

## U.S. Department of Labor

Occupational Safety and Health Administration  
J.F.K. Federal Building, Room E340  
Boston, MA 02203  
Telephone (617) 565-9860  
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Reply to the Attention of: /OSHA/BOS/EPTS

July 7, 2005

Ms. Leona Roach, Executive Director  
Massachusetts Marine Trades Association  
P.O. Box 272  
Milton, MA 02186

Dear Ms. Roach:

Your February 10, 2005 letter to Department of Labor Attorney Constance Franklin concerning OSHA's citing safety violations to some Association members for their use of forklift trucks to tow loaded boat trailers within their properties was forwarded to this office for a direct reply. In your letter, you indicated that you would like to know what OSHA regulations or policies pertain to this practice, and "how one might participate in reevaluating that regulation or policy.

Specifically, the issue you have raised concerns the practice by marina operators and boat repair facilities where modifications are made to a forklift truck. A hole is drilled through one of the forks of a forklift truck, through which is mounted the steel ball for a trailer hitch. After boat trailers are attached to this hitch ball, the forklift is used to tow or push boat/trailer combinations about the marina or boat yard.

Without **prior** written approval from the manufacturer, the safety regulation for powered industrial trucks **prohibits** employers from making forklift truck modifications such as these, which can affect the **load capacity** or safe operation of the truck. Please refer to 29 CFR 1910.178 in general, and 1910.178(a)(4) in particular. Note that your industry's reported practice of modifying forklifts to use them for **pushing** or pulling purposes is prohibited only if the requisite approval is not obtained.

Where the manufacturer approves a requested modification, the regulation also requires that the truck's **capacity**, operation and instruction data plates, tags or labels be changed accordingly. Where the **manufacturer** is nonresponsive to the employer's request (e.g. regarding a modification or the altered **load capacity**/operational characteristics information for a revised truck capacity plate), the OSHA **National Office** has issued several letters of interpretation to guide the employer. Copies of these letters are enclosed. For example, the interpretation letter dated October 22, 1999 states:

"Employers must seek written approval from powered industrial truck manufacturers when modifications and additions affect the capacity and safe operation of powered industrial trucks. However, if no response or a negative response is received from the manufacturer, OSHA will accept a written approval of the modification/addition from a Qualified Registered Professional Engineer. A Qualified Registered Professional Engineer must perform a safety analysis and address any safety and/or structural issues contained in the manufacturer's negative response prior to granting approval. Machine data plates must be changed accordingly."

Unapproved modifications of forklifts can jeopardize the safety not only of their drivers but of workers in the vicinity of the forklift. For example, look at the impact of the modification and use reported in your industry. Forklift truck capacities, as listed on the truck's load information data plate, specify maximum load weights for particular "load centers." The load center in part reflects the distance from the vertical face of the forks to the center of gravity of the load being handled. The greater the distance from the vertical face of the forks to the load's center of gravity, the lower the weight that can be safely handled by the forklift truck. When a trailer hitch ball is attached to one of the forks of a forklift truck, it will typically be installed towards the outer end of the fork. The tongue weight of a trailer placed at this distance will have greater effect on the longitudinal stability of the truck than a palletized load, of the same weight, positioned up against the vertical mast.

Three types of hazardous situations may arise from the practice of using unapproved modified forklifts to push and pull trailered boats.

Forklift trucks, unless specially modified to be so equipped, do not have the connections needed to operate the trailer brakes required on the heavier boat/trailer combinations. Consequently, the momentum of a heavy boat/trailer connected to a moving forklift truck could prove hazardous, depending on the terrain etc.

There is also the possibility that a heavy boat/trailer combination could disconnect from the forklift while being towed or pushed. In this situation, employees might be struck by the moving boat/trailer combination or caught between the trailer and a fixed object causing serious or fatal injury.

- One way this situation could arise results from the fact that since the hitch ball is not installed at the very tip of the fork, a portion of the fork will extend beyond and beneath the tongue of the boat trailer. Unevenness in the travel surface could cause the fork to press up against the underside of the trailer tongue causing it to disconnect from the ball hitch.
- Unevenness in the travel surface or an abrupt acceleration of the vehicles may also cause the tongue weight of the boat trailer to momentarily go negative, that is, the trailer tongue may pull upward on the hitch ball instead of pressing downward. This too could result in separation either because the fork pivots upward, or because the connection between the trailer tongue and hitch ball is not sufficient for the forces imposed.
- The same event could occur when the forklift makes a sharp turn. In this situation, the trailer's momentum would place a side load on the hitch ball installed on the fork, possibly causing the L shaped fork to pivot on its upper support and move in a sideways arc with resulting disconnection of the trailer.

The third hazardous situation concerns the lateral or longitudinal stability of the forklift truck, which could be reduced by the forces imposed by the boat/trailer combination to the point where it tips over. Note that forklift truck upsets are the most common cause of fatal injury to forklift operators.

- In the case of a trailer attached to a trailer hitch, the tongue weight of the trailer is not static, but varies as a result of variations in the road surface and from forces imparted by the trailer tongue during accelerations of the trailer, especially when slowing and turning. When towing a heavy boat/trailer combination using a forklift, slowing the forklift abruptly, a sometimes unavoidable occurrence, can result in a significant increase in the downforce exerted by the

trailer tongue on the forklift fork. If the forklift were operating near its capacity, this could result in its capacity being exceeded and tipping of the truck.

- Tongue weight is not the only parameter that needs to be taken into account when using a forklift to tow or push a trailer. Tongue weight pertains only to the downward force exerted on the trailer hitch. It reveals nothing about the horizontal forces imposed on the hitch whenever the trailer is accelerated by speeding up, slowing down or turning. Typically, when a load is transported by a forklift, the entire mass of the load, and therefore, its entire weight rests on the forks. This is not the case when using a forklift to move a trailer. Most of the weight of the trailer and its load is supported on the trailer's wheels. When a forklift is used for towing, it is capable of towing a load that weighs much more than its rated load capacity. Consequently, an insidious hazard may arise when a forklift is used to tow a heavy boat trailer: the trailer's momentum can impose a significant side load on the forklift whenever it is turning, which can cause the forklift to tip over.

These hazards are discussed to enhance your industry's understanding of the regulation's requirement that employers obtain prior approval from the manufacturer (or a registered professional engineer) before modifying forklift trucks to use in pulling or pushing boats.

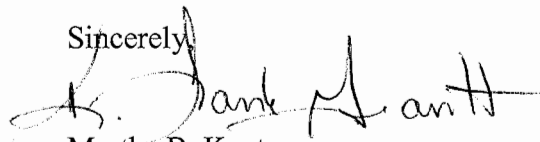
The corresponding requirement to change the modified forklift truck's data/capacity plates is essential to ensure that the forklift operators have instant access to basic information regarding the forklift, such as towing weight limitations, terrain limitations, etc.

In addition, the mandatory training and evaluation required for all forklift operators (see 1910.178(l)) need to address the hazards that are unique to towing a trailer with a forklift.

To facilitate employers' access to forklift safety information and regulation, there is a wealth of information on OSHA's website. We suggest you start at <http://www.osha.gov/dccsp/ote/trng-materials/pit/pit.html> and <http://www.osha.gov/SLTC/powerindustrialtrucks/index.html>.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that OSHA's enforcement guidance is subject to periodic review and clarification, amplification, or correction. Such guidance could also be affected by subsequent rulemaking. In the future, should you wish to verify that the guidance herein remains current, you may consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please feel free to contact safety specialist Jim Mulligan at (617) 565-3748.

Sincerely,

  
for Marthe B. Kent  
Regional Administrator

Enclosures



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Standard Interpretations

**10/22/1999 - Forklifts: free rigging requires manufacturer approval.**

Standard Interpretations - Table of Contents

• **Standard Number:** 1910.178(a)(4)

October 22, 1999

Mr. Dennis C. Humphreys  
Department of Energy  
Richland Operations Office  
P.O. Box 550, R-3-78  
Richland, Washington 99352

Dear Mr. Humphreys:

Thank you for your June 1, 1999 letter to Mr. Art Buchanan, Director, Office of General Industry Compliance Assistance, regarding powered industrial truck safety. You request compliance assistance regarding the practice of "free rigging" off the tines of a forklift for a below-the-tine lift. We appreciate the opportunity to provide you with clarification on this matter.

Free rigging is the direct attachment to or placement of rigging equipment (slings, shackles, rings, etc.) onto the tines of a powered industrial truck for a below-the-tines lift. This type of lift does not use an approved lifting attachment.

Although free rigging is a common practice, it could affect the capacity and safe operation of a powered industrial truck. 29 CFR 1910.178(a)(4) requires that "Modifications and additions which affect the capacity and safe operation shall not be performed by the customer or user without manufacturers prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly." In addition, 1910.178(o)(1) requires that "Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered."

Employers must seek written approval from powered industrial truck manufacturers when modifications and additions affect the capacity and safe operation of powered industrial trucks. However, if no response or a negative response is received from the manufacturer, OSHA will accept a written approval of the modification/addition from a Qualified Registered Professional Engineer. A Qualified Registered Professional Engineer must perform a safety analysis and address any safety and/or structural issues contained in the manufacturer's negative response prior to granting approval. Machine data plates must be changed accordingly. Of course, the use of an approved attachment to make lifts would be a viable alternative for an employer who does not seek written approval from a manufacturer

or a Qualified Registered Professional Engineer.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that OSHA's enforcement guidance is subject to periodic review and clarification, amplification, or correction. Such guidance could also be affected by subsequent rulemaking. In the future, should you wish to verify that the guidance provided herein remains current, you may consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please contact the Office of General Industry Compliance Assistance at (202) 693-1850.


Sincerely,

Richard E. Fairfax, Director  
Directorate of Compliance Programs

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Standard Interpretations

**07/03/2002 - Powered industrial truck addition/modification approval and marking requirements.**

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• **Standard Number:** 1910.178(a)(4); 1910.178(a)(5)

July 3, 2002

Mr. Douglas M. Sund  
11951 McCrumb Dr.  
Northglenn, CO 80233

Dear Mr. Sund:

Thank you for your June 28, 2000 letter to the Occupational Safety and Health Administration's (OSHA's) Directorate of Compliance Programs. This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any questions not delineated within your original correspondence. You had specific questions regarding clarification of powered industrial truck issues in 29 CFR 1910.178, **Powered Industrial Trucks**.

Please accept our apology for the delay in responding to your letter. However, as you were advised by telephone and interim letter, our reply required extensive research, and several levels of departmental review.

**Question:** Are sections (a)(4) and (5) stand alone sections? Should it be interpreted that **prior written approval is required from the manufacturer** to use front-end attachments as well as making any modifications and/or additions to a powered industrial truck.

**Reply:** A front-end attachment would generally be an "addition" within the meaning of §1910.178(a)(4) that affects capacity and safe operation. Section §1910.178(a)(5) assumes that the truck with the attachments will already be, "marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered." Before a non-factory-installed attachment may be used, however, the user must comply both with (a)(4), by obtaining the truck manufacturer's written approval, and with (a)(5), by having the truck appropriately marked.

Please be aware that OSHA would consider the lack of manufacturer's approval to be a **de minimis** violation if you had obtained written approval from a qualified Registered Professional Engineer after receiving no response or a negative response from the powered industrial truck manufacturer. If the manufacturer's response was negative then the engineer, prior to granting approval for the modification or addition, would need to perform a safety analysis and address all safety and/or structural issues contained in the manufacturer's disapproval. OSHA might not accept an engineer's written approval if it did

not address all of the manufacturer's safety and structural issues.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. Also, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please feel free to contact the [Office of General Industry Enforcement] at (202) 693-1850.


Sincerely,

Richard E. Fairfax, Director  
Directorate of Compliance Programs

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Standard Interpretations

## 03/30/2004 - Written approval requirements for powered industrial truck modifications and additions that affect capacity or safe operation.

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• **Standard Number:** 1910.178; 1910.178(a)(4)

**This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any situation not delineated within the original correspondence.**

March 30, 2004

Mr. Michael Boyles  
Taylor Machine Works  
650 Church Avenue  
Louisville, MS 39339-2033

Dear Mr. Boyles:

Thank you for your March 5, 2003 letter to the Occupational Safety and Health Administration's (OSHA) Directorate of Enforcement Programs (DEP). Your letter has been referred to DEP's Office of General Industry Enforcement for an answer to your question regarding OSHA's powered industrial truck standard 29 CFR 1910.178. It is my understanding that you have discussed your letter with my staff, and your question has been restated below for clarity.

**Background:** The American Society of Mechanical Engineers (ASME) Safety Standard for Low Lift and High Lift Trucks B56.1-2000 contains specific requirements for elevating personnel on powered industrial trucks. For example, operator-up highlift trucks (order pickers, etc.) are addressed by paragraphs 4.17.1, 4.17.2, and 7.36. Trucks with work platforms that do not fit that category are covered by paragraphs 4.17.2, 4.17.3, and 7.36.3.

**Question:** Does 29 CFR 1910.178(a)(4) require an employer to obtain prior written approval from the original equipment manufacturer for the attachment of a work platform that meets the applicable requirements as outlined in paragraphs 4.17.2, 4.17.3, and 7.36.3 of ASME B56.1-2000?

**Reply:** Yes, written approval from the manufacturer of a powered industrial truck is required for modifications and/or additions if the modifications and/or additions affect the capacity and safe operation of the truck. However, please be aware that OSHA would consider the lack of manufacturer's approval to be a de minimis violation if the employer has obtained written approval from a qualified Registered Professional Engineer after receiving no response or a negative response from the powered industrial truck manufacturer. If the manufacturer's response was negative, then the engineer, prior to granting approval for the modification or addition, would need to perform a safety analysis and address all safety and/or structural

issues contained in the manufacturer's disapproval.


Even where the addition of a work platform to a powered industrial truck is permitted under §1910.178(a)(4) or the de minimis policy stated above, employers must also address the fall hazards that result from the use of elevated platforms. OSHA has proposed revisions to Subpart D of 29 CFR Part 1910 that include, in a new section §1910.31, requirements for mobile elevating work platforms, mobile ladder stands, and powered industrial truck platforms. (See 55 *FR* 13396, April 10, 1990, and 68 *FR* 23530, May 2, 2003.) Until a final rule is promulgated, an employer's failure to prevent or correct, to the extent feasible, fall hazards from elevated work platforms might be citable as a violation of Section 5(a)(1) of the OSHAct. OSHA's evaluation of the existence of a serious, recognized hazard and the availability of feasible means of abatement would include consideration of the relevant provisions of the ASME B56.1-2000 standard.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards, and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. In addition, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please feel free to contact the Office of General Industry Enforcement at (202) 693-1850.


Sincerely,

Richard E. Fairfax, Director  
Directorate of Enforcement Programs

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