LANDOLL
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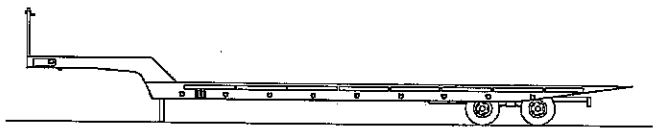


MODEL 317
CITY OF NEW YORK

OPERATOR/SERVICE MANUAL

SERIAL NUMBER: _____

FORM F-121

8/89

TABLE OF CONTENTS

THE WARRANTY CARD IS LOCATED AT HE BACK OF THIS MANUAL. THE WARRANTY CARD MUST BE FILLED OUT AND RETURNED WITHIN 15 DAYS OF THE PURCHASE DATE OF THE SEMITRAILER.

SAFETY PRECAUTIONS

THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. WHEN YOU SEE THIS SYMBOL, CAREFULLY READ AND STUDY THE MESSAGE THAT FOLLOWS. BEFORE BEGINNING THAT OPERATION, BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

KEEP ALL PERSONNEL CLEAR OF FRONT, REAR, AND SIDES OF TOWING VEHICLE AND SEMITRAILER DURING COUPLING, COMPONENT OPERATIONS, AND UNCOUPLING. FAILURE TO STAY CLEAR MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

ALWAYS CHECK BEHIND AND UNDER THE TRACTOR AND SEMITRAILER FOR PERSONS OR OBJECTS BEFORE BACKING. FAILURE TO DO SO MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH TO OTHERS OR DAMAGE TO PROPERTY.

WHEN CRAWLING UNDER THE SEMITRAILER IS NECESSARY, CHOCK ALL WHEELS OF THE TRAILER AND TRACTOR. WHEN JACKING IS NECESSARY, CHOCK ALL WHEELS AND SUPPORT THE TRAILER WITH JACK STANDS SUFFICIENT TO WITHSTAND THE WEIGHT OF THE TRAILER AND ITS LOAD. FAILURE TO TAKE ADEQUATE SAFETY MEASURES DURING THESE OPERATIONS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

DO NOT OPERATE THE SEMITRAILER UNTIL YOU COMPLETELY UNDERSTAND THE PROPER USAGE AND FUNCTION OF ALL CONTROLS. IMPROPER USAGE OF THE SEMITRAILER MAY CAUSE PERSONAL INJURY, DAMAGE TO YOUR SEMITRAILER AND CARGO, AND TIME CONSUMING BREAKDOWNS.

WHEN LEAVING THE SEMITRAILER UNATTENDED, POSITION ALL HYDRAULIC CONTROLS TO THE NEUTRAL POSITION AND SHUT OFF THE HYDRAULIC PUMP.

OPERATING THE TRACTOR OR SEMITRAILER WITH DEFECTIVE, BROKEN, OR MISSING PARTS MAY RESULT IN SERIOUS INJURY OR DEATH OF PERSONNEL, DAMAGE TO THE TRACTOR OR SEMITRAILER OR ITS CARGO, AND PROPERTY IN ITS PATH.

WHEN SERVICING THE BRAKES, ALWAYS CHOCK WHEELS BEFORE RELEASING BRAKES. FAILURE TO CHOCK WHEELS BEFORE RELEASING BRAKES MAY ALLOW THE SEMITRAILER TO ROLL RESULTING IN SERIOUS PERSONNEL INJURY OR DEATH.

SAFETY PRECAUTIONS

USE GREAT CARE IF WHEELS OR BRAKE DRUMS MUST BE TOUCHED OR HANDLED. THEY MAY BE VERY HOT AND CAN CAUSE SERIOUS INJURY.

THE WINCH IS NOT DESIGNED OR INTENDED FOR USE IN THE LIFTING OR MOVING OF PERSONS! USING THE WINCH TO LIFT OR MOVE ANY PERSON MAY RESULT IN THE SERIOUS INJURY OR DEATH OF THAT PERSON.

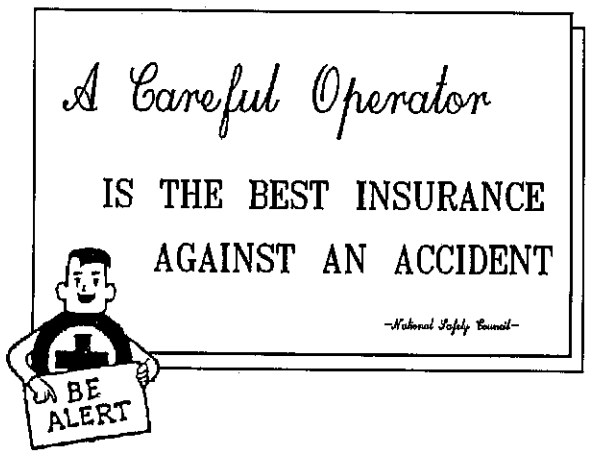
NEVER ATTEMPT TO DISENGAGE THE WINCH CABLE SPOOL WHEN THE CABLE IS UNDER TENSION. THE LOAD MAY ROLL AWAY AT WILL. SERIOUS INJURY OR DEATH MAY RESULT TO PERSONS IN THE PATH OF THE ROLLING LOAD.

DO NOT HANDLE THE WINCH CABLE WHEN THE WINCH IS IN THE ENGAGE POSITION. HANDS, OR CLOTHING COULD GET CAUGHT IN THE CABLE AND BE PULLED INTO THE SPOOL CAUSING SERIOUS PERSONAL INJURY.

FAILURE TO LEAVE AT LEAST FIVE WINCH CABLE WRAPS ON THE WINCH CABLE SPOOL COULD ALLOW THE CABLE TO COME OFF THE SPOOL. THIS COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH TO ANYONE IN THE PATH OF THE LOOSE WINCH CABLE.

DO NOT EXCEED THE GROSS AXLE WEIGHT RATINGS FOR ANY AXLE ON YOUR VEHICLE.

THE COMBINED WEIGHT OF THE TRACTOR, TRAILER, AND CARGO MUST NOT EXCEED THE GROSS VEHICLE WEIGHT RATING (GVWR) OF THE TRACTOR.



Remember. . .
Quality is always a bargain!

1 INTRODUCTION

THIS MANUAL PROVIDES OPERATING PROCEDURES TO HELP YOU OBTAIN EFFICIENT AND DEPENDABLE USE FROM YOUR NEW EQUIPMENT. THIS MANUAL ALSO CONTAINS GENERAL INFORMATION, SPECIFICATIONS, SAFETY PRECAUTIONS, MAINTENANCE, PARTS LISTS, AND ILLUSTRATIONS. READ THIS MANUAL CAREFULLY BEFORE OPERATING THE EQUIPMENT. KEEP IT HANDY FOR FUTURE REFERENCE.

IF AT ANY TIME YOU HAVE ANY QUESTIONS, OR FOR LANDOLL REPLACEMENT PARTS AND SERVICE, CONTACT YOUR LANDOLL DEALER, OR CALL:

LANDOLL CORPORATION
SALES & SERVICE
1700 MAY STREET
MARYSVILLE, KANSAS 66508

OR PHONE:
(785)562-5381
1-800-HAULOLL
(1-800-428- 5655)
FAX NO.: (785) 562-4893

THE LANDOLL MODEL 317 NEW YORK CITY SEMITRAILERS ARE A QUALITY PRODUCT DESIGNED TO GIVE YEARS OF TROUBLE-FREE PERFORMANCE. IF YOU WILL UTILIZE THE INFORMATION CONTAINED IN EACH SECTION OF THIS MANUAL, YOUR EQUIPMENT WILL PERFORM AS DESIGNED FOR YOU AND YOUR BUSINESS.

NOTES:

2 TERMINOLOGY

The figure below of the Model 317 New York City Semitrailer lists terms which are used throughout this manual. A good knowledge of the terms in the following illustrations will make the study of this manual easier.

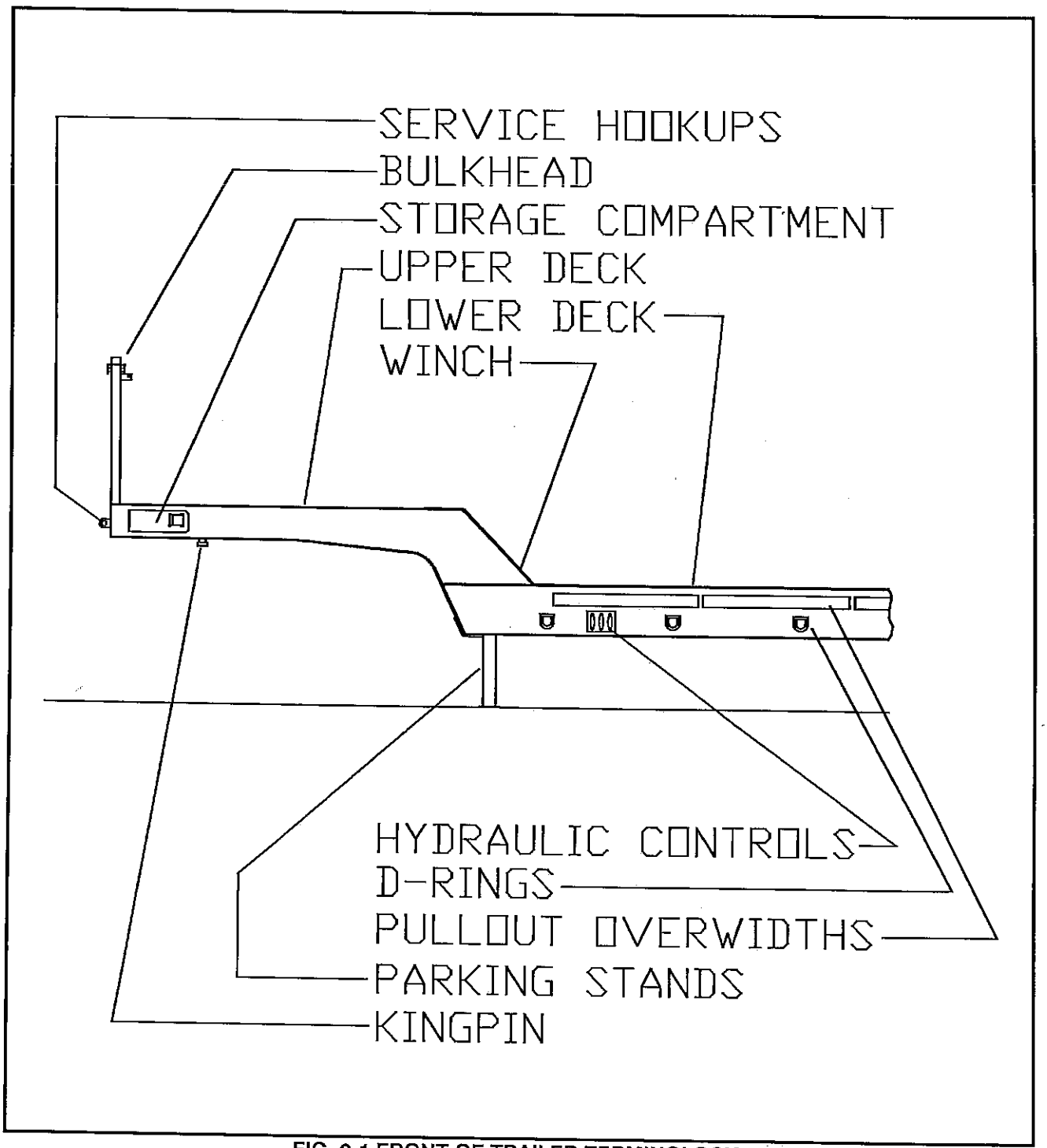


FIG. 2-1 FRONT OF TRAILER TERMINOLOGY

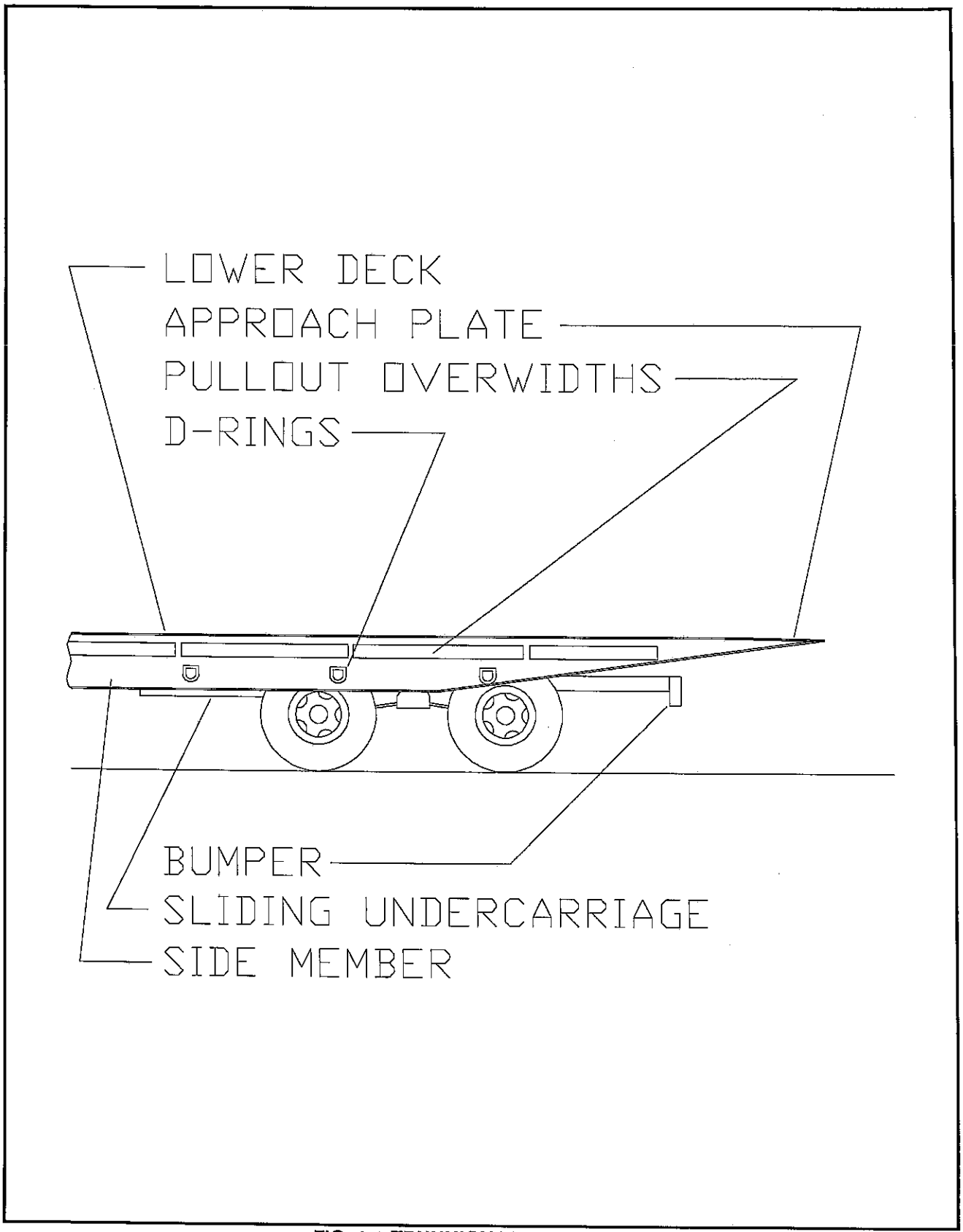


FIG. 2-2 TRUNNION TERMINOLOGY

3 STANDARD SPECIFICATIONS

OVERALL LENGTH . . . . . 44'-10"

OVERALL WIDTH . . . . . .102"

APPROXIMATE WEIGHT . . . . . 17,000#

GOOSENECK:
- LENGTH . . . . . .9'-2"
- WIDTH . . . . . .102"

LOWER DECK:
- LENGTH . . . . . 33'-10"
- WIDTH . . . . . .102"

FIFTH WHEEL HEIGHT . . . . . 52"

PIN SETTING . . . . . 30"

SWING CLEARANCE . . . . . 69"

*CAPACITY:
- WEIGHT . . . . . 60,000#
- GAWR . . . . . 17,993#
- GVWR . . . . . 77,000#

*INDIVIDUAL TRAILER LOAD CAPACITIES ARE RATED FOR THE SPECIFIC TIRE AND WHEEL LISTED ON THE VEHICLE IDENTIFICATION PLATE LOCATED ON THE FRONT OF THE SEMITRAILER. USING A TIRE OR WHEEL OTHER THAN THE ONE LISTED MAY RESULT IN A LOWER TRAILER LOAD CAPACITY.

SPECIFIC BOLT TORQUE:

OUTER SPINDLE NUTS	250-400 FT. LBS.
INNER WHEEL NUTS	450-500 FT. LBS.
OUTER WHEEL NUTS	450-500 FT. LBS.
AXLE CLAMP U-BOLTS**	300 FT. LBS.
EQUALIZER BEAM PIVOT BOLT	480-500 FT. LBS.
TORQUE ARM BOLT	250 FT. LBS.
TORQUE ARM CLAMP NUTS	60 FT. LBS.

**AXLE U-BOLTS MUST BE TIGHTENED EVENLY SO THAT EACH END HAS AN EQUAL AMOUNT OF THREADS SHOWING AFTER TIGHTENED TO TORQUE SPECIFICATIONS.

TABLE. 3-1 STANDARD BOLT TORQUES

GENERAL TORQUE SPECIFICATION TABLE (REVISED 9-87)

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN.

NOTE: These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly-disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads.

SAE Grade No.		2				5				8 *			
Bolt head identification marks as per grade NOTE: Manufacturing Marks will vary.													
		Torque				Torque				Torque			
Bolt Size		Foot Pounds		Newton-Meters		Foot Pounds		Newton-Meters		Foot Pounds		Newton-Meters	
Inches	Millimeters	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.35	5	6	7	9	9	11	12	15	12	15	16	20
5/16	7.94	10	12	14	16	17	20	23	28	24	29	32	39
3/8	9.53	20	23	27	31	35	42	48	57	45	54	61	73
7/16	11.11	30	35	41	47	54	64	73	87	70	84	95	114
1/2	12.70	45	52	61	70	80	96	108	130	110	132	149	179
9/16	14.29	65	75	88	102	110	132	149	179	160	192	217	260
5/8	15.88	95	105	129	142	150	180	203	244	220	264	298	358
3/4	19.05	150	185	203	250	270	324	366	439	380	456	516	618
7/8	22.23	160	200	217	271	400	480	542	651	600	720	814	976
1	25.40	250	300	339	406	580	696	786	944	900	1080	1220	1464
1-1/8	25.58					800	880	1085	1193	1280	1440	1736	1953
1-1/4	31.75					1120	1240	1519	1681	1820	2000	2468	2712
1-3/8	34.93					1460	1680	1980	2278	2380	2720	3227	3688
1-1/2	38.10					1940	2200	2631	2983	3160	3560	4285	4827

* Thick nuts must be used with Grade 8 bolts

NOTE: When hardware is plated, reduce torque values by 25%
When locknuts are used, increase torque value by 25%
When plated hardware is used w/locknuts, use torque value in chart

4 CONTROLS

PREFACE

This section describes the controls used to operate the 317 New York City Semitrailer. Controls are conveniently located and easy to use. A hydraulic pump must be coupled to the trailer hydraulic system before any hydraulic controls will become functional. The towing vehicle's air system must be coupled to the semitrailer and charged to 90 PSI minimum before the brakes will become functional.

CAUTION

DO NOT OPERATE THE SEMITRAILER UNTIL YOU COMPLETELY UNDERSTAND THE PROPER USAGE AND FUNCTION OF ALL CONTROLS. IMPROPER USAGE MAY CAUSE PERSONAL INJURY, DAMAGE TO YOUR SEMITRAILER AND CARGO, AND TIME CONSUMING BREAKDOWNS!

4-1 5th WHEEL UP/DOWN

The **5th WHEEL** lever **(See FIG. 2-1 and FIG. 4-1)** is located on the drivers side and the curb side of the front, lower deck side frames. It is the front-most lever on both sides. The lever has three positions:

UP: This position lowers the fifth wheel weldment, raising the trailer front to the load position.

CENTERED: This is a neutral position. This position will not operate any of the semitrailer components.

DOWN: This position raises the fifth wheel weldment, lowering the trailer to the hook-up or transport position.

4-2 WINCH IN/OUT

The **WINCH IN/OUT** lever **(See FIG. 2-1 and FIG. 4-1)** is located on the drivers side and the curb side of the front, lower deck side frames. It is the center lever on both sides. The lever has three positions:

UP: This position will cause the winch to reel cable onto the winch spool when the winch is engaged.

CENTERED: This is a neutral position. This position will not operate any of the semitrailer components.

DOWN: This position will cause the winch to reel cable off of the winch spool when the winch is engaged.

4-3 AXLE RETRACT/EXTEND

The **AXLE** lever **(See FIG. 2-1 and FIG. 4-2)** is located on the drivers side and the curb side of the front, lower deck side frames. It is the rear-most lever on both sides.This lever has three positions.

UP: This position slides the undercarriage forward, allowing the semitrailer to be tilted for loading purposes.

CENTERED: This is a neutral position. This position will not operate any of the semitrailer components.

DOWN: This position slides the undercarriage to the rear-most position, allowing the semitrailer to be transported or parked.

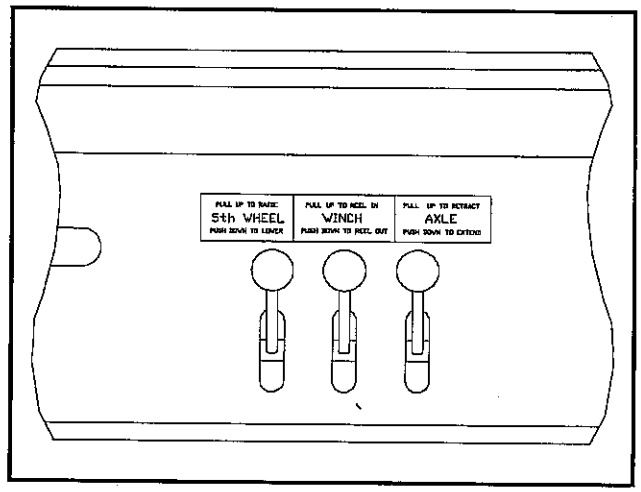


FIG. 4-1 HYDRAULIC CONTROLS

4-4 WINCH CLUTCH

The **WINCH CLUTCH** handle **(See FIG. 4-2)** is located on the right or curb-side end of the winch assembly. The function of the **WINCH CLUTCH** handle is to engage or disengage the winch, allowing it to respond to the Winch In/Out lever.

The **WINCH CLUTCH** handle has only two positions:

RIGHT: When the handle is placed in this position, the winch is disengaged. This allows the spool to "free-wheel" and the winch is not affected by use of the Winch In/Out lever.

LEFT: When the handle is placed in this position, the winch is engaged and cable may be spooled on or off the winch spool. The winch can now be controlled through the use of the Winch In/Out lever.

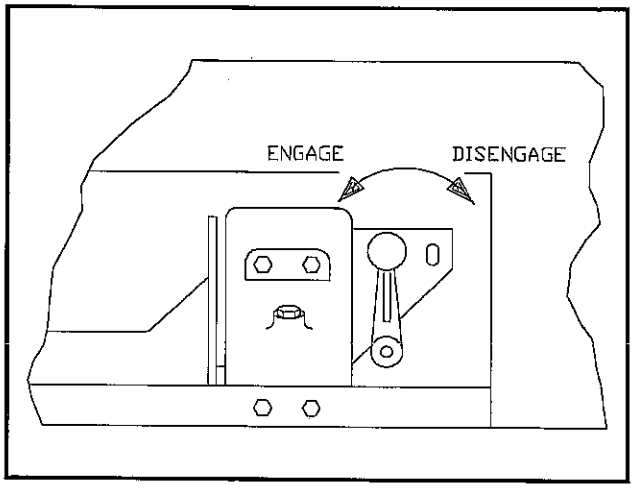


FIG. 4-2 WINCH CLUTCH HANDLE

NOTES:

5 OPERATION

PREFACE

This section describes the proper operating procedures for the 317 New York City Semitrailer and should be read completely before operating the semitrailer.

INDEX

DANGER

1. KEEP ALL PERSONNEL CLEAR OF FRONT, REAR, AND SIDES OF TOWING VEHICLE AND SEMITRAILER DURING COUPLING, COMPONENT OPERATIONS, AND UNCOUPLING. FAILURE TO STAY CLEAR MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

2. ALWAYS CHECK BEHIND AND UNDER THE TRACTOR AND SEMITRAILER FOR PERSONS OR OBJECTS BEFORE BACKING. FAILURE TO DO SO MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH TO OTHERS OR DAMAGE TO PROPERTY.

3. OPERATING THE TRACTOR OR SEMITRAILER WITH DEFECTIVE, BROKEN, OR MISSING PARTS MAY RESULT IN SERIOUS INJURY OR DEATH OF PERSONNEL, DAMAGE TO THE TRACTOR OR SEMITRAILER OR ITS CARGO, AND PROPERTY IN ITS PATH.

4. THE WINCH IS NOT DESIGNED OR INTENDED FOR USE IN THE LIFTING OR MOVING OF PERSONS. USING THE WINCH TO LIFT OR MOVE ANY PERSON MAY RESULT IN THE SERIOUS INJURY OR DEATH OF THAT PERSON.

5. NEVER ATTEMPT TO DISENGAGE THE WINCH CABLE SPOOL WHEN THE CABLE IS UNDER TENSION. THE LOAD MAY ROLL AWAY AT WILL. SERIOUS INJURY OR DEATH MAY RESULT TO PERSONS IN THE PATH OF THE ROLLING LOAD.

6. FAILURE TO LEAVE AT LEAST FIVE WINCH CABLE WRAPS ON THE WINCH CABLE SPOOL COULD ALLOW THE CABLE TO COME OFF THE SPOOL. THIS COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH TO ANYONE IN THE PATH OF THE LOOSE WINCH CABLE.

CAUTION

1. WHEN LEAVING THE SEMITRAILER UNATTENDED, POSITION ALL HYDRAULIC CONTROLS TO THE NEUTRAL POSITION AND SHUT OFF THE HYDRAULIC PUMP.

2. DO NOT EXCEED THE GROSS AXLE WEIGHT RATINGS FOR ANY AXLE ON YOUR VEHICLE.

3. THE COMBINED WEIGHT OF THE TRACTOR, TRAILER, AND CARGO MUST NOT EXCEED THE GROSS VEHICLE WEIGHT RATING (GVWR) OF THE TRACTOR.

4. DO NOT HANDLE THE WINCH CABLE WHEN THE WINCH IS IN THE ENGAGE POSITION. HANDS OR CLOTHING COULD GET CAUGHT IN THE CABLE AND BE PULLED INTO THE SPOOL CAUSING SERIOUS PERSONAL INJURY.

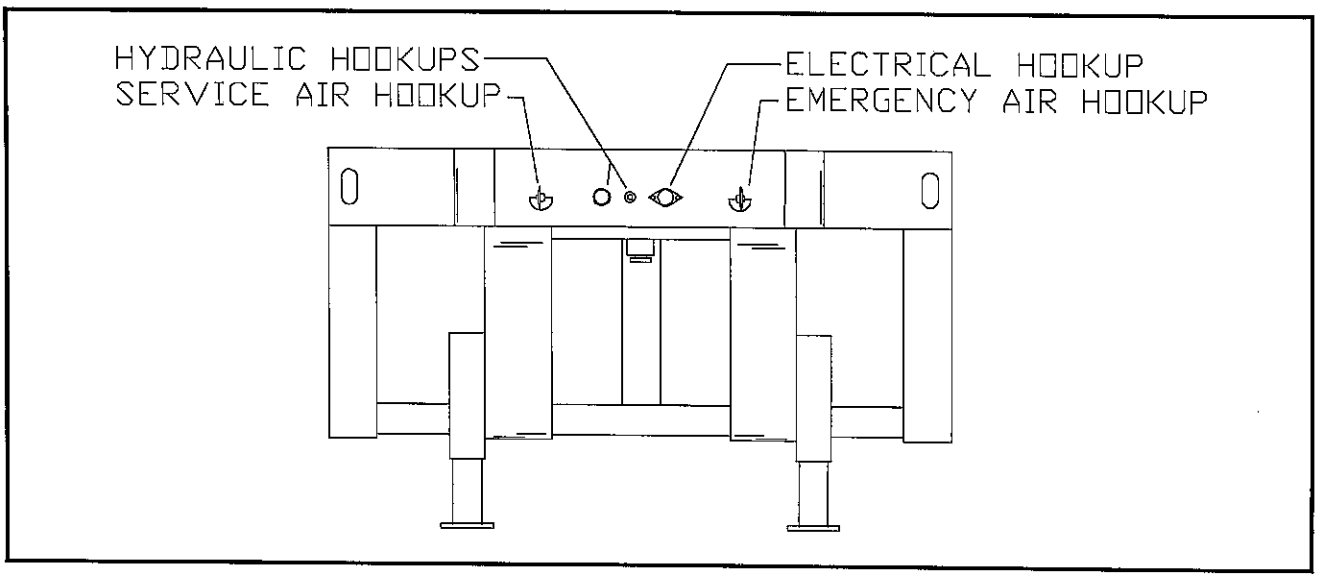


FIG. 5-1 SERVICE HOOKUPS

5-1 PRE-COUPLING OF SEMITRAILER AND TRACTOR

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

5-1.1 Slowly back the tractor/truck (towing vehicle) up to the front end of the semi-trailer so the king pin of the semitrailer is centered between the tractor fifth wheel jaws. Stop the towing vehicle just inches ahead of the semitrailer. Set tractor parking brake.

5-1.2 Check the semitrailer king pin plate height. The king pin plate should be the same height, to slightly lower, than the latch area of the fifth wheel plate of the towing vehicle. If necessary, use the Trailer Tilt Lever to raise or lower the kinpin plate sufficiently to allow proper coupling. Drain all air and moisture from the towing vehicle air brake system in accordance with the towing vehicle manufacturer's instructions.

5-1.3 Allow full air build-up in the towing vehicle's air system.

5-1.4 Connect the service and emergency air hoses of the towing vehicle to their respective gladhand on the front of the semitrailer; red emergency line to the gladhand with the **"EMERGENCY"** tag, and the blue service line to the gladhand with the **"SERVICE"** tag **(See FIG. 5-1).** Activate the semitrailer air supply valve in the towing vehicle. Set the parking brakes and chock the trailer wheels.

5-1.5 Check the air brake operations of the semitrailer as follows:

a. Apply brakes and inspect brake action on all wheels for prompt application.

b. Release brakes. All brakes should release immediately. Air pressure should discharge quickly from the relay emergency valve.

c. Disconnect the emergency air line from the semitrailer gladhand. Trailer brakes should promptly set.

d. Re-connect the emergency air line to the trailer and activate the trailer air supply valve. The parking brakes should set.

5-2 COUPLING OF THE TRACTOR TO THE SEMITRAILER

READ SECTION 5.1 "PRE-COUPLING OF SEMITRAILER AND TRACTOR" BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

5-2.1 Verify that the trailer wheels are chocked and brakes function properly.

5-2.2 Make certain the coupler of the towing vehicle's fifth wheel is open by pulling the latch handle.

5-2.3 Slowly back the towing vehicle so it's fifth wheel contacts the front of the king pin plate on the semitrailer and slips under it. Continue backing until the fifth wheel coupler locks onto the semitrailer kingpin.

5-2.4 Verify the vehicle coupling is secure by attempting to pull the tractor forward a few inches. If the tractor disconnects from the trailer, locate

source of coupling failure and repair before continuing. Repeat steps **5-2.3** and **5-2.4.**

5-2.5 If the towing vehicle couples securely to the semitrailer, set towing vehicle and trailer parking brakes for the remainder of the hookup and check-out procedures and for parking.

5-3 CONNECTING TRACTOR SERVICES TO THE TRAILER

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

5-3.1 Connect the towing vehicle 7 pole electrical plug to the electrical receptacle on the front of the semitrailer. **(See FIG. 5-1)**

NOTE: The key on the plug and the keyway in the socket must be properly aligned before inserting the plug into the trailer socket.

5-3.2 Air Lines: See **Section 5-1.4.**

5-4 TRACTOR & TRAILER CHECK-OUT

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

5-4.1 Raise parking stands. Secure each parking stand in the full up position with park stand retaining pin before transporting. Check the operation of all lights and signals on the semitrailer for proper response to switch positions (stop, right turn, left turn and clearance).

5-4.2 Check tire inflation, adjust as needed to the pressure listed on the trailer VIN plate, located on the front of the semitrailer..

5-4.3 Check tractor/trailer rig for air leaks. If air leakage if found, repair the defect before transporting.

5-4.4 Check the oil in each hub for proper level and freedom from contamination. If hubs are contaminated with water, dirt, or some other foreign material, clean before transporting.

5-4.5 Check tractor air pressure. Pressure must not fall below 80 PSI, even after activating brakes a couple of times. Set emergency brake and try pulling forward. The trailer wheels must not rotate. If trailer brakes do not apply, **DO NOT** transport until defect, or defects, are repaired.

5-4.6 Set parking brake and carefully remove all wheel chocks. If brakes are not properly set, the tractor/trailer may roll when removing wheel chocks.

5-5 TOWING THE SEMITRAILER

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

Driving the towing vehicle with the semitrailer coupled behind requires constant attention to the overall length of the combination. The "hinged-in-the-middle" configuration of the tractor and trailer, load, and weight affect performance. Turning, passing, acceleration, braking, stopping, and backup require special considerations. When executing steep grades or turning tight curves, the semitrailer must not be allowed to push the towing vehicle, or "jackknifing" of the semitrailer with the towing vehicle may result. Application of the semitrailer brakes to keep the trailer in tow will help prevent this pushing. Braking should begin before descending a hill or attempting a curve, to assure control.

5-5.1 Make a moving test of the semitrailer brakes at low, and medium speeds before traveling at full speed.

5-5.2 Monitor the air pressure gauge on the dash of the towing vehicle. Pressure should not fall below 80 PSI at any time.

5-5.3 The semitrailer wheels track to the inside of the towing vehicle during turns. Thus, turning corners requires a wide swing to prevent "curb hopping", and to allow the semitrailer wheels to clear any obstacle on the inside of the corner.

5-5.4 Stopping should be done with a gradual and smooth application of brakes. If grabbing occurs, apply less pressure - grabbing brakes are not efficient.

5-5.5 Backing should be done with care. Tail over-hang, trailer length, and allowable space must be taken into consideration when backing the semitrailer.

5-6 PARKING THE SEMITRAILER

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

5-6.1 Position tractor/trailer rig on a level, solid surface.

5-6.2 Set the **PARKING** brake, **NOT TRAILER HAND BRAKE**, and check for proper brake holding.

5-6.3 Chock wheels.
5-6.4 Check for any air leaks in lines, relay valve, brake pods, or any other air system component.

5-7 UNCOUPLING TRACTOR FROM SEMITRAILER

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.
5-7.1 Park the semitrailer according to instructions in **Section 5-6.**
5-7.2 Lower the park stands to the ground. Raise only enough to insert pin through both inner and outer legs of stand. Legs must be equal distance from the ground.
5-7.3 Disconnect emergency and service air lines and attach them to the tractor gladhand holders.
5-7.4 Disconnect the 7 pole cable from the trailer and store with the tractor.
5-7.5 Pull the tractor fifth wheel plate latch release lever.
5-7.6 Attempt to pull the tractor forward. If the tractor uncouples, verify all service lines are disconnected and trailer wheels are chocked. If tractor does not disconnect, repeat steps **5-7.5** and **5-7.6.**
5-7.7 Pull the tractor away from the trailer.

5-8 COLD WEATHER OPERATION

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.
Cold weather causes lubricants to congeal, insulation and rubber parts to become hard, and fabricated parts to become somewhat brittle. These trends may lead to problems found in bearings, electrical systems, air systems, and weldments. Moisture attracted by warm parts due to usage can condense, collect and freeze to immobilize equipment. The operator of the tractor/trailer rig must constantly be alert for indications of the effect of cold weather.
5-8.1 During any stop of an extended period, neither the service or parking brake should be used as they may freeze up. Use wheel chocks to secure the vehicle from moving.
5-8.2 Check all structural fastenings, air system fittings, gaskets or seals, and bearings for looseness that may develope due to contraction with cold. Do not over-tighten.
5-8.3 Check tire inflation. Tire inflation will decrease with temperature drop.
5-8.4 Periodically check drain holes in the bottom of the relay valve and storage compartments. They must be open at all times to avoid moisture entrapment.

5-9 HOT WEATHER OPERATION

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.
Hot weather operation can create certain problems which must be checked. Expansion of parts may result in tightening of bearings, fasteners, and moving parts. Failure of gaskets and seals may also occur.
5-9.1 The semitrailer should be parked in the shade if possible. Long exposure to the sun will shorten service life of rubber components (ie, tires, light and hose grommets, hoses, etc.) and paint life.
5-9.2 Check tire pressure early in the day before beginning operations while the tire is cool. Replace all valve stem caps after checking.
5-9.3 If the area is extremely humid, protect electrical terminals with ignition insulation spray. Coat paint and bare metal surfaces with an appropriate protective sealer.
5-9.4 The use of a filter-lubricator in the towing vehicle's air delivery system is recommended.

5-10 PREPARATION FOR UNLOADING

READ ALL SAFETY PRECAUTIONS LOCATED AT THE FRONT OF THIS SECTION BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.
5-10.1 Park the semitrailer in accordance with the instructions in **Section 5-6 "PARKING THE SEMITRAILER".**
5-10.2 Engage the tractor P.T.O. system.
5-10.3 Using the **WINCH IN/OUT LEVER**, attach the winch cable to a rolling load and remove all slack from the winch cable. Remove wheel chocks and load securing devices from the load.
5-10.4 Using the **5th WHEEL LEVER**, raise the front of the trailer 1 to 2 feet.
5-10.5 Use the **AXLE SLIDE LEVER** to pull the axles forward until they are just behind the center of gravity of the loaded trailer.

5-10.6 Raise the trailer to an appropriate unloading height.

5-10.7 Pull the undercarriage fully forward.

5-10.8 Adjust the unloading height and the position of the undercarriage until the rear of the trailer is on the ground and the rear axle is supporting part of the weight of the intended load.

5-10.9 Remove the load from the trailer, lower the trailer, and slide the undercarriage to the full back position.

5-10.10 Disengage the P.T.O. system of the tractor.

5-11 Preparation for Loading

5-11.1 The procedure for loading the semitrailer is the similar to the procedure for unloading the trailer. When winching or driving a load onto the trailer be sure that the center of gravity of the loaded trailer is just ahead of the undercarriage in the forward loading position. The load should never place more weight on the kingpin than on the rear axles during loading or unloading.

5-11.2 Secure the load using approved standard tie-down methods. Nine D-rings are supplied on each side for tie-down purposes.

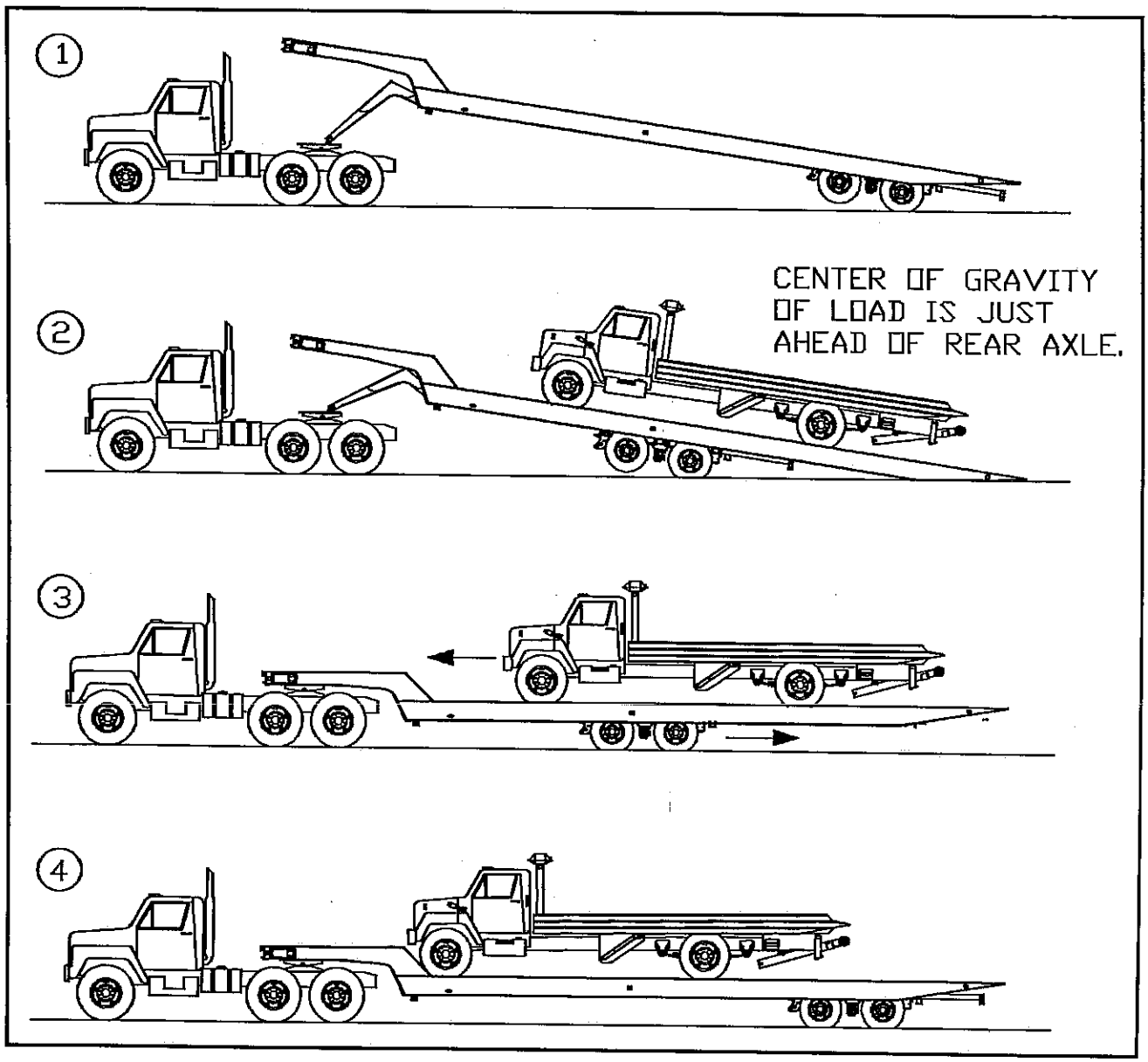


FIG. 5-2 STEPS FOR LOADING AND UNLOADING

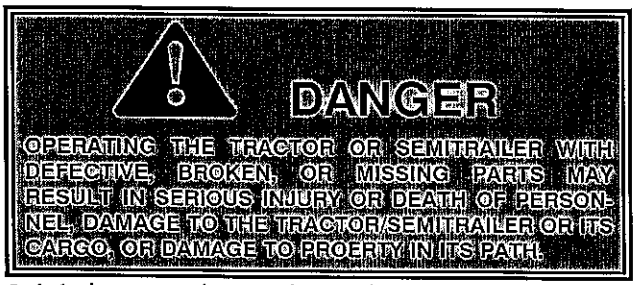
NOTES

6 MAINTENANCE AND LUBRICATION

The Model 317 New York City Semitrailers are designed for years of service with minimal maintenance. The following maintenance, however, is very important for durability and for safe operation of your semitrailer. Maintenance is an owner/user responsibility.

INDEX

6-1 INSPECTION



6-1.1 Inspect the towing vehicle, the trailer, and trailer components periodically for damage or evidence of pending failure. Damaged or broken parts must be repaired or replaced immediately. The cause of any binding or hydraulic leakage should be determined immediately and the problem corrected before using the tractor or semitrailer.

6-2 GOOSENECK, FRAME, AND DECK

The semitrailer and gooseneck should be checked daily for cracks or material fatigue. Cracks will normally appear best under loaded conditions. If any cracks or breaks are found, return the trailer immediately to the Landoll factory for repairs. The deck should be examined daily for broken or missing planking or missing attaching hardware. Replace any defective parts immediately.

6-3 HYDRAULIC SYSTEM

6-3.1 Check the hydraulic oil level weekly, or after any leakage. See **TABLE 6-1** for proper hydraulic oil. Check the hydraulic oil level with all hydraulic cylinders in the retracted position. Disengage the hydraulic pump.

6-3.2 Overfilling may result in overflow of hydraulic fluid during component operations.

6-4 ELECTRICAL SYSTEM

6-4.1 Maintenance of the electrical system consists of inspection, and minor servicing. Any wire, connection, or electrical component showing signs of corrosion, wear, breakage, or unraveling must be repaired or replaced.

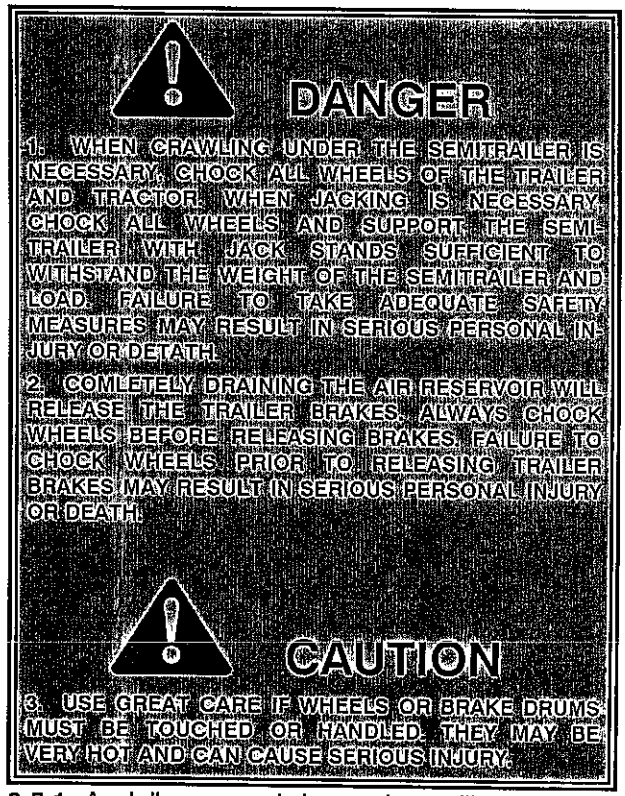
6-4.2 Frayed or unraveling wire must have the defective section removed and replaced with wire of the same color and gauge. Seal all connections and insulate.

6-4.3 Corroded terminals must have the corrosion removed, source of corrosion neutralized, terminal resealed, protected, and insulated.

6-4.4 Fuse or circuit breaker burn-out or "blow-out" usually indicates an electrical short-circuit, although a fuse may occasionally fail from vibration. Insert a second fuse or reset the breaker. If this fuse immediately burns out or the breaker trips, locate the cause of the electrical short and repair.

6-4.5 Lights with a repeated lamp burn-out usually indicates a loose connection, either at the lamp socket, the system ground, or a malfunctioning voltage regulator. Locate the source of the problem and repair. System grounds must be grounded to bare metal surfaces. Paint, grease, wax, and other coatings act as insulators. Replacement lamps must be equivalent to the factory installed lamp.

6-5 SPRING BRAKE SYSTEM



6-5.1 A daily general inspection will reveal the most common problems found in the spring brake system. This inspection should include:

6-5.2 Checking air lines for cracking or kinks.

6-5.3 Check linkage pins, keepers and other fastening hardware for excessive wear, corrosion, and for being secure.

6-5.4 Check brake linings for excessive wear or distortion.

6-5.5 Drain air reservoir of all moisture daily using the hand pull drain valve. **(See FIG. 6-1).**

NOTE: COMPLETELY DRAINING THE AIR RESERVOIR WILL RELEASE THE TRAILER BRAKES.

6-6 SPRING BRAKE CHAMBERS

NOTE: READ THE SAFETY PRECAUTIONS AT THE BEGINNING OF SECTION 6.5 BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

Check the condensation holes on the underside of the brake chambers to make sure they are open. The brake chambers should be disassembled and cleaned at 50,000 miles or yearly. Repair or replace faulty units. When replacing the diaphragm or hardware, replace the corresponding parts for the other chamber on the same axle. This will aid in even brake application and releasing. Examine yoke pin for wear and replace if necessary. For parts identification see **Section 8 "Illustrated Parts Listing."**

6-6.1 MANUAL RELEASE AND SET BRAKES.

a. Chock the trailer wheels.

b. Remove dust cap from spring brake chamber.

c. Remove the release bolt from it's holding brackets and insert it into the spring brake chamber. **DO NOT USE AN IMPACT WRENCH TO CAGE THE SPRING BRAKE!**

d. Turn the bolt until the spring brake is caged. This should be 2-1/4 to 2-1/2 inches of release bolt extension.

e. The brakes should now be totally released.

f. To reset the spring brake, turn the release bolt until the spring is released. Remove the release bolt and store it in its brackets.

g. Snap the dust cap back in place on the chamber.

6-6.2 REMOVAL:

a. Chock all tractor and trailer wheels and drain the air system.

b. Mark the brake chamber for proper air line port alignment during re-assembly.

c. CAGE THE POWER SPRING following the steps outlined in **Section 6-6.1 (c.) and (d.).**

d. Disconnect the slack adjuster from the connecting rod by removing the clevis pin **(See FIG. 6-2 on next page).**

e. Mark all air service lines for proper re-installation and disconnect from the brake chamber.

f. Remove the brake chamber from the axle brackets.

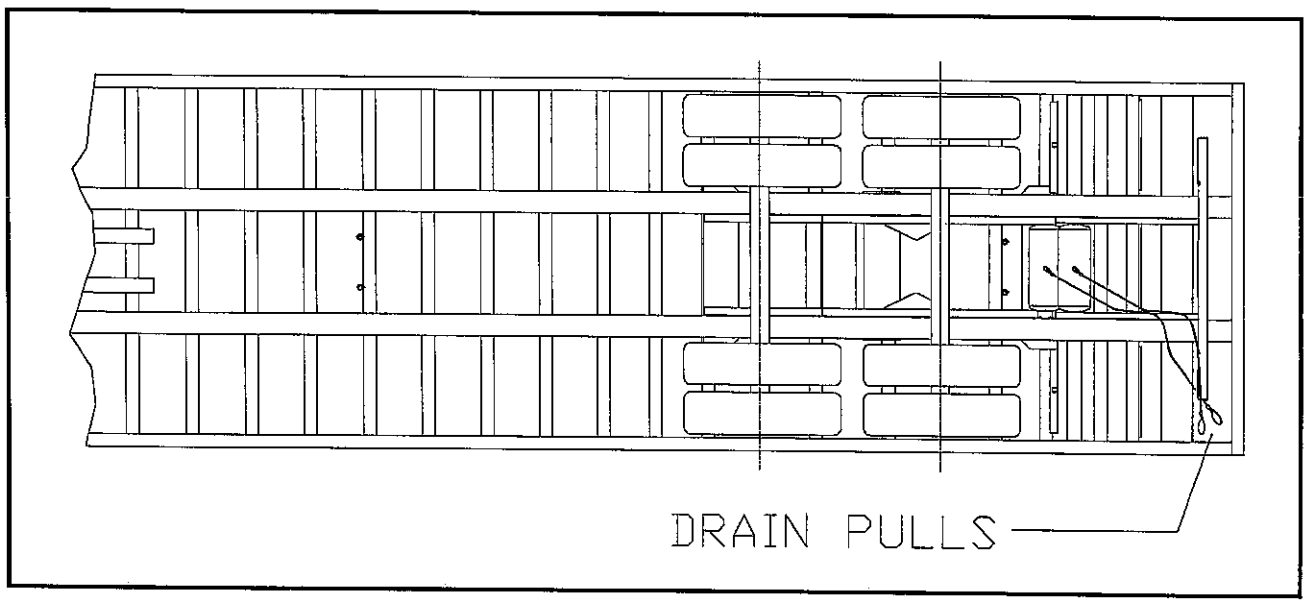
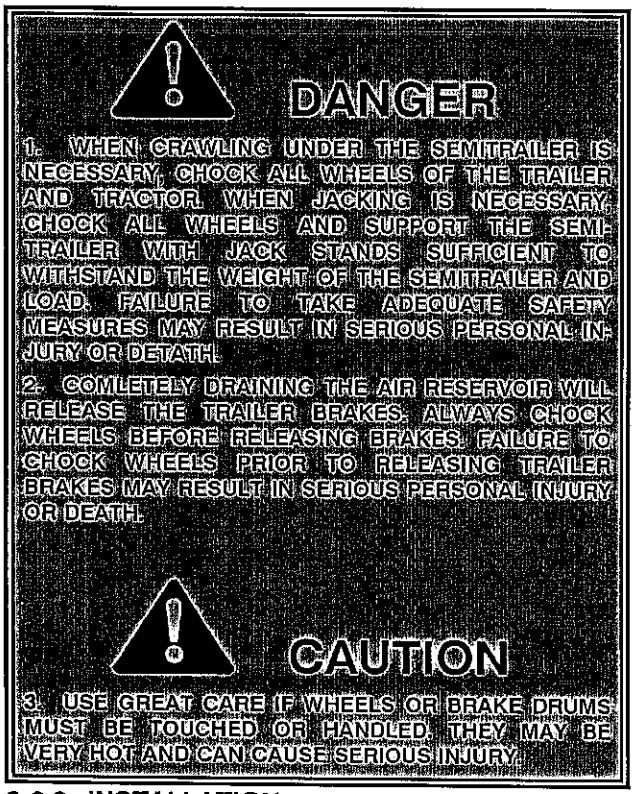


FIG. 6-1 DRAIN PULL LOCATIONS



6-6.3 INSTALLATION:

a. CAGE THE POWER SPRING following the steps outlined in **Section 6-6.1 (c.) and (d.).**

b. Position the inlet ports by loosening the service chamber clamp bands and rotating center housing such that ports are located according to alignment marks made during disassembly, then re-tighten the clamp bands.

c. Position the breather hole in the downward facing position by loosening the clamp bands on the spring brake chamber and rotating the chamber housing until the breather hole faces downward. Re-tighten the clamp bands.

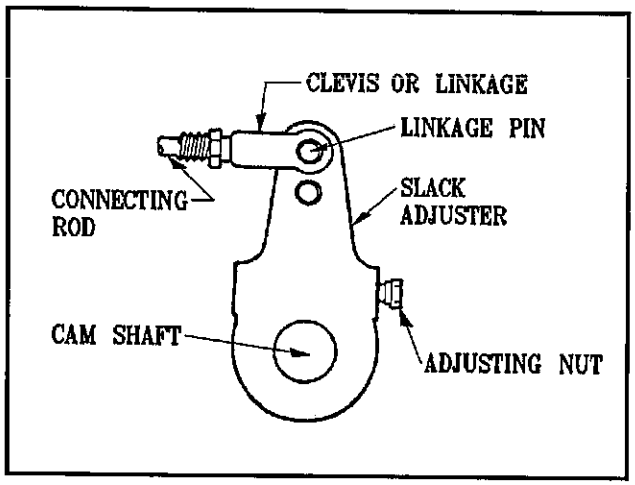


FIG. 6-2 SLACK ADJUSTER TERMINOLOGY

d. Remount the brake chamber on the axle brackets and reconnect the air service hoses and the slack adjuster connecting rod **(See FIG. 6-2).**

NOTE: BE SURE THE SERVICE LINE IS ON THE SERVICE CHAMBER PORT AND THE EMERGENCY LINE IS ON THE SPRING BRAKE PORT.

e. Check for leakage by charging the air system to minimum of 90 PSI and apply soap suds to the brake chamber and connections. If a growing bubble is detected or bubbles are blown away, locate the source of the leak and repair.

6-6.4 DIAPHRAGM SERVICING

a. The spring brake chamber diaphragm should be replaced every two years and the service chamber diaphragm should be replaced every year. The following steps should be followed to replace the diaphragms:

1. Mark unit for proper alignment when re-assembling.
2. Remove the spring brake caging bolt from its brackets and insert it into the spring brake chamber.
3. Turn the caging bolt until the spring brake is completely caged. The caging bolt should extend 2-1/4 to 2-1/2 inches from the nut at this point.
4. Remove the bands from the chamber to be serviced and disassemble the unit. Replace the diaphragm and re-assemble the chamber.
5. Follow steps **(d.)** and **(e.)** in **Section 6-6.3** .

6-7 RELAY/EMERGENCY VALVE

NOTE: READ THE SAFETY PRECAUTIONS AT THE BEGINNING OF SECTION 6-6.3 BEFORE PERFORMING ANY OF THE FOLLOWING PROCEDURES.

Every 3600 operating hours or 100,000 miles or yearly, the Relay Emergency Valve should be disassembled, cleaned, and lubricated with DOW CORNING 33 GREASE or equivalent. Worn, damaged, and rubber parts must be replaced. Listed below is the procedure for testing the relay valve.

6-7.1 SET-UP:

a. Check the air pressure gauge in the tractor with a known-accurate test gauge before starting these tests. Connect tractor air lines to the trailer. Chock wheels of both tractor and trailer to prevent rolling.

6-7.2 TESTING:

a. Drain all air from the tractor and trailer air systems at the reservoirs.

b. Start tractor and allow pressure to build up to full charge. Make several full service brake applications. All semitrailer brakes should set and release promptly and evenly.

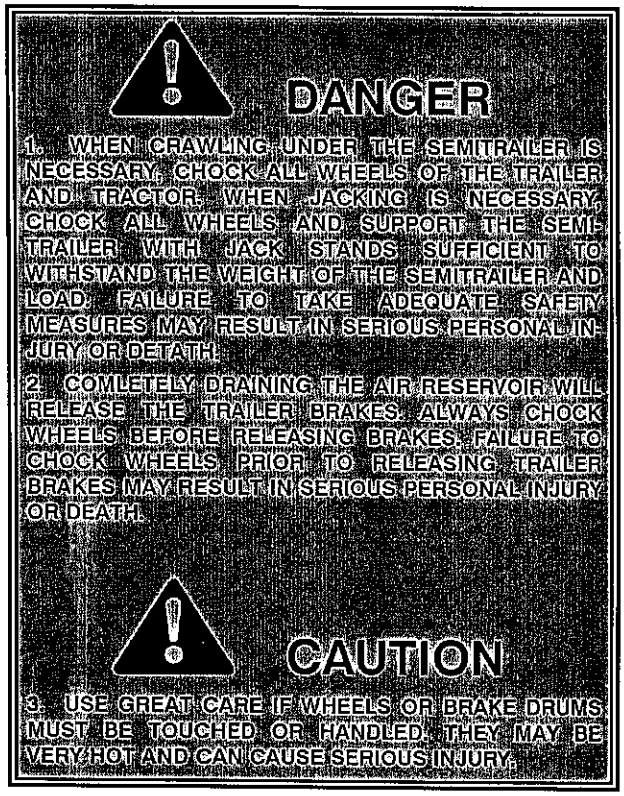
c. Allow air pressure to build up to 90 PSI with the brakes released. Shut off tractor engine and monitor air pressure for two (2) minutes. A maximum of 6 PSI drop is allowed in two minutes. If more than 6 PSI drop is experienced, apply soap suds to the exhaust port of the relay valve. A one (1) inch bubble in 5 seconds is maximum allowable leakage. NO leakage is allowed at pipe plugs or fittings.

d. Start the tractor and allow pressure to build up to full charge. Make several full service brake applications. All semitrailer brakes should set and release promptly and evenly. Allow pressure to stabilize at 90 PSI. Shut tractor engine off. Apply and hold a full service brake application for two (2) minutes. A maximum of eight (8) PSI drop is allowed in two (2) minutes. If more than 8 PSI drop in two minutes is experienced, allow pressure to stabilize at 90 PSI and apply soap suds to the relay valve cover and exhaust port with the service brake applied. This detects body O-ring and exhaust valve leakage. A maximum of a one (1) inch bubble in three (3) seconds is allowed. Release the service brake.

e. Start the tractor and allow pressure to build up to full charge. Make several full service brake applications. All semitrailer brakes should set and release promptly and evenly. Allow pressure to stabilize at 90 PSI. Shut tractor engine off. Disconnect the emergency line at the trailer. Trailer brakes should immediately set. Apply soap suds to the trailer emergency gladhand port. NO leakage is allowed. A leak at the emergency gladhand indicates a leaking check valve or piston O-rings in the relay valve. Disconnect the service line at the trailer and apply soap suds to the trailer service line gladhand. NO leakage is allowed. A leak indicates leaking relay valve piston O-rings.

f. Connect tractor emergency and service line to the trailer. Start tractor engine and allow air pressure to build up. Activate tractor air supply valve to charge trailer brake air supply as soon as possible. Trailer brakes should release at a maximum of 65 PSI trailer emergency line pressure.

SAFETY FIRST!



6-8 BRAKE MAINTENANCE

6-8.1 BRAKE INSPECTION/LUBRICATION

Lubricate brake assembly per **FIG. 6-12 LUBRICATION POINTS** and **TABLE 6-1 MAINTENANCE SCHEDULE.**

Inspect and adjust brake assembly every 2,000 miles or monthly, which ever comes first. Examine brake linings visually to locate the lining showing the greatest amount of wear. If lining thickness is 3/8 inch or less, remove the wheel and drum and replace linings. **DO NOT** allow linings to wear thin enough so the lining rivets contact the drum. Refer to **Fig. 6-3 on page 6-6** for brake assembly parts identification. The following is the recommended procedure for brake disassembly:

6-8.2 DISASSEMBLY:

a. Jack up the trailer wheel which needs brake lining service.

b. Remove trailer wheel/tire assembly and set aside.

c. Adjust the slack adjuster (16) to completely release the brake. Remove hub cap, spindle nuts (3, 24), and lock washer (25, 26), hub and brake drum assembly. Be careful to protect the bearings (22, 23) from dirt and other foreign material.

d. Remove brake retract springs (29).

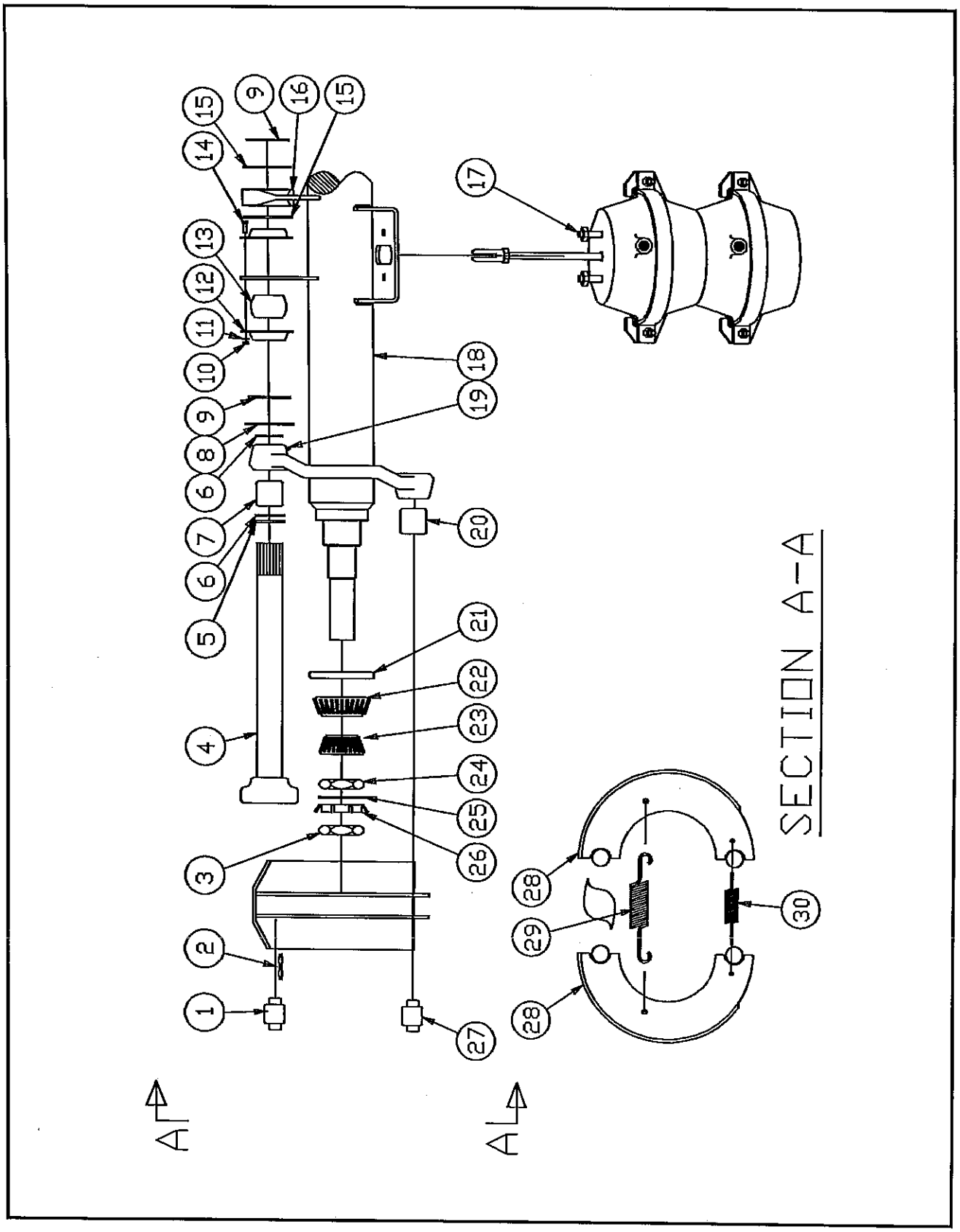


FIG. 6-3 BRAKE/AXLE TERMINOLOGY

e. Remove retainer springs (30) from anchor pins. Remove anchor pins (27) and brake shoe assemblies (28).

f. Remove slack adjuster lock ring (9) and washers (15).

g. Remove slack adjuster (16).

h. Remove cam shaft lock ring (9) and spacer washer (8), located toward inside of spider boss.

i. Remove camshaft (4).

j. Remove camshaft washer (5), located under camshaft head.

k. Remove roller retainer springs (not shown), rollers (1), anchor pin bushings (20) from spider, spider camshaft bushing (7), and camshaft grease seals (6).

l. Remove bolts from bushing retainer plates (12) and remove camshaft bushing (13).

m. Clean all parts and spider with brake cleaner such as CRC brand "BRAKLEEN 05089" or its equivalent. Inspect all parts and replace any part which shows any sign of wear, fracture, distortion, or discoloration due to excessive heat.

6-8.3 ASSEMBLY:

a. Install new anchor pin bushings (20), spider camshaft grease seals (6) and bushing (7).

b. Install cam roller pins (1) and retainer springs (not shown).

c. Place camshaft washer (5) under cam head, position cam (4) through spider, install spacer washer (8) and lock ring (9), position camshaft (4) through camshaft bracket, and install slack adjuster washers (15) and locking ring (9).

d. Set new brake shoes (28) into position and insert anchor pins (27) in the anchor pin holes.

e. Secure anchor pins with retainer springs (30).

f. Install brake shoe retract spring (29) on retaining pins (2).

g. Install slack adjuster (16) and connect to brake chamber (17) push rod. The angle between the slack adjuster and connecting rod should be approximately 95° when the brake is not applied.

h. Clean and inspect bearings (22, 23). Replace hub oil seal.

i. Install hub and adjust wheel bearings as outlined in **Section 6-10 "WHEEL BEARING LUBRICATION and ADJUSTMENT".**

6-9 BRAKE ADJUSTMENT

a. Slack adjusters provide the means for routine brake adjustment to compensate for lining wear. Inspect and adjust slack adjusters weekly or at 2,000 mile intervals.

6-9.1 CHECKING:

a. Release brakes.

b. Measure the distance (D1) from the face of the brake air chamber to the center of the slack adjuster linkage p in **(See FIG. 6-4).**

c. Apply brakes.

d. Repeat step b. (Distance is now D2).

e. Subtract the two distances to find the air chamber push rod travel. The total travel of the brake push rod must be less than 1-3/4" (one and three fourth inches) to meet Federal "IN-SERVICE" criteria. It is advisable to adjust all brakes on the same axle to within 1/2" (one half inch) of each other to prevent unbalanced braking.

6-9.2 ADJUSTING:

a. Release brakes.

b. Place a 9/16 inch wrench on the slack adjuster adjusting nut (See FIG. 6-2), and push in on the locking sleeve.

c. Adjust by rotating the adjusting nut counterclockwise to loosen the brake and

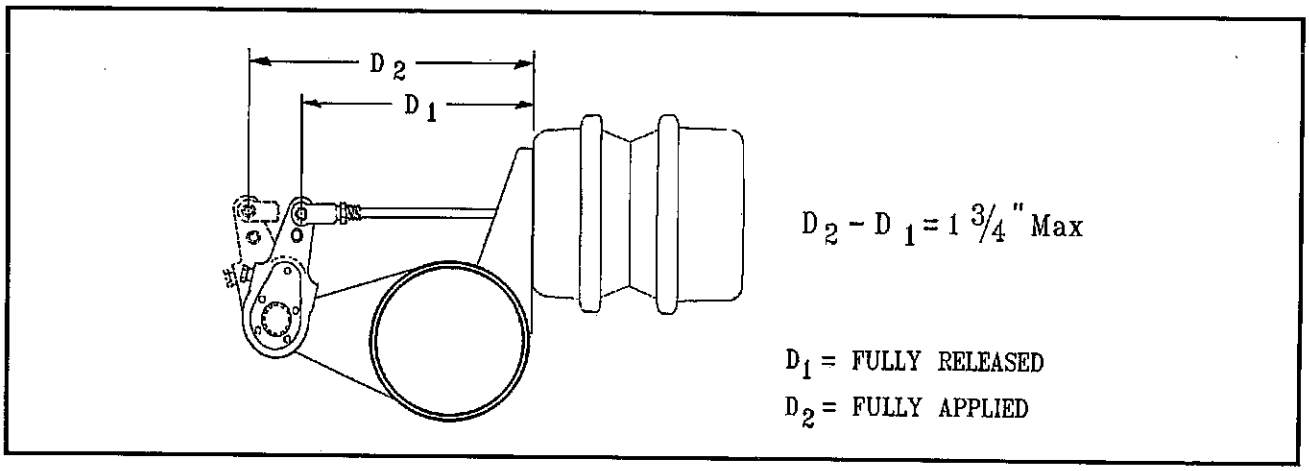


FIG. 6-4 CHECKING BRAKE ADJUSTMENT

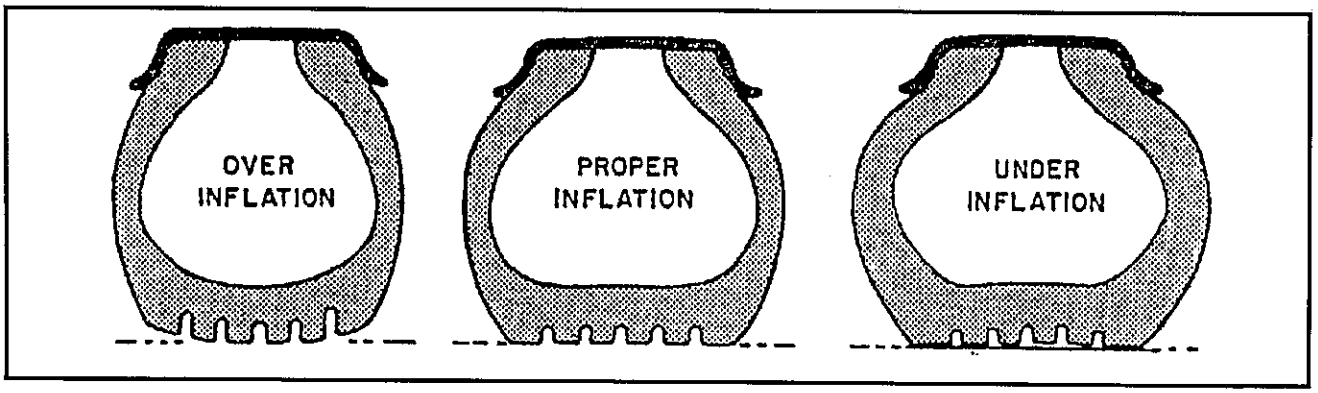


FIG. 6-5 TIRE INFLATION EXAMPLES

clockwise to tighten the brake.

d. Remeasure air chamber push rod travel from release to full brake application. If the adjustment is not within the "IN-SERVICE"criteria, readjust. If the adjustment has brought the travel to within specifications, proceed to next step.

e. Remove wrench from slack adjuster. Check locking sleeve to verify that it has sprung back out and is locking the adjusting nut. If it did not snap back out, the adjuster will have to be rotated slightly.

6-10 TIRE INFLATION

Tire inflation will produce the tire to ground contact characteristics **(See FIG. 6-5).** Tire inflation should be checked daily while the tire is cold, and during road stops. Checking the tire pressures while tires are hot will give a faulty increased pressure reading. Adjusting tire air pressure to the specified amount while tires are hot will produce improper tire to road contact and thus abnormal wear. Do not exceed cold inflation pressure listed on the trailer VIN plate located on the front of the semi-trailer. Exceeding cold inflation pressure will result in damaged tire bodies, rims, and wheels. Replace all valve stem caps when pressure checking/adjusting has been completed. remove any foreign objects from between duals.

6-11 TIRE MATCHING

Both tires on the same spindle must be the same size in order to properly distribute the load and braking forces between them. Tire size can be checked by two methods; measuring tape, or with a straight edge or string the same length or longer than the trailer tracking width. The straight edge or string method can not be used if tire and wheel assemblies are not mounted on the axle. In both methods, the tire must be mounted on a rim and properly inflated. If there is a difference in size, and is within the allowable difference, the smaller tire should be mounted to the inside position of the duals.

6-11.1 MEASURING TAPE METHOD :

a. Measure around each tire on the tread surface. A maximum difference of 3/4 inch in the measurements is allowed between the two mating tires of a dual **(See FIG. 6-6).**

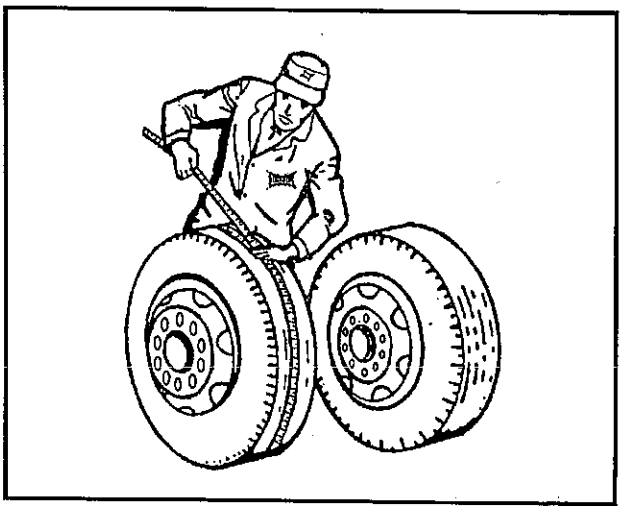


FIG. 6-6 CHECKING TIRE SIZE WITH MEASURING TAPE

6-11.2 STRAIGHT EDGE OR STRING METHOD:

a. Jack trailer up until the wheels are off of the ground. Hold a straight edge against the tires of both ends of an axle. A gap at one tire indicates a smaller tire. A maximum of 1/8 inch gap is allowed **(See FIG. 6-7).**

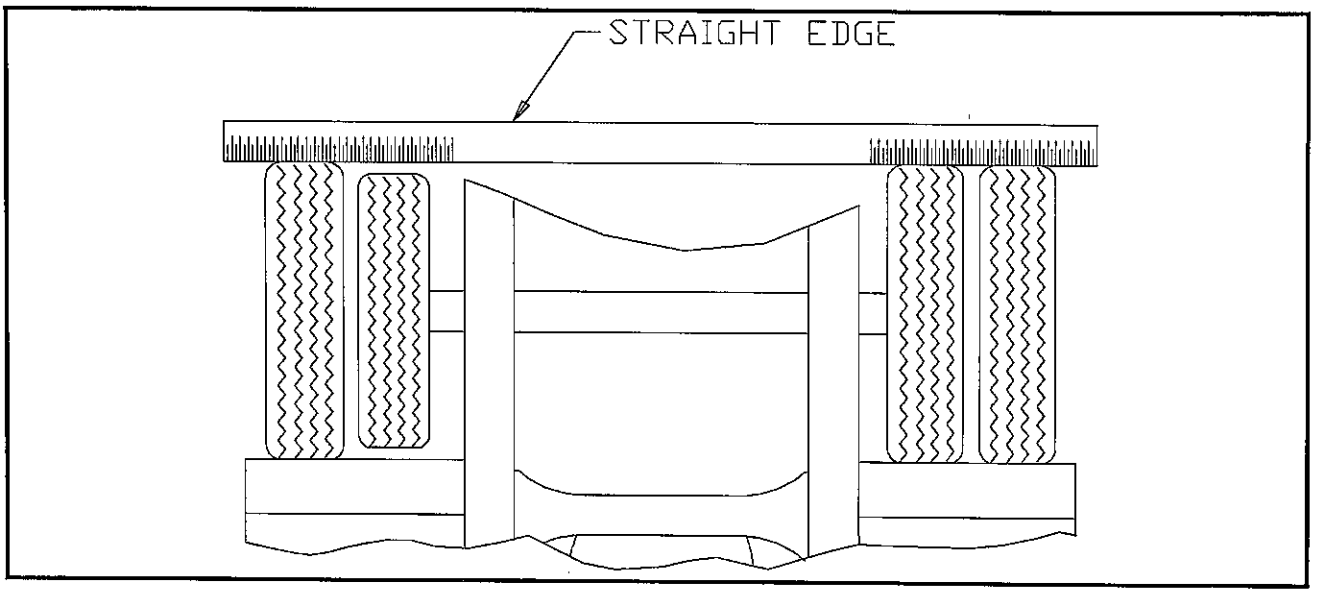


FIG. 6-7 STRAIGHT EDGE METHOD

6-12 WHEEL BEARING LUBRICATION AND ADJUSTMENT

Oil level must be checked daily and maintained between the "ADD" and "FULL" lines on the hub cap window **(See FIG. 6-8)**. Check for cracked windows, missing filler plugs, and for oil leaks. Add hub oil through the **"POP-IN"** filler plug located in the center of the hub windows. Re-install the **"POP-IN"** plugs after filling each hub. Adjust wheel bearings and change oil every 50,000 miles or with each brake lining replacement, which ever occurs first.

6-12.1 ADJUSTMENT:

a. With a drain pan under the hub cap, remove the hub cap assembly allowing oil to drain.

b. Lift the wheel off of the ground.

c. Adjust slack adjuster to eliminate brake drag during tire/wheel rotation.

d. Remove the outside spindle nut and locking washer.

e. Rotate the tire by hand and tighten the inner nut until there is a slight bind. Back off the inner spindle nut 1/3 turn to allow free rotation of wheel.

f. Install spindle locking washer. Align inner nut locking peg with the nearest washer hole.

g. Install outer spindle nut and torque to 250 min - 400 max lb/ft.

h. Install hub cap with new gasket and fill with oil to the full mark. Use 90 weight gear oil.

i. Adjust brakes according to **Section 6-7 "BRAKE ADJUSTMENT".**

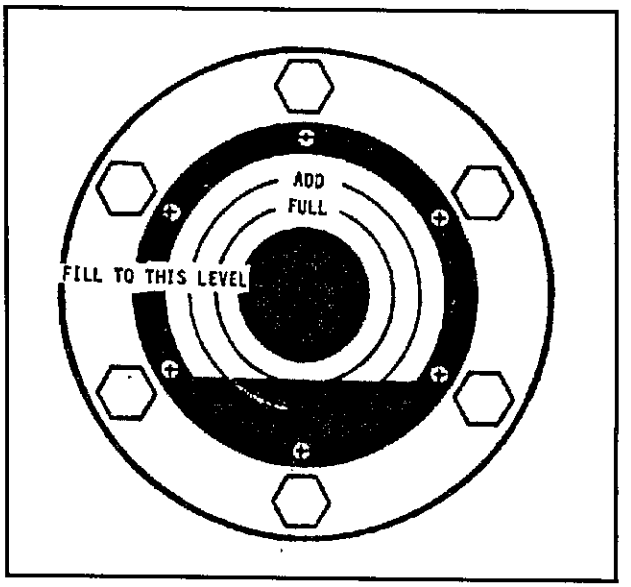


FIG. 6-8 HUB OIL LEVELS

j. Check hub oil level after the wheel has set in one position for a few minutes to allow the oil to work into the bearings.

6-13 SUSPENSION AND WHEELS

Visually examine the suspension for broken or missing parts. Check brackets, equalizing beams, and frame members. Replace all defective parts. See **Section 8 "ILLUSTRATED PARTS LISTING"** for suspension parts identification.

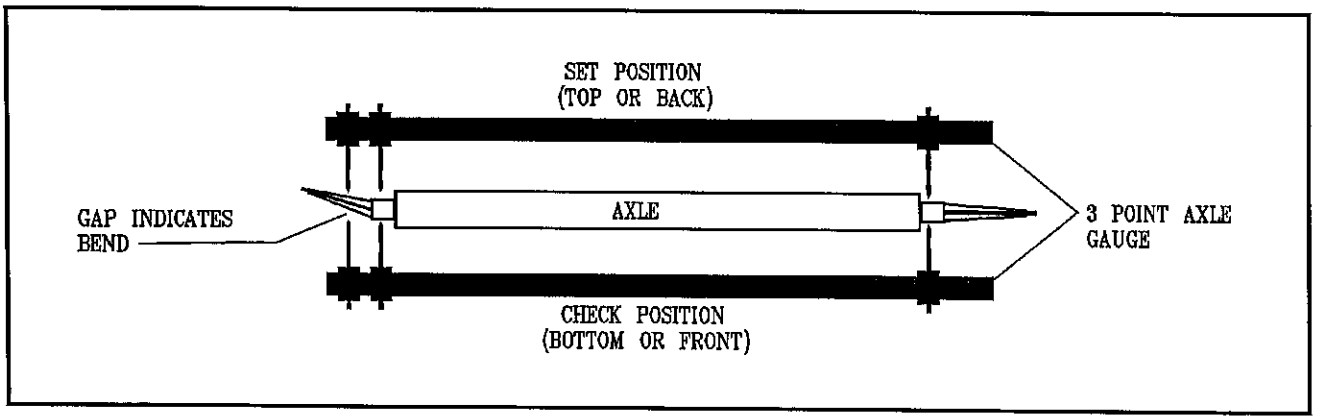


FIG. 6-9 BENT AXLE CHECK

6-14 WHEEL ALIGNMENT

When trailer tires show signs of scuffing, feather-edging or uneven wear, examine the semi-trailer for damaged suspension (frame, shocks, linkage, etc), axle, wheel bearings, and wheels. Proper wheel alignment, and wheel bearing adjustment is essential for proper tire wear. The simplest form of checking wheel alignment "toe" is by running the trailer over a "SCUFF GAUGE". A scuff gauge reading of 16 feet or less per mile is considered satisfactory. If a scuff gauge is not readily available, or edge wear on one side of a tire is occurring signifying positive or negative camber, alignment can be checked as follows:

6-14.1 Jack trailer up so that the tires are off of the ground.

6-14.2 Support the trailer on jack stands with sufficient capacity to support the total weight of the trailer and any load which it may be carrying.

6-14.3 Remove wheel, hub, and bearing assemblies.

6-14.4 Place a 3 point axle gauge against the front side of the axle, and adjust each axle gauge point to the axle. (Double point end against the inner and outer wheel bearing surfaces of the spindle being checked and the other point on the inner bearing surface on the other spindle) **(See Fig. 6-9).**

6-14.5 Move the axle gauge and place against the back side of the axle. If either of the points of double point end fails to touch the axle surface, a bent spindle is evident. A point gap of .015 (15 thousandths) of an inch or more is considered excessive tire "toe" and the axle must be replaced **(See Fig. 6-9).**

6-14.6 Follow the same procedures as in **steps 6-16.4** and **6-16.5** except place the axle gauge above and below the axle. If gauge point gap is found, the axle has positive or negative camber. The semi-trailer axle has no camber from the factory, thus if it is found to have positive or negative camber, axle replacement is necessary **(See Fig. 6-13 for examples of camber).**

6-15 AXLE ALIGNMENT

Proper axle to king pin alignment is necessary to obtain straight tracking. If axle alignment is off, "dog-tracking" will occur. Check alignment manually or by using a trailer alignment machine. In either case, a thorough inspection of the complete suspension must be performed and all defects corrected before aligning.

6-15.1 MANUAL ALIGNMENT PROCEDURES:

a. Position trailer on a firm and level surface. Eliminate any suspension binding due to sharp turns or unusual maneuvers.

b. Detach tractor from the trailer and jack the trailer up sufficiently to permit measuring from the underside of the trailer.

c. Suspend a plumb bob at axle height from the center of the king pin.

d. Measure (D) from the plumb bob to the center point on one end of the axle. Record this measurement. **(See FIG. 6-12)**

e. Measure (D1) to the other end of the axle in the same manner as in **step d.** Record this measurement. **(See FIG. 6-12)**

f. The two measurements must be within 1/16 inch of each other for proper axle alignment.

g. In all cases, all suspensions must be in good repair with no binding or other restrictions

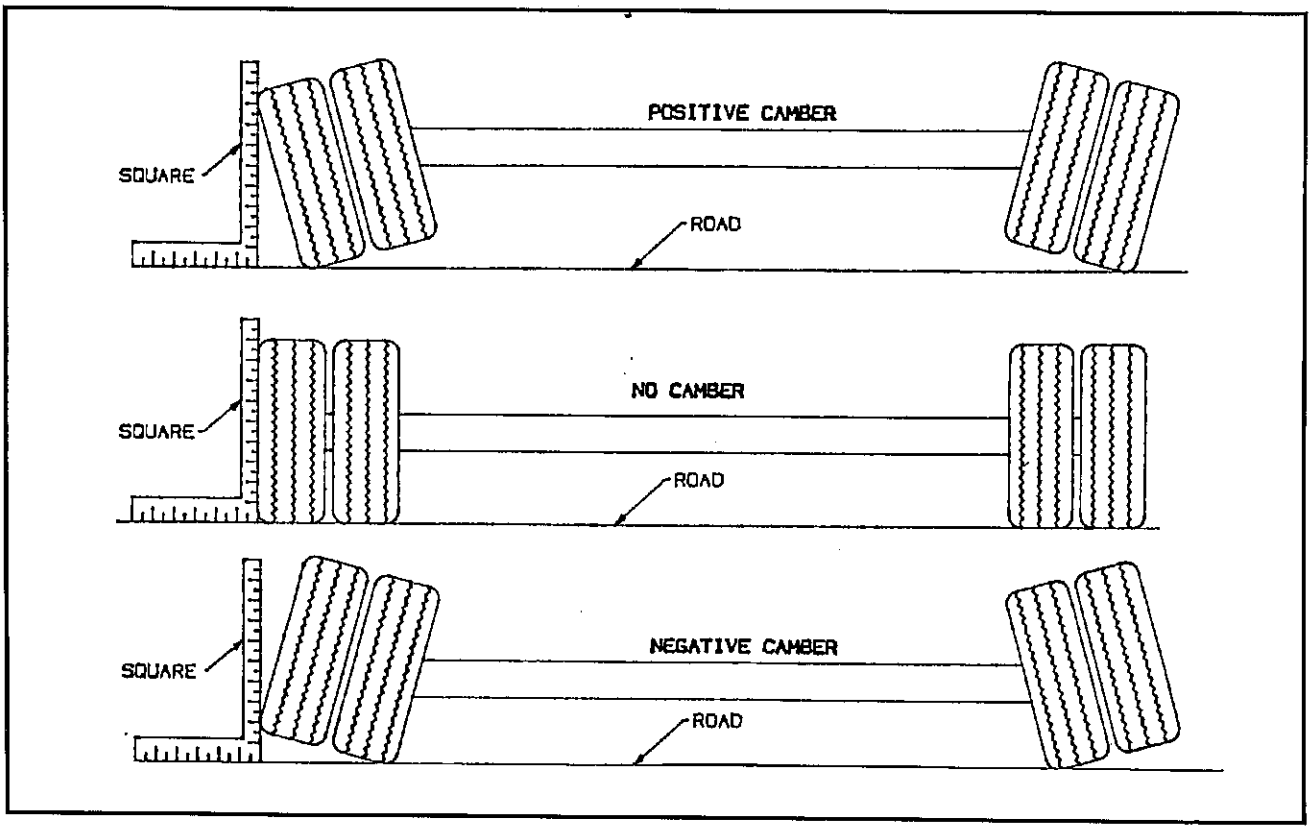


FIG. 6-10 EXAMPLES OF CAMBER

before the alignment process can be undertaken properly. All defective parts of the suspension or axles must be replaced immediately.

6-15.2 SPRING SUSPENSION AXLES

a. Loosen the torque arm clamp bolts on the adjustable torque arms and loosen the axle u-bolts.

b. Adjust the adjustable torque arm on the front axle until the proper alignment has been achieved using the procedure outlined in **Section 6-17.1.**

c. Tighten the axle u-bolts down to the torque values listed in **Section 3 "Specifications".**

d. Tighten the front axle torque arm clamp bolts to the torque listed in **Section 3 "Specifications".**

e. Now align the rear axle to the front axle in the same manner using the torque arm for adjusting. The rear axle should be exactly parallel to the front axle. In other words, dimensions Y and Y1 in **Fig. 6-12** should be the same.

f. Tighten the rear axle u-bolts to the torque listed in **Section 3 "Specifications".**

g. Tighten the rear axle torque arm clamp bolts to the torque listed in **Section 3 "Specifications".**

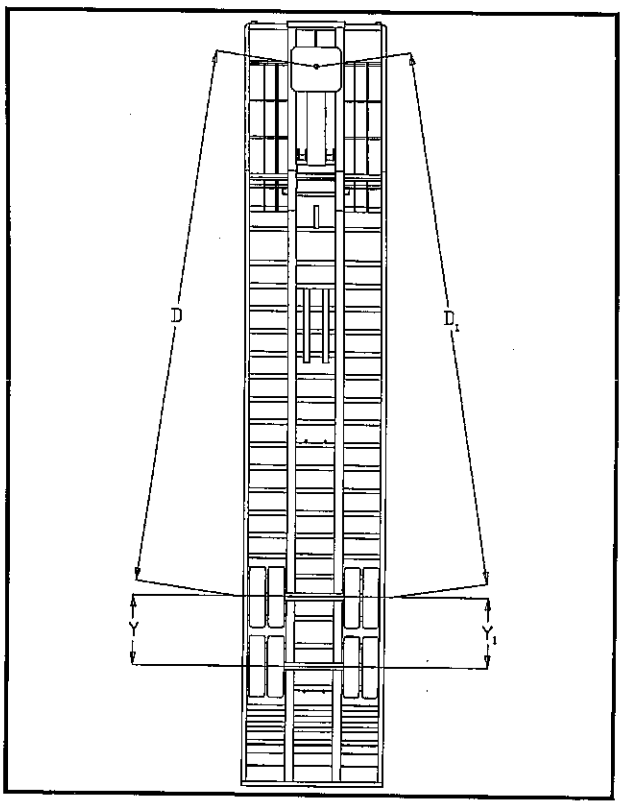


FIG. 6-11 CHECKING AXLE ALIGNMENT

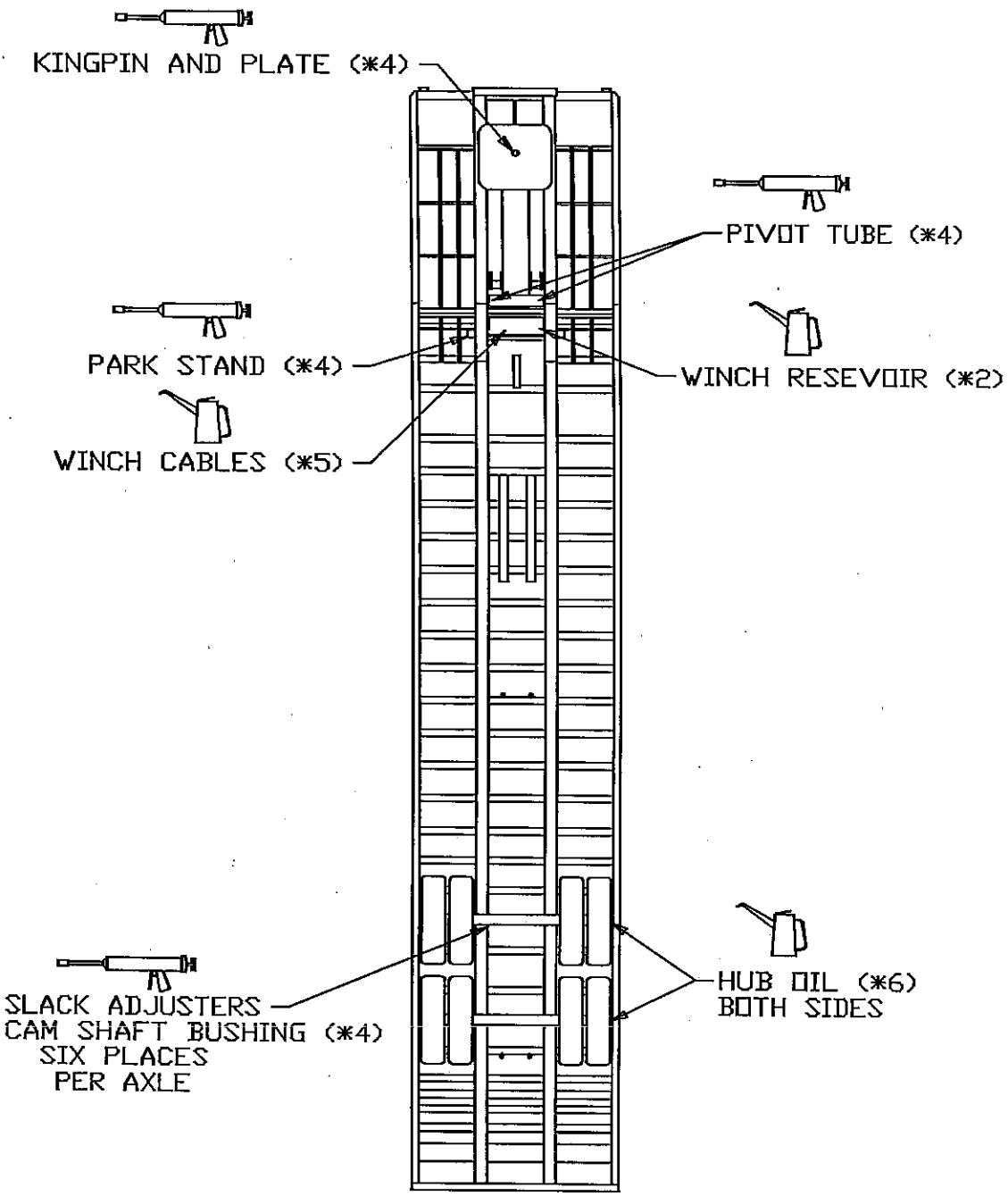


FIG. 6-12 LUBRICATION POINTS

LUBE #	SEASON	BRAND AND PRODUCT (weight and/or type)			
		AMOCO	EXXON	PHILLIPS	TEXACO
1	SUMMER	RYCON MV	HDX Plus 10W	Mangus Oil 150	Rando HD-AZ
	WINTER	RYCON MV	HDX Plus 10W	Mangus Oil 150	Rando HD-AZ
2	SUMMER	Multi-Purpose 140	Gear Oil GX 85-140	Worm Gear Oil SAE 90 #9332D1	Maropa SAE 90 #3
	WINTER	Multi-Purpose 90	Gear Oil GX 85-140	Worm Gear Oil SAE 90 #9332D1	Maropa SAE 90 #3
3	SUMMER & WINTER	USE DRY SILICONE SPRAY, ONLY IF ADDITIONAL LUBRICATION IS NECCESARY.			
4	SUMMER	Lit-Multi-Purpose Grease	Rondex Multi-Purpose Grease	Phil Lube M.W. Grease	MarFax All Purpose
	WINTER	Lit-Multi-Purpose Grease	Rondex Multi-Purpose Grease	Phil Lube M.W. Grease	MarFax All Purpose
5	SUMMER & WINTER	USE ANY CABLE LUBE OR CABLE GREASE			
6	SUMMER	Multi-Purpose 90	Gear Oil GTX 85-140	Phil Lube All Purp. Gear SAE 90 #90501	Multi-Gear EP 80W90
	WINTER	Multi-Purpose 90	Gear Oil GTX 85-140	Phil Lube All Purp. Gear SAE 90 #90501	Multi-Gear EP 80W90

FIG. 6-13 LUBRICATION SPECIFICATIONS

I-INSPECT R-REPLACE T-TIGHTEN/TORQUE ADJ. L-LUBRICATE C-CLEAN

NORMAL OPERATING SERVICE INTERVALS - PERFORM AT THE TIME SHOWN SHORTEN SERVICE INTERVALS WHEN OPERATING IN SEVERE OR DIRTY CONDITIONS								
SERVICE INTERVAL ITEM:	TIMES	1st 5 HRS	WEEKLY	MONTHLY	6 MONTH	YEARLY	LUBE #	NOTES
	MILES	50	500	2,000	12,000	25,000		
ELECTRICAL								
LIGHTS		I	I					
WIRING AND CONNECTIONS		I		I				
MISCELLANEOUS								
FASTENERS		I,T		I				a
KING PIN AND PLATE		I		C,I,L			4*	
BRAKE AIR SYSTEM		I	I	I				
RELAY VALVES						I,C		
BRAKE ADJUSTMENT AND WEAR		I		I,T				c
SLACK ADJUSTERS		I	I			L	4*	
CAM SHAFT ASSEMBLIES		I	I			L	4*	
HUB OIL		I	I,L			R*	6*	
WHEEL BEARINGS		I			I,T		6*	d
TIRE INFLATION AND WEAR		I	I					e
WHEEL LUG-NUTS		I,T	I	I,T				a
SUSPENSION ALIGNMENT		I		I				
HYDRAULICS								
OIL		I	I			R	1*	
FILTER		R			R			
HOSES (Inspect & Replace as needed)		I		I		I,R	2*	
WINCH GEAR CASE		I		I				

TABLE 6-2 MAINTENANCE SCHEDULE

* FOR RECOMMENDED LUBRICANT, SEE LUBE SPECIFICATION CHART
(a) SEE BOLT TORQUE SHART IN SECTION 3 "SPECIFICATIONS" FOR CORRECT TORQUE.
(b) NOT APPLICABLE
(c) SEE SECTION 6-9 AND 6-10 FOR PROCEDURES.
(d) SEE SECTION 6-13 FOR PROCEDURES.
(e) SEE SERIAL NUMBER PLATE ON THE FRONT OF THE SEMITRAILER FOR PROPER INFLATION.

TABLE 6-1 MAINTENANCE SCHEDULE

7 TROUBLE SHOOTING

INDEX

7-1 ELECTRICAL

Most electrical system problems show up as a burned out light or fuse, or inoperative electrical component. Wiring, grounds, or components may be at fault. Locate the symptom in this section that best identifies your electrical problem. Check out each possible problem under that symptom. If the problem can not be located, see an automotive electrical specialist. For maintenance procedures see **Section 6-4.**

SYMPTOM	PROBLEM: REMEDY
NO LIGHTS	Fuse blown: replace fuse. Connection at plug-in: tighten connection. Broken or corroded wires: replace wire. Ground wire loose: clean and tighten ground.
LIGHTS FLICKERING	Wires shorted or loose: locate, insulate, replace, or tighten.
LIGHTS DIM	Voltage difference between trailer & tractor: match bulbs with tractor voltage.
LIGHTS BRIGHT & BURN OUT	Voltage difference between trailer & tractor: match bulbs with tractor voltage.
FUSE BLOW-OUT OR CIRCUIT BREAKER TRIPPING	Vibration: locate source of vibration and repair. Short circuit: replace fuse and try all accessories. If fuse blows right away, locate short and repair.
LAMP BULB BURN OUT	Vibration: locate source of vibration and repair. Short circuit: replace fuse and try all accessories. If fuse blows right away, locate short and repair. Loose connection: check lamp sockets and ground connections. Intermittent short: locate short and repair. Improper voltage: check voltage regulator output.

7-2 TIRES - WHEELS - SUSPENSION

Most tire, wheel, and suspension related problems are due to excessive loads, extreme conditions, and improper maintenance. Tire, wheel, and suspension problems can be easily detected and solved by checking the following guide. For maintenance procedures see **Sections 6-10 thru 6-15.**

SYMPTOM	PROBLEM: REMEDY
VIBRATIONS WHILE DRIVING	Improper tire inflation: inflate to proper pressure. Tires cupped or have flat spots: replace tires. Wheels bent or loose: replace or tighten. Tires incorrectly mounted: remount. Mud in wheels: clean wheels. Tire(s) out of balance: balance tires. Brakes dragging: locate cause and repair. Object(s) stuck between duals: remove object(s).
RAPID TIRE WEAR/DETERIORATION:	
CENTER TREAD WEAR	Over inflation: deflate to correct inflation.
SHOULDER TREAD WEAR - BOTH SHOULDERS	Under inflation: increase inflation to correct PSI.
SHOULDER TREAD WEAR - ONE SHOULDER	Axle damage: straighten or replace axle.
OVERALL TREAD WEAR	Overloading: check tire load rating. High speeds: adjust speed according to road and load conditions. Incorrect dual matching: properly match dual tires.
TIRE FLAT SPOTS	Quick stops: adjust braking practices. Grabbing brakes: adjust brakes properly. Worn or loose wheel bearings: adjust or replace as needed. Out of balance wheels and tire: balance wheels and tires.
UNEVEN WEAR	Undercarriage bushings worn: replace bushings. Worn or loose wheel bearings: adjust or replace as needed. Out of balance wheels and tires: balance wheels and tires.
RIM FAILURE*:	
CRACKING	Overinflated tires: deflate tire to proper PSI. High speeds: adjust speed according to road and load conditions. High speed cornering: adjust cornering practices. Over loading: check rim load rating.

***IN ALL INSTANCES OF RIM FAILURE, REPLACE THE RIM IMMEDIATELY!**

TIRES - WHEELS - SUSPENSION CONTINUED

SYMTOMS	PROBLEM: REMEDY
BENDING OR WARPING	Curb-hopping or potholes: adjust turning practices and adjust speed accordingly with road conditions. Improper tightening sequence: follow proper tightening sequence.
BROKEN STUDS*	Over tightening: use correct torque when mounting.

***REPLACE BROKEN STUDS BEFORE USING THE SEMITRAILER!**

TRAILER TRACKING PROBLEMS:

TRACKS TO ONE SIDE	Axle alignment: re-align axle.
TRACKS TO EITHER SIDE	Broken or bent springs or equalizers: replace defective parts.

7-3 BRAKES

For maintenance procedures see **Sections 6-6 thru 6-10.**

SYMPTOM	PROBLEM: REMEDY
NO BRAKES OR BRAKES ARE INTERMITTENT	Brake air system improperly connected: reconnect hand valves properly. Relay/Emergency valve plugged: clean valve. Defective tractor protection valve: repair or replace. Restricted tubing or hose line: locate and eliminate restriction. Broken line: locate break and repair. Tractor air system failure: troubleshoot tractor air system and repair.
SINGLE BRAKE DRAGGING OR LOCKED	Broken internal brake component: locate and replace broken part. Flat spot on cam roller or cam shaft: replace and lubricate. Improper adjustment: adjust slack adjusters. Spider bushing or cam bracket bushing binding: lubricate or replace bushing. Improper lubrication: lubricate per FIG. 6-12. Worn brake shoe bushing: replace bushing. Brake drum distortion: replace drum. Broken brake chamber spring: replace spring. Brake chamber pushrod binding: re-align brake chamber bracket. Air brake line loose or broken: tighten or repair.
UNEVEN BRAKES	See "SINGLE BRAKE DRAGGING OR LOCKED" Restriction in hose: locate restriction and remove. Worn brake linings: reline brakes. Grease on linings: reline brakes. Broken slack adjuster: replace slack adjuster. Leaking brake chamber diaphragm: replace diaphragm.

BRAKES, CONTINUED

SYMPTOM	PROBLEM: REMEDY
BRAKES APPLY TOO SLOWLY	Brakes need adjusting or lubrication: adjust or lubricate as needed. Low air pressure in brake system (below 80 PSI): check tractor air system. Restricted tubing or hose: locate restriction and remove. Defective relay valve: clean or replace.
BRAKES RELEASE TOO SLOWLY	Brakes need adjusting or lubrication: adjust or lubricate as needed. Brake rigging binding: align brakes or replace bent parts. Exhaust port of relay valve restricted or plugged: clean valve.
ALL BRAKES DO NOT RELEASE	Air system improperly connected to tractor: tighten or adjust connections. Brake valve on tractor is applied: release brake. Relay emergency valve in emergency position: check line pressure and check valve. Restricted tubing or line: locate restriction and remove. Defective tractor protection valve: troubleshoot tractor air system. Parking brakes locked: troubleshoot air system.
INSUFFICIENT BRAKES	Brakes need adjusting: adjust brakes. Brakes need lubricating: lubricate brakes. Brakes need relining: reline brakes. Low air pressure: troubleshoot air system. Defective relay emergency valve: repair or replace. Brakes overheated: stop and allow brakes to cool, locate cause of overheating.
BRAKES GRABBING	Grease on brake linings: reline brakes. Brake rigging binding: align brakes or replace bent parts. Defective brake valve on tractor: repair or replace valve. Defective relay emergency valve: repair or replace valve.
EXCESSIVE LEAKAGE WITH BRAKES RELEASED	Relay emergency valve leaking: repair or replace valve. Leaking tubing or hose: replace defective part.
EXCESSIVE LEAKAGE WITH BRAKES APPLIED	Relay emergency valve leaking: repair or replace valve. Leaking brake chamber diaphragm: replace diaphragm. Leaking tubing or hose: replace defective part.
EXCESSIVE LEAKAGE WITH EMERGENCY SYSTEM ONLY APPLIED - NO LEAKAGE WITH NORMAL BRAKING	Defective relay emergency valve: repair or replace valve.
EXCESSIVE WATER PRESENT IN BRAKE SYSTEM	Reservoir not drained often enough: drain reservoir daily.
EXCESSIVE OIL PRESENT IN BRAKE SYSTEM	Compressor on tractor passing excessive oil: repair compressor.

BRAKES, CONTINUED

SYMPTOM	PROBLEM: REMEDY
BRAKE WILL NOT APPLY PROPERLY	Flat spot on cam roller or camshaft: replace and lubricate.
BRAKES WILL NOT APPLY WHEN EMERGENCY LINE IS DISCONNECTED	Initial air pressure too low: allow air system to build up to minimum 90 PSI and stabilize. Defective relay valve: repair or replace valve. Air line leak: locate leak and repair. Brake chamber leak: locate leak and repair or replace.

7-4 BRAKE DRUMS:

For maintenance procedures see **Chapter 6 "MAINTENANCE AND LUBRICATION".**

SYMPTOM	PROBLEM: REMEDY
EXCESSIVE LOSS OF BRAKES OR FADING	Overheated brake drums: check for defective or misadjusted brake linings, distorted or over-machined drums. Also check for operating conditions or loads that create severe or excessive brake applications.
BRAKES PULL TO EITHER SIDE	Drums of different diameters: replace with drums of same diameter. Foreign matter in drums: clean drums out.
ROUGH OR NOISY BRAKING ACTION	Defective drums: pull drums and inspect for any of the following; Heat spotted drums, grease spotting, blue drums, scored drums, excessive wear at rivet holes or edges, polished drums, out of round drums, unbalanced drums, worn/damaged brake components, foreign matter in drums. Correct situation or replace defective part(s).
VIBRATION IN RIDE	Defective drums or out-of-round: replace drums. Out-of-balance drums: balance drums.

7-5 HYDRAULIC SYSTEM

Most hydraulic system failures follow the same pattern: a gradual or sudden loss of pressure or flow with a resulting loss of cylinder or motor power. Any one of the system's components may be at fault. By following step-by-step procedures, the trouble can be located in a short time.

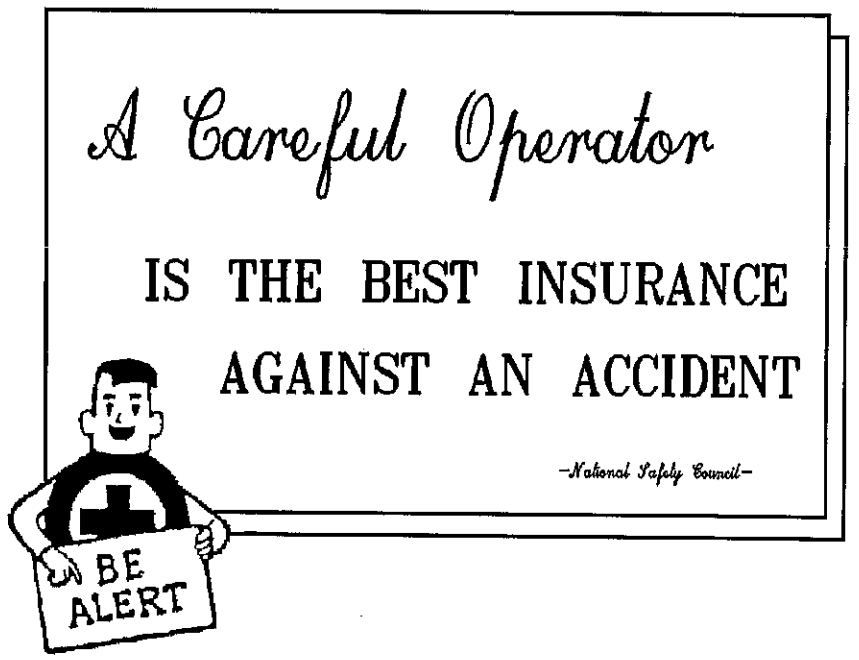
SYMPTOM	PROBLEM: REMEDY
SYSTEM INOPERATIVE	Not enough oil in system: fill, check for leaks. Wrong oil in system: change oil, see specifications. Filter dirty or clogged: drain oil and replace filter. Oil lines dirty or collapsed: clean or replace as necessary. Air leaks in pump suction line: repair or replace as necessary. Worn or dirty pump: clean, repair or replace. Check for contaminated oil. Drain and flush.

HYDRAULIC SYSTEM , CONTINUED

SYMPTOM	PROBLEM: REMEDY
SYSTEM INOPERATIVE, CONTINUED	Badly worn components: examine for internal leakage. Replace faulty components. Check for cause of wear. Leakage: check all components, and relief valve for proper settings. Excessive load: check unit specifications for load limits. Slipping or broken pump drive: repair or replace couplings. Check for alignment.
SYSTEM OPERATES ERRATICALLY	Air in the system: check suction side of system for leaks. Repair leaks. Cold oil: allow ample warm-up time. Use proper weight oil for operating temperature. Dirty or damaged components: clean or repair as needed. Restriction in filters or lines: clean and/or replace filter or lines.
SYSTEM OPERATES SLOWLY	Oil viscosity too high, or "cold oil". Allow oil to warm up before operating. Low pump drive speed: increase engine speed (check pump owners manual for specifications). Low oil level: check reservoir and add oil as necessary. Air in system: check suction side for leaks. Repair leaks. Badly worn pump, valves, cylinders, etc.: repair or replace faulty component(s) as necessary. Restrictions in lines or filter: clean and/or replace filter or lines. Improper adjustments: check orifices, relief valves, etc. Adjust as necessary. Oil leaks: tighten fittings. Replace seals, gaskets and damaged lines.
SYSTEM OPERATES TOO FAST	Wrong size or incorrectly adjusted restrictor: replace or adjust as necessary. Engine running too fast: reduce engine speed.
OVER HEATING OF OIL IN SYSTEM	Oil passing thru relief valve for excessive time: return control valve to neutral when not in use. Incorrect, low, dirty oil: use recommended oil. Fill reservoir with clean oil. Replace filter. Engine running too fast: reduce engine speed. Excessive component internal leakage: repair or replace component as necessary. Restriction in filters or lines: clean and/or replace filter or lines. Insufficient heat radiation: clean dirt and mud from reservoir and components. Malfunctioning component: repair or replace.
FOAMING OF OIL	Incorrect, low, dirty oil: replace, clean or add oil as needed. Air leaks: check suction line and component seals for suction leaks. Replace defective parts.
NOISY PUMP	Low, incorrect, foamy oil: replace, clean, or add oil as needed. Suction line plugged: clean out obstruction or replace line. Flush system, replace filter.

HYDRAULIC SYSTEM , CONTINUED

SYMPTOM	PROBLEM: REMEDY
LEAKY PUMP	Damaged or worn shaft seal: Replace seal and check for misalignment. Loose or broken parts: Tighten or replace.
CYLINDERS MOVE WITH CONTROL VALVE IN NEUTRAL POSITION	Leaking cylinder seals or fittings: Replace worn seals or fittings. Control valve not centering when released: Check linkage for binding and repair. Valve damaged: Repair or replace.
CONTROL VALVE LEAKS	Seals damaged or worn: Replace.
CYLINDER LEAKS	Seals worn or damaged: Replace. Rod damaged: Replace. Barrel damaged: Replace.
CYLINDERS DO NOT FUNCTION, OR CREEP WITH PTO DISENGAGED	Leaking fittings or cylinder seals: Tighten loose fittings. Replace worn seals or fittings. Piloted check valve or O-ring leak: Replace defective component.



NOTES:

8 ILLUSTRATED PARTS LIST

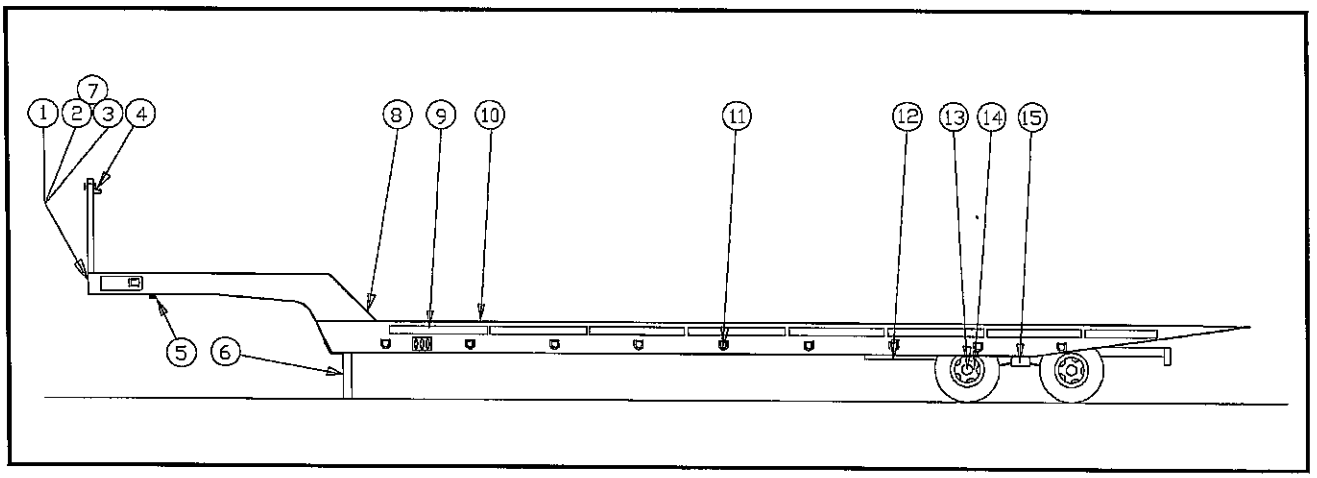


FIG. 8-1 SEMITRAILER MAIN COMPONENTS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	B3-128-063	AIR SYSTEM (SEE FIG. 8-2)	REF.
2	B3-272-064	ELECTRICAL SYSTEM (SEE FIG. 8-3)	REF.
3	B3-407-141	MAIN HYDRAULIC SYSTEM (SEE FIG. 8-4)	REF.
4	3-141-010025	BULKHEAD WELDMENT, CHAIN RACK AND	1
5	B3-407-056	GOOSENECK ASSEMBLY (SEE FIG. 8-10)	REF.
6	3-311-010145	PARKING STANDS	2
	. 346SL	PIN, LOCKING HITCH	2
7	B3-573-023	DECALS (SEE FIG. 8-13)	REF.
8	B3-873-057	WINCH (SEE FIG. 8-16)	1
9	B3-276-126	OVERWIDTH EXTENSIONS, PULLOUT (SEE FIG. 8-11)	REF.
10	3-311-015-492	FRAME, MAIN TRAILER	1
	. 1-DSL LATCH	LATCH, TOOL COMPARTMENT	2
	. . BSL-6-4	RIVET, TOOL COMPARTMENT LATCH	8
	. 1-822-010002	TRIM-LOK	A/R
11	3-793-010002	D-RING	18
	. 3-311-010182	HOLD-DOWN, D-RING	18
12	3-762-010569	UNDERCARRIAGE (SEE FIG. 8-12)	1
13	3-042-010039	AXLE ASSEMBLY (SEE FIG. 8-15)	2
14	B7-870-019	HUB/DRUM ASSEMBLY (SEE FIG. 8-14)	2
	. 3-406-010044	HUB/DRUM, LEFTHAND	2
	. 3-406-010045	HUB/DRUM, RIGHTHAND	8
	. 3-870-010012	WHEEL, DISC	8
	. . TR500	STEM, STRAIGHT VALVE	4
	. . TR573	STEM, VALVE	8
	. . 7381	EXTENSION, VALVE STEM	4
	. 10RX17.5 GY	TIRE, TUBELESS TRAILER	8
	. B3-870-028	TIRE ASSEMBLY, SPARE	6
	. . 10RX17.5 GY	TIRE, TUBELESS	6
	. . 3-870-010012	WHEEL, DISC	6
	. . . TR573	STEM, VALVE	6
15	HW-UM2-ER1-U-1H	SUSPENSION SYSTEM (SEE FIG. 8-13)	1

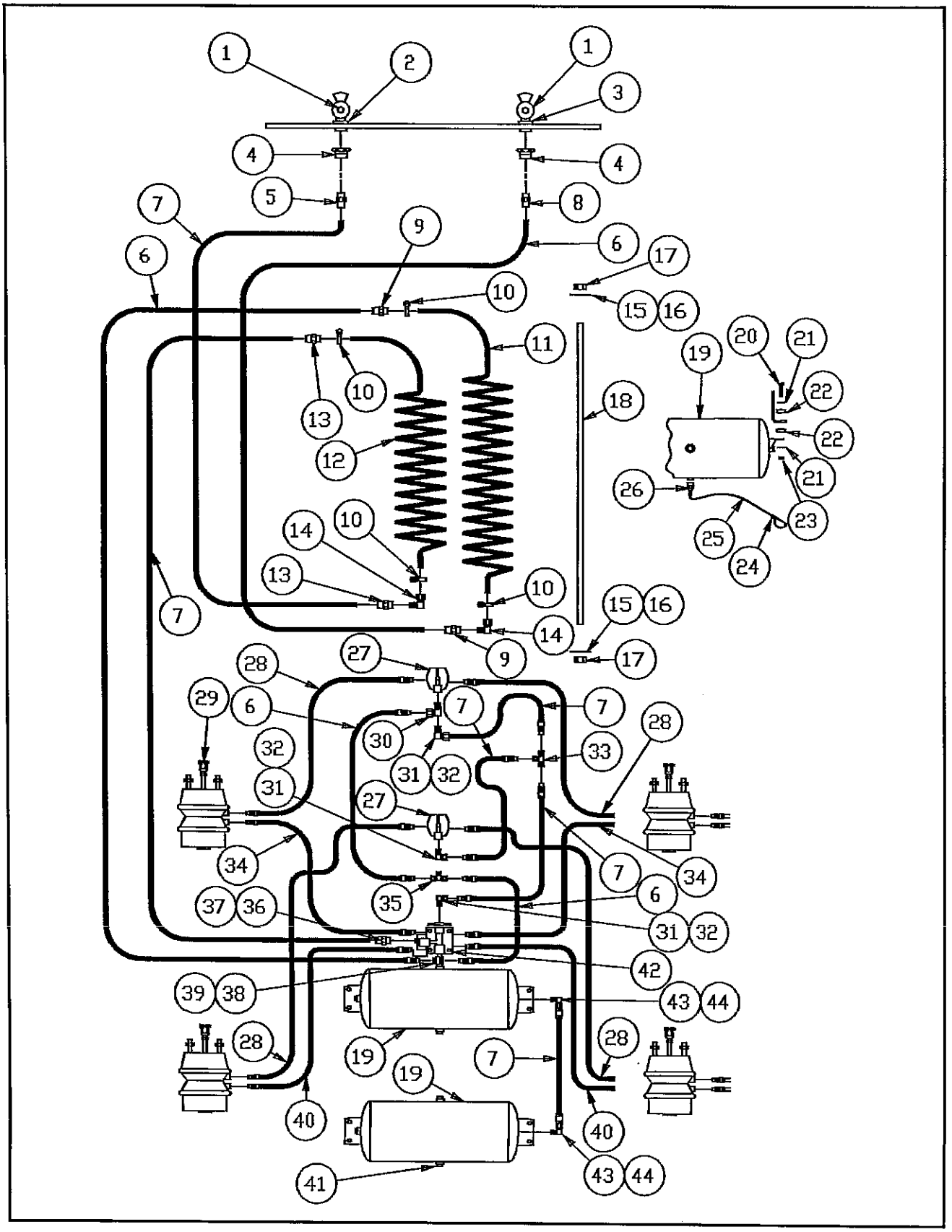


FIG. 8-2 AIR SYSTEM SCHEMATIC

SCHEMATIC, AIR SYSTEM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	55B11	GLADHAND	2
2	55B61-6	TAG, EMERGENCY LINE	1
3	55B61-7	TAG, SERVICE LINE	1
4	55B61	UNION, FRAME	2
5	HO-168-8X4	CONNECTOR	1
6	62P6	TUBING, AIRLINE	A/R
7	62P8	TUBING, AIRLINE	A/R
8	1469X6	ELBOW, MALE	1
9	1466X6X6	FITTING	2
10	239-9076-1	CLAMP, SUPPORT	4
11	3-384-010003	AIRLINE, COILED SERVICE	1
12	3-384-010004	AIRLINE, COILED EMERGENCY	1
13	14686X8	FITTING	2
14	2047-8X6S	FITTING, AIRLINE	2
15	5/8FW	WASHER, FLAT	2
16	5/8SLW	WASHER, SPLIT LOCK	2
17	5/8-11HFN	NUT, HEX	2
18	3-642-010033	ROD, HOSE SUPPORT	1
19	3-780-010002	RESERVOIR, AIR	2
20	3/8-16X1-1/2CS	CAP SCREW, HEX HEAD	8
21	3/8FW	WASHER, FLAT	16
22	805-2	BUSHINGS, STEP	16
23	3/8-16HFLN	NUT, LOCKING HEX	8
24	3-182-010034	CLAMP, CABLE	4
25	3-153-010002	CABLE, VINYL COATED	1
26	757-363	VALVE, CABLE PULL DRAIN	2
27	758-182	VALVE, BRAKE SERVICE	2
28	3-384-010019	AIR HOSE	2
29	3-128-010002	CHAMBER, SPRING BRAKE (SEE PAGE 8-21 FOR REPLACEMENT PARTS)	4
30	1469X6	ELBOW, MALE	1
31	2047-8X6	ELBOW	3
32	HO-168-8X6	CONNECTOR, MALE	3
33	1464X8X8X8	FITTING, TEE	1
34	3-384-010014	AIR HOSE	4
35	1472X6X6X6	TEE, BRASS WEATHER	1
36	HO-159-8BP	INSERT	1
37	HO-168-8X6	FITTING, TUBE	1
38	1472X6	FITTING	1
39	2083-8-8S	FITTING	1
40	3-384-010024	AIR HOSE	2
41	1/2 PIPE PLUG	PLUG, PIPE	4
42	758-181	VALVE, FOUR PORT TASK	1
43	HO-159-8BP	INSERT	2
44	2047-8X8	FITTING	2

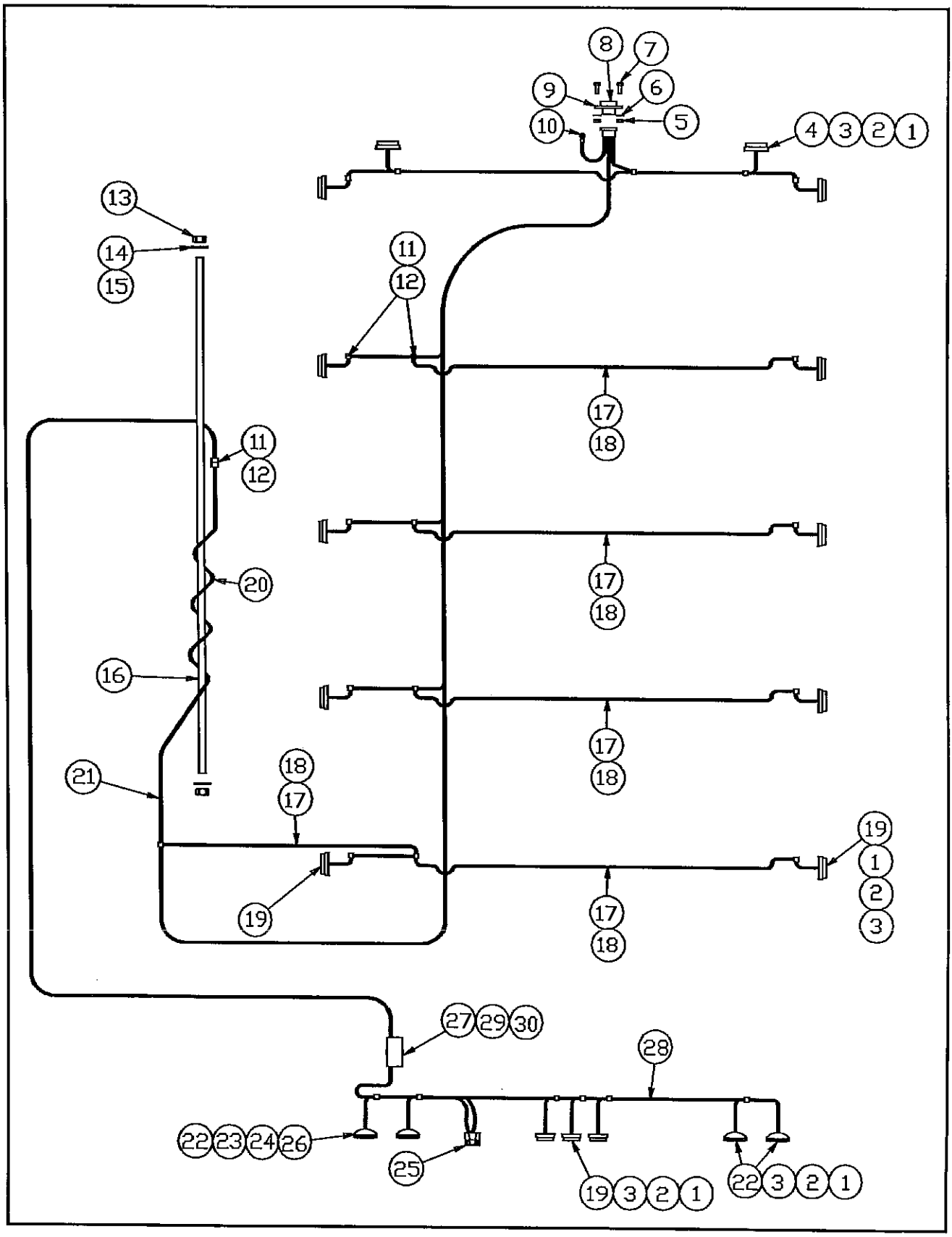


FIG. 8-3 ELECTRICAL SYSTEM SCHEMATIC

SCHEMATIC, ELECTRICAL SYSTEM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	103-0635	NUT, LOCKING	42
2	111-0600	SCREW, MACHINE ROUND HEAD	42
3	2552	GROMMET	30
4	559-3129	LIGHT, YELLOW CLEARANCE	10
5	5/16-18HFN	NUT, HEX	2
6	5/16SLW	WASHER, SPLIT LOCK	2
7	5/16-18X1-1/4CS	CAP SCREW, HEX HEAD	2
8	59S-7	RECEPTACLE, 7 PIN	1
9	59W-2-3	BOOT, RUBBER	1
10	DO1-412	TERMINAL, RING	1
11	3-272-010021	SPLICE, ELECTRICAL BUTT	31
12	3-272-010022	SPLICE, ELECTRICAL BUTT	6
13	5/8-11HFN	NUT, HEX	2
14	5/8FW	WASHER, FLAT	2
15	5/8SLW	WASHER, SPLIT LOCK	2
16	3-642-010033	SUPPORT, HOSE ROD	1
17	1-879-010005	CONDUIT, 14 AWG BROWN	A/R
18	3-201-010002	CONDUIT PLASTIC FLEX	1
19	559-3629	LIGHT, RED CLEARANCE	5
20	3-156--010009	CABLE, MULTI CONDUCTOR	A/R
21	3-156-010002	CABLE, COILED ELECTRICAL	1
22	3/16-3/4RHD STV	STOVE BOLT, ROUND HEAD	8
23	3/16SLW	WASHER, SPLIT LOCK	8
24	3/16-24HFN	NUT, HEX	8
25	15009	LAMP, LICENSE	1
26	766-2655	LIGHT, STOP/TURN/TAIL	4
27	750-029	JUNCTION BOX	1
28	3-368-010024	HARNESS, REAR WIRING	1
29	1/4-20HFLN	NUT, LOCKING HEX	2
30	1/4-20X3/4HHCS	CAP SCREW, HEX HEAD	2
NO NUMBER:			
	CO1-416	TERMINAL, RING	2
	DO1-407	TERMINAL, RING	2
	3-203-010001	TERMINAL, RING	11

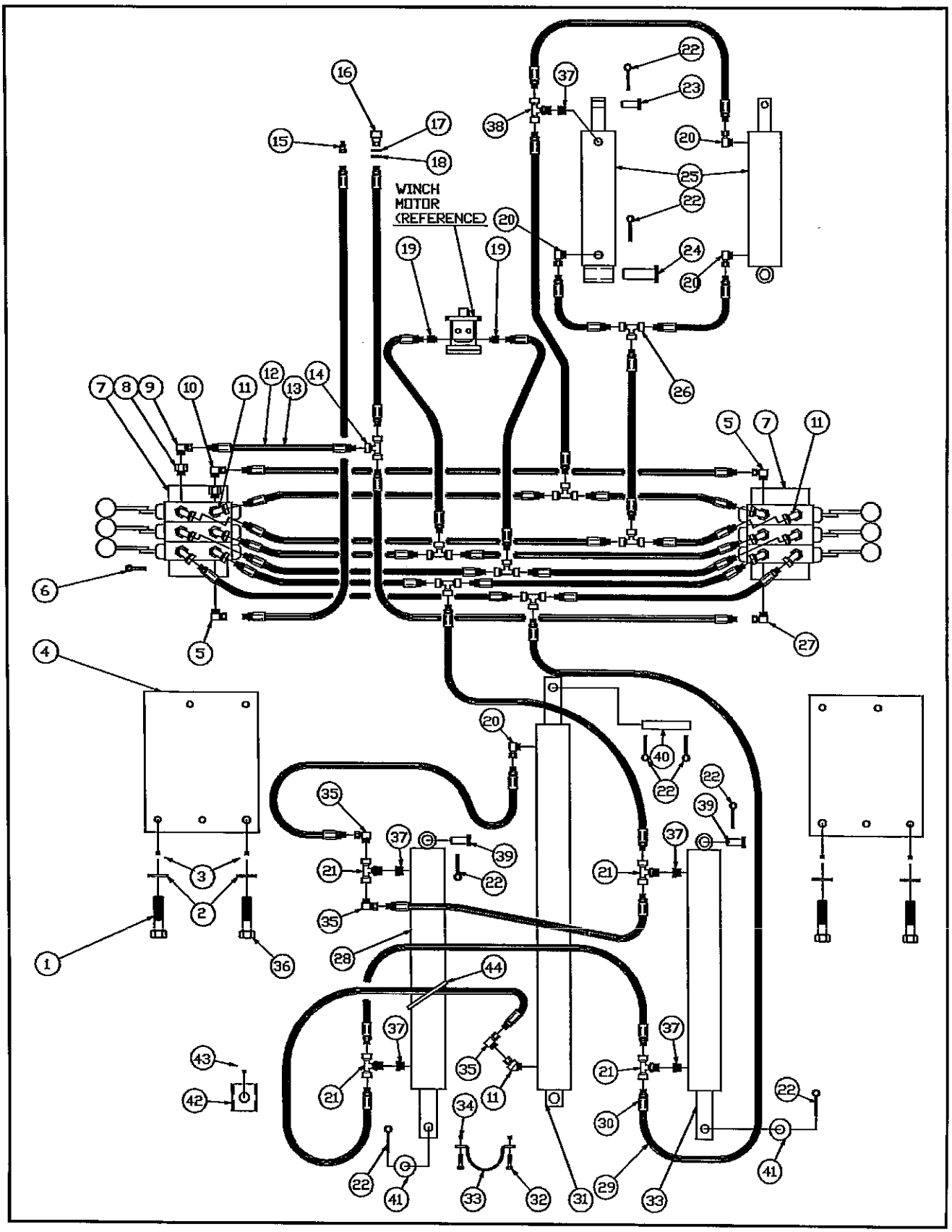


FIG. 8-4 HYDRAULIC SYSTEM SCHEMATIC

SCHEMATIC, HYDRAULIC SYSTEM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3/8-16X2CS	CAP SCREW, HEX HEAD	6
2	3/8SLW	WASHER, LOCK	18
3	3/8-16HFN	NUT, HEX	18
4	3-120-010079	PLATE, VALVE MOUNTING	2
5	1-007-010024	ELBOW, O-RING 90°	2
6	1/8X1	PIN, COTTER	2
7	3-846-010002	VALVE, 3 SPOOL (SEE FIG. 8-)	2
8	2066-12-8S	SWIVEL, O-RING	1
9	2047-12-125	SWIVEL, PIPE	1
10	1-007-010013	SWIVEL, 90°	1
11	1-007-010023	ADAPTER, O-RING	13
12	1-397-010044	HOSE, HYDRAULIC	A/R
13	1-299-010001	HOSE END	54
14	2255-12-12S	SWIVEL, TEE	1
15	8010-4	COUPLER, MALE	1
16	S25F-6	COUPLER, FEMALE	1
17	7/8MACH BUSH	BUSHING, MACHINERY	2
18	1/2HOSE WASHER	WASHER, HOSE	1
19	2066-8-10S	ADAPTER, O-RING	2
20	1-007-010007	ELBOW, 90°	4
21	2254-8-8S	ADAPTER, TEE	5
22	3/16X2-1/4	PIN COTTER	18
23	3-557-010059	PIN, ROD END CYLINDER	2
24	3-557-010033	PIN, BUTT END CYLINDER	2
25	3-242-010099	CYLINDER, TRAILER TILT HYDRAULIC	2
26	2255-8-8S	TEE, PIPE SWIVEL	7
27	2068-12-12S	ADAPTER, 90° O-RING	1
28	3-242-010118	CYLINDER, LOW LOAD ANGLE HYDRAULIC	1
29	1-397-010010	HOSE, HYDRAULIC	A/R
30	1-299--10002	HOSE END	6
31	3-242-010103	CYLINDER, BED SLIDE HYDRAULIC	1
	. 3-242-010031	PIN, END	1
32	5/8-11X2HHCS	CAP SCREW, HEX HEAD	4
33	2-078-010001	STRAP, BEARING	1
34	5/8-11HFN	NUT, HEX	4
35	2047-8-8S	ADAPTER	3
36	3/8-16X1-1/4CS	CAP SCREW, HEX HEAD	4
37	2066-8-8S	ADAPTER, PIPE	5
38	FF1469-0808085	ADAPTER, TEE	1
39	3-557-010031	PIN, UNDERCARRIAGE CYLINDER	2
40	3-557-010120	PIN, UNDERCARRIAGE CYLINDER	1
41	RRT146X.25	TUBE, ROUND	2
42	2-181-010001	CLAMP, HOSE	2
43	3/8-16HFLN	NUT, LOCKING HEX	6
44	T120R	TYTON STRAP	25

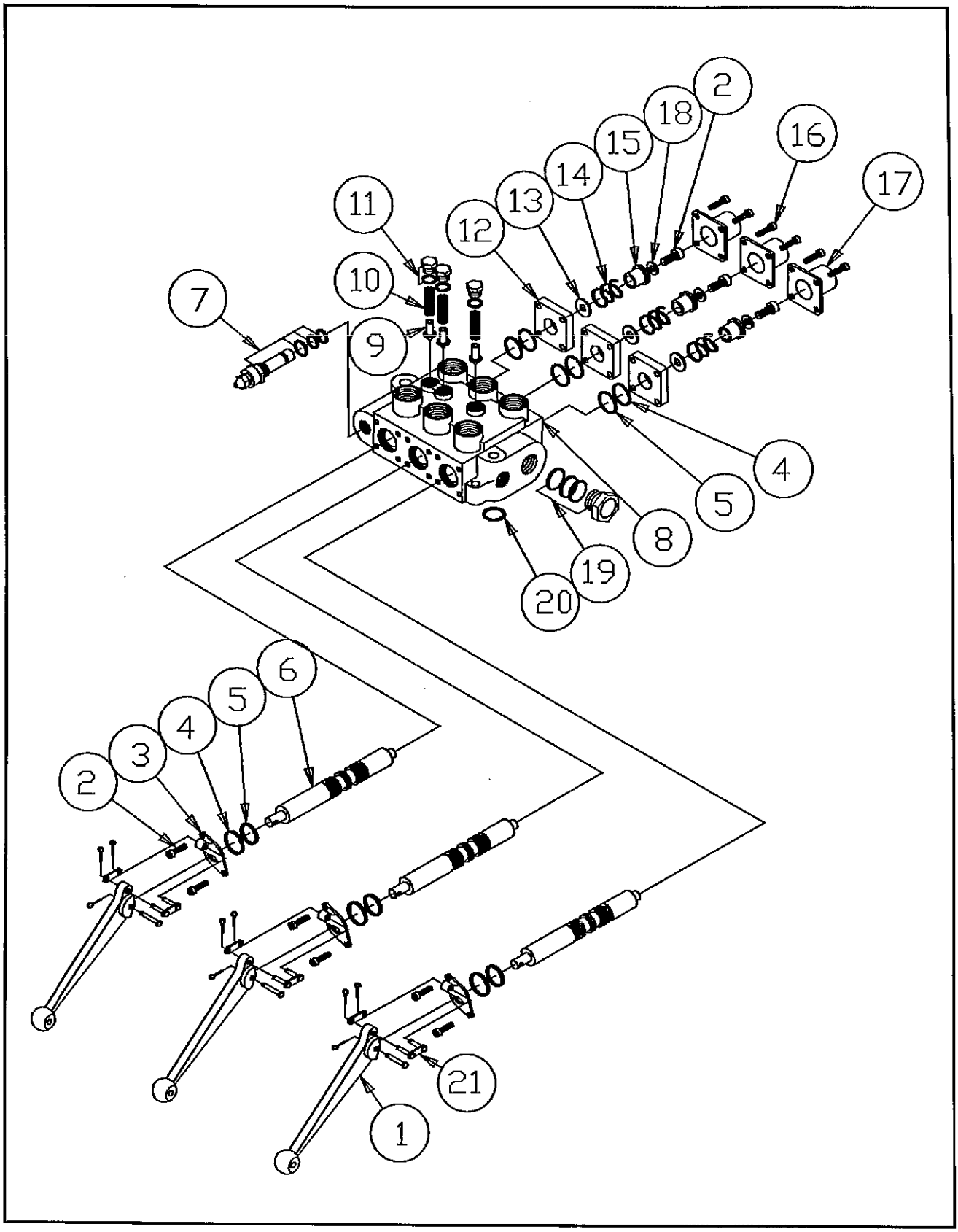


FIG. 8-5 THREE SPOOL VALVE

VALVE, THREE SPOOL

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-846-010007	VALVE ASSEMBLY, COMPLETE THREE SPOOL	2**
1	1V1703	VALVE, HANDLE	3
2	2A0079-404	CAP SCREW (Torque TO 7 - 11 ft. lbs.)	9
3	4Z4306	BRACKET, HANDLE	3
4	1A0711	WASHER, O-RING SPOOL	6
5	2A0283-7214	SEAL, SPOOL	6
6*	1V0090	SPOOL, 4-WAY	3
7	1R0017	RELIEF ASSEMBLY (1500 - 3000 PSI)(PRESET AT 2500 PSI)	1
8	1V0360	HOUSING, VALVE	1
9	1V0081	POPPET, LOAD CHECK	3
10	1A0757	SPRING, LOAD CHECK	3
11	1V1725	PLUG, LOAD CHECK	3
12	1A0709	SPACER, END	3
13	1A0291	WASHER, STOP	3
14	1A0744	SPRING, CENTERING	3
15	1A0292	COLLAR, STOP	3
16	2A0079-406	CAP SCREW (Torque TO 7 - 11 ft. lbs.)	12
17	1A0294	CAP, END	3
18	1A0290	WASHER, CENTERING SPRING	3
19	1V0208	ADAPTER ASSEMBLY, REMOTE POWER BEYOND (Contains all necesssary O-rings)	1
20	2A0283-7214	GROMMET, RUBBER (Bottom Outlet)	1
21	1V1701	PIN KIT	3

* SOLD AS MATCHED SET ONLY
** THIS QUANTITY IS PER TRAILER, ALL OTHER QUANTITIES ON THIS PAGE ARE PER VALVE.

CYLINDER, TRAILER TILT

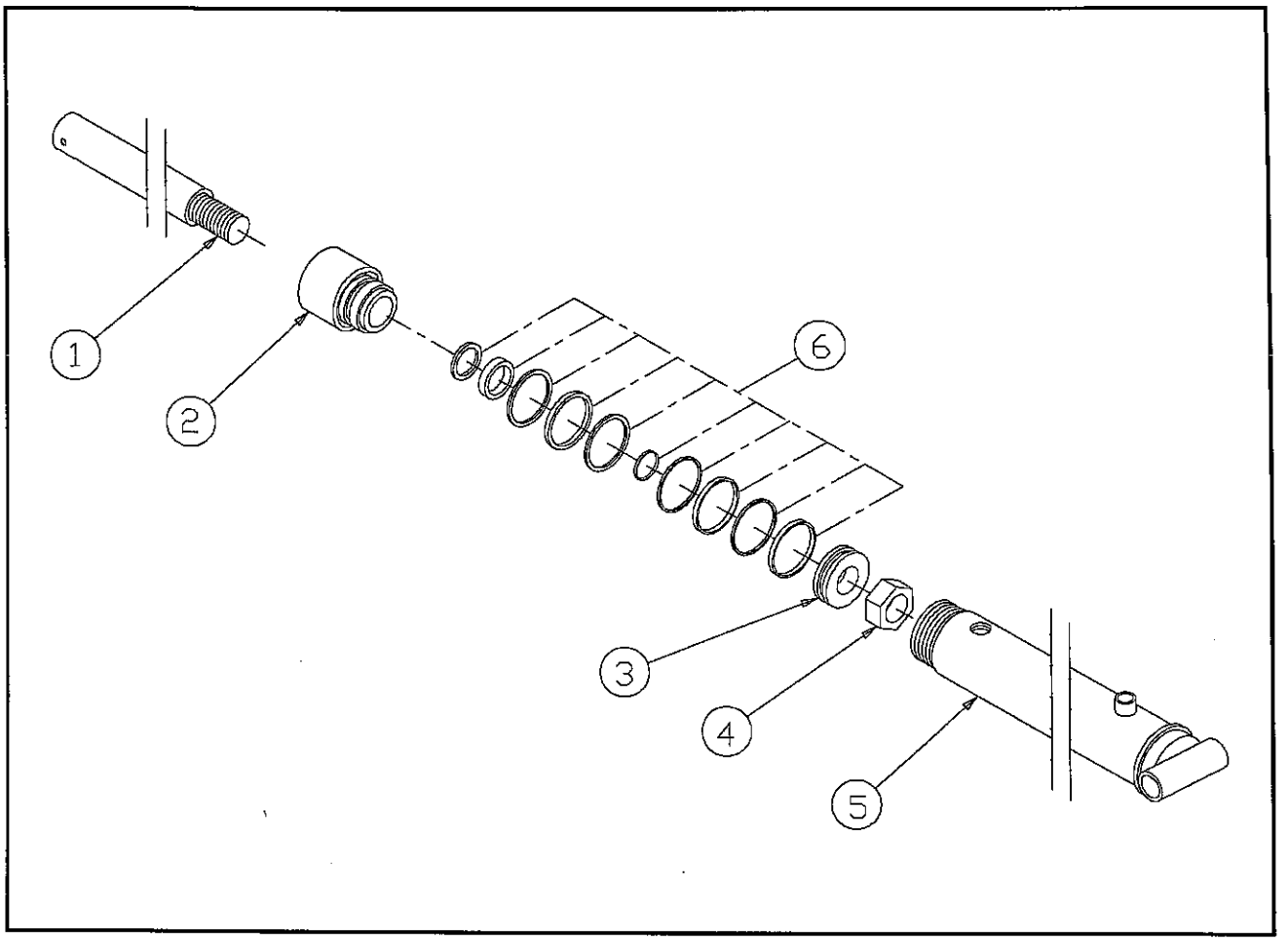


FIG. 8-6 TRAILER TILT CYLINDER

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-242-010099	CYLINDER ASSEMBLY, TRAILER TILT	2
1	011100550	PISTON ROD	1
2	081900295	GLAND	1
	. 230007400	RETAINER, SQUARE WIRE	1
3	071901048	PISTON	1
4	220000212	NUT, LOCKING HEX	1
5	NO NUMBER	TUBE ASSEMBLY, BUTT AND	1
6	PCMK-AD-460	PACKING KIT (Contains all necessary seals and O-rings)	A/R

CYLINDER, UNDERCARRIAGE SLIDE

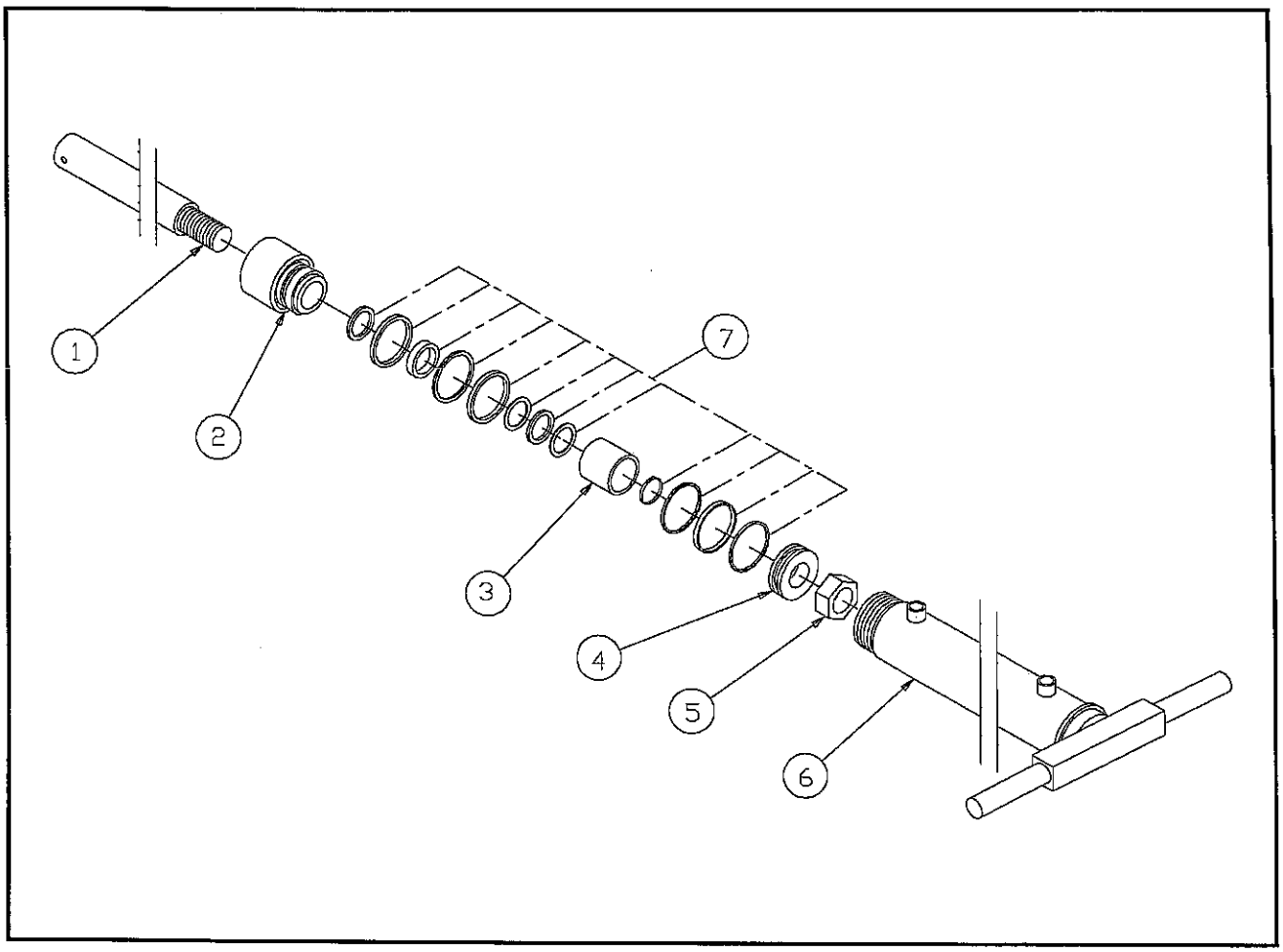


FIG. 8-7 UNDERCARRIAGE SLIDE CYLINDER

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-242-010103	CYLINDER ASSEMBLY, UNDERCARRIAGE SLIDE	1
1	011300179	PISTON ROD	1
2	081900277	GLAND	1
	. 230007400	RING, SQUARE RETAINING	1
3	211300024	SPACER	1
4	079100195	PISTON	1
5	220000212	LOCKNUT	1
6	NO NUMBER	TUBE ASSEMBLY, BUTT AND	1
7	PMCK-AD-461	PACKING KIT (Contains all necessary seals and O-rings)	A/R

CYLINDER, LOW LOAD ANGLE

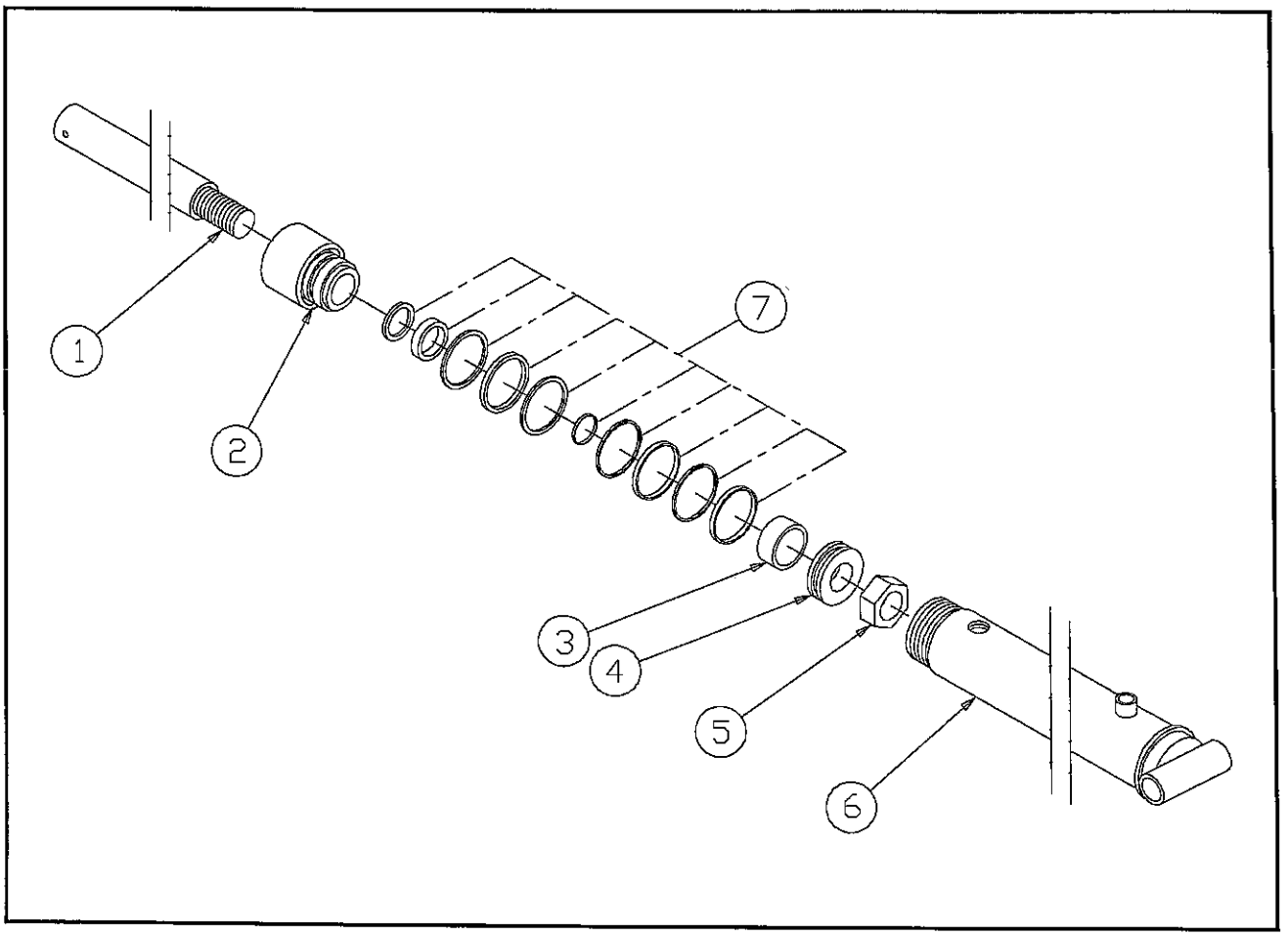


FIG. 8-8 LOW LOAD ANGLE CYLINDER

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-242-010118	CYLINDER ASSEMBLY, LOW LOAD ANGLE	2
1	011100550	PISTON ROD	1
2	081900295	GLAND	1
	230007400	RETAINER, SQUARE WIRE	1
3	211100247	SPACER	1
4	071900048	PISTON	1
5	220000212	LOCKNUT	1
6	061900567	TUBE ASSEMBLY, BUTT AND	1
7	PMCK-AD-460	PACKING KIT (Contains all necessary seals and O-rings)	A/R

DECAL INSTALLATION

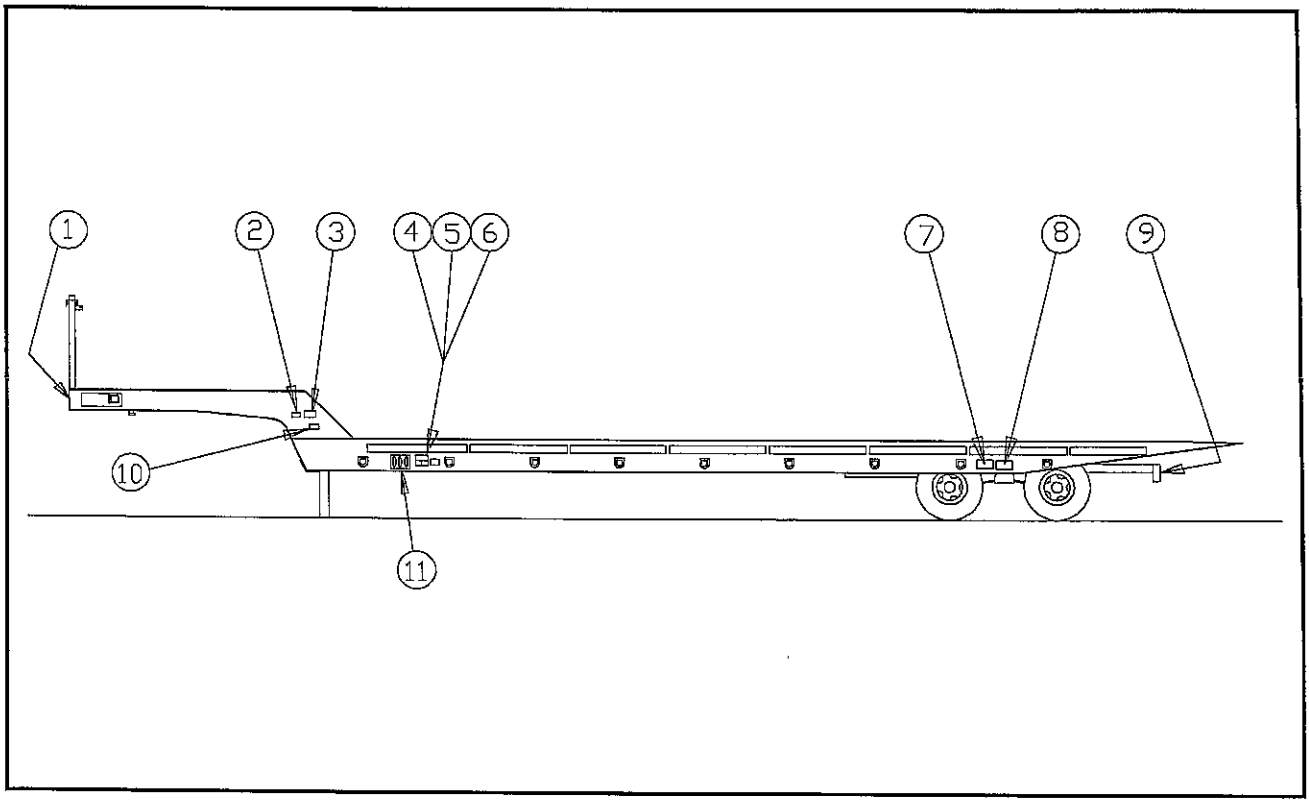


FIG. 8-9 DECAL PLACEMENT

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	B3-573-023	PACKAGE, DECAL	1
1	3-573-010020	PLATE, IDENTIFICATION	1
2	1-573-010082	DECAL, PATENT	2
3	3-573-010035	DECAL, 40000 LBS CONCENTRATED LOAD	2
4	3-573-010025	DECAL, WINCH WARNING	2
5	3-573-010057	DECAL, INSTRUCTION (street side)	2
6	3-573-010038	DECAL, CAUTION	2
7	3-573-010189	DECAL, TIRE CHANGING PROCEDURE	2
8	3-573-010080	DECAL, TORQUE SPECIFICATIONS	2
9	3-573-010031	DECAL, TRAILER BUMPER	1
10	3-573-010060	DECAL, TOLL-FREE NUMBER	2
11	3-573-010128	DECAL, OPERATION (curb side)	2

*** If trailer is repainted or if decals become non-legible, order new ones from the factory and replace.**

LIFT ASSEMBLY, GOOSENECK

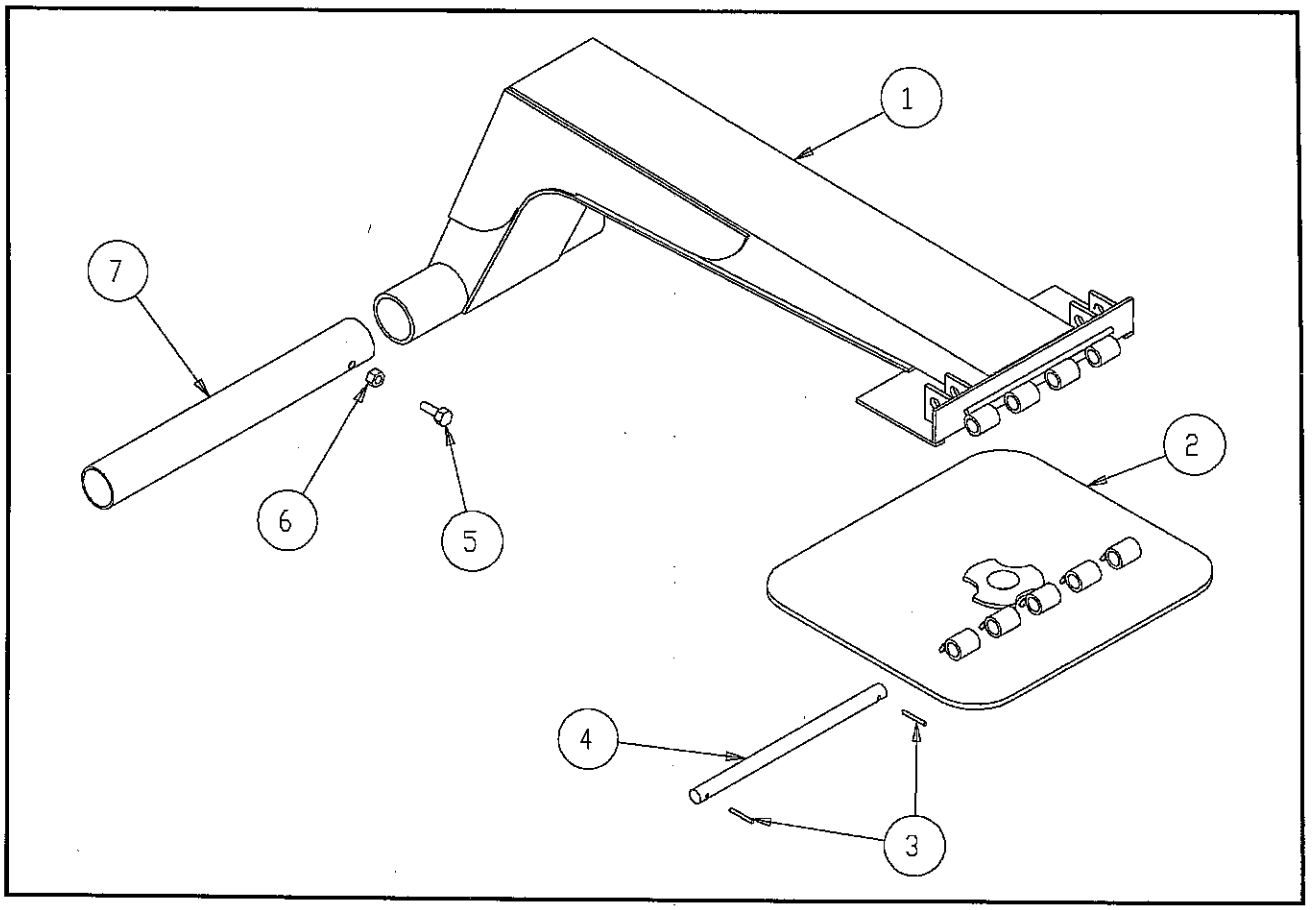


FIG. 8-10 GOOSENECK LIFT ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3-375-010222	WELDMENT, FIFTH WHEEL GOOSENECK	1
	5010	ZERK, GREASE	1
2	3-375-010250	PLATE, KING PIN	1
3	0600-375-02000	ROLLPIN	2
4	3-557-010030	PIN, KINGPIN PLATE HINGE	1
5	3/4-10X2-1/2CS	CAP SCREW, HEX HEAD	2
6	3/4-10HFN	NUT, HEX	2
7	3-311-010578	TUBE, HINGE	1

EXTENSIONS,PULL-OUT OVERWIDTH

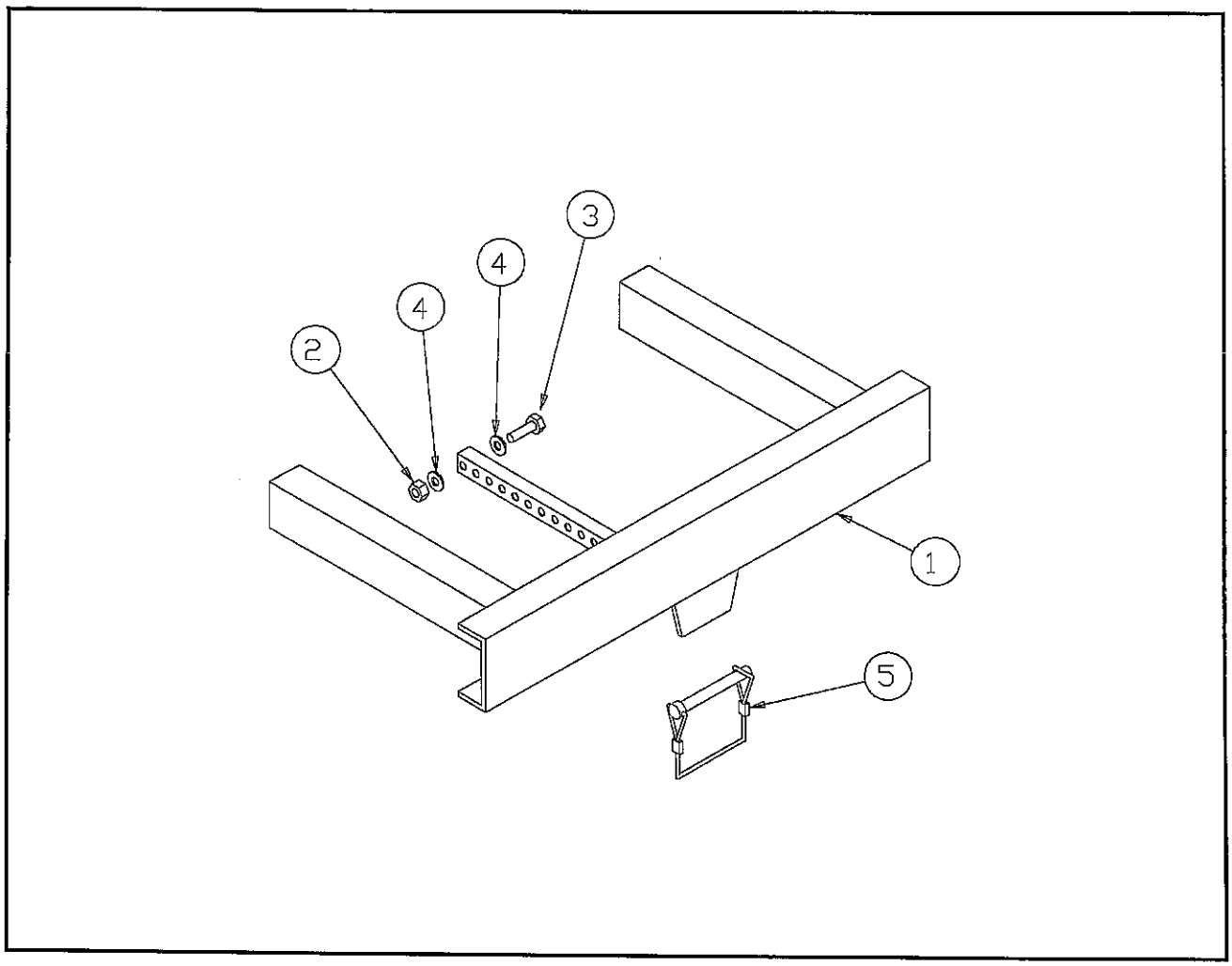


FIG. 8-11 PULLOUT OVERWIDTH EXTENSION ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3-276-010378	EXTENSION, 36-1/2" SIDE RAIL	10
	3-276-010383	EXTENSION, 19-1/2" SIDE RAIL	2
	3-276-010598	EXTENSION, 21" SIDE RAIL	4
2	3/8-16HFN	NUT, HEX	16
3	3/8-16X2CS GR5	CAP SCREW, HEX HEAD	16
4	3/8FW	WASHER, FLAT	32
5	516-22PTL	PIN, RETAINING	16

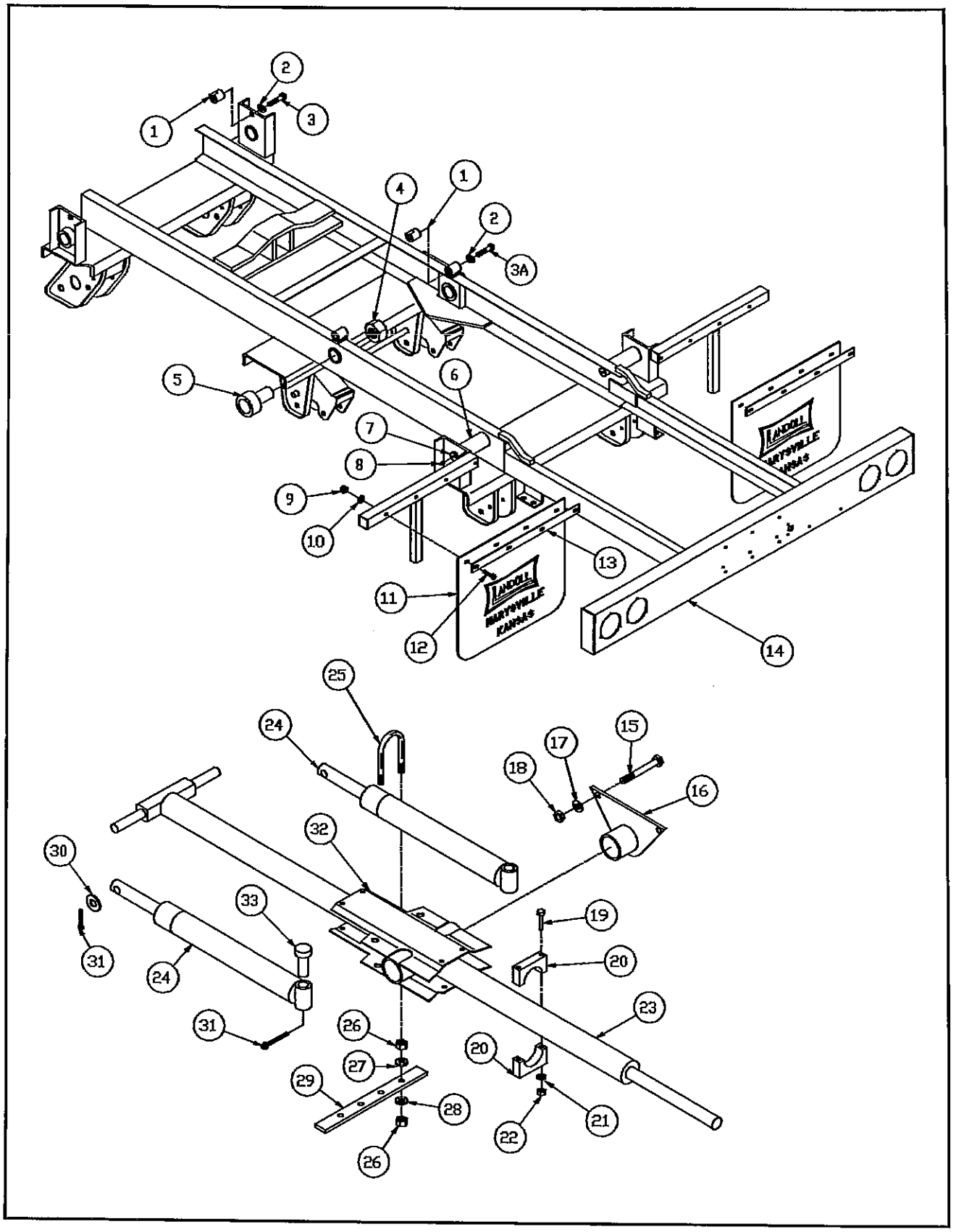


FIG. 8-12 SLIDING UNDERCARRIAGE COMPONENTS

UNDERCARRIAGE, SLIDING

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3-762-010016	HOLDDOWN, UNDERCARRIAGE	4
2	3/4SLW	WASHER, SPLIT LOCK	4
3	3/4-10X2-1/2CS	CAP SCREW, HEX HEAD	2
3A	3/4-10X3HHCS	CAP SCREW, HEX HEAD	2
4	2-12HFN	NUT	4
5	3-076-010005	BEARING	4
	5029	ZERK, GREASE	4
6	RRT114X6	ROLLER	2
7	3-762-010012	PIN, ROLLER	2
8	5010	ZERK, GREASE	2
9	3/8-16HFN	NUT, HEX	8
10	3/8SLW	WASHER, SPLIT LOCK	8
11	3-485-010001	MUD FLAP	2
12	3/8-16X1-1/2CS	CAP SCREW, HEX HEAD	2
	3/8-16X3HHCS	CAP SCREW, HEX HEAD	6
13	3/762-010017	CLAMP, MUD FLAP	2
14	3-762-010569	WELDMENT, UNDERCARRIAGE	1
15	3/4-10X6HHCS	CAP SCREW, HEX HEAD	4
16	3-120-010128	MOUNTING ASSEMBLY, CYLINDER TRUNNION	1
17	3/4SLW	WASHER, SPLIT LOCK	4
18	3/4-10HFN	NUT, HEX	4
19	5/8-11X8HHCS	CAP SCREW, HEX HEAD	4
20	3-120-010117	BEARING, NYLATRON	4
21	5/8SLW	WASHER, SPLIT LOCK	4
22	5/8-11HFN	NUT, HEX	4
23	REFERENCE	CYLINDER, SLIDE (SEE FIG. 8-7)	1
24	REFERENCE	CYLINDER, LOW LOAD ANGLE (SEE FIG. 8-8)	2
25	3-102-010022	U-BOLT, CYLINDER SUPPORT	2
26	1/2X13HFN	NUT, HEX	4
27	1/2FW	WASHER, FLAT	2
28	1/2SLW	WASHER, SPLIT LOCK	2
29	3-146-010001	BUMPER, RUBBER CYLINDER	1
30	7/8MACH BUSH	BUSHING, MACHINERY	2
31	3/16X2-1/4	PIN, COTTER	4
32	3-120-010125	TRUNNION ASSEMBLY, CYLINDER	1
33	3-557-010031	PIN, CYLINDER	2

SUSPENSION, SINGLE LEAF SPRING

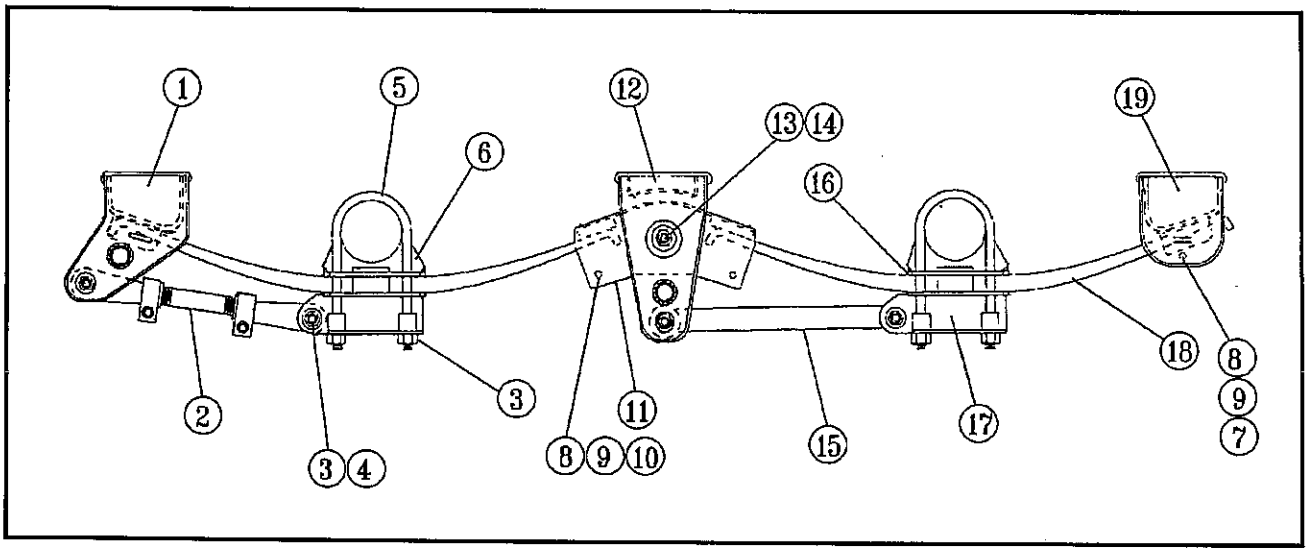


FIG. 8-13 SINGLE LEAF SPRING SUSPENSION

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	HW-UM-2-5R-1-U-1H	SUSPENSION ASSEMBLY	1
1	0049-00	HANGER, FRONT	2
2	1035-20	TORQUE ARM, ADJUSTABLE (INCLUDES FOLLOWING ITEMS)	2
	. 0032-01	EYE END, L.H. ADJUSTABLE TORQUE ARM	2
	. 0032-02	EYE END, R.H. ADJUSTABLE TORQUE ARM	2
	. 0029-20	ADJUSTABLE SCREW	2
	. 0022-00	BUSHING, TORQUE ARM	4
	. 000-19	BOLT	4
	. 0002-10	NUT	4
3	0002-09	NUT, LOCKING	24
4	0001-08	BOLT	8
5	0102-12	U-BOLT	4
6	0647-01	AXLE SEAT	4
7	0001-02	BOLT, HEX	2
8	0741-01	ROLLER, SPRING	6
9	0002-07	NUT, HEX	6
10	0001-04	BOLT, HEX	4
11	0650-00	BEAM ASSEMBLY, EQUALIZER (INCLUDES INDENTED ITEMS)	2
	. 0649-02	EQUALIZER BUSHING	2
	. 0001-14	EQUALIZER SHAFT	1
12	0065-00	HANGER, EQUALIZER	2
13	0001-14	SHAFT, EQUALIZER	2
14	0274-01	NUT, LOCKING	2
15	0075-20	TORQUE ARM, RIGID	2
16	0375-00	SPRING LINER, DELRIN	4
17	0508-00	BOTTOM PLATE, UNDERSLUNG	4
18	0179-01	SPRING, ONE LEAF, HIGH ARCH	4
19	0053-00	REAR HANGER, UNDERMOUNT	2

DRUM ITEMS, HUB AND

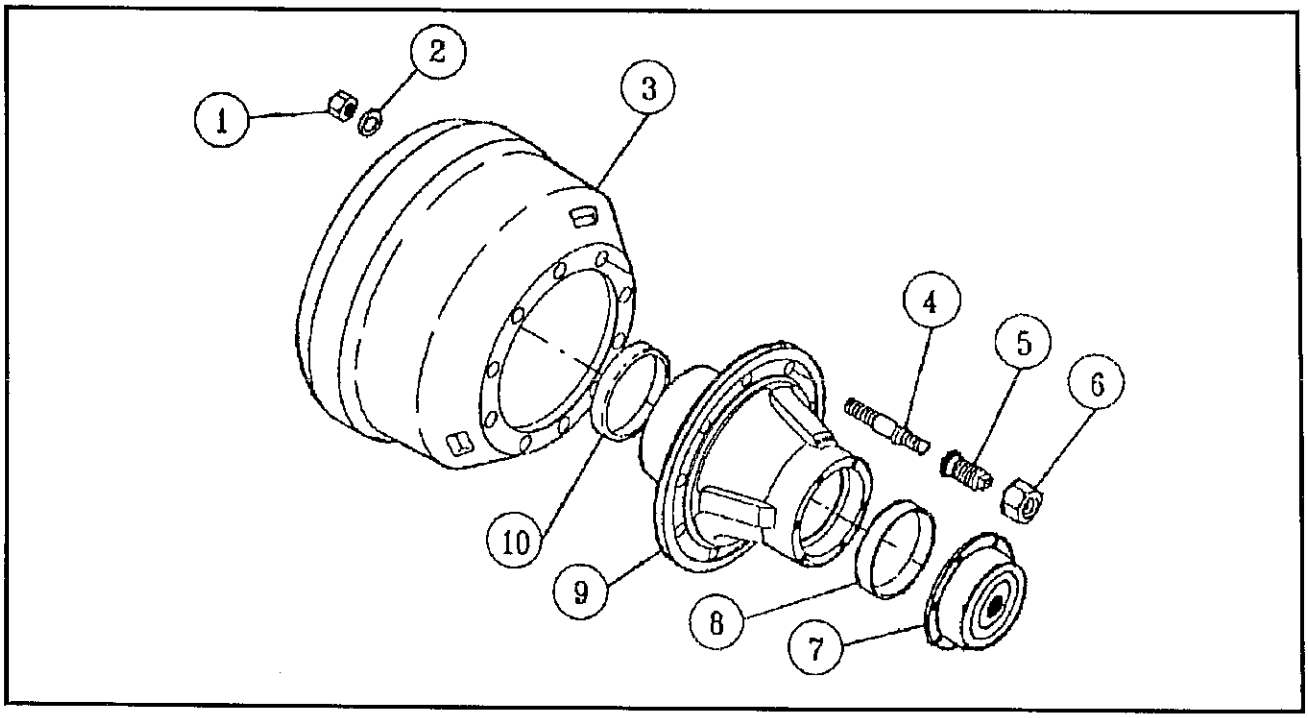


FIG. 8-14 HUB AND DRUM ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-406-010044	HUB AND DRUM ASSEMBLY, L.H.	2
	3-406-010045	HUB AND DRUM ASSEMBLY, R.H.	2
1	75716	NUT, LOCKING HEX	6
2	257	WASHER	6
3	63635	DRUM, BRAKE	1
4	139913	STUD, L.H.	6
	139902	STUD, R.H.	6
5	107091	CAP NUT, INNER L.H.	6
	107080	CAP NUT, INNER R.H.	6
6	178921	CAP NUT, OUTER L.H.	6
	178910	CAP NUT, OUTER R.H.	6
7	M10WK120	HUB CAP, OIL LEVEL INDICATOR	1
	3303009	GASKET	1
	M10HH106-X	SEAL	1
	5/16-18X3/4HHCS	CAP SCREW, HEX HEAD	6
	5.16SLW	WASHER, SPLIT LOCK	6
8	HM212011	CUP, OUTER BEARING	1
9	1056	HUB	1
10	HM218210	CUP, INNER BEARING	1

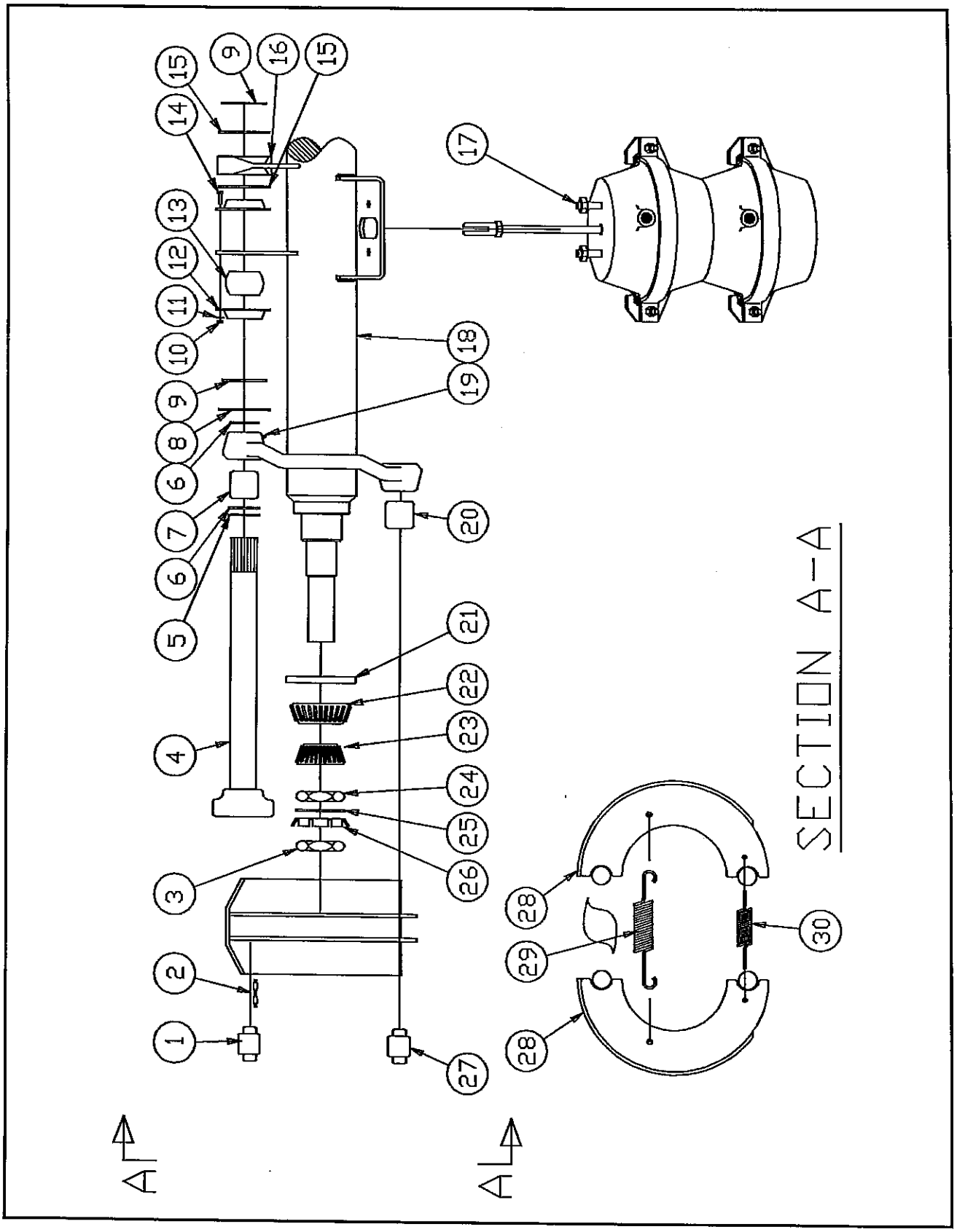


FIG. 8-15 SEMITRAILER AXLE COMPONENTS

BRAKE ITEMS, AXLE AND

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-042-010039	ASSEMBLY, COMPLETE TRAILER AXLE	2
1	NO NUMBER	ROLLER, BRAKE SHOE	4
2	56-18	PIN, RETRACT SPRING RETAINER	4
3	6-115	NUT, OUTER SPINDLE	2
4	34-49	CAM, L.H. BRAKE	1
	34-50	CAM, R.H. BRAKE	1
5	5-96	WASHER, CAMSHAFT HEAD SPACER	2
6	10-52	SEAL, CAMSHAFT GREASE	4
7	14-56	BUSHING, CAMSHAFT SPIDER	2
8	5-97	WASHER, CAMSHAFT SPACER	2
9	69-20	RETAINER, CAMSHAFT	4
10	6-99	NUT, HEX	8
11	5-79	WASHER, LOCKING	8
12	34-32	PLATE, RETAINER	4
13	14-58	BUSHING, CAMSHAFT SUPPORT	2
14	7-139	CAP SCREW, HEX HEAD	8
15	5-97	WASHER, CAMSHAFT SPACER	4
16	55-10	SLACK ADJUSTER, MANUAL	2
17	3-128-010002	CHAMBER, SPRING BRAKE	2
	. 19305SERVICE	BODY, REPLACEMENT NON-PRESSURE	2
	. 19307SERVICE	SPRING, REPLACEMENT SERVICE CHAMBER RETURN	2
	. 19306SERVICE	PUSHROD ASSEMBLY, REPLACEMENT	2
	. 18300SERVICE	DIAPHRAGM, REPLACEMENT	4
	. SN2100	KIT, REPLACEMENT CAGING BOLT AND BRACKET	2
18	3-042-010036	AXLE	1
19	61-3	ZERK, GREASE	2
20	14-68	BUSHING, SPIDER ANCHOR PIN	4
21	10-55	SEAL, GREASE	2
22	HM218248	CONE, OUTER BEARING	2
23	HM212049	CONE, INNER BEARING	2
24	6-114	NUT, INNER SPINDLE	2
25	5-98	WASHER, SPINDLE LOCK	2
26	5-99	WASHER, TABBED SPINDLE LOCK	2
27	56-17	PIN, ANCHOR	4
28	40-180-1	ROLLER ASSEMBLY, BRAKE SHOE AND	4
29	46-96	SPRING, SHOE RETRACTOR	2
30	46-97	SPRING, SHOE KEEPER	4

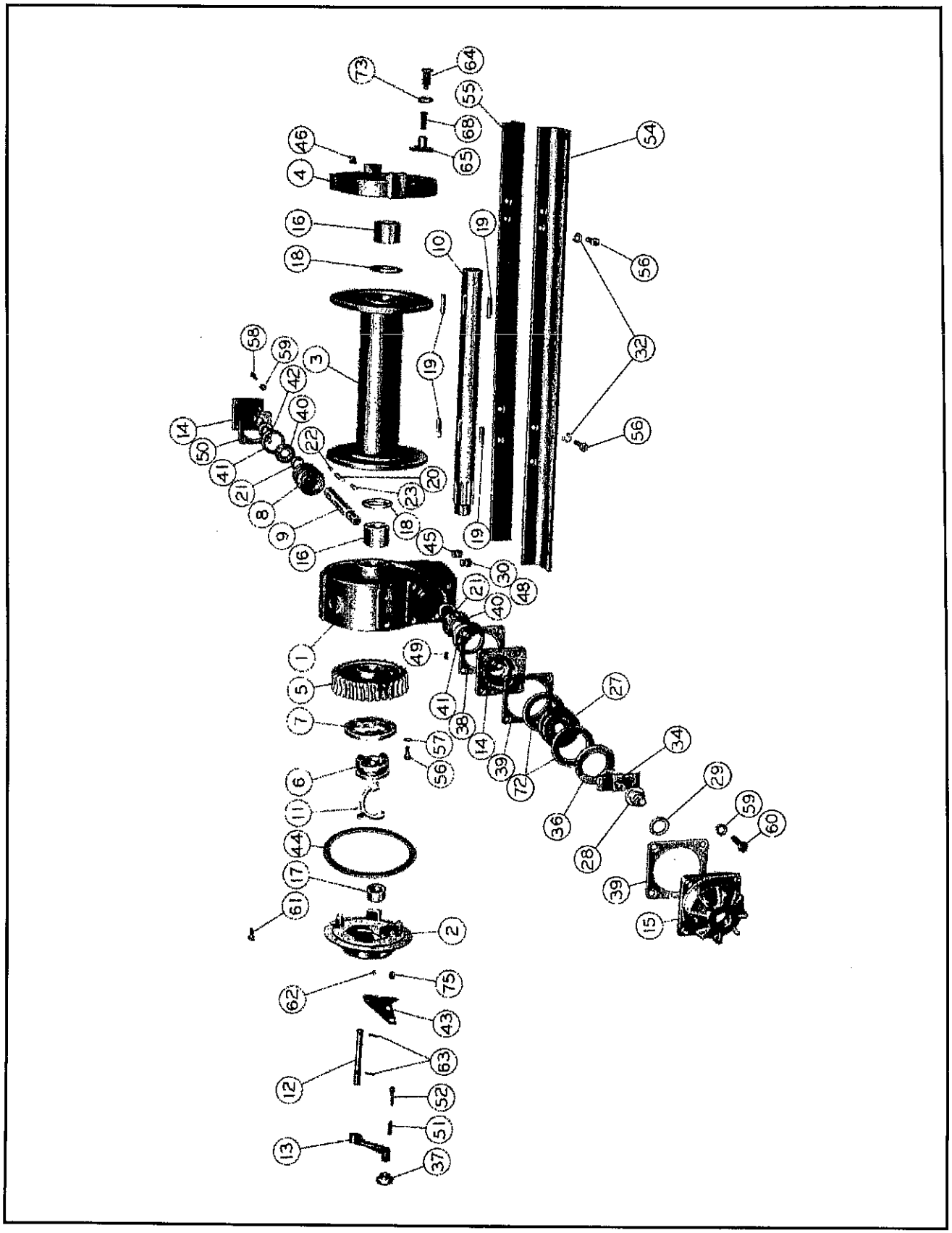


FIG. 8-16 WINCH COMPONENTS

WINCH ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	81078	WORM HOUSING ASSEMBLY	1
2	81213	COVER ASSEMBLY, WORM HOUSING	1
3	11449	DRUM, CABLE	1
4	81077	LEG ASSEMBLY, BEARING	1
5	11434	WORM GEAR, RIGHT	1
	11433	WORM GEAR, LEFT	1
6	11421	CLUTCH, SLIDING	1
7	11419	DRIVE, CLUTCH	1
8	11404	WORM, RIGHT	1
	11403	WORM, LEFT	1
9	11405	SHAFT, WORM	1
10	11414	SHAFT, CABLE DRUM	1
11	11422	FORK, SHIFTER	1
12	11423	SHAFT, SHIFTER	1
13	11496	HANDLE, SHIFTER	1
14	11427	CONTAINER, BEARING	2
15	11445	COVER, WORM BRAKE	1
16	18035	BUSHING	2
17	11425	BUSHING	1
18	11420	RING, RETAINING	2
19	11641	DRUM KIT, CABLE	4
20	11402	KEY, WORM	1
21	11407	SPACER, WORM	2
22	11586	KEY, SPROCKET	1
23	18044	KEY, ROTOR	1
27	81080	ROTOR ASSEMBLY, BRAKE	1
28	11599	ADJUSTING NUT, WORM BRAKE	1
29	12465	O-RING	1
30	19014	PLUG, FILLER	1
32	11026	WASHER, LOCK	10
34	81081	SPRING ASSEMBLY, SAFETY BRAKE	1
36	11431	PLATE, PRESSURE	1
37	NO NUMBER	KNOB, SHIFTER	1
38	11429	GASKET	4
39	11446	GASKET	2
40	18033	BEARING CONE	2
41	18034	BEARING CUP	2
42	12073	SEAL, GREASE	1
43	NO NUMBER	BRCKET, SHIFTER	1
44	11411	COVER GASKET, HOUSING	1
45	19045	PLUG, DRAIN	1
46	18047	FITTING, GREASE	1
48	18053	PLUG, VENT	1
49	18009	PLUG, LEVEL	1
50	11430	GASKET	4
51	11310	SPRING, SHIFTER KNOB	1
52	11309	STEM, SHIFTER KNOB	1
54	12921	ANGLE, FRONT BASE	1
55	12922	ANGLE, REAR BASE	1
56	13939	CAPSCREW	16
57	12781	WASHER, LOCK	8
58	21044	CAPSCREW	4
59	11025	WASHER, LOCK	3
60	22695	CAPSCREW	4
61	22047	CAPSCREW	6
62	NO NUMBER	PLUG, EXPANSION	A/R
63	NO NUMBER	ROLLPIN	A/R
64	11398	SCREW, ADJUSTING	1
65	88005	SHOE ASSEMBLY, DRAG BRAKE	1
68	18002	SHOE ASSEMBLLY, DRAG BRAKE	1
72	11426	DISC, FRICTION	2
73	11791	NUT, JAM	1
75	NO NUMBER	PLUG, EXPANSION	A/R
76	22729	CAPSCREW	2

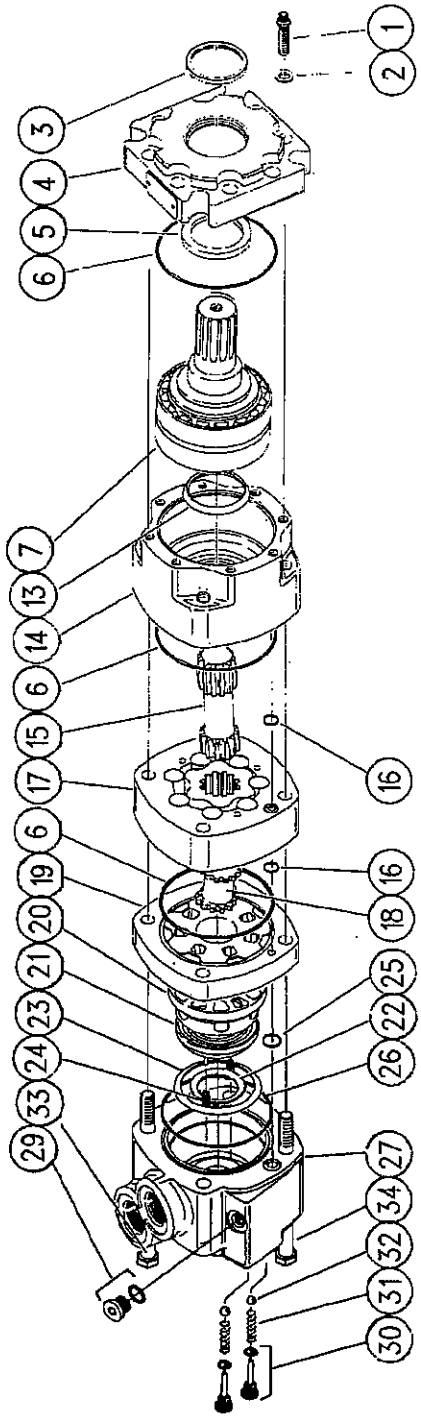


FIG. 8-17 WINCH MOTOR ITEMS

WINCH MOTOR ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	5389-27	SCREW, CAP	8
2*	6049	WASHER	8
3*	9031-1	SEAL, DUST	1
4	8559	RETAINER, FRONT	1
5*	9068-2	SEAL, SHAFT	1
6*,**	9022-8	SEAL, 3-1/2" ID	3
7	8709--1	BEARING KIT, SHAFT AND (includes the following:)	1
	NSS	SHAFT	1
	NSS	CONE, BEARING	2
	NSS	CUP, BEARING	2
	NSS	SPACER, BEARING	1
	NSS	RETAINER, RING	1
10	14392-11	KEY (NOT SHOWN)	1
11	14230	KEY, HEX (NOT SHOWN)	1
13*	9070-1	SEAL, SHAFT FACE	1
14	8487	HOUSING, BEARING	1
15	8487-4	DRIVE	1
16**	9022-3	SEAL, 1/4" ID	2
17	8464-4	GEROLER 7/8 WIDTH	1
18	8510	DRIVE, VALVE	1
19	8504	PLATE, VALVE	1
20	8500	VALVE	1
21	6942	PLATE, BALANCE ASSEMBLY	1
22**	6961	SEAL, FACE, INNER	1
23**	6962	SEAL, FACE, OUTER	1
24	6203	SPRING	2
25**	15006	SEAL, 5/16" ID	1
26**	9022-7	SEAL, 3-1/4" ID	1
27	8501-3	HOUSING, VALVE	1
29	9072-3	PLUG ASSEMBLY	1
	NSS	PLUG	1
**	250003-904	O-RING	1
30	8350	CHECK PLUG ASSEMBLY	2
	NSS	PLUG	2
**	250003-903	O-RING	2
31	6464	SPRING	2
32	18026	BALL, STEEL	2
33	14386-9	BOLT	2
34	14386-7	BOLT	2
*	61236	SEAL KIT, MOTOR, REAR CONTAINS PARTS INDICATED BY "*"	
**	61234	SEAL KIT, SHAFT, CONTAINS PARTS INDICATED BY "**	