



SURFACE VEHICLE STANDARD

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Industrial Rotary Mowers

RATIONALE

This document is superseded to ISO 4254-12 and ISO 4254-13.

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Documents

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1. **Scope**—This SAE Standard establishes performance criteria for towed, semi-mounted, or mounted and arm type rotary mowers with one or more blade assemblies of 77.5 cm blade tip circle diameter or over, mounted on a propelling tractor or machine of at least 15 kW, intended for marketing as industrial mowing equipment and designed for cutting grass and other growth in public use areas such as parks, cemeteries, and along roadways and highways.

The use of the word “industrial” is not to be confused with “in-plant industrial equipment.”

This document does not apply to:

- a. Turf care equipment primarily designed for personal use, consumption, or enjoyment of a consumer in or around a permanent or temporary household or residence.
- b. Equipment designed primarily for agricultural purposes but which may be used for industrial use.
- c. Self-powered or self-propelled mowers or mowing machines.

2. References

- 2.1 **Applicable Publications**—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated, the latest revision of SAE publications shall apply.

- 2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J115 FEB1995—Safety Signs—(ASAE S441.1)
SAE J517 APR2001—Hydraulic Hoses
SAE J920 SEP1985—Technical Publications for Agricultural Equipment—(ASAE EP363.1 DEC97)
SAE J1150 JUL1997—Terminology for Agricultural Equipment—(ASAE S390.1)
SAE J1170 JUN91—Rear Power Take-off for Agricultural Tractors

- 2.1.2 ASAE PUBLICATIONS—Available from 2950 Niles Road, Saint Joseph, MI 49085-9601.

ASAE S203.13—Front and Rear Power Take-Off for Agricultural Tractors
ASAE S217.11—Three-Point Free-Link Hitch Attachment of Implements to Agricultural Wheeled Tractors
ASAE S278.6 JAN2001—Three-Point Hitch, Implement Quick-Attaching Coupler, Agricultural Tractors
ANSI/ASAE S318.14 SEP99—Safety for Agricultural Field Equipment
ASAE S483—Rotary Mower Blade Ductility Test

2.1.3 ASTM PUBLICATIONS—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 2529-74—Test for Bursting Strength of Paperboard and Linerboard

ASTM D 2738-71—Test for Bursting Strength of Corrugated and Solid Fiberboard

3. Definitions—(See also SAE J1150 JUL1997)

- 3.1 Arm Type Mower**—Mowers which are intended to be used frequently with the cutter portion not adjacent or parallel to the ground.
- 3.2 Functional Component**—A working mechanism of an attachment or implement designed to perform a specific task such as the cutting blade of a rotary mower.
- 3.3 Guarded by Location**—A potential hazard is so guarded when it is covered by other parts or components of the machine, or because of its remote location, inadvertent contact is minimized during normal operation or servicing.
- 3.4 Hit**—Rupture of the front layer but not the back layer of the thrown object target material by a test projectile.
- 3.5 Inadvertent Contact**—Contact between a person and a moving machinery part hazard, or other type of hazard, resulting from the person's unintentional actions during normal operation.
- 3.6 Moving Machinery Part Hazard**—A source of potential injury created by moving machinery parts which can cause serious injury upon contact or by entanglement of personal apparel. This includes, but is not limited to, the pinch points of power driven gears, run-on points of belts and chains, and projections on rotating parts.
- 3.7 Normal Operating Position**—The space within operator zone occupied by the operator while operating mower. The operator is sitting on the seat with hands on the steering controls and feet on controls or areas provided for foot placement. For Operator zone, see Figures 1, 2, and 3.
- 3.8 Power Take-Off (PTO)**—An external shaft on the rear of a tractor to provide rotational power to implements (ASAE S203.13).
- 3.9 Implement Input Driveline (IID)**—Two universal joints and their connecting member(s) and fastening means for transmitting rotational power from the tractor PTO to the implement input connection. A double Cardan, constant velocity joint is considered a single joint. The IID also includes integral shielding where provided. Reference ASAE S318.14 SEP99).
- 3.10 Propelling Machine**—A tractor or self-propelled machine.
- 3.11 Puncture**—The rupture of all layers of the thrown object target material by a test projectile.
- 3.12 Rotary Mower**—A power mower in which one or more functional components cut or shear by impact and rotate about an axis perpendicular to the cutting plane.
- 3.13 Standard Test Operator**—A person weighing 95 kg $\pm$ 5 kg and standing 188 cm $\pm$ 5 cm.
- 3.14 Shield (or Guard)**—A barrier which minimizes inadvertent personal contact with hazards created by moving machinery parts.
- 3.15 Target Material**—160 kg uncoated corrugated board, specification paper weight 41 kg-12 kg-41 kg B flute per ASTM D 2738 and D 2529 (see Figure 4):

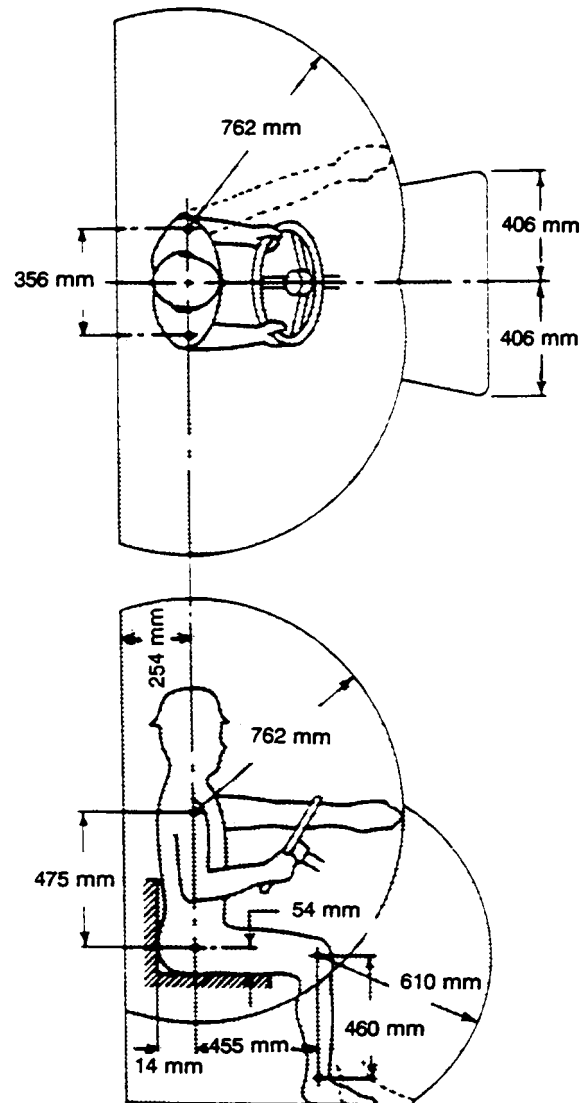
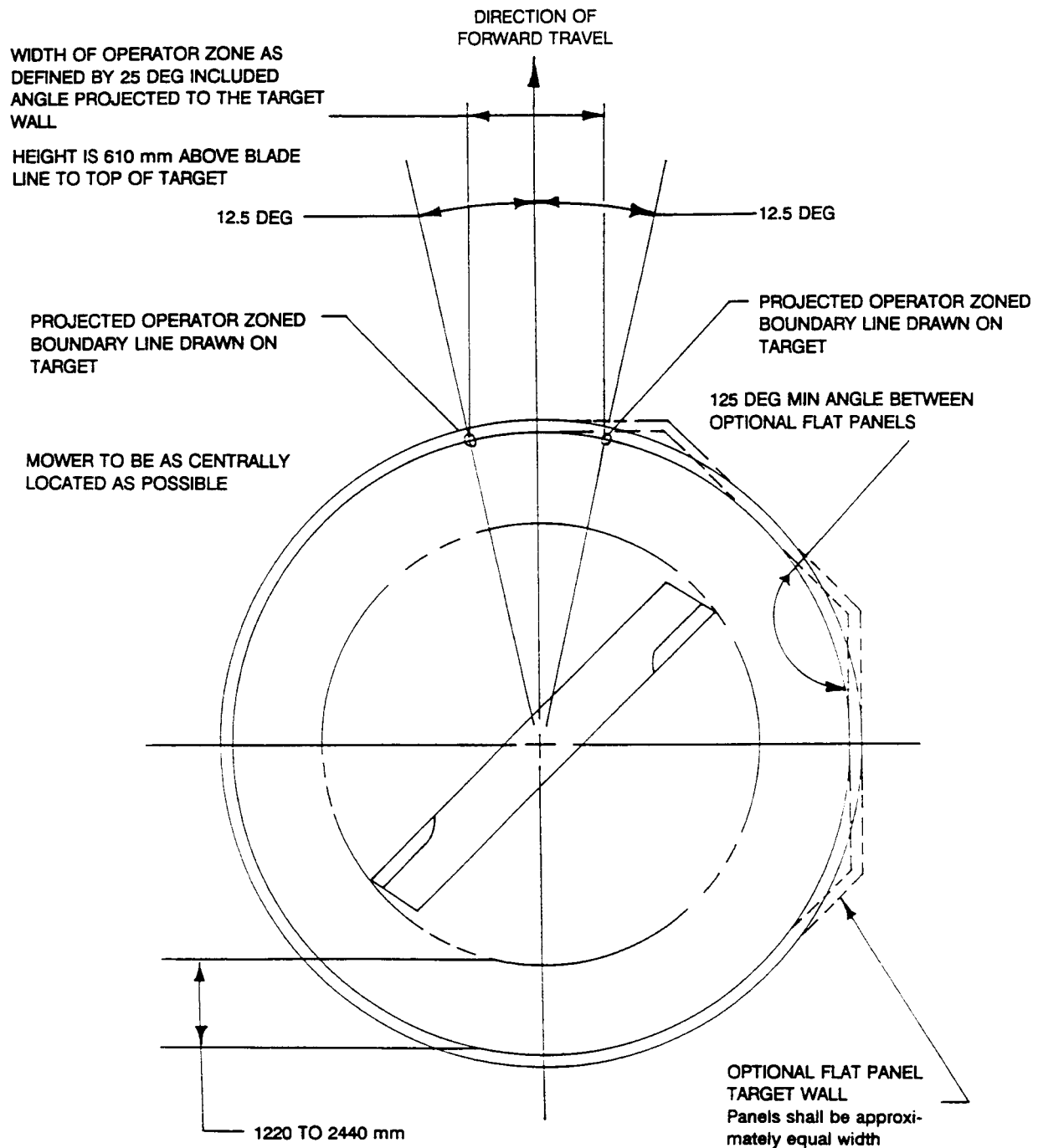


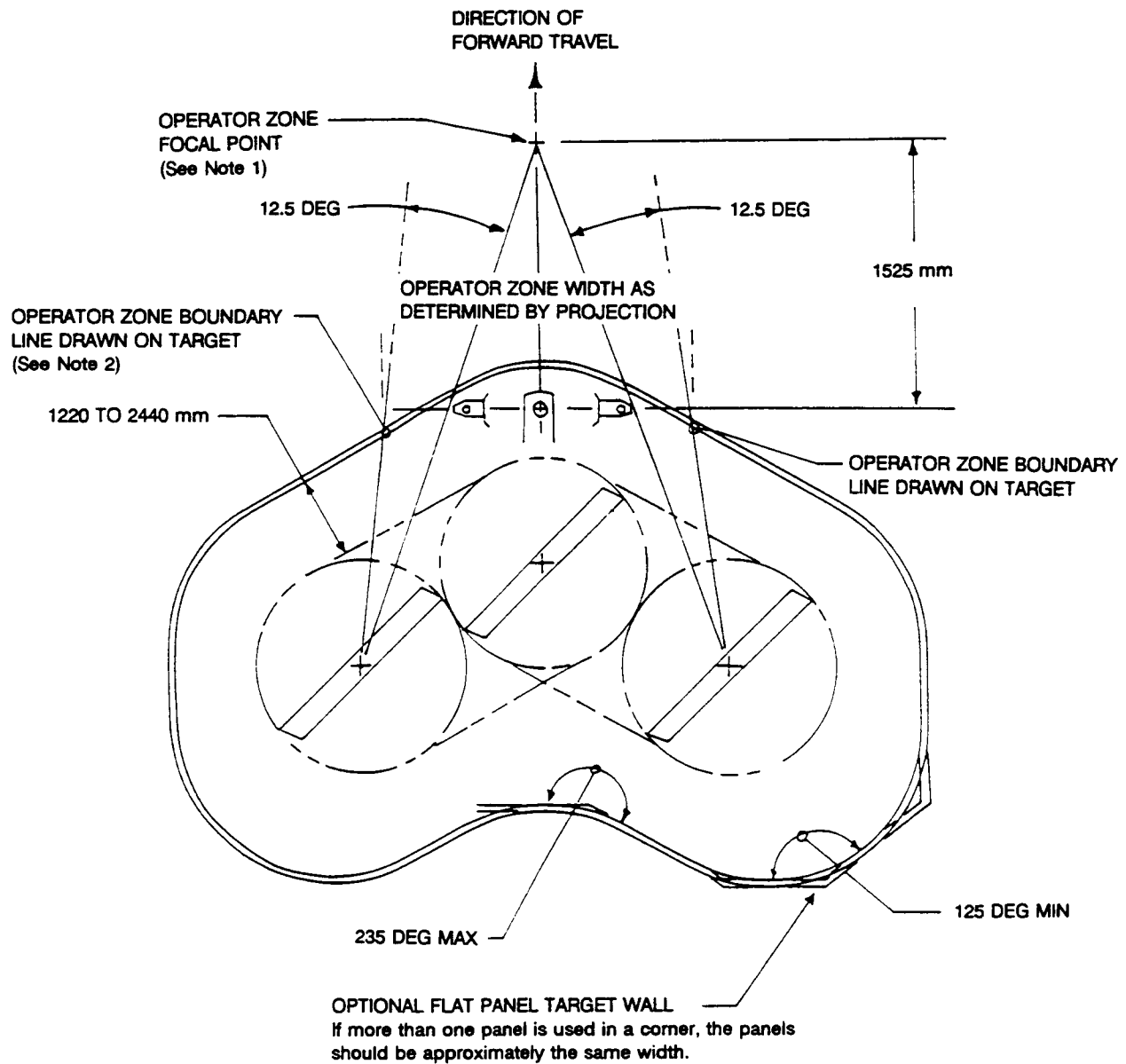
FIGURE 1—OPERATOR ZONE



NOTES

- (1) The operator zone focal point shall be on a line in the forward direction of travel midway between the hitch pins or on the centerline of the tongue hole.
- (2) Operator zone height is 610 mm above the blade line to the top of the target wall.
- (3) The mower position shall be as symmetrical as possible within the target enclosure.

FIGURE 2—TARGET CONFIGURATION AND OPERATOR ZONE FOR SINGLE-BLADE MOWERS



NOTES

- (1) The operator zone focal point shall be on a line in the forward direction of travel midway between the hitch pins or on the centerline of the tongue hole.
- (2) Operator zone height is 610 mm above the blade line to the top of the target wall.
- (3) The mower position shall be as symmetrical as possible within the target enclosure.

FIGURE 3—TARGET CONFIGURATION AND OPERATOR ZONE FOR MULTI-BLADE MOWERS

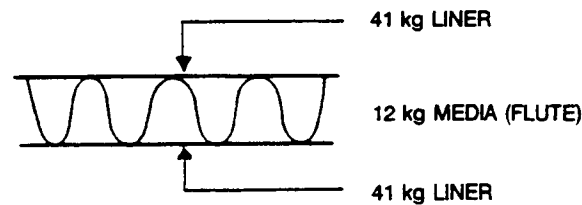


FIGURE 4—SINGLE WALL

3.16 Test Projectile—An uncoated six penny steel box nail or common nail with the following approximate dimensional limits (see Figure 5):

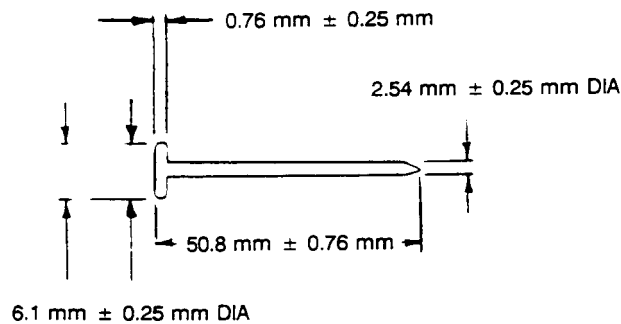


FIGURE 5—SIX PENNY STEEL BOX NAIL DIMENSIONS

4. General Requirements

4.1 Guarding and Shielding

- 4.1.1 Inadvertent contact with moving machinery parts hazards shall be minimized during normal mounting, starting, operating, or dismounting the equipment by guarding and shielding.
- 4.1.2 The following are some of the potential hazard areas:
 - 4.1.2.1 Pinch points of gears and the run-on point where a belt or chain contacts a sheave, sprocket, or idler.
 - 4.1.2.2 Outside faces of pulleys, sheaves, sprockets, and gears on rotating drives.
 - 4.1.2.3 Rotating parts with projections such as exposed bolts, keys, or set screws.
 - 4.1.2.4 Revolving shafts, except smooth (without keyways, splines, etc.) shaft ends protruding less than one-half the diameter of the rotating element.
 - 4.1.2.5 Implement input driveline.
- 4.1.3 Shields shall remain functional under the forces that would be applied by a 123 kg individual leaning on, falling against, or stepping on them. This applies only to those forces that would be expected in normal machine operation or maintenance.