

POLYESTER CONCRETE PAVERS

APCP800



SAFETY & OPERATIONS MANUAL

Manual Part #: 075775 | Revision: C
Language: English | Original Instructions



ALLEN
CONCRETE PAVERS

POLY-PAVER

SAFETY & OPERATIONS MANUAL

This manual covers the products listed below:

<u>Part No.</u>	<u>Description</u>
071600	Poly-Paver, Hatz Tier 4 Diesel

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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Allen Products are covered under one or more of the following patent numbers:

6,582,153; 6,857,815B2; 6,955,404B1; 7,108,449B1; 7,114,876B1; 7,316,523B1; 7,690,864B2; 8,360,680B2; 9,068,301;
10,100,537B1

With other Patents Pending.

Printed in U.S.A.

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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 are 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.

GENERAL INFORMATION

Dealer Information / Ordering Parts

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: _____		

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.

Model Number / Serial Number Unit Identification

GENERAL INFORMATION

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

APCP 800 A B

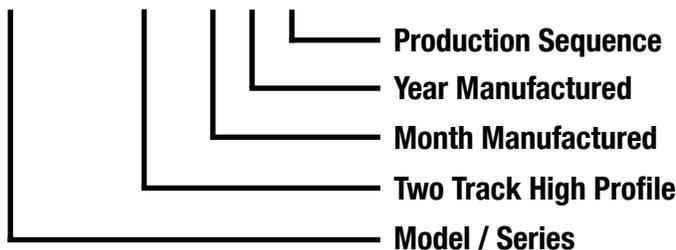


Serial Number

The serial number found on the identification plate is in a 10-14 digit format. The model number identifies your machine and will ensure that you receive the correct replacement parts.

Serial Number Example

APCP800 - 2THP8 09 22 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 the control panel. 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.

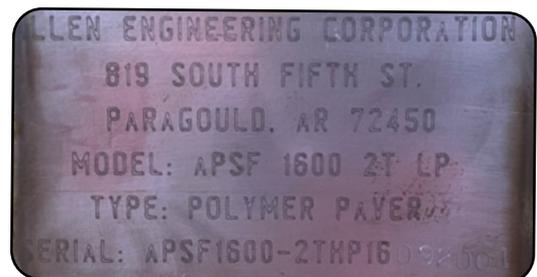
FILL IN FOR FUTURE REFERENCE

Model Number: _____

Serial Number: _____

Date Purchased: _____

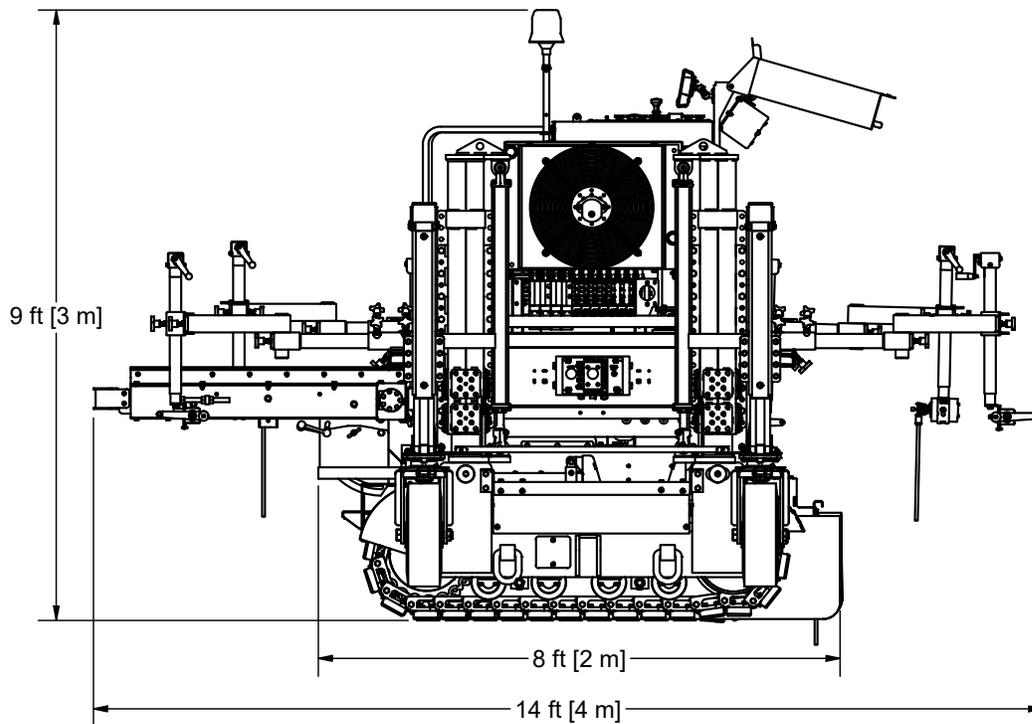
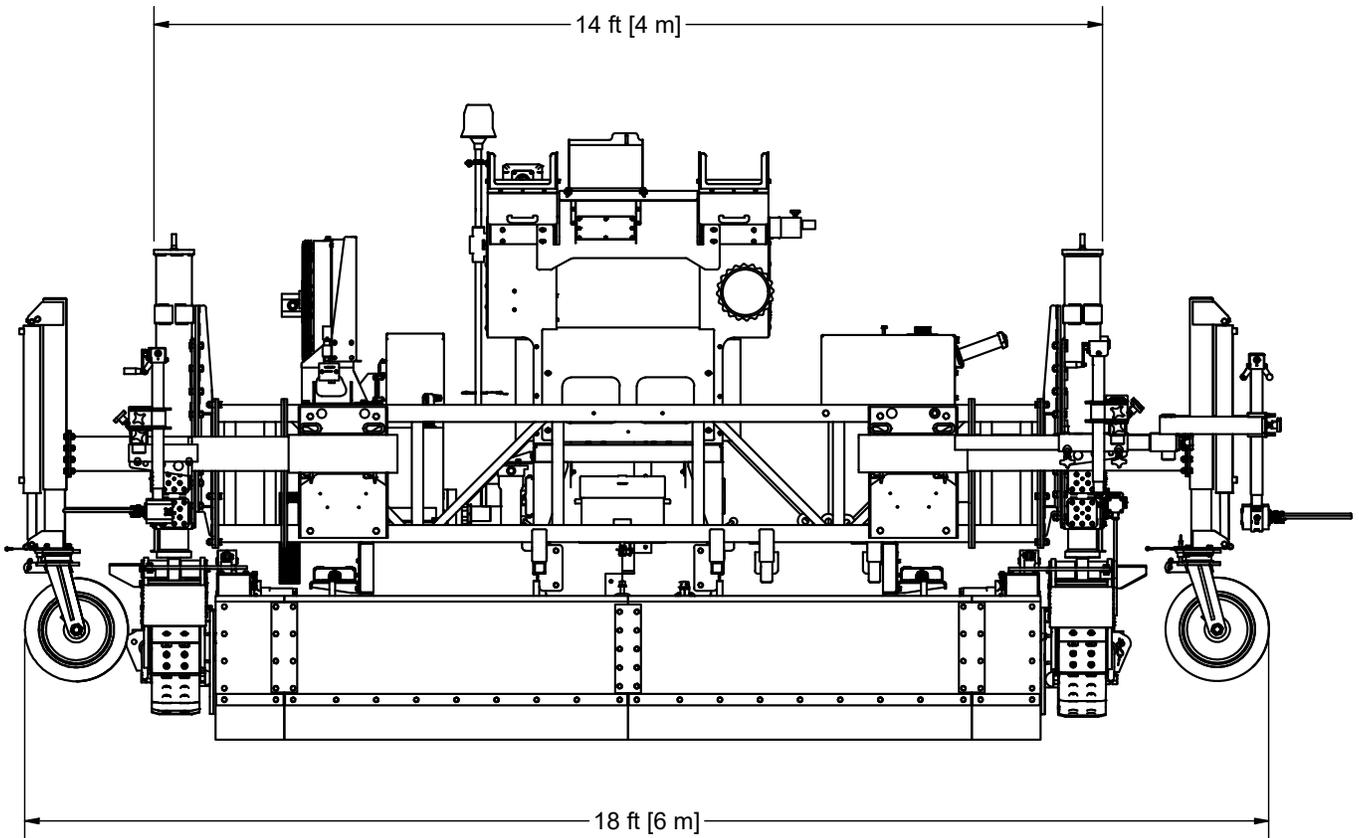
Purchased From: _____



GENERAL INFORMATION

Machine Dimensions

Unit Dimensions are in Feet [Meters].



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Allen 800 Two Track Polyester Concrete Slipform Paver

- Model: APCP800
- Weight: 14,000 lb [6,350 kg]

Main Frame Power Unit:

- Engine: Hatz 4H50TIC (T4F)
- Fuel reservoir 24 gal. [90.8 L]

Main Frame:

- Paving width 12'
- 10' Rectangular tube frame section
- 1' Standard end frames

Paving Pan:

- 12ft. long X 36" wide X 3/8" AR200 steel paving pan
- Isolator mounted to a tubular frame work attached to the paver mainframe.
- 10' long adjustable texturing tine

Vibration System:

- 5 Minnich M-1200 hydraulic pan vibrators with individual speed control with 6 station adjustable speed control manifold.
- Vibrators centrifugal force is 1200 lbs. at 9000 VPM; requires 5.3 GPM per vibrator.

Hydraulic System:

- Engine mounted tandem hydraulic pump system with control valves, Heat exchanger, complete system producing approximately 60 GPM at 3000 PSIG.
- 46 gal. [159 L] hydraulic reservoir
- AW32 Hydraulic Oil

Adjustable Side Forms:

- 5/8' thick steel side form 18" tall by 60" long end frame mounted with hydraulic lift.

Auger Spreading System:

- 9" diameter, 1/2 pitch, split reversible, heavy duty auger system
- Hydraulic driven each end with separate split control valves
- Auger box with rub skirt to contain the polyester concrete that meters the material to the paving pan.

Crawler Tracks:

- 2 tracks 6.40 ft. [2 m] long
- Adjustable front idler and rear drive sprocket.
- Hydraulically driven planetary drives
- Hydraulic drive motors with slow speed for paving (down to 2 ft./min.) and high speed for travel up to 18 ft. /min.

Grade Control System:

- Four string line sensors with adjustable vertical jacks and horizontal slides.
- Four heavy duty hydraulic lift cylinders with a 36" stroke.
- Automatic and manual grade control from operator's platform.

Steering System:

- Two hydraulic string line sensor controls steering.
- Steer from right side or left side of machine.
- Automatic or manual steering, controlled from operator's platform.

Intermittent Shut-Down System:

- Single switch operation.
- Electronic over hydraulic.
- Controls all critical functions of machine: grade, travel, vibration.
- Emergency hydraulic shut-down on each end of machine and control panel.

Operator Platform:

- Electric over Hydraulic controls for travel, vibrators, auger, grade, and steer.
- Hydraulic system pressure gauges located in display
- High visibility split operator console.
- Engine controls and monitoring devices mounted on console.
- Safety railing.
- Engineered for easy monitoring of all machine functions.
- Sectionalized open steel grid rear mounted walkway.

GENERAL INFORMATION

Engine Specifications

Hatz Engine Information

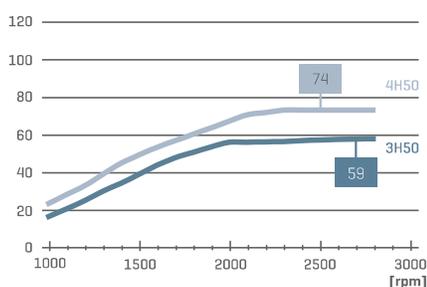
Model:	4H50TIC
Fuel Type:	Diesel
Horsepower [KW]:	74 [55]
Engine Idle RPM:	900
Engine Full RPM:	2800
Engine Type:	Liquid - Cooled
Number of Cylinders:	4
Bore x Stroke, in. [mm]:	3.3 x 3.5 [84 x 88]
Displacement (in ³):	119.12
Injection System:	Direct Injection
Injection Pressure [PSI]:	26,100.0
Compression Ratio:	17.5:1
Cooling System:	Liquid
Direction of Rotation Rev.:	Clockwise
Engine Oil Capacity in gallons:	1.85
Dry Weight, lbs:	562
Dimensions:	
• Length, in. [cm]:	35.2 [89.4]
• Width, in. [cm]:	27.0 [68.6]
• Height, in. [cm]:	31.8 [80.7]

Emission Certifications:

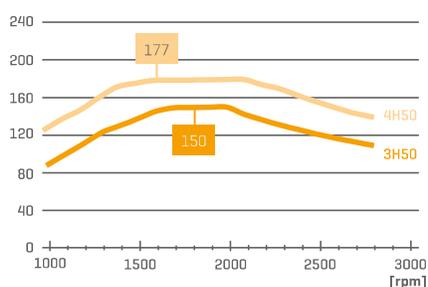
- EPA Non-Road LSI Tier 4 Certified
- EU Stage IIIB Certified

3H50TIC | 4H50TIC

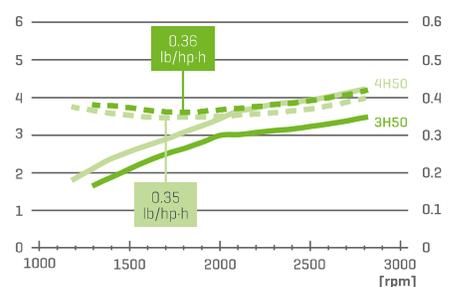
Output [hp]



Torque [ft·lb]



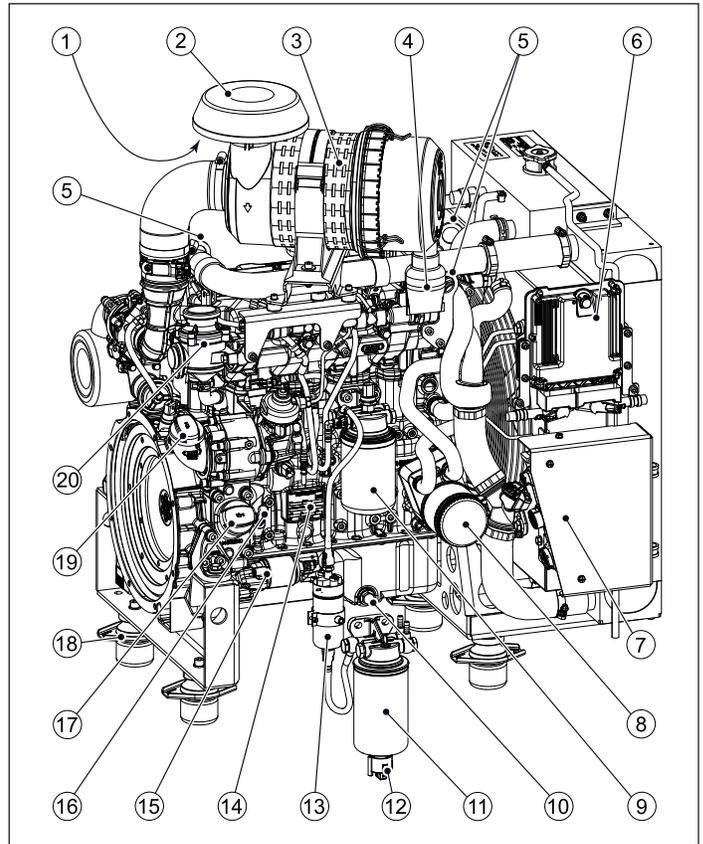
Fuel consumption — [gal/h] --- [lb/hp·h]



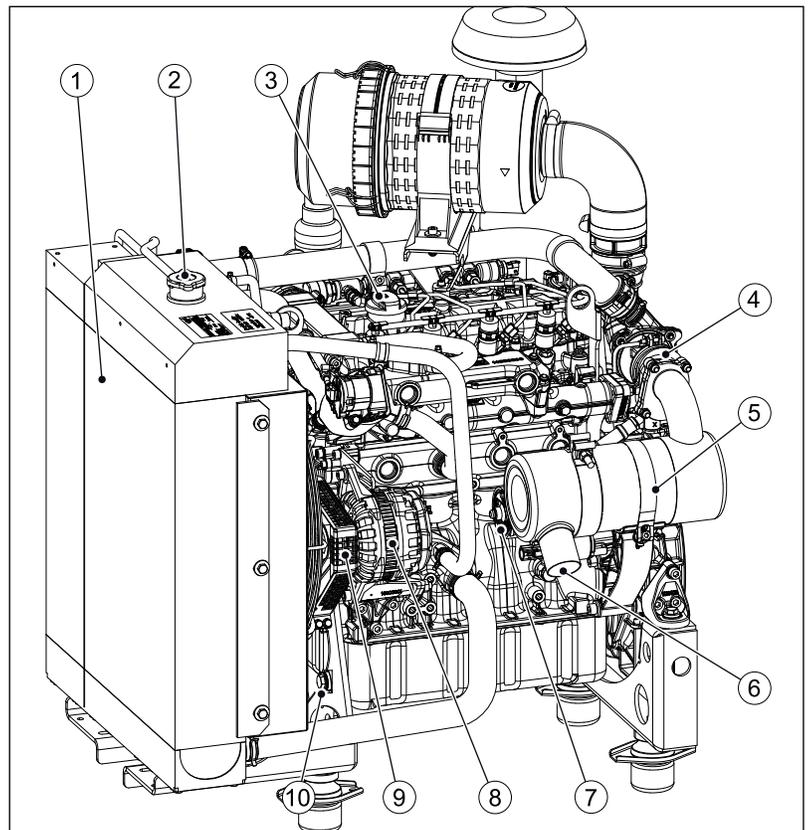
Engine Specifications

GENERAL INFORMATION

REF. #	PART NAME
1	Intake Opening
2	Rain Cap
3	Air Filter (Optional)
4	Dust Discharge Valve
5	Lifting Eyes
6	Engine Control Unit
7	Plug Holder
8	Oil Filter
9	Fuel Main Filter
10	Side Oil Drain Screw
11	Fuel Prefilter
12	Drain Plug
13	Electric Fuel Pump
14	Engine Type Plate
15	Starter (Low Mounting Position)
16	Dipstick
17	Oil Filler Plug, Bottom
18	Vibration Damper
19	Oil Filler Plug, Middle (Option)
20	Crankcase Ventilation



REF. #	PART NAME
1	Radiator, Integrated Expansion Tank
2	Sealing Cap for Coolant
3	Oil Filler Plug, Top (Option)
4	Turbocharger
5	Diesel Oxidation Catalyst (DOC)
6	Exhaust Outlet
7	Starter (High Mounting Position)
8	Three Phase Alternator
9	Belt Guard (Option)
10	Oil Drain Screw, Front



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

Gasoline 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

⚠ WARNING ⚠ ADVERTENCIA	
	<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** 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 the engine off before performing maintenance or making repairs.
- **ALWAYS** remain aware of moving parts and keep hands, feet, and loose clothing away from the moving parts of the equipment.
- **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.
- **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!

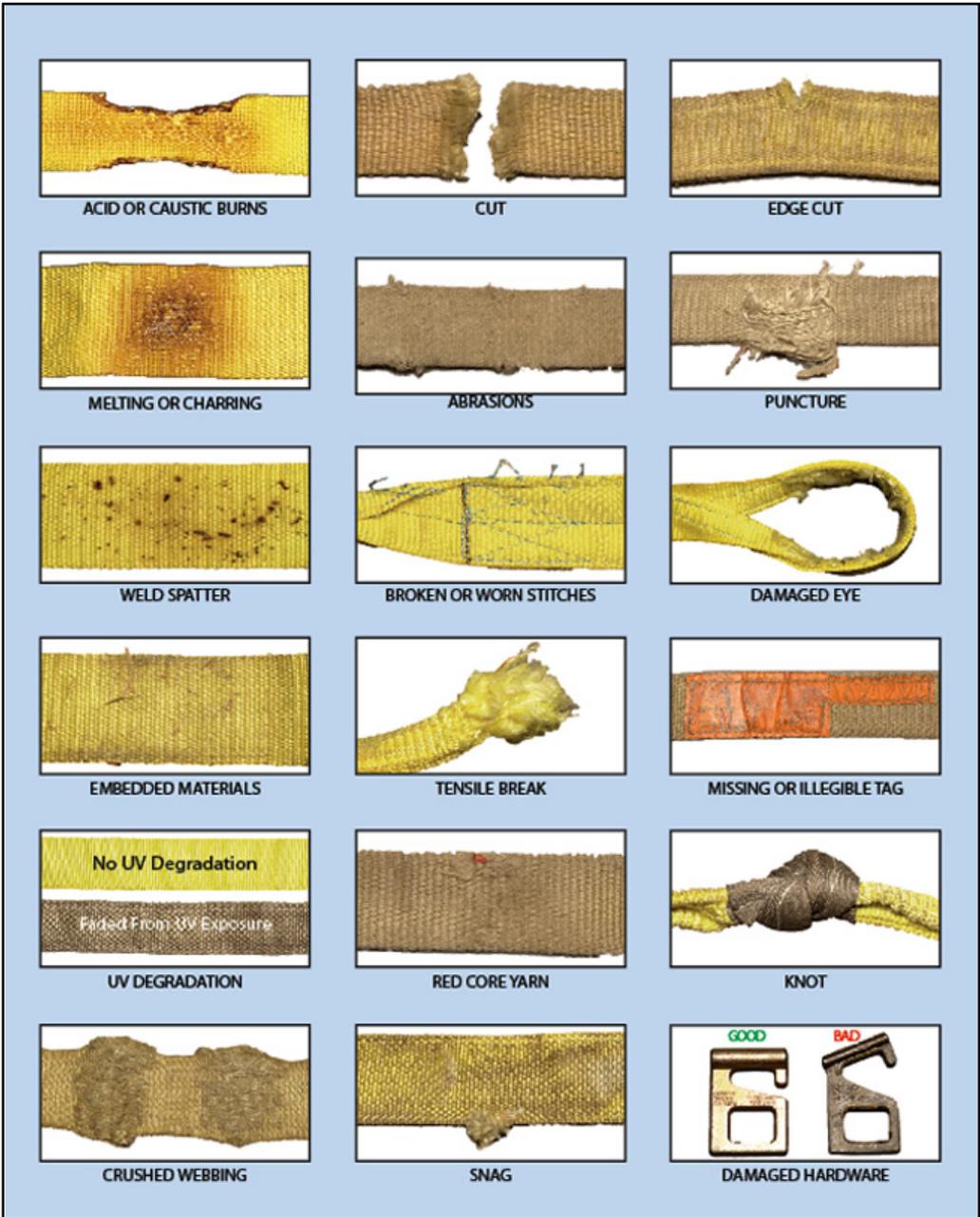
OSHA has set forth guidelines which detail the use of Rigging Equipment for Material handling. This guideline is found under

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

Transportation Safety

- 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.

Loading the Paver

The Paver can be loaded on a Tow Truck with a Rollback bed or it can be lifted onto a trailer.

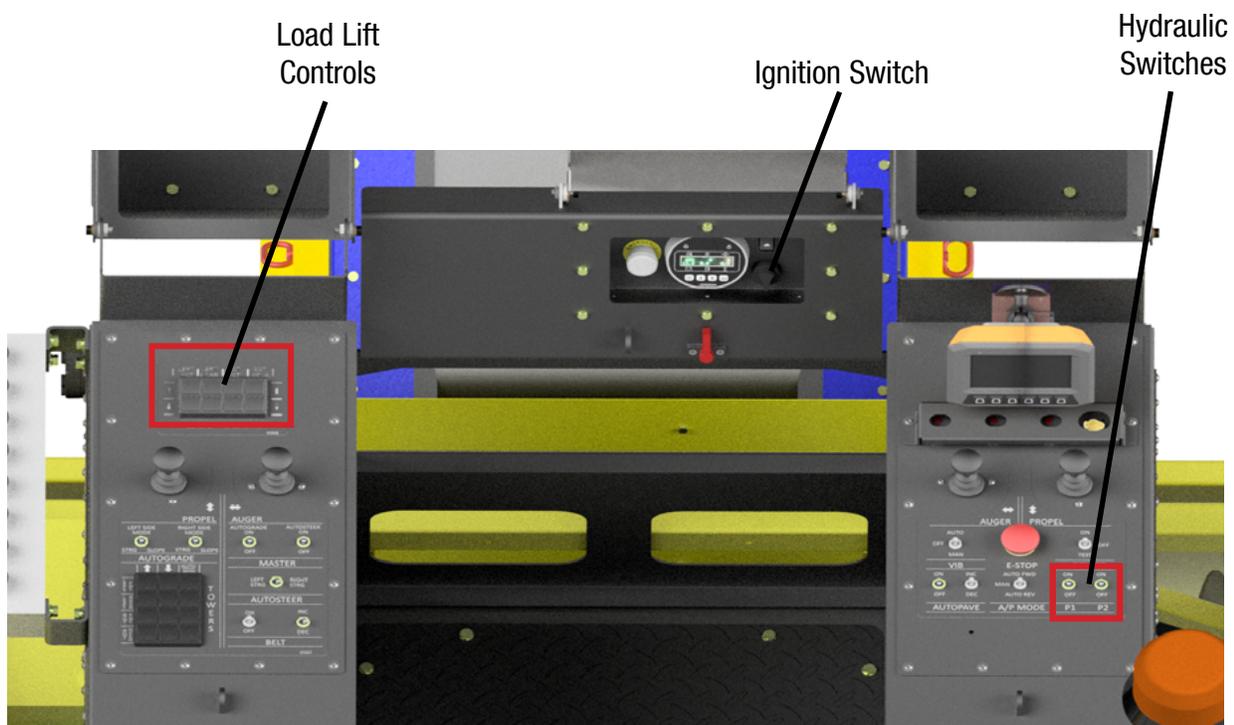
- Start the Paver's engine, see "Engine Start Procedure" on page 41, the hydraulic pump switches P1 and P2 must be in the ON position for the hydraulic system to work.
- Locate the Load Lift Cylinder controls on the left control panel. Using the load lift controls, evenly and slowly raise the machine off the ground.
- Use the tow rings on the side of the tracks to pull the machine onto the truck bed. Then, slowly lower the machine back down.
- Once the paver is on the truck bed or trailer, shutdown and secure the paver to the truck bed or trailer.
- The machine can also be lifted by a crane. Connect straps to the each of the four 1' end frames. See page 26.

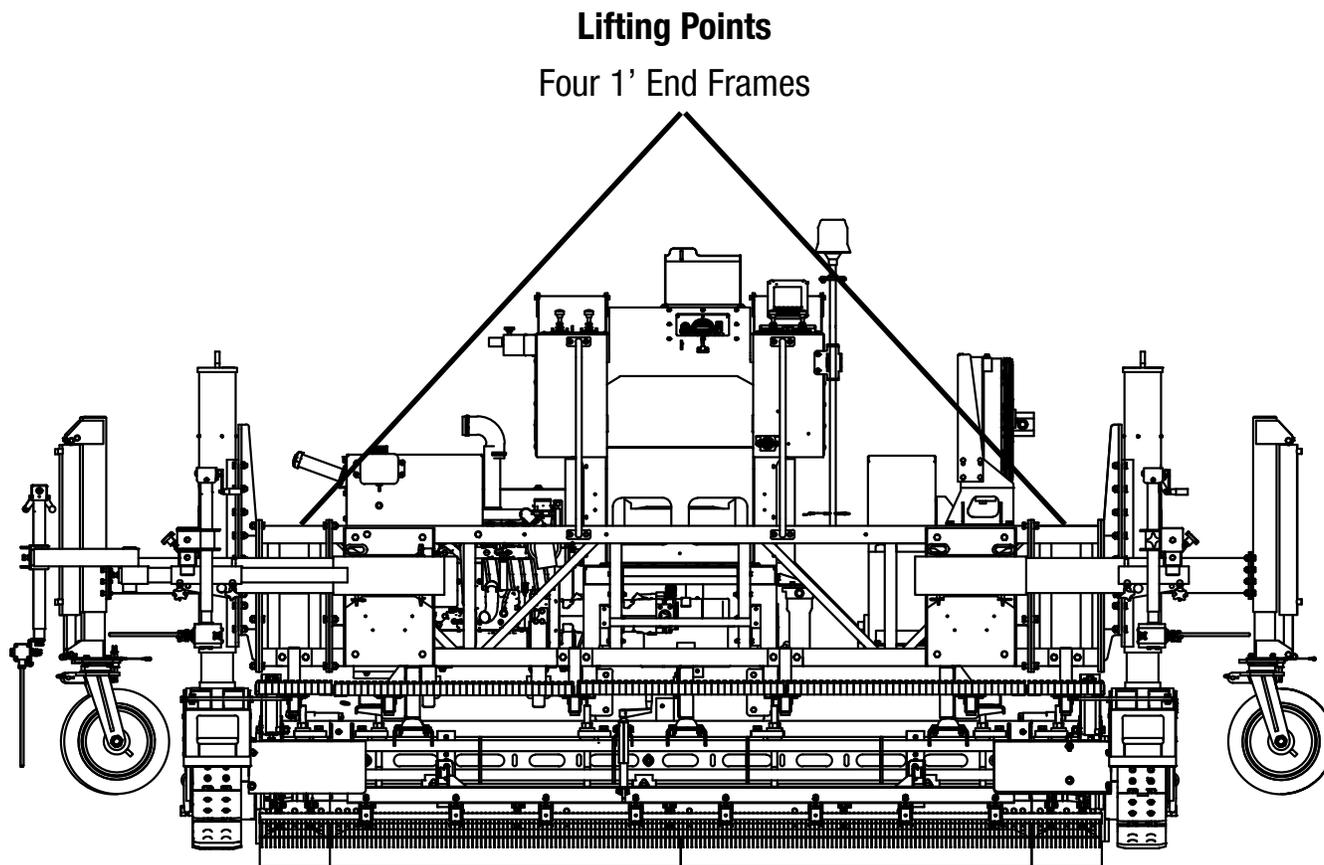
Unloading the Paver

- To unload the paver power the machine on as stated above and use the load legs to raise the machine and slowly unload the machine off of the truck bed.

Before Transporting the paver:

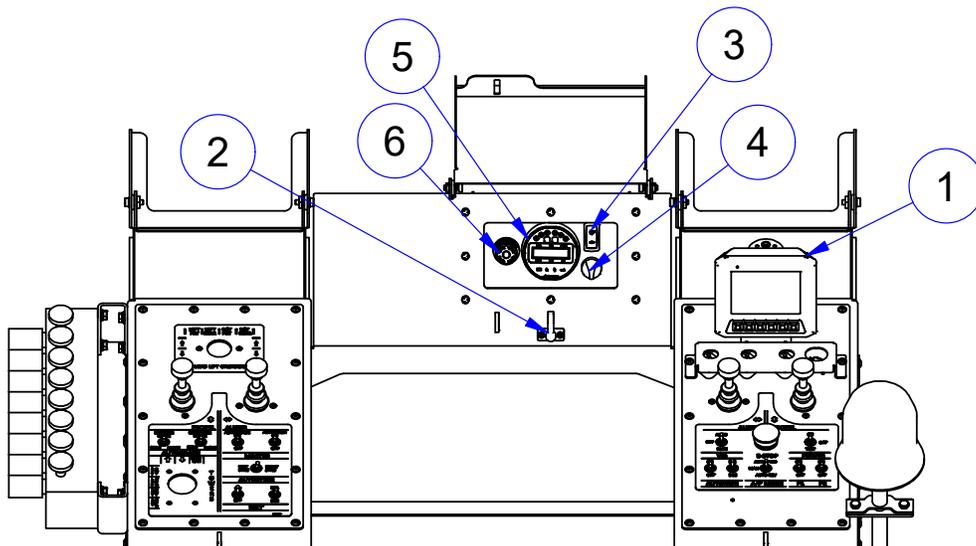
- Ensure that the machine is completely powered off, all switches are in the off or neutral position
- All control panel covers are closed
- Any loose components are secured





- Use the four 1' end frames as a lifting point. The lines shown in the figure above 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.
- The straps angle should be **greater than 60° OR AS CLOSE TO 90° AS POSSIBLE**. Ensure that the slings/straps do not contact the paver's components.
- 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. **Machine Weight: 14,000 lb [6,350 kg]**
- Please make sure all ground personnel are clear of danger while the machine is being lifted.

SECTION 2: OPERATION



1 - Display

The diagnostic displays diagnostic trouble codes (DTCs) as they are accessed. Other information on the system can be accessed using the touch keys. If the diagnostic gauge receives a trouble code from an engine control unit, the current display will switch to a warning or shutdown (depending on the severity of the code) screen that will display the trouble code number, the description of the code and the corrective action needed.

2 - Latch For Engine Control Panel Cover

This latch is used to hold the engine control panel cover closed when it is not in use

3 - Rocker Switch Throttle

The high-low speed select switch is used to set the engine operating speeds at slow (turtle) or fast (rabbit). Hold down the switch to increase or decrease the rpm.

4 - Ignition Switch

The three-position start switch controls the engine electrical system. When the switch is turned clockwise to "START", the engine will crank. When the engine starts, the key is released and returns to the "ON" (RUN) position.

5 - Engine Display

The engine display shows operating information from the engine and can be accessed using the touch keys.

6 - Emergency Stop Switch

Pressing this E-Stop will kill engine, however it will not shut down the control system. E-Stops are also located on both End Panels of machine as well as the one located on the right operator panel, these E-Stops will shut down the hydraulic system. E-Stop warning will appear on the display if any of the other three E-Stops are pushed in.

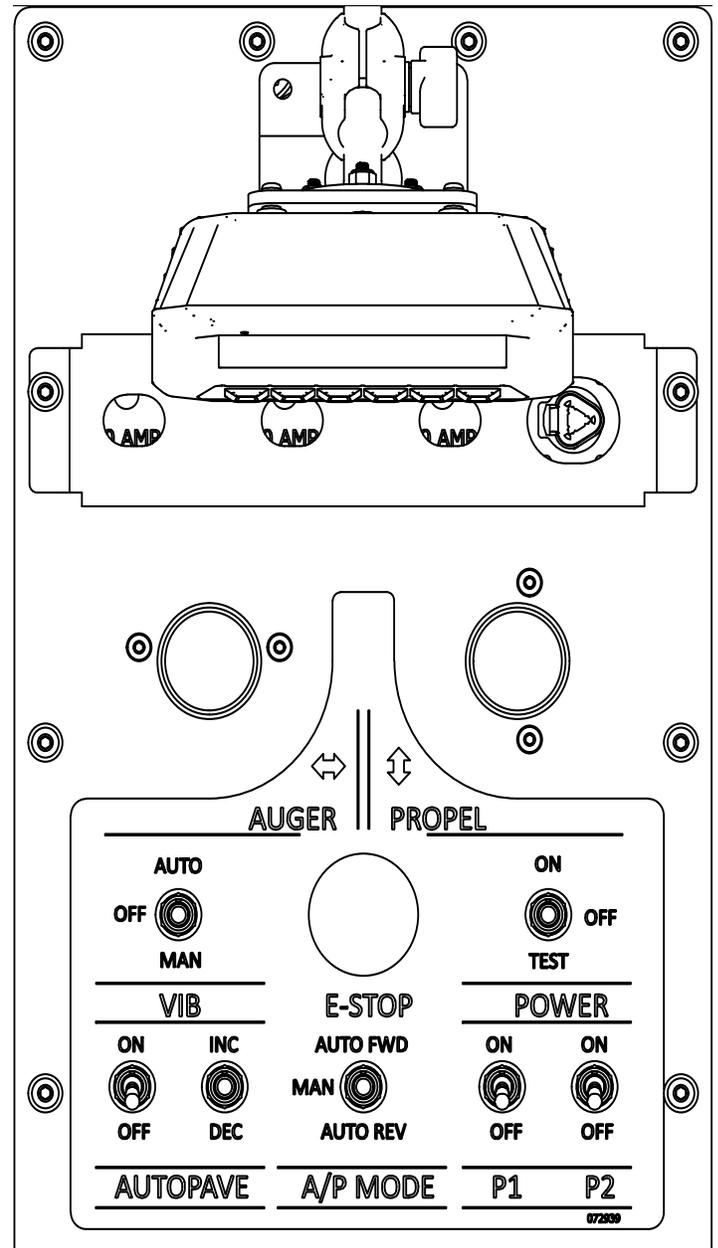
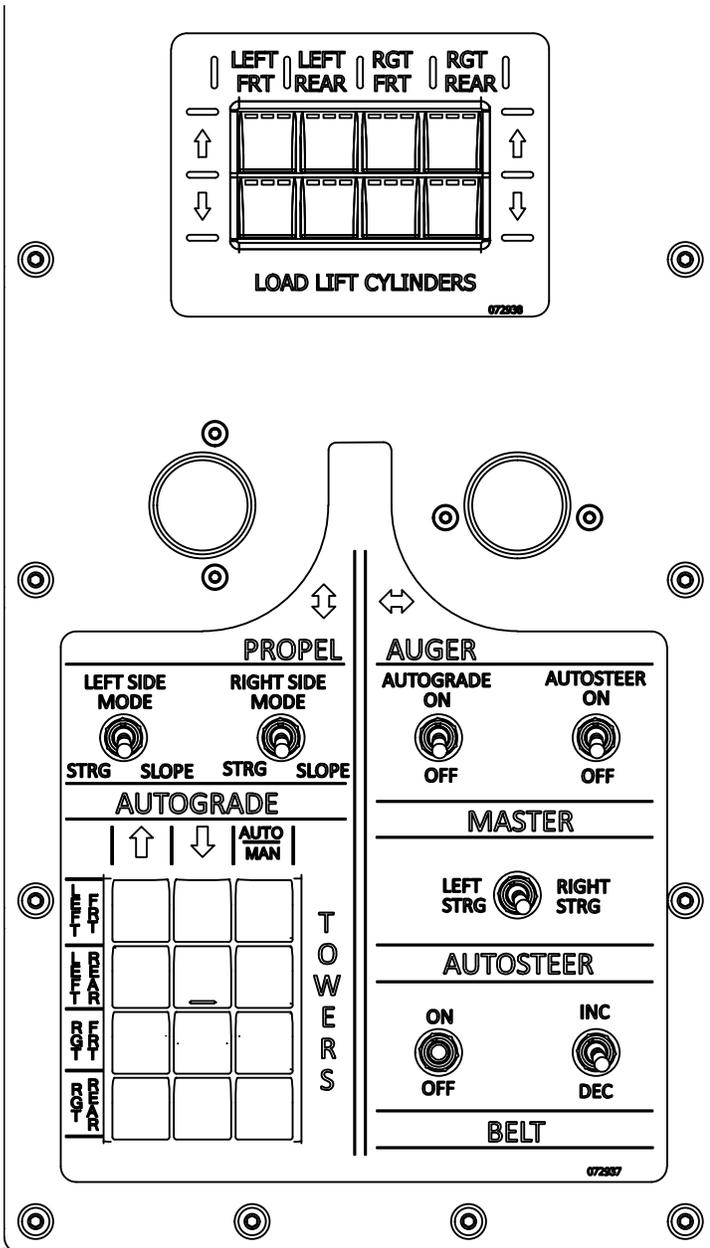
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SECTION 2 OPERATIONS

Switches & Keypads Functions

Left Hand Controls, see pgs 32 & 33

Right Hand Controls, see pgs 32 & 33

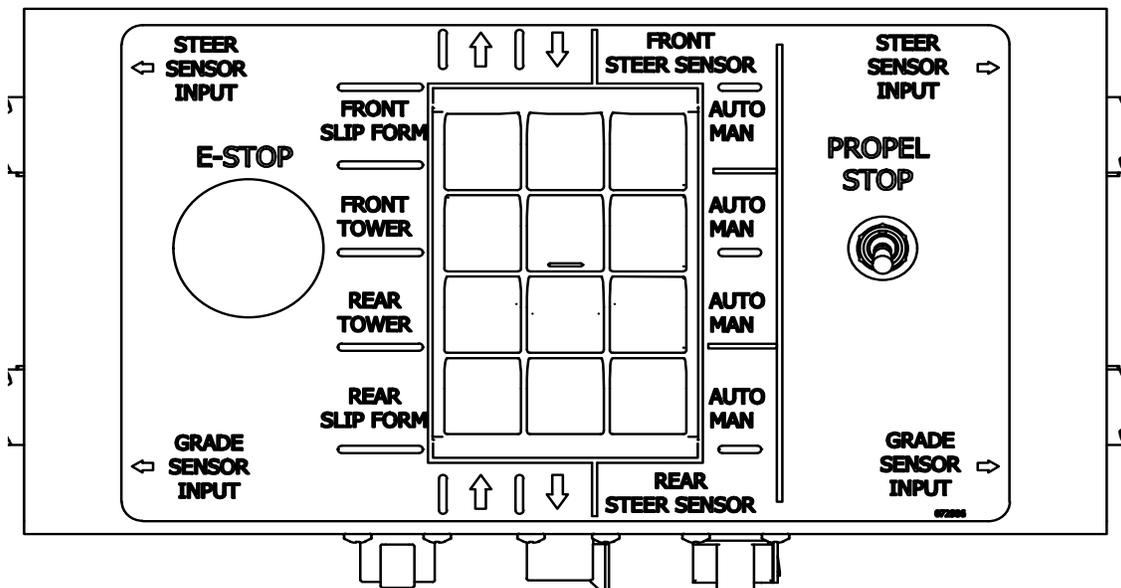


- End Frame Keypad**

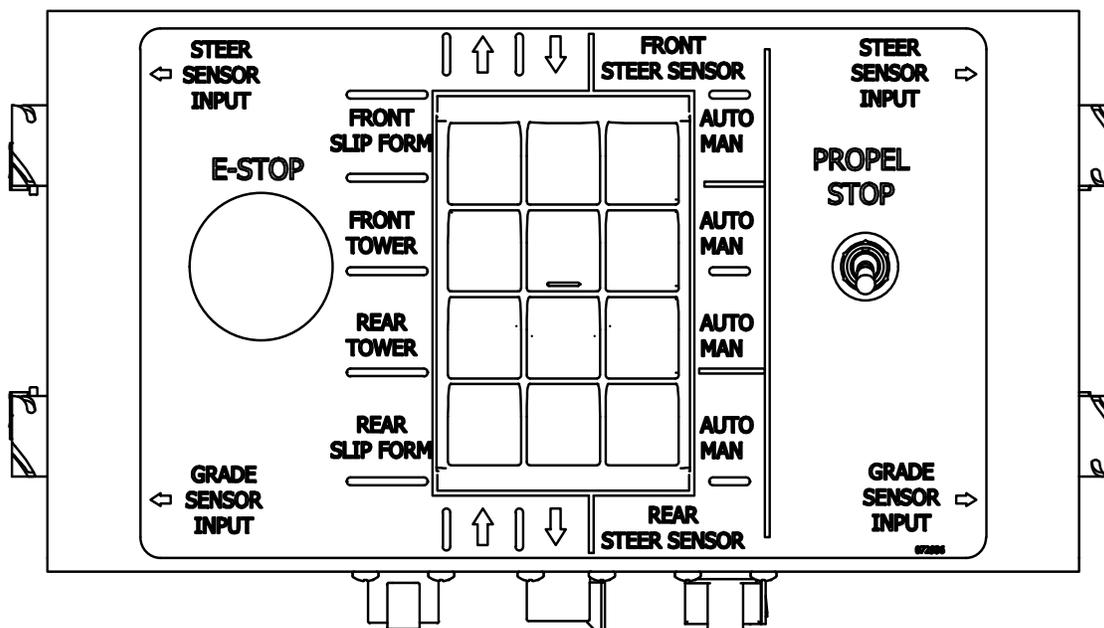
This 4 x 3 Keypad (12 Keys) is located on the Paver's End Frames. There are buttons assigned to each slip form cylinder and each tower and the two keys starting from the left provide a raise and lower function when tower is in manual and a sensitivity adjustment when in Auto mode. The Auto/Man mode is reflected by the 3 LEDs located on the most right hand key being ON in Auto Mode and OFF in Manual mode. This mode is also reflected on the operator Display with an A for Auto for each Tower and an M for Manual for each tower. Pressing the Right hand key for the respective tower turns the tower mode from manual to auto. Auto Mode is only enabled when Autograde switch is set to ON and the Autopave Switch is set to ON.

There is also an Emergency Stop button and a Switch to stop the paver's movement (propel).

Left Hand End Panel Controls



Right Hand End Panel Controls



Basic Power Up/Functionality of Switches and Keypads:

Set Switches as Noted Prior to Startup

Operator Control Panels:

- **Control Power Switch** (Located on Right Panel)
Control power switch has 3 positions. ON, OFF, TEST. At current time the TEST position is not an active function. Turning on the control power powers up the display and the controllers. Left Circuit Breaker on Right Panel controls power to center console, Center Circuit Breaker controls power to left side controller, Right Circuit Breaker controls power to right side controller. Make sure none of the circuit breakers have the yellow tab visible.
- **E-Stop Switch** - Verify it is fully in the Up Position (Located on Right Panel)
E-Stop warning to check E-Stops will appear on the display if any of the three E-Stops are pushed in. E-Stops are located on End Panels of machine as well as the one located on the right operator panel. Pressing E-Stop will kill engine, however will not shut down the control system.
- **P1, P2, Switches** - Set to Off Position (Located on Right Panel)
Controls the main hydraulic pumps and when activated brings respective pump(s) to operating pressure. P1 is normally set at 2500 PSI and P2 is normally set at 1500 PSI. Pressures are indicated on the operating panel
- **Load Lift Keypad**
This 2 x 4 Keypad (8 Keys) is located on left console. It provides individual control of load lift cylinders. Multiple buttons can be pressed at the same time. It is active at any time the pumps are at pressure.
- **Tower Keypad**
This 4 x 3 Keypad (12 Keys) is located on the left console and is dedicated to Tower Control. There are 3 keys assigned to each tower (1 row per tower) and the two keys starting from the left provide a raise and lower function when tower is in manual and a sensitivity adjustment when in Auto mode. The Auto/Man mode is reflected by the 3 LEDs located on the most right hand key being on in Auto Mode and off in Manual mode. This mode is also reflected on the operator Display with an A for Auto for each Tower and an M for Manual for each tower. Pressing the Right hand key for the respective tower turns the tower mode from manual to auto. Auto Mode is only enabled when Autograde switch is set to ON and the Autopave Switch is set to ON.
- **Right Propel Joystick** - Set to Neutral Position (Located on Right Panel)
Right propel Joystick controls right track direction and speed when propel mode switch is in Mid position. (MAN)
- **Left Propel Joystick** - Set to Neutral Position (Located on Left Panel)
Left propel Joystick controls Left track direction and speed when propel mode switch is in Mid position. (MAN)
- **Right Auger Joystick** - Set to Neutral Position (Located on Right Panel)
Right Auger Joystick controls right material auger direction and speed. Auger can be operated at any time pumps are at pressure.
- **Left Auger Joystick** - Set to Neutral Position (Located on Left Panel)
Left Auger Joystick controls left material auger direction and speed. Auger can be operated at any time pumps are at pressure.

- **Propel Mode (A/P Mode)** – Set to **MAN** (Mid Position) Located on Right Panel
Propel Mode switch controls the propel functionality. The “AUTOPAVE FWD” selects FWD travel in Autopave mode with the respective FWD steer sensor based on the Right or Left Side Selection of the AUTO STEER switch located on left panel. The “AUTOPAVE REV” selects REV travel in Autopave mode with the respective REV steer sensor based on the RIGHT or LEFT side selection of the AUTO STEER switch. No Movement will occur if AUTOPAVE switch is not in the **ON** position or if the respective steering sensor being requested is not within an operational band of 10-90 Percent of the rotational movement of the sensor (if sensor not on line/ a fault message will appear when travel is requested). The MAN or Mid position of the switch activates the functionality of the propel joysticks (Left on Left Panel/Right on the Right Panel)
- **AutoPave Switch** - Set to “**OFF**” Position (Located on Right Panel)
Auto Pave switch is a Master switch for the Auto functions. This includes steer, tower control (grade/slope) and propel. None of these functions will operate in an auto mode without this switch in the ON position.
- **Autopave INC/DEC Switch** (Located on Right Panel)
This switch increases or decreases the propel speed setting when in Autopave mode. A bar graph on screen indicates the speed setting of the Autopave speed. This speed setting can be adjusted at any time. (Auto pave speed is limited to approximately 20% of full speed)
- **Auto Grade Switch** - Set to off (Located on Left Panel)
This switch controls the Tower Auto functions based on the selection of string or slope control for the respective side. For this switch to be active the AutoPave master switch must be in the ON position.
If this switch is in the ON position when the AutoPave switch is turned on, then all towers will come up in the last state. (If all were in Auto, then all towers will come on in auto.
If this switch is OFF when Auto Pave is turned on, then all towers will come up in Manual mode and can be set to AUTO mode one at a time with the AUTO/MAN Key located on the Tower Keypad. When positioning machine before operation, always power up with Auto Grade set to off and manually turn each tower to AUTO and get that axis stable before turning on additional towers.
- **Autosteer Switch** - Set to off (Located on Left Panel)
The Master AUTOSTEER switch turns the Autosteer function ON/OFF.
The Autosteer Left or Right string switch selection depends on whether the string line and the steering sensors are on the Left or Right hand side. For this switch to be active the master AutoPave switch and the master AutoSteer switch must be in the **ON** position.
- **Belt ON/OFF Switch** - Set to Off (Located on Left Panel)
This switch stops and starts the conveyor belt. The speed of the belt is controlled by the INC/DEC switch located beside the on/off switch. Current speed setting is indicated by bar graph on main screen. Belt will return to last set speed. Conveyor can be operated at any time the pumps are at pressure.
- **Belt INC/DEC Switch**
This switch adjusts speed of the conveyor belt. A bar graph is located on display that shows the current speed setting of conveyor belt. Speed can be adjusted at any time
- **Vibrator Switch** - Set to “**OFF**” Position (Located on Right Panel)
“**MAN**” turns on Vibrators at any time, “**AUTO**” setting turns vibrators on/off with AutoPave ON/OFF switch so when propel is turned off, vibrators automatically stop.

NOTE

When setting string line sensors to grade, if the machine is running on averaging skis or locked down on tracks, then both Auto Grade Left and Right Side Mode (Located on the Left Panel) switches need to be set on STRING.

If only one Side Mode Switch is selected to run on String and one set to Slope, then only the side selected to run on STRING should have the grade sensors connected. For the side set to run on SLOPE, disconnect the grade sensors.

Cross Slope Paving:

- Set the Autograde Side Mode switches to String line unless you are using the Slope.
- The Operator must decide if the string line will be based on the Left Hand or Right Hand side, **disconnect the grade sensors on the opposite side.**
- » If the steering sensors are set up on the Left side then the **AUTOSTEER** should be set to **LEFT STRING**, if the steering sensors are set up on the Right side then the **AUTOSTEER** should be set to **RIGHT STRING**.

Set up for a Left Hand String line:

- Right side will be controlled in Slope Mode, Left Side will be String line control
- Setup Switches will be as follows:
 - ON LEFT PANEL - Auto Grade Left Side Mode Set to **STRING**
 - » Selects Function of Left Towers in Auto Mode
 - ON LEFT PANEL - Auto Grade Right Side Mode Set to **SLOPE**
 - » Selects Function of Right Towers in Auto Mode
 - ON LEFT PANEL - Auto Steer Set to **LEFT STRING**
 - » Selects String side that will be used for Auto Steer

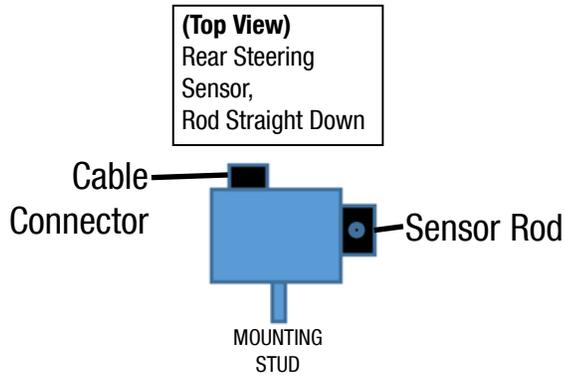
Set up for a Right Hand String line:

- Right side will be controlled in Slope Mode, Left Side will be String line control
- Setup Switches will be as follows:
 - ON LEFT PANEL - Auto Grade Left Side Mode Set to **SLOPE**
 - » Selects Function of Left Towers in Auto Mode
 - ON LEFT PANEL - Auto Grade Right Side Mode Set to **STRING**
 - » Selects Function of Right Towers in Auto Mode
 - ON LEFT PANEL - Auto Steer Set to **RIGHT STRING**
 - » Selects String side that will be used for Auto Steer

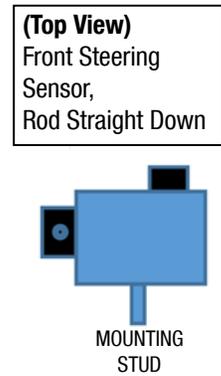
NOTE

This machine is equipped with four grade (string line) sensors and two steering sensors. Depending on the set up of the paving job the steering sensors may need to change sides, but they will still follow the orientation below.

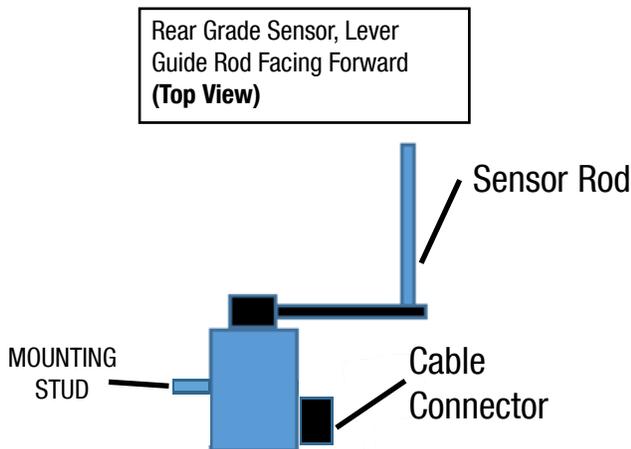
(Reference) Example: Position String line & Steering Sensors on the LEFT String Line with the Orientation as Shown:



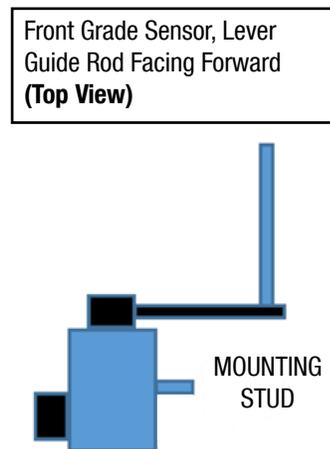
Cable Connector (connected to top connector port on rear side of left end panel)



Cable Connector (connected to top connector port on front side of left end panel)



Cable Connector (connected to lower connector port on rear side of left end panel)



Cable Connector (connected to lower connector port on front side of left end panel)

The right side sensors orientation is the same as the left sensor orientation.

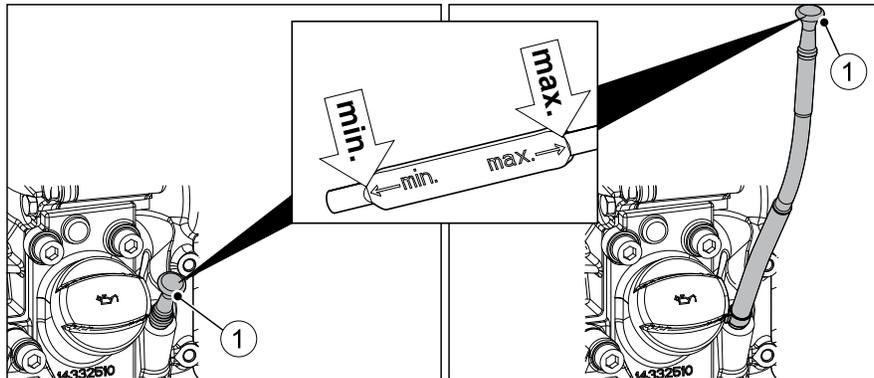
Pre-Start (Daily Check) Procedures

Before operation each day, check for the following:

- **Check engine oil level on dipstick.** Add as required.

NOTICE

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



- **Check the coolant level** when the engine is cold. Add proper coolant solution to radiator if level is low. (See “Engine Coolant Detail” on page 59 Check overall cooling system for leaks.

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.

High-Pressure Fluids



- **Check the Air Cleaner.** If the air cleaner has an dust discharge valve, squeeze the unloader valve on air cleaner assembly to clear away any dust buildup.
-

- **Do 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 leak 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.

- **Check the water separator on the pre-fuel filter.** If the maximum permissible water level is reached there will be a signal from the water level sensor.

Drain water into a suitable container and dispose of it properly.

SECTION 2 OPERATIONS

Pre-Start Procedure

- **Grease Points.** Some points on the machine need to be greased daily in order to maintain proper operation. See page 60 in this manual for detailed explanations on which points need to be greased daily and ones that need weekly attention.

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



- **Check that:**
 1. All guards, side screens and panels are in place
 2. All safety and information signs are in place and legible
 3. Gearbox, and Hydraulic Oil levels are correct.
 4. Fuel level in fuel tank.
 5. Condition of the Vibrators
 6. Check operating controls for proper operation and adjustment
 7. Check speed control operation before and after starting engine for proper operation
 8. Check for any hydraulic leaks
 9. Check for obstructions and debris under paving pan
 10. Check engine fan for obstructions
 11. Remove any loose objects that could interfere with the operation of the Paver
 12. Check that all switches and control levers are in the neutral position
 13. Check 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 paver until the problem has been fixed.

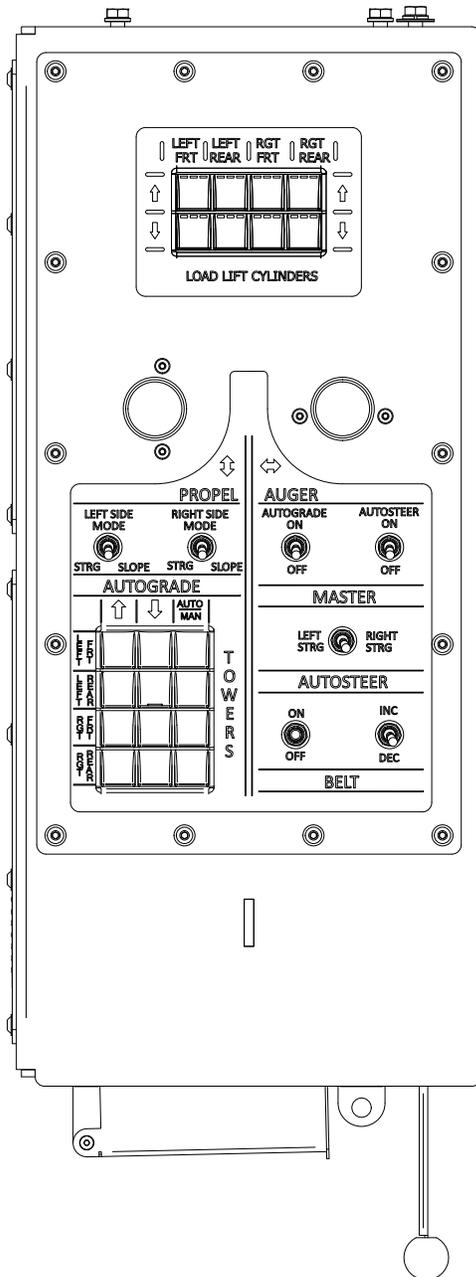
NOTE

- **Every switch must start in the OFF or NEUTRAL position.** Always check the position of the control panel switches before starting the machine. Make sure that the control panel switches are in the off or neutral position.

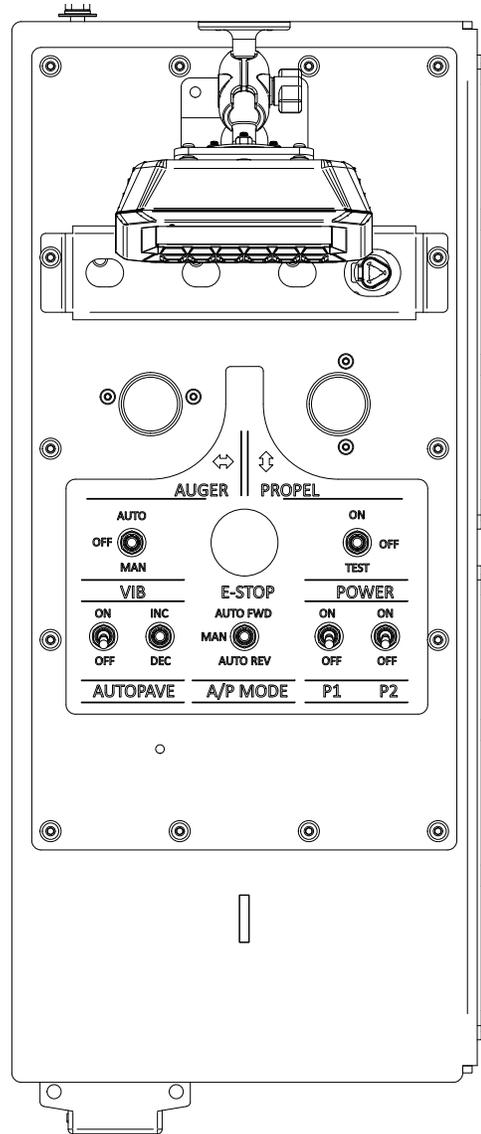
CAUTION:

ALWAYS PUT MACHINE ON LINE AND POSITION THE MACHINE AS CLOSE TO FINAL STRING LINE POSITION AS PRACTICAL BEFORE TURNING ON ANY AUTOMATIC TOWER 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 OFF THE GROUND AND CREATE AN UNDESIRABLE SITUATION

Left Side Panel



Right Side Panel



NOTE

The machine can be manually operated for the following functions:

- Dolly Jacks/Load legs
- Manual Grade
- Left and Right hand Propel/Travel
- Left and Right hand Auger and Belt

AUTO Functions:

- Auto Pave
- Auto Steer & Propel
- Auto Grade
- Vibration

Key Notes:

- The machine should be manually driven to the initial paving position.
- Before the machine is put into AUTO mode, the machine must be manually lowered or raised as close to grade as possible.
- The Auto Pave switch is a master switch for all the auto functions. Auto controls will not work if AUTOPAVE is not in the ON position, ref “Switches & Keypads Functions” on page 33.
- After grade has been established and the steering sensor has been set, the side forms need to be lowered to the subgrade. The side forms are controlled by the control panel key pads on the paver’s end frame panels. Ref “Switches & Keypads Functions” on page 31
- If necessary, adjust the nose blocks on the inner side of the tracks, this is to ensure that the material stays contained within the side forms. See Figure 2.1, and “Nose Block & Paving Pan Adjustments” on page 64.
- There should be an equal distance from the Frame of the machine to the Paving Pan, if necessary use the pan adjusters to adjust. See Figure 2.2, and “Nose Block & Paving Pan Adjustments” on page 64.

[For additional Concrete Paver information visit the Allen Engineering Corporation YouTube Channel.](#)

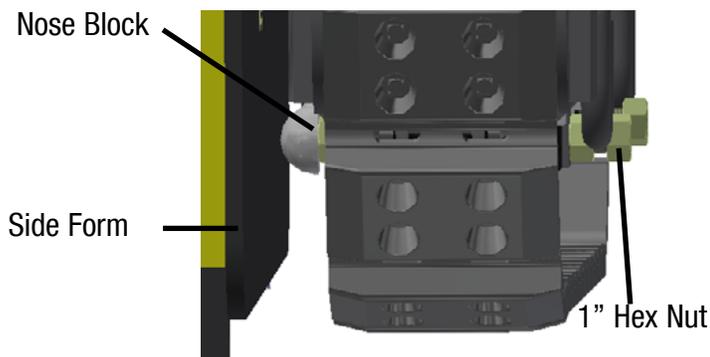


Figure 2.1: Nose Block for Side Forms

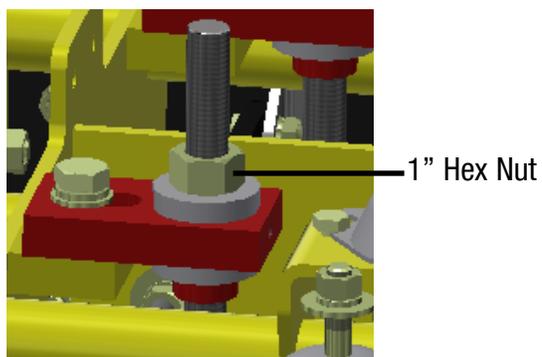


Figure 2.2: Pull Up Adjustment for Paving Pan

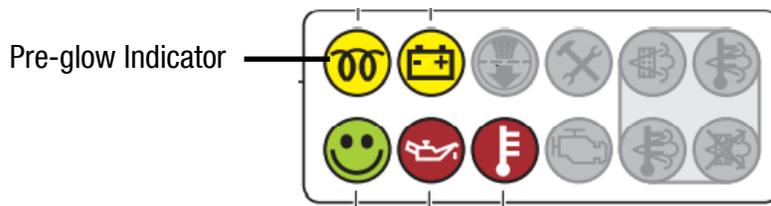
Starting the Engine

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

1. Perform all pre-starting checks outlined in “Pre-Start Procedure” on page 36
2. Ensure that every switch is in the OFF or NEUTRAL position before starting the Paver.
3. Turn the ignition switch (#4, pg 28) to the ON 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 position, and “II” is the start 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, 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.



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.

4. Flip the Power Toggle switch to the ON position.
5. Set slow idle as follows:
 - **Panels with high-low speed select rocker switch (“Engine Instrument Panel” on page 28) :** Set slow speed by pressing lower half of switch.
6. Turn switches P1 and P2 to the ON position.
7. After engine starts, idle engine at no more than 1200 RPM until warm.

Changing Engine Speed

Changing from slow to fast speed using Adjustable High-Low Speed Select Rocker Switch

Engine panels have an adjustable three-position rocker switch that can be used to select slow idle, fast idle, or and adjustable (“ADJ”) intermediate speed.

- For slow speed, press lower half of rocker switch (indicated by turtle symbol)
- For fast speed, press upper half of rocker switch (indicated by rabbit symbol)

Stopping the Engine

1. Stop the machine and return the movement controls to their neutral position.
2. Run engine at a reduced speed and load for at least 5 minutes to cool.
3. Set the Speed Select Rocker Switch (J) to low idle, and set desired speed with remaining control.
4. Return all switches to the off position or their neutral position.
5. Turn ignition switch to “0” position to stop the engine.

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 relevant Pre-Start procedures, return all switches to their neutral position, and set the engine speed to slow.

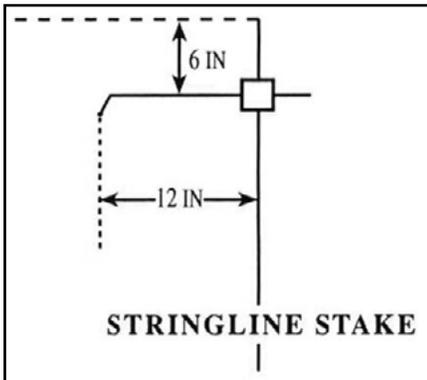


For ALL emergency shutdowns, the controller must be reset before the engine can be restarted. Recycle the key switch to reset the controller.

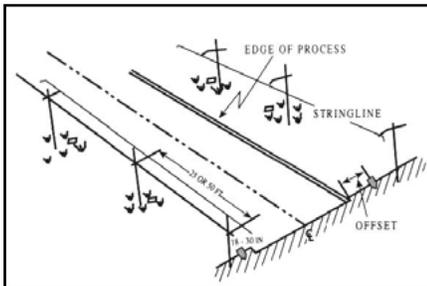
3. Recycle the key start switch (F) as follows:
 - a. Turn ignition switch off.
 - b. Wait 15 seconds.
 - c. Turn ignition switch clockwise to the “I” or operation position, when the pre-glow indicator goes out start the engine.
4. Before operating the paver let the engine run at a no more than 1200 RPM, and check all displays and for normal engine operation.

SECTION 2 OPERATIONS

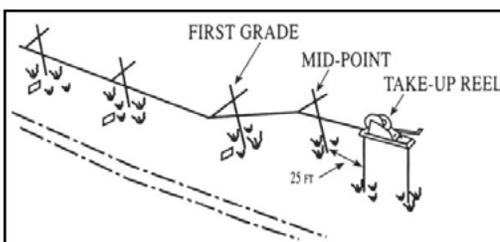
String line Setup



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



Typical String line Installation



Take-up Reel Installation

1. Typical string line installation.

Start by sliding the string line 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 string line 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 string line hub along the route. The number of stakes required will depend on the length of the string line 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 string line 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 string line stakes are positioned, install one string line take-up reel about 25 ft (8m) behind the first string line stake. Offset the take-up reel 12-18 in (300-450 mm) outside the line of string line stakes with the crank handle to the outside.

To set up the take-up reel, drive two string line 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 string line stake midway between the first string line stake and the take-up reel. The string line 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 string line.

To reel out the string line rapidly, place a storage reel (two reels if it's a dual string line) in the bed of a truck. Tie the end of the string line 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 string line 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 string line breaks and slack is needed to repair the break.

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

Then walk down the roadway, placing the string line in the notches in the holders. The string line 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 string line is tight. There should be no sag between the string line stakes.

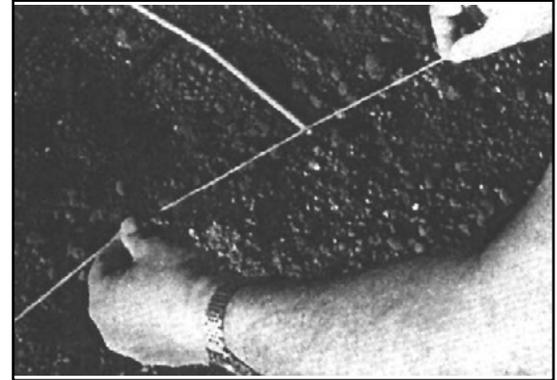
With the folding rule and plumb bob, check the elevation and alignment of the of the string line at each stake.

4. Continuous string line

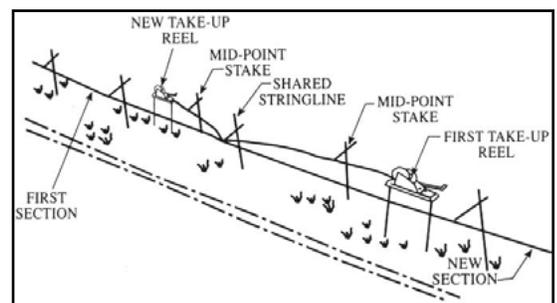
String line stations, the distance between take-up reels, should be limited to 1,500 ft (450m). To continue the string line for greater distances, an anchoring station must be installed.

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

When the new string line 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 string lines 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 string line station and the beginning of a new one.



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



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

SECTION 2 OPERATIONS

String line Setup

5. String line gates

Sometimes, “gates” must be created in continuous string lines to permit entry and exit for material supply trucks. A simple and effective way to create a gate is to remove the string line from one holder and use cement blocks at the stakes on either side of that stake and holder to force the string line 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 string line from two consecutive holders to gain enough slack in the string line to force it down so trucks can drive over it.

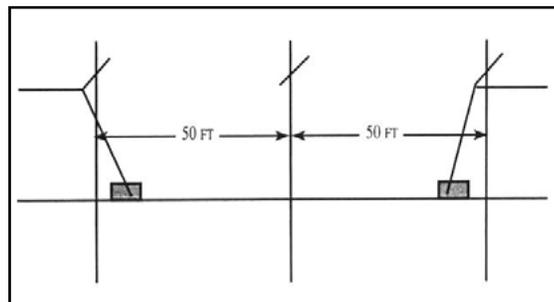
6. Dismantling the string line

To dismantle and store the string line, first, remove the string line 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 string line onto the storage reel(s).

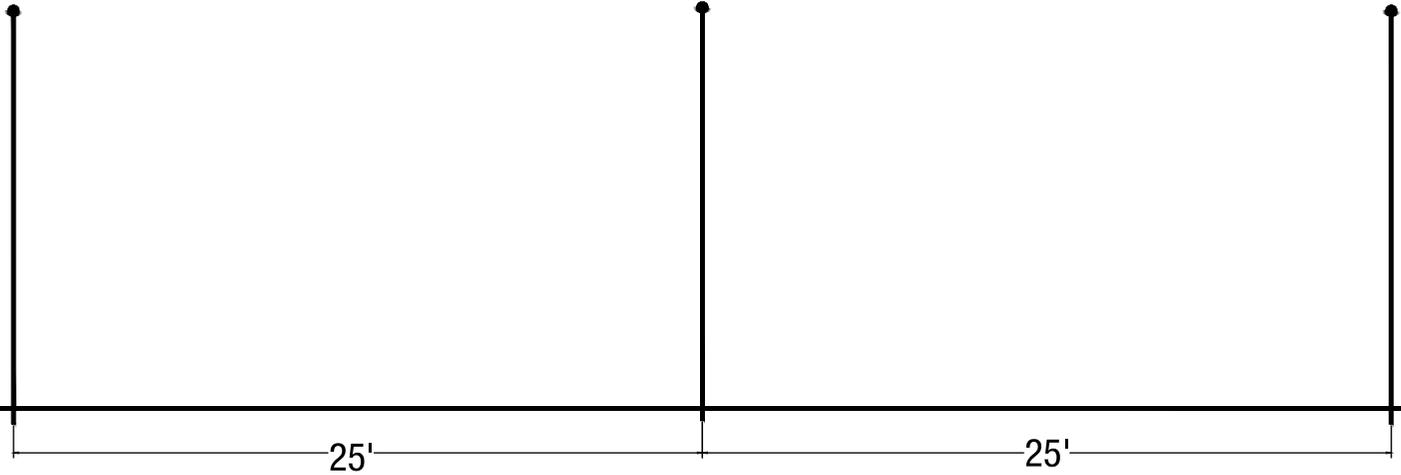
7. String line Repair

A break in the string line can be repaired by tying the string line 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 string line. All loose ends at the knot must be trimmed.

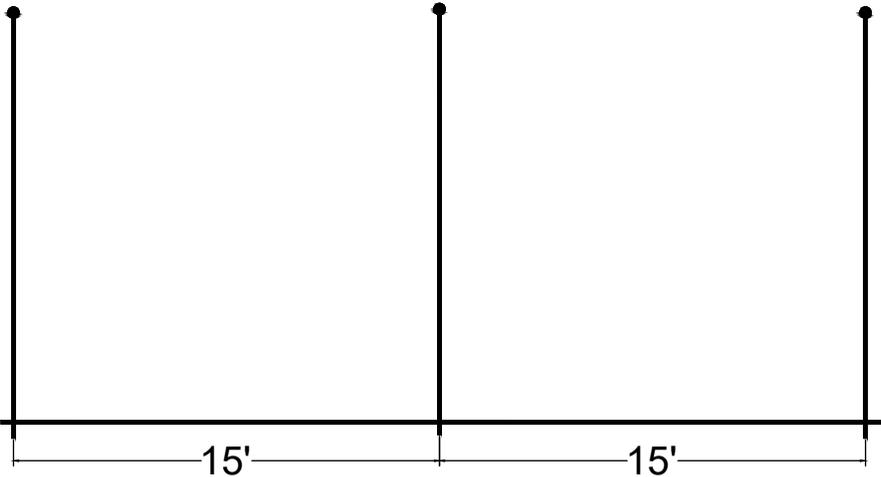


String line “gates” can be made by removing from one string line holder and using cement blocks to force down the string line at the two adjacent string line stakes.

STRINGLINE STAKE SPACING
GENERAL SETUP TANGENT SECTION

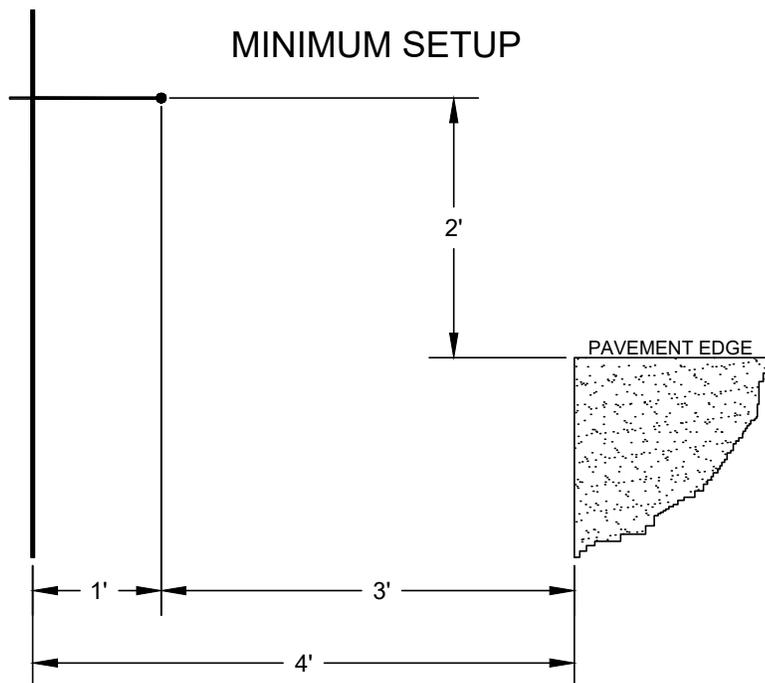
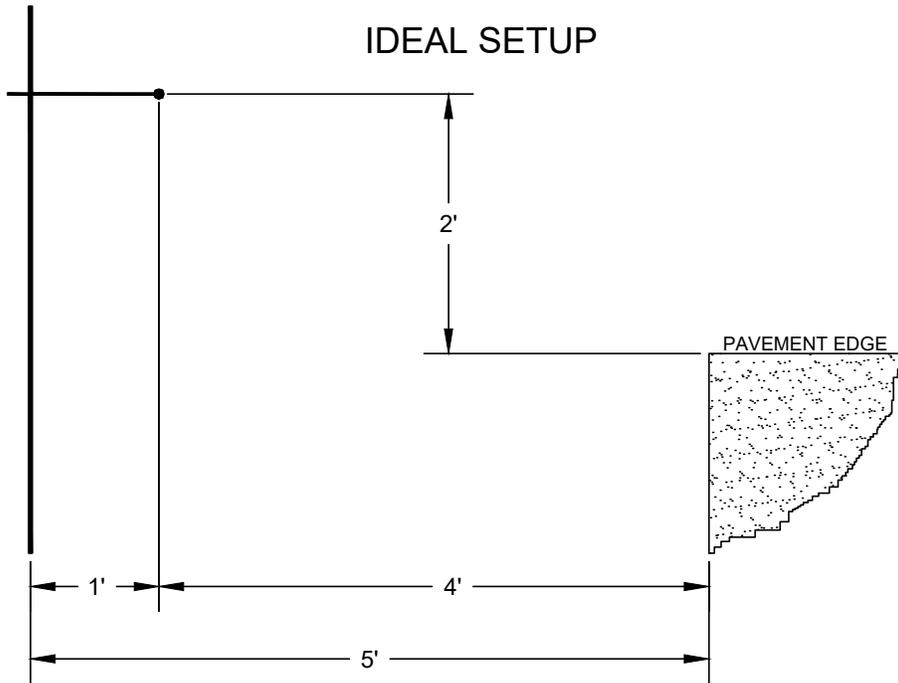


RIDE SPEC - 12 AND BELOW

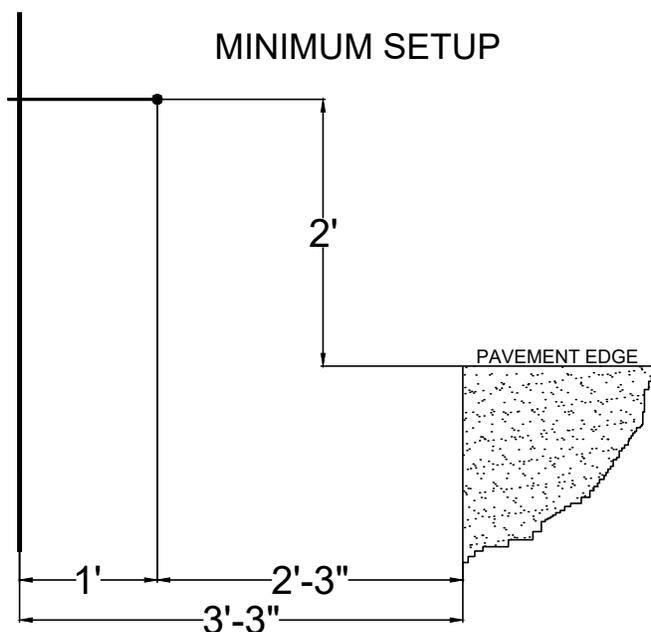
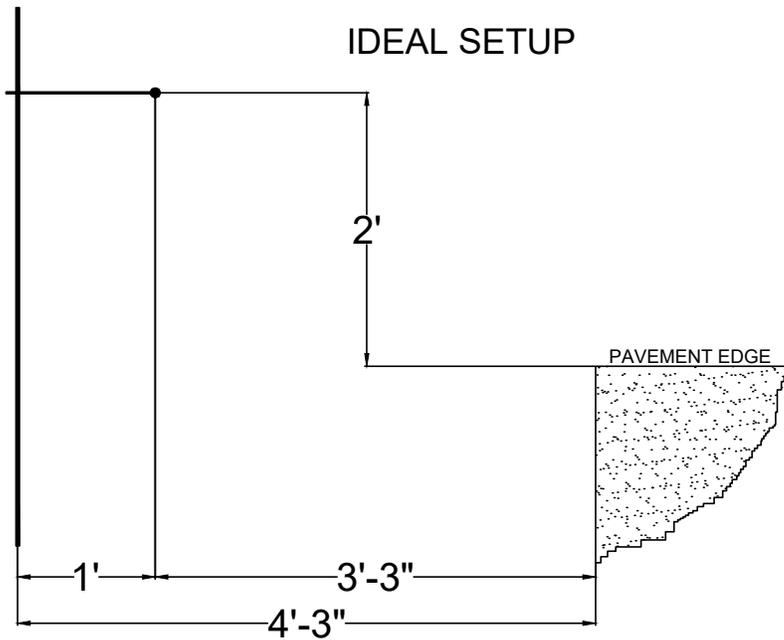


STRINGLINE MUST BE SET ACCURATELY AND TIGHT.
USE WINCH SETUP TO KEEP TIGHT

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



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

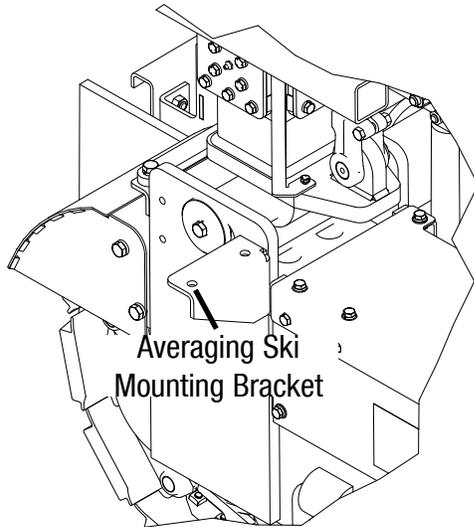


SECTION 2 OPERATIONS

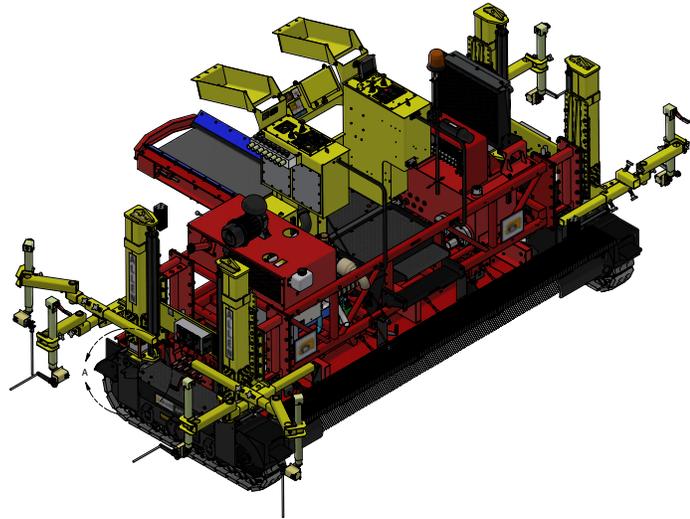
Averaging Ski Mounting Points

Mounting the Averaging Ski

The averaging ski can mount either the Left Hand or Right Hand side of the paver. On the paver's tracks there are two mounting brackets one near/under each grade tower. These brackets are bolted (1/2"-13 bolt w/ lock washer) onto the paver's track frame. Ensure that the brackets are in the orientation shown in the figure, for both sides the flange with the bolt holes should be facing up and pointing towards the end of the tracks.

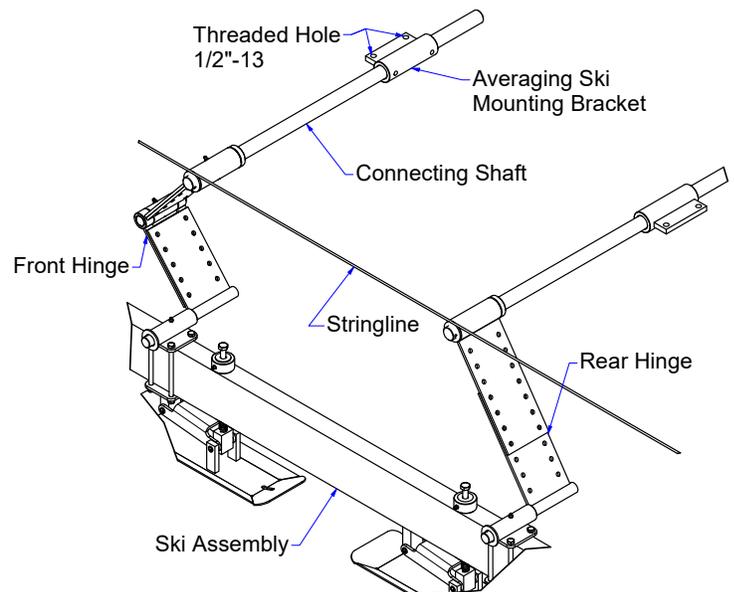


DETAIL A



On the Averaging Ski, the two mounting brackets will sit on top of the track frame mounting brackets. With the tube side sitting between the grade towers or facing the center of the tracks. The holes are fit for 1/2"-13 bolts.

See the next page for more details.



DO NOT MOVE THE MACHINE IN REVERSE WHEN THE AVERAGING SKI IS ATTACHED! DAMAGE TO THE AVERAGING SKI WILL OCCUR!

Mounting the Averaging Ski Continued

The default side for the Averaging Ski connection is the left hand side, if the Ski is used on the right hand side the connecting shaft (and the steering sensors) for the Averaging ski will need to be flipped. The Ski must not be driven in the wrong direction, use the arrow decals to make sure the Ski is in the right orientation.

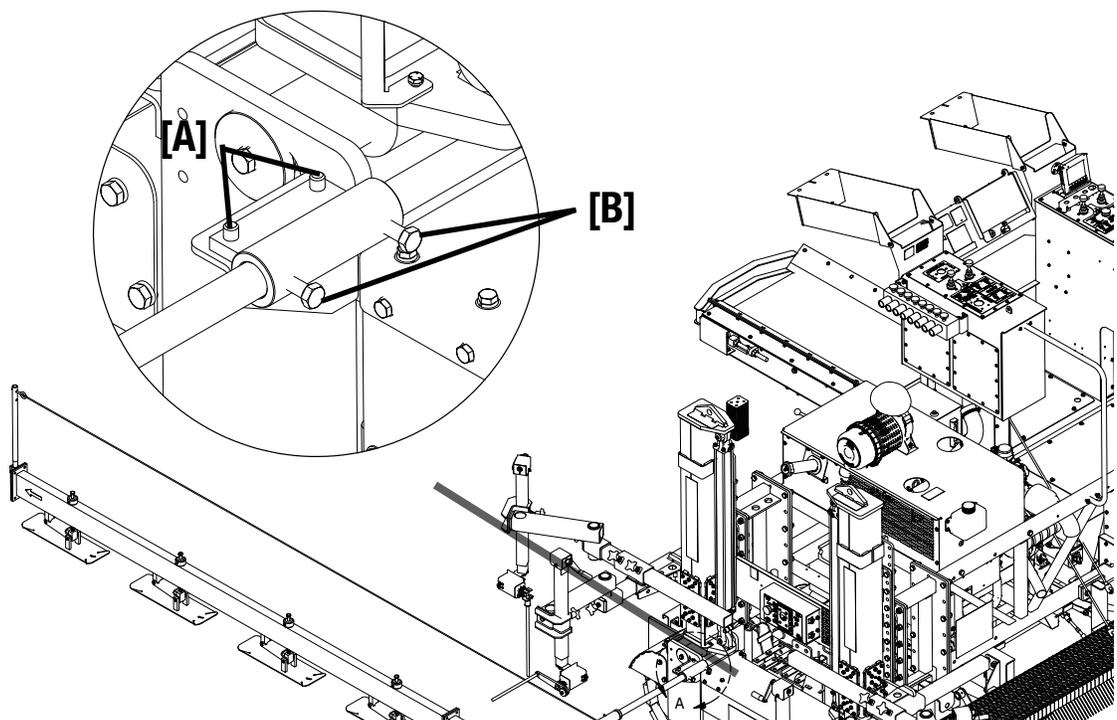
The Ski is fastened to the track frame using 1/2"-13 bolts. There are 4 bolts per bracket, see the figure below.

- [A] 2 (1/2") bolts with a lock washer are used to fasten the Ski bracket to the track frame. See note.
- [B] 2 (1/2") bolts are used to hold the Ski bracket in place on the connecting shaft.

NOTE: The Ski mounting bracket holes are threaded, the bolt and lock washer will need to be fastened from the bottom to successfully clamp the two pieces together.

NOTICE

- To help make the mounting process easier, first mount the Ski mount bracket and connecting shaft to the track frame separately from the Averaging Ski sections. The shaft is held into the hinges with a cotter pin.
- It may also be helpful to keep the front and rear hinge (4) bolts loose to make adjustment easier before use.
- The Averaging Ski should be placed as close the machine as possible to help limit vibration, depending on site conditions the Ski connecting shaft may have to be modified.



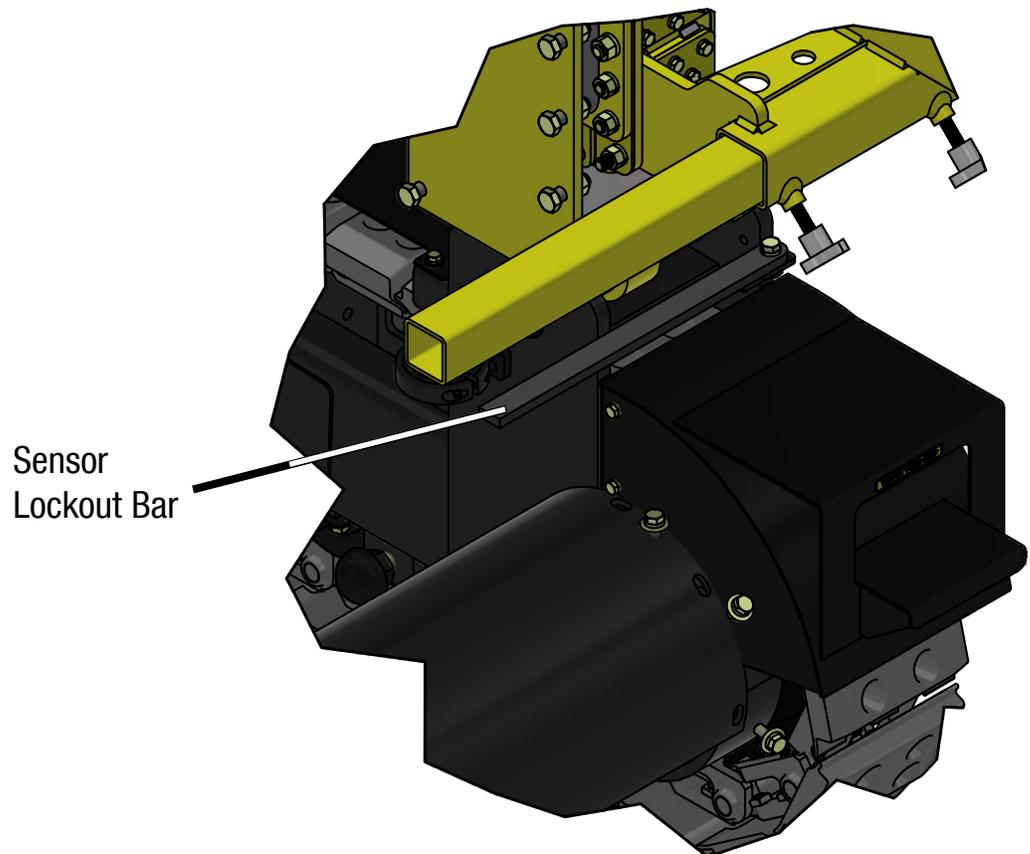
DO NOT MOVE THE MACHINE IN REVERSE WHEN THE AVERAGING SKI IS ATTACHED! DAMAGE TO THE AVERAGING SKI WILL OCCUR!

Averaging Ski Set up and General Operation

The Averaging Ski acts as a reference system that moves along side the paver, and averages the imperfections that are present in the current surface over a 30ft span. Once the Averaging Ski is attached to the machine, position the grade and steering sensors on the string line.

It is very important that the sensors are positioned correctly. For the grade sensors, the wand will sit horizontally and will need to rest under the string line. For the steering sensors, the wand will sit vertically and will rest on the inside of the string line. Adjust the sensor arms to sit at the proper height/distance to match the grade. **See “Sensor Set Up” on page 34** also reference the Pre-Start Procedure and Quick Start Guide pages 38-40.

- If the averaging ski is only used on one side, depending on the control set up (switches and sensors), the Sensor Lockout bar may need to be used. This bar is located beside each grade tower.
- For the side that does not have a string line, setting the Auto Grade Side Mode switch to slope should allow the machine to function properly. But if necessary swing out the lock out bar, fastened by 1/2” bolt and lock washer, and position the grade sensor on the bar as if it was a string line. This will allow the sensor to follow the tracks movement on the sub grade.

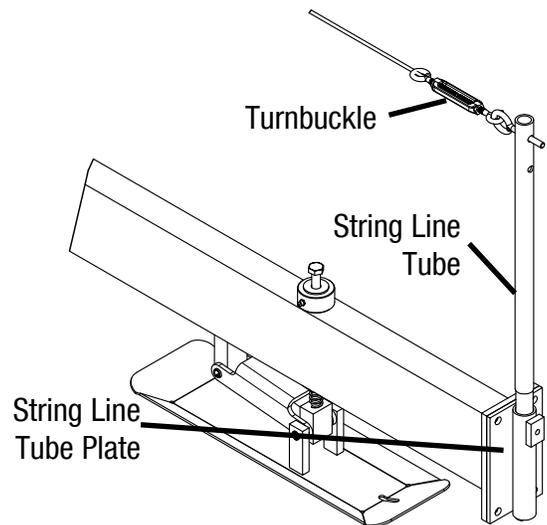
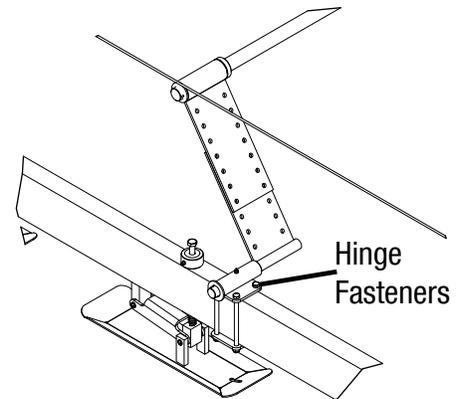


DO NOT MOVE THE MACHINE IN REVERSE WHEN THE AVERAGING SKI IS ATTACHED! DAMAGE TO THE AVERAGING SKI WILL OCCUR!

Averaging Ski Set up and General Operation Continued

The Ski should rest on the sub grade even with the bottom of the paver's tracks. If the Ski shoes are on a separate sub grade the hinges may need to be moved. **The hinge assemblies must remain in the center section, and the front hinge assembly must always have a few inches of travel (must stay bent).**

- The averaging ski will need to be checked to see if each section is level, use a beam level to check. If sections of the Ski are found to be unlevelled then the hinges may need to be adjusted. Loosen the (4) 3/8"-16 X 6 bolts to adjust the hinge(s) assembly forward or backward until the Ski is level.
- Check to ensure that the string line is level, if it is unlevelled tighten the string line using the turnbuckle on the rear of the Ski. Or check to ensure that the string line vertical tube & tube plate is set/fastened correctly (4) 7/16-14 X 1-1/4 and a 3/8" set screw/bolt.
- There are two heights that the string line can be set at, approximately 29-1/2" or 27-1/2".



See page 63 for Averaging Ski maintenance.

SECTION 3: SERVICE

Maintenance Schedule

SECTION 3 SERVICE

Maintenance Schedule				
Description	Daily	500 Hours of Operation / or Every 12 Months	2000 Hours of Operation / or Every 24 Months	As Required
Visual Walk Around Inspection	x			
Check Engine Oil	x			
Check Radiator Fins for Accumulation	x			
Check Air Cleaner Dust Discharge Valve	x			
Check Cooling System	x			
Verify daily & weekly Grease Points	x			
Check Engine Mounts		x		
Service Battery		x		
Change Engine Oil and Replace Oil Filter ^{1,2}		x		
Check Crankcase Vent System		x		
Change Oil Separator of the Crankcase Vent		x		
Check Air Intake Hoses, Connections, & System		x		
Change Air Filter (Primary)		x		
Replace Fuel Filter Elements		x		
Check Poly V Belt		x		
Check Engine Electrical Ground Connection		x		
Check Cooling System		x		
Check Engine Speeds		x		
Drain the Water Separator			x	
Flush and Refill Cooling System			x	
Test Thermostats			x	
Check and Adjust Engine Valve Clearance			x	
Test Glow Plugs			x	
Add Coolant				x
Replace Fan and Alternator Belts				x
Check Fuses				x
Check Air Compressor (if equipped)				x
Bleed Fuel System				x
Change Hydraulic Filters				x
Flush and Refill Hydraulic System ³				x

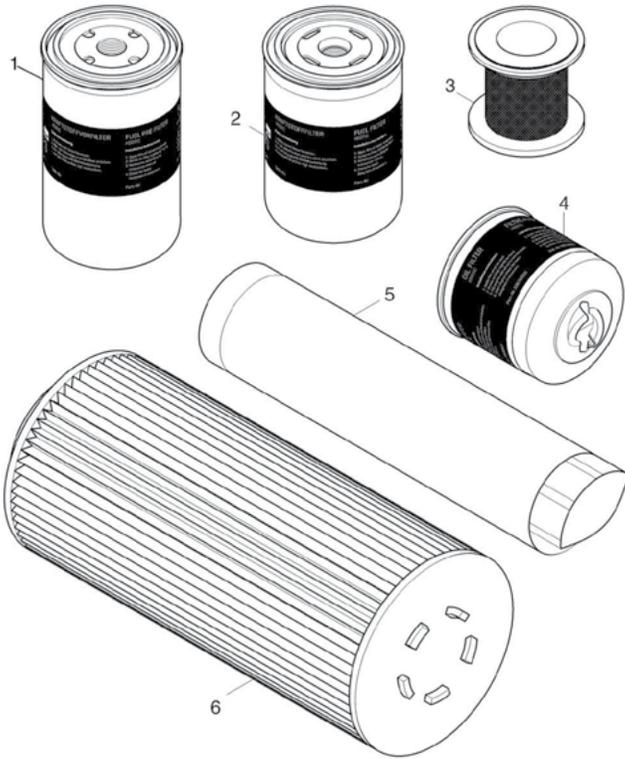
¹ During engine break in, change the oil and filter for the first time after 100 hours of operation (maximum).

² Service intervals depend on sulfur content of the diesel fuel, oil pan capacity, and the oil and filter used.

³ A system “flush and refill” will only be required when hydraulic fluid is tested and found to be at an unacceptable level of usage. As a precaution the hydraulic system should be flushed and refilled annually.

SECTION 3 SERVICE

Replacement Filters / Fluids



For detailed engine service instructions see the Maintenance section in the Hatz Operator's Manual

Hatz Replacement Filters			
Item	Part #	Description	Qty
1	065851	Pre-Fuel Filter	1
2	065852	Fuel Filter	1
3	065853	Oil Separator	1
4	065854	Oil Filter	1
5	065855	Air Filter - Secondary	1
6	065856	Air Filter - Primary	1



Part #: 073418
Description: Filter, Hydraulic, for APCP800 (Hyd. Tank Return Filter)



Part #: 073419
Description: Filter, Hydraulic, for APCP800 (High Pressure Filter)



Part #: 073518
Description: Filter, Fuel, for APCP800

FLUIDS

Part #: 001002-2
Description: Fluid, Hydraulic, QTY: 46 Gal (174 L)

Part #: 055399
Description: Oil, Gear, QTY: 25 oz (739 ml)

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, BS 2869 A1/A2, ASTM D975-09a 1-D s15 or 2-D S15 are recommended. It is recommended to use ultra low sulfur diesel fuel only.

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.

CAUTION

- 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.

Diesel engine oil meeting at least one of the following specifications are suitable

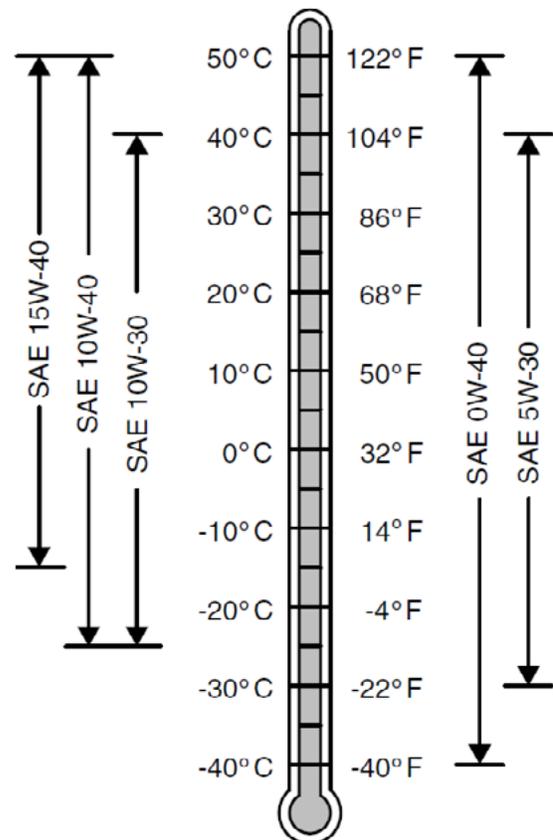
- ACEA E6 (Recommended)
- ACEA E9
- ACEA C3/C4 (HTHS greater than or equal to 3.5mPas)
- API CJ-4

DIESEL ENGINE OIL

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

Diesel fuel quality and fuel sulfur content must comply with all existing emissions regulations for the area in which the engine operates.

Only use engine oils with very low quantities of sulfate ash, phosphor and sulfur.



Oil Viscosities for Air Temperature Ranges

The following engine coolants are preferred:

- H50-Coolant

Other Coolants

If the preferred coolant is unavailable, use other radiator protection fluids that are approved by HATZ. For a list of approved fluids see the Technical Data section 4.4 in the Hatz 4H50TIC Operator's Manual.

Water Quality

Water quality is important to the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate. All water used in the cooling system should meet the following minimum specifications for quality:

Chlorides	< 40 mg/L
Sulfates	< 100 mg/L
Total Dissolved Solids	< 340 mg/L
Total Hardness	< 170 mg/L
pH	5.5 to 9.0

IMPORTANT:

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

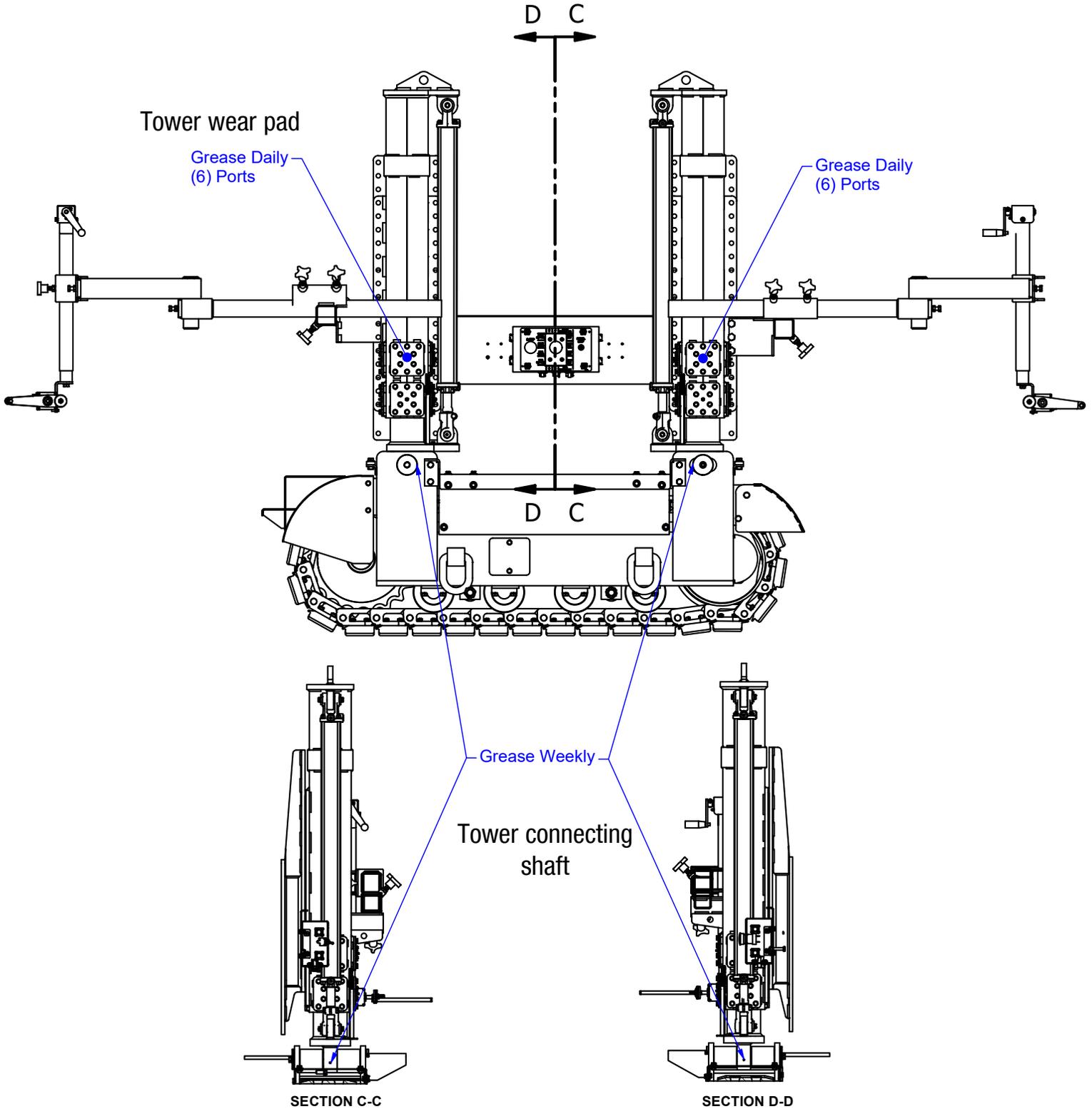
DO NOT mix ethylene glycol and propylene glycol base coolants.

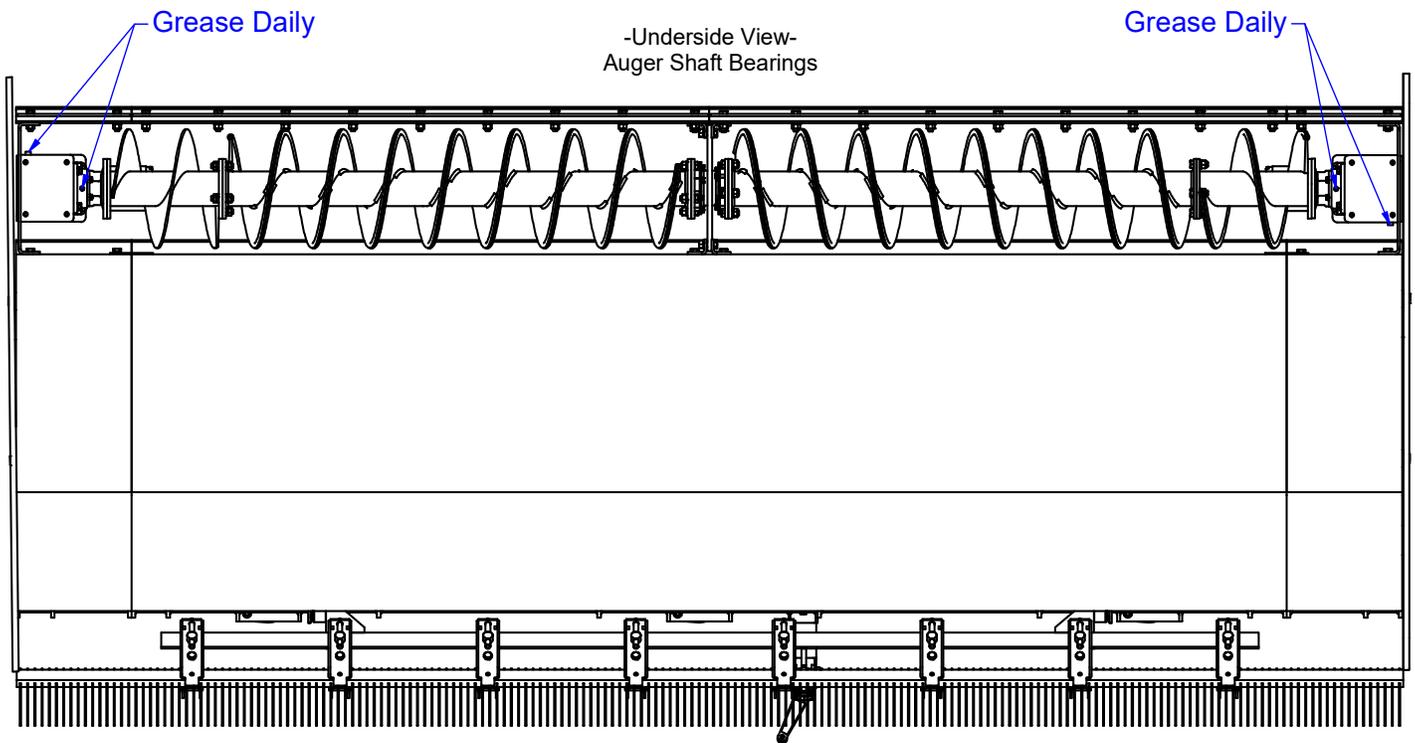
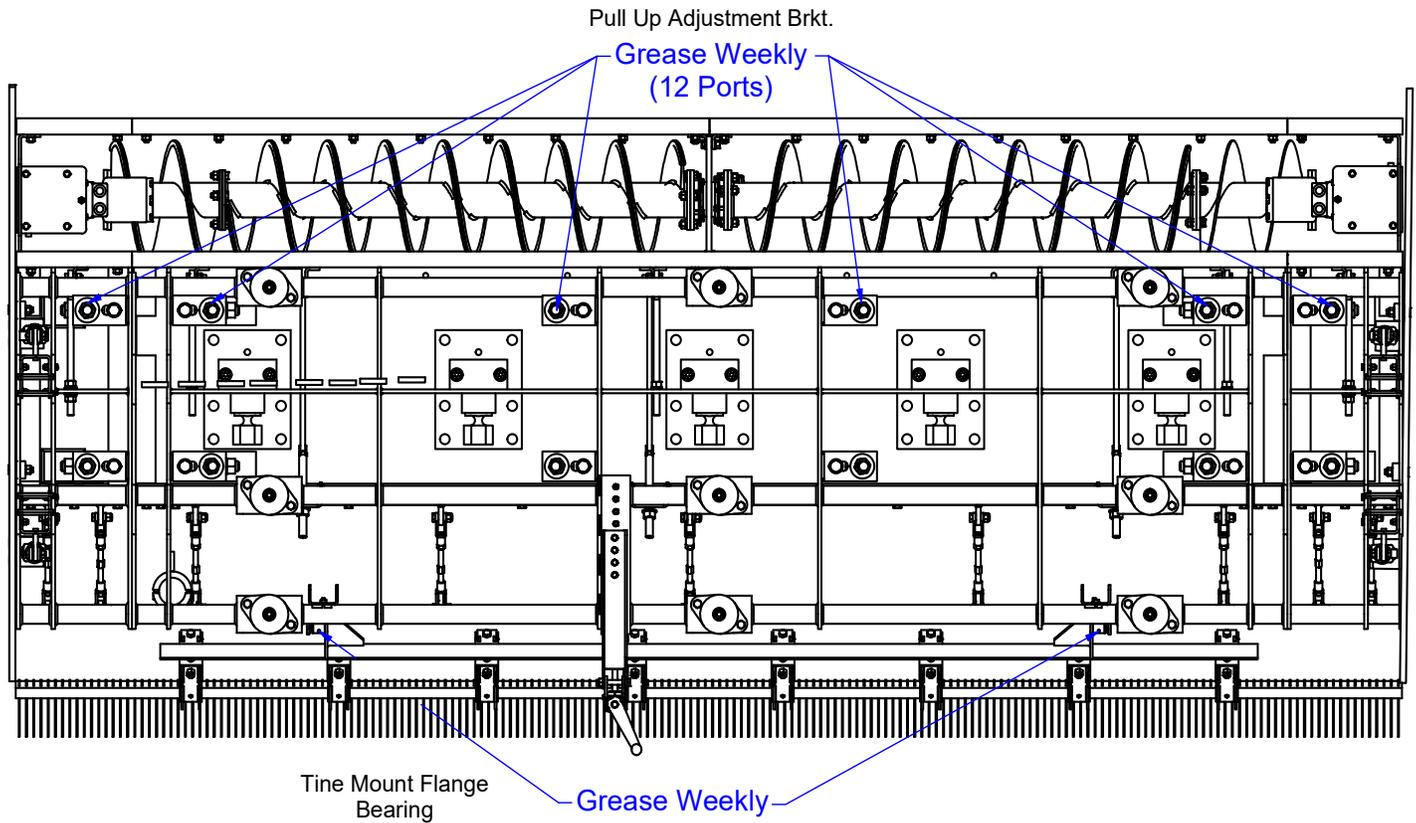
DO NOT use coolants that contain nitrites.

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

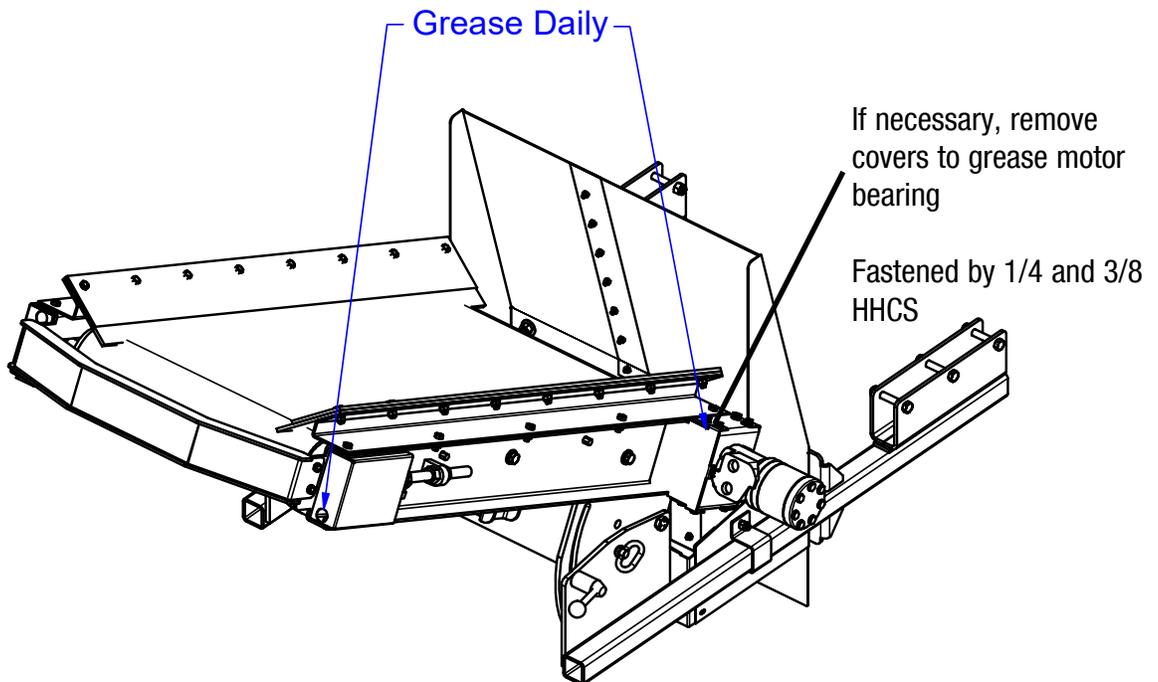
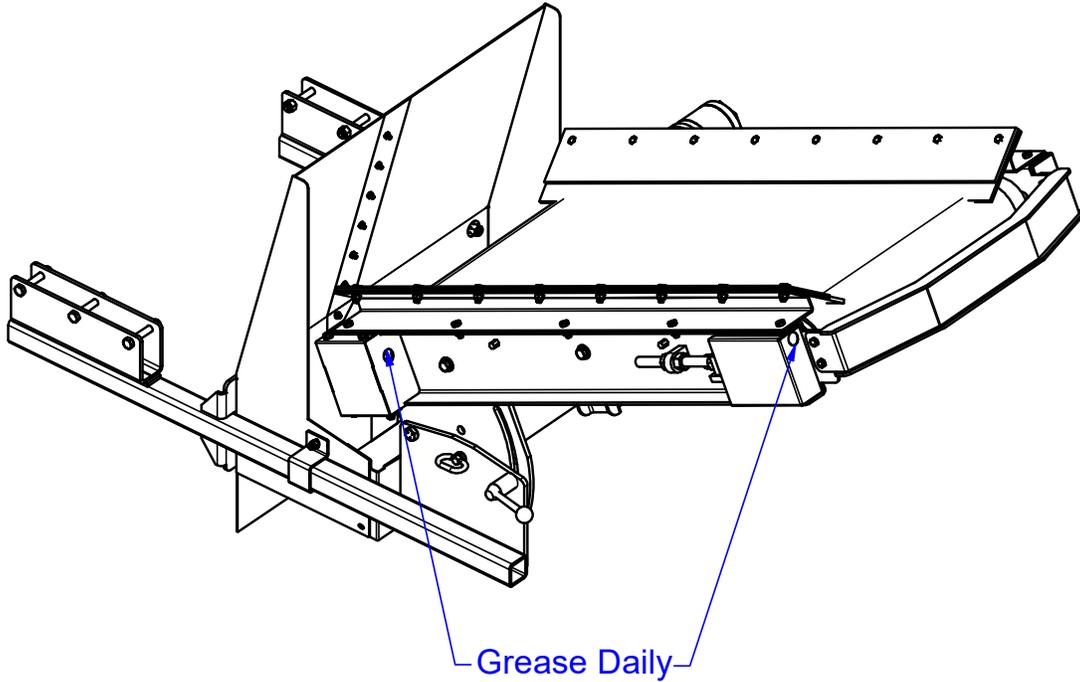
Grease Points - End Frames

Left and Right Hand end frames have the same grease points





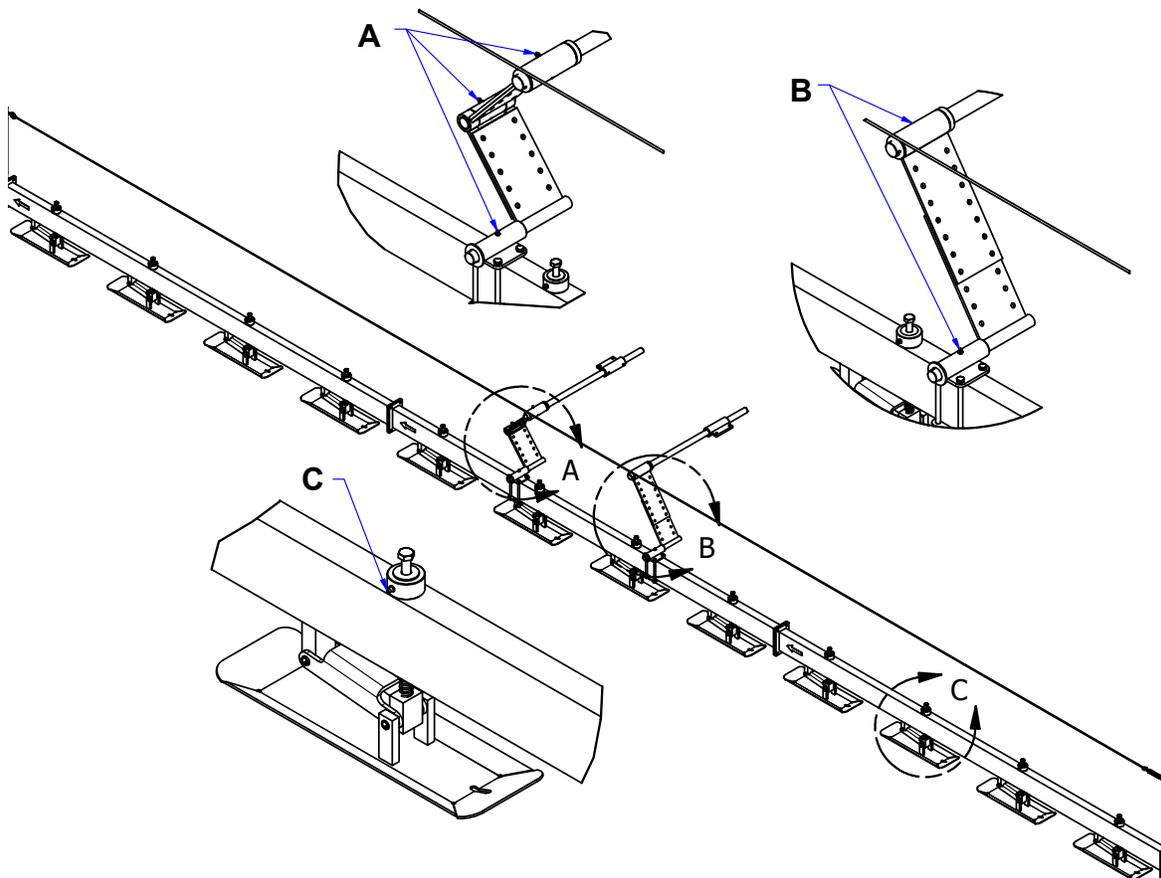
Material Conveyor Roller Bearings



Averaging Ski Maintenance

The averaging ski grease points will need to be greased according to usage. If the Ski is used often then it should be greased approximately every other job, and if the Ski has not been in use for an extended period check/grease it before use.

- The grease points are [A] Front hinge tubes, [B] Rear hinge tubes, and [C] Skid shoe assembly bearing
- For the Front hinge there are three grease points, the rear hinge has two, and each Skid shoe assembly has a bearing grease point.



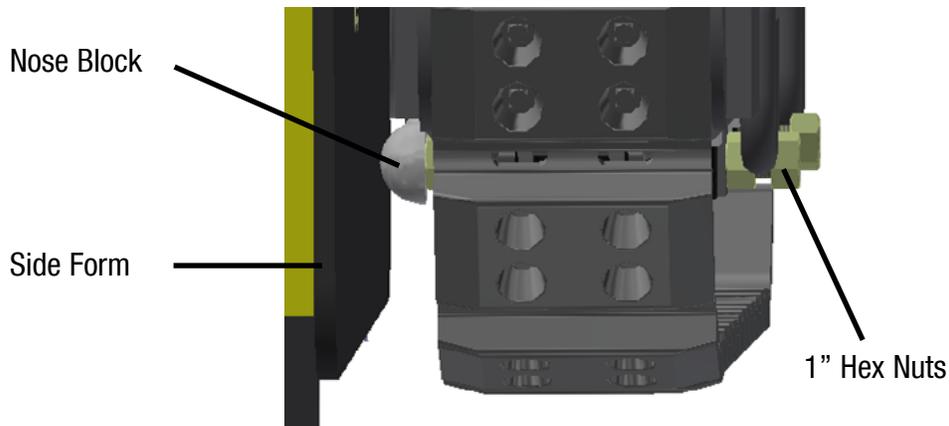
Averaging Ski Maintenance: Storage

The Averaging Ski can be disassembled for easy storage. First the String line will need to be undone. Use the turnbuckle on the rear of the Ski to loosen and then unfasten the string line. Then each section can be unfastened from each other by removing the (4) 7/16-14 X 1-1/4" bolts, lock washer and hex nut.

Clean dirt and debris before storing the Averaging Ski in a clean dry area.

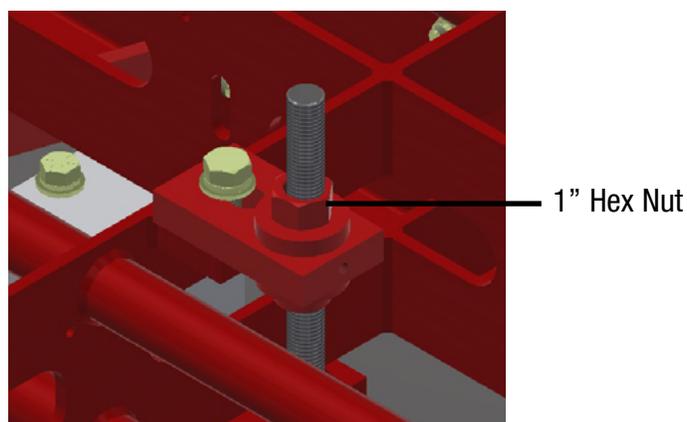
Adjust the Side Form Nose Block

The nose block should be in contact with the side forms to seal the edge of the paving pan, this insures that the material is contained. If the nose block is not in contact with the side form adjust the 1" hex nuts until the nose block assembly makes contact with the side form.



Adjust the Paving Pan

From the frame of the machine to the paving pan, there should be an equal distance on all four corners. If the paving pan is uneven, use the pan adjusters to level the paving pan. Tighten the 1" hex nut to lower the pan and loosen the hex nut to raise the pan.



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.

 **WARNING**

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.

 **WARNING**

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.

 **CAUTION**

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

 **CAUTION**

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

NOTICE

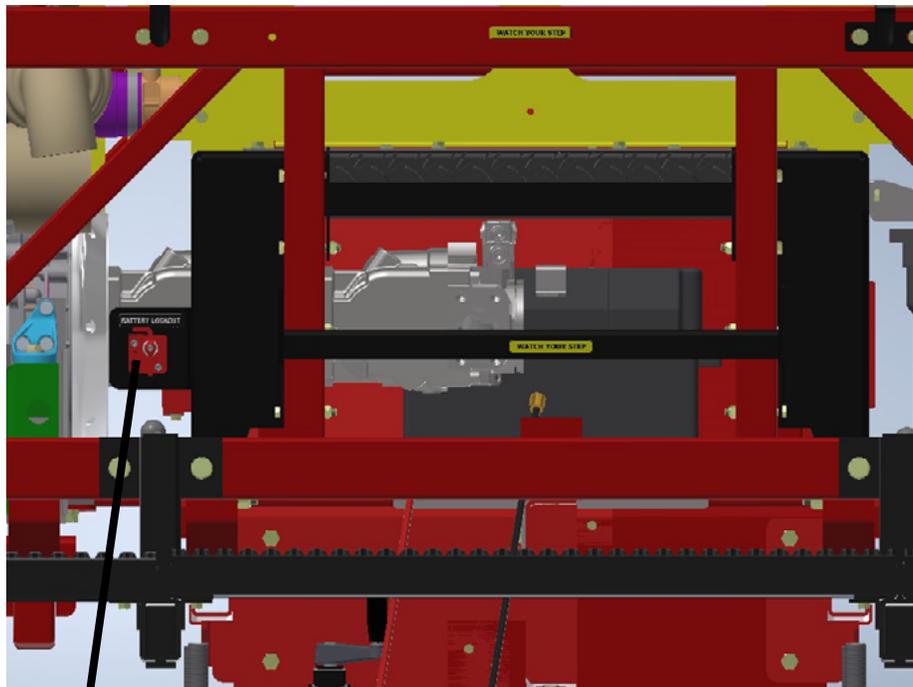
Battery Lockout

To help prevent excessive battery drain during low usage, turn the battery lock out switch to the off position.

The battery lockout switch is located on the rear left of the machine near the operator console steps.



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



Battery Lockout

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
- Avoid spraying water on the engine and electronic components. Examples include electronic displays, lights, switches, wiring, etc. The electronic components may be damaged if water is sprayed on them.
- 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	

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, Equipment manuals, and then Paving manuals.

MANUAL REVISION DETAIL

REVISION #	REVISION DATE	REVISION REFERENCE	REVISION BY
-	5/23	Initial Release	MK
A	8/23	Averaging Ski Details	MK
B	02/26	Updated warranty policy 2026	MK
C	02/26	Updated Loading/Unloading details	MK



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