



# Diamond Grade™ Series 983 Conspicuity Markings Application Instructions

## For Trucks, Trailers and Specialty Vehicles

Information Folder 4.9

March 2006

Replaces IF 4.9 dated June 2004

### Description

3M™ Diamond Grade™ Series 983 Conspicuity Marking is precoated with an aggressive pressure sensitive adhesive for application to most clean, dry, wax-free, non-corroded, weather resistant surfaces. The adhesive is protected with a clear plastic easy release liner. Series 983 markings are intended to be applied to the side and rear perimeter of vehicles in a continuous stripe to enhance visibility and recognition by motorists. See examples in this bulletin.

Series 983 markings must be applied to flat surfaces (with or without rivets) and non-compound curved surfaces with a radius greater than 5 inches. For application to corrugated vehicles, apply the marking to the bottom and top rails or between corrugations if adequate flat surface is available.

Application is not recommended to rusted or corroded metal, loose or chalking paint, irregular shaped framework, bolts, rivets larger than 1/2 inch high, support plates, corrugations, within 1/8 inch of door hinges, exterior posts, weld joints, ends of vehicle, and within 3 inches of mandated lights, reflectors or turn signals.

**Important:** The following information should be carefully reviewed before proceeding with individual instructions.

### Storage

Diamond Grade conspicuity markings can be stored for a period of two years in a cool, dry area at temperatures of 65-75°F (16-24°C) and must be applied within the two year time frame. Rolls should be stored horizontally or in their shipping carton. Partially used rolls should be returned to the shipping carton or suspended horizontally from a rod or pipe through the core.

### Application Instructions

#### A. Tools

1. Plastic Applicator, PA-1 (blue or gold); available from 3M.
2. Low Friction Sleeve, SA-1 (used on the plastic applicator to minimize surface scratching); available from 3M.
3. Utility knife; available locally at hardware or industrial supply stores.
4. Osborne Arch Punch No. 149 or Osborne Belt Punch No. 245 of proper size; available at hardware and industrial supply distributors.



Osborne Arch Punch No. 149



Osborne Belt Punch No. 245

5. Industrial heat gun such as Dayton Industrial Heat Gun 500-750°F (260-399°C) or equivalent; available at industrial supply stores.
6. Scotch-Brite™ Heavy Duty Cleaning Pad (green or brown); available locally at paint or industrial supply stores.
7. Lint free paper towels and recommended cleaning solvent.

#### B. Temperature

For optimum adhesion and durability, series 983 markings should be applied when air and application surface temperatures are within the following limits.

#### Application Temperature

Product	Minimum	Maximum
983	35°F (10°C)	100°F (38°C)

Markings may also be applied when air and application surface temperatures are beyond these limits with the following precautions.

If applied at temperatures above 100°F (38°C), care must be taken to avoid preadhesion.

If the substrate is below the minimum application temperature of 35°F (10°C), the substrate surface may be mechanically heated to this temperature by using a portable heater, heat lamps, hot water or steam. If hot water or steam is used, the surface must be thoroughly dry before application.

In addition, when outside temperatures are below the minimum application temperature, the applied marking must also be heated using an industrial heat gun and immediately resqueeged. The heat gun should be held 8-12 inches from the marking to avoid burning, melting, or distorting the marking (CAUTION: to ensure marking is not distorted, applied heat should be regulated so that the marking surface is comfortable to the touch).

### C. Surface Preparation

**All surfaces must be considered contaminated and must be cleaned prior to application.** Wash surface with detergent and water to remove dirt and road film. Solvent wipe using a paper towel saturated with DuPont's Prep-Sol Brand Solvent Cleaner 3919S, isopropyl alcohol or 3M™ Prep Solvent 70. Immediately dry surface with a paper towel before solvent dries, paying close attention to rivets, seams and door hinge areas.

An application surface that has been washed, dried, and solvent wiped can still have poor adhesion in the area around rivets and seams due to liquid retention caused by capillary action. This problem can be overcome by allowing a cleaned vehicle to stand overnight prior to application of markings, or by the use of a heat gun to dry out retained solvent.

Application to rusted, severely pitted, loose or chalking painted surfaces is not recommended. These surfaces (frequently found on flatbed trailers and railroad cars) can be prepared by using a Scotch-Brite™ Surface Conditioning Disc or by using a Scotch-Brite™ Heavy Duty Cleaning Pad to remove rust and chalking paint.

For stainless steel applications, initial adhesion is improved by wiping and drying with white distilled vinegar.

### Cleaning Procedures for Rusted Surfaces

1. Wash surface with detergent and water.
2. Remove rust using Scotch-Brite heavy duty cleaning pad.
3. Areas which have been abraded down to bare metal should be painted or primed with a rust preventative fast-dry paint or primer.

### D. Application Procedure

1. Marking should be applied in a continuous stripe or red/white pieces; see examples in this bulletin. The marking must be cut to allow a 3 inch distance from required lights or reflectors, 1/8 inch away from exterior posts, tie down posts and large bolts or rivets if applied on the frame rail.

Apply marking on the frame rail on corrugated trailers if a flat surface is not available and cut around rivet heads as recommended in this information folder. Apply marking no closer than 1/8 inch to door hinges, door hardware, ends of the trailer and weld joints to avoid wrinkling or lifting; see Figure 1. Cut marking 1/8 inch back on lower panel of expansion joints on tank trailer.

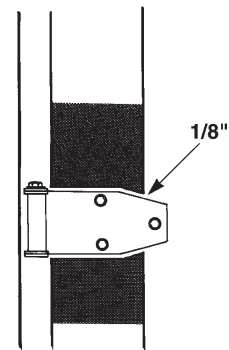


Figure 1

2. Remove a small section of the liner (6-12 inches) from back of marking, position and align the marking on the vehicle and tack down lightly to hold in position.
3. Firmly hold 2-3 feet (arms length) of marking in position against the surface with your left hand. Slowly remove the liner from the back with your right hand by pulling down on the liner. Do not lose alignment. Removing liner from the marking before aligning will cause preadhesion and misalignment (Figure 2).

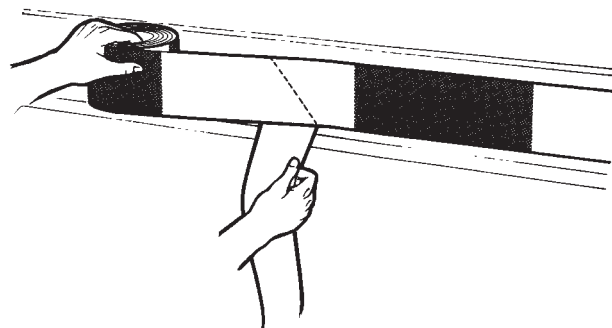


Figure 2

4. Using a PA-1 applicator, press the marking to the surface using firm, vertical overlapping strokes. Be sure all edges are adhered.
5. Apply the remaining markings using the above procedures. To avoid holding the complete roll of marking during application, unroll 10-20 feet of marking and set the roll on a table, chair, stepladder, etc. beside the vehicle in the direction your are working.
6. Apply tape over rivets and body panel seams using firm pressure leaving a bridge which will adhere when the marking is cut in these areas.
7. Cut marking between all body panels and door openings using a sharp utility knife and squeegee the marking to the surface. Cut marking no closer than 1/8 inch to exterior post weld joints, door hinges, door hardware, lower panel of expansion joints on tank trailers, and ends of the trailer to avoid lifting and wrinkling.
8. Cut marking around rivets using an Osborne cutting tool of proper size to fit over rivet. Place tool over top of rivet and marking and tap lightly using a small hammer (Figure 3). Squeegee the marking around the rivet with firm pressure. The cut film on the rivet head can be left on the rivet but will eventually come off during washing. Avoid applying marking over closely spaced rivets where possible. Apply the marking above the bottom row of closely spaced rivets on side panels.

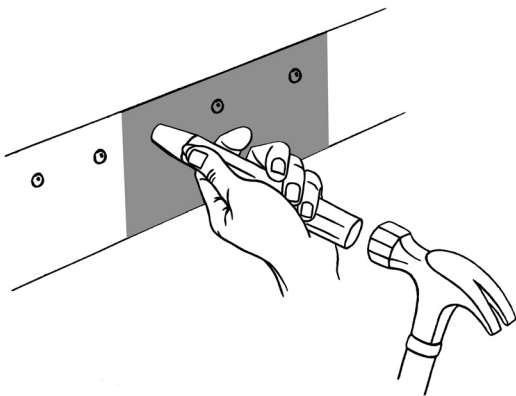


Figure 3

Do not apply the marking beyond panel edges where moisture and dirt can get to the adhesive. Marking should not be overlapped but should be butted together to make seams and joint pieces.

## Edge Sealing

Edge sealing is not required for 3M™ Diamond™ Grade Conspicuity Markings Series 983.

## Cleaning

Routine washing is recommended for maximum performance. The following cleaning methods are recommended.

- Wash with sponge, cloth or soft brush using water and detergent.
- Automatic truck/car wash or standard high-pressure hand spray:  
**Maximum** pressure-1200 PSI/80 bar.  
**Maximum** water/wash solution temperature-140°F/60°C.  
**Minimum** of 12 inches/30cm distance of cleaning jet(s) from markings. Spray nozzles must spray at a 15 degree flat water fan type pattern.  
 Cleaning wand or jets to be at **no greater** angle than 45 degrees from perpendicular to the sheeting surface.
- When using metal brighteners, follow manufacturer's recommendations for dilution. Thoroughly rinse from markings after soaking vehicle.

Information about the volatile organic compounds (VOC) content of chemical products. Consult local regulatory authorities for possible restrictions on product VOC content and/or VOC emissions. For 3M products you may contact the 3M Corporate Contact Center at 1-800-3MHELPS.

## Removal Instructions

### Required Tools:

1. Single edge razor blades
2. Longer handle tool to hold razor blades
3. Safety Glasses
4. Solvent resistant protective gloves
5. Absorbent paper towels

### Recommended Solvents:

1. Isopropyl Alcohol (rubbing alcohol)
2. Suggested adhesive removing products;
  - A. 3M Industrial Cleaner
  - B. Brake cleaning fluid
  - C. Paint remover in aerosol can-Used ONLY on Bare Metals (non-painted)

NOTE: Always follow manufacturer's instructions and safety recommendations.

### Removing Conspicuity Markings:

1. Use handle tool containing new single edge razor to lift an edge of the marking.
2. While keeping the edge of the razor close to the surface of the substrate, begin to work the razor from side-to-side in small strokes in the direction of removal.

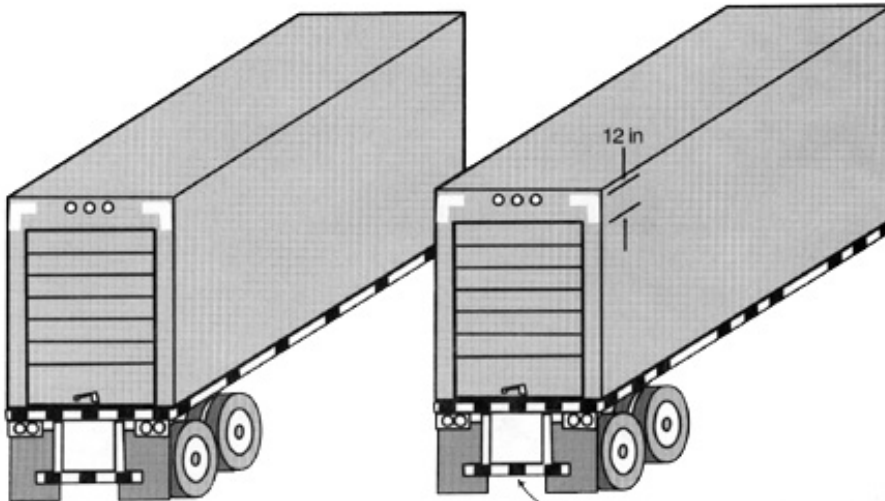
3. Pull the loose marking with minimal tension at approximately 45 degrees away from the substrate while working the razor back and forth.
4. If markings break away from substrate, keep repeating steps 1-3 above. Note: Ease of marking removal will depend on initial adhesion and/or time on substrate.
5. It is very important to always have a sharp razor blade to obtain best results.

**Removing Adhesive:**

1. Spray one of the suggested adhesive removing products mentioned above onto the adhesive. Use or try other products that you feel might work better to de-tackify the adhesive.

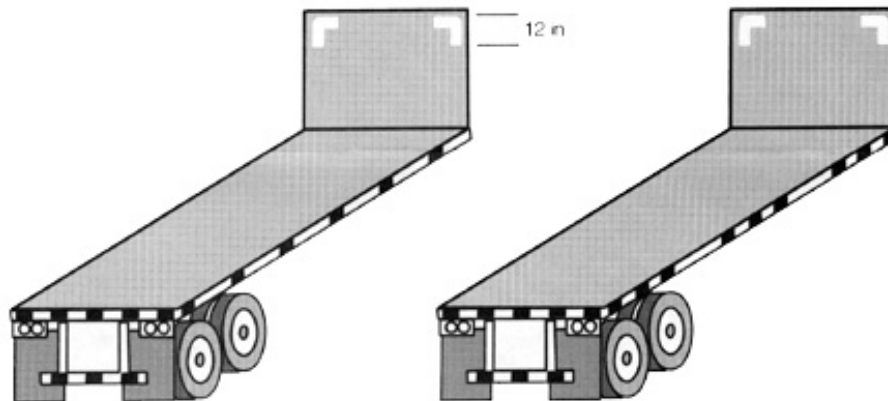
2. Leave adhesive remover soak on adhesive for 3-5 minutes.
3. Use handle tool with razor to scrape of adhesive.
4. Wipe adhesive residue off onto paper towel.
5. It may be necessary to repeat steps 1-4 several times to remove all adhesive residue.
6. Always use a sharp razor blade for best results.
7. All adhesive residues must be removed before re-application of markings.
8. Substrate needs to be cleaned with alcohol using one paper towel to clean and one to wipe away residue before re-application of markings.

**Truck and trailer application guidelines for  
3M™ Diamond Grade™ Conspicuity Markings  
Series 983**

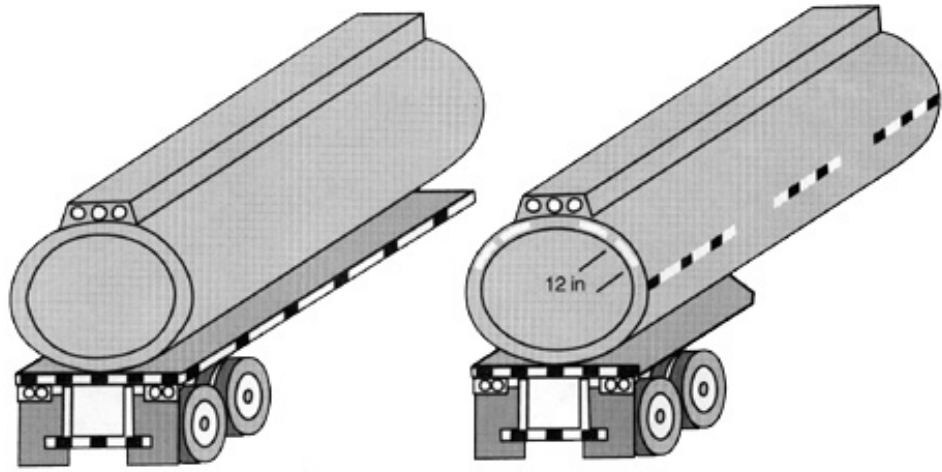


**Typical Spacing**

Underride bar is not required to be marked on trailers manufactured prior to December 1, 1991.

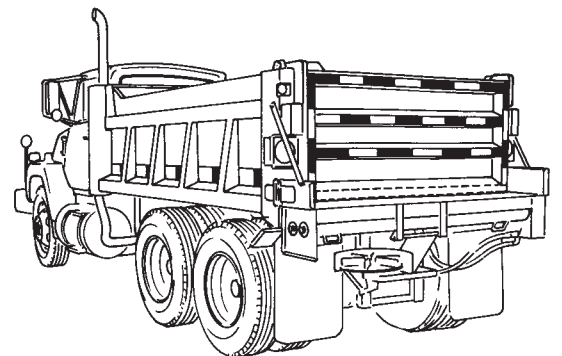
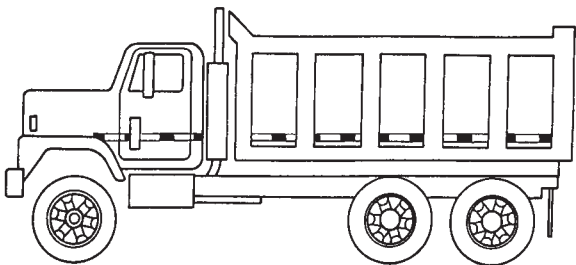
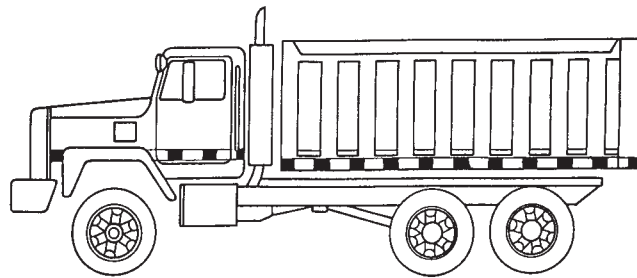
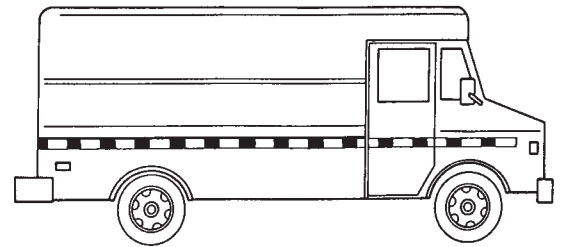
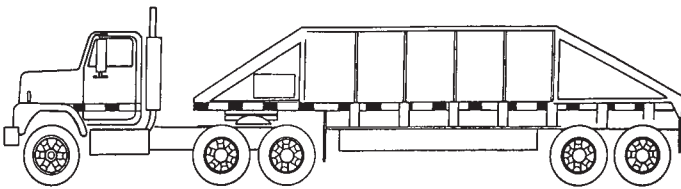


**Typical Spacing**



Typical Spacing

**Suggested Applications**  
**3M™ Diamond Grade™ Conspicuity Markings**  
**Series 983**



## Health and Safety Information

Read all health hazard, precautionary and first aid statements found in the Material Safety Data Sheets (MSDS), and/or product label of chemical prior to handling or use. Also refer to MSDS for information about the volatile organic compounds (VOC) content of chemical products. Consult local regulatory authorities for possible restrictions on product VOC content and/or VOC emissions. For 3M products you may contact the 3M Corporate Contact Center at 1-800-3MHELPS.

## FOR INFORMATION OR ASSISTANCE

**CALL:**

**1-800-553-1380**

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**1-800-265-1840**

**Fax-on-Demand in the U.S. and Canada:**

**1-800-887-3238**

**Internet:**

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