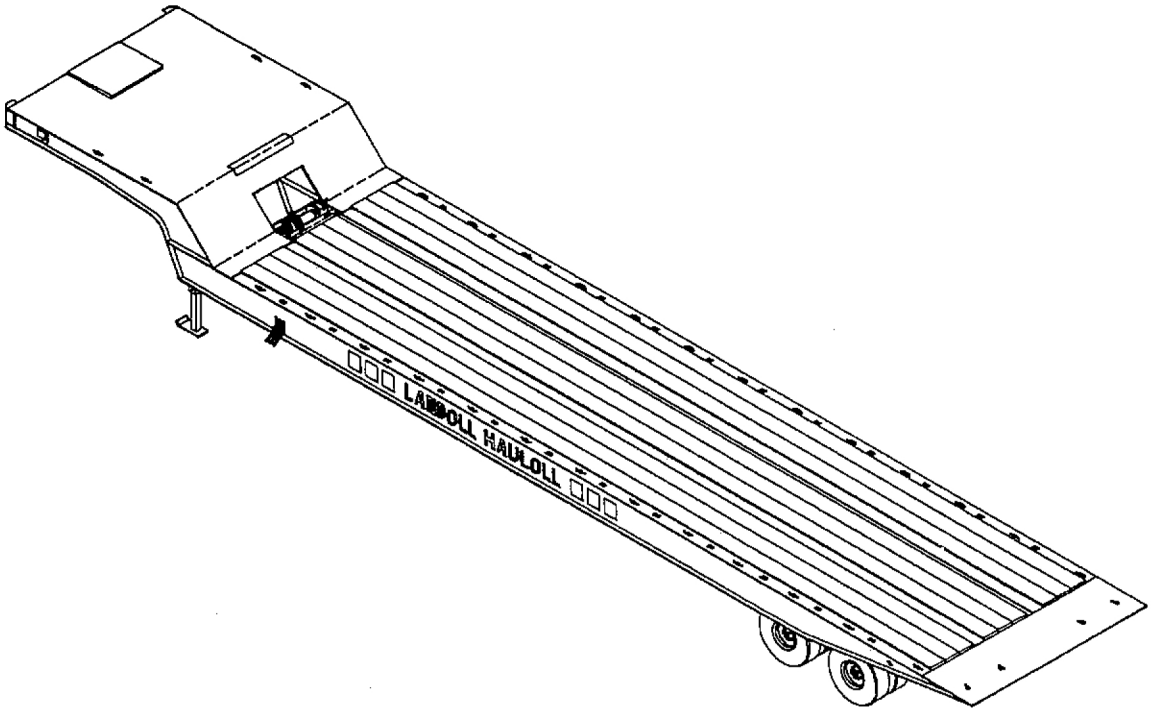


MODEL 317A

SEMITRAILER OWNER'S MANUAL

LANDOLL
MARYSVILLE, KANSAS

1700 MAY STREET
MARYSVILLE, KANSAS 66508
(913) 562-5381

WARRANTY

MANUFACTURER'S GUARANTEE POLICY

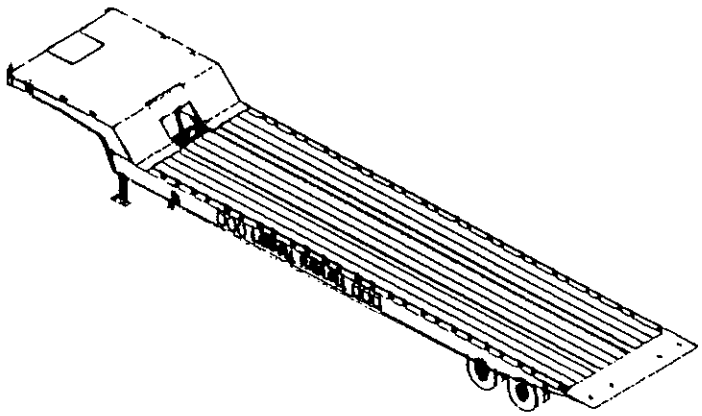
LANDOLL CORPORATION WARRANTY

LANDOLL warrants each new and unused LANDOLL machine, when properly assembled, adjusted, and operated, to be free of defects in material and workmanship, in normal use and when properly serviced, for a period of twelve (12) months after date of delivery by the Dealer to the original retail purchaser. LANDOLL shall repair or replace, at its option, freight on board (f.o.b.) at its factory or designated DEALER location, any part or parts of such new and unused machine which shall have been reported in writing to LANDOLL within thirty (30) days from date of failure thereof and which LANDOLL inspection shall disclose to have been defective. Defective parts must be returned to the LANDOLL factory, freight prepaid. LANDOLL will not be liable for labor, transportation, or any other charges resulting from replacement of a defective part. This warranty is void if any part not supplied by LANDOLL is used in assembly or repair, or if the machine has been altered, abused, or neglected. LANDOLL repair parts are warranted for ninety (90) days from date of replacement or for the unexpired warranty period of the applicable LANDOLL machine, whichever period is longer. LANDOLL makes no warranty, whatsoever, as to purchased component parts and other trade accessories, except to the extent that such items are warranted by the manufacturer thereof. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER EXPRESSED, IMPLIED, OR STATUTORY (INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE), AND LANDOLL SHALL NOT BE LIABLE FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND ON ACCOUNT OF ANY LANDOLL PRODUCT.

NO EMPLOYEE OR REPRESENTATIVE IS AUTHORIZED TO CHANGE THIS WARRANTY, VERBALLY OR IN WRITING, OR GRANT ANY OTHER WARRANTY.

LANDOLL CORPORATION, WHOSE POLICY IS ONE OF CONTINUOUS IMPROVEMENT, RESERVES THE RIGHT TO MAKE CHANGES WITHOUT OBLIGATION TO MODIFY PREVIOUSLY PRODUCED EQUIPMENT.

LANDOLL
MARYSVILLE, KANSAS



MODEL 317A

SEMITRAILER
OWNER'S MANUAL

PURCHASED FROM: _____ DATE_____/_____/_____

ADDRESS: _____

_____

_____

PHONE NO:_____ SERIAL NO:_____

FORM NO. F-131-292 2/92

SAFETY HOT LINE

If you believe that a vehicle or item of motor vehicle equipment (such as tires, lamps, etc.) has a potential safety-related defect, you may notify the National Highway Traffic Safety Administration (NHTSA). You may either call TOLL FREE at 800-424-9393 (OR 366-0123 IN WASHINGTON, D.C.) or write: ADMINISTRATOR, NHTSA, 400 SEVENTH STREET, S.W., WASHINGTON, D.C., 20590. NHTSA investigates alleged safety-related defects and may order a recall and remedy campaign . However, NHTSA does not become directly involved in the dealings between a particular consumer and a vehicle manufacturer regarding a defect in the consumer's vehicle.

In the event of a defect or problem with your LANDOLL equipment, please notify LANDOLL CORPORATION:

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
FOR REPLACEMENT PARTS:
1-800-423- 4320
FAX NO.: (785) 562-4892

TABLE OF CONTENTS

SAFETY PRECAUTIONS

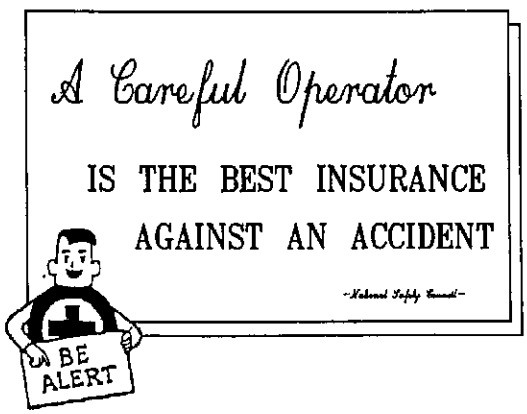
THIS IS THE INTERNATIONAL SAFETY ALERT SYMBOL. IT ALERTS YOU TO IMPORTANT SAFETY MESSAGES ON THE MACHINE AND IN THIS MANUAL. PLACEMENT OF THIS SYMBOL MEANS THAT DEATH, SEVERE INJURY, OR EQUIPMENT DAMAGE CAN OCCUR AS A RESULT OF IMPROPER USE OF EQUIPMENT, OR NEGLECTING SPECIFIC PRECAUTIONS STATED ON SAFETY ALERT LABELS AND IN THE MANUAL. CAREFULLY READ AND STUDY THESE LABELS AND MESSAGES BEFORE MACHINE ASSEMBLY AND OPERATION.

There are three degrees of severity used with safety alert messages:

DANGER . . . means **A LIFE THREATENING SITUATION EXISTS** in the immediate area of this label. **DEATH CAN OCCUR** in the immediate area of this label on the equipment if the information on this label is not correctly followed, or should an accident occur near this label on the equipment..

WARNING . . . means **SERIOUS INJURY AND POSSIBLY DEATH CAN OCCUR** in the immediate area of this label on the equipment. Injury or death is likely if safety measures or instructions provided by this label on the equipment are not properly followed.

CAUTION . . . means **serious equipment or other property damage can occur**. Damage can occur to the equipment if instructions or safety measures given by this label are not properly followed.



HOW TO USE THIS MANUAL 1

The Landoll 317A Semitrailer is a quality product designed to give years of trouble free performance. By following each section of this manual, your system will perform as designed for You and Your operation.

This manual includes eight major sections:

SECTION 1 . . . is basic instructions, for your information, on the use of this manual.

SECTION 2 . . . defines terminology useful for studying this manual.

SECTION 3 . . . gives product specifications. These specifications supply lengths and measures for your equipment. Torque specifications state, in foot-pounds, how tight the various bolts used on the equipment should be when assembled.

SECTION 4 . . . defines the various controls and levers used with the 317A semitrailer.

SECTION 5 . . . describes specific operation of the 317A semitrailer.

SECTION 6 . . . gives general maintenance procedures for the safe upkeeping of the 317A semitrailer. There is also a lubrication chart and a maintenance schedule provided to help you to keep your semitrailer in top operating condition.

NOTE: IF THE EQUIPMENT IS IMPROPERLY MAINTAINED, THE WARRANTY IS VOID. If you have any questions, please contact your LANDOLL Dealer, or write to:

LANDOLL CORPORATION **1900 NORTH STREET** **MARYSVILLE, KANSAS 66508**	**or phone:** **(785) 562-5381 or** **(800) 428-5655** **or FAX:** **(785) 562-4893**

SECTION 7 . . . is troubleshooting suggestions. These are useful for locating problems with the semitrailer and pointing you to the location of the fault.

NOTE: Proper adjustment, regular maintenance and observing recommended safety precautions will, in most cases, extend the useful life of your LANDOLL product for years.

SECTION 8 . . . is the Illustrated Parts List. Refer to this section when ordering Landoll replacement parts, as needed. The number in the balloon on the illustration points to one or more parts with the same number in the parts list, usually on the facing page. Using part numbers, when ordering parts, will make it easier to identify those parts and ensure the proper part is replaced. Order parts from your Landoll dealer or call the **Landoll Parts Distribution Center** at:

(913) 562-2056 / (800) 423-4320
or **FAX:** (913) 562-2099

NOTE: ALWAYS READ THE SAFETY PRECAUTIONS ON THE MACHINE AND IN THE MANUAL BEFORE DOING ANYTHING NEAR THE SAFETY ALERT SYMBOL ON YOUR EQUIPMENT.

1-1 WARRANTY

The Warranty Registration Card is located inside the front cover of the manual. It is postage paid if mailed within the United States. **Please fill it out and mail it within fifteen (15) days** of purchase. *The Warranty* is printed inside the front cover.

NOTE: Improper assembly, modification, or maintenance of your Landoll machine can void your warranty. The instructions in this manual are designed to keep your equipment running properly according to Landoll Corporation specifications.

The Warranty for the Engine Package is a limited two year warranty, provided by the manufacturer (Onan). A Maintenance Schedule is provided in Section Six of this manual.

1-2 COMMENTS! QUESTIONS?

Address all comments or questions on this publication to:
LANDOLL CORPORATION
1700 MAY STREET
MARYSVILLE, KANSAS 66508
ATTENTION: PUBLISHING - DEPT. 73

NOTES:

The figures in this section list terms which are used for the Model 317A Semitrailer throughout this manual. Knowledge of these terms will make the study of this manual easier.

NOTE: *Throughout this manual, left and right are relative to a person standing at the rear of the trailer facing the front of the trailer.*

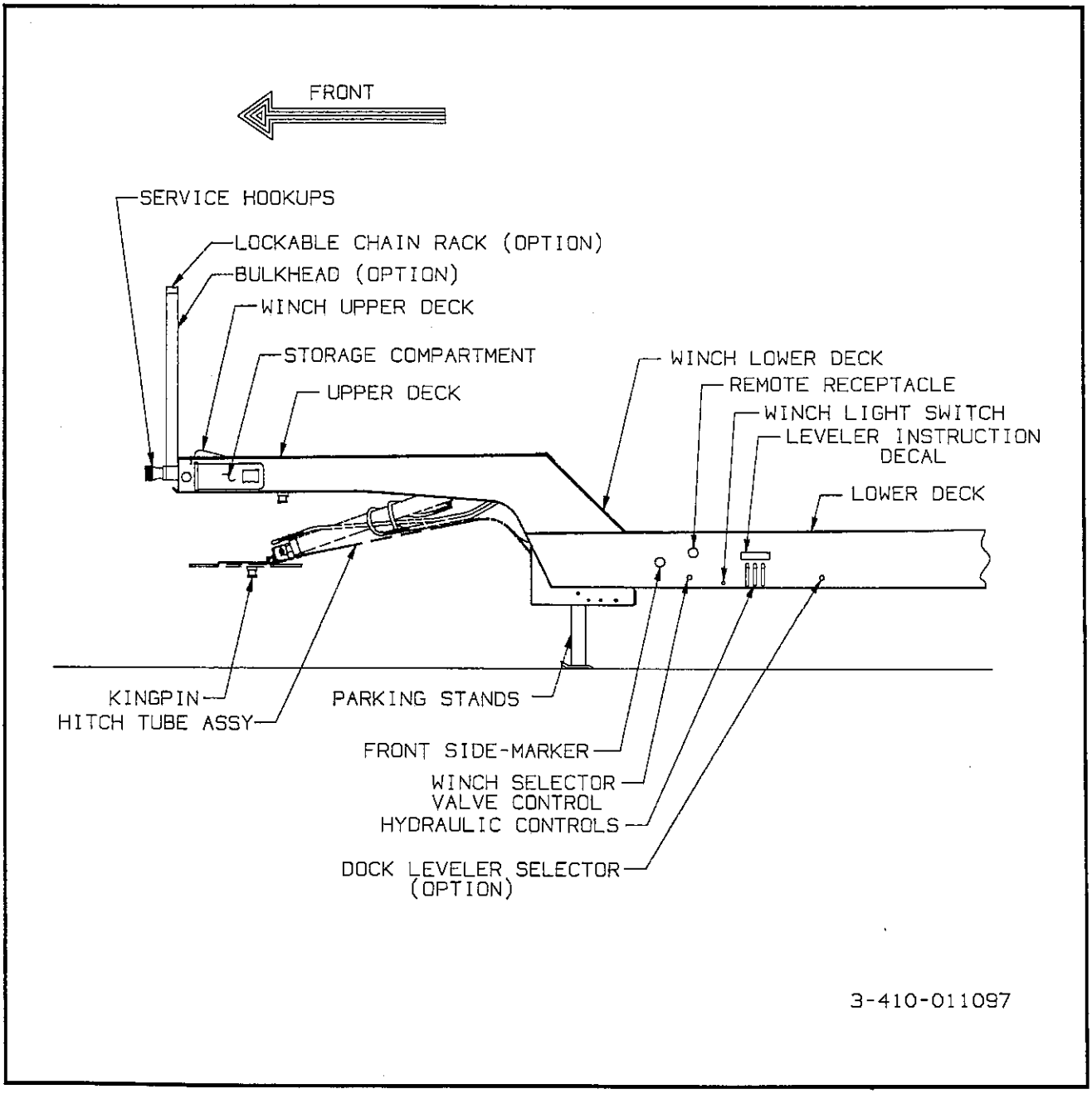


FIG. 2-1 FRONT OF TRAILER TERMINOLOGY

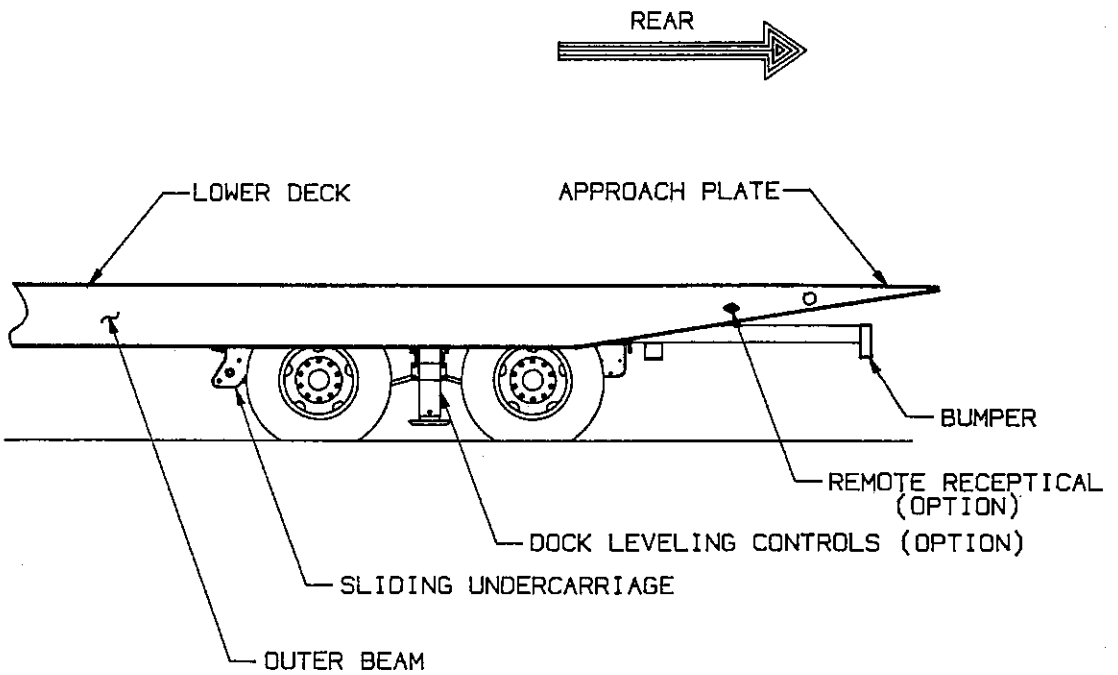


FIG. 2-2 REAR TRAILER TERMINOLOGY

STANDARD SPECIFICATIONS 3

CAPACITY* (FRAME DESIGN): . . . . . 60,000 LB. DISTRIBUTED, 40,000 CONCENTRATED IN 10'

GOOSENECK: . . . . . HYDRAULIC TILT

KING PIN SETTING: . . . . . .18" OR 24" (Standard is 24")

UNDERCARRIAGE TRAVEL:
STANDARD: . . . . . .10' 6"
LOW LOAD ANGLE: . . . . . .14'
GROUND LOAD ANGLE:
STANDARD: . . . . . .11°
LOW LOAD ANGLE: . . . . . 8.5°

3-1 SPECIFIC BOLT TORQUES

AIR RIDE SUSPENSION:

EQUALIZER BEAM PIVOT BOLT:	600 FT.-LBS.
SHOCK ABSORBER MOUNTING	150 FT.-LBS.
AXLE CLAMP U-BOLTS**	680 FT.-LBS.
AIR SPRING MOUNTING: 1/2'	25 FT.-LBS.
3/4'	50 FT.-LBS.

FOUR SPRING SUSPENSION:

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.

ALL MODELS - WHEEL FASTENERS:

OUTER SPINDLE NUTS	250-400 FT.-LBS.
INNER WHEEL NUTS	450-500 FT.-LBS.
OUTER WHEEL NUTS	450-500 FT.-LBS.

*TIRE, BRAKE, AXLE, OR WHEEL SELECTION MAY LIMIT CAPACITY.

**AXLE U-BOLTS MUST BE TIGHTENED EVENLY TO EQUAL TENSION IN INCREMENTS OF 50 FT-LBS.

TABLE. 3-1 STANDARD BOLT TORQUES

GENERAL TORQUE SPECIFICATIONS (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.													
Bolt Size		Torque Foot Pounds		Torque Newton-Meters		Torque Foot Pounds		Torque Newton-Meters		Torque Foot Pounds		Torque 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	204	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

NOTES:

1. When hardware is plated, reduce torque values by 25%.
2. When locknuts are use, increase torque value by 25%.
3. When plated hardware is used w/locknuts, use torque value chart.

* Thick nuts must be used with Grade 8 bolts.

NOTE: **BOLT TORQUES SPECIFIED ARE FOR ZINC PLATED NUTS & BOLTS ONLY.** If other types of nut/bolt combinations are required, contact your Landoll Customer Service Representative or Dealer for assistance.

OPERATION OF CONTROLS 4

This section describes the controls used to operate the Model 317A Semitrailer. Most controls are located on the driver's side of the trailer (see Figures 2-1 and 2-2). A hydraulic pump must be coupled to the trailer hydraulic system, or the optional hydraulic engine package started, before any hydraulic controls can function. The towing vehicle's air system must be coupled to the semitrailer and charged to 90 psi minimum before the brakes can adequately function.

WARNING

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

2. WHEN LEAVING THE SEMITRAILER UNATTENDED, POSITION ALL HYDRAULIC CONTROLS TO THE NEUTRAL OR "OFF" POSITION AND SHUT OFF THE HYDRAULIC ENGINE POWER SUPPLY, OR DISCONNECT THE TRACTOR HYDRAULIC HOOK-UP.

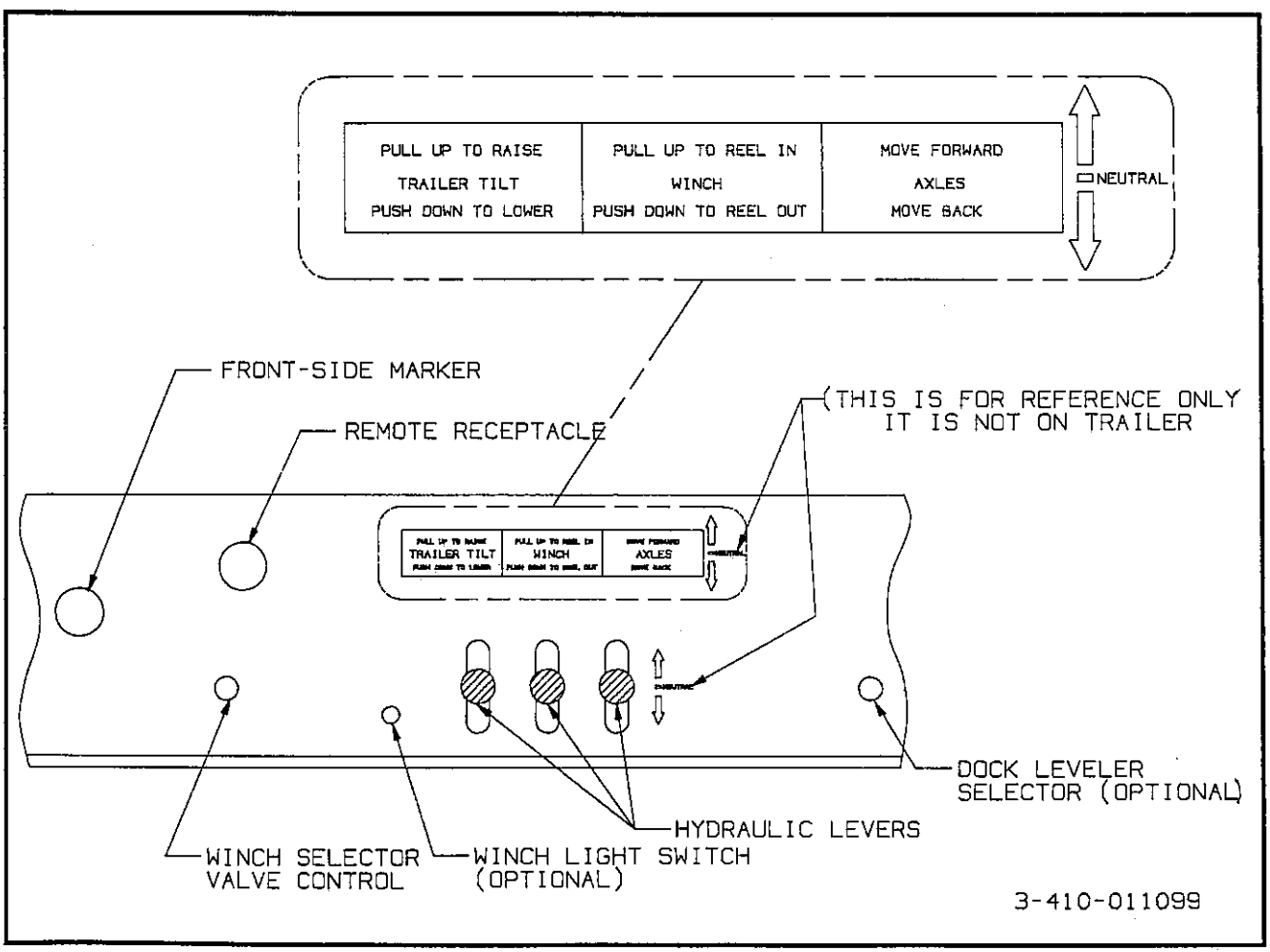


Figure 4-1 Hydraulic Control Levers

NOTE: All controls can be operated manually as described below, or using an optional electric remote unit (see Paragraph 4-11).

4-1 Trailer Tilt Lever

The Trailer Tilt Lever (see Figures 2-1 and 4-1) is located on the front, lower deck of the driver's side outer beam. It is the front lever with three positions:

UP In this position, the front end of the trailer rises to the load position.

CENTER This is neutral position. The semitrailer stays in its current position.

DOWN In this position, the front end of the trailer lowers to the transport position.

4-2 Winch Hydraulic Lever

The WINCH Hydraulic Lever (see Figures 2-1 and 4-1) is located on the front, lower deck of the driver's side frame member. (Paragraph 4-4 describes operation of units with an upper deck winch). It is the center lever with three positions:

UP In this position, cable can be "power" spooled onto the spool.

CENTER This is neutral position.

DOWN In this position, cable can be "power" spooled off the spool.

4-3 Axle Retract/Extend Lever

The AXLE lever (see Figures 2-1 and 4-2) is located on the front, lower deck of the driver's side frame member. It is the rear lever with three positions:

UP In this position, the undercarriage slides forward for loading.

CENTER This is neutral position.

DOWN In this position, the undercarriage slides to the rear. The undercarriage must be in the rear-most position for transport.

4-4 Winch Selector Valve Control

If your trailer is equipped with two winches, the winch to be operated must be selected using the WINCH SELECTOR VALVE CONTROL (see Figure 4-2). The winch selector valve control is located just to the left of the standard controls. To select the lower deck winch, push this control in. To select the upper deck winch, pull this control out. Once the winch is selected, winch operation is the same as described in Paragraph 4-2.

NOTE: Electric remote operation is described in Paragraph 4-11.

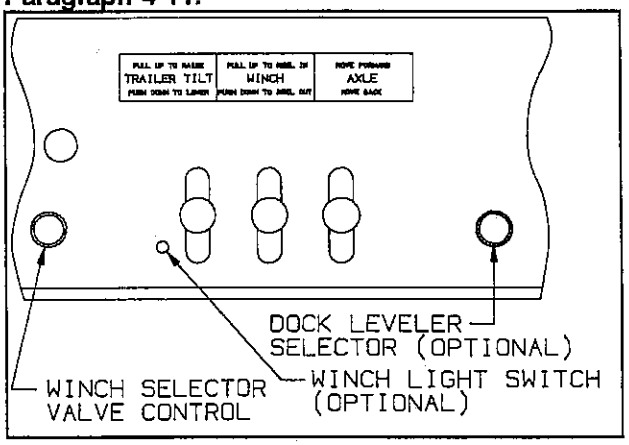


Figure 4-2 Winch Selector Valve Control

4-5 Winch Light Switch (Option)

The Winch Light Switch is left of the Hydraulic Lever decals, when installed. It illuminates the Winch Light(s), when turned on.

4-6 12,000# Winch Clutch

The 12,000 WINCH CLUTCH (see Figure 4-3) is on the curbside of the winch assembly. The 12,000

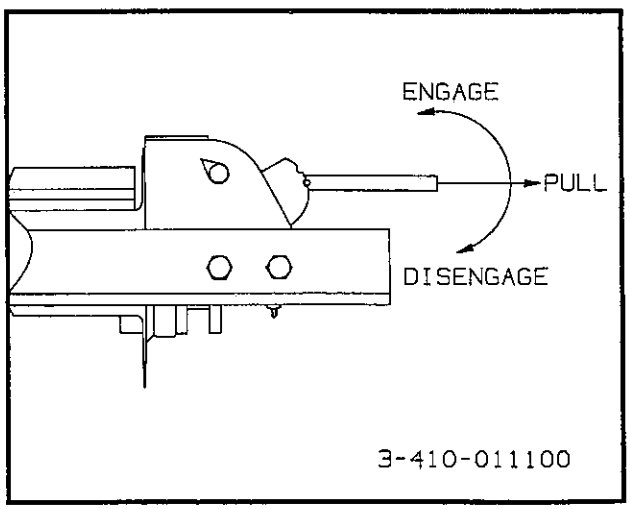


Figure 4-3 12,000# Winch Clutch

pound WINCH CLUTCH has two positions that engage or disengage the winch spool:

DOWN In this position the winch is disengaged. This allows the spool to "free-wheel".

UP In this position the winch is engaged. Cable may be "power" spooled on or off the winch spool. The winch is now controlled by the Winch Hydraulic Lever (see Paragraph 4-2).

4-7 20,000# Winch Clutch

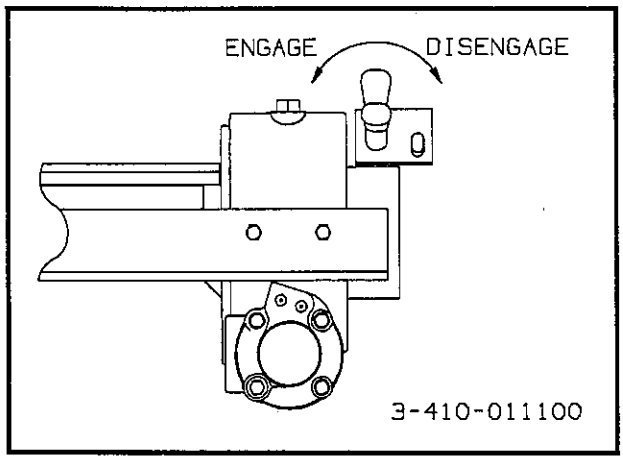


Figure 4-4 20,000# Winch Clutch

The 20,000 pound WINCH CLUTCH (see Figure 4-4) is on the curbside of the winch assembly. The 20,000 pound WINCH CLUTCH engages or disengages the 20,000 pound winch. This winch clutch has two positions:

RIGHT In this position, the winch is disengaged. This allows the spool to "free-wheel".

LEFT In this position the winch is engaged, and cable can be "power" spooled on or off the winch spool. The winch is now controlled by the Winch Hydraulic Lever.

4-8 Engine Ignition Switch

NOTE: 1. Check the following before starting the hydraulic power supply engine: engine oil level, hydraulic fluid level, and fuel level. Fill any fluid supply level that is low, before operating the hydraulic engine.

2. If the engine does not crank, check the battery charge, fluid, terminals, and cables as needed. Take corrective actions as needed (clean the terminals, replace fluid or cables, recharge or replace the battery).

CAUTION

IF THE HYDRAULIC FLUID LEVEL IS LOW DURING OPERATION, THE TRAILER MAY NOT OPERATE CORRECTLY, RESULTING IN DAMAGE TO THE TRAILER.

The Engine Ignition Switch (see Figure 4-5) is located below the hydraulic controls, and ahead of them on the driver's side of the semitrailer. Use the key to start and stop the Hydraulic Power Supply Engine. This switch has three positions:

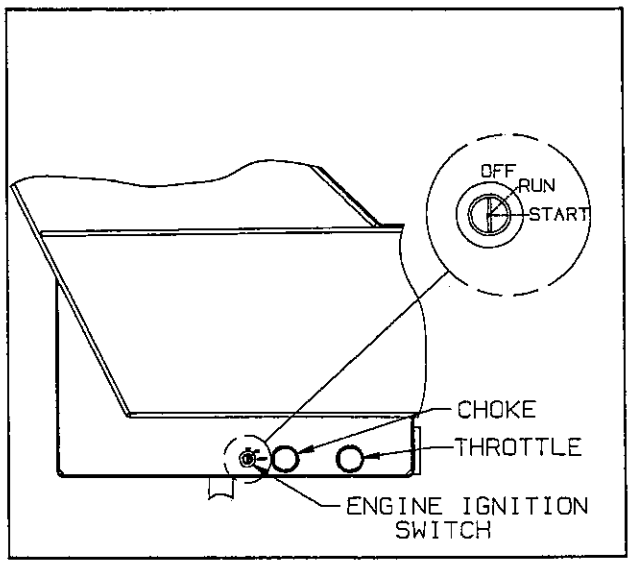


Figure 4-5 Engine Ignition Switch

OFF In this position, the power package engine does not run. The key can only be inserted or removed from this position.

RUN: In this position, the engine runs without using the starter.

START In this position, the starter cranks the power package engine, letting it start. After the engine is started, release the key to the RUN position.

4-9 Hydraulic Power Supply Engine Choke

The Hydraulic Power Supply Engine CHOKE (see Figure 4-5) is located just to the right of the Engine Ignition Switch on the driver's side of the semitrailer. The purpose of the CHOKE is to aid the starting procedure.

IN This is normal operating position.

OUT Set the choke in this position as an to aid to start the engine. Once the engine is started, push in the choke fully.

4-10 Hydraulic Power Supply Engine Throttle

The ENGINE THROTTLE (see Figure 4-5) located just to the right of the choke on the driver's side of the trailer. The ENGINE THROTTLE controls the speed at which the engine operates. It is a variable position control:

FULL OUT In this position the engine throttle is fully open, letting it run at full speed.

FULL IN In this position the engine throttle is completely closed, letting the engine run at slow idle.

4-11 Dock Leveler Controls

DANGER

WHEN OPERATING THE DOCK LEVELERS, THE TRAILER MUST BE KEPT LEVEL AT ALL TIMES, AND THE PARKING STANDS MUST BE RAISED. LOADS BEING PLACED ON THE TRAILER MUST BE KEPT CENTERED ON THE TRAILER. AN UNLEVEL TRAILER CAN CAUSE A LOAD TO SLIDE, RESULTING IN INJURY OR DEATH TO ANYONE NEAR THE LOAD.

Dock Leveler equipment includes the Dock Leveler Selector Valve Control and the Dock Lev-

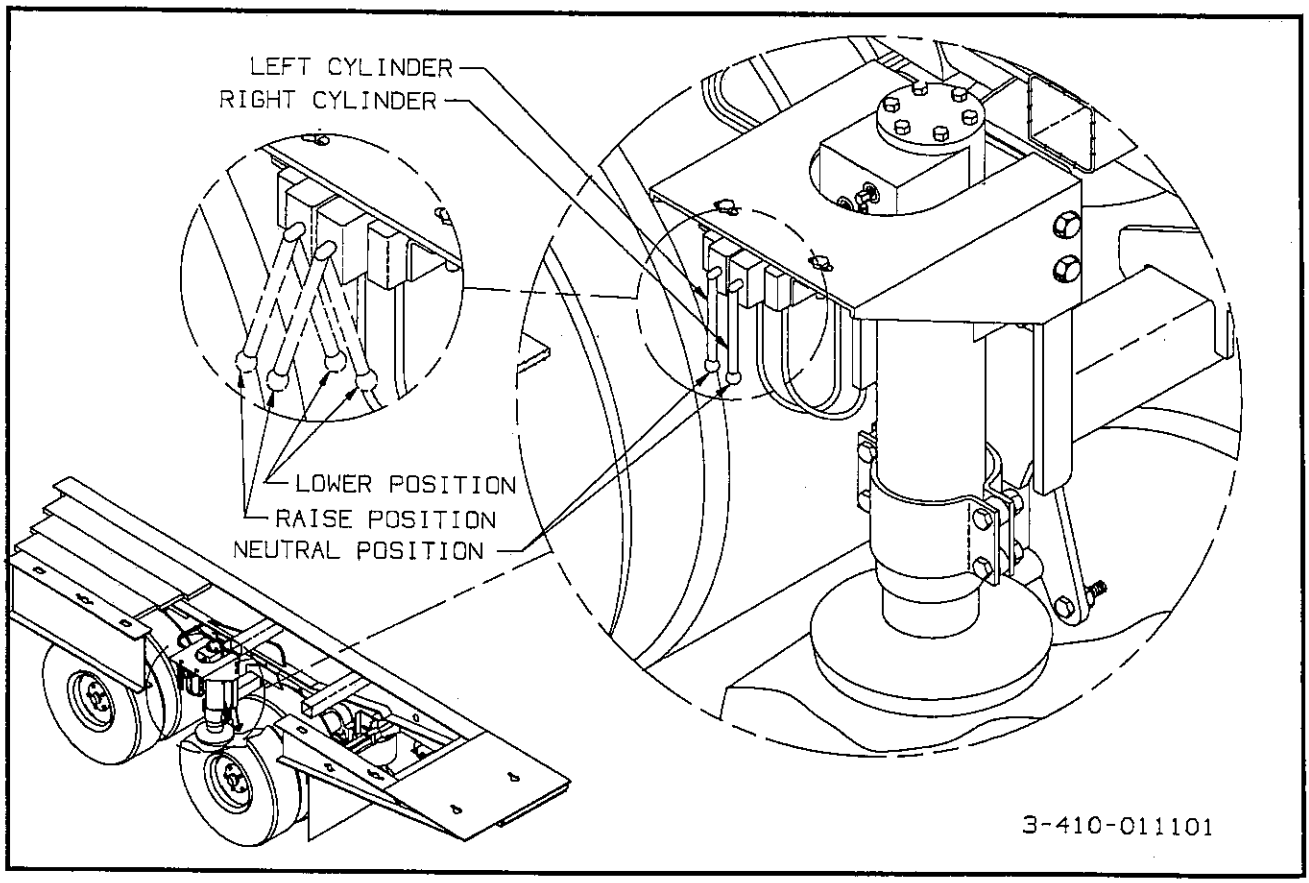


Figure 4-6 Dock Leveler Controls

eler Controls. The Dock Leveler Selector must be pushed in before the Dock Leveler Controls are operable. When this valve is pulled out, the TILT, WINCH, and AXLE functions can be used, and the Dock Leveler becomes inoperable.

The Dock Leveler Controls are dual action controls, located under the deck, on the driver's side, between the axles (see Figure 4-6). They adjust the height of the dock leveler cylinders. The left control adjusts the cylinder on the driver's (street) side of the trailer. The right control adjusts the cylinder on the curb side of the trailer. The three positions are:

IN : Pushing in, toward the center of the trailer, lowers the corresponding side of the trailer.

CENTER : This position is neutral for both controls. In neutral, the corresponding dock leveler cylinder is stationary.

OUT : Pulling out, away from the center of the trailer, raises the corresponding side of the trailer.

4-12 Electric Remote Option

The electric remote control is a box that plugs into an electrical receptacle usually placed to the rear of the trailer (see Figure 4-7 for optional locations). The remote can be used to operate one (usually the Winch) or two controls installed on your 317A trailer. First, use the SELECTOR SWITCH at the *top* of the remote box to select the function to be operated (Trailer Tilt or Winch). Then use the IN or OUT buttons to move the control levers up or down. The controls work the same as those described in Paragraphs 4-1 through 4-3.

NOTE: If your trailer has two winches, you must first manually select the winch to be operated per the Winch Selector Valve Control (see Paragraph 4-4).

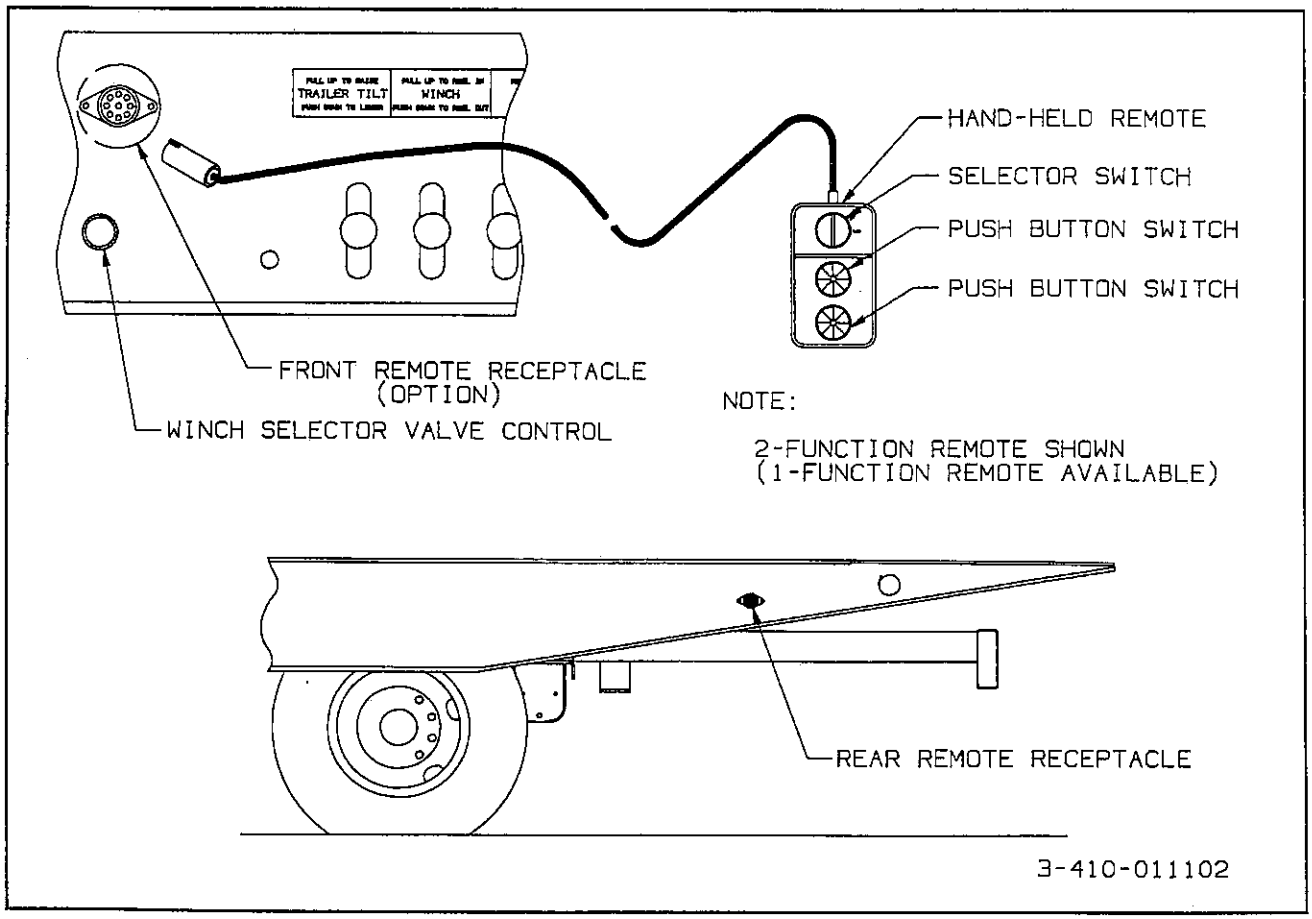


Figure 4-7 Electric Remote Controls

NOTES:

TRAILER OPERATION 5

This section describes the proper operating procedures for the 317A Semitrailer. It should be read completely before operation.

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 CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.
2. ALWAYS CHECK BEHIND AND UNDER THE TRACTOR AND SEMITRAILER FOR PERSONS OR OBJECTS BEFORE MOVING. FAILURE TO CHECK CAN LEAD TO SERIOUS PERSONAL INJURY OR DEATH TO OTHERS, OR DAMAGE TO PROPERTY.
3. OPERATING THE TRACTOR OR SEMITRAILER WITH DEFECTIVE, BROKEN, OR MISSING PARTS CAN 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 TO BE USED FOR LIFTING OR MOVING PEOPLE. USING THE WINCH TO LIFT OR MOVE PEOPLE CAN CAUSE SERIOUS INJURY OR DEATH.
5. NEVER ATTEMPT TO DISENGAGE THE WINCH CABLE SPOOL WHEN THE CABLE IS UNDER TENSION. THE LOAD CAN ROLL AWAY. SERIOUS INJURY OR DEATH CAN RESULT TO PEOPLE 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.

WARNING

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.

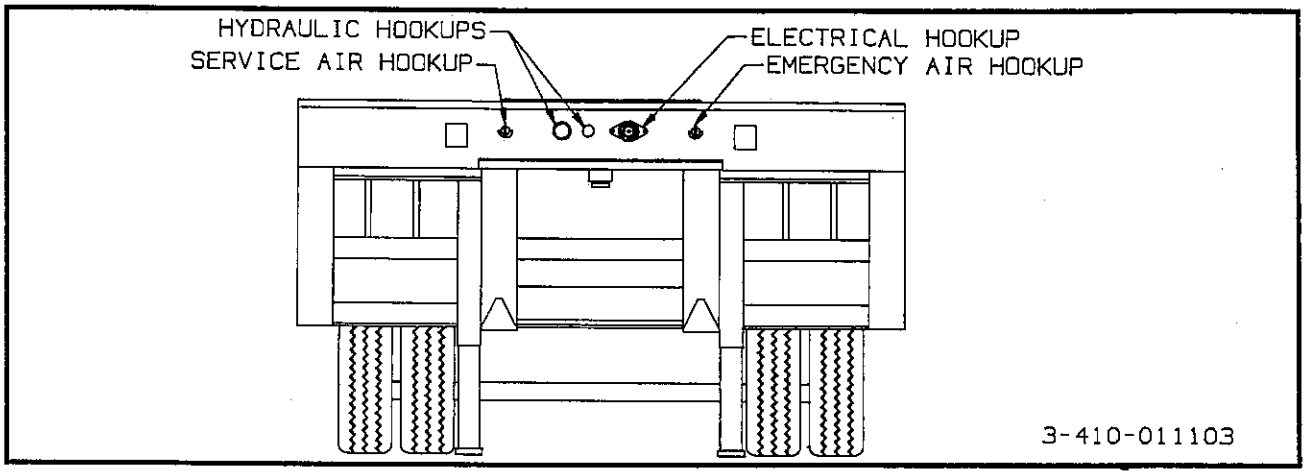


Figure 5-1 Service Hookups (Front View)

5-1 Pre-coupling Of Semitrailer And Tractor

NOTE: *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 semitrailer so the *kingpin* 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 *kingpin plate* height. The kingpin plate should be the same height, to slightly lower, than the latch area of the fifth wheel plate of the towing vehicle. If necessary, connect the tractor hydraulic lines, or start the trailer hydraulic power engine, and use the *Trailer Tilt Lever* to raise or lower the kingpin plate sufficiently to set proper coupling height. **Drain all air and moisture** from the towing vehicle air brake system in accordance with the towing vehicle manufacturer's instructions.

5-1.3 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 Figure 5-1). Chock the trailer wheels** before activating the semitrailer air supply valve in the towing vehicle. **Set the trailer brakes.**

5-1.4 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 trailer brakes should set.

5-2 Coupling Of The Tractor To The Semitrailer

NOTE: Reread Paragraph 5-1 before performing any of the following procedures.

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

5-2.2 Make sure the towing vehicle's fifth wheel coupler is open.

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

5-2.4 Try to pull the tractor forward a few inches to verify the vehicle coupling is secure. **If the tractor disconnects from the trailer:** locate source of coupling failure; repair before continuing; and repeat Steps 5-2.3 and 5-2.4.

CAUTION:
PUSHING THE TRAILER BACKWARDS CAN DAMAGE PARK STANDS.

5-2.5 Check that the towing vehicle couples securely to the semitrailer before setting towing vehicle and trailer parking brakes.

NOTE: *Keep brakes engaged for remainder of Hookup, Checkout Procedures, and for parking.*

5-3 Connecting Tractor Services To The Trailer

NOTE: *Reread 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-way electrical plug to the electrical receptacle on the front of the semitrailer **(see Figure 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 If you have not already done so, connect the tractor hydraulic lines to the semitrailer unless your trailer is equipped with the self-contained Hydraulic Power Engine Package.

5-3.3 Air Lines: See **Paragraph 5-1.4.**

5-4 Tractor & Trailer Check-out

NOTE: *Reread all safety precautions located at the front of this section before performing any of the following procedures.*

5-4.1 With hydraulic power operating, activate the TRAILER TILT lever "UP" until weight is off the park stands. Raise park stands. Secure each park stand with a park stand retaining pin in the full "UP" position before transporting.

5-4.2 Activate the TRAILER TILT lever "DOWN" until the trailer is fully lowered. Hold Trailer Tilt lever in the down position until hydraulic system works against the bottomed out Hydraulic Tilt Cylinders.

5-4.3 Verify the traveling undercarriage is completely slid back to transport position. Shut off hydraulic power.

5-4.4 Check the operation of all lights and signals on the semitrailer for proper response to switch positions (stop, right turn, left turn and clearance).

5-4.5 Check tire inflation. Adjust as needed to the pressure listed on the tire.

5-4.6 Check tractor/trailer rig for air leaks. If air leakage if found, repair the defect before transporting.

5-4.7 Check the oil in each hub for proper level and freedom from contamination. If hubs contain water, dirt, or other foreign matter, clean them before transporting.

5-4.8 Check tractor air pressure. Pressure must not fall below 65 psi, even after activating brakes a couple of times. Set parking brake and carefully remove all wheel chocks. 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.**

5-5 Towing The Semitrailer

NOTE: *Reread 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 effect 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 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 highway speed.

5-5.2 Monitor the air pressure gauge on the dash of the towing vehicle. Pressure should not fall below 90 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 To stop, use 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 overhang, trailer length, and allowable space must be taken into consideration when backing the semitrailer.

5-6 Parking The Semitrailer

NOTE: *Reread 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 the 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

NOTE: *Reread 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 **Paragraph 5-6.**

5-7.2 Lower the park stands to the ground. Hydraulically raise front end of trailer until next hole in park stand is available. Insert pin through both inner and outer legs of the stand. Hydraulically lower trailer onto legs.

5-7.3 Disconnect emergency and service air lines and attach them to the tractor gladhand holders.

5-7.4 Disconnect the 7-way cable and hydraulic lines 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

NOTE: *Reread 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. These may lead to problems found in bearings, electrical systems, air systems. Moisture attracted by warm parts due to usage can condense, collect and freeze to immobilize equipment. The tractor/trailer operator must always be alert for indicators of cold weather malfunctions.

5-8.1 During any extended stop period, neither the service nor parking brake should be used as they can freeze up. Use wheel chocks to secure the vehicle from moving.

5-8.2 Check all structural fastenings, air system fittings, gaskets, seals and bearings for looseness that can develop due to contraction with cold. Do not over-tighten.

5-8.3 Check tire inflation. Tire inflation decreases when the temperature decreases.

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

NOTE: *Reread 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 result in tightening of bearings, fasteners, and moving parts. Gaskets or seals failure can 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 (i.e., 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. Put all valve stem caps back on 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 Loading

NOTE: *Reread all safety precautions located at the front of this section before performing any of the following procedures.*

5-10.1 The procedure for loading the semitrailer is similar to the procedure for unloading the trailer.

NOTE: *When operating the winch 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.*

5-10.2 Secure the load using approved standard tie-down methods. "Gotchas" are supplied on each side for tie-down purposes.

5-11 Preparation For Unloading

NOTE: *Reread all safety precautions located at the front of this section before performing any of the following procedures.*

5-11.1 Park tractor and trailer in a straight line on relatively level ground.

5-11.2 Set tractor brakes and release trailer brakes.

5-11.3 Engage the P.T.O. or start the hydraulic power engine.

5-11.4 Pull the axles forward, out of their pockets.

5-11.5 Alternate between raising the trailer and pulling the axles forward until the approach plate touches the ground.

WARNING

DO NOT ALLOW THE BACK AXLE TO LEAVE THE GROUND. THIS CAN UPEND THE TRACTOR, AND CAUSE UNCERTAIN DAMAGE TO THE TRACTOR. PERSONAL INJURY OR DEATH IS POSSIBLE IF THIS SITUATION GOES UNCHECKED AND THE TRACTOR ROLLS OUT OF CONTROL.

5-11.6 To return to level position, reverse the steps used to tilt the trailer (Steps 5 and 4).

5-11.7 To remove the load from the trailer, lower the trailer, and slide the undercarriage back to transport position.

Disengage the P.T.O. system of the tractor or shut off the hydraulic power engine.

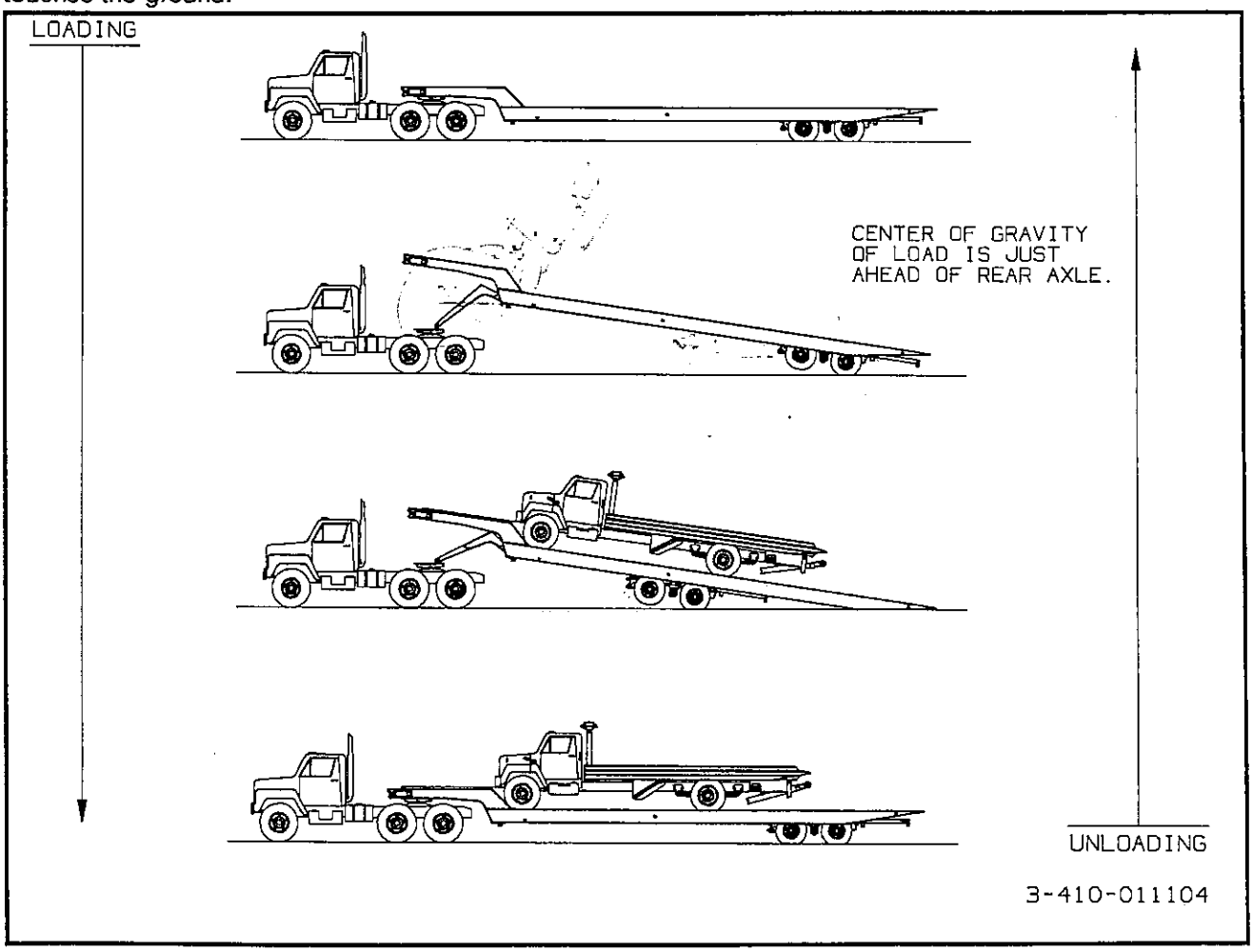


Figure 5-2 Steps for Loading & Unloading

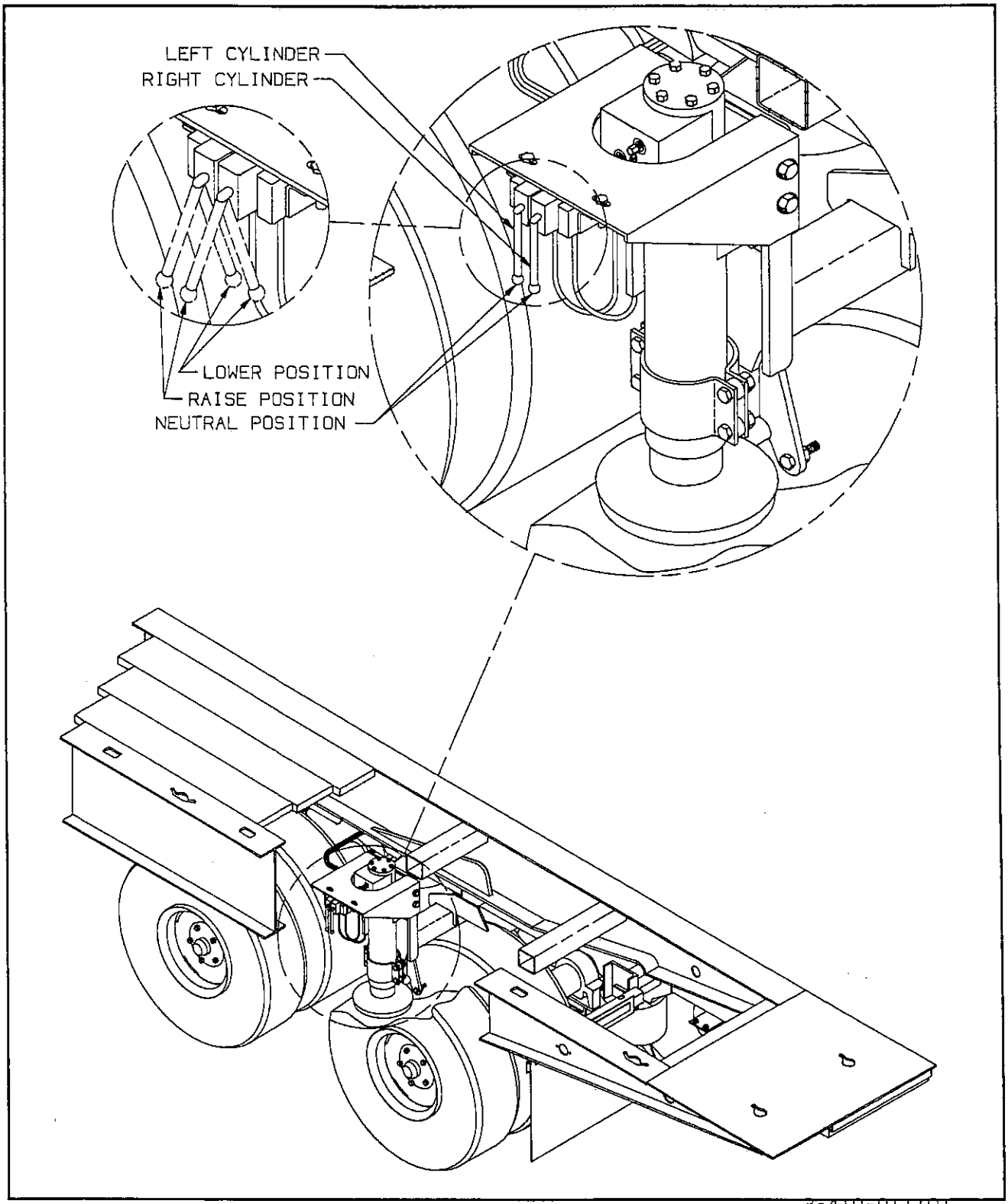


Figure 5-3 Dock leveler operation

5-12 Use Of Dock Levelers

DANGER

1. WHEN USING DOCK LEVELERS, THE TRAILER MUST BE KEPT LEVEL AT ALL TIMES. DO NOT LOWER THE PARKING STANDS. LOADS BEING PLACED ON THE TRAILER MUST BE KEPT CENTERED ON THE TRAILER. AN UNLEVEL TRAILER MAY ALLOW A LOAD TO SLIDE, CAUSING INJURY OR DEATH TO ANYONE NEAR THE LOAD!

2. DO NOT OPERATE DOCK LEVELERS WITH INSUFFICIENT SPACE ON BOTH SIDES OF THE TRAILER. TRAILER WILL LEAN TOWARD THE SIDE WITH THE SHORTEST CYLINDER. PERSONS OR EQUIPMENT CAN BE CRUSHED BETWEEN TRAILER SIDE AND RIGID OBJECTS.

CAUTION

BE SURE TO CHECK THAT THE DOCK LEVELERS ARE FULLY RETRACTED BEFORE MOVING THE SEMITRAILER. FAILURE TO RETRACT THE DOCK LEVELERS BEFORE OPERATING CAN CAUSE SEVERE DAMAGE TO THE SEMITRAILER.

NOTE: *Reread all safety precautions located at the front of this section before performing any of the following procedures.*

5-12.1 If your semitrailer is equipped with optional dock leveler hydraulics, these may be used to level the rear of the semitrailer to a loading dock.

5-12.2 Park the semitrailer in front of the dock according to instructions in **Paragraph 5-6 "Parking the Semitrailer".**

5-12.3 Push in the Dock Leveler Selector so hydraulic power is available to the Dock Leveler circuit. Use the dock leveler controls located between the axles on the drivers side of the trailer to raise the rear corners of the trailer as needed. Operate both controls at the same time. Pull the dock leveler controls to raise the trailer deck (to extend the dock leveler legs). Push the dock leveler controls to lower the trailer deck (to retract the trailer legs). Use one control to level adjust the trailer bed.

NOTE: Be sure to lower the dock levelers when finished. Push the dock leveler controls in — at the same time — to retract the dock leveler legs and lower the trailer bed.

5-12.4 Pull out dock leveler selector to return trailer hydraulics to normal operation. Shut off the hydraulic power.

5-13 Hydraulic Power Supply Engine Operation

DANGER

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 PLUS IT'S LOAD. FAILURE TO TAKE ADEQUATE SAFETY MEASURES DURING THESE OPERATIONS CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

NOTE: *Reread all safety precautions located at the front of this section before performing any of the following procedures.*

The hydraulic power supply engine is used to power the hydraulic funtions, should the towing vehicle not be equipped with hydraulic hookups.

NOTE: *1. Check the following fluid levels before starting the engine package: Engine Oil, Fuel Supply, Hydraulic Oil.*

The engine package may not work properly if these fluids are low.

2. If the engine does not crank, check the following on the battery: Charge, fluid, terminals, and cables. Take corrective actions as needed.

The procedure for operating the hydraulic power supply engine system is as follows:

5-13.1 Locate the throttle, choke, and Engine Ignition Switch on the side frame member (see Figure 4-5).

5-13.2 Pull the choke completely out and turn out the throttle several rotations.

5-13.3 Turn the key to the "START" position. The engine should crank and then start. If the engine does not start, refer to the note above. If problems persist, then see the *owner's manual provided with the engine package.*

5-13.4 When the engine starts, release the key to the "ON" position. After engine warm up, push the choke completely in.

5-13.5 To adjust the speed, turn the throttle control in or out, as needed, until the engine runs smoothly at a speed capable of withstanding using the hydaulic controls. The hydraulic controls should now be functional.

5-13.6 Before shutting it off, **allow the engine to cool down.** To cool down the engine, run at a slow idle for one to two minutes.

5-13.7 Once the engine is cool, turn or push the throttle and choke control completely in and turn the key to the "OFF" position.

5-14 Air Ride Operation

CAUTION:

IF SUSPENSION AIR LOSS SHOULD OCCUR, COMPLETELY DEFLATE SUSPENSION AND TEMPORARILY OPERATE ON THE AIR SPRINGS INTERNAL RUBBER BUMPERS. CAREFULLY PROCEED TO THE NEAREST TRAILER SERVICE FACILITY. TO DEFLATE THE AIR SUSPENSION, DISCONNECT THE LOWER CONNECTION ON THE LINKAGE OF THE AUTOMATIC AIR VALVES. ROTATE THE VALVE CONTROL ARMS DOWN ABOUT 45° TO EXHAUST THE AIR. TO RESTORE TO NORMAL OPERATION, SIMPLY REVERSE THE PROCEDURE.

NOTE: *Reread all safety precautions located at the front of this section before performing any of the following procedures.*

Trailer air pressure must be maintained above 65 PSI before operating. This enables the "*PROTECTION VALVE*" to maintain safe air brake pressure during suspension system air loss.

5-15 Front Extension/Bulkheads

5-15.1 Optional bulkheads may come with or without chain racks. To remove a bulkhead, simply remove the bolts and nuts holding the bulkhead into the pockets on the trailer front and lift the bulkhead off.

5-15.2 To use the front bulkhead as an extension, Remove the top-most pin from the trailer bracket. Lower the bulkhead to a horizontal position. Replace the front-most pin in it's original position. To use the extension as a bulkhead, simply return the extension to it's original position.

5-15.3 In all cases, be sure to secure the pins with the lynch pins provided.

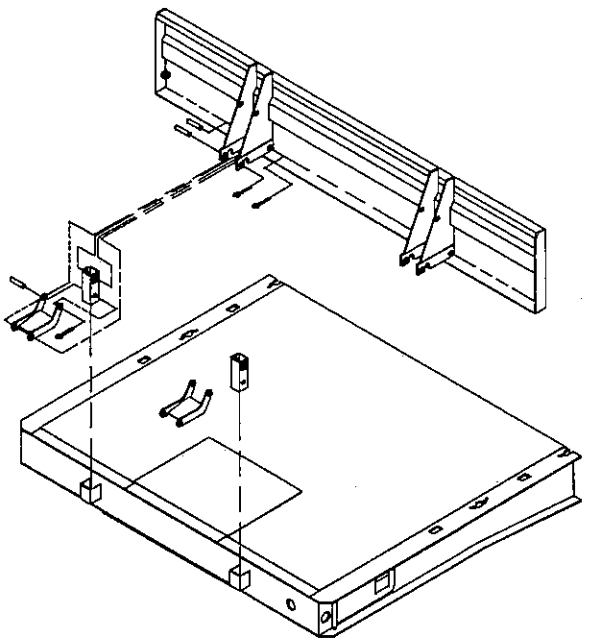


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FIG. 5-4 FRONT EXTENSION

MAINTENANCE AND LUBRICATION 6

The Model 317 Semitrailer is 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.

6-1 Inspection

DANGER

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

6-1.1 Inspect the towing vehicle, the trailer, and trailer parts periodically for damage or signs of pending failure. Damaged or broken parts must be repaired or replaced at once. Determine the cause of any binding or hydraulic leakage at once. Correct the problem before using the tractor or semitrailer.

6-2 Gooseneck, Frame, And Deck

Check the frame, gooseneck, and undercarriage daily for cracks or material fatigue. If any cracks or breaks are found, return the trailer at once to the Landoll factory for repairs. Inspect the deck daily for broken or missing planks or missing attachments. Replace any defective parts promptly.

6-3 Hydraulic System

WARNING

IF MORE OIL THAN SPECIFIED IS SENT TO DOCK LEVELER VALVE, DAMAGE TO DOCK LEVELERS AND PERSONAL INJURY CAN OCCUR. IF LESS OIL THAN SPECIFIED IS SENT TO DOCK LEVELER THEY WILL NOT OPERATE OR OPERATION WILL BE ERRATIC.

6-3.1 Check the oil level of the tractor wet kit hydraulic tank 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 can cause hydraulic fluid overflow during operation.

6-3.3 Dock leveler flow bypass regulator (Item 34, Figure 8-27), must provide 2.2 to 2.8 gallons per minute to dock leveler valve.

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 (see Figure 6-11).

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 and the terminals 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 can 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, poor 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

DANGER

1. 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 SEMITRAILER UNDERCARRIAGE WITH JACK STANDS SUFFICIENT TO WITHSTAND THE WEIGHT OF THE SEMITRAILER AND LOAD. FAILURE TO TAKE ADEQUATE SAFETY MEASURES MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

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

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

a. Checking air lines for cracking or kinks.

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

c. Check brake linings for excessive wear or distortion.

6-5.2 Drain air reservoir of all moisture daily.

6-6 Spring Brake Chambers (30/30)

DANGER

SPRING BRAKE ACTUATORS (BRAKE CHAMBERS) EMPLOY A SPRING WITH HIGH FORCES REQUIRING EXTREME CARE WHILE SERVICING. PERSONNEL UNFAMILIAR WITH DISASSEMBLY TECHNIQUE SHOULD NOT ATTEMPT THIS PROCEDURE. DISASSEMBLING THE SPRING CHAMBER WITHOUT PROPERLY CAGING THE SPRING MAY RESULT IN SERIOUS INJURY OR DEATH.

NOTE: *Reread the safety precautions at the beginning of Paragraph 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 by a qualified technician at 50,000 miles or yearly. Repair or replace faulty units. If the diaphragm or hardware is replaced, 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 List."**

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. Do not operate loaded trailer with brake manually 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 for reassembly.

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

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

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.

6-6.3 Installation:

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

b. Position the inlet ports by loosening the service chamber clamp bands and rotating center using 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.

d. Remount the brake chamber on the axle brackets and reconnect the air service hoses and the slack adjuster connecting rod **(See Figure 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.

f. Insure that the clamp band is properly seated and tight *before* uncaging the power spring.

SAFETY FIRST!

6-7 Air Brake Chambers (Type 30)

DANGER

DO NOT USE THIS PROCEDURE FOR TRAILERS WITH SPRING BRAKES. THE FORCE RELEASED BY DISMANTLING SPRING BRAKE CHAMBERS CAN CAUSE A REACTION THAT CAN RESULT IN SERIOUS INJURY OR DEATH.

The air brake chamber may be serviced while still on the semitrailer. The following steps describe the procedure for servicing the air brake chamber.

6-7.1 Chock trailer wheels.

6-7.2 Drain the semitrailer air system of all air and moisture **(See Figure 6-1)**.

NOTE: Draining the air system will allow the trailer to roll if the wheels are not properly chocked.

6-7.3 Mark the chamber for proper reassembly alignment, loosen the clamp bands around the chamber, and remove the chamber head.

6-7.4 Remove and replace diaphragm. Check all fasteners for defects. If defects are found, the defective part must be replaced.

6-7.5 Replace the chamber head and tighten the clamp band.

DANGER

1. 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 SEMITRAILER UNDERCARRIAGE WITH JACK STANDS SUFFICIENT TO WITHSTAND THE WEIGHT OF THE SEMITRAILER AND LOAD. FAILURE TO TAKE ADEQUATE SAFETY MEASURES CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

2. COMPLETELY DRAINING THE AIR RESERVOIR WILL RELEASE THE TRAILER BRAKES. ALWAYS CHOCK WHEELS BEFORE RELEASING BRAKES. FAILURE TO CHOCK WHEELS PRIOR TO RELEASING TRAILER BRAKES CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

WARNING

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

WARNING

REPAIR OR REPLACEMENT OF THE RELAY/EMERGENCY VALVE IS A COMPLEX OPERATION AND SHOULD BE PERFORMED BY TRAINED SERVICE PERSONNEL. IF THE RELAY OR EMERGENCY VALVE NEEDS REPAIR, CONTACT A LANDOLL AUTHORIZED SERVICE CENTER OR THE LANDOLL FACTORY FOR SERVICING.

6-7.6 Recharge the semitrailer air system and check the air chamber for leaks by applying soap suds to the chamber. A growing bubble or suds being blown away indicates a leak. Locate the source of the leak and repair before using the semitrailer.

6-8 Relay/Emergency Valve

Every 3600 operating hours or 100,000 miles or yearly, the Relay Emergency Valve should be disassembled, cleaned, and lubricated by a trained technician.

6-9 Brake Maintenance

6-9.1 Brake Inspection/lubrication

Lubricate brake assembly per **Figure 6-11, "LUBRICATION POINTS"** and **Table 6-2, "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 **Figure 6-1** for brake assembly parts identification. The recommended procedure for brake disassembly is **Paragraph 6-9.2**. The recommended procedure for brake assembly is **Paragraph 6-9.3.**

6-9.2 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 (8, 22), and lock washer (23, 24), hub and brake drum assembly. Be careful to protect the bearings from dirt and other foreign material.

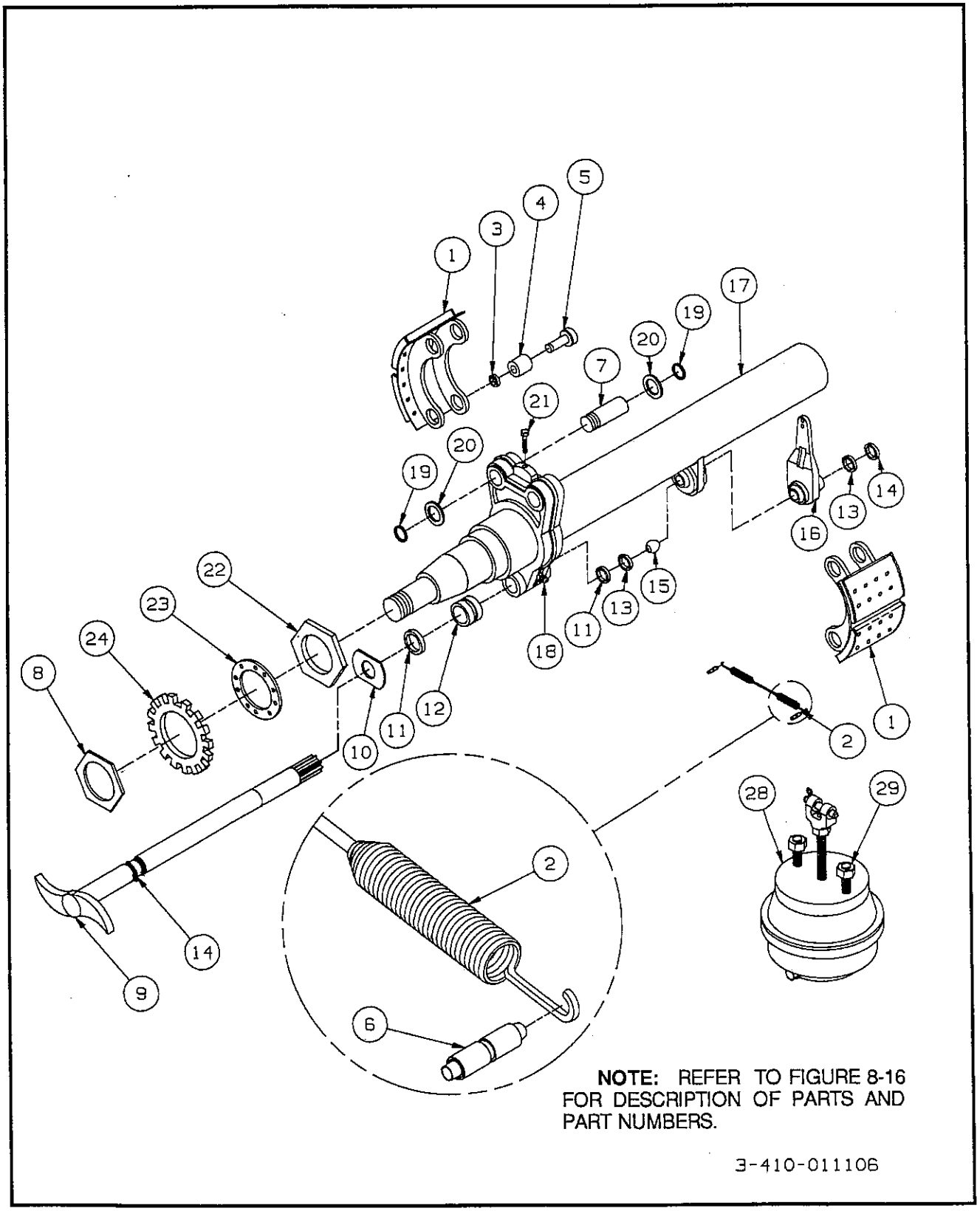

Figure 6-1 Brake & Axle Terms

d. Remove anti-rotation bolt (21) from spider assembly.

e. Remove pin retainers (19), anchor pin washers (20), and anchor pins (7). This should be enough to loosen the brake shoes from the axle assembly. If you need to remove the cashaft, continue with Step f; otherwise, go to Step h.

f. Release pressure from the brake chambers (28). Then remove the camshaft retainer (14), and camshaft washer (13) from the slack adjuster (16). This will dislodge the camshaft (9).

g. Loosen the retainer (14) at the end of the camshaft and slide the camshaft (9) back out of the axle assembly to remove it. Be sure to keep all bushings, washers, rollers, etc. (items 10, 11, 12, 13, 15) close to where the shaft was removed.

h. 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.

6-9.3 Assembly

a. If you did not remove the camshaft when you disassembled the axle, start at Step f.

DANGER

1. 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 SEMITRAILER WITH JACK STANDS SUFFICIENT TO WITHSTAND THE WEIGHT OF THE SEMITRAILER AND LOAD. FAILURE TO TAKE ADEQUATE SAFETY MEASURES CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

2. COMPLETELY DRAINING THE AIR RESERVOIR WILL RELEASE THE TRAILER BRAKES. ALWAYS CHOCK WHEELS BEFORE RELEASING BRAKES. FAILURE TO CHOCK WHEELS PRIOR TO RELEASING TRAILER BRAKES CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

WARNING

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

b. Slide the camshaft retainer (14), "D" Washer (10), Grease Seal (11), and camshaft spider bushing (12) onto the camshaft (9). Slide the camshaft through the spider opening, seating the bushing inside the spider.

c. Slip the grease seal (11), camshaft washer (13), and camshaft support bushing (15) onto the camshaft.

d. Insert the camshaft through the slack adjuster (16), seating the bushing inside the slack adjuster.

e. When the camshaft is properly seated, hold the unit on with another camshaft washer (13) and camshaft retainer (14).

f. To assemble the brake assembly, position the brake shoe assemblies on both sides of the spider and insert pin anchors (7) through the spider.

g. Hold the pin anchors in place with new anchor pin washers (20) and anchor pin retainers (19) at the top of the shoe.

h. Insert shoe roller pin (5) and roller (4) through the bottom of the brake shoes and hold with roller pin retainers (3).

i. Hold the brake pads together with shoe return springs (2) on shoe return spring retainers (6). Install anti-rotation bolt.

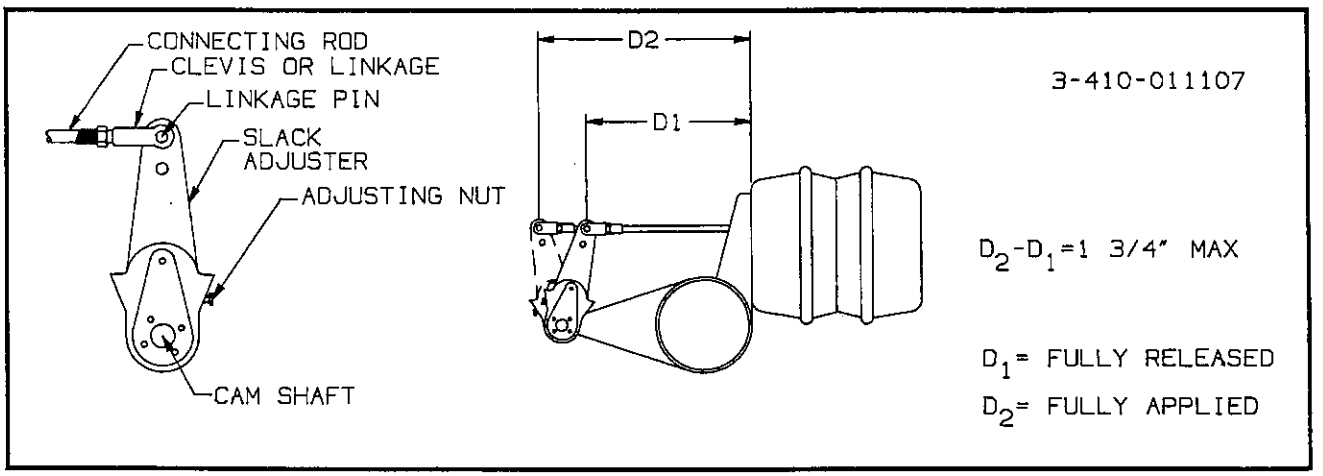

Figure 6-2 Checking Brake Adjustment

j. Connect brake chamber (28) to slack adjuster (16) (if necessary). The angle between the slack adjuster and connecting rod should be approximately 95° when the brake is not applied.

k. Clean and inspect bearings and replace hub oil seal.

l. Install hub and adjust bearings (see Paragraph **6-13), "Wheel Bearing Lubrication and Adjustment".**

6-10 Brake Adjustment

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.

6-10.1 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 pin **(see Figure 6-2).**

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" to meet Federal "IN-SERVICE" criteria. It is advisable to adjust all brakes on the same axle to within 1/2" of each other to prevent unbalanced braking.

6-10.2 Adjusting

a. Release brakes.

b. Place a 9/16" box end or socket wrench on the slack adjuster adjusting nut **(see Figure 6-2),** and push in on the locking sleeve.

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

6-11 Tire Inflation

Tire inflation will cause tire to ground contact characteristics as shown in Figure 6-3. 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 semitrailer. 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.

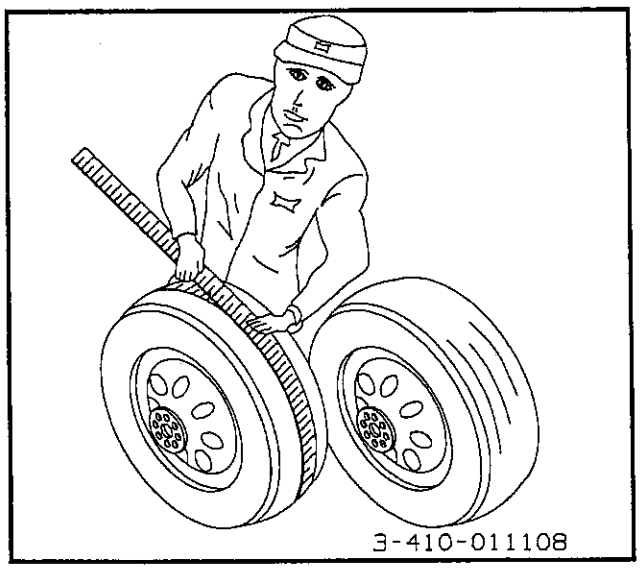

Figure 6-4 Checking Tire Size with Measuring Tape

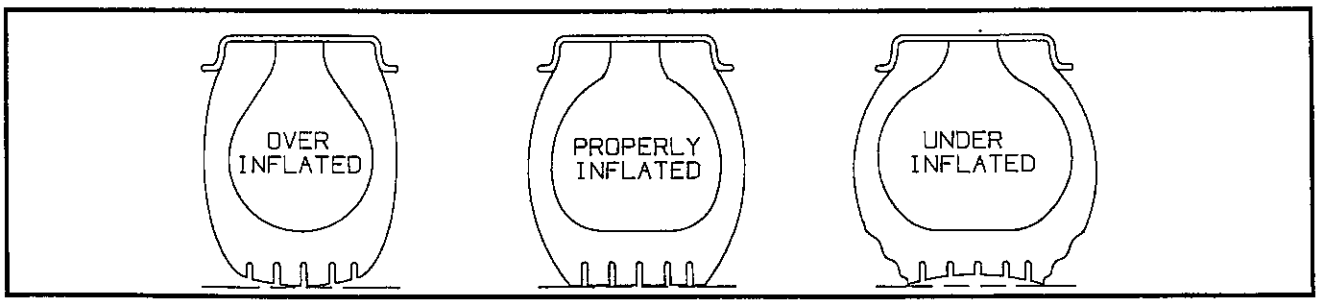

Figure 6-3 Tire Inflation Examples

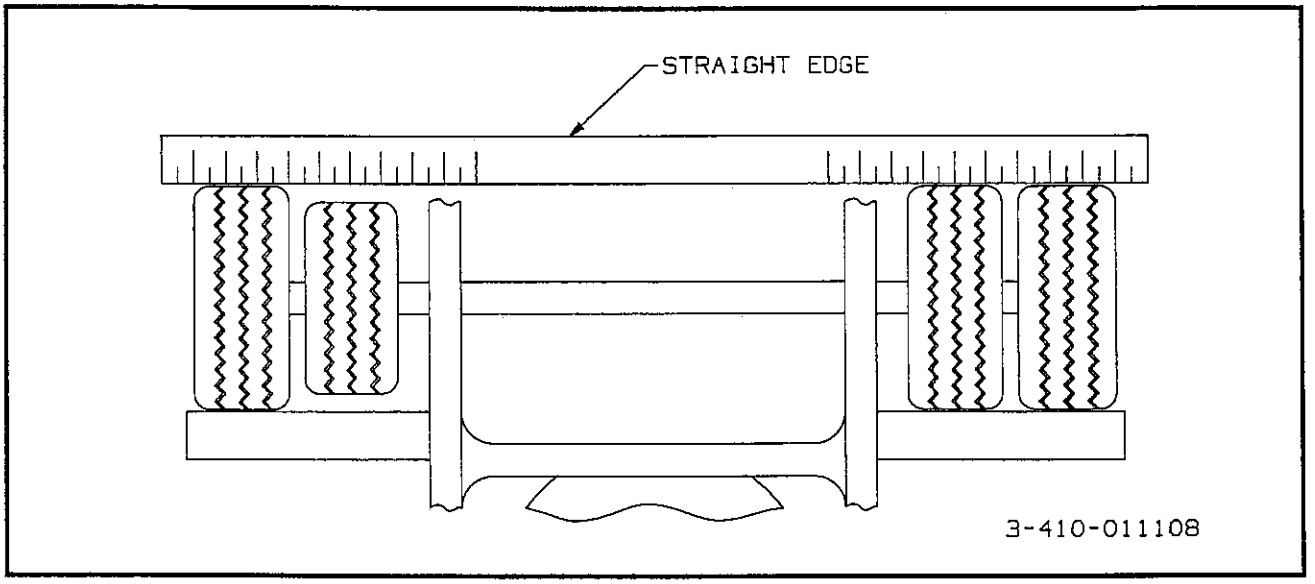

Figure 6-5 Straight Edge Method

6-12 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.

6-12.1 Tape Measuring Method

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

6-12.2 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" gap is allowed **(See Figure 6-5).**

6-13 Wheel Bearing Lubrication And Adjustment

With trailer sitting level, the oil level must be checked daily and maintained between the "ADD" and "FULL" lines on the hub cap window. Check for cracked windows, missing filler plugs and 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.

6-13.1 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 one-third 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 tighten to 250 (min.) - 400 (max.) ft-lb.

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 **Paragraph 6-10, "Brake Adjustment".**

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

SAFETY FIRST!

6-14 Suspension Maintenance

DANGER

1. 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 SEMITRAILER WITH JACK STANDS SUFFICIENT TO WITHSTAND THE WEIGHT OF THE SEMITRAILER AND LOAD. FAILURE TO TAKE ADEQUATE SAFETY MEASURES MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

2. COMPLETELY DRAINING THE AIR RESERVOIR WILL RELEASE THE TRAILER BRAKES. ALWAYS CHOCK WHEELS BEFORE RELEASING BRAKES. FAILURE TO CHOCK WHEELS PRIOR TO RELEASING TRAILER BRAKES MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH.

WARNING

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

This paragraph covers the maintenance of the air ride and spring suspensions offered for the semitrailer. Not all the procedures listed here pertain to both suspensions. Use the procedures that apply to the suspension on your semitrailer. Visually examine the suspension for broken or missing parts. Replace all defective parts. See **Section 8, "Illustrated Parts List"** for suspension parts identification.

6-14.1 Make certain that all springs (spring suspensions only) are properly located on the wear pads. Twisted springs or cocked hangers will cause uneven spring contact with wear pad and will result in excessive wear on the spring suspension. Check the shocks for excessive wear and the air bags (air suspension only) for excessive wear and proper inflation.

6-14.2 Air Ride Height Adjustment

The following is the procedure for adjusting the air ride height (**See Figure 6-6** for parts identification).

a. Before adjusting, vehicle must be empty with the gooseneck kingpin at operating height and air supplied to the semitrailer.

b. Disconnect linkage at the control arms and raise control arms to the "up" position, raising the trailer the full extent of suspension travel.

c. Position a 7-1/4" wood block between the axle caps and undercarriage frame.

d. Lower the trailer by exhausting all air from the system. Recheck the ride height.

e. Move the control arms to the "down" position (about 45°) for 10-15 seconds. Slowly return the control arms to the center position and insert locating pins into the nylon block and bracket on the automatic height control valves (**see Figure 6-6**).

f. Loosen the 1/4" lock nut located on the nylon blocks, allowing the control arm move approximately 1 inch.

g. Reconnect the linkage to the control arm lower brackets and re-tighten the 1/4" lock nut.

h. Repeat this procedure for the other valve.

i. Remove the locator pins, pressurize the trailer air system, and raise the trailer. The height control valves may be used as an improvised jack by disconnecting the control arms at the lower bracket and pushing the control arms to an "up" position.

j. Remove the spacers and reconnect the linkage. This allows the *Automatic Height Control Valves* to resume normal operation.

k. Check the air ride height. If neccesary, go through the adjustment prodecure again until the proper air ride height is achieved.

l. Check the air ride height periodically and adjust as needed.

6-14.3 Four Spring Suspension Bushings

Replacing the equalizer bushings and the torque arm bushings on the four spring suspension is a complex operation and should be left to trained service personnel. If the bushings in your four spring suspension need to be replaced contact a *Landoll* authorized service center or the *Landoll* factory for servicing.

6-15 Wheel Alignment

DANGER

TO PREVENT A POTENTIALLY LIFE THREATING ACCIDENT:

1. SUPPORT TRAILER AND UNDERCARRIAGE SO TIRES ARE OFF THE GROUND.

2. SUPPORT THE TRAILER AND UNDERCARRIAGE ON JACK STANDS WITH SUFFICIENT CAPACITY TO SUPPORT THE TOTAL WEIGHT OF THE TRAILER AND ANY LOAD WHICH IT MAY BE CARRYING.

When trailer tires show signs of scuffing, feather-edging or uneven wear, examine the semitrailer for damaged suspension (frame, shocks, linkage, etc), axle, wheel bearings and wheels. Proper

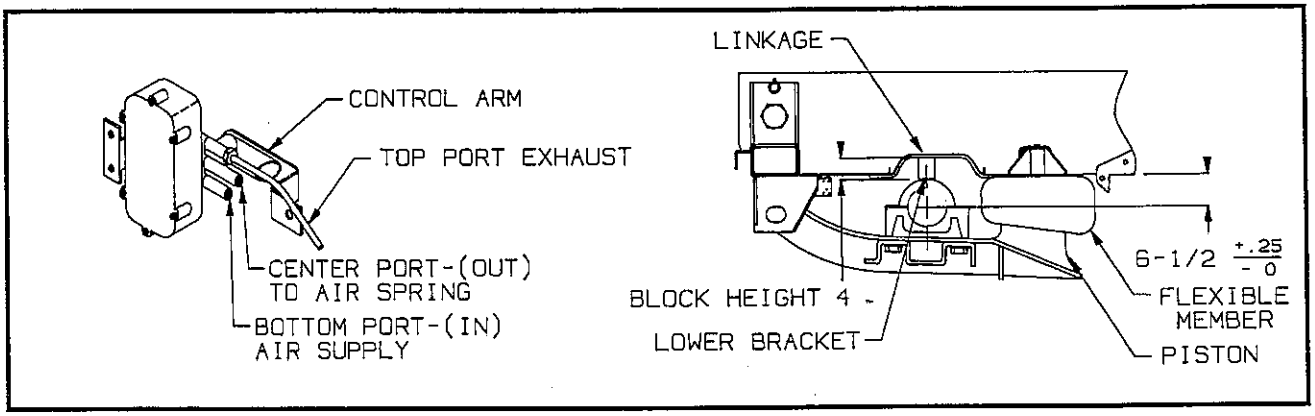

Figure 6-6 Air Ride Adjustment

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:

6-15.1 Remove wheel, hub and bearing assemblies.

6-15.2 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 Figure 6-7).**

6-15.3 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" or more is considered excessive tire "toe" and the axle must be replaced **(see Figure 6-7).**

6-15.4 Follow the same procedures as in **Paragraph 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 semitrailer axle has no camber from the factory, thus if it is found to have positive or negative camber, axle replacement is necessary **(see Figure 6-8 for examples of camber).**

6-16 Axle Alignment

Proper axle to king pin alignment is necessary to obtain straight tracking. If axle alignment is off, "dog-tracking" occurs. 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.

6-16.1 Manual Alignment Procedures

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

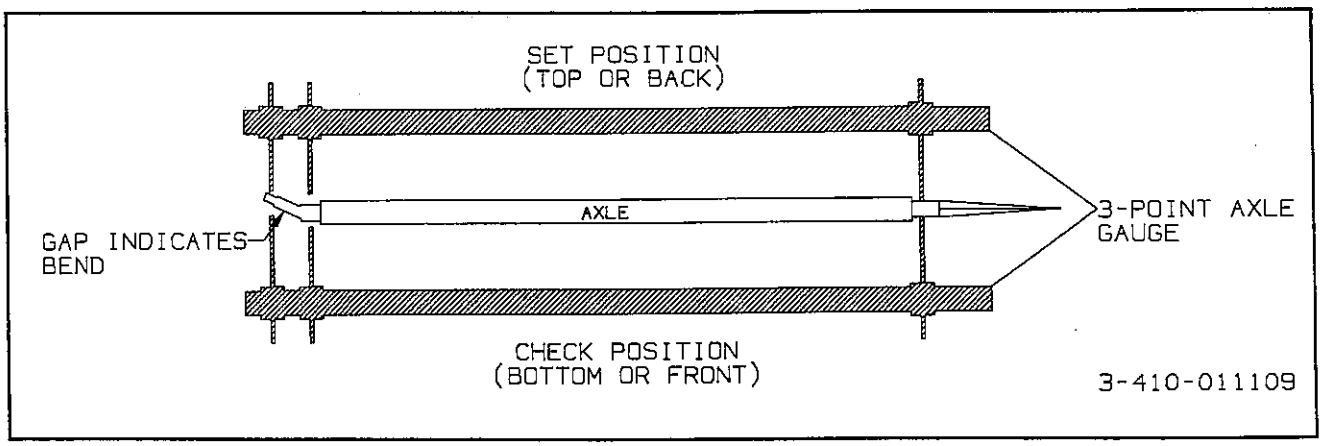

Figure 6-7 Bent Axle Check

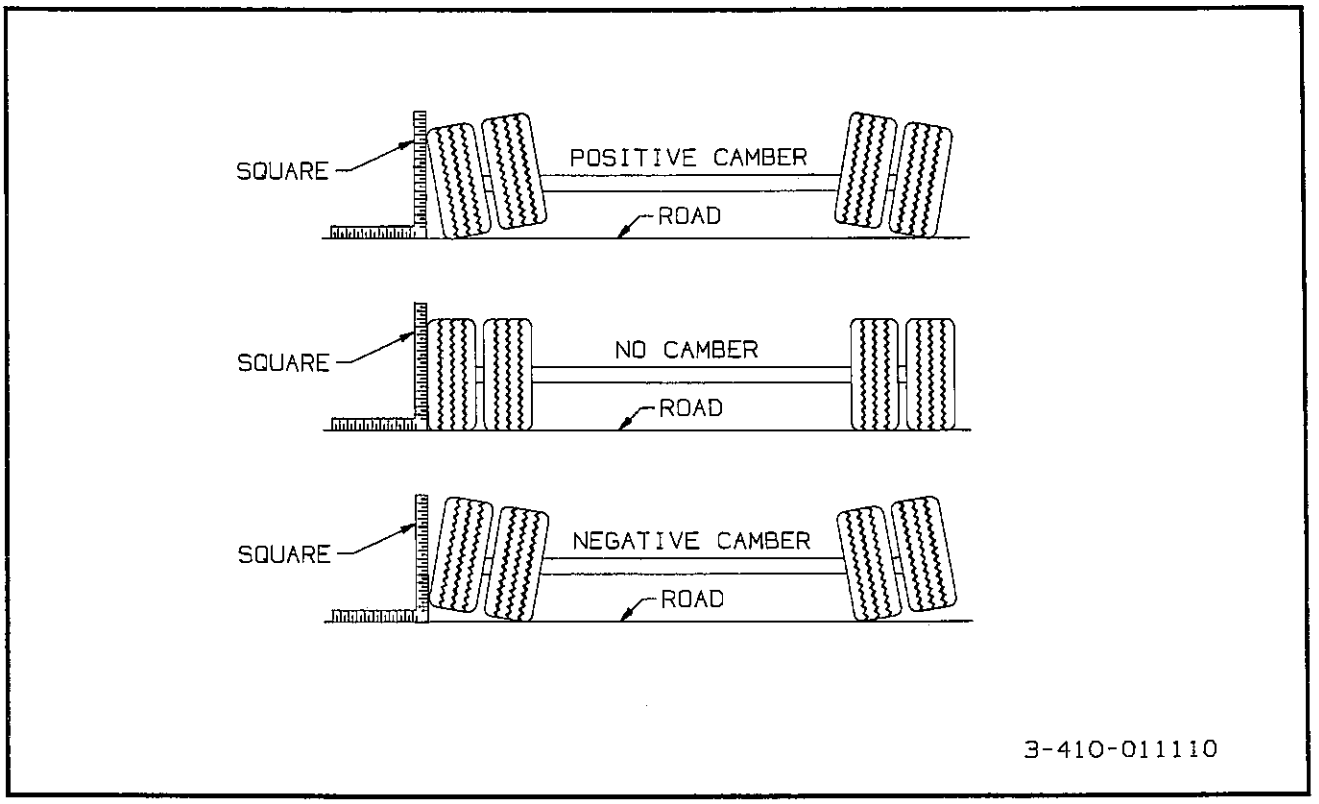

Figure 6-8 Examples of Camber

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 Figure 6-9).**

e. Measure (D1) to the other end of the axle in the same manner as in **Step d**. Record this measurement **(See Figure 6-9).**

f. It is usually necessary to set D1 about 1/8" shorter than D to insure proper trailer tracking on slope of road.

g. In all cases, all suspensions must be in good repair with no binding or other restrictions before the alignment process can be undertaken properly. All defective parts of the suspension or axles must be replaced immediately.

6-16.2 Air Ride Suspension Axles

a. The air ride suspension is aligned and welded at the factory and it should not be necessary to align the axles. If, however, it does become necessary to align the axles, the procedure is as follows in Steps b through f.

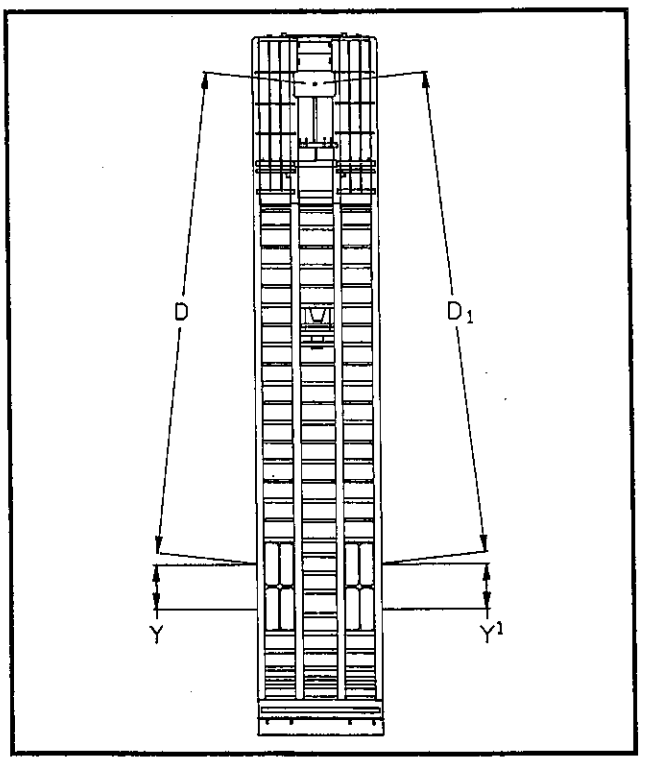

Figure 6-9 Checking Axle Alignment

b. To align air ride suspension axles, locate the welded washer for the front axle in front of the drivers side equalizer beam. Cut this washer loose and loosen the suspension pivot bolt.

c. Align the front axle using the method outlined in **Paragraph 6-16.1.**

d. After proper alignment has been obtained, tighten the suspension pivot bolt nut to the torque listed in **Section 3, "Standard Specifications",** and reweld the washer.

e. Align the rear axle to the front axle. The rear axle should be exactly parallel with the front axle. In other words, the dimensions Y and Y1 in should be the same.

f. Tighten the suspension pivot bolt nut to the torque listed in **Section 3, "Standard Specifications"** and reweld the washer.

6-16.3 Spring Suspension Axles

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

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

c. Tighten the axle u-bolts to the torques listed in **Section 3, "Standard Specifications".**

d. Tighten the front axle torque arm clamp bolts to the torque listed in **Section 3, "Standard 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 **Figure 6-9 should be the same.**

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

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

6-17 Hydraulic Engine Package

The hydraulic engine package should be inspected weekly to insure continued proper operation. The inspection should include:

a. Check the hydraulic oil level weekly, or after any leakage. **See Table 6-1** for proper hydraulic oil. With all hydraulic cylinders in the retracted position and with the engine stopped, check the hydraulic oil level.

b. Check hoses weekly for cracks or leaks. If a valve or line leaks, it should be replaced immediately.

c. Check the engine oil each time before using. Oil level should be maintained between the **"ADD"** and **"FULL"** marks on the oil dip stick. For further maintenance procedures and proper lubrication specifications, please refer to the engine owners manual that was supplied with the hydraulic engine package.

d. Replace hydraulic filter with new filter at least *every 6 months* or more often under adverse conditions.

e. Use the fuel recommended for the engine package installed on your trailer.

6-18 Winches

Inspect the winch cable before and after *every* usage. If frayed wires, nicks, kinks, worn spots, breaks or any other sign of deterioration of damage is found, immediate replacement is mandatory before further usage. If the trailer is going to be out in the weather for any length of time, it is advisable to oil the winch cable to prevent untimely rusting and deterioration of the cable.

Inspect the winch mechanism thoroughly each week to insure safe, efficient operation.

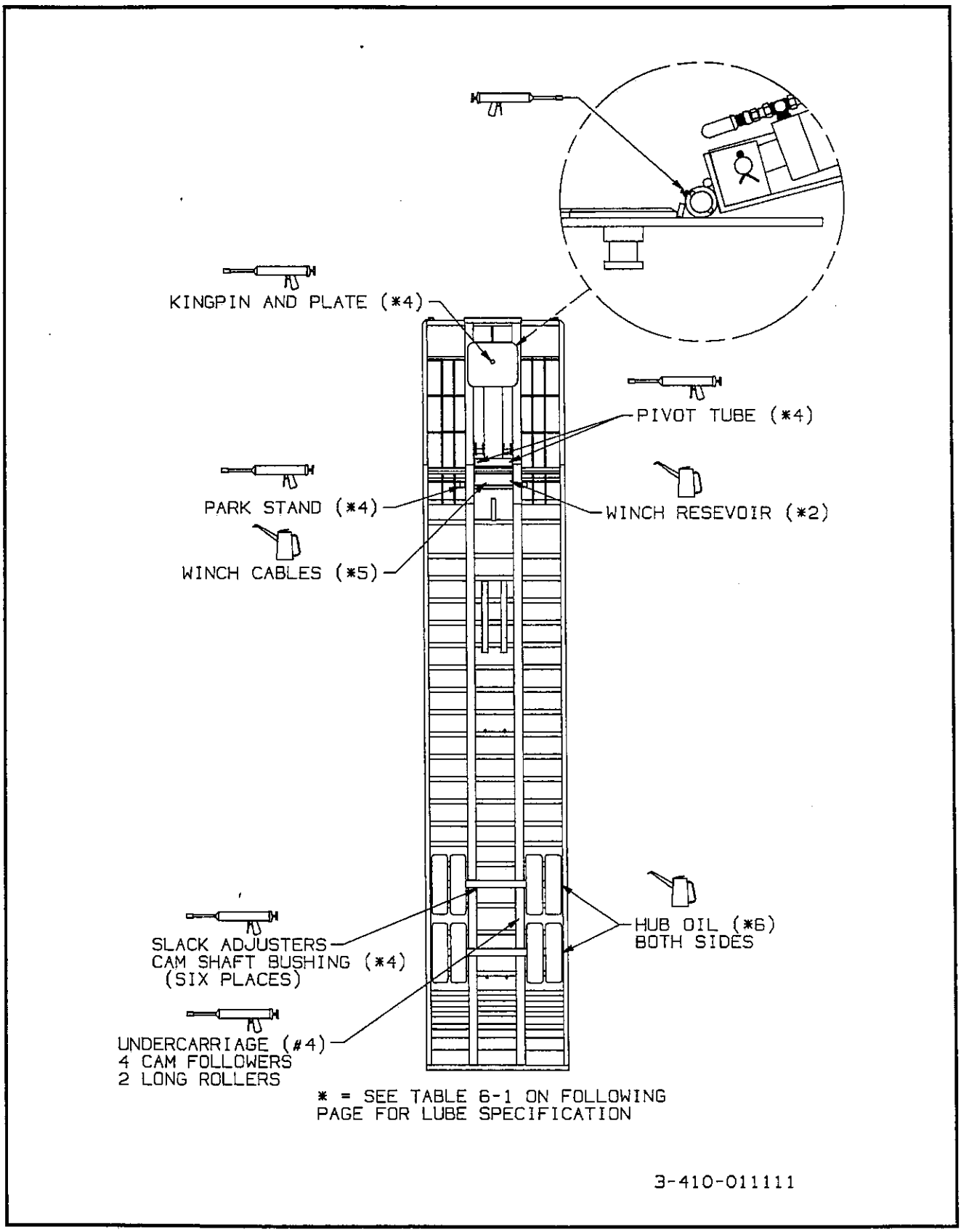

Figure 6-10 Lubrication Points

LUBE #	SEASON	BRAND & PRODUCT (Weight &/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 NEEDED.			
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-purpose Gear SAE 90 # 90501	Multi-gear EP 80W90
	WINTER	Multi-purpose 90	Gear Oil GTX 85-140	Phil Lube All-purpose Gear SAE 90 # 90501	Multi-gear EP 80W90

Table 6-1 Lubrication Specifications

NORMAL OPERATING SERVICE INTERVALS [a]								
SERVICE INTERVAL : ITEM	TIMES	1st 5 Hrs	Weekly	Monthly	6 Months	Yearly	LUBE #	NOTES
	MILES	50	500	2,000	12,000	25,000		
ELECTRICAL								
LIGHTS		I	I					
WIRING & CONNECTIONS		I		I				
MISCELLANEOUS								
FASTENERS		I, T		I				b
KING PIN & PLATE		I		C, I, L			4	c
BRAKE AIR SYSTEM		I	I	I				
RELAY VALVES						I, C		
BRAKE ADJ & WEAR		I		I, T				d
SLACK ADJUSTERS		I	I			L	4	c
CAMSHAFT ASSYS		I	I			L	4	c
HUB OIL		I	I, L			R	6	c
WHEEL BEARINGS		I			I, T		6	c, e
TIRE INFLATION & WEAR		I	I					f
WHEEL LUG NUTS		I, T	I	I, T				b
SUSPENSION ALIGNMENT		I		I				
UNDERCARRIAGE ROLLERS				L			4	c
OIL		I	I			R	1	c
FILTER		R			R			
(Inspect & Replace as needed) HOSES		I		I		I, R		
WINCH GEAR CASE		I		I			2	c

I – Inspect, R – Replace, T– Tighten/ Adjust Torque, L – Lubricate, C – Clean

NOTES:

a. Perform at the time shown. Shorten service intervals when operating in severe or dirty conditions.
b. See Table 3-1 (Bolt Torque Chart) for correct torque.
c. See Table 6-1 (Lube Specification Chart) for recommended lubricant.
d. See Paragraphs 6-9 and 6-10 for procedures.
e. See Paragraph 6-13 for procedures.
f. See Serial Number Plate on the front of the semitrailer for proper inflation requirements.

Table 6-2 -- 317 Maintenance Schedule

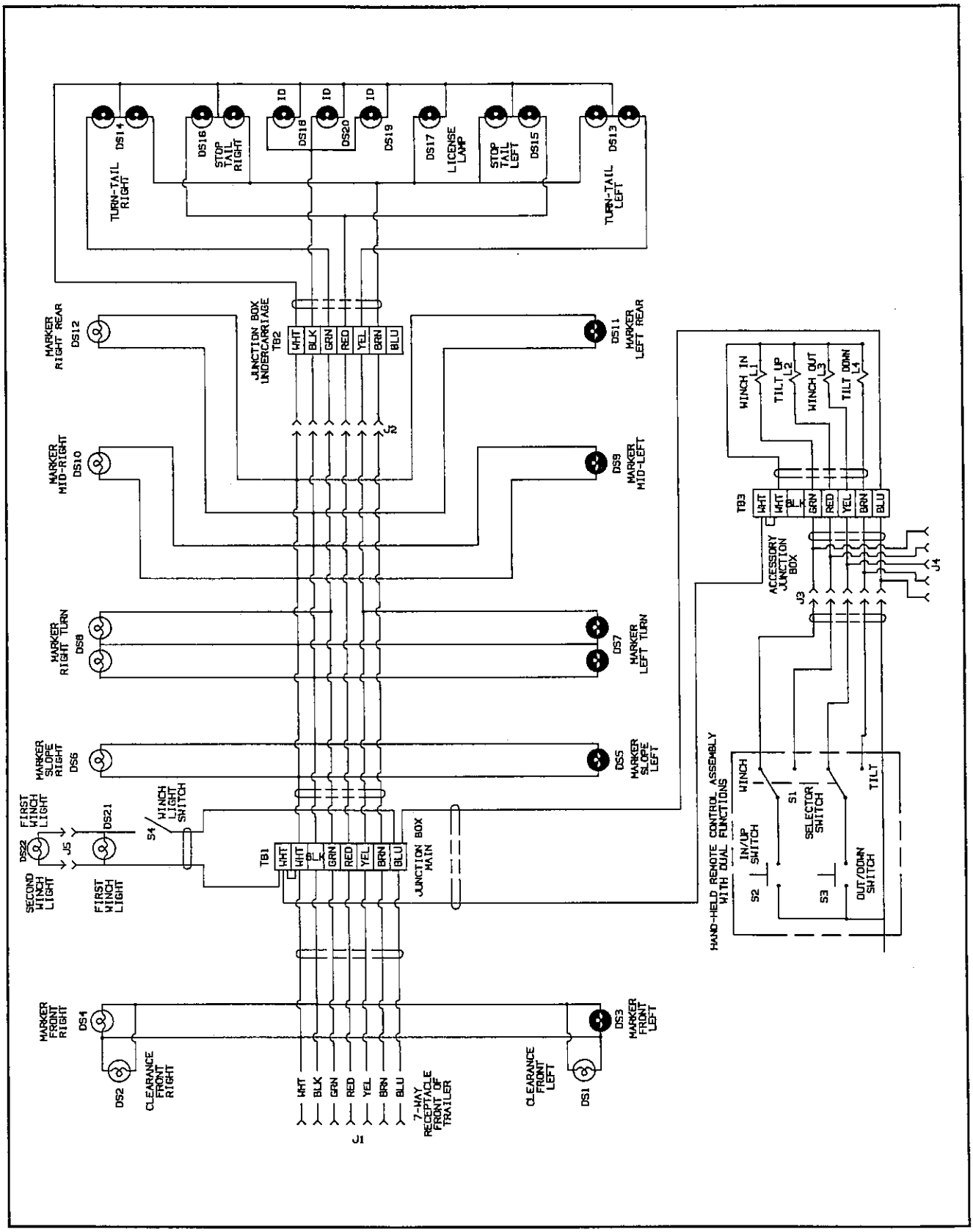

Figure 6-11 – 317A Wiring Diagram

317A WIRING PART LIST

REF DES	PART NUMBER	DESCRIPTION	FUNCTION
DS1	10205Y	REFLECTOR LAMP,YELLOW	FRONT LEFT CLEARANCE
DS2	10205Y	REFLECTOR LAMP,YELLOW	FRONT RIGHT CLEARANCE
DS3	10205Y	REFLECTOR LAMP,YELLOW	FRONT LEFT MARKER
DS4	10205Y	REFLECTOR LAMP,YELLOW	FRONT RIGHT MARKER
DS5	10205Y	REFLECTOR LAMP,YELLOW	LEFT SLOPE MARKER
DS6	10205Y	REFLECTOR LAMP,YELLOW	RIGHT SLOPE MARKER
DS7	60015Y	LIGHT,TURN AND CLEARANCE	LEFT SIDE MARKER/TURN
DS8	60015Y	LIGHT,TURN AND CLEARANCE	RIGHT SIDE MARKER/TURN
DS9	10205Y	REFLECTOR LAMP,YELLOW	MID-LEFT SIDE MARKER
DS10	10205Y	REFLECTOR LAMP,YELLOW	MID-RIGHT SIDE MARKER
DS11	10205R	REFLECTOR LAMP,RED	LEFT REAR SIDE MARKER
DS12	10205R	REFLECTOR LAMP,RED	RIGHT REAR SIDE MARKER
DS13	40015R	4IN TAIL LAMP W/REFLECTOR	LEFT TURN/TAIL
DS14	40015R	4IN TAIL LAMP W/REFLECTOR	RIGHT TURN/TAIL
DS15	40015R	4IN TAIL LAMP W/REFLECTOR	LEFT STOP/TAIL
DS16	40015R	4IN TAIL LAMP W/REFLECTOR	RIGHT STOP/TAIL
DS17	15009	LICENCE LAMP	LICENCE PLATE LIGHT
DS18	10205R	REFLECTOR LAMP,RED	IDENTIFICATION RIGHT
DS19	10205R	REFLECTOR LAMP,RED	IDENTIFICATION LEFT
DS20	10205R	REFLECTOR LAMP,RED	IDENTIFICATION CENTER
DS21	64181	RECT QUARTZ HALOGEN LAMP	FIRST WINCH LIGHT
DS22	64181	RECT QUARTZ HALOGEN LAMP	FIRST WINCH LIGHT
J1	59S-7	RECEPTACLE,7 PIN	FRONT MAIN CONNECTOR
J2	----------	PART OF HARNESS ASSEMBLY	U/C BUMPER PLUG
J3	59S-7	RECEPTACLE,7 PIN	LEFT REMOTE PLUG
J4	59S-7	RECEPTACLE,7 PIN	RIGHT REMOTE PLUG
J5	----------	PART OF HARNESS ASSEMBLY	SECOND WINCH LIGHT PLUG
L1	----------	PART OF 3-SPOOL HYD VALVE	SOLENOID,WINCH IN
L2	----------	PART OF 3-SPOOL HYD VALVE	SOLENOID,TILT UP
L3	----------	PART OF 3-SPOOL HYD VALVE	SOLENOID,WINCH OUT
L4	----------	PART OF 3-SPOOL HYD VALVE	SOLENOID,TILT DOWN
S1	----------	PART OF REMOTE CONTROL	SOLENOID,WINCH IN
S2	----------	PART OF REMOTE CONTROL	SOLENOID,TILT UP
S3	----------	PART OF REMOTE CONTROL	SOLENOID,WINCH OUT
S4	----------	PART OF REMOTE CONTROL	SOLENOID,TILT DOWN
TB1	3-113-010002	BOX,ELECTRICAL,FLG MNT	PRIMARY JUNCTION BOX
TB2	750-029	JUNCTION BOX,7 STUD	UNDERCARRIAGE JUNCTION BOX
TB3	3-113-010002	BOX,ELECTRICAL,FLG MNT	ACCESSORY JUNCTION BOX

PERIODIC MAINTENANCE SCHEDULE							
	AFTER EACH CYCLE OF INDICATED HOURS						
SERVICE THESE ITEMS	8	25	50	100	200	500	1000
Inspect Engine Generally	X[1]						
Check Oil Level	X						
Service Air Cleaner Element and Element Wrapper		X[2]					
Service Crankcase Oil (all engines without filter)		X[2]					
Change Crankcase Oil (standard base with filter)		X[3]	X[2]				
Change Crankcase Oil (high capacity base with filter)		X[3]		X[2]			
Replace Oil Filter		X[3]		X[2]			
Check Battery Electrolyte Level			X				
Clean Cooling Fins			X[2]				
Replace Air Cleaner Element					X[2]		
Replace Fuel Filter					X		
Check or Replace Spark Plugs						X	
Check Valve Clearance (standard engines)					X[4]		
Check Valve Clearance (LP and natural gas conversion engines)						X[4]	
Check Valve Clearance (P224 only)						X[4]	
Check Valve Clearance (extended service life engines)							X[4]
Clean Carbon and Lead Deposits (cylinder head)							X[5]

1 – Check for fuel leaks. With engine running, visually and audibly check exhaust system for leaks.
2 – Perform more often when running under severe operating conditions.
3 – Required for initial break-in only.
4 – For detailed maintenance, contact an Onan Service Center or refer to the SERVICE MANUAL.
5 – Clean carbon more frequently when running under continuous light load and /or on leaded fuel. Use of Onan 4C carburetor and combustion cleaner is recommended every 200 hours to help reduce carbon buildup.

WARNING Breathing exhaust gases can result in severe personal injury or death. Do not use air cleaner, exhaust elbow, or connecting parts as a supporting step. Damage to these and connecting parts can cause an exhaust leak.

Table 6-3 Hydraulic Engine Maintenance Schedule

TROUBLESHOOTING 7

NOTE: Troubleshooting should be performed by a trained and competent technician. Landoll Corporation is not responsible for equipment that is improperly maintained. Contact an authorized Landoll Service center or contact the Landoll factory for servicing.

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 cannot be located, see an automotive electrical specialist. For maintenance procedures see **Paragraph 6-4.**

SYMPTOM	Problem: Remedy
NO LIGHTS	**Fuse blown on tractor:** Replace fuse. **Loose 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:** Tractor supply wire or circuit components too low capacity - enlarge wire or component, match bulbs with tractor voltage.
LIGHTS BRIGHT & BURN OUT	**Ground wire disconnected:** Self-explanatory. **Voltage difference between trailer & tractor:** Tractor supply wire or circuit components too low capacity - enlarge wire or component, 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 **Paragraphs 6-11 thru 6-16.**

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.check axle alignment. **Outerload:** Loads are above rated tire capacity. *Do not load above rated tire capacity.*
SHOULDER TREAD WEAR - ONE SHOULDER	**Axle damage:** Straighten or replace axle. **Axles not parallel:** Check axle alignment.
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	**Suspension 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 and tightening sequence 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 equalizer bushings:** Replace worn parts. **Axles not parallel:** Adjust axle spacing to be parallel.

AIR RIDE HEIGHT PROBLEMS:

TOO HIGH	**Axle to control valve linkage:** Readjust linkage. **Height Control Valve internal leak:** Repair or replace valve.
TOO LOW	**Axle to control valve linkage:** Readjust linkage. **Height Control Valve filter plugged:** Clean or replace valve. **Pressure Protection Valve filter plugged:** Clean or replace valve. **System air pressure low (65 PSI minimum required):** Troubleshoot air supply.
UNEVEN FROM SIDE TO SIDE	**Linkage adjustment:** Readjust linkage so both sides are the same. **Exhaust port plugged:** Clean or replace valve(s). **Height control valve internal leak:** Repair or replace valve. **Supply line to one height control valve pinched, restricted, or plugged:** Repair or replace line.

7-3 Brakes

For maintenance procedures see **Paragraphs 6-5 thru 6-10.**

SYMPTOM	Problem: Remedy
NO BRAKES OR BRAKES ARE INTERMITTENT	**Brake air system improperly connected:** Reconnect gladhands 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.

Brakes, Continued

SYMPTOM	Problem: Remedy
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 Figure 6-12. **Worn brake shoe bushing:** Replace bushing. **Brake drum distortion:** Replace drum. **Broken brake chamber spring:** Replace spring. **Brake chamber pushrod binding:** Realign 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. **Call Factory or see qualified Trailer/Brake Technician** **Leaking brake chamber diaphragm:** Replace diaphragm.
BRAKES APPLY TOO SLOWLY	**Brakes need adjusting or lubrication:** Adjust or lubricate as needed. **Low air pressure in brake system (below 90 psi):** Check tractor air system. **Restricted tubing or hose:** Locate restriction and remove. **Worn or broken relay valve:** Replace. **Call Factory or see qualified Trailer/Brake Technician**
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:** Replace 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. **Tractor protection valve failure:** Troubleshoot tractor air system. **Parking brakes locked:** Troubleshoot air system. **Moisture in air system:** Check air system.
INSUFFICIENT BRAKES	**Brakes need adjusting:** Adjust brakes. **Cams need lubricating:** Lubricate cams. **Brakes need relining:** Reline brakes. **Low air pressure:** Troubleshoot air system. **Relay emergency valve failure:** Replace. **Brakes overheated:** Stop and allow brakes to cool, locate cause of overheating.
BRAKES GRABBING	**Grease on brake linings:** Reline brakes. **Brake rigging binds:** Align brakes or replace bent parts. **Brake valve on tractor failed or worn:** Replace valve. **Relay emergency valve failed or worn:** Replace valve.

BRAKES, CONTINUED

SYMPTOM	Problem: Remedy
EXCESSIVE LEAKAGE WITH BRAKES RELEASED	**Relay emergency valve leaking:** Replace valve. **Leaking tube or hose:** Replace part(s).
EXCESSIVE LEAKAGE WITH BRAKES APPLIED	**Relay emergency valve leaking:** Replace valve. **Leaking brake chamber diaphragm:** Replace brake chamber. **Call Factory or see qualified Trailer/Brake Technician** **Leaking tubing or hose:** Replace part(s).
EXCESSIVE LEAKAGE WITH EMERGENCY SYSTEM ONLY APPLIED - NO LEAKAGE WITH NORMAL BRAKING	**Relay emergency valve failure:** 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:** Refer to *Tractor Repair manual.*
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. **Relay valve failure:** Replace valve. **Air line leak:** Locate leak and repair. **Brake chamber leak:** Replace brake chamber.

7-4 Brake Drums

For maintenance procedures see **See Paragraphs 6-5 thru 6-10.**

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	**Worn 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 worn part(s).
VIBRATION IN RIDE	**Worn or out-of-round drums:** 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
TRAILER TILT	
TRAILER LOCKED IN TILTED POSITION:	**Velocity fuse activated:** Raise the trailer slightly (to reset the velocity fuse), then lower the trailer slowly.
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. **Badly worn parts:** Examine for internal leakage. Replace faulty parts. Check for cause of wear. **Leakage:** Check all parts, and relief valve for proper settings. **Excessive load:** Check unit specifications for load limits. **Slipping or broken pump drive:** Repair or replace couplings. Hydraulic supply hooked up backwards.
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 parts:** 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:** Check *Pump Owner's Manual* for engine speed (RPM's) and pump specifications. **Low oil level:** Check reservoir and add oil as needed. **Air in system:** Check suction side for leaks. Repair leaks. **Badly worn pump, valves, cylinders, etc.:** Repair or replace faulty part(s) as needed. **Restrictions in lines or filter:** Replace filter and flush lines. **Improper adjustments:** Check ports, relief valves, etc., adjust as needed. **Oil leaks:** Tighten fittings. Replace seals, gaskets and damaged lines.
SYSTEM OPERATES TOO FAST	**Engine running too fast:** Reduce engine speed. **Call Factory or see Landoll Dealer.**

SYMPTOM	Problem: Remedy
OVERHEATING OF OIL IN SYSTEM	**Incorrect, low, dirty oil:** Use recommended oil. Fill reservoir with clean oil. Replace filter. **Engine running too fast:** Reduce engine speed. **Excessive internal leakage:** Repair or replace part(s) as needed. **Restriction in filters or lines:** Replace filter or flush lines. **Insufficient heat radiation:** Clean dirt and mud from reservoir, hydraulic lines and parts. **Malfunctioning part(s):** Repair or replace.
OIL FOAMY	**Oil is low:** Add or replace oil. **Wrong oil type:** Replace oil. **Foamy oil:** Add or replace oil. **Water in oil:** Replace oil. **Air leaks:** Check suction line and component seals for suction leaks. Replace defective parts.
NOISY PUMP	**Oil is low:** Add or replace oil. **Wrong oil type:** Replace oil. **Foamy oil:** Add or replace oil. **Suction line plugged:** Clean out obstruction or replace line. Flush system, replace filter. **Pump damaged:** Repair or replace.
LEAKY PUMP	**Damaged or worn shaft seal:** Replace seal and/or shaft, 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, repair or replace as needed. **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 seals. Replace worn seals or fittings.

7-6 Hydraulic Power Supply Engine Package

To troubleshoot the engine in the hydraulic engine package, please refer to the owners manual that was provided with the engine package.

7-7 Optional Equipment

REMOTE	**No power:** Check center pin of 7-way connector with voltmeter (+12 VDC) . Correct wiring per *Tractor Repair manual.* **Check remote plugged in:** Self-explanatory. **No current to solenoid:** Check wire harness connection to tractor. **No air supply to solenoid:** Check hydraulics connections.
DOCK LEVELER	**Piloted check valve or O-ring leak:** Replace defective component.

NOTES:

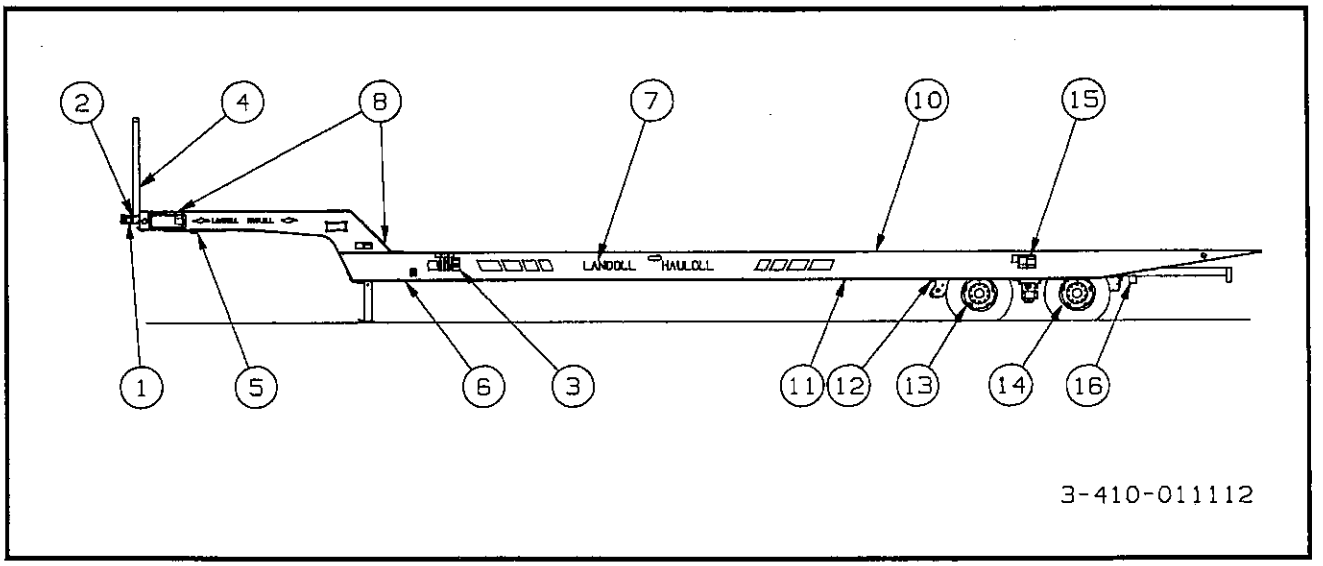

Figure 8-1 - 317 Subassemblies & Parts

Item No.	Fig. Ref	Description	Page
1	8-2, 8-3	AIR SYSTEM	8-2 thru 8-5
2	8-4	ELECTRICAL SYSTEM	8-6, 8-7
3	8-5 THRU 8-10	MAIN HYDRAULIC SYSTEM	8-8 thru 8-17
4	8-13	FRONT EXTENSION/BULKHEAD WELDMENT	8-22, 8-23
5	8-14	HITCH INSTALLATION ASS'Y (2 AXLE 60,000 LB.)	8-24
6	3-311-0101145	PARKING STANDS	8-1
7	8-24	DECALS	8-39
8	8-21 THRU 8-23	WINCH	8-34 thru 8-38
9	8-28, 8-29	ENGINE PACKAGE (ON TRACTOR)	8-46 thru 8-49
10	8-1	FRAME, MAIN TRAILER	8-1
11	8-26, 8-27	DOCK LEVELERS	8-42 thru 8-45
12	8-11, 8-12	UNDERCARRIAGE	8-18 thru 8-21
13	8-16	AXLE ASSEMBLY	8-26 thru 8-27
14	8-15, 8-17	HUB AND DRUM ASSEMBLY	8-25, 8-28
15	8-25	REMOTE CONTROL	8-40, 8-41
16	8-11, 8-12, 8-19, 8-20 [AIR]	SUSPENSION SYSTEM	8-18 thru 8-21, 8-30 thru 8-33
	8-18 [SPRING]	SUSPENSION SYSTEM	8-29
	8-30, 8-31	WET KIT ITEMS (NOT SHOWN)	8-50 thru 8-52
		MISCELLANEOUS ITEMS	8-53

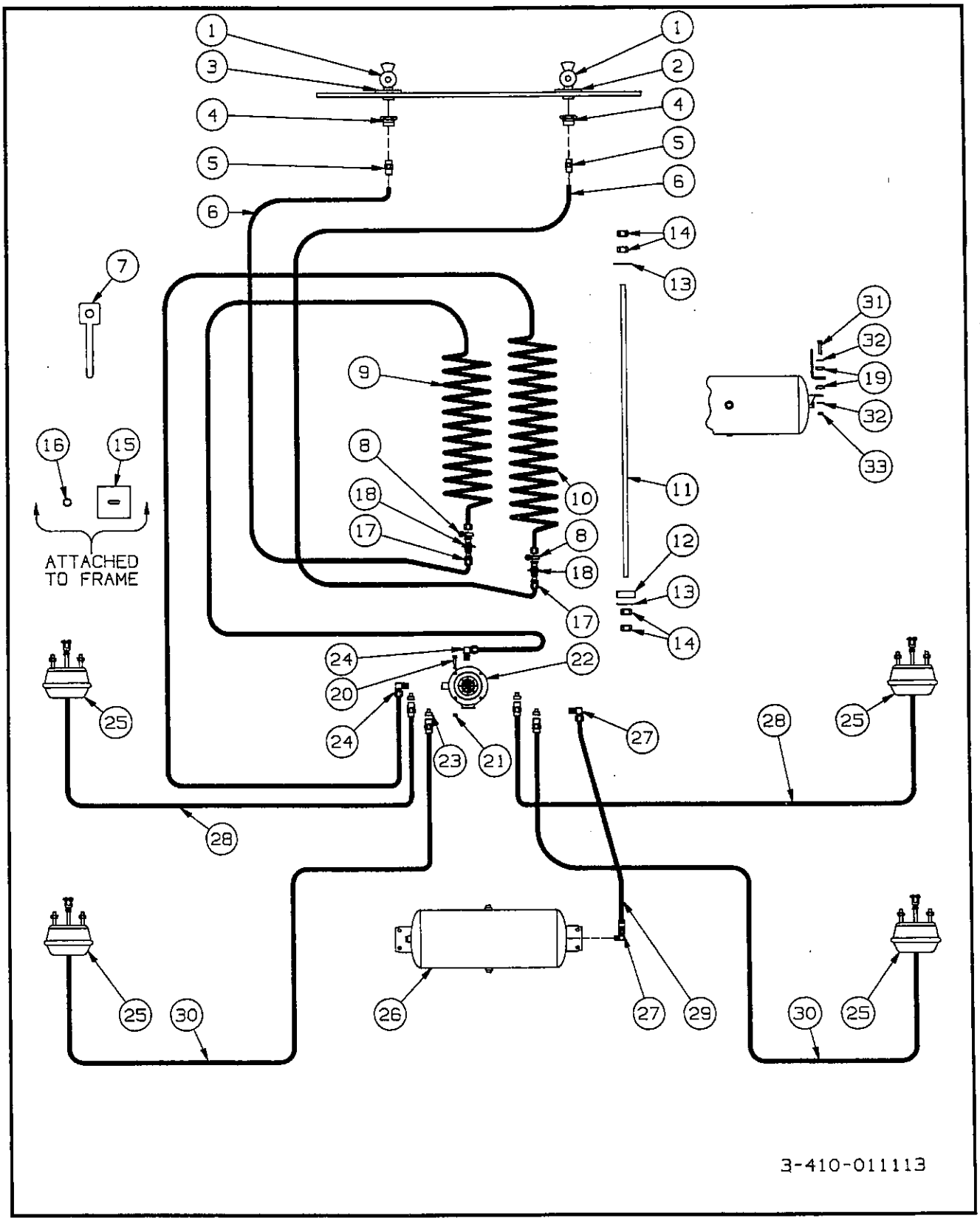

Figure 8-2 Tandem Air Brake Schematic

SCHEMATIC, TANDEM W/AIR BRAKE AIR SYSTEM

ITEM NO.	PART NO.	DESCRIPTION	QTY
	3-128-010015-1	AIR SYSTEM, 317, 45 FT	1
	3-128-010015-2	AIR SYSTEM, 317, 48 FT	1
	3-128-010015-3	AIR SYSTEM, 317, 51 FT	1
	3-128-010015-4	AIR SYSTEM, 317, 53 FT	1
1	55B11	GLADHAND	2
2	55B61-7	TAG, SERVICE LINE	1
3	55B61-6	TAG, EMERGENCY LINE	1
4	55B61	UNION, FRAME	2
5	1-297-010007-11	FITTING, AIR	2
6	62P6	TUBING, AIRLINE	A/R
7	1-796-010003	TIE, PLASTIC STRAP	A/R
8	6828	CLAMP, HOSE	2
9	3-384-010004	AIRLINE, COILED EMERGENCY (WITH LOW LOAD ANGLE) RED	1
10	3-384-010003	AIRLINE, COILED SERVICE (WITH LOW LOAD ANGLE) BLUE	1
11	3-642-010033	ROD, HOSE SUPPORT (WITH LOW LOAD ANGLE)	1
12	3-711-010047	SPACER	1
13	1-861-010032-19	WASHER, FLAT	2
14	5/8-11HFN	NUT, HEX JAM	4
15	2-181-010001	CLAMP, HOSE	1
16	1-510-010001	NUT, LOCKING HEX	1
17	1-297-010007-13	FITTING, AIR TUBE	2
18	1-297-010022-04	FITTING, AIR	2
19	805-2	BUSHING, STEP	8
20	1-654-010051-06	SCREW, HEX CAP	3
21	1-512-010005-05	NUT, HEX SELF LOCKING	3
22	3-843-010013	VALVE, RELAY	1
23	1-297-010004-04	ADAPTER, BULKHEAD	4
24	2047-6-6S	INT P SWIVEL	2
25	M10WJ103	CHAMBER, AIR BRAKE	4
26	3-780-010002	TANK, AIR W/ PORTS	1
27	1-297-010008-24	FITTING, AIR, 90°	2
28	1-384-010038-1	HOSE, AIR	2
29	1-833-010003-1	TUBING, NYLON	1
30	1-384-010038-2	HOSE, AIR	2
31	1-654-010051-08	SCREW, HEX CAP	4
32	1-861-010032-11	WASHER, PLAIN	8
33	1-512-010005-05	NUT, HEX, SELF-LOCKING	4
34	56D4	COCK, DRAIN AIR TANK	1

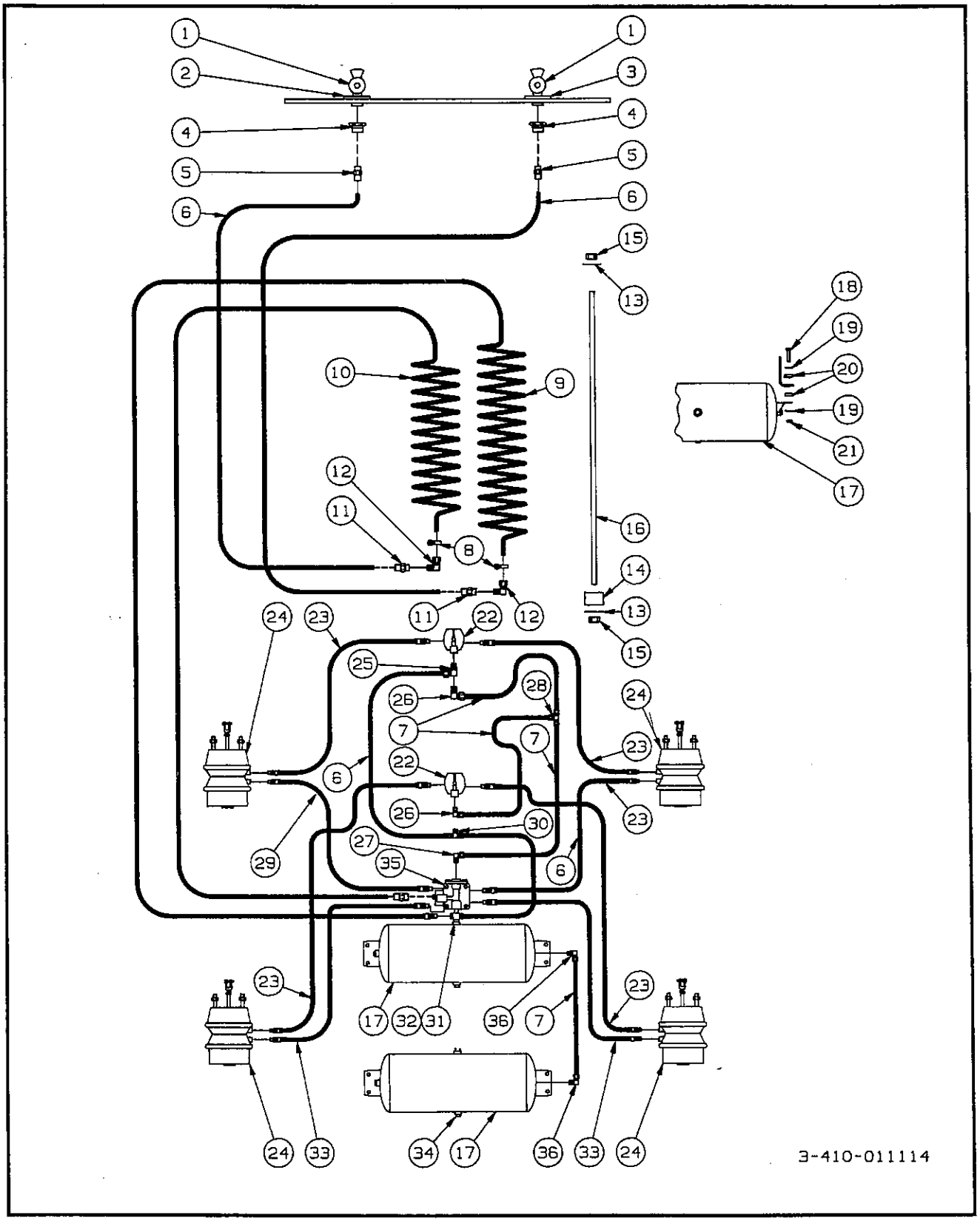

Figure 8-3 Tandem Spring Brake Schematic

SCHEMATIC, TANDEM W/SPRING BRAKE 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	1-297-010007-11	FITTING, AIR	2
6	62P6	TUBING, NYLON	A/R
7	62P8	TUBING, NYLON	A/R
8	6828	CLAMP, HOSE	2
9	3-384-010003	AIR LINE, COILED SERVICE (WITH LOW LOAD ANGLE) BLUE	1
10	3-384-010004	AIR LINE, EMERGENCY (WITH LOW LOAD ANGLE) RED	1
11	1-297-010007-13	FITTING, AIR	2
12	1-297-010022-04	FITTING, AIR, ANCHOR CPLG	2
13	5/8FW	WASHER, FLAT	2
14	3-711-010047	SPACER	1
15	5/8-11HFN	NUT, HEX JAM	2
16	3-642-010033	ROD, HOSE SUPPORT (WITH LOW LOAD ANGLE)	1
17	3-780-010002	RESERVOIR, AIR	2
18	1-654-010051-08	SCREW, HEX CAP	8
19	1-861-010032-11	WASHER, FLAT	16
20	805-2	BUSHING, STEP	16
21	1-512-010005-05	NUT, LOCKING HEX	8
22	3-843-010005	VALVE, BRAKE SERVICE	2
23	3-384-010019	HOSE, AIR	2
24	3-128-010002	CHAMBER, SPRING BRAKE	
	(SEE FIGURE 8-16 FOR REPLACEMENT PARTS)		4
25	1-297-010008-18	FITTING, AIR	1
26	2047-6-6S	INT P SWIVEL	3
27	1-297-010007-15	FITTING, AIR	4
28	1-297-010010-06	FITTING, AIR, UNION TEE	1
29	3-384-010014	HOSE, AIR	4
30	1-297-010015-06	FITTING, AIR, BRASS TEE	1
31	1-297-010015-07	FITTING, AIR, BRASS TEE	1
32	2083-8-8S	NIPPLE	1
33	3-384-010024	HOSE, AIR	2
34	1/2-PIPE PLUG	PLUG, PIPE	4
35	758-181	VALVE, FOUR PORT TASK	1
36	1-297-010008-24	FITTING, AIR, 90°	2

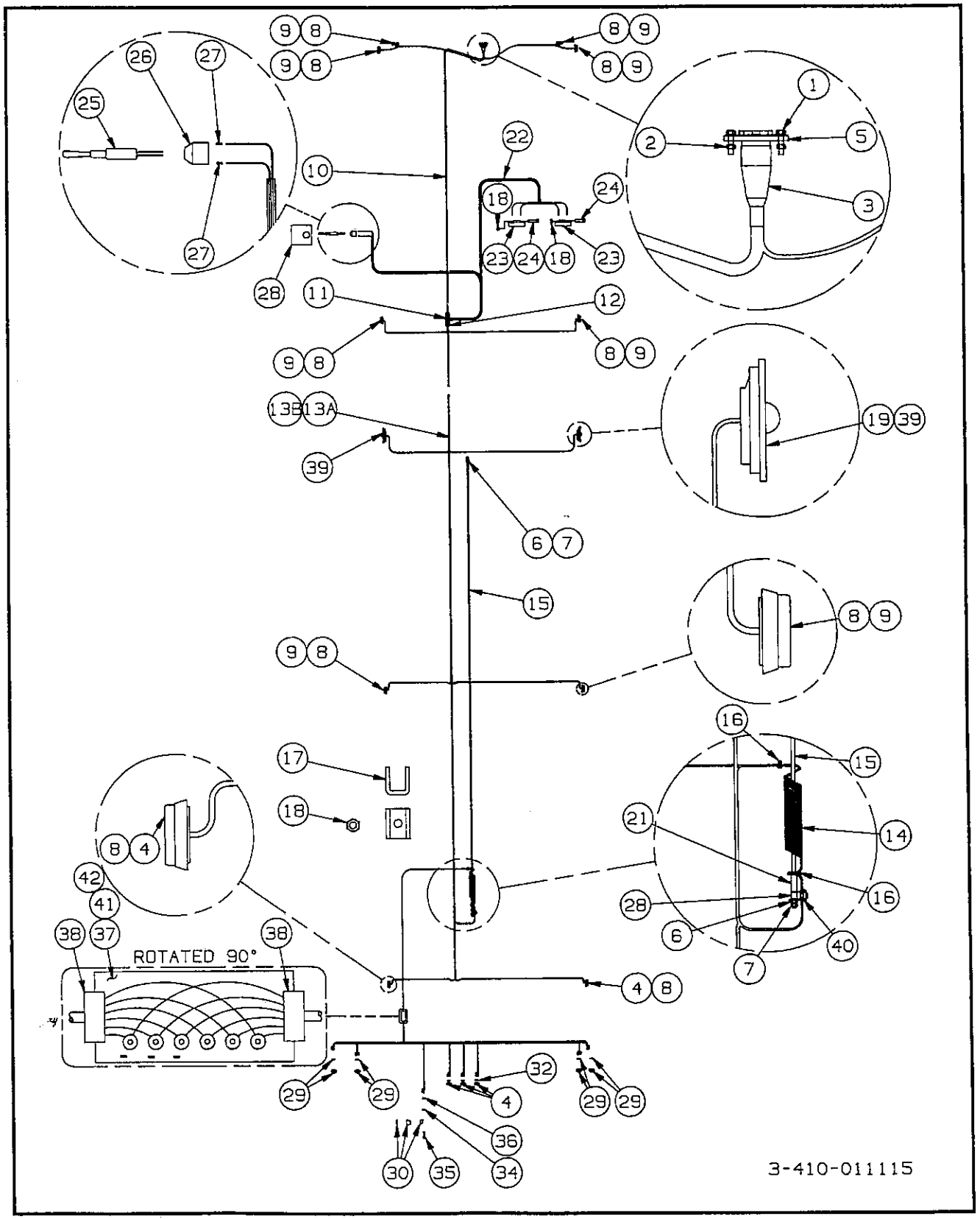

Figure 8-4 - 317 Electric System Schematic

SCHEMATIC, 317 ELECTRICAL SYSTEM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1-654-010049-06	CAP SCREW, HEX	2
2	1-512-010005-03	HEX, NUT, LOCK	2
3	59W-2-3	BOOT, RUBBER	1
4	10205R	LAMP, RED REFLECTOR	5
5	59S-7	RECEPTACLE, 7-PIN	1
6	1-861-010032-19	WASHER, FLAT	2
7	5/8-11HFN	NUT, HEX	4
8	10403	GROMMET MOUNT	10
9	10205Y	LAMP, YELLOW REFLECTOR	8
10	3-368-010120	HARNESS ASSY, FRT, MAIN, 317	1
11	3-113-010002	BOX, ELECTRICAL FLANGE MOUNT	1
12	3-296-010001-3	FITTING, ELECTRICAL CORD	2
13A	3-368-010121	HARNESS WIRING (317-45, 317-48)	1
13B	3-368-010130	WIRING HARNESS, MAIN (317-51, 317-53)	1
14	3-156-010037	CABLE ASSY, COILED, 20 FT, W/PLUG	1
15	3-642-010033	ROD, HOSE SUPPORT, 19 FT	1
16	6828	HOSE CLAMP	2
17	2-181-010001	HOSE CLAMP	10
18	1-510-010001	NUT, FLANGE LOCK	10
19	60700	GROMMET, LIGHT	2
20	3-711-010045	SPACER, TUBE	1
21	3-711-010046	SPACER, TUBE	1
22	3-368-010122	HARNESS ASSY, WINCH LIGHT	1
23	64181	LAMP, RECT QUARTZ HALOGEN	2
24	1-654-010051-05	SCREW, HEX CAP	1
25	3-272-010017	TOGGLE SWITCH, SEALED——	1
26	81264	RUBBER BOOT FOR ELECT SWITCH	1
27	3-272-010021	ELECTRICAL BUTT SPLICE W/SEAL	2
28	3-573-010273	DECAL, WINCH LIGHT	1
29	40015R	LAMP, TAIL, W/REFLECTOR	4
30	15009	LICENSE LAMP	1
31	3-368-010024	WIRING HARNESS, REAR FOR TRVL	1
32	10404	GROMMET MOUNT	3
34	1-861-010034-07	WASHER, LOCKING HELICAL SPRING	2
35	3/16X3/4RHD STV	BOLT, ROUND HEAD STOVE	2
36	3/16-24HFN	NUT, HEX, SELF LOCKING	2
37	750-029	JUNCTION BOX, 7-STUD	1
38	1-654-010047-04	SCREW, HEX CAP	2
39	60015Y	LIGHT, TURN & CLEARANCE W/GROMMET	2
	60215Y	LAMP ONLY, TURN CLEARANCE	2
40	3-120-010308	BRACKET, 6-PIN ELECTRICAL CONNECTOR	2
41	1-861-010034-09	WASHER	2
42	1-654-010047-04	SCREW	2

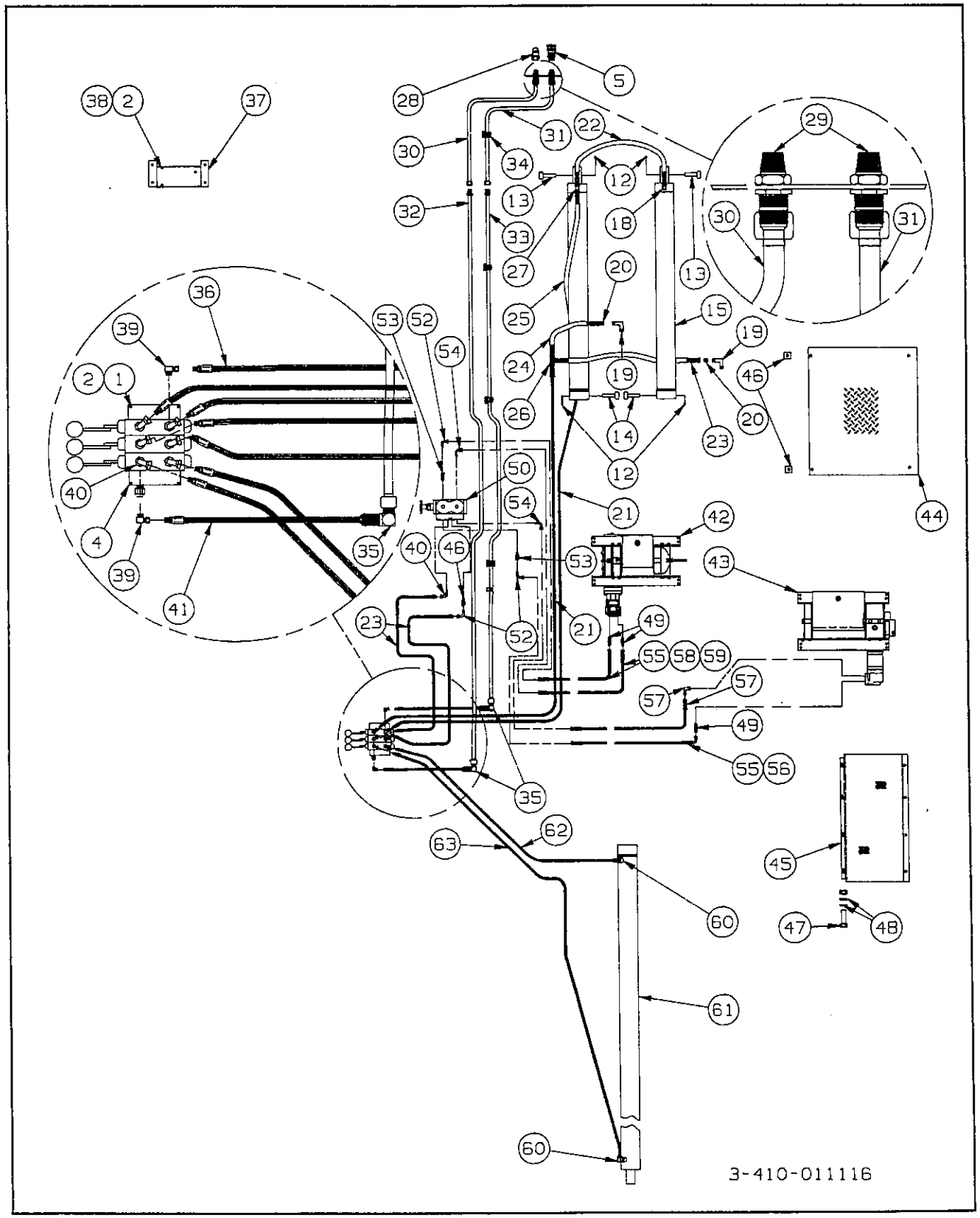

Figure 8-5 Standard Hydraulic System Schematic

SCHEMATIC, HYDRAULIC SYSTEM (STD LOAD ANGLE)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3/8-16X2CS GR5	SCREW, HEX CAP	3
2	1-510-010001	NUT, FLANGE LOCK	29
3	3-573-010057	DECAL, INSTRUCTION (SEE FIGURE 8-24 FOR PLACEMENT)	1
4	3-846-010008	VALVE, THREE SPOOL (SEE FIGURE. 8-8)	1
5	S25F-6	COUPLER, FEMALE HALF	1
	1-654-010051-12	SCREW, HEX CAP	2
12	1-557-010362-54	PIN, COTTER	10
13	3-557-010059	PIN, CYL ROD END	2
14	3-557-010033	PIN, CYL BUTT END	2
15	3-242-010099	CYLINDER, HYDR, 4 X 42 (TILT – SEE FIG. 8-9)	2
18	2062-8-8S	ADAPTER, 90°	1
19	206801-8-8S	ADAPTER, 90°	2
20	3-846-010116-2	VALVE, HYD, VEL FUSE, 14 GPM	2
21	1-397-010301127	HOSE ASSY, STR	1
22	1-397-010301034	HOSE ASSY, STR	1
23	1-397-010301042	HOSE ASSY, STR	3
24	1-397-010301040	HOSE ASSY, STR	1
25	1-397-010301157	HOSE ASSY, STR	1
26	2033-8-8S	ADAPTER, TEE	1
27	203003-8-8S	ADAPTER, TEE	1
28	S21F-6	COUPLER, MALE HALF	1
29	2240-12-12S	ADAPTER, BULKHEAD	2
30	3-832-010300	TUBE ASSY, PRESSURE, FRONT	1
31	3-832-010302	TUBE ASSY, RETURN FRONT	1
32	3-832-010301	TUBE ASSY, PRESSURE REAR	1
33	3-832-010303	TUBE ASSY, RETURN REAR	1
34	9-181-010021-3	CLAMP, TUBE, CHANNEL MT	8
35	2043-12-12S	ADAPTER, 90°, BULKHD	2
36	1-397-010304029	HOSE ASSY, STR	1
37	3-482-010292	MOUNT, VALVE, 3-SPOOL, 317A	1
38	1-654-010051-07	SCREW, HEX CAP	8
39	2062-12-12S	ADAPTER, 90°	2
40	2061-8-8S	ADAPTER, 45°	7
41	1-397-010304025	HOSE ASSY, STR	2
42	3-873-010126-2	WINCH ASSY, 12000 LB (SEE FIGS. 8-22, 8-23, MISC. OPTIONS)	1
43	3-873-010129-2	WINCH ASSY, 20000 LB SLOPE (SEE FIGS. 8-21, 8-23, MISC. OPTIONS)	1
44	3-222-010079	COVER, UPPER DECK WINCH	1
45	3-222-010083	COVER, WINCH, SLOPE	1
46	3-711-010028	SPACER, WINCH COVER	2
47	1-654-010055-05	SCREW, HEX CAP	4
48	1-861-010032-15	WASHER, FLAT	8
49	202702-10-8S	ADAPTER, STR	3
50	3-846-010100	VALVE, HYDR SELECTOR	1
51	2062-10-8S	ADAPTER, 90°	1
52	2071-8-8S	ADAPTER, 45°	3
53	202702-12-8S	ADAPTER, STR	3
54	2062-12-8S	ADAPTER, STR	2
55	1-397-010302216	HOSE ASSY, STR	2*
56	1-397-010302078	HOSE ASSY, STR – 90°	1
57	1-397-010301076	HOSE ASSY, STR	1
58	1-397-010302072	HOSE ASSY, STR	1
59	1-397-010302068	HOSE ASSY, STR	1
60	2062-8-8S	ADAPTER, 90°	2
61	3-242-010102	CYLINDER. HYD, 4" X 126" O-RING	1
62	1-397-010301051	HOSE ASSY, STR	1
	1-397-010301054	HOSE ASSY, STR	1
	1-397-010301090	HOSE ASSY, STR	1
	1-397-010301114	HOSE ASSY, STR	1
63	1-397-010302064	HOSE ASSY, STR-90°	1
	1-397-010302112	HOSE ASSY, STR-90°	1
	1-397-010302136	HOSE ASSY, STR-90°	1
	1-397-010302160	HOSE ASSY, STR-90°	1

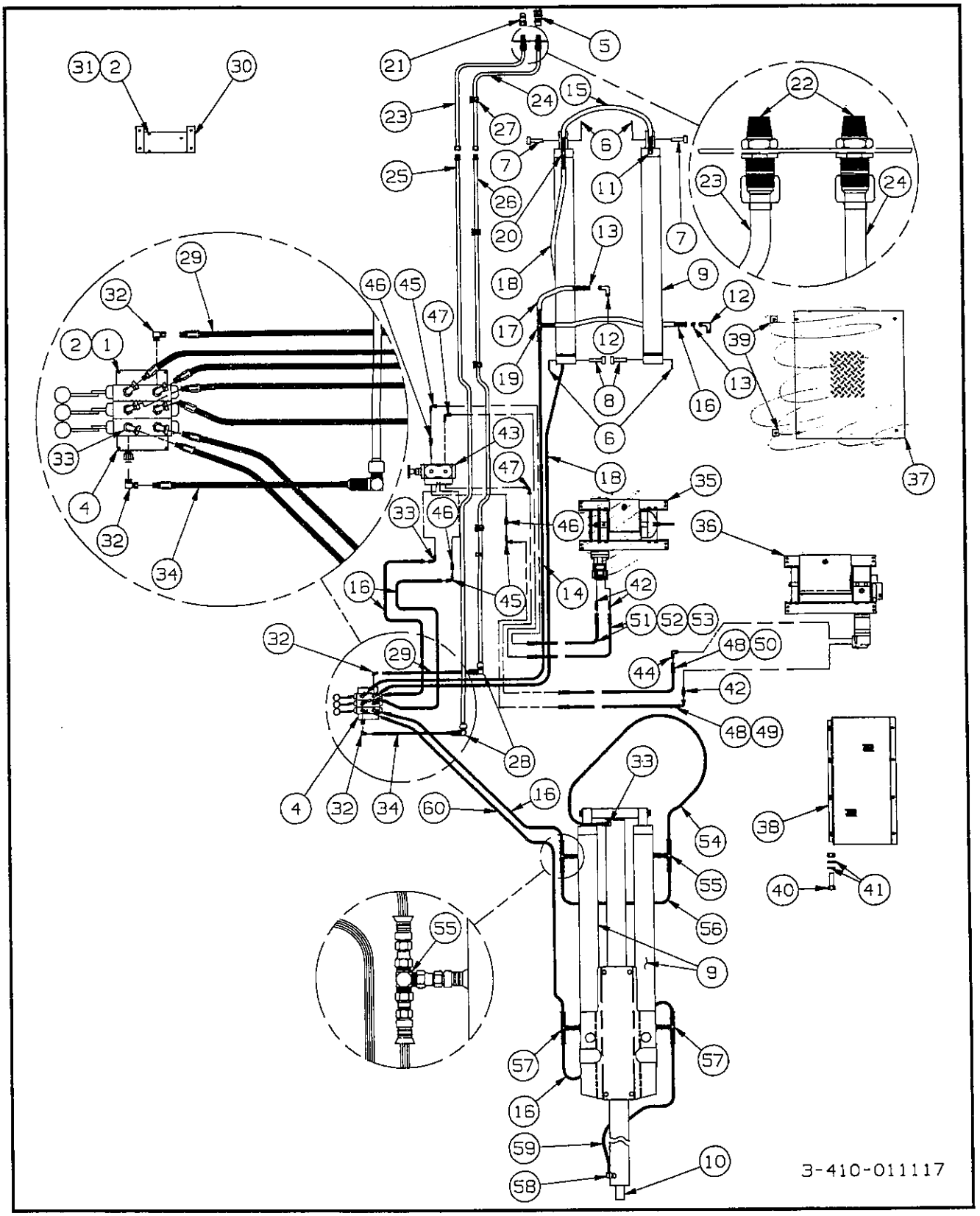

Figure 8-6 Low Load Hydraulic Schematic

SCHEMATIC, LOW LOAD ANGLE HYDRAULIC SYSTEM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3/8-16X2CS GR5	SCREW, HEX CAP	3
2	1-510-010001	NUT, HEX LOCK	29
3	3-573-010057	INSTRUCTION DECAL (SEE FIGURE 8-24)	1
4	3-846-010008	VALVE, THREE SPOOL (SEE FIG. 8-8)	1
5	S25F-6	COUPLER, FEMALE HALF	1
6	1-557-010362-54	PIN, COTTER	10
7	3-557-010059	PIN, CYL ROD END	2
8	3-557-010033	PIN, CYL BUTT END	2
9	3-242-010099	CYLINDER, HYDRAULIC 4 X 42" (45' TRAILERS)(SEE FIG. 8-7 & 8-9)	4
		CYLINDER, TRAILER TILT AND LOW LOAD (48' TRAILERS)	4
10	3-242-010103	CYLINDER, HYDRAULIC, 4 X 126" ORB W/PIN (SEE FIG. 8-10)	1
11	2062-8-8S	ADAPTER, 90°	1
12	206801-8-8S	ADAPTER, 90°	2
13	3-846-010116-2	VALVE, HYDR VEL FUSE, 14 GPM	2
14	1-397-010301127	HOSE ASSY, STR	1
15	1-397-010301034	HOSE ASSY, STR	1
16	1-397-010301042	HOSE ASSY, STR (45' TRAILER)	2
	1-397-010301048	HOSE ASSY, STR (48' TRAILER)	1
	1-397-010301084	HOSE ASSY, STR (51' TRAILER)	1
	1-397-010301108	HOSE ASSY, STR-90° (53' TRAILER)	1
17	1-397-010301040	HOSE ASSY, STR	1
18	1-397-010301157	HOSE ASSY, STR	1
19	2033-8-8S	ADAPTER, TEE	1
20	203003-8-8S	ADAPTER, TEE	1
21	S21F-6	COUPLER, MALE HALF	1
22	2240-12-12S	ADAPTER, BULKHEAD	2
23	3-832-010300	TUBE ASSY, PRESSURE, FRONT	1
24	3-832-010302	TUBE ASSY, PRESSURE, FRONT	1
25	3-832-010301	TUBE ASSY, PRESSURE, REAR	1
26	3-832-010303	TUBE ASSY, RETURN, REAR	1
27	9-181-010021-3	CLAMP, TUBE, CHANNEL MT	8
28	2043-12-12S	ADAPTER, 90°, BULKHEAD	2
29	1-397-010304029	HOSE ASSY, STR	1
30	3-482-010292	MOUNT, VALVE, 3-SPOOL	1
31	1-654-010051-07	SCREW, HEX CAP	8
32	2062-12-12S	ADAPTER, 90°	2
33	2061-8-8S	ADAPTER, 45°	6
34	1-397-010304025	HOSE ASSY, STR	2
35	3-873-010126-2	WINCH ASSY, 12000 LB (SEE FIGS. 8-22, 8-23, MISC. OPTIONS)	1
36	3-873-010129-2	WINCH ASSY, 20K LB (SEE FIGS. 8-21, 8-23, MISC. OPTIONS)	1
37	3-222-010079	COVER, UPPER UPPER DECK WINCH	1
38	3-222-010083	COVER, WINCH, SLOPE	1
39	3-711-010028	SPACER, WINCH COVER	2
40	1-654-010055-05	SCREW, HEX CAP	4
41	1-861-010032-15	WASHER, FLAT	8*
42	202702-10-8S	ADAPTER, STR	2*
43	3-846-010100	VALVE, HYDR, SELECTOR O-RING	1**
	1-654-010051-12	SCREW, HEX CAP	2
44	2062-10-8S	ADAPTER, 90°	1
45	2071-8-8S	ADAPTER, 90°	3
46	202702-12-8S	ADAPTER, STR	3
47	2062-12-8S	ADAPTER, 90°	3
48	1-397-010302216	HOSE ASSY, STR-90° (UPPER DECK WINCH ONLY)	4
49	1-397-010302078	HOSE ASSY, STR-90° (LOWER DECK WINCH ONLY)	1
50	1-397-010301076	HOSE ASSY, STR (LOWER DECK, 20000# WINCH ONLY)	1

SCHEMATIC, LOW LOAD ANGLE HYDRAULIC SYSTEM (CONT.)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
51	1-397-010302216	HOSE ASSY, STR-90° (UPPER DECK, 12,000# WINCH ONLY)	2
52	1-397-010302072	HOSE ASSY, STR-90° (LOWER DECK, 12,000# WINCH ONLY)	1
53	1-397-010302068	HOSE ASSY, STR-90° (LOWER DECK, 12,0000# WINCH ONLY)	1
54	3-397-010302070	HOSE ASSY, STR-90°	1
55	203003-8-8S	ADAPTER, TEE,	2
56	1-397-010301033	HOSE ASSY, STR	1
57	203005-8-8S	ADAPTER, TEE	2
58	2062-8-8S	ADAPTER, 90°	1
59	1-397-010302087	HOSE ASSY, STR-90°	1
60	1-397-010302064	HOSE ASSY, STR-90° (45' TRAILER)	1
	1-397-010302112	HOSE ASSY, STR-90° (48' TRAILER)	1
	1-397-010302136	HOSE ASSY, STR-90° (51' TRAILER)	1
	1-397-010302160	HOSE ASSY, STR-90° (53' TRAILER)	1

* Quantities shown in items 41 and 42 are for part nos. 3-873-010129 and 3-873-010127 (Lower Deck Winches). Quantity for Item 41 is 8, for item 42 is 16 for Part Nos. 3-873-010130 and 3-873-010131 (Upper Deck Winches).

** Quantity shown in item 43 is for part nos. 3-873-010128 and 3-873-010130 (20,000 lb. Winch). Quantity for part nos. 3-873-010127 and 3-873-010131 (12,000 lb. Winch) is 2.

CYLINDER, LOW LOAD ANGLE

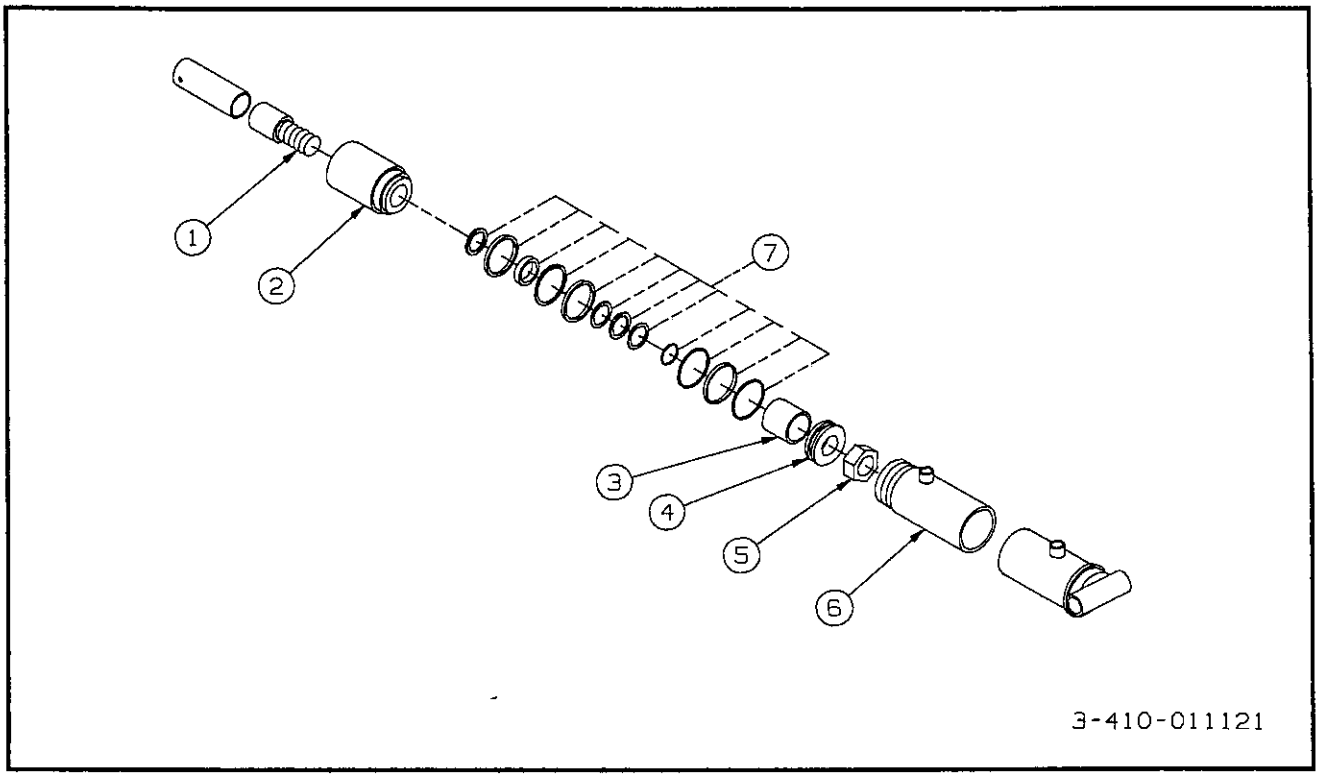

Figure 8-7 Low Load Angle Cylinder

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-242-010118	CYLINDER HYDRAULIC,4" X 42" (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	NUT, LOCK	1
6	*	TUBE ASSEMBLY, BUTT AND	1
7	PMCK-AD-460	PACKING KIT	A/R**

* Part not sold separately. Requires purchase of entire assembly.
** Contains all necessary seals and O-rings.

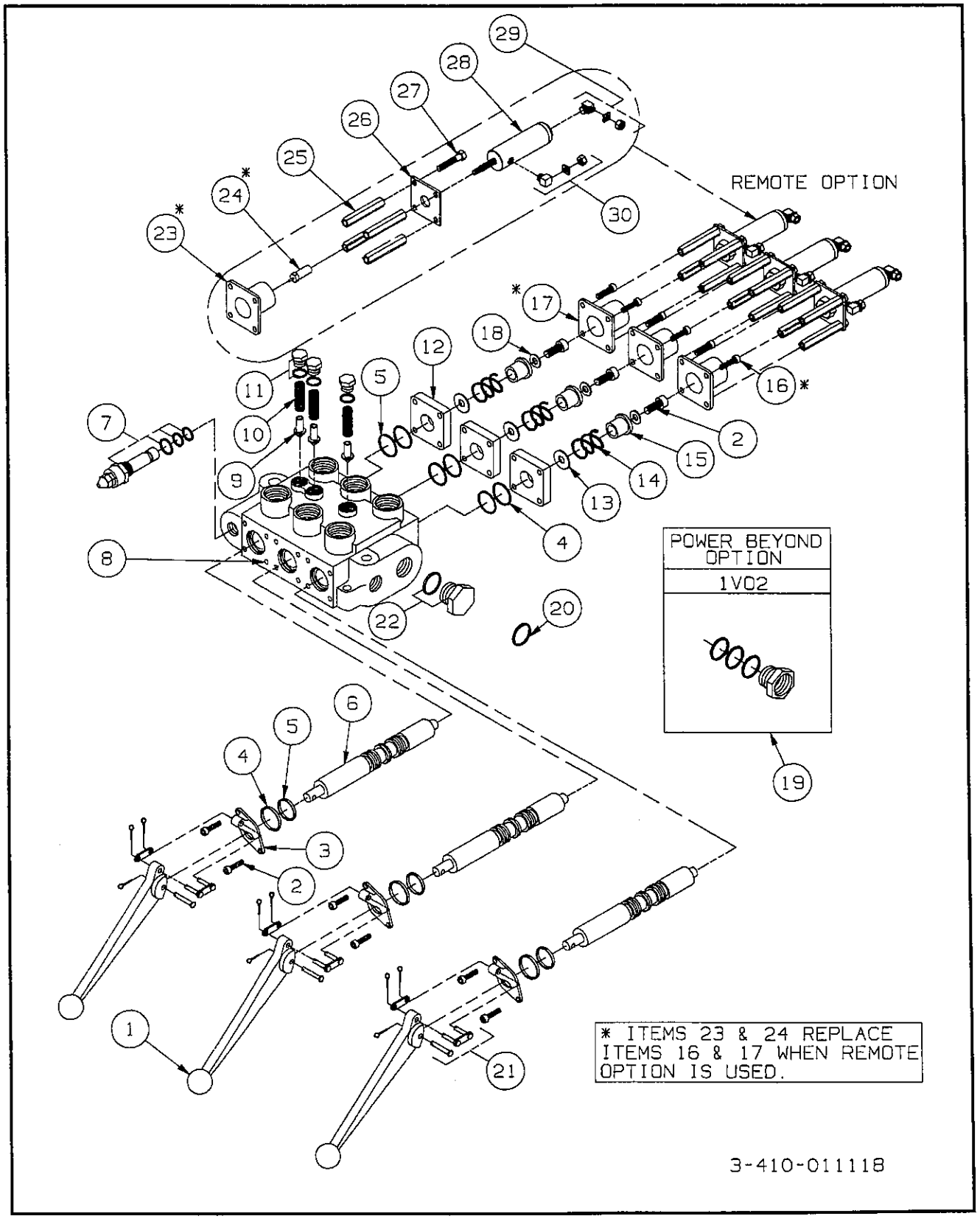

Figure 8-8 Three Spool Valve

VALVE, THREE SPOOL

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-846-010008	VALVE ASSEMBLY, COMPLETE THREE SPOOL	1
1	1V1703	VALVE, HANDLE	3
2	2A0079-404	CAP SCREW (TIGHTEN 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 @ 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 (TIGHTEN 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
22	2A0354-121	PLUG, CONVERSION	1
23**	3-161-010034	CAP, MODIFIED, VALVE SPOOL	1
24**	1-007-010029	ADAPTER, SWIVEL	1
25	3-711-010055	SPACER	4
26	3-482-010288	MOUNT, AIR CYL VALVE	1
27	1-654-010047-02	SCREW, HEX CAP	4
28	3-238-010001	CYLINDER, AIR	1
29	1-297-010008-01	FITTING, AIR 90°	1
30	68CA-2-2	CONNECTOR	1

* SOLD AS MATCHED SET ONLY
** ITEMS 23 & 24 REPLACE ITEMS 16 & 17 WHEN REMOTE OPTION IS USED.

CYLINDER, TRAILER TILT

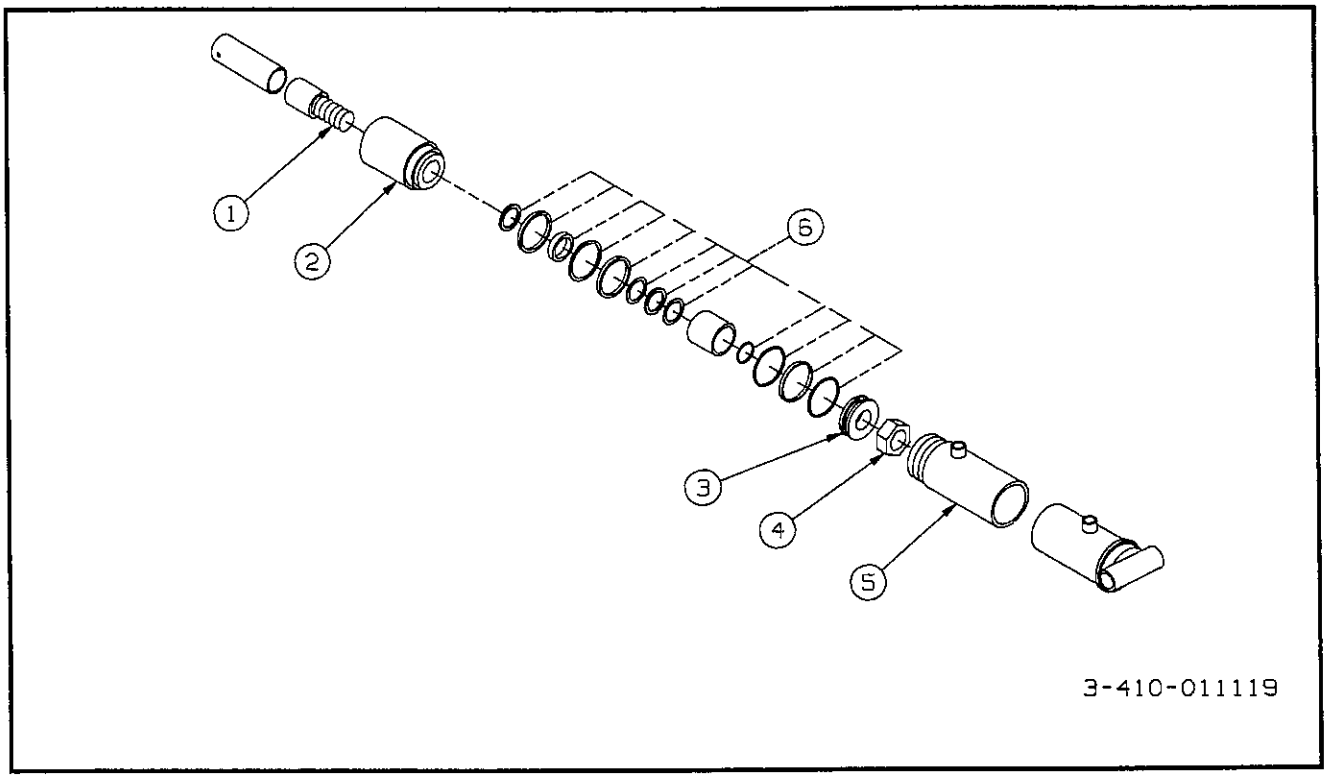

Figure 8-9 Trailer Tilt Cylinder

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-242-010099	CYLINDER, HYDRAULIC, 4" X 42" (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	1
5	*	TUBE ASSEMBLY, BUTT AND	1
6	PMCK-AD-460	PACKING KIT (Contains all necessary seals and O-rings)	A/R

* Part not sold separately. Requires purchase of entire assembly.

CYLINDER, UNDERCARRIAGE SLIDE

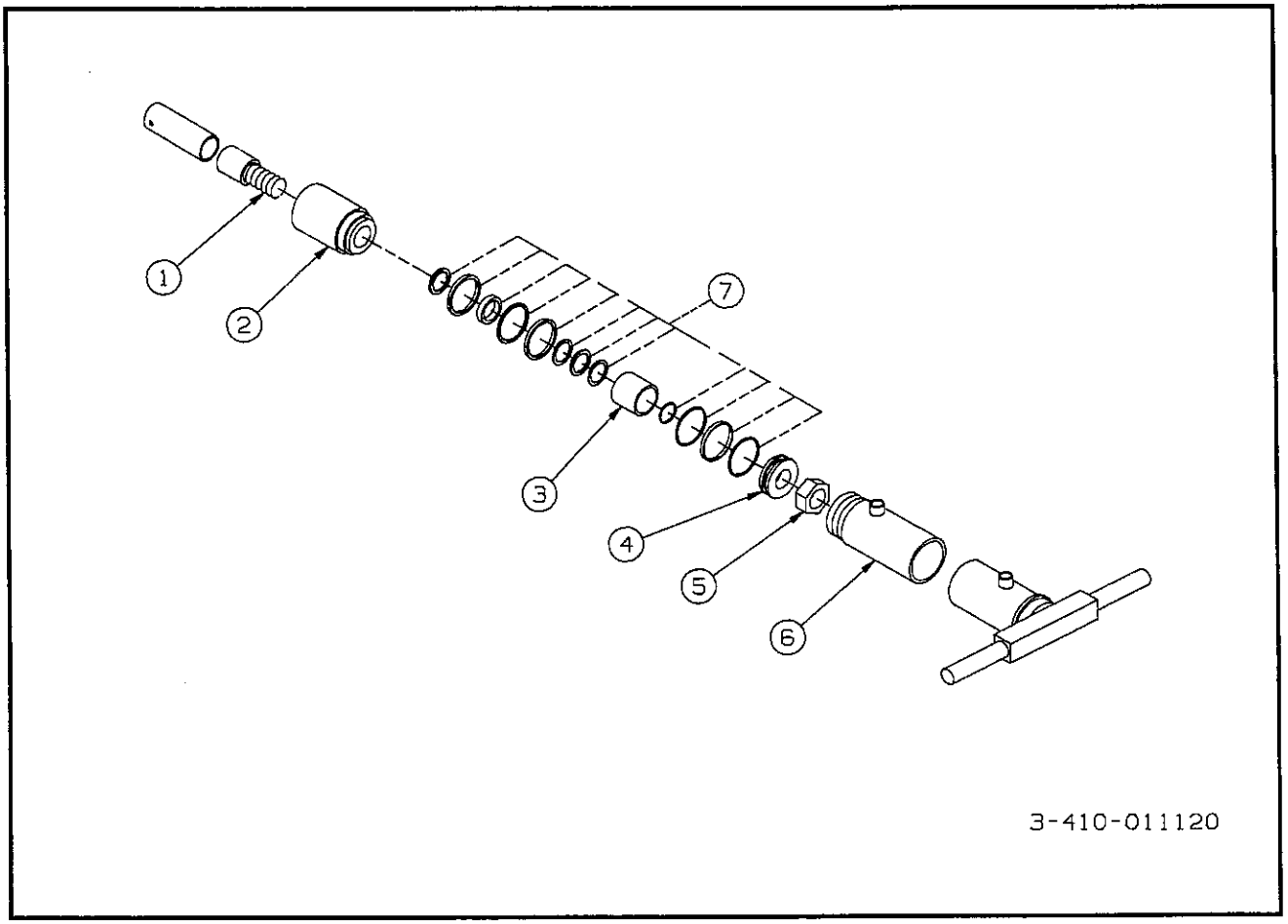

Fig. 8-10 Undercarriage Slide Cylinder (Low Load Angle)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-242-010103	CYLINDER, HYDRAULIC, 4" X 126" (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	NUT, LOCKING	1
6	*	TUBE ASSEMBLY, BUTT AND	1
7	PMCK-AD-461	PACKING KIT (Contains all necessary seals and O-rings)	A/R

* Part not sold separately. Requires purchase of entire assembly.

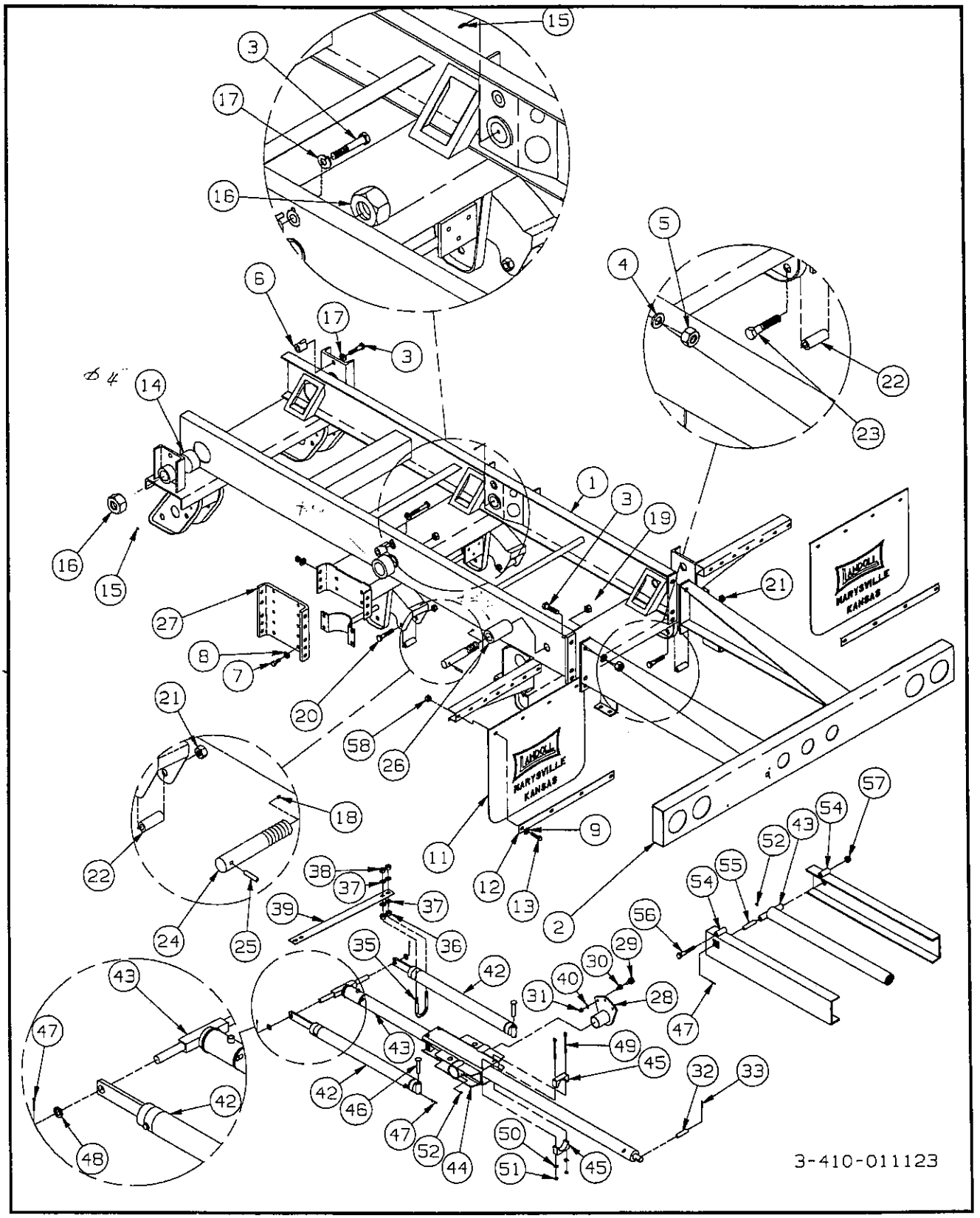

Figure 8-11 Spring Suspension Undercarriage

UNDERCARRIAGE, SPRING SUSPENSION

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3-762-010604	SUSPESION, SPRING, 317 (W/DOCK LEVEL HYDR)	1
2	3-146-010029	BUMPER WLDMT, 317-42	1
3	1-654-010061-04	SCREW, HEX CAP	6
4	1-861-010032-20	FLAT WASHER	4
5	1-512-010005-15	NUT, HEX LOCK	4
6	3-762-010016	HOLDDOWN, CARRIAGE	4
7	1-654-010059-02	SCREW, HEX CAP	0, 24*
8	1-861-010034-15	WASHER, LOCKING HELICAL SPRING	0,24*
9	1-861-010032-11	WASHER, FLAT	16, 19*
10	1-512-010005-05	NUT, HEX LOCK	7, 14*
11	3-485-010001	MUD FLAP	2
12	3-762-010017	CLAMP, MUD FLAP	2
13	1-654-010051-07	SCREW, HEX CAP	8, 13*
14	3-076-010005	BEARING, CAM FOLLOWER	4
15	5029	ZERK FITTING	4
16	2-12HFN	HEX NUT	4
17	1-861-010034-17	WASHER, LOCKING HELICAL SPRING	4
18	5000	ZERK FITTING	2
19	1-1/4-7HFLN	NUT, PLATED LOCK	2
20	0001-04***	RETAINER	4
21	00002-07***	LOCKNUT, HEX CENTER	6
22	0741-01***	SPRING ROLLER	6
23	0001-02***	SCREW, HEX CAP	2
24	3-557-010396	PIN, REAR ROLLER	2
25	0600-375-02000	ROLL PIN	2
26	RRT114X6	TUBE, ROUND	2
27	3-125-010336	MOUNTING BRACKET, DOCK LEVEL SPR SUSP	0, 2*
28	3-125-010241	BRACKET, CYL MOUNT	2, 0*
	3-125-010244	BRACKET WLDMT, CYL, TRUNNION	0, 2*
29	1-654-010061-06	SCREW, HEX CAP	6
30	3-861-010038	WASHER, STEP	6
31	1-512-010005-15	NUT, HEX, SELF LOCKING	6
32	3-557-010120	PIN, UNDERCARRIAGE CYLINDER	1
33	1-557-010362-54	PIN, COTTER	2
35	3-102-010022	U-BOLT, CYL SUPPORT	0, 2*
	3-102-010048	U-BOLT	0,1*
36	1/2-13HFN	NUT	2, 4*
37	1-861-010032-15	WASHER, FLAT	4, 8*
38	1-512-010005-09	NUT, HEX SELF LOCKING	2, 4*
39	3-146-010001	RUBBER BUMPER CYLINDER	0, 1*
40	1-861-010032-21	WASHER, FLAT	6
42	3-242-010099	HYDRAULIC CYLINDER WELDMENT	2**
43	3-242-010103	CYLINDER HYDR, 4" X 126"	1**
	3-242-010102	CYLINDER, HYDRAULIC, 4 X 126	1
44	3-120-010125	CYLINDER, TRUNNION ASSY	1**
45	3-120-010117	NYLATRON BEARING	4**
46	3-557-010031	PIN, CYLINDER BUTT END	2**
47	1-557-010362-54	PIN, COTTER	1, 4**
48	RRT146X.25	TUBE, ROUND	2**
49	1-654-010059-21	SCREW, HEX CAP	4**
50	1-861-010032-19	WASHER, PLAIN, WIDE	4**
51	1-512-010005-13	NUT, HEX, SELF LOCKING	4**
52	1-298-010001-1	FITTING, GREASE	1, 2**
54	3-120-010073	BRACKET ASSY, CYLINDER TRUNNION	2
55	3-557-010033	PIN, CYLINDER, BUTT END	1
56	1-654-010055-17	SCREW, HEX CAP	6
57	1-512-010005-09	NUT, HEX, SELF LOCKING	6
58	1-510-010001	NUT, FLANGE LOCK	8

* First quantity is for Assy Nos. 3-407-010038-01 thru 3-407-010038-04. Second quantity is for assy nos. 3-407-010038-5 thru 3-407-010038-8. ** For low load angle assy only. *** Items cross-referenced in Figure 8-18.

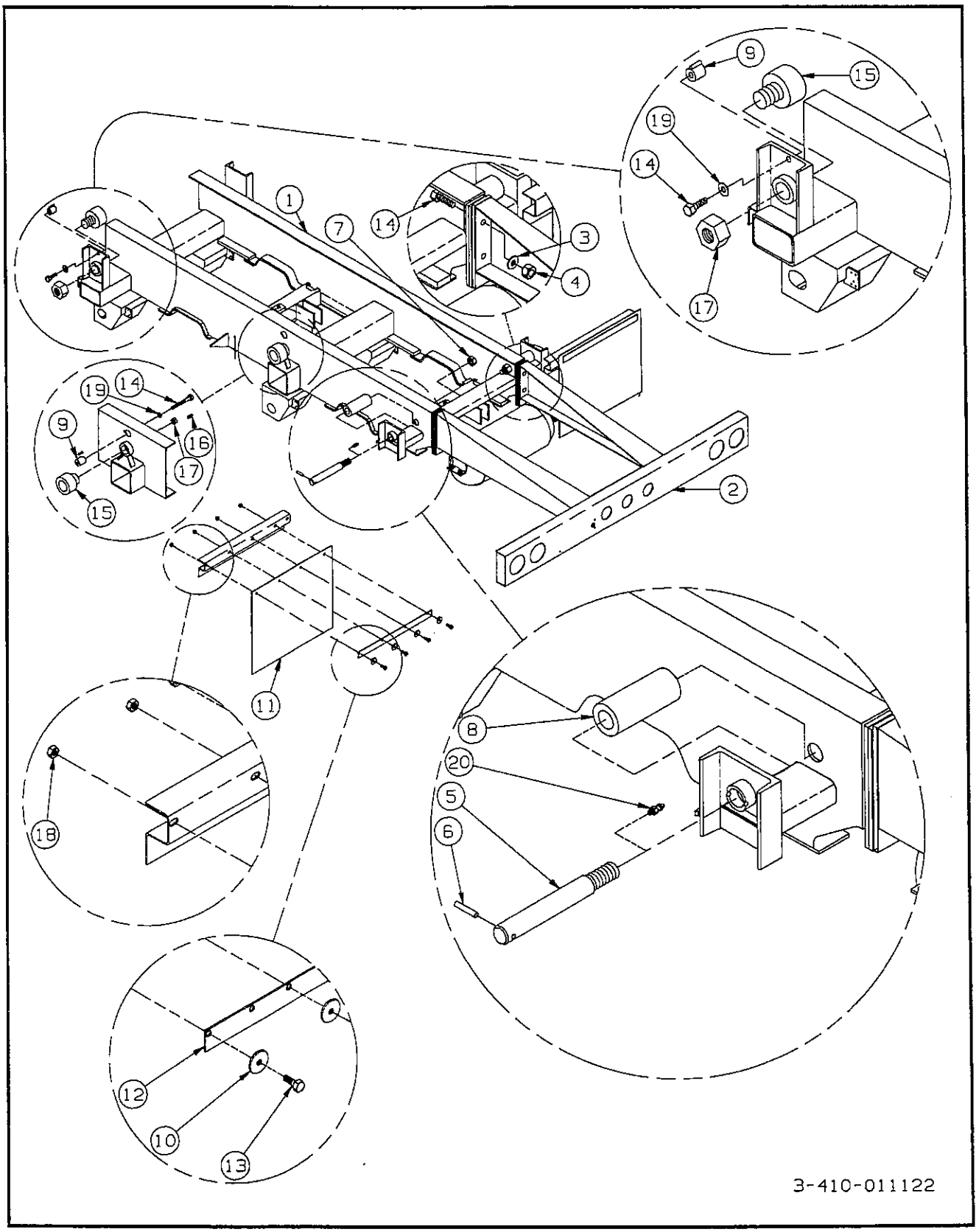

Figure 8-12 Air Undercarriage Suspension

AIR UNDERCARRIAGE SUSPENSION

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3-762-010603	SUSPENSION, AIR RIDE	1
2	3-146-010029	BUMPER WLDMT	1
3	1-861-010032-20	WASHER, FLAT	4
4	1-512-010005-15	NUT, HEX SELF LOCKING	4
5	3-557-010396	PIN, REAR ROLLER	2
6	0600-375-02000	ROLL PIN	2
7	1-1/4-7HFLN	NUT, PLATED LOCK	2
8	RRT114X6	TUBE, ROUND	2
9	3-762-010016	HOLD DOWN, UNDERCARRIAGE	4
10	1-861-010032-11	WASHER, FLAT	16
11	3-485-010001	MUD FLAP	2
12	3-762-010017	CLAMP, MUD FLAP	2
13	1-654-010051-07	SCREW, HEX CAP	8
14	1-654-010061-04	SCREW, HEX CAP	6
15	3-076-010005	BEARING, CAM FOLLOWER	4
16	5029	ZERK FITTING	4
17	2-12HFN	HEX NUT	4
18	1-510-010001	NUT, FLANGE LOCK	8
19	1-861-010034-17	WASHER, LOCKING HELICAL SPRING	4
20	5000	ZERK FITTING	2

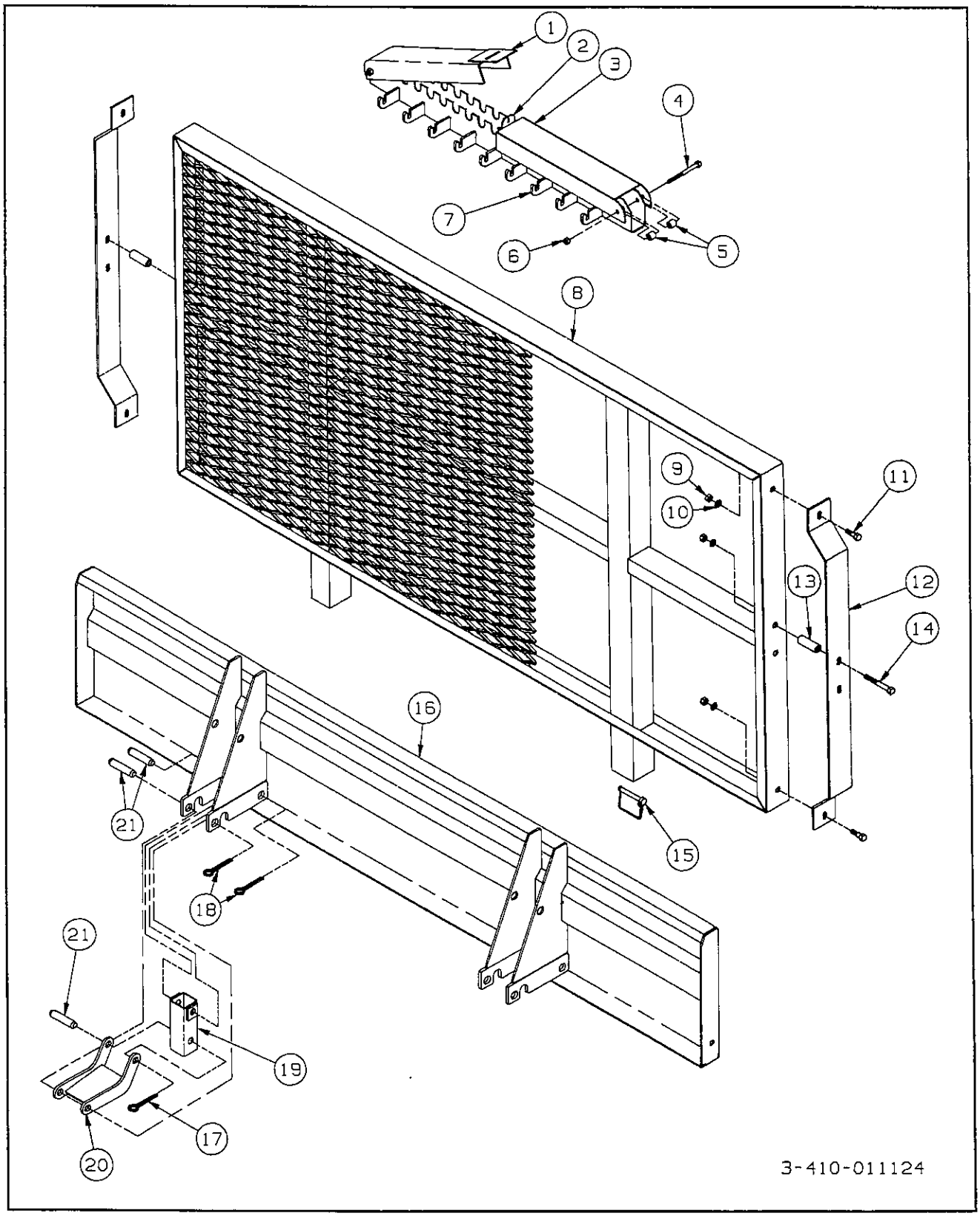

Figure 8-13 Front Extension & Bulkhead items

FRONT EXTENSION/BULKHEAD ASSEMBLY

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1*	3-141-010012	NOTCHED PLATE, LOCKING	1**
2*	3-141-010011	PLATE, LOCK	1***
3*	3-141-010013	CHANNEL, COVER	2**
4*	1/2-13X6HHCS	CAP SCREW, HEX HEAD	2
5*	RRT128 X 1	BUSHING, SPACER	4
6*	1/2-13HFN	NUT, HEX	2
7*	3-141-010014	HANGER, CHAIN	1***
8	3-141-010120	WELDMENT, 96" X 48" BULKHEAD	1
9	1-512-010005-09	NUT, HEX, SELF LOCKING	6
10	1-861-010032-15	WASHER, PLAIN, TYPE A	6
11	1-654-010055-03	SCREW, HEX CAP	4
12	3-054-010101	BAR, SIDE, 48" BULKHEAD,102" EXTENSION	2
13	3-711-010025	SPACER	2
14	1-654-010055-13	SCREW, HEX CAP	2
15	9-557-010360	PIN, SNAP LOCK	2
16	~~3-141-010118~~	BULKHEAD WELDMENT, 16" x 96"	1
	3-141-010119	BULKHEAD WELDMENT, 16" X 102"	1
17	1-557-010014	HAIRPIN	2
18	1/4X2	COTTER PIN	10
19	3-482-010249	MOUNT WELDMENT	2
20	3-755-010080	SUPPORT WELDMENT	2
21	3-557-010380	SUPPORT PIN	6

* Items can be ordered as one assembly:
3-141-010008 CHAIN HANGER LOCKING CHANNEL ASS'Y

** Item 1 sold as part of weldment for left half of item 3.

*** Item 2 sold as part of weldment for item 7.

HITCH INSTALLATION ASSEMBLY

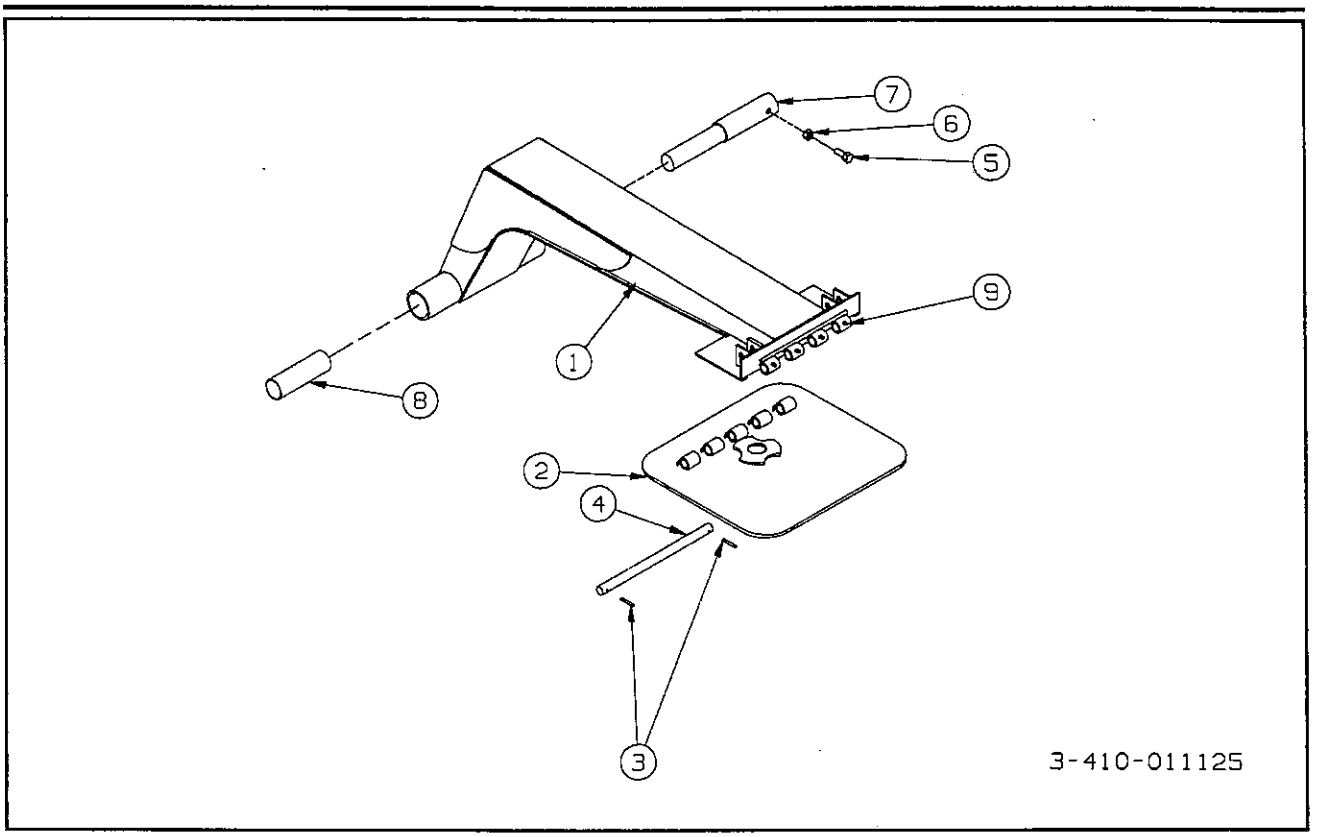

Figure 8-14 Hitch Installation Assembly Parts

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-375-010489-1	24-PIN HITCH INSTALLATION	
	3-375-010489-2	18-PIN HITCH INSTALLATION (OPTION)	
1	3-375-010222	WELDMENT, FIFTH WHEEL, GOOSENECK	1
2	3-375-010250	PLATE, 24" KINGPIN HITCH	1
	3-375-010349	PLATE, 18" KINGPIN HITCH	1
3	1-647-010004255	SPRING PIN, SLOTTED	2
4	3-557-010030	PIN, FIFTH WHEEL HINGE	1
5	1-654-010061-07	SCREW, HEX CAP	2
6	1-512-010005-15	NUT, HEX, SELF-LOCKING	2
7	3-826-010015	TUBE WLDMT, INNER FIFTH WHEEL	1
8	3-826-010014	TUBE, INNER HINGE, FIFTH WHEEL	1
9	1-298-010001-1	FITTING, GREASE	4

DRUM ITEMS, HUB AND

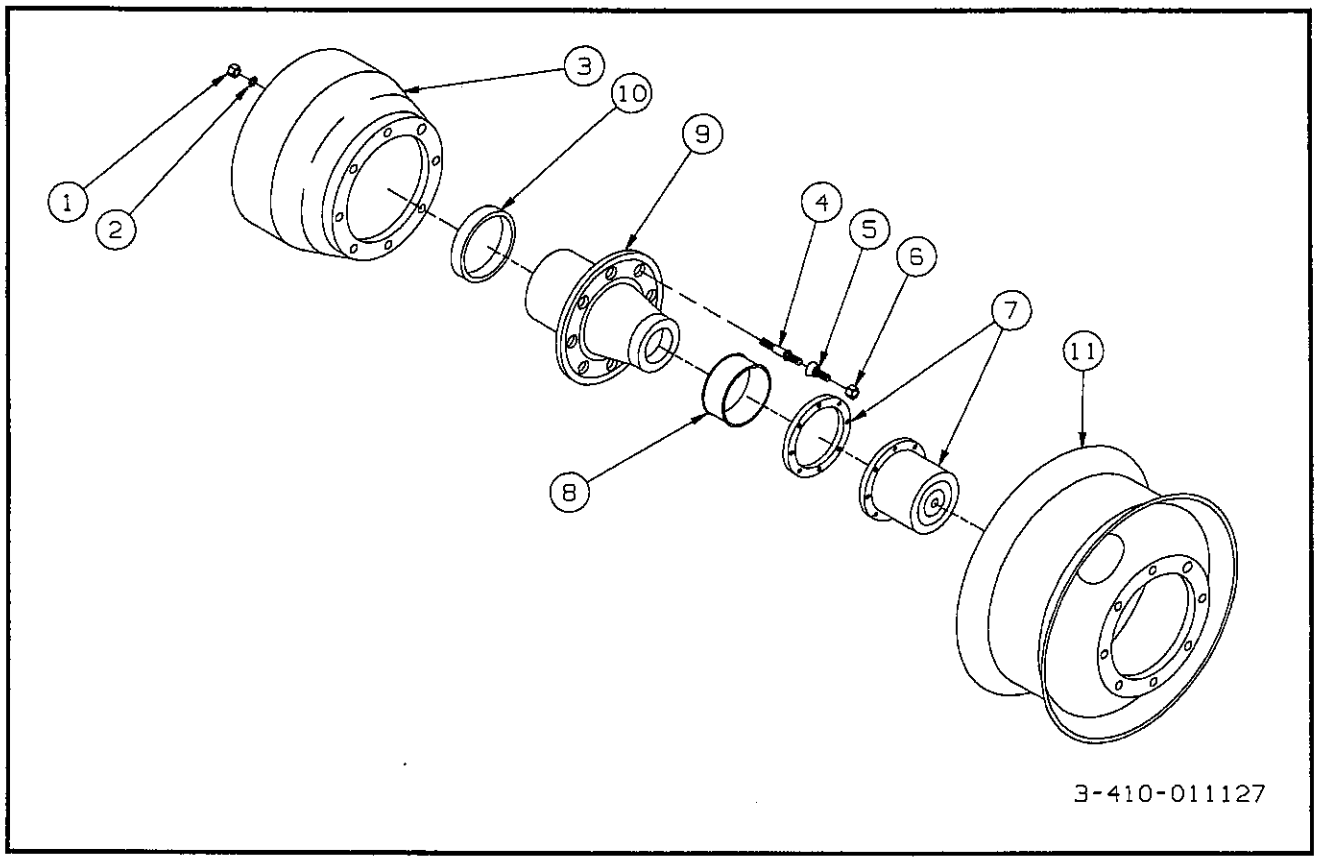

Figure 8-15 Hub & Drum Items

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	021-038-02	HUB CAP, OIL LEVEL INDICATOR	1
	071-124-00	GASKET	1
	3-659-010012	SEAL	1
	5/16-18X3/4HHCS	CAP SCREW, HEX HEAD	6
	5/16SLW	WASHER, SPLIT LOCK	6
8	HM212011	CUP, OUTER BEARING	1
	HM212049	CONE, OUTER BEARING (NOT SHOWN)	2
9	1056	HUB	1
10	HM218210	CUP, INNER BEARING	1
	HM212048	CONE, INNER BEARING (NOT SHOWN)	2
11	3-870-010012	WHEEL	1

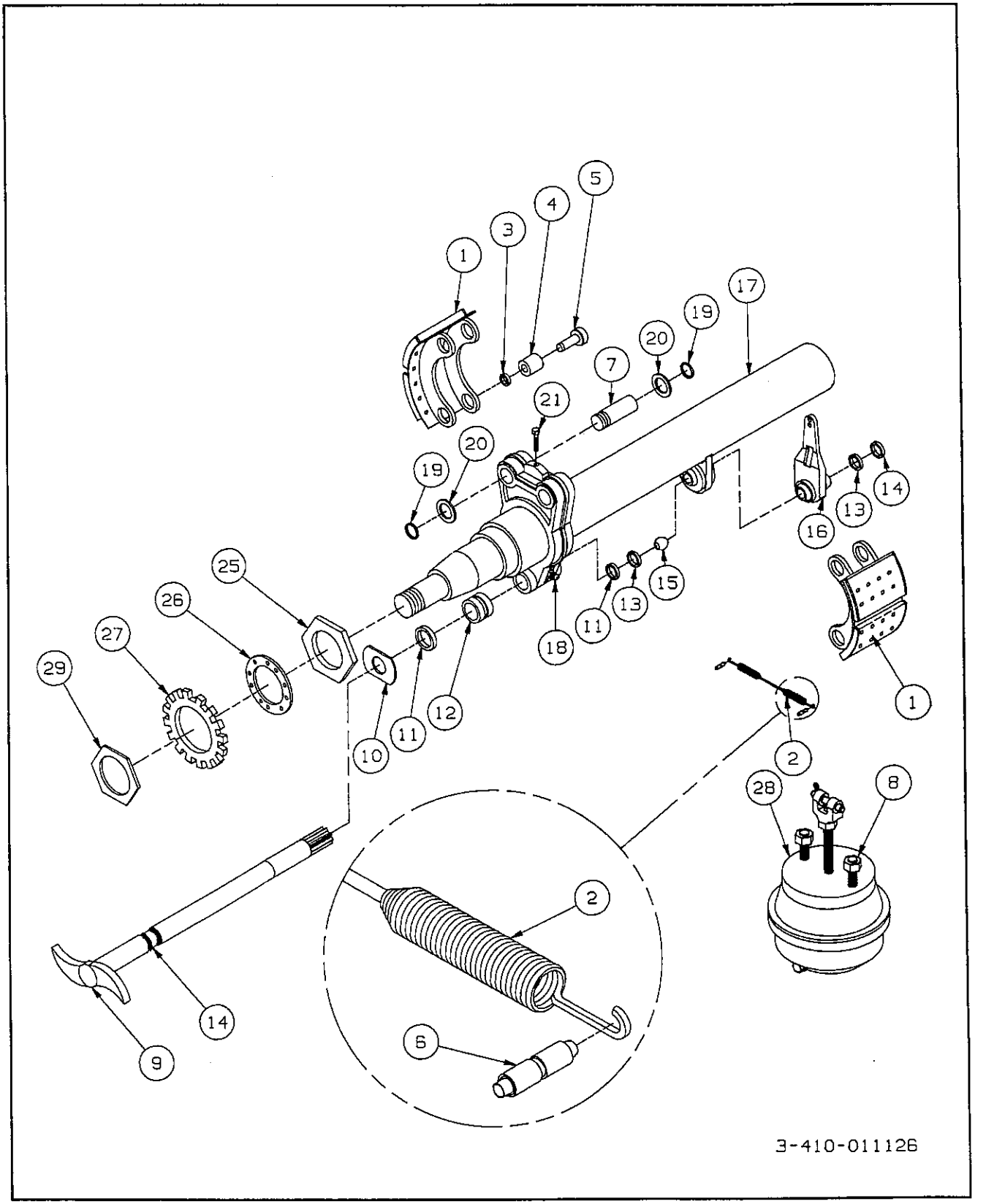

Figure 8-16 Semitrailer Axle Parts

AXLE AND BRAKE ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-042-010039	ASSEMBLY, COMPLETE 102" WIDE TRAILER AXLE	A/R
	3-042-010040	ASSEMBLY, COMPLETE 96" WIDE TRAILER AXLE	A/R
1	040-175-01	BRAKE SHOE AND LINING (REQUIRE 4 PER AXLE)	4
	040-175-02	L.H. BRAKE SHOE AND ROLLER ASSEMBLY	2
	040-175-03	R.H. BRAKE SHOE AND ROLLER ASSEMBLY	2
	071-133-00	BRAKE LINERS WITH RIVETS ONLY (REQ. 2 PER AXLE)	4
2	046-092-00	SPRING, SHOE RETURN	2
	046-097-00	SPRING, SHOE KEEPER (NOT SHOWN)	2
3	069-018-00	RETAINER, ROLLER PIN	4
4	014-057-00	ROLLER, KNURLED	4
5	056-010-00	PIN, SHOE ROLLER	4
6	056-012-00	RETAINER,PIN SHOE RETURN SPRING	4
7	056-011-00	PIN, ANCHOR	4
8	061-003-00	NUT	2
9	034-014-00	CAMSHAFT, LEFT HALF	1
	034-015-00	CAMSHAFT, RIGHT HALF	1
10	005-074-00	"D" WASHER	2
11	010-052-00	SEAL, GREASE	4
12	014-056-00	BUSHING, CAMSHAFT SPIDER	2
13	005-075-00	WASHER, CAMSHAFT	4
14	069-020-00	RETAINER, CAMSHAFT	2
15	014-058-00	BUSHING, CAMSHAFT SUPPORT	2
	034-032-00	RETAINER, CAMSHAFT BUSHING	4
16	055-010-00	SLACK ADJUSTER, MANUAL	2
	055-011-00	SLACK ADJUSTER,AUTOMATIC	2
17	D-2012	AXLE (1/2" WALL/20,000 LB. CAP)	1
18	061-003-00	FITTING, GREASE, 45°	2
19	069-019-00	RETAINER, ANCHOR PIN	8
20	005-073-00	WASHER, ANCHOR PIN	8
21	007-137-00	BOLT, ANTI-ROTATION	2
25	006-114-00	NUT, INNER SPINDLE	2
26	005-098-00	WASHER, SPINDLE LOCK	2
27	005-099-00	WASHER, TABBED SPINDLE LOCK	2
28	034-057-01	CHAMBER, AIR BRAKE	2
	034-058-01	CHAMBER, SPRING BRAKE (NOT SHOWN)	2
29	006-115-00	NUT, OUTER SPINDLE	2

NOTE: PART NUMBERS ARE FOR DEXTER 12-1/4" X 7-1/2" BRAKE AND AXLE ASSEMBLY.

DRUM ITEMS, THREE SPOKE HUB AND

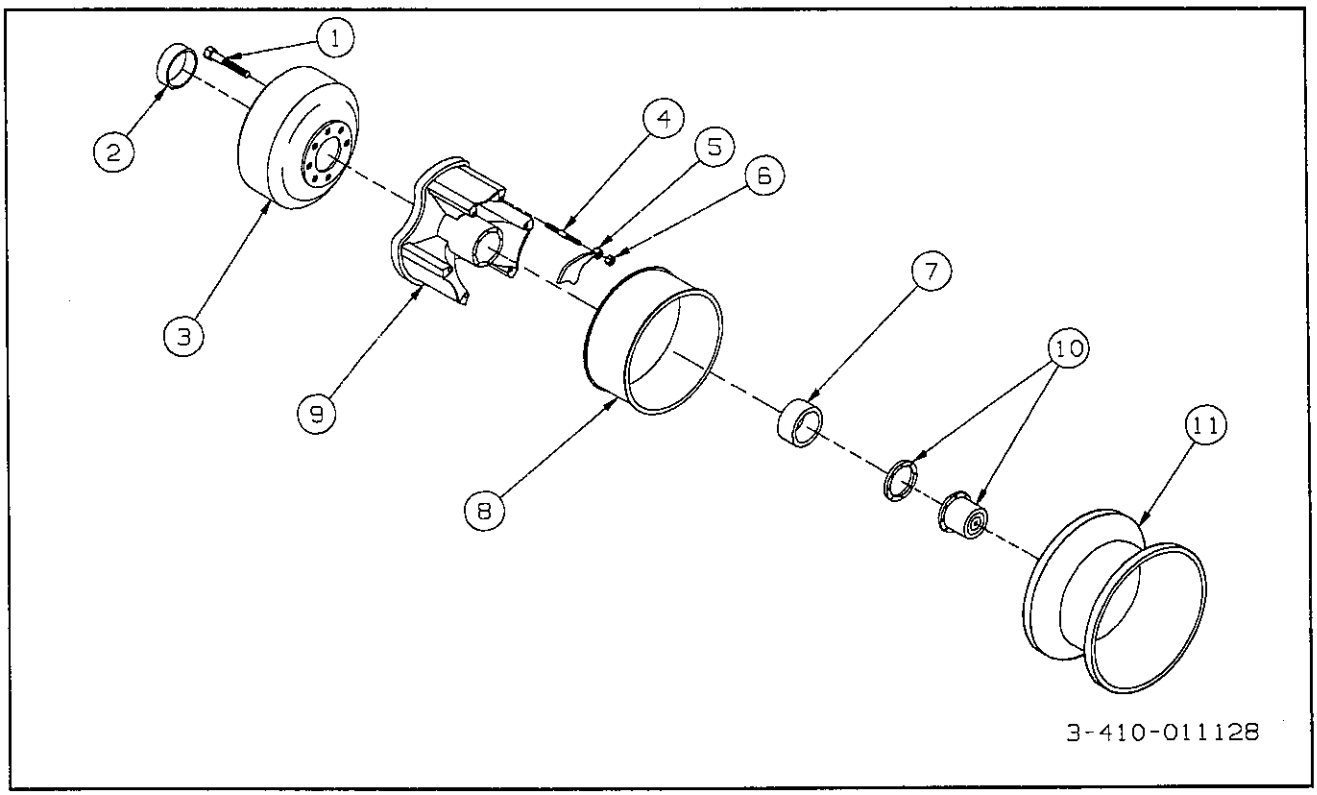

Figure 8-17 Three Spoke Hub & Drum Items

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-870-010066	15" HUB & DRUM - DAYTON FOR DEXTER	1
1	96218	CAP SCREW, HEX	6
2	HM218210	CUP, INNER	1
	HM218248	CONE, INNER BEARING	1
3	63637	DRUM, BRAKE	1
4	171027	STUD	6
5	3319L	CLAMP, RIM	3
6	74710	NUT, HEX	6
7	HM212011	CUP, OUTER	1
	HM212049	CONE, OUTER BEARING	1
8	41533	SPACER, RIM	1
9	7000	HUB	1
10	021-038-02	HUB CAP, OIL LEVEL INDICATOR	1
	071-124-00	GASKET	1
	3-659-010012	SEAL	1
	5/16-18X3/4HHCS	CAP SCREW, HEX	6
	5/16SLW	WASHER, SPLIT LOCK	6
11	675175 RTD	RIM, TUBELESS TIRE	1

NOTE: PARTS FOR 12.25 X 7.5 BRAKES ONLY

SUSPENSION, SINGLE LEAF SPRING

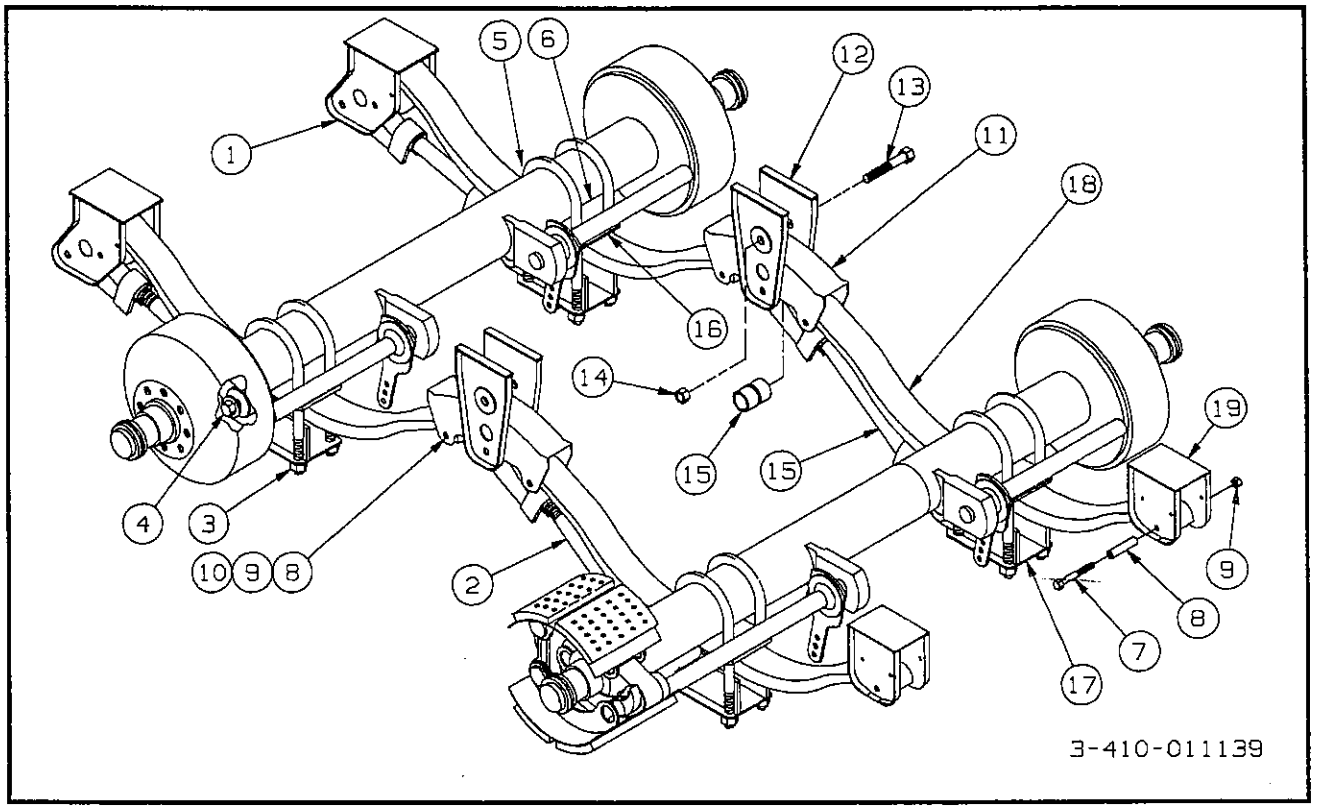

Figure 8-18 Single Leaf Spring Suspension

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	0002-12	NUT, LOCKING	24
4	0001-08	BOLT	8
5	0102-13	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
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
	.0022-00	BUSHING, TORQUE ARM	4
16	0375-00	SPRING LINER, DELRIN	4
17	0508-00	BOTTOM PLATE, UNDERSLUNG	4
18	3-720-010030	SPRING, ONE LEAF, HIGH ARCH	4
19	0053-00	REAR HANGER, UNDERMOUNT	2

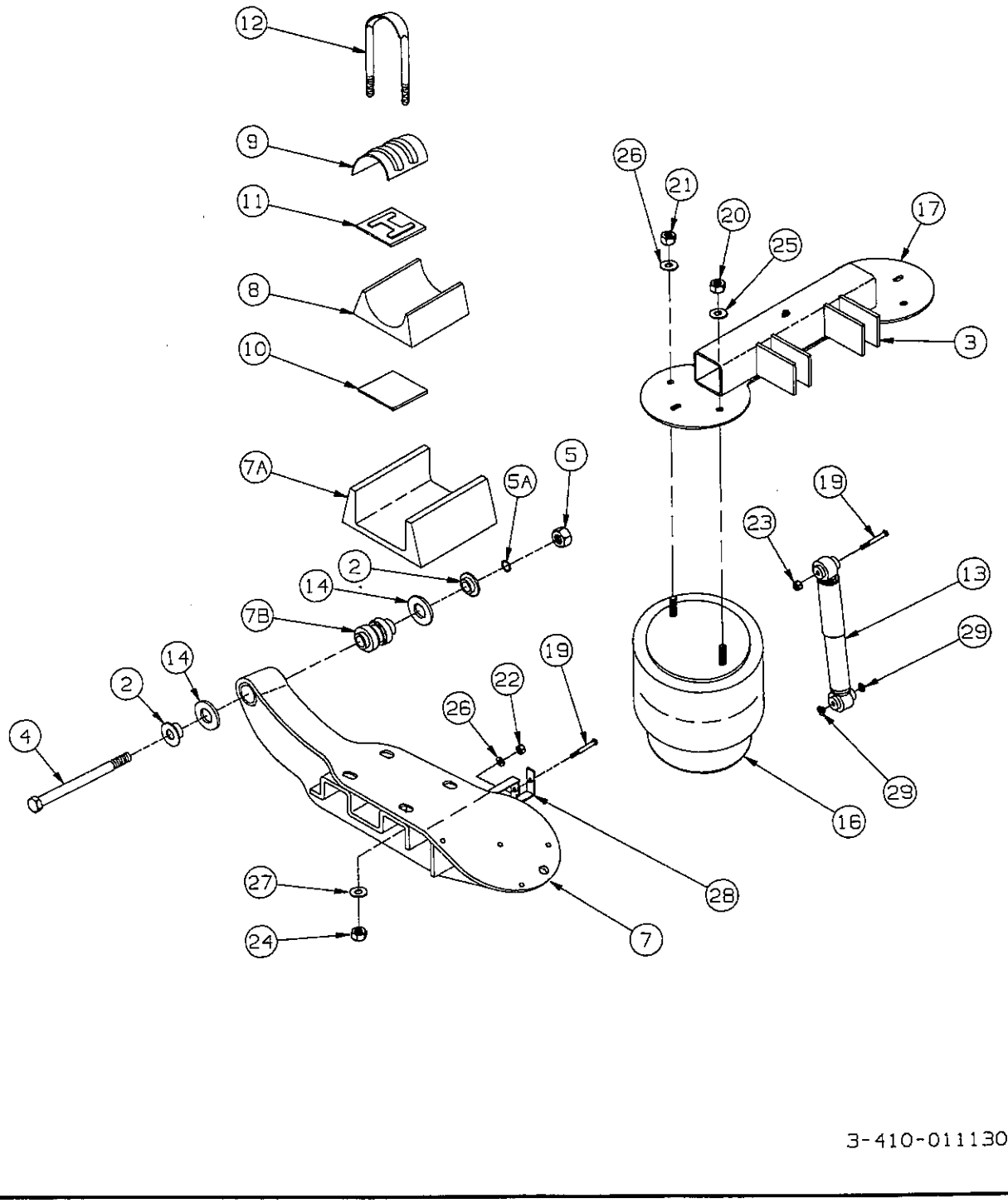

Figure 8-19 Air Ride Suspension Items

SUSPENSION ITEMS, AR-45 AIR RIDE

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	905-19-361	FRAME, BRACKET, L.H. ADJUSTABLE	1
	905-19-362	FRAME BRACKET, R.H. FIXED	1
2	900-08-141	BUSHING, ALIGNMENT	4
3	900-32-561	MOUNTING BRACKET, UPPER SHOCK	4
4	932-01-046	CAP SCREW	2
5	939-00-165	NUT, SMART	2
5A	939-00-164	RING (USED WITH ITEM 5)	2
7	905-15-857	BEAM ASSEMBLY, L.H. EQUALIZING (INCLUDES 7A & 7B)	1
	905-15-858	BEAM ASSEMBLY, R.H. EQUALIZING (INCLUDES 7A & 7B)	1
7A	900-01-006	SEAT, BEAM	2
7B	900-08-139	BUSHING	2
8	900-01-082	ADAPTER, AXLE	2
9	900-10-032	AXLE CAP	2
10	900-28-075	PAD, STEEL/RUBBER	2
11	900-28-047	WRAPPER, RUBBER	2
12	900-41-878	U-BOLT	2
13	3-687-010001	SHOCK ABSORBER	2
14	900-36-140	WASHER, SPACER	4
16	905-57-023	SPRING ASSEMBLY, AIR	2
17	905-44-573	CROSS-MEMBER	1
19	930-03-599	CAP SCREW	4
20	934-00-136	NUT, HEX	2
21	934-00-149	NUT, HEX	2
22	934-00-367	NUT, SQUARE	2
23	934-00-492	NUT, LOCK	4
24	934-00-502	NUT, LOCK	8
25	936-00-072	WASHER, LOCK	2
26	936-00-077	WASHER, LOCK	4
27	939-00-027	WASHER, FLAT	8
28	905-19-425	BRACKET, LOWER SHOCK	2
29	905-08-004	BUSHINGS	8

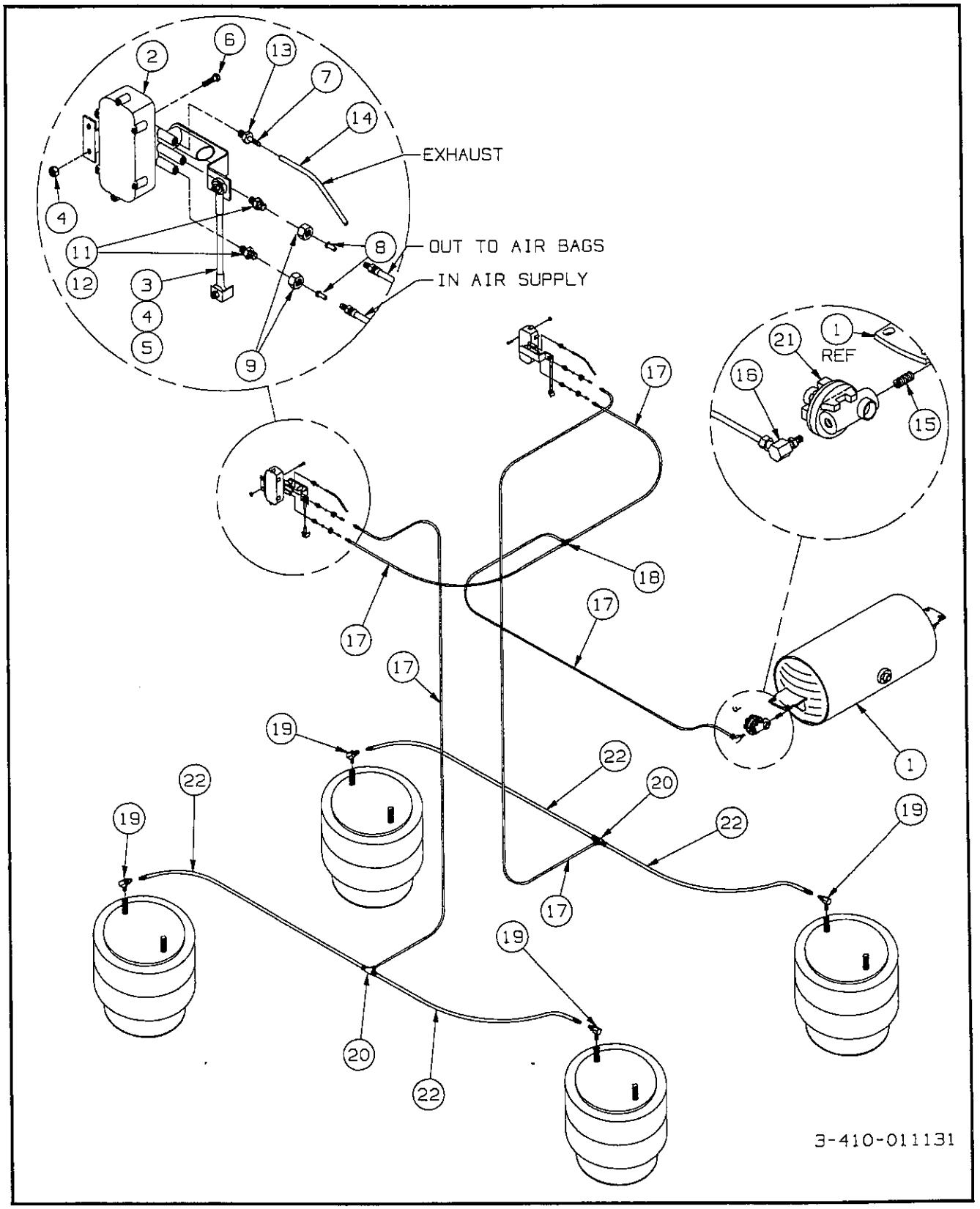

Figure 8-20 Tandem Air Suspension Plumbing

SUSPENSION ITEMS, TANDEM AIR

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3-780-010002	TANK, AIR	1
2	900-54-113	HEIGHT CONTROL VALVE	2
3	900-54-442	LINK	2
4	934-00-060	NUT, LOCKING	8
5	930-02-361	CAP SCREW	4
6	930-02-349	CAP SCREW	4
7	900-54-122	LOCATING PIN	2
8	938-00-014	INSERT	4
9	938-00-140	BRASS NUT	4
10	NOT USED		
11	928-00-062	DELRIN SLEEVE	4
12	905-54-059	FILTER	4
13	938-00-139	FITTING, EXHAUST	2
14	900-54-276	EXHAUST HOSE	2
15	2083-8-4S	NIPPLE, HEX	1
16	1-297-010008-07	FITTING, AIR, 90°	1
17	1-833-010001-3	TUBING, NYLON	5 (A/R)
18	1-297-010010-01	FITTING, AIR, UNION TEE	1
19	1-297-010007-11	FITTING, AIR	4
20	1-297-010010-04	FITTING, AIR, UNION TEE	2
21	905-54-107	PRESSURE PROTECTION VALVE & FILTER	1
	481-00-200	FILTER ONLY	1
22	1-833-010002-3	TUBING, NYLON	4 (A/R)
23	941-00-119	DECAL, OPERATING (NOT SHOWN)	1

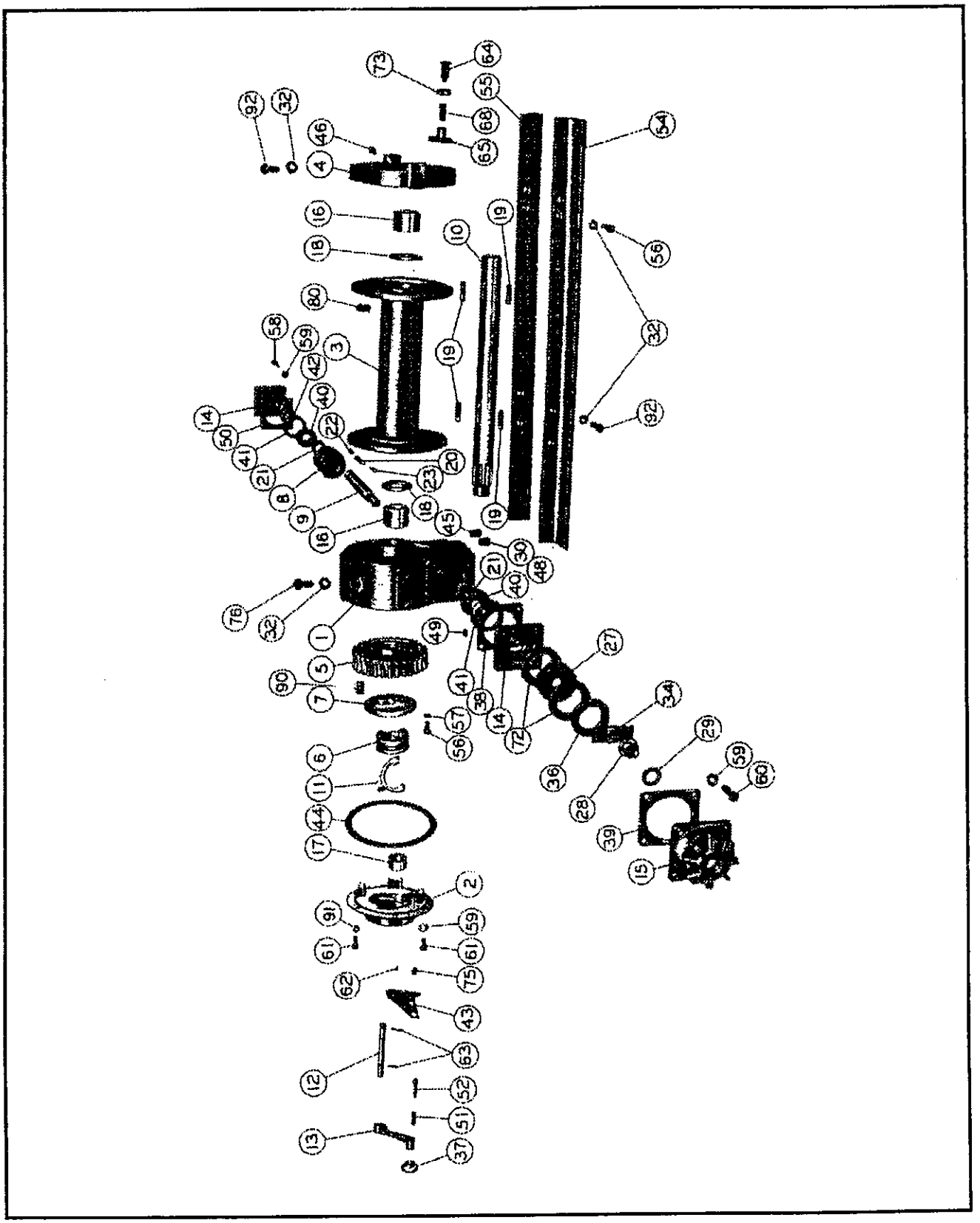

Figure 8-21 20,000# Winch Parts

20,000# WINCH ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-873-010123	WINCH, 20,000 # W/BOLT-ON ANGLES	
1	81078	WORM HOUSING ASSEMBLY	1
2	81082	COVER ASSEMBLY, WORM HOUSING	1
3	11449	DRUM, CABLE	1
4	81077	LEG ASSEMBLY, BEARING	1
5	11434	WORM GEAR, RIGHT	1
6	11421	CLUTCH, SLIDING	1
7	11419	DRIVE, CLUTCH	1
8	11404	WORM, RIGHT	1
9	11405	SHAFT, WORM	1
10	11414	SHAFT, CABLE DRUM	1
11	11440	FORK, SHIFTER	1
12	11441	SHAFT, SHIFTER	1
13	11442	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	22055	DRUM KET, CABLE	4
20	11402	KEY, WORM	1
21	11407	SPACER, WORM	2
22	23367	KEY, SPROCKET	1
23	10078	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	18022	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	12783	BRACKET, SHIFTER	1
44	11411	COVER GASKET, HOUSING	1
45	19045	PLUG, DRAIN	1
46	18047	FITTING, GREASE	1
PARTS NOT SHOWN (SEE FIGURE 8-32);			
	3-155-010018-1	CABLE W/LOOP (5/8" X 60')	1
	3-155-010018-4	CABLE W/LOOP (5/8" X 85')	1
	3-873-010129-2	20,000# WINCH ASSY (SEE MISCELLANEOUS OPTIONS)	1
	3-352-010017-2	ROLLER GUIDE ASSY, 20,000# (SEE MISCELLANEOUS OPTIONS)	1
	3-352-010026	ROLLER SLOPE (SEE MISCELLANEOUS OPTIONS)	1
	3-793-010041	D-RING MOUNTED AT WINCH (OPTION)	1

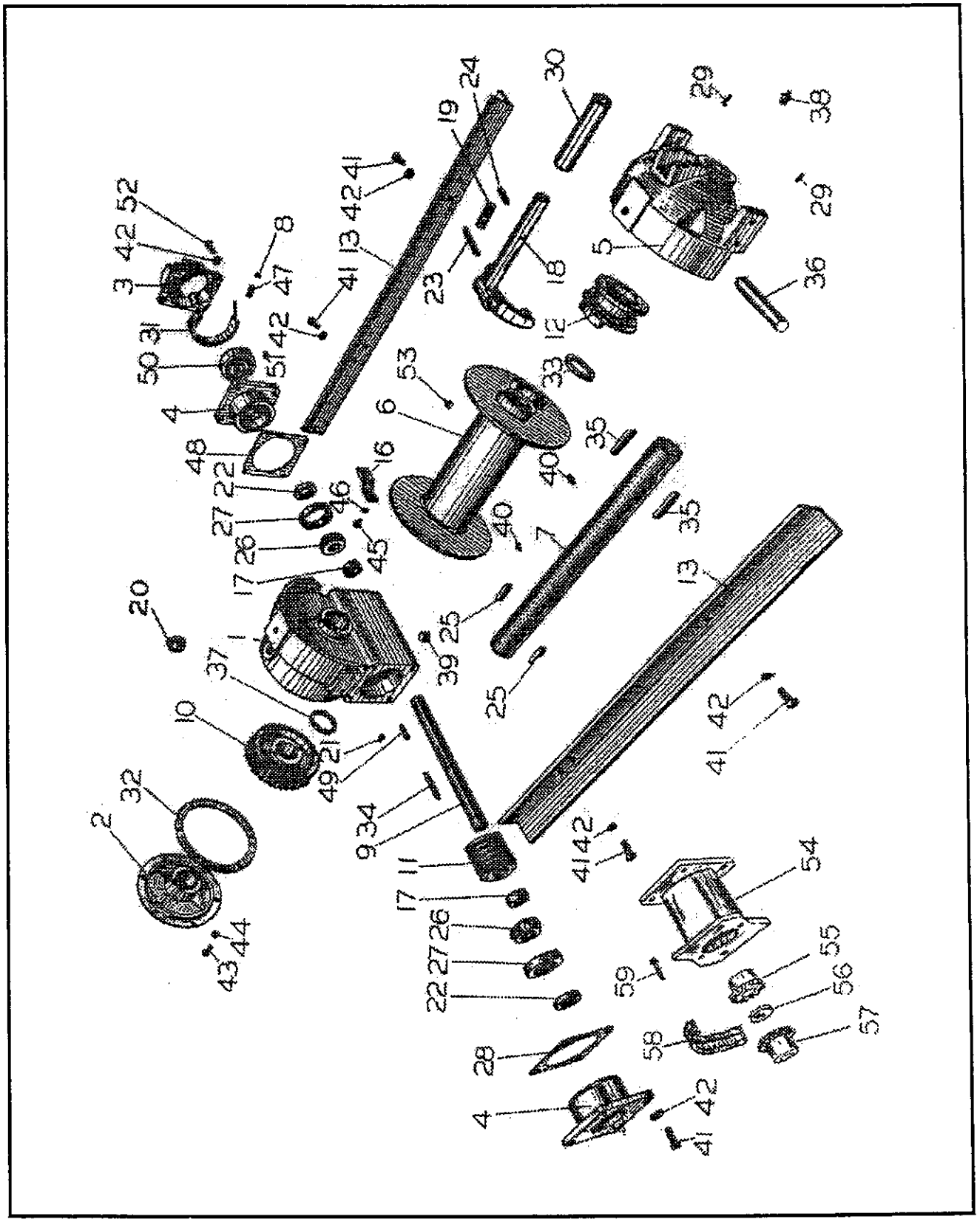

Figure 8-22 12,000# Winch Parts

12,000# WINCH ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-873-010122	WINCH, 12,000#	1
1	81006	HOUSING ASSEMBLY, WORM	1
2	81009	HOUSING COVER, WORM	1
3	18032	HOUSING, SAFETY BRAKE	1
4	23303	CONTAINER, BEARING	2
5	81530	LEG ASSEMBLY, BEARING	1
6	11128	DRUM, CABLE	1
7	11129	DRUM SHAFT, CABLE	1
8	13468	NUT, JAM	4
9	23470	SHAFT, WORM	1
10	11144	GEAR, WORM, 31-TOOTH	1
11	11142	WORM	1
12	18039	CLUTCH	1
13	22752	ANGLE, BASE	2
16	81025	BRAKE, DRAG	1
17	11308	SPACER, WORM	2
18	13839	FORK, SHIFTER	1
19	18002	SPRING	1
20	22775	PLUG, PIPE	1
21	18009	PLUG, PIPE	1
22	18026	SEAL, GREASE	2
23	13028	PIN, ROLL	1
24	18056	PIN, ROLL	1
25	11117	KEY, WORM GEAR	2
26	18015	CONE, BEARING	2
27	18016	CUP, BEARING	2
28	18027	GASKET	3
29	11837	PIN, ROLL	2
30	12817	SHIFTER HANDLE	1
31	21925	BAND, BRAKE	1
32	11133	GASKET	3
33	18019	PIN, RETAINER	1
34	18030	KEY, WORM	1
35	18020	KEY, CLUTCH	2
36	11130	FORK, PIN	1
37	11240	RING, THRUST	1
38	18047	FITTING, GREASE	1
39	19045	PLUG, PIPE	1
40	11799	FITTING, GREASE	2
41	21961	CAPSCREW	12
42	18003	WASHER, LOCK	16
43	11767	CAPSCREW	6
44	11011	WASHER, LOCK	6
45	13005	CAPSCREW	2
46	12780	WASHER, LOCK	2
47	18029	SPRING	1
48	18024	GASKET	3
49	18044	KEY	2
50	18028	DRUM, BRAKE	1
51	12075	SCREW, SET	1
52	22694	CAPSCREW	4
53	24032	SCREW, SET	1
54	23079	ADAPTER, MOTOR	1
55	23081	COUPLER HALF, WINCH	1
56	23078	SPACER, CONSTANT	1
57	23083	COUPLING HALF, MOTOR	1
58	13424	CHAIN	1
59	13413	CAPSCREW	2
ITEMS NOT SHOWN (SEE FIGURE 8-32):			
	3-873-010126-2	12,000# WINCH ASSY (SEE MISCELLANEOUS OPTIONS)	1
	3-155-010017-1	CABLE W/LOOP (1/2" X 60')	1
	3-155-010017-4	CABLE W/LOOP (1/2" X 85')	1
	3-352-010017-1	ROLLER GUIDE ASSY, 12,000# (SEE MISCELLANEOUS OPTIONS)	1
	3-793-010041	D-RING MOUNTED AT WINCH (OPTION)	1

WINCH MOTOR

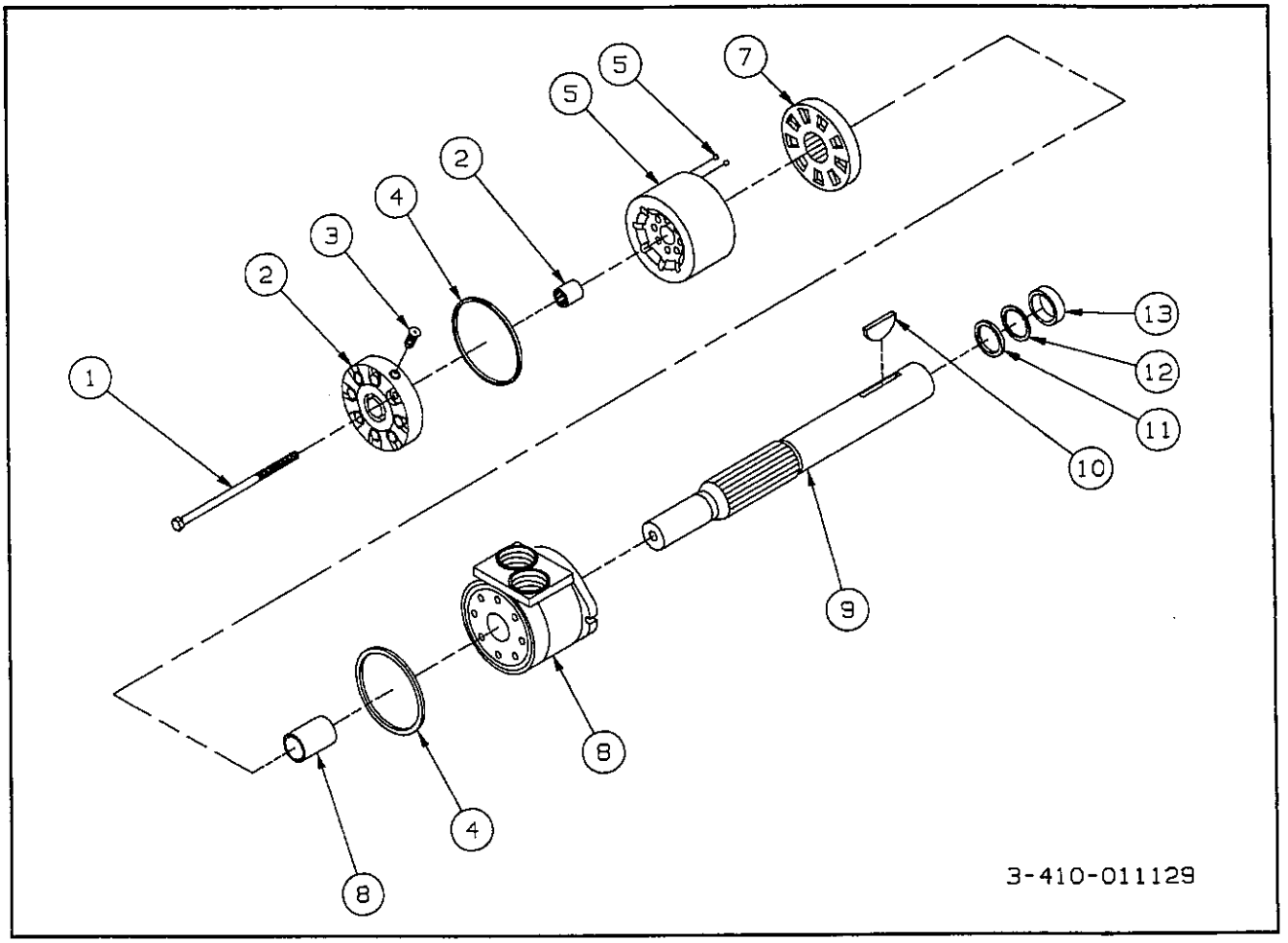

Figure 8-23 Winch Motor Items

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	1014-4	BOLT, HEX (12000#)	8
	1014-2	BOLT, HEX (20000#)	8
2	M110C-1	COVER/BEARING ASSY	1
3	1019-4	PLUG, VENT W/O-RING	1
4	1046	SQUARE RING SEAL	2
5	1004-6	IGR ASSY (20000#)	1
	1004-3	IGR ASSY (12000#)	1
6	1021	CHECK VALVE BALL	2
7	1644	VALVE PLATE	1
8	M110B-7	BODY, BEARING ASSY (20000#)	1
	M110B-1	BODY, BEARING ASSY (12000#)	1
9	1366-X	SHAFT, 1.25" KEYED, STR (20000#)	1
	1682-X	SHAFT, 1" KEYED, STR (12000#)	1
10	1020-3	KEY, STRAIGHT	1
	1655	KEY, WOODRUFF	1
11	1062-15	SEALED, QUAD RING	1
12	1142-14	BACK-UP RING	1
13	1061	SEAL, DUST	1

DECAL INSTALLATION

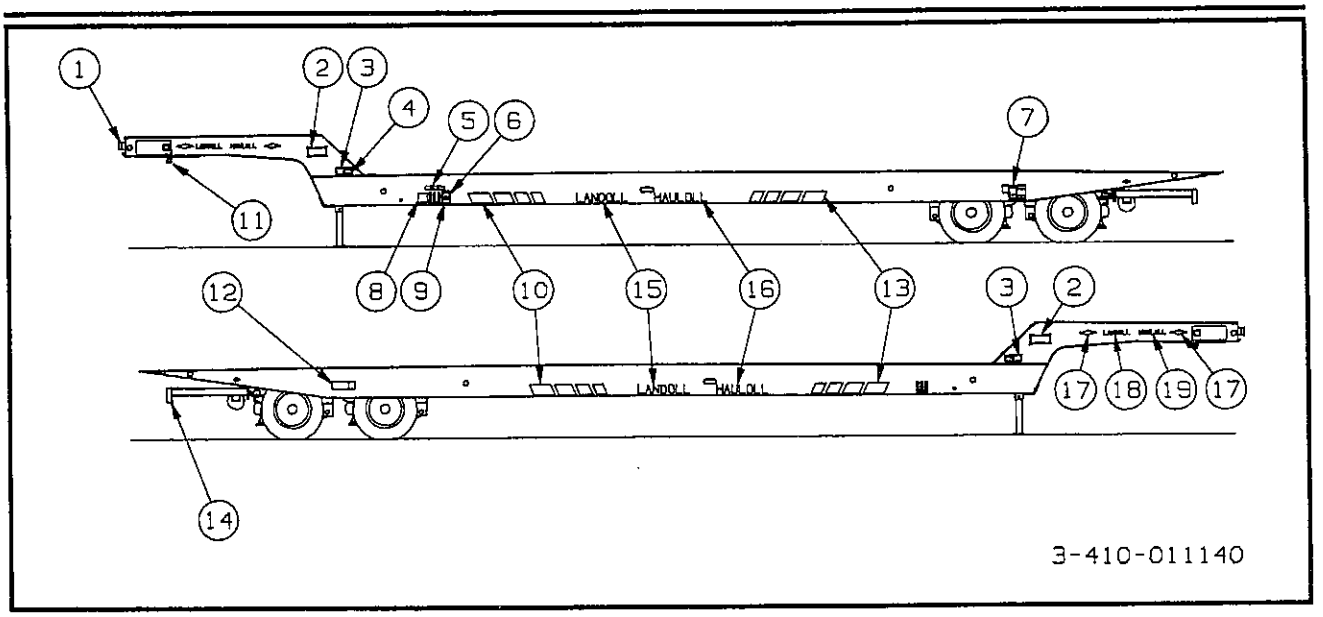

FIG. 8-24 DECAL PLACEMENT

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3-573-010020	PLATE, IDENTIFICATION	1
2	1-573-010001	DECAL, LANDOLL BLACK	2
	1-573-010013	DECAL, LANDOLL WHITE	2
3	1-573-010298	DECAL, PATENT	2
4	3-573-010297	DECAL, "CAUTION! CONCENTRATED LOAD ..."	2
5	3-573-010300	DECAL, "WARNING! RIDE POSITION ..."	1
6	3-573-010057	DECAL, INSTRUCTION (street side)	1
7	3-573-010202	PLACARD, "DANGER!" DOCK LEVELER OPERATION	1
8	3-573-010127	DECAL, 3-AXLE OPERATION	1
9	3-573-010299	DECAL, "WARNING!" WINCH CABLE	1
10	3-573-010042	DECAL, FRONT STRIPE (LEFT, WHITE)	2
	3-573-010040	DECAL, FRONT STRIPE (LEFT, BLACK)	2
11	3-573-010080	DECAL, TORQUE SPECIFICATIONS	2
12	3-573-010189	DECAL, TIRE CHANGING PROCEDURE	2
13	3-573-010043	DECAL, FRONT STRIPE (RIGHT, WHITE)	2
	3-573-010041	DECAL, FRONT STRIPE (RIGHT, BLACK)	2
14	3-573-010009	DECAL, "CAUTION!" TRAILER BUMPER	1
15	3-573-010049	DECAL, LANDOLL WHITE	2
	3-573-010048	DECAL, LANDOLL BLACK	2
16	3-573-010051	DECAL, HAULOLL WHITE	2
	3-573-010050	DECAL, HAULOLL BLACK	2
17	1-573-010014	DECAL, "L" WHITE	4
	1-573-010002	DECAL, "L" BLACK	4
18	1-573-010015	DECAL, "LANDOLL" WHITE	2
	1-573-010003	DECAL, "LANDOLL" BLACK	2
19	1-573-010016	DECAL "HAULOLL" WHITE	2
	1-573-010004	DECAL, "HAULOLL" BLACK	2

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

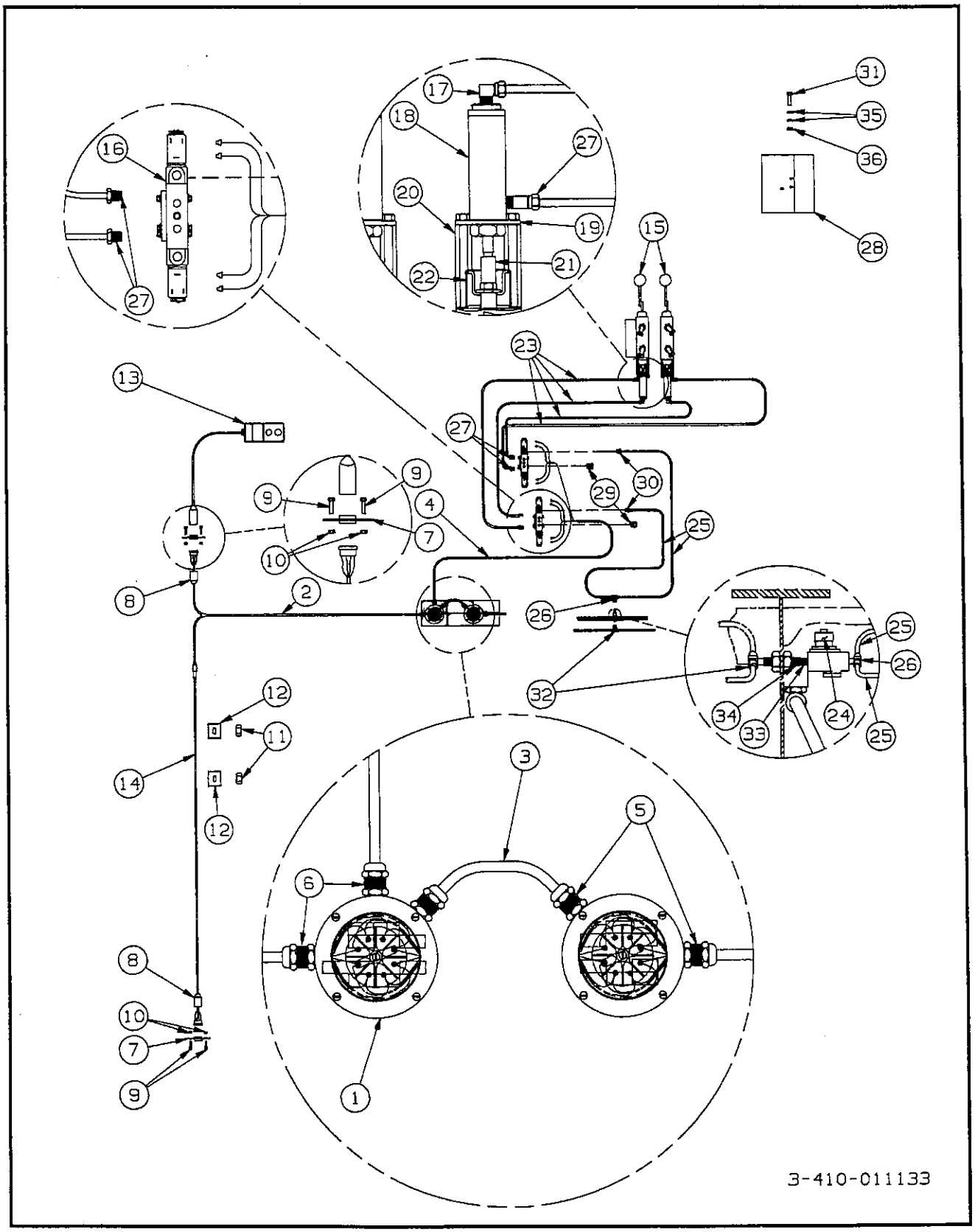

Figure 8-25 Remote Control Items

REMOTE CONTROL ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.*
1	3-113-010002	BOX, ELECTRICAL, FLANGE MT	1
2	3-368-010126	HARNESS ASSY, SINGLE RMT, 45 - 48 FT.	1
	3-368-010127	HARNESS ASSY, SINGLE RMT, 51 - 53 FT.	1
	3-368-010123	HARNESS ASSY, DUAL RMT, 45 - 48 FT	1
	3-368-010128	HARNESS ASSY, DUAL RMT, 51 - 53 FT	1
3	3-368-010124	HARNESS ASSY, ACCESS JUMPER	1
4	3-368-010129	HARNESS ASSY, SGL RMT, SOLENOID	1
	3-368-010125	HARNESS ASSY, DUAL RMT, SOLENOID	1
5	3-296-010001-1	FITTING, ELECTRICAL CORD, 3/8" I.D.	2
6	3-296-010001-2	FITTING, ELECTRICAL CORD 1/2" I.D.	2
7	59S-7	RECEPTACLE, 7-PIN	1,2**
8	59W-2-3	RUBBER BOOT	1,2**
9	1-654-010049-06	SCREW, HEX CAP	2,4**
10	1-512-010005-03	NUT, HEX, SELF-LOCKING	2,4**
11	1-510-010001	NUT, FLANGE LOCK	2,5**
12	2-181-010001	HOSE CLAMP	2,5**
13	3-765-010001	SWITCH, REMOTE CONTROL ASSY	1
	3-209-010004	CONTROL, ELECTRICAL, DUAL FUNC RMT	1
14	3-368-010131	HARNESS ASSY, 2ND REMOTE OUTLET	1
15	3-846-010008	VALVE, 3-SPOOL	1
16	3-843-010015	VALVE, PNEUMATIC, 4-WAY, 3-POSN	1,2***
17	1-297-010008-01	FITTING, AIR, 90°	1,2***
18	3-238-010001	CYLINDER, AIR	1,2***
19	3-482-010288	MOUNT, AIR CYL, VALVE	1,2***
20	3-711-010055	SPACER	4,8***
21	3-007-010039	ADAPTER, AIR CYLINDER	1,2***
22	3-161-010034	CAP, MODIFIED, VALVE SPOOL	1,2**
23	NB-2-016	TUBING, NYLON, FLEX	A/R
24	90554107	VALVE & FILTER PRESSURE	1
25	62P4	TUBING, NYLON, FLEX	A/R
26	1-297-010015-06	FITTING, AIR, TEE	1#
	1-297-010008-07	FITTING, AIR, 90°	1##
27	68-CA-2-2	CONNECTOR, AIR	3,6***
28	3-222-010110	COVER, PNEUMATIC VALVE	1
29	3-136-010001-01	BREATHER, PNEUMATIC EXHAUST	2,4***
30	1-297-010008-05	FITTING, AIR, 90°	1,2***
31	1-654-010024-018	SCREW, MACH, SLOT FLSTR HD	3#
	1-654-010024-014	SCREW, MACH, SLOT FLSTR HD	3##
32	1-297-010015-06	FITTING, AIR, BRASS TEE	1
33	1-297-010020-02	FITTING, BRASS PIPE	1
34	1-297-010022-02	FITTING, AIR ANCHOR COUPLING	1
35	1-861-010032-01	WASHER, FLAT	6
36	1-512-010003-02	NUT, HEX, SELF LOCKING W/NYLON INSERT	3

* Quantities may not apply to all options of remote installation assemblies. Check with your dealer or the Landoll Parts Distribution Center for quantities.

** First quantity is for assembly numbers 3-272-010082-04. Second quantity is for assembly numbers 3-272-010082-05 thru 3-272-010082-08.

*** First quantity is for assembly numbers 3-407-010036-05 thru 3-407-010036-08. Second quantity is for assembly numbers 3-407-010036-09 thru 3-407-010036-12.

Part used for assembly numbers 3-407-010036-09 thru 3-407-010036-12 only.

Part used for assembly numbers 3-407-010036-05 thru 010036-08 only.

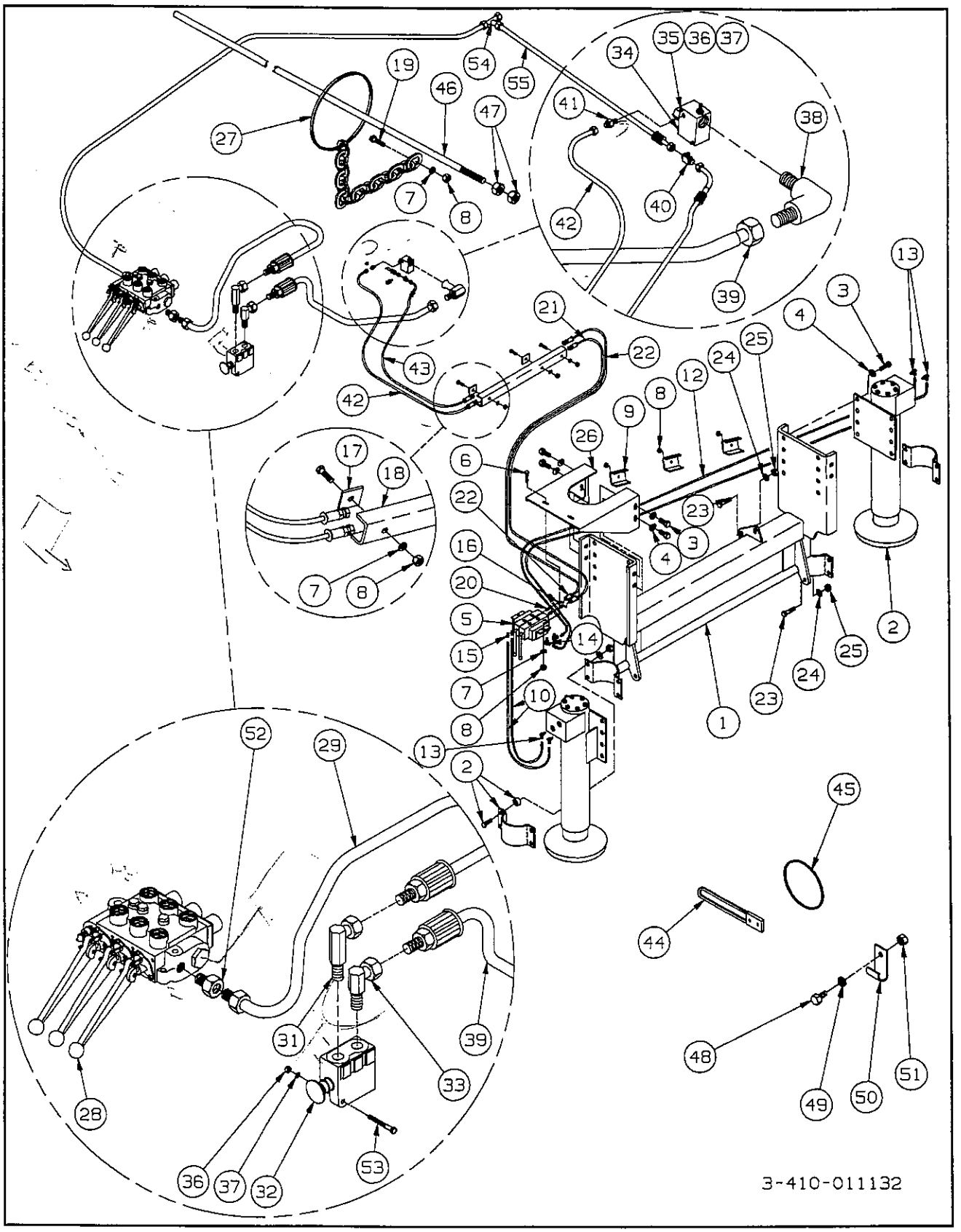

Figure 8-26 Dock Leveler Hydraulic System

DOCK LEVELER, HYDRAULIC SYSTEM

ITEM NO	PART NO	DESCRIPTION	QTY
1	3-482-010150	MOUNT WLDMT, STD DCK LEVEL	1
2	3-242-010147	CYLINDER, HYDR, DCK LVLR	2
3	1-654-010059-01	SCREW, HEX CAP	20
4	1-861-010034-15	WASHER, HELICAL SPRING LOCK	20
5	3-846-010056	VALVE, DOUBLE SPOOL	1
6	1-654-010051-05	SCREW, HEX CAP	2
7	1-861-010032-11	WASHER, FLAT	7
8	1-512-010005-05	NUT, HEX LOCK	8
9	2-181-010001	CLAMP, HOSE	3
10	1-397-010262-4	HOSE ASSY	2
12	1-397-010262-3	HOSE ASSY	2
13	2024-6-4S	ADAPTER, 90°	4
14	2062-6-4S	ADAPTER, 90°	2
15	202702-6-4S	ADAPTER, STR	2
16	1-007-010041-3	ADAPTER, HYDR, 45°	2
17	3-565-010287	PLATE, DCK LVLR HOSE STOP	2
18	3-120-010228	BRACKET, DOCK LEVELER HOSE	1
19	1-654-010051-07	SCREW, HEX CAP	2
20	202702-6-6s	ADAPTER, STR	2
21	1-397-010310096	HOSE ASSY	1
22	1-397-010307099	HOSE ASSY	1
23	1-654-010055-03	SCREW, HEX CAP	6
24	1-861-010032-14	WASHER, PLAIN	6
25	1-512-010005-09	NUT, HEX LOCK, GRB	6
26	3-120-010351	BRACKET, BOLT-ON, DOCK LEVELER, 317	1
27	3-462-010008	LOOP W/CHAIN, HOSE	1
28	3-846-010008	VALVE, 3-SPOOL, 2500 PSI	1
29	1-397-010304018	HOSE ASSY	1
30	203102-12-12S	ADAPTER	1
31	206209-12-12S	ADAPTER	1
32	3-846-010120	VALVE	1
33	2062-12-8S	ADAPTER	2
34	1-626-010002	REGULATOR, FLOW BYPASS	1
35	1-654-010049-11	SCREW	2
36	1-512-010005-03	NUT	4
37	1-861-010032-09	WASHER	4
38	2062-8-8S	ADAPTER, 90°	1
39	1-397-010301028	HOSE ASSY	1
40	203003-8-8S	ADAPTER, TEE	1
41	202702-8-6S	ADAPTER, STRAIGHT	1
42	1-397-010310224	HOSE ASSY, 45' TRAILER	1
	1-397-010310260	HOSE ASSY, 48' TRAILER	1
	1-397-010310296	HOSE ASSY, 51' TRAILER	1
	1-397-010310320	HOSE ASSY, 53' TRAILER	1
43	1-397-010309224	HOSE ASSY, 45' TRAILER	1
	1-397-010309260	HOSE ASSY, 48' TRAILER	1
	1-397-010309296	HOSE ASSY, 51' TRAILER	1
	1-397-010309320	HOSE ASSY, 53' TRAILER	1
44	TY244MX	TY-RAP, BLACK	14
45	3-462-010001	LOOP, HOSE	14
46	3-642-010083	ROD, HOSE SUPPORT, 17'	1
	3-642-010033	ROD, HOSE SUPPORT,19'	1
47	5/8-11HFN	NUT	4
48	1-654-010051-06	SCREW, HEX CAP	2
49	1-861-010032-11	WASHER	2
50	900729-3	CLAMP, HOSE	2
51	1-512-010005-05	NUT, HEX LOCK	2
52	202702-12-12S	ADAPTER	1
53	1-654-010049-09	SCREW	2
54	203102-12-12S	ADAPTER, TEE	1
55	1-397-010306028	HOSE ASSY	1

* Part Number ending varies with number of winches, type of winch(es) installed, and type of operation (manual or remote).

NOTE: Item 1 is sold for air ride suspension with brackets according to which suspension is purchased. Not sold with dock levelers bracket weldment.

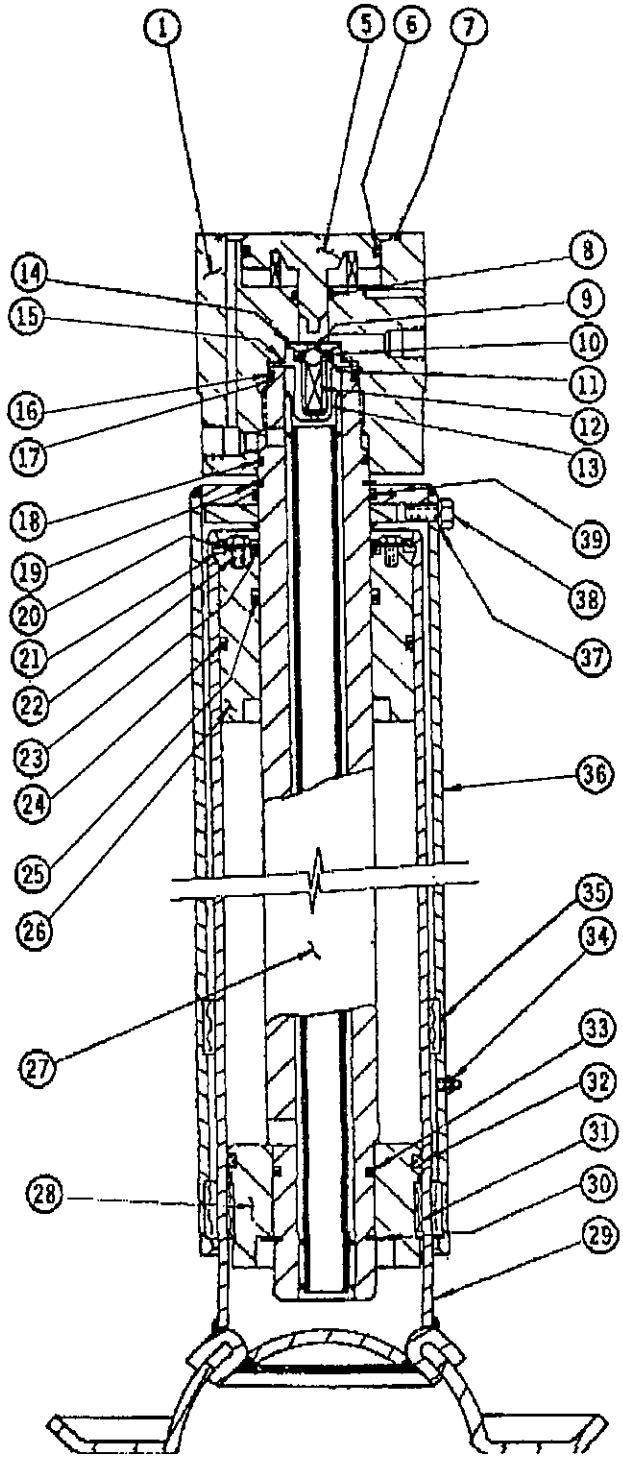

Figure 8-27 Dock Leveler Leg Items

LEG ITEMS, DOCK LEVELER

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-242-010147	COMPLETE ASSEMBLY, LEG CYLINDER (40,000# CAP.)	2
	101225	COMPLETE ASSEMBLY, CHECK VALVE (ITEMS 1-18)	1
4	15-1011	CAP SCREW, HEX	6
5	N/A	PISTON, CHECK VALVE	1
6	NSS	O-RING	1*
7	NSS	O-RING	1*
8	NSS	QUAD-RING	1*
9	19-10001	BALL, STEEL	1*
10	NSS	O-RING	1*
11	100532	O-RING, CHECK INSERT	1*
12	100212	SPRING	1*
13	100213	BODY, CHECK INSERT	1
14	100533	TOP, CHECK INSERT	1
15	NSS	O-RING	1*
16	NSS	O-RING	1*,**
17	NSS	WASHER, BACKUP	1*,**
18	NSS	O-RING	1*,**
19	17-1002	SNAP RING	1**
20	100278	RETAINER ASS'Y., CYLINDER HEAD (3-242-010147)	1
	100279	RETAINER ASS'Y., CYLINDER HEAD (3-242-010148)	1
21	17-1004	RING, RETAINER (3-242-010147)	1**
	17-1005	RING, RETAINER (3-242-010148)	1**
22	15-1012	CAP SCREW, HEX HEAD	4
23	NSS	SEAL, OIL	1
24	NSS	O-RING	1**
25	NSS	O-RING	1**
26	100216	HEAD, CYLINDER (3-242-010147)	1
	100276	HEAD, CYLINDER (3-242-010148)	1
27	100593	ROD, PISTON	1
28	100217	PISTON (3-242-010147)	1
	100277	PISTON (3-242-010148)	1
29	100542	TUBE, CYLINDER (3-242-010147)	1
	100926	TUBE, CYLINDER (3-242-010148)	1
30	17-1003	RING, SNAP	1**
31	NSS	RING, WEAR	1**
32	NSS	SEAL, PISTON	1**
33	NSS	O-RING	1**
34	10-1001	FITTING, GREASE	1
35	NSS	RING, WEAR	2**
36	100574	TUBE, WELL (3-242-010147)	1
	100926	TUBE, WELL (3-242-010148)	1
37	16-1002	WASHER, LOCK	1
38	15-1004	CAP SCREW, HEX HEAD (3-242-010147)	1
	15-1021	CAP SCREW, HEX HEAD (3-242-010148)	1
39	NSS	O-RING	1**

* - ITEMS ARE CONTAINED IN THE CHECK VALVE REPAIR KIT 100221 (NOT SOLD SEPARATELY).
** - ITEMS ARE CONTAINED IN THE LEG REPAIR KIT 100223 (FOR 3-242-010147) OR IN THE LEG REPAIR KIT 100422 (FOR 3-242-010148).
NSS: NOT SOLD SEPARATELY *N/A:* NOT AVAILABLE

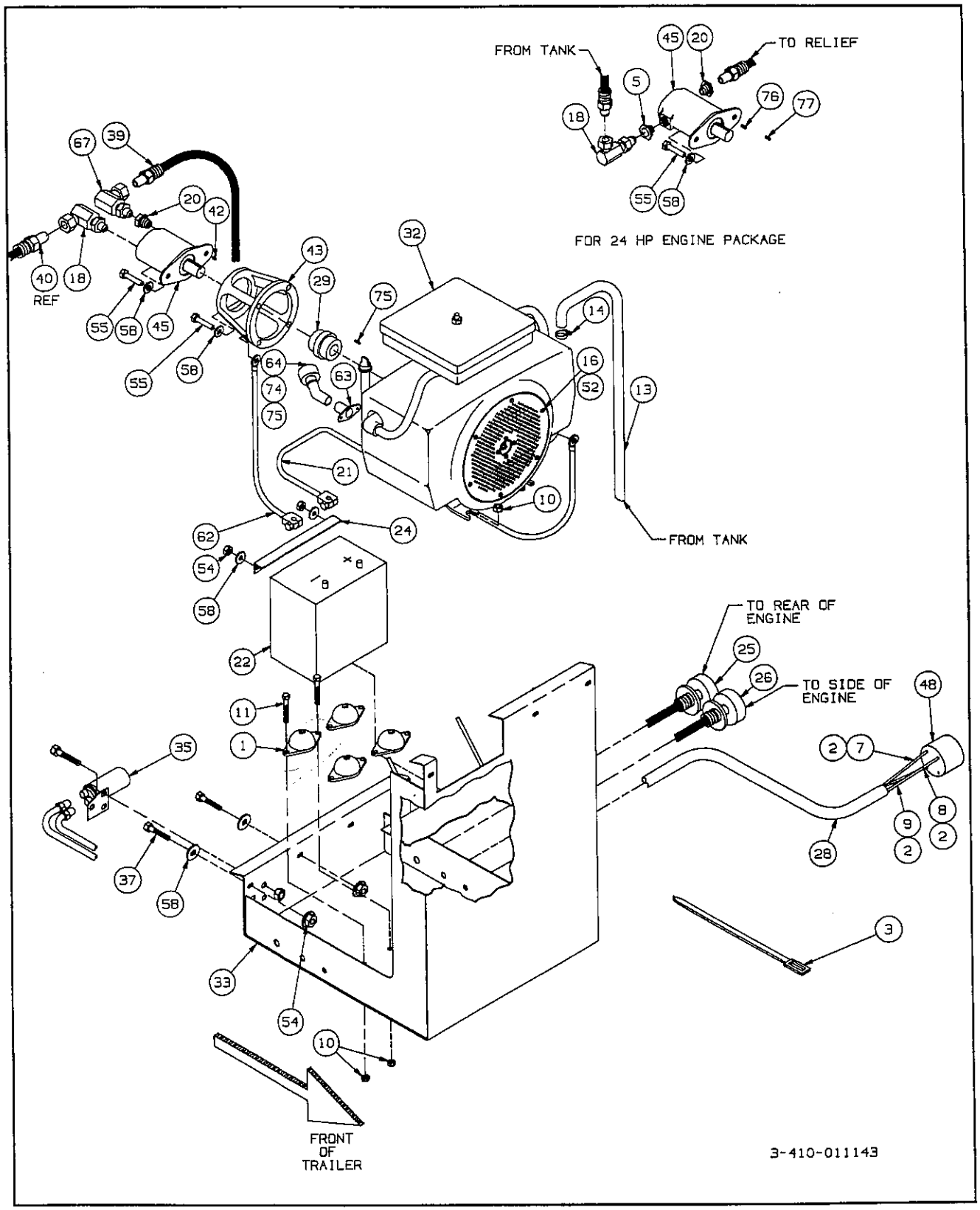

Figure 8-28 Hydraulic Power Auxiliary Engine (1 of 2)

AUXILIARY ENGINE ITEMS, HYDRAULIC POWER

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-273-010015-1	20 H.P. ENGINE PACKAGE	1
	3-273-010015-2	24 H.P. ENGINE PACKAGE	1
1	CA-1595	MACHINE MOUNT, 40 DROMETER	4
2	C01-412	RING TERMINAL (20 H.P. ENGINE)*	3*
3	T120R	TYTON STRAP	A/R
5	1-1/4X3/4BUSH	BLACK PIPE BUSHING (20 H.P. ENGINE)*	1*
7	1-879-010004	WIRE, RED, 14 AWG (20 H.P. ENGINE ONLY)	A/R
8	1-879-010006	WIRE, 14 AWG GREEN	A/R
9	1-879-010010	WIRE, 14 AWG, WHITE	A/R
10	1/2-13HFLN	NUT, HEX LOCK	12
11	1/2-13X1-1/2CS	SCREW, HEX CAP	12
13	104-0505	HOSE, FUEL LINE	A/R
14	105-0105	CLAMP, HOSE	2
16	134-4560	GUARD	1
18	2047-12-16S	ELBOW, 90°, SWIVEL PIPE	1
20	2081-16-8S	REDUCER, EXTERNAL/INTERNAL PIPE	1
21	239-8113-66	CABLE, BATTERY (-), AUX ENGINE	1
22	2481X	BATTERY, 12V	1
24	3-120-010124	BATTERY CLAMP BRKT	1
25	3-155-010012	CABLE, THROTTLE	1
26	3-153-010001	CABLE, CHOKE	1
28	3-201-010002	CONDUIT, PLASTIC FLEX	A/R
29	3-220-010003	FLEXIBLE COUPLING (20 HP. ENGINE ONLY)	1
	3-220-010002	FLEXIBLE COUPLING (24 H.P. ENGINE ONLY)	1
32	3-273-010006	ENGINE, 20 H.P.	1
	3-273-010013	ENGINE, 24 H.P.	1
33	3-482-010339	MOUNT, POWER CENTER WLDMNT	1
35	122-0554	ADAPT KIT, RMT OIL FILTER	1
37	1-654-010051-05	SCREW, HEX CAP	6
39	1-397-010311	HOSE ASSY	1
42	3-427-010003	KEY, WOODRUFF (20 H.P. ENGINE ONLY)	1
43	3-482-010003	20 H.P. HYDRAULIC PUMP MOUNT	1
45	3-591-010005	PUMP GEAR, HYDR, .75 CID (20 H.P. ENGINE ONLY)	1
	3-591-01003	HYDRAULIC GEAR PUMP, .878 CID (24 H.P. ENGINE ONLY)	1
48	3-765-010005	IGNITION SWITCH	1
52	3/16X3/4CS SELF	SCREW, HEX CAP, SELF DRILL	4
54	1-510-010001	NUT, FLANGE LOCK	12
55	1-654-010051-06	SCREW, HEX CAP	6
58	3/8FW	WASHER, FLAT	12
62	514-9045-66	CABLE, BATTERY (+), AUX ENGINE	1
63	541-0203	EXHAUST ADAPTER KIT (20 H.P. ENGINE ONLY)	1
	541-0257	EXHAUST ADAPTER KIT, (24 H.P. ENGINE ONLY)	1
64	542-7205	MUFFLER, KIT (20 HP. ENGINE ONLY)	1
67	2047-8-8S	ADAPTER	1
74	542-7101	MUFFLER, KIT (24 H.P. ENGINE ONLY)	1
75	110-4338	SQ KEY (20 H.P. ENGINE ONLY)	1**
76	110-4334	KEY (24 H.P. ENGINE ONLY)	1***
77	110-4348	KEY (24 H.P. ENGINE ONLY)	1**

NOTES:
* FOR 24 H.P. ENGINE: QUANTITY FOR ITEM 2 IS 6, ITEM 5 IS 2.
** ITEMS 75, 77 INCLUDED WITH ENGINE.
*** ITEM 76 INCLUDED WITH PUMP.

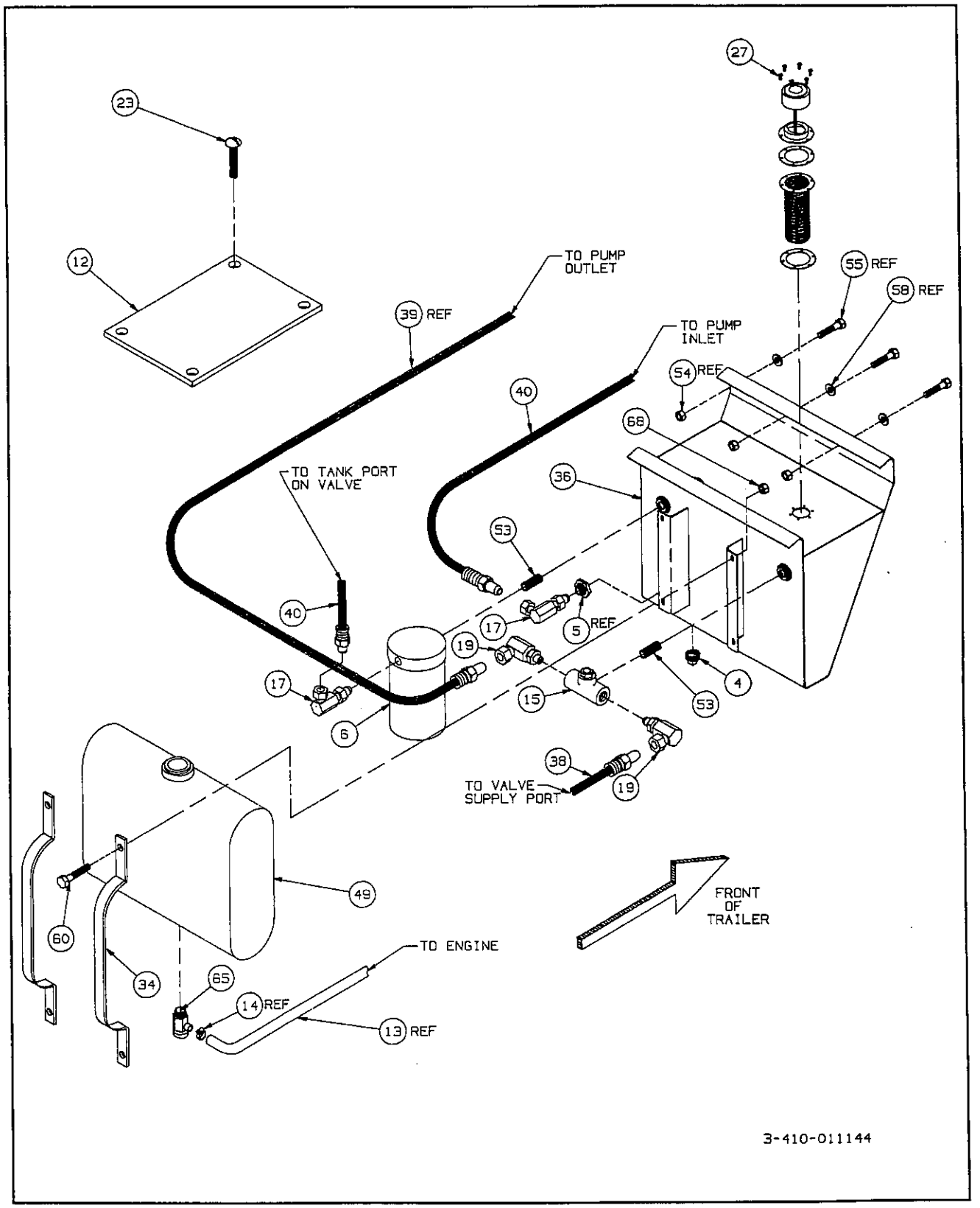

Figure 8-29 Hydraulic Power Auxiliary Engine (2 of 2)

AUXILIARY ENGINE ITEMS, HYDRAULIC POWER (CONT.)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
4	1-1/4 PIPE PLUG	BLACK, SQ HEAD	1
6	1-295-010001	FILTER, RETURN LINE	1
12	3-222-010120	COVER, SLOPE	2
15	125130	HYDRAULIC BY-PASS	1
17	2047-12-12S	PIPE, SWIVEL 90° MALE (20 H.P. ENGINE)*	2*
19	1-007-010013	SWIVEL, 90°	2
23	1-654-010089-13	SCREW, SOCKET BUTTON CAP	8
27	3-162-010001	FILLER BREATHER STRAINER ASSY	1
34	3-482-010342	MOUNT, BOLT-ON STRAP, FUEL TANK	2
36	3-786-010059	TANK, HYDRAULIC WLDMT	1
38	1-397-010332	HOSE ASSY	1
40	1-397-010313	HOSE ASSY	2
49	3-783-010006	TANK, FUEL	1
53	3/4NIPPLE	ALL THREAD NIPPLE	2
60	5/16-18X1-1/4CS	SCREW, HEX CAP	4
65	6600	VALVE, SHUT OFF, GAS WEATHERHEAD	1
68	5/16-18 HFLN	NUT, LOCKING HEX	4
72	1-879-010004	WIRE, RED 14 AWG [NOT SHOWN]	A/R

* FOR 24 HP. ENGINE: QUANTITY FOR ITEM 17 IS 3.

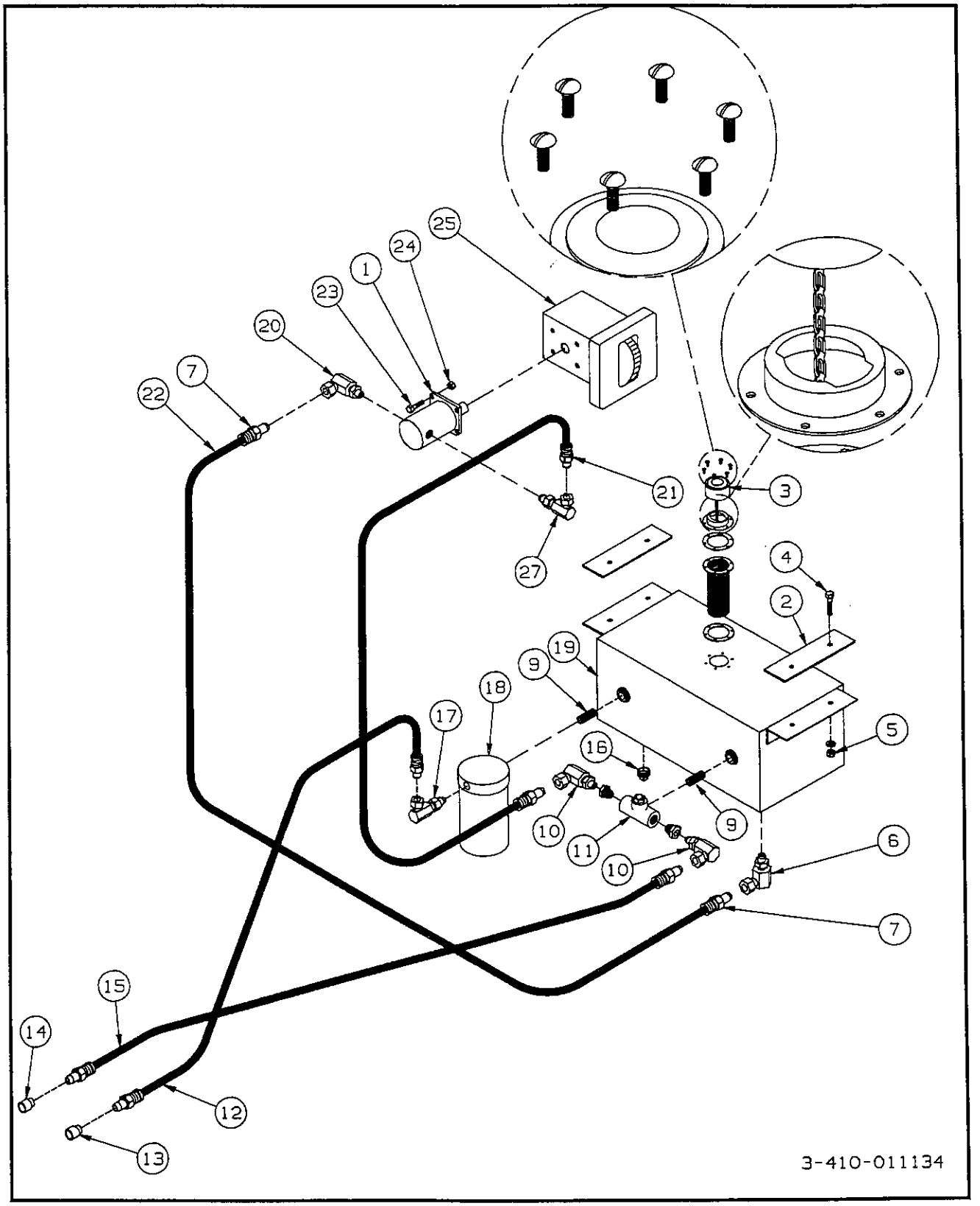

Figure 8-30 Transmission Mounted Wet Kit Items

TRANSMISSION MOUNTED WET KIT ITEMS

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-410-010839	KIT, COMPLETE WET	1
1	3-591-010001	PUMP, HYDRAULIC GEAR	1
2	3-120-010103	CLAMP, HYDRAULIC TANK	2
3	3-162-010001	FILLER, BREATHER STRAINER	1
4	3/8-16X1-1/4CS	CAP SCREW, HEX	4
5	3/8-16HFLN	NUT, LOCKING HEX	4
6	1-1/4ST ELL	ELBOW, 90°	1
7	3-561-010001	HOSE, BARB	2
8	6828	CLAMP, HOSE	2
9	3/4NIPPLE	NIPPLE, ALL THREAD	2
10	1-007-010013	SWIVEL, 90°	2
11	125130	BYPASS, HYDRAULIC	1
12	1-397-010075	HOSE, ASSEMBLY	1
13	S21F-6	COUPLER, MALE HALF	1
14	S25F-6	COUPLER, FEMALE HALF	1
15	3-397-010011	HOSE ASSEMBLY	1
16	1-1/4 PIPE PLUG	PLUG, BLACK PIPE	1
17	2047-12-12S	SWIVEL, 90°	1
18	1-295-010001	FILTER, RETURN	1
	1-295-010002	FILTER ELEMENT	1
19	3-786-010005	TANK, HYDRAULIC	1
20	1-007-010006	O-RING FITTING	2
21	6-397-010005	HOSE ASSEMBLY	1
22	3-399-010001048	HOSE, SUCTION	1
23	1/2-13X1-1/2CS	CAP SCREW, HEX	4
24	1/2SLW	WASHER, SPLIT LOCK	4
25	PTO*	POWER TAKEOFF	1
26	3/4ST ELL	ELBOW PIPE	1
27	1-007-010009'	O-RING FITTING	1

* IF IT BECOMES NECESSARY TO ORDER A NEW POWER TAKEOFF, HAVE READY THE TRANSMISSION MODEL NUMBER AND SERIAL NUMBER BEFORE CALLING THE PARTS DISTRIBUTION CENTER.

PUMP, WET KIT HYDRAULIC

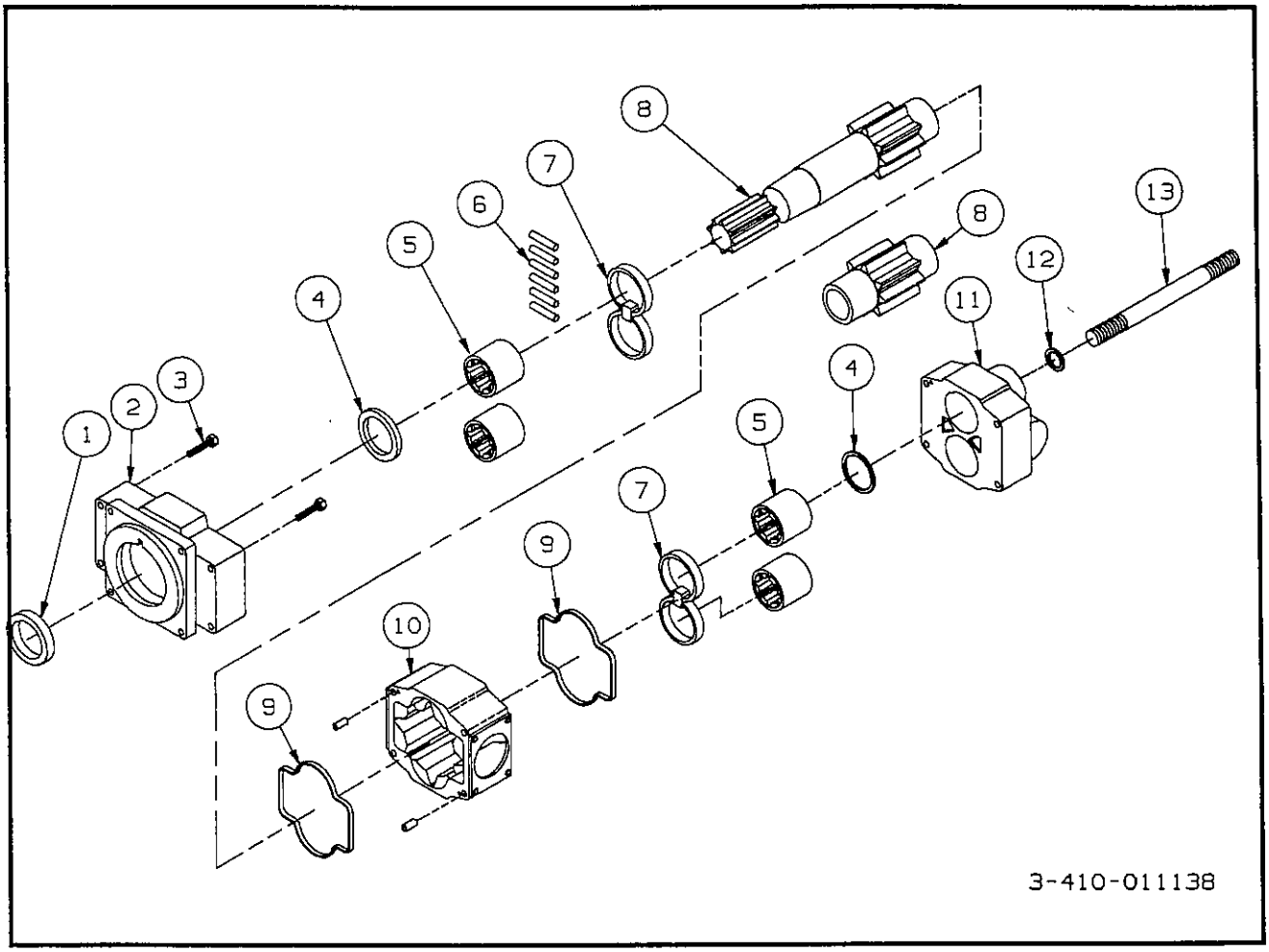

Figure 8-31 Wet Kit Pump Items

ITEM NO.	PART NO.	DESCRIPTION	QTY.
	3-591-010001	ASSEMBLY, COMPLETE WET KIT PUMP	1
1	X73-37-16	SEAL, SHAFT	1
2	EB 1685-3	COVER, SHAFT END	1
3	M 1391-K	CHECK	2
4	LB 1669-1	SEAL, RING	2
5	Y 1032	BEARING, ROLLER	4
6	BA 3026-2	STRIP, POCKET SEAL	1
7	AA 1058	PLATE, THRUST	2
8	BD 1135M-3-17	GEAR SET, SHAFT AND	1
9	UB 3006-242	GASKET, HOUSING	2
10	RA 1688-17-64	HOUSING	1
11	XA 1603	PORT END	1
12	X 144-3	WASHER	1
13	X2-25	STUD	1

MISCELLANEOUS OPTIONS

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	B3-619-015	RAMP, ALUMINUM SLOPE - 79-3/4"	2
	.1/2-13HFLN	NUT, LOCKING HEX	12
	.1/2-13X1-3/4CB	BOLT, CARRIAGE	12
	.3-014-010051	WELDMENT, RAMP ANCHOR	2
	.3-619-010073	WELDMENT, ALUMINUM RAMP	2
	.3/4-10HFN	NUT, HEX	4
	.3/4SLW	WASHER, SPLIT LOCK	4
2	B3-619-007	RAMP, ALUMINUM SLOPE - 60"	2
	.1/2-13HFN	NUT, HEX	6
	.1/2-13X1-3/4CB	BOLT, CARRIAGE	6
	.1/2SLW	WASHER,SPLIT	6
	.3-014-010061	WELDMENT, RAMP ANCHOR	2
	.3-619-010059	WELDMENT, ALUMINUM RAMP	2
	.3/4-10HFN	NUT, HEX	4
	.3/4SLW	WASHER, SPLIT LOCK	4
3	3-873-010128-2	317A WINCH INSTALLATION, 20K	
	1-654-010055-05	SCREW, HEX CAP	4, 8*
	1-861-010032-15	WASHER, PLAIN, TYPE A	8
	1-512-010005-09	NUT, HEX, SELF-LOCKING	12, 16*
	3-711-010028	SPACER, WINCH COVER	2**
	3-174-010038	CHAIN LINK, CONNECTING	1
	3-174-010039036	CHAIN, GR7	1
	7HCGHT500	1/2 CLEVIS GRAB HOOK	1
	1-654-010055-03	SCREW, HEX CAP	8
4	3-873-010127-2	317A WINCH INSLALLATION, 12K	
	1-654-010055-05	SCREW, HEX CAP	4, 8*
	1-861-010032-15	WASHER, PLAIN, TYPE A	8
	1-512-010005-09	NUT, HEX, SELF-LOCKING	12, 16*
	3-711-010028	SPACER, WINCH COVER	2**
	3-174-010038	CHAIN LINK, CONNECTING	1
	3-174-010022036	CHAIN, GR7	1
	7HCGHT500	1/2 CLEVIS GRAB HOOK	1
	1-654-010055-03	SCREW, HEX CAP	8
5	3-352-010026	GUIDE ASSY, WINCH CAPLE, SLOPE ROLLER	
	1-482-010326	MOUNT WLDMT, SLOPE ROLLER	1
	3-565-010770	PLATE, CABLE GUIDE LOCK	2
	1-654-010051-03	SCREW, HEX CAP	2
	1-861-010034-11	WASHER, LOCKING	2
	3-557-010383	PIN, CABLE GUIDE ROLLER	2
	1-298-010001-1	GREASE FITTING, STR	1
	5410	GREASE FITTING, 90°	1
	3-873-010040	CABLE ROLLER ASSY	2
	AA-1703-10	SLEEVE	4
6	3-352-010017-1	GUIDE INSTALLATION, WINCH CABLE, 12K	1
	1-512-010005-09	NUT, HEX, SELF-LOCKING	4
	1-654-010055-05	SCREW, HEX CAP	4
	3-352-010015-1	GUIDE ASSY, WINCH CABLE	1
	1-298-010001-1	FITTING, GREASE	2
	1-654-010051-03	SCREW, HEX CAP	2
	1-861-010034-11	WASHER, LOCKING, HELICAL SPRING	2
	3-557-010383	PIN, CABLE GUIDE ROLLER	2
	3-565-010770	PLATE, CABLE GUIDE LOCK	2
	3-120-010295	BRACKET WLDMT, 12K	1

* First quantity is upperdeck installation only. Second quantity is slope installation only.

MISCELLANEOUS OPTIONS (CONT.)

ITEM NO.	PART NO.	DESCRIPTION	QTY
7	3-352-010017-2	GUIDE INSTALLATION, WINCH CABLE, 20K	1
	1-512-010005-09	NUT, HEX, SELF-LOCKING	4
	1-654-010055-05	SCREW, HEX CAP	4
	3-352-010015-2	GUIDE ASSY, WINCH CABLE, 20K	1
	1-298-010001-1	FITTING, GREASE	2
	1-654-010051-03	SCREW, HEX CAP	2
	1-861-010034-11	WASHER, LOCKING, HELICAL SPRING	2
	3-557-010383	PIN, CABLE GUIDE ROLLER	2
	3-565-010770	PLATE, CABLE GUIDE LOCK	2
	3-120-010294	BRACKET WLDMT, 20K	1

NOTES: