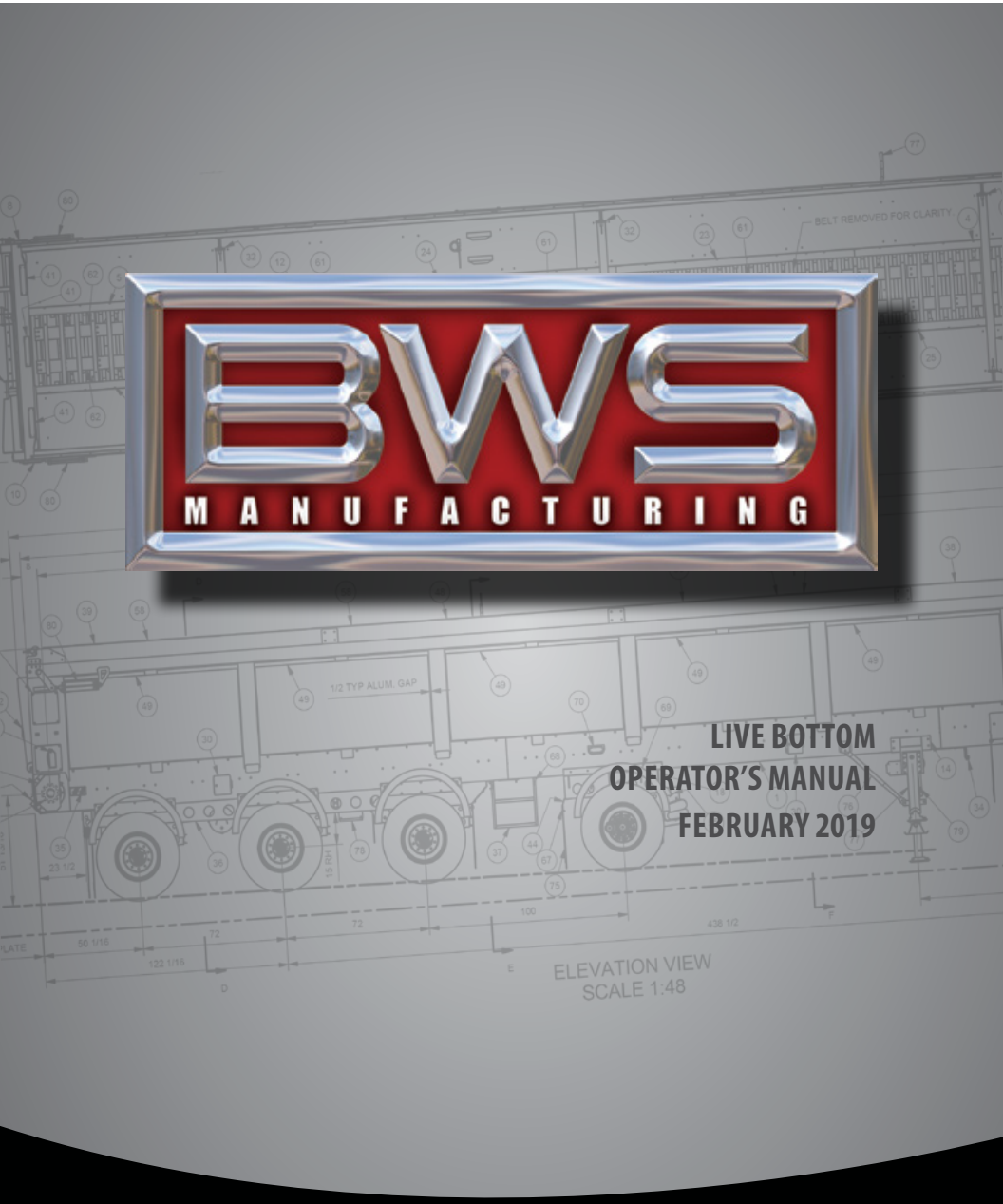
BWS P/N: 40967111 REV: 1



BWS MANUFACTURING

LIVE BOTTOM OPERATOR'S MANUAL

FEBRUARY 2019

www.bwstrailers.com
toll free 888.896.5777

ISO 9001:2015 CERTIFIED

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BWS COMPANY HISTORY

BWS Trailers are engineered, designed and manufactured in Centreville, New Brunswick. It is a family owned and managed business that is dedicated and committed to delivering outstanding value. Its success is built on thinking like the customer and producing trailers that can be relied on year after year without fail.

Since 1967, it has gained and maintained the trust and respect of experienced customers who work in the oil fields, construction, equipment and machinery moving, forestry, road building, paving and private contracting industries.

Originally BWS manufactured custom trailers with a focus on forestry and agriculture. Having built a solid reputation in this rough off-road industry and operating in the tough Canadian environment, BWS continues today to manufacture trailers that are designed to meet the customers' expectations in the environments in which they operate. The units are designed to go to work and stay at work.

BWS has expanded its product line into areas where it can continue to provide high quality solutions that deliver value.

The employees of BWS are a dedicated workforce with a "craftsman" mentality. Many of its senior people have past experience operating trailers and equipment and this has resulted in their philosophy of putting themselves in the shoes of their customers. BWS relies heavily on feedback from both their dealers and their customers. They build what performs, not just what sells and that is what has contributed to their significant growth throughout North America over the last several years.

INTRODUCTION

The BWS product you have just taken delivery of has been carefully designed and built for easy, low maintenance, reliable operation that meets the requirements of a shrewd transportation industry.

We take this opportunity to thank you for choosing BWS, and assure you of our interest in the continued safe and reliable operation of this equipment through its' dealer and service network abroad. BWS trailers require you and anyone else who will be operating or maintaining the trailer, to read this manual carefully and understand the Safety, Operation, Maintenance and Trouble Shooting information contained in the Operator's Manual.

PRODUCTS

AGRICULTURE

Air Detachable Gooseneck AG ULP
Air Detachable Gooseneck AGC
Hydraulic Detachable Gooseneck AG
Hydraulic Detachable Gooseneck AG ULP
Hydraulic Detachable Gooseneck AGC
Hydraulic Detachable Gooseneck AGNR
LandPRO

CONSTRUCTION

Air Ramp Tilt
Air Tilt, No Ramp
Flat Deck, No Tilt
Non-Tilt Tag
Dump trailers
Live Bottom trailers
Equipment trailers
Paving & Recovery
Aggregate Screeners

FORESTRY

Logging trailers, straight and drop frames
B-Train loggers
Jeeps

HIGHWAY

Air Detachable Gooseneck
Highway B-Train
Highway Drop
Highway Flat

SPECIALIZED TRAILERS

Cable Reel
Flip Axle
Mechanical Detachable Extendable
Nuclear Waste
Booster
Turnkey Truck
U Body Dump Sanders
Sander Body
Hopper Sander
Glass Trailers

OIL & GAS

Rigidneck
Scissorneck
Oilfield Float
Oilfied Jeep
Hydraulic Jeep

CERTIFIED
CSA W47.1

QUALITY POLICY

BWS Manufacturing is totally committed to understanding and meeting the quality needs and expectations of all our customers. Our company has a proud reputation for delivering quality equipment and components.

BWS strives for continuous improvement of our product and meeting the objectives of the company. We are also committed to the continuous improvement of our quality management system to insure its suitability to meet all company, customer, regulatory, legal and ISO requirements.

The entire BWS team will adhere to the spirit and intent of our quality policy, as well as the directives of this quality assurance manual and its supporting quality system documentation. We will continue to aggressively strive to insure that customer satisfaction is achieved at all times, and in all things.

Hugo. St-Cyr
CEO

COMPLIANCE PLATE

The compliance plate is located on the road side of the trailer frame. The National Safety Mark (NSM) verifies compliance with all applicable Canadian Motor Vehicle Safety Standards (CMVSS) and/or American Federal Motor Vehicle Safety Standards (FMVSS) , and records the following information.

V.I.N. Vehicle Identification Number

DATE Date of Manufacture

TYPE (TRA/REM) in Canada only
MODEL BWS Trailer Model
G.V.W.R Gross Vehicle Weight Rating is the sum of the trailer weight and the allowable trailer load.

G.A.W.R Gross Axle Weight Rating is the lowest capacity of all the individual components in the axle assembly. It reflects the "weakest link" in the entire suspension system, whether it be springs, axles, wheels, rims or tires.

RIM Rim Diameter x Width
TIRE "Outside Diameter"/ "Width" R "Inside Diameter"

PRESSURE COLD Cold tire inflation pressure in psi (US) / kPa and psi (Can.)

It is the practice of BWS to use maximum pressure for tire inflation.

NSM BWS has been assigned a registration number and has been authorized to use the NSM on their products. The NSM signifies conformance with the CMVSS set by transport Canada.

COMPLIANCE PLATE

0

MANUFACTURED BY / FABRIQUÉ PAR:
BWS MANUFACTURING
CENTREVILLE NEW/NOUVEAU BRUNSWICK CANADA

TYPE OF VEHICLE / TYPE DE VÉHICULE:	TRA / REM	
MODEL / MODÈLE:	0	
GVWR / PNBV:	0 KG	0 LB
TARE:	0 KG	0 LB
DOM / DDF:	0 M/M	0 Y/A
VIN / NIV:	0	

CMVSS · CANADA · NSVAC 543 TRANSPORT

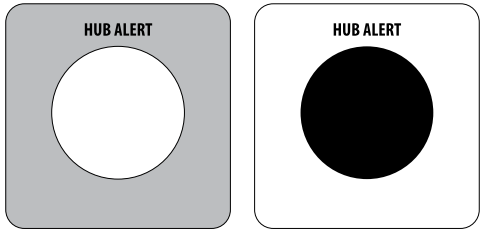
GAWR / PNBE			RIM / JANTE	TIRE / PNEU			COLD INFLATED PRESSURE / PRESS. DE GONFLÉ À FROID	
POSITION	KG	LB	DIMENSION	DIMENSION	S/S	D/J	KPA	PSI / LPC
FR/AV	0	0	0	0			0	0
INT 1:								
INT 2:								
RR/AR								

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FMVSS AND CANADIAN CMVSS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
CE VÉHICULE SE CONFORME A TOUS LES ÉTATS-UNIS APPLICABLES FMVSS ET CMVSS CANADIEN EN EFFET LA DATE DE LA FABRICATION MONTRÉE CI-DESSUS.

HUB ALERT™

HEAT SENSING LABELS
IDENTIFY POTENTIAL BRAKE, BEARING OR SEAL ISSUES BEFORE THEY CAUSE COSTLY REPAIRS!

THE NORMAL OPERATING TEMPERATURE OF HUB/HUBCAP GREASE OR OIL SHOULD NOT EXCEED 225°F (107°C).



- HUB ALERT™ will alert you to above normal wheel end operating temperature!
-
- HUB ALERT™ heat sensing label will turn **BLACK** when hub/hubcap surface temperature reaches 250°F (121°C).
-
- HUB ALERT™ indicates the need for a more detailed inspection of the overheating wheel end.
-
- New HUB ALERT™ label is applied to the hub/hubcap after resolving overheating issues

1.0 SAFETY PRECAUTIONS

SAFETY ALERT SYMBOL

This safety Alert symbol means

ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!

NEEDS DETAILED INSPECTION

The Safety Alert Symbol identifies important safety messages on the BWS trailer and in the manual. When you see the symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

WARNING and ***CAUTION*** with the safety message. The appropriate signal word for each message has been selected using the following guidelines:

DANGER - An immediate specific hazard which WILL result in severe personal injury or death if the proper precautions are not taken.

WARNING - A specific hazard or unsafe practice which COULD result in severe personal injury or death if proper precautions are NOT TAKEN.

CAUTION - Unsafe practices which COULD result in personal injury if proper precautions are NOT TAKEN, or as a reminder of good safety practices.

YOU are responsible for the SAFE operation and maintenance of your BWS trailer. YOU must ensure that you and anyone else who is going to operate, maintain or work around the trailer be familiar with the operating and maintenance procedures and related SAFETY information contained in the operator's manual.

Remember, YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that EVERYONE operating this equipment is familiar with the recommended procedures and follows all safety precautions. Do not risk injury or death.

Remember the difference between being a driver and an efficient operator: Drivers may drive but an operator is a very safe, cost efficient and professional person.

Trailer owners must review operating instructions with operators or employees before allowing them to operate the equipment, and review at least annually thereafter.

The most important device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow them.

Any person who has not read and understood all operating and safety instructions is not qualified to operate the equipment.

Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety of the equipment and affect trailer life.

THINK SAFETY! WORK SAFELY!

1.0 SAFETY PRECAUTIONS

1.1 OPERATING SAFETY

1. Read and understand the operator's manual and all safety signs before operating, maintaining or adjusting the BWS trailer.
2. Do not allow riders on any part of the trailer during road or highway travel.
3. Keep hands, feet, clothing and hair away from all moving parts.
4. Tie load before moving or transporting trailer.
5. Check tie-downs frequently during transport to prevent shifting or movement of the cargo.
6. Clear the area of all bystanders, especially children, before starting up and operating the truck, trailer or equipment.
7. Make sure that all lights and reflectors required by local highways and transport authorities are in place, clean and can be seen clearly by all overtaking and oncoming traffic.
8. Before disconnecting the tractor from the trailer unit(s) make sure that the tractor and trailer are on level ground and that the trailer park brakes are applied.

1.2 MAINTENANCE SAFETY

1. Read and understand all the information in the operator's manual regarding maintenance, adjustment and operation of any BWS trailer or unit.
2. Stop the engine, remove ignition key and set the park brake before adjusting, servicing or maintaining any part of the trailer unit.

1.3 LOADING SAFETY

1. Do not drop load on trailer in order to prevent damaging the trailer.
2. Do not exceed load concentration and total load carrying specifications for trailer.

1.4 SAFETY DECAL MAINTENANCE

1. Keep safety decals and signs clean and legible at all times.
2. Replace safety decals and signs that are missing or have become illegible.
3. When ordering replacement parts that display a safety sign or decal, be sure to order the replacement safety sign or decal also.
4. Safety decals or signs are available from your Dealer Parts Department.

1.5 SIGN-OFF FORM

Anyone operating and/or maintaining a BWS trailer must read and clearly understand ALL safety, operating and maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Review this information annually.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment.

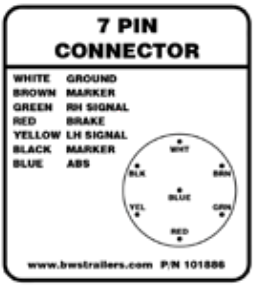
A sign-off sheet is provided for your record keeping to show that all personnel who will be operating or maintaining the equipment have read, the information in the operator's manual and have been instructed in the operation of the equipment.

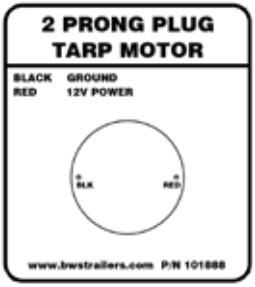
DATE	EMPLOYEE NAME	EMPLOYEE SIGNATURE

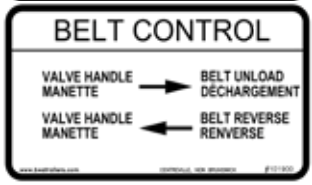
2.0 SAFETY DECALS

The types of decals used on the equipment are shown below. Responsible practices require you to familiarize yourself with the various Safety Decals, the type of warning and the area, or particular function related to that area that requires your SAFETY AWARENESS.

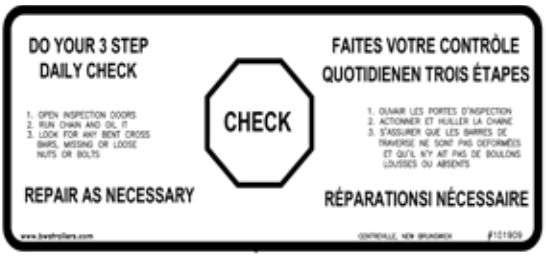
THINK SAFETY! WORK SAFELY!







2.0 SAFETY DECALS



REMEMBER

1. Keep decals and signs clean and legible at all times.
2. Replace decals and signs that are missing or have become illegible.
3. When ordering replacement parts that display a sign or decal, be sure to order the replacement sign or decal also.
4. New decals are available from your authorized dealer.

INTRODUCTION

Your new Live Bottom trailer has been carefully designed and built for easy operation, low maintenance, and reliability that meets the demands of the transportation industry. The Live Bottom trailers are equipped to carry and unload the maximum rated volume of payload at a controlled rate. Horizontal rear unloading is accomplished by a hydraulically powered conveyor belt. For safe, effective and trouble free operation of your Live Bottom, each operator should read this manual to assure that your equipment continues to perform optimally.

3.0 GENERAL OPERATING PROCEDURES

3.1 BREAK-IN/INSPECTION

Time and distance specify the normal break-in procedure for the BWS trailer:

1. Check slack adjuster function for the first 3 weeks of operation.
2. Check hub oil levels daily for the first 3 weeks of operation.
3. Check tires for proper inflation pressures. Re-torque wheel nuts after 100 km.

3.1.1 500 MILE / 800 KM INSPECTION

After the first 500 miles/800km of service, some "settling in" will have occurred, particularly in the suspension components.

AT THIS TIME:

1. Re-torque all bolts and fasteners paying particular attention to the axle U-bolts, hub studs, upper and lower fifth wheel bolts and the suspension system. Refer to values in the maintenance section when re-torquing.
2. Check tires for proper inflation pressures and rim alignment. Re-torque wheel nuts. Block the axle and spin the wheels. Check for brake drag and wheel bearing adjustment.
3. Check oil levels in hubs. Maintain proper oil level. If any levels are low, check for leaks and repair.
4. Check axle alignment. Refer to maintenance section for procedure.

3.1.2 10,000 MILE / 16,000 KM INSPECTION

1. Check the function and adjustment of the brakes on each axle. No shoes should drag on the drum when the brakes are not applied.
2. Check tire inflation pressures and tread wear. Always match tires with tread wear that is worn to 1/8" in difference. If unusual or excessive tire wear occurs, it indicates something is wrong. Check further to determine the cause and correct it. See tires section for further information.
3. Re-torque all bolts and bolted connections.
4. Visually check all welds and adjacent areas for cracks. Any cracks should be repaired as soon as possible by an authrozied BWS dealer.
5. Ensure all suspension hangers and related members are tight and secure.
6. Check axle alignment. Refer to maintenance section for procedure.

3.1.3 20,000 MILE / 32,000 KM INSPECTION

1. Check each brake lining for wear. Replace or adjust as required.
2. Check the axle alignment. Refer to maintenance section for procedure. The operator can then go to the service schedule as defined in the service intervals section on page 35.

3.2 PRE-OPERATION VEHICLE INSPECTION PROCEDURE

The safe and trouble-free use of a BWS trailer requires the operator to maintain the unit in good operating condition. To assist the operator, a pre-operation checklist is provided that should be followed each time before the trailer is used. Item numbers in Figure 1 correspond to the following "WALK AROUND SEQUENCE"

WALK AROUND SEQUENCE

STEP 1 – TRAILER FRONTAL AREA

1. Air and Electrical Connections

a. Verify that glad hands are properly mounted, free of damage, not leaking and not worn.

b. Check electrical line receptacle: Ensure that it is properly mounted, free of damage and the plug is adequately seated with safety catch engaged to prevent accidental disconnection.

c. Ensure that air and electrical lines are properly secure against tangling, snagging and chafing with sufficient slack for turns.

2. Lights and Reflectors

a. Check front trailer clearance and identification lights clean and operating.

b. Ensure reflectors present and clean.

STEP 2 - FIFTH WHEEL COUPLING AREA

1. Fifth Wheel (Lower)
a. Secure mount to frame.
b. No missing or damaged parts.
c. No visible space between upper and lower fifth wheel.
d. Locking jaws are around the shank and not the head of the kingpin.
e. Release lever properly sealed and safety latch lock engaged.

2. Fifth Wheel (Upper)
a. Kingpin is not worn, bent or damaged.

3. Sliding Fifth Wheel
a. Mechanism not worn, bent, damaged or parts missing.
b. Properly lubricated.
c. All locking pins present and locked in place.
d. If air operated: there should be no air leaks.
e. Check the fifth wheel is not so far forward that the tractor frame will strike landing gear during turns.

4. Air and Electrical Lines Visible From This Point
a. Ensure lines are properly secured and are free from tangling, snagging, and chaffing.
b. Free of damage, oil and grease.

NOTE!

The tractor items, part of North American Walk Around Sequence have been omitted.

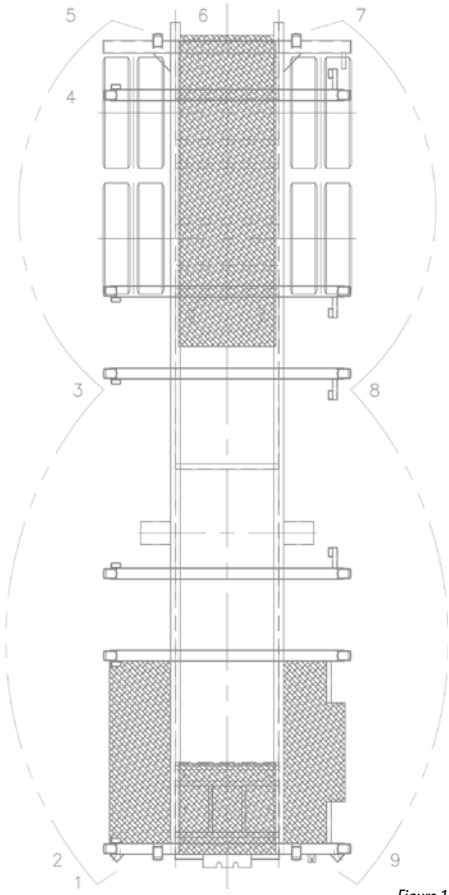


Figure 1

STEP 3 - RIGHT SIDE OF TRAILER AREA

1. Front Trailer Support
a. Fully raised, no missing parts, not bent or otherwise damaged.
b. Crank handle present and secured (typically on left side).
c. If power operated, no air or hydraulic leaks.

2. Spare Tires
a. Carrier or rack not damaged.
b. Tire and/or wheel securely mounted in the rack.
c. Tire and wheel condition adequate. Proper spare tire size, correctly inflated.

3. Lights and Reflectors
a. Clearance lights clean, operating and proper color.
b. Reflectors clean and proper color.

4. Frame and Body
a. Frame and cross members not bent, cracked, damaged or missing.
b. Body parts not damaged or missing.

5. Placarding
a. Proper identification of trailer load.

STEP 4 - BRAKES

a. Check condition of brake linings and drums.
b. Check condition of hoses, lines & valves.
c. Check slack adjusters.
d. Check air chamber mounting.
e. Check spring brakes.
f. Drain moisture from air tank, close petcock

STEP 5 - RIGHT REAR TRAILER WHEEL AREA

1. Wheels/Axles

a. Check condition of wheels and rims. Verify that there are – no cracked or bent rims, broken spacers, studs, clamps or lugs.
b. Condition of tires – properly inflated, valve stems not touching wheel rims or brake drums, valve caps in place, no serious cuts, bulges, tread wear or any signs of misalignment and no debris stuck between the tires.
c. Tires all same type, e.g. DO NOT mix radial and bias types on the same axle.
d. Wheel bearings and hub have no obvious leaking.
e. Mud flaps in place and in good condition.
f. If equipped with sliding axles check position and alignment, look for damaged, worn or missing parts. Check for locking pins in locking position.
g. Ensure that air lines are not cracked, cut, crimped or otherwise damaged and secured against tangling, snagging or chafing.

2. Suspension

a. Condition of spring(s), spring hangers, equalizers and U-bolts.
b. Axle alignment.
c. Condition of torque rod arms and bushings.

STEP 6 - REAR OF TRAILER

1. Lights and Reflectors

a. Rear clearance and identification lights – clean, operating and proper color.
b. Reflectors are clean and proper color.
c. Taillights - clean, operating and proper color.

2. Cargo Securement

a. Cargo properly loaded front to back.
b. Canvas or tarp (if required) are properly secured to prevent water damage or blockage of either the mirrors or rear lights.

STEP 7- LEFT REAR TRAILER WHEEL AREA AND BRAKES

Check all items as done on right side (step 5).

STEP 8- LEFT SIDE OF TRAILER AREA

Check all items as done on right side (step 3).

STEP 9- TRAILER(S) FUNCTIONAL CHECK (TRACTOR ATTACHED)

1. Check for proper connection of air brake glad hands, and secure contact of electrical connection.
2. Start engine.
3. Build up air pressure in the tractor-trailer systems.
4. Turn on lights and inspect for proper function of:
    a. Clearance lights.
    b. Identification lights.
    c. Turn signals and 4-way flashers.
    d. Side marker lights.
    e. Tail lights.
    f. Stop lights
5. Check the function of brakes.
    a. Apply service brakes.
    b. Apply parking brakes.
    c. Apply accelerator with brakes in emergency to ensure park brake functions.
    d. Stop engine.
        i. Release trailer emergency brakes.
        ii. Apply service brakes.

AIR LOSS SHOULD NOT EXCEED:

3 psi per minute on single vehicles.
4 psi per minute on combination.

IMPORTANT!

Broken or malfunctioning equipment is dangerous and is to be replaced immediately.

3.3 FIFTH WHEEL OPERATING INSTRUCTIONS

1. Failure to read, understand and follow the important information contained herein may result in a hazardous condition or cause a hazardous condition to develop.
2. Relative to the tractor trailer operations, there are other checks, inspections and procedures not listed here which are necessary, prudent and/or required by law. The following is in addition to these, and pertains to the fifth wheel only.
3. Perform these procedures with the area clear of obstacles and other personnel.

3.3.1 COUPLING PROCEDURE

1. Visually inspect the equipment before coupling.
   - Make sure the fifth wheel is properly lubricated, the locks are open and the ramps are tilted down in the proper position.
   - Make sure the mounting of the fifth wheel to the tractor or trailer is in good condition and tight.
2. Back up close to the trailer, centering the kingpin in the cradle of the fifth wheel, STOP.
3. Check to see that the trailer is at the proper height for coupling. The leading edge of the trailer plate should initially contact the fifth wheel top bearing surface behind its pivot axis as the tractor or trailer backs under the trailer. Raise or lower the deck supports as required to obtain this position.
4. Back under the trailer, keeping the trailer kingpin centered in the crotch of the fifth wheel.
5. After picking up the trailer with the fifth wheel, STOP, then continue backing until the fifth wheel locks firmly on the king pin.
6. Back up tight to the kingpin. Pull forward to test the completeness of the coupling as an initial check.
7. Visually check to see that the kingpin is in the fifth wheel locks, ensure that it is not overhanging the fifth wheel or caught in a grease groove. There should be no gap between the trailer plate and the fifth wheel.
8. Connect the light cord and the brake lines and be sure any slack in the lines is supported and the brake lines do not become tangled.
9. If your fifth wheel is equipped with a manual secondary lock, check to see that it is properly engaged.
10. Release air to the deck supports until they retract.
11. Hook air lines and light cord from tractor to trailer.

⚠ WARNING!

Attempting to couple the trailer at an improper height could result in a false or improper coupling and could cause damage to the fifth wheel or trailer.

FIFTH WHEEL

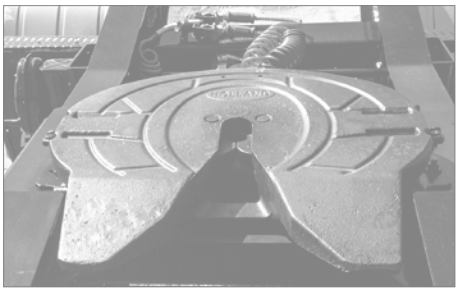


Figure 2

⚠ WARNING!

If you do not obtain a proper coupling, repeat this sequence. Do not use any fifth wheel which fails to operate properly.

⚠ WARNING!

A direct visual inspection is required to assure proper coupling. Several types of improper couplings will pass the initial pull test and the sound is unreliable. Do not take for granted it is properly coupled.

3.3.2 UNCOUPLING PROCEDURE

1. Set the emergency brake on the tractor.
2. Set the trailer brakes with the tractor trailer protection switch.
3. Block the trailer wheels.
4. If the trailer is equipped with air ride suspension, air should be dumped from the air bags after the parking brake is applied and before landing gear is extended.
5. Crank down the landing gear until they touch the ground and give a few extra turns in low gear (figure 4). Do not raise the trailer off the fifth wheel.
6. It may be necessary to provide a base for the landing gear in poor conditions if the trailers are loaded without the tractor attached.
7. Fold down or remove the crack handle and place it in the crank handle holder.
8. Disconnect the light cord and brake lines.
9. Unlock the fifth wheel, including the mandatory secondary lock if so equipped. Dump the suspension if the truck is truck is equipped with an air ride suspension.
10. Release the tractor emergency brake and puill out slowly from under the trailer. Let the trailer slide down the fifth wheel and pick up ramps with minimal impact of the trailer landing gear with the ground.

3.4 TRANSPORTING
3.4.1 BRAKING GUIDELINES
Safe, reliable and trouble-free operation of your trailer requires that the brakes be maintained in good operating condition. The improper use of brakes by the driver can contribute to shorter brake component life, result in system malfunctions, and cause poor tire wear patterns. The following list summarizes some basic operational guidelines for the driver.

1. Check the function of the brake system before starting a trip.
2. Maintain a safe speed at all times. Slow down for rough, slippery, congested, or winding road conditions.
3. Always provide sufficient vehicle spacing on the road to allow for safe stopping distance.
4. Apply brakes gradually to produce an even deceleration until the vehicle is stopped.
5. Watch traffic patterns ahead. Anticipate pattern changes that could result in an emergency. Apply the brakes gradually in sufficient time to produce a controlled stop.
6. Shift to a lower gear to use engine compression as the retarding force when going down steep grades.
7. Do not apply brakes for a long period of time such as when traveling on a long downgrade. Light intermittent brake application will result in proper vehicle control and keep brakes from overheating.
8. Dry the brakes by applying them several times after going through water.
9. Release the brakes just before going over railroad tracks or in other rough conditions. By allowing the wheels to turn over rough road surfaces, there will be no shock loads to the brake system components and the possibility of flat spotting tires will be reduced.
10. Wet, icy or snow-packed surfaces require special care. Make sure ABS is functioning properly.
11. Use wheel chocks, apply trailer and tractor parking brakes when parking the unit.
12. When trailer-parking brakes are applied with hot drums, it may result in a cracked drum. Allow drums to cool before applying the brakes.
13. Fanning, or repeated on-and-off applications, will use up the system air reserves. This procedure is not recommended with ABS. The wasting of air pressure reserves could result in insufficient air pressure should an emergency occur.
14. Hard or panic stops can overheat the linings and drums. Overheating will cause brake fade. Severe overheating and fade can result in the complete loss of braking capability. Overheating will also substantially reduce the expected life of brake components.

3.4.2 TIRES
When operating the trailer, it is the responsibility of the driver to check the tires frequently. Inflation pressures, wear patterns and matching are critical parameters that must be monitored. The following factors affect tire life:

1. INSPECTION FREQUENCY
Tires should always be checked before the start of a run, twice during the day or every 4 hours, whichever comes first. It is also good practice to check the tires at each rest period during the day. When a driver hears or feels unusual handling characteristics, the first items to check are the tires. Problems found early can help avoid more serious problems later on. A sample of typical abnormal wear patterns are shown in the maintenance section of the tire wear problem before proceeding.

2. INFLATION PRESSURE
Tires should always be operated at specified pressures. The tire is designed to run with the full width of the tread flat on the contact surface. Operating at other than specified pressures will change the tread contact patterns and dramatically shorten tire life. In addition, the tires will run hotter and can lead to blow-outs.

Check tire pressure when the tire is cold. A hot tire can read as much as 20 psi higher than a cold tire. If tires are over inflated, check for poor load distribution, uneven surface contact, over-loading or poor operating conditions. For inflation pressures, refer to manufacturers' specifications.

3. TIRE MATCHING
Do not mix radial and bias-ply tires on the same axle. Their operating characteristics are different and will lead to uneven tire loading, rapid tire wear and adverse handling characteristics. Matching also includes combining tires that have the same amount of tread remaining. A tire with more tread has a larger rolling radius and will have to carry a heavier load. The best performance will be obtained when the rolling radius is within 1/8" for all tires on the axle.

4.0 MAINTENANCE AND INSPECTION
4.1 KING PIN AND UPPER COUPLER

WARNING!

Do not attempt to build up a worn kingpin by welding. The heat of the weld may weaken the special steel used to make the component. Work must be done by an authorized service technician only.

Inspect the kingpin and its structure on the trailer at regular intervals to be sure that they have not suffered damage or undue wear. The kingpin should not be bent.

The kingpin should be checked for excessive wear, looseness, chipped areas or cracks. Any kingpin bent or showing the above defects should be replaced or repaired at once.
Inspect the upper coupler assembly for any excessive bowing or cracks. Ensure the entire assembly is safely secured to the trailer by checking the condition of the welds, bolts or rivets, as used in the original construction (Figure 31).

4.2 AXLES
4.2.1 SUGGESTED PREVENTATIVE MAINTENANCE SCHEDULE

1. 18,000 Mile/30,000 km to 24,000 Mile/40,000 km
   - Check brake lining wear and re-line as required.
   - Check brake adjustments and inspect roller, roller shafts, anchor pins and bushings.
   - Inspect brake actuator, camshaft, camshaft bushings, camshaft brackets and camshaft bracket bushings for any wear. Lubricate brake actuating components.
2. 60,000 Mile/100,000 km or at Time of Brake Reline
   - Overhaul and lubricate all brake actuating components.
   - Check all brake chambers.
   - Replace oil in wheel bearings.
3. 100,000 Mile/150,000 km or Min. of Twice a Year
   - Inspect wheel bearings. Check all seals for signs of wear.

4.2.2 AXLE ALIGNMENT

Improper axle alignment with the vehicle frame or chassis will cause excessive tire wear and vehicle dog-tracking. Proper axle alignment is a vital part of your operation (maintenance) and should be checked on a regular basis.

Each BWS trailer is checked for correct alignment before it leaves the factory, but settlement of suspension may necessitate realignment after first 500 miles / 800 km.

The kingpin has a dead-center mark on the bottom side. To ensure proper alignment, a steel tape measure should be run from the center part of the kingpin to an identical location on either side of the front axle.

A small rigid hook in the shape of a question mark made of ¼" bar stock will facilitate this alignment inspection. A steel tape can be attached to the end and this tool hooked over the kingpin. Figure 3 shows another example of a device used for alignment purposes.

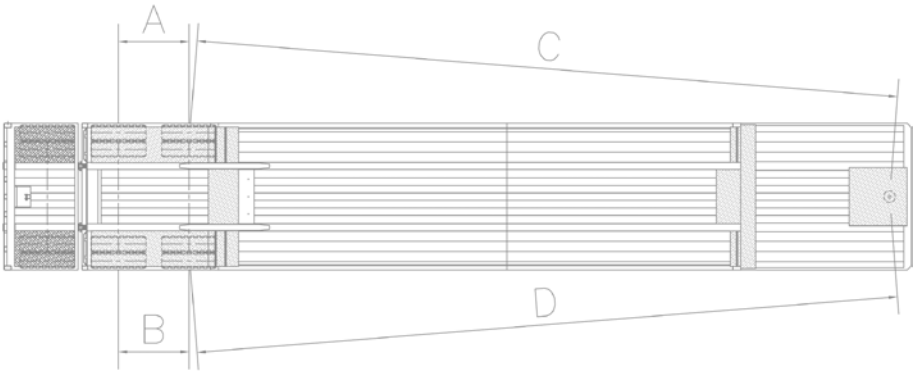
PROCEDURE:

a. Roll the vehicle back and forth over a level floor a few times to permit the connecting linkage to properly position itself and to center front and rear wheel track.
b. Center the vehicle across its transverse and longitudinal sections.
c. Measure the distances "C" and "D" (Figure 3) from the
d. Kingpin to forward axle. These distances must be within 1/8" (3.2 mm) of each other.
e. Measure the distances "A" and "B" (Figure 4) between the front and rear tandem axles.

Figure 3

These distances must be with in 1/8" (1.6 mm) of each other.

Figure 4



The small gauge in Figure 4 simplifies measuring the inner axle distances “A” and “B” in Figure 3. The gauge can be made of drill rod or pipe fittings. The material and details are not important as long as the parts are rigid and true. The pointer arms of the gauge should be parallel and held in the same plane.

If any of these measurements do not fall within the stated limit, the vehicle suspension should be thoroughly inspected for loose, worn or broken connecting and supporting parts. Adjustments in the suspension and the replacement of broken or worn parts should be made to bring the axles into alignment.

The limits of 1/16” and 1/8” appear very small in comparison to the overall dimensions of the vehicle, but they are recognized as the maximum permissible variation. The relatively small size of these limits make it important that measurements be accurate.

Failure to keep the axles properly aligned may cause tire scrub and suspension component strain.

4.3 Wheels

Your trailer may be equipped with either steel or aluminum wheels. Check for damaged (bent) and loose wheels, studs, bolts and nuts regularly.

The following procedure is to be used when mounting Hub-piloted Wheels (Disc Wheels) to an axle:

IMPORTANT!

Replace and repair components as required.

CAUTION!

Insufficient mounting tourque can cause wheel shimmy, resulting in damage to parts and extreme tire wear. Excessive mounting torque can cause studs and cap nuts to break and discs to crack in stud hole area.

CAUTION!

Nuts must be kept tight by retorquing on a routine basis and by using the proper torque sequence. Loose nuts could result in loose wheel or premature wheel failure. This can result in an accident or injury.

1. Mount both wheels and snug up nuts in sequence shown (Figure 5A & 5B).
2. Torque in the sequence shown to proper torque level.
3. Recommended torque 450-500 ft.-lbs. (Torques are for clean dry threads.)
4. Check tires and wheels for proper seating and alignment.

The wheels should be retorqued after running for 50 to 100 miles, whenever they have been removed for maintenance, and when they leave the factory.

4.3.1. WHEEL HUBS

The main type of wheel being used on Air Detachable trailers in the commercial trucking industry today is as follows (Figure 6):

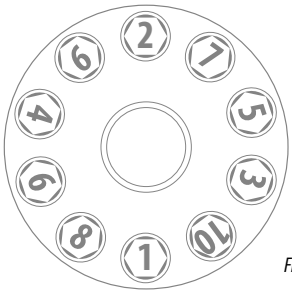


Figure 5A

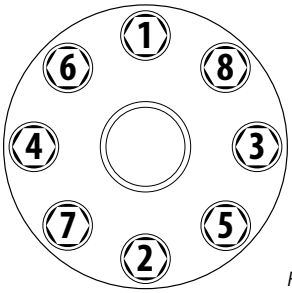


Figure 5B

HUB PILOTED DISC WHEELS:

1. Known as “Motor” wheels or “Unimount” wheels.
2. Have straight through bolt holes, no ball seats.
3. Center large hole of wheel onto pilot guides built on hub.
4. One nut per stud fastens wheels in place.
5. Clamped together with two piece flange nuts and spinning washers.
6. Right hand threads only for left and right sides of the trailer.

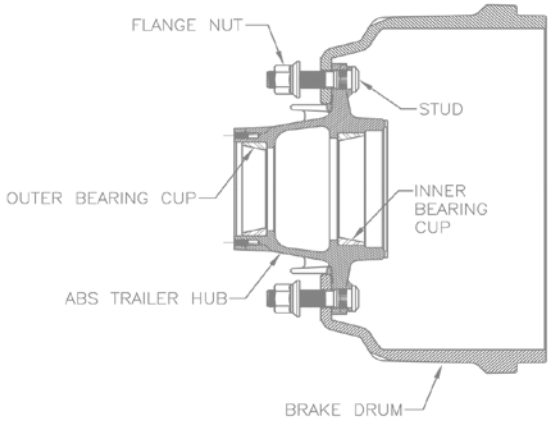


Figure 6

WHEEL BEARING / AXLE DIAGRAM (FIGURE 7)

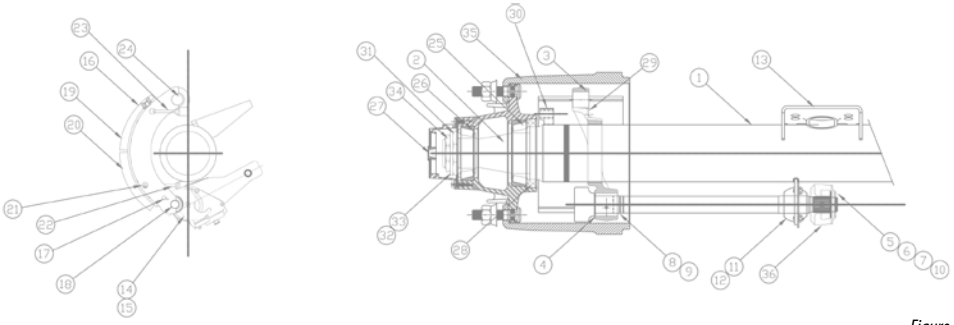


Figure 7

WHEEL BEARINGS PART BRAKE DOWN

ITEM	DESCRIPTION	QTY
1	AXLE FN 77.5 LDA L/SH	1
2	SPINDLE - 0.625 WALL	2
3	SPIDER	2
4	WASHER 1 5/8" CAM	2
5	WASHER - SPLINE END	8
6	WASHER - SPLINE END	2
7	WASHER - SPLINE END	4
8	WASHER - 1 5/8" SPIDER END	2
9	SNAP RING - SPIDER END	2
10	SNAP RING - SLACK END	2
11	CAM BRACKET - LH	1
12	CAM BRACKET - RH	1
13	BRK'T (SMILEY FACE) #	2
14	CAM - LH	1
15	CAM - RH	1
16	BRAKE SHOE FMSI-4515E	4
17	ROLLER RETAINER	4
18	CAM ROLLER	4
19	BRAKE LINING	8
20	RIVET	80

ITEM	DESCRIPTION	QTY
21	SPRING RETAINER	4
22	SPRING RETURN HD 16.5	2
23	SPRING TENSION 16.5 #	4
24	PIN ANCHOR - FUWA #D1	4
25	BEARING ASY 3.543 ID	2
26	BEARING - ASY 2.625 ID	2
27	HUB CAP FN #343-4009	2
27	GASKET H/C 5.5" B.C. #	2
28	SEAL ASSY FN 307-0743	2
29	RUBBER GROMMET	2
30	ABS SENSOR #4410328080	2
30	BUSH - ABS 38997598154	2
31	HHCS 5/16' 18NC 3/4"L	12
31	L'WASHER 5/16 MED	12
32	LOCK WASHER	2
33	STAR WASHER	2
34	SPINDLE NUT - OURTER	2
35	H&D STL H/P 20231UQ6T	2
36	SLACK 6.0" 28 SP 409-	2
37	DUST SHIELD 16.5X7	2

4.4.1 BEARING ADJUSTMENT PROCEDURE

TMC's Wheel End task force (The Maintenance Council task force on tractor-trailer communications) developed the following bearing adjustment recommendations. It represents the combined input of manufacturers of wheel end components.

STEP 1 BEARING LUBRICATION
Lubricate the wheel bearing with clean lubricant of the same type, as used in the axle sump or hub assembly.

STEP 2
Initial Adjusting Nut Torque Adjustment (While Rotating the Wheel) Tighten the adjusting nut to a torque of 200 ft.lbs.

STEP 3 INITIAL BACK-OFF
Back the adjusting nut off one full turn.

STEP 4 FINAL ADJUSTING NUT TORQUE
Tighten the adjusting nut to a final torque of 100 ft.lbs while rotating the wheel.

STEP 5 FINAL BACK-OFF
Back the adjusting nut off 1/8 to 1/4 turn (app. 0.003 inches)

Note: For self-locking nut systems consult manufacturers' specifications. BWS assumes no responsibility for bearing warranty.

Acceptable end play is .001"-.005" As measured with a dial indicator.

Note: Loose wheel bearings are the major cause of seal leakage. Be sure bearing tolerance is correct.

4.4.2 BEARING ADJUSTMENT
Bearings must be correctly adjusted and properly lubricated to achieve maximum bearing life and to prevent damage to wheels, axles, and possibly the trailer. The bearings should be lubricated at regular intervals, depending on vehicle speeds, loads and general operating conditions. Changes of wheel bearing lubricants are recommended every 20,000 – 25,000 miles, or twice a year (Spring & Fall)

Remove wheel assembly and bearing cones. Clean all old lube from hub of wheel bearings & hubcap with a good grade commercial cleaner and a stiff brush, not steel. DO NOT use gasoline or air hose in cleaning operation. Avoid spinning cone while cleaning.

Allow the cleaned parts to dry and wipe them up with a clean, absorbent cloth or paper towel. Clean all tools used in the service operation.

Note: Grease will not adhere to a surface that is wet
with solvent because the solvent may dilute the lubricant.

Cleanliness is most important. Contamination may damage the bearing components.

Inspect seals and seal spring surfaces, bearing cups and bearing cones for indications of wear or damage. Handle all parts carefully during inspection and packaging so the cage will not be bent or the rollers and cone damaged.

Place bearing cones in cups and check for proper fit, and proper number.

Oil Lubricated Bearings – Use a gear type oil
SAE-90 and spread a light coat of oil on all parts before
assembly.

To prevent “Hot” bearings and provide for maximum load carrying capacity, bearings should be kept free of “slack” and “play”. For positive close adjustment, a torque wrench should be used to tighten the bearing to the manufacturers’ specifications.

Note: It is recommended to replace axle seals each time wheel ends are serviced.

The following procedure will provide for satisfactory bearing adjustment when the torque method is not feasible. It should be noted that whenever wheels, hubs and drums are removed for any purpose, the bearings will require re-adjustment.

With the wheel raised off the ground and the component parts on the spindle, the inner spindle nut should be tightened until there is no “slack” or “play” in the bearings. The inner nut should then be backed-off approximately one-half turn. The lock (thrust) washer is then placed in position. Next, the outer spindle nut is tightened against the washer.

Once the procedure is completed, the bearings should be given a final check for any “play”. This condition can be corrected by progressive tightening of the inner nut, followed by a readjustment of the lock washer and outer nut.

NOTE: SPINDLE NUT WRENCHES FOR THE VARIOUS AXLE MODELS CAN BE PURCHASED FROM OUR PARTS DEPARTMENT.

4.3 GREASE RETAINERS / OIL SEALS

4.3.1 RING AND SEAL TYPE (OIL) MAINTENANCE

Whenever the wheels must be removed for any reason, the seals should be replaced.

4.3.2 RING AND SEAL TYPE (OIL) REPLACEMENT

Remove the seal from the hub by tapping on the face of the bearing cone. Care should be taken to avoid bending the cone cage or nicking the cone rollers.
If the axle ring is found to be defective, it can be removed by carefully and lightly tapping the ring all around with a ball peen hammer. Extreme care must be exercised to avoid cutting through the ring and damaging the spindle collar. After properly tapping the seal, it should expand so as to be removed by hand. Do not try to force the ring by hitting it from the axle bar side. There is no collar or lip on this side of the ring sufficient to prevent spindle damage.

1. To install the new ring and seal, it is mandatory that the seal manufacturers’ recommended tool be used.
2. Prior to installing the new ring, the spindle should be clean and free from chips, burrs, etc.
3. Apply a thin coating of No. 2 sealer to the spindle axle ring collar.
4. Using the proper tool, install the ring on the spindle. (See manufacturers’ recommendations for the proper position on the ring).
5. Apply No. 2 sealer to the seat’s outer diameter.
6. Using the proper tool, press the seal into the hub until it is properly seated. (Proper seating specifications are available from the seal manufacturer).
7. Inspect the installation to assure that the seal components have bottomed evenly and are in the proper position.

4.4 SUSPENSION SYSTEM (AIR)

The axles are attached to and carried by the suspension system. The BWS trailer uses an air ride suspension system.

Each must be kept tight and in good working order to obtain maximum performance and life. Listed below are BWS suspension service and maintenance procedures to use.

4.4.1 INSPECTION

1. FREQUENCY

a. During pre-delivery inspection.
b. After first 500 miles / 800 km of operation.

2. ACTION

- Check that all fasteners are tightened to their specific torque.
- Check for damaged or broken components.
- Check all suspension system and axle welds or cracks.
- Evaluate tire wear patterns. Use the wear patterns as a guide to determine if maintenance or adjustments are required on the suspension system.
- Check the alignment of the axles.
- Ensure air pressure is being maintained at a pressure greater than 65 p.s.i.

RIDEWELL BOLT TORQUE SPECIFICATION CHART

Bolt Diameter (in.)	Lubricated Threads	
	Torque (Imp.)	Torque (SI)
1 1/2	1,100 ft.lbs.	1,490 N-m
1 1/4	1,000 ft.lbs.	1.350 N-m
1 1/8	500 ft.lbs.	680 N-m
1	360 ft.lbs.	490 N-m
1	460 ft.lbs.	625 N-m
7/8	350 ft.lbs.	475 N-m
3/4	160 ft.lbs.	220 N-m
3/4	190 ft.lbs.	260 N-m
5/8	100 ft.lbs.	135 N-m
3/4	50 ft.lbs.	70 N-m
1/2	25 ft.lbs.	35 N-m

IMPORTANT!

Replace and repair components as required.

RIDEWELL AIR RIDE TORQUE SPECIFICATION CHART

SUSPENSION BOLT TORQUE - MINIMUM SPECIFICATIONS		
LOCATION	**TORQUE (IMP.)**	**TORQUE (SI)**
Eccentric Pivot Bolt	1,000 ft.lbs.	1,350 N-m
Shock Bolt	160 ft.lbs.	220 N-m
Air Spring Connection - 3/4”	50 ft.lbs.	70 N-m
Air Spring Connection - 1/2”	25 ft.lbs.	35 N-m
Bushing Clamp Bolt	190 ft.lbs.	260 N-m

AXLE ADJUSTMENT PROCEDURE:

- AXLE ALIGNMENT SHALL BE IN ACCORDANCE WITH SAE OR TMC RECOMMENDED STANDARDS.
- LOOSEN PIVOT NUT.
- USING 1/2" DRIVE BREAKER BAR, ROTATE ADJUSTER PLATE IN THE DIRECTION OF DESIRED AXLE MOVEMENT.
- ENSURE THAT THE ADJUSTER PLATE AND ALIGNMENT WASHER HAVE MOVED IN UNISON. IT IS IMPORTANT THAT THE BUSHING IS NOT SKEWED IN THE HANGER PRIOR TO TIGHTENING.
- SNUG PIVOT FASTENERS AND RECHECK ALIGNMENT.
- TORQUE PIVOT BOLT USING A 1" DRIVE IMPACT WRENCH AND #6100054 E-20 TORX SOCKET (OR EQUIVALENT) UNTIL THE TORX HEAD SHEARS OFF FROM THE BOLT.
- WELDING OF ADJUSTER PLATES OR ALIGNMENT WASHERS TO THE HANGER SIDEWALLS IS NOT REQUIRED OR RECOMMENDED.

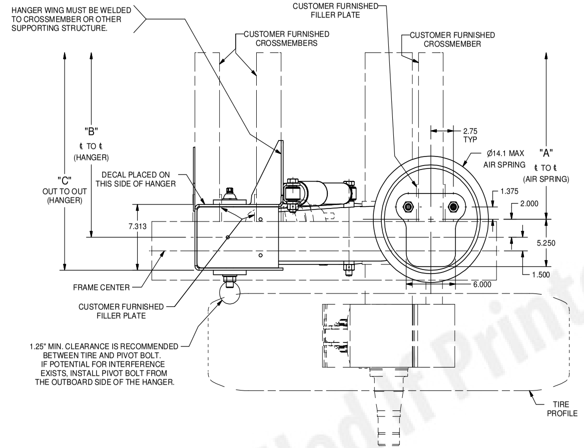
ITEM	SIZE	TORQUE (FT-LB)	TORQUE (N-M)
PIVOT BOLT/NUT	7/8-9	SEE ABOVE	SEE ABOVE
SHOCK BOLT/NUT	3/4-10	200-230	271-312
AIR SPRING NUT, UPPER	3/4-16	45-50	61-68
AIR SPRING NUT, LOWER	1/2-13	45-50	61-68

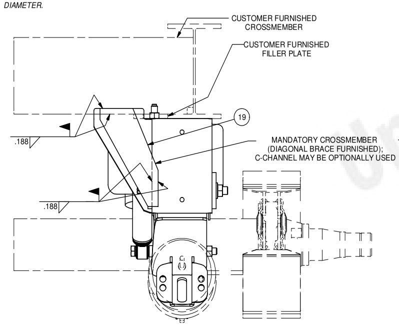
NOTES:

- MAIN PIVOT FASTENERS WILL BE SHIPPED WITH MINIMAL TORQUE APPLIED. IT IS THE INSTALLER'S RESPONSIBILITY TO PROPERLY TORQUE THESE FASTENERS AFTER AXLE IS ALIGNED.
- TORQUE VALUES REFLECT LUBRICATED THREAD CONDITION (NUTS ARE PRE-LUBED).
- SUSPENSION FASTENERS TO BE RETORQUED INITIALLY AT 6,000 MILES (9,656 KM) AND 50,000 MILES (80,467 KM) INCREMENTS THEREAFTER. DO NOT RETORQUE PIVOT FASTENERS.
- FOR BUSHING REPLACEMENT ORDER KIT #6040098; BUSHING INSTALLATION TOOL #6100051 CAN BE USED.
- SUGGESTED CROSSMEMBER LOCATION AND SIZE ARE GIVEN. SIZE AND SHAPE MAY VARY WITH THE TRAILER DESIGN AND ARE THE RESPONSIBLITY OF THE TRAILER OEM.
- STATED DOWN TRAVEL REFLECTS SUSPENSION WITH SHOCK ABSORBERS AT MAXIMUM EXTENSION AND WITH UNPRESSURIZED AIR SPRINGS. STATED UP TRAVEL REFLECTS SUSPENSION WITH AIR SPRINGS AT BUMPER CONTACT.
- STATED CAPACITY RATING FOR SUSPENSION ONLY. RATING OF AXLE, BRAKES, AND WHEEL END EQUIPMENT PER MANUFACTURER.
- CONTACT RIDEWELL FOR AIR CONTROL KIT OPTIONS.
- INSTALLER MUST SET THE SUSPENSION TO THE SPECIFIED MOUNTING HEIGHT BEFORE TORQUING THE PIVOT BOLT TO PREVENT PRE-LOADING THE RUBBER IN THE BUSHING.

CLEARANCE SPECIFICATIONS:

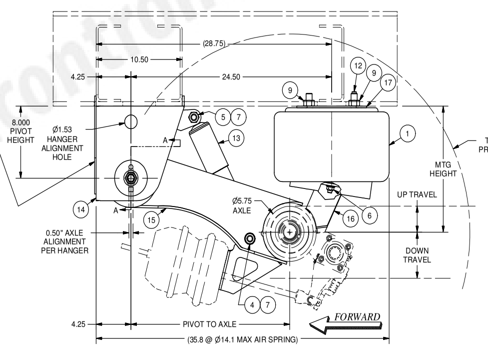
a) 1.5 INCH MINIMUM CLEARANCE REQUIRED BETWEEN TOP OF TIRE AND BOTTOM OF TRAILER STRUCTURE WHEN AXLE IS AT BUMPER CONTACT.
b) 2.0 INCHES MINIMUM CLEARANCE REQUIRED BETWEEN INSIDE OF TIRE AND TRAILER STRUCTURE FOR LATERAL MOVEMENT.
c) 0.75 INCH MINIMUM CLEARANCE MUST BE MAINTAINED AROUND AIR SPRING WHEN IT IS AT MAXIMUM DIAMETER.





NOTES:

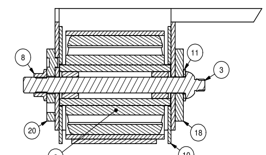
1. FAILURE TO BRACE HANGERS FOR LATERAL LOADS VOIDS WARRANTY.



14 INCH MOUNTING HEIGHT SHOWN

PARTS REQUIRED FOR 6000240 (CARTON OF PARTS)					
PARTS REQUIRED FOR HANGERS AND PIVOT HARDWARE					
PARTS REQUIRED FOR 5960009 (AXLE BEAM PEDESTAL ASSY)					
ITEM	PART NO.	DESCRIPTION	QTY	QTY	QTY
1	1001R14250G	AIR SPRING 1R14-250			2
2	1110084	BUSH CAVITY TENNECO MB96B914260	2		
3	1130031	PIVOT BOLT RD HD SHEAR-TYPE 7/8" 9NC 10"LG		2	
4	1140071	HHCS 3/4" 10NC 10"LG GR8 ZINC PLATE			2
5	1147698B105	HHCS 3/4" 10NC 3-1/4"LG GRADE 5, ZINC PLATE			2
6	1150012	L'NUT 1/2" 13NC FLANGED T-L GR 8 (G)			2
7	1150023	L'NUT 3/4"-10NC CENTER LOCK GR-B			4
8	1150067	L'NUT 7/8" 9UNC FL/TL GrG ZNC		2	
9	1150558B102	NUT 3/4" 16NF GRD 2			4
10	1160021	WEAR WASHER UHMW-PE MODEL 260		4	
11	1160036	WASHER 7/8" F436 ZINC/COATED		2	
12	1230059	PIPE PLUG, 1/4" MNPT, HEX SOCKET, STEEL			2
13	1270563B000	SHOCK ASSY 6" MONROE			2
14	3260272	HANGER ASSY - LH		1	
	3260273	HANGER ASSY - RH		1	
15	4280296	BEAM ASSY - LH	1		
	4280297	BEAM ASSY - RH	1		
16	4670033	PEDESTAL ASSY - LH	1		
	4670034	PEDESTAL ASSY - RH	1		
17	7000894	AIR SPRING MOUNTING PLATE			2
18	7002249	ALIGNMENT WASHER 4.0"OD		2	
19	7002580	BRACE DIAGONAL 266 HANGER			2
20	7002686	ADJUSTER PLATE 4.0"OD		2	

NOTE:
REFERENCE SALES ORDER FOR AXLE SPECIFICATION



SECTION A-A

TRACK WIDTH (IN)	71.50	77.50
DIMENSION "A" (IN)	31.00	37.00
DIMENSION "B" (IN)	35.00	41.00
DIMENSION "C" (IN)	42.31	48.31

MODEL NUMBER	MTG HEIGHT	UP TRAVEL	DOWN TRAVEL	PIVOT TO AXLE
RAR-266-7-15-25-OSW	14.0" 15.0" 16.0"	2.9" 3.9" 4.9"	5.1" 4.1" 3.1"	19.4" 19.0" 18.6"

REV	PROJ / ECR	DESCRIPTION	DATE	BY	CHK	APPD
D	B143	ITEM 8 WAS 1150032, ITEM 11 WAS 1160868B100.	9/13/2017	BWH	MDJ	CJB
C	12112	CHANGE A/SPG PART NUMBER, WAS 1001R14243G	6/19/2015	PMB	MDJ	CJB
B	12112	ADDED ALIGNMENT FEATURE.	4/2/14	MLH	MJ	MLH

DRAWN BY:	MLH	8/20/2013
CHECKED:	MDJ	9/11/2013
APPROVED:	MLH	9/12/2013

PROJECT NO: 12112 — SCALE: B - SIZE NTS, D - SIZE NTS

MATERIAL: SEE B.O.M. — Weight: N/A — Feet

TOLERANCES UNLESS OTHERWISE SPECIFIED: DECIMAL: .X ± 0.1, .XX ± 0.06, .XXX ± 0.030; FRAC: ± 1/16; ANG: X ± 1°; KCC
★WELD TOLERANCES PER ISO W045-02

RIDEWELL CORPORATION
PO BOX 4586 SPRINGFIELD, MISSOURI 65808

TITLE:
25,000LB. CAPACITY
OVERSLUNG SUSPENSION
RAR-266-7-15-25-OSW

SHEET 1 OF 1 — PART NO: 266411400 — REV: D

4.5 SUSPENSION SYSTEM

The axles are attached to and carried by the suspension system. BWS trailers use either a mechanical or air ride suspension system depending on the specifications. Each must be kept tight and in good working order to obtain maximum performance and life. Review the section that applies to your trailer to familiarize yourself with the service and maintenance procedures.

1. FREQUENCY

a. During pre-delivery inspection.
b. After first 500 miles (800 km) of operation.
c. Periodically.

2. ACTION

- Check that all fasteners are tightened to their specific torque.
- Check for damaged or broken components.
- Check all suspension system for axle wear or cracks.
- Evaluate tire wear patterns. Use the wear patterns as a guide to determine if maintenance or adjustments are required on the suspension system.
- Check the alignment of axles.

WARNING!

Axle restraint devices are a maintenance item. Failure to replace broken restraints will results in other suspension component failures.
Componenets damaged by over extending the suspension will no be covered by warranty.

4.6 AIR-RIDE SUSPENSION (FIGURE 8)

Pre-operation Inspection - Before Vehicle is put in Service

a. Inspect all welds at hanger to frame connections.
b. Inspect for proper installation of cross member between hangers.
c. Inspect axle alignment to kingpin.
d. Check automatic air control valve and all line and fitting connections.
e. Inspect air springs with 65 p.s.i. supply air or greater on a level surface for equal pressure and clearance.
f. Inspect for proper mounting height.
g. Inspect pivot bolts as per suspension manufactures specifications.

1. DAILY INSPECTION

Visually inspect trailer to be sure it is level and that suspension ride height is correct. Check for loose or broken parts.

2. ROUTINE MAINTENANCE

30 days

- Check clearance around moving parts. Correct signs of interference.
- Check Axle, weld and bolt connections. Correct signs of security and wear.

60 days - Check all welds.

- Check all pivot connections, suspension and shock.

4.6.1 MAINTENANCE

1. AIR SPRING PROBLEMS

These seldom occur with the air springs unless they are rubbed, scuffed or punctured. If they fail, the chassis will settle down on the rubber bumper and you can drive to the next service depot for repairs. Identify and correct the cause of this problem before continuing. (Figure 11)

2. AIR SPRING REPLACEMENT

a. Exhaust air from system.
b. Raise vehicle and support on safety stands.
c. Remove air spring.
d. Raise new air spring and tighten fasteners to their specified torque.

⚠ CAUTION

Do not raise chassis unless shock absorbers are in place. Without shocks, the air spring will be over-extended and damaged.

3. SHOCK ABSORBERS

Shock absorbers absorb vibration energy from the system and act as rebound stops for the suspension.

To replace shock absorber:

- Remove end fasteners.
- Install new shock absorbers using new mounting hardware.
- Tighten fasteners at their specified torque.

4. PIVOT BUSHING

The pivot bushing is a very durable, long lasting component. Failures are rare and replacement should be undertaken only when all other potential problem causes have been eliminated.
If replacement is required, obtain the removal/installation tool and replacement kit from your authorized BWS dealer.

4.6.2 PIVOT CONNECTION

The eccentric bolt at the pivot connection should have the anti-turn washer installed. Proper welding can not occur without the washer in place. Check for proper welding as per manufacturer's specifications.

4.6.3 AIR CONTROL SYSTEM

Air is supplied to the air springs by the air supply system from the tractor. A single height control valve on one of the axles monitors the chassis height from the axle and adds or exhausts air from the system as required to maintain a constant distance. The dimension is variable for your trailer and can be controlled by the variable height control adjustment.

4.6.4 HEIGHT CONTROL VALVE

This valve controls the adding or exhausting of air from the air springs. Air is added when the distance between the axle and chassis is decreased. Air is exhausted when the distance increases. A 5 to 15 second time delay is built into the valve to minimize jerking. Replace the valve if it does not function properly.

4.6.5 HEIGHT CONTROL VALVE WITH DUAL RIDE HEIGHT

The use of a single solenoid valve, one or more Height Control Valves can be operated to adjust the air pressure in the spring bellows to a set second position. This valve can also be used to raise and lower crossing uneven surfaces, such as speed bumps in parking lots, or when loading and unloading the vehicle on ferry or transit units.

4.6.6 AIR DUMP VALVE

All air control systems are equipped with a dump valve that allows the operator to exhaust the air from the system in the following situations.

1. Parking trailer. (Loaded or unloaded)
2. Loading or unloading trailers when supported by the deck supports.

AIR DUMP VALVE WITH GAUGE

⚠CAUTION

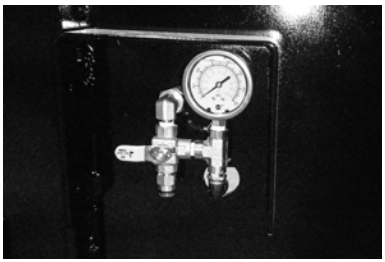


Figure 9

CAUTION
release brakes when exhausting from the air system to allow the

HEIGHT CONTROL VALVE

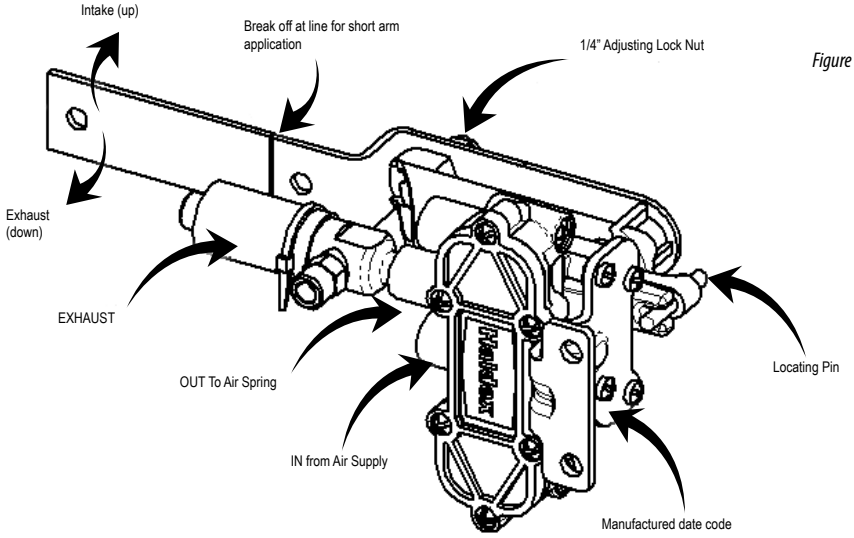


Figure 10

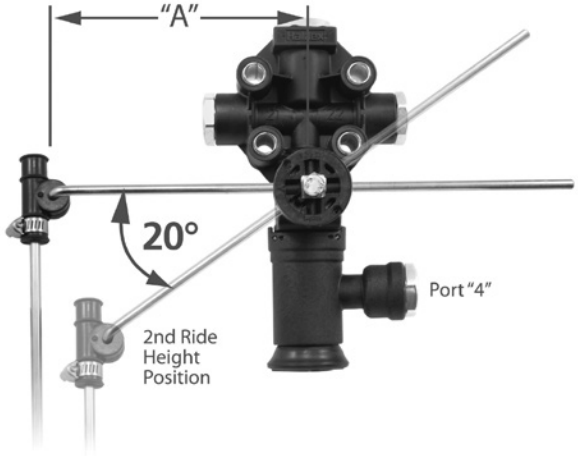


Figure 10A

4.7 BRAKES
BRAKE CHAMBER

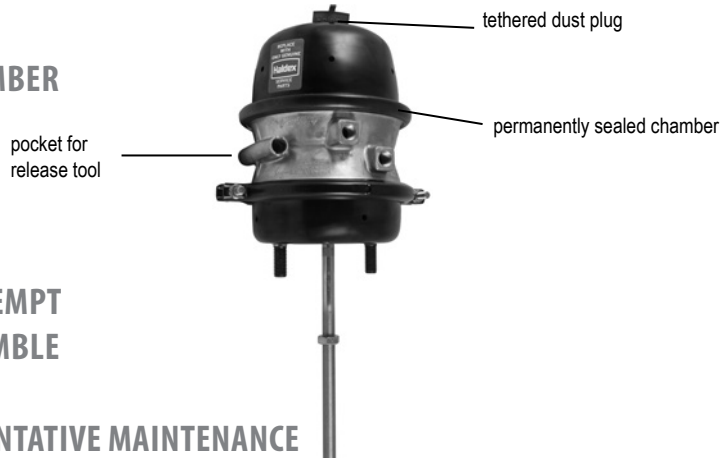


Figure 11

CAUTION:
DO NOT ATTEMPT TO DISASSEMBLE

4.7.1 PREVENTATIVE MAINTENANCE

The operator, on the basis of past experience and severity of operation, should establish a schedule for the periodic cleaning, adjustment and inspection of brake equipment. Drum and linings are particularly subject to wear.

The air brake system needs to be inspected, cleaned, lubricated and adjusted on a regular basis and each time the hubs are removed.

1. BRAKE DRUMS

Inspect brake drums. Any accumulation of mud, dirt or rust on the drums should be removed. Any broken or cracked drums should be removed from service. Brake drum manufacturers do not recommend re-boring of brake drums because of the reduced strength of refaced drums.

2. BRAKE LINING

Check and determine how much of the lining has been worn. Replace linings as required by current safety legislation.

ITEM	PART NAME
1	Retaining Ring
2	Camshaft Adjusting Washer
3	Steel Spacer
4	Grease Seal
5	Camshaft Bushing
6	Grease Fitting
7	Bracket Mounting Bolt
8	Lock Washer
9	Camshaft Bracket
10	Dust Shield Mounting Bolt
11	Lock Washer
12	Dust Shield (Half)
13	Spider Sub-Assembly
14	Anchor Pin Bushing

ITEM	PART NAME
15	Anchor Pin
16	Steel Spacer Plate
17	Camshaft
18	Cam Roller
19	Shoe and Lining Assembly
20	Return Spring Pin
21	Show Retainer Spring
22	Show Return Spring
23	Lining
24	Brake Lining Rivet
25	Snap Ring
26	Washer
27	Bronze Bushing
28	Brake Roller Spring
29	Matching Screw/Nut Combination

BRAKE COMPONENT IDENTIFICATION

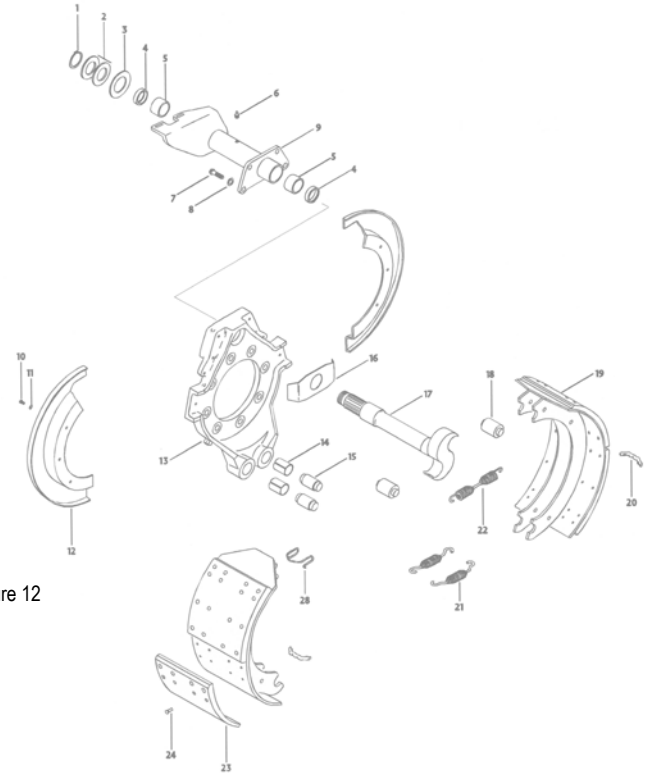


Figure 12

4.7.2 MAINTENANCE

1. BRAKES

Your BWS trailer is equipped with quick change brakes. These brakes require no maintenance other than if they are leaking they must be replaced. Adjustable brakes maintenance and practices can be obtained from your brake manufacture.

2. AUTOMATIC SLACK ADJUSTERS

Trailers are equipped with automatic (self-adjusting) slack adjusters. A self-adjusting slack adjuster should never have to be manually adjusted while in service. The only time it should be adjusted is during installation or at re-line. By constantly manually adjusting, the internal clutch life can be shortened. Consult individual manufacturer for proper adjustment procedure. (Figure 13A & 13B)

SLACK ADJUSTER SCHEMATIC

⚠ WARNING!

Do not attempt to repair or disassemble air brake chambers. A spring brake contains a very powerful compression spring. Incorrect handling may result in forceful release of the piggy back spring chamber and it's contents which could cause death, severe personal injury and/or property damage.

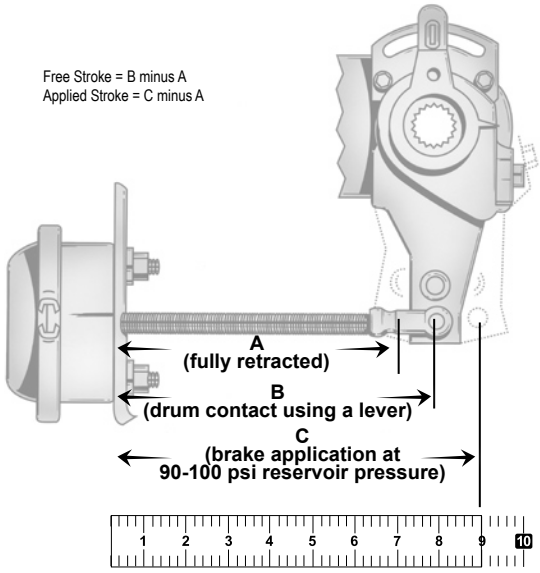


Figure 13A

HALDEX AUTO SLACK ADJUSTER

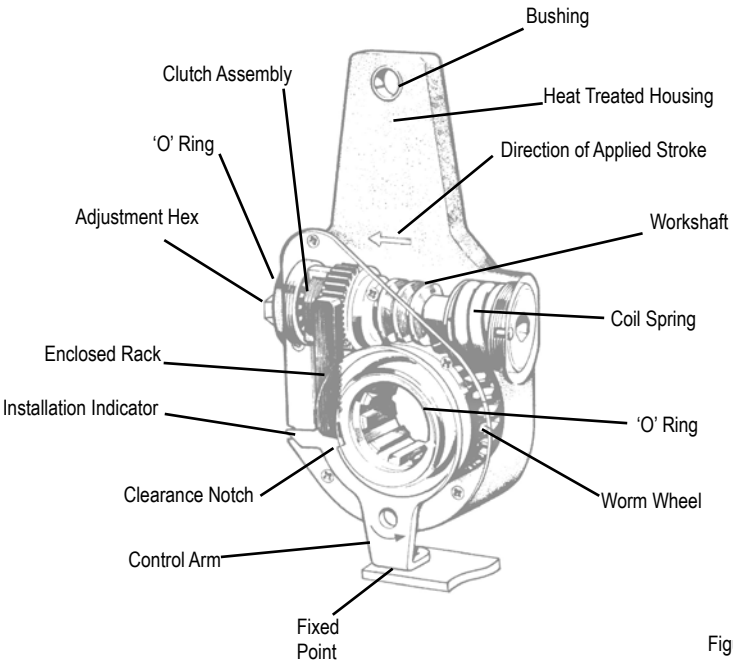


Figure 13B

4.8.TIRES

4.8.1 TIRE CARE AND MAINTENANCE

Although seemingly not requiring instruction, it has been established that through neglect, tires wear fast or fail early, even with the best of maintenance and service that tires deliver.

4.8.2 TIRE INSPECTION

A regular inspection of the tires is the first step in increasing tire mileage. These inspections will help to identify troubles, such as under-inflation, over-inflation and improper alignment. Minor damages, that may be repaired, can be detected during these inspections and save a tire that would otherwise fail.

Inflate tires to manufacturers recommended pressures. Proper inflation costs nothing, but will increase tire mileage. Under-inflation causes abnormal wear at the sides of the tread because the outer edges of the tire carry the load, while the center tends to flex up away from the road. This causes the tire to run hotter.

Tires found to be under-inflated before operation should be returned to the proper pressure.

Over-inflation causes abnormal wear at the center of the tread, also shortening the life of the tire. This is caused because the center of the tire tread carries more than its share of the load.

Check for correct pressure when tires are cool. When a tire is in use and becomes heated, the air in the tire expands and the air pressure increases. Normal pressure build up is 20 pounds or less. Never “bleed” the tire to relieve build up pressure. If excessive build up of pressure occurs, load distribution, under-inflation, speed or any combination of these is responsible.

Over-inflation reduces the ability of the tire to absorb ordinary shock and causes fabric or tread separation, or both, resulting in tire failures. It will not compensate for overloading. An over-inflated tire is more vulnerable to snags, cuts and punctures.

4.9 TORQUE SPECIFICATIONS

4.9.1 MECHANICAL IRREGULARITIES

Mechanical irregularities that will cause excessive wear include a sprung or sagging axle, which will cause the inside dual tire to carry a greater load.

Brakes that are out of adjustment, or out-of-round brake drums will contribute to rapid and spotty tire wear. Improper brake adjustments will lead to spotty tire wear in several places, while out-of-round drums usually wear in a single spot. Improperly adjusted or worn wheel bearings can lead to uneven tire wear. Also improper axle alignment and worn torque rods bushings will cause excessive tire wear.

4.9.2 RADIAL TIRE APPLICATION

Radial and bias-ply tires should never be “mixed” either in dual combination or on the same axle except in an emergency situation. “Mixing” on the same dual combination will result in uneven wear because of different flexing characteristics.

4.9.3 MATCHING TIRES TO RIMS

When mounting tires on rims, be sure the right tires are used on the right rims. Many tire failures can be traced to not having matched the tires properly. In most cases there is a preferred and an alternate rim for the popular tire sizes. The preferred widths are recommended as they provide the optimum rim for the tire ratio. Refer to manufacturer’s recommendations.

The tires of each wheel must be matched to within 1/8” of the same rolling radius (3/4” of the same rolling circumference) under normal loading conditions. The tires should have equal pressures.

4.9.4 TIRE WEAR PATTERNS OVER-INFLATION:

Excessive wear at the center of the tire indicates the air pressure in the tire is consistently too high. The tire is riding on the center tread and wearing it prematurely. Occasionally, this wear pattern can result from extremely wide tires on narrow rims. To correct, replace either the tires or the wheels.

UNDER-INFLATION:

This type of wear usually results from consistent under-inflation. When a tire is under-inflated, there is too much contact with the road by the outer treads, which wear prematurely. When this type of wear occurs and the tire pressure is known to be consistently correct, the need for axle alignment could be indicated.

FEATHERING:

Feathering is a condition when the edge of each tread rib develops a slightly rounded edge on one side and a sharp edge on the other. By running your hand over the tire, you can usually feel the sharper edges before you will be able to see them. The most common causes of feathering are an incorrect toe-in setting, deteriorated bushing in the suspension or misalignment.

ONE SIDE WEAR:

When an inner or outer rib wears faster than the rest of the tire, the need for axle alignment is indicated. Misalignment could also be due to sagging springs or worn suspension system components.

CUPPING:

Cups or scalloped dips appearing around the edge of the tread almost always indicate worn (sometimes bent) suspension parts. Adjustments of axle alignment alone will seldom cure the problem. Any worn component that connects the wheel to the suspension can cause this type of wear. Occasionally, wheels that are out of balance will wear like this, but wheel imbalance usually shows up as bald spots between the outside edges and centre of the tread.

SECOND RIB WEAR:

Second rib wear is usually found only in radial tires, and appears where the steel belts end in relation to the tread. It can be kept to a minimum by careful attention to tire pressure and frequently rotating the tires. This is often considered normal wear but excessive amounts indicate that the tires are too wide for the wheels.

4.10 AIR SYSTEM COMPONENTS

Pressurized air is supplied to the system by the tractor and provides power to release and operate service and parking brakes. A variety of valves can be at various locations in the system and valves must be inspected and functionally checked on a regular basis to insure proper operation.

4.10.1 GLAD HANDS

During the pre-trip inspection, the driver should inspect the glad hands (Figure 14). Check for worn or damaged parts. Replace or repair as required.

Figure 14 Live Bottom Glad Hands

4.10.2 ABS

BWS trailers incorporate a Haldex ABS systems. BWS reserves the right to change suppliers at any time. The following web sites contain valuable information including downloadable copies of ABS service and maintenance manuals.

MERITOR WABCO:

www.arvinmeritor.com (ABS manual: MM-0180)

HALDEX:

www.hbsna.com (ABS manual: L30030HBS)

IMPORTANT!

The air system works best when clean, dry air is supplied from the tractor. Equipping the system with a dryer and a filter pays dividends by reducing maintenance requirements.

4.11 ELECTRICAL SYSTEM

The electrical system features modular, vapor proof GROTE Ultra Blue system that conforms with LED CMVSS 108/FMVSS 108. The lighting system incorporates sealed beam tail-lights and shock resistant clearance lights (Figure 15 through 17).

It is important that all systems are checked each day or before every trip, and that lenses and reflective identification devices are kept clean. The operator should periodically, during night operation, check for lights flickering or momentary outages. This often indicates loose connections, light bulb or lens problems.

TAIL LIGHTS

Figure 15

REAR WORKING LIGHTS

Figure 16

MIDWAY TURN SIGNALS

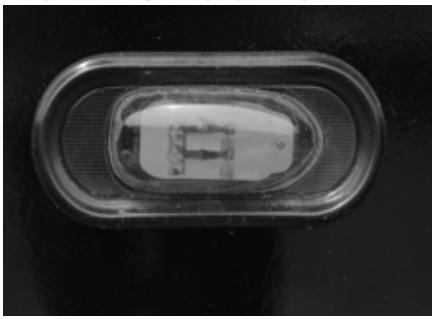
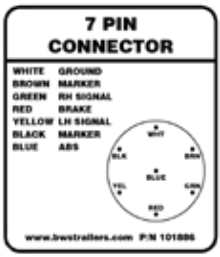


Figure 17

ELECTRICAL DECAL



5.0 OPERATOR INSTRUCTIONS
5.1 LOADING

Prior to loading the BWS Live Bottom trailer, please review government regulations. Do not exceed the trailers gross vehicle weight rating, gross axle weight rating or the maximum trailer payload capacity. Overloading the trailer can result in the trailer operating in a negative manner and potentially causing damage to the trailer or injury to personnel.

The BWS Live Bottom trailer was designed to transport materials such as: hot asphault mix, aggregate materials, sand, top soil, wood chips, fly ash, coal and similarly related products. The Live Bottom trailer is not deisgned for products such as: large boulders and demolitian material or any similar material that would cause damage to the trailer or to the conveyor system. Hauling these unsuitable materials will void the trailers warranty.

Please be careful in how you load the product onto the trailer, so not to cause damage to the trailer or conveyor belt. We recommend dumping this product slowly at first, creating a material bed, to help minimize impact on the conveyor system. Our BWS Live Bottom trailer is designed to carry aggregate products 2 1/2" or less.

When loading the Live Bottom trailer try not to drop the material from too high of an elevation, causing unnecessary impact on the trailer. Be careful not to strike the trailer with the payloader or loading equipment.

5.1.2 UNLOADING

Unloading into a paving machine- Back the BWS trailer up to the unloading location. Stop when backed up to within 1-2ft from the paving machine. Allow the paving machine to drive up to make contact with you. This ensures not bumping the paving machine. Once contact is made, activate the tail gate lock cylinders, opening the rear tail gate locks. This can be done by a tail gate lock switch inside the truck cab.

Once the tail gate locks are open, activate the tail gate lift cylinders, opening the tail gate. This can be done by a switch in the truck cab. You will need to watch the tail gate indicator to make sure the tail gate has successfully opened. (The tail gate locks and lift cylinder can be manuaully operated by the tail gate lock solenoid valve and lift solenoid valve in the control panel on the drivers rear of the trailer).Now that the tail gate is opened, you can start the Live Bottom conveyor. This can be operated from inside the cab of the truck or by manually moving the lever on the control valve, near the drivers side rear of the trailer.

Inside the Truck Conveyor Controls- If the driver is controlling the conveyor from inside the truck cab, the control valve lever has to be "OPEN" or "ON" position (valve lever arm pushed towards the rear of the trailer). While the truck is in neutral and at an idle RPM, the driver engages the PTO to start the flow of the hydraulic fluid to the control valve. Because the control valve is in the "OPEN" or "ON" position, the hydraulic travels through the control valve to the hydraulic motors and starts to unload the conveyor. Speed of the conveyor can be adjusted by changing the RPM of the truck engine.

Manual Conveyor Controls at Control Valve (near rear of trailer) - If the driver is controlling the conveyor manually at the control valve, the control valve must be initially in the "OFF" position. Again, at the proper idle, the driver engages the PTO sending hydraulic fluid to the control valve. This time the conveyor does not start until the control valve handle is pushed toward the rear, opening the control valve, starting to unload the conveyor.

The BWS Live Bottom trailer is equipped with a conveyor reverse option. This needs to be done manuaully at the control valve by pushing the control valve lever towards the front of the trailer. ***NEVER OPERATE THE CONVEYOR IN REVERSE FROM THE INSIDE OF THE TRUCK**. (only manually at the control valve) ***NEVER REVERSE THE LOAD SO THAT THE LOAD PUSHES ON THE FRONT WALL OF THE TRAILER.*NEVER ATTEMPT TO REVERSE THE LOAD WITH MORE THAN 1/4 OF THE TRAILERS MAXIMUM LOAD CAPACITY.**

Trailer Unload Inspection - Once the trailer is empty, let the conveyor run for a minute to make sure it is completely cleaned out. Pull the trailer away, to a safe area to inspect and clean the trailer. **ALWAYS INSTALL THE THE TAIL GATE SAFETY PROPS PRIOR TO CLEANING OR WORKING AROUND AN OPENED TAIL GATE.**

Close the tailgate by the tail gate lift switch inside the cab or manually by the tailgate lift solenoid valve inside the control panel. After the tail gate is closed, lock the tail gate lock switch from inside the truck cab or manually by the tail gate lock solenoid valve in the control panel.

Stockpile Unloading- If unloading at a stockpile location, be careful not to let the pile build up too much at rear, near the hydraulic motor location or at the suspension area. Pull the trailer ahead 5ft and start dumping again when required. You may have to do this several times to unload the full trailer.

5.1.3 TARP OPERATING (OPTIONAL)

The BWS Live Bottom trailer comes with an optional Electric Tarp with Manual Crank back-up.The electric tarp comes complete with the truck side wiring and rocker switch. The rocker switch will be mounted on or in the truck in a place that the driver / operator can still see the tarp as it opens and closes.

To open or close the tarp, push the rocker switch open or close until the tarp is completely extended or retracted. **DO NOT HOLD THE ROCKER SWITCH ON ONCE THE TARP HAS REACHED ITS LIMITS. THIS MIGHT CAUSE DAMAGE TO THE TARP OR THE ELECTRIC MOTOR.**

If the 25AMP cicrcuit breaker gets overloaded and tripped, it will reset itself within one minute. This electric tarp system comes with a manual crank back up. If the electric motor fails, remove the electric motor chain and attach the manual crank chain. Crank the manual crank handle to open or close the tarp. The manual crank pin gets pinned in the crank bracket slot to lock tarp into position. Always keep the tarp all the way open or completely closed when driving. Failure to do so will result in premature wearing of the tarp and cables and will void the tarp warranty.

Figure 18 Electric Tarp

Figure 19 Tarp fully extended

5.2 LIVE BOTTOM CONVEYOR MAINTENANCE AND INSPECTION

5.2.1 CONVEYOR CHAIN TENSIONING

Conveyor Chain Tensioning - It is critical that the conveyor chain has the proper tension. If the chain is too loose, the carrying side of the chain will be tight but the return side may have excessive slack. This can cause the return chain to bunch up and lock on the bottom of the sprocket, causing serious damage to the conveying system.

To apply tension to the chain back off the jamb nuts on the take-up rods. Take-up adjusting rods must be turned equally in small increments from side to side to insure the front shaft is at a right angle to the frame. When one side reaches the correct torque range **(100 ft. lbs),** tighten the 2nd take-up adjusting rod to the same dimension from the shaft to the front bulkhead plate. **DO NOT USE AN IMPACT GUN TO ADJUST TAKE-UP RODS.**

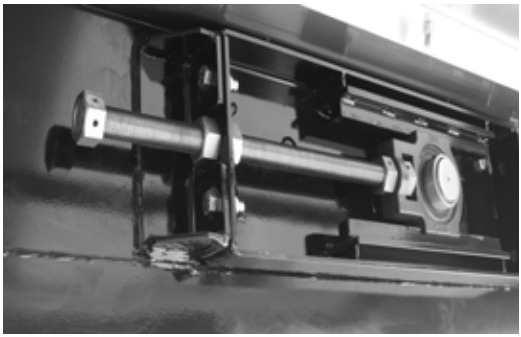


Figure 20 Take-Up Adjustment Rod

5.2.2 CHECKING CONVEYOR CHAIN TENSION

Checking Conveyor Chain Tension - To check the conveyor chain tension, climb under the trailer in between the front axle and the front conveyor sprockets. Push up on the return belt and chain. Ideally, the chain should not lift off the return chain rail by more than 5/8". Another good check would be that, when pushing up on the return belt/ chain, the chain moves as a whole (no individual links kinking or pivoting). If you notice excessive chain lift or individual chain links pivoting, you should increase the tension on the chain tensioning assembly. During the "Break in Period", extra attention must be paid to the chain to keep it well lubricated and properly tensioned. This will help ensure a long life of the conveyor system.

5.2.3 CHAIN OILING SYSTEM

Chain Oiling System - The BWS Live Bottom Trailer is set up with an automatic chain oiling system. When the conveyor system is operating so is the oiling system. The chain oiling flow can be adjusted at the oil regulator valve by turning the (2) knobs at the top of the valve. See figure 21. We recommend adjusting the regulator valve so that the chain stays consistantly slightly moist without over oiling. In the front sprocket area, hydraulic oil is applied to each chain, by a brush. See figure 22. Failure to keep the roller chain properly oiled will result in premature chain failure.

Figure 21 Oil Metering Valve

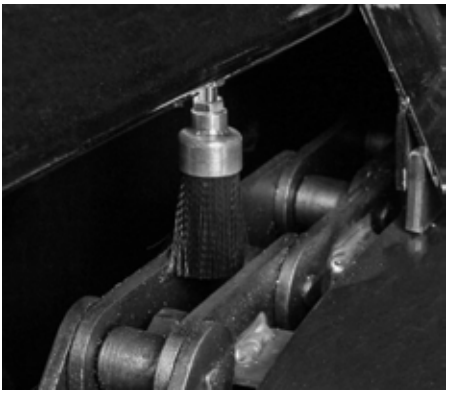


Figure 22 Oiler Brush

5.2.4 CONVEYOR BELT AND INSPECTION

Conveyor Belt and Inspection - Check the conveyor belt for damage like cuts and cracking on a daily basis. Inspect the belt for loose or missing elevator bolts. Check for bent or damaged chain flights. Replace components if required.

The BWS Live Bottom trailer has (2) belt scrapers on it to aid in keeping the belt clean. See figure 24. Both have a high heat / wear resistant piece of UHMW that scrapes the material off. This UHMV needs to be adjusted periodically when you notice it not touching the belt.

Figure 23 Inspection Door

Figure 24 Belt Scraper

5.2.5 MAINTENANCE SAFETY

The safe and efficient operation of your BWS trailer will depend a great deal on your diligence in following the maintenance and adjustment procedures outlined in this section. If you follow these recommendations your trailer will work to its full potential. With adequate attention to regular and preventative maintenance your costs can be reduced significantly.

The various components and systems of your Live Bottom trailer, which will requite daily and/or periodic inspections, maintenance and adjustments are presented in this section.

⚠ MAINTENANCE SAFETY

1. Always block vehicle wheels. Stop engine when working under a vehicle. Depleting vehicle air system pressure may cause a vehicle to roll. Keep hands away from chamber push rods and slack adjusters; they may automatically apply as system pressure drops.
2. Never connect or disconnect a hose or line containing air pressure. It may whip as air escapes. Never remove a component or pipe plug unless you are certain all system pressure has been depleted.
3. Never exceed recommended air pressure and always wear safety glasses when working with air pressure. Never look into air jets or direct them at anyone.
4. Never attempt to disassemble a component until you have read and understood recommended procedures. Some components contain powerful springs and injury can result if not properly disassembled. Use only proper tools and observe all precautions pertaining to use of those tools.
5. Use original manufacturer replacement parts and components.
   - Only components, devices, mounting and attaching hardware specifically designed should be used.
   - Replacement hardware, tubing, hose fittings, etc. should be the equivalent size, type, length and strength as the original equipment.
   - Make certain that when replacing tubing or hose, all supports, clamps or suspending devices that were originally installed by the vehicle manufacturer are reinstalled.
   - Devices with stripped threads or damaged parts should be replaced. Repairs requiring machining should not be attempted.

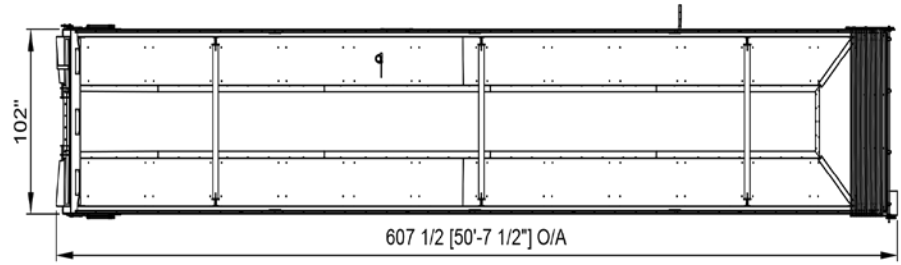
5.2.6 MAINTENANCE AND INSPECTION SUMMARY

COMPONENT	FREQUENCY	INSPECTION
King Pin	30,000 mile/50,000 km or every 3 months	Kingpin wear and no damage to anchoring
Fifth wheel	30,000 mile/50,000 km or every 3 months	Hardware tight and kingpin lock clearance
Wheel Bearing	25,000 mile/40,000 km or every 3 months	Remover wheel for seal leaks, end play, bearing condition and cleanliness
Hub Oil	Daily	Check oil level
Oil Seals	Daily	Check for leaks and replace seals when leaks occur or wheel removed
Brakes	25,000 mile/40,000 km	Check lining wear. Check brake adjustments.
	1000,000 mile/150,000 km	Re-line as required
Wheels	Daily	Check for wobbles, cracked or bent rims and for loose, missing, broken stripped or otherwise ineffective fasteners.
Tires	Daily	Tire pressure Wear patterns

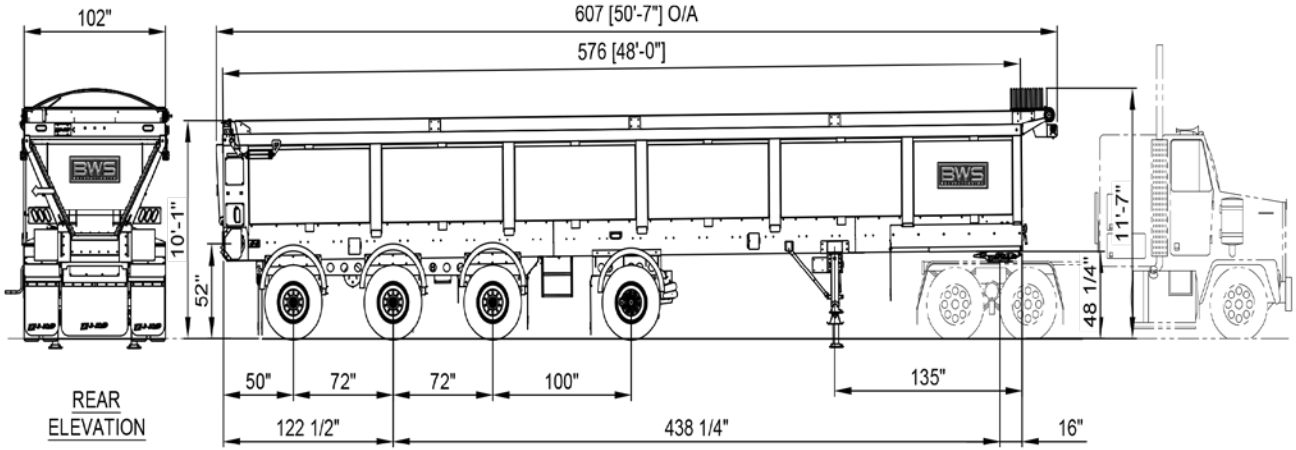
5.2.6 MAINTENANCE AND INSPECTION SUMMARY

COMPONENT	FREQUENCY	INSPECTION
Axles	As required	Alignment to chassis
SUSPENSION		
Air Ride Suspension	Daily, also see section 4.8	Air leakage Hardware tightness Mechanical Height check
AIR SYSTEM		
Relay Emergency Value	Every 3 to 6 months	Perform operating and leakage tests
Glad Hands	Daily	Check for cracks, worn or damaged components.
Spring Brake Value	Annually or 100,000 mile/150,000 km	Perform operating and leakage tests
Relay Value	Annually or 100,000 mile/150,000 km	Perform operating and leakage tests
Reservoir	Daily Every 6 months	Drain air tanks Integral check value function
Air Lines / Hoses	Daily	Check for leaks, chafing, kinking or other mechanical damage
Electrical System	Daily	Check for burned out bulbs and loose connections

COMPONENT	FREQUENCY	INSPECTION
Conveyor Belt	Daily	Check belt for damage, cracks, cuts. Inspect the belt for loose or missing elevator bolts.
Conveyor Chain Tension	Regularly throughout the “Break In Period”	Check that no individual links are kinked or pivoting and that it’s well lubricated.
Planetary Gear Drives	After the first 50 hours of operation	Change the oil in both planetary gear drives. 80W-90 (-26°C), 75W-90 (-40°C)
Lubricant Levels	Daily	Check lubricant levels.



PLAN VIEW

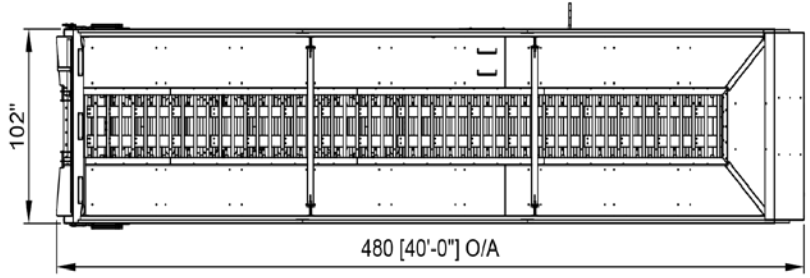


REAR ELEVATION

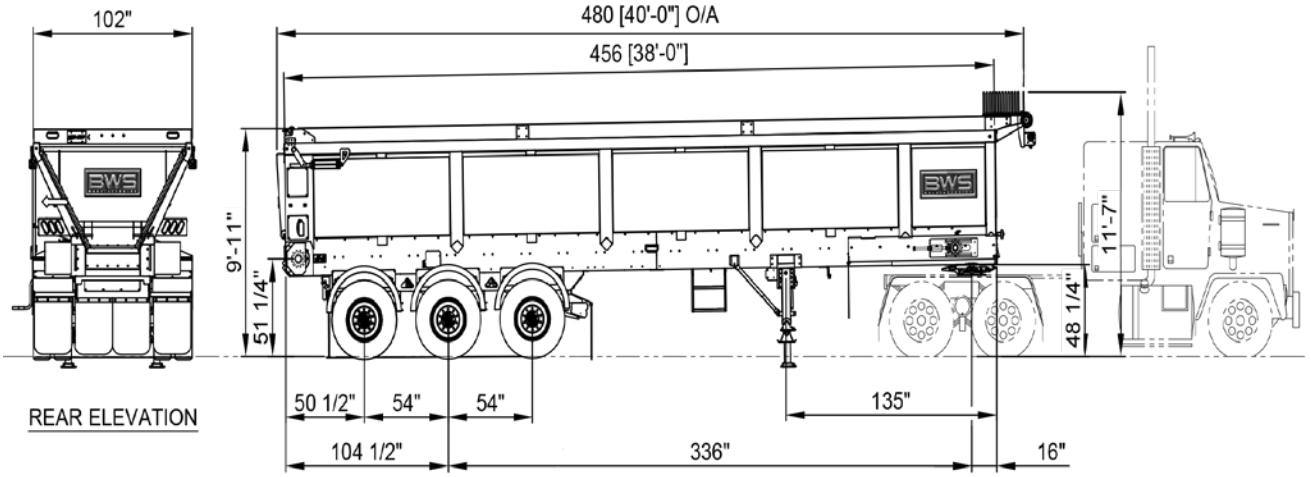
ELEVATION VIEW

MODEL: 48ALB4X LIVE BOTTOM TRAILER

NOTE: ALL DIMENSIONS ARE LOADED & NOMINAL.



PLAN VIEW

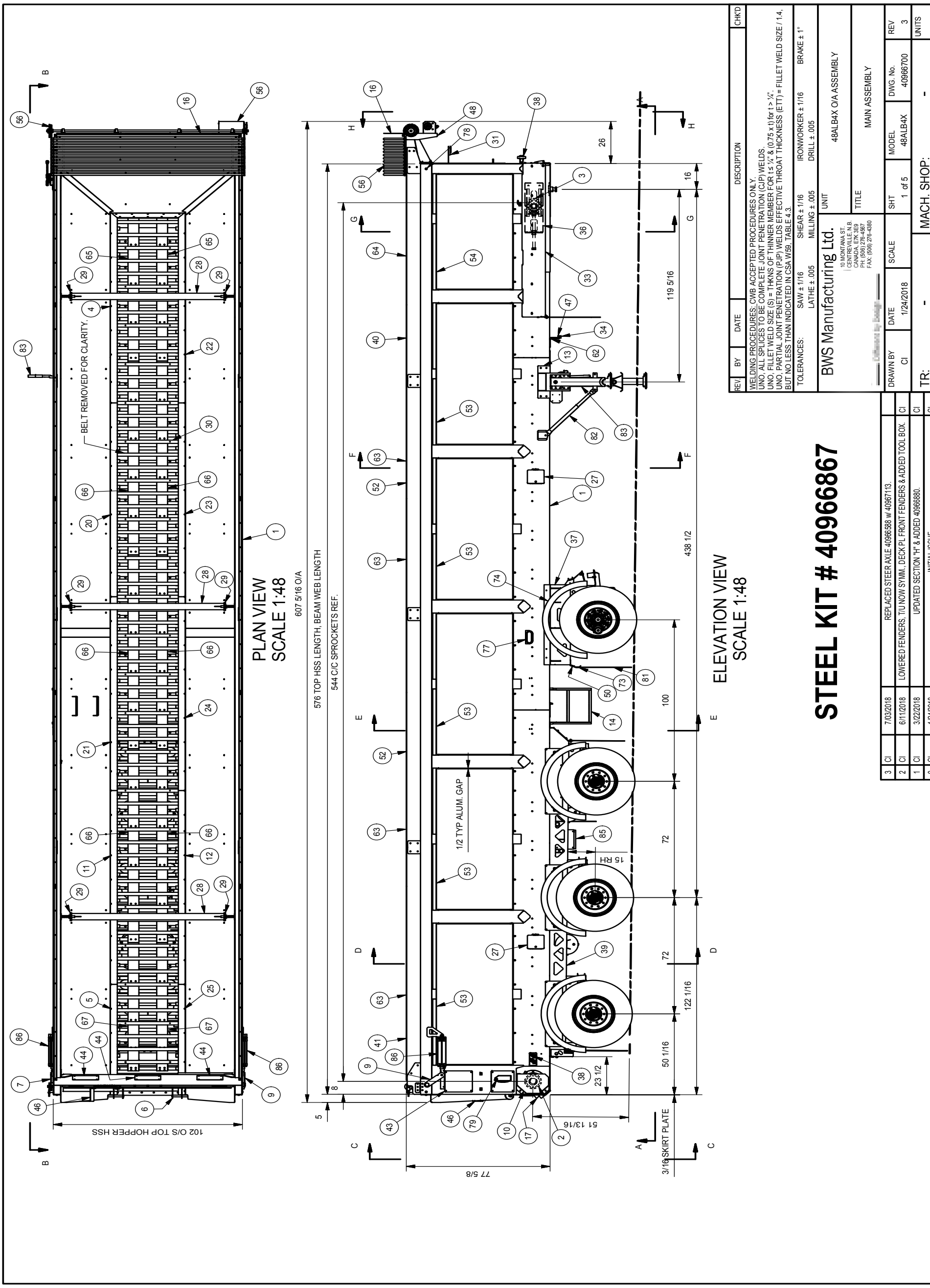


REAR ELEVATION

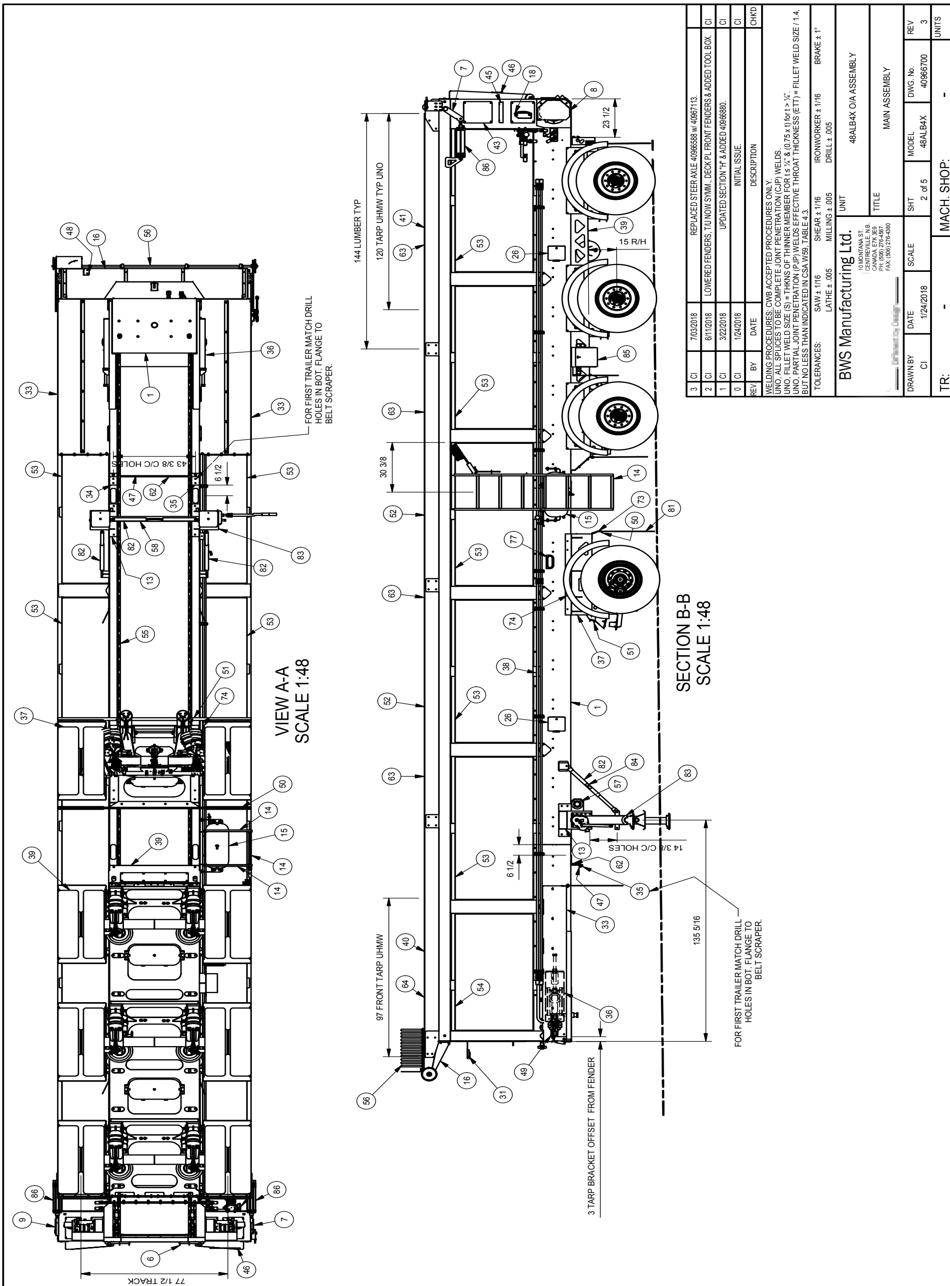
ELEVATION VIEW

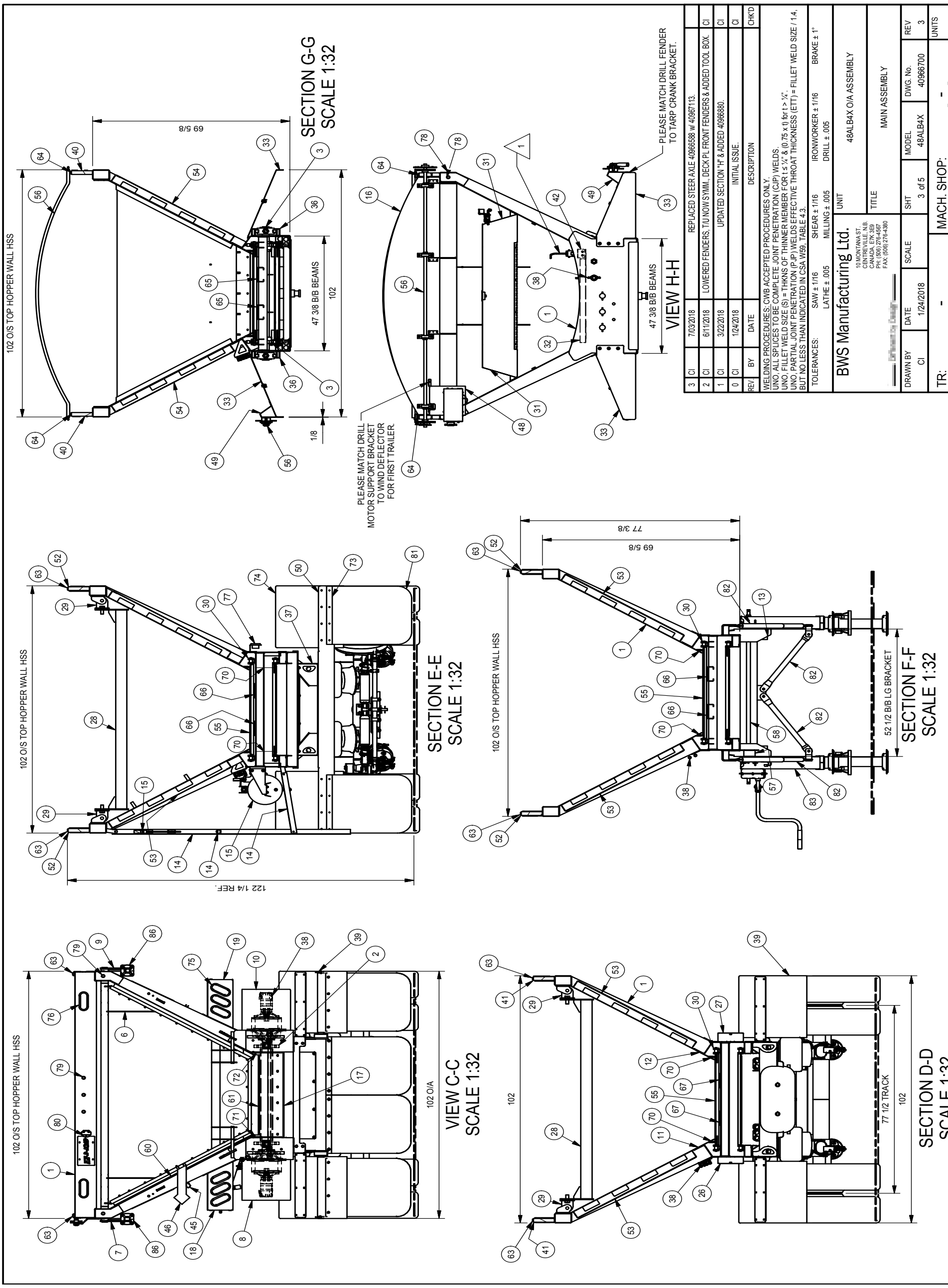
MODEL: 39ALB3X LIVE BOTTOM TRAILER

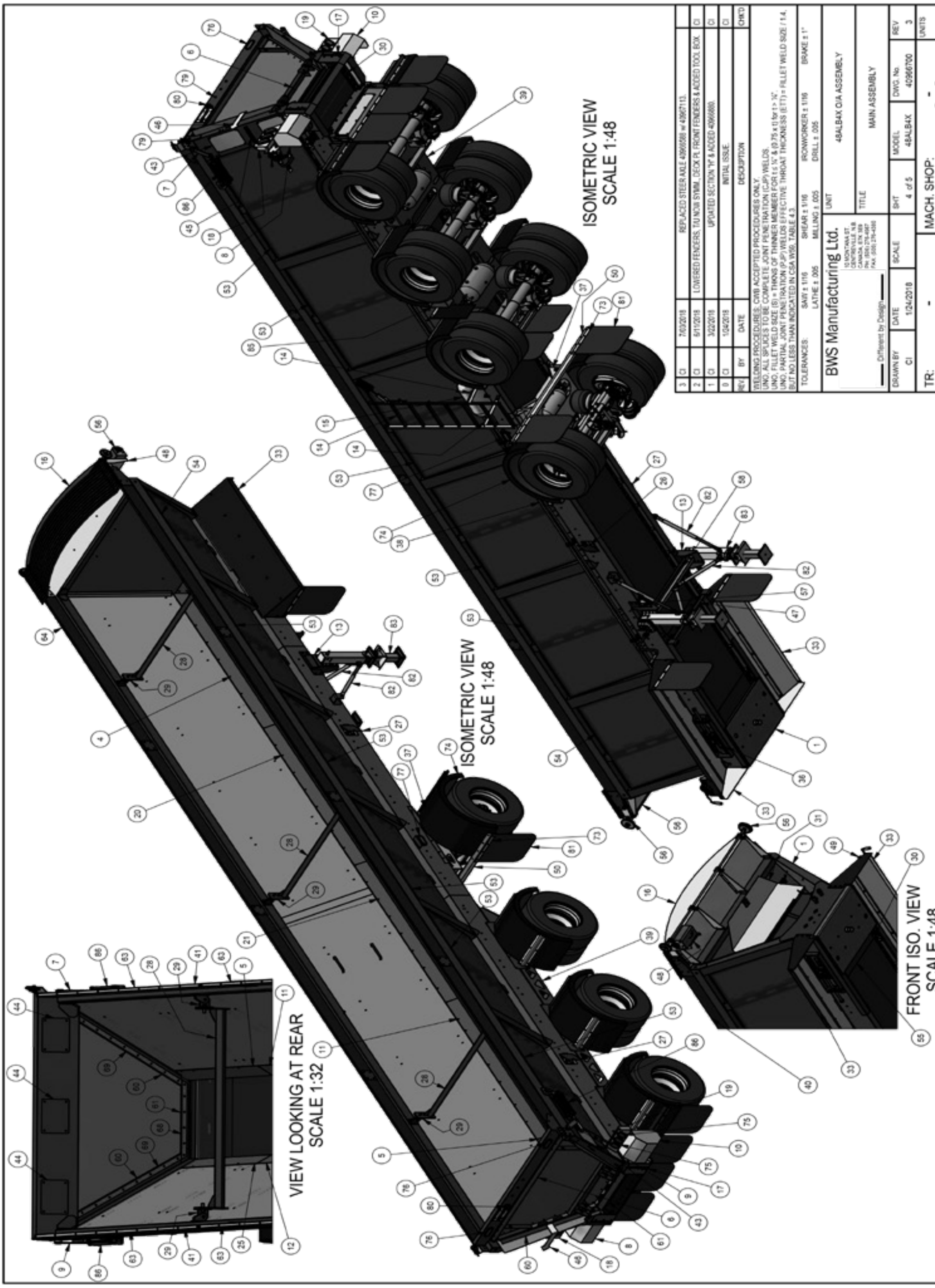
NOTE: ALL DIMENSIONS ARE LOADED & NOMINAL.



PLAN VIEW
SCALE 1:48
BELT REMOVED FOR CLARITY.
102 O/S TOP HOPPER HSS
607 5/16 O/A
576 TOP HSS LENGTH, BEAM WEB LENGTH
544 C/C SPROCKETS REF.
1/2 TYP ALUM. GAP
ELEVATION VIEW
SCALE 1:48
3/16 SKIRT PLATE
STEEL KIT # 40966867
WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
UNO, ALL SPLICES TO BE COMPLETE JOINT PENETRATION (CJP) WELDS.
TOLERANCES:
BWS Manufacturing Ltd.
48ALB4X O/A ASSEMBLY
MAIN ASSEMBLY
DRAWN BY CI
DATE 1/24/2018
SHT 1 of 5
MODEL 48ALB4X
DWG. No. 40966700
REV 3
MACH. SHOP:
REPLACED STEER AXLE 40966388 w/ 40967113.
LOWERED FENDERS, T/U NOW SYMM., DECK PL FRONT FENDERS & ADDED TOOL BOX.
UPDATED SECTION "H" & ADDED 40966880.
INITIAL ISSUE.


VIEW A-A
SCALE 1:48
SECTION B-B
SCALE 1:48
144 LUMBER TYP
120 TARP UHMW TYP UNO
97 FRONT TARP UHMW
3 TARP BRACKET OFFSET FROM FENDER
FOR FIRST TRAILER MATCH DRILL HOLES IN BOT. FLANGE TO BELT SCRAPER.
77 1/2 TRACK
43 3/8 C/C HOLES
14 3/8 C/C HOLES
135 5/16
30 3/8
23 1/2
6 1/2
15 R/H
REPLACED STEER AXLE 40966588 w/ 40967113.
LOWERED FENDERS, T/U NOW SYMM., DECK PL FRONT FENDERS & ADDED TOOL BOX.
UPDATED SECTION "H" & ADDED 40966880.
INITIAL ISSUE.
WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
TOLERANCES:
BWS Manufacturing Ltd.
48ALB4X O/A ASSEMBLY
MAIN ASSEMBLY
48ALB4X
40966700
2 of 5
1/24/2018
MACH. SHOP:


SECTION G-G
SCALE 1:32
VIEW H-H
PLEASE MATCH DRILL FENDER TO TARP CRANK BRACKET.
PLEASE MATCH DRILL MOTOR SUPPORT BRACKET TO WIND DEFLECTOR FOR FIRST TRAILER
102 O/S TOP HOPPER WALL HSS
47 3/8 B/B BEAMS
69 5/8
77 3/8
122 1/4 REF.
52 1/2 B/B LG BRACKET
SECTION E-E
SCALE 1:32
SECTION F-F
SCALE 1:32
VIEW C-C
SCALE 1:32
102 O/A
77 1/2 TRACK
SECTION D-D
SCALE 1:32
3 CI 7/03/2018 REPLACED STEER AXLE 40966588 w/ 40967113.
2 CI 6/11/2018 LOWERED FENDERS, T/U NOW SYMM., DECK PL FRONT FENDERS & ADDED TOOL BOX. CI
1 CI 3/22/2018 UPDATED SECTION "H" & ADDED 40966880. CI
0 CI 1/24/2018 INITIAL ISSUE. CI
REV. BY DATE DESCRIPTION CHK'D
WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
BWS Manufacturing Ltd.
48ALB4X O/A ASSEMBLY
MAIN ASSEMBLY
DRAWN BY CI DATE 1/24/2018 SCALE SHT 3 of 5 MODEL 48ALB4X DWG. No. 40966700 REV 3
MACH. SHOP:
TR:



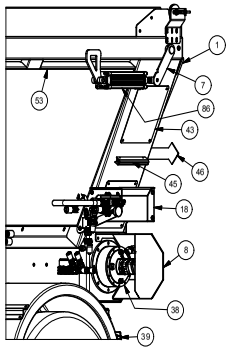
ISOMETRIC VIEW
SCALE 1:48
ISOMETRIC VIEW
SCALE 1:48
FRONT ISO. VIEW
SCALE 1:48
VIEW LOOKING AT REAR
SCALE 1:32
BWS Manufacturing Ltd.
48ALB4X O/A ASSEMBLY
MAIN ASSEMBLY
48ALB4X
40966700

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
1	1		40966316	48LBA4X WELDED ASSY				ASS'Y
2	1		40966324	HEAD SHAFT ASS'Y				ASS'Y
3	1		40966329	TAIL SHAFT ASSY				ASS'Y
4	1		40966352	SKIRT BOARD ASS'Y D/S #1				ASS'Y
5	1		40966356	SKIRT BOARD ASS'Y D/S #5				ASS'Y
6	1		40966381	TAIL GATE ASS'Y				ASS'Y
7	1		40966395	TAIL GATE HINGE / LEVER ARM ASSY D/S				ASS'Y
8	1		40966447	DRIVE GUARD ASSY D/S				ASS'Y
9	1		40966453	TAIL GATE HINGE / LEVER ARM ASSY P/S				ASS'Y
10	1		40966477	DRIVE GUARD ASSY P/S				ASS'Y
11	1		40966479	SKIRT BOARD ASS'Y D/S #4				ASS'Y
12	1		40966484	SKIRT BOARD ASS'Y P/S #4				ASS'Y
13	1		40966493	LANDING GEAR MOUNTING ASS'Y				ASS'Y
14	1		40966538	LADDER ASSEMBLY				ASS'Y
15	1		40966550	ALUMINUM SPRAY TANK ASSEMBLY				ASS'Y
16	1		40966577	TARP WIND DEFLECTOR				ASS'Y
17	1		40966725	REAR SKIRT ASS'Y				ASS'Y
18	1		40966734	TAIL LIGHT BRACKET D/S				ASS'Y
19	1		40966750	TAIL LIGHT BRACKET P/S				ASS'Y
20	1		40966762	SKIRT BOARD ASS'Y D/S #2				ASS'Y
21	1		40966764	SKIRT BOARD ASS'Y D/S #3				ASS'Y
22	1		40966766	SKIRT BOARD ASS'Y P/S #1				ASS'Y
23	1		40966768	SKIRT BOARD ASS'Y P/S #2				ASS'Y
24	1		40966770	SKIRT BOARD ASS'Y P/S #3				ASS'Y
25	1		40966772	SKIRT BOARD ASS'Y P/S #5				ASS'Y
26	2		40966780	INSPECTION DOOR D/S				ASS'Y
27	2		40966785	INSPECTION DOOR P/S				ASS'Y
28	3		40966858	LOAD LEVEL X-MEMBER, PIVOTING STYLE				ASS'Y
29	6		40966863	PIVOTING CLEVIS				ASS'Y
30	1		40966866	48ALB4X CHAIN ASSEMBLY				ASS'Y
31	1		40967014	TOOL BOX COVER				ASS'Y
32	1		40967018	FRONT SPROCKET GUARD				ASS'Y
33	1		40967028	FRONT FENDER ASSEMBLY				ASS'Y
34	1		40967039	FRONT SCRAPER BRACKET R/H				ASS'Y
35	1		40967040	FRONT SCRAPER BRACKET L/H				ASS'Y
36	2		40967044	TAKE-UP O/A ASSEMBLY				ASS'Y
37	1		40967113	UNIVERSAL LB LIFT AXLE WELDED ASSEMBLY				ASS'Y
38	1		40966522	LB HYDRAULIC ASSEMBLY				ASSY
39	1		40966560	LB 3 AXLE SUSPENSION ASSEMBLY				ASSY
40	2		40966841	2 X 8 LUMBER	144 in	7 1/2 in		DWG, CUT, DRILL
41	2		40966842	2 X 8 LUMBER	144 in	7 1/2 in		DWG, CUT, DRILL
42	1	3418	40966880	1/8 ALUMINUM PLATE	3 1/2 in	4 13/16 in	0.12	DWG, SHEAR, IRONW.
43	2	3418	40966439	1/8 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	17 in	13 in	1.53	LASER
44	3	2710G	40966442	10 GA. PLATE	14 in	10 in	0.97	LASER
45	2	3418	40966815	1/8 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	12 1/2 in	4 11/16 in	0.41	LASER
46	1	3414	40967025	1/4 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	23 9/16 in	8 3/4 in	1.43	LASER
47	1	7214	40966874	1/4 50W PLATE	44 3/4 in	7 5/16 in	2.27	LASER, BRAKE
48	1	34316	40966878	3/16 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	16 13/16 in	19 5/8 in	2.29	LASER, BRAKE
49	1	3518	40967031	1/8 ALUMINUM DECK PLATE (3003 GRADE)	14 in	16 1/8 in		LASER, BRAKE
50	1	34316	40967043	3/16 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	102 in	9 3/8 in	6.66	LASER, BRAKE
51	1	34316	40967042	3/16 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	102 in	3 7/8 in	2.72	LASER, BRAKE
52	4		40966715	2 X 8 LUMBER	144 in	7 1/2 in		MATCH DRILL
53	10	3414G	40966363	14 GA. ALUM. PLATE GR.5052-H32 (*SPV COATED*)	87 in	48 in	29.00	MS, SHEAR
54	2	3414G	40966364	14 GA. ALUM. PLATE GR.5052-H32 (*SPV COATED*)	71 in	48 in	23.67	MS, SHEAR
55	1		40966351	36" WIDE 3/16" X 1/16 CONVR BELT				PURCHASED
56	1		40966843	MICHELS GRAVEL GUARD TARP, ELECTRIC c/w MANUAL OVERRIDE				PURCHASED
57	1	402613	RA011G-C001	LOAD SCALE GUAGE c/w PROTECTIVE CASE				PURCHASED

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
58	1	402020	402020	LANDING GEAR X-PIPE	44 7/8 in			SAW, DRILL
59	2	3414G	40967010	14 GA. ALUM. PLATE	24 in	6 13/16 in	1.13	SHEAR, BRAKE
60	2		40966739	3/8 RUBBER (HEAT RESISTANT)	59 7/16 in	9 1/2 in	3.91	STD
61	1		40966741	3/8 RUBBER (HEAT RESISTANT)	37 5/16 in	9 3/16 in	2.38	STD
62	1		40966743	1/2 UHMW QUICK SILVER	35 in	4 1/2 in	1.09	STD
63	8		40966821	1/4" UHMW TYVAR 1000 (WHITE)	120 in	1 in	0.83	STD
64	2		40966822	1/4" UHMW TYVAR 1000 (WHITE)	97 in	1 in	0.67	STD
65	2		40966827	1/2 UHMW QUICKSILVER	91 13/16 in	5 7/8 in		STD
66	6		40966828	1/2 UHMW QUICKSILVER	120 in	5 7/8 in		STD
67	2		40966829	1/2 UHMW QUICKSILVER	79 5/8 in	5 7/8 in		STD
68	1	53316 2	40966868	FLAT BAR 3/16 X 2	32 3/4 in	2 in	0.45	STD
69	2	53316 2	40966869	FLAT BAR 3/16 X 2	55 1/4 in	2 in	0.77	STD
70	8		40966870	3/8 RUBBER (HEAT RESISTANT)	120 in	1 9/16 in	1.30	STD
71	1		40966871	3/8 RUBBER (HEAT RESISTANT)	68 1/4 in	4 in	1.90	STD
72	1		40967024	3/8 RUBBER (HEAT RESISTANT)	68 1/4 in	4 in	1.90	STD
73	6	3518	40900492	1/8 ALUMINUM DECK PLATE	24 in	2 in		STD, SHEAR, IRONW., F.OFF
74	2			07250-FENDER REVOLVE			0.00	STOCK
75	6		06010	GROTE RED TORPEDO TAIL LIGHT				STOCK
76	2		06697	OVAL STROBE LIGHT#77363				STOCK
77	2		06697 + 06533	MIDWAY LIGHT AND GROMMET				STOCK
78	7	49333	06746	GROTE ENHANCE LIGHT, ROUND AMBER, #49333				STOCK
79	9		06751	GROTE ENHANCE LIGHT, ROUND RED				STOCK
80	1	60701	06769	LIGHT, LICENSE PLATE, 60701, BLACK LED				STOCK
81	2		19075	BWS BLACK RUBBER MUDFLAP, 19075, FULL	30 in	24 in		STOCK
82	4		401499	L'GEAR EXTENDABLE BRACE				STOCK
83	1		402253	L'GEAR ASS'Y, AXN PRO 60 WITH STD FOOT				STOCK
84	1	LGP-CH-U	402435	L'GEAR HANDLE CLIP, LGP-CH-U, AXN				STOCK
85	1		402614	CONTROL BOX, SS FOR LIVE BOTTOM				STOCK
86	2	04290	R480677201	CYLINDER, AVENTICS, 4" BORE, 12" STROKE				STOCK



ISOMETRIC VIEW
SCALE 1:24

STEEL KIT # 40966867

REV	BY	DATE	DESCRIPTION	CHK'D
3	Q	7/03/2018	REPLACED STEER AXLE 40966568 w/ 40967113.	
2	Q	6/11/2018	LOWERED FENDERS. TU NOW SYMM., DECK PL. FRONT FENDERS & ADDED TOOL BOX.	Q
1	Q	3/22/2018	UPDATED SECTION "H" & ADDED 40966880.	CI
0	Q	1/24/2018	INITIAL ISSUE	CI

WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
UNO, ALL SPLICES TO BE COMPLETE JOINT PENETRATION (CJP) WELDS.
UNO, FILLET WELD SIZE (S) = THKNS OF THINNER MEMBER FOR t ≤ ¼" & (0.75 x t) for t > ¼".
UNO, PARTIAL JOINT PENETRATION (PJP) WELDS EFFECTIVE THROAT THICKNESS (ETT) = FILLET WELD SIZE / 1.4, BUT NO LESS THAN INDICATED IN CSA W59, TABLE 4.3.

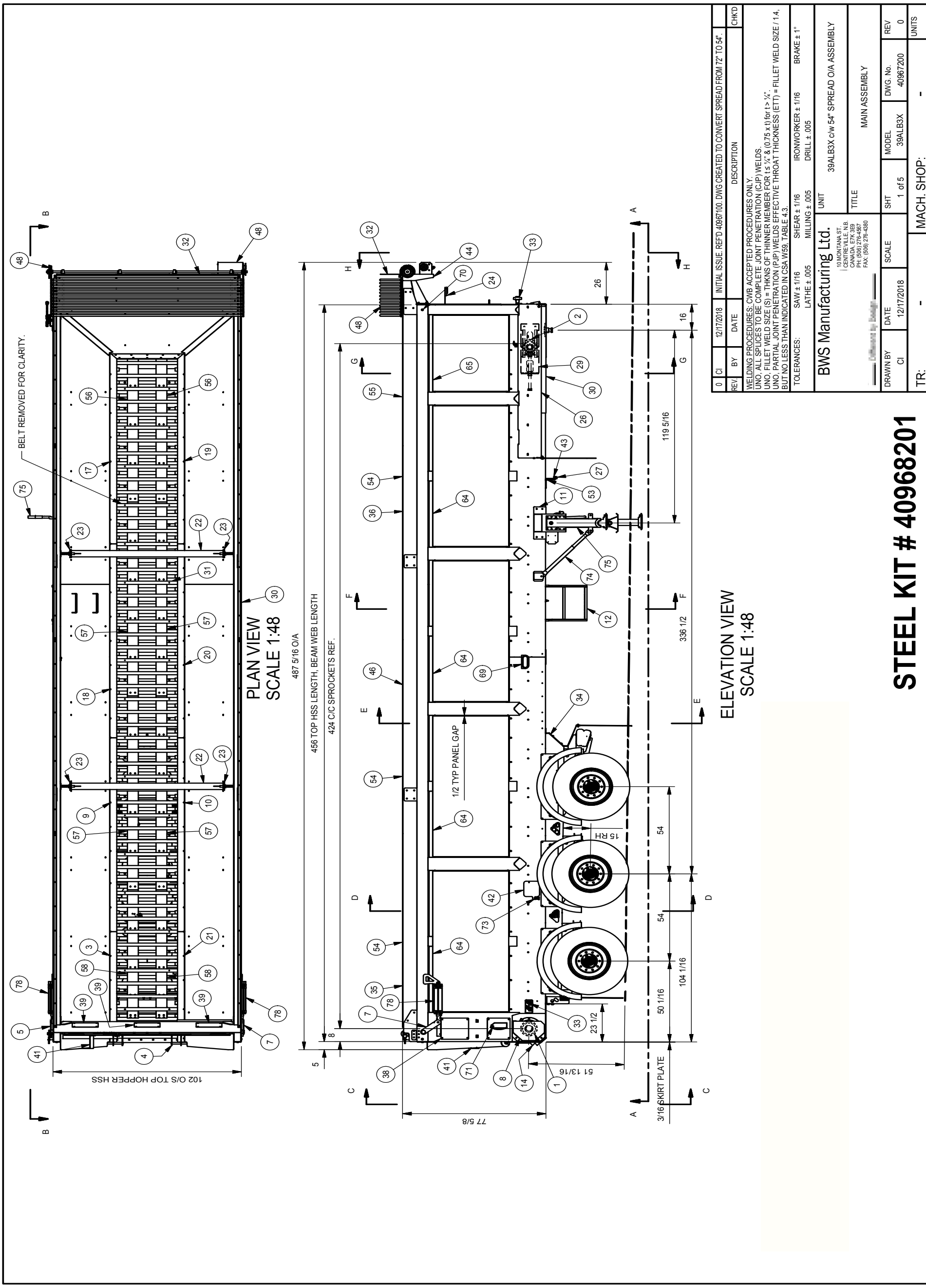
TOLERANCES:	SAW ± 1/16	SHEAR ± 1/16	IRONWORKER ± 1/16	BRAKE ± 1°
	LATHE ± .005	MILLING ± .005	DRILL ± .005	

BWS Manufacturing Ltd.
10 MONTANA ST.
CENTREVILLE, N.B.
CANADA, E7K 2E9
PH: (506) 276-4187
FAX: (506) 276-4089
Different by Design

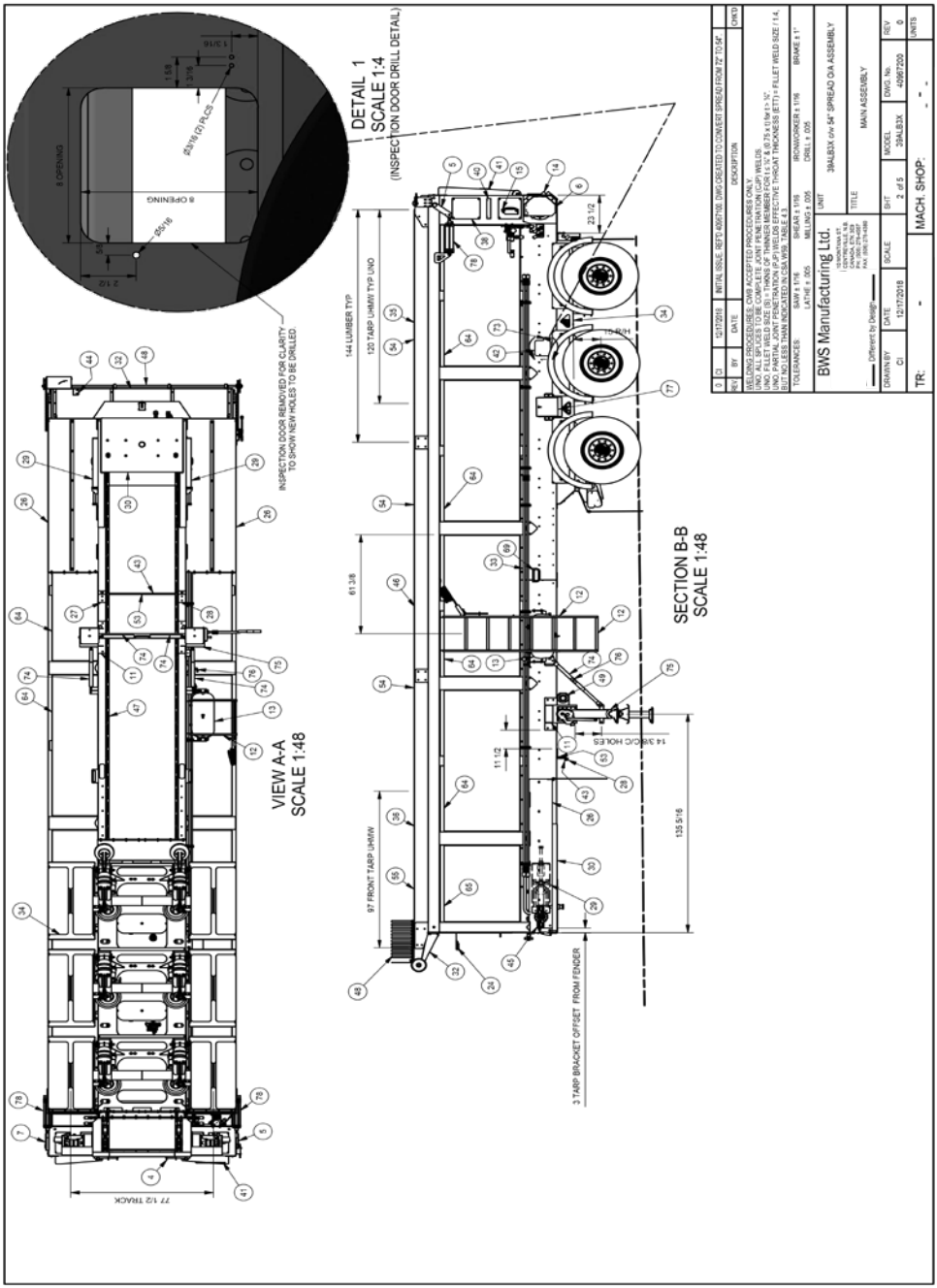
UNIT	48ALB4 X O/A ASSEMBLY
TITLE	MAIN ASSEMBLY

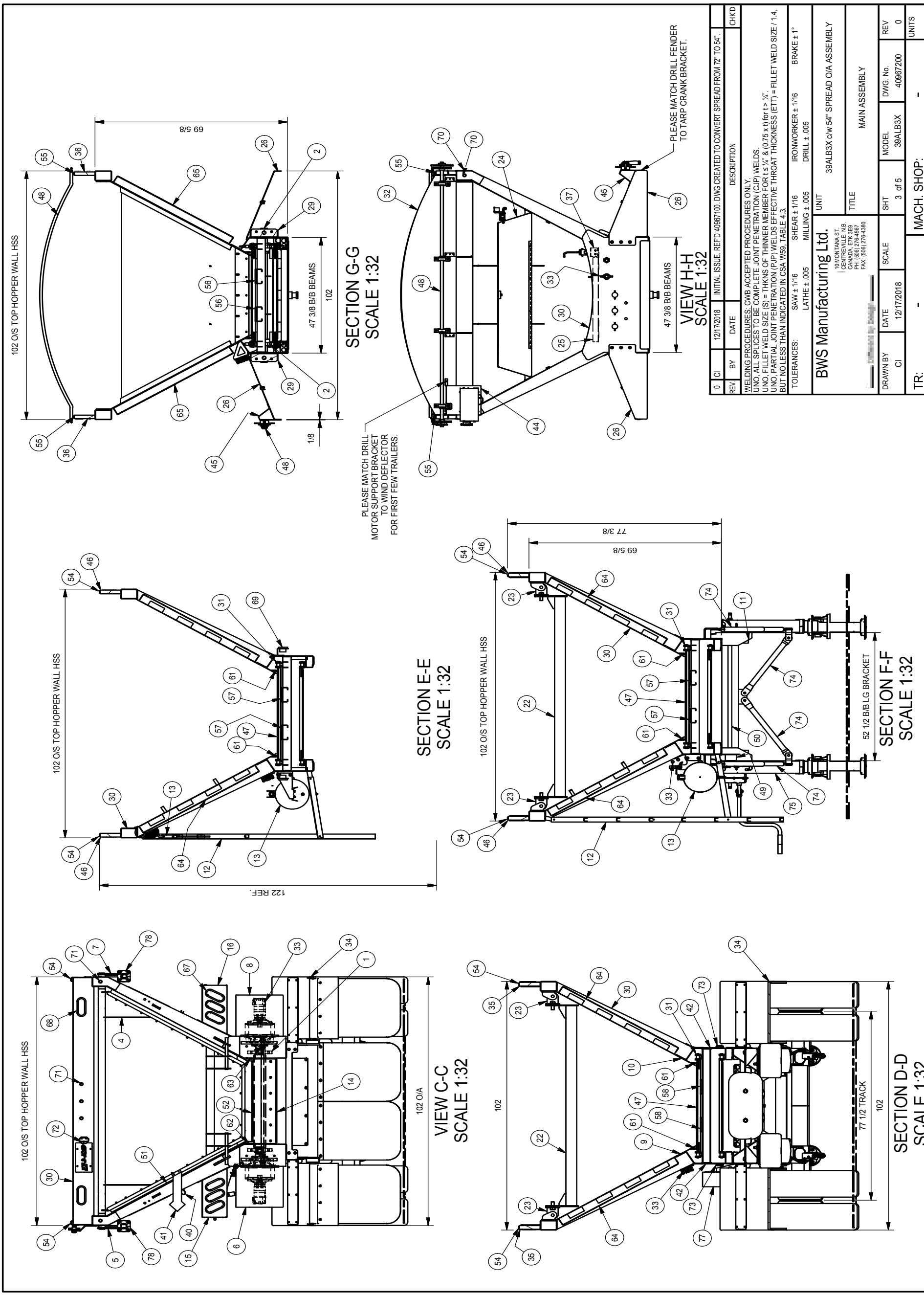
DRAWN BY	DATE	SCALE	SHT	MODEL	DWG. No.	REV
CI	1/24/2018		5 of 5	48ALB4X	40966700	3

TR:	-	MACH. SHOP:	_ - _	UNITS

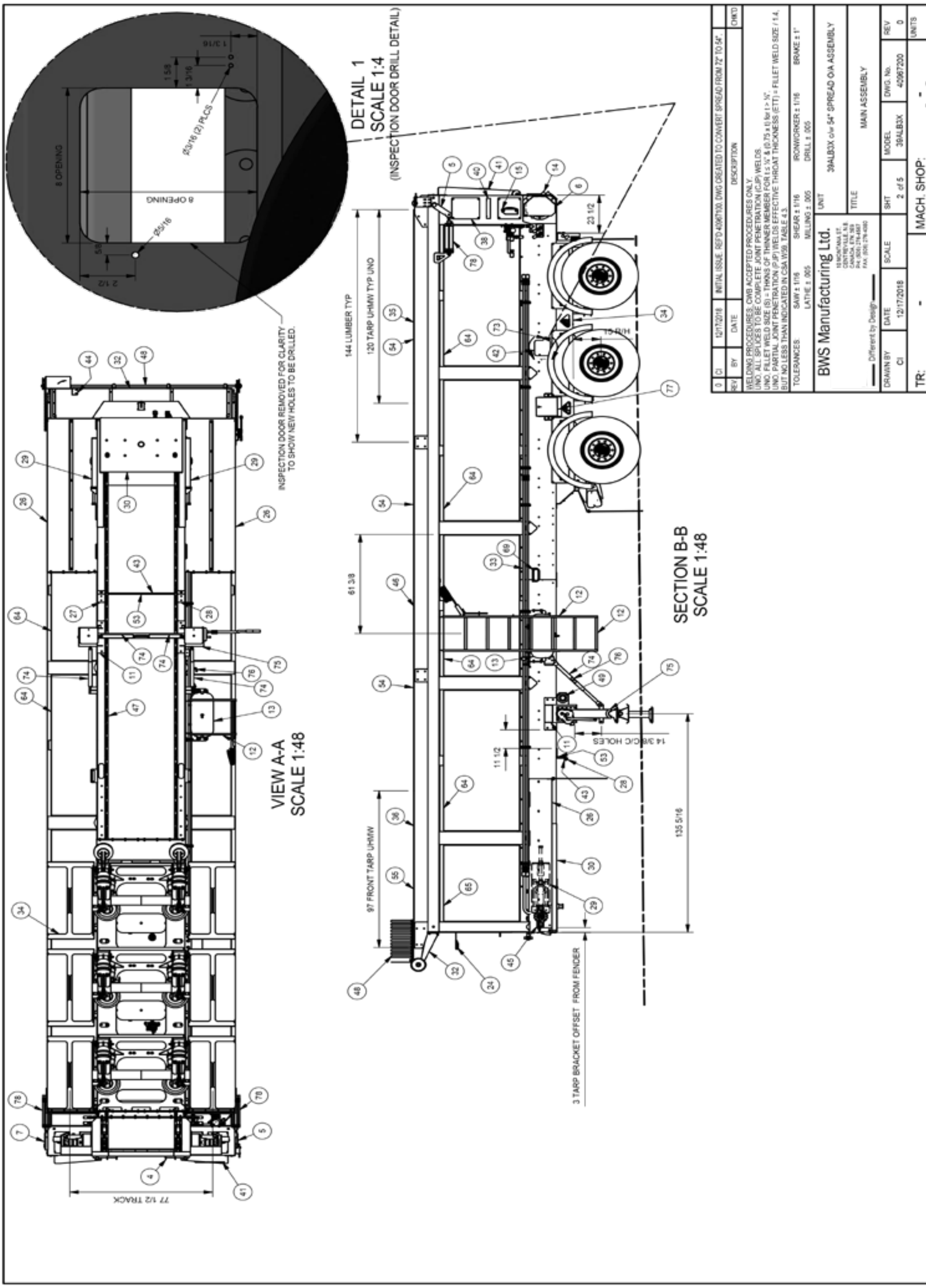


PLAN VIEW
SCALE 1:48
ELEVATION VIEW
SCALE 1:48
BELT REMOVED FOR CLARITY.
102 O/S TOP HOPPER HSS
487 5/16 O/A
456 TOP HSS LENGTH, BEAM WEB LENGTH
424 C/C SPROCKETS REF.
1/2 TYP PANEL GAP
3/16 SKIRT PLATE
STEEL KIT # 40968201
BWS Manufacturing Ltd.
39ALB3X c/w 54" SPREAD O/A ASSEMBLY
MAIN ASSEMBLY
40967200
12/17/2018


DETAIL 1
SCALE 1:4
(INSPECTION DOOR DRILL DETAIL)
8 OPENING
Ø3/16 (2) PLCS
INSPECTION DOOR REMOVED FOR CLARITY
TO SHOW NEW HOLES TO BE DRILLED
VIEW A-A
SCALE 1:48
77 1/2 TRACK
SECTION B-B
SCALE 1:48
144 LUMBER TYP
120 TARP UHMW TYP UNO
97 FRONT TARP UHMW
61 3/8
11 1/2
14 3/8 O/C HOLES
135 5/16
3 TARP BRACKET OFFSET FROM FENDER
23 1/2
BWS Manufacturing Ltd.
39ALB3X c/w 54" SPREAD O/A ASSEMBLY
MAIN ASSEMBLY
DRAWN BY: CI
DATE: 12/17/2018
SCALE: 2 of 5
UNIT: MODEL: 39ALB3X
DWG. No. 40967200
REV: 0
TR: -
MACH. SHOP: - - -
UNITS



SECTION G-G
SCALE 1:32
VIEW H-H
SCALE 1:32
SECTION E-E
SCALE 1:32
SECTION F-F
SCALE 1:32
VIEW C-C
SCALE 1:32
SECTION D-D
SCALE 1:32
102 O/S TOP HOPPER WALL HSS
69 5/8
47 3/8 B/B BEAMS
77 3/8
122 REF.
52 1/2 B/B LG BRACKET
77 1/2 TRACK
102 O/A
PLEASE MATCH DRILL FENDER TO TARP CRANK BRACKET.
PLEASE MATCH DRILL MOTOR SUPPORT BRACKET TO WIND DEFLECTOR FOR FIRST FEW TRAILERS.
0 CI 12/17/2018 INITIAL ISSUE. REF'D 40967100. DWG CREATED TO CONVERT SPREAD FROM 72" TO 54".
REV BY DATE DESCRIPTION CHK'D
WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
UNO. ALL SPLICES TO BE COMPLETE JOINT PENETRATION (CJP) WELDS.
TOLERANCES: SAW ± 1/16 SHEAR ± 1/16 IRONWORKER ± 1/16 BRAKE ± 1° LATHE ± .005 MILLING ± .005 DRILL ± .005
BWS Manufacturing Ltd.
39ALB3X c/w 54" SPREAD O/A ASSEMBLY
MAIN ASSEMBLY
DRAWN BY CI
DATE 12/17/2018
SCALE -
SHT 3 of 5
MODEL 39ALB3X
DWG. No. 40967200
REV 0
MACH. SHOP:
TR:



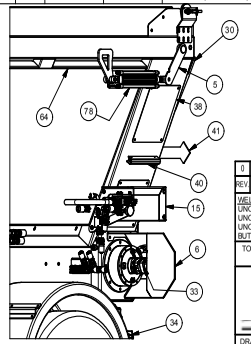
DETAIL 1
SCALE 1:4
(INSPECTION DOOR DRILL DETAIL)
INSPECTION DOOR REMOVED FOR CLARITY TO SHOW NEW HOLES TO BE DRILLED.
VIEW A-A
SCALE 1:48
SECTION B-B
SCALE 1:48
144 LUMBER TYP
120 TARP UHMW TYP UNO
97 FRONT TARP UHMW
3 TARP BRACKET OFFSET FROM FENDER
77 1/2 TRACK
BWS Manufacturing Ltd.
39ALB3X c/w 54" SPREAD O/A ASSEMBLY
MAIN ASSEMBLY
40967200
MACH. SHOP:
TR:

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
1	1	09929	40966324	HEAD SHAFT ASS'Y				ASS'Y
2	1	09928	40966329	TAIL SHAFT ASS'Y				ASS'Y
3	1		40966356	SKIRT BOARD ASS'Y D/S #5				ASS'Y
4	1		40966381	TAIL GATE ASS'Y				ASS'Y
5	1		40966395	TAIL GATE HINGE/ LEVER ARM ASS'Y D/S				ASS'Y
6	1		40966447	DRIVE GUARD ASS'Y D/S				ASS'Y
7	1		40966453	TAIL GATE HINGE/ LEVER ARM ASS'Y P/S				ASS'Y
8	1		40966477	DRIVE GUARD ASS'Y P/S				ASS'Y
9	1		40966479	SKIRT BOARD ASS'Y D/S #4				ASS'Y
10	1		40966484	SKIRT BOARD ASS'Y P/S #4				ASS'Y
11	1		40966493	LANDING GEAR MOUNTING ASS'Y				ASS'Y
12	1		40966538	LADDER ASSEMBLY				ASS'Y
13	1		40966550	ALUMINUM SPRAY TANK ASSEMBLY				ASS'Y
14	1		40966725	REAR SKIRT ASS'Y				ASS'Y
15	1		40966734	TAIL LIGHT BRACKET D/S				ASS'Y
16	1		40966750	TAIL LIGHT BRACKET P/S				ASS'Y
17	1		40966762	SKIRT BOARD ASS'Y D/S #2				ASS'Y
18	1		40966764	SKIRT BOARD ASS'Y D/S #3				ASS'Y
19	1		40966768	SKIRT BOARD ASS'Y P/S #2				ASS'Y
20	1		40966770	SKIRT BOARD ASS'Y P/S #3				ASS'Y
21	1		40966772	SKIRT BOARD ASS'Y P/S #5				ASS'Y
22	2		40966858	LOAD LEVEL X-MEMBER, PIVOTING STYLE				ASS'Y
23	4		40966863	PIVOTING CLEVIS				ASS'Y
24	1		40967014	TOOL BOX COVER				ASS'Y
25	1		40967018	FRONT SPROCKET GUARD				ASS'Y
26	1		40967028	FRONT FENDER ASSEMBLY				ASS'Y
27	1		40967039	FRONT SCRAPER BRACKET R/H				ASS'Y
28	1		40967040	FRONT SCRAPER BRACKET L/H				ASS'Y
29	2		40967044	TAKE-UP O/A ASSEMBLY				ASS'Y
30	1		40967077	38ALB3X WELDED ASS'Y				ASS'Y
31	1		40967099	38ALB3X CHAIN ASSEMBLY				ASS'Y
32	1		40968209	TARP WIND DEFLECTOR				ASS'Y
33	1		40967107	LB HYDRAULIC ASSEMBLY				ASSY
34	1		40968202	LB 3 AXLE SUSP. 54" SPREAD c/w FRONT AXLE LIFT				ASSY
35	2		40966842	2 X 8 LUMBER	144 in	7 1/2 in		DWG, CUT, DRILL
36	2		40967106	2 X 8 LUMBER	168 1/4 in	7 1/2 in		DWG, CUT, DRILL
37	1	3418	40966880	1/8 ALUMINUM PLATE	3 1/2 in	4 13/16 in	0.12	DWG, SHEAR, IRONW.
38	2	3418	40966439	1/8 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	17 in	13 in	1.53	LASER
39	3	2710G	40966442	10 GA. PLATE	14 in	10 in	0.97	LASER
40	2	3418	40966815	1/8 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	12 1/2 in	4 11/16 in	0.41	LASER
41	1	3414	40967025	1/4 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	23 9/16 in	8 3/4 in	1.43	LASER
42	2	2710G	40968213	10 GA. PLATE	11 1/4 in	8 1/2 in	0.66	LASER
43	1	7214	40966874	1/4 50W PLATE	44 3/4 in	7 5/16 in	2.27	LASER, BRAKE
44	1	34316	40966878	3/16 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	16 13/16 in	19 5/8 in	2.29	LASER, BRAKE
45	1	3518	40967031	1/8 ALUMINUM DECK PLATE (3003 GRADE)	14 in	16 1/8 in		LASER, BRAKE

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
46	2		40966715	2 X 8 LUMBER	144 in	7 1/2 in		MATCH DRILL
47	1		40967084	36" 2 PLY 220 PIW 3/16" X 1/16 HOT TAR & ASPHALT CONVEYOR BELT				PURCHASED
48	1		40967098	MICHELS GRAVEL GUARD TARP, ELECTRIC c/w MANUAL OVERRIDE				PURCHASED
49	1	402613	RA011G-C001	LOAD SCALE GUAGE c/w PROTECTIVE CASE				PURCHASED
50	1	402020	402020	LANDING GEAR X-PIPE	44 7/8 in			SAW, DRILL
51	2		40966739	3/8 RUBBER (HEAT RESISTANT)	59 7/16 in	9 1/2 in	3.91	STD
52	1		40966741	3/8 RUBBER (HEAT RESISTANT)	37 5/16 in	9 3/16 in	2.38	STD
53	1		40966743	1/2 UHMW QUICK SILVER	35 in	4 1/2 in	1.09	STD
54	6		40966821	1/4" UHMW TYVAR 1000 (WHITE)	120 in	1 in	0.83	STD
55	2		40966822	1/4" UHMW TYVAR 1000 (WHITE)	97 in	1 in	0.67	STD
56	2		40966827	1/2 UHMW QUICKSILVER	91 13/16 in	5 7/8 in		STD
57	4		40966828	1/2 UHMW QUICKSILVER	120 in	5 7/8 in		STD
58	2		40966829	1/2 UHMW QUICKSILVER	79 5/8 in	5 7/8 in		STD
59	1	533162	40966868	FLAT BAR 3/16 X 2	32 3/4 in	2 in	0.45	STD
60	2	533162	40966869	FLAT BAR 3/16 X 2	55 1/4 in	2 in	0.77	STD
61	6		40966870	3/8 RUBBER (HEAT RESISTANT)	120 in	1 9/16 in	1.30	STD
62	1		40966871	3/8 RUBBER (HEAT RESISTANT)	68 1/4 in	4 in	1.90	STD
63	1		40967024	3/8 RUBBER (HEAT RESISTANT)	68 1/4 in	4 in	1.90	STD
64	8	7518G#8	40968207	18 GA. STAINLESS 304L #8 POLISHED (*SPV COATED*)	87 in	48 in	29.00	STD, DRILL
65	2	7518G#8	40968208	18 GA. STAINLESS 304L #8 POLISHED (*SPV COATED*)	47 in	48 in	15.67	STD, DRILL
66	2	3414G	40967010	14 GA. ALUM. PLATE	24 in	6 13/16 in	1.13	STD, SHEAR, BRAKE
67	6		06010	GROTE RED TORPEDO TAIL LIGHT				STOCK
68	2		06697	OVAL STROBE LIGHT#77363				STOCK
69	2		06697 + 06533	MIDWAY LIGHT AND GROMMET, 06697 + 06533				STOCK
70	10	49333	06746	GROTE ENHANCE LIGHT, ROUND AMBER, #49333				STOCK
71	9		06751	GROTE ENHANCE LIGHT, ROUND RED				STOCK
72	1	60701	06769	LIGHT, LICENSE PLATE, 60701, BLACK LED				STOCK
73	2		401039	LATCH, RUBBER TIE DOWN (SMALL)				STOCK
74	4		401499	L'GEAR EXTENDABLE BRACE				STOCK
75	1		402253	L'GEAR ASSY, AXN PRO 60 WITH STD FOOT				STOCK
76	1	LGP-CH-U	402435	L'GEAR HANDLE CLIP, LGP-CH-U, AXN				STOCK
77	1		402656	CONTROL BOX RA013S-C003, SS				STOCK
78	2	04290	R480677201	CYLINDER, AVENTICS, 4" BORE, 12" STROKE				STOCK



ISOMETRIC VIEW
SCALE 1:24

STEEL KIT # 40968201

REV	BY	DATE	DESCRIPTION	CHK'D
0	CI	12/17/2018	INITIAL ISSUE. REF'D 40967100.DWG CREATED TO CONVERT SPREAD FROM 72" TO 54".	

WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
UNO, ALL SPLICES TO BE COMPLETE JOINT PENETRATION (CJP) WELDS.
UNO, FILLET WELD SIZE (S) = THKNS OF THINNER MEMBER FOR t ≤ ¼" & (0.75 x t) for t > ¼".
UNO, PARTIAL JOINT PENETRATION (PJP) WELDS EFFECTIVE THROAT THICKNESS (ETT) = FILLET WELD SIZE / 1.4, BUT NO LESS THAN INDICATED IN CSA W59, TABLE 4.3.

TOLERANCES: SAW ± 1/16 | SHEAR ± 1/16 | IRONWORKER ± 1/16 | BRAKE ± 1°
LATHE ± .005 | MILLING ± .005 | DRILL ± .005

BWS Manufacturing Ltd.
1 DMONTANA ST.
CENTREVILLE, N.B.
CANADA. E7K 3E5
PH: (506) 276-4567
FAX: (506) 276-4360

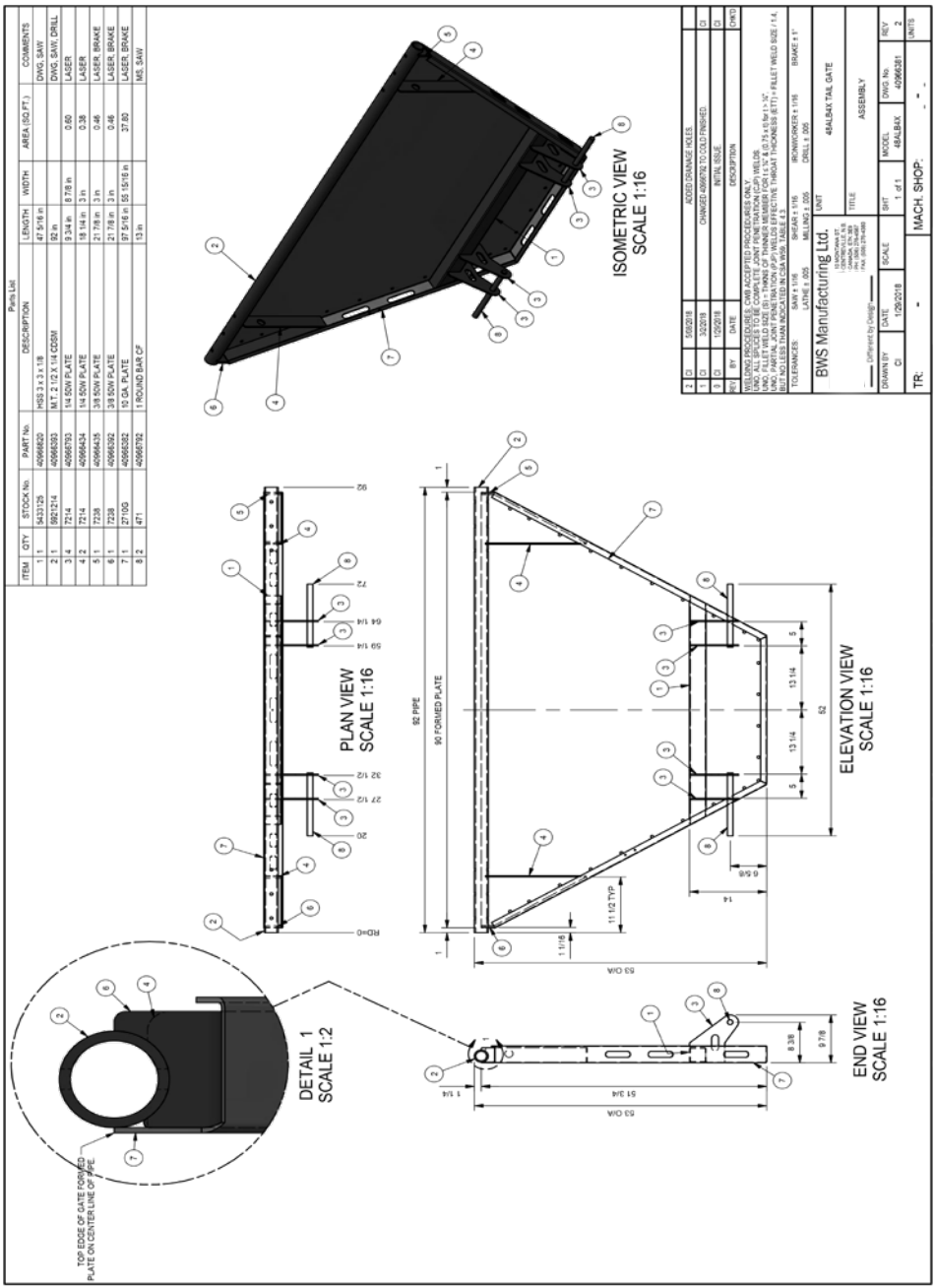
UNIT: 39ALB3X c/w 54" SPREAD O/A ASSEMBLY
TITLE: MAIN ASSEMBLY

DRAWN BY	DATE	SCALE	SHT	MODEL	DWG. No.	REV
CI	12/17/2018		5 of 5	39ALB3X	40967200	0

TR: - MACH. SHOP: _ - _ UNITS

TAILGATE ASSEMBLY

48ALB4X 40966381 REV. 2



6.0 HYDRAULIC SYSTEM

The conveyors main control valve is the PV-4 Proportional Valve. It is located at the driver side rear of the trailer. With the PTO engaged and the valve handle pushed towards the rear of the trailer, the conveyor will start to unload the product. The valve's pressure relief will be set to 2650 PSI. There is a pressure gauge mounted on the control valve to indicate line pressure at the valve. Pulling the valve handle back to the neutral position will stop the conveyor bed from moving. Pulling the control valve handle towards the front of the trailer will reverse the conveyor. ***NEVER OPERATE THE CONVEYOR IN REVERSE FROM INSIDE THE TRUCK.** There is a pressure relief valve on the reverse side, set between 500 & 700 PSI. Never adjust the reverse side relief valve higher and operate. This may cause serious damage to the trailer and may void the Live Bottom Trailer's warranty. Disengaging the PTO will also stop and start the conveyor bed from moving, if being operated from inside the truck.

The Live Bottom trailer is equipped with (2) hydraulic motors and (2) planetary gear drives. It is recommended to change the oil in both planetary gear drives after the first 50 hours of operation. It is not uncommon to see metal filings in the oil during the "Break in Period".

Figure 25 Hydraulic Pressure lines

Figure 27 Belt Control

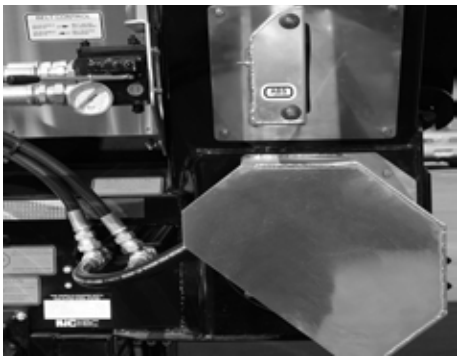


Figure 26 Hydraulic Motor box

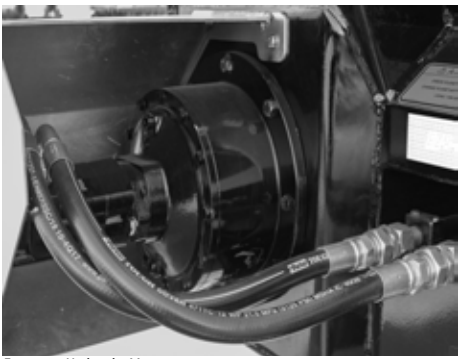
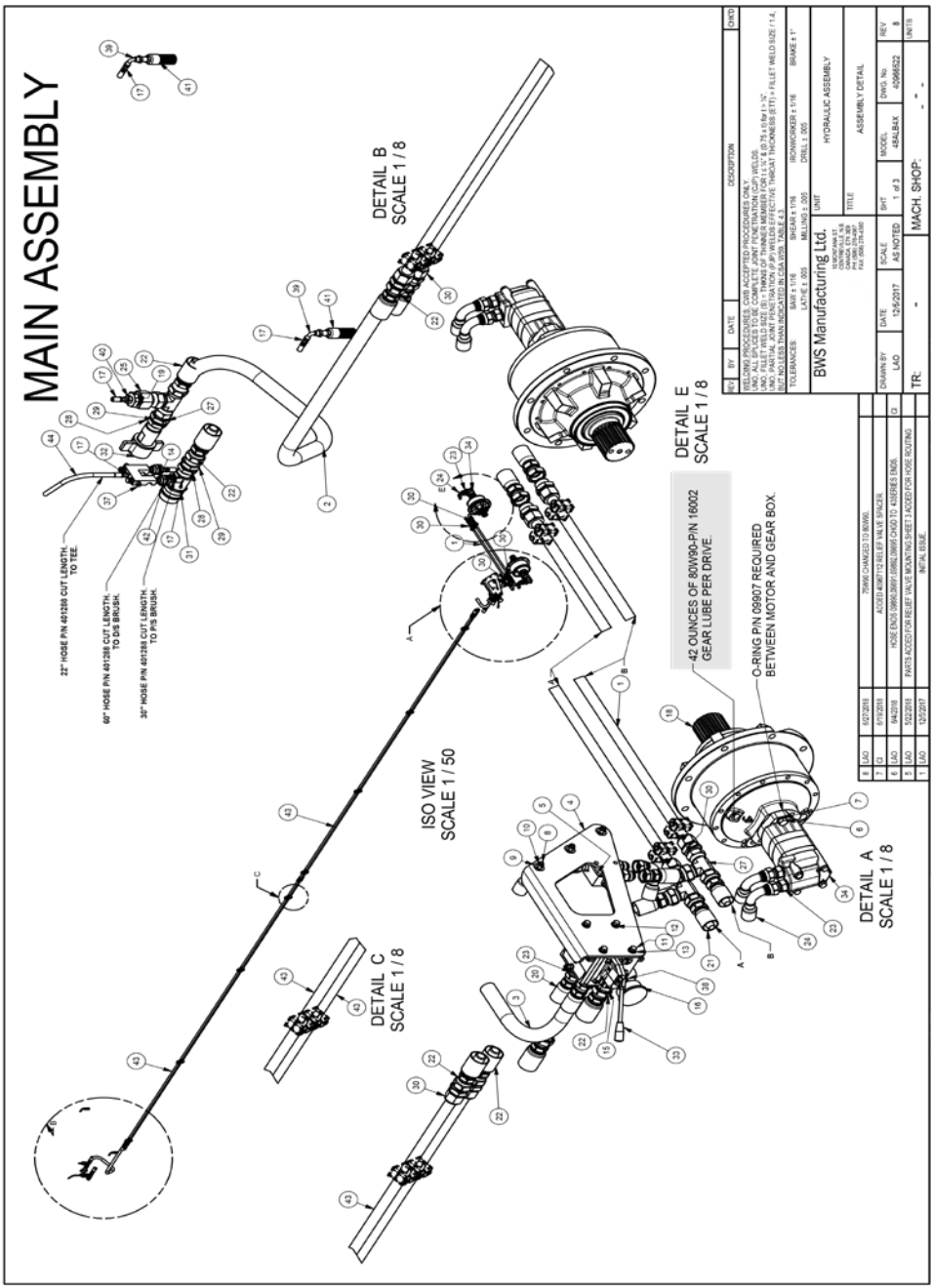


Figure 28 Hydraulic Motor

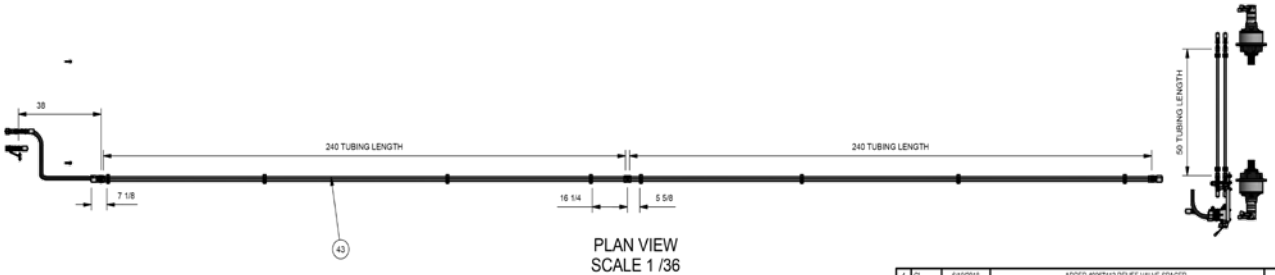

MAIN ASSEMBLY
ISO VIEW
SCALE 1 / 50
DETAIL A
SCALE 1 / 8
DETAIL B
SCALE 1 / 8
DETAIL C
SCALE 1 / 8
DETAIL E
SCALE 1 / 8
22" HOSE P/N 401288 CUT LENGTH TO TEE
60" HOSE P/N 401286 CUT LENGTH TO DS BRUSH.
30" HOSE P/N 401284 CUT LENGTH TO PS BRUSH.
42 OUNCES OF 80W90-P/N 16002 GEAR LUBE PER DRIVE.
O-RING P/N 09907 REQUIRED BETWEEN MOTOR AND GEAR BOX.
BWS Manufacturing Ltd.
UNIT
HYDRAULIC ASSEMBLY
TITLE
ASSEMBLY DETAIL
DRAWN BY
LAO
DATE
12/5/2017
SCALE
AS NOTED
SHT
1 of 3
MODEL
48ALB4X
DWG. No.
40966522
REV
8
TR:
-
MACH. SHOP:
- -
UNITS

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
1	2		591120	40966525	1" HYD TUBING 1" OD X .120 WALL	50 in			CUT
2	1		19109	40966530	PARKER 1" HYD HOSE 471TC-16-RL				CUT
3	1		19108	40966537	PARKER 3/4 INCH HYDRAULIC HOSE 471TC-12-RL				CUT
4	1		3414	40966623	PLATE 1/4 ALUMINUM SMOOTH GR.5052-H32 (*SPV COATED*)	19 1/4 in	13 1/16 in	1.75	LASER, BRAKE
5	1		3414	40967112	1/4 ALUMINUM PLATE GR.5052-H32 (*SPV COATED*)	2 3/4 in	2 3/4 in	0.06	LASER
6	4			03106	Bolt, Hex 1/2-13 UNC - 1.5				STOCK
7	4			03268	Plain Lock washer, 0.5				STOCK
8	3			03746	BOLT 3/8 X 1 1/4 UNC SS				STOCK
9	6			03752	Flat Washer,0.375 - Regular - Type B				STOCK
10	3			03797	3/8 SS NC Nylon Lock Nut				STOCK
11	4			03996	Bolt, Hex M8 x 1.25 x 20				STOCK
12	4			03997	WASHER, SPRING, 8MM				STOCK
13	4			03998	WASHER, FLAT, 8MM				STOCK
14	2			07082	FITTING 1/8 NPT CLOSE NIPPLE				STOCK
15	2			07373	PARKER 12 ORB X 16 JIC (16-12-F50X-S)				STOCK
16	1		USG-1559	08300	GAUGE, 0-5000 PSI, HYDRAULIC, LIQUID FILLED				STOCK
17	6		09710	09710	1/8 NPT SWIVEL HOSE END FOR 3/16 HOSE				STOCK
18	2			09687	AUBURN POWER WHEEL 8 DRIVE				STOCK
19	1			09688	1 NPT X 3/8 NPT REDUCER PARKER FITTING				STOCK
20	3			09690	10643 .12.12 PARKER HOSE END				STOCK
21	7			09691	10643-16-12 PARKER HOSE END				STOCK
22	8			09692	1-1/16 JIC SW TO 1 " HOSE PARKER 10643 16-16				STOCK
23	9			09693	12-10 F50X-S ST CONN PARKER FITTING				STOCK

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
24	6		09895	13943 12-12 PARKER HOSE END				STOCK
25	1		09896	16GEX-S PARKER FITTING				STOCK
26	2		09897	1" TUBE UNION PARKER FITTING 16HBU-S				STOCK
27	4		09898	TEE 1-5/16 JIC 16REX-S PARKER FITTING				STOCK
28	2		09899	BULKHEAD 16 WFTX-S PARKER FITTING				STOCK
29	2		09900	16 WLN-S PARKER BULK HEAD FITTING NUT				STOCK
30	8		09901	1" TUBE TO 1-5/16 JIC 16XHBU-S PARKER TUBE FITTING				STOCK
31	1		09903	6105-16 PARKER QUICK COUPLER				STOCK
32	1		09904	6125-16 PARKER QUICK COUPLER				STOCK
33	1		09905	VALVE PV4010014FE212				STOCK
34	2	104-1033-006	09906	TORQUE MOTOR, EATON #104-1033-006				STOCK
35	2		09907	SAE A2-042 O-RING FOR TORQUE MOTOR				STOCK
36	1	09909	09909	RELIEF VALVE IN LINE 300PSI TO 1500PSI.				STOCK
37	1		09914	OILRITE YB4689-102				STOCK
38	1	09926	09926	1/2 ORB M TO 1/4 NPT FM PARKER 5-1/4 F50G-S				STOCK
39	2	17142	17142	ELBOW 1/8 NPT STREET BLACK IRON				STOCK
40	1		17250	3/8 NPT TO 1/8 NPT REDUCING BUSHING				STOCK
41	2		402595	OILRITE LUBRICATING BRUSH				STOCK
42	2	1495B-A	40482	TERMINAL BOLT 1/8 NPT FM-31/32 LONG				STOCK
43	4	591120	40966523	1" HYD TUBING 1" OD X .120 WALL	240 in			STOCK
44	1	401288	40966553	1/8 HOSE PARKER HLB02				STOCK



PLAN VIEW
SCALE 1 /36

REV	BY	DATE	DESCRIPTION	CHK'D
4	CI	6/19/2018	ADDED 40967112 RELIEF VALVE SPACER.	
3	LAO	4/6/2018	TUBING DIMENSION 240" ADDED TO DRAWING.	CI
2	LAO	4/02/2018	QUANTITY 1 OF 09926 ADDED.	
1	LAO	12/5/2017	INITIAL ISSUE.	

WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
UNO, ALL SPLICES TO BE COMPLETE JOINT PENETRATION (CJP) WELDS.
UNO, FILLET WELD SIZE (S) = THKNS OF THINNER MEMBER FOR t ≤ ¼" & (0.75 x t) for t > ¼".
UNO, PARTIAL JOINT PENETRATION (PJP) WELDS EFFECTIVE THROAT THICKNESS (ETT) = FILLET WELD SIZE / 1.4, BUT NO LESS THAN INDICATED IN CSA W59, TABLE 4.3.

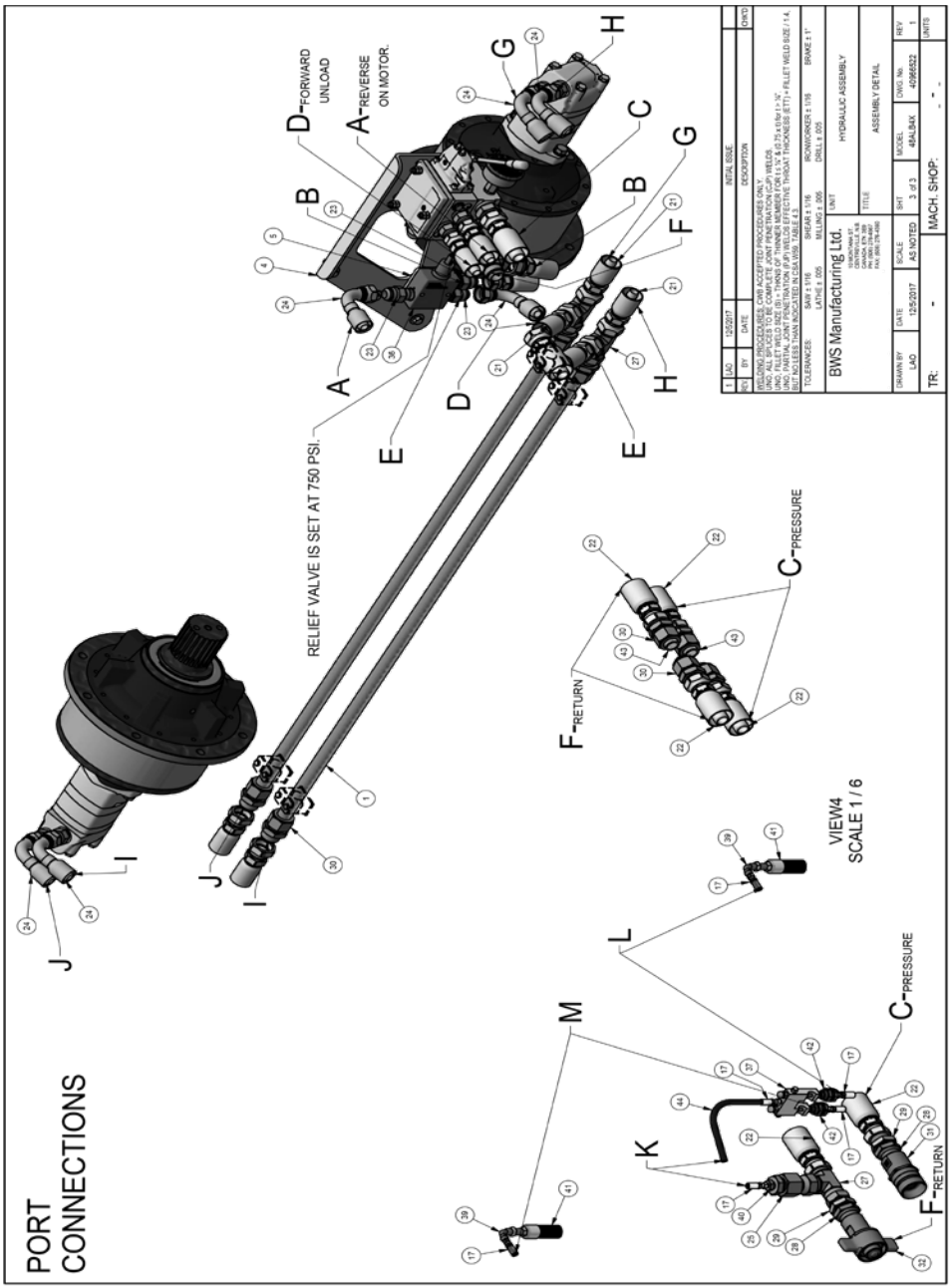
TOLERANCES: SAW ± 1/16, LATHE ± .005; SHEAR ± 1/16, MILLING ± .005; IRONWORKER ± 1/16, DRILL ± .005; BRAKE ± 1°

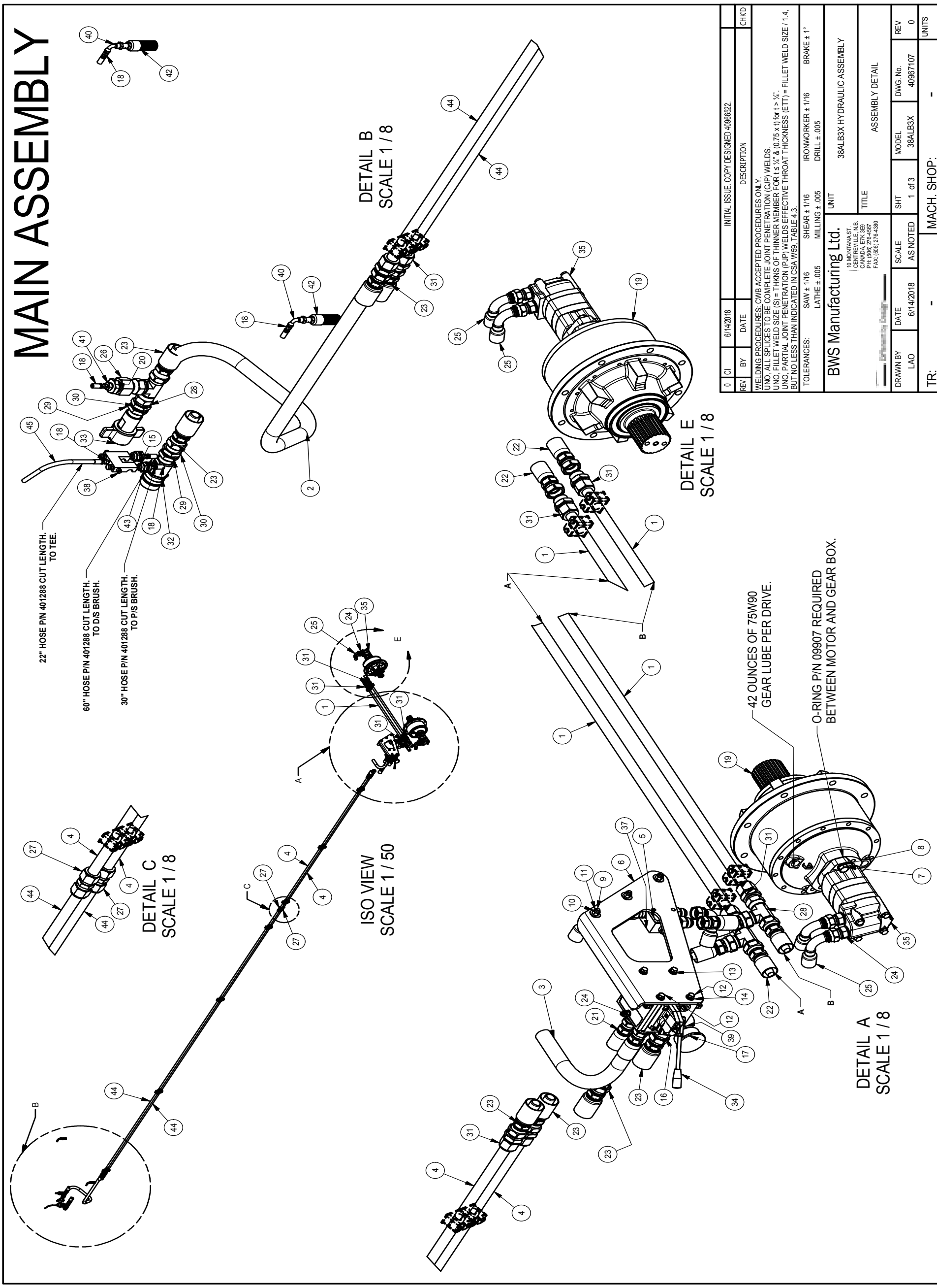
BWS Manufacturing Ltd.
10 MONTANA ST.
CENTREVILLE, N.B.
CANADA, E7K 3S9
PH: (506) 276-4987
FAX: (506) 276-4380

UNIT: HYDRAULIC ASSEMBLY
TITLE: ASSEMBLY DETAIL

DRAWN BY	DATE	SCALE	SHT	MODEL	DWG. No.	REV
LAO	12/5/2017	AS NOTED	2 of 3	48ALB4X	40966522	4

TR: - MACH. SHOP: - - - UNITS


PORT CONNECTIONS
RELIEF VALVE IS SET AT 750 PSI.
A-REVERSE ON MOTOR.
D-FORWARD UNLOAD
C-PRESSURE
F-RETURN
VIEW4 SCALE 1 / 6
BWS Manufacturing Ltd.
HYDRAULIC ASSEMBLY
ASSEMBLY DETAIL
48ALB4X
40966522



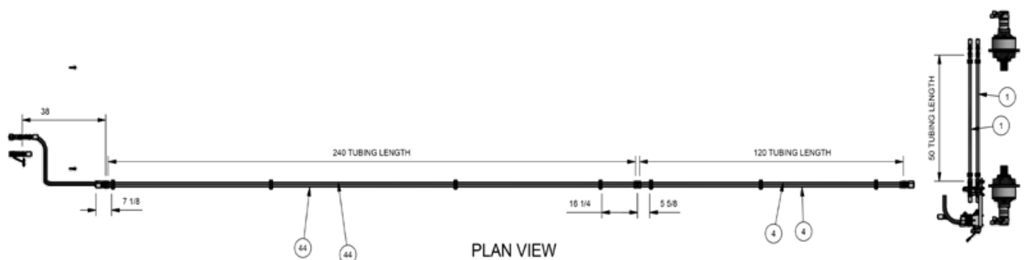
MAIN ASSEMBLY
DETAIL B
SCALE 1 / 8
DETAIL E
SCALE 1 / 8
DETAIL C
SCALE 1 / 8
ISO VIEW
SCALE 1 / 50
DETAIL A
SCALE 1 / 8
22" HOSE P/N 401288 CUT LENGTH. TO TEE.
60" HOSE P/N 401288 CUT LENGTH. TO D/S BRUSH.
30" HOSE P/N 401288 CUT LENGTH. TO P/S BRUSH.
42 OUNCES OF 75W90 GEAR LUBE PER DRIVE.
O-RING P/N 09907 REQUIRED BETWEEN MOTOR AND GEAR BOX.
INITIAL ISSUE. COPY DESIGNED 40966522.
BWS Manufacturing Ltd.
38ALB3X HYDRAULIC ASSEMBLY
ASSEMBLY DETAIL
LAO
6/14/2018
AS NOTED
1 of 3
38ALB3X
40967107
MACH. SHOP:

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
1	2	591120	40966525	1" HYD TUBING 1" OD X .120 WALL	50 in			CUT
2	1	19109	40966530	PARKER 1" HYD HOSE 471TC-16-RL				CUT
3	1	19108	40966537	PARKER 3/4 INCH HYDRAULIC HOSE 471TC-12-RL				CUT
4	2	591120	40967108	1" HYD TUBING 1" OD X .120 WALL	120 in			CUT
5	1	3414	40967112	1/4 ALUMINUM PLATE GR.5052-H32 ("SPV COATED")	2 3/4 in	2 3/4 in	0.06	LASER
6	1	3414	40966623	PLATE 1/4 ALUMINUM SMOOTH GR.5052-H32 ("SPV COATED")	19 1/4 in	13 1/16 in	1.75	LASER, BRAKE
7	4		03106	Bolt, Hex 1/2-13 UNC - 1.5				STOCK
8	4		03258	Plain Lock washer, 0.5				STOCK
9	3		03746	BOLT 3/8 X 1 1/4 UNC SS				STOCK
10	6		03752	Flat Washer,0.375 - Regular - Type B				STOCK
11	3		03797	3/8 SS NC Nylon Lock Nut				STOCK
12	4		03996	Bolt, Hex M8 x 1.25 x 20				STOCK
13	4		03997	WASHER, SPRING, 8MM				STOCK
14	4		03998	WASHER, FLAT, 8MM				STOCK
15	2		07082	FITTING 1/8 NPT CLOSE NIPPLE				STOCK
16	2		07373	PARKER 12 ORB X 16 JIC (16-12-F50X-S)				STOCK
17	1	USG-1559	08300	GAUGE, 0-5000 PSI, HYDRAULIC, LIQUID FILLED				STOCK
18	6	09710	09710	1/8 NPT SWIVEL HOSE END FOR 3/16 HOSE				STOCK
19	2		09887	AUBURN POWER WHEEL 8 DRIVE				STOCK
20	1		09888	1 NPT X 3/8 NPT REDUCER PARKER FITTING				STOCK
21	3		09890	10643 -12-12 PARKER HOSE END				STOCK
22	7		09891	10643-16-12 PARKER HOSE END				STOCK

Parts List

ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
23	8		09892	1-1/16 JIC SW TO 1 " HOSE PARKER 10643 16-16				STOCK
24	9		09893	12-10 F50X-S ST CONN PARKER FITTING				STOCK
25	6		09895	13943 12-12 PARKER HOSE END				STOCK
26	1		09896	16G6X-S PARKER FITTING				STOCK
27	2		09897	1" TUBE UNION PARKER FITTING 16HBU-S				STOCK
28	4		09898	TEE 1-5/16 JIC 16R6X-S PARKER FITTING				STOCK
29	2		09899	BULKHEAD 16 WFTX-S PARKER FITTING				STOCK
30	2		09900	16 WLN-S PARKER BULK HEAD FITTING NUT				STOCK
31	8		09901	1" TUBE TO 1-5/16 JIC 16XHBU-S PARKER TUBE FITTING				STOCK
32	1		09903	6105-16 PARKER QUICK COUPLER				STOCK
33	1		09904	6125-16 PARKER QUICK COUPLER				STOCK
34	1		09905	VALVE PV4010014FE212				STOCK
35	2	104-1033-006	09906	TORQUE MOTOR, EATON #104-1033-006				STOCK
36	2		09907	SAE A2-042 O-RING FOR TORQUE MOTOR				STOCK
37	1	09909	09909	RELIEF VALVE IN LINE 300PSI TO 1500PSI.				STOCK
38	1		09914	OILRITE YB4689-102				STOCK
39	1	09926	09926	1/2 ORB M TO 1/4 NPT FM PARKER 5-1/4 F5OG-S				STOCK
40	2	17142	17142	ELBOW 1/8 NPT STREET BLACK IRON				STOCK
41	1		17250	3/8 NPT TO 1/8 NPT REDUCING BUSHING				STOCK
42	2		402595	OILRITE LUBRICATING BRUSH				STOCK
43	2	1495B-A	40482	TERMINAL BOLT 1/8 NPT FM-31/32 LONG				STOCK
44	2	591120	40966523	1" HYD TUBING 1" OD X .120 WALL	240 in			STOCK
45	1	401288	40966553	1/8 HOSE PARKER HLB02				STOCK



PLAN VIEW
SCALE 1 /36

REV	BY	DATE	DESCRIPTION	CHK'D
0	CI	6/14/2018	INITIAL ISSUE. COPY DESIGNED 40966522	

WELDING PROCEDURES: CWB ACCEPTED PROCEDURES ONLY.
UNO. ALL SPLICES TO BE COMPLETE JOINT PENETRATION (CJP) WELDS.
UNO. FILLET WELD SIZE (S) = THKNS OF THINNER MEMBER FOR t ≤ ¼" & (0.75 x t) for t > ¼".
UNO. PARTIAL JOINT PENETRATION (PJP) WELDS EFFECTIVE THROAT THICKNESS (ETT) = FILLET WELD SIZE / 1.4,
BUT NO LESS THAN INDICATED IN CSA W59, TABLE 4.3.

TOLERANCES: SAW ± 1/16, LATHE ± .005, SHEAR ± 1/16, MILLING ± .005, IRONWORKER ± 1/16, DRILL ± .005, BRAKE ± 1°

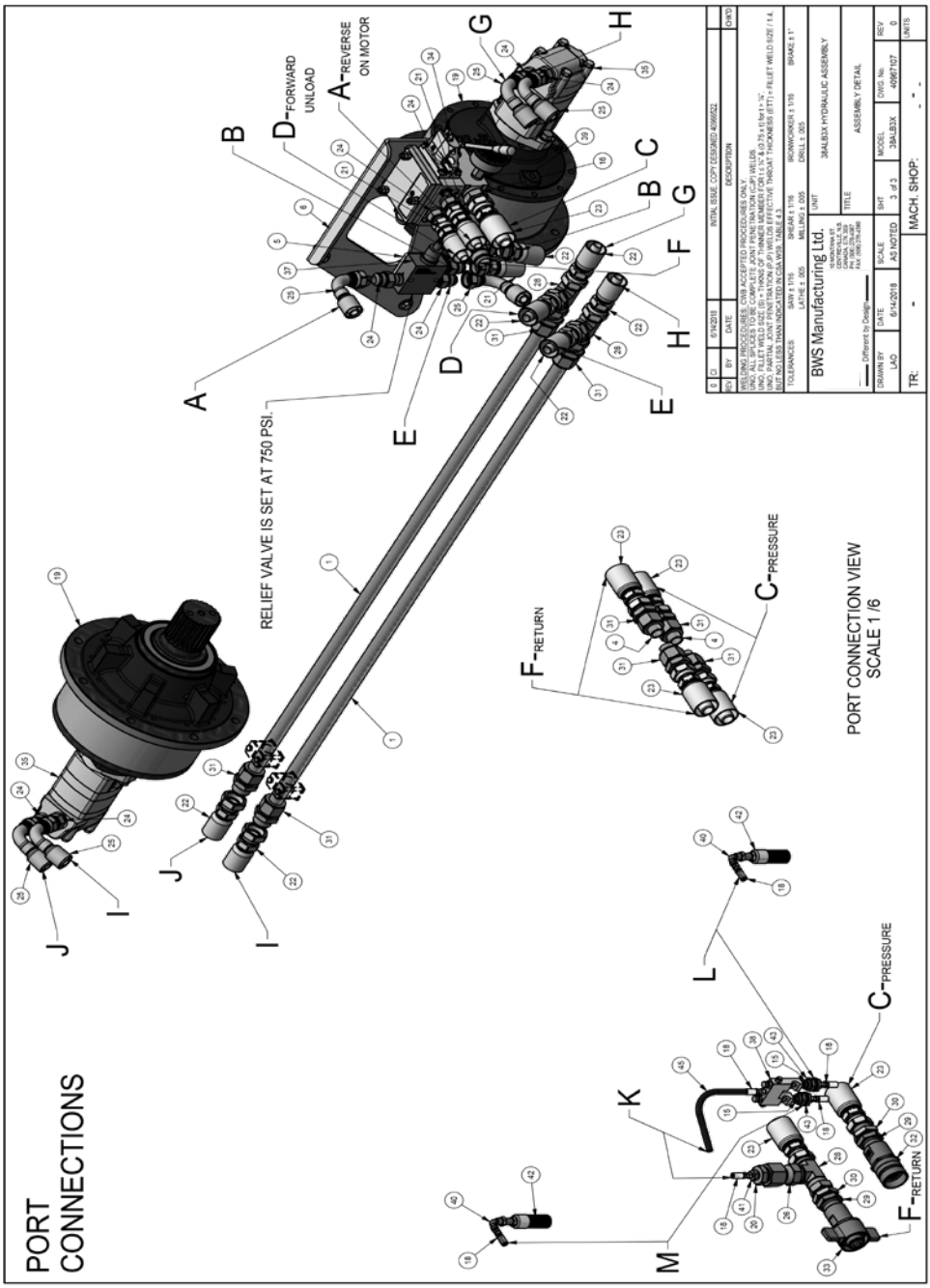
BWS Manufacturing Ltd. — Different by Design
10 MONTANA ST. CENTREVILLE, N.B. CANADA, E7K 3E9 PH (506) 276-4567 FAX (506) 276-4380

UNIT: 38ALB3X HYDRAULIC ASSEMBLY
TITLE: ASSEMBLY DETAIL

DRAWN BY	DATE	SCALE	SHT	MODEL	DWG. No.	REV
LAO	6/14/2018	AS NOTED	2 of 3	38ALB3X	40967107	0

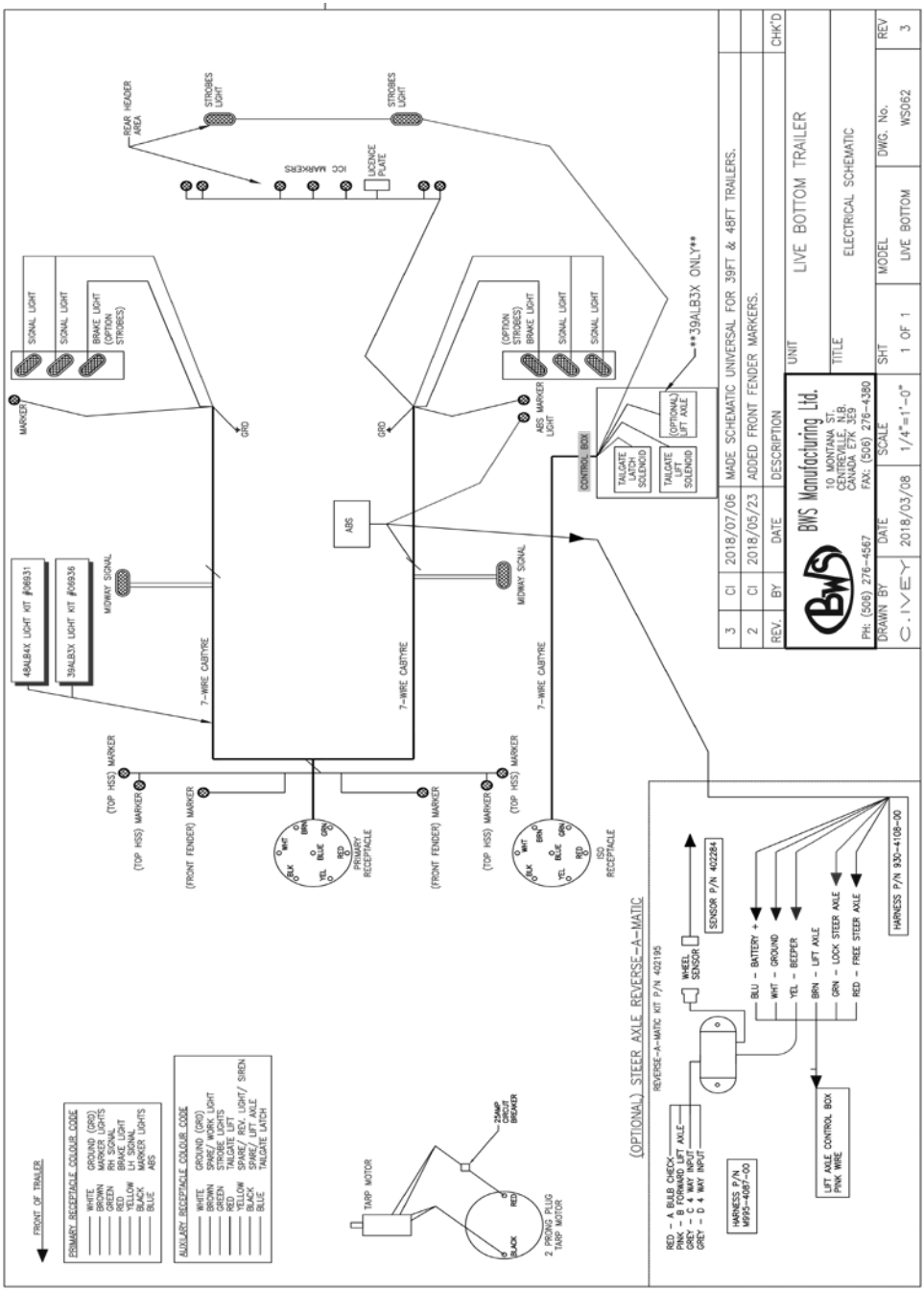
TR: - MACH. SHOP: _ - _ UNITS

BWS MANUFACTURING


PORT CONNECTIONS
A-REVERSE ON MOTOR
D-FORWARD UNLOAD
RELIEF VALVE IS SET AT 750 PSI.
F-RETURN
C-PRESSURE
PORT CONNECTION VIEW
SCALE 1 /6
BWS Manufacturing Ltd.
39ALB3X HYDRAULIC ASSEMBLY
ASSEMBLY DETAIL
40967107

ELECTRICAL SCHEMATIC

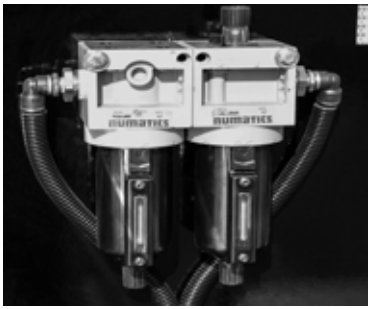
39ALB3X & 48ALB4X WS062 REV. 3



7.0 PNEUMATIC SYSTEM

The BWS Live Bottom Trailer is equipped with a Ride Air RA016S-C002 Suspension & Tail Gate Control Box. This Suspension & Tail Gate Control Box is located at the rear of the trailer on the driver's side. The (2) solenoid valves on the right "C" and "D" allow the operator to operate the tail gate from inside the truck. The "C" solenoid valve (behind) opens and closes the lock cylinders. The "D" solenoid valve opens and closes the lift cylinders. These (2) tailgate solenoids can also be manually operated by pushing and rotating the plunger on top of the valve. Located on the inside of the control box door is a detailed component diagram.

Figure 29 Suspension / Tailgate Control



The **air cylinder filter** and **lubricator** are located above the control box at the driver's side rear of the trailer. The filter is used to remove excessive moisture and contaminants from air lines prior to the tail gate cylinders. The filter is equipped with a sight glass and drain valve at the bottom, to release the stored moisture. The lubricator is used to help lubricate internal air cylinder components and to prevent cylinder seals/ gaskets from drying out and excessive wear. The lubricator is also equipped with a sight glass. Lubricant levels should be checked daily.

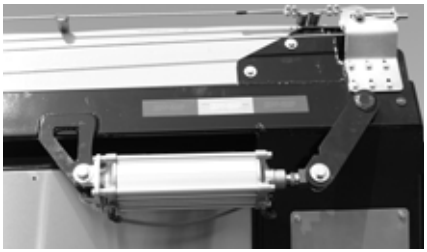


Figure 30 Lift Cylinder

Figure 32 Tailgate Latch

7.1 SPRAY TANK CLEANING SYSTEM

Spray Tank Cleaning System (Optional) - The BWS Live Bottom Trailer may be equipped with a Spray Tank Cleaning System. It is used to spray the inside hopper walls of the trailer, prior to loading the trailer. The system uses pressurized air from the spray tank to spray a releasing agent, thru a hand-held spray nozzle. ***NEVER TRY TO REMOVE TANK FILL CAP WHEN TANK IS PRESSURIZED….. *NEVER EXCEED 100 PSI ON SPRAY TANK.**

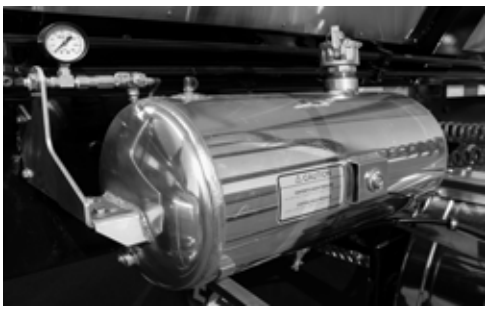
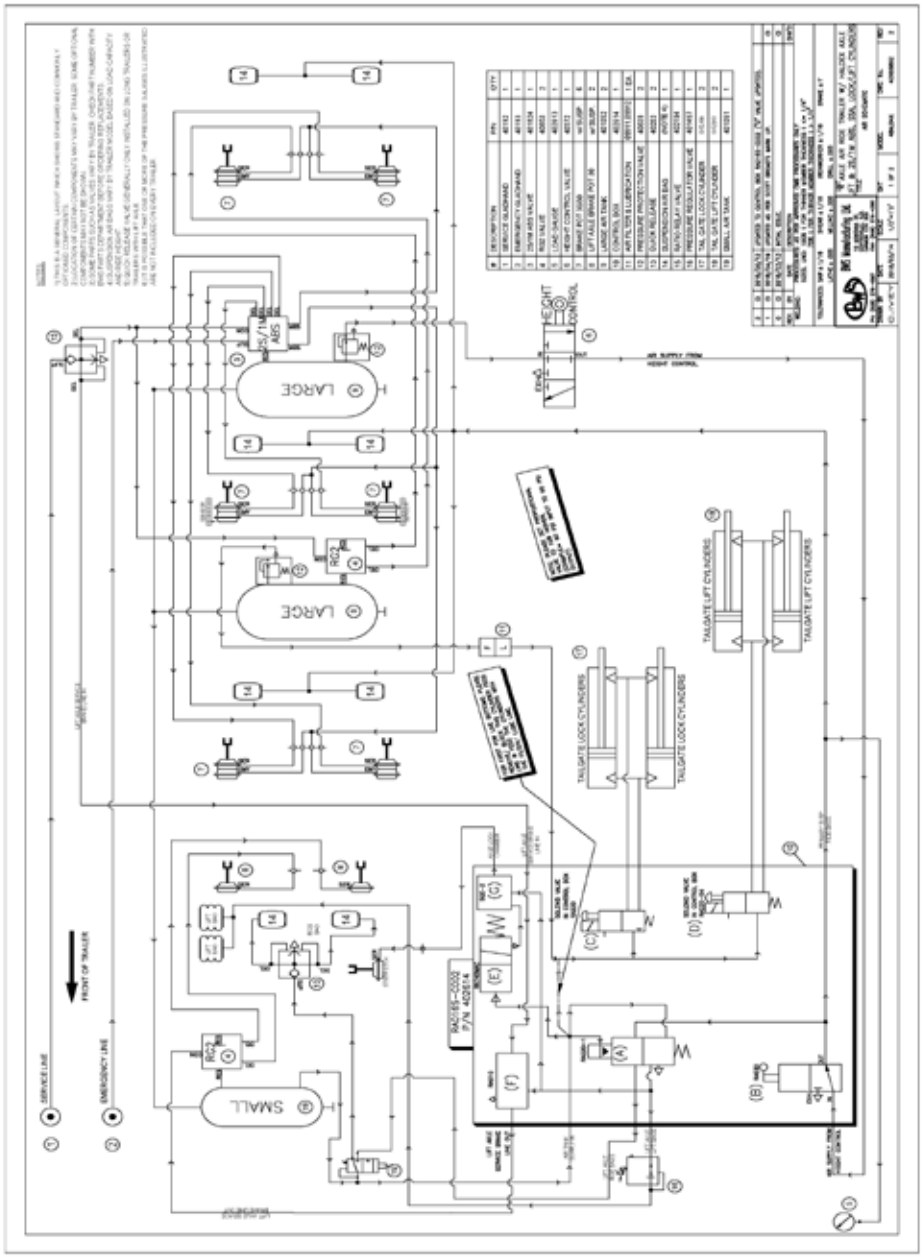


Figure 33 Spray Tank

TO ADD THE RELEASING AGENT TO THE SPRAY TANK

1. Close the regulator valve.
2. Open the ball valve (on the right of the air pressure gauge) to realease the spray tanks air pressure.
3. Remove the tank cap and add the releasing agent, (making sure to allow room for air)


LARGE
LARGE
SMALL
HEIGHT CONTROL
TAILGATE LIFT CYLINDERS
TAILGATE LOCK CYLINDERS
FRONT OF TRAILER
SERVICE LINE
EMERGENCY LINE

RA016S-C002
Suspension / Tailgate Control

S/N -1561801

Lift Axle Service Brake - Line Out

Solenoid Wires

System Supply - Line In

Lift Axle - Ride Bags

Lift Axle - Lift Bag(s)

Height Control - Line In

Lift Axle Service Brake - Line In

Axle Lock Chamber (NC - air to lock)

Tailgate Cylinder- port A - (Behind)

High Lift Tailgate Cylinder

High Lift Tailgate Cylinder

Tailgate Cylinder- port B - (Behind)

Primary Suspension Ride Bags

System Operation:

Suspension Dump: - To fill air suspension push control knob (B) down (as shown).
- To dump air suspension lift control knob (B) up.

Lift Axle Control: - Down - With the manual control knob (A) up and electric power off, the lift axle ride bags will fill to the pressure supplied by the height control valve.
- Up - Supply 12 volt DC power to the solenoid (the manual control knob must be up) OR manually push control knob (A) down and twist to lock.

Tailgate Control: - To release the tailgate supply 12 VDC power to valve (C) or push the manual control knob down and twist to lock.
- Reverse operation to lock tailgate

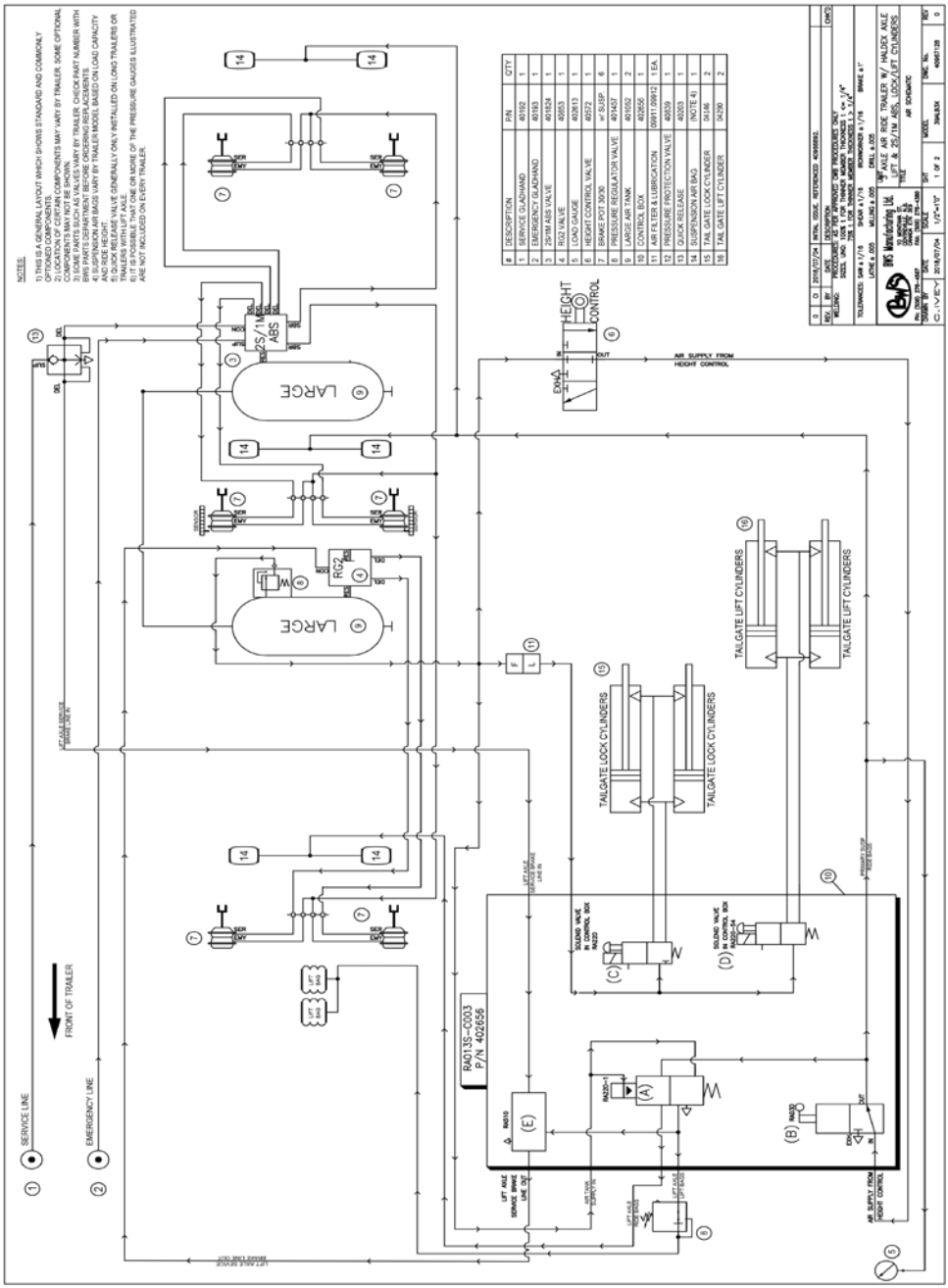
High Lift Control: - To operate the high lift tailgate option supply 12 VDC to valve (D) or push the manual control knob down and twist to lock.
- Reverse operation to lower tailgate.

Component List:

(A) - RA220-1	- Lift Axle solenoid valve	(B) - RA030	- Dump valve
(C) - RA220	- Tailgate solenoid valve	(D) - RA220-54	- High Lift solenoid valve
(E) - RA740MAC	- Axle Lock Solenoid	(F) - RA510	- Pilot Valve - lift axle brakes
(G) - SQE-2	- Axle Lock Shuttle Valve	(H) - RA001BS-4	- Stainless Steel Box

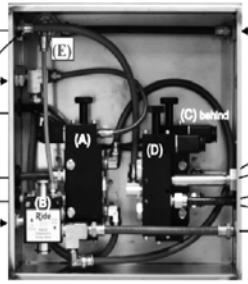
AIR SCHEMATIC 1/2

39ALB3X 40967128 REV. 0



RA013S-C003 Suspension / Tailgate Control

S/N - 2211800



Lift Axle Service Brake - Line Out
System Supply - Line In
Solenoid Wires
Lift Axle - Ride Bags
Lift Axle - Lift Bag(s)
Height Control - Line In

Lift Axle Service Brake - Line In
Tailgate Cylinder- port A - (Behind)
High Lift Tailgate Cylinder
High Lift Tailgate Cylinder
Tailgate Cylinder- port B - (Behind)
Primary Suspension Ride Bags

System Operation:

Suspension Dump: - To fill air suspension push control knob (B) down (as shown).
- To dump air suspension lift control knob (B) up.

Lift Axle Control: - Down - With the manual control knob (A) up and electric power off, the lift axle ride bags will fill to the pressure supplied by the height control valve.
- Up - Supply 12 volt DC power to the solenoid (the manual control knob must be up) OR manually push control knob (A) down and twist to lock.

Tailgate Control: - To release the tailgate, supply 12 VDC power to valve (C) or push the manual control knob down and twist to lock.
- Reverse operation to lock tailgate

High Lift Control: - To operate the high lift tailgate option supply 12 VDC to valve (D) or push the manual control knob down and twist to lock.
- Reverse operation to lower tailgate.

Component List:

(A) - RA220-1	- Lift Axle solenoid valve	(B) - RA030	- Dump valve
(C) - RA220	- Tailgate solenoid valve (LOCKS)	(D) - RA220-54	- High Lift solenoid valve (TAILGATE LIFT)
(E) - RA510	- Pilot Valve - lift axle brakes	(F) - RA001BS-4	- Stainless Steel Box

8.0 WARRANTY

BWS Manufacturing Ltd. warrants directly to you that the BWS equipment identified below, except for exclusions specified below, will be free from defects in materials and workmanship for a period of 12 months beginning at the date of equipment delivery (in service date), under normal use and service. This warranty extends only to you, the first owner/purchaser, it is not transferable and applies only to those items that were originally installed by BWS Manufacturing at time of manufacture. Auction sales are as-is-where-is-. NO warranty is applied to these products.

COMPONENT PARTS

BWS Manufacturing Ltd. provides 100% parts and labor coverage on all non-wear components for the first year from the in-service date with the exception of tires and ABS sensor alignment. After the first year, any remaining extended supplier warranty coverage and terms apply. Consequential damage is not covered.

Trailer frame and steel components	3 years 0-1 year 100% 1-2 years 50% 2-3 years 25%
Conveyor chain, slats, drive shaft and rubber belt.	1 year 100% **(Note A)**
Hydraulic lines, hoses, and fittings	1 year 100% **(Note B)**
Hydraulic motor	1 year 100% **(Note B)**
Planetary Gearbox	1 year 100% **(Note C)**
Tarp mechanism installed by BWS Manufacturing	1 year 100%
Airlines, air bags, pneumatic leveling valve, shock absorbers, bearings, Pneumatic cylinder, and other components	1 year 100%

Note A: If used in accordance with BWS approved practices, a pro-rated warranty will be applied to the belt, the chains, the slats and the main drive shaft. 1-2 years (75%) • 2-3 years (50%). The use of the trailer must be on a base of maximum of 12 hours, 5 days a week or 60 hours. If trailer is used on a base of 24 hours per day this pro-rated warranty does not apply.

Note B: Hydraulic components need to be kept free of contamination such as heat, dirt, and water.

Note C: The oil in the planetary gear box must be replaced as per manufacturer's instructions.

EXCLUSIONS FROM WARRANTY COVERAGE

This warranty shall not apply to:

1. Components manufactured by persons or organizations other than "BWS", when independently warranted by that Component Supplier/Manufacturer beyond the BWS 12 month warranty period. a). Such as, but not limited to: tires (refer all tire claims directly to tire manufacturer), suspension components, axles, wheel bearings, brakes, ABS system components, air, electrical or hydraulic systems, or brake shoes etc.)
2. Component warranties are all subject to the original manufacturer warranty once beyond the BWS first year total warranty.
3. Any trailers/units which shall have been operated in such a manner against the specific instructions or recommendations of BWS, or which shall have been maintenance neglected, or used in any way deemed inappropriate to the opinion of BWS, consequesntly affecting the intended performance levels.
4. Any trailers/units to which parts have been replaced, or alterations made, without the express of written consent and approval of BWS Manufacturing.
5. Normal required regular maintenance, adjustment(s) and service.
6. BWS products operated with cargo/payload(s) exceeding BWS' rated unit capacity.
7. Any/all freight and transportation costs associated any any warranty claims to BWS.

Any new or used BWS equipment sold through any auction (private or public), does not qualify for any BWS administered or supported warranty coverage.

8.0 WARRANTY

OTHER TERMS/CONDITIONS

Coverage detailed in this Warranty Agreement is availavle to the first purchaser only. Your sole exclusive remedy against BWS Manufacturing Ltd. and the selling BWS dealer, arising from your purchase and use of this BWS equipment, is limited to the repair or replacement pf specified defective parts/materials or workmanship at an Authorized BWS Warranty Centre, or at the BWS OEM facility (in Centreville, NB). Claims made from the remote locations may necessitate advance repair quote submissions from local service facilities to be prepared for, reviewed and accepted by BWS prior to the commencement of service or repair.

GENERAL CONDITIONS

- Warranty is only extended to the original owner of the trailer bought from an authorized BWS Dealer.
- Warranty is based on normal use, proper care and regular maintenance of the equipment.
- Wear or consequential damage is not considered as warrantable defects.
- All units must have the warranty registered with BWS Manufacturing Ltd to receive warranty claim processing.
- The customer is responsible for delivery and pick up of the trailer to the assigned service provider.
- Authorization is required from BWS Manufacturing Ltd prior to warranty work commencing.
- Component parts claims are pending the supplier's warranty review and approval – parts usually have to be returned for inspection. After one year.
- For all claims, take-off warranty parts must be salvaged, bagged, & tagged, made ready to be returned either to BWS or the supplier as instructed.

3 YEARS	Trailer Frame
3 YEARS	Paint warranty with BWS standard colors
6 YEARS	ABS Valve
Haldex Brake Parts	Slack Adjuster
4 YEARS	Brake Chambers Gold Seal
8 YEARS	Brake Chambers Life Seal
7 YEARS	Grote Ultra Blue Wire Harness
10 YEARS	Grote Supernova LED Lights

For more information, contact the nearest BWS Manufacturing Ltd. authorized dealer, visit www.bwstrailers.com or contact us.

BWS CONTACT INFORMATION

29 Hawkins Road, Centreville, NB E7K 1A4
Phone 1 (506) 276-4567 Toll Free 1-888-896-5777
Email warranty@bwstrailers.com

Monday-Friday
8:00am-5:00pm AST

After hours email: gary.thomas@bwstrailers.com

8.5 TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
COUPLER LOCK DOES NOT FULLY ENGAGE	Dirt or gravel contamination.	Wash and inspect.
	Worn parts.	Check fifth wheeling locking adjustment (see Maintenance Section).
	Mechanism improperly adjusted.	Check for excessive wear.
EXCESSIVE OR UNEVEN TIRE WEAR	Over or under inflation.	Inflate to recommended pressure.
	Loose wheel nuts or clamps.	Tighten wheel nuts or clamps to recommended torque.
	Loose or tight wheel bearing.	Adjust bearings.
	Axle bent or out of alignment.	Straighten, align or replace axle.
	Tires not properly matched.	Match tires.
	Improper acting brakes.	Correct brakes as required.
	Rapid stopping.	Apply brakes slowly when approaching stops.
	Excessive speed on turns.	Reduce speed.
*See your tire dealer for any tire issues.		
SCUFFED TIRES	Over or under inflation.	Inflate to recommended pressure.
	Excessive speed on turns.	Reduce speed.
WOBBLY TIRES	Tire wobble due to uneven rim clamping.	Torque tighten all rim clamps.
	Worn or damaged wheel bearings.	Replace bearings.
	Broken or bent wheel or rim.	Replace wheel or rim.
	Bent axle.	Replace or straighten axle.
	Broken wheel studs.	Replace wheel studs.
DOG TRACKING	Blown air bag.	Replace air bag.
	Bent axle.	Replace or straighten axle.
	Frame or suspension (axles) out of alignment.	Straighten frame or align axles.
	Worn or damaged torque arms or bushings.	Check or replace.

8.5 TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
LOSS OF TIRE AIR PRESSURE	Puncture in tire.	Repair or replace tire.
	Faulty valve or valve core.	Replace valve assembly or core.
	Wheel or rim damage.	Replace wheel or rim.
BRAKES DO NOT APPLY EVENLY	Brake valve(s) not operating correctly.	Check brake adjustment and related items.
	Loading of trailer not proportional.	Redistribute load.
BRAKES DO NOT RELEASE	Brake shoe bound up at anchor pins.	Lubricate brake operating parts.
	Brake hoses restricted.	Replace hoses.
	Brakes out of alignment.	Adjust brakes.
	Damaged brake assembly.	Replace damaged parts.
	Contaminated air valves.	Clean or replace.
	Tractor lines crossed.	Attach properly.
NO BRAKES OR INSUFFICIENT BRAKES	Source of air supply shut off at tractor.	Open cutout cocks at rear of tractor cab or push control valve “IN”.
	Disconnected or not properly coupled glad hands.	Connect or properly couple glad hands.
	Lower brake line pressure.	Check air pressure gauge on tractor or for inoperative compressor.
	Brake pads worn or glazed.	Replace pads.
	Reservoir drain valve open.	Close drain valve.
GRABBING BRAKES	Oil, grease or foreign material on brake lining.	Reline brakes.
	Brakes out of adjustment.	Adjust brakes.
	Brake drum out-of-round.	Replace brake drum.
	Damaged brake chamber or internal assembly.	Replace complete brake chamber.
	Leaking or broken hose between valve and brake chamber.	Replace or repair as required.

8.5 TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
	Control valve linkage broken or disconnect.	Inspect and repair.
EXCESSIVE SHOCK ABSORBER WEAR.	Defective height control valve.	Replace valve.
	Damaged air spring.	Replace air spring(s).
HEIGHT CONTROL VALVE NOT FUNCTIONING.	Dirt or foreign matter in air supply line.	Check and clean air filter. Inspect, clean or replace height control valve.
DIM OR FLICKERING LIGHTS.	Battery on tractor not sufficiently charged.	Charge battery.
	Bad connection.	Check electrical system circuits.
	Damaged wire in jumper cable.	Repair or replace cable.
	Poor ground sockets.	Repair as necessary.
COMPLETE LOSS OF TRAILER LIGHTS.	Broken main harness.	Repair or replace.
	Frayed wires.	Check circuit breaker at front.
BELT NOT TURNING	No Hydraulic Pressure	Check pump.
	Valve not turned on.	Turn on valve.
	Valve malfunction.	Replace as necessary.
	Truck pump not delivering enough oil or pressure.	Repair as necessary.
	Oil too hot.	Cool down.
	Oil bypass is open.	Replace as necessary.
	Hydraulic Motor Malfunction	Replace as necessary.
	Planetary Gear Box Malfunction	Replace as necessary.

8.5 TROUBLE SHOOTING

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
BELT NOT TURNING	Oil Hose leaking.	Repair oil hose.
	Check Belt Slats for twisted or broken pieces.	Replace as necessary.
	Idler bearing not turning.	Replace as necessary.
BELT TURNING TOO SLOW	Truck Pump Malfunction	Repair.
	Oil bypass open	Replace as necessary.
	Not enough engine RPM's.	Increase RPM's.
BELT IS LOOSE	Adjust idler bearing take up bolts.	Repair as necessary.
HYDRAULIC NOISE	Oil is too hot.	Cool down.
	Oil bypass malfunction.	Replace as necessary.
	Oil leak.	Repair leak.

HARD WORKING TRAILERS

FOR HARD WORKING PEOPLE

www.bwstrailers.com
toll free 888.896.5777

ISO 9001:2015 CERTIFIED