

COLOR, MARKING, AND CAMOUFLAGE
PAINTING OF MILITARY VEHICLES,
CONSTRUCTION EQUIPMENT
AND
MATERIALS HANDLING EQUIPMENT

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This copy is a reprint which includes current
pages from Change 1.

HEADQUARTERS. DEPARTMENT OF THE ARMY
31 OCTOBER 1990

SPECIFIC HAZARDS

WARNING

The local safety office and preventive medicine support activity must be consulted prior to using Chemical Agent Resistant Coatings (CARC). This also applies to all spray painting operations, regardless of the material used.

Spray Painting.

- All personnel who work in or near a spray painting booth must wear a respirator when spray painting operations are underway.
- Only one person will spray paint at a time. This is to eliminate the hazard of accidentally spraying paint on another person.
- No spray painting will be conducted in an area where unprotected personnel are within a 50-foot radius.
- No unprotected personnel can enter an area of spray painting without protection until 30 minutes after all painting/cleaning is completed.

Cleaning.

- Do not use gasoline or other hydrocarbons for cleaning.
- Avoid skin contact with cleaning solvents. Wear synthetic rubber gloves.

Fire Hazards.

- Observe fire regulations when using paint and lacquer thinners, as they are highly flammable
- Post "NO SMOKING" signs in paint warehouses.
- Listed below are the various specific hazards associated with spray painting, cleaning, fires, safety equipment, hazardous materials, temperatures and equipment.
- The dried spray dust of lusterless enamels is an extreme fire hazard. Remove this dust daily. The danger of fire can be materially reduced by the use of a water-wash or water fall type of spray booth.

- Lacquer thinner is highly flammable. Keep away from flames and sparks.
- Do not use electric sanders in a paint shop or near a spray paint area.
- Wiping cloths soaked with linseed oil must either be destroyed or spread out to dry in a well ventilated area to prevent possible spontaneous combustion.

Safety Equipment.

- Protective equipment must be worn during painting, cleaning, abrasive blasting, grinding, buffing, or where compressed air is being used. Approved respirators must be worn when required.
- When painting with CARC, use silicon rubber (impervious, not cloth) gloves for protection.

Hazardous Materials.

- Items containing xylene, toluene, naphtha, methyl ethyl ketone, methylisobutyl ketone, and 1,1,1 trichloroethane may be hazardous materials and must be disposed of in accordance with AR 420-47, Solid and Hazardous Waste Management.
- Many materials are carcinogens. Pay careful attention to all warnings, cautions, notes, and safety procedures when using any paints, primers, solvents, and cleaners.
- Extreme care must be observed in the handling of paints containing mercury or other fungicides to prevent poisoning or skin irritation.
- Avoid skin contact with lacquer thinner. It can cause a skin rash.
- Persons known to be allergic to isocyanites shall not paint with polyurethane's.
- Do not apply CARC to surfaces reaching 400^o F (204^o C). Doing so may produce toxic fumes and/or equipment damage.
- All electrical equipment must be properly grounded before starting any painting procedures.

**CHANGE
NO. 1**

**HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 7 May 1991**

**COLOR, MARKING, AND CAMOUFLAGE
PAINTING OF MILITARY VEHICLES,
CONSTRUCTION EQUIPMENT,
AND MATERIALS HANDLING EQUIPMENT**

TB 43-0209, 31 October, 1990, is changed as follows:

1. Remove old pages and insert new pages as indicated below.
2. New or changed information is indicated by a vertical bar in the margin of the page.

Remove Pages
D-1 and D-2

Insert Pages
D-1 and D-2

File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

PATRICIA P. HICKERSON
Colonel, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-34-E, block 0528, requirements for TB 43-0209.

TECHNICAL BULLETIN

*No. 43-0209

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., 31 October 1990

**COLOR, MARKING, AND CAMOUFLAGE
PAINTING OF MILITARY VEHICLES,
CONSTRUCTION EQUIPMENT,
AND MATERIALS HANDLING EQUIPMENT**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028, Recommended Changes to Publications and Blank Forms, or DA Form 2028-2 located in back of this manual direct to: U.S. Army Tank-Automotive Command, ATTN: AMSTA-MBT, Warren, Michigan 48397-5000. A reply will be furnished to you.

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*This manual supersedes TB 43-0209, 29 October 1976.

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SECTION I. GENERAL

1. PURPOSE.

a. This bulletin is published to implement AR 750-1 in defining the color marking and camouflage pattern painting requirements for Department of the Army military vehicles (except vehicles in administrative use), construction and highway maintenance equipment, and self-propelled materials handling equipment.

b. Special color and marking requirements for vehicles in administrative use are contained in AR 58-1.

2. SCOPE.

a. These instructions apply to all Department of the Army activities and installations using, maintaining or procuring such vehicles or equipment. Specific exceptions to normal color and marking requirements are identified in later sections of this bulletin.

b. Instructions for application of special technical markings not shown in these instructions are located in specific Department of the Army publications.

c. Vehicle and equipment painting instructions are contained in TM 43-0139.

3. EXCEPTIONS.

a. Vehicles used for intelligence, criminal investigation, and similar purposes requiring concealment of the true identity of the activity involved, may be painted and marked as deemed appropriate by the responsible commander. Identification of such vehicles will be marked in inconspicuous locations as prescribed in applicable Department of the Army publications.

b. Reporting Equipment Improvement Recommendations (EIR's): You can help improve this equipment by recommending design improvements and/or better service and repair procedures. EIR's will be prepared using SF 368, Quality Deficiency Report. Instructions for preparing EIR's are provided in DA Pam 738-750. Mail directly to: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-QRT, Warren, Michigan 48397-5000. A reply will be furnished to you.

4. GENERAL.

a. Markings that are not authorized, are not of the authorized style, or are not in approved location per this bulletin, will be changed or relocated at the time of vehicle repainting, or when the condition of the existing marking becomes unsuitable due to deterioration or damage.

b. Vehicles and equipment will be repainted only when required for preservation purposes, or at time of vehicle

overhaul, in colors authorized by this bulletin. Repainting will not be done merely to change color unless such is considered necessary for safety or security purposes by the responsible commander. Spot painting for preservation only will be the rule rather than the exception. Upon removal from storage to be issued or placed in service, vehicle and equipment will be marked as prescribed by these instructions.

c. Any new markings will conform to the requirements of this bulletin.

d. Markings, in addition to those prescribed or authorized in this bulletin, will be applied only on specific approval of the Department of the Army (paragraph 3a) or as identified in official Department of the Army publications.

e. Markings peculiar to any vehicle, or series of vehicles, will be applied as specified in this bulletin. Description, identification, and location of vehicle peculiar markings will be found in the appropriate vehicle technical manual.

f. Under tactical conditions, when it becomes necessary to conceal the markings, all such prominent markings may be covered with temporary paint (Paint, temporary, lusterless, gasoline removable MIL-P-13983) on authority of the responsible commander. Such markings may also be temporarily camouflaged by the use of oil, dirt, mud, or other readily removable substance.

SECTION II. DESCRIPTION

5. DESCRIPTION OF MARKINGS.

a. All letters and numerals used in the marking of vehicles and equipment will be of the gothic style illustrated in Figure 1. Thickness of the characters (stroke width) will be between 1/6 and 1/7In of their height.

b. All markings will be of the size shown and specified in this bulletin.

c. Permanent markings may be applied in the form of adhesive backed markers of the prescribed color, may be painted on when markers are unavailable, or when application must be made on canvas or other porous surface. Non-reflective markers will be of material conforming to MIL-M43719, Type II, Class 1, and will conform to applicable detailed specification sheets. Reflective markers will be of material conforming to Federal Specification L-S-300, Type I or II, Class 3, reflectivity 1.

(1) Stencil and paint. Paper and metal stencils are available as individual letters, numerals, and legends of various sizes, and may be located by National Stock Number under FSC 7520, Federal Supply Catalog C7510/30-IL-A. Table 2-1 lists several different size metal stencil sets.

TABLE 2-1

BRASS STENCIL OUTFIT		
1/2"	SE	7520-00-205-1760
1"	SE	7520-00-298-7043
1 1/2"	SE	7520-00-272-9680
2"	SE	7520-00-298-7044
3"	SE	7520-00-272-9683
5"	SE	7520-00-272-9684
METAL STENCIL OUTFIT		
4"	SE	7520-00-272-9684

(2) Black-pressure sensitive adhesive vinyl: Markings made of this material are available as die cut letters, numerals and legends of various sizes, and are listed in Table 2-2 through 2-4.

TABLE 2-2
LUSTERLESS BLACK PRESSURE-SENSITIVE
DECALS NSN 7690-01

LETTER	1-IN	1-1/2 IN	2-IN	3-IN	4-IN
A	030-7126	031-4660	031-9543	032-0732	032-0741
B	030-5778	031-4661	031-5335	032-0733	032-0742
C	030-5779	031-5521	031-5536	032-2428	032-0743
D	030-5780	031-5222	031-6394	032-2430	032-2434
E	030-5781	031-5523	031-9544	032-2432	032-2436
F	030-5782	031-5224	031-5537	032-0734	032-2437
G	030-5783	031-4662	031-5538	032-0735	032-0744
H	030-5784	031-4663	031-5539	032-0736	032-0745
I	030-8542	031-4664	031-5540	032-0737	032-1402
J	030-5785	031-4665	031-5541	032-0738	032-1403
K	030-5786	031-4666	031-5542	032-0739	032-1404
L	030-8543	031-4667	031-5543	032-0740	032-1405
M	030-7816	031-4668	031-5544	031-9545	032-2438
N	030-8544	031-4669	031-5545	031-9546	032-1406
O	030-8545	031-4670	031-5546	031-9547	032-3712
P	031-6395	031-5525	031-5547	031-9548	032-2439
Q	030-8546	031-5526	031-5548	031-9549	032-2441
R	030-8547	031-5527	031-5549	031-9550	032-1407
S	030-8548	031-5528	031-5550	031-9551	032-2443
T	030-8549	031-5529	031-5551	031-9552	032-2445
U	030-8550	031-5530	031-5552	031-9553	032-2447
V	030-8551	031-5531	031-5553	031-9554	032-2449
W	030-8552	031-5532	031-5554	031-9555	032-1408
X	030-8553	031-5333	031-5555	031-9556	032-2451
Y	030-8554	031-4671	031-1400	031-9557	032-4593
Z	030-8555	031-4672	032-0727	031-9558	032-4594

d. Temporary markings will be applied with a temporary paint or removable vinyl markings in accordance with instructions contained herein.

e. Unless otherwise indicated in Section VIII, markings on vehicles and equipment will be applied in contrasting lusterless black 37030 or green 383 (34094).

f. When pressure-sensitive adhesive markers are used, and gloss white markers are unavailable, lusterless white 37875 may be used on vehicles requiring gloss white.

6. DESCRIPTION OF COLORS.

a. Refer to TM 43-0139 for color requirements for specific usage's other than those shown in these instructions.

b. Vehicles assigned to Explosive Ordnance Disposal Units will have all fenders painted lusterless red 31136 on vehicles painted lusterless green 383 or forest green.

TABLE 2-3
LUSTERLESS NUMERALS -- NSN 7690-01

NUMBER	1-IN	1-1/2 IN	2-IN	3-IN	4-IN
1	030-8556	031-4673	032-0728	031-9559	032-4595
2	030-8557	031-4674	032-0729	031-9560	032-4596
3	030-8558	031-4675	032-2421	031-9561	032-4597
4	030-8559	031-4676	032-2422	031-9562	032-4598
5	030-8560	031-4677	032-1401	031-9563	032-4599
6	030-8561	031-5534	032-2423	031-9564	032-4600
7	030-8562	031-4678	032-2424	031-9565	032-4601
8	030-8563	031-4679	032-2425	031-9566	032-2452
9	030-8564	031-4680	032-0730	031-9567	032-2453
0	030-8565	031-4681	032-0731	031-9568	032-2454

TABLE 2-4
MISCELLANEOUS DECALS -- NSN 7690-01

	1-IN	1 1/2-IN	2-IN	3-IN	4-IN	6-IN
				042-0671		
MAX SPEED	032-3713	032-3715				
NO SMOKING	032-3714	032-4602	032-4604	036-4777		
US ARMY		032-4603	032-4605	032-4607	032-4609	
MIL POLICE			032-4606	032-4608		
FLAM-MABLE						047-6457*

* with white background

SECTION III. IDENTIFICATION MARKINGS

7. AGENCY IDENTIFICATION AND REGISTRATION NUMBER.

There is no further requirement to mark vehicles and equipment with the identification legend "US Army." When vehicles and equipment are camouflaged, both the "US Army" and the registration number will be removed from vehicle/equipment exterior. The preferred location of the registration number is any appropriate interior area which is visible from outside a locked or secured item.

8. NATIONAL SYMBOL.

a. The national symbol is a 5-point star in contrasting lusterless black 37030 or green 383 (34094) in a size that fits inside a 3 inch diameter circle. It will be applied to all tactical and combat vehicles and appropriate equipment in CONUS and overseas. The symbol will be applied to vehicles and equipment only when withdrawn for issue to US Army units. It will not be applied to ambulance or other medical service vehicles affected by international agreement concerning such vehicles.

b. The star will be applied to front and rear of vehicles/equipment as specified in Appendix C. On the rear of wheeled vehicles, the star may be centered on the tailgate, Figure 2.

9. UNIT IDENTIFICATION.

a. These markings will be applied to vehicles and equipment by units to which they are assigned. The markings will be maintained at all times but will be removed when the vehicle or equipment is permanently transferred.

b. The unit identification markings will normally appear on both the front and rear of each vehicle. Suitable surfaces (bumperette, tailgates, fenders, rear and front) may be used provided the unit identification marking does not conflict with the location and legibility of other markings. Where no suitable surface is available at the front or rear, the markings will be applied in an appropriate location on each side of the vehicle. If necessary, the unit identification may be applied to the vehicle mounted equipment. Refer to Figures 2 through 13.

c. CARC markings. Equipment painted with CARC with data plates shall have the word "CARC" painted in black or green contrasting color in a conspicuous area as near the data plate as possible. Painting shall be in block letters, as large as possible, not to exceed one inch. All major items having a log book shall have the Equipment Control Record, DA Form 2408-9, annotated in the lower left corner of Block 21, Remarks, to reflect the word "CARC" and the date applied.

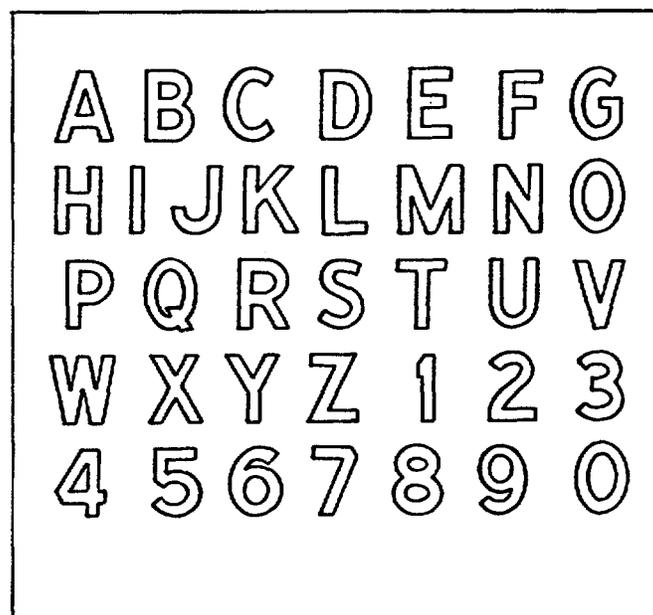


Figure 1. Gothic style alphabet and numerals.

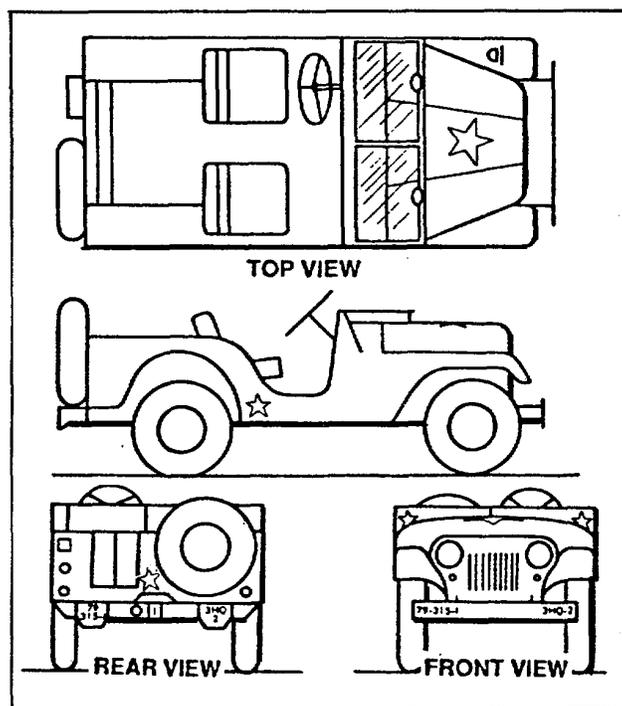


Figure 2. Marking location for 1/4-ton trucks.

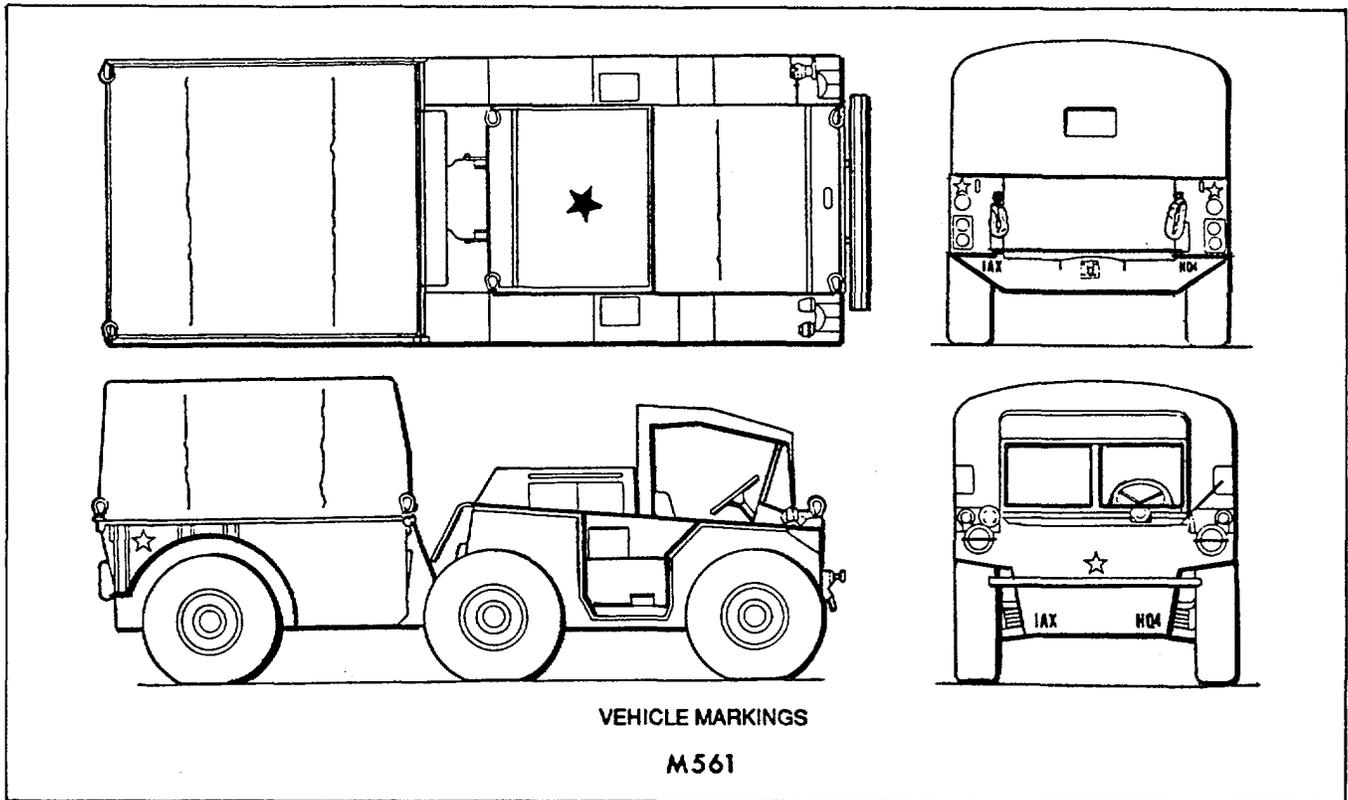


Figure 3. Marking locations for 1-1/4-ton trucks.

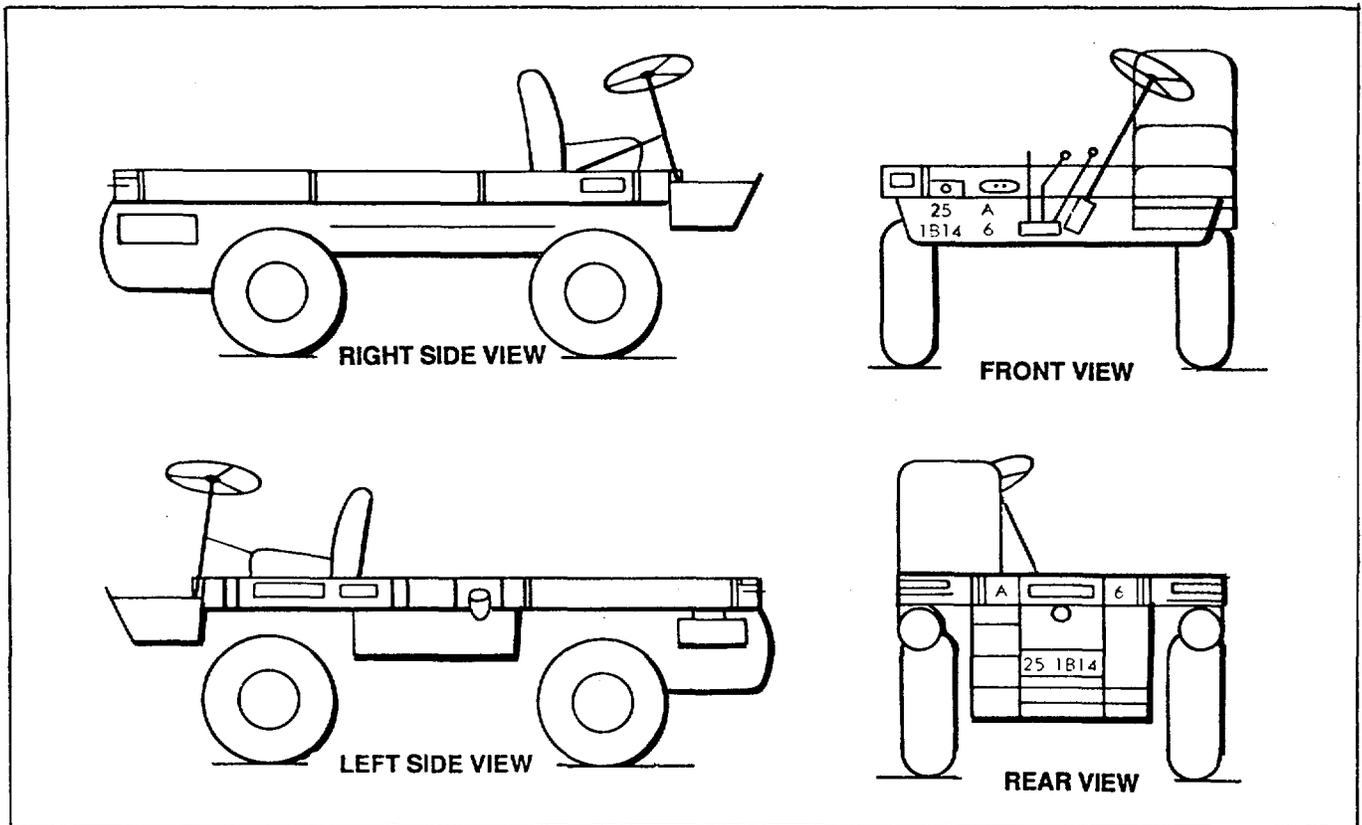


Figure 4. Marking locations for 1/2-ton trucks.

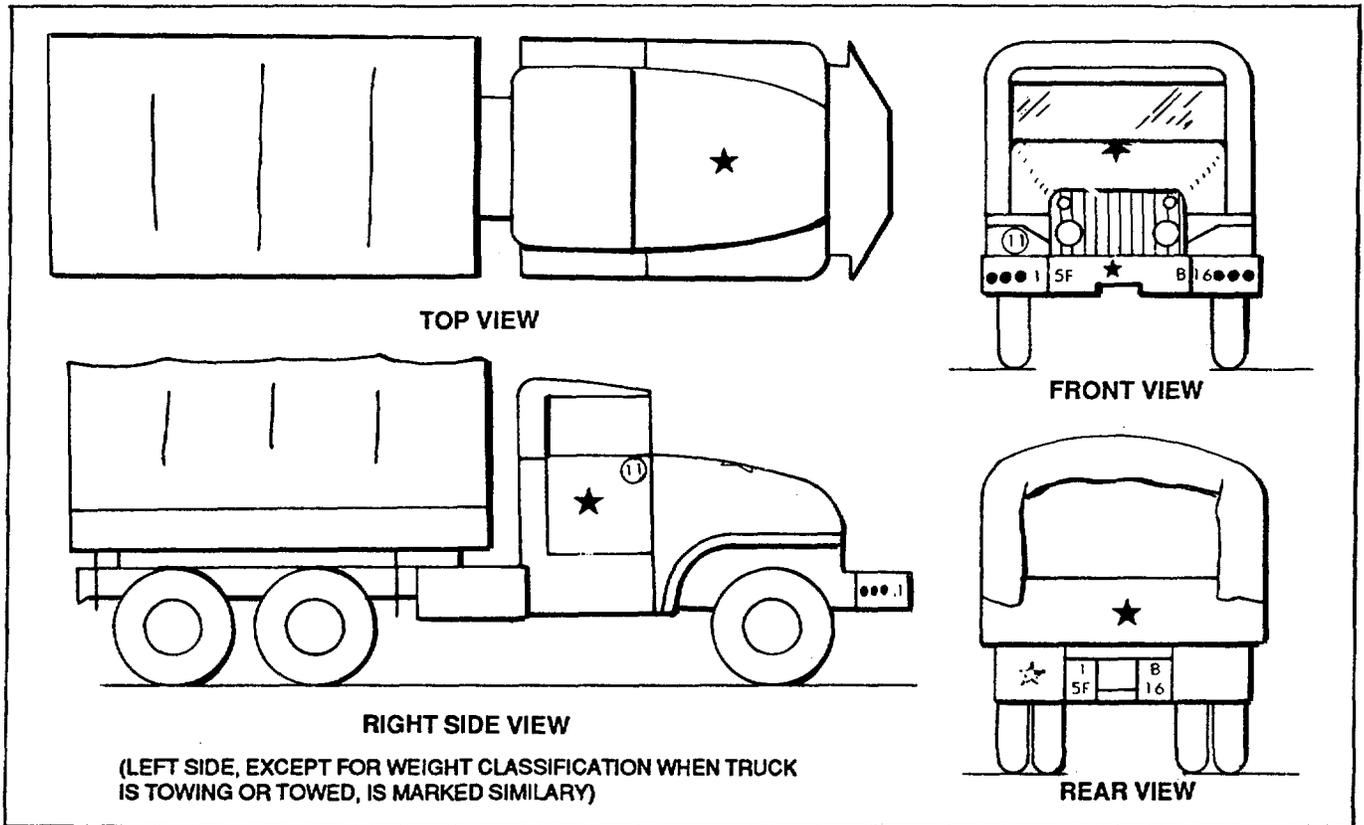


Figure 5. Marking locations—(typical) 2-1/2-, 5- and 10-ton trucks.

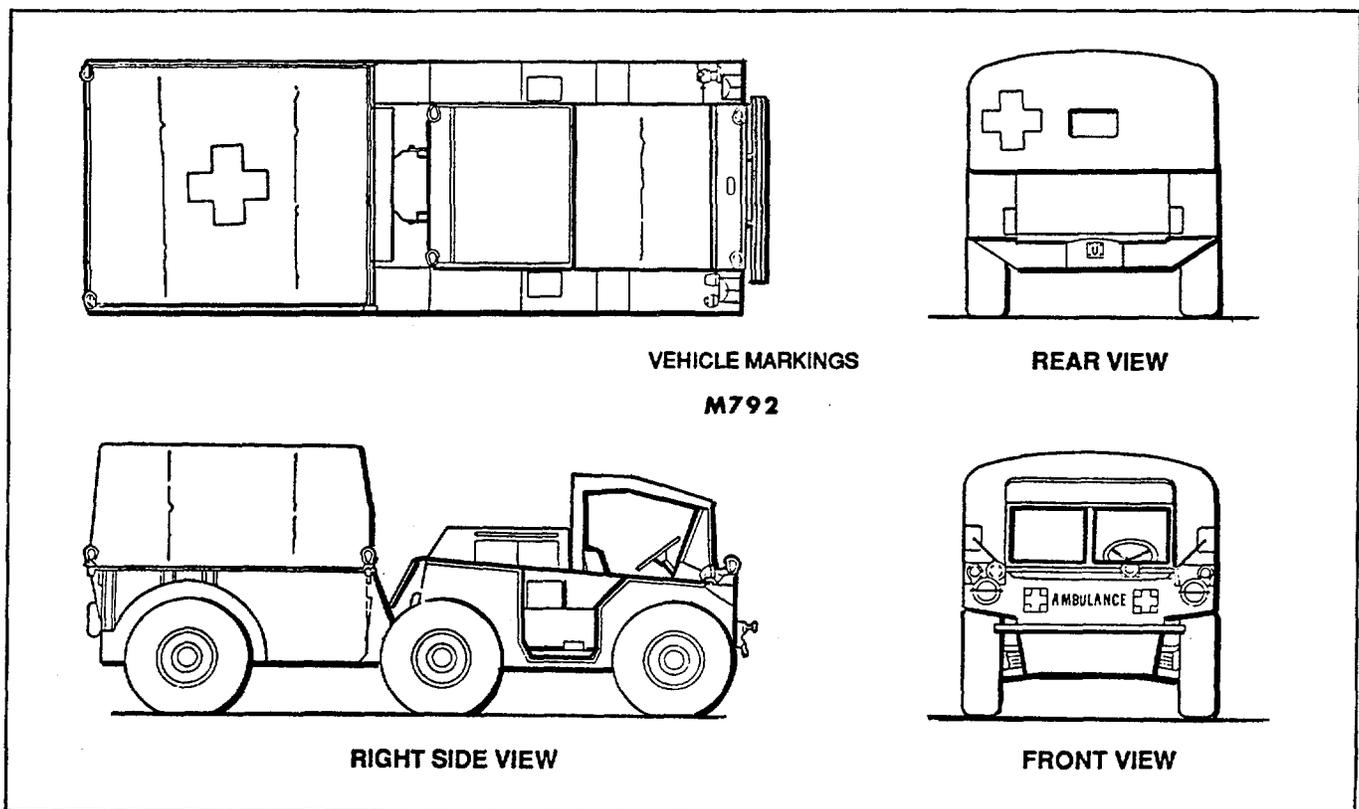


Figure 6. Marking locations -- 1-1/4-ton cargo trucks.

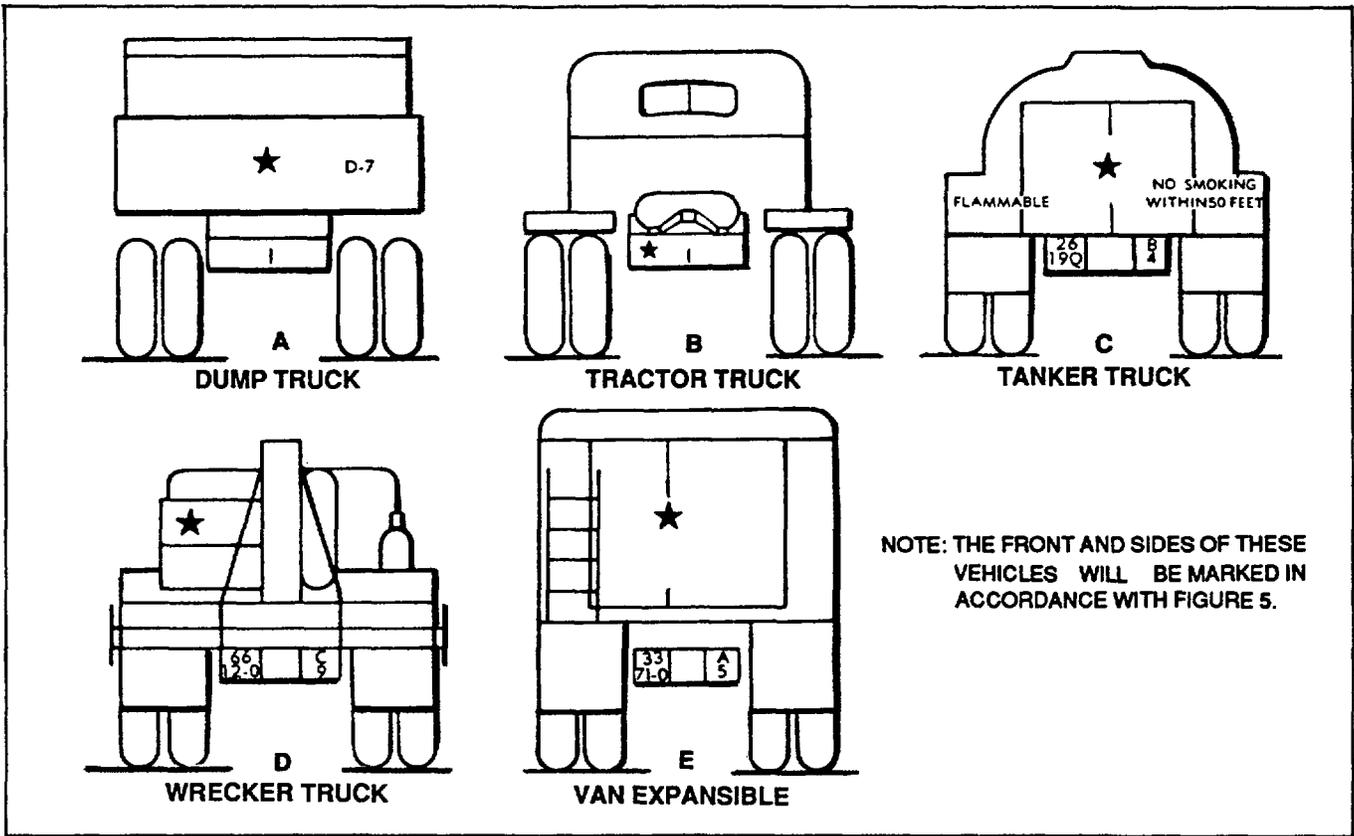


Figure 7. Marking locations -- (typical) 2-1/2-, 5- and 10-ton trucks.)

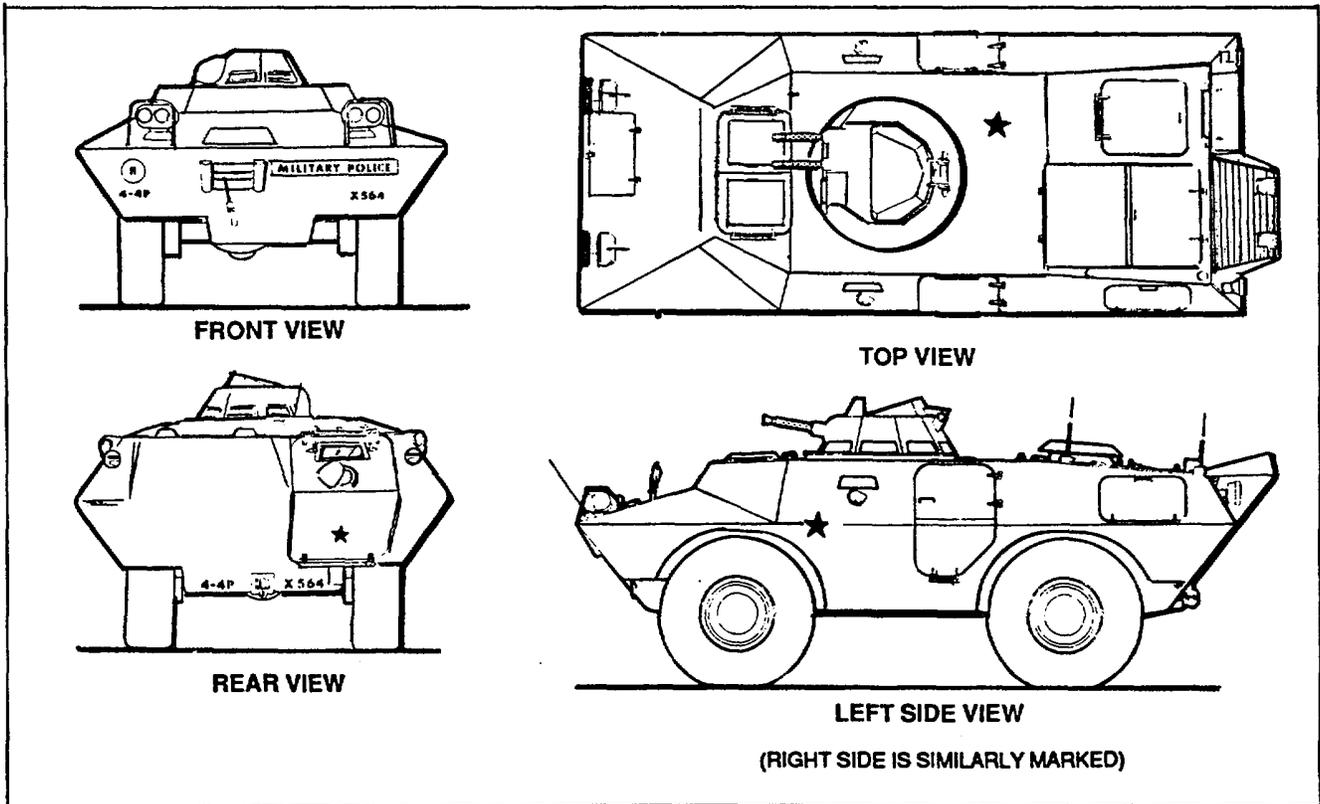


Figure 8. Marking locations -- combat vehicles. (1 of 5)

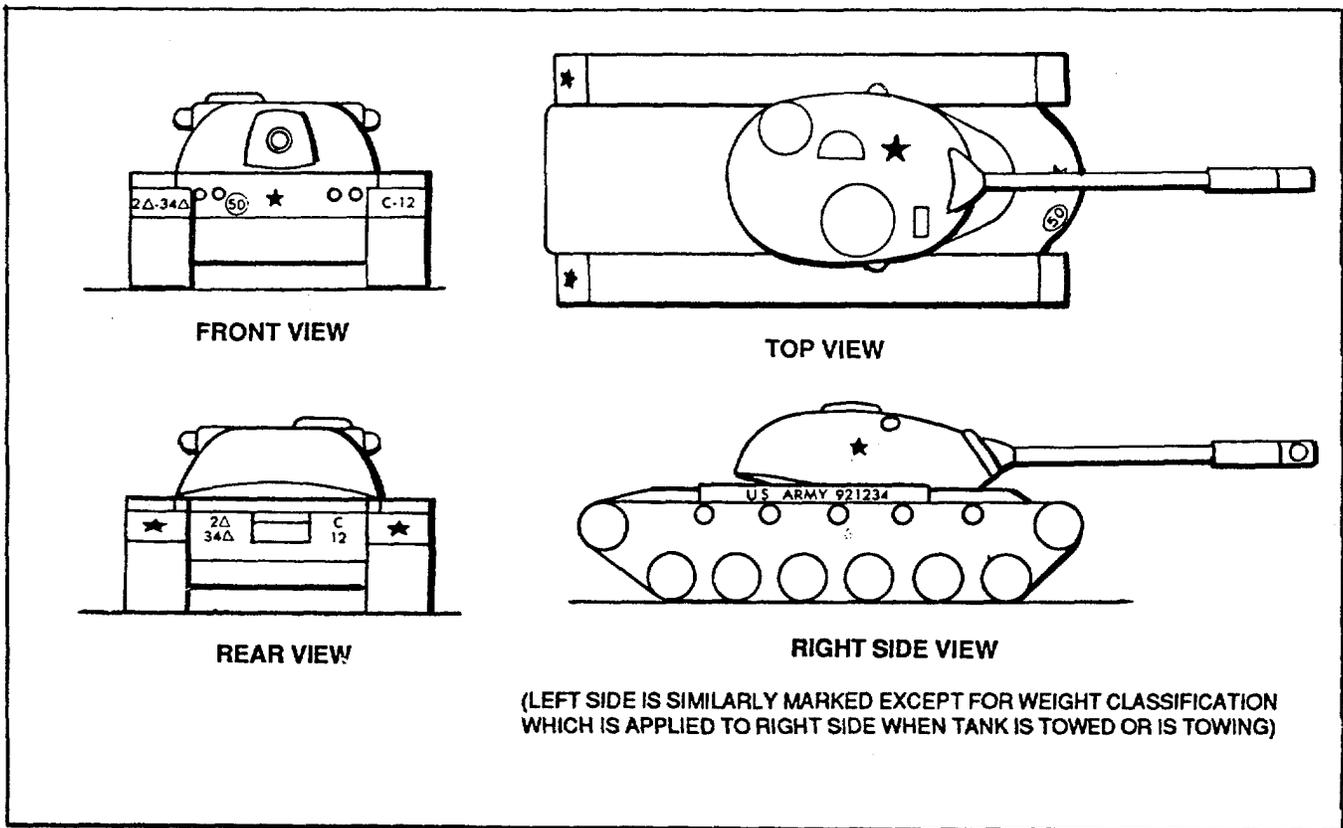


Figure 8. Marking locations -- combat vehicles. (2 of 5)

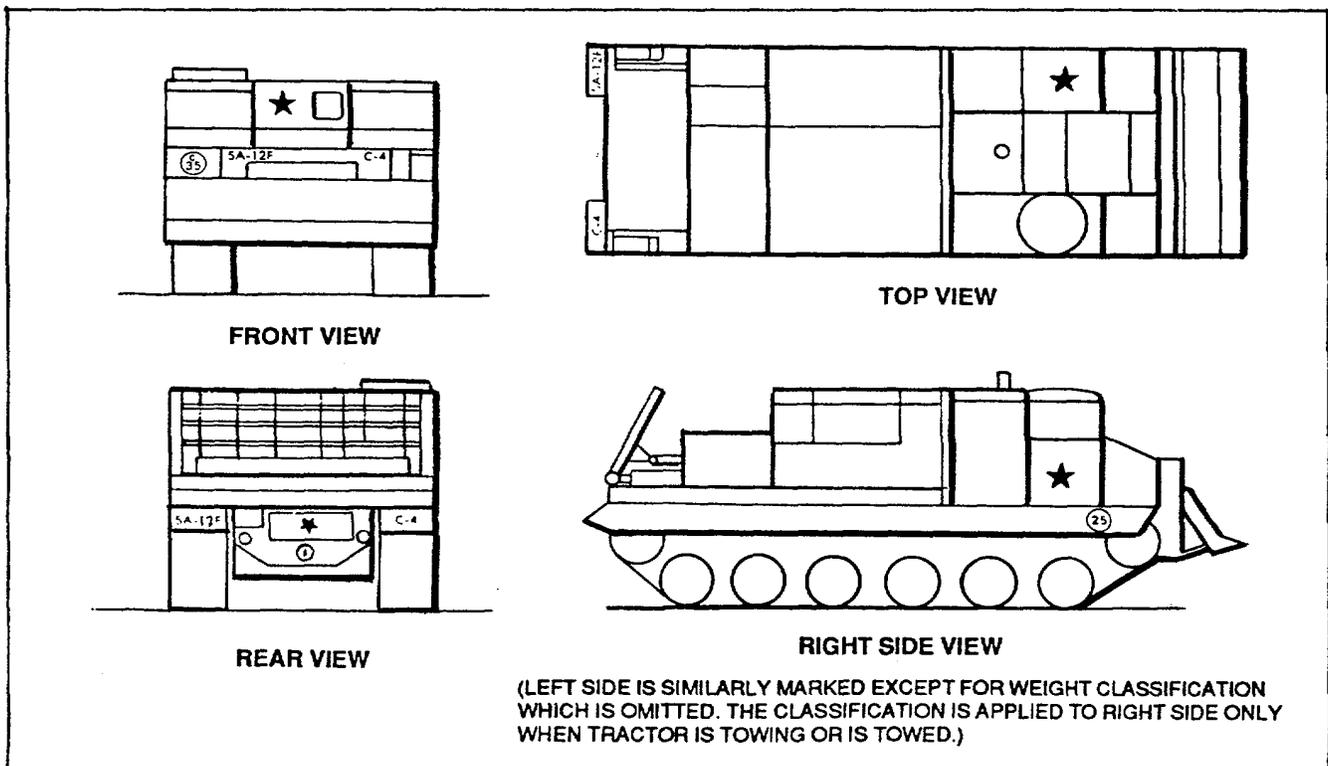


Figure 8. Marking locations--combat vehicles.(3 of 5)

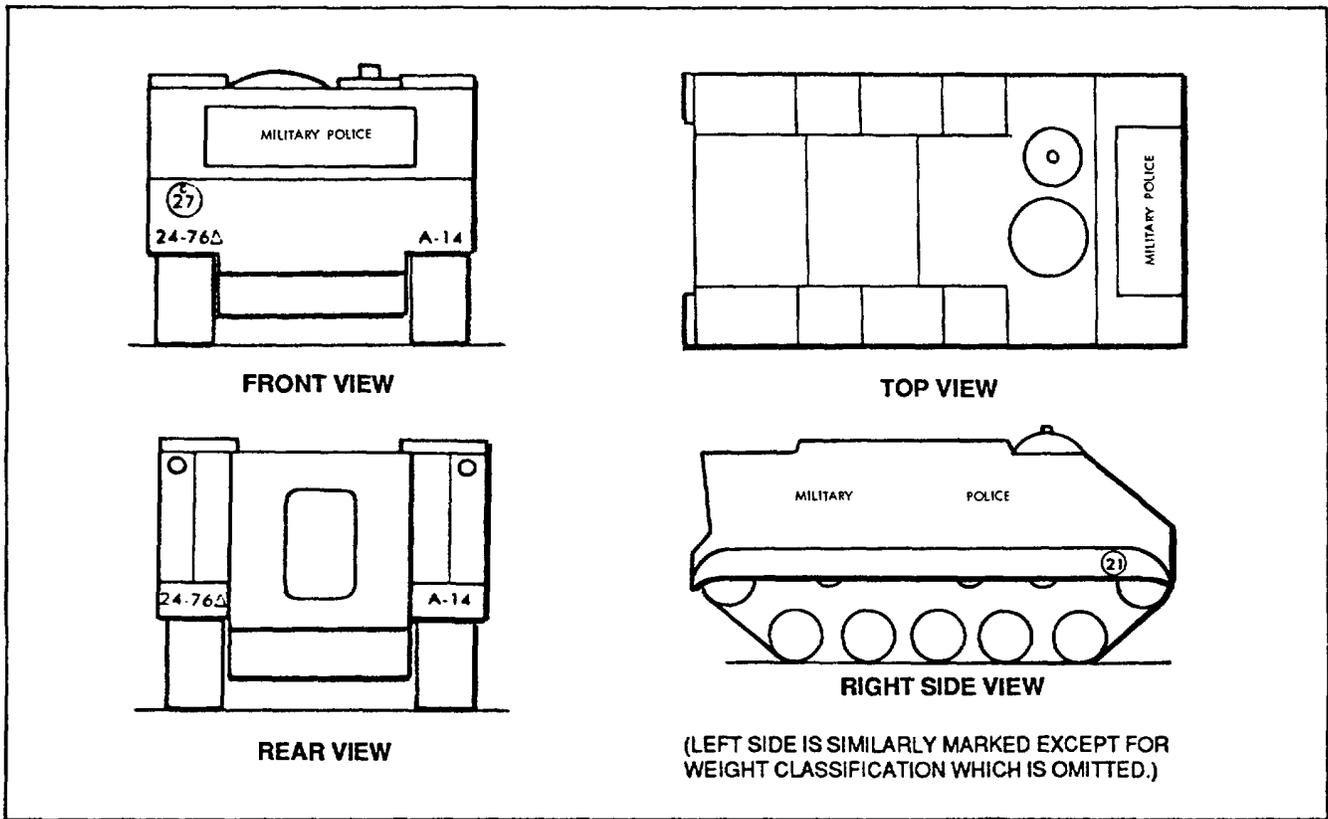


Figure 8. Marking locations -- combat vehicles. (4 of 5)

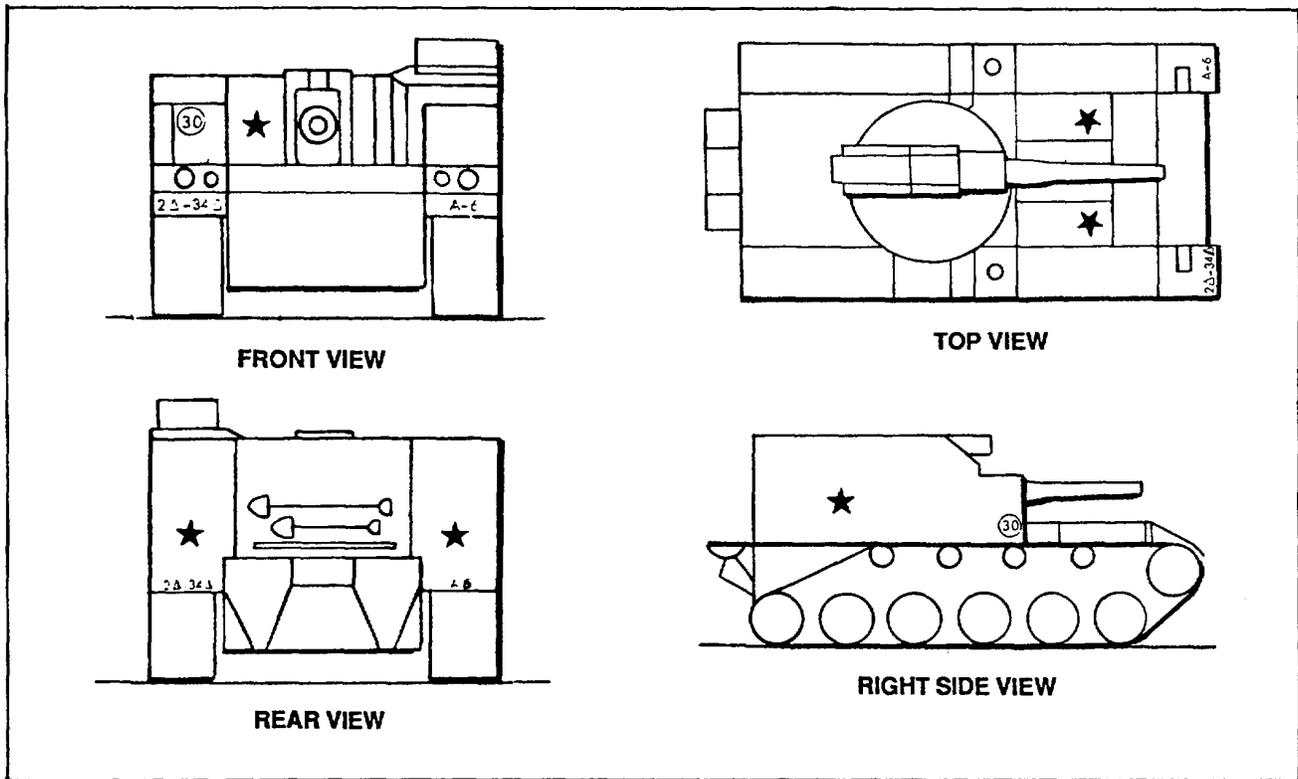


Figure 8. Marking locations -- combat vehicles. (5 of 5)

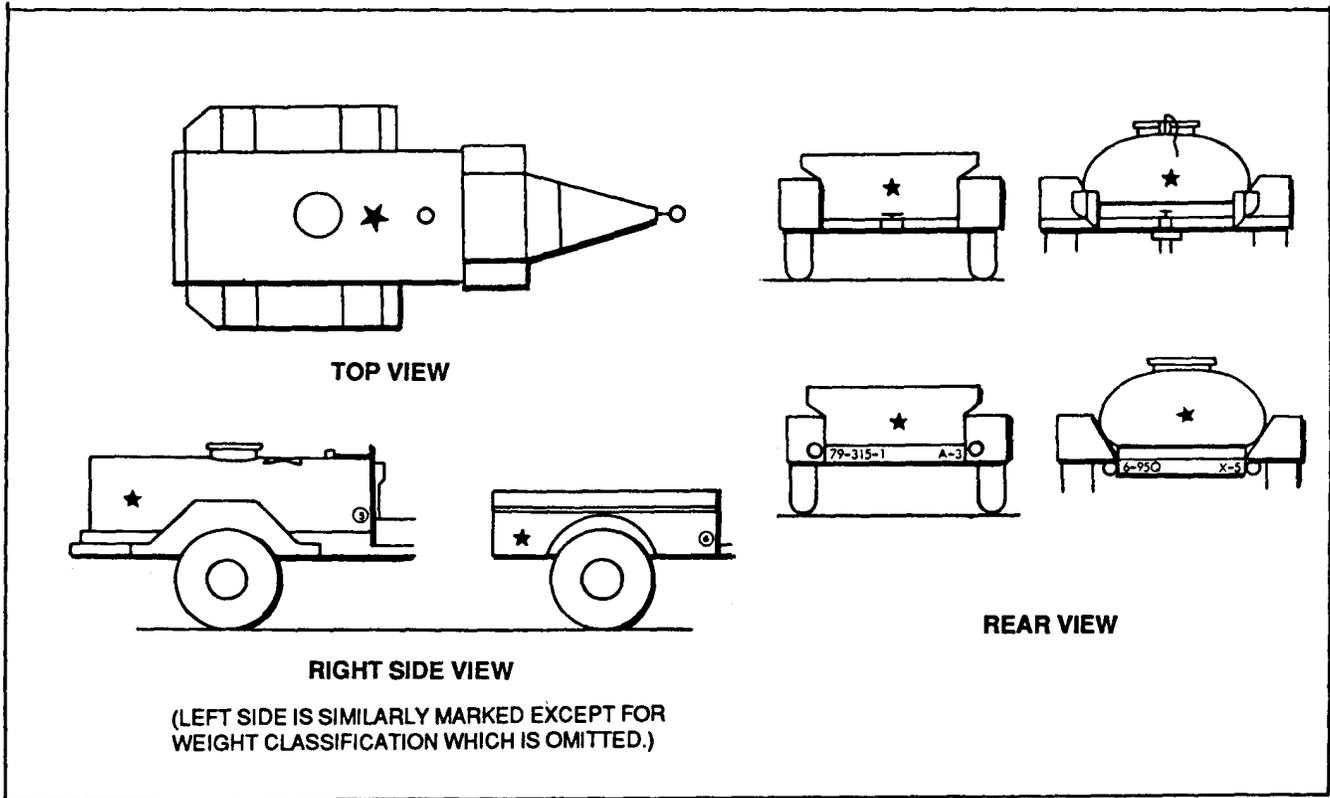


Figure 9. Marking locations -- cargo trailers and tankers.

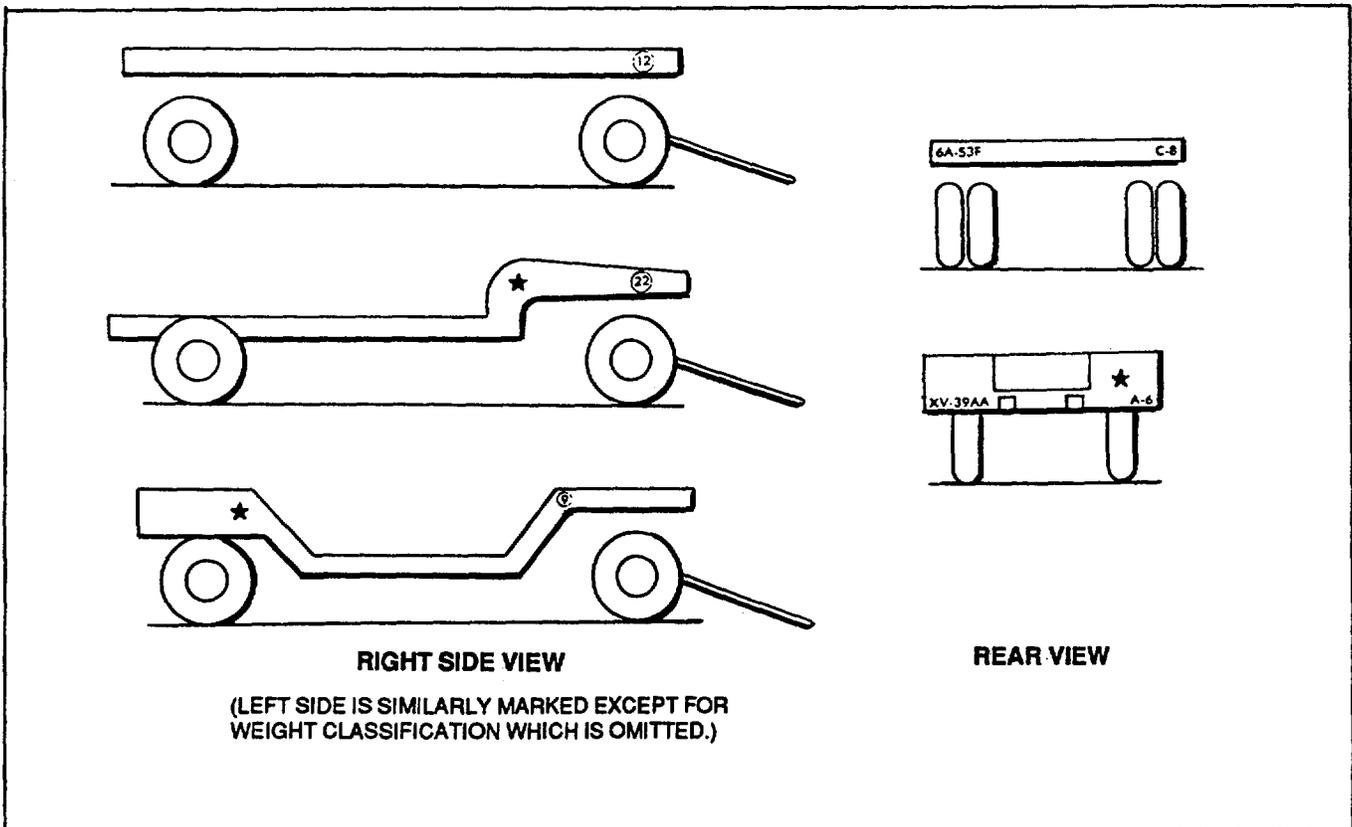


Figure 10. Marking locations -- dollies.

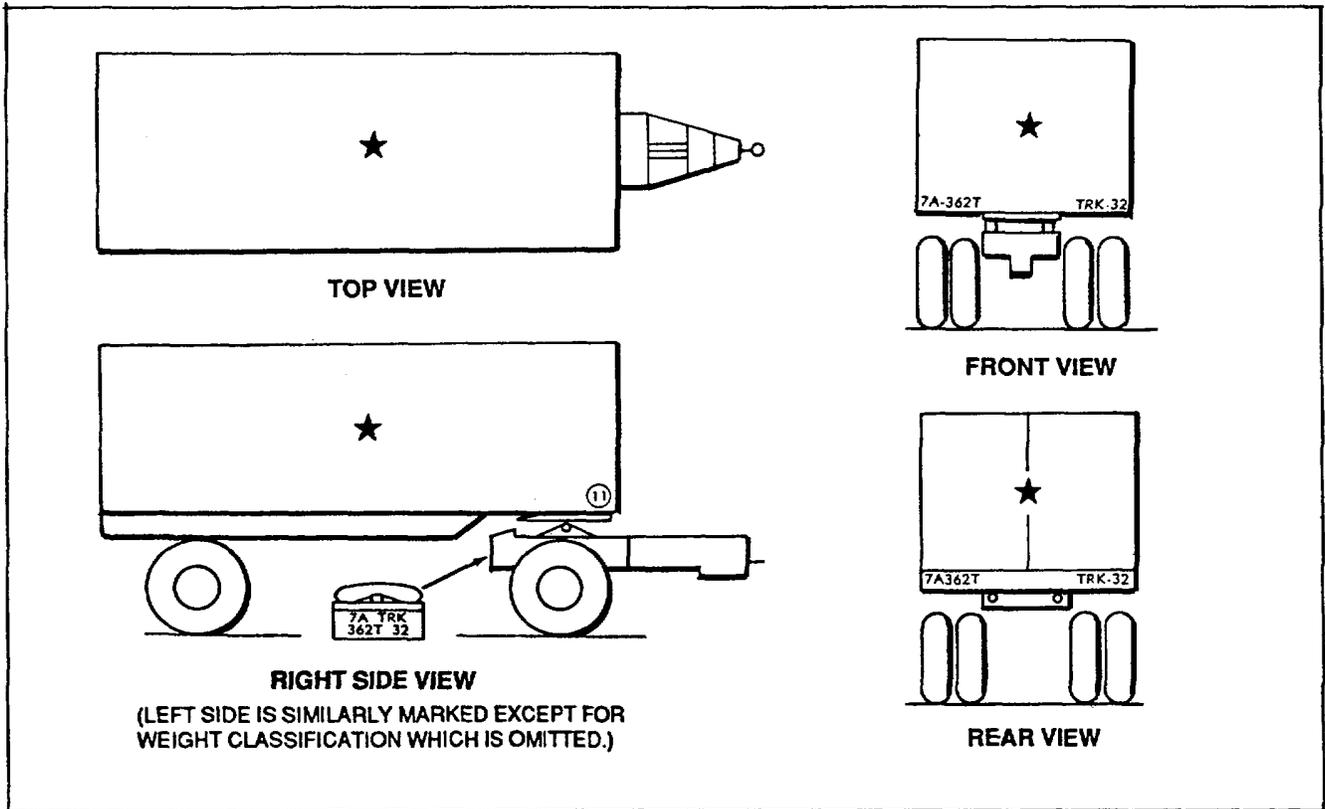


Figure 11. Marking locations -- trailer and Semitrailer van.

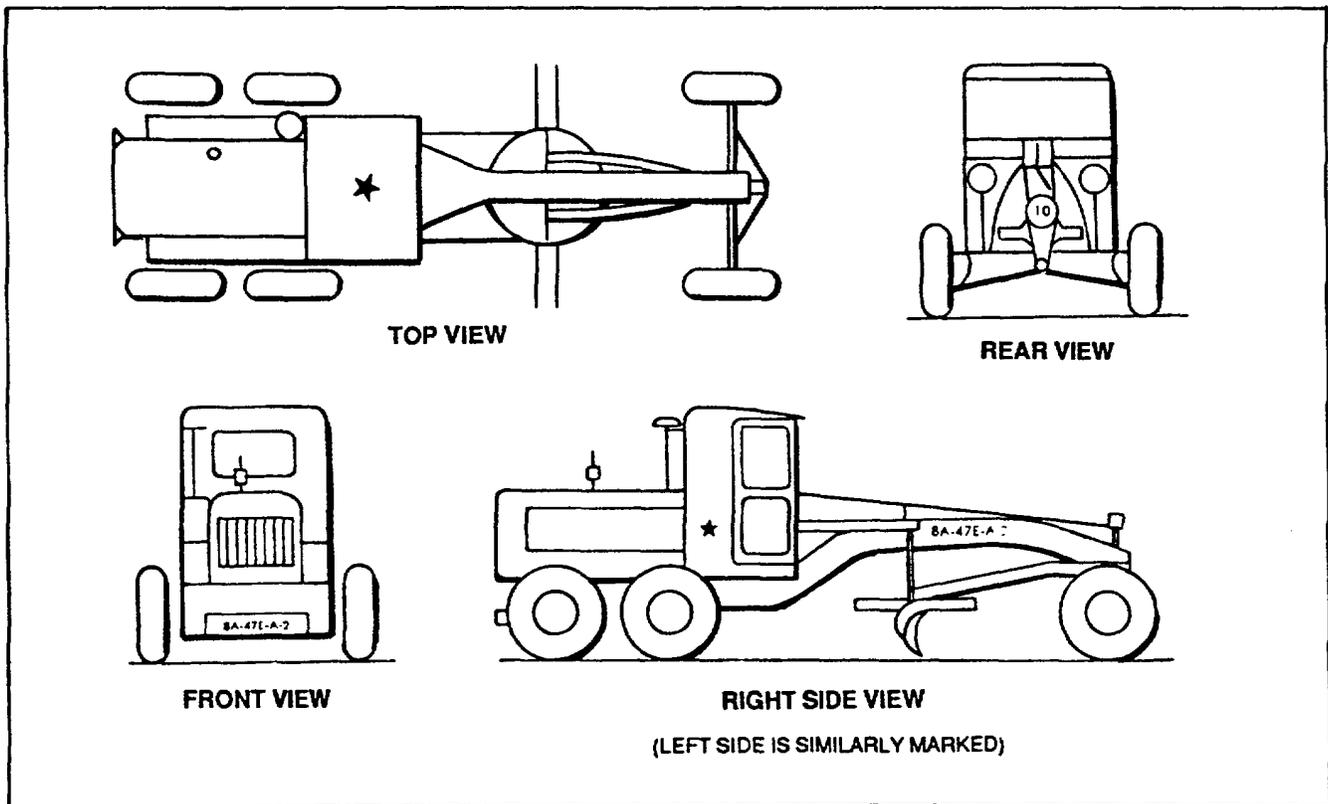


Figure 12. Marking locations -- construction and highway construction equipment. (1 of 6)

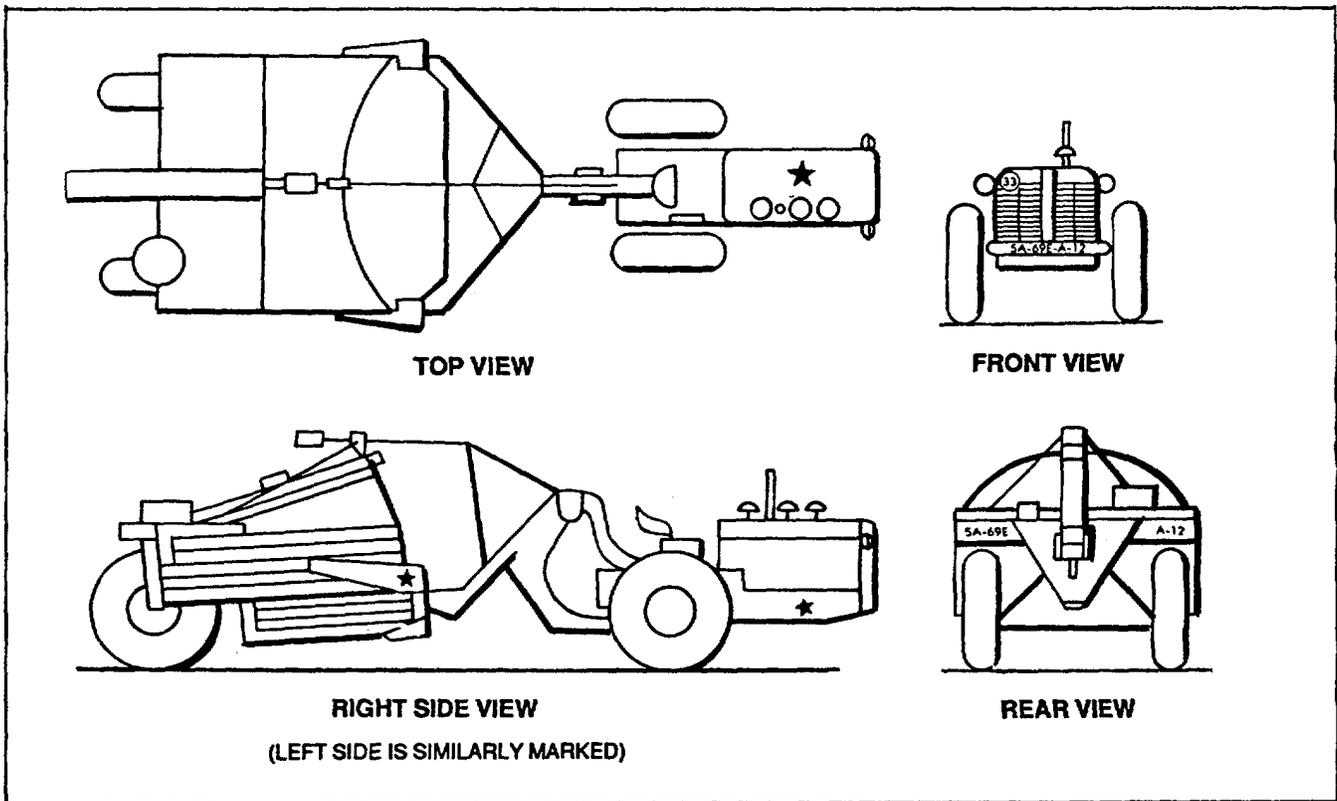


Figure 12. Marking locations -- construction and highway construction equipment. (2 of 6)

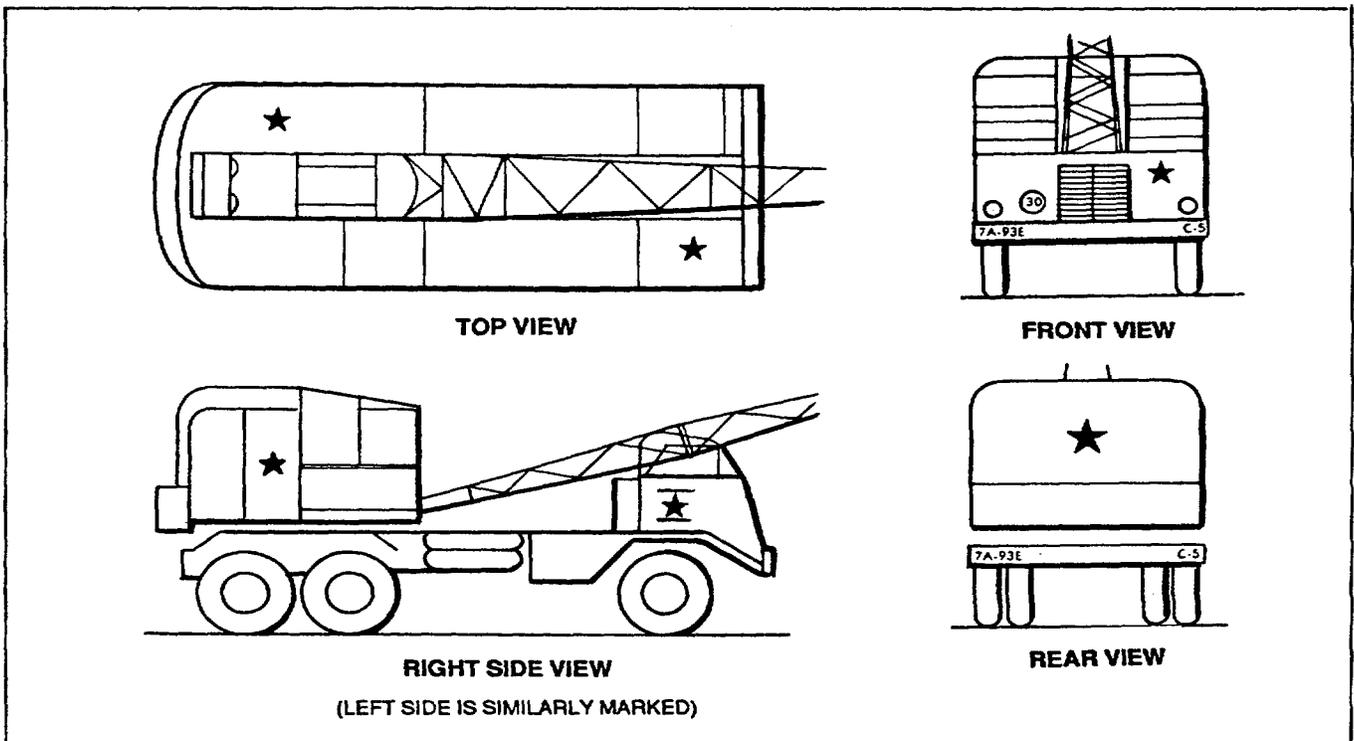


Figure 12. Marking locations -- construction and highway construction equipment. (3 of 6)

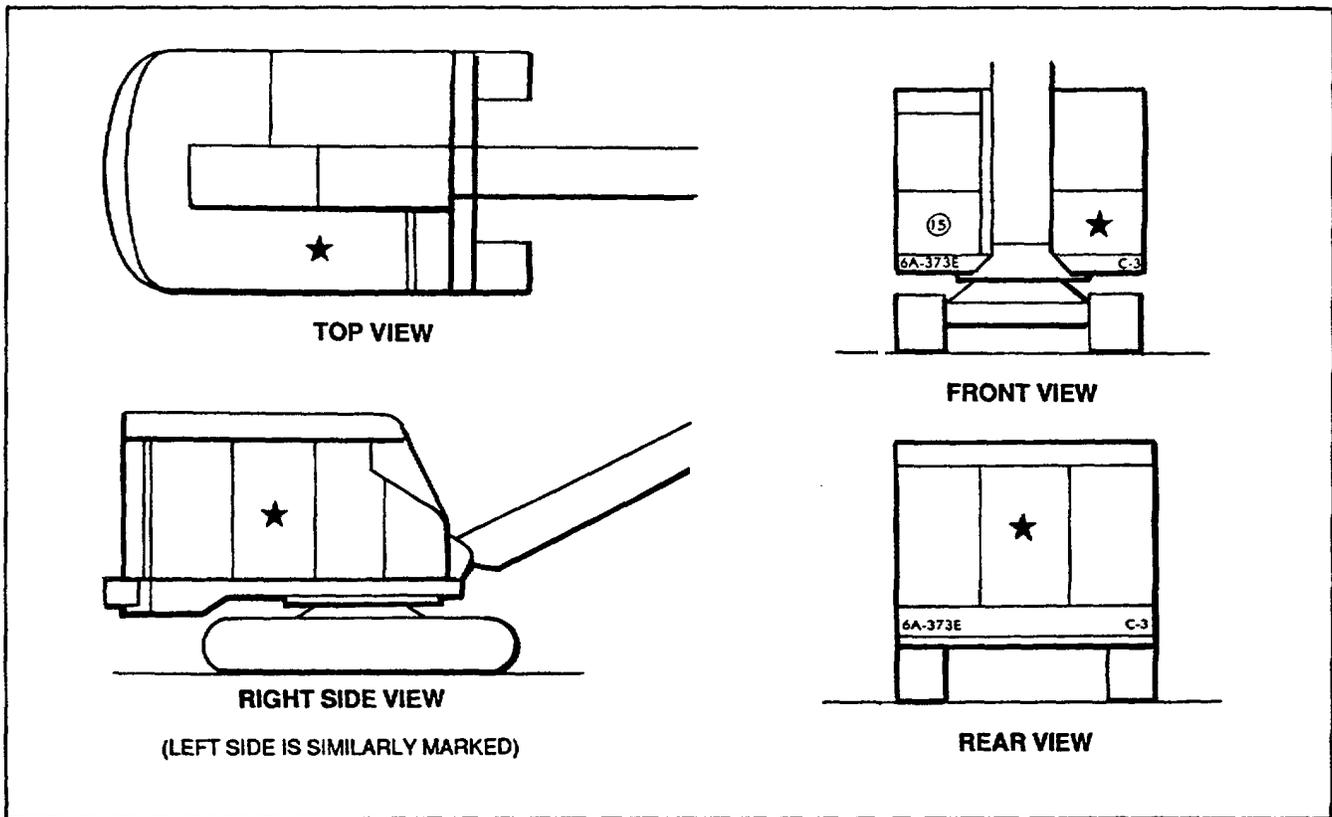


Figure 12. Marking locations -- construction and highway construction equipment. (4 of 6)

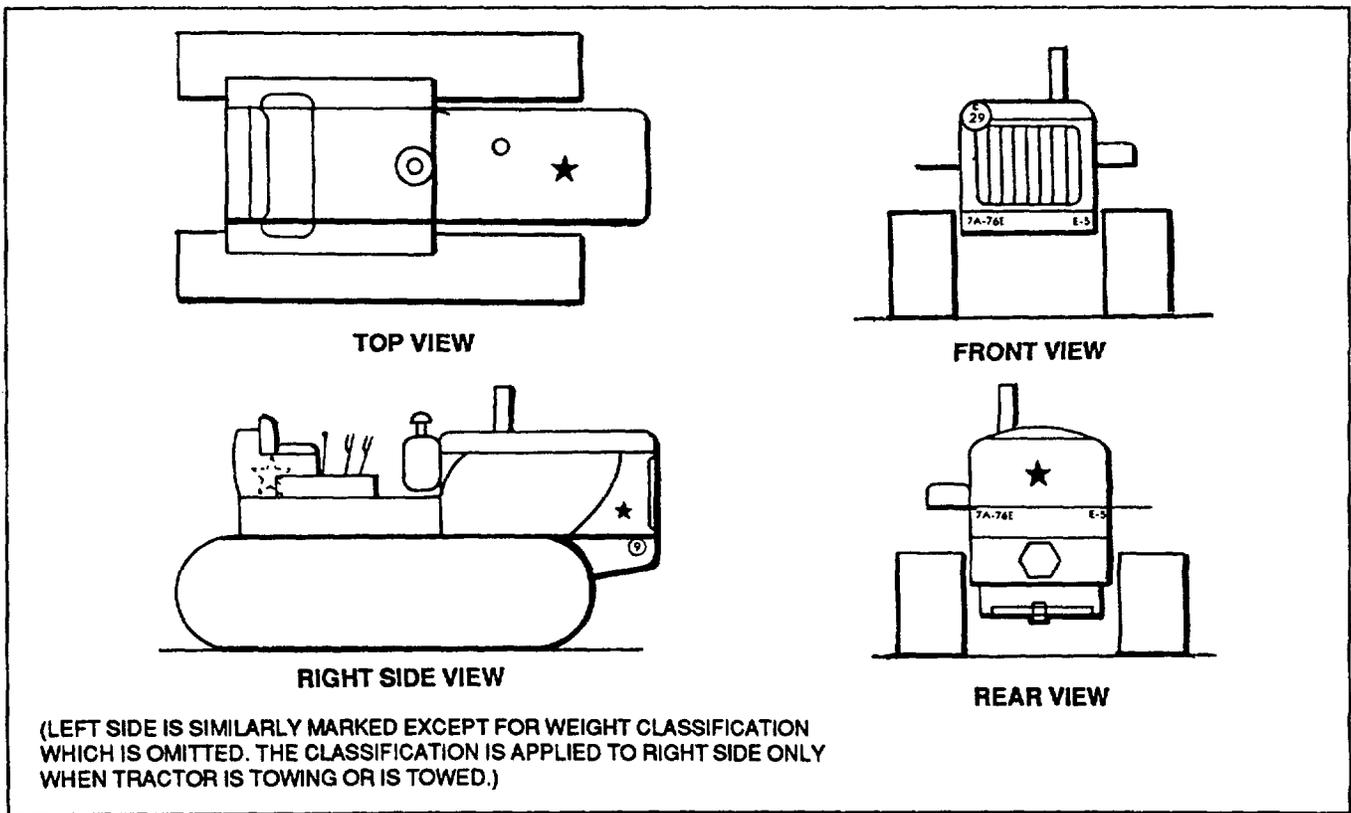


Figure 12. Marking locations -- construction and highway construction equipment. (5 of 6)

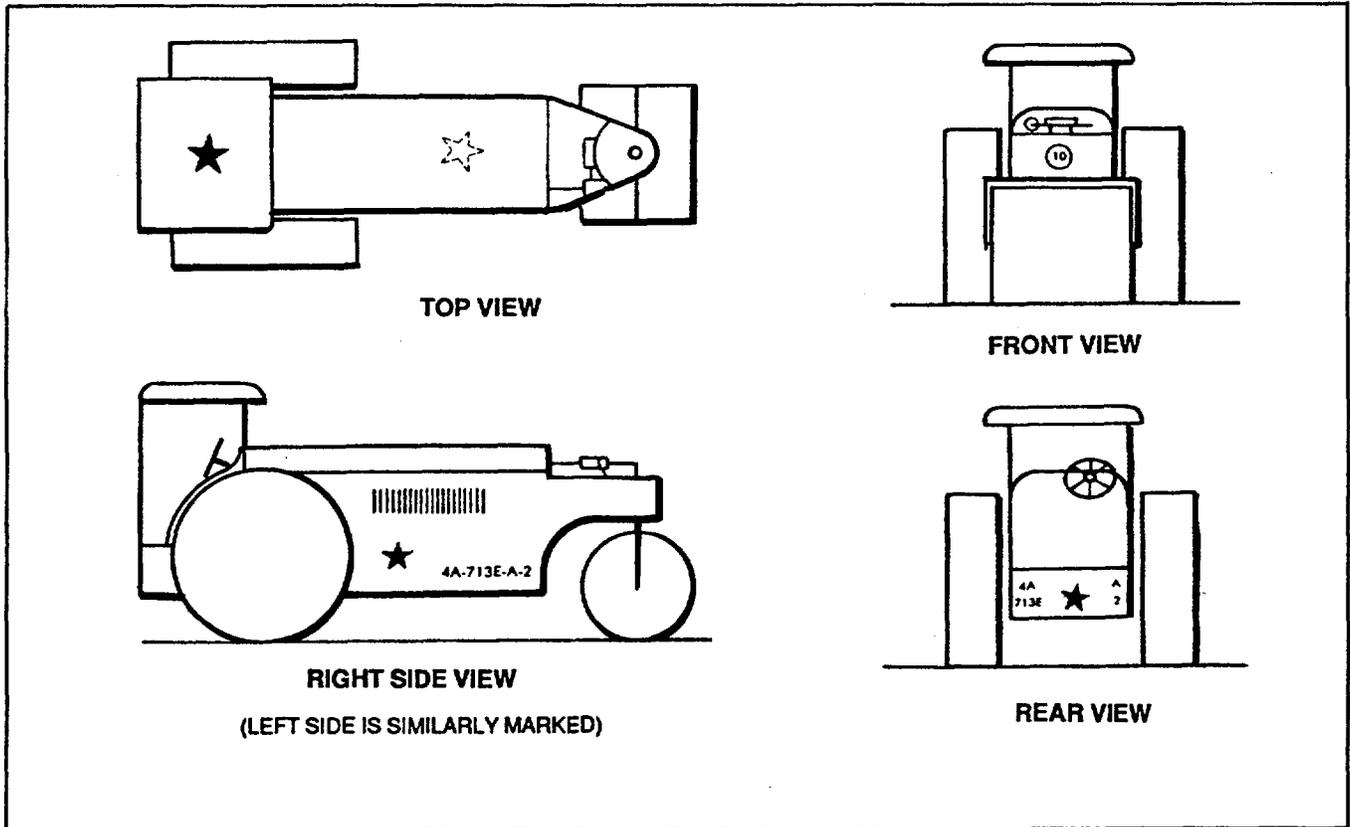


Figure 12. Marking locations -- construction and highway construction equipment. (6 of 6)

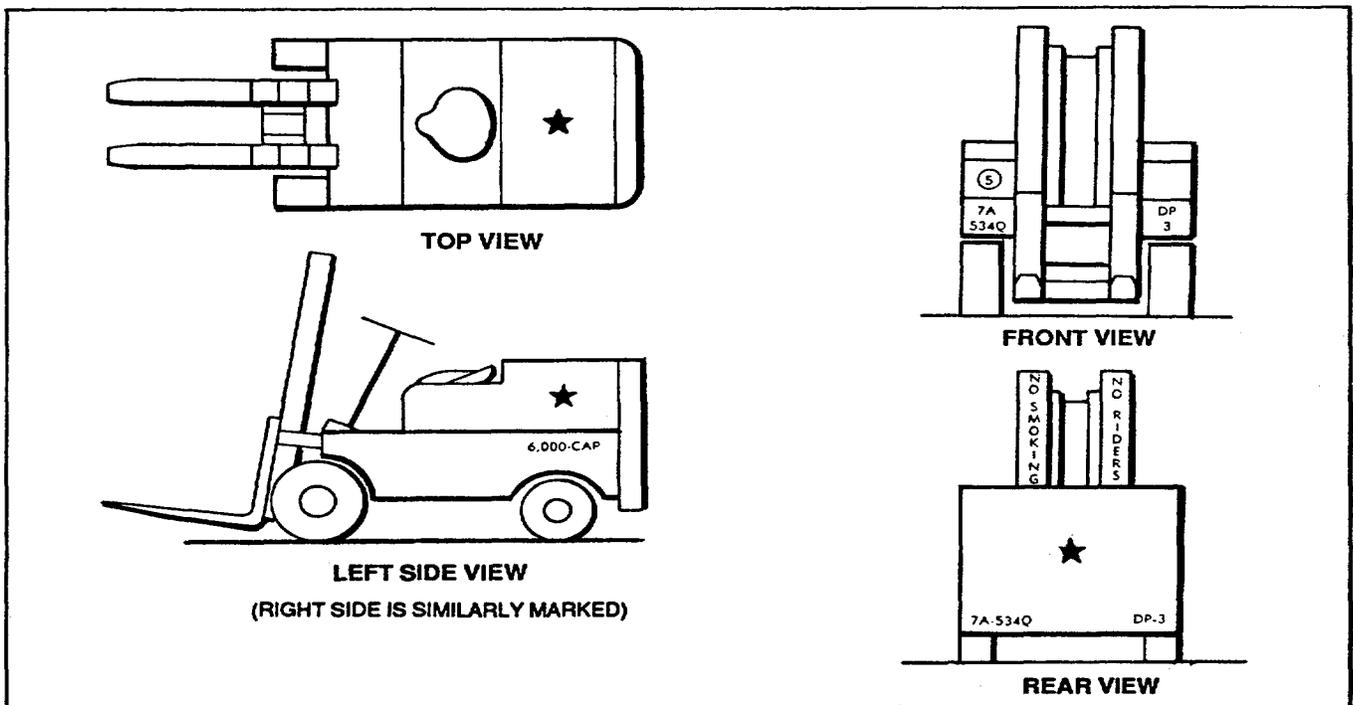


Figure 13. Marking locations -- materials handling equipment. (1 of 4)

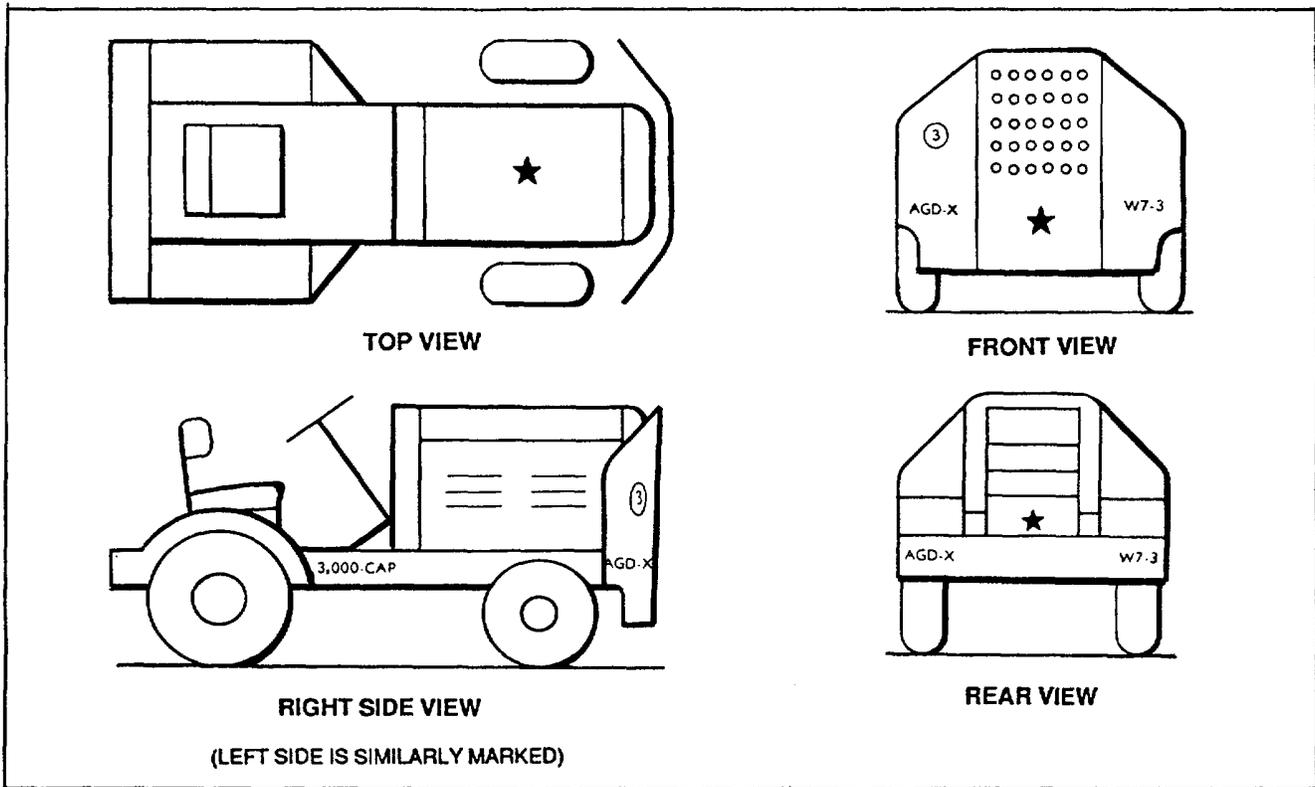


Figure 13. Marking locations -- materials handling equipment. (2 of 4)

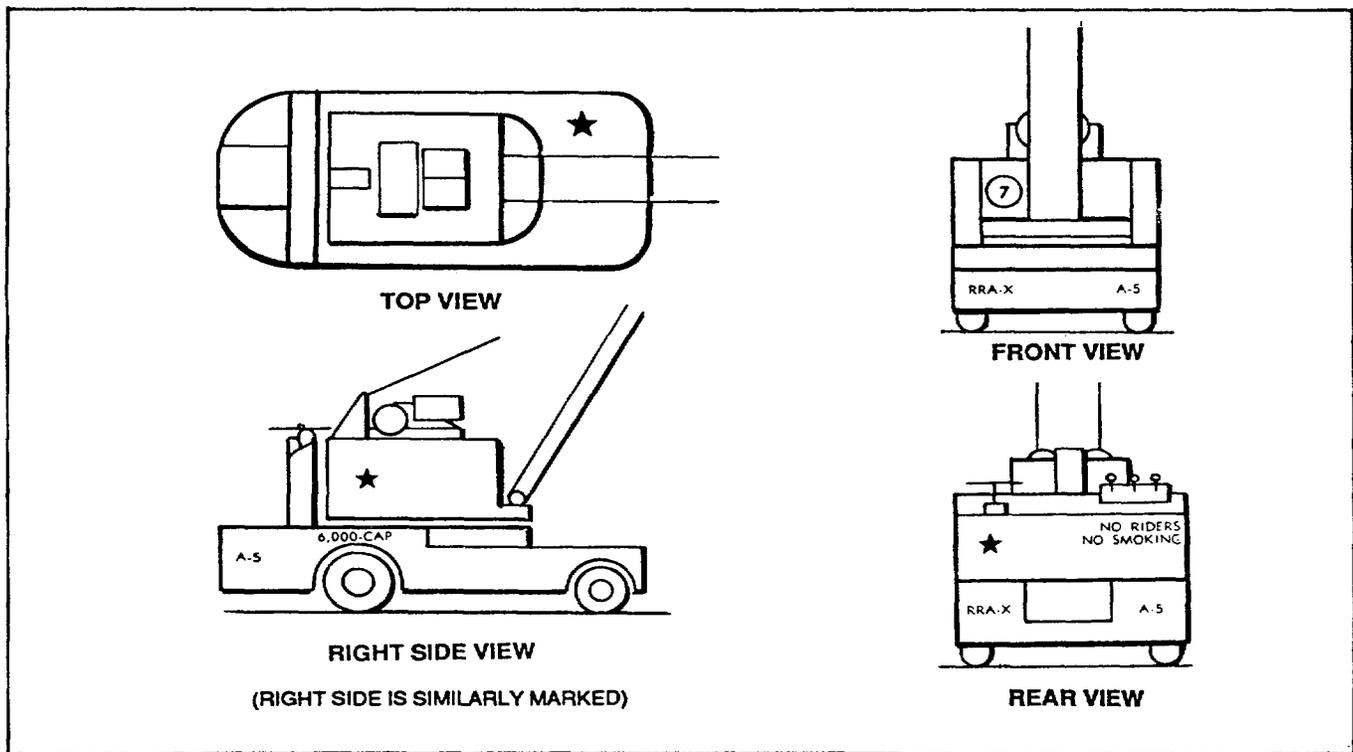


Figure 13. Marking locations -- materials handling equipment. (3 of 4)

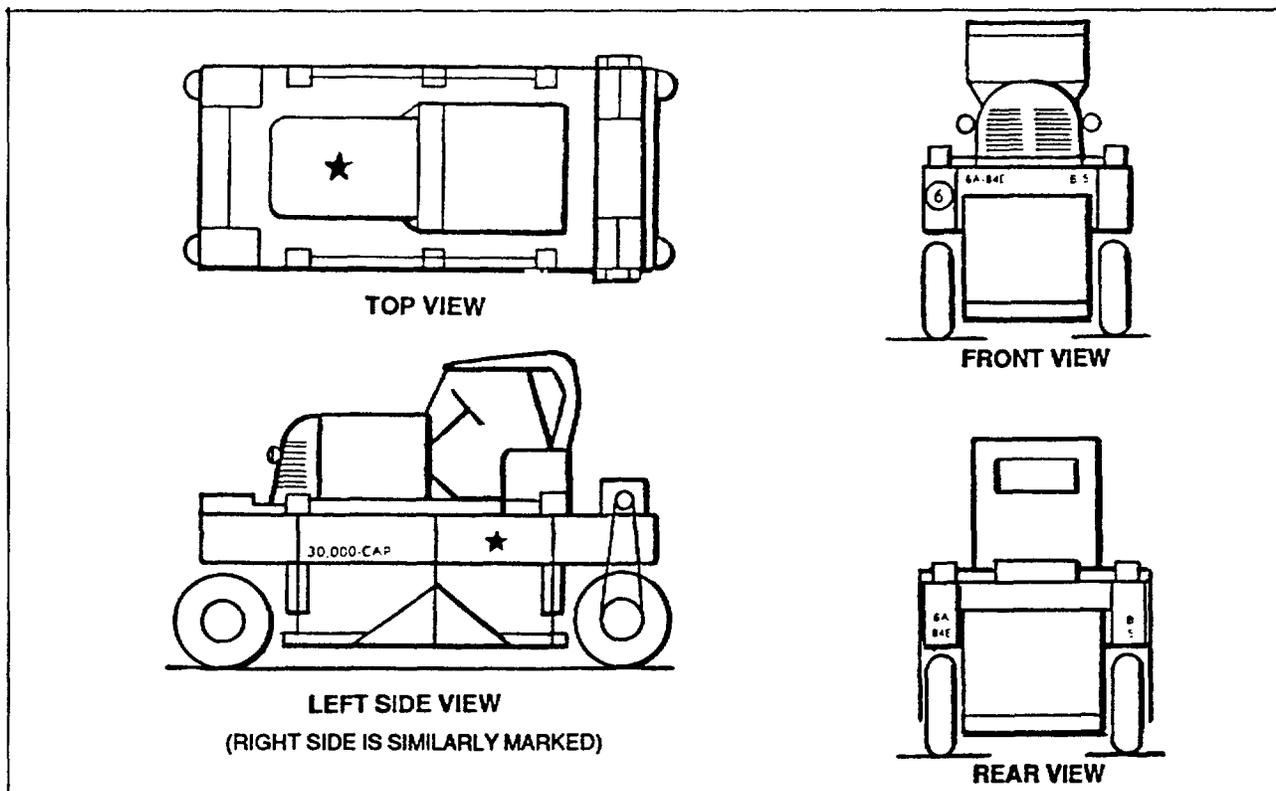


Figure 13. Marking locations -- materials handling equipment. (4 of 4)

d. The markings will be in uniform letters and numerals of the largest size practical, but not to exceed four inches in height. Symbols used will be approximately the same size and stroke widths as the letter and numeral characters.

e. The unit identification markings will be applied with a temporary paint or with removable adhesive-backed decals. The markings will be applied in colors as prescribed in paragraph 5e and in Appendix C.

f. Unit identification markings, when painted, will be applied by stencils whenever possible. When stencils or removable adhesive-backed decals are not readily available, the markings may be applied freehand with a brush at the discretion of the unit commander.

g. Unit identification markings are divided into four elements arranged from left to right:

- (1) Major Command, Organization or Activity.
- (2) Intermediate Organization or Activity.
- (3) Unit or Activity
- (4) Vehicle or Equipment number.

h. Beginning on the left side, the first marking denotes Major Command, Organization or Activity as follows: (1) Army-Arabic numeral followed by A.

- (2) Corps-Roman numeral only
- (3) Command

(4) Army Air Defense Command AADCOM
 (5) Army Reserve Command-Arabic numeral as assigned, followed by C-R

- (6) Training and Doctrine Command TRADOC
- (7) Electronics Command ECOM
- (8) Missile Command MICOM
- (9) Tank-Automotive Command TACOM
- (10) Test & Evaluation Command TECOM
- (11) Armament Command AMMCOM
- (12) Military District of Washington MDW
- (13) Major Oversea Command. See AR 310-50.
- (14) Group-Arabic numeral followed by GP
- (15) Other Major Commands, Organizations, or Activities. Appropriate and non-conflicting letters and, where applicable, numerals to properly identify the Command, Organization or Activity. See AR 310-50.

i. The second unit marking on the left side denotes Intermediate Commands, Organizations or Activities as follows:

- (1) Corps-Roman numeral only
- (2) Division-Arabic numeral followed by appropriate service designation shown in I below.
- (3) Brigade-Arabic numeral followed by BDE
- (4) Group-Arabic numeral followed by GP
- (5) Command

- (6) Division Support Command DSC
- (7) Army Posts, Camps and Stations. See AR 310-50.
- (8) Army Depots and Arsenals. See AR 310-50.

(9) Reception Center RC
 (10) Replacement Training Center RTC, preceded by appropriate service designation shown in 1 below.

(11) Battalion or Squadron organic to a larger force. Arabic numeral designating the battalion/squadron, followed by a slash (1), followed by the Arabic numeral designating the larger force, followed by the appropriate service designation shown in 1 below.

(12) Other Intermediate Command, Organization or Activity. Appropriate and nonconflicting letters, and where applicable, numerals to properly identify the Command, Organization or Activity. See AR 310-50.

j. The third markings, which will appear on the right side in the unit markings, denotes company, battery, or other small unit. Typical examples are shown below:

- (1) Automatic Weapons AW
- (2) Calibration CAL
- (3) Collection & Classification C&C
- (4) Direct Support DS
- (5) Explosive Ordnance Disposal EOD
- (6) Floating Bridge FLB
- (7) General Supply GSP
- (8) Heavy Equip Maintenance HEM
- (9) Inventory Control Co. (center) ICC
- (10) Light Truck LTRK
- (11) Missile MSL
- (12) Medium Boat MB
- (13) Panel Bridge PB
- (14) Petroleum PET
- (15) Reconnaissance R
- (16) Repair Parts Supply RPS
- (17) Service SV
- (18) Support SPT
- (19) Supply & Service S&S
- (20) Transportation Motor Pool TMP
- (21) Tire Repair TR
- (22) Other Units--Appropriate and non-conflicting letters, normally not to exceed three, which will easily identify the unit. AR 310-50 should be used as a guide when choosing a unit designation.

k. The last marking on the right denotes the vehicle number in the unit. In tactical type units, vehicles will be numbered in the sequence of their normal order of march. Vehicles in administrative use assigned to transportation motor pools or depot operations may be marked in any appropriate sequence.

Trailers will be marked with the same number as the vehicle which normally tows them, preceded by the letter T.

l. Branch of Service. The following symbols will be used to denote the branch of service:

- (1) Airborne ABN
- (2) Airmobile AM
- (3) Amphibious APH
- (4) Antiaircraft AA
- (5) Armored Equilateral triangle with base down
- (6) Cavalry CAV
- (7) Air Cavalry ACAV
- (8) Armored Cavalry Equilateral triangle with base down, followed by CAV
- (9) Chemical C
- (10) Civil Affairs CA
- (11) Engineer E
- (12) Field Artillery F
- (13) Infantry I, preceded by a dash 1 in long
- (14) Mechanized MCH
- (15) Medical M
- (16) Military Intelligence MI
- (17) Military Police P
- (18) Ordnance O, preceded by a dash 1 in. long
- (19) Quartermaster Q
- (20) Signal S
- (21) Transportation T

m. A list of Approved Abbreviations is found in AR 310-50.

n. Typical examples of the above markings are as follows:

- (1) 1A-X-HQ-4: First United States Army, Hq & Hq Co, 4th vehicle.
- (2) VII-M-X-9: VII Corps, Med. Det, 9th vehicle.
- (3) 25-1/27-C-3: 25th Inf. Div, 1st Bn, 27th Inf., Co C, 3d vehicle.
- (4) 4-2R8-A-6: 4th Div, 2d Recon Sq of 8th Cav, Trp A, 6th vehicle.
- (5) 3-1/32-B-7: 3d Armd Div, 1st Tk Bn of 32d Armor, Co B, 7th vehicle.
- (6) 10-2F7-C-2: 10th Inf. Div, 2d Bn of 7th FA, Btry C, 2d vehicle.
- (7) 82ABN-820F-D-5: 82d Abn Div, 820th FA, Btry D, 5th vehicle.
- (8) 2-1/50-A-8: 2d Armd Div, 1st AR Bn of 50th Inf., Co A, 8th vehicle 2-BDE.

(9) 2BDE-53APH-A-4: 2d Engr Amph Spt Brig, 53-2d Amph Spt Regt, Trans Boat Co A, 4th vehicle.

(10) 4GP-S-HQ-2: 4th Sig Gp, Hq & Hq Det, 2d vehicle.

(11) 1A-962-O-AM-5: First United States Army, 962 Ord Ammo Co, 5th vehicle.

(12) 4A-483Q-REF-1: Fourth United States Army, 483d Q Refrigerating Co, 1st vehicle.

(13) 3A-1M-SUR-10: Third United States Army, 1st Surg Hosp, 10th vehicle.

(14) 5A-531T-TRK-7: Fifth United States Army, 531st Trans Trk Co, 7th vehicle.

(15) 1AADC-52ADA-3HQ-2: 1st Rgn Army Air Def Comd, 52d Air Def Arty Rgt, Hq Btry of 3d Msl Bn, 2d vehicle.

(16) TC-FE-TMP-12: Trans Corps, Ft. Eustis, Trans Mtr Pool, 12th vehicle.

(17) 6A-FO-TMP-9: Sixth United States Army, Ft Ord, Trans Mtr Pool, 9th vehicle.

o. The unit identification markings will be applied on one line whenever possible, and will consist of each of the four basic categories described above, in the same order. Where space is limited, requiring the use of two lines, the Major Command marking will appear directly above the Intermediate Activity, and the Unit Identification will appear directly above the Vehicle Number. The first two categories will appear to the left of the last two categories. The following arrangements of markings shown in g above are permitted.

(1) (1)--(2)--(3)--(4)

(2) (1)--(3)

(2)--(4)

p. When directed on authority from the responsible commander for security purposes, the first and second categories listed in this paragraph will be completely removed from all vehicles and equipment being shipped with units outside the continental United States.

10. OPERATIONAL MARKINGS.

a. Tactical markings are used to provide a more visible means for identifying vehicles of tactical units by the personnel of those units during tactical operations. Commanders of major organizations are responsible for determination of the type of tactical markings to be used by all units within their organizations and the location of the markings on the vehicles. Changes may be made only with the approval of the major commanders.

(1) These tactical markings may consist of stripes, geometrical figures, or other simple designs, including name, for individual vehicles.

(2) The markings will be of suitable size for identification from the ground at reasonable distances, and may be applied in any appropriate color using temporary paint or removable adhesive-backed decal markings.

(3) Tactical markings should be designed to be as nearly unintelligible to enemy observation as possible. The markings will not, in any way, represent or suggest the numerical designation or distinctive insignia of any unit. No written record will be made or published describing the system of markings used.

b. Priority sign is a sign to mark those vehicles which are assigned priority of movement over all other vehicles in an area by the responsible area commander. These markings may be authorized for any significant and essential reason and are valid only within the area under the jurisdiction of the responsible commander. They must be removed when no longer required for the priority mission. They may not be displayed when the vehicle is not actually on a priority mission.

(1) The priority sign will be made of sheet metal in the shape of an equilateral triangle with one point down. Each side will be 12 inches long; the corners will be rounded to a 1/2inch radius, Figure 14.

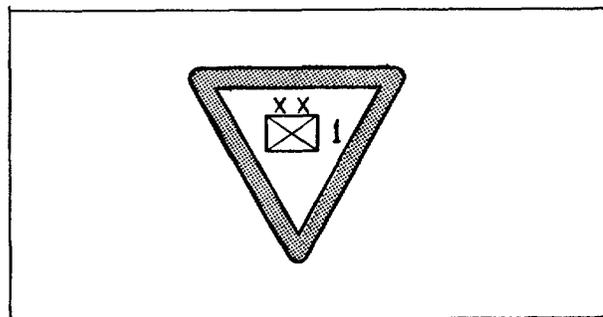


Figure 14. Priority sign.

(2) The background color will be lusterless white 37875. A one-inch border will be lusterless red 31136. The military symbol of the organization, whose commander authorized the priority, will be centered in the triangle. Color of the symbol will be lusterless red 31136.

(3) All symbols used will conform to FM 21-30.

SECTION IV. SAFETY MARKINGS

11. SAFETY MARKINGS.

a. Vehicles used for the bulk transportation of gasoline, fuel oil or other flammable liquids will be marked on both sides and on the rear of the body with the word "FLAMMABLE" in 6-inch block letters, and directly below where space permits, or on the same line with the words "NO SMOKING WITHIN 50 FEET" in 3-inch block letters and numerals, green 383, lusterless black 37030. When the vehicle is commonly used on public highways in CONUS, Title 49, Sec 177.823, Code of Federal Regulations, requires 6-inch block letters in gloss red 11105 or 11136 for word "FLAMMABLE" and 3-inch block letters, "NO SMOKING WITHIN 50 FEET" also in gloss red 11105 or 11136. Gloss white 17875 will be used as a background extending one inch all around the lettering. If available, reflective markings should be used. Markings may be permanently installed by painting or by use of adhesive-backed decals. Vehicles used infrequently on public highways must employ removable or reversible signs which are securely fastened while in use. These safety markings will be applied upon receipt by the using service.

b. Vehicles carrying explosives or other dangerous material will be marked as follows:

(1) When used for the transportation of such dangerous material over public highways, vehicles will be marked or equipped with appropriate placards in accordance with AR 55-355.

(2) When used for the transportation of such dangerous material to training areas, vehicles will be marked or equipped with placards on both sides and ends. The word "Explosives" will be marked in white letters not less than 3 inches high on a red background in accordance with AR 385-63. Reflectorized placard should be used. These are available as follows:

ADHESIVE-BACKED

- "Explosives A"-NSN 7540-01-054-5090
- "Explosives B"-NSN 7540-01-054-7237
- "Explosives C"-NSN 7540-01-054-7238

PLACARD

- "Explosives A"-NSN 7540-01-028-5124
- "Explosives B"-NSN 7540-01-029-5669

c. When authorized by the responsible commander, stripes of a contrasting color may be applied to certain vehicles, Figure 15, and equipment used in a nontactical area, that because of size, construction or function, presents a possible hazard. These stripes are applied to permit vehicles to be more readily seen by drivers of other vehicles. They are normally applied to the rear of such vehicles; they may, however, be also applied to the front or certain side surfaces if required.

(1) The stripes will be applied across the face of the bumper, or across the width of the vehicle on a flat surface above the bumper in a band not to exceed two feet in height. Other appropriate surfaces may be utilized when necessary.

(2) Width of the stripes will be 4 inches with a 4 inch space between stripes. They will be inclined at a 45' angle in opposite directions from the center line of the vehicle to form an inverted V pattern.

(3) Reflective red and white adhesive-backed stripes conforming to Federal Specification LS-300 will be utilized.

(4) Gloss black 17038 will be used for stripes on vehicles painted yellow or other light color.

d. All motorized materials handling equipment will be marked with the legends "No Smoking" and "No Riders."

(1) These legends will be placed on a surface facing the operator.

(2) The markings will be applied in 1-inch letters in lusterless white 37875 for vehicles in tactical use, and in gloss red 11105 or 11130 for nontactical vehicles.

(3) The markings may be applied horizontally to read left to right or vertically to read top to bottom.

e. Fuel and oil dispensing vehicles and equipment used for servicing aircraft will be marked with the grade of fuel or oil on each side of the tank. Marking will be lusterless white 37875 in the following sizes:

- (1) Semitrailers.....6 inches high
- (2) Trucks.....4 inches high
- (3) 2-Wheel trailers3 inches high

NOTE

For hard top vehicles, Figure 16, with Explosive Ordnance Disposal marking (EOD) roof must be painted in lusterless white so as to reduce the internal temperature. This will also reduce bleed off of the liquid nitrogen.

f. Examples of such markings follow:

- (1) Gasoline (number) grade
- (2) Oil (number) grade
- (3) Water alcohol
- (4) Explosive Ordnance Disposal (EOD)

Where available and certified, the capacity of tank compartments in gallons will be marked below and to the right of the cupola covers: "() Gals Cap" in 2-inch letters and numerals.

12. TECHNICAL MARKINGS.

a. The prescribed vehicle tire pressure will be marked on the dash of all motor vehicles and pneumatic-tired equipment. This marking will also be applied to the fenders above each wheel or, if fenders are not used, to the body or frame immediately above each wheel. On towed vehicles or equipment, this marking will be applied to the body or frame immediately above each wheel. On tandem axle vehicles, the marking will be centered between the two wheel sets.

(1) The markings will consist of the numerals representing the proper pressures, preceded by the letters TP.

(2) Letters and numerals will be 1 inch high and in the same color as the unit markings.

b. When maximum speed is specified by a manufacturer, or in an applicable technical manual, and when appropriate operation plates are not available, the maximum speed of the vehicle in its highest range and gear ratio will be marked on the dash.

(1) The marking will consist of the numerals representing maximum speed, preceded by the abbreviation "Max Speed."

(2) Letters and numerals will be 1 inch high and in the same color as the unit markings.

c. All vehicles and equipment processed with special arctic lubricants, and/or other materials for operation in cold climates, will be marked with a temporary marking as follows:

(1) The words "Arctic Lubricated" will be marked in the following order of preference:

(a) Adjacent to the name or identification plate.

(b) On other conspicuous location in order that the markings may be readily seen prior to operation or use. Specific locations may be prescribed in applicable technical publications for the vehicle or equipment.

(2) Letters of the marking will be 1 inch high and in the same color as the unit markings.

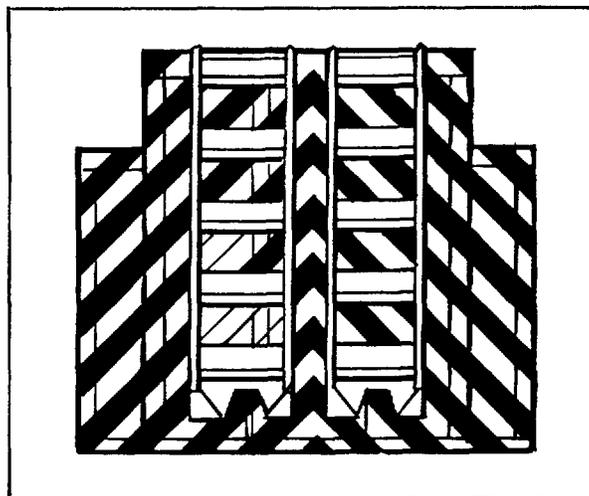


Figure 15. Safety marking calibration liftgate.

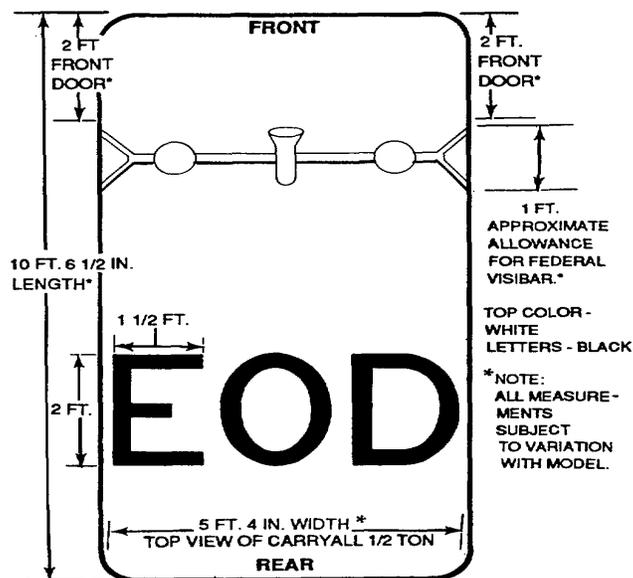


Figure 16. Hardtop vehicle with explosive ordnance disposal marking.

(3) The marking will be kept in a legible condition until the vehicle or equipment is deprocessed, and will then be thoroughly removed.

d. All tactical use wheeled vehicles which are equipped with an engine hood safety hook will be marked with the words "Warning: Secure Hood in Raised Position with Safety Hook Before Servicing Engine."

(1) The marking will be applied at the rear area on the underside of the hood panel.

(2) Letters of the marking will be 1 inch high and white.

e. Boom extension markings are required to assure operation within boom radii limits specified on the crane safe load data plates.

(1) Boom markings will be applied in a permanent method of marking. Color will be the same as the unit markings.

(2) Procedure for truck wreckers M60 and M108.

(a) Retract boom and retain in horizontal position.

(b) Measure, scribe, and mark a 3/4-inch vertical stripe along the outer edge of the shipper, extending the stripe onto the boom, Figure 17.

(c) To the right of and parallel with the stripe, mark "8 Ft" in 2-inch letters.

(d) Mark a horizontal arrow on the shipper pointing to the stripe.

(e) Extend the boom to its maximum length.

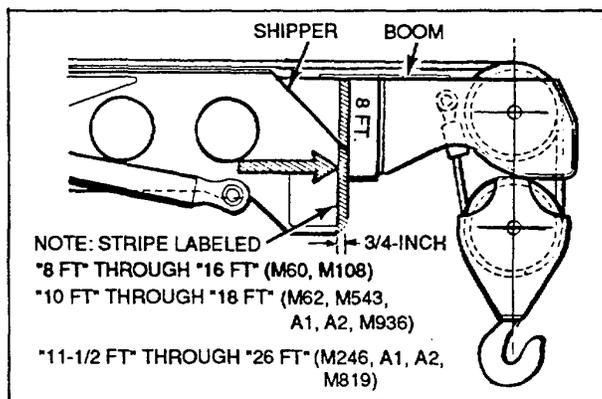


Figure 17. Boom markings (boom retracted).

marked, and labeled "12 Ft." Each succeeding stripe will be marked consecutively through "26 Ft."

f. This paragraph applies to tactical transport vehicles, and is intended to reduce the possibility of fuel spillage due to fuel tank overfilling and subsequent fire hazard, regardless of fuel type.

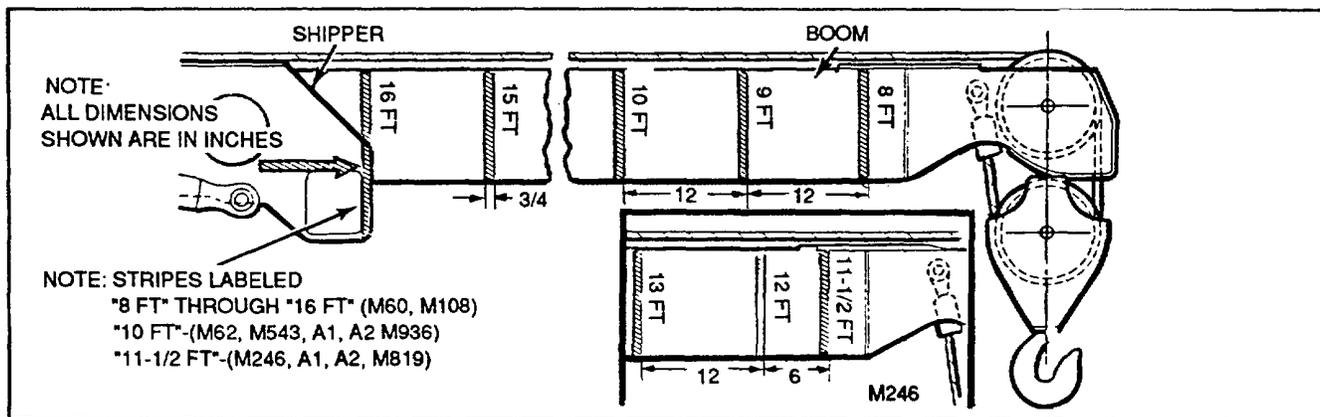


Figure 18. Boom markings (boom extended).

(f) Measure from the "8 Ft" stripe. Scribe and mark 3/4inch vertical stripes at intervals of 12 inches along the boom (Figure 18).

(g) Mark the second stripe "9 Ft," and each succeeding stripe consecutively through "16 Ft," in each case to the right of and parallel to each stripe.

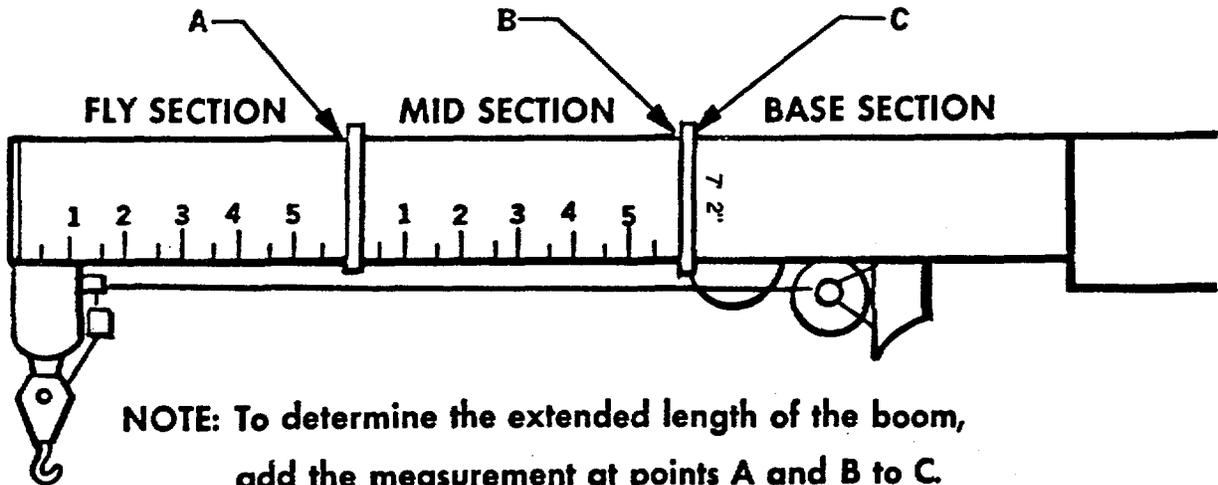
(3) The procedure for Truck wreckers M62, M936, and M543 is the same, except that the stripe will be marked "10 Ft" and each succeeding stripe will be marked consecutively "11 Ft" through "18 Ft." (4) The procedure for Truck wrecker M246, A1, A2, and M819 is the same, except that the first stripe will be marked "11 1/2 Ft." The second stripe is to be measured, scribed,

(1) If the fuel tank filler cap is a relief valve type, but does not bear a warning decal reading "Pressurized: Open Slowly," the warning note "Pressure: Open Slowly" will be marked in 1-inch lusterless black letters on the fuel tank near the filler pipe.

(2) On fuel tanks, where a mark would be readily visible, measure 2 inches down from the top of the tank and mark a 1/4 x 8-inch line, with the following note in 1-inch lusterless black letters: "Caution: Do Not Fill Above Line to Allow For Expansion," Figure 20.

(3) On vehicles where a mark on the fuel tank would not be readily visible, mark the following note in 1-inch lusterless black letters as near as possible to the filler pipes: "Caution: Do not Overfill--Allow for Expansion."

Marking Instructions for M984E1 Crane Boom



NOTE: To determine the extended length of the boom, add the measurement at points A and B to C.

FORMULA: $A+B+C=$ EXTENDED LENGTH.

NOTE: The mid section and fly section are marked the same.

1. Place the crane in operation condition (TM 9-2320-279-10-2).
2. Raise boom to horizontal position with extensions fully extended.
3. Measure and mark a 3/4-inch vertical strip along the outer edge of the three boom sections.
4. On the base section boom to the right of and parallel to the 3/4-inch strip mark 7' 2" in two-inch letters.
5. Measure from the outer edge of the boom section mark at 6-inch intervals a vertical strip 1/2 inch wide. Mark the first strip 2 inches high from bottom of section and the second strip 4 inches high rotating the 2-inch and the 4-inch strips the complete length of the section.
6. Above each 4-inch strip, in two inch letters mark the appropriate feet measurement (1, 2, 3, etc).

Figure 19. Boom Marking Instructions for M984E1.

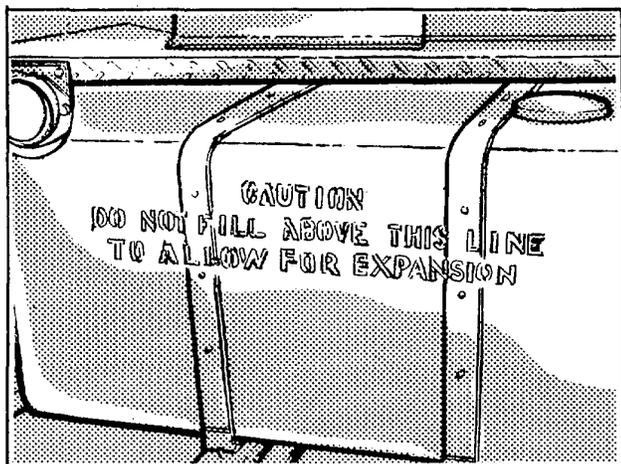


Figure 20. Fuel tank markings.

g. All calibration vehicles will be marked with a calibration insignia plate as provided in kit ORD 7911573. These plates will be applied on each side of the M820, M934 and M935 Expansive Vans, between the second and sixth rails, Figure 21. On other types of calibration vehicles (such as vans and panel trucks), the plates will be applied to the most appropriate surface, depending on surface size and window location.

h. All motorized materials handling equipment will have the capacity marked on each side. The marking will consist of the numerals showing the applicable pounds followed by the letters CAP. The actual weight of the equipment will also be marked on each side, in numerals, to show the applicable pounds, followed by the letters MTWT. Letters and numerals will be one inch high in the same color as the registration marking.

i. Other necessary technical instructions may be marked on appropriate surfaces as required or authorized by the responsible command.

(1) Such markings will be applied in letters and numerals normally one inch in height, but not less than 1/2 inch.

(2) Color of the markings will be lusterless green 383 or black, whichever affords the greater contrast with the surface color. If practicable, the color chosen will be the same as the registration marking.

(3) Temporary instructions will be applied with removable vinyl markings or gasoline soluble paint.

13. WEIGHT CLASSIFICATION.

a. All single vehicles with a gross weight of over 3 tons, and all trailers with a rated payload exceeding 1-1/2 tons, are classified for the purpose of bridge crossing per FM 5-36.

Each single vehicle and vehicle combination has a classification number for empty, cross-country loading. The classification numbers are used to determine whether a bridge, correspondingly classified, can be safely crossed.

b. All applicable self-propelled vehicles subject to camouflaging, not towing other vehicles, will carry a circular sign of 9-inch diameter with the vehicle classification number in black on a green background. This will normally be located on the front of the vehicle toward the right side and below the driver's line of vision.

c. All applicable self-propelled vehicles subject to camouflaging, towing other vehicles, will carry a sign similar in size, design, and location except that the classification number of the vehicle combination will be shown with the letter C in black above the number. A 6-inch green circle with tone basic vehicle classification number in black will be marked on the right side of the vehicle in a conspicuous location. The towed vehicle will be similarly marked with its basic classification number.

d. When the classification number of the vehicle is not subject to change, the marking may be applied directly on a suitable surface. Use adhesive-backed markings or paint with stencils. Side markings may be applied by painting or by using adhesive-backed decals. On vehicles not subject to camouflaging, painted in gloss colors, the markings will be gloss yellow 13538; gloss black 17038; and gloss red 11136. On vehicles not subject to camouflaging, painted in semigloss or lusterless colors, the markings will be lusterless yellow 33538; gloss black 17038; and gloss red 11136. When the marking is applied directly to vehicles painted in the same or similar color, the circumference of the circle will be outlined with a black circle 3/4 inch wide.

e. In usages where the classification number may change, a sign kit will be utilized which consists of a 9-inch metal disk, a retaining plate, and two sets of five different numeral plates. By installing the retaining plate, the numeral plates will be locked in place. The sign has black numerals on a green background and a black C on the top of the retaining plate, Figure 22.

f. The following weight classification sign kit is being supplied initially with mounting brackets and hardware.

NAME	PART NO.	NSN	QTY
KIT: vehicle class sign, w/brackets and hardware Consisting of:	6-1-2248	9905-00-565-6267	1
6 ea. BOLT, MACHINE: hex-hd, S, cd or zn-pltd 5/16-24 UNF-2A x 3/4 in.	MS90726-32	5306-00-225-9087	
2 ea. BOLT, MACHINE: hex-hd, low-carb-S cd- or zn-pltd, 5/16-24UNF-2A x 1-3/4 in.	MS90726-39	5306-00-225-9094	
1 ea. BRACKET: unit, lg*			
1 ea. BRACKET: unit, short*			
1 ea. DISK: vehicle class sign, 9-in.			
6 ea. NUT, PLAIN, HEXAGON: S, cd- or zn-chromatic-fin, 5/16-24UNF-2B-1/2 w, 17/24 thick	MS51968-5	5310-00-880-7746	
2 ea. PLATE: numeral, 0 one side, 1 other side			
2 ea. PLATE: numeral 2 One side, 3 other side			
2 ea. PLATE: numeral, 4 One side, 5 other side			
2 ea. PLATE: numeral, 6 one side, 7 other side			
2 ea. PLATE: numeral, 8 one side, 9 other side			
1 ea. PLATE: retaining, C on one side			
6 ea. WASHER, LOCK: int-teeth, S, cd- or zn-pltd, 5/16 in. screw size	MS35333-41	5310-00-167-0721	
Hardware items not required for the specific installation procedure will be returned to local stock. *Brackets not required for the specific installation procedure will be scrapped.			

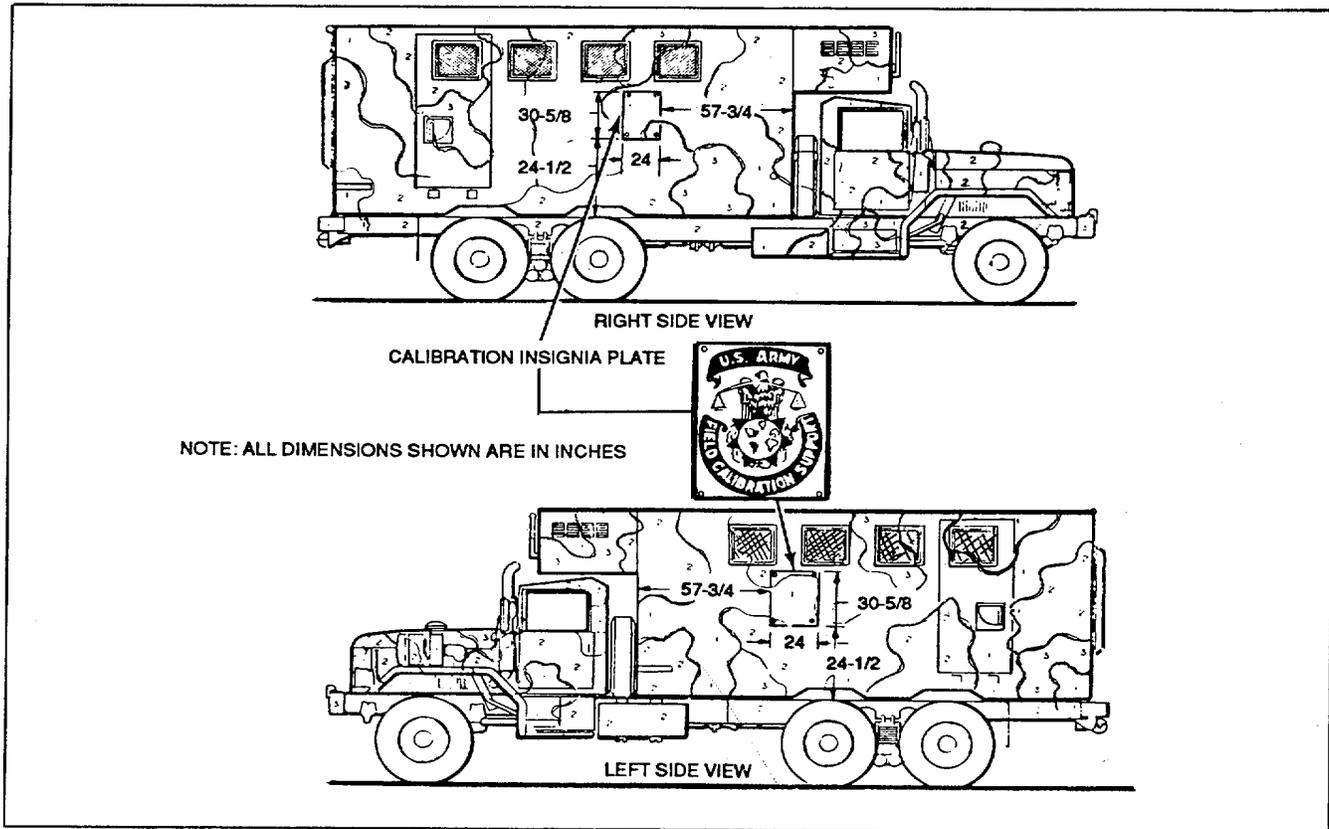


Figure 21. M929, M920, M921, and M934 Expandable Van (Calibration).

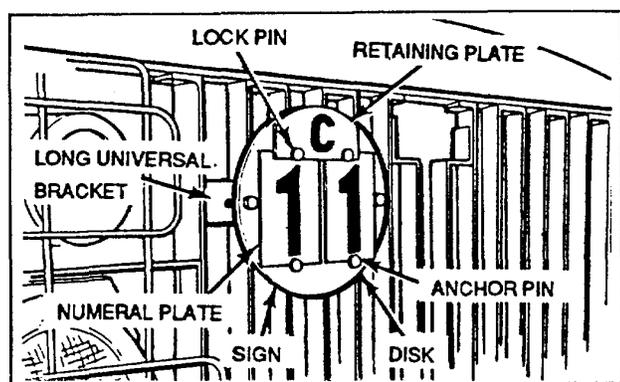


Figure 22. Vehicle weight classification sign installed.

g. In addition, a replacement kit itemized below, is authorized for the replacement of lost or damaged numeral plates and retaining plates:

Name	National Stock No.
KIT: Retaining and Numeral Plate Replacement, for Vehicle Class Signs	9905-00-565-6268

Consisting of:

- 1 each PLATE: numeral, 0 one side, 1 other side
- 1 each PLATE: numeral, 2 one side, 3 other side
- 1 each PLATE: numeral, 4 one side, 5 other side
- 1 each PLATE: numeral, 6 one side, 7 other side
- 1 each PLATE: numeral, 8 one side, 9 other side
- 1 each PLATE: retaining, C on one side

h. A vehicle weight classification sign kit, as described herein, will be installed on the front of each vehicle except:

- (1) All trailers.
- (2) Vehicles having a gross weight of 3 tons or less.
- (3) Vehicles having standard classification numbers higher than 99.
- (4) Vehicles having rated payloads of 3/4 to 1-1/2 tons. This exception does not apply to vehicles authorized for towing loads.
- (5) Vehicles with fixed loads (such as tanks, self-propelled guns, etc.).

i. Front classification signs for vehicles included in h(3), (4), and (5) above, will be painted directly on the vehicle. Side classification signs, where applicable, will also be painted directly on the vehicle.

j. These vehicle weight classification sign kits can be installed on vehicles in different ways. For example, in the case of Cargo Truck, the sign can be installed on the brush guard, on the splash shield, or in an upright position on the fender. The choice of method is left to the using organization.

(1) Location.

(a) The classification sign will be installed on the vehicle in one of the following locations:

1. Right front fender.
2. Right side of brush guard.
3. Right front section of hull.
4. Right side of center front bumper splash shield.

(b) The sign will be placed below the driver's line of vision and will be positioned so that it will not block headlamps, marker lights, blackout lights, air intakes, etc.

(2) Installation.

(a) On brush guard.

1. Paint the long universal bracket (channel) with rust-inhibiting enamel.

2. After the enamel has dried, position the bracket so that the two holes in the bracket align with two bolt holes (9 o'clock positions) in the sign. Assure that the flat bearing surface of the bracket faces toward the sign. Install one bolt (1-3/4 inches long) P/N 123798, NSN 5306-00-012-3798, one washer P/N 138538, NSN 5310-00-272-4119, and one nut P/N 120368, NSN 5310-00-012: 0368. Turn nut two or three turns.

3. With the bracket in a vertical position, insert it between two bars of the brush guard at the desired location. With one hand, reach behind the brush guard and adjust the bracket to a horizontal position. With the other hand, install another bolt (1-3/4 inches long), washer, and nut. Tighten both bolts, but apply only enough torque to secure the sign to brush guard. Excessive torque will cause the sign disk to bend. Figure 22 shows the sign installed on brush guard.

CAUTION

If it is found that the vehicle classification sign seriously obstructs airflow to the radiator, as indicated by engine overheating, remove sign from brush guard and install sign elsewhere.

(b) On the sloping fender, install the sign as indicated in 1 and 2 below only when the slope of the fender is less than 30° from vertical. When the slope of the fender is more than 30° from vertical, install the sign in a vertical position, as outlined in (c) below, to insure readability of the sign.

1. Position the sign in the desired location on the fender and, using the sign as a template, drill two 1 1/32-inch holes in fender to align with bolt holes in the sign at the 9 o'clock and 3 o'clock positions.

2. Install the sign to the fender with two bolts (3/4 inch long), P/N 120741, NSN 5306-00-012-0741, two washers, P/N 138538, NSN 5310-00-272-4118, and two nuts, P/N 120368, NSN 5310-00-012-0368. Tighten bolts securely, Figure 23.

(c) In a vertical position on fender or on splash shield, alter the long universal bracket (channel), Figure 24.

1. Paint both the altered bracket and the short universal bracket (angle) with rust-inhibiting enamel.

2. After the enamel has dried, position the long leg of the short bracket on the back of the sign and align two holes in bracket with the two lower bolt holes in the sign.

NOTE

When installing the sign on a horizontal surface, position the short leg of the bracket so that it faces rearward, Figure 25. When installing the sign on a sloping surface, position the short leg of bracket so that it faces forward, Figure 26.

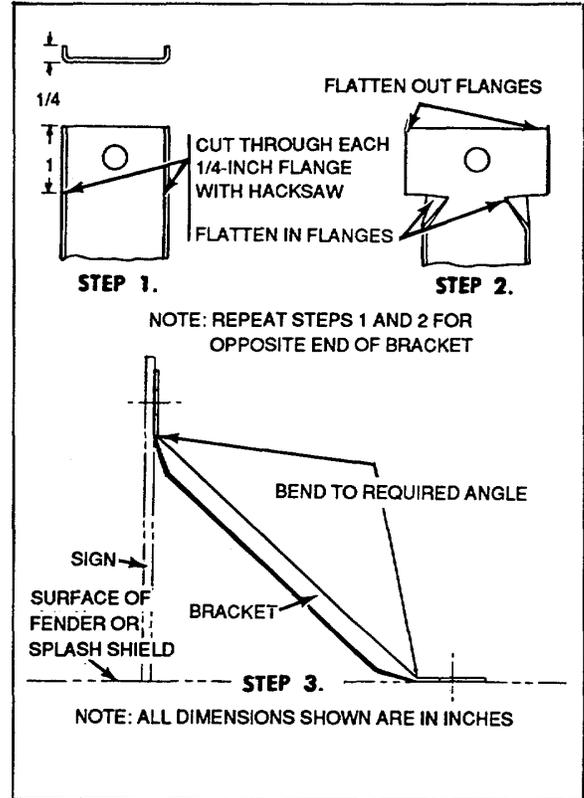


Figure 24. Alteration of bracket.

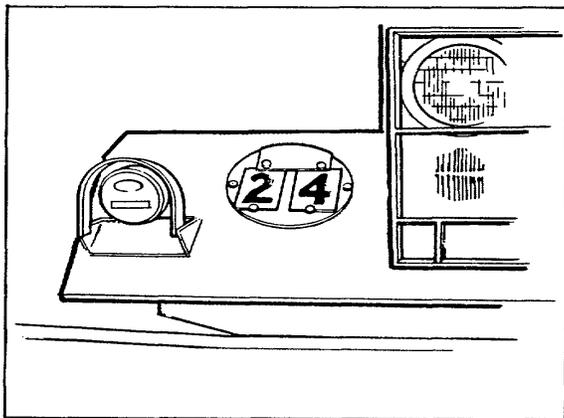


Figure 23. Sign installed on sloping fender (slope angle less than 30° from vertical).

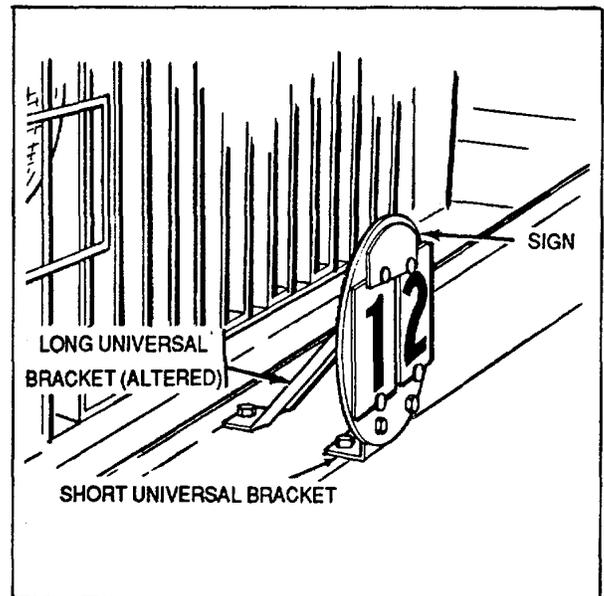


Figure 25. Sign installed on splash shield.

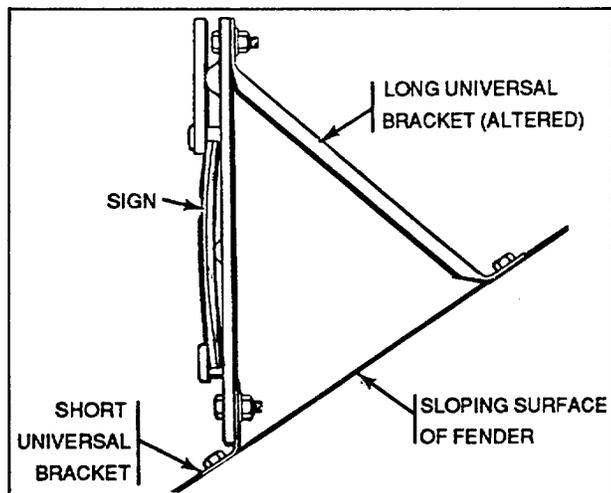


Figure 26. Sign installed on sloping fender (slope angle exceeds 30° from vertical).

3. Install bracket to sign with two bolts (3/4 inch long), P/N 120741, NSN 5306-00-012-0741 two washers P/N 138538, NSN 5310-00-272-4119, and two nuts P/N 120368, NSN 5310-00-012-0368.

4. Position the sign in the desired location on the fender or splash shield. Bend short leg of bracket, as required, to conform to the contour or slope of fender.

5. Using the short leg of the bracket as a template, drill two 11/32-inch holes in fender or splash shield.

6. Attach the sign to the fender or splash shield with two bolts (3/4 inch long), two washers and two nuts.

7. Secure the altered long universal bracket to the sign with one bolt (3/4 inch long), one washer, and one nut. (Insert bolt in hole located between two stacks of numeral plates on sign).

8. Drill an 11/32-inch hole in fender or splash shield to correspond with the hole in the altered bracket and secure the bracket with a bolt (3/4 inch long), washer, and nut. Figure 25 shows sign installed on splash shield and Figure 26 shows sign installed on sloping fender.

k. Instructions for unlocking and locking the retaining plate are as follows:

(1) When unlocking retaining plate, use the thumb of one hand and press down firmly on one stack of numeral plates, Figure 27. With the other hand, press gently on the retaining plate and pivot the plate away from the lock pin. To remove retaining plate completely, press down firmly on the remaining stack of numeral plates and free retaining plate from the other lock pin.

(2) To lock retaining plate, make sure that five numeral plates are tacked on each anchor pin with the two top plates showing the desired classification number. If the vehicle is to be used in combination, position the retaining plate so that the C on one side of the plate will be visible. If the vehicle is to be used singly, position the retaining plate so that the C will not be visible. Press down firmly on the top of one stack of numeral plates and slide the retaining plate onto the lock pin until the plate snaps in place. Repeat the procedure for the remaining stack of plates and lock the retaining plate to the remaining lock pin. Refer to FM 5-36 for vehicle weight classification data.

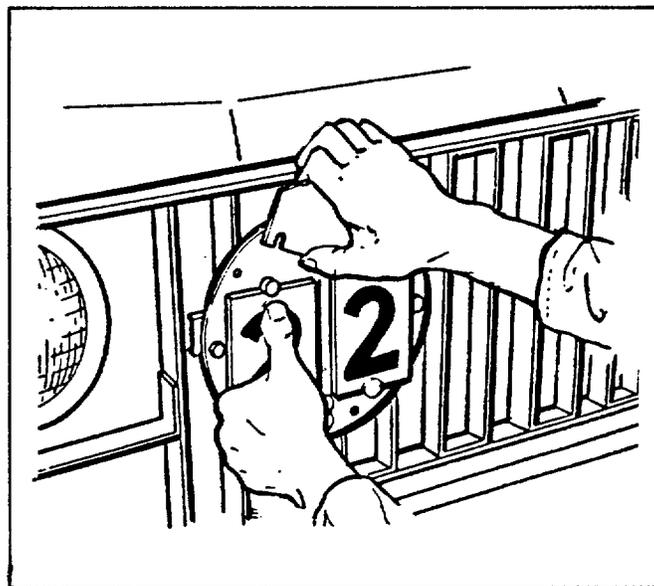


Figure 27. Unlocking the retaining plate.

14. OPERATION AND DESIGNATION PLATES.

a. These plates, as provided on vehicles and equipment, will be kept clear and free from paint at all times.

b. Operation plates contain data or instructions on vehicle operation and will be installed within the normal view of the operator when in an operating position. The plates will include:

(1) Road speed plates. To prescribe the maximum permissible speed for operation in each gear ratio and range.

(2) Shift diagram plates. To show the location of each position of the transmission, transfer, and/or power takeoff.

c. Operation plates containing precautionary instructions to avoid personnel injury or equipment damage will have a red background. This applies to new plates of photosensitive anodized aluminum, conforming to type H, MIL-SPEC 15024.

Existing plates will be replaced only when no longer serviceable.

d. Designation plates contain data pertinent to the vehicle or equipment, but are not required for actual operation. They will be located in convenient position without creating confusion with operation plates. The plates will include:

(1) Name or identification plates. To show nomenclature, manufacturer, model, serial number, stock number, contract number, US registration number, and date of delivery to the Government.

(2) Data plates. To show empty weight, maximum payload and/or gross weight, weight on each axle and/or maximum towed load for highway and cross-country, center of gravity empty and loaded, shipping cubage, overall and reducible dimensions, and other pertinent linear and angular dimensions.

(3) Servicing data plates. To show fuel capacity and minimum octane, cooling system capacity, draining instructions, tire pressures for terrain conditions, lubricant data for different temperature ranges, and other servicing data for the vehicle, components, or equipment installed.

(4) Responsible agency plates. To show the Commodity Command or Agency responsible for the procurement and/or maintenance of the vehicle or its chassis, body, and/or equipment.

(5) Publication plates. To show the manuals (operator's maintenance, and supply) and lubrication order applicable to the vehicles.

e. Designation plates may be combined plates when space conditions warrant.

15. AMBULANCE MARKINGS--TACTICAL USE VEHICLE.

a. Truck, Ambulance, 1-1/4-Ton, 4x4 M1010, Figure 28, will have on the left and right side outer panel of the ambulance body, a red cross on a white field decal, P/N 23-0196, Cage 25022, NSN 7690-01-165-0541. Also on each of these panels will be a decal, P/N 230193, Cage 25022, NSN 7690-01-165-0542.

(1) The Ambulance Body roof panel will have a red cross on a white field decal, 36 x 36 inch, P/N 230198, Cage 25022, NSN 7690-01-165-0544.

(2) The Ambulance Body left and right rear doors, will have a red cross on a white field decal, P/N 230200, Cage 25022, NSN 7690-01-165-6901.

b. The Truck Ambulance M996 and M997, Figure 29, (HMMWV) has attached reversible markings, See TM 9-2320-280 series manuals for details.

c. Truck, Ambulance, 1/4-Ton, 4 x 4, M718 (series), will have an 18-inch red cross on a 20-inch-square white field marked on each canvas side curtain directly to the rear of the canvas side doors, Figure 28.

(1) An 18-inch red cross on a 20-inch-square white field will be marked on the rear of the vehicle. The upper half of this marking will be applied on the canvas rear doors and the lower half on the tailgate, centered with the centerline of the vehicle, in order that the full marking is shown when the rear doors are closed.

(2) A 45-inch red cross on a 48-inch-square white field will be marked centered on the canvas roof.

d. Truck Ambulance, M1010 will have the word "Ambulance" marked in 3-inch-high-white letters, centered three-quarters of an inch above the windshield.

(1) A 3-inch red cross on a 4-inch-square white field will be marked to each side of, and in line with, the word "Ambulance" above the windshield.

(2) A 33-inch red cross on a 36-inch-square white field will be marked on each side of the body below the roof joint and centered above the rear wheels.

(3) A 33-inch red cross on a 36-inch-square white field will be marked on the rear door panels directly below the windows and centered on the vertical centerline of the vehicle.

(4) A 60-inch red cross on a 64-inch-square white field will be marked on the roof 14 inches from the rear of the vehicle, Figure 28.

e. Vehicles other than the ones enumerated, that are intended for such usage and that are affected by international agreement concerning such vehicles, will be marked in a similar manner.

f. The National Symbol will not be applied to Medical Service vehicles. The sizes of the red crosses specified are measured across opposite ends. Each limb of the cross will be a square having sides equal to one-third the size of the cross.

g. The following colors will be used for ambulance markings, as applicable:

(1) Gloss red 11136 and gloss white 17875 on vehicles painted gloss or semigloss olive drab.

(2) Lusterless red 31136 and lusterless white 37875 on vehicles painted lusterless forest green.

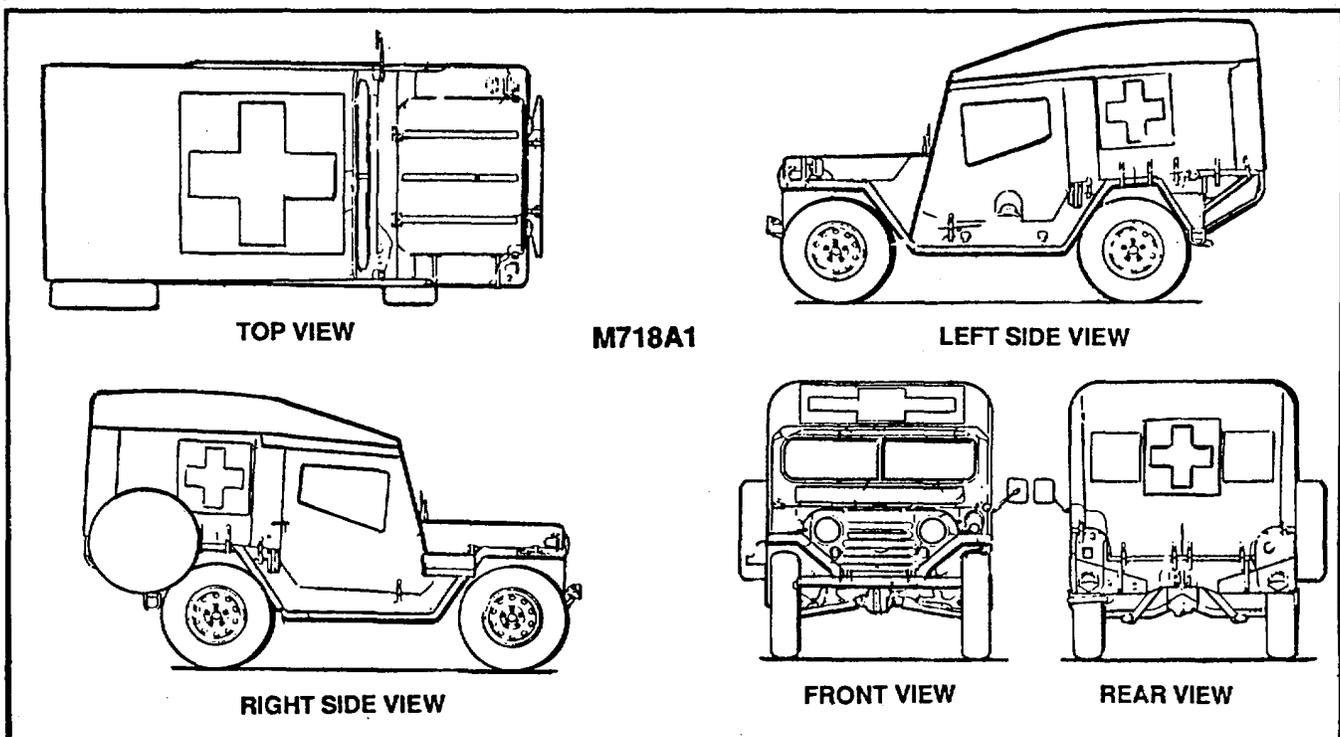
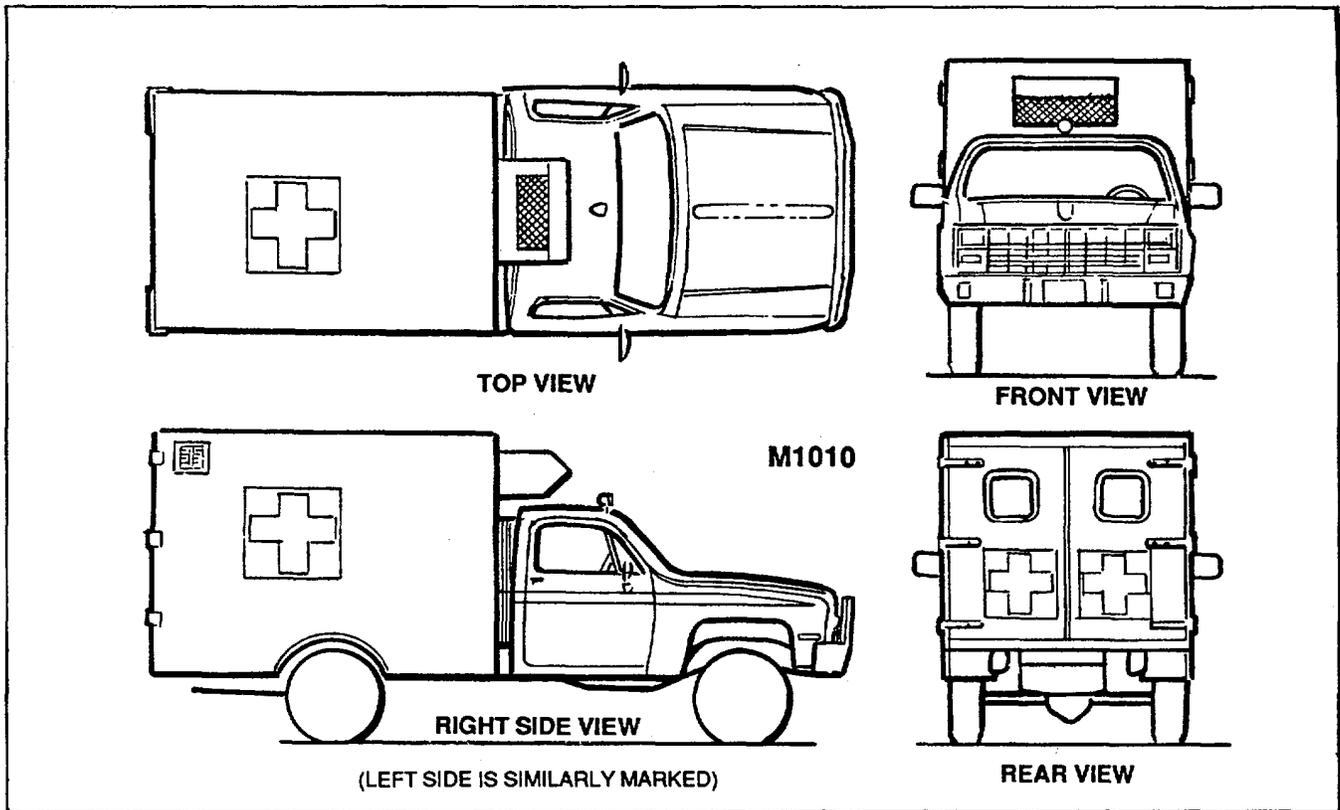


Figure 28. Ambulance marking military design vehicle.

16. MILITARY POLICE MARKINGS--TACTICAL USE VEHICLES.

a The HMMWV, M998 series and CUCV, M1008 when used as Military Police Tactical Vehicles, should be treated as such for identification. The words Military Police will be 3inch block letters and used in reference to the markings of the HMMWV, M998 series and the CUCV, M1008 Vehicles.

(1) CUCV: The tops of the "Military Police" will be located 9-1/2 inches from the top crease of the left and right passenger doors and centered horizontally on the doors, Figure 30. The tops of the words "Military Police" will be 3-1/8 inches below the cargo door handle in the rear and centered horizontally, Figure 30. The words "Military Police" will be located immediately above the leading edge of the hood and centered horizontally, Figure 30.

(2) HMMWV: The bottom of the words "Military Police" will be located 10-1/2 inches above the rear wheel well and centered using 2-inch block letters, Figure 30. The bottom of the words "Military Police" will be located 1-1/2 inches above the bottom edge of the cargo shell door and evenly spaced on either side of the door latch using 3-inch block letters, Figure

30. The words "Military Police" will be centered on the front hood using 2-inch block letters, Figure 30.

b. Truck, Utility, 1/4-Ton 4 X 4, M151 Series: a white disk, 16 inches in diameter with the words "Military Police" in 3inch black letters located around the circumference of the disk, 1/2 inch from the disk edge, will be attached to the center of the spare wheel on the rear of the vehicle. The sign will be locally fabricated from 16-gage sheet metal or thicker. The disk will be attached by means of a bracket made from strap-iron, 1 inch wide and 1/8 inch thick.

(1) M151 series truck will have a detachable white sign, 5 inches high and 36 inches long, with the words "Military Police" in 3-inch-high black letters, mounted on the windshield panel below the glass. The sign will be fabricated from 16-gage sheet metal or thicker and will be attached to the windshield with sheet metal screws.

(2) Motorcycle, solo, will be marked with a white band, 3 inches high, with the words "Military Police" in 2-inch-high black letters, across the front of the windshield directly above the horizontal support. When not obstructed by lights or sirens, the band may be placed below the support.

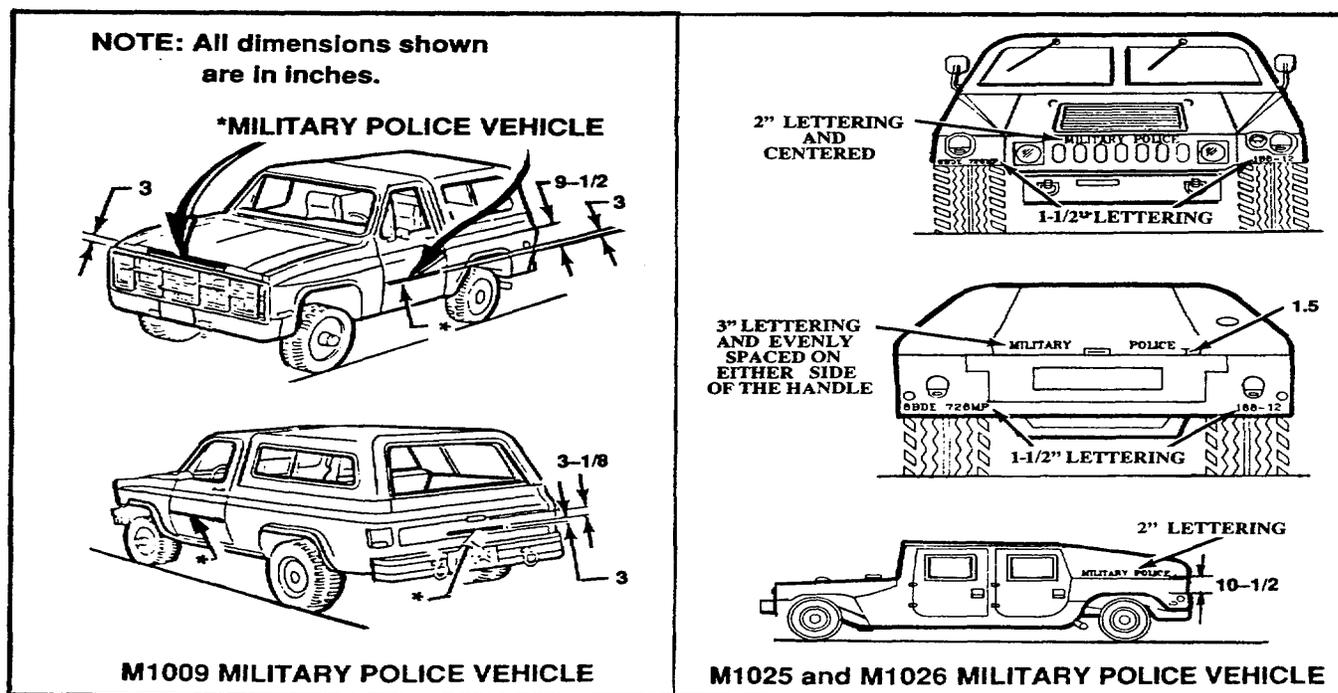


Figure 30. Military Police Markings.

SECTION V. SAFETY SUMMARY

17. GENERAL

a. Fumes.

Thinners used with paints and enamels may have harmful effects. Continued breathing of fumes during and after painting operations should be avoided. Toxic fumes will persist, in some cases, for many days indoors after painting operations. Avoid inhaling solvent vapors.

b. Contact with Paint Materials.

Avoid skin contact with paint materials, particularly if there are cuts or open wounds on the hands. Unwashed hands may convey poisonous matter to food. Many painting materials contain lead sulfide, lead carbonate, chromium compounds, and other poisonous materials. Lead chromate is particularly dangerous, and like other lead paints, may enter the system during eating, or handling. Many of the thinners are also poisonous and can enter the human system through the skin, through inhalation, or through carelessness in handling food. Wear personal protection equipment (PPE) as recommended in paragraph 19a.

c. Fire.

The mist that comes from a spray gun is highly flammable. A spark will cause it to flash. Smoking is prohibited in paint shops. Open cans containing paint removers, thinners, paints, and paint materials are a fire hazard. Empty drums or other containers in which solvents, thinners, and similar materials have been shipped are potential hazards since they often contain enough vaporized material of a flammable nature to cause explosions. Accumulated spray in booths and in cracks and corners of the paint shop is particularly dangerous for it easily flares up in spontaneous combustion. Oil or solvent-soaked cloths, if not promptly disposed of, may cause fire by spontaneous combustion. Fires which occur in spray booths result from six principle causes: broken electric lamps and other electrical defects; cleaning interior of booths, fans, and motors with highly flammable solvents; accumulations of deposits in the booths, tubes, and vent pipes; defective fans and motors used for ventilating the booths; poorly designed vent tubes; or static electricity. Electrical mercury switches and vapor proof lighting fixtures with protective screens should be installed to reduce electrical spark hazard.

d. Safe Air.

If it is at all practical, painting of material should be accomplished in the open air. Adequate forced draft ventilation for indoor work should be provided to carry off fumes. Respirators should be worn during all spray-painting operations. Refer to paragraph 19b for specific respiratory protection required.

e. Safe Practices.

Preparations containing benzene should not be used for spraying. Only vapor proof lamps should be used where spraying is being done. Paints should be stored in a steel cabinet in a small building away from work buildings. Once opened, cans containing paint removers, thinners, paints, and paint materials should be covered tightly before being stored or put away overnight. Do not apply heat or flame to drums, cans, or other containers that have contained solvents, thinners, or other paint materials. Observe safe operating procedures at all times, particularly when handling cleaning materials. For disposal of unserviceable paints, refer to paragraph 21.

18. MATERIAL SAFETY DATA SHEETS (MSDS)

MSDS are prepared by the manufacturer and should accompany each single shipment or batch of paint, primer or thinner. It is mandatory that personnel working with these substances read this information. Because of the variations involved, MSDS must be reviewed for each shipment procured on a single purchase order. MSDS must be filed in a location readily accessible to workers exposed to the substances. MSDS also assist management by directing attention to need for specific control engineering, work practices and protective measures to ensure safe handling and use of the material. Along with the products ingredients and specific protection information, the MSDS contain the following data:

a. Reactivity Data.

This informs the paint user about the stability, hazardous decomposition, or polymerization properties of the coating.

b. Spill and Disposal Procedures.

This informs the paint user the steps to be taken for proper spill or disposal methods.

c. Fire and Explosion Hazard Data.

This informs the paint user about the flash point of the product, special fire fighting procedures, and the extinguishing media.

d. Health Hazards.

Personnel should be familiar with emergency and first aid procedures -s outlined in the product's MSDS. This includes medical procedures to be followed if the product is inhaled, or if the procedure has come in contact with the skin or eyes of an individual.

19. CONTROL MEASURES

a. Personal Protection.

(1) Personal Protection Equipment (PPE) used in conjunction with respiratory protection equipment (paragraph 19b) includes cloth coveralls, eye protection, and head coverings. Cloth gloves are suitable unless cellosolve acetate (2-ethoxyethyl acetate) is present in the paint, solvent, or primer. When this solvent is present, silicon rubber gloves are recommended. Spot painters applying paint by brush or roller must wear clothing and gloves affording full skin coverage. Persons who clean mixing and painting accessories should wear eye protection and rubber gloves to preclude solvent absorption and defatting of the hands caused by the thinner.

(2) The use of barrier creams is acceptable; however, their usefulness in preventing the absorption of solvent through the skin is not documented. If a solvent with a skin notation is being used, then silicon rubber gloves must be used. Barrier creams are useful in preventing paint from adhering to the skin and in combating the "dryness" associated with the defatting action of most solvents. Solvents must never be used to remove paint/coating from the skin.

(3) Work clothing should be provided. After completing painting or sanding operations, hygienic showers should be taken prior to changing into street clothing.

b. Respiratory Protection.

NOTE

For the purpose of determining respiratory protection required for a given operation, a confined space is any of the following sites:

- Any area where dilution ventilation cannot take place, or where airflow is obstructed
- Under or in vehicles/equipment, whether indoors or outdoors
- Indoor areas (not in spray paint booth) of less than 10,000 cubic feet
- Indoor areas where ceiling height is less than 16 feet a
- Touchup paint areas with partitions, balconies, or any structural barriers obstructing cross-ventilation
- Any area where outside air is not mechanically distributed at a minimum rate of 3.5 cfm per square foot of bay/room/area where touchup painting takes place

(1) Spray Painting Indoors. An approved airline respirator is the standard respirator to be worn when paint spraying indoors; however, alternatives are permitted when spray operations are not conducted in a confined space and valid sampling results document the personal exposure levels.

(a) Large Vehicular or Walk-in Booths. If the diisocyanate concentration is below the standard, a full facepiece chemical cartridge respirator with a paint prefilter is adequate. If the solvent concentration is less than 10 times the standard, a paint-spray respirator is adequate. If the pigment containing lead or chromate concentration is less than 10 times the standard, an organic vapor respirator with a HEPA filter is adequate.

(b) Spray Cabinet or Conveyor-type Booth. If the contaminant (solvent, pigment, or diisocyanate) concentration is below the standard, no respiratory protection is required. If either the solvent or diisocyanate concentration exceeds the standard, an airline respirator is required. If the pigment containing lead or chromate concentration exceeds the standard, but is less than 10 times the standard, an organic vapor respirator with a HEPA filter is required.

(c) Spray Painting Outdoors. If in a confined space, an airline respirator is required. If not in a confined space, a paint-spray respirator is required.

(2) Brush or Roller Painting Indoors or Outdoors. If not in confined space, an organic vapor respirator, unless deemed unnecessary by preventive medicine/industrial hygiene personnel. In a confined space, an approved airline respirator is required. Application of a water-base paint does not normally require respiratory protection; however, local preventive medicine/industrial hygiene personnel will determine the requirements.

(3) All Painting. If respiratory protection other than an approved airline respirator is used, then exposure must be documented by preventive medicine/industrial hygiene personnel.

(4) Sampling. Sampling is done during the painting of different vehicles and equipment, when the booths' filters are clean and dirty, when changes or modifications occur in or to the booths, and for each painter. The sampling will be performed according to the US Army Environmental Hygiene Agency's Technical Guide No. 141 and in sufficient numbers to be statistically valid. Sampling methods other than those listed in the Tech Guide, i.e., NIOSH methods, may be used upon approval by the laboratory providing services. The documentation will be revalidated every 2 years if the initial sampling results are below one-half of the standard and every 6 months if greater than one-half of the standard. Additional monitoring is required whenever there has been a production, process, control or personnel change or whenever there is any other change that may result in new or additional exposures.

c. Ventilation.

The use of respiratory protection equipment does NOT waive the requirement for engineering control measures. The ventilation design specifications for spray paint booths are in TB MED 514.

d. Preferred Paints.

Whenever possible, Type II or Type III aliphatic polyurethane paints (PUP) should be substituted for Type I since they contain no lead or chromate. Non-lead-containing primers should be used when available.

e. Warning Labels.

Warning labels are required on products containing lead or chromium IV.

20. MEDICAL SURVEILLANCE General. Medical surveillance to detect adverse health effects will be determined by the installation medical authority (IMA) based on the specific constituents of the coating. In general, medical surveillance is required for anyone who works more than 30 days per year in either a paint spraying operation or in a brush or roller application when respiratory protection is required. Personnel involved in painting at direct support, general support, and depot levels of maintenance will normally require surveillance. Vehicle/equipment operators and unit maintenance section personnel usually do not perform enough brush touchup painting to warrant medical surveillance.

21. DISPOSAL**a. General.**

Unserviceable paints including aliphatic polyurethane paint (PUP)/epoxy polyamide enamel (EPE) blend must be discarded as a hazardous waste according to AR 420-47. Note that because they contain ignitable solvents, these unusable blends of PUP are defined as hazardous wastes by the Resource Conservation and Recovery Act (RCRA) of 1976 as amended by the Hazardous and Solid Waste Amendments of 1984. Unserviceable component B is a hazardous waste per RCRA due to ignitable solvent content; not because it contains HDI.

b. Method of Disposal.

The method used to dispose of this waste stream depends on the types of paint used. When the paints contain no hazardous heavy metals, the liquid portion of the waste stream may be able to be discharged into the sanitary sewer and the sludge disposed of in a sanitary landfill. The environmental coordinator should be contacted to ensure state and local ordinances are not violated. If heavy metal-based paints have been used, samples of the liquid and sludge should be analyzed for the characteristic of extraction procedure (EP) toxicity (heavy metals) and disposed of accordingly.

(1) If a sanitary sewer serving a paint processing operation discharges to a government-operated sewage treatment plant (STP), notify the STP operator of the approximate additional loadings of total organic carbon, biochemical oxygen demand, and total processing operation prior to discharge.

(2) If a sanitary sewer serving a paint processing operation discharges to privately owned treatment works, pretreatment of wastewaters may be required by local regulatory authority. The installation environmental coordinator should determine such cases with public environmental regulators having primacy over government installations. Pretreatment regulations have been summarized by the USAEHE Water Quality Information Paper No. 13.

22. SPECIFIC HAZARDS**a. Temperature.****CAUTION**

- **Coatings should not be applied at temperatures below 50°F (10°C) as they will not cure properly.**

b. Equipment Hazards.**CAUTION**

- **Mask intake and exhaust parts, breathers, etc., carefully to prevent dust, solution, water, or metal conditioner from entering the engines of vehicles.**
- **Do not use solvents on electronic equipment as they may cause changes in performance.**
- **Do not use petroleum based products on natural rubber as they are destructive agents.**
- **Do not use spray equipment containing any aluminum components to apply coatings formulated with 1,1,1 trichloroethane (such as MIL-C-46168, Type m).**

23. OTHER PUBLICATIONS

Additional safety information is contained in the following publications:

- AR 40-5, Preventive Medicine.
- CFR 1910, OSHA Safety and Health Standards.
- DODI 4145.19-R-1, Hazardous Materials Handling and Storage Criteria.
- TB MED 502, Occupational and Environmental Health Respiratory Protection Program.

e. TB MED 514, Occupational and Environmental Health Requirements for Painting Operations.

SECTION VI. CAMOUFLAGING PROCEDURES

24. CAMOUFLAGE PATTERN PAINTING

a. This section covers methods of applying Camouflage Paint Patterns (CPP) to Army material. It also covers procedures for inspecting applied CPP. Equipment consists mainly of brushes and guns; paints consist of Chemical Agent Resistant Coatings (CARC), such as those listed in Appendix B. The CARC topcoats are suited for camouflage painting and protect military material against visual and infrared detection and chemical agent contamination. The CARC camouflage topcoats are MIL-C-46168 and MIL-C-53039. The CARC epoxy primers are MIL-P-52192, MIL-P-23377, MIL-P-53022, and MIL-P-53030.

b. Information on specific finish systems and kinds of paint to be used for various applications is contained in Appendix B. Surface preparation is covered in paragraph 27. Application techniques are covered in paragraphs 30-32. For additional information on camouflage, refer to the following publications:

AR 750-1	Army Materiel Management	Maintenance
FM 5-20	Camouflage	
TM 5-200	Camouflage Materials	

c. Major items to be camouflage-painted are weapons systems, vehicles, construction equipment, and materials handling equipment. The painting procedures described in this chapter do not apply to aircraft. Three-color camouflage patterns are created for all combat, combat support, and combat service support equipment having an area greater than nine square feet on one or more sides. New items of tactical equipment normally will be CARC coated in a three-color camouflage pattern at the factory or depot. Some items, however, may be painted with lusterless CARC green 383 when the pattern has not been developed, Items painted in CARC green 383 or alkyd enamel will only be three-color camouflage CARC coated when a complete repainting is required for maintenance purposes.

d. Only DS/GS Support and Depot level personnel are authorized complete painting and repainting of components with any topcoat or primer. DS/GS Direct Support personnel are authorized complete painting/repainting only if they use an OSHA approved spray-paint booth. Unit level personnel are permitted to use topcoats and primers for touchup efforts only. This includes all CARC coatings.

25. REASON FOR PATTERN PAINTING

a. All military vehicles and equipment have characteristic shapes and shadows. These shapes and shadows contrast with the material surroundings and make the object stand out. Pattern painting using wavy, irregular patches of camouflage colors does much to break up the characteristic shapes of the equipment by reducing contrasts with sod and vegetation, pattern shape, and placement. Patterns have been designed for each type of vehicle to cut off sharp corners, avoid straight, vertical, and horizontal lines, and extend shadows in shapes similar to natural features and vegetation; however, the accuracy with which the CPP is applied completely determines how well the CPP camouflages the equipment.

b. Pattern painting is not a magic, cure-all camouflage technique, but it makes the item much harder to see and recognize as a military object. It also provides an excellent base for applying further natural camouflage such as tree limbs, shrubs and grass.

c. The theory behind pattern design is to provide a camouflage system for equipment that is universal and can be adapted to various geographical, seasonal, and terrain changes by the changing of one or possibly two colors. For instance, temperate zone colors of green, brown and black may be changed to desert colors by changing green to tan.

NOTE

CARC colors should not be mixed with one another as this will alter their individual effectiveness when applied to the end item. Blending is not permitted.

d. These resins also lend themselves to touchup painting with better results than are now obtainable from touchup of the current olive-drab vehicles. Slight mismatches in color are expected at times and will not be noticeable except upon close inspection. Likewise, minor abrasions and scaling of surfaces will be equally inconspicuous. Marring and surface lightening due to handling is characteristic of camouflage coatings and does not impede camouflage or infrared properties. This is typical of low gloss and sheen coatings in dark colors and is considered satisfactory.

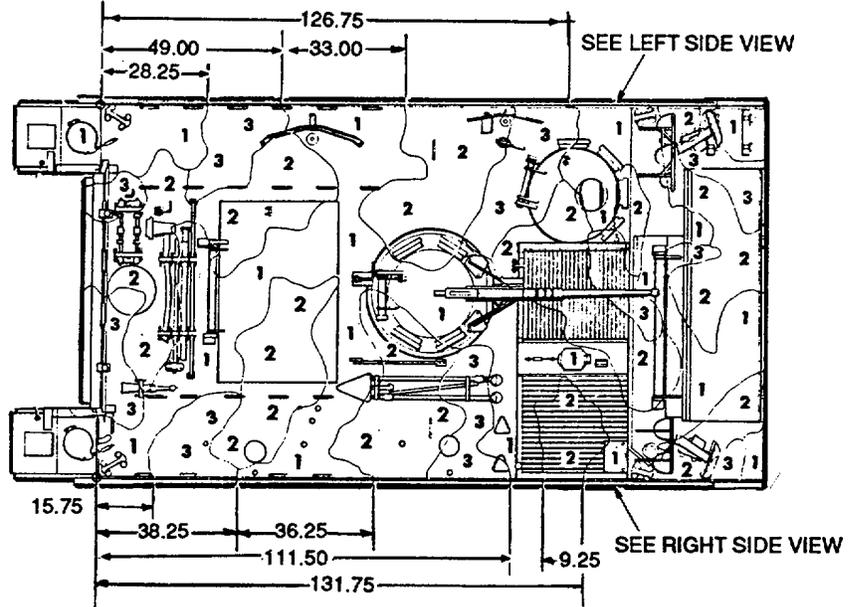
26. PATTERN DESIGNS

See Figure 31, for example of the CPP for the M113A1, Personnel Carrier. Within each area is a number that stands for the color to be painted. There are five views of the vehicle; front, back, left side, top, and right side. Most designs will show these five views. The base, or "primary" color is Color #2 and is usually applied first over all surfaces. Color patches #1 and #3 are then applied over the primary coating. The approximate distribution, in percent, of the three colors is: green--44 percent, black--41 percent, and brown--15 percent.

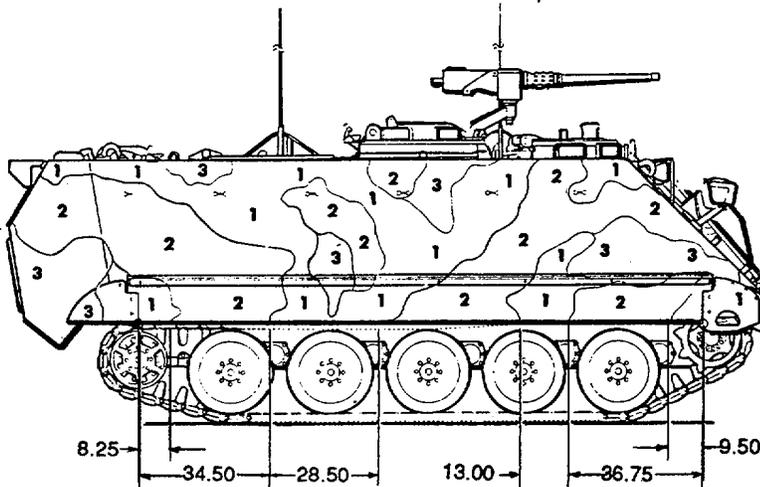
**ARMORED
PERSONNEL
CARRIER
FULL TRACKED
M 113A1**

LEGEND

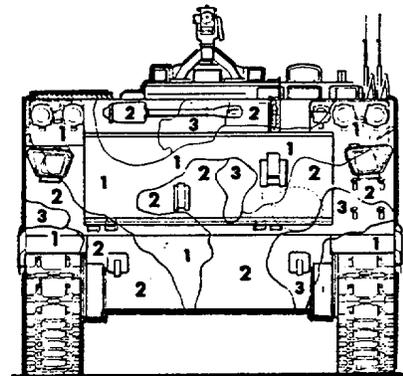
- 1 - BLACK**
- 2 - GREEN**
- 3 - BROWN**



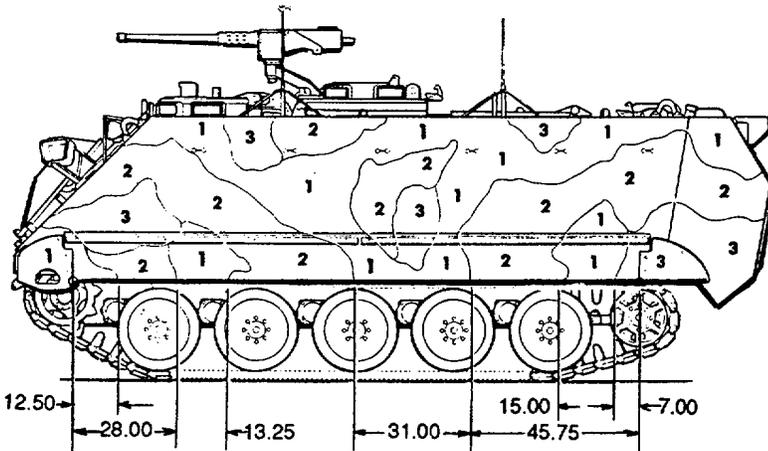
TOP VIEW



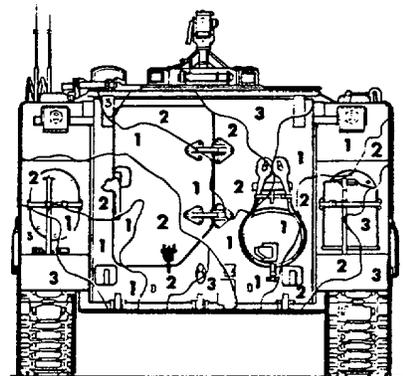
RIGHT SIDE VIEW



FRONT VIEW



LEFT SIDE VIEW



REAR VIEW

Figure 31. Pattern Painting Design for the M113A1 Personnel Carrier.

27. PREPARATION FOR PATTERN PAINTING

a. The first step in pattern painting an item is to thoroughly clean the surfaces to be painted. Applying paint to anything less than a totally clean surface will result in rapid peeling, cracking, and scaling of the new coating.

NOTE

Check for cleanliness by the red litmus or water break test before applying CARC materials.

b. Clean with detergent or solvent and thoroughly rinse or steam clean to insure a totally clean surface suitable for a durable coating. Grease, oil, dirt, markings, and all loose and scaling paint must be removed. Reference TM 43-0139.

c. Sanding of rough areas to remove the oxidized surface from the old paint will also make the new paint job look better and last longer. If bare metal is exposed following sanding and cleaning, apply an epoxy primer to the bare metal. The primer should be allowed to thoroughly dry before CARC is applied.

d. All glass, grease fittings, and items which can be damaged by paint must be masked with masking tape and/or paper.

NOTE

Grease should not be used for masking because it can easily be smeared onto other parts of the equipment and prevent the paint from sticking.

e. The following is a list of items needed for pattern painting:

- (1) Vehicle or other item of equipment.
- (2) Pattern-painting design for the specific vehicle or other item of equipment.
- (3) Spray guns, if applicable.
- (4) Paint.
- (5) Thinners as required by TM 43-0139.
- (6) Mixing buckets.
- (7) Paint brushes, 1/2-inch, 1-inch, and 3-inch.
- (8) Paddles or sticks to mix paint.
- (9) Painters' masks.

- (10) Masking tape for masking small items.
- (11) Brown (kraft) paper for masking windshields, etc.
- (12) Detergent to clean vehicles.
- (13) Chalk for marking paint areas.
- (14) Steel wool or sandpaper.
- (15) Rags.
- (16) Compressed air source, if applicable..
- (17) Water separators and fittings with pressure gage.
- (18) Wrenches for spray guns, if applicable.

28. OUTLINING THE CAMOUFLAGE PATTERN ON THE VEHICLE

a. The black bands, located at the visual center of each side in a pattern, are the key to the three-color camouflage systems.

These bands must be in the correct place and must be the correct width.

b. To ensure correct placement and width, each pattern has between 10 and 25 critical reference points. Critical reference points are based on fixed features on the item and are reflected on the vehicle patterns in Section VIII.

c. All dimensions are listed in inches

d. All dimensional tolerances are limited to +1.00 inch.

e. The right side view is the primary view of the CPP drawings.

f. In the top view of the paint pattern drawings, the horizontal is established as being from front-to-back along the longest dimension of the item.

g. The edge of the band must be within one inch of a critical-location reference point and the pattern must be no more than one inch wider or narrower than stated at a critical-width reference point. The rest of the item will mirror the camouflage pattern as much as possible.

h. Inspections will only be measured at reference points and will evaluate the overall effect at 50 feet. In addition, overspray which can be discerned at 50 feet will be considered sloppy painting and will be corrected.

i. Outlining the camouflage pattern can be done in a variety of ways. Successful methods include freehand, template, wire-form and viewgraph, Figure 32.

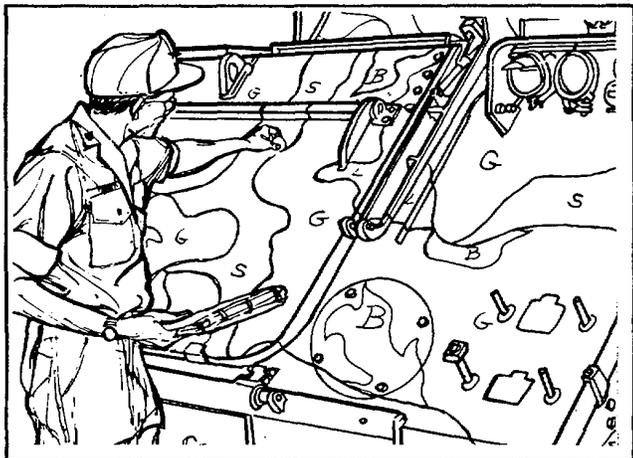


Figure 32. Applying Pattern with Chalk.

29. CAMOUFLAGE PAINTING

WARNING

The local safety office and preventive medicine support activity must be consulted prior to initial CARC painting.

The paints and thinners to be used in pattern painting are to be obtained through normal supply channels. Pattern painting will begin upon receipt of the necessary pattern designs and paints. Use the equipment and procedures described in TM 43-0139 to accomplish the painting.

30. TECHNIQUES OF MIXING AND THINNING

a. Method.

The best, quickest, and easiest method of painting is by spraying. Paint rollers are used on large surfaces when spraying is impractical. Paints are brushed on when other methods are impractical or special equipment is not available.

In general, the use of brushes is confined to touchup jobs.

b. Readiness.

In most cases, paints are issued ready mixed. Hence color blending is not required. CARC paints MIL-C-46168 and MIL-C-22750, however, are issued in a two-component form and require accurate mixing techniques.

c. Preservation.

(1) **Stirring.** Stir paints well before use. If the liquid portion (vehicle) has separated from the pigment, pour off

most of the liquid portion into a clean container. Stir the thick settled portion (pigment) in the bottom until all chunks are softened and dissolved. Restore the poured off portion a little at a time, stirring constantly with a lifting and beating motion.

"Box" the paint thoroughly by pouring it from one container to another several times, stirring the paint for a few minutes between each transfer.

NOTE

Do not "box" lacquer, as this will cause a loss of the liquid portion by evaporation.

(2) **Straining.** When paint stands over a period of time, a skin may form over the surface and the pigment may form into chunks to the extent that stirring will not mix all of the ingredients properly. In such cases, strain the paint through a strainer into a clean container, discarding the residue left in the strainer. Do not strain CARC coatings, however. CARC coatings which cannot be properly mixed will be resealed and disposed of as hazardous wastes.

(3) **Thinning.**

(a) When it is necessary to thin paint, use a small amount of the prescribed thinner. Because of its volatility, thinner will evaporate from the paint film, leaving practically the same ratio of vehicle to pigment per square foot of surface as the paint would have provided before thinning. The warmer and drier the weather, the less thinner is needed because heat tends to thin it. More thinner is required in cold weather to hasten the drying and hardening of the film. Thinner should be used with care, as the less used, the more durable the applied coat will be.

(b) Polyurethane coatings may be thinned up to 20 percent by volume with thinner MIL-T-81772, Type I, or with the manufacturer's recommended thinner. Epoxy primers which are blended (admixed) four to one by volume, such as MIL-P-52192 and MIL-P-53022, may be thinned up to 20 percent by volume with epoxy thinner MIL-T-81772, Type II.

Epoxy enamels and primer which are blended one to one by volume, such as MIL-C-22750 and MIL-P-23377, usually have satisfactory spray viscosities, but may be thinned with small amounts of MIL-T-81772, Type II, if necessary. Water is used to thin MIL-P-53030.

(c) Paints which contain a slow-drying vehicle may require additional thinner.

31. TIPS ON PAINTING

Certain basic precautions are applicable to paint, varnish, enamel, and lacquer. The following should be observed at all times:

- a. Do not paint over an unclean surface. Be sure all dirt, rust, scale, etc., are removed.
- b. Do not fail to stir paint thoroughly.
- c. Do not mix one paint with another unless instructed to do so.
- d. Do not fail to follow instructions that appear on containers, particularly those concerning safety, the addition of thinner, and the application instructions.
- e. Do not apply paint or varnish unless the drying conditions are satisfactory.
- f. Do not paint in wet or extremely cold weather, below 50° F (10° C).
- g. Do not apply abnormally heavy coats.
- h. Do not add too much thinner.
- i. Do not use paint buckets, cans, paint rollers, spray guns, or brushes which are not clean.
- j. Do not apply cold paints on varnishes.
- k. Do not leave old paint and oil-soaked cloths laying around in the paint shop; they are a fire hazard.
- l. Do not fail to clean brushes, paint rollers, and spray guns immediately after using.
- m. Do not smoke when painting. Do not smoke near paint storage areas or paint booths.
- n. Do not release the tops of pressure-feed material containers before releasing the air pressure.
- o. Do not use electrical connections that show any inclination to becoming loose.
- p. Do not pour paint out of a container in a manner that obscures the label.
- q. Do not fail to strain paint before using, if required.
CARC paints cannot be strained, however.
- r. Do not fail to remove all traces of wax from surfaces where paint or varnish is to be used.
- s. Do not paint without proper respiratory equipment and ventilation.

t. Do not waste paint by spraying beyond the item being coated.

u. Do not paint over a moist or wet surface.

v. Do not paint between the ground strap and hull of tanks.

w. Do not paint on operator-instruction plates.

32. TIPS ON PAINTING WITH CARC

The following precautions should be observed, in addition to those listed in paragraph 31 above, when applying Chemical Agent Resistant Coatings (CARC):

a. Spray 'nes for epoxy applications should not be used with polyurethane coatings without complete flushing or cleaning with solvents.

b. Test for cleanliness when applying CARC with the red litmus or war-r break test.

c. Remember to notify the local safety office and preventive medicine support activity prior to initial CARC painting. This also applies to all spray painting operations, regardless of the material used.

d. Do not use CARC for items like manifolds and mufflers that exceed 400° F. Do not use CARC on rubber, lacquer coatings, or vinyl.

e. Use silicon rubber (impervious), not cloth, gloves when applying CARC.

f. Only DS/GS General Support and Depot level personnel are authorized complete painting and repainting of components with topcoats and primers. Unit and DS/GS Direct Support level personnel are only permitted to use topcoats and primers for touchup efforts.

g. When using CARC, mix only the amount needed to do the job (i.e. don't open a large container for a small job) because unused CARC must be disposed of and cannot be stored.

h. Epoxy-polyamide coatings build up thickness quickly.

Thick films are detrimental for good adhesion. Do not apply CARC beyond its thickness tolerances.

33. MARKINGS TO BE APPLIED TO EQUIPMENT

After the equipment has been pattern painted, only the following markings are to be applied:

- a. **Unit identification.**

b. National Symbol.

All stars will be removed and replaced by a 3-inch star in contrasting lusterless black 37030 or green 383, front and rear.

Placement should be centered on the equipment, on line with

unit ID markings. On the rear of wheeled vehicles, the star may

be placed on the tailgate.

c. Agency Identification and Registration Number.

All U.S. Army identification and registration numbers will be removed from the item's exterior surfaces. The identification and registration number shall be placed on any appropriate interior area which is visible from outside a locked or secured item.

Combat Vehicles and Trailer Tankers: "registration number" will be applied to both sides of the vehicle. The numbers will be painted to contrast with color patch painted over, Figure 32A.

NOTE

The identification legend "US ARMY" is no longer required.

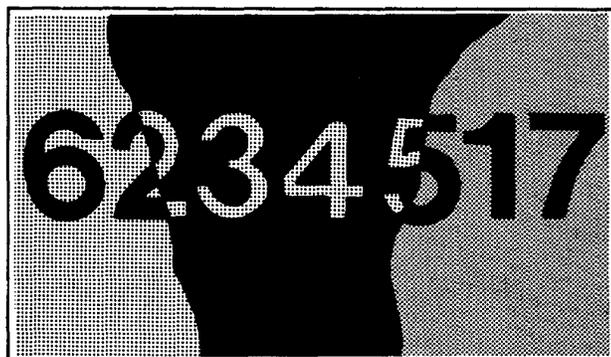


Figure 32A. Markings on Camouflaged Combat Equipment

d. Safety and Instructional Markings.

Markings such as tire pressure, fuel type, and fill level may be retained in contrasting lusterless black 37030 or green 383 (34094), letters no larger than one inch. Markings directly related to troop safety, such as wrecker boom capacity and danger zones, must be evaluated by safety personnel.

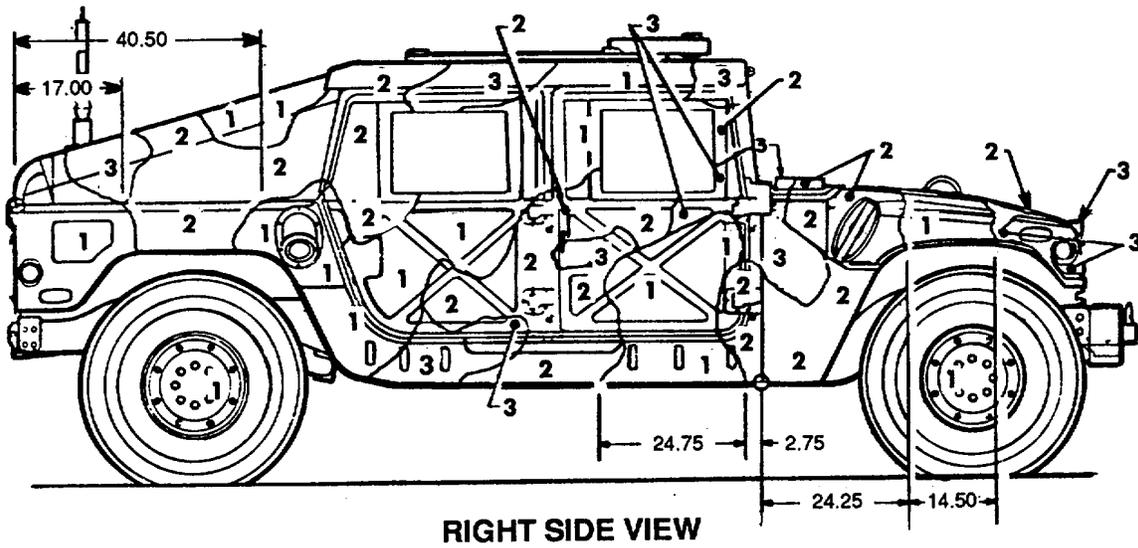
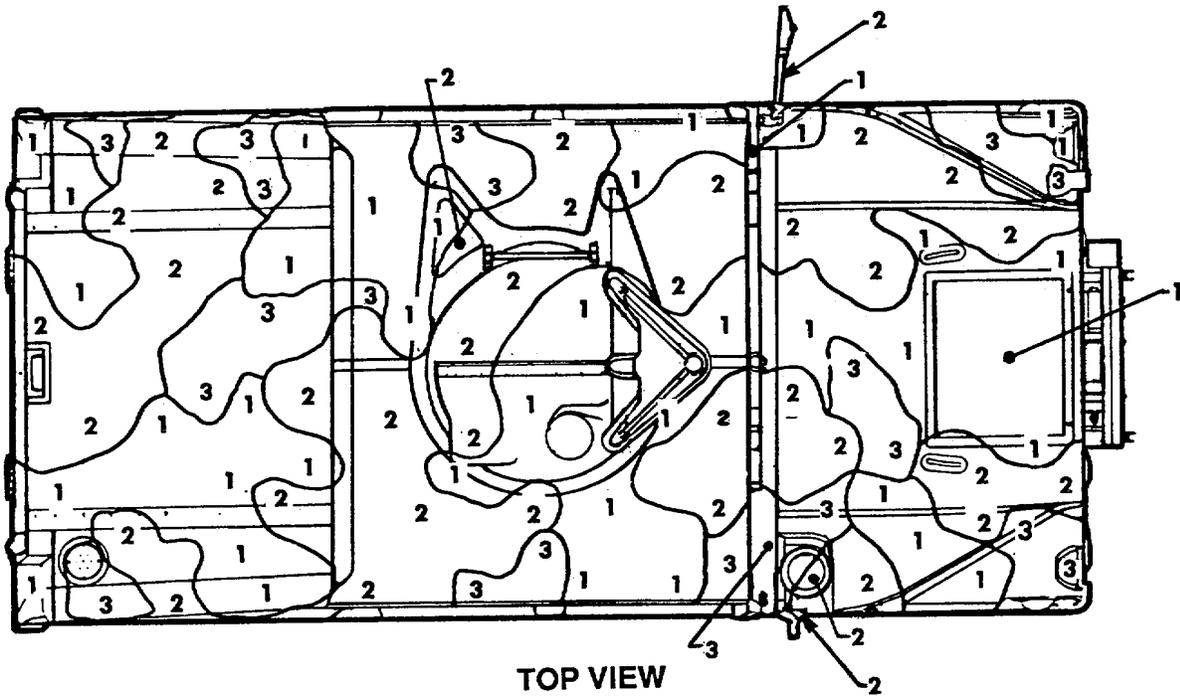
e. CARC and Alkyd Markings.

Equipment with data plates shall have the word "CARC," as applicable, painted in black or green contrasting color in a conspicuous area as near the data plate as possible. Painting shall be in block letters, as large as possible, not to exceed one inch.

All major items having a log book shall have the Equipment Control Record, DA Form 2408-9, annotated in the lower left corner of Block 21, Remarks, to reflect the word "CARC", as applicable, and the date applied.

SECTION VII.**VEHICLE CAMOUFLAGE PATTERNS****INSPECTION NOTES FOR ALL CAMOUFLAGE PATTERNS.**

- ALL DIMENSIONS ARE IN INCHES.
- O DENOTES A LOCATION ON THE ITEM THAT IS USED AS A REFERENCE POINT. THE DISTANCE FROM THIS REFERENCE POINT TO THE EDGE OF THE BLACK BAND IS THE LOCATING DIMENSION. TOLERANCE ON THIS DIMENSION IS ± 1.00 INCH.
- THE HORIZONTAL DISTANCE ACROSS A BLACK BAND IS THE BAND WIDTH. IF THIS DIMENSION IS SHOWN THE TOLERANCE IS ± 1.00 INCH.
- Δ LOCATES A PHYSICAL FEATURE THAT THE PATTERN CONTOUR INTERSECTS WITHIN + 1.00 INCH. NO LOCATING DIMENSION IS REQUIRED.
- INSPECTION OF THE CAMOUFLAGE PATTERN WILL CONSIST OF CHECKING ALL LOCATING DIMENSIONS AND BAND WIDTHS SHOWN ON INSPECTION SHEET AS A MINIMUM. ALTERNATE OR ADDITIONAL REFERENCE POINTS, LOCATING DIMENSIONS AND BAND WIDTHS MAY BE INCLUDED IN THE INSPECTION. DIMENSIONS WILL BE DEVELOPED BY SCALING FROM PATTERN DRAWINGS. DO NOT USE INSPECTION SHEET TO DEVELOP DIMENSIONS. THE TOLERANCE FOR ALL DEVELOPED DIMENSIONS WILL BE ± 1.00 INCH.



M1025

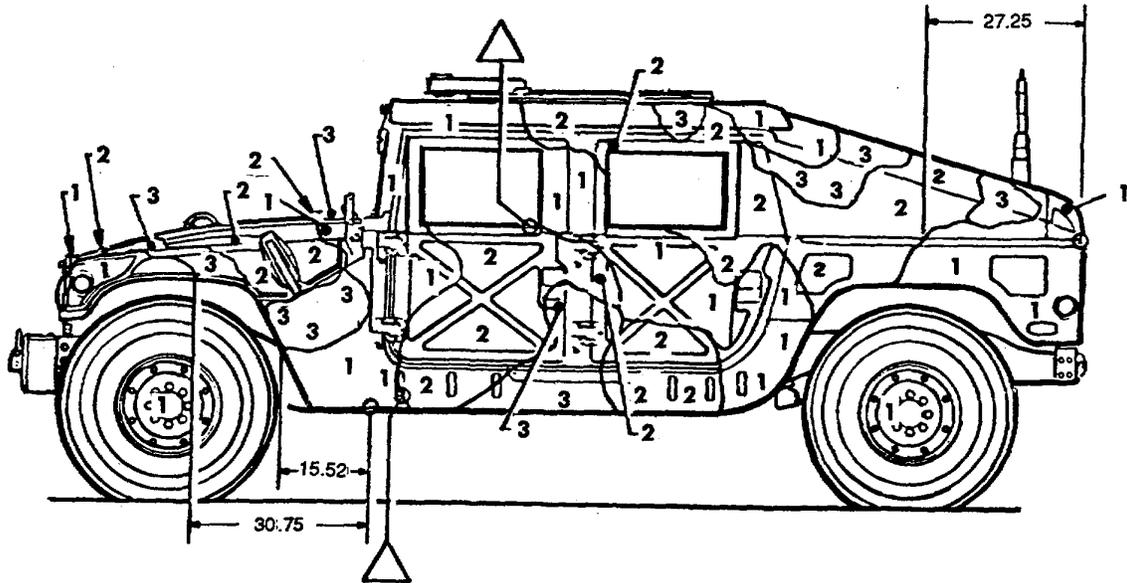
M1026

M1044

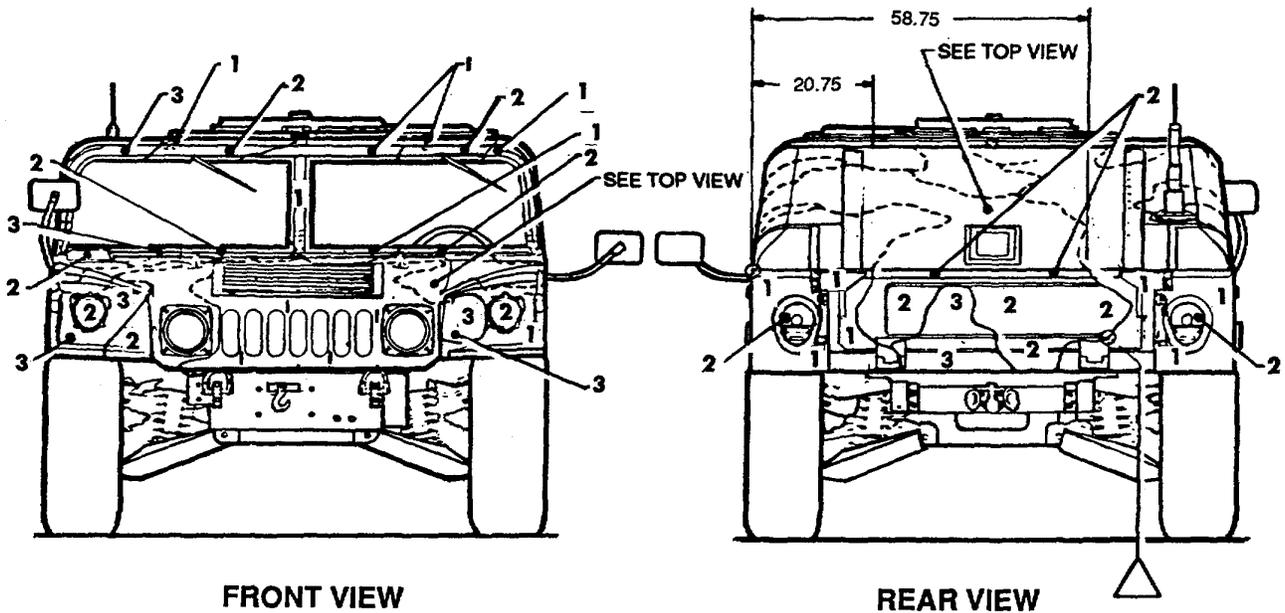
M1045

M1046

Figure 40. Truck, utility: armament carrier, armored 1-1/4-ton, 4 x 4, M996, M1025, M1026 w/winch, M1044, M1045, and M1046. (1 of 2)



LEFT SIDE VIEW



FRONT VIEW

REAR VIEW

M1025

M1026

M1044

M1045

M1046

Figure 40. Truck, utility: armament carrier, armored 1-1/4-ton, 4 x 4, M996, M1025, M1026 w/winch, M1044, M1045, and M1046. (2 of 2)