SAFETY INSTRUCTIONS

PLEASE READ CAREFULLY BEFORE USING TIRE CAGES

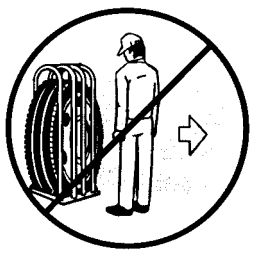
This cage is designed to restrain multi-piece wheel and rim components during inflation as required by Federal O.S.H.A. Standard No. 29 CFR 1910.177.

Before using cage, check the following: Cage must be freestanding and at least three feet from any other objects or obstructions. Do not modify the cage in any way. Discard cage if it is bent, cracked, or shows other signs of damage. Use a clip-on chuck, remote inflation and deflation valve, and sufficient length of hose to stand clear of the tire during inflation. Do not use this cage on assemblies rated more than 120 P.S.I. See your supervisor for proper safety procedures.

DO NOT REACH INTO CAGE DURING INFLATION

Prior to inflating the tire: Roll the tire assembly into the cage. Follow the O.S.H.A. Standard and the Wheel and Rim Manufacturers recommended procedures. See enclosed O.S.H.A. charts. Center the tire in the cage in an upright position. Rotate tire so that inflation valve is between inflation cage tubes. Clean inflation area of all debris. Clean tire and wheel of loose debris.

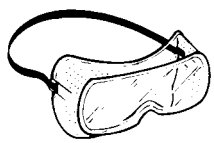
Warning: Wheel and rim assembly components may separate or fail any time during inflation and/or mounting process. Flying rim components can cause serious injury or death to operator or bystander.



DO NOT STAND IN TRAJECTORY ZONE

Warning: Tire failure may cause sudden air release of significant force to cause serious injury or death to operator or bystander. Debris propelled by air may also cause serious injury or death.

Warning: Tire changing can be dangerous, and should be done only by trained personnel using proper tools and equipment as directed by Federal OSHA Standard No. 29 CFR Part 1910.177. Tires and wheels may violently separate during inflation causing injury to operator or bystander. Do not stand in trajectory zone. Keep all parts of body outside cage. While inflating tires, wear safety goggles. Use clip-on chuck, remote valve, and sufficient length of hose to stand clear of cage and tire during inflation. Keep all bystanders away from inflation area during tire inflation. Always use a cage when inflating tires. See supervisor for proper safety procedures.



ALWAYS WEAR SAFETY GOGGLES

Warning: Other hazards associated with tire changing include sidewall rupture ("zippers"), bead failures, and sudden release of air and debris, which may also cause injury to operator or bystander. This cage cannot restrain air releases and the associated debris.

Danger: Cage may move in the event of rim separation or other tire failure.

⚠ WARNING

If you don't know how to use tire changing tools - STOP!
Tire changing should only be done by trained persons.
If you do it wrong, you could be hurt or killed.

Here are some safety rules.
For complete tire servicing procedures, read the tire and rim makers' service manuals. You can also get free wall charts about tire servicing by calling OSHA at 1-202-523-9667

USING TIRE TOOLS

Always wear eye protection when servicing tires and wheels and whenever using hand tools.
Always use soft-faced hammers when driving tire irons.
Never use one hammer to strike another hammer.
Never use a hammer with a loose or cracked handle.
Never use a dented, cracked, chipped, mushroomed, or deformed tool.
Never use a tire tool for anything except mounting tires.

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• Part Number:	1910
• Part Title:	Occupational Safety and Health Standards
• Subpart:	N
• Subpart Title:	Materials Handling and Storage
• Standard Number:	1910.177
• Title:	Servicing multi-piece and single piece rim wheels.
• Appendix:	A , B

1910.177(a)

Scope.

1910.177(a)(1)

This section applies to the servicing of multi-piece and single piece rim wheels used on large vehicles such as trucks, tractors, trailers, buses and off-road machines. It does not apply to the servicing of rim wheels used on automobiles, or on pickup trucks and vans utilizing automobile tires or truck tires designated "LT".

1910.177(a)(2)

This section does not apply to employers and places of employment regulated under the Construction Safety Standards, 29 CFR Part 1926; the Agriculture Standards, 29 CFR Part 1928; the Shipyard Standards, 29 CFR Part 1915; or the Longshoring Standards, 29 CFR Part 1918.

1910.177(a)(3)

All provisions of this section apply to the servicing of both single piece rim wheels and multi-piece rim wheels unless designated otherwise.

1910.177(b)

Definitions.

"Barrier" means a fence, wall or other structure or object placed between a single piece rim wheel and an employee during tire inflation, to contain the rim wheel components in the event of the sudden release of the contained air of the single piece rim wheel.

"Charts" means the U. S. Department of Labor, Occupational Safety and Health Administration publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Wheel Matching Chart," the National Highway Traffic Safety Administration (NHTSA) publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Wheel Matching Chart," or any other poster which contains at least the same instructions, safety precautions and other information contained in the charts that is applicable to the types of wheels being serviced.

"Installing a rim wheel" means the transfer and attachment of an assembled rim wheel onto a vehicle axle hub. "Removing" means the opposite of installing.

"Mounting a tire" means the assembly or putting together of the wheel and tire components to form a rim wheel, including inflation. "Demounting" means the opposite of mounting.

"Multi-piece rim wheel" means the assemblage of a multi-piece wheel with the tire tube and other components.

"Multi-piece wheel" means a vehicle wheel consisting of two or more parts, one of which is a side or locking ring designed to hold the tire on the wheel by interlocking components when the tire is inflated.

"Restraining device" means an apparatus such as a cage, rack, assemblage of bars and other components that will constrain all rim wheel components during an explosive separation of a multi-piece rim wheel, or during the sudden release of the contained air of a single piece rim wheel.

"Rim manual" means a publication containing instructions from the manufacturer or other qualified organization for correct mounting, demounting, maintenance, and safety precautions peculiar to the type of wheel being serviced.

"Rim wheel" means an assemblage of tire, tube and liner (where appropriate), and wheel components.

"Service" or "servicing" means the mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing,

removing, and handling.

"Service area" means that part of an employer's premises used for the servicing of rim wheels, or any other place where an employee services rim wheels.

"Single piece rim wheel" means the assemblage of single piece rim wheel with the tire and other components.

"Single piece wheel" means a vehicle wheel consisting of one part, designed to hold the tire on the wheel when the tire is inflated.

"Trajectory" means any potential path or route that a rim wheel component may travel during an explosive separation, or the sudden release of the pressurized air, or an area at which an airblast from a single piece rim wheel may be released. The trajectory may deviate from paths which are perpendicular to the assembled position of the rim wheel at the time of separation or explosion. (See Appendix A for examples of trajectories.)

"Wheel" means that portion of a rim wheel which provides the method of attachment of the assembly to the axle of a vehicle and also provides the means to contain the inflated portion of the assembly (i.e., the tire and/or tube).

1910.177(c)

Employee training.

1910.177(c)(1)

The employer shall provide a program to train all employees who service rim wheels in the hazards involved in servicing those rim wheels and the safety procedures to be followed.

..1910.177(c)(1)(i)

1910.177(c)(1)(i)

The employer shall assure that no employee services any rim wheel unless the employee has been trained and instructed in correct procedures of servicing the type of wheel being serviced, and in the safe operating procedures described in paragraphs (f) and (g) of this section.

1910.177(c)(1)(ii)

Information to be used in the training program shall include, at a minimum, the applicable data contained in the charts (rim manuals) and the contents of this standard.

1910.177(c)(1)(iii)

Where an employer knows or has reason to believe that any of his employees is unable to read and understand the charts or rim manual, the employer shall assure that the employee is instructed concerning the contents of the charts and rim manual in a manner which the employee is able to understand.

1910.177(c)(2)

The employer shall assure that each employee demonstrates and maintains the ability to service rim wheels safely, including performance of the following tasks:

1910.177(c)(2)(i)

Demounting of tires (including deflation);

1910.177(c)(2)(ii)

Inspection and identification of the rim wheel components;

1910.177(c)(2)(iii)

Mounting of tires (including inflation with a restraining device or other safeguard required by this section);

1910.177(c)(2)(iv)

Use of the restraining device or barrier, and other equipment required by this section;

..1910.177(c)(2)(v)

1910.177(c)(2)(v)

Handling of rim wheels;

1910.177(c)(2)(vi)

Inflation of the tire when a single piece rim wheel is mounted on a vehicle;

1910.177(c)(2)(vii)

An understanding of the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation; and

1910.177(c)(2)(viii)

Installation and removal of rim wheels.

1910.177(c)(3)

The employer shall evaluate each employee's ability to perform these tasks and to service rim wheels safely, and shall provide additional training as necessary to assure that each employee maintains his or her proficiency.

1910.177(d)

Tire servicing equipment.

1910.177(d)(1)

The employer shall furnish a restraining device for inflating tires on multi-piece wheels.

1910.177(d)(2)

The employer shall provide a restraining device or barrier for inflating tires on single piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

1910.177(d)(3)

Restraining devices and barriers shall comply with the following requirements:

..1910.177(d)(3)(i)

1910.177(d)(3)(i)

Each restraining device or barrier shall have the capacity to withstand the maximum force that would be transferred to it during a rim wheel separation occurring at 150 percent of the maximum tire specification pressure for the type of rim wheel being serviced.

1910.177(d)(3)(ii)

Restraining devices and barriers shall be capable of preventing the rim wheel components from being thrown outside or beyond the device or barrier for any rim wheel positioned within or behind the device;

1910.177(d)(3)(iii)

Restraining devices and barriers shall be visually inspected prior to each day's use and after any separation of the rim wheel components or sudden release of contained air. Any restraining device or barrier exhibiting damage such as the following defects shall be immediately removed from service:

1910.177(d)(3)(iii)(A)

Cracks at welds;

1910.177(d)(3)(iii)(B)

Cracked or broken components;

1910.177(d)(3)(iii)(C)

Bent or sprung components caused by mishandling, abuse, tire explosion or rim wheel separation;

1910.177(d)(3)(iii)(D)

Pitting of components due to corrosion; or

1910.177(d)(3)(iii)(E)

Other structural damage which would decrease its effectiveness.

..1910.177(d)(3)(iv)

1910.177(d)(3)(iv)

Restraining devices or barriers removed from service shall not be returned to service until they are repaired and reinspected. Restraining devices or barriers requiring structural repair such as component replacement or rewelding shall not be returned to service until they are certified by either the manufacturer or a Registered Professional Engineer as meeting the strength requirements of paragraph (d)(3)(i) of this section.

1910.177(d)(4)

The employer shall furnish and assure that an air line assembly consisting of the following components be used for inflating tires:

1910.177(d)(4)(i)

A clip-on chuck;

1910.177(d)(4)(ii)

An in-line valve with a pressure gauge or a presettable regulator; and

1910.177(d)(4)(iii)

A sufficient length of hose between the clip-on chuck and the in-line valve (if one is used) to allow the employee to stand outside the trajectory.

1910.177(d)(5)

Current charts or rim manuals containing instructions for the type of wheels being serviced shall be available in the service area.

1910.177(d)(6)

The employer shall furnish and assure that only tools recommended in the rim manual for the type of wheel being serviced are used to

service rim wheels.

..1910.177(e)

1910.177(e)

Wheel component acceptability.

1910.177(e)(1)

Multi-piece wheel components shall not be interchanged except as provided in the charts or in the applicable rim manual.

1910.177(e)(2)

Multi-piece wheel components and single piece wheels shall be inspected prior to assembly. Any wheel or wheel component which is bent out of shape, pitted from corrosion, broken, or cracked shall not be used and shall be marked or tagged unserviceable and removed from the service area. Damaged or leaky valves shall be replaced.

1910.177(e)(3)

Rim flanges, rim gutters, rings, bead seating surfaces and the bead areas of tires shall be free of any dirt, surface rust, scale or loose or flaked rubber build-up prior to mounting and inflation.

1910.177(e)(4)

The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel shall be checked for compatibility prior to assembly of the rim wheel.

1910.177(f)

Safe operating procedure - multi-piece rim wheels. The employer shall establish a safe operating procedure for servicing multi-piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

1910.177(f)(1)

Tires shall be completely deflated before demounting by removal of the valve core.

..1910.177(f)(2)

1910.177(f)(2)

Tires shall be completely deflated by removing the valve core before a rim wheel is removed from the axle in either of the following situations:

1910.177(f)(2)(i)

When the tire has been driven underinflated at 80% or less of its recommended pressure, or

1910.177(f)(2)(ii)

When there is obvious or suspected damage to the tire or wheel components.

1910.177(f)(3)

Rubber lubricant shall be applied to bead and rim mating surfaces during assembly of the wheel and inflation of the tire, unless the tire or wheel manufacturer recommends against it.

1910.177(f)(4)

If a tire on a vehicle is underinflated but has more than 80% of the recommended pressure, the tire may be inflated while the rim wheel is on the vehicle provided remote control inflation equipment is used, and no employees remain in the trajectory during inflation.

1910.177(f)(5)

Tires shall be inflated outside a restraining device only to a pressure sufficient to force the tire bead onto the rim ledge and create an airtight seal with the tire and bead.

1910.177(f)(6)

Whenever a rim wheel is in a restraining device the employee shall not rest or lean any part of his body or equipment on or against the restraining device.

..1910.177(f)(7)

1910.177(f)(7)

After tire inflation, the tire and wheel components shall be inspected while still within the restraining device to make sure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, the tire shall be deflated by removal of the valve core before the adjustment is made.

1910.177(f)(8)

No attempt shall be made to correct the seating of side and lock rings by hammering, striking or forcing the components while the tire is pressurized.

1910.177(f)(9)

Cracked, broken, bent or otherwise damaged rim components shall not be reworked, welded, brazed, or otherwise heated.

1910.177(f)(10)

Whenever multi-piece rim wheels are being handled, employees shall stay out of the trajectory unless the employer can demonstrate that performance of the servicing makes the employee's presence in the trajectory necessary.

1910.177(f)(11)

No heat shall be applied to a multi-piece wheel or wheel component.

1910.177(g)

Safe operating procedure-single piece rim wheels. The employer shall establish a safe operating procedure for servicing single piece rim wheels and shall assure that employees are instructed in and follow that procedure. The procedure shall include at least the following elements:

1910.177(g)(1)

Tires shall be completely deflated by removal of the valve core before demounting.

..1910.177(g)(2)

1910.177(g)(2)

Mounting and demounting of the tire shall be done only from the narrow ledge side of the wheel. Care shall be taken to avoid damaging the tire beads while mounting tires on wheels. Tires shall be mounted only on compatible wheels of matching bead diameter and width.

1910.177(g)(3)

Nonflammable rubber lubricant shall be applied to bead and wheel mating surfaces before assembly of the rim wheel, unless the tire or wheel manufacturer recommends against the use of any rubber lubricant.

1910.177(g)(4)

If a tire changing machine is used, the tire shall be inflated only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.

1910.177(g)(5)

If a bead expander is used, it shall be removed before the valve core is installed and as soon as the rim wheel becomes airtight (the tire bead slips onto the bead seat).

1910.177(g)(6)

Tires may be inflated only when contained within a restraining device, positioned behind a barrier or bolted on the vehicle with the lug nuts fully tightened.

1910.177(g)(7)

Tires shall not be inflated when any flat, solid surface is in the trajectory and within one foot of the sidewall.

1910.177(g)(8)

Employees shall stay out of the trajectory when inflating a tire.

..1910.177(g)(9)

1910.177(g)(9)

Tires shall not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.

1910.177(g)(10)

Tires shall not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

1910.177(g)(11)

No heat shall be applied to a single piece wheel.

1910.177(g)(12)

Cracked, broken, bent, or otherwise damaged wheels shall not be reworked, welded, brazed, or otherwise heated.

[39 FR 23502, June 27, 1974, as amended at 52 FR 36026, Sept. 25, 1987; 53 FR 34736, Sept. 8, 1988]