DEPARTMENT OF LICENSING AND REGULATORY AFFAIRS

DIRECTOR'S OFFICE

GENERAL INDUSTRY SAFETY AND HEALTH STANDARD

(By authority conferred on the director of the department of licensing and regulatory affairs by sections 16 and 21 of the Michigan occupational safety and health act, 1974 PA 154, MCL 408.1016 and 408.1021, and Executive Reorganization Order Nos. 1996-2, 2003-1, 2008-4, and 2011-4, MCL 445.2001, 445.2011, 445.2025, and 445.2030)

PART 7. GUARDS FOR POWER TRANSMISSION

R 408.10701 Scope.

Rule 701. This part applies to all equipment used in the transmission of power, excluding the point of operation.

History: 1979 AC.

R 408.10702 Referenced standard.

Rule 702. The Michigan Occupational Safety and Health Administration (MIOSHA) standard General Industry Safety and Health Standard Part 2. "Walking-Working Surfaces," R 408.10201 to R 408.10241, is referenced in these rules. Up to 5 copies of this standard may be obtained at no charge from the Michigan Department of Licensing and Regulatory Affairs, MIOSHA Regulatory Services Section, 530 West Allegan Street, P.O. Box 30643, Lansing, Michigan, 48909-8143 or via the internet at the following website: www.michigan.gov/mioshastandards. For quantities greater than 5, the cost, at the time of adoption of these rules, is 4 cents per page.

History: 2016 AACS; 2019 AACS.

R 408.10703 Definitions; B to G.

Rule 703. (1) "Belt" includes any power transmission belt, including, but not limited to, a flat belt, round belt, and V-belt, overhead chain and link belt. It does not include a conveyor belt.

(2) "Belt pole" means a device used in shifting belts on and off fixed pulleys on a line or countershaft if there are no loose pulleys.

(3) "Belt shifter" means a device for mechanically shifting belts from tight to loose idler pulleys or vice versa, or for shifting belts on cones of speed pulleys.

(4) "Exposed to contact" means that the location of an object is such that a person might come into contact with it and be injured.

(5) "Flywheel" includes a balance wheel and a flywheel pulley mounted and revolving on the crankshaft of an engine or other shafting.

(6) "Gears" means a set or train of wheels or parts that engages another part as by meshing teeth.

(7) "Guarded" or "enclosed" means that an object is covered, fenced, or surrounded so that it is not exposed to contact.

History: 1979 AC; 1982 AACS.

R 408.10704 Definitions; H to V.

Rule 704. (1) "Horizontal belt" means a belt running within a 60 degree angle from horizontal.

(2) "Maintenance runway" means a permanent runway or platform used for oiling, maintenance, running adjustment, or repair work, but not for a passageway.

(3) "Nip-point belt and pulley guard" means a device which encloses a pulley and is provided with rounded or rolled edge slots through which the belt passes.

(4) "Point of operation" means that point at which cutting, shaping, or forming by a machine is accomplished upon stock and other points that may offer a hazard to the operator in inserting or manipulating stock in the operation of the machine.

(5) "Securely fastened" means that the safety device or object referred to shall be so secured in place that it cannot be moved under normal or reasonably foreseen conditions or circumstances.

(6) "Vertical belt" means a belt running within a 30 degree angle from vertical.

History: 1979 AC.

POWER TRANSMISSION EQUIPMENT

R 408.10711 Flywheels.

Rule 711. An employer shall ensure that any part of a flywheel 7 feet or less above the floor or platform is guarded in 1 of the following ways:

(a) Enclosed by a guard pursuant to R 408.10751 to R 408.10754.

(b) With guardrail systems placed not less than 15, nor more than 20, inches from the rim of the flywheel in compliance with General Industry Safety and Health Standard Part 2. “Walking-Working Surfaces,” as referenced in R 408.10702.

(c) The upper rim of a flywheel protruding through a working floor is enclosed or surrounded by a guardrail system in compliance with General Industry Safety and Health Standard Part 2. “Walking-Working Surfaces,” as referenced in R 408.10702.

(d) A flywheel with a smooth rim 5 feet or less in diameter may be guarded pursuant to R 408.10756.

History: 1979 AC; 1982 AACS; 2016 AACS; 2019 AACS.

R 408.10712 Cranks and connecting rods.

Rule 712. A crank and a connecting rod, if exposed to contact, must be guarded pursuant to R 408.10751 to R 408.10754 or by a guardrail system in compliance with General Industry Safety and Health Standard Part 2. "Walking-Working Surfaces," as referenced in R 408.10702.

History: 1979 AC; 1982 AACS; 2016 AACS; 2019 AACS.

R 408.10713 Tail rods and extension piston rods.

Rule 713. Tail rods and extension piston rods exposed to contact must be guarded pursuant to R 408.10751 to R 408.10754 or by a guardrail system in compliance with General Industry Safety and Health Standard Part 2. "Walking-Working Surfaces," as referenced in R 408.10702, which allows a clearance of not less than 15, nor more than 20, inches from the fully extended tail rod or extension piston rod.

History: 1979 AC; 1982 AACS; 2016 AACS; 2019 AACS.

R 408.10714 Rescinded.

History: 1979 AC; 1982 AACS.

R 408.10715 Discharge or exhaust pipes.

Rule 715. The discharge of an exhaust pipe or boiler blowoff, if exposed to contact, shall be guarded pursuant to R 408.10751 to R 408.10754.

History: 1979 AC; 1982 AACS.

R 408.10716 Revolving and reciprocating parts.

Rule 716. A revolving or reciprocating part, if exposed to contact, shall be guarded pursuant to R 408.10751 to R 408.10754.

History: 1979 AC; 1982 AACS.

R 408.10721 Shafts.

Rule 721. (1) A continuous line of shafting shall be secured in position against endwise movement.

(2) An inclined or vertical shaft will be held in position against endwise trust.

(3) A project shaft end, if exposed to contact, shall be made flush or guarded pursuant to R 408.10751 to R 408.10754.

History: 1979 AC; 1982 AACS.

R 408.10722 Shafting.

Rule 722. (1) Shafting exposed to contact 7 feet or less above a floor or platform level shall be guarded pursuant to R 408.10751 to R 408.10754.

(2) Horizontal shafting extending over a driveway shall be guarded with a trough guard unless it is located 15 feet or more above the driveway or is a part of an overhead traveling crane.

(3) Horizontal transmission shafting exposed to contact under benches shall be guarded in 1 of the following ways:

(a) Be completely enclosed.

(b) Be guarded by a trough guard. The sides of the trough shall come to the underside of the table or, if the shafting is located near a floor, to the floor.

(c) Be guarded on exposed sides with a rigid shield guard extending from the underside of the bench top to 2 inches below the line of shafting.

History: 1979 AC; 1982 AACS.

R 408.10723 Rescinded.

History: 1979 AC.

R 408.10725 Pulley guards and guides.

Rule 725. (1) A pulley and a pulley part exposed to contact 7 feet or less from the floor or platform shall be guarded pursuant to R 408.10751 to R 408.10754.

(2) If the distance from a pulley to the nearest fixed pulley, clutch, or hanger is less than the width of the belt used, a guide shall be provided to prevent the belt from leaving the pulley.

(3) If there is an overhanging pulley on a line, jack, or countershaft with no bearing between the pulley and the outer end of the shaft, a guide to prevent the belt from running off the pulley shall be provided.

History: 1979 AC; 1982 AACS.

R 408.10726 Pulley condition and operation.

Rule 726. (1) A pulley with a defect, including, but not limited to, a crack or a piece broken out, shall not be used.

(2) A pulley subject to active corrosive conditions shall be of corrosion-resisting material.

(3) A pulley permanently out of service shall not be allowed to remain on shafting which is in use, unless enclosed with a guard pursuant to R 408.10751 to R 408.10754.

(4) A pulley shall not be operated at more than its designed rim speed.

History: 1979 AC; 1982 AACS.

R 408.10727 Belts.

Rule 727. (1) A belt and pulley that is 7 feet or less above the floor or platform and that is exposed to contact must be guarded pursuant to R 408.10751 to R 408.10754. In a power plant or power-development room, a guardrail system may be used in compliance with General Industry Safety and Health Standard Part 2. "Walking-Working Surfaces," as referenced in R 408.10702.

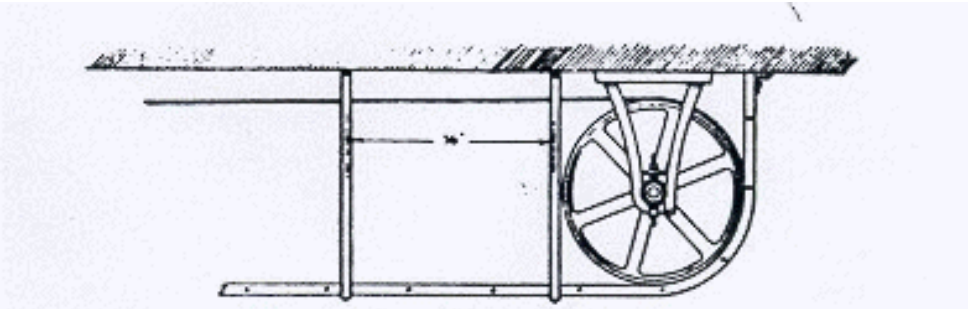
(2) A horizontal belt more than 7 feet above the floor or platform must be guarded for its entire length if located over a passageway or work place pursuant to R 408.10753 and figure 2 contained in subrule (5) of this rule.

(3) A passageway between horizontal belts must have a lower run guarded by a platform that is provided with a guardrail system in compliance with General Industry Safety and Health Standard Part 2. "Walking-Working Surfaces," as referenced in R 408.10702, and the upper run guarded pursuant to subrule (2) of this rule.

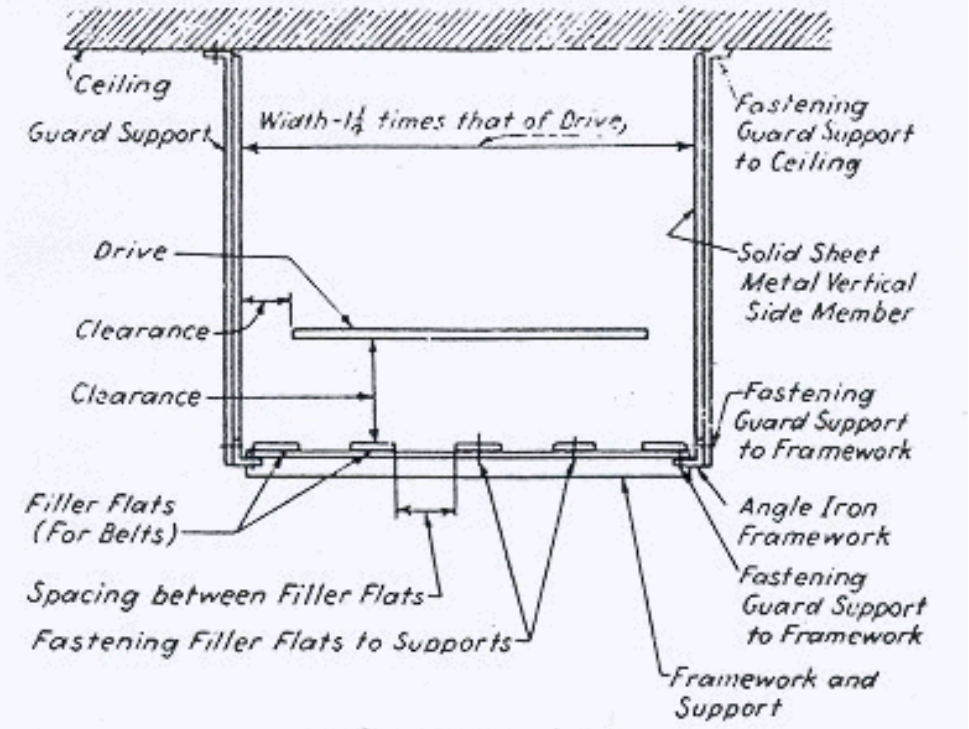
(4) A vertical or inclined belt running over a lower pulley more than 7 feet above the floor or platform and located over a passageway or work place must be guarded pursuant to subrule (2) of this rule.

(5) Figure 2 reads as follows:

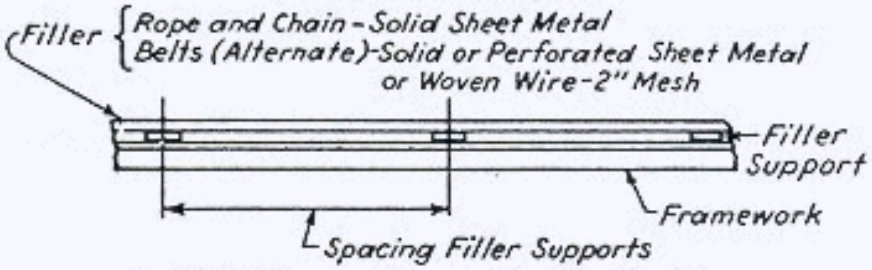
FIGURE 2



Overhead Belt and Pulley Guard



A—Cross Section of Guard



B—Detail Showing Construction Used for Ropes Chains, and as Alternate for Belts

History: 1979 AC; 1982 AACS; 2016 AACS; 2019 AACS.

R 408.10728 Rescinded.

History: 1979 AC.

R 408.10729 Cone pulley belts.

Rule 729. (1) A cone belt and pulley shall be equipped with a belt shifter so constructed as to adequately guard the nip-point of the belt and pulley. If the frame of the belt shifter does not adequately guard the nip-point of the belt and pulley, the nip-point shall be further protected by means of a guard which extends at least to the top of the largest step of the cone.

(2) If the belt is of the endless type or laced with rawhide laces, and a belt shifter is not desired, the belt will be considered guarded if the nip-point of the belt and pulley is protected by a nip-point guard which extends at least to the top of the largest step of the cone, and formed to show the contour of the cone in order to give the nip-point of the belt and pulley the maximum protection.

(3) If the cone is located less than 3 feet from the floor or working platform, the cone pulley and belt shall be guarded to a height of 3 feet regardless of whether the belt is endless or laced with rawhide.

History: 1979 AC.

R 408.10730 Belt tighteners and counterweights.

Rule 730. (1) A suspended counterbalanced belt tightener and its parts shall be provided with a safety cable or device to prevent the tightener from being exposed to contact if the belt breaks or they shall be guarded pursuant to R 408.10751 to R 408.10754.

(2) A suspended counterweight exposed to contact or a part of a counterweight which could subject an employee to injury shall be guarded pursuant to R 408.10751 to R 408.10754 or shall be provided with a safety cable or device to prevent a fall.

History: 1979 AC; 1982 AACS.

R 408.10731 Gears, sprockets, and chain drives.

Rule 731. (1) Gears, sprockets, and chain drives exposed to contact shall be guarded pursuant to R 408.10751 to R 408.10754. This does not apply to hand-operated gear sprockets and chain drives used to adjust machine parts which do not move after hand power is removed.

(2) Protection against falling chain or metal belts shall be provided pursuant to R 408.10751 to R 408.10754 where drives extend over a work area or passageway.

History: 1979 AC; 1982 AACS.

R 408.10732 Openings for oiling.

Rule 732. If frequent oiling is necessary, openings with hinged or sliding self-closing covers shall be provided. Points not readily accessible shall have remote lubricating means

if the lubricant is to be added while machinery is in motion and the oiler would be exposed to contact.

History: 1979 AC.

R 408.10734 Friction drives.

Rule 734. The driving points and moving parts of friction drives, if exposed to contact, shall be guarded pursuant to R 408.10751 to R 408.10754.

History: 1979 AC; 1982 AACS.

R 408.10736 Projections.

Rule 736. Projecting keys, set screws, and other projections in revolving parts exposed to contact shall be removed, made flush, or guarded. This does not apply to keys or set screws within gear or sprocket casings or other enclosures, nor to keys, set screws, or oil cups in hubs of pulleys less than 20 inches in diameter if they are within the plane of the rim of the pulley.

History: 1979 AC.

R 408.10738 Rescinded.

History: 1979 AC.

STARTING AND STOPPING DEVICES

R 408.10741 Clutches.

Rule 741. (1) A clutch, cut-off coupling, or clutch pulley having any projecting parts exposed to contact shall be enclosed by a stationary guard constructed pursuant to R 408.10751 to R 408.10754.

(2) On a line shaft the shifting part of a jaw clutch and the shifting or mechanism part of a friction clutch coupling shall be attached to the driven shaft.

History: 1979 AC; 1982 AACS.

R 408.10743 Belt shifters.

Rule 743. (1) A tight pulley and a loose pulley shall be equipped with a permanent belt shifter provided with mechanical means to prevent the belt from creeping from the loose to the tight pulley.

(2) A belt shifter and clutch handle shall be rounded and be located to prevent being exposed to contact, but within easy reach of the operator. If an overhead belt shifter is not

directly located over a machine or bench, the handles shall be cut off 7 feet above floor level.

History: 1979 AC.

R 408.10744 Belt poles, perches, and fasteners.

Rule 744. (1) If loose pulleys or idlers are not practicable, belt perches in the form of brackets and rollers shall be used to keep idle belts away from the shafts.

(2) Belts shifted by hand shall be glued or fastened with leather lacing.

History: 1979 AC; 1982 AACS.

GUARD DESIGN AND CONSTRUCTION

R 408.10751 Design.

Rule 751. (1) The design of a guard shall take into consideration:

(a) The nature of protection required of the guard.

(b) The possibility of guard failure.

(c) The amount of maintenance required on the guard.

(2) In a place where it is necessary to change belts, make adjustments, or apply oil or grease, a guard may have hinged sections or be of a removable design. A guard shall be closed or replaced after servicing.

History: 1979 AC.

R 408.10752 Construction.

Rule 752. A guard shall be practicable, durable, and effective, and it shall not introduce a new hazard, including, but not limited to, burrs and sharp edges.

History: 1979 AC.

R 408.10753 Materials.

Rule 753. (1) Wood guards may be used if the presence of fumes or if manufacturing conditions cause rapid deterioration of metal guards, in construction work, and in locations outdoors if extreme cold or extreme heat makes metal guards and railings undesirable.

(2) Material sizes and clearances shall be pursuant to table A. See Figure 2, and Appendices A and B.

(3) Table A reads as follows:

TABLE A STANDARD MATERIALS AND DIMENSIONS FOR MACHINERY GUARDS					
Size and Clearance of Filler Materials					
Material	Clearance From Moving Part At All Points (Inches)		Largest Mesh or Opening Allowable B (Inches)	Minimum Gauge (U.S. Standard) Or Thickness	
Woven Wire	Under 2 2-4 4-15		3/8 1/2 2	No. 16-1/8 In. No. 16-1/2 No. 12-2	
Expanded Metal	Under 4 4-15		1/2 2	No. 18-1/2 In. No. 13-2	
Perforated Metal	Under 4 4-15		1/2 2	No. 20-1/2 In. No. 14-2	
Sheet Metal	Under 4 4-15		- - -	No. 22 No. 22	
Wood Or Metal Strips Crossed	}	Under 4 4-15	1/2 2	}	3/4 In. Wood Or No. 16 Metal
Wood Or Metal Strips Not Crossed	}	Under 4 4-15	1/2 The Width One Width		
Plywood, Plastic Or Equivalent	Under 4 4-15		- - -	1/4 In. 1/4 In.	
Standard Railing	Min. 15 Max. 20		- - -	- - -	

History: 1979 AC; 1982 AACS; 2016 AACS.

R 408.10754 Frames.

Rule 754. (1) If a guard has a frame, the material shall be securely fastened to it.

(2) The minimum dimensions of materials in the frame of a guard shall be of sufficient strength and rigidity to hold the filler material fastened to it and to give the guard sufficient strength and rigidity in order to provide the desired protection.

History: 1979 AC; 1982 AACS.

R 408.10756 Disk guards.

Rule 756. A disk guard shall be made of materials specified in table A of R 408.10753 and fastened securely to spokes of pulleys, flywheels, or gears. If a possibility of contact with sharp edges of the disk exists, the edge shall be rolled. Lock nuts or washers shall be placed on the unexposed side of the wheel.

History: 1979 AC; 1982 AACS.

R 408.10757 Rescinded.

History: 1979 AC; 1982 AACS.

POWER DISCONNECTS AND LOCK-OUTS

R 408.10761 Rescinded.

History: 1979 AC; 2013 AACS.

R 408.10763 Rescinded.

History: 1979 AC; 1982 AACS; 2013 AACS.

R 408.10765. Inspection and care of equipment; clothing for oilers.

Rule 765. (1) All power-transmission equipment shall be inspected at intervals not exceeding 60 days and be kept in good working condition at all times.

(2) Shafting shall be kept in alignment, free from rust and excess oil or grease.

(3) Where explosives, explosive dusts, flammable vapors, or flammable liquids exist, the hazard of static sparks from shafting shall be carefully considered.

(4) Bearings shall be kept in alignment and properly adjusted.

(5) Hangers shall be inspected to make certain that all supporting bolts and screws are tight and that supports of hangers boxes are adjusted properly.

(6) Pulleys shall be kept in proper alignment to prevent belts from running off.

(7) Inspection shall be made of belts, lacings, and fasteners, and such equipment shall be kept in good repair.

History: 1979 AC; 2013 AACS.