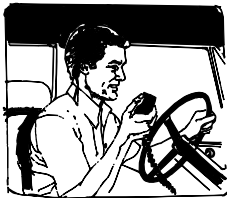




# WIND BLADE HAULER

## WBH SERIES TRAILER - 4 SECTION

### PARTS AND OPERATION MANUAL



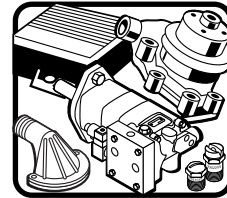
Operation



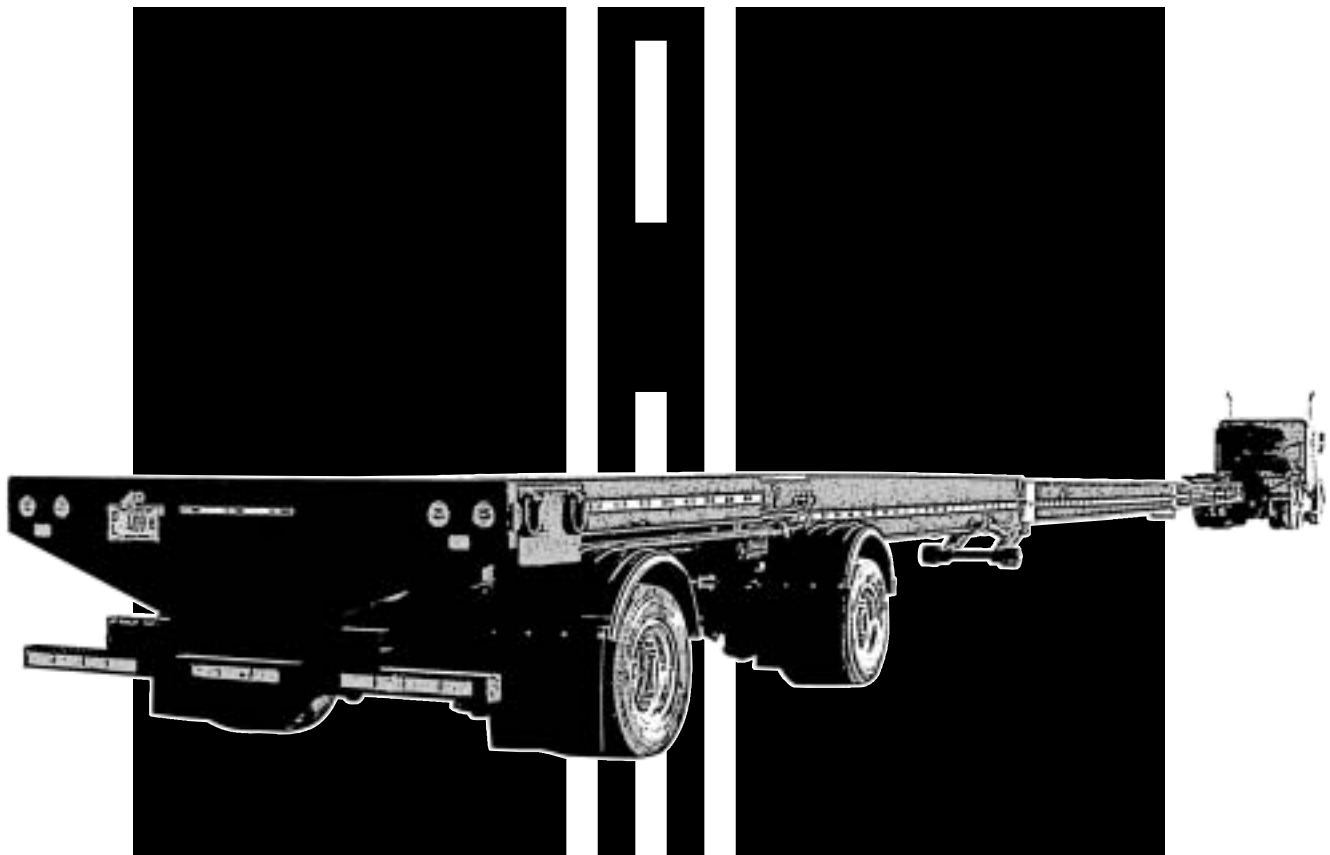
Maintenance



Safety



Repair Parts



E. D. ETNYRE & CO. 1333 S. Daysville Road, Oregon, Illinois 61061

Phone 815-732-2116 or 800-995-2116 Fax: 800-521-1107 [www.etnyre.com](http://www.etnyre.com)

**M-WBH4-10**  
**WIND BLADE HAULER**  
**WBH SERIES TRAILER - 4 SECTION**  
**PARTS AND OPERATION MANUAL**

**WARRANTY**

E. D. Etnyre Co. warrants to the original Purchaser, it's new product to be free from defects in material and workmanship for a period of one (1) year after date of delivery to original Purchaser. The obligation of the Company is limited to repairing or replacing any defective part returned to the Company and will not be responsible for consequential damages or any further loss by reason of such defect.

**The company excludes all implied warranties of merchantability and fitness for a particular purpose. There are no warranties, express or implied, which extend beyond the description of the goods contained in this contract.**

This warranty does not obligate the Company to bear the cost of machine transportation in connection with the replacement or repair of defective parts, nor does it guarantee repair or replacement of any parts on which unauthorized repairs or alterations have been made or for components not manufactured by the Company except to the extent of the warranty given by the original Manufacturer.

This warranty does not apply to:

- (1) Normal start-up services, normal maintenance services or adjustments usually performed by the selling dealer, factory service representative or customer personnel.
- (2) Any product manufactured by E. D. Etnyre Co. purchased or subjected to rental use.
- (3) Any product or part thereof which shows improper operation, improper maintenance, abuse, neglect, damage or modification after shipment from factory.
- (4) Any product or part thereof damaged or lost in shipment. Inspection for damage should be made before acceptance or signing any delivery documents releasing responsibility of the delivering carrier.

This warranty and foregoing obligations are in lieu of all other obligations and liabilities including negligence and all warranties of merchantability or otherwise, express or implied in fact or by law.



E. D. ETNYRE & CO., Oregon, Illinois 61061-9778  
1333 South Daysville Road Phone: 800/995/2116 or 815/732-2116 Fax: 815-732-7400  
[www.etnyre.com](http://www.etnyre.com)

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## 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.

### General

This manual contains operation, maintenance and service instructions for the Etnyre WBH Series trailers (see figure 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 WBH 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:

	35		TD	
(A)	(B)	(C)	(D)	

A. The first group describes trailer type: **RPS** model, Paver Special.

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

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

### 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 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 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 the General Section

Q506064

**Etnyre** MFD. BY ETNYRE TRAILER CO. OREGON, IL U.S.A.

SERIAL NUMBER: [ ] MFD. DATE [ ] MONTH/YEAR

GVWR: [ ] KG [ ] (LBS)

GAWR: [ ] KG [ ] (LBS) ALL AXLES

WITH [ ] TIRES [ ] RIMS, DUALS

INFLATION PRESSURE [ ] KPa [ ] (PSI) COLD

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

VIN: [ ] WEIGHT: [ ] (LBS)

CLASSIFICATION: TRAILER MODEL: [ ]

Figure 2. Unit Nameplate or Certification Label

**Operating Instructions**

Operating instructions are contained in the Operation Section.

**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 the Operation Section (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 3 for the location of the nameplate and decals on the Etnyre trailer.

**General Identification**

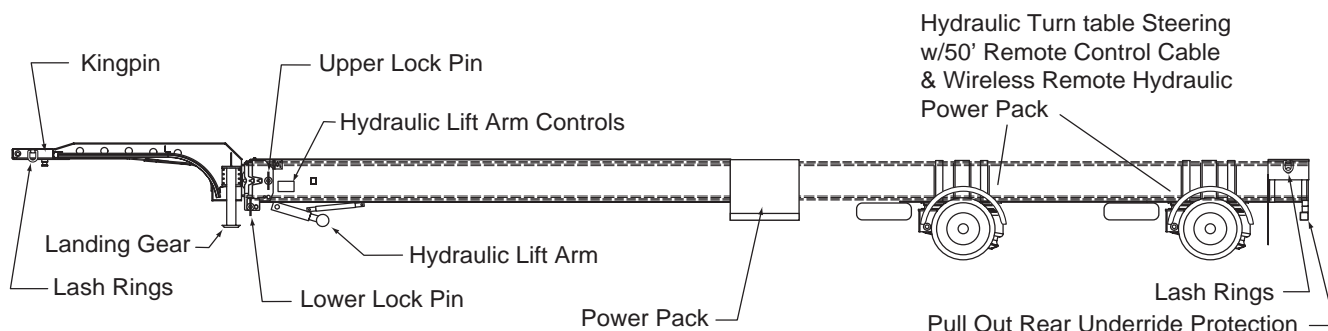
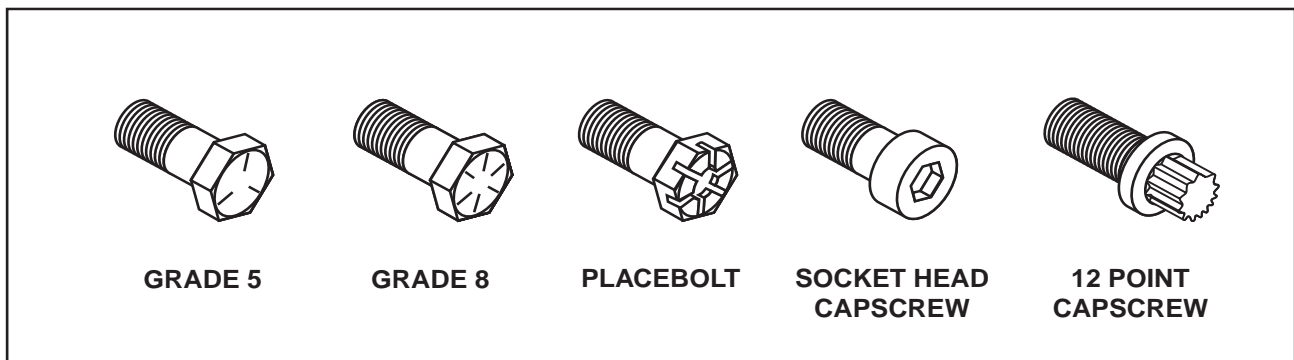


Figure 1. Etnyre WBH

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	395	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	2200	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

Table 1. Torque Specifications For Standard Hardware

**NOTE:** This table lists torque values for standard hardware and is intended as a guide for average applications involving 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.



## General

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

### WARNING

Read these instructions thoroughly and observe them when operating Etnyre trailers. Operate by Authorized, Trained Personnel 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 Connect Procedure

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 5).

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

4. Connect the trailer to the fifth wheel.

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

6. Connect the plug into the electrical socket. Make

sure that electrical connection between trailer and truck is made.

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

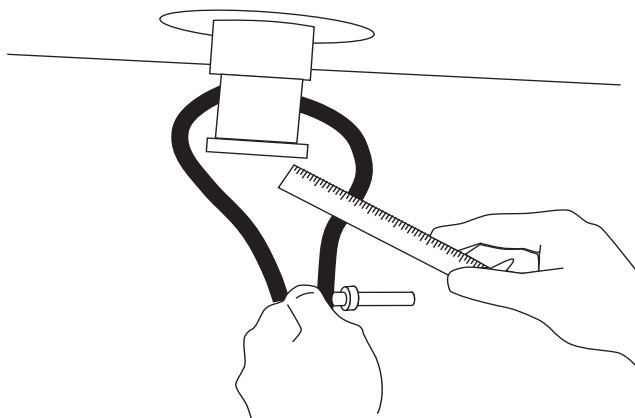


Figure 5. Inspection of Kingpin for wear

### WARNING

Check to insure that the kingpin is locked into the tractor fifth wheel.

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. Raise the landing legs and pin them in the up position.

## Trailer to Tractor Disconnect Procedure

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

2. Lower the landing legs and pin them in the lowered position.



**⚠ WARNING**

Block the trailer wheels

3. Disconnect the fifth wheel lock pin.
4. Pull tractor away from the trailer.

**⚠ WARNING**

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

### General Loading and Unloading Procedures

These procedures must be followed when loading or unloading trailers.

**⚠ WARNING**

Load and unload on solid, level terrain.

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

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

**⚠ WARNING**

Block the trailer wheels.

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

**⚠ WARNING**

Proceed cautiously since a malfunctions 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 Figure 10),
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.

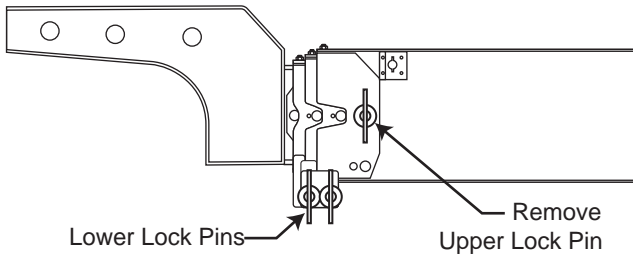
**⚠ WARNING**

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

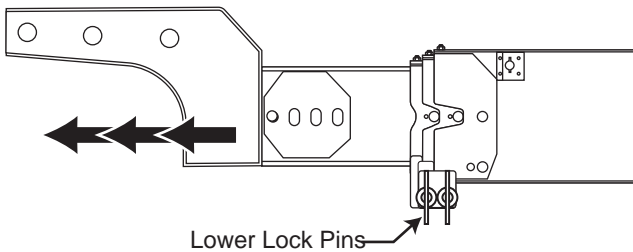
# OPERATING INSTRUCTIONS

## TO EXPAND TRAILER

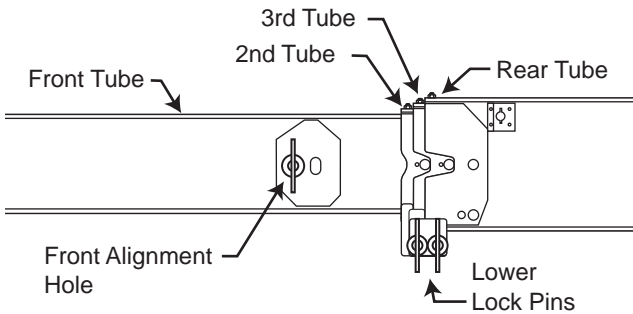
1. Disconnect air and electric connections at quick disconnects between gooseneck and rear tube.
2. Start power pack, open ball valve and lower lift arm.



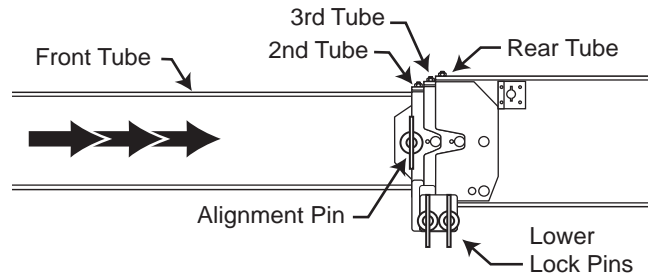
3. Remove lock pin from center of tubes, front tube is now free to move.



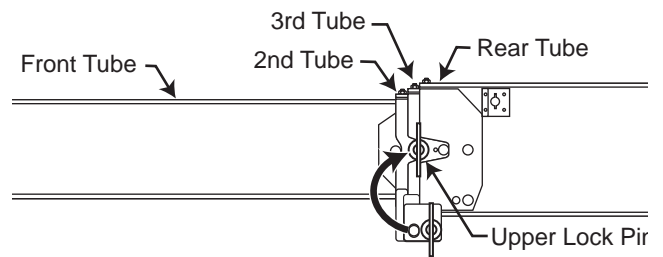
4. Adjust lift arm as needed to relieve load at sliding joint, pull tractor forward slowly to extend front tube.



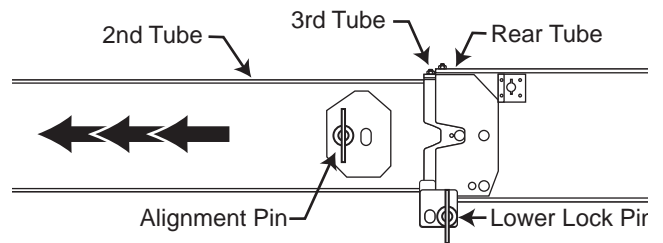
5. When yellow on side of tube shows, ease ahead slowly and insert pin in front alignment hole.



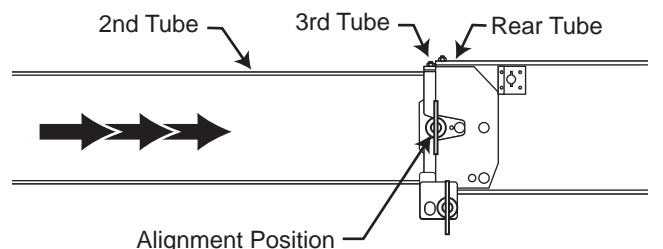
6. Back tractor up until alignment pin stops against 2nd tube.



7. Remove front lower lock pin and insert in second hole this locks front and 2nd tubes together. Then remove front pin from alignment position.

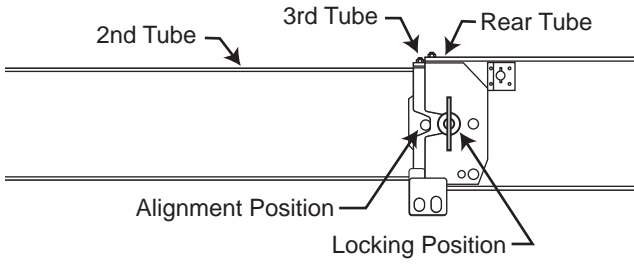


8. Adjust lift arm as needed to relieve load at sliding joint. Pull tractor ahead slowly to extend second tube, when yellow on side of tube shows, ease ahead slowly and insert pin in front alignment hole.

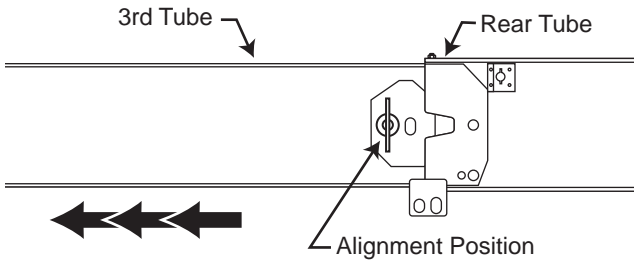


9. Back tractor up until pin stops against 3rd tube.

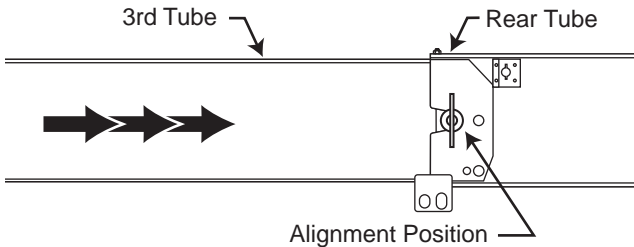
OPERATION



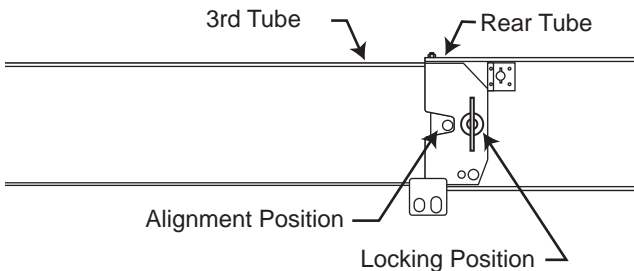
10. Remove lock pin from alignment position and insert in locking position this locks 2nd and 3rd tubes together. Remove lower lock pin.



11. Adjust lift arm as needed to relieve load at sliding joint. Pull tractor ahead slowly to extend 3rd tube, when yellow on side of tube shows, ease ahead slowly and insert pin in front alignment hole.



12. Back tractor up until alignment pin stops against rear tube.



13. Pull alignment pin and insert into locking hole in rear tube.

14. Shut off power pack, raise lift arm and close ball valve so lift arm does not drift down.

15. Insert ring hose retainers into small holes in drivers side webs of front and middle tubes.

16. Connect long jumper hoses and electric line and hang in ring hose retainers.

17. Insert clamp alignment bolts, tighten and slide spring locks over head of bolts.

18. Insert retaining pins into all lock pins on curb side of trailer.

(This procedure fully extends trailer, any hole in first tube may be used if shorter total length is required.)

<b>WARNING</b>
<p>Lock Pin(s) must be installed in the Locking Position hole (not Alignment Position) before road travel or trailer could pull apart.</p> <p>Failure to do so could cause serious injury or death.</p>

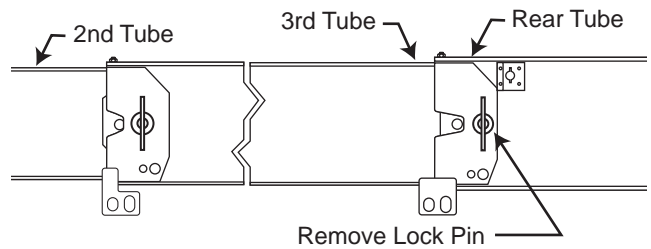
### OPERATING INSTRUCTIONS TO COLLAPSE TRAILER

1. Disconnect air and electric jumper hoses at quick disconnects at rear of gooseneck and at last tube connection.

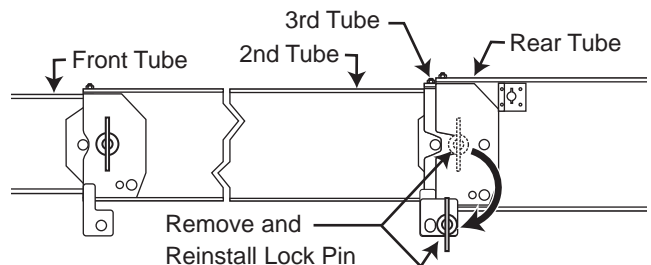
2. Remove jumper hoses and ring-hose retainers.

3. Remove clamp alignment bolts.

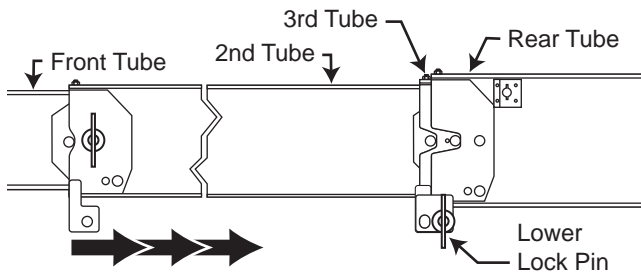
4. Start power pack and lower hydraulic support arm.



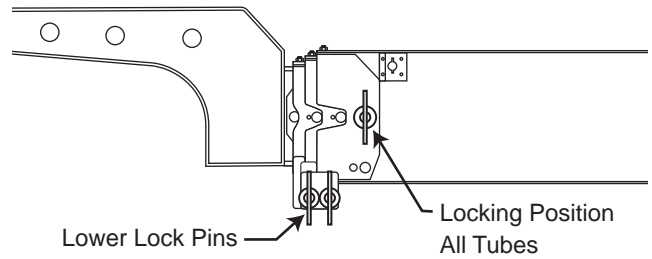
5. Remove lock pin between 3rd tube and rear tube. Adjust hydraulic support arm to relieve load at sliding joint.



6. Back up tractor until lock pin between 2nd and 3rd tubes is seated against the rear tube. Remove lock pin between 3rd tube and 2nd tube and install in bottom hole, to maintain alignment between 3rd and rear tube.



7. Adjust hydraulic support arm to relieve load at sliding joint and back up tractor until the pin at front of second tube stops against the third tube.

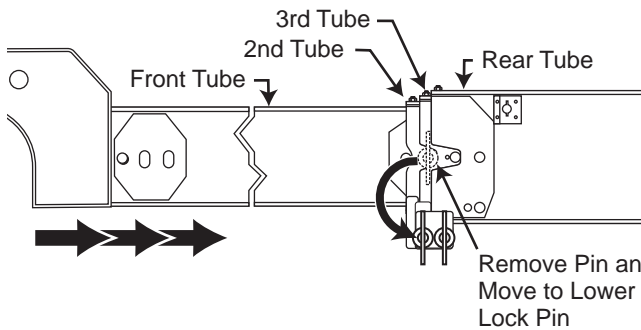


11. Connect all trailer tubes by inserting lock pin in rear hole (locking position) and insert retainer pins in all pins on curb side of trailer.

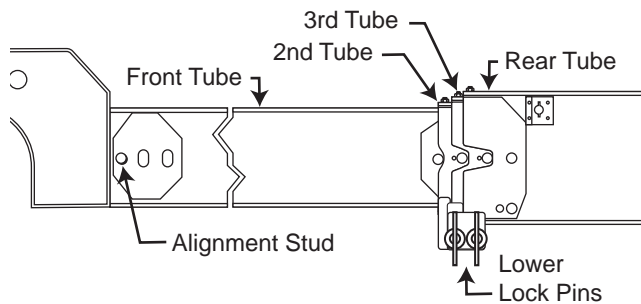
12. Lift hydraulic support arm and close ball valve so lift arm does not drift down.

13. Shut off power pack.

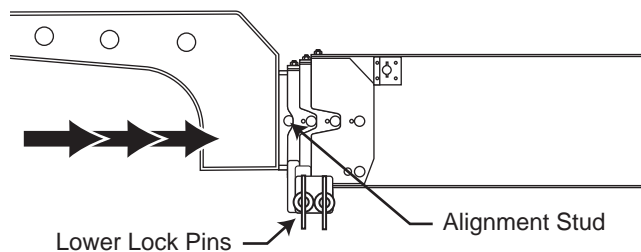
14. Reconnect hoses at rear of gooseneck.



8. Remove Alignment Pin. Install lower lock pin in front hole, to maintain alignment between 2nd and 3rd tube.



9. Adjust hydraulic support arm to relieve load at sliding joint.



10. Back up tractor until the front tube alignment stud is seated against the second tube in alignment position.

## Maintenance

### General

This section contains instructions for the care and maintenance of the Etnyre RPS 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 2.

### Maintenance Schedule

Table 2 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 2 should be used to locate the applicable maintenance procedure and illustration. Figure 8 shows the maintenance points.

ITEM NO.	ITEM	SCHEDULE					QUAN	TYPE or REMARKS
		Day	Wk	Mo	25,000 mi. or 6 mo	50,000 mi. or 1 year		
1	5th Wheel Plate Kingpin	X	X					Multipurpose Grease No .1 (No. 0 Below 32°F) Inspect
2	Frame		X					Check
3	Undercarriage		X					Check
4	Wheel Bearings (Oil Lubricated)	X				C	3 Pints per axle (1.42 liter)	Multipurpose Gear Oil Grade 90
5	Rims & Brake Drums (Disc)			X				Inspect
6	Wheels	X	X					Visual Check. Tighten Lug Nuts or Rim Clamps
7	Tires	X						Check Inflation & Remove Debris Between Duals
8	Air Lines	X	X					Test Inspect
9	Air Reservoir	X					2	Drain Condensation
10	Relay Emergency Valve					X	1	Clean
11	Brake Chambers			X		X	2 per axle	Check Condensation Holes Clean. Inspect & Replace Diaphragm

Table 2. Maintenance Schedule

ITEM NO.	ITEM	SCHEDULE					QUAN	TYPE or REMARKS
		Day	Wk	Mo	25,000 mi. or 6 mo	50,000 mi. or 1 year		
12	Brakes	X	X					Check for Overheating Inspect
13	Lights & Reflectors	X						Check Operation
14 - with Power Pack	Hydraulic Oil			X		X	13.4	SAE 10W Hydraulic Oil
15 - with Power Pack	Hydraulic Filter Element					X	1	Period Shown or 50 hours of Power Pack Operation - See Parts Manual.
16 - with Power Pack	Battery	X						Fill as Required - Use Distilled Water.
17 - with Power Pack	Power Pack		X					Check Motor Mount Bolts for Tightness. Check electrical connetions for tightness.
18	Turntable Bearing			X			2	Inspect

Table 2 Maintenance Schedule

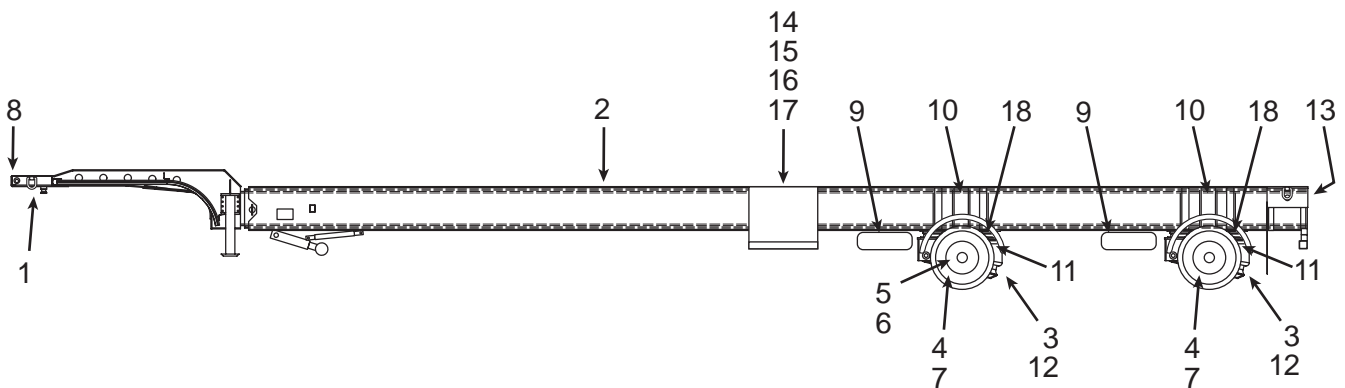


Figure 8. Maintenance Checkpoints

## 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 5).

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.

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

### 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.*


 <b>WARNING</b>
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 do not contain stress concentrations which could lead to another failure. Repair of T-1 steel especially requires additional care.

Table 3 lists the recommended electrodes for the various steels used in Etnyre trailers.

### Wheel Bearings

The oil level must be maintained between the "add" and "full" lines on the hub cap windows (see figure 9). 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.

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 3. Electrodes for Weld Repairs.**

## 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 cap nuts for tightness daily. See Figure 10 for torque specifications and tightening sequence. Brake drums should be carefully examined for cracks.

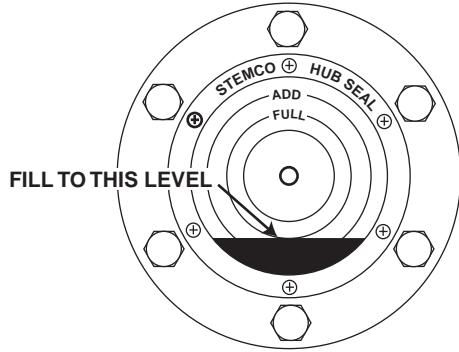
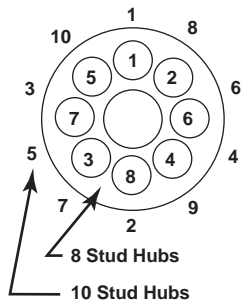


Figure 9. Check Oil Level of Oil Lubricated Bearings.

### CAUTION

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



Tighten Lug Nuts to recommended torque using sequence shown	
Nut Size	Torque Value
3/4" Back Nuts	180-200 ft lbs -Dry Threads
3/4" Inner & Outer Cap Nuts	450-500 ft lbs -Dry Threads
M22 x 1.5 Flanged Nuts	450-500 ft lbs -Lubricated Threads

Figure 10. Tightening Sequence

## Service Guide - CUSH Suspensions

Inspection: 30-day, 90-day, and at every brake lining change.

1. Check installation clearance requirements.
2. Check for any signs of wear or component interferences.
3. Check suspension attachment welds for signs of problems.
4. Check that all bolts are in place and securely torqued.
5. Check pivot bushings and clamping connections for problems.
6. Check that trailer is level.
7. Check tire wear that might indicate an alignment problem.

## Air Springs & Height Control Valve

This air-ride suspension is designed to dampen the shocks transmitted from road surface to trailer frame through the Air Springs. The Height Control Valve is used to maintain the proper ride height from air spring to chassis (whether empty or loaded) by controlling the volume of air in the springs.

You may use either a single or dual (leveling) height control valve system on your trailer. This service manual addresses the Single Valve System which controls ride height only. A manual or automatic dump valve may also be incorporated to exhaust air to prevent "dock creep" when loading or unloading.

**Important Note:** The air springs used on the suspension have internal rubber bumpers designed to carry the trailer load should air spring failure or sudden loss of air supply occur. Should an air spring fail on a "single height control valve system," then all of the air springs will deflate allowing the suspension to operate on internal bumpers until repairs can be made. Should an air spring fail on a "dual height control or leveling valve system," the springs would deflate on one side only. Simply deflate the other side by removing the vertical linkage rod from the valve and rotate the horizontal lever arm DOWN to fully exhaust the spring.



## Air Pressure & Brake Protection Valve

This air-ride suspension is dependent on air pressure from the trailer supply system. Air pressure must be maintained above 65 P.S.I. before operation. A Brake Protection Valve must be installed in the air system to prevent air loss below 65 P.S.I. and to insure safe air brake pressure in the event of air loss in the suspension system.

## Operational Inspection

1. Inspect all welds at hanger-to-frame connections.
2. Inspect for proper installation of cross member between hangers. Hangers should be adequately supported to prevent side movement.
3. Inspect axle to lower beam weld. Axle should be snug in contoured axle seat and welded according to guidelines shown in Figures 12, 13 and 14.
4. Inspect axle alignment to kingpin. Forward axle should be  $\pm 1/16$ " left to right relative to kingpin. Rear axle, if equipped, should be in line with forward axle  $\pm 1/16$ " axle center to axle center. Refer to axle alignment procedure shown in Figure 15.
5. Inspect automatic air control valve for proper installation. Valve should be mounted so linkage is free to operate without interference. Check all linkage connections and air fittings on valve for tightness. Refer to Figure 20.
6. Inspect air spring. With unloaded trailer on level surface and supply air pressure in excess of 65 P.S.I., all air springs should be of equal pressure. Check for proper clearance around air spring: minimum 1-3/4".
7. Inspect for proper mounting height. If measurement is incorrect, adjust height control valve until proper mounting height is achieved.
8. Check all air connections for leaks and tighten if needed.
9. Inspect air lines. They should be free from sharp objects and secured to prevent premature failure.

## Preventive Maintenance

### Daily

Visually inspect trailer to be sure it is level and that suspension ride height is correct.

Check for loose or broken parts on or around suspension to prevent any serious problems from occurring.

### Every 30 Days

Check clearances around all moving suspension parts, air springs, tires and shock absorbers. Any signs of interference should be immediately corrected.

Visually inspect axle connection weld and bolt connections to make sure they are secure. Review and correct any signs of wear.

### Every 90 Days & With Annual Inspection

Check items mentioned above in Daily & 30 Day inspections.

Also inspect weld integrity at the following connections: suspension-to-axle, anti-turn washer, locking plate and hanger-to-frame.

All pivot and clamping connections such as the suspension pivot and the shock mounting must be inspected. All pivot and clamping connections such as the suspension pivot and the shock mounting must be inspected.

NOTICE!! CUSH bears no responsibility for suspensions damaged by abuse or neglect. In addition, any suspensions driven to complete destruction will not be covered by warranty.

## Welding Guidelines

The following precautions and recommendations must be read and understood by qualified personnel prior to weld installation of Air-Ride Trailer Suspensions to trailer axles. Any welding procedures or materials that do not clearly fall within these guidelines could compromise the integrity and safety of the installation.

### Welding Methods, Materials & Personnel

A) All welders and welding operators should be certified per A.W.S (American Welding Society) D1.1 Section 5 Procedures or equal.

B) Recommended welding methods are shielded metal arc (stick), gas metal arc (solid wire) or flux cored arc (tubular wire) welding. Whatever electrode and method used must develop a minimum weld tensile

strength of 70,000 P.S.I. Refer to the electrode manufacturer's recommendation for voltage, current and shielding medium for the diameter electrode to be used so the best fusion and mechanical properties can be obtained.

C) All electrodes used should meet A.W.S. Section 5 Specifications and Classifications for welding carbon and low alloy steels.

D) If shielded metal arc electrodes (stick) are used, they must be new and unused, dry, free of contaminants and come from a stock that has been purchased and stored per A.W.S. Section 4.5.2., Low Hydrogen Electrode Storage Specifications.

### Weld Joint Preparation

A) **All grease, dirt, paint, slag or other contaminants must be removed from the weld joint without gouging the axle tube.**

B) Insure the lower beam assembly fits the axle with a weld root gap of 1/16" to 1/8" maximum between the welding wings or uprights as illustrated. (See Figure 16.)

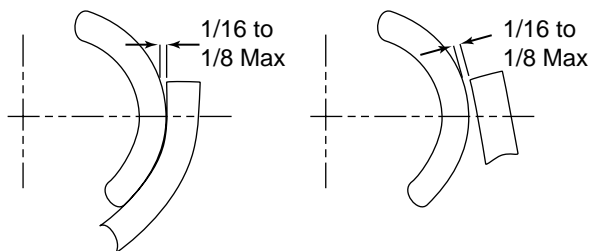


Figure 12. Root Weld Gap

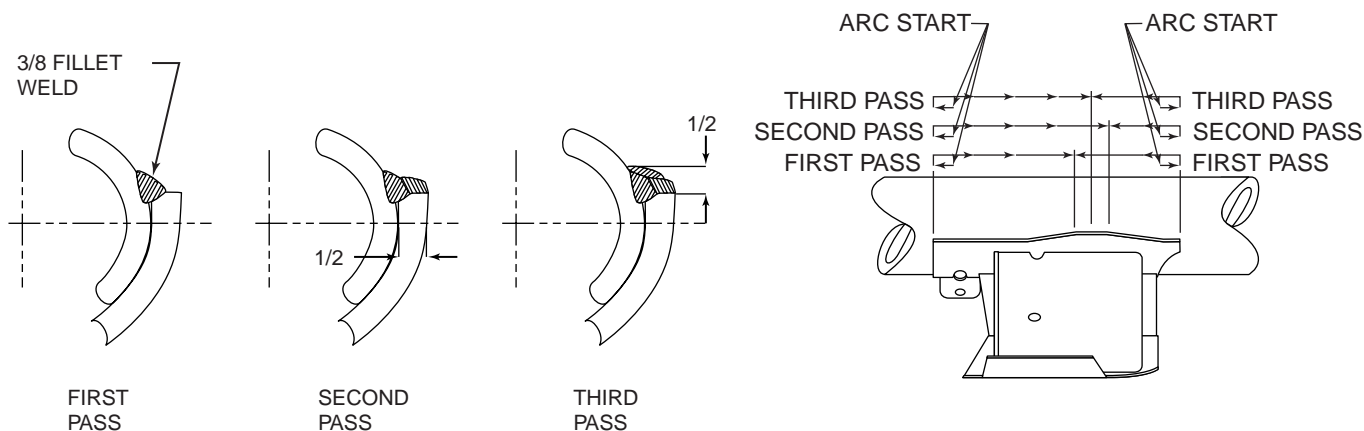


Figure 13. Multiple Pass Recommended Method

### Welding Procedure

A) Ground the axle to one of the attached axle parts such as the air chamber brackets, cam brackets, or the brake spider. **Never ground the axle to a wheel or hub as the spindle bearing may sustain damage.**

B) The axle assembly should be at a minimum temperature of 60° F (15° C) prior to welding. **Pre-heating the weld zone to the axle manufacturer's recommended pre-heat temperature is recommended.** This will minimize the formation of martensitic or brittle metal structures in the fusion line or the heat affected zone which may contribute to a premature fatigue failure in service.

C) The joint to be welded should be positioned in the flat or horizontal position if possible.

D) Multiple pass welding may be used on the beam/ axle connection using the following guidelines. Total fillet weld size should be 1/2" (12.7mm).

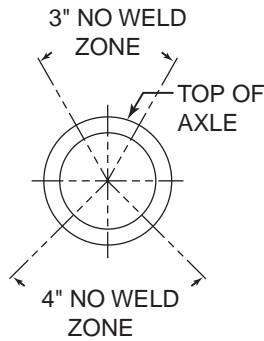
Multiple pass (recommended method, SMAW, GMAW, FCAW) weld initiation and termination should be performed as outlined and shown in (Figure 13).

NOTE: All slag must be removed between passes. Backstep fill all craters. Each pass must be accomplished in two segments. Recommended electrode is E7018 if SMAW (stick) is used.

**IMPORTANT: It may be necessary to C-clamp axle to axle beam seat prior to welding. This will insure that complete contact occurs between the axle housing and beam seat.**

## Repair Welding

If the beam/axle weld is cracked or broken, the weld



**Figure 14. No Weld Zones**

can only be repaired if the crack or break does not extend into the axle tube. To repair the weld, grid or back gouge the weld/crack down to the base metal. If the crack extends into the axle tube, or if any other area of the axle is cracked, the axle must be replaced. Apply the repair weld according to the information in Sections 1-3 of the guideline.

## Welding Precautions

A) All welds must be kept away from the top and bottom of the axle where maximum stresses occur. The "no weld" zones are illustrated in (Figure 14).

B) **Do not test weld the arc on any part of the axle tube.** This can cause a material change which can lead to a small crack that may eventually grow and affect the fatigue life of the axle.

## Alignment Of Axle

### For Tandem Axle Trailer

1. Align the forward axle to center of kingpin (see "A" in Figure 15), then align rear axle to center of forward axle (see "B" in Figure 15). The measurement from left to right side of axle centers should not exceed 1/8" difference.

2. To align the axle, loosen the eccentric bolt lock nut and remove the anti-turn washer from head of eccentric bolt.

3. To move the axle forward, rotate the eccentric bolt arrow toward the front of the trailer. The bolt may be rotated a maximum of a 1/4 turn from top center.

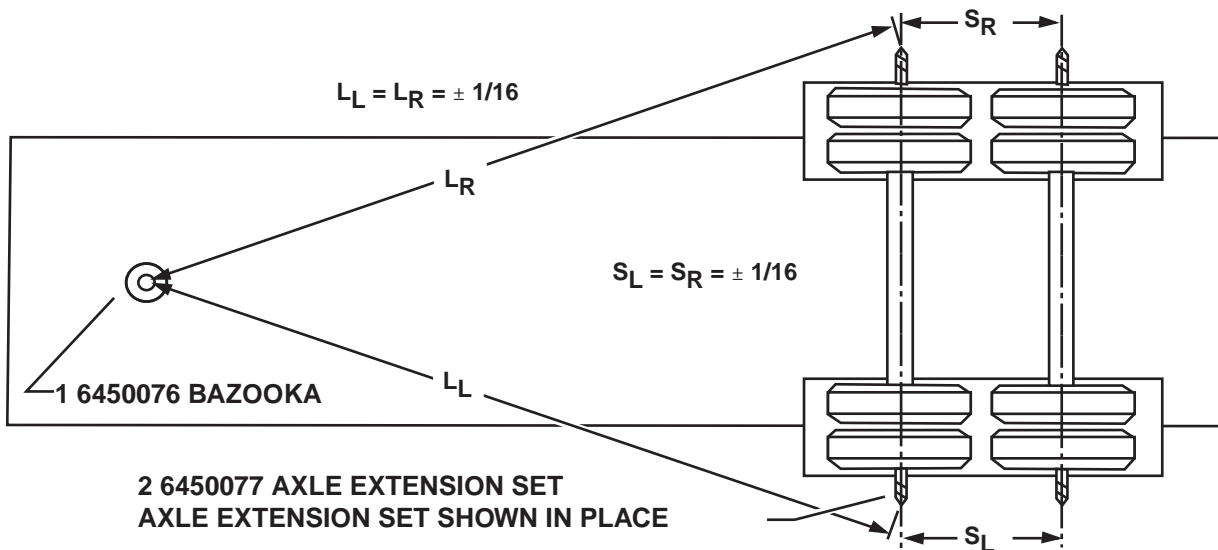
4. To move the axle rearward, rotate the eccentric bolt arrow toward the rear of the trailer. The bolt may be rotated a maximum of a 1/4 turn from top center.

5. After alignment is achieved, re-install anti-turn washer and weld at positions as shown in figure 15. Re-torque the eccentric bolt lock nut to specified torque.

## Height Control Valve

### Operation (See Figure 17)

As load is applied, the horizontal actuating lever arm moves from **NEUTRAL** position to **UP (intake)** position. As load is removed, the horizontal actuating lever arm moves from **NEUTRAL** position to **DOWN (exhaust)** position. The valve opens and air is allowed to exhaust from air springs bringing the horizontal actuating lever arm back to a neutral position. Optimum



**Figure 15. Alignment of Axle**

performance is achieved when valve is adjusted accurately to the suspension by increasing or decreasing horizontal lever arm length to a point where valve and lever arm approach 45° maximum, up or down from neutral position.

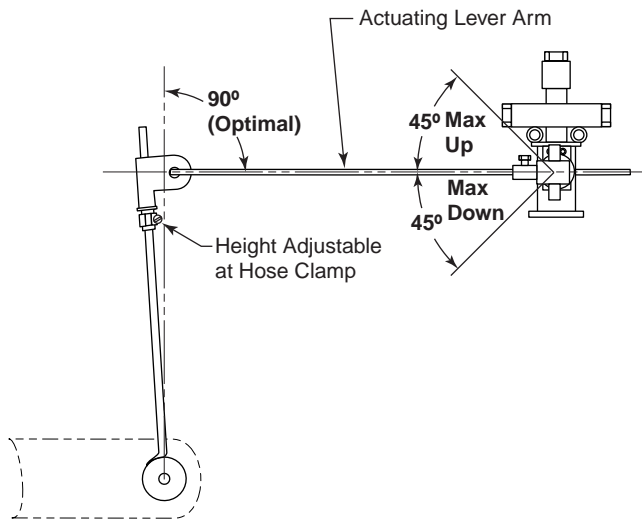


Figure 17. Height Control Valve Asm

### Set Up

1. Insert vertical link rod through offset dampener link. Do not tighten clamp until final adjustment (discussed in **ADJUSTMENT** section) is made.
2. Insert horizontal lever arm through 5/16" cap screw side of insert to desired length. Tighten 5/16" cap screw to 10 Ft. Lbs.

**NOTE:** The horizontal actuating lever arm can be adjusted in length. The recommended length is 7", however a maximum length of 11-1/2" is acceptable.

A right or left-hand valve can be achieved by simply rotating the horizontal lever arm 180°.

### Adjustment

1. With vehicle on level ground, build and maintain supply air pressure in excess of 65 P.S.I.
2. Rotate horizontal lever arm **DOWN** to exhaust air spring or rotate **UP** to inflate springs until proper ride height is achieved. Place lever arm at neutral position and insert wood centering pins into valve.
3. Slide vertical link rod through hole in the offset dampener link. Install vertical link rod grommet to pin on mounting bracket at axle. Place mounting bracket

on axle and attach. Tighten clamp on offset dampener link and remove wood centering pins.

4. **TEST:** Disconnect vertical link rod grommet from mounting bracket at axle pin. Rotate horizontal lever arm **DOWN** to exhaust air springs about half-way.

Rotate horizontal lever arm **UP** until grommet is at axle mounting bracket pin level. Air springs should re-inflate to ride height level.

5. Re-connect grommet to pin, Check to see if air springs are of equal firmness.
6. Trim off excess vertical link rod "stick-out" past the offset dampener link if needed for proper operation. **CAUTION: Vertical link rod must extend completely through offset dampener at all times.** Also trim excess rod on horizontal lever arm.

### Valve Replacement

1. Build and maintain supply air pressure in excess of 65 P.S.I.
2. Disconnect lower anchor.
3. Move actuating lever arm up-air should flow into related air springs.
4. Move actuating lever arm to neutral position-air flow should stop.
5. Move actuating lever arm down to exhaust air.
6. Move actuating lever arm to neutral position-air flow should stop.
7. Valve is functional if performance is as noted.

### Tires And Disc Wheels

#### Tire Inflation

Proper and improper inflation will produce the tire section and ground contact characteristics shown in Figure 18. Tire inflation must be checked daily while tires are cold.

Either over-inflation or under-inflation will cause premature tire failure

 <b>CAUTION</b>
<p>Do not attempt to adjust the inflation pressure while the tires are hot.</p>

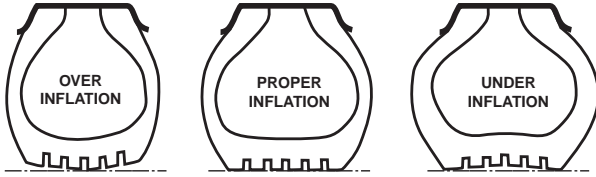


Figure 18. Proper Tire Inflation

**CAUTION**

Do not exceed the cold inflation pressures. In some cases the rim will have a lower inflation pressure than 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**

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

MAINTENANCE

**Tire Overinflation**

Overinflation weakens the cord body of the tire by reducing its 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.

**WARNING**

Do not overinflate tires.

**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 1/2 inch (6.35 mm) in diameter or 1-1/2 inch (19.1 mm) in circumference are allowed.

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

**Removing Tire and Disc Wheel Assembly**

**WARNING**

Before removing the tire and rim 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 (see Warning on this page). Remove the cap nuts (see Figure 19). Remove the outside tire and disc wheel. Remove the inside tire and disc wheel if it must be changed.

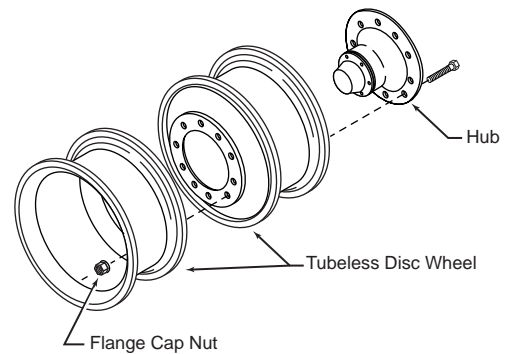


Figure 19. Removal of Tires and Hub Piloted Disc Wheels

## Mounting and Demounting Tires on 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 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 disc wheels. Scrap damaged parts.
3. Match the duals.
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 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

10. 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 flange nut, torque after the first 50-100 miles of service. Tighten the nuts as shown in Figure 10.

## Hubs

### Hub Removal

Demountable disc wheels must be removed before removing hubs. Support the hub assembly prior to removal. The hub is 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 hub assembly carefully to avoid damage to the bearing, spindle and inner seal. Catch the bearing cones as the hub is removed from the spindle.

### Inspection and Cleaning

While the hub is removed, inspect the condition of the brake rotors 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.

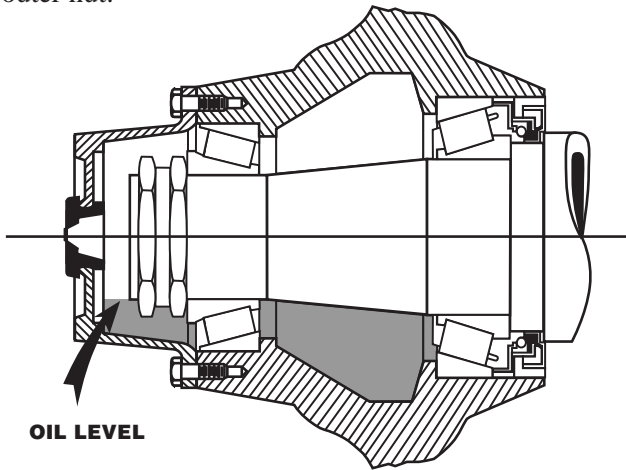
### Hub Installation

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

1. Assemble the inner cone and seal into the hub.
2. Place the hub over the spindle, being careful to avoid damage to the spindle, seal and brake.
3. Put the outer cone into position.
4. Tighten the inner spindle nut while rotating the hub both directions until a slight bind is felt.
5. Loosen the nut 1/4 turn. The 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.



**Figure 20. Checking Oil Level in Hub**

10. Install the hub cap gasket and hub cap. Fill the hub to the "Full" line on the hub cap window (see Figure 9 & Figure 20).

## Air Systems and Brakes

### Air Systems 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.

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

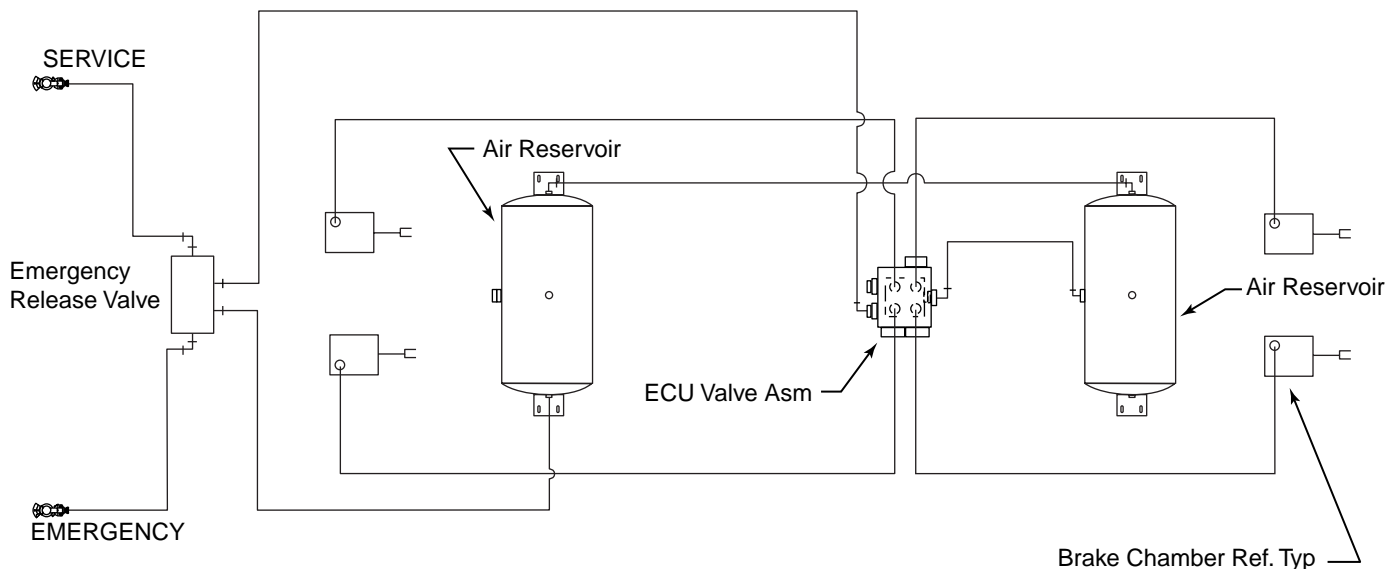
Drain condensation from the reservoir while the reservoir is pressurized. Cables for the drain valves are located on the roadside of the trailer frame. Listen for leaks after releasing the drain valve cables.

## 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.



**Figure 21. Brake Air Supply System - 2 Axle Shown**

## 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 21)

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 22)

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.

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.

 <b>WARNING</b>
Block the wheels during these tests.

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.

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.

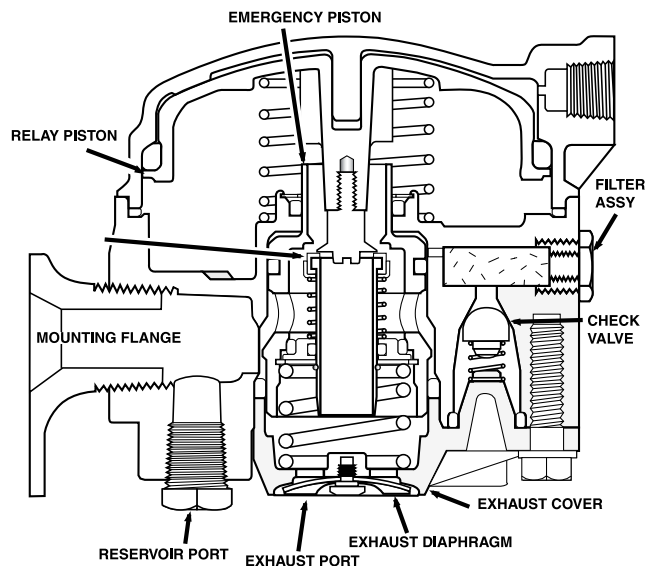


Figure 22. Relay Emergency Valve



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

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


### Brake Chambers

(see Figure 23)

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.

 <b>CAUTION</b>
<p>Overtightening the bolts can cause permanent distortion of the clamp ring. Do Not exceed a torque of 130 inch lbs. (14.7 N.M..)</p>

### Brake Chamber Removal

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

### 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° 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.

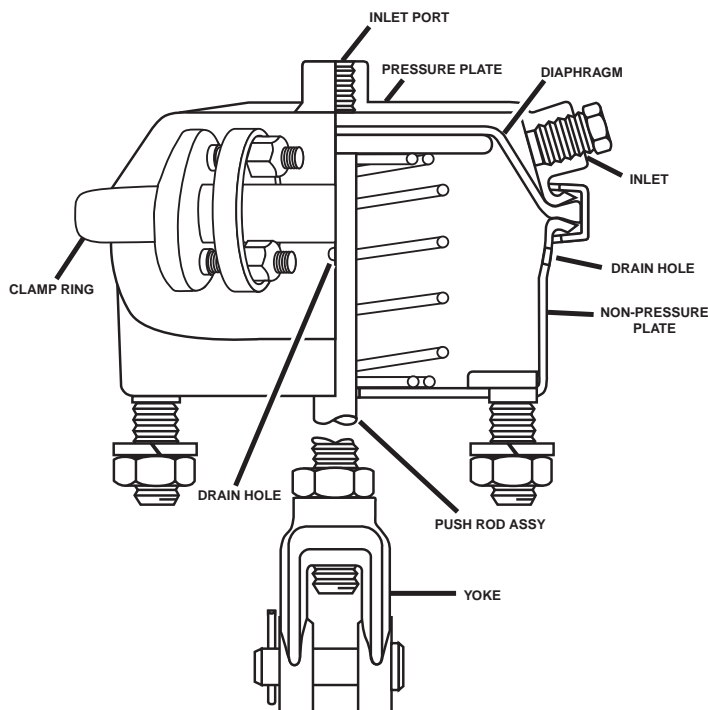


Figure 23. Brake Chamber

## Trailer ABS

Meritor WABCO ABS is an electronic system that monitors and controls wheel speed during braking. The system works with standard air brake systems.

ABS monitors wheel speed at all times and controls braking during wheel lock situations. The system improves vehicle stability and control by reducing wheel lock during braking.

The ECU receives and processes signals from the wheel speed sensors. When the ECU detects a wheel lockup, the unit activates the appropriate modulator valve, and the air pressure is controlled.

In the event of a malfunction in the system, the ABS in the affected wheel(s) is disabled; that wheel still has normal brakes. The other wheels keep the ABS function.

An ABS warning light lets drivers know the status of the system.

For a complete description of diagnostic and maintenance procedures refer to Meritor WABCO Maintenance Manual no. 33.

## Air Brakes

### Operating Checks

Periodically check the brake assemblies for heating.

A cool brake assembly may indicate an inoperative brake.

 <b>WARNING</b>
Proceed cautiously. Malfunctioning or misaligned brakes can cause the brake assembly to become extremely hot. Do not operate the vehicle until the problem causing the overheating is corrected.

### Brake Assembly

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

**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.

<b>Trouble Analysis for Air Brakes</b>		
<b>Trouble</b>	<b>Probable Cause</b>	<b>Corrective Action</b>
No brakes or intermittent brakes.	Brake air system improperly connected.	Reconnect correctly.
	Relay emergency valve contains water or oil.	Clean valve.
Single brake dragging or locked.	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.
	Broken component within brakes: a. Retract spring. b. Cam roller. c. Shoe. d. Lining fasteners. e. Anchor pin. f. Spider.	Replace broken part.
	Flat spot on cam roller or camshaft	Replace defective parts. DO NOT lubricate mating surfaces of cam or cam roller.
	Improper adjustment. Spider bushing or cam bracket bushing binding.	Adjust slack adjusters. Lubricate or replace bushing.
	Improper Lubrication Worn anchor pin bushing. Brake drum distortion. Broken brake chamber spring. Brake chamber pushrod binding.	Lubricate Replace bushing. Repair or replace drum. Replace spring. Realign brake chamber bracket or install correct brake chamber.

(continued)

**Trouble Analysis for Brakes (continued)**

Trouble	Probable Cause	Corrective Action
Uneven brakes.	<p><i>See "Single brake dragging or locked" in this section.</i></p> <p>Restriction in brake hoses.</p> <p>Leaking brake chamber diaphragm.</p> <p>Linings worn out.</p> <p>Grease on linings.</p> <p>Broken slack adjuster.</p>	<p>Locate and remove restriction.</p> <p>Replace diaphragm.</p> <p>Reline brakes.</p> <p>Reline brakes.</p> <p>Replace slack adjuster.</p>
Brakes apply too slowly	<p>Brakes need adjustment or lubrication</p> <p>Low air pressure in brake system</p> <p>Restricted tubing or hose.</p> <p>Defective relay emergency valve.</p>	<p>Adjust and lubricate brakes.</p> <p>Check tractor air system (below 80 PSI) (5.5 Bar)</p> <p>Locate and remove restriction.</p> <p>Clean and repair or replace valve</p>
Brakes release too slowly.	<p>Brakes need adjustment or lubrication.</p> <p>Brake components binding.</p> <p>Exhaust port or relay emergency valve restricted or plugged.</p>	<p>Adjust and lubricate brakes.</p> <p>Align brackets or replace bent components.</p> <p>Clean valve.</p>
All brakes do not release	<p>Brake air system improperly connected</p> <p>Brake valve on towing vehicle applied.</p> <p>Relay emergency valve in emergency</p> <p>Restriction in brake hoses.</p> <p>Tractor protection valve malfunction.</p>	<p>Reconnect correctly.</p> <p>Release brake.</p> <p>Check line pressure and valve position.</p> <p>Locate and remove restriction.</p> <p>Troubleshoot tractor air system.</p>

(continued)

### Trouble Analysis for Brakes (continued)

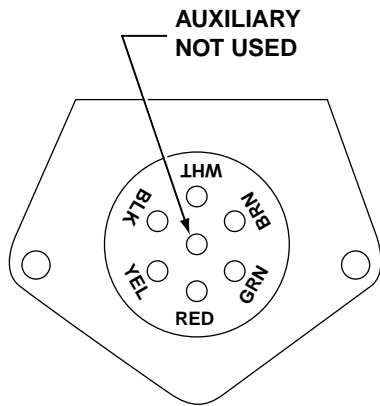
Trouble	Probable Cause	Corrective Action
Insufficient brakes.	Brakes need adjustment.	Adjust brakes.
	Brakes need lubrication.	Lubricate brakes.
Brakes grabbing.	Lining worn away.	Reline brakes.
	Defective relay emergency valve.	Repair or replace valve.
	Brakes overheated.	Stop and allow to cool. Locate the cause of overheating.
	Low air pressure.	Troubleshoot tractor air system.
	Lubricant on brake lining.	Reline brake.
Excessive leakage with brakes released.	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 applied.	Relay emergency valve leaking.	Repair or replace valve.
	Leaking tubing or hose line.	Tighten or replace leaking lines.
Excessive leakage with emergency system only applied - no leakage with normal brake application.	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.
Excessive water present in Reservoir brake system.	Defective relay emergency valve.	Clean and repair, or replace valve.
	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.

For RPS 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.



**Figure 32. Gooseneck Socket Connection**

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

## Hydraulics

### General

Trailer equipped with hydraulic system. Hydraulic system pressure is supplied by the hydraulic power pack mounted in the trailer frame. Refer to the system description and repair procedures when checking or servicing hydraulic systems.

## 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 33).

## Changing Hydraulic Oil

1. Retract the cylinders fully.
2. Clean around the reservoir fill plug and remove it.
3. Clean around the reservoir drain plug and remove it. Allow all the oil to drain and replace the plug
4. Remove the fill level plug at the rear of the reservoir. Fill the reservoir till the fluid is visible in the elbow.

### CAUTION

Do not Overfill

5. Replace the fill level plug and operate the hydraulic cylinders 5 times and recheck the oil level. Add oil as required to bring the oil level up to the "FULL" mark.
6. Replace the fill level plug.

## Checking and Adjusting Relief Pressure on the Control Valve

**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.

1. Remove the hex cap nut and loosen the jam nut.
2. Start the power pack engine.
3. Put the control valve in the EXTEND position. With the system in relief, check the system pressure on the gauge.

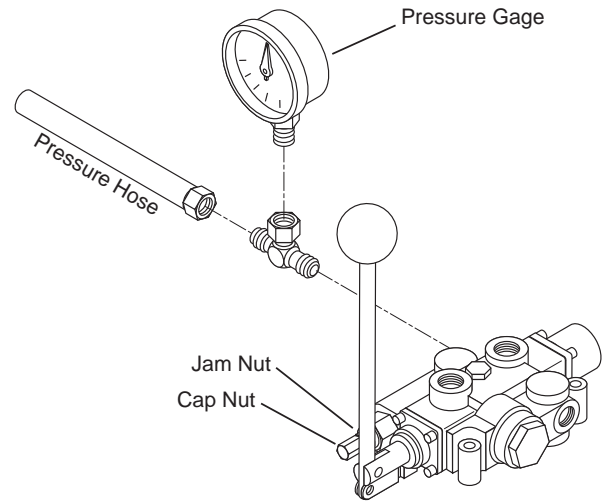
**NOTE:** Oil flowing through the relief valve can cause the adjusting screw to loosen. Hold the adjusting screw with a wrench while checking the relief pressure. The pressure shown on the gauge must read 1200 PSI plus or minus 50 PSI (83 Bar plus or minus 3 Bar). If the pressure is not correct, adjust 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.

4. 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.

- 5. Check the pressure reading as in step "4".
- 6. Shut off the power pack engine (if so equipped) or disengage the wet line system.

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



**Figure 34. 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.

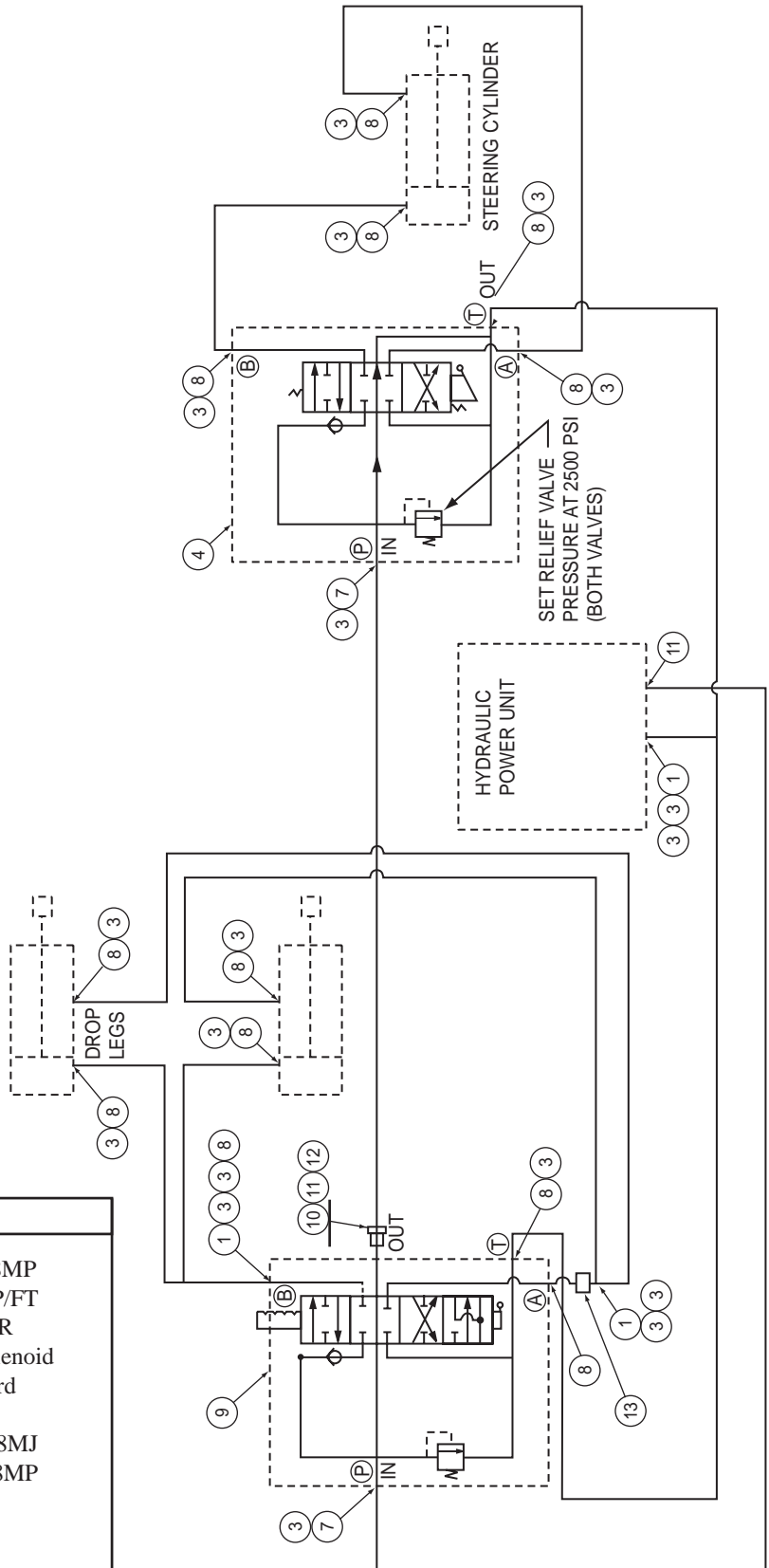
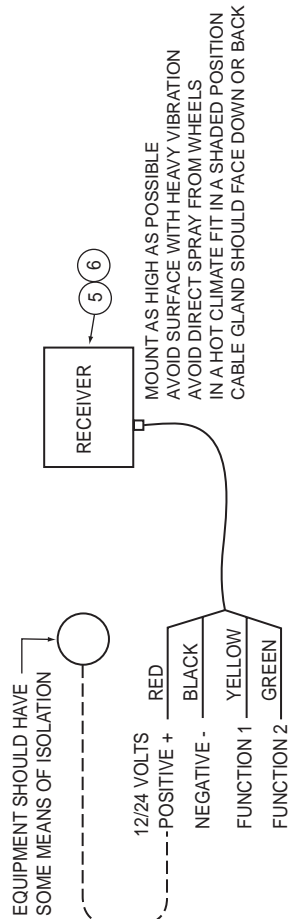
MAINTENANCE



HYDRAULIC

### Hydraulic Schematic - Drop Legs, Steering

Q538661

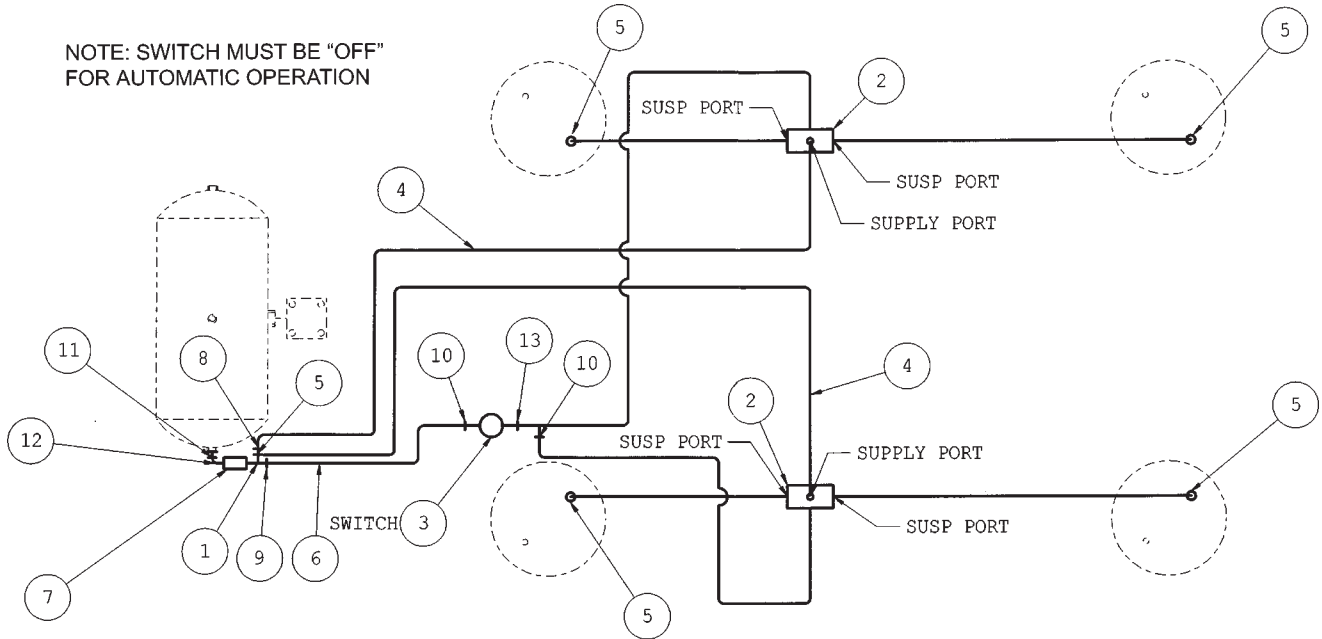


REF	PART NO.	QTY	DESCRIPTION
1	6602488	3	Tee-Hydr, 08MJ-08MJ-08MP
2	6601963	80	Hose-Hyd, 0.50, 3000 WP/FT
3	6601978	18	Hose End-08X08FJX, STR
4	6603883	1	Valve-Hydraulic, Elec Solenoid
5	6703898	1	Remote- 2 Button, 50' Cord
6	6603882	1	Trans/Recv-2 Function
7	6602248	2	Elbow-Hydr, 90, 12MP-08MJ
8	6600958	12	Elbow-Hydr, 90, 08MJ-08MP
9	Q479336	1	Valve-Hydraulic
10	Q478113	1	Power Beyond Sleeve
11	6602077	2	Hose End-08X08FJX90S
12	6600921	1	Adapter-Hydr, ST, 08MJ-12MB
13	6602459	2	Valve-Ball, Med Press, 1/2" NPT

## Auxiliary Air Group

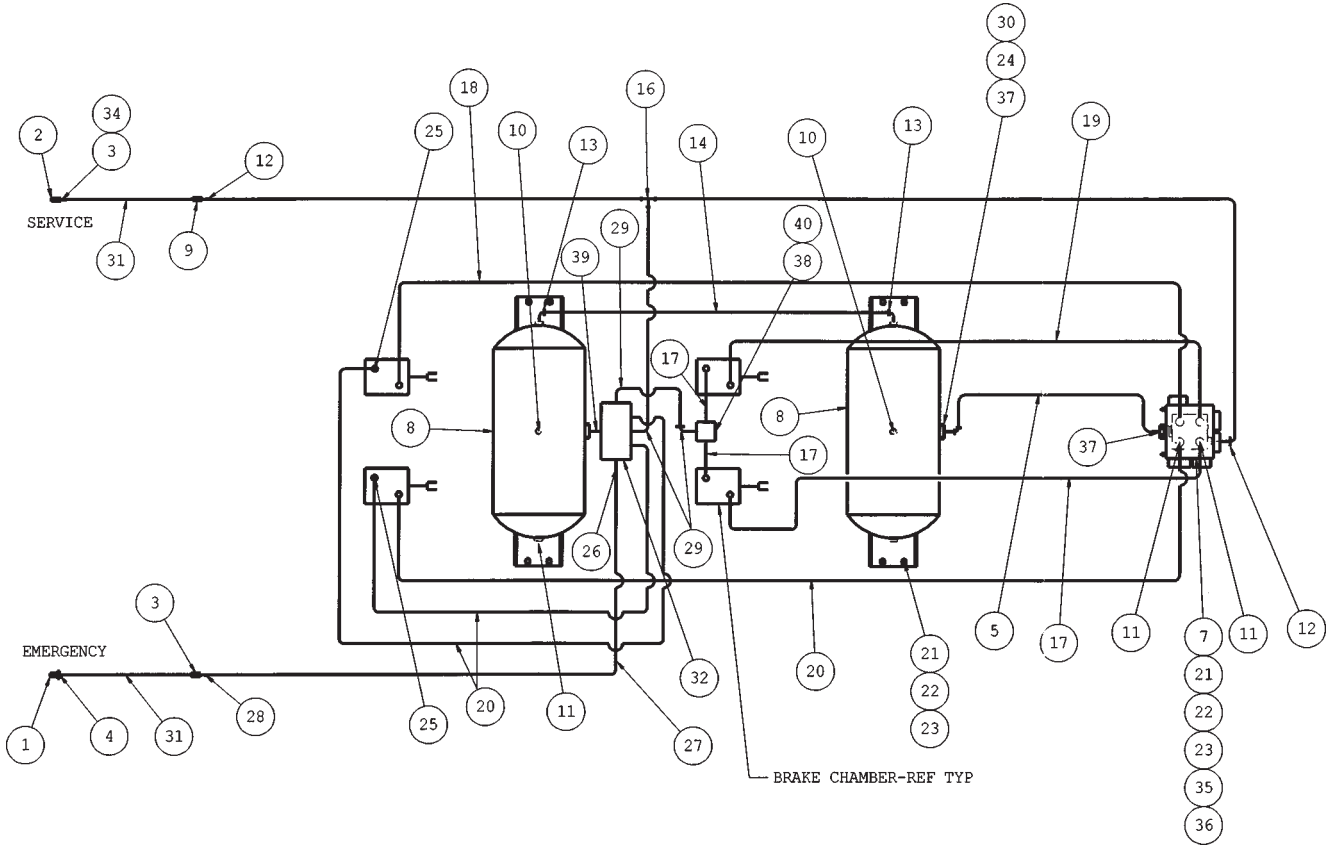
### Air Ride W/Manual Lowering System - Q536620

NOTE: SWITCH MUST BE "OFF" FOR AUTOMATIC OPERATION



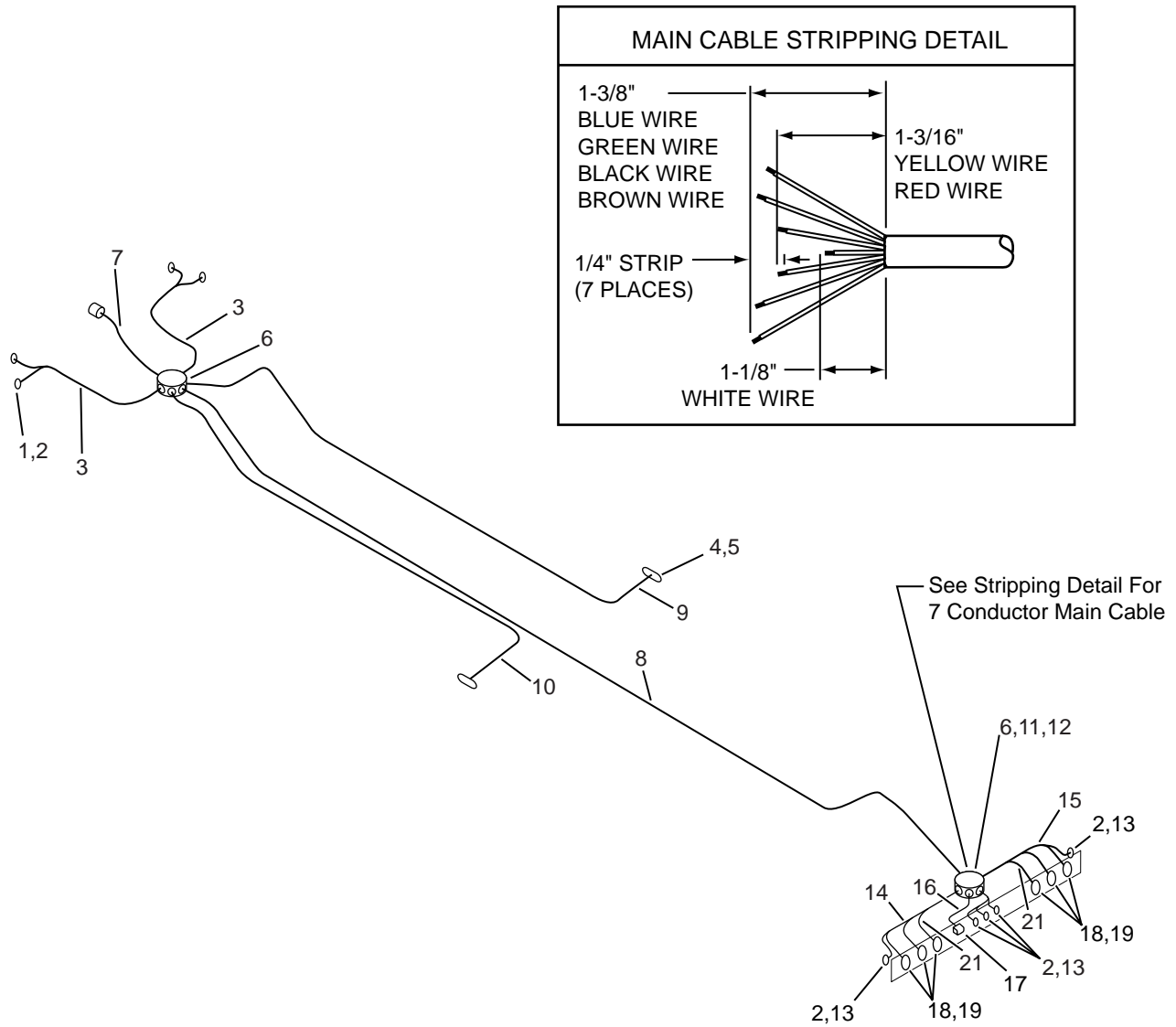
REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	Q461540	2	1/4 NPTF Tee-Street	10	6600833	1	Elbow-Arbk,90,02MP-06MT
2	Q527670	2	Valve-Height Control w/ Dump	11	Q012836	1	Adapter-Auto,ST,06MP-04MP
3	6450540	1	Manual Operated Air Switch	12	Q402138	1	Elbow-Street,1/4 NPT
4	6309162	8	Tube-Nylon,Air,Generic	13	6602474	1	Tee-Street, 1/8-27 NPTF Brass
5	6600832	5	Elbow-Arbk,90,04MP-06MT				
6	6602543	10	Tube-Nylon,Air,Red,0.38				
7	6450575	1	Valve-Pressure Protection				
8	6200541	1	Tee-Arbk, 06MT-06MT-04MP				
9	6600831	1	Adapter-Arbk,ST,04MP-06MT				

### Air Schematic - 2 Axle With 2S/2M ABS Q534018



REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	1	6602767	NIPPLE-QUICK CONNECT 3/8" MALE	22	4	0274993	NUT-HEX, LOCK-0.38NC, EA. PD
2	1	Q402813	BODY ASM-FEMALE QUICK COUPLER	23	8	0446363	WASHER-FLAT,0.31A(0.38X0.88)PD
3	2	6602466	FITTING-ANCHOR	24	2	0144129	ELBOW-PTPE,90, 0.75NPT, PD
4	1	6602479	ADAPTER-ARBK, ST, 08FP-08MT	25	2	6602465	ELBOW-90 STREET, 06MP-06FP
5	6	6309165	TUBE-NYLON, AIR 0.75, GENERIC	26	1	6600938	ADAPTR-ARBK ST 06MP-08MT
6	40	6309162	TUBE-NYLON, AIR, 0.38, GENERIC	27	45	6309169	TUBE-NYLON, AIR, 0.50, GENERIC
7	1	6451270	ECU/VALVE ASM-25/2M STANDARD	28	1	6600942	ELBOW-ARBK, 90, 06MP-08MT
8	2	6450357	RESERVOIR-AIR 9.69 X 0.25	29	4	6600945	ELBOW-ARB90, 06MP-06MT
9	1	Q449698	COUPLING TUBE	30	2	6600852	ADAPTER-ARBK, ST, 12MP-12MT
10	2	6600162	COCK-DRAIN, 0.25", EXTERNAL SEAT	31	2	Q486016	JUMPER-HOSE, AIR REF. DWG Q450999
11	5	0444867	PLUG-AUTO,HEX SOCK, 0.38NPTF, PD	32	1	6450785	VALVE-SER.RSVR PRIORITY, SEALCO
12	2	6600832	ELBOW-ARBK, 90, 04MP-06MT	33	2	Q400241	HOSE SEPARATOR M-473
13	2	Q444344	ELBOW-MALE 90 DEG. #1469X10X6	34	1	6600831	ADAPTR-ARBK, ST, 04MP-06MT
14	10	Q431000	TUBE-NYLON, AIR, BLK, 0.63, GEN	35	1	Q514275	MOUNTING ANGLE, ABS ECU/VALVE
15	1	0273469	PLUG-AUTO SQ SOCK, 0.75NPT, PD	36	8	0120382	WASHER-LOCK 0.38, SPRING, PD
16	1	6600830	TEE-ARBK 06MT-06MT-06MT	37	2	Q012833	HEX NEPPLE FTG 12 X 12
17	3	6602380	HOSE ASM-AIR BRAKE, 038ID	38	1	6450184	VALVE-QUICK RELEASE, #51147
18	1	6602380	HOSE ASM-AIR BRAKE, 0.38ID	39	1	Q016074	FITTING HYDRAULIC 3/4" TO 1/2"
19	1	6602380	HOSE ASM-AIR BRAKE 0 38ID	40	1	4010064	ANGLE-MTG, QUICK RELEASE VALVE
20	3	6602380	HOSE ASM-AIR BRAKE, 0.38ID				
21	4	0122145	SCREW-HEX 0.38NCX1 2,GR2, PD				

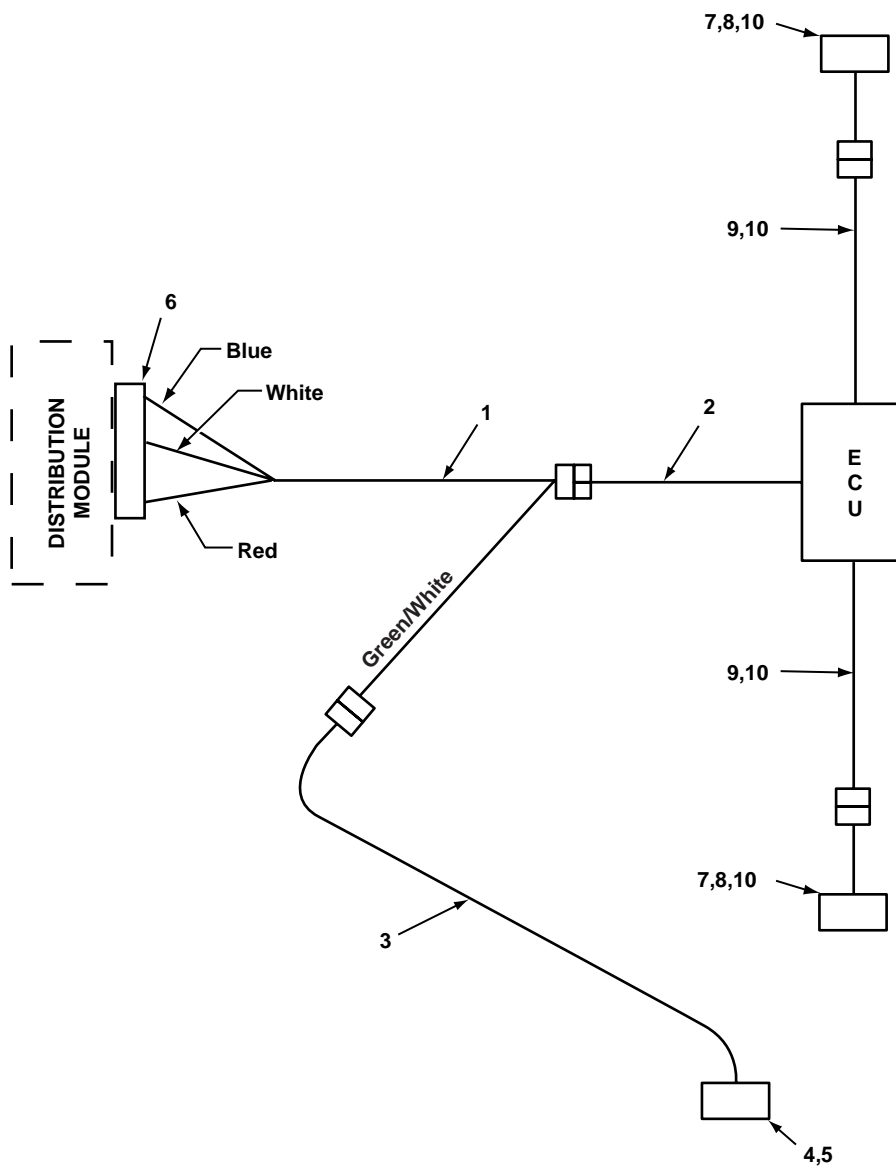
## Electrical Group - Q502012



REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	1025Y	2	Amber Lamp	12	77853	4	Filler Plug
2	10700	7	Grommet	13	10205R	5	Red Lamp
3	77304-156	2	Front M/C Harness	14	77209-60	1	LH-STOP, TURN & M/C Harness
4	60215Y	2	Amber Mid Turn Lamp	15	77208-60	1	RH-STOP, TURN & M/C Harness
5	60700	2	Grommet	16	77308	1	Lower ID & License Harness
6	77808	2	8 Outlet Distribution Module	17	15011	1	License Lamp Asm
7	770001-0144	1	Middle 7 Conductor Main Cable	18	40242R	6	Red-STOP, TURN Lamp
8	770001-0444	1	Rear 7 Conductor Main Cable	19	40700	6	Grommet
9	77342-0168	1	RH Mid Turn Harness	20	97944	1	NYK-77 Compound, 2oz Tube
10	50310	1	Harness Clear Marker-Center	21	50325	2	Harness Single Plug
11	77852	1	Boot Kit				

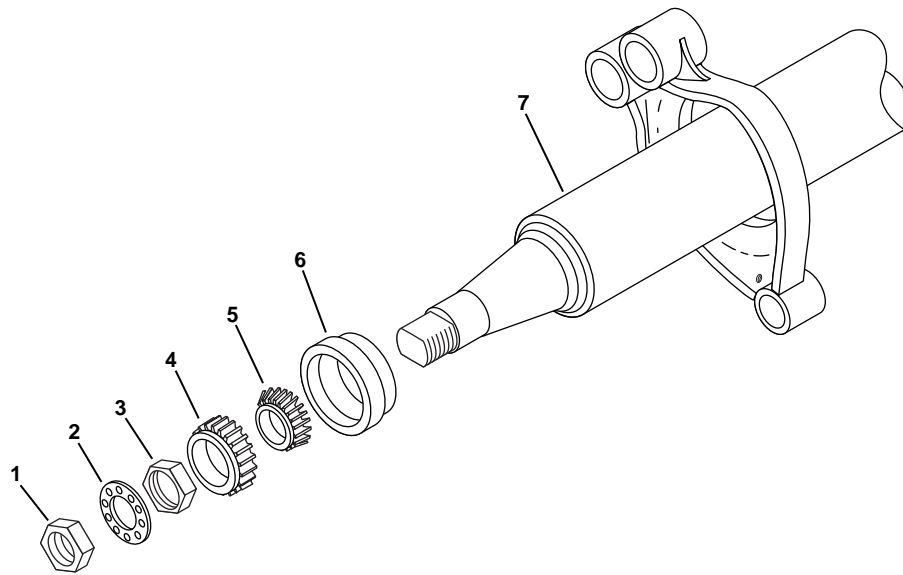
### Electrical Schematic-ABS

Q513582



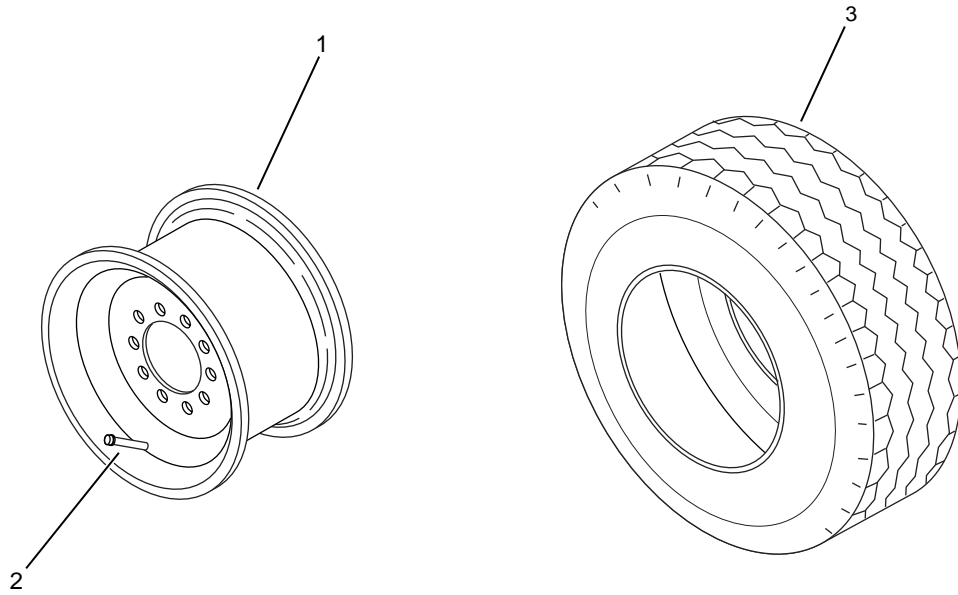
REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	6702506	1	Harness-ABS Power TL52100 x 120"	9	6451076	2	Cable-Sensor, 1.8M Long
2	6703016	1	Harness-1.0 Meter Power Cable	10	6700169	16	Tie-Plt-4SCP-0, Black, Extra Lg.
3	6702507	1	Harness-ABS Lamp Jumper				
4	6702505	1	Light-Marker, 2" ABS, TL 30257Y				
5	6702151	1	Grommet-Mounting (Blackhawk)				
6	Q495727	1	Connector, 1/2" ID (5 Cond, Cable)				
7	6450956	2	Sensor Spring Clip				
8	6451097	2	Sensor Asm-441 032 808 0				

**Axle**  
6452779



REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	***	2	Nut				
2	***	2	Nut-Lock				
3	***	2	Nut				
4	***	2	Cone-Brg Outer				
5	***	2	Cone-Brg Inner				
6	***	2	Oil Seal (Guardian)				
7	***	1	Axle Asm				
*** Specify Serial Number of Trailer							

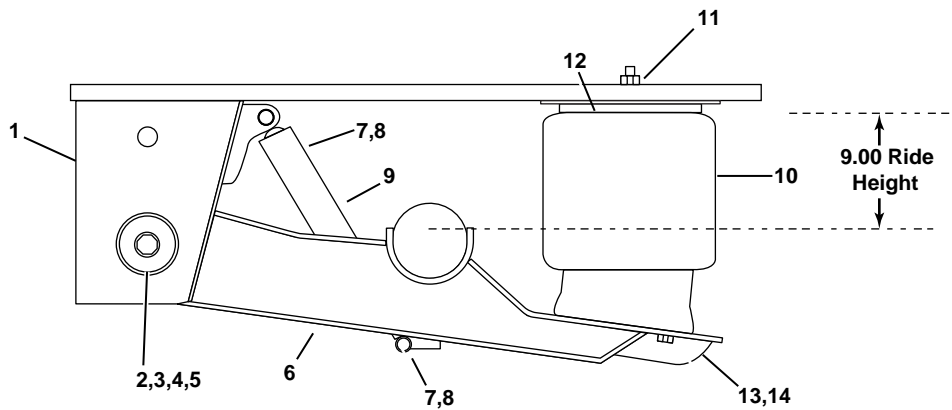
## Tire & Wheel Assembly



WHEELS & TIRES

REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	Q451284	4	Wheel-Disc, Aluminum, Polished				
	Q502014	4	Wheel-Disc, Machine Finished				
2	Q471414	8	Valve-Dill #VS-900-572-03				
3	Q535444	8	Tire-Radial, 245/70R-17.5 LR (H)				

## CUSH Air Suspension 6452820



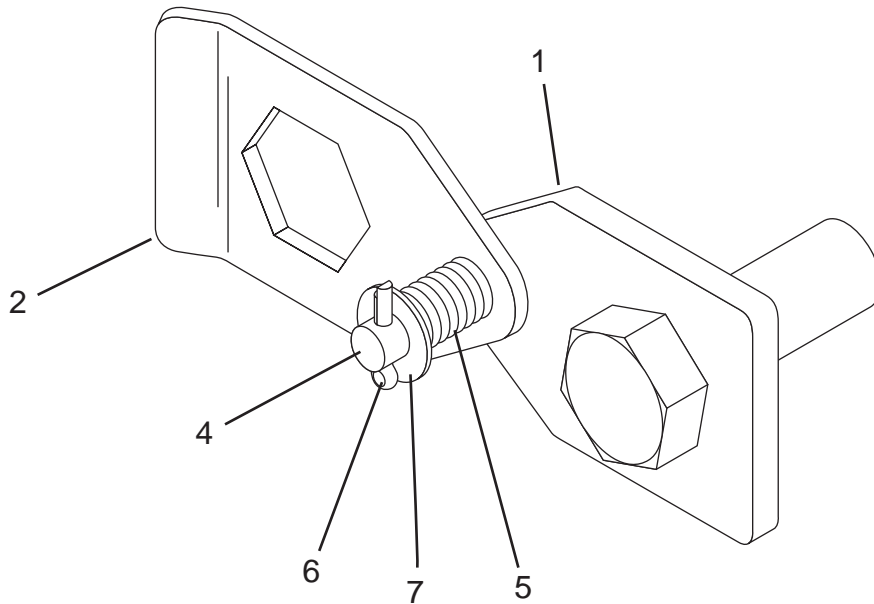
REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	***	1	LH Hanger Assembly	8	***	4	Lock Nut 3/4-10NC Oval
	***	1	RH Hanger Assembly	9	***	2	Shock-Monroe 6 Stroke
2	***	2	Eccentric Bolt-9 1/2 Lg.	10	***	2	Air Spring Goodyear 1R12-492
3	***	2	Lock Nut 1 1/4-7NC Sps Flex Lock	11	***	2	Lock Nut- 3/4-16NF Jam-Thin
4	***	2	Washer-UHMW 6 1/4 OD	12	***	2	Air Spring Mounting Plate
5	***	2	Washer, Anti-Turn	13	***	6	HHCS 1/2-13NC 1 1/4 Lg
6	***	1	LH Beam Assembly	14	***	6	Lock Washer 1/2 S/T Med
	***	1	RH Beam Assembly	15	***	1	Bushing Kit- Complete kit for one axle
7	***	4	HHCS 3/4-10NC 3 1/2 Lg				

\*\*\* Specify Unit Serial Number

SUSPENSION



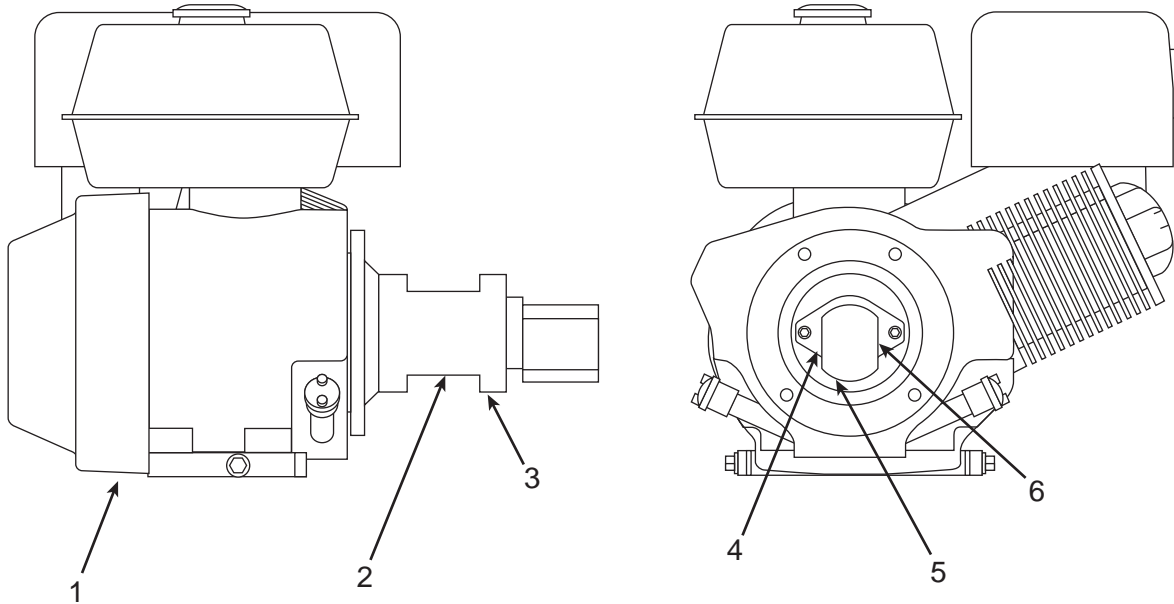
**Bolt Lock assembly**  
Q537493



DECK

REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	Q537478	1	Lock Plate				
2	Q537488	1	Cover-Bolt Lock				
4	Q537498	1	Pin-Lock				
5	6001869	1	Spring-Compress, STLS				
6	6100634	1	Pin-Cotter, 5/32 Dia X 1 Lg				
7	0120396	1	Washer-Flat, SAE STD, 0.50				

## Power Pack Assembly 13HP Q531553



To hook up Honda motor to Honda starter:

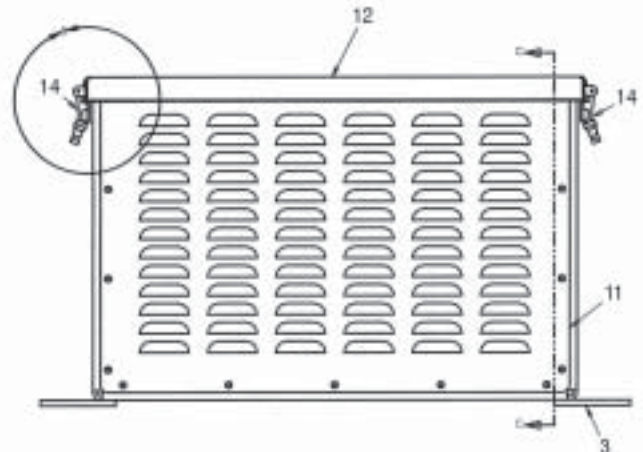
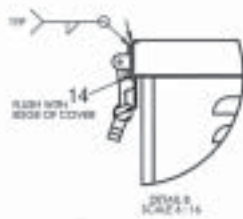
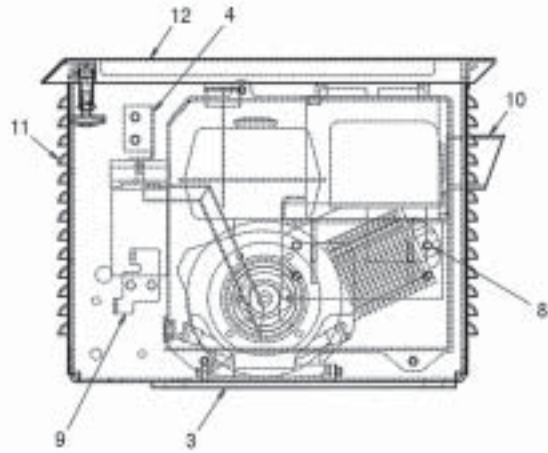
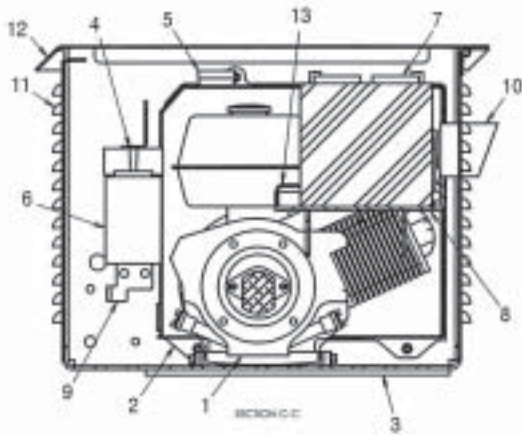
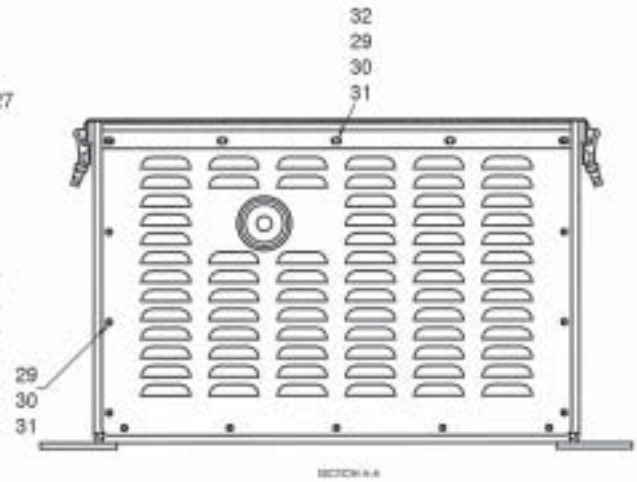
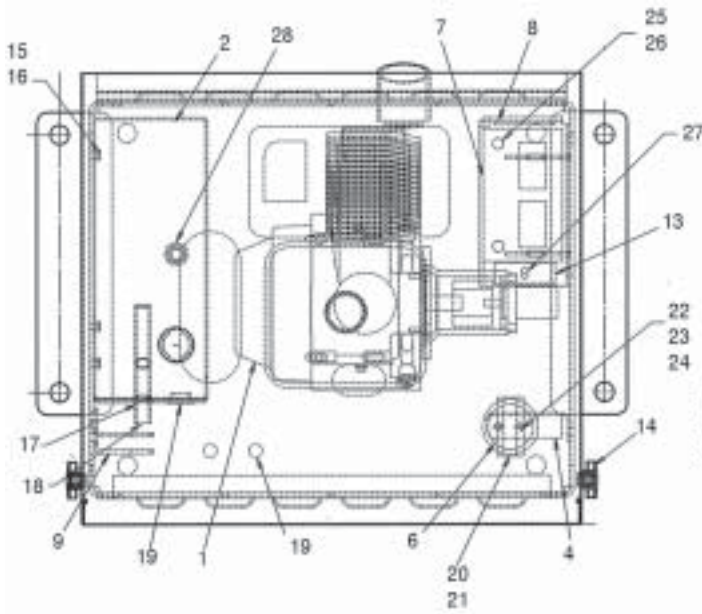
6700119	1')	Wire-14GA, Plastic, Red
6700261	1')	Wire-14GA, Plastic, Gray
6700121	1')	Wire-14GA, Plastic, Yellow
6700120	1')	Wire-14GA, Plastic, White
6700115	1')	Wire-14GA, Plastic, Black
6701740	1.67')	Tubing-Shrink
6000111	.67')	Loom-Fibre, .5 in Wiremold Corp

Cut wires from control and splice. After splicing , bundle and secure wires. Wires leading out of the Honda motor start switch box, solder (2) places, cover with shrink tubing.

REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	Q480566	1	13hp Honda Engine				
2	Q412336	1	Coupler-drive				
3	Q475554	1	Adapter-hyd Pump Mount 8hp				
4	6603411	1	Hydraulic Pump				
5	6601811	1	Elbow-hydr, 90, 10mb-12mj				
6	9410977	1	Elbow-hydr, 90, 08mb-08mj				

# Power Pack Module

Q531552 - 13HP



DECK

## Power Pack Module

Q531552 - 13HP

REF	PART NO.	QTY	DESCRIPTION	REF	PART NO.	QTY	DESCRIPTION
1	Q531553	1	Power Pack Assembly, 13HP				
2	Q515900	1	Tank Assembly				
3	Q531551	1	Power Pack Weldment				
4	Q513241	1	Filter Bracket				
5	Q469793	1	Hyd, Dip Stick				
6	Q180441	1	Filter-Hyd				
	Q180595	1	Filter Element Replacement Kit				
7	Q446975	1	Battery, 12 Volt-22NF Wet				
8	Q513222	1	Battery Support, Bolt-In				
9	Q513220	1	Plate-Honda Control. Bolt-In				
10	Q541543	1	Cover Asm-Power Pack				
11	Q531545	1	Cover-Power Pack				
12	Q531548	1	Cover Asm				
13	Q475762	1	Plate-Formed				
14	6001161	2	Latch- Tee Handle, Rubber				
15	0122119	8	Screw-Hex, 0.38NC X 0.75, GR2, PD				
16	0120388	8	Washer-Flat, SAE, STD, 0.375				
17	0219199	1	Plug-Pipe, Sq Hd, 0.50NPT, PN				
18	0144129	1	Plug-Pipe, SqHd, 0.75NPT, PN				
19	9403255	2	Adapter-Hyd, BHD, ST, 08MJ-08MJ				
20	Q513041	1	Hose Asm-Inside, PP, Return				
21	6602248	2	Elbow-Hyd, 90, 12MP-08MJ				
22	6100354	2	Screw-Hex, 0.25NC X 1.00, GR8, PD				
23	0120386	4	Washer-Flat, 0.25A(0.31 x 0.73), PD				
24	0120380	2	Washer-Lock, 0.25, Spring, PD				
25	Q488973	1	Battery Cable Asm				
26	Q488974	1	Battery Cable Asm				
27	0122194	1	Screw-Hex, 0.38NC x 2.50, GR2, PD				
28	Q436379	1	Breather Cartridge				
29	0122007	29	Screw-Hex, 0.31NC X 0.75, GR2, PD				
30	0446363	29	Washer-Flat, 0.31A (0.38X0.88) PD				
31	0120214	29	Washer-Lock, 0.31, Spring, PD				
32	0124824	3	Nut-Hex, Jam, 0.31NC, PD				
33	0180177	8	Screw-Hex, 0.50NC X 1.50, GR5, PD				
34	0120378	8	Nut-Hex, 0.50NC, PD				
35	0120390	8	Washer-Flat, 0.50A, W. PD				
36	0120384	8	Washer-Lock, 0.50, Spring, PD				

DECK

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0050310	35	6451270	34	40242R	35	Q537488	40		
0050325	35	6452779	37	60215Y	35	Q537498	40		
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0077852	35	6600831	33	77209-60	35				
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## Something Wrong with this manual?

If you find inaccurate or confusing information in this manual, or just have a suggestion for improvement, please let us know.

Mail or FAX this form to us at: E. D. ETNYRE & CO. 1333 S. Daysville Rd.  
Oregon, Illinois 61061 • Fax: 800-521-1107 • [www.etnyre.com](http://www.etnyre.com)

Attn: Service Manager

Recommended changes from: \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip \_\_\_\_\_

Phone \_\_\_\_\_

Date Sent \_\_\_\_\_

**Manual Number** (upper right corner of front cover) \_\_\_\_\_

**Manual Title** \_\_\_\_\_

### Explain the problem in the space below.

Page Number	Reference Number	Paragraph Number	Figure Number	Problem (please be specific)

## 1 BEFORE YOU START

- The Receiver is designed to carry a maximum of 15 Amps. That is for example 15 Amps through one output, or 5 Amps each through 3 outputs.
- Master Output, this can be configured to Continuous or Parallel operation, see overleaf for details. (This feature is not available on 9200 and 9300 models)
- If Receiver outputs are connected in parallel with an external switching device (wired remote) the Receiver will instantly switch off if the wired remote is operated
- Lodar Receivers **MUST** have an **isolation switch** for safety, and to allow for registering a replacement Transmitter.
- Safety Feature both the Transmitter and the Receiver will switch off after 30 minutes of inactivity.

## 2 IDENTIFY POWER CONNECTION POINT AND ISOLATE SUPPLY

Remove fuse

or Disconnect Battery

**WARNING**  
Vehicle batteries contain gases which are flammable and explosive. Wear eye protection and do not lean over battery while disconnecting. Do not wear metal jewellery.

## 3 MOUNT RECEIVER

**CAUTION**

Secure using 5mm (3/16") bolts (not supplied) through the 4 mounting feet

TAKE TIME TO LOCATE THE BEST POSITION

If necessary power the Receiver and move it around the vehicle until the required performance is achieved. Operate the Transmitter and observe the Receiver internal LED's.

Mount as **HIGH** as possible  
**AVOID** surfaces with **HEAVY VIBRATION**  
**AVOID DIRECT SPRAY** from wheels  
 In a **HOT CLIMATE** fit in a **SHADED** position  
 Cable gland should face **DOWN** or **BACK**

Receiver 9200 and 9300 Series  
 Waterproof to IP67 complete with 3 metres (10 feet) cable

Models 9200 & 9300 have 4 core cable

Models 9202/4 & 9302/4 have 7 core cable

## 4 CONNECT WIRES

Transmitter Function I.D.

RECEIVER WIRES for given Transmitter Operation			
WIRE COLOUR	FUNCTION	9200 9300	9202 9302 9204 9304
RED	12 to 36 Volts DC Positive	YES	YES
BLACK	Negative	YES	YES
GREEN	Output F1	YES	YES
YELLOW	Output F2	YES	YES
BROWN	Output F3	NOT AVAILABLE	NOT USED
BLUE	Output F4	NOT AVAILABLE	USED
WHITE	Master Output	NOT AVAILABLE	YES

## 5 ACTIVATE SUPPLY

Replace fuse

or re-connect Battery

## 6 TEST

Press the Transmitter **RESET** button to activate the system, and carefully test each function for correct operation.

**FM Series - Effective working range up to a distance of 60 metres (200 feet).**  
**Narrow Band FM Series - Effective working range up to a distance of 300 metres (1000 feet)**

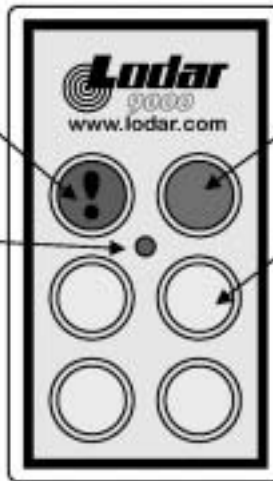
STOP Button switches off the Receiver and the keypad function buttons

L.E.D. Blinks when Transmitter and Receiver are active.

L.E.D. ON when a Transmitter Button is pressed.

**SAFETY FEATURE**

The Transmitter automatically transmits a STOP signal after 30 minutes; this de-activates the Receiver and the Transmitter keypad.



RESET Button activates the Receiver and the keypad function buttons

Function Buttons (Yellow)

Release Catch

Battery Compartment

Rear



**TRANSMITTER REGISTRATION - IF YOUR LODAR DOES NOT WORK TRY THIS FIRST**

During transit security scanning can sometimes cause a Receiver to lose the Transmitter registration in its memory.

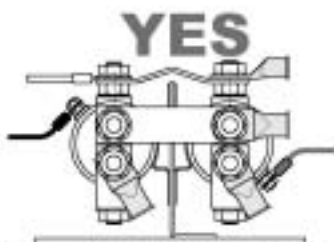
**To register a Transmitter to a Receiver.**

- Step 1. Switch OFF or DISCONNECT the power to the Receiver.
- Step 2. Switch ON or Reconnect the power to the Receiver. This opens a 20 second registration window in the Receiver processor. *If you are looking at the Receiver PCB the Fault LED Flashes.*
- Step 3. Immediately PRESS and HOLD the Transmitter Reset Button (The Green Button) for a minimum of 10 seconds during this 20 second window. *When the Transmitter is Registered the Fault LED goes out, and the Set LED comes on. Your Transmitter is now operating the Receiver.*



**WHAT CAN LODAR OUTPUTS BE CONNECTED TO ?**

**IF IN DOUBT ASK**



Electric Winch, Solenoid Coils



Hydraulic Valve, Solenoid Coils



Directly to Electric Motors

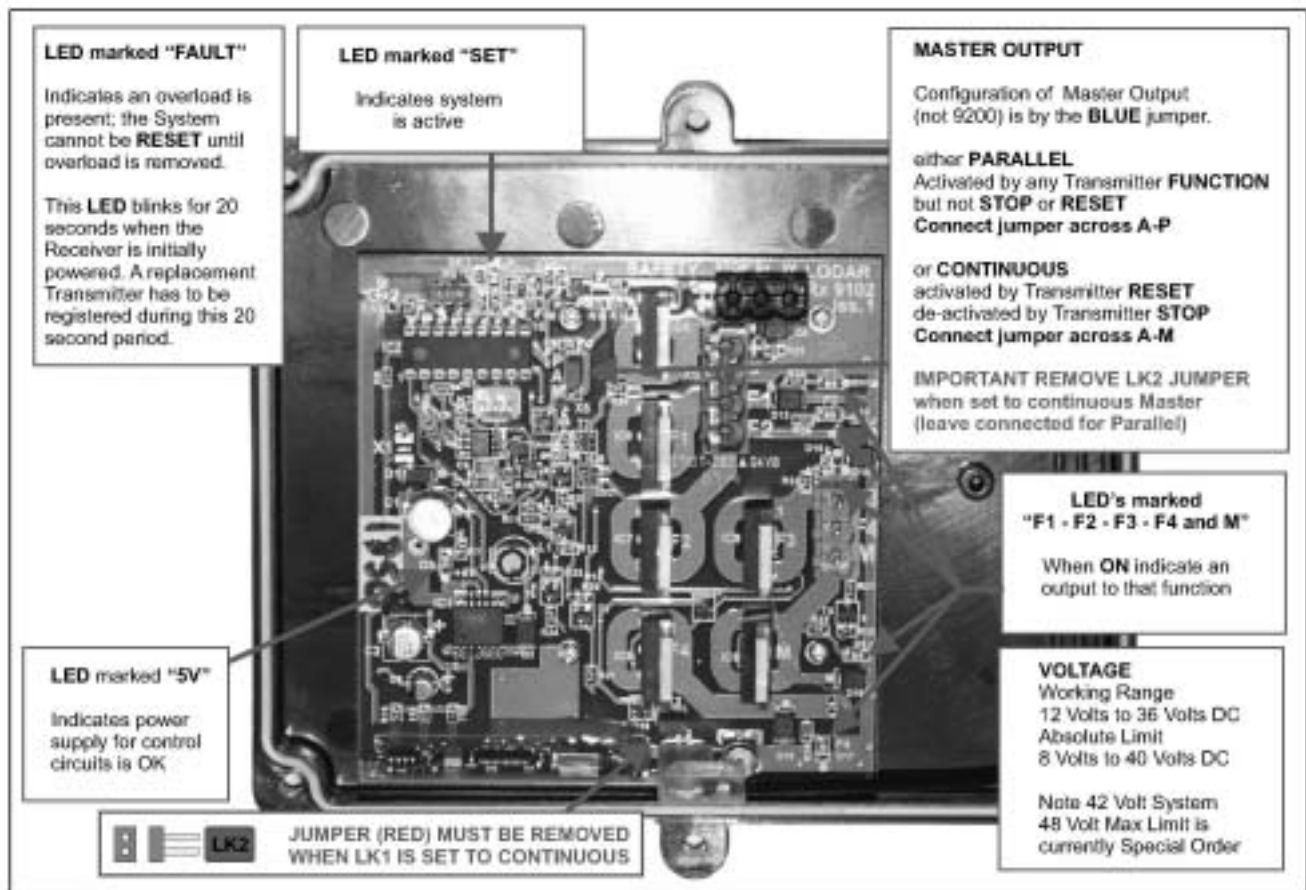


Your product is marked with this symbol. It means that used electrical and electronic products should not be mixed with general household waste. There is a separate collection system for these products.

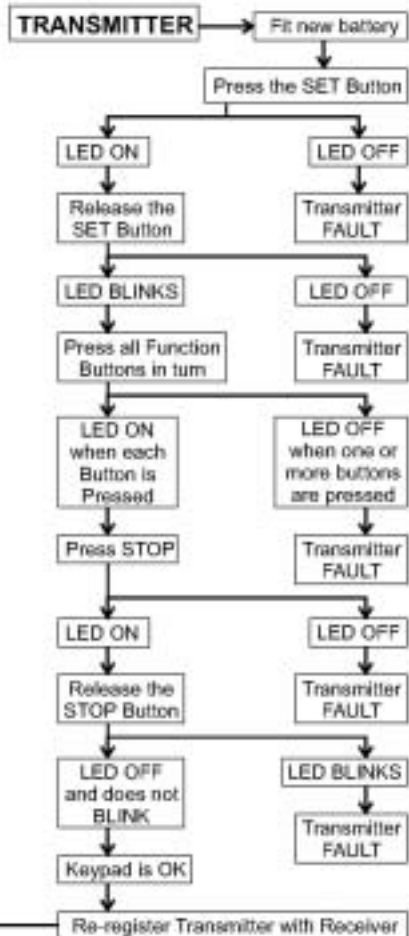
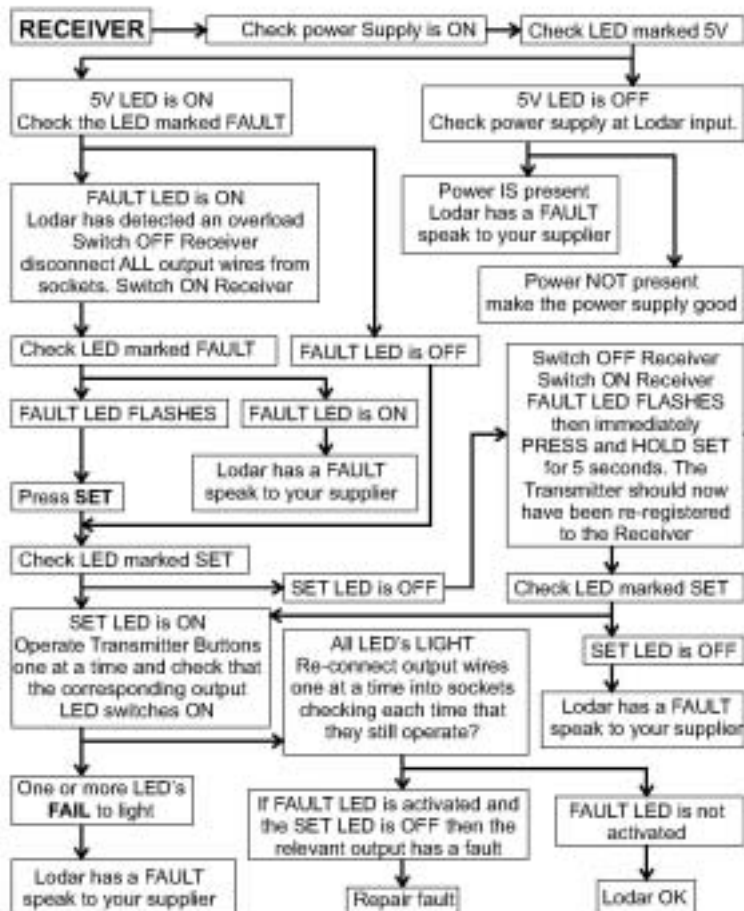
**In the EEC** - Please contact your National Distributor (see [www.lodar.com](http://www.lodar.com) for this information) who will inform you about the take-back of the product. You might be charged for the costs arising from the take-back and recycling. Small products might be taken back by your local collection facilities.

**Outside the EEC** - If you wish to discard this product please contact your local authorities and ask for the correct method of disposal





### FAULT CHECK



**Skidmore 4WD Limited Warranty for LODAR Valid Worldwide**

**Limited Warranty.**

Skidmore 4wd Ltd ("Seller") warrants to the original buyer ("You") all parts and components to be free of faults in materials/workmanship for a period of two (2) years from provable date of purchase. Any Lodar product that is faulty will be repaired or replaced without charge to you, upon compliance with these procedures. The Warranties set forth herein are exclusive and in lieu of all other Warranties, whether oral or written, express or implied.

**Limited Warranty Performance Procedure**

Upon discovery of a faulty Lodar product, you shall notify the Seller in writing, at his factory or at any authorized distributor, details of the said fault and mail, or otherwise ship the faulty Lodar product, postage or other carriage prepaid. Repairs or replacements by the Seller under this Limited Warranty will normally be accomplished within fifteen (15) working days after the receipt of the faulty Lodar product. The Seller, or its authorized distributor, may make reasonable charges for repairs that are not covered by this Limited Warranty.

**Warranty and Remedy Limitations and Exclusions**

The following exclusions or limitations of Warranties and limitations of remedies shall be expressly applicable:

**Express Warranties.** Seller warrants that the Lodar is as described in the "Lodar Owners Manual" provided herewith; no other express Warranty is made in respect to the Lodar. If any model or sample was shown to you, such model or sample was used for illustrative purposes only, and shall not be construed as a Warranty that the Lodar will conform to the sample or model.

**Implied Warranties.** The implied Warranty of merchantability and all other implied Warranties shall only extend from the provable date of purchase for two(2) years. Some States within the USA do not allow limitations on how long an implied Warranty lasts, so the above limitation may not apply to you.

**Incidental and Consequential Damage.** Subject to the Seller's Limited Warranty obligations set forth herein, the Seller shall not be responsible for incidental damages of any kind, or for consequential damages to property, loss of profits and loss of use which may be caused by any fault in, or malfunction, or failure of the enclosed Lodar. Some States within the USA do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

**Condition of Warranty.** The Seller shall not be required to comply with its Warranty duties provided herein if the fault, malfunction or failure of the Lodar was caused by damage (not resulting from faulty or malfunctioning components) or unreasonable use by you. Unreasonable use shall include, but not be limited to, the failure to provide reasonable and necessary maintenance or installation or use of the Lodar without compliance with the instructions contained in the Lodar Owners manual. Seller's liability under this Warranty or for any loss or damage to the Lodar product shall not exceed the cost of correcting the defects in or replacing the Lodar product, and upon expiration of the Warranty period, all such liability shall terminate. The agents, distributors and employees of the Seller are not authorized to make modifications to this Warranty, or additional Warranties binding on the Seller. Accordingly, additional statements, whether oral or written, do not constitute Warranties and should not be relied upon.

**Legal Remedies of the Buyer**

This limited Warranty gives you specific legal rights, and you may also have other legal rights, which may vary from State to State within the USA and from country to country. You also have implied Warranty rights. In the event of a problem with Limited Warranty service or performance, you may be able to go to a small claims court, a state court or a federal district court in the USA or to appropriate jurisdictions outside the USA.

**Enquiries**

Any enquiries regarding compliance with Warranties provided herein may be addressed in writing to: Skidmore 4WD Limited, 60 Sandwell Street, Walsall WS1 3EB, England.

We, Skidmore 4wd Ltd., 60 Sandwell St., Walsall, WS1 3EB England.

Declare under our sole responsibility that the product:

Product Details	Name	- Lodar	
	Series	- 9200	9300
	Type	- 9200/24	9300/24

To which this declaration relates is in conformity with the essential requirements and/or other relevant requirements, and is compliant with the standards and/or other documents, of the following directives :

EN 301 489-3	(1999/5/EC)	
R&TTE	Low Voltage Directive 300.683	
Safety	BS EN 954-1 to Category 3.	
	BS EN 60204-1	
EMC	89/336/EEC	ETSI 300-320 v1.1.1
Automotive EMC	Approval Granted - e11*72/245*95/54*308*00	
FCC	Approval Granted	
Spectrum	433.92 MHz F1D (EUROPE)	(CE)
	418.0 MHz F1D (USA)	

Please note that this certificate only covers Lodar and not the installation

Martin Skidmore	Position	Date
	CEO	July 2007

**F.C.C. PART 15 INTENTIONAL RADIATOR MANUAL STATEMENT RADIO FREQUENCY INTERFERENCE STATEMENT**

Note, this equipment has been tested and found to comply with the limits for an intentional radiator, pursuant to Part 15, subpart C of the F.C.C. Rules. This equipment generates uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause interference to radio communications.

The limits are designed to provide reasonable protection against such interference in a residential situation. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna of the affected radio or television
- Increase the separation between the equipment and the affected receiver.
- Connect the equipment and the affected receiver to power outlets on separate circuits.
- Consult the dealer or experienced radio/TV technician for help.

**MODIFICATIONS**

Changes or modifications not expressly approved by Skidmore 4wd Ltd. could void the users authority to operate the equipment

Lodar 9200 FM Series and 9300 Narrow Band FM Series are guaranteed for a period of 24 months from the date of purchase, as long as it is wired in accordance with our instructions, and that the equipment is fitted with an isolation system to shut off all power in event of an emergency.

**CONTACT INFORMATION**

Lodar  
60 Sandwell Street,  
Walsall, WS1 3EB.  
England

Tel: +44 (0)1922 613633  
Fax: +44 (0)1922 626991  
email: sales@lodar.com

[www.lodar.com](http://www.lodar.com)

**FM Series**

System Part No.	Transmitter Part No.
USA ONLY	- 418 MHz
9200-8 <input type="checkbox"/>	9102TX-8
9202-8 <input type="checkbox"/>	9102TX-8
9204-8 <input type="checkbox"/>	9104TX-8
Rest of the World	- 433.92 MHz
9200-3 <input type="checkbox"/>	9102TX-3
9202-3 <input type="checkbox"/>	9102TX-3
9204-3 <input type="checkbox"/>	9104TX-3

**Narrow Band FM Series**

System Part No.	Transmitter Part No.
9300-x <input type="checkbox"/>	9302TX-x
9302-x <input type="checkbox"/>	9302TX-x
9304-x <input type="checkbox"/>	9304TX-x

(where "x" is the channel number)

Channel No. 1  2  3  4  5

Date purchased

Serial No.

For your records, put a cross in the relevant box , & enter date purchased & serial No.