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/cooling units, etc.; and

3. Be aware of others where NH$_3$ is being released during normal operating processes and incidents.
<table>
<thead>
<tr>
<th>MN RULE CITATION</th>
<th>EQUIPMENT IDENTIFICATION/TYP/GALLON CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1513.0220</td>
<td>1. Tank painting (white or aluminum per Federal Regulations)</td>
</tr>
<tr>
<td>1513.1040</td>
<td>2. &quot;Anhydrous Ammonia&quot; in 2-inch letters on 4 sides</td>
</tr>
<tr>
<td>1513.1040</td>
<td>3. &quot;Inhalation Hazard&quot; in 2-inch letters on 2 sides</td>
</tr>
<tr>
<td>1513.1040</td>
<td>4. &quot;1005&quot; placards on 4 sides</td>
</tr>
<tr>
<td>1513.1040</td>
<td>5. Reflective tape on sides, rear, rear axle [For nurse tank(s) 80+ &amp; 10,000 #G.W]</td>
</tr>
<tr>
<td>1513.1040</td>
<td>6. Applicator tank legible ammonia transfer instructions</td>
</tr>
<tr>
<td>1513.1040</td>
<td>7. Slow-Moving Vehicle (SMV) emblem</td>
</tr>
<tr>
<td>1513.1050</td>
<td>8. Two independently-operating safety chains</td>
</tr>
<tr>
<td>1513.1020</td>
<td>9. Applicator and Nurse Tank anchoring</td>
</tr>
<tr>
<td>1513.1050</td>
<td>10. Applicator Tank Cradle friction</td>
</tr>
<tr>
<td>1513.1050</td>
<td>11. Tires and running gear require repair</td>
</tr>
<tr>
<td>1513.1050</td>
<td>12. Nurse tank brakes</td>
</tr>
<tr>
<td>1513.0120</td>
<td>13. Non-code welding (NCW) or Dent &gt; 1/2&quot; deep (D) on tank.</td>
</tr>
<tr>
<td>1513.0140</td>
<td>14. Tank nameplate absent (AB); illegible (IL); Clean (C)</td>
</tr>
<tr>
<td>1513.1030</td>
<td>15. Valve guard protecting valves and piping (no piping allowed outside confines of valve guard)</td>
</tr>
<tr>
<td>1513.1030</td>
<td>16. Withdrawal (WD), Liquid fill (L), Vapor (V) tank valves</td>
</tr>
<tr>
<td>1513.1030</td>
<td>17. Anchored excess-flow valve or equivalent flow protection for dual nurse tanks at junction where withdrawal hoses merge.</td>
</tr>
<tr>
<td>1513.1030</td>
<td>18. 0-400 (tank) or 0-60/150 (TB manifold) psi/NH3-rated gauge</td>
</tr>
<tr>
<td>1513.1030</td>
<td>19. Float/mechanical liquid level gauge</td>
</tr>
<tr>
<td>1513.0190</td>
<td>20. Filled greater than 85% @ 5°F or 90.6% @ 60°F</td>
</tr>
<tr>
<td>1513.1090</td>
<td>21. 85% fixed liquid level gauge</td>
</tr>
<tr>
<td>1513.1060</td>
<td>22. Five gallon emergency water tank &amp; hosing: Accessibility (IA); Cap (B); Cleaning (C); Hosing (H); Repair (R); Replacement (RP)</td>
</tr>
<tr>
<td>1513.0180</td>
<td>23. PRV installation records maintained</td>
</tr>
<tr>
<td>1513.0180</td>
<td>24. Replace Out-of-date / Out-of-condition PRV</td>
</tr>
<tr>
<td>1513.0180</td>
<td>25. PRV Cleaning (C); Rain cap (RC);</td>
</tr>
<tr>
<td>1513.0170</td>
<td>26. Hose &amp; connections out of condition</td>
</tr>
<tr>
<td>1513.0170</td>
<td>27. Hose-end (HS) or bleeder valve (BV) out of condition</td>
</tr>
<tr>
<td>1513.1030</td>
<td>28. Secure hose and hose end valve(s).</td>
</tr>
<tr>
<td>1513.0160</td>
<td>29. Ammonia-rated piping/fittings (i.e. black forged steel fittings)</td>
</tr>
<tr>
<td>1513.1030</td>
<td>30. Control valve between regulator/break-away coupling device must indicate whether the valve is open or closed.</td>
</tr>
<tr>
<td>1513.0180</td>
<td>31. In withdrawal valve (WD) and between shut-off valves (SV)</td>
</tr>
<tr>
<td>1513.0180</td>
<td>32. Toolbar: Hose-end valve or female section of coupling device when withdrawal hose is permanent attached</td>
</tr>
<tr>
<td>1513.0180</td>
<td>33. Toolbar: Hydrostat(s) in heat transfer unit–check psi rating</td>
</tr>
<tr>
<td>1513.0180</td>
<td>34. Clean (C), Replace (RP) hydrostat, or Rain cap (RC)</td>
</tr>
<tr>
<td>1513.1030</td>
<td>35. Coupling Device (CD) or Bleeder Valve (BV)</td>
</tr>
<tr>
<td>1513.1030</td>
<td>36. Coupling device DOUBLE SWIVEL</td>
</tr>
<tr>
<td>1513.1060</td>
<td>37. Connect/disconnect information readily visible near coupling device</td>
</tr>
</tbody>
</table>
Anhydrous Ammonia Inspection Checklist Compliance Item Information

**Cargo Tanks Verse Nurse Tanks - What Constitutes An Implements 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. An 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, a 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:

<table>
<thead>
<tr>
<th>Anhydrous Ammonia Equipment Out of Service Tag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm/Person:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Equipment Identification:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Date Taken Out of Service:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Authorized Name (Print) &amp; Signature:</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>COMPLIANCE ITEMS</th>
<th>DATE OF SELF-INSPECTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Tank painting</td>
<td>□ Withdrawal Valve</td>
</tr>
<tr>
<td>□ Anhydrous Ammonia</td>
<td>□ Liquid Fill Valve</td>
</tr>
<tr>
<td>□ Inhalation Hazard</td>
<td>□ Vapor Valve</td>
</tr>
<tr>
<td>□ 1005 Placard</td>
<td>□ Dual tanks EFV Valve</td>
</tr>
<tr>
<td>□ Reflective Markings</td>
<td>□ 0-400 psi/NH3 gauge</td>
</tr>
<tr>
<td>□ AP Transfer Instructions</td>
<td>□ 0-60/150 psi/NH3 gauge</td>
</tr>
<tr>
<td>□ SMV Emblem</td>
<td>□ 85% Fixed Liquid Gauge</td>
</tr>
<tr>
<td>□ Safety Chains</td>
<td>□ Tank Over Filled</td>
</tr>
<tr>
<td>□ Tank Anchoring</td>
<td>□ Five Gallon Emergency Water Tank</td>
</tr>
<tr>
<td>□ Tank Cradle</td>
<td>□ Emergency Water Tank Hosing</td>
</tr>
<tr>
<td>□ Tires</td>
<td>□ Emergency Water Tank Cap</td>
</tr>
<tr>
<td>□ Running Gear</td>
<td>□ PRV Installation Record</td>
</tr>
<tr>
<td>□ Brakes</td>
<td>□ PRV Out of □ Condition □ Service Life</td>
</tr>
<tr>
<td>□ Non-Code Tank Welding</td>
<td>□ PRV Cleaning or □ Rain Cap</td>
</tr>
<tr>
<td>□ Tank Dent ½” or deeper</td>
<td>□ Hose &amp; connections</td>
</tr>
<tr>
<td>□ Tank Nameplate</td>
<td>□ Secure hose/hose-end valve</td>
</tr>
<tr>
<td></td>
<td>□ NH3-rated piping/fittings - □ Piping □ Fittings</td>
</tr>
<tr>
<td></td>
<td>□ Hydrostat in withdrawal valve</td>
</tr>
<tr>
<td></td>
<td>□ Hydrostat in hose-end valve or female section of pull-away coupling device when withdrawal hose is permanent attached to toolbar.</td>
</tr>
<tr>
<td></td>
<td>□ Hydrostats of specific psi-rating in heat transfer or cold flow unit.</td>
</tr>
<tr>
<td></td>
<td>□ Hydrostat cleaning or □ Rain Cap.</td>
</tr>
<tr>
<td></td>
<td>□ Pull-away Coupling Device</td>
</tr>
<tr>
<td></td>
<td>□ Pull-away Coupler bleeder valve.</td>
</tr>
<tr>
<td></td>
<td>□ PA Coupler DOUBLE SWIVEL</td>
</tr>
<tr>
<td></td>
<td>□ Connecting/disconnecting information readily visible near Pull-away Coupler.</td>
</tr>
<tr>
<td></td>
<td>□ No violations found.</td>
</tr>
<tr>
<td></td>
<td>□ All non-compliant items corrected on –</td>
</tr>
</tbody>
</table>
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 maintaining a good paint finish is to 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. 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.

#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 "1005" placards must be placed 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 in 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 pealing, 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, TB) = Slow Moving Vehicle (SMV) emblem is required and must be displayed so as to be visible from a distance of 600 feet to the rear. No area of the emblem must be faded or have areas missing.
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 is 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 adequate 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 will 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 will be listed on the inspection report. Photos will 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.

<table>
<thead>
<tr>
<th>Size – inch</th>
<th>Grade 30 Proof Coil – WLL (pounds)</th>
<th>Grade 43 High Test – WLL (pounds)</th>
<th>Grade 70 Transport – WLL (pounds)</th>
<th>Grade 80 Alloy – WLL (pounds)</th>
<th>Grade 100 Alloy – WLL (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>¼</td>
<td>WLL = 1,300</td>
<td>2,600</td>
<td>3,150</td>
<td>3,500</td>
<td>4,300</td>
</tr>
<tr>
<td></td>
<td>UTS = 5,200</td>
<td>7,800</td>
<td>12,600</td>
<td>14,000</td>
<td>17,200</td>
</tr>
<tr>
<td>5/16</td>
<td>1,900</td>
<td>3,900</td>
<td>4,700</td>
<td>4,500</td>
<td>5,700</td>
</tr>
<tr>
<td></td>
<td>UTS = 7,600</td>
<td>11,700</td>
<td>18,000</td>
<td>18,000</td>
<td>22,800</td>
</tr>
<tr>
<td>3/8</td>
<td>2,600</td>
<td>5,400</td>
<td>6,600</td>
<td>7,100</td>
<td>8,800</td>
</tr>
<tr>
<td></td>
<td>UTS = 10,600</td>
<td>16,200</td>
<td>26,400</td>
<td>28,400</td>
<td>35,200</td>
</tr>
<tr>
<td>7/16</td>
<td>3,700</td>
<td>7,200</td>
<td>8,750</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>UTS = 14,800</td>
<td>21,600</td>
<td>35,000</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>½</td>
<td>4,500</td>
<td>9,200</td>
<td>11,300</td>
<td>12,000</td>
<td>15,000</td>
</tr>
<tr>
<td></td>
<td>UTS = 18,000</td>
<td>27,600</td>
<td>45,200</td>
<td>48,000</td>
<td>60,000</td>
</tr>
<tr>
<td>5/8</td>
<td>6,900</td>
<td>13,000</td>
<td>15,800</td>
<td>18,100</td>
<td>22,000</td>
</tr>
<tr>
<td></td>
<td>UTS = 27,600</td>
<td>39,000</td>
<td>63,200</td>
<td>72,400</td>
<td>88,000</td>
</tr>
<tr>
<td>Chain Markings</td>
<td>PC, G3 or 30</td>
<td>43, HT, G4, or 40</td>
<td>G7 or 70</td>
<td>G8 or 80</td>
<td>G10 or 100</td>
</tr>
<tr>
<td>Cable</td>
<td>⅜ Inch = 10,900</td>
<td>7/8 Inch = 16,100</td>
<td>1 Inch = 20,900</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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:
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 in welding and metal must be repaired. 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).

#13. **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 an 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 (to determine quality/soundness of welding and vessel) and reconciled (possibly removed, re-fabricated, etc.) by a R-stamp firm.

Who/What is the National Board (NB)?

Short for the **National Board of Boiler & Pressure Vessel Inspectors**. The NB is a non-governmental organization that developed a code (National Board Inspection Code or NBIC) at/around 1918. The NBIC governs the alteration and repair of existing pressure vessels originally manufactured per the ASME Code or without any code designation (pre-ASME or non code pressure vessels).

The NBIC also governs the accreditation of businesses (firms) that:

1. alter and repair pressure vessels (i.e. R-stamp firms); and
2. perform authorized inspections of alterations and repairs made on pressure vessels.

Upon the successful completion of an extensive accreditation process the NB issues an ‘R-stamp’ or ‘Authorized Inspector/Inspection Agency’ designation. Both the R-stamp firm and Authorized Inspector/Inspection Agency must strictly adhere to the NBIC. Subsequent periodic audits/reviews are performed by the NB of R-stamp firms and Authorized Inspector/Inspection Agencies to ensure compliance to the NBIC.

Though separate organizations, the ASME and NB works closely together with regards to codes requirements relating to pressure vessels. The ASME acknowledges the accreditation and audit/review processes administered by the NB.

To contact the NB:

(614) 888-8320

or

www.nationalboard.org/nationalboard/Default.aspx
Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#14. Tank Nameplate

(NT, AP) = Applicator and nurse tank nameplate is the permanent documented identification. According to Code of Federal Regulations 173.315(m)(1) applicator and nurse tanks "must have a minimum design pressure rating of 250 psi and meets the requirements of the edition of the ASME code in effect at the time it was manufactured and is MARKED ACCORDINGLY". Determine if the nameplate is painted over requiring cleaning, illegible due to excessive wear, or completely removed from the tank.

Required nameplate markings per the ASME Code, Division 1, Section 8, UG116 through UG 118(b). for the years prior to 1988

Nameplate Markings per the
Prior to the 1986 ASME Code/1988 Addendum

1. Name of Manufacturer;
2. Manufacturer’s Serial No. (National Board No. optional);
3. Official Code “U” Symbol;
4. Maximum Allowable Working Pressure (MAWP);
5. Year Built; and

Plant Built – For Trinity Steel or Industries tanks.
For MDA Use Only – Not explicitly required to be marked on nameplate via the ASME Code

Nameplate Markings per the
1986 ASME Code/1988 Addendum to Present

1. Name of Manufacturer;
2. Manufacturer’s Serial No. (National Board No. optional);
3. Official Code “U” Symbol;
4. Maximum Allowable Working Pressure (MAWP);
5. Minimum Design Metal Temperature (MDMT)
6. Year Built; and

Plant Built – For Trinity Steel or Industries tanks.
For MDA Use Only – Not explicitly required to be marked on nameplate via the ASME Code

What to do when nameplate is illegible or missing?
1. Permanently remove tank from ammonia service;
2. Re-stamp or replacement existing nameplate;
3. Federal DOT Special Permit, SP-13554

In summary, the following required markings and their placement as it relates to DOT-SP 13554:
1. “Month/Year V, T, P” placed on the front head of each tank;
2. “DOT-SP 13554” placed anywhere on each tank, preferably near the front/side area of tank; and
3. Owner’s unique unit identification preferably placed near/adjacent to the “DOT-SP 13554” marking.

It is important that markings be positioned on the tank in a manner that: (1) are readily visible; and (2) does not interfere with any other markings or placards on the tank. One example is the placement of markings on the in-board/inner sides of a dual nurse tank assembly, where the markings are not readily visible.

Contact Mike Ritchie at MNDOT if you have further questions at (651) 366-3697 or more preferred via email at Michael.Ritchie@dot.mn.us.
Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#14. *Tank Nameplate* Federal DOT Special Permit 13554

Federal DOT Special Permit 13554

August 3, 2006

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

DOT-SP 13554
(SIXTH REVISION)

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. **GRANTEE:** (See individual authorization letter)

2. **PURPOSE AND LIMITATION:**

   a. This special permit authorizes the continued transportation in commerce of non-DOT specification cargo tanks, described as nurse tanks, which have lost the required ASME identification plates. These nurse tanks are authorized for the transportation of anhydrous ammonia, under the conditions and terms specified in this special permit. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.

   b. The safety analyses performed in development of this special permit only considered the hazards and risks associated with transportation in commerce.

   c. Unless otherwise stated herein, this special permit consists of the special permit authorization letter issued to the grantee together with this document.

3. **REGULATORY SYSTEM AFFECTED:** 49 CFR Parts 106, 107 and 171-180.

4. **REGULATIONS FROM WHICH EXEMPTED:** 49 CFR § 173.315(m) (1) in that a nurse tank transporting anhydrous ammonia is not authorized unless the tank is marked in accordance with the ASME Code, except as specified herein.

5. **BASIS:** This special permit is based on the application of The Fertilizer Institute dated March 25, 2004, submitted in accordance with § 107.105 and the public proceeding thereon and an additional letter dated July 26, 2006.
Continuation of DOT-SP 13554 (6th Rev.)

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

<table>
<thead>
<tr>
<th>Hazardous Materials Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name</td>
</tr>
<tr>
<td>Ammonia, anhydrous</td>
</tr>
</tbody>
</table>

7. SAFETY CONTROL MEASURES:

   a. **PACKAGING** – Packaging prescribed is a non-DOT specification cargo tank, described as a nurse tank, as provided for in § 173.315(m). Each tank must conform to all requirements of § 173.315(m) except that the nurse tank does not have the ASME nameplate specified in § 173.315(m)(1). Each tank must be marked with a unique owner’s identification number. This number must be maintained by the tank owner and the grantee and be made available to a DOT representative upon request.

   b. **TESTING** –

      (1) Each nurse tank authorized by this special permit must be inspected and tested by a person meeting the requirements of § 180.407(d).

      (2) Prior to marking a nurse tank with the special permit number, the person marking the nurse tank must perform the following tests and inspections:

         (i) External visual inspection and testing using the procedures specified in § 180.407(d);

         (ii) Thickness tested using the procedures specified in § 180.407(i). Nurse tanks with a capacity of less than 1,500 gallon must have a minimum head thickness of 0.203 inch and a minimum shell thickness of 0.239 inch. Nurse tanks with a capacity of 1,500 gallons and above must have a minimum thickness of 0.250 inch. Any nurse tank with a thickness test reading of less than that specified above on any point on the nurse tank must be removed from hazardous material service;
Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#14. **Tank Nameplate** Federal DOT Special Permit 13554  Page 3

Continuation of DOT-SP 13554 (6th Rev.)  Page 3

(iii) Pressure tested using the procedures specified in § 180.407(g). The minimum test pressure is 375 psig. Pneumatic testing is not authorized; and

(iv) After the tanks have successfully passed the external visual inspection and thickness and pressure tests, the tanks must be marked in accordance with § 180.415.

(3) Each nurse tank covered by this special permit must have the above described tests performed at least once every 5 years after the completion of the initial tests.

c. **OPERATIONAL CONTROLS**

(1) Each nurse tank authorized by this special permit must be transported by a private carrier and used only for agricultural purposes.

(2) Each nurse tank operating under this special permit must be plainly and durably marked (near the special permit number marking as required by paragraph 8.c.) with a unique owner's identification number in letters and numbers at least 1/2 inch in height and width.

(3) Welded repairs are prohibited.

8. **SPECIAL PROVISIONS:**

a. Each tank owner of a nurse tank operated under terms of this special permit must maintain a copy of the test inspection report prepared by the inspector. The test report must contain the results of the test and meet the requirements in § 180.417(b) and be made available to a DOT representative upon request.

b. A current copy of this special permit must be maintained at each facility where the nurse tank is tested and at each facility where the nurse tank is offered or reoffered for transportation.

c. Each tank must be plainly and durably marked "DOT-SP 13554" in accordance with the provisions of § 172.302(b) and (c).
Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#14. Tank Nameplate Federal DOT Special Permit 13554 Page 4

Continuation of DOT-SP 13554 (6th Rev.) Page 4

August 3, 2006

d. Packagings permanently marked 'DOT-E 13554', prior to October 1, 2007 may continue to be used under this special permit for the remaining service life of the packaging or until the special permit is no longer valid. Packagings marked on or after October 1, 2007 must be marked 'DOT-SP 13554'.

e. Shipping papers displaying 'DOT-E 13554' may continue to be used until October 1, 2007, provided the special permit remains valid.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle.

10. MODAL REQUIREMENTS: The owner of each tank authorized by this special permit must have a current copy of this special permit and make it available to a DOT representative upon request.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

   o All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.

   o Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.

   o Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Continuation of DOT-SP 13554 (6th Rev.)

1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term 'exemption' to 'special permit' and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 - Immediate notice of certain hazardous materials incidents, and 171.16 - Detailed hazardous materials incident reports. In addition, the grantee(s) of this special permit must notify the Associate Administrator for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:

for Robert A. McGuire
Associate Administrator
for Hazardous Materials Safety


Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at http:// hazmat.dot.gov/sp_app/special_permit/spec_perm_index.htm Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: PTO/d1
Anhydrous Ammonia Inspection Checklist Compliance Item Information

**Equipment Inspection Checklist Compliance Item:**

**#15. Nurse Tank Valve Guard / Roll Cage Protection**

(NT) = Valve guard protection is required on nurse tanks to protect tank appurtenances, including piping. In the case of a nurse tank equipped with bottom withdrawal, the valve guard protections must constructed in accordance to the same requirements noted in Minnesota Rules, Part 1513.1030, Subpart 6. The bottom withdrawal valving, hosing, etc. must not be lower than the lowest horizontal edge of the running gear axles. The bottom withdrawal hose must be drained and depressurized before the container is moved or towed on a public road. Any welded repair required attaching valve guard to the nurse tank via welding must be performed by an R-stamp firm.

When a roll cage is replaced or altered it must meet the following specifications from MN Rules, Part 1513.1030, subpart 6., which states, “Appurtenances on farm wagons must be protected from physical damage by a rigid guard designed to withstand static loading in any direction equal to twice the weight of the container and lading using a safety factor of four based on the ultimate strength of the material used. If the guard encloses the pressure relief valve, the valve must be properly vented through the guard.”

It is required that all piping be kept within the confines of the valve guard. This requirement also applied to nurse tanks equipped with bottom withdrawal.

**#16-17. Positive Shut-off Valves With Excess Flow Valves & Supplemental Excess Flow Valves**

#16 & 17 (NT & AP) = Positive shut-off valves positioned in applicator and nurse tanks must be equipped with excess flow valves. Excess flow valves are intended to close upon excessive discharge of liquid or vapor resulting from a break in hosing or piping. Leaky shutoff valves must be repaired or replaced. Access the condition of o-rings positioned in the shutoff valves. Replace o-rings if torn or out of shape. O-rings are an integral part of the shutoff valve, and if out of condition, the seal between connections will not be adequate, causing a leak in the connection.

#17 (NT) = In dual nurse tank setups where hosing from both tanks are merged, a supplemental excess flow valve or other suitable protection must be positioned in the junction of the connection between the two tanks and prior to the acme adapter. In the event of a break in the withdrawal hose during a field application, the withdrawal valve excess flow valves in either tank is unlikely to close off. In contrast, a higher probability that the supplemental excess flow valve will slam shut, preventing the remaining contents in both tanks from releasing. Reference Minnesota Rules, Part 1513.1030. subpart 5. (connections). The excess flow or other flow control protection device must be protected from being sheared from it position during an incident. Anchoring or other methods of protection is required.

**#18. Pressure Gauges**

(NT, AP & TB) = 0-400 psi/AMMONIA-rated pressure gauge is required on applicator and nurse tanks.

For toolbars, a 0-60 or 0-150 psi / AMMONIA-rated pressure gauge is recommended (not required) in the LOW PRESSURE piping of applicators and toolbars.

Replace pressure gauges when pressure is not accurately recorded. Clean or replace gauge crystal if is dirty or broken.

**#19-21. Float & Fixed Liquid Level Gauges & Maximum Allowable Liquid Level**

#19 (NT & AP) = Float liquid level gauge is required on applicator and nurse tanks. The float liquid level gauge, in most cases, are located on the front of applicator and the top of nurse tanks. As the liquid rises in the tank, the float rises and through a gear, magnetic mechanism moves an indicator needle on the gauge face. The float gauge should only be used as a general guide to determine the approximate liquid level in the an applicator and nurse tank. Repair or replace the float gauge when the liquid level in not accurately recorded, even though an 85% fixed liquid level gauge is installed in applicator and nurse tank.

#20 (NT & AP) = Ammonia tanks may not be filled greater than 85% @ 5°F or 90.6% @ 60°F, respectively. When found overfilled, tanks must immediately have the liquid level reduced to a legal level.

#21 (NT & AP) = The 85% fixed liquid level gauge are required on all applicator and nurse tanks. It is a short tube extending into the tank with a bleeder valve on the end. When the tank is being filled the bleeder valve should be opened. When liquid begin to spew from the bleeder valve, the tank has been filled to the 85% level. Make sure that dirt, paint, or other foreign material is not impeding the functioning of the bleeder valve of the 85% fixed liquid level gauge.
Anhydrous Ammonia Inspection Checklist Compliance Item Information

**Equipment Inspection Checklist Compliance Item:**

**#22. Water Tanks & Hosing**

**#22 (NT & AP)** Each applicator and nurse tank must have at least a five (5) gallon CLEAN water supply attached to the tank and ACCESSIBLE for use. Frequent inspection of the water supply container and water quality is essential. Immediately repair or replace leaky water supply container and hosing. Under freezing conditions an extra 5 gallon water supply may be required.

**#’s 23-25. 250 Psi / Ammonia-Rated Pressure Relief Valves (PRVs)**

A pressure relief valve, or often referred to as the “pop-off” valve, functions to prevent excess pressure from building up inside the tank. A pressure relief valve automatically vents into the atmosphere at approximately 250 psi. When the pressure has been relieved, the pressure relief valve automatically closes. Abrupt heat or temperature changes and over filling of the applicator or nurse tank are leading causes for venting of a pressure relief valve.

**#23 (NT & AP)** Accurate records documenting the tank identification and installation date of pressure relief valves must be kept up to date. Month and year are required date data that must be kept along with the tank identification. Facility must have records available for review during a MDA inspection.

**#24 (NT & AP)** The replacement date of pressure relief valve is based either on THE DATE OF INSTALLATION. A maximum use life of five years from date installed as verified by ammonia equipment maintenance records is set for all pressure relief valves on applicator, nurse, and storage tanks. Pressure relief valves deemed out of condition must be replaced regardless of installation date.

**#25 (NT & AP)** Clean or replace pressure relief valve if dirt, paint, moisture, or other foreign material is present inside the valve. Replace pressure relief valve if corrosion is present inside the valve. The weep hole positioned at the bottom of the pressure relief valve must always be kept open. If weep holes are blocked, excess moisture will accumulate inside the pressure relief valve, causing corrosion and reducing the valve’s useful life. A rain cap must be maintained on the pressure relief valve. The rain cap prevent foreign material and moisture from entering the pressure relief valve.

NOTE: Facilities are required to perform periodic (annual) inspections of pressure relief devices (pressure relief valves and hydrostats). The follow items must be inspected:

- Free of evidence of tampering, damage, corrosion, or foreign matter that might prevent proper operation;
- Not painted;
- Free of leakage when subject to pressure below the minimum allowable start to discharge setting;
- Has a properly secured rain cap to disallow entry moisture or other matter; and
- Has an open weep hole to permit moisture to escape (specific to PRVs).

**#26. Hosing &Connections**

**NT, AP, TB** = Hosing used for AMMONIA must be labeled for such use and have a labeled minimum operating pressure of 350 psi. Thoroughly examine hoses for bulges, cracks, cuts, leaks, or defective hose connectors. IMMEDIATELY replace hoses that have bulges, cracks/cuts to the hoses cords, leaks, or have defective connectors.

Most AMMONIA hoses are designed with built-in weep holes. These weep holes relieve excess pressure from the outer layer of rubber on the hose. The whitish residue on the hose is the minute condensed ammonia excreted from the weep hoses. This is not a defect in the hosing.

Removing hoses from service and storing in a dry, temperature controlled location during off-season period will extent hose service life. Note the replacement date that is labeled on the AMMONIA hose.

Hose and hose connections located on the low pressure side of flow control or pressure reducing valves or devices discharging to atmospheric pressure, like that on an applicator or toolbar, must be designed for a minimum working pressure of 60 psi and be labeled for AMMONIA use. Hosing and clamps/connectors used for this application must be constructed of AMMONIA-resistant materials and be labeled for AMMONIA use. IMMEDIATELY replace low-pressure hosing if bulges, cracks, cuts, leaks, or defective clamps/connectors are discovered.

**Hosing length:** Avoid having a length of withdrawal hose that will become caught or pinched on the nurse tank and toolbar assembly or impede the function of pull-away coupler. Avoid over-securing the withdrawal hose via bungee cords, ropes, chains, or tying down onto hitches or tanks. Provisions must be made to secure both ends of the withdrawal hose in transit (either over the road or during field application). An expert with a hose manufacturer indicates that the, “**appropriate length is defined as the distance between nurse tank connection and tool bar connection with approximately twelve inches added in order to accommodate travel while making turns. It is also hazardous to operate with a withdrawal hose which is short as it may be pulled apart or out of the end fittings.**”
Anhydrous Ammonia Inspection Checklist Compliance Item Information

**Equipment Inspection Checklist Compliance Item:**

### #'s 27-29. **Hose End & Bleeder Valves and Fittings/Piping**

#### #27 (NT, AP, TB)
Hose end valve and acme coupler must be in good condition. Leaky and cracked hose-end valves/acme coupler must be replaced immediately. Hose end valves must be equipped with a bleeder valve that allows trapped ammonia in the hose end valve to be released.

#### #28 (NT, AP, TB)
Provision must be made either on the applicator/nurse tank or toolbar for the hose end valve and liquid withdrawal hose to be secured to prevent damage to hose end valve and withdrawal hose.

#### #29 (NT, AP, TB)
Fittings and piping used for AMMONIA must consist of forged steel and certain alloys proven to be satisfactory for AMMONIA service. Piping made of brass, copper, alloys consisting of copper base, and zinc, especially the zinc coating on galvanized fittings and piping may not be used. On the high pressure side of an AMMONIA system, threaded fittings must consist of A105 Class 2000 or greater forged steel (Forged) and threaded piping that is schedule 80 with ASTM A53, Grades B or S or its equivalent is required.

On the low pressure side of an AMMONIA system, as in the case of the low pressure side of an applicator or toolbar, non-schedule 80 piping may be used, so long as the piping is made of a material suitable for AMMONIA service. Venting stacks for applicators should be made of PVC or other non-corrosive material.

### #'s 30 **Control Valve Requirements**

#### #30 (AP, TB)
Any control valve installed between the regulator and the break-away coupling device must indicate whether the valve is open or closed. The indicator is generally consist of a small metal plate that sticks outward from the valve housing. The position of the indicator will move approximately 90 degrees to indicate whether the valve is in an open or closed position. Illustration shows control valve indicator (rounded metal plate) located on top of the valve assembly.

### #'s 31-34. **300-400 psi / Ammonia-Rated Hydrostatic Relief Valves**
Hydrostatic relief valves, or hydrostats for short, are located in liquid and vapor lines that are closed at each end (between a pair of shut-off valves and other closures). The purpose of a hydrostat is to protect piping and hosing from excess pressure. Hydrostats relieves pressure caused by expansion of liquid trapped in the line.

#### #31 (NT & AP)
Hydrostats are required in the liquid withdrawal valve positioned on the applicator or nurse tank. In dual nurse tank setups, a hydrostat are required between each pair of shutoff valves to protect hosing/piping shared by both tanks. Some liquid withdrawal valves have a built-in hydrostatic relief mechanism.

#### #32 (TB)
If the withdrawal hose is permanently attached to the toolbar an additional hydrostat is required in the female section of the coupling device.

#### #33 (TB)
Note the psi rating of the hydrostats installed in the thermal transfer unit. Replace with like-rated hydrostats if out-of-condition. Clean or replace dirty, or painted over hydrostats. Rain cap protection is required per 1513.0180, Subpart 13C.

#### #34 (NT& AP & TB)
Hydrostats must be kept clean from dirt, paint, and other foreign material that would prevent hydrostats from functioning properly. Replace out-of-condition hydrostats. Rain caps are required per 1513.0180, Subpart 13C.

**NOTE:** Facilities are required to perform periodic (annual) inspections of pressure relief devices (pressure relief valves and hydrostats). The follow items must be inspected:
- Free of evidence of tampering, damage, corrosion, or foreign matter that might prevent proper operation;
- Not painted;
- Free of leakage when subject to pressure below the minimum allowable start to discharge setting;
- Has a properly secured rain cap to disallow entry moisture or other matter; and
- Has an open weep hole to permit moisture to escape (specific to PRVs).
Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#'s 35-37. Break-away, Self-Closing Coupling Devices (Coupler) (AP & TB) = One of the leading causes of ammonia incidents is due to faulty brake away / self-closing couplers. Couplers must be equipped with a double swivel assembly. The double swivel assembly aids in maintaining a straight-line relationship with the coupler and liquid withdrawal hose, allowing for optimum chance for disengagement of the coupler in the event of a disconnection between the toolbar and nurse tank. One half of the double swivel that collars/holds the female end of the coupler must be attached to the “other” half of the double swivel assembly. The two halves provides the assembly with a vertical pivot for which the coupler to maintain a straight line relationships with the withdrawal hose. The “other” half of the double swivel is also attached to the “third bar” or its equivalent. The “third bar” or its equivalent provides support for the double swivel assembly. The third bar, equipped with a bushing, also provides a horizontal pivot point for the double swivel assembly. Also of significance is the hose extending from the coupler to the toolbar shutoff valve/meter. This hose must be of sufficient length to allow for full disengagement of the coupler from any angle/position. For the Parker/Pioneer coupler the hose must have enough slack to allow movement in both directions up to an 85% angle for coupler disengagement. The Squibb-Taylor coupler requires two foot slack in the jumper hose to allow 90% angle movement for coupler disengagement. Consult the Parker Pioneer or Squibb Taylor break-away coupler literature of for specifics regarding the length and position for this hose. Four brands of break-away couplers are illustrated on this and the next page:

Parker Pioneer NH3 Coupler/Double Swivel/Third Bar Assembly

Squibb Taylor RB Coupler Installation Specifications

The 45° angle outlet must be oriented as shown.
Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#’s 35-37. Break-Away, Self-Closing Coupling Devices (Coupler)

Squibb Taylor Flo-Max Coupler Installation Specifications (Model FM1.25-1000)

Continental NH₃ High Flow Coupler

- NO REPLACEMENT DATE
- 10 – 15 PERCENT FLOW INCREASE
- STAINLESS EXPANSION COLLAR, NO MOVING BALL BEARINGS
- STANDARD MOUNTING BRACKET
- HARD COATED ALUMINUM GUIDE SPIDER COMPLETELY ELIMINATES RUSTING.
- 100 PERCENT N-SERVE COMPATIBLE
- 2 BLEEDER VALVES INCLUDED

General Coupler Inspection Tips: Before inspecting coupler make sure that all ammonia is bled from both sides of coupler/system. Review manufacturer’s procedural and safety tips before performing inspection. For Pioneer/Parker or Continental NH₃ couplers use the T-bar to separate the male end from the female end. For a Squibb Taylor brand coupler a screw driver must be used to separate the both ends. If the coupler being examined fails to separate, document this on the inspection checklist, requiring the firm to separate, clear, lubricate, or replace the coupler. If separation is achieved determine if cleaning, lubrication, or repair/replacement is required. Check to determine if O-rings and spring loaded poppets work/seal and other internal components. Document any disrepair/malfunctioning of the coupler.

Tips to provide to firms: Manufacturers’ recommend periodic cleaning, lubrication during use, and while being stored in a clean/dry area during the off season. Separation during the off-season reduces the possibility of poppet springs positioned inside the coupler from becoming permanently compressed or rusted, preventing the poppets from closing completely. Couplers require a bleeder valve in the female section per manufacturer’s specifications.

Hosing length and Operation of the Break-Away Coupling Device:
Avoid having a length of withdrawal hose that will become caught or pinched on the nurse tank and toolbar assembly or impede the function of pull-away coupler. Avoid over-securing the withdrawal hose via bungee cords, ropes, chains, or tying down onto hitches or tanks. Provisions must be made to secure both ends of the withdrawal hose in transit (either over the road or during field application). An expert with a hose manufacturer indicates that the

“appropriate length is defined as the distance between nurse tank connection and toolbar connection with eight to twelve inches added in order to accommodate travel while making turns. It is also hazardous to operate with a withdrawal hose which is short as it may be pulled apart or out of the end fittings.”
Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

#’s 35-37.  **Break-away, Self-Closing Coupling Devices (Coupler)**

Squibb Taylor Recall – Type FM125-1000 and FM125-1004 Toolbar Breakaway Coupler Recall

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SQUIBB TAYLOR

Incorporated

P.O. BOX 541175 DALLAS, TEXAS 75354-1175

To: NH3 Manager
From: Pat Hodges
cc: Al Sherrard

Date: January 31, 2005

Subject: **IMPORTANT SAFETY NOTICE**
Type FM125-1000 and FM125-1004 Toolbar Breakaway Coupler Recall

Early models of the FloMax safety coupler have demonstrated a tendency for the plunger on the male half to stick after a pull away and not allow closure of the flapper valve. When this occurs, stopping the release of NH3 from the nurse tank is dependant on proper operation of the excess flow valve in the nurse tank.

Early models of the FloMax coupler can easily be identified by the absence of a disc riveted to the hex head bolt in the side of the male half as shown in the picture.

![Image of coupler](image)

After 01/01/2005

Pre 01/01/2005 Recalled Unit

The new model will have a much stronger flapper spring that will not allow the flapper plunger to “stick” after a pull away when the unit has remained in the connected position for extended periods.

**ALL RECALLED (PRE 01/01/2005) MALE HALFS OF THE FLOMAX COUPLER MUST BE RETURNED FOR UPDATE AND SHOULD NOT BE USED.**

**Action Required:** Please return the male half only of the FloMax via UPS collect, use Squibb Taylor’s account number 751 445. We will have the updated units back to you in 3 to 4 weeks. Your prompt attention to this matter will help us accomplish this recall prior to the start of this spring season.

Please contact Al Sherrard (800-345-8105) if you have any questions or concerns.

Thanks,

Pat Hodges

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Anhydrous Ammonia Inspection Checklist Compliance Item Information

Equipment Inspection Checklist Compliance Item:

Other Toolbar Items Not Listed On The Equipment Inspection Checklist:

**Toolbar Meter / Manual Shutoff / And Filter**
Stress maintenance of meters and periodic checking/cleaning filter for optimum flow. Periodic check for flow rate

**Toolbar Hydraulic Shutoff**
Check for leaks or bypass of hydraulic fluid to reduce possibility of premature opening or inadequate closure of shut-off valve. A flag must be present on the shut off valve indicating if the valve is open or closed.

**Toolbar Thermal Transfer Units**
With the advent of thermal transfer (cold flow or cooler) units in conjunction with the use of electronic flow metering, the need for additional hydrostatic relief is essential. Hydrostats are required in each thermal transfer unit to protect unit and adjacent hosing/piping from excess pressure.

To maximize AMMONIA liquid flowing through the electronic flow meter a thermal transfer unit converts AMMONIA vapor, coming from the nurse tank, to a liquid by transferring heat from the warmer incoming liquid-vapor mix. The heat transfer cools the incoming vapor, which then condenses the vapor into liquid providing a pure liquid flow for accurate metering.

IT IS ESSENTIAL to make sure that the thermal transfer unit is completely drained/pressure relieved when performing maintenance or placing in an Out of Service status. Make sure that all bleeder valves are open prior to taking connections apart.

**SAFETY – FIRST & ALWAYS**
1. Wear NH₃ rated goggles and gloves when handling NH₃ or performing inspections/maintenance;
2. Have an accessible emergency water supply in close proximity when handling NH₃ or performing inspections and maintenance;
3. Never assume that all NH₃ is bled off from hosing, piping, tanks, cold flow/cooler units, etc.; and
4. Be aware of others where NH₃ is being released during normal operating processes and incidents.