

SAND, GRAVEL, AND CRUSHED STONE ON-THE-JOB TRAINING MODULES

Module 16 - “Handling Material with a Shop Overhead Traveling Crane”

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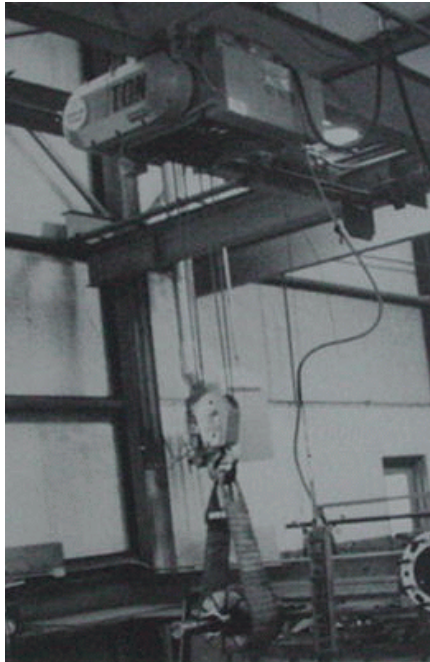
INSTRUCTION GUIDE SERIES

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**MODULE NUMBER 16
OF
INSTRUCTION GUIDE NUMBER 40**

**ON-THE-JOB TRAINING
FOR THE
SAND, GRAVEL, AND CRUSHED STONE INDUSTRY**

**HANDLING MATERIAL WITH A SHOP OVERHEAD TRAVELING
CRANE**



This module describes the basic job steps, potential hazards and accidents, and recommended safe job procedures for handling materials with a shop overhead traveling crane.

An overhead crane may be operated either from a cab or from the floor. If a crane is operated from the floor, control devices may be either pendant, push-buttons, or pull-ropes. Control handles should be clearly identified by signs, shape, or position, so that an operator, while looking at the signal man (if needed), can tell by “feel” which motion is being controlled. Controls on floor-operated, and on cab-operated, cranes should be identified. If there are

several cranes on the same runway, or in the same building, all should have the controls in identical positions so that a substitute operator will not be confused. Safe means must be provided for the operator to access a cab-operated crane. In case of fire, the operator must be able to escape from the crane, regardless of its location on the runway.

The bridge-truck wheels and trolley wheels should have sweeps to push away a person's feet or hands. An automatic alarm should sound continuously from the time the travel controller handle is first moved from the "off" position, until it is returned to the "off" position. Warning bells, or horns, and flashing lights (arranged to operate automatically when a crane is approaching) should be placed in aisles and walkways. An electronic device, which sounds a distinct alarm at a predetermined distance, should be used to warn operators, when two or more cranes are operating on the same runway.

Operations

When not in use, the crane should be parked with the load hook and slings raised high enough to clear the heads of persons working on the floor below. The operator should also place all controls in the "off" position, and lockout the crane. A light should be visible from the floor to indicate when the main switch is on. Controllers should be the spring return type; or the momentary contact, push-button type.

The operator should center the trolley over the load when starting to make a lift, and should slowly accelerate lifting motions, or brake lowering motions, in order to minimize stress on the crane. The operator should also periodically check that the crane is running square with the runway rails, by carefully running the crane up against the rail stops. Both sides should bump against the stops at the same time.

The following is a set of safety rules for operation of overhead cranes:

1. Only authorized operators are allowed to use any crane.
2. Remain in the crane cab when on duty.
3. Never go on top of the crane, or permit anyone else to do so, without first opening the main power disconnect switch and locking it out and tagging it.
4. Be sure hook is high enough to clear obstacles before "traveling" trolley or crane bridge.
5. Never permit the crane to bump into another crane.
6. Examine the crane at the start of every shift for loose or defective gears, keys, runways, railings, warning bells, signs, switches, sweep-brushes, cables, etc. Do not operate crane with any safety defects. Be sure that crane is kept clean and well lubricated.

7. While hoisting equipment is in operation, operator should not perform any other work, and should not leave position at the controls until the load is safely landed or returned to ground level.
8. Do not carry a load above personnel. Sound alarm when necessary.
9. Do not allow personnel to ride on a load or on crane hooks.
10. If the power goes off, move the controller to the "off" position until the power is restored.
11. Check that the fire extinguisher on the crane is properly maintained.
12. Do not operate a crane if you are not physically fit. When ill, report to your foreman.
13. Do not drag the slings, chains, or load block. After the load is removed, do not move the crane until the hook is lowered and hook-on operator has hooked up chain or sling.
14. If asked to do something that seems unsafe, call foreman or repairman in charge for advice.
15. Before leaving cab, open the main switch. Make sure that the magnet, or hook, is empty and that the magnet-controller (if any) is off. Lock, or otherwise secure, equipment in order to prevent unauthorized use.
16. When parking an outside crane at the end of a shift, always set brake, or chain crane to the track. Lower booms to ground level, or secure them against displacement by wind or other outside forces.
17. Stop operation and open the power switch if the crane fails to respond correctly. Then notify the foreman. Attempting to get out of difficulty by repeated operation may make a condition worse.
18. Whenever a slack-line condition occurs, check the seating of the ropes on sheaves and drums before further operation.
19. Never pick up a load beyond the rated load capacity of the crane. In case of doubt, call the foreman.
20. Never move the load, or crane, unless you understand the floor signal.
21. When there are several ground persons, obey only the signals from the person in charge - except, obey an emergency stop signal given by anyone.
22. Do not allow the load to swing against the hook-on man or other floor-men. Make sure that all persons are clear of a load.

23. When raising or lowering a load, make sure that the load safely clears adjacent stockpiles or machinery.
24. Never leave a load suspended.

The following safe job procedures will help to minimize incidents which could cause injuries and adversely affect production.

REQUIRED OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:

**HARD HAT, SAFETY SHOES, SAFETY GLASSES, GLOVES,
HEARING PROTECTION**

SEQUENCE OF BASIC JOB STEPS	POTENTIAL ACCIDENTS OR HAZARDS	RECOMMENDED SAFE JOB PROCEDURES
1. Move hoist to material to be handled.	1. A) Struck by hoist hook or sling. B) Slip, trip, or fall; struck against stationary object.	1. A) Carry hook high when moving hoist. Walk clear of hook movement, and sound warning to other workers. B) Use designated walkways, and keep them clear of tripping hazards and spills. Avoid undue haste. Face in direction of travel.
2. Check sling or chain, if used.	2. A) Struck against hook or sling. Contact with burrs, or sharp metal.	2. A) Never handle metal objects with bare hands. Keep rope slings or chains in good condition. Replace bad ropes or chains.
3. Attach sling or chain to load.	3. A) Struck against, or caught on material handled.	3. A) Adjust movement to clearance. Material should be stored so that it is easily accessible. Keep slings in good repair.
4. Lower hoist hook.	4. A) Struck by hoist hook.	4. A) Stand clear of hook being lowered. Keep other workers clear.

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| 5. Attach hoist hook to sling. | 5. A) Caught between hoist hook and sling, or material.

B) Fall while hooking load. Overexertion. | 5. A) Get enough slack to make hook-up easier. Keep body parts out of pinch points.

B) Maintain good body balance. Do not over-reach. Have ample slack to make hook-up. |
| 6. Raise load. | 6. A) Struck by load, if sling fails. Caught between load and floor, or other object. | 6. A) Load should not be raised until proper signal is given. Use lift sling of adequate size. Make secure hook-up. Hook sling such that load is balanced. Stand clear of load. Use push pole or tag line to maneuver load. |
| 7. Move load to desired point. | 7. A) Slip, trip, or fall.

B) Struck by load being moved. Caught between load and fixed object. | 7. A) Keep walkways clear. Clean up any spills. Face direction of travel.

B) Face direction of travel. Use tag line or push pole to guide load. Sound warning, and be sure other workers are away from load. Obey stop signal from anyone. |
| 8. Lower load. | 8. A) Struck against load and another object.

B) Caught between load and fixed object. | 8. A) Avoid undue haste. Adjust movement to available clearance.

B) Keep all workers clear of area where load is being deposited. |

9. Unhook load from hoist.

9. A) Caught between hook and sling, or load and sling.

B) Overexertion while removing sling.

9. A) Wear gloves. Remove hand from controls when unhooking, in order to prevent accidental tightening or slack.

B) Have ample slack to unhook sling.

10. Move hoist clear of load.

10. A) Struck by hook.

10. A) Keep all workers clear of hook movement. Give warning. Have good communication with co-workers in area.

11. Remove sling from load.

11. A) Overexertion removing sling.

B) Struck by shifting load.

11. A) Set load on blocks, so that sling or chain can be easily removed.

B) Secure load in place before removing sling.

GENERAL INFORMATION

This module is part of an Instruction Guide that was developed to assist the sand, gravel, and crushed stone industry in conducting effective on-the-job training (OJT) of new employees, or employees reassigned to different jobs. The use of training materials, such as this module, is an important part of an effective, systematic, OJT program.

This Instruction Guide uses a generic Job Safety Analysis (JSA) of jobs common to the industry. The JSA format facilitates uniform basic training in safe job procedures, while requiring only a minimum of time and effort on the part of the trainer. This material is generic to the industry; therefore, each company using this guide will need to tailor the material somewhat to fit their particular requirements. In some cases, the material must be general in nature, and will not include specific details of procedures or equipment that must be taught by the trainer.

Recommendations for an overall OJT program are contained in the Mine Safety and Health Administration (MSHA) guide: "Structuring Effective On-The-Job Training Programs"

TRAINING RECOMMENDATIONS

On-the-job training is usually best done by the employee's immediate supervisor. If the supervisor relies on another employee to do certain parts of the training, the supervisor should be present to monitor the training. OJT is conducted at the actual job site, where the work will be done.

The supervisor/trainer should use the training materials (this module, or other materials) while the training is being done, to help ensure that all job steps are covered, and that no important safety precautions are omitted. Effective OJT should begin with an explanation (lecture and/or discussion) of the safe job procedure. The explanation should be followed by a hands-on demonstration of the proper job procedure. A good demonstration is, perhaps, the most important part of OJT. The demonstration is followed by supervised practice, during which the supervisor/trainer coaches (corrects and encourages) the employee, and evaluates when the employee is ready to do the job without direct supervision.

The first step - explaining the job to the employee - can be done in different ways. The supervisor/trainer and the employee can sit down and go through the training materials together. It may be advantageous to provide the employee with a copy of the training modules that are applicable to his/her job. The fact that most of the training is conducted at the job site does not preclude the use of a classroom, or a quiet office, for the first part of the training. Any general theory, or knowledge training, as well as the initial explanation of the job procedure, may be best done in an office/classroom setting; especially when noise levels, or other conditions at the job site, make communication difficult. A complete series of job steps could be presented through the use of slides developed at the mining operation.