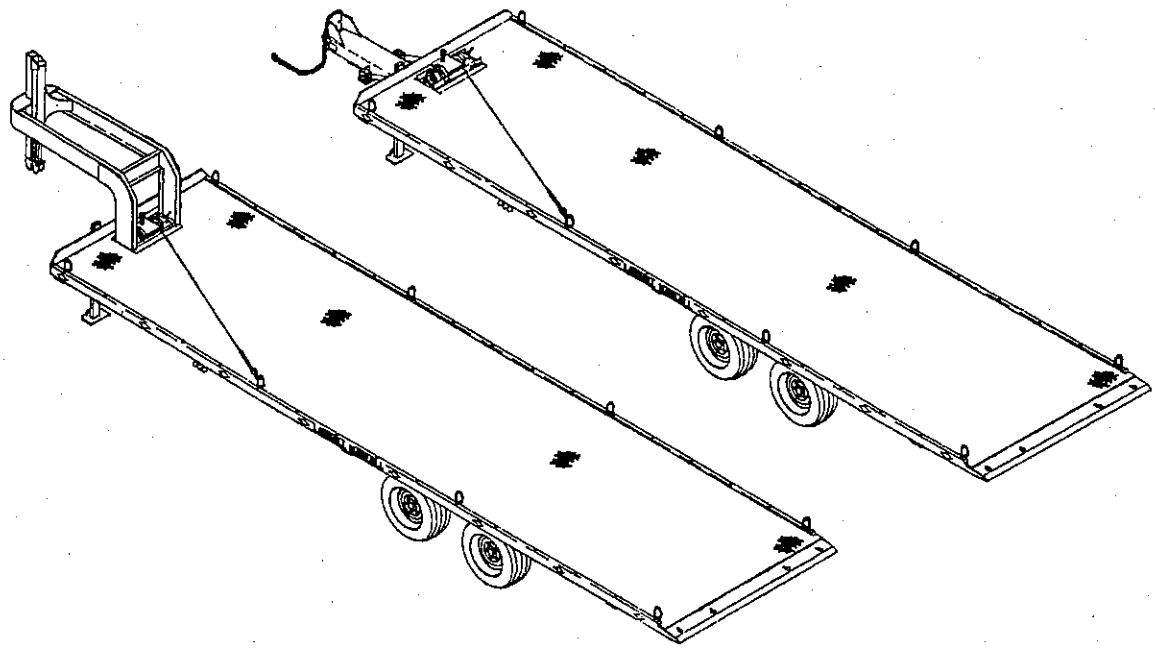
LANDOLL
MARYSVILLE, KANSAS

MODEL 300
SEMITRAILER
OWNER'S MANUAL



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.

MODEL 300
GOOSENECK SEMITRAILER
OWNER'S MANUAL

PURCHASED FROM: _____ DATE ____ / ____ / ____

ADDRESS: _____

_____

_____

PHONE NO.: _____ SERIAL NO.: _____

FORM NO. F-151-1193 11/93

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REPORTING SAFETY DEFECTS

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Landoll Manufacturing.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Landoll Manufacturing.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (or 366-0123 in Washington, D.C. area) or write to: NHTSA, U.S. Department of Transportation, Washington, D.C. 20590. You can also obtain other information about motor vehicle safety from the Hotline.

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

LANDOLL CORPORATION
SALES AND SERVICE
1900 NORTH 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

INTRODUCTION 1

This manual provides operating, servicing, and maintenance instructions, with detailed parts lists for Model 300 gooseneck semitrailer, manufactured by Landoll Corporation, Marysville, Kansas 66508.

SECTION 1 gives basic instructions on the use of this manual.

SECTION 2 gives specifications for the semitrailer, including measurements and component specifications. A Standard Bolt Torque Table is provided to give guidelines for bolt torques to be used when servicing this product.

SECTION 3 gives instructions for the proper operation of the equipment.

SECTION 4 gives general maintenance procedures, a maintenance schedule, and a lubrication schedule. Improper maintenance will void your warranty.

IF YOU HAVE ANY QUESTIONS CONTACT:

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

SECTION 5 is a troubleshooting guide to aid in diagnosing and solving problems with the semitrailer.

SECTION 6 is an illustrated parts lists of the various assemblies, subassemblies, and systems. Refer to this section when ordering Landoll replacement parts. Order parts from your Landoll dealer or call the Landoll Parts Distribution Center at:

(913) 562-4650 or
(800) 423-4320 or
FAX: (913) 562-4654

WARRANTY The Warranty Registration Card is located inside the front cover of the manual. It is postage paid if mailed within the United States. Fill it out and mail it within 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.

COMMENTS Address comments or questions regarding this publication to:

LANDOLL CORPORATION
1900 NORTH STREET
MARYSVILLE, KANSAS 66508
ATTENTION: PUBLISHING - DEPT. 73

STANDARD SPECIFICATIONS 2

CAPACITY*: ..... 16,000 LB.

KING PIN SETTING: ..... 5"

UNDERCARRIAGE TRAVEL: ..... 10'-6"

LOAD ANGLE: ..... 7°

SPECIFIC BOLT TORQUES

SUSPENSION SYSTEM:

AXLE CLAMP U-BOLTS**:	120 FT.-LBS.
EQUALIZER BOLT	375-425 FT.-LBS.
SPRING EYE BOLT	225-275 FT.-LBS.

WHEEL FASTENERS - ALL MODELS:

5/8" FLANGED NUT (BEFORE FEB 92)	275-325 FT.-LBS.
5/8" SWIVELING FLANGED NUT (AFTER FEB 92)	250-300 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.

LANDOLL CORPORATION
GENERAL TORQUE SPECIFICATIONS (REV. 4/97)

THIS CHART PROVIDES TIGHTENING TORQUES FOR GENERAL PURPOSE APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.
ASSEMBLY TORQUES APPLY TO PLATED NUTS AND CAPSCREWS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED.
WHEN FASTENERS ARE DRY (SOLVENT CLEANED), ADD 33% TO AS RECEIVED CONDITION TORQUE.
BOLT HEAD IDENTIFICATION MARKS INDICATE GRADE AND MAY VARY FROM MANUFACTURER TO MANUFACTURER.
THICK NUTS MUST BE USED ON GRADE 8 CAPSCREWS.
USE VALUE IN [ ] IF USING PREVAILING TORQUE NUTS.
TORQUE IS SPECIFIED IN FOOT POUNDS

UNC Size	SAE Grade 2		SAE Grade 5		SAE Grade 8		UNF Size	SAE Grade 2		SAE Grade 5		SAE Grade 8	
1/4-20	4	[5]	6	[7]	9	[11]	1/4-28	5	[6]	7	[9]	10	[12]
5/16-18	8	[10]	13	[16]	18	[22]	5/16-24	9	[11]	14	[17]	20	[25]
3/8-16	15	[19]	23	[29]	35	[43]	3/8-24	17	[21]	25	[31]	35	[44]
7/16-14	24	[30]	35	[43]	55	[62]	7/16-20	27	[34]	40	[50]	60	[75]
1/2-13	35	[43]	55	[62]	80	[100]	1/2-20	40	[50]	65	[81]	90	[112]
9/16-12	55	[62]	80	[100]	110	[137]	9/16-18	60	[75]	90	[112]	130	[162]
5/8-11	75	[94]	110	[137]	170	[212]	5/8-18	85	[106]	130	[162]	180	[225]
3/4-10	130	[162]	200	[250]	280	[350]	3/4-16	150	[188]	220	[275]	320	[400]
7/8-9	125	[156]	320	[400]	460	[575]	7/8-14	140	[175]	360	[450]	500	[625]
1-8	190	[237]	408	[506]	680	[850]	1-14	210	[263]	540	[675]	760	[950]
1-1/8-7	270	[337]	600	[750]	960	[1200]	1-1/8-12	300	[375]	660	[825]	1080	[1350]
1-1/4-7	380	[475]	840	[1050]	1426	[1782]	1-1/4-12	420	[525]	920	[1150]	1500	[1875]
1-3/8-6	490	[612]	110	[1375]	1780	[2225]	1-3/8-12	560	[700]	1260	[1575]	2010	[2512]
1/1-2-6	650	[812]	1460	[1825]	2360	[2950]	1/1-2-12	730	[912]	1640	[2050]	2660	[3325]

METRIC

COARSE THREAD METRIC CLASS 10.9 FASTENERS AND CLASS 10.0 NUTS AND THROUGH HARDENED FLAT WASHERS, PHOSPHATE COATED, ROCKWELL "C" 38-45.
USE VALUE IN [ ] IF USING PREVAILING TORQUE NUTS.

Nominal Thread Diameter mm	Standard Torque				Nominal Thread Diameter mm	Standard Torque			
	Newton-Meters		Foot-Pounds			Newton-Meters		Foot-Pounds	
6	10	[14]	7	[10]	20	385	[450]	290	[335]
7	16	[22]	12	[16]	24	670	[775]	500	[625]
8	23	[32]	17	[24]	27	980	[1105]	730	[825]
10	46	[60]	34	[47]	30	1330	[1470]	990	[1090]
12	80	[101]	60	[75]	33	1790	[1950]	1340	[1450]
14	125	[155]	90	[115]	36	2325	[2515]	1730	[1870]
16	200	[240]	150	[180]	39	3010	[3210]	2240	[2380]
18	275	[330]	205	[245]					

Table 2-1 General Torque Specifications

LANDOLL CORPORATION
HYDRAULIC FITTING TORQUE SPECIFICATIONS
37° JIC, ORS, & ORB (REV. 10/97)

THIS CHART PROVIDES TIGHTENING TORQUES FOR HYDRAULIC FITTING APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.
ASSEMBLY TORQUES APPLY TO PLATED CARBON STEEL AND STAINLESS STEEL FITTINGS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED.
BRASS FITTINGS AND ADAPTERS - 65% OF THE TORQUE VALUE FOR STEEL. STAINLESS STEEL, ALUMINUM AND MONEL - THREADS ARE TO BE LUBRICATED.
TORQUE IS SPECIFIED IN FOOT POUNDS

PARKER BRAND FITTINGS

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-13	15-17	13-15
-5	14-16	—	21-23
-6	20-22	34-36	25-29
-8	43-47	58-62	40-44
-10	55-65	100-110	57.5-62.5
-12	80-90	134-146	75-85
-16	115-125	202-218	109-121
-20	160-180	248-272	213-237
-24	185-215	303-327	238-262
-32	250-290	—	310-340

LANDOLL CORPORATION
HYDRAULIC FITTING TORQUE SPECIFICATIONS
37° JIC, ORS & ORB (REV. 10/97)

THIS CHART PROVIDES TIGHTENING TORQUES FOR HYDRAULIC FITTING APPLICATIONS WHEN SPECIAL TORQUES ARE NOT SPECIFIED ON PROCESS OR DRAWING.
ASSEMBLY TORQUES APPLY TO PLATED CARBON STEEL AND STAINLESS STEEL FITTINGS ASSEMBLED WITHOUT SUPPLEMENTAL LUBRICATION (AS RECEIVED CONDITION). THEY DO NOT APPLY IF SPECIAL GRAPHITE MOLY-DISULFIDE OR OTHER EXTREME PRESSURE LUBRICANTS ARE USED.
BRASS FITTINGS AND ADAPTERS - 65% OF THE TORQUE VALUE FOR STEEL.
TORQUE IS SPECIFIED IN FOOT POUNDS.

AEROQUIP BRAND FITTINGS

Dash Size	37 Degree JIC	O-Ring (ORS)	O-Ring Boss (ORB)
-4	11-12	10-12	14-16
-5	15-16	—	18-20
-6	18-20	18-20	24-26
-8	38-42	32-35	50-60
-10	57-62	46-50	72-80
-12	79-87	65-70	125-135
-14	—	—	160-180
-16	108-113	92-100	200-220
-20	127-133	125-140	210-280
-24	158-167	150-165	270-360
-32	245-258	—	—

Table 2-2 Hydraulic Fitting Torque Specifications

OPERATING INSTRUCTIONS 3

This section provides instructions for the proper operation of the semitrailer. A description of the location and use of each of the controls on this semitrailer is provided. Read all instructions, warnings, cautions and danger notes before attempting to operate the semitrailer.

A hydraulic pump must be coupled to the trailer hydraulic system, or the optional hydraulic engine package started, before using hydraulic controls.

⚠ WARNING

DO NOT OPERATE THE SEMITRAILER WITH ANY KNOWN FAULT THAT MIGHT ENDANGER THE OCCUPANTS, NEARBY WORKERS, OTHER TRAFFIC, THE LOAD, OR THE EQUIPMENT.

3-1 PRE-COUPLING OF SEMITRAILER AND TRACTOR

3-1.1 Swivel Hitch

a. Slowly back the tractor up under the front of the trailer hitch until the hitch clevis on the trailer is centered above the swivel hitch on the truck bed within 1".

3-1.2 Pintle Hitch

a. Slowly back the tractor up to the front end of the semitrailer so the hook on the tractor lines up with the pintle eye on the semitrailer hitch.

3-1.3 Fifth Wheel Hitch

a. Slowly back the tractor up to the front end of the semitrailer so the kingpin of the semitrailer is centered between the tractor fifth wheel jaws. Stop the tractor several inches ahead of the semitrailer. Set the tractor parking brake.

b. The king pin plate should be the same height as, or slightly lower than, the latch area of the fifth wheel plate of the tractor. If necessary, connect the tractor hydraulic lines or start the trailer hydraulic power engine. Use the **5th WHEEL** lever (**see Figure 3-2**) to raise or lower the kingpin plate sufficiently to allow proper coupling.

3-1.4 Drain all air and moisture from the tractor air brake system in accordance with the tractor manufacturer's instructions.

3-1.5 Connect the hydraulic lines unless your trailer is equipped with the auxiliary hydraulic power engine package.

3-1.6 Connect the service and emergency air hoses of the tractor to their respective quick couplers on the front of the semitrailer. The **red emergency line to** the quick coupler with the **"SUPPLY"** tag, and the **blue service line to** the quick coupler with the **"CONTROL"** tag. (Trailers equipped with the full air brake option will have gladhands tagged emergency and service in place of quick couplers.) Chock the semitrailer wheels before activating the semitrailer air supply valve in the tractor. Set the semitrailer brakes.

3-1.7 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 quick coupler. Semitrailer brakes should promptly set.

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

3-2 COUPLING OF THE TRACTOR TO THE SEMITRAILER

⚠ DANGER

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

3-2.1 Verify the semitrailer wheels are chocked and brakes function proper.

3-2.2 Hitch semitrailer using one of the following three methods:

a. Swivel Hitch (see Figure 3-1). With the hydraulic power operating, use the **5th Wheel** lever to lower the hitch clevis onto the swivel hitch. Install the hitch pin through the clevis and swivel hitch and secure with the lynch pin.

b. Pintle Hitch. Slowly back the tractor until the pintle eye slides into the pintle hook and locks in place. Hook the safety chains to the tractor.

c. Fifth Wheel Hitch. Make sure the tractor's fifth wheel coupler is open. Slowly back the tractor so its 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.

3-2.3 Try to pull the tractor forward a few inches to verify the vehicle coupling is secure. If the tractor disconnects from the semitrailer: locate the source of the coupling failure; repair before continuing; and repeat Step 3-2.2.

⚠ CAUTION

PUSHING SEMITRAILER BACKWARDS CAN DAMAGE LANDING GEAR.

3-2.4 Check that the tractor couples securely to the semitrailer before setting tractor and semitrailer parking brakes.

NOTE: Keep brakes engaged for remainder of coupling, check-out, and parking.

3-2.5 Connect the trailer's 7-way electrical plug to the electrical receptacle on the truck bed.

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

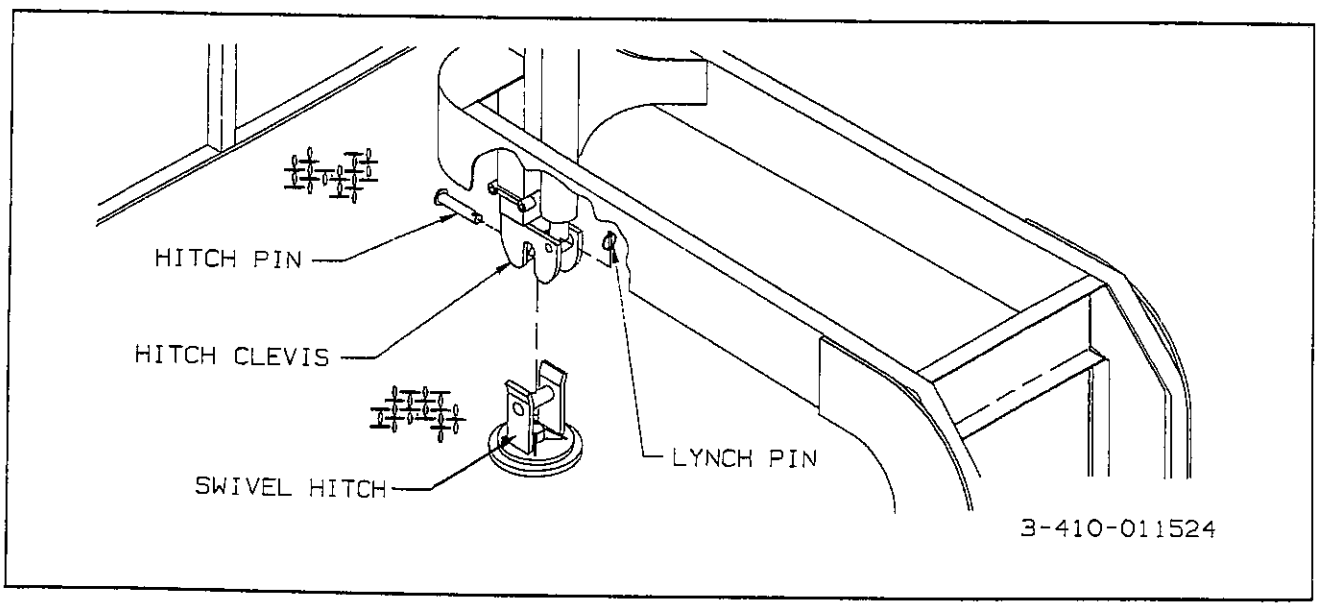

Figure 3-1 Swivel Hitch Coupling

3-3 TRACTOR AND SEMITRAILER CHECK-OUT

3-3.1 While hydraulic power is operating, raise the front end of the semitrailer with the 5th WHEEL lever (see **Figure 3-2**) until weight is off the landing gear. Raise the landing gear. Secure each leg in fully retracted position, with a park stand retaining pin, before transporting.

⚠ WARNING

LANDING GEAR LEGS MUST BE FULLY RETRACTED AND SECURED WITH PINS BEFORE OPERATING OR MOVING SEMITRAILER.

3-3.2 Lower the front end with the **5th WHEEL** lever until the semitrailer is fully lowered. Hold lever in the down position until hydraulic system works against the bottomed out hydraulic tilt cylinders.

3-3.3 Verify that the traveling undercarriage is completely slid back to transport position. Shut off hydraulic power.

3-3.4 Check the operation of all lights and signals on the semitrailer for proper response to switch positions (stop, right turn, left turn and clearance).

3-3.5 Check that tire inflation matches the pressure listed on the tire.

3-3.6 Check tractor/semitrailer rig for air leaks. If air leakage is found, repair the defect before transporting.

3-3.7 Check that the oil in each hub is at the proper level and free from contamination. If hubs contain water, dirt, or other foreign matter, clean them before transporting.

3-3.8 Check tractor air pressure. Pressure must not fall below 65 psi for air brakes; 80 psi for air/hydraulic brakes; or 15 inches of vacuum for vacuum/hydraulic brakes, even after activating brakes several times. Set parking brake and carefully remove all wheel chocks. Set emergency brake and try pulling forward. The semitrailer wheels must not rotate. If semitrailer brakes do not apply, do not transport until defect, or defects, are repaired.

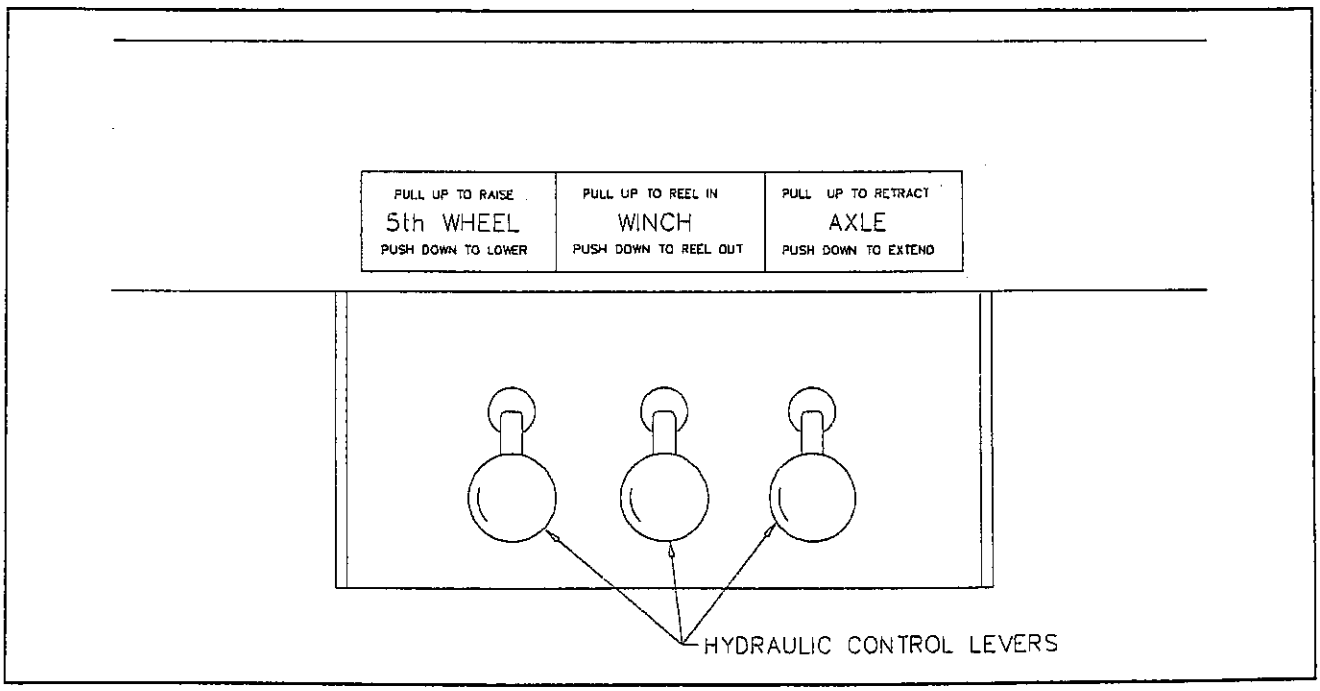

Figure 3-2 Hydraulic Control Levers

3-4 TOWING THE SEMITRAILER

3-4.1 Driving the tractor with the semitrailer coupled behind requires constant attention to the overall length. Turning, passing, accelerating, braking, stopping, and back-up require special considerations. When executing steep grades or turning tight curves, the semitrailer must not be allowed to push the tractor, or jackknifing may result. Application of the semitrailer brakes to keep the semitrailer in tow will help prevent this situation. To assure control, brake before descending a hill or attempting a curve.

3-4.2 Make a moving test of the semitrailer brakes at low, and medium speeds before traveling at highway speed.

3-4.3 Monitor the air pressure gauge on the dash of the tractor. Pressure should not fall below 90 psi at any time.

⚠ CAUTION

WHEN OPERATING TRAILER, DO NOT BACK OVER CURB. THIS WILL CAUSE SEVERE DAMAGE TO UNDERCARRIAGE AND UNDERCARRIAGE CYLINDER.

3-4.4 The semitrailer wheels track to the inside of the tractor 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.

3-4.5 To stop, use a gradual and smooth application of brakes. If grabbing occurs, apply less pressure. Grabbing brakes are not efficient.

⚠ DANGER

ALWAYS CHECK BEHIND AND UNDER THE TRACTOR AND SEMITRAILER FOR PERSONS OR OBJECTS BEFORE MOVING. FAILURE TO CHECK CAN LEAD TO SERIOUS PERSONAL INJURY, DEATH, OR DAMAGE TO PROPERTY.

3-4.6 Backing should be done with care. Tail overhang, semitrailer length, and allowable space must be taken into consideration.

3-5 PARKING THE SEMITRAILER

3-5.1 Position tractor/trailer rig on a level, solid surface.

3-5.2 Set the **PARKING BRAKE**, not the semitrailer emergency hand brake, and check for proper brake holding.

3-5.3 Chock wheels.

3-5.4 Check for any air leaks in lines, relay valve, brake pods, or any other air system component.

⚠ WARNING

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.

3-6 UNCOUPLING TRACTOR FROM SEMITRAILER

3-6.1 Park the semitrailer according to instructions in **Paragraph 3-5.**

3-6.2 Remove retaining pin and lower landing gear (park stands) to the ground. Hydraulically raise the front end of the semitrailer until the next hole in the landing gear is available. Insert lock pin through the landing gear brackets and the legs of the landing gear.

3-6.3 Uncouple the semitrailer using one of the following methods:

a. Swivel Hitch. Remove the hitch pin from the hitch clevis. Hydraulically raise the trailer so the clevis clears the swivel hitch.

b. Pintle Hitch. Hydraulically lower the semitrailer onto the legs. Unlatch the pintle hook.

c. Fifth Wheel Hitch. Hydraulically lower semitrailer onto the legs. Pull the tractor fifth wheel plate latch release.

3-6.4 Disconnect emergency and service air lines.

3-6.5 Disconnect the 7-way cable and hydraulic lines from the semitrailer and store with the tractor.

3-6.6 Attempt to pull the tractor forward. If the tractor uncouples, verify that all service lines are disconnected and semitrailer wheels are chocked. If tractor does not disconnect, repeat Step 3-6.3.

3-6.7 Pull the tractor away from the semitrailer.

3-7 LOADING AND UNLOADING THE SEMITRAILER

⚠ WARNING

1. THE SEMITRAILER MUST BE COUPLED TO A TRACTOR AND THE LANDING GEAR RAISED OFF THE GROUND BEFORE OPERATING.
2. DO NOT EXCEED THE GROSS AXLE WEIGHT RATINGS FOR ANY AXLE ON YOUR VEHICLE. THE COMBINED WEIGHT OF THE TRACTOR, SEMITRAILER, AND CARGO MUST NOT EXCEED THE GROSS VEHICLE WEIGHT RATING (GVWR) OF THE TRACTOR.

3-7.1 5th WHEEL Lever

The **5th WHEEL** Lever is located on the driver side of the semitrailer under the outer frame siderail (**see Figure 3-2**). It has three positions:

PULL In this position, the front end of the semitrailer rises to the load position.

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

PUSH In this position, the front end of the semitrailer lowers to the transport position.

3-7.2 AXLE Control Lever

The **AXLE** control lever (**see Figure 3-2**) is the control on the right with three positions:

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

CENTER This is the neutral position.

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

3-7.3 Loading Procedure

a. Park the tractor/trailer in a straight line on a level even surface. Set the tractor brakes and release the semitrailer brakes.

b. Engage the tractor P.T.O. or start and warm up the auxiliary hydraulic power engine following engine operating instructions in **paragraph 3-11.**

c. Using the **5th WHEEL** lever raise the front of the semitrailer to the approximate loading angle.

d. Using the **AXLE** lever, pull the axles to the full forward position.

e. Adjust the semitrailer angle until the rear of the trailer rests on the ground.

⚠ CAUTION

DO NOT ALLOW THE BACK SEMITRAILER AXLE TO LEAVE THE GROUND. THIS CAN RESULT IN DAMAGE TO THE SEMITRAILER.

f. Winch or drive the load onto the semitrailer. Insure that the load is steering straight up onto the semitrailer and does not maneuver off the side of the semitrailer. Continue until load center of gravity is just ahead of the axles. The load should never place more weight on the kingpin than on the rear axles during loading or unloading.

⚠ DANGER

THE CENTER OF GRAVITY OF THE LOAD MUST BE IN FRONT OF THE CENTER OF THE UNDERCARRIAGE WHENEVER THE APPROACH PLATE IS NOT SUPPORTED BY THE GROUND. FAILURE TO DO THIS CAN CAUSE THE SEMITRAILER TO TILT BACK RESULTING IN INJURY OR DEATH.

g. Securely tiedown the load and securely attach the winch cable to the front of the load, if it is not already attached. Reel in winch cable until it becomes tight. (Winch cable serves as a safety in case load tiedown fails but is not to replace tiedowns.)

h. Slide the axles all the way back.

i. Lower the front of the semitrailer until it is in the level position.

⚠ CAUTION

MAXIMUM CONCENTRATED LOAD IN A 10 FT. AREA IS 16,000 LBS.

j. Disengage the P.T.O. system of the tractor or shut down the auxiliary hydraulic power engine following operating instructions in **paragraph 3-11.**

3-7.4 Unloading Procedure (see Figure 3-3):

a. Park the tractor/trailer in a straight line on a level even surface. Set the tractor brakes and release the semitrailer brakes.

b. Engage tractor P.T.O. or start and warm up the auxiliary hydraulic power engine following engine operating instructions in **paragraph 3-11.**

c. Insure that the winch cable is firmly attached to the load and sufficient tension is on the cable so load securing devices can be safely removed.

d. Using the **5th WHEEL** lever, raise the front of the semitrailer to the approximate loading angle. If the load is unbalanced with more weight on the king pin than on the trailer axles, pull the axles a few feet forward to balance out the load before tilting the trailer.

e. Using the **AXLE** lever, pull the axles to the full forward position.

f. Adjust the semitrailer angle until the rear of the trailer rests on the ground.

g. With load securing devices removed, reel out the winch so that the load moves back towards the rear of the semitrailer. Insure that the load is steering straight so it does not maneuver off the side of the semitrailer.

h. After load is completely off the rear of the semitrailer, secure it so it will not move, and disconnect winch cable.

i. Lower the front of the semitrailer and slide the axles all the way back.

j. Disengage the P.T.O. system of the tractor or shut down the auxiliary hydraulic power engine following operating instructions in **paragraph 3-11.**

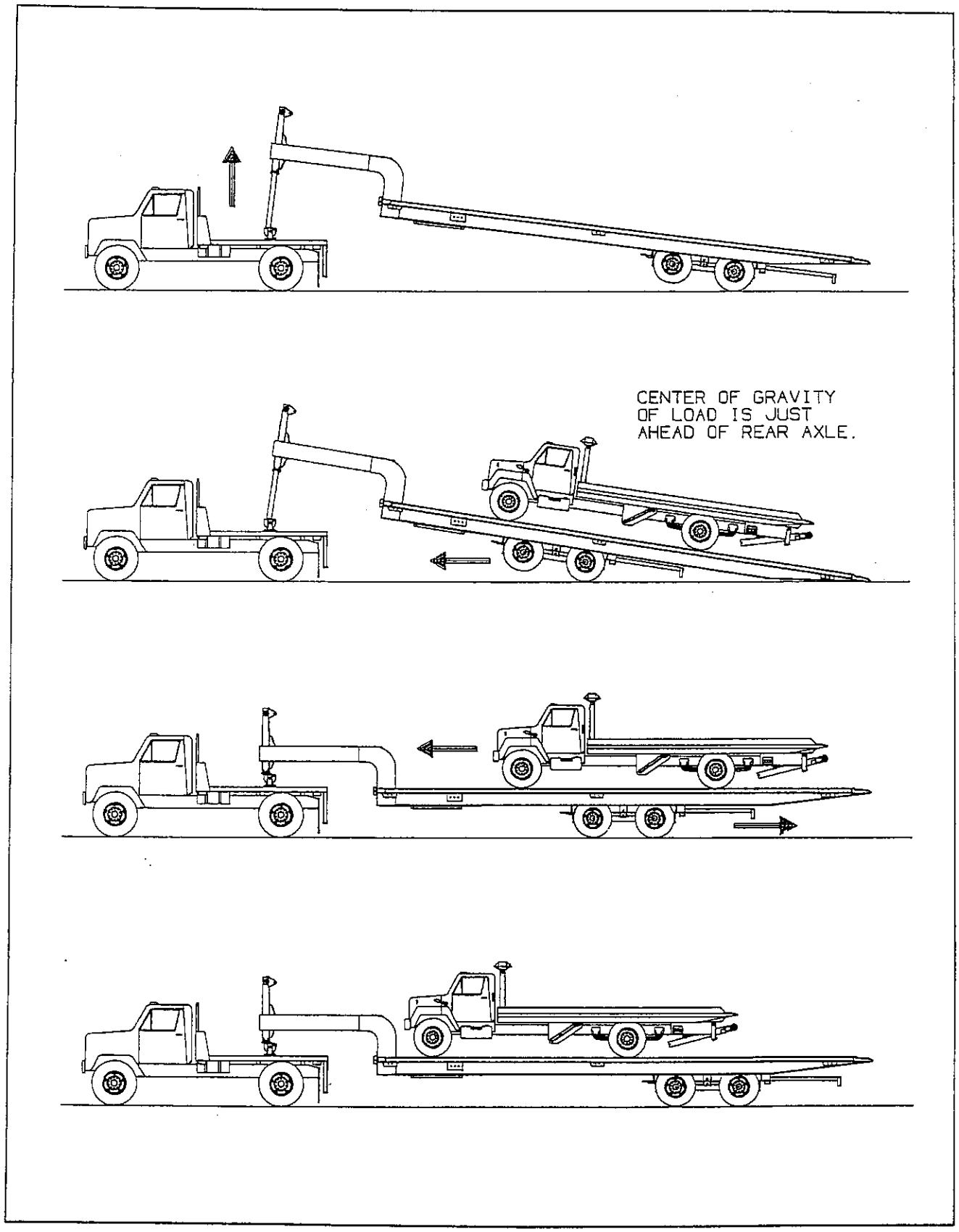

Figure 3-3 Steps for Loading and Unloading

3-8 OPERATION UNDER UNUSUAL CONDITIONS

3-8.1 Cold Weather Operation

a. Cold weather causes lubricants to congeal, and insulation and rubber parts to become hard, which may lead to problems in bearings, electrical systems, and air systems. Moisture attracted by warm parts can condense, collect and freeze to immobilize equipment. The tractor/trailer operator must always be alert for indicators of cold weather malfunctions.

b. 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.

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

d. Check tire inflation. Tire inflation decreases when the temperature decreases.

e. 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.

3-8.2 Hot Weather Operation

a. Hot weather operation can cause expansion of parts resulting in tightening of bearings, fasteners, and moving parts. Failure of gaskets or seals can occur.

b. 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.

c. Check tire pressure early in the day before beginning operations while the tire is cool. Put all valve stem caps back on after checking.

d. If the area is extremely humid, protect electrical terminals with ignition insulation spray. Coat paint and bare metal surfaces with an appropriate protective sealer.

e. The use of a filter-lubricator in the tractor's air delivery system is recommended.

3-9 COMBINE WELL OPERATION

3-9.1 Tilt trailer for loading as described on Page 3-6.

3-9.2 Back the combine onto the trailer until the steering wheels are past the combine wells.

3-9.3 Pull each combine well up and out so the support bar on the combine well clears the slot on the frame.

3-9.4 Pull the combine wells out until they line up with the drive wheels of the combine. Lower the wells onto the ground. The safety chain on the bumper will keep the combine well from sliding completely out of the bumper.

3-9.5 Back the combine until the drive wheels are centered on the combine well.

3-9.6 Level the trailer for transport as described on Page 3-6.

3-9.7 Reverse the procedure to unload the combine and stow the combine wells.

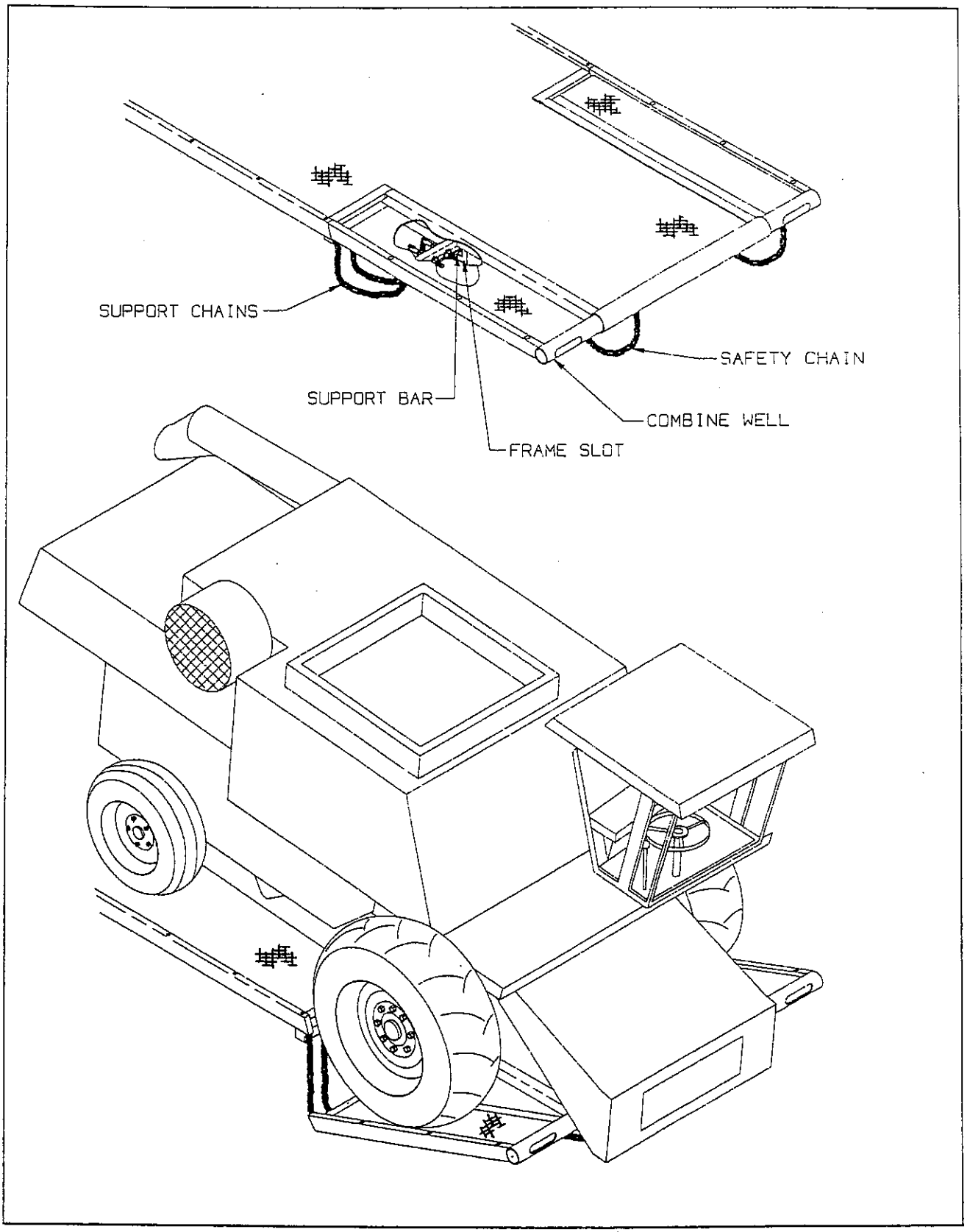

Figure 3-4 Combine Well Operation

DANGER

1. THE WINCH IS NOT DESIGNED OR INTENDED TO BE USED FOR LIFTING OR MOVING PEOPLE. USING IT THIS WAY CAN CAUSE SERIOUS INJURY OR DEATH.
2. 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 IF PEOPLE ARE IN THE PATH OF THE ROLLING LOAD.
3. FAILURE TO LEAVE AT LEAST FIVE WINCH CABLE WRAPS ON THE WINCH CABLE SPOOL COULD ALLOW THE CABLE TO COME OFF THE SPOOL, RESULTING IN SERIOUS PERSONAL INJURY OR DEATH.

3-10.1 The Winch Clutch (see Figure 3-5) is on the curbside of the winch assembly. It engages or disengages the winch.

a. 12,000# Winch Clutch.

The winch clutch handle must be pulled out to change positions and pushed in to lock into one of two positions:

DOWN In this position, the winch is disengaged and The cable can "free-wheel".

UP In this position, the winch is engaged and the cable can be "power" spooled in or out. The winch is now controlled by the **WINCH** hydraulic lever.

3-10.2 The **WINCH** hydraulic lever (see Figure 3-2) is the center lever. It is a three position control:

PULL In this position, cable is "power" spooled onto the spool.

CENTER This is neutral position.

PUSH In this position, cable is "power" spooled off the spool.

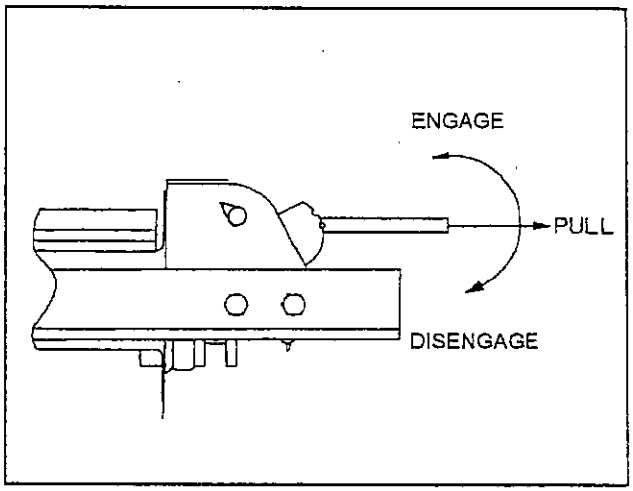

Figure 3-5 12,000# Winch Clutch

3-11 AUXILIARY HYDRAULIC POWER ENGINE OPERATION

3-11.1 The Hydraulic Power Supply Engine is used to power the hydraulic functions, should the tractor not be equipped with hydraulic hookups.

NOTE: 1. Check the following fluid levels before starting the engine package: engine oil, fuel supply, hydraulic oil. (Check oil level while semitrailer is not tilted as tilting will change the oil level in the tank.)

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

⚠ CAUTION

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

3-11.2 The Engine Ignition Switch, Choke and Throttle are on the Engine Control Panel mounted on the drivers side of the engine package. (see **Figure 3-6**).

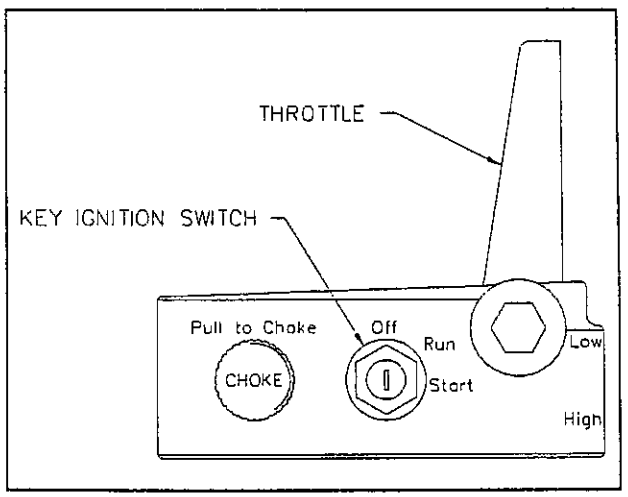

Figure 3-6 Engine Control Panel

3-11.3 The Hydraulic Power Supply Engine Throttle controls the speed at which the engine operates (see **Figure 3-6**). It is a variable position control:

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

LOW In this position, the engine throttle is closed, letting the engine run at a slow idle.

3-11.4 To start pull the choke completely out and set the throttle to the LOW position.

3-11.5 Turn the ignition key to the START position. The engine should crank and then start.

⚠ CAUTION

DO NOT CRANK ENGINE FOR MORE THAN 30 SECONDS. IF ENGINE DOES NOT START CONSULT THE OWNER'S MANUAL SUPPLIED WITH THE ENGINE.

3-11.6 When the engine starts, release the key. Gradually push the choke lever in until the engine runs smoothly.

3-11.7 Black smoke from the exhaust and a rough running engine usually indicate over-choking.

3-11.8 To adjust the speed, turn the throttle control in or out, as needed, until the engine runs smoothly at a speed capable of withstanding use of the hydraulic controls. The hydraulic controls should now be functional.

3-11.9 Before shutting it off, allow the engine to cool down by running at a slow idle for one to two minutes. Then turn the ignition switch to the off position.

3-11.10 Once the engine is cool, turn or push the throttle and choke control completely in and turn the key to the OFF position.

NOTES:

MAINTENANCE AND LUBRICATION 4

This section contains instructions necessary for proper maintenance of the semitrailer. The 300 semitrailer is designed for years of service with minimal maintenance. However, proper maintenance is important for durability and safe operation and is an owner/user responsibility.

⚠ DANGER

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

4-1 MAINTENANCE SCHEDULE.

Semitrailer maintenance includes periodic inspection and lubrication. **Table 4-2, Maintenance Schedule**, lists the recommended maintenance and lubrication tasks by time interval and by accumulated mileage (use whichever occurs first). **Table 4-3, Hydraulic Engine Maintenance Schedule**, lists the recommended maintenance tasks for the hydraulic engine package.

4-1.1 Inspection

a. Inspect the tractor, the semitrailer, and semitrailer 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.

b. Use the Troubleshooting Guide to check for "SYMPTOMS" and "PROBLEMS" of any semitrailer system not functioning correctly, or where wear, distortion, or breakage are found. Administer "REMEDY" according to the right-hand column of the Troubleshooting Guide.

4-1.2 Lubrication.

Table 4-1 details lubrication points and intervals, method of application, and lubricant required, and illustrates the location of each part to be lubricated. During inspections of the semitrailer, if lubricants are found to be fouled with dirt or sand, those parts should be cleaned with paint thinner, dried, and relubricated immediately. Dirt in a lubricant forms an abrasive compound that will wear parts rapidly.

⚠ WARNING

PAINT THINNER AND OTHER SOLVENTS ARE FLAMMABLE AND TOXIC TO EYES, SKIN, AND RESPIRATORY TRACT. AVOID SKIN AND EYE CONTACT. GOOD GENERAL VENTILATION IS NORMALLY ADEQUATE. KEEP AWAY FROM OPEN FLAMES OR OTHER COMBUSTIBLE ITEMS.

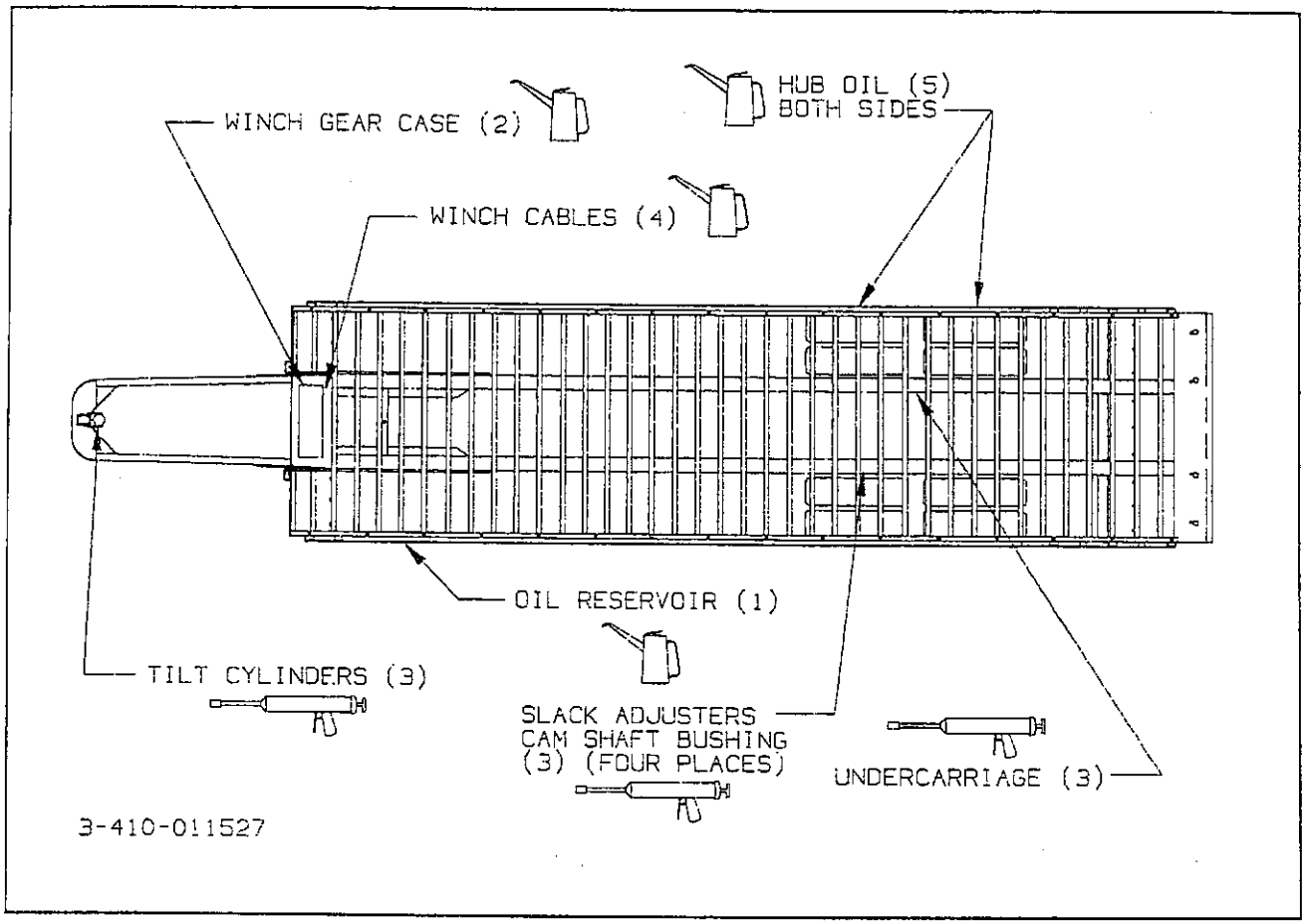

Figure 4-1 Lubrication Points

LUBE	SEASON	BRAND AND PRODUCT (WEIGHT AND/OR TYPE)			
		AMOCO	EXXON	PHILLIPS	TEXACO
1	ALL YEAR	Rycon MV	HDX Plus 10W	Mangus Oil 150	Rando HD-AZ
2	SUMMER	Multi-purpose 140	Gear Oil GX 85W-140	Worm Gear Oil SAE 90 #9332D1	Maropa SAE 90 #3
	WINTER	Multi-purpose 90	Gear Oil GX 85W-140	Worm Gear Oil SAE 90 #9332D1	Maropa SAE 90 #3
3	ALL YEAR	Lit-Multi-purpose Grease	Rondex Multi-purpose Grease	Phil Lube M.W. Grease	MarFax All Purpose
4	ALL YEAR	Industrial Oil 32	Estic 32	Condor 150 or Magnus 150	Regal Oil R&O 32
5	ALL YEAR	Multi-purpose 90	Gear Oil GX 85W-140	Phil Lube All-purpose Gear SAE 90 #90501	Multi-gear EP 80W90

Table 4-1 Lubrication Specifications

NORMAL OPERATING SERVICE INTERVALS [a]								
SERVICE INTERVAL :	TIMES	1st 5 Hrs	Weekly	Monthly	6 Months	Yearly	LUBE #	NOTES
ITEM	MILES	50	500	2,000	12,000	25,000		
LIGHTS		I	I					
WIRING & CONNECTIONS		I		I				
FASTENERS		I, T		I				b
KING PIN & PLATE		I		C, I, L			3	c
BRAKE AIR SYSTEM		I	I	I				
RELAY VALVES						I, C		
BRAKE ADJ & WEAR		I		I, T				d
SLACK ADJUSTERS		I	I			L	3	c
CAMSHAFT ASSYS		I	I			L	3	c
HUB OIL		I	I, L			R	5	c
WHEEL BEARINGS		I			I, T		5	c
TIRE INFLATION & WEAR		I	I					e
WHEEL LUG NUTS		I, T	I	I, T				f
SUSPENSION ALIGNMENT		I		I	I			
UNDERCARRIAGE ROLLERS				L			3	c
HYDRAULIC OIL		I	I			R	1	c
HYDRAULIC FILTER		R			R			
HOSES (Inspect & Replace as needed)		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 2-1 (Bolt Torque Chart) for correct torque.
c. See Table 4-1 (Lube Specification Chart) for recommended lubricant.
d. Call Landoll Customer Services for procedures to replace.
e. See Serial Number Plate on the front of the semitrailer for proper inflation requirements.
f. See Figure 4-11, Stud Tightening Sequence.

Table 4-2 Maintenance Schedule

ENGINE MAINTENANCE SCHEDULE							
OPERATION	AFTER EACH CYCLE OF INDICATED HOURS						
	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]					
Change Crankcase Oil (20 hp engine)		X[3]	X[2]				
Change Crankcase Oil (24 hp engine)		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							X[4]
Clean Carbon and Lead Deposits (cylinder head)							X[5]

NOTES:

X[1]. Check for fuel leaks. With engine running, visually and audibly check exhaust system for leaks.
X[2]. Perform more often when running under severe operating conditions.
X[3]. Required for initial break-in only.
X[4]. For detailed maintenance, contact an Onan Service Center or refer to the Service Manual.
X[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 4-3 Hydraulic Engine Maintenance Schedule

4-2 MAINTENANCE PROCEDURES.

4-2.1 Tools and Equipment. Tools, equipment, and personnel normally found in a facility capable of making truck repairs will be adequate for maintenance of the semitrailer. No other special tools or equipment should be necessary.

4-2.2 Standard Torque Values. Table 2-1 lists torque values for standard hardware and is intended as a guide for average applications involving typical stresses and mechanical surfaces. Values are based on the physical limitations of clean, plated, and lubricated hardware. In all cases, when an individual torque value is specified, it takes priority over values given in this table. Replace original fasteners with hardware of equal grade. **Table 2-1** illustrates the markings on the heads of steel bolts and screws that indicate their ASTM and SAE grades.

4-2.3 Cleaning

⚠ WARNING

PAINT THINNER AND OTHER SOLVENTS ARE FLAMMABLE AND TOXIC TO EYES, SKIN, AND RESPIRATORY TRACT. AVOID SKIN AND EYE CONTACT. GOOD GENERAL VENTILATION IS NORMALLY ADEQUATE. KEEP AWAY FROM OPEN FLAMES OR OTHER COMBUSTIBLE ITEMS.

a. Wash semitrailer to remove all accumulated dirt and grime.

b. Use any mineral spirits paint thinner (or its equivalent) to remove grease and oil from all parts of the semitrailer. Rinse degreasing solution off with cold water.

c. Inspect semitrailer for cause of any reported troubles.

d. Scrape, sand, prime, and repaint areas where finish is missing or where there is evidence of corrosion.

e. After disassembling any components, thoroughly clean dirt and old lubricant from all parts. Do not use a wire brush on any bearing parts or surfaces — use a stiff bristle brush. Do not use compressed air, or spin bearing parts when cleaning. These practices can throw solvents, dirt, or metal particles into your eyes. Dry clean parts with lint free, clean, soft, absorbent, cloth or paper. Wash and dry hands.

f. Inspect seals, seal wiping surfaces, bearing caps, and bearing cones for wear, pitting, chipping, or other damage.

4-3 FRAME, AND DECK

4-3.1 Repairing Structural Defects

If any structural defect is found, the fault must be corrected before further use of the vehicle. To continue usage could endanger the semitrailer, its load, personnel, traffic, and properties. If any cracks or breaks are found, return the semitrailer to Landoll factory for repairs. Inspect the deck daily for broken or missing planks or missing attachments. Replace any defective parts promptly.

4-4 HYDRAULIC SYSTEM.

4-4.1 General

a. Check the oil level of the tractor wet kit hydraulic tank weekly, or after any leakage. See **Table 4-1** for proper hydraulic oil. Check the hydraulic oil level with hydraulic cylinders in the retracted position. Disengage the hydraulic pump.

b. Overfilling can cause hydraulic fluid overflow during operation.

c. Hydraulic system pressure relief valves should be set at 2500 PSI.

4-4.2 Hydraulic Engine Package

a. Check the hydraulic oil level weekly, or after any leakage. See **Table 4-1** for proper hydraulic oil. Check oil level with hydraulic cylinders in the retracted position and with the engine stopped.

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.

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 semitrailer.

f. For further maintenance procedures and proper lubrication specifications, please refer to the engine owners manual that was supplied with the hydraulic engine package.

4-5 ELECTRICAL SYSTEM

4-5.1 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.

4-5.2 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.

4-5.3 Corroded terminals must have the corrosion removed, source of corrosion neutralized and the terminals resealed, protected, and insulated.

4-5.4 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.

4-5.5 A light that repeatedly burns-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.

4-6 SUSPENSION MAINTENANCE

4-6.1 A visual daily inspection of the spring suspension system is recommended.

4-6.2 After the first 500 miles of operation all nuts and bolts should be checked and tightened until mating parts are metal to metal at bolt area. Repeat at 3000 miles.

SUSPENSION BOLT NUT TORQUE	
EQUALIZER	375-425 FT. LB.
SPRING EYE	225-275 FT. LB.
U-BOLTS	120 FT. LB.

4-6.3 Springs that have flattened (loss of camber) should be replaced. To check for loss of camber, spring must be in free (unloaded) state.

⚠ CAUTION

FAILURE TO MAINTAIN PROPER BOLT TORQUE WILL RESULT IN DAMAGE TO THE SPRING EYE AND EQUALIZER BUSHINGS, DESTROYING THE ANTI-HOP FEATURE AND COMPONENTS OF THE SUSPENSION.

4-6.4 A periodic inspection of the suspension is recommended every 10,000 miles, with all bolts and nuts checked and tightened if required. This inspection requires very little time and will assure continued trouble free operation.

4-7 ALIGNMENT

4-7.1 **Wheel Alignment**

⚠ DANGER

TO PREVENT A POTENTIALLY LIFE THREATENING ACCIDENT:

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

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

When semitrailer 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 wheel alignment and wheel bearing adjustment is essential for proper tire wear. The simplest form of checking wheel alignment "toe" is by running the semitrailer 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:

a. Remove wheel, hub and bearing assemblies.

b. 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 4-2**).

c. 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 4-2**).

d. Follow the same procedures as in **Paragraph 4-7.1 b** and c, 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. If it is found to have positive or negative camber, axle replacement is necessary (**see Figure 4-3 for examples of camber**).

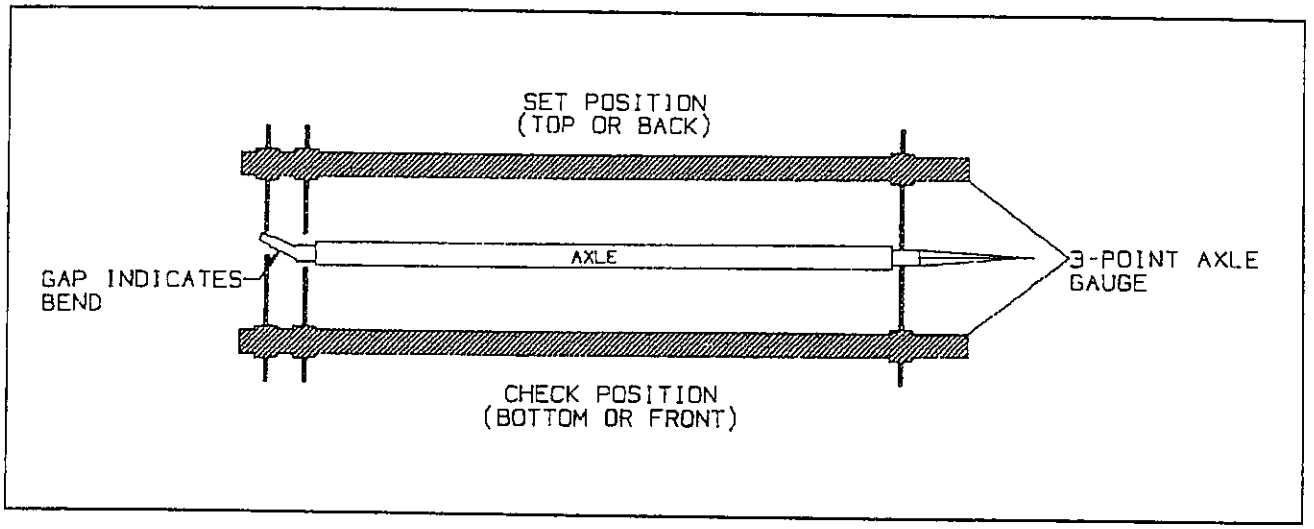

Figure 4-2 Checking Axle for Bend

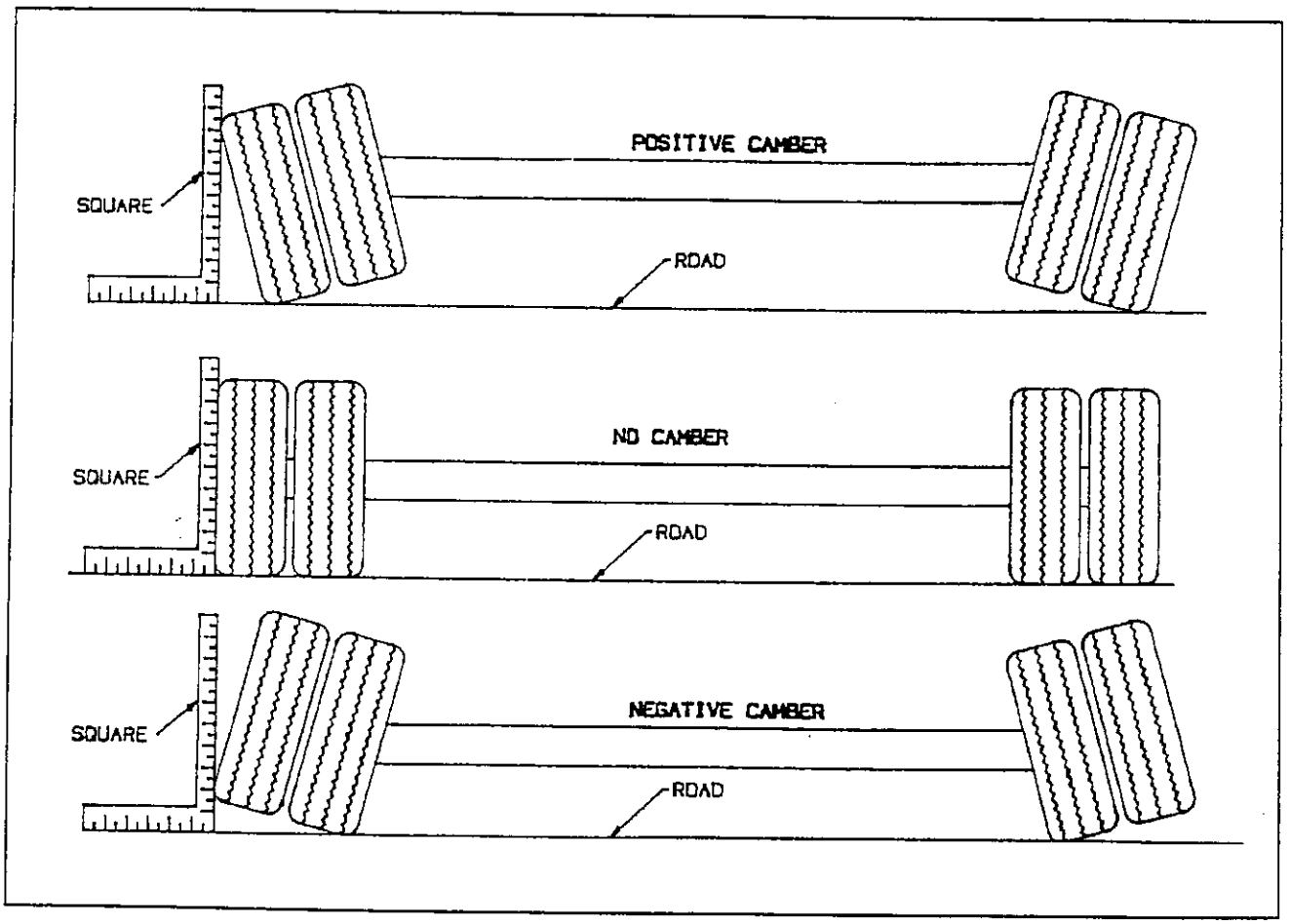

Figure 4-3 Examples of Camber

⚠ WARNING

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

4-8.1 General.

a. Check air and vacuum hoses for chafing, bends, kinks, or damaged fittings. Replace defective hoses.

b. Check the brake system for loose, missing, deformed, or corroded fastenings. Replace and tighten defective hardware.

c. Check brake linings for excessive wear or distortion.

d. On air brake systems drain the air reservoir daily. A drain cock on the bottom of each air reservoir vents the tank to drain collected water and oil. If held open, air pressure in the tanks is relieved, causing the emergency or parking brakes to be applied.

e. The brake assemblies should be inspected and adjusted every 2,000 miles or monthly.

4-8.2 Brake Linings.

a. Examine the brake linings visually to locate the lining showing the greatest amount of wear. The wheel and drum should be removed and the linings replaced if the thinnest portion of the lining is less than 1/32 in. (.8 mm) above the rivets, shows irregular wear, or is contaminated with oil or grease. Do not allow the linings to wear thin enough that the lining rivet contacts the drum. (**see Figure 4-4**).

b. Brake shoes should always be replaced in pairs, both brakes on the same axle.

⚠ WARNING

DO NOT ALLOW GREASE TO CONTACT BRAKE LININGS AS THIS COULD RESULT IN REDUCED BRAKING PERFORMANCE.

4-8.3 Trailer Relay Valve (Hydraulic Brakes)

Clean and oil the filter every 60 days. Wash it in soapy water, dry, and re-oil with a light weight engine oil. Squeeze out all excess oil before reinstallation.

4-8.4 Hydraulic Disc Brake Maintenance

The hydraulic disc is self adjusting. To remove the hub and rotor, the caliper assembly must be removed from the torque plate by removing two 3/8" bolts and the retainer plates.

4-8.5 Air Brake Maintenance

a. **Air 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.

1. To check adjustment release brakes.
2. Measure the distance (D1) from the face of the brake air chamber to the center of the slack adjuster linkage pin (**see Figure 4-5**)
3. Apply brakes.
4. Repeat step 2 to measure the distance (D2).
5. Subtract the two distances to find the air chamber push rod travel. The total travel of the

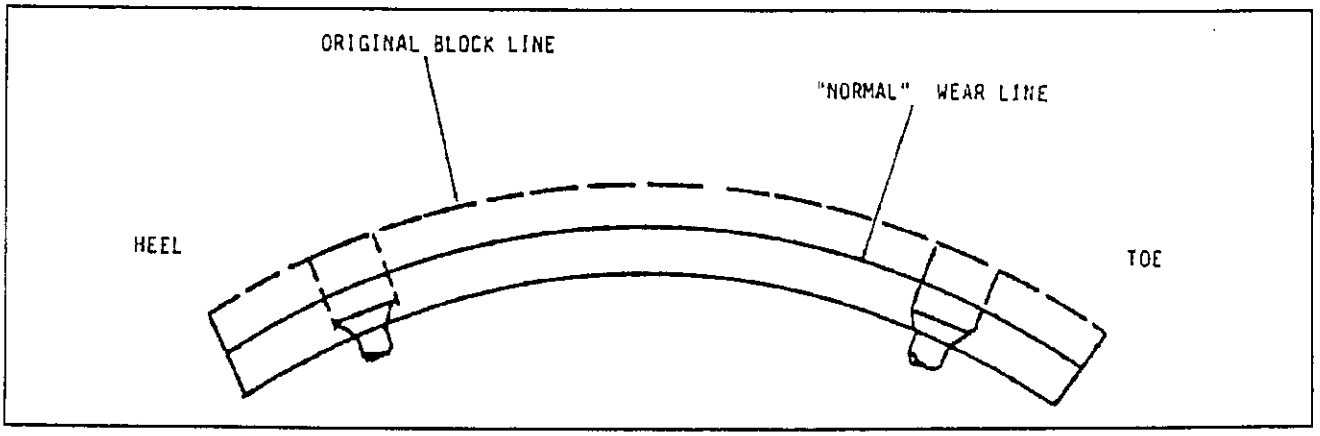

Figure 4-4 Brake Lining Wear

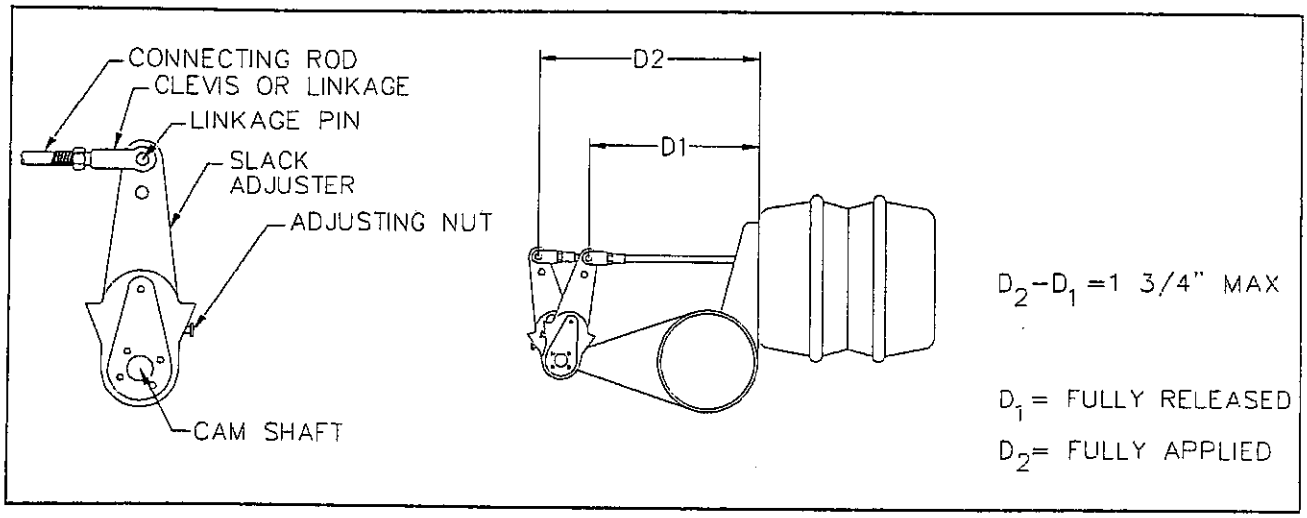

Figure 4-5 Checking Brake Adjustment

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. To adjust, release brakes.
7. Place a 9/16" box end or socket wrench on the slack adjuster adjusting nut (**see Figure 4-5**), and push in on the locking sleeve.
8. Adjust by rotating the adjusting nut counterclockwise to loosen the brake and clockwise to tighten the brake.
9. 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 the next step.
10. Remove wrench from slack adjuster. Check locking sleeve to verify that it has sprung back out and is locking the adjusting nut. If not, the adjuster will have to be rotated slightly.

b. Air Brake Disassembly (see Figure 4-6)

1. Release brakes and back off slack adjuster.
2. Remove slack adjuster lock ring and slack adjuster.
3. Remove drum assembly (**see page 4-13**).
4. Disengage the roller retainers from the rollers.
5. Press down on the bottom brake shoe and remove the lower cam roller. Lift the top shoe and take out the top cam roller.
6. Lift out the shoe retractor spring, which is now free of tension.
7. Swing the lower shoe back approximately 180° to relieve the tension on the anchor pin retainer. Remove the anchor pin retainer and slip the shoes off the anchor pins.
8. Remove camshaft lock ring, spacer washer(s) and camshaft.
9. After removing the shoes, completely inspect all brake components, servicing as necessary.

c. Air Brake Reassembly

1. Install new anchor pin bushings, camshaft bushing, and camshaft seals into the spider.

NOTE: When installing camshaft seals, the seal on the slack adjuster side is installed facing into the spider. This allows grease to purge outside the brake assembly when greasing the camshaft bushing.

2. Install cam roller, retainer clip and retractor spring retainers onto the brake shoes.
3. Install 1/8" thick camshaft washer onto the camshaft.
4. Install the cam shaft into the spider. Install spacer washer and lock ring retainer on camshaft before sliding the camshaft through the camshaft support bracket. Install the slack adjuster, washer, and lock ring retainer.
5. Install the anchor pin retainer onto the shoes. Install shoes onto the spider by placing shoes in place on the anchor pins, then "wrap" the two shoes into place about the spider.
6. Install the shoe retractor spring onto the shoes.
7. Connect the slack adjuster to the brake chamber pushrod.
8. Adjust brakes as outlined in brake adjustment procedures.

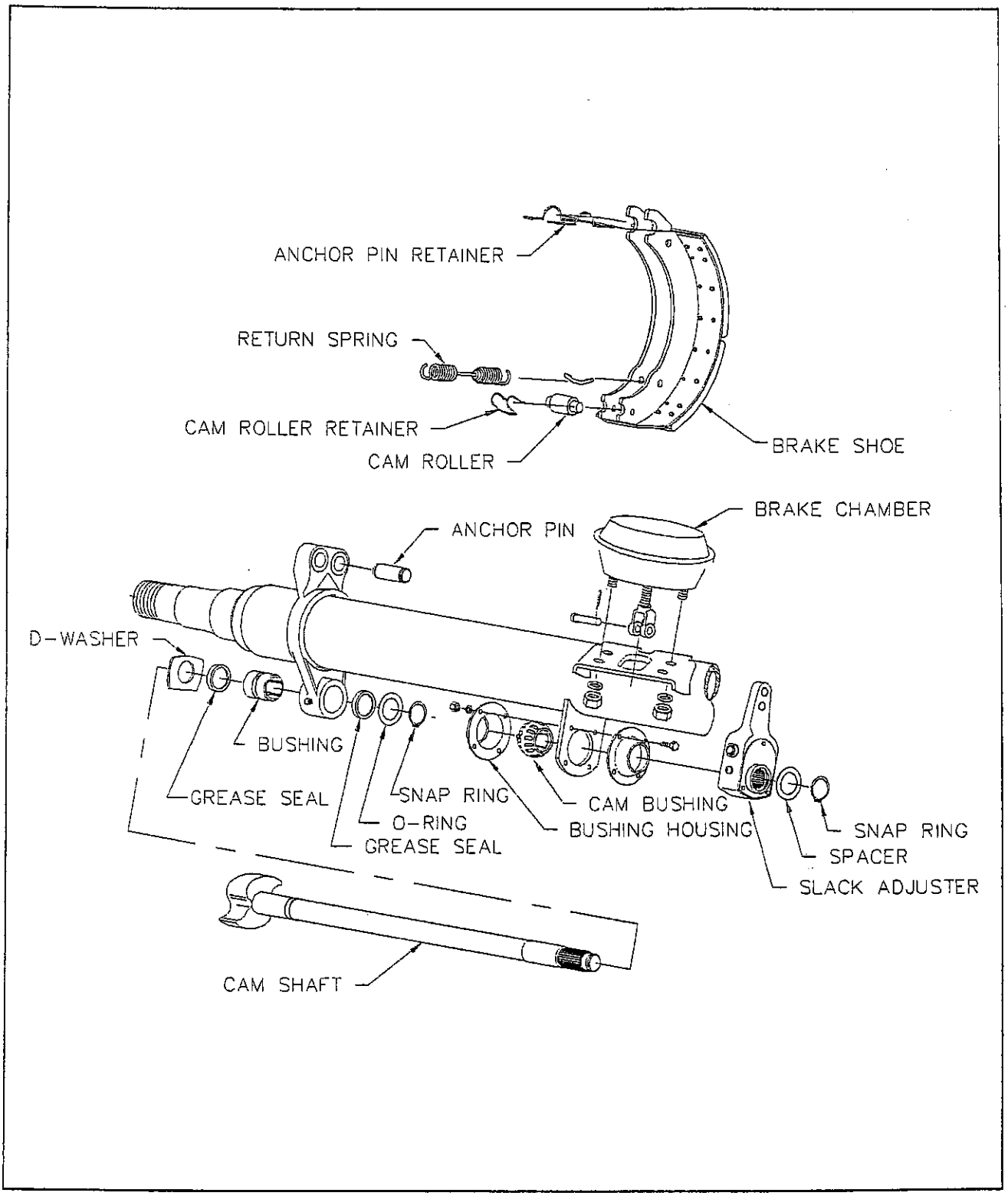

Figure 4-6 Axle and Brake Assembly

4-8.5 Spring Air Brake Chamber

Repair or replace faulty units. Check the condensation holes on the underside of the brake chambers to make sure they are open. The spring brake has two brake chambers, a service chamber and and an emergency chamber or spring chamber. Service brake chambers should be disassembled and cleaned at 50,000 miles or yearly. The diaphragm and any marginal parts should be replaced. The spring chamber should not be serviced. Replace entire unit if spring chamber becomes faulty. When replacing the service diaphragm, replace the corresponding parts for the other chamber on the same axle (to aid in even brake application and release). Examine yoke pin for wear and replace as necessary.

⚠ WARNING

THE SPRING BRAKE CHAMBER EMPLOYS A SPRING WITH HIGH FORCES. SERVICE SHOULD NOT BE ATTEMPTED. SERIOUS INJURY OR DEATH MAY RESULT.

a. Caging the Power Spring

1. Chock the semitrailer wheels.
2. Remove dust cap from spring brake chamber.
3. 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!
4. Turn the bolt until the spring brake is caged. This should be 2-1/4 to 2-1/2 inches of release bolt extension.
5. The brakes should now be released. Do not operate loaded semitrailer with brake manually released.
6. To reset the spring brake, turn the release bolt until the spring is released. Remove the release bolt and store it in its brackets.
7. Snap the dust cap back in place on the chamber.

b. Removal

1. Chock all tractor and semitrailer wheels and drain the air system.
2. Mark the brake chamber for proper air line port alignment for reassembly.
3. CAGE THE POWER SPRING following the steps outlined in **Paragraph 4-8.5 a.**
4. Disconnect the slack adjuster from the connecting rod by removing the clevis pin (See **Figure 4-5**).
5. Mark all air service lines for proper re-installation and disconnect from the brake chamber.
6. Remove the brake chamber from the axle brackets.

c. Installation

1. CAGE THE POWER SPRING following the steps outlined in **Paragraph 4-8.5a.**
2. Position the inlet ports by loosening the service chamber clamp bands and rotating the center housing so the ports align with marks made during disassembly. Then re-tighten the clamp bands.
3. Loosen the clamp bands on the spring brake chamber and rotate the chamber housing until the breather hole faces downward. Re-tighten the clamp bands.
4. Remount the brake chamber on the axle brackets and reconnect the air service hoses and the slack adjuster connecting rod (See **Figure 4-5**).

NOTE: Be sure the service line is on the service chamber port and the emergency line is on the spring brake port.

d. Check for leakage by charging the air system to a minimum of 90 psi and applying 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.

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

4-8.6 Tandem Relay Valve (Air Brake)

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

⚠ WARNING

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

4-9 HUB AND DRUM MAINTENANCE

4-9.1 Remove the drum to inspect the braking surface.

4-9.2 If the drum has heavy scoring, shows excessive wear, or has a runout that exceeds .020, it should be remachined.

4-9.3 When the bore of the drum exceeds the maximum diameter cast on the drum, it should be replaced.

4-9.4 Brake drums that have been remachined must be thoroughly cleaned and checked for metal chips before installation.

4-10 WHEEL BEARINGS

4-10.1 A loose, worn, or damaged wheel bearing is a common cause of "grabby" brakes. Bearings must be inspected and lubricated periodically to ensure reliable, safe operation of your axle. **(See Figure 4-7.)**

4-10.2 Remove the hub and drum or rotor to inspect the bearing cups and cones for wear or damage (flat spots on rollers, broken cases, or rust and pitting).

4-10.3 If the bearings are damaged or worn, they must be replaced.

4-10.4 Replace the bearings and cups in sets. Replace the seal each time the hub is removed.

4-10.5 **Adjustment**

a. Axles that are subjected to extended periods of non-use or submerged in water often, should have bearings inspected and packed more frequently.

b. Every time the hub is removed, the wheel bearing must be adjusted.

c. Turn the hub slowly to seat the bearings while tightening the spindle nut until the hub is noticeably tighter.

d. While the hub is stationary, loosen the spindle nut and snug it up by hand to find zero bearing clearance.

e. Loosen it enough to align the next notch in the spindle nut with the hole in the spindle. Insert cotter pin and bend flat over the end of the spindle.

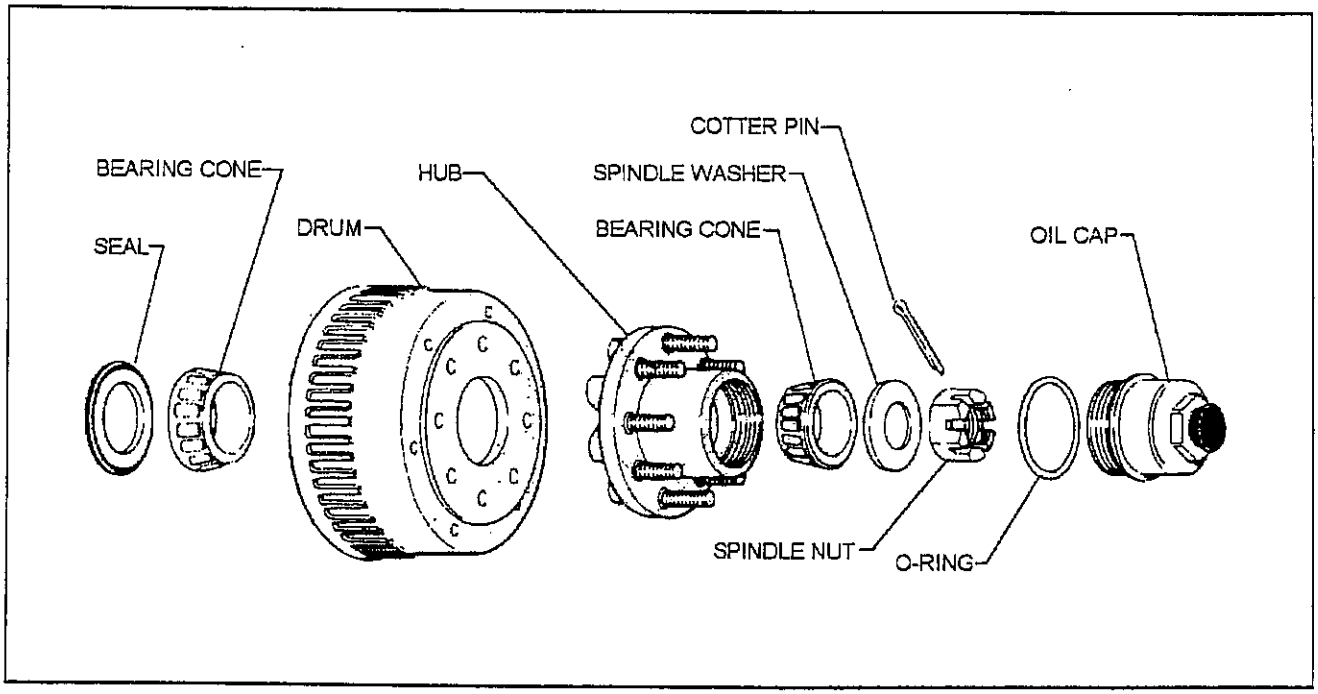

Figure 4-7 Bearing Adjustment

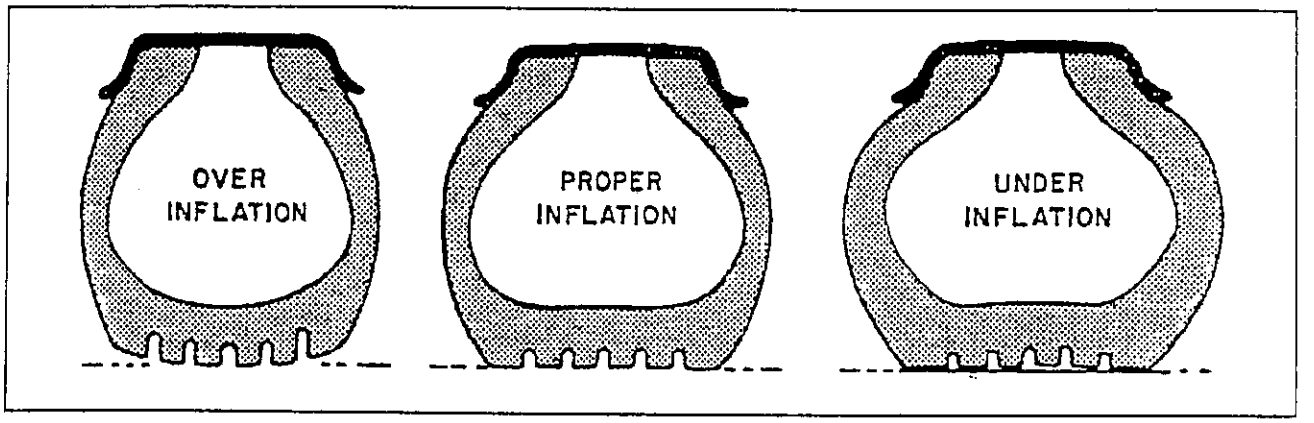

Fig. 4-8 Tire Inflation Examples

4-11.1 **Tire Inflation.** Tire inflation will cause tire to ground contact characteristics as shown in **Figure 4-8.** 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 semitrailer 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.

4-11.2 **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. The tire must be mounted on a rim and properly inflated before measuring. If there is an allowable difference in size the smaller tire should be mounted to the inside position of the duals.

a. **Tape Measuring Method**: Measure around each tire on the tread surface. A maximum difference of 3/4" is allowed between the two mating tires of a dual (**See Figure 4-9**).

b. **Straight Edge or String Method:** (This method can not be used if tire and wheel assemblies are not mounted on the axle.) Jack semitrailer 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 4-10**).

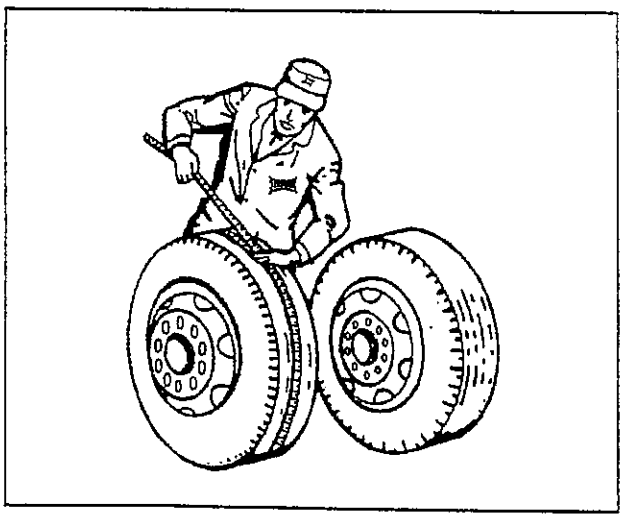

Fig. 4-9 Measuring Tape Method

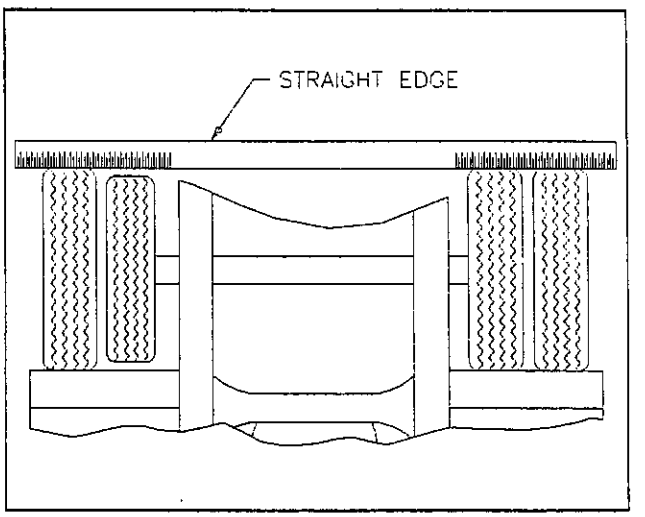

Fig. 4-10 Straight Edge Method

4-11.3 Mounting Tire and Wheel

a. It is important to maintain proper torque specifications to provide safe and secure attachment of the wheel to the hub. Start all lug nuts by hand to prevent cross threading.

b. Tighten lug nuts in three stages using a cross star pattern (see **Figure 4-11**). 5/8" flanged wheel nuts are torqued to 275-325 foot-pounds, and 5/8" swiveling flange wheel nuts are torqued to 250-300 foot-pounds.

c. These torques must be maintained by checking every 50 miles for the first 200 miles, then at periodic maintenance checks and at every change in wheel mounting.

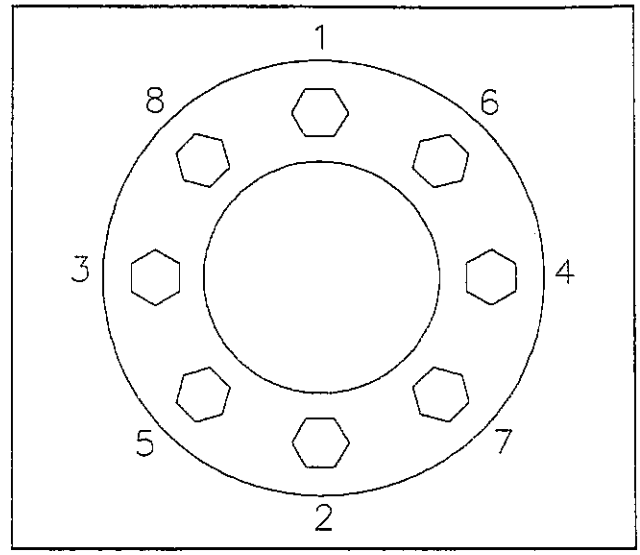

Figure 4-11 Lug Nut Tightening Sequence

4-12 WINCHES

Inspect the winch cable before and after **every** usage. If frayed wires, nicks, kinks, worn spots, breaks or any other sign of deterioration or damage is found, immediate replacement is mandatory before further usage. If the semitrailer 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.

NOTES:

TROUBLESHOOTING GUIDE 5

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

5-1 HYDRAULIC SYSTEM

Most hydraulic system failures start as 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. For maintenance procedures see **Paragraph 4-4.**

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 and 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 TOO SLOW	**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.

SYMPTOM	PROBLEM: REMEDY
SYSTEM OPERATES TOO FAST	**Engine running too fast:** Reduce engine speed. **Call Factory or see Landoll Dealer.**
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.

5-2 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.

5-3 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 4-5.**

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 are too low a capacity. - Enlarge wire or component. Match bulbs with tractor voltage.
LIGHTS BRIGHT & BURN OUT	**Ground wire disconnected:** Connect ground wire. **Voltage difference between trailer & tractor:** Tractor supply wire or circuit components are too low a 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.

5-4 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 4-6, 4-7, and 4-11.**

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.

Tires - Wheels - Suspension, Continued

SYMPTOM	PROBLEM: REMEDY
SHOULDER TREAD WEAR - BOTH SHOULDERS	**Under inflation:** Increase inflation to correct psi. Check axle alignment. **Overload:** 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!**	
BENDING OR WARPING	**Curb-hopping or potholes:** Adjust turning practices and speed according to 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.

5-5 BRAKES

For maintenance procedures see **Paragraphs 4-8.**

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.
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 4-1. **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.

Brakes, Continued

SYMPTOM	PROBLEM: REMEDY
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.
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.

5-6 BRAKE DRUMS

For maintenance procedures see **See Paragraphs 4-9.**

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.

5-7 WINCH

SYMPTOM	PROBLEM: REMEDY
POWER SPOOL DOES NOT DISENGAGE	**Load on cable:** Properly secure trailer load as required and reel out cable to remove load. **Tension on winch gears:** When reeling winch, momentarily rotate reel in opposite direction to relieve tension on winch gears. Disengage winch..

NOTES:

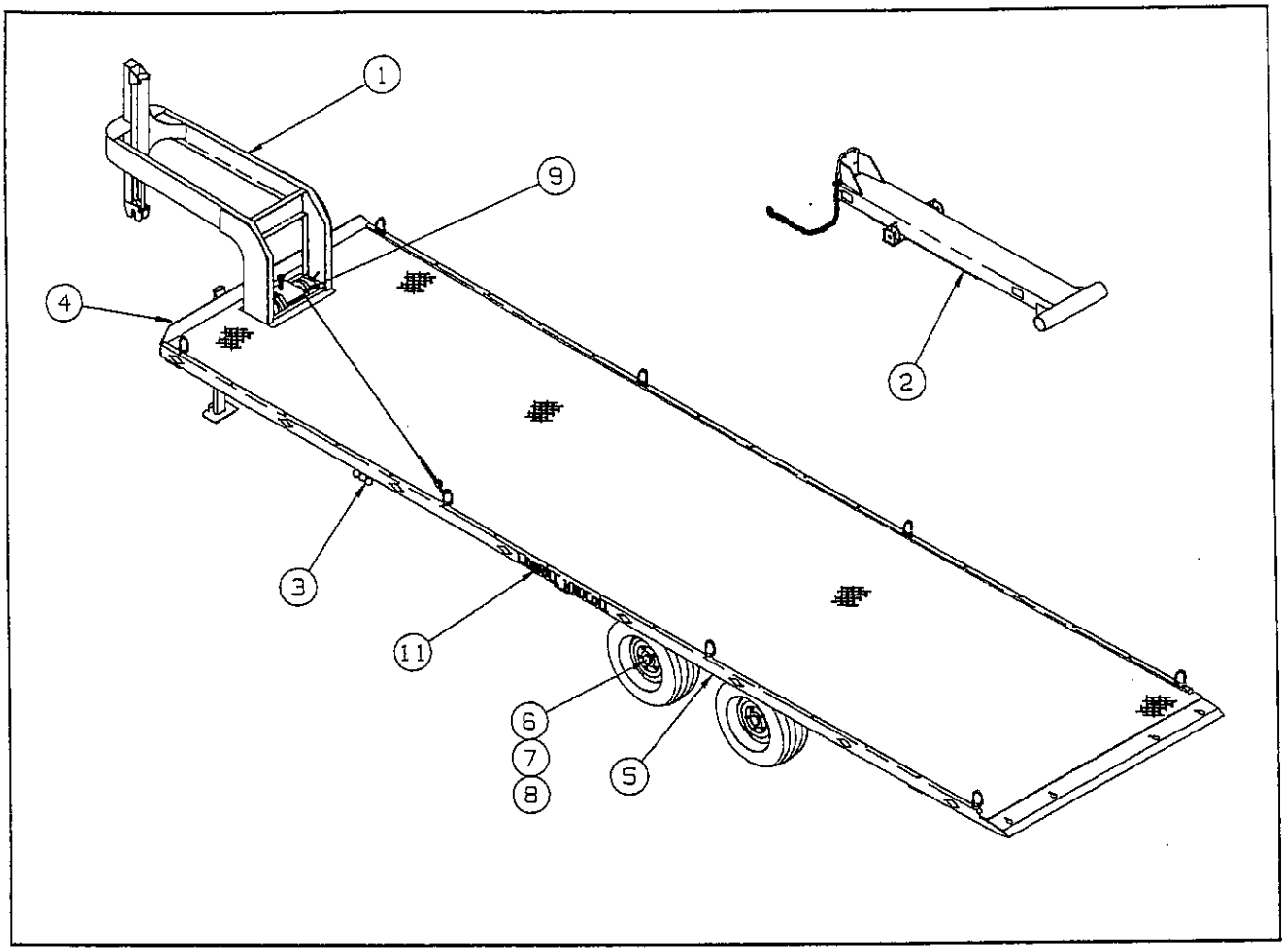

Figure 6-1 General Assembly

GENERAL ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
1	6-2 TO 6-5	GOOSENECK FRAME AND HITCH ASSEMBLY	1
2	6-6	PINTLE FRAME AND HITCH ASSEMBLY	
3	6-8 TO 6-15	HYDRAULIC SYSTEM	1
4	6-16	ELECTRICAL SYSTEM	1
5	6-18	UNDERCARRIAGE AND SUSPENSION ASSEMBLY	1
6	6-20 TO 6-23	BRAKE AND AXLE ASSEMBLY	1
7	6-24 TO 6-29	BRAKE SYSTEM	1
8	6-30 AND 6-31	HUB AND DRUM OR ROTOR ASSEMBLY	4
9	6-32 TO 6-35	WINCH	1
10	6-36 TO 6-38	WET KIT (OPTIONAL)	1
11	6-39	DECAL PLACEMENT	1
12	6-40 TO 6-43	AUXILIARY ENGINE, HYDRAULIC POWER (OPTION)	1
13	6-44 TO 6-47	TRUCK BED OPTIONS	1
14	6-48 AND 6-49	TRUCK BRAKE KIT OPTION	1

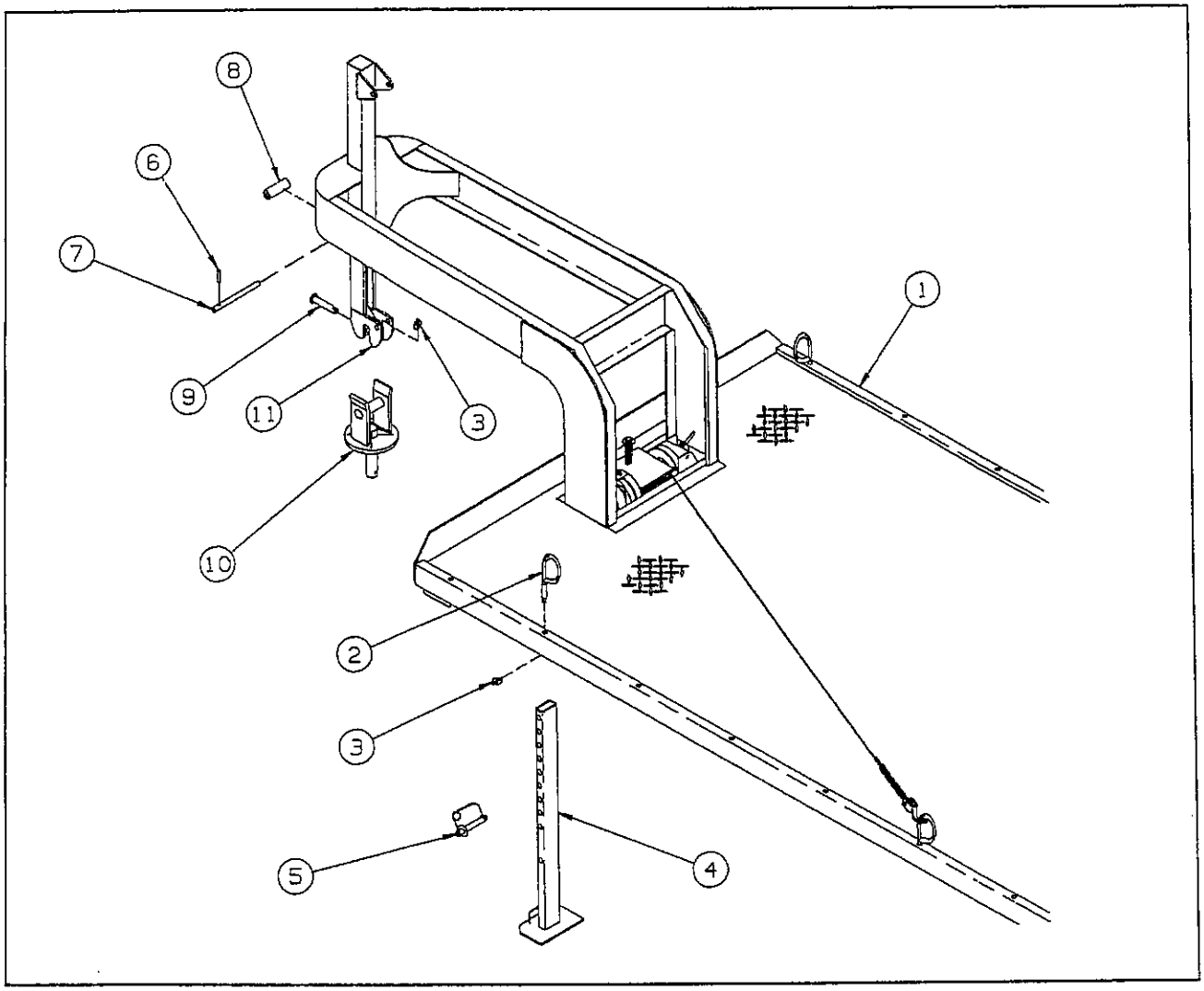

Figure 6-2 Gooseneck Frame and Hitch Assembly

GOOSENECK FRAME AND HITCH ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
1	----------	FRAME, GOOSENECK	1
2	3-793-010001	TIE DOWN LOOP	8
3	2-557-010009	LYNCH PIN	8
4	3-311-010147	PARK STAND	2
5	346SL	LOCK HITCH PIN	2
6	0600-375-02000	ROLL PIN	1
7	3-557-010044	PIN, GOOSENECK HITCH ROLLER	2
8	3-311-010262	GOOSENECK HITCH ROLLER	2
9	3-557-010034	HITCH PIN	1
10	3-375-010021	SWIVEL HITCH	1
11	3-311-010143	HITCH ASSEMBLY	1

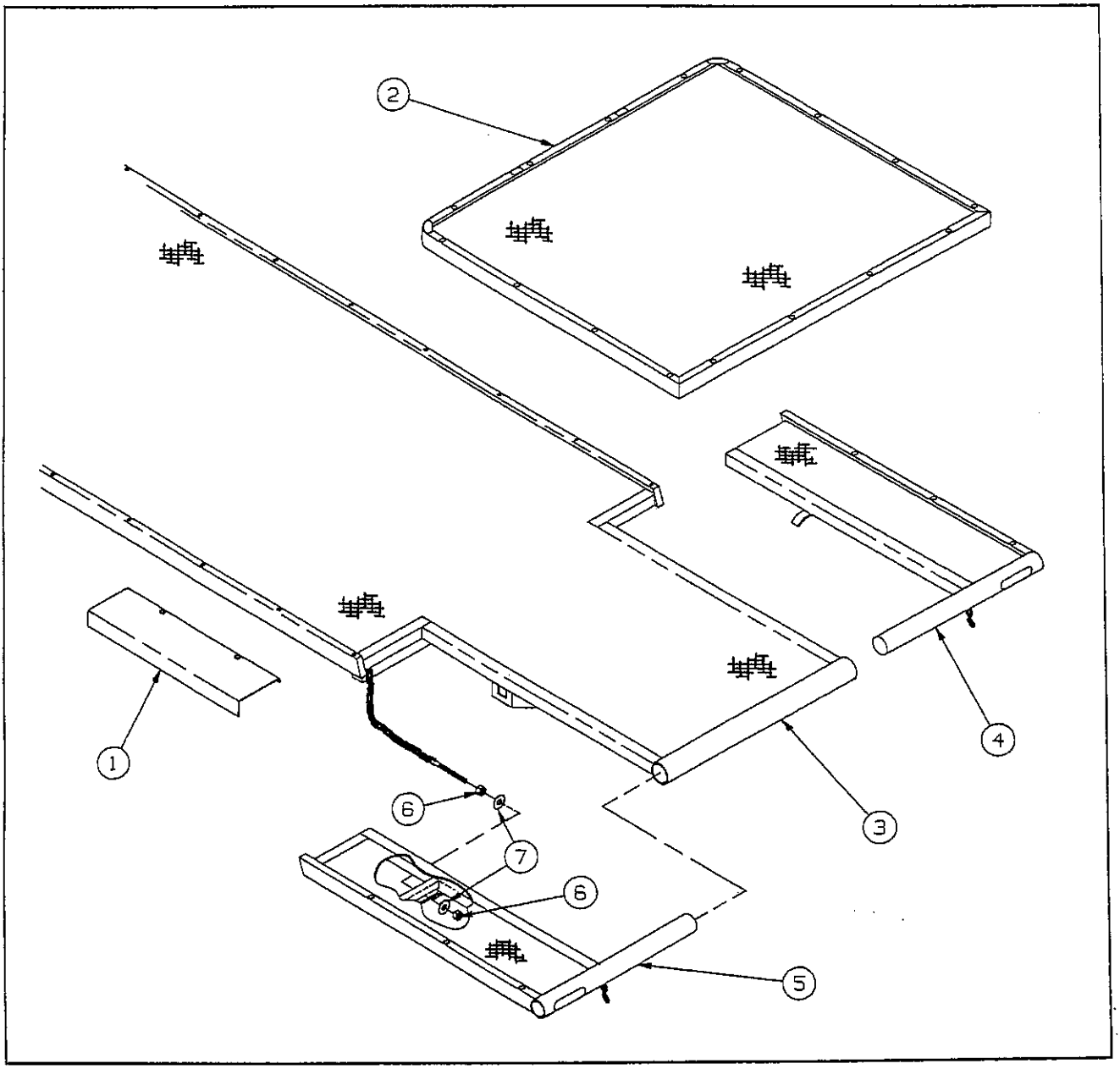

Figure 6-3 Frame Options

FRAME OPTIONS

ITEM	PART NO.	DESCRIPTION	QTY.
1	3-276-010537	OVERWIDTH EXTENSION, 48"	1
2	B3-311-017	UPPER DECK	1
3	----------	FRAME, GOOSENECK W/COMBINE WELLS	1
	B3-869-003	COMBINE WELLS (INCLUDES ITEMS 4 -7)	
4	3-869-010001	WHEEL WELL RT	1
5	3-869-010003	WHEEL WELL LT	1
6	7/8-9HFN	NUT ZP GR2	8
7	7/8FW	FLAT WASHER ZP	8

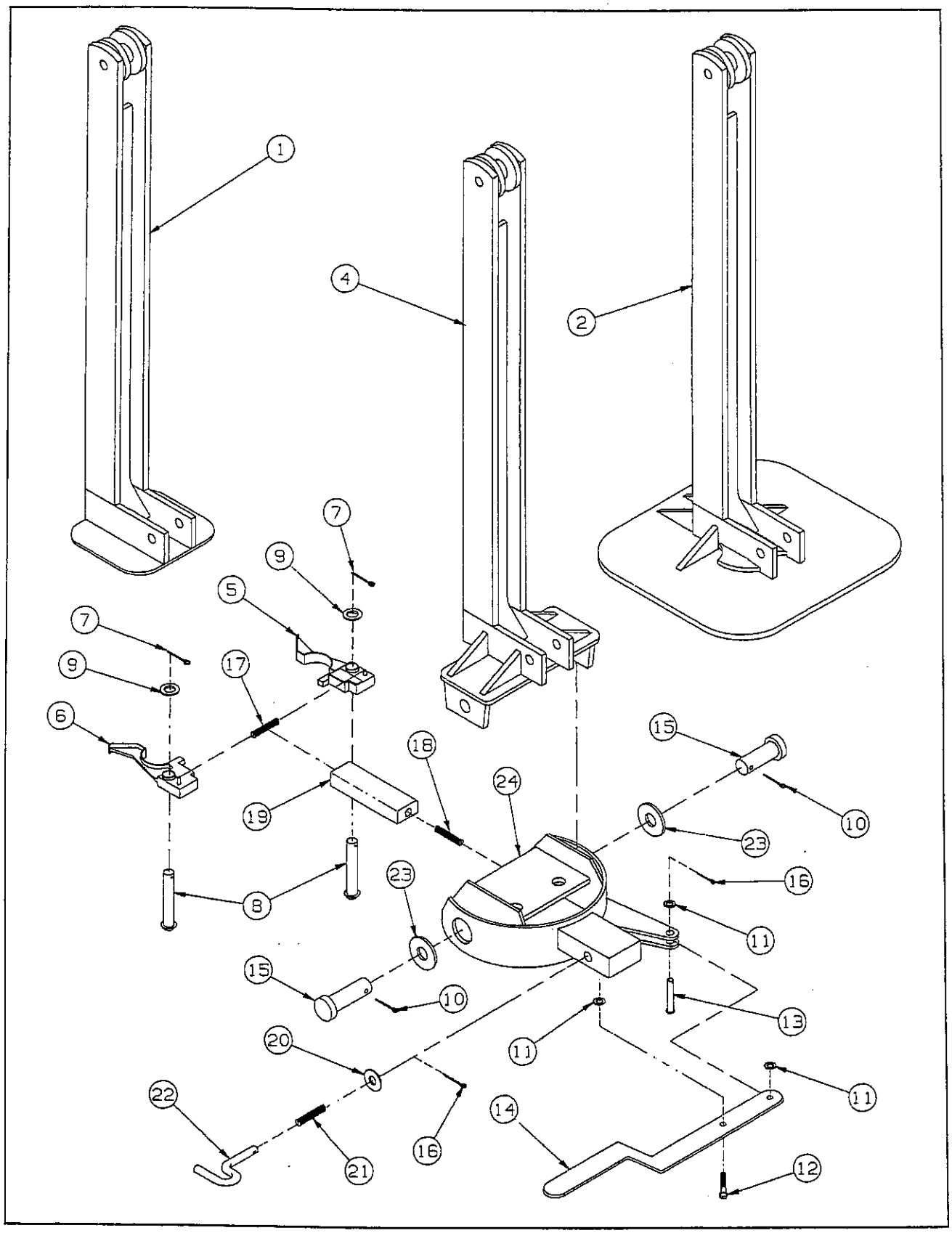

Figure 6-4 Other Hitch Options (Gooseneck)

OTHER HITCH OPTIONS (GOOSENECK)

ITEM	PART NO.	DESCRIPTION	QTY.
1	3-375-010453	BALL COUPLER ASSY, 2-5/16"	1
2	3-375-010157	FIFTH WHEEL HITCH ASSY	1
3	3-375-010331	JR. FIFTH WHEEL HITCH ASSY (INCLUDES ITEMS 4 - 24)	1
4	3-375-010332	JR. FIFTH WHEEL HITCH WELDMENT	1
5	200931	W/A-JAW, COUPLING	1
6	200949	W/A-JAW, COUPLING	1
7	200998	PIN-COTTER, 3/16" DIA.X1-1/2"	2
8	201004	PIN-CLEVIS, 1" DIA.X4", SPL.	2
9	201012	WASHER-FLAT, 1-5/8"O.D.X 1-1/32"I.D.	2
10	200881	PIN COTTER 1/4" DIA.X2"	2
11	202135	WASHER, FLAT 1-1/16"O.D.X 17/32"I.D.	3
12	201020	SCREW, SHOULDER, 1/2"DIA.X 1/2"	1
13	201038	PIN, CLEVIS, 1/2"DIA.X 1-1/4"	1
14	200964	LEVER, TRIP	1
15	200899	PIN, CLEVIS, 1-1/4"DIA.X 2-1/4",SPL	2
16	201046	PIN, COTTER, 1/8"DIA.X3/4"	2
17	201053	SPRING-EXTENSION	1
18	201061	SPRING, COMPRESSION	1
19	200972	BLOCK, LOCKING	1
20	201079	WASHER, FLAT, 3/8"STD.,TYPE A, "N"	1
21	201087	SPRING, COMPRESSION	1
22	200980	HANDLE, SAFETY LOCK	1
23	200873	WASHER, FLAT, 2-1/4" O.D.X1-1/4"I.D	2
24	200956	W/A-HOUSING, FIFTH WHEEL	1

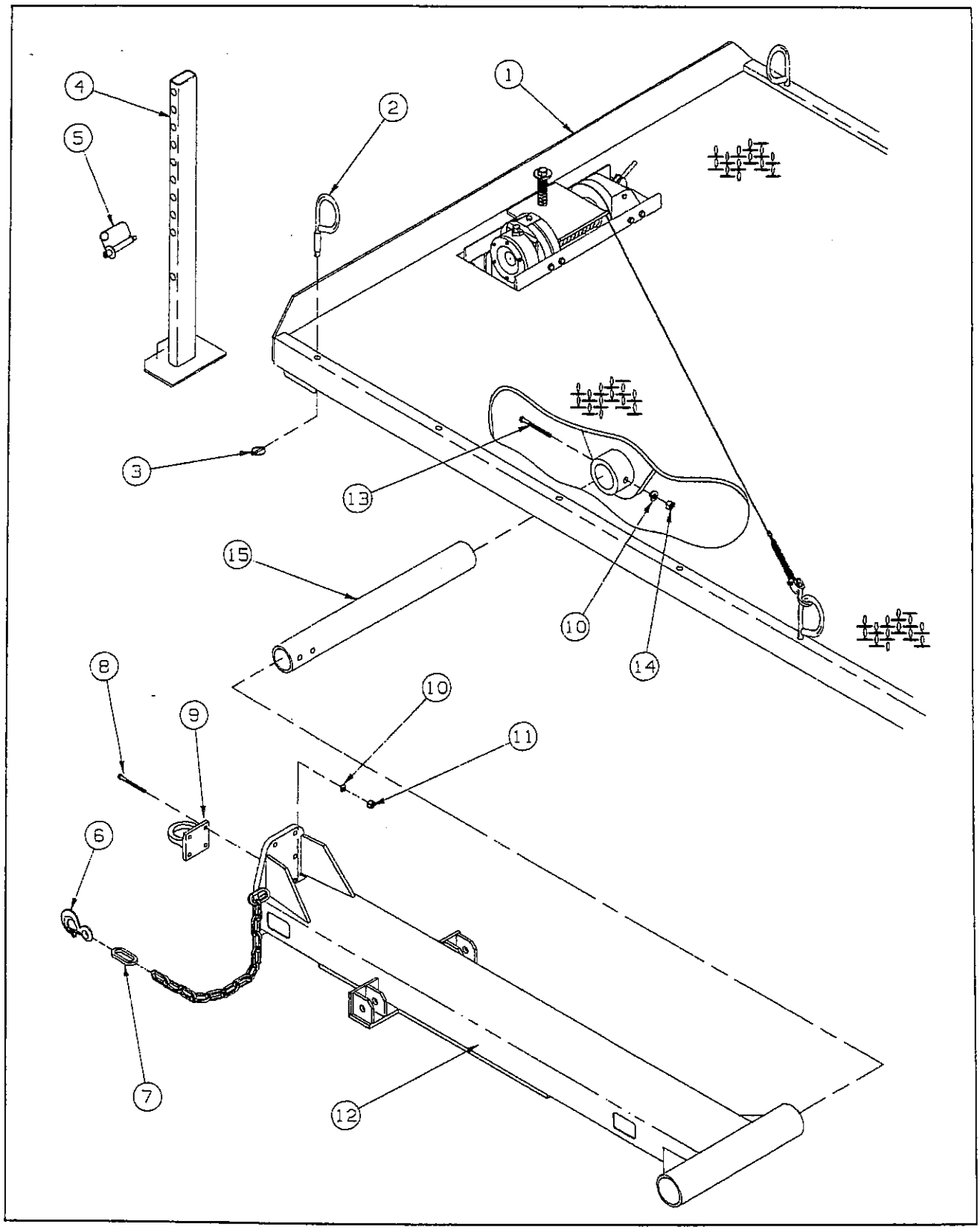

Figure 6-5 Pintle Frame and Hitch Assembly

PINTLE FRAME AND HITCH ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
1	----------	FRAME, PINTLE HITCH	1
2	3-793-010001	TIE DOWN LOOP	8
3	2-557-010009	LYNCH PIN	8
4	3-725-010052	PARK STAND	2
5	346SL	LOCK HITCH PIN	2
6	3-382-010019	HOOK, EYE, W/LATCH	2
7	3-174-010042	CHAIN LINK CONNECTING 3/8	2
8	3/4-10X3CS GR8	SCREW, HEX HEAD CAP	4
9	1385	PINTLE EYE	1
10	3/4SLW	SPLIT LOCK WASHER	5
11	3/4-10HFN GR8	NUT, HEX FLAT GR8	4
12	3-375-010493	HITCH WLDMT 5 FT	1
13	3/4-10X2-1/2CS	SCREW HEX CAP GR5 ZP	1
14	3/4-10HFN	NUT ZP GR2	1
15	3-375-010329	HINGE TUBE	1

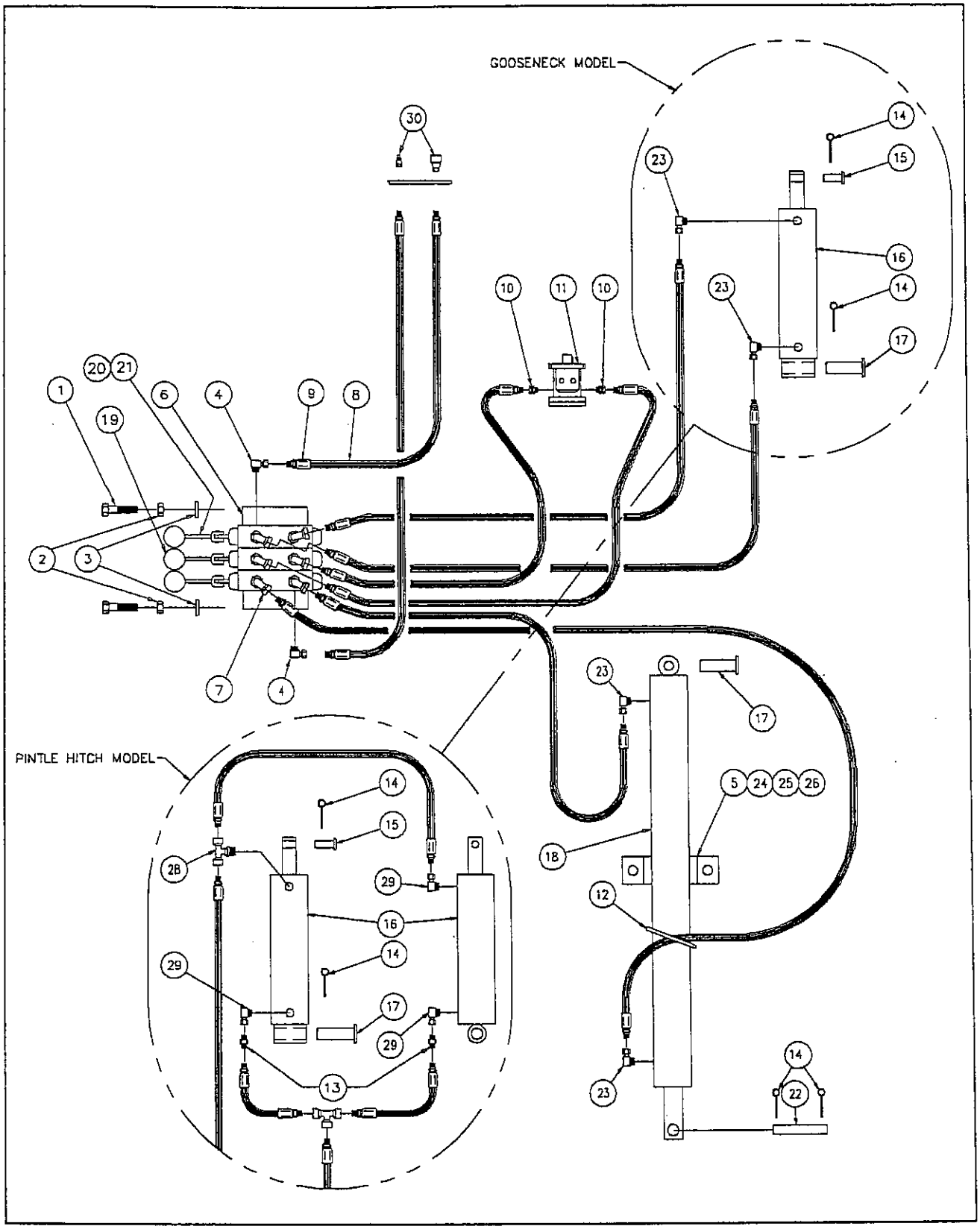

Figure 6-6 Hydraulic System

HYDRAULIC SYSTEM

ITEM	PART NO.	DESCRIPTION	QTY.
1	3/8-16X2CS GR5	SCREW, HHCS ZP GR5	3
2	3/8-16HFN	NUT, ZP GR2	3
3	3/8SLW	WASHER, LOCK	3
4	1-007-010024	1/2 PIPE TO 1-1/16 O-RING 90	2
5	2-078-010001	BEARING, CYLINDER SUPPORT	1
6	3-846-010008	VALVE, 3 SPOOL 2500 PSI	1
7	1-007-010023	ADAPT, HYD 45° .5 NPT/ .75 O-RING	6
8	1-397-010010	HOSE, HYDRAULIC 1/2	103FT.
9	1-299-010001	END, HOSE 1/2" MALE CRIMP ON	16
10	2066-8-10S	O-RING ADAPTER TO PT	2
11	104-1003	MOTOR, 12,000# WINCH	REF
12	T120R	TYTON STRAP	20
13	3-846-010080-1	VALVE, HYDR VEL FUSE 12.5 GPM	1,2
14	3/16X2-1/4	COTTER PIN	4,6
15	3-557-010032	PIN, CYL. ROD END	1,2
16	3-242-010099	CYLINDER, HYDR 4"X42" (GOOSENECK)	1
	PMC5624	CYLINDER, HYDR 4"X24" (PINTLE HITCH)	2
17	3-557-010033	PIN, CYL BUTT END	2,3
18	3-242-010102	CYLINDER, HYD. 4"X126" O-RING	1
19	95	BALL KNOB	3
20	3-360-010006	HANDLE EXTENSION	3
21	1/8X1	COTTER PIN	3
22	3-557-010031	PIN, UNDERCARRIAGE CYL.	1
23	1-007-010007	ELBOW, 90° 3/4 O-RING, 1/2 PIPE	4
24	5/8-11HFN	NUT, ZP GR2	4
25	5/8-11X2CS-5	SCREW, HEX CAP GR5	2
26	5/8FW	WASHER FLAT ZP	2
27	5/8SLW	WASHER SPLIT LOCK ZP	4
28	2255-8-8S	TEE INTERNAL PIPE SWIVEL	2
29	2047-8-8S	ADAPTER, 90° SWIVEL	3
30	4000-4	COUPLING, 1/2" COMPLETE	1

NOTE: WHERE THERE ARE TWO QUANTITIES LISTED, THE FIRST IS FOR THE GOOSENECK MODEL AND THE SECOND IS FOR THE PINTLE HITCH MODEL.

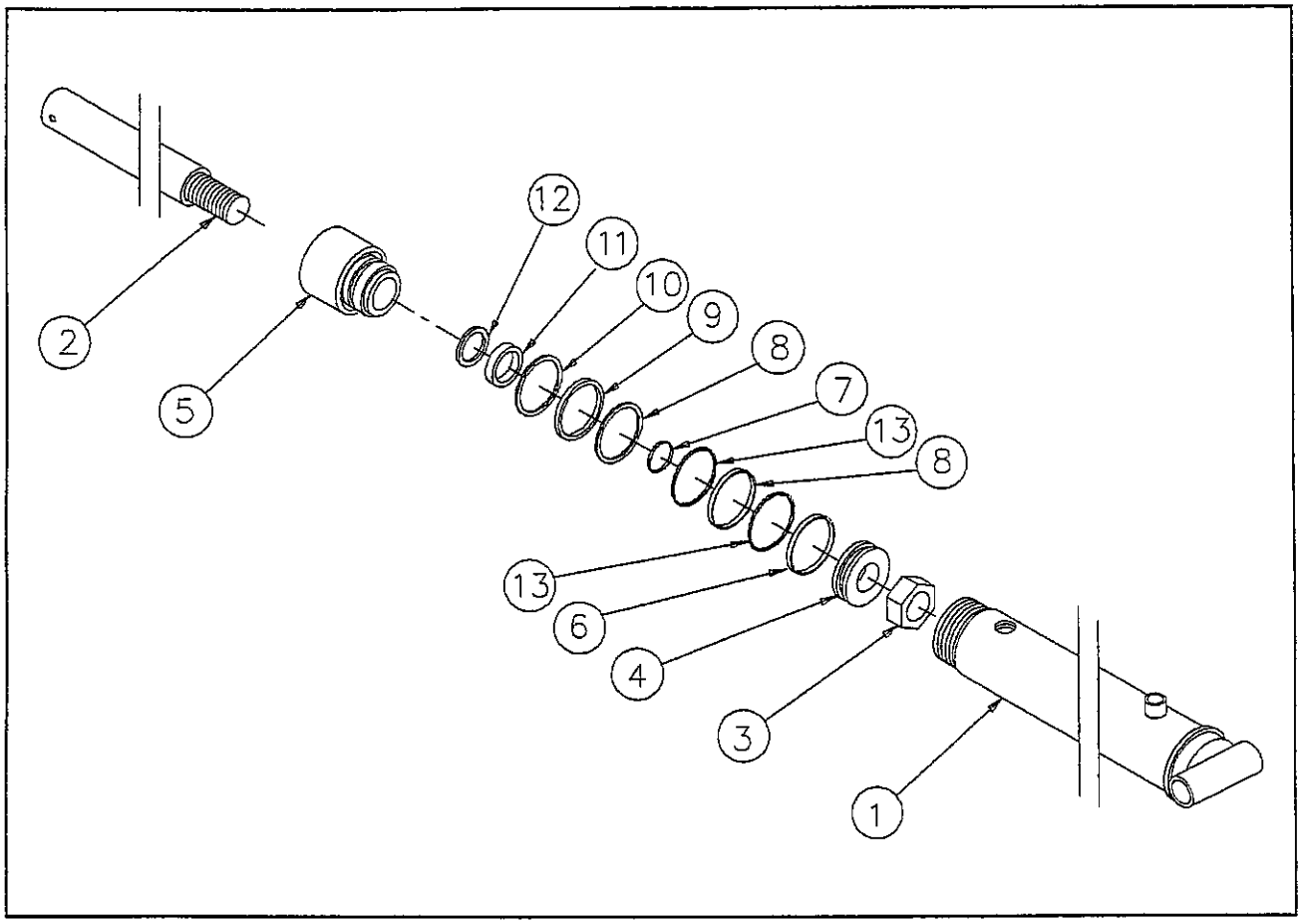

Figure 6-7 Gooseneck Trailer Tilt Cylinder Assembly

GOOSENECK TRAILER TILT CYLINDER (PRINCE)

ITEM	PART NO.	DESCRIPTION	QTY.
	3-242-010099	CYLINDER, HYDRAULIC, 4"X42" (AD-460)	1
1	061900567	BUTT AND TUBE ASSEMBLY (ALTERED PER 3-242-010099)	1
2	011100550	PISTON ROD	1
3	220000212	LOCKNUT (1-1/4 - 12)	1
4	071900048	PISTON	1
5	081900295	GLAND	1
6	240004008	PISTON RING	1
7	240000026	O-RING	1
8	240000342	O-RING	2
9	240005342	B/U WASHER	1
10	230007400	SQUARE WIRE RETAINER	1
11	240020009	U-CUP	1
12	250001329	WIPER	1
13	240034342	B/U WASHER	2
14	PMCK-AD-460	PACKING KIT (PARTS 6 THROUGH 13) (CONTAINS ALL NECESSARY SEALS AND O-RINGS)	1

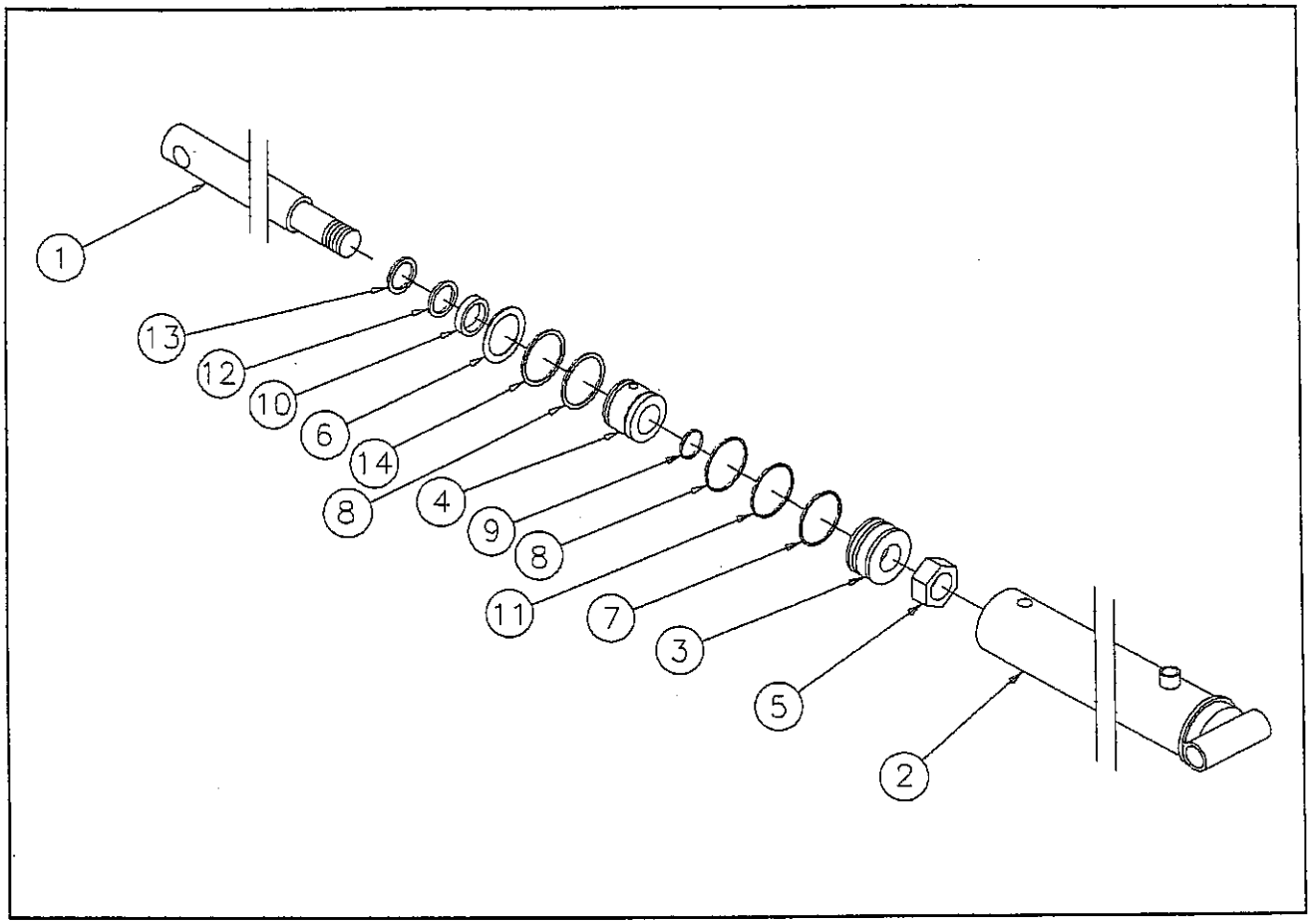

Figure 6-8 Pintle Hitch Trailer Tilt Cylinder Assembly

PINTLE HITCH TRAILER TILT CYLINDER (PRINCE)

ITEM	PART NO.	DESCRIPTION	QTY.
	PMC-5624	CYLINDER, HYDRAULIC, 4"X24"	1
1	011100075	PISTON ROD	1
2	061900039	BUTT AND TUBE ASSY.	1
3	071900019	PISTON	1
4	081900019	GLAND	1
5	220000212	LOCK NUT	1
6	230001400	SNAP RING	1
7	240004008	PISTON RING	1
8	240000342	O-RING	2
9	240000026	O-RING	1
10	240010329	QUAD RING	1
11	240034342	BU-WASHER	2
12	240005329	BU-WASHER	1
13	250001329	WIPER	1
14	240061342	BU-WASHER	1
15	PMCK-5600	PACKING KIT (PARTS 7 THROUGH 14) (CONTAINS ALL NECESSARY SEALS AND O-RINGS)	1

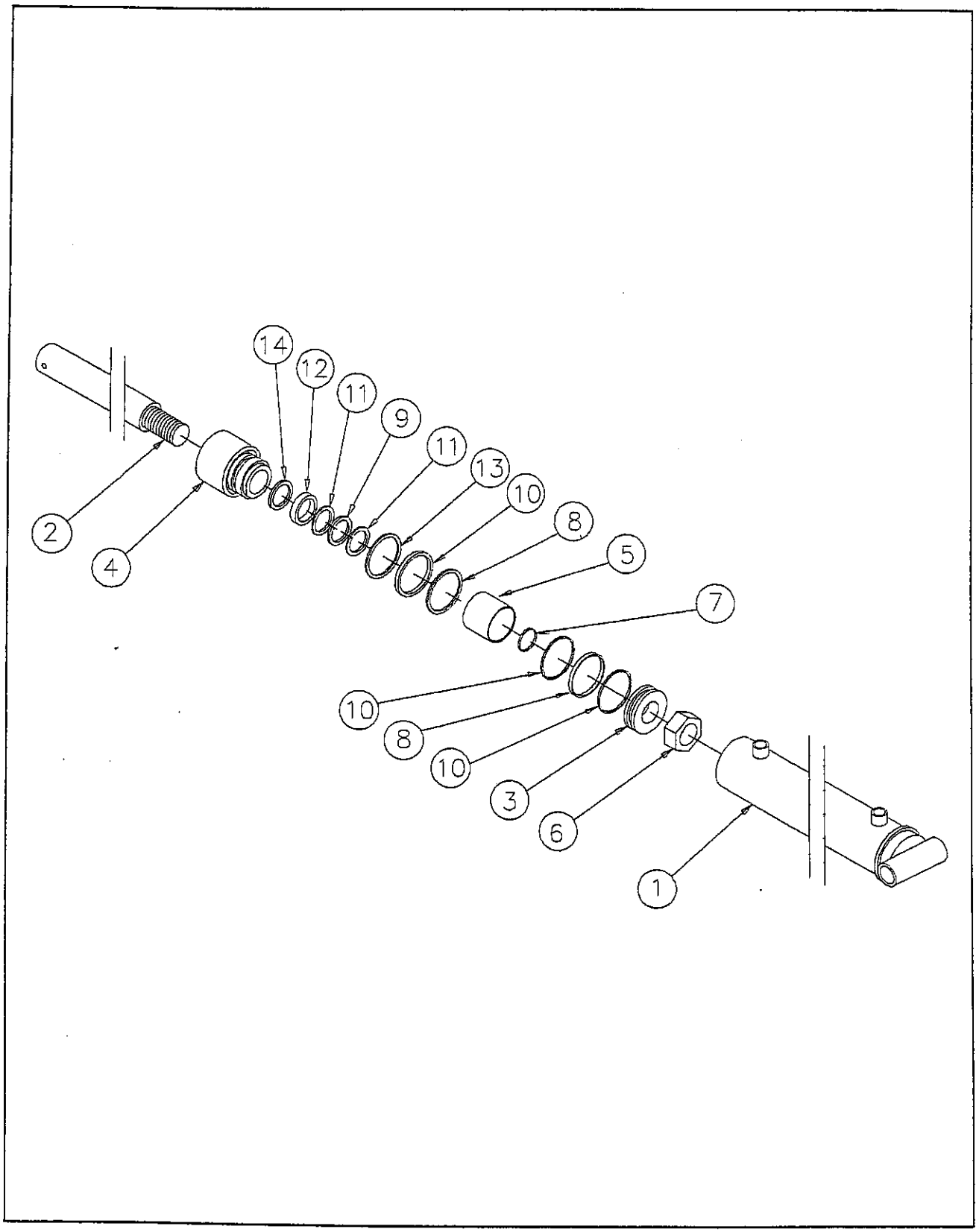

Figure 6-9 Undercarriage Slide Cylinder Assembly

UNDERCARRIAGE SLIDE CYLINDER (PRINCE)

ITEM	PART NO.	DESCRIPTION	QTY.
	3-242-010102	CYLINDER, HYDRAULIC, 4"X126" (AD-461)	1
1	061900539	BUTT AND TUBE ASSEMBLY (ALTERED PER 3-242-010102)	1
2	011300179	PISTON ROD	1
3	071900195	PISTON	1
4	081900277	GLAND	1
5	211300024	SPACER	1
6	220000212	LOCKNUT (1-1/4 - 12)PISTON RING	1
7	240000026	O-RING	1
8	240000342	O-RING	2
9	240000333	O-RING	1
10	240005342	B/U WASHER	3
11	240005333	B/U WASHER	2
12	240020015	U-CUP	1
13	230007400	SQUARE RETAINING RING	1
14	250002213	WIPER	1
15	200013106	PLUG, SAE ORB	2
17	PMCK-AD-461	PACKING KIT (PARTS 7 THROUGH 14) (CONTAINS ALL NECESSARY SEALS AND O-RINGS)	1

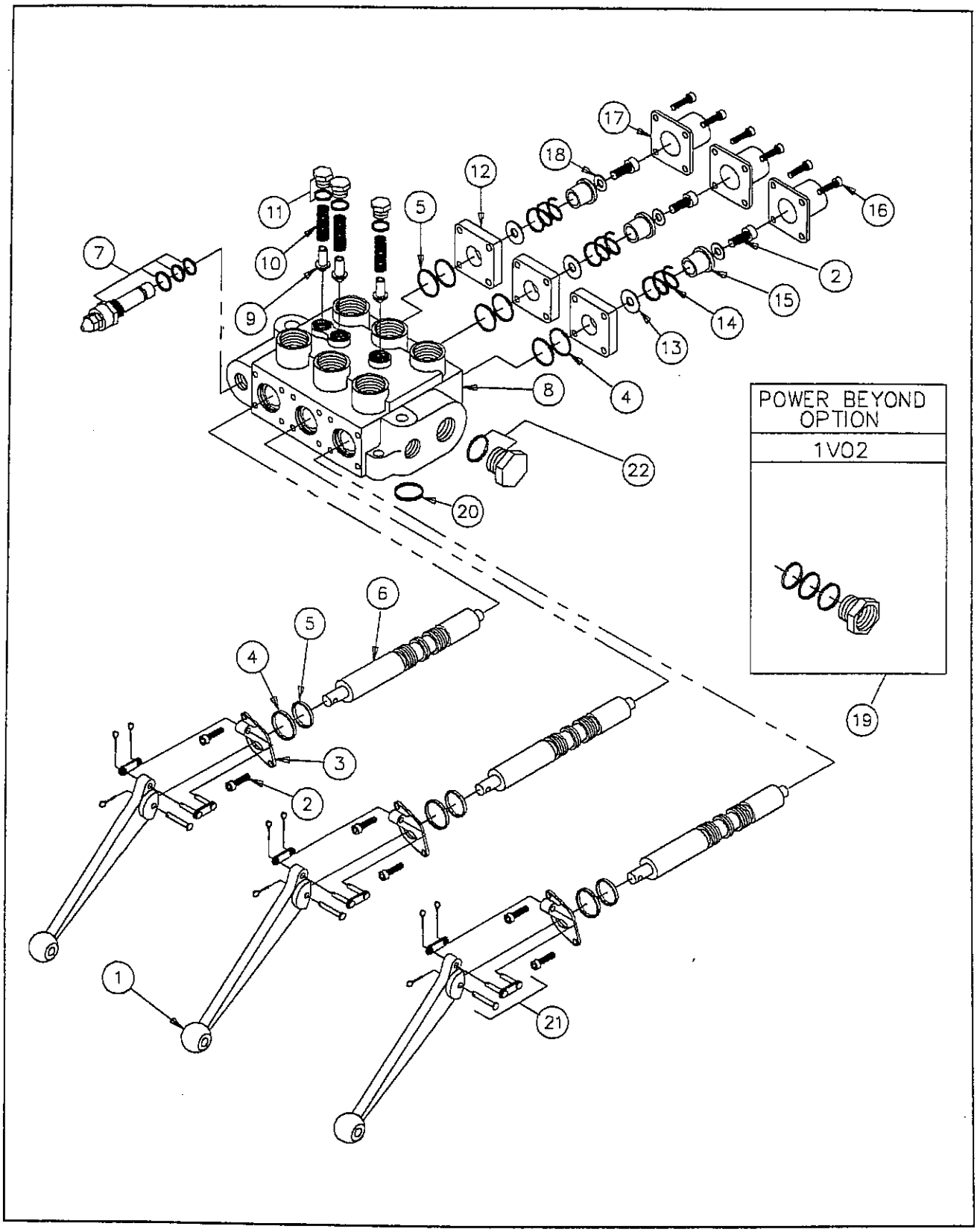

Figure 6-10 Three Spool Valve

THREE SPOOL VALVE

ITEM	PART NO.	DESCRIPTION	QTY.
	3-846-010008	VALVE ASSEMBLY	1
1	3-360-010008	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 NECESSARY O-RINGS)	1
20	2A0283-7214	GROMMET, RUBBER (BOTTOM OUTLET)	1
21	1V1701	PIN KIT	3
22	2A0354-121	PLUG, CONVERSION	1
23	2V0010	SEAL KIT	1

* NOT SOLD SEPARATELY.

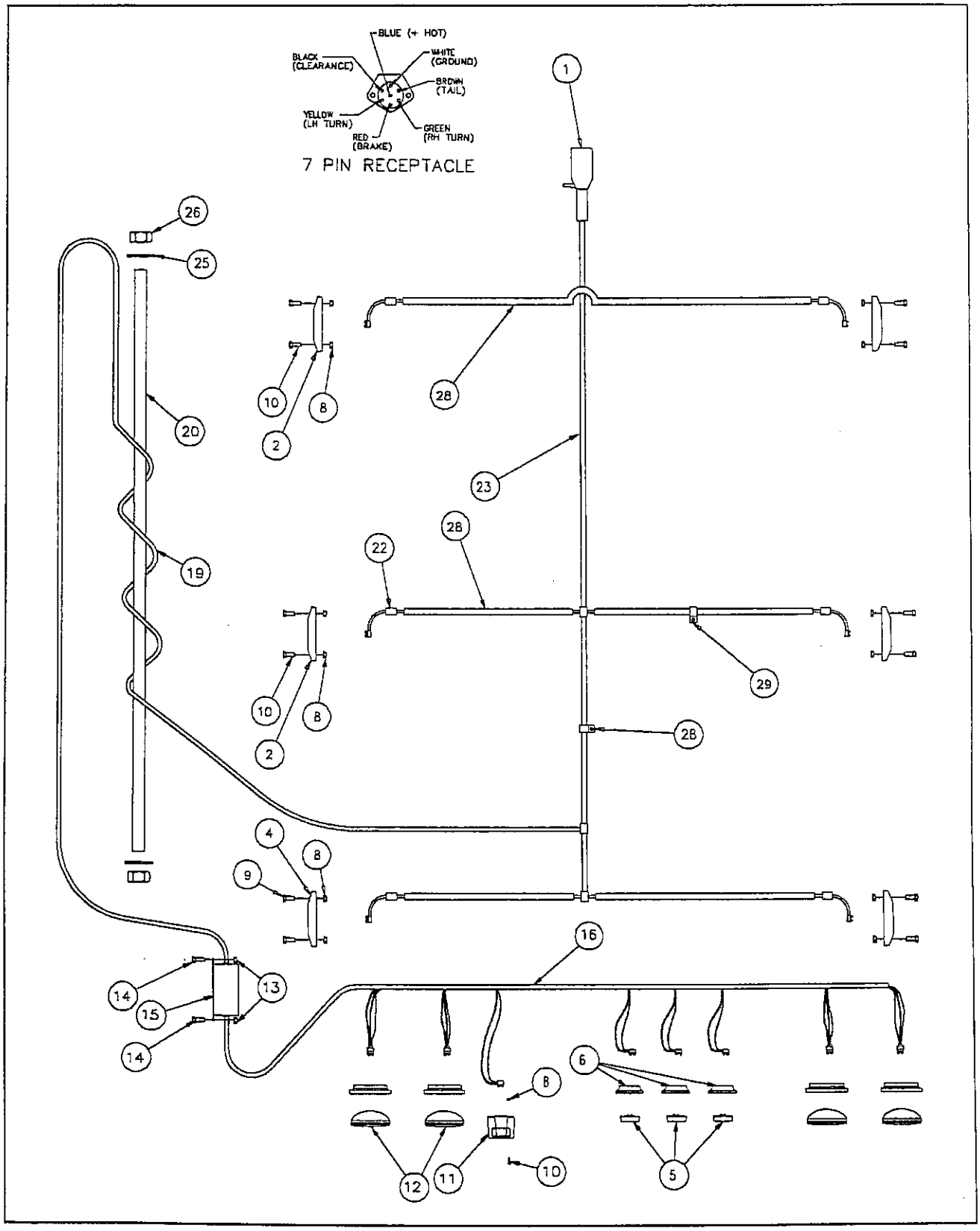

Figure 6-11 Electrical System

ELECTRICAL SYSTEM

ITEM	PART NO.	DESCRIPTION	QTY.
1	59P7	TRAILER CONNECTOR	1
2	M130A	CLEARANCE LIGHT, AMBER	4
	130-25A	REPLACEMENT LENS	4
	194	REPLACEMENT BULB	4
3	3-201-010002	CONDUIT, PLASTIC FLEX 3/8	AR
4	M130R	CLEARANCE LIGHT, RED	2
	130-25R	REPLACEMENT LENS	2
	194	REPLACEMENT BULB	2
5	10205R	REFLECTOR LAMP RED (STANDARD)	3
	M107-3R-12	LAMP, 3 BAR (WITH REAR WELLS)	1
6	10404	GROMMET MOUNT 3 IN	3
7	31003	TERMINAL, 16-14GA W/#10RING WAY	5
8	3/16-24HFN	NUT ZP GR2	20
9	3/16X1-1/2RHD	BOLT, ROUND HEAD STOVE	4
10	3/16X3/4RHDSTV	BOLT, ROUND HEAD STOVE	16
11	15009	LICENSE LAMP (STANDARD)	1
	M436-12	LICENSE LAMP (WITH REAR WELLS)	1
12	40002R	LAMP, TAIL 4 IN (STANDARD)	4
	430L	STOP AND TAIL LIGHT LH (WITH REAR WELLS)	1
	430R	STOP AND TAIL LIGHT RH (WITH REAR WELLS)	1
13	1/4-20HFLN	NUT HEX LOCK GRB CAD W/WAX	2
14	1/4-20X3/4HHCS	SCREW ZP GR5	2
15	750-029	JUNCTION BOX 7 STUD	1
16	3-368-010195	WIRING HARNESS, REAR FOR TRAVEL	1
17	1-879-010005	WIRE BROWN 14 AWG	AR
18	2552	GROMMET	16
19	3-156-010001	COILED CABLE, ELECTRICAL	1
20	3-642-010007	ROD HOSE SUPPORT	1
21	1-879-010010	WIRE WHITE 14 AWG	AR
22	3-272-010021	ELECT. BUTT SPLICE 16-14	12
23	3-156-010009	CABLE MULTI CONDUCTOR	AR
24	6812	IDEAL HOSE CLAMP	2
25	5/8SLW	WASHER, SPLIT LOCK	2
26	5/8-11HFN	NUT, HEX	2
27	3-272-010022	ELECT. BUTT SPLICE 12-10	11
28	16-900	CLAMP CONDUIT 1/2 STEEL	3
29	16-901	CLAMP CONDUIT 3/4 STEEL	8
30	5236-23	TAIL LIGHT LH (WITH REAR WELLS ONLY)	1
	5237-23	TAIL LIGHT RH (WITH REAR WELLS ONLY)	1
	9090-23	REPLACEMENT LENS, LONG	1
	9091-23	REPLACEMENT LENS, SHORT	1
	1157	REPLACEMENT BULB, DOUBLE ELEMENT	1
	1895	REPLACEMENT BULB, SINGLE ELEMENT	1

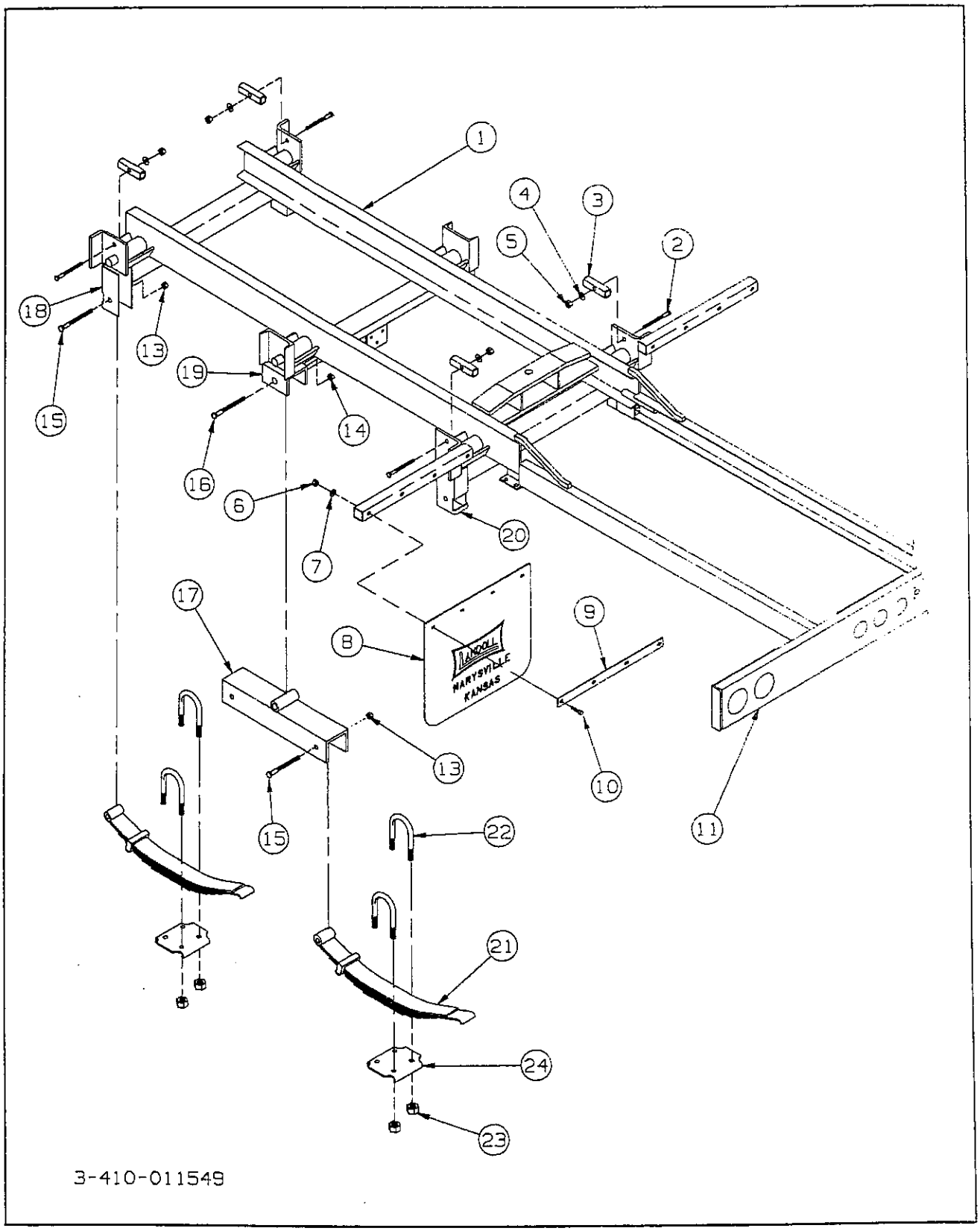

Figure 6-12 Undercarriage and Suspension Assembly

UNDERCARRIAGE AND SUSPENSION ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
1	3-762-010050	UNDERCARRIAGE	1
2	3/4-10X3HHCS	SCREW, HEX HEAD CAP ZP GR5	4
3	3-762-010004	UNDERCARRIAGE HOLDOWN	4
4	3/4SLW	WASHER, SPLIT LOCK	4
5	3/4-10HFLN	NUT, HEX LOCK GRB CAD W/WAX	4
6	3/8-16HFLN	NUT, HEX LOCK GRB CAD W/WAX	8
7	3/8FW	WASHER FLAT ZP	8
8	3-485-010001	MUD FLAP, 21 IN.	2
9	3-762-010017	CLAMP, MUD FLAP	2
10	3/8-16X3HHCS	SCREW, HEX HEAD CAP ZP GR5	8
11	3-146-010072	BUMPER SUB-WLDMT TRUCK-LITE	1
	3-762-010080	BUMPER ASSEMBLY (WITH REAR WELLS ONLY)	1
12	5000	ZERK FITTING (NOT SHOWN)	12
	60190711	HANGER KIT (INCLUDES ITEMS 13-20)	
13	090637	LOCK NUT, EYE 3/4	4
14	090636	LOCK NUT EQUALIZER 1"	2
15	090754	BOLT, SPRING EYE 3/4"	4
16	090746	BOLT EQUALIZER 1"	2
17	9138711	LONG EQUALIZER, RH	1
	9138710	LONG EQUALIZER, LH	1
18	9283308	FRONT HANGER, RH (WELDED TO UNDERCARRIAGE)	1
	9283307	FRONT HANGER, LH (WELDED TO UNDERCARRIAGE)	1
19	9292500	CENTER HANGER (WELDED TO UNDERCARRIAGE)	2
20	093026	REAR HANGER (WELDED TO UNDERCARRIAGE)	2
21	093161	SPRING - 5 LEAF 5,000 LB.	4
22	091126	U-BOLT 5/8"X10-1/2"	8
23	090622	NUT, HEX	16
24	091216	TIE PLATE	4

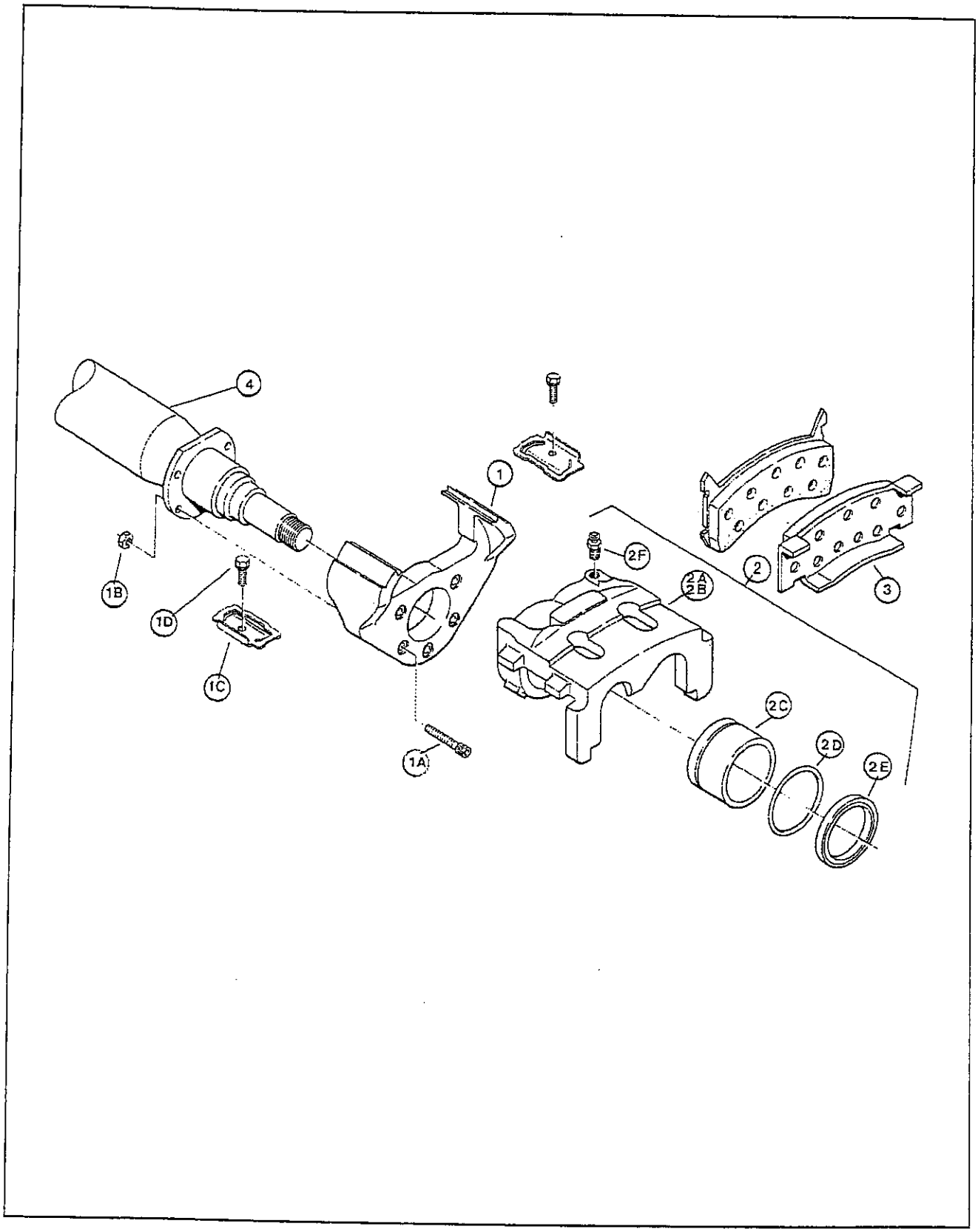

Figure 6-13 Hydraulic Disc Brake and Axle Assembly

HYDRAULIC DISC BRAKE AND AXLE ASSEMBLY (HAYES)

ITEM	PART NO.	DESCRIPTION	QTY.
1	3-565-010042	TORQUE PLATE	1
1A	90756	BOLT (090721 FOR TRAILERS PRIOR TO 1979)	5
1B	90617	NUT	5
1C	9633700	RETAINER PLATE (87837 FOR TRAILERS PRIOR TO 1979)	2
1D	87805	BOLT AND LOCK WASHER	2
2A	9231512	CALIPER ASSY L.H. (091201-01 FOR TRAILERS PRIOR TO 1979)	1
2B	9231511	CALIPER ASSY R.H. (091200-01 FOR TRAILERS PRIOR TO 1979)	1
2C	96930	PISTON	2
2D	77564	SEAL-PISTON	2
2E	9443501	RUBBER BOOT-PISTON	2
2F	30686	BLEEDER SCREW	1
3	SL-116	SHOE AND LINING KIT	1
4	3-042-010023	AXLE BEAM W/SPINDLE, 10K, OIL (66"TRK,38" SP. CT.)	1
5	H-110	CALIPER REPAIR KIT (CONTAINS PISTON SEALS) (080862 FOR TRAILERS PRIOR TO 1979)	

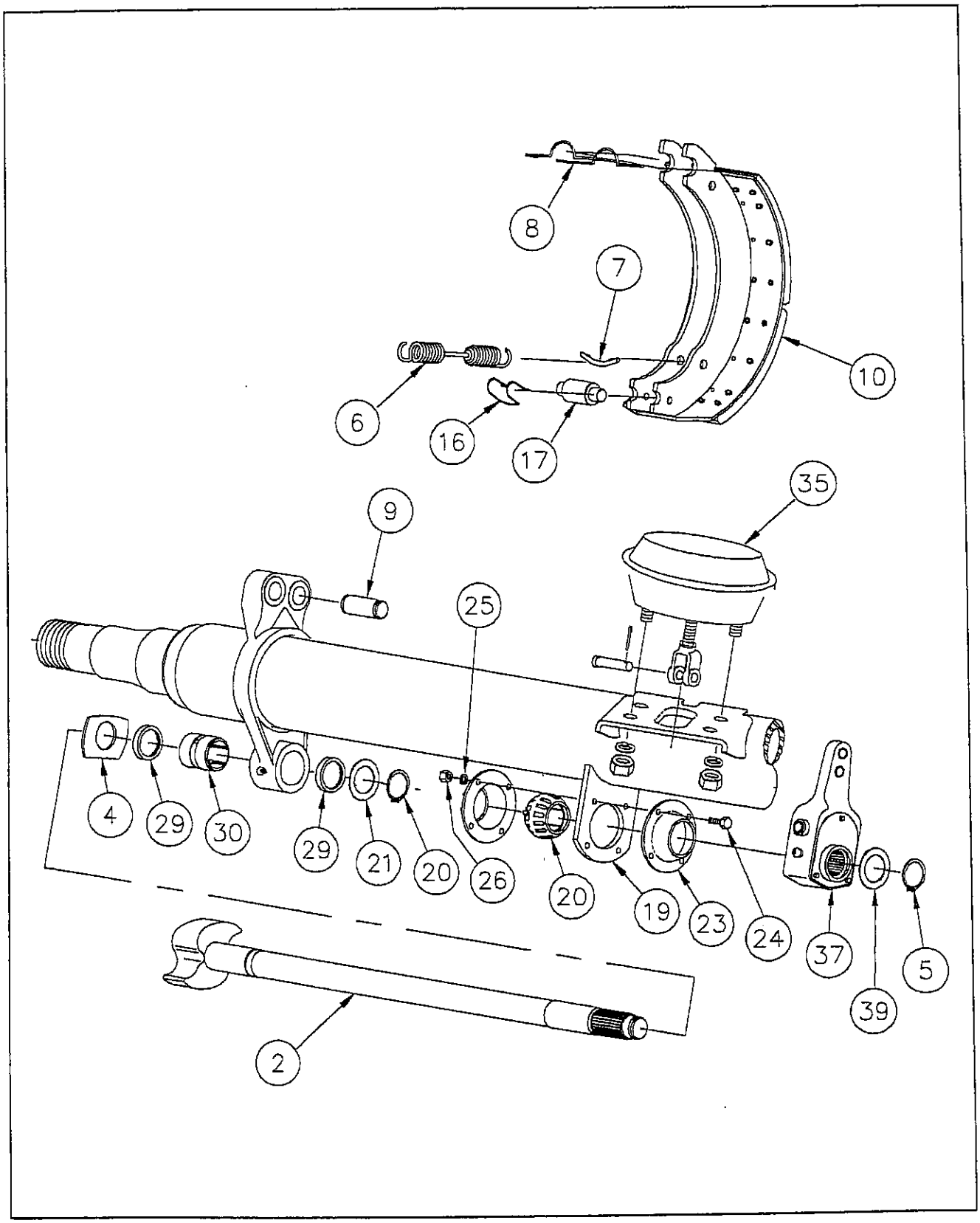

Figure 6-14 Air Brake and Axle Assembly

AIR BRAKE AND AXLE ASSEMBLY (HAYES) (OPTION)

ITEM	PART NO.	DESCRIPTION	QTY.
	9231551	RH 12-1/4 X 5-1/2 AIR BRAKE	
	9231550	LH 12-1/4 X 5-1/2 AIR BRAKE	
1	9694626	BRAKE CAM RIGHT HAND (21-1/4")	1
2	9694627	BRAKE CAM LEFT HAND (21-1/4")	1
3	9054715	SPACER-STEEL	
4	9054716	SPACER-FLAT	2
5	9680820	RING-SNAP	2
6	9652914	RETURN SPRING	2
7	9680822	SPRING RETAINER	4
8	9680823	ANCHOR PIN RETAINER	2
9	9662640	PIN-ANCHOR	4
10	SL-137	SHOE AND LINING KIT, 5-1/2" (CONVERTS 5" TO 5-1/2")	1
11	9672716	BRAKE LINING, ANCHOR END (5-1/2")	4
12	9672717	BRAKE LINING, CAM END (5-1/2")	4
13	9077123	BOLT SET 3/16"	4
14	60251004	BRAKE SHOE, (5-1/2")	4
16	9680821	ROLLER RETAINER	4
17	9662631	CAM ROLLER	4
18	9694628	BRACKET ASSY	
19	9367126	PLATE-MOUNTING	2
20	9694871	BUSHING-CAM	2
21	9103311	O-RING	6
22	9367132	GREASE FITTING 1/4"	2
23	9367180	CAM BUSH HOUSING	4
24	9077121	CAP SCREW	8
25	9054723	WASHER-LOCK	8
26	9690655	NUT	8
27	9046833	SPIDER BRAKE SUB ASSY, W/BUSHING	2
28	9046834	SPIDER BRAKE	2
29	9103310	SEAL-OIL	2
30	9141904	BUSHING-NYLON	2
31	9367128	LUBE FITTING	2
32	9694633	AIR CHAMBER BRACKET	2
35	9694673	AIR CHAMBER #20 W/HARDWARE (FRONT AXLE)	2
	9694634	AIR CHAMBER, SPRING 20-24 W/ HDWE (REAR AXLE)	2
37	9694623	SLACK ADJUSTER	2
39	9054732	SPACER WASHER	AR

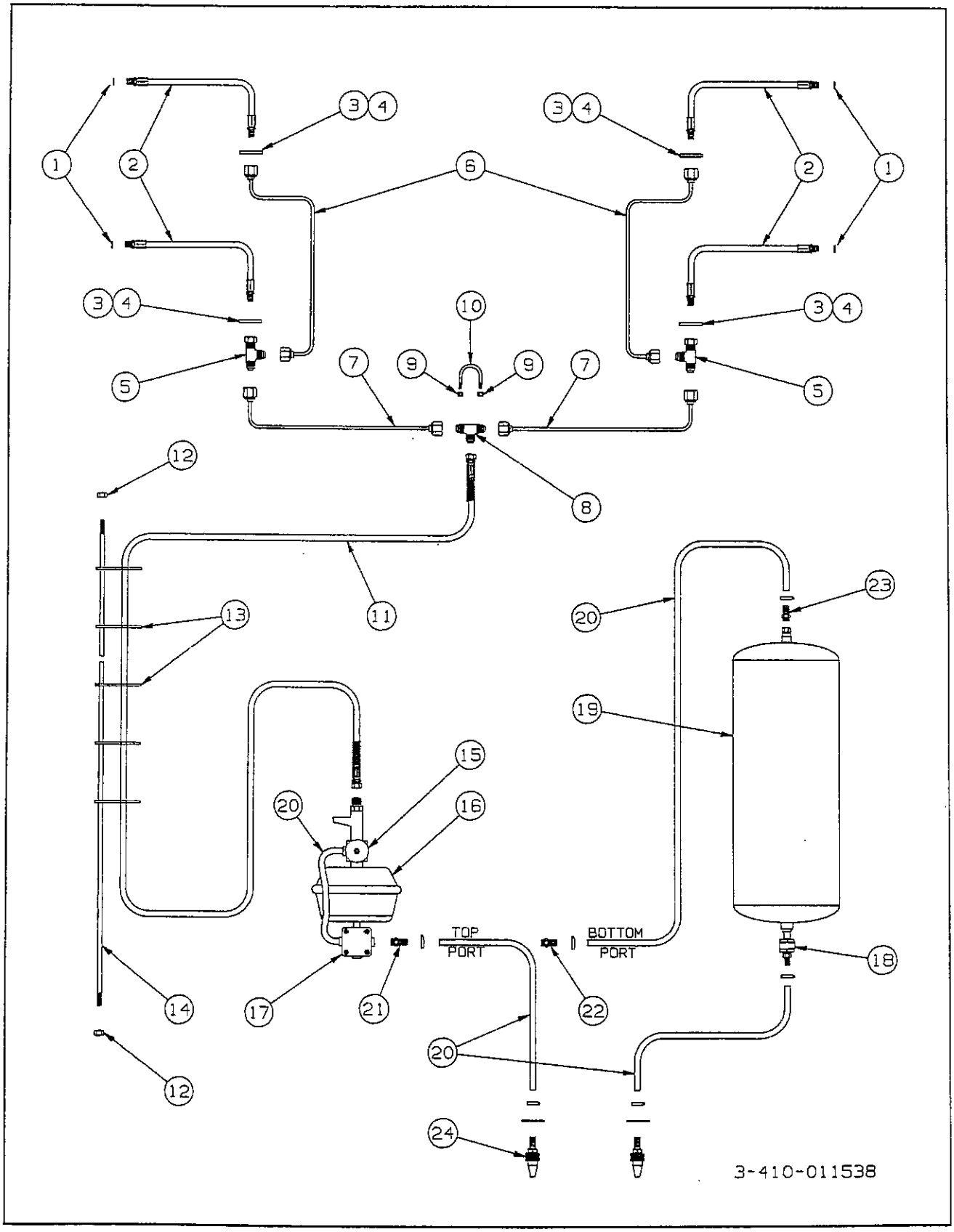

Figure 6-15 Vacuum/Hydraulic Brake System

VACUUM/HYDRAULIC BRAKE SYSTEM

ITEM	PART NO.	DESCRIPTION	QTY.
	VK-S15-TV-G21C	VACUUM/HYD. BRAKE KIT	1
1	H-1011-G	COPPER GASKET	4
2	H-798-HA	HYDRAULIC HOSE ASSEMBLY	4
3	H-801-BKT	HOSE BRACKET	4
4	H-802-CL	HOSE CLIP	4
5	H-898-ST	SERVICE TEE	2
6	H-451-TA	TUBE ASSY.	4
7	H-430-TA	TUBE ASSEMBLY	2
8	H-1/4-UT	FRAME TEE	1
9	1/4-20HFN	NUT ZP GR2	2
10	3-102-010010	U-BOLT HOSE SUPPORT	1
11	3-392-010001	HOSE ASSEMBLY	1
12	5/8-11HFLN	NUT, HEX LOCK GRB	2
13	3-452-010001	LOOP, HOSE ZP	5
14	3-642-010007	ROD HOSE SUPPORT	10
15	V10025RA14	FLUID RESERVOIR	1
16	V10015SB	BOOSTER	1
17	V7102TRV14	TRAILER RELAY VALVE	1
	V10015SBR	BOOSTER WITH RELAY VALVE	1
	V10025DC	REPLACEMENT CAP FOR MASTER CYLINDER	1
	V10025L	REPLACEMENT GASKET FOR MASTER CYLINDER	1
18	V7064CVO	CHECK VALVE	1
19	V12107VT	VACUUM RESERVOIR (1000 CU. IN.)	1
20	V12272VH	VACUUM HOSE, 1/2"	1
21	V1/2X1/4HN	HOSE NIPPLE	1
22	V1/2X3/8HN	HOSE NIPPLE	1
23	V1/2X1/2HN	HOSE NIPPLE	1
24	V12251MC	MALE CONNECTOR	2
25	6812	IDEAL HOSE CLAMP	4

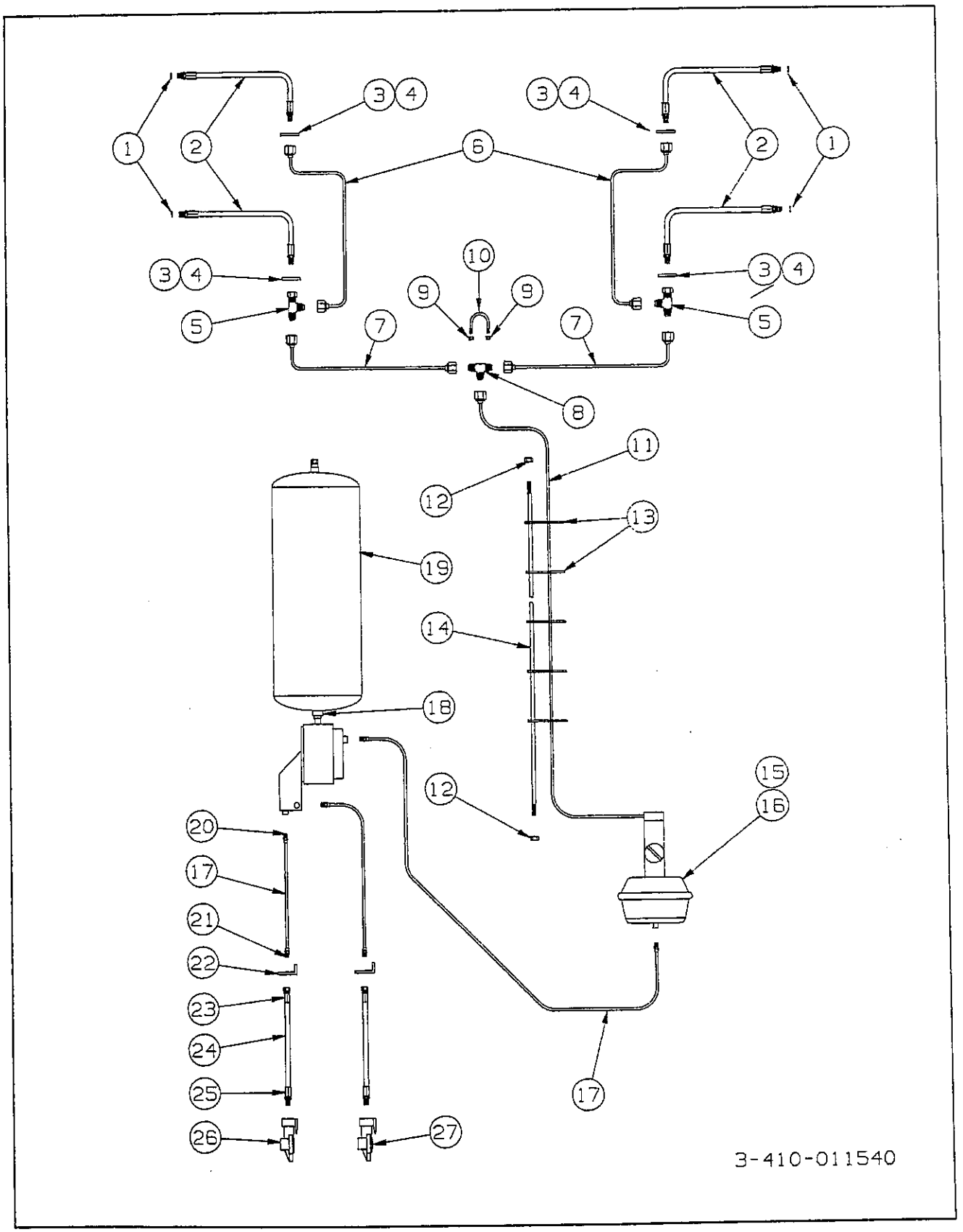

Figure 6-16 Air/Hydraulic Brake System

AIR/HYDRAULIC BRAKE SYSTEM (OPTION)

ITEM	PART NO.	DESCRIPTION	QTY.
	35125KH	AIR/HYD. BRAKE KIT (PASCO #35125-2A5-1C)	1
1	H-1011-G	COPPER GASKET	4
2	H-798-HA	HYDRAULIC HOSE ASSEMBLY	4
3	H-801-BKT	HOSE BRACKET	4
4	H-802-CL	HOSE CLIP	4
5	H-898-ST	SERVICE TEE	2
6	H-451-TA	TUBE ASSY.	4
7	H-430-TA	TUBE ASSEMBLY	2
8	H-1/4-UT	FRAME TEE	1
9	1/4-20HFN	NUT ZP GR2	2
10	3-102-010010	U-BOLT HOSE SUPPORT	1
11	3-392-010001	HOSE ASSEMBLY	1
12	5/8-11HFLN	NUT, HEX LOCK GRB	2
13	3-452-010001	LOOP, HOSE ZP	5
14	3-642-010007	ROD HOSE SUPPORT	10
15	12464A	AIR SLAVE BOOSTER (INCLUDES MASTER CYLINDER)	1
16	12661A	REPLACEMENT MASTER CYLINDER	1
17	12653	3/8" AIR TUBING	3
18	3-843-010004	EMERGENCY RELAY VALVE	1
19	12353	AIR TANK	1
20	A3/8X1/4MC	MALE CONNECTOR	2
21	A3/8X3/8MC	MALE CONNECTOR	2
22	V12354HTB	HOSE TERMINAL BRACKET	2
23	12284	STRAIGHT FITTING	2
24	12560B	3/8" AIR HOSE	2
25	12285	STRAIGHT FITTING	2
26	12260-S	SERVICE GLADHAND	1
27	12260-E	EMERGENCY GLADHAND	1

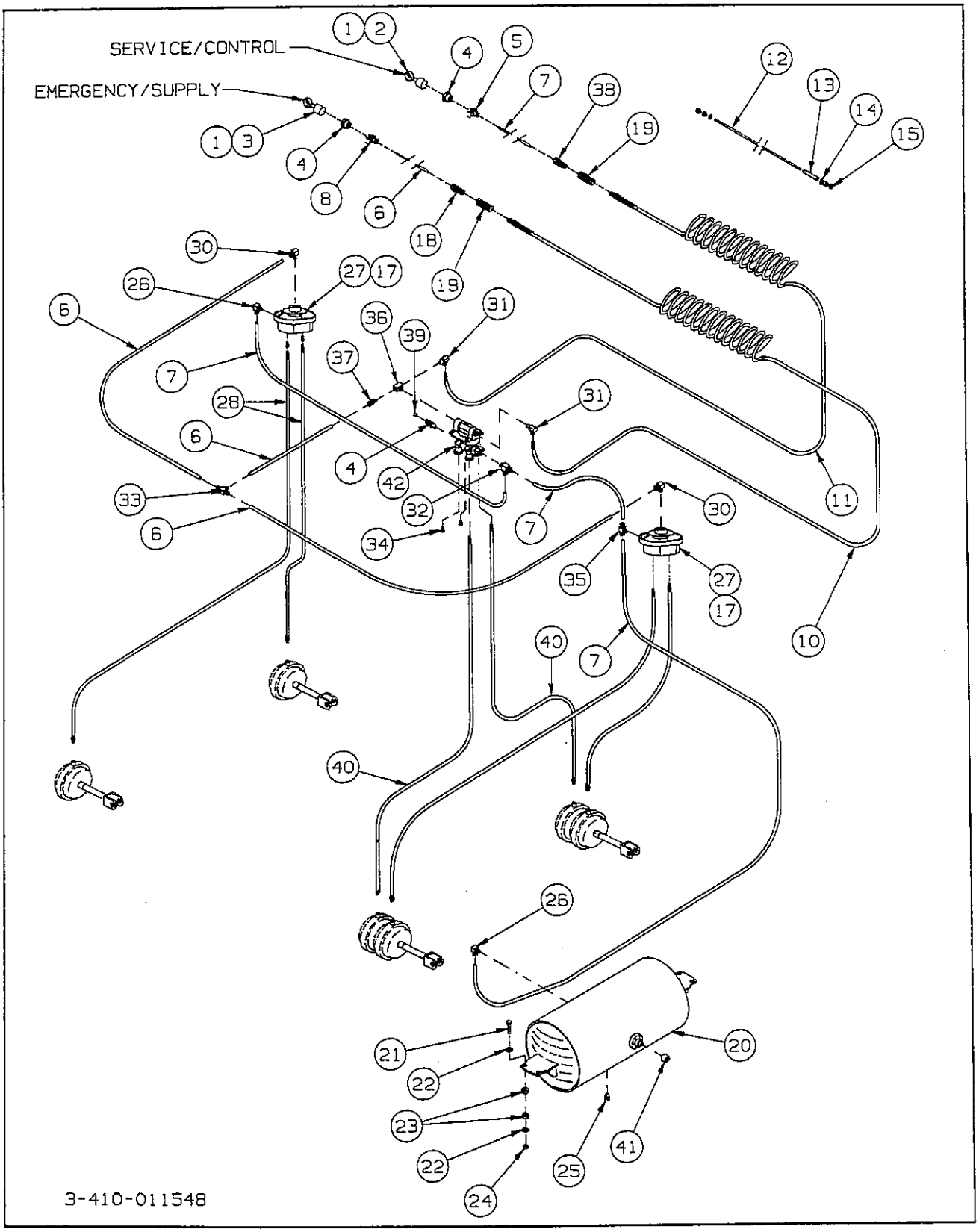

Figure 6-17 Air Brake System

AIR BRAKE SYSTEM (OPTION)

ITEM	PART NO.	DESCRIPTION	QTY.
1	55B11	GLAD HAND	2
2	55B61-7	TAG SERVICE LINE	1
3	55B61-6	TAG EMERGENCY LINE	1
4	55B61	FRAME UNION	3
5	1-297-010012-16	FITTING, AIR	1
6	62P6	TUBING, NYLON 3/8	A/R
7	62P8	TUBING, NYLON 1/2	A/R
8	1-297-010013-11	FITTING, AIR, 45°	1
9	6828	HOSE CLAMP	2
10	3-384-010001	COILED AIR BK HOSE RED 12FT	1
11	3-384-010002	COILED AIR BK HOSE, BLUE 12FT	1
12	3-642-010007	ROD HOSE SUPPORT	1
13	3-711-010047	SPACER	1
14	1-861-010032-19	FLAT WASHER	2
15	5/8-11HFN	HEX JAM NUT	4
16	2-181-010001	HOSE CLAMP	1
17	1-510-010001	FLANGE LOCK NUT	1
18	1-297-010007-13	FITTING, AIR	1
19	1-297-010022-04	FITTING, AIR, ANCHOR COUPLING	2
20	3-780-010002	RESERVOIR, AIR	2
21	3/8-16X1-1/2CS	SCREW, HEX HEAD CAP GR5	4
22	3/8FW	FLAT WASHER	8
23	805-2	STEP BUSHING	8
24	3/8-16HFLN	SELF LOCKING NUT	4
25	56D4	AIR TANK DRAIN COCK	1
26	1-297-010008-24	FITTING, AIR 90°	2
27	3-843-010005	VALVE, RELAY 2 PORT	2
28	3-384-010020	AIR HOSE	4
30	1-297-010008-20	HOSE FITTING, 90°	2
31	2047-6-6S	ELBOW	2
32	1-297-010011-06	FITTING, AIR, M/RUN TEE	1
33	1-297-010010-03	FITTING, AIR, UNION TEE	1
34	1-560-010002-03	PLUG, BLACK PIPE 3/8 NPT	2
35	1-297-010015-11	FITTING, AIR, BR TEE	1
36	1-297-010017-03	FITTING BRS PIPE, M/BR TEE	1
37	1-297-010007-12	FITTING, AIR	1
38	1-297-010007-16	FITTING, AIR	1
39	1-560-010002-02	BLACK PIPE PLUG	1
40	1-384-010038-1	AIR HOSE 15"	2
41	1/2PIPE PLUG	PIPE PLUG	3
42	758-181	VALVE, FOUR PORT TASK	1
43	3-125-010216	AIR LINE BRACKET, BULKHEAD	1

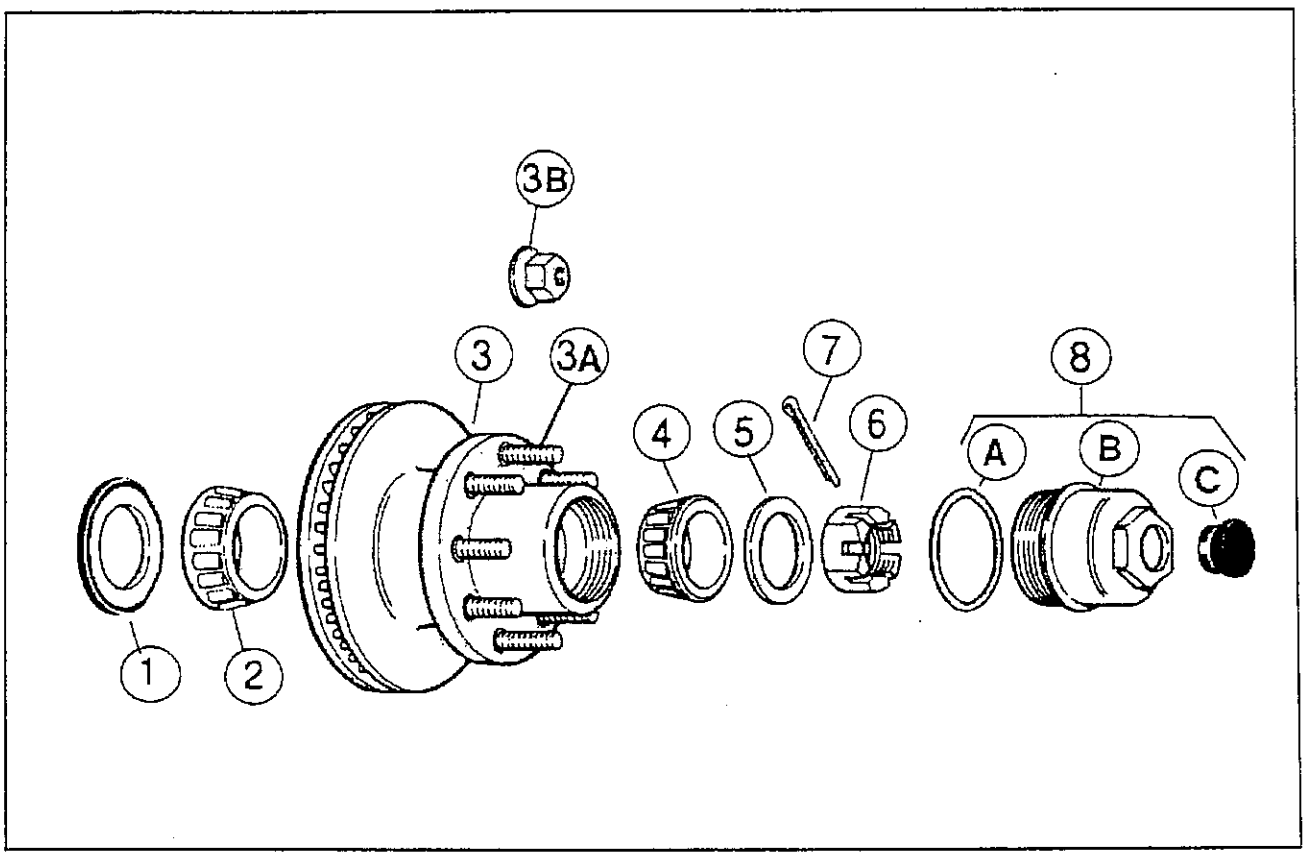

Figure 6-18 Hub and Rotor Assembly

HUB AND ROTOR FOR HYDRAULIC DISC BRAKE (HAYES)

ITEM	PART NO.	DESCRIPTION	QTY.
1	91023	OIL SEAL	1
2	93717	INNER BEARING	1
3*	9089421	HUB AND ROTOR ASSEMBLY (FLAT FACE)	1
3**	90814	HUB AND ROTOR ASSEMBLY (COIN IN-OUT)	1
3A	90737	STUD 5/8"	8
3B*	9065602	NUT 5/8" SWIVELING FLANGE (FLAT FACE)	8
3B**	90633	NUT 5/8" FLANGE (COIN IN-OUT)	8
4	93715	OUTER BEARING	1
5	90525	SPINDLE WASHER	1
6	90623	SPINDLE NUT	1
7	91903	COTTER PIN	1
9	92124	OIL CAP ASSEMBLY	1
9A	92125	OIL CAP	1
9B	92127	O-RING	1
9C	92126	PLUG	1
10*	3-870-010096	WHEEL (FLAT FACED) 16.5X6.75	1
10**	91708	WHEEL (COIN IN-OUT) 16.5X6.75	1
11	TR416	VALVE STEM	1

* USED AFTER FEBRUARY 1992.
** USED BEFORE FEBRUARY 1992.

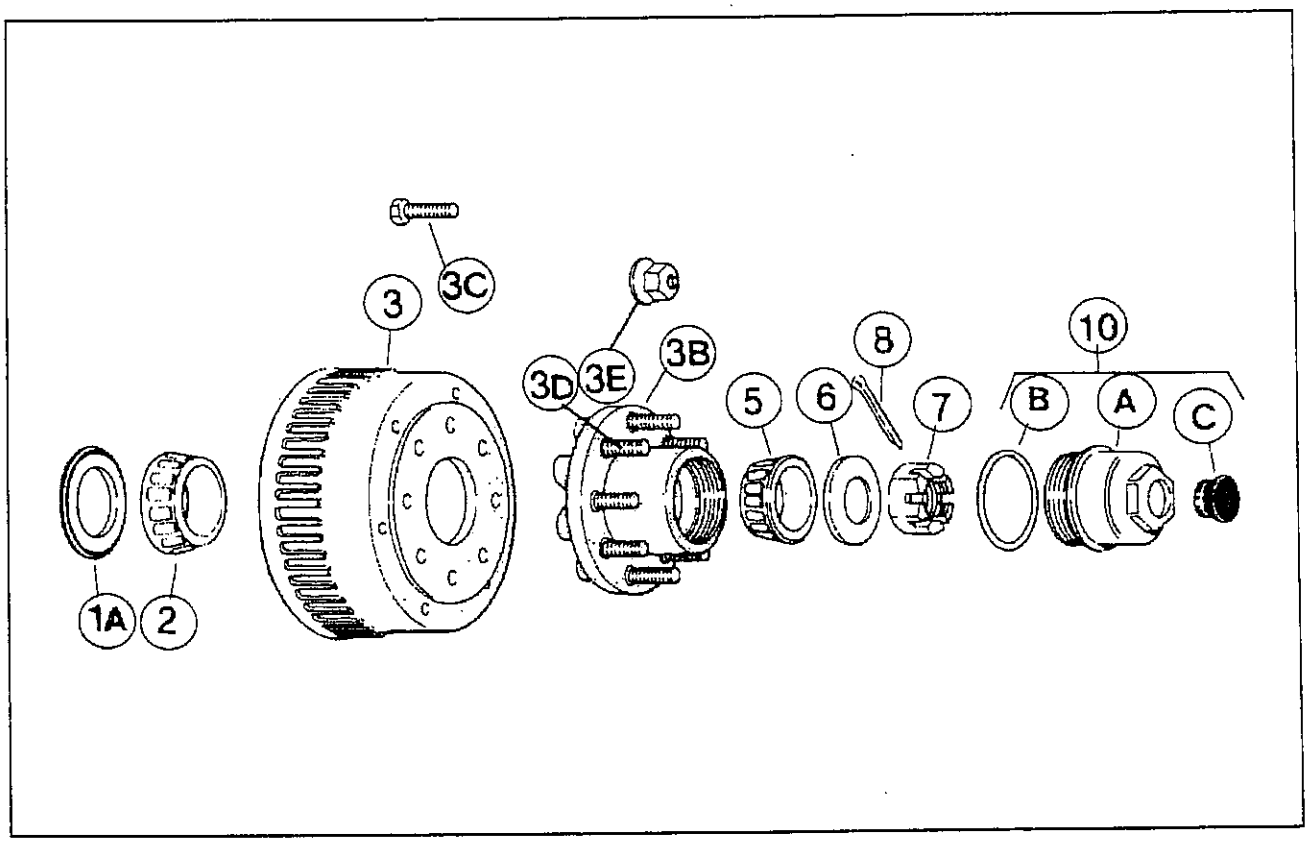

Figure 6-19 Hub and Drum Assembly

HUB AND DRUM FOR AIR BRAKE (HAYES)

ITEM	PART NO.	DESCRIPTION	QTY.
1	91023	OIL SEAL	1
2	93717	INNER BEARING	1
3*	9089411	HUB/DRUM ASSEMBLY(FLAT FACE)	
3**	9080638	HUB/DRUM ASSEMBLY(COIN IN-OUT)	1
3A	9090402	DRUM	1
3B*	9089371	HUB (FLAT FACE)	
3B**	90884	HUB (COIN IN-OUT)	1
3C	90745	CAP SCREW	
3D	90737	STUD, 5/8"	8
3E*	9065602	NUT 5/8" SWIVELING FLANGE (FLAT FACE)	
3E**	90633	NUT 5/8" FLANGE (COIN IN-OUT)	8
5	93715	OUTER BEARING	1
6	90525	SPINDLE WASHER	1
7	90623	SPINDLE NUT	1
8	91903	COTTER PIN	1
10	92124	OIL CAP ASSY	1
10A	92125	OIL CAP	1
10B	92127	O'RING	1
10C	92126	PLUG	1
10*	3-870-010096	WHEEL (FLAT FACED) 16.5X6.75	1
10**	91708	WHEEL (COIN IN-OUT) 16.5X6.75	1
11	TR416	VALVE STEM	1

* USED AFTER FEBRUARY 1992.

** USED BEFORE FEBRUARY 1992.

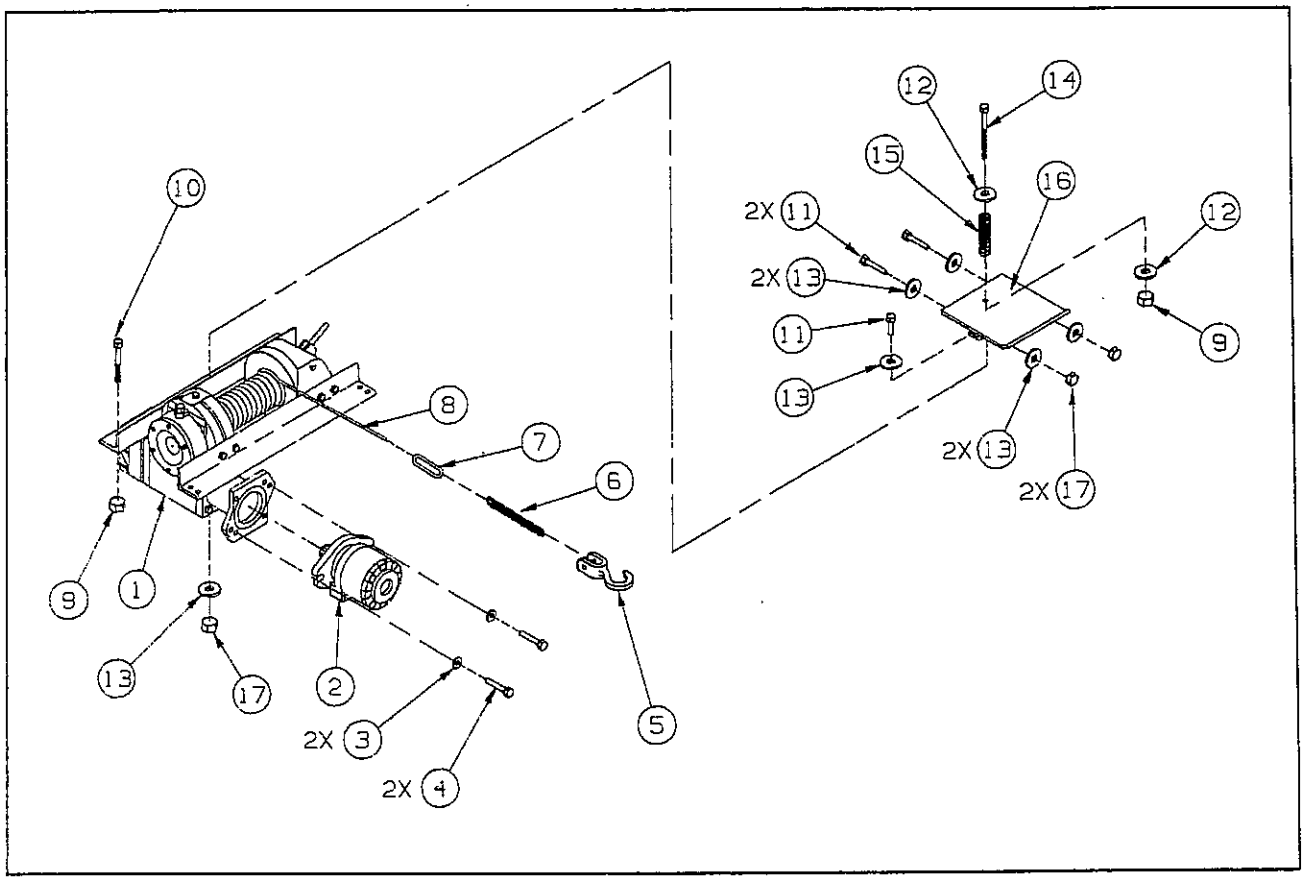

Figure 6-20 Winch Installation

WINCH INSTALLATION

ITEM	PART NO.	DESCRIPTION	QTY.
1	3-873-010122	WINCH ASSY 12K	1
2	104-1003	MOTOR HYD.	1
3	1-861-010032-15	WASHER, FLAT 1/2"	2
4	1-654-010055-04	SCREW, HEX CAP	2
5	7HCGHT500	HOOK	1
6	3-174-010022036	CHAIN	1
7	3-174-010038	LINK	1
8	3-155-010017-1	CABLE 1/2"X60'	1
9	1/2-13HFN	NUT, ZP GR2	9
10	1/2-13X1-1/2CS	SCREW, HEX CAP	8
11	3/8-16X1-1/4CS	SCREW, HHCS ZP GR5	3
12	1/2FW	FLAT WASHER ZP	2
13	1-861-010032-10	WASHER, FLAT 3/8"	6
14	1/2-13X5-1/2HCS	SCREW, CAP GR5	1
15	3-720-010010	SPRING COMP LEVEL WIND	1
16	3-873-010124	WINCH TENSIONER WLDMT	1
17	3/8-16HFLN	NUT, HEX LOCK GRB CAD W/WAX	3

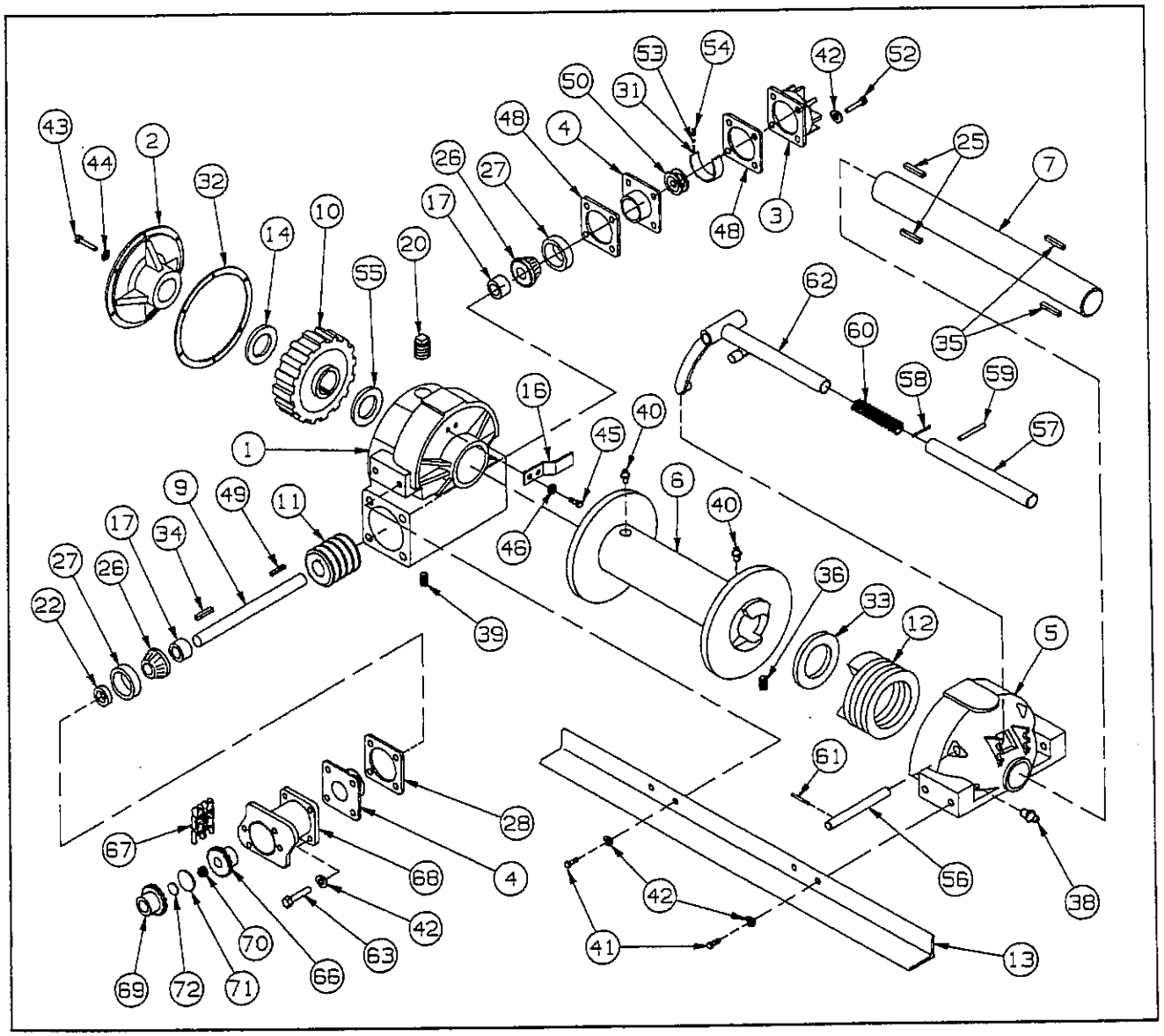

Figure 6-21 12,000# Winch Items

12,000# WINCH ASSEMBLY

ITEM	PART NO.	DESCRIPTION	QTY.
	3-873-010122	WINCH ASSY 12K (BRADEN MODEL	1
1	81006	WORM HOUSING ASSEMBLY (INCLUDES ITEM 18)	1
2	81009	COVER ASSEMBLY, WORM HOUSING (INCLUDES ITEM 19)	1
3	18032	HOUSING, SAFETY BRAKE	1
4	23303	CONTAINER, BEARING	2
5	81530	LEG ASSEMBLY, BEARING (INCLUDES ITEM 47)	1
6	11128	DRUM, CABLE	1
7	11129	DRUM SHAFT, CABLE	1
9	23470	SHAFT, WORM	1
10	11144	GEAR, WORM, LEFT HAND	1
11	11142	WORM, LEFT HAND	1
12	18039	SLIDING CLUTCH	1
13	22752	ANGLE, BASE	2
14	13680	THRUST RING	1

12,000# WINCH ASSEMBLY (CONTINUED)

ITEM	PART NO.	DESCRIPTION	QTY.
16	81025	BRAKE, DRAG	1
17	11308	SPACER, WORM	2
18	18078	BUSHING	1
19	11368	BUSHING	1
20	22775	PLUG, PIPE	1
21	18009	PLUG, PIPE	1
22	18026	SEAL, GREASE	2
25	11117	KEY, WORM GEAR	2
26	18015	CONE, BEARING	2
27	18016	CUP, BEARING	2
28	18027	GASKET	3
31	21925	BAND, BRAKE	1
32	11133	WORM HOUSING COVER GASKET	3
33	18019	RETAINER RING	1
34	18030	KEY WORM	1
35	18020	KEY, CLUTCH	2
36	24032	SETSCREW	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	18078	BUSHING	1
48	18024	BEARING CONTAINER GASKET	3
49	10078	KEY	1
50	18028	DRUM, BRAKE	1
51	12075	SCREW, SET	1
52	22703	CAPSCREW	4
53	13468	JAM NUT	4
54	18029	BRAKE BAND SPRING	1
55	11240	RETAINER RING	1
56	11130	SHIFTER SHAFT	1
57	12817	SHIFTER HANDLE	1
58	18056	ROLLPIN	1
59	13028	ROLL PIN	1
60	18002	SPRING	1
61	11837	ROLLPIN	2
62	13839	SHIFTER FORK	1
63	22704	CAPSCREW	4
65	18044	KEY	1
66	23081	COUPLING HALF (WORM SHAFT)	1
67	13424	ROLLER CHAIN	1
68	23079	MOTOR ADAPTER	1
69	23083	COUPLING HALF (MOTOR SHAFT)	1
70	23353	SPRING	1
71	23078	SPACER	1
72	23085	SPACER	1

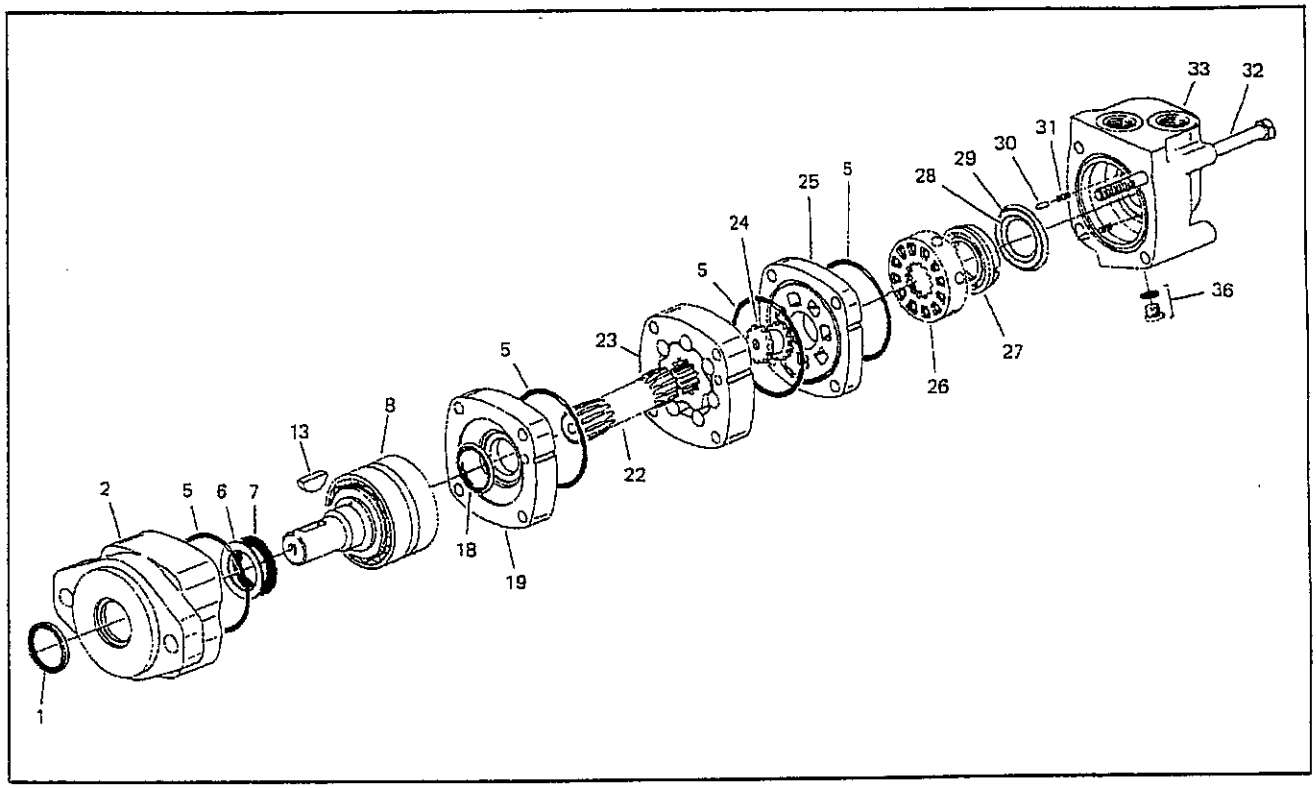

Figure 6-22 Winch Motor Assembly, 12,000#

WINCH MOTOR ASSEMBLY, 12,000#

ITEM	PART NO.	DESCRIPTION	QTY.
	104-1003	MOTOR HYD. (FOR 12K)	1
1	9121-1	SEAL, EXCLUSION	1
2	21578-4	HOUSING, BEARING	1
5	9022-6	SEAL, 3 IN. ID	4
6	7382	RING, BACK-UP	1
7	9057-9	SEAL, SHAFT	1
8	21618-1	SHAFT AND BEARING KIT	1
13	14193	KEY, SHAFT	1
18	9050	SEAL, SHAFT FACE	1
19	22102	PLATE, WEAR	1
22	21371-4	DRIVE	1
23	21625-3	GEROLER	1
24	8433	DRIVE, VALVE	1
25	22134	PLATE, VALVE	1
26	21466	VALVE	1
27	8915	BALANCE RING	1
28	9049-1	SEAL, FACE, INNER	1
29	9135-2	SEAL, FACE, OUTER	1
30	14351	PIN	2
31	7383	SPRING	2
32	14384-007	BOLT	4
33	21564-1	HOUSING, VALVE	1
36	9072-3	PLUG ASSEMBLY 7/16-20 UNF	1
	61258	SEAL KIT (CONTAINS ITEMS 1, 5-7, 18, 28, AND 29)	
	61260	VITON SEAL KIT (CONTAINS ITEMS 1, 5-7, 18, 28, AND 29)	

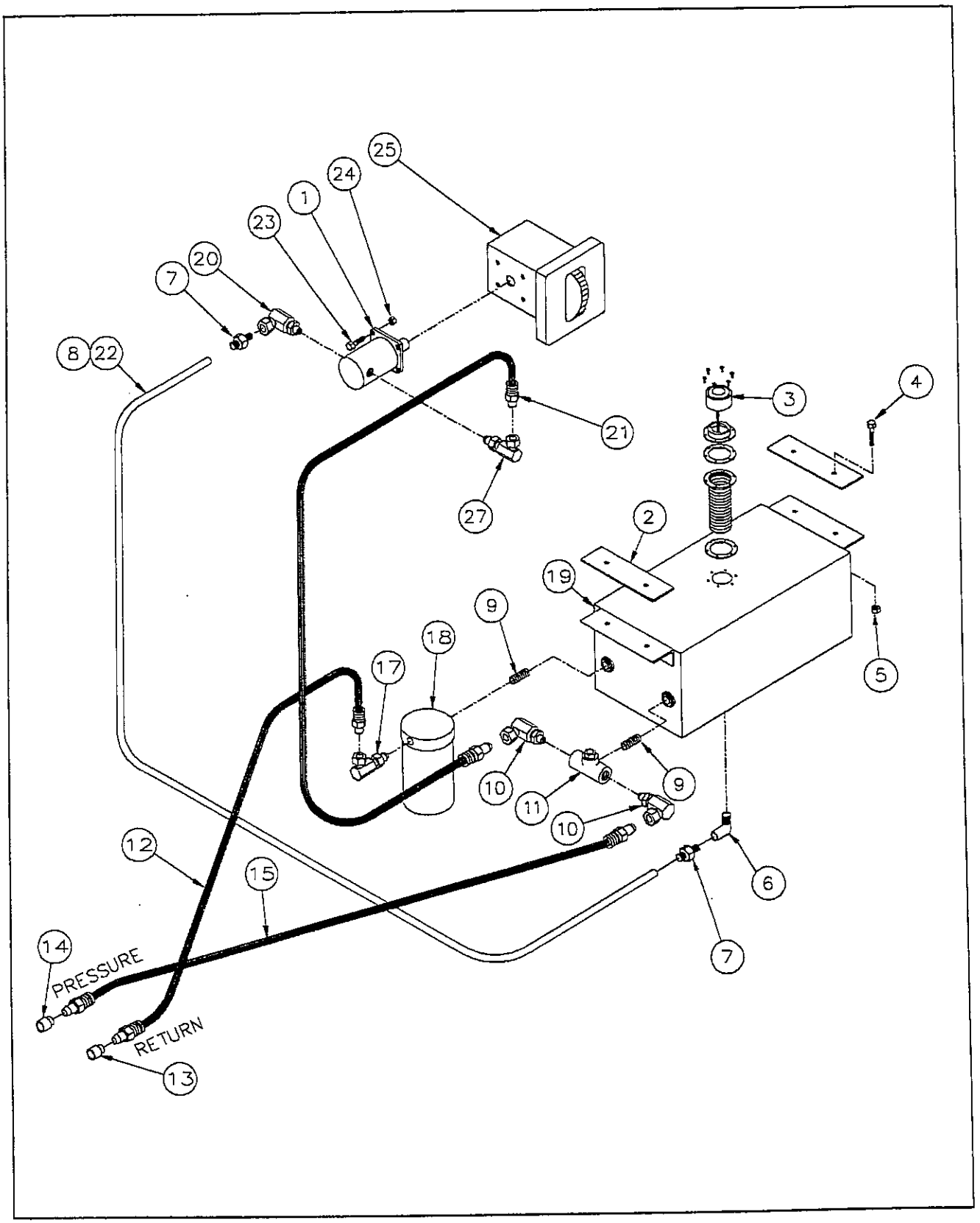

Figure 6-23 Wet Kit (Optional)

HYDRAULIC WET KIT, (OPTIONAL)

ITEM	PART NO.	DESCRIPTION	QTY.
	3-410-010839	HYDRAULIC WET KIT ASSEMBLY	1
1	3-591-010001	HYDRAULIC GEAR PUMP	1
2	3-120-010103	CLAMP HYD TANK	2
3	3-162-010001	FILLER BREATHER STRAINER ASSY	1
4	3/8-16X1-1/4CS	SCREW, HHCS ZP GR5	4
5	3/8-16HFLN	NUT, HEX LOCK GR8 CAD W/WAX	4
6	1-1/4ST ELL	ELBOW, BLK PIPE 90° ST	1
7	3-561-010001	HOSE BARB 1-1/4 NPT	2
8	6828	HOSE CLAMP, IDEAL 2.25MAX-1/3MIN	2
9	3/4NIPPLE	NIPPLE, ALL THREAD	2
10	1-007-010013	SWIVEL, 1/2 FPT, 3/4 MPT 90°	2
11	125130	BY PASS, RD12D HYD SRDD	1
12	1-397-010044	HOSE HYDRAULIC 3/4"	AR*
	1-299-010002	HOSE END, 3/4"	2
13	S21F-6	COUPLER, 3/4 NPT MALE HALF	1
14	4050-4	COUPLER BODY HALF	1
15	3-397-010010	HOSE HYDRAULIC, 1/2"	AR*
	1-299-010001	HOSE END, 1/2"	2
17	2047-12-12S	PIPE SWIVEL, 90° MALE 3/4-14	1
18	1-295-010001	RETURN FILTER	1
	1-295-010002	FILTER ELEMENT	1
19	3-786-010001	TANK, HYDR 5TH WHEEL	1
20	1-007-010006	90° EL, 1-5/16 O-RING-1-1/4 HOSE	2
21	1-397-010010	HOSE HYDRAULIC, 1/2"	AR*
	1-299-010001	HOSE END, 1/2"	2
22	3-399-010001048	HOSE 1-1/4X4'-0" SUCTION	1
23	1/2-13X1-1/2CS	SCREW, HEX CAP ZP GR5	4
24	1/2SLW	WASHER, SPLIT LOCK ZP	4
25	PTO	POWER TAKE OFF	1
27	1-007-010009	90° 3L, 1-5/16 O-RING-1/2-14NPT	1

* GIVE LENGTH WHEN ORDERING HOSE ASSEMBLIES.

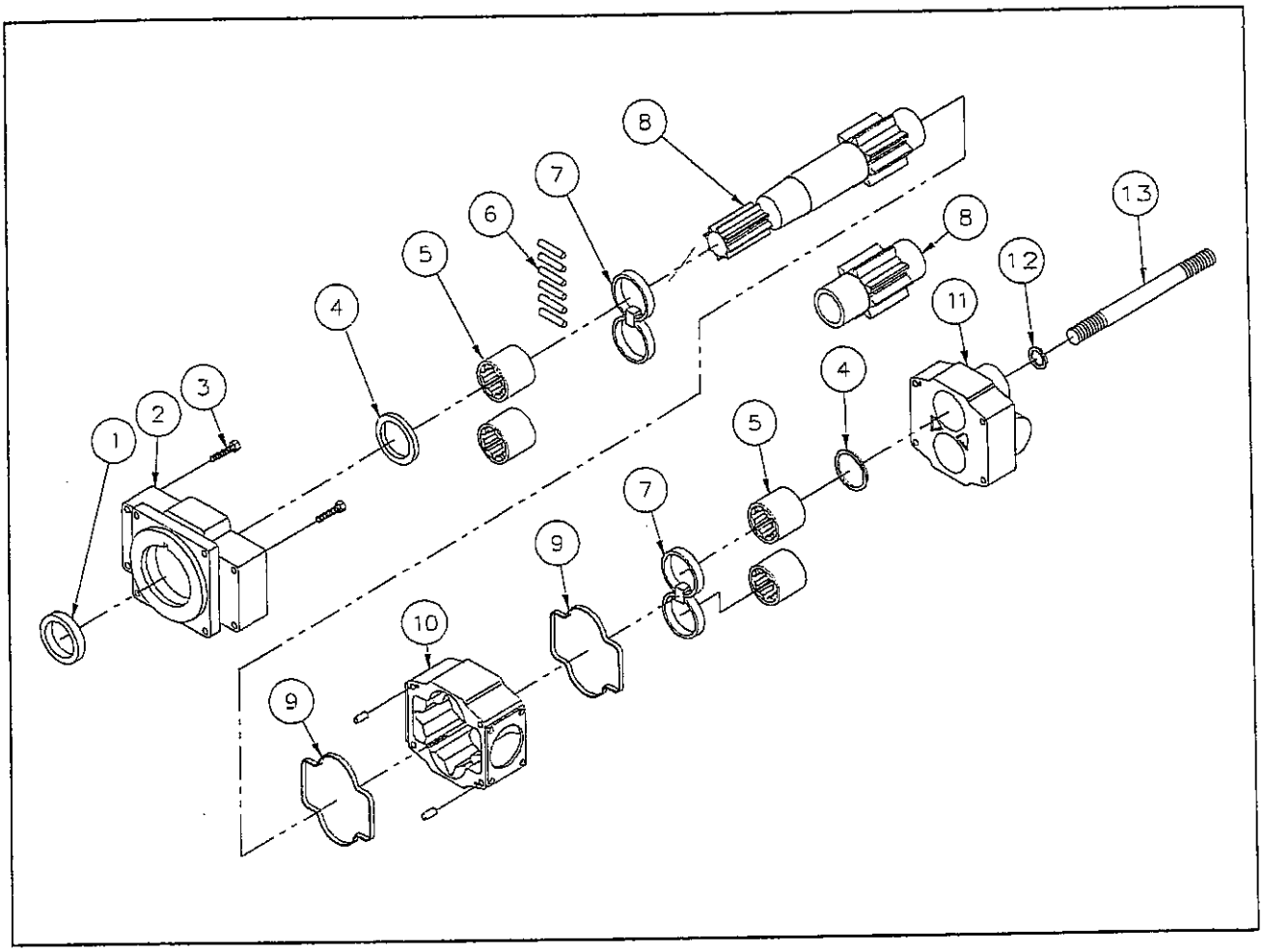

Figure 6-24 Wet Kit Pump

HYDRAULIC PUMP, WET KIT (OPTIONAL)

ITEM	PART NO.	DESCRIPTION	QTY.
	3-591-010001	HYDRAULIC PUMP ASSEMBLY	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
14	391-1802-119	SEAL KIT	

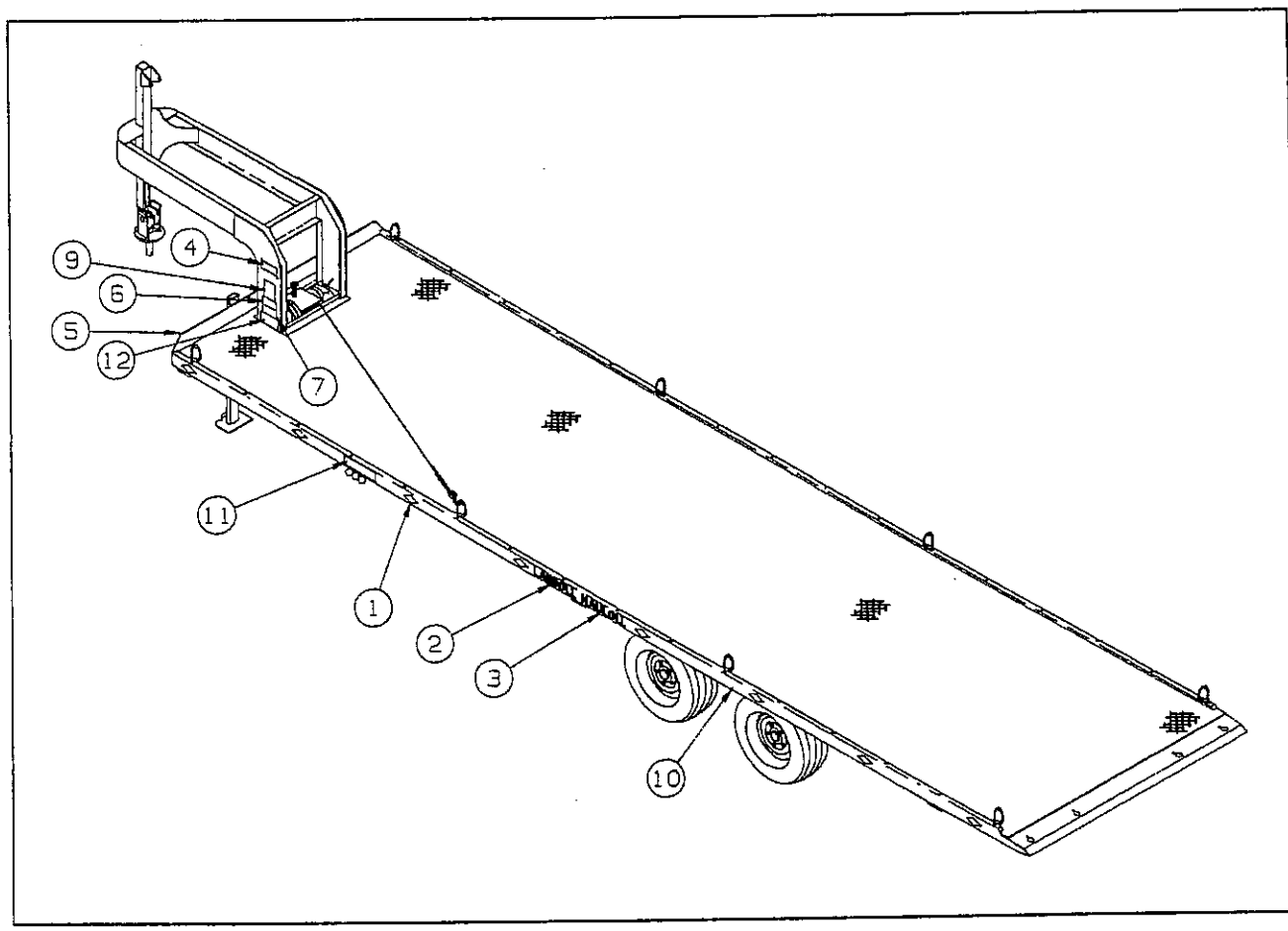

Figure 6-25 Decal Placement

DECAL PLACEMENT

ITEM	PART NO.	DESCRIPTION	QTY.
1	1-573-010014	DECAL L WHITE	20
	1-573-010002	DECAL L BLACK	20
2	1-573-010015	DECAL LANDOLL WHITE	4
	1-573-010003	DECAL LANDOLL BLACK	4
3	1-573-010016	DECAL HAULOLL WHITE	4
	1-573-010004	DECAL HAULOLL BLACK	4
4	1-573-010013	DECAL LANDOLL WHITE	4
	1-573-010001	DECAL LANDOLL BLACK	4
5	3-573-010020	PLATE, IDENTIFICATION	1
6	1-573-010082	DECAL, PATENT TRAILERS	2
7	3-573-010038	DECAL, CAUTION	1
8	3-573-010060	DECAL, TOLL- FREE NO.	1
9	3-573-010127	DECAL, OPERATION 3-AXLE	1
10	3-573-010189	DECAL, TIRE CHANGING PROCEDURE	2
11	3-573-010009	DECAL, INSTRUCTION	1
12	3-573-010025	DECAL, WINCH	2

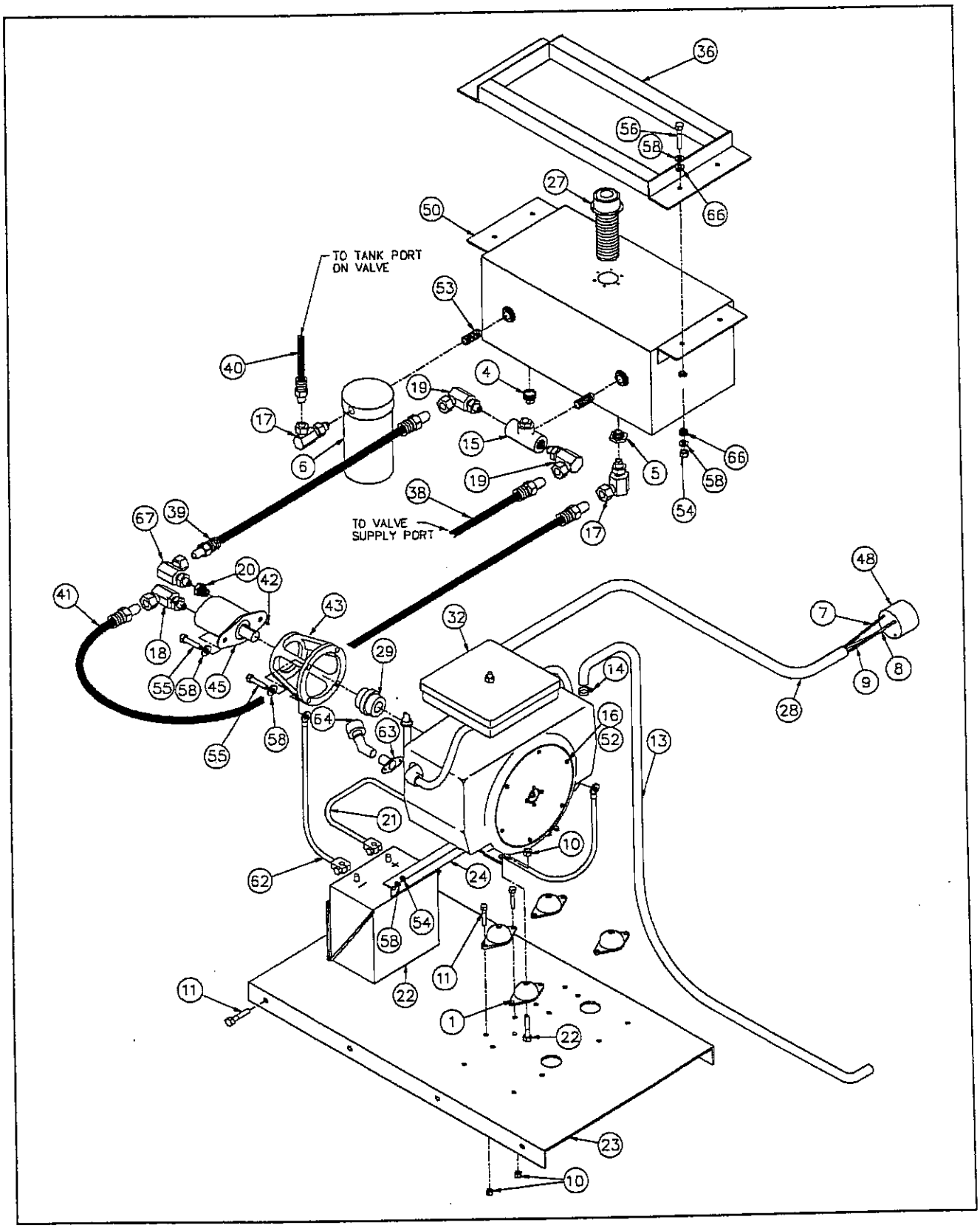

Figure 6-26 Auxiliary Engine Package (1 of 2)

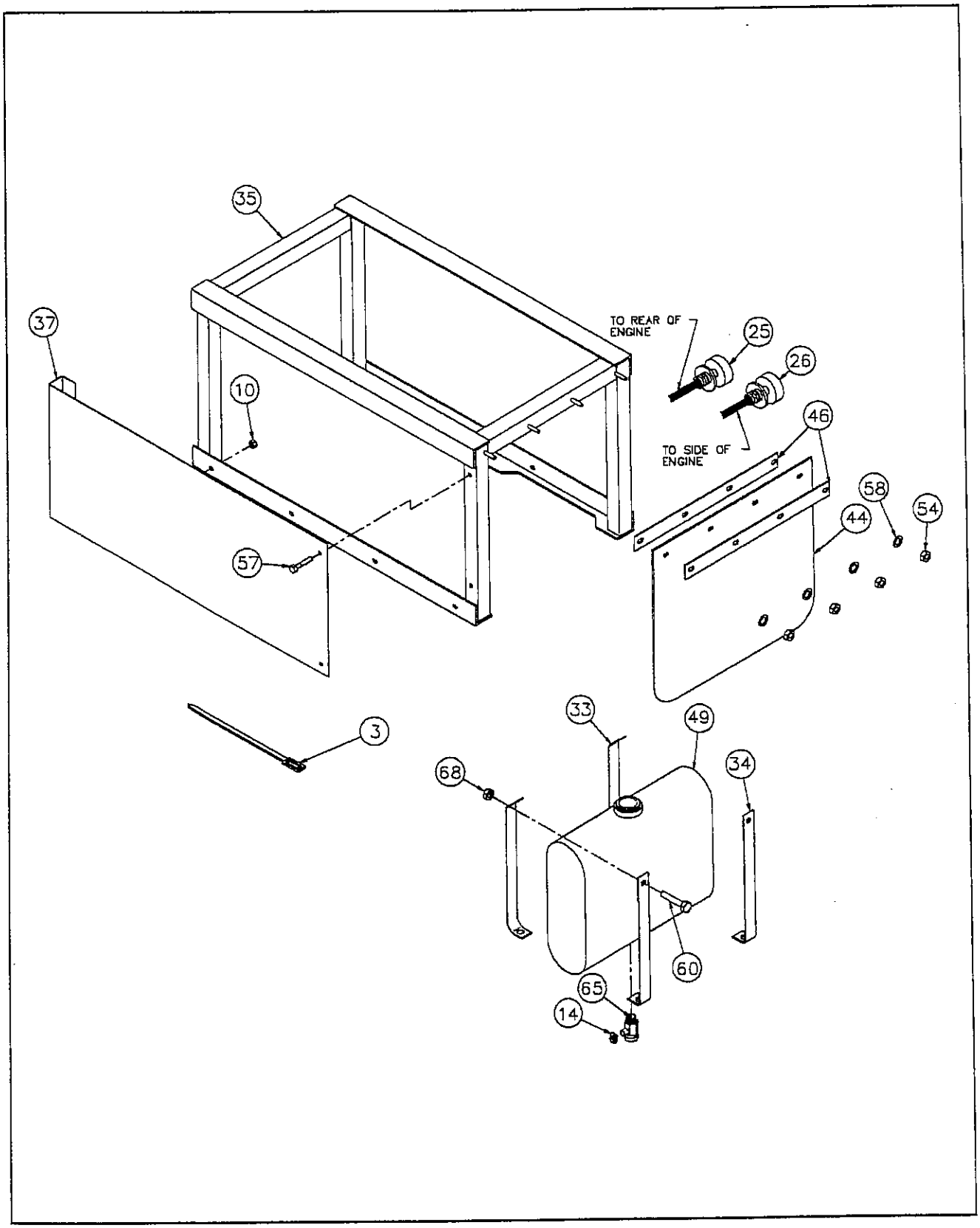

Figure 6-27 Auxiliary Engine Package (2 of 2)

AUXILIARY ENGINE PACKAGE (OPTIONAL)

ITEM	PART NO.	DESCRIPTION	QTY.
1	CA-1595	MACHINE MOUNT	4
2	C01-412	RING TERMINAL 1/4DIA 16-14 GA	3
3	T120R	TYTON STRAP	30
4	1-1/4 PIPE PLUG	BLACK 1-1/4 SQ HEAD	1
5	1-1/4 X 3/4BUSH	BLACK PIPE BUSHING	1
6	1-295-010001	FILTER, RETURN LINE	1
7	1-879-010004120	WIRE, RED 14 AWG 120 IN	1
8	1-879-010006120	WIRE, GREEN 14 AWG 10FT	1
9	1-879-010010120	WIRE, WHITE 14 AWG 10FT	1
10	1/2-13HFLN	NUT HEX LOCK GR8 CAD W/WAX	20
11	1/2-13X1-1/2CS	SCREW HEX HEAD CAP ZP GR5	20
12	3-125-010254	BRACKET ENGINE CONTROLS	1
13	104-0505	HOSE FUEL LINE 1/4 ID	9.52FT
14	105-0105	CLAMP, HOSE IDEAL 6203	2
15	125130	RD12D HYD BY PASS SRDD	1
16	134-4560	GUARD, ENGINE ONAN	1
17	2047-12-12S	SWIVEL 90° PIPE 3/4-14	2
18	2047-12-16S	SWIVEL 90° PIPE 3/4-1	1
19	1-007-010013	SWIVEL1/2 FPT 3/4 MPT 90°	2
20	2081-16-8S	REDUCER EXTERNALL PIPE/ INTERNAL PIPE	1
21	239-8113-36	CABLE, BATTERY, (-)	1
22	2481X	BATTERY 12 VOLT	1
23	3-055-010005	BASE, POWER CENTER, WLDMT	1
24	3-120-010124	BATTERY, CLAMP BRACKET	1
25	3-153-010001	CHOKE CABLE	1
26	3-155-010012	CABLE THROTTLE	1
27	3-162-010001	FILLER BREATHER STRAINER	1
28	3-201-010002120	CONDUIT PLASTIC FLEX 3/8X10FT	1
29	3-220-010003	FLEXIBLE COUPLING 1-1/8X3/4	1
30	3-272-010021	ELECT BUTT SPLICE 16-14 W/SEA	2
31	3-272-010022	ELECT BUTT SPLICE 12-10 W/SEA	1
32	3-273-010006	ENGINE 20 HP ONAN	1
33	3-311-014058	STRAP, FUEL TANK	2
34	3-311-014059	STRAP FUEL TANK	1
35	3-311-015692	BASE POWER CENTER WLDMT	1
36	3-311-014262	MOUNT HYD TANK	1
37	3-681-010066	SHIELD POWER CENTER	1
38	1-397-010313052	HOSE ASSY, 3/4X52", 3/4MPT ENDS	1
39	1-397-010311016	HOSE ASSY, 1/2X16",1/2 MPT ENDS	1
40	1-397-010311068	HOSE ASSY, 1/2X68" 1/2MPT ENDS	1
41	1-397-010313039	HOSE ASSY, 3/4X39", 3/4MPT ENDS	1
42	3-427-010003	KEY, WOODRUFF	1
43	3-482-010003	20HP HYDRAULIC PUMP MOUNT	1
44	3-485-010002	MUD FLAP 30 IN TRK BED	2
45	3-591-010005	PUMP GEAR HYDR .75 CID	1
46	3-762-010017	CLAMP MUD FLAP	2

AUXILIARY ENGINE PACKAGE (OPTIONAL) (CONTINUED)

ITEM	PART NO.	DESCRIPTION	QTY.
47	3-762-010509	BRACKET, MUD FLAP SHORT	1
48	3-765-010005	IGNITION SWITCH	1
49	3-783-010006	TANK, FUEL	1
50	3-786-010015	TANK HYDR ASSY	1
51	3-828-010005	TUBE 3/8 O.D.X1/4 I.D. POLY	72
52	3/16X3/4CS SELF	SCREW, HEX HEAD CAP SELF DRILL	4
53	3/4NIPPLE	ALL THREAD NIPPLE	1
54	3/8-16HFLN	NUT HEX LOCK GR8 CAD W/WAX	16
55	3/8-16X1-1/4CS	SCREW, HEX HEAD CAPZP GR5	6
56	3/8-16X1-3/4CS	SCREW, HEX HEAD CAPZP GR5	4
57	3/8-16X3-1/2CS	SCREW, HEX HEAD CAPZP GR2	2
58	3/8FW	WASHER, FLAT ZP	18
59	3/4X5NIPPLE	NIPPLE 3/4X5" LONG	1
60	5/16-18X1-1/4CS	CAP SCREW HEX GR2	2
61	5/16-18X3/4HHCS	SCREW, HEX HEAD CAPZP GR5	2
62	514-9045-36	CABLE, BATTERY (+)-AUX ENGINE	1
63	541-0203	EXHAUST ADAPTER KIT	1
64	542-7205	MUFFLER KIT ONAN	1
65	6600	VALVE SHUT-OFF GAS WEATHERHEAD	1
66	805-2	BUSHINGS, STEP	8
67	2047-8-8S	ADAPTER	1
68	5/16-18HFLN	NUT LOCKING HEX	4

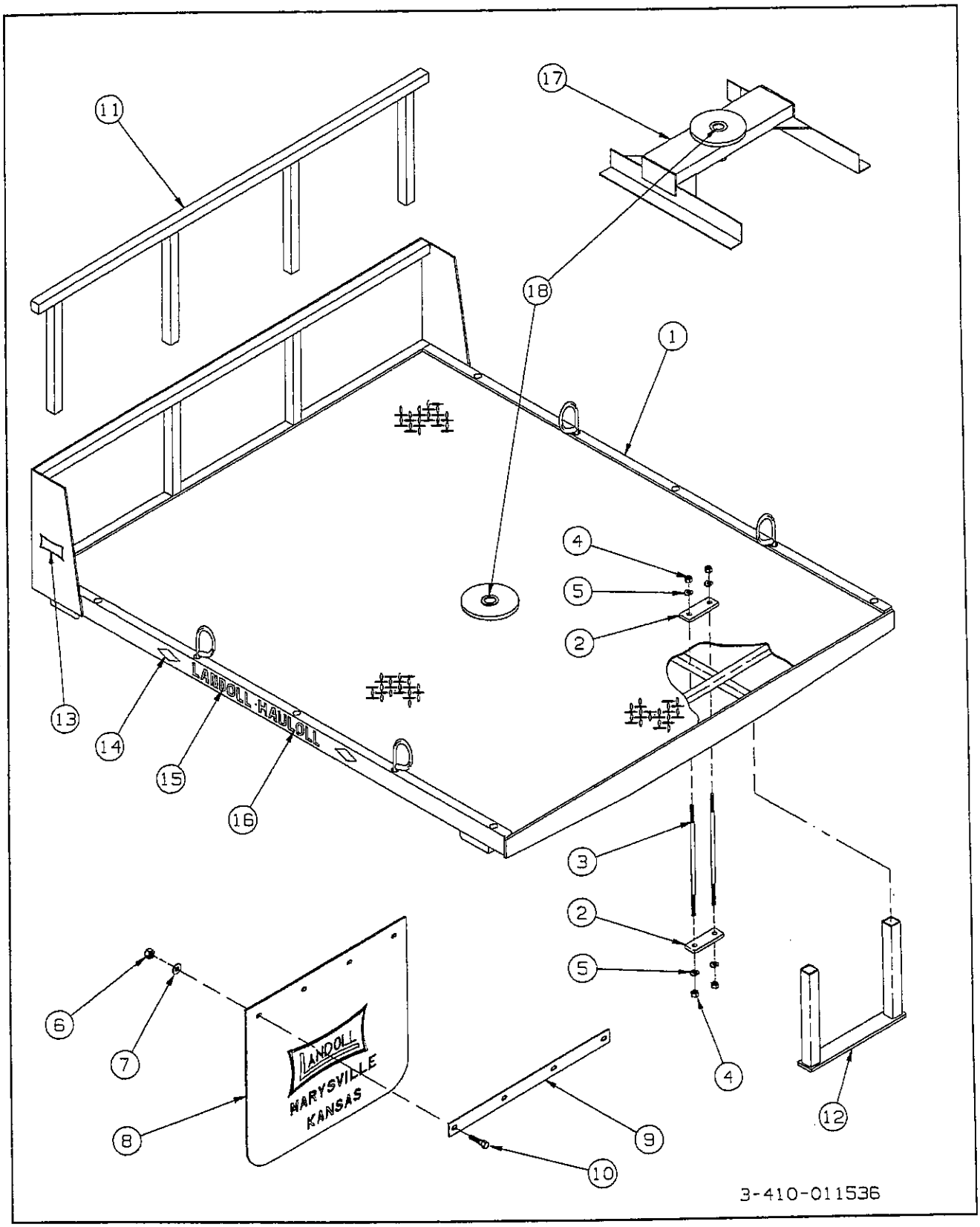

Figure 6-28 Truck Bed Options

TRUCK BED OPTIONS

ITEM	PART NO.	DESCRIPTION	QTY.
1	B3-080-001	TRUCK BED, FLUSH MOUNT HITCH, 7'6" X 8'6"	1
	B3-080-002	TRUCK BED, FLUSH MOUNT HITCH, 8' X 9'6"	1
	B3-080-003	TRUCK BED, RECESSED HITCH, 8' X 10'6"	1
	B3-080-003	TRUCK BED, RECESSED HITCH, 8' X 11'6"	
	B3-080-003	TRUCK BED, RECESSED HITCH, 8' X 9'6"	
2	3-120-010005	BRACKET, TRUCK BED CLAMP	12
3	3-642-010017	TIE DOWN ROD, 16"	12
	3-642-010018	TIE DOWN ROD, 18"	12
	3-642-010019	TIE DOWN ROD, 20"	12
4	5/8-11HFN	NUT, ZP GR2	24
5	5/8SLW	WASHER, SPLIT LOCK	24
6	3/8-16HFN	NUT, ZP GR2	8
7	3/8SLW	WASHER LOCK	8
8	3-485-010002	MUD FLAP, 30 IN.	2
9	3-762-010017	CLAMP, MUD FLAP	2
10	3/8-16X3HHCS	SCREW, HEX HEAD CAP ZP GR5	8
11	3-410-010093	BULKHEAD EXTENSION (OPTION-WELDED TO TRUCK BED)	1
12	3-410-010094*	IMPLEMENT HITCH OPTION (WELDED TO TRUCK BED)	1
	* 18" FOR TRUCK BED WITH FLUSH HITCH, 24" FOR TRUCK BED WITH RECESSED		
13	1-573-010017	DECAL LANDOLL WHITE	2
	1-573-010007	DECAL LANDOLL BLACK	2
14	1-573-010014	DECAL L WHITE	4
	1-573-010002	DECAL L BLACK	4
15	1-573-010015	DECAL LANDOLL WHITE	2
	1-573-010003	DECAL LANDOLL BLACK	2
16	1-573-010016	DECAL HAULOLL WHITE	2
	1-573-010004	DECAL HAULOLL BLACK	2
17	3-375-010038	GOOSENECK HITCH FOR PICKUP INSTALLATION	1
18	AA2203-10	OILITE BUSHING	1

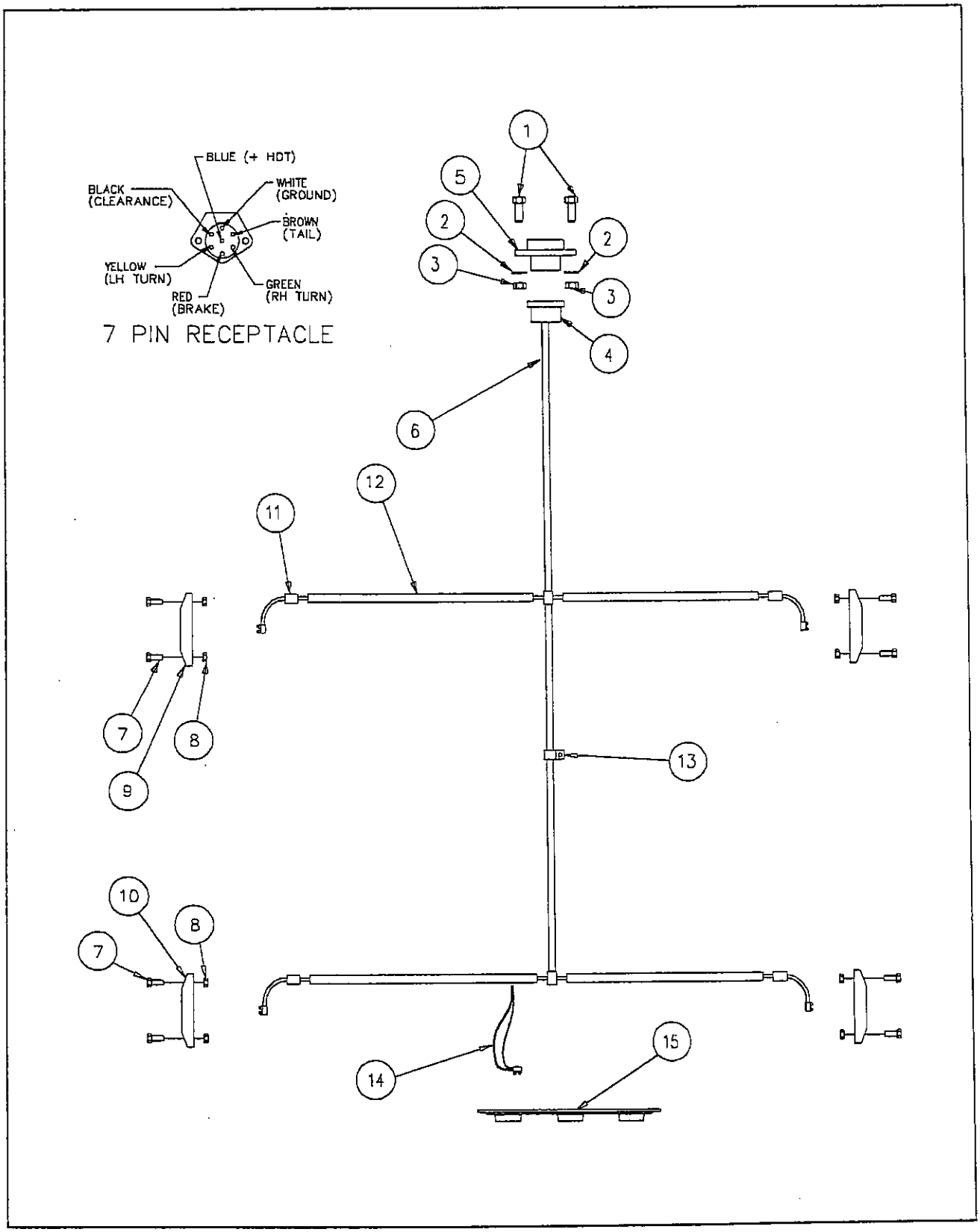

Figure 6-29 Truck Bed Electrical System

TRUCK BED ELECTRICAL SYSTEM

ITEM	PART NO.	DESCRIPTION	QTY.
1	5/16-18X1-1/4CS	CAPSCREW, HEX GR2	2
2	5/16-18HFN	NUT ZP GR2	2
3	5/16SLW	WASHER, SPLIT LOCK	2
4	59W-23	RUBBER BOOT	1
5	59S-7	RECEPTACLE, 7-PIN	1
6	3-156-010009	CABLE, MULTI-CONDUCTOR	AR
7	3/16X3/4RHD STV	BOLT, STOVE ROUND HEAD	8
8	3/16-24HFN	NUT ZP GR2	8
9	M130A	CLEARANCE LIGHT, AMBER	2
	130-25A	REPLACEMENT LENS	2
	194	REPLACEMENT BULB	2
10	M130R	CLEARANCE LIGHT, RED	2
	130-25R	REPLACEMENT LENS	2
	194	REPLACEMENT BULB	2
11	3-272-010022	ELECT. BUTT SPLICE 12-10 W/SEAL	10
12	3-201-010001060	CONDUIT PLASTIC FLEX 5/16"X5'	1
13	16-900	CLAMP CONDUIT 1/2 STEEL	2
14	1-879-010004	WIRE RED 14 AWG	22FT
15	M107-3R-12	LAMP, 3 BAR	1
16	2552	GROMMET	12

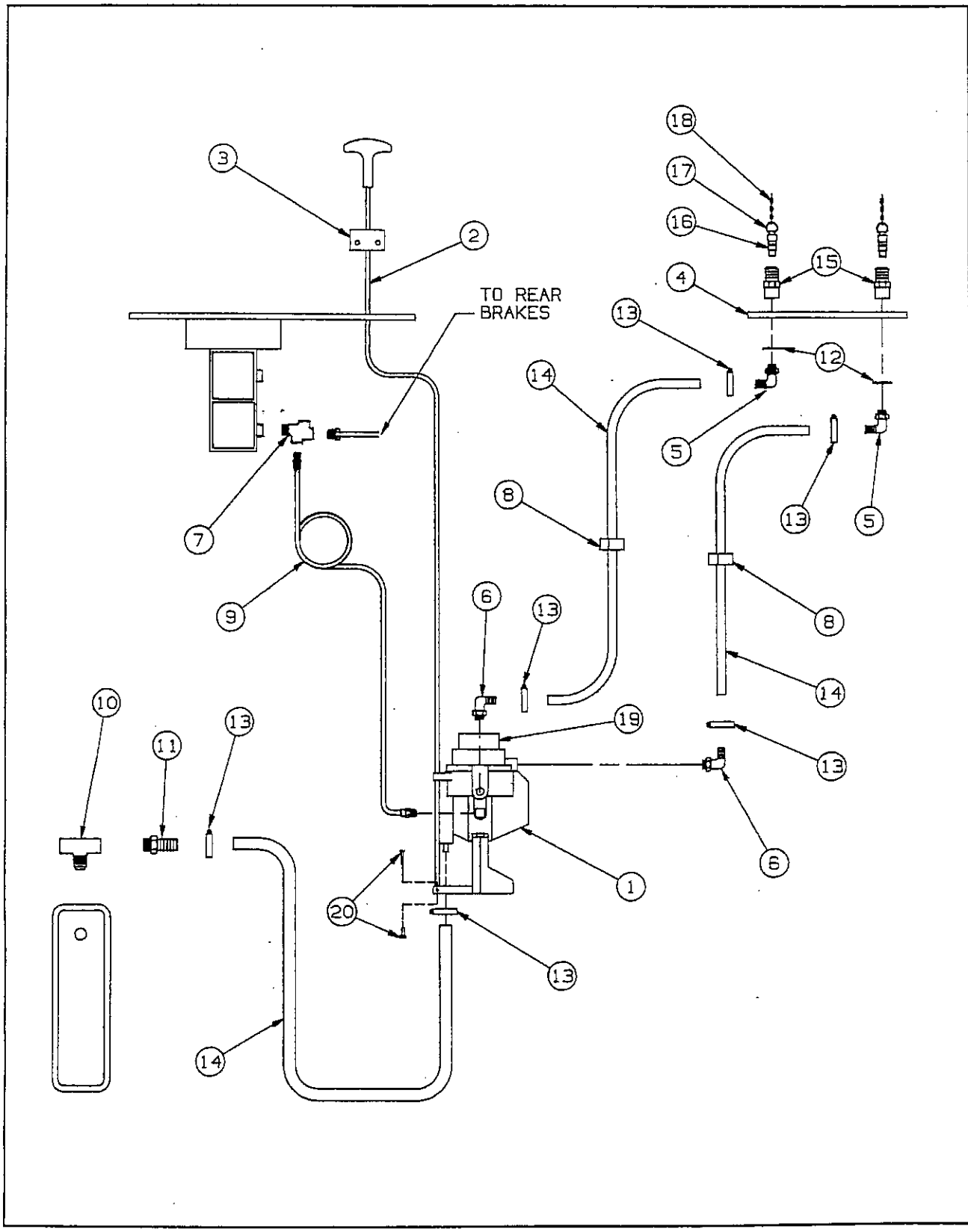

Figure 6-30 Truck Brake Kit

TRUCK BRAKE KIT OPTION

ITEM	PART NO.	DESCRIPTION	QTY.
	VK-COM-7GLSA	1/2, 3/4, AND 1 TON TRUCKS	1
	VK-COM-11GLSA	1-1/2 TON AND LARGER TRUCKS	1
1	V-7007-COM	MANUAL HYD/VAC CONTROL VALVE (1/2 TO 1 TON)	1
	V-7011-COM	MANUAL HYD/VAC CONTROL VALVE (1-1/2 TON AND UP)	1
2	V-7225-HBC	PULL CABLE ASSEMBLY	1
3	X-7248-CB	CABLE BRACKET ASSEMBLY	1
4	V-12258-CHB	BRACKET ASSEMBLY (INCLUDES ITEMS 15 THROUGH 18)	1
5	V-1/2"X3/8"-HE	HOSE ELBOW	2
6	V-1/2"X1/2"-HE	HOSE ELBOW (COMES WITH ITEM 1)	2
7	H-904-ST*	SERVICE TEE	1
8	V-12416-CP	HOSE CLIP	2
9	H-340-TA	3/16" X 40" STEEL LINE	1
10	P-3/8-BT	TEE	1
11	V-1/2"X3/8"-HN	HOSE NIPPLE	1
12	V-12250-R	COUPLER RETAINER	4
13	V-12386-SC	HOSE CLAMP	6
14	V-12272-VH	1/2" VACUUM HOSE	33FT
15	V-12250-FC	FEMALE CONNECTOR	2
16	V-12253-CP	PLUG	2
17	V-12253-PR	RING	2
18	V-12263-AC	CHAIN	2
19	CV-FRK	REPLACEMENT FILTER KIT	1
20	V-7249-CS	CABLE STOP AND SCREW (COMES WITH ITEM 1)	1

* PART NUMBER H-904-ST IS FOR USE ON MOST CHEVROLET MODELS. OTHER MODELS MAY REQUIRE A DIFFERENT SIZE SERVICE TEE.

NOTES: