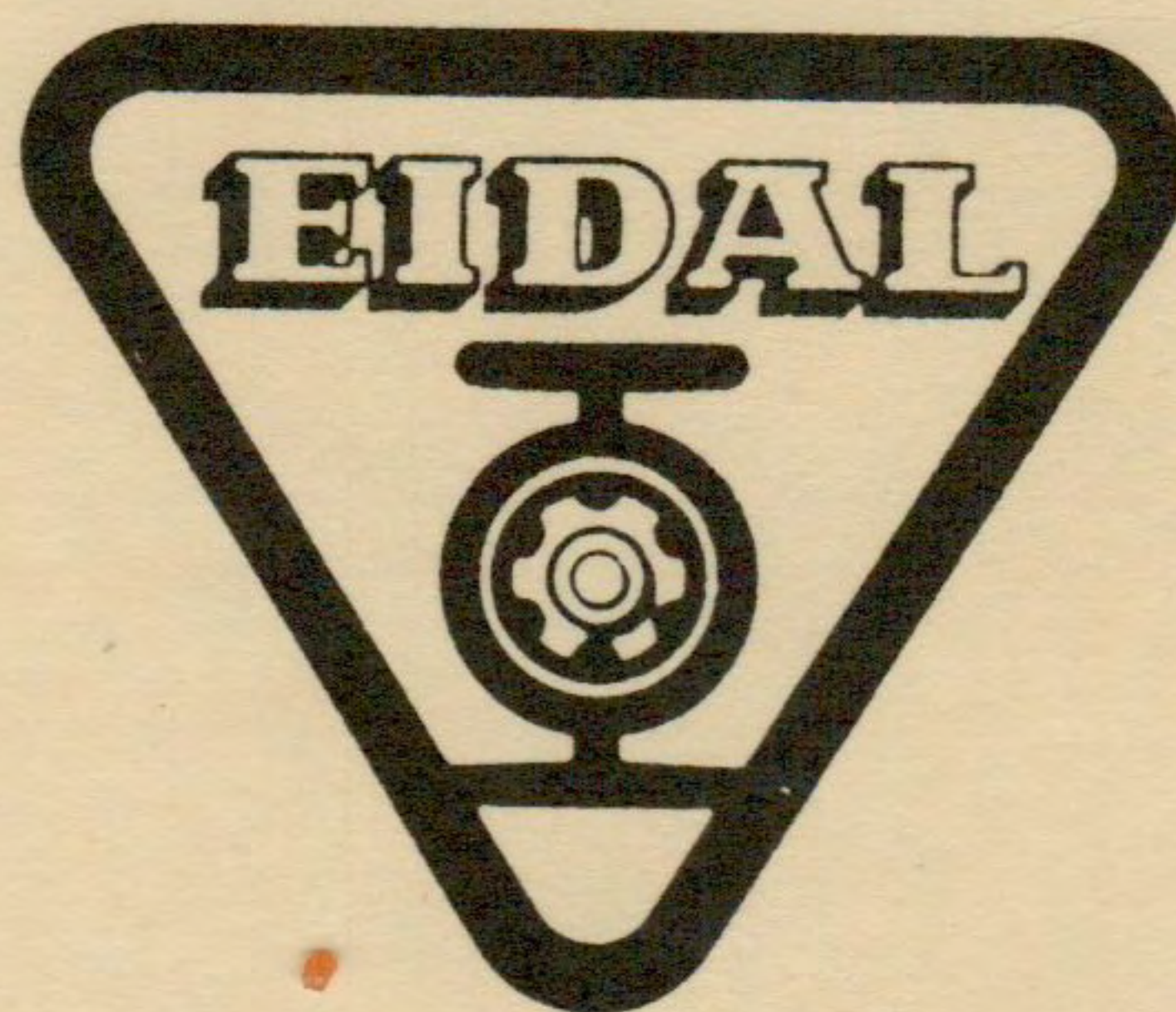


OPERATION AND MAINTENANCE MANUAL

**70 TON General Purpose
Off road Transporter**

MODEL 77-0010B

May, 1991



**3535 WEST FIFTH STREET
OXNARD, CALIFORNIA 93030-6498 U.S.A.**

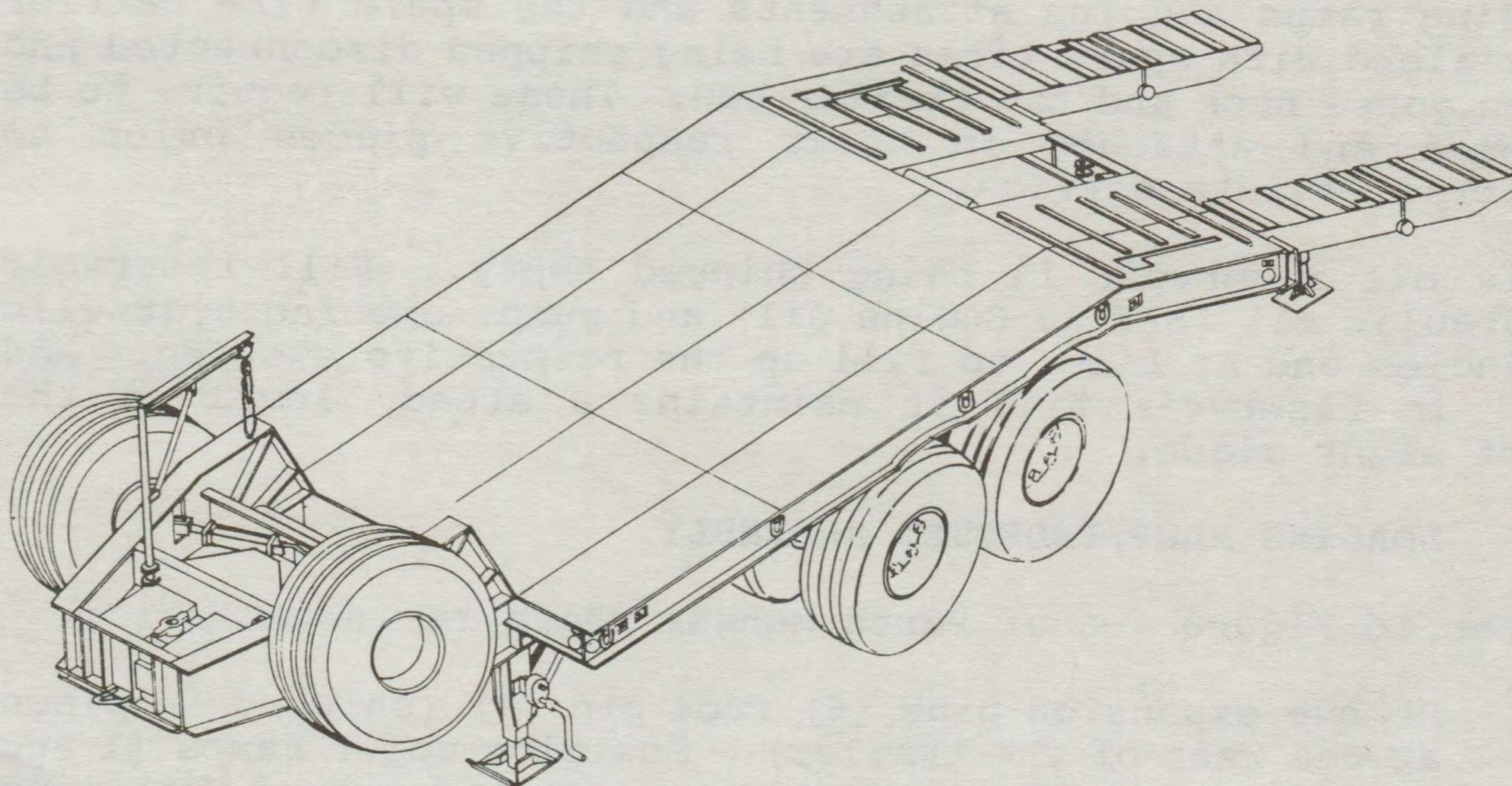
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2. INTRODUCTION



The EIDAL Model 77-0010B is a General Purpose 70-Ton Capacity Transporter designed as a heavy duty on-and-off road transporter.* Its design features optimum underbody clearance and short length to permit maximum maneuverability over desert terrain. These design features enable the unit to be used as a hauling platform for tracked or wheeled vehicles, as well as general cargo.

Through text and illustrations, this manual will cover three primary areas:

- a. Overall description of the system and its main subsystems.
- b. General and preventive maintenance.
- c. Troubleshooting and operational measures which are felt to be necessary by the manufacturer.

*Coupled with a heavy duty prime mover having appropriate sand and highway tires and a laden fifth wheel height of 64 inches (1624mm).

2-1. INITIAL ASSEMBLY

The loading ramps and its attachments and the spare tire carrier assembly along with spare tires are being shipped disconnected and placed on goose neck and the trailer bed. These will require to be reassembled and attached in their respective places prior to putting trailer into service.

Hydraulic oil reservoir is being shipped empty. Fill reservoir with hydraulic oil (SAE 20 Engine Oil) and pump, opening hydraulic valve handles one at time, to fill up the respective systems. Add more oil in reservoir till it maintains a steady level at the center of sight glass.

2-1.1 LOADING RAMP/PEDESTAL ASSEMBLY

Refer to Figure 4-6 of Parts Manual while re-installation.

1. Remove expansion pins (6) from pin (7) (shipped in place at the rear of the trailer). Position upper ramps (1 and 3) (shipped on the trailer) in place and secure with pins (6 and 7).
2. Remove expansion pins (11) from pins (10) (shipped in place on the upper ramps). Place lower ramps (2 and 4) (shipped on the trailer) in place and secure with pins (10 and 11).
3. Remove expansions pins (11) and flat washers (12) (shipped in place on the lower ramps). Position yoke (13) (attached to the upper ramp) in place and secure with flat washers (12) and expansion pins (11).
4. Remove pin from sleeve (attached to the upper ramp) and install the lower leg of pedestal assembly (5) in the sleeve and secure with pin.

CAUTION

To avoid damage to ramps, ensure when ramp is fully extended and touching ground, the pedestal assembly (5) leg is approximately 3-5 inches above ground level.

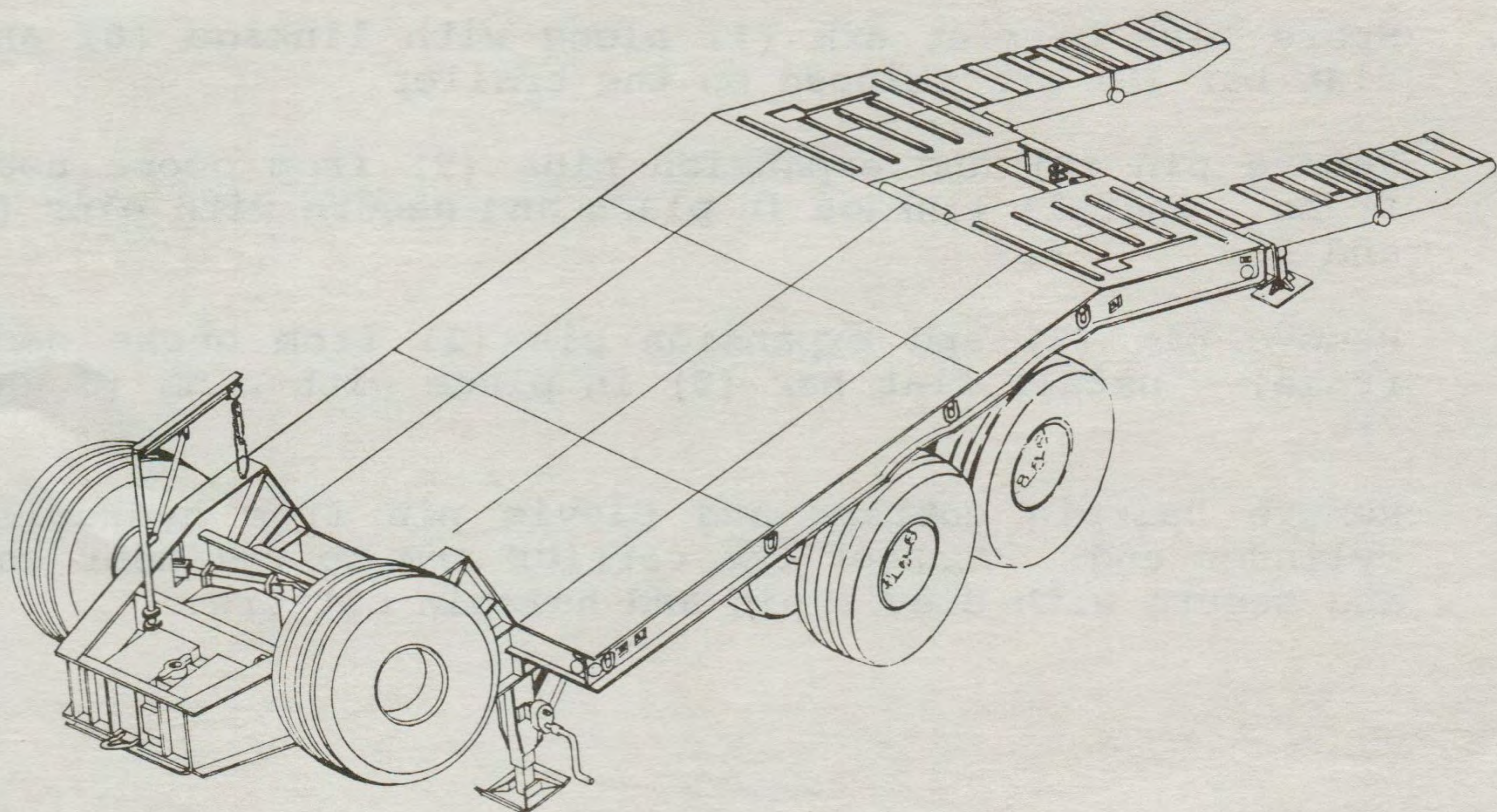
5. Position the height of pedestal assembly by placing the pin in the correct height leg hole.
6. Ramps hydraulic cylinders are disconnected at the ramp block and clevis pin installed at cylinder end when shipped. Remove hairpin cotters and clevis pin and connect hydraulic cylinder at block and re-install clevis pin and hairpin cotters.

2-1.2 SPARE TIRE CARRIER

Refer to Figure 4-3 of Parts Manual while re-installation.

1. Spare tire carrier arm (1) along with linkage (6) and flat bar (5) are shipped on the trailer.
2. Remove pin (8) and expansion pins (9) from goose neck frame. Install linkage in place and secure with pins (8 and 9).
3. Remove pin (7) and expansion pin (3) from goose neck frame. Install flat bar (5) in place with pins (3 and 7).
4. Remove hairpin cotters and clevis pin from hydraulic cylinder end. Connect the carrier arm to cylinder end and secure with clevis pin and hairpin cotters.

3. GENERAL DESCRIPTION AND SPECIFICATIONS

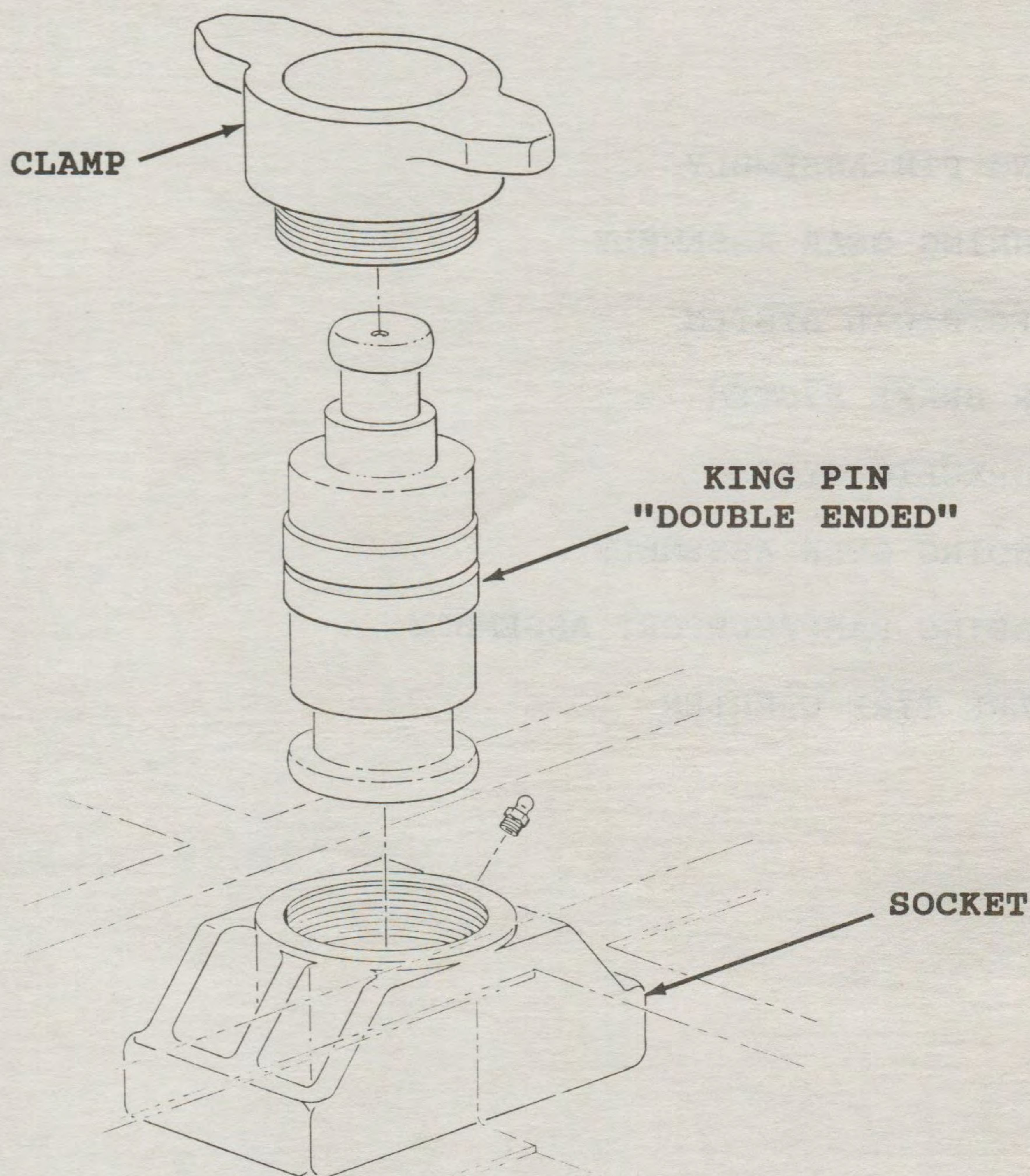


Length, Overall (Approx.)	500	inches
(Loading Ramp extended)		(12,700 mm)
Length, Overall (Approx.)	448	inches
(Loading Ramp Assembly stowed)		(11,380 mm)
Length, Deck	231	inches
		(5,867 mm)
Width, Overall	159	inches
		(4,036 mm)
Height to top of spare tire (stowed)	118	inches
		(2,997 mm)
Height to Deck (Laden)	64	inches
		(1,624 mm)
Height to Deck (Empty)	66	inches
		(1,676 mm)
Height of stowed Loading Ramp Assembly	86	inches
		(2,184 mm)
Height to King Pin plate (Level, laden)	64	inches
		(1,624 mm)
Height to King Pin plate (Level, empty)	66	inches
		(1,676 mm)
Weight of Semitrailer	33,100	pounds
		(15,011 kg)
Payload Capacity	140,000	pounds
		(63,492 kg)
Maximum Speed Off-Highway (loaded)	20	mph
		(32 kph)
Tires	24 x 21	(18 Ply Rating)
		Sand and Highway, Tube Type
Brakes	Air Operated,	All Wheels
Lighting/Electrical	12/24	Volt

4. MAINTENANCE AND COMPONENTS

- 4-1 KING PIN ASSEMBLY
- 4-2 RUNNING GEAR ASSEMBLY
- 4-3 ELECTRICAL SYSTEM
- 4-4 AIR BRAKE SYSTEM
- 4-5 HYDRAULIC SYSTEM
- 4-6 LANDING GEAR ASSEMBLY
- 4-7 LOADING RAMP/SUPPORT ASSEMBLY
- 4-8 SPARE TIRE CARRIER

4-1. KING PIN ASSEMBLY



The King Pin Assembly is of "double ended" design to give added flexibility in the selection of the prime mover. Because of the primary importance of the King Pin as a support mechanism, it is essential that it be regularly lubricated with multipurpose grease, Automotive #1 and inspected for foreign material.

The King Pin is securely clamped in a machined socket built into the upper coupler assembly (goose neck) of the trailer. A clamp fits over the upper shoulder of the King Pin and threads into the socket to prevent the King Pin from being displaced accidentally.

The King Pin can be used with either a standard or a heavy duty prime mover's fifth wheel. Being of "double ended" design, one end is 2 inches in diameter while the opposing end is 3-1/2 inches (SAE J700-J848).

4-1.1 KING PIN INSTALLATION

Before installation, consideration must be given to the proper selection of the end which will mate to the prime mover. The socket must be lubricated with multipurpose grease, Automotive #1 before installation. After setting the King Pin in the socket, lower the clamp over the King Pin and turn the clamp clockwise to engage the threads. Tighten the clamp securely over the King Pin to insure that the clamp will not loosen during operation.

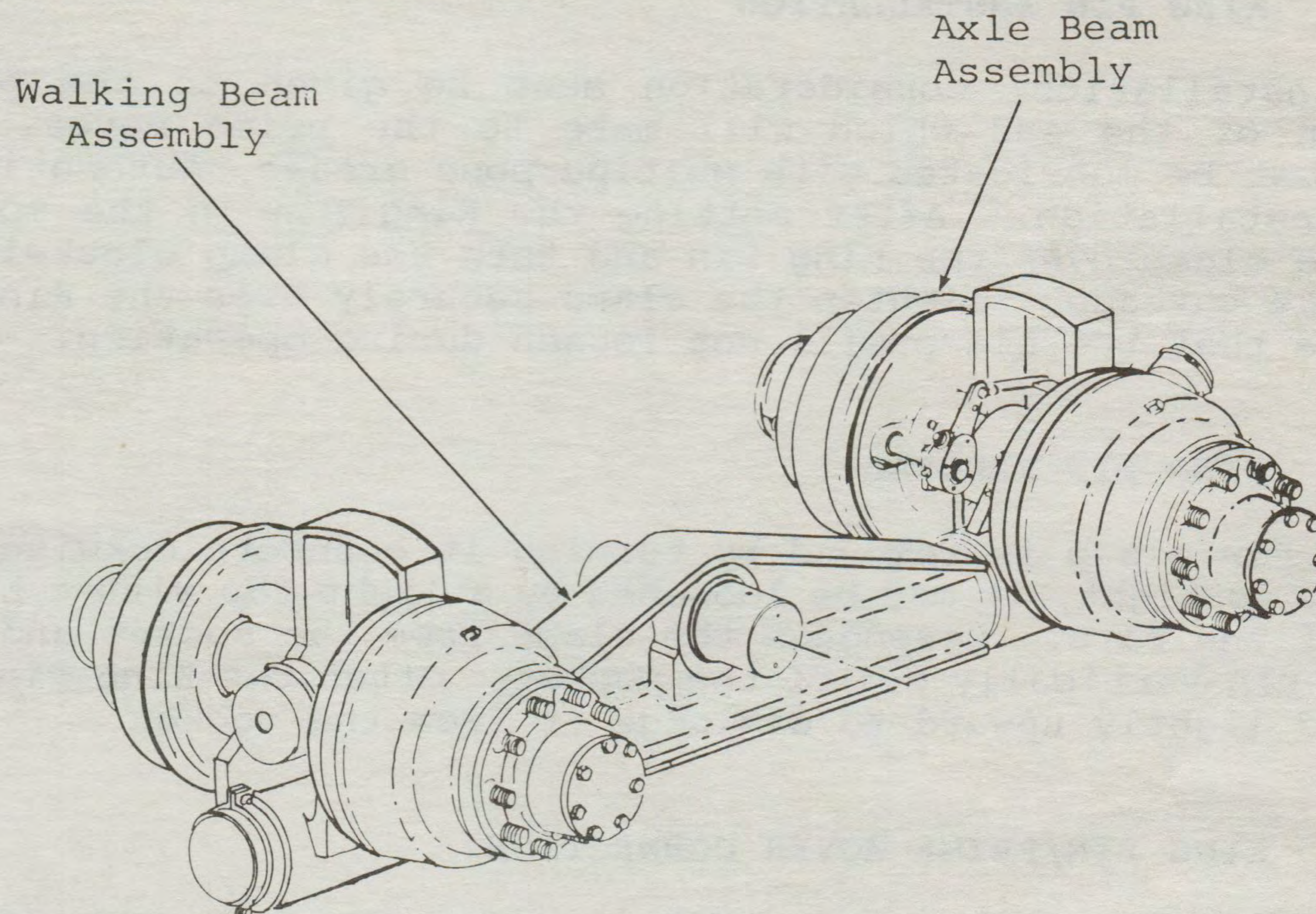
4-1.2 KING PIN REMOVAL

The King Pin clamp is removed by turning it counterclockwise. If the clamp is tight, it may be loosened by a light tap with a hammer on one of the ears. Disengage the clamp from the socket and lift the King Pin vertically out of the socket. Often the King Pin must be tapped lightly upward to dislodge it from the socket.

4-1.3 KING PIN/PRIME MOVER CONNECTION

Refer to Prime Mover Operation Manual. The King Pin is inserted into the fifth wheel by moving the prime mover in reverse under the trailer to engage the goose neck. The King Pin must move into the slot of the fifth wheel plate and be securely locked in place by the locking mechanism of the fifth wheel. To disengage the King Pin, the same steps are followed in a reverse order, after the brakes on the trailer are set and after the Landing Gear Assembly is lowered and secured. When the fifth wheel locking mechanism is disengaged, the prime mover can be detached from the semitrailer.

4-2. RUNNING GEAR ASSEMBLY



TW-WB-60 SUSPENSION

The Running Gear Assembly is the prime support system for Model 77-0010B. The semitrailer suspension system is denoted as the TW-WB-60.

The main elements which comprise the Running Gear Assembly are: 1) Walking Beam, 2) Front and Rear Axles, and 3) Wheel and Tire Assembly. Being the prime subsystem, continuous maintenance and observation is required. The Walking Beam Assembly is a steel tube uniting the Front and Rear Axles, forming the running gear unit. During operation, the walking beam oscillates around the Trunnion Bracket Assembly.

The Front and Rear Axle Assemblies pass over the ends of the walking beam. Each set of clamps (four sets) is slipped over the end and bolted in place. This prevents the axle assemblies from slipping off the walking beam. At 5000-mile intervals, the bearings at the front and rear axles must be inspected. The principal running gear service is the wheel bearing. No adjustment of the axle is necessary, since this is done at the time of manufacturing.

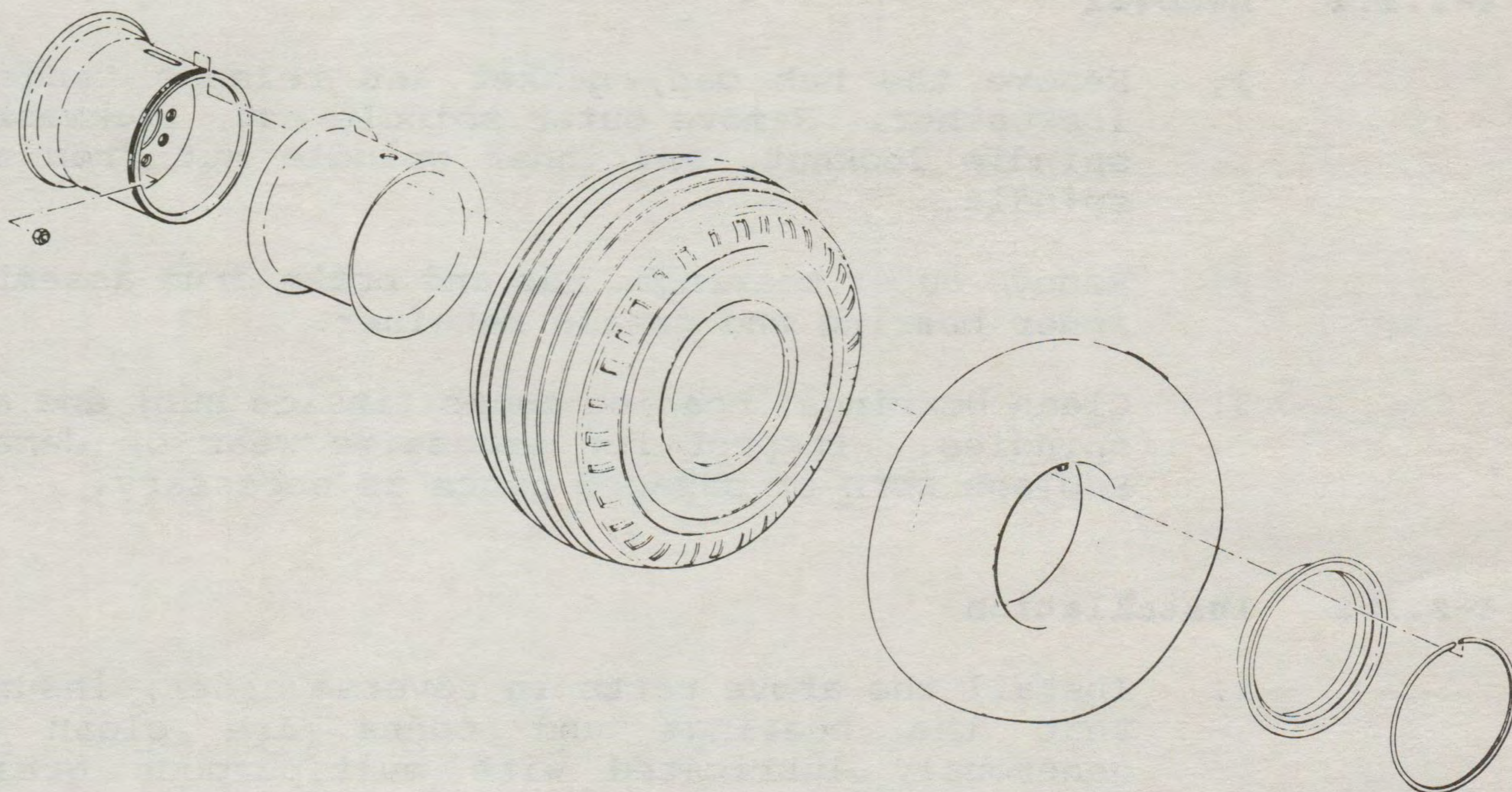
4-2.1 WHEEL BEARING

4-2.1.1 Removal

1. Remove the hub cap, gasket and release tangs on lockwasher. Remove outer spindle nut, lockwasher, spindle locknut, and inner spindle nut from axle spindle.
2. Remove outer bearings, hub and brake drum assembly, inner bearing and grease retainer.
3. Clean bearings, bearing cones (inside hub) and axle spindles. Inspect for excessive wear or damage. Replace worn or damaged parts as necessary.

4-2.1.2 Installation

1. Install the above parts in reverse order, insuring that the bearings and cones are clean and generously lubricated with multipurpose grease, Automotive #1.
2. Upon installing the inner spindle nut, manually tighten the nut with the spindle nut wrench and handle. Next using a torque wrench tighten to 45 to 50 ft-lbs. Back off inner spindle $1/6$ to $1/4$ turn. Install spindle locknut, lockwasher and outer spindle nut in that order.
3. Upon installing the outer spindle nut, tighten the nut securely against the spindle locknut and lockwasher. Tighten to a torque of 185 - 210 ft-lbs. Bend tangs of lockwasher to lock spindle nut.
4. Install hubcap and gasket with seven cap screws and their lockwashers.



The model 77-0010B is provided with eight 24 x 21 - 18 ply sand and highway service tires and two spares which are secured in place on the upper deck of the goose neck.

The tires must not be operated under any condition over 50 psi. Refer to the highway service list below.

	<u>Load</u>	<u>Speed</u>	<u>Tire Pressure (Cold)</u>
On Highway/Hard Surface	140,000 lbs	50 mph	45 psi
Off Highway	140,000 lbs	10 mph	35 psi
	140,000 lbs	5 mph	25 psi

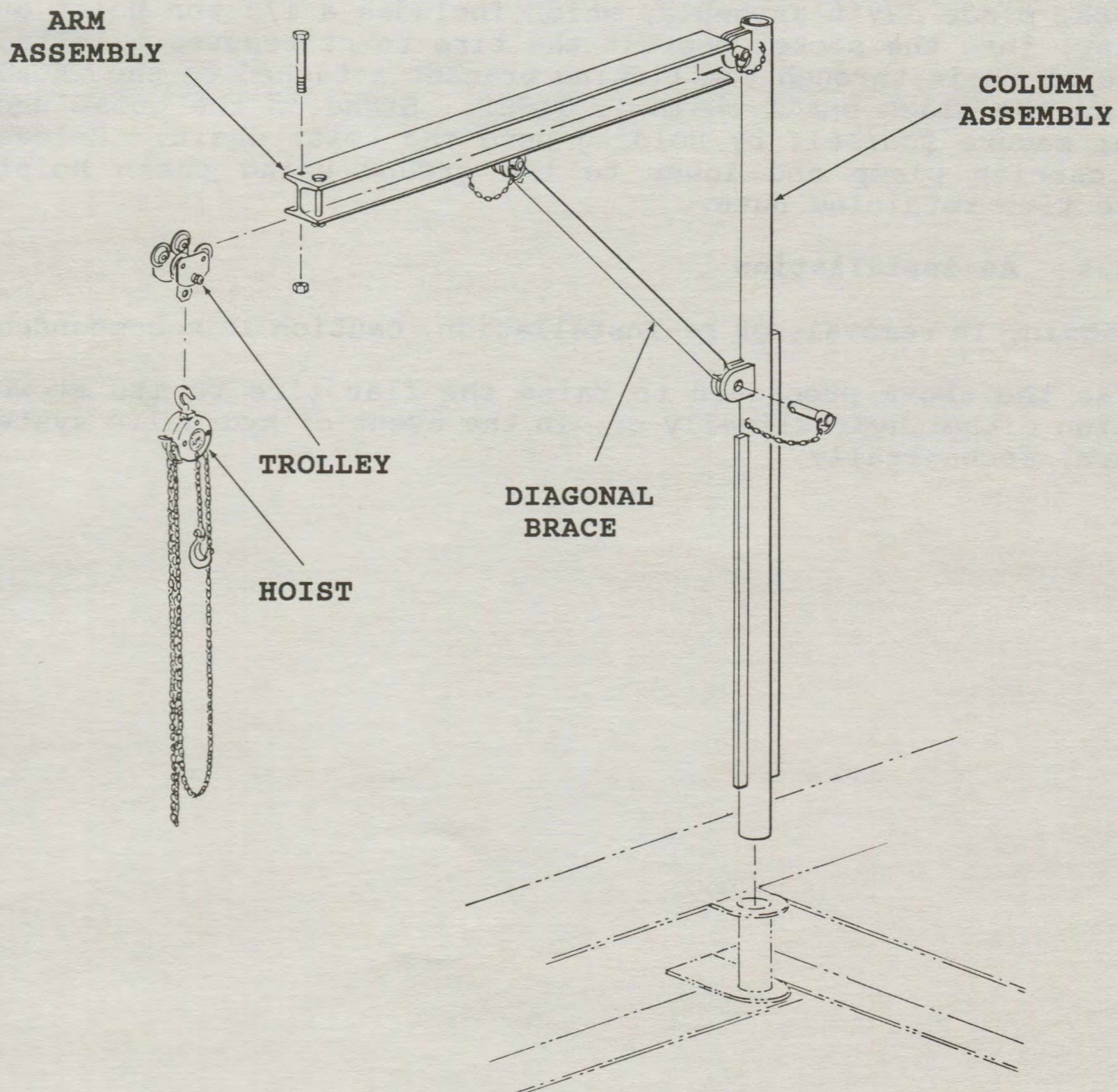
4-2.3

TIRE REPLACEMENT

The replacement of a flat or defective tire is accomplished by using the 30 ton capacity jack (provided with trailer), placing the jack under the axle of the flat tire, raise the jack until pressure is taken off the tire and loosen the wheel studs using lug nut wrench provided in tool box.

Jack up the tire until it is clear of the ground. Remove the wheel nuts and slide wheel off of the hub, taking care not to damage the studs. Note that the wheel is heavy and cumbersome and caution must be used in removal. For removing an inside rear tire, the Davit Assembly is used to lift the tire up through the rear deck opening. The Davit Assembly is provided with a half-ton hoist and trolley. A front inner tire is removed by moving it forward and laying it on the ground, then pulling it out from beneath the trailer.

DAVIT ASSEMBLY



The spare tires and wheel assemblies are mounted on hydraulically operated carriers along side the trailer's goose neck. When the replacement of a defective or flat tire is required, the following procedures are recommended:

NOTE

The size and weight of the tire and wheel can make the job of removal very awkward. Therefore, a degree of caution is recommended in the removal phase and the remounting of the tires and wheels.

4-2.3.1 Removal

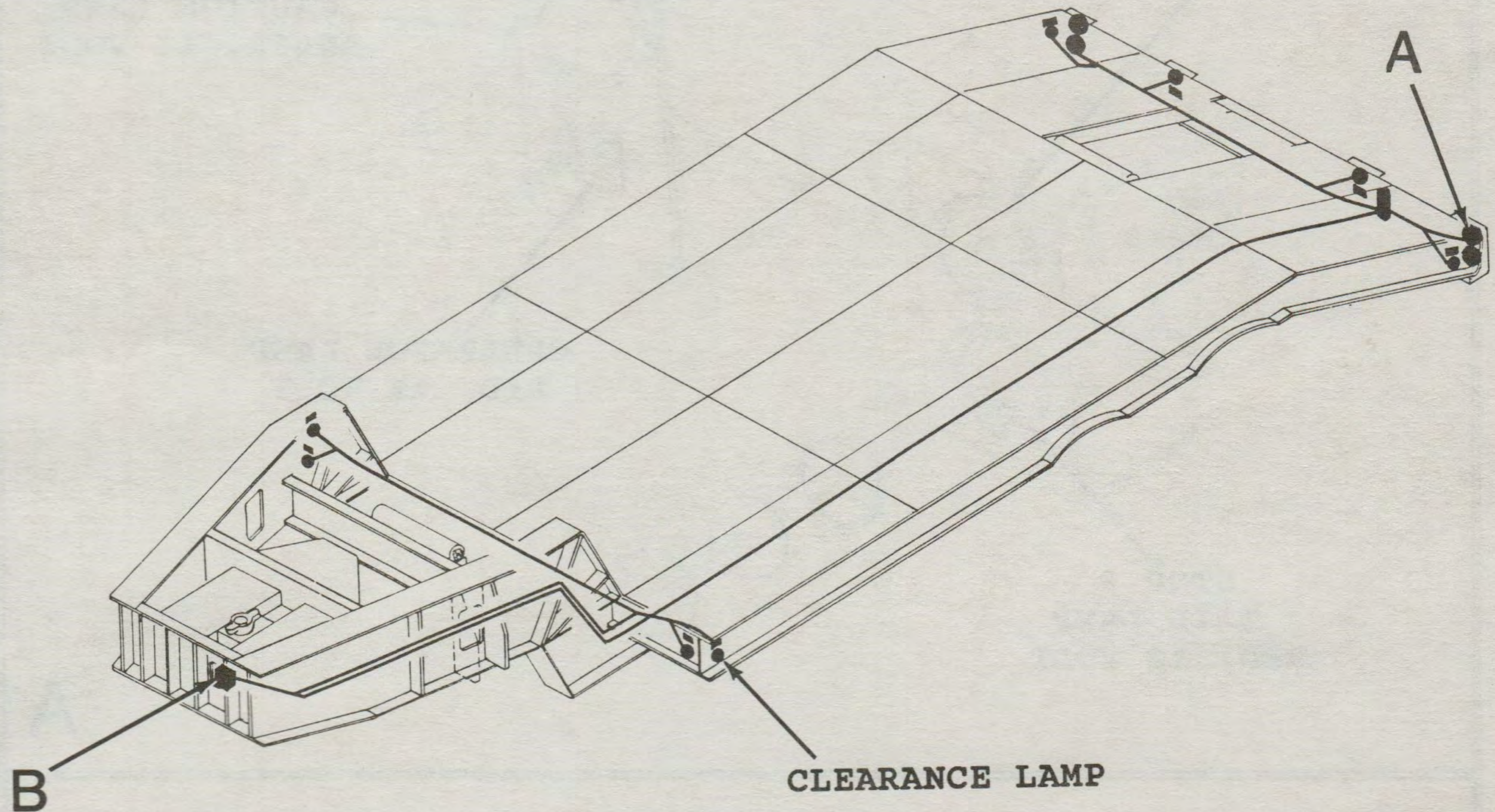
Release tire carrier locking clamp and lower to ground by operating the appropriate hydraulic valve. In the event of hydraulic system failure, place davit assembly, which includes a 1/2-ton hoist and trolley, into the socket nearest the tire to be removed. Install the hoist chain through the lifting bracket attached to the wheel. Pull up the slack until chain is TIGHT. Stand on the goose neck frame; secure yourself by holding onto the hoist chain. Release tire carrier clamp and lower to the ground using chain hoist. Remove tire retaining nuts.

4-2.3.2 Re-installation

Once again, in removal, or re-installation, caution is recommended.

Reverse the above procedure to raise the flat tire to its stowed position either hydraulically or, in the event of hydraulic system failure, mechanically.

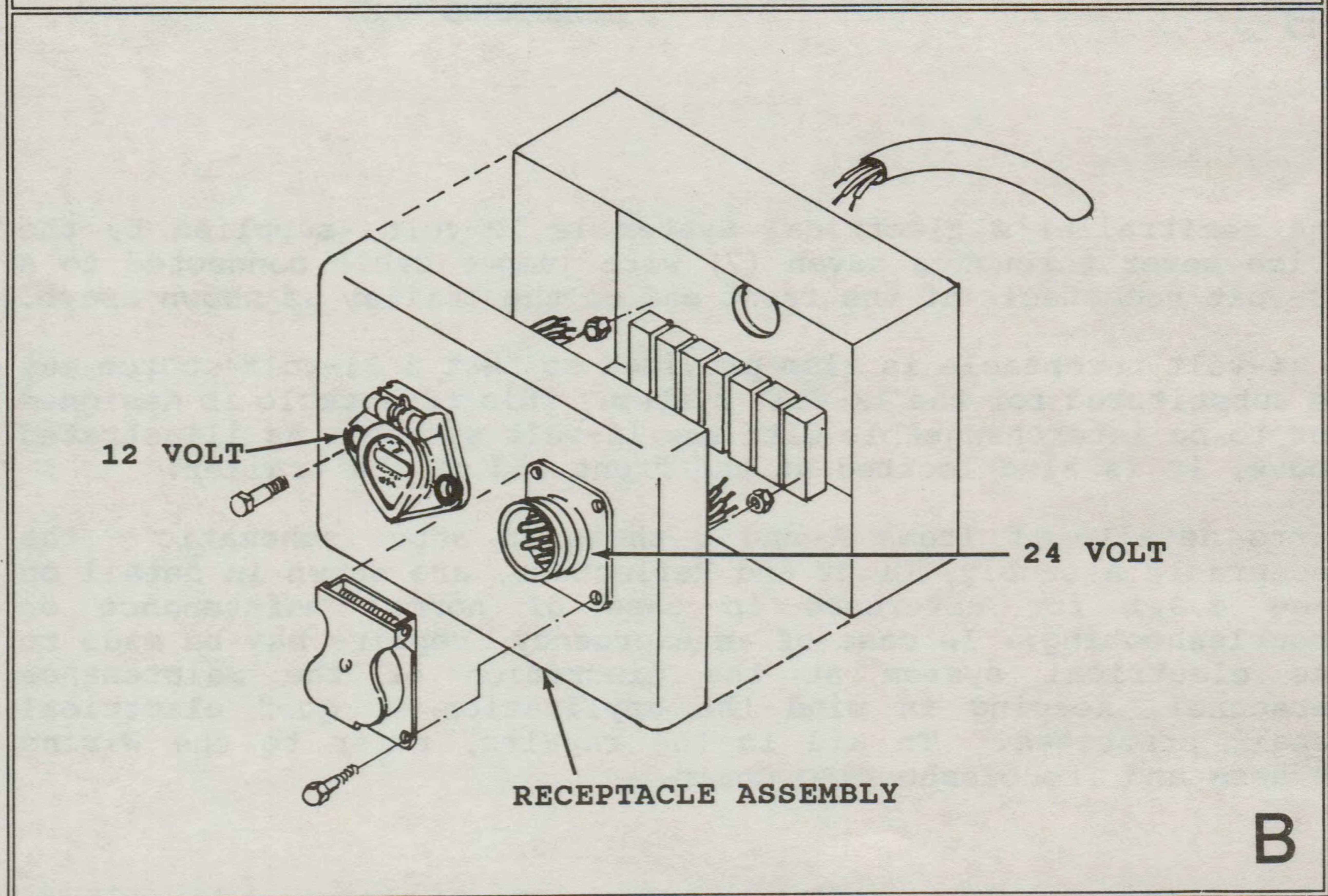
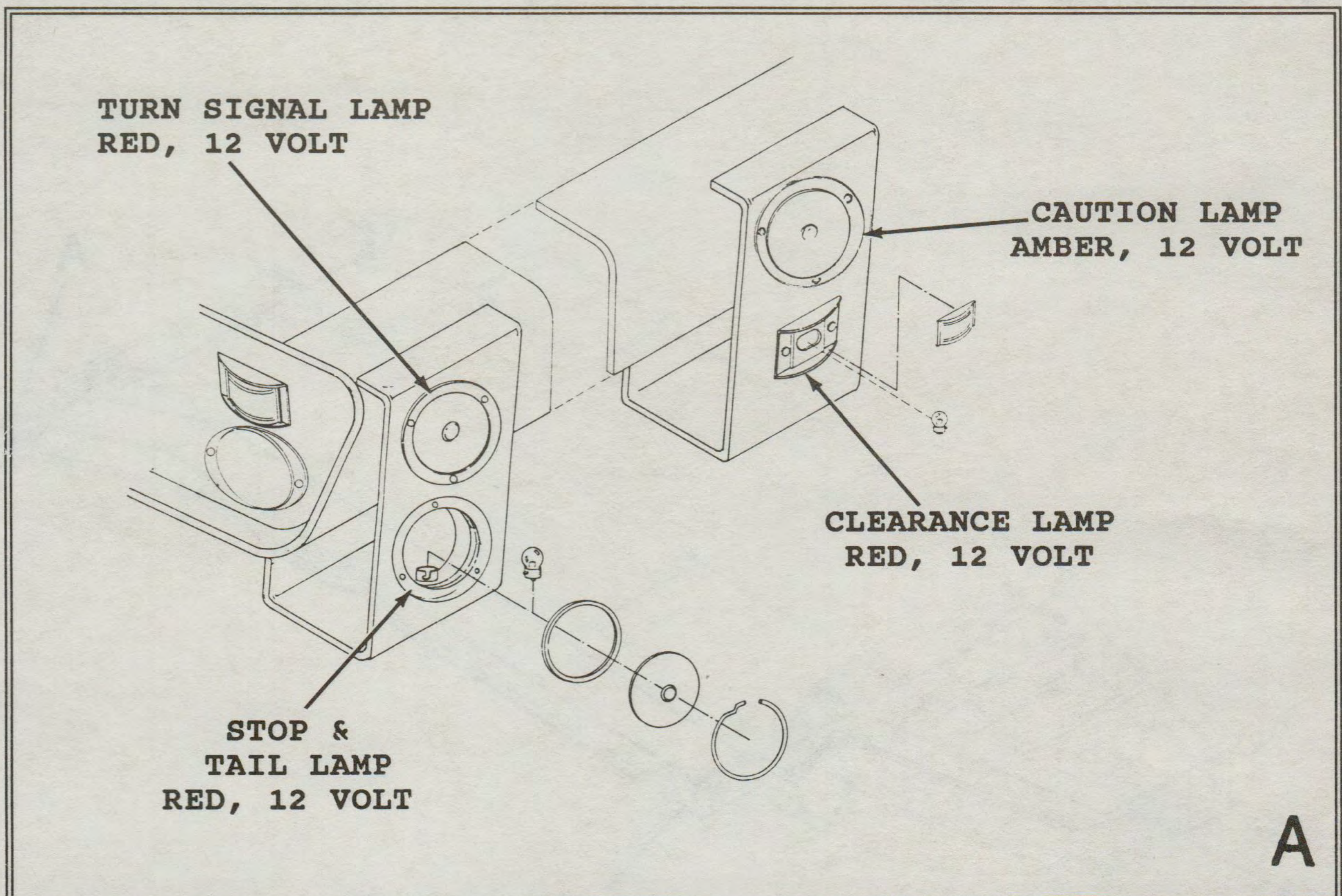
4-3. ELECTRICAL SYSTEM



The semitrailer's Electrical System is 12-volt, supplied by the prime mover through a seven (7) wire jumper cable connected to a 12-volt receptacle at the front end of the trailer as shown above.

A 24-volt receptacle is also provided so that a 24-volt source may be substituted for the 12-volt system. This receptacle is designed not to be interchangeable with the 12-volt system. As illustrated above, it is also located at the front end of the trailer.

Parts details of Items A and B shown in above schematic - the Receptacle Assembly, Light and Reflectors, are shown in detail on page 4.3.1 for reference in case of normal maintenance or troubleshooting. In case of an emergency, repairs may be made to the electrical system at the discretion of the maintenance personnel, keeping in mind the application of good electrical repair practices. To aid in the repairs, refer to the Wiring Harness and Troubleshooting Chart.



4-3.1 RECEPTACLE ASSEMBLY, LIGHTS AND REFLECTORS PARTS DETAIL

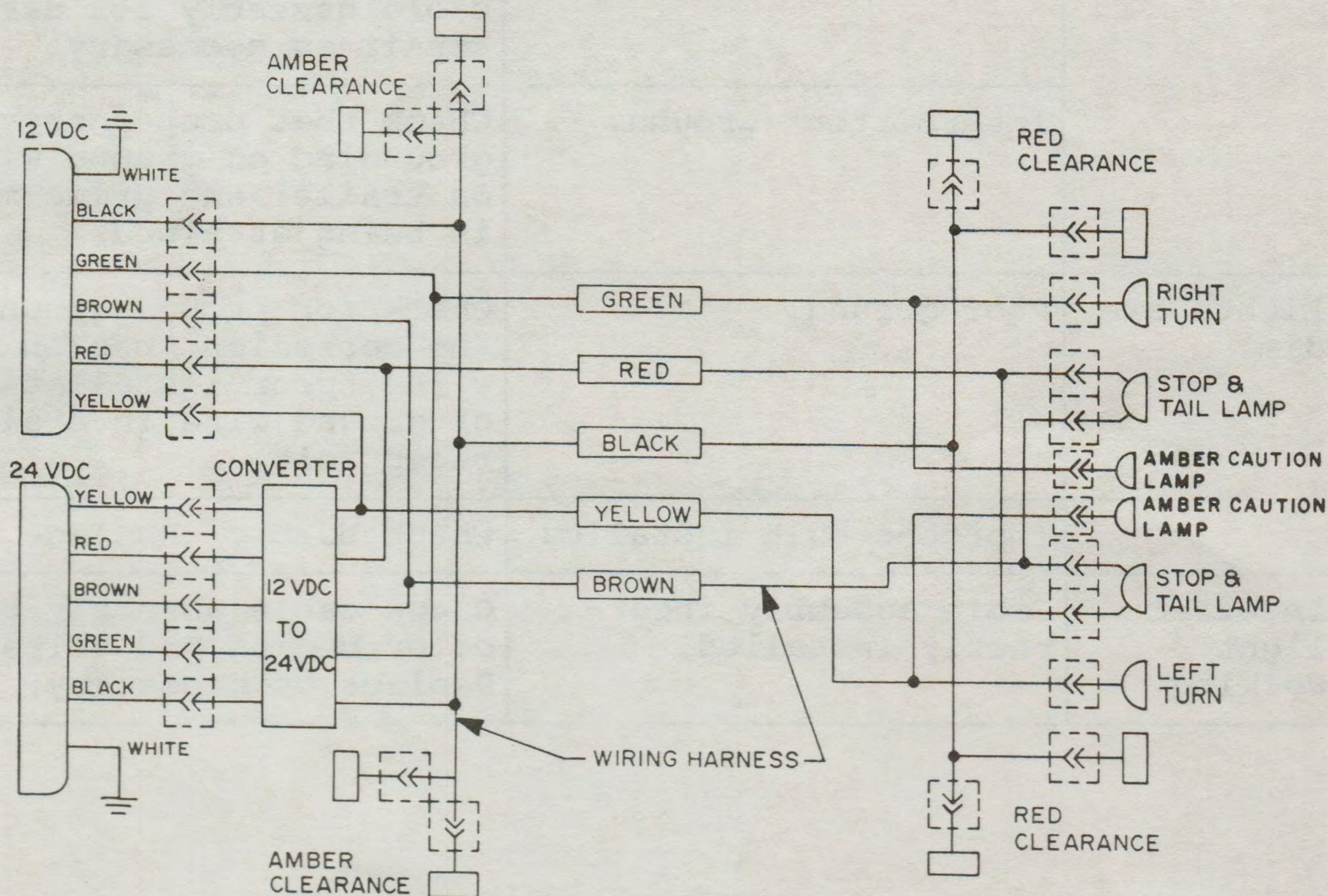
4-3.2

COMPONENTS OF THE ELECTRICAL SYSTEM

<u>Number (each)</u>	<u>Type</u>	<u>Voltage</u>
2	Amber Front End Clearance Lamps	12
2	Amber Front End Side Clearance Lamps	12
2	Red Rear End Clearance Lamps	12
2	Red Rear End Side Clearance Lamps	12
2	Red Rear End Turn Signal Lamps	12
2	Red Rear End Stop and Tail Lamps	12
2	Amber Rear End Caution Lamps	12
1	Front End Conductor Receptacle	12
1	Wiring Harness	--
1	Converter, 24 to 12 Volt	--
6	Amber Reflectors (no power required) - Mounted on the front and front sides of the trailer.	
2	Red Reflectors (no power required) - Mounted on the rear sides of the trailer.	

4-3.3

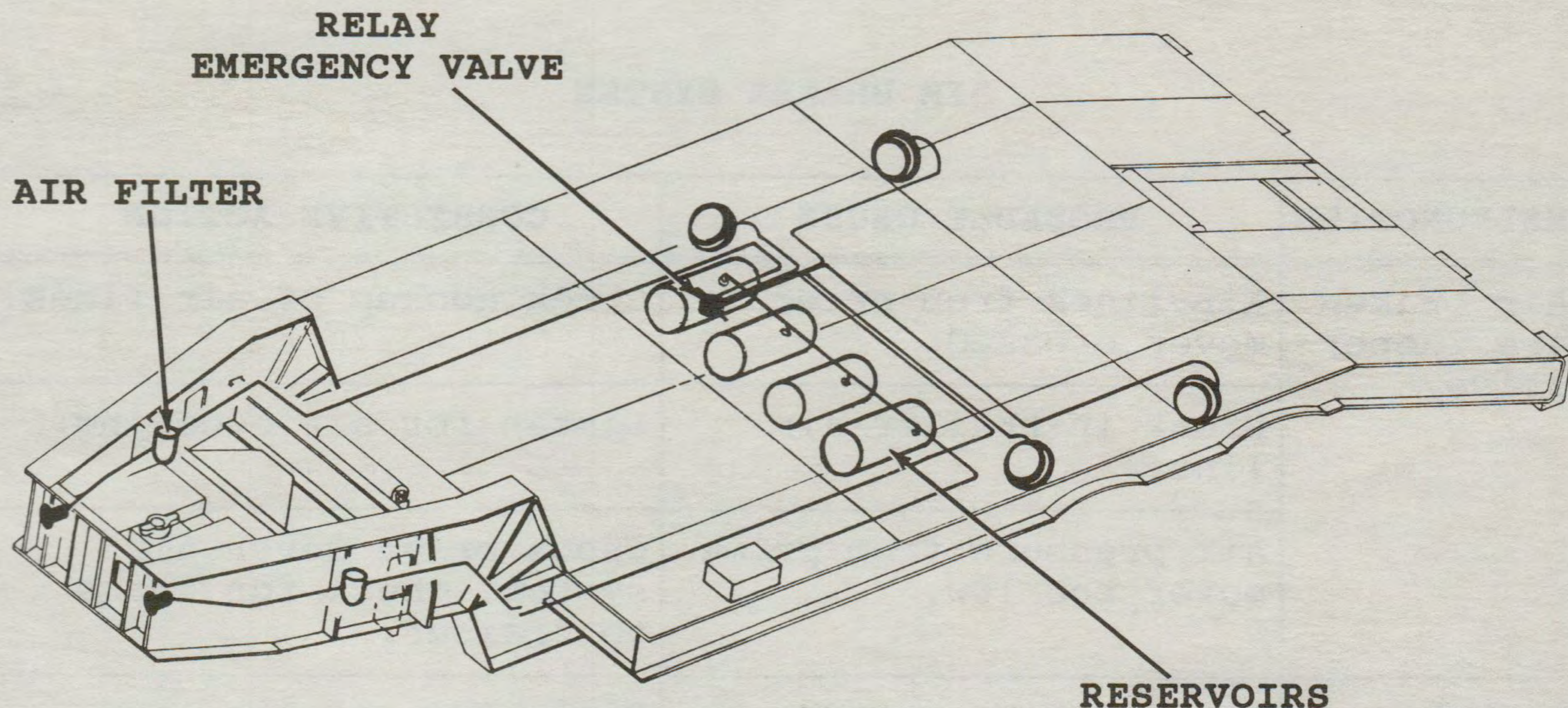
WIRING HARNESS



ELECTRICAL SYSTEM

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Lights will not work.	Prime mover connector not properly secured in trailer receptacle.	Check connector/receptacle engagement.
	Cable assembly wires open.	Check wiring harness for damage and for voltage to determine where the break in line is occurring.
	No ground.	Check ground wire at receptacle. Also check ground on prime mover. Repair as necessary.
Lights intermittently work.	Loose cable assembly connector or partially severed line.	Check cable assembly connectors and receptacle connections for proper assembly; usually check cable assembly for damage. Repair as necessary.
	Intermittent ground.	Check that proper physical grounding of ground wires on trailer and prime mover is being attained.
Lights are dim.	Poor ground.	Check for proper grounding (no corrosion, broken wires, poor installation of ground wire in trailer receptacle)
	Improper bulb installed.	Check bulbs. Replace.
Incorrect light working.	Cable assembly incorrectly installed.	Check cable assembly by color coding and voltage. Replace as necessary.

4-4. AIR BRAKE SYSTEM



The Air Brake System operates at a pressure of 100 psi supplied by the prime mover. The air reservoirs are located within the main frame, midway between the goose neck and the rear end of the semitrailer.

The Relay Emergency Valve controls the air flow from the reservoirs. The valve is located on the right hand reservoir. When the brakes are applied, the emergency valve is activated and pressure is sent from the reservoirs to the semitrailer's brakes.

The reservoirs are charged from the prime mover through the service and emergency air lines. The air filters within the air line prevent any "large" impurities from entering the down stream part of the air system. If the air line pressure drops under 45 psi, the emergency valve will release air from the reservoirs to the brake chambers; applying the brakes. Only an increase in line pressure to 100 psi will restore usage of the brakes. If there is no release of the brakes, the prime mover, jumper hose, and air system piping must be checked for leakage.

Parking brake action can be obtained by rotating the brake pushrod tube (Parts Manual Figure 4-7.2, item 21) counterclockwise by hand or using a wrench on the hex nut, till the tube touches the brake chamber. Brakes must be actuated to do above.

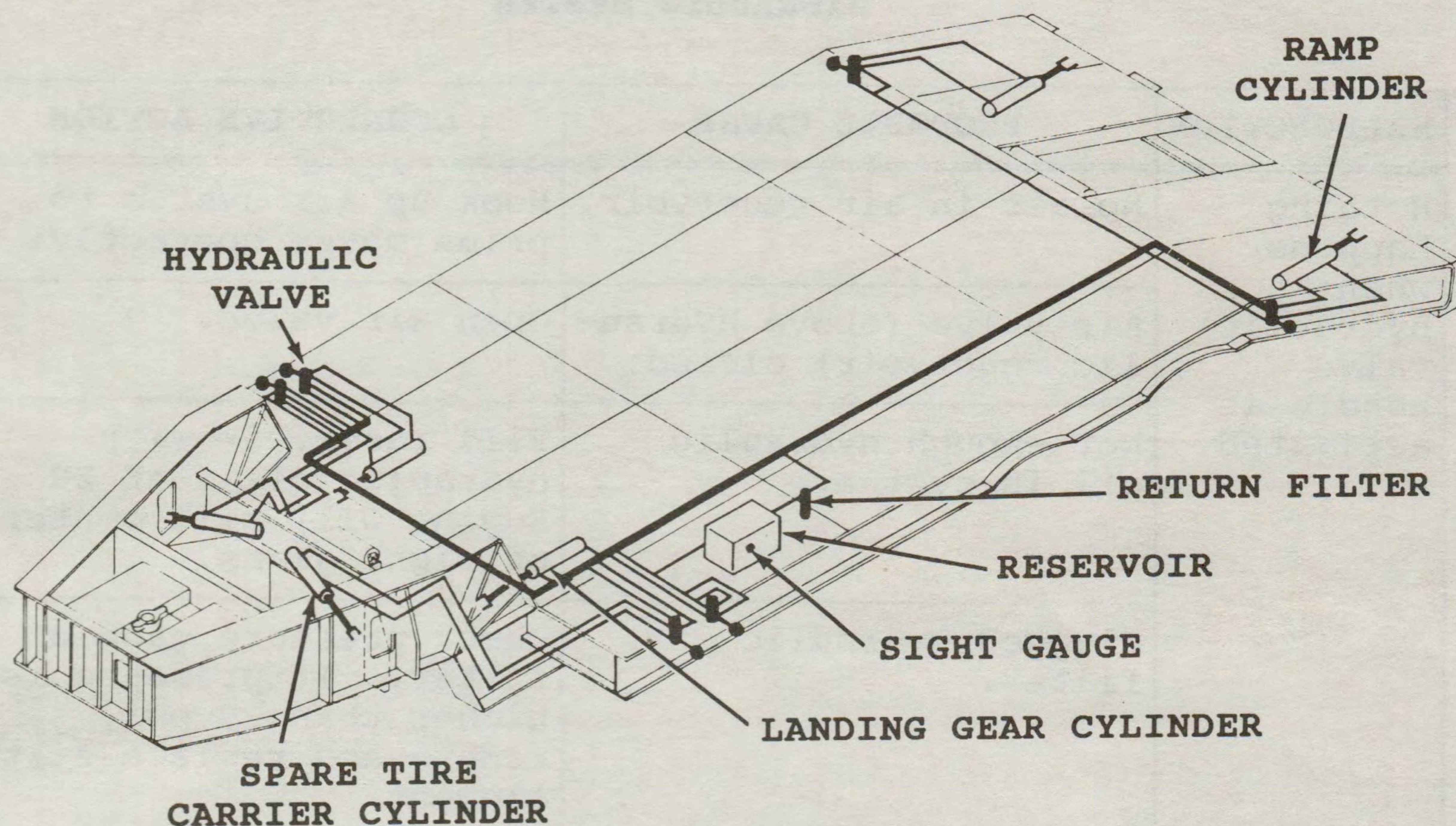
CAUTION

Only use when parking on slopes and ensure tube is rotated clockwise back to original position before moving trailer.

AIR BRAKES SYSTEM

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Air brakes are inoperative.	Air lines from prime mover crossed.	Check hookup of air lines.
	Break in trailer air line.	Listen for air escaping.
	Air pressure from prime mover too low.	Check prime mover air system, check for leaks to trailer.
Brakes locked up all the time.	Loss of air pressure to emergency relay valve.	Find cause of air loss and repair as necessary.
	Defective emergency valve.	Check action of valve and replace if defective.
	Parking brake actuator left in place.	Remove parking brake actuator from rear brake chambers.
One side of brake engages before the other side.	Usually caused by misadjustment of brakes.	Check adjustment of slack adjustor(s).
	Restriction of cam shaft movement.	Cycle system checking cam shaft movement. Replace parts(s) as necessary.
One side of brakes locked up all the time.	Usually caused by defective spider brake bearing.	Cycle system checking cam shaft movement. Replace part(s) as necessary.
Brakes slipping.	Usually adjustment, or possible defective parts of brake assembly.	Check adjustment or replace part(s) as necessary.

4-5. HYDRAULIC SYSTEM



The trailer is equipped with a hydraulic system that operates from prime mover supplied compressed air to operate the loading ramps, landing gear and spare tire carrier.

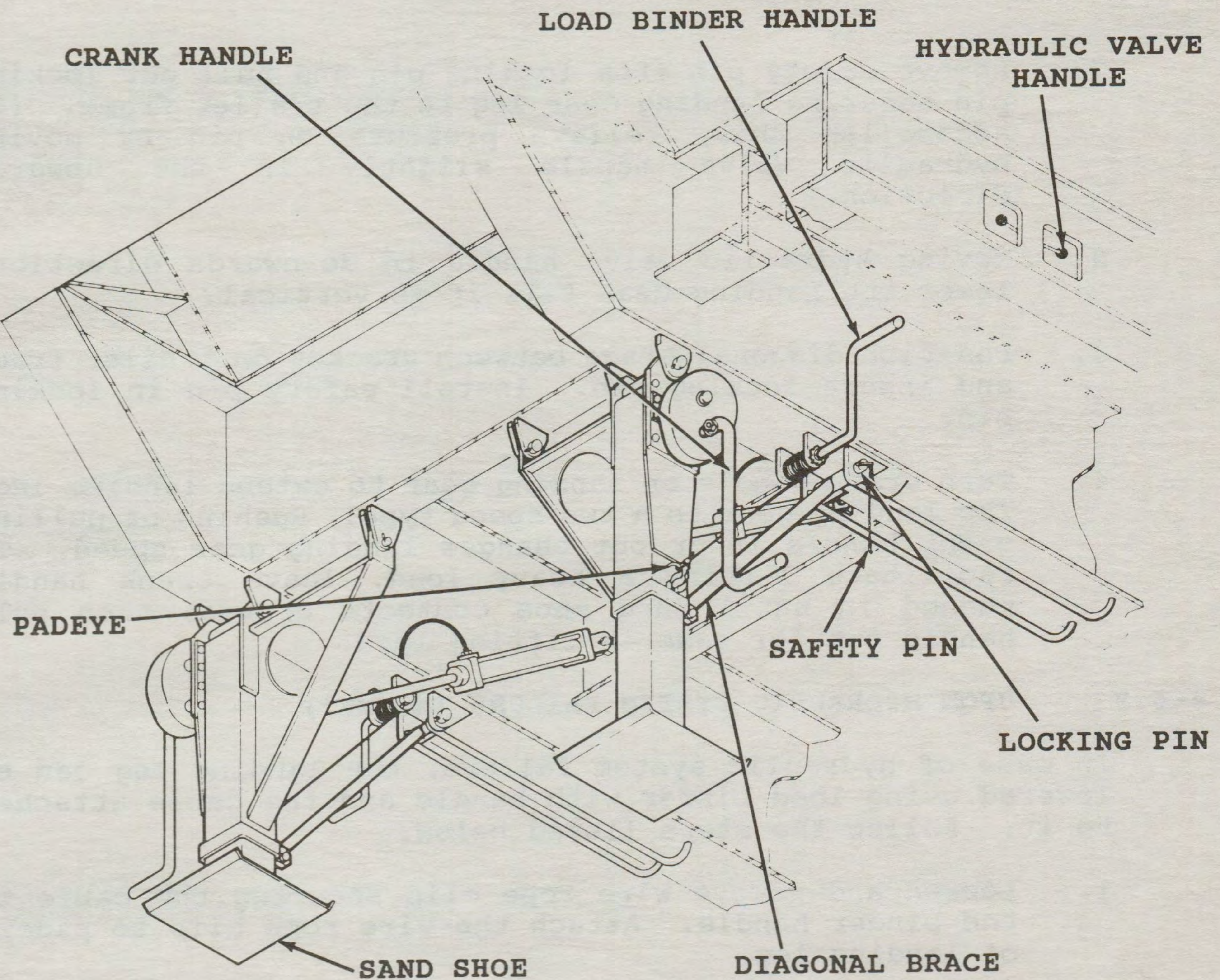
The Hydraulic System consists of an air operated pump mounted inside a reservoir, hydraulic valves, hydraulic cylinders, return line filter, hoses and fittings. The air operated pump has a mechanical handle operated override for emergency. The reservoir is located at the left front of the trailer.

The reservoir is filled with hydraulic oil (SAE 20 Engine Oil) whose level should always be maintained till the center of sight glass. The hydraulic system is pressurized by air at 100 psi provided from the prime mover. Opening the shut-off valve (located on the top of reservoir) provides air to the hydraulic pump. Operating any of the six hydraulic valves in the desired direction, provides pressurized hydraulic fluid to the respective cylinders. It pressurizes the hydraulic cylinder in the desired direction and raises or lowers that equipment. Oil returns to the reservoir through the return line filter. Upon completion of the desired action, the air valve should be closed.

HYDRAULIC SYSTEM

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
Nothing happens when hydraulic valve handle is activated.	No air in air reservoir.	Hook up air system to prime mover correctly.
	Air valve (above hydraulic reservoir) closed.	Open air valve.
	Not enough hydraulic oil in system.	Fill reservoir with hydraulic oil (SAE 20 Engine Oil) till center of sight glass.
	Clogged hydraulic filter.	Check pressure gage on filter. If pressure is higher than 25 psi, remove and replace filter element.
	Defective hydraulic valve or hydraulic cylinder.	Repair or replace respective valve or cylinder.

4-6. LANDING GEAR ASSEMBLY



When the semitrailer is disconnected from its prime mover, the Landing Gear Assembly is the trailer's main support member (with the exception of the suspension).

To lower the Landing Gear follow the steps listed below. To raise the Landing Gear the reverse order is followed. The steps are provided for both the hydraulic system functioning and not working at all.

4-6.1 HYDRAULIC SYSTEM WORKING

NOTE

Before raising Landing Gear be sure the kingpin is locked into the fifth wheel of the prime mover and hydraulic oil (Engine Oil SAE 20) level is visible in the reservoir sight glass.

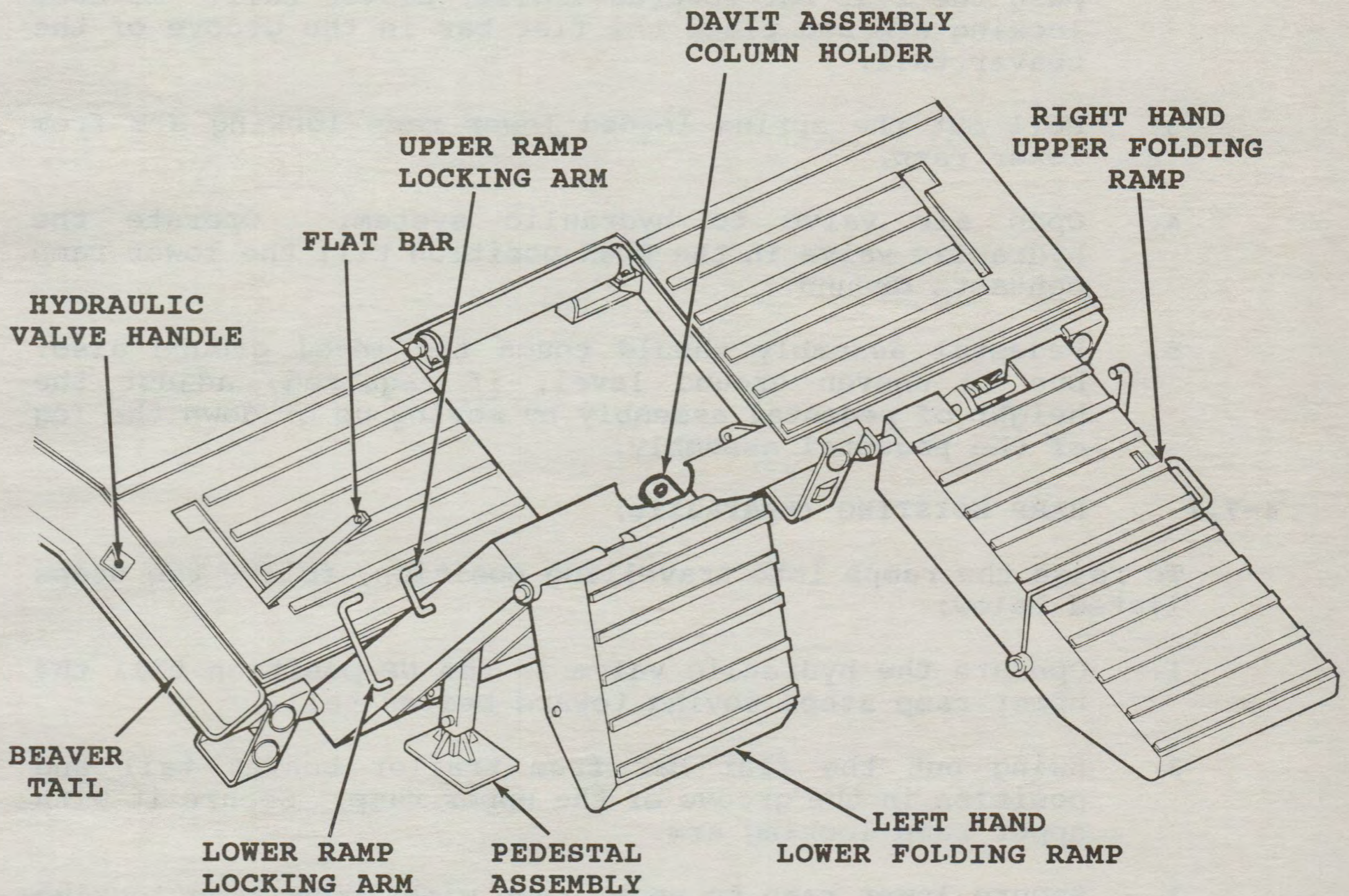
1. Remove safety pin from locking pin and pull out locking pin securing Landing Gear leg to the trailer frame. (To accomplish this, relieve pressure on pin by moving hydraulic valve handle slightly in the upwards direction.)
2. Moving hydraulic valve handle in downwards direction, lower the Landing Gear till it is vertical.
3. Position diagonal brace between bracket on trailer frame and insert locking pin. Install safety pin in locking pin.
4. Turn crank handle on landing gear to extend landing leg. The landing gear is a two speed type. Pushing or pulling crank handle in or out changes landing gear speed. To facilitate lifting a heavy load, leave crank handle pushed in until sand shoe contacts ground; then pull handle out for ease in lifting load.

4-6.2 UPON HYDRAULIC SYSTEM FAILURE (Manual)

In case of hydraulic system failure, the landing leg can be lowered using load binder with handle and the cable attached to it. Follow the steps listed below.

1. Loosen and remove wire rope clip securing the cable to the binder handle. Attach the wire rope clip to padeye of landing leg.
2. Perform step 1 of paragraph 4.6.1.
3. Holding binder handle firmly, release pawl from ratchet and lower landing gear by controlling rotation of handle.
4. Perform steps 3 and 4 of paragraph 4.6.1.

4-7. LOADING RAMP/PEDESTAL ASSEMBLY



The Loading Ramp/Pedestal Assembly consists of two folding ramps hinged to the rear of the trailer and a Pedestal Assembly attached to the upper segment of the ramp. The 30-inch-wide loading ramps are raised and lowered by use of a Hydraulic Valve handle.

4-7.1 RAMP LOWERING (Hydraulic)

To lower the ramps into the loading position, follow the steps listed below:

1. Set semitrailer brakes.

2. Pull out the spring loaded upper ramp locking arm and push the flat bar towards trailer beaver tail. Release locking arm and place the flat bar in the groove of the beaver tail.
3. Pull out the spring loaded lower ramp locking arm from lower ramp.
4. Open air valve to hydraulic system. Operate the hydraulic valve in the DOWN position till the lower ramp contacts ground.
5. Pedestal assembly should touch the level ground also. Due to uneven ground level, if required, adjust the height of pedestal assembly by moving up or down the leg of the pedestal assembly.

4-7.2 RAMP HOISTING (Hydraulic)

To raise the ramps into travelling position, follow the steps listed below:

1. Operate the hydraulic valve in the UP position till the upper ramp stops moving toward beaver tail.
2. Swing out the flat bar from trailer beaver tail and position in the groove of the upper ramp. Secure it with upper ramp locking arm.
3. Secure lower ramp to upper ramp with lower ramp locking arm.

4-7.3 RAMP LOWERING (Manually)

In case of hydraulic system failure, the loading ramp can be lowered by following the steps listed below.

1. Perform steps 1 through 3 of paragraph 4-7.1.
2. Turn the hydraulic valve handle in DOWN position and push hard on the upper ramp. The ramp will fall open in fully extended position.

4-7.4 RAMP HOISTING (Manually)

In case of hydraulic system failure, the loading ramp is hoisted using the Davit Assembly (placed in the tool box on goose neck). The Davit Assembly is provided with a half-ton hoist and trolley. Follow the steps listed below.

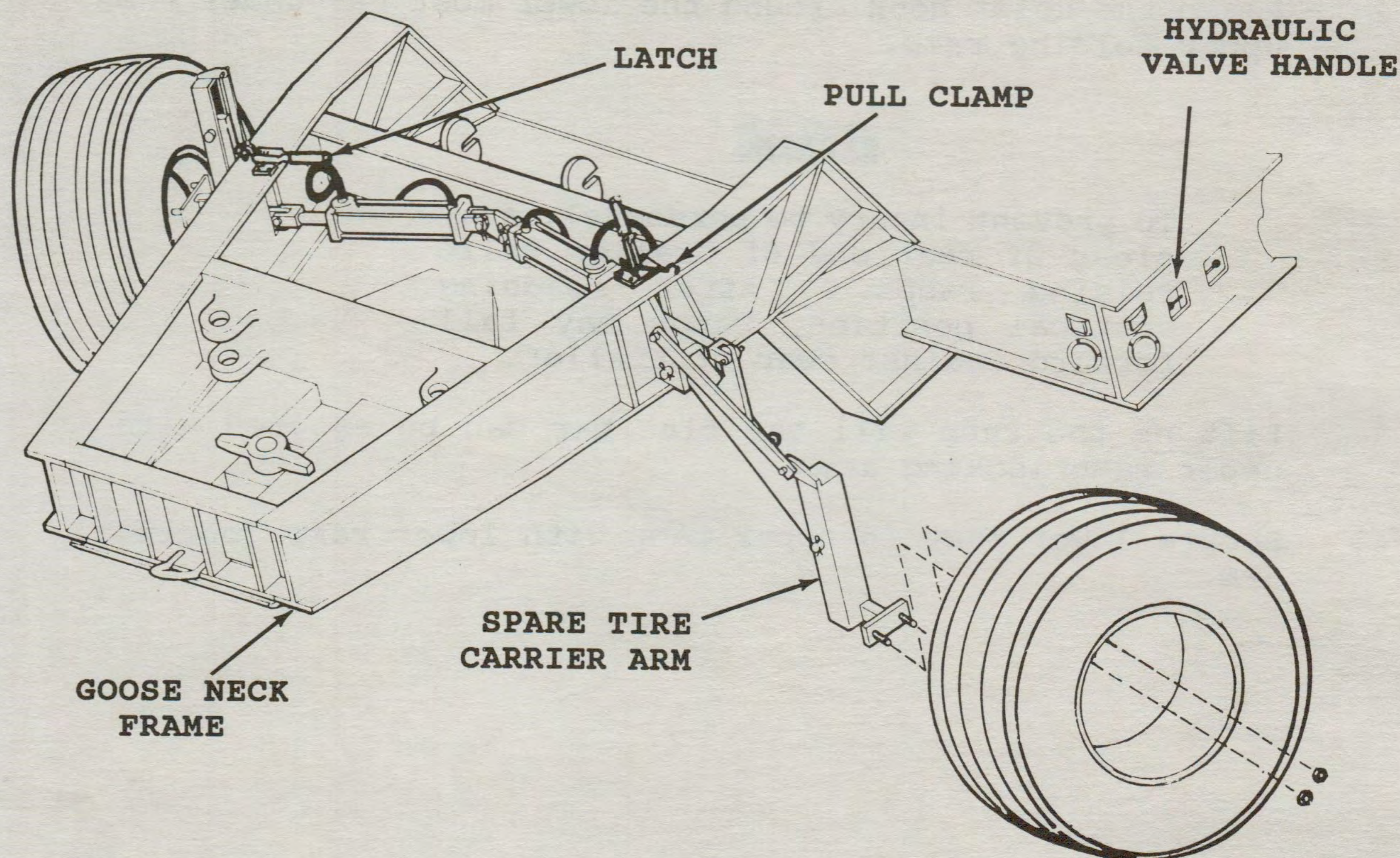
1. Position the column of davit assembly in the space provided, between two loading ramps on the inner rear end of the trailer.
2. Place the hoist hook around the lower most bar under the upper folding ramp.

WARNING

To prevent injury to personnel, stay clear of rear end of trailer while raising ramps. After reaching vertical position, ramps may fall forward against rear of trailer.

3. Lift up the ramp till the flat bar can be secured with upper ramp locking arm.
4. Secure lower ramp to upper ramp with lower ramp locking arm.

4-8. SPARE TIRE CARRIER



The spare tires and wheel assemblies are mounted on hydraulically operated carriers along side of the trailer's goose neck. In the event of hydraulic system failure, follow procedures given in paragraph 4-2.3.

4-8.1 LOWERING SPARE TIRE

1. Release latch securing spare tire carrier arm to goose neck frame.
2. Operate appropriate hydraulic valve handle to lower tire to ground.
3. Remove tire from carrier arm by removing two nuts and lockwashers.

4-8.2 RAISING SPARE TIRE

1. Secure spare tire to spare tire carrier arm with two lockwashers and nuts.
2. Operate appropriate hydraulic valve handle to raise spare tire to stowed position.
3. Secure spare tire carrier arm to goose neck frame with pull clamp and engage latch.

5. OPERATION CHECKLIST

5-1. PLACING TRAILER IN SERVICE

1. Use trailer only with proper prime mover. The trailer must be properly secured to the prime mover. The electrical and air jumper cables must be properly hooked up.
2. Check to see that the payload is properly secured on the deck.
3. Inspect all nuts and bolts to insure tightness.
4. Check for proper connection of the electrical jumper cable.
5. Thoroughly check the lights and turn signals.
6. Check for proper brake operation.
7. Check the tire pressure for proper inflation.
8. Secure the Loading Ramps in place on the sloping rear deck with the available chains and load binders.
9. Fill Hydraulic Oil (SAE 20 Engine Oil) in reservoir to the center of sight glass.

5-2. DURING OPERATION

1. Stop at 2-hour intervals to check tires for excessive heat.
2. At this time, check the payload for security.

5-3. WHEN PARKING

1. Lower Landing Gear. (See page 4.6)
2. Set trailer brakes by pulling the parking brake lever in cab of prime mover.
3. Disengage air and electrical lines and secure them on prime mover.
4. Disengage locking mechanism on fifth wheel.
5. Extend landing gear to obtain clearance between fifth wheel and king pin plate on trailer.
6. Pull Prime mover slowly away from trailer.