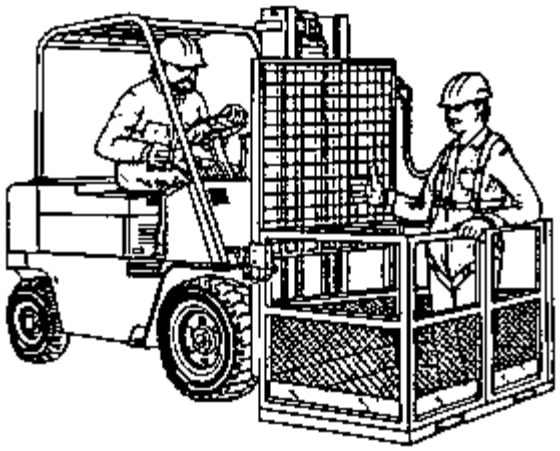
CODE OF PRACTICE

For the Safe Operation of Powered Lift Trucks



September 1998
Workplace Safety and Health Division

Manitoba
Building for the Future

TABLE OF CONTENTS

INTRODUCTION

The Code for Safe Operation of Powered Lift Trucks has been developed to help employers implement and maintain safe systems of work in workplaces where powered lift trucks are operated.

Definition:

For purposes of this code, Powered Lift Trucks include self-propelled vehicles of Class 1 to 7 as defined by the Industrial Truck Association as follows:

- **Class I** - Electric motor rider trucks
- **Class 2** - Electric motor narrow aisle trucks
- **Class 3** - Electric motor-driven hand trucks
- **Class 4 & 5** - Internal combustion engine lift trucks, cushion or pneumatic tires
- **Class 6** - Electric and internal combustion engine tractors
- **Class 7** - Rough terrain lift trucks

Injury data analysis indicates that powered lift trucks continue to pose significant risks to workers who operate or work around them. A review of accident scenarios involving lift trucks suggests that accidents usually result from a variety of causes. In the majority of cases, there was a breakdown in the overall system of work organization - people, equipment, tasks and the workplace environment. Another significant observation from the scenarios was that many accidents could have been prevented if existing regulatory requirements had been obeyed.

This code is intended to provide practical advice on how employers may fulfil their obligations to protect the safety and health of workers who operate or work around powered lift trucks. Section A of the code presents the key elements to be included in an effective safety program for lift trucks. One such element is competence of the lift truck operator.

Section B sets out a definition for "competence" to operate a powered lift truck.

SECTION A:

Key Elements of an Effective Safety Program For Powered Lift Trucks

1.0 GENERAL

The Workplace Safety and Health Division recommends that employers whose work requires the use of powered lift trucks, implement a lift truck safety program which includes the following key elements:

- **HAZARD IDENTIFICATION** - identify the ways in which workers who operate or work around powered lift trucks may be harmed;

- **INFORMATION, INSTRUCTION, TRAINING** - provide training, information and instruction to lift truck operators and those who work in the vicinity of the lift trucks about the hazards associated with the work and how to protect themselves and others from them;

- **EFFECTIVE SUPERVISION** - appoint competent supervisors;

- **INTERNAL RESPONSIBILITY** - involve workplace parties in managing the safety of lift truck operations;

- **RULES FOR EQUIPMENT MAINTENANCE, REPAIR, MODIFICATION** - prepare rules and procedures for the proper testing, maintenance, repair and modification of lift trucks, including rules governing the qualifications of persons authorized to carry out these activities;

- **LIFT TRUCK SELECTION CRITERIA** - select lift trucks based on the type of job to be done and the environment in which the job will be done;

- **SAFE OPERATING PROCEDURES** - establish safe work practices and management systems;

- **FACILITY DESIGN** - design and maintain the work environment in a manner to reduce the likelihood of accidents involving powered lift trucks.

2.0 HAZARD IDENTIFICATION

The Act requires an employer to "provide and maintain a workplace, necessary equipment, system, and tools that are safe and without risks...". To satisfy this requirement, an employer must first identify the hazards. The Workplace Safety and Health Division recommends that employers:

2.1 Identify the ways in which a worker who operates or works around a powered lift truck may be harmed, taking into consideration the equipment that will be used, the jobs to be done and the workplace environment.

2.2 Prepare a written report specifying the potential sources of harm identified. The written report will be useful in ensuring complete and consistent information to workers about the hazards associated with their work.

2.3 Reassess the sources of harm if any element of the work changes in a significant way - equipment, worker, load, work environment - and make appropriate changes to the written report on hazards if necessary.

NOTE:
A number of techniques may be used to identify hazards, for example: seeking advice from safety associations or other specialists, talking with supervisors and workers, reviewing information from manufacturers, analyzing work processes, analyzing incidents, accident and injury data.

3.0 PEOPLE: Training, Instruction, Supervision

The Act and regulations impose certain obligations on employers regarding training of workers in the workplace. Under the Act employers have an obligation to: i) acquaint a worker with the handling of any equipment; ii) inform a worker and supervisor about any hazard in the work; iii) instruct, inform and supervise workers to protect their health and safety; and iv) appoint competent persons as supervisors. An employer must ensure that a person assigned to operate a powered lift truck is "competent" or "qualified" to do so. To fulfil these obligations an employer should:

3.1 Establish the Competence of Workers who will Operate Lift Trucks:

3.1.1 Before assigning a worker to operate a powered lift truck without direct supervision, ensure that the worker has achieved the appropriate standards specified as final outcomes in the Definition for Competence to Operate Powered Lift Trucks in section B. The introduction to section B includes recommendations on how an employer may ensure that a worker has achieved the required standard.

3.2 Inform and Instruct Pedestrians and Others in the Workplace:

3.2.1 For each hazard/potential source of harm identified, prepare written rules and procedures for preventing accidents and injuries.

3.2.2 Inform and instruct supervisors and all workers who will lwork around lift trucks about the hazards and the rules and procedures they must follow to avoid harm, and the location of the written rules and procedures.

3.2.3 Ensure supervisors and workers are informed of any changes to the rules and procedures because of changes in the work.

3.3 Provide Effective Supervision:

3.3.1 Appoint as supervisors of lift truck operations only those persons who, through training and experience, know the hazards associated with the type of lift truck being used, the loads being handled and the environment in which the truck will be operated and are able to identify unsafe conditions and implement corrective measures.

3.3.2 Encourage supervisors to be vigilant for unsafe conditions and to correct them immediately they are detected.

3.4 Promote Internal Responsibility:

3.4.1 Involve the Safety and Health Committee, safety and health representative (if any), supervisor, workers in identifying workplace hazards, the development of rules and procedures to prevent injuries, identifying causes of accidents, incidents and "near misses" and monitoring lift truck safety improvements.

4.0 EQUIPMENT: Maintenance, Repair, Modification, Selection, Safety

The Act requires employers to maintain in good condition any equipment provided to workers. Maintenance must be carried out by a competent person and any repairs or modifications to any equipment or part of equipment must not reduce the safety factor. The Workplace Safety and Health Division recommends that employers:

4.1 Prepare and Enforce Rules for Inspection, Testing, Maintenance:

4.1.1 Prepare written instructions on the nature and frequency of inspections, testing and maintenance, taking into account the work to be done and the environmental conditions to which the truck will be exposed and ensuring that the instructions are at least equivalent to the minimum requirements established by the manufacturer and any applicable regulations. The instructions for maintenance should require verification of the lifting capabilities of the truck prior to being used for the first time, as well as indicate the frequency of monitoring the adequacy of the lifting capabilities, the mechanical fitness and vehicle emissions.

NOTE:
Where a supplier is responsible for maintenance of the lift truck an employer may want to ask the supplier to provide written notice of the nature and frequency of testing and maintenance at initiation of the rental/leasing arrangement so that he/she can monitor the supplier's compliance with the schedule.

4.1.2 Permit inspection, testing or maintenance to be performed only by persons whose training and experience provide them with expert knowledge on such activities and ensure that they comply with the written instructions.

4.1.3 Permit only persons whose training and experience provide them with expert knowledge of the effects of modification on the safety factor and the safe operation of the truck, such as the manufacturer's representative or qualified mechanic or engineer to perform any repair, modification or replacement of any part of a powered lift truck.

4.1.4 Ensure that a record is kept at the workplace of any inspection, testing, maintenance, repair or modification to the truck and the name and qualifications of the person doing the work.

4.2 Establish Lift Truck Selection Criteria:

4.2.1 Ensure that the fire hazard designation, carrying capacity, reach capabilities and the features of the lift truck selected to do a job are suitable for the types of loads to be handled, the terrain over which loads will be carried, the atmospheric conditions in the workplace and the design of the workplace. For example, gas, propane or diesel operated lift trucks are not recommended for use in locations where explosive concentrations of flammable gases or vapours may be present and also should not be operated in areas where exhaust gases may accumulate creating a hazard of carbon monoxide poisoning.

4.3 Provide Safe Lift Trucks:

4.3.1 Ensure operators are protected against falling or intruding materials by means of suitable screens, guards, grills or structures.

4.3.2 Ensure every lift truck clearly displays a load chart showing the maximum rated load and the variation of the rated safe load capacity with the reach of the equipment, and if the truck has been modified, the chart must be changed to reflect new load ratings.

4.3.3 Ensure lift trucks are equipped with warning devices and lights that are appropriate for the work environment.

4.3.4 Where a seat belt or other restraining device is likely to contribute to the safety of the operator, equip the lift truck with such a restraining device if it is feasible to do so.

5.0 SAFE OPERATING PROCEDURES: Work Practices, Traffic Management

Injury data indicate that issues related to work practices and traffic management have been contributing factors in a number of fatalities and critical injuries involving powered lift trucks.

5.1 Therefore, as a minimum, employers should ensure that the following requirements are complied with:

- no part of a load must pass over any worker; a lift truck left unattended must be immobilized and secured against accidental movement and forks, buckets or other attachments must be in the lowered position or be firmly supported;
- no load may exceed the maximum rated load and loads must be handled in accordance with the height and weight restrictions on the load chart;
- when a load is in the raised position, the controls must be attended by an operator

- if an operator does not have a clear view of the path a signaller who has been instructed in a code of signals for managing traffic in the workplace must be used;
- loads must be carried as close to the ground or floor as the situation permits;
- loads that may tip or fall and endanger a worker must be secured;
  where a lift truck is required to enter or exit a vehicle to load or unload, the vehicle must be immobilized and secured against accidental movement;
- a lift truck must not be used to support, raise or lower a worker unless the work is carried out in accordance with the code "codes for Work Platforms Mounted on Industrial Forklift Trucks";
- barriers, warning signs, designated walkways or other safeguards must be provided where pedestrians are exposed to the risk of collision.

5.2 In addition to the safe operating procedures above, each workplace should develop and implement a set of rules and safe operating procedures to address the specific hazards in the workplace.

6.0 THE ENVIRONMENT: Facility Design

Poorly designed workplaces contribute to accidents and injuries. Therefore, employers should:

6.1 Ensure that in aisles, at loading docks, through doorways and in rooms, overhead and side clearances are adequate to permit safe operation of the lift truck.
6.2 Ensure floors, aisles and passageways are kept clear and free of hazards.
6.3 Ensure the workplace is so ventilated as to prevent the accumulation of vapours from the refuelling and operation of lift trucks.

SECTION B:

Definition of Competence to Operate Powered Lift Trucks

1.0 INTRODUCTION

The Workplace Safety and Health Act requires employers to ensure that a worker who is assigned to operate a powered lift truck is competent or qualified to do so. This section sets out the knowledge and skills a competent/qualified operator must demonstrate.

A competent/qualified operator is one who knows not only how to operate the particular class of powered lift truck(s) to which he/she has been assigned but also knows the hazards associated with the work he/she has been asked to do and how to operate the truck(s) in a manner that protects his or her own safety and the safety of others in the specific workplace.

Establishing the Competence of Operators

To establish a worker's competence to operate a powered lift truck, an employer should ensure that the worker:

a) has been informed of the hazards associated with operating a powered lift truck in the particular workplace, including the hazards associated with the load, the design of the workplace, the environmental conditions;
b) knows how to protect him/herself and others from the hazards;
c) has demonstrated to a person whose training and experience provide him/her with expert knowledge on the safe operation of powered lift trucks that he/she has acquired the skills and knowledge identified as final outcomes in the Definition.

Employers may consult a safety association or the lift truck manufacturer for information on institutions, agencies or persons with expert knowledge of lift trucks.

Employers should maintain in the workplace a record of workers competent to operate powered lift trucks. For each worker, the record should indicate the skills and knowledge successfully demonstrated, the class or classes of truck on which he/she was assessed, the name and affiliation of the assessor and the date the assessment was done. To facilitate identification of competent operators, employers shall issue certificates to such workers.

If a medical condition affects a worker's ability to operate a powered lift truck safely around other workers, he/she should not be assigned to operate this equipment.

2.0 KNOWLEDGE AND SKILLS REQUIRED TO BE COMPETENT

2.1 Knowledge

A "competent" operator knows/understands:

- the sections of the Workplace Safety and Health Act and regulations applicable to the work;

- the hazards associated with the work, including the principles of operation and features of the lift truck, workplace conditions and environment, and activities that pose actual or potential danger to health and safety in the workplace;

- the manufacturer's specifications related to the operation and safe load handling for the class or type of truck(s) he/she will be operating.

- the procedures and practices for ensuring worker safety that are specific to the workplace.

2.2 Skills

A "competent" operator must be able to perform the following procedures in a manner consistent with the competence standards using the device he/she will be assigned and under typical workplace conditions:

- Pre-operational check

- Start-up and Shut-down

- General Operation - stopping, starting, turning, driving forward and in reverse, parking, operating around personnel

- Load Handling - selection and security of loads, pick-up and placement, personnel lifting, stacking and destacking

- Loading and Unloading - transport vehicles, structures, elevators

- Operational Maintenance - refuelling, recharging (where appropriate).

2.3 KNOWLEDGE TO BE ACQUIRED

	INSTRUCTIONAL OBJECTIVES	FINAL OUTCOMES FOR OPERATOR COMPETENCE
Applicable Legislation	• applicable sections of the Workplace Safety and Health Act	A competent operator knows/understands: • a worker's duties • a worker's right to refuse work where health or safety is in danger • an employer's duties to protect workers
	• applicable sections of Regulations made under the Act	A competent operator knows/understands: • how to ensure the safety of other workers in the area • requirements for lifting devices, material handling, motor vehicles, traffic control • requirements related to the handling of loads • requirements for protective equipment
Features of the Lift Truck	• principles of operation and features	A competent operator knows/understands: • lift truck classification and designations • lift truck stability triangle and trapezoid • what is meant by load centres • centre of gravity of load • longitudinal and lateral stability • "centre of gravity" of lift truck • the effects of speed, acceleration, sharp cornering, height, attachment, grade/ ramps and load security • operator blind spots associated with the design of the lift truck (components, permanent equipment, attachment) • the main components of the lift truck with emphasis on the lifting/handling systems and their basic functions • the factors affecting stability, reach/ retract, counterbalance principles, tilt

	INSTRUCTIONAL OBJECTIVES	FINAL OUTCOMES FOR OPERATOR COMPETENCE
Features of the Lift Truck (cont'd)	• principles of operation and features (cont'd)	A competent operator knows/understands: • the location of the capacity plate and the information outlined on the plate • model/serial number, • capacity rating at a given load centre at a given height, • maximum lifting height of forks/attachment, • truck weight and minimum battery weight
	• manufacturer's specifications	A competent operator knows/understands: • where to access the Operator Manual • the operating information outlined in the Manual the pre-operational and maintenance tasks described in the Operator Manual
Hazards in the Workplace	• dangerous activities	A competent operator understands the dangers of: • operating with restricted visibility (blind spots, corners, intersections) • parking a vehicle on an incline • not stopping before entering an incline • travelling over railway tracks • allowing riders unless there is an approved passenger seat • permitting anyone to stand/walk under loads or ride on loads • not keeping all parts of the body inside the operator's compartment at all times • travelling with the load lifted more than 10 cm above the floor • dragging the forks when inserting or withdrawing them from a load • increasing the capacity of the truck or overloading the truck • stunt driving and horseplay • allowing anyone to stand on the forks or climb on the upright assembly

	INSTRUCTIONAL OBJECTIVES	FINAL OUTCOMES FOR OPERATOR COMPETENCE
Hazards in the Workplace (cont'd)	• dangerous activities (cont"d)	A competent operator understands the dangers of: • moving a load with someone steadying it • jumping from the lift truck in the event of a tip over • uneven surfaces • mast not tilted back enough to stabilize the load
	• dangerous conditions	A competent operator understands the dangers of: • explosive atmospheres • operating on a slippery surface (floor, ramps, dock plate etc.) • the accumulation of exhaust emissions (carbon monoxide) in restricted spaces such as railway cars, trucks etc. • operating with restrictions such as overhead equipment and/or other obstructing stationary building structures • pedestrian traffic along the path of the travel route • workplace noise • inadequate lighting • other vehicular traffic
Workplace specific procedures and practices	• emergency procedures	A competent operator knows/understands: • the emergency procedures defined by the employer • how to operate the particular type or class of fire extinguisher in the workplace
	• workplace specific rules and procedures	A competent operator knows/understands: • the procedures and rules that have been established by the employer to ensure safe operation of powered lift trucks in the workplace including, rules for when pedestrians have the right-of-way, code of signals used to manage traffic (if any), rules for maintenance, testing and repair of the lift truck.

2.4 SKILLS TO BE ACQUIRED

PROCEDURE	TASKS To be assessed	FINAL OUTCOMES FOR OPERATOR COMPETENCE
General Operation	• pre-operational check(circle check)	Before operating a lift truck, a competent operator: • carries out a visual inspection of the truck and its attachments to ensure that all are in good operating condition, using a checklist provided by the employer • follows recommended procedures for daily inspections of oil and water levels
	• start up	A competent operator: • uses the correct mounting procedure • assumes the appropriate driving position • ensures transmission/directional control lever in "Neutral" • ensures parking brakes applied • activates start button/ switch • ensures warning system operating
	• starting, stopping and turning	A competent operator: • starts and stops safely with and without a load • allows sufficient room for turning corners • operates at low speed when turning • uses appropriate steering techniques when turning in confined and limited spaces
	• shut-down and parking	A competent operator: • brings the truck to a complete stop, sets the parking brake, returns transmission/ directional control lever to "Neutral" • lowers forks to the ground, tilts them forward • uses appropriate shut down procedures and turns off power supply • chocks wheels if risk of truck moving
	forward and reverse driving on level ground	A competent operator: • keeps all parts of the body inside the operator's compartment at all times • ensures clear visibility in the intended direction of travel • if visibility is restricted, drives the truck in reverse or asks to be guided • keeps the load-engaging means or the load itself low (usually within 10 cm of the floor) and tilted backward • keeps safe operating distance from other lifting devices, pedestrians, machinery

PROCEDURE	TASKS To be assessed	FINAL OUTCOMES FOR OPERATOR COMPETENCE
General Operation	• forward and reverse driving on level ground (cont'd)	• observes traffic management rules established by the employer • drives at an appropriate speed, taking into consideration the type of device, the load, the pedestrian traffic along the path of the travel route, any obstructions and the condition of the driving surface • adjusts fork arms and/or attachments appropriately to maintain stability • observes weight restrictions for floors and elevators • takes appropriate action when meeting restrictions such as overhead equipment and/or other obstructing stationary structures
	• forward and reverse driving on inclines, ramps or uneven terrain	A competent operator: • when not carrying a load, travels forward down an incline and travels in reverse up an incline • when carrying a load, travels in reverse down an incline and travels forward up an incline • ensures that there is sufficient clearance for the lift truck, operator and load prior to travelling on an incline or uneven terrain • does not turn the truck around on a ramp or incline • drives at an appropriate speed taking into consideration the effects of gradient on the truck and on load security • approaches the grade straight and not at an angle • operates in gear • ensures visibility is clear in the direction of travel • verifies that the incline does not exceed the maximum permissible slope
	• operating around personnel	A competent operator: • always faces in the direction of travel • when turning, ensures no personnel within the truck's danger zone • observes employer's codes for ensuring the safety of pedestrians • if stopped at intersection, does not move until eye contact made with any personnel at intersection • maintains safe distance from pedestrians

PROCEDURE	TASKS To be assessed	FINAL OUTCOMES FOR OPERATOR COMPETENCE
Load Handling	• selection of loads	Before picking up a load, a competent operator: • assesses the weight distribution of the load and identifies limitations of the structures where the load has to be placed • ensures that load is within the rated capacity for the device, taking into account the job to be done • checks forks/attachments to ensure that they are safe to use with respect to capacity rating
	• load pick up and placement	A competent operator: • checks overhead clearance • ensures truck safe distance from any live power lines • engages at least 2/3 of the load length to be lifted and centres load evenly on forks • adjusts the tilting angle of the mast, height of fork arms and reach extension to stabilize load • ensures no loose articles lying on top of the load • does not drag the forks when inserting or withdrawing them from a load • does not raise or lower loads while truck is in motion
	• load security and integrity	A competent operator: • observes the limits for freestanding stack height • makes sure load is secure and balanced before lifting
	• stacking and destacking	A competent operator: • is able to stack safely the particular types of loads encountered in the workplace • ensures that pallets or skids are safe to be moved and stored; for example, ensures no broken runners or legs
	• personnel lifting, lowering and supporting	• ensures lift truck meets prescribed requirements • uses only a platform specifically designed for the purpose and having a guardrail • ensures that the platform is secured to the mast as prescribed • raises and lowers the platform to test its operation before allowing anyone on it • ensures that the person on the platform is secured as prescribed

PROCEDURE	TASKS To be assessed	FINAL OUTCOMES FOR OPERATOR COMPETENCE
Load Handling (cont'd)	personnel lifting, lowering and supporting (cont'd)	• keeps the upright in a vertical position • remains at the controls at all times while a person is on the platform • does not travel with personnel on the platform • ensures the safety of pedestrians in the area
Loading and Unloading	loading trucks and railway cars	Before driving into any truck, trailer or railway boxcar, with or without a load, a competent operator: • ensures that the vehicle being loaded is adequately restrained to prevent movement • inspects floors for stability and integrity • ensures adequate lighting • ensures that the dock/bridge plate is one designed to support the mass of the loaded lift truck • ensures that the dock/bridge plate is firmly in position • ensures the trailer is properly supported by a jackstand where appropriate (e.g., when not connected to the tractor)
	• transporting loads in elevators	A competent operator: • ensures the elevator is capable of supporting the loaded lift truck • before entering, makes sure the elevator floor is level with the building floor • if applicable, waits for the signal from the elevator operator before entering • ensures that no other person remains on the elevator with a truck and load on board • sets the brakes "on", lowers the load to the floor, places controls in neutral, shuts off the power and gets off the truck
	• unloading	A competent operator: • verifies that the structure where the load has to be placed is able to carry the weight of the load • when stacking loads, does not block access to fire • extinguishers, exits or stairways • ensures the load at the bottom is secure and levelled • tilts load forward • exits with forks level

PROCEDURE	TASKS To be assessed	FINAL OUTCOMES FOR OPERATOR COMPETENCE
Operational Maintenance	• refuelling and recharging	A competent operator who will perform routine maintenance and has been trained to do so safely: • follows the manufacturer's requirements and employer's procedures for safe refuelling and recharging of lift trucks including: • wearing the appropriate personal protective equipment, including eye protection • properly positioning and securing vehicle • observing workplace precautions with respect to fires

Acknowledgment:
Workplace Safety and Health Division wishes to acknowledge the Ontario Ministry of Labour for permission to reprint with some adaptation their Guideline for Safe Operation of Powered Lift Trucks (ISBN 0-7778-6030-9).