

MINNESOTA DEPARTMENT OF AGRICULTURE

Anhydrous Ammonia Equipment Inspection Specifications

Minnesota Department of Agriculture

Inspection & Permitting Unit

July 2009

SAFETY – FIRST & ALWAYS....

1. Wear NH_3 rated goggles and gloves and have an accessible water supply in close proximity when handling anhydrous ammonia (NH_3) or performing inspections/maintenance;
2. Never assume that all NH_3 is bled off from hosing, piping, tanks, cold flow/cooler units, etc.; and
3. Be aware of others where NH_3 is being released during normal operating processes and incidents.

Anhydrous Ammonia Inspection Checklist Compliance Item Information

ANHYDROUS AMMONIA EQUIPMENT INSPECTION CHECKLIST				PAGE:	
Minnesota Department of Agriculture • Pesticide & Fertilizer Management Division • 625 Robert St. N, St. Paul, MN 55155-2638				OF	
FIRM NAME:		PLANT LOCATION		DATE	
				Initials of Inspector	
INSTRUCTIONS: UNLESS OTHERWISE NOTED, specify deficiencies/violations by entering ("X") in boxes					
EQUIPMENT IDENTIFICATION/TYPE/GALLON CAPACITY/SERVICE STATUS					
Equipment Unit Identification: Firm (F), MDA Tag (MT), Mfr. Serial # (MS)					
Applicator(AP),Nurse Tank(NT),Dual Nurse Tank(D), Toolbar (TB)					
Gallon Capacity of Tank(s) - at or less than 3000 gallons on a single running gear					
Service Status: In Service (IS); Out of Service (OS); or Zero Product/Pressure Out of Service (ZP)					
Compliant to Service Status Policy (Tagging/Lock Outs, etc.)					
TANK PAINTING/MARKINGS/PLACARDING/SMV EMBLEM/REFLECTIVE STRIPS					
1. Tank painting (white or aluminum per Federal Regulations)					
2. "Anhydrous Ammonia" in 2-inch letters on both ends and sides					
3. "Inhalation Hazard" in 2-inch letters on 2 sides					
4. Class 2.2 placards with 1005 ID number on both ends and sides					
5. Reflective tape on sides, rear, rear axle of tank(s). [80+inches & 10,000 # GVW]					
6. Applicator tank legible ammonia transfer instructions					
7. Slow-Moving Vehicle (SMV) emblem					
SAFETY CHAINS/RUNNING GEAR ANCHORING/CRADLE FRICTION/TIRES/BRAKES					
8. Two independently-operating safety chains					
9. Applicator and Nurse tank anchoring to running gear					
10. Applicator Tank Cradle friction					
11. Tires and running gear					
12. Nurse tank brakes					
TANK NON-CODE WELDING/DEFECTS/NAMEPLATE					
13. Tank not NH3 or 250 psi rated					
14. Tank non-code/documented welding (NCW), Dent (D), or Leak (L)					
15. Tank nameplate absent (AB); illegible (IL); DOT Certification Required (DOT) or Cleaning Required (C). What's required: (1) Name of Manufacturer; (2) Manufacturer Serial No.; (3) "U" Stamp; (3) 250 psi rating; (4) Year Built; and (5) Min. Design Metal Temp or MDMT (MDMT required for tank built from January 1, 1989 to present).					
16. DOT SP-13554 markings – preferably in front side area of each tank: What's required: (a) DOT SP-13554 in .24-inch wide by 2-inch high lettering, (b) Month/Year V, T, P in 1-1/4-inch lettering; and (c) Unique ID for each tank in 1/2-inch lettering;					
NURSE TANK VALVE GUARD (ROLLCAGE) PROTECTION					
17. Valve guard protecting valves and piping (no piping allowed outside confines of valve guard)					
POSITIVE SHUT-OFF VALVE/EXCESS FLOW VALVES					
18. Withdrawal (WD), Liquid fill (L), Vapor (V) tank valves					
19. Anchored excess-flow valve or equivalent flow protection for dual nurse tanks at junction where withdrawal hoses merge.					
TANK PRESSURE GAUGES/LIQUID LEVEL GAUGES/NH₃ LIQUID LEVEL					
20. 0-400 (tank) or 0-60/150 (TB manifold) psi/NH3-rated gauge					
21. Float/mechanical liquid level gauge					
22. Filled greater than 85% @ 5°F or 90.6% @ 60°F (Equal to 56% filling density at respective temperatures)					
23. 85% fixed liquid level gauge					

Anhydrous Ammonia Inspection Checklist Compliance Item Information

ANHYDROUS AMMONIA EQUIPMENT INSPECTION CHECKLIST				PAGE:	
Minnesota Department of Agriculture • Pesticide & Fertilizer Management Division • 625 Robert St. N, St. Paul, MN 55155-2538				OF	
FIRM NAME:		PLANT LOCATION		DATE	
				Initials of Inspector	
INSTRUCTIONS: UNLESS OTHERWISE NOTED, specify deficiencies/violations by entering ("X") in boxes					
EMERGENCY WATER TANKS & HOSING					
24. Five gallon emergency water tank & hosing: Accessibility (IA); Cap (B); Cleaning (C); Hosing (H); Repair (R); Replacement (RP)					
TANK 250 PSI/AMMONIA-RATED PRESSURE RELIEF VALVE (PRV)					
25. PRV installation records maintained					
26. Replace Out-of-date / Out-of-condition PRV					
27. PRV Cleaning (C); Rain cap (RC); and/or Periodic (annual) Inspection (PI)					
HOSING/PIPING/HOSE-END VALVES/HOSE SECURED/CONTROL VALVE					
28. Hose & connections out of condition					
29. Hose-end (HS) or bleeder valve (BV) out of condition					
30. Secure hose and hose end valve(s) on tank or application unit					
31. Ammonia-rated piping/fittings (i.e. black forged steel fittings)					
32. Control valve between regulator/break-away coupling device must indicate whether the valve is open or closed.					
AMMONIA-RATED HYDROSTATIC RELIEF VALVES (HYDROSTATS)					
33. In withdrawal valve (WD) and between each pair of shut-off valves (SV)					
34. Toolbar: Hose-end valve or female section of coupling device when withdrawal hose is permanent attached – to protect withdrawal hose.					
35. Toolbar: Hydrostat(s) in heat transfer unit–check psi rating specified by manufacturer					
36. Clean (C), Replace (RP) hydrostat, Rain cap (RC); and/or Periodic (annual) Inspection (PI)					
AUTOMATIC BREAK-AWAY, SELF-CLOSING COUPLING DEVICE					
37. Coupling Device (CD) or Bleeder Valve (BV)					
38. Coupling device DOUBLE SWIVEL (DS) & FLAT BAR (FB) or other approved (i.e. BlueJet Supershooter [®] approved by Parker Hannifin-Pioneer & Squibb Taylor)					
39. Connect/disconnect information readily visible near coupling device					
Comments:					

Anhydrous Ammonia Inspection Checklist Compliance Item Information

Cargo Tanks Versus Nurse Tanks - What Constitutes an Implement of Husbandry

An ASME portable tank built for anhydrous ammonia use used for transport and application is considered an implement of husbandry or a nurse tank by the DOT. A portable ammonia tank unit used exclusively for transporting anhydrous ammonia is considered a DOT cargo tank, therefore, not a nurse tank/implement of husbandry. Also, an ammonia portable tank unit with a total capacity of over 3000 gallons used for transporting and application of anhydrous ammonia is also considered a DOT cargo (nurse) tank. DOT cargo tank regulations are much more stringent than for nurse tanks. See Federal DOT Nurse Tank Specifications 49 CFR, § 173.315(m).

Determining Side & Ends of Ammonia Implements

SIDES: *Driver side equals the left-hand side and passenger side equals the right-hand side* of the implement.

ENDS: Front end equals the end where implement hitch and towing vehicle hitch connects, and back end equals the opposite end.

Service Status Policy

The Service Status policy details conditions when anhydrous ammonia (ammonia) equipment and storage systems are considered to be "in service" (in use) and "out of service" (not in use) in compliance with Minnesota statutes/rules. No specific regulatory relief for ammonia equipment and storage systems based on use or nonuse is explicitly stated in Minnesota statutes/rules. However, as a means to fairly and reasonably assess the compliance status and any subsequent enforcement action of ammonia equipment and storage systems, the following Service Status categories have been established. The Service Status categories are: (1) *In Service*; (2) *Out of Service*; and (3) *Zero Product/Pressure Out of Service*.

Equipment and storage systems that are "In Service" are subject to **full** inspection and enforcement action by the MDA in relationship to compliance with related Minnesota statutes/rules. Equipment (does not apply to storage systems) that is "Out of Service" is subject to **limited** inspection and enforcement by the MDA. Equipment and storage systems that are "Zero Product/Pressure Out of Service" are **normally not** subject to inspection and enforcement by the MDA.

In-Service Status

Anhydrous ammonia equipment and storage systems will be considered "In Service" by the MDA and subject to inspection and compliance with anhydrous ammonia regulations unless placed in either an "Out of Service" or a "Zero Product/Pressure Out of Service" status as detailed below.

Out of Service Status

The objective of the "Out of Service" status is to allow applicator/nurse tanks and toolbars (equipment) to be taken out of service to correct non-compliance issues (violations) during the use season or for non-use/off-season placement. **Out of Service status does not apply to storage systems.** The *Out of Service* status must be established by the facility or person *prior* to a MDA inspection. Applicator/nurse tanks generally contain anhydrous ammonia. This poses a risk to human health, and therefore, must be in compliance with critical safety requirements to prevent and reduce the risk of a complaint or incident. It is also of importance that equipment placed in an *Out of Service* status be conspicuously identified and secured.

Out of Service Status Conditions

Equipment placed in an *Out of Service* status must meet the following conditions:

1. Tanks must be emptied down to a liquid level of less than 10% liquid level.
2. Be conspicuously tagged, preferably with a weather-proof tag. Tag must include the following information:
 - a. firm/person owning equipment
 - b. date taken out of service;
 - c. identification #, etc. of equipment (i.e. "nurse tank #10" or "A"); and
 - d. authorized firm/person name (printed) and signature.
3. Have withdrawal hose emptied and removed from equipment;
4. Have lock outs installed, securing valves, consisting of cable ties between each pair of valves. Cable ties may be removed when correcting violations. Equipment placed back into an *Out of Service* status after violation correction(s) must be locked out.
5. Toolbars must be emptied/pressure relieved. In addition, the pull-away coupling device/double swivel assembly must be removed if out of compliance (i.e. failure of coupling device to separate, incorrect installation of double swivel, etc.).

Refer to equipment checklist compliance items #'s 35 through 37.

Anhydrous Ammonia Inspection Checklist Compliance Item Information

Service Status Policy – continued from previous page

Out of Service Status Conditions – continued from previous page.

6. Compliance condition requirements - Refer to equipment inspection checklist compliance items listed below:

- a. Compliance condition of applicator/nurse tanks must be adequate to hold product.
Equipment inspection checklist compliance items #'s 13 and 14;
- b. Pressure relief valves must be in sound condition, including rain caps, and be within the 5 year service life. Pressure relief valve installation records must be accurate and up to date.
Equipment inspection checklist compliance items #'s 23, 24, and 25;
- c. Fittings, hosing, connections, piping, and valves/bleeder valves must meet code requirements, be installed correctly, and be in sound condition. *This does not include plastic tubing on toolbars that goes from distribution manifold(s) to knives.*
Equipment inspection checklist compliance items #'s 26 through 29; and
- d. Hydrostatic relief valves must be in sound condition, including rain caps.
Equipment inspection checklist compliance items #'s 31 through 34.

7. Information on *Out of Service* tags must be accurate, complete, and legible. Lock outs must adequately secure valves.

8. Before equipment is placed back into service:

- a. All violations and other noncompliant issues must be corrected; and
- b. Tag and lock outs must be removed.

Example of an *Out of Service* Tag. A weather-proof tag is recommended.
The following required information must be legible on an *Out of Service* tag:

Anhydrous Ammonia Equipment Out of Service Tag	
	Firm/Person:
	Equipment Identification:
	Date Taken Out of Service:
	Authorized Name (Print) & Signature:
Remember: (recommended line item) This tag must be removed when equipment is placed back into service.	

RECOMMENDED: Using *back side of tag* listing compliance items for performing a self-inspection:

COMPLIANCE ITEMS	DATE OF SELF-INSPECTION:	
<ul style="list-style-type: none"> <input type="checkbox"/> Tank painting <input type="checkbox"/> Anhydrous Ammonia <input type="checkbox"/> Inhalation Hazard <input type="checkbox"/> 1005 Placard <input type="checkbox"/> Reflective Markings <input type="checkbox"/> AP Transfer Instructions <input type="checkbox"/> SMV Emblem <input type="checkbox"/> Safety Chains <input type="checkbox"/> Tank Anchoring <input type="checkbox"/> Tank Cradle <input type="checkbox"/> Tires <input type="checkbox"/> Running Gear <input type="checkbox"/> Brakes <input type="checkbox"/> Non-Code Tank Welding <input type="checkbox"/> Tank Dent 1/2" or deeper 	<ul style="list-style-type: none"> <input type="checkbox"/> Withdrawal Valve <input type="checkbox"/> Liquid Fill Valve <input type="checkbox"/> Vapor Valve <input type="checkbox"/> Dual tanks EFV Valve <input type="checkbox"/> 0-400 psi/NH3 gauge <input type="checkbox"/> 0-60/150 psi/NH3 gauge <input type="checkbox"/> Liquid Fill Gauge <input type="checkbox"/> 85% Fixed Liquid Gauge <input type="checkbox"/> Tank Over Filled <input type="checkbox"/> Five Gallon Emergency Water Tank <input type="checkbox"/> Emergency Water Tank Hosing <input type="checkbox"/> Emergency Water Tank Cap <input type="checkbox"/> PRV Installation Record PRV Out of: <input type="checkbox"/> Condition/ <input type="checkbox"/> Service Life <input type="checkbox"/> PRV Cleaning or <input type="checkbox"/> Rain Cap 	<ul style="list-style-type: none"> <input type="checkbox"/> Secure hose/hose-end valve <input type="checkbox"/> NH3-rated piping/fittings - <input type="checkbox"/> Piping <input type="checkbox"/> Fittings <input type="checkbox"/> Hydrostat in withdrawal valve <input type="checkbox"/> Hydrostat in hose-end valve or female section of pull-away coupling device when withdrawal hose is permanent attached to toolbar. <input type="checkbox"/> Hydrostats of specific psi-rating in heat transfer or cold flow unit. <input type="checkbox"/> Hydrostat cleaning or <input type="checkbox"/> Rain Cap. <input type="checkbox"/> Pull-away Coupling Device <input type="checkbox"/> Pull-away Coupler bleeder valve. <input type="checkbox"/> PA Coupler DOUBLE SWIVEL <input type="checkbox"/> Connecting/disconnecting information readily visible near Pull-away Coupler. <input type="checkbox"/> No violations found.

Anhydrous Ammonia Inspection Checklist Compliance Item Information

Service Status Policy – continued from previous page

Zero Product/Pressure Out of Service

Ammonia tanks, storage systems, and toolbars that contain no anhydrous ammonia and are not intended to be used in the immediate future are normally not subject to inspection and enforcement by the MDA. However, the *Zero Product/Pressure Out of Service* status must be established by the facility or person prior to a MDA inspection. Conditions of the *Zero Product/Pressure Out of Service* status are:

1. All anhydrous ammonia and vapor pressure must be completely removed (0% liquid level and 0 psi), including storage system piping/appurtenances and toolbar heat exchange/cooler units;
2. All hosing must be emptied, pressure relieved, and removed. *Does not include plastic tubing on toolbars that goes from distribution manifold(s) to knives; and*
3. In addition, toolbars pull-away coupling device(s), double swivel(s), jumper hose(s), and heat exchange/cooler unit(s) must be removed.

When the Service Status Compliance Policy Does Not Apply:

Tank(s), storage system(s), or toolbar(s) involved in a complaint or incident under investigation by the MDA.

Equipment Inspection Checklist Compliance Item:

#1. Painting

(NT & AP) = The purpose for maintaining a good white or aluminum paint face on applicator/nurse tanks is to reduce the undue heating of AMMONIA, in turn, increasing tank pressure. Applicator/nurse tanks are to be painted white or aluminum so as to avoid surface corrosion, exposure of dark-colored primer or in any manner where the tank surface is not adequately reflecting sunlight. Another important reason for maintain a adequate paint finish is preserve metal thickness. Applicator and nurse tanks are designed with no allowance for corrosion. Review tank from a distance of 10 feet to assess condition of paint finish. Areas where the paint finish is missing must be refinished. Particles of oxidized metal within the matrix of the paint finish, resulting from residual metal from sandblasting tank, is generally not considered a reason for requiring a correction of the paint finish.

#'s 2, 3, & 4. Markings & Placarding

(NT & AP) = Current markings and placards must always be present on applicator/nurse tanks. Markings and placards must be in sound, readable condition. No area of the markings and placards must be faded or have pieces, letters, or numbers missing. The "Anhydrous Ammonia" marking must be placed on all four sides of the tank and be composed of a minimum of two-inch lettering. The "Inhalation Hazard" marking must be placed on two sides of the tank and be composed of a minimum of two-inch lettering. DOT approved Class 2.2; ID number "1005" placards must be place on all four sides of the tank.

The ends and outer sides of each nurse tank on a dual tank running gear must be individually marked and placarded. Another exception are nurse tanks that have the shut-off valves located the front end (front head) of the tank. No marking or placarding is required in the front head area of such a nurse tank where the shut off valves are located.

Replacement is required once markings and placards start peeling, are incomplete in any way, or are noticeably faded.

#5. Reflective Tape on Sides, Rear, and Rear Axle

(NT) Reflective tape is required on nurse tanks with a width of 80+ inches and GVW of 10,001 pounds must install 2 inch reflective strips between 15 to 60 inches from ground level at the following areas of tank/trailer assembly: (1) Sides – red/white strips along at least half the overall length (including tongue/hitch); (2) Upper rear corners- two pairs of 12 inch long white strips placed horizontally/vertically; and (3) Lower rear – red/white strips across width of trailer axle.

No area of the reflective tape must be faded or have missing segments.

#6. Applicator Transfer Instructions

(AP) = Applicators must have a legible decal depicting the instructions for step-by-step ammonia transfer. No area of the decal must be faded or have areas missing.

#7. Slow Moving Vehicle or SMV Emblem

(NT AP TR) = Slow Moving Vehicle (SMV) emblem is required and must be displayed so as to be visible from a

Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#8. Safety Chains

(NT, AP, & TB) = All applicator, nurse tanks, and toolbars (NH₃ implements) must be securely attached to the vehicle drawing them by means of drawbars supplemented by hitch pins with a retainer and suitable safety chains. Safety chains consist of two independently operating chains with hooks of sufficient size/ultimate towing strength (UTS) in relationship to the gross weight of the NH₃ implement being towed. Hooks may be equipped without latches, but are strongly recommended, which is in agreement with the way the Minnesota State Patrol deals with safety chain hooks. However, NH₃ implement, towing vehicle hitch, and safety chains must be equipped with the hardware (eyelets, etc.) to provide for secure attachment/retention.

Safety chains must be permanently attached or have provision for permanent attachment (permanently attachment during use season) to all NH₃ implements or towing vehicles. The firm or farmer may not exclude any NH₃ implements or towing vehicles from this requirement. If the firm so claims to have safety chains exclusively on the towing vehicles, the firm must be able to demonstrate that there is a set of suitable safe chains for each towing vehicle that has the capability to tow an NH₃ implement (has a hitch and is large enough to tow an implement). The NH₃ implement or towing vehicle hitch and safety chains must be equipped with the hardware (eyelets, etc.) to provide for adequate attachment/retention. No capable vehicle may be excluded from this requirement.

The Inspector will list the total number of capable towing vehicles at the firm on the inspection report. Photos may also be compiled to document the actual sets of safety chains allocated for this purpose. Safety chains are **not** required when a tractor or other self-propelled implement of husbandry is pulling a NH₃ implement (intent for custom application assemblies and farmer operated tractors).

The firm must demonstrate that they have the capability to provide safety chains for their customers. Determination of this will be based on the percentage of NH₃ implements delivered by the firm and/or the number of customers who pull NH₃ equipment. The firm may designate the specific customers who pull NH₃ equipment and if they have their own safety chains on the towing vehicle. This information may be listed on the inspection report. Photos may also be compiled to document the actual sets of safety chains allocated for this purpose.

Guide to determine the suitability of safety chains. The following is a list of safety chains specifications, size, and Working Load Limits (WLL) and **Ultimate Towing Strength (UTS)** in pounds that may be utilized for outfitting ammonia implement or towing vehicle with safety chains. To determine what specification and size chain/accessories to use:

Match up loaded GVW with UTS value of safety chain assembly that equals chains & attachment components-latched hook, etc. Assign the lowest UTS (Grade 30) if Grade marking is not visible on chain.

Size – inch	Grade 30 Proof Coil –WLL (pounds) UTS (pounds)	Grade 43 High Test WLL (pounds) UTS (pounds)	Grade 70 Transport WLL (pounds) UTS (pounds)	Grade 80 Alloy WLL (pounds) UTS (pounds)	Grade 100 Alloy WLL (pounds) UTS (pounds)
¼	WLL = 1,300 UTS = 5,200	2,600 7,800	3,150 12,600	3,500 14,000	4,300 17,200
5/16	1,900 UTS = 7,600	3,900 11,700	4,700 18,000	4,500 18,000	5,700 22,800
3/8	2,650 UTS = 10,600	5,400 16,200	6,600 26,400	7,100 28,400	8,800 35,200
7/16	3,700 UTS = 14,800	7,200 21,600	8,750 35,000	None	None
½	4,500 UTS = 18,000	9,200 27,600	11,300 45,200	12,000 48,000	15,000 60,000
5/8	6,900 UTS = 27,600	13,000 39,000	15,800 63,200	18,100 72,400	22,000 88,000
Chain Markings	PC, G3 or 30	43, HT, G4, or 40	G7 or 70	G8 or 80	G10 or 100
Cable	¾ Inch = 10,900	7/8 Inch = 16,100	1 Inch = 20,900		

Sizes 5/16 inch and 3/8 inch for Grade 43 and 70 chain are embossed at intervals no greater than 1 foot. All other sizes for Grades 30, 43, 70, 80, and 100 chains shall be embossed at intervals no greater than 3 feet.

References:

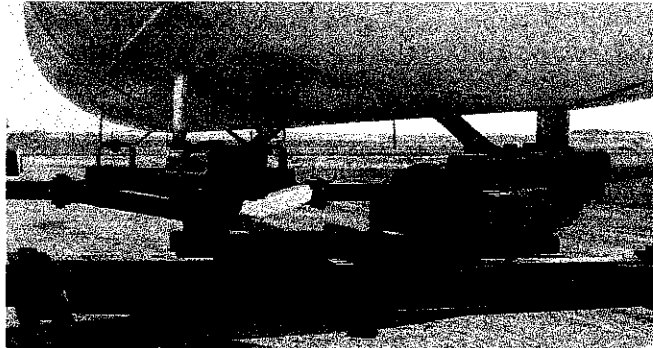
1. Title 49 CFR, Part 393, Subpart 1. (9-27-2002 Edition), Tables in § 393.108 – Working Load Limits (WLL), Chains and Wire Rope (Cable)
2. Society of Automotive Engineers (SAE), Surface Vehicle Standard J684 – Trailer Couplings, Hitches, and Safety Chains, June 2004.
3. National Association of Chain Manufacturers, November 15, 1999, Welded Steel Chain Specifications, pages 1-8.

Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#'s 9-12. Running Gear Components

(NT, AP & TB) = Applicator, nurse tanks and toolbars must be constructed and maintained so they will follow substantially in the path of the towing vehicle and will prevent the towed tank or toolbar from whipping and swerving dangerously from side to side. Running gear components, tires, wheel bearings must be in sound condition. Cracks, breaks, and distortions, etc. in welding and metal on running gear must be repaired before further use. Excess tire wear/defects along with worn wheel bearings must be replaced and repaired. Loose or broken anchor bolts must be replaced or tighten. Saddle protection must be provided for applicators. Brakes must be present and in sound condition (via visual inspection) and accessible for use (access chain or cable that allows engagement of brake mechanism) on nurse tank larger than 1450 gallons (statutory reference Minnesota Statute 169.67).



- (1) A tire shall be considered unsafe if it has:
- (1) any part of the ply or cord exposed; or
 - (2) any bump, bulge or separation; or
 - (3) a tread design depth of less than 2/32 (1/16) of an inch measured in the tread groove nearest the center of the tire at three locations equally spaced around the circumference of the tire, exclusive of tie bars or for those tires with tread wear indicators; or
 - (4) been worn to the level of the tread wear indicators in any two tread grooves at three locations; or
 - (5) a marking "not for highway use," or "for racing purposes only," or "unsafe for highway use;" or
 - (6) tread or sidewall cracks, cuts or snags deep enough to expose the body cords; or
 - (7) been re-grooved or re-cut below the original tread design depth, except special taxicab tires which have extra under-tread rubber and are identified as such.

(1) Source M.S. 169.723. Tires Considered Unsafe.

#13. Tank NH3/250 psi Rated

(NT, AP) = NH3 tanks must be rated for 250 psi and marked on the tank nameplate. Propane tanks are not rated for NH3 service because propane tank head are not stress relieved as NH3 tanks are.

#14. Tank Dents/Damage & Non-Code Welding

(NT, AP) = Any crack, breaks, distortions in the welding or metal directly connected to the applicator/nurse tank must be repaired by an "R" stamped firm. Any time a tank is involved in an incident (rollover, etc.) it may have potential damage it must be examined and tested by a "R" stamped firm. These are the **only** firms that are authorized by the National Board of Boiler and Pressure Vessel Inspectors, the Minnesota Department of Labor and Industry, and the Minnesota Department of Agriculture (MDA) to perform such examinations, repairs and testing to pressure vessels. Welding repairs on ammonia pressure vessels performed by NON-R-stamp firms is a violation of Minnesota Rules, Part 1513.0120. All dents greater than 1/2 inch must be examined and repaired/reconciled by an R-stamp firm.

Upon completion of welded repairs and/or examination/testing on a ammonia pressure vessel, a R-stamp firm must compile and submit to the client for their records an **R-1 or R-2 report** (Report of Welded Repair Or Alteration), or other similar documentation as indicated and signed by the R-stamp firm's authorized inspector/quality control person for each ammonia pressure vessel repaired and/or examined/tested. A hydrostatic pressure test must be performed, unless specified and justified by the R-stamp firm's authorized inspector/quality control person.

It is important to **maintain** the R-1 or R-2 forms for examination by the MDA. Without these records, any unusual welded appurtenances, repairs, or examination/testing performed on ammonia pressure vessels may be regarded or suspected as non-code welding or insufficient. Any suspected non-code welding on ammonia pressure vessels will need to be inspected

