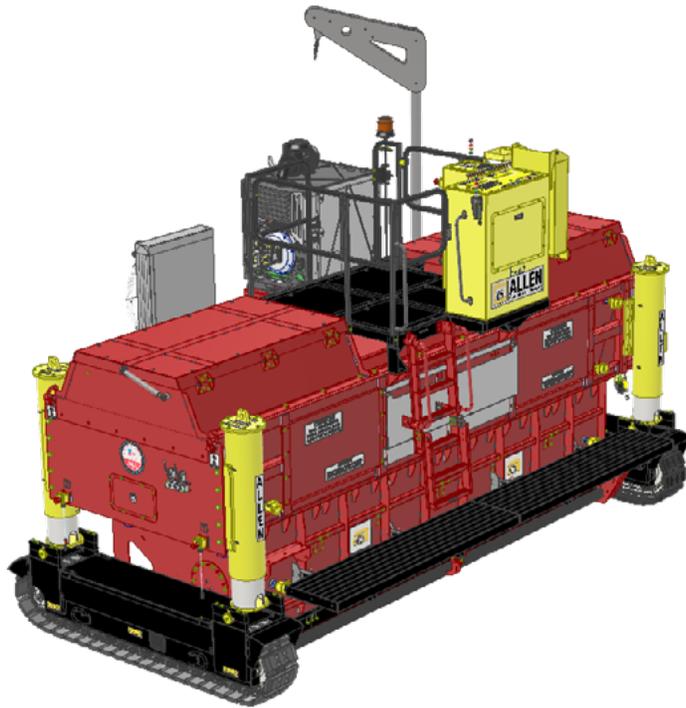


**AGGREGATE SPREADER**

# **AAS310**



# **SAFETY & OPERATIONS MANUAL**

Manual Part #: 080742 | Revision: -  
Language: English | Original Instructions



**ALLEN**  
CONCRETE PAVERS

# AGGREGATE SPREADER

## SAFETY & OPERATIONS MANUAL

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This manual covers the products listed below:

<u>Part No.</u>	<u>Description</u>
080200	Aggregate Spreader, Diesel, Tier 4

### NOTICE

This manual, or a copy of it, must be kept with the machine at all times.  
There is a manual storage container located on the machine for your convenience.

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All information, specifications, and illustrations in this manual are subject to change without notice and are based on the latest information at the time of publication. No part of this manual may be reproduced or transmitted in any form or by any means, electronics or mechanical, for any purpose, without the express written permission of Allen Engineering Corporation (AEC). AEC assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.

Allen Products are covered under one or more of the following patent numbers:  
10,100,537; 9,068,301; 9,068,300; 8,360,680; 7,690,864; 7,114,876B1; 6,857,815B2; 6,582,153  
With other Patents Pending.

Printed in U.S.A.  
Page 2

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Sect No.	Title	Page
	<b>Table of Contents</b> .....	<b>3</b>
	Limited Warranty & Limitation of Liability.....	5
	Information Contained in this Manual.....	6
	Dealer Information / Ordering Parts.....	7
	Model Number / Serial Number Unit Identification.....	8
	Machine Dimensions.....	9
	Technical Specifications .....	10
	Engine Specifications.....	12
<b>1</b>	<b>SAFETY</b> .....	<b>14</b>
	Federal / State Warning Regulations .....	15
	Manual Tag Safety Detail.....	16
	Spark Arrestor Notice.....	17
	Operating Safety .....	18
	Engine Safety.....	19
	Service Safety.....	20
	Lifting Safety .....	21
	Loading / Unloading Safety .....	22
	Transportation Safety.....	23
<b>2</b>	<b>OPERATION</b> .....	<b>24</b>
	Machine Overview .....	25
	Load Legs Loading & Transportation Procedure .....	27
	Loading & Transportation Procedure.....	30
	Introduction .....	32
	Pre-Start Procedure .....	33
	Control Panel Overview.....	36
	Quick Start Guide.....	38
	Engine Start Procedure .....	42
	Operating Procedure.....	44
	Operating Procedure: Paving Guideline .....	48
	Hopper: Loading and Cleaning .....	50
	Stringline Setup .....	52

<b>Sect No.</b>	<b>Title</b>	<b>Page</b>
<b>3</b>	<b>SERVICE .....</b>	<b>58</b>
	Maintenance Schedule.....	59
	Replacement Filters / Fluids.....	60
	Diesel Fuel Detail.....	61
	Engine Oil Detail .....	62
	Engine Coolant Detail.....	63
	Hydraulic Service .....	64
	Motor Gear Oil Service.....	65
	Hydraulic Service: Motor Manual Brake Release .....	66
	Grease Points .....	68
	Grease Points & Chain Maintenance .....	73
	Battery Jump Start Procedure.....	74
	Cleaning Procedure.....	75
	Troubleshooting .....	76
	Hydraulic and Electrical Schematic Information.....	78
	Revision Details .....	79

# Limited Warranty & Limitation of Liability

## GENERAL INFORMATION

### I. LIMITED WARRANTY & LIMITATION OF LIABILITY

Allen Engineering Corporation (“Allen”) warrants its products to be free of defects in material or workmanship for:

**TWO YEARS FROM END USER’S DATE OF PURCHASE, SUBJECT TO THE EXCEPTIONS AND SHORTER WARRANTY PERIODS DESCRIBED HEREIN.**

**The warranty period begins on the date of purchase by the End User of the product. All warranty is based on the following limited warranty terms and conditions, including the disclaimer of all implied warranties of any type and the disclaimer of consequential damages.**



1. Allen’s obligation and liability under this warranty are limited to repairing or replacing parts if, after Allen’s inspection, there is determined to be a defect in material or workmanship. Allen reserves the choice to repair or replace.
2. All warranty-related parts must be purchased in advance through an Allen dealer. The parts will be made available to the Allen Distributor, Dealer, or Rental Center from whom the End User purchased the product.  
For machines being prepared, a warranty request form and/ or RGA request form must be submitted to AEC after the repairs are completed.
3. Replacement warranty parts, installed in the product, are warranted only for the remainder of the warranty period of the product as though they were the original parts.
4. BATTERY POWERED PRODUCTS ARE WARRANTED FOR ONE YEAR FROM END USER’S DATE OF PURCHASE.
5. Allen does not warranty engines or batteries. Engine warranty claims should be made directly to an authorized factory service center for the particular engine manufacturer. Batteries are not warranted due to unknown treatment during transport, etc., and any battery claims should be directed to the battery manufacturer.
6. Allen’s warranty does not cover the normal maintenance of products or their components(such as engine tune-ups and oil & filter changes). The warranty also does not cover normal wear and tear items(such as belts, tires, blades, pans and other consumables).
7. Hydraulic Component’s are required to be maintained per Allen’s mandatory service intervals in each machines owners manual. OEM Allen hydraulic filters and consumables are required to service machines during the warranty period. Failure to use OEM Allen hydraulic filters will result in denied warranty.
8. Allen’s warranty will be void if it is determined that the defect resulted from operator abuse, failure to perform normal maintenance on the product, modification to product, alterations, or repairs made to the product without the written approval of Allen. Allen specifically excludes from warranty any damage to any trowels resulting from a drop or impact to the rotors.
9. Impact damage to gearboxes is not covered under the Allen warranty and is deemed customer abuse.
10. Impact damage to trowels in any way is not covered under the Allen Warranty and is deemed customer abuse. ( Example: Dropping a machine)
11. Allen will pay shop labor on warranty items at the Allen Shop Labor Rate in existence on the date of the warranty claim. An Allen labor chart will determine the time allowed to complete a repair and will govern the shop labor hours that will be allowed.
12. Allen will credit the cost of ground freight on warranty replacement parts after approval of the warranty claim. No warranty replacement parts will be shipped air-freight at the expense of Allen. Allen does not pay any inbound freight.
13. ALLEN ENGINEERING CORPORATION’S WARRANTY POLICY WILL NOT COVER THE FOLLOWING: TAXES; SHOP SUPPLIES; ENVIRONMENTAL SURCHARGES; AIR FREIGHT; TRAVEL TIME;LOSS OF TIME;INCONVENIENCE;LOSS OF RENTAL REVENUE; RENTAL COSTS OF EQUIPMENT USED TO REPLACE THE PRODUCT BEING REPAIRED;LOSS OF USE OF THE PRODUCT; COMMERCIAL LOSS; OR ANY OTHER CHARGES WHATSOEVER OR ANY LIABILITIES FOR DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGE OR DELAY.
14. ALLEN ENGINEERING CORPORATION MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THIS LIMITED WARRANTY IS IN LIEU OF THE WARRANTY OF MERCHANTABILITY AND FITNESS. THERE ARE NO OTHER WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THIS DOCUMENT.
15. No Allen employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of Allen Engineering Corporation.
16. Warranty claims must be submitted within 30 days from the date of failure.
17. Once a warranty claim has been submitted, AEC has up to 90 business days to process the request.
18. Standard service part warranty will not exceed 90 days from the date of purchase. Exceptions to this are:  
#1 Gearboxes: 1year warranty from date of purchase.  
#2 Electrical Components: 30 day warranty from date of purchase. This applies to wiring harnesses, transmitters, ECUs, display screens, and toggle switches.
19. All purchased components are subject to the inspection and warranty of the respective manufacturer. This inspection may extend beyond 90 days.
20. If warranty is suspected do not disassemble any hydraulic or electrical components. Failure to comply with this instruction will lead to denial of a warranty claim.



This manual provides information and procedures to safely operate and maintain the Allen Machine.

For your own safety and protection from personal injury, carefully read, understand, and observe the safety instructions described in this manual. Keep this manual or a copy of it with the machine at all times.

Always operate this machine in accordance with the instructions described in this manual. A well maintained piece of equipment will provide many years of trouble free operation.

This manual is divided into the following sections:

**SECTION 1  
SAFETY**

**SECTION 2  
OPERATIONS**

**SECTION 3  
SERVICE**

---

Complete any warranty requirements as specified by the engine manufacturer in their instructions

Your engine is not manufactured by Allen Engineering Corporation, Inc, and therefore is not covered under Allen Engineering Corporation, Inc warranty.

Your engine manufacturer should be contacted if you wish to purchase a parts manual or a repair manual for your engine.

Refer to enclosed owners engine manual for complete O&M instructions. See your battery manufacturer for battery warranty.

Your Dealer has Allen Engineering Corporation trained mechanics and original Allen replacement parts. Always contact the Allen Dealer who sold you this machine for Allen Certified repairs and replacement parts.

Place Allen Dealer information below for future reference.

Dealer Name: _____		
Phone #: (____) - ____ - _____		
Address: _____		
City: _____	State: _____	Zip: _____
Salesman: _____	Mobile Phone: _____	
Additional Comments: _____		
_____		
_____		

### NOTE

ALL INFORMATION, SPECIFICATIONS, AND ILLUSTRATIONS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE AND ARE BASED ON THE LATEST INFORMATION AT THE TIME OF PUBLICATION.

The Parts section in this manual contains illustrated parts lists for help in ordering replacement parts for your machine. Follow the instructions below when ordering parts to insure prompt and accurate delivery:

1. All orders for service parts - include the serial number for the machine. Shipment will be delayed if this information is not available.
2. Include correct description and part number from the Parts Section
3. Specify exact shipping instructions, including the preferred routing and complete destination address.
4. DO NOT return parts to AEC without receiving written authorization from AEC. All authorized returns must be shipped pre-paid.
5. When placing an order, please contact the AEC dealer nearest you.

# GENERAL INFORMATION

## Model Number / Serial Number Unit Identification

### Manufacturer's Codes:

When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine. The legends below specifically defines each significant character or group of characters of the Model Number and Serial Number codes.

### Model Number

AAS 310

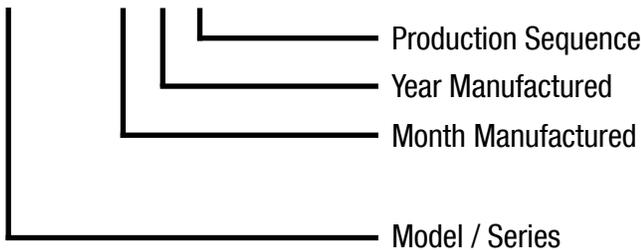


### Serial Number

The serial number found on the identification plate is a ten digit format. The model number identifies your machine and will ensure that you receive the correct replacement parts.

### Serial Number Example

A310 - 09 20 01



### Unit Identification Plate Location:

An identification plate listing the model number and the serial number is attached to each unit and is located on the rear lower left side of mainframe. Refer below for serial number and model number location. This plate should not be removed at any time.

Please record the information found on this plate below so it will be available should the identification plate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine.

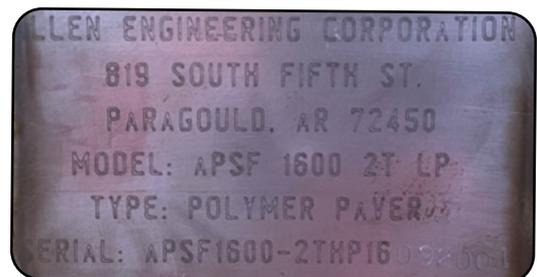
FILL IN FOR FUTURE REFERENCE

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Date Purchased: \_\_\_\_\_

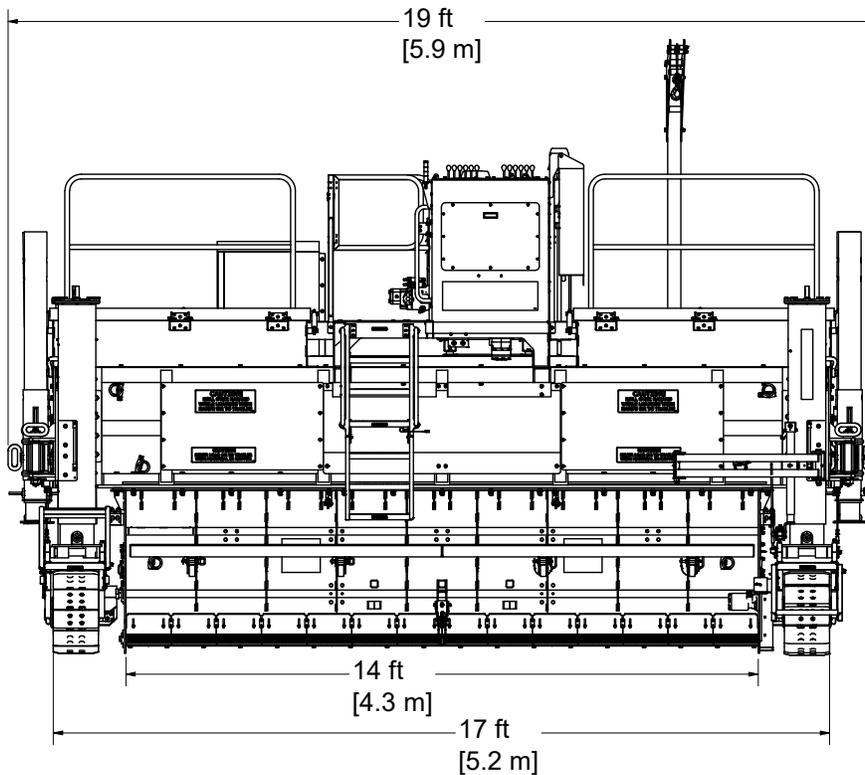
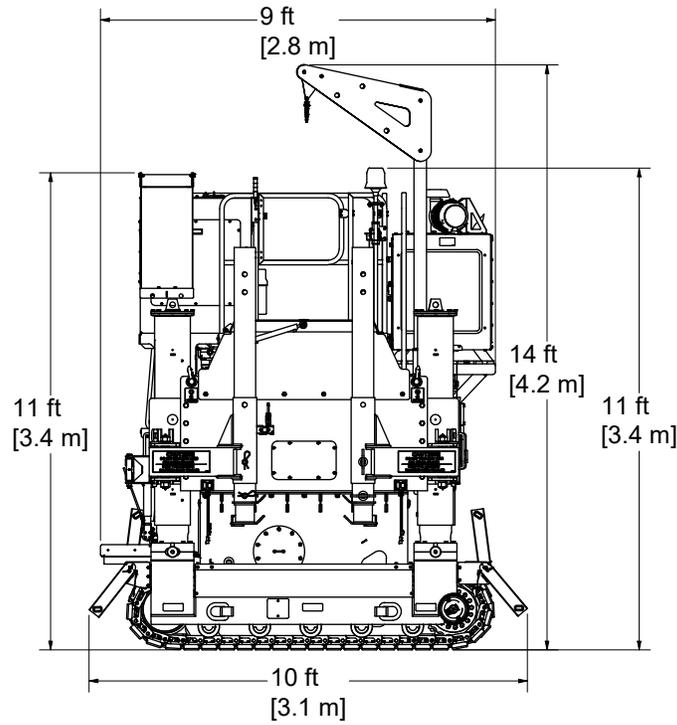
Purchased From: \_\_\_\_\_



# Machine Dimensions

# GENERAL INFORMATION

Unit Dimensions are in Feet [Meters].



## Allen Two Track Aggregate Spreader

Model: AAS310

Total approximate Machine Weight: 22,000 lbs or 9,979 kg.

### Main Frame Power Unit:

- Hatz 4H50TIC T4, Silent Pack
- Fuel reservoir 45 gal.

### Hopper:

- Features an Upper and Lower Hopper
- Helical Spreader Bar
- Volume of 310 ft<sup>3</sup>, 8.78 m<sup>3</sup>
- The **maximum** material weight allowed in the hopper is 20,000lbs [EX. 4,000 lb bag = 5 bags to reach max capacity].

### Vibration System

- 2 Minnich M-1200 hydraulic vibrators.

### Spreader Bar:

- 1ft. Long helical coil sections, 14ft total.
- Hydraulic powered chain driven drive line
- Sectional adjustable feed gate

### Hydraulic System:

- Engine mounted tandem hydraulic pump system with control valving, Heat exchanger, complete system producing approximately 36.5 GPM.
- 62 GAL (234 L) Hydraulic reservoir
- #32 Hydraulic Fluid

### Auger Spreading System:

- Two heavy duty augers
- Hydraulic driven with separate split control valves

### Crawler Tracks:

- 2 tracks 8.5 ft. long with 5 bottom rollers, 2 top rollers
- Adjustable drive sprocket.
- Hydraulically driven planetary drives
- Two each hydraulic drive motors with slow speed for paving at approximately 3 ft/min and high speed paving with travel up to approximately 24 ft/min.

### Grade Control System:

- Heavy duty hydraulic tower system with four 3.5" diameter x 48" stroke hydraulic lift cylinders.
- Manual grade control from operator's platform.

### Steering System:

- Hydraulic string line sensor with an adjustable arm.
- Automatic or manual steering, controlled from operator's platform.

### Intermittent Shut-Down System:

- Single switch operation.
- Controls all critical functions of machine.
- Emergency shut-down on each end of machine and control panel.

### Operator Platform:

- Direct Hydraulic controls for travel, spreader bar, auger, grade, and steer.
- Electric over Hydraulic control for Auto steer functions.
- Hydraulic system pump pressure gauge
- Warning lights for low hydraulic oil, high hydraulic fluid temperature
- High visibility split operator console.
- Safety railing.
- Engineered for easy monitoring of all machine functions.

**Engine Information**

The Aggregate Spreader is equipped with a 74HP Hatz diesel engine. Refer to the applicable engine OEM Owner's manual for specific instructions regarding engine operation. This manual is included with the paver at the time of shipping from AEC. The Silent Pack for the 4H50TIC engine reduces noise and adds additional weather protection.

**Engine Features:**

Model Number:	4H50TIC, Silent Pack
Access:	Features a top and control side removable panel for maintenance
Engine Type:	Liquid Cooled 4 stroke diesel
Fuel Type:	Diesel
Output Rotation:	Counterclockwise
Displacement:	119.1 in <sup>3</sup> (1.952 L)
Bore:	3.3 in (84 mm)
Stroke:	3.4 in (88 mm)
Peak Torque:	179 ft-lb (244 Nm)
Compression Ratio:	17.5:1
Dry Weight:	767 lb (348 kg)
Oil Capacity:	Max 1.85 Gal (7 L) // Min. 1.58 Gal (6 L)
Engine RPM Range:	1500-3000 RPM
Dimensions L x W x H:	40 x 28 x 36.2 in (1009 x 712 x 922 mm)



Photographs may show non-standard equipment



Please follow this link to the manufactures website for more information

# **SECTION 1: SAFETY**



### RESPIRATORY HAZARDS

Grinding/cutting/drilling of masonry, concrete, metal and other materials can generate dust, mists and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproductive harm.

### SILICOSIS WARNING

Grinding/cutting/drilling of masonry, concrete, metal and other materials with silica in their composition may give off dust or mists containing crystalline silica.



### CALIFORNIA PROPOSITION 65 WARNING

Engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

**Safety-Alert Signs**

This manual contains Safety-Alert Signs, as defined below, which must be followed to reduce the possibility of improper service damage to the equipment or personal injury. Read and follow all Safety-Alert Signs included in this manual.



NOTE defines an operating procedure, condition, etc. which is essential to highlight that contains useful or important information.



EMERGENCY is used for the identification of safety equipment, first aid, or emergency egress locations.



NOTICE used to convey safety information on labels and signs.



CAUTION is indicative of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



WARNING Indicative of a potentially hazardous situations that could result in death or serious injury



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury

 <b>WARNING</b>  <b>ADVERTENCIA</b>	
	<p>Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.</p> <p>El funcionamiento de este equipo puede producir chispas que pueden iniciar incendios en vegetación seca. Un supresor de chispas puede ser necesario. El operador debe comunicarse con las agencias locales de bomberos para las leyes o reglamentos relativos a los requisitos de prevención de incendios.</p>

Some states require that in certain locations arrestors be used on internal combustion engines. A spark arrestor is a device designed to prevent the discharge of spark or flames from the engine exhaust. It is often required when operating equipment on forested land to prevent the risk of fires. Consult the engine distributor or local authorities and make sure that you comply with regulations regarding spark arrestors.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Rotating parts/crush hazards
	Pressurized fluid hazards
	Hydraulic fluid hazards

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety notes.

# SECTION 1 SAFETY

## Operating Safety



Familiarity and proper training are required for the safe operation of this equipment! Equipment operated improperly or by untrained personnel can be dangerous! Read the operating instructions contained in both this manual and the engine manual and familiarize yourself with the location and proper use of all controls.

- ALWAYS read, understand, and follow procedures in the Operator's Manual before attempting to operate the equipment.



- NEVER operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- NEVER operate this machine while under the influence of drugs or alcohol.



- NEVER allow anyone to operate this equipment without proper training. People operating this equipment must be familiar with the risks and hazards associated with it.

- NEVER touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.



- NEVER use accessories or attachments that are not recommended by AEC. Damage to equipment and injury to the user may result.

- NEVER operate the machine with the belt guard missing. Exposed drive belt and pulleys create potentially dangerous hazards that can cause serious injuries.



- NEVER leave machine running unattended.

- DO NOT run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.



- ALWAYS remain aware of moving parts and keep hands, feet, and loose clothing away from the moving parts of the equipment.



- ALWAYS close fuel valve on equipped engines when machine is not being operated.

- ALWAYS store the equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children.



Internal combustion engines present special hazards during operation and fueling. Read and follow the warning instructions in the engine owner's manual and the safety guidelines below. Failure to follow the warnings and safety guidelines could result in severe injury or death.

- DO NOT run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.
- DO NOT smoke while operating the machine.
- DO NOT smoke when refueling the engine.
- DO NOT refuel a hot or running engine.
- DO NOT refuel the engine near an open flame.
- DO NOT spill fuel when refueling the engine.
- DO NOT run the engine near open flames.
- ALWAYS refill the fuel tank in a well-ventilated area.
- ALWAYS replace the fuel tank cap after refueling.
- ALWAYS keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.



## SECTION 1 SAFETY

### Service Safety



Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

- ALWAYS disconnect the battery before servicing the equipment. 
- DO NOT attempt to clean or service the machine while it is running. Rotating parts can cause severe injury. 
- DO NOT use the load legs as stands while servicing the machine.
- DO NOT crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening. 
- DO NOT test for spark on gasoline-powered engines if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes. 
- DO NOT use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.
- ALWAYS turn engine off and remove key from machine before performing maintenance or making repairs.
- ALWAYS keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.
- ALWAYS replace worn or damaged components with spare parts designed and recommended by AEC Corporation.
- ALWAYS disconnect the spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.
- ALWAYS relieve all pressure in the air, oil and cooling systems before disconnecting any lines, fittings or related items. Escaping fluid under pressure has sufficient force to penetrate skin causing serious personal injury, DO NOT check for leaks your hands. 
- ALWAYS switch off the power supply at the battery disconnect before adjusting or maintaining the electrical equipment.
- ALWAYS keep the machine clean and labels legible. Replace all missing and hard-to read labels. Labels provide important operating instructions and warn of dangers and hazards.
- ALWAYS wear rubber gloves to avoid personal injury, when you treat fluids used in machine. In case of contact with skin, immediately wash off. 

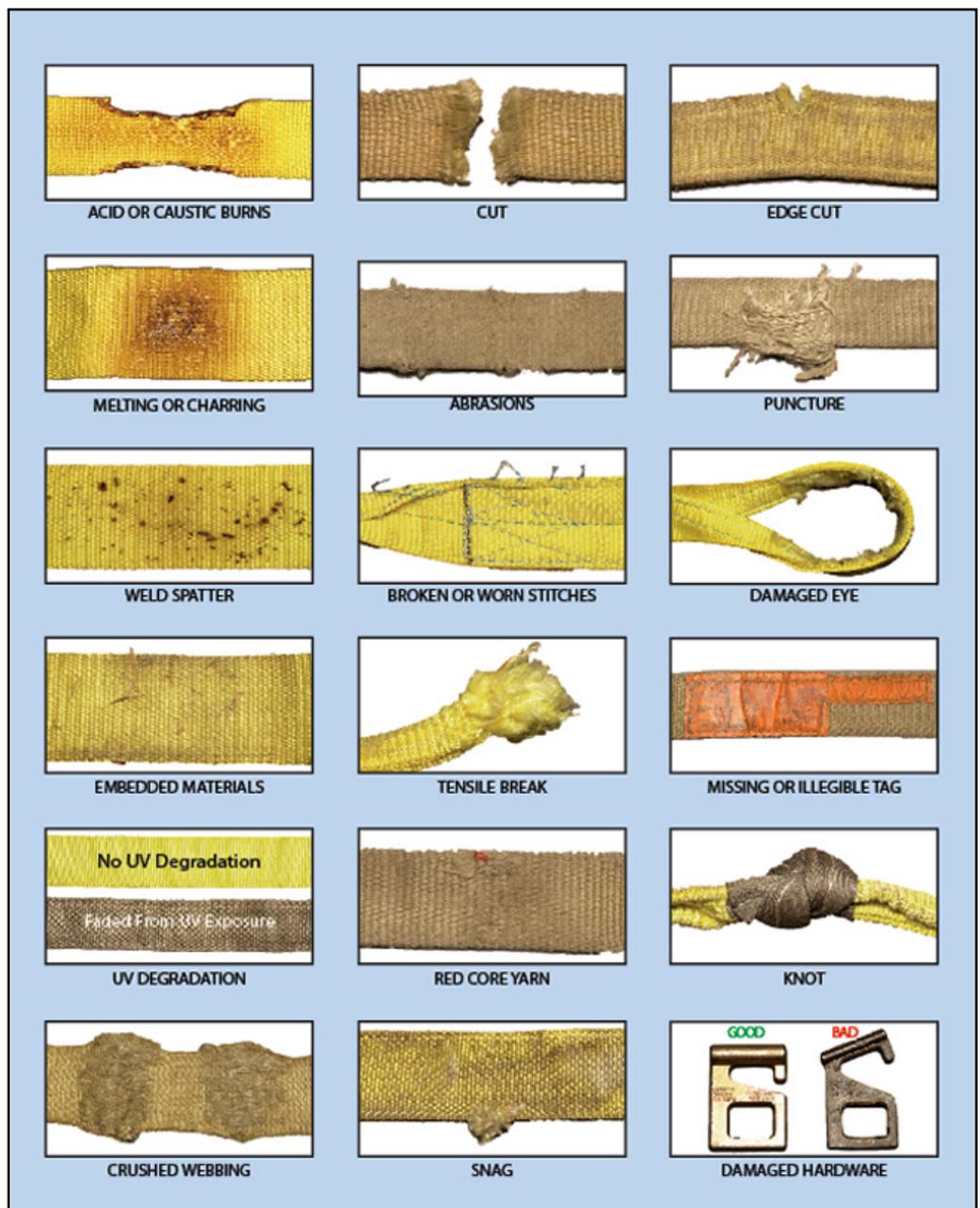
**ALWAYS DO A THOROUGH INSPECTION OF THE SLINGS, CHAINS, AND HOOKS BEFORE ATTEMPTING TO LIFT THE MACHINE!**

OSHA has set forth guidelines which detail the use of Rigging Equipment for Material handling. This guideline is found under

OSHA Standard Number: 1926.251

Please read and follow all guidelines found in this standard.

Removal from service.  
Synthetic web slings shall be immediately removed from service if any of the following conditions are present:  
  
OSHA 1926.251(e)(8)



## SECTION 1 SAFETY

## Loading / Unloading Safety

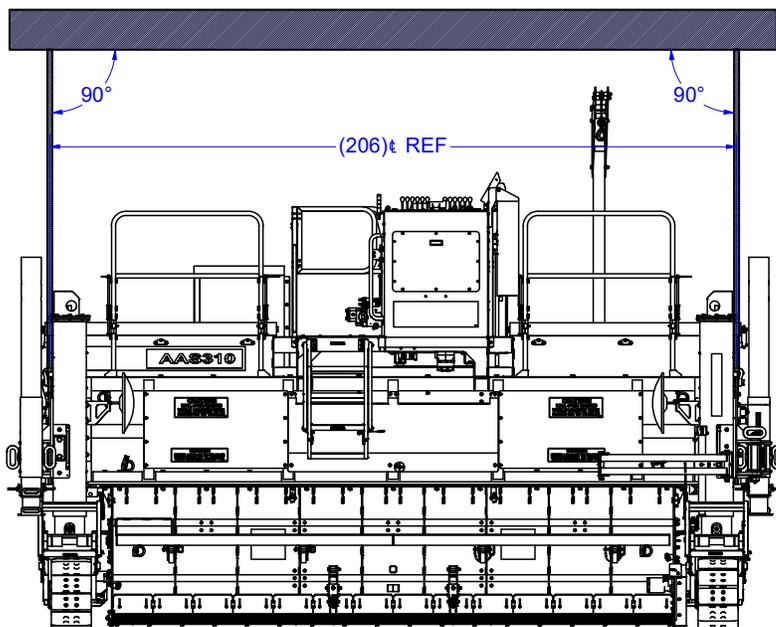


Follow QR Code link for video on loading the Poly-Paver. Reference this video when lifting the Spreader.

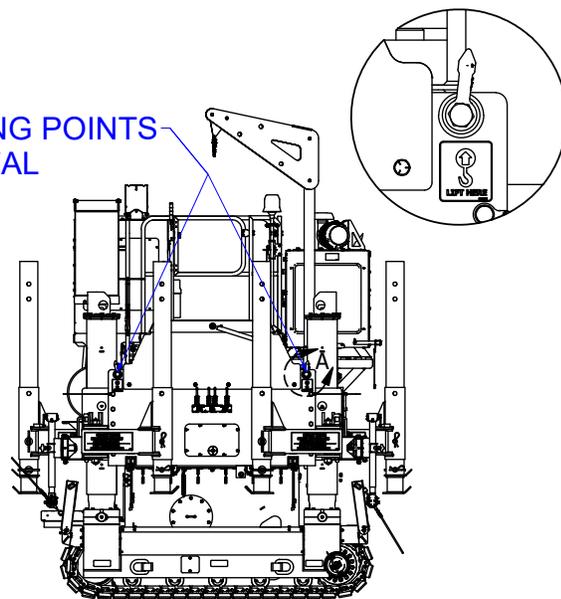


- **ONLY** use lifting shackles if no other transportation options are available. The machine should be loaded and unloaded using the load legs when possible.
- **For service** only lift one side of the machine at a time.
- The sling angle should be **AS CLOSE TO 90° AS POSSIBLE**, a spreader bar should be used. Each sling pair on the same side of the load should be kept at an angle greater than 60° OR AS CLOSE TO 90° AS POSSIBLE. Ensure that the slings/straps do not contact the paver's components.
- Use the four frame shackles as lifting points. The lines shown in the figures below are for reference only.
- Before the machine is lifted check that the straps do not make excessive contact with the paver's equipment. Contact between the paver's equipment and the straps could result in damage to the paver and the lifting equipment.
- Make sure crane or lifting equipment has enough capacity to lift the weight of the machine. Please make sure all lifting apparatus, straps & cables are free from structural damage and are rated for the proper lifting capacity. **Total approximate Machine Weight: 22,000 lbs or 9,979 kg.**
- Please make sure all ground personnel are clear of danger while the machine is being lifted.

The sling angle should be **AS CLOSE TO 90° AS POSSIBLE**, a spreader bar should be used.



LIFTING POINTS  
4 TOTAL



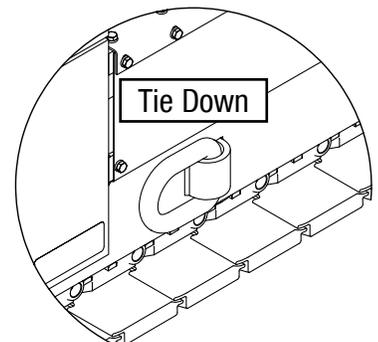


**NEVER transport the machine with material in the hoppers. The machine must be transported empty.**

**[Be aware of roll over hazards while loading]**



- **When loading with ramps onto a trailer, the ramp angle must not exceed 12°** (minimum of 188 in long at 40in deck height, every inch decrease in deck height reduces the required ramp length by approximately 4.5 in).
- When loading the machine using the load legs, **max ground level grade should not exceed 7%**. NOTE, trailer offset from the machine can be MAX of 1° at MAX deck height (40 in).
- Select a trailer with a MAX deck height of 40 in (102 cm) and a width no wider than 109 in (277 cm)
- Make sure the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer “gross vehicle weight rating.”
- ALWAYS inspect the hitch and coupling for wear. Never tow a trailer with defective hitches, couplings, chains, etc.
- Check the tire air pressure on both towing vehicle and trailer. Trailer tires should be inflated to 50 psi cold. Also check the tire tread wear on both vehicles.
- ALWAYS make sure the trailer is equipped with a safety chain.
- ALWAYS properly attach trailer’s safety chains to towing vehicle.
- ALWAYS make sure the vehicle and trailer directional, backup, brake and trailer lights are connected and working properly.
- DOT Requirements include the following:
  - Connect and test electric brake operation.
  - Secure portable power cables in cable tray with tie wraps.
- The maximum speed for highway towing is 55 MPH unless posted otherwise. Recommended off-road towing is not to exceed 15 MPH or less depending on type of terrain.
- Avoid sudden stops and starts. This can cause skidding, or jack-knifing. Smooth, gradual starts and stops will improve towing.
- Avoid sharp turns to prevent rolling.
- Trailer should be adjusted to a level position at all times when towing.
- Raise and lock trailer wheel stand in up position when towing.
- Place chock blocks underneath wheel to prevent rolling while parked.
- Place support blocks underneath the trailer’s bumper to prevent tipping while parked.
- Use the trailer’s swivel jack to adjust the trailer height to a level position while parked.
- Use tie downs to ensure machine does not move during transportation.



**SECTION 2: OPERATION**

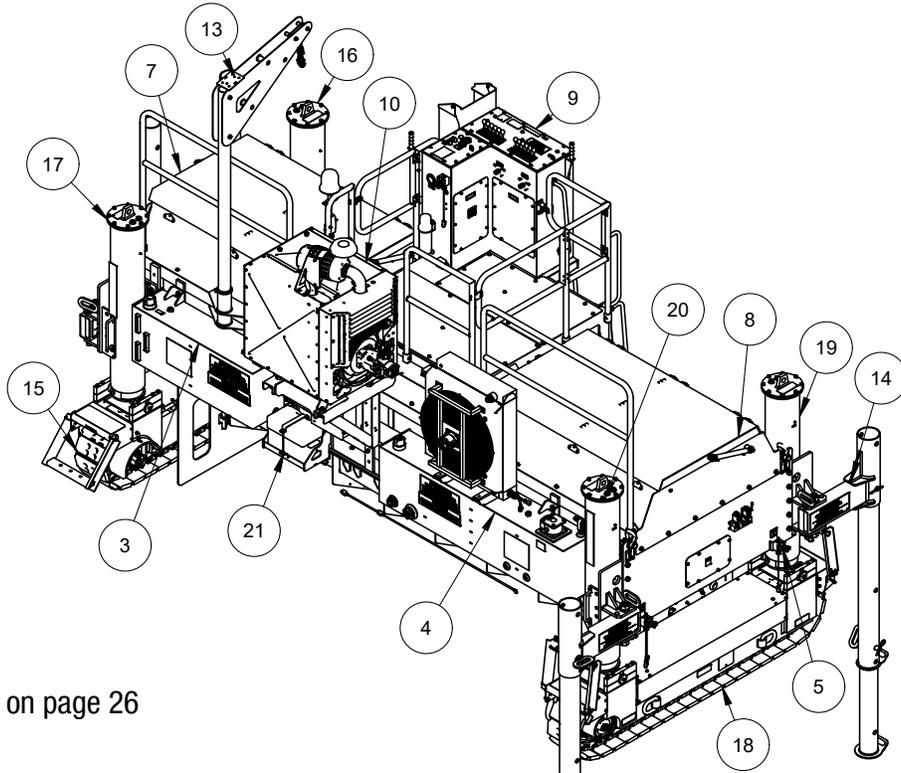
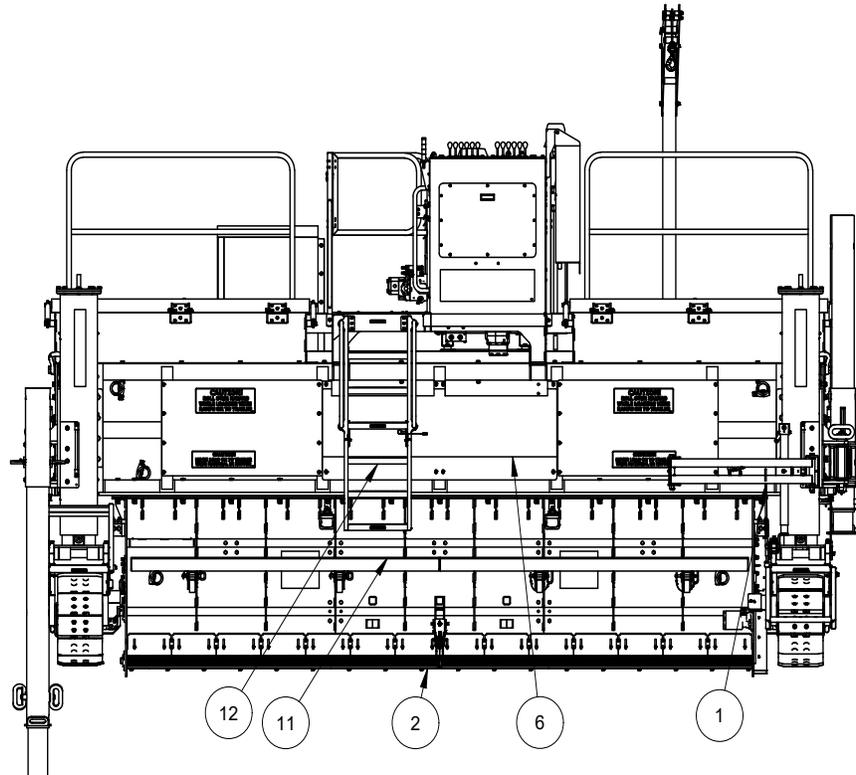


Illustration continued on page 26

ITEM #	DESCRIPTION
1	AUTO STEER SENSOR & ADJUSTMENT ARM
2	LOWER HOPPER
3	FUEL TANK, 45 GAL (170 L)
4	HYDRAULIC TANK [APPROX. 62 GAL (234 L)]
5	E-STOP, 2 PER EACH END FRAME
6	UPPER HOPPER
7	LEFT HAND HOPPER DOOR, OPEN TO FILL
8	RIGHT HAND HOPPER DOOR, OPEN TO FILL
9	OPERATOR CONTROL PANEL
10	ENGINE
11	OPERATOR WALKWAY
12	LADDER
13	RECOVERY MAST
14	DROP LEG (LOADING ONLY), RETRACTED & EXTENDED
15	TRACK, LEFT HAND
16	GRADE TOWER, FRONT LEFT HAND
17	GRADE TOWER, REAR LEFT HAND
18	TRACK, RIGHT HAND
19	GRADE TOWER, FRONT RIGHT HAND
20	GRADE TOWER, REAR RIGHT HAND
21	BATTERY & BATTERY LOCKOUT SWITCH

# SECTION 2 OPERATIONS

## Machine Overview Continued



ITEM #	DESCRIPTION
1	AUTO STEER SENSOR & ADJUSTMENT ARM
2	LOWER HOPPER
3	FUEL TANK, 45 GAL (170 L)
4	HYDRAULIC TANK [APPROX. 62 GAL (234 L)]
5	E-STOP, 2 PER EACH END FRAME
6	UPPER HOPPER
7	LEFT HAND HOPPER DOOR, OPEN TO FILL
8	RIGHT HAND HOPPER DOOR, OPEN TO FILL
9	OPERATOR CONTROL PANEL
10	ENGINE
11	OPERATOR WALKWAY
12	LADDER
13	RECOVERY MAST
14	DROP LEG (LOADING ONLY), RETRACTED & EXTENDED
15	TRACK, LEFT HAND
16	GRADE TOWER, FRONT LEFT HAND
17	GRADE TOWER, REAR LEFT HAND
18	TRACK, RIGHT HAND
19	GRADE TOWER, FRONT RIGHT HAND
20	GRADE TOWER, REAR RIGHT HAND
21	BATTERIES & BATTERY LOCKOUT SWITCH

### Loading Procedure:

Drive and position the machine to a clear area that is appropriate for a flat bed trailer to drive underneath the tracks. The loading Drop Legs are telescoping manually extended and retracted tubes, secured in place with heavy duty pins.

When the Load Legs are fully extended:

- Inside to Inside Width: 115 in or 292 cm
- Ground Clearance: 43 in or 109 cm
- Total approximate Machine Length: 202 in or 559 cm, [17ft, 5.18 m]
- Total approximate Machine Weight: 22,000 lbs or 9,979 kg

Select a trailer with a MAX deck height of 40 in (102 cm) and a width no wider than 109 in (277 cm)



**The inner tubes will fall if not supported or fixed in place. Be aware of pinch points. DO NOT stand directly under the load leg. NEVER transport the machine with material in the hopper**



**[Be aware of roll over hazards while loading]**

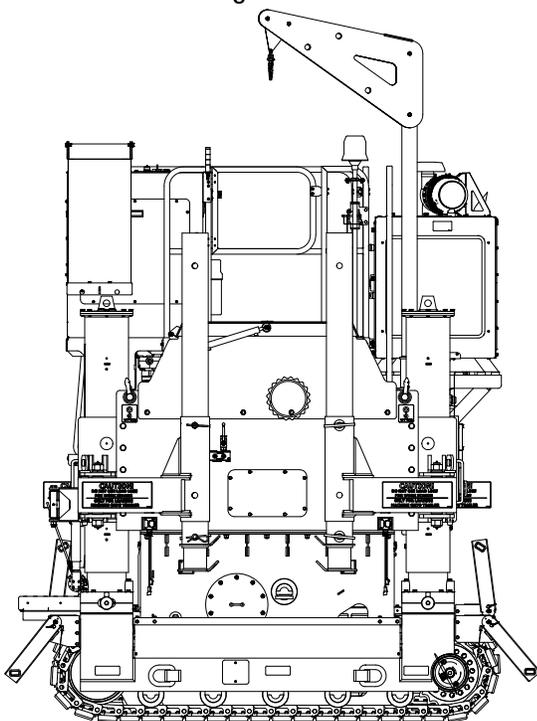
- **When loading with ramps onto a trailer, the ramp angle must not exceed 12°** (minimum of 188 in long at 40in deck height, every inch decrease in deck height reduces the required ramp length by approximately 4.5 in).
- When loading the machine using the load legs, **max ground level grade should not exceed 7%**. NOTE, trailer offset from the machine can be MAX of 1° at MAX deck height (40 in).



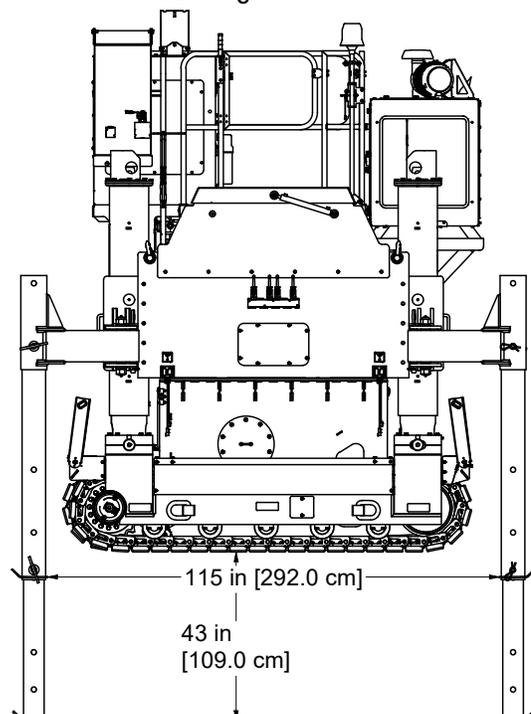
### Preparing the Loading Legs:

With the tracks still on the ground or trailer deck, move the Load Legs from their retracted position to a partially extended position. The main retaining pin on the Load Leg pivot arm will need to be removed to rotate the leg. Reinsert the main pin after positioning the Load Leg. **Reference the illustrations below and on the next two pages.**

Load Legs: Retracted



Load Legs: Extended

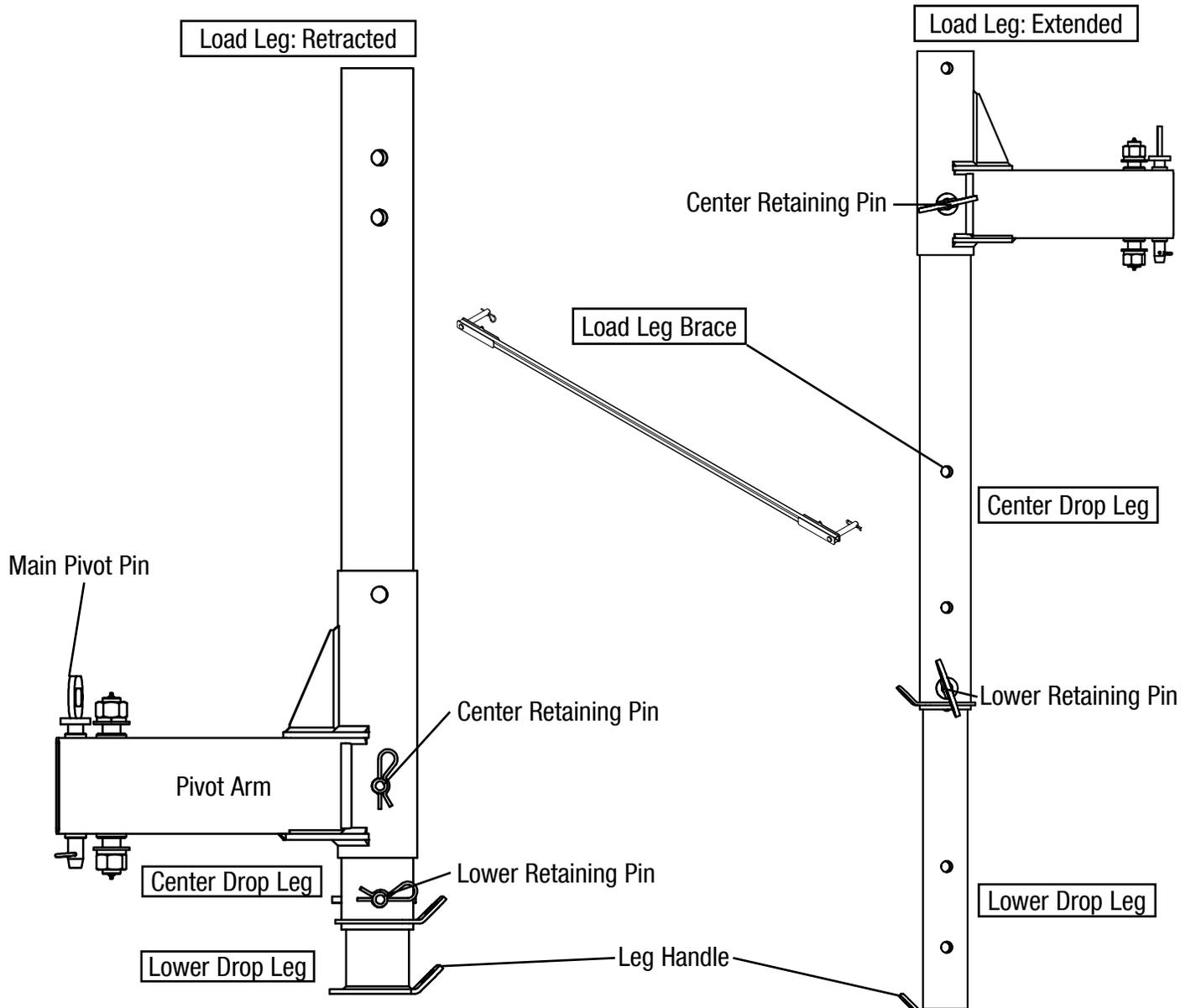


## SECTION 2 OPERATIONS

# Load Legs Loading & Transportation Procedure

### Preparing the Loading Legs:

- Remove the lowest retaining pin holding the lower leg to the center leg and slowly lower the tube's foot to the ground.
- After the lower leg is on the ground and securely supported, re-insert the retaining pin to fix the lower leg to the center leg, reposition the lower leg if necessary to align the retaining pin holes.
- If the lower leg is supported on the ground and the lower retaining pin is inserted, when the center retaining pin is removed the center leg should remain fixed. While supporting the middle tube remove the center retaining pin holding the middle tube to the pivot arm.
- Before continuing ensure that the steps above have been done on all four load legs.
- To extend the center leg, turn the machine on and use the hydraulic Grade levers to evenly and gradually raise the machine. Once the retaining pin hole at the top center leg and the lower hole on the pivot arm align re-insert the retaining pin.
- Use the load leg brace to stabilize the legs, insert the brace into the available pin hole on the center leg. **Check for identifying marks on the brace**, #1 should be used on the right side of the machine and #2 on the left side. **Due to unique fitment/alignment a certain load leg brace achieves the best fitment on a specific side.** NOTE, the load legs may have to be adjusted/repositioned to allow better brace fitment.

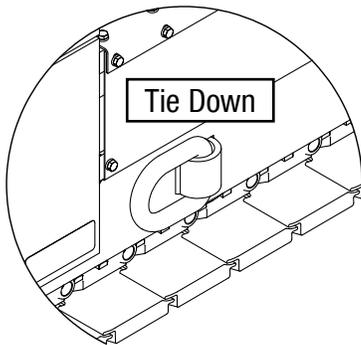


### Loading the Machine onto a trailer:

While the machine is running, with the load legs fully extended and the retaining pins in the proper holes:

- Use the hydraulic Grade levers to evenly and gradually retract the Grade Towers and track assemblies back up to the machine.
- A trailer can be driven under the tracks, once the trailer is in a good position use the hydraulic Grade levers to evenly and gradually extend the Grade Towers and the track assemblies down to the trailer's deck.
- The machines weight should now be supported by the track assemblies and the trailer bed, at this point the load legs can be retracted.
- Once the Load Legs are returned to their fully retracted position (See below), use the hydraulic Grade levers to evenly and gradually retract the Grade Towers to their lowest position before transporting the machine.

### Use D-Ring tie down points to secure the machine to the trailer.



### To retract the Load Legs:

1. Remove the lower retaining pin from the lower leg, and lift the lower leg up into the center leg. Once the lowest hole on the lower leg aligns with the lowest hole on the center leg re-insert the retaining pin.
2. **DO NOT** remove the center retaining pin without supporting the bottom of the leg. If the center retaining pin is removed while the Load Leg is unsupported it will free fall.
3. With the load leg supported, remove the center retaining pin and lift the center and lower legs up into the pivot arm tube. Once the second from the bottom hole of the center leg and the bottom hole of the pivot arm align re-insert the retaining pin.
4. Move the Load Legs from the partially extended position to the retracted position. The main retaining pin on the Load Leg mount point will need to be removed to rotate the leg. Reinsert the main pin after positioning the Load Leg

### Unloading the Machine from a trailer:

With the load legs fully retracted and the retaining pins in the proper holes:

If applicable, return machine components from their loading position to their running position see page 30.

- Reference and follow the instructions for “Preparing the Loading Legs”.
- With the load legs fully extended and the retaining pins in the proper holes, the machine tracks should be lifted off of the trailer deck and the trailer can be driven out from under the tracks.
- Once the trailer is out from underneath the machine use the hydraulic Grade levers to evenly and gradually extend the Grade Towers and Track Assemblies to the ground.
- The machines weight should now be supported by the track assemblies, at this point the load legs can be retracted.

## SECTION 2 OPERATIONS

# Loading & Transportation Procedure



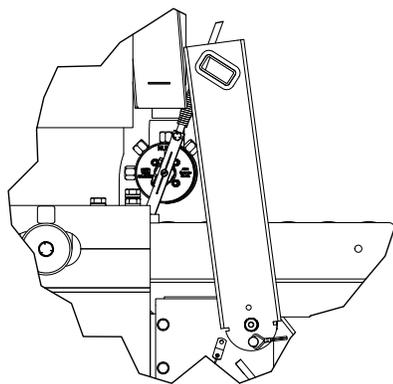
NEVER transport the machine with material in the hoppers. The machine must be transported empty.

### Transportation:

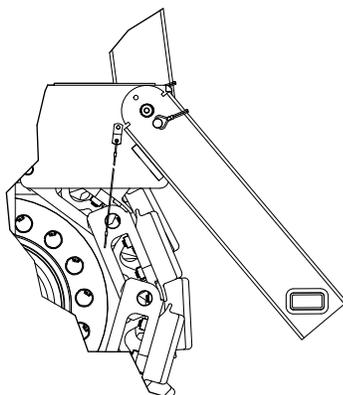
The following items will need to be repositioned before the machine is transported:

- Load legs  
Ensure that the Load Legs are in their fully retracted position.
- Track steps/bumpers  
The tracks have a step/bumper on each end, reposition the step/bumper up into the loading position. The step/bumper is fastened with a shoulder bolt and a pin.
- Sensor arm  
During transportation remove the sensor arm from the machine and store in a secure area until the machine is ready to be set up on the job site. The arm is mounted to the tower mount with 3/4" fasteners, disconnect the hoses for the steering valve at the junction block, reference "Quick Start Guide".
- Recovery Mast  
Remove the recovery mast from the machine, it is mounted to the upper hopper with 5/8" and 1/2" fasteners.
- Close hopper doors  
Ensure that the upper hopper doors are fully closed.
- Latch controls cover  
Ensure that the operator's control panel controls cover is fastened down.
- Fold up ladder  
Reposition the ladder to its loading position. The lower portion of the ladder can be rotated up and secured in place with a pin.
- Fold up walkway  
Reposition the walkways to their loading position. The walkways can be rotated up and secured in place with a retaining pin.
- Close feed gate doors  
Ensure that the lower hopper feed gate doors are fully closed.
- Before transportation shut off battery switch.  
The battery shut off switch is located under the engine on the engine mount frame.

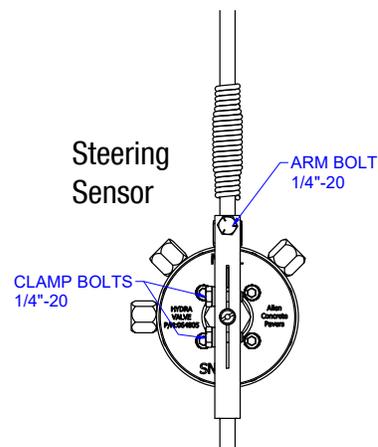
Reference the illustrations below and on the next page.



DETAIL TRACK  
STEP/BUMPER  
LOADING POSITION

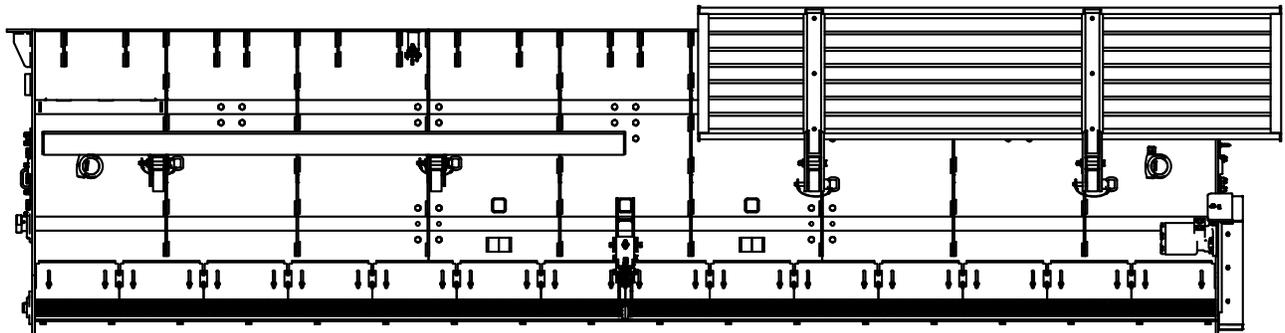
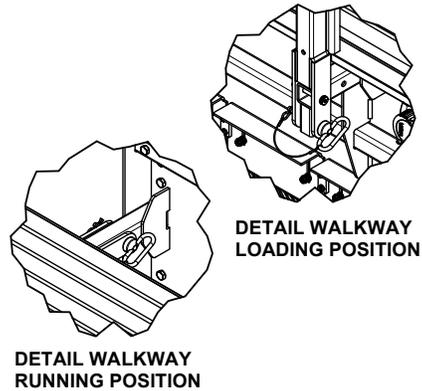
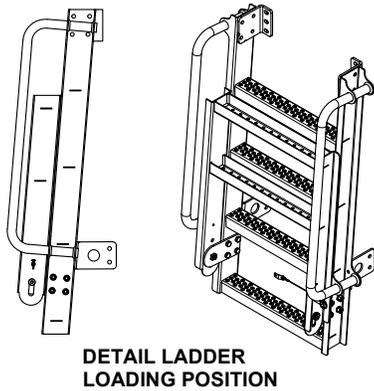
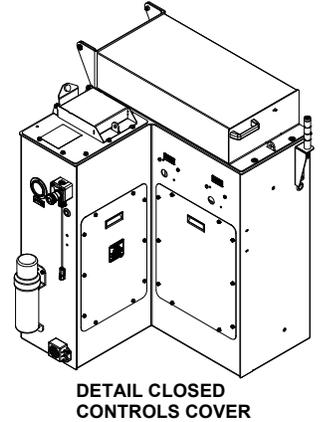
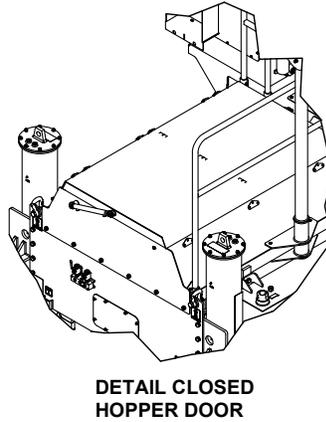
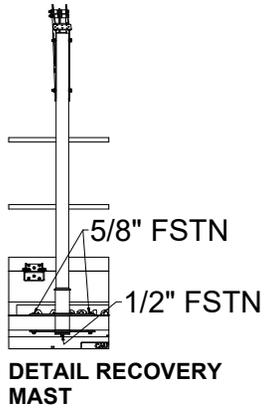
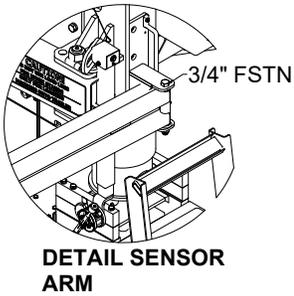


DETAIL TRACK  
STEP/BUMPER  
RUNNING POSITION



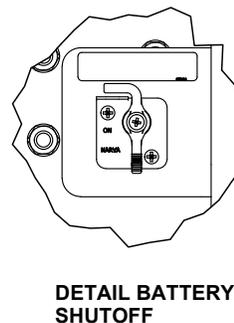
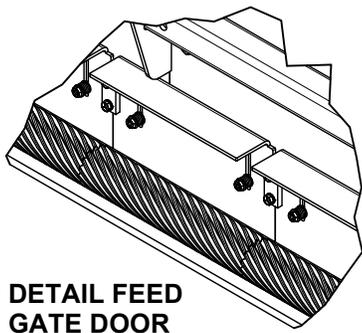
# Loading & Transportation Procedure

## SECTION 2 OPERATIONS



Walk Way: Running Position

Walk Way: Loading Position





This machine is built with user safety in mind. However, it can present hazards if improperly operated and serviced. Follow operating instructions carefully. If you have any questions about operating or servicing this equipment, please contact your Allen Engineering Dealer or AEC Customer Service at 800-643-0095 or 870-236-7751.

The Allen AAS310 Aggregate Spreader utilizes a helical spreader bar with a sectional adjustable width feed gate to spread aggregate material over a maximum width of 14ft, 4.2m. There are Emergency Stop buttons located on both ends of the machine and on the operator's control panel.

The machine features manual hydraulic controlled grade towers with 48in of stroke and automatic/manual hydraulic steering. The machine is track driven, which is propelled with planetary drive hydraulic motors with a maximum travel speed of approximately 24 ft/min [7.3 meter/min].

The AAS310's hoppers can hold a total of 310 cubic feet of aggregate material, and features hydraulically controlled hopper loading doors, two sets of augers to distribute material within the hopper, and a helical spreader bar to distribute aggregate material out of the hopper. **The maximum material weight allowed in the hopper is 20,000lbs [EX. 4,000 lb per bag = 5 bags to reach max capacity].**

For an overview of machine components see page 25.

For loading & unloading and transportation procedures and notes see page 27.

## Pre-Start (Daily Check) Procedures

Before operation each day, check for the following:

1. Check engine oil level on the dipstick. The control side panel on the engine assembly will need to be removed to access the engine oil dipstick.

The filler cap/dipstick is on right side when facing the flywheel. Add as required, using seasonal viscosity grade oil. (See service "Engine Oil Detail" on page 62).

### NOTICE

DO NOT fill above the top mark on the dipstick. Oil Levels anywhere within min and max marks are considered in the acceptable operating range.

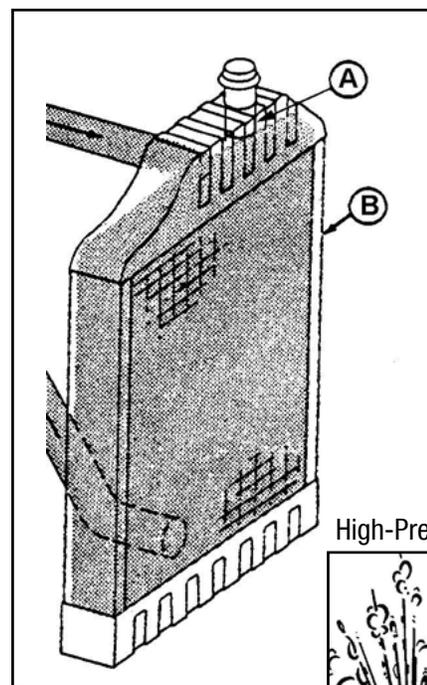
2. Check the coolant level when engine is cold. Remove the top panel on the engine assembly. Open the radiator cap, if needed fill the coolant up to the bottom of the pipe section. (See service "Engine Coolant Detail" on page 63) Check overall cooling system for leaks.

### CAUTION

CAUTION: Explosive release of fluids from pressurized cooling system can cause serious burns.

Only remove filler cap when engine is cold or when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

Fill Radiator  
Image for reference only



High-Pressure Fluids



3. Check the main fuel filter for water or debris. Remove the control side panel on the engine assembly. Drain the water separator as needed based on a daily visual inspection.

### NOTICE

The fuel tank sits lower than the main fuel filter, before unscrewing the water separator drain screw, plug the fuel supply line with a hose clip. Plugging the fuel supply line prevents fuel from flowing back into the fuel tank after the drain screw is opened. **See Hatz Engine manual for more details.**

Drain water into a suitable container and dispose of properly.

- a. Plug fuel supply line with hose clip.
- b. Hand loosen the drain screw at bottom of the fuel filter. If the liquid does not flow easily, open the vent screw located on the top of the filter housing.
- c. Drain water from bottom until fuel starts to drain out. When fuel starts to drain out, tighten drain plug and the vent screw if applicable.
- d. Unfasten the hose clip from the fuel supply line.

- 
4. Check the Air Cleaner. Check the intake opening for contamination. The air cleaner also has a dust discharge valve, squeeze the discharge valve on air cleaner assembly to clear away any dust buildup.

Also check to ensure that the discharge valve lips are parallel to each other. The gap between the lips must not exceed 2mm or approx. 1/16in.

- 
5. Make a thorough inspection of the engine compartment. Look for oil or coolant leaks, worn fan and accessory drive belts, loose connections and trash buildup. Remove trash buildup and have repairs made as needed if leaks are found.

Inspect:

- Radiator for leaks and trash build-up
- Air intake system hoses and connections for cracks and loose clamps
- Fan, alternator, and accessory drive belts for cracks, breaks, or other damage.
- Coolant pump for coolant leaks

Wipe all fittings, caps, and plugs before performing any maintenance to reduce the chance of system contamination.

It is normal for a small amount of leakage to occur as the engine cools down and parts contract. Excessive coolant leakage may indicate the need to replace the coolant pump seal.

Contact your engine distributor or servicing dealer for repairs.

- Grease Points. Some points on the machine need to be greased daily in order to maintain proper operation. See “GREASE POINTS” in this manual for detail explanations on which points need to be greased daily and ones that need weekly attention.

**NOTE**

NOTE: Grease type Mobil SHC 220 or similar is recommended for use on this machine.



### Before operation each day, check for the following:

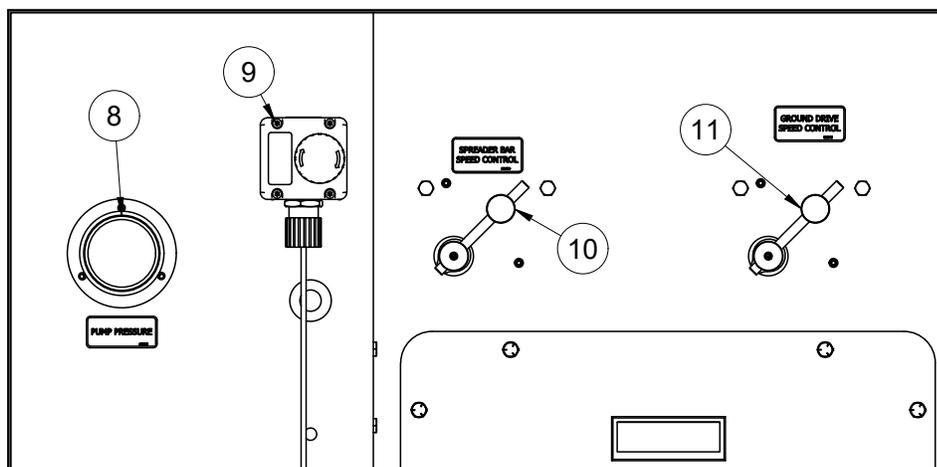
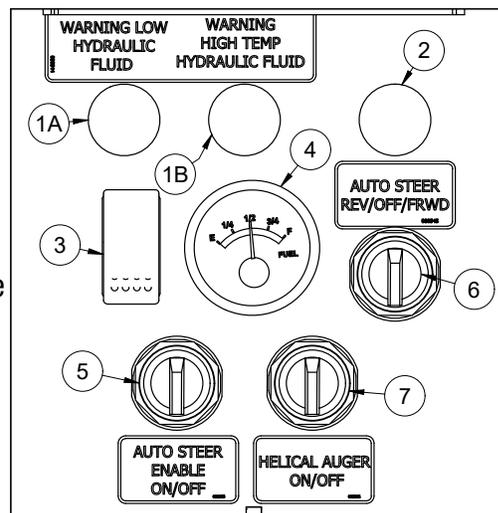
- All guards, side screens and panels are in place
- All safety and information signs are in place and legible
- Hydraulic Oil levels are correct.
- Fuel level in fuel tank.
- Operating controls for proper operation and adjustment
- Speed control operation before and after starting engine for proper operation
- For any hydraulic leaks
- For obstructions and debris under hopper body and spreader bar
- Engine fan for obstructions
- Remove any loose objects that could interfere with the operation of the Spreader
- That all switches and control levers are in the neutral position
- That all personal are free and clear of moving parts

Note: If there is any indication that faulty equipment exists, shutdown safely, inform the proper authority and DO NOT operate the equipment until the problem has been fixed.

## SECTION 2 OPERATIONS

### Control Panel Overview

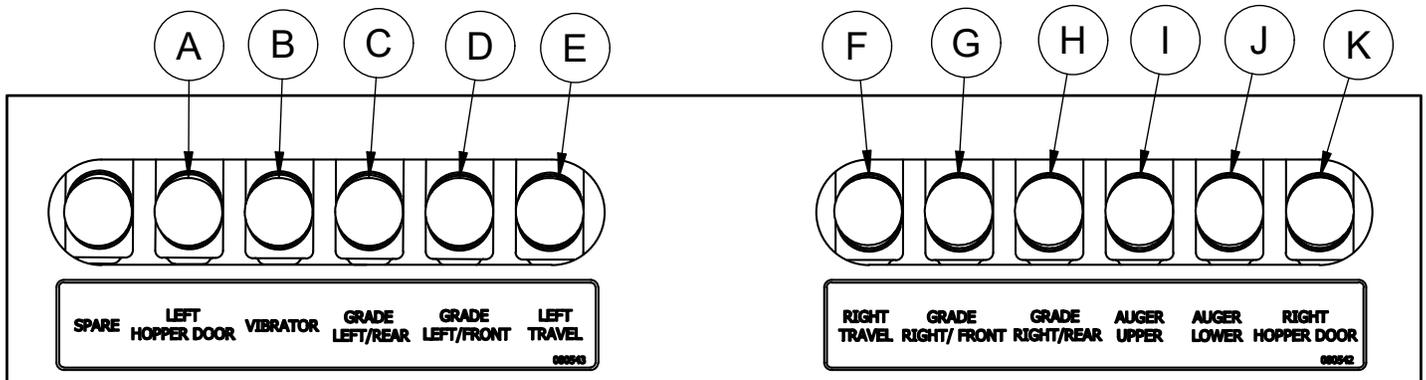
1. LED Indicators, Hydraulic Fluid (Red) - When one or both of these lights come on, stop the machine immediately or as soon as safely possible to prevent damage. Correct problem before restarting
  - A - Low Hyd. Fluid - Check fluid level in the hydraulic tank, located on the rear right side of the machine. Fill the tank with the appropriate fluid, see service section for more details.
  - B - High Hyd. Fluid Temperature - Stop the machine immediately or as soon as safely possible, see Troubleshooting section.
2. LED Indicator, Auto steer - A green LED will illuminate if Auto steer is enabled.
3. Light Switch - Toggle the switch to turn on and turn off the lights, there are six lights located on the lower hopper.
4. Fuel Gauge - Displays the fuel level of the fuel tank, the tank is mounted on the rear left side of the machine.
5. Auto Steer Enable Switch - Neutral position OFF, Left position, ON. This switch must be ON to enable operation of the Auto Steer switch.
6. Auto Steer Switch - A three way switch to enable Auto Steer functions. Neutral position, OFF. Right position, Forward. Left position, Reverse.
7. Helical Auger (Spreader Bar) Switch - This switch enables the helical auger functions. Neutral position OFF, Left position, ON.
8. Pump Pressure Gauge - Displays the pump pressure. Unloaded pump pressure should read around 300-350 psi.
9. E-Stop Switch - *Verify* it is fully in the UP Position. Additional E-Stops are located on the End Panels of the machine as well as the one located on the left operator panel. Pressing E-Stop down will kill engine push in to shut down the machine in case of an emergency.
10. Helical Spreader Bar Speed Control - This valve controls the speed of the helical spreader bar located on the lower hopper outlet. This valve can be operated only if the Helical Auger switch is enabled.
11. Ground Drive Speed Control - This valve controls the speed of the Left and Right Tracks. This valve can be operated only during AUTO functions.
- Hydraulic Control Levers - Controls hydraulic functions of the machine, see next page



The hydraulic control levers are located on the top of the front operator control panel. The levers are used to control the Manual functions of the machine.

The hydraulic control levers are all spring centered levers. They will return to their neutral position.

- The hydraulic control levers are proportional, as the levers are actuated more they will allow more flow up to the specified flow for that machine function.



- A. Left Hopper Door - This lever controls hydraulic cylinder which will open and close the left hopper door.
- B. Vibrator - Enables the operation of the vibrators located on the rear of the lower hopper.
- C. Grade Rear Left Tower - Controls the grade or height of the rear left tower assembly.
- D. Grade Front Left Tower - Controls the grade or height of the front left tower assembly.
- E. Left Travel Lever - Left Travel Lever controls Left track direction.
- F. Right Travel Lever - Right Travel Lever controls right track direction.
- G. Grade Front Right Tower - Controls the grade or height of the front right tower assembly.
- H. Grade Rear Right Tower - Controls the grade or height of the rear right tower assembly.
- I. Upper Auger Lever - Upper Auger lever controls upper material augers.
- J. Lower Auger Lever - Lower Auger lever controls lower material augers.
- K. Right Hopper Door - This lever controls hydraulic cylinder which will open and close the right hopper door.

## SECTION 2 OPERATIONS

### Quick Start Guide

#### Basic Power Up/Functionality of Switches:

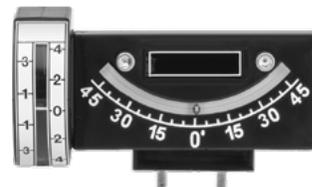
Set Switches as Noted Prior to Startup

#### Operator Control Panels:

- *Auto Steer Enable & Auto Steer Switch* - Set to “OFF” Position (Located on Left Panel)  
Auto Steer Enable switch is a Master switch for the Auto functions. None of the Auto Steer functions will operate without this switch in the ON position.
- *Speed Control Valves* - Set to their lowest setting  
There are two speed control valves, located below the hydraulic control levers. One valve is for the Helical feed bar and one for the left and right Track Drives.
- Ensure that all hydraulic valve levers located on the control panel are in the Neutral position
- Ensure that the Auto Steer junction block valve handles are in the correct orientation, see next page.

#### Grade functions:

The grade of the machine can be manually adjusted. There is a 2-Axis inclinometer located on the operator control panel. This inclinometer will measure Front/Back tilt 0-40° (10° increments) and Side-Side tilt 0-45° (5° increments).



There are independent controls for each corner tower of the machine. Use the hydraulic levers on the operator's control panel to manually adjust the height of the front/rear towers to match the grade of the ground or pavement floor. **Adjust the height of the towers evenly, do not allow one side to have a large height difference. Doing so may result in the track being pulled off the ground or galling of the tubes.**

### CAUTION:

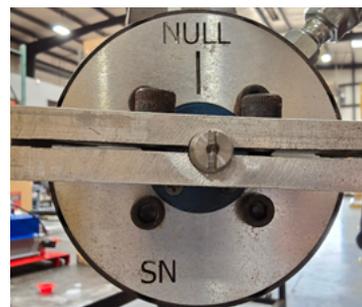
**ALWAYS PUT MACHINE ON LINE AND POSITION THE MACHINE AS CLOSE TO FINAL STRING LINE POSITION AS PRACTICAL BEFORE TURNING ON ANY AUTOMATIC OPERATION.**

**LARGE FRAME MACHINES HAVE A LIMIT TO THE AMOUNT OF VARIATION THAT CAN BE ACCOMMODATED FROM TOWER TO TOWER, SO IF A TOWER IS COMMANDED TO LOWER THE FRAME AND THE FRAME CANNOT ACCOMMODATE THAT MOVEMENT, THEN THE TOWER WILL PULL THE TRACK OF THE GROUND AND CREATE AN UNDESIRABLE SITUATION.**

#### Auto Steer functions:

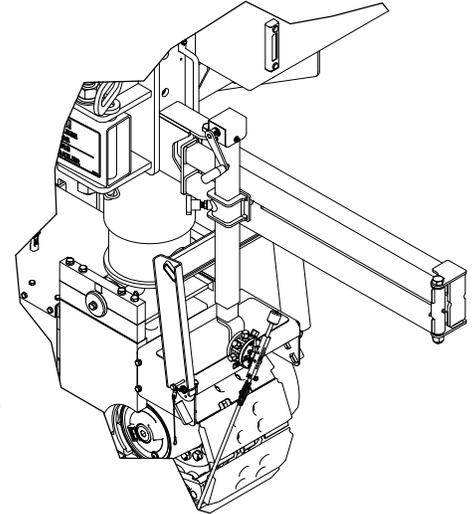
The machine utilizes Microtork valves. These are located on an adjustable arm mounted on the left side of the machine. This valve can be mounted in any position and requires no adjustment. The sensor wand is removable and can be adjusted to fit the stringline.

Position the valve's sensor arm on the inside of the string line. The slot in the center of the valve's shaft should be in-line with the NULL line on the valve body. As the machine moves the sensor arm will track the machines side to side movement and correct it to follow the string line. As the machine moves away from or closer to the string line the sensor arm will rotate out of the NULL positing and allow fluid to flow and control the track drive to keep the machine on the string line's path.



## Auto Steer functions continued:

For the best adjustability the steering sensor should be oriented as shown, this illustration shows the LH rear sensor arm for a LH stringline. The outer pivot arm with the sensor mount bracket should swing towards the outside.

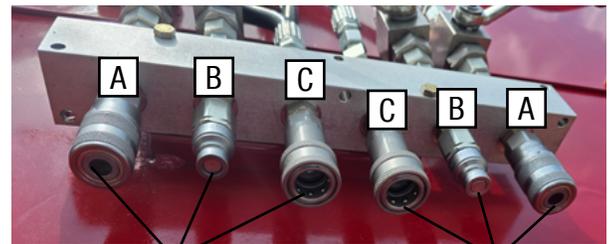


- To change the machine to follow a RH stringline the front LH sensor and arm should be moved to the rear RH side. The rear LH sensor and arm should be moved to the front RH side.
- When changing the steering sensors from the left or right side it will be necessary to remove the hoses from the Auto Steer junction block, there are three hoses for each steering sensor. Each of these hoses and their respective port on the junction block port will have a unique Quick Disconnect fitting (QDC).

On the junction block ports there is a Flat-Face female QDC fitting [A], a male QDC fitting [B], and a Standard female QDC fitting [C]. Ensure that the corresponding hoses and fittings match when connecting the forward or reverse steering valves to the junction block.

### NOTE

Depending on whether the machine will be operated manually or by the auto steering function, the auto steering junction block valve handles will need to be oriented in a specific manner. **Reference the images on the next two pages.** Stop the machine before making any changes to the junction block valve handles.



REVERSE  
SENSOR  
FITTINGS

FORWARD  
SENSOR  
FITTINGS

Figure: Auto Steering Junction Block  
(For LH Stringline)

- Operating the machine using manual controls: For manual controls both the left and right side junction block valve handles need to be fully closed.
- Whenever the operator switches from Manual operation to Auto Steer **forwards** the valve handles will need to change:

**Left hand string line:** All of the right side valve handles need to be fully closed or horizontal. On the left side the two valve handles closest to the front of the machine need to be open/vertical, and the two valve handles closest to the rear of the machine need to be closed/horizontal.

**Right hand string line:** All of the left side valve handles need to be fully closed or horizontal. On the right side the two valve handles closest to the front of the machine need to be open/vertical, and the two valve handles closest to the rear of the machine need to be closed/horizontal.

- Whenever the operator switches from Auto Steer forward to Auto Steer in **reverse** the valve handles will need to change:

**Left hand string line:** All of the right side valve handles need to be fully closed or horizontal. On the left side the two valve handles closest to the front of the machine need to be closed/horizontal, and the two valve handles closest to the rear of the machine need to be open/vertical.

**Right hand string line:** All of the left side valve handles need to be fully closed or horizontal. On the right side two valve handles closest to the front of the machine need to be closed/horizontal, and the two valve handles closest to the rear of the machine need to be open/vertical.

## SECTION 2 OPERATIONS

### Quick Start Guide

Reference these two images for **MANUAL** control steer sensor junction block handle orientation.  
All items in this manual are describe from the operator “Sitting On Machine” or SOM for short.

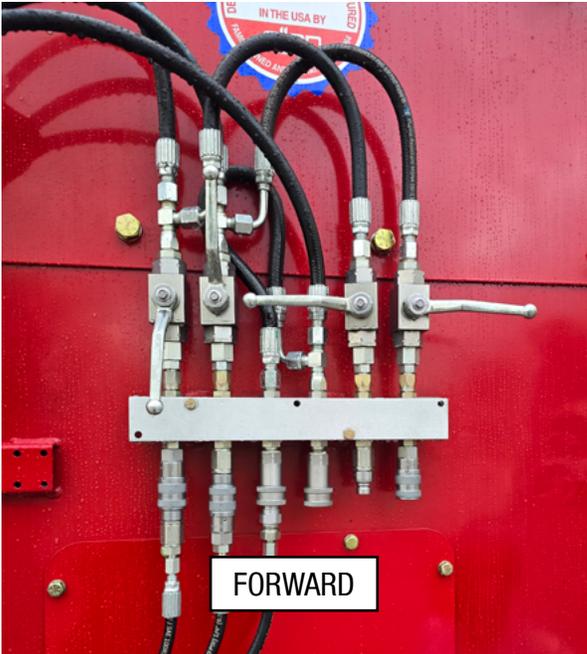


Left Side Steer junction block:  
Forward Closed, Reverse Closed

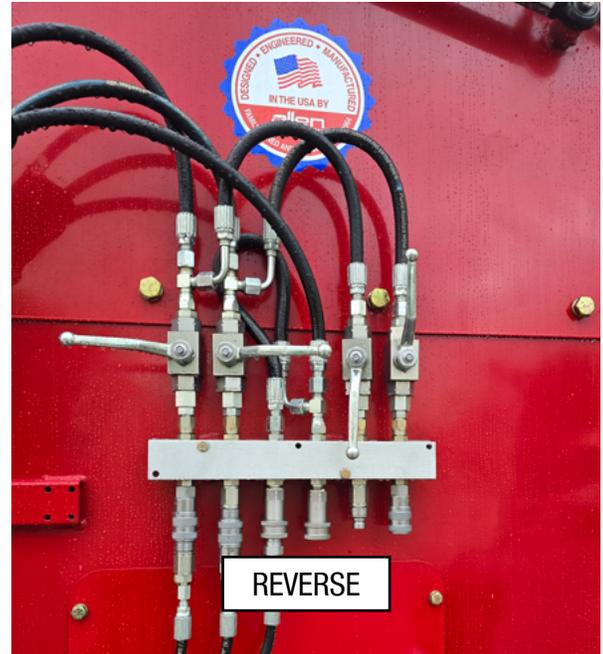


Right Side Steer junction block:  
Reverse Closed, Forward Closed

Reference these images for AUTO control steer sensor junction block handle orientation.  
All items in this manual are describe from the operator "Sitting On Machine" or SOM for short.



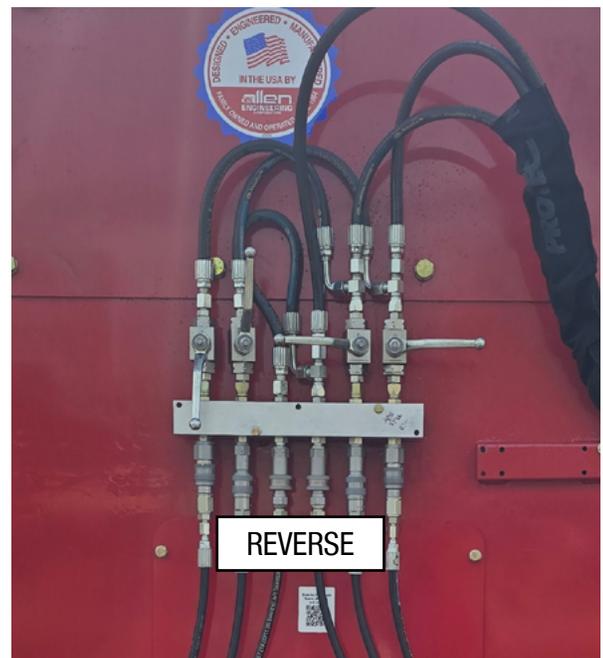
Left Side Steer junction block:  
Forward Open, Reverse Closed



Left Side Steer junction block:  
Forward Closed, Reverse Open



Right Side Steer junction block:  
Reverse Closed, Forward Open



Right Side Steer junction block:  
Reverse Open, Forward Closed

### Starting the Engine



Before starting engine in confined building, install proper outlet exhaust ventilation equipment. Always use safety approved fuel storage and piping.

NOTE: If temperature is below 0°C (32°F), it may be necessary to use cold weather starting aids.

1. Perform all pre-operation instructions outlined page 33
2. Ensure that the controls are in the OFF or NEUTRAL position before starting the Paver.
3. Turn the ignition switch to the RUN or I position before fully starting the engine

The ignition switch is a three position start switch. Where “0” is the OFF position, “I” is the operation or RUN position, and “II” is the start or CRANK position.

- To start the engine turn the switch clockwise to the “I” position, indicators will light up.
  - Wait until the Engine Pre-glow Indicator light turns off (a horizontal curl), then turn the key start switch clockwise “II” position to crank the engine.
  - When the engine starts, release the key switch so that it returns to the “I” position.
4. After engine starts, idle engine at a low RPM until warm.



Do not operate the starter for more than 20 SECONDS at a time. To do so may overheat the starter. If the engine does not start the first time, wait at least 2 minutes before trying again. If engine does not start see the Troubleshooting section in this manual and the OEM manual.

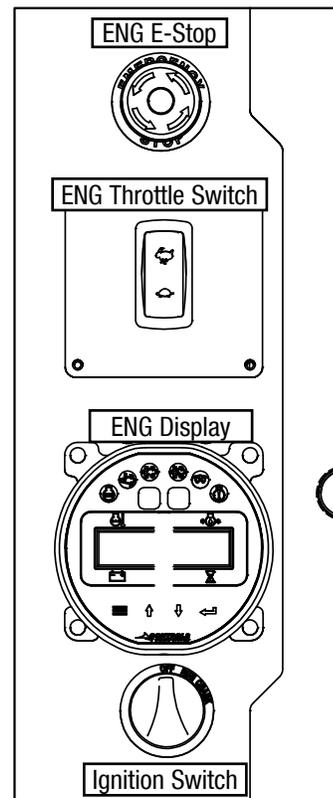
If the key switch is released before the engine starts, wait until the starter and the engine stop turning before trying again. This will prevent possible damage to the starter and/or flywheel.

### Stopping the Engine

Before stopping an engine that has been operating at working load, idle engine at least 2 minutes at a low RPM to cool hot engine parts.

1. Turn the ignition switch to the OFF or 0 position, the engine will shut down.

The engine may run for several seconds after it is turned off, allow the moving components of the engine to come to a complete standstill before any further actions.



### Normal Engine Operation

Observe engine coolant temperature and engine oil pressure. Temperatures and pressures will vary between engines and with changing operating conditions, temperatures, and loads.

Normal engine coolant operating temperature range is 82°—94°C (180°—202°F). If coolant temperature rises above 112°C (234°F), reduce load on engine. Unless temperature drops quickly, stop engine and determine cause before resuming operation.

Normal engine oil pressure at slow idle should be at least 2.5 bar and should rise to at least 4.5 bar at rated speed. Operate the engine under a lighter load and at slower than normal speed for first 15 minutes after startup. DO NOT run engine at slow idle.

Should the engine die while operating under load, immediately remove load and restart the engine. Overheating of the turbocharger parts may occur when oil flow is stopped.

### NOTICE

Stop engine immediately if there are any signs of part failure. Symptoms that may be early signs of engine problems are:

- Sudden drop in oil pressure
- Abnormal coolant temperatures
- Unusual noise or vibration
- Sudden loss of power
- Excessive black exhaust
- Excessive fuel consumption
- Excessive oil consumption
- Fluid leaks

---

### Restarting Engine After Emergency Shutdown

In the event of an emergency engine shutdown, the following procedures are required to restart the engine.

1. Correct the condition causing the emergency shutdown
2. Perform initial restarting procedures, as required. See “Engine Start Procedure” on page 42, steps 1 through 4, earlier in this section.



**NOTE** For ALL emergency shutdowns, the controller must be reset before the engine can be restarted. Recycle the key switch to reset the controller.

3. Recycle the key start switch (F) as follows:
  - a. Turn key switch off.
  - b. Wait 15 seconds.
  - c. Turn key switch clockwise to crank the engine.
4. Before operating the Spreader let the engine run at idle speed, and check all displays and for normal engine operation.

## SECTION 2 OPERATIONS

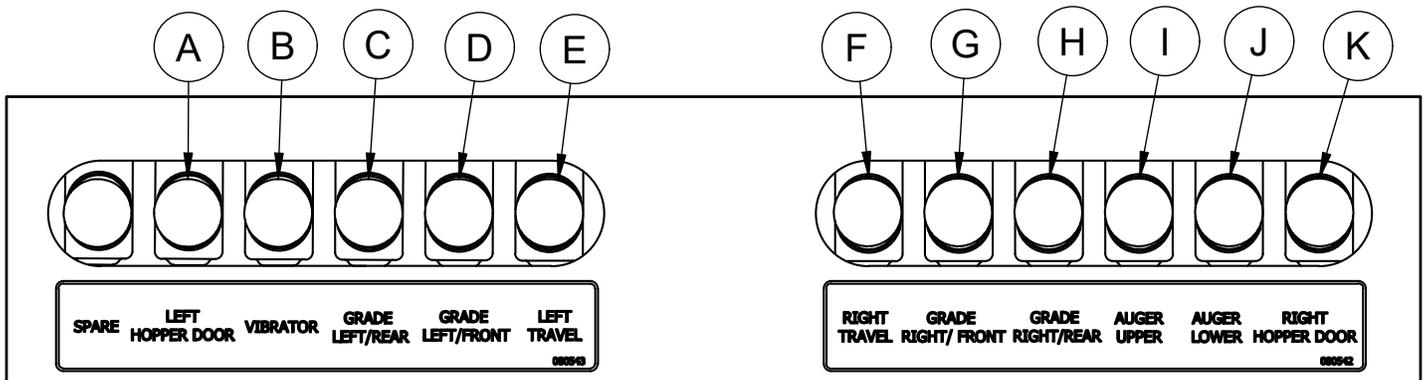
# Operating Procedure

### How to begin operating the machine

After allowing the engine to warm up bring Engine RPM up to operating speed, use the switch on the Engine Power Unit (Rabbit symbol) to increase the engine RPM to full speed.

#### NOTE

Before operating the hydraulic controls ensure that the pump pressure gauge reads roughly 300-350 psi (unloaded). Check that the Ground Drive Speed Control valve is at its lowest setting.



#### NOTE

- The hydraulic control levers are spring centered.
- The hydraulic control levers are proportional, as the levers are actuated more they will allow more flow up to the specified flow for that machine function. **The travel or ground drive speed control valve only functions while AUTO steering is enabled.**
- **Before Manually operating any hydraulic controls ensure that the Auto Steer junction block valve handles are closed or horizontal.** There are two of these blocks on the machine, one on the left and right ends of the machine's upper hopper. Reference the image below, these must be closed for proper manual machine operation.
- Be aware that the primary functions are Travel/Steer and Helical Auger operation, the use of multiple other functions at once may affect machine performance.

### Manual Travel and Grade Controls:

Use the Travel levers **[E and F]** to move the machine forward, reverse and to steer the machine towards the start of the string line or to the start of the paving path.

- Actuate the levers forward to move the machine forward and move them in reverse to go backwards.
- To adjust the travel speed gradually increase the control lever forward or reverse to increase and decrease the travel speed.

Using the Grade Tower levers **[C, D, G, H]** raise and lower the machines Grade Towers to the correct grade. The Grade Towers **MUST** be raised and lowered evenly, see caution note on page 38.

- Actuate the levers forward to raise the machine and move them backwards to lower the machine.



### Hopper Controls:

The Hopper consists of an upper and lower hopper. The upper hopper has material loading doors on the top and an auger to distribute material. The lower hopper has an auger to distribute material and a helical spreader bar/auger on the outlet to spread aggregate material on the paving path. See page 50 for additional Hopper details.

- Use the Hopper Door levers **[A and K]** to open and close the upper hopper loading doors, load aggregate material as needed.
- Use Auger levers **[I and J]** to start the augers. Actuate the levers forward to move the augers clockwise and reverse the levers to spin the augers counter-clockwise. It is recommend to use the augers periodically. Adjust the directions as needed to evenly distribute the material.
- Turn the Helical Feed Bar Switch to the left/ON position to start moving material out of the Hopper. To adjust the feed bar speed gradually rotate the Ground Drive Speed Control valve lever clockwise to increase and counter-clockwise to decrease the travel speed.



**DO NOT use the auger(s) if they are completely submerged by the material in the hopper.** Do so may cause the drive chain to slip and increase wear on the chain and sprocket.

### Automatic Controls

The machine can be set to use automatic steering. Position the machine as close to the stringline as possible before enabling automatic controls. Set the sensor arm on the stringline. A green LED will illuminate to indicate that Auto Steer is active.

- Actuate the Auto Steer Enable switch to the left/ON to enable auto steer. To disable auto steer, return the switch to the neutral position. Control the direction of travel using the three way “Auto Steer” switch. Neutral position, OFF. Right position, Forward. Left position, Reverse.
- To adjust the travel speed gradually rotate the Ground Drive Speed Control valve lever clockwise to increase and counter-clockwise to decrease the travel speed.



Before enabling the auto steer function, **ensure that the Auto Steer junction block valve handles are oriented in the correct positions.** There are two of these blocks on the machine, one on the left and right ends of the machine’s upper hopper. Reference the illustrations on the next page, these must be in the correct orientation for proper machine operation. Reference “Quick Start Guide” on page 38

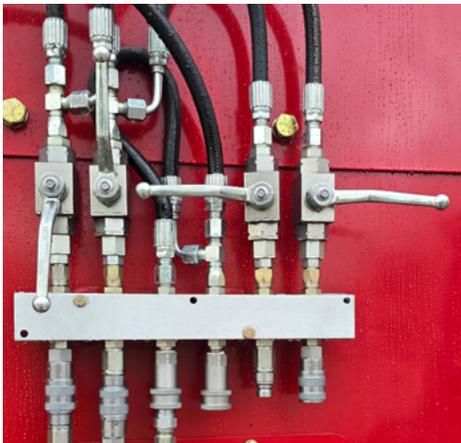
- While in auto steer to change directions the **machine must be stopped** and then the valve handles must be re-positioned in the forward direction orientation or the reverse direction orientation depending on the desired direction of travel.
- When turning off auto steer and returning to manual controls, the **machine must be stopped** and then the valve handles must be re-positioned to have all valve handles set to the closed position.
- **Be aware that the primary functions are Travel/Steer and Helical Auger operation, during auto steering the use of other functions may impede machine performance.** It is recommended to stop the machine if there is a need to use the augers, open hopper doors or any other hydraulic functions.

# SECTION 2 OPERATIONS

## Operating Procedure

### Junction Block valve handle orientations for Automatic Controls

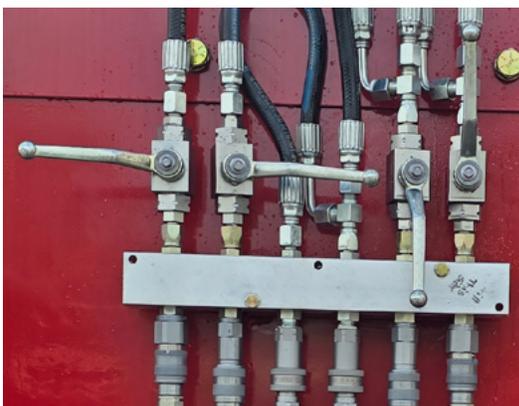
LH (SOM) Auto Steer Forward



LH (SOM) Auto Steer Reverse



RH (SOM) Auto Steer Forward



RH (SOM) Auto Steer Reverse



Closed for Manual Controls



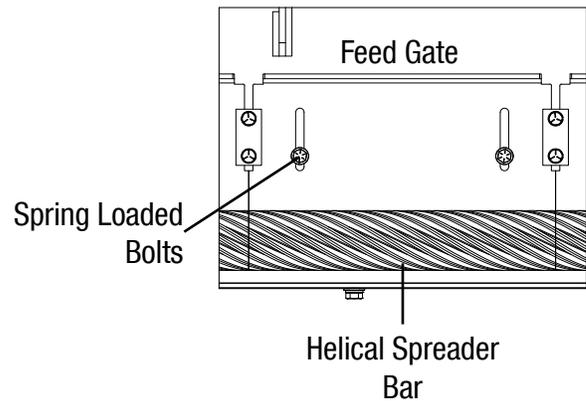
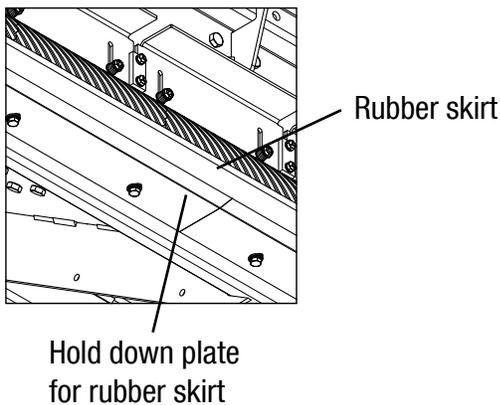
### Adjusting Feed Gate Width:

The lower hopper outlet spans 14ft, there are 14 individual 1ft long feed gates. These are fastened to the hopper outlet with spring loaded bolts to allow for quick adjustment.

- Change the hopper outlet span by closing and opening the feed gates to fit the paving path.



**Do not adjust the feed gate while the machine is running, only adjust the feed gate when the machine is off.**

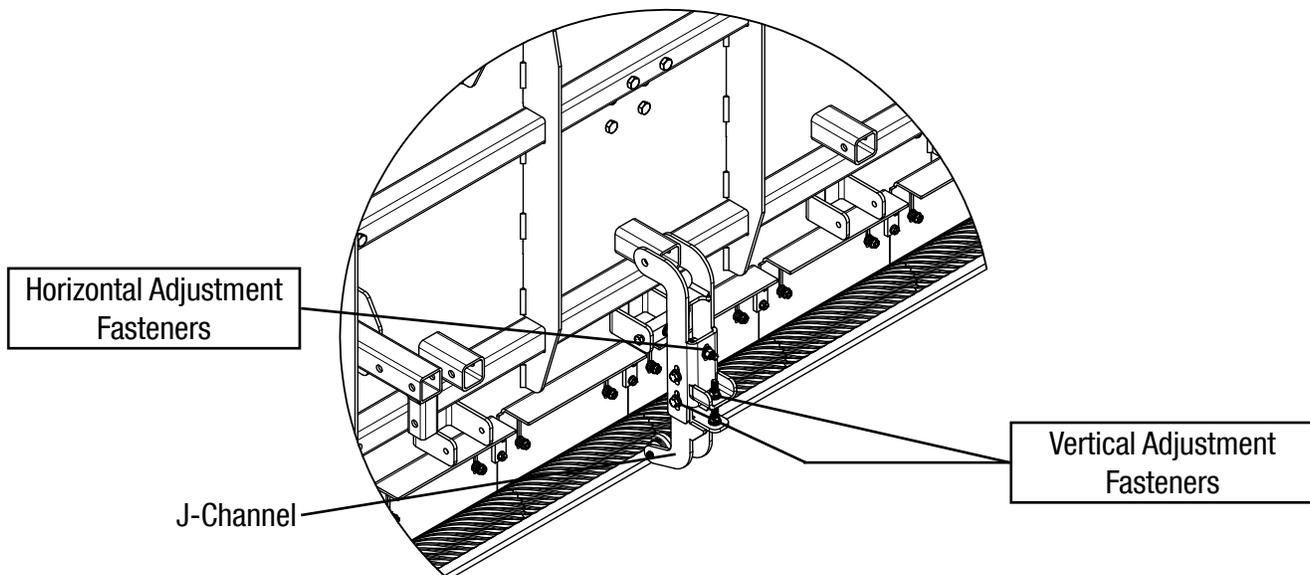


### Adjusting Helical Spreader Bar Support:

To ensure that there is not excessive bending in the spreader bar, an adjustable roller support is mounted on the center of the lower hopper. The roller support has horizontal and vertical adjustment.

- To adjust the support horizontally loosen the 3/8" hex nuts on the center of the J-Channel. Adjust the nuts to move the support in and out.
- To adjust the support vertically loosen the four 3/8" hex bolts on the sides of the lower portion of the J-Channel and loosen the 3/8" hex nuts on the outside of the lower J-Channel. Adjust the nuts to move the support up and down.

The support's roller wheel should contact the lower outer portion of the spreader bar. Re-tighten loose bolts and nuts.



## SECTION 2 OPERATIONS

# Operating Procedure: Paving Guideline

### NOTICE

The following values are estimates for reference only. Accurate material deposit values depend on travel speed and spreader bar RPM and must be determined through field testing on-site.

**Note: Flow control settings 1-2 contain a dead band.**

During operation the Feed Gate gap height, the machine travel speed and the helical spreader bar speed will affect the amount of material deposited.

The Feed Gate can be adjusted from fully closed to a max gap height of approximately 1-13/16" at the lower hopper outlet. During operation, to ensure a uniform distribution of material fully open the Feed Gate door to the max height. The max paving width is 14ft, adjust the paving width by closing/opening the feed gate doors. There are 14 total doors, each door is 1ft.

- Travel Speed (ft/min) x Paving Width (ft) = Paving Area (ft<sup>2</sup>/min)
- Material Exit Volume (ft<sup>3</sup>/min) / Paving Area (ft<sup>2</sup>/min) = Material Thickness (ft) [multiply by 12 to get inches]

Travel Speed Adjustment Table				
Valve Setting	GPM	Motor Speed RPM	Output RPM	Travel Speed ft/min
1	0	0	0.0	0.0
2	0	0	0.0	0.0
3	2	38	0.7	3.0
4	5	95	1.8	7.5
5	7	133	2.5	10.5
6	9	170	3.2	13.5
7	11	208	3.9	16.5
8	15	284	5.4	22.5
9	15.5	293	5.5	23.3
10	16	303	5.7	24.0

Helical Spreader Bar Speed Adjustment Table						
Valve Setting	GPM	Motor Speed RPM	Output RPM	14ft, Material Volume (ft <sup>3</sup> /min)	12ft, Material Volume (ft <sup>3</sup> /min)	10ft, Material Volume (ft <sup>3</sup> /min)
1	0	0.0	0.0	0.00	0.00	0.00
2	0	0.0	0.0	0.00	0.00	0.00
3	1.00	8.2	6.3	0.78	0.67	0.55
4	2.50	20.4	15.7	1.95	1.66	1.38
5	3.50	28.6	22.0	2.72	2.33	1.94
6	4.50	36.7	28.3	3.50	3.00	2.49
7	5.50	44.9	34.6	4.28	3.66	3.04
8	7.50	61.2	47.1	5.84	4.99	4.15
9	7.75	63.3	48.7	6.03	5.16	4.28
10	8.00	65.3	50.3	6.23	5.32	4.42

# Operating Procedure: Paving Guideline

## SECTION 2 OPERATIONS

### NOTICE

The following values are estimates for reference only. Accurate material deposit values depend on travel speed and spreader bar RPM and must be determined through field testing on-site.

Note: Flow control settings 1-2 contain a dead band. The tables below have a minimum thickness value of 1/16”.

Estimated Material Thickness Based on Flow Valve Settings, 14ft paving width												
		Travel Speed Flow Control Valve Setting										
		1	2	3	4	5	6	7	8	9	10	
Helical Spreader Bar Flow Control Valve Setting	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.222	0.089	0.064	0.063	0.063	0.063	0.063	0.063	0.063
	4	0.000	0.000	0.556	0.222	0.159	0.124	0.101	0.074	0.072	0.069	0.069
	5	0.000	0.000	0.778	0.311	0.222	0.173	0.142	0.104	0.100	0.097	0.097
	6	0.000	0.000	1.001	0.400	0.286	0.222	0.182	0.133	0.129	0.125	0.125
	7	0.000	0.000	1.223	0.489	0.349	0.272	0.222	0.163	0.157	0.153	0.153
	8	0.000	0.000	1.668	0.667	0.477	0.371	0.303	0.222	0.215	0.208	0.208
	9	0.000	0.000	1.724	0.689	0.492	0.383	0.313	0.230	0.222	0.215	0.215
	10	0.000	0.000	1.779	0.712	0.508	0.395	0.323	0.237	0.229	0.222	0.222

Estimated Material Thickness Based on Flow Valve Settings, 12ft paving width												
		Travel Speed Flow Setting										
		1	2	3	4	5	6	7	8	9	10	
Helical Spreader Bar Flow Control Valve Setting	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.222	0.089	0.063	0.063	0.063	0.063	0.063	0.063	0.063
	4	0.000	0.000	0.555	0.222	0.158	0.100	0.101	0.074	0.071	0.069	0.069
	5	0.000	0.000	0.777	0.311	0.222	0.140	0.141	0.104	0.100	0.097	0.097
	6	0.000	0.000	0.998	0.399	0.285	0.180	0.182	0.133	0.129	0.125	0.125
	7	0.000	0.000	1.220	0.488	0.349	0.219	0.222	0.163	0.157	0.153	0.153
	8	0.000	0.000	1.664	0.666	0.475	0.299	0.303	0.222	0.214	0.208	0.208
	9	0.000	0.000	1.720	0.688	0.491	0.309	0.313	0.229	0.221	0.215	0.215
	10	0.000	0.000	1.775	0.710	0.507	0.319	0.323	0.237	0.229	0.222	0.222

Estimated Material Thickness Based on Flow Valve Settings, 10ft paving width												
		Travel Speed Flow Setting										
		1	2	3	4	5	6	7	8	9	10	
Helical Spreader Bar Flow Control Valve Setting	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.221	0.088	0.063	0.063	0.063	0.063	0.063	0.063	0.063
	4	0.000	0.000	0.553	0.221	0.158	0.123	0.101	0.074	0.071	0.069	0.069
	5	0.000	0.000	0.774	0.310	0.221	0.172	0.141	0.103	0.100	0.097	0.097
	6	0.000	0.000	0.995	0.398	0.284	0.221	0.181	0.133	0.128	0.124	0.124
	7	0.000	0.000	1.216	0.487	0.348	0.270	0.221	0.162	0.157	0.152	0.152
	8	0.000	0.000	1.659	0.663	0.474	0.369	0.302	0.221	0.214	0.207	0.207
	9	0.000	0.000	1.714	0.686	0.490	0.381	0.312	0.229	0.221	0.214	0.214
	10	0.000	0.000	1.769	0.708	0.505	0.393	0.322	0.236	0.228	0.221	0.221

## SECTION 2 OPERATIONS

### Hopper: Loading and Cleaning

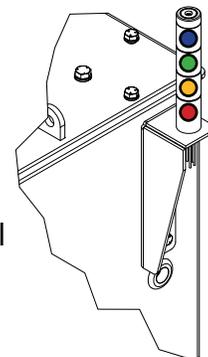
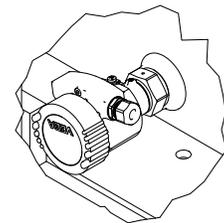


**DANGER**

**DO NOT overfill the hopper. The maximum material weight allowed in the hopper is 20,000lbs. EX. 4,000 lb bag = 5 bags to reach max capacity.**

#### Loading the Hopper & How Hopper sensors work:

- Fill the hopper by using the hydraulic levers on the control panel labeled Left or Right “Hopper Door” to open the hopper doors. The hopper door hydraulic cylinders have a 10in stroke, when opening the hopper doors keep them within a 90° window, do not allow the doors to go beyond vertical. Once the doors are open aggregate material can be loaded into the hopper.
- The Hopper features six load level sensors (3 per side), on each side there are two located on the upper hopper and one is located on the lower hopper. There are two corresponding light indicators on the operator control panel.
- The sensors will indicate that the hoppers are Full, 3/4 Full, Half-Full, and Near-Empty. Each level indication is represented by a Blue, Green, Orange, and Red light respectively. As aggregate material reaches the sensor level the light indicator will illuminate the corresponding color.



**DANGER**

Depending on the material weight, the Full or Blue indicator on the level sensor indicates that the machine may be overloaded, or material may be accumulated more on one side.

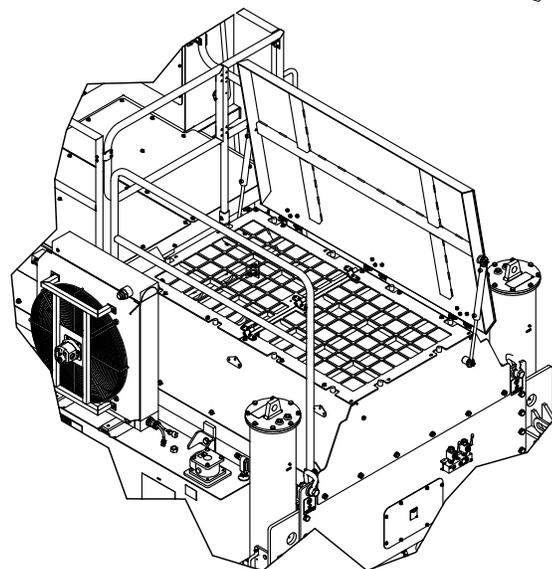
- If the level sensor is Blue check the material weight and ensure that the machine is not overloaded, and/or check that the material is spread evenly.



**CAUTION**

**DO NOT use the auger(s) if they are completely submerged by the material in the hopper.** Do so may cause the drive chain to slip and increase wear on the chain and sprocket.

- When the material is at or below the center of the auger shaft, adjust the directions as needed to evenly distribute the material. Moving too much material to one side may result in excess material compaction and limit the augers ability to move the material.



# Hopper: Loading and Cleaning

## SECTION 2 OPERATIONS

### Cleaning the Hopper:



Only enter the Hopper after the machine has been turned off.

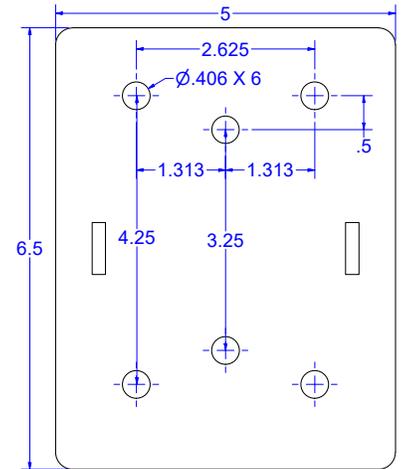
The top of the upper hopper's opening is blocked off by a hinged metal grid.

### NOTICE

**The top of the hopper must only be accessed if the personnel recovery mast is used.**

The metal grid is hinged in the middle, to open the grid unfasten the 3/8" bolts from one side.

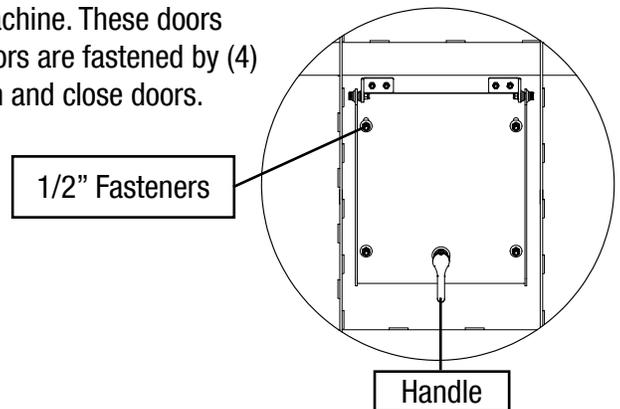
- Use the Hopper Door levers to open and close the upper hopper loading doors.



Recovery mast mount plate  
U/M: Inches

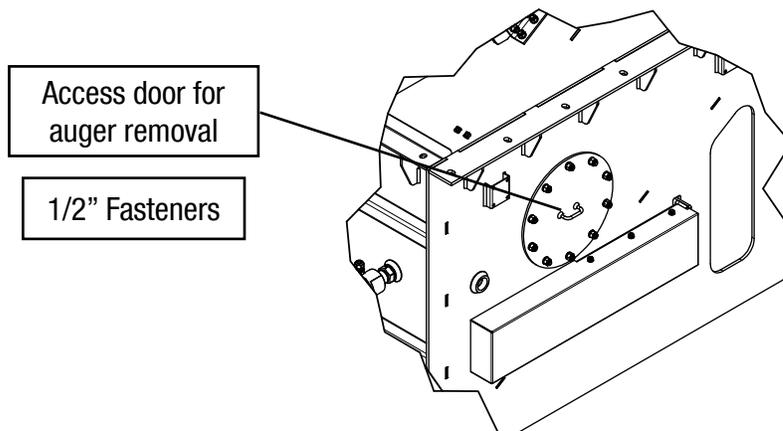
The lower hopper has four access doors on the bottom rear of the machine. These doors are hinged and are fastened to the lower hopper in two ways. The doors are fastened by (4) 1/2" Studs and Hex Nuts as well as a cam latch styled handle to open and close doors.

- Unfasten and open these doors to gain access to the Hopper.



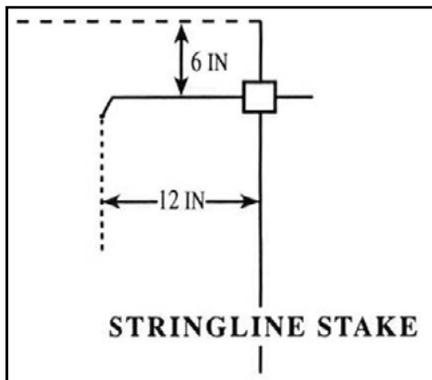
The lower hopper also has two access doors on the left and right sides of the machine (one per). These doors are fastened to the lower hopper by (10) 1/2" Studs and Hex Nuts. The main purpose of these access doors is to assist in removal of the augers if they are ever in need of repair or replacement.

- Unfasten and open these doors to gain access to the Hopper.

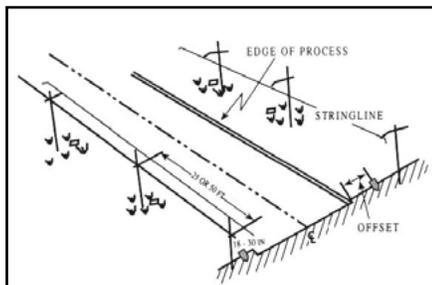


## SECTION 2 OPERATIONS

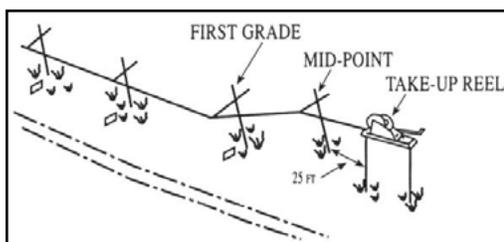
### Stringline Setup



Assemble the stringline stakes so the stringline holders are uniform horizontally and vertically.



Typical Stringline Installation



Take-up Reel Installation

#### 1. Typical stringline installation.

Start by sliding the stringline rod into the bracket and securing it with a set screw. The notched end of the rod should be about 12 inches (300mm) from the rod bracket. Slide the rod bracket onto the stringline stake, with the notched end up, and position it about 6 inches (150mm) from the blunt end of the stake. Temporarily secure with the set screw.

Load the stakes on a truck and drop one stake at each stringline hub along the route. The number of stakes required will depend on the length of the stringline station - normally 1,500 ft. (450 m) maximum - and the spacing between hubs.

After the stakes have been dropped, work back toward the starting point. Drive one stake about 1 ft. (30mm) to the rear of each hub. Each stake must be vertical and driven deeply enough to give it stability. The slotted end of the holder must be directly over the tack line. Use a plumb bob to determine the holder's horizontal placement. Then, use the folding rule or a rod marked with the exact dimension to position the holder vertically. The height of the holders is calculated beforehand and is uniform for each stringline stake. The agreed upon distance between the holder and the hub should be between 1.5 ft and 2.5 ft (450-750 mm) whenever possible.

#### 2. Take-up reel installation

After the stringline stakes are positioned, install one stringline take-up reel about 25 ft (8m) behind the first stringline stake. Offset the take-up reel 12-18 in (300-450 mm) outside the line of stringline stakes with the crank handle to the outside.

To set up the take-up reel, drive two stringline stakes through the pockets of the take-up reel firmly in place. Slide the reel up the stakes to a height that is convenient for turning the crank.

Locate another stringline stake midway between the first stringline stake and the take-up reel. The stringline holder of the mid-point stake should be 1-2 in (25-50 mm) higher than the other holders. This stake will serve to relieve the strain on the first stake. It will prevent the sensor wand from tracing the take-up line.

### 3. Reeling out stringline.

To reel out the stringline rapidly, place a storage reel (two reels if it's a dual stringline) in the bed of a truck. Tie the end of the stringline to the take-up reel and wind about 25 ft (7.5 m) of line on the take-up reel. Then, drive the truck the length of the stringline stake.

Unwind an additional 50 ft (15 m) of line. Twenty-five ft (7.5 m) of the extra line is for the distance to the next take-up reel and then the other 25 ft (7.5 m) is for winding on the take-up reel. The extra line on each take-up reel is used in case the stringline breaks and slack is needed to repair the break.

Install another take-up reel and mid-point stake behind the last stringline stake. Pull the stringline as tightly as possible by hand and tie the line to the take-up reel. Tighten the stringline with the take-up reel until it is taught.

Then walk down the roadway, placing the stringline in the notches in the holders. The stringline should slip into the notches easily, but not pull out without force. Adjustment of the notch openings can be made using a screwdriver to open it or a pair of pliers to close it. Check to see if there are any burrs on the notches that would cut the line. Use the three-cornered saw file to deburr the notches.

Be sure the stringline is tight. There should be no sag between the stringline stakes.

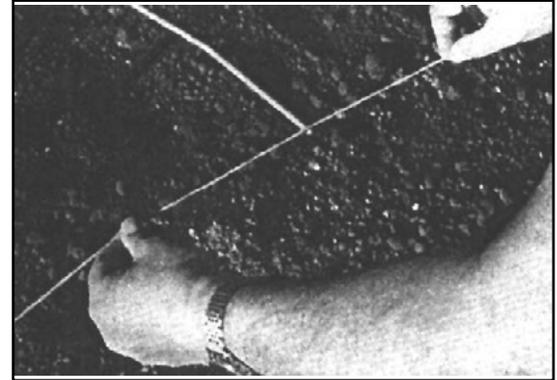
With the folding rule and plumb bob, check the elevation and alignment of the of the stringline at each stake.

### 4. Continuous stringline

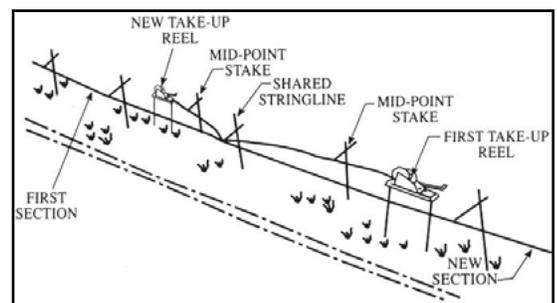
Stringline stations, the distance between take-up reels, should be limited to 1,500 ft (450m). To continue the stringline for greater distances, an anchoring station must be installed.

To continue the stringline, place a new take-up reel and mid-point stake between the last two stakes of the first stringline station. Secure the new reel and install the stringline on the reel in the previously described manner.

When the new stringline is being fitted in the holder notches, the last stake in the old station will become the first stake in the new station. That notch will have two stringlines in it and will have to be widened to accommodate the extra thickness. The shared stake will be in the middle of the anchor station. It marks the end of one stringline station and the beginning of a new one.



The stringline should slip into the notches easily, but not pull out without force



Anchor stations are used to connect stringline stations which are normally no more than 1,500ft (450 m) long.

## SECTION 2 OPERATIONS

### Stringline Setup

#### 5. Stringline gates

Sometimes, “gates” must be created in continuous stringlines to permit entry and exit for material supply trucks. A simple and effective way to create a gate is to remove the stringline from one holder and use cement blocks at the stakes on either side of that stake and holder to force the stringline down. This works when the stakes are placed at 50 ft (15 m) intervals. If the stakes are placed at 25 ft (7.5 m) intervals, remove the stringline from two consecutive holders to gain enough slack in the stringline to force it down so trucks can drive over it.

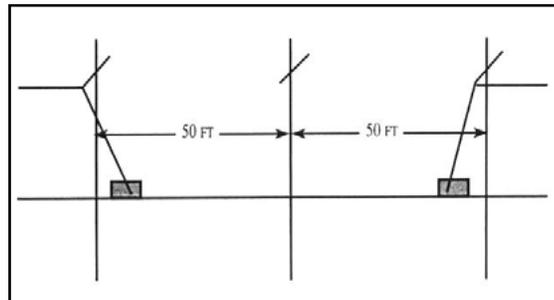
#### 6. Dismantling the stringline

To dismantle and store the stringline, first, remove the stringline from the holder notches. Then, release the tension on the take-up reels and unwind the excess line from the reels.

Pull the stakes and load them in a truck for transport to the next section of roadway or to storage. Wind the stringline onto the storage reel(s).

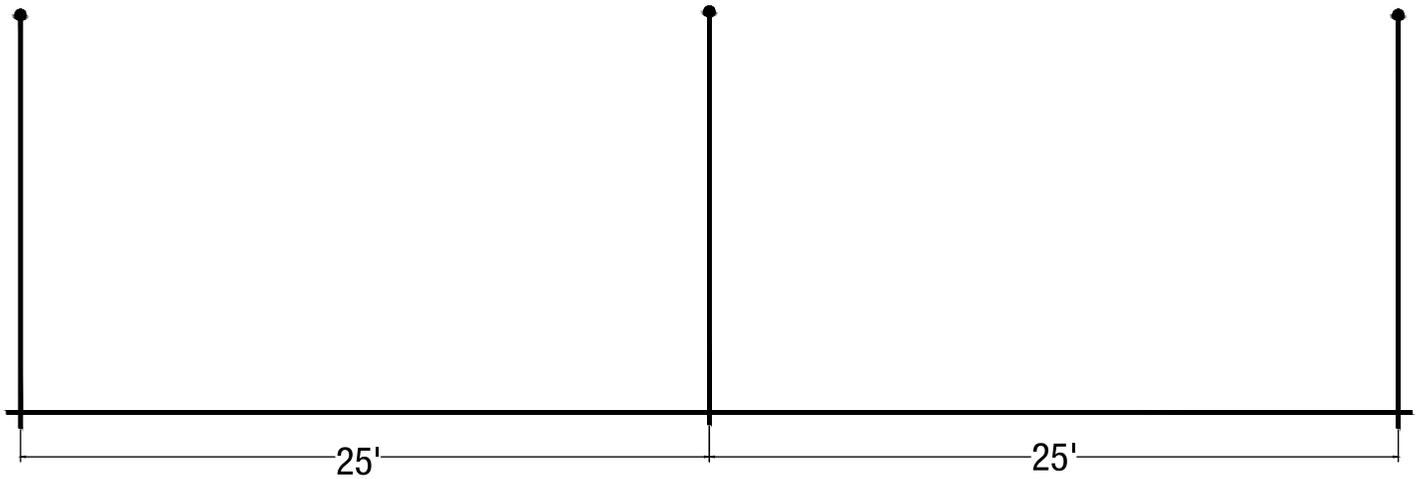
#### 7. Stringline Repair

A break in the stringline can be repaired by tying the stringline together with a square knot. The knot will not alter the accuracy of the reference but it must be tied securely enough to permit proper tightening of the stringline. All loose ends at the knot must be trimmed.

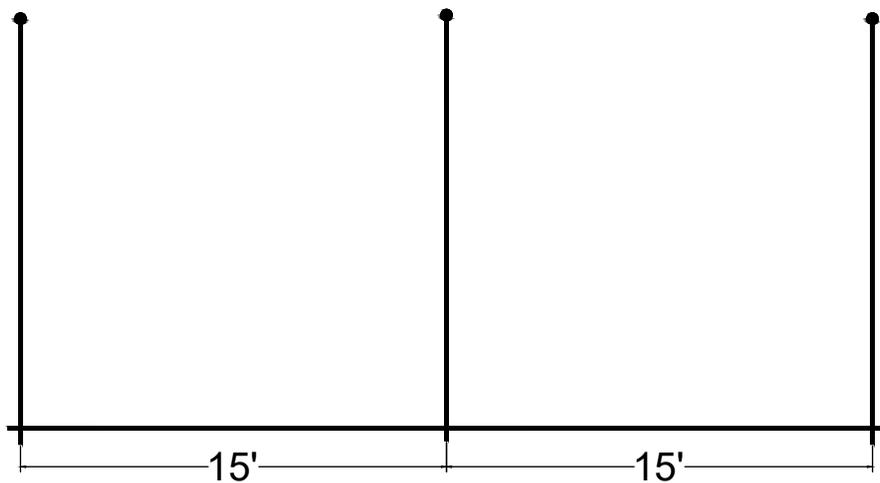


Stringline “gates” can be made by removing from one stringline holder and using cement blocks to force down the stringline at the two adjacent stringline stakes.

STRINGLINE STAKE SPACING  
GENERAL SETUP TANGENT SECTION

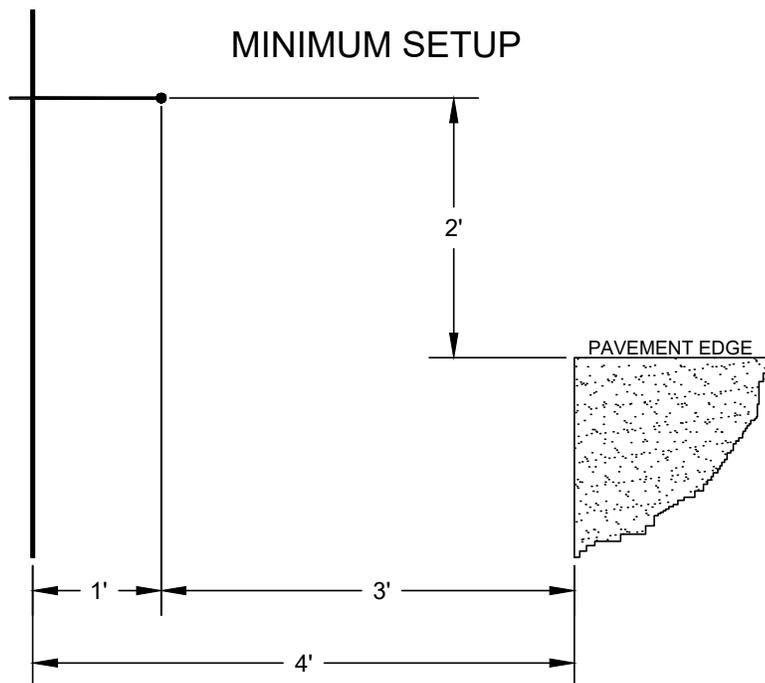
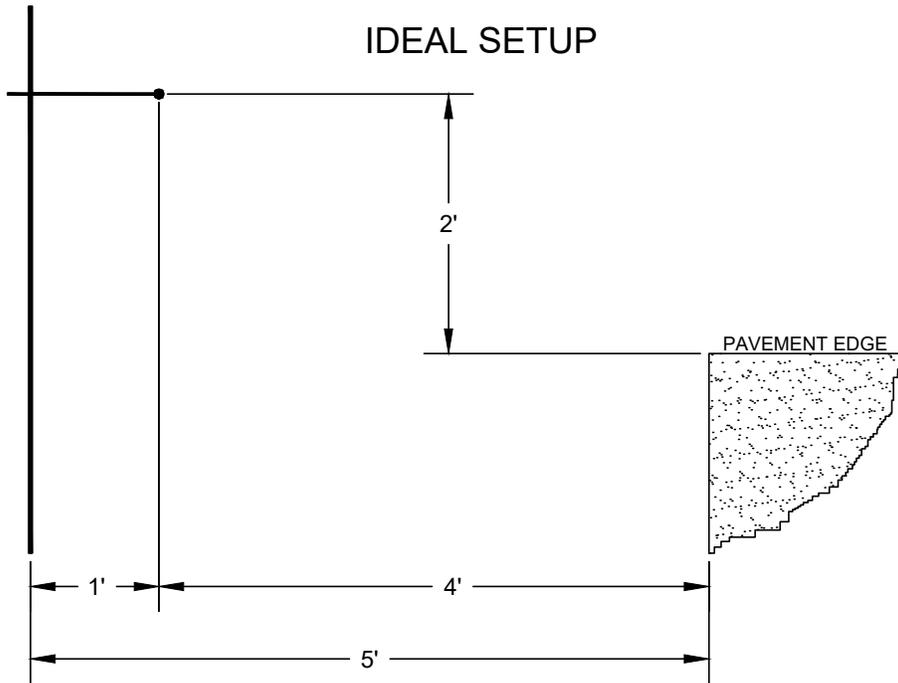


RIDE SPEC - 12 AND BELOW

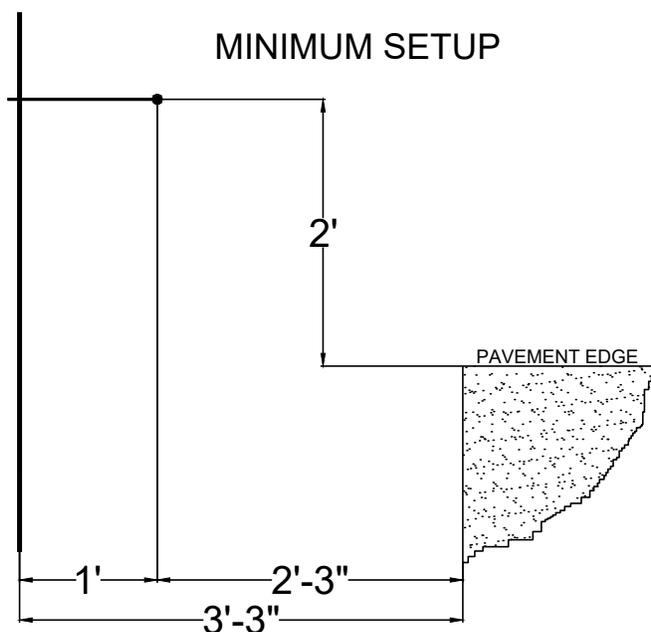
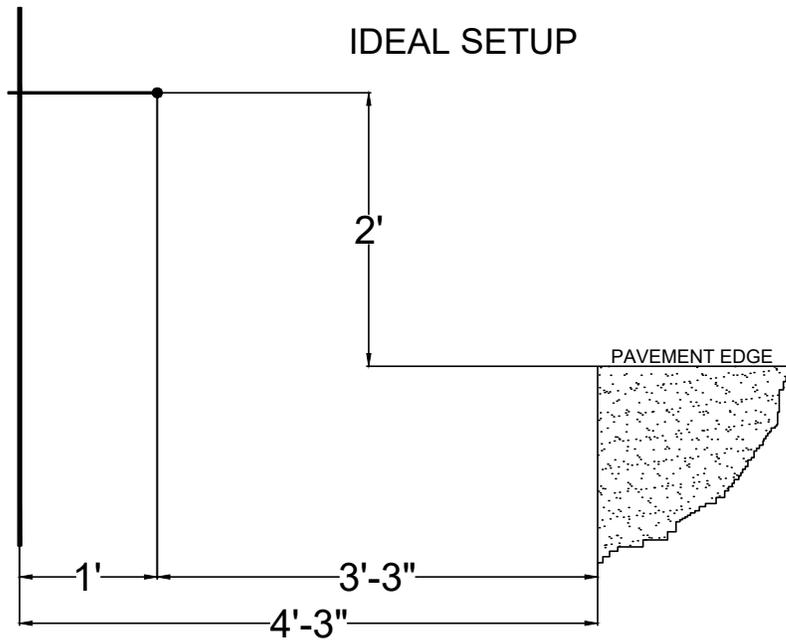


STRINGLINE MUST BE SET ACCURATELY AND TIGHT.  
USE WINCH SETUP TO KEEP TIGHT

**STANDARD TRACK MACHINE: 27" OUTSIDE OF  
TRACK STRINGLINE SETUP**



NARROW CLEARANCE TRACK MACHINE: 18"  
OUTSIDE OF TRACK STRINGLINE SETUP



**SECTION 3: SERVICE**

# Maintenance Schedule

## SECTION 3 SERVICE

Maintenance Schedule						
Description	Daily	Weekly	Monthly	500 Hours/ Every 12 Months	1500 Hours/ Every 36 Months	As Required
Visual Walk Around Inspection	x					
Check Engine Oil and Coolant Level	x					
Check Fuel Filter / Water Bowl	x					
Check Air Cleaner Dust Unloader Valve	x					
Check Restriction Indicator Gauge <sup>1</sup>	x <sup>1</sup>					
Check Engine Mounts				x		
Check Air Intake Hoses, Connections, & System				x		
Check Automatic Belt Tensioner and Belt Wear				x		
Check Engine Electrical Ground Connection				x		
Check Cooling System				x		
Check Engine Speeds				x		
Service Battery				x		
Change Engine Oil and Replace Oil Filter <sup>2,3</sup>				x <sup>2,3</sup>		
Replace Fuel Filters				x		
Flush and Refill Cooling System <sup>4</sup>						x <sup>4</sup>
Check and Adjust Engine Valve Clearance					x	
Test Glow Plugs					x	
Add Coolant						x
Replace Fan and Alternator Belts						x
Check Fuses						x
Bleed Fuel System						x
Change Hydraulic Filters <sup>5</sup>					x <sup>5</sup>	
Flush and Refill Hydraulic System <sup>6</sup>					x <sup>6</sup>	
Check Motor Fastener & Seals				x		
Change Motor Gear Oil <sup>7</sup>				x		
Clean Hoppers						x
Grease Points	x	x				
Inspect and Clean Hyd. Chain Drives			x			

1. Replace primary air cleaner element when restriction indicator shows a vacuum of 625 mm (25 in.) H<sub>2</sub>O. If not equipped with indicator, replace air cleaner elements at 500 hours or 12 months, whichever occurs first.
2. During engine break-in, change the oil and filter for the first time after 50 hours of operation (maximum).
3. Service intervals depend on sulfur content of the diesel fuel, oil pan capacity, and the oil and filter used.
4. Change engine coolant every 4 years.
5. Check the hydraulic tank return line filter gauge monthly, Green - Element has service life left, Yellow - Element is contaminated, change the filter element, Red - Filter bypass valve is open, unfiltered oil is flowing into the tank change filter immediately.
6. A system "flush and refill" will only be required when hydraulic fluid is tested and found to be at an unacceptable level of usage.
7. Change the motor gear oil after the first 100 hours of use, then for Mineral Oil change every 12 months for Synthetic Oil change every 24 months

## SECTION 3 SERVICE

## Replacement Filters / Fluids

### NOTE

Images are for reference only

### FILTERS



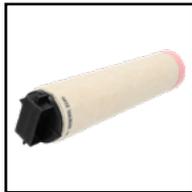
Part #: 065854

Description: Filter, Oil, for Hatz 4H50TIC



Part #: 065856

Description: Filter, Primary Air, for Hatz 4H50TIC



Part #: 065855

Description: Filter, Safety Air, for Hatz 4H50TIC



Part #: 078612

Description: Filter, Primary Fuel, for Hatz 4H50TIC



Part #: 078629

Description: Filter, In-Line Fuel, for Hatz 4H50TIC



Part #: 073418

Description: Filter, Hydraulic, for AAS310

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### FLUIDS

Part #: 001002-2

Description: Fluid, Hydraulic, QTY: 62 GAL (234 L)

Consult your local fuel distributor for properties of the diesel fuel available in your area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed.

Diesel fuels specified to EN 590 or 15940, BS 2869 A1/A2, ASTM D 975-09a 1-D S15 or 2-D S15 are recommended.

**IMPORTANT:** Do not mix used diesel engine oil or any other type of lubricating oil with diesel fuel.

**IMPORTANT:** Improper fuel additive usage may cause damage on fuel injection equipment of diesel engines.

---

## Handling and Storing Diesel Fuel



Reduce the risk of fire. Handle fuel carefully. DO NOT fill the fuel tank when engine is running. DO NOT smoke while you fill the fuel tank or service the fuel system.

Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing during cold weather.

Keep all storage tanks as full as practicable to minimize condensation.

Ensure that all fuel tank caps and covers are installed properly to prevent moisture from entering. Monitor water content of the fuel regularly.

When using biodiesel fuel, the fuel filter may require more frequent replacement due to premature plugging.

Check engine oil level daily prior to starting engine. A rising oil level may indicate fuel dilution of the engine oil.

**IMPORTANT:** The fuel tank is vented through the filler cap. If a new filler cap is required, always replace it with an original vented cap.

When fuel is stored for an extended period or if there is a slow turnover of fuel, add a fuel conditioner to stabilize the fuel and prevent water condensation. Contact your fuel supplier for recommendations.

Storage for long periods may result in deposit build up, this may result in clogged filters and damage to the injection system

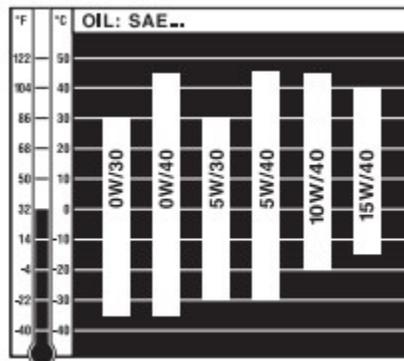
**DIESEL ENGINE OIL**

Operate the engine under various conditions, particularly heavy loads with minimal idling, to help seat engine components properly.

Change the oil and filter after the **FIRST 50 HOURS** of operation. All brands that meet one or more of the following specifications are suitable for use:

- ACEA E6 or E8 (recommended)
- ACEA E9 or E11
- ACEA C3/C4 (HTHS  $\geq 3.5$ mPas)
- API CK or CJ-4

Use oil viscosity based on the expected air temperature range during the period between oil changes.



The engine cooling system is filled to provide year round protection against corrosion and freezing

Recommended coolant for Hatz engines: Mitan C12+ (5 L).

See Hatz Engine Manual for a list of approved alternative engine coolants.

The additive package must be part of one of the following coolant mixtures:

- Ethylene glycol or propylene glycol base prediluted (40—60%) heavy duty coolant
- Ethylene glycol or propylene glycol base heavy duty coolant concentrate in a 40—60% mixture of concentrate with quality water

### Water Quality

The following values must not be exceeded:

	Max
Water hardness (°GH)	20
Water hardness (mmol/l)	3.6
Chloride content (ppm)	100
Sulfate content (ppm)	100

The coolant mixture ratio must not be below or exceed the following:

Coolant	Water	Frost-resistant to approx.
min. 40 vol%	60 vol%	-24°C
max. 50 vol%	50 vol%	-36°C

### IMPORTANT:

DO NOT use cooling system sealing additives or antifreeze that contains sealing additives.

DO NOT mix ethylene glycol and propylene glycol base coolants.

DO NOT use coolants that contain nitrites.

DO NOT use a coolant-water mixture greater than 60% ethylene glycol or 60% propylene glycol.

## SECTION 3 SERVICE

# Hydraulic Service

### DANGER

Hydraulic system service safety:

- **DO NOT** check for leaks with your hands.
- **Ensure that the machine is powered off and the hydraulic system is depressurized.** (The levers may need to be actuated to relieve pressure in the system.)
- If applicable, **DO NOT** service a hot machine. Allow the machine to cool before servicing hydraulic components.



The filter's status should be checked weekly. Check the gauge on the filter, or check the light on the control panel (machine must be on).

### NOTICE

In cold conditions the oil may thicken in this case wait for the machine to properly warm up before determining the filter status.

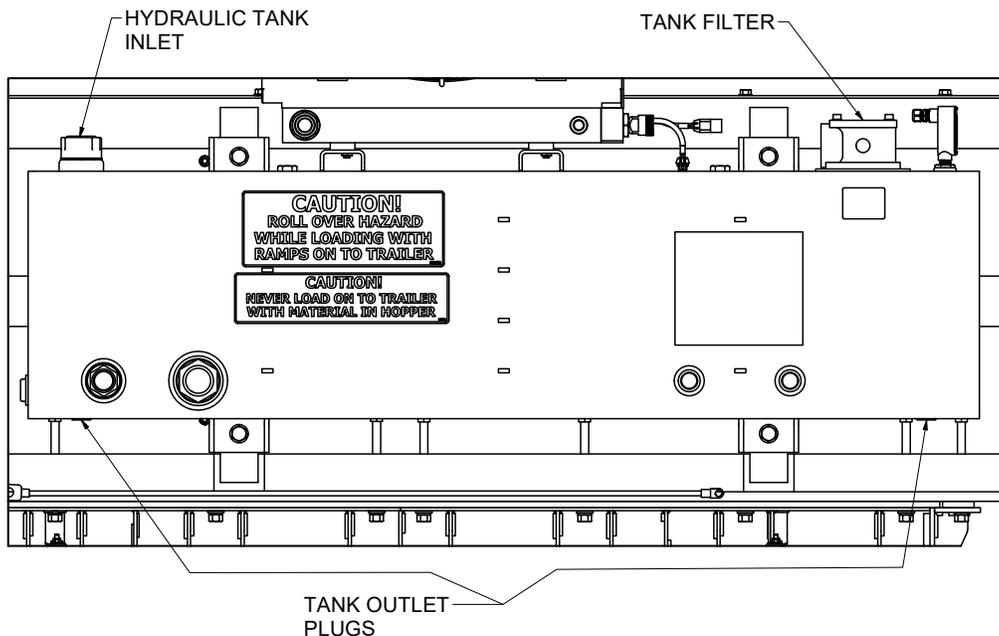
Be sure to use a pan/container to catch any oil that drains when changing the filter, The hydraulic tank is 62 GAL (234L). Do not overfill the hydraulic tank.

\*Replace Hydraulic Fluid with Hydraulic Oil AW32 or Equivalent\*

Note: Images for reference only

The hydraulic tank is located on the rear right side of the machine.

- The filter body will need to be unfastened to access the filter element. Remove the filter body top cap to access and remove the filter from the tank. Remove and replace the filter element, re-fasten the filter cap to the filter body.
- To drain the tank remove one or both of the plugs located on the bottom of the tank. (SAE #12 Hex Plugs)



### Hydraulic motor wheel gear service:

**NOTE** Do not mix different kinds of gear oil.

Refill motor wheel gear with oils (mineral or synthetic) that meet the following standards: ISO VG 150, ISO VG 220, ISO VG 320.

For prolonged work periods where the motor wheel gears may experience temperatures up to or greater than 140°F or 60°C, synthetic oil is recommended.

### To change gear oil:

1. Position the wheel gear as shown in the figure [Drain Position] below.
2. Loosen and remove both of the plugs. Be sure to use a pan/container to catch any oil that drains.
3. Wash the inside of the wheel gear with an appropriate detergent.
4. Position the wheel gear as shown in figure [Fill Position]. The fill port should be raised slightly off the horizontal axis.
5. Fill with oil until oil begins to drain out the opposite port.
6. Close the plugs, changing the seals each time.

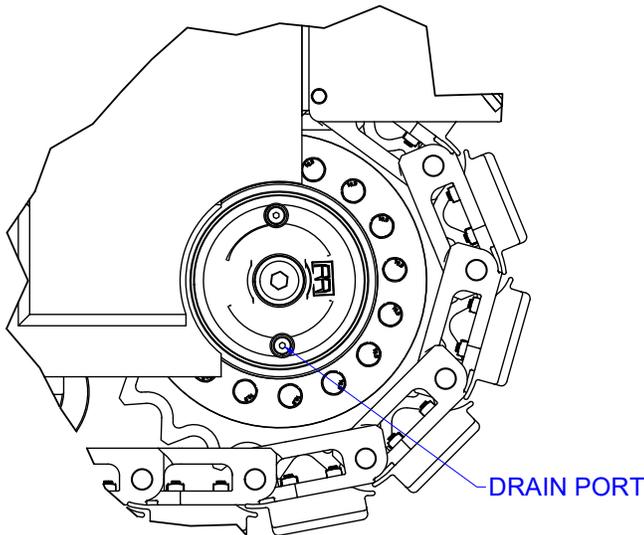


### Service intervals:

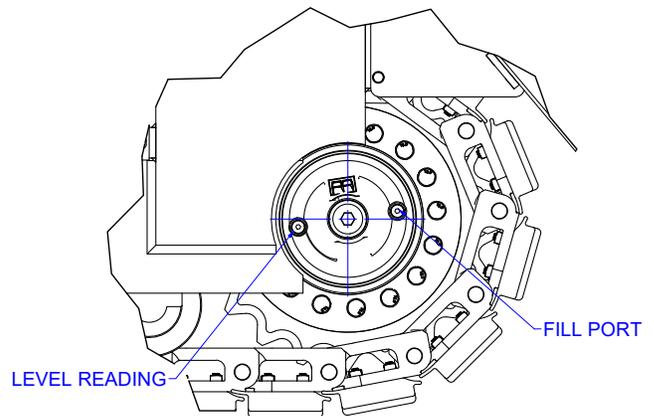
After the first 100 hours of use change the motor wheel gear oil.

Every 500 hours check the condition of the seals and verify that there are no leaks. Check that all fasteners are tight.

As a general rule change Mineral oil every 12 months and Synthetic oil [PAO and PO] every 24 months.



**DETAIL: MOTOR WHEEL GEAR  
DRAIN POSITION**



**DETAIL: MOTOR WHEEL GEAR  
FILL POSITION**

## SECTION 3 SERVICE

# Hydraulic Service: Motor Manual Brake Release

### DANGER



Hydraulic system service safety:

- **DO NOT** check for leaks with your hands.
- **Ensure that the machine is powered off and the hydraulic system is depressurized.** (The levers may need to be actuated to relieve pressure in the system.)
- If applicable, **DO NOT** service a hot machine. Allow the machine to cool before servicing hydraulic components.

The hydraulic brakes will be engaged if the Travel Levers are in their neutral position. When the Levers are actuated forward or reverse the brakes will release.

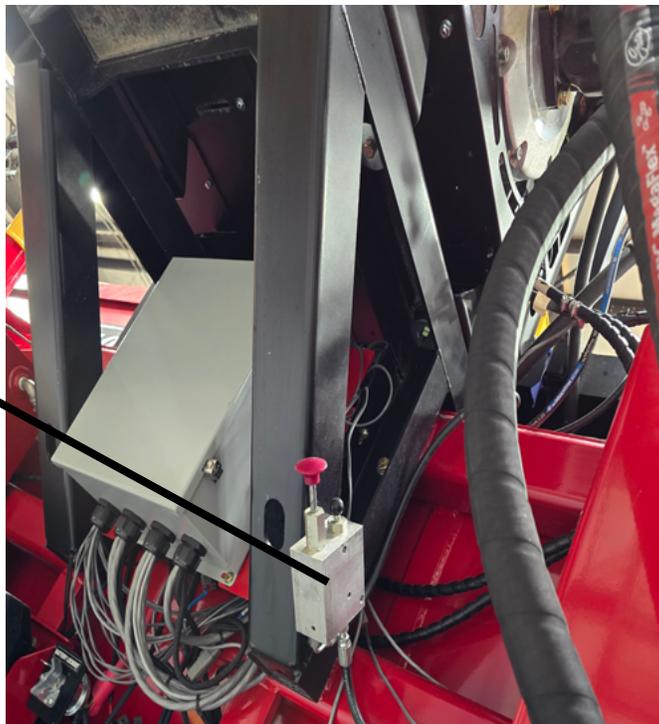
### To manually release the motor's brake:

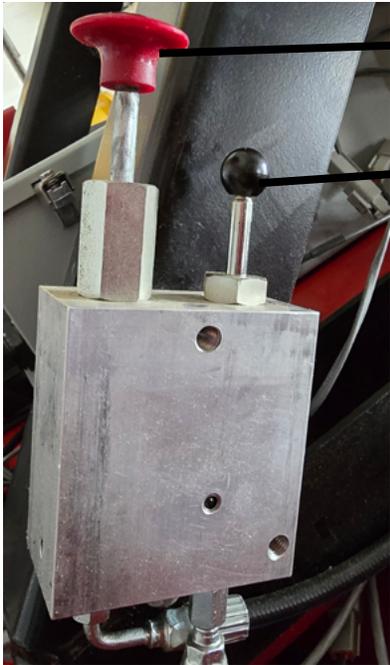
- Locate the manual brake release valve. On the rear of the machine underneath the engine mount, there is a hydraulic valve with a manual hand pump.
- Depress the valve rod with a black knob until it is firmly seated.
- Pump the lever on the valve to release the motor's brake. The manual pump can release the brake within approximately 1-5 pumps.
- To re-engage the motor's brake, pull the valve rod up to relieve pressure from the manual brake release valve.

### NOTE

To prevent the brake release valve from disabling the brakes during normal operation the valve rod will automatically pop out if the main brake system is pressurized, and return the brake system back to normal operation.

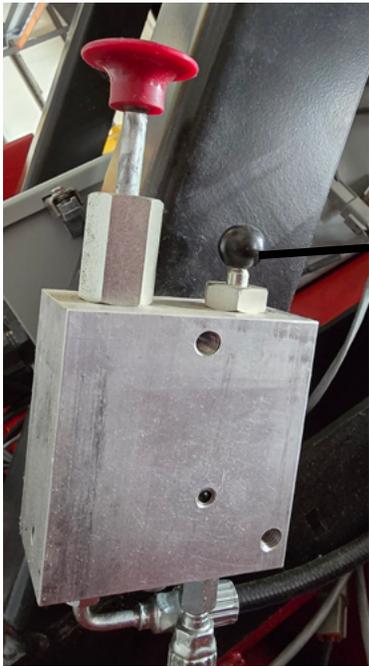
Valve, Break Release





Pump Lever

Valve Rod



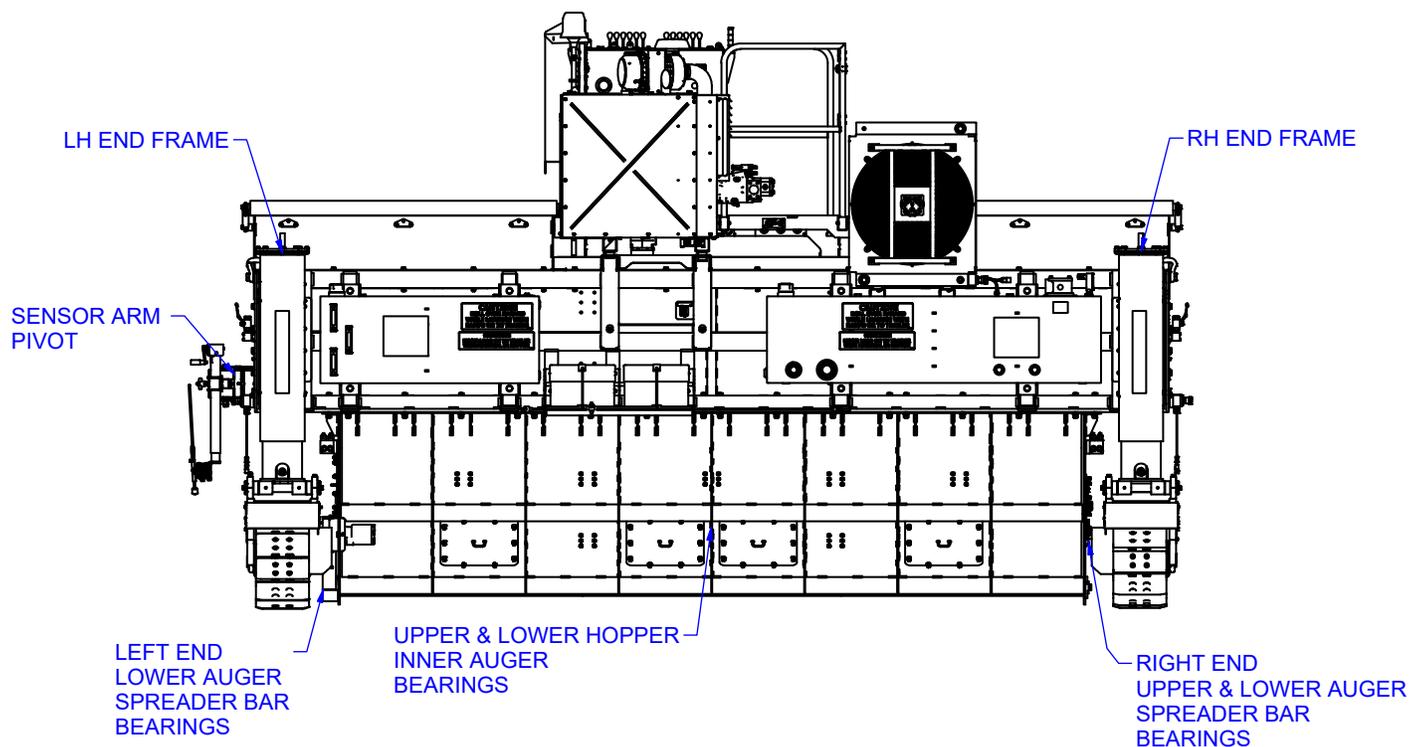
Valve Rod, Depressed

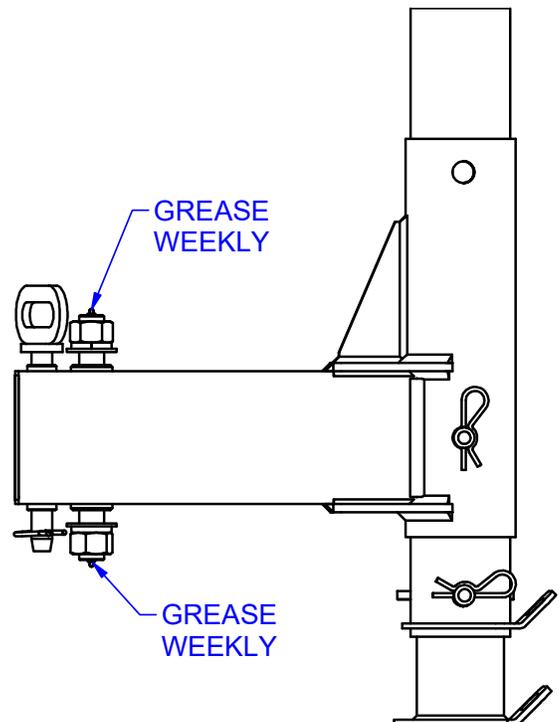
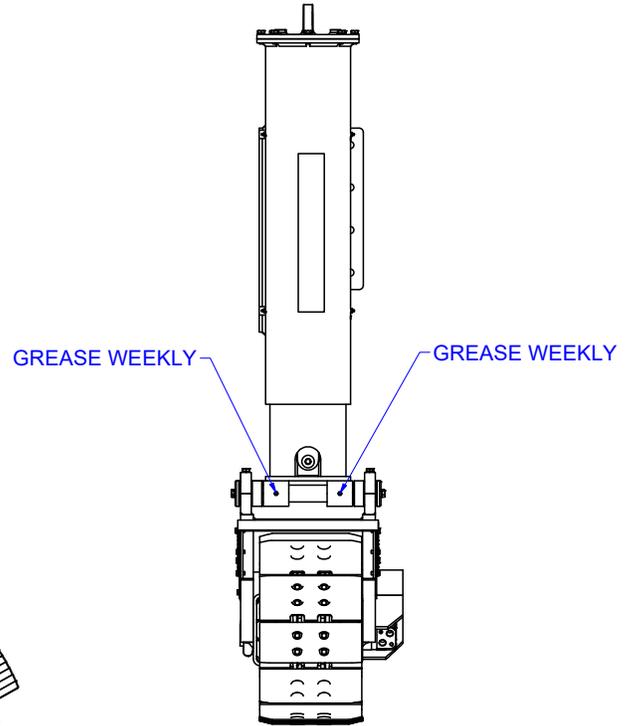
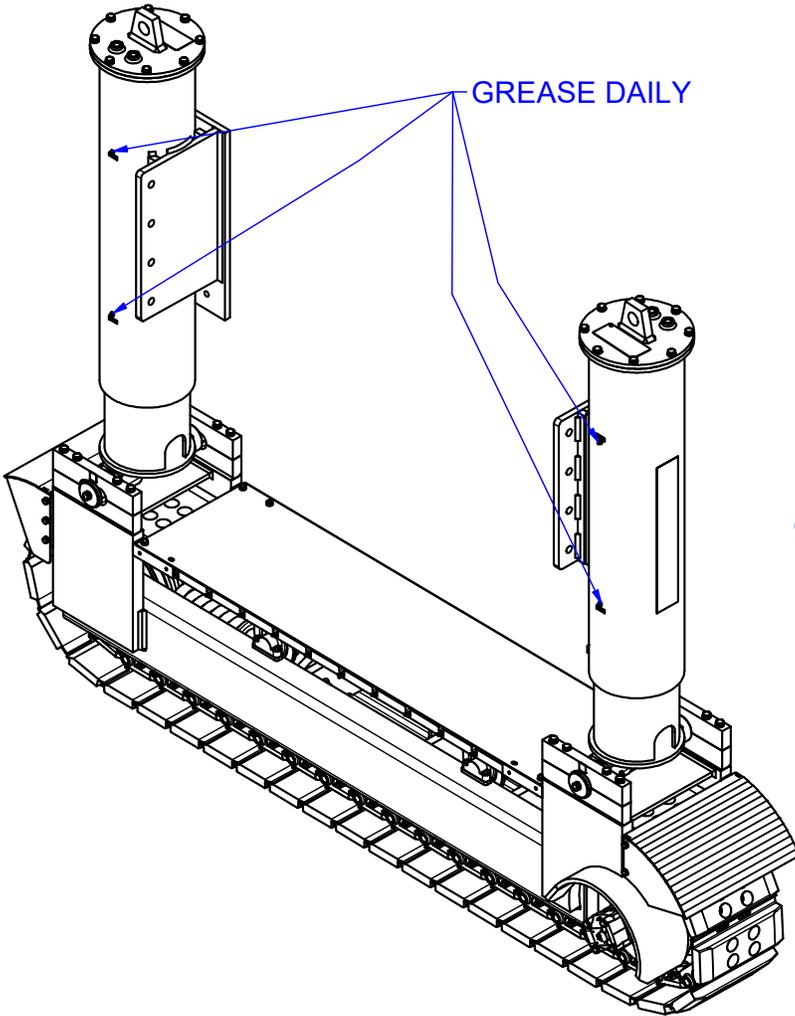
# SECTION 3 SERVICE

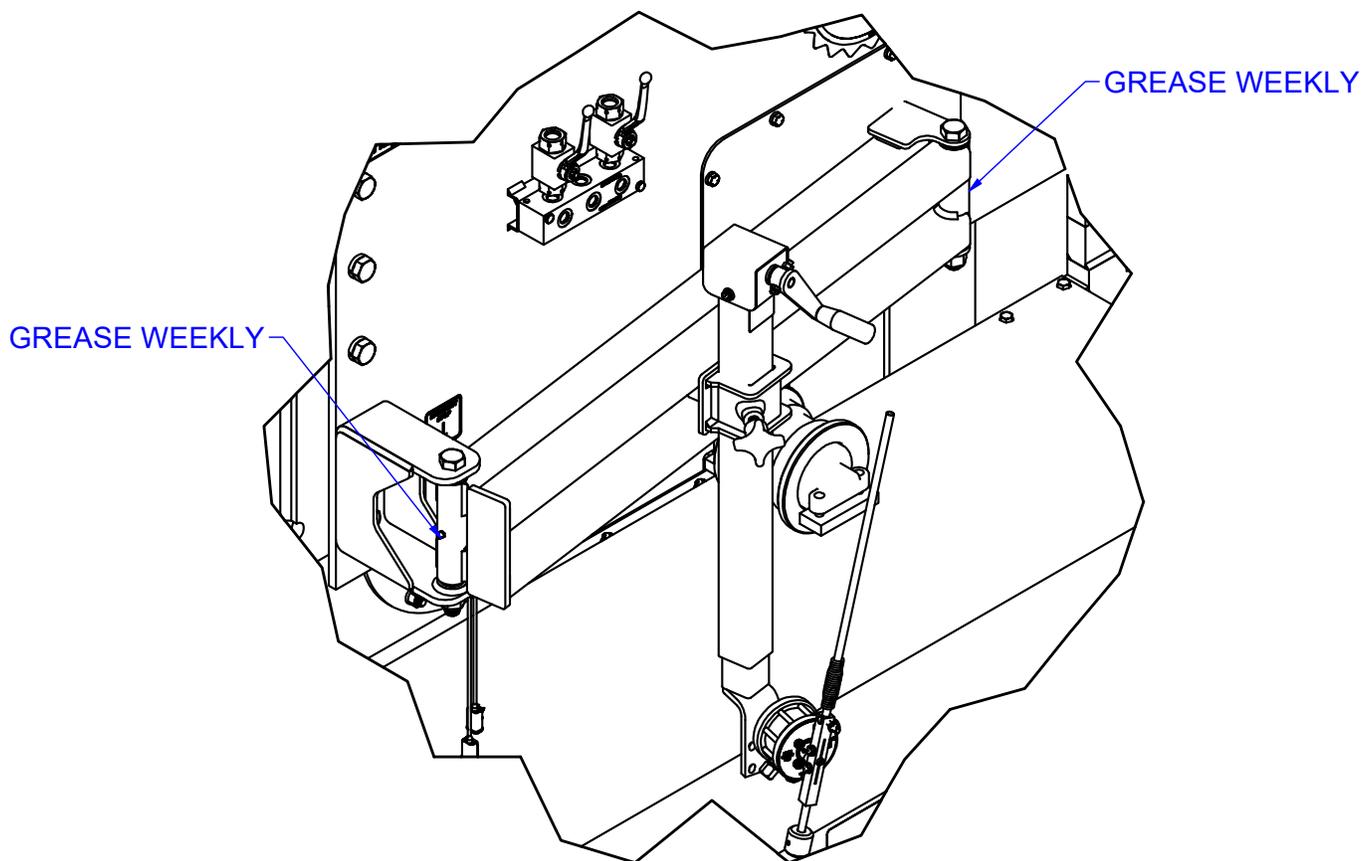
## Grease Points

Grease Points: Some points on the machine need to be greased daily, weekly or monthly in order to maintain proper operation.

NOTE: Grease type Mobil SHC 220 or similar is recommended for use on this machine.



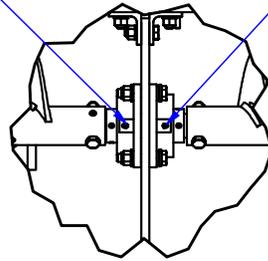




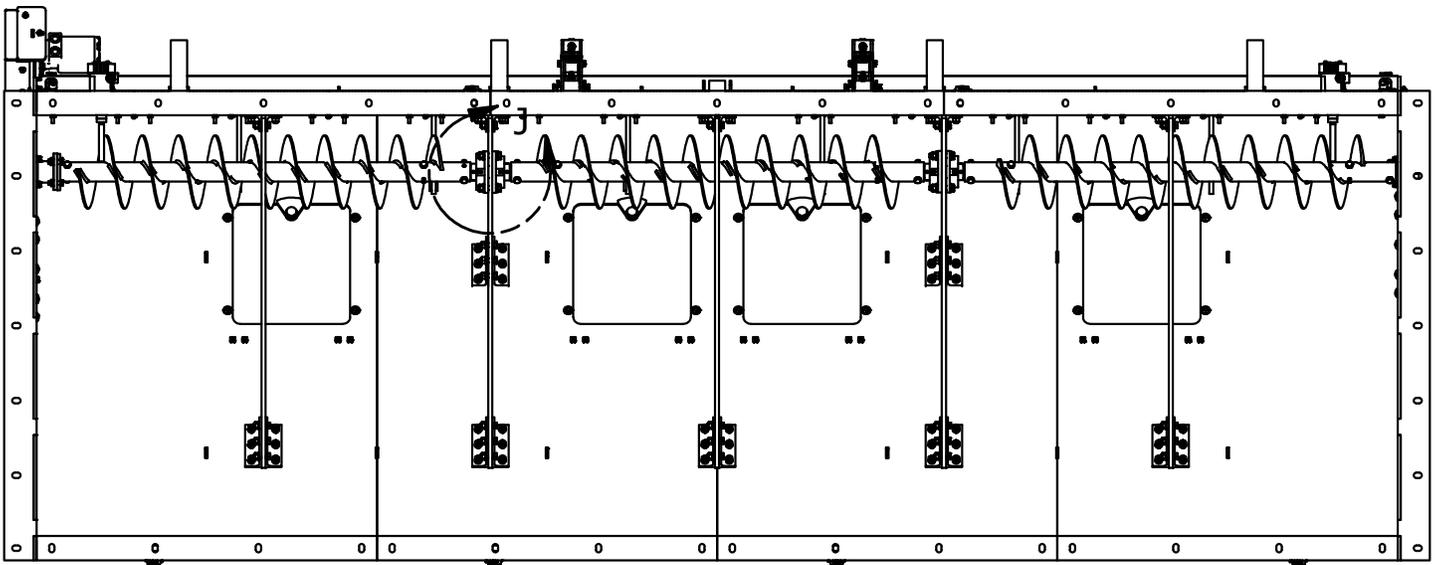
**DETAIL H**  
SENSOR ARM PIVOT

GREASE BEARING  
DAILY

GREASE BEARING  
DAILY



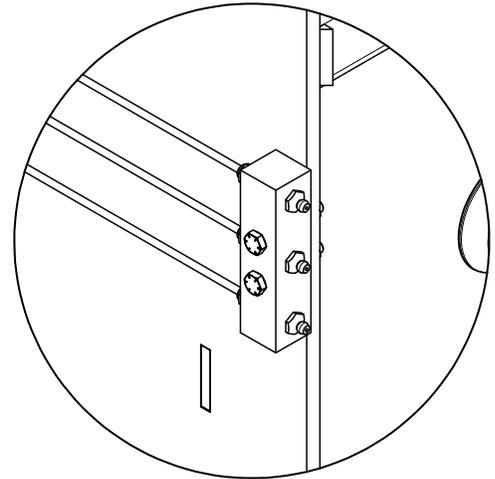
**DETAIL J**  
UPPER & LOWER AUGER  
INNER SUPPORT BEARINGS



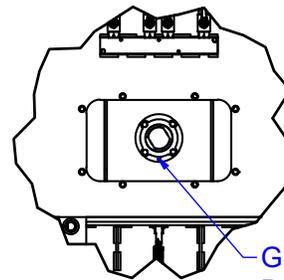
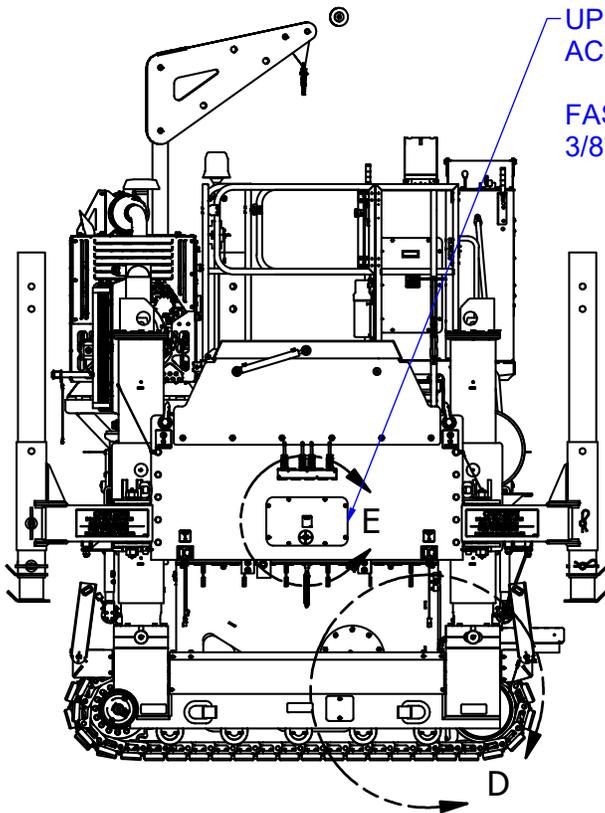
# SECTION 3 SERVICE

## Grease Points

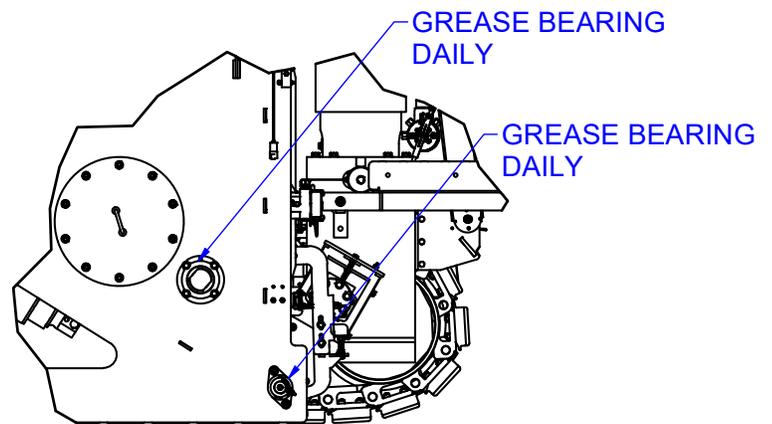
The lower hopper features a grease manifold mounted on each end. The manifold has three grease lines connected to the exterior bearings for the upper and lower augers & the helical spreader bar.



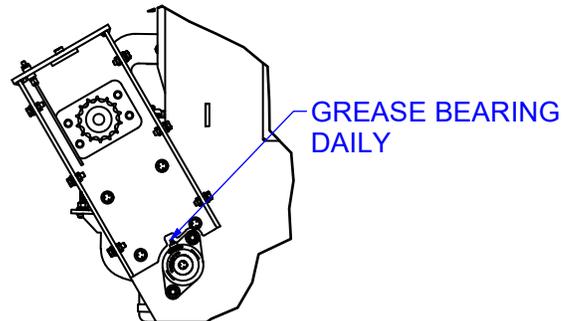
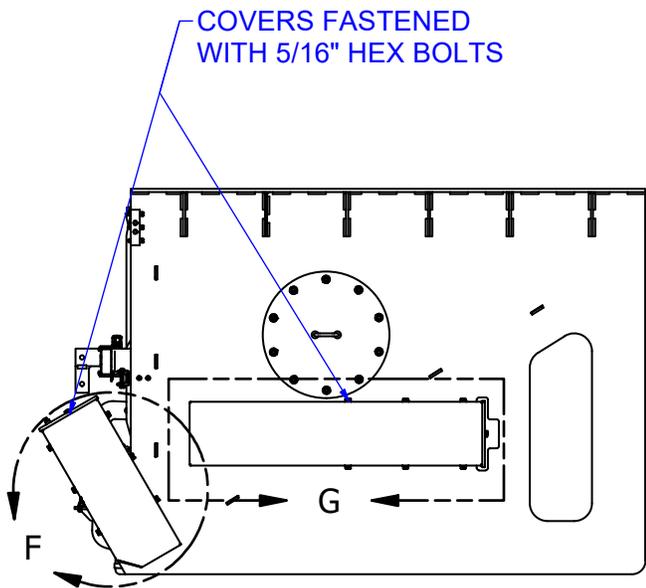
**DETAIL K**  
AUGERS & SPREADER BAR  
BEARING GREASE MANIFOLD



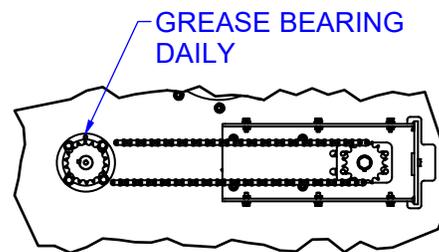
**DETAIL E**  
RIGHT END UPPER  
AUGER BEARING



**DETAIL D**  
RIGHT END LOWER AUGER &  
SPREADER BAR BEARINGS



**DETAIL F**  
LEFT END SPREADER  
BAR BEARING



**DETAIL G**  
LEFT END LOWER  
AUGER BEARING

### **NOTE**

#### Chain Maintenance:

With the lower hopper auger and spreader bar drive ends covers removed, check the condition of the sprockets and chains.

- Ensure that the sprocket's teeth are in good condition and not worn down, replace the sprocket if the teeth are worn.
- Check the condition of the chain. If the chain is dirty clean it with an appropriate chain cleaner and re-lubricate the chain with chain lubrication.
- Ensure that there is not an excessive amount of slack in the chain:
  - Lower Auger Drive Chain: Acceptable chain slack is approximately within 1/2 in to 1 in.
  - Spreader Bar Drive Chain: Acceptable chain slack is approximately within 1/4 in to 7/16 in.

To check the chain slack: find the midpoint between the sprockets mark this as the full-slack point, push up on the bottom of the chain until the slack is removed and measure the distance from the upper position to the lower position. Replace the chain if it is outside of the acceptable slack range.



## **Battery Jump Start Procedure**

Occasionally it may be necessary to jump start a weak battery. If jump starting is necessary the following procedure is recommended to prevent starter damage, battery damage, and personal injury.



Jump starting a battery incorrectly can cause the battery to explode resulting in severe personal injury or death. Do not smoke or allow any ignition sources near the battery and do not start a frozen battery.



Electrical arcing can cause severe personal injury.  
Do not allow positive and negative cable ends to touch.

1. Use a battery of the same voltage (12V) as is used with your engine.
2. Attach one end of the positive booster cable (red) to the positive (+) terminal of the booster battery. Attach the other end to the terminal of your engine battery.
3. Attach one end of the negative booster cable (black) to the negative (-) terminal on the booster. Attach the other end of the negative cable to your engine battery.
4. Jump starting in any other manner may result in damage to the battery or the electrical system.



Over cranking the engine can cause starter damage.  
Allow 5 minutes for starter to cool if engaged for more than 15 seconds.



When using lights or high amperage draw accessories,  
idle the engine for a period of 20 minutes to bring the battery to charge state.

### Machine Cleaning Procedure

When cleaning the machine, please adhere to the following information to ensure proper cleaning and to keep the machine in the best condition possible.

Power Washing Procedure:

#### NOTICE

- Ensure that the water pressure is below 2000 PSI (14 MPa)
- Always keep the water temperature below 180°F (80°C)
- Use a spray nozzle with at minimum 40° wide spray angle
- Keep the nozzle at least 1 foot (300mm) away from the machine
- Keep a perpendicular angle (90°) when cleaning over a decal.
  - Holding nozzle of a pressure washer at an angle different from 90° may lift the decal from the machine.
- Recommended using a safe cement dissolver, BACK-SET or similar, to remove hardened concrete.
- It is NOT recommended to use chemicals such as:
  - Muriatic Acid
  - Hydrochloric Acid
  - Hydrofluoric Acid
  - Sulfuric Acid
  - Phosphoric Acid
- To prevent build-up of concrete on the machine, use BODY GUARD or similar protection wax.

Filter Cleaning Procedure:

- Remove air filters and blow out with compressed air, NOT to exceed 80 PSI.

# SECTION 3 SERVICE

## Troubleshooting

Area	Malfunction	Possible Cause	Corrective Measure	Ref.
Engine	Engine does not start, or is difficult to start	Battery is discharged	- Add battery fluid - Charge the battery - Replace the battery	
		Battery cable is disconnected	- Connect battery cable	
		Blown fuse	- Replace fuse	
		Bad connection or breakage in the wiring	- Contact your AEC dealer	
		Out of fuel	- Fill fuel	
		Air is in fuel	- Contact your AEC dealer	
		Engine fouled	- Wait a while and try starting again	
		Insufficient or wrong oil	- Fill or change oil	
		Dirty or damaged spark plug	- Clean or replace spark plug	
		Contamination in fuel system	- Contact your AEC dealer	
	Other (other than above)	- Contact your AEC dealer		
	Engine stalls	Out of fuel	- Fill fuel	
		Cold engine	- Warm up the engine	
		Other (other than above)	- Contact your AEC dealer	
	Engine stops abruptly	Out of fuel	- Fill fuel	
		Piston seizure due to insufficient or bad oil	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Engine does not stop	Electrical malfunction	- Contact your AEC dealer	
		Other (other than above)	- Contact your AEC dealer	
	Idling is not stable	Insufficient intake air (clogged air cleaner)	- Clean or replace the air cleaner	
		Other (other than above)	- Contact your AEC dealer	
	Poor power or acceleration	Bad fuel	- Change fuel	
		Wrong oil (improper viscosity)	- Change to suitable oil	
		Accelerator (throttle) is not properly adjusted	- Contact your AEC dealer	
		Insufficient intake air (clogged air cleaner)	- Clean or replace the air cleaner	
		Excessive load	- Reduce load	
		Loose drive belt	- Adjust	
	Irregular noise or vibration from or around the engine		- Contact your AEC dealer	
	Excessive oil consumption		- Contact your AEC dealer	
	Engine overheats	Insufficient amount of engine oil	- Fill oil	
		Cooling fan is clogged or blocked	- Clean	
Other (other than above)		- Contact your AEC dealer		
Excessive fuel consumption	Clogged air cleaner	- Clean or replace air cleaner		
	Other (other than above)	- Contact your AEC dealer		

Area	Malfunction	Possible Cause	Corrective Measure	Ref.
Engine	Black smoke comes out of exhaust	Bad fuel	- Change fuel	
		Clogged air cleaner	- Clean or replace the air cleaner	
		Choke is not fully open	- Open the choke fully	
		Other (other than above)	- Contact your AEC dealer	
	White or blue smoke comes out of exhaust	Engine oil level is too high	- Adjust the oil level	
	Other (other than above)	- Contact your AEC dealer		
Safety Devices	Lamp does not light	Blown bulb	- Replace	
		Blown fuse	- Replace	
		Other (other than above)	- Contact your AEC dealer	
Hydraulic System	Pump does not work	Insufficient or deteriorated hydraulic fluid	- Add or change fluid	
		Other (other than above)	- Contact your AEC dealer	
	High hydraulic fluid temperature	Clogged filter	Inspect/change hydraulic oil filter	
		Hydraulic system air leaks	Inspect for leaks	
		Low fluid level	Check reservoir level	
		Malfunctioning oil cooler	Inspect oil cooler, check for blocked fins or broken components.	

Hydraulic and Electrical Schematics are available in 3 ways:

1. Located in the PVC tube attached to the machine
2. On the USB drive that was provided with other documentation
3. Available online on the Allen Engineering Website, under the service tab and then manuals

## Revision Details

### MANUAL REVISION DETAIL

REVISION #	REVISION DATE	REVISION REFERENCE #	REVISION BY
-	-	Initial Release	MK



**AEC FACTORY & HEADQUARTERS**

819 S. 5TH STREET  
PARAGOULD, ARKANSAS 72450  
870.236.7751  
800.643.0095 (TOLL FREE (USA ONLY))

**MAILING**

PO BOX 819  
PARAGOULD, ARKANSAS 72451

**ALLENENG.COM**

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