

ATLB-1390: MASON TENDING FORKLIFT

Cuyahoga Community College

Viewing: ATLB-1390 : Mason Tending Forklift

Board of Trustees:

2017-06-29

Academic Term:

Spring 2019

Subject Code

ATLB - AIT-Construct/Hazard Material

Course Number:

1390

Title:

Mason Tending Forklift

Catalog Description:

Course covers the safe operation of the rough terrain forklift and addresses site effects of machine operation. In addition, related load capacities, including boom angles, swing loads and machine maintenance affect operation and machine life.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: admission to the Laborer's apprenticeship program.

Outcomes

Course Outcome(s):

Evaluate the safe operation of the rough terrain forklift and identify the terms, components and forces related to the equipment and its operation and accident prevention.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Identify and define the terms related to rough terrain forklifts.
2. List the components of the rough terrain forklift.
3. Identify and discuss the effects of mechanical physics on the equipment.
4. Discuss how machine tipping is a result of changing centers of gravity.
5. List the uses of the rough terrain forklift.
6. Discuss the various maneuvers of the equipment.
7. Differentiate between rough terrain forklifts and standard motor vehicles.

Course Outcome(s):

Explain how ground conditions on construction sites affect the operation and stability of the rough terrain forklift.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Identify the environmental effects on ground conditions.
 2. Discuss the effects of wheel ruts with respect to rough terrain forklifts.
 3. Explain the importance of identifying safe travel paths for rough terrain equipment.
 4. Identify jobsite obstructions for equipment operation including overhead electrical lines, low clearances and physical obstructions.
 5. Discuss the effects of varying ground features including sloping topography and soft ground conditions on lifting equipment.
 6. Discuss the effects of equipment speed with respect to ground conditions.
 7. List the various types of construction site ground conditions.
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Course Outcome(s):

Examine the related load capacities of mason forklifts and explain how boom angle, swinging loads and outriggers affect the calculated and estimated machine capacity.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Explain how varying boom angles and lengths affect load carrying capacities.
 2. Discuss the importance of securing loads and the use of outriggers when lifting material using a mason forklift.
 3. Calculate load carrying capacities by interpolating load charts and calculating material weight and volumes of construction components.
 4. Describe the how equipment maintenance can affect lifting capacities.
 5. Explain how suspended loads affect lifting momentum machine stability and safety.
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Course Outcome(s):

Explain and express the importance of regularly schedule maintenance on mason forklifts and discuss inspection procedures.

Essential Learning Outcome Mapping:

Critical/Creative Thinking: Analyze, evaluate, and synthesize information in order to consider problems/ideas and transform them in innovative or imaginative ways.

Objective(s):

1. Discuss the procedures that are followed during machine inspections
 2. Discuss the effects of machine capacities relative to regular inspection schedules
 3. List the inspection checklist items that should be addressed during routine maintenance.
 4. Demonstrate the ability to conduct a pre-operational inspection of mason forklifts.
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Methods of Evaluation:

1. Quizzes
2. Tests
3. Class participation

Course Content Outline:

1. Rough terrain forklift
 - a. Terminology
 - i. Center of gravity
 - ii. Momentum
 - iii. Leverage
 - iv. Axle width
 - v. Wheel base
 - vi. Forks
 - vii. Boom
 - viii. Feathering
 - ix. Straight mast
 - x. Extended reach
 - b. Equipment components
 - i. Forks
 - ii. Boom

- iii. Outriggers
 - iv. Counter weight
 - v. Axle
- c. Mechanical physics
 - i. Momentum
 - ii. Leverage
 - iii. Center of gravity
 - iv. Mechanical advantage
 - v. Effects
 - 1. Tipping
 - 2. Roll over
 - 3. Lifting loads
 - 4. Falling loads
 - 5. Instability
- d. Tipping and center of gravity
 - i. Load and axle distance
 - ii. Load height
 - iii. Weight
 - iv. Starts and stops
 - v. Change of direction
 - vi. Sloping ground
- e. Uses
 - i. Material transport
 - ii. Equipment relocation
 - iii. Working platforms
- f. Maneuvers
 - i. Boom raising
 - ii. Boom lowering
 - iii. Fork tipping
 - 1. Up
 - 2. Down
 - iv. Machine leveling
 - v. Driving
 - 1. Forward
 - 2. Reverse
 - vi. Outrigger deployment
 - vii. Boom retraction
- g. Rough terrain forklift versus motor vehicle
 - i. Differences
 - 1. Steering
 - 2. Stability
 - 3. Braking systems
 - 4. Hydraulics
 - ii. Similarities
 - 1. Directional driving
 - 2. Brakes/parking
 - 3. Fuel
- 2. Ground conditions
 - a. Equipment speed
 - i. Site profile
 - ii. Excessive travel speed
 - iii. Downward travel
 - iv. Reverse travel
 - v. Site conditions
 - vi. Load carrying
 - b. Types
 - i. Wet
 - ii. Muddy
 - iii. Slick

- iv. Sloped
 - v. Frozen
 - vi. Ruts
 - vii. Ideal
 - c. Wheel rut effects
 - i. Jolts
 - ii. Tipping
 - d. Environmental effects
 - i. Rain
 - ii. Snow fog
 - iii. Wind
 - e. Travel paths
 - i. Obstruction avoidance
 - ii. Safe routes
 - iii. Vehicle conflicts
 - f. Jobsite obstructions
 - i. Power lines
 - ii. Low clearances
 - iii. Excavations
 - iv. Utility poles
 - v. Parked equipment
 - g. Sloped and soft ground effects
3. Load capacity
- a. Forklift boom
 - i. Boom angle
 - 1. Greater
 - 2. Less
 - 3. Trajectory
 - ii. Boom length
 - 1. Increase
 - 2. Decrease
 - b. Secure load affects
 - i. Shifting
 - ii. Slipping
 - iii. Tipping factor
 - c. Outriggers
 - i. Increased capacities
 - ii. Machine stability
 - iii. Boom extension
 - d. Equipment maintenance
 - i. Tire pressure
 - ii. Lubrication
 - iii. Hydraulics
 - e. Suspended loads
 - i. Lifting momentum
 - ii. Safety
4. Machine inspection
- a. Inspection and capacity
 - i. Machine life
 - ii. Load carrying
 - iii. Equipment failure
 - b. Inspection procedures
 - i. Documentation
 - ii. Checklist
 - iii. Corrective measures
 - c. Checklist items
 - i. Tires
 - ii. Wheels
 - iii. Fluids

1. Transmission
2. Hydraulic
3. Coolant
4. Oil
5. Water
- iv. Battery
- v. Hoses
- vi. Brakes
- vii. Roll over protection structure
- viii. Seat belt
- ix. Visual
 1. Headlights
 2. Glass
- x. Alarms
- xi. Boom
- xii. Outriggers
- xiii. Electrical

Resources

Drexel J. Thrash Training Center. *Forklift Safety*. current. Howard, Ohio 43028; Drexel J. Thrash Training Center, 2012.

Yates. *Safety Professionals*. second. Boca Raton, FL; CRC publishers, 2015.

Bauer, Roger. *Safety and Health for Engineers*. third. Hoboken, NJ; Wiley Publishing, 2016.

Resources Other

"OSHA's 1926 Standard, Subpart L"

<http://www.OSHA.gov>

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