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Safety

**AGRICULTURAL TRACTORS AND
IMPLEMENT ATTACHMENTS**

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(SMSgt Pennie Hardesty)
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The criteria in this standard are the Air Force's minimum safety, fire prevention, and occupational health requirements for agricultural tractors and their attachments. Major commands (MAJCOM), direct reporting units (DRU), and field operating agencies (FOA) may supplement this standard when additional or more stringent safety, fire prevention, and health criteria are required. Refer to Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*, for instructions on processing supplements or variances. Report conflicts in guidance between this standard, federal standards, or other Air Force directives through MAJCOM, DRU, or FOA ground safety offices to Headquarters, Air Force Safety Center, Ground Safety Division, Safety Engineering and Standards Branch (HQ AFSC/SEGS), 9700 G Avenue, SE, Kirtland AFB NM 87117-5670.

This standard applies to all agricultural tractors and attachment implements which are used as defined in **Attachment 1**. It provides the requirements and guidelines for operators' instructions, maintenance, and service. The standard applies to all US Air Force organizations, including all US Air Reserve personnel and when Air National Guard personnel are on federal service.

NOTE: AFOSH 127-series standards are being converted to 91-series standards and the 161-series to 48-series standards. However, not all standards have been converted as of the effective date of this standard. To help you locate these documents, references to AFOSH standards are stated in the updated series and standard number, with the outgoing series and standard number stated as "formerly designated as" in the references section of **Attachment 1**.

SUMMARY OF REVISIONS

Administrative changes have been made to update this standard to electronic format. Paragraphs have been renumbered and references updated as required. A glossary of references, abbreviations, acronyms, and terms is provided at **Attachment 1**. A | indicates revisions from the previous edition.

1. Hazards and Human Factors. Injury to workers and damage to equipment are usually the result of careless or improper handling of tractors and the attached implements. The failure of personnel to install

and maintain guards at the point of operation, unauthorized removal of guards or controls, improper maintenance, and unsafe operating practices are principal sources of mishaps. Tractor operators are exposed to many conditions which can affect their ability to safely operate equipment: Fatigue, equipment, vibration, and environmental conditions such as noise, dust, engine exhaust, noxious fumes, temperature, and climate can impair their physical condition and affect their awareness and judgment. Tractor operators must be acutely aware of pedestrian traffic in high noise areas such as aircraft parking ramps and taxiways since the equipment will normally not be heard and other personnel will not be aware of their presence. Operator training, environmental controls, maintenance programs, and job planning will eliminate the majority of hazards generated by, or encountered in the operation of agricultural tractors and equipment.

2. Requirements:

2.1. Procurement. Agricultural tractors procured for the Air Force will meet the requirements of Occupational Safety and Health Administration (OSHA) Standard 29 Code of Federal Regulations (CFR) 1928.51, Rollover Protective Structures (ROPS) for Tractors Used in Agricultural Operations, and military specifications. Where commercially available, agricultural tractors will be purchased with noise levels at the operator position of less than 85 Decibels-A-Weighted (dBA).

2.2. Supervisor's Responsibilities. Supervisors will:

2.2.1. Ensure operators have completed an approved training program for agricultural tractor operations.

2.2.2. Be knowledgeable of terrain conditions in all areas of operation, especially where the degree of slope is at or exceeds a 4-inch drop or rise per foot of travel.

2.2.3. Identify hazardous areas to operators, particularly those where the use of agricultural tractors is prohibited.

2.2.4. Ensure availability and use of protective equipment that minimizes the possibilities of injury to operators. These will normally consist of:

- Glass or plastic safety spectacles or soft sided plastic cover goggles with a lens at least .040 inches thick.
- Hard hats when danger exists from falling objects and overhead obstructions.
- Leather shoes or boots with steel safety-toe.
- Leather or coated fabric gloves.
- Noise and respiratory protection when determined necessary by the bioenvironmental engineer.

2.3. Operator's Responsibilities:

2.3.1. All guards will be kept in place when the tractor and implements are in operation.

2.3.2. Riders other than the operator will not be permitted.

2.3.3. Operators will stop the engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, or cleaning the equipment, except where the machine must be running to be properly serviced or maintained. In this case the operator will follow all steps and procedures to safely service or maintain the equipment.

2.3.4. Operators will ensure all other personnel are clear of machinery prior to operation of the tractor or any attachment.

2.3.5. Operators will be especially alert when operating over rough ground and limited access areas, and will reduce vehicle speed when operating on sloping terrain. Mowing operations will not be performed on slopes at or greater than a 4-inch drop or rise per foot of travel. When the operator is in doubt as to the degree of slope, the operation will cease until the degree of slope is confirmed. When using a sickle bar to mow slopes, the sickle bar will be on the up-slope side of the tractor.

2.3.6. Operators will park tractors on level surfaces. The attachment implement will be lowered to rest on the surface. After the engine has stopped, the transmission will be placed in low or reverse. Automatic transmissions will be placed in "park" and the engine will be shut off.

2.3.7. Operators will wear and maintain the protective equipment required for their health and safety.

2.4. Training:

2.4.1. Specific authorization for operating agricultural tractors will be noted according to AFMAN 24-309, *Vehicle Operations*.

2.4.2. Every employee who operates an agricultural tractor will be trained in safe operating procedures and practices dictated by the work environment. Supervisors will provide such instructions at the time of initial assignment.

2.5. Inspection and Maintenance:

2.5.1. The operator will inspect the equipment prior to initial startup on each shift. Inspection will include: tire pressure and condition; fuel, oil, and coolant levels; lubrication; exhaust system; security of bolts and nuts; implement mountings; and adjustments. The operator will also inspect to make sure machine guards are properly installed and functioning.

2.5.2. Immediately upon starting the vehicle, braking devices will be checked for serviceable condition. Steering will be checked for play which may cause a steering problem.

2.5.3. Operators will perform minor maintenance required to ensure safe operation of the vehicle.

2.6. Rollover Protection. Agricultural tractors which are operated on slopes will be retrofitted with Rollover Protection Structures (ROPS). Generally, these type vehicles are given a 10-year life expectancy. If vehicles are near replacement age (within 1 year), retrofit will normally not be accomplished unless service life is extended. If a tractor is exempted from ROPS because of projected replacement, the vehicle will not be operated on sloped areas. ROPS-equipped tractors will be furnished with seat belts meeting the requirements set forth in Society of Automotive Engineers Standards SAE J4C, 1965 Motor Vehicle Seat Belt Assemblies. Where a suspended seat is used, the seatbelt shall be fastened to the movable portion of the seat to accommodate a ride motion of the operator.

2.7. Hazardous Noise Warnings. If the noise level at the operator position is 85 dBA or greater, tractors will be marked with a decal stating: "Caution - Hazardous Noise - Operator Ear Protection Required."

2.8. Vehicle Emblems. Each agricultural tractor will have a slow-moving vehicle emblem affixed on the rear in a way that is visible to all oncoming traffic. Care will be exercised to preclude obstructing

the rear view of the operator. Agricultural tractors that are operated in high traffic areas and at night will also be equipped with an amber caution flashing light.

2.9. Guarding and Shielding:

2.9.1. All power take-off shafts, including rear-, mid-, or side-mounted shafts, will be shielded to protect employee from contact with moving machinery parts.

2.9.2. Guards will be capable of withstanding 250 pounds of force applied downward or inward.

2.9.3. Guards will be free of burrs, and sharp edges, or corners, and will be securely fastened to the equipment.

2.9.4. Guards may be removed for servicing or adjusting attachments only after the tractor has been stopped, the motor shut off, and all shafts, pulleys, and gears have ceased rotating. Guards will be reinstalled prior to restart of the equipment for operation.

2.10. Protection from Spillage. Batteries, fuel tanks, oil reservoirs, and coolant systems shall be constructed and located or sealed to assure that spillage, which may come in contact with the operator in the event of an upset, will not occur.

FRANCIS C. GIDEON, Jr., Maj General, USAF
Chief of Safety

Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, ACRONYMS, AND TERMS

References

Air Force Instruction (AFI) 91-301, *Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program*

Air Force Occupational Safety and Health (AFOSH) 48-1, *Respiratory Protection Program*

AFOSH Standard 48-20, *Hearing Conservation Program* (formerly designated as AFOSH Standard 161-20)

AFOSH Standard 91-31, *Personal Protective Equipment* (formerly designated as AFOSH Standard 91-31)

Occupational Safety and Health Administration (OSHA) 29 Code of Federal Regulations (CFR) 1928.51, *Roll-Over Protective Structures*

Society of Automotive Engineers Standard SAE J4C, 1965, *Motor Vehicle Seat Belt Assemblies*

Abbreviations and Acronyms

AFI—Air Force Instruction (new designation)

AFOSH—Air Force Occupational Safety and Health

AFSC—Air Force Safety Center

BE—Bioenvironmental Engineering

BEE—Bioenvironmental Engineer

C—Celsius

CFR—Code of Federal Regulations

dBA—Decibels-A-Weighted

DRU—Direct Reporting Unit

FOA—Field Operating Center

HQ—Headquarters

MAJCOM—Major Command

OSHA—Occupational Safety and Health Administration

PDO—Publishing Distribution Office

PTO—Power Take-Off

ROPS—Rollover Protection Structures

SAE—Society of Automotive Engineers

WWW—World-Wide Web

Terms

Shall—Indicates a mandatory requirement.

Will—Is also used to indicate a mandatory requirement and in addition is used to express a declaration of intent, probability, or determination.

Should—Indicates a preferred method of accomplishment.

May—Indicates an acceptable or satisfactory method of accomplishment

Definitions

Agricultural Tractor—A three- or four-wheel drive-type vehicle designed to seat the operator and furnish power to roll, carry, propel, or drive implements that are designed for agriculture.

Implement—Any item that is designed to be attached to the agricultural tractor by a three-point hitch, draw bar, bolted to the frame or a combination thereof. Most common powered implements are driven by the tractor power take-off (PTO) shaft.

Low Profile Tractor—A wheeled tractor possessing the following characteristics:

- The front wheel spacing is equal to the rear wheel spacing, as measured from the centerline of each right wheel to the centerline of the corresponding left wheel;
- The clearance from the bottom of the tractor chassis to the ground does not exceed 18 inches;;
- The highest point of the hood does not exceed 60 inches; and
- The tractor is designed so the operator straddles the transmission when seated.

Slope—A piece of ground that is not level. Degree or ratio is expressed numerically in inches of drop or rise versus foot of travel.

Attachment 2

AGRICULTURAL TRACTORS AND IMPLEMENT ATTACHMENTS CHECKLIST

This is not an all-inclusive checklist. It simply highlights some critical items in this standard. Other requirements exist in the standard that are not included in the checklist. Where appropriate, MAJCOMs, DRUs, and FOAs, local safety offices, and supervisors will add to this checklist to include command or individual shop-unique requirements or situations.

A2.1. Do design and operating characteristics of agricultural tractors in use by Air Force units meet OSHA Standards? (Reference paragraph 2.1.)

A2.2. Do supervisory personnel take needed actions to ensure: (Reference paragraph 2.2.)

A2.2.1. Proper training of assigned operators?

A2.2.2. Awareness of area operating hazards due to terrain features and conditions?

A2.2.3. Operator awareness of hazardous or prohibited areas?

A2.2.4. Validation of need for and use of personal protective equipment such as head, eye, and ear protectors, gloves, respirators, etc.?

A2.3. Are all guards secured in place and kept in place during machine use? (Reference paragraph 2.3.)

A2.4. Have procedures been published and enforced to prohibit operators from allowing riders on tractors? (Reference paragraph 2.3.)

A2.5. Does the operator stop the engine, disconnect the power sources, and wait for all machine movement to stop before servicing, adjusting, or cleaning the equipment (except where the machine must be running to properly service or maintain the equipment)? (Reference paragraph 2.3.)

A2.6. Do operators keep personnel clear of operating machinery or attachments? (Reference paragraph 2.3.)

A2.7. Do mowing machine operators refrain from attempting to mow on slopes that exceed 4 inches of drop per foot of travel (33 percent)? (Reference paragraph 2.3.)

A2.8. When using a sickle bar attachment for mowing, does the operator always position the sickle bar on the up-slope side of the tractor? (Reference paragraph 2.3.)

A2.9. Does the operator park the tractor on a level surface, lower the attachment so it rests on the surface, place the transmission in low or reverse after the engine has stopped (automatic transmission in "park") and shut the engine off, before the operator leaves the seat of the vehicle? (Reference paragraph 2.3.)

A2.10. Do operators wear the protective equipment required for their safety and health? (Reference paragraph 2.3.)

A2.11. Are all tractors operated on sloping terrain equipped with Roll Over Protection Structures (ROPS)? (Reference paragraph **2.6.**)

A2.12. Have all units been subjected to a noise hazard survey and those whose noise level exceeds 85 dBA placarded with noise hazard warning? (Reference paragraph **2.7.**)

A2.13. Are approved “slow-moving vehicle” emblems and flashing amber light units installed on agricultural tractors used in high traffic areas? (Reference paragraph **2.8.**)

A2.14. Are all power takeoff shafts shielded? Are guards capable of withstanding 250 pounds of downward or inward force? Are guards free of burrs and sharp corners or projections and securely fastened to the unit? (Reference paragraph **2.9.**)

A2.15. Are all guards that were removed for servicing and maintenance reinstalled prior to placing units in use? (Reference paragraph **2.9.**)

A2.16. Are batteries, fuel tanks, oil reservoirs, and coolant systems constructed and located or sealed to assure that spillage will not occur in the event of an upset? (Reference paragraph **2.10.**)