

BWS P/N:40959252 REV: 5



**ALL SEASON SANDER / DUMP
OPERATOR'S MANUAL**

JUNE 2019

MODEL: 2313NB
13 FT. NB ALL SEASON BODY
NOTE: ALL DIMENSIONS ARE NOMINAL.

www.bwstrailers.com
toll free 888.896.5777



**ISO 9001:2015
CERTIFIED**

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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 requires that you and anyone else who will be operating or maintaining the unit, read this manual carefully and understand the safety, operation, maintenance and trouble shooting information contained in the operator's manual.

PRODUCTS

FORESTRY

- Logging trailers, straight and drop frames
- Hydraulic & air detachable goosenecks
- B-Train loggers
- Jeeps
- Tag-a-longs

GENERAL FREIGHT

- Equipment trailers
- Hydraulic & Air Detachable Goosenecks
- Highway Drop Decks
- Highway Flatbeds
- B-Train Flatbeds
- Pony Trailer

CONSTRUCTION

- Low bed equipment trailers
- Detachable & fixed goosenecks
- Hydraulic & air detachable goosenecks
- Tag-a-long trailers, tilting & non-tilting decks
- Dump trailers
- Jeeps
- Boosters

HYDRO/TELEPHONE

- Cable Reel trailers

SPECIAL ORDER TRAILERS

- Nuclear Waste
- Generator Trailers
- Wagon Type Trailers
- Military Trailers
- Specialty Trailers for offshore products
- A/S Dump Sanders
- A/S U-Body Dump Sanders

OIL & GAS

- Oil field trailers
- Equipment trailers
- Oil field jeeps / Oil field hydraulics
- Hydraulic goosenecks
- Scissor-necks
- Tag-a-longs

PAVING & RECOVERY

- Aggregate Screeners
- Hydraulic & air detachable goosenecks
- Equipment trailers
- Tag-a-longs
- Dump Trailer

SNOW & ICE

- Sander Bodies
- Hopper Sanders
- U Body
- Turn Key Trucks

BWS COMPANY HISTORY

BWS products are engineered, designed and manufactured by BWS, located 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, snow & ice, 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.





**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.

A handwritten signature in black ink, appearing to read "Hugo St-Cyr".

Hugo. St-Cyr
CEO

A handwritten signature in black ink, appearing to read "Randy McDougall".

Randy McDougall
COO



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 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.

TAG COMPLIANCE PLATE





WARNING

All air must be removed from the two inner floor side tipping cylinders prior to operation of the hydraulic system. Air must also be bled from the hydraulic system any time the hydraulic fluid gets low or if hoses have been removed for any reason. Failure to bleed the air may result in structural damage to the front headboard of the All Season Dump body.

Functional requirements for proper operation of your BWS All Season Sander include:

- 23 gallons per minute of uninterrupted hydraulic fluid to the sander control valve.
- A minimum of 8 gallons per minute to the spinner motor and 15 gallons per minute to the auger motor.
- High volume control valve for the cylinder.

Failure to provide any of the above will result in malfunction and may preclude compatibility with some electronic spreading devices.

MAINTENANCE & OPERATION

OPERATION

The BWS All Season Dump/Sander has been designed with the user in mind. To provide a unit that can be utilized 12 months of the year as a dump truck or as a mineral spreader.

To convert the unit from a dump truck to a spreader, lift and lock conveyor cover and open the conveyor discharge gate (approximately 2").

All controls are in the truck cab. Select required knob positions to provide the desired spread pattern. Make sure discharge gate is properly adjusted to provide full opening when spreading sand and partly opened when spreading salt.

CONTROL OF SPREADER

Hydra-Tac Hydraulics or Compuspread of Dickey-John:
Refer to separate manual enclosed if applicable.



INNER FLOOR

The inner floor should not be raised more than necessary to keep conveyor side full to avoid undue stress on the chains. As the material supply diminished, the inner floor is raised further to move material as required. Raise the inner floor as required until the entire load has been spread. Use the observation holes on dump head board to view the inner floor dump angle.

NOTES: FOLLOW THE LED LIGHT TO DETERMINE THE LOAD ANGLE. MARKER LIGHTS MUST BE ON FOR THE LOAD ANGLE LIGHT TO ILLUMINATE.



It is not recommended to load the unit with material that will be left standing for a long period of time. Failure to follow this instruction may cause gearbox failure on the conveyor.

MAINTENANCE INSTRUCTIONS

Systematic preventative maintenance is the best cure to keep the unit in good condition. Damage may be done before major symptoms appear.

1. Remove all hydraulic pressure from the system before opening any hydraulic circuit.
2. After daily operation it is advisable, when possible, to hose down the mechanical parts of the unit to wash away the brine which, if allowed to remain, will corrode parts and cut down efficiency.
3. After every 50 hours of operation, lubricate all bearing and hinge points.
4. Check oil levels.
5. The hydraulic oil should be replaced periodically. The following replacement schedule is offered as a guide.
6. The original filter element should be replaced after a maximum of 50 hours of operation. Subsequent changes are dependant on operating conditions:
 - Average atmosphere - after each 500 hour of operation
 - Duty atmosphere - after each 250 hours of operation

GEAR BOX

Complete Gear Box P/N 08305

1. Use an hex key/Allen wrench to reveal the input area at the top of the gear box.
2. Continue adding oil until it starts to seep out the bottom output.
3. Wipe the outside with a rag.
4. Replace the plug.



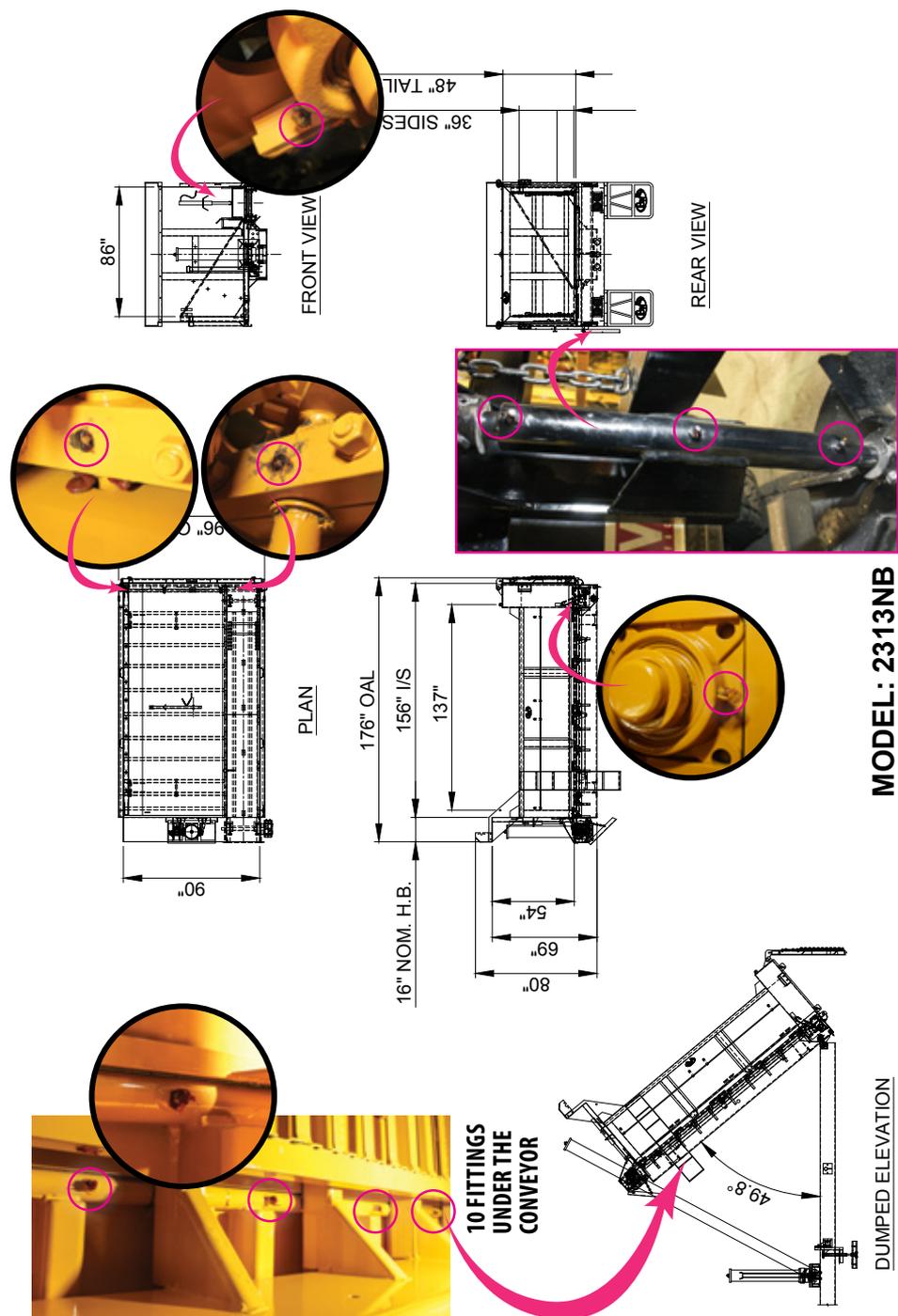
BLEEDING PROCEDURE

1. Ensure the inner floor is in the closed position.
2. Loosen the bleeder screws located at the top and bottom of both inner floor cylinders.
3. Start the vehicle and engage the hydraulic pump.
4. Have an operator gently open the inner floor cylinder valve to the raised position.
5. Once all of the air bubbles have been expelled and a constant flow of clear oil is present, tighten bleeder screws and disengage the pump.
6. Ensure that the hydraulic lines remain full of oil to prevent more air from being trapped within the hydraulic system.
7. Top up the hydraulic reservoir to full level.
8. Check the hydraulic tank gauge. Make certain to read the gauge when all cylinders are in the return position.
9. Operate the inner floor up and down a few times to check for any leaks.



NOTE: FAILURE TO FOLLOW THESE PROCEDURES MAY RESULT IN FAILURE OF THE INNER FLOOR EQUALIZING SYSTEM AND THUS SERIOUS STRUCTURAL DAMAGE TO YOUR BWS ALL SEASON DUMP SANDER.

GREASE FITTINGS

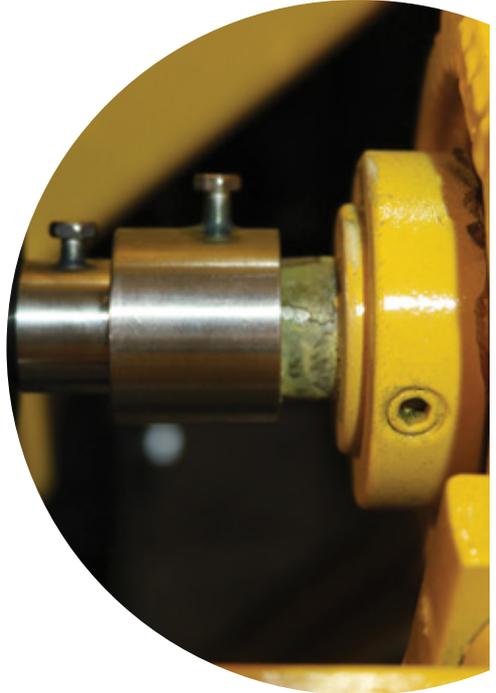


QUALITY CONTROL

The following check list is to be used on all season dump sanders BEFORE being used. BWS will not be responsible for damage resulting in negligence of this checklist. All BWS equipment is tested before leaving the factory.

PRE-OPERATING MAINTENANCE

1. Check all bearings and apply the standard chassis lube of your choice if required, including all sealed bearings in conveyor system as well as all grease fitting on the spinner assembly.
2. Check the oil level on the conveyor system gear reducer. This can be done by removing small plug. If the oil level is up to the inspection hole, it is acceptable. If not, fill with the proper fluid (#90 gear lube).
3. Check (with truck engine shut off) set screws in crank drive shaft to ensure that the unit is intact and operational.
4. Check all adjustments on conveyor and spinner assemblies to ensure the locking devices are tight.
5. Check hydraulic oil levels by observing the sight gauge. Oil level should full on the sight gauge. If not, bring up to half level using hydraulic oil #32.



NOTE: DO NOT OVER FILL THIS UNIT.

DAILY OPERATIONAL MAINTENANCE

After every 50 hours of operation, step 1 should be repeated. After every 100 hours of operation, steps through 3 should be repeated.

SEASONAL MAINTENANCE

At the end of each season, you BWS unit should be washed or steamed thoroughly to ensure maximum life of the entire unit. Salt corrodes, not only the chassis, but the drive chain, bearing seals and gear box seals. Once the unit has been thoroughly cleaned, inspect complete unit for excessive wear of parts. Replacement parts are available through the BWS Parts Department in Centreville, NB.

INSTALLATION PROCEDURE

Your safety and that of others are the first considerations when engaging in the installation and maintenance of equipment. Always be conscious of weight. Never attempt to move heavy parts without the aid of a mechanical device. Do not allow heavy objects to rest in an unstable position. When raising a portion of the equipment, ensure that the adequate support is provided.

These warnings are given to alert the installer to the possibility of personal injuries and/or equipment damage resulting from improper installation and handling. Furthermore, the authorized dealer and the final stage installer have the full responsibility to certify that the completed all season sander vehicle conforms to all required safety rules or standards applicable in its area of operation.

BWS Manufacturing Ltd. will not be liable for any claim for loss of usage, any kind of injuries or any other claims that could be the product of a faulty or incomplete installation by an authorized dealer or distributor.

INSTALLATION OF CYLINDER BASE

Locate the pre-assembled BWS cylinder base at the appropriate position on the truck frame in regards to the position of the front body cross members.

1. Before any welding is started on the vehicle, make certain that the battery is disconnected to avoid any computer issues.
2. Install the mounting angles (2) under the pre-assembled BWS cylinder base.
3. Match the drill holes on the truck frame in the proper location.
4. Install the bolts (3) and proceed to the tightening procedure with the nuts (4).
5. Proceed to the last adjustments between the mounting angles (2) and the cylinder base cross members (6).
6. Proceed with all welds needed to join the mounting angles (2) with the cylinder base cross members (6).

Be sure the positioning guides (1) are correctly located on the cylinder base before proceeding with the welding. Allow a maximum spacing of 1/16" between the positioning guides welded on the dump body.

INSTALLATION OF HINGES SYSTEM

1. Establish the exact location of the hinge assembly (4) to be installed at the back extremity of the truck frame (1).
2. Trim the truck (1) to the required dimensions, then proceed with the hinge assembly (4) installation.
3. Install and fix the booster guard (2) and the horizontal bar (3).
4. Install and weld the standard tow plate (5) as well as the heavy duty tow plate, if required.

AIR OPERATED TAILGATE SYSTEM

For safety, insure that the tailgate locking system is positively locked, only being opened by operating the pneumatic control, located in the cab of the truck, for dumping purposes.



An indicator light helps the operator to know when the tailgate is open by illuminating on the cab controls.

See air schematic for further details. (PAGE 53)

NOTE: IN THE CASE OF A SYSTEM FAILURE, THE OPERATOR IS ABLE TO OPEN AND CLOSE THE TAILGATE MANUALLY. A TOOL STORED AT THE FRONT OF THE BOX, ON THE DRIVER SIDE TO ALLOW THE OPERATOR TO COMPLETE THE TASK.



INSTALLATION OF BWS MUD FLAP

Installation with loose mud flap brackets:

1. Attach mud flap to the mount using back plate, nuts and washers.
2. Make sure all nuts have been tightened.

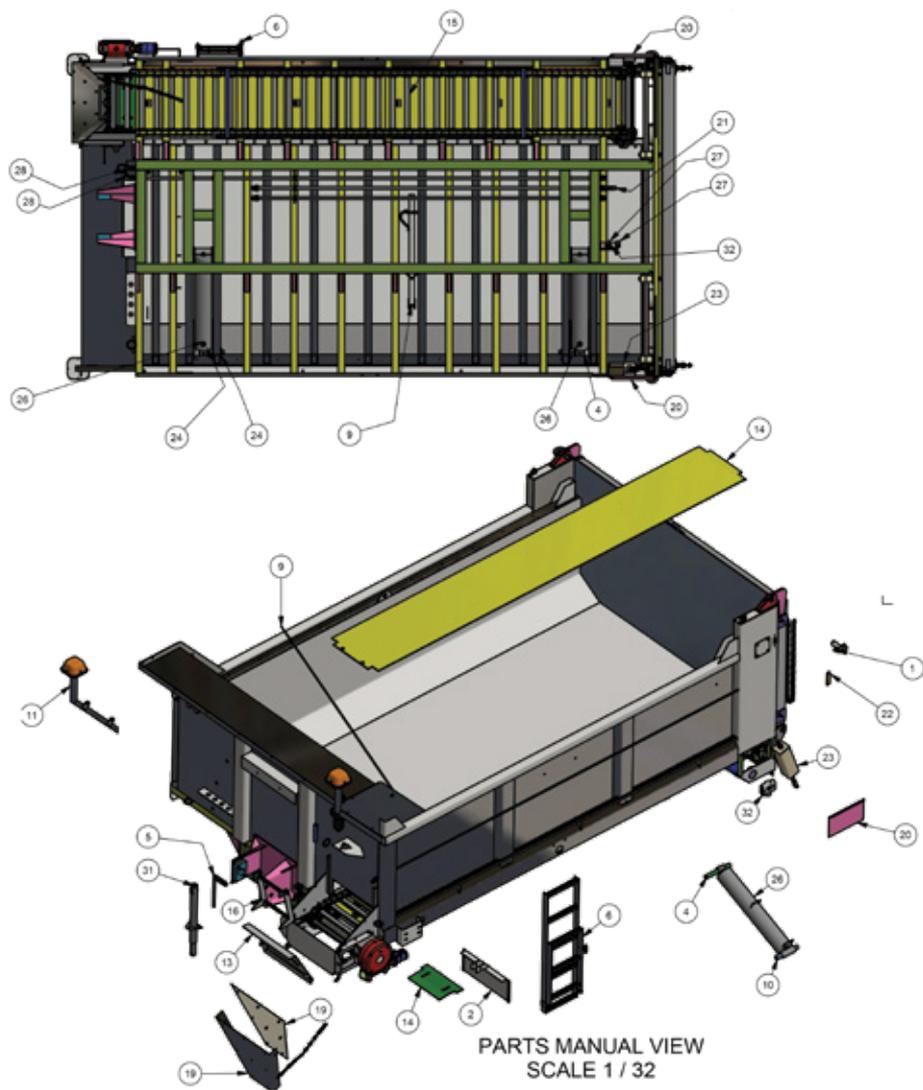
NOTE: FRONT MUD FLAPS MAY BE INSTALLED IN FRONT OF THE FRONT AXLE OF SINGLE OR DOUBLE TRUCKS. REAR MUD FLAPS MUST BE INSTALLED AT THE BACK OF THE SINGLE OR DOUBLE AXLE TRUCKS, EITHER ON THE DUMP BODY OR THE TRUCK FRAME.



PARTS LISTINGS

ALL-SEASON SANDER BOX MAIN ASSEMBLY

22201799 REV. 1



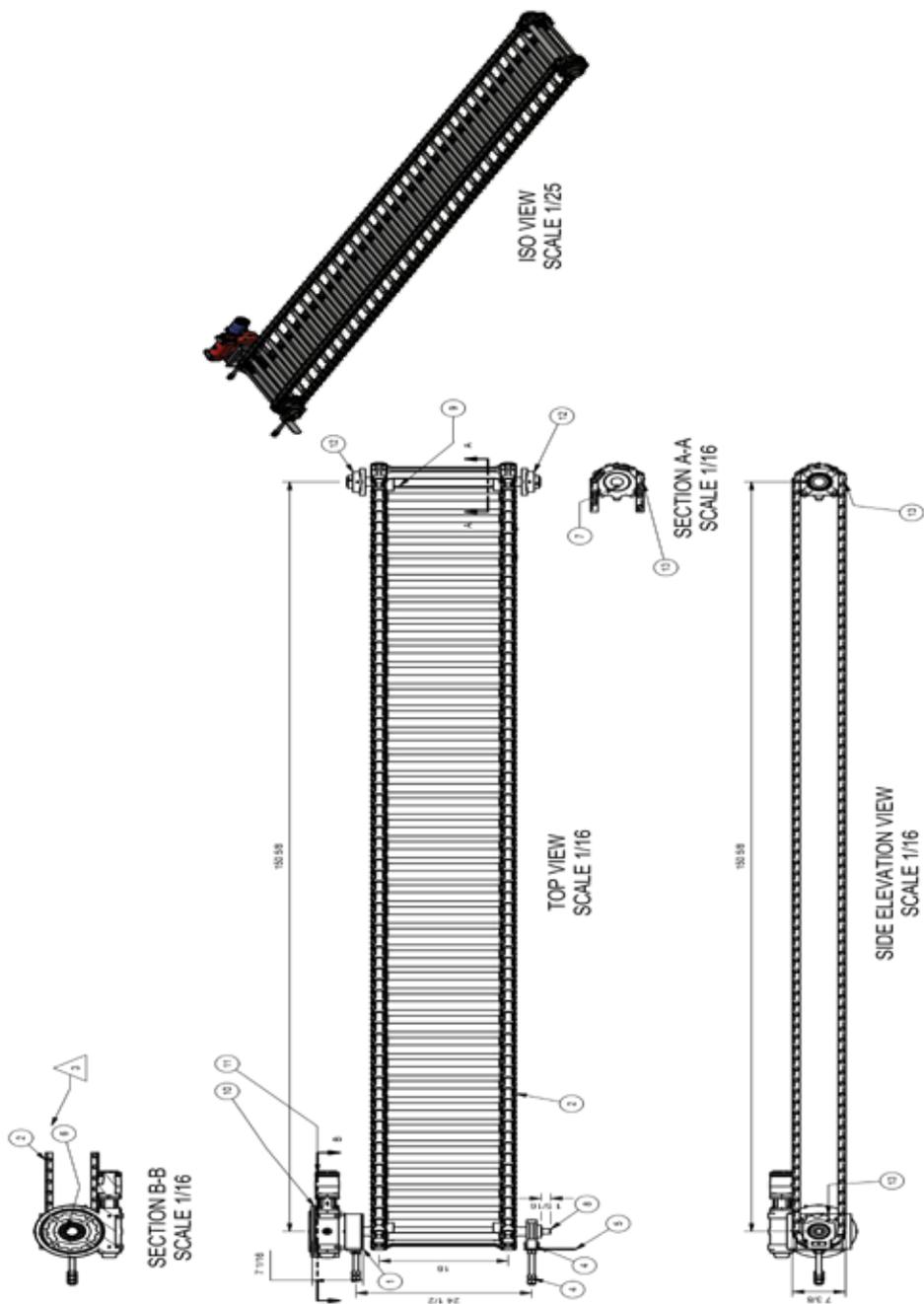
ALL-SEASON SANDER BOX MAIN PARTS LIST

22201799 REV. 1

Parts List								
ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ. FT.)	COMMENTS
1	2		22200170	TAILGATE PIN ASSEMBLY				ASSY
2	1		22201754	CONVEYOR GATE ASSEMBLY				ASSY
3	1		22201863	GEAR BOX GUIDE ASSEMBLY				ASSY
4	2		22201810	TOP CYLINDER PIN ASSEMBLY				ASSY
5	1		22201830	TAILGATE UN- LOCK TOOL				ASSY
6	1		22201825	LADDER ASSEMBLY				ASSY
7	1		22201816	CONVEYOR COVER ASSEMBLY				ASSY
8	1		22201193	BASE TAILGATE ASSEMBLY				ASSY
9	1		22202021	INNER FLOOR ASSEMBLY				ASSY
10	2		22201809	BOTTOM CYLINDER PIN ASSEMBLY				ASSY
11	1		22202899	STROBE LIGHT ASSEMBLY P/S				ASSY
12	1		22202906	STROBE LIGHT ASSY D/S				ASSY
13	1		22201837	CONVEYOR COVER ASSEMBLY FRONT				ASSY
14	1		22201843	CONVEYOR WEAR PLATE ASSEMBLY.				ASSY
15	1		22201833	ALL SEASON CONVEYOR ASSEMBLY				ASSY
16	1		22202925	2313 INSIDE STEP ASSY				ASSY
17	2		22201862	TAKE UP BEARING GUIDE ASSEMBLY				ASSY
18	2	2710GA	22202915	PLATE 10GA	5 1/2 in	5 1/2 in		LASER
19	1		22200319	CHUTE ASSEMBLY POLY-LINED				STD. ASSY
20	2	2710G	22201805	10 GA. PLATE	13 3/4 in	8 1/2 in	0.81	STD. DWG, SHEAR, IRONW, BRAKE
21	1	09609	09609	TEE 3/4 JIC M X 3/4 JIC M X3/4 JIC F SW (S3551-12)				STOCK
22	4	ED3701A	06941	6 LED, THIN SURFACE MNT, 12/24				STOCK
23	1		04124	CYL ASSY (TAILGATE) TGC3250BV, SEAL KIT # 04166				STOCK
24	19	03273		FLAT WASHER, 1 1/4				STOCK
25	1	17092	17092	1/2 NPT PLUG				STOCK
26	2	P120458B5858	09741	CYLINDER, MALHOT, #P120458B5858				STOCK
27	3	09718	09718	ELBOW 1/2 NPT FM X 1/2 NPT M 90 DEG				STOCK
28	2	09608	09608	ELBOW 90 3/4 JIC M X 3/4 JIC FSW(S3549-12)				STOCK
29	8	09610	09610	PARKER TUBE CONN 3/4 M JIC X 3/4 F TUBE				STOCK
30	23		19066	GROMMET, WIRE, 1.25" ROUND				STOCK
31	1	11011	11011	2019 ALL SEASON ELECTRIC JACK 0093500 BUYERS				STOCK
32	1	B100	09010	FLOW DIVIDER, B100 GENERIC VALVE				STOCK

CONVEYOR ASSEMBLY

22201833 REV. 3



CONVEYOR ASSEMBLY PARTS LIST

22201833 REV. 3

Parts List								
ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
1	1		22201842	GEAR BOX ADJUSTER ASSEMBLY				ASSY
7	4	5212	22201769	1/2" CF SQUARE BAR	2 1/4 in			STD. MS. SAW
6	1	5238	22202914	3/8 CF SQUARE BAR	2 1/2 in			STD. MS. SAW
2	1		22201834	COMPLETE MAIN CHAIN ALL SEASON				STD
3	1		22201191	GEARBOX ROD WITH NUTS				STD. ASS'Y
4	1		22200335	GEARBOX ROD WITH NUTS				STD. ASS'Y
5	1	53142	22201800	FLAT BAR 1/4 X 2 MS	7 in			STD. DWG. IRONW
8	1	48134	22200408	1 3/4 DIA. STRESSPROOF SHAFT	33 1/4 in			STD. SAW, MACH.
9	1	48134	22200113	1 3/4 DIA. STRESSPROOF SHAFT	27 in			STD. SAW, MACH.
10	1		08305	GEAR BOX, USIMAX 50-1, MW131-908				STOCK
11	1		09605	MOTOR, HYD GEAR BOX (EATON 101-1011-009)				STOCK
12	2		02018	1 3/4 DIA. 4-BOLT FLANGE BEARING				STOCK
13	4	22029	40952208	22029 SPROCKET AL667XH B 9T X 1-3/4 C/W SCREWS				STOCK

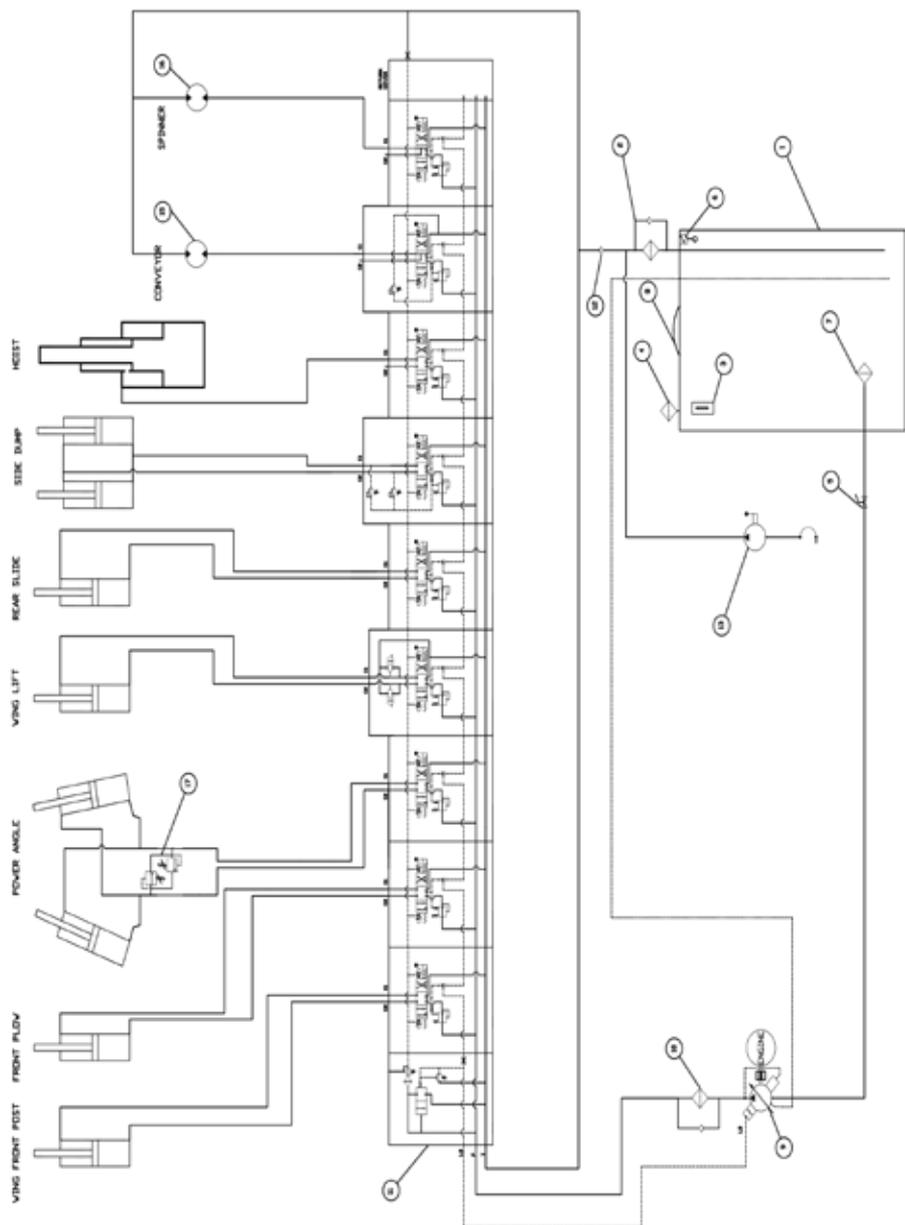
HYDRAULIC CYLINDER BASE & BODY PROP FOR ALL SEASON DUMP / SANDER DIAGRAM

40959280 REV. 7

Parts List								
ITEM	QTY	STOCK No.	PART No.	DESCRIPTION	LENGTH	WIDTH	AREA (SQ.FT.)	COMMENTS
1	1	53384	40957336	FLAT BAR 3/8 X 4	7 in	4 in	0.19	DWG. IRONW, BRAKE
2	1	5433375	40957335	TUBING 3 X 3 X 3/8	44 5/8 in			DWG. SAW, DRILL
3	1	5314112	22201482	FLAT BAR 1/4 X 1-1/2 MS	3 1/8 in	1 1/2 in	0.03	DWG. SAW, DRILL, TAP
4	1	53385	40959281	FLAT BAR 3/8" X 5" MS	13 1/4 in	5 in	0.46	MS, IRONW
5	1	53141	40959212	FLAT BAR 1/4" X 1" MS	3 1/2 in	1 in		MS, IRONW
6	2	53382	40959283	FLAT BAR 3/8 X 2 MS	10 3/4 in			MS, IRONW
7	2	7212	22201542	PLATE 1/2 50W	8 7/8 in	7 in		STD. LASER
8	1	233 829	22455	PIN Q/R STAINLESS #233-829				STOCK
9	1	03220	03220	Bolt, Hex 7/8-9 UNC - 5.5, Grade 8				STOCK
10	1		03219	7/8 Std NC Nylock Nut, GR. 8				STOCK
11	1		03193	Nut, Hex 1/2 - 13 UNC				STOCK
12	1		03106	Bolt, Hex 1/2-13 UNC - 1.5				STOCK
13	1	AC4040	09586	H-FRAME AC4040				STOCK
14	1	04001		CHAIN, 1/8" (14 LINKS)				STOCK, CUT

FLUID CONTROL DIAGRAM

14371 H REV. 0



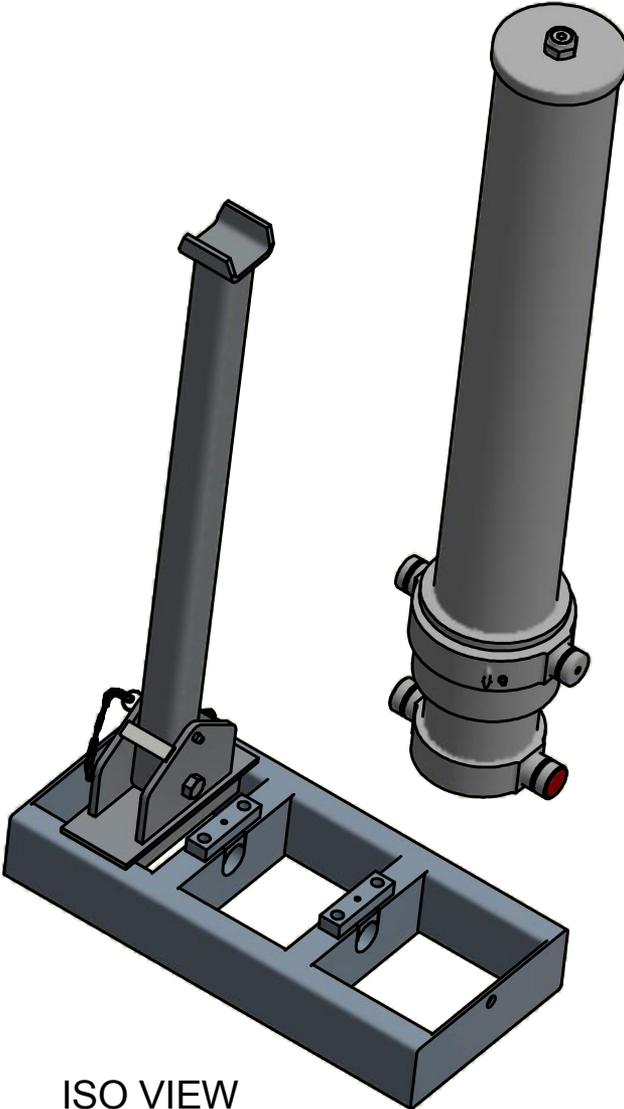
FLUID CONTROL DIAGRAM

14371 H REV. 0

17*	1	GRESEN	CROSS PORT RELIEF (CUSHION VALVE)
16*	1	SPINNER MOTOR	VARIABLES WITH BOX MANUFACTURER 101-1001
15*	1	CONVEYOR MOTOR	VARIABLES WITH BOX MANUFACTURER 101-2420
14	1	B4B F50-06X04	ORRIFICE FITTING
13*	1	FRL 150	HAND PUMP SUPPLIED BY DOT
12	1	HYSCIT-06-07N	1" CHECK VALVE
11	1	VAL6910-2404-006	DIRECTIONAL CONTROL VALVE
10	1	CF40-1CC10-SD5	HIGH PRESSURE FILTER
9	1	421AK00423B	PISTON PUMP
8	1	ECBA-12	12" DIA. CLEAN OUT COVER
7		P169017	SUCTION STRAINER
6	1	01701	FLOAT SWITCH
5	1	2" NPT 150 PSI	BRONZE THREADED BALL VALVE
4	1	P564425	BREATHER FILTER
3	1	AGL-5T	SIGHT GLASS C/W THERMOMETER
2	1	SSF120-25-1/SF6720	RETURN LINE FILTER 25 MICRON
1	1	FABRICATED 30 GALLON	HYDRAULIC RESERVOIR
		DESCRIPTION	DESCRIPTION
* ITEM NUMBERS ARE SUPPLIED BY OTHERS AND			
MAY VARY DEPNDING ON PLOW AND BOX MANUFACTURER			

HOIST & H-FRAME DIAGRAM

22201235 REV. 1



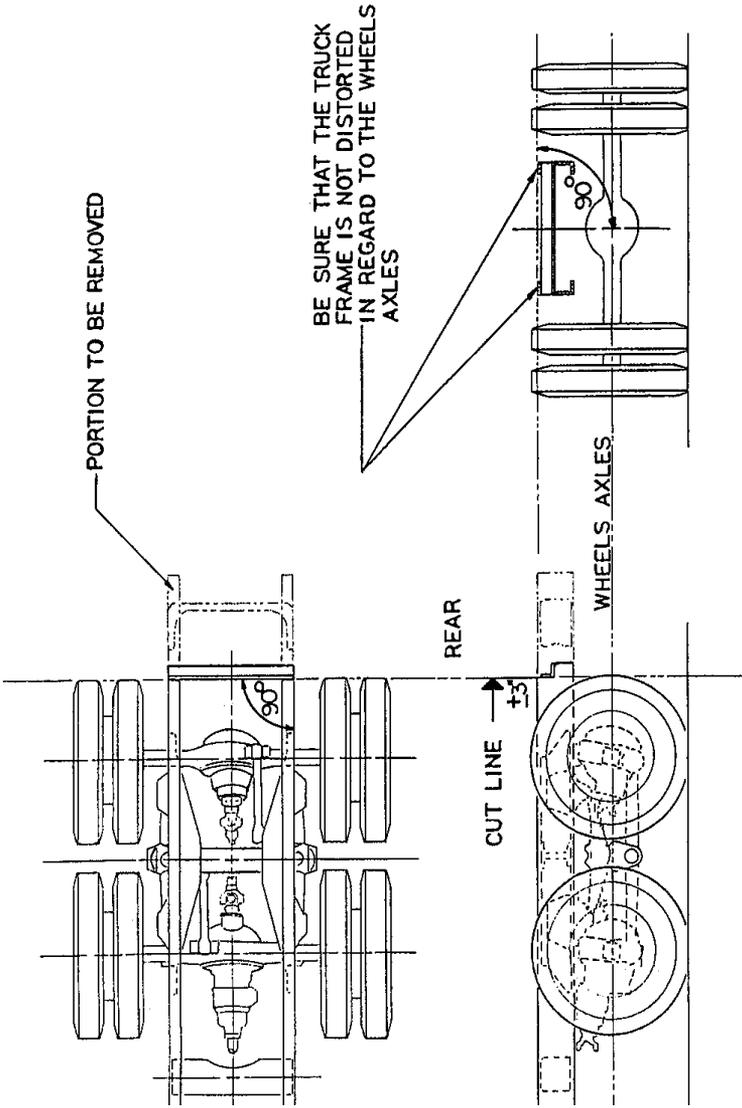
ISO VIEW
SCALE 1/12

HOIST & H-FRAME PARTS LIST

22201235 REV. 1

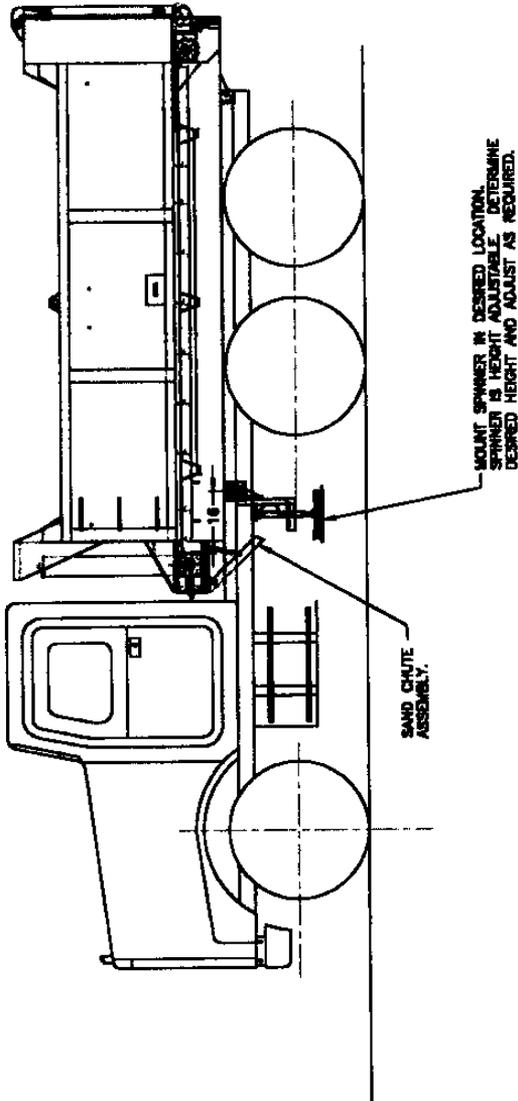
ITEM	QTY	STOCK No.	PART No.	DESCRIPTION
1	1		22201891	NBDOT MAILHOT CYLINDER 09705 ASSEMBLY
2	1		40959280	14 FT U-BODY SAFETY PROP ASS'Y

TRUCK FRAME CUT LINE



TRUCK FRAME CUT LINE

SPINNER LOCATION AND ELEVATION



- TO INSTALL SAND CHUTE:
1. USING 3/4" BOLTS AND NUTS, ATTACH CHUTE TO TAGS LOCATED UNDER THE ALLSEASON DISCHARGE.
 2. DETERMINE THE DESIRED CHUTE ANGLE AND ATTACH THE CHAIN AS REQUIRED.

13' F-MODEL ALL SEASON SANDER/DUMP BODY

QTY	BWS PART #	DESCRIPTION
2	17258	lynch pin
3	04058	1/2" diameter clevis pin
3	04056	1/2" clevis
1	09705	telescopic cylinder CS 130-6-3
1	09283	hoist blocks and bolts
2	22200117	tailgate latch
1	11005	spreader gate jack
1	222200627	conveyor chain
1	02011	1 3/4" take-up bearing
1	40953264	discharge chute
1	19080	1/2" x 6" 80" rubber belting
1	222001193	49" x 93" box style tailgate
4	22200626	bearing block c/w neoprene bushing
1	22201754	21" spreader gate door
2	19063	rod end
1	22201334	1 1/4" x 155" floor hinge pin
1	22201830	manual tailgate latch handle
1	22202022	inner floor safety prop
1	22201760	discharge end plate

ALL SEASON SANDER/DUMP HYDRAULIC COMPONENTS

QTY	BWS PART #	DESCRIPTION
1	09604	1/4" hydraulic motor for spinner
1	09705	hoist cylinder M100-4.5 - 3

SAFETY FEATURES



INNER FLOOR PROP

Used for maintenance when operator is working under the unit.

It is recommended that two people perform this operation.

1. Raise the inner floor to the full angle.
2. Remove pin from the prop and move to the support position on the frame, inside the angle kick-out stop.
3. Lower the inner floor down until the weight is being supported by the prop.



SANDER BOX PROP

Used for maintenance when operator is working under the unit.

1. Raise the sander box.
2. Pull the pin on the prop and move it to the desired position.
3. Lower the sander box until the prop is holding the full weight.



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INTRODUCTION



This manual was created to provide you with the necessary information to perform general disassembly and assembly of the C-series Single and Double Acting telescopic cylinder, manufactured by Mailhot Industries Inc.

Please be sure to closely follow the recommendations given. We believe this manual can be a useful tool for you and is intended to further enhance the quality of service provided by Mailhot Industries Inc.

GENERAL INFORMATION

Before starting work on any hydraulic cylinder, be sure the work area is clean, and offers enough space to extend the cylinder to its full stroke. Work area obstructions or lack of space could make the cylinder difficult to handle increasing the risk for injury or potential damage to the cylinder.

WARNING

It is strongly recommended to take all necessary precautions to avoid an accident during the disassembly and assembly process. During removal of the cylinder, it is recommended that the safety prop(s) and a secondary support be used to keep the truck body in the open position at all times.

NOTICE

Before starting any work on the C-series single or Double Acting telescopic cylinder it is important to verify the warranty status of the product. Unauthorized service of a cylinder within the warranty period without the consent of Mailhot Industries Inc. may void the warranty. Please contact the customer service department in your region to obtain an R.G.A. and further instructions.

St-Jacques, Quebec, Canada	(450) 839-3663	or (800) 563-3663
Guelph, Ontario, Canada	(519) 763-6116	or (800) 688-6810
Edmonton, Alberta, Canada	(780) 482-2121	or (888) 988-2121
Hudson, New Hampshire, USA	(603) 880-9380	or (800) 624-5468
Mailhot, Mexico	(011) 5255-586-4583	

DISCLAIMER

This maintenance manual is intended to provide general guidance when servicing your C-CS series Single or Double Acting telescopic cylinder manufactured by Mailhot Industries Inc. All illustrations and photos should only be used as reference for disassembling and assembling the hydraulic cylinder. Mailhot Industries Inc. will not be liable and is not responsible for damages due to inadequate tools, incorrect procedures, incorrect and/or aftermarket components used and for any other damages. Please contact the Mailhot Industries Inc. customer service department in your region for further information.

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C-CS Series Single and Double Acting Telescopic Cylinder



Internal Configuration

All cylinders are the same! False! Our new generation of C-CS series telescopic cylinders has a unique design that uses 40% less parts than comparable models. This simplified concept improves performance and makes assembly and disassembly a more manageable task. All gland nuts are removable using a minimal set of basic tools.

Figure 1

Single Acting

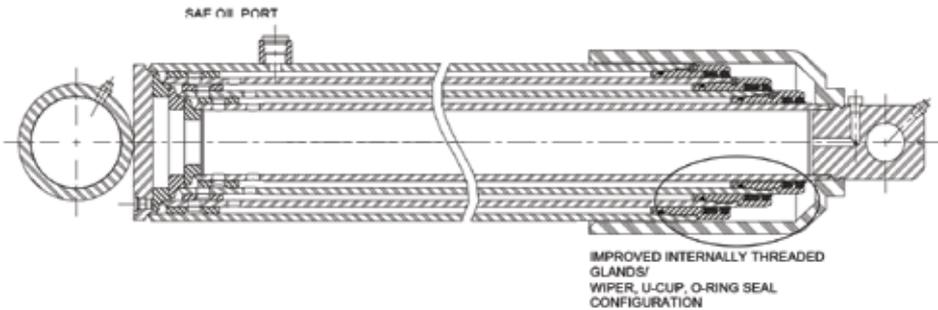


Figure 2

Double Acting

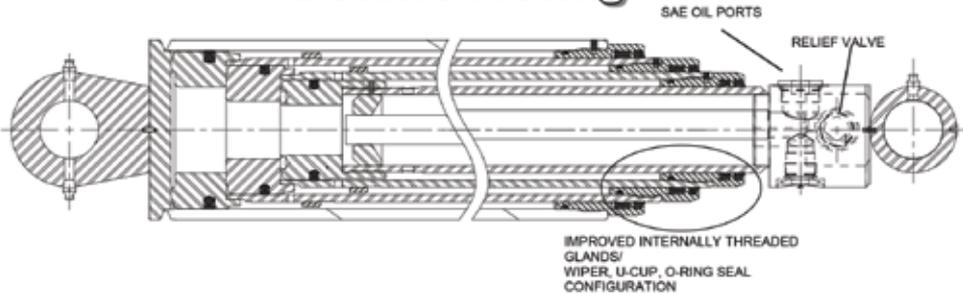
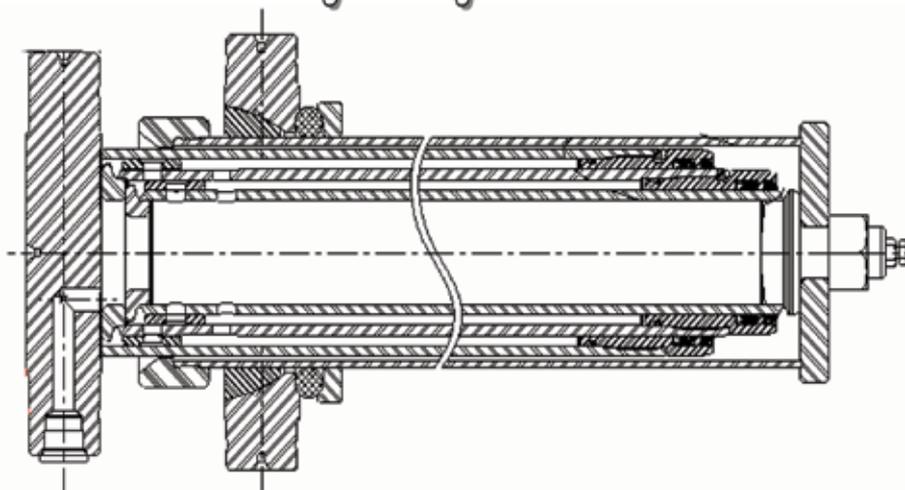


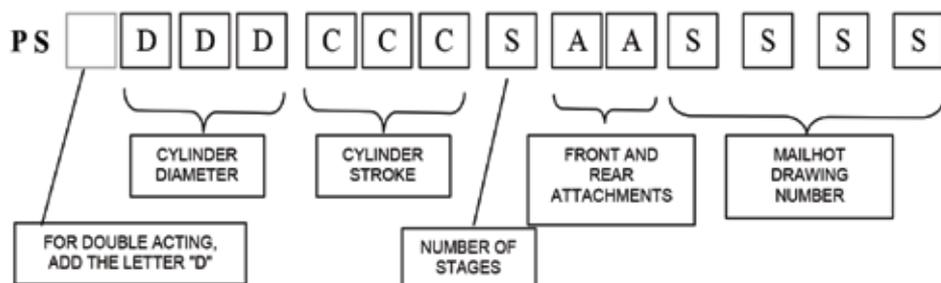


Figure 3

CS-Single Acting with Cover



When you want to order or repair your new generation C-CS series Single or Double Acting telescopic cylinder, we strongly recommend you contact the Mailhot Industries Inc. representative in your region for instructions. Below you will find the coding method that will help you to understand the part number terminology.



IDENTIFYING THE CORRECT CYLINDER FOR YOUR NEEDS

Identifying the Correct Cylinder for Your Needs

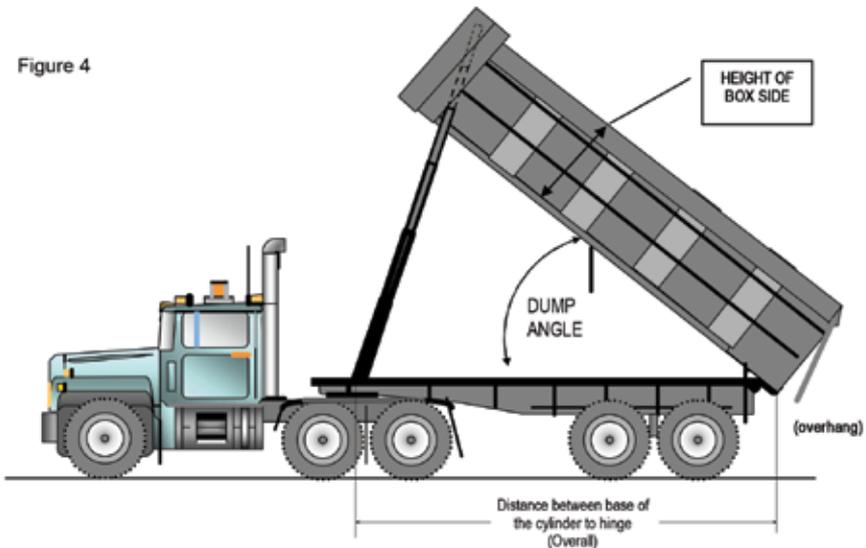


Mailhot Industries Inc. manufactures a variety of cylinder sizes to accommodate different body lengths and capacity requirements. If provided with the correct information, we can determine, based on experience and with the use of application software the C-series telescopic cylinder that is best for your specific application.

When contacting a Mailhot Industries Inc. representative to select a cylinder, please have the following information available;

Overall box length:	Total length of dump body from end to end.
Overhang:	Distance from the center of rear hinge pin to the back of the dump body.
Height of box sides :	Distance from the bottom of the box side to the highest point, in the middle of the side.
Working pressure:	Working pressure per square inch (P.S.I.) applied to cylinder.

Figure 4



With this data in hand, your representative will be able to exactly determine the cylinder type you need for your intended use.

Safety First



Suggestions and Recommendations for the Safety Aspects of Your Cylinder

VISUAL INSPECTION

Inspect the cylinder in the non-extended position, the entire hydraulic system and cylinder during extension.

- Inspect for leakage at the pump, cylinder and hoses.
- Inspect tank for leakage and correct oil level.
- Verify with the cylinder extended that all gland nuts are tight (not partially unscrewed or show any other signs of damage)

HANDLING

When it is necessary to remove the cylinder, it is important to handle it with great care to prevent potential injury or damage to the cylinder. Any hard contact to the outer wall of the cylinder can cause serious damage. It is important to inspect the cylinder for any scoring, imperfections or dents that prevent the cylinder from working correctly. If leakage is visible or the cylinder does not stage correctly rendering the cylinder unusable, please contact the Mailhot Industries Inc. customer service department in your region for instructions. A damaged cylinder installed on a vehicle could lead to serious personal injury or even death.

STORAGE

If a cylinder must be stored for any period of time, it should be protected from poor weather conditions, direct sunlight and extreme temperature variation. Oil ports must be sealed with an appropriate plug to prevent dust, water, humidity or any other contaminant from entering the cylinder. Adding oil inside the cylinder will prevent potential corrosion, especially if cylinder is stored outside. Depending on the length of time the cylinder will be in storage, some additional precautions should be taken.

- 6 months of storage or less, no special precautions other than those stated above are required.
- 6-12 months, cylinders should be stored vertically.
- 12-24 months of storage, cylinder should be pressure tested before installation to ensure seals are functioning properly.
- 24 months or more of storage, all seals should be replaced.

If the cylinder must be stored outside with little or no protection from the weather, the cylinder should be at least stored vertically and filled with oil.

HYDRAULIC OIL

For optimum performance from your hydraulic system Mailhot Industries Inc. recommends using oil specifically designed to be used in hydraulic systems with a viscosity grade between 32 cSt (150 SUS) and 68 cSt (315 SUS) with anti-friction additives.

It is important to verify that the hydraulic oil used is compatible with all the components that comprise your hydraulic system. Due to a wide variety of applications with varying climatic conditions, it is important to consult with a hydraulic oil supplier to determine the appropriate hydraulic oil that will help to prolong the life of your hydraulic system.

PRESSURE IN THE CYLINDER

When the cylinder is under pressure, a small leak could allow oil to escape at more than 2000 P.S.I. causing serious injury. Loose clothing, safety goggles and work gloves are always suggested when working around a pressured system requiring service.

When disassembling a cylinder, great care must be taken because there is always residual pressure that remains in the cylinder. Pressure can remain in a cylinder even after it has been removed and in storage for some time. When stages are moved, even without an oil supply, pressure can built up between the stages, especially if an oil port is clogged or blocked. A sudden unclogging, removal of blockage, or leak in a seal can generate enough pressure to cause serious injury.

Warnings:

- A cylinder is a lifting device only. A cylinder is not a structural component of the truck/box assembly. A cylinder is not and should not be considered a stabilization device.
- A cylinder should be allowed to complete its stroke without any obstacle. There should be nothing in the path of the cylinder that could interfere with its natural movement during extension and retraction.
- Cylinder installation should only be performed by trained and/or qualified personnel, otherwise, serious damage and/or injury is possible.
- When operating a cylinder, equipment should be on level ground and all axles should be in alignment (trailers and end-dump trailers should never be unloaded in a jack-knifed position.)
- Never unload if the ground is not level, too soft or strong winds are present, causing the vehicle to tilt. Lateral movements will result in damage to the cylinder, misalignment of the cylinder stages and could lead to a possible rollover of the vehicle.
- Never unload if equipment or people are in the unloading area.
- The operator of the equipment should always stay at the controls. If the vehicle starts to tilt, it should be lowered immediately. Always be careful not to lower the body too fast and try to lower in a steady motion. Sudden stopping or jerking can cause a sudden peak in pressure within the cylinder and could cause damage.
- Never overload the trailer. The load should be evenly distributed in the body in a horizontal and vertical manner. A load that sticks to the body increases the risk of tilting or potential rollover. The operator should lower the body to assess the situation.
- Never jerk the body to release a stuck load. This can cause damage to the body, hydraulic system, and the vehicle itself. It is preferable to lower the body and to use a manual or mechanical means to free the material. Do not move the truck and/or use sudden stops with the cylinder extended to free a stuck load.
- Over pressurization of the cylinder must be avoided. This could cause serious damage to the cylinder, serious injuries or even death. **Do not operate a cylinder with pressures above 2000 P.S.I. without a written notice and approval of Mailhot Industries Inc.**
- Maintenance is essential to keep the vehicle working safely and to prolong the useful life of the vehicle. An inspection of the vehicle should be part of the operator's daily routine; this will increase safety and helps to detect problems before damage occurs.
- Hydraulic oil changes are very important. Periodic changing of the oil will greatly increase the performance of the hydraulic system.
- Never extend the trailer cylinder in the presence of high voltage electrical lines.

Installation of the Cylinder



To ensure an efficient installation of all the hydraulic circuitry components (pump, tank and hoses) it is necessary to do the following:

Oil Tank and Pump

Oil tank should be installed higher than the pump to ensure a positive flow to the oil port. It is important to fill the tank with new and clean hydraulic oil. Oil should also be selected according to temperature and application uses and specifications mentioned in this manual.

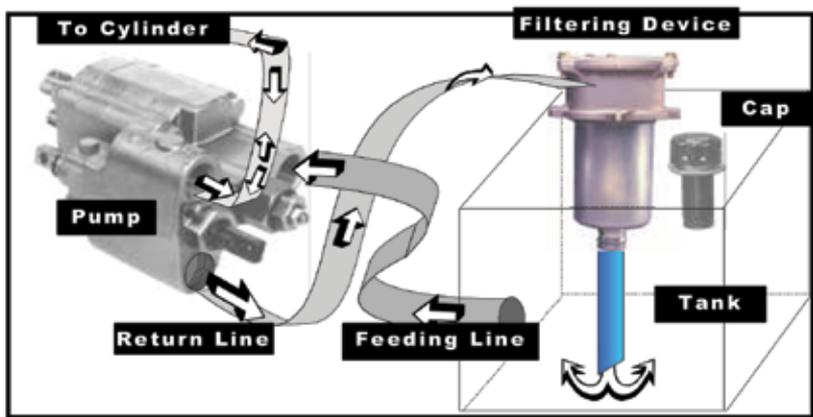
Starting

When pump and oil tank are installed, pump must be primed by hand before connecting it to the P.T.O. Rotate the shaft manually until the pump is filled with hydraulic oil. **WARNING:** never engage an empty pump.

Filtering Device

We **highly recommended** installing a filtering device on the oil return line of the hydraulic circuitry. This will protect all the components against contaminants and impurities that could be present in the circuit. The ideal dimension of the filtering element should be between 20 microns (700 mesh) and 35 microns (400 mesh). To address the potential problems surrounding the installation and removal of the filtering element, we have designed a tank-filter assembly (below) that permits easy servicing of replaceable parts. We also recommend changing the hydraulic oil at least once a year.

Figure 5



INSTALLATION OF THE CYLINDER



It is important that the cylinder is aligned correctly with the truck/trailer frame when installed. The cylinder should be exactly centered in both the vertical axis and the horizontal axis in relation with the truck/trailer frame. Vertically, the cylinder should be perpendicular (90° angle) or should tilt forward. Correct installation is critical to the overall performance of the cylinder. It is recommended to periodically check the alignment between the cylinder, truck/trailer frame, body and rear hinge. (See figure A & B)

When installing the cylinder, Mailhot Industries Inc. recommends placing the cylinder in its intended location and then add a minimum of $1/2"$ of cylinder extension before installing the upper mounting pin. This will prevent the cylinder from bottoming out when in the closed position.

Mailhot Industries Inc. recommends the use of a stroke limiter to avoid hard collisions at end of stroke. One of the most popular methods is a pump disengagement cable. This device automatically stops the pump just before the end of the cylinder stroke.

Another useful device is a body stabilizer. This device allows the body to rise in a parallel axis to the truck, preventing side loading of the cylinder when the truck is on an unlevelled surface or has an uneven load.

IMPORTANT: Ensure that none of the devices described above are in any way altering neither the movement of the cylinder nor the parallelism of body with the truck/trailer frame. Damage could result due to improper installation. Please consult your truck/trailer body manufacturer to obtain restrictions and recommendations for the installation of such devices.

Figure 6

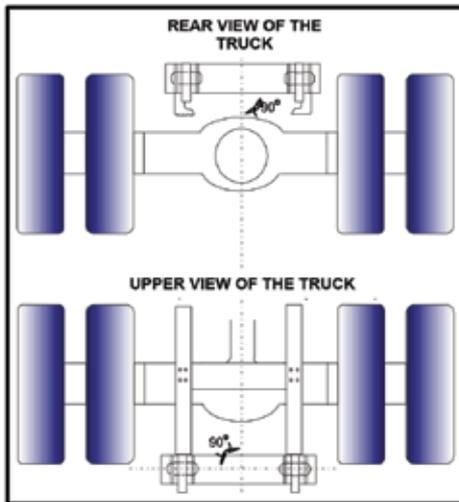
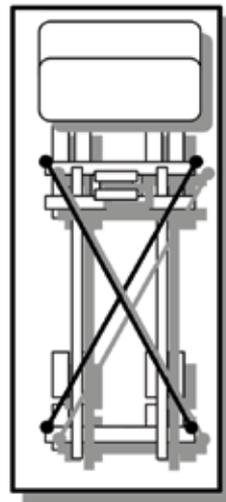


Figure 7



Tools to Service Your Telescopic Cylinder



When the cylinder is removed from the truck, it is suggested to use the following tools to disassemble and assemble it.

- ✓ Figure 8: Metal brush
- ✓ Figure 9: Mechanic type hammer
- ✓ Figure 10: ViseGrip™ chain wrench
- ✓ Figure 11: Seal hook
- ✓ Figure 12: Drill and drill bits
- ✓ Figure 13: Electrical contact cleaner
- Figure 14: Screwdriver with a flat rounded tip
- Figure 15: Mailhot key (wrench)
- Figure 16: 3/16" pointed punch
- Figure 17: 3/16" flatted punch
- ✓ Non-illustrated: Thread sealant (Loctite™ 565) and Bond glue (Loctite™ 222)



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12



Figure 13

TOOLS TO SERVICE YOUR TELESCOPIC CYLINDER



Figure 14



Figure 15

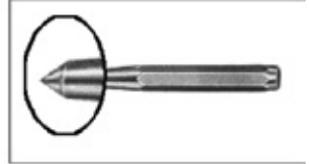


Figure 16



Figure 17

Disassembly, Assembly, Test and Bleeding Procedure



Step 1:

WARNING: Before starting to remove the cylinder from the truck/trailer, take all necessary safety precautions and be sure to install a blocking device to prevent the box from coming down.

Stop the box in open position. Remove the upper mounting pin. Retract the cylinder. Support the cylinder and remove the lower mounting pin at the base and remove the cylinder from the truck/trailer.

WARNING: Be careful when removing oil hoses, residual pressure can be present in the cylinder or in the hydraulic system.

After the cylinder has been removed from the truck/trailer, place the cylinder where it will be able to reach full extension without any obstacle. **Caution:** the stand or bench where the cylinder will be serviced must be capable of holding the weight. If you have a hydraulic bench, be sure that the jaws or any other object will not damage the stages of the cylinder.

Step 2:

Verify that the cylinder does not contain any oil pressure and all oil ports are clear, the air bleeder (if equipped) as well as the grease nipple on the upper attachment must be removed.

The single acting model is equipped with a sleeve over the upper stages. This has to be removed. Run a metal ring of adequate diameter on the cylinder, from the base until it reaches the sleeve. Using a hammer (plastic is recommended) hit the ring all around in order to remove the sleeve.

NOTE: Because all of the stages are to be pulled apart from the cylinder, it is important to leave adequate space on the extension side of the cylinder to avoid an accident.

There are dowel pins located on the tube near each gland nut. To find them, look for punch marks (2 marks).

Turn each stage (using the chain pliers) to align punch marks.

Using the drill and a 3/16" drill bit, drill the center of each dowel pin, but take care not to drill too deep that will only result in damage to the cylinder. Each dowel pin is about 1/16" deeper than the tube thickness. (Figure 18)

Figure 18



DISASSEMBLY, ASSEMBLY, TEST & BLEEDING PROCEDURE



Step 3:

Using the chain wrench, unscrew the smallest gland nut counterclockwise (see image on the right) If the next stage tube is rotating at the same time (this is normal), use chain pliers as close as possible to the gland nut to hold it while unscrewing the gland nut. Take every precaution not to damage the tube. If it still does not unscrew, it will be probably necessary to slightly heat the gland nut with an acetylene torch. **DO NOT OVERHEAT.**

Completely unscrew the gland nut and remove it from the tube, sliding it toward the upper part of the tube, attachment side.

Repeat the above procedure for each and every stage of the cylinder.

Note: If you encounter any resistance when unscrewing a gland nut, verify that there is nothing left of the dowel pins. Also, you can use a second set of chain pliers.



Figure 19

Place every disassembled tube on a clean (soft cloth or shop towels) and level surface, to avoid scoring or scratches.

Step 4:

Inspect each tube carefully looking for damage. All tubes must be exempt from scores, scratches, flat spots, or cracks.

If any damage is found, it is highly recommended to contact Mailhot Industries Inc. or an authorized representative to obtain an evaluation of the cylinder and/or possible solutions to correct any damage if possible or to replace defective parts.

Also inspect gland nuts and tube threads to make sure everything is in working order.

If parts are required, replacement kits and parts are readily available. Upon receipt of new parts, be sure to verify that replacement parts are 100% correct and correspond to the cylinder that you are servicing (contact your representative if necessary).



Step 5:

To remove the wiper, take a flat screwdriver and insert the tip between the outer lip and the edge of the gland nut (Figure 20) and insert the seal hook to pull off the wiper.

Repeat the same operation with the seal hook and the screwdriver to remove the u-cup from the gland nut. (Figure 21)

Normally, these parts should be removed by hand but it is possible that one or more parts are jammed in the head or the gland nut so the seal would be sturdy. If this is the case, use a flat screwdriver with a rounded tip to get under each of these parts. **WARNING:** Be careful not to score the seal groove when removing the seals.

Replace the u-cup with a new one. Finally replace the wiper making sure the lip is facing out of the gland nut (upper side).

Turn the gland nut upside down and take off the O-ring and the backup ring as well (Figure 22). Replace with new ones. (Complete seal kit should be changed (Figure 23))

Repeat this step for each gland nut of the cylinder.

Figure 20



Figure 21

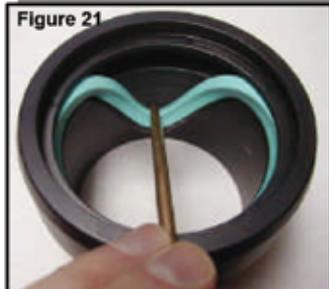


Figure 22



Figure 23



Step 6:

To put the cylinder back together, install the base tube in the jaw of the hydraulic bench (if you have one) otherwise, secure the tube in a sturdy device to hold it in place. **DO NOT** squeeze the tube too much; this could make the tube out of round.

Thoroughly inspect the inside of the tube, particularly where the dowel pin was when the cylinder was taken apart. Remove any metal residue from drilling or metal filings as well. Apply grease at the very end of the threads. (Figure 24)

Figure 24



Insert the first section (next tube) in the base section and push it in approximately half way. Be sure to keep the section inserted as parallel as possible.

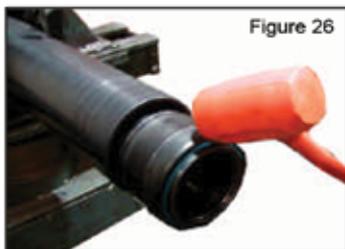


Figure 25



Install a sleeve (if available) on the threads of the section newly installed (Figure 25). Take the gland nut corresponding to the section that was just inserted and apply grease to it, specifically where the seal assembly is. Hydraulic oil soluble grease is strongly recommended.

Insert the gland nut, keeping it as parallel to the tube as possible. Threads must be inserted first. After insertion, place the palm of your hands on each outer front side of the nut and slightly rotate, push in the nut until the threads can be engaged on the bigger tube. If too tight, a plastic hammer can be used (Figure 26).



Also, if the gland is too hard to move easily on the tube, install the chain pliers on it. This will give you the grip to move it along the tube.

Step 8:

Install the sleeve over the upper stages and secure it in place using a plastic hammer. The sleeve head must rest in the groove. If too loose or badly damaged, this part should be replaced. Contact your Mailhot Industries representative.

Finally, install and tighten the air bleeder (if equipped).

Install the cylinder on the truck.

Connect the cylinder to the hose(s).

If equipped with an air bleeder: The last step is to bleed any air that could be trapped in the cylinder. Fully extend the cylinder (dump body/trailer should be empty) for the first time. Then lower the cylinder to within a foot of the frame. Turn the bleeder in a counterclockwise direction, this opens the valve and will allow air to escape. When a steady flow of oil comes from the bleeder, turn the valve clockwise until the valve is closed.

Troubleshooting



Before using this section, be sure to review the procedures outlined in the INSTALLATION-RECOMMENDATIONS section of this manual.

PROBLEMS	PROBABLE CAUSES	SOLUTION
Pressure loss	<ul style="list-style-type: none"> • Safety valve is stuck in open position • Pump is broken 	<ul style="list-style-type: none"> • Clean or replace the safety valve • Change worn-out parts
Noisy pump	<ul style="list-style-type: none"> • Air is entering the hydraulic circuitry • Pump is running too fast • Pump is misaligned with the P.T.O. • Pump is broken 	<ul style="list-style-type: none"> • Look for infiltration and repair • Verify manufacturer's specifications and adjust • Correct alignment • Change worn-out parts
One or more stages of the cylinder stay open	<ul style="list-style-type: none"> • Pump flow is too high, plungers and gland nuts are jamming. • Pump is running too fast. 	<ul style="list-style-type: none"> • Verify if the pump is the one recommended for the type of cylinder used. • Use a lower P.T.O. coupling. • Install a limiting device
Cylinder is leaking oil	<ul style="list-style-type: none"> • Misalignment of the cylinder cradle or back hinge. • Seals are worn 	<ul style="list-style-type: none"> • Verify and correct alignment. • Change worn-out parts.
Stage or stages are scored.	<ul style="list-style-type: none"> • Misalignment of the cylinder cradle or back hinge. 	<ul style="list-style-type: none"> • Verify and rectify the alignment.
Cylinder opens and closes without smooth operation	<ul style="list-style-type: none"> • Oil tank is too small for the cylinder capacity. • Internal parts of the cylinder are worn. 	<ul style="list-style-type: none"> • Call your Mailhot Industries representative to obtain a tank size recommendation • Verify worn-out parts and replace them.
One of the stages does not work properly	<ul style="list-style-type: none"> • One of the plunger or gland nuts is swollen or not sliding smoothly. • Pressure from the pump is too low. • Air trapped inside cylinder 	<ul style="list-style-type: none"> • Verify and replace worn-out parts. • Verify and adjust pump pressure. • Bleed cylinder

The above table is only a general guide for troubleshooting. If you suspect a more serious problem, it is strongly recommended you contact the Mailhot Industries Inc. customer service representative in your region for assistance.

Warranty



A) DURATION

Mailhot Industries Inc. warranty starts at the date of invoice:

1. Non-nitrided cylinders and components, Mailhot branded hydraulic components and nitrided cylinder's components are covered with a one (1) year period against manufacturing defects or raw material defect.
2. Nitrided cylinders are covered for a two (2) year period against all manufacturing or material defects.

B) COVERAGE

1. Warranty mentioned in paragraph A applies to defective parts only and actual work done on those parts by Mailhot Industries Inc. employees, at a designated and authorized Mailhot Industries service center, or by a third party, provided there is an agreement between Mailhot Industries Inc. and the buyer. In all these cases, a Return Goods Authorization (R.G.A.) number must be issued by Mailhot Industries Inc. or its authorized representative. Notwithstanding the above, Mailhot Industries Inc. reserves the right to replace, in all or in part, or to credit product covered by this warranty.
2. Costs and expenditures caused by the removal and reinstallation of the defective product from "Mailhot Industries Inc" are at the buyer's expense. If the product is defective and this defectiveness is covered by the present warranty, Mailhot Industries Inc. will reimburse to the buyer costs according to the agreement negotiated when the Return Goods Authorization number was issued.
3. This warranty is ruled with a maximal workmanship allowance according to the case and region. You must call Mailhot Industries Inc. to get all details.
4. All product must be returned to Mailhot Industries Inc. or its authorized representative using ground transportation and prepaid. If the product is defective and this defectiveness is covered with the present warranty, Mailhot Industries Inc will reimburse to the buyer costs of transport as agreed when the Returned Merchandise Authorization number was issued.

C) NON COVERAGE (EXCLUSIONS)

This Mailhot Industries Inc. warranty does not apply to:

1. Modification on Mailhot hydraulic components, cylinder and/or it's components;
2. Bad maintenance on Mailhot hydraulic components, cylinder and/or it's components;
3. Abusive use of Mailhot hydraulic components, cylinder and/or it's components;
4. Installation or use not according to instructions supplied in maintenance manual for the purchased product;
5. Use of Mailhot hydraulic components and/or cylinder and/or components after a defect has been found, a functional defect or any defect that would interfere with the normal use;
6. Any non-authorized repair of a Mailhot component and/or cylinder and/or it's components;
7. Any damage or defect caused by an impact or accident on the vehicle or the equipment where the Mailhot component and/or cylinder and/or it's component was installed;
8. Any Mailhot hydraulic components, cylinder and/or it's components working under excessive working pressure specified by Mailhot Industries Inc.;
9. Any Mailhot hydraulic components, cylinder and/or it's components within an hydraulic system not equipped with a filtering system as described in the maintenance manual;
10. Any traveling fees from the buyer to verify a related problem to the Mailhot hydraulic components, cylinder and/or it's components;
11. Any expenses for lubricant or workshop expenditures



12. Any expenses for repainting a Mailhot hydraulic components, cylinder and/or it's components
13. Failing to report within 30 days to Mailhot Industries Inc. or it's authorized representative about the knowledge of a defect or breakage of a Mailhot hydraulic components, cylinder and/or it's components;
14. Normal wear of seals or wear caused by contamination.
15. Inadequate warehousing of the product (refer to the maintenance manual)

D) RESPONSIBILITY EXCLUSION

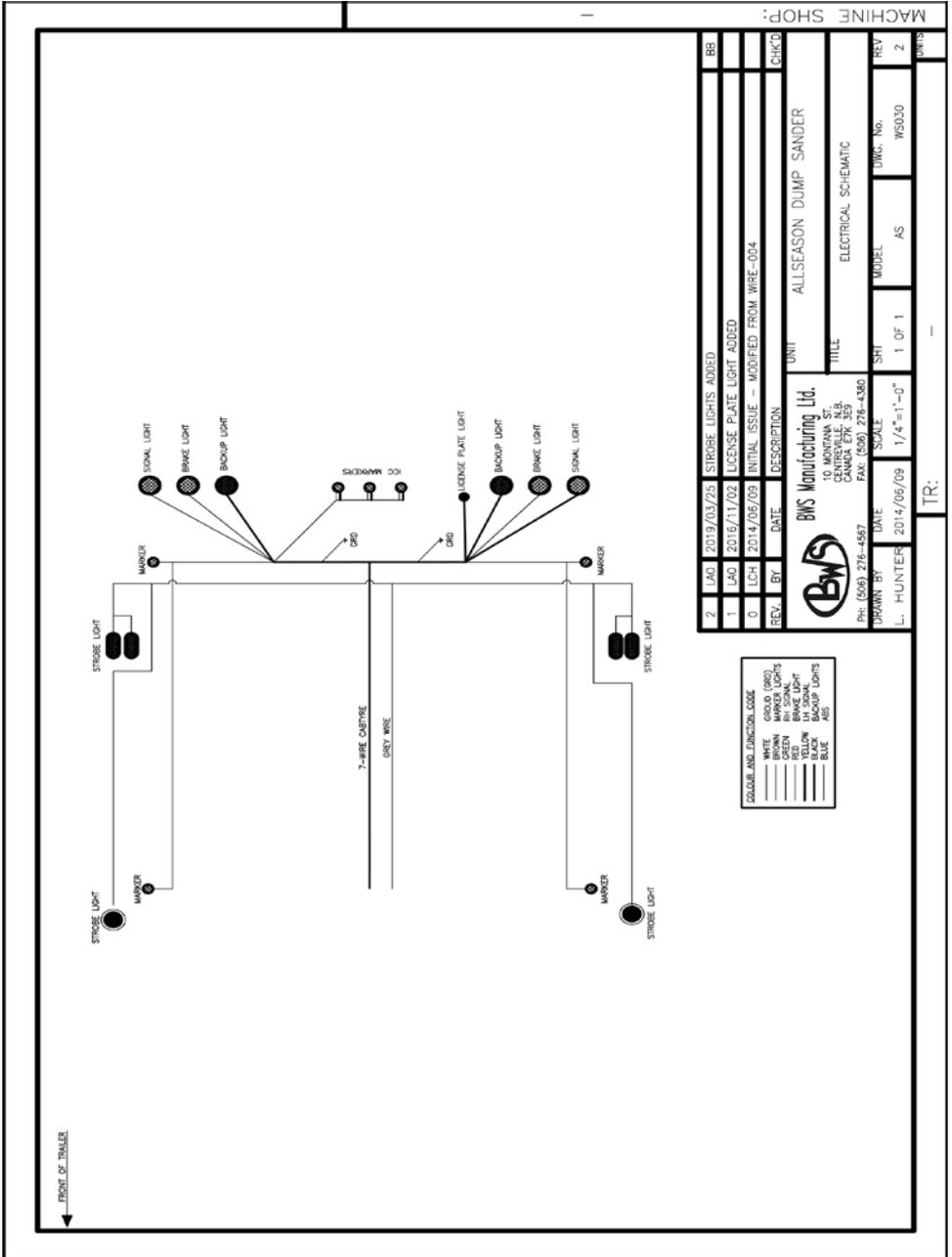
Mailhot Industries Inc. will not be liable for the consequential damages or contingent liabilities, including, but not limited to, loss of life, personal injury, loss of business income, downtime costs and trade, or other commercial loss arising out of the failure of Mailhot cylinder or hydraulic component covered by present warranty.

E) ELECTED PLACE OF RESIDENCE

Mailhot Industries Inc. and the buyer agree, for any and all claims, or lawsuit for any reason whatsoever, in relation with present agreement, to choose the law district of Joliette, province of Quebec, Canada, as the proper place of auditions of claims or lawsuits to the exclusion of any other law district that could have jurisdiction on such claims or lawsuit, as prescribed by the law.

SCHEMATICS ELECTRICAL SCHEMATIC

WS030 REV. 2

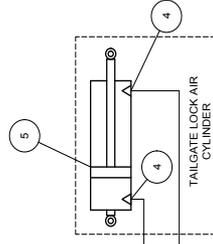
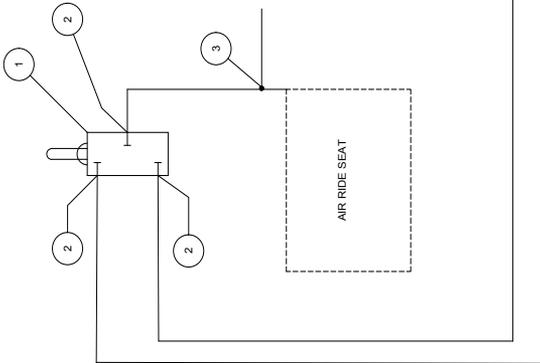


AIR SCHEMATIC

PS2313NB REV. 0

NOTES:
 1. THIS IS A GENERAL LAYOUT WHICH SHOWS STANDARD AND COMMONLY USED PARTS.
 2. LOCAL AND/OR REGIONAL COMPONENTS MAY VARY BY TRAILER, SOME OPTIONAL COMPONENTS MAY NOT BE SHOWN. (E.G. CHECK PART NUMBER WITH BWS PARTS DEPARTMENT BEFORE ORDERING REPLACEMENTS.)
 3. SYSTEM CAPACITY MAY VARY BY TRAILER MODEL BASED ON LOAD CAPACITY AND RIDE HEIGHT.

#	DESCRIPTION	P/N	QTY
1	AIR VALVE	401068	1
2	1/2" TUBE TO 1/2" NPT 90 DEGREE	07027	3
3	1/2" AIR TEE	07116	1
4	1/2" TUBE TO 1/2" NPT 90 DEGREE	07133	2
5	AIR CYLINDER	401068	1
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			



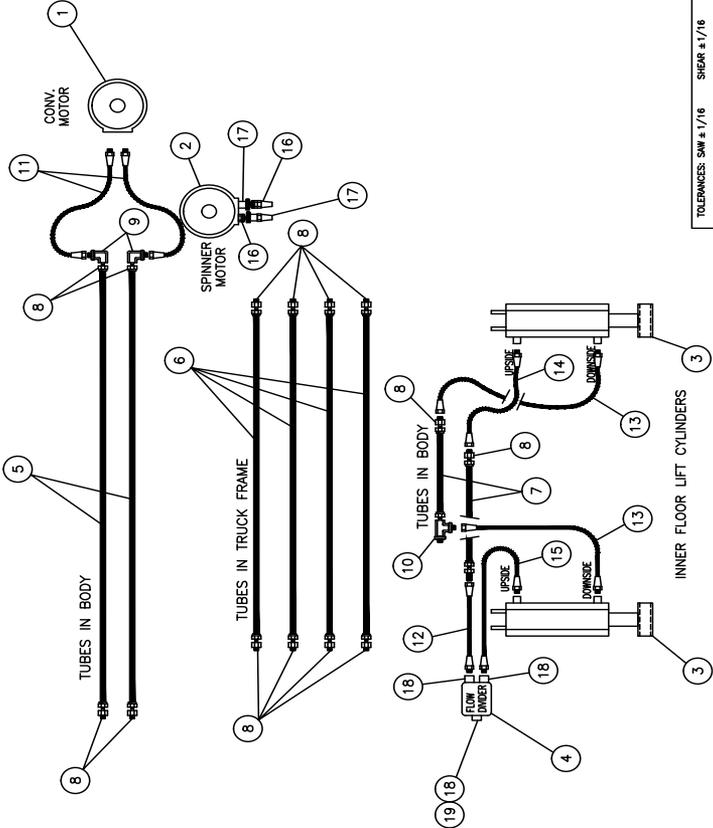
REV.	0	BY	LAO	DATE	2016/10/19	DESCRIPTION	INITIAL ISSUE COPY REF FROM PS1A1JX.	CHK'D	
						UNIT	TAILGATE AIR LOCK		
						TITLE	AIR SCHEMATIC		
						SCALE	1/2"=1'-0"		
						DATE	10/20/2016		
						MODEL	2313NB		
						SHF	1 OF 1		
						DWG. No.	PS2313NB		
						REV	0		

BWS Manufacturing Ltd.
 1000 W. CENTREVILLE AVE.
 CENTREVILLE, N.B.
 PH: (508) 276-4667
 FAX: (508) 276-4380

FRONT OF TRUCK

HYDRAULIC SCHEMATIC

HS013



TOLERANCES: S.M. ± 1/16 DIMS. ± .005	SHEAR ± 1/16 MILING ± .005	IRONWORKER ± 1/16 DRILL ± .005	BRAKE ± 1"
UNIT		UNIT	
BMS Manufacturing Ltd.		NB DOT STYLE ALLSEASON	
P.O. BOX 429 DANFORTH, ONT. L4W 1H6		HYDRAULIC SCHEMATIC	
PH: (416) 276-1800	FAX: (416) 276-1800	DATE: 10/04/97	REV: 1
A. DYER	MIS	MODEL	DWG. No.
		2313NB	HS013

TROUBLE SHOOTING

PROBLEM	POSSIBLE SOLUTIONS
Spinner not turning	Check spinner drive assembly and keys.
	Check for motor rotation.
	Check motor shaft key to see if the key was sheared off.
Conveyor is not operating.	Check for anything jammed in the conveyor chain.
	Check gearbox drive shaft to conveyor for rotation.
	If shaft is not turning check for gear box damage.
	Remove motor from gear box to see if motor shaft key is sheared.
	Check if motor shaft is turning.
None of the hydraulic circuits are working.	Shut down the truck as soon as it is safe to do so. Check under the truck for hydraulic oil. If there isn't oil under the truck, install pressure gauge at the test port on the valve box. If there is no pressure shown on the gauge there is a possible pump or electrical failure.
	Check main power fuse under drivers seat this is the main power supply to the control valve and cab controls.

WARRANTY

BWS ALL SEASON SANDER WARRANTY AGREEMENT

This is a legal contract between the original owner, BWS Manufacturing Ltd. and the retailing BWS Authorized Representative/Dealership.

1 YEAR BASIC WARRANTY

Except for exclusions specified below, BWS Manufacturing Ltd. warrants that the specified BWS equipment herein will be free from defects in materials and workmanship, under normal use and service, for the period of the first 12 months of regular service post the date-in-service. This warranty extends only to the original 1st owner. It is not transferable and applies only to OEM installed components & equipment.

EXTENDED BWS FRAME SUPER STRUCTURE WARRANTY COVERAGE

In addition to the above prescribed 12 month warranty period, BWS Manufacturing Ltd. also warrants the trailer main frame beams or 'super-structure' (consisting of the top & bottom flanges, and their connecting web) to be free from defects in materials & workmanship, under normal use and service for a period of 5 years from the date-in-service (DIS) only to the first owner.

PAINT/FINISH

Guaranteed against defects in materials & workmanship for 3 years. Any custom colors are subject to a 1 year warranty only. Does not cover against general wear and tear such as stone chips or fade as of 2016.

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

AT THE SOLE DISCRETION OF BWS MANUFACTURING LTD.:

- Your sole exclusive remedy arising from your use of this BWS equipment; is limited to the repair or replacement, of any specified defective parts and/or materials. All warranty work is to be performed at an authorized BWS Warranty Dealer, or at the BWS Manufacturing Ltd. OEM facility (in Centreville, NB).
- Claims made from far away / remote locations may necessitate advance repair quote submissions from local & capable repair shops / facilities to be prepared for, reviewed and accepted by BWS Manufacturing Ltd., as being the best & most reasonable remedy for a given situation.
- The warranty coverage period expiry term applies fairly as to when the specified BWS equipment is brought to an authorized BWS Dealer, or to the BWS OEM facility for remedy or correction(s) of any user suspected possibly warrantable defect(s).

EXCLUSIONS FROM BWS 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 12 month BWS warranty terms period. Such as, but not limited to:
 - air, electrical
 - hydraulic accessory systems (eg. ABS sensor alignment)
2. Any trailer/unit which shall have been operated in such a manner against the specific instructions or recommendations of BWS Manufacturing Ltd., or which shall have been neglected in regular user maintenance or used in any way deemed inappropriate to the opinion of BWS Manufacturing Ltd., consequently adversely affecting the intended performance levels.
3. Any trailer/unit to which affected original parts have been removed or altered, or had user custom alterations made, without the express written consent & approval of BWS Manufacturing Ltd.
4. Normal required regular maintenance, adjustment(s), & service.
5. BWS Products operated with cargo(s)/payload(s) exceeding BWS' rated unit capacity.
6. Any freight or transportation costs associated with warranty claim(s).
7. BWS is not involved in any warranty claims of any OEM installed engines.

BWS WARRANTY DISCLAIMER AND LIMITATIONS OF LIABILITY

BWS Manufacturing Ltd. And the authorized dealer offer no other warranties, expressed or implied. It is agreed that neither BWS, nor the dealer shall be liable for any incidental or consequential damages. Including but not limited to:

- loss of income
- damage of vehicle(s) or equipment
- damage to attachments
- damage to cargo
- towing expenses
- attorney fees
- liability you may have in respect to any other person or party

TIME LIMIT ON COMMENCING LEGAL ACTION

It is agreed that you have one (1) year from the accrual of the cause of action to commence any legal action, arising from the purchase or use of the specified BWS equipment or be barred forever. To the extent any provision of this warranty contravenes the law of an affected local legal jurisdiction, such provision shall be inapplicable in such jurisdiction, and the remainder of the warranty shall not be affected thereby.

On the date of sale, I have read the complete BWS Warranty Agreement, I understand its terms & conditions, and acknowledge receipt of my copy of this agreement.

WARRANTY REGISTRATION FORM

Please print clearly or type.

date of sale

BWS serial #

date of delivery

BWS Model

purchaser name

purchaser title /position within the company

purchaser signature

purchaser/company name

ship to address

city/town

province/state

postal/zip code

dealership name

primary contact at the dealership

primary contact phone

ship to address

city/town

province/state

postal/zip code

Please record required information and submit to BWS Warranty Department.

Email warranty@bwstrailers.com or fax (506) 276-4380.

Make certain to provide a copy to the customer/trailer purchaser and keep a copy at the dealer office.

The following items are to be performed by the dealer at the time of delivery. Customer is to review and sign off each item as verification that it was performed.

	Completed the BWS Warranty Registration Form		Explain required maintenance program to Customer.
	Review operation and service manual with the Customer.		Explain the BWS warranty to the Customer
	Explain and demonstrate the equipment operation to the Customer.		Present completed warranty registration copy to the Customer and fax copy to BWS Warranty Department.

FOR ASSISTANCE, PLEASE CALL SERVICE

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

Toll Free (888) 896-5777
Phone (506) 276-4567
Email: sales@bwstrailers.com

STRUCTURAL & COMPONENT WARRANTIES

No warranty what-so-ever on tires or ABS sensor alignment.
1 year complete - 100% Parts and Labour (from the In Service Date)

BWS CONTACT INFORMATION

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



www.bwstrailers.com
toll free 888.896.5777



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CERTIFIED