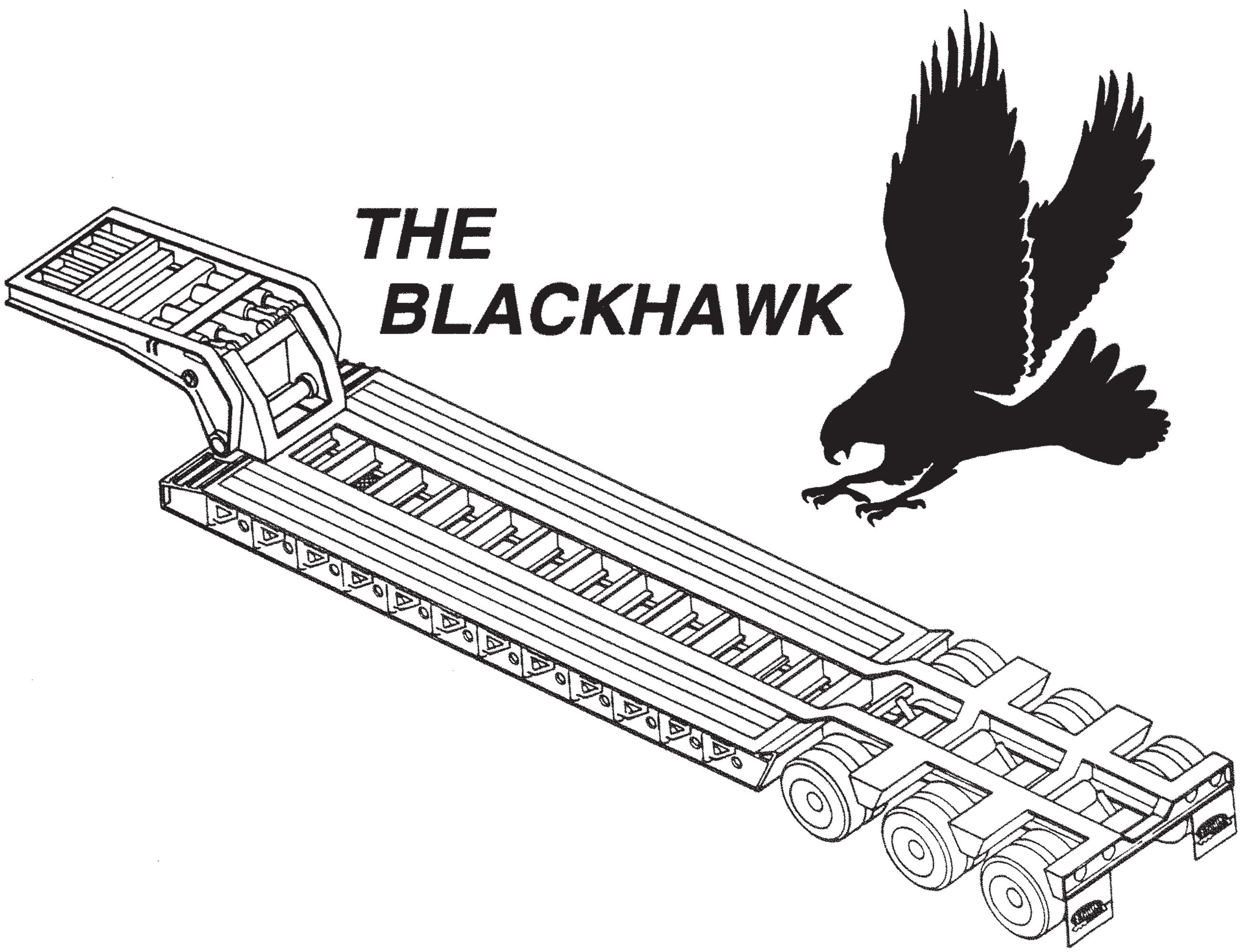
MO-RTN-95R

OWNER'S OPERATOR'S GUIDE

RTN Series Trailers



ETNYRE TRAILER CO., Oregon, Illinois 61061

MO-RTN-95

OWNER'S OPERATOR'S GUIDE

RTN Series Trailer

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WARNING

Unsafe operation of equipment may cause injury.

Read, understand and follow the manuals when operating or performing maintenance.

ETNYRE TRAILER CO. Oregon, Illinois 61061-9778

1333 South Daysville Road, Phone: 815/732-2116, Fax: 815-732-7400, Telex: MCI 6505104321

Section 1
INTRODUCTION

Safety Precautions, Hazard Seriousness Level

You will find safety information boxes throughout this manual. These boxes contain information alerting you to situations or actions to avoid.

Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness. Their selection is based on the likely consequence of human interaction with a hazard. Definitions of hazard levels are as follows.

DANGER - Immediate hazards which **will** result in severe personal injury or death.

WARNING - Hazards or unsafe practices which **could** result in severe personal injury or death.

CAUTION - Hazards or unsafe practices which could result in minor personal injury or product or property damage.

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 E. D. ETNYRE & CO.

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 E. D. ETNYRE & CO.

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. 20696. You can also obtain other information about motor vehicle safety from the hotline.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Please note this warning and remember -

Always start and operate the engine in a well-ventilated area;

If in an enclosed area, vent the exhaust to the outside;

Do not modify or tamper with the exhaust system.

Section 1
INTRODUCTION

GENERAL

This manual contains operation, maintenance and service instructions for the Etnyre RTN Series trailers (see figure 1-1). The operating instructions must be read and understood before operating the unit. The operator must be responsible for maintaining the unit in good working condition.

To identify the maximum load capacity of your trailer, examine the Etnyre model number. It contains a condensed description of the unit.

This manual covers the standard features and options of the Etnyre Blackhawk series trailers. If your trailer incorporates custom features, some of the information contained in this manual may not apply. If you have any questions regarding this manual or your trailer, contact your dealer or the E. D. Etnyre Service Department at 1-800-995-2116.

A typical model number such as RTN35TD3-T1 would describe the following trailer:

RTN	**35**	**TD3**	**T1**
(A)	(B)	(C)	(D)

A. The first group describes trailer **type:** RTN model, removable gooseneck.

B. The second group indicates trailer **capacity**: 35 = thirty five U.S. tons.

C. The third group describes trailer **undercarriage** and **platform**: TD3 = triple axle undercarriage with a drop deck ("TD" only indicates a tandem axle un dercarriage with a drop deck).

D. The fourth group describes **additional information**: T1 = constructed using T1 steel.

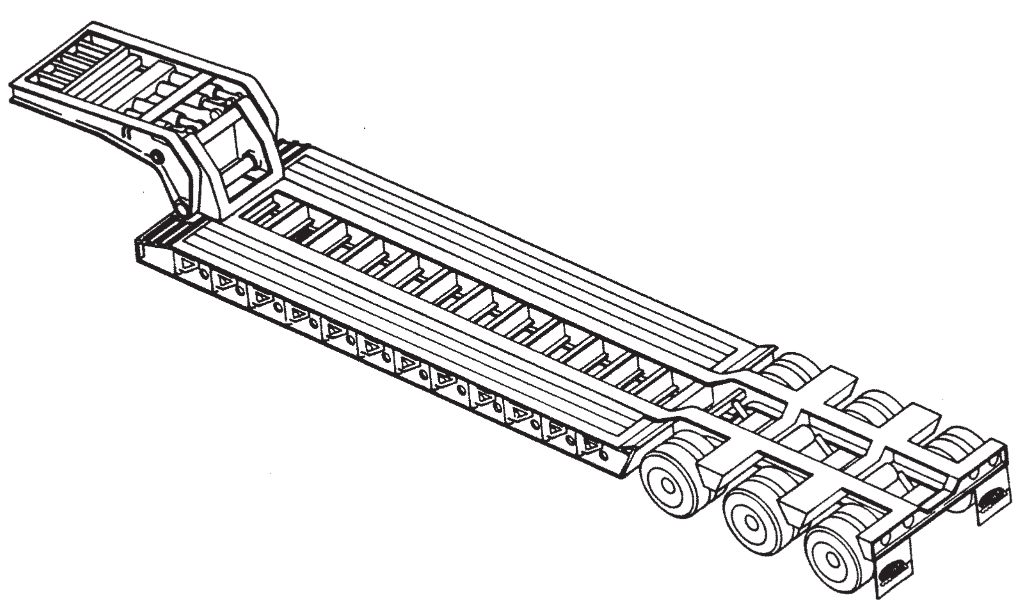


Figure 1-1. Etnyre RTN trailer

Section 1
INTRODUCTION

Unit Nameplate or Certification Label

The unit serial number plate or certification label is located on the left hand gooseneck beam web. The nameplate or certification label must remain permanently affixed to the unit. (See figure 1-2).

Serial Number Data

The unit serial number on the certification label is also stamped into the gooseneck beam web plate near the nameplate and on the outside frame member at the left hand forward corner of the frame. (See figure 1-2).

NOTE: The ***complete serial number*** must be identified when ordering parts or communicating service information to Etnyre.

Trailer Capacity Data

Trailers manufactured in the United States list the maximum "Gross Vehicle Weight Rating" (GVWR) and the maximum "Gross Axle Weight Rating" (GAWR) on the certification label.

The Gross Vehicle Weight Rating is the sum of the trailer weight and the trailer capacity. This is the maximum structural capacity of the trailer.

The Gross Axle Weight Rating is the maximum load any axle can carry.

The certification label shows "GVWR" and "GAWR" at reduced speeds, at the bottom of the label. The GVWR may be reached under certain circumstances before the GAWR or vice versa.

WARNING

Do not exceed the GVWR or GAWR at the specified speed. These weight limitations are independent of road weight limitations imposed by law.

Tire and Rim Data

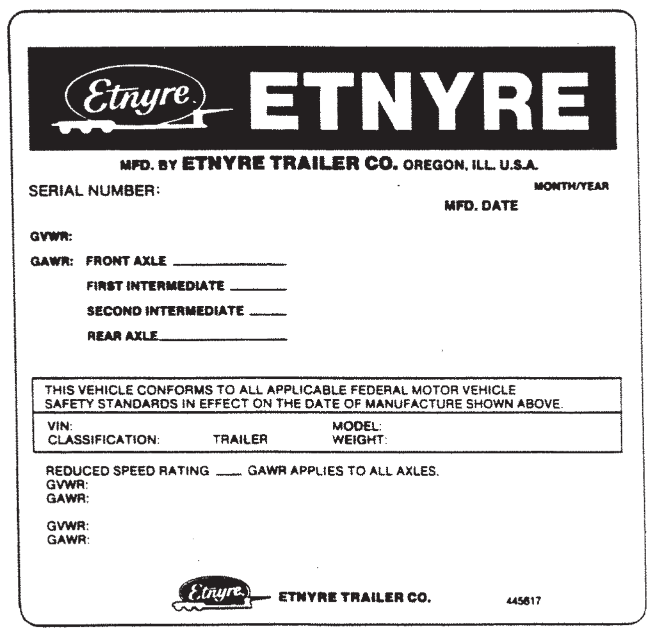
The certification label lists the correct rim size, tire size and tire inflation pressures for the trailer.

WARNING

Do not use undersize rims or tires. Do not underinflate or overinflate the tires.

System Specifications

Unit specifications are listed in Section 2. See page 2-1 for a complete content listing.


ETNYRE

MFD. BY ETNYRE TRAILER CO. OREGON, ILL. U.S.A.

SERIAL NUMBER: MONTH/YEAR MFD. DATE

GVWR:

GAWR: FRONT AXLE ________
FIRST INTERMEDIATE ____
SECOND INTERMEDIATE ____
REAR AXLE ________

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: MODEL:
CLASSIFICATION: TRAILER WEIGHT:

REDUCED SPEED RATING ___ GAWR APPLIES TO ALL AXLES.
GVWR:
GAWR:

GVWR:
GAWR:

ETNYRE TRAILER CO. 445617

Figure 1-2.
Unit Nameplate or Certification Label

Section 1
INTRODUCTION

Operating Instructions

Operating instructions are contained in Section 3. See page 3-1 for a complete content listing.

> **WARNING**
>
> The operator must understand the operating instructions completely before operating the unit. Personal injury and/or damage to the unit may occur if the operating instructions are not followed.

Warning and Caution Information

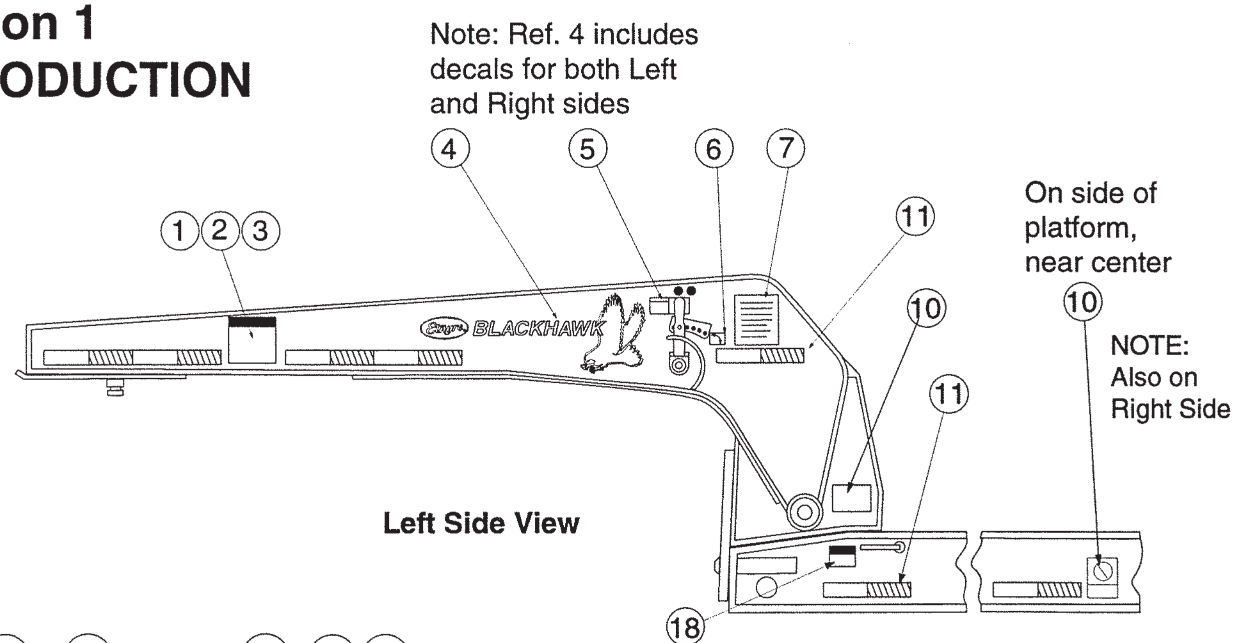
Warning and caution information is given throughout this manual. Particular care must be given to warning and caution information contained in Section 3 (Operating Instructions) and where noted with proper service procedures in other sections.

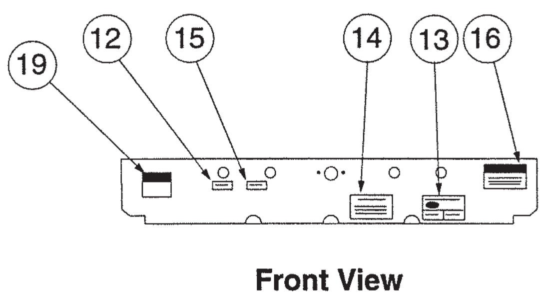
NOTE: Warning and caution decals are affixed to all units at the factory. These decals contain warning and caution information which must be followed by all persons operating or servicing an Etnyre trailer. Any warning or caution decal which is lost, or difficult to read, ***must be replaced at once.*** Replacement decals may be obtained from any Etnyre trailer dealer.

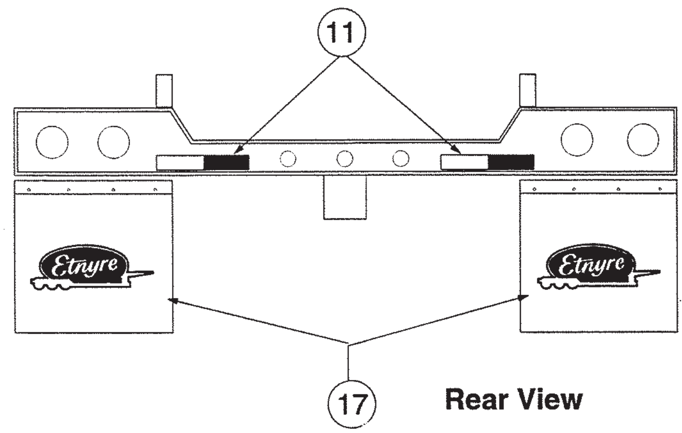
Refer to Figure 1-3 for the location of the nameplate and decals on the Etnyre RTN trailer.

Care and Maintenance

Care and maintenance information for your Etnyre trailer is given in Section 4. Maintenance schedules and recommended procedures **must** be followed to maximize service life. See page 4-1 for a complete content listing.







Ref.	Part No.	Qty.	Description
1	Q445617	1	Serial Number Plate Decal
2	Q445616	1	Cover-Serial Plate
3	Q403882	4	Pop Rivet
4	Q489201	1	Decal Set-Blackhawk Logo
5	Q489290	1	Decal-Platform Height (Black)
	Q489291	1	Decal-Platform Height (White)
6	Q489288	1	Decal-Compression Blocks (Black)
	Q489289	1	Decal-Compression Blocks (White)
7	Q489295	1	Decal-Operating Instructions (Black)
	Q489296	1	Decal-Operating Instructions (White)
10	Q471243	2	Decal-Warning, Sideload
11	2790527	AR	Tape-Conspicuity, 2 in, Red/White
12	Q451436	1	Decal-Return
13	Q452390	1	Decal-Trademark and Patents
14	Q401734	1	Decal- T1 Steel
15	Q451435	1	Decal-Pressure
16	Q452415	1	Decal-Warning, Operation
17	Q401213	2	Flap-Mud

Ref.	Part No.	Qty.	Description
18	Q493384	1	Decal-Caution, Do not Pry
19	Q495194	1	Decal-Caution,Truck Hydraulics
20	Q495199	1	Decal-Valve Operation (Black)
	Q495189	1	Decal-Valve Operation (White)

⚠ WARNING

Unsafe operation of equipment may cause injury.

Read, understand and follow the manuals when operating or performing maintenance.

Figure 1-3.
Nameplate and Decals, Model RTN

Section 2
SPECIFICATIONS

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Section 2 Specifications

Section 2
SPECIFICATIONS

Model RTN35TD-T1

STANDARD FEATURES

70,000 Pounds Payload Capacity
Hydraulic Removable Gooseneck
Non-Ground Bearing Design
Teardrop (Pin and Stirrup) Connection
High-Lift Gooseneck, 32" Travel
Gooseneck Support Cylinder
Scraper Style Gooseneck
84" Swing Clearance with 16" Pin Setting
50" Loaded 5th Wheel Height (adjustable)
24" Loaded Deck Height (adjustable)
8" Loaded Ground Clearance (adjustable)
8'-6" (102") Width
42'-3" Overall Length
22'-0" Deck Length (clear, unobstructed)
Crossmembers on 24" Centers
4 I-Beam T-1 Steel Construction
Fully Cambered Beams
12" Swinging/Removable Outriggers
8 Lash Rings
Hutch Four Spring Suspension
22,500 Pound Capacity Axles
16-1/2" x 7" Full Air Brakes
Automatic Slack Adjusters
1-1/2" Hardwood Flooring (open center)
Boom Well (full length of rear section)
255/70R22.5 (H) Radial Tires
Steel Disc Wheels (white)
Truck-Lite Sealed Lighting System
Etnyre Mud Flaps
Undercoating
Black Enamel Paint Finish
Wet Line (PTO) Operation

OPTIONAL EQUIPMENT

21'-0" Deck Length (clear, unobstructed)
23'-0" Deck Length (clear, unobstructed)
10 Gauge Gooseneck Fenders (8' wide)
Self Contained Engine Package
Double Hook-On Front Outriggers
1-1/2" Apitong Flooring (open center)
10" Outrigger Planks (2" x 10")
Outside Flange Reinforcing
Front Fold-Over Ramps
Turner Air Ride Suspension
Manual Exhaust Valve for Air Ride
25,000 Pound Capacity Axles
Cast Spoke Wheels
Wheel Well Covers (over tires only)
Spring Parking Brakes
Hubometer
3rd Flip/Removable Axle with Air Ride
Additional Lash Rings

NOTE: All specifications are subject to change without notice. Weights and dimensions are shown fully loaded and are approximate. Platform heights will increase if loaded at less than full capacity.

Model RTN50TD3-T1

STANDARD FEATURES

100,000 Pounds Payload Capacity
Hydraulic Removable Gooseneck
Non-Ground Bearing Design
Teardrop (Pin and Stirrup) Connection
High-Lift Gooseneck, 32" Travel
Gooseneck Support Cylinder
Scraper Style Gooseneck
84" Swing Clearance with 16" Pin Setting
50" Loaded 5th Wheel Height (adjustable)
24" Loaded Deck Height (adjustable)
8" Loaded Ground Clearance (adjustable)
8'-6" (102") Width
48'-0" Overall Length
24'-0" Deck Length (clear, unobstructed)
Crossmembers on 24" Centers
4 I-Beam T-1 Steel Construction
Fully Cambered Beams
12" Swinging/Removable Outriggers
10 Lash Rings
Turner Air Ride Suspension
Manual Suspension Raise & Lower (+3-3)
54" Axle Spacing
22,500 Pound Capacity Axles
16-1/2" x 7" Full Air Brakes
Automatic Slack Adjusters
1-1/2" Hardwood Flooring (open center)
Boom Well (full length of rear section)
255/70R22.5 (H) Radial Tires
Steel Disc Wheels (white)
Truck-Lite Sealed Lighting System
Etnyre Mud Flaps
Undercoating
Black Enamel Paint Finish
Wet Line (PTO) Operation

OPTIONAL EQUIPMENT

23'-0" Deck Length (clear, unobstructed)
25'-0" Deck Length (clear, unobstructed)
108" Gooseneck Swing Clearance
10 Gauge Gooseneck Fenders (8' wide)
Self Contained Engine Package
Double Hook-On Front Outriggers
1-1/2" Apitong Flooring (open center)
10" Outrigger Planks (2" x 10")
Outside Flange Reinforcing
Front Fold-Over Ramps
Manual Exhaust Valve for Air Ride
25,000 Pound Capacity Axles
Cast Spoke Wheels
Wheel Well Covers (over tires only)
Spring Parking Brakes
Hubometer
4th Flip/Removable Axle with Air Ride
Additional Lash Rings

NOTE: All specifications are subject to change without notice. Weights and dimensions are shown fully loaded and are approximate. Platform heights will increase if loaded at less than full capacity.

Section 2
SPECIFICATIONS

Table 2-9. Torque Specifications for Standard Hardware

Nominal Size	Thread Series	SAE Grade 5 Capscrews				SAE Grade 8 Capscrews			
		Torque (ft. lbs.)		Torque (Nm)		Torque (ft. lbs.)		Torque (Nm)	
		DRY	LUBED	DRY	LUBED	DRY	LUBED	DRY	LUBED
1/4	20 UNC	8	6	11	9	12	9	16	12
	28 UNF	10	7	13	10	14	10	19	14
5/16	18 UNC	17	13	24	18	25	18	33	25
	24 UNF	19	14	26	20	27	20	37	28
3/8	16 UNC	31	23	42	31	44	33	59	44
	24 UNF	35	26	47	36	49	37	67	50
7/16	14 UNC	49	37	67	50	70	52	95	71
	20 UNF	55	41	75	56	78	58	105	79
1/2	13 UNC	75	57	100	77	105	80	145	110
	20 UNF	85	64	115	86	120	90	165	120
9/16	12 UNC	110	82	145	110	155	115	210	155
	18 UNF	120	91	165	125	170	130	230	175
5/8	11 UNC	150	115	205	155	210	160	285	215
	18 UNF	170	130	230	175	240	180	325	245
3/4	10 UNC	265	200	360	270	375	280	510	380
	16 UNF	295	225	405	300	420	315	570	425
7/8	9 UNC	430	320	580	435	605	455	820	615
	14 UNF	475	355	640	480	670	500	905	680
1	8 UNC	645	485	875	655	910	680	1230	925
	14 UNF	720	540	980	735	1020	765	1380	1040
1 - 1/8	7 UNC	795	595	1080	805	1290	965	1750	1310
	12 UNF	890	670	1210	905	1440	1080	1960	1470
1 - 1/4	7 UNC	1120	840	1520	1140	1820	1360	2460	1850
	12 UNF	1240	930	1680	1260	2010	1500	2730	2050
1 - 3/8	6 UNC	1470	1100	1990	1490	2380	1780	3230	2420
	12 UNF	1670	1250	2270	1700	2710	2040	3680	2760
1 - 1/2	6 UNC	1950	1460	2640	1980	3160	2370	4290	3210
	12 UNF	2190	1650	2970	2230	3560	2670	4820	3620

NOTE: This table lists torque values for standard hardware and is intended as a guide for average applications invloving typical stresses and machined 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 should take priority over values given in this table. Replace original equipment with hardware of equal grade.

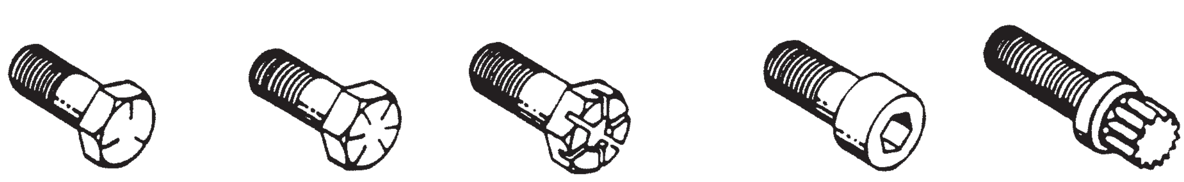

Figure 2-1. Standard Hardware

Section 3
OPERATION

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Section 3 Operation

Illustrations

Section 3
OPERATION

General

This section contains information required for the operation of Etnyre RTN model trailers.

> **⚠ WARNING**
>
> Read these instructions thoroughly and observe them when operating Etnyre trailers. Operate by **Autorized, Trained** personel **Only!**

The trailer must be maintained in good operating condition. Minor damage can quickly result in a major failure if not repaired.

> **⚠ WARNING**
>
> Do not operate a trailer needing repair.
>
> Do not undersize the prime mover. The prime mover (tractor) must be compatible with the trailer and have adequate capacity.
>
> Do not permit the bottom of a trailer with low ground clearance to hit or slide on or over curbs, railroad crossings or other obstructions that can cause damage to the trailer or stall the vehicle.
>
> Do not exceed either the GVWR or GAWR shown on the certification label. These ratings are listed for trailers at various speeds and reflect the maximum GVWR and GAWR at those speeds.
>
> Keep personnel clear when loading and unloading trailers.

Trailer to Tractor Connecting Procedures

1. Inspect the fifth wheel area and the trailer frame for wear, structural cracks, damaged or broken decking.

2. Check the kingpin for wear or damage. Replace it if the diameter measures less than 1 7/8" at any point (see figure 3-1).

3. Check the bolts for tightness. Tighten if required. Refer to Figure 2-1 for correct torque values.

4. Connect the trailer to the fifth wheel.

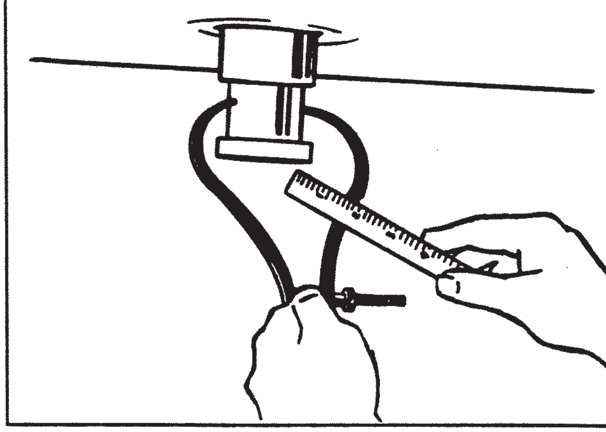


Figure 3-1. Inspection of Kingpin for wear

> **⚠ WARNING**
>
> Check to insure that the kingpin is locked into the tractor fifth wheel and that the gooseneck to platform safety pin is fully engaged.
>
> If the safety pin is disengaged the gooseneck could seperate from the trailer during operation.

5. Connect the glad hands and build up reservoir air pressure. Make sure that air line connections between gooseneck and platform are made.

6. Connect the plug into the electrical socket. Make sure that electrical connection between gooseneck and platform is made.

7. Check the lights, turn signals and reflectors for operation.

8. Before operating the trailer, test the air brake system using the following procedure:

a. Check the air system pressure. The system must hold 100 PSI (7 Bar) minimum.

b. Apply the brakes. Inspect the brake action on all the wheels for proper application.

c. Release the brakes. The brakes must release promptly. The air pressure must discharge quickly from the relay emergency valve.

d. Disconnect the emergency line from the trailer. The trailer brakes must automatically apply.

e. Connect the emergency line to the trailer. The trailer brakes must release.

9. Check the tires for proper inflation pressure. Inspect the tires for cuts or other damage.

10. **Power pack operated units,** start engine and adjust the throttle. **Truck operated units,** hook up hydraulic lines and engage the pump.

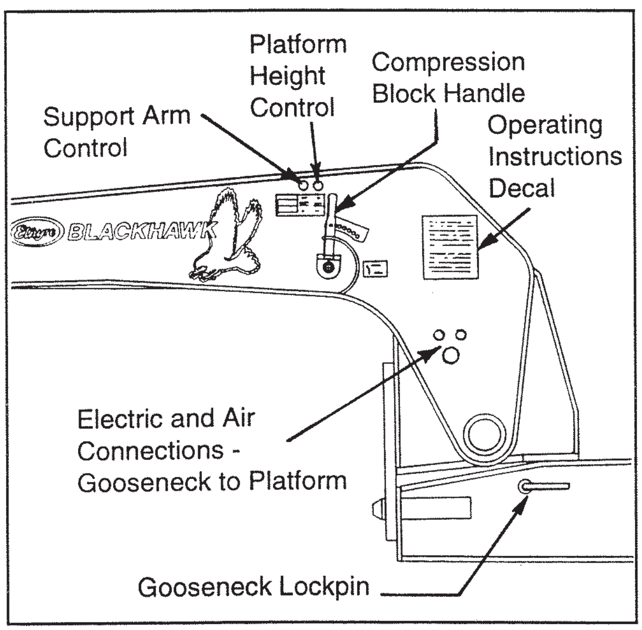


Figure 3-2. Identification of Controls

11. Move the platform height control to the "Raise" position until the compression blocks fall into the "Transport" position.

12. Move the platform height control to the "Lower" position until the compression blocks are completely seated.

13. Insure that gooseneck support arm is fully retracted.

14. **Power pack operated units,** shut off engine. **Truck operated units,** disengage pump.

Trailer to Tractor Disconnection Procedure

1. Disconnect the electrical and air connection between the gooseneck and the truck.

⚠ WARNING
Block the trailer wheels

2. Power pack operated units, start the engine and adjust the throttle. Truck operated units, hook up hydraulic lines and engage pump.

3. Move the platform height control to the "Raise" position until the compression blocks disengage the gooseneck link (refer to figure 3-3).

4. Rotate the compression blocks to the "Release" position (refer to figure 3-3).

5. Move the platform height control to the "Lower" position until the platform is on the ground and the load is removed from the tractor fifth wheel.

⚠ WARNING
Make sure that the gooseneck to platform safety pin is fully engaged. If the pin is disengaged, the gooseneck could drop uncontrollably to the ground.

Section 3
OPERATION

6. **Power pack operated units,** shut off power pack engine. **Truck operated units,** disengage truck pump and disconnect hydraulic lines from the truck.

7. Disconnect the fifth wheel lock pin.

8. Pull tractor away from the trailer.

WARNING
Keep hands and feet clear of the point where the frame contacts the ground.

Gooseneck Removal

(See figures 3-2 and 3-3)

1. Set tractor brakes.

2. Power pack units, start the engine and adjust the throttle. Truck operated units, hook up hydraulic lines and engage the pump.

3. Move the platform height control knob to the "Raise" position until the platform lifts enough to free the compression blocks.

4. Rotate the compression block handle to the "Release" position. See figure 3-3.

5. Move the platform height control knob to the "Lower" position until the platform is on the ground and the gooseneck teardrops are approximately 1/4" below platform the pins.

6. Disconnect the electrical and air connection between the gooseneck and the platform.

7. Release the gooseneck lock pin (pull handle on left side of platform, twist handle 30° to hold in released position, if pin will not release, back trailer up slightly). See figure 3-2.

8. Move the support arm control knob to the "Lower" position until the support arm contacts the truck frame and supports the gooseneck.

WARNING
Keep hands and feet clear of the point where the frame contacts the ground.

9. **Power pack units** - shut off power pack engine. **Truck operated units** - disengage truck pump.

10. Pull tractor and gooseneck away from the platform to permit loading.

Gooseneck Attachment

(See figures 3-2 and 3-3)

1. Release gooseneck lock pin (twist handle 30° and insure handle is positioned into hole.

2. Back gooseneck into the platform until lock pin handle snaps into transport position. Ensure that the lock pin is fully engaged.

3. **Power pack units** - start engine and adjust throttle. **Truck operated units** - engage pump.

4. Move the support arm control knob to the "Raise" position until the support arm is fully retracted.

5. Move the platform height control knob to the "Raise" position until the compression blocks can swing into the desired "transport position".

6. Rotate compression block handle to the selected transport position.

7. Move the platform height control knob to the "Lower" position until the compression blocks are completely seated.

8. **Power pack units** - shut off engine. **Truck operated units** - disengage pump.

9. Connect the electrical and air connections between the gooseneck and the platform.

Multiple Ride Height Adjustment

The RTN trailer gooseneck can be adjusted to provide a standard ride height with a range of tractor fifth wheel heights or multiple ride heights with any given fifth wheel height. This adjustment is accomplished by positioning the compression blocks to mesh with the gooseneck link through a range of positions. An adjustable stop cam is provided to stop the compression blocks in a preselected position. See figure 3-5

NOTE: The top tooth of the compression block must always be above the top tooth of the gooseneck llink when the block and link are engaged in the travel position. Likewise, the bottom tooth of the compression block must always be below the bottom tooth of the gooseneck link (see figure 3-6).

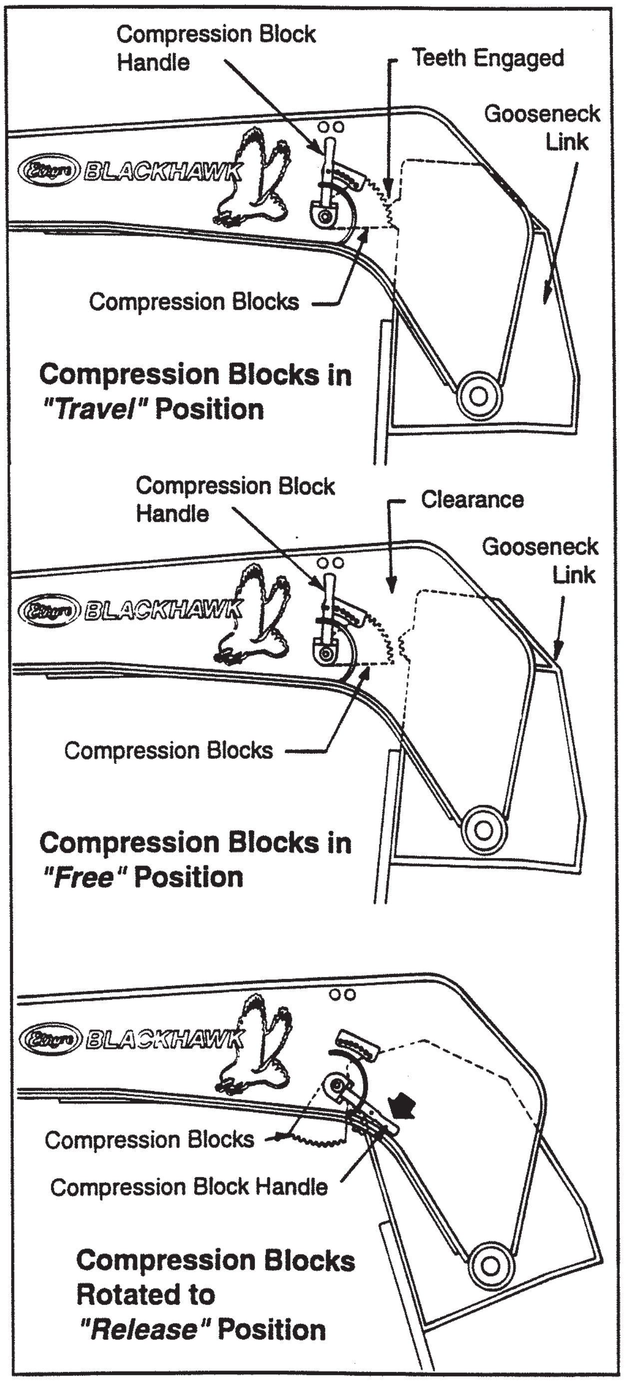


Figure 3-3 Compression Block Positions

⚠ WARNING
All teeth on the gooseneck link must be fully engaged with the compression block when in the Travel position.

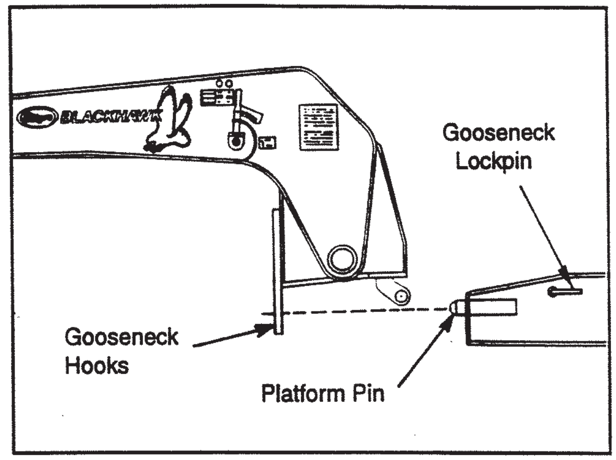


**Figure 3-4.
Gooseneck to Platform Connections**

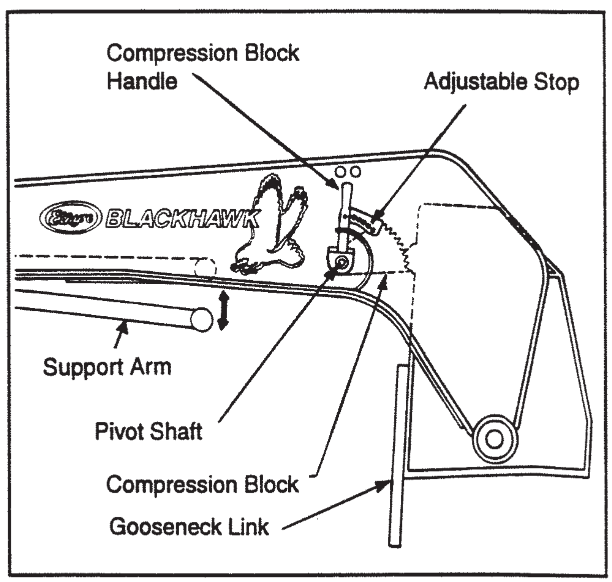


**Figure 3-5.
Compression Block Adjustment**

Section 3
OPERATION

High Lift Gooseneck Operation

The Etnyre RTN trailer features a High Lift gooseneck. This gooseneck provides 32" of vertical travel at the front of the trailer platform, allowing the trailer to clear obstacles or to avoid "high centering".

Raise the trailer only high enough to clear the obstacle. Travel speeds while in the High Lift position **must be limited to 10 mph maximum** and the trailer must be **towed only in a straight line** due to tractor fifth wheel oscillation limitations. Attempting to turn while the trailer is in the High Lift position could damage the tractor and/or the trailer.

⚠ WARNING
Do not raise loaded trailer so high as to lift the front axle off the ground. Damage to the trailer frame and/or suspension could occur.

⚠ WARNING
Do not make turns with the trailer in the high lift position. Damage to the trailer and/or tractor could occur.

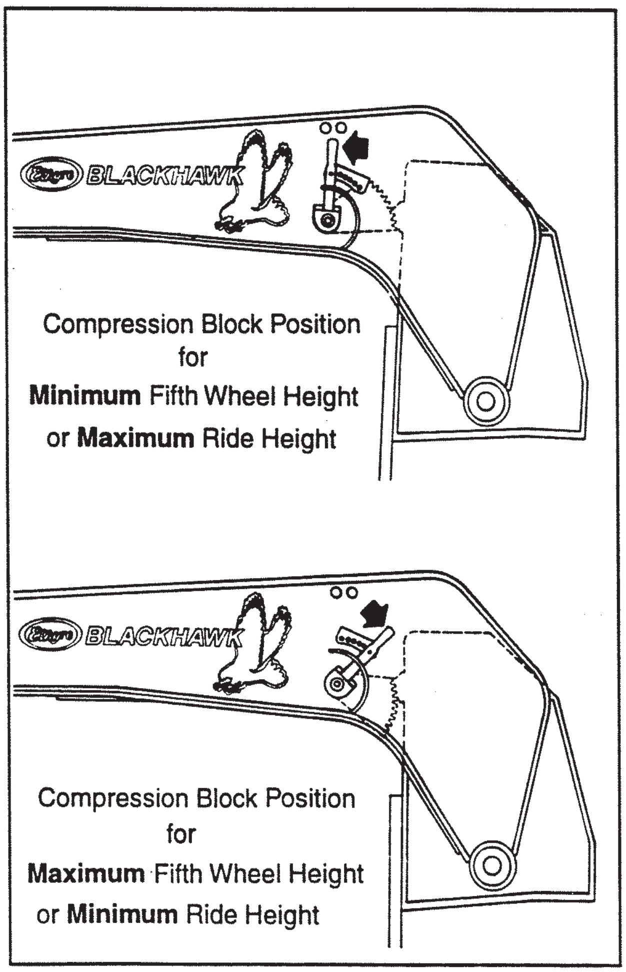


Figure 3-6. Ride Height Adjustment

Loading and Unloading Procedures

General

The model RTN trailers are front loaded by detaching the gooseneck. The detached gooseneck is then moved away with the tractor and the trailer is front loaded.

⚠ WARNING
Read these instructions thoroughly and observe them when operating hydraulic removable gooseneck trailers. Also read and observe the general operating procedures for tatilers at the beginning of this section.

Front Loading and Unloading Procedures

These procedures ***must*** be followed when front loading or unloading hydraulic removable goosenck trailers.

WARNING

Load and unload on solid, level terrain.

1. Set the brakes on the trailer.

WARNING

Block the trailer wheels.

2. Use extension brackets (optional equipment) to increase the platform width to support wide loads.

WARNING

Use care when loading an unloading. Move the machine on or off the trailer slowly!

Extension brackets will not support the full load weight.

3. Center the load. ***Do Not*** load to one side. Position the load for proper weight distribution.

4. Fasten the load to the trailer.

WARNING

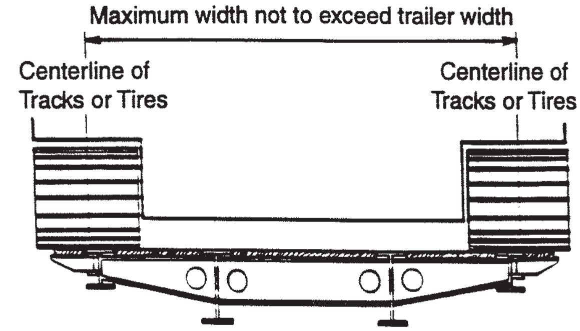
The load must be securely and adequately fastened to the trailer.

WARNING

Keep hands an feet clear of the point where the frame contacts the gorund.

WARNING

Extension Brackets



Top of extension bracket boards must be flush with main deck boards.

Centerline of tracks or tires must be loaded on the main deck, not on the extension brackets.

Failure to load extension brackets properly can result in equipment damage and personal injury.

Rear Loading And Unloading Procedures

These procedures Must be followed when rear loading or unloading trailers (the Rear Loading Feature is optional equipment).

WARNING

Load and unload on solid, level terrain.

All rear loading trailers must be connected to the prime mover (tractor) during all rear loading and unloading procedures.

1. Set the brakes on the prime mover and trailer.

⚠ WARNING

Block the trailer wheels.

2. When loading or unloading the trailer from the rear, block under the rear of the trailer frame and under the load ramps (see figure 3-7).

NOTE: Place blocks under the load ramps to support the ramps during loading or unloading. These trailers can also be loaded and unloaded from a dock or embankment.

3. Use extension brackets (optional equipment) to increase the platform width to support wide loads.

⚠ WARNING

Use care when loading and unloading. Move the machine on or off the trailer ***slowly!***

Extension brackets ***will not*** support full load weight.

4. Center the load. Do Not load to one side. Position the load for proper weight distribution.

5. Fasten the load to the trailer.

⚠ WARNING

The load must be securely and adequately fastened to the trailer.

General Road Check Procedures

During road stops, check the trailer and the load using the following procedures:

1. Check the fastening equipment.

⚠ WARNING

The load must be securely and adequately fastened to the trailer.

2. Inspect the trailer frame structure.

3. Check all the trailer brake drums for heating.

NOTE: A cool brake drum can indicate an inoperative brake.

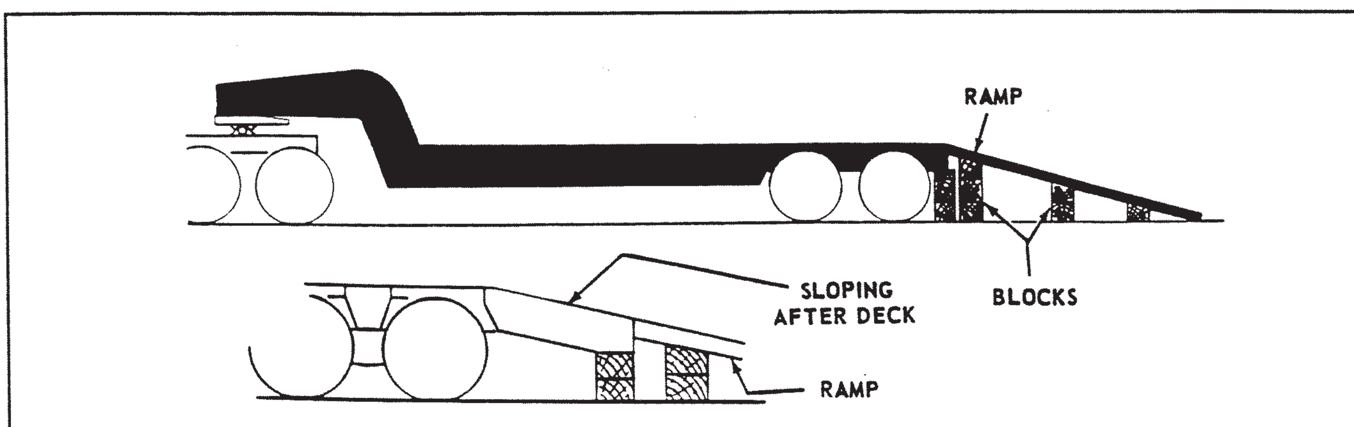


Figure 3-7. Blocking Under Rear of Trailer and Under Load Ramps

CAUTION

Proceed cautiously since a malfunctioning or misadjusted brake can cause the drum to become extremely hot. **Do Not** operate the trailer until the cause of overheating is corrected.

4. Check to be sure all the wheel nuts are tight. Tighten as required (see Section 4, Figure 4-9),

5. Check the tire inflation. Inspect the tires for cuts or other damage.

WARNING

Do Not bleed air from the tires when they are hot.

6. Inspect the lights, turn signals and reflectors for operation.

WARNING

Do Not operate a trailer needing repair. Correct any problems found during the road check immediately.

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Maintenance

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Section 4
Maintenance

General

This section contains instructions for the care and maintenance of the Etnyre RTN trailer. This section is divided into two subsections: a **Maintenance Schedule** and **Maintenance Procedures.** The maintenance schedule lists the recommended distance/time intervals between maintenance checks. The procedures subsection provides detailed instructions for performing the maintenance checks. The instructions listed in the procedures subsection are given by systems and are not necessarily in the order listed in Table 4-1.

Maintenance Schedule

Table 4-1 lists the recommended maintenance checks. It is outlined in two schedules: the mileage schedule and the periodic schedule. Perform maintenance on the basis of whichever occurs first.

The first column of Maintenance Table 4-1 should be used to locate the applicable maintenance procedure and illustration. Figure 4-1 shows the maintenance points.

Fig. 4.1 ITEM NO.	ITEM	SCHEDULE					QUAN-TITY	TYPE or REMARKS
		Day	Wk	Mo.	25,000 mi. or 6 mo.	50,000 mi. or 1 year		
1	Fifth Wheel Plate and Kingpin	X	X					Multipurpose Grease No. 1 (No. 0 Below 32º F) Inspect
2	Frame and Decking	X						Check
3	Undercarriage	See Operator's Guide for the undercarriage specific to your trailer						
4	Wheel Bearings (Oil Lubricated)	X				C	3 pints per axle (1.42 liter)	Multipurpose Gear Oil Grade 90 see page 4-6.
5	Rims and Brake Drums			X				Inspect

X = Check C = Change

(continued)

Table 4-1 Maintenance Schedule

Fig. 4.1 ITEM NO.	ITEM	SCHEDULE					QTY.	TYPE or REMARKS
		Day	Wk	Mo.	25,000 mi. or 6 mo.	50,000 mi. or 1 year		
6	Wheels	X	X					Visual Check. Tighten Cap Nuts or Rim Clamps.
7	Tires	X						Check Inflation and Remove Debris Between Duals.
8	Air Lines	X						Test. See Page 4-13.
				X				Inspection
9	Air Reservoir	X						Drain Condensation
10	Relay Emergency Valve					X		Clean
11	Brake Chambers			X				Check Condensation Holes
						X	2 Diaphragms per axle.	Clean. Inspect and replace Diaphragm. See Page 4-16.
12	Slack Adjuster and Yoke Pin				X		2 Zerks per Axle	Inspect. Lubricate with Multipurpose Grease.
13	Brakes				X		4 Fittings per Axle	Multipurpose Grease. Note: Do not over-grease Brake Spider (or Anchor Pins when applicable).
		X						Check for Overheating.
			X					Inspect and Adjust.
14	Lights and Reflectors	X						Check Operation.

X = Check C = Change

(continued)

Table 4-1. (continued) MAINTENANCE SCHEDULE.

Fig. 4.1 ITEM NO.	ITEM	SCHEDULE					QUAN	TYPE or REMARKS
		Day	Wk	Mo.	25,000 mi. or 6 mo.	50,000 mi. or 1 year		
15 - with Power Pack	Hydraulic Oil			X		X	13.4 Gal. (51 liter)	SAE 10W Hydraulic Oil
16 - with Power Pack	Hydraulic Filter Element					X	1	Period Shown or 50 hours of Power Pack Operation - See Parts Manual.
17 - with Power Pack	Battery		X					Fill as Required - Use Distilled Water.
18 - with Power Pack	Engine		X					Check Air Cleaner and Motor Mount Bolts for Tightness. Check module isolators. See Engine Manual for Additional Maintenance Information.

X = Check C = Change

Table 4-1 (continued). MAINTENANCE SCHEDULE

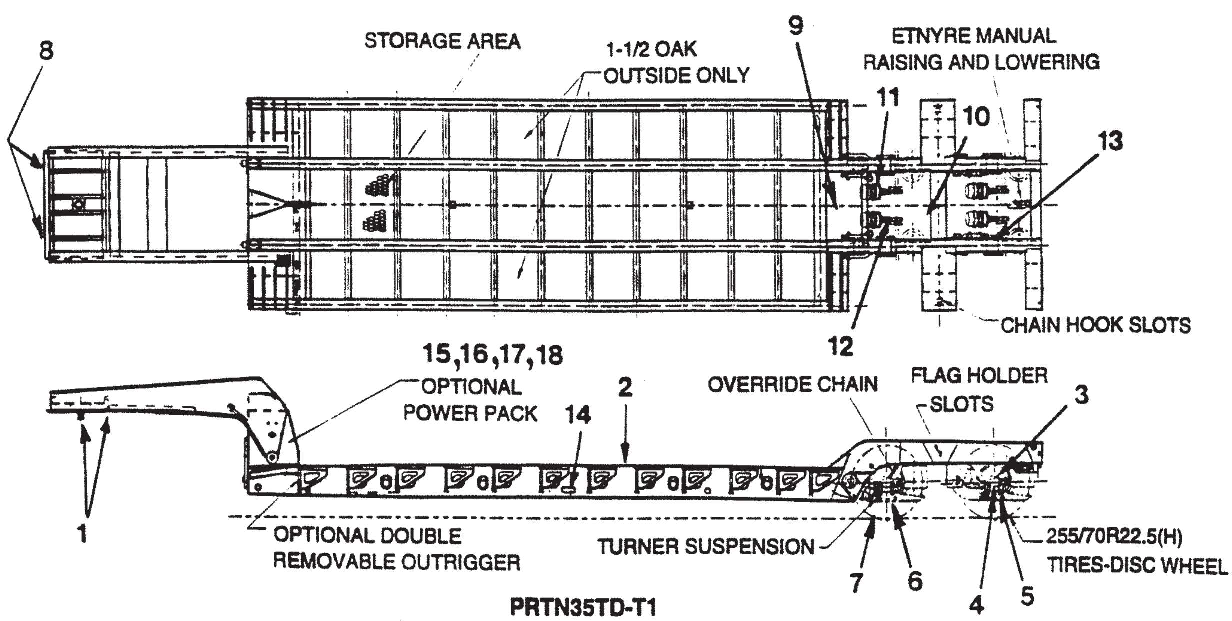

Figure 4-1. Maintenance Checkpoints

Section 4
Maintenance

Maintenance Procedures

Fifth Wheel Plate and Kingpin Inspection and Lubrication

Inspect the kingpin throat for signs of wear. Replace the kingpin if worn 1/8 inch (3.18 mm) undersize (see figure 3-1).

If the grease remaining on the fifth wheel plate contains sand and dirt, clean it before lubricating. The kingpin and the fifth wheel plate should be greased thoroughly with multipurpose grease before connecting the tractor and trailer.

Frame Inspection

An important phase of trailer maintenance is the inspection and repair, if required, of all structural members of the trailer frame. The frame must be one solid unit to carry the load. This also helps prevent major repair costs and trailer downtime.

Complete frame inspection is required for various reasons. Trailers are subjected to considerable abuse due to heavy loads and difficult road conditions under which they are operated. A trailer loaded to the maximum rated capacity and pulled at the highest rated speeds for long periods of time, could develop structural damage faster than a trailer carrying lighter loads at lower speeds. Rough use and poor maintenance will shorten the life of the trailer.

Check the trailer frame daily for cracked structure, cracked welds, and broken, damaged or lost parts. Structural cracks will usually show best when the trailer is loaded. Failures are the result of metal fatigue caused by flexing and vibration. They will appear as cracks in the steel frame members. If repairs are needed Do Not operate the unit until the repairs are made. Structural repairs must be done by persons experienced in this field.

Weld Repairs

Minor repairs to crossmembers, floorplates, and other parts which are not part of a main structural member, may be repaired without special instruction *if good welding practices are followed.*

WARNING

Repairs to major structural members must be made according to the requirements of the part being repaired. Care must be taken to ensure that the repairs don not contain stress concentrations which could lead to another failure. Repair of T-1 steel especially requires additional care.

Table 4-2 lists the recommended electrodes for the various steels used in Etnyre trailers.

Type of Steel	Position of Work	AWS Electrode	Usual Size
Carbon and High Strength	Vertical, Overhead & Flat Position	E6013 E7014 E7018*	3/16"
T1 Alloy	Vertical, Overhead & Flat Position	E7018* E8018* E11018* *Low Hydrogen	3/16

Table 4-2. Electrodes For Weld Repairs

NOTE: Failure to maintain decking in good condition may cause damage to crossmembers.

Wheel Bearings

The oil level must be maintained between the "add" and "full" lines on the hub cap windows (see figure 4-2). Check for cracked windows, missing vent plugs and for oil leaks around the hub cap. Oil can be added through either the vent plug or the filler plug. Clean and inspect the bearings and change the oil at 50,000 miles or at brake relinings.

Undercarriage

The undercarriage must be visually examined for broken and missing parts. Check brackets, adjusting screws and walking beam ends. Replace faulty parts. Check the rim clamps or cap nuts for tightness daily. See Figure 4-3 for torque specifications and tightening sequence. Brake drums should be carefully examined for cracks.

CAUTION

Do not allow brake drums to become excessively worn or expensive repairs will be required.

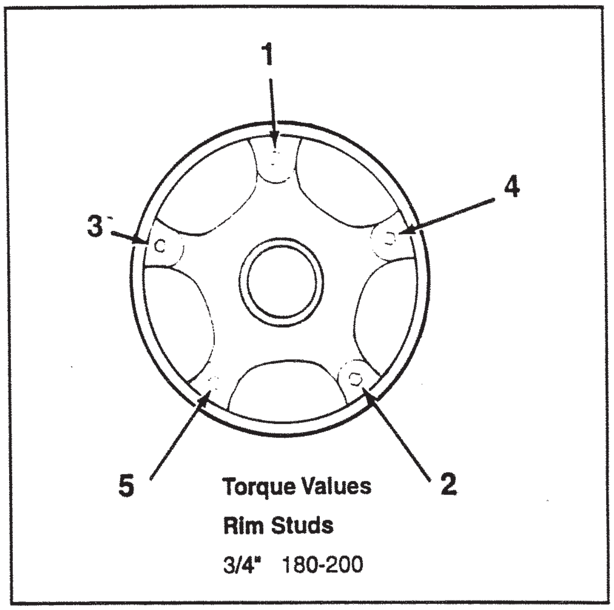

Figure 4-3. Tightening Sequence

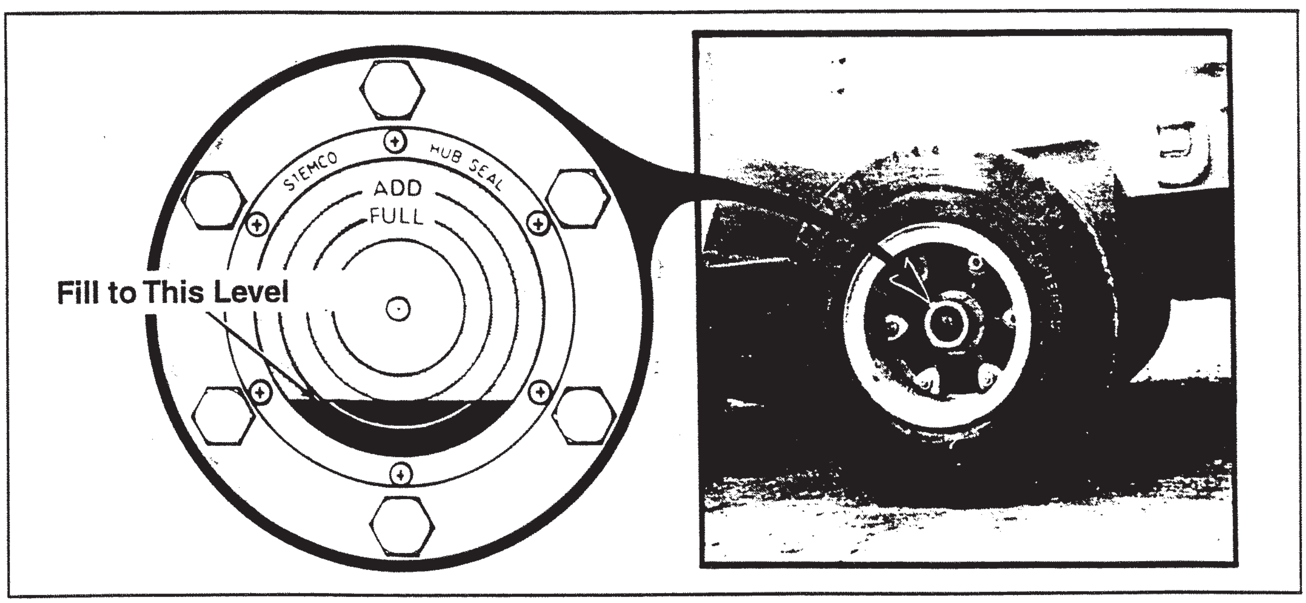

Figure 4-2. Check Oil Level of Oil Lubricated Bearings

Section 4
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Installation and Maintenance "Hutch" Spring Suspension

1. **Installations on other than original equipment.** The long life and trouble free service which you expect from your "Hutch" suspension is dependent upon adequate subframe design and proper installation. Special care should be taken whenever new "Hutch" suspensions or components are mounted to an old subframe or trailer beam. Used frames should be cleaned and inspected for cracks, rusting and other signs of damage or depreciation. Proper repair or replacement should be made wherever needed prior to installation of new suspension or component parts. Be certain adequate crossmembers, gussets and other parts are properly located to support hangers, beam guides, etc. Do not assume that because another suspension was mounted to the frame previously that the structure is adequate for the new suspension.

2. Hanger spacing is always measured from centerline of hanger to centerline of hanger. Unless otherwise noted on tandem axle installations, the front and rear hangers are always located an equal distance from the center hanger or rocker bream brackets. Hanger spacing should not vary from the dimensions shown in the catalog section more than plus or minus 1/16 inch (+ or - 1/16"). Hangers on one side of the subframe must not be in front of or behind corresponding hangers on the other side of the subframe by more than plus or minus 1/16 inch (+ or - 1/16"). Hangers must be mounted in proper alignment with one another and must not be cocked or tilted in respect to their mounting surfaces. For best performance and optimum life of hangers and other component parts, these instructions should be followed closely.

3. **Rocker Hanger assembly.** Most "Hutch" rocker beams are shipped from the factory installed in the rocker beam bracket or hanger. Some suspension options such as the sidemount weld-on and the widespread are shipped with the rocker beam loose. When this occurs, assemble the rocker beam in the bracket by inserting the two 5/8" by 6" step bolts through the holes provided in the rocker beam and bracket. The nuts and special lock washers should be located on the outside of the assembly to allow for easy access. These nuts should be tightened with a properly calibrated torque wrench or impact tool to 125 - 155 foot pounds torque.

4. **Axle clamp assembly.** Place the axle in a holding fixture or other device so that the camber marks are straight up. Position axle seats on top of the axle in the proper spring center location. Always locate spring seats an equal distance from the center point of the axle. Be certain that all seats fit the axle properly. If necessary, grind the axle seats to insure that both seats fit properly and are horizontal and parallel. Tack-weld seats in place and recheck with a level to make certain they are still level, parallel, and in the proper location and alignment.

CAUTION

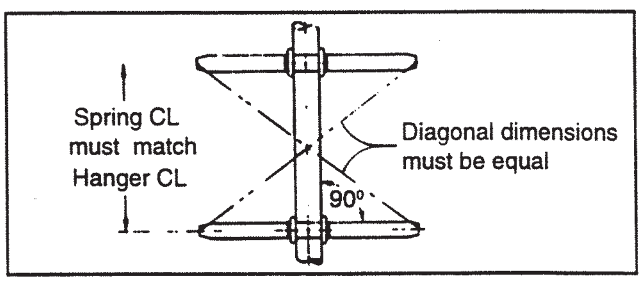
Before welding, be certain that axle seat welding instructions outlined in the preceding illustrations are followed.

Next, assemble springs and related axle clamp parts as indicated in the sketch below. If U-bolt bottom plates are used, be certain they fit the axle properly. If necessary, grind the bottom plates to provide proper fit. Position fabricated seats by tightening to 100 - 110 foot pounds. Before welding, be certain that the bottom plate and spring seat welding instructions outlined in the preceding illustrations for the desired assembly are followed.

CAUTION

Do not attach welding ground clamps to U-bolts, springs or axles. Do not strike an arc on U-bolts or springs. These parts should also be protected from welding splatter.

Do not strike an arc or weld on axles except at designated weld points. Always contact axle manufacturer for welding specifications.



After completion of assembly, the U-bolt nuts should be tightened with a properly calibrated torque wrench or impact tool to 275 to 300 foot pounds torque.

5. On standard model suspensions having one adjustable and one nonadjustable torque arm on each axle, install the nonadjustable torque arm on the curb side and the adjustable torque arm on the road side. On suspension models utilizing the "No-Hop" feature, two adjustable torque arms are provided for the rear axle. Torque arms should be assembled to the spring seat with the nuts facing outward toward the tires. The completed assembly of axles, springs, etc. should be rolled under the subframe or trailer, and the forward ends of the torque arms assembled to the hangers with nuts facing outward. When supplied, washers should be placed under the torque arm bolt nuts. The 1" torque arm bolt nuts should be tightened to 350 - 375 foot pounds torque.

CAUTION

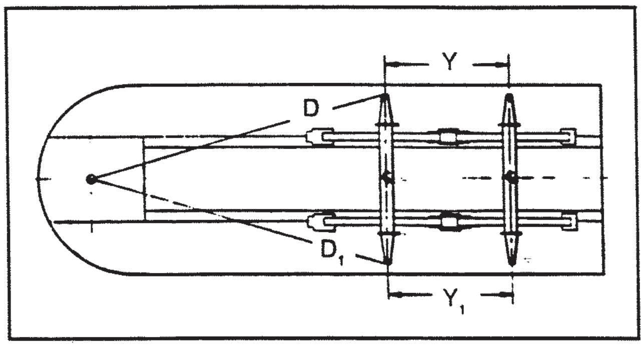
Torque readings should be taken from the nut only. Torquing bolt head will not produce the same clamping force on the bushing as tightening the nut.

6. **Completing the assembly.** Install the 5/8" spring retainer bolts, spacers and lock nuts into the equalizer with the nut facing to the outside.

7. **Alignment.** After the suspension has been installed under the vehicle, the axles should be properly aligned in relation to the trailer king pin. Prior to alignment, make certain the suspension is free and loose and has not been placed in a bind due to sharp turns or unusual maneuvers. Alignment can be accomplished with an optical device designed especially for this purpose, or it can be accomplished manually in the following manner:

Measure the distance from the kingpin to the centerline of the spindles on the front axle. It is recommended that spindle extensions be utilized. As noted in the sketch below, dimensions D & D_1 must be equal. Alignment can be accomplished by loosening the torque arm clamp screws on both ends of the adjustable torque arm and turning the adjustment screw. After alignment has been accomplished on the front axle, tighten the 1/2" torque arm clamp bolts 45 - 55 foot pounds torque in order to lock the alignment on the front axle.

Next, align any succeeding axles with the front axle by following the same procedure of loosening the torque arm clamp bolts, turning the adjustment screw until dimensions Y and Y_1 are equal and then tightening the clamp bolts to the proper torque. After alignment has been completed on all axles, all 1/2" torque arm clamp bolts should be rechecked to make certain that they are tightened to the necessary 45 - 55 foot pounds torque.



8. **Visual inspection.** After proper installation and alignment of the suspension, a visual inspection of the unit should be made. These four items should be carefully checked.

(a) Make certain that all springs are properly located on the wear pad. Twisted springs or cocked hangers will cause uneven spring contact with wear pad and will result in excessive wear on the suspension.

(b) Check to make sure that there is sufficient clearance between the springs and the sides of the hangers and rockers. Improper spring centers and/or hanger spacing will create binding in this area and result in excessive wear.

(c) Check the rocker beam to be sure that there is adequate clearance between the ends of the spring and the rocker beam hub when the axle is unloaded and loaded.

(d) Double check all bolts to see that they have been tightened to the proper torque as indicated on the following chart.

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	Oiled	Dry
1 1/8-7 (9600/9700 Rocker Bolt)	590 lb-ft	790 lb-ft
1-14 (7700 Radius Rod Bolt)	540 lb-ft	720 lb-ft
7/8-14 (Axle U-Bolts & 7600 Rad. Rod Bolt)	350 lb-ft	470 lb-ft
3/4-16 (Axle U-Bolts)	310 lb-ft	420 lb-ft
5/8-18 (7600/7700 Rocker Step Bolt & Cast Rad. Rod Clamp Bolt)	130 lb-ft	170 lb-ft
5/8-18 (Spring Retainer Bolt)	35 lb-ft	50 lb-ft
1/2-20 (Rad. Rod Clamp Bolt)	65 lb-ft	85 lb-ft

9. **Maintenance.** After an initial break in period on the road, and at regular intervals thereafter, all bolts should be checked to insure that the proper torque listed in the chart above has been maintained.

Service Guide - Trailer Air Suspensions

Periodic Inspections

Daily: A quick look to verify that the trailer is level and at the correct ride height will help to identify any obvious problems. A close inspection will also locate any loose or broken parts before any serious problems appear.

Every Thirty Days: Review the clearance around air springs, tires, shock absorbers and all other moving parts. Any evidence of part interferences requires immediate attention. Visually verify that all bolt connections appear secure along with the axle connection. Any signs of wear should be reviewed.

Every Ninety Days: In addition to the above, inspect all welded connections for signs of deterioration. Pay particular attention to the axle connection welds, the alignment collar welds and the frame attachment. Inspect all pivot and clamping connections such as the suspension pivot and the shock mounting.

Suspension Components

Pivot Connection

This connection is crucial to the performance of the suspension. But, when properly installed, no periodic maintenance or adjustment is required. Two types of connections are used:

The **Huck Fastener** is installed either by Hendrickson Turner or the suspension installer. It must be cut for removal.

A **Threaded Pivot Bolt and Nut** can be installed by the suspension installer or used as a field replacement. It must be torqued to 800 ft. lbs. (dry). Tack welding the nut to the bolt threads is required.

Alignment Adjustment

The Alignment adjustment is located at the **pivot connection** . The alignment collars travel within the alignment slots in the frame brackets. Once alignment is set, the collars are welded into place. Normally, no additional adjustments are required unless the suspension was originally misaligned or if there has been damage to the suspension system.

Height Control Valve

This valve maintains the suspension(s) at a constant ride height. The ride height can be altered by changing the adjustment slot on the valve's control arm or by replacing the links. This valve is designed to have a time delay between five and fifteen seconds.

Component Replacement - Air Suspension

Air Sprimgs

1. Exhaust the suspension air.
2. Raise and support the trailer.
3. Disconnect the air connections.
4. Unbolt and remove.
5. Reverse the above steps for installation.

Shocks

1. Simply remove the upper and lower mounting bolts and remove the shock.

2. Only replacement shocks supplied by Hendrickson Turner or its distributors can be used. The use of substitute components may void the suspension warranty.

3. Use new mounting hardware and torque to 250 ft. lbs.

Pivot Bushing

The pivot bushing is a very durable, long lasting component. Bushing failures are rare and replacement should be attempted only when all other problem causes have been eliminated.

1. A bushing removal/installation tool is required and can be borrowed from Hendrickson Turner. A five to ten ton porta-power is also required and is to be supplied by the customer.

2. Hendrickson Turner offers a bushing replacement kit which consists of the bushing, pivot bolt kit and the correct lubricant. No other lubricant should be used.

Commonly Misdiagnosed Bushing Problems

While the following problems can result from a failed bushing, most often they are the result of the items listed below.

Problem	Causes	Solutions
Trailer leans*...		
... Constantly in one direction.	Suspension beams installed out of parallel.	Determine which beam is out of parallel, Cut from axle, reposition and re-weld.
... varies from side to side.	Axle welds missing or broken.	Clear away old welds, reposition the beams to be parallel and re-weld to axle.
... varies in one direction.	Failed pivot bushing (rare).	Contact Hendrickson Turner Technical Service Department.
Trailer "Dog-Tracks"...		
... constantly to one side.	Trailer out of alignment.	Remove weld from the alignment collars on those axles requiring adjustment. Realign per procedure provided by Hendrickson Turner.
... from side to side.	Missing or broken alignment collar welds.	Clear away failed welds and realign per procedure provided by Hendrickson Turner.
... to one side under load.	Suspension not square to axle.	Contact the Hendrickson Turner Technical Service Department.
	Air springs misaligned.	Compare the installation to the suspension drawing and reposition mountings as required.
	Failed pivot bushing (rare).	Contact the Hendrickson Turner Technical Service Department.

* Contact the Hendrickson Turner Technical Service Department for materials to assist in diagnosing the problem.

Commonly Misdiagnosed Bushing Problems (continued) While the following problems can result from a failed bushing, most often they are the result of the items listed below.		
Problem	**Causes**	**Solutions**
Bushing Walk (The suspension beams have. shifted from the center of the pivot bushings).	Incorrect alignment.	Re-bush the suspension and realign as per Hendrickson Turner instructions.
	Suspension beams out of parallel (vertically or longitudinally).	Determine which beam(s) is out of position, cut from axle, reposition and weld. Re-bush both suspension pivots.
	Frame bracket centers do not match the suspension beam centers.	Compare the installation dimensions to the suspension assembly drawing. Reposition the incorrect components and re-bush both suspension pivots.
	Use of improper bushing lubricant.	Re-bush using lubricant supplied by Hendrickson Turner.
Appearance	**Perception**	**Explanation**
Pivot can be moved vertically.	Faulty or worn bushing.	Normal travels for the tri-functional bushing.
Bushing protrudes from the bushing tube.	Failed bushing.	Rubber protruding from both ends of the bushing tube is normal. Excess rubber protruding from one end can indicate a bushing walk condition.

Tire, Rims and Disc Wheels

Tire Inflation

Proper and improper inflation will produce the tire section and ground contact characteristics shown in Figure 4-4. Tire inflation must be checked daily while tires are cold.

Either overinflation or underinflation will cause premature tire wear.

CAUTION

Do not exceed the cold inflation pressures. In some cases the rim or disc wheel will have a lower inflation pressure that the tire, in which case the lower pressure must be used. The maximum inflation pressure to be used is shown on the certification label. Tire inflation must be checked during road stops to locate air losses. Also, remove any foreign objects jammed between the dual wheels.

CAUTION

Do not attempt to adjust the inflation pressure while the tires are hot.

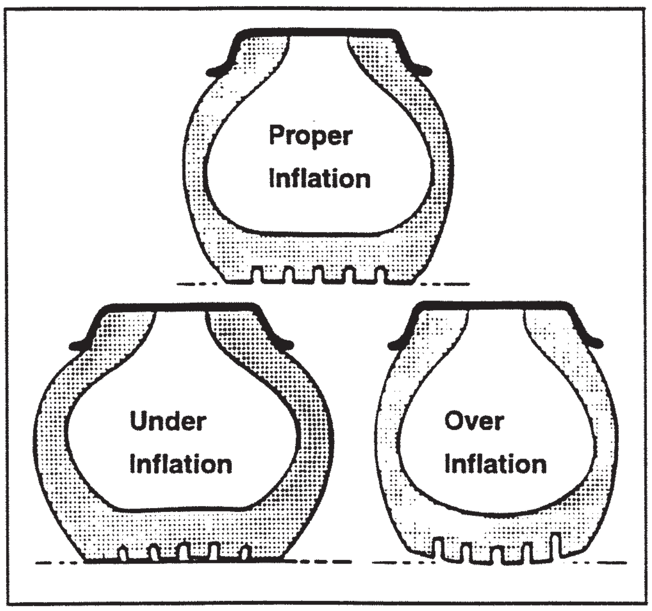

Figure 4-4. Proper tire Inflation

WARNING

Repair any leaks immediately. All tires must be equipped with valve caps.

Tire Overinflation

Overinflation weakens the cord body of the tire by reducing it's ability to absorb road shocks.

Overinflation can cause failure due to fatigue cracks.

Overinflation can also cause rim and wheel damage.

1. Inflate to correct pressure when tires are cool.

WARNING

Do not overinflate tires.

2. Never "bleed" tires to relieve excessive pressure buildup when the tires are warm. Excessive buildup of air pressure can be due to load, underinflation, speed, or a combination of the three.

Tire Underinflation

Underinflation causes rapid wear and premature failure. Underinflation or overloading of the tires on any vehicle driven at sustained speeds will result in weakening of the tire cords. This can make the tire susceptible to further damage or failure even under normal load and inflation conditions.

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Matching Dual tires

Matching of the duals by size will result in longer tire life. Improper matching will cause the larger diameter tire to carry an overload. This will cause typical overloaded tire difficulties. The smaller diameter tire will also wear more rapidly due to scuffing. Differences of not more than 1/4 inch (6.35 mm) in diameter or 3/4 inch (19.1 mm) in circumference are allowed.

NOTE: The smaller of the two tires should be mounted in the inside position.

Tire Measurement

Measure the circumference of the tire with an endless tape after being placed on the rim and inflated, but Not mounted on the trailer (see figure 4-5). A straightedge, square or string gauge can be used to check the tires mounted on the trailer (see figure 4-6).

NOTE: The dimension between the straightedge and the tires should not exceed 1/2 of the allowable difference in diameter.

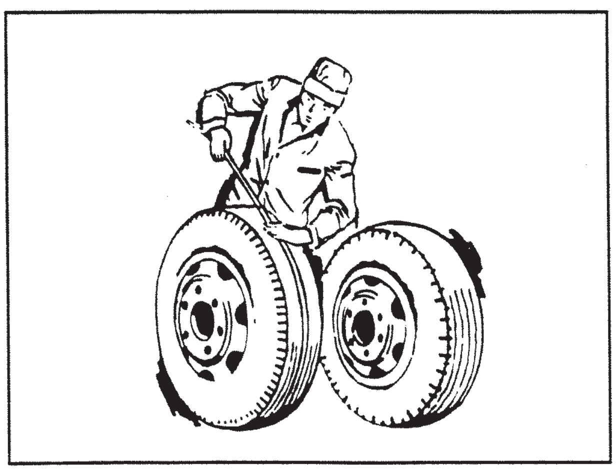


Figure 4-5
Measuring Tire With Endless Tape

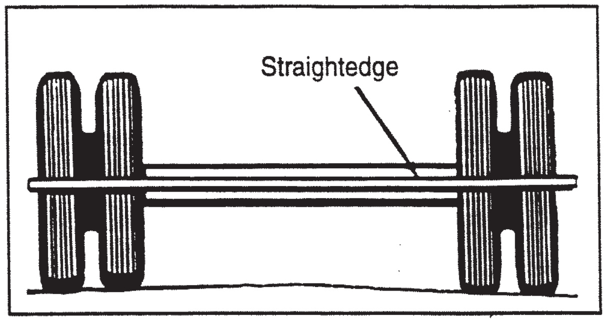


Figure 4-6 Use of Tire Straightedge

Removing Tire and Rim Assemblies

WARNING

Before removing the tire and rim or the tire and disc wheel assemblies, remove the valve core and exhaust all air from both tires in the dual assembly. Check the valve stem by running a piece of wire through the stem to make sure it is not plugged.

With the trailer supported by jacks and blocks, remove all the air from the tires. Remove all the rim nuts and the clamps (see Figure 4-7). Remove the outside tire and rim assembly. Remove the spacer band and the inside tire and rim assembly if required.

Removing Tire and Disc Wheel Assemblies

With the trailer supported by jacks and blocks, remove all the air from the tires (see warning on this page). Remove the cap nuts (see figures 4-8 and 4-8a). Remove the outside tire and disc wheel. Remove the inside tire and disc wheel if it must be changed.

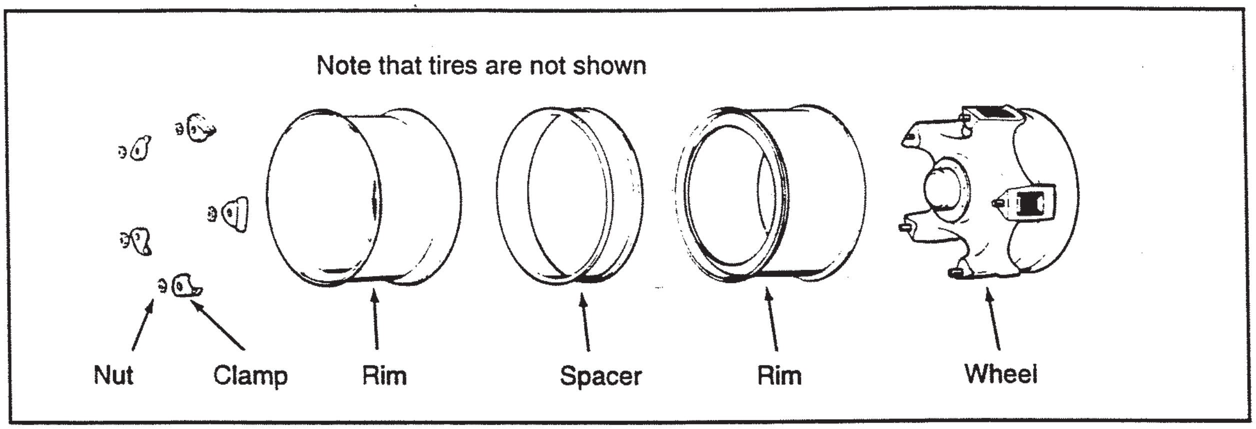


Figure 4-7. Removal of Rims on Cast Spoke Wheels

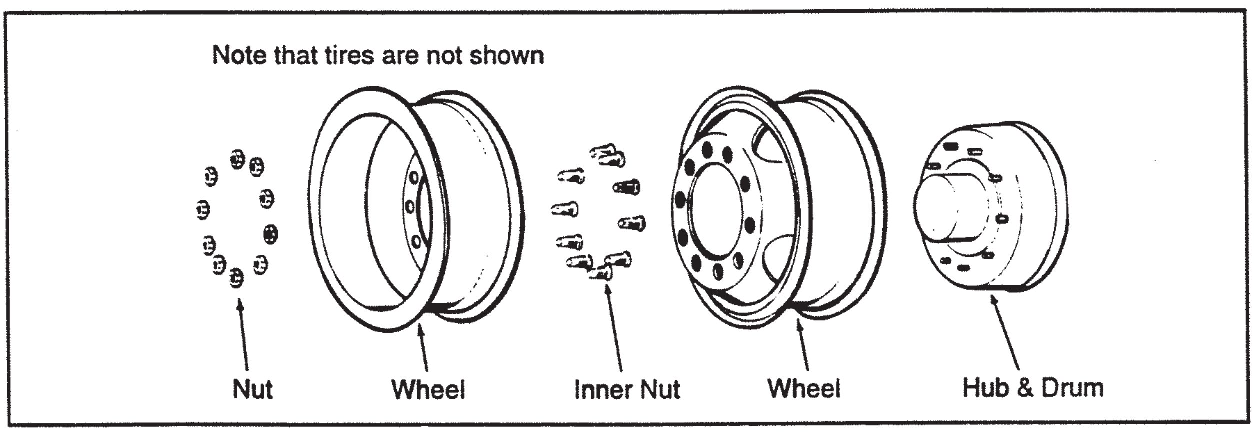


Figure 4-8. Removal of Tires and Ball Seat Disc Wheels

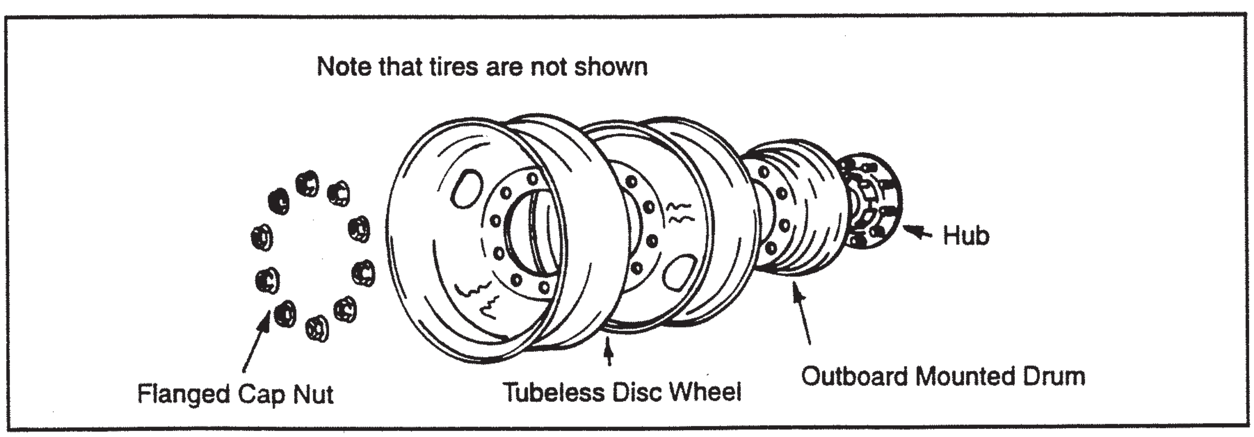


Figure 4-8a. Removal of Tires and Hub Piloted Disc Wheels

Mounting and Dismounting Tires on Rims or Disc Wheels

⚠ WARNING

Mounting and demounting of tires must be done by trained personnel only!

Always use industry approved procedures.

The following points must be considered when changing or repairing tires on rims or disc wheels.

1. Do not mix rim or wheel components. They may come apart during inflation.

2. Check the rim base, side rings and lock rings for cracks or other damage. Do not attempt to repair rims or disc wheels. Scrap damaged parts.

3. Match the duals (see page 4-13).

4. Use only correct rim sizes.

5. Keep rims clean and painted to avoid corrosion.

6. Use proper valve stems and extensions. If valve spacers are used, be sure they are in place before reassembling.

7. Do not overinflate tires.

⚠ WARNING

Use properly constructed cages, guards or baskets when inflating tires.

Tires are to be mounted by trained service personnel only!

8. When the tires are worn, the tube will also be worn. Replace the tube. Use the proper size tube.

9. Replace chafed, pinched, stretched or creased tubes.

10. Replace twisted, creased or folded flaps.

Mounting Tire and Rim Assemblies

Place the inside tire and rim on the wheel.

NOTE: If the inside tire and rim were not removed, be sure the side ring and/or lock ring are seated properly. Install the valve core, but do not inflate the tire.

Put on the spacer band and the outside tire and rim. Put on the rim clamps and nuts. Tighten to the torque and in the sequence shown in figure 4-3.

NOTE: Tighten in several stages to avoid distorting the rim. If the inside tire and rim were not removed, inflate the tire to the proper pressure.

Checking Tightness on Cast Wheel/Rim Assemblies

After the first 50 - 100 miles of service, check the clamp nut torque. Tighten the clamp nuts as shown in Figure 4-3.

Mounting Tire and Hub Piloted Type Disc Wheels

Before mounting the disc wheel, clean the mounting face of dirt and excess paint.

Place the inside tire and disc wheel assembly on the hub. Place the outside tire and disc wheel assembly on the hub and start the flange nuts. Valve stems for the two wheels should be mounted in different circumferential positions for easy inflation. Tighten the flange nuts to the torque and in the sequence shown in Figure 4-9. If the inside tire and disc wheel assembly was not removed, inflate the tire to the proper pressure.

Mounting Tire and Ball Seat Type Disc Wheel Assemblies

Before mounting the disc wheel, clean the mounting face of dirt and excess paint.

⚠ WARNING

Mounting faces which have been damaged must be repaired or replaced.

Right-hand threads are on the right side of the vehicle, and left-hand threads are on the left side.

Place the inside tire and disc wheel assembly on the hub and start the inner cap nuts. Tighten the inner cap nuts to the torque and in the sequence shown for your arrangement (see figure 4-9). Tighten in several stages to avoid distortion of the disc.

> **NOTE:** If the inside tire and disc wheel assembly was not removed, tighten the inner cap nuts as described. Be sure the side ring and/or lock ring are seated properly. Install the valve core, but do not inflate the tire.

Place the outside tire and disc wheel assembly on the hub and start the outer cap nuts. Valve stems for the two wheels should be mounted in different circumferential positions for easy inflation. Tighten the outer cap nuts to the torque and in the sequence shown in Figure 4-9. If the inside tire and disc wheel assembly was not removed, inflate the tire to the proper pressure.

Checking Tightness on Mounted Dual Disc Wheels

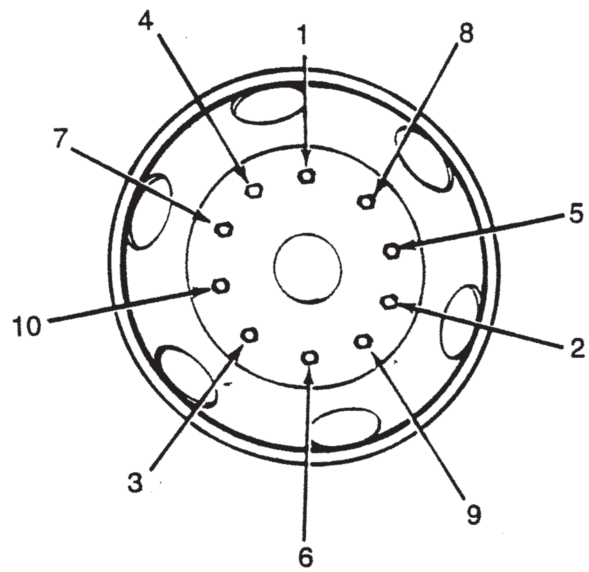
Check the inner and outer cap nut (ball seat style) or flange nut (cast spoke style) torque after the first 50 - 100 miles of service. Loosen the outer cap nut before tightening the inner cap nut. Tighten the nuts as shown in figure 4-9.

Wheels and Hubs

General

Two types of wheels are commonly used on Etnyre trailers. Disc wheels mounted on hubs are standard. Cast wheels with demountable rims are optional. Bearing cups are pressed into the wheel "spider" on cast wheels and into the hubs for disc wheels.

10 Stud Disc Wheel Tightening Sequence



Hub-Piloted (Two piece flange nuts)

Wheel Stud Thread Size	**Torque Lbs. Ft. (Oiled*)**
M22x1.5 (W/1-1/2" Hex)	450 - 500

Torque Values for Dual Wheels
Dry Threads - No Lubrication

Stud Size	**Inner & Outer Capnut**
3/4 - 16	450 - 500 ft. lbs.

Backnut Torque

Size	**Torque**
3/4 - 16	175 - 200 ft. lbs.

Figure 4-9. Tightening Sequence of Standard Gunite Disc Wheels

For other wheel brands, follow manufacturers recommended sequence.

Section 4
Maintenance

Cast Wheel or Hub Removal

Demountable rims and disc wheels must be removed before removing cast wheels or hubs. Support the cast wheel or hub assemblies prior to removal. The cast wheel and drum or hub and drum are removed as an assembly using the following procedure.

1. Loosen the brake adjustment by turning the adjusting screw on the slack adjuster.

2. Remove the hub.

3. Bend the flap or tang of the lockwasher from the flat of the outer spindle nut.

4. Remove the outer spindle nut, two (2) lockwashers, and the inner spindle nut.

5. Pull the cast wheel and drum or hub and drum assemblies carefully to avoid damage to the bearing, spindle, and inner seal. Catch the bearing cones as the wheel or hub is removed from the spindle.

Inspection and Cleaning

While the wheel or hub is removed, inspect the condition of the brake drum and linings. Also check the condition of the cups, cones, seal, and axle ring.

Preparing Bearing for Assembly

Coat the bearing cones and cups with oil prior to assembly.

Cast Wheel or Hub Installation

(see Figure 4-10)

After the parts have been cleaned, inspected and bearings oiled, install as follows:

1. Assemble the inner cone and seal into the wheel or hub.

2. Place the wheel or hub over the spindle, being careful to avoid damage to the spindle, seal and brake.

3. Put the outer cone into position.

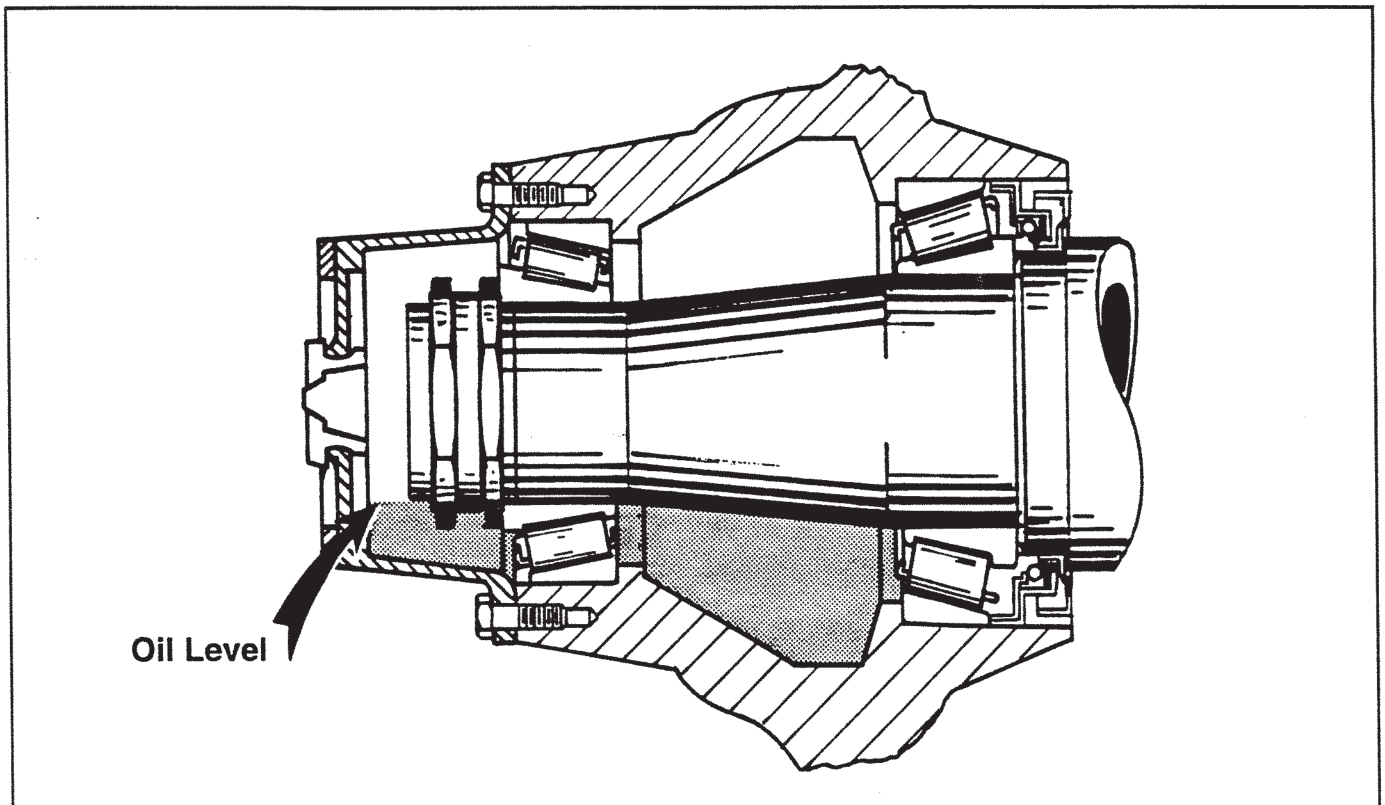


Figure 4-10. Filling Oil Lubricated Hub

4. Tighten the inner spindle nut while rotating the wheel or hub both directions until a slight bind is felt.

5. Loosen the nut 1/4 turn. The wheel or hub must rotate freely.

6. Install the inner nut lock and place the outer lockwasher on the spindle.

7. Tighten the outer nut.

8. The end play must be .001 in. (.0254 mm) to .010 in. (.254 mm).

9. Lock the outer spindle nut in place by bending the tangs or edge of the lockwasher over one flat on the outer nut.

10. Install the hub cap gasket and hub cap. Fill the hub to the "Full" line on the hub cap window (see Figure 4-2).

11. Adjust the brakes.

Air System and Brakes

Air System and Brakes - General

This section contains a description of the operation of the trailer brake air supply system.

Also included in this section are test instructions, disassembly and assembly procedures and a troubleshooting guide.

Air System Tests

A series of tests must be run daily before operating trailers with air brakes.

1. Connect the air lines, turn on the air, and pressurize the system. The system must hold 100 PSI (7 Bar) pressure minimum.

2. Apply the brakes. Inspect the brake action on all the wheels for proper application.

3. Release the brakes. The brakes must release promptly. Air pressure must discharge quickly from the relay emergency valve.

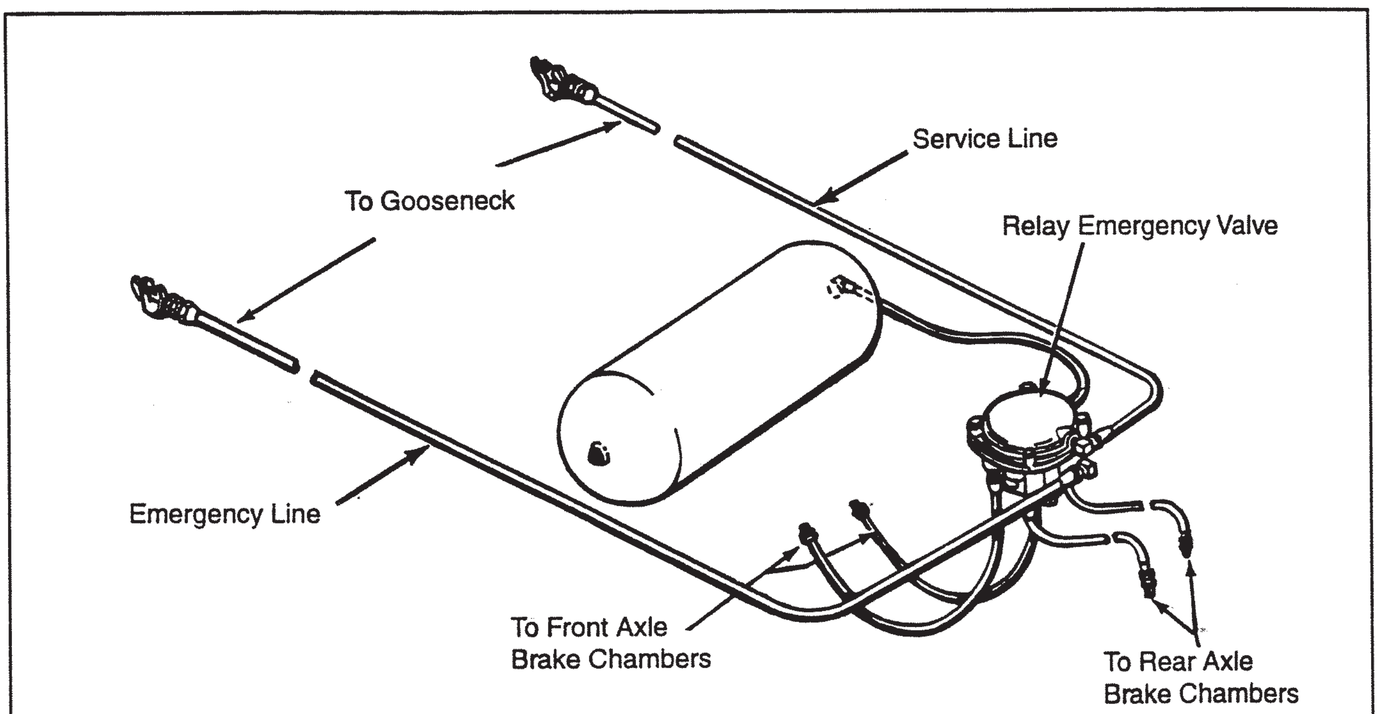


Figure 4-11. Brake Air Supply System

4. Disconnect the emergency line from the trailer. The trailer brakes must automatically apply.

5. Connect the emergency line. The brakes must release.

Air Reservoir

Drain condensation from the reservoir while the reservoir is pressurized. Listen for leaks after closing the drain valve. The drain valve is located on the underside of the reservoir.

Air Hoses and Tubing

Air hoses and tubing must be checked for chafing, bends, and kinking. Replace faulty parts.

Brake Relay Emergency Valve

The air system tests may disclose a malfunction of the relay emergency valve. Repair or replace faulty units. Contact an authorized representative of the original equipment manufacturer for relay valve servicing.

Air Brake Chambers

The air system tests should disclose any malfunctioning brake chambers. Repair or replace faulty units. The diaphragm and any worn parts must be replaced. When replacing the diaphragm or the spring, replace the corresponding parts for the other chamber on the same axle, to aid in even brake application and release. Examine the yoke pin for wear and replace it if necessary.

Brake Air Supply System Description

(see Figure 4-11)

The trailer relies on the tractor for its air supply. A description of the system operation follows:

1. When the service and emergency lines are connected to the towing vehicle, the reservoir is charged to approximately the same pressure as is present in the tractor reservoir. The relay emergency valve will keep the trailer brakes applied until the emergency line pressure reaches 60 PSI (4.14 Bar). The brakes will then be released.

2. When the towing vehicle and the trailer are traveling over the road, the brakes are released and the emergency line and reservoir are charged to full pressure.

3. When the service brakes are applied in the towing vehicle, the pressure is increased in the service line. This fills the brake chambers with the same pressure as the service line, and applies the trailer brakes.

4. Releasing the service brakes will cause the pressure in the service line to decrease, causing the relay emergency valve to exhaust the pressure from the brake chambers.

5. The trailer brakes can also be applied independently from the tractor brakes by actuating a hand controller. This supplies air pressure to the service line.

6. The brakes will also apply if the pressure in the emergency line is reduced to about 30 PSI (2.07 Bar). A gradual decrease in the emergency line pressure will cause a gradual increase in the pressure to the brake chambers.

7. A sudden release of pressure in the emergency line will cause a full release of reservoir pressure into the brake chambers, resulting in full brake application.

Relay Emergency Valve

(see Figure 4-12)

The relay emergency valve senses the line pressures and relays the response to the brake chambers. Daily operating tests are described elsewhere in this manual. Before conducting further tests, check the tractor air pressure gauge against an accurate test gauge.

⚠ WARNING

Block the wheels during these tests

1. Connect the service and emergency lines. When the pressure reaches 60 -65 PSI (4.14 - 4.48 Bar), the brakes must automatically release.

2. Apply and release the service brake several times. Check for prompt brake application and release.

3. Release the brakes and stop the engine with the system pressure between 90 - 100 PSI (6.2 -6.9 Bar). A two minute check must show a pressure drop of no more than 6 PSI (0.41 Bar) for the combination vehicle system.

4. If step "3" indicates possible leakage, apply soap suds at the relay emergency valve exhaust port. A one inch (25.4 mm) soap bubble in not less than five seconds is permissible.

5. Apply soap suds at the pipe plugs and fittings. Correct all leaks as indicated.

6. With the engine stopped and the pressure at 90 - 100 PSI (6.2 - 6.9 Bar) make and hold a full service brake application. A two minute check must show a pressure drop of no more than 8 PSI (0.55 Bar) for the combination vehicle system.

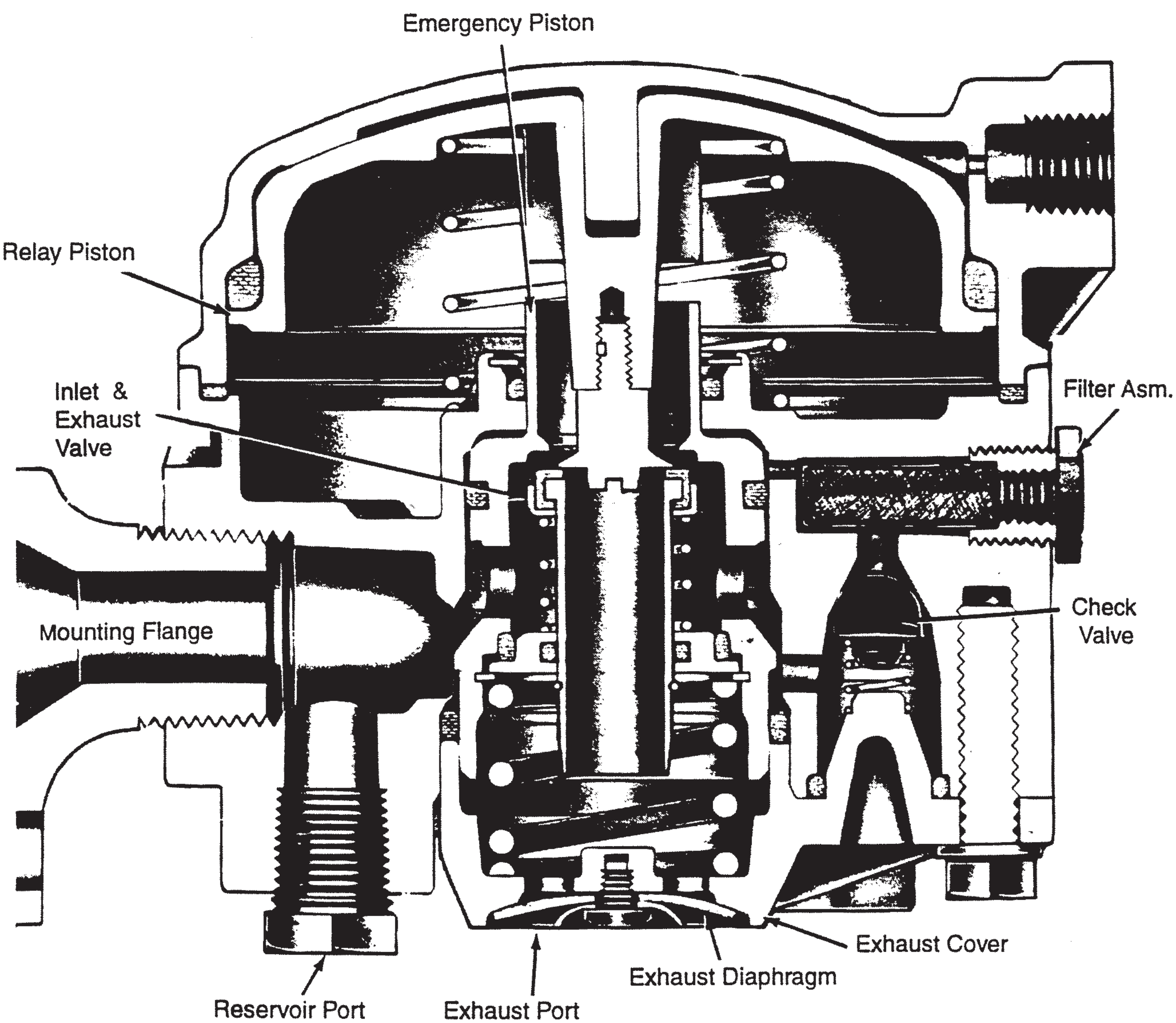


Figure 4-12. Relay Emergency Valve

7. If Step "6" indicates possible leakage, apply soap suds on the relay emergency valve cover and exhaust port. A one inch (25.4 mm) bubble in not less than three seconds is permissible. Correct all leaks as indicated.

8. Place the tractor protection control valve in "emergency" position or close the cutoff valve on the emergency line. Disconnect the emergency line coupling. The trailer brakes must apply promptly. Check for leakage at the emergency coupling. A leak indicates a leaking check valve or O-rings in the relay emergency valve. Also check the service line. A leak here indicates leaking O-rings in the relay emergency valve. Recharge the system. The brakes must release at 65 PSI (4.48 Bar) emergency line pressure.

9. Stop the engine with the system fully charged. Make a series of foot valve applications. Reduce the pressure

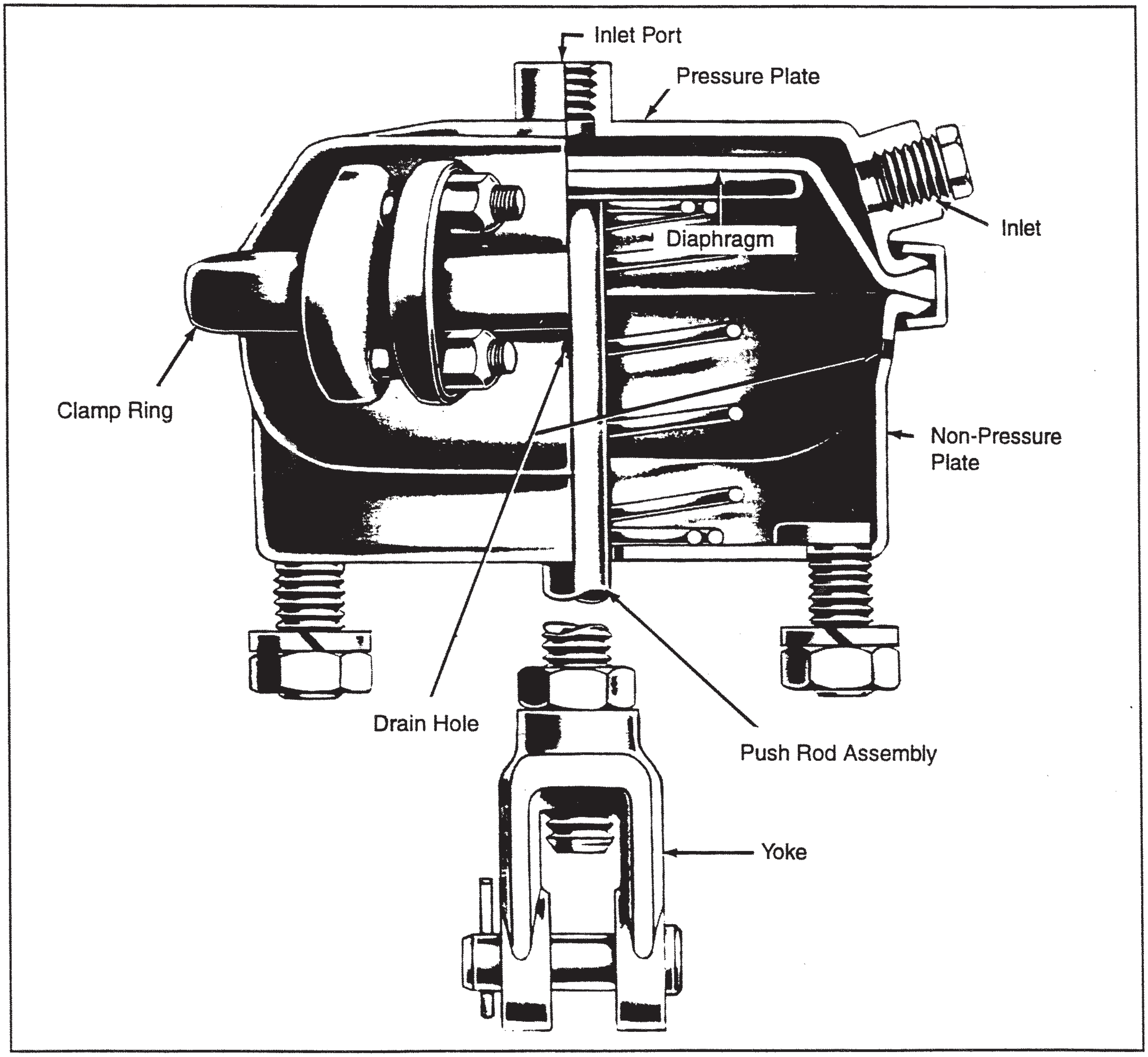


Figure 4-13. Brake Chamber

to 30 PSI (2.07 Bar). The trailer brakes must apply automatically at this pressure or at the emergency setting of the tractor protection equipment.

If the valve does not function properly or leakage is excessive, it must be repaired or replaced.

Brake Chambers

(see Figure 4-13)

Air pressure on the pressure plate side of the brake chamber diaphragm pushes the diaphragm against the push rod assembly. This extension of the push rod pushes against the slack adjuster, which actuates the brakes.

Brake Chamber Servicing

If an air leak is detected around the clamp ring, the bolts can be tightened to stop the leak.

CAUTION

Overtightening the bolts can cause permanent distortion of the clamp ring. Do Not exceed a torque of 130 inch lbs. (14.7 N.m.)

Brake Chamber Removal

Disconnect the air line and the push rod yoke. Remove the nuts from the mounting studs. Remove the air chamber.

Brake Chamber Disassembly

1. Clean the exterior of the brake chamber.

2. Put a mark on the parts so they can be reassembled in the same relative positions.

3. Pull out the push rod and clamp the push rod in the extended position with vise grip pliers.

NOTE: Tape the grips to prevent damage to the push rod.

4. Remove the bolts from the clamp ring.

5. Spread the clamp ring and remove it.

CAUTION

Use care not to bend the clamp ring out of shape.

6. Remove the pressure plate and diaphragm.

7. Remove the locknut and the yoke from the push rod.

8. Release the grip on the push rod.

9. Remove the push rod and the spring.

Cleaning and Inspection of Parts

Clean the metal parts in a solvent. Inspect all the parts for damage, wear or deterioration and replace defective parts.

Brake Chamber Assembly

1. Stand the push rod assembly on a flat surface.

2. Put the return spring in position.

3. Place the non-pressure plate over the push rod.

4. Push the non-pressure plate down against the flat surface. Hold it in place with vise grip pliers clamped to the push rod.

NOTE: Tape the grips to prevent damage to the push rod.

5. Place the clamp ring over the non-pressure plate clamping surface.

6. Position the diaphragm in the pressure plate. Assemble it with the non-pressure plate by working the clamp ring over the pressure plate. Align all the marks made during disassembly.

7. Draw the clamp lugs together. Start the clamp bolts and nuts. Tighten the nuts to a maximum torque of 130 inch lbs. (14.7 N.m.).

CAUTION

Overtightening the bolts can cause permanent distortion of the clamp ring.

Installation

Place the brake chamber in the mounting bracket and tighten the nuts on the studs. The drain hole must be placed in the down position. Install the yoke and the locknut on the push rod. Connect the push rod to the slack adjuster with the yoke pin. Adjust the brakes. Check the angle formed by the slack adjuster and the push rod with the brakes applied. This angle must not be less than 90^0 with the brakes adjusted. Turn the yoke to obtain this angle. The angle must be the same for all slack adjusters to obtain equal braking force at all wheels.

Air Brakes

Air Brakes - General

Etnyre trailers are equipped with cam actuated brakes. Braking force is supplied by air pressure in the brake chamber, which pushes a pushrod against the end of the slack adjuster. The slack adjuster rotates the camshaft, which forces the brake shoes against the brake drum.

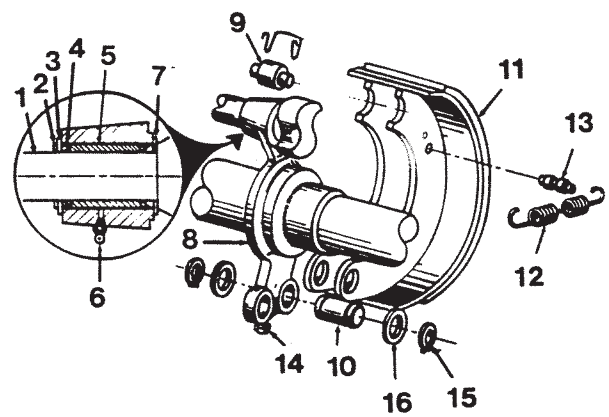
Operating Checks

During road stops, check the brake drums for heating.

WARNING

Proceed cautiously. Malfunctioning or misaligned brakes can cause the drum to become extremely hot. Do not operate the vehicle until the problem causing the overheating is corrected.

A cool brake drum may indicate an inoperative brake. A series of tests are outlined on page 4-18.



Weld-on Spider*   16 1/2" Brake

1. Camshaft
2. Snap Ring
3. Washer
4. Seal
5. Bushing
6. Grease Zerk
7. Spacer Washer
8. Brake Spider
9. Roller
10. Anchor Pin
11. Brake Shoe and Lining
12. Retract Spring
13. Retract Spring Pin
14. Clamp Bolt
15. Anchor Pin Lock
16. Washer

*NOTE: One (1) Brake Shoe & Lining Assembly with related parts has been deleted for easier visualization.

**Figure 4-14.
Foundation Brake Components**

Brake Assembly

Examine the brake linings visually to locate the lining showing the greatest amount of wear.

⚠ CAUTION

Do Not allow the linings to wear thin enough so the lining bolts or rivets contact the drum.

Grease the anchor pins, camshaft bracket bearing and the spider busing at four (4) grease fittings. Do Not use an excessive amount of grease on the anchor pins and spider bushing. Avoid getting grease on the brake lining surfaces.

Slack Adjuster

Automatic Slack Adjuster Recommended Preventive Maintenance

Every Three Months or 25,000 Miles

1. Check the condition of the foundation brakes, including drums, shoes and linings, cams, rollers, bearings, etc.

2. Check for structural damage of the automatic slack adjuster housing and condition of the boot for cuts, tears, etc. Replace if necessary.

3. After allowing brake drum to cool to room temperature, check for correct chamber stroke. See chart below for recommended stroke measurements.

Chamber Type	Maximum Stroke
12	less than 1-3/8"
16	less than 1-3/4"
20	less than 1-3/4"
24	less than 1-3/4"
30	less than 2"

Every Six Months or 50,000 Miles

The Gunite automatic slack adjusters are factory lubricated and extensively sealed to protect against dirt, water, salt and other corrosive elements. Nevertheless, periodic lubrication is recommended.

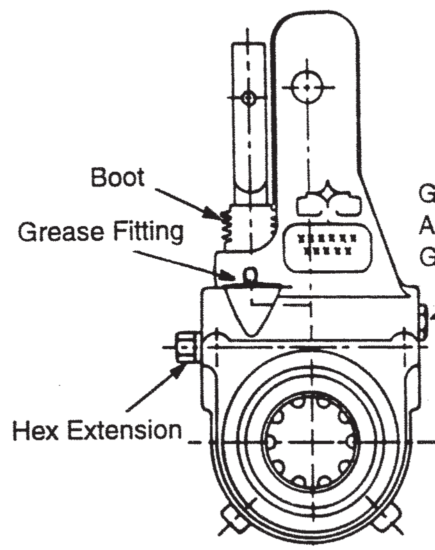
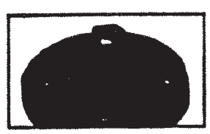


**Figure 6.
Lubrication Points - Slack Adjuster**

1. Grease the automatic slack adjuster.

(a) The styles of grease plugs or reliefs vary according to models. Determine which you may have by comparing it to the photos below.



Grease Plug

Style A Grease Relief

Style B Grease Relief

(b) If your model has a grease plug, remove it from cap opposite hex extension.

NOTE: Failure to remove grease plug could result in boot and/or seal damage.

(c) A grease fitting is provided to allow fresh lubrication during normal chassis servicing. With a conventional grease gun and an approved grease, fill the inside of the slack until grease flows from the grease plug hole or automatic grease relief opening.

(d) **Lubriplate Aero** is an approved grease and is used in the manufacture of Gunite automatic slack adjusters. It is recommended for use in temperatures as low as -40° F. Texaco Multifak EP-2 and Mobil Grease #77 are also approved greases, but are not recommended for use in temperatures below -20° F.

(e) Install the grease plug if your model has one, and tighten to 70 - 90 in.-lbs. torque.

2. Test adjuster function.

Testing Adjuster Function

If maximum stroke at 85 psi of the Gunite automatic slack adjuster is less than the distance in the **Maximum Stroke Chart** below, the adjuster is functioning properly.

Chamber Type	Maximum Stroke
12	less than 1-3/8"
16	less than 1-3/4"
20	less than 1-3/4"
24	less than 1-3/4"
30	less than 2"

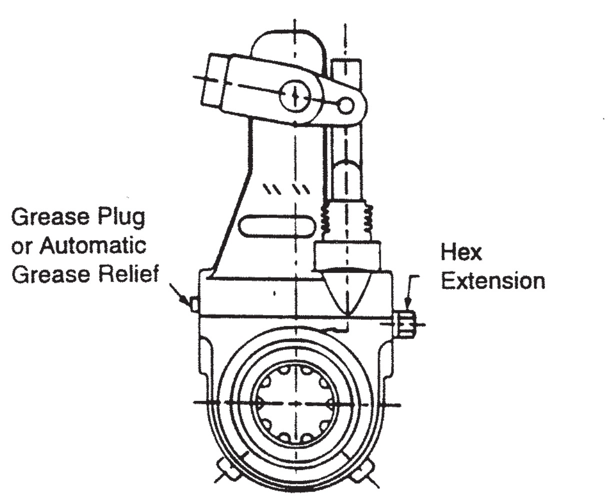


Figure 7. Adjuster Function

1. The Gunite Automatic Slack Adjuster should not require manual readjustment. If the maximum chamber stroke is within the range for the size chamber used (see figure 11), the slack should not be manually readjusted. If the chamber stroke exceeds the limit, turn the hex extension 1/2 turn **counterclockwise.** Apply the brakes several times and watch for the hex to rotate **clockwise.** A box wrench on the hex makes an excellent indicator to magnify the movement. The hex extension must rotate **clockwise.** The adjustment is intentionally made in small increments so it will take several cycles to bring the adjuster within the stroke limit shown in the chart.

2. Check the torque by attaching a torque wrench to the hex extension and turning it in **a counterclockwise** direction and record the measurement.

3. If the hex extension did not rotate clockwise or there is less than 15 ft.-lbs. of torque in the counterclockwise direction, the automatic slack must be replaced. If immediate replacement is not possible, proper brake adjustment must be maintained by manual adjustment.

4. If the hex extension rotates clockwise and has a counterclockwise torque of greater than 15 ft.-lbs., the slack is functioning properly. Check the foundation brake for proper function, worn cam bushings, pins and rollers or broken springs. Repair as necessary and repeat the test.

5. Readjust the brake after the Function Test.

Boot Replacement

1. Remove the 1/4" and 1/2" clevis pins.

2. Rotate the hex extension counterclockwise to clear the link from the clevis. This will require up to 45 ft.- lbs. of torque and produce a clicking noise. Only the link needs to be cleared which requires about one revolution of the hex extension.

3. Remove the damaged boot from the link.

4. Install the replacement boot over the link with the heavy section down. Care should be taken not to damage the boot with a sharp tool.

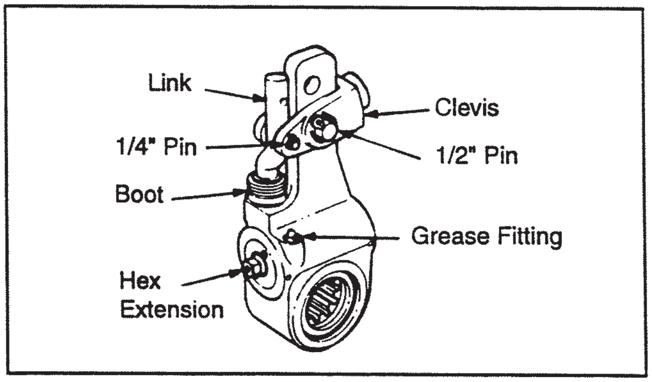


Figure 8. Location of Clevis Pins, Hex Extension, and Boot

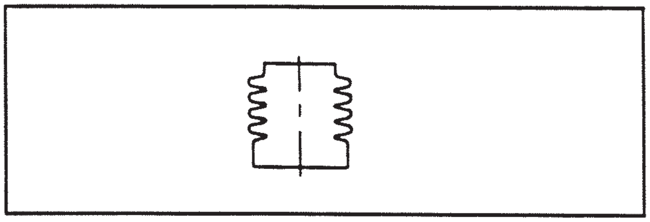


Figure 9. Boot

5. Position the boot on the link so that the bottom is retained by the boot insert and the top is positioned by the groove in the link.

6. Install the clevis pins.

7. Check the torque as detailed under "TESTING ADJUSTER FUNCTION" above.

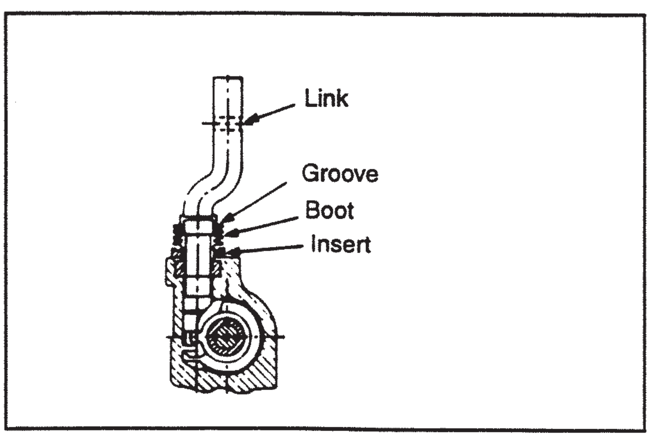


Figure 10. Boot Position

Lining/Drum Replacement Procedure

Special attention must be given to proper maintenance procedures of the automatic slack adjuster when you change brake linings and/or brake drums.

1. If the axle is equipped with spring brake chambers, manually cage the spring brakes, following the manufacturer's recommended procedures.

2. Apply 10 to 20 psi of air pressure to the brake chambers. This relieves the internal pressure on the adjusting mechanism, minimizing wear when backing off.

3. Using a wrench, rotate the hex extension counterclockwise until adequate clearance is reached for the new brake linings and/or brake drum.

4. Now release the 10 to 20 psi in the system.

5. Proceed with the lining change and/or brake drum replacement.

6. Rotate the hex extension **clockwise** until the brake linings contact the brake drum.

7. Back off the automatic slack by rotating the hex counterclockwise 1/4 to 1/2 turn. This provides running clearance between the lining and drum.

8. Measure the distance from the face of the air chamber to the center of the 1/2" pin in the clevis (fig. 11). Apply 85 psi to the chambers and allow the air chamber push rod to travel its maximum stroke. Measure to the center of the 1/2" pin.

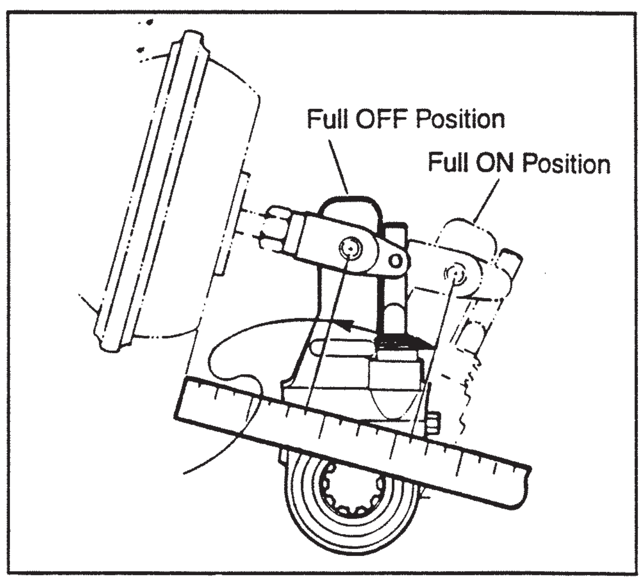


Figure 11. Measuring Maximum Stroke

9. Check the chart below for the proper maximum stroke after adjustment of the brakes.

Chamber Type	Maximum Stroke
12	less than 1-3/8"
16	less than 1-3/4"
20	less than 1-3/4"
24	less than 1-3/4"
30	less than 2"

10. Manually uncage the spring brakes.

Camshaft Removal

1. Support the trailer on blocks and remove the cast wheel or hub and drum.

WARNING

Block Securely.

2. Remove the brake shoe retract springs.

CAUTION

Lower the shoes gently to prevent damage.

3. Remove the yoke pin from the slack adjuster.

4. Remove the snap rings at the slack adjuster and the brake spider.

5. Remove the slack adjuster.

6. Remove the camshaft.

NOTE: The cam retainer washer and cam spacer washer will also be removed with the camshaft.

7. Remove the grease seals and the spider bushing from the spider.

Cleaning and Inspection

Clean the metal parts in solvent. Check the brake drum, linings, cam rollers, cam bracket bushing, spider bushing, retract springs, yoke, yoke pin, cam spacer washer, and the cam retainer washer for wear and damage. Replace defective parts. If the brake linings require replacement, see "Relining Brakes", in this section. Always assemble the brake assembly with new spider bushing grease seals when the camshaft is removed.

Camshaft Installation

1. Press in the spider bushing.

NOTE: Line up the grease hole in the bushing with the grease hole in the spider.

2. Press new seals in place on both sides of the spider bushing.

NOTE: The lips of both seals must face the slack adjusters.

3. Coat the spider bushing and the camshaft bracket bushing with multipurpose grease.

4. Put a light coating of grease on the cam spacer washer and place it under the camshaft head.

5. Assemble the camshaft through the spider.

CAUTION

Do Not damage the bushing and seals.

6. Place the cam retainer washer and one snap ring over the cam spline. Push the camshaft through the camshaft bracket.

7. Put the slack adjuster on the camshaft splines.

8. Insert the snap rings.

NOTE: Oil the cam rollers. If the camshaft is replaced, use new rollers (and shafts if they are seperate parts).

> **CAUTION**
>
> *Do Not* lubricate the mating surfaces of the cam and the cam roller.

9. Install the brake shoe retract springs.

10. Align the slack adjuster by turning the slack adjuster screw. Insert the yoke pin.

11. Install the cast wheel or hub and drum (see the procedure described elsewhere in this section).

12. Adjust the brakes (see the procedure described elsewhere in this section).

Relining Brakes

Brake Disassembly

(see Figure 4-17)

1. Loosen the brake adjustment by turning the slack adjuster screw.

2. Remove the cast wheel or hub and drum (see the procedure described elsewhere in this section).

3. Remove the brake shoe retract springs.

4. Remove the anchor pin retainers.

5. Loosen the anchor pin clamp bolt (not used on all brakes).

6. Remove the anchor pins, retainer washer, and pin felts.

7. Remove the shoe and lining assembly.

8. Press out the anchor pin bushings.

9. Remove the set screws or clip retaining the cam roller shaft.

10. Remove the cam roller and shaft.

11. Remove the lining rivets or bolts, nuts and lockwashers.

Installing New Brake Linings

1. Assemble the new brake linings, new rivets or bolts, nuts and washers onto the brake shoes. Tighten the lining bolts to a torque of 18 - 21 ft. lbs. (24.4 - 28.5 Nm.). See Figures 4-14 and 4-17.

Checking Brake Drums

1. Scored or barrel-shaped drum - The drum will require turning down if a .010 inch (.254 mm) wire will pass between the drum and a straightedge placed on the brake drum surfaces (see Figure 4-18).

2. Bell mouthing - The drum can be checked for inside diameters at both edges of lining contact points. Differences of more than .010 inch (.254 mm) must be turned out (see Figure 4-19).

3. Recondition out-of-round brake drums. Check with an inside micrometer or dial indicator.

> **WARNING**
>
> All out-of-round conditions must be corrected. Replace cracked, badly scored, or severely heat checked brake drums.

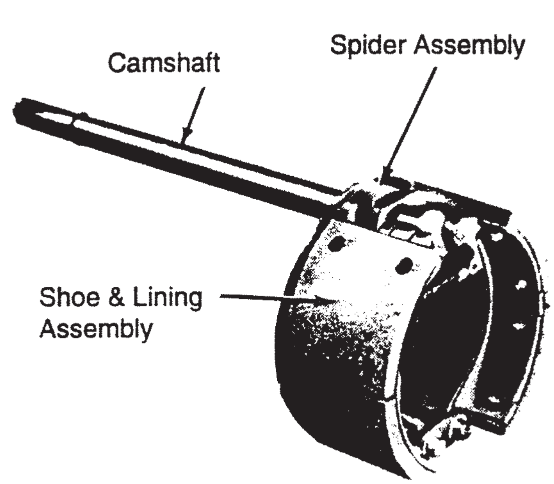


Figure 4-17. Brake Assembly

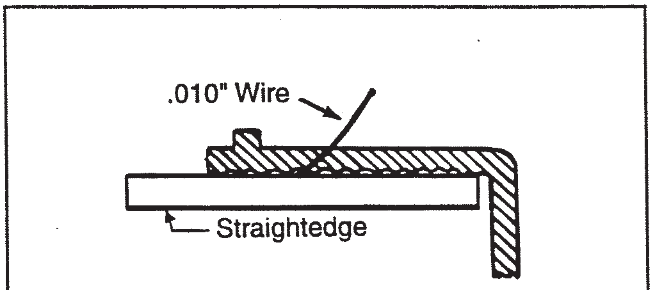


Figure 4-18. Checking for Scored Drum

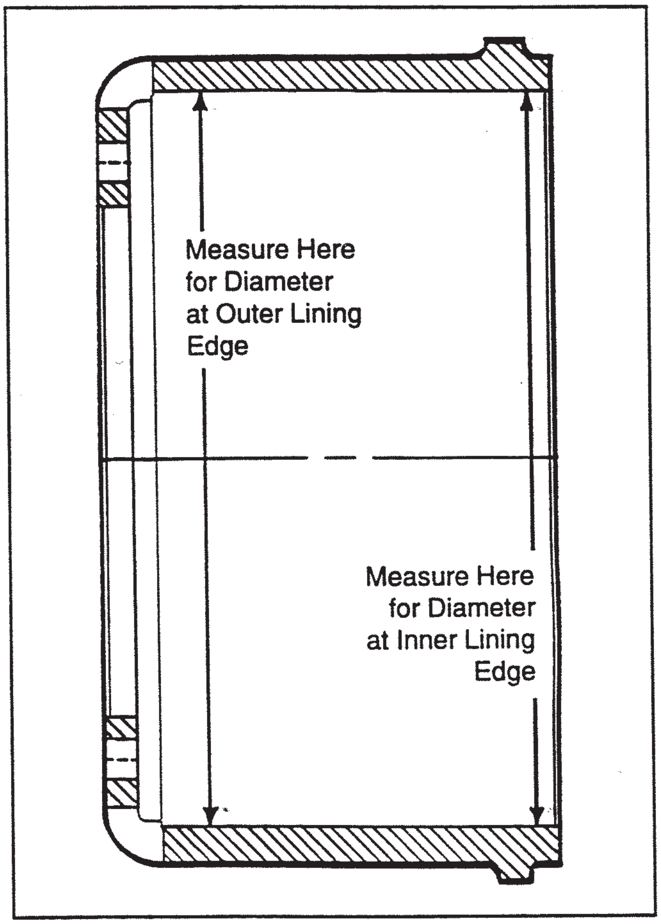


Figure 4-19. Checking for Bell Mouthing

Refinishing Brake Drums

⚠ WARNING

Do Not exceed the maximum inside diameter specification cast into the brake drum.

1. Refinish the drum to 180 microinches (4.5 micrometers) maximum roughness.

2. Refinish both of the drums on an axle at the same time.

Checking Brake Parts

1. Check the removed brake shoe against a new shoe (if possible) for distortion.

⚠ WARNING

Do Not use distorted shoes.

2. Measure the retract spring for elongation. Replace the spring if it is elongated.

3. Use new anchor pin bushings, cam rollers, roller shafts and lining rivets, or bolts, nuts and lockwashers.

4. Visually examine the cam faces, cam washers, anchor pins, clips and snap rings for wear or breakage, and distortion. Replace defective parts.

5. Check for grease leakage under the cam head. Remove the camshaft and replace the seals if grease leakage is found.

6. Check for side movement of the cam in the spider bushing. If movement is detectable, replace the bushings and the seals.

7. If the camshaft bushings are worn, or if the seals are leaking see "Camshaft Removal", "Cleaning and Inspection" and "Camshaft Installation" in this section.

Assembling Brakes

1. Clean the metal parts in solvent and dry thoroughly.

2. Press the new anchor pin bushings into the spider.

3. Assemble the new brake linings, new rivets or bolts, nuts, and washers onto the brake shoes. Tighten the lining bolts to a torque of 18 - 21 ft. lbs. (24.4 - 28.5 Nm.).

NOTE: Use proper oversize linings if the brake drums have been refinished oversize.

4. Oil the new roller and the shaft. Assemble them into the shoe.

CAUTION
Do Not allow oil or grease to contact the brake lining during handling or assembly.

5. Grease the anchor pins and assemble them into the shoes.

6. Assemble the cast wheel or hub and drum (see the procedure described elsewhere in this section).

7. Assemble the slack adjuster to the camshaft (see "Camshaft Installation").

NOTE: Replace the slack adjuster if the adjusting screw turns easily or if the yoke pin hole is worn.

8. Adjust the brakes (see the procedure described elsewhere in this section).

CAUTION
Check the brake adjustment frequently during the first 500 miles after relining. Overloading or using only the trailer brakes to stop the complete tractor-trailer unit will cause the heat absorption capacity of the brake to be exceeded. Hotter brake linings and drums, longer stopping distances, and shorter brake lining life will result.

Trouble Analysis For Air Brakes

Trouble	Probable Cause	Corrective Action
No brakes or intermittent brakes.	Brake air system improperly connected.	Reconnect correctly.
	Relay emergency valve contains water or oil.	Clean valve.
	Tractor protection valve malfunction.	Repair or replace valve.
	Restricted tubing or hose line.	Locate and remove restriction.
	No air pressure due to: a. Broken line. b. Failure in tractor air supply.	 Locate leak and repair. Troubleshoot tractor air system.
Single brake dragging or locked.	Broken component within brakes: a. Retract spring. b. Cam roller. c. Shoe. d. Lining fasteners. e. Anchor pin. f. Spider.	Replace broken part.

(continued)

Trouble Analysis for Air Brakes (continued)		
Trouble	**Probable Cause**	**Corrective Action**
Single brake dragging or locked (continued)	Flat spot on cam roller or camshaft	Replace defective parts. DO NOT lubricate mating surfaces of cam or cam roller.
	Improper adjustment.	Adjust slack adjusters.
	Spider bushing or cam bracket bushing binding.	Lubricate or replace bushing.
	Improper lubrication.	Lubricate.
	Worn anchor pin bushing.	Replace bushing.
	Brake drum distortion.	Repair or replace drum.
	Broken brake chamber spring.	Replace spring.
	Brake chamber pushrod binding.	Realign brake chamber bracket or install correct brake chamber.
Uneven brakes.	*See "Single brake dragging or locked" in this section.*	
	Restriction in brake hoses.	Locate and remove restriction.
	Leaking brake chamber diaphragm.	Replace diaphragm.
	Linings worn out.	Reline brakes.
	Grease on linings.	Reline brakes.
	Broken slack adjuster.	Replace slack adjuster.
Brakes apply too slowly.	Brakes need adjustment or lubrication.	Adjust and lubricate brakes.
	Low air pressure in brake system (below 80 PSI) (5.5 Bar).	Check tractor air system.
	Restricted tubing or hose.	Locate and remove restriction.
	Defective relay emergency valve.	Clean and repair or replace valve.
Brakes release too slowly.	Brakes need adjustment or lubrication.	Adjust and lubricate brakes.
	Brake components binding.	Align brackets or replace bent components.
	Exhaust port or relay emergency valve restricted or plugged.	Clean valve.
	(continued)	

Trouble Analysis for Air Brakes (continued)		
Trouble	**Probable Cause**	**Corrective Action**
All brakes do not release.	Brake air system improperly connected.	Reconnect correctly.
	Brake valve on towing vehicle applied.	Release brake.
	Relay emergency valve in emergency position.	Check line pressure and valve.
	Restriction in brake hoses.	Locate and remove restriction.
	Tractor protection valve malfunction.	Troubleshoot tractor air system.
Insufficient brakes.	Brakes need adjustment.	Adjust brakes.
	Brakes need lubrication.	Lubricate brakes.
	Lining worn away.	Reline brakes.
	Defective relay emergency valve.	Repair or replace valve.
	Brakes overheated.	Stop and allow to cool. Locate the cause of overheating.
	Low air pressure.	Troubleshoot tractor air system.
Brakes grabbing.	Lubricant on brake lining.	Reline brake.
	Brake components binding.	Locate cause and repair, adjust or replace components.
	Defective brake valve on towing vehicle.	Repair or replace valve.
	Defective relay emergency valve.	Repair or replace valve.
Excessive leakage with brakes released.	Relay emergency valve leaking.	Repair or replace valve.
	Leaking tubing or hose line.	Tighten or replace leaking lines.
Excessive leakage with brakes applied.	Relay emergency valve leaking.	Repair or replace valve.
	Leaking brake chamber or diaphragm.	Tighten clamp ring or replace diaphragm.
	Leaking tubing or hose line.	Tighten or replace leaking lines.

(continued)

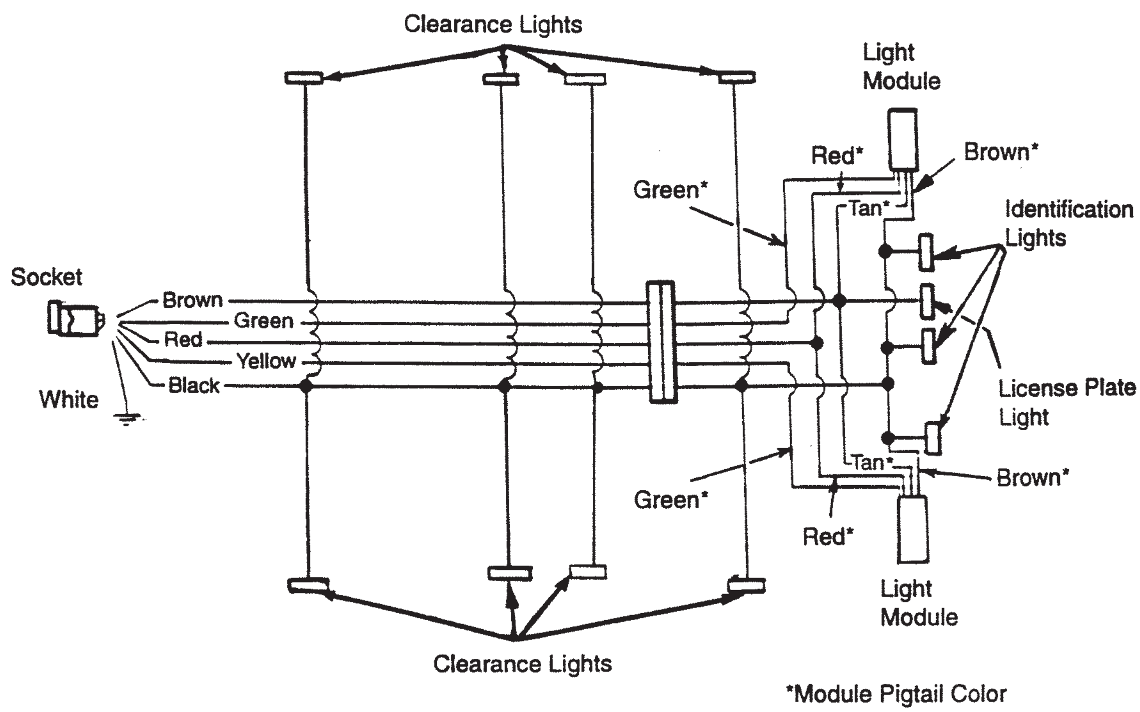
Trouble Analysis for Air Brakes (continued)		
Trouble	**Probable Cause**	**Corrective Action**
Excessive leakage with emergency system only applied - no leakage with normal brake application.	Defective relay emergency valve.	Clean and repair, or replace valve.
Excessive water present in brake system.	Reservoir not drained often enough.	Drain reservoir daily.
Excessive oil present in brake system.	Compressor on towing vehicle passing excessive oil.	Repair compressor.
Brake will not apply.	Flat spot on cam roller or camshaft.	Replace defective parts.

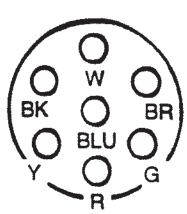
Electrical

Lighting System

Etnyre trailer light wiring is color coded per SAE specifications. The standard trailer lighting system operates on 12 volt current. If the tractor electrical system provides other than 12 volts, the trailer light bulbs must be changed to match the tractor system voltage. Figure 4-20 is a typical trailer electrical schematic.

For RTN model trailers with optional self-contained hydraulic system: See the engine manual supplied with your trailer for troubleshooting the engine electrical system for the self-contained hydraulic system.





Ground white terminal to a convenient place on the truck frame. This gives a dependable ground to the trailer lights without grounding through fifth wheel.

Code	Color	Use (circuit)
W	White	Ground
BK	Black	Identification Lights
Y	Yellow	Left Turn Signal
R	Red	Stop Lights
G	Green	Right Turn Signal
BR	Brown	Tail & License Plate Lights

Figure 4-20. Typical Trailer Electrical Schematic (Air Brakes)

Section 4
Maintenance

Hydraulics

Hydraulics, General

Hydraulic removable gooseneck trailers are equipped with hydraulic systems for gooseneck operation. Hydraulic system pressure is supplied by the tractor pump (in wet line systems) or by the optional hydraulic power pack mounted in the trailer frame. Refer to the system description and repair procedures when checking or servicing hydraulic systems. See Figure 4-24 in this section for a hydraulic system schematic.

Hydraulic Power Pack Filter

Use only Etnyre approved parts to ensure proper functioning. First, apply a film of oil to the gasket and hand turn the filter until the gasket contacts the filter head. Then tighten one-quarter turn only. Operate the system and check for leaks.

Checking Hydraulic Reservoir Oil Level

Check the oil level with the cylinder(s) completely retracted. Use the dipstick (see Figure 4-22).

Changing Hydraulic Oil

1. Retract the cylinder(s) fully.

2. Clean around the reservoir drain plug and remove it. Allow all the oil to drain and replace the plug (see Figure 4-22).

3. Clean around the reservoir fill cap. Remove the fill cap and fill the reservoir to the full mark on the dipstick.

⚠ CAUTION
Do not overfill.

4. Operate the hydraulic cylinder(s) 5 times and recheck the oil level. Add oil as required to bring the oil level up to the "FULL" mark.

5. Replace the cap.

Hydraulic Power Pack Battery

Keep the battery full to the ring. Use distilled water only.

⚠ CAUTION
Do Not overfill.

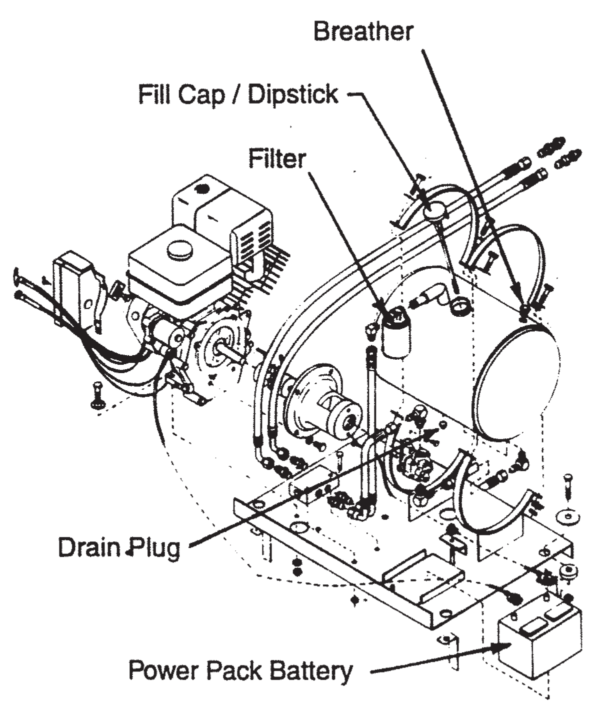
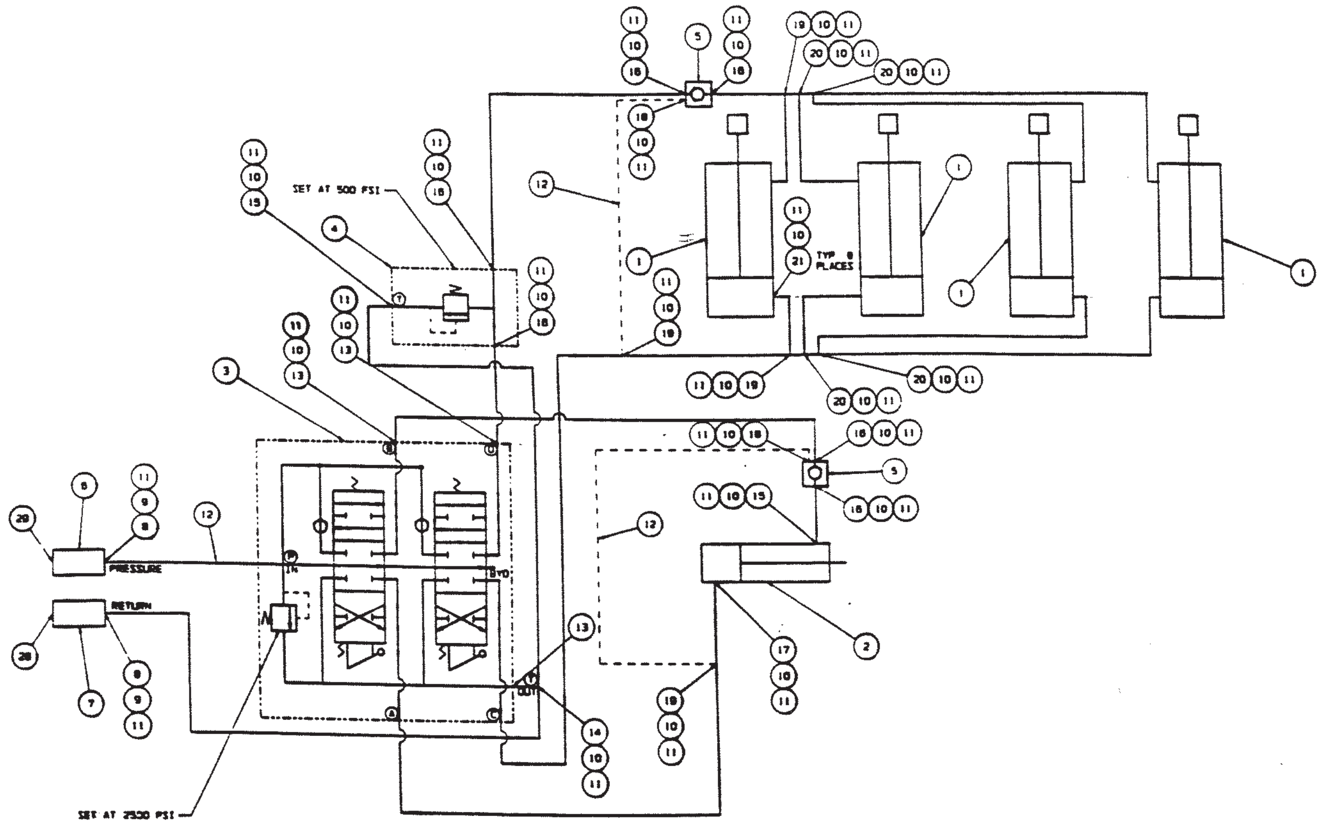


**Figure 4-22.
Hydraulic Oil Check
Hydraulic Oil Drain Plug.**



REF.	PART NO.	QTY.	DESCRIPTION
1	Q487628	4	Hydraulic Cylinder, 6 x 16
	Q489470	1	Packing Kit
2	Q467399	1	Hydraulic Cylinder
	Q470167	1	Packing Kit
3	Q488525	1	Directional Control Valve Asm
4	Q458735	1	Valve Hyd., Relief
5	Q487041	2	Vlave Check, Pilot Operated
	Q489404	1	Seal Kit
6	Q6602313	1	Coupling, Hyd, Half, Female
7	Q6602312	1	Coupling, Hyd, Half, Male
8	Q6602314	2	Adapter, Hyd, Blkhd, 12MP-12MJ
9	Q6601977	2	Hose End, Str, 12FJX-08
10	Q6601978	42	Hose End-08FJX
11	Q6601964	42	Ferrule 1/2"
12	Q6601963	30'	Hose Hyd., 1/2" Bulk
13	Q6602165	6	Elbow Hyd. 90Deg., 12MB-08MJ
14	Q6601991	1	Tee-Hyd. 90Deg., 12MB-08FJX
15	Q6600958	2	Elbow Hyd, 90, 08MJ-08MP
16	Q9402709	6	Adapter Hyd. ST, 08MP-08MJ
17	Q465423	1	Restrictor Fitting
18	Q6602192	2	Adapter-Hyd., ST, 08MJ-04MP
19	Q6602078	4	Tee Hyd, 08MJ-08MJ-08MJ
20	Q9410333	4	Tee Hyd. 08MJ-08FJX-08MJ
21	Q9410977	8	Elbow-Hyd, 90, 08MB-08MJ
22	Q0274993	5	Nut-Lock
23	Q153069	1	Clamp
24	Q016828	2	Screw-Hex, 0.38NC x 1.25Lg.
25	Q015156	3	Lockwasher, 3/8
26	Q016379	3	Screw-Hex, 0.38NC x 2.25Lg.
27	Q0251994	1	Clamp, Insulated
28	Q451436	1	Decal, Return
29	Q451435	1	Decal, Pressure
30	Q6800007	5Gal.	Oil Hydraulic

Figure 4-24. Hydraulic System Schematic

Section 4
Maintenance

Checking and Adjusting Relief Pressure on the Gooseneck Control Valve

(see Figure 4-25)

NOTE: Repair all hydraulic system oil leaks. The hydraulic oil level must be at the correct level. The hydraulic pressure source must be operating properly before checking and/or adjusting the hydraulic control valve relief pressure.

WARNING
Set the trailer brakes and block the wheels.

1. Remove the plug from the line tee near the valve. Install a test gauge capable of measuring pressures in excess of 3000 PSI (207 Bar).

2. Remove the hex cap nut and loosen the jam nut.

3. Start the power pack engine (if so equipped) or engage the wet line system.

NOTE: If using the power pack, set the throttle control in the high speed position.

4. Put the control valve in the EXTEND position. With the system in relief, check the system pressure on the gauge.

NOTE: Oil flowing through the relief valve can cause the adjusting screw to loosen. Hold the adjusting screw with a wrench while checking the relief pressure. The pressure shown on the gauge must read 2500 PSI plus or minus 50 PSI (172 Bar plus or minus 3 Bar). If the pressure is not correct, adjust the relief valve adjusting screw to obtain the correct relief pressure. Turn the adjusting screw in a **clockwise** direction to **increase** the relief valve pressure. Turn the adjusting screw in a **counterclockwise** direction to **decrease** the relief valve pressure.

5. After the correct relief valve pressure is obtained, return the control valve to the neutral position. Install the hex cap nut on the adjusting screw and tighten it.

NOTE: Do Not move the adjusting screw during this procedure.

6. Check the pressure reading as in step "4".

7. Shut off the power pack engine (if so equipped) or disengage the wet line system.

8. Remove the pressure gauge from the tee fitting and install the line plug.

NOTE: Test the valve and system for function and hydraulic oil leak problems. Correct if required.

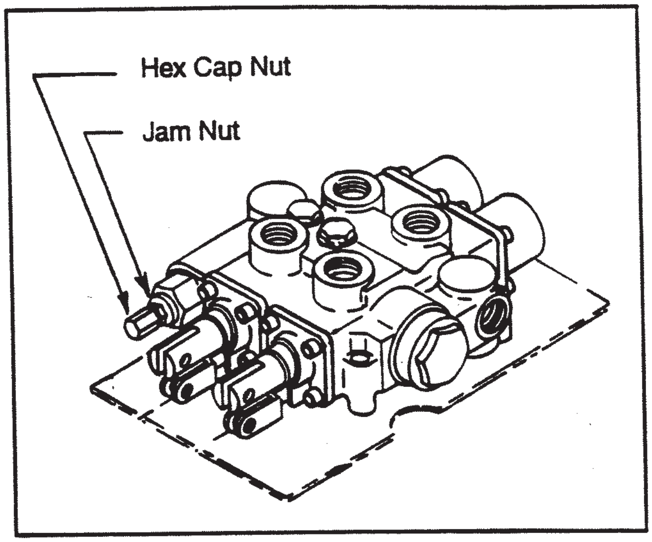


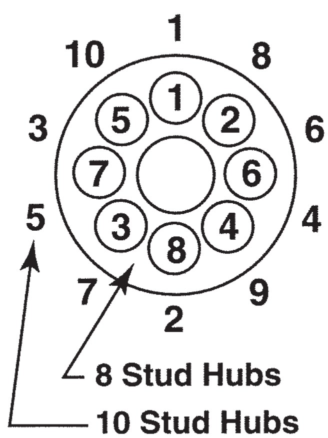
Figure 4-25.
Directional Control Valve Pressure Relief

Trouble Analysis for Hydraulic Systems		
Trouble	**Probable Cause**	**Corrective Action**
Hydraulic system operates slowly or trailer will not lift capacity load.	Piston seals leaking, allowing oil to bypass.	Repack piston
	Pressure relief valve incorrectly adjusted or broken.	Adjust valve or replace defective parts.
	External leak on cylinder head.	Repack head.
	External leak at fittings.	Remove and reseal or replace fittings.
	Defective control valve.	Repair or replace valve.
	Overload on trailer.	Do not exceed capacity of trailer.
	Hydraulic oil cold.	Cycle oil to raise temperature and improve oil flow.
Excessive hydraulic system noise.	Air cavitating the system due to:	
	a. Low oil level.	Fill system.
	b. Suction line leaks air (foam present in tank).	Replace defective parts. Seal and tighten leaking fittings.
	c. Incorrect hydraulic filter.	Replace with Etnyre approved filter.

WEBB Torque Specifications
HUBS
(for Pilot Mounted Disc-Wheels)

8 - 10 Stud Hubs

Applies to M22 X 1.5 studs/two piece flange nut.



All threads are right hand metric.

Tighten Flange Nuts to 50 ft. lb. using sequence shown.

Check Disc-Wheel for proper positioning on pads and proper seating against flange.

Tighten Flange Nuts to recommended torque using sequence shown.

Recommended Torque Dry: 450 - 500 ft. lbs.

DANGER

Read and Understand the installation, service and safety instructions manual before installing or servicing the hub. Failure to do so may result in personal injury or death, and may result in a compromise of your vehicle's safety through loss or failure of a wheel or compromise the braking system.

Use a torque wrench to assure proper torque, failure to do so will compromise your products service, life and safety. Under torque and over torque can cause thread and/or nut damage, and may result in the loss of a wheel.

Recheck torque after the first 50 to 100 miles of service. Parts may seat naturally, causing the torque to drop. Proper torque is essential for the service, life and safety of this product.