270. HAND AND PORTABLE POWERED TOOLS AND EQUIPMENT

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270. HAND AND PORTABLE POWERED TOOLS AND EQUIPMENT. (7-1-97)

01. Scope: (7-1-97)

a. Hand and portable powered tools and equipment shall conform to all other applicable requirements of this standard, as well as the following provisions. Nothing in this standard shall be construed to prohibit better or otherwise safer conditions than specified herein. (7-1-97)

b. The purpose of this section is to provide reasonable safety for life, limb, and property, by establishing requirements for design, construction, operation, service, and storage of powder actuated fastening tools, fasteners, and power loads. (7-1-97)

02. Definitions: For definitions of other terms used in this section, see sub-section 010 of this standard. (7-1-97)

a. Angle Control is a safety feature designed to prevent a tool from operating when tilted beyond a predetermined angle. (7-1-97)

b. Blade Tip Circle is the path described by the outermost point of the blade as it is rotated about its shaft axis. (7-1-97)

c. Cased Powder Load is a powder load with the propellant contained in a closed case. (7-1-97)
d. Caseless Powder Load is a powder load with the propellant in solid form not requiring containment. (7-1-97)

e. Catcher Assemblies are parts or combinations of parts which provide a means for collecting grass clippings or debris. (7-1-97)

f. Chamber (noun) is the location in the tool into which the powder load is placed and in which it is actuated. (7-1-97)

g. Chamber (verb) is to fit the chamber according to the manufacturer's specifications. (7-1-97)

h. Deadman Control is a control designed so that it will automatically interrupt power to a drive when the operator's actuating force is removed. (7-1-97)

i. Direct-Acting Tool is a tool in which the expanding gas of the powder load acts directly on the fastener to be driven. (7-1-97)

j. Fasteners are any pins (unthreaded heads) or studs (threaded heads) driven by powder actuated tools. (7-1-97)

k. Fixture is a special shield that provides equivalent protection where the standard shield cannot be used. (7-1-97)

l. Guards are a part or an assembly provided for shielding a hazardous area of a machine. (7-1-97)

m. Head is that portion of a fastener that extends above the work surface after being properly driven. (7-1-97)

n. High-Velocity Tool is a tool whose test velocity has been measured ten (10) times while utilizing the combination of: the lightest commercially available fastener designed for the tool; the strongest commercially available powder load which will properly chamber in the tool; and that will produce an average velocity from the ten (10) tests in excess of four-hundred-nighty-two (492) feet per second. (7-1-97)

o. Indirect-Acting Tool is a tool in which the expanding gas of the powder load acts on a captive piston, which in turn drives the fastener. (7-1-97)

p. Jack is an appliance for lifting and lowering or moving horizontally a load by application of a pushing force. NOTE: Jacks may be of the following types: lever and ratchet, screw and hydraulic. (7-1-97)

q. Lowest Blade Position is the lowest blade position under static conditions. (7-1-97)

r. Low Velocity Tool is a tool whose test velocity has been measured ten (10) times while utilizing the highest velocity combination of: the lightest commercially available fastener
designed for that specific tool; the strongest commercially available powder load that will properly chamber in the tool; and the piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from the ten (10) tests not in excess of three-hundred-twenty-eight (328) feet per second with no single test having a velocity of over three-hundred-fifty-four (354) feet per second. (7-1-97)

s. Medium-Velocity Tool is a tool whose velocity has been measured ten (10) times while utilizing the highest velocity combination of: the lightest commercially available fastener designed for the tool; the strongest commercially available powder load that will properly chamber in the tool; and the piston designed for that tool and appropriate for that fastener; that will produce an average test velocity from ten (10) tests in excess of three-hundred-twenty-eight (328) feet per second but not in excess of four-hundred-nighty-two (492) feet per second with no single test having a velocity of five-hundred-twenty-five (525) feet per second. (7-1-97)

t. Misfire is a condition in which the powder load fails to ignite after the tool has been operated. (7-1-97)

u. Mounted Wheels usually two (2) inch diameter or smaller, and of various shapes, may be either organic or inorganic bonded abrasive wheels. They are secured to plain or threaded steel mandrels. (7-1-97)

v. Operator Area for discharge interference purposes, that area confined within a circle no smaller than thirty (30) inches in diameter, the center of which is located to the rear of the mower on its longitudinal centerline thirty (30) inches behind the nearest blade tip circle. (7-1-97)

w. Organic Bonded Wheels are wheels which are bonded by means of an organic material such as resin, rubber, shellac, or other similar bonding agent. (7-1-97)

x. Portable Grinding is a grinding operation where the grinding machine is designed to be hand held and may be easily moved from one location to another. (7-1-97)

y. Powder Actuated Fastening System is a method comprising the use of a powder actuated tool, a powder load, and a fastener. (7-1-97)

z. Powder Actuated Tool is a tool that utilizes the expanding gases from a powder load to drive a fastener. (7-1-97)

aa. Powder Load is the energy source used in powder actuated tools. (7-1-97)

bb. Power Reel Mower is a lawn-cutting machine utilizing a power source to rotate one or more helically formed blades about a horizontal axis to provide a shearing action with a stationary cutter bar or bed knife. (7-1-97)

cc. Power Rotary Mower is a lawn-cutting machine utilizing a power source to rotate one or more cutting blades about a vertical axis. (7-1-97)
dd. Qualified Operator is a person who meets the requirements of sub-section 270.12.fff. through sub-section 270.12.hhh. of this section. (7-1-97)

e. Rating of a jack is the maximum working load for which it is designed to lift safely that load throughout its specified amount of travel. NOTE: To raise the rated load of a jack, the point of application of the load, the applied force, and the length of the lever arm should be those designated by the manufacturer for the particular jack considered. (7-1-97)

ff. Reinforced Wheels as applied to grinding wheels shall define a class of organic wheels which contain strengthening fabric or filament. The term reinforced does not cover wheels using such mechanical additions as steel rings, steel cup backs, or wire or tape winding. (7-1-97)

gg. Riding Mower is a powered, self-propelled lawn cutting vehicle on which the operator rides and controls the machine. (7-1-97)

hh. Safety Guard is a safety guard is an enclosure designed to restrain the pieces of the grinding wheel and furnish all possible protection in the event that the wheel is broken in operation. (7-1-97)

ii. Shield is a device, attached to the muzzle end of a powder actuated tool, which is designed to confine flying particles. (7-1-97)

jj. Spalled area is a damaged and non-uniform concrete or masonry surface. (7-1-97)

kk. Sulky Type Mower is normally a walk-behind mower which has been converted to a riding mower by the addition of a sulky. (7-1-97)

ll. Test Velocity is the measurement of fastener velocity performed in accordance with sub-section 270.12.p. of this section. (7-1-97)

mm. Tuck Pointing is removal, by grinding, of cement, mortar, or other nonmetallic jointing material. (7-1-97)

nn. Tuck Pointing Wheels are usually Type-I, reinforced organic bonded wheels have diameter thickness and hole size dimension. They are subject to the same limitations of use and mounting as Type 1 wheels defined in sub-section 270.12.qq. of this section. Limitation: Wheels used for tuck pointing shall be reinforced, organic bonded. (7-1-97)

oo. Type-II Flaring Cup Wheels are wheels that have double diameter dimensions d. and j., and in addition have thickness, hole size, rim and back thickness dimensions. Grinding is always performed on rim face, W dimension. Type II wheels are subject to all limitations of use and mounting listed for Type-6 straight sided cup wheels definition in i. of this subsection. See Figure 270.02-A. Type- II - Flaring-cup Wheel Side grinding wheel having a wall flared or tapered outward from the back. Wall thickness at the back is normally greater than at the grinding face (W).
Type-6 Cup Wheels have diameter, thickness, hole size, rim thickness, and back thickness dimensions. Grinding is always performed on rim face, W dimension. Limitation: Minimum back thickness, E dimension, should not be less than one-fourth (1/4) T dimension. In addition, when unthreaded hole wheels are specified, the inside flat, K dimension, must be large enough to accommodate a suitable flange. Side grinding wheel having a diameter, thickness and hole with one side straight or flat and the opposite side recessed. This type, however, differs from Type-5 in that the grinding is performed on the wall of the abrasive created by difference between the diameter of the recess and the outside diameter of the wheel. Therefore, the wall dimension "W" takes precedence over the diameter of the wheel D. (7-1-97)

Type-I Straight Wheels have a diameter, thickness, and hole size dimensions and should be used only on the periphery. Type-1 wheels shall be mounted between flanges. Limitation: Hole dimension (H) should not be greater than two-thirds (2/3) of wheel diameter dimension (D) for precision, cylindrical, center less, or surface grinding applications. Maximum hole size for all other application should not exceed one-half wheel diameter. See Figure 270.02-C. (7-1-97)
rr. Walk-Behind Mower is a mower either pushed or self-propelled and normally guided by the operator walking behind the unit. (7-1-97)

03. General Requirements: (7-1-97)

a. Each employer shall be responsible for the safe condition of tools and equipment used by employees, including tools and equipment which may be furnished by employees. (7-1-97)

b. All cracked blades and wheels shall be removed from service. (7-1-03)

c. Portable electric powered tools shall meet the electrical requirements of section 150 of this standard and the National Electrical Code. (7-1-97)

04. Compressed Air: (7-1-97)

a. Compressed air shall not be used for cleaning purposes except where reduced to less than thirty (30) psi and then only with effective chip guarding and personal protective equipment. (7-1-97)

b. Compressed air shall not be used for cleaning personnel, or clothing and equipment while they are being worn. (7-1-97)

c. Air hose and hose connections used for conducting compressed air to equipment shall be designed for the pressure and service to which they are subjected. (7-1-97)

05. Compressed Air Tools: (7-1-97)

a. The operating trigger on portable hand-operated equipment shall be so located as to minimize the possibility of its accidental operation and shall be arranged to close the air inlet valve automatically when the pressure of the operator's hand is removed. (7-1-97)

b. When momentarily out of use the gun should be laid in such position that the tool cannot fly out if the pressure is accidentally released. When not in use, all tools should be removed from the gun. (7-1-97)

c. In disconnecting a compressed air tool from the air line, care shall be exercised first to shut off the pressure and then to operate the tool to exhaust the pressure remaining in the hose. (7-1-97)
d. Compressed air hose or guns shall not be pointed at or brought into contact with the body of any person. (7-1-97)

e. In the use of compressed air tools, care should be used to prevent the tool from being shot from the gun. (7-1-97)

f. A tool retainer shall be installed on each piece of equipment which, without such a retainer, may eject the tool. (7-1-97)

06. Air Hammer: (7-1-97)

a. Before laying down an air hammer, remove tool from hammer unless it is held in place by safety catch. (7-1-97)

07. Portable Circular Saws: (7-1-97)

a. All portable power-driven circular saws having a blade diameter greater than two (2) inches shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work, the lower guard shall automatically and instantly return to covering position. This section does not apply to circular saws used in the meat industry for meat cutting purposes. (7-1-97)

08. Saber, Scroll, and Jig Saws: (7-1-97)

a. Saber, scroll, and jig saws, with nonstandard blade holders, may use blades with shanks which are nonuniform in width, provided the narrowest portion of the blade shank is an integral part in the mounting of the blade. (7-1-97)

b. Blade shank width shall be measured at the narrowest portion of the blade shank when saber, scroll, and jig saws have non-standard blade holders. (7-1-97)

09. Portable Belt Sanding Machines: (7-1-97)

a. Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs onto a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contact. (7-1-97)

10. Switches and Controls: (7-1-97)

a. All hand held powered circular saws having a blade diameter greater than 2-inches, electric, hydraulic, or pneumatic chain saws, and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch or control that will shut off the power when the pressure is released. All hand held gasoline powered chain saws shall be equipped with
a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released. (7-1-97)

b. All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than two (2) inches in diameter, disc sanders with discs greater than two (2) inches in diameter, belt sanders, reciprocating saws, saber, scroll, and jig saws with blade shanks greater than a nominal one-fourth (1/4) inch, and other similarly operating powered tools shall be equipped with a constant pressure switch or control and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on. (7-1-97)

c. All other hand-held powered tools such as, but not limited to, platen sanders, grinders with wheels two (2) inches in diameter or less, disc sanders with discs two (2) inches in diameter or less, routers, planers, laminate trimmers, nibblers, shears, saber, scroll, and jig saws with blade shanks a nominal one-fourth (1/4) inch wide or less, may be equipped with either a positive on-off control, or other controls as described in sub-section 270.08.a. and b. of this section. (7-1-97)

d. The operating control on hand-held power tools shall be so located as to minimize the possibility of its accidental operation, if such accidental operation would constitute a hazard to employees. (7-1-97)

e. This subsection does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, garden appliances, household and kitchen appliances, personal car appliances, medical or dental equipment, or to fixed machinery. (7-1-97)

11. Portable Abrasive Wheel Grinders: (7-1-97)

a. All abrasive wheels shall be used only on machines provided with safety guards as defined in this subsection. Exceptions: This requirement shall not apply to the following classes of wheels and conditions: wheels used for internal work while within the work being ground; mounted wheels used in portable grinders two (2) inches and smaller in diameter; and types 16, 17, 18, 18R, and 19 cones and plugs and threaded hole pot balls as illustrated and described in 1.4.11 of ANSI B7.1-1970 Safety Code for the Use, Care and Protection of Abrasive Wheels, where the work offers protection. (7-1-97)

b. The safety guard shall cover the spindle end, nut, and flange projections. The safety guard shall be mounted so as to maintain proper alignment with the wheel, and the strength of the fastenings shall exceed the strength of the guard. Exceptions: Safety guards on all operations where the work provides a suitable measure of protection to the operator, may be so constructed that the spindle end, nut, and outer flange are exposed; the spindle end, nut and outer flange may be exposed on portable machines designed for, and used with, type 6, 11, 27, and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels; and the spindle end, nut, and outer flange may be exposed on machines designed as portable saws. (7-1-97)

c. Cup wheels (type 6 and 11) shall be guarded by safety guards as specified in this subsection. (7-1-97)
d. Special revolving cup guards which mount behind the wheel and turn with it. They shall be made of steel or other material with adequate strength and shall enclose the wheel sides upward from the back for one-third of the wheel thickness. The mounting features shall conform with all regulations. (See sub-section 270.11.g. through sub-section 270.11.k. of this section). It is necessary to maintain clearance between the wheel side and the guard. The clearance shall not exceed one-sixteenth (1/16) inch; or, some other form of guard that will insure as good protection as that which would be provided by the guards specified in sub-section 270.11.b. of this section. (7-1-97)

e. Safety guards used on machines known as right angle head or vertical portable grinders shall have a maximum exposure angle of one-hundred-eighty (180) degrees, and the guard shall be located so as to be between the operator and the wheel during use. Adjustment of guard shall be such that pieces of an accidentally broken wheel will be deflected away from the operator. (See Figure 270.11-A). (7-1-97)

FIGURE 270.11-A

f. The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on other portable grinding machines shall not exceed one-hundred-eighty (180) degrees and the top half of the wheel shall be enclosed at all times. (See Figures 270.11-B). (7-1-97)

FIGURE 270.11-B
g. Immediately before mounting, all wheels shall be closely inspected and sounded by the user (ring test) to make sure they have not been damaged in transit, storage, or otherwise. The spindle speed of the machine shall be checked before mounting of the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel. Wheels should be tapped gently; if they sound cracked (dead), they shall not be used. NOTE: Wheels shall be tapped gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels. This is known as the Ring Test. (7-1-97)

h. Grinding wheels shall fit freely on the spindle and remain free under all grinding conditions. The machine spindle shall be made to nominal (standard) size plus zero (0) minus zero-point-zero-zero-two (0.002) inch, and the wheel hole shall be made suitably oversize to assure safety clearance under the conditions of operating heat and pressure. NOTE: A controlled clearance between the wheel hole and the machine spindle (or wheel sleeves or adapters) is essential to avoid excessive pressure from mounting and spindle expansion. (7-1-97)

i. All contact surfaces of wheels, blotters, and flanges shall be flat and free of foreign matter. (7-1-97)

j. When a bushing is used in the wheel hole, it shall not exceed the width of the wheel and shall not contract the flanges. (7-1-97)

k. For requirements for the use of flanges and blotters see sub-section 250.20.x. through sub-section 250.20.z. of this standard. NOTE: Excluded machinery. Natural sandstone wheels and
metal, wooden, cloth, or paper discs, having a layer of abrasive on the surface are not covered by this subsection. (7-1-97)

12. **Powder Actuated Fastening Systems**: (7-1-97)

a. This Section provides safety requirements for a powder actuated fastening tool or machine which propels a stud, pin, fastener, or other object for the purpose of affixing it by penetration to another object. (7-1-97)

b. This subsection does not apply to devices designed for attaching objects to soft construction materials, such as wood, plaster, tar, dry wallboard, and the like, or to stud welding equipment. (7-1-97)

c. Powder actuated tools can be divided into two types: direct acting and indirect acting; and three classes: low velocity, medium velocity, and high velocity. (7-1-97)

d. The tool shall be designed to prevent inadvertent actuation. (7-1-97)

e. The tool shall be designed to prevent actuation when dropped in any attitude from a height of ten (10) feet onto a smooth, hard surface such as concrete or steel, if such actuation can propel a fastener or any part thereof in free flight. (7-1-97)

f. Actuation of the tool shall be dependent upon at least two (2) separate and distinct operations by the operator, with at least one (1) operation being separate from the operation of holding the tool against the work surface. (7-1-97)

g. The tool shall be designed not to be operable other than against a work surface with a force on the work surface equal to five (5) pounds greater than the weight of the tool or a minimum impact energy of three (3) foot-pounds. (7-1-97)

h. All tools shall be designed so that compatible protective shields or fixtures, designed, built, and supplied by the manufacturer of the tool can be used (see sub-section 270.12.q. of this section). (7-1-97)

i. The tool shall be designed so that a determinable means of varying the power levels is available for selecting a power level adequate to perform the desired work (See sub-section 270.12.x. of this section). (7-1-97)

j. The tool shall be designed so that all principal functional parts can be checked for foreign matter that may affect operation. (7-1-97)

k. The tool shall be designed so that all parts will be of adequate strength to resist maximum stresses imposed on actuation when the tool is used in accordance with the manufacturer's instructions and is powered by any commercially available powder load which will properly chamber in the tool. (7-1-97)
1. Each tool shall bear a legible permanent model designation, which shall serve as a means of identification. Each tool shall also bear a legible, permanent manufacturer's unique serial number. (7-1-97)

m. A lockable container shall be provided for each tool. The works POWDER ACTUATED TOOL shall appear in plain sight on the outside of the container. The following notice shall be attached on the inside cover of the container: WARNING, POWDER ACTUATED TOOL TO BE USED ONLY BY A QUALIFIED OPERATOR AND KEPT UNDER LOCK AND KEY WHEN NOT IN USE. (7-1-97)

n. Each tool shall bear a durable warning label with the following statement, or the equivalent: WARNING, FOR USE ONLY BY QUALIFIED OPERATORS ACCORDING TO MANUFACTURER'S INSTRUCTION MANUAL. (7-1-97)

o. Each tool shall be supplied with the following: operator's instruction and service manual; power load chart; tool inspection record; service tools and accessories. (7-1-97)

p. In determining tool test velocities the velocity of the fastener shall be measured in free flight at a distance of six and one-half (6 1/2) feet from the muzzle end of the tool, using accepted ballistic test methods. (7-1-97)

q. Low-velocity tools shall be supplied with a shield. Medium-velocity tools shall have a shield at least two and one-half (2 1/2) inches in diameter mounted perpendicular to, and concentric with the muzzle end, when it is indexed to the center position. High-velocity tools shall have a shield at least three and one-half (3 1/2) inches in diameter mounted perpendicular to, and concentric with, the muzzle end, when it is indexed to the center position. A special shield or fixture may be used when it provides equivalent protection. (7-1-97)

r. The powder actuated tools shall be designed so that it cannot be actuated unless it is equipped with a shield or fixture. (7-1-97)

s. The medium-velocity tools shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position if the bearing surface of the shield is tilted more than twelve (12) degrees from a flat surface. (7-1-97)

t. The high-velocity tool shall be designed with angle control so that it will not actuate when equipped with the standard shield indexed to the center position, if the bearing surface of the shield is tilted more than eight (8) degrees from a flat surface. (7-1-97)

u. Cased powder loads shall be coded to identify powder load levels by case color and powder load color as specified in Table 270.12-A. Caseless powder loads shall be coded to identify powder load levels by powder load color as specified in Table 270.12-A and by configuration. (7-1-97)
## Power Load Identification

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<th>Power Level</th>
<th>Color Identification</th>
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<td>Load Color</td>
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<td>Gray</td>
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</table>

NOTE: The nominal velocity applies to a 3/8-inch diameter 350-grain ballistic slug fired in a test device and has no reference to actual fastener velocity developed in any specific tool.

(7-1-97)

v. No powder load (cased or caseless) shall be used if it will not properly chamber in any existing commercially available tool and will cause a fastener to have a test velocity in excess of the maximum test velocities specified for the said tool. (7-1-97)

w. Powder load packages shall provide a visual number-color indication of the power level of the powder load as specified in Table 270.12-A. (7-1-97)
x. Optional power load variation where means other than powder loads of varying power levels are to be used to control penetration, such means shall provide an equivalent power level variation. (7-1-97)

y. Fasteners for use in powder actuated tools shall be designed and manufactured to function compatibly with these tools and, when used in masonry, concrete, or steel, to effect properly the application for which they are recommended. (7-1-97)

z. Only tools meeting the requirements of this standard shall be used. (7-1-97)

aa. Only qualified operators shall operate tools. (7-1-97)

bb. The lowest velocity class of tool that will properly set the fastener shall be used. (7-1-97)

c. Tools shall be operated in strict accordance with the manufacturer's instructions. (7-1-97)

d. Eye or face protection, or both, shall be worn by operators, assistants, and adjacent personnel when tool is in use. Hearing protection shall be used when making fastenings in confined areas. (7-1-97)

e. Each day, prior to use, the operator shall inspect the tool to determine that it is in proper working condition in accordance with the testing methods recommended by the manufacturer of the tool. (7-1-97)

ff. Any tool found not to be in proper working condition shall be immediately removed from service and tagged DEFECTIVE; it shall not be used until it has been properly repaired in accordance with the manufacturer's instructions. (7-1-97)

g. The proper shield, fixture, adaptor, or accessory, suited for the application, as recommended and supplied by the manufacturer, shall be used. (7-1-97)

hh. Only those types of fasteners and powder loads recommended by the tool manufacturer shall be used. (7-1-97)

ii. Before fastening into any questionable material, the operator shall determine its suitability by using a fastener as a center punch. If the fastener point does not easily penetrate, is not blunted, and does not fracture the material, initial test fastenings shall then be made in accordance with the tool manufacturer's recommendations. (See sub-section 270.12.rr. of this section). (7-1-97)

jj. No tool shall be loaded unless it is being prepared for immediate use. If the work is interrupted after loading, the tool shall be unloaded at once. (7-1-97)

kk. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any person; hands shall be kept clear of the open barrel end. (7-1-97)
The tool shall always be held perpendicular to the work surface when fastening into any material, except for specific applications recommended by the tool manufacturer. (7-1-97)

In the event of a misfire, the operator shall hold the tool firmly against the work surface for a period of thirty (30) seconds and then follow the explicit instructions set forth in the manufacturer's instructions. (7-1-97)

Powder loads of different power levels and types shall be kept in separate compartments or containers. (7-1-97)

A sign, at least eight (8) x ten (10) inches, using boldface type no less than one (1) inch in height, shall be posted in plain sight on all construction projects where tools are used. The sign shall bear wording similar to the following: POWDER ACTUATED TOOL IN USE. (7-1-97)

The tool shall not be used in an explosive or flammable atmosphere. (7-1-97)

A tool shall never be left unattended in a place where it would be available to unauthorized persons. (7-1-97)

Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tile, hardened steel, glass block, natural rock, hollow tile, or most brick. (See sub-section 270.12.ii. of this section.) (7-1-97)

Fasteners shall not be driven into easily penetrated or thin materials or materials of questionable resistance, unless backed by a material that will prevent the fastener from passing completely through the other side. (7-1-97)

Fasteners shall not be driven closer than three (3) inches from the unsupported edge of masonry materials except for specific applications recommended by the tool manufacturer. (7-1-97)

Fasteners shall not be driven closer than one-half (1/2) inch from the edge of steel except for specific applications recommended by the tool manufacturer. (7-1-97)

Fasteners shall not be driven into concrete unless material thickness is at least three (3) times the fastener shank penetration. (7-1-97)

Fasteners shall not be driven through existing holes unless a specific guide means, as recommended and supplied by the tool manufacturer, is used to ensure positive alignment. (7-1-97)

The tool shall be serviced and inspected for worn or damaged parts at regular intervals as recommended by the tool manufacturer. Prior to the tool being put back into use, all worn or damaged parts shall be replaced by a qualified person using only parts supplied by the tool manufacturer.
manufacturer. A record of this inspection shall be noted and dated on the tool inspection record. (7-1-97)

**zz.** Instruction manuals, maintenance tools, and accessories supplied with the tool shall be stored in the tool container when not in use. (7-1-97)

**aaa.** Powder actuated tools and powder loads shall be locked in a container and stored in a safe place when not in use and shall be accessible only to authorized personnel. (7-1-97)

**bbb.** Only persons trained and authorized by the tool manufacturer or by an authorized representative of the tool manufacturer shall be qualified to instruct and qualify operators for the manufacturer’s powder actuated tools. (7-1-97)

**ccc.** All authorized instructors shall have read and be familiar with this standard, and shall be capable of: disassembling, servicing, and re-assembling the tool; recognizing any worn or damaged parts or defective operation; recognizing and clearly identifying the colors used to identify power load levels; using the tool correctly within the limitations of its use; and training and testing operators prior to issuing a qualified operators card. (7-1-97)

**ddd.** All authorized instructors shall have in their possession a valid authorized instructor’s card issued and signed by an authorized representative of the manufacturer. The card shall be wallet size of approximately two and one-half (2 1/2) x three and one-half (3 1/2) inches and the face of the card shall bear text similar to that shown in Figure 270.12-A. (7-1-97)

**FIGURE 270.12-A**
A list of all instructors authorized by the manufacturer to instruct and qualify operators shall be maintained by the tool manufacturer and be made available to the Department upon request. An instructor's card may be revoked by the authorizing agent or the Department upon request. An instructor's card may be revoked by the authorizing agent or the Department, if the instructor is known to have issued a qualified operator's card in violation of any regulation contained in this standard. When an instructor is no longer authorized to issue qualified operator's cards, he shall surrender his card to the authorizing agent or to the Department. (7-1-97)

The operator shall be trained by an authorized instructor to be familiar with the provisions of this standard and the instructions provided by the manufacturer for operation and maintenance. The operator shall also be capable of: reading and understanding the manufacturer's instruction manual; cleaning the tool correctly; recognizing any worn or damaged parts or defective operation; recognizing the number color code system used in this standard to identify powder load levels. In the event the operator is unable to distinguish the colors used, he shall be given special instruction to enable him to avoid error; and using the tool correctly within the limitations of its use and demonstrating his competence by operating the tool in the presence of the instructor. (7-1-97)

After training, the operator shall, to substantiate his competency, satisfactorily complete a written examination provided by the manufacturer of the tool. The operator's written examination shall consist of questions to establish the operator's competence with respect to: the requirements of this standard; the powder actuated fastening system; and the specific details of operation and
maintenance of the tool(s) involved. The examination shall provide a statement, attested to by the 
instructor, that the applicant can (or cannot) readily distinguish the colors used to identify 
powder load levels. (See sub-section 274.05.u. through sub-section 270.12.w. of this section.) (7-
1-97)

hhh. Each applicant who meets the requirements as set forth in Subsection 270.12.fff. and ggg. 
of this section shall receive a qualified operator's card, issued and signed by both the instructor 
and applicant. While using the tool, the operator shall have this card in his possession. The 
qualified operator's card supplied by the manufacturer shall be wallet size of approximately two 
and one-half (2 1/2) x three and one-half (3 1/2) inches and the face of the card shall bear text 
similar to that shown in Figure 270.12-B. There shall be printed on the card a notation reading: 
Revocation of card - Failure to comply with any of the rules and regulation for safe operation of 
powder actuated fastening tools shall be cause for the immediate revocation of this card. (7-1-97)

FIGURE 270.12-B

<table>
<thead>
<tr>
<th>QUALIFIED OPERATOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder Actuated Tools</td>
<td>Date</td>
</tr>
<tr>
<td>(MAKE)</td>
<td></td>
</tr>
<tr>
<td>Card No.</td>
<td>Social Security No.</td>
</tr>
<tr>
<td>This certifies that</td>
<td>(NAME OF INSTRUCTOR)</td>
</tr>
<tr>
<td>has received the prescribed training in the operation of powder actuated</td>
<td></td>
</tr>
<tr>
<td>tools manufactured by</td>
<td>(NAME OF MANUFACTURER)</td>
</tr>
<tr>
<td>and is qualified to</td>
<td></td>
</tr>
<tr>
<td>train and certify operators of</td>
<td>(MAKE)</td>
</tr>
<tr>
<td>Model(s)</td>
<td></td>
</tr>
<tr>
<td>Authorized by</td>
<td></td>
</tr>
<tr>
<td>I have received instruction by the manufacturer's authorized representative in the training of</td>
<td></td>
</tr>
<tr>
<td>operators of the above tools and agree to conform to all rules and regulations governing the</td>
<td></td>
</tr>
<tr>
<td>the instruction of tool operators.</td>
<td></td>
</tr>
<tr>
<td>Date of Birth</td>
<td>(SIGNATURE)</td>
</tr>
</tbody>
</table>

13. Power Lawn Mowers: (7-1-97)
a. Power lawn mowers of the walk-behind, riding-rotary types, and reel power lawn mowers 
designed for use by employees shall meet the design specifications in "American National 
Standard Safety Specifications for Power Lawnmowers" ANSI B71.1. These specifications do
not apply to sulky-type mowers, flail mowers, sickle-bar mowers, or mowers designed for commercial use. (7-1-97)

b. All power-drive chains, belts and gears shall be so positioned or otherwise guarded to prevent the operator's accidental contact therewith, during normal starting, mounting, and operation of the machine. (7-1-97)

c. A shut-off device shall be provided to stop operation of the motor or engine. This device shall require manual and intentional reactivation to restart the motor or engine. (7-1-97)

d. All positions of the operating controls shall be clearly identified. (7-1-97)

e. The words, Caution. Be Sure The Operating Control(s) Is In Neutral Before Starting The Engine, or similar wording shall be clearly visible at an engine starting control point on self-propelled mowers. (7-1-97)

f. The walk-behind and riding rotary mower blade shall be enclosed except on the bottom and the enclosure shall extend to or below the lowest cutting point of the blade in the lowest blade position. (7-1-97)

g. Guards which must be removed to install a catcher assembly shall comply with the following: Warning instructions shall be affixed to the mower near the opening stating that the mower shall not be used without either the catcher assembly or the guard in place. The catcher assembly or the guard shall be shipped and sold as part of the mower. The instruction manual shall state that the mower shall not be used without either the catcher assembly or the guard in place. The catcher assembly, when properly and completely installed, shall not create a condition which violates the limits given for the guarded opening. (7-1-97)

h. Openings in the blade enclosure, intended for the discharge of grass, shall be limited to a maximum vertical angle of the opening of thirty (30) degrees. Measurements shall be taken from the lowest blade position. (7-1-97)

i. The total effective opening area of the grass discharge opening(s) shall not exceed one-hundred (100) square inches on units having a width of cut less than twenty-seven and one-half (27 1/2) inches, or two-hundred (200) square inches on units having a width of cut twenty-seven and one-half (27 1/2) inches or over. (7-1-97)

j. The word "CAUTION" or stronger wording, shall be placed on the mower at or near each discharge opening. (7-1-97)

k. Blade(s) shall stop rotating from the manufacturer's specified maximum speed within fifteen (15) seconds after declutching, or shutting off power. (7-1-97)

l. In a multi piece blade, the means of fastening the cutting members to the body of the blade or disc shall be so designed that they will not become worn to a hazardous condition before the cutting members themselves are worn beyond use. (7-1-97)
m. The maximum tip speed of any blade shall be nineteen-thousand (19,000) feet per minute. (7-1-97)

n. The horizontal angle of the opening(s) in the blade enclosure, intended for the discharge of grass, shall not contact the operator area. (7-1-97)

o. There shall be one of the following at all openings in the blade enclosure intended for the discharge of grass: A minimum unobstructed horizontal distance of three (3) inches from the end of the discharge chute to the blade tip circle. A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar shall be no higher than the bottom edge of the blade enclosure. (7-1-97)

p. The highest point(s) on the front of the blade enclosure for walk behind rotary mowers, except discharge openings, shall be such that any line extending a maximum of fifteen (15) degrees downward from the horizontal toward the blade shaft axis shall not intersect the horizontal plane within the blade tip circle. The highest point(s) on the blade enclosure front, except discharge-openings, shall not exceed one and one-fourth (1 1/4) inches above the lowest cutting point of the blade in the lowest blade position. Mowers with a swing-over handle are to be considered as having no front in the blade enclosure and therefore shall comply with sub-section 270.13.a. of this section. (7-1-97)

q. The mower handle for walk behind rotary mowers shall be fastened to the mower so as to prevent loss of control by unintentional uncoupling while in operation. (7-1-97)

r. A positive up-stop or latch shall be provided for walk behind rotary mowers the mower handle in the normal operating position(s). The up-stop shall not be subject to unintentional disengagement during normal operation of the mower. The up-stop or latch shall not allow the center or the handle grips to come closer than seventeen (17) inches horizontally behind the closest path of the mower blade(s) unless manually disengaged. (7-1-97)

s. A swing-over handle for walk behind rotary mowers, which complies with the above requirements will be permitted. (7-1-97)

t. Wheel drive disengaging controls, except deadman controls, shall move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls shall comply with sub-section 270.02.h. of this section and may operate in any direction to disengage the drive. (7-1-97)

u. The highest point(s) of all openings in the blade enclosure front for riding rotary mowers shall be limited by a vertical angle of opening of fifteen (15) degrees and a maximum distance of one and one-fourth (1 1/4) inches above the lowest cutting point of the blade position. (7-1-97)

v. Opening(s) shall be placed so that grass or debris from riding rotary mowers will not discharge directly toward any part of an operator seated in a normal operator position. (7-1-97)
w. There shall be one of the following at all openings in the blade enclosure intended for the
discharge of grass for riding rotary mowers: A minimum unobstructed horizontal distance of 6
inches from the end of the discharge chute to the blade tip circle. A rigid bar fastened across the
discharge opening, secured to prevent removal without the use of tools. The bottom of the bar
shall be no higher than the bottom edge of the blade enclosure. (7-1-97)

x. Riding rotary mowers shall be provided with stops to prevent jackknifing or locking of the
steering mechanism. (7-1-97)

y. Riding rotary mower stopping means shall be provided. (7-1-97)

z. Hand-operated wheel drive disengaging controls for riding rotary mowers shall move opposite
to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive
disengaging controls shall be depressed to disengage the drive. Deadman controls, both hand and
foot operated, shall comply with sub-section 270.02.h. of this section, and may operate in any
direction to disengage the drive. (7-1-97)

14. Jacks: (7-1-97)

a. The operator shall make sure that the jack used has a rating sufficient to lift and sustain the
load. (7-1-97)

b. The rated load shall be legibly and permanently marked in a prominent location on the jack by
casting, stamping, or other suitable means. (7-1-97)

c. In the absence of a firm foundation the base of the jack shall be blocked. If there is a
possibility of slippage of the cap, a block shall be placed in between the cap and the load. (7-1-
97)

d. The operator shall watch the stop indicator, which shall be kept clean, in order to determine
the limit of travel. The indicated limit shall not be overrun. (7-1-97)

e. After the load has been raised it shall immediately be cribbed, blocked, or otherwise secured.
(7-1-97)

f. Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze
liquid. (7-1-97)

g. All jacks shall be properly lubricated at regular intervals. The lubricating instructions of the
manufacturer should be followed, and only lubricants recommended by him should be used. (7-
1-97)

h. Each jack shall be thoroughly inspected at times which depend upon the service conditions.
Inspections shall be not less frequent than the following: for constant or intermittent use at one
locality, once every six (6) months; for jacks sent out of shop for special work, when sent out and
when returned; and for a jack subjected to abnormal load or shock, immediately before and immediately thereafter. (7-1-97)

i. Repair or replacement parts shall be examined for possible defects. (7-1-97)

j. Jacks which are unserviceable shall be taken out of service, shall be tagged accordingly, and shall not be used until repairs are made. (7-1-03)

271. -- 279. (RESERVED)