

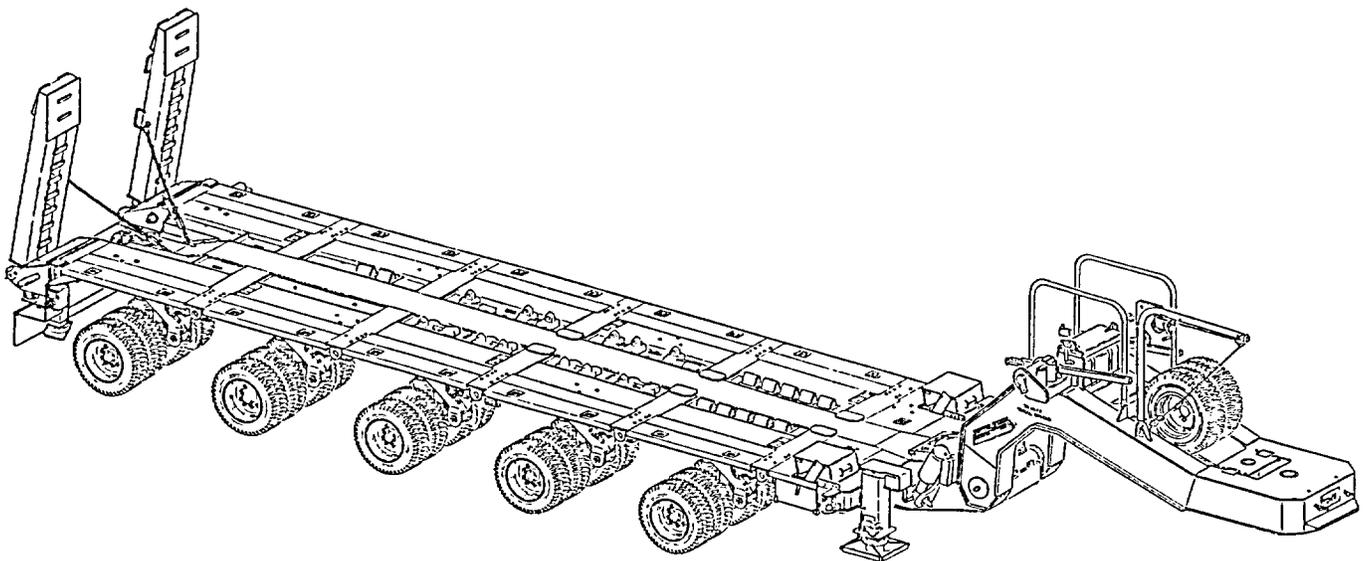
**TECHNICAL BULLETIN**

**OPERATOR'S AND UNIT MAINTENANCE**

**FOR**

**SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT  
70 TON, M1000**

**WHEN LOADED WITH ABRAMS MAIN BATTLE  
TANK SERIES WITH MINE CLEARING BLADE ATTACHED**



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**HEADQUARTERS, DEPARTMENT OF THE ARMY**

**AUGUST 2000**

FOLLOWING IS A SUMMARY OF WARNINGS PRESENTED WITHIN THIS TECHNICAL BULLETIN:

OBSERVE THE FOLLOWING PRECAUTIONS WHEN DRIVING THE M1070 TRACTOR/M1000 SEMITRAILER OR SERIOUS INJURY OR DEATH TO PERSONNEL AND DAMAGE TO EQUIPMENT MAY OCCUR:

**WARNING**

- Brake adjustment must be checked before each mission when operating the M1000 semitrailer with the Abrams Main Battle Tank (MBT) series with mine clearing blade attached or braking will be uneven.
- When the M1000 semitrailer is loaded with an Abrams MBT series with mine clearing blade attached, under no circumstances shall speeds exceed the following:
  - Highway.....40 mph (64 km/h)
  - Secondary.....35 mph (56 km/h)
  - Off-road.....10 mph (16 km/h)

OBSERVE THE FOLLOWING PRECAUTIONS DURING LOADING/UNLOADING OPERATIONS OR SERIOUS INJURY OR DEATH TO PERSONNEL AND DAMAGE TO EQUIPMENT MAY OCCUR:

**WARNING**

- Unnecessary personnel must stand well clear of the vehicles, especially behind the payload (engine/turbine exhaust) during loading/unloading operations. At no time during any loading/unloading operation while the payload is moving should personnel be on semitrailer platform. The payload operator must drive the payload slowly up or down the loading ramps and onto the platform or ground.
- At no time during any loading/unloading operations while the payload is being pulled on and/or off with winches should personnel be on semitrailer platform.
- Load/unload an able payload on semitrailer on level ground whenever possible. In adverse conditions, loading/unloading of an able payload can be done on grades up to 10 percent with a maximum offset angle of 10 degrees between tractor and semitrailer. Avoid exceeding these limitations to prevent payload from rolling on/off semitrailer.
- Two ground guides (spotters) are required for able payload loading/unloading operations. The payload operator must know the position of spotters at all times.
- Load/unload a disabled payload on semitrailer on level ground whenever possible. In adverse conditions, loading/unloading of a disabled payload can be done on grades up to 10 percent. Due to the possibility of winch cables piling up against the end flanges of the cable drums and causing injury to personnel and damage to equipment, the following offset limits between tractor and semitrailer must be adhered to: 10° Left; 4° Right.

OBSERVE THE FOLLOWING PRECAUTIONS DURING LOADING/UNLOADING OPERATIONS OR SERIOUS INJURY OR DEATH TO PERSONNEL AND DAMAGE TO EQUIPMENT MAY OCCUR:

**WARNING**

- **Two ground guides (spotters) are required for disabled payload loading/unloading operations. The winch operator must maintain visual contact with the spotters at all times.**
- **If possible, provide ample clear space behind the disabled payload during loading/unloading in case the cables break while the payload is being loaded/unloaded.**
- **Make sure winch cables are not kinked, clevises are secured to winch cables, and snatch blocks and shackles are in good condition and properly secured.**
- **Extreme caution should be exercised during any operation on a slope.**
- **Hearing protection is required within 10 feet (3m) of the Auxiliary Power Unit (APU) when the APU is running. Use eye and ear protection and protective gloves when inspecting the APU while it is running or injury could result from moving parts, excessive noise level, and engine heat.**
- **Due to semitrailer being outfitted with various chains (1/2-inch and/or 3/4-inch link sizes), all chains must be inventoried in the platform storage compartment prior to placing chains on the platform. Once chains are inventoried, read and familiarize yourself with the procedures to determine tiedown needed to properly secure the payload.**
- **Always wear leather gloves when handling winch cable. Never allow cable to run through hands.**
- **Make sure winch cables are inspected in accordance with TB 43-0142.**
- **All ground personnel must stand clear of winch cables except when handling the cables.**
- **Extreme caution must be used when removing winch cables from the payload. Cable may be under tension or be twisted. If winch cable has tension when removed, slowly and carefully, using both hands, rotate cable to relieve tension. Do not allow cable to twist or whip freely.**
- **Make sure winch cable is disconnected from gooseneck fairlead before moving tractor/semitrailer combination or, as the combination is moved, winch cable can stretch and/or break.**
- **Do not position a ground guide (spotter) on the gooseneck if payload is to be backed onto semitrailer platform.**
- **Winch operator and ground guide (spotter) must be completely familiar with the sequence of steps prior to using winches.**

OBSERVE THE FOLLOWING PRECAUTIONS DURING LOADING/UNLOADING OPERATIONS OR SERIOUS INJURY OR DEATH TO PERSONNEL AND DAMAGE TO EQUIPMENT MAY OCCUR:

**WARNING**

- **Winch operator must try to maintain even tension on both winch cables during entire offloading procedure. Payload adjustments, side to side (turning), must be kept to a minimum. Ground guide (spotter) must notify winch operator of any required payload adjustments while unloading.**
- **Always extend safety rails while attaching or removing the payload winch cable.**
- **Do not disconnect the winch cable until the platform is level and the payload is chocked.**
- **When on top of the gooseneck, always hold onto semitrailer with one hand to avoid falling.**
- **Ground guide(s) (spotter(s)) must stand off curbside and/or streetside of semitrailer and maintain visual contact with the winch operator. Spotter(s) must observe cables, snatch blocks, shackles, and payload position during loading/unloading operations.**
- **During winch-on operations on a downgrade, the payload must be restrained from the rear with some other vehicle to prevent possible loss of control of the payload.**
- **Do not overload tractor winches. Know the ratings of the winches being used and the existence of any protection devices (such as shear pins).**

**LIST OF EFFECTIVE PAGES** Insert latest changed pages. Destroy superseded pages.

**NOTE**

The portion of the text effected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by a shadowed or screened area, or by miniature pointing hands.

Dates of issue for original and changed pages are:

Original .....7 August 2000                      Revision.....0

TOTAL NUMBER OF PAGES ON THIS PUBLICATION IS 108 CONSISTING OF THE FOLLOWING:

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TECHNICAL BULLETIN  
OPERATOR'S AND UNIT MAINTENANCE

FOR

SEMITRAILER, TRANSPORTER, HEAVY EQUIPMENT, 70 TON, M1000

WHEN LOADED WITH ABRAMS MAIN BATTLE TANK SERIES WITH MINE CLEARING BLADE ATTACHED

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can help improve this publication. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Submit your DA Form 2028-2 (Recommended Changes to Equipment Technical Publications), through the Internet, on the Army Electronic Product Support (AEPS) website. The Internet address is <http://aeprs.ria.army.mil>. If you need a password, scroll down and click on "ACCESS REQUEST FORM". The DA Form 2028 is located in the ONLINE FORMS PROCESSING section of the AEPS. Fill out the form and click on SUBMIT. Using this form on the AEPS will enable us to respond quicker to your comments and better manage the DA Form 2028 program. You may also mail, fax or E-mail your letter, DA Form 2028, or DA Form 2028-2 direct to: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CIP-WT, Rock Island, IL 61299-7630. The email address is TACOM-TECH-PUBS@ria.army.mil. The fax number is DSN 793-0726 or Commercial (309) 782-0726.

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## CHAPTER 1

### INTRODUCTION

<u>SECTION NO.</u>	<u>TITLE</u>
I.....	General Information
II.....	Operational and Maintenance Considerations

#### Section I. GENERAL INFORMATION

<u>PARA. NO.</u>	<u>TITLE</u>
1-1.....	Scope
1-2.....	Metric Units
1-3.....	List of Abbreviations
1-4.....	Equipment Data

#### 1-1. SCOPE

- 1-1.1. Type of Manual. Operator's and unit maintenance technical bulletin.
- 1-1.2. Model Number and Equipment Name. M1000 Heavy Equipment Transporter Semitrailer (HETS).
- 1-1.3. Purpose of Equipment. To load or unload and transport a battle-dressed Abrams Main Battle Tank (MBT) series with mine clearing blade attached onto the M1000 Heavy Equipment Transporter Semitrailer (HETS), able or disabled, with or without tracks, during administrative and tactical operations.

#### 1-2. METRIC UNITS

Metric units, in addition to English units, are included in this manual. An English-to-metric conversion table is included on the inside back cover of this manual.

#### 1-3. LIST OF ABBREVIATIONS

AAL	Additional Authorization List
APU	Auxiliary Power Unit
BII	Basic Issue Items List
CCW	Counterclockwise
CTA	Common Table of Allowances
CTIS	Central Tire Inflation System
CW	Clockwise
HETS	Heavy Equipment Transporter Semitrailer
JTA	Joint Table of Allowances
MBT	Main Battle Tank
MLC	Military Load Classification
MTOE	Modification Table of Organization and Equipment
PMCS	Preventive Maintenance Checks and Services
PTO	Power Takeoff
TDA	Table of Distribution and Allowances

**1-4. EQUIPMENT DATA**

**NOTE**

**Only equipment data elements which are different from those given in TM 9-2330-381-14 are given in this technical bulletin.**

**M1000 SEMITRAILER (WITH M1A2 MBT WITH MINE CLEARING BLADE ATTACHED)**

Weight (fully loaded) ..... 198,400 lbs (90,074 kg)

**Section II. OPERATIONAL AND MAINTENANCE CONSIDERATIONS**

<u>PARA. NO.</u>	<u>TITLE</u>
1-5.....	Operational Considerations
1-6.....	Maintenance Considerations

**1-5. OPERATIONAL CONSIDERATIONS**

**CAUTION**

**The Abrams MBT series with mine clearing blade attached exceeds the M1000 semitrailer design maximum payload weight. The heaviest of these payloads, the M1A2 MBT with mine clearing blade attached, exceeds the M1000 semitrailer design maximum payload weight by approximately 8,000 pounds (3,632 kg). In addition, when loading or unloading this special payload, the mine clearing blade will scrape the ground. Extreme caution is necessary to prevent damage to equipment.**

**To operate the M1000 semitrailer with the Abrams MBT series with mine clearing blade attached, semitrailer tire pressure must be increased, special loading and unloading procedures must be followed, maximum driving speeds must be reduced, and stopping distance must be increased to avoid damage to equipment.**

- a. Before loading the M1000 semitrailer with the Abrams MBT series with mine clearing blade attached, the tire pressure on all semitrailer tires must be increased to 100-110 psi (690-758 kPa).
- b. When loading the Abrams MBT series with mine clearing blade attached onto the M1000 semitrailer, the special loading and unloading procedures in Chapter 2 of this supplement must be followed carefully.
- c. When the Abrams MBT series with mine clearing blade attached is loaded onto the M1000 semitrailer, the following maximum driving speeds must be observed:
  - Highway ..... 40 mph (64 km/h)
  - Secondary ..... 35 mph (56 km/h)
  - Off-road..... 10 mph (16 km/h)
- d. When the Abrams MBT series with mine clearing blade attached is loaded onto the M1000 semitrailer, separation distance in convoys must be increased to account for the greater stopping distance required resulting from the increased weight.

- e. The Military Load Classification (MLC) for the vehicle with payload is raised from 96 to 101. The special vehicle classification data plate must be installed per Chapter 2.

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**1-6. MAINTENANCE CONSIDERATIONS**

**WARNING**

**Brake adjustment must be checked before each mission when operating the M1000 semitrailer with the Abrams MBT series with mine clearing blade attached or braking will be uneven causing serious injury or death to personnel.**

- a. Before each mission with the M1000 semitrailer loaded with the Abrams MBT series with mine clearing blade attached, check that brakes are in adjustment in accordance with TM 9-2330-381-14, Unit Preventive Maintenance Checks and Services (PMCS). If adjustment is required, perform brake adjustment before loading the special payload.
- b. If the same M1000 semitrailers are used to transport the Abrams MBT series with mine clearing blade attached on a recurring basis, the following Unit PMCS inspection intervals (TM 9-2330-381-14) must be decreased (inspected more frequently):

<u>Inspection</u>	<u>Interval</u>
Ultra bushing	Semiannual
Wheel bearing	Semiannual
Suspension spindle bearing	Semiannual
Platform weldment	Semiannual

**CHAPTER 2**  
**OPERATING INSTRUCTIONS**

<u>PARA NO.</u>	<u>TITLE</u>
2-1 .....	GENERAL
2-2 .....	LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED
2-3 .....	DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED

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**2-1. GENERAL**

This chapter contains the instructions for loading and unloading the Abrams Main Battle Tank (MBT) series with mine clearing blade attached onto the M1000 Heavy Equipment Transporter Semitrailer (HETS). Paragraph 2-2 contains the procedures for loading and unloading when the MBT can be driven onto the platform. Paragraph 2-3 contains the procedures for loading and unloading when the MBT is disabled and must be pulled onto the platform using the M1070 Tractor winches.

**NOTE**

**Throughout this technical bulletin, the terms used to describe areas and parts of the semitrailer, and their location relative to each other, are referenced as follows:**

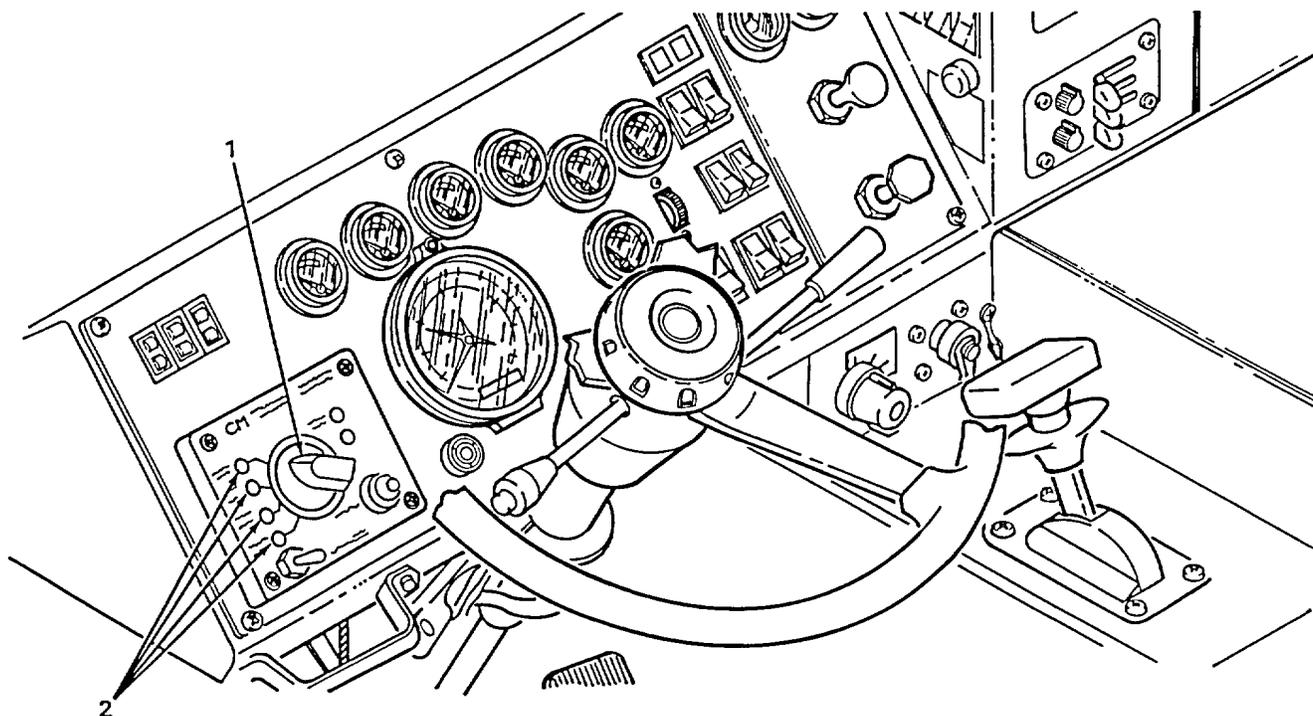
**When a person stands at the loading ramp end (rear) of the semitrailer looking toward the gooseneck on the forward (front) end of the semitrailer, the side on the left is designated as the "streetside" and the side on the right is designated as the "curbside". Locations of areas and items on or under the semitrailer platform will be identified as inboard (toward or nearest the center of the platform) or outboard (farthest from the center). For example, the hydraulic operating controls and gages are located on the curbside of the semitrailer under the front corner of the platform. The crowbar is mounted at the rear of the platform.**

**Since the payload is loaded backward (rear of the payload first), special care is taken to describe locations at the front of the payload (where the driver's compartment is) and at the rear of the payload (where the engine exhaust is).**

**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED****NOTE**

The following procedures provide instructions for loading an able payload (Abrams MBT series with mine clearing blade attached) onto the M1000 semitrailer. The M1070 tractor is illustrated as the prime mover throughout these instructions. If other prime movers are used, these procedures will need to be changed significantly.

- a. Loading an able payload. To load an able payload, proceed as follows:
- (1) Inflate all semitrailer tires to 100 to 110 psi (690 to 758 kPa).
  - (2) Start tractor per TM 9-2320-360-10.
  - (3) On tractor, set Central Tire Inflation System (CTIS) switch (1) to setting for expected road/terrain conditions and allow tractor to sit until selected CTIS indicator (2) remains lit for that CTIS setting.



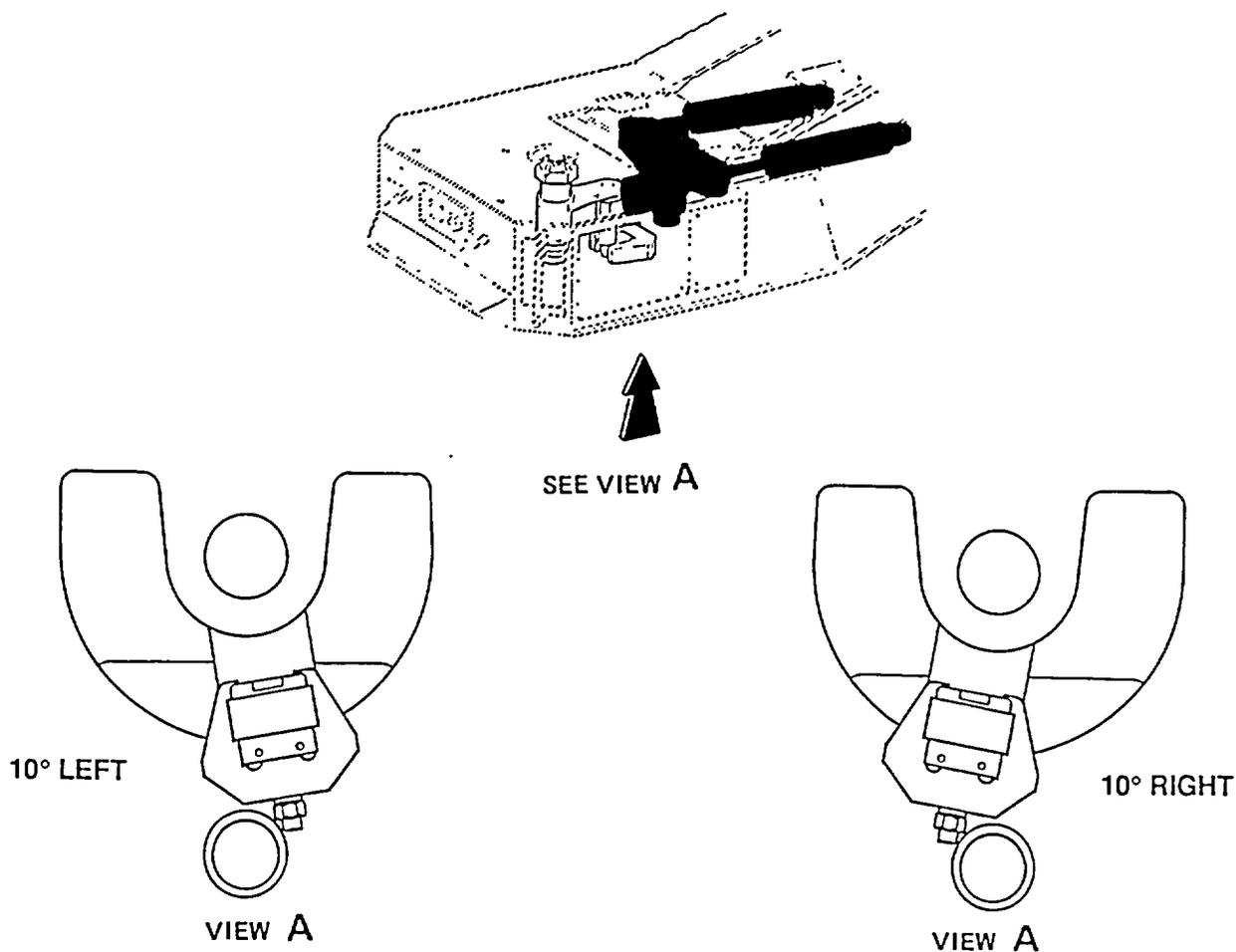
**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (4) Couple tractor to semitrailer per TM 9-2330-381-14.

**WARNING**

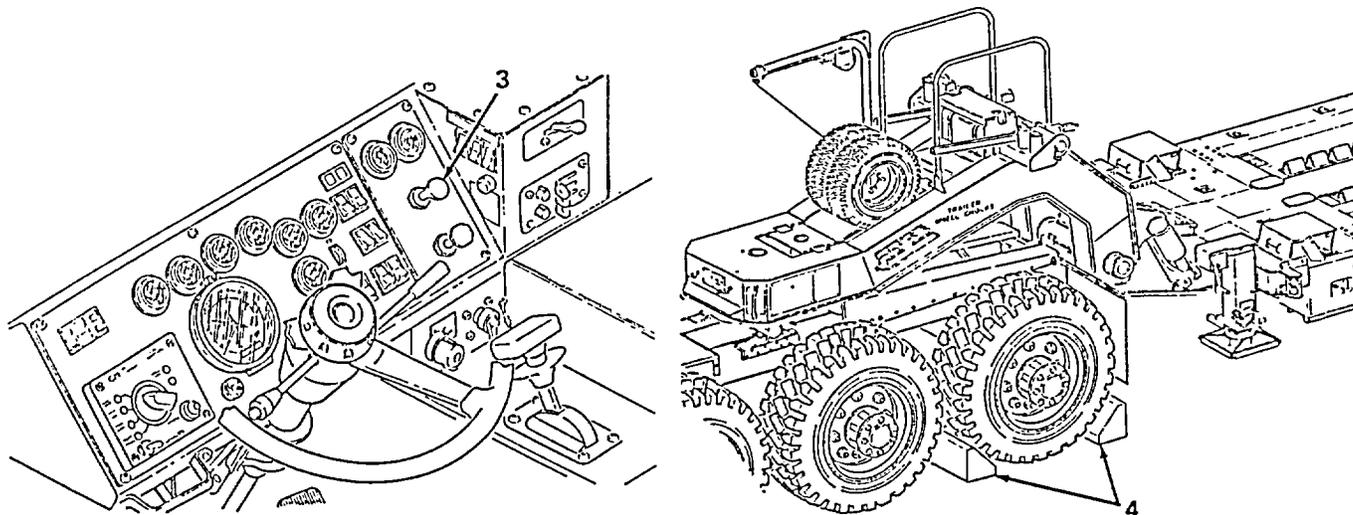
**Load semitrailer on level ground whenever possible. In adverse conditions, loading can be done on grades up to 10 percent with a maximum offset angle of 10 degrees between tractor and semitrailer. Avoid exceeding these limitations to prevent payload from rolling on semitrailer and causing serious injury or death to personnel and damage to equipment.**

- (5) Aline back of tractor/semitrailer combination as close as possible to back of payload, approximately 15 feet (4.6m), on ground as level as possible.
- (6) Visually check tractor/semitrailer offset angle by having ground guide (spotter) check relationship between steering wedge bolt and weld circle at bottom rear of pickup plate. If inside edge of bolt alines with outside edge of weld circle, offset angle is 10 degrees. Make any required adjustments to tractor.



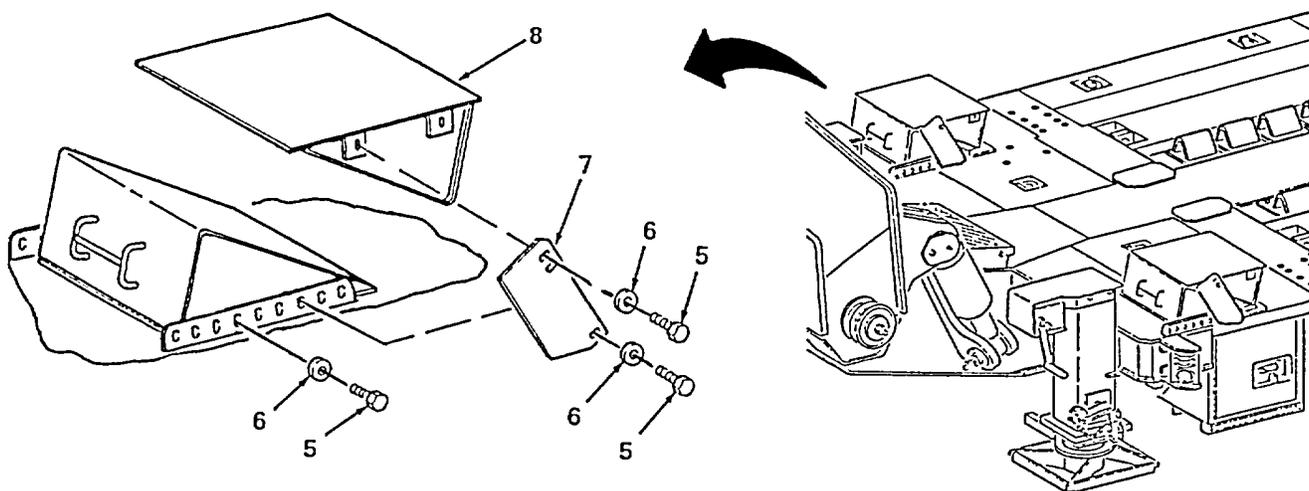
(7) Apply tractor parking brakes by pulling out parking brake valve (3).

(8) Remove four wheel chocks (4) from stowage on tractor and chock wheels on both sides of tractor.



(9) Remove 10 capscrews (5), washers (6), and 4 sheets (7) from 2 payload chocks (8).

(10) Remove two payload chocks (8) from platform.

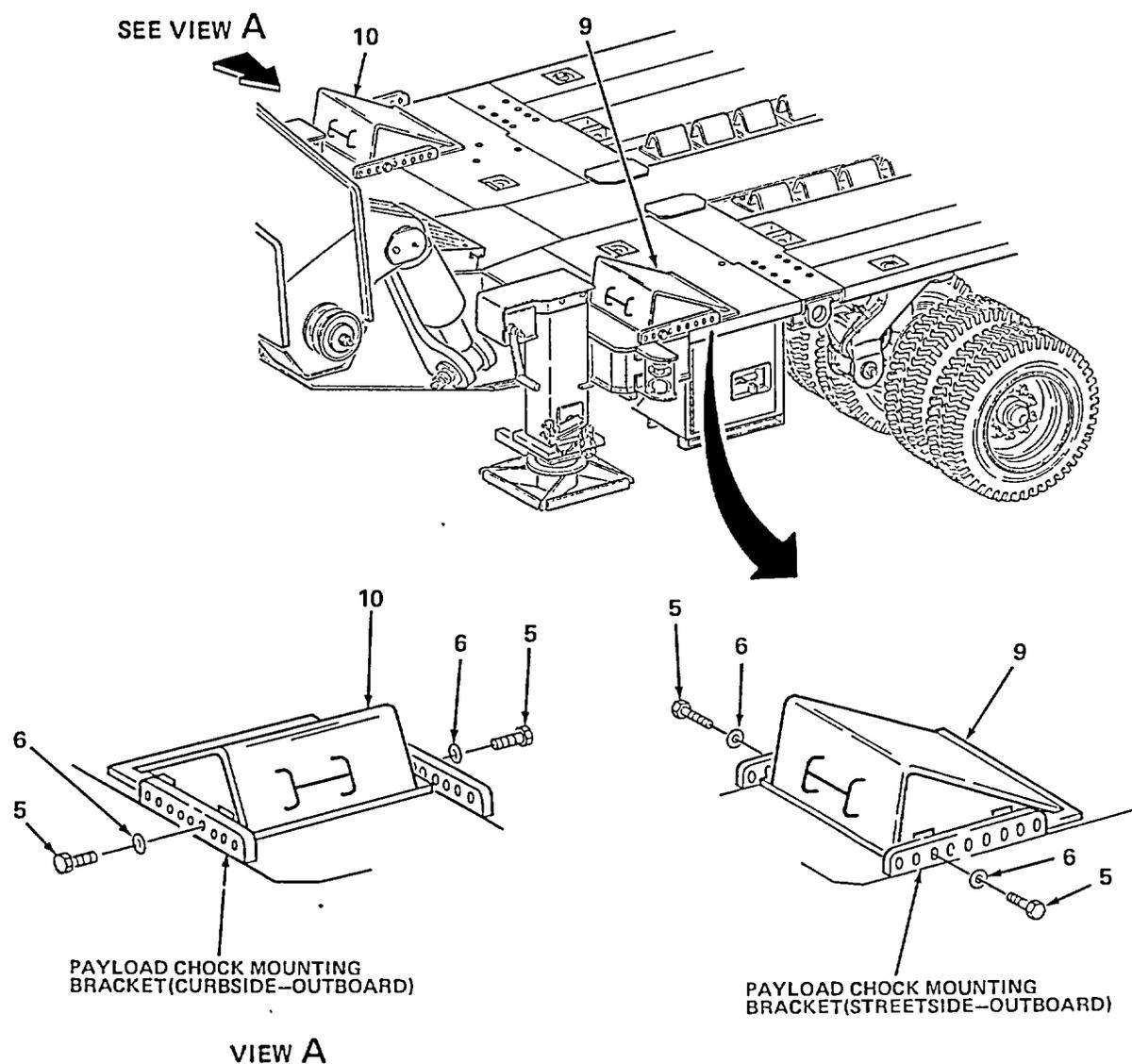


## 2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)

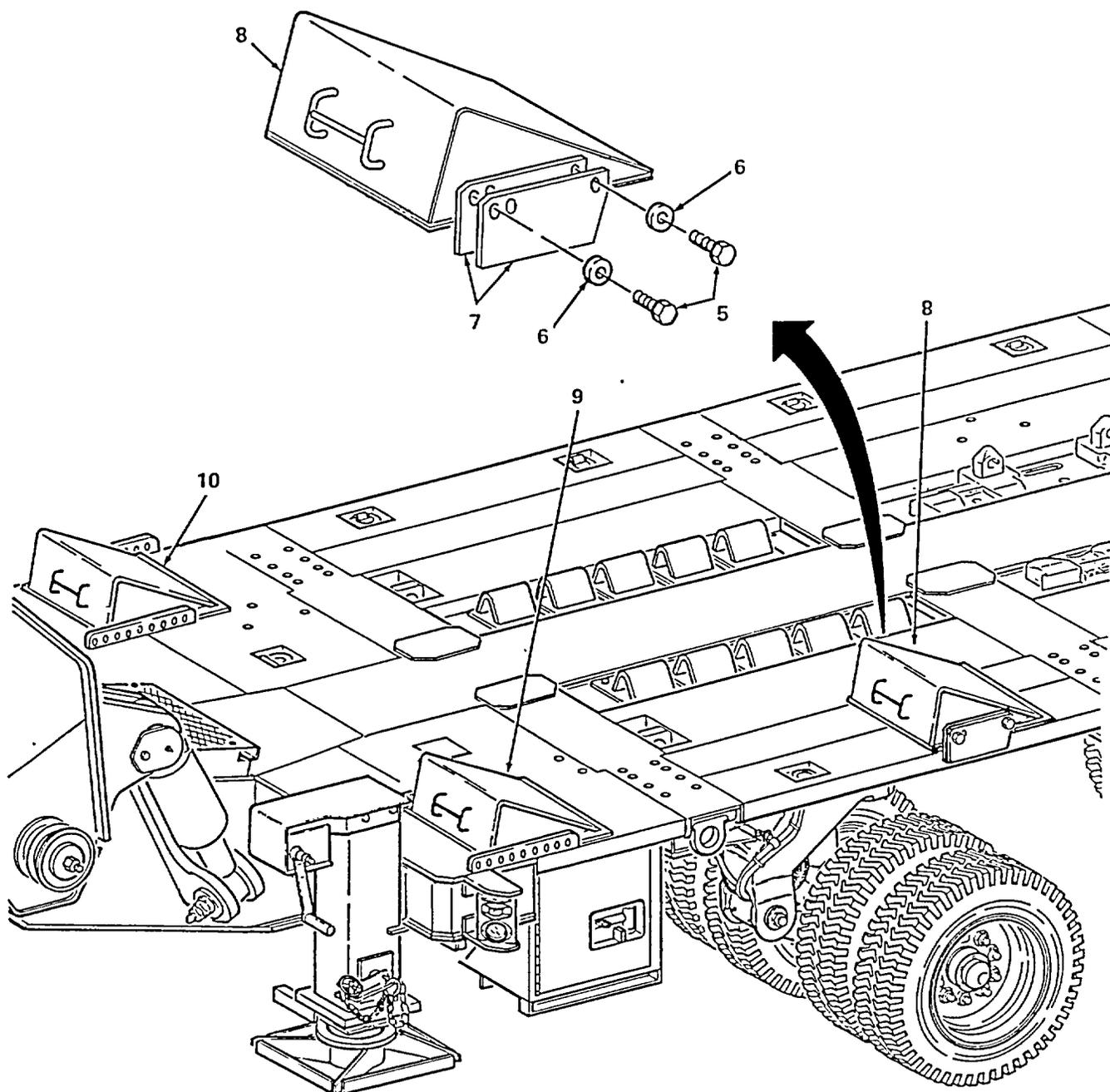
## NOTE

Prior to loading, front payload chocks must be adjusted to accommodate the offset of rear road-wheels on the MBT, and the MBT braking system must be released.

- (11) Position streetside front payload chock (9) between mounting brackets and align forward mounting holes of payload chock (9) with third hole from front of outboard payload chock mounting brackets on platform.
- (12) Position curbside front payload chock (10) between mounting brackets and align forward mounting holes of payload chock (10) with fourth hole from front of outboard payload chock mounting brackets on platform.
- (13) Secure front payload chocks (9 and 10) to mounting brackets at front of platform with two capscrews (5) and washers (6).

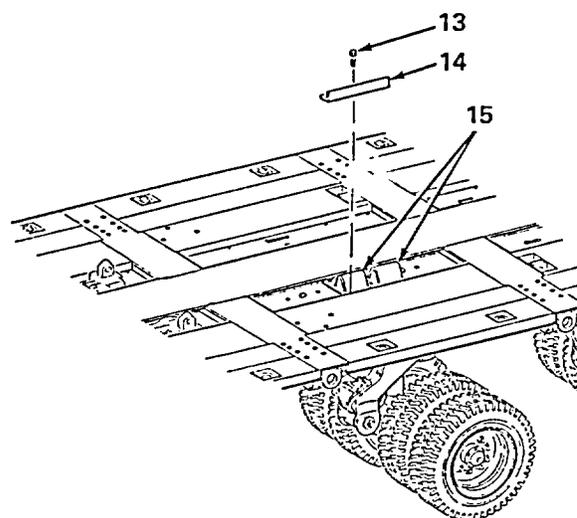
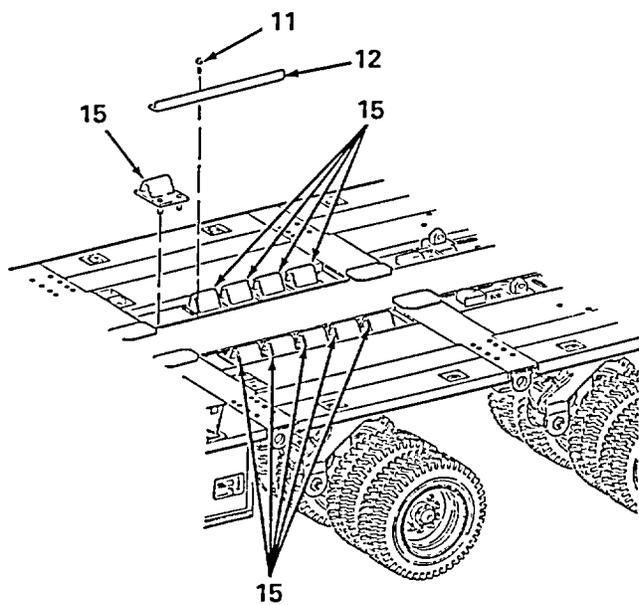


- (14) Assemble two sheets (7) to outboard side of each of two free payload chocks (8) using four capscrews (5) and washers (6).
- (15) Position one free payload chock (8) on streetside of platform over first bogie. Position second free payload chock (8) on ground at streetside of semitrailer.



**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

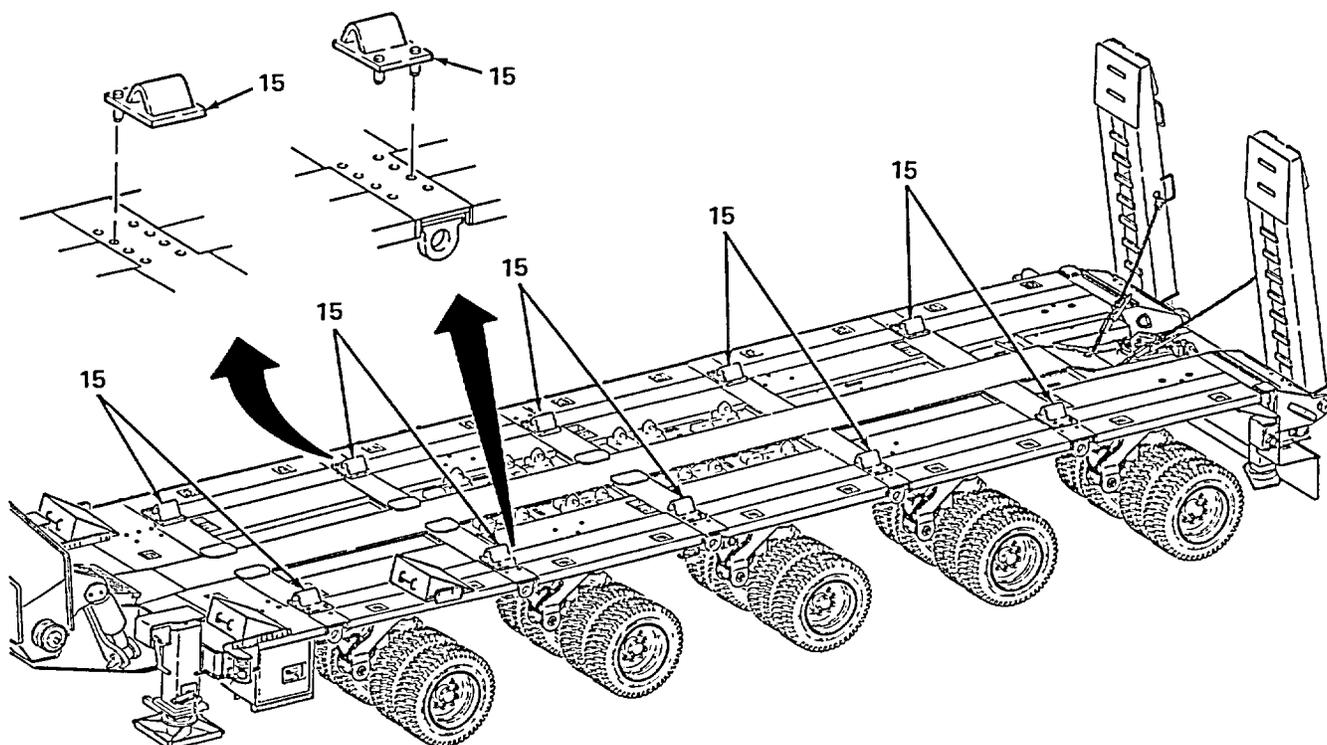
- (16) From forward recessed area on platform, remove two capscrews (11) and curb guide stowage brackets (12).
- (17) From aft recessed area on platform, remove capscrew (13) and curb guide stowage bracket (14).
- (18) Remove all 12 curb guides (15) from stowage points on platform.
- (19) Install two curb guide stowage brackets (12) and capscrews (11) in forward recessed area on platform.



**NOTE**

**Two curb guides will be installed on beavertail after the loading ramps are lowered.**

- (20) Install 10 curb guides (15) (five on each side) into second hole inboard from platform edge (pin side facing outboard from center of platform).
- (21) Set two remaining curb guides (15) aside until ramps are lowered.



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**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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**CAUTION**

Ensure that chains are positioned inboard of both curbside and streetside curb guides or damage to equipment may occur when payload is loaded.

Chains may vary slightly in length. Ensure that chains used at front of semitrailer are the same length and are properly laid out or payload may contact gooseneck and cause damage to equipment.

**NOTE**

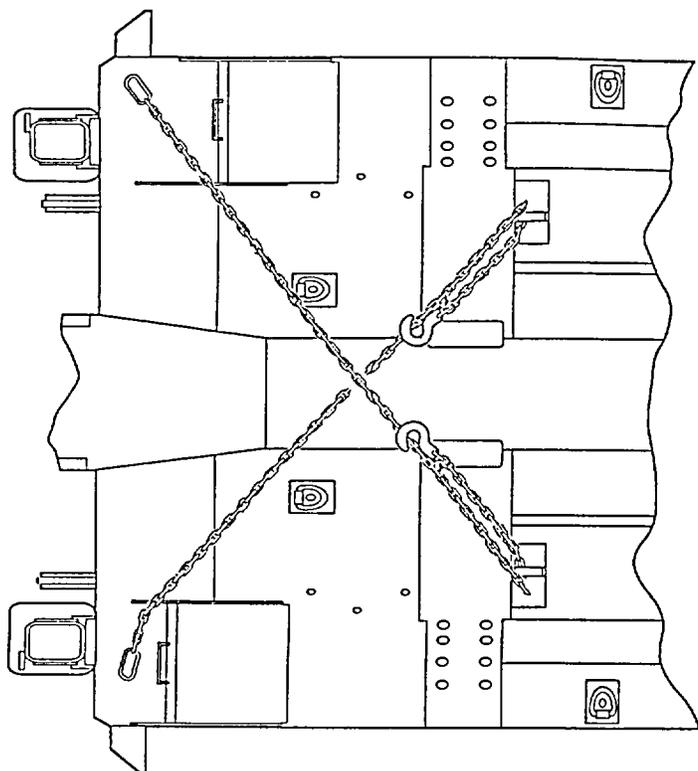
Some early semitrailers were issued with 3/4-inch link size chains of different lengths than the 1/2-inch link size chains on most semitrailers. This procedure describes tiedown with 1/2-inch link size chains only.

This procedure requires four 25-ton shackles, two additional 19-foot (5.8m) chains, two additional 11-foot (3.4m) chains, and Military Load Classification (MLC) data plate not authorized in TM 9-2330-381-14 Basic issue Item (BII) List. These items must be acquired through Additional Authorization List (AAL), Appendix B, of this technical bulletin.

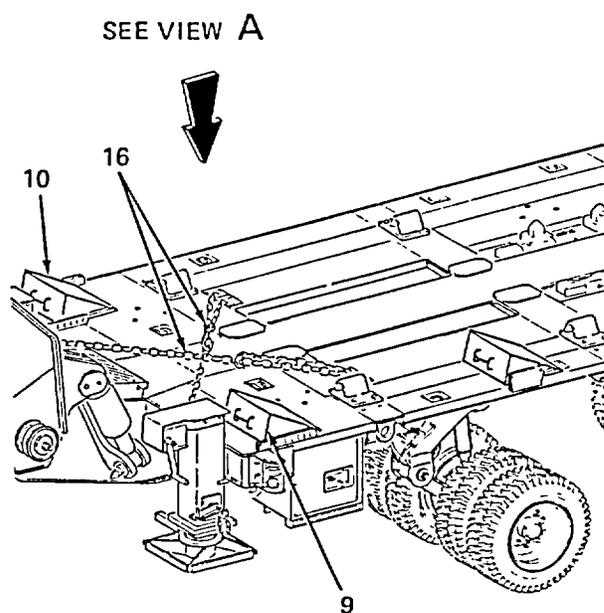
With chains crossed so chain from streetside tiedown ring crosses over chain from curbside tiedown ring, oval end links of both chains should be in front of outboard edge of payload chocks.

(22) Arrange payload tiedown chains as follows:

- (a) Select two 11-foot (3.4m) tiedown chains (16) and loop through two front tiedown rings recessed in platform.
- (b) Hook tiedown chains (16) to themselves such that both chains have 39 links between hook and oval end link.
- (c) Position tiedown chains (16) so oval end links are in front of outboard edge of front payload chocks (9 and 10).
- (d) Lay tiedown chains (16) so they are crossed near front of platform with chain from streetside tiedown ring over chain from curbside tiedown ring.



VIEW A

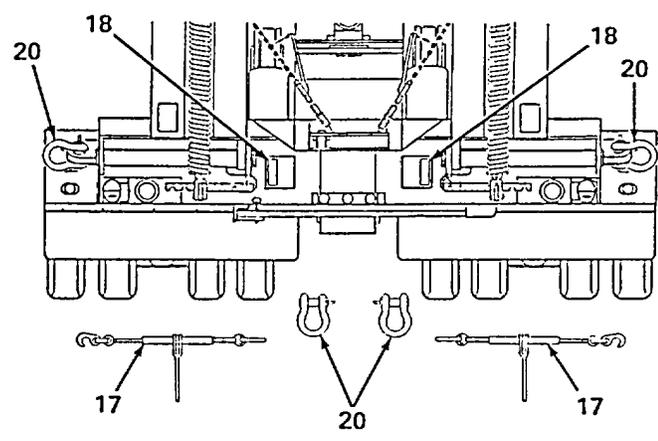
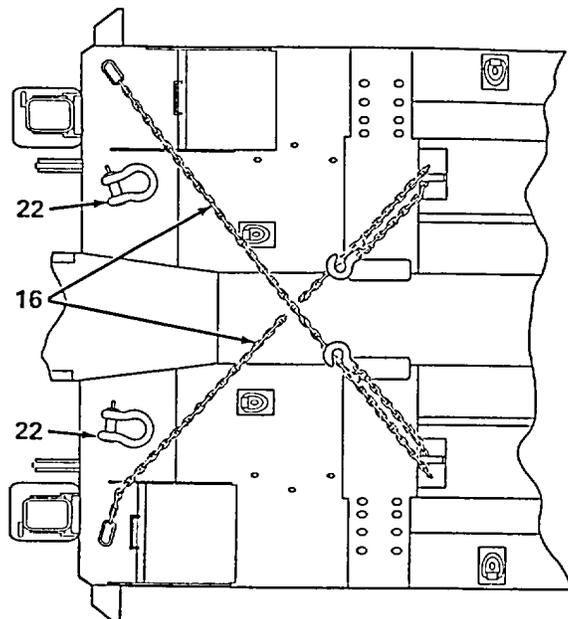
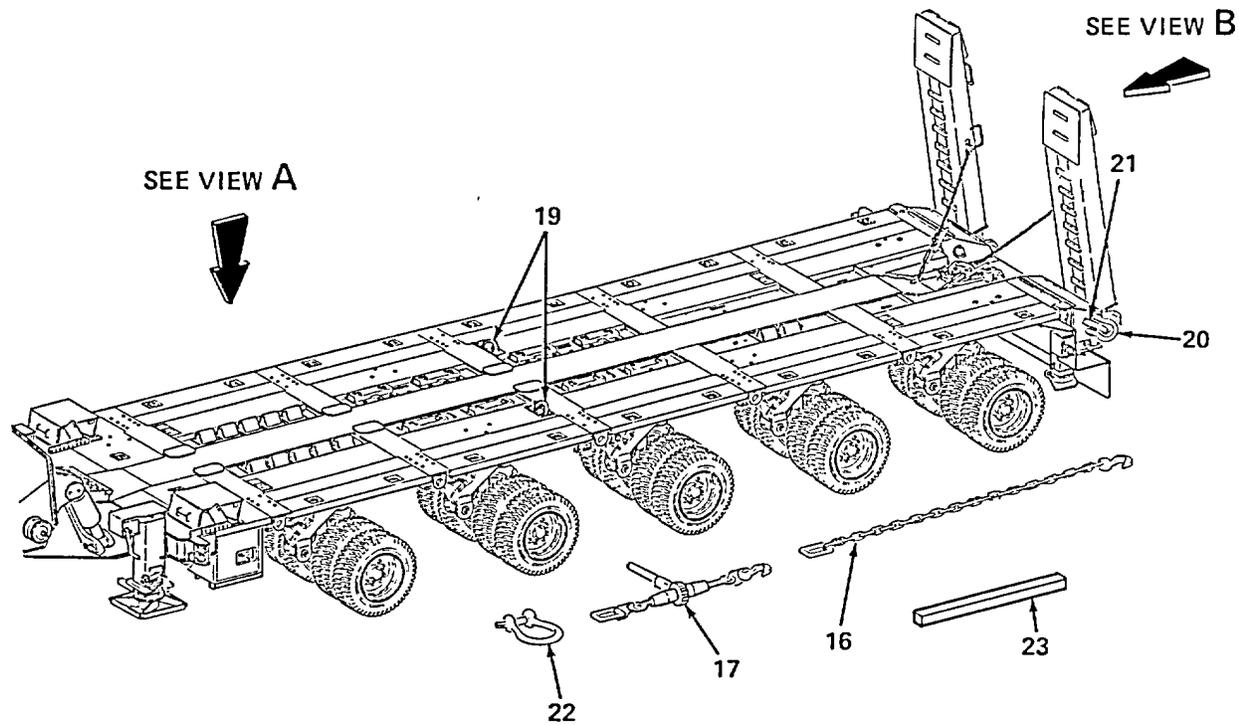


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**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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- (e) Extend four load binders (17) to show approximately 6.5 inches (16.5 cm) of thread on both ends.
- (f) Position two load binders (17) on ground near rear recovery eyes (18).
- (g) Position other two load binders (17) on ground on each side of platform near #4 bogey position.
- (h) Select two towing shackles (19) and four 25-ton (1-3/4-inch diameter) shackles (20).
- (i) Install two towing shackles (19) in center tiedown rings in platform.
- (j) Install two 25-ton shackles (20) in lifting eyes (21) at outside rear of semitrailer.
- (k) Position remaining two 25-ton shackles (20) with load binders (17) at end of platform near rear recovery eyes (18).
- (l) Select four payload tiedown shackles (22).
- (m) Position two payload tiedown shackles (22) at front of platform near oval end link of front tiedown chains (16).
- (n) Position remaining two payload tiedown shackles (22) on ground near load binders (17) at #4 bogey positions.
- (o) Locate two 4-inch x 4-inch x 4-foot (10.2 cm x 10.2 cm x 1.2m) (may be larger but not longer) timbers (23) and position on ground near payload tiedown shackles (22) and load binders (17).
- (p) Select two additional 11-foot (3.4m) tiedown chains (16) and position on ground alongside #4 and #5 bogey positions with oval end link near load binders (17) and hook end near rear lifting eyes (21). Do not connect.

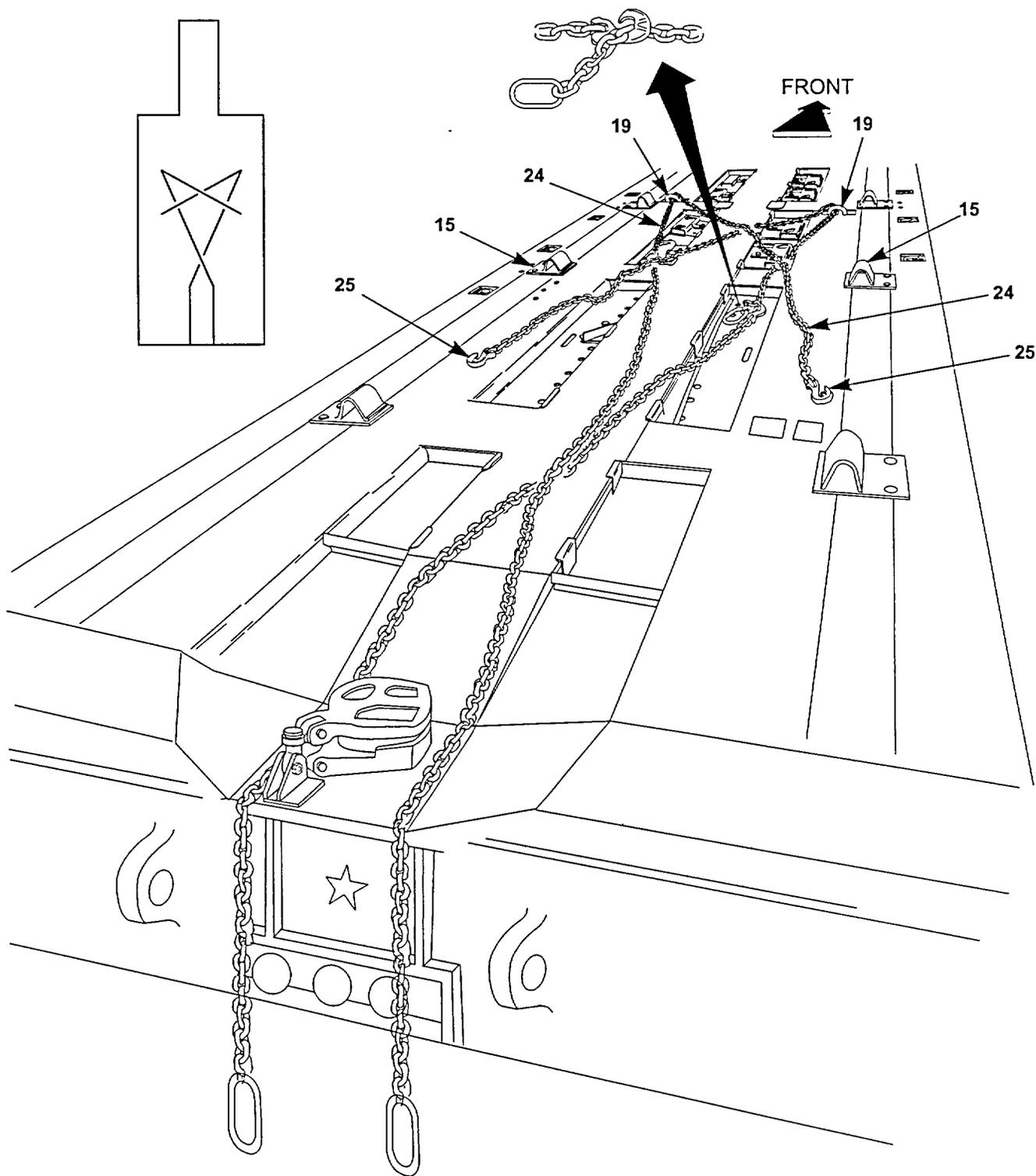


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**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

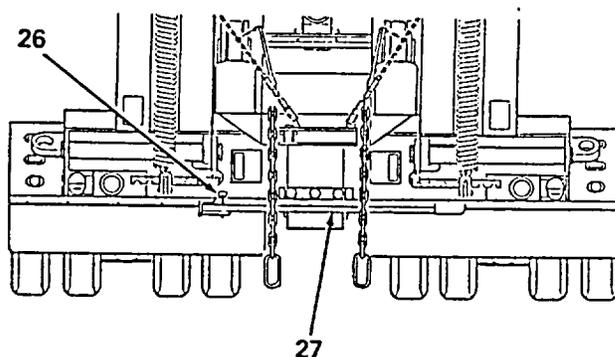
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- (q) Select four 19-foot (5.8m) tiedown chains (24) and lay out as follows:
1. Connect two 19-foot (5.8m) chains (24) together with hook of one near oval end link of other to make one long chain (24).
  2. Position free oval end link over rear of platform near streetside rear tow lug.
  3. Route long chain (24) forward through towing shackle (19) in curbside center tiedown ring. Ensure that hook end of chain (24) goes over top of shackle and oval link end is under shackle flat on platform.
  4. Route long chain (24) across center of platform and back until free hook (25) is near streetside rear tiedown ring. Ensure that all of chain (24) is positioned inboard of track curb guides (15) positioned on platform.
  5. Connect remaining two 19-foot (5.8m) chains (24) together with hook of one near oval end link of other to make a second long chain (24).
  6. Position free oval end link over rear of platform near curbside rear tow lug.
  7. Route long chain (24) forward over top of chain (24) positioned in steps 1 thru 4 above and through towing shackle (19) in streetside center tiedown ring. Ensure that hook end of chain (24) goes over top of shackle and oval link end is under shackle, flat on platform.
  8. Route long chain (24) across center of platform and back until free hook (25) is near curbside rear tiedown ring. Ensure that all of chain (24) is positioned inboard of track curb guides (15) positioned on platform.

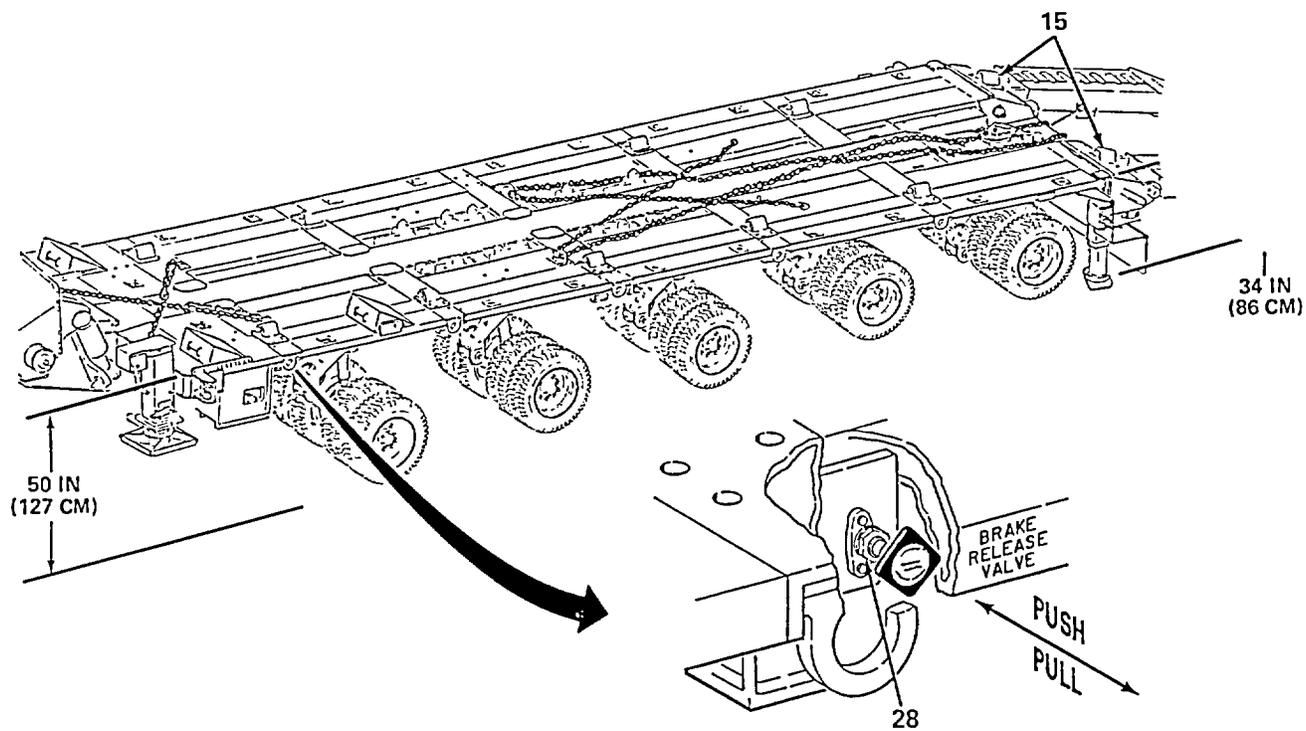


**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (23) Remove hitch pin (26) and crowbar (27) from rear of semitrailer below loading ramps. Reinstall hitch pin (26).



- (24) Raise ramps perpendicular to platform and adjust ramp span width fully outboard per TM 9-2330-381-14.
- (25) Start and run Auxiliary Power Unit (APU) per TM 9-2330-381-14.
- (26) Release semitrailer parking brakes by pushing inward on knob of brake release valve (28).
- (27) Adjust platform height per TM 9-2330-381-14 to loading position as follows:
- Raise front of semitrailer to 50 inches (127 cm), top mark on crowbar.
  - Lower rear of semitrailer to approximately 34 inches (86 cm), bottom mark on crowbar.
  - Lower rear support legs until feet are in firm contact with ground. Turn adjusting nut, as necessary, to position socket head screw outboard and close cover.
- (28) Unhook loading ramp stow chains and lower loading ramps to ground per TM 9-2330-381-14.
- (29) Apply semitrailer parking brakes by pulling outward on knob of brake release valve (28).
- (30) Aline and install two curb guides (15) into second hole inboard from platform edge at beavertail just in front of each loading ramp. Ensure that pin side of each curb guide (15) faces outward from center of platform.



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**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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**WARNING**

**Two ground guides (spotters) are required for loading operations. The payload operator must know the position of spotters at all times or serious injury or death to personnel may occur.**

**Do not allow ground guide (spotter) to be directly behind payload as payload is backed onto semitrailer platform. Payload exhaust is extremely hot and may cause serious injury to personnel.**

(31) Position two spotters as follows:

- (a) Position first spotter in front of payload facing forward. Spotter must be in constant visual contact with payload operator and second spotter.
- (b) Position second spotter near curbside rear of payload to observe alinement of payload tracks with semitrailer ramps/curb guides. Spotter must be in constant visual contact with first spotter located at front of payload facing payload operator.

**CAUTION**

**Ensure that all chains on platform are inboard of the curb guides and are clear of the payload tracks or damage to equipment may occur.**

- (32) Start and warm payload. Ensure that mine clearing blade tines are raised and locked in the travel position and dog-bone is resting on skids per TM 9-2590-509-10.
- (33) Aline payload to semitrailer prior to loading (center of payload to center of semitrailer).

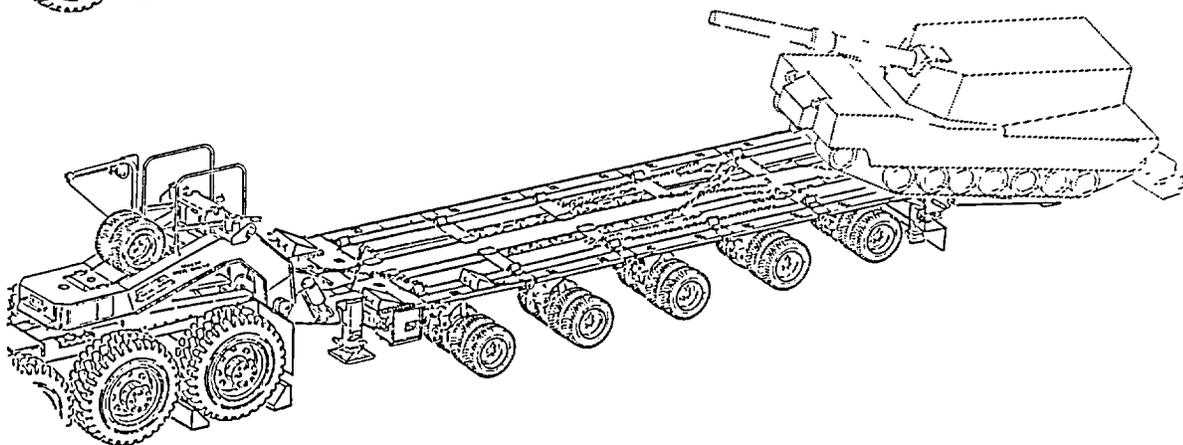
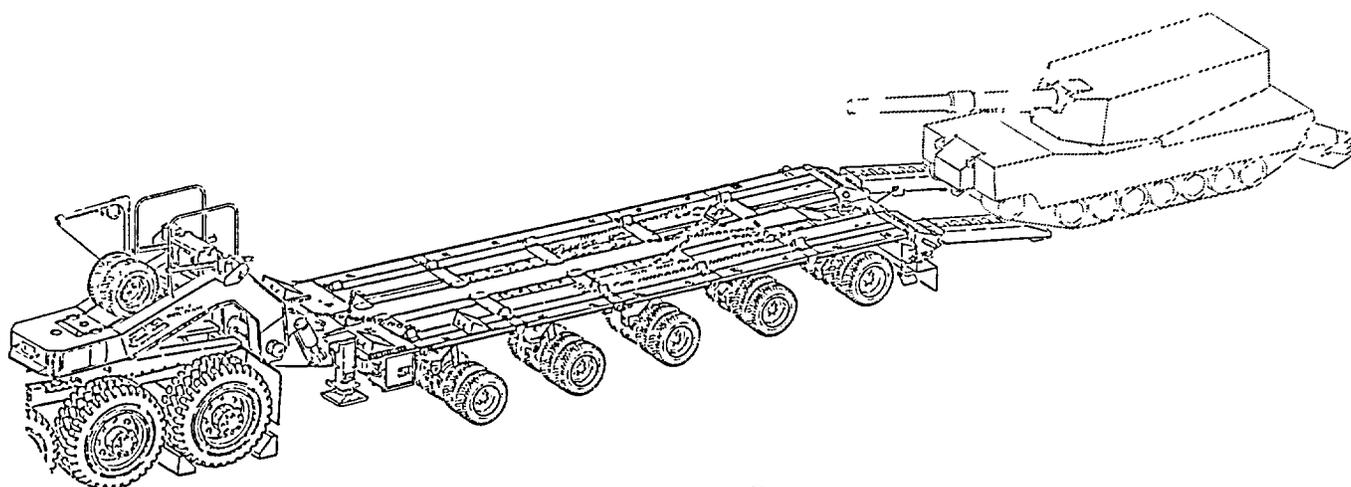
**WARNING**

**Personnel other than winch operator and ground guide (spotter) must stand well clear of the vehicles, especially behind the payload (engine/turbine exhaust) during loading operations. No personnel should be on the semitrailer platform while the payload is moving at any time during any loading operations. The payload operator must back the payload slowly up the loading ramps and onto the platform or serious injury or death to personnel and damage to equipment may occur.**

**Payload adjustments, side to side (turning), must be kept to a minimum or serious injury to personnel and damage to equipment may occur.**

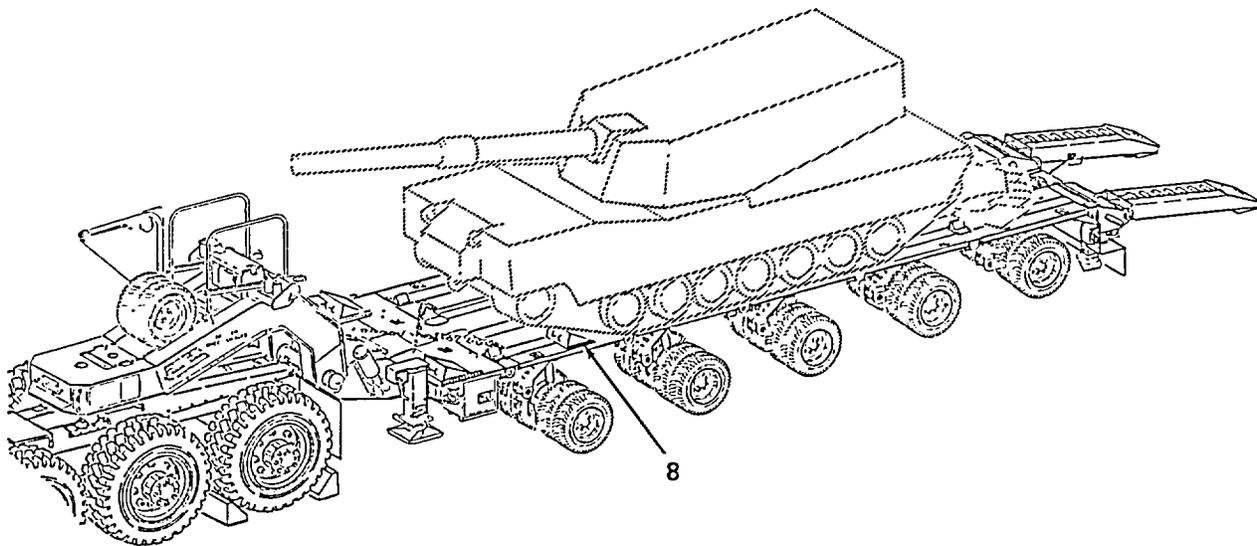
**Mine clearing blade tines will contact ground as payload is backed onto ramps. Personnel must remain well clear and backing must be performed slowly to prevent serious injury to personnel and damage to equipment.**

- (34) Using hand signals, front spotter must signal payload operator to back payload slowly up onto platform. Curbside spotter must notify front spotter of any required payload adjustments while loading.
- (35) Payload operator back payload onto ramps and platform.



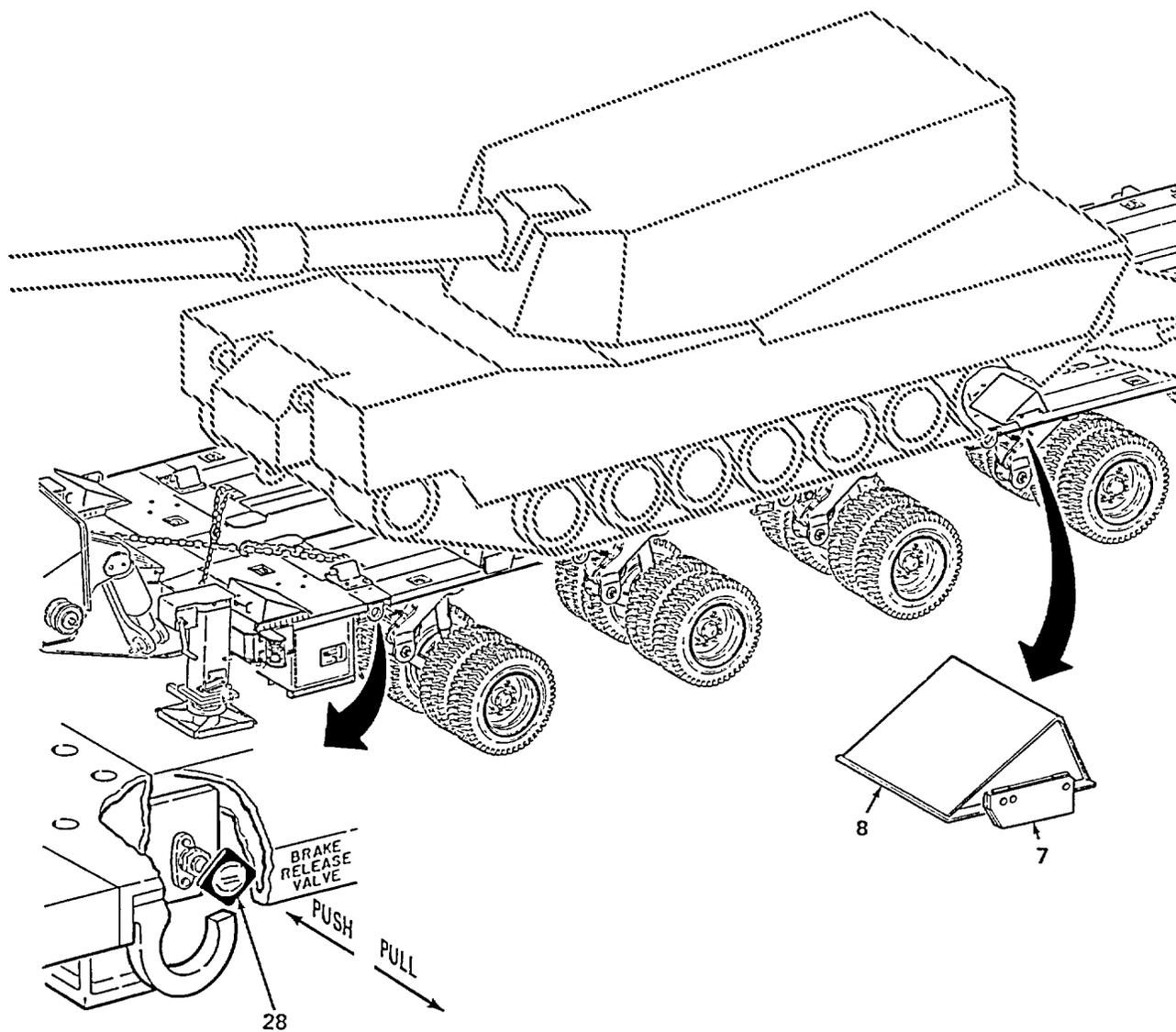
**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (36) Front spotter must guide payload operator until payload has made firm contact with free payload chock (8) on streetside of platform.

**WARNING**

**Failure to set the payload parking brake could allow the payload to roll causing serious injury to personnel and damage to equipment.**

- (37) Payload operator apply payload parking brake.
- (38) Chock streetside front of payload with second free payload chock (8) with two sheets (7) attached. Ensure that sheets (7) are positioned flush against side of platform to prevent inward shifting of payload chocks (8).
- (39) Adjust platform to normal running height as follows:
- Release semitrailer parking brakes by pushing inward on knob of brake release valve (28).
  - Adjust platform height to normal running height of 43 inches (109 cm) per TM 9-2330-381-14.
  - Using bed height indicators, check each corner of platform for height of 43 inches (109 cm).
  - Apply semitrailer parking brakes by pulling outward on knob of brake release valve (28).



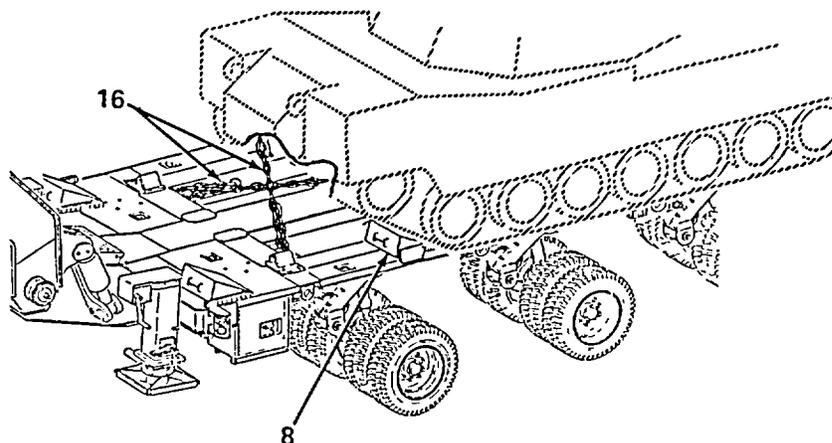
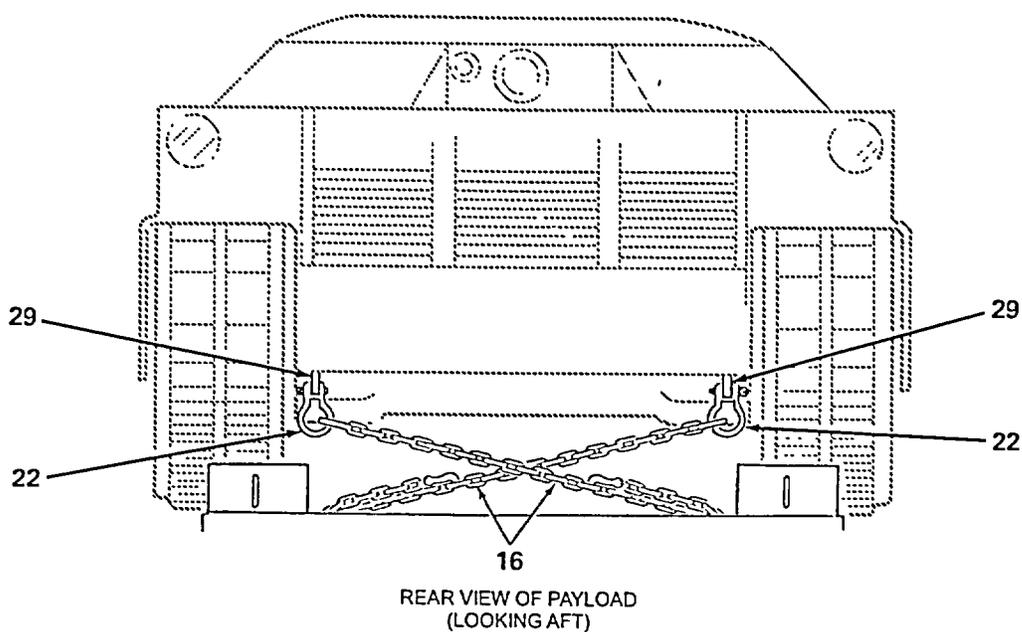
**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (40) Using two payload tiedown shackles (22) attach two front tiedown chains (16) to two rear tow lugs (29) on payload.

**NOTE**

It may be necessary to release the payload parking brake, move the free payload chock under streetside front of payload track approximately 12 inches (30 cm) toward rear of platform, and move the payload slightly toward rear of platform to remove free payload chock from rear of payload track.

- (41) Remove free payload chock (8) from streetside rear of payload.



- (42) Using hand signals, front spotter signal payload operator to back payload slowly until front tiedown chains (16) are tight and payload tracks (rear road-wheels) are firmly on secured front payload chocks (9 and 10).

**WARNING**

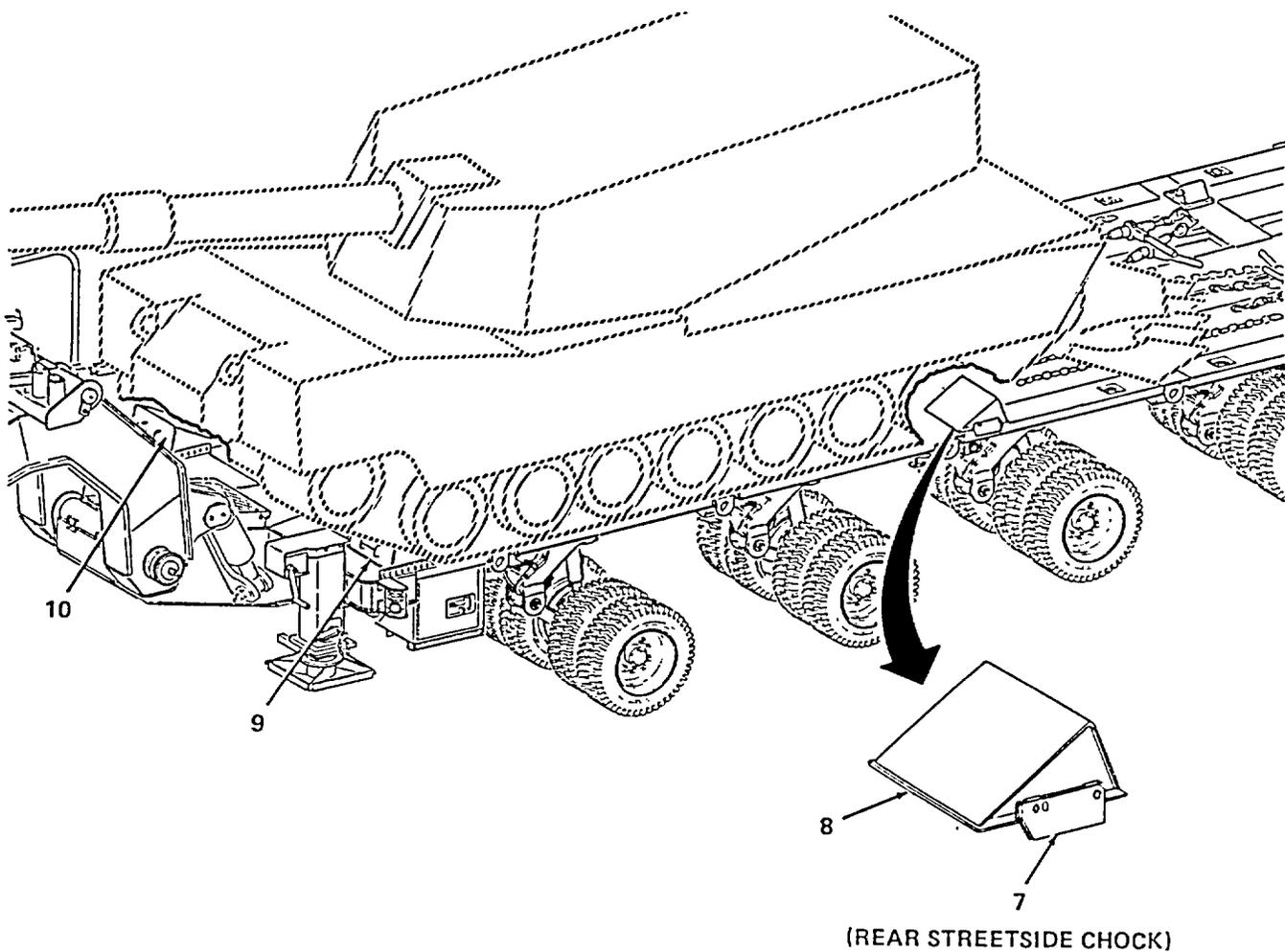
**Failure to set the payload parking brake could allow the payload to roll causing serious injury to personnel and damage to equipment.**

- (43) Payload operator apply payload parking brake.

**NOTE**

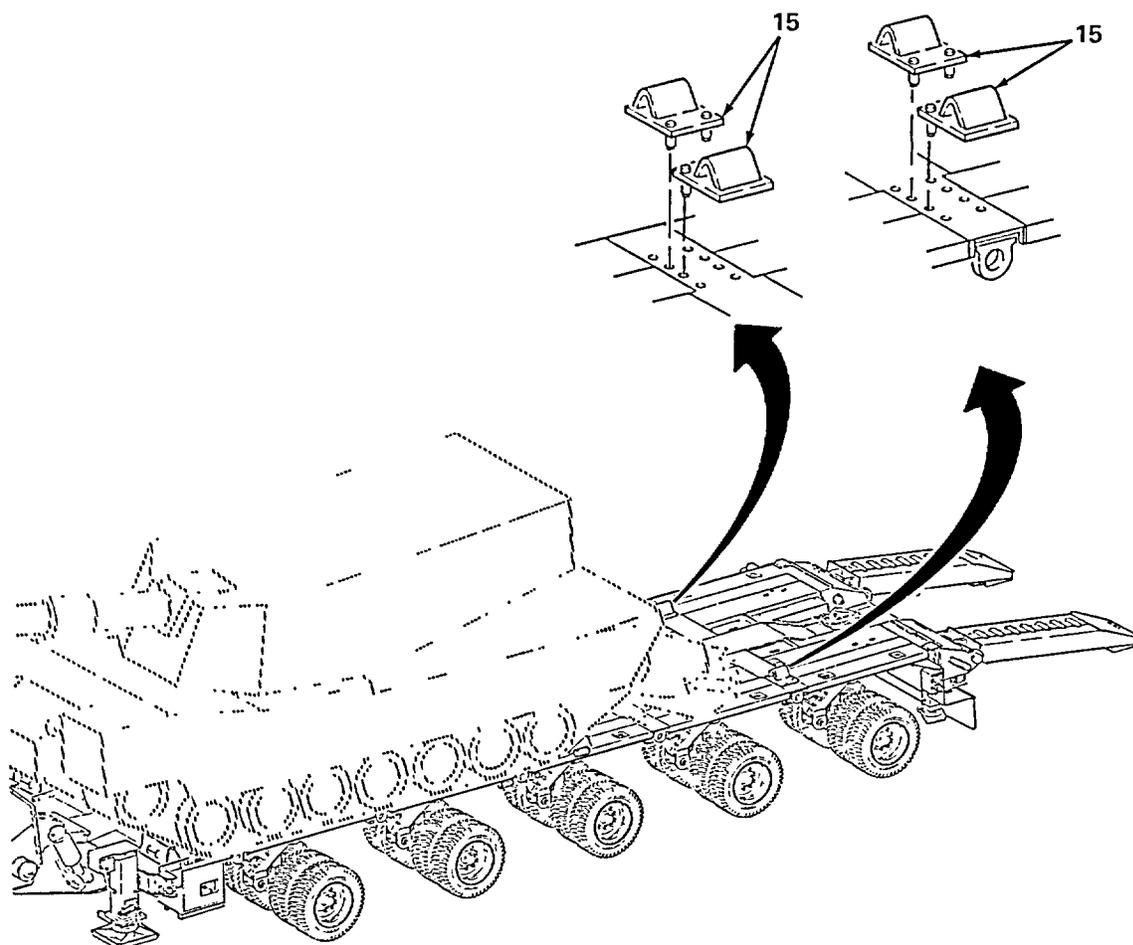
**Install free payload chocks with sheets positioned flush against side of platform to prevent inward shifting of chocks.**

- (44) Place both free payload chocks (8), with sheets (7) attached, to front curbside and streetside of payload.



**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (45) Rotate two curb guides (15) at rear of platform to second pin holes with pin side facing inboard.
- (46) Install two curb guides (15) from between #4 and #5 bogies next to rearmost curb guides (15) with pins in third pin hole set with pin side facing outboard from center.

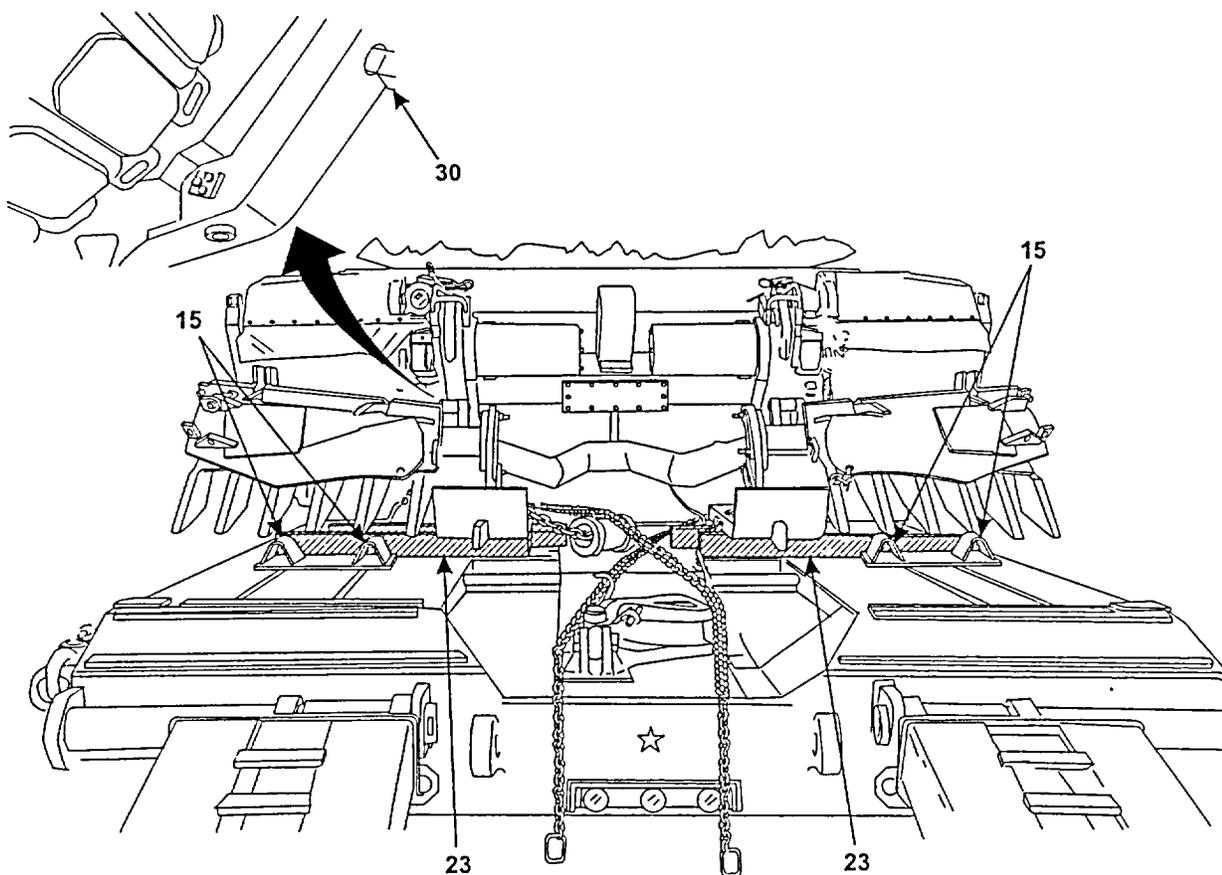


- (47) Place one timber (23) on each side of platform against curb guides (15) and under mine clearing blade inboard of third tine from outboard edge of mine plow.
- (48) Ensure that chain hooks are forward of timbers (23) and that cargo (not payload) tiedown rings are not covered by timbers (23).
- (49) Payload operator lower mine clearing blade tines onto timbers (23).
- (50) Shut down payload.

**CAUTION**

**Adjustment bolts in the mine clearing blade mounting frame must be tight against the front of the payload to ensure that the mine clearing blade is mounted firmly to the payload. Otherwise, damage to equipment may occur.**

- (51) On both sides of payload, verify that mine clearing blade mounting frame adjustment bolts (30) are tight.



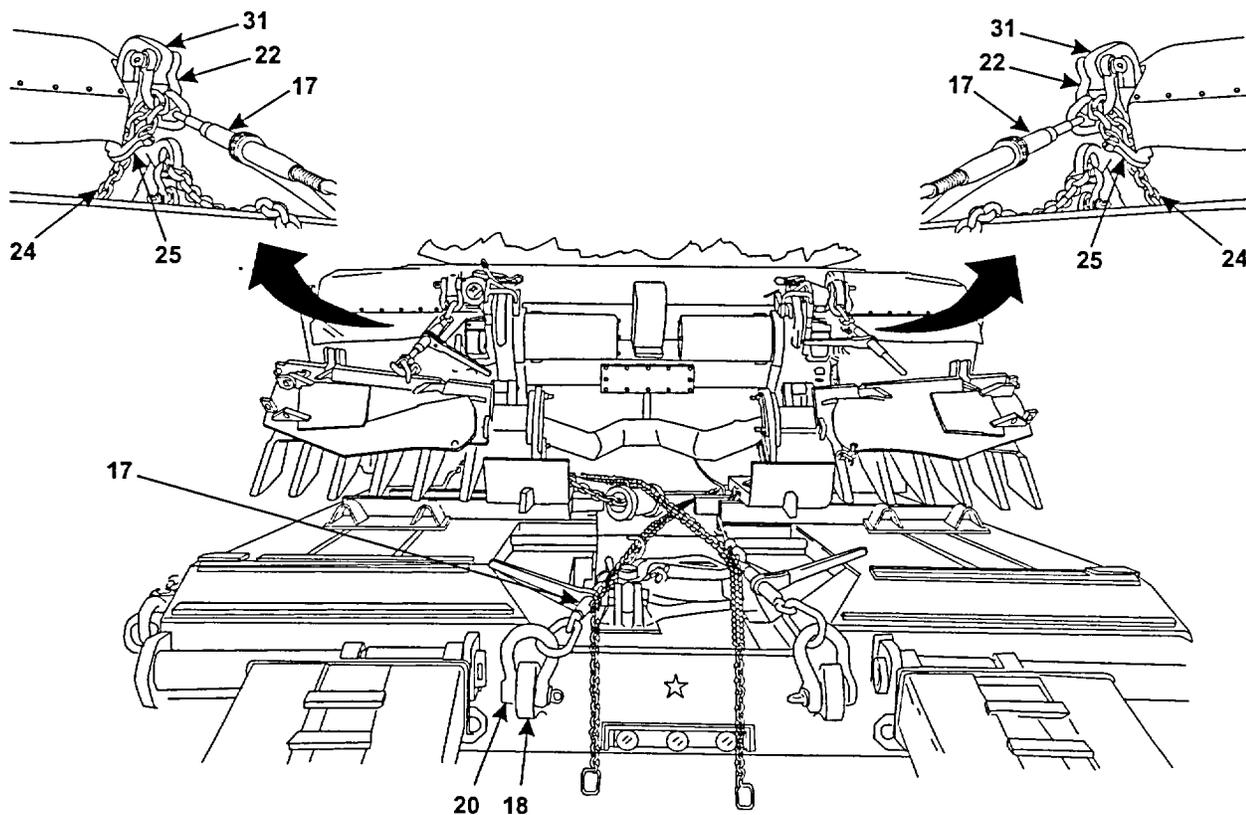
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**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**


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(52) Secure payload to semitrailer platform as follows:

- (a) Using two payload tiedown shackles (22) attach free ends of long chains (24) and two load binders (17) to upper lifting eyes (31) on front of payload. Ensure that long chains (24) are looped around tiedown shackles (22) with chain hooks (25) outboard of load binders (17).
- (b) Using two 25-ton shackles (20), attach two load binders (17) to rear recovery eyes (18) on semitrailer.,



**NOTE**

When correctly positioned, long chains cross twice. First, they are crossed under the payload when routed forward and from one side of the payload through the towing shackle in the center tiedown ring on the opposite side of the platform. They are crossed again as they run from the 25-ton shackle to the load binder attached to the rear tow lug.

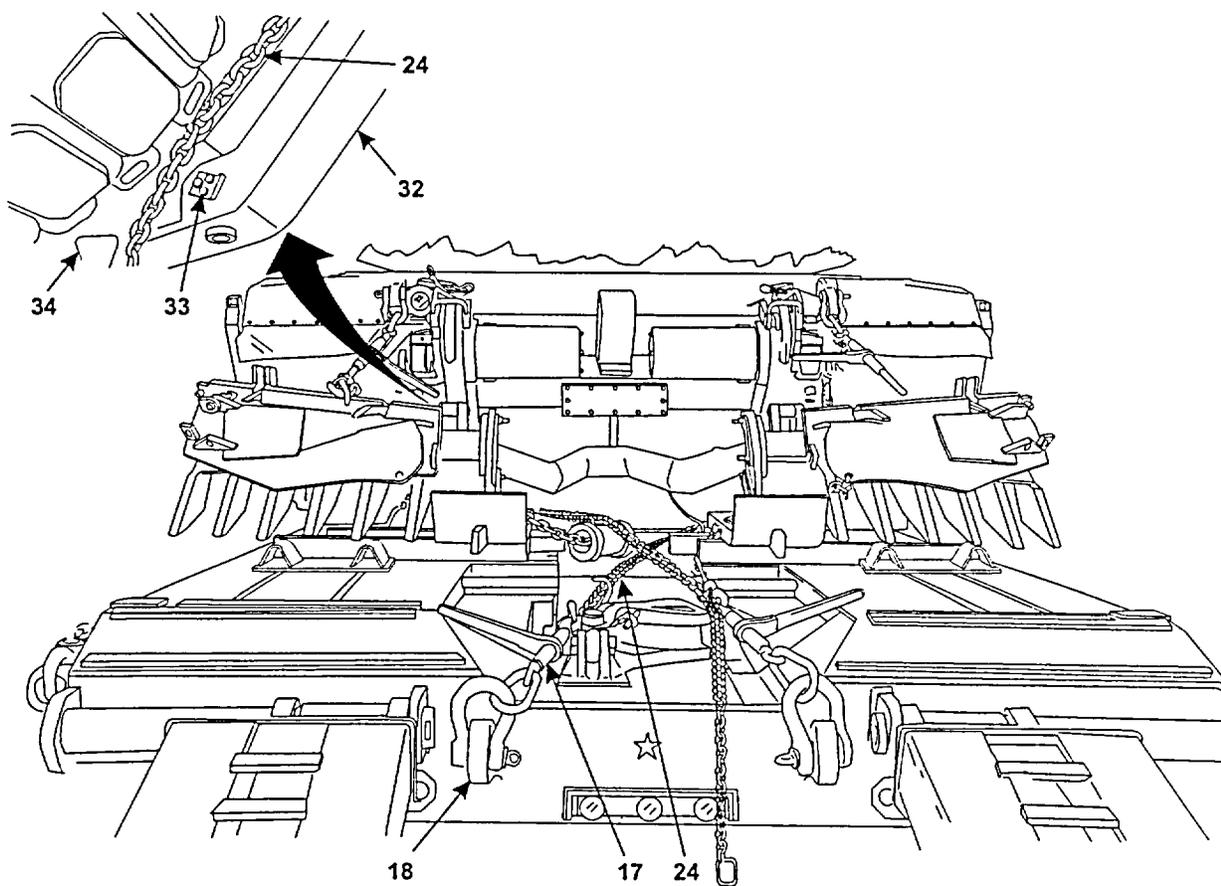
- (c) On streetside of semitrailer, route long chain (24) from towing shackle in lifting eye along outer payload hull, between hull and track, and then under mine clearing blade mounting frame (32) approximately midway between pin (33) that attaches mounting frame (32) to payload and pin (34) that attaches push beam to mounting frame (32).

- (d) Remove as much slack as possible between mounting frame (32) and towing shackle in curbside center tiedown ring so long chain (24) will stay in position.

**NOTE**

**When attaching load binders to tiedown chains, take up as much slack as possible so the remaining slack can be taken up when load binders are operated.**

- (e) Take up as much slack as possible and attach long chain (24) to load binder (17) attached to streetside rear recovery eye (18) of semitrailer.
- (f) Operate load binder (17) to tighten long chain (24).



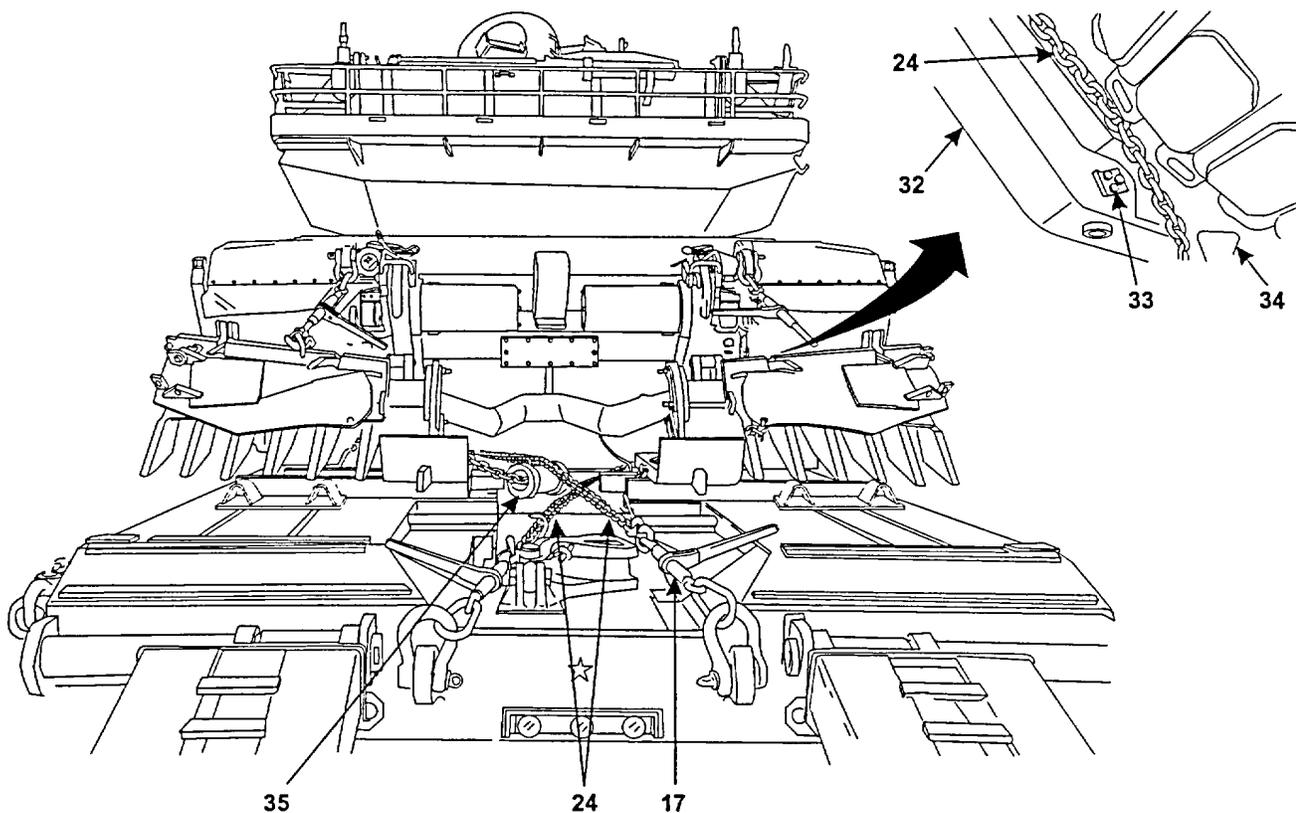
**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (g) On curbside of semitrailer, route long chain (24) from towing shackle in lifting eye along outer payload hull, between hull and track, and then under mine clearing blade mounting frame (32) approximately midway between pin (33) that attaches mounting frame (32) to payload and pin (34) that attaches push beam to mounting frame (32).
- (h) Remove as much slack as possible between mounting frame (32) and towing shackle in streetside center tiedown ring so long chain (24) will stay in position.
- (i) Position mine clearing blade dog-bone (35) at angle near long chain (24) attached to streetside load binder (17) and under chain (24) being attached to curbside load binder (17).

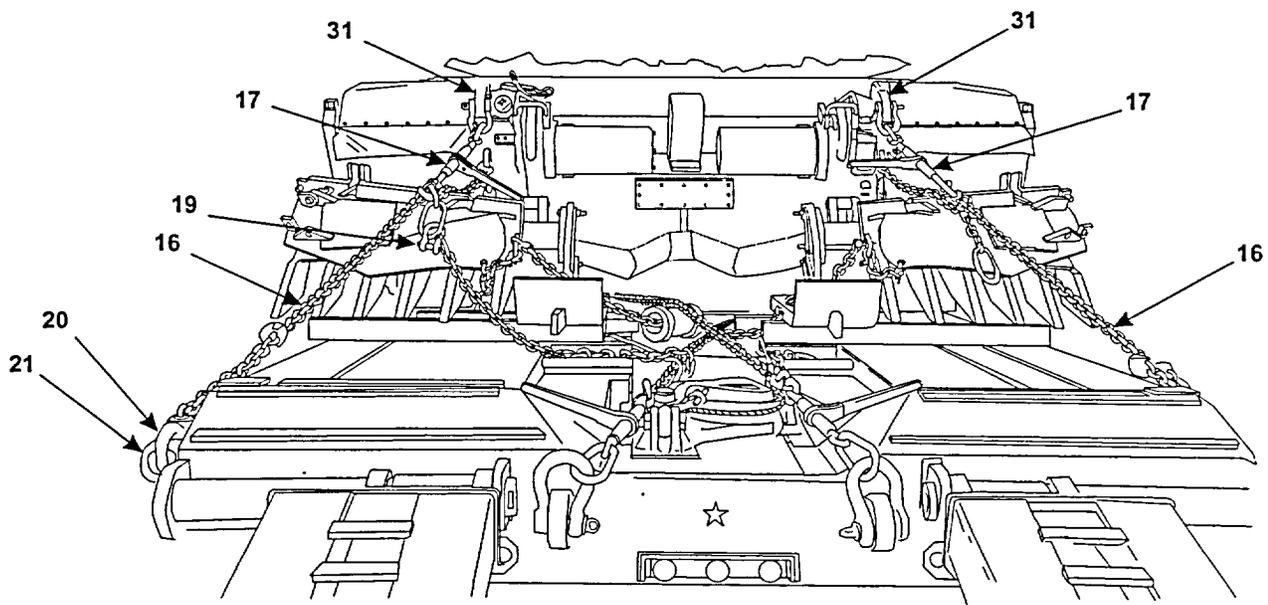
**NOTE**

**When attaching load binders to tiedown chains, take up as much slack as possible so the remaining slack can be taken up when load binders are operated.**

- (j) Take up as much slack as possible and attach long chain (24) to curbside load binder (17).
- (k) Operate curbside load binder (17) to tighten long chain (24) until dog-bone (35) is held firm. Ensure that two tightened chains (24) do not contact each other.

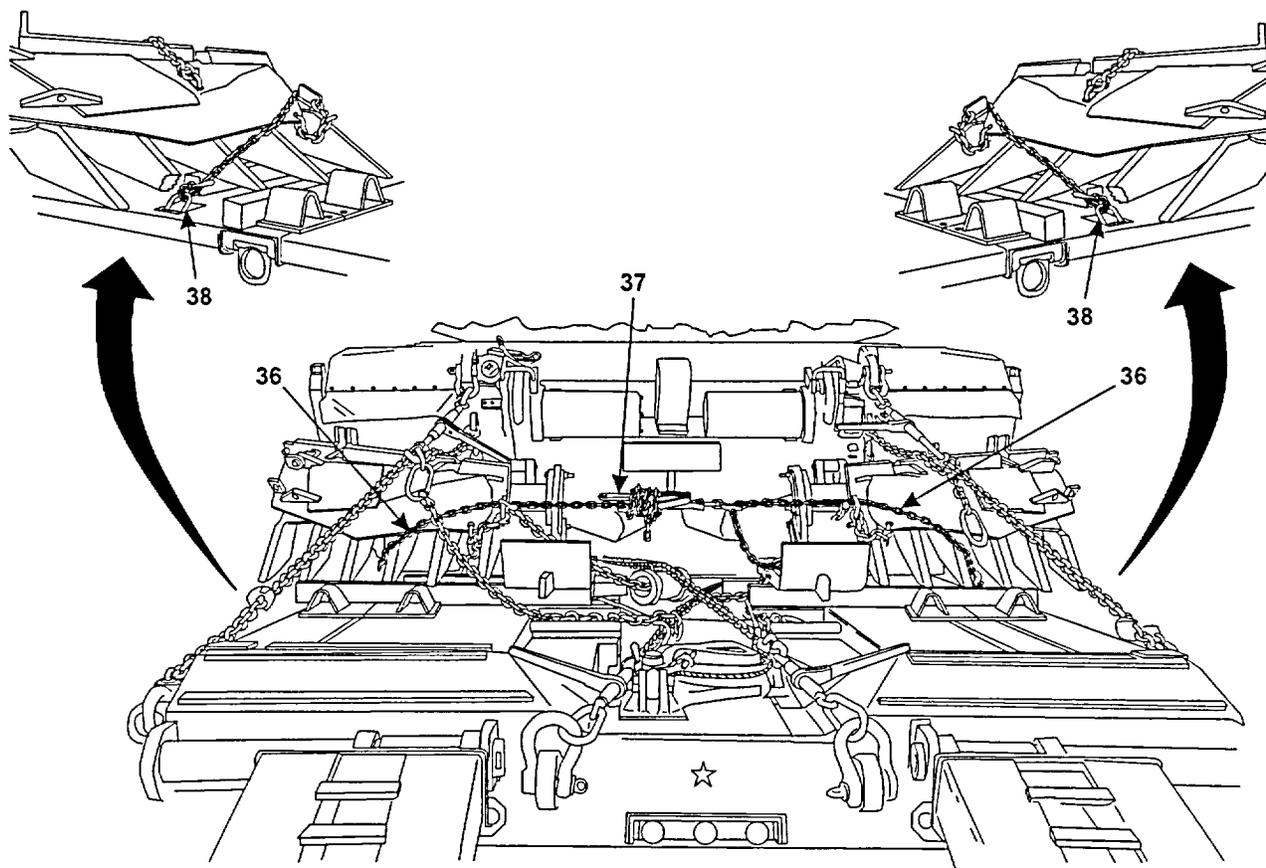


- (l) On streetside of semitrailer, route hook end of 11-foot (3.4m) chain (16) through 25-ton shackle (20) in streetside lifting eye (21) and hook back to itself.
- (m) Take up as much slack as possible and connect tiedown chain (16) to load binder (17) attached to payload front lifting eye (31).
- (n) Operate load binder (17) to tighten tiedown chain (16). Repeat on curbside of semitrailer.
- (o) Secure loose ends of both long chains (24) through towing shackle (19) attached to oval link of streetside tiedown chain (16).

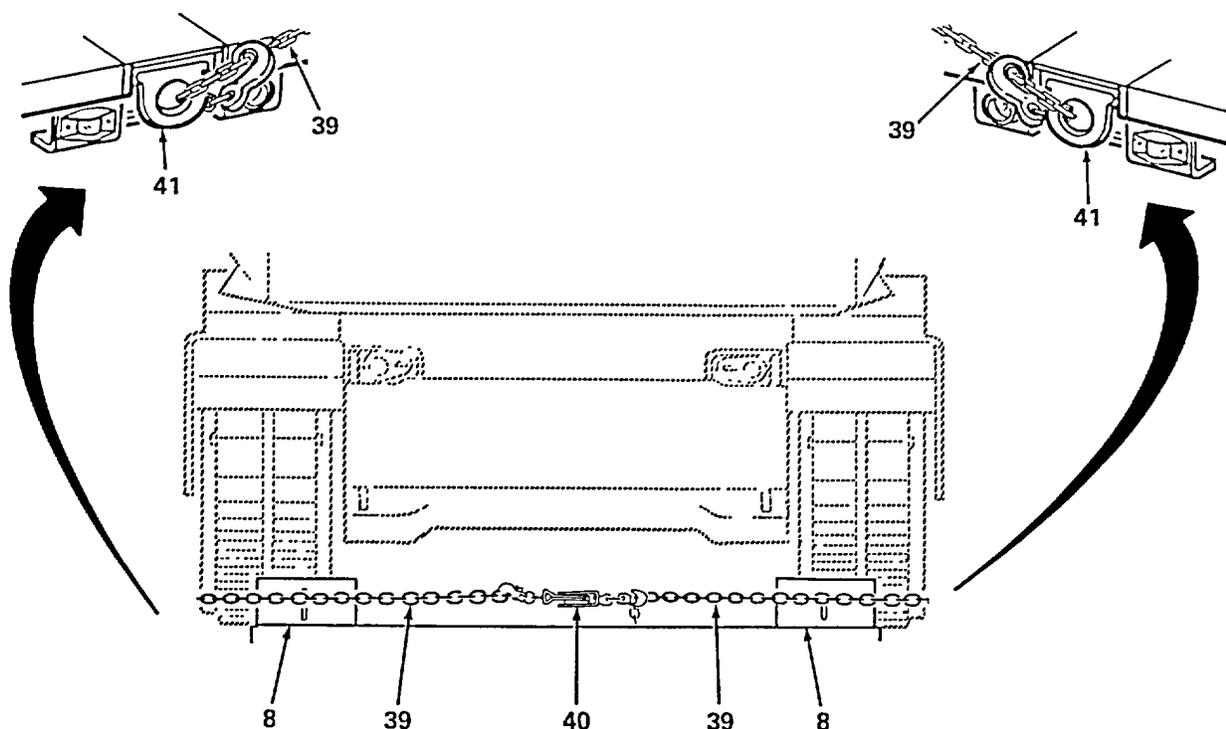


**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (p) Select two 11-foot (3.4m) utility chains (36) and utility load binder (37).
- (q) Route utility chains (36) through cargo tiedown rings (38) between tines of mine clearing blade on each side of platform. Route chains (36) over top of tines.
- (r) Connect utility chains (36) and tighten using utility load binder (37).



- (s) Select two remaining 11-foot (3.4m) utility chains (39) and remaining utility load binder (40).
- (t) Attach two utility chains (39) through transport tiedown rings (41) on each side of platform just forward of each payload chock (8) and connect hook to each chain (39).
- (u) Pass free end of utility chains (39) through both handles of both free payload chocks (8).
- (v) Place free ends of both utility chains (39) at center of platform and tighten using utility load binder (40).



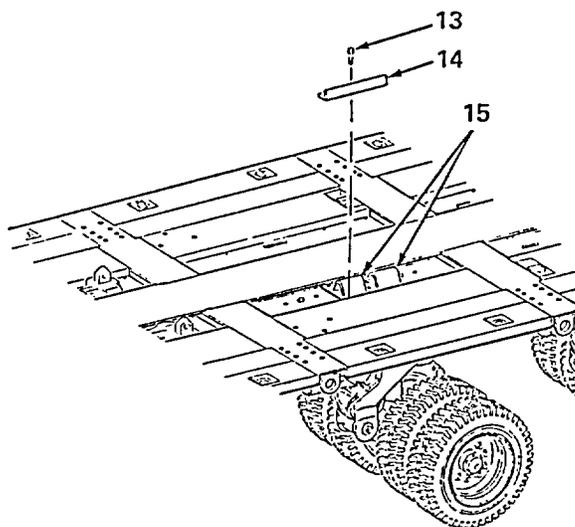
FRONT VIEW OF PAYLOAD  
(LOOKING FORWARD)  
MINE PLOW NOT SHOWN

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**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

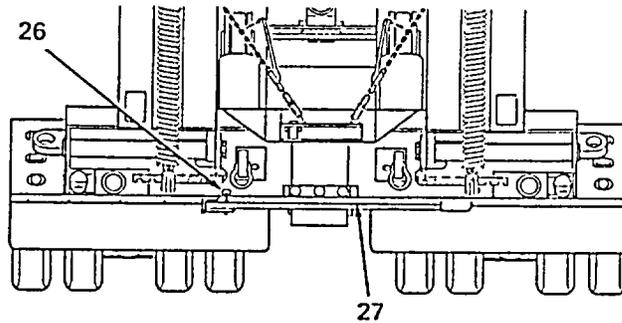
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- (53) Remove two curb guides (15) from beavertail and stow in rear recessed area of platform.
- (54) Secure two curb guides (15) with curb guide stowage bracket (14) and capscrews (13).

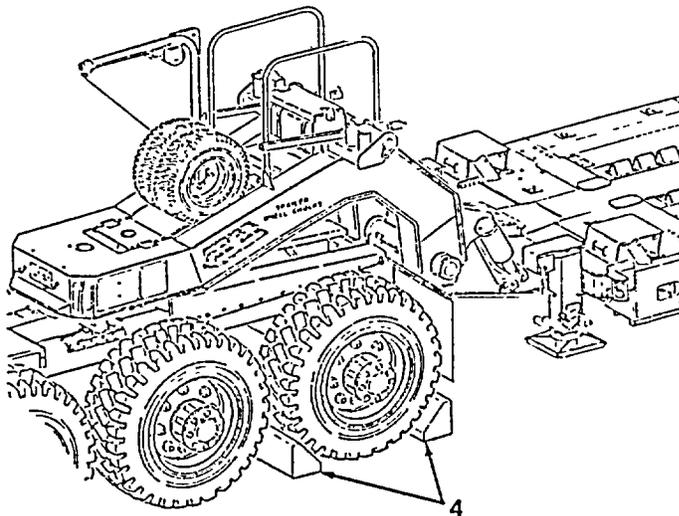


- (55) Raise ramps perpendicular to platform, adjust ramp span width to furthest inboard position, and stow ramps for transport per TM 9-2330-381-14.
- (56) Shut down APU per TM 9-2330-381-14.
- (57) Raise rear support legs per TM 9-2330-381-14.

- (58) Stow crowbar (27) at back of platform and secure in place with hitch pin (26).
- (59) Stow all tools used during loading procedure in platform stowage compartment.



- (60) Remove four wheel chocks (4) from tractor tires and restow wheel chocks (4) onto tractor.



- (61) Have driver pull tractor/semitrailer forward a short distance and stop. Check payload tiedown chains for looseness after stop, and tighten chains as necessary. If either long chain loosened, check that chain is still routed between payload hull and tread before tightening.
- (62) Use crowbar to tighten chains until they do not lose tension when tractor/semitrailer is stopped.
- (63) Install vehicle classification data plate over existing numbers on curbside front of tractor.

**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)****NOTE**

The following procedures provide instructions for unloading an able payload (Abrams MBT series with mine clearing blade attached) onto the M1000 semitrailer. The M1070 tractor is illustrated as the prime mover throughout these instructions. If other prime movers are used, these procedures will need to be changed significantly.

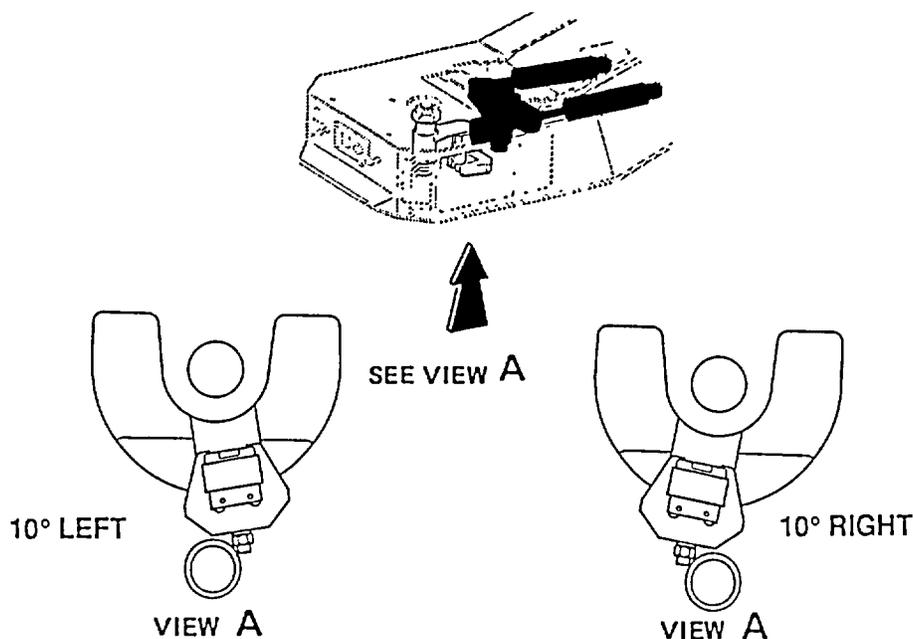
b. Unloading an able payload. To unload an able payload, proceed as follows:

- (1) If tractor and semitrailer are already coupled, proceed to step (2) below. If tractor/semitrailer are uncoupled, perform procedures in paragraph 2-2a, steps (2) thru (4).

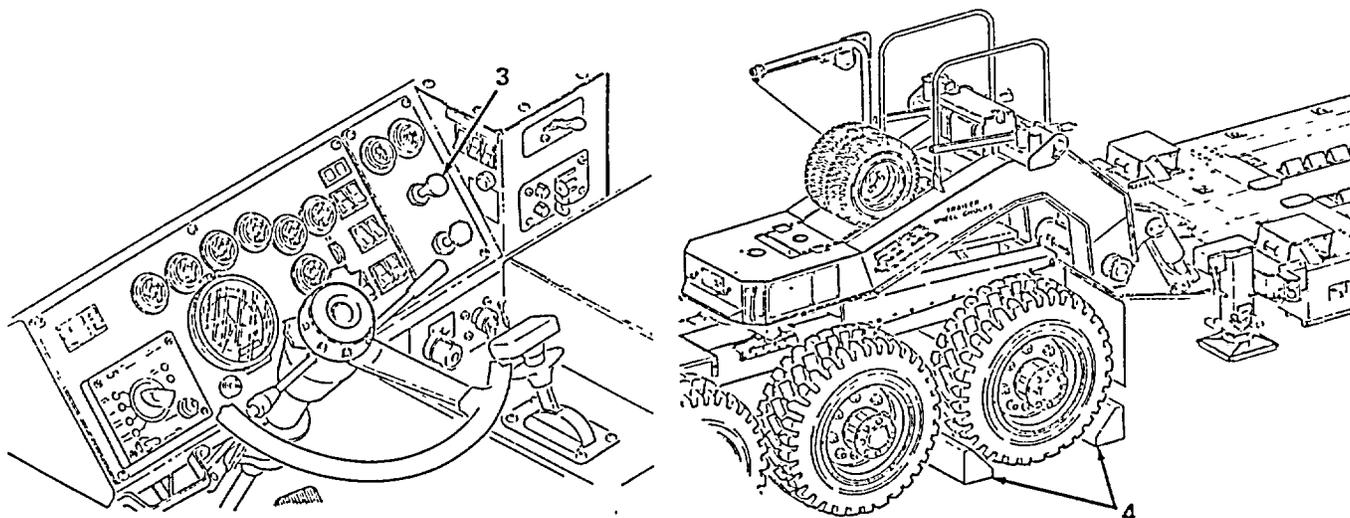
**WARNING**

**Unload semitrailer on level ground whenever possible. In adverse conditions, unloading can be done on grades up to 10 percent with a maximum offset angle of 10 degrees between tractor and semitrailer. Avoid exceeding these limitations to prevent payload from rolling off semitrailer and causing serious injury or death to personnel and damage to equipment.**

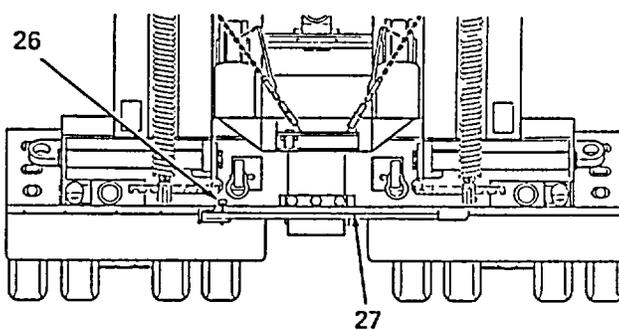
- (2) Aline back of tractor/semitrailer combination with area to be used for unloading. Ensure that ample space is provided for ramps to be lowered and payload to be off-loaded past end of ramps and that ground is as level as possible.
- (3) Visually check tractor/semitrailer offset angle by having ground guide (spotter) check relationship between steering wedge bolt and weld circle at bottom rear of pickup plate. If inside edge of bolt aligns with outside edge of weld circle, offset angle is 10 degrees. Make any required adjustments to tractor.



- (4) Apply tractor parking brakes by pulling out parking brake valve (3).
- (5) Remove four wheel chocks (4) from stowage on tractor and chock wheels on tractor.

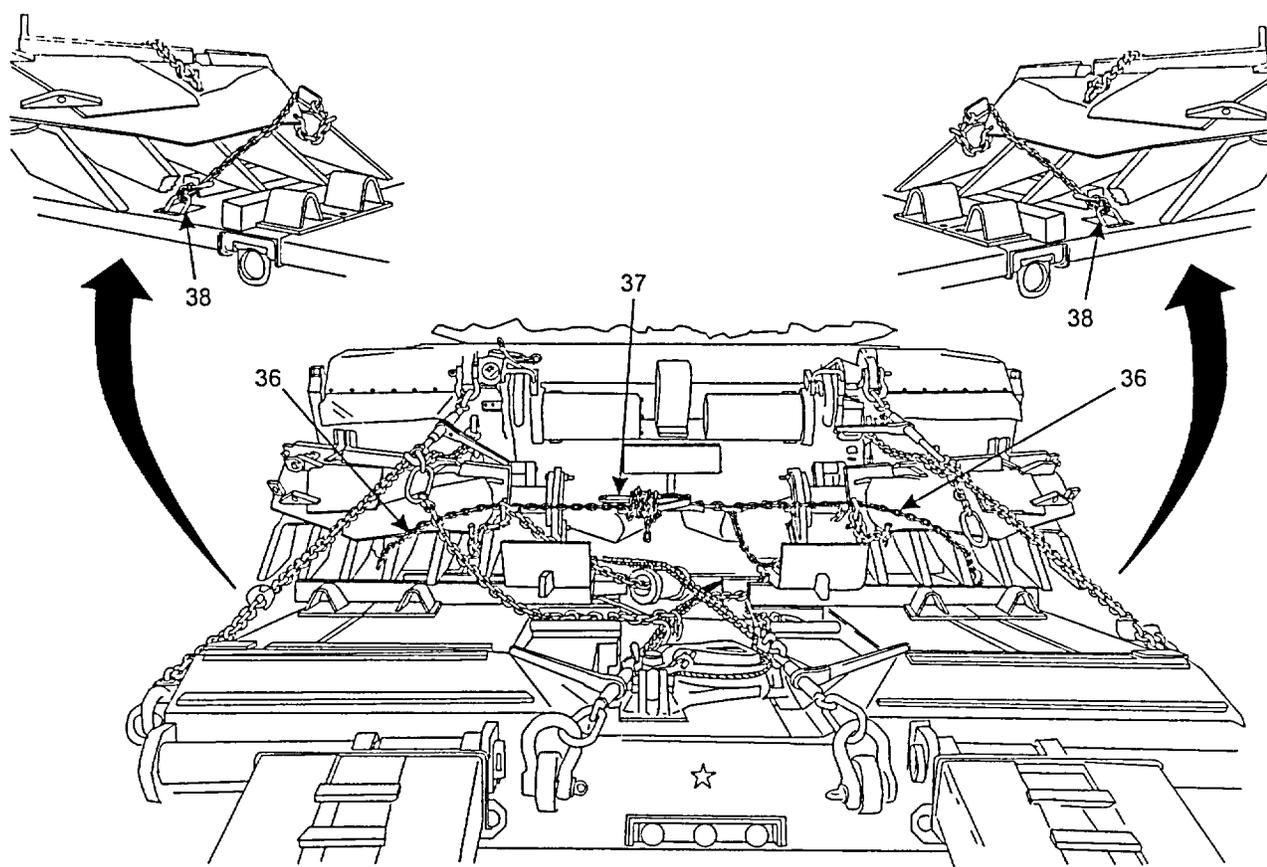


- (6) Remove hitch pin (26) and crowbar (27) from rear of semitrailer below loading ramps. Reinstall hitch pin (26).

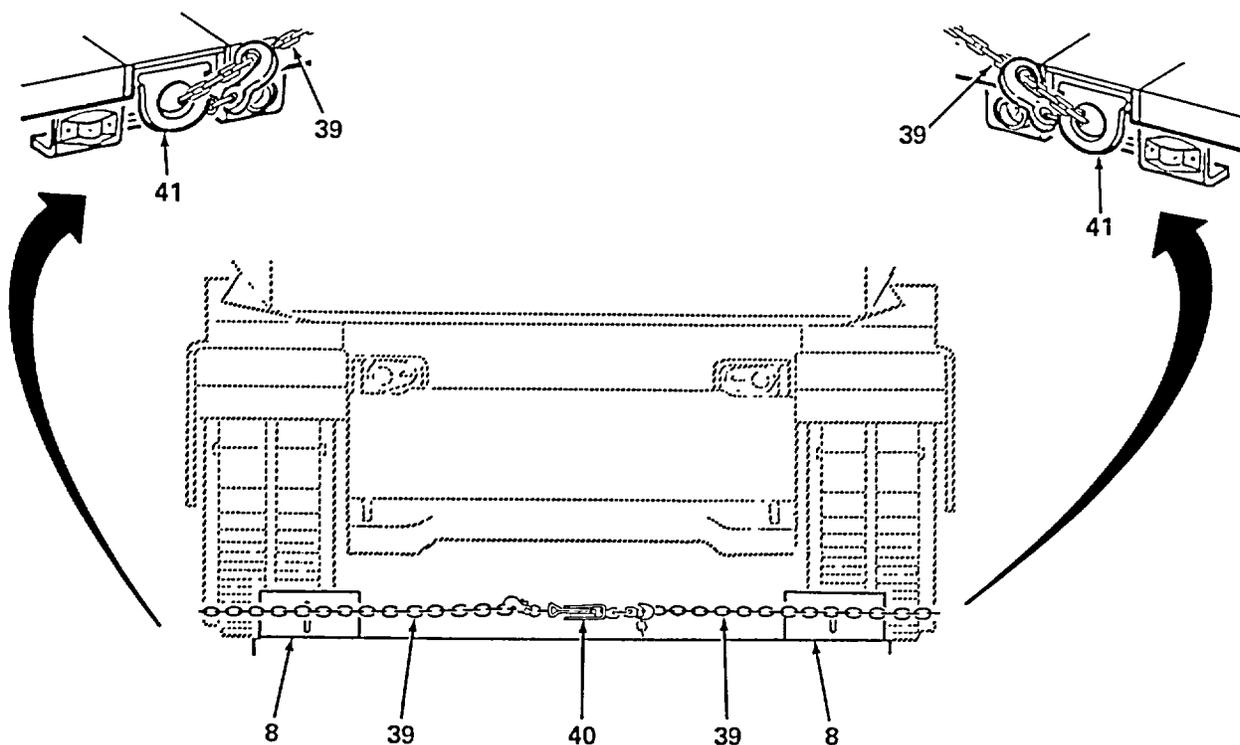


**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (7) Adjust ramp span width to match payload track width, as required, per TM 9-2330-381-14.
- (8) Remove payload tiedowns and payload chock tiedowns from payload as follows:
  - (a) Open utility load binder (37) and remove two 11-foot (3.4m) utility chains (36) from over mine clearing blade tines and from two cargo tiedown rings (38).
  - (b) Remove two utility chains (36) and utility load binder (37) from platform.



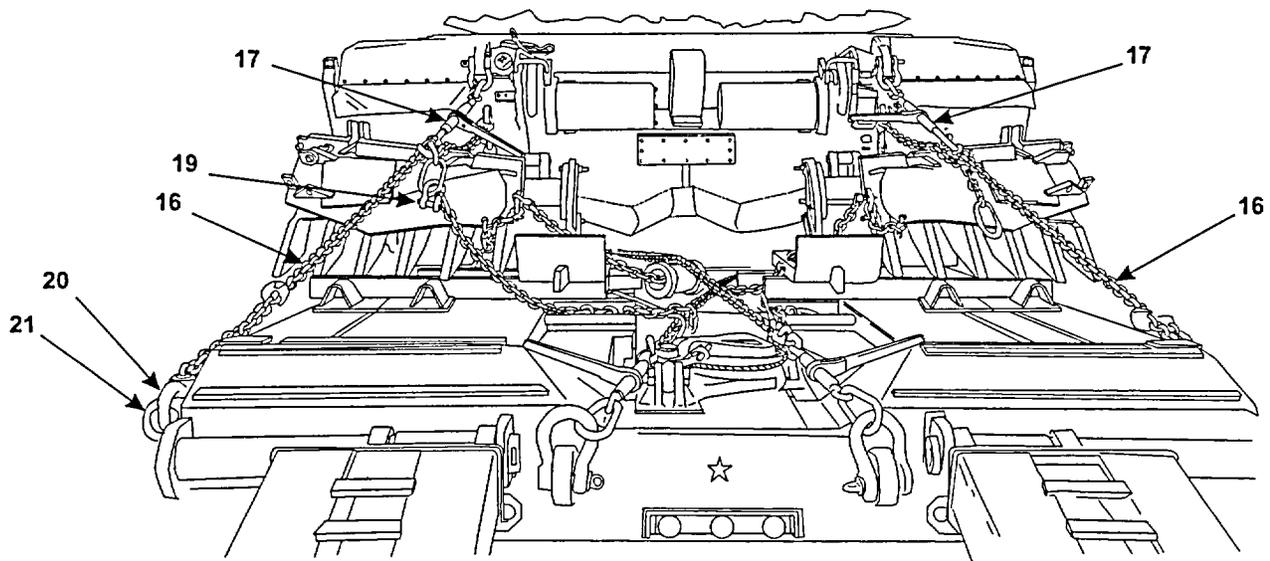
- (c) Open second utility load binder (40) and remove two 11-foot (3.4m) utility chains (39) from two transport tiedown rings (41).
- (d) Remove utility chains (39) from two free payload chocks (8).
- (e) Remove utility chains (39) and utility load binder (40) from platform.



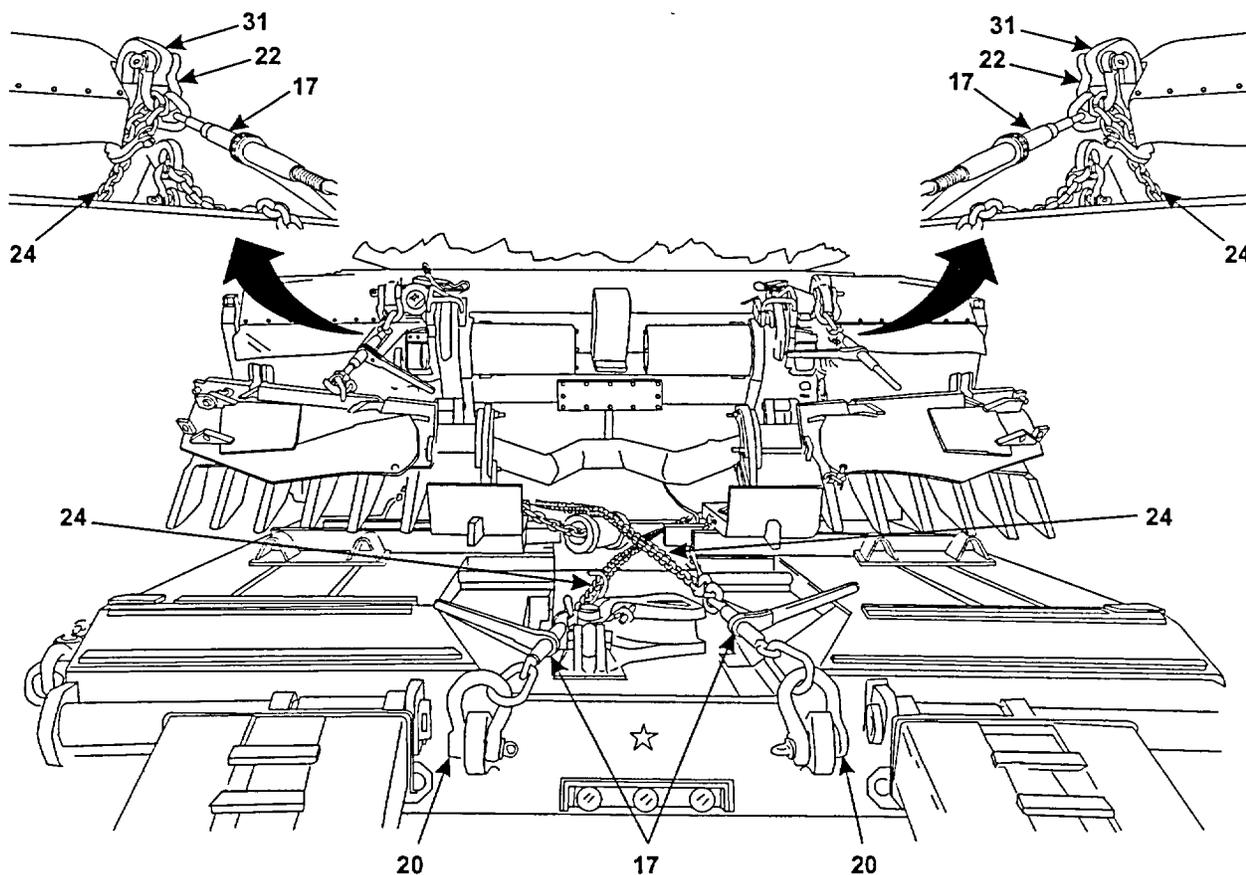
FRONT VIEW OF PAYLOAD  
(LOOKING FORWARD)  
MINE PLOW NOT SHOWN

**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (f) Operate two load binders (17) to loosen two 11-foot (3.4m) rear payload tiedown chains (16).
- (g) Remove two long chains from towing shackle (19) attached to oval link of tiedown chain (16).
- (h) Disconnect both tiedown chains (16) from load binders (17) and remove from 25-ton shackle (20) in semitrailer rear lifting eyes (21).
- (i) Remove 25-ton shackles (20) from semitrailer rear lifting eyes (21).

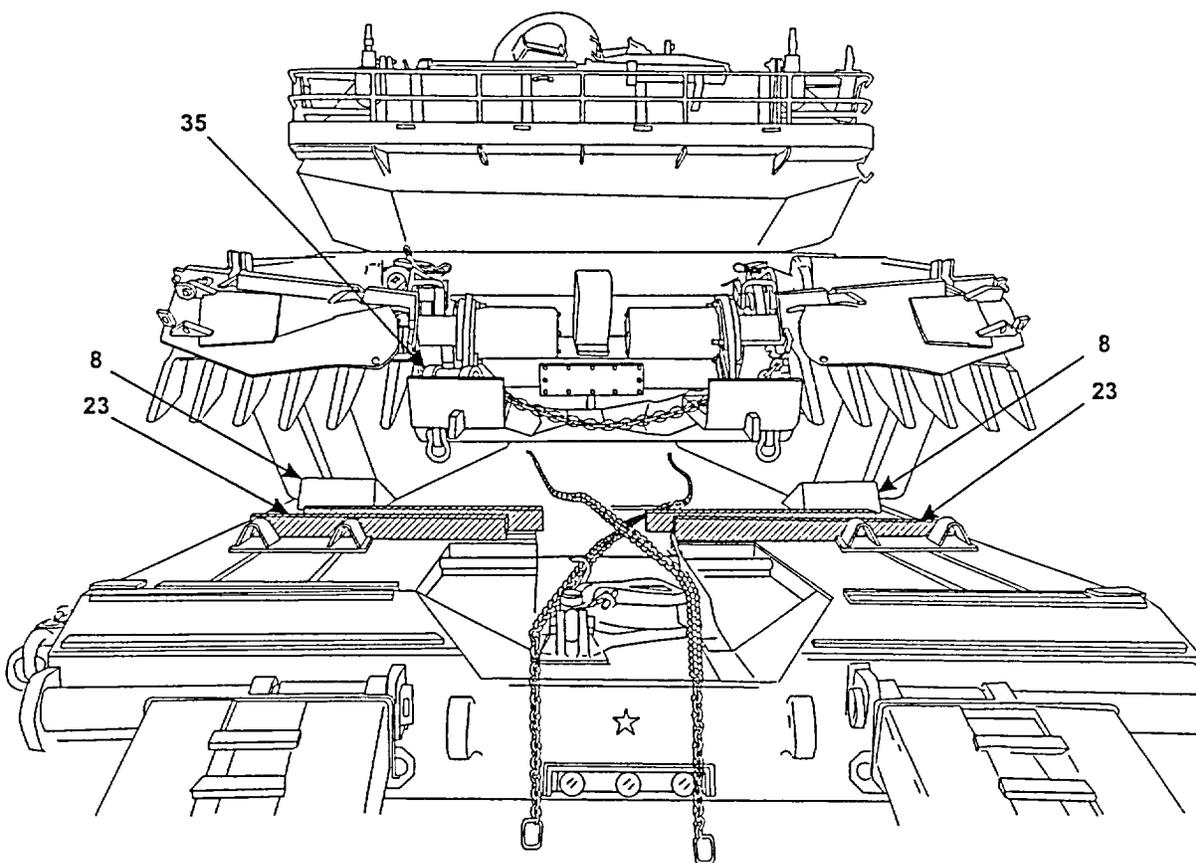


- (j) Operate two load binders (17) to loosen both long tiedown chains (24).
- (k) Disconnect long tiedown chains (24) from load binders (17).
- (l) Remove two load binders (17) and two 25-ton shackles (20) from platform.
- (m) Disconnect two long chains (24) from payload tiedown shackles (22) in front lifting eyes (31) on front of payload.
- (n) Remove two payload tiedown shackles (22) and two load binders (17) from front lifting eyes (31) on front of payload and remove from platform.
- (o) Lay tiedown chains (16) toward center of platform, between and clear of payload tracks, until payload is unloaded.



**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (9) Place dog-bone (35) in mine clearing blade skid shoe.
- (10) Payload operator start and warm payload, raise mine clearing blade, and lock in travel position per TM 9-2590-509-10.
- (11) Remove two timbers (23) from platform.
- (12) Front ground guide (spotter) must signal payload operator to release payload brakes and drive slowly forward until payload is onto free payload chocks (8).



**WARNING**

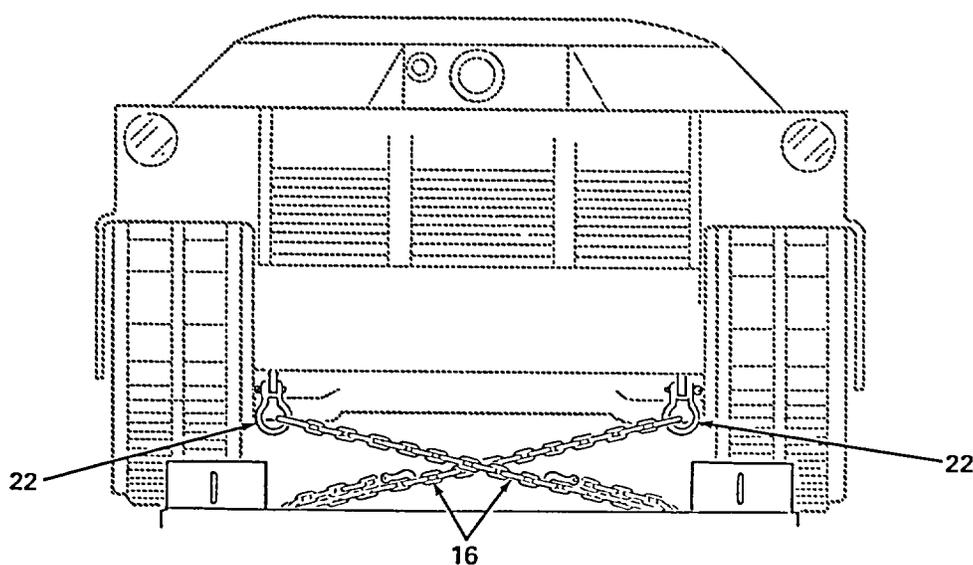
Failure to set the payload parking brake could allow the payload to roll causing serious injury to personnel and damage to equipment.

- (13) Payload operator stop payload and apply payload parking brake.

**WARNING**

Tiedown chains, shackles, and all other metal surfaces at rear of payload will become extremely hot from exhaust. Exercise extreme care while removing tiedown chains and shackles to prevent serious injury to personnel.

- (14) Remove two 11-foot (3.4m) tiedown chains (16) from tiedown shackles (22) on rear of payload.  
(15) Lay two 11-foot (3.4m) tiedown chains (16) forward toward center of platform.



REAR VIEW OF PAYLOAD  
(LOOKING AFT)

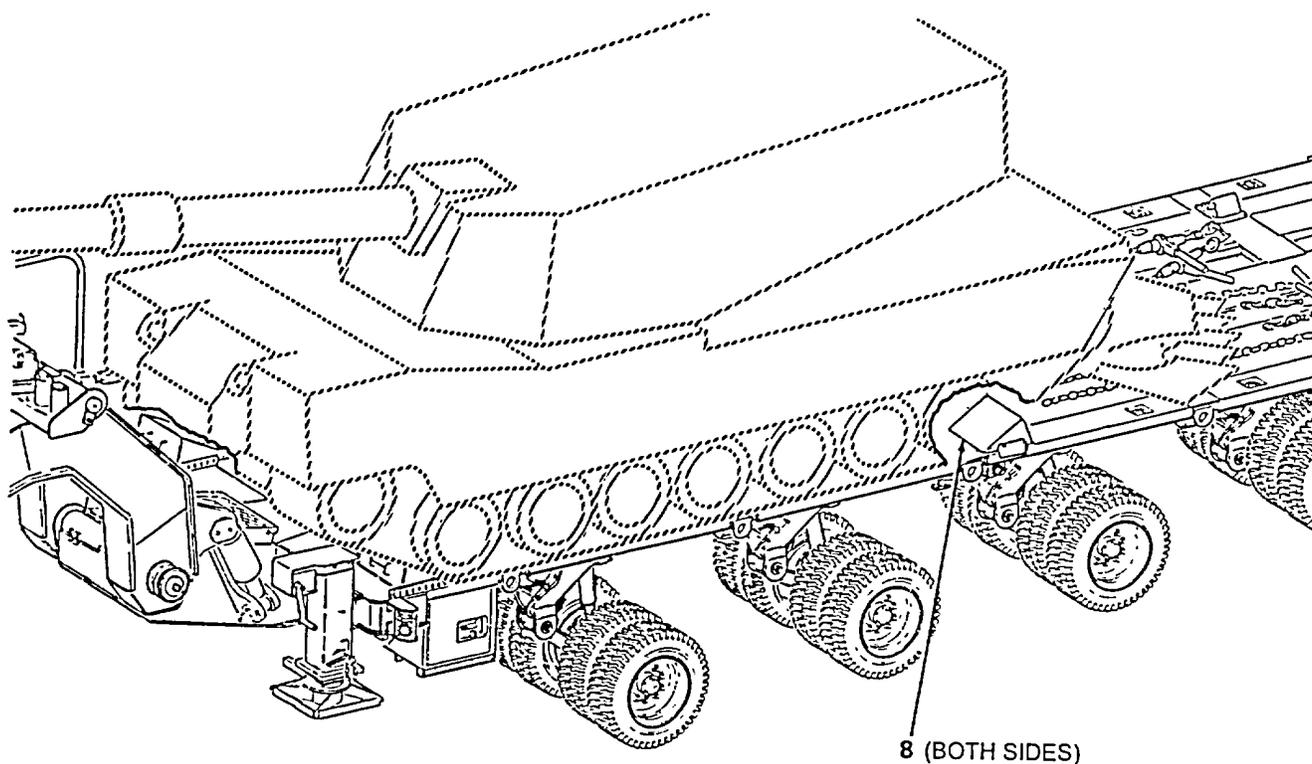
**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (16) Front spotter must signal payload operator to start moving toward front of semitrailer until free payload chocks (8) can be removed from rear of platform.

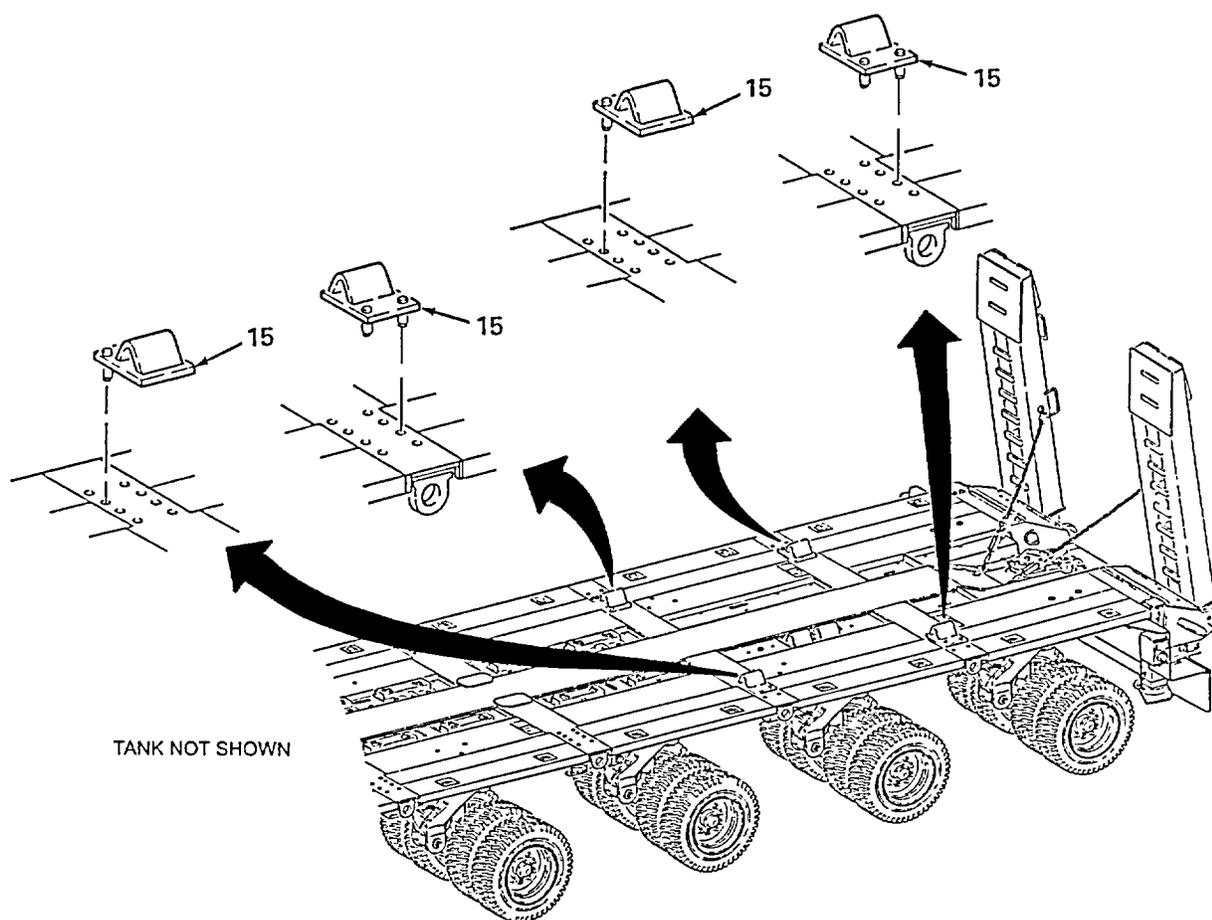
**WARNING**

**Failure to set the payload parking brake could allow the payload to roll causing serious injury to personnel and damage to equipment.**

- (17) Payload operator apply payload parking brake.  
(18) Remove two free payload chocks (8) from platform.



- (19) Remove two outboard curb guides (15) and position in second pin holes between #3 and #4 bogies with pin side facing outboard from center of platform.
- (20) Move two inboard curb guides (15) to second pin holes with pin side facing outboard from center of platform.
- (21) Perform procedures in paragraph 2-2a, steps (25) thru (30), and adjust platform height to platform unloading position, lower ramps, and install two curb guides (15).



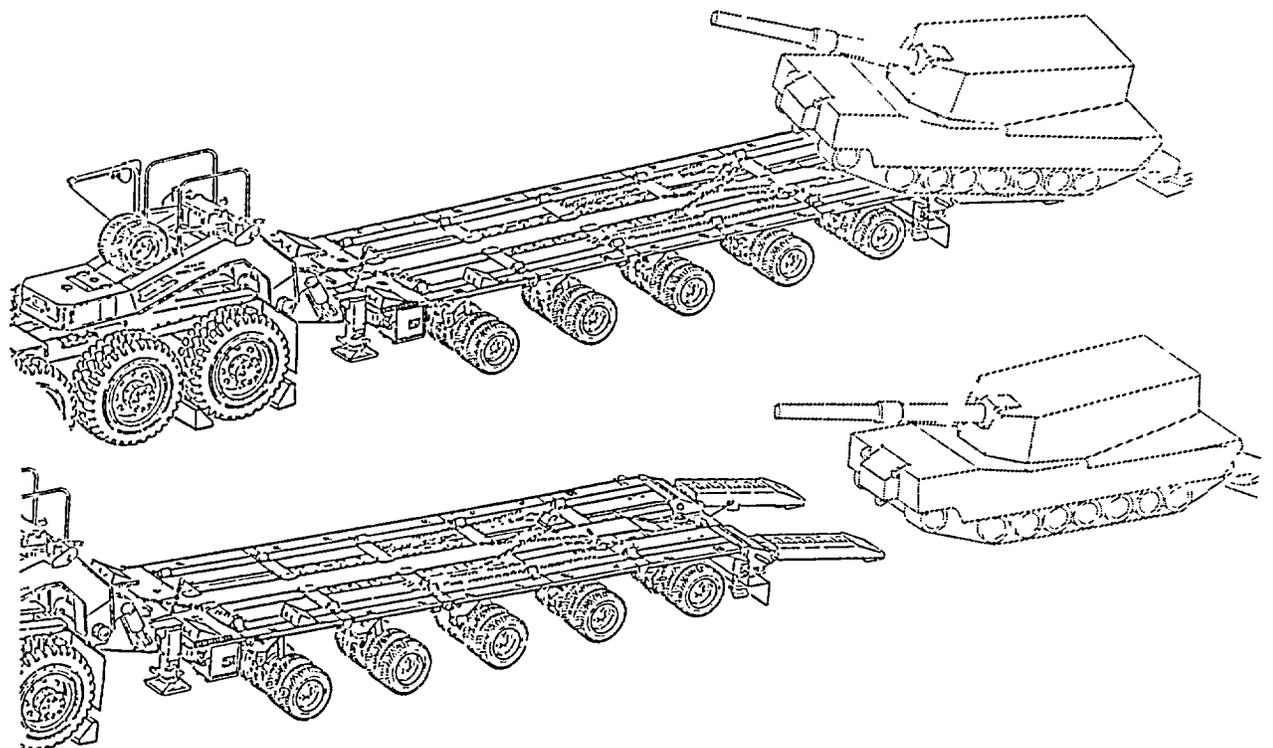
**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)****WARNING**

Personnel other than winch operator and ground guide (spotter) shall stand well clear of the vehicles, especially behind the payload (engine/turbine exhaust) during unloading operations. No personnel should be on the semitrailer platform while the payload is moving at any time during any unloading operations. The payload operator must drive the payload slowly down the loading ramps and onto the ground or serious injury or death to personnel and damage to equipment may occur. Payload adjustments, side to side (turning), must be kept to a minimum or serious injury to personnel and damage to equipment may occur.

Mine clearing blade tines will contact ground as payload is driven off ramps. Personnel must remain well clear and driving must be performed slowly to prevent serious injury to personnel or damage to equipment.

Two ground guides (spotters) are required for unloading operations. The payload operator must know the position of spotters at all times or serious injury or death to personnel may occur.

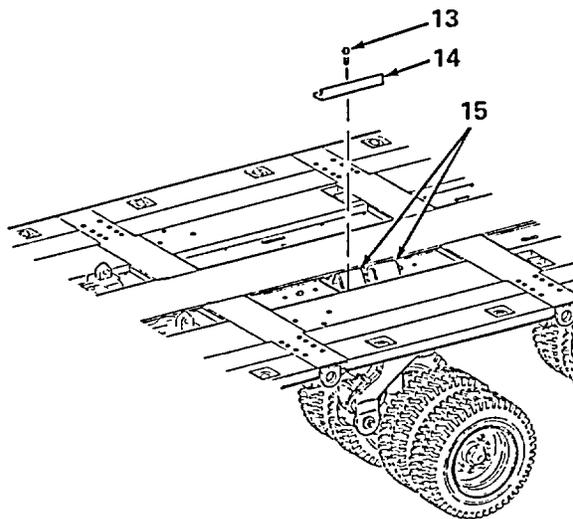
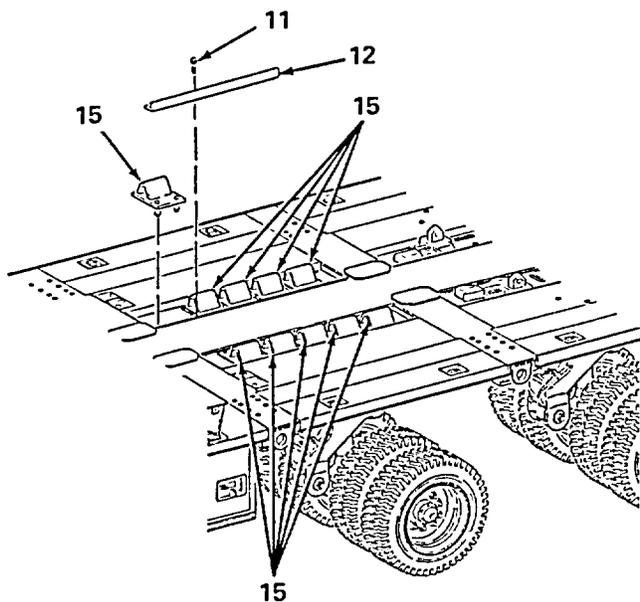
- (22) Using hand signals, front spotter must signal payload operator to drive payload slowly off platform and ramps. Curbside spotter must notify front spotter of any required payload adjustments while unloading.
- (23) Payload operator must drive payload forward 5 feet (1.5m) beyond ramps to allow extra clearance for raising and stowing load ramps.



**WARNING**

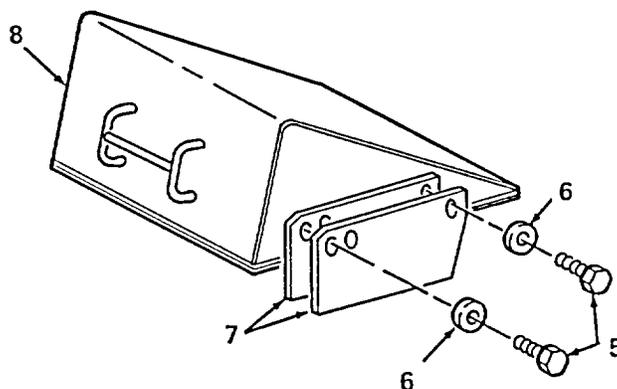
**Failure to set the payload parking brake could allow the payload to roll causing serious injury to personnel and damage to equipment.**

- (24) Once payload is on ground and clear of semitrailer, apply payload parking brake.
- (25) Shut down payload.
- (26) Remove all tiedown chains from platform.
- (27) Stow all chains, load binders, and shackles into platform storage compartment.
- (28) Remove two capscrews (11) and two curb guide stowage brackets (12) from forward recessed area on platform.
- (29) Remove all 12 curb guides (15) from loading positions on platform and place in center of platform for storage (10 curb guides located forward; 2 curb guides located aft).
- (30) Secure 10 curb guides (15), located forward, by installing two curb guide stowage brackets (12) and capscrews (11).
- (31) Remove capscrew (13) and curb guide stowage bracket (14) from platform storage compartment.
- (32) Secure two curb guides (15), located aft, by installing curb guide stowage bracket (14) and capscrew (13).



**2-2. LOADING AND UNLOADING ABLE PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

(33) Remove two capscrews (5), washers (6), and two sheets (7) from each of two free payload chocks (8).

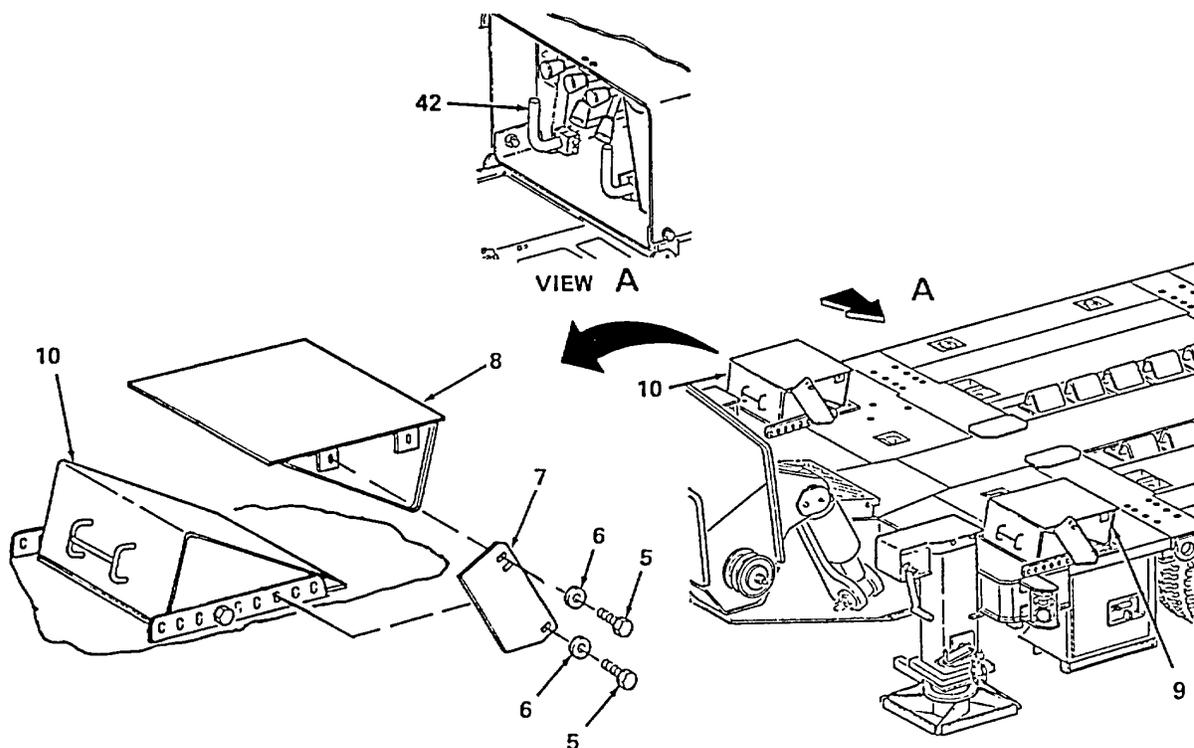


(34) Position two free payload chocks (8) on top of two secured front payload chocks (9 and 10).

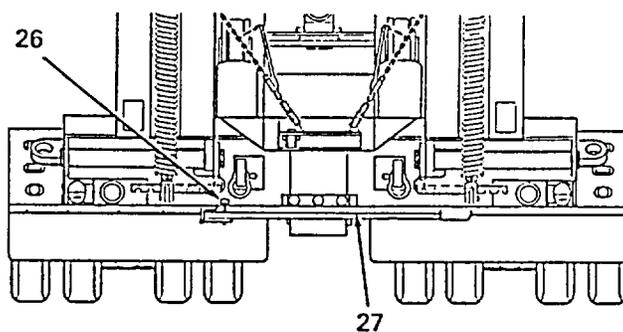
(35) Install four sheets (7), washers (6), and 10 capscrews (5).

(36) Perform procedures in paragraph 2-2a, step (39), and adjust platform to normal running height.

(37) Move suspension shutoff lever (42) to RUN position.



- (38) Raise rear support legs per TM 9-2330-381-14.
- (39) Adjust ramp span width inboard (furthest inboard position) and stow loading ramps for transport as required per TM 9-2330-381-14.
- (40) Shut down APU per TM 9-2330-381-14.
- (41) Stow crowbar (27) at back of platform and secure in place with hitch pin (26).



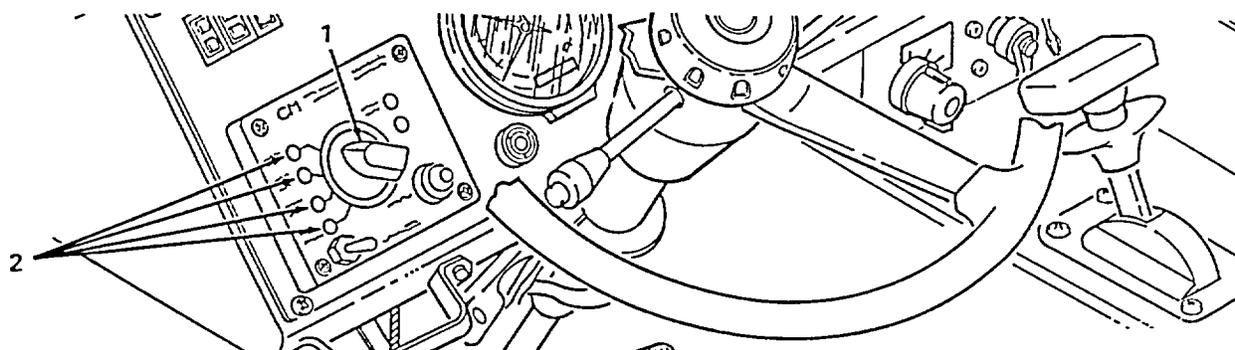
- (42) Restow all tools and equipment used during unloading procedure in platform stowage compartment.
- (43) If tractor/semitrailer is not going to remain parked at this time, stow tractor wheel chocks.
- (44) Remove vehicle classification data plate from number holder on curbside front of tractor.

## 2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED

### NOTE

The following procedures provide instructions for loading a disabled payload (Abrams MBT series with mine clearing blade attached) onto the M1000 semitrailer. The M1070 tractor is illustrated as the prime mover throughout these instructions, and operation of the M1070 winch controls is described herein. If other prime movers are used, these procedures will need to be changed significantly.

- a. Dual winch loading of disabled payload. To load a disabled payload, proceed as follows:
- (1) Inflate all semitrailer tires to 100 to 110 psi (690 to 758 kPa).
  - (2) Start tractor per TM 9-2320-360-10.
  - (3) On tractor, set CTIS switch (1) to setting for expected road/terrain conditions and allow tractor to sit until selected CTIS indicator (2) remains lit for that CTIS setting.



- (4) If tractor is not already coupled to semitrailer, refer to TM 9-2330-381-14.

### NOTE

**The Abrams MBT with mine clearing blade attached must be loaded onto the semitrailer rearward, with winch cables attached to the upper rear recovery eyes.**

- (5) Aline back of tractor/semitrailer combination as close as possible to back of payload, approximately 15 feet (4.6m) on ground as level as possible.

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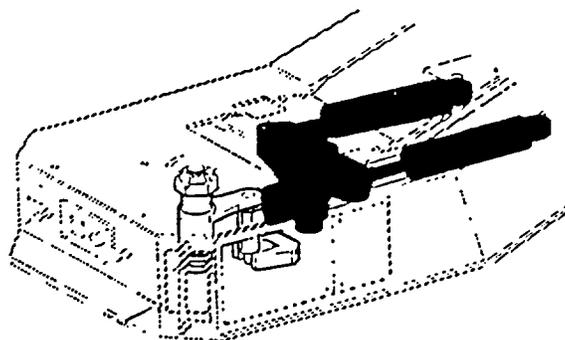
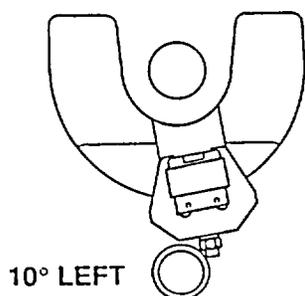
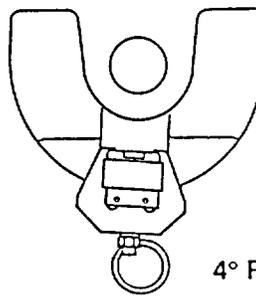
**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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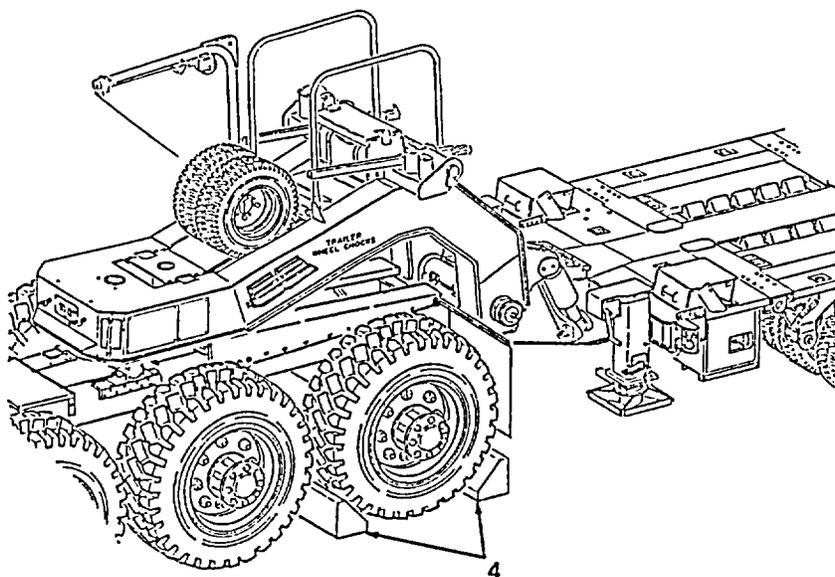
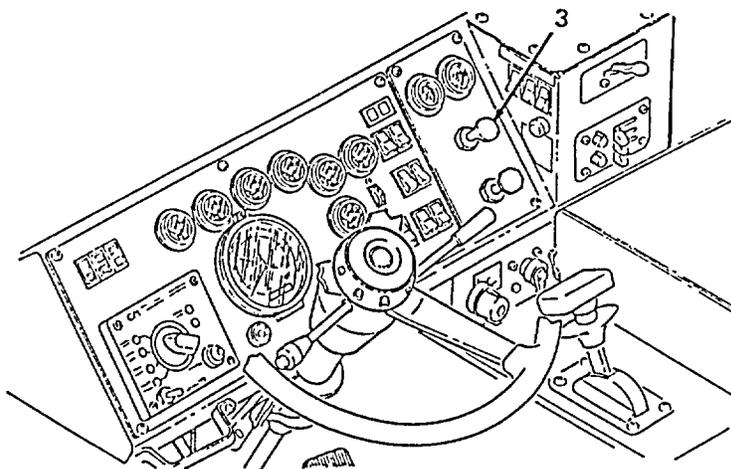
**WARNING**

Load semitrailer on level ground whenever possible. In adverse conditions, loading can be done on grades up to 10 percent. Due to the possibility of winch cables piling up against the end flanges of the cable drums and causing serious injury to personnel and damage to equipment, the following offset limits between tractor and semitrailer must be adhered to: 10° Left; 4° Right.

- (6) Visually check tractor/semitrailer offset angle. Make any required adjustments to tractor by having spotter check relationship between steering wedge bolt and weld circle at bottom rear of pickup plate. If inside edge of bolt aligns with outside edge of weld circle, offset angle is 10 degrees. Make any required adjustments to tractor.

**SEE VIEWS****10° LEFT****4° RIGHT****M1070 TRACTOR**

- (7) Apply tractor parking brakes by pulling out parking brake valve (3).
- (8) Remove four wheel chocks (4) from stowage on tractor and chock wheels on both sides of tractor.



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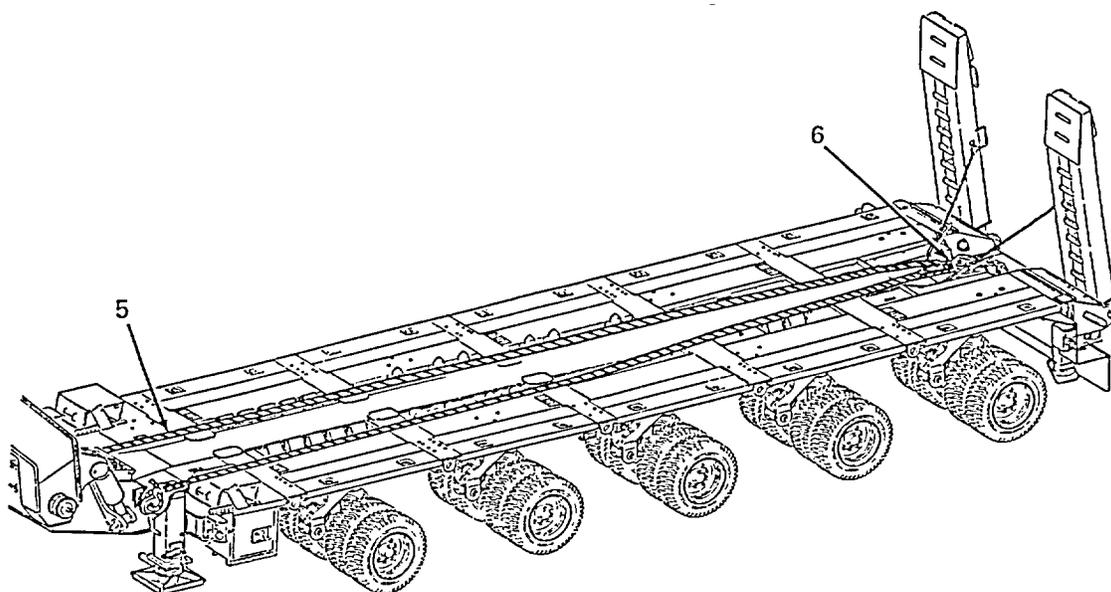
**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**


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**NOTE**

**A manila rope will be used to pull the tractor winch cable through the snatch block for use during unloading procedures.**

- (9) Remove manila rope (5) from platform stowage compartment.
- (10) Starting from front streetside corner of platform, pull one end of manila rope (5) back and through snatch block (6) and forward to front curbside corner of platform.
- (11) Tie both ends of manila rope (5) to front lifting eyes on platform (just inboard of each front support leg).



- (12) Perform procedures in paragraph 2-2a, steps (9) thru (30), and position payload chocks, curb guides, and tiedown chains; adjust platform to loading position; and lower ramps.

**WARNING**

**Observe the following precautions during the loading process:**

**If possible, provide ample clear space behind the disabled payload during loading to prevent serious injury or death to personnel and damage to equipment should cables break while payload is being loaded.**

**Ensure that winch cables are not kinked, clevises are secured to winch cables, and snatch blocks and shackles are in good condition and properly secured or serious injury or death to personnel may occur.**

**WARNING**

Observe the following precautions during the loading process:

Ensure that winch cables are inspected in accordance with TB 43-0142 or serious injury to personnel may occur.

Extreme caution should be exercised during any operation on a slope or serious injury to personnel may occur.

A ground guide (spotter) must stand off curbside of semitrailer and maintain visual contact with the winch operator. The spotter must observe cables, snatch blocks, shackles, and payload position during loading or serious injury to personnel may occur.

Do not overload tractor winches. Know the ratings of the winches being used and the existence of any protection devices (such as shear pins)

or serious injury to personnel may occur.

All ground personnel must stand clear of winch cables except when handling or serious injury to personnel may occur.

During winch-on operations on a downgrade, the payload must be restrained from the front with some other vehicle to prevent possible loss of control of the payload causing serious injury to personnel.

At no time during loading operations while the payload is being pulled on with winches should personnel be on the semitrailer platform or serious injury or death to personnel may occur.

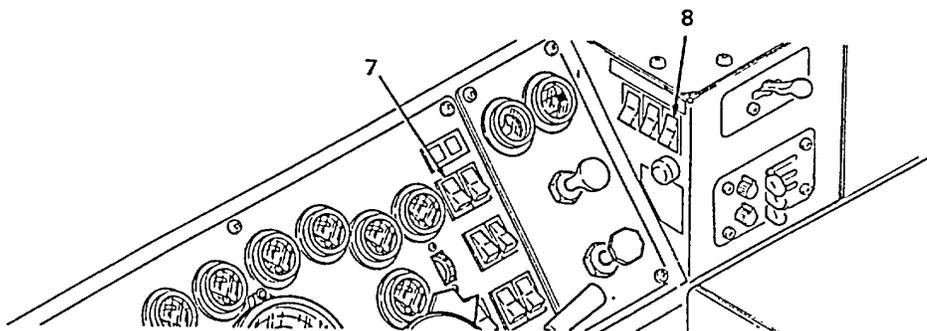
Always wear leather gloves when handling winch cable. Never allow cable to run through hands or serious injury to personnel may occur.

(13) On tractor, use auxiliary winch to pay out main winch cables as follows:

**NOTE**

Ensure that tractor parking brakes are applied. Power Takeoff (PTO) will not engage unless tractor parking brakes are set.

(a) Set beacon light switch (7) to ON. With engine idling, set PTO switch (8) to ON.



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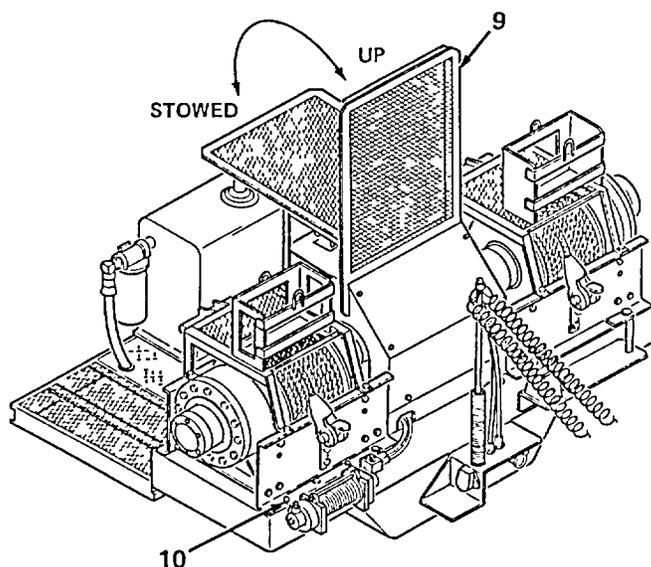
**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**


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**WARNING**

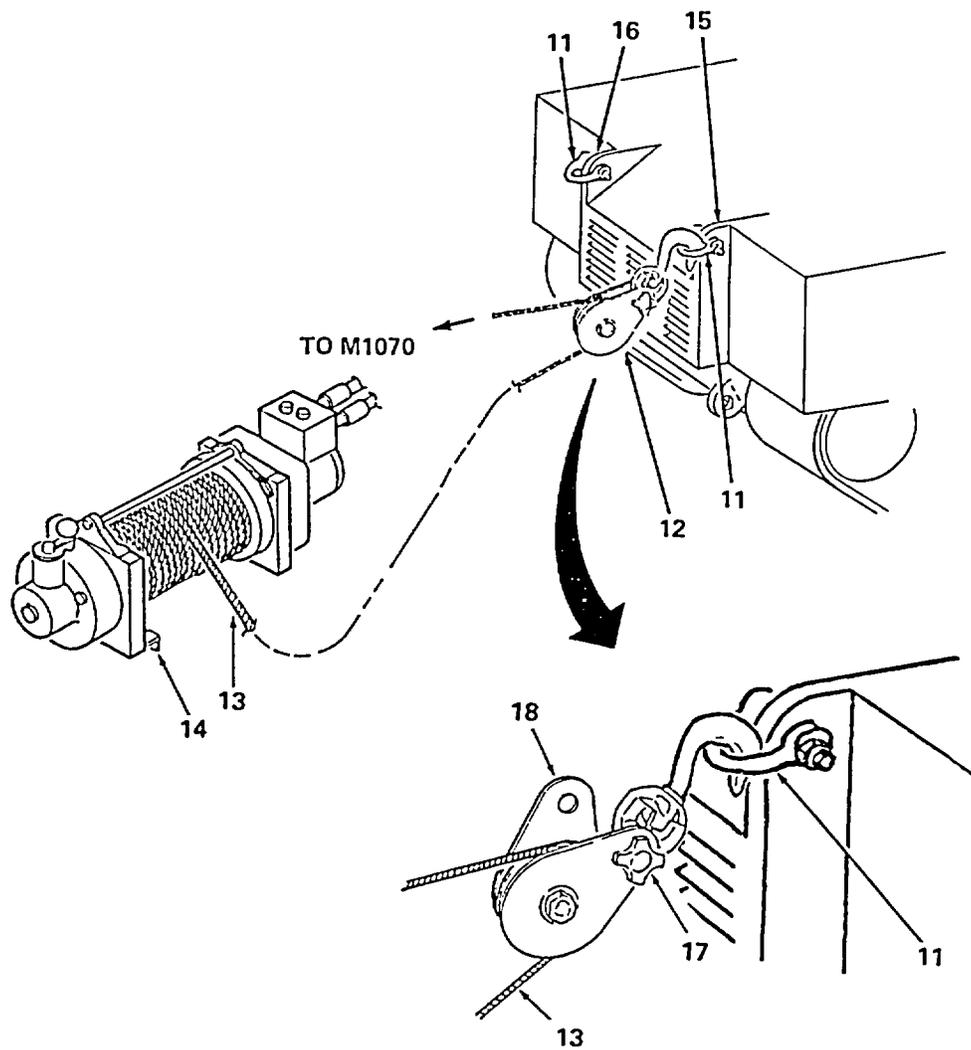
**Hearing protection must be worn when near winching station or when operating winches or serious injury to personnel may occur.**

- (b) Raise guard (9), lock in upright position, and release AUXILIARY WINCH KICKOUT by lifting and rotating AUXILIARY WINCH KICKOUT lever (10) counterclockwise (CCW).



- (c) Remove two payload tiedown shackles (11) from platform stowage compartment and auxiliary snatch block (12) from tractor stowage.
- (d) Unhook auxiliary winch cable (13) from stow hook (14).
- (e) Pull auxiliary winch cable (13) along streetside of gooseneck and over platform to rear of payload.
- (f) Install two payload tiedown shackles (11) on upper right rear recovery eye (15) and upper left rear recovery eye (16).
- (g) Attach auxiliary snatch block (12) to payload tiedown shackle (11) on upper right rear recovery eye (15) of payload.
- (h) Unscrew retainer bolt (17), rotate side housing (18) to open auxiliary snatch block (12), pass auxiliary winch cable (13) through auxiliary snatch block (12), and rotate side housing (18) to close.

- (i) Tighten retainer bolt (17) to secure side housing (18) in closed position.
- (j) Pull auxiliary winch cable (13) forward over platform and along curbside of gooseneck toward passenger side winching station on tractor.

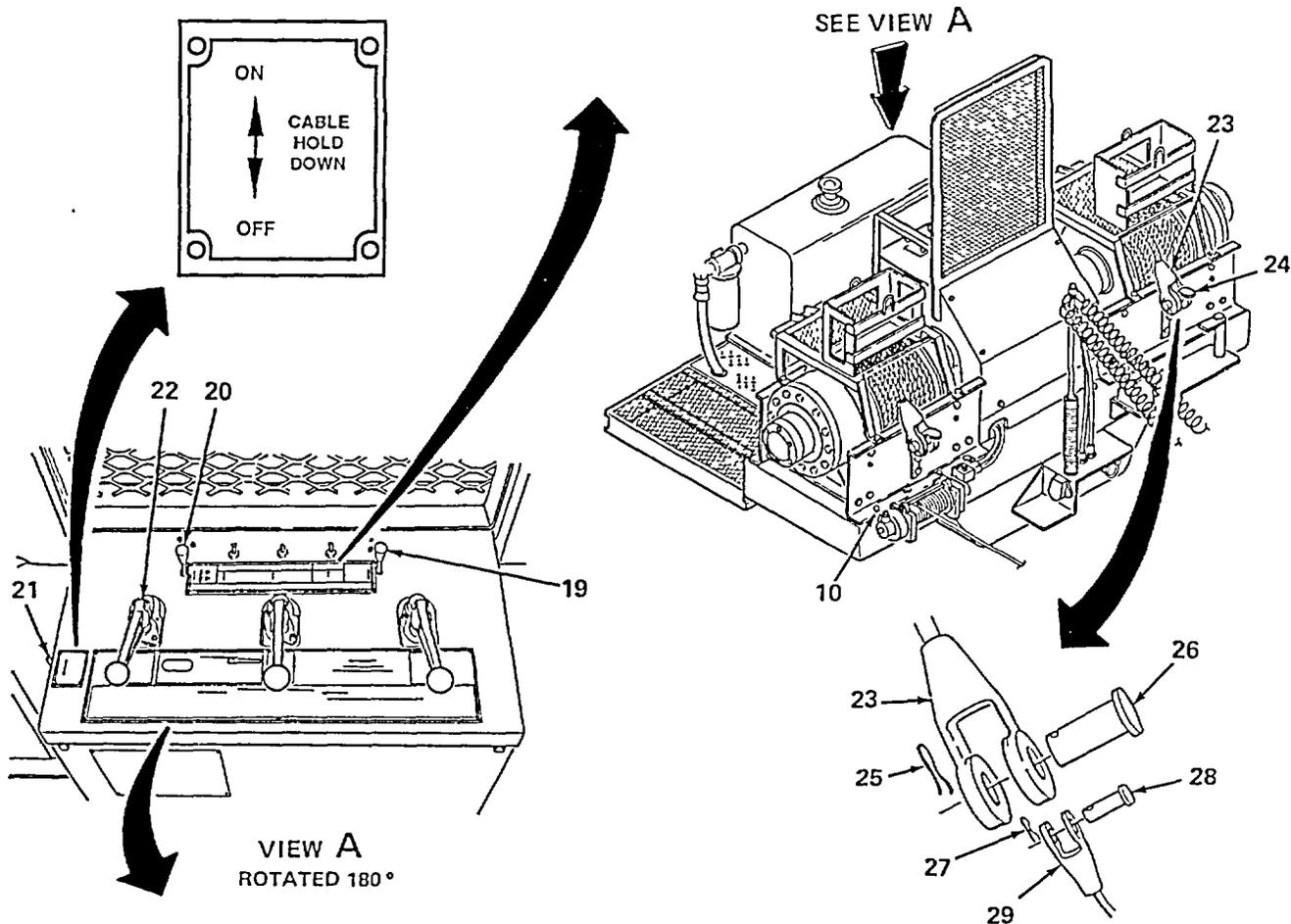
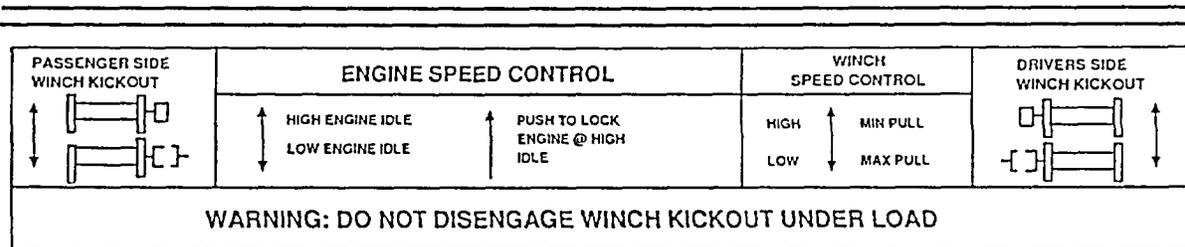


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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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- (k) Engage DRIVERS SIDE WINCH KICKOUT switch (19) and PASSENGER SIDE WINCH KICKOUT switch (20) by pushing on each switch.
- (l) Push CABLE HOLD DOWN lever (21) to ON.
- (m) Pull PASSENGER SIDE WINCH lever (22) upward momentarily until there is enough slack in passenger side winch cable (23) to be removed from stow hook (24).
- (n) Move clevis on passenger side winch cable (23) off stow hook (24) to unstow winch cable (23).
- (o) Continue paying out passenger side winch cable (23) until spotter on ground can reach clevis.
- (p) Release PASSENGER SIDE WINCH lever (22).
- (q) Remove and retain cotter pin (25) and shouldered pin (26) from clevis on passenger side winch cable (23).
- (r) Remove cotter pin (27) and shouldered pin (28) from auxiliary winch cable clevis (29).
- (s) Install auxiliary winch cable clevis (29) over one ear of clevis on passenger side winch cable (23) and install shouldered pin (28) and cotter pin (27).
- (t) Engage AUXILIARY WINCH KICKOUT by lifting and rotating AUXILIARY WINCH KICKOUT lever (10) clockwise (CW).
- (u) Disengage PASSENGER SIDE WINCH KICKOUT switch (20) by pulling on switch.



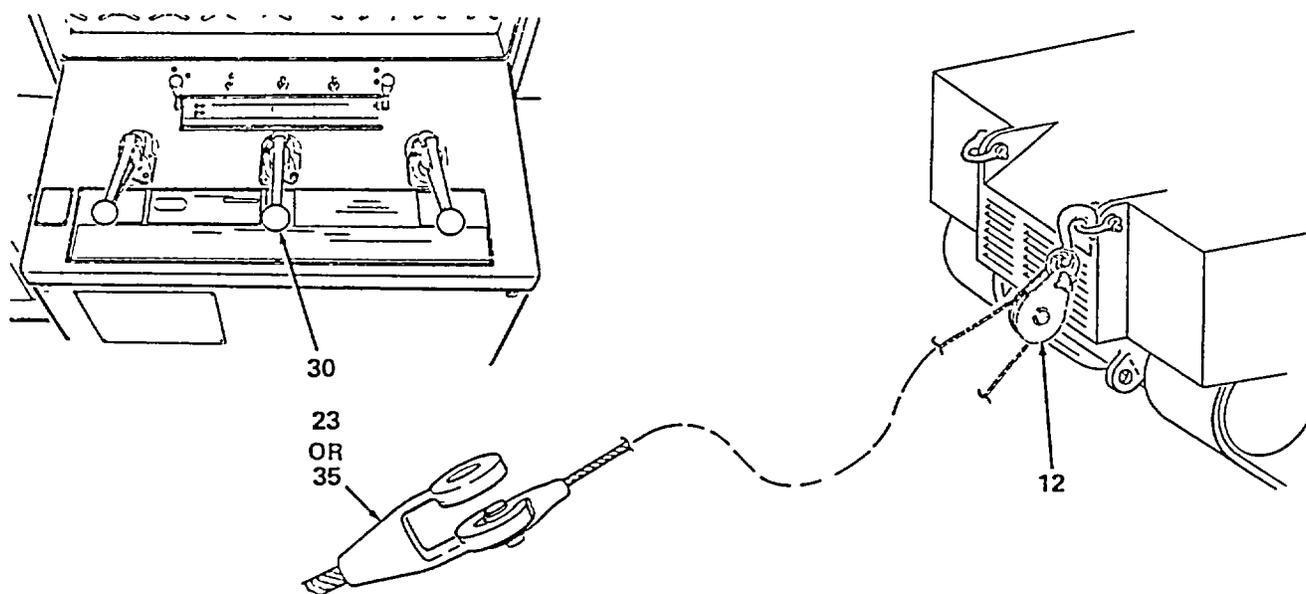
PASSENGER SIDE WINCH 	MANUFACTURING CORPORATION TULSA, OKLAHOMA, USA	MODEL NUMBER _____ SERIAL NUMBER _____ COMBINED CAP. - 110,000 LBS LINE SPEED "HIGH" 24 FPM LINE SPEED "LOW" 12 FPM	CABLE OUT CABLE IN AUXILIARY WINCH	<b>WARNING</b> DO NOT USE WINCH TO MOVE PERSONS	CABLE OUT CABLE IN DRIVERS SIDE WINCH
<b>WINCH SYSTEM OPERATING INSTRUCTIONS</b>					
1 ENGAGE PTO WITH ENGINE @ IDLE. 2 TEMPARTURE BELOW 20° F REFER TO COLD CLIMATE OPERATION SECTION OF INSTRUCTION MANUAL. 3 ENGINE RPM @ HIGH DURING WINCHING OPERATION	<b>AUXILIARY WINCH</b> 1 USED TO PULL CABLE FROM MAIN WINCHES. 2. CABLE OUT, DISENGAGE MANUAL KICKOUT 3. RETRIEVE CABLE USE CENTER CONTROL VALVE. *KICKOUT MUST BE ENGAGED.	<b>MAIN WINCHES</b> 1 FREESPOOL CABLE OUT DISENGAGE KICKOUT <b>WARNING, DO NOT DISENGAGE KICKOUT WHILE UNDER LOAD</b> 2. WINCH SPEED "LOW" FOR MAXIMUM PULL AND "HIGH" FOR MINIMUM PULL.			

## 2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)

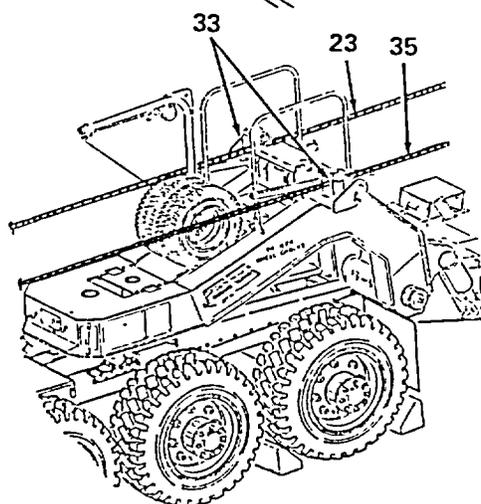
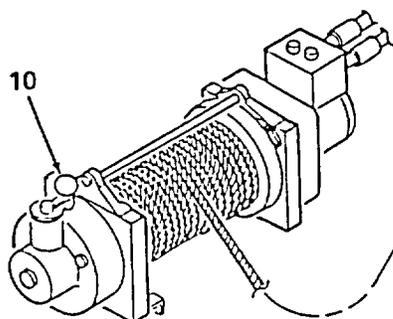
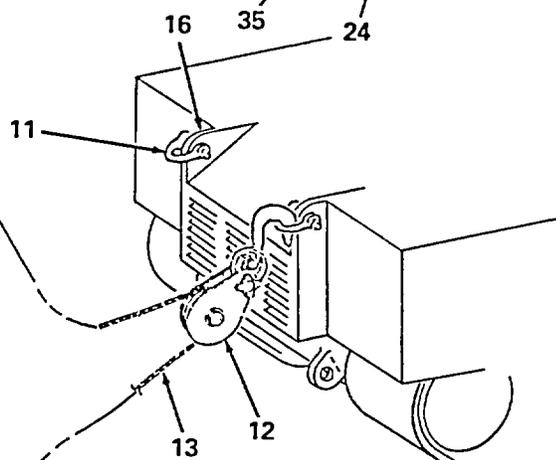
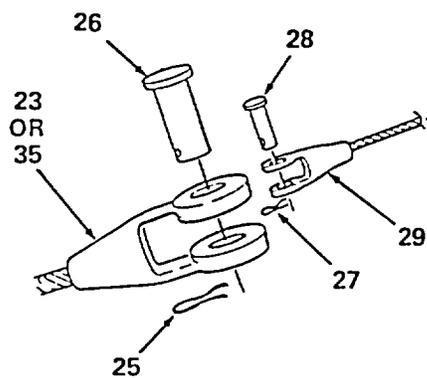
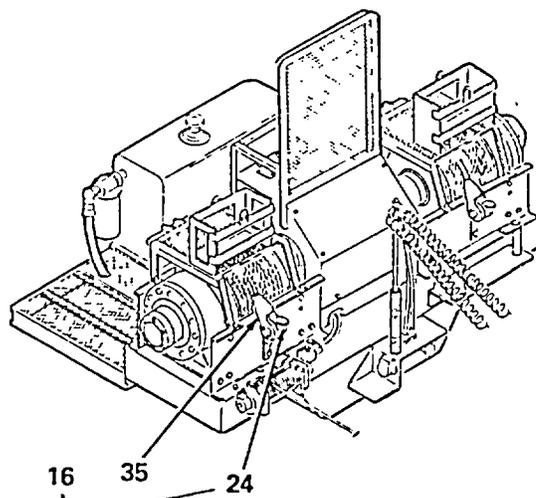
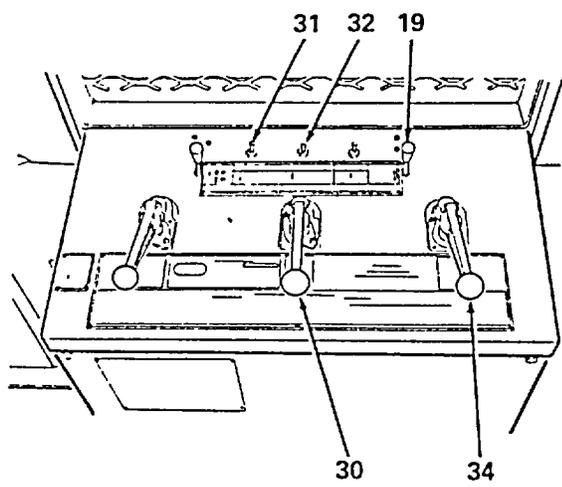
### **WARNING**

**Do not allow auxiliary winch cable to cross itself or knot up on winch or serious injury to personnel may occur.**

- (v) With one person to operate winch controls and a second person to ensure that winch cable devices do not hang up on platform, push down on AUXILIARY WINCH lever (30) to pull passenger side winch cable (23) toward auxiliary snatch block (12).



- (w) If auxiliary winch cable (13) does not pull passenger side winch cable (23), push ENGINE SPEED CONTROL switch (31) to HIGH ENGINE IDLE.
- (x) Momentarily push ENGINE SPEED CONTROL switch (32) to lock engine speed at high engine idle (approximately 1,500 rpm) and then release switch.



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

---

- (y) When passenger side winch cable (23) reaches front of platform, release AUXILIARY WINCH lever (30).
- (z) Route passenger side winch cable (23) through gooseneck cable guide (33).
- (aa) Push down on AUXILIARY WINCH lever (30) and continue to pull passenger side winch cable (23) to auxiliary snatch block (12).
- (ab) Release AUXILIARY WINCH lever (30) when passenger side winch cable (23) is approximately 12 inches (30 cm) from auxiliary snatch block (12).
- (ac) Spotter must continue to pull passenger side winch cable (23) until winch cable has enough slack that it touches ground.
- (ad) Remove cotter pin (27) and shouldered pin (28) from auxiliary winch cable clevis (29).
- (ae) Separate auxiliary winch cable (13) from passenger side winch cable (23).
- (af) Lay passenger side winch cable (23) on ground at rear of payload.
- (ag) Release AUXILIARY WINCH KICKOUT by lifting and rotating AUXILIARY WINCH KICKOUT lever (10) CCW.
- (ah) Move auxiliary snatch block (12) to payload tiedown shackle (11) at upper left rear recovery eye (16) of payload.
- (ai) Pull auxiliary winch cable (13) forward over platform and along streetside of gooseneck toward driver's side of winching station on tractor.
- (aj) Pull DRIVERS SIDE WINCH lever (34) upward momentarily until there is enough slack in driver's side winch cable (35) to be removed from stow hook (24).
- (ak) Move clevis on driver's side winch cable (35) off stow hook (24) to unstow winch cable.
- (al) Continue paying out driver's side winch cable (35) until spotter on ground can reach clevis.
- (am) Release DRIVERS SIDE WINCH lever (34).
- (an) Remove and retain cotter pin (25) and shouldered pin (26) from clevis on driver's side winch cable (35).
- (ao) Install auxiliary winch cable clevis (29) over one ear of clevis on driver's side winch cable (35) and install shouldered pin (28) and cotter pin (27).

- (ap) Engage AUXILIARY WINCH KICKOUT by lifting and rotating AUXILIARY WINCH KICKOUT lever (10) CW.
- (aq) Disengage DRIVERS SIDE WINCH KICKOUT (19) switch by pulling switch.

**WARNING**

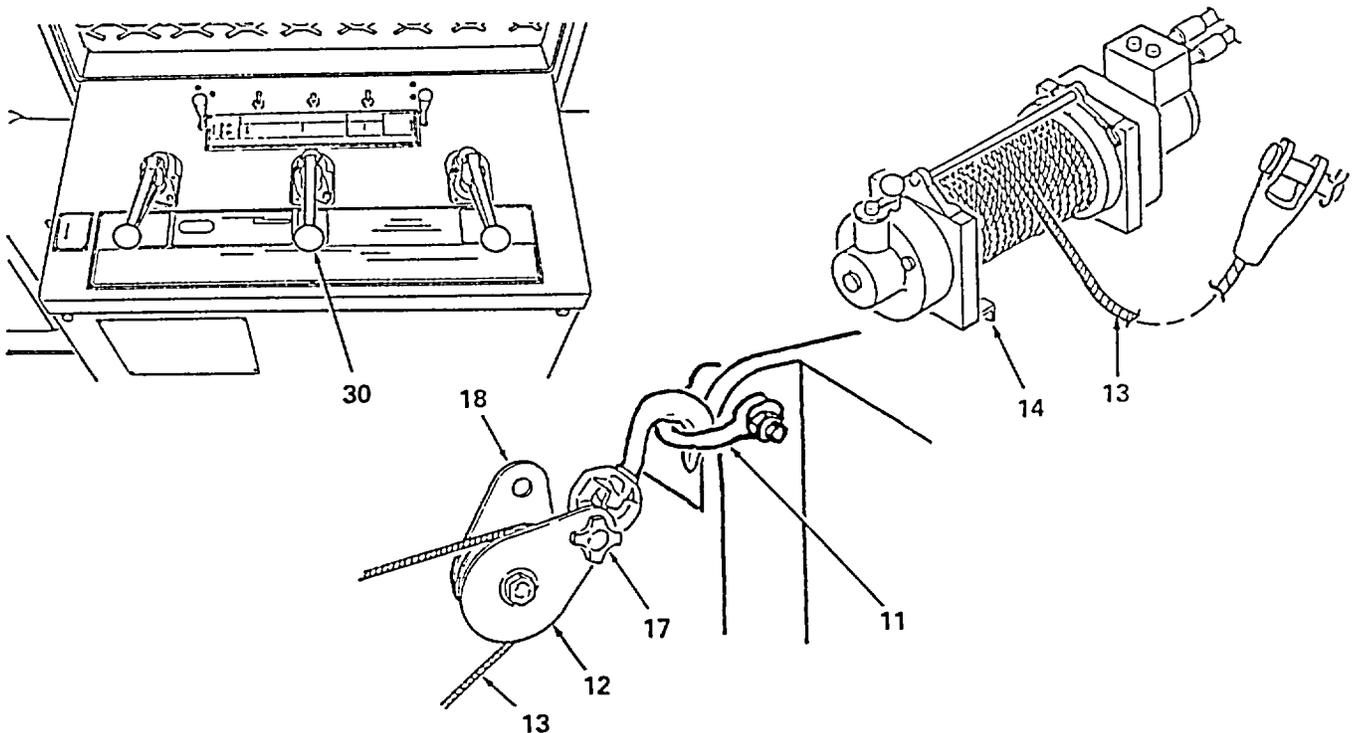
**Do not allow auxiliary winch cable to cross itself or knot up on winch or serious injury to personnel may occur.**

- (ar) With one person to operate winch controls and a second person to ensure that winch cable does not hang up on platform, push down on AUXILIARY WINCH lever (30) to pull driver's side winch cable (35) to auxiliary snatch block (12).
- (as) If auxiliary winch cable (13) does not pull driver's side winch cable (35), push ENGINE SPEED CONTROL switch (31) to HIGH ENGINE IDLE.
- (at) Momentarily push ENGINE SPEED CONTROL switch (32) to lock engine speed at high engine idle (approximately 1,500 rpm) and then release switch.
- (au) When driver's side winch cable (35) reaches front of platform, release AUXILIARY WINCH lever (30).
- (av) Route driver's side winch cable (35) through gooseneck cable guide (33).
- (aw) Push down on AUXILIARY WINCH lever (30) and continue to pull driver's side winch cable (35) to auxiliary snatch block (12).
- (ax) Release AUXILIARY WINCH lever (30) when driver's side winch cable (35) is approximately 12 inches (30 cm) from auxiliary snatch block (12).
- (ay) Spotter must continue to pull driver's side winch cable (35) until winch cable has enough slack that it touches ground.
- (az) Remove cotter pin (27) and shouldered pin (28) from auxiliary winch cable clevis (29).
- (ba) Separate auxiliary winch cable (13) from driver's side winch cable (35).
- (bb) Lay driver's side winch cable (35) on ground at rear of payload.
- (bc) Install shouldered pin (28) and cotter pin (27) into auxiliary winch cable clevis (29).

## 2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)

(bd) Restow auxiliary snatch block and winch cable as follows:

1. Unscrew retainer bolt (17) and rotate side housing (18) on auxiliary snatch block (12) to open snatch block.
2. Remove auxiliary winch cable (13) from auxiliary snatch block (12), rotate side housing (18) to close, and tighten retainer bolt (17) to secure side housing (18) in closed position.
3. Remove auxiliary snatch block (12) from payload tiedown shackle (11) and place back into tractor storage.
4. Remove two payload tiedown shackles (11) from upper left rear recovery and upper right rear recovery eyes.
5. Return payload tiedown shackles (11) to platform stowage compartment.
6. With one person to push downward on AUXILIARY WINCH lever (30) and one person to maintain tension on auxiliary winch cable (13), retract winch cable (13) and restow on stow hook (14).



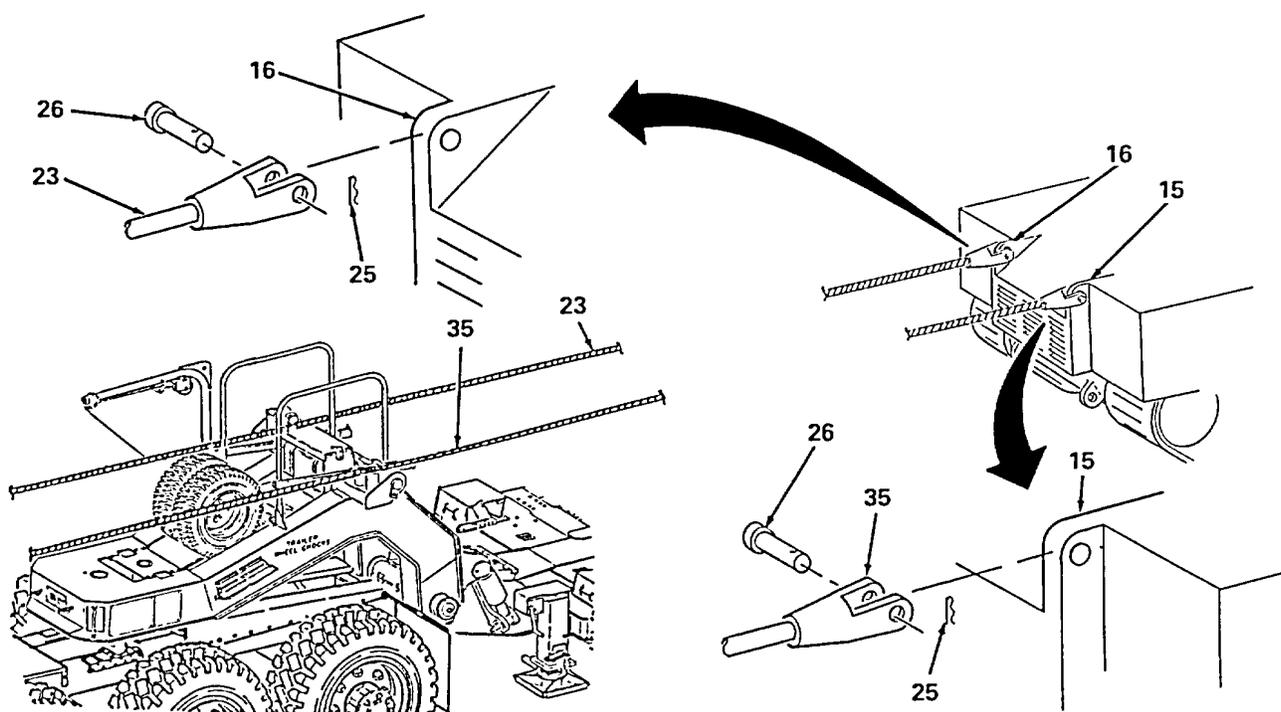
**WARNING**

During winching operations, cables can rotate and twist out of control. Exercise extreme care when connecting and disconnecting cable to recovery eyes and shackles or serious injury to personnel may occur.

**NOTE**

When winching payloads onto the semitrailer, a straight winch cable pull is the preferred method. Crossed winch cable pulls may be used if significant directional control problems are expected.

- (14) Two people connect passenger side winch cable (23) upper left rear recovery eye (16) on payload and secure in place by installing shouldered pin (26) and cotter pin (25).
- (15) Two people connect driver's side winch cable (35) to upper right rear recovery eye (15) on payload and secure in place by installing shouldered pin (26) and cotter pin (25).

**CAUTION**

The payload parking brake must be released and the mine clearing blade locked in the travel position prior to winching payload onto semitrailer or damage to equipment may occur.

- (16) Ensure that payload parking brake is released and mine clearing blade raised and locked in travel position.

---

**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

---

**WARNING**

**A cable breaking under strain can lash out and cause serious injury or death to personnel. Ground guides (spotters) shall position themselves to avoid the reach of uncontrolled cables.**

- (17) Position spotter on left side of payload to direct winch operator during winching operation.

**CAUTION**

**The WINCH SPEED CONTROL must be placed in LOW for MAX PULL when loading payloads or damage to equipment may occur.**

- (18) Pull WINCH SPEED CONTROL switch (36) to LOW.
- (19) Push ENGINE SPEED CONTROL switch (31) to HIGH ENGINE IDLE.
- (20) Momentarily push ENGINE SPEED CONTROL switch (32) to lock engine speed at high engine idle (approximately 1,500 rpm) and then release switch.
- (21) Engage DRIVERS SIDE WINCH KICKOUT switch (19) and PASSENGER SIDE WINCH KICKOUT switch (20) by pushing on each switch.
- (22) Push CABLE HOLD DOWN lever (21) to ON.
- (23) Take up all slack in driver's side winch cable (35) and passenger side winch cable (23) by pushing down on DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (22).
- (24) Release DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (32) when winch cables are tight.

**NOTE**

**Prior to pulling payload onto the ramps, check the alinement of the payload tracks (inboard edge) to the curb guides.**

- (25) Check payload for proper alinement. If adjustment is required to aline payload with platform, proceed as follows:
- (a) If payload is angled toward curbside of semitrailer, proceed as follows:
1. Place scrap blocks of wood under right side track of payload, just behind last road-wheel.
  2. Operate PASSENGER SIDE WINCH lever (22) and pull payload into alinement with ramps.

- (b) If payload is angled toward streetside of semitrailer, proceed as follows:
1. Place scrap blocks of wood under left side track of payload, just behind last road-wheel.
  2. Operate DRIVERS SIDE WINCH lever (34) and pull payload into alignment with ramps.

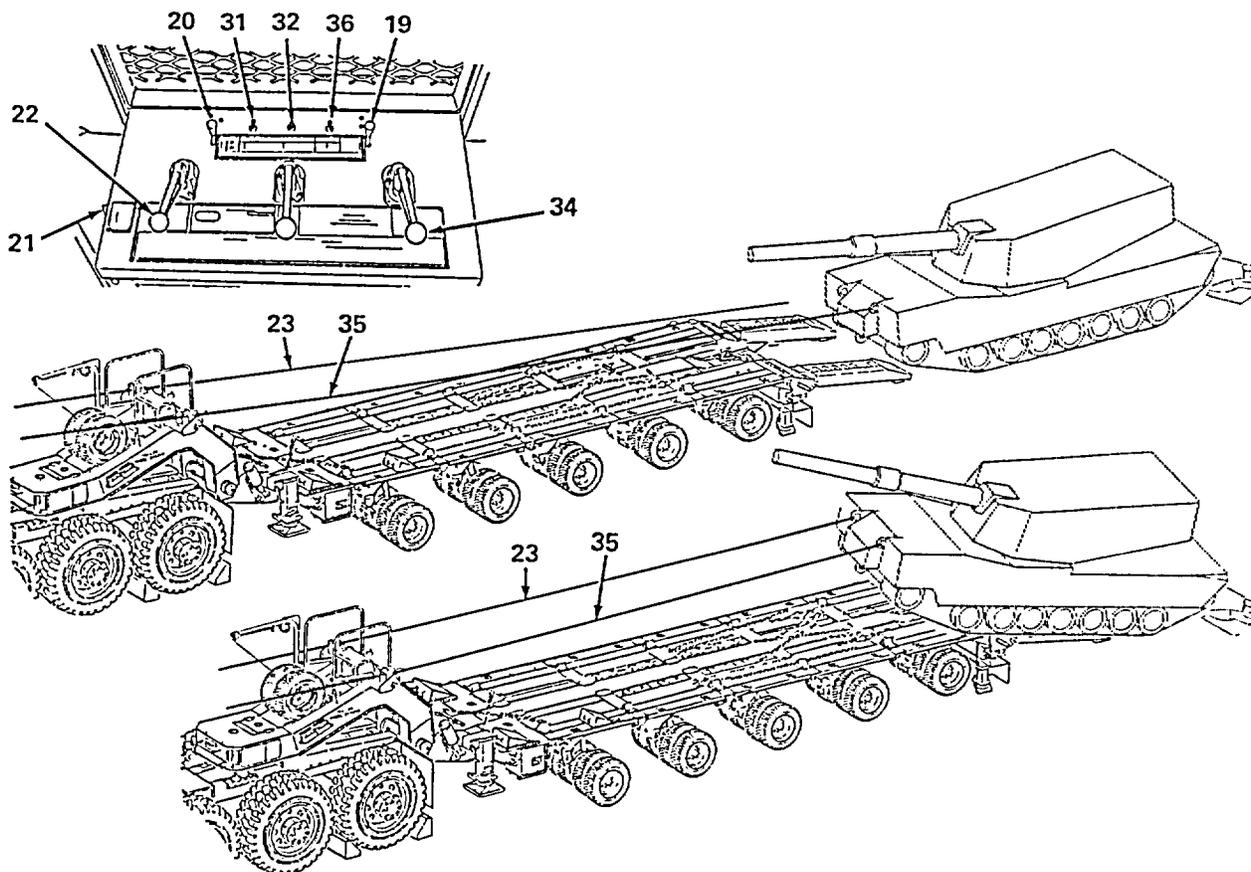
**WARNING**

**Mine clearing blade tines will contact ground as payload is pulled back onto ramps. Personnel must remain well clear and winching must be performed slowly to prevent serious injury to personnel and damage to equipment.**

**CAUTION**

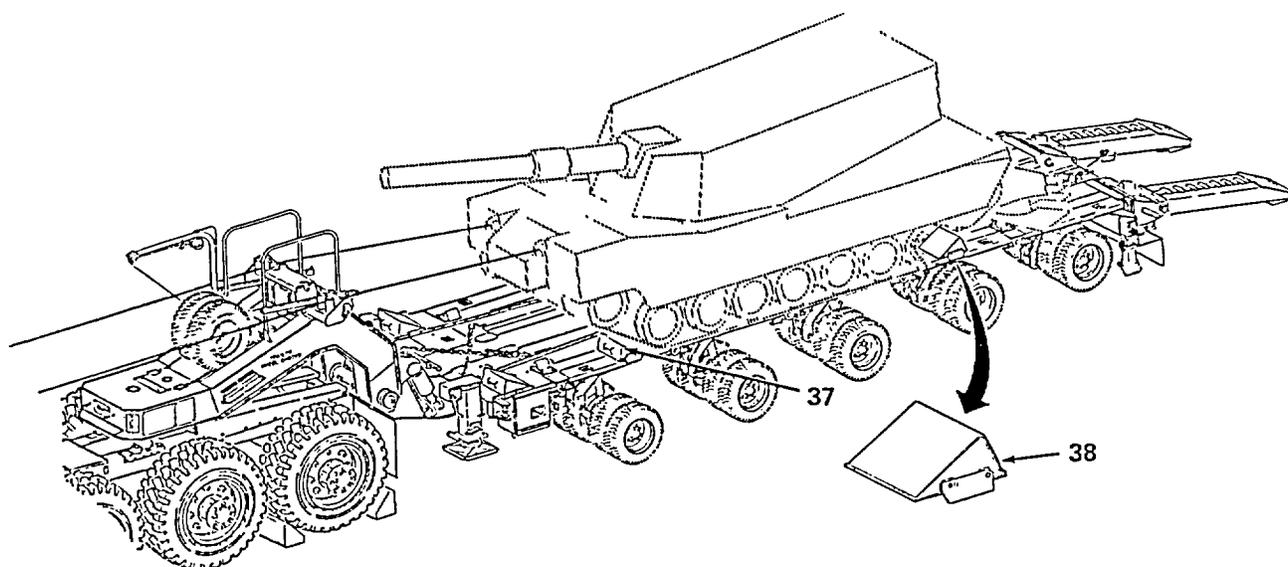
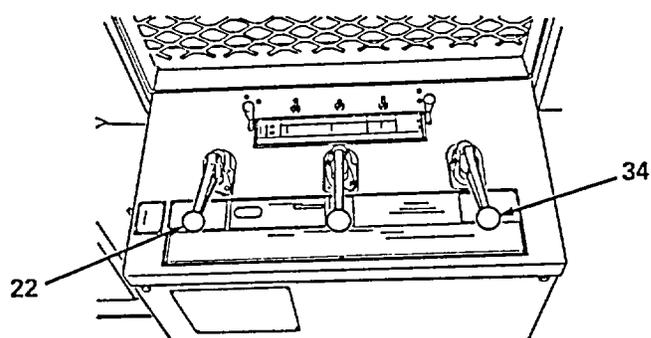
**Maintain even tension on both winch cables to keep payload centered with semitrailer or damage to equipment may occur.**

- (26) Push down DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (22) to pull payload slowly up ramps onto platform, adjusting pull on either driver's side winch cable (35) or passenger side winch cable (23), as required, to maintain alignment of payload tracks to curb guides.

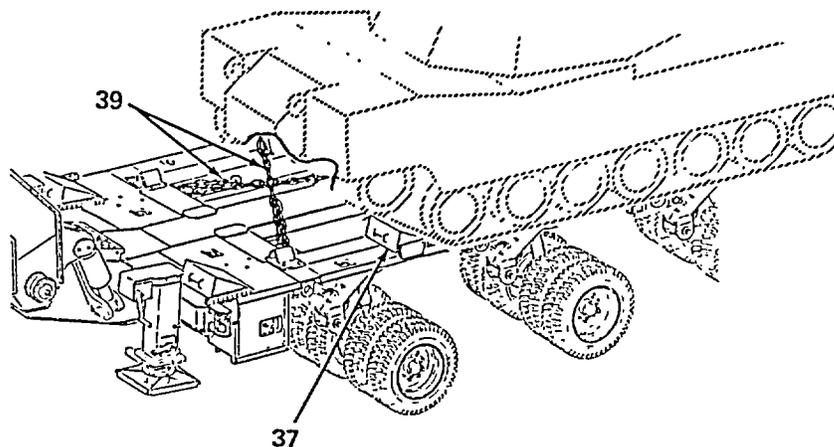
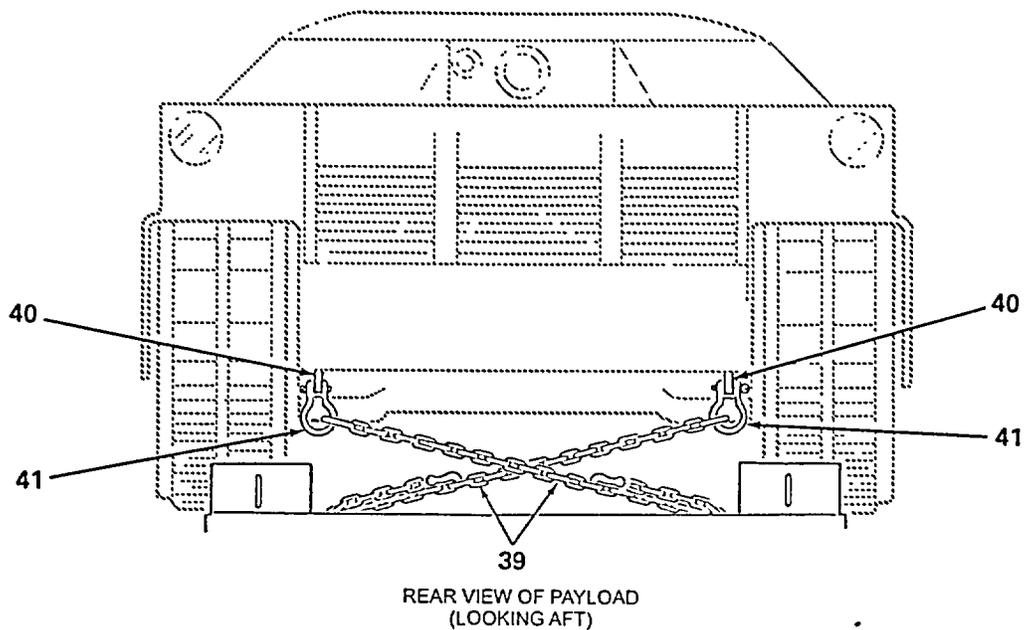


**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (27) When payload track makes contact with free payload chock (37) on streetside of platform, winch operator must release DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (22) to stop payload.
- (28) Chock streetside front of payload track using second free payload chock (38). Ensure that sheets are flush against side of platform to prevent inward shifting of free payload chock (38).



- (29) Perform procedure in paragraph 2-2a, step (39), and adjust front of platform to normal running height (43 inches (109 cm) ).
- (30) Attach two front tiedown chains (39) to two rear towing eyes (40) on payload using two payload tiedown shackles (41).
- (31) Remove free payload chock (37) from streetside rear of payload.



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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- (32) Operate DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (22) until front tiedown chains are tight and payload tracks (rear road-wheels) are firmly on front payload chocks (42).
- (33) Place both free payload chocks (37 and 38) to front curbside and streetside tracks of payload.

**WARNING**

**Prior to removing winch cable from payload, winch operator must be sure each cable sags to top of tractor tires to relieve cable twist or serious injury to personnel may occur.**

- (34) Operate DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH levers (22) until each winch cable sags to top of tractor tires.

**WARNING**

**Extend safety rails while attaching or removing payload winch cable or serious injury to personnel may occur.**

- (35) Unlatch and extend gooseneck safety rails (43).
- (36) Check for twist on driver's side winch cable (35) and passenger side winch cable (23) before disconnecting from upper right rear recovery eyes (15) and upper left rear recovery eye (16).
- (37) Remove cotter pins (25) and shouldered pins (26) from devises on driver's side winch cable (35) and passenger side winch cable (23) and remove cables from upper right rear recovery eye (15) and upper left rear recovery eye (16) on payload.

**WARNING**

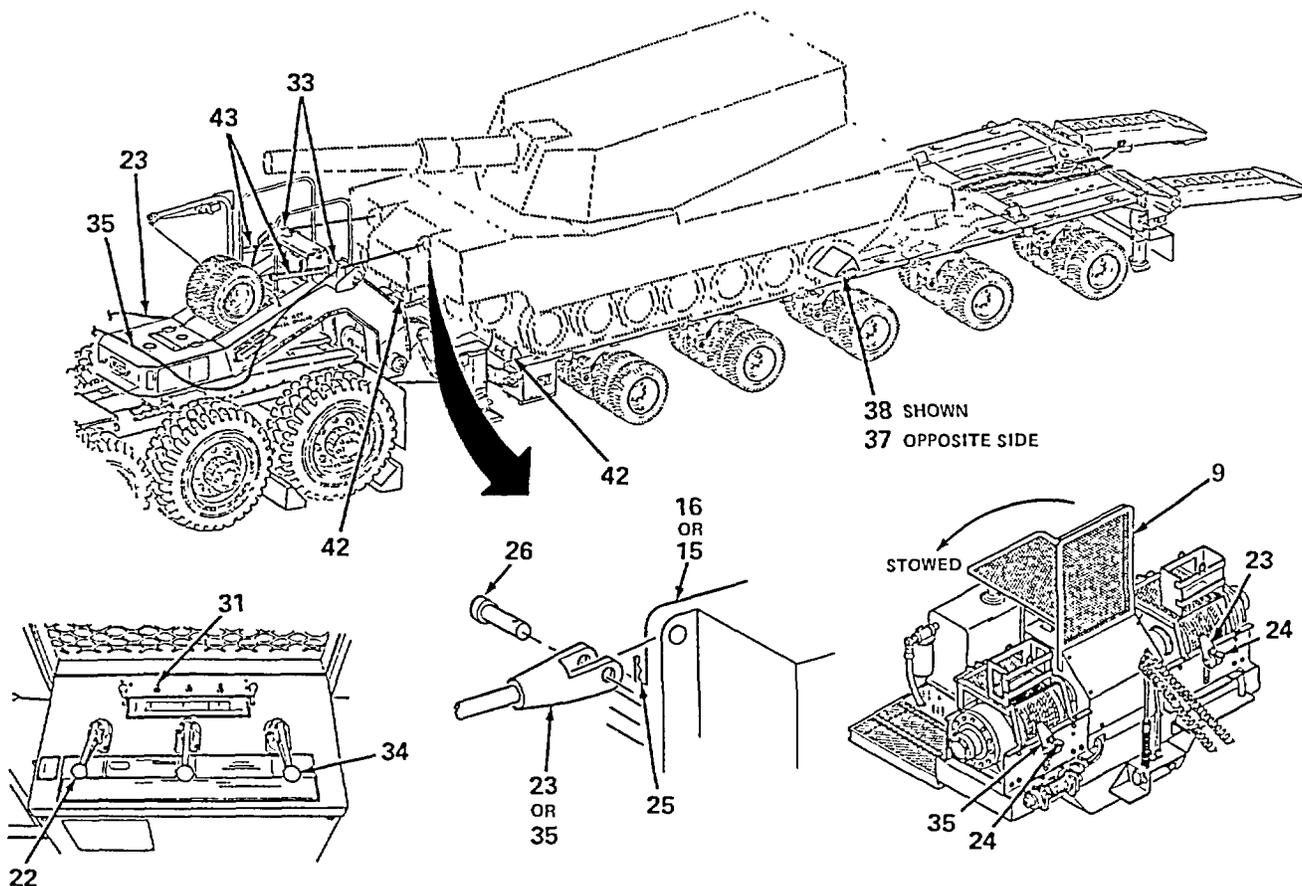
**Retract and latch gooseneck safety rails before operating tractor/ semitrailer or serious injury to personnel and damage to equipment may occur.**

- (38) Retract and latch gooseneck safety rails (43).
- (39) Perform procedures in paragraph 2-2a, steps (45) thru (52) (u), and secure payload to semitrailer platform.
- (40) Install shouldered pins (26) and cotter pins (25) into devises on driver's side winch cable (35) and passenger side winch cable (23).
- (41) Remove driver's side winch cable (35) and passenger side winch cable (23) from gooseneck cable guides (33).

**WARNING**

**Do not allow hands to get between clevis and winch or serious injury to personnel may occur.**

- (42) With one person to push down on DRIVERS SIDE WINCH lever (34) and one person to maintain tension on driver's side winch cable (35), retract and stow winch cable (35) onto stow hook (24).
- (43) Release DRIVERS SIDE WINCH lever (34).
- (44) With one person to push down on PASSENGER SIDE WINCH lever (22) and one person to maintain tension on passenger side winch cable (23), retract and stow winch cable (23) onto stow hook (24).
- (45) Release PASSENGER SIDE WINCH lever (22).
- (46) Pull ENGINE SPEED CONTROL switch (31) to LOW ENGINE IDLE. Lower guard (9) and lock in place.

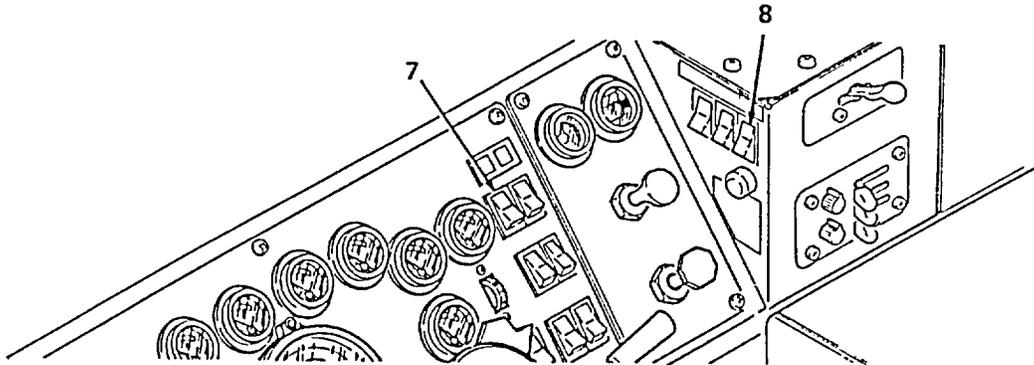


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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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- (47) Perform procedures in paragraph 2-2a, steps (53) thru (60), and raise and secure ramps and stow curb guides, crowbar, and all tools used during loading procedure.
- (48) On tractor, set PTO switch (8) to OFF and set beacon light switch (7) to OFF.



**NOTE**

The following procedures provide instructions for unloading a disabled payload (Abrams MBT series with mine clearing blade attached) onto the M1000 semitrailer. The M1070 tractor is illustrated as the prime mover throughout these instructions. If other prime movers are used, these procedures will need to be changed significantly.

- b. Dual winch unloading of disabled payload. To unload a disabled payload, proceed as follows:
- (1) Perform procedures in paragraph 2-2b, steps (1) thru (8), and position semitrailer, adjust ramp span width, and position curb guides.

**WARNING**

Observe the following precautions during the unloading process:

If possible, provide ample clear space behind the disabled payload during unloading to prevent serious injury or death to personnel and damage to equipment should cables break while payload is being unloaded.

Ensure that winch cables are not kinked, clevises are secured to winch cables, and snatch blocks and shackles are in good condition and properly secured or serious injury or death to personnel may occur.

Ensure that winch cables are inspected in accordance with TB 43-0142 or serious injury to personnel may occur.

Extreme caution should be exercised during any operation on a slope or serious injury to personnel may occur.

A ground guide (spotter) must stand off curbside of semitrailer and maintain visual contact with the winch operator. The spotter must observe cables, snatch blocks, shackles, and payload position during unloading or serious injury to personnel may occur.

Do not overload tractor winches. Know the ratings of the winches being used and the existence of any protection devices (such as shear pins) or serious injury to personnel may occur.

All ground personnel must stand clear of winch cables except when handling or serious injury to personnel may occur.

At no time during unloading operations while the payload is being pulled off with winches should personnel be on the semitrailer platform or serious injury or death to personnel may occur.

Always wear leather gloves when handling winch cable. Never allow cable to run through hands or serious injury to personnel may occur.

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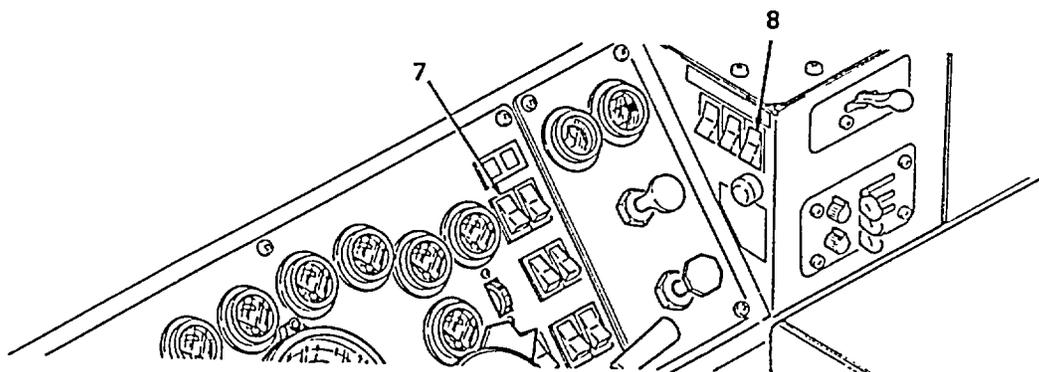
**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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**NOTE**

**Ensure that tractor parking brakes are applied. PTO will not engage unless tractor parking brakes are set.**

- (2) Set beacon light switch (7) to ON.
- (3) With engine idling, set PTO switch (8) to ON.

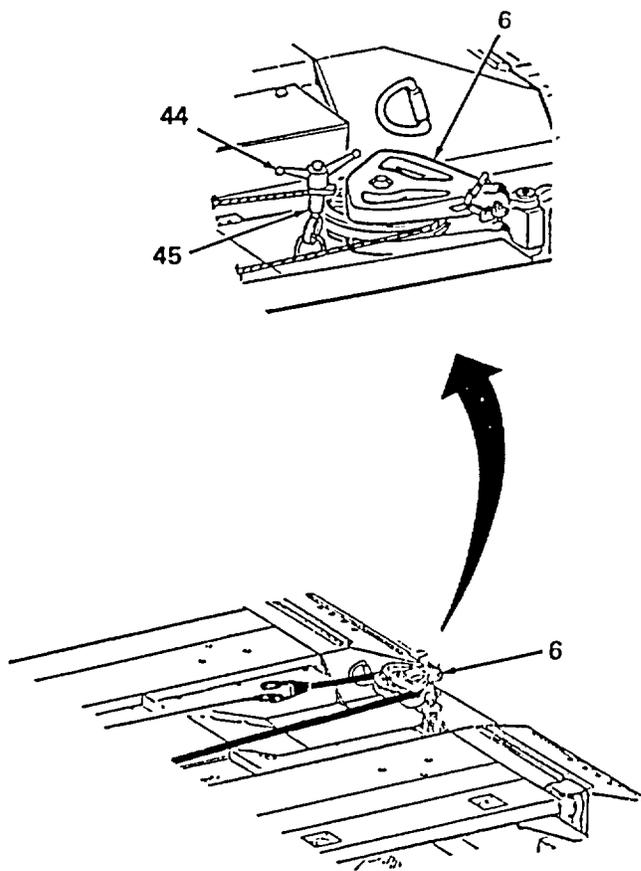
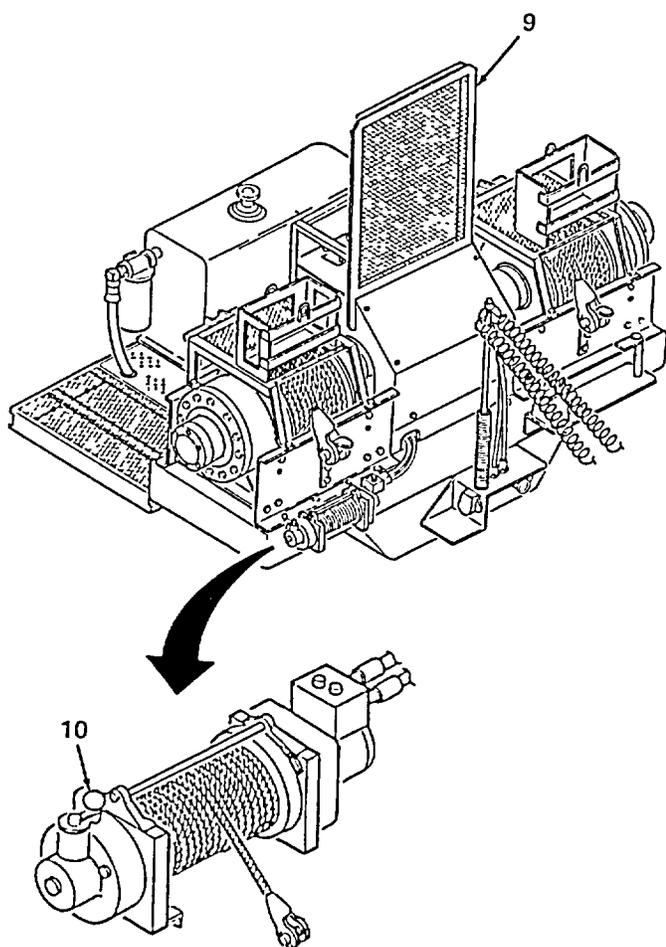


- (4) Loosen handle (44) of snatch block stow clamp (45) and remove snatch block (6) from stowed position off platform stow pins.

**WARNING**

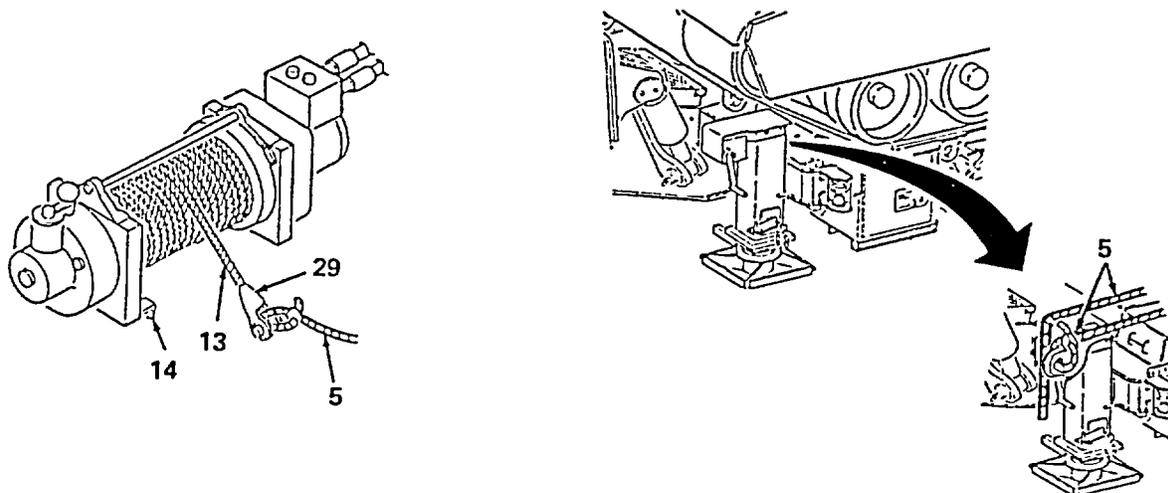
**Hearing protection must be worn when near winching station or when operating winches or serious injury to personnel may occur.**

- (5) Raise guard (9), lock in upright position, and release AUXILIARY WINCH KICKOUT by lifting and rotating AUXILIARY WINCH KICKOUT lever (10) CCW.

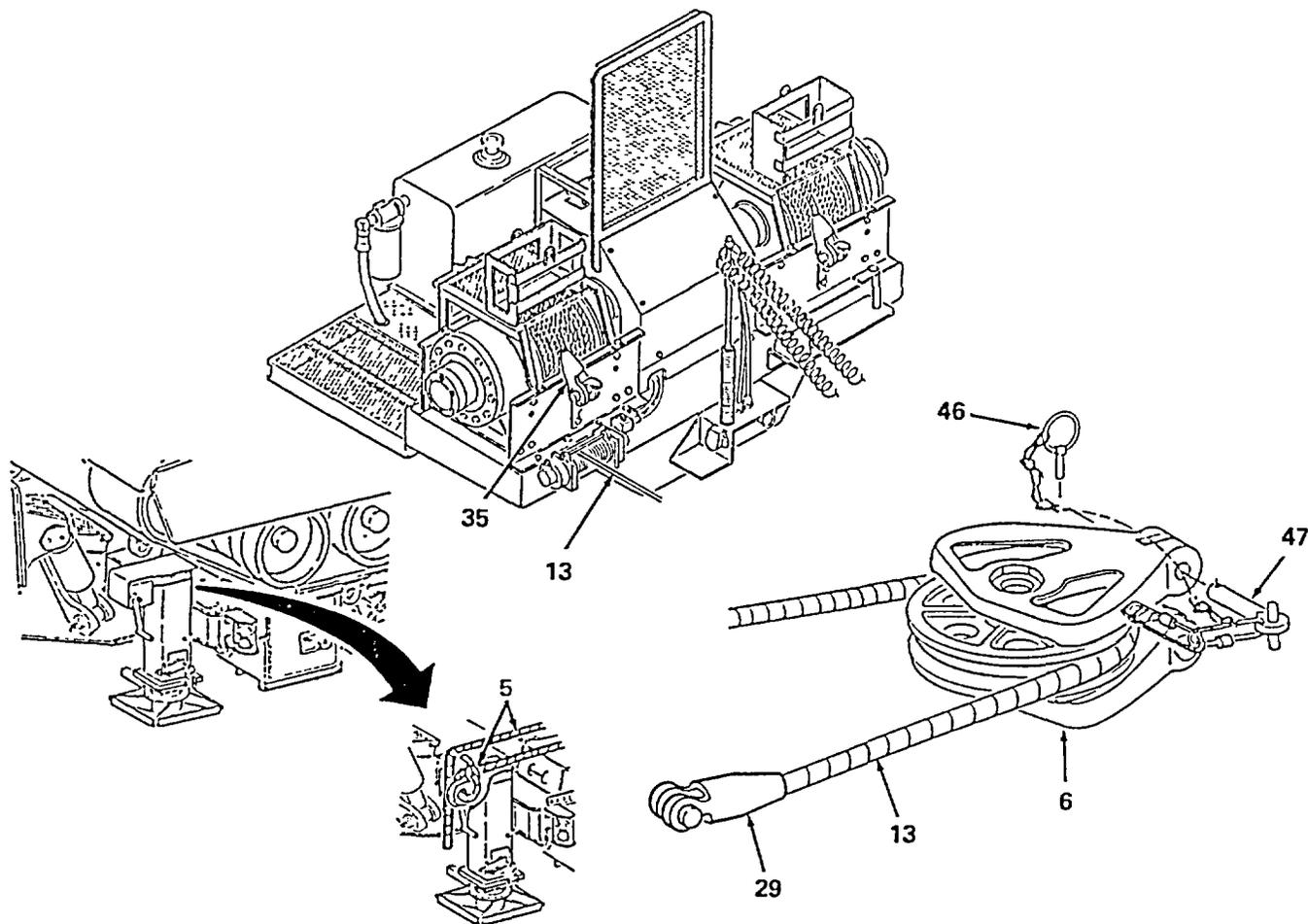


**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

- (6) Untie manila rope (5) from curbside front lifting eye on platform and move end of manila rope (5) to streetside front lifting eye.
- (7) Unhook auxiliary winch cable (13) from stow hook (14). Pull auxiliary winch cable (13) to free end of manila rope (5) and tie manila rope (5) to auxiliary winch cable clevis (29).



- (8) Untie manila rope (5) from streetside front lifting eye on platform and use manila rope (5) to pull auxiliary winch cable (13) rearward under payload to snatch block (6).
- (9) Remove linch pin (46) and keeper pin (47) and open snatch block (6).
- (10) Pass auxiliary winch cable (13), curbside to streetside, through snatch block (6).
- (11) Close snatch block (6), reinstall keeper pin (47), and secure with linch pin (46).
- (12) Continue pulling manila rope (5) forward until auxiliary cable winch clevis (29) reaches clevis on driver's side winch cable (35).
- (13) Untie manila rope (5) from auxiliary winch cable clevis (29).

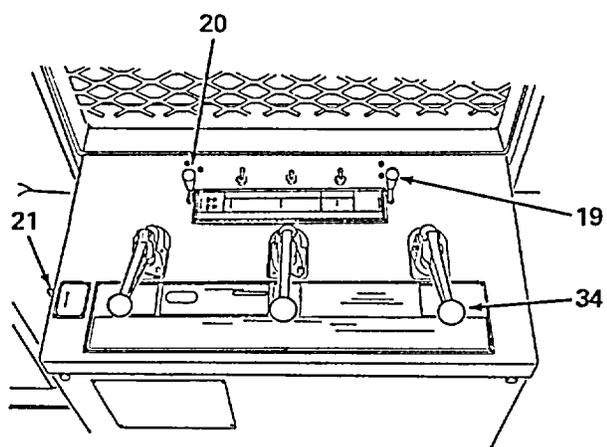


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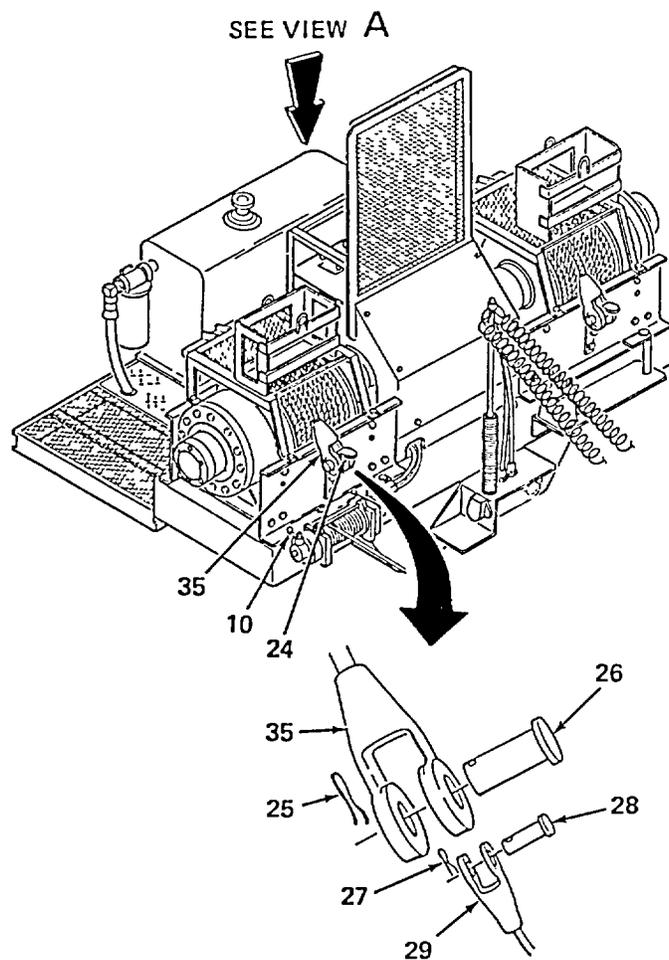
**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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- (14) Ensure that DRIVERS SIDE WINCH KICKOUT switch (19) and PASSENGER SIDE WINCH KICKOUT switch (20) are ENGAGED (pushed away from operator).
- (15) Ensure that CABLE HOLD DOWN lever (21) is ON (pushed away from operator).
- (16) Pull DRIVERS SIDE WINCH lever (34) upward momentarily until there is enough slack in driver's side winch cable (35) to be removed from stow hook (24).
- (17) Move clevis on driver's side winch cable (35) off stow hook (24) to unstow winch cable (35).
- (18) Continue paying out driver's side winch cable (35) until spotter on ground can reach clevis; then release DRIVERS SIDE WINCH lever (34).
- (19) Remove and retain cotter pin (25) and shouldered pin (26) from clevis on driver's side winch cable (35).
- (20) Remove cotter pin (27) and shouldered pin (28) from auxiliary winch cable clevis (29).
- (21) Install auxiliary winch cable clevis (29) over one ear of clevis on driver's side winch cable (35) and install shouldered pin (28) and cotter pin (27).
- (22) Engage AUXILIARY WINCH KICKOUT by lifting and rotating AUXILIARY WINCH KICKOUT lever (10) CW. Disengage DRIVERS SIDE WINCH KICKOUT switch (19) by pulling switch.



VIEW A  
ROTATED 180°



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

---

**WARNING**

**Do not allow auxiliary winch cable to cross itself or knot up on winch or serious injury to personnel may occur.**

- (23) With one person to operate winch controls and one person to ensure that winch cable devices do not hang up on platform, push down on AUXILIARY WINCH lever (30) to pull driver's side winch cable (35) to snatch block (6).
- (24) If auxiliary winch cable (13) does not pull driver's side winch cable (35), push ENGINE SPEED CONTROL switch (31) to HIGH ENGINE IDLE.
- (25) Momentarily push ENGINE SPEED CONTROL switch (32) to lock engine speed at high idle (approximately 1500 rpm) and then release switch.

**NOTE**

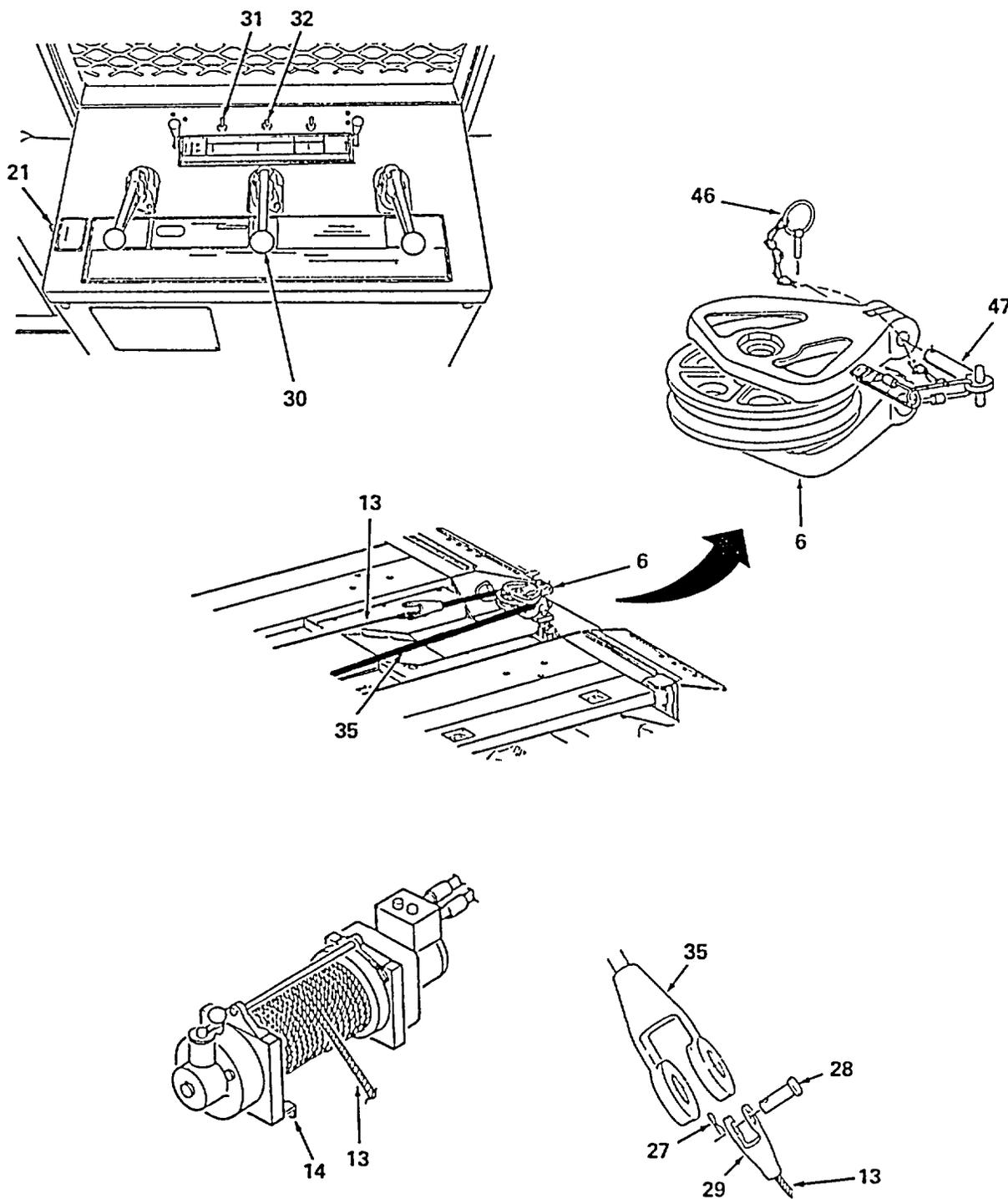
**To keep winch cable clevis from becoming stuck on platform, spotter should watch clevis as it passes under payload.**

- (26) Release lever (30) when driver's side winch cable (35) reaches snatch block (6).
- (27) Pull on driver's side winch cable (35) to get enough slack so cable can be passed through snatch block (6).
- (28) Unfasten lynch pin (46) from keeper pin (47), remove keeper pin (47) from snatch block (6), lift and open snatch block (6), and pass driver's side winch cable (35) through snatch block (6).
- (29) Once driver's side winch cable (35) is past pulley on snatch block (6), close snatch block (6) and reinstall keeper pin (47).
- (30) Secure keeper pin (47) to snatch block (6) by installing lynch pin (46).
- (31) Push down and hold AUXILIARY WINCH lever (30) to pull driver's side winch cable (35) to front of platform.
- (32) Release AUXILIARY WINCH lever (30) when driver's side winch cable (35) is approximately 12 inches (30 cm) past streetside front of platform.

**WARNING**

**Prior to disconnecting any winch cables, be sure each cable is not twisted. A twisted winch cable, when operated, can develop extreme tension, which may cause serious injury to personnel when cable clevis is removed.**

- (33) Remove cotter pin (27) and shouldered pin (28) from auxiliary winch cable clevis (29) and remove auxiliary winch cable clevis (29) from driver's side winch cable (35).
- (34) With one person to push downward on AUXILIARY WINCH lever (30) and one person to maintain tension on auxiliary winch cable (13), retract winch cable (13) and restow on stow hook (14).
- (35) Move CABLE HOLD DOWN lever (21) to OFF.



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

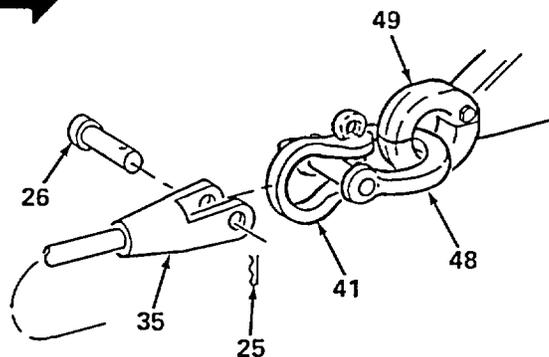
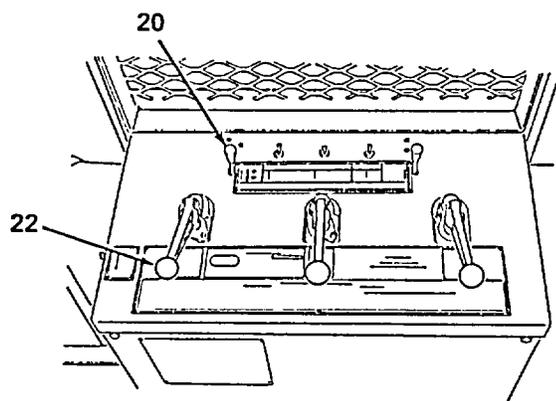
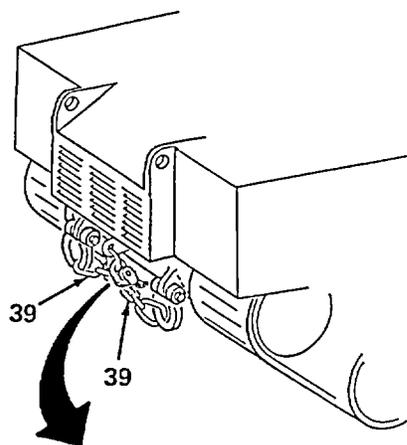
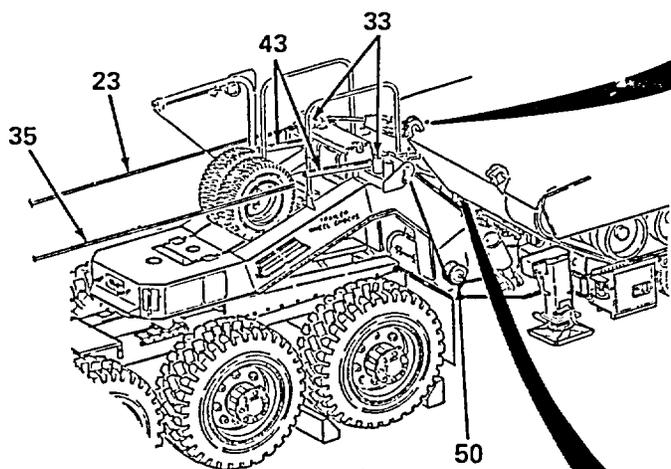
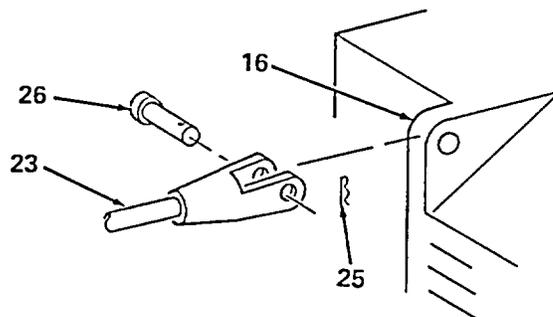
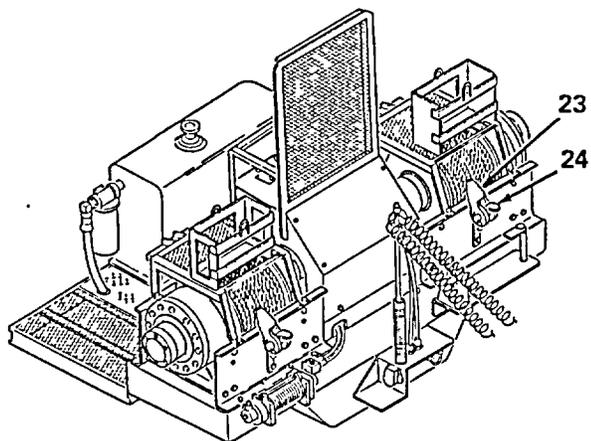
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- (36) Pull driver's side winch cable (35) to center rear of payload and route over both front tiedown chains (39).
- (37) Pull PASSENGER SIDE WINCH lever (22) upward momentarily until there is enough slack in passenger side winch cable (23) to be removed from stow hook (24).
- (38) Move clevis on passenger side winch cable (23) off stow hook (24) to unstow winch cable (23).
- (39) Continue paying out passenger side winch cable (23) until spotter on ground can reach clevis.
- (40) Release PASSENGER SIDE WINCH lever (22).
- (41) Disengage PASSENGER SIDE WINCH KICKOUT switch (20) by pulling on switch.
- (42) Remove cotter pin (25) and shouldered pin (26) from clevis on passenger side winch cable (23).
- (43) Perform procedure in paragraph 2-2b, step (8), and disconnect all tiedown chains (39) from front of payload.
- (44) Remove one towing shackle (48) and one payload tiedown shackle (41) from rear of platform and install to pintle (49) on rear center of payload.
- (45) Attach clevis on driver's side winch cable (35) to payload tiedown shackle (41) on pintle (49) at center rear of payload.
- (46) Secure driver's side winch cable (35) by installing shouldered pin (26) and cotter pin (25).

**WARNING**

**Extend safety rails while attaching or removing payload winch cable or serious injury to personnel may occur.**

- (47) Unlatch and extend both gooseneck safety rails (43).
- (48) Route driver's side winch cable (35) through streetside gooseneck cable guide (33) and around pivot pin sheave (50).
- (49) Pull out passenger side winch cable (23) and attach clevis to payload upper left rear recovery eye (16).
- (50) Secure passenger side winch cable (23) by installing shouldered pin (26) and cotter pin (25).



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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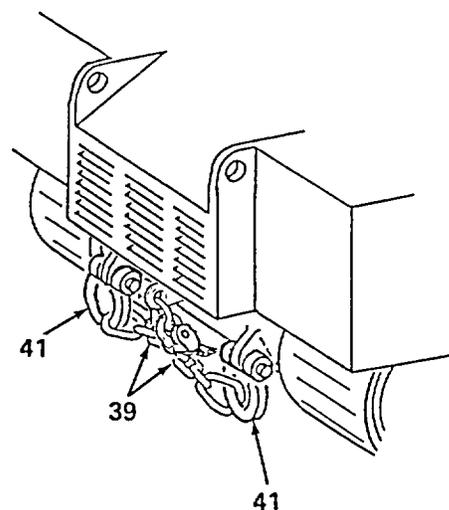
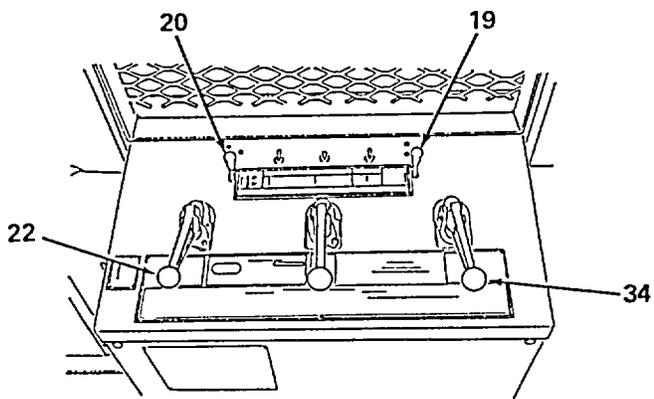
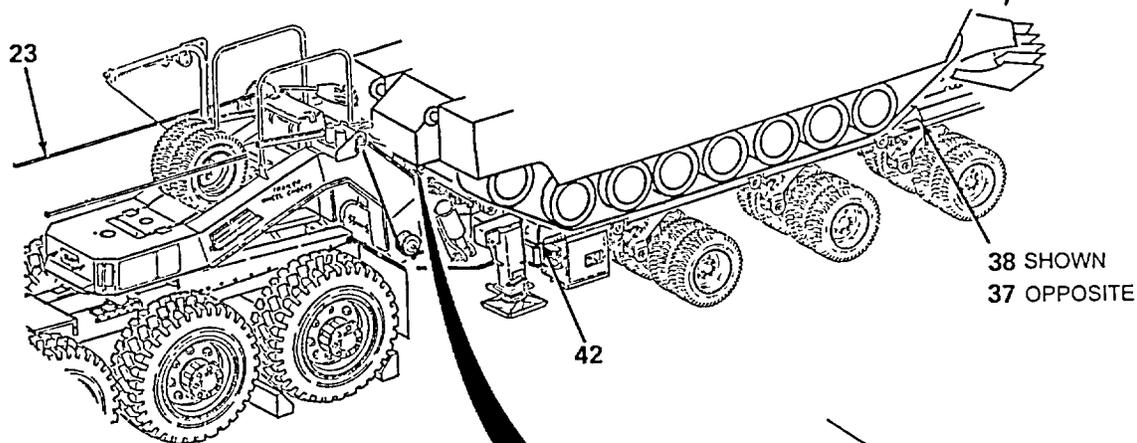
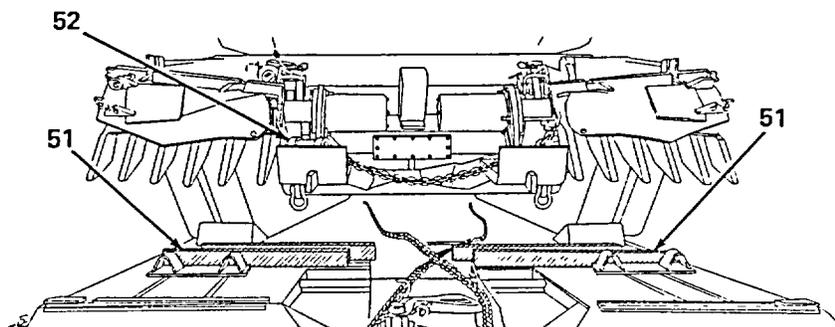
- (51) Route passenger side winch cable (23) through gooseneck cable guide (33).

**WARNING**

**Retract and latch gooseneck safety rails before operating tractor/semitrailer or serious injury to personnel and damage to equipment may occur.**

- (52) Retract and latch both gooseneck safety rails (43).
- (53) Engage PASSENGER SIDE WINCH KICKOUT switch (20) by pushing in on switch.
- (54) Momentarily push down and release PASSENGER SIDE WINCH lever (22) to take up slack in passenger side winch cable (23).
- (55) Raise tines of mine clearing blade and lock tines in travel position per TM 9-2590-509-10.

- (56) Remove timbers (51) from platform.
- (57) Place dog-bone (52) in mine clearing blade skid shoe.



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

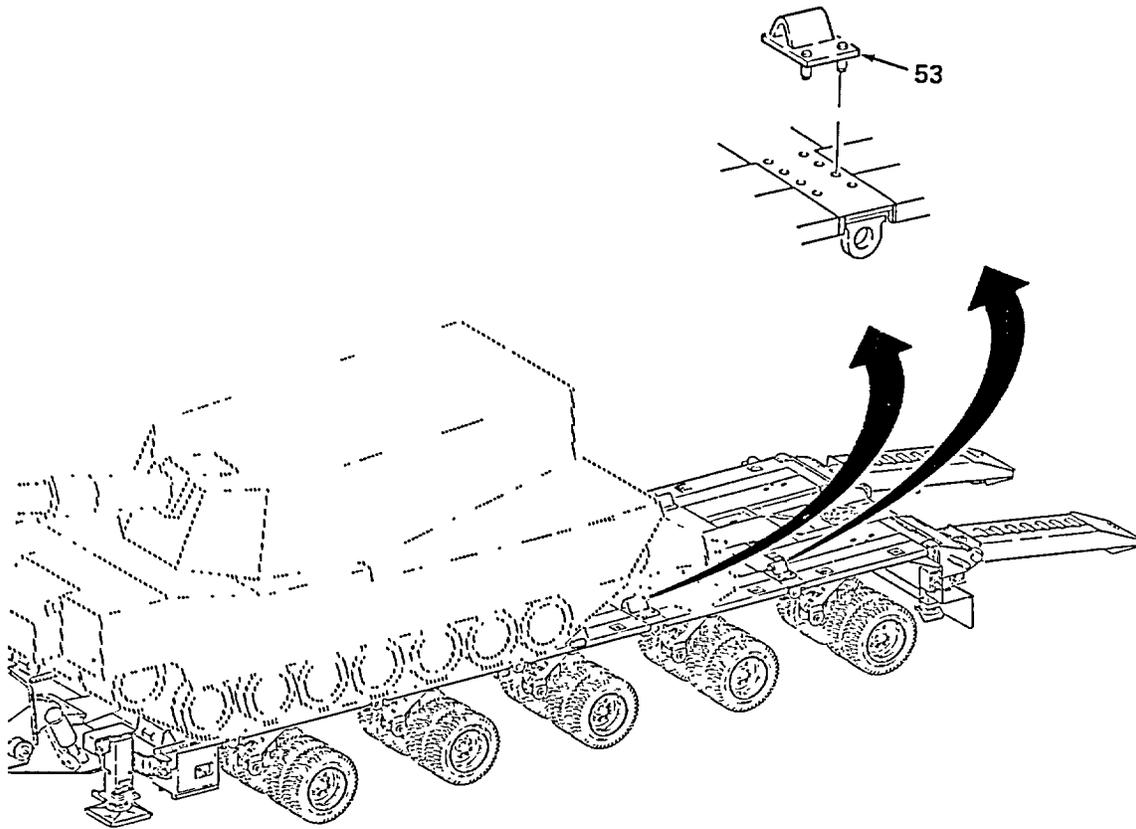
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**WARNING**

**The driver's side winch cable will be used to pull the payload back, and the passenger side winch cable will be used to restrain the payload. Do not allow the driver's side winch cable to pull against the passenger side winch cable or serious injury to personnel and damage to equipment may occur.**

- (58) Engage DRIVERS SIDE WINCH KICKOUT by pushing DRIVERS SIDE WINCH KICKOUT switch (19).
- (59) Push down DRIVERS SIDE WINCH lever (34) to move payload back onto free payload chock (38) and free payload chock (37) and pull up PASSENGER SIDE WINCH lever (22) enough to allow payload to move without excess slack in passenger side winch cable (23).
- (60) Release DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (22) when payload tracks are on free payload chock (38) and free payload chock (37) and front tiedown chains (39) are loose.
- (61) Remove two tiedown chains (39) and payload tiedown shackles (41) from rear of payload.
- (62) Lay tiedown chains (39) and payload tiedown shackles (41) forward toward center of platform.
- (63) Engage PASSENGER SIDE WINCH KICKOUT by pushing PASSENGER SIDE WINCH KICKOUT switch (20).
- (64) Push down PASSENGER SIDE WINCH lever (22) to move payload forward to front payload chocks (42) and pull up DRIVERS SIDE WINCH lever (34) enough to allow payload to move.
- (65) Release DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (22) when payload makes firm contact with front payload chocks (42).
- (66) Remove free payload chock (38) and free payload chock (37) from front of payload tracks and place on ground.

- (67) Remove two outboard curb guides (53) and position in second pin holes between #4 and #5 bogies with pin side facing outboard from center of platform.
- (68) Move two inboard curb guides (53) to second pin holes with pin side facing outboard from center of platform.



- (69) Adjust ramp span width to match payload.
- (70) Perform procedures in paragraph 2-2a, steps (26) thru (30), and adjust platform height to platform unloading position, lower ramps, and install remaining curb guides.

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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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**WARNING**

**A ground guide (spotter) is required for unloading operations. The winch operator must maintain visual contact with the spotter at all times or serious injury to personnel may occur.**

- (71) Position spotter on curbside of payload to maintain visual contact with winch operator.
- (72) Pull WINCH SPEED CONTROL switch (36) to LOW.
- (73) Push ENGINE SPEED CONTROL switch (31) to HIGH ENGINE IDLE.
- (74) Momentarily push ENGINE SPEED CONTROL switch (32) to lock engine speed at high engine idle (approximately 1,500 rpm) and then release switch.

**WARNING**

**Personnel must not be on the platform during the winching operation. The winch operator must offload the payload slowly or serious injury or death to personnel and damage to equipment may occur.**

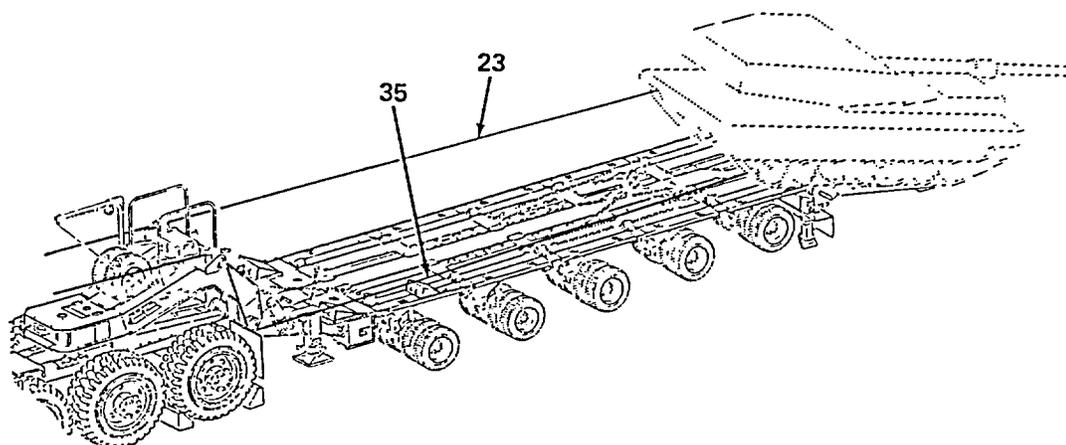
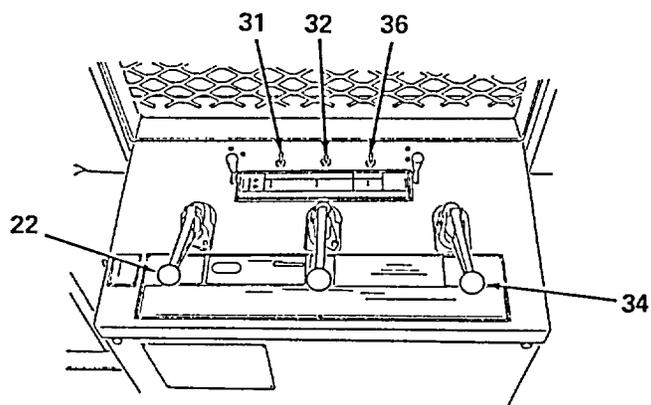
**During winching operation, ensure that one cable is always under tension and the other cable has some slack so the two winches are never pulling against each other. Otherwise, serious injury to personnel and damage to equipment may occur.**

**Payload adjustments, side to side (turning), must be kept to a minimum or serious injury to personnel and damage to equipment may occur. Ground guide (spotter) must notify winch operator of any required payload adjustments while unloading.**

**Mine clearing blade tines will contact ground as payload rolls off ramps. Personnel must remain well clear and winching must be performed slowly to prevent serious injury to personnel and damage to equipment.**

- (75) Pull up PASSENGER SIDE WINCH lever (22) to pay out passenger side winch cable (23) to restrain payload and push down DRIVERS SIDE WINCH lever (34) to take up driver's side winch cable (35). As long as driver's side winch cable (35) is pulling payload, winch operator must keep a slight sag in passenger side winch cable (23).
- (76) When payload rolls on its own, allow slack in driver's side winch cable (35) and keep tension on passenger side winch cable (23) to control speed of roll.
- (77) When payload passes over snatch block (6), pull up on DRIVERS SIDE WINCH lever (34) and PASSENGER SIDE WINCH lever (22) to pay out both cables. Continue paying out until payload rolls down ramps and off semitrailer.

(78) Release PASSENGER SIDE WINCH lever (22) and DRIVERS SIDE WINCH lever (34).



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

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**WARNING**

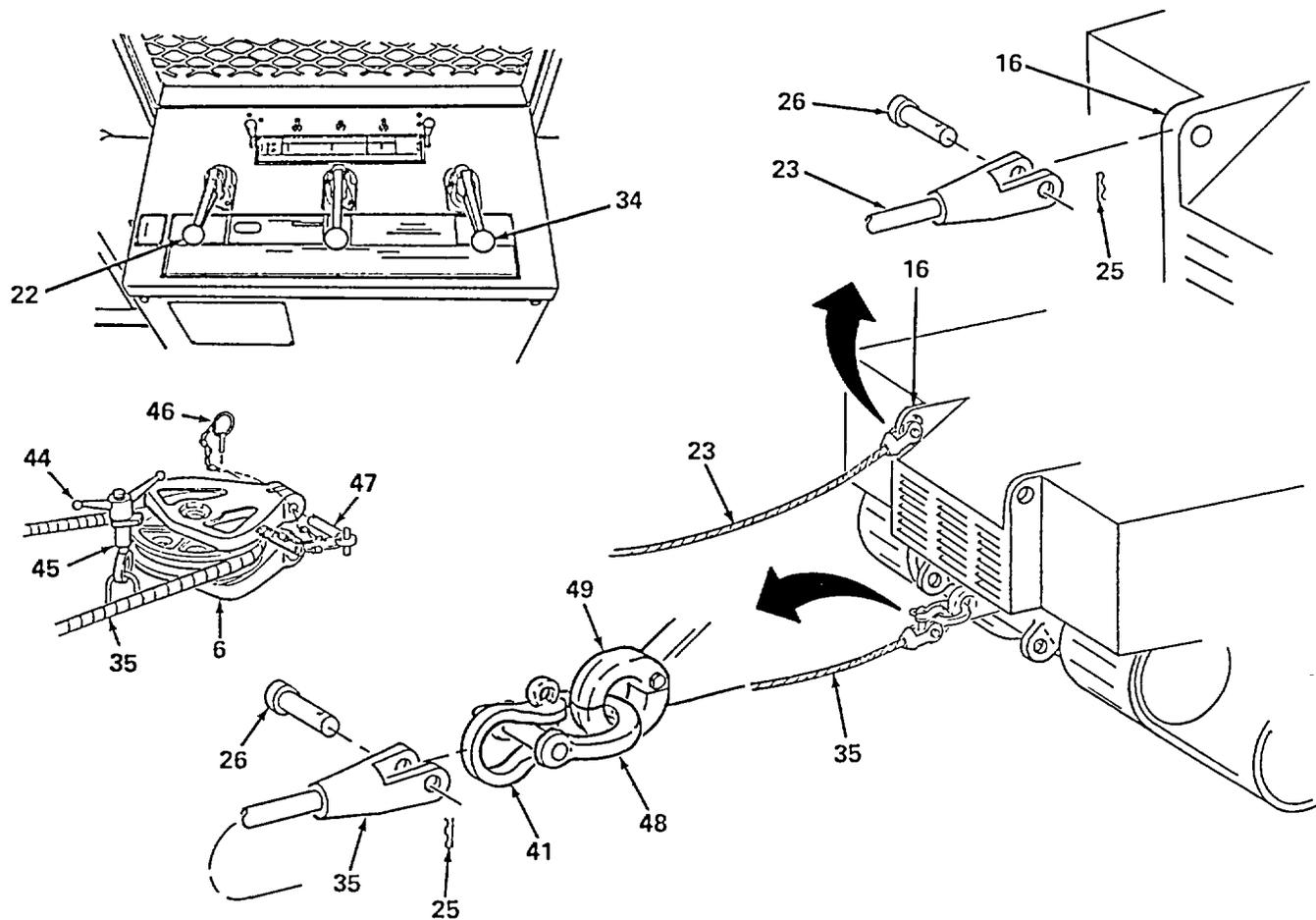
**Extreme caution must be used when removing winch cables from payload. Cable may be under tension or be twisted. If winch cable has tension when removed, slowly and carefully, using both hands, rotate cable to relieve tension. Do not allow cable to twist or whip freely or serious injury to personnel may occur.**

- (79) Pull up on DRIVERS SIDE WINCH lever (34) to pay out driver's side winch cable (35) until winch cable sags to ground and has enough slack to relieve tension in winch cable.
- (80) Release DRIVERS SIDE WINCH lever (34).
- (81) Check for twist in driver's side winch cable (35).
- (82) Two persons remove cotter pin (25), shouldered pin (26), driver's side winch cable (35), payload tiedown shackle (41), and towing shackle (48) from pintle (49).
- (83) Remove linch pin (46) and keeper pin (47) and open snatch block (6).
- (84) Remove driver's side winch cable (35), close snatch block (6), reinstall keeper pin (47), and secure with linch pin (46).
- (85) Place snatch block (6) in stowage position, install snatch block stow clamp (45), and secure by tightening clamp handle (44).

**WARNING**

**Extreme caution must be used when removing the winch cables from payload. Cable may be under tension or be twisted. If the winch cable has tension when removed, slowly and carefully, using both hands, rotate cable to relieve tension. Do not allow cable to twist or whip freely or serious injury to personnel may occur.**

- (86) Pull up on PASSENGER SIDE WINCH lever (22) to pay out passenger side winch cable (23) until winch cable sags to ground and has enough slack to relieve tension in winch cable.
- (87) Release PASSENGER SIDE WINCH lever (22).
- (88) Check for twist in passenger side winch cable (23).
- (89) Two persons remove cotter pin (25), shouldered pin (26), and passenger side winch cable (23) from upper left rear recovery eye (16) and lay winch cable (23) on platform.



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**2-3. DUAL WINCH LOADING AND UNLOADING DISABLED PAYLOAD WITH MINE CLEARING BLADE ATTACHED (CONT)**

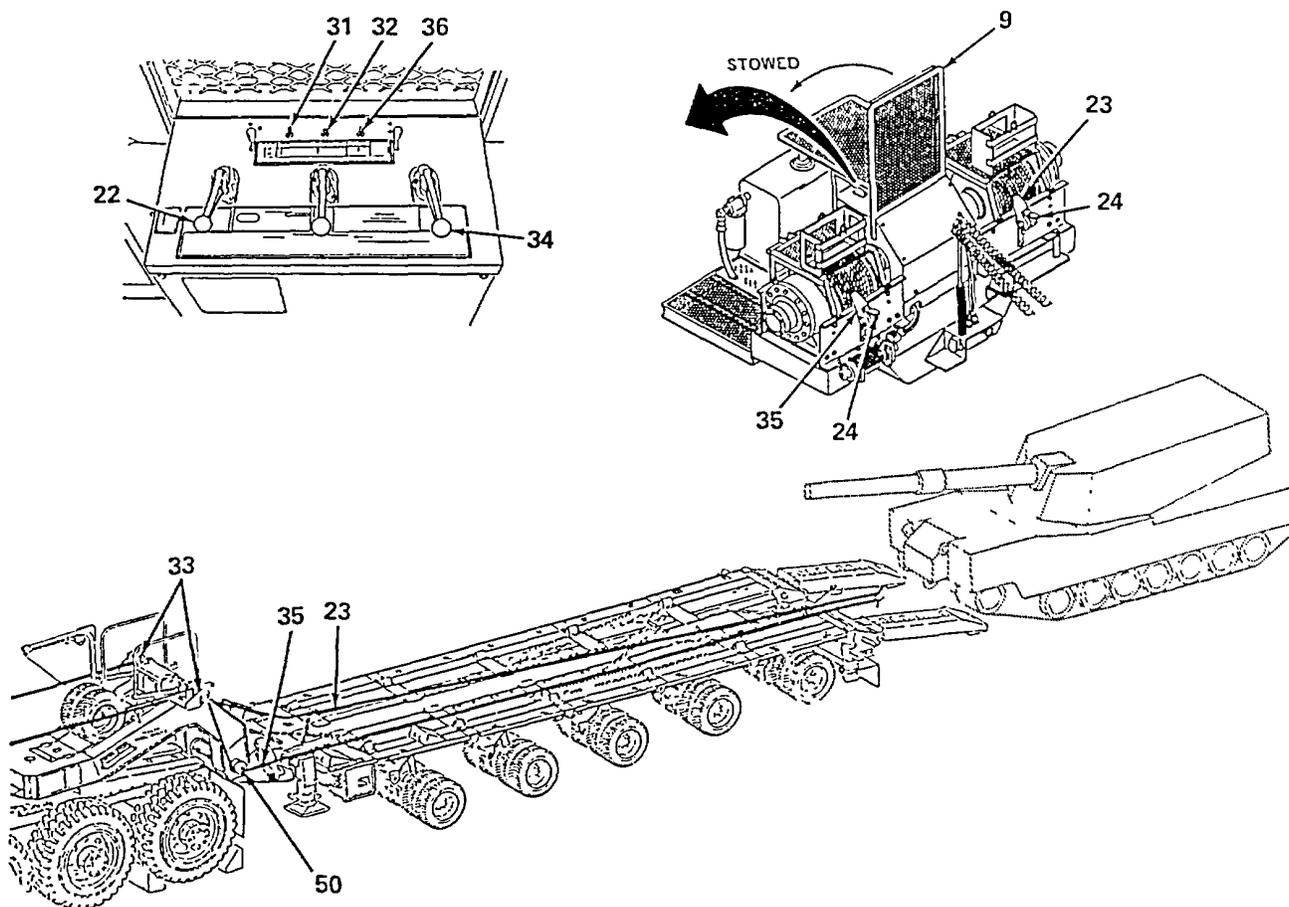
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- (90) Push ENGINE SPEED CONTROL switch (31) to HIGH ENGINE IDLE.
- (91) Momentarily push ENGINE SPEED CONTROL switch (32) to lock engine speed at high engine idle (approximately 1,500 rpm) and then release switch.
- (92) Push WINCH SPEED CONTROL SWITCH (36) to HIGH.
- (93) Remove driver's side winch cable (35) from gooseneck cable guide (33) and pivot pin sheave (50).
- (94) Leave driver's side winch cable (35) on semitrailer platform.
- (95) Remove passenger side winch cable (23) from gooseneck cable guide (33).
- (96) Leave passenger side winch cable (23) on semitrailer platform.

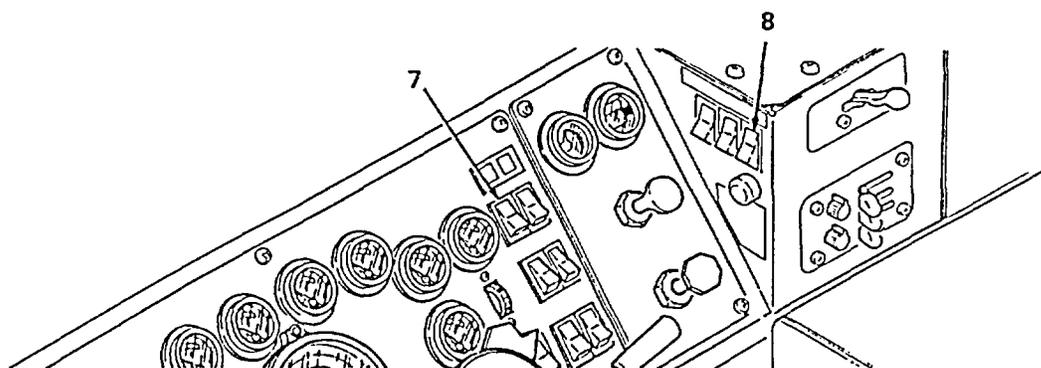
**WARNING**

**Do not allow hands to get between clevis and winch or serious injury to personnel may occur.**

- (97) With one person to push down on DRIVERS SIDE WINCH lever (34) and one person to maintain tension on driver's side winch cable (35), retract and stow winch cable (35) onto stow hook (24).
- (98) Release DRIVERS SIDE WINCH lever (34).
- (99) With one person to push down on PASSENGER SIDE WINCH lever (22) and one person to maintain tension on passenger side winch cable (23), retract and stow winch cable (23) onto stow hook (24).
- (100) Release PASSENGER SIDE WINCH lever (22).
- (101) Pull ENGINE SPEED CONTROL switch (31) to LOW ENGINE IDLE.
- (102) Lower guard (9) and lock in place.



(103) On tractor, set PTO switch (8) to OFF and set beacon light switch (7) to OFF.



(104) Remove all chains and load binders from platform and stow in platform storage compartment.

(105) Perform procedures in paragraph 2-2b, steps (26) thru (43), and stow equipment used during this procedure and prepare tractor and semitrailer for transport.

**APPENDIX A****REFERENCES**

---

**A-1. SCOPE**

This appendix lists forms, technical bulletin, and technical manuals referenced in this technical bulletin for the support of the M1000 Heavy Equipment Transport Semitrailer (HETS) when loaded with the Abrams Main Battle Tank (MBT) series with mine clearing blade attached.

**A-2. FORMS**

Recommended Changes to Publications and Blank Forms DA Form 2028

Recommended Changes to Equipment Technical Manuals DA Form 2028-2

**A-3. TECHNICAL BULLETIN**

Safety Inspection and Testing of Lifting Devices TB 43-0142

**A-4. TECHNICAL MANUALS**

Operator's, Unit, Direct Support, and General Support  
Maintenance Manual for Semitrailer, Transporter, Heavy  
Equipment, 70 Ton, M1000 TM 9-2330-381-14

Operator's Manual for Truck, Tractor, M1070, 8 X 8, Heavy  
Equipment Transporter (HET) TM 9-2320-360-10

Operator's Manual for Mine Clearing Blade for M1, IPM1  
M1A1, M1A2 Abrams Tank TM 9-2590-509-10

## APPENDIX B

## ADDITIONAL AUTHORIZATION LIST (AAL)

## Section I. INTRODUCTION

**B-1. SCOPE**

This appendix lists additional items you are authorized in this technical bulletin for the support of the M1000 Heavy Equipment Transport Semitrailer (HETS) when loaded with the Abrams Main Battle Tank (MBT) series with mine clearing blade attached.

**B-2. GENERAL**

This list identifies items that do not have to accompany the trailer and that do not have to be turned in with it. These items are all authorized to you by Common Table of Allowances (CTA), Modification Table of Organization and Equipment (MTOE), Table of Distribution and Allowances (TDA), or Joint Table of Allowances (JTA).

**B-3. EXPLANATION OF LISTING**

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

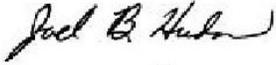
## Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION CAGE AND PART NUMBER AND USABLE ON CODE	(3) U/M	(4) QTY AUTH
4010-01-371-5772	Chain Assembly, 1/2" LK, 11 ft L (Payload Tiedown) (98255), SW33303-2	EA	2
4010-01-385-5974	Chain Assembly, 1/2" LK, 19 ft L (Payload Tiedown) (98255), SW33303-3	EA	2
-	Data Plate, Vehicle Classification (19207), 12479566	EA	1
4030-00-160-1262	Shackle, 25-ton, (75535), G-209-1 3/4 IN.	EA	4

By Order of the Secretary of the Army.

ERIC K. SHINSEKI  
*General, United States Army*  
*Chief of Staff*

Official:



JOEL B. HUDSON  
*Administrative Assistant to the*  
*Secretary of the Army*  
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PUBLICATION DATE  
7 Aug 00

PUBLICATION TITLE  
M1000 HETS Semitrailer Supplement

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*should be*  
*"Assemble two sheets (7)..."*

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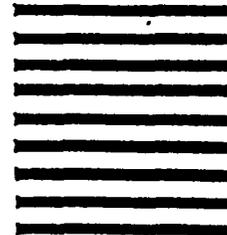
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TEAR ALONG PERFORATED LINE

## THE METRIC SYSTEM AND EQUIVALENTS

### LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches  
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches  
 1 Kilometer = 1000 Meters = 0.621 Miles

### WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces  
 1 Kilogram = 1000 Grams = 2.2 Lb  
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

### LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces  
 1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

### SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches  
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet  
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

### CUBIC MEASURE

1 Cu Centimeter = 1000 Cu Millimeters = 0.06 Cu Inches  
 1 Cu Meter = 1,000,000 Cu Centimeters = 35.31 Cu. Feet

### TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$   
 212° Fahrenheit is equivalent to 100° Celsius  
 90° Fahrenheit is equivalent to 32.2° Celsius  
 32° Fahrenheit is equivalent to 0° Celsius  
 $9/5 (^{\circ}\text{C} + 32) = ^{\circ}\text{F}$

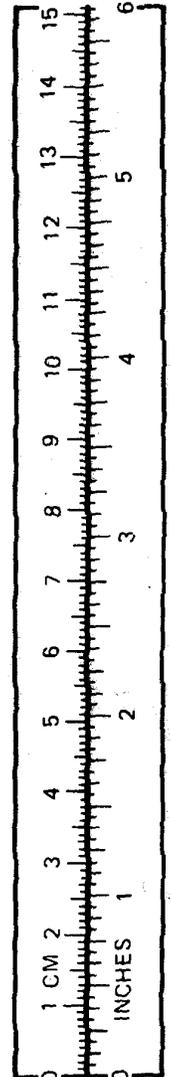
## APPROXIMATE CONVERSION FACTORS

### TO CHANGE

TO CHANGE	TO	MULTIPLY BY
Inches .....	Centimeters .....	2.540
Feet .....	Meters .....	0.305
Yards .....	Meters .....	0.914
Miles .....	Kilometers .....	1.609
Square Inches .....	Square Centimeters .....	6.451
Square Feet .....	Square Meters .....	0.093
Square Yards .....	Square Meters .....	0.836
Square Miles .....	Square Kilometers .....	2.590
Acres .....	Square Hectometers .....	0.405
Cubic Feet .....	Cubic Meters .....	0.028
Cubic Yards .....	Cubic Meters .....	0.765
Fluid .....	Ounces Milliliters .....	29.573
Pints .....	Liters .....	0.473
Quarts .....	Liters .....	0.946
Quarts .....	Liters .....	0.946
Gallons .....	Liters .....	3.785
Ounces .....	Grams .....	28.349
Pounds .....	Kilograms .....	0.45
Short Tons .....	Metric Tons .....	0.907
Pound-Feet .....	Newton-Meters .....	1.356
Pounds per Square Inch .....	Kilopascals .....	6.895
Miles per Gallon .....	Kilometers per Liter .....	0.425
Miles per Hour .....	Kilometers per Hour .....	1.609

### TO CHANGE

TO CHANGE	TO	MULTIPLY BY
Centimeters .....	Inches .....	0.394
Meters .....	Feet .....	3.280
Meters .....	Yards .....	1.094
Meters .....	Yards .....	1.094
Kilometers .....	Miles .....	0.621
Square Centimeters .....	Square Inches .....	0.155
Square Meters .....	Square Feet .....	10.764
Square Meters .....	Square Yards .....	1.195
Square Kilometers .....	Square Miles .....	0.386
Square Hectometers .....	Acres .....	2.471
Cubic Meters .....	Cubic Feet .....	35.315
Cubic Meters .....	Cubic Yards .....	1.308
Milliliters Fluid .....	Ounces .....	0.034
Liters .....	Pints .....	2.113
Liters .....	Quarts .....	1.057
Liters .....	Gallons .....	0.264
Grams .....	Ounces .....	0.035
Kilograms .....	Pounds .....	2.205
Metric Tons .....	Short Tons .....	1.102
Newton-Meters .....	Pound-Feet .....	0.738
Kilopascals .....	Pounds per Square Inch .....	0.145
Kilometers per Liter .....	Miles per Gallon .....	2.354
Kilometers per Hour .....	Miles per Hour .....	0.621



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