U.S. Department
of Transportation

**Federal Railroad
Administration**

TRAILER-ON-FLAT CAR (TOFC) AND CONTAINER-ON-FLAT CAR (COFC) LOADING AND SECUREMENT SAFETY

Report to the Secretary of Transportation

Office of Safety **September 1994**

US Department
of Transportation
Federal Railroad
Administration

Administrator

400 Seventh St., S.W.
Washington, D.C. 20590

September 15, 1994

The Honorable Federico Peña
Secretary of Transportation
Washington, D.C. 20590

Dear Mr. Secretary:

I am pleased to submit the enclosed report by the Federal Railroad Administration on "Trailer-on-Flat Car and Container-on-Flat Car Loading and Securement Safety." This report responds to your directive to evaluate the safety of the loading and securement of intermodal railroad freight.

Railroads are playing a major role in achieving the national intermodal transportation system envisioned in the Department's Strategic Plan. In 1993, railroads moved 7.2 million highway trailers and shipping containers, allowing the American economy to benefit from the service and efficiency of an integrated highway, water, and rail transportation network.

The safety record of railroad intermodal freight is admirable. Of those 7.2 million loadings, only 7 caused an accident or incident due to faulty securement or improper loading. However, our goal is zero accidents, and this report identifies areas of concern and ways in which FRA, in conjunction with the railroad industry, will improve safety and work to eliminate those accidents altogether. In fact, the Association of American Railroads has already begun work on some of the actions the report recommends, and an FRA Administrator's Roundtable on the subject is tentatively scheduled for November 18, 1994.

This report outlines an encouraging vision for the future. I look forward to working with you to advance our shared objective of improving safety on the nation's railroads.

Sincerely,

Jolene M. Molitoris

Jolene M. Molitoris

Enclosure

TABLE OF CONTENTS

Executive Summary

INTRODUCTION

Intermodal traffic--hauling shipping containers and highway trailers by rail--is the fastest-growing segment of rail freight transportation. Since its introduction in the late 1950s, intermodal has grown to be the second-largest type of rail traffic, after rail's traditional keystone of coal. In 1993, 7.2 million containers and trailers moved by rail. Each of these movements reduced highway congestion and contributed to a complete intermodal transportation system which utilizes the efficiency of rail for long-haul freight but relies on the convenience of highways to provide door-to-door service.

Innovations in technology and operations led to the explosive growth of intermodal traffic in the 1980s, which continues today. The introduction of the double-stack car, which carries two standard international shipping containers, and the RoadRailer, a hybrid trailer which can run on roads and rails, have reduced costs and increased speeds for intermodal traffic. Marketing innovations such as rail partnerships with trucking companies and land-bridge service, wherein double-stack trains bring shiploads of containers across the continent and eliminate a Panama Canal crossing, have greatly increased the volume of trailer and container traffic.

The Strategic Plan for the Department of Transportation, announced in early 1994 by Secretary Federico Peña, reflects the Clinton Administration's goal of improving America's transportation network through intermodal connections. Goal 1 of the Plan states that DOT will "'Tie America Together' through an effective intermodal transportation system" that "integrates all modes and emphasizes connections, choices, and coordination of transportation services." Trailer-on-flat car and container-on-flat car (TOFC/COFC) service is one of the railroads' greatest contributions to meeting this objective.

Continued growth in intermodal rail traffic presents significant safety challenges. Unlike traditional rail freight, TOFC/COFC freight is not placed inside a freight car subject to traditional rail safety oversight, but rests on top of and attached to flat cars. Thus, the securement of each container or trailer to the flat car must be sufficiently strong to withstand the forces encountered on the rail journey. Because each individual load involves a separate securement, thousands of these crucial procedures take place every day across the country.

Each of these securements has the potential to cause a major accident if it fails. Yet it is a testament to the professionalism and reliability of the railroad workers who loaded and secured 62 million trailers and containers between 1983 and 1993 that faulty securements caused only 65 accidents. In addition, the safety record is improving dramatically: in 1983, there were 16 reported accidents in 4.1 million trailers and containers moved; in 1993, there

were only 7 incidents, but 7.2 million TOFC/COFC movements.

The accident on May 16, 1994, in Smithfield, North Carolina, tragically underscored the importance of the safe loading of intermodal equipment. In that accident, a trailer that was not completely secured to its flat car shifted off the car and was struck by an Amtrak train traveling in the opposite direction on the adjacent track. Both trains derailed; the Amtrak Assistant Engineer was killed and 11 Amtrak passengers and crew were seriously injured.

As a result of this accident, the Secretary of Transportation directed the Federal Railroad Administration to evaluate loading and securement procedures in the industry, the safety risks of those procedures, and ways to reduce those risks.

This study found that while their safety record is good, TOFC/COFC loading practices have not been treated as the crucial safety procedures that they are. Industry standards need to be set for minimum training requirements as well as maintenance procedures. In addition, formal pre-departure inspections of the securements must be instituted where they are not already standard practice.

As an initial step, the best way to establish these standards is through cooperation with the railroad industry, rather than through regulatory proceedings. FRA will initiate a series of partnerships with the industry which, FRA believes, will establish appropriate industry standards effectively and efficiently. Given the importance of these goals, however, FRA will consider initiating regulatory proceedings if partnerships with industry do not produce the desired results in an acceptable time frame.

THIS STUDY

Following the May 16, 1994, derailment of an Amtrak train caused by a collision with a trailer that fell from a flat car in Smithfield, North Carolina, the Secretary of Transportation directed the Federal Railroad Administration (FRA) to assess trailers on flat cars and containers on flat cars (TOFC/COFC) safety.

The FRA assessment consisted of a search of the reported accident/incident statistics for the eleven-year period from 1983 to 1993 for TOFC/COFC related accidents/incidents and visits to 63 TOFC/COFC loading sites located across the country.

The site surveys were done to assess loading crew knowledge and training; loading procedures; pre-departure inspection procedures; adequacy of design of tie-down devices; and equipment maintenance programs. To ensure the survey included a broad, industry-wide perspective, FRA invited representatives of the National Transportation Safety Board (NTSB), Brotherhood Railway Carmen Division (BRC), Association of American Railroads (AAR) and the United Transportation Union (UTU) to participate. All these organizations have a strong interest in railroad safety. NTSB and UTU elected not to have representatives on the survey teams.

FINDINGS

Between 1983 and 1993, there were 108 accidents or incidents caused by TOFC/COFC loading problems. Of these, 65, or 60%, were caused by the load securement. The lading or cargo caused 32, or about 30%, and about 10% had other causes.

While intermodal traffic has increased considerably in the eleven year period studied, the number of accidents per year has declined significantly. For 1993, the latest year for which data is available, 7 accidents/incidents were reported while 7.2 million intermodal car loadings took place. The small number of reported accidents/incidents compared to the huge intermodal loading volume, along with the declining number of accidents indicates that TOFC/COFC freight movement is a safe operation with an improving safety record. The data shows no trends that would indicate weaknesses in a specific attachment design or tie down device. The main safety concern indicated by the data is a need for a thorough post-loading, pre-departure inspection of the securement system by a knowledgeable inspector. Such an inspection may have prevented many, if not most of the accidents/incidents.

The quality of loading crew training, pre-departure inspection practices, loading procedures, and maintenance practices varies widely among loading sites. At some sites, trailers or containers are sometimes loaded by a single individual and have no pre-departure securement system inspection.

SOLUTIONS

The accidents and incidents caused by improper loading of TOFC/COFC equipment or failure of TOFC/COFC tie-down systems would be reduced by:

1. Requiring a thorough post-loading, pre-departure above deck inspection of TOFC/COFC tie down systems to include trailers and containers secured by these tie-down systems by knowledgeable inspectors;

2. Implementing industry-wide minimum formal training criteria for loading crews;

3. Implementing industry wide minimum maintenance criteria for TOFC/COFC equipment; and

4. Requiring the industry to develop and enforce the use of written standard operating procedures for the safe loading of TOFC/COFC equipment.

5. Ensuring that all railroads hold contractors performing TOFC/COFC loading operations to the same high set of standards required of the railroad's own employees.

FRA ACTIONS

In partnership with the industry, FRA will promote the following actions to strengthen or eliminate safety weaknesses identified in TOFC/COFC loading operations:

1. **require post-loading, pre-departure inspections** of all loaded TOFC/COFC equipment by personnel other than the loading crew such as loading crew supervisors or carmen;

2. **establish a uniform minimum set of training requirements** to qualify TOFC/COFC loading crews throughout the industry;

3. **establish required preventative maintenance intervals** for TOFC/COFC securement systems that include cleaning and re-lubrication of critical moving parts;

4. **develop written standard operating procedures** for safely loading TOFC/COFC equipment at each loading site;

5. **discontinue the practice of collapsing defective hitches into the floor of the flat car** and loading the car with containers without providing a means of positively preventing the defective hitch from being raised and used after it is unloaded;

6. **review design standards of trailers and containers** to be loaded on TOFC/COFC equipment to ensure they are compatible with the various lifting modes while loaded to capacity; and

7. **provide railroad oversight of the work of contractors** performing TOFC/COFC loading work to ensure the contractors follow all the established safety procedures.

The most timely and effective way to implement these measures is through a voluntary cooperative approach with the railroad industry. FRA will promptly initiate a cooperative venture among railroads, labor organizations, and equipment suppliers to rectify the identified safety problems. Further, throughout their routine inspections, FRA inspectors will emphasize adherence to the TOFC/COFC "Best Practices" that are to be developed as a result of this report. FRA is confident that this approach will succeed. However, should the voluntary actions of industry prove insufficient, FRA will take further action to reduce the potential for railroad accidents/incidents caused by the improper loading or faulty securement systems of TOFC/COFC equipment.

CHAPTER I

Introduction

The Federal Railroad Administration (FRA) performed a safety assessment of loading operations of trailer-on-flat car (TOFC) and container-on-flat car (COFC) railroad equipment. The assessment included a search of the FRA accident/incident data base for reported railroad accidents or incidents attributable to failure of TOFC/COFC securement systems or improper loading of trailers or containers on TOFC/COFC equipment. The assessment also included site surveys to observe loading of containers and trailers and operation of securement systems at TOFC/COFC hubs nationwide. The FRA conducted the assessment in an attempt to identify safety weaknesses in TOFC/COFC loading operations that may contribute to the type of accident described below.

The Accident

On May 16, 1994, at 4:36 a.m. Eastern Standard Time, southbound National Railroad Passenger Corporation (Amtrak) train #87, the "Silver Meteor", struck a highway trailer and derailed at Smithfield, North Carolina, at Mile Post 162.5 on CSXT's Florence Division, Southend Subdivision. The highway trailer was on the fifty-first flat car of a fifty-two car passing northbound CSX Transportation (CSXT) freight train R176-15 (CSXT 176). The collision caused all but the last car of Amtrak train 87 and the next to the last car (fifty-first car) on CSXT 176 to derail. The Amtrak assistant engineer was killed and 11 passengers and crew members aboard Amtrak train 87 were seriously injured. No injuries occurred to the CSXT crew.

Amtrak train 87 originated in New York City and was bound for Miami. The Train departed on May 15 at 6:30 p.m. consisting of 2 locomotives, 2 baggage cars and 15 passenger cars. CSXT train 176 originated in Tampa on May 15 and was destined for Kearny, New Jersey. CSXT 176 was a TOFC/COFC train made up of predominately TOFC cars. The train consisted of 3 locomotives, 50 loaded and 2 empty cars weighing 4,449 trailing tons and was 6,188 feet long.

The highway trailer, REAZ 232980, that fell from CSXT 176 and was struck by Amtrak 87 was loaded on an 89 foot flat car KTTX 251988 at the CSX Intermodal facility, Taft Yard, Orlando, Florida. The trailer causing the accident was loaded in the lead position on the A-end of the car. The hitch that attached the trailer to the car was welded in place. The hitch head assembly was built by ACF, Amcar Division and was a model 6-L rigid hitch. This type of hitch automatically locks when the kingpin of the trailer is correctly installed and pushed back into the hitch slot during loading.

Two video frames of trailer REAZ 232980 loaded on car KTTX 251988 were taken as CSXT 176 passed through Savannah, Georgia and Florence, South Carolina (see

Figures 1 & 2)[1]. The video frame from Savannah was taken approximately seven hours before the accident and the video frame from Florence was taken about two and a half hours before the accident. Figure 3 indicates the correct position of a properly secured trailer when the kingpin is correctly locked in place in the flat car hitch. The relative distance of trailer REAZ 232980 from the hitch indicates that trailer REAZ 232980 moved approximately 2 feet forward when compared to a properly loaded trailer. This is an indication the kingpin of REAZ 232980 was not locked in the hitch on KTTX 251988 as the train passed through Savannah and Florence.

[1]The video scanner used to reproduce these pictures is used to check the train consists to ensure that all of the cars that are supposed to be in the train are there, and is not used to continually monitor the train consists for detection of potential safety problems en route.

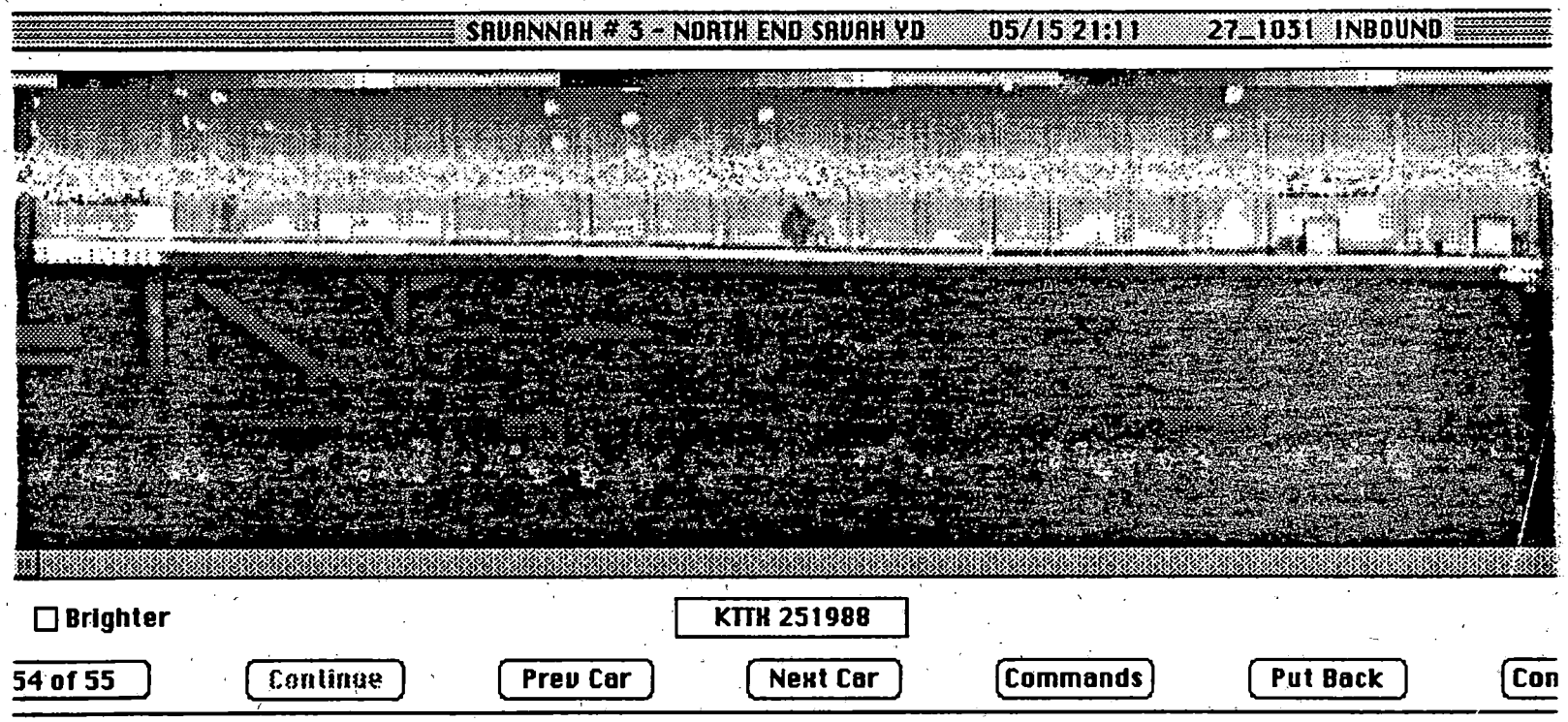

SAVANNAH # 3 - NORTH END SAVAH YD 05/15 21:11 27_1031 INBOUND
Brighter
KTTH 251988
54 of 55
Continue
Prev Car
Next Car
Commands
Put Back

Figure 1

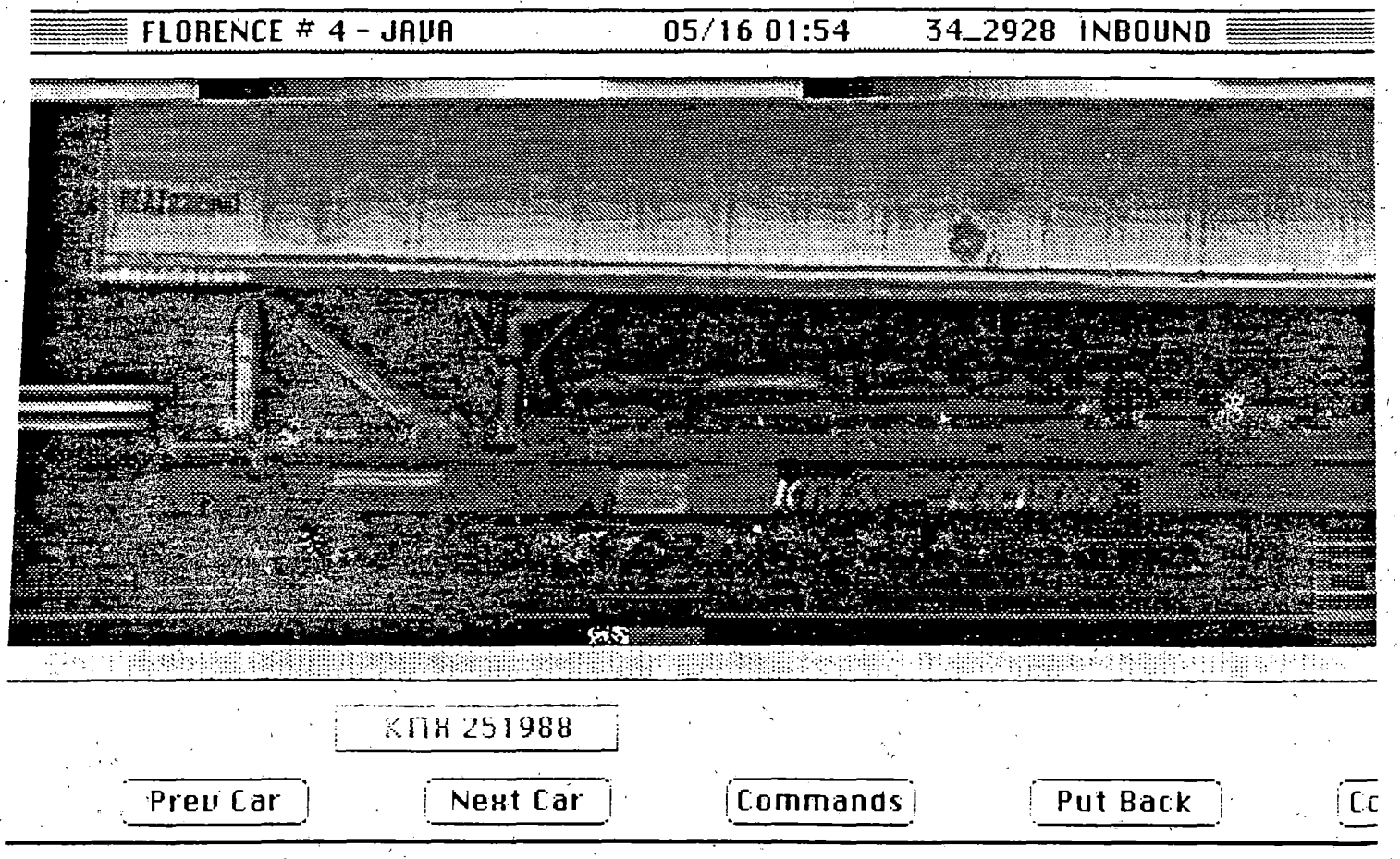

FLORENCE # 4 - JAVA
05/16 01:54
34_2928 INBOUND
KMTU 251988
Prev Car
Next Car
Commands
Put Back

Figure 2

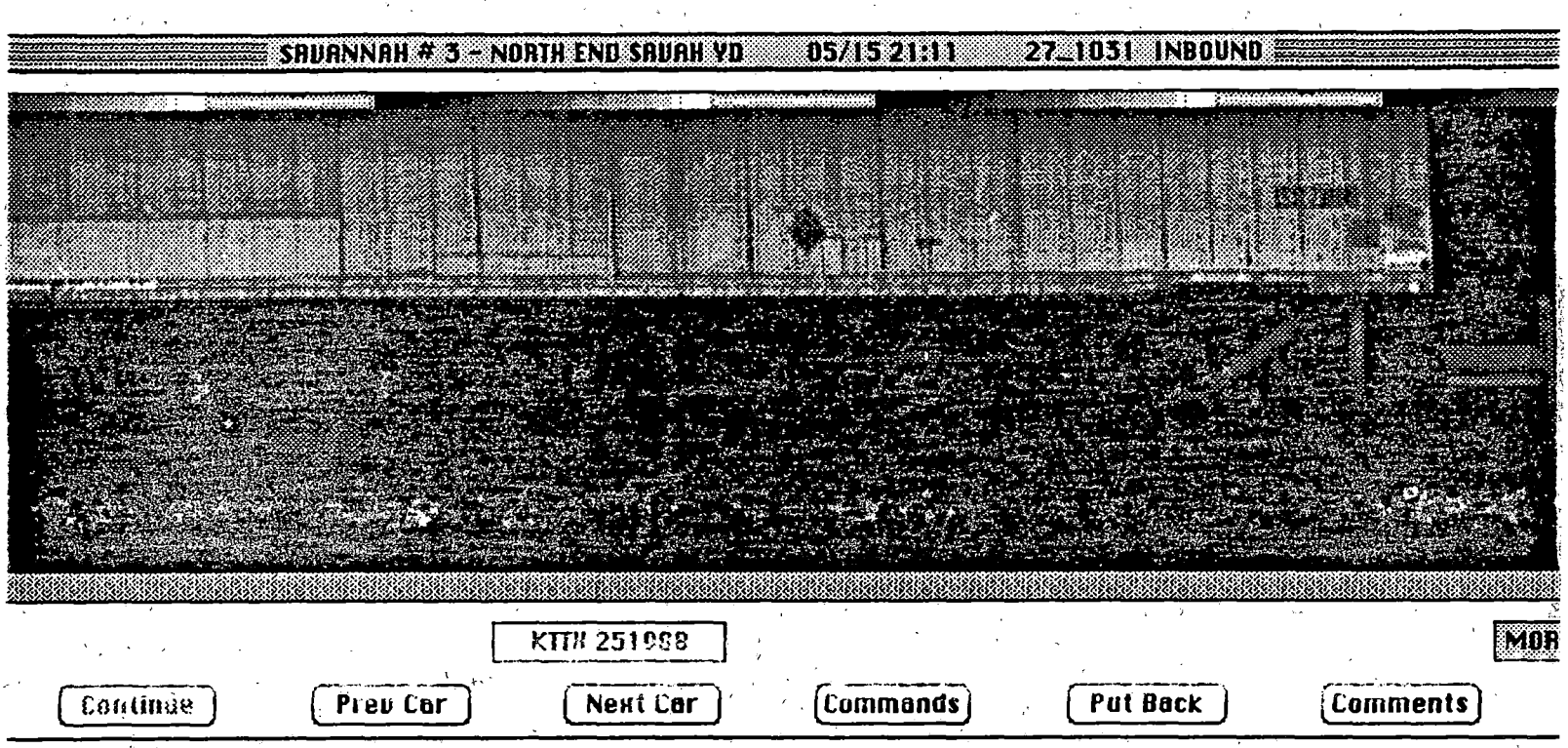

SAVANNAH # 3 - NORTH END SAVAH YD 05/15 21:11 27_1031 INBOUND
KTTX 251988
MOR
Continue
Prev Car
Next Car
Commands
Put Back
Comments

Figure 3

CHAPTER II

Container and Trailer Equipment

Intermodal transportation, including the carrying of tractor trailers and containers on flat bed rail cars, has become the fastest-growing segment of the rail industry in recent years. Commonly referred to as TOFC (Trailer on Flat Car), COFC (Container on Flat Car), or "piggyback" traffic, the success of this service depends on the relative ease with which the trailers and containers can be loaded on, secured to, and unloaded from the rail flat cars. Several trailer hitches have been developed to support and secure highway trailers at their kingpin location for long distance transport on rail cars.

Similarly, several types of container restraints exist to secure containers to flat cars, including special tie-down designs to allow double stacking of containers, which greatly increases the carrying capacity and the profit potential for railroads.

Common TOFC Equipment

All piggyback trailer hitches consist of three main load carrying members -- the head, or top plate, (also called the "fifth wheel"), the vertical or diagonal front strut, and the diagonal rear strut as shown in Appendix A, page 1. The main components of TOFC securement systems are:

Head or Top Plate - The portion of the hitch that physically contacts and secures the trailer kingpin. The head is fitted with a jaw assembly that functions to receive a trailer kingpin during the loading cycle, and then either manually or automatically locks securely around the kingpin to hold the trailer during transit.

Vertical/Diagonal Front Strut - This strut, mounted on the platform of the flat car, supports the head on a pivot mount. It forms one leg of a triangle, with the rear strut and the car floor, that supports the front portion of the trailer.

Diagonal Rear Strut - This strut supports and locks the front vertical or diagonal strut in the raised position, and thus secures the entire assembly against longitudinal movement.

Three common types of trailer hitches are used to support the fifth wheel of trailers loaded on flat cars: non-retractable, (also called fixed); wrench-operated retractable; and pull-up retractable. Hitches may or may not be cushioned, depending on the design of the car. Generally, rigid hitches are used on flat cars with an end-of-car hydraulic cushioning device, and cushioned hitches are used on flat cars with standard draft gear. The three common types of hitches can be characterized as follows:

Non-Retractable: Constructed in the fixed upright position, and require loading and unloading operations using an overhead crane or loading lift.

Wrench Operated Retractable: Raised or lowered using a power wrench (electric or pneumatic) to operate a long elevating screw, and then locked in the upright position. See illustration in Appendix A, page 2.

Pull-up Retractable: Raised by pulling the hitch up with a hostler tractor or other device, and lowered or knocked down by backing the tractor against the knock down lever. Also called a tractor-operated hitch. See illustration in Appendix A, page 3.

The two types of devices commonly used to secure the trailer kingpin to the piggyback trailer hitch are described as follows:

Screw Type - Requires manual locking and unlocking. The kingpin is locked into the top plate by applying a wrench to the locking screw and translating the moveable jaw to capture the kingpin securely.

Semi-automatic - Locks automatically during loading, but requires manual unlocking before unloading. The kingpin lock consists of a rotor or jaws, activated by the movement of the trailer kingpin into the gathering slot of the top plate. Depending on the design, either the off-center camming action rotates the rotor to the locked position, or the left and right hand jaws symmetrically close around the trailer kingpin, locking it in place.

All types of hitch/top plate/kingpin locks have integral indicators which permit visual confirmation that the trailer kingpin is positively locked into the top plate. In the most common arrangement, if the lock pin indicator protrudes from the top plate casting (approximately 1 to 1-1/2 inches), the lock is unsecured. If the lock pin indicator is flush with the top plate casting, the load is secured.

All hitch/top plate/kingpin locks can be manually unlocked using a short pry bar or hammer, or by manipulation of an integral lock handle designed for this purpose.

Flat cars designed for TOFC service are constructed with tire rub rails located either at the outside edges of the flat car deck, or at the centerline of the car. Tire rub rails are 6 to 8 inches high and serve as guides for trailer wheels during drive on loading or unloading. They also prevent lateral motion of the rear wheels of the trailer during transit.

TOFC Loading Techniques

The three common techniques used to load trailers onto flat bed rail cars are:

Circus or Tractor Loading - This type of loading cannot be performed with rail cars incorporating non-retractable hitches. The trailer is driven by tractor up a ramp and across the rail car platforms until it reaches the car to which it will be secured. The trailer is then backed into position so that the trailer kingpin is appropriately located for the type of hitch being used. The hitch is then raised, either by pulling it up with the tractor (for pull-up retractable hitches) or by rotating the elevating screw (for wrench-operated retractable hitches) until the hitch is locked in its vertical position. The trailer kingpin is then positioned and secured inside the jaws of the kingpin locking mechanism. The appropriate visual indicators are checked to verify that the kingpin is secured and the trailer is ready for transport.

Overhead and Side Loading - Many TOFC facilities employ overhead cranes or sideloaders to eliminate the time- consuming circus-style loading. After the hitch is locked in the raised position, the trailer is lifted by the overhead crane or sideloader and lowered to the railcar, positioning the kingpin appropriately for the type of hitch being used. The trailer kingpin is then positioned and secured inside the jaws of the kingpin locking mechanism. The appropriate visual indicators are checked to verify that the kingpin is secured and the trailer is ready for transport.

Critical TOFC Loading Safety Measures

While there are numerous piggyback trailer hitch designs that are unique in their operating characteristics and their inspection and maintenance requirements, each of these perform the same function and have similar critical safety features that must be followed to ensure that the load is properly secured. These general safety features that are common to all are outlined as follows:

Diagonal Strut - The diagonal strut must be locked in place to brace and lock the vertical strut in the raised position, and to secure the entire hitch assembly against longitudinal movement.

Kingpin Securement - The trailer kingpin must be secured inside the jaw mechanism of the top plate of the hitch assembly.

Locked Hitch Inspection - After a trailer has been loaded on a rail car and secured to the hitch, a visual locked hitch inspection must be made to assure that the trailer is properly anchored to the hitch. There are different visual indicators for the different hitch designs, but all are clear and easily discernable if properly inspected.

COFC Loading Equipment and Techniques

The securement of containers onto rail flat cars involves fewer moving, mechanical parts than TOFC loading procedures. An overhead crane or sideloader lifts, positions, and lowers

the container onto the rail car, ensuring that the container is aligned so that all four corners are secured on the corner pedestals of the rail car. There are several different types of pedestals, or locking devices, used on COFC type flat cars to support and secure the container during transit. These are described as follows:

Foldaway Latch Type Pedestal - This type pedestal is used primarily on 89 foot cars. These can be moved to different locations in slots on the deck of the car to accommodate various lengths and combinations of containers. These pedestals support the container at the four corners and are equipped with spring-loaded, automatic latches, which hold the container firmly on the car. When loaded, the bottom of the container is 6 inches above the deck of the car.

Non-Retractable Latch Type Pedestal - This pedestal is non-retractable and has the same automatic type of spring loaded latch mechanism as the foldaway pedestal described above.

Helical Automatic Twist Lock - This type of twist lock is designed to rotate under the weight of the container on "helical wings" during the loading process, and then snap back to the locked position when the container is fully seated on the corner support. The twist lock will also rotate during the unloading process.

Manual Twist Lock - These locks are manually rotated to the locked and unlocked position by a handle on the side of the car. Each pair of locks can be operated from the same side of the car using one handle. When the handle is vertical the twist locks are locked; when the handle is horizontal they are unlocked. There are handles on each side of the car.

Non-Locking Container Restraint Curb - On this type of securement, the walls of the pedestal are 11 to 12 inches high, which eliminates the need for a locking mechanism. Some of these curbs rotate down to allow the loading of long containers; others are fixed.

Inter-Box Connector (IBC) - Double stack loads utilize an Inter-Box Connector on each of the four corners of the container to stabilize and secure the combined load. This is the same type of connector that is used to stack containers on ships. After the container is positioned, the loader rotates a mechanical lever that locks the IBC in place and secures the load.

Critical COFC Loading Safety Measures

COFC Securement - As in the inspection of TOFC loads, a visual confirmation that each of the corners of the container are properly locked must be performed to ensure that the container is secure and safe for transport.

CHAPTER III

TOFC/COFC Loading Accidents/Incidents

The regulation at 49 CFR Part 225 requires railroads to report accidents or incidents resulting in more than $6,300 damage to railroad property. To prepare this report, FRA searched the database for all reported accidents between 1983 and 1993 caused by TOFC/COFC loading problems. The accidents were then sorted by cause, including the following:

a) Load Shifted
b) Load Fell From Car
c) Improperly Loaded Car
d) Trailer/Container Tie Down Equipment Improperly Applied
e) Over-Loaded or Improperly Loaded Container/Trailer on Flat Car
f) Broken or Defective Tie-Down Equipment
g) Broken or Defective Container
h) Broken or Defective Trailer
i) Other Trailer or Container on Flat Car Defects

FRA carefully reviewed the set of accident/incident reports resulting from this data base search and sort. A manual review culled reports that did not apply to loading problems of TOFC or COFC equipment.

Due to the extensive knowledge of the TTX Company on TOFC/COFC equipment and operations, and the fact that TTX owns the majority of the TOFC/COFC fleet, FRA requested that TTX review the data in these tables and provide specific information on the type of tie down system used on each piece of equipment owned by TTX involved in an accident/incident. The corrections were made and tie down information supplied by TTX is included in the tables 1 and 2, which summarize the reported accidents/incidents. See Appendix B, "TTX Company Review of Accident/Incident Data."

Table 1 is a summary of the 82 reported TOFC incidents; table 2 is a summary of the 26 reported COFC incidents. The damage cost reported in these tables is the cost of damage to railroad property only. The damage cost given does not include the cost of damage to trailers, containers, lading or any contractual penalties incurred by railroads.

Table 3 gives the number of TOFC/COFC accidents/incidents per year and compares the number of accidents/incidents to the number of intermodal car loadings each year for the eleven year period. The data given in table 3 is presented graphically in figure 4. Figure 4 contains trend lines of the numbers of TOFC, COFC and total intermodal reported accidents/incidents referenced to the left vertical axis scale. The trend for all three is sharply down. Referenced to the right vertical axis scale, figure 4 gives the trend of total intermodal

loadings over the eleven year period. This trend is sharply up. The small number of reported accidents/incidents, compared to the tremendous intermodal loading volume, and the declining loading failure rate indicates that TOFC/COFC freight movement is a safe operation with an improving safety record. However, the $6300 damage threshold for requiring accidents/incidents to be reported to the FRA may cause many TOFC/COFC loading problem incidents to go unreported. In fact, for the purposes of the reporting system, trailers and containers are considered lading rather than railroad property. Thus, loss of a trailer or container without other damage would never be reported. The May 16 incident at Smithfield, North Carolina might have gone unreported had the Amtrak train not struck the loose trailer, turning a minor incident into a major accident.

In some instances, accident cause descriptions given in tables 1 and 2 are not adequate to determine whether the cause of an accident/incident was due to the mechanical failure of a tie-down system component or human error in the loading procedure. Approximately 60% of the reported accidents are attributable to securement of the load, 30% to the lading or cargo itself, and 10% to other causes.

The data shows no patterns or trends that suggest that specific tie-down design weaknesses or types should be safety concerns. The main implication of the data is that a thorough post-loading, pre-departure inspection of the securement system by a knowledgeable inspector could have prevented many, if not most, of the accidents and incidents.

Trailer on Flat Car - Load Loss due to Failure of Flat Car, Failure of Trailer or Human Error

Date	Railroad	Car Numbers	Accident Cause	Damage Cost	Killed	Injured	Type Tie Down	Additional Information
18-Jan-83	CR	LTTX 501211	Broken Center Sill	$33,000	0	0	ACF 2	
15-Mar-83	ATSF	ATSF 003220	Improperly Loaded Trailer	$7,000	0	0		Side Swipe Locomotive on next Track
03-May-83	NS	TTX 603986	5th Wheel not engaged	$47,000	0	0	LP4SA	Trailer fell from Car
16-May-83	KCS	AFPX 945223	Load Shifted	$112,000	0	0		Car Derailed
24-Jun-83	ATSF	SLFC 901497	Load Fell from Car	$11,000	0	0		Damaged other Cars
25-Jun-83	SP	TTX 157161	King Pin Not Engaged	$42,000	0	0	LP4SA	Hitch was Locked, Trailer Fell
22-Jul-83	SBD	TTX 602206	5th Wheel Improperly Locked	$140,000	0	0	ACF 2	Trailer Fell From Car
23-Jul-83	SBD	TTX 150734	Broken Lock Down Beam	$48,000	0	0	ACF 2	11 Cars Derailed
23-Sep-83	SBD	TTX 255728	5th Wheel not Engaged	$6,000	0	0	ACF 5	Trailer Fell From Car
25-Sep-83	BO	TTAX 993598	Improper Tie Down	$23,000	0	0	LP3SA	Trailer Shifted, Damaged Signal
03-Nov-83	SP	TTX 156240	Load Shifted	$125,000	0	0	LP4SA	Derailed Several Cars
28-Jan-84	BN	TTX 160042	Broken Tie Down	$25,000	0	0	LP4SA	12 Cars Derailed
12-Mar-84	MKT	TTX 253084	Load Shifted	$96,000	0	0	LP4SA	
15-Mar-84	BN	XTRZ 257103	Improper Tie Down	$7,000	0	0		Trailer Fell From Car
25-Apr-84	SP	TTX 252544	Wind Blew Container Off Chassis	$22,000	0	0	ACF 5	Trailer Fell From Car
25-May-84	MILW	KTTX 960074	Load Shifted	$2,000	0	0	TT2-P	
03-Jul-84	SBD	ATSF 290743	Improper Tie Down	$12,000	0	0		Trailer Hanging, Stuck Pole
05-Jul-84	LA	TTX 101377	Load Fell from Car	$11,000	0	0	ACF 2	Damaged Switch
13-Jul-84	BO	TTX 155326	Load Shifted	$33,000	0	0	ACF 2	Derailed 6 Cars
27-Jul-84	ATSF	AT 290493	Defective Tie Down Equipment	$25,000	0	0		Trailer Fell From Car
15-Aug-84	CR	TTX 255711	Load Shifted	$15,000	0	0	ACF 5	Side Swiped Passing Train
03-Sep-84	SP	SP 900726	Trailer Shifted	$155,000	0	0		Car Derailed
24-Oct-84	BN	TTX 470571	Trailer Fell From Car	$4,000	0	0	ACF A-1	Hit Helper Unit
25-Oct-84	BN	TTX 100113	Wind Blew Container off Chassis	$66,000	0	0	ACF A-1	Signals Damaged
28-Oct-84	CR	TTWX 973152	Improper Tie Down	$13,000	0	0	B-End LP3SA; A-End ACF 5	
10-Nov-84	ATSF	AT 296131	Jaws Unlocked	$14,000	0	0		Trailer Fell From Car in Tunnel
21-Nov-84	BN	TTX 253039	Improper Tie Down	$12,000	0	0	LP4	Trailer Fell From Car
11-Dec-84	CR	TTX 157154	Improper Tie Down	$7,000	0	0	LP4	Trailer Struck Signals

TABLE 1

				Damage			Type	
Date	Railroad	Car Numbers	Accident Cause	Cost	Killed	Injured	Tie Down	Additional Information
27-Jan-85	BN	SP 520554	Defective Tie Down	$10,000	0	0		Trailer Fell From Car
04-Feb-85	CR	TTUX 145222	Hitch not Locked	$6,000	0	0	NRC-2	Trailer Fell From Car
23-Mar-85	MKT	TTX 604341	Load in Trailer Shifted	$10,000	0	0	B-End LP-4; A-End ACF 5	
17-Jul-85	ATSF	ATSF 008737	Defective Tie Down	$18,000	0	0		Shifted, Side Swiped locomotive
02-Jan-86	ATSF	TTWX 604556	Improper Tie Down	$10,000	0	0	B-End LP4; A-End ACF 5	Trailer Fell From Car
30-Jan-86	ATSF	ATSF 299232	Trailer not Locked in Hitch	$24,000	0	0		Trailer Fell From Car
31-Jan-86	CSX	RTTX 253538	Improper Tie Down	$34,000	0	0	Ends LP4SA; Mid ACF 2	Shifted, Hit Rock Cut
27-Feb-86	CSX	REAZ 230419	Trailer Fell From Car	$11,000	0	0		Trailer Struck by Passing Train
02-Mar-86	MKT	WTTX 930030	Load Shifted Inside Trailer	$45,000	0	0	LP3SA	Car Derailed
12-May-86	BN	BN 008007	Improper Tie Down	$7,000	0	0		Trailer Fell From Car
29-May-86	CR	TTWX 980736	Trailer King Pin Failed	$183,000	0	0	B-End LP3SA; A-End ACF 5	Derailed
10-Jun-86	SOO	TTWX 973802	King Pin not in Hitch	$8,000	0	0	B-End LP3; A-End ACF 5	Trailer Fell into River
15-Jun-86	CR	TTX 604428	Deflated Trailer Tires	$22,000	0	0	ACF 5	Load Shifted, Derailed Car
18-Jun-86	CNW	TTX 156031	Overloaded Trailer	$12,000	0	0	ACF 5	Trailer fell off Car on Curve
12-Oct-86	ATSF	SFLC 902043	King Pin not Locked in Hitch	$10,000	0	0		Trailer Fell From Car
31-Jan-87	OKKT	TTX 153121	Load Shifted Inside Trailer	$42,000	0	0	ACF 2	
19-Mar-87	CSX	TTX 160016	Container Came Loose	$31,000	0	0	LP4	
24-May-87	ATSF	TTWX 974499	King Pin not Locked in	$23,000	0	0	B-End LP3; A-End ACF 5	Trailer Fell From Car
25-Jun-87	IHB	ATSF 290590	Load Fell from Car	$6,000	0	0		Damaged Switch
28-Jun-87	BN	KTTX 154995	Improper Tie Down	$28,000	0	0	ACF 6-2	Trailer Fell From Car
03-Jul-87	ATSF	TTX 478926	Container Came Loose from Chassis	$66,000	0	0	ACF 2	Struck Bridge
27-Jul-87	BN	CNW 780529	Trailer Fell From Flatcar	$6,000	0	0		Damaged Signal
14-Aug-87	UP	RTTX 158606	Load Shifted Inside Trailer	$39,000	0	0	Ends NRC-1P; Mid ACF 5	Car Derailed
20-Sep-87	CR	RTTX 250115	Improper Tie Down	$15,000	0	0	Ends TT5 w/ SA Heads; Mid A	Trailers Shifted and Dragged
15-Nov-87	ATSF	ATSF 290470	5th Wheel not Locked	$33,000	0	0		Shifted, Struck Signal
21-Nov-87	ATSF	WTTX 159831	Improper Tie Down	$40,000	0	0	B-End LP4SA; A-End ACFSC	Container Shifted, Struck Signal
01-Mar-88	SP	TTX 150632	Improper Tie Down	$50,000	0	0	ACF 2	Trailer Fell From Car
19-Mar-88	CSX	TTX 477616	Container Separated from Chassis	$4,000	0	0	ACF 2	Passing Train Side Swiped

TABLE 1

Trailer on Flat Car - Load Loss due to Failure of Flat Car, Failure of Trailer or Human Error

				Damage			Type	
Date	Railroad	Car Numbers	Accident Cause	Cost	Killed	Injured	Tie Down	Additional Information
22-Apr-88	UP	SP 900278	King Pin not Locked in	$8,000	0	0		Trailer Fell From Car
28-Jun-88	ATSF	ATSF 290600	Hitch Unlocked	$8,000	0	0		Trailer Fell From Car
11-Aug-88	ATSF	RTTX 253199	King Pin Not Locked In	$14,000	0	0	Ends LP4SA; Mid ACF 2	Trailer fell from Car
05-Sep-88	CSX	TTWX 970224	Load Shifted Inside Trailer	$10,000	0	0	B-End LP3SA; A-End ACF 5	
24-Oct-88	BN	TTWX 992513	Trailer Fell From Car	$8,000	0	0	B End - LP3SA; A End - ACF 5	Damaged Signal
02-Nov-88	UP	NERZ 418100	Trailer Buckled	$19,000	0	0		Trailer dragged by Train
10-Feb-89	SP	WTTX 156223	Locking Pin Not Secure	$12,000	0	0	B-End LP4SA; A-End ACF 2	Container Fell From Car
16-May-89	SSW	KTTX 910159	Improper Tie Down	$54,000	0	0	TT2 with ACF 6 mount head	Load Fell, Struck Signal
21-Jul-89	ATSF	TTWX 992053	King Pin Not Engaged	$23,000	0	0	LP3SA	Trailer Fell From Car
30-Jan-90	SP	TTWZ 979331	Improper Loaded Intermodal Car	$23,000	0	0		Car Derailed
19-Apr-90	ATSF	FEC 004343	Load Shifted	$25,000	0	0		Struck Signal
07-May-90	CR	Not Given	Trailer Not Locked in Hitch	$70,000	0	0		Trailer Fell From Car
29-Sep-90	MRL	RTTX 253351	Improperly Loaded Van	$2,000	0	0	Ends LP4SA; Mid ACF 5	Car Derailed
14-Feb-91	CSX	RTTX 157376	Improperly Loaded Trailer	$350,000	0	0	Ends LP4SA; Mid ACF 5	Trailer Fell From Car
27-Feb-91	CR	TTWX 990317	Load Shifted	$9,000	0	0	B-End LP3SA; A-End ACF 5	Derailed 7 Cars
12-Mar-91	UP	TTX 602013	Defective Tie Down	$8,000	0	0	ACF 2	Trailer Fell From Car, Struck Bridge
21-Mar-91	SSWN	RTTX155727	Load Shifted Inside Trailer	$6,000	0	0	Ends TT5 with 6 mount heads;	Derailed
10-Jan-92	SOO	SOO 055034	King Pin Not in Hole	$9,000	0	0		Derailed 2 Cars
18-Jun-92	BN	TTWX 991123	Lost Load	$9,000	0	0	LP3SA	
01-Oct-92	BN	TTOX 140371	Improper Tie Down	$780,000	0	0	NCR-2	Derailed 31 Cars
11-Nov-92	KCS	Not Given	5th Wheel Lock Not Secure	$45,000	0	0		Trailer Fell From Car, Struck Bridge
03-Jan-93	SSWN	TTWX 990959	5th Wheel Not Locked	$11,000	0	0	B-End LP3SA; A-End ACF 5	Trailer Fell From Car
26-May-93	UP	TTAX 780278	Improper Tie Down	$12,000	0	0	ACF 6 P 37	Load Shifted, Broke Band
28-Jul-93	SP	LTTX 501836	Load Shifted Inside trailer	$7,000	0	0		Derailed Car
13-Dec-93	UP	TTAX 553028	Improper Tie Down	$140,000	0	0	LP12	Load Shifted
20-Dec-93	SP	TTFX 060043	Improper Tie Down	$30,000	0	0	NRC-2P	Load Shifted, Car Derailed

TABLE 1

Container on Flat Car - Load Loss due to Failure of Flatcar, Failure of Container or Human Error

Date	Railroad	Car Numbers	Accident Cause	Damage Cost	Killed	Injured	Type COFC Tie Down	Additional Information
20-May-83	BN	TTAX 971512	Tie Downs Came Loose	$9,000	0	0	MF-8400	Load Fell From Car
21-May-83	ATSF	TTAX 981830	Container Struck Signal Mast	$25,000	0	0	MF-8400 Pedestals; LP3SA Hitches	Fell from Car
15-Aug-83	ATSF	ATSF 999796	Wind Lifted Empty Container	$129,000	0	1		Derailed Caboose
09-Sep-83	ATSF	ATSF 999206	Improperly Loaded Container	$24,000	0	0		Derailed 7 Cars
11-Nov-83	ATSF	MEC 032071	Tie Down Failed	$4,000	0	0		Container Fell From Car
04-Sep-84	ATSF	FEC 004141	Improperly Loaded Container	$93,000	0	0		Friction Caused Fire
15-Nov-84	SSW	SP 513342	Improperly Loaded Container	$37,000	0	0		Load Hanging, Struck Bridge
18-Nov-84	NW	SOU 155329	Defective Tie Down	$32,000	0	0		Container of Beer Fell
11-Apr-85	SP	TTWX 974547	Load Shifted in Container	$7,000	0	0	MF-8400	Car Derailed
11-Jul-85	ATSF	SFLC 801287	Broken Locking Pin	$30,000	0	0		Container Fell from Car
04-Aug-85	ATSF	TTWX 982743	Locking Mechanism Malfunction	$23,000	0	0	MF-8400	Container Fell From Car
15-Feb-86	ICG	DTTX 063115	Overloaded Container	$350,000	0	0	Bulkheads	Container Floor Failed
15-Feb-86	UP	DTTX 062118	Container Shifted	$40,000	0	0	IBC's	Signals Damaged
21-Jul-86	NW	DTI 090150	Container Shifted	$21,000	0	0		Struck Signals
10-Jun-87	CSX	NYSW 007025	Bottom Fell Out of Container	$6,000	0	0		
22-Dec-87	ATSF	TTWX 972710	Container Unlatched	$38,000	0	0	MF-8400	Container Fell From Car
28-Aug-88	UP	SP 513737	Broken Container	$5,000	0	0		
08-Sep-88	UP	TTWX 979415	Corner Lock Missing	$206,000	0	0	MF-8400	Container Fell Causing Derailment
18-May-89	UP	TRTU 264947	Improper Tie Down	$18,000	0	0		Container fell Damaging Signals
29-Jan-90	IC	TTWX 982705	Improper Tie Down	$22,000	0	0	MF-8400	Container Fell From Car
16-Aug-90	MWRR	DTTX 072178	Container Improperly Loaded	$70,000	0	0	IBC's	Container Struck Overpass
28-Nov-91	UP	Not Given	Defective Tie Down	$15,000	0	0		Container Fell From Car
02-Mar-92	CSX	IAIS 902237	Improperly Loaded Container	$3,000	0	0		Shifted, Side Swipe by Passing Train
11-Sep-92	SOO	SOO 054991	Not Given	$8,000	0	0		Missing Containers
14-Mar-93	UP	DTTX 072209	Improperly Loaded Container	$56,000	0	0	IBC's	Top Container Fell From Car
24-Mar-93	BN	VTTX 097508	Containers Collapsed	$22,000	0	3	Fixed Pedestal	Raking Collision

TABLE 2

TOFC/COFC Accident/Incident Trends

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
TOFC Reported Accidents/Incidents	11	17	4	11	11	8	3	4	4	4	5
COFC Reported Accidents/Incidents	5	3	3	3	2	2	1	2	1	2	2
Total Accidents Incidents	16	20	7	14	13	10	4	6	5	6	7
Total Intermodal Loadings (Millions)	4.1	4.6	4.6	5	5.5	5.8	6	6.2	6.2	6.8	7.2
Number Loadings Between Accident/Incidents	256250	230000	657143	357143	423077	580000	1500000	1033333	1240000	1133333	1028571

TABLE 3

TOFC/COFC LOADING ACCIDENT/INCIDENT TRENDS

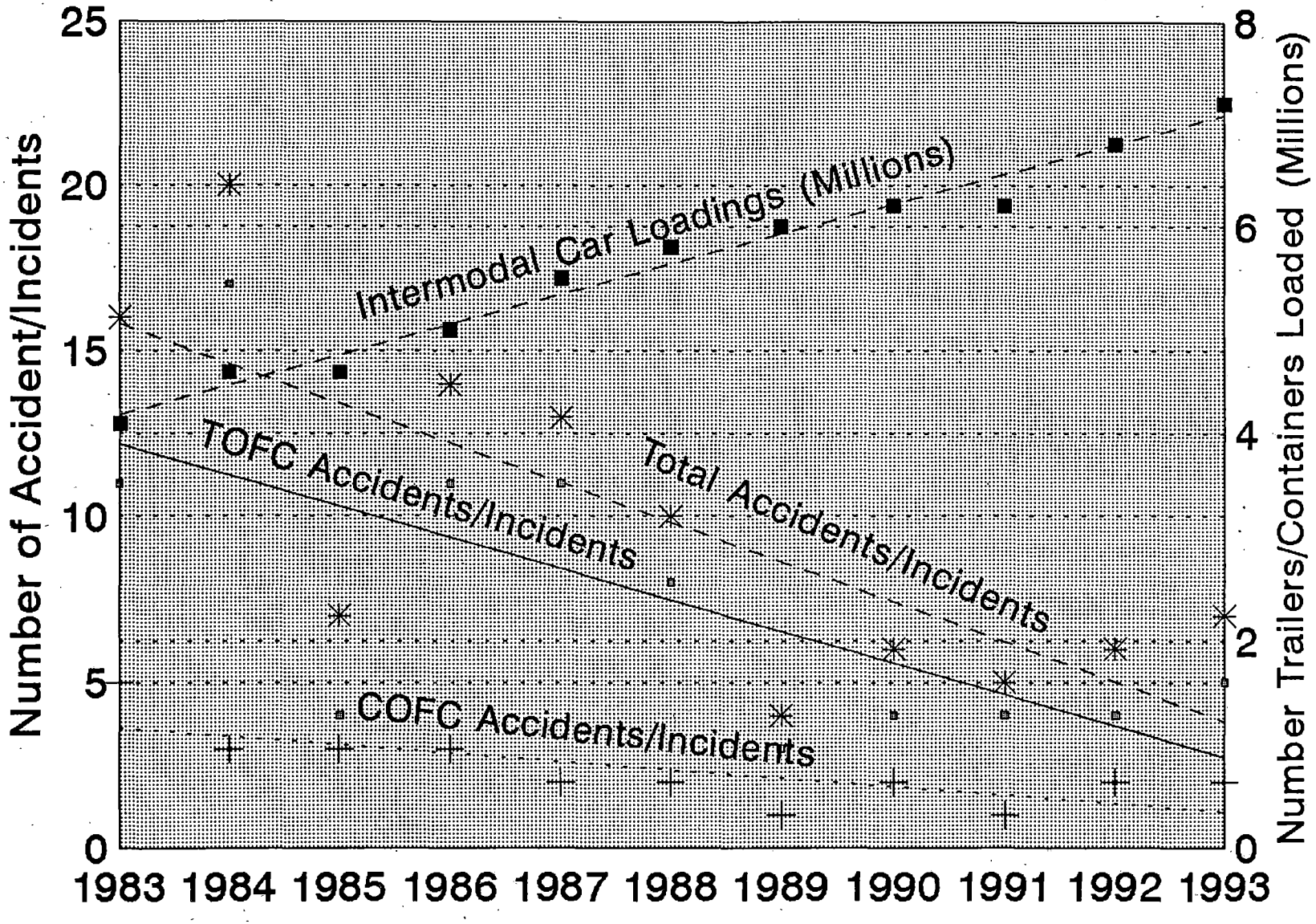


FIGURE 4

CHAPTER IV

Site Surveys

FRA selected TOFC/COFC loading hubs throughout the country to include in a series of site visits to assess loading procedures, inspection procedures, and the knowledge of loading crews. The FRA formed two inspection teams led by experienced FRA inspectors. In order to give the inspection teams the benefit of diverse points of view, FRA offered the Association of American Railroads, TTX Company, the National Transportation Safety Board, United Transportation Union, and Brotherhood of Railway Carmen the opportunity to be represented on the inspection teams. The United Transportation Union and National Transportation Safety Board elected not to participate in the site surveys.

Survey Objectives

The FRA conducted the site surveys to assess the following:

a) The knowledge of loading crews of how TOFC/COFC securement systems operate;

b) The extent and effectiveness of formal training on TOFC/COFC loading procedures provided by railroads or contractors to loading crews;

c) The extent and effectiveness of supervisory quality control and oversight of loading crews;

d) The policies and procedures of railroads and contractors on post-loading, pre-departure inspections of TOFC/COFC loads and securement systems;

e) The existence of known TOFC/COFC tie-down system design problems;

f) The procedures for handling TOFC/COFC equipment with defective tie-down systems;

g) The preventive maintenance procedures for TOFC/COFC tie-down systems; and

h) Occurrences of TOFC/COFC loads becoming insecure en route.

Pre-Survey Planning

TTX Company keeps extensive records of TOFC/COFC loading activity. FRA used these records to select a set of loading hubs for the survey that would show:

a) Loading of all types of TOFC/COFC equipment;

b) Various operating tempos and all shifts, including weekends;

c) Operation by several different major railroads;

d) Operation by several different companies under contract to railroads to operate TOFC/COFC loading facilities;

e) Various methods of loading;

f) A geographic cross-section of the country; and

g) A significant fraction of the annual TOFC/COFC loading capacity in the country.

The sites selected for the survey are listed in table 4, "Summary of TOFC/COFC Loading Site Visits".

Before starting the survey, FRA developed a survey report form for the survey team members to record their observations and the responses of the loading crew members and equipment inspectors to their questions. A sample of the survey report form is included in Appendix C, "Loading Site Survey Data Sheet and Questions".

Survey Scope

The survey was conducted from June 12, 1994, through July 1, 1994. Survey teams visited a total of 63 sites loading sites across the country. From the records of sites visited in column 4 of table 4, these loading sites reported a combined total peak rate of 8.4 million trailer/container lifts per year. Adjusting this peak lift (loads plus unloads) rate to an average loading rate, the sites visited load approximately 3.7 million containers or trailers on flat cars per year. This represents more than 50% of the total of 7.2 million such loadings reported by the Association of American Railroads for 1993. Thus, the sites visited represent over 50% of the nation's TOFC/COFC capacity.

All types of locations were surveyed, including large and small facilities, to provide a good sampling. The hours of the survey visits were staggered, to cover all shifts, including weekends, and all types of loading operations. Attempts were made to observe high-volume loading operations to see if stress caused changes in established loading procedures. Sites were also selected to include those operated by railroads and those operated by contractors, and all types of loading operations.

SUMMARY OF TOFC/COFC LOADING SITE VISITS

REPORT/DATE	RAILROAD	CITY/STATE	TRAINYARD	LOADINGS (x1000) MONTH / YEAR	RATIO (%) TOFC / COFC	LOADINGS PERFORMED BY: RR / PRIV CONT / OTHER	LOADINGS OBSERVED TOFC / COFC
2-1: 6/13/94	UNION PACIFIC	MESQUITE, TX	MESQUITE INTERMODAL FAC.	11.7 / 140	86 / 14	CONT: U.P. MOTOR FREIGHT	26 / 1
2-2: 6/13/94	SOUTHERN PACIFIC	DALLAS, TX	MILLER	17 / 204	50 / 50	CONT: INTERMINAL SERVICES	46 / 0
2-3: 6/14/94	ATSF	HASLET, TX	ALLIANCE INTERMODAL FAC.	16 / 192	60 / 40	CONT: INTERMINAL SERVICES	20 / 1
2-4: 6/15/94	SOUTHERN PACIFIC	HOUSTON, TX	SOUTH PAC INTERMODAL FAC	16 / 192	20 / 80	CONT: PACIFIC RAIL SERV.	25 / 39
2-5: 6/16/94	ATSF	HOUSTON, TX	PEARLAND	7 / 84	16 / 84	CONT: INTERMINAL SERVICES	
2-6: 6/16/94	UNION PACIFIC	HOUSTON, TX	SETTEGAST	11 / 132	75 / 25	CONT: U.P. MOTOR FREIGHT	77 / 0
2-7: 6/19/94	BURLINGTON NORTHERN	KANSAS CITY, MO	B.N. KANSAS CITY HUB CEN.	8 / 96	33 / 67	CONT: KAN CITY PIGGYBACK	18 / 6
2-8: 6/19/94	KANSAS CITY SOUTHERN	KANSAS CITY, MO	CHOUTEAU	6.7 / 80.4	65 / 35	CONT: K.C. SO. TRANSPORT	10 / 0
2-9: 6/19/94	UNION PACIFIC	KANSAS CITY, MO	U.P. MOTOR FREIGHT	5.5 / 66	50 / 50	CONT: U.P. MOTOR FREIGHT	27 / 5
2-10: 6/20/94	ATSF	KANSAS CITY, KA	ARGENTINE	13 / 156	85 / 15	CONT: INTERMINAL SERVICES	21 / 0
2-11: 6/20/94	SOUTHERN PACIFIC	KANSAS CITY, KA	SSW INTERMODAL RAMP	5 / 60	40 / 60	CONT: PARSEC	12 / 7
2-12: 6/21/94	NORTHERN SOUTHERN	KANSAS CITY, KA	N.S. TOFC RAMP	2.4 / 29.2	100 / 0	OTHER: SCHOCK TRANSFER	21 / 0
2-13: 6/23/94	BURLINGTON NORTHERN	OMAHA, NB	NEBRASKA HUB CENTER	3.3 / 40	45 / 55	CONT: EAGLE SYSTEMS	24 / 6
2-14: 6/23/94	UNION PACIFIC	OMAHA, NB	U.P. TOFC RAMP	2.5 / 30	30 / 70	CONT: U.P. MOTOR FREIGHT	36 / 0
2-16: 6/27/94	SOUTHERN PACIFIC	LONG BEACH, CA	INT'L CONT. TRANS. FAC.	50 / 600	0 / 100	RR: SOUTHERN PACIFIC	0 / 47
2-17: 6/28/94	SOUTHERN PACIFIC	LOS ANGELES, CA	L.A. TRAFFIC CENTER	19 / 228	70 / 30	CONT: PARSEC	63 / 15
2-18: 6/28/94	UNION PACIFIC	LOS ANGELES, CA	EAST YARD, L.A.	25 / 300	80 / 20	CONT: INTERMINAL SERVICES	0 / 16
2-19: 6/29/94	ATSF	LOS ANGELES, CA	HOBART	54 / 648	30 / 70	CONT: INTERMINAL SERVICES	86 / 1
2-20: 6/30/94	B.N. AND U.P.	TACOMA, WA	TACOMA NO. INTERMODAL	17.3 / 208	0 / 100	OTHER:PORT OF TACOMA	
2-21: 6/30/94	B.N. AND U.P.	TACOMA, WA	SOUTH INTERMODAL YARD	8.7 / 104	5 / 95	CONT: PACIFIC RAIL SERV.	11 / 11
2-22: 7/1/94	BURLINGTON NORTHERN	SEATTLE, WA	PUGET SOUND HUB CENTER	16.5 / 198	30 / 70	CONT: EAGLE SYSTEMS	8 / 9
2-23: 7/1/94	BURLINGTON NORTHERN	SEATTLE, WA	STACY STREET	23 / 276	1 / 99	CONT: PACIFIC RAIL SERV.	5 / 15
2-24: 7/1/94	UNION PACIFIC	SEATTLE, WA	U.P. INTERMODAL FACILITY	21.5 / 258	20 / 80	CONT: U.P. MOTOR FREIGHT	0 / 17
1-1: 6/13/94	ATSF	CHICAGO, IL	CORWITH	74/890	75/25	CONT: INTERMINAL SERVICES	30 / 4
1-2: 6/14/94	CONRAIL	CHICAGO, IL	55TH STREET CONRAIL	60 / 720		CONT: INTERMINAL SERVICES	75 / 0
1-3: 6/15/94	BURLINGTON NORTHERN	CICERO, IL	CICERO			CONT: TTX	
1-4: 6/15/94	BURLINGTON NORTHERN	CICERO, IL	OGDEN AVE RAMP	6 / 72		RR: BURLINGTON NORTHERN	53 / 0
1-5: 6/15/94	CSX	BEDFORD PARK, IL	BEDFORD PARK	24.3 / 292		CONT: PARSEC	92 / 0
1-6: 6/16/94	ILLINOIS CENTRAL	HOMEWOOD, IL	HOMEWOOD	4.6 / 54.6		CONT: INTERMINAL SERVICES	48 / 0
1-7: 6/16/94	UNION PACIFIC	DOLTON, IA	INTERMODAL YARD CENTER	14.2 / 170		CONT: INTERMINAL SERVICES	26 / 0
1-8: 6/16/94	CHICAGO/NORTHWESTERN	MELROSE PARK, IA	GLOBAL II INTERMODAL FAC	11.7 / 140.4		CONT: PENN TRUCK LINES	32 / 0
1-9: 6/17/94	NORFOLK SOUTHERN	CHICAGO, IL	LANDERS			RR: NORFOLK SOUTHERN	109 / 0
1-10: 6/17/94	UNION PACIFIC	CHICAGO, IL	CANAL STREET			OTHER: TTX MECH. DEPT.	
1-10: 6/17/94	UNION PACIFIC	CHICAGO, IL	CANAL STREET	15.2 / 182		OTHER: U.P. MOTOR FREIGHT	54 / 0
1-11: 6/18/94	CANADIAN PACIFIC	BENSENVILLE, IL	BENSENVILLE	12.5 / 150		CONT: PACIFIC RAIL SERV.	34 / 9
1-12: 6/18/94	CANADIAN PACIFIC	SCHILLEN, IL	SCHILLEN PARK EAST	2.1 / 25	0 / 100	RR: CANADIAN PACIFIC	
1-13: 6/19/94	BURLINGTON NORTHERN	MEMPHIS, TN	TENN	10 / 120		CONT: BRIMHALL PIGGYBACK	16 / 5
1-14: 6/20/94	ILLINOIS CENTRAL	MEMPHIS, TN	JOHNSTON (CAR SHOP)			RR (REPAIRS)	
1-14: 6/20/94	ILLINOIS CENTRAL	MEMPHIS, TN	JOHNSTON	6 / 72	40 / 60	CONT: INTERMINAL SERVICES	
1-15: 6/20/94	UNION PACIFIC	MEMPHIS, TN	SARGENT			RR: UNION PACIFIC	
1-15: 6/20/94	UNION PACIFIC	MEMPHIS, TN		6.9 / 83		RR: U.P. MOTOR FREIGHT	56 / 0
1-15: 6/20/94	CSX	MEMPHIS, TN	LEEWOOD CAR SHOP	N/A			
1-16: 6/21/94	NORFOLK SOUTHERN	MEMPHIS, TN	FOREST	3.1 / 36.9	64 / 36	CONT: PACIFIC RAIL SERV.	35 / 3
1-17: 6/21/94	SOUTHERN PACIFIC	MEMPHIS, TN	S.P. INTERMODAL FACILITY			CONT: PARSEC	36 / 2
1-18: 6/22/94	CSX	JACKSONVILLE, FL	DUVAL RAMP	16.7 / 200	60 / 40	CONT: TTX	
1-19: 6/22/94	NORFOLK SOUTHERN	JACKSONVILLE, FL	SIMPSON INTERMODAL DEPT	6.7 / 80	60 / 40	CONT: BANKHEAD ENT.	
1-19: 6/22/94	FLORIDA EAST COAST	JACKSONVILLE, FL	BOWDEN	10.4 / 125	70 / 30	RR: FLORIDA EAST COAST	
1-20: 6/22/94	CSX	TAFT, FL	TAFT INTERMODAL	5.8 / 70	90 / 10	OTHER: CSX EMPLOYEES	
1-21: 6/23/94	FLORIDA EAST COAST	W. PALM BEACH, FL	WEST PALM BEACH	1.5 / 18	95 / 5	OTHER: FLORIDA EAST COAST	
1-22: 6/23/94	CSX	TAMPA, FL	TAMPA INTERMODAL RAMP	4.8 / 57	75 / 25	RR: CSX	
1-23: 6/23/94	FLORIDA EAST COAST	FT. PIERCE, FL	FT. PIERCE	0.5 / 6	100 / 0	RR: FLORIDA EAST COAST	
1-24: 6/24/94	FLORIDA EAST COAST	FT. LAUDERDALE, FL	FT. LAUDERDALE	16 / 192	60 / 40	RR: FLORIDA EAST COAST	
1-25: 6/24/94	FLORIDA EAST COAST	MIAMI, FL	MIAMI RAMP, COMMERCE PK	23.2 / 278	80 / 20	RR: FLORIDA EAST COAST	
1-26: 6/28/94	CONRAIL	KEARNY, NJ	SOUTH KEARNY	41.7 / 500	80 / 20	CONT: PACIFIC RAIL SERV.	23 / 0
1-27: 6/28/94	AMERICAN PRESIDENT CO.	S. KEARNY, NJ	SOUTH KEARNY	5 / 60	0 / 100	OTHER: COMPANY MEN	0 / 6
1-28: 6/28/94	CONRAIL	N. BERGEN, NJ	NORTH BERGEN	5 / 60	100 / 0	CONT: PACIFIC RAIL SERV.	26 / 0
1-29: 6/29/94	CONRAIL	MORRISVILLE, PA	MORRISVILLE	11 / 132	90 / 10	RR: CARMEN	7 / 1
1-30: 6/29/94	CONRAIL	LANGHORNE, PA	MORRISVILLE RAMP "C" YARD	3.8 / 45	99 / 1	CONT: PARSEC	
1-31: 6/30/94	CONRAIL	S. KEARNY, NJ	TRAILVAN TERMINAL				28 / 7
1-32: 6/30/94	CP RAIL	NEWARK, NJ		3.6 / 43.7	98 / 2	CONT: GPS TERMINAL SERV.	7 / 0
1-33: 6/30/94	CONRAIL	ELIZABETH, NJ	EASTERN RAIL	1.3 / 15	0 / 100	CONT: PACIFIC RAIL SERV.	0 / 2
1-34: 6/30/94	CONRAIL	ELIZABETH, NJ	EXPRESS RAIL	4.2 / 50	0 / 100	CONT:UNSPECIFIED	0 / 4
1-35: 7/1/94	CONRAIL	CROXTON, NJ	CROXTON	4.3 / 52	0 / 100	RR: CONRAIL	

TABLE 4

Method of Conducting the Survey

Upon arrival at each terminal or loading facility, the FRA survey team leader met with the acting manager of the site to explain the purpose of the visit. FRA emphasized that the visit was an information gathering rather than an enforcement action and that no formal inspection reports, violation reports, legal actions, penalties or other repercussions would result. Obvious safety problems were pointed out to the facility operator to take action to correct them.

The inspection team requested copies of any training materials, safety rule books, operating guidelines, training plans, loading and unloading procedures, and any other written safety guides used at each facility. The inspection team also asked for statistical data on the workload at the site.

The survey team leader informed the site manager that the fact-finding teams would not interfere with or delay normal loading operations. As the work schedule of the loading crew members permitted, team members asked them questions about the training they had received, the procedures they used, and the checks they performed.

The team leader invited the railroad or railroad contractor operating the loading facility to accompany the inspection team during the survey. Some did, and some did not. Without exception, the survey teams received excellent cooperation from personnel at the loading sites.

CHAPTER V

Findings of the Loading Site Survey

Loading Crew Knowledge and Training

Inspectors placed major emphasis on evaluation of training programs -- including formal classroom training and On-the-Job Training (OJT) -- provided to the loading crew and inspection personnel. This evaluation also assessed the availability of written operating procedures and other training aids such as instructional videos, vendor manuals, and periodic safety meetings to promote safe operations. The details of the results of the training survey are reported in Appendix D , "Summary of Responses to Training Questions".

Inspectors reported the following concerns regarding the state of training and training materials:

a) Many loading crew and inspection personnel receive little, if any, formal classroom training on TOFC/COFC operations. Formal classroom training consists of classes varying from 15 minutes to one week in length, covering a variety of subjects, including hitch operation and maintenance. These classes are rarely mandatory, and, in several instances, it had been several years since the personnel interviewed had received classroom instruction.

b) Many workers indicated that they had received OJT, usually working with an experienced worker until they gained adequate proficiency in the required tasks. However, personnel identified widely varying time periods in which they received OJT.

c) There is no structured approach to qualify and certify operators and inspectors. Only a few sites require a written or operational test.

d) Most of the sites surveyed provided copies of manuals, books, and operating procedures that are available for review by loaders and inspectors. However, loaders and inspectors are not generally required to have a copy of the applicable operational procedures in their possession when performing the work. Some facilities had no such reference materials.

e) While many workers indicated that they had seen instructional videos regarding the proper operation and maintenance of hitches, very few locations identified regular safety meetings as a means of continually updating workers on safety information.

f) Requirements for, or efforts to provide workers with, periodic refresher training on hitch operation, maintenance, and inspection are rare. Many employees indicated that it had been a number of years since they had received any type of training.

Most employees indicated that they would welcome additional classroom training on the most current information on hitch operation, maintenance, and inspection. Much of the information gathered during the surveys regarding hitch types and their operation is outdated and provides information regarding obsolete hitches.

Loading Procedures

The FRA survey teams found written TOFC/COFC loading procedures available at most of the loading sites. Loading crew members are generally aware of the location of the procedures and what they contain. Few sites use quick reference cards that highlight approved procedures, and are intended to be in the loading crews' possession. Some employees observed a pattern of strict enforcement of the approved procedures immediately after a safety incident, but said that such enforcement soon diminishes.

In general, formal procedures exist. Their enforcement by management varies with site and is cyclical. Some sites need to develop formal written procedures and all sites need to be vigilant that the procedures are followed, even during busy periods.

Pre-Departure Inspection Procedures

Most loading site managers told the survey teams that they strongly enforce a written policy of checks and in some cases double checks of TOFC/COFC loads by either carmen or supervisors outside the loading crews. Many sites require the inspector to certify that the inspection of each loaded car was actually done. A few sites do not require pre-departure inspections by persons not on the loading crew.

At sites that do have a strong inspection policy, the survey team found that peak workload pressures or lack of personnel on certain shifts can cause the inspections to be neglected. At some sites, on some shifts, a car can be loaded by a single person and approved for departure without a check of any kind.

The industry generally intends to do a good job of inspecting TOFC/COFC loads, but operational pressures frequently cause these intentions to be neglected. Because the pre-departure inspection is the last line of defense against a misloaded car or a defective tie-down component, inadequate procedures or lapses in procedures can have disastrous consequences.

Securement System Maintenance Procedures

The survey teams found written maintenance procedures developed by securement component manufacturers or TTX Company are available, but periodic maintenance of TOFC/COFC securement system or tie-down components is not a high priority to most operators. TOFC/COFC equipment is in high demand, and pressure to move trailers and containers often causes normal maintenance to be delayed or neglected. Securement system maintenance tends to receive more attention at sites with a TTX Company presence.

Inspectors found many cars still in service well past the stencilled hitch lubrication date. FRA believes current hitch lubrication practices may be misleading. Periodic re-application of new grease without cleaning the remnants of old lubricant may be harmful. Grease tends to trap dirt and other harmful contaminants. Excessive grease can cake and harden causing interference with moving parts. Hitches seem to be able to operate correctly for long periods of time with minimum lubrication. Alternate means of providing lubrication that do not tend to trap dirt -- such as silicon sprays or the use of teflon coatings -- may prove beneficial in a TOFC hitch application. A re-evaluation of hitch lubrication practices is necessary.

A common practice used by loading crews when they discover a defective trailer hitch is to lower the hitch and load the car with containers. The defective hitch is not blocked or disabled to prevent its use. The destination site of the car has no way to know that the car has a defective hitch, and may load it. Defective hitches must be positively blocked to prevent their possible use until they are repaired.

While inspecting TOFC/COFC cars, the survey teams found missing parts, and instances of damaged or worn tie down system components that should be found and replaced by an effective preventative maintenance program. Some clear examples of such defects are given in Appendix E, "Illustrations of Securement System Defects". FRA has been working with the industry to develop periodic maintenance intervals tied to mileage for high-utilization double stack equipment. The industry should extend this concept to the maintenance of TOFC/COFC tie-down systems.

CHAPTER VI

Observations of Participating Organizations

Association of American Railroads

Appendix F contains a summary of the observations made during the site visits by the Association of American Railroads (AAR). The AAR's approach to reducing the potential for accidents/incidents caused by improper loading or defective securement systems of TOFC/COFC equipment is very similar to the approach being considered by FRA.

TTX Company

Appendix G contains a summary of the observations made during the site visits by TTX Company. The TTX observations focus on the role TTX company plays in TOFC/COFC operations.

Brotherhood of Railway Carmen

Appendix H contains a summary of the observations made during the site visits by the Brotherhood of Railway Carmen. These observations parallel the findings presented in this report.

CHAPTER VII

Conclusion

Intermodal freight is the railroads' fastest growing type of traffic. Railroads hauled 7.2 million containers and trailers in 1993, exploiting the flexibility of an intermodal transportation system that combines the railroad's long-haul efficiency with the truck's door-to-door convenience. Making use of intermodal opportunities is a major priority of the Department of Transportation, and trailer-on-flat car and container-on-flat car service is a shining example of its success.

TOFC/COFC is also a very safe service. Between 1983 and 1993, 65 million containers and trailers moved by rail, and this movement caused only 108 reported accidents/incidents in the entire eleven-year period. Reported accidents or incidents caused by improper loading or failure of load securement systems of TOFC/COFC equipment averaged only 10 per year, while TOFC/COFC car loadings averaged over 5 million per year.

In addition, the safety of TOFC/COFC operations is improving: the number of reported accidents/incidents per year is declining while the number of car loadings is rapidly climbing. Some of the reported accidents/incidents involved equipment of an early design that has either been modified to correct a design problem or removed from service.

Observations Causing Safety Concerns

Even though accident/incident data indicates that TOFC/COFC operation has a good safety record, operational safety weaknesses must be eliminated to decrease the chances for a potentially dangerous accident. The loading site surveys and accident/incident data base search done by FRA indicate several target areas to strengthen TOFC/COFC loading safety.

1. **Loading crew knowledge varies at different sites.**

   The knowledge of trailer and/or container loading crews of how securement systems operate, of proper loading procedures and of how to check that a load is safely secured varies at different terminals. Some crews are very knowledgeable; others clearly lack the knowledge necessary to secure loads safely without close monitoring and supervision.

2. **Loading crew training varies at different sites.**

   The training provided to and required from loading crews of how securement system operate, of proper loading procedures and of the safety critical checks of load securement varies at different terminals. Some facilities provide extensive training;

others give only a few days of on-the-job training before the crew member is considered qualified to perform loading operations.

3. **Some loading sites operate without written procedures.**

Some loading sites provide written loading policies and loading safety procedures to loading crews. However, several sites operate without such written policies and loading procedures.

4. **Pre-departure inspections are not universally required.**

Some loading sites require loading crew supervisors or carmen to inspect the securement of trailers and containers before loaded cars leave the terminal. However, several sites do not require such inspections, and thus provide no safety check on the securements done by the often-rushed crews. At some sites, the crane or forklift operator loads flat cars alone, without securement checks by anyone on the ground before departure.

5. **Maintenance of securement systems is not a high priority.**

Railroads do not give the maintenance and lubrication[2] of TOFC/COFC securement systems a high priority. FRA inspectors observed many cars with past-due lubrication dates, and some cars with broken, missing, or defective securement system components. Sites with a TTX representative tended to pay more attention to maintenance and lubrication of securement systems than sites without a TTX presence.

6. **Hitches are not cleaned before lubrication.**

Excessive lubricant traps dirt, and old lubricant cakes, potentially obstructing moving parts. Hitches need to be cleaned of old lubricant before a minimum amount of new lubricant is applied.

7. **Above-the-deck inspections are not universal.**

Many railroads do not require carmen to perform an above-the-deck inspection of TOFC/COFC equipment. The carmen generally perform the freight car safety inspection required by 49 CFR Part 215 and inspect the hitch from the ground.

---

[2]Rule 5 of the AAR Lubrication Manual requires:
a) the cleaning of surfaces requiring lubrication, and
b) the painting of locking indicators when lubrication is performed.

However, they rarely inspect the rub rails on the car deck that hold trailer tires in place laterally. As a result, many TOFC cars have rub rails with bolts missing or welds broken, and the rail can move several inches.

8. **Defective hitches frequently are not reported.**

Some flat cars are equipped for both TOFC and COFC operation; to load containers, the trailer hitch can be lowered into the deck of these cars. Frequently, when a hitch defect is found on such a car, the defect is not reported and repaired; the defective hitch is simply lowered and the car is loaded with containers. The risk exists that, at the next location, the car will be returned to TOFC service without repairing the hitch defect.

9. **Locking indicators are not easily seen.**

Securement system locking indicators are often difficult for inspectors to see because they are either in an obstructed location or they do not stand out from their background.

10. **Inter-Box Connectors are difficult to inspect.**

Inter-Box Connector (IBC) locks are a key securement system component on many COFC cars. A thorough inspection of these locks is extremely difficult to make from the ground. The process of climbing a car to make an inspection of the locks requires the inspector to place himself in a precarious position with no handholds or other safety devices available.

11. **Improper lifting of containers and trailers.**

Some containers and trailers were not designed to be lifted and loaded in all the ways sites load railcars. The containers and trailers damaged by these movements have caused some of the accidents and incidents that were not caused by loading procedures or securement system failures.

12. **Containers and trailers are not weighed to ensure that they are not overloaded.**

Containers and trailers are rarely weighed to determine whether they are overloaded. As a result, damage can occur to the trailer or container structure during the lifting operation. This damage can cause incidents in which the contents of the trailer or container shift or spill in transit.

13. **Many TOFC/COFC accidents and incidents go unreported.**

The monetary threshold for reporting accidents/incidents, and the practice of excluding damage to trailers and containers in the computation of the damage cost, causes many TOFC/COFC loading incidents to go unreported.

14. **Loading requirements often reduce compliance with loading and inspection procedures.**

Contractors operating loading sites measure efficiency by the speed of the loading operation; this is particularly important as the demand for intermodal freight grows. During periods of peak traffic, crews may feel pressured to increase the speed of loading by taking short cuts to established loading and inspection procedures.

FRA Actions

FRA will work in partnership with the railroad industry -- including management, labor, contractors, and suppliers -- to address the safety concerns identified in this report. Voluntary actions developed and implemented during this cooperative effort will reduce the potential for accidents/incidents caused by improper loading of TOFC/COFC equipment or the failure of tie-down systems.

One of FRA's initiatives is the Administrator's Roundtable series, which brings together leaders from all aspects of the railroad industry for frank, day-long discussions on particular topics of concern to the railroad industry. This method of acting in cooperation has already fostered concrete progress in areas such as Positive Train Control development and research and development. FRA is confident that cooperative effort, rather than immediate regulation, is the best way to improve the safety of TOFC/COFC loading and securement procedures.

Within the next 60 days, FRA will convene an industry roundtable to begin work on improving TOFC/COFC loading and securement safety. Given the intermodal nature of this roundtable discussion, representatives from both the shipping and trucking industries will also be invited to attend and participate.

At this roundtable, FRA will seek to promote a coordinated industry effort to:

1. **Establish a uniform minimum set of training requirements** to be used industry-wide to qualify TOFC/COFC loading crews and loading inspectors. The requirements should be applied to contractors that perform TOFC/COFC loading operations for railroads as well as railroad employees.

2. **Ensure that each TOFC/COFC loading site has written standard operating procedures** for safely loading trailers and containers on flatcars. The standard operating procedures should be:

   a. tailored to the specific operating environment at each site;

   b. posted in prominent locations;

   c. mandated by site management as the only way to perform the loading operations;

   d. required as part of the training of loading crews;

   e. updated and verified at least annually;

   f. enforced by loading crew supervisors; and

   g. enforced by railroads on contractors performing TOFC/COFC loading work.

3. **Conduct post-loading, pre-departure inspections of all loaded TOFC/COFC equipment** by personnel other than the loading crew, such as loading crew supervisors or carmen. The inspection should:

   a. include an above-the-deck check to ensure that rub rails are secure and tires are inflated;

   b. include a positive check of the proper elevation and locking of retractable hitches;

   c. include a positive check that the kingpin is locked into the hitch;

   d. include a positive check of container-to-flatcar or container-to-trailer chassis locks;

   e. include a visual inspection of the structural integrity of the container or trailer;

   f. include a visual inspection for the proper position and balance of all trailers and containers on their host flatcars;

   g. be performed by personnel trained to perform load securement inspections and thoroughly familiar with all types of TOFC/COFC securement systems; and

   h. be recorded and signed by the inspector performing the inspection.

4. **Initiate effective TOFC/COFC securement system preventative maintenance intervals.** The program should include the cleaning of critical parts before they are re-lubricated with a prescribed amount of lubricant, and a thorough check of visibility of locking indicators. Cleaning and re-lubrication must be performed by the due dates, and equipment overdue for maintenance must not be allowed to continue in service;

5. **Discontinue the practice with flat cars with defective hitches of dropping the defective hitch and loading the car with containers.** A defective hitch should be effectively blocked or locked out to prevent its use; this must be accomplished before the car is allowed to continue in service of any kind.

6. **Review design standards for trailers and containers to be loaded on TOFC/COFC equipment.** Compare designs and loading methods to be sure that they are compatible.

7. **Determine and promote best practices for TOFC/COFC loading safety.**

FRA is confident that a cooperative effort with the industry will accomplish all of these objectives. **FRA will monitor the progress of the voluntary actions taken by the industry and assess their effectiveness in reducing the potential for accidents/incidents caused by improper loading or faulty securement systems of TOFC/COFC equipment.** Also, FRA inspectors, as part of their routine inspections, will emphasize adherence of loading crews to the TOFC/COFC safety recommendations identified above. If voluntary industry actions are not sufficient, additional measures to reduce the potential for these accidents/incidents will be necessary.

By ensuring the safety of COFC/TOFC loading and securement procedures, FRA and the nation's railroads will protect lives and property while improving transportation and helping to achieve the Department's goal to "Tie America Together" through a safe, effective, intermodal transportation system.

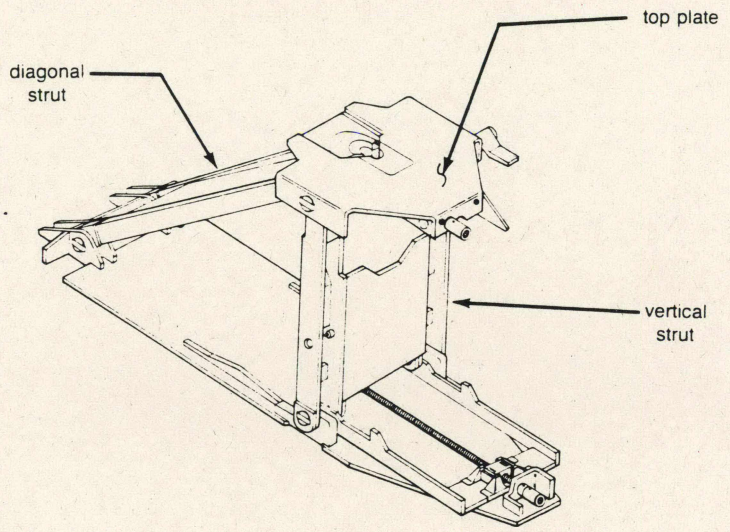
APPENDIX A

ILLUSTRATIONS OF TOFC/COFC EQUIPMENT AND LOADING TECHNIQUES

TTX Hitch Maintenance Guide

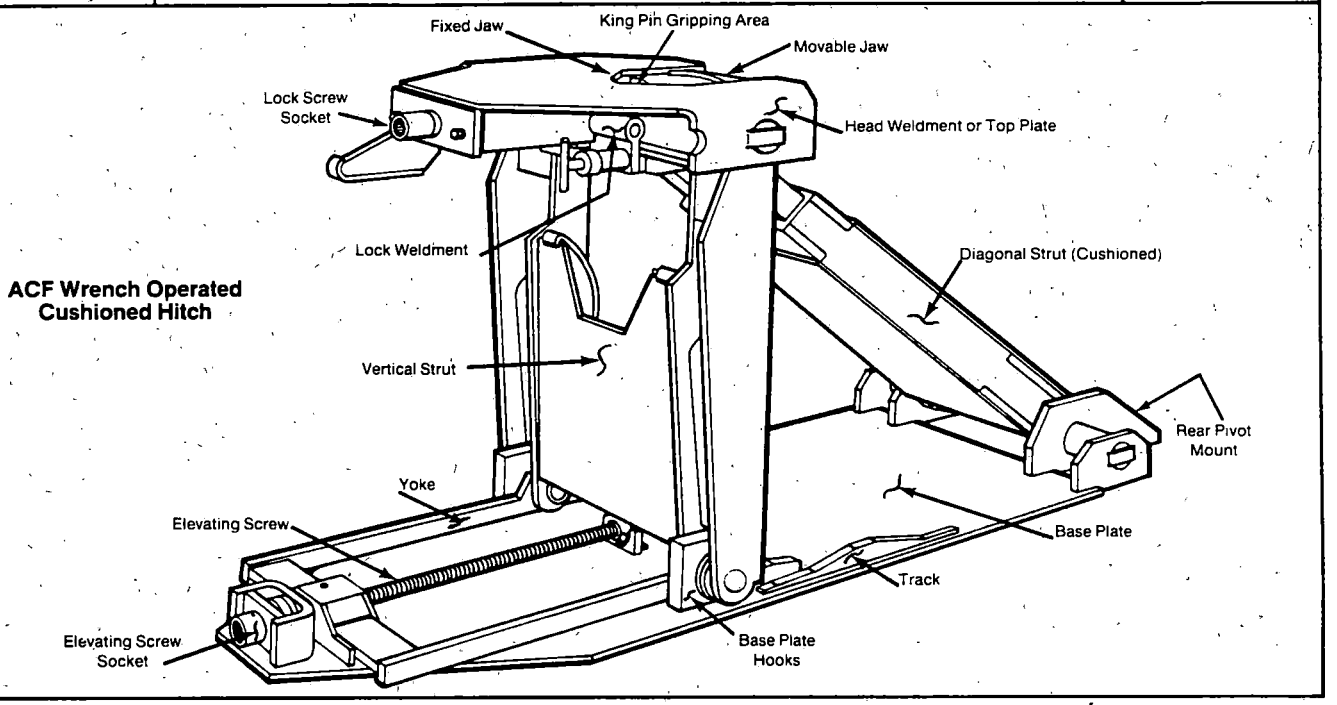
GENERAL HITCH INFORMATION

Piggyback trailer hitches are semi-precision mechanical devices used to support (hold up) and secure (lock) highway trailers on railroad flatcars for long distance rail movement. They consist of three main parts — the vertical strut, the diagonal strut, and the top plate, or head. These three parts are identified in the drawing of a typical hitch, shown below.



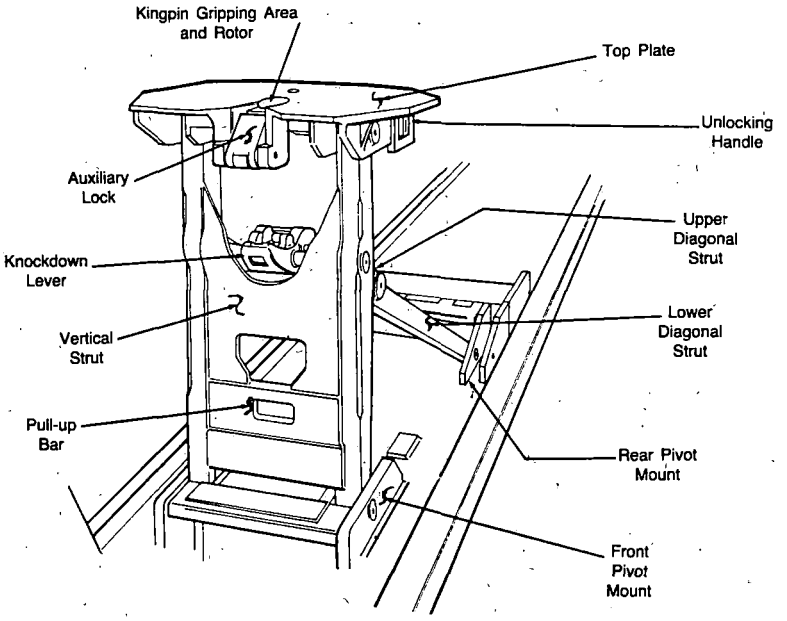
TTX Hitch Maintenance Guide

General Information	Identification of Hitch Parts	Wrench Operated Hitches



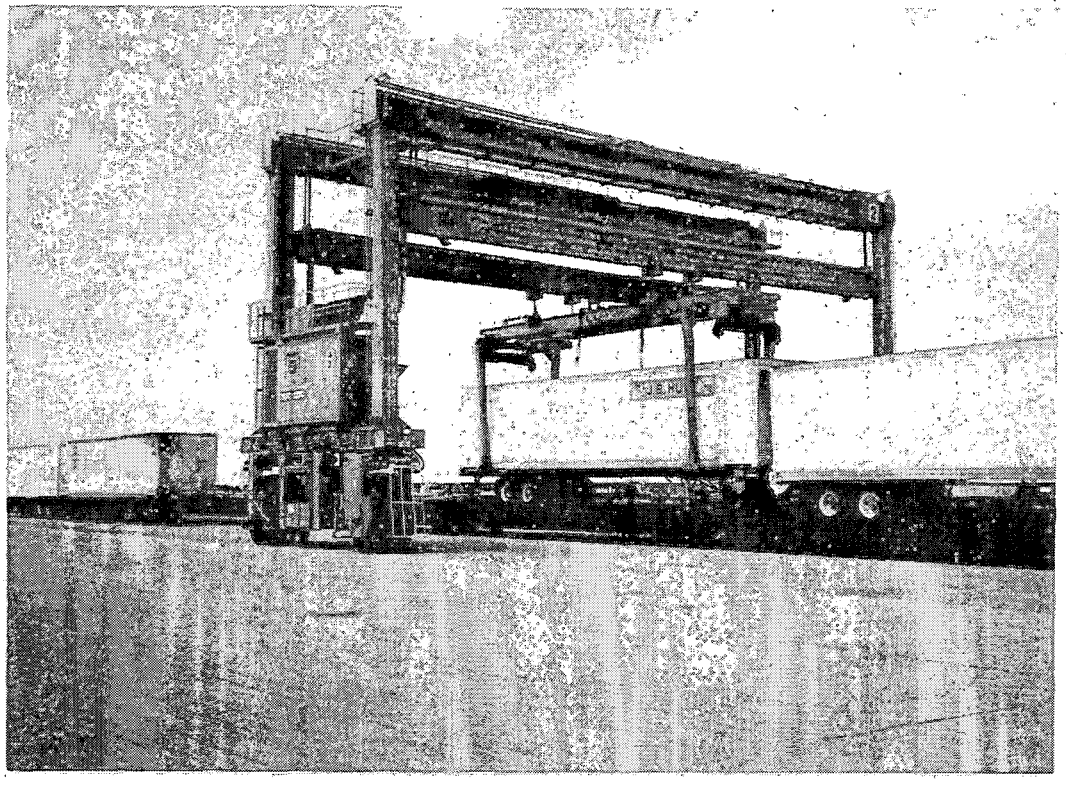
TTX Hitch Maintenance Guide

General Information	Identification of Hitch Parts	Tractor Operated Hitches

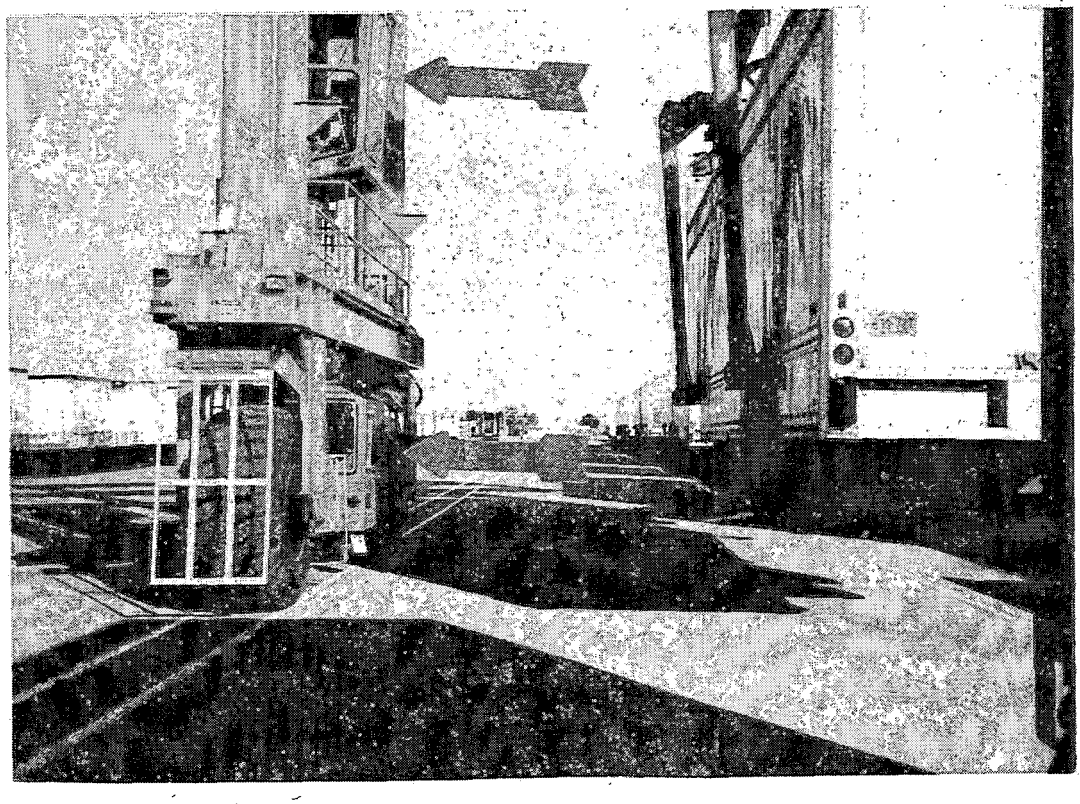


Pullman Semi-Automatic Rigid Hitch

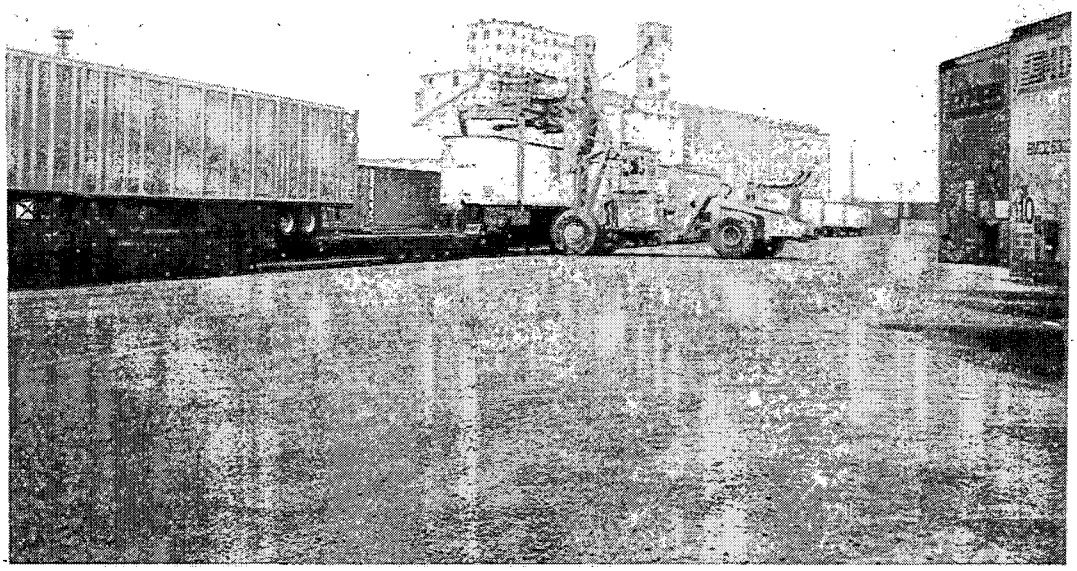
APPENDIX A
Illustrations of TOFC / COFC Equipment and Loading Techniques



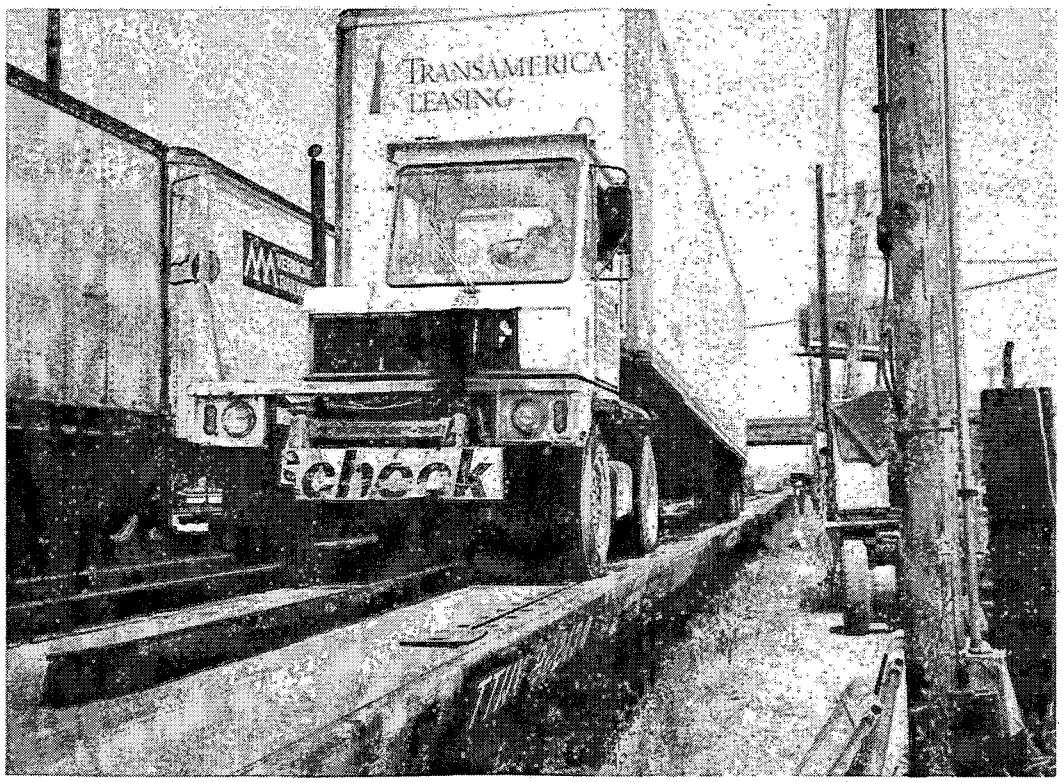
E - 1
Loading Trailers with straddle crane.



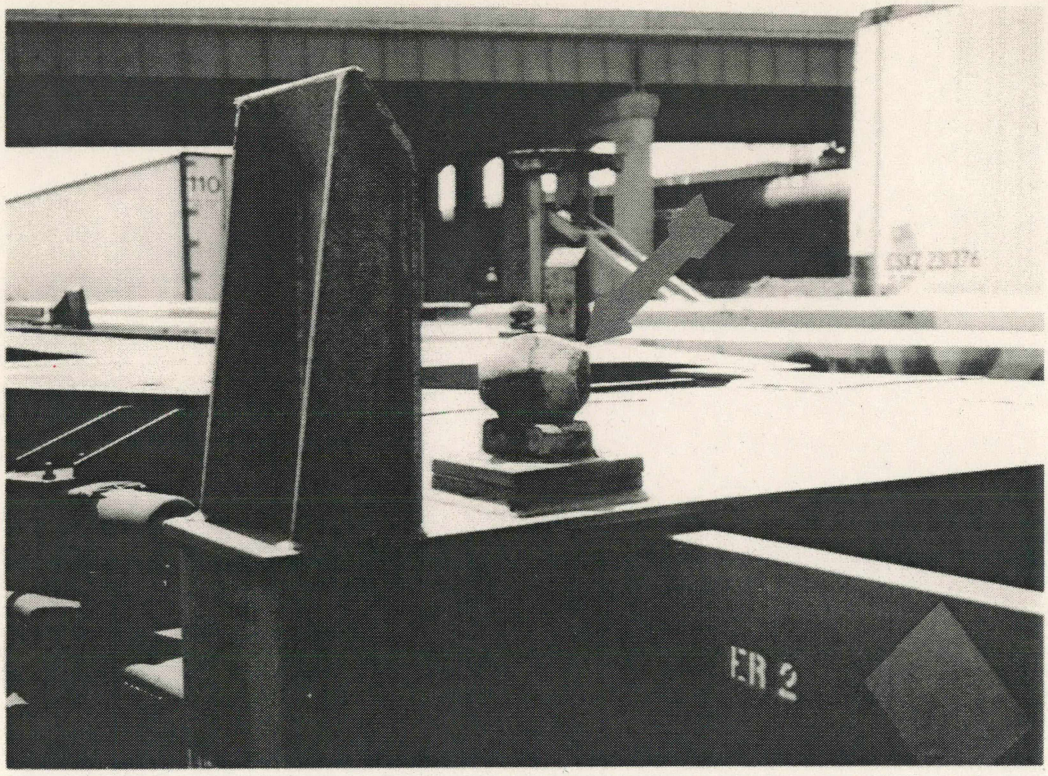
E - 2
Straddle crane equipped with high cab for containers and low cab for trailers.



E - 3
Loading trailers with sideloader.

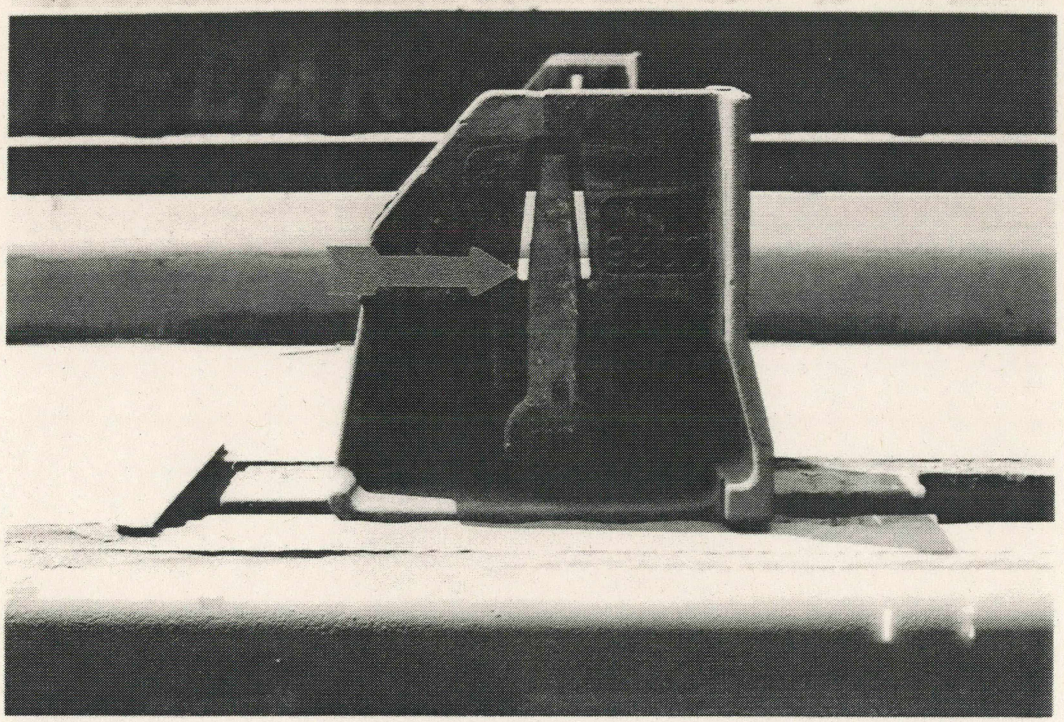


E - 4
Loading trailers, circus style.

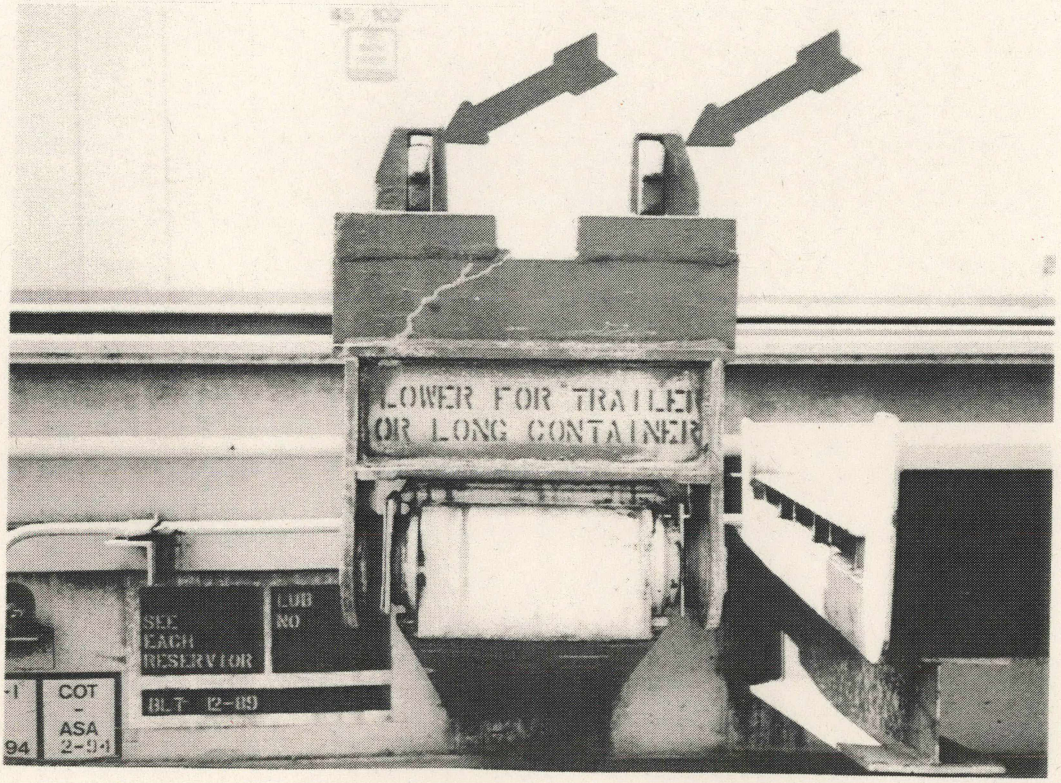


E - 5
Automatic twist lock for containers.

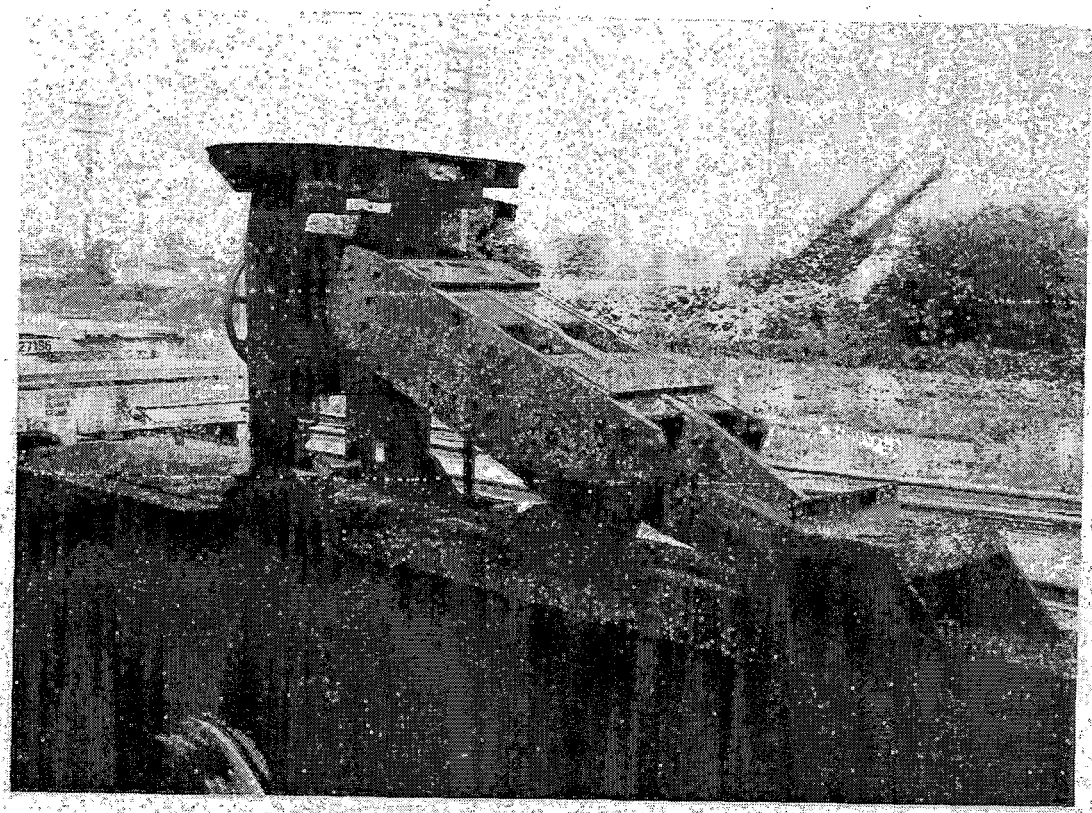
E - 6
Container pedestal with automatic twist lock.



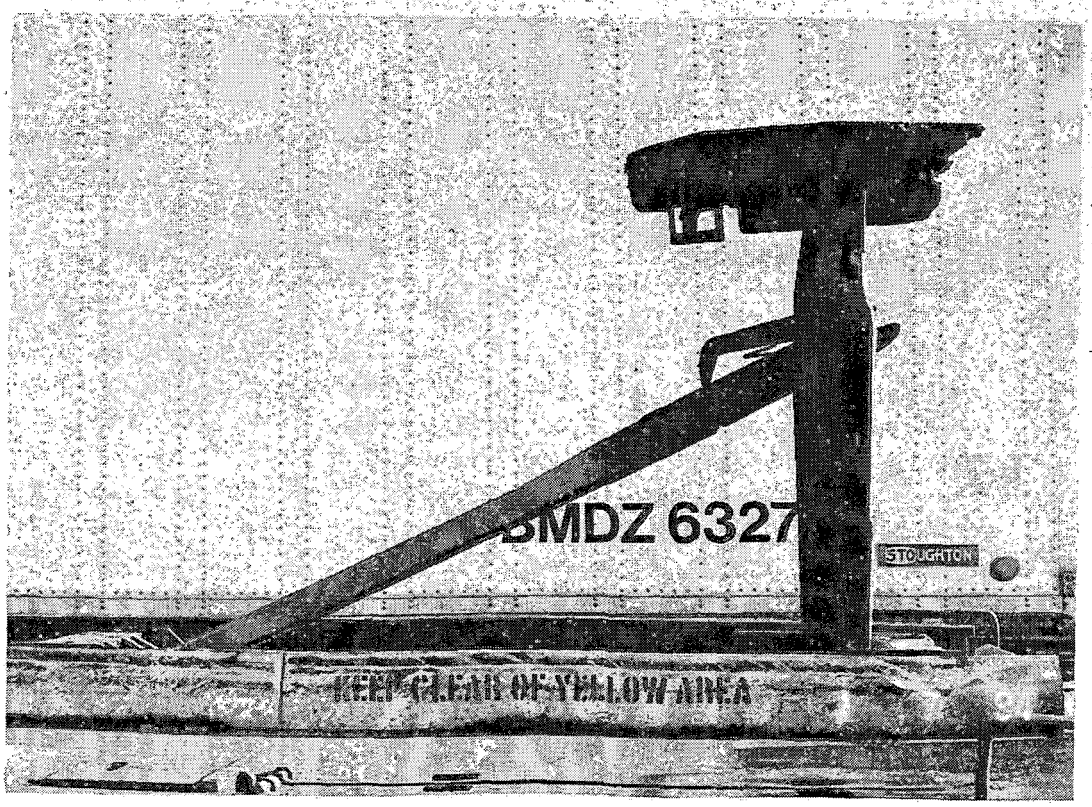
E - 7
Pedestal with automatic locking hook.



E - 8
Pedestal with automatic locking hook.



E - 9
Non-Retractable hitch with semi-automatic locking top plate.



E - 10
Pull-Up retractable hitch with semi-automatic top plate.

E - 11
Wrench operated retractable hitch with screw type locking plate.

APPENDIX B

TTX COMPANY REVIEW OF ACCIDENT/INCIDENT DATA

TTX COMPANY
101 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606
(312) 853-3223

ROBERT S. HULICK
SENIOR VICE PRESIDENT EQUIPMENT

DIRECT LINE (312) 984-3807
FAX (312) 984-3875

July 8, 1994

Mr. R. Mowatt-Larssen
Chief - Motive Power and Equipment Division
Federal Railroad Administration
400 Seventh Street, S. W.
Washington, D. C. 20590-0001

Dear Mr. Mowatt-Larssen:

We have reviewed the trailer/container loss data forwarded to my attention by FRA. Non-intermodal incidents were removed from the data base and securement equipment identified for instances involving TTX Company equipment. Updated data files were forwarded to Tom Peacock for his use.

Incidents reported to FRA from 1983-1993 totaled 108. Of these, seventy involved TTX equipment. The attached tables summarize incidents by year and normalize industry data by loadings for each year. There has been a significant reduction in the incident rate during this period, which is particularly notable because intermodal loadings increased from 4.1 MM in 1983 to 7.2 MM in 1993.

TTX data revealed that twelve distinct types of cars, designated by different reporting marks, were involved in these incidents. Eight of these car types are TOFC only equipment, two are COFC only and two are TOFC/COFC all-purpose equipment. Of the seventy incidents involving TTX equipment, fifty-eight were trailer-related while twelve were container-related.

Trailer-related incidents and container-related incidents are tabulated by cause on another attachment. Improper loading of trailers or containers on the railcar accounted for 41% of the causes while trailers or containers with improperly distributed or secured loads represented 27%. Railcar securement equipment malfunctions were listed as the causal factor in only 10% of the incidents.

Our review of securement equipment malfunctions revealed the following:

TOFC

	DATE	CAR NO.	CAUSE	SECUREMENT TYPE
1)	23- July - 83	TTX 150734	Broken Lock Down Beam	ACF2 Hitch
2)	28- Jan - 84	TTX 160042	Broken Tie Down	LP4SA Hitch
3)	12- Mar - 91	TTX 602013	Defective Tie Down	ACF2 Hitch

COFC

4)	20- May - 83	TTAX 971512	Tie Downs Came Loose	MF 8400 Ped.
5)	04- Aug - 85	TTWX 982743	Locking Mechanism Malfunction	MF 8400 Ped.
6)	22- Dec - 87	TTWX 972710	Container Unlatched	MF 8400 Ped.
7)	08- Sep - 88	TTWX 979415	Corner Lock Missing	MF 8400 Ped.

Two hitch types (ACF 2, LP4SA) were listed in the three TOFC incidents and the MF8400 container pedestal was listed in all four COFC incidents.

The ACF 2 hitch is a screw type (wrench operated) hitch. Currently only 2,008 of these hitches remain in service (2.7% of our capacity). The LP4SA hitch is a semi-automatic design. Currently only 199 of these hitches are in service on TTX cars (less than 1% of our capacity). The quantities of these two hitch types within our intermodal fleet have been decreasing over the time period reviewed. Car conversions driven by commercial reasons to accommodate two 45' trailers or autoracks have caused the removal of these hitches.

Until the advent of double stack equipment in the mid 1980s, the retractable container pedestal (MF 8400 style) applied to 89' all-purpose flat cars was the primary method of securement for containers. Today we have 10,800 cars so equipped in our fleet. We continue to stress proper maintenance of the latch mechanism on these pedestals to the personnel responsible for inspecting and maintaining this equipment. You should note that no incidents attributable to pedestal malfunctions have been reported for almost six years.

Our review has not revealed any undesirable trends or significant equipment problems regarding the securement devices applied to TTX equipment in intermodal service. As an industry, we are all working toward the elimination of these incidents through training, proper equipment design and maintenance, proper trailer/container loading and proper securement of the trailer/container to the railcar.

If I can be of further assistance, please contact me at your convenience.

Sincerely yours,

Robert S. Hulick

RSH:pss
Attachments

INCIDENTS BY YEAR

YEAR	TOFC	COFC	TOTAL
1983	11	5	16
1984	17	3	20
1985	4	3	7
1986	11	3	14
1987	11	2	13
1988	8	2	10
1989	3	1	4
1990	4	2	6
1991	4	1	5
1992	4	2	6
1993	5	2	7
	82	26	108

INCIDENTS NORMALIZED BY LOADINGS

LOADING IN MILLIONS

YEAR	TOFC	COFC	TOTAL	NUMBER OF INCIDENCES	INCIDENTS PER MILLION LOADS
1983	2.9	1.2	4.1	16	3.9
1984	3.0	1.6	4.6	20	4.4
1985	2.9	1.7	4.6	7	1.5
1986	3.0	2.0	5.0	14	2.8
1987	3.2	2.3	5.5	13	0.4
1988	3.5	2.3	5.8	10	1.7
1989	3.5	2.5	6.0	4	0.7
1990	3.5	2.8	6.3	6	1.0
1991	3.2	3.0	6.2	5	0.8
1992	3.4	3.4	6.8	6	0.9
1993	3.5	3.7	7.2	7	0.9

TTX EQUIPMENT

INTIAL	TOFC	COFC	TOTAL
DTTX		4	4
KTTX	3		3
LTTX	2		2
RTTX	7		7
VTTX		1	1
TTAX	3	2	5
TTFX	1		1
TTOX	1		1
TTUX	1		1
TTWX	12	5	17
TTX	25		25
WTTX	3		3
	58	12	70

TTX EQUIPMENT INCIDENT ANALYSIS

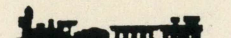
CAUSAL FACTOR	TOFC	COFC	TOTAL
IMPROPERLY LOADED RAILCAR	26	3	29
IMPROPERLY LOADED TRAILER/CONTAINER	17	2	19
TRAILER/CONTAINER SECUREMENT MALFUNCTION	3	4	7
LOST/SHIFTED LOAD	4	2	6
CONTAINER-CHASSIS INTERFACE	5	0	5
FREIGHT CAR/TRAILER/CONTAINER FAILURE	3	1	4
			70

APPENDIX C

LOADING SITE SURVEY DATA SHEET

AND QUESTIONNAIRE

TOFC - COFC SECUREMENT SURVEY REPORT _____/_____



DATE: _____ TIME: _____

REGION: _____

NAME OF INSPECTOR (s):

FRA: _____

FRA: _____

AAR: _____

BRC: _____

NTSB: _____

TTX: _____

FULL CORPORATE NAME OF RAILROAD _____

_____

CITY: _____

COUNTY: _____

STATE: _____

EXACT NAME OF TRAIN YARD:

_____

WHAT TRAINING IS AVAILABLE FOR LOADING CREW MEMBERS:
FORMAL ☐ # OF DAYS_____ O.J.T._____

ARE WRITTEN TRAINING PROGRAMS AVAILABLE
FOR FORMAL ☐ O.J.T. ☐

WHAT IS THE PEAK LOADING RATE:

PER 8 HOURS TOFC COFC

TOTAL ANNUAL LOADING RATE TOFC COFC

SIZE OF WORKFORCE TO HANDLE
LOADINGS:
TOFC COFC

ABILITY TO IDENTIFY HITCH DESIGNS:

HOW ARE UNUSUAL LOADS HANDLED:

EXPLAIN:

WHO DOES THE WORK:::: BE SPECIFIC

OTHER:

CARMEN: PRIVATE CONTRACT:

ARE WRITTEN LOADING & SECUREMENT PROCEDURES AVAILABLE:

DOES THE LOADING CREWS HAVE IN THEIR POSSESSION THE
PROCEDURES: YES ☐ NO ☐

IS THERE A BACK-UP INSPECTION: YES NO

IF YES, NAME & TITLE:_____

DOES A SUPERVISOR SPOT-CHECK: YES NO

WHAT DO LOADING CREWMEMBERS LOOK FOR RELATIVE TO KINGPIN LOCK-UP:

IS THE KING PIN RECEIVER PLATE & THE HITCH HEAD IN CONSTANT CONTACT OR IS THERE A GAP.

EXPLAIN:

ARE TOFC & COFC EQUIPMENT SECUREMENT INSPECTED/EXAMINED BY RR MECHANICAL PERSONEL, YES NO

BY PRIVATE CONTRACTOR, YES NO (CIRCLE ONE)

BY RAILROAD CREW MEMBERS, YES NO

FREQUENCY OF SHIFTED LOADS PER MONTH FOUND BY LOADING CREW MEMBERS:

COMMENTS:

ARE DATES FOR NEXT SERVICE PERIOD CLEARLY STENCILED:

NOTES:

FREQUENCY OF SHIFTED LOADS FOUND BY INSPECTORS:

IS LOCKING INDICATOR CLEARLY VISIBLE TO OPERATOR (LOADER)

EXPLAIN:

WHAT DO INSPECTORS SPECIFICALLY LOOK FOR:

EXPLAIN:

PROCEDURES, IF LOADING PROBLEM:

EXPLAIN:

KNOWN DESIGN PROBLEMS WITH TOFC / COFC EQUIPMENT:

WHAT IS THE CONDITION OF THE HITCH HEAD LOCKING INDICATOR:

DIRTY BROKEN BENT OTHER

IS THEIR A SPECIFIC AUDIBLE SOUND HEARD WHEN TRAILER IS PROPERLY LOCKED INTO HITCH HEAD:

EXPLAIN:

CAR No.	HITCH POSITION	TYPE OF HITCH*	OTHER	TRAILER KING PIN LOCKING SYSTEM		VISIBILITY OF LOCK INDICATORS		HITCH LUBE DATE	TIRE GUIDE RAIL HGT.		TRUCK SPRING HEIGHT MINIMUM	MECH. INSP. DATE
				SEMI AUTO	SCREW	CLEAR	POOR		INSIDE	OUTSIDE		

*WRITE IN TYPE OF HITCH

U.S. Department of Transportation
Federal Railroad Administration

COFC SECUREMENT SURVEY

LOCATION:_____ REPORT_____/_____ Pg.4B

DATE:_____ COFC FORM

CAR No.	END	SIDE	CONTAINER LOCK LOCATION CONDITION OF LATCH OR TWIST LOCK (SEE CODES BELOW)										
	CIRCLE		1	2	3	4	5	6	7	8	9	10	(*) TYPE & COMMENTS
	A	L											
	B	R											
	A	L											
	B	R											
	A	L											
	B	R											
	A	L											
	B	R											
	A	L											
	B	R											
	A	L											
	B	R											

*PORTEC, HOLLAND, McCLEAN-FOGG

NOTE: <0> OK-OPERATIONAL
<1> MISSING OR BROKEN LATCH
<2> INOPERATIVE MECHANISM
<3> OTHER

REPORT_____/_____

DATE:_____TIME:_____

EMPLOYEE AFFILIATION:_____

TITLE:_____

LOCATION:_____

Interview randomly, **EMPLOYEES RESPONSIBLE FOR LOADING & UNLOADING TRAILERS,** request the following information:

> **Type of Training Received? On The Job (OTJ) - Classroom - etc.**

ANSWER:

> **Length of Training Period?**

ANSWER:

> **Training Materials Received? (Manuals - Video's - etc)**

ANSWER:

> **Ask Employees To Explain Specific Duties In Detail.**

ANSWER:

> **Ask Employee To Explain The Operation of The Locking Indicators of The Various Hitches Encountered in His Duties.**

ANSWER:

> **Is A Follow-Up Inspection Conducted To Insure That The Stantion And Hitches And Trailer King Pins Are Properly Secured? If So, WHO PERFORMS THE INSPECTION?**

ANSWER:

If car inspectors are employed, do they perform Pre-Departure Inspections (In Accordance With 49 CFR Part 215.13) and required Air Brake Tests. Interview car inspectors to determine:

> **Is The Inspection of The Hitches Part of Their Inspection.**

ANSWER:

> **Has The Carrier Provided Instruction Procedures To Inspect Hitches.**

ANSWER:

> **If So, What Training Have They Received? Length of Training?**

ANSWER:

> **Manuals and Other Reference Materials Received?**

ANSWER:

At locations where train crewmembers are responsible for Pre-Departure inspections in accordance with FRA's requirements as described in 49 CFR Part 215 "Appendix D" interview random train crews to determine the following:

> **Inspection Procedures, describing What They Examine During The Inspection?**

ANSWER:

> **Are Trailer Hitches And Indicators Inspected?**

ANSWER:

> **Does The Carrier Require Them To Inspect The Hitches?**
> **(WRITTEN INSTRUCTIONS)**

ANSWER:

> **What Equipment Is Used?**

Daytime:

NightTime:

(FLASHLITE, WRENCH, etc.)

> **LUBRICATION?**

Mechanical Inspection

Requirements & Stenciling

> Ask to explain the use and purpose of using two loaders.
NOTES:

> Ask to see the MASTER WORK SHEETS.
NOTES:

QUALIFICATIONS:

Ask the employee to explain in his/her own words what they think or feel it means to be qualified.

What did the employee do to become qualified.

APPENDIX D

SUMMARY OF RESPONSES

TO TRAINING QUESTIONS

POSITION	CLASSROOM INSTRUCTION DURATION	ON-THE-JOB TRAINING DURATION	MATERIALS BOOKS/MANUALS	MATERIALS VIDEOS	MATERIALS OTHER	OTHER
REPORT 2-1 RAILROAD: UNION PACIFIC LOCATION: MESQUITE, TX TRAINYARD: MESQUITE INTERMODAL FACILITY						
CRANE OPERATOR/ LOADER	YES MINIMAL	YES NOT SPECIFIED	X	X		
CRANE OPERATOR/ LOADER	NONE	YES 10 - 12 YRS EXP	X	X		
CRANE OPERATOR/ LOADER	NONE	YES 8 YRS EXP	X	X		
CARMAN	NONE	YES NOT SPECIFIED	X	X		
REPORT 2-2 RAILROAD: SOUTHERN PACIFIC LOCATION: DALLAS, TX TRAINYARD: MILLER YARD						
CRANE OPERATOR/ LOADER	NONE	YES 1 YEAR	X	X		WRITTEN TEST THREE YEARS AGO
CAR FOREMAN	YES NOT SPECIFIED	YES 3 YR APPRENTICESHIP	X			
CARMAN	YES VARIOUS CLASSES	YES 3 YR APPRENTICESHIP	X			
REPORT 2-3 RAILROAD: ATSF LOCATION: HASLET, TX TRAINYARD: ALLIANCE INTERMODAL TERMINAL						
CRANE OPERATOR	NONE	YES 6 MONTHS	X	X		
CRANE OPERATOR	YES NOT SPECIFIED	YES 4-5 MONTHS		X		REGULAR MEETINGS HELD WITH TRAINING VIDEOS
FIELD MAINTENANCE SPECIALIST	NONE	YES 4 YR APPRENTICESHIP	X	X		
CARMAN	YES NOT SPECIFIED	YES NOT SPECIFIED	X			

POSITION	CLASSROOM INSTRUCTION DURATION	ON-THE-JOB TRAINING DURATION	MATERIALS BOOKS/MANUALS	MATERIALS VIDEOS	MATERIALS OTHER	OTHER
REPORT 2-4 RAILROAD: SOUTHERN PACIFIC LOCATION: HOUSTON, TX TRAINYARD: SOUTHERN PACIFIC INTERMODAL FACILITY						
CRANE OPERATOR/ LOADER	NONE	YES NOT SPECIFIED				
CRANE OPERATOR/ LOADER	YES NOT SPECIFIED	YES 6 YRS EXP				
CRANE OPERATOR	YES NOT SPECIFIED	YES 6 MO - 1 YR	X	X		HAD MEETING, AND ORAL TEST AT MEETING
CRANE OPERATOR	NONE	YES 30 YRS EXP				
CARMAN	YES 8 HOUR CLASS	YES APPRENTICESHIP	X	X		
CARMAN	YES 15 MINUTES	YES NOT SPECIFIED	X			
REPORT 2-5 RAILROAD: ATSF LOCATION: HOUSTON, TX TRAINYARD: PEARLAND YARD						
CRANE OPERATOR	YES NOT SPECIFIED	YES 4-6 MONTHS	X	X		TOOK WRITTEN AND OPERATIONAL TESTS WITH CRANE
CRANE OPERATOR	YES NOT SPECIFIED	YES 1 YEAR	X	X		TOOK WRITTEN AND OPERATIONAL TESTS WITH CRANE
CARMAN	NONE	YES NOT SPECIFIED	X	X		
REPORT 2-6 RAILROAD: UNION PACIFIC LOCATION: HOUSTON, TX TRAINYARD: SETTEGAST YARD						
CRANE OPERATOR	YES 1 WEEK	YES 1 WEEK	X	X		TOOK WRITTEN TEST
CRANE OPERATOR	YES 1 DAY	YES 2 WEEKS	X	X		
CARMAN	YES NOT SPECIFIED	YES APPRENTICESHIP	X	X		
CARMAN	NONE	YES APPRENTICESHIP				

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 2-7 RAILROAD: BURLINGTON NORTHERN LOCATION: KANSAS CITY, MO TRAINYARD: KANSAS CITY HUB CENTER						
LOADER OPERATOR	NONE	YES 30 DAYS	X			
LOADER OPERATOR	NONE	YES 30 DAYS	X			
LOADER OPERATOR	NONE	YES 30 DAYS	X			
FIELD MAINTENANCE SPECIALIST	NONE	YES 5 YEARS	X			
FIELD MAINTENANCE SPECIALIST	NONE	YES 10 YEARS	X			
CARMAN	YES MINIMAL	YES APPRENTICESHIP	X			
CARMAN	YES NOT SPECIFIED	YES APPRENTICESHIP	X			
GROUNDMAN/HOSTLER	NONE	YES 20 DAYS	X			TOOK OPERATIONAL TEST
GROUNDMAN/HOSTLER	NONE	YES 20 DAYS				
REPORT 2-8 RAILROAD: KANSAS CITY SOUTHERN LOCATION: KANSAS CITY, MO TRAINYARD: CHOUTEAU YARD						
CARMAN	NONE	YES 1 DAY				
CARMAN	YES 10-20 MINUTES	YES APPRENTICESHIP				

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 2-9 RAILROAD: UNION PACIFIC LOCATION: KANSAS CITY, MO TRAINYARD: UNION PACIFIC MOTOR FREIGHT						
LOADER OPERATOR/ GROUNDMAN	YES 2 HOURS	YES NOT SPECIFIED	X			
LOADER OPERATOR/ GROUNDMAN	NONE	YES 1-2 WEEKS	X			
CAR FOREMAN		YES NOT SPECIFIED	X			
CAR INSPECTOR	NONE	YES 3 YRS APPRENTICESHIP				
CAR INSPECTOR	NONE	YES NOT SPECIFIED	X			
CAR INSPECTOR	NONE	YES APPRENTICESHIP	X			
REPORT 2-10 RAILROAD: ATSF LOCATION: KANSAS CITY, KA TRAINYARD: ARGENTINE YARD						
CRANE OPERATOR/ LOADER	NONE	YES 3 MONTHS	X	X		
CRANE OPERATOR	NONE	YES 1 MONTH	X			
CAR INSPECTOR	YES 1 WEEK	YES NOT SPECIFIED	X			
CAR INSPECTOR	NONE	NONE				DOES NOT LOOK AT HITCHES
CAR INSPECTOR	NONE	NONE				DOES NOT LOOK AT HITCHES
CARMAN	YES 1 WEEK					

POSITION	CLASSROOM INSTRUCTION DURATION	ON-THE-JOB TRAINING DURATION	MATERIALS BOOKS/MANUALS	MATERIALS VIDEOS	MATERIALS OTHER	OTHER
REPORT 2-11 RAILROAD: SOUTHERN PACIFIC LOCATION: KANSAS CITY, KA TRAINYARD: SSW INTERMODAL RAMP						
CRANE OPERATOR	NONE	YES 5 YRS EXP	X			
CRANE OPERATOR	NONE	YES 6 MONTHS				
MECHANIC	YES 3-4 HOURS ANNUALLY		X	X		
TRAINING SPECIALIST	YES 2 DAYS		X	X		
CAR INSPECTOR	YES 2 1/2 HOURS	YES NOT SPECIFIED		X		TTX CAR WITH HITCHES AND INSTRUCTOR
CAR INSPECTOR	YES 2 1/2 HOURS		X	X		TTX CAR WITH HITCHES AND INSTRUCTOR
CAR INSPECTOR	YES 2 1/2 HOURS	YES NOT SPECIFIED	X			TTX CAR WITH HITCHES AND INSTRUCTOR
REPORT 2-12 RAILROAD: NORTHERN SOUTHERN LOCATION: KANSAS CITY, MO TRAINYARD: NORTHERN SOUTHERN TOFC RAMP						
HITCH MAN ON CIRCUS RAMP	NONE	YES 6 YRS EXP	X			
CAR INSPECTOR	NONE	YES 4 YRS EXP			VERBAL INSTRUCTIONS	
CAR INSPECTOR	NONE	YES 18 YRS EXP	X	X	VERBAL INSTRUCTIONS	
CAR INSPECTOR	NONE	YES 17 YRS EXP	X	X		
REPORT 2-13 RAILROAD: BURLINGTON NORTHERN LOCATION: OMAHA, NB TRAINYARD: NEBRASKA HUB CENTER						
OPERATOR/ GROUNDMAN	NONE	YES 6 MONTHS	X			
OPERATOR/ GROUNDMAN	NONE	YES 6 MONTHS	X			

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 2-14 RAILROAD: UNION PACIFIC LOCATION: OMAHA, NB TRAINYARD: UNION PACIFIC TOFC RAMP						
DRIVER/OPERATOR	NONE	YES 1 HOUR	X			
FOREMAN		YES 7 YRS EXP	X	X		
CARMAN	NONE	YES ONGOING				
GROUNDMAN	NONE	YES 5 WEEKS	X			
REPORT 2-16 RAILROAD: SOUTHERN PACIFIC LOCATION: LONG BEACH, CA TRAINYARD: INTERNATIONAL CONTAINER TRANSFER FACILITY						
CAR FOREMAN		YES 732 DAYS	X	X		
CAR FOREMAN	NONE	YES APPRENTICESHIP	X	X		
CRANE OPERATOR/ GROUNDMAN	YES NOT SPECIFIED	YES 6 MONTHS		X		
OPERATOR/DRIVER	YES NOT SPECIFIED	YES 6 MONTHS				
OPERATOR/DRIVER GROUNDMAN	NONE	YES 29 YRS EXP	X			
CARMAN	YES 30 DAYS	YES 10 YRS EXP	X			
CARMAN	YES VARIOUS CLASSES	YES NOT SPECIFIED	X			

POSITION	CLASSROOM INSTRUCTION DURATION	ON-THE-JOB TRAINING DURATION	MATERIALS			OTHER
			BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 2-17 RAILROAD: SOUTHERN PACIFIC LOCATION: LOS ANGELES, CA TRAINYARD: LOS ANGELES TRAFFIC CENTER						
CRANE OPERATOR/ GROUNDMAN	NONE	YES IN PROCESS	X			
CRANE OPERATOR/ GROUNDMAN	YES LITTLE	YES 4-6 WEEKS	X	X	MEETINGS	
CRANE OPERATOR/ GROUNDMAN	YES 3 WEEKS	YES 2 MONTHS		X	MEETINGS WHEN NEEDED	
CARMAN	NONE	YES 1 WEEK	X			SEERVED APPRENTICESHIP IN LATE 50'S
CARMAN	YES 2 HOURS		X			TTX TRAINING CAR
REPORT 2-18 RAILROAD: UNION PACIFIC LOCATION: LOS ANGELES, CA TRAINYARD: EAST YARD, LOS ANGELES						
CRANE OPERATOR	YES 1 1/2 DAYS	YES 2 MONTHS	X	X		
CARMAN	NONE	NONE				
LOADER	YES 1 HOUR	YES 10 DAYS	X			
LOADER/GROUNDMAN	YES 2-4 HOURS	YES 6 WEEKS				
CAR INSPECTOR	NONE YES	YES 23 YRS EXP				
CAR INSPECTOR	5-6 HOURS	YES 4 WEEKS	X	X		

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 2-19 RAILROAD: ATSF LOCATION: LOS ANGELES, CA TRAINYARD: HOBART						
CRANE OPERATOR	NONE	YES 2-4 WEEKS	X	X		
CRANE OPERATOR/ GROUNDMAN/HOSTLER	YES NOT SPECIFIED	YES 1-3 WEEKS	X			
CARMAN	YES 1-2 HOURS	YES 35 YRS EXP	X	X		
CARMAN	NONE	YES 21 YRS EXP	X			
REPORT 2-20 RAILROAD: BURLINGTON NORTHERN AND UNION PACIFIC LOCATION: TACOMA, WA TRAINYARD: TACOMA NORTH TERMINAL						
OPERATOR	NONE	YES 1 WEEK				
GROUNDMAN	NONE	YES 6 MONTHS				
REPORT 2-21 RAILROAD: BURLINGTON NORTHERN AND UNION PACIFIC LOCATION: TACOMA, WA TRAINYARD: PORT OF TACOMA SOUTH INTERMODAL YARD						
CARMAN		YES 11 YRS EXP	X			
OPERATOR/GROUNDMAN	YES 1 WEEK	YES 1 WEEK	X	X		
REPORT 2-22 RAILROAD: BURLINGTON NORTHERN LOCATION: SEATTLE, WA TRAINYARD: PUGET SOUND HUB CENTER						
CRANE OPERATOR/ GROUNDMAN		YES 29 YRS EXP				
CRANE OPERATOR/ GROUNDMAN	NONE	YES 2 WEEKS				
CARMAN	NONE	YES 3 YEARS	X			
MAINTENANCE SPECIALIST	NONE	YES NOT SPECIFIED	X			

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 2-23 RAILROAD: BURLINGTON NORTHERN LOCATION: SEATTLE, WA TRAINYARD: STACY STREET YARD						
CRANE OPERATOR/ GROUNDMAN	NONE	YES 9 YRS EXP	X			
CRANE OPERATOR/GROU CARMAN	NONE	YES NOT SPECIFIED	X			
CARMAN		YES APPRENTICESHIP				
		YES NOT SPECIFIED				
REPORT 2-24 RAILROAD: UNION PACIFIC LOCATION: SEATTLE, WA TRAINYARD: UNION PACIFIC INTERMODAL FACILITY						
PACKER/OPERATOR	NONE	YES 19 YRS EXP				
CARMAN	NONE	YES 2 WEEKS	X			
CARMAN	NONE	YES 4 YR APPRENTICESHIP	X			
GROUNDMAN	NONE	YES 1 MONTH				

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 1-1 RAILROAD: ATSF LOCATION: CHICAGO, IL TRAINYARD: CORWITH YARD						
CARMAN	YES 1 WEEK / MONTH		X	X		
CAR INSPECTOR	YES		X			
REPORT 1-2 RAILROAD: CONRAIL LOCATION: CHICAGO, IL TRAINYARD: '55TH STREET CONRAIL YARD						
LOADING CREW	YES NOT SPECIFIED	YES NOT SPECIFIED	X			6 MONTHS TOTAL TRAINING PERIOD
CARMEN						NO WRITTEN MATERIAL AT THE PRESENT TIME TTX MANUAL CURRENTLY BEING ASSEMBLED
REPORT 1-3 RAILROAD: BURLINGTON NORTHERN LOCATION: CICERO, IL TRAINYARD: CICERO TRAINYARD						
LOADING CREW	YES NOT SPECIFIED					ADVANCED COURSES AVAILABLE AT OVERLAND PARK, KANSAS
CARMEN	NONE	YES 23-25 YRS EXP				
REPORT 1-4 RAILROAD: BURLINGTON NORTHERN LOCATION: CICERO, IL TRAINYARD:						
LOADING CREW	YES 30 MINUTES		X	X		
CRANE OPERATOR	YES NOT SPECIFIED					WRITTEN, CLOSED BOOK TEST
REPORT 1-5 RAILROAD: CSX LOCATION: BEDFORD PARK, IL TRAINYARD: BEDFORD PARK YARD						
LOADING CREW		YES NOT SPECIFIED				
GROUNDMAN	YES 1 HR TWICE EA 6 MO	YES 4-40 HOURS	X			

POSITION	CLASSROOM INSTRUCTION DURATION	ON-THE-JOB TRAINING DURATION	MATERIALS			OTHER
			BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 1-6 RAILROAD: ILLINOIS CENTRAL LOCATION: HOMEWOOD, IL TRAINYARD: HOMEWOOD YARD						
LOADING CREW	NONE	YES 3-6 MONTHS	X			
CARMEN			X			TRAINING PLANNED FOR JULY 1994
REPORT 1-7 RAILROAD: UNION PACIFIC LOCATION: DOLTON, IL TRAINYARD: YARD CENTER						
LOADING CREW	YES 1-2 DAYS	YES UP TO 3 MONTHS	X			
REPORT 1-8 RAILROAD: CHICAGO AND NORTHWESTERN LOCATION: MELROSE PARK, IL TRAINYARD: GLOBAL II INTERMODAL FACILITY						
LOADING CREW	NONE	YES 3-4 DAYS	X			
CARMEN			X	X		
REPORT 1-9 RAILROAD: NORFOLK AND SOUTHERN LOCATION: CHICAGO, IL TRAINYARD: LANDERS YARD						
OPERATOR	NONE	YES 1 WEEK	X			
GROUNDMAN	NONE	YES 2 WEEKS	X			
REPORT 1-10 RAILROAD: UNION PACIFIC LOCATION: CHICAGO, IL TRAINYARD: CANAL STREET YARD						
LOADING CREW	YES 8 HOURS MINIMUM	YES UP TO 1 YEAR	X			

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 1-11 RAILROAD: CANADIAN PACIFIC LOCATION: BENSENVILLE, IL TRAINYARD: BENSENVILLE YARD						
LOADING CREW	YES 2 DAYS	YES 2 WEEKS				
MECHANICAL DEPT		YES NOT SPECIFIED	X			
REPORT 1-12 RAILROAD: CANADIAN PACIFIC LOCATION: SCHILLEN, IL TRAINYARD: SCHILLEN PARK EAST						
LOADING CREW	YES 4 HOURS	NONE	X			
REPORT 1-13 RAILROAD: BURLINGTON NORTHERN LOCATION: MEMPHIS, TN TRAINYARD: TENN YARD						
LOADING CREW	NONE	YES 7 MONTHS	X			
MECHANICAL DEPT		YES 6 MONTHS	X	X		
REPORT 1-14 RAILROAD: ILLINOIS CENTRAL LOCATION: MEMPHIS, TN TRAINYARD: JOHNSTON CAR SHOP						
LOADING CREW	YES ABOUT 40 HOURS	YES NOT SPECIFIED	X	X		CLASSROOM TRAINING SCHEDULED FOR JULY 1994
REPORT 1-15 RAILROAD: UNION PACIFIC LOCATION: MEMPHIS, TN TRAINYARD: SARGENT YARD						
CARMEN	NONE	NONE				

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 1-15 RAILROAD: UNION PACIFIC LOCATION: MEMPHIS, TN TRAINYARD:						
LOADING CREW	YES NOT SPECIFIED	YES NOT SPECIFIED	X		REGULAR MEETINGS	
REPORT 1-16 RAILROAD: NORFOLK SOUTHERN LOCATION: MEMPHIS, TN TRAINYARD: FOREST YARD						
LOADING CREW		YES 3 WEEKS	X			
CAR DEPT	YES 1 DAY COURSE			X		
REPORT 1-17 RAILROAD: SOUTHERN PACIFIC LOCATION: MEMPHIS, TN TRAINYARD: SOUTHERN PACIFIC INTERMODAL FACILITY						
LOADING CREW		YES 3WEEKS MINIMUM	X	X		
REPORT 1-18 RAILROAD: CSX LOCATION: JACKSONVILLE, FL TRAINYARD: DUVAL RAMP						
CSX OPERATORS	NONE	YES NOT SPECIFIED	X			
TTX EMPLOYEES	YES 18 MONTHS	YES				
REPORT 1-19 RAILROAD: NORFOLK SOUTHERN LOCATION: JACKSONVILLE, FL TRAINYARD: SIMPSON YARD						
LOADING CREW	NONE	YES 2 MONTHS	X	X		
NS CARMEN		YES NOT SPECIFIED	X	X		

POSITION	CLASSROOM INSTRUCTION DURATION	ON-THE-JOB TRAINING DURATION	MATERIALS BOOKS/MANUALS	MATERIALS VIDEOS	MATERIALS OTHER	OTHER
REPORT 1-19 RAILROAD: FLORIDA EAST COAST LOCATION: JACKSONVILLE, FL TRAINYARD: BOWDEN YARD						
LOADING CREW	YES 1 DAY	YES 2 WEEKS	X			
REPORT 1-20 RAILROAD: CSX LOCATION: TAFT, FL TRAINYARD: TAFT YARD						
LOADING CREW	YES 2 WEEKS	YES ONGOING	X	X		
REPORT 1-21 RAILROAD: FLORIDA EAST COAST LOCATION: WEST PALM BEACH, FL TRAINYARD: WEST PALM BEACH YARD						
LOADING CREW			X	X		ALL HAVE SEEN TTX MULTI-HITCH CAR
REPORT 1-22 RAILROAD: CSX LOCATION: TAMPA, FL TRAINYARD: TAMPA INTERMODAL RAMP						
LOADING CREW	NONE	NONE				TTX TRAINER CAR DUE IN AUG 1994
REPORT 1-23 RAILROAD: FLORIDA EAST COAST LOCATION: FT. PIERCE, FL TRAINYARD: FT. PIERCE YARD						
LOADING CREW	YES SEVERAL CLASSES		X			

POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	
REPORT 1-24 RAILROAD: FLORIDA EAST COAST LOCATION: FT. LAUDERDALE, FL TRAINYARD: FT. LAUDERDALE YARD						
LOADING CREW		YES NOT SPECIFIED	X			TRAINING UTILIZES TTX MULTI-HITCH CAR
REPORT 1-25 RAILROAD: FLORIDA EAST COAST LOCATION: MIAMI, FL TRAINYARD: MIAMI RAMP / COMMERCE PARK						
LOADING CREW		YES NOT SPECIFIED	X			
REPORT 1-26 RAILROAD: CONRAIL LOCATION: KEARNY, NJ TRAINYARD: SOUTH KEARNY YARD						
LOADING CREW		YES 6 WEEKS	X			
CARMEN			X			TTX MULTI-HITCH TRAINING CAR UTILIZED
REPORT 1-27 RAILROAD: AMERICAN PRESIDENT LOCATION: SOUTH KEARNY, NJ TRAINYARD: SOUTH KEARNY YARD						
LOADING CREW		YES 3 MONTHS				
REPORT 1-28 RAILROAD: CONRAIL LOCATION: NORTH BERGEN, NJ TRAINYARD: CONRAIL, NORTH BERGEN YARD						
OPERATOR		YES 6 MONTHS	X			
GROUNDMAN		YES 2 WEEKS	X			

POSITION	CLASSROOM INSTRUCTION DURATION	ON-THE-JOB TRAINING DURATION	MATERIALS BOOKS/MANUALS	MATERIALS VIDEOS	MATERIALS OTHER	OTHER
REPORT 1-29 RAILROAD: CONRAIL LOCATION: MORRISVILLE, PA TRAINYARD: MORRISVILLE YARD						
CARMEN		YES NOT SPECIFIED	X			
REPORT 1-30 RAILROAD: CONRAIL LOCATION: LANGHORNE, PA TRAINYARD: MORRISVILLE RAMP "C" YARD						
OPERATOR		YES 6 MONTHS	X			
GROUNDMAN		YES 2 MONTHS	X			
REPORT 1-32 RAILROAD: CP RAIL LOCATION: NEWARK, NJ TRAINYARD:						
LOADING CREW	NONE	NONE				NO TRAINING OR TRAINING MATERIALS AT THIS LOCATION
REPORT 1-33 RAILROAD: CONRAIL LOCATION: ELIZABETH, NJ TRAINYARD: EASTERN RAIL						
LOADING CREW		YES 3 WEEKS	X			
REPORT 1-34 RAILROAD: CONRAIL LOCATION: ELIZABETH, NJ TRAINYARD: EXPRESS RAIL						
LOADING CREW		YES 2 WEEKS - 1 YEAR	X			

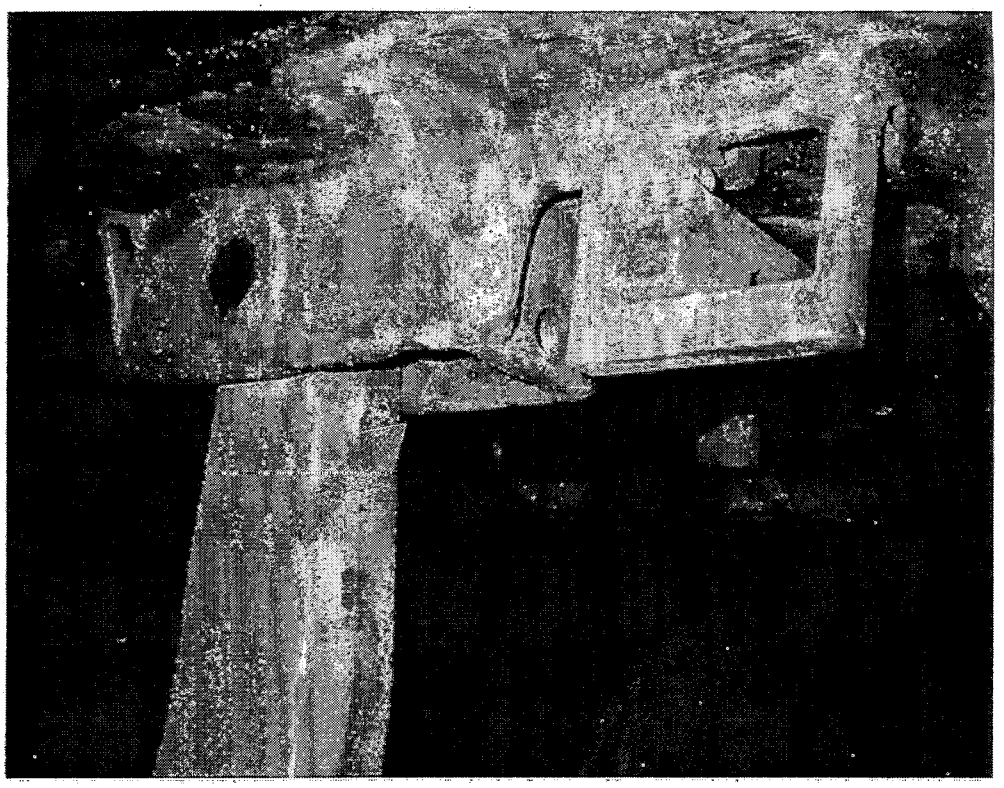
POSITION	CLASSROOM INSTRUCTION	ON-THE-JOB TRAINING	MATERIALS			OTHER
	DURATION	DURATION	BOOKS/MANUALS	VIDEOS	OTHER	

REPORT 1-35 RAILROAD: CONRAIL LOCATION: CROXTON, NJ TRAINYARD: CROXTON YARD

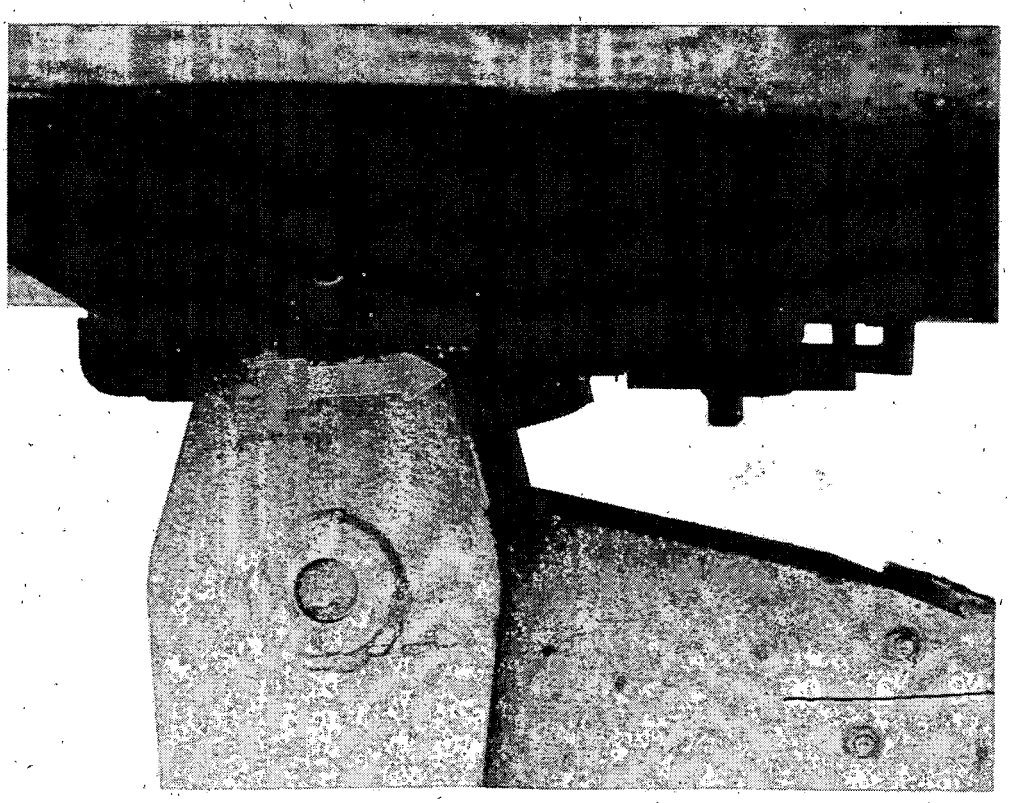
LOADING CREW		YES 1 WEEK				

APPENDIX E

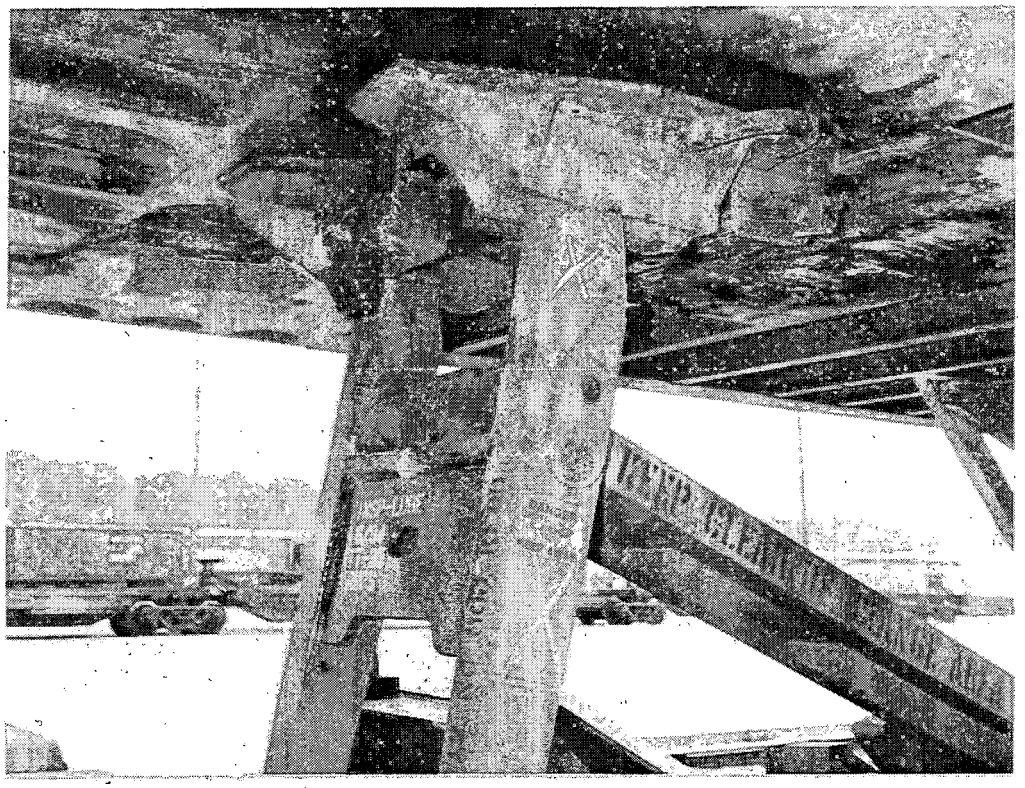
ILLUSTRATIONS OF SECUREMENT SYSTEM DEFECTS



T - 1
Hitch stabilizer assembly missing.

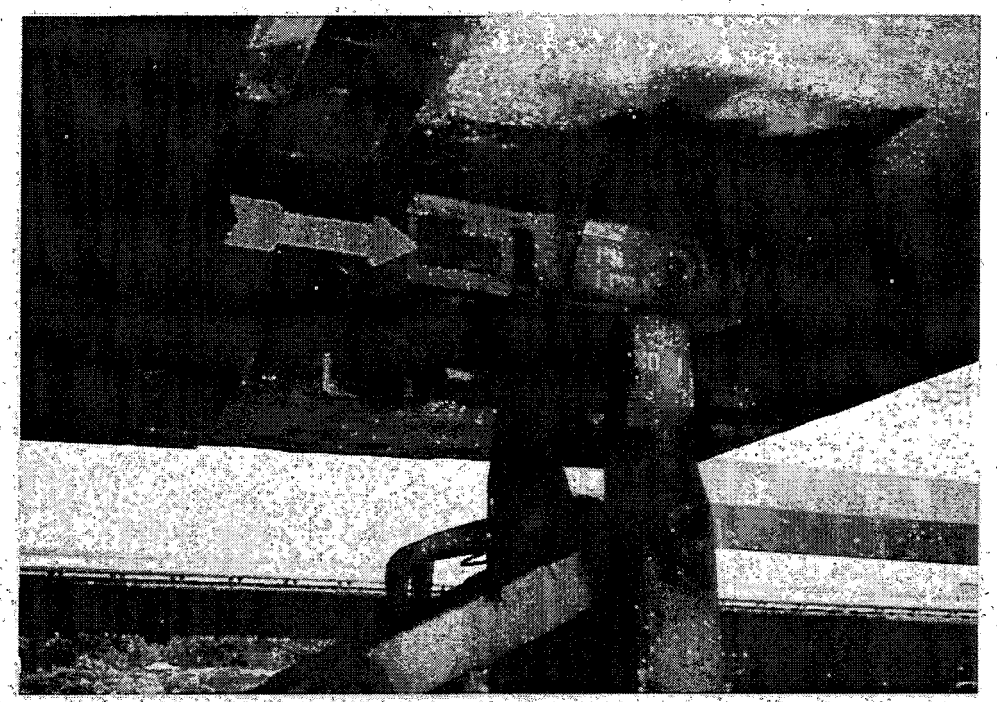


T - 2
Hitch stabilizer assembly insecure and out of position.

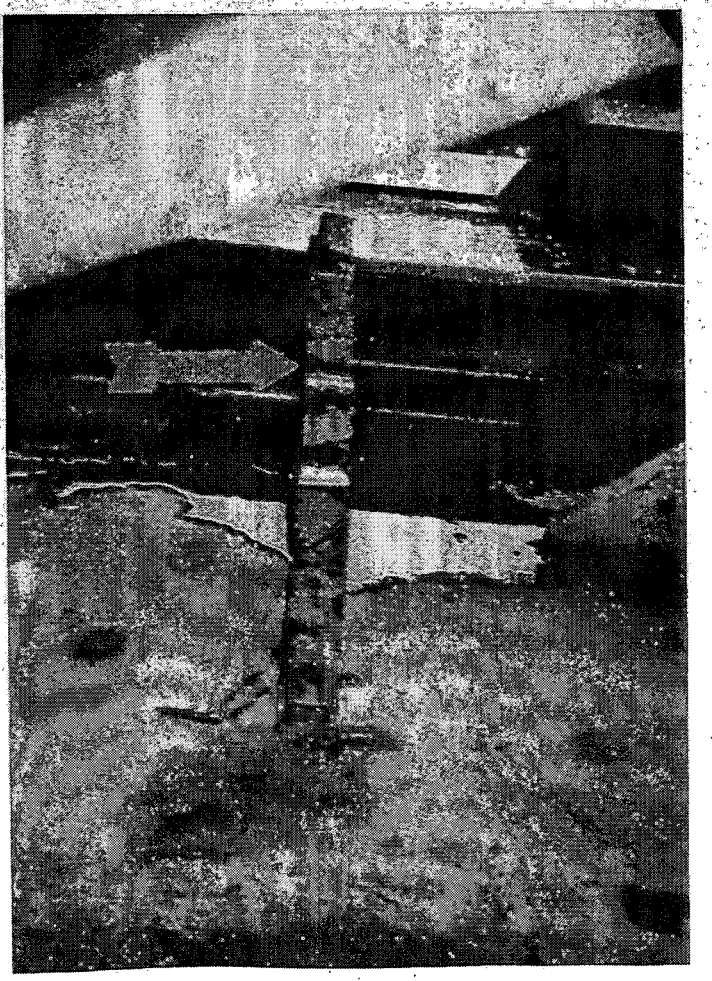


T - 3
Auxiliary lock out of position, last hitch lubrication and inspection 6-94.
Kansas City, MO. 6-20-94

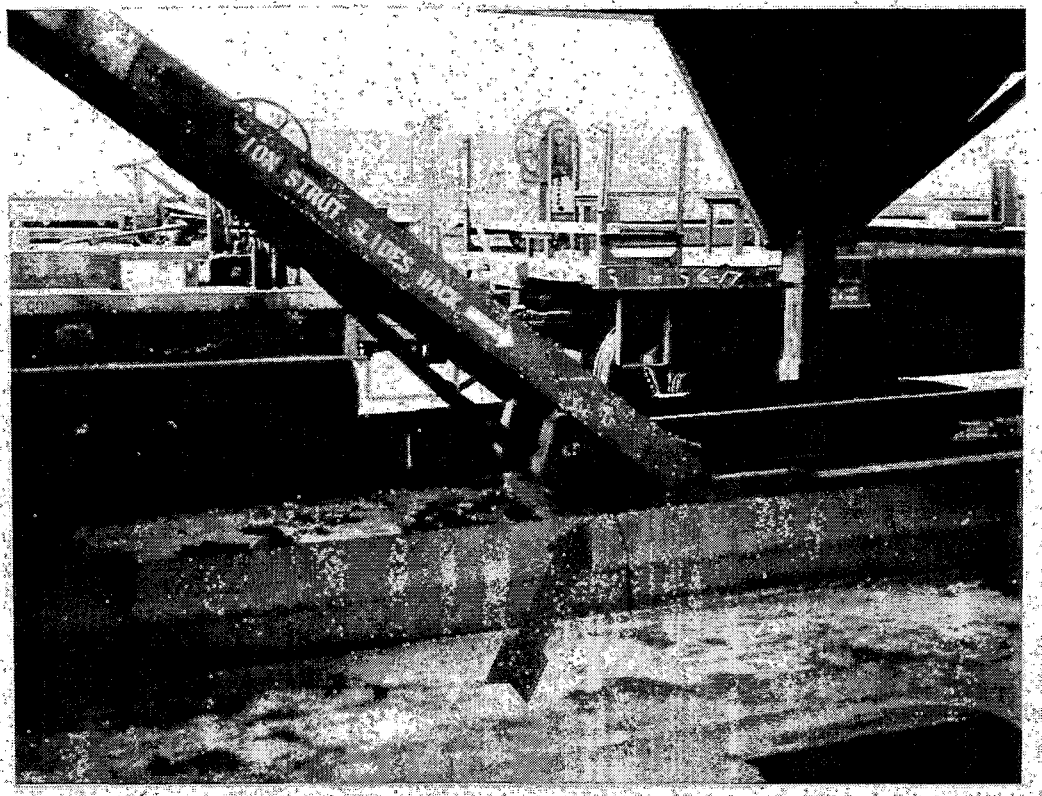
T - 4
Bent operating rod makes hitches difficult to operate.
Kansas City, MO. 6-19-94



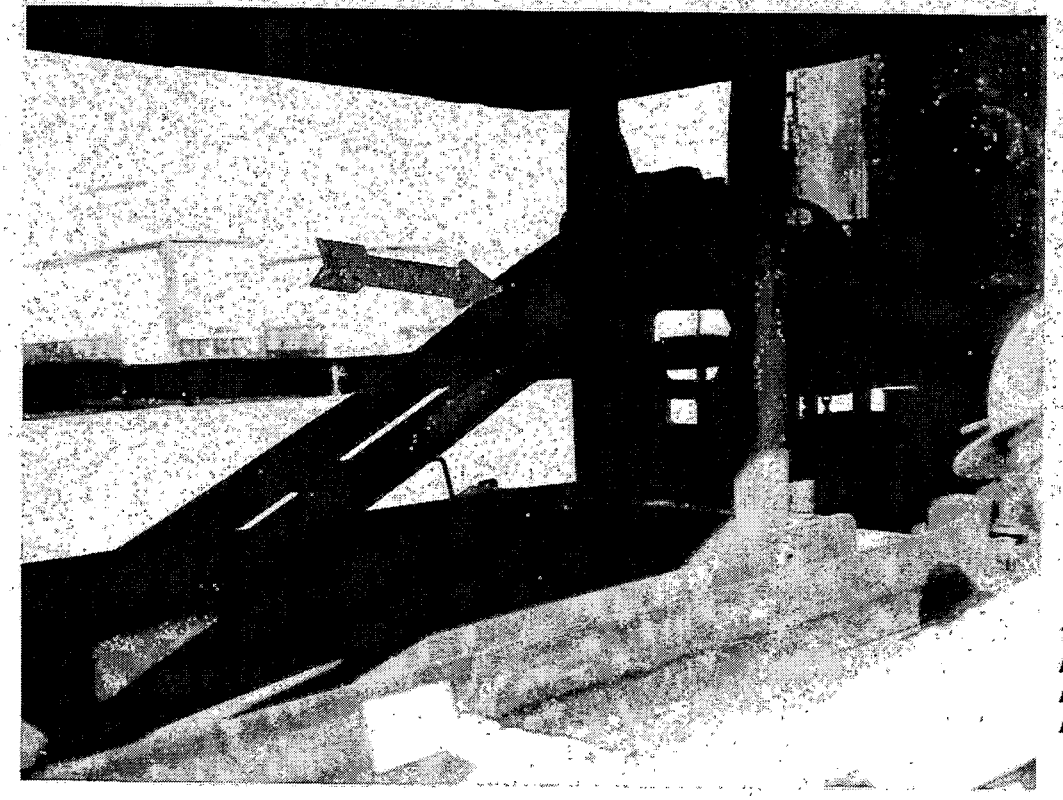
T - 5
Hitch head with operating lever missing.
Seattle, WA. 7-1-94



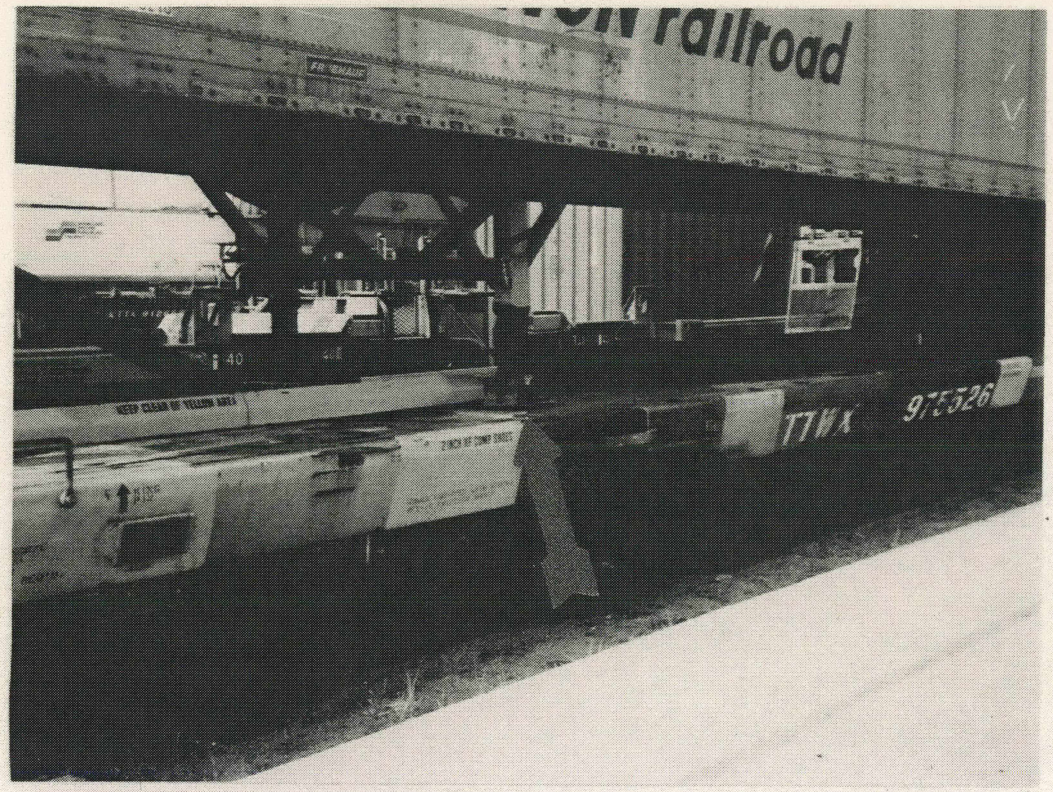
T - 6
Operating rod from above hitch head.



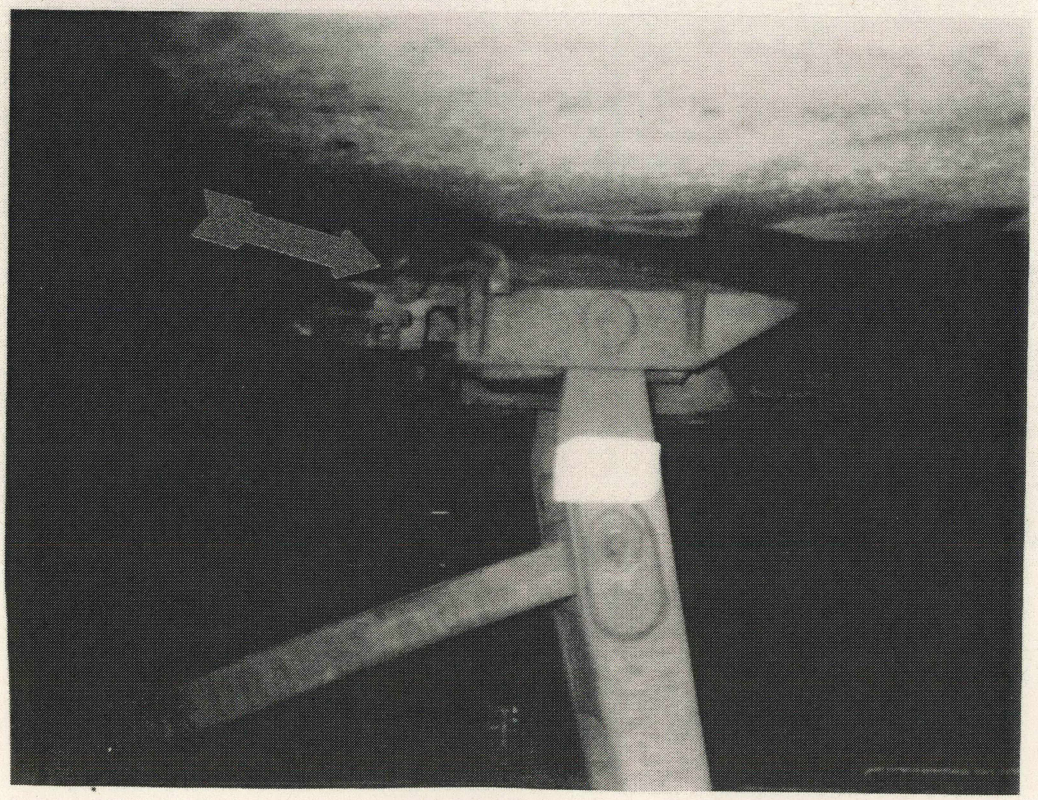
T - 7
Diagonal strut lock not fully engaged.
Kansas City, MO. 6-20-94



T - 8
Diagonal strut lock not fully engaged.
Dallas, TX. 6-13-94

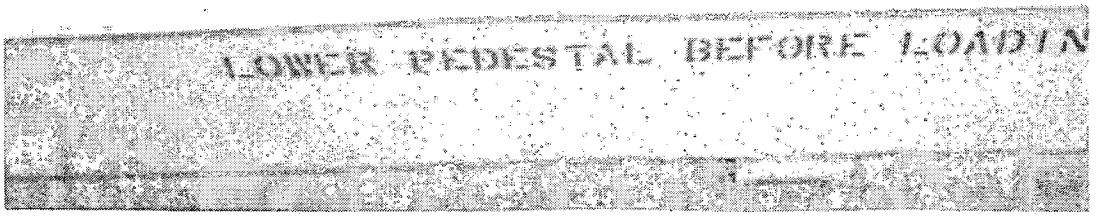


T - 9
Trailer landing gear in contact with deck.
Kansas City, MO.
6-19-94

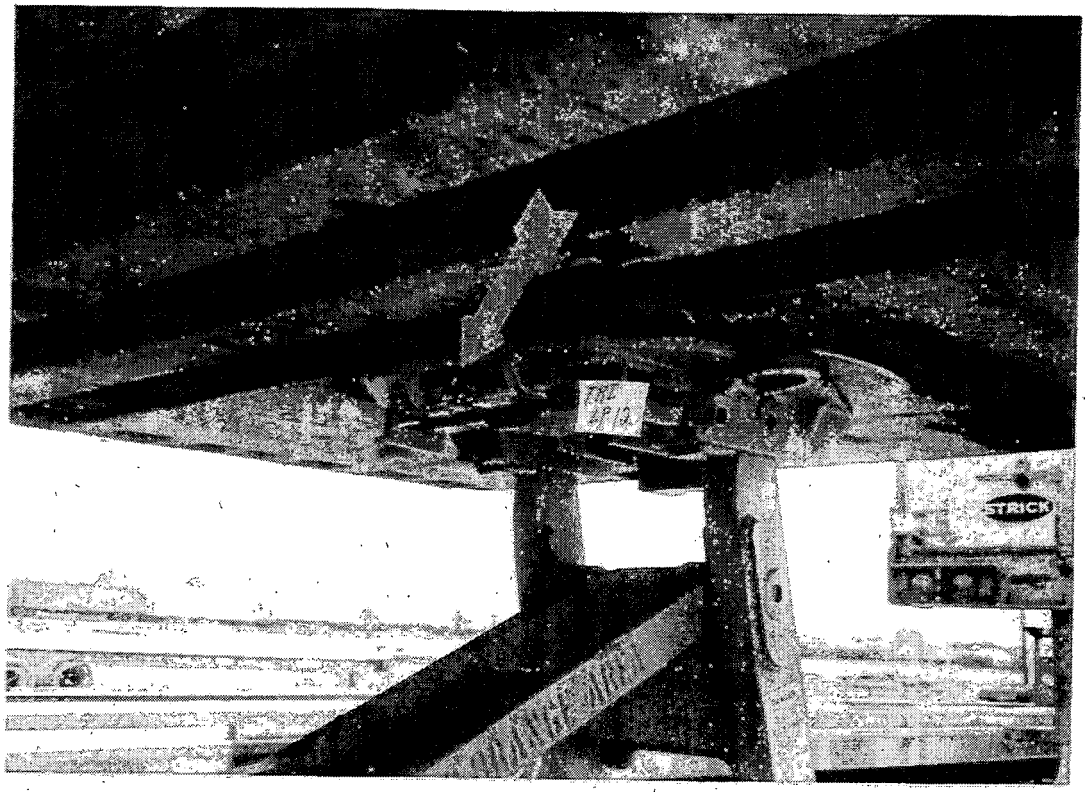


T - 10
Lifting eye broken loose at weld.
Haslet, TX. 6-14-94

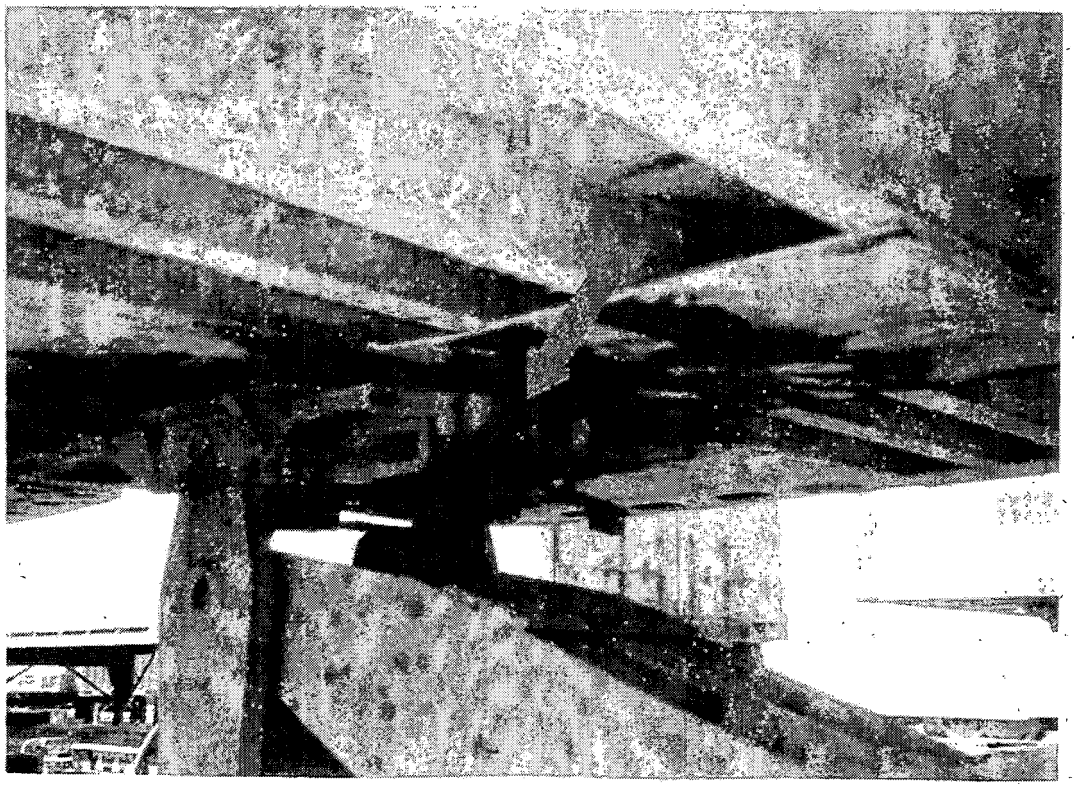
T - 11
Trailer on flat car with pedestals in raised position.
Houston, TX. 6-15-94



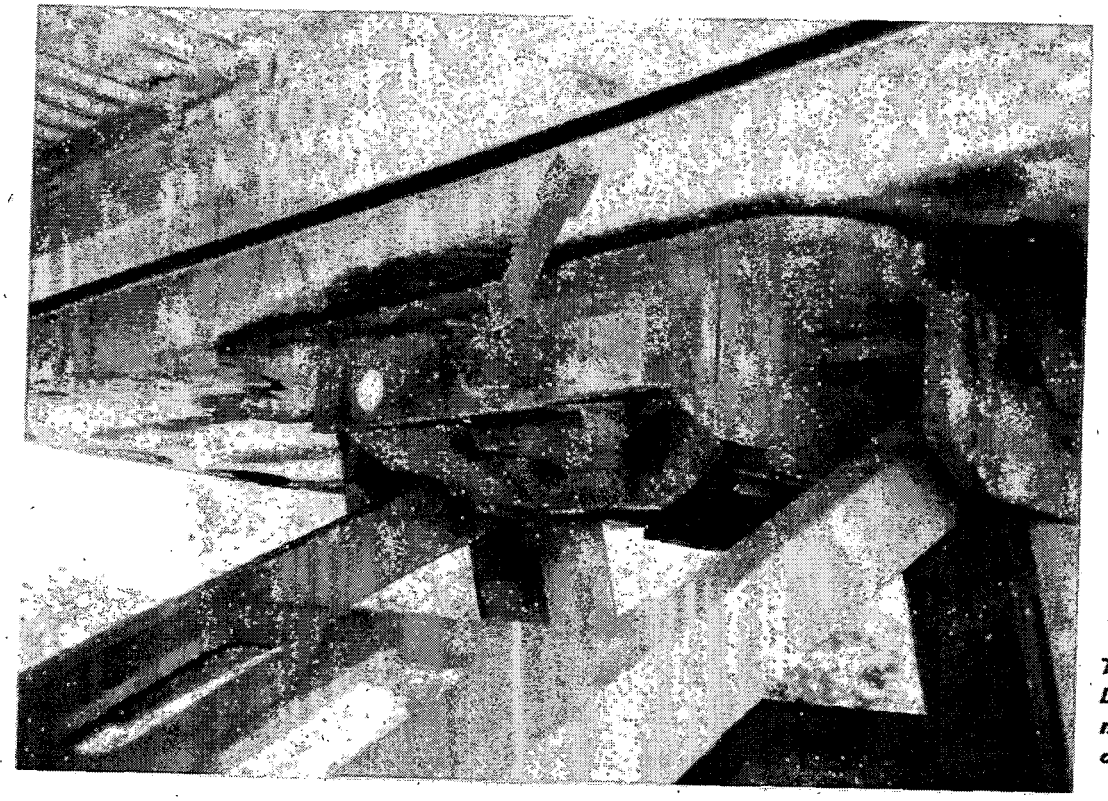
T - 12
Trailer on flat car with pedestal door open.
Kansas City, MO. 6-20-94



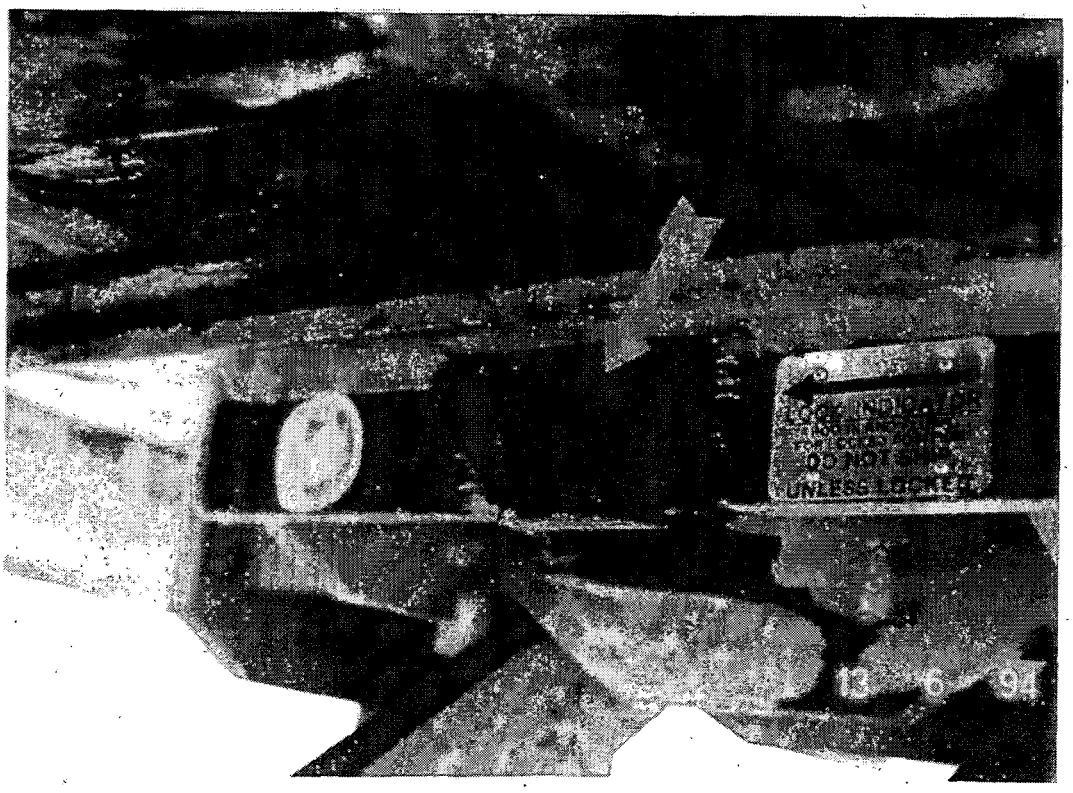
T - 13
Locking pin indicator painted contrasting color. Has good visibility.
Houston, TX. 6-16-94



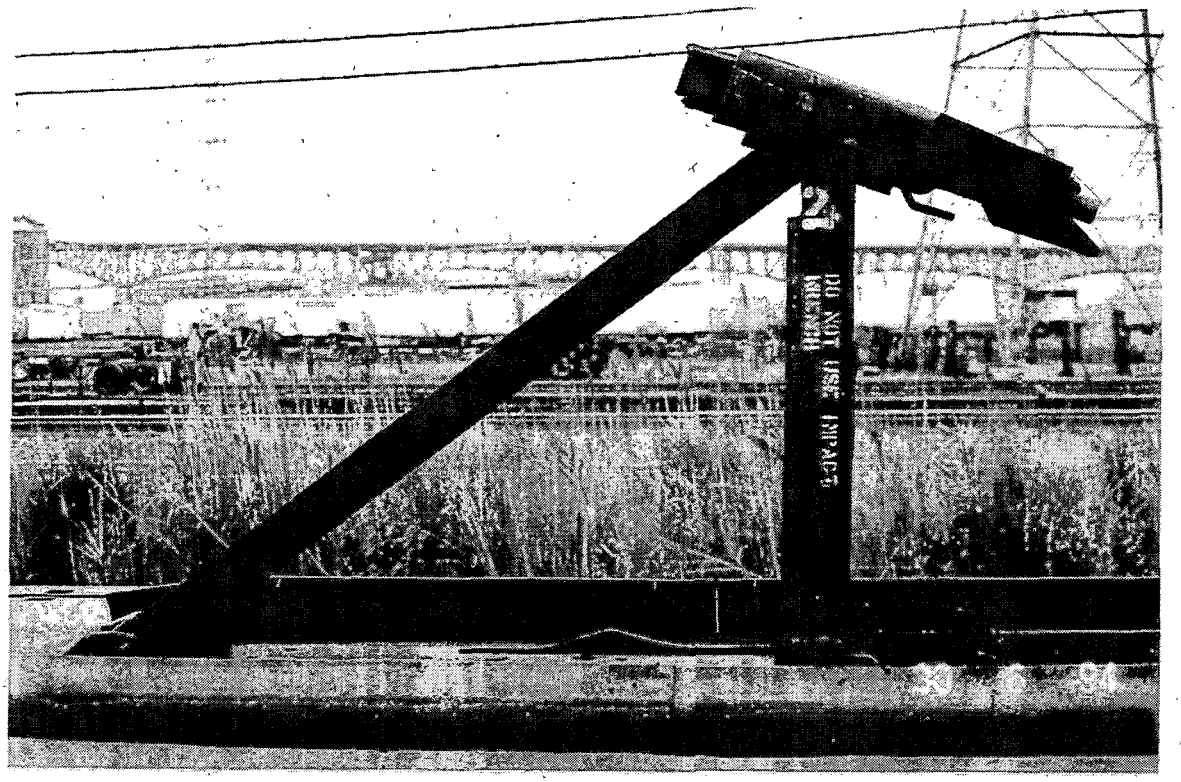
T - 14
Locking pin indicator not painted contrasting color. Has poor visibility.
Dallas, TX. 6-13-94



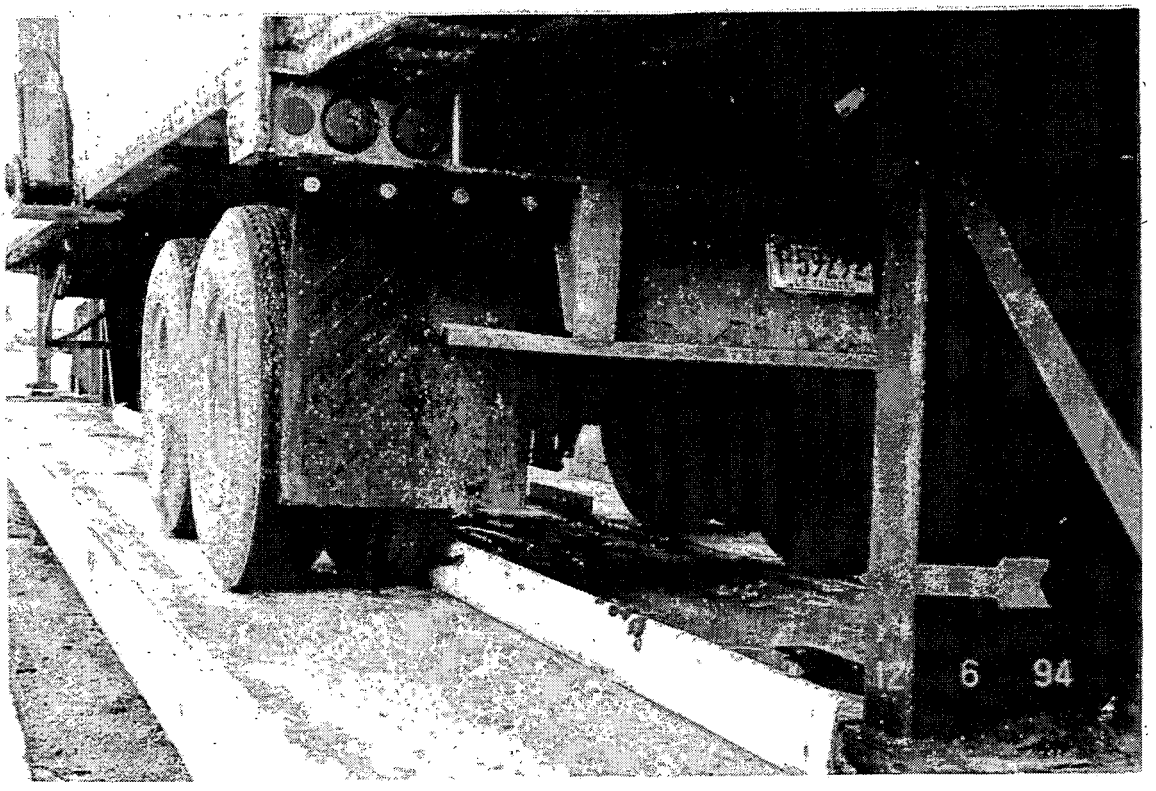
T - 15
Locking pin indicator not painted contrasting color, has poor visibility.



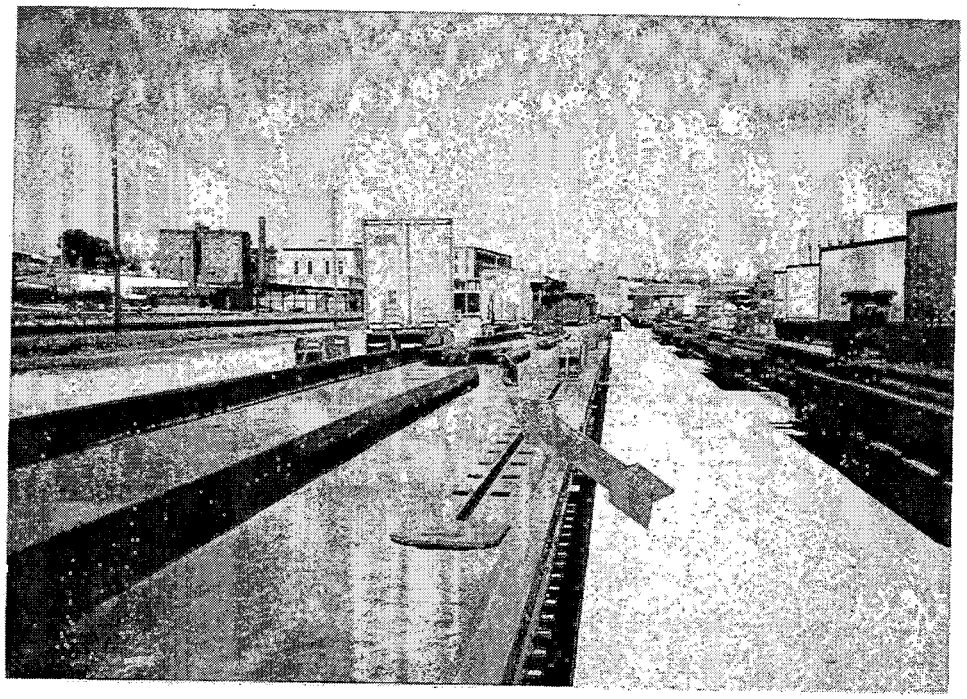
T - 16
Same as above.



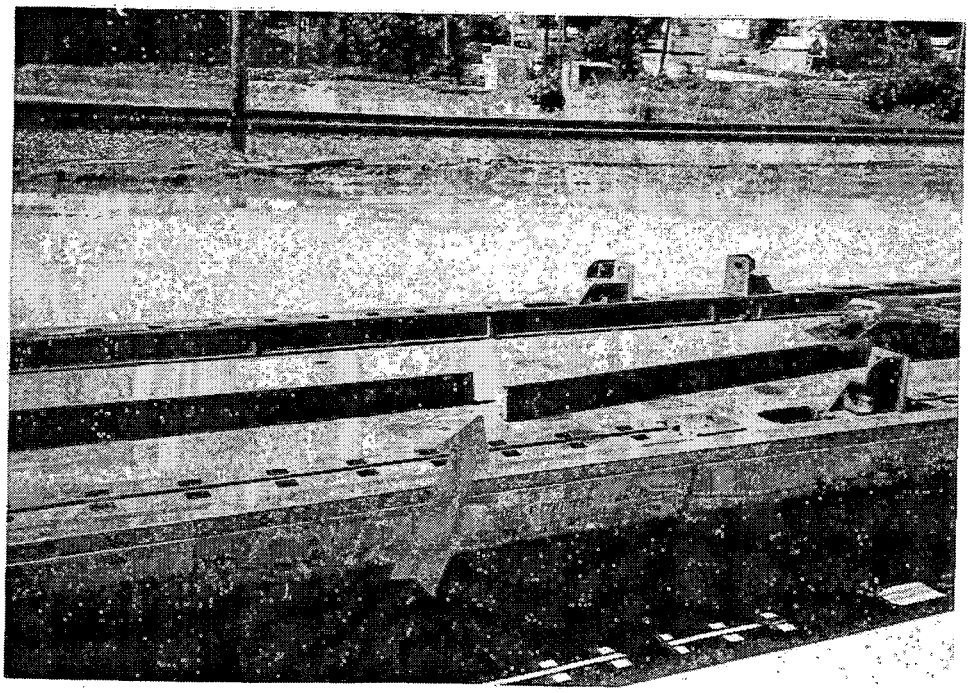
T - 17
Wrench operated retractable hitch.



T - 18
Rub Rail Missing.
Chicago, IL. 6-12-94

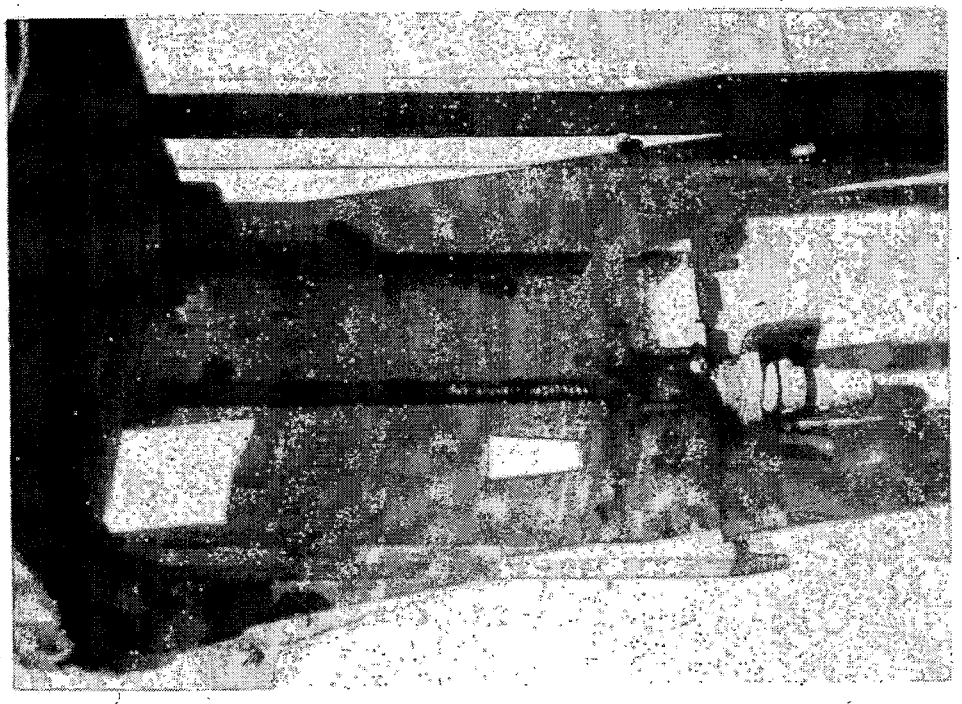


T - 19
Broken rub rail.
Omaha, NE. 6-23-94



T - 20
Same car as above.
Broken Rub Rail.

T - 21
Excessive old lubricant. Screw type hitch lubricated and inspected 6-94. No lubricant on sliding surface. Omaha, NE. 6-23-94

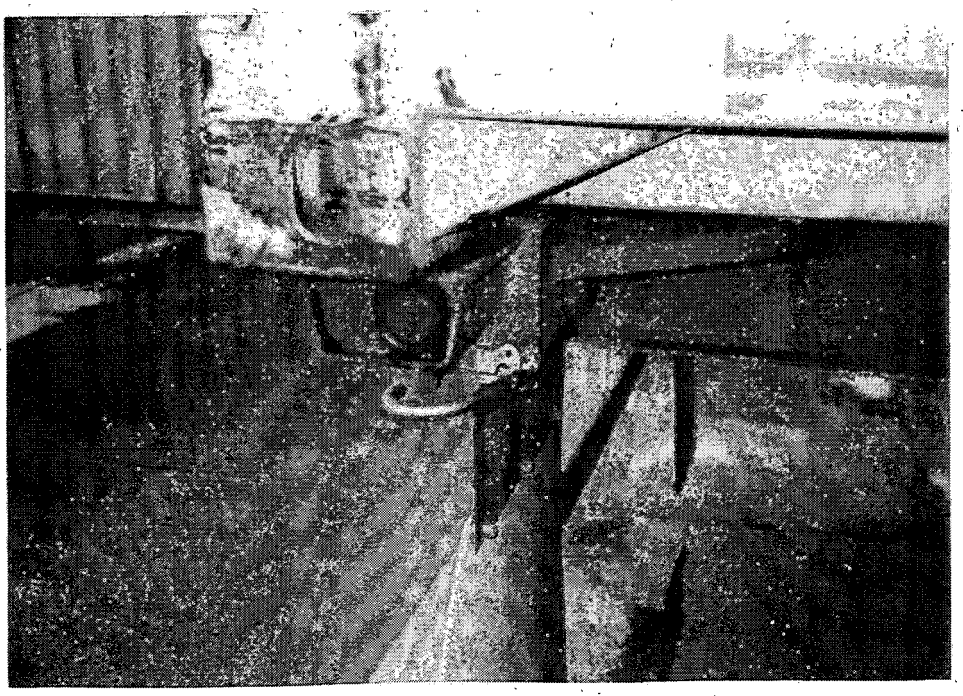


T - 22
Same hitch as above. No grease on lifting/ lowering screw.

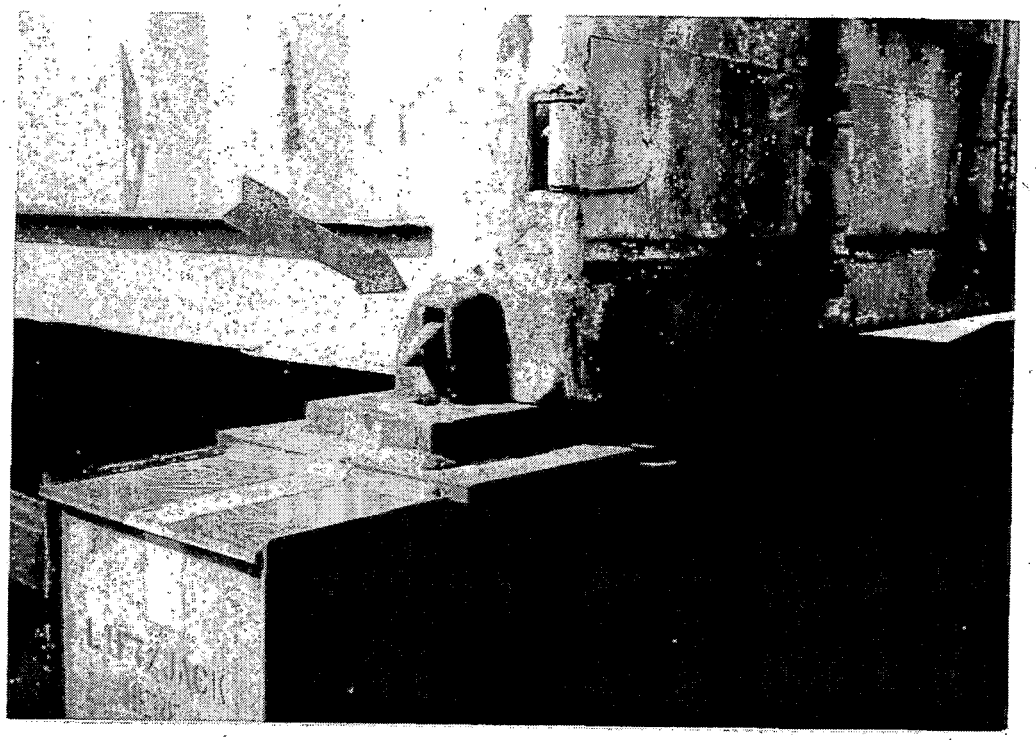
T - 23
Chassis pin engaged and locked in position. Container is secured to chassis.
Omaha, NE. 6-23-94

T - 24
Chassis pin not engaged. Container is not secured to chassis.
Omaha, NE. 6-23-94

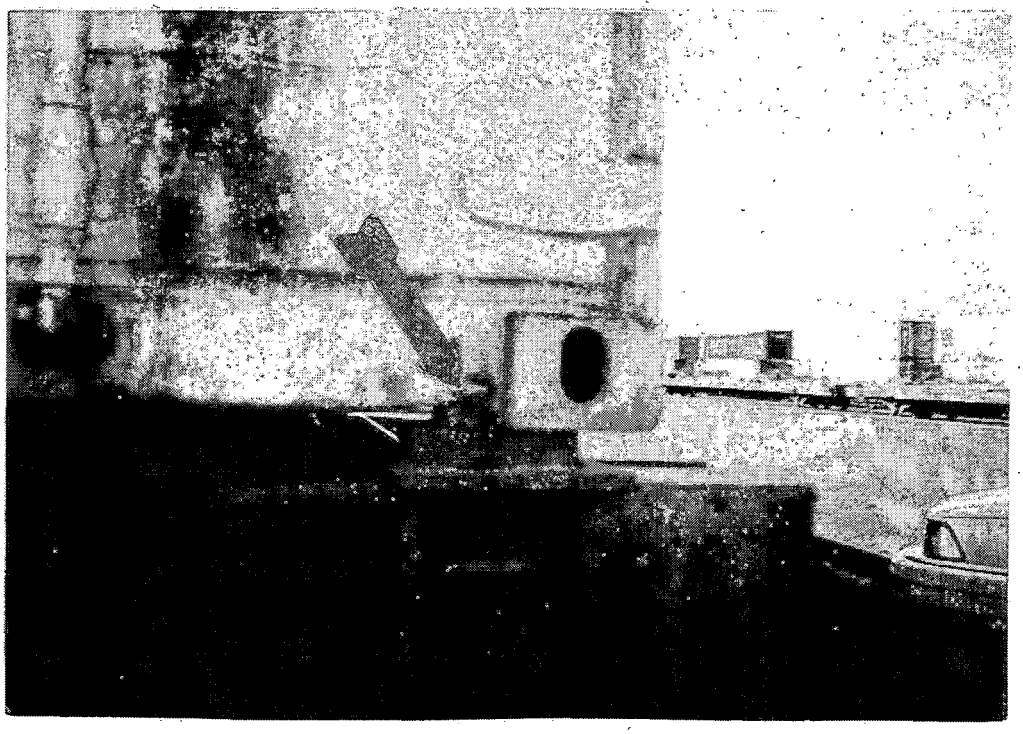
T - 25
Container is not secured to chassis pin. Locking handle is not fully engaged in lock.
Omaha, NE. 6-23-94



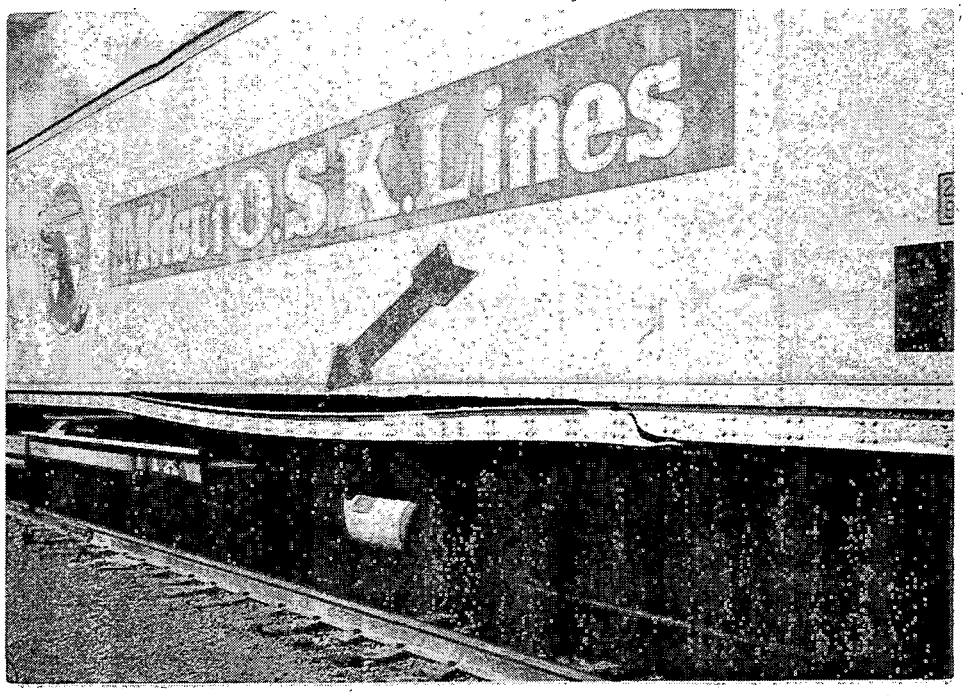
T - 26
Container not secured to chassis, account chassis pin handle is not engaged in safety lock. (Handle Bent)
Omaha, NE. 6-23-97



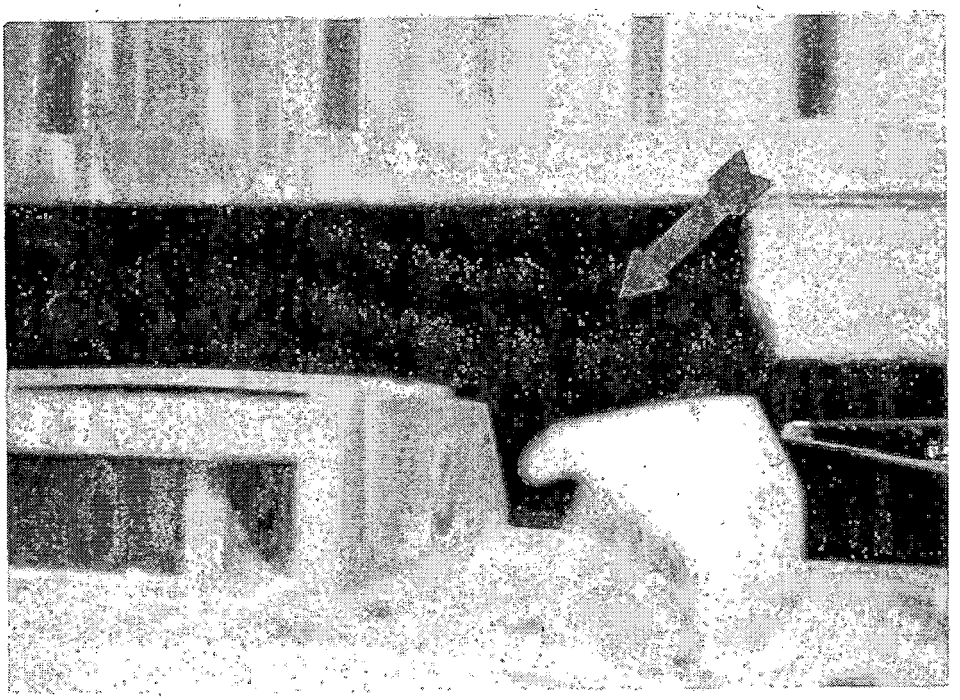
C - 1
Container partially resting on pad of spine car. Guide pin and lock not engaged in container. (Inbound-Left Side) Seattle, WA. 7/1/94



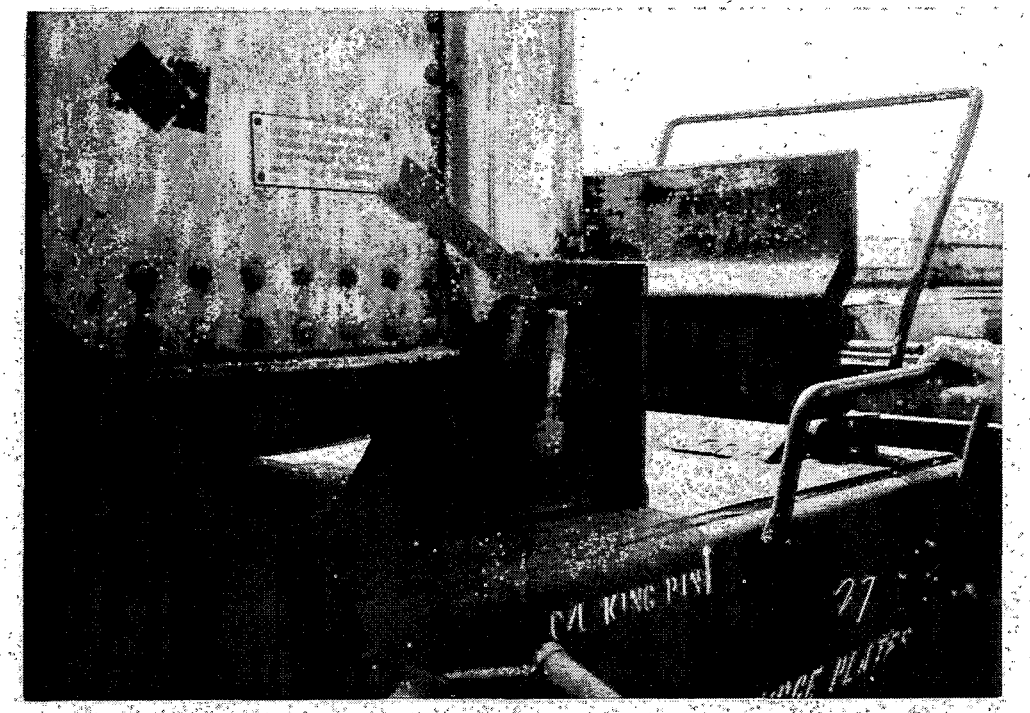
C - 2
Same container and car as above, guide pin and lock are not engaged in container. (Inbound-Right Side)



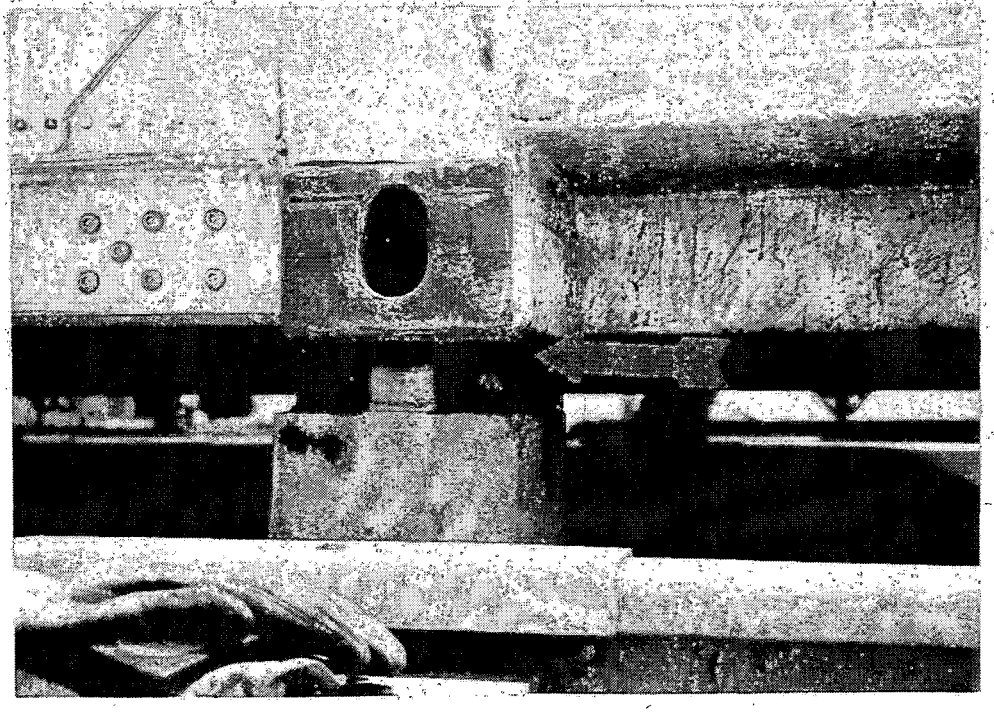
C - 3
Container bottom seperated from side. (Inbound) Seattle, WA. 7/1/94



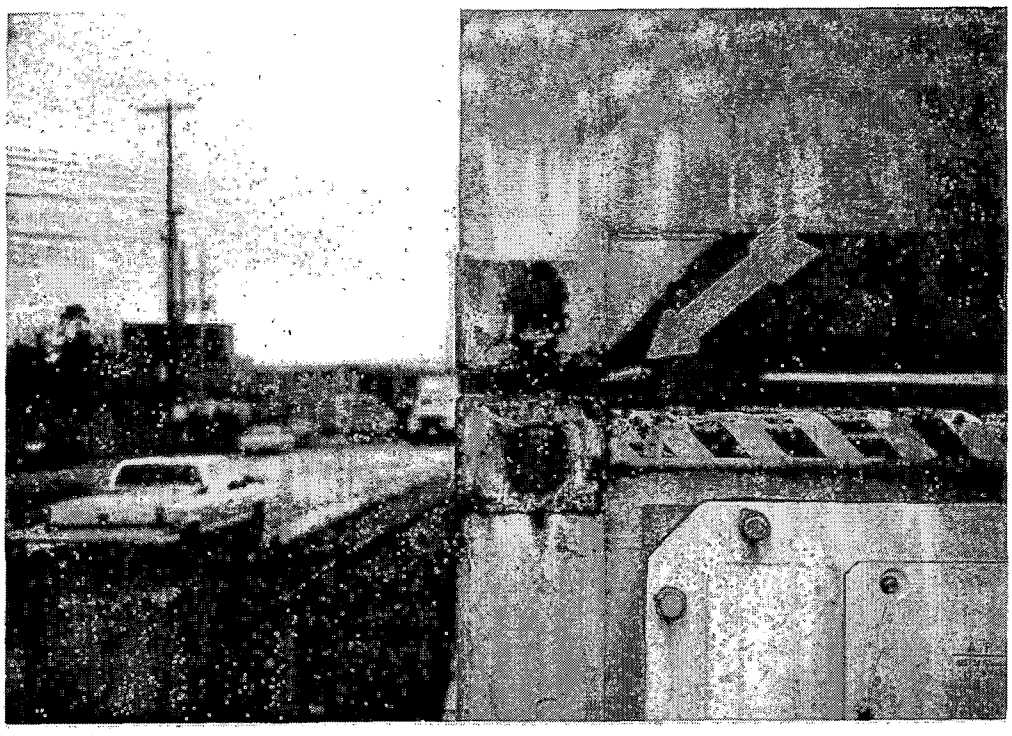
C - 4
Container resting on partially raised hitch. Omaha, NE. 6/23/94



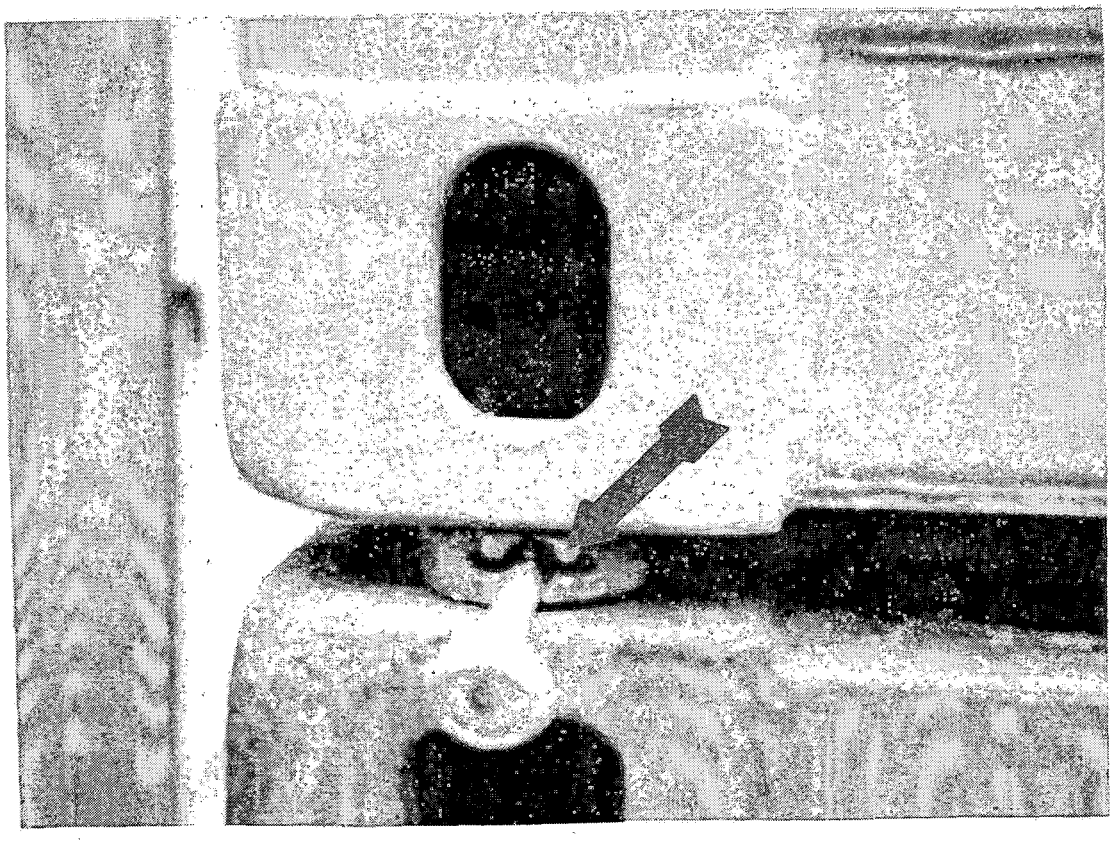
C - 5
Pedestal lock is not engaged.
Tacoma, WA. 6/30/94



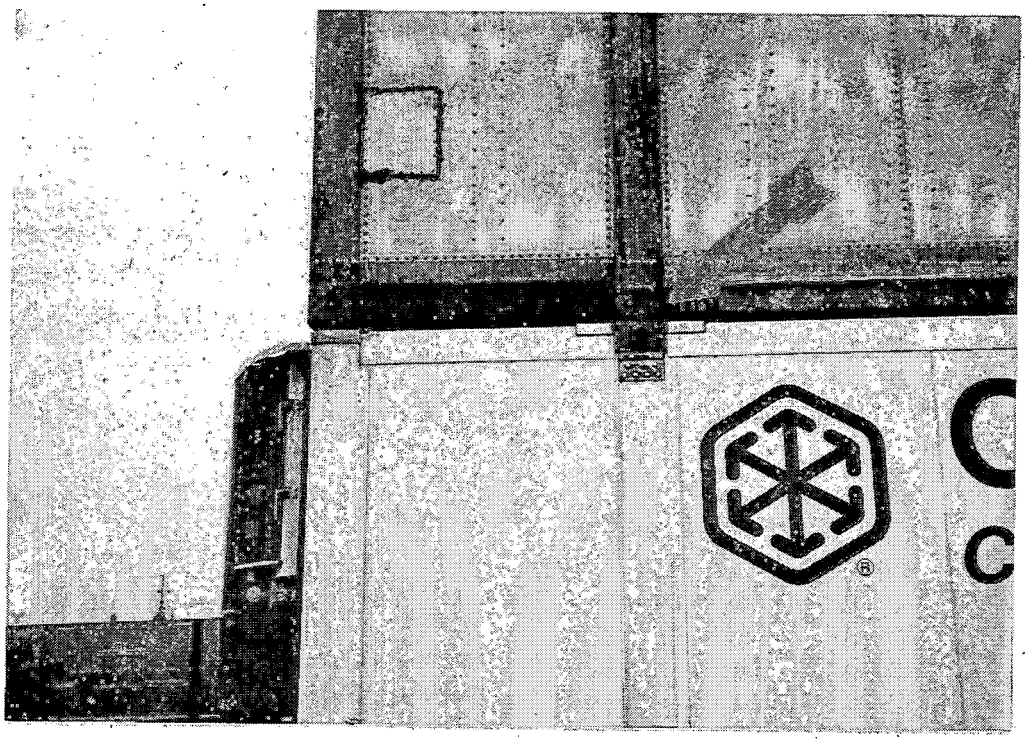
C - 6
Container is not in contact with rail car pedestal pad.
Los Angeles, CA. 6/28/94



C - 7
Double Stack
Inter-Box Connector
(IBC) in unlocked position.
Omaha, NE. 6/23/94

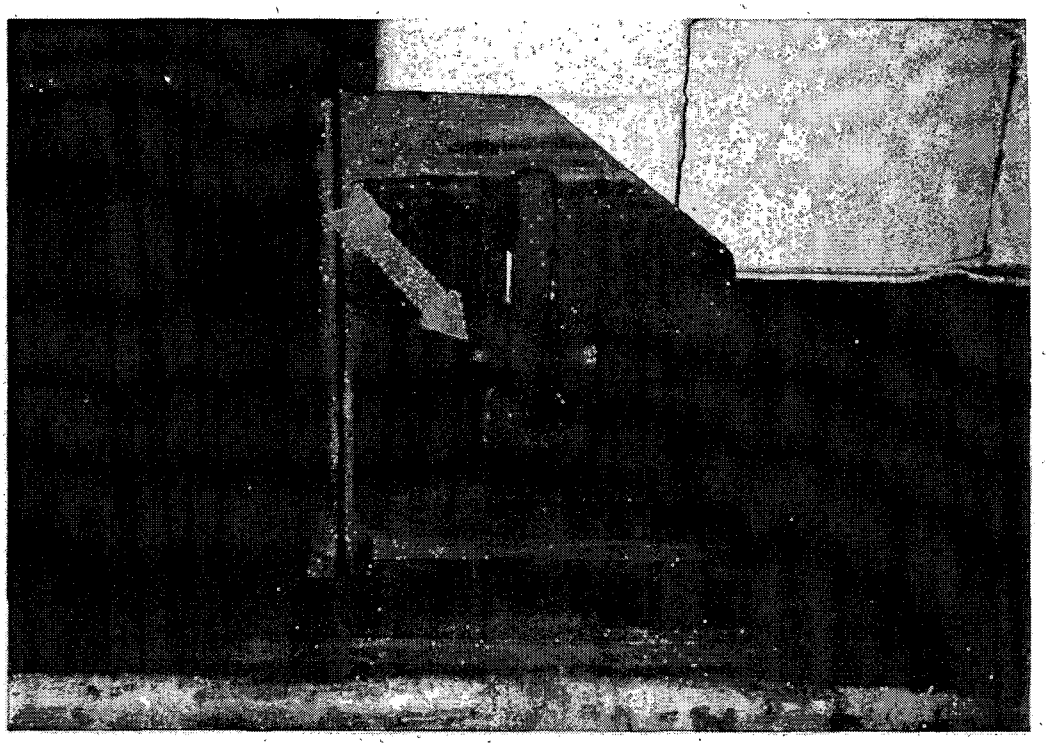


C - 8
Double Stack
Inter-Box Connector
(IBC) in unlocked position.
6/13/94

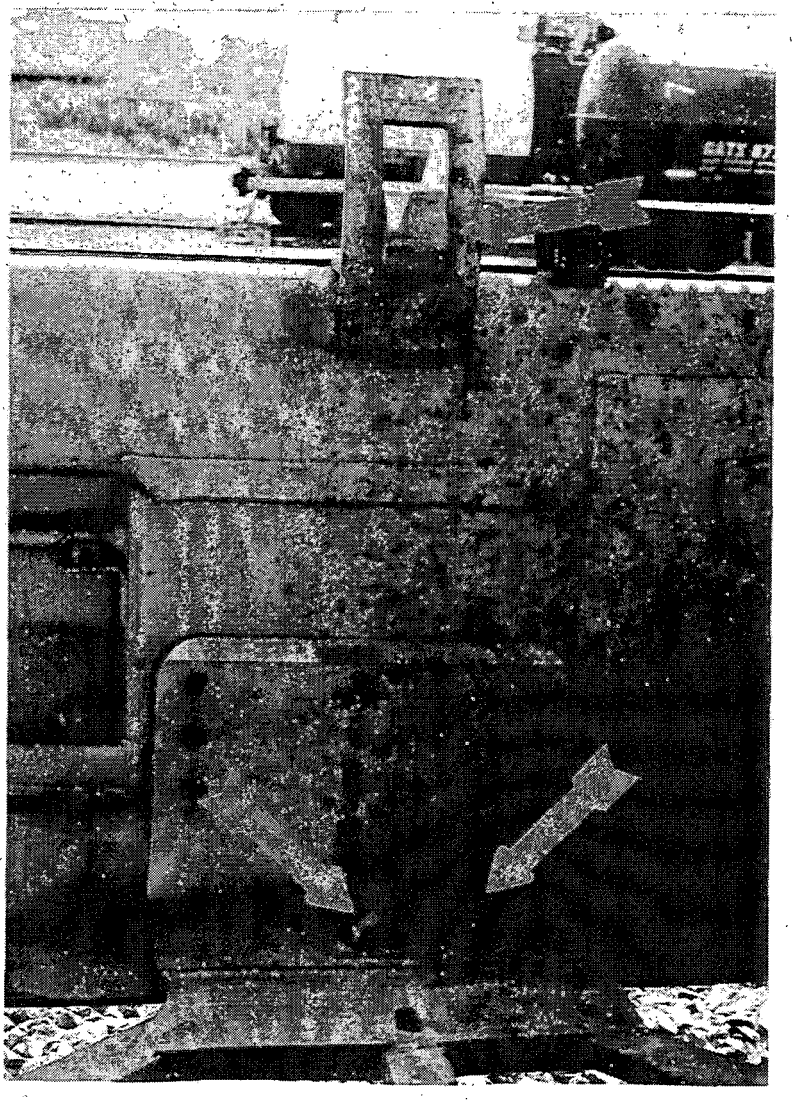


C - 9
Some Double Stack Inter-Box Connectors (IBC) are not visible from the ground.
Los Angeles, CA. 6/28/94

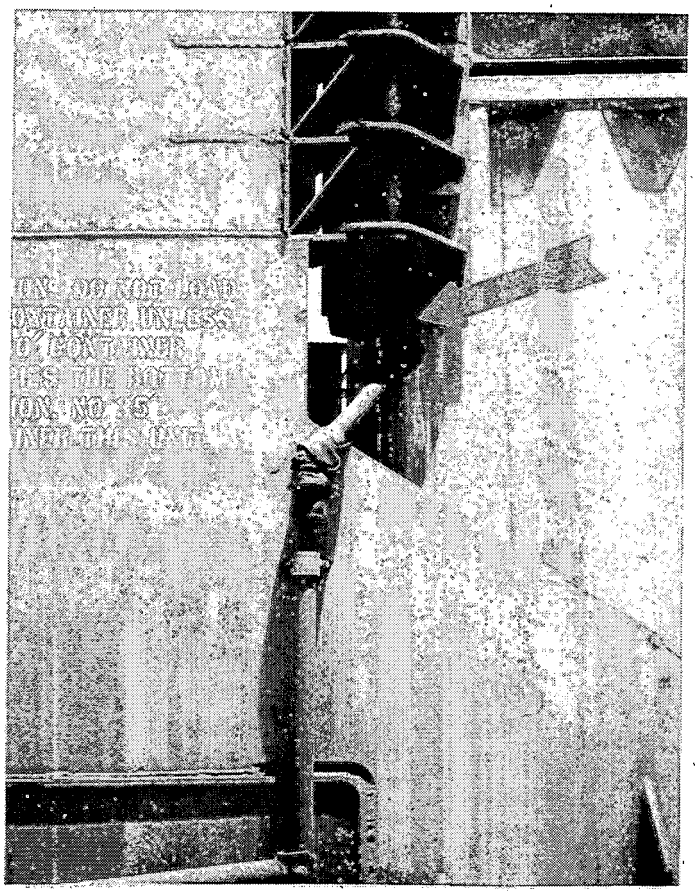
C - 10
On some Inter-Box Connectors on double stack cars, it is necessary for the inspector to board the car to inspect the locks.
Los Angeles, CA. 6/28/94



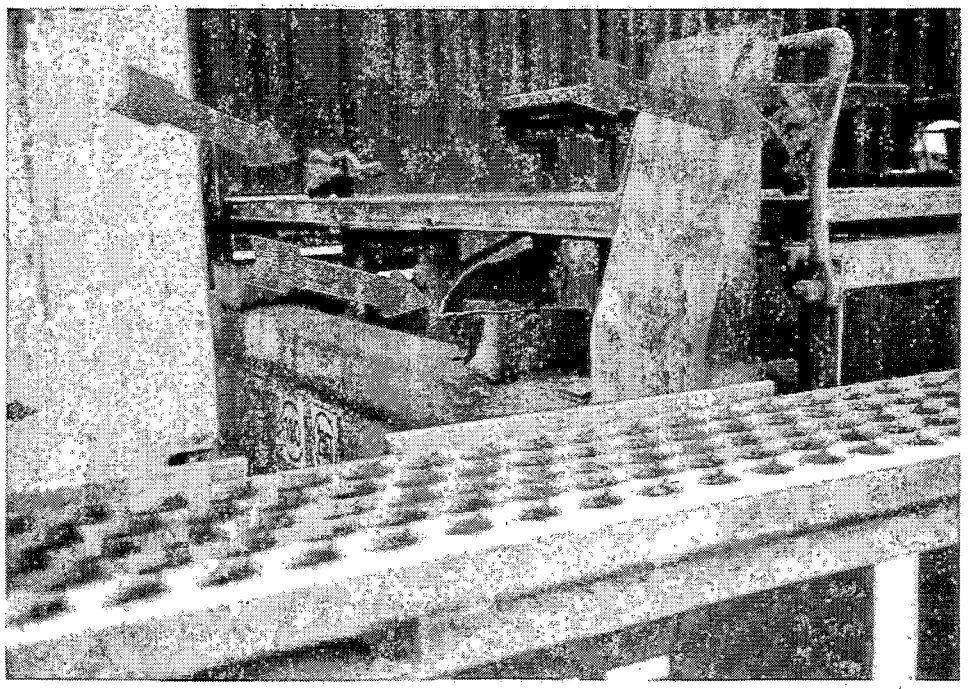
C - 11
Pedestal lock pin nut missing.



C - 12
Side guide and floor guide pin and block on well container car.



C - 13
Twist Lock Rod disconnected.
Long Beach, CA. 6/27/94



C - 14
Double stack Inter-Box Connector (IBC) container box damaged and walkway obstructed by IBC's.
Omaha, NE. 6/23/94

APPENDIX F

AAR LOADING SITE SURVEY OBSERVATIONS

ASSOCIATION
OF AMERICAN
RAILROADS

C. E. Dettmann
Vice President

July 15, 1994

Mr. Rolf Mowatt-Larssen
Chief - Motive Power & Equipment Division
Federal Railroad Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. Mowatt-Larssen:

The Association of American Railroads (AAR) appreciated the opportunity to participate with your inspection teams on the recent survey of intermodal terminal facilities conducted during the three week period ending July 1, 1994. Members of our Casualty Prevention Field Operations staff accompanied the FRA inspection teams. Following our participation in the team effort we initiated actions that we believe will be effective. Our plan of action is described below.

1. Almost all Intermodal loading and unloading is performed by private contractors under an agreement with the handling railroad. The level of experience possessed by these contractor personnel varies widely among locations and there appears to be a need for formal technical training available to assure the technical competency of those charged with TOFC/COFC securement.

   ACTION I:
   AAR, in cooperation with TTX and carrier Mechanical and Intermodal representatives, has begun an intensive effort to develop industry recommended practices for training terminal personnel in proper loading, inspection and maintenance practices applicable to trailer and container equipment and securement devices. A Task Force is being organized, and it will achieve timely results.

   ACTION II:
   AAR Field Operations inspection priorities will include, as a primary objective, the monitoring of intermodal terminal operations, specifically, trailer and container loading and securement, hitch maintenance practices and mechanical inspection activities. The Task Force which will develop recommended practices will, of course, address this issue for the longer term.

cont...

2. At many locations, trailer hitches and container pedestal locks were found to be in need of required periodic mechanical attention.

ACTION:
This situation has been brought to the attention of carrier Chief Operating Officers and steps will be taken to improve the level of hitch and container lock maintenance.

The information gained through participation in this survey has been extremely beneficial. Should there be other findings in your final report that you believe could be addressed by AAR, we will be pleased to consider additional actions that might be responsive.

Thank you again for the opportunity to participate in this effort to improve the safety of rail intermodal transportation.

Sincerely,

C. E. Dettmann

APPENDIX G

TTX LOADING SITE SURVEY OBSERVATIONS

TTX Company, a major owner of intermodal equipment, has in place extensive programs for the inspection and maintenance of cars equipped with trailer hitches and container securement devices. In addition, TTX Company provides training for personnel involved in the inspection and maintenance of intermodal securement devices.

TTX utilizes four special training cars, which are made available to railroads and shippers for use in training their personnel on the proper inspection and maintenance of trailer hitches and container securement devices. Each of these cars is equipped with trailer hitches and container securement devices applied to cars in the TTX fleet. TTX personnel are active in conducting these training programs or in assisting others in their training programs.

TTX is also preparing a consolidated "Trailer and Container Securement Guide". This guide will provide equipment users general information on how to determine if a hitch is properly raised and if a trailer or container is properly positioned and locked. This compilation of information on all types of securement devices will simplify training and maintenance of reference materials such as the "Hitch Maintenance Guide," which TTX developed with the Railway Education Bureau.

The primary function of TTX maintenance operations is to inspect and maintain the TTX fleet. This is accomplished through the use of four TTX owned shops and independent repair facilities as well as Field Maintenance Operations (FMO's). The FMO's are located at major intermodal facilities or at mobile repair sites strategically located throughout the country. TTX has an aggressive periodic maintenance program carried out by the repair shops to keep its fleet in good working order. Under the periodic maintenance program, cars are scheduled into shops for heavy maintenance according to mileage intervals established by TTX's long experience with intermodal equipment. FMO's provide a frequent inspection and minor repair capabilities at the loading sites.

APPENDIX H

BRC LOADING SITE SURVEY OBSERVATIONS

Brotherhood Railway Carmen Division
TRANSPORTATION • COMMUNICATIONS
INTERNATIONAL UNION
AFL-CIO, CLC

ROBERT P. WOJTOWICZ
General President

July 22, 1994

Mr. Edward R. English, Director
Office of Safety Enforcement
U.S. Department of Transportation
Federal Railroad Administration
400 7th Street, S.W., Room 8326 RRS-10
Washington, D.C. 20590

Dear Mr. English:

Attached please find report of the Brotherhood Railway Carmen Division of the Transportation•Communications International Union in connection with our recent participation in the FRA COFC/TOFC Loading and Securement Nationwide Railroad Safety Survey conducted June 13-30, 1994.

We respectfully request that you incorporate our findings into the Administration's report filed with the Secretary of the Department of Transportation, the Honorable Federico Peña.

Please accept our thanks for inviting us to participate in this much needed survey.

Very truly yours,

R P. Wojtowicz

General President

RPW/sjm
enclosure

cc: R. A. Scardelletti
H. W. Randolph
R. A. Johnson
J. J. Parry
H. B. Lewin
G. Gray

3 Research Place ● Rockville, MD 20850 ● (301) 948-4910 ● FAX (301) 948-1369

REPORT OF THE

BROTHERHOOD RAILWAY CARMEN (BRC)

DIVISION OF THE

TRANSPORTATION•COMMUNICATIONS INTERNATIONAL UNION (TCU)

In Connection with the Findings

of the

FEDERAL RAILROAD ADMINISTRATION (FRA)

COFC/LOFC LOADING & SECUREMENT

RAILROAD SAFETY SURVEY

Conducted

JUNE 13 - 30, 1994

Prepared July 22, 1994
at Rockville, Maryland

BRC PARTICIPANTS

James J. Parry
General Vice President
3 Research Place
Rockville, MD 20850
(301) 948-4910/EXT. 319

Illinois

Florida

New Jersey

Gerald Gray
General Vice President
1106 Allen Road
Burns, TN 37029
(615) 446-3754

Tennessee

Henry B. Lewin
General Vice President
400 North Capital Street, N.W.
Suite 858
Washington, D.C. 2001
(202) 737-1541

California

Washington

Properties Visited

Railroad	Location	City	State	Date
ATSF	Corwith Yard	Chicago	IL	6-13-94
Conrail	51st/55th Street Yards	Chicago	IL	6-14-94
BN	Cicero Yard	Chicago	IL	6-15-94
CSX	Bedford Park	Chicago	IL	6-15-94
IC	Johnston Yard	Memphis	TN	6-19-94
UP	Sergeant Yard	Memphis	TN	6-20-94
CSX	Leewood Yard	Memphis	TN	6-20-94
BN	Memphis Yard	Memphis	TN	6-20-94
NS	Forrest Yard	Memphis	TN	6-21-94
SSW	Memphis Yard	Memphis	TN	6-21-94
CSX	Duvall Ramp	Jacksonville	FL	6-22-94
NS	Simpson Yard	Jacksonville	FL	6-22-94
FEC	Bowden Yard	Jacksonville	FL	6-22-94
CSX	Taft Yard	Orlando	FL	6-22-94
CSX	Tampa Ramp	Tampa	FL	6-23-94
FEC	Ft. Pierce Ramp	Ft. Pierce	FL	6-23-94
FEC	West Palm Beach Ramp	West Palm Beach	FL	6-23-94
FEC	Ft. Lauderdale Ramp	Ft. Lauderdale	FL	6-24-94
FEC	Hialiah Ramp	Hialiah	FL	6-24-94
Conrail	South Kearny Trailvan Terminal	So. Kearny	NJ	6-28-94
	APL Terminal	So. Kearny	NJ	6-28-94
UP	East Los Angeles Yard	E. Los Angeles	CA	6-28-94
ATSF	Los Angeles Ramp	Los Angeles	CA	6-28-94
UP	Los Angeles Ramp	Los Angeles	CA	6-29-94
SF	TOFC Los Angeles Ramp	Los Angeles	CA	6-29-94
Conrail	North Bergen Yard	N. Bergen	NJ	6-29-94
Conrail	Morrisville Yard	Morrisville	PA	6-29-94

Railroad	Location	City	State	Date
BN/UP	Tacoma North Intermodal Yard	Tacoma	WA	6-30-94
BN/UP	Sim Yard	Tacoma	WA	6-30-94
Conrail	South Kearny Trailvan Terminal	So. Kearny	NJ	6-30-94
D&H	Oak Island Yard	Newark	NJ	6-30-94
	K-Line Terminal	Elizabethport	NJ	6-30-94
	Maher Terminal	Port Newark	NJ	6-30-94
BN	Puget Sound Hub Center	Seattle	WA	7-1-94
BN	Stacy Street Yard	Seattle	WA	7-1-94

In visiting the many railroad properties and ramps to conduct the survey where both COFC (Container on Flat Car) and TOFC (Trailer on Flat Car) Loading and unloading was being performed mostly on a around-the-clock basis (24 hours a day, seven days per week) a majority of this work was being performed by inexperienced employees of outside contractors, many of who averaged only about 3 years practical experience in COFC/TOFC loading. At some locations surveyed, the contractors' employes' possessed less than a year's experience in performing this type of work. These employees did not demonstrate much ability to be able to identify the several different type of hitch designs and models. Other than knowing how to lock and unlock the hitches, they had little or no mechanical knowledge of the internal and external parts of the hitch and how they function on the various types and models. More alarming, as was indicated by this survey, was the lack of training available to these employees, much of which consisted mostly of OJT (On-the-job training), with the exception at some locations of either visual aids, such as video films and/or SOP (Standard Operating Procedures) manuals, which were for the most part kept in the contractor's office. Most of the contractors' employees' interviewed had not received any personal written material on loading and securement procedures.

The combined COFC/TOFC peak loading rate per eight hour shift for the locations visited, ranged from as low as 18 to 20 TOFC's loaded circus-style at FEC's Ft. Pierce, FL Ramp, to 1,819 per eight hour shift at ATSF's Corwith Yard in Chicago, IL. The average peak loading rate was about 300 to 400 units per shift. Again, as we have already stated, most of the actual loading and unloading of intermodal equipment in the industry is being performed by outside contractors, with the mechanical and final inspections of the trains being the responsibility of the carmen; and the inspection, repairs and periodic lubrication of the hitches being done by both carmen and TTX-FMO employees, depending on each individual property.

Although the survey overall indicated that there were inspections and back-up inspections being made to the trains to assure that all TOFC's were properly loaded on the car and locked into the hitch; and that all COFC's were properly loaded and locked in the pedestals or corner latches; interviews conducted during the survey revealed that there were reports of a considerable number of trailers and containers arriving on in-bound trains throughout the country, that were not properly loaded and in some cases, were not locked in the hitch or pedestal locks. It should also be noted that on numerous cars inspected during the survey, many of the hitches requiring periodic inspection, lubrication and stenciling, were infact overdate. In some cases, when a defective hitch for TOFC loading was found on a car, rather than the car being "shopped" or bad ordered, the hitches would be lowered and the car then used for COFC loading.

There were several complaints about known design problems with TOFC/COFC equipment, the most common being those of unpainted and dirty locking indicators; indicator locking rods too long and sticking out anywhere from 1/8" to 3/8" of an inch, making it difficult to tell whether or not the hitch is locked. Also, the top twist-type doublestack locks are almost impossible to see if they are in the locked position while inspecting in the dark; and/or if the car is in the train yard and there is not adequate space between the tracks to stand back from the car to see up into the top locks to make certain that they are in the locked position. Last but not least, the stenciling of the dimensions of the container is usually at each end in the lower portion of the center of the container, thereby making it almost impossible to see when the container is placed in the well of the doublestack car. Of the many cars inspected throughout the survey, we found an overabundance of TOFC rub rails loose and some which were not secured to the car; also TOFC dollywheels and/or landing gear not rolled up and making contact with the deck of the car.

Our most serious concerns brought out by the survey, were the many locations and terminals on the various properties where these trains originate after being loaded, made up and depart without receiving a mechanical inspection and/or initial terminal air brake test required in accordance with Federal regulations.

Notwithstanding of the fact that this survey was conducted solely for the purpose of gathering information rather than an enforcement action as outlined in the Administration's open letter of initial remarks to the railroads, we feel it is incumbent upon this Organization to express our displeasure and grave concerns of the lack of mechanical inspections and/or initial terminal air brake tests currently not being performed on these intermodal trains on the various properties, creating not only an unsafe industry for our members, but also jeopardizing the safety of the general public.

Respectfully Submitted by,

The Brotherhood Railway Carmen
Division of T•CU