TEREX Cedarapids

Operation & Maintenance Manual

300 SERIES

Hot Mix Asphalt Paver

Covers All 352 & 362 Models

(P/N 499992523106) 23028 (12/03)

To the Owner & Operator:

We have tried to provide information that gives our customers a clear understanding of equipment construction, function, capabilities and requirements. This information is based on the knowledge and experience of qualified people at our company and in our field organization. Proper use of this information rewards users of our equipment with high efficiency, maximum service life and low maintenance costs. That is why we strongly recommend that anyone using our equipment be familiar with this manual.

Information presented here should not be considered authoritative in every situation. Users will as a matter of course encounter problems and circumstances that raise questions not anticipated here. Such questions should be directed to their distributor or the factory.

Anyone who uses this equipment for any purpose other than that for which it was intended assumes sole responsibility for dangers encountered and injuries sustained as a result of such misuse.

⚠DANGER

Federal, state and local safety regulations aim to protect both people and property from accident, injury and harmful exposure. When complied with, such regulations are often effective. Hazards to personnel and property are further reduced when this equipment is used in accordance with all operation and maintenance instructions. Generally:

(1) Read and heed all danger, warning, caution, and notice decals. Know what guards and protective devices are included and see that each is installed and in operational condition. Additional guards and protective devices may be required and must be installed by the user (owner) before operating.

(2) Never attempt to maintain, lubricate or adjust this equipment while it is running. Lock out and tag out all energy sources before doing maintenance, cleaning, adjusting or repairing this equipment. Make it impossible for anyone to start this machine while others are working on it or in it.

(3) Wear personal protective equipment such as hard hats, ear plugs, safety glasses and safety shoes when operating this equipment. Do not wear loose clothing or long hair.

(4) Think safety and act safely. Stay alert at all times. Eliminate or neutralize potential hazards as soon as you spot them. Never allow anyone to engage in horseplay when near this equipment.

⚠DANGER

Failure to take these precautions will result in death or severe personal injury.

The following warning applies to equipment supplied with lead-acid batteries:

⚠WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm.
Wash hands after handling.

The following warning applies to equipment supplied with diesel powered engines:

⚠WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Cedarapids Warranty Policy

Cedarapids Inc, hereafter referred to as **Cedarapids**, warrants its new products manufactured and sold worldwide to be free of defects in material or workmanship for a period of one (1) year, or 2000 hours of use, whichever occurs first.

The warranty will commence on the day the equipment is put into operation by the customer for use, whether sold, rented or leased or one (1) year after shipment from the factory, whichever occurs first. **Delivery Inspection forms are required for warranty validation and processing.**

Cedarapids' obligation and liability under this warranty is expressly limited to, at Cedarapids' sole option, repairing or replacing with new or remanufactured parts or components, any part which appears to Cedarapids upon inspection to have been defective in material or workmanship. Such parts shall be provided at no cost to the user, FOB a Cedarapids parts facility.

Cedarapids shall pay, to the extent outlined in the Warranty Reimbursement section, the cost of labor to install any repaired or replaced part provided under this warranty.

This warranty may not apply to component parts or accessories not manufactured by Cedarapids and which carry the warranty of the manufacturer thereof. Furthermore, normal maintenance, adjustments, or maintenance/wear parts are not covered by this warranty.

Cedarapids makes no other warranty, express or implied, and makes no warranty of merchantability or fitness for any particular purpose.

No employee or representative is authorized to change this warranty unless such change is made in writing and signed by an authorized representative of Cedarapids.

Cedarapids' obligation under this warranty shall not include duty, taxes, or any other charges whatsoever, or any liability for direct, indirect, incidental, or consequential damage or delay.

If requested by Cedarapids, components or parts for which a warranty claim is made are to be returned to the location designated by Cedarapids.

Improper maintenance, improper use, improper storage, operation beyond rated capacity, operation after discovery of defective or worn parts, or alteration or repair of the equipment by persons not authorized by Cedarapids shall render this warranty null and void. This warranty shall be null and void if parts other than genuine Cedarapids are used in the equipment. Cedarapids reserves the right to inspect the installation of the product and review maintenance procedures to determine if the failure was due to improper maintenance, improper use, operation beyond rated capacity, operation after discovery of defective or worn parts, or alteration or repair by persons not authorized by Cedarapids.

Replacement Parts Warranty: Cedarapids warrants the replacement parts ordered from the Parts Department to be free of defect in material or workmanship for a period of 6 months or 1000 hours of operation, whichever occurs first.

Extended Warranty: Extended warranties are available for purchase at the time of sale. The terms and conditions of the Extended Warranty will be provided upon request.

TRANSFERABILITY OF WARRANTY: The balance, if any, of the original equipment warranty may be transfered to second and subsequent owners provided certain conditions are met. Please contact your local Cedarapids Dealer for additional details if needed.

Cedarapids Warranty Policy - Continued

The following items are NOT covered under the Cedarapids Warranty:

1) Items sold by any non-authorized Cedarapids Dealers.
2) Some components are not covered by Cedarapids warranty, but rather are covered only by the warranty that is provided by the manufacturer. Such components include, but are not limited to, the engines, electric motors, air compressors, air conditioners, batteries, tires etc.
3) **Replacement of Assemblies:** Cedarapids has the option to repair or replace any failed part or assembly. It is Cedarapids policy to refuse claims for the replacement of a complete assembly that is field repairable by the replacement or repair of defective part(s) within the assembly.
4) **Component Products:** Product that is not genuine Cedarapids parts.
5) **Normal Operational Maintenance Services and Wear Parts:** Maintenance services and wear parts are excluded from warranty claims. Maintenance services not covered include, but are not limited to, such items as: sheave adjustments and alignment, screen cloth installation and tensioning, wear liner and chute work, wear or adjustment of jaw and toggle plates, proper tightening of bolts, nuts and pipe fittings, adding or replacing of fluids, filter, breathers, belts, nozzles, screed plates, adjustments of pumps and motors, spark plugs, etc. Wear parts not covered include, but are not limited to, such items as: screen cloth, wear liners, wear of jaw and toggle plates, fluids, filters, breathers, belts, nozzles, screed plates, spark plugs, etc.
6) **Transportation Damage:** Any damage caused by carrier handling is a transportation claim and should be filed immediately with the respective carrier.
7) **Deterioration:** Repairs of parts exposed to age, storage, weathering, lack of use, demonstration use.
8) **Towing or Hauling:** Towing or hauling charges or damages.
9) **Lifting Devices:** Crane rentals or other lifting devices.
10) **Secondary Failures:** Should the owner or operator continue to operate a machine after it has been noted that a failure has occurred, Cedarapids will not be responsible under the warranty for resultant damage to other parts due to that continued operation.
11) **Parts Orders and Minimum Billing Charges:** Special handling and minimum charges for parts items will not be reimbursed.
12) **Field Installation:** Proper installation of options and kits is the responsibility of the company performing the work. Cedarapids accepts no warranty responsibility for improper or unauthorized installations.
13) **Field Modification:** Only approved modifications and Cedarapids directed retrofits may be made on equipment or attachments to equipment produced by Cedarapids. Approval must be obtained from Cedarapids Service Department prior to the modification being made. Modifications or retrofits that are made without Cedarapids approval will not be covered by warranty.
14) **Workmanship of Others:** Cedarapids does not accept responsibility for improper installation or the replacement parts labor costs.
15) **Stop and Go Warranty:** Cedarapids does not recognize "Stop and Go" warranties.
16) **Machine Improvements or Design Changes:** Cedarapids reserves the right to change any specifications or make design changes without notice. Cedarapids shall not be obligated to make such changes in goods or parts previously delivered or any equipment previously sold to an end user.
17) **Incidental or Consequential Damage:** Cedarapids shall not be liable for any Incidental or Consequential Damages of any kind including, but not limited to, lost profits, loss of production, increased overhead, loss of business opportunity, delays in production, costs of replacement components and increased costs of operation that may arise from the breach of this warranty. Customer's sole remedy shall be limited to repair or replacement of the defective part.
18) **General Exclusions:** Any product which has, in Cedarapids' judgment, been damaged due to misuse, negligence, loading beyond its normal capacity, alteration, accident, or lack of regular maintenance service. Our obligation under this warranty shall not include any:
    - Equipment operated at speeds other than factory recommendations.
    - Equipment adjusted to any settings other than factory recommendation.
    - Equipment installed by others without Cedarapids Service assistance will not be warranted for the following:
        - Workmanship pertaining to the installation of equipment.
        - Length of time to install the equipment.
        - Instructions given on operating the equipment.
        - Instructions given on maintaining the equipment.
        - Instructions given on troubleshooting the equipment.

[Taken from Cedarapids Warranty Policy Document F/N 22633 Dated (4/01)]

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Section 1 - Introduction

About This Manual

This book is an operation and maintenance manual for the owner or operator of the equipment described within.

We strongly recommend that anyone working with this equipment become familiar with the manual, whether or not you have experience with similar equipment.

This manual will help you understand how to install your equipment, prepare it for operation, and perform normal operation and maintenance tasks.

⚠ DANGER

This manual contains information necessary for proper and safe operation. Carefully read this manual before attempting to operate. Failure to read and heed instructions preceded by a safety-alert symbol can cause death or severe personal injury as well as equipment and environmental damage.

Experience has shown it is to your advantage to keep a copy of this manual where operators can consult it as needed and to have a copy on file in your office, so that shift leaders or supervisors can conveniently refer to it. Additional copies can be ordered through your distributor.

This equipment is precisely engineered, highly functional, and heavy-duty designed to provide years of excellent service performing to customer specifications. We are proud to manufacture this equipment for your use and profit. We also take pride in the quality of our service and replacement parts.

This manual, however, is not a parts catalog and should not be used to order parts. Only your Parts Book, identified with your machine's serial number, is an authoritative source of part numbers and part descriptions for your equipment.

Ongoing improvement of product design may in the future result in changes to some parts. Use part numbers, model numbers and serial numbers from your Parts Book to communicate with your distributor.

About This Manual

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Section 2 - Safety

Introduction

This equipment is designed expressly for hot mix paver operations. When our equipment is used for purposes other than those for which it was designed, user assumes sole responsibility for any injuries or damage that may result from said misuse. We emphatically recommend that this equipment be operated only by personnel who are trained in its use.

We make no guarantee, either expressly or by implication, that this equipment meets all local or federal safety regulations. It is the responsibility of those individuals who own and/or operate this machine to verify that all safety regulations are complied with before starting either this unit or any associated equipment.

Symbols and Standards

Important symbols and hazard classification standards relating to safe equipment operation are used throughout this manual. Make sure you read, understand and follow all DANGER, WARNING and CAUTION decals on equipment.

Safety Alert Symbol

The safety alert symbol (Figure 2 - 1) is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Figure 2 - 1 Safety Alert Symbol

Hazard Classification

A multi-tier hazard classification system is used to communicate potential personal injury hazards. The following signal words used with the safety alert symbol indicate a specific level of severity of the potential hazard (Figure 2 - 2). Signal words used without the safety alert symbol relate to property damage and protection only. All are used as attention-getting devices throughout this manual as well as on decals and labels fixed to the machinery to assist in potential hazard recognition and prevention.

⚠DANGER	**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION	**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
CAUTION	**CAUTION** used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.
NOTICE	**NOTICE** indicates information or a company policy that relates directly or indirectly to the safety or protection of property.

Figure 2 - 2 Hazard Classification

Symbols and Standards

Decals and Icons

Beneath all safety regulations lies a set of common-sense rules. Everyone who works with or near heavy equipment must be aware of those rules. To foster and maintain such an awareness in our customers, safety decals are fixed on our equipment.

Icons on our safety decals remind both workers and supervisors of common hazards and procedures that, in the course of a busy day, they might otherwise forget. The language of the icons is simple and direct (Figure 2 - 3).

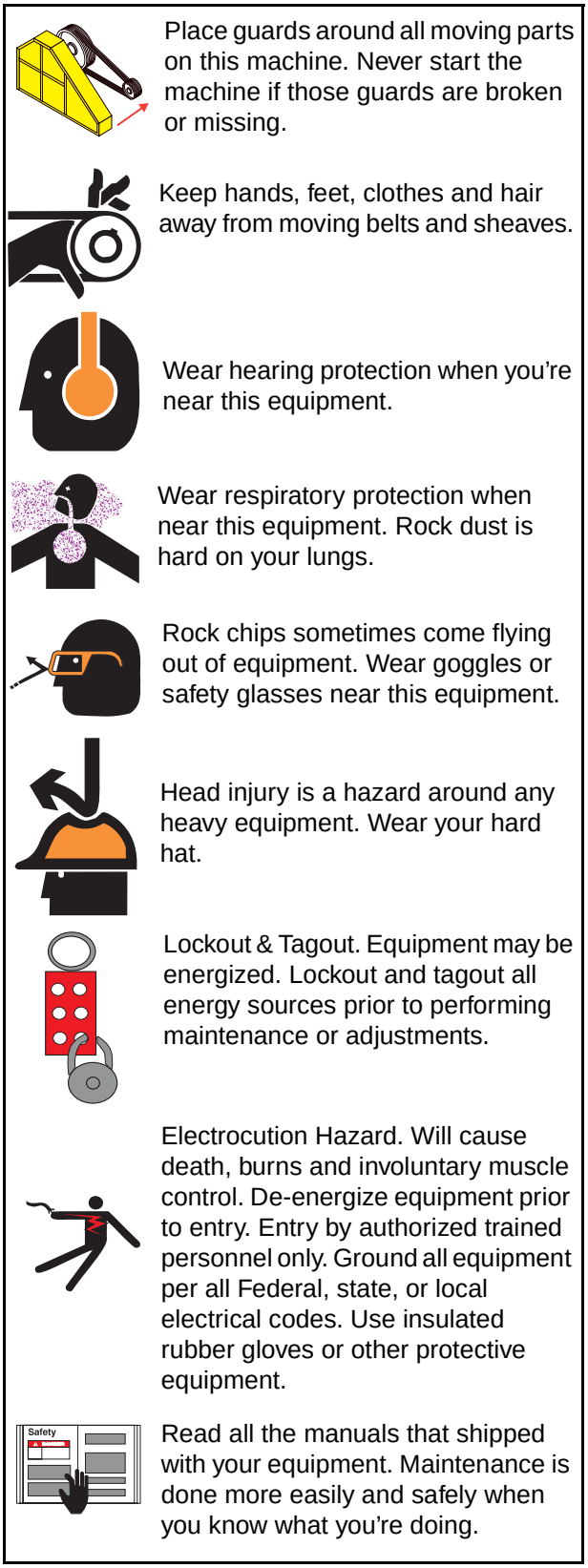


Figure 2 - 3 Safety Pictograms Explained

Decal Locations

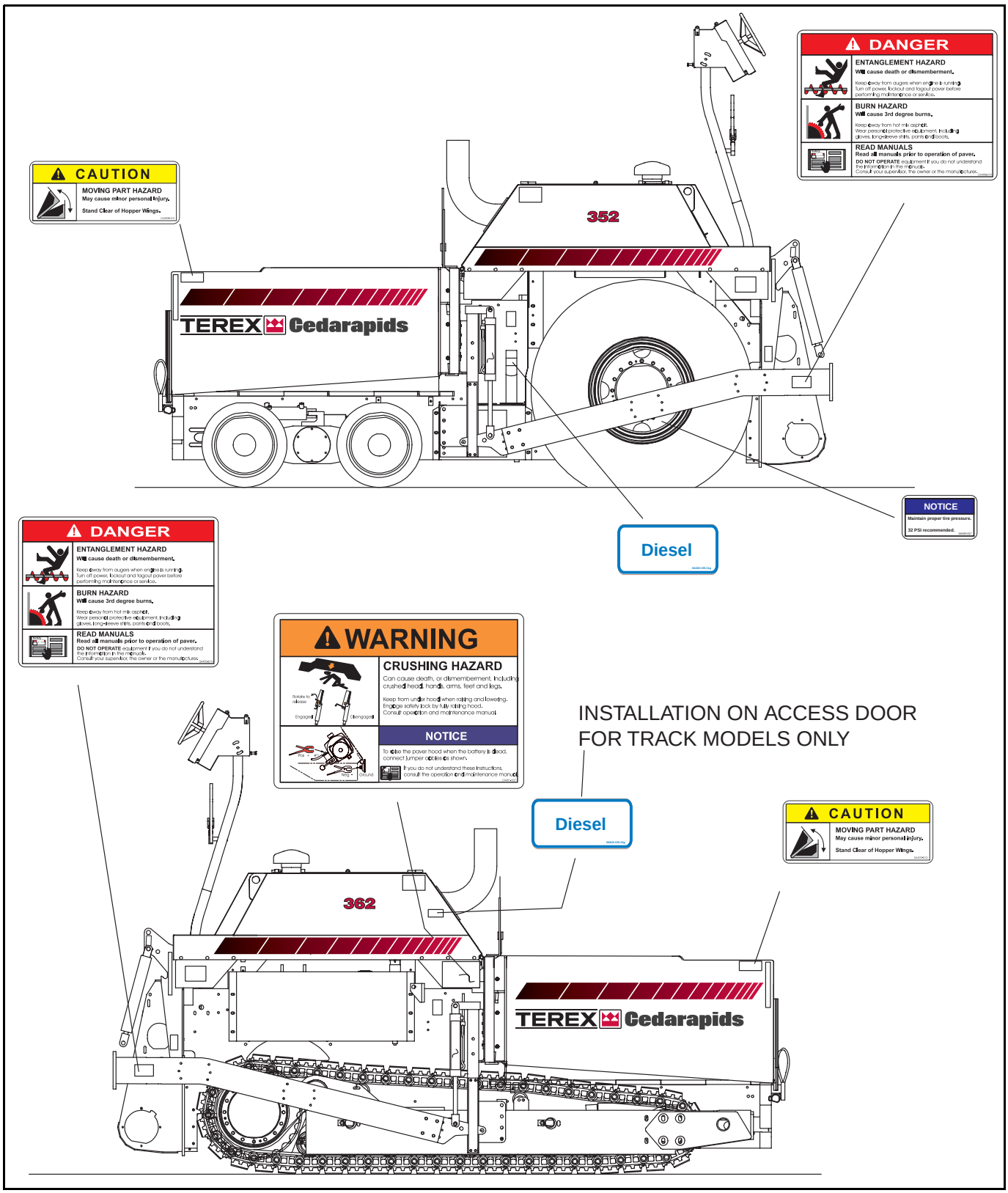


Figure 2 - 4 Decal Locations - Side Views

Symbols and Standards

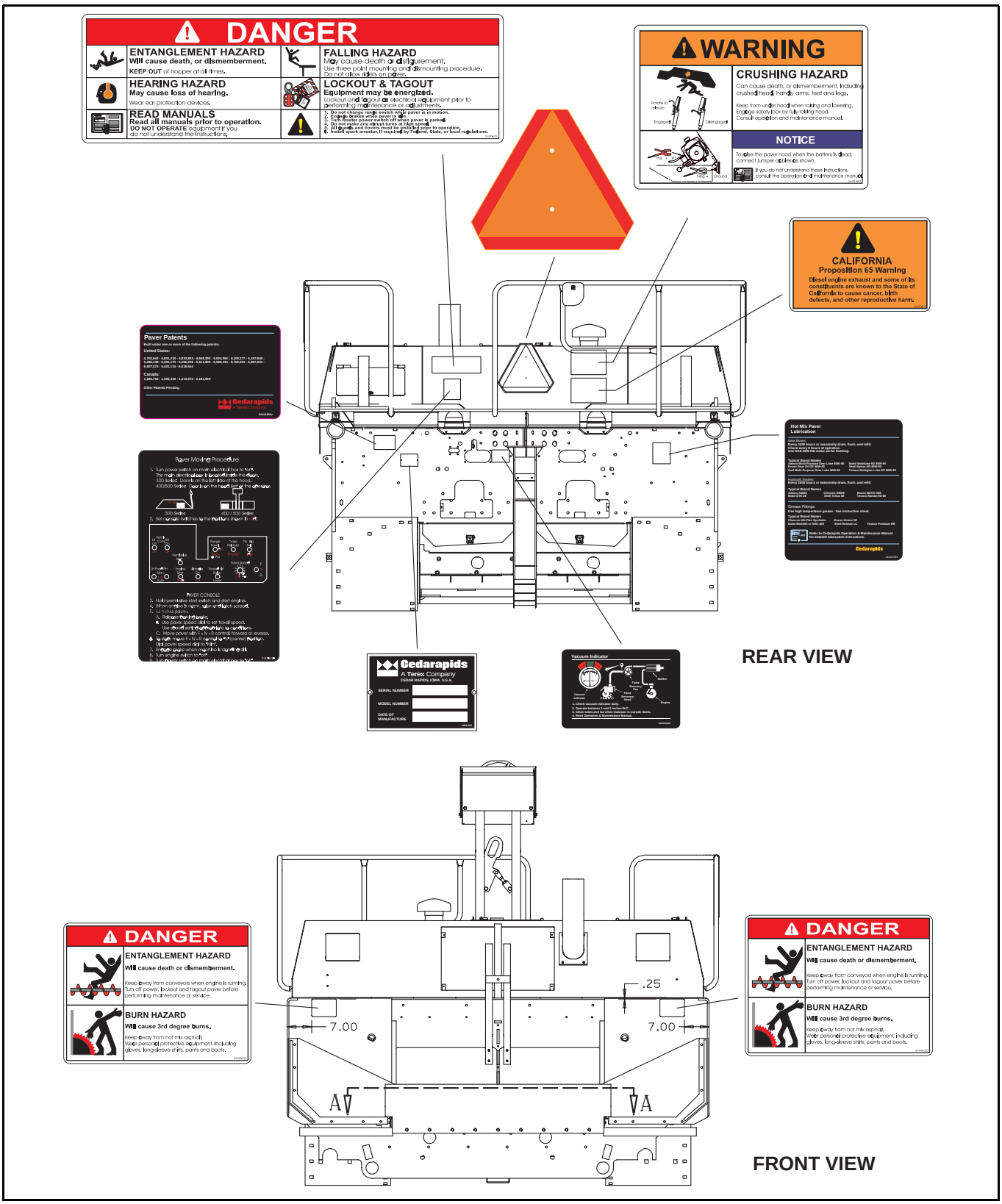


Figure 2 - 5 Decal Locations - Front and Rear Views

Symbols and Standards

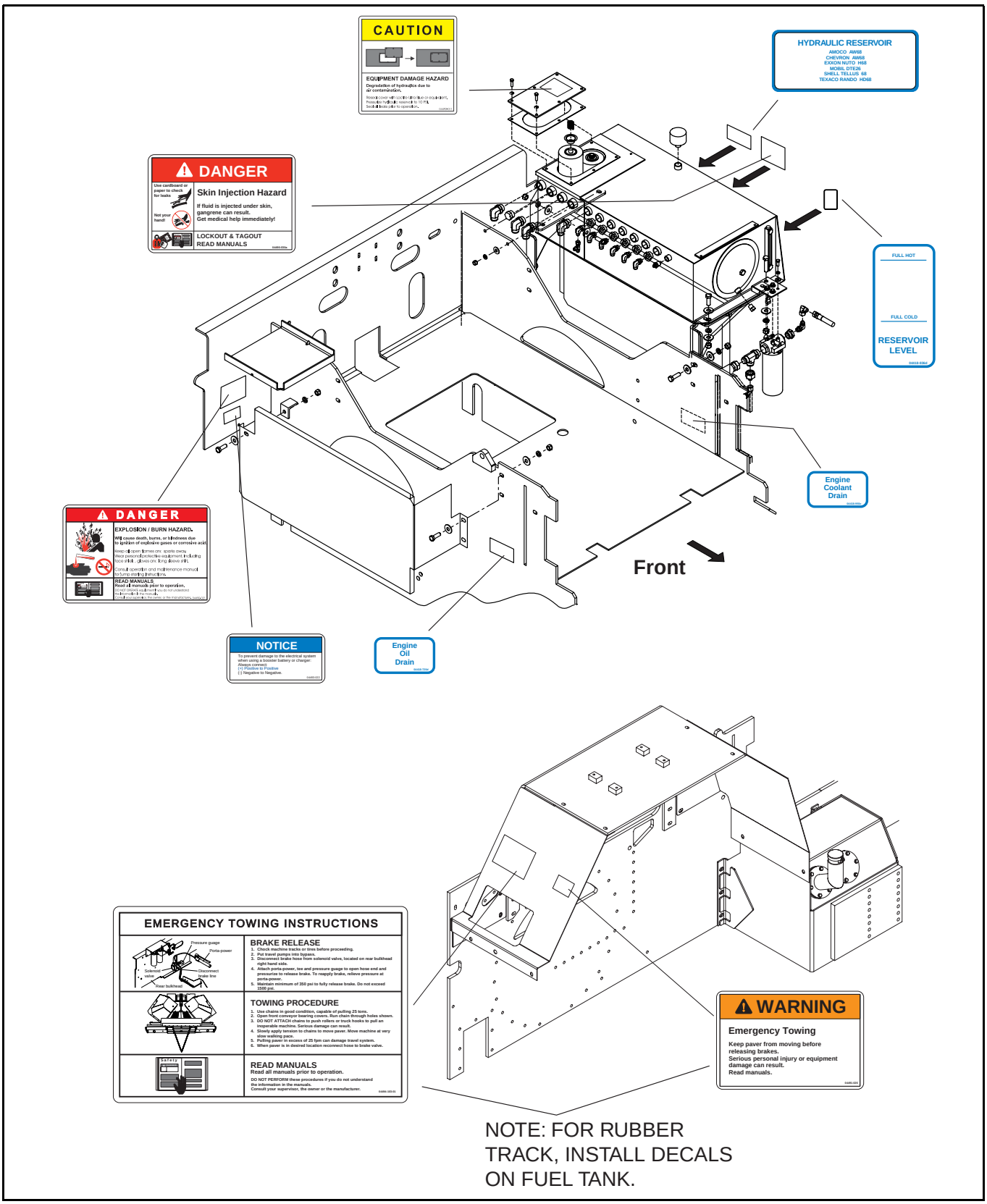


Figure 2 - 6 Decal Locations - Fender and Hydraulic Reservoir

Personal Safety

This equipment is designed with the safety of all personnel in mind. Never attempt to change, modify, eliminate or bypass any of the safety devices installed at the factory. Guards, covers and shields installed around moving parts at the factory are meant to prevent accidental injury to operators and other personnel. **Do not remove them**.

⚠ DANGER

Sometimes, at a customer's request, equipment is shipped without certain features such as a drive sheave. When this occurs, we attach a warning decal to alert installers that the related guard or other safety feature is missing. In such cases it is the customer's responsibility to guard the machine properly.

We recommend the following basic safety practices:

Management Responsibilities

- Make sure that everyone working on or near this equipment is familiar with safety precautions. Have a supervisor at the job site responsible for job safety.
- Give crew members specific safety responsibilities and instruct them to report any unsafe conditions to their supervisor

Operator Responsibilities

- Read all danger, warning, caution and notice signs.
- Always lock out and tag out involved energy sources before performing maintenance or adjustments on this equipment. Make it impossible for anyone to start this machine while others work on it or in it.
- Never remove any guard, cover or shield when this equipment is in motion.
- Replace guards, covers and shields when the task for which you removed them is finished.
- Block parts as necessary to prevent their sudden movement while people are working on the machine.
- Never attempt to clear away jammed feed material, discharge material or other stoppage while the machine is running. Stop the equipment, lock out and tag out before touching this machine with your tools or your hands.
- Wear proper personal protective equipment, including eye protection, hard hat and safety shoes, whenever you're near this machine while it is running.
- Dress appropriately in every way. Never wear loose clothes, long hair, coat tails, jewelry, pockets full of tools or any other item that could get caught in moving parts.
- Know where your fellow workers are. Always look around and inside this machine before starting it. Make sure nobody is in the way of moving parts or working on the machine.
- Lift with your legs, not with your back. Keep the weight close to your body. If the load is more than 40 lbs., get someone to help you.
- Never engage in horseplay when near this machine, or any other.
- Report any defective machinery or equipment and unsafe conditions or activity to your boss immediately.

Personal Safety

- Don’t limit safety practices to the few rules listed here. Think safety and act safely at all times.
- Most of all, know your equipment. Understand the machinery, the conditions under which it operates and what it is capable of doing.

Work Area Safety

- Keep the work area as neat and clean as practical.
- Keep all product safety signs clean, clear and current.
- Make sure all electrical equipment is properly grounded. Wet spots near electrical current are especially dangerous.
- Store hazardous materials in restricted access areas and mark them clearly. Federal regulations require special labeling of certain materials.
- Never start an engine in an enclosed space without properly venting the exhaust.
- Do not smoke or allow smoking near fuels and solvents. Never strike a spark or use an open flame near fuels and solvents.
- Store flammable fuels, solvents and gases in secure, well ventilated areas. Never allow fumes to accumulate in the storage area. Use nonflammable solvents for cleaning parts and equipment whenever possible.
- Know where fire extinguishers and other fire-suppression equipment are located. Learn how to use them effectively.
- Be alert and wary around any pressurized system, hydraulic or pneumatic. High-pressure oils and gases are very dangerous.

Equipment & Tools

- Clean tools that are properly labeled and stored are safer tools. Keep your tools in good order.
- Keep drive belts and sheaves in good condition. Frayed belts or cracked sheaves are not only dangerous, they cost you downtime.
- Always use mechanical assistance to lift heavy loads. Never overload a hoist, crane, jack or other lifting device. Check lifting tackle regularly; replace it at the first sign of stretch, fraying or other wear.
- Keep your equipment clean, free of dirt and grease, so that loose, cracked or broken parts are more easily spotted. Replace defective parts as soon as they are discovered.

What is Lockout & Tagout?

Lockout & Tagout is a procedure that's designed to prevent the unexpected or accidental startup of equipment and to alert all workers whenever it is unsafe to operate any piece of equipment. When used as intended, Lockout & Tagout also protects personnel from energy stored in devices such as springs, accumulators, batteries, hydraulic systems, etc.

When is Lockout & Tagout required?

- Any time anyone is maintaining, repairing, lubricating, or, for whatever reason, working on the equipment.
- When the equipment is broken or, for whatever reason, unfit or unsafe to operate.
- While clearing blocked or jammed mechanisms.
- Whenever the equipment is left unattended.

Who must apply a lock & tag?

- Any person working on the equipment.
- Foreman or other person responsible for the work being done.
- If several people are working on a machine at the same time, each person must apply his or her own lock and tag.

When can a lock and tag be removed?

After performing these six steps:

1) All safety guards are back in place.
2) All work is complete and tools are put away.
3) All workers are notified that a lock is being removed.
4) All workers are positioned safely for startup.
5) Controls are positioned for safe startup.
6) The machine is ready for safe operation.

Who can remove a lock and tag?

- Only the person who applied a lock and tag is permitted to remove them.

Lockout & Tagout rules laid out here are generic. To get instructions for your particular workplace, consult your employer's lockout/tagout procedure.

Screed Safety Information

Training and Knowledge

Proper training and equipment knowledge is essential to the safe operation of this machine. Carefully read the entire manual before attempting to operate the paver. Keep this manual for future reference.

⚠WARNING

Do not operate this equipment until you have been trained in its operation or maintenance. This equipment may only be operated or maintained by trained personnel, who have demonstrated their ability to do so safely.

Safe Paver Operation

The following safety information concerns the operation of your paver.

⚠DANGER

- Install all auger guards and vibrator covers before operating the paver.
- Never attempt to install or remove any part or assembly when the paver is running.
- Do not allow personnel to stand or walk between the front of the paver and the back of the truck while the paver is operating.
- Engage screed locks or lower the screed before performing any inspections, repairs or adjustments to the screed.
- All guards and protective devices must be in place when the paver is being operated or moved.
- Keep all personnel clear of augers when the paver is operating.
- Do not refuel the paver with the engine or screed heater system running. All sparks and open flames must be kept a minimum of 50 feet away from the paver when refueling.
- Do not wash or spray down the screed or tractor with the screed heater system operating.
- Read, understand and follow all current OSHA, federal, state and local regulations that are applicable to your job and equipment.
- This equipment must be used in accordance with all operation and maintenance instructions.
- All persons involved with this equipment must be familiar with this manual.
- Read, understand, and follow all Danger, Warning, Caution and instruction decals in this book and on the paver.
- When changing the paver configuration or adding equipment to the paver, all additional guards associated with the added equipment must be installed before operating or moving the paver.
- Any changes made to the original design of the paver must be approved by qualified personnel to ensure that the changes include appropriate guarding and provide a safe working environment for all personnel.
- Wear clothing that fits snug to prevent getting caught in moving parts. Loose-fitting clothing should never be worn.

- Mount and dismount the paver from the rear using only the steps, handrails and walkways provided.
- Do not mount the paver when it is moving.
- Allow only the operator on the operator's platform when the paver is in operation.
- Before starting the paver, make sure the brakes are ON, all other systems are OFF and all personnel are clear.
- Before leaving operator's seat, always place the brake switch ON, and all other controls or switches in OFF or NEUTRAL position.
- Reduce travel speed when going down step grades to prevent over-speeding.
- Do not allow personnel near the hopper area when the paver is running.

Screed Safety Information

⚠CAUTION

- Wear protective mask when harmful air pollution exists.
- Wear safety goggles, gloves and long-sleeve shirts when working near hot asphalt materials.
- Wear ear plugs while paver is running.
- Keep operator's platform, steps and screed walkways clear of all obstructions, tools and other items to prevent tripping or falling.
- To prevent fire hazards, keep the screed and engine basket area free of oil, asphalt and trash buildup.

Screed Safety Information

Section 3 - Set Up and Operation

Receiving New Equipment

Pre-Operation Check

Before accepting and unloading a new paver, the consignee must inspect the equipment for evidence of damage or missing parts. This inspection process should be thorough, because once the freight receipt is signed, it is assumed that all of the equipment listed on the receipt was received in good condition.

Make a thorough inventory of all loose components packaged in boxes. A check list is provided in each box listing the components in the box. While performing the inventory, inspect all loose components for damage which may have occurred during transit. Any damage that happens to the equipment in transit is the responsibility of the carrier **not** Cedarapids. Claims for damage must be submitted to the carrier for settlement.

When evidence of damage or loss is discovered, have the driver make a notation on both the carrier's and consignees' copies of the freight bill. Prior to signing the freight bill, take pictures of the damage and identify the truck if possible. The consignee can then sign the bill to acknowledge delivery. The consignee should then have the carrier's terminal manager or his authorized representative make an official inspection of the damage or loss.

Equipment should not be moved from the original receiving point until this official inspection has been made. Good clear photos will verify and explain damage in any claim action which may follow. When the inspection is done, the consignee should file a written damage claim with the carrier's office and should report this action to the area distributor for Cedarapids Inc.

If hidden damage is found after the carrier's representative has gone, do not continue to unpack or move the equipment. Contact the carrier's local office and have the terminal manger or authorized representative make an immediate personal inspection of the damage. Obtain a written description of the damage, and photos if possible, signed by the representative as proof of a valid claim.

A packet of equipment warranty/start-up information will be sent to the distributor before the equipment leaves the factory. All warranty/ start-up forms must be filled out and returned to Cedarapids within **24 hours** after the equipment is received.

Principle Of Operation

The paver will lay a uniform, high-density, asphalt mat for highways, roadways, airport runways, parking lots and driveways. It is capable of performing jobs with strict control specifications and high production requirements.

The paver will level and compact mix up to 12” in depth, with mat widths varying from 6’ to 30’. Mat depth and width variations are accomplished by adjusting feed controls and adjusting the screed.

The hot mix is dumped by truck into the hopper or picked up by a windrow machine at a rate suitable for continuous paving. While dumping mix, the truck is pushed forward by the paver.

For the Slat Conveyor Paver, (Figure 3 - 1) hot mix is carried by two independently controlled slat conveyors to the augers at the rear of the tractor and in front of the screed. Material feed may be either manually or automatically regulated to maintain an even and consistent “head of material” in front of the screed. Material flow rate is regulated by a combination of varying slat conveyor speed and material gate height.

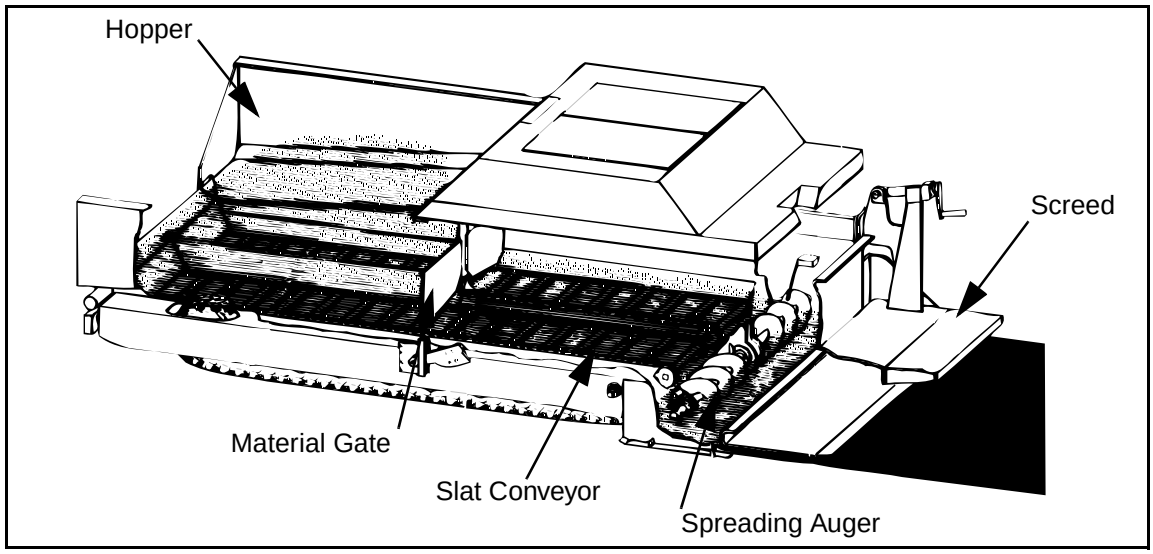


Figure 3 - 1 Slat Conveyor Paver

A strike off plate mounted directly in front of the screed bottom meters the material passing under the screed bottom. The screed rides up or floats on the mix to level and smooth the mat. Contour of the mat may be set to a desired slope with the adjustable screed controls. Screed controls are adjusted manually or automatically to create the desired mat.

The screed bottom flexes at its midpoint into a slight V-shape (negative crown) or into a slight inverted V-shape (positive crown). Such adjustment produces a negative or positive crown on mat for specified water drainage requirements.

The screed has vibrators which perform the initial “ironing” of the mat. Final compaction of the newly laid mat is accomplished by a roller.

The screed has burners that heat the screed bottom close to the temperature of the mix before paving begins. Heating the screed bottom prevents asphalt from sticking to the screed bottom which causes tearing and a poor mat surface.

The screed can be fitted with extensions or extendible strike-offs for paving wide widths or shoulders.

Fume Recovery System

The fume recovery system is designed to collect fumes given off by hot mix asphalt and discharge them away from operator work areas. This system is standard equipment on all pavers. (Figure 3 - 2) The system is designed to collect fumes given off by asphalt mix as it is distributed along the length of the main screed by the spreading augers. The fumes are drawn into a hydraulically driven fan. The fan then blows the fumes into the engine exhaust muffler. Inside the muffler the asphalt fumes are combined with the engine exhaust and discharged through the exhaust pipe. A vacuum gauge indicates amount of vacuum generated in the fan intake manifold.

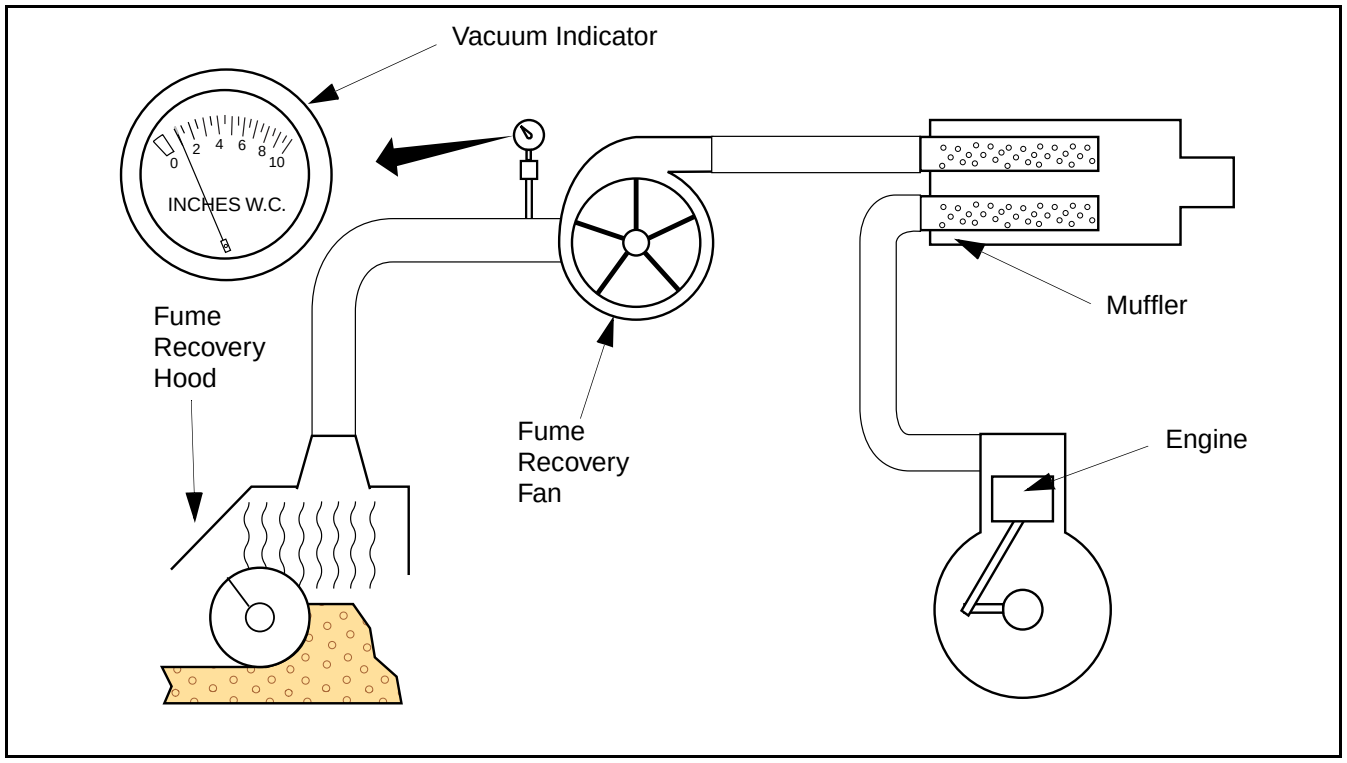


Figure 3 - 2 Fume Recovery System Overview

Operator's Console

The operator's console can be positioned so that the paver can be operated from the left or right seat. To reposition the operator's console:

1) Lift the locking handle to release the console. (Figure 3 - 3)

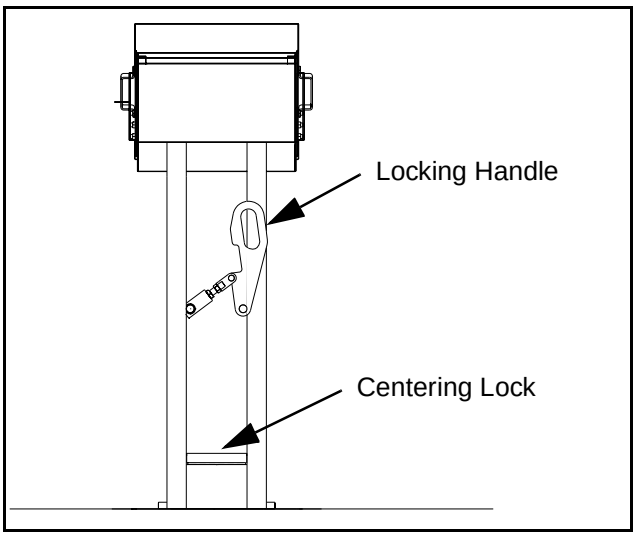


Figure 3 - 3 Repositioning Operator's Console

2) Pull the operator's console toward the center of the paver. When the console is positioned vertically the centering lock will automatically engage.

   Important - When raising the hood, the operator's console must be locked in the center position to prevent the hood from hitting console.

3) Step on the centering lock to release the console and position the console to the desired side of the paver.

Refer to (Figure 3 - 4) and (Figure 3 - 5) for instructions on the operator's console for Slat Conveyor Pavers.

Operator's Console

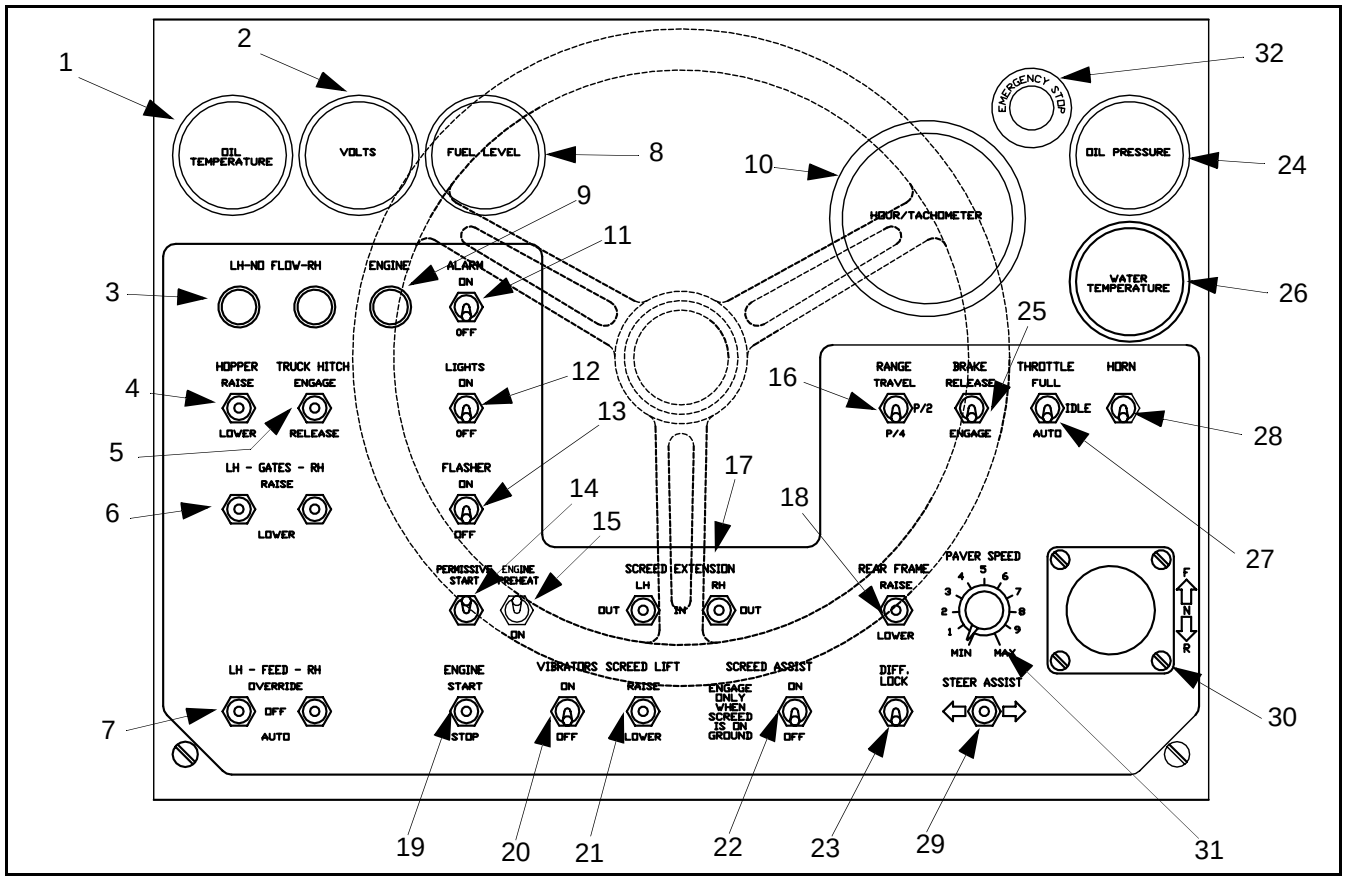


Figure 3 - 4 Wheeled Slat Conveyor Paver Operator's Console

1) Oil Temperature Gauge
2) Voltmeter Gauge
3) Mix Flow Indicators
4) Hopper Switch
5) Truck Hitch Switch
6) Gates Switch
7) Feed Override Switches
8) Fuel Level Gauge
9) Engine Oil Pressure Ind.
10) Hour/Tachometer
11) Alarm Switch
12) Lights Switch
13) Flasher Switch
14) Permissive Start Switch
15) Engine Preheat Switch
16) Range Travel Switch
17) Screed Extension Switches
18) Rear Frame Switch
19) Engine Switch
20) Vibrators Switch
21) Screed Lift Switch
22) Screed Assist Switch
23) Differential Lock Switch
24) Oil Pressure Gauge
25) Brake Switch
26) Water Temperature Gauge
27) Throttle Switch
28) Horn Switch
29) Steer Assist Switch
30) Travel Joy Stick
31) Paver Speed Dial
32) Emergency Stop Switch

Operator's Console

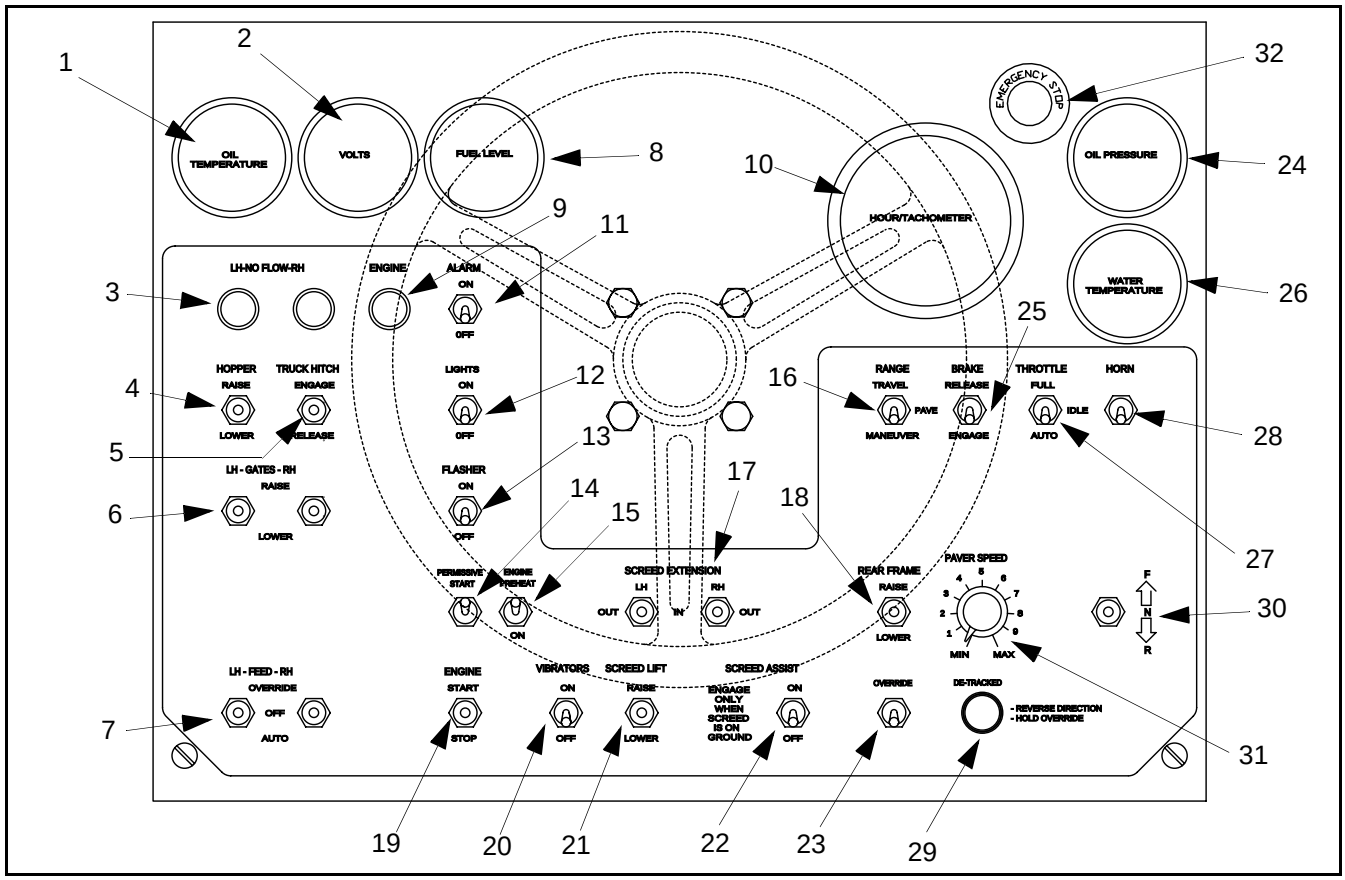


Figure 3 - 5 Track Slat Conveyor Paver Operator's Console

1) Oil Temperature Gauge
2) Voltmeter Gauge
3) Mix Flow Indicators
4) Hopper Switch
5) Truck Hitch Switch
6) Gates Switch
7) Feed Override Switches
8) Fuel Level Gauge
9) Engine Oil Pressure Ind.
10) Hour/Tachometer
11) Alarm Switch
12) Lights Switch
13) Flasher Switch
14) Permissive Start Switch
15) Engine Preheat Switch
16) Range Travel Switch
17) Screed Extension Switches
18) Rear Frame Switch
19) Engine Switch
20) Vibrators Switch
21) Screed Lift Switch
22) Screed Assist Switch
23) Override Switch
24) Oil Pressure Gauge
25) Brake Switch
26) Water Temperature Gauge
27) Throttle Switch
28) Horn Switch
29) De-Tracked Indicator
30) Travel Switch
31) Paver Speed Dial
32) Emergency Stop Switch

Operator's Console

1) **Oil Temperature Gauge -** Indicates temperature of hydraulic fluid. If fluid temperature exceeds 180° F stop paving and determine cause.

2) **Voltmeter** - Indicates battery and alternator condition. (Table 3 - 1)

Reading on Voltmeter	Engine not running or running at idle	Engine running at Full throttle
less than 10 V	Dead or disconnected battery	Dead or disconnected battery
10 V to 12 V	Low battery charge. Constant reading in this area may indicate problems with the charging system.	A voltmeter reading below 12 volts means that the current being drawn for lights, charging the battery, solenoids, etc. exceeds the output of the alternator. Check for a defective battery or a short in the wiring.
12 V to 13 V	Well charged battery in good condition.	When the engine is started the pointer may stay in this area temporarily but should gradually rise above 13 volts as alternator reaches normal output.
13 V to 15 V	Readings in this area while the engine is not running indicate defective voltmeter.	This is where the readings should be when the alternator and battery are in good condition and functioning properly.
Above 15 V	Readings in this area while the engine is not running indicate defective voltmeter.	When the pointer goes above 15 volts, the alternator is putting out too much voltage and should be checked. Continued operation of the engine in this range will damage the battery and solenoid valves.

Table 3 - 1 Voltmeter indications

3) **Mix Flow Indicators** - Sensors on the gates cause indicator lights on control panel to light when material is not contacting sensors. Each conveyor has a separate sensor and indicator.

4) **Hopper Switch** - The hopper raise switch is spring-loaded to automatically return to the neutral position when released. It must be held in the "Raise" or "Lower" position to control the hopper wings.

5) **Truck Hitch Switch** - The optional truck hitch switch holds the truck in position at the front of the paver so little or no material is spilled after a truck is captured. The truck driver does not have to ride the brakes to stay firm against the paver.

The Truck Hitch switch is spring-loaded to return to the neutral position when the switch is released. To engage the truck, hold the switch in "Engage" until the truck is in place, then let the switch return to neutral to hydraulically lock the truck. To unhitch, place the switch in the "Release" position.

The truck hook is equipped with an adjustable needle valve on the front bulkhead which controls the speed that the truck hook engages the trucks wheels. Rotate the needle valve clockwise to reduce the engage speed and counterclockwise to engage the truck hook quicker. A pressure reducing valve is incorporated into the hydraulic circuit to prevent the truck hook from bending truck rims or causing tires to pop off their rims.

Operator's Console

6) **Gates Switch** - The hopper gates regulate the depth of mix carried to each auger. The spring-loaded switches must be held in "Raise" or "Lower" until the desired gate height is obtained. When released, the switch returns to neutral.

7) **Feed Switch**- This is a 3-position switch. If this switch is set to "Off" (center position), the spreading conveyors stop.

   If this switch is set to the "Auto" position, the spreading conveyors run and are controlled by the sonic controls.

   When this switch is in the "Override" position, the spreading conveyors run at full speed.

8) **Fuel Level Gauge -** This gauge displays quantity of fuel remaining in the tank.

9) **Low Engine Oil Pressure Indicator** - This indicator will light when the engine oil pressure falls below 5 PSI. When the engine is first started and the permissive start switch is held on, this indicator will remain lit until the engine oil pressure rises above 5 PSI. Once this indicator goes out the permissive start switch can be released.

10) **Hour Meter / Tachometer** - Indicates engine RPM's and operating hours.
    Full throttle engine speed = 2100 RPM,
    Idle engine speed = 950 RPM.
    Idle engine speed when equipped with electric screed = 1400 RPM

11) **Audible Alarm Switch** - With this switch in the "On" position and when the Mix Flow Indicators light, an audible alarm will sound to make the operator aware of the problem. When this switch is in the "Off" position, the alarm is silenced but the Mix Flow Indicator lights still operate.

12) **Lights Switch** - Push up to turn headlights "On" and down to turn headlights "Off".

13) **Flasher Switch** - Push up to turn flashers "On", down to turn flashers "Off".

14) **Permissive Start Switch** - When starting the engine, this switch must be held down until the engine starts and the engine oil pressure rises over 5 PSI and the Engine indicator goes out. If this switch is released before the engine oil pressure reaches 5PSI, the engine will stop.

15) **Engine Preheat Switch** - Pull down on this spring-loaded switch to activate the engine pre-heater. During cold weather, use this switch to pre-heat the engine before attempting to start. Releasing the switch will return it to the "Off" position.

16) **Range Switch** - The range switch has three positions:

    Track Paver - "Travel", "Pave", and "Maneuver".

    Wheeled Paver - "Travel", "P/2", and "P/4".

"Travel" - Both Paver types. Use for roading or traveling around the job site.

"Pave" - Track Paver. Use for straight paving.

"Maneuver" - Track Paver. Use for moving paver around in tight turning circumstances.

"P/2" - Wheeled Paver. Use the "P/2" position for paving in normal drive.

Operator's Console

"P/4" - Wheeled Paver. (If paver not equipped with this option, it operates the same as for "P/2".) Use the "P/4" position to engage the front wheel assist. Engaging the optional front wheel assist will reduce the paver speed by 30% but it provides 50% more pulling capacity.

The paver must be stopped before changing from "Travel" to "Pave", "P/2", or "P/4", or back the opposite way.

⚠WARNING

Failure to stop the paver before changing from "Travel" to "Pave"("P/2 or "P/4"), or the opposite way, could result in serious injury to anyone riding the paver.

17) **Screed Extension Switches**- Used on Stretch model screeds to extend or retract the extensions. On Fastach screeds this switch is used to extend or retract the optional hydraulic sloping strike-off extension.

18) **Rear Frame Switch** - Push up to "Raise" the rear of the paver, down to "Lower" the rear of the paver.

This switch allows the operator to elevate the rear of the tractor to give maximum ground clearance for loading the paver or traveling over rough ground or obstacles. An initial setting of about halfway is suggested.

When using a heavy screed with extensions or other heavy accessories, it may be necessary to lower the screed to the ground before engaging the Frame Raise system.

19) **Engine Switch** - The engine will start only if the brakes are engaged, the travel lever/switch is in neutral, the permissive start switch is engaged, and the Master Key is "On".

20) **Vibrators Switch** - The vibrator switch will function only when the travel lever/switch is forward and the brake is released. Push up to turn vibrators "On", down to turn vibrators "Off".

21) **Screed Lift Switch** - Push up to "Raise" the screed, down to "Lower" the screed, or center for "Neutral". After the screed is raised to the desired height and the switch is released, it returns to the hold position. The screed is hydraulically locked at that height. While paving, the switch must be set in the "Lower" float position.

22) **Screed Assist Switch** - Pavers equipped with power extending screeds (Stretch 16 or Stretch 20) have a Screed Assist system that allows adjustment of the screed bearing pressure on the mat. Once turned on, the screed assist should be left on. Do not switch the screed assist on and off while the paver is in motion. The screed assist should only be turned on when the screed is resting on the ground and should be turned off prior to raising the screed.

NOTICE

If the screed is raised when the screed assist switch is in the ON position the screed could drop suddenly, seriously damaging the screed.

Operator's Console

23) **Differential Lock Switch** - (Wheeled paver) In wet or slick conditions one wheel could lose traction and begin to spin. By activating the differential lock switch, both rear wheels will drive regardless of how much traction is on either wheel.

23) **Override Switch** - (Track paver) When a de-tracking event occurs, this switch must be pushed forward and held for the paver to move. Movement is enabled only for as long as this switch is held in this position. The Travel Switch (30) should be switched to the opposite direction and the paver moved until the track re-engages.

24) **Engine Oil Pressure Gauge** - Indicates engine oil pressure. Minimum oil pressure = 5 psi. Engine will shut down if engine oil pressure falls below 5 psi and the permissive start switch is not engaged.

25) **Brake Switch** - The brake switch engages and releases the brakes. Brakes will not release until sufficient system pressure is built up and the switch is set to the "Release" position. Do not use for routine braking. Use only for parking and emergency stops.

26) **Water Temperature Gauge** - Indicates engine coolant temperature. Normal operating temperature = 205° F. Engine will shut down if engine coolant temperature exceeds 223° F.

27) **Throttle Switch** - The switch has three positions "Idle", "Full" and "Auto". Use "Idle" to start and warm up the engine, hydraulic oil, and screed. "Full" will run the engine at full throttle. Switch to "Full" only after engine and hydraulic oil have warmed up. "Auto" will run the engine at idle when the travel lever/switch is in neutral and then at full throttle when travel lever/switch is moved to move the paver.

28) **Horn Switch** - Push up to sound the horn. When the switch is released, it will return to the "Off" position.

29) **Steer Assist** - (Wheeled paver) The steer assist switch is spring-loaded to return to center. When the switch is activated to one side or the other, the system slows the inside rear drive motor while continuing to drive the other motor at regular speed. This has the effect of abruptly steering the paver in the direction the switch is pushed. This switch is only active in the Pave mode and not in Travel mode.

29) **De - Tracked Indicator** - (Track paver) Indicates when paver de-tracked condition/ correction situation exists. The paver will stop moving until the condition is remedied and this indicator light is not illuminated.

30) **Travel Lever** - (Wheeled paver) Moving the lever forward or back moves the paver in the desired direction. Speed is increased as the lever is moved more forward or reverse. This provides a smooth start.

30) **Travel Switch** - (Track paver) Moving the switch forward or back moves the paver in the desired direction.

31) **Paver Speed** - This dial is used to govern the maximum travel speed of the paver. The travel lever (wheeled paver) provides variable speed up to the setting on the speed dial.

Maximum speed for the wheeled paver is about 365 feet/minute (110 meters/minute) and about 13 miles/hour (20.9 km/hour).

Maximum speed for the track pavers is: 205 feet/minute (63 meters/minute) and about 8.8 miles/hour (14.1 km/hour) for rubber track.

The steel track paver maximum speed is 165 feet/minute (50 meters/minute) and about 5.6 miles/hour (9 km/hour). A setting of five should be about half maximum speed.

With the Max Paver Speed dial at zero and travel lever/switch forward, the paver should not move. This is used to test the auto feed, vibrators, and auto grade & slope functions.

32) **Emergency Stop Switch** - This push-button switch, when activated, immediately shuts down all paver systems.

Optional Equipment

Screed Extension

Screed extensions are furnished in 6",12", 24" and 36" lengths which make it possible to pave widths up to 30'. Both screed and auger extensions can be quickly attached. It is recommended that auger extensions be 1' less than the screed extensions used. For example; with a 1' screed extension no auger extension is needed, with a 2' screed extension use a 1' auger extension, etc. (Figure 3 - 6)

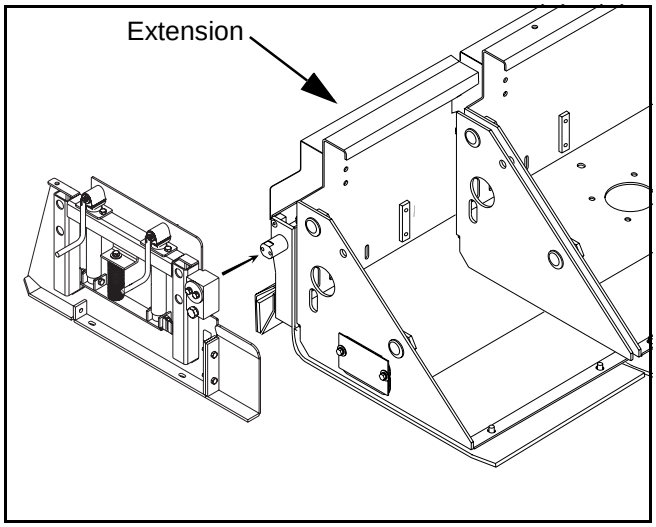


Figure 3 - 6 Screed Extension

Slopeable Hydraulic Strike-off Extension

Hydraulic strike-off extensions are ideal for parking lots because they reduce or eliminate handwork to bleed out material at driveways, tapers, flush-to-wall work, etc. This reduces the need for extra passes which saves time and makes any paving operation more profitable.

These strike-offs provide a level surface and constant mat depth extendible up to 4' on each side. Strike-off blades are easily adjusted to match main screed strike-offs. Hydraulic slope adjustment simplifies laying drainage contours and other special applications. (Figure 3 - 7)

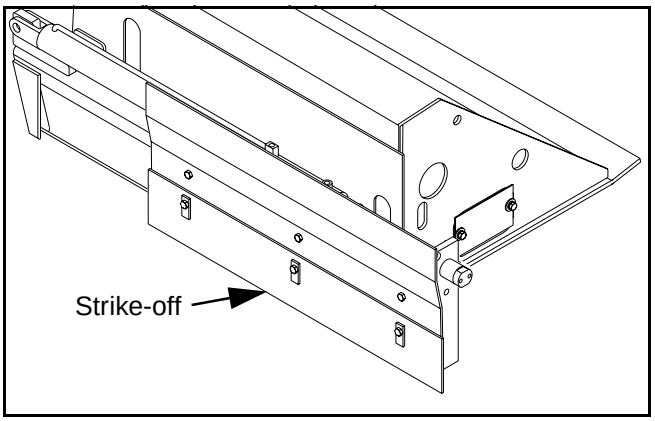


Figure 3 - 7 Slopeable Hydraulic Strike-off Extension

Optional Equipment

Truck Hook

The truck wheels ride against the push rollers which pushes the truck ahead of the paver. To prevent the truck from pulling away from the paver while moving down a hill, retractable rollers hook into the inside of the truck wheels. (Figure 3 - 8)

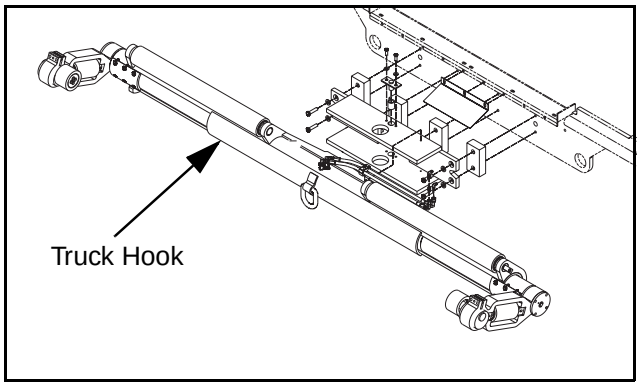


Figure 3 - 8 Truck Hook

Bevel Guide Plate

The adjustable bevel plate bolts to screed end plate to assure a smooth sloping contour on the edge of the mat. Two plates are available: one for 1-1/2” depth and one for 3" depth with bevel angle at 45°. (Figure 3 - 9)

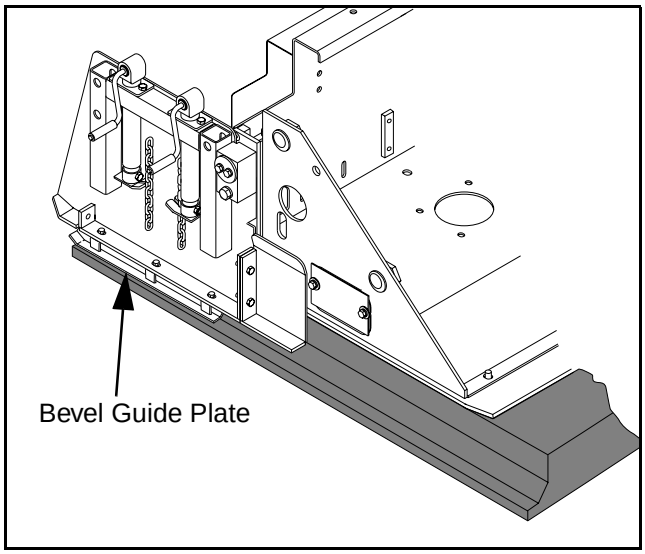


Figure 3 - 9 Bevel Guide Plate

Automatic Grade and Slope Control

The grade and slope control enables the paving contractor to lay uniform and smooth mats automatically, regardless of irregularities in the roadway. It also provides precise slope angle for curves in roadway.

Topcon Grade and Slope Control

The Topcon grade and slope control system includes sonic grade sensors and a pendulum slope sensor to maintain the desired mat profile. (Figure 3 - 10)

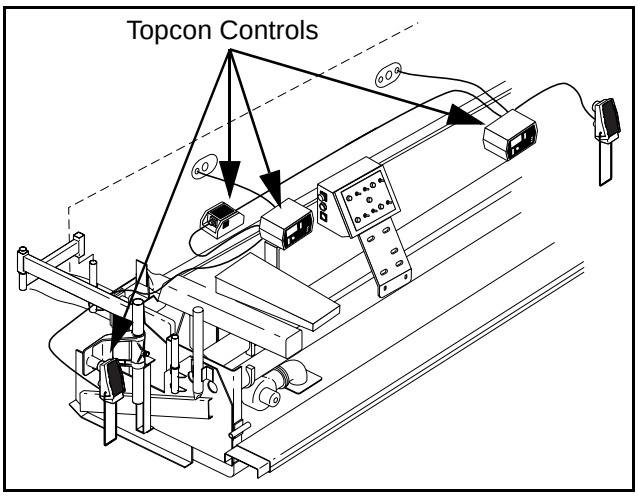


Figure 3 - 10 Topcon Grade and Slope Control

Auxiliary Generator

The auxiliary generator includes a hydraulically driven generator and four electrical outlets to use for various electrical functions such as the night lighting shown below. (Figure 3 - 11)

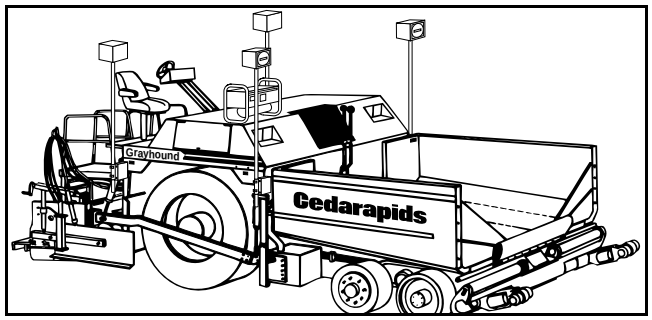


Figure 3 - 11 Night Lighting Shown

Optional Equipment

Grade Reference Ski

Two grade reference ski systems are available; the multi-foot ski and tube ski. The skis are available in 20', 30', and 40' lengths. Skis travel along an existing road surface sensing changes in grade while averaging out bumps. The tube ski consists of a single tube section which rides directly on the road surface. The multi-foot ski consists of a main beam supported by several skid plates. Each skid plate is spring mounted to provide independent movement over irregular surfaces. As the ski passes over bumps, each skid plate is deflected independently, while the main beam maintains a constant level. This allows the screed to produce a mat with minimal bumps. (Figure 3 - 12)

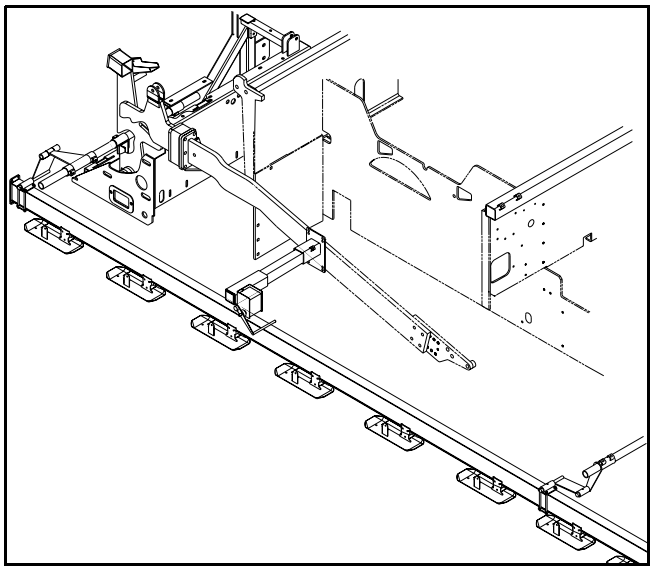


Figure 3 - 12 Multi-Foot Ski

The over-the-screed ski uses the multi-foot or tube ski in front of the screed to sense changing grade and a skid plate that rides behind the screed on the new mat surface. This system produces the smoothest mat surface by "averaging" the grade of the existing road surface and the newly laid mat. (Figure 3 - 13)

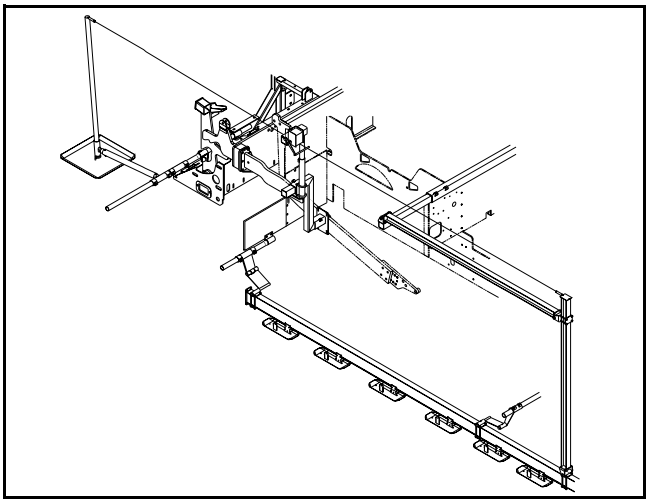


Figure 3 - 13 Over-the-Screed Ski

Material Retaining Plates

Two-foot (2') Material Retaining Plates are mounted to the paver frame and extend out toward the end gate during wide width paving. They limit the amount of material that builds up in front of the auger. When auger extensions up to Three feet (3') are added to either side of the paver, a retaining plate support brace is attached to the screed pull arm. When four feet (4'), or more (3ea. 1-ft. sections), extensions are used, an extra support brace is added. (Figure 3 - 14)

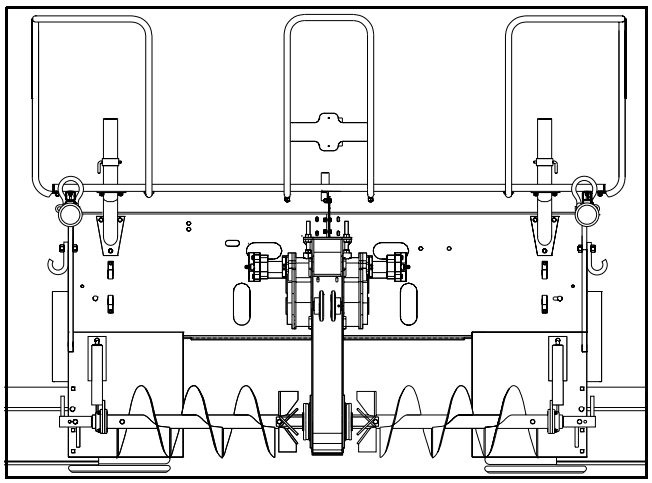


Figure 3 - 14 Material Retaining Plates

Optional Equipment

Auger Extensions

As extensions are added to the screed or when a screed or strike-off is extended, auger extensions must be added to move material out the full width of the screed. Auger extensions are available in one, three, and five-foot lengths. (Figure 3 - 15)

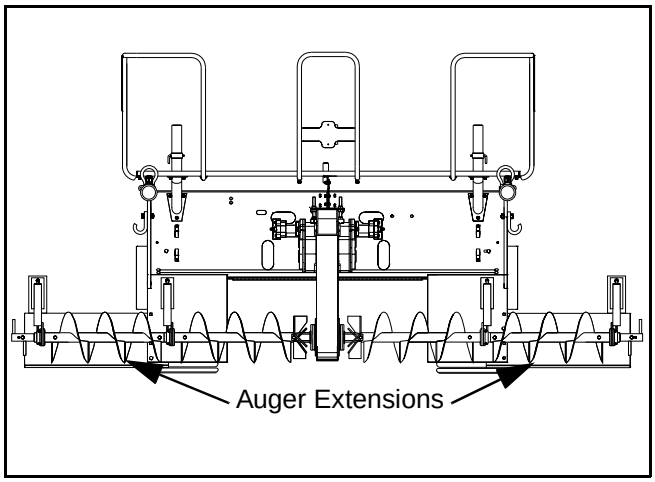


Figure 3 - 15 Auger Extensions

End Gates

End Gates are mounted on the end of the screed, extension, or extendable strike-off. They prevent material from spilling out beyond the reach of the screed and form a good edge on the mat.
(Figure 3 - 16)

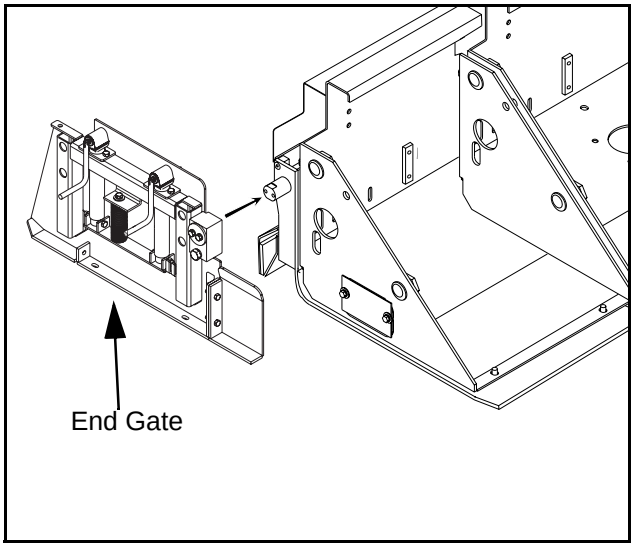


Figure 3 - 16 End Gates

Cutoff Shoe

Standard cutoff shoes attach to the screed end gate when paving at less than the full width of the screed. The shoe can be adjusted in 1-1/2” increments. (Figure 3 - 17)

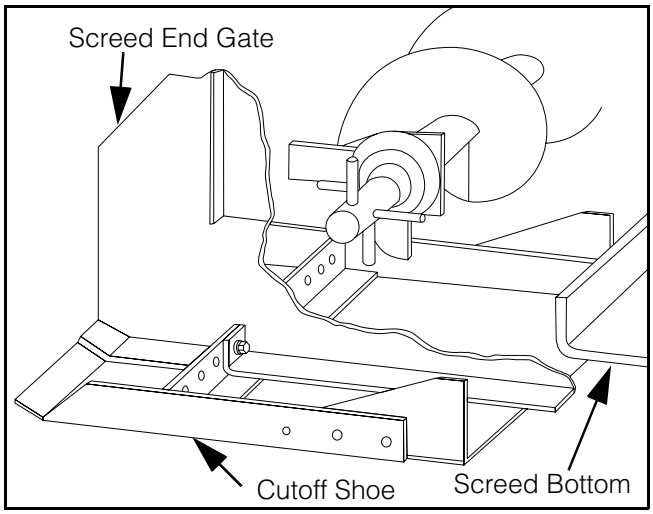


Figure 3 - 17 Cutoff Shoe

Front Wheel Assist

Gives paver up to 50% more pulling capacity with the flip of a switch on the operator’s control panel on the Wheeled Paver. (Figure 3 - 18)

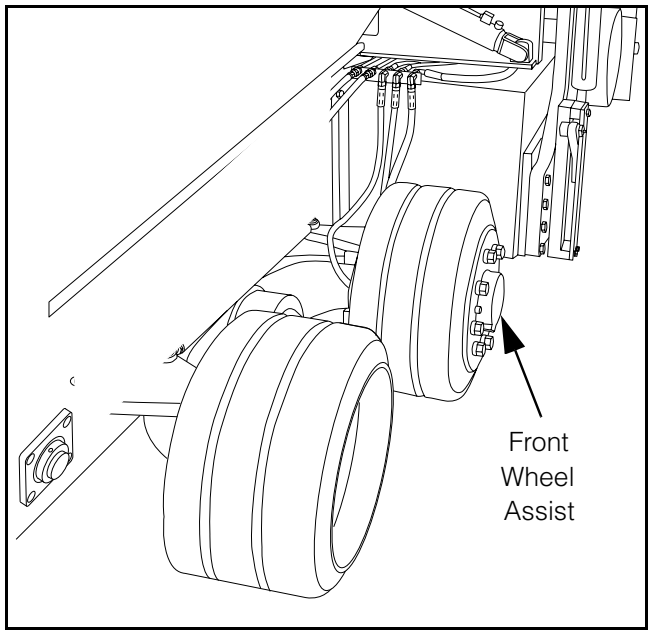


Figure 3 - 18 Front Wheel Assist

Optional Equipment

Proportional Material Feed control

A mechanical wand measures the height of the material and adjusts conveyor speed as needed to maintain a uniform head of material in front of the screed. (Figure 3 - 19)

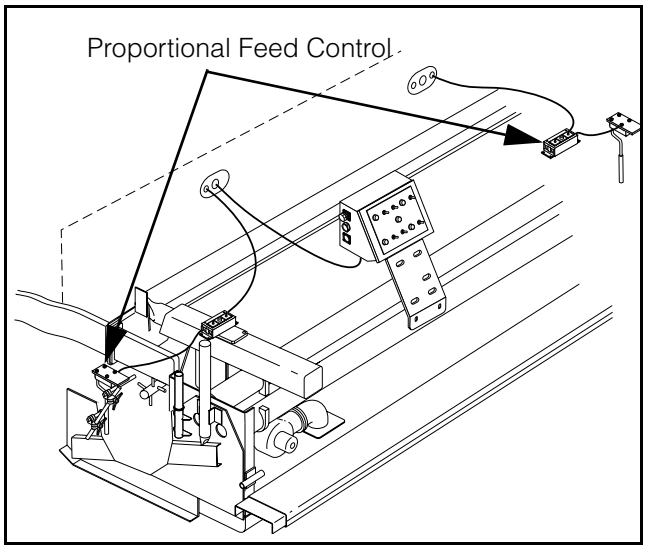


Figure 3 - 19 Proportional Feed Control

Sonic Feed control

Adding a Sonic control further automates material feed to the auger. Weather-resistant sensor unit uses sound pulses to measure material height at the auger. Material delivery is regulated to maintain a uniform material head. (Figure 3 - 20)

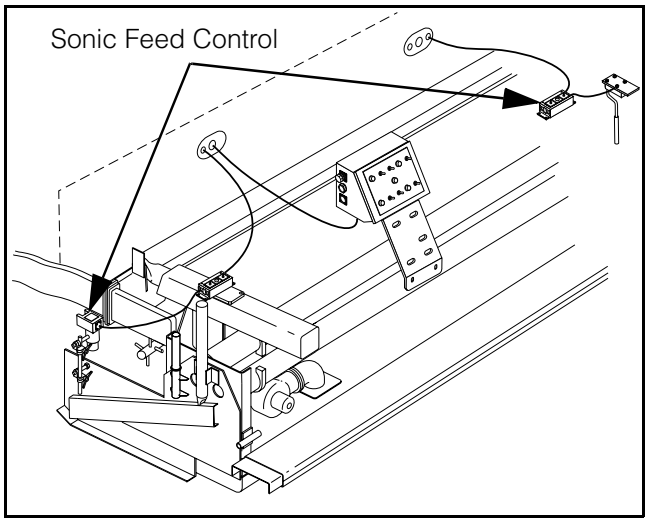


Figure 3 - 20 Sonic Feed Control

Starting the Engine

1) Make sure all personnel are clear of the paver and aware that the paver is going to be started.

2) Set the Master Switch to the ON position. The Master Switch can be accessed through an access door in the hood on the left side of the operator platform. (Figure 3 - 21).

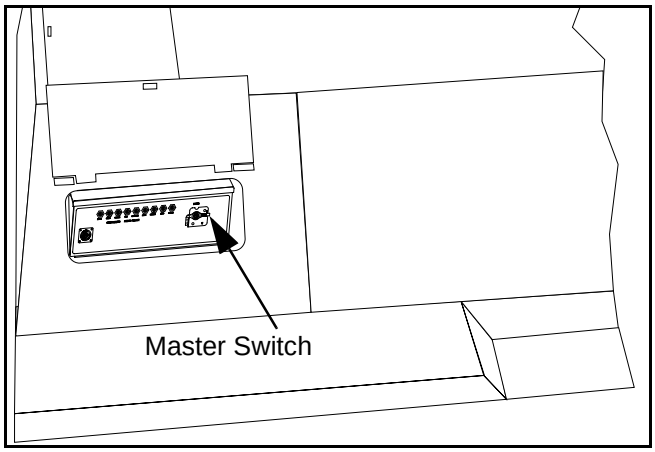


Figure 3 - 21 Master Switch Platform Location

3) Set the console switches and controls as follows:

Left and Right Feed Conveyors	Off
Vibrators	Off
Screed Assist	Off
Range - Track Paver - Wheeled Paver	Pave P/2
Brake	Engage
Throttle	Idle
Rear Frame	mid-position
Paver Speed	“Min.”
Travel Direction	“N” (neutral)

Table 3 - 2 Prestart switch settings

Starting the Engine

NOTICE

The engine will not start if the console switches are not set as indicated in Table 3 - 2 .

1) Pull the spring-loaded permissive start switch down and push the spring-loaded Engine Start/ Stop switch up. Engine will start cranking. If the engine does not start after 30 seconds, release the switch, and let the starter cool down before cranking the engine again.

2) Once the engine starts, release the Engine Start/Stop switch (switch returns to the mid-position) while still holding the permissive start switch engaged. If the permissive start switch is released before engine oil pressure reaches 5 psi., the engine will stop immediately.

This system is designed to protect the engine when the oil pressure drops below 5 psi or the engine temperature rises above 223 degrees F.

Important - After the engine oil pressure is above 5 psi and the engine temperature is below 223 degrees F., the engine light will go out and the permissive start switch can be released.

Once the engine is running, allow it to idle for at least 5 minutes to warm up before bringing the engine to full throttle.

Starting the Engine

Engine start-up after stall

Under certain conditions the engine could stall while under load.

⚠CAUTION

Attempting to restart the engine immediately after it stalls, could overload and damage the starter.

If the engine stalls under load, allow 5 to 10 minutes for the hydraulic system pressures to "leak down" before trying to restart the engine.

Jump-Starting/Charging Batteries

⚠WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash hands after handling.**

⚠WARNING

Batteries give off explosive hydrogen gas when charging. Keep flame and sparks away from the battery while jump-starting or charging.

NOTICE

The pavers use a 12-Volt electrical system. When jump starting or charging the paver, make sure to use a 12 Volt power source.

1) Raise the hood. Refer to the Raising the Hood section in this manual.

2) Connect the jumper cables to the power source. (Figure 3 - 22)

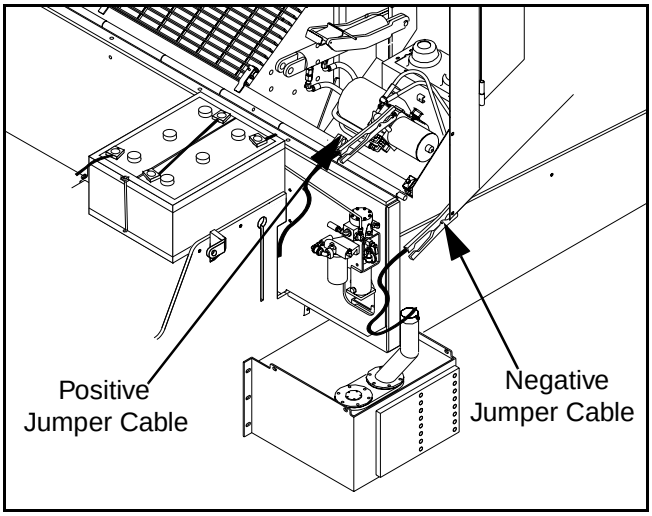


Figure 3 - 22 Jumper Cable Connection Points

⚠WARNING

It is critical that the last cable connected and the first cable disconnected be the negative (-) cable. Make the negative (-) cable connection as far away from the battery as possible. Connecting and disconnecting jumper cables or a battery charger to and from a battery could cause a spark and ignite the hydrogen gas that is produced by the battery.

3) Connect the positive (+) cable to the positive (+) battery terminal or power terminal on the hood raise power pack motor.

4) Connect the negative (-) cable to the paver frame away from the battery. The negative (-) cable should always be connected away from the battery.

5) As soon as the engine starts, remove the jumper cables.

Emergency Towing

If your paver becomes disabled, and the engine can not be started, it may be necessary to tow the paver. Pavers have a parking brake that automatically engages anytime the engine is not running. Before towing a paver, the brakes must be released, and the travel pumps put into bypass.

⚠WARNING

Read all of the towing instructions before starting this procedure.

⚠WARNING

Block or restrain the paver before releasing the brakes. Failure to block or restrain the paver could result in serious injury or death.

⚠WARNING

When towing the paver using the following procedure, the paver will not have drive, braking, or steering control. Do not travel down steep grades which could cause the paver to collide with the towing vehicle.

1) Turn bypass valve on each travel pump counterclockwise slowly 2 turns. (Figure 3 - 23)

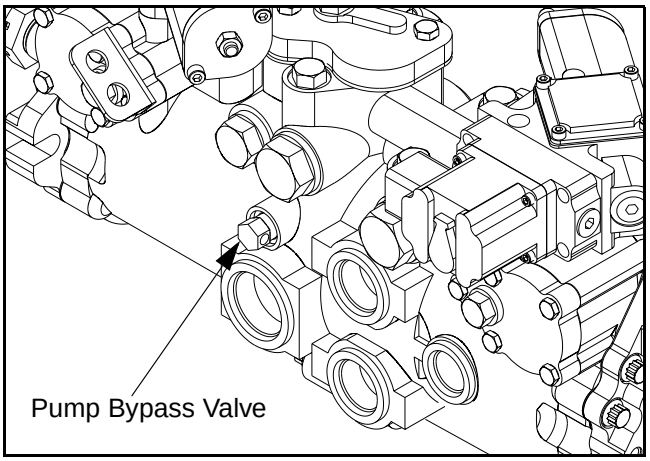


Figure 3 - 23 Travel Pump Bypass Valve

2) Disconnect brake hoses from brake/range-shift solenoid valve located on right-hand rear of engine (Figure 3 - 24). Place caps on the valve fittings to keep dirt out of the hydraulic system.

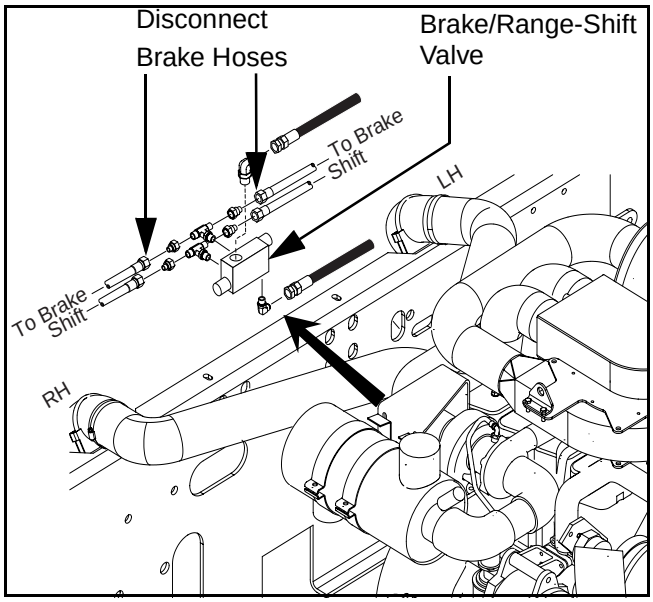


Figure 3 - 24 Preparing to release brakes

3) Attach a porta-power to open hose ends and pump the pressure up to at least 350 psi to release the brakes (Figure 3 - 25). The brakes can be reapplied by releasing the pressure at the porta-power.

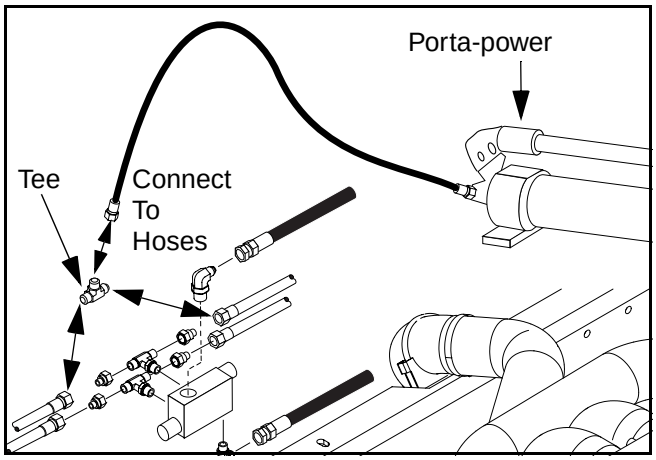


Figure 3 - 25 Releasing Brakes with Porta-power

NOTICE

Maintain a minimum of 350 psi to fully release the brakes. Do not exceed 1500 psi.

⚠WARNING

Use a chain in good condition that is capable of pulling the paver.

4) Open the front conveyor bearing covers.

5) Run the chain through the holes shown. (Figure 3 - 26)

Emergency Towing

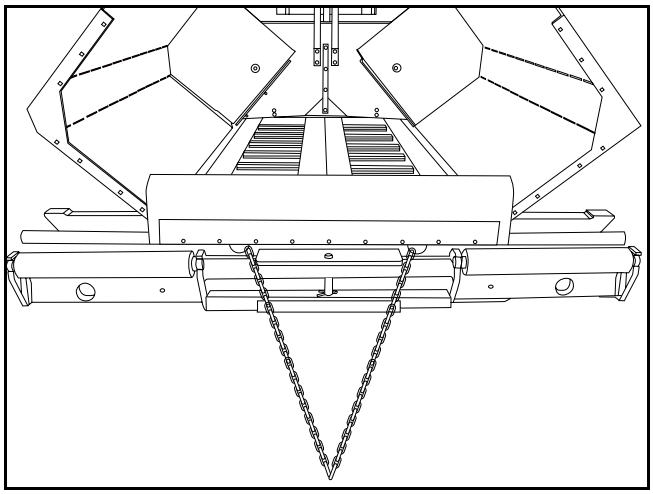


Figure 3 - 26 Attaching chain for towing

NOTICE

Attaching chains to the push roller frame or truck hook frame could result in serious and expensive damage.

6) Slowly apply tension to chains to start paver moving. Move the paver at a very slow walking pace.

NOTICE

Pulling the paver faster than 25 feet per minute can result in serious and expensive damage to the travel system.

7) When the paver is in desired location, release the pressure at the porta-power and reconnect the hoses to the brake valve.

8) Close the bypass valves on each travel pump by rotating clockwise until snug against seat. (Figure 3 - 23)

9) Tighten to 7 - 10 ft./lbs.

Loading/Unloading

Driving the Paver off a Trailer

The paver can be loaded or unloaded from various kinds of trailers. When loading or unloading a paver the clearance from the ground to the auger or screed becomes a concern. Some trailers will require construction of a ramp long enough so the augers or screed will not drag on the ground.

NOTICE

Always use the frame raise system to raise the rear of the paver as high as possible before loading or unloading the paver. The screed or augers could be damaged if they drag on the ground.

Pavers have a Frame Raise feature which allows the rear of the paver to be raised during loading and unloading. The paver should be raised as high as possible for maximum ground clearance during loading or unloading. (Figure 3 - 27) and (Figure 3 - 28)

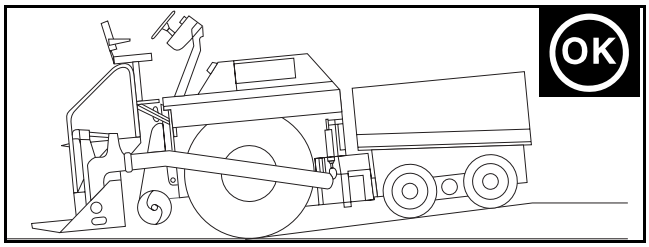


Figure 3 - 27 Sufficient ground clearance

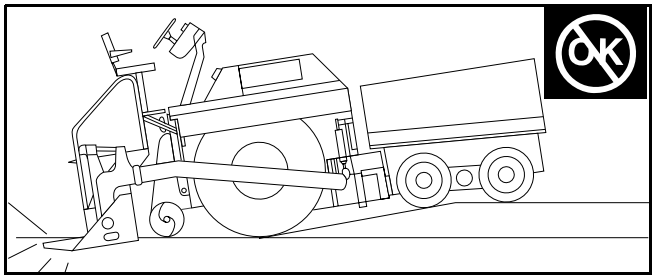


Figure 3 - 28 Insufficient ground clearance

The screed should always be raised and the screed lock hooked when loading or unloading the paver. If the paver cannot be loaded or unloaded without the screed dragging the ground, the screed can be removed.

NOTICE

If the screed is removed, carefully watch the augers to make sure they do not drag on the ground during loading and unloading.

NOTICE

All constructed ramps must be capable of supporting the total machine weight.

NOTICE

Rubber Tracks can be damaged by sharp objects on the surface of ramps or trailer when loading and unloading.

To move the paver on or off a trailer:

1) Remove all chains and binders from the paver frame.

2) Start the engine.

3) Use the frame raise system to elevate the rear of the paver as much as possible.

4) Raise the screed and hook the screed lock.

5) Have a person on the ground to help guide you on or off the trailer.

6) Set the Pave/Travel switch to Pave (P2 on rubber tired models) and Speed Dial to 0.

7) Bring the engine to Full throttle.

Loading/Unloading

8) Place the brake switch in the Release position.

9) Place the Travel Direction switch in the direction needed.

10) Slowly increase the setting on the speed dial until the paver starts moving. It is safer to use a slow speed while loading or unloading.

You can use the brake switch to engage the brakes in an emergency.

⚠WARNING

If the brakes are used to stop a moving paver, the paver will stop suddenly. The brakes should be used to stop the paver only in an emergency.

Lifting With Crane

Ensure the crane and cables to be used are capable of safely supporting the total machine weight.

Attach one cable to each of the two lifting points on the rear of the paver. (Figure 3 - 29) Loop a chain through the lifting eyes at the front of the paver and attach it to the crane hook. (Figure 3 - 30)

The two rear cables must be of equal length and the front cable/chain must be adjusted to two equal lengths.

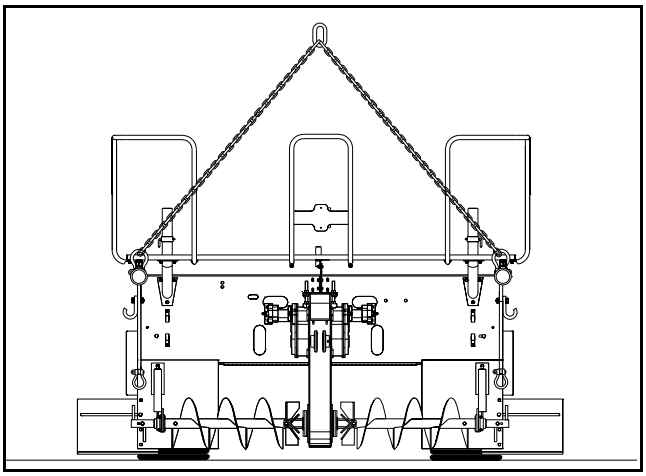


Figure 3 - 29 Rear lift points

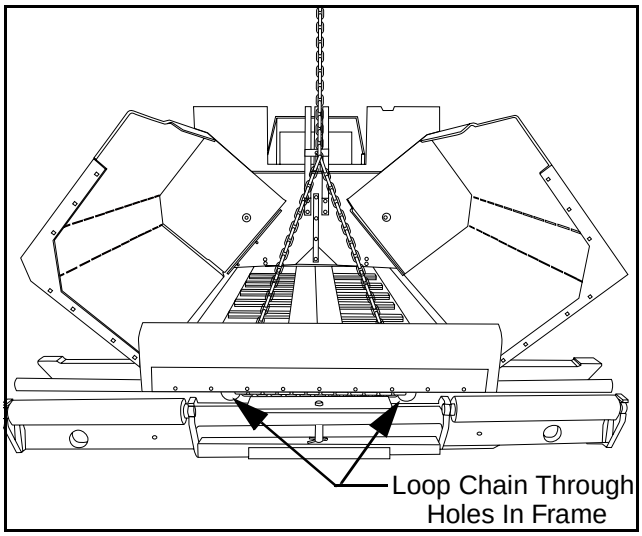


Figure 3 - 30 Front lift points

⚠WARNING

Each lifting cable must be hooked to the crane hook independently. (Figure 3 - 31) Do not loop a single lifting cable through the crane hook and back to a second lifting point.

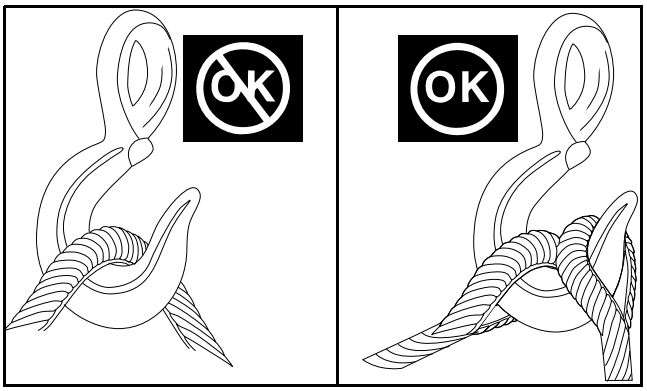


Figure 3 - 31 Attach cables correctly

Attach the lifting device to the integrated screed lock. (Figure 3 - 32)

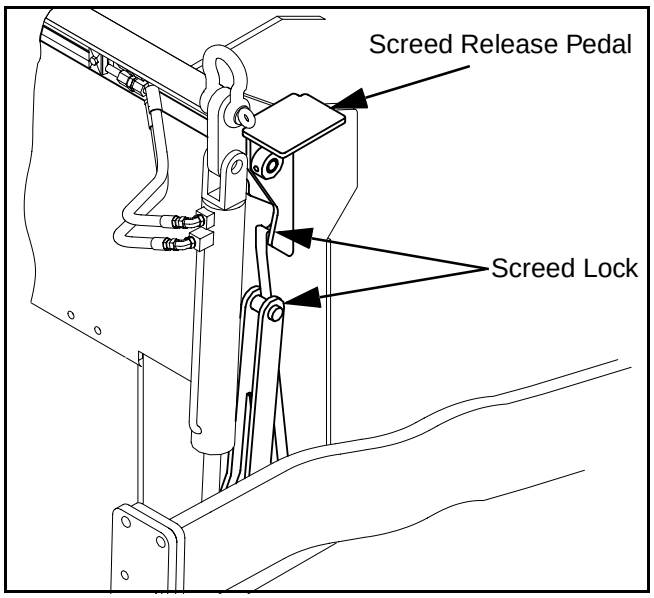


Figure 3 - 32 Screed Lock

Raise the screed - the lock engages automatically when the screed is fully raised.

To lower the screed, step on the screed release pedal.

⚠CAUTION

Do not run the paver engine while lifting the paver by a crane.

Preparation for transport

1) Load the paver onto the trailer or truck.

2) Lower the screed onto blocks at each end and in the center of the screed. (Figure 3 - 33) Never set the screed on nails, rivets, or bolt which could damage the screed bottom.

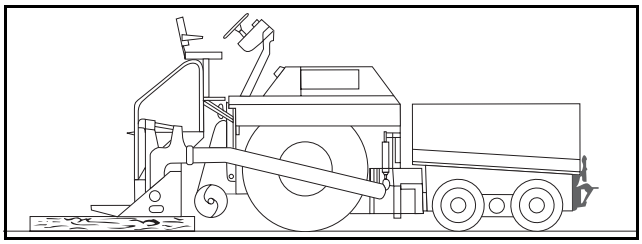


Figure 3 - 33 Set screed on blocks

3) Use the frame raise switch on the operators console to lower the rear of the paver as much as possible.

4) Use chains and chain binders to tie the paver down in the front (Figure 3 - 34) and rear (Figure 3 - 35) of the paver.

Chaining directly to the screed, truck hook, or tow arms could damage the equipment. All chains should be secured to the paver frame only.

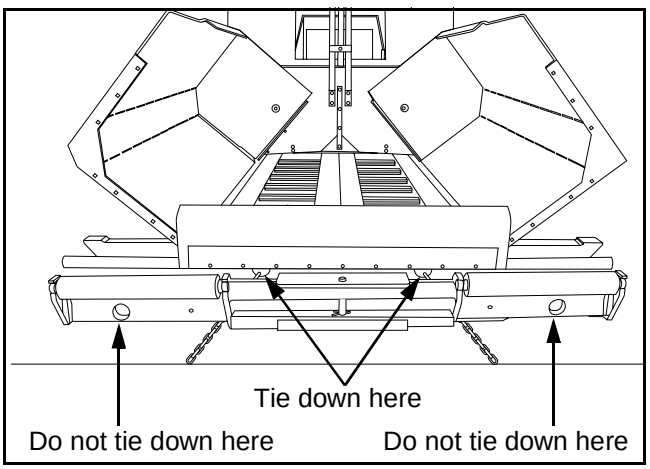


Figure 3 - 34 Front tie down points

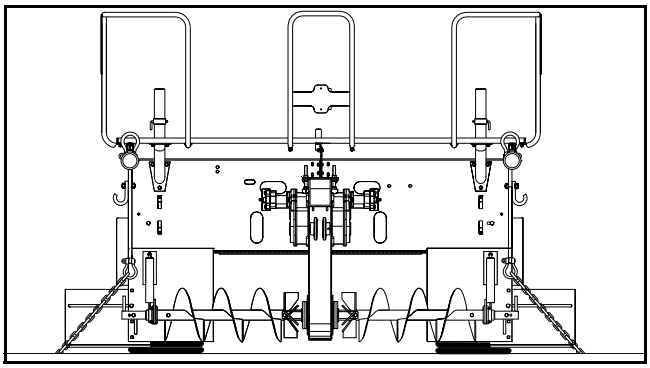


Figure 3 - 35 Rear tie down points

Preparing to Pave

Fume Recovery System

The fume recovery system is designed to collect fumes given off by hot mix asphalt and discharge them away from operator work areas.
(Figure 3 - 36). The system is designed to meet minimum emission standards.

Automatic feed sensor mounting hole covers can be removed to install a proportional feed sensor. If a proportional sensor is not used, the mounting hole covers should be reinstalled.

The fume recovery fan starts automatically when the engine is started and continues to run while the engine runs. The vacuum indicator should be checked each day before starting paving. The indicator should register a vacuum reading with engine running at full throttle. A low or no reading indicates a malfunction in the system. Refer to Section 6 for troubleshooting.

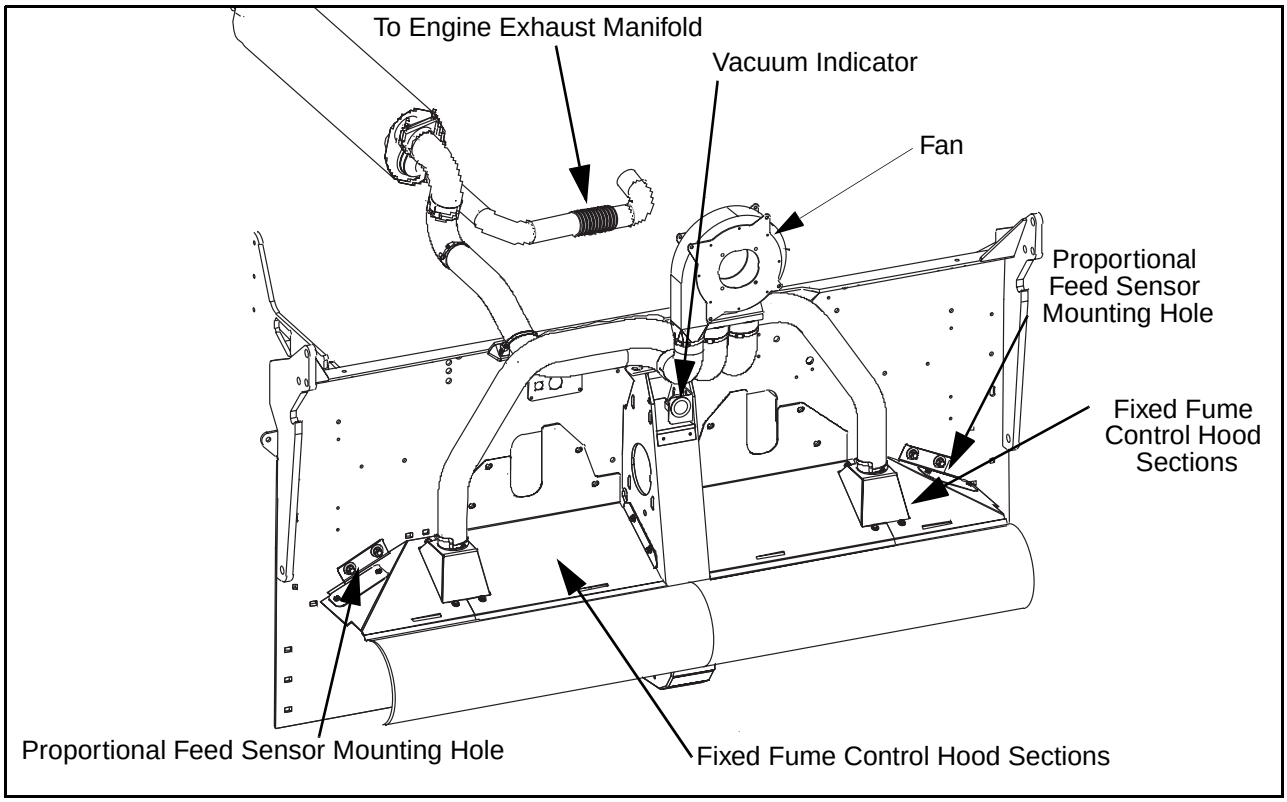


Figure 3 - 36 Fume recovery system

Preparing to Pave

Nulling Screed

NOTICE

The following is partial information on setting up the screed The Quality Paving Guide should be read completely and be kept with the paver for reference on setting up the screed.

Typically, when a screed is nulled, its angle of attack is adjusted to 0 in relation to a specific depth. This is traditionally done with the use of boards that equal the desired loose mat depth. Then a given amount of nose up attitude is introduced to the screed. The procedure is as follows:

1) The boards needed should be equal to the thickness of the loose or unrolled mat. The number needed will depend on the width at which the screed is set up to pave. Generally two (2) boards at 10' wide, four (4) boards at 20', etc. The length of each board should be such that the screed bottom is fully supported from front to tail when set on the boards.

2) Place the boards under the screed as illustrated. Attention should be placed on the grade conditions where the boards will be placed. If a board is placed on a high point or a depression, a false null setting will occur. Additional boards may be needed if you are paving at extended widths to provide support for the screed extensions. (Figure 3 - 37)

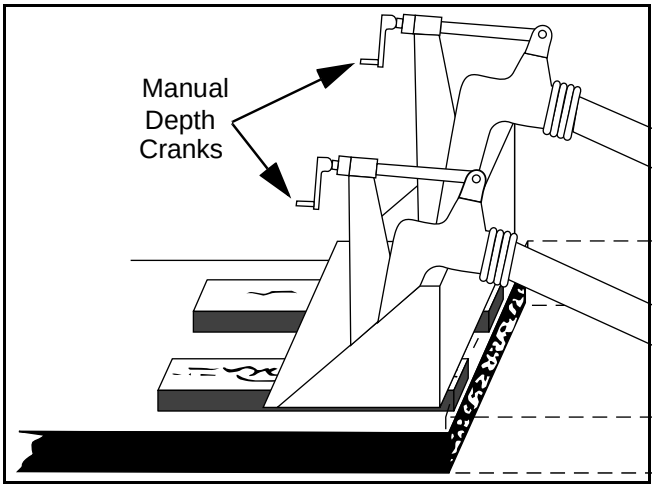


Figure 3 - 37 Nulling the Screed

3) Place the screed lift switch in LOWER position. The screed will lower down and rest on the boards.

4) Turn both manual depth cranks on the screed until the screed face is resting flat on the boards. When the screed is resting flat on the boards the hand cranks will have a small area of free rotary movement where little resistance is felt. This indicates a null position.

5) After the screed has been nulled, we need to introduce a nose up attitude (initial angle of attack) on the screed. The amount of initial angle of attack is dependent on material design, temperature of material, head of material, tow point position and type of screed. Refer to these subjects for more information. Generally, the amount of initial angle of attack required will be 1 to 2 turns of clockwise rotation on the hand cranks. As paving begins, check the depth of the mat being placed and correct for as necessary. As most contractors work with a limited number of mix designs, the paver crews quickly learn the exact amount of initial angle of attack needed for specific mix designs.

Preparing to Pave

Joints

There are two types of joints that are constructed in a paving operation, Longitudinal and Transverse. Proper construction of these joints is important not only in producing a smooth rideable surface but also in how they resist penetration of water, air and other substances that would cause a premature failure of the joint. (Figure 3 - 38)

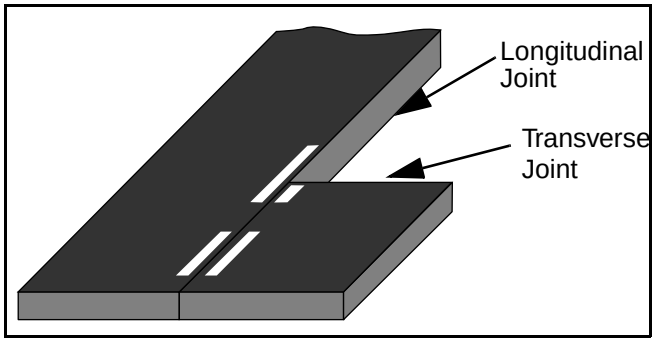


Figure 3 - 38 Types of Joints

Transverse Joints

Transverse joints are created when an existing mat or lane is to be continued. The quality and durability of the joint depends on careful preparation of the existing mat or lane. It is critical that any taper or defective area be removed.

NOTICE

The joint area has to be perfectly flat and parallel with the line of paving. If it is not, a depression or bump will be produced.

Joint Preparation

The following illustration shows, how an existing mat is checked and the tapered area removed to produce a joint area that is flat and parallel with the line of paving. (Figure 3 - 39)

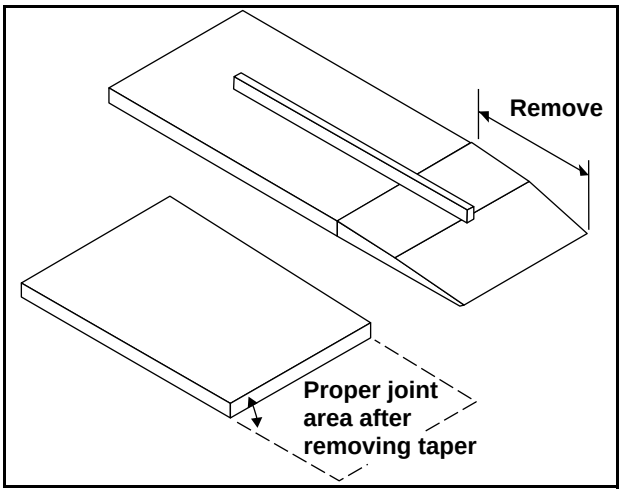


Figure 3 - 39 Joint Preparation

Joint Construction

The next step to proper joint construction is placing boards or lath that equal the amount of compaction in the joint area. (Figure 3 - 40) Remember compaction rates change due to thickness of material & material design. Once the compaction rate has been determined and the correct thickness of lath has been acquired, place the lath at the edge of the joint to elevate & support the screed to the correct starting level.

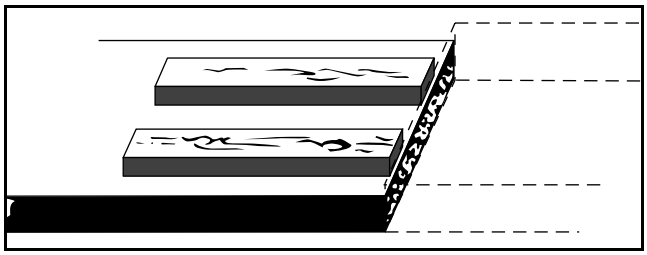


Figure 3 - 40 Matching existing mat

The screed should be preheated to the temperature of the material being used. A cold screed will not only tear the surface of the mat being placed but will also have a tendency to come off the joint low, creating a depression in the mat. Do not over heat the screed bottom, as this will damage or warp the screed bottom.

Preparing to Pave

Back the paver up over the joint and align the screed (Figure 3 - 41), so the face or mold board is square with the edge of the joint. Lower the screed onto the boards or lath and null the screed. Perform Nulling Screed procedure on page 24.

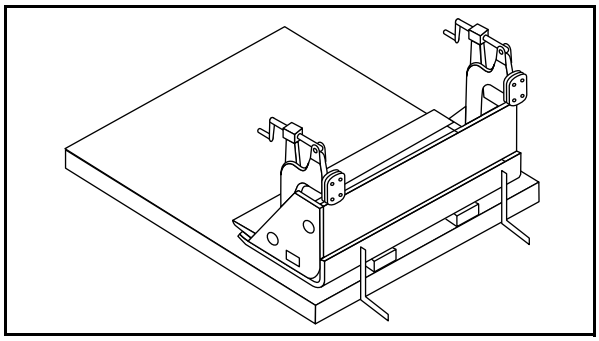


Figure 3 - 41 Aligning screed over joint

Once the screed has been nulled and the initial angle of attack has been introduced, the auger chamber should be filled to no more than 1⁄2 an auger level. Do not over fill the auger chamber, as this is the most common cause of creating a bump just after pulling off a joint. If needed the corner areas on the ends of the screed should be hand filled to prevent force feeding an excessive high head of material in the center areas of the screed.

After filling the auger chamber to the correct level, move the paver forward slowly, allowing the screed operator time to check and correct the depth if necessary. The feeder controls should be set to auto, and feed sensors checked and set to maintain the correct head of material. Once the paver has moved away from the joint area, the joint can be checked and prepared for rolling. The excess or over lap material must be removed, as this material can not be compacted into a cold or existing mat. (Figure 3 - 42) Do not shovel this overlap material back onto the fresh mat as this extra material might not be compacted down to the same height as the rest of the joint. This could create a bump.

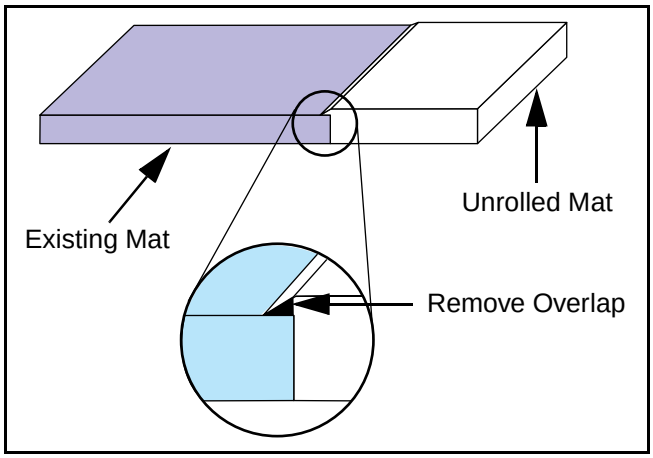


Figure 3 - 42 Removing overlap material before rolling

Once the over lap material has been removed, the joint should be checked with a good straight edge to ensure the thickness of the new mat is correct. If the new mat does not have enough material thickness at the joint when it is rolled, the density in the area where the new mat joins to the old mat will be low. This could cause a premature joint failure. If there is too much material in the joint area a bump will be produced.

Rubber Track Operating Hints

The following are some specific considerations for operation of asphalt pavers equipped with rubber tracks. While not all-inclusive, following these recommendations should reduce the risk of problems and improve rubber track durability and reliability. (Figure 3 - 43)

Do Not Allow Asphalt Build-up on Track

During paving, asphalt sometimes flows down to the rear drive wheel and become packed between the track and wheel. This may cause the following problems:

- Oil in the asphalt will cause the rubber in the track to soften and reduce the durability.
- Aggregate will abrade the rubber in the track and shorten its life.
- Asphalt material build-up in the undercarriage will cause additional tension on the track.

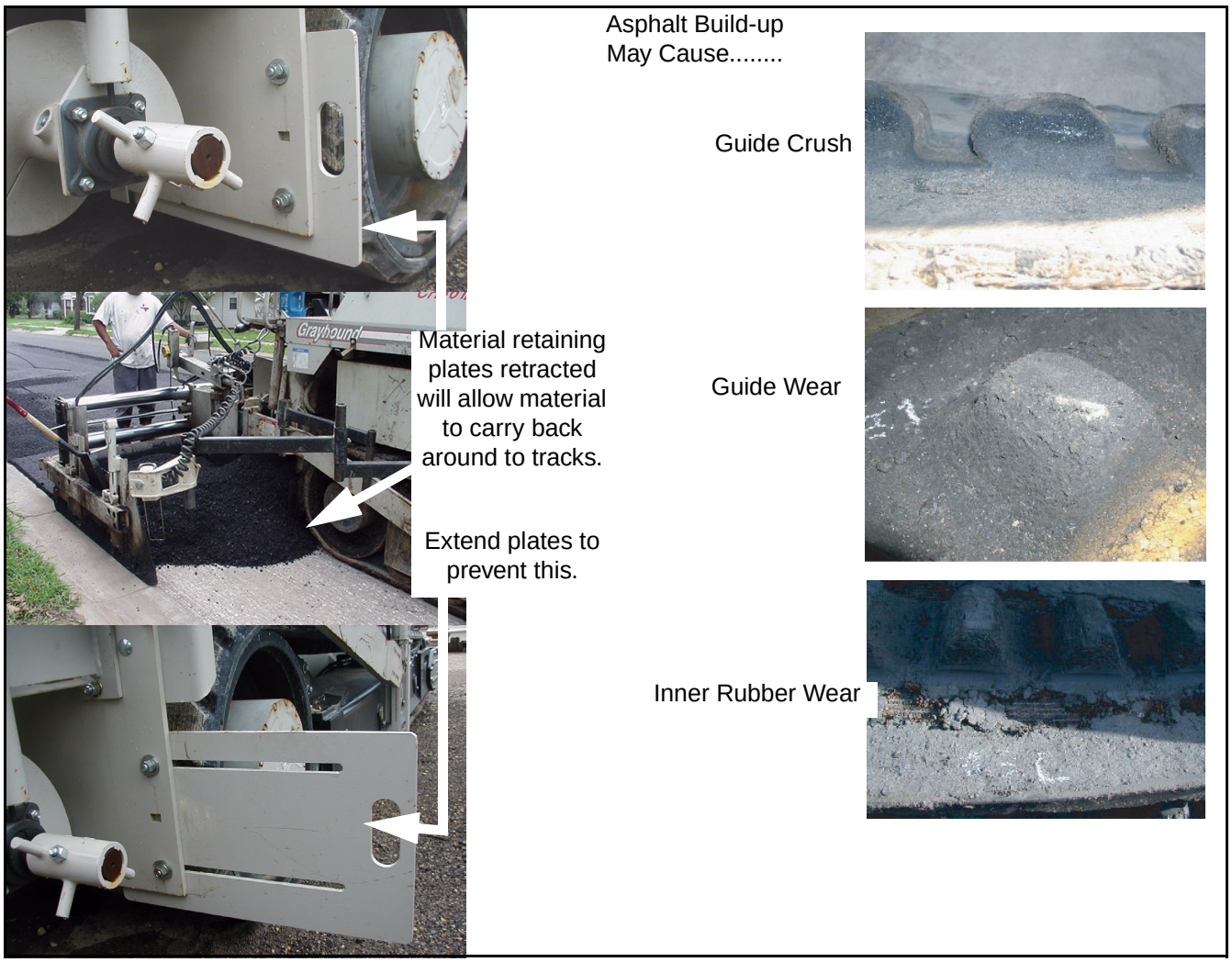


Figure 3 - 43 Asphalt on Track & Wear

Rubber Track Operating Hints

Proper Installation of Material Retaining Plates

Machines are shipped with the material retaining plates as shown in (Figure 3 - 44). To work properly, the plates must have the bottom edge of the plate below the bottom edge of the machine frame bulkhead and be extended.

Figure 3 - 44 Material Plate As Shipped

Before paving begins, loosen nuts, slide plate out from frame and re-tighten nuts to hold plate in position. (Figure 3 - 45)

Figure 3 - 45 Material Plate ExtendedManeuvering On Hot Asphalt

Rubber Track Operating Hints

Maneuvering On Hot Asphalt

Pavers are not normally operated on newly paved hot asphalt as it will damage the surface of the mat. (Figure 3 - 46) There may however be certain conditions when this becomes unavoidable. If it is necessary to drive on newly paved asphalt, be aware this could be problematic.

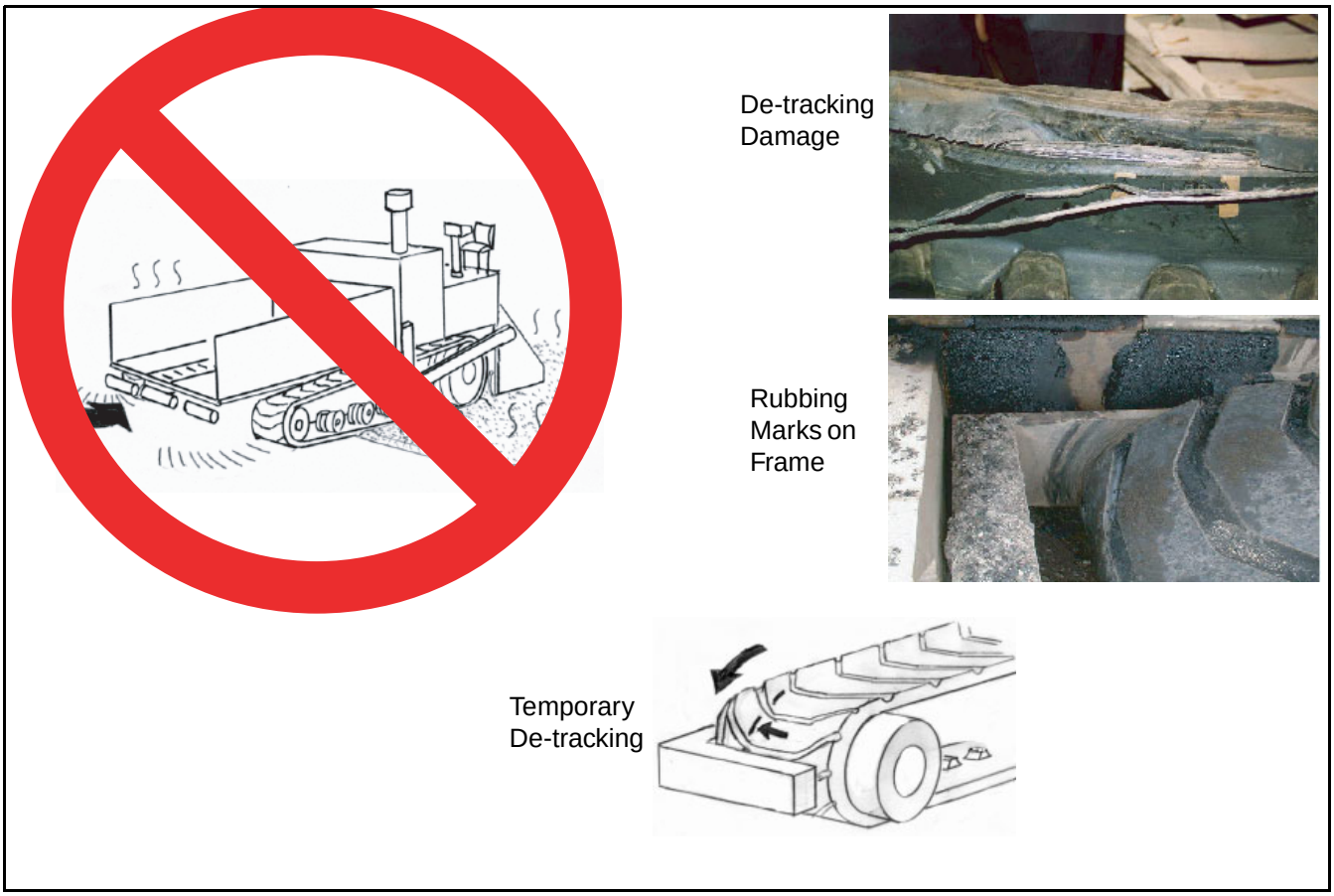


Figure 3 - 46 De-tracking

Rubber Track Operating Hints

Generally, “de-tracking” occurs when the paver turns. If rubbing marks are noted on track frame, check track inner surfaces for signs of scarring caused by temporary de-tracking. To avoid “de-tracking”, it is recommended:

- **Do not turn on or near hot asphalt.** Move to a cold area and turn there. If turning on the hot asphalt is necessary, use forward as much as permissible and keep the turn gradual in as large an arc as possible. Maneuvering should be done at as slow a speed as possible.
- **Do not park on hot asphalt.** (Figure 3 - 47) High temperature can deteriorate the track rubber. It is recommended to remain on the hot area of asphalt **no longer than twenty (20) minutes.**

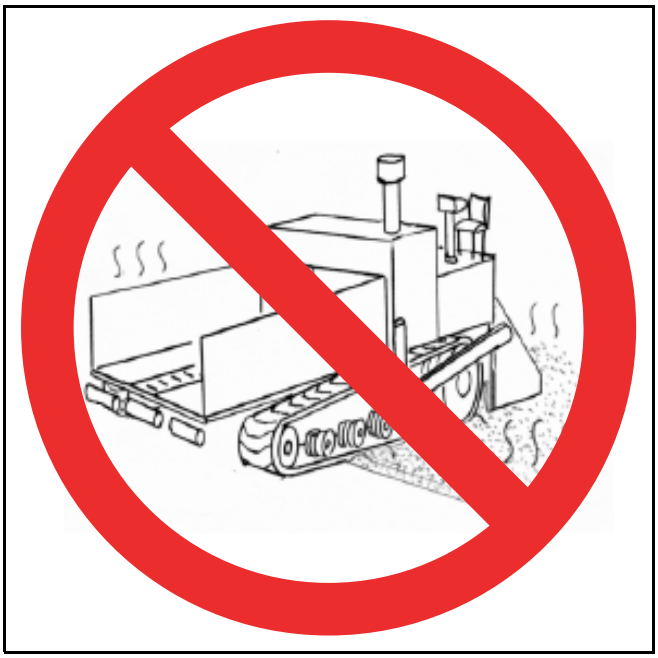


Figure 3 - 47 Do Not Park On Hot Asphalt

Rubber Track Operating Hints

Maneuvering On Uneven Surface

Uneven terrain such as curbs, concrete ridges or joints of paved and unpaved surfaces (step in elevation) may affect machine maneuverability. One concern is the stress concentration caused by the sharp edges of the surface and another is when a track is parallel to an edge. (Figure 3 - 48) and (Figure 3 - 49)

⚠CAUTION

If a turn is attempted on an edge, track damage or “de-tracking” could occur.

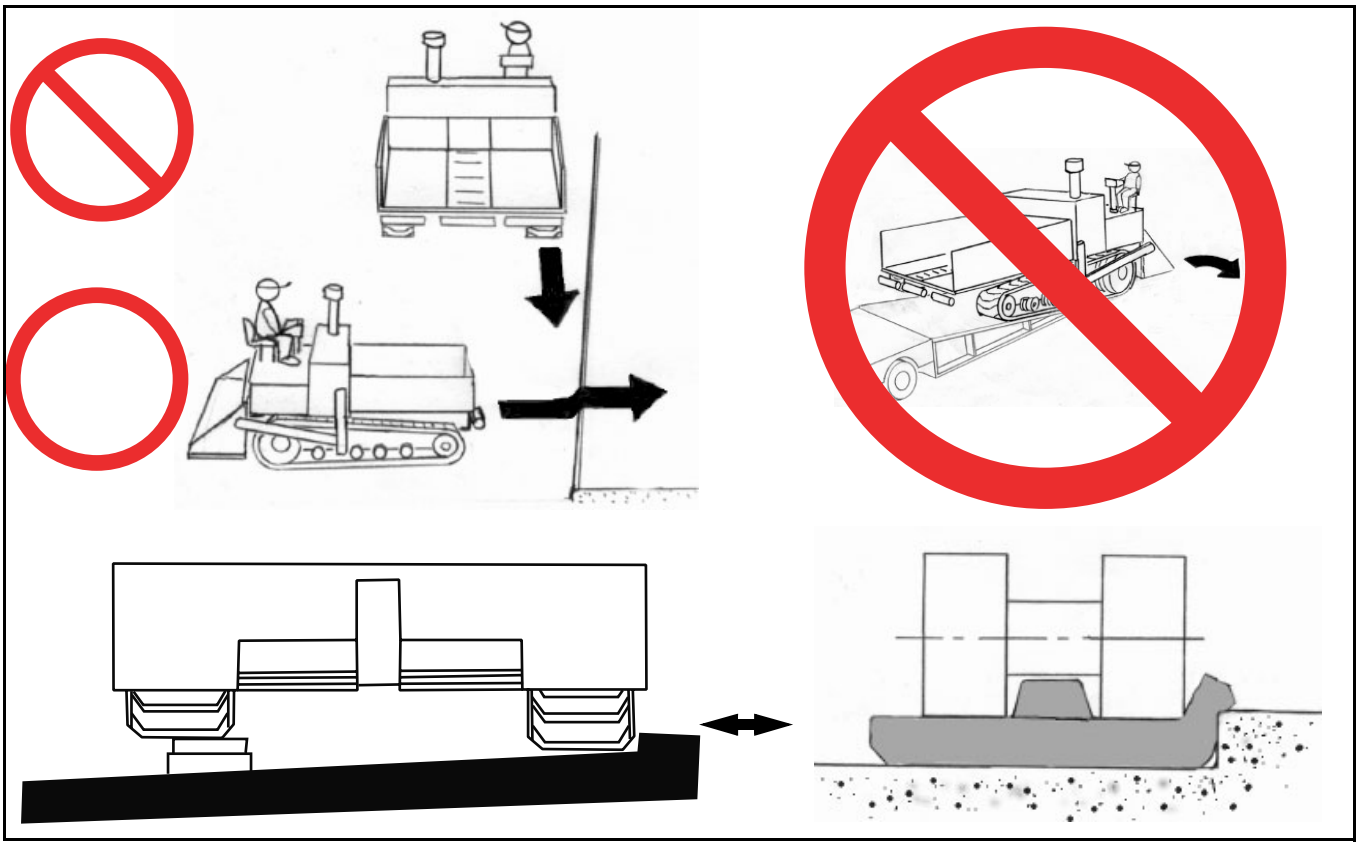


Figure 3 - 48 Steps in Elevation & Uneven Surfaces

- **Do not turn on or near sharp edges of uneven surfaces.** It is best to make a turn while on an even surface. If a turn is made with a portion of the track on an edge or the track comes into contact with an edge during the turn, it could cause a cut, tear, or even “de-tracking”. If this situation is unavoidable, keep the turn gradual in as large an arc as possible, at slow speed, in forward and with a spotter to watch the track safety.
- **Do not approach a step in elevation at a sharp angle.** If it is necessary to move from one level of elevation to another, it is recommended the approach angle should be more than 45 degrees. The best method is to go perpendicular to it.
- **Do not park on a step in elevation.** When parking, make sure the tracks are not resting on an edge or any sharp object. This may cause damage to the track.

Rubber Track Operating Hints

Tearing

Chunking

Figure 3 - 49 Damage From Steps in Elevation & Uneven Surfaces

Rubber Track Operating Hints

Maintenance of Track

To maintain and preserve the life of the rubber track it is important to follow these recommendations:

- **Do not use solvents to wash the rubber track.** Solvents including kerosene, gasoline, diesel fuel, or oils cannot be used to wash the surface of track rubber. The track rubber absorbs these solvents and will gradually soften and reduce its durability. Soap and water are recommended for cleaning the rubber track.

NOTICE

If you scrape the rubber track surface to clean it, be careful to not damage or cut it when cleaning.

- **Covering track for long term outdoor storage.** Rubber is affected by exposure to sunlight (ozone). Covering the track with something like a vinyl sheet if the machine is idle for an extended length of time, such as over Winter, will help keep the surface in good condition. (Figure 3 - 50)This is especially true where the rubber is bent and stretched around wheels.

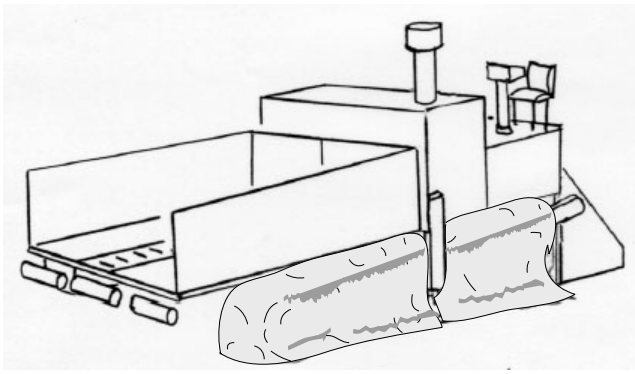


Figure 3 - 50 Cover Track for Outdoor Storage

Rubber Track Operating Hints

- **Releasing Paver Track Tension for long term storage.** As is true for covering the track, releasing the track tension when the machine is idle for an extended length of time, such as over Winter, will prolong its life.

NOTICE

Before releasing track tension, make sure machine is parked on level ground.

Release 300 Series Rubber Track Tension

1) Shut off engine and remove key from ignition.

2) Loosen jam nut on track tension valve discharge cartridge (Figure 3 - 51).

3) Insert an allen wrench into the adjusting screw, slowly turn it counter-clockwise to open the shut-off valve and release hydraulic pressure.

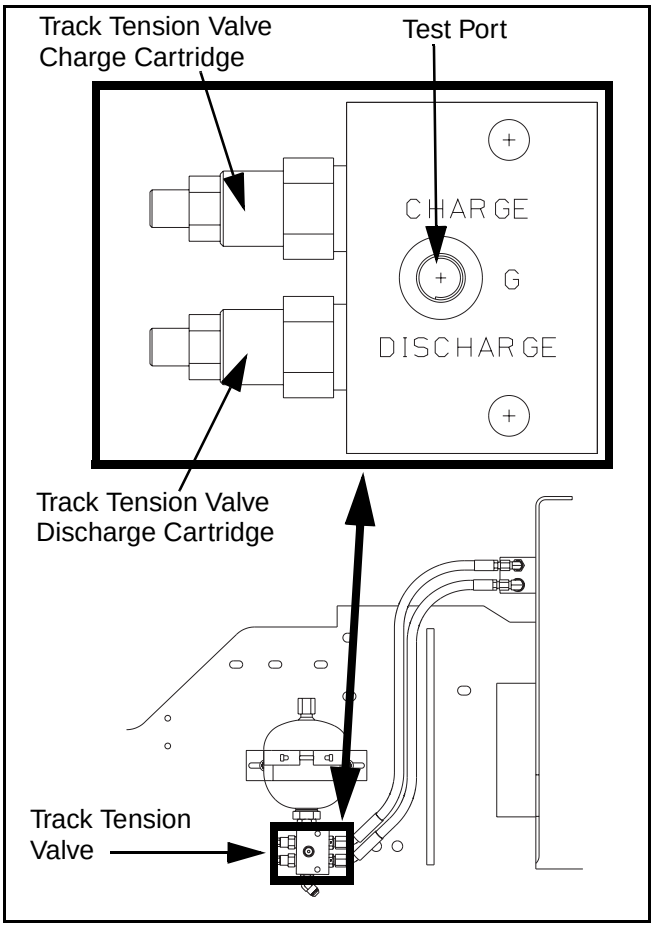


Figure 3 - 51 Release 300 Series Rubber Track Tension

4) Insert an allen wrench into the adjusting screw on the discharge valve cartridge and slowly turn it clockwise to close the valve.

5) Tighten jam nut on track tension valve discharge cartridge (Figure 3 - 51).

6) Repeat for the other track.

The paver will require tracks to be re-tensioned after removal from long term storage. This is not done automatically. See procedure in Section 6.

Rubber Track Operating Hints

- **Check track alignment.** Rubber track undercarriage component alignment is very important to the life of the track. An easy, quick check is to inspect the track center lugs. (Figure 3 - 52) If one side is worn more than the other side, one or more of the following conditions could exist. Factors such as asphalt build-up on the track inner surface, road crown, track tensioning, etc. If any of the above is present, correct the situation before excessive track wear occurs.

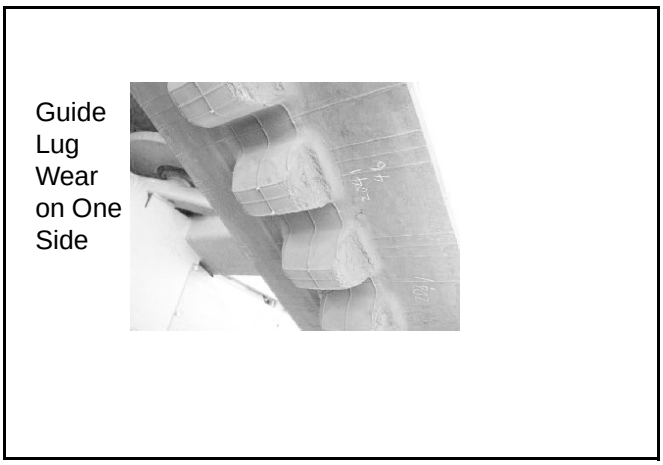


Figure 3 - 52 Rubber Track Alignment

- **Visual Inspection.** Unlike pneumatic tires, the rubber track is not as sensitive to chippings and cracks on the surface unless they extend to the separation of rubber from belt. The rubber track is not a 100% maintenance free product. The following items will be helpful to maintain and inspect your rubber tracks: (Figure 3 - 53)

1) Record track serial numbers.

2) Record the date and hour meter reading when you mount tracks on machine.

3) Periodically check condition of tread, guide lugs, and inner surface for wear, cracks, chipping and chunking.

4) Periodically check that any steel cable or ply cord are not exposed.

5) Periodically check that track is properly tensioned. A loose track could cause de-tracking. (Refer to Tension information in the Operation and Maintenance Manual.

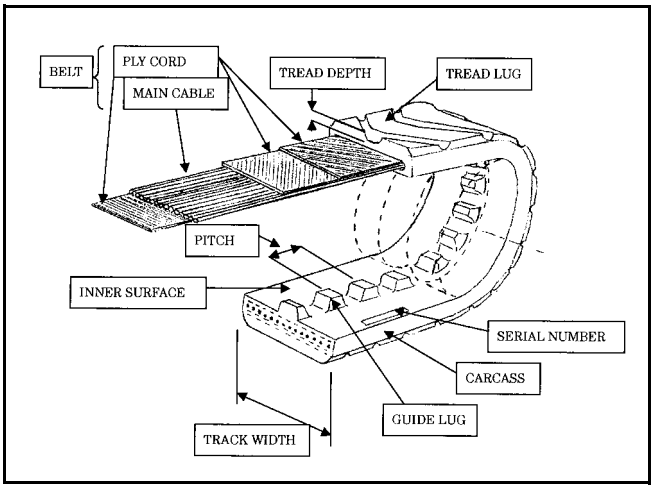


Figure 3 - 53 Rubber Track Identification

You may use the following table (Table 3 - 3)to record the information off the tracks on your machine.

Data	Right	Left
Machine Serial Number		
Hour Meter Reading		
Date of Track 1st Use		
Track Width		
Number of Pitches		
Pitch	6 inches	6 inches
Track Serial Number		

Table 3 - 3 Rubber Track Data

Spray Down and Cleaning

Paver Cleaning Procedure

Cleaning the paver is extremely important to keep the chains and augers free and prevent build-up of asphalt. Clean the paver thoroughly each day or any time the paver will be stopped for an extended period of time.

NOTICE

Hot mix gets hard quickly. Do not allow mix to cool in the hopper. Run remix augers to remove all material from the hopper any time the paver will be stopped for an extended period of time.

⚠WARNING

Use only environmentally safe solvents to clean paver.

⚠WARNING

Do not spray solvent in the presence of open flame, sparks, welding arcs. etc. A serious fire or explosion could result.

NOTICE

Keep solvent spray away from all electrical components, rubber parts and engine compartment. Do not spray the paver when it is parked on the mat. Move it to the side of the road for drainage of solvent and dissolved mix. Avoid spraying rubber hoses, cables, tires and/or rubber tracks with solvent as this may cause premature deterioration.

1) Run slat conveyors/remix augers until all mix is out of the hopper. Remove any piles or large chunks of mix from the paver and screed.

2) Clean all parts which come in contact with hot mix. The paver must be completely cleaned, even if the paver was used for a short time.

3) Start cleaning at the truck hook/push rollers and work your way to the rear of the machine cleaning the hopper wings, slat conveyors/ remix augers, hopper gates, spreading augers, screed bottom, end gates, strike-offs, etc. (Figure 3 - 54)

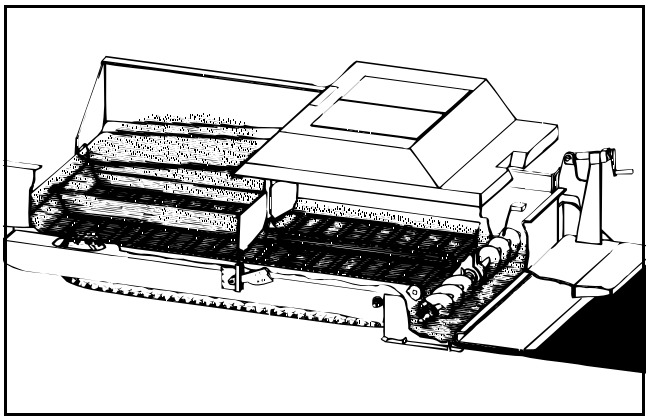


Figure 3 - 54 Shaded areas to be sprayed down daily

4) Operate slat conveyors/remix augers during spray-down, to be sure all surfaces are cleaned.

5) Spray down surfaces that have come in contact with asphalt. Refer to Section 6 for information on when and how to clean fume recovery system fan and/or tubes.

6) If a mechanical feed sensor is used, clean the wand with solvent and wipe any asphalt off of the feed controller with a cloth dampened with solvent. (Figure 3 - 55)

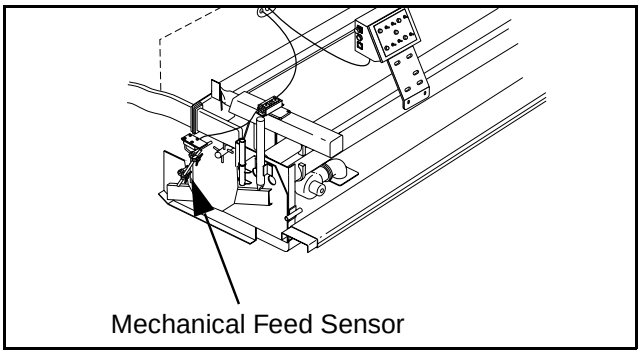


Figure 3 - 55 Mechanical feed sensor

7) Every time the paver is cleaned, the steel track should be cleaned and sprayed with light oil to lubricate the track pins to prevent them from rusting and binding.

Generation III Sonic Sensor Cleaning

1) Inspect the sensor daily for damage and material buildup. The sensor must be kept clean in order for the sonic control to function properly. The sensor is easily cleaned and if cleaned routinely, problems can be minimized.

2) Before cleaning, turn off power to the sonic control. Disconnect sensor cable from control unit and remove sensor from its mount. Install protective caps on all electrical connectors.

NOTICE

Using a sharp or solid object to scrape material from transducer could damage the sensor. Damage to the transducer requires replacement of the complete sensor. The sensor is permanently sealed and can not be repaired.

3) Check transducer daily for material buildup. The transducer can be cleaned with Simple Green cleaning fluid. Place cleaning fluid on a clean rag and rub transducer gently to remove any material. Wipe transducer clean and dry. (Figure 3 - 56)

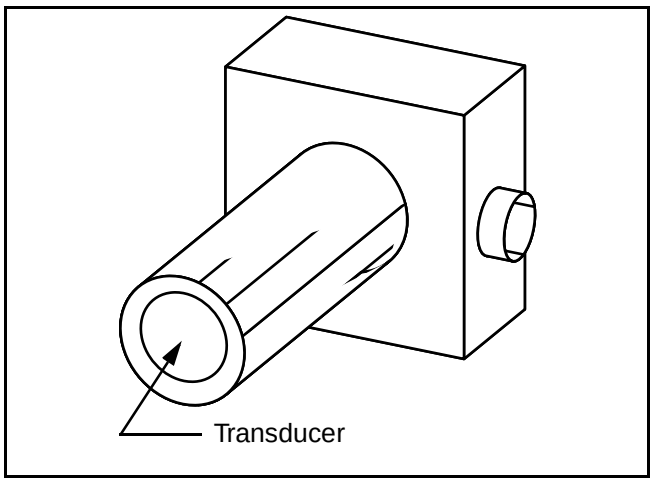


Figure 3 - 56 Cleaning sonic sensor

Pressure Cleaning

The entire paver can be pressure-washed to remove dirt and grease. When pressure washing the paver:

1) Do not use a steam cleaner. Steam cleaning can damage seals, bearings, gearboxes, and electrical components.

2) Do not use an acid-based solvent with the pressure washer. Use only mild detergents or degreasers.

Spray Down and Cleaning

3) Do not spray directly at electrical components, seals, bearings, gearboxes, or hydraulic cylinder rods. Water can be forced into electrical connections or the hydraulic system which could damage the system.

4) Do not spray the screed or engine until it is cool. Spraying a hot screed bottom with cold water could warp the screed bottom. Spraying cold water on a hot engine manifold could crack the manifold.

5) Use extreme caution when spraying in the engine compartment. The engine compartment is full of electrical and hydraulic components which could be damaged by high pressure water. Use a commercial engine cleaning foam to remove dirt and grease from the engine compartment.

6) If you must spray near electrical or hydraulic components, cover the components before spraying.

Section 4 - Electrical System

Engine Control System

General Information

The engine control system is an electronically operated system that also provides many operator and equipment features.

The base functions of the control system include shut-down of the engine when operating ranges are exceeded for engine oil pressure and engine coolant temperature.

The control system uses inputs from sensors or switches to provide information on operating parameters.

Hydraulic Fan Control System

HFS Fan Controller

The HFS fan controller (located inside the main electrical control box) controls a hydraulically driven fan to regulate engine coolant and hydraulic oil temperatures.

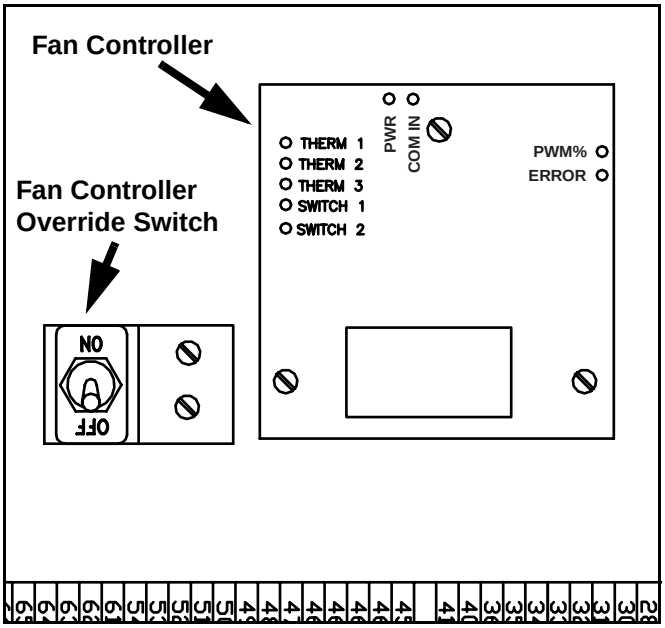


Figure 4 - 1 Hydraulic Fan Controller

Fan Controller Override Switch

The fan controller override switch (located inside the main electrical control box) is a two position switch. This switch is used to override the fan controller and allow the fan motor to run at maximum speed.

The switch is in the OFF position during normal operation which allows the fan controller to determine cooling fan speed.

If the switch is placed in the ON position, the fan controller does not vary the speed of the fan, but causes the fan to run at maximum speed. When the switch is ON, the SWITCH 1 Input LED on the fan controller is on and the PWM% LED is on solid green.

Controller LED Indicators

The fan controller status can be observed by the appearance of the LED lamps (Figure 4 - 1). These consist of five green input LEDs, one red power LED, one red error LED and one clear PWM% LED.

- The power LED is on if the controller is supplied with 8 to 40 volts DC and is operational.
- The input LEDs are on only if their programmed set points are reached or exceeded.
  Three of the input LEDs (labeled THERM 1, 2, AND 3) accept varying voltages from thermistors proportional to temperature.
  Two of the input LEDs (labeled as SWITCH 1 AND 2) are either on or off depending whether their switch is closed or open.
- The PWM% LED displays the state of the controller's output and its color will vary from red when off to green when fully on. It also displays varying shades of orange to yellow for states in between full on and full off.The LEDs are useful in determining the controller's status as well as to aid in diagnosing faults that may have occurred.

The red error LED will blink on and off in a particular pattern if a fault has occurred.

See the table below for general fault indications.

Red Error LED		
	Number of Blinks	Error Description
Note: If more than one error occurs at the same time the error with the highest priority will be displayed. 1 has highest priority and 6 the lowest.	1	Memory Checksum error
	2	Controller temperature greater than 75 Degrees C.
	3	"Controlling" input shorted
	4	"Controlling" input open
	6	Overtemp reached on one or more of the inputs

Paver Electrical Schematics

To find the paver electrical schematics, refer to Appendix B.

Section 5 - Hydraulic System

General Description

Paver Hydraulic Circuits

The separate hydraulic circuits are supplied by the pumps shown below in (Figure 5 - 1).

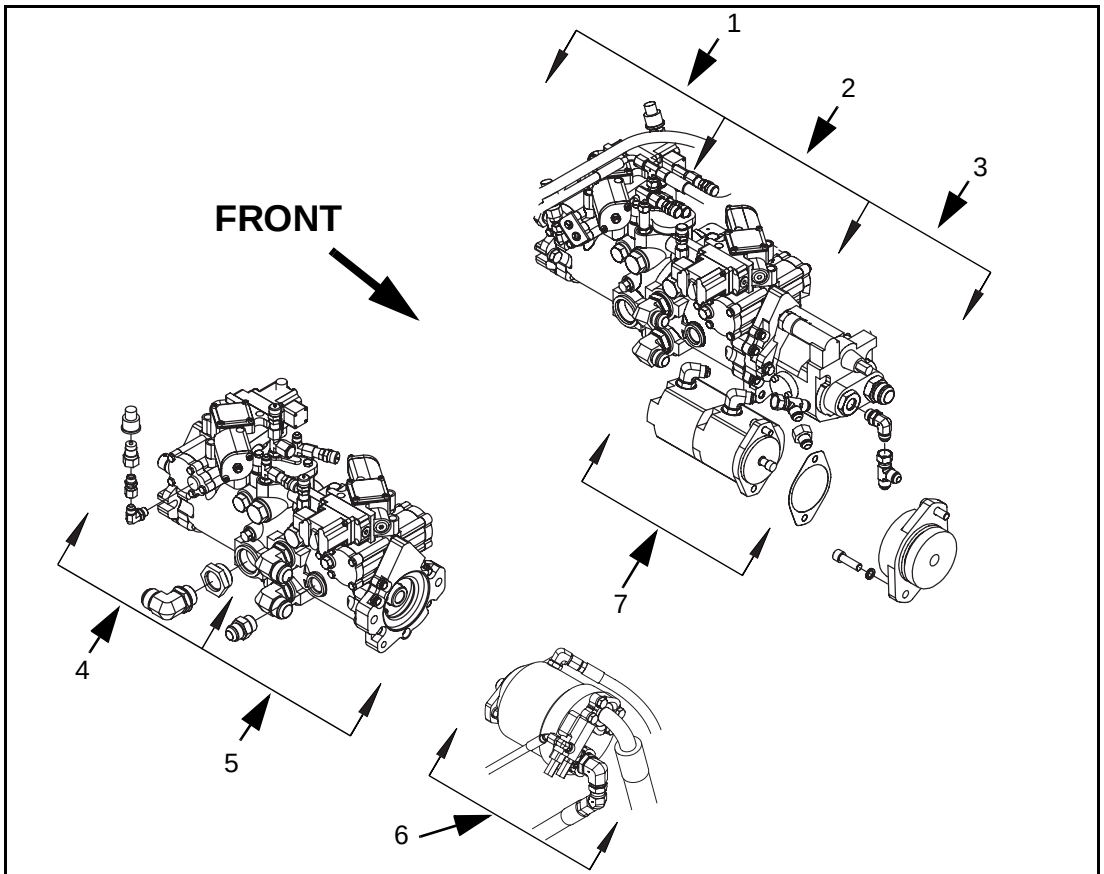
Two pumps drive the travel motors (one circuit for each drive). This includes the front wheel assist on tire pavers with this equipment.

Two pumps drive the conveyors (one circuit for each side).

One pump supplies all auxiliary functions such as hopper wings, truck hook, tow point cylinders, tow arm cylinders, steering cylinders, frame raise cylinders, screed assist (if equipped) and screed lift cylinders.

One tandem pump supplies the fume recovery fan motor and screed vibrators from one section as well as the engine and hydraulic cooling fan from the other section. This pump is mounted and driven directly off the engine front gear housing.

The optional generator pump supplies the generator drive motor circuit if the paver is equipped with an electric screed or a generator to power lights or other electrical devices. This pump is added to the right side pump stack.



1 - Left Travel Pump
2 - Left Conveyor Pump
3 - Auxiliary Pump
4 - Right Travel Pump
5 - Right Conveyor Pump
6 - (Opt.) Generator Pump
7 - Tandem Cooling Pump

Figure 5 - 1 Paver Hydraulic Pumps

Hydraulic Fluid Reservoir

The hydraulic fluid reservoir (Figure 5 - 2) serves all hydraulic systems and is located beneath the hood on the left-hand side of the paver. Reservoir fluid capacity is 45 gallons.

A baffle divides the inlet side of reservoir from the outlet side. This baffle reduces oil foaming and air suspended in the oil which can damage the pumps. A breather/fill cap is located on top of the reservoir to release pressure that builds up as the oil heats up and cools down. The breather should be kept clean to allow air flow through it. A drain plug is located on the bottom of the reservoir to make changing the hydraulic oil convenient.

NOTICE

All filter elements and suction hose fittings should be checked and tightened regularly to avoid leaks and prevent air from entering the hydraulic system. Prolonged operation with air in a hydraulic system will result in damage to a pump and poor system performance.

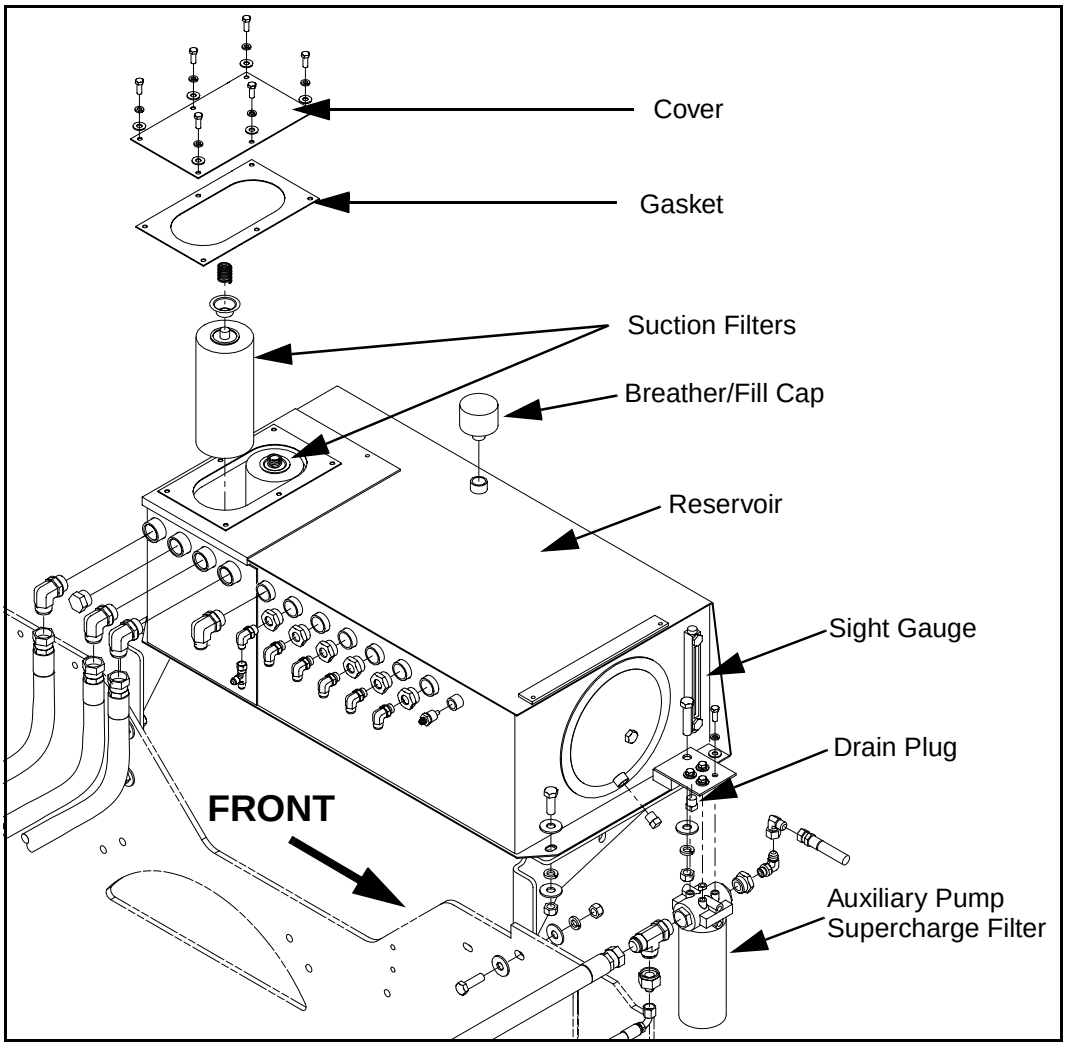


Figure 5 - 2 Hydraulic Fluid Reservoir & Filters

Hydraulic Oil Cooler

The pavers use a remote-mounted oil cooler, mounted to the hood, with a hydraulically driven cooling fan to maintain an operable fluid temperature.

Fluid Temperature

Excessively hot hydraulic fluid is an indicator of trouble developing in the hydraulic system. An operator should make it a habit to check the hydraulic oil temperature reading periodically throughout the day, just as he does the engine oil pressure, coolant temperature, voltage, etc. Normal operating range is 120° to 160°F. Any time the hydraulic fluid temperature approaches or exceeds 180°F, stop paving, determine the cause and correct as necessary.

Tandem Pumps

The travel and conveyor circuits are supplied by pumps which are mounted in tandem. (Figure 5 - 3) Right and Left side pumps are of the same series but have different size through drives. When replacing either pump, make sure to use the correct replacement.

Each tandem pump contains one internal fixed displacement pump which supplies charge oil to both the travel and conveyor sections.

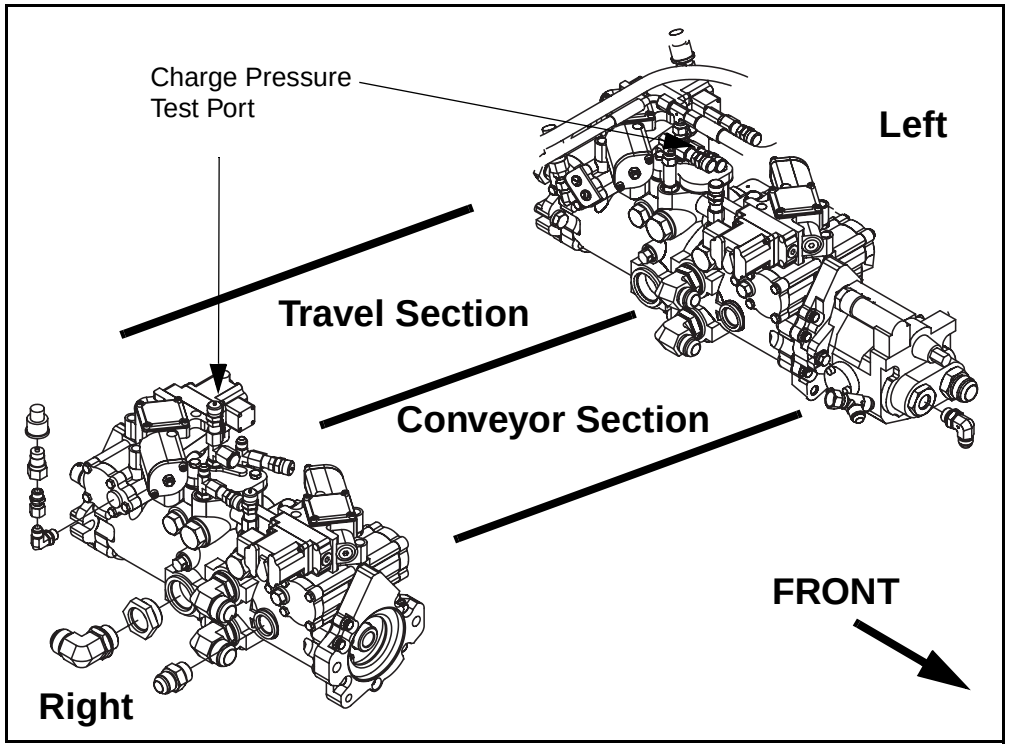


Figure 5 - 3 Tandem Pumps Charge Pressure Ports

Checking Charge Pressure

It will often be useful to test each pump's charge and case pressure at the same time the high pressure setting is checked. Extremely high case pressure readings could mean restriction in return lines or in the oil cooler. If charge pressure is low, the charge relief valve should be inspected for wear or foreign material. For full repair and troubleshooting of hydraulic pumps, refer to Hydraulic System Troubleshooting in the Paver Technical Manual.

Important: All pressure tests must be made with the hydraulic oil at operating temperature.

To check charge pump pressure:

1) Install 600 PSI gauge in charge pressure test port. (Figure 5 - 3)

2) Start engine and run at full throttle.

3) Read pressure gauge. Pressure should be 390 ±50 PSI.

   Note: If pressure is low, refer to Hydraulic System Troubleshooting in the Paver Technical Manual.

Travel Pumps

Each travel motor is supplied by a separate travel pump. Each travel pump is made up of a variable displacement axial piston main pump and a charge pump. The charge pump draws oil from the reservoir and outputs it to the main pump. The main pump supplies 5400 PSI maximum pressure directly to the travel motor. If the pressure reaches 5400 PSI, the relief valves open to bypass fluid to the reservoir. Bypassing fluid over the relief valves for a long period of time will generate excessive heat in the system.

Travel Drive Systems

The travel drive system permits infinitely variable speed adjustment from zero to maximum with torque available for any normal paving load. The speed will be maintained within the governed allowance whether the paver is pushing a loaded truck uphill or emptying the hopper. There will be no acceleration downhill even when hooked to a loaded truck.

Since each travel drive motor is supplied by its own pump, this provides independent control of each track/wheel. The fluid output of the travel drive pumps can be reversed so the paver can move either forward or backward without mechanical gear shifting.

To move forward the operator places the Travel Direction Switch or Travel Lever in the forward (F) position and slowly rotates the Speed Dial clockwise. As the Speed Dial is rotated, the Electric Displacement Control (EDC) on the travel pump proportionally increases the angle of the swash plate. The increased swash plate angle increases the length of travel for the pump pistons which increases the speed of the travel motor.

Travel High Pressure Check

The following procedure is to check each travel pump's high pressure setting:

1) Disconnect, cap and plug travel pump high pressure lines at motor bulkhead. (Figure 5 - 4)

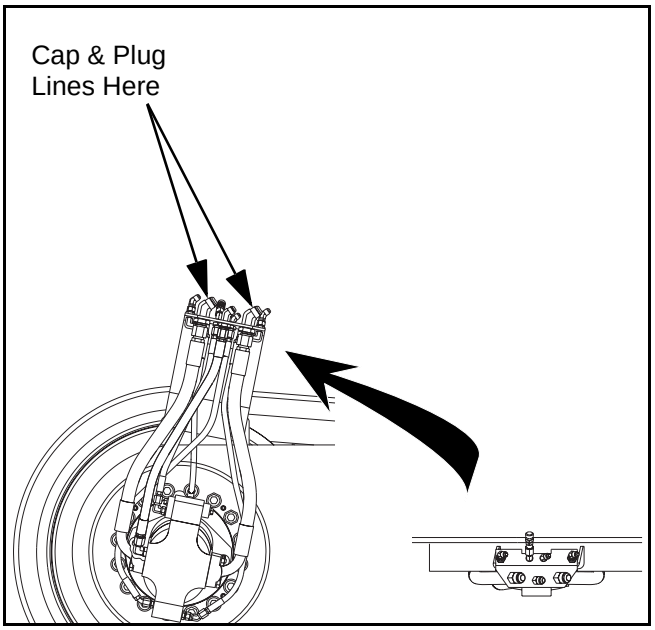


Figure 5 - 4 Travel Motor Bulkhead

2) Install two 10,000 PSI pressure gauges in the high pressure gauge ports. (Figure 5 - 5)

Travel Pumps

Important: All pressure tests must be made with the hydraulic oil at operating temperature.

3) Start the engine and run at full throttle.

4) Set brake switch to OFF.

5) Set speed dial to 0.

6) Slowly move travel switch/lever to FORWARD.

7) Move speed dial to 5 or 6.

8) Read pressure gauge. Pressure should be 5400 PSI.

NOTICE

Hold pump on stroke **only** long enough to read gauge. Holding on stroke for an extended length of time generates a lot of heat and may damage the hydraulic system.

9) Repeat steps 6 through 8 for REVERSE.

NOTICE

If pressure is low, refer to Hydraulic System Troubleshooting in the Paver Technical Manual.

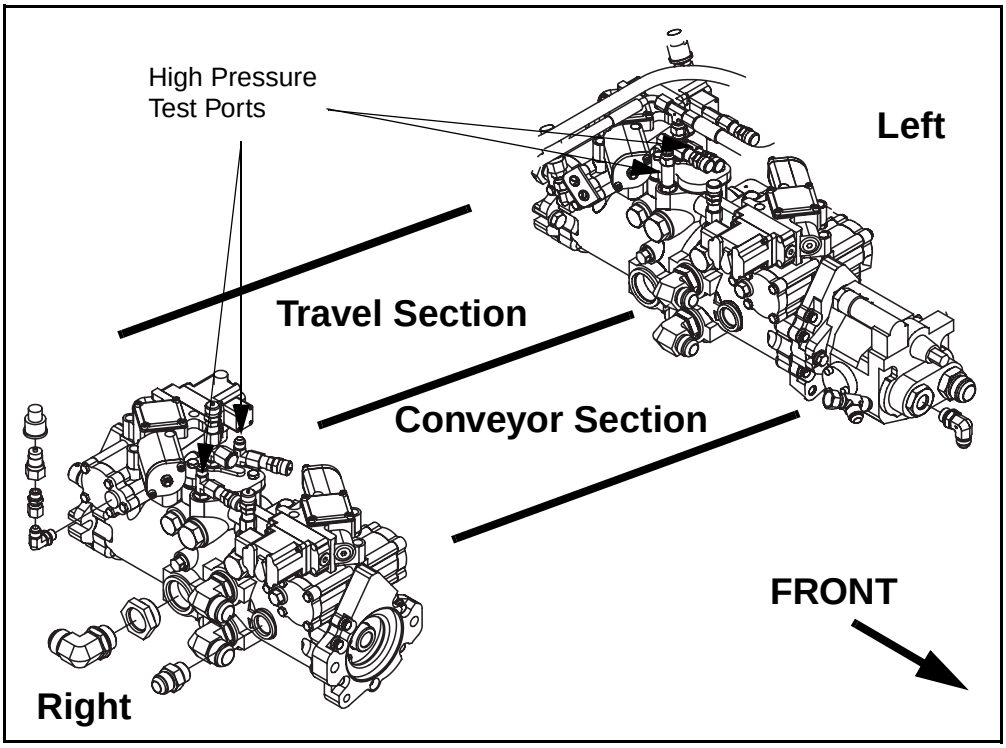


Figure 5 - 5 Travel High Pressure Test Ports

Conveyor Pumps

Each conveyor motor is driven by a separate conveyor pump. Each conveyor pump is made up of a variable displacement main pump and a charge pump. The charge pump draws oil from the reservoir and outputs it to the main pump. The main pump supplies 3400 PSI maximum pressure directly to the conveyor motor. If the pressure goes over 3400 PSI the relief valves open to bypass fluid to the reservoir. Bypassing fluid over the relief valves for a long period of time will generate excessive heat in the system.

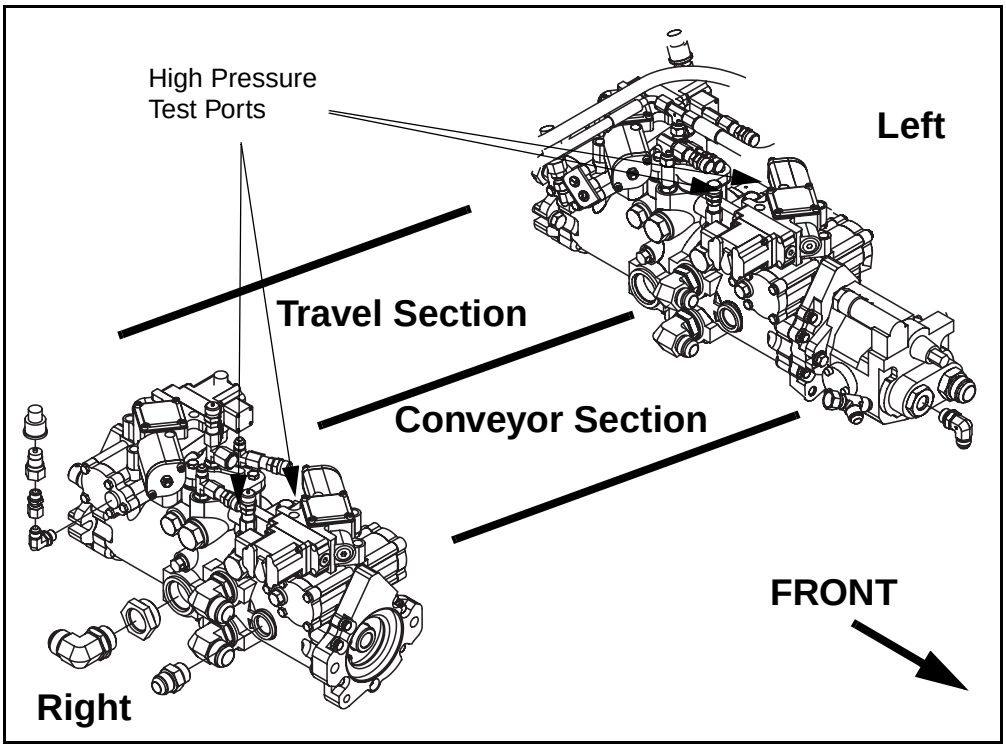


Figure 5 - 6 Conveyor High Pressure Test Ports

Conveyor Drive Systems

Each slat conveyor/auger combination has its own hydraulic drive. The augers are linked to the slat conveyors by chain drive and are driven by a hydraulic motor with a chain-drive sprocket on the motor output shaft.

Important: All pressure tests must be made with the hydraulic oil at operating temperature.

Conveyor Pumps

Cleaning a Disabled Paver

If the paver becomes disabled with the hopper full of mix, the mix must be shovelled out of the hopper and the conveyors must be cleaned out before the mix cools.

To remove the mix from the conveyors:

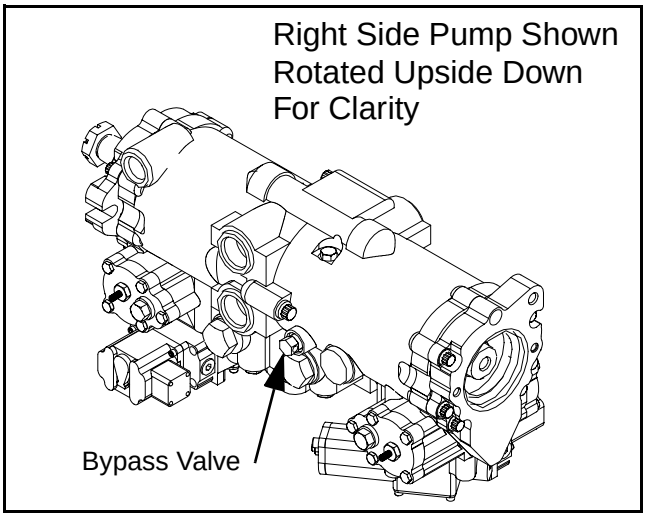


Figure 5 - 7 Conveyor Pump Bypass Valve

1) Rotate the conveyor pump bypass valve counterclockwise no more than two turns. (Figure 5 - 7)

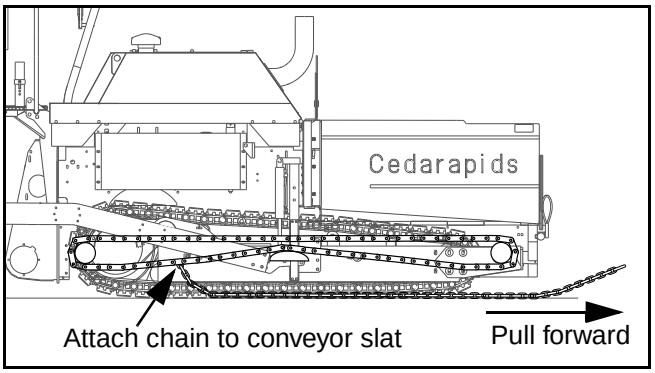


Figure 5 - 8 Attach chain to conveyor slat

2) Run a chain under the paver from the front to the back. Attach chain to the slat conveyor on the bottom rear of the slat conveyor. (Figure 5 - 8)

3) Pull forward on the chain. Once the chain connection point reaches the front of the paver, stop pulling the chain.

4) Tow the paver, (as described in Emergency Towing procedure found in Section 4) forward away from the pile of mix, reattach the conveyor chain, and repeat this procedure until the hopper is completely empty.

5) Tighten the conveyor pump bypass valves.

Conveyor Pumps

Conveyor System Relief Setting

The pressure relief valves for the conveyor pumps are factory set and should bypass fluid at 3400 PSI. Do not attempt to adjust the conveyor relief pressure setting. If load reaches this limit, fluid is bypassed around hydraulic motor and conveyor will stall. The factory setting is adequate for any paving condition. Therefore in the event of a stall, cause of overload should be determined and eliminated.

If a relief valve emits a high-pitched squeal, operator should quickly determine the cause. Continued operation will result in component damage and operating problems.

In the event that the conveyor speed settings are vastly different when each conveyor is doing an identical amount of work, it is probable that the side requiring the higher speed setting has a worn pump or motor. When an equal load situation exists, the pressure gauge readings should be nearly equal.

To test the conveyor high pressure relief setting:

1) Raise hopper gates fully open.

2) Block slat conveyor firmly and safely with a steel 2 x 4 bar against the hopper gate to prevent movement when power is applied. (Figure 5 - 9)

⚠WARNING

Extreme care should be taken when blocking conveyors to assure steel 2 x 4 bar does not slip off hopper gate. Personnel should stay clear of hopper area while tests are performed.

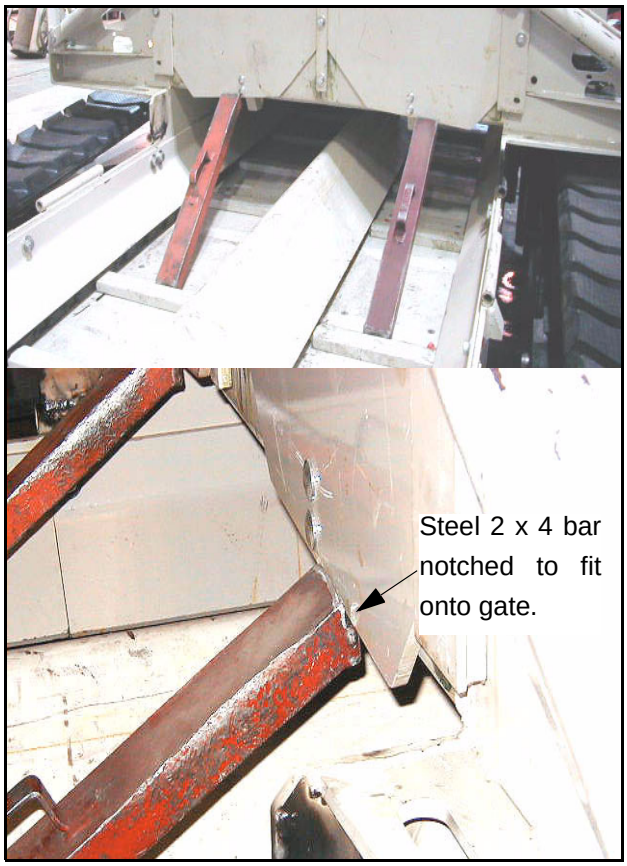


Figure 5 - 9 Block Slat Conveyor

3) Turn conveyor switches OFF and conveyor speed switch to LOW.

4) Install two 10,000 PSI pressure gauges in the high pressure gauge ports. (Figure 5 - 10)

5) Start the engine and run at full throttle.

NOTICE

Do not run the pressure over relief any longer than it takes to read the gauge.

Conveyor Pumps

6) Turn the conveyor speed dial or pile height dial to zero and move the conveyor switch to MANUAL. The gauge should read 0 psi.

7) Slowly rotate the conveyor speed dial or pile height dial clockwise until the gauge pressure increases. The pressure should hold steady at 3400 PSI.

NOTICE

Hold pump on stroke **only** long enough to read gauge. Holding on stroke for an extended length of time generates a lot of heat and may damage the hydraulic system.

If pressure is significantly higher or lower than 3400 PSI, the pressure relief valve is defective and must be replaced. If replacement is necessary, refer to pump repair manual in the Paver Technical Manual.

NOTICE

The relief valves are factory set and should not be tampered with except for replacing the entire cartridge. Disassembly may change the setting and cause erratic operation or premature failure.

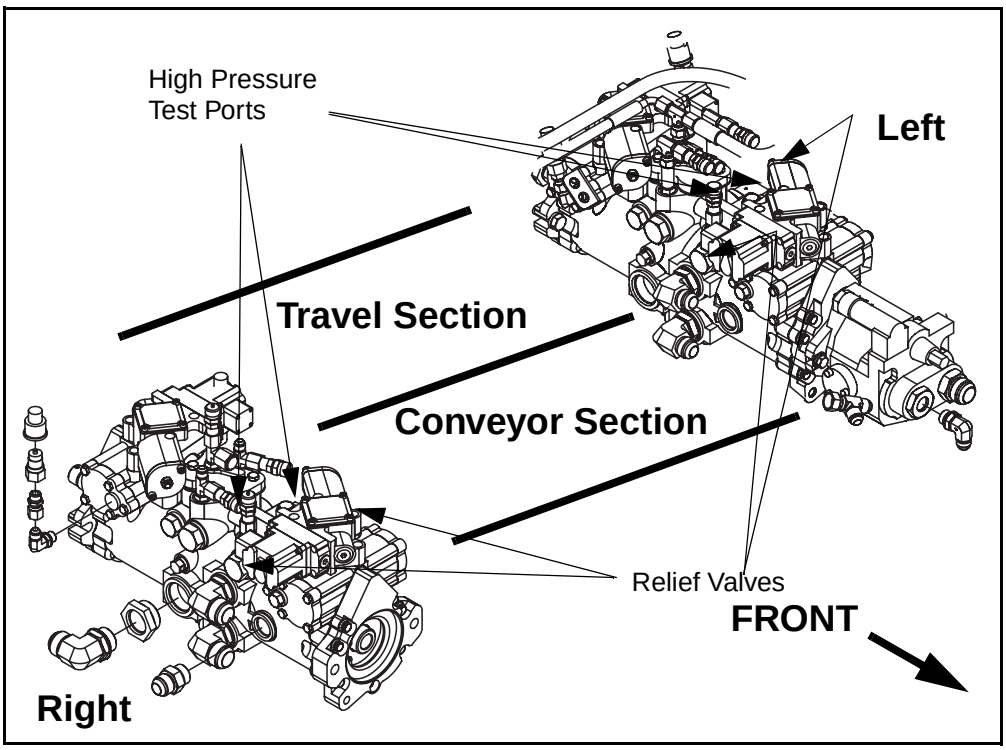


Figure 5 - 10 Conveyor High Pressure Reliefs

Conveyor Pumps

Conveyor Neutral Adjustment

If a slat conveyor movement, or “creep”, is observed when the conveyor switch is OFF, the neutral settings must be readjusted. These are factory set and normally will not need adjustment. If neutral adjustment becomes necessary, perform the following procedure. Refer to (Figure 5 - 11) through (Figure 5 - 14) during this procedure.

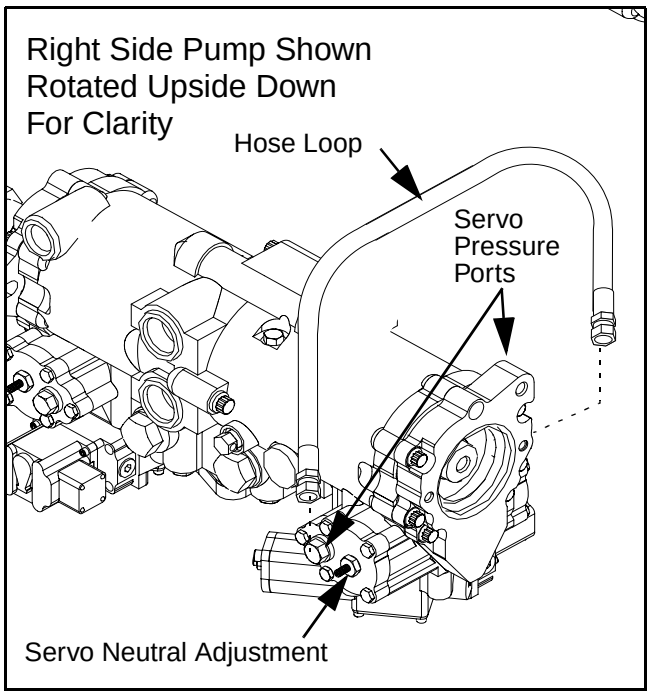


Figure 5 - 11 Conveyor Pump Neutral Adjustment

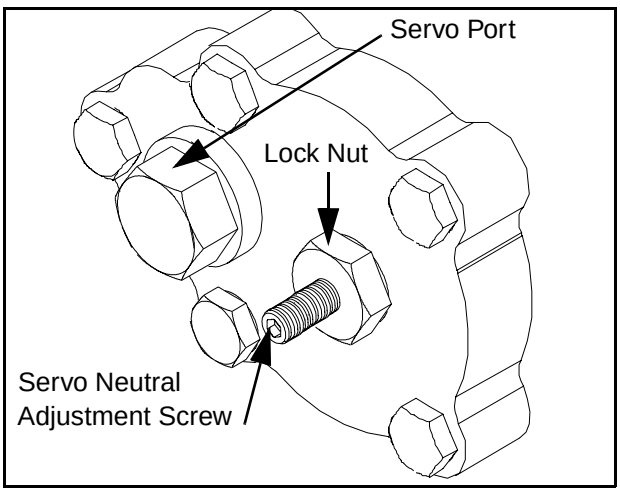


Figure 5 - 12 Conveyor Pump Servo

⚠WARNING

All personnel should stay clear of conveyors as they will move during the following adjustment.

1) Install a low pressure hose loop (500 psi min.) connecting conveyor pump servo ports. (Figure 5 - 11) This removes the effects of any control pressure on the servo piston.

2) Install pressure gauges (10,000 psi) in the system pressure gauge ports (Figure 5 - 10).

3) Start the engine and run at full throttle.

4) Loosen the lock nut while holding the servo neutral adjustment screw in position (Figure 5 - 12). Turn the adjustment screw until the two system pressure gauge readings are equal.

5) Rotate the adjusting screw clockwise until one of the system pressures starts increasing. Note the position “A” of the allen wrench. Rotate the adjusting screw counter-clockwise until system pressure increases in the other gauge. Note the position “B” of the allen wrench. (Figure 5 - 13)

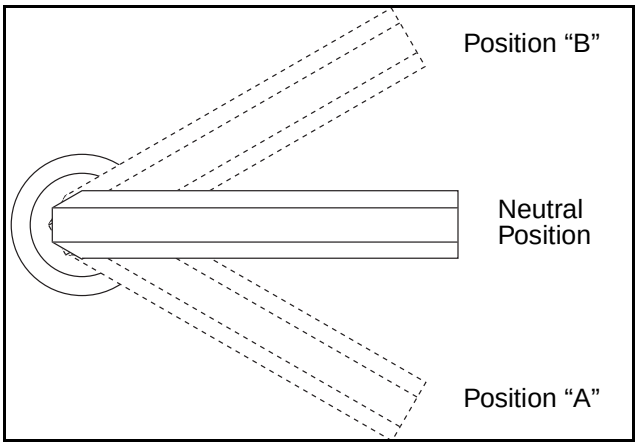


Figure 5 - 13 Finding Neutral Position

Conveyor Pumps

6) Rotate the servo neutral adjustment screw clockwise half the distance between positions “A” & “B”. The pump swash plate should now be in a neutral position. In this position the gauges should read approximately the same pressure.

7) While holding the servo neutral adjustment screw from turning, torque lock nut to 13 - 18 ft. lbs.

8) Stop the engine and remove the hose loop from the servo ports.

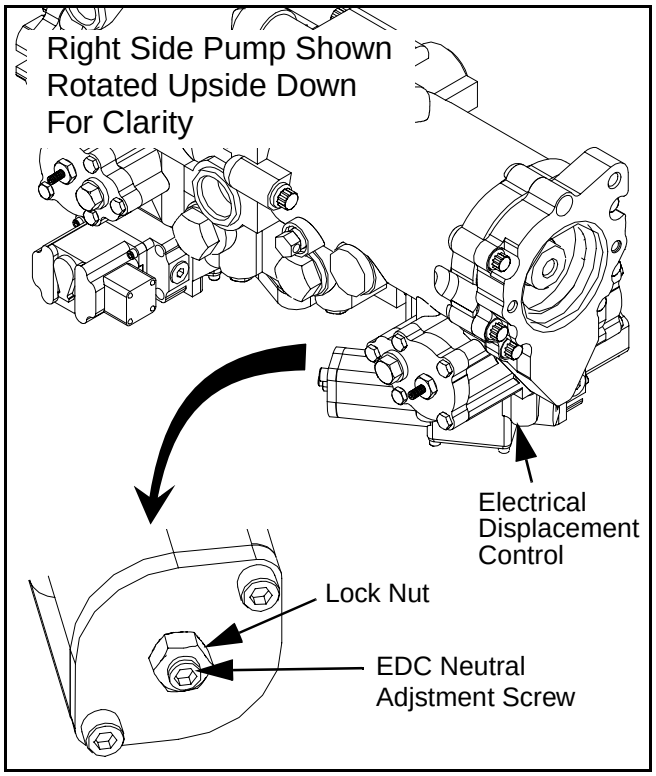


Figure 5 - 14 Electrical Displacement Control

9) Disconnect wiring from the Electrical Displacement Control (EDC) at the pump. (Figure 5 - 14)

10) Install 300 psi gauges in the servo ports from where the hose loop was just removed.

⚠WARNING

All personnel should stay clear of conveyors as they will move during the following adjustment.

11) Start the engine and run at full throttle.

12) Loosen lock nut with 1/2” wrench while holding the EDC neutral adjustment screw in position with a 5/32” allen wrench inserted into the internal hex. (Figure 5 - 14)

13) Turn the adjustment screw clockwise until one of the servo pressures starts to increase. Note the position “A” of the allen wrench. (Figure 5 - 13)

14) Without removing the allen wrench, rotate the adjusting screw counter-clockwise until the pressure increases in the other gauge. Note the position “B” of the allen wrench.

15) Rotate the EDC neutral adjustment screw clockwise half the distance between location “A” & “B”. The EDC should now be in a neutral position. In this position the gauges should read approximately the same pressure.

16) While holding the adjustment screw from turning, torque the lock nut to 25 - 30 in. lbs.

17) Stop the engine.

18) Reconnect the wiring to the EDC at the pump.

19) Remove all pressure gauges.

Vibrator Pump

One fixed displacement gear pump section is used in the paver to power the screed vibrators. This pump provides up to 1500 PSI fluid to the screed vibrators at 2100 RPM engine speed. As engine speed is reduced, the pump output rate and pressure capability is reduced.

To check and adjust the vibrator system pressure:

20) Disconnect vibrator hoses to the screed at the rear bulkhead.

21) Install a 2500 PSI pressure gauge to the test port on the vibrator solenoid valve. (Figure 5 - 15)

22) Start the engine and run at full throttle.

23) Release the paver's brakes.

24) Turn the vibrator switch ON, speed dial to ZERO, and the travel control FORWARD. Gauge should read 1500 PSI.

Important: The vibrators do not engage until the travel control is in the forward position.

If the pressure gauge does not read 1500 PSI, do the following:

1) Loosen the relief valve adjustment jam nut.

2) Rotate the relief valve adjustment screw clockwise until the pressure reads 1500 PSI.

3) Tighten the relief valve adjustment jam nut.

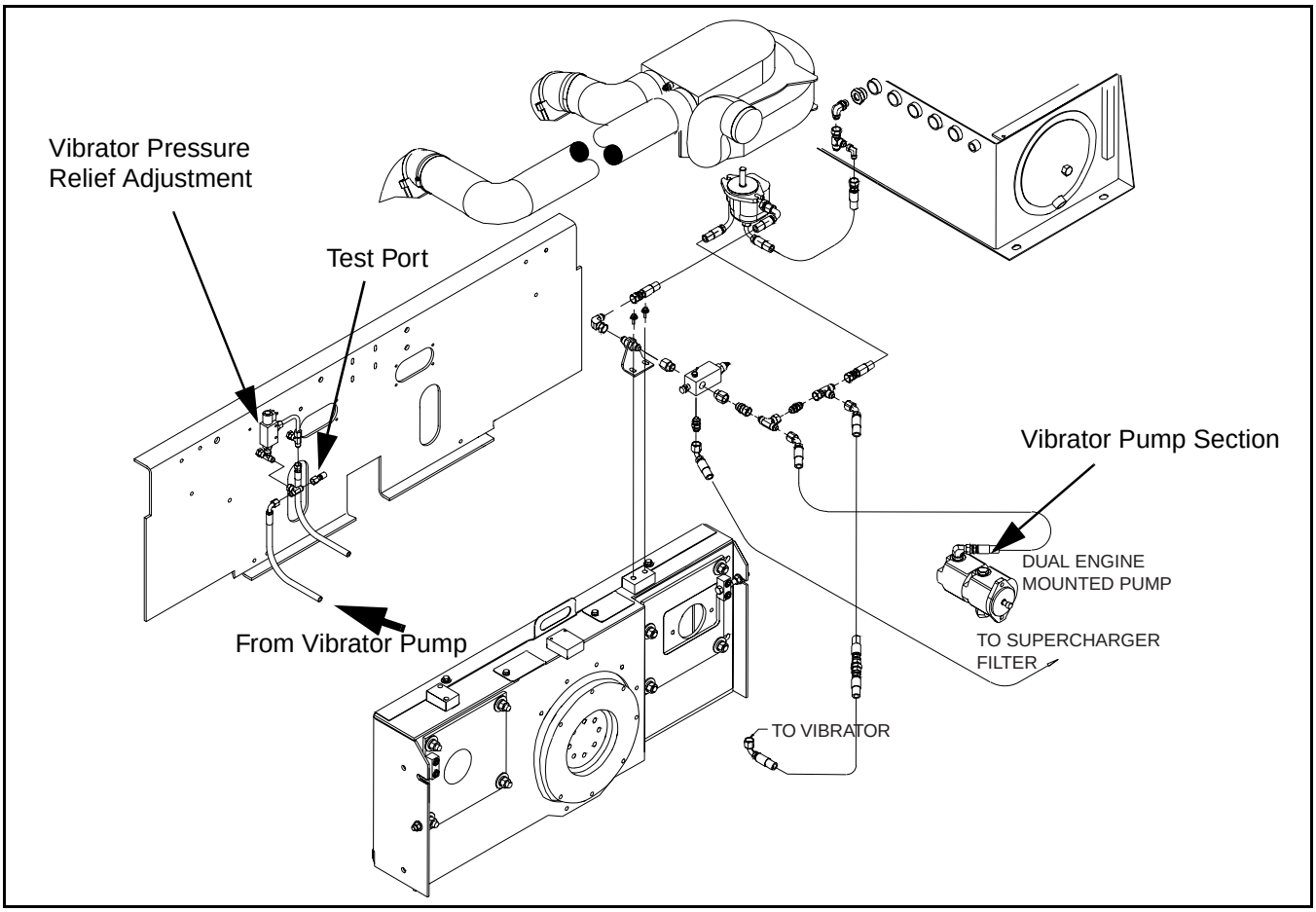


Figure 5 - 15 Vibrator Pressure Test

Fume Recovery Hydraulics

The fume recovery fan hydraulic motor is supplied by the vibrator pump section. This pump provides up to 2800 PSI fluid to the fan motor at 2100 RPM engine speed. As engine speed is reduced, the pump output rate and pressure capability is reduced.

To check and adjust the fume recovery system pressure:

1) Disconnect, plug hose, and cap fitting on inside of fume recovery pressure relief valve. (Figure 5 - 16)

2) Install a 3000 PSI pressure gauge to the test port on the fume recovery pressure relief valve. (Figure 5 - 16)

3) Start the engine and run at full throttle.

4) Gauge should read 2800 PSI.

   Important: Do not run any longer than it takes to read the gauge. Oil will heat quickly running over relief.

If the pressure gauge does not read 2800 PSI, do the following:

1) Loosen the relief valve adjustment jam nut.

2) Rotate the relief valve adjustment screw clockwise until the pressure reads 2800 PSI.

3) Tighten the relief valve adjustment jam nut.

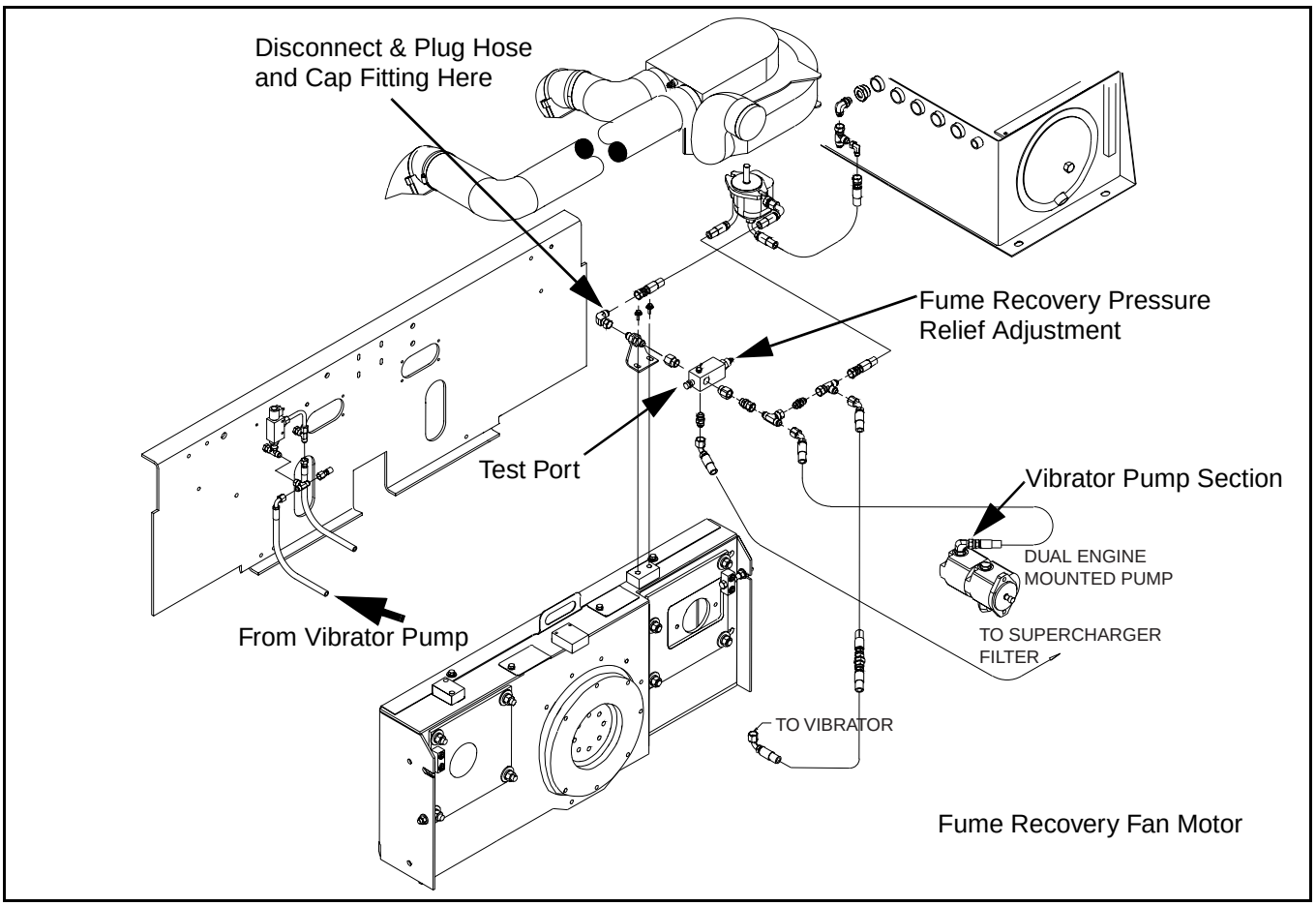


Figure 5 - 16 Fume Recovery Pressure Test

Auxiliary Systems Pump

Auxiliary System

The auxiliary system consists of a pressure-compensated variable-displacement pump to raise and lower the screed, hopper wings, pull points, frame raise, operate rubber track tensioning system, and engage the truck hook.

Solenoid-operated selector valves are controlled by toggle switches from the operator's console or at the screed. When none of the above functions are being operated, the pump is destroked to minimize fluid flow while maintaining 2500 psi pressure.

The auxiliary pump is supplied with supercharged oil from the oil cooler pump section.

Auxiliary System Pressure Compensator Check

The compensator for the auxiliary system should be set to bypass fluid at 2500 +/- 100 psi.

1) Install a pressure gauge (3000 psi) at the auxiliary system test port. (Figure 5 - 17)

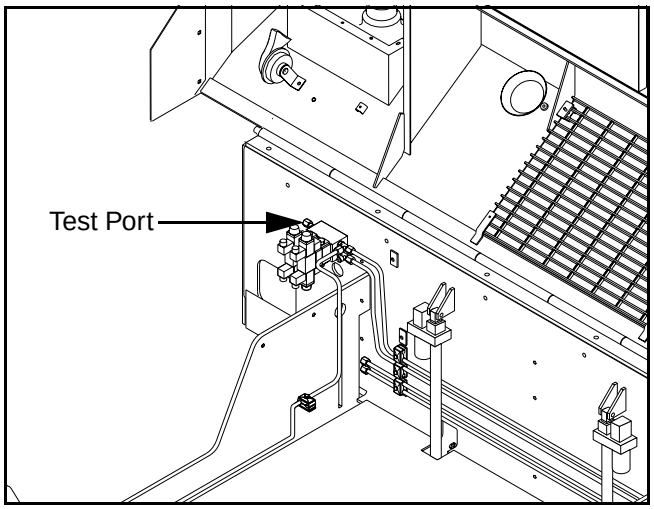


Figure 5 - 17 Auxiliary Pressure Test Port

2) Start the engine and warm up the hydraulic oil. When the engine and oil are warm, move the throttle switch to full.

3) Observe the pressure gauge. The pump should maintain 2500 +/- 100 psi at full throttle.

4) If the pump will not maintain 2500 psi, rotate the compensator adjustment (Figure 5 - 18) clockwise to increase the pressure or counter-clockwise to reduce the pressure. If pressure cannot be attained, refer to Hot Mix Paver Technical Manual, Pumps-Motors-Drives section for more troubleshooting and repair information.

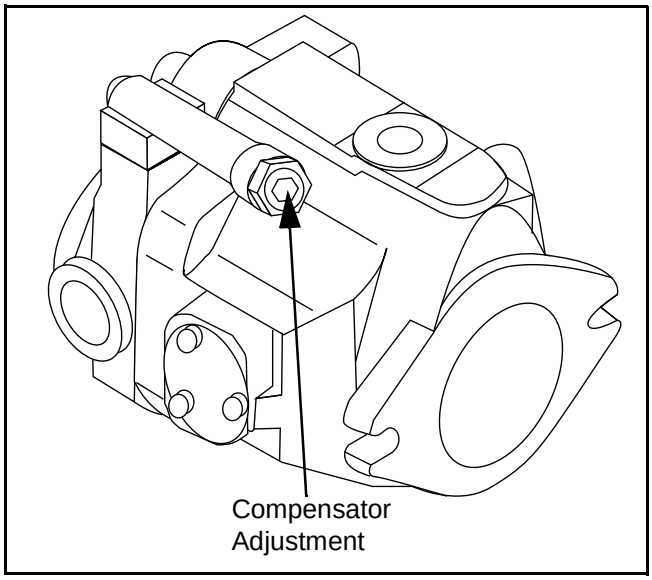


Figure 5 - 18 Auxiliary Pump

NOTICE

When installing a new auxiliary pump, you must adjust the system pressure compensator to obtain the required 2500 psi. **New pumps do not come pre-set.**

Rubber Track Hydraulic System

The rubber track hydraulic system, see schematic (Figure 5 - 19), provides pressurized oil to the piston ends of track tension cylinders. Each track is independent and supplied by the auxiliary pump.

Pressurized oil is held in the piston end of each track tension cylinder between tension valves and tension cylinders.

When the paver is started, oil is directed from the auxiliary pump to the track tension valves at 2500 psi. When tension pressure needs to be adjusted, oil is then routed to the piston side of the track tension cylinders by opening the tension valve charge cartridge needle valves allowing oil pressure to rise to 2500 psi. An accumulator for each track is placed in the circuit between the tension valve and the piston side of the track tensioning cylinders. The accumulator is pre-charged with dry nitrogen at 2250 psi to allow the track tension cylinders to retract and return if an impact is encountered.

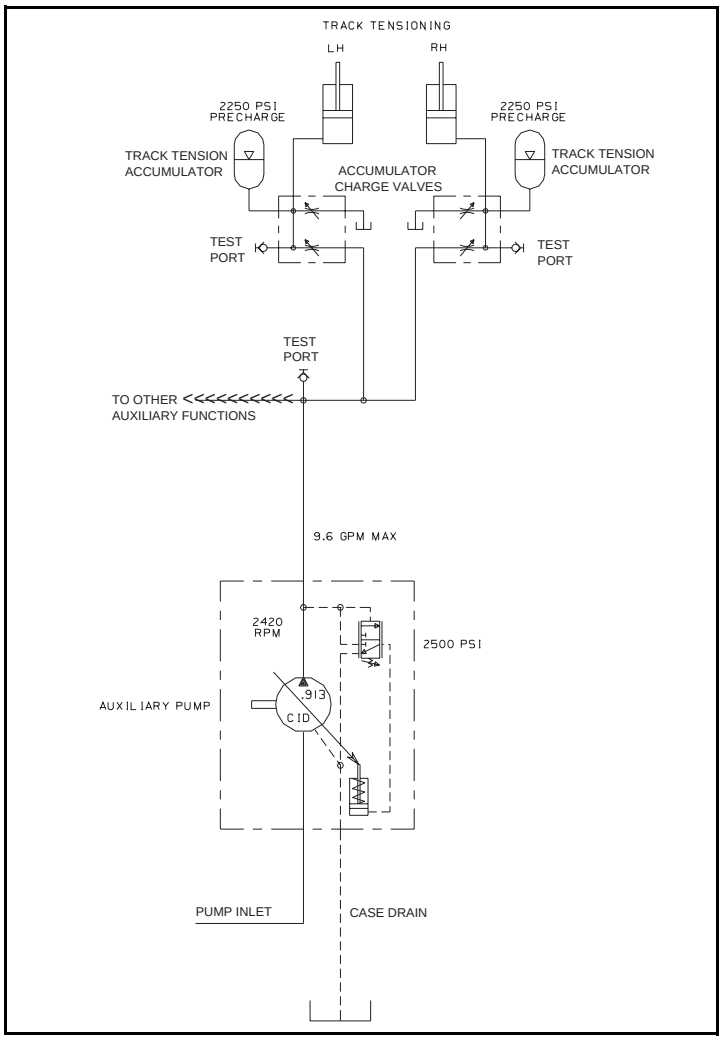


Figure 5 - 19 Rubber Track Hydraulic System Schematic

Rubber Track Hydraulic System

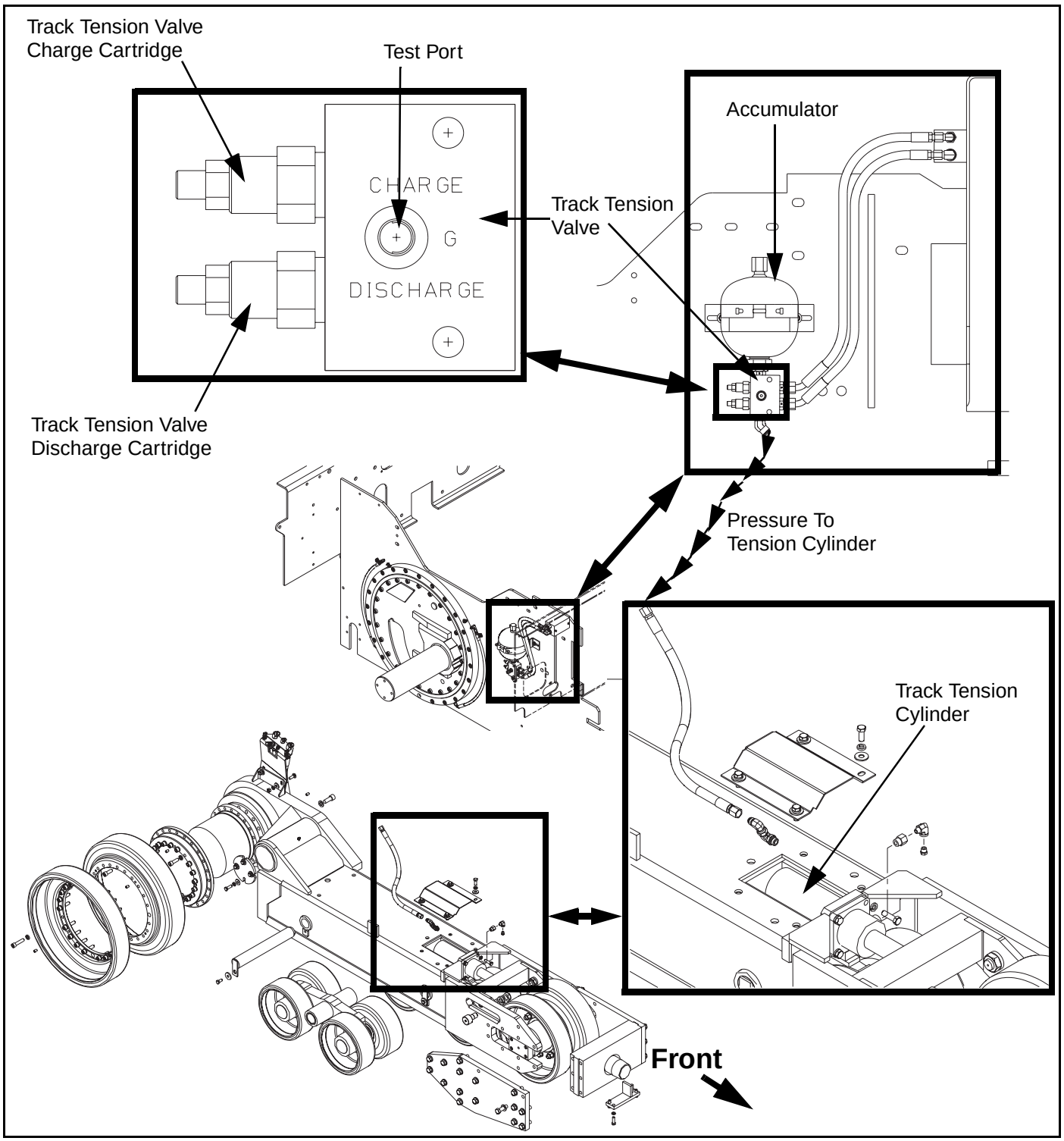


Figure 5 - 20 Rubber Track Hydraulic System Components

Rubber Track Hydraulic System

Checking Rubber Track Hydraulic System

The rubber track hydraulic system contains components which will automatically maintain track tension (Figure 5 - 20). To check out the system, follow the steps below:

Auxiliary System Pump Pressure

First check the auxiliary pump pressure compensator adjustment to be sure the system is set to 2500 +/- 100 psi. See Section 5, page 5-10 for this procedure.

Track Tension Accumulator

Check pre-charge of track tension accumulators on each side.

1) Install pressure gauge (3000 psi) at test port marked G on the Track Tension Valve (Figure 5 - 20).

2) Start and run engine at full throttle.

3) Pressure should read 2500 psi.

4) Shut engine off. Pressure on gauge should not change.

5) Loosen jam nut on discharge cartridge of track tension valve.

6) Insert an allen wrench into the adjusting screw, slowly turn it counter-clockwise to open the discharge needle valve and release hydraulic pressure while carefully watching the gauge.

7) The pressure reading should drop off slowly until it reaches the accumulator dry nitrogen pre-charge pressure. When the pressure reaches the accumulator pre-charge point, the gauge will drop quickly to 0 psi.

8) The gauge reading at the point where it drops quickly to 0 psi should be 2250 psi at 68 degrees F. This reading may be slightly more or less depending the ambient temperature and the hydraulic system temperature.

9) If the accumulator dry nitrogen pre-charge is at 2250 psi, then tighten the discharge needle valve screw by turning it clockwise until snug on its seat.

10) Re-tighten jam nut on discharge cartridge.

11) Charge the tension circuit to 2500 psi as described below.

12) If the pressure is below 2250 psi when it drops quickly to 0 psi, re-charge the accumulator with dry nitrogen as described in Track Tension Accumulator Pre-Charging procedure in the Paver Technical Manual, then test again.

13) If pressure is above 2250 psi, bleed off some dry nitrogen from the accumulator.

14) If the pressure drops steadily all the way to 0 psi and re-charging the accumulator does not work, then replace the accumulator.

Track Tension Pressure

Check the track tension pressure on each side.

1) Install pressure gauge (3000 psi) at test port marked G on the Track Tension Valve (Figure 5 - 20).

2) Pressure should read 2500 psi.

If pressure is not to 2500 psi, then do the following:

1) Start and run engine at full throttle.

2) Loosen jam nut on charge cartridge of track tension valve.

Rubber Track Hydraulic System

3) Insert an allen wrench into the adjusting screw, slowly turn it counter-clockwise to open the charge needle valve and allow hydraulic pressure to build to 2500 psi while carefully watching the gauge.

4) When the gauge reaches 2500 psi, close the charge needle valve by turning it clockwise until snug on its seat.

5) Shut off engine and note pressure.

Pressure should hold at 2500 psi.

Track Tension Valve Cartridges & Track Tension Cylinder

If the track tension cylinder bounces during operation as if there is air in the lines, do the following:

1) Loosen jam nuts on both charge and discharge cartridges of track tension valve. (Figure 5 - 20)

2) Start and run engine at full throttle.

3) Insert an allen wrench into the adjusting screws on the needle valves.

4) Alternately open and close each needle valve. Start with the discharge and then the charge.

5) Do step 4 until air is eliminated.

6) Tighten both needle valves snug on their seats.

7) Tighten jam nuts on each needle valve.

8) Shut off engine and note pressure.

Pressure should hold at 2500 psi.

If pressure does not hold, do the following:

1) Remove and cap lines from auxiliary pump-to-tension valve and from tension valve-to-tank. (Figure 5 - 21)

⚠WARNING

Escaping fluid under pressure can penetrate the skin causing serious injury. Be very careful when disconnecting hydraulic or other lines. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids. Any fluid injected into the skin must be removed immediately by a doctor.

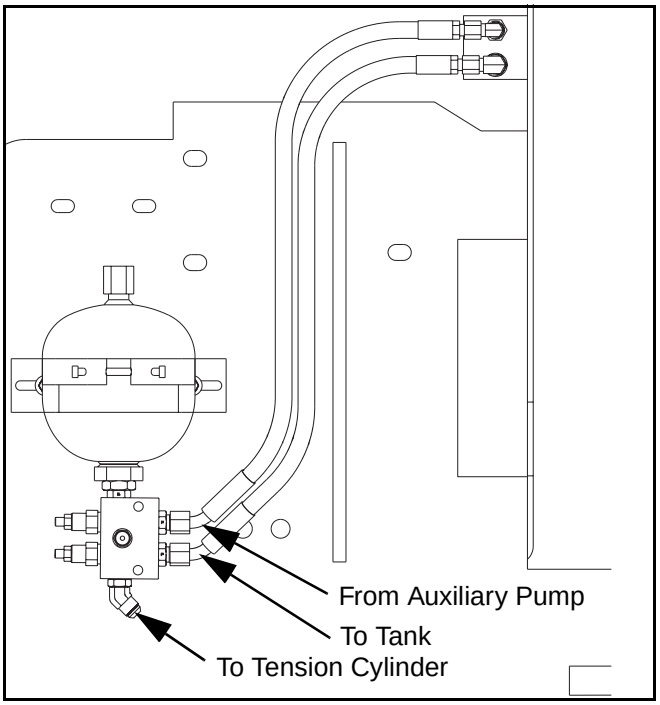


Figure 5 - 21 Track Tension Valve Hydraulic Lines

2) Observe pressure on gauge.

3) If pressure drops from 2500 psi, observe which tension valve cartridge port (charge or discharge) is leaking hydraulic fluid.

Rubber Track Hydraulic System

4) Verify that both tension valve cartridge needle valves are completely shut as described above.

5) If one of the cartridge ports leaks, replace that cartridge.

6) If none of the cartridge ports is leaking, but the pressure still drops off, check the breather on the track tension cylinder. (Figure 5 - 22)

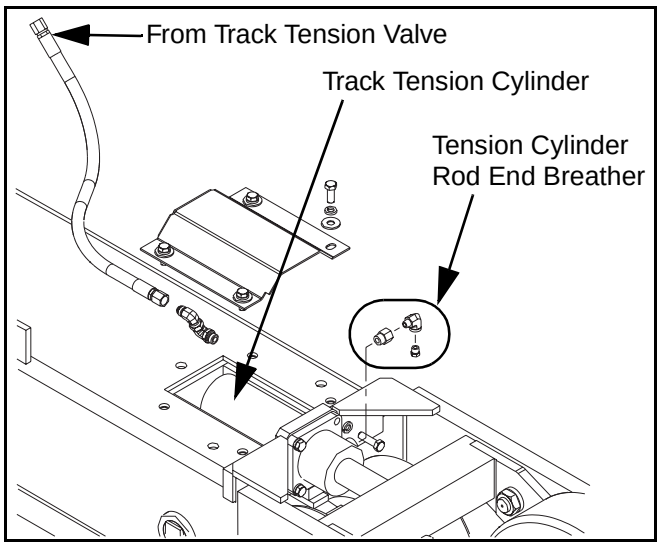


Figure 5 - 22 Track Tension Cylinder

7) If hydraulic fluid is leaking from breather, the cylinder packing or cylinder wall may be damaged. Remove and repair or replace tension cylinder as necessary.

8) Remove caps from lines installed in Step 1 above and reinstall lines to tension valve.

⚠WARNING

Escaping fluid under pressure can penetrate the skin causing serious injury. Be very careful when disconnecting hydraulic or other lines. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids. Any fluid injected into the skin must be removed immediately by a doctor.

Filters

The paver has three hydraulic fluid filters for maximum component protection. There are two travel/conveyor pump suction filters, and one auxiliary pump supercharge filter. (Figure 5 - 23)

NOTICE

Always replace filters with the filter listed in your paver parts book. Using lower quality filters could lead to expensive damage to the hydraulic system.

The auxiliary pump supercharge filter indicator should be checked daily with the engine at full throttle after the oil is warmed. If a filter is used until it is excessively clogged, the filter bypass valve will activate and the indicator on the filter base will indicate in the red. **NEVER** operate with a clogged filter! If the indicator is in the red area, the filter should be replaced. All hydraulic filters should be replaced every 500 hours of operation, when the indicator indicates red, or seasonally, whichever occurs first. Do not wait for an indicator to indicate red before replacing the filter.

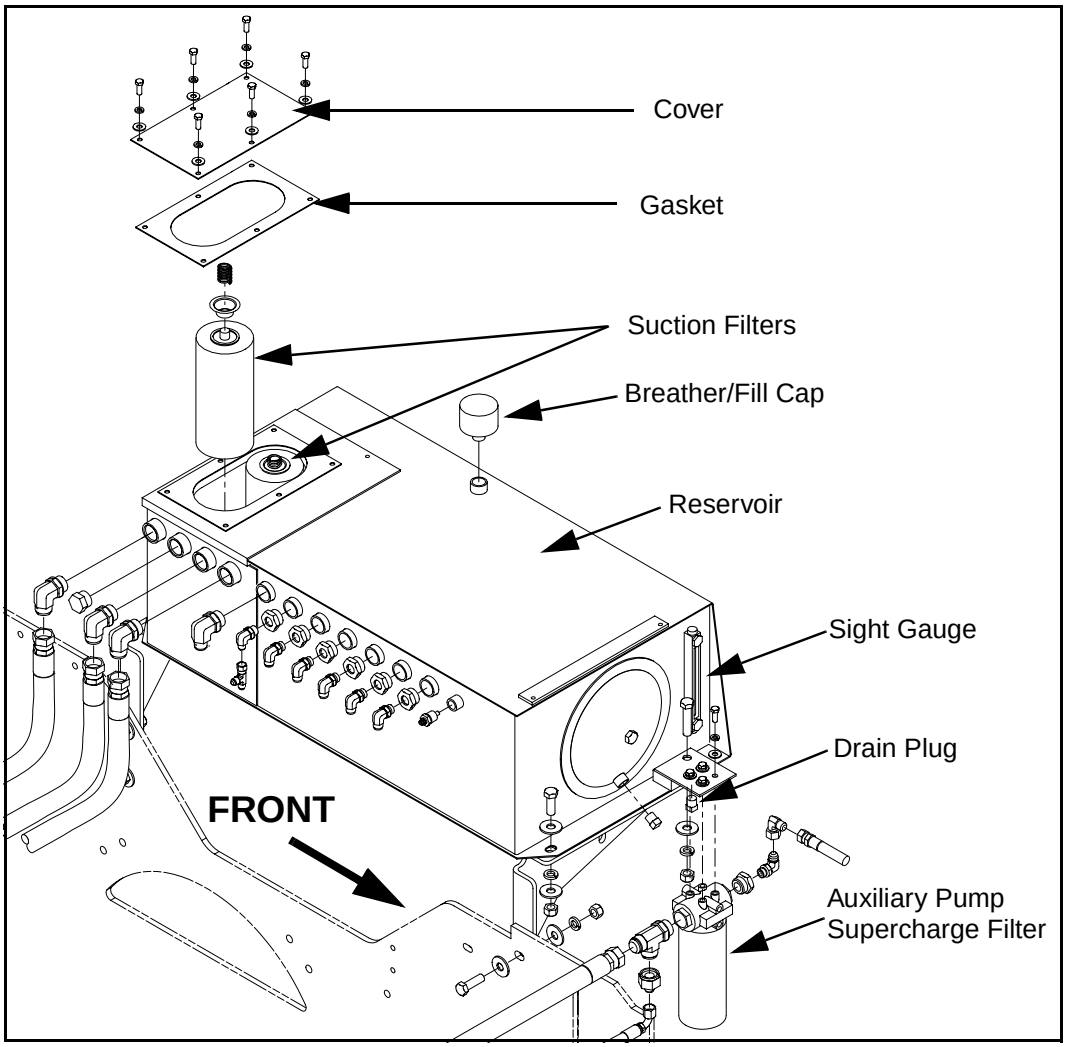


Figure 5 - 23 Hydraulic System Filters

Solenoid Valves

Solenoid valves mounted on top of each of the valve banks are controlled by toggle switches on the operator's console. These spool-type valves direct oil flow to and from the various hydraulic cylinders which control the paver and screed.

All of the 4-way, solenoid-operated directional valves used on the paver are identical units. They are double-acting valves with spring return of the spool to the neutral position.

When one of the switch contacts is closed, a 12 VDC solenoid is energized and the spool position is shifted by the plunger to connect internal porting so that pressurized hydraulic fluid flows to one end of the hydraulic cylinder(s). Fluid displaced by the moving cylinder rod flows through aligned ports of the same valve bank to the reservoir.

When the toggle switch is moved to the opposite position, the opposite solenoid is energized and the spool is shifted to reverse the pressure and return flow ports, so that the cylinder rod moves in an opposite direction.

When the switch is OFF, the spool is centered in the valve body by coil spring action and all ports connected to cylinders are closed so that no flow to or from the cylinders can occur.

Each solenoid uses a DIN connector which contains an LED. The LED lights when 12 VDC is applied. The first check to make when determining the cause of a hydraulic failure should be to see if the LED lights when the solenoid is energized. Keep in mind this is only a preliminary check; it is possible the LED may be burned out. (Figure 5 - 24)

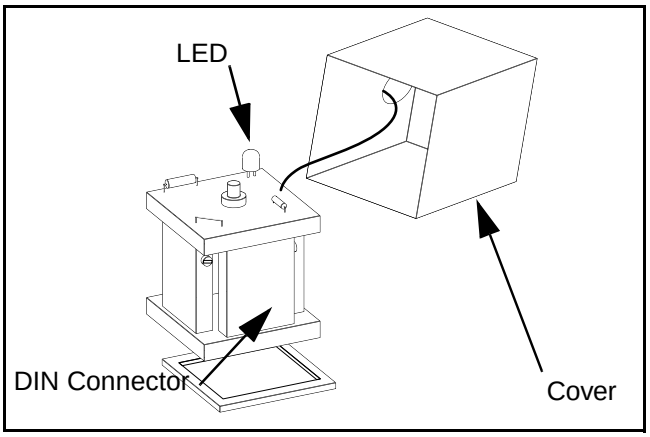


Figure 5 - 24 DIN Connector LED

If one of the paver functions does not operate, refer to the Technical Manual for troubleshooting and repair information.

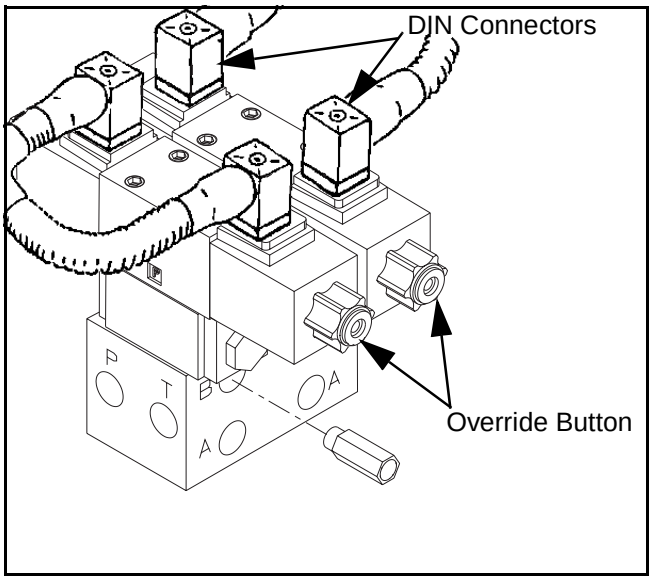
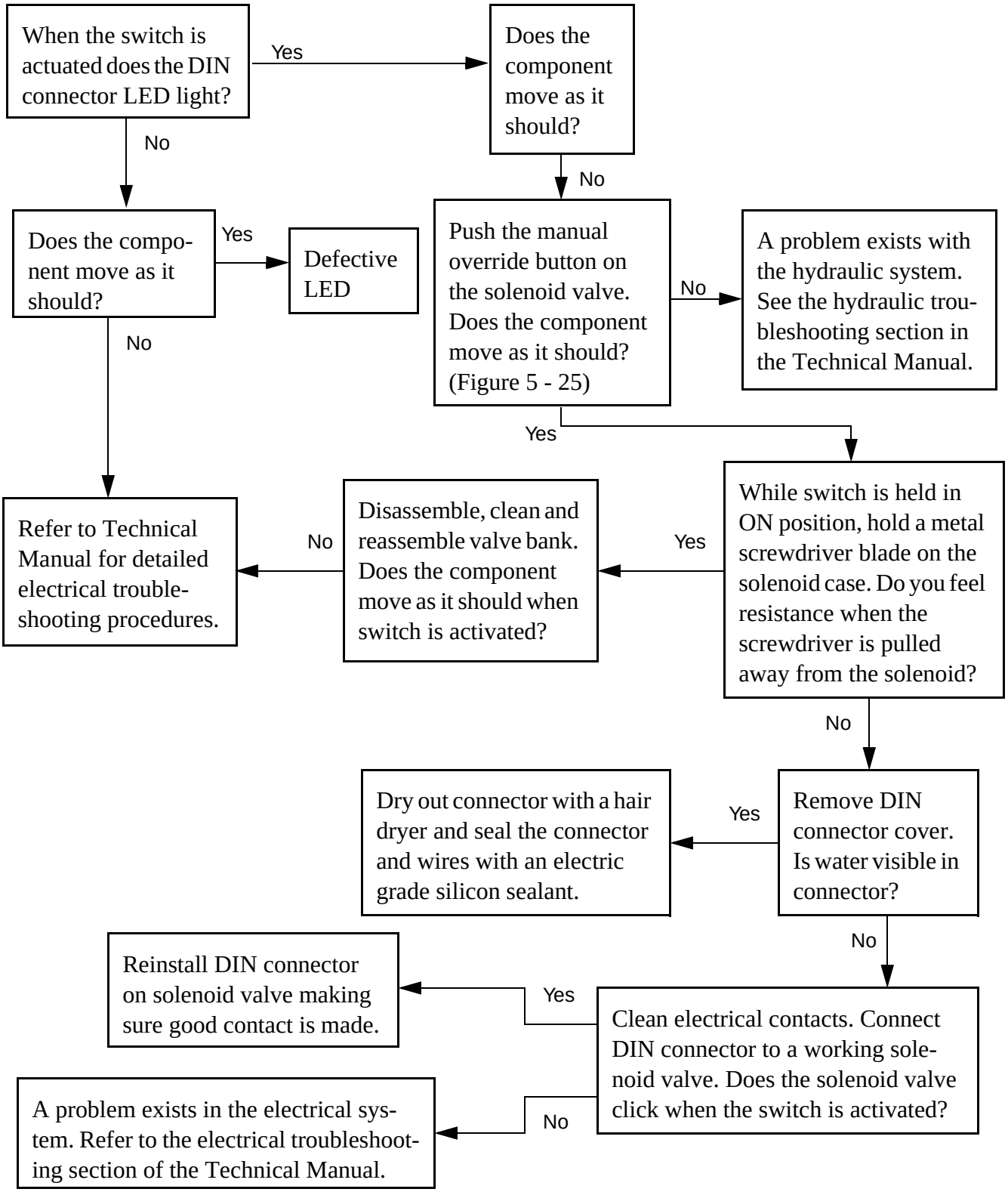


Figure 5 - 25 Solenoid Valve Override Button

Solenoid Valves



Solenoid Valves

Manual Testing of Solenoid Valves

If the spool cannot be manually shifted or fails to return by spring action to the OFF position, the valve should be completely dismantled, inspected, cleaned, and tested. If manual shifting succeeds in operating the system, try electrical operation again to see if the coil's magnetic force is strong enough to consistently move and hold the plunger.

Removing/disassembling Valve Bank

⚠WARNING

Before removing any hydraulic hoses or valves make sure the hopper wings, screed, frame raise, and pull point cylinders are lowered as far as possible.

When it is necessary to detach and disassemble any of the valves which make up a valve bank assembly, it is necessary that the bank be disconnected from hydraulic hoses, unbolted from the mounting brackets, and moved to a totally clean work bench area. The detached unit should also be plugged and washed clean externally before any disassembling is started. The following instructions should be used to maintain the frame raise, truck hook, hopper wings, screed lift, left tow point, and right tow point valve banks. Some of the components referred to may not be used on all valve banks. (Figure 5 - 26)

1) Remove the screw retaining each of the DIN connectors to the solenoids. Unplug the DIN connector from the solenoid.

2) Mark each hose and its companion port on the valve bank with a code that will assure reconnection is made to the correct port when the bank is installed. If hoses and ports are not marked, refer to schematic diagrams for correct connection details.

3) As each hose is disconnected, plug the end of the hose and port with a clean plastic plug.

4) Remove the nuts which hold the valve bank to the paver and remove the valve bank.

NOTICE

Scrub and rinse the exposed surfaces of the entire valve bank to remove all dirt and place the assembly on a clean working surface.

5) Remove the four stud nuts which hold the valve bank together and disassemble the valve bank. Retain all of the O-rings which will be between each of the valve bank components.

6) Remove the throttle valve from the valve block.

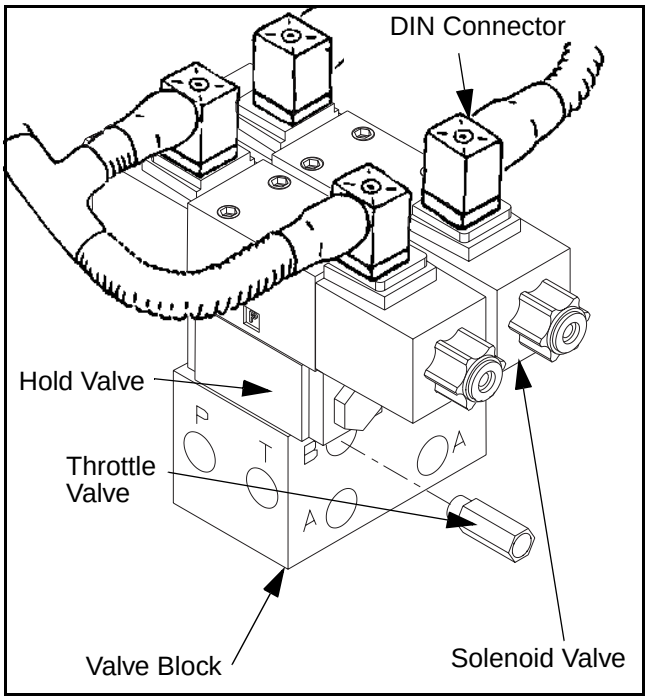


Figure 5 - 26 Typical Valve Bank

Valve Bank Components

Throttle Valve

The throttle valve allows unrestricted flow in one direction and metered or restricted flow in the opposite direction. In the case of screed lift, flow in RAISE direction is unrestricted while return flow in the LOWER direction is restricted by a 3/32” diameter orifice. This permits the screed to raise quickly but to descend at a slower, safe rate.

A drilled poppet is the only moving part in a throttle valve. The valve can be easily inspected for presence of foreign matter in orifice. The orifice can be cleaned using a piece of 1/16” diameter wire and compressed air. If probing succeeds in clearing a blockage, the valve should then be flushed clean with mineral spirits solvent. These same valves are used in the hopper wing circuit.

Holding Valve

Holding valves are used on the frame raise, hopper wings, screed lift, and tow point valve banks. If the engine stalls or a hydraulic line breaks between the pressure source and valve, the holding valve locks the cylinder in its current position to prevent the screed, hopper wings, etc. from dropping unexpectedly. When the hydraulic line is repaired and the engine is restarted the valve continues to work normally.

⚠WARNING

Holding valves do not contain any serviceable or replaceable parts. Do not attempt to disassemble and repair a holding valve cartridge.

A holding valve consists of a valve body and one or more valve spools. If a holding valve is not working properly remove the valve and blow the valve body and spool off with compressed air. Reinstall the valve. If it still does not work, replace the valve.

Flow Control Valve

The flow control valve is used in the tow point and truck hook cylinders to control the speed at which the cylinders move. The valve consists of a valve body with a needle valve cartridge.

To clean the flow control valve, remove the cartridge, blow the valve and valve body out with compressed air, and reinstall the cartridge.

Assembling Valve Banks

The valve bank should be assembled on a clean lint-free shop towel in a clean work area. All components should be wiped clean before assembly. For specific valve bank illustrations, refer to (Figure 5 - 27), (Figure 5 - 28), and (Figure 5 - 29).

Valve Bank Components

1) Inspect all O-rings before assembly. Replace any O-rings that are cracked, damaged, dried out, or not flexible.

2) Lubricate each O-ring with clean oil or light grease before assembly.

3) Place O-rings in the O-ring recesses . Make sure O-rings do not get pinched during assembly.

4) Refer to illustrations on the following page for proper orientation of each valve bank component.

5) To ensure that each component is properly oriented during assembly the following procedure should be done for each component:

   a) apply a thin coating of oil or grease to the O-rings

   b) install the next valve stack component on the studs

   c) remove the component

The O-rings will leave a circular oil mark on the mating valve surface. If the component was installed in the proper orientation the four oil ports in the mating component surface will be centered in the four oil marks left by the O-rings. If the oil marks do not line up with the oil ports, check the orientation of the component and reinstall.

NOTICE

When assembling valve bank, tighten screws alternately, evenly, and with not more than 48 to 60 inch-pounds of torque. It is important that the machined contact surfaces and O-rings make a leak-free contact without excessive screw tightness which can warp the valve body and cause binding of the spool.

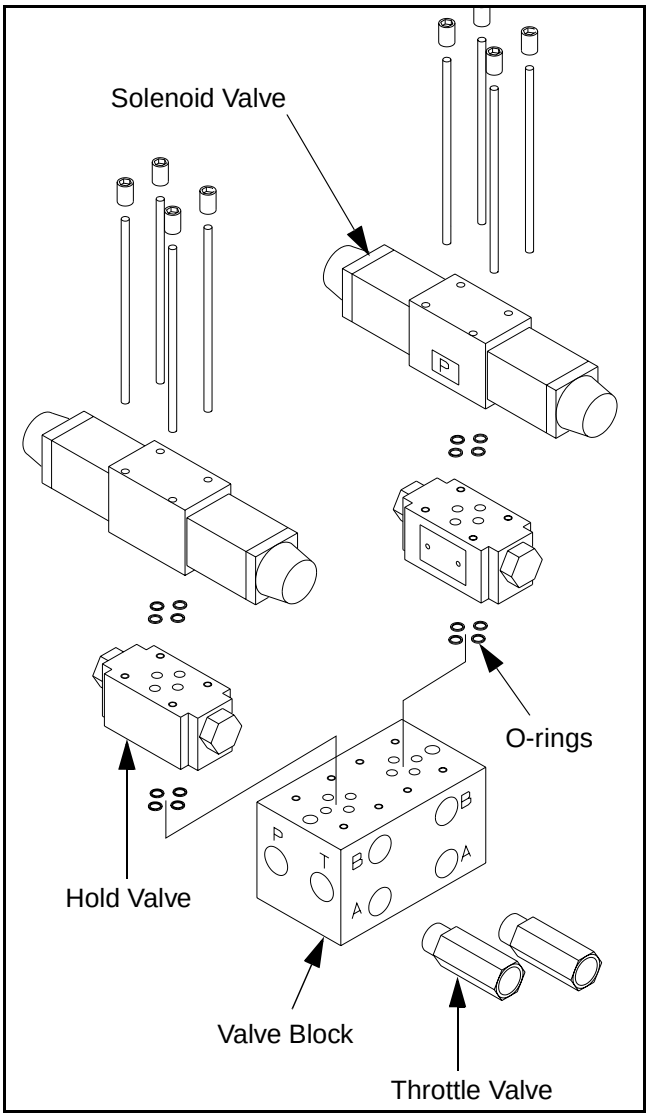


Figure 5 - 27 Frame Raise/Screed Lift Valve Bank

Valve Bank Components

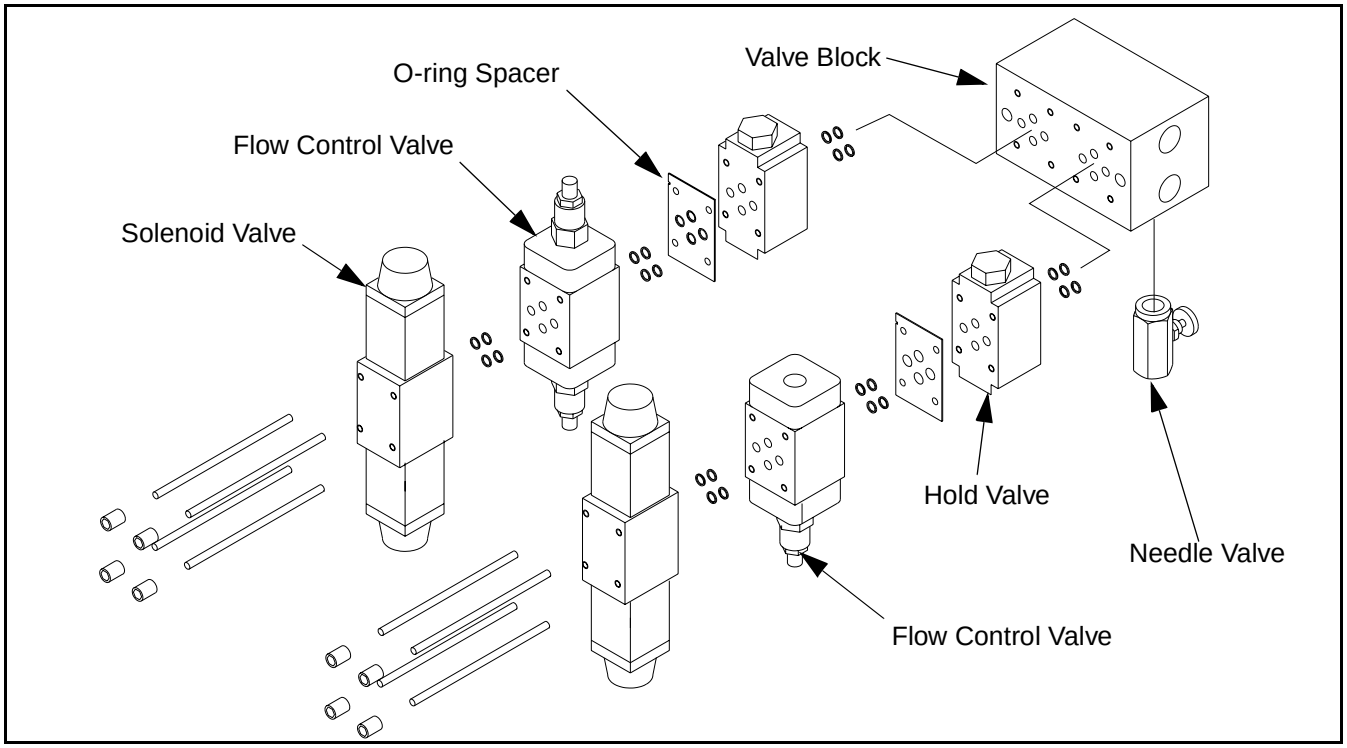


Figure 5 - 28 Truck Hook/Left Tow Point Valve Bank

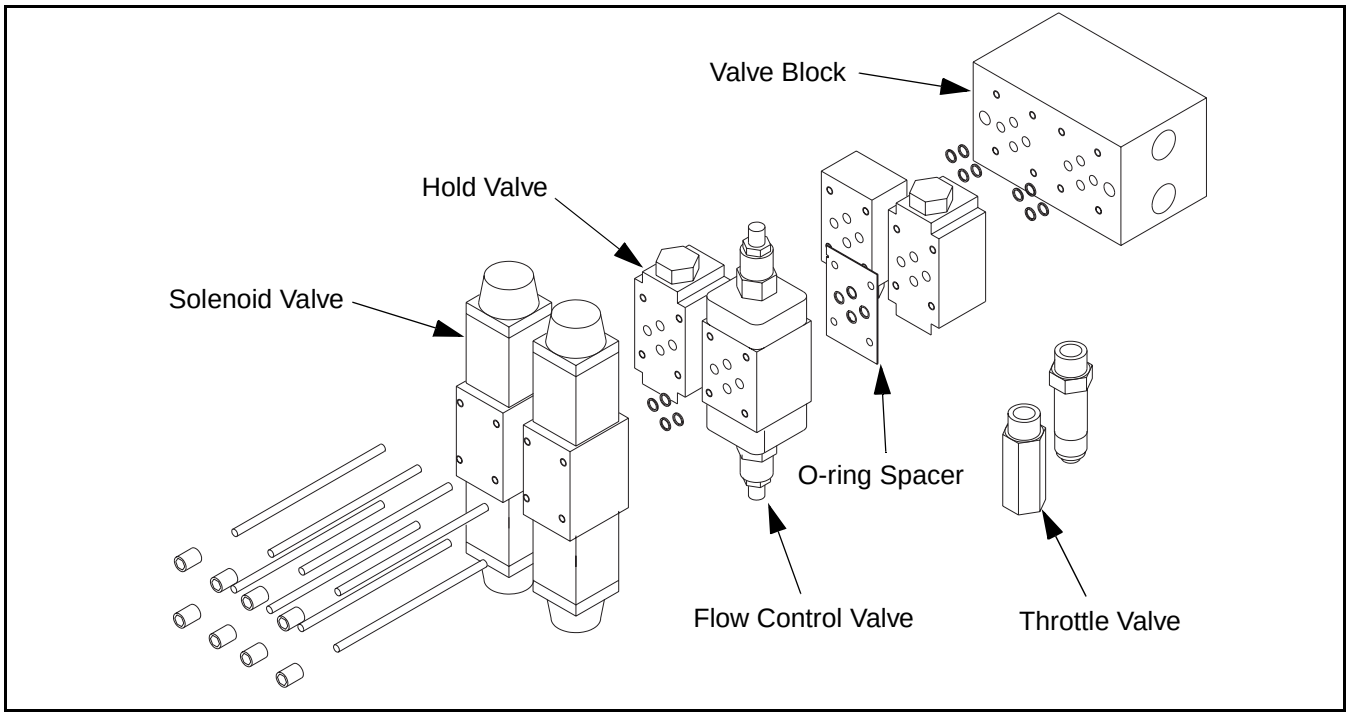


Figure 5 - 29 Hopper Wings/Right Tow Point Valve Bank

Hydraulic System Troubleshooting

Hydraulic Fluid Overheating

The following factors can cause fluid temperature above 160°F:

1) **Low Fluid Level in Supply Tank:** When the fluid level is kept high more heat is radiated from the tank walls and the circulating (cooling) time is increased. Keep fluid level FULL on the sight gauge, especially when outdoor temperature is high.

2) **Cooler Not Functioning Properly:** The flow of hydraulic fluid must be free and unrestricted at all times. The air passages through the radiator and cooler must be kept clear of dirt, fibers, and insects so that an unrestricted flow of air is assured at all times during engine operation. The radiator and cooler are placed in the top of the hood above the engine with a hydraulically driven suction type cooling fan moving air through from above. Keep the louvers above the radiator and cooler free from obstructions.

Failing Pumps or Motors

In the event that one of the pumps or one *of* the motors is beginning to fail internally, excessive heat will usually be produced. When this occurs the fluid temperature will become abnormally high. It is recommended that a “touch” test be made immediately in an effort to determine where an internal failure of parts is beginning to occur. The hottest fluid will be passing back to the reservoirs through a case drain hose. It is sometimes possible to touch the fittings of each of these hose lines and detect an extremely hot one which feels different from the others. If paving can be suspended for a “cooling off” period it is easier to detect the difference at the next start-up as the line from the failing unit will heat up much faster than the others. If a “hot” pump or motor is detected, have the pump or motor serviced immediately.

NOTICE

If the conveyors are not feeding equal quantities of material, the one moving the most material will be slightly hotter than the other. This should be considered in making temperature comparisons. Temperature checks can also be made by taping an accurate indicating thermometer to the case drain fittings.

Air in the Systems

The suction force developed by each of the six hydraulic pumps on the paver draws the fluid from reservoirs through hose lines to the charge pumps. With all points on these suction lines under negative pressure, air can be drawn in wherever an opening exists. When air is mixed with the fluid entering any of the pumps, an abnormal situation is created and serious operating problems develop.

The charge pumps which force feed the drive pumps cannot develop enough fluid pressure to keep the main pump passages filled with fluid. Pump pressure fluctuates and paver operation becomes jerky and erratic as the pumps cavitate.

Causes of Air in System

1) Low fluid level in reservoirs. When fluid level approaches tips of suction pipes near bottom of reservoir, air begins to enter along with fluid. Always keep tank filled to sight gauge level.

2) Air leakage through an opening at any connection in fluid supply lines to pumps. If gasket at top of a filter element is not sealing properly, air will be drawn in.

Locating Air Leaks

If an air leak is suspected but cannot be located or confirmed, the best way to test for it is by pressurizing the reservoir with air and finding the point of fluid leakage. To do so, remove both breather fill caps and attach an air line which includes a pressure regulator and gauge so that **not more than 15 psi** air pressure will be applied. Any point where fluid leakage occurs under air pressure is a point of air entry.

When fluid leakage is located and stopped, pressurize reservoir to 15 psi, close air inlet valve, and see if system will hold pressure for an hour or two without dropping. This will verify that all leaks have been stopped and air will no longer enter the system when operation is resumed. Remove plugs from fill holes and replace with breather fill caps.

Paver Hydraulic Schematics

To find the paver hydraulic schematics, refer to Appendix C.

Paver Hydraulic Schematics

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Section 6 - Maintenance

Raising the hood

The paver's hood must be raised to gain access to the engine for daily maintenance. The hood is raised using a hydraulic cylinder which is activated by a lever just under the hood on the right side of the machine in front of the rear wheel or drive sprocket. (Figure 6 - 1)

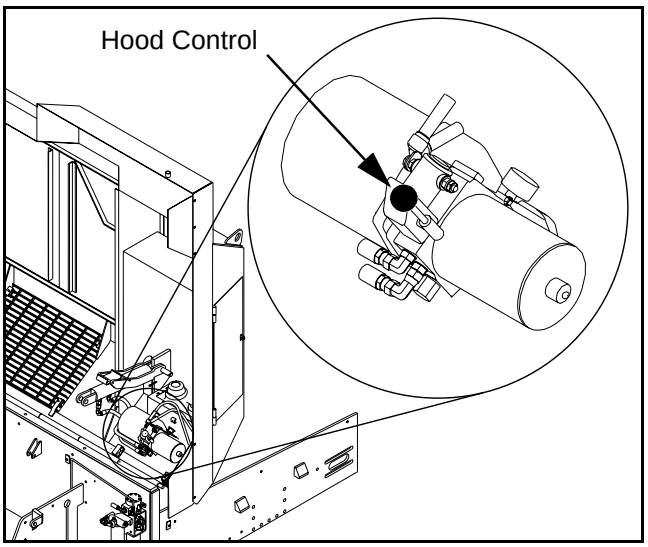


Figure 6 - 1 Hood Control

To raise the hood:

1) Position and lock the operator's console in the center position.

2) Turn on the master key switch before activating the hood control. Once the hood raising cylinder is fully extended, the hood safety lever will engage automatically.

⚠WARNING

Keep all personnel out from under the hood until the hood safety latch is engage. Failure to follow these instructions could result in death or serious injury.

3) Verify that the hood safety latch is engaged.

If the paver's batteries become discharged, jumper cables must be attached to the solenoid next to the hood raising lever and to the paver frame. (Figure 6 - 2) This will allow the hood raising lever to function in the normal manner.

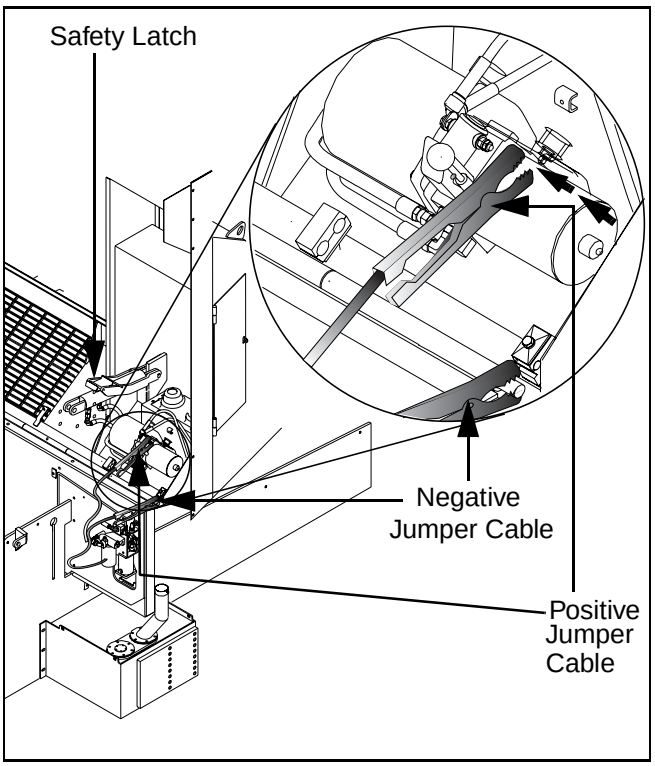


Figure 6 - 2 Connecting Jumper Cables

WARNING

Keep all personnel out from under the hood until the hood safety latch is engage. Failure to follow these instructions could result in death or serious injury.

To lower the hood, release the hood safety latch and activate the hood raising lever. (Figure 6 - 2)

Before Starting Engine

Before starting the engine, the operator should check the following details personally.

- Verify that all decals are properly adhered to the machine, undamaged, and legible.
- Be sure all safety items (decals, guards, walkways, fire extinguisher, etc.) are in place and properly installed.
- Engine Oil Level should be at the “Full” mark on the dip stick. If engine oil is low, add oil to bring the level up to the “Full” mark. Refer to the engine manual for the correct oil type.
- Coolant Level inside the radiator should be just above the baffle. If not add the correct mixture of antifreeze and water. Do not over fill as excesses will be blown out the over flow. Refer to the engine manual to find the correct antifreeze and water mixture to use for the temperatures found in your working area.
- Hydraulic Oil Level must be checked while the hydraulic oil is cold and the machine is sitting level. If the hydraulic oil level is low, add the correct amounts of make up oil to bring the level to the COLD level on the sight glass.

NOTICE

Over filling the hydraulic tank does not leave enough room in the hydraulic system for thermal expansion when the oil is at running temperature. Excess oil will be blown out the breathers which could cause external radiator clogging.

NOTICE

Do not mix different types of oil. This could lead to unexpected failures.

- Engine Fuel Tank Level should be checked to ensure you have enough fuel to operate the paver for the desired amount of time.

Perform a visual inspection of the complete paver including engine compartment, for any signs of damage or leaks. Do not start the paver until all damage and leaks are repaired.

Maintenance Checklist

Ref.	Item to be checked	8 hrs	40 hrs	250 hrs	500 hrs	1000 hrs	Yearly	As Needed
1	Fuel level	I						F
2	Fuel Filter / Water Separator	D			R			
3	Travel Lever Alignment		I					A
4	Hydraulic Fluid	I/F			R*	R		
5	Oil Cooler	I						C
6	Suction Filters				R			
7	Aux. Pump Supercharge Filter		I		R			
8	Hydraulic lines and components	I						
9	Air Restriction Indicator	I						
10	Air Filter							C/R
11	Engine Oil	I/F		R				
12	Engine Oil Filter			R				
13	Engine Coolant	I/F					R	
14	Engine Belt		I					A
15	Radiator	I						C
16	Engine Cooling Fan	I						
17	Battery		I/F					
18	Tire Pressure		I/F					
19	Frame Raise Eccentric				L			
20	Steel Track Tension		I					A
21	Rubber Track Tension		I					
22	Track Pivot		L					
23	Fire Extinguisher			I				
24	Horn	I						
25	Pump Drive Belts		I					A
26	Depth Cranks			L				
27	Vibrator Bearings	L						
28	Crown Control			L				
29	Match Height Assembly		L					
30	Extension Slope Assembly		L					
31	Final Drive Oil		I/F*			R		
32	Steering Bogie Alignment							I/A
33	Steering Linkage			L			I/A	
34	Bogie Beam Bearings			L				

Key: I - Inspect C - Clean R - Replace A - Adjust
D - Drain L - Lubricate F - Fill * - Initial change only

Table 6 - 1 Maintenance checklist

Maintenance Checklist

Ref.	Item to be checked	8 hrs	40 hrs	250 hrs	500 hrs	1000 hrs	Yearly	As Needed
35	Front Wheel Bearings						L	
36	Bogie Wheel Toe In						I/A	
37	Conveyor Slat Chains	I/L	I/A					
38	Conveyor Bearings	L						
39	Auger Bearings	L						
40	Feeder Drive Chain		I					A
41	Conveyor Drive		I					
42	Hood Raise Reservoir			I				
43	Operator Console Pivot Bearings			L				
44	Tow Arm Nose Roller	L						
45	Slope Beam Rod Ends			L				
46	Truck Hitch	C/L						
47	Fume Recovery System	I					I	C

Key: I - Inspect C - Clean R - Replace A - Adjust
D - Drain L - Lubricate F - Fill * - Initial change only

Table 6 - 1 Maintenance checklist (Continued)

Periodic Maintenance

Numerical values assigned to the paragraphs that follow directly relate to the numbers in the “Ref.” column of Table 6 - 1, above.

1) Fuel Level

⚠WARNING

Keep away from sparks or open flame while working with fuel.

Check fuel level before each work period to ensure you have enough fuel to operate for the desired period of time. Refer to the engine manufacturers manual to determine what grade of fuel to use for your operating temperature and conditions.

2) Fuel/Water Separator

Daily Maintenance

Drain the water and sediment from the separator daily. (Figure 6 - 3)

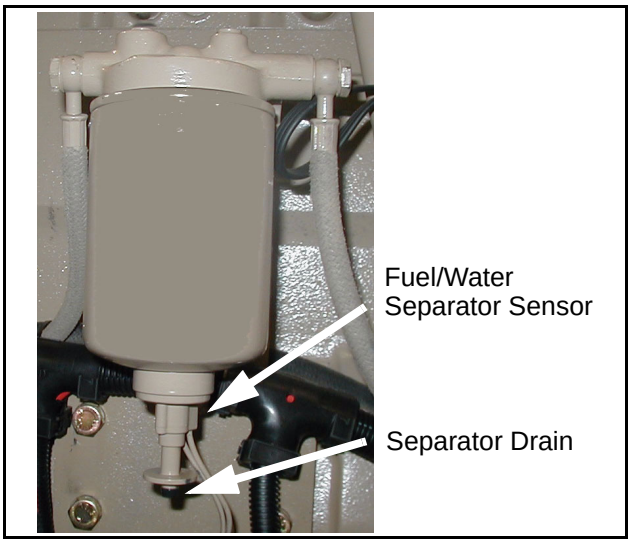


Figure 6 - 3 Draining fuel/water separator

Shut off the engine. Use your finger to push up on the drain valve until liquid starts draining slowly. Drain the filter sump of water until clean fuel is visible.

Release the valve to close the drain.

NOTICE

Check the valve after draining to make sure it does not leak.

Filter Replacement

Replace the fuel filter/water separator every 500 hour of operation. Some operating conditions may require replacement at shorter intervals for proper engine operation.

To replace the fuel filters:

1) Clean the area around the filter head.
2) Remove the filters.
3) Clean the gasket surface of the filter head.
4) Replace the O-ring.
5) Fill new filters with clean fuel and lubricate the O-ring seal with clean lubricating oil.
6) Install filters and tighten.

NOTICE

Overtightening may distort the treads or damage the filter element.

3) Travel Lever Alignment

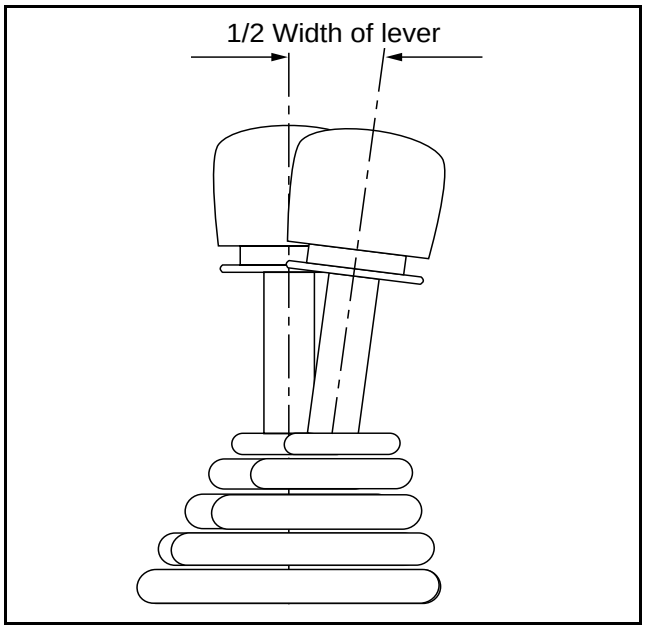


Figure 6 - 4 Travel lever alignment

Tire pavers and some track use a travel levers to control travel speed and direction. During normal operation, when the track paver is travelling in a straight line over a flat, level surface, both travel levers should be advanced an equal amount. The travel levers need to be brought back into alignment when one travel lever is advanced more than 1/2 of the width of a travel lever more than the other lever. (Figure 6 - 4) Refer to the Technical manual for travel lever adjustment procedures.

When travelling on a grade, on uneven terrain, or when connected to a truck or pickup machine, one travel lever may need to be advanced considerably farther than the other to maintain straight travel. Also, as the speed dial setting is varied, the travel lever position may need to be adjusted to keep the paver traveling in a straight line. In each of these cases the travel levers will need to be adjusted only if one of the travel levers is advanced to the stop before straight travel is achieved. If travel levers are consistently out of alignment in one direction or the other, the travel levers should be adjusted to bring them back into alignment.

4) Hydraulic Fluid

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance.

Hydraulic oil level must be checked while the hydraulic oil is cold and the machine is sitting level. If the hydraulic oil level is low, add the correct amounts of make up oil to bring the level to the COLD level on the sight glass.

NOTICE

Overfilling the hydraulic tank does not leave enough room in the hydraulic system for thermal expansion when the oil is at running temperature. Excess oil will be blown out the breathers which could cause external radiator clogging.

NOTICE

Do not mix different types of oil. This could lead to unexpected failures.

The hydraulic fluid should be drained and replaced with new fluid every 1000 hours of operation. The hydraulic fluid in a new paver or a paver that has just had a new hydraulic pump or motor installed should be replaced after the first 500 hours of operation.

Cedarapids recommends use of a premium anti-wear, ISO Grade 68 hydraulic oil in all 400-Series Pavers. Pavers ship from the factory with Texaco Rando HD 68 hydraulic oil. Other approved hydraulic oils in this class are: Amoco AW68; Exxon NUTO H68; Mobil DTE26; Shell Tellus 68; Chevron AW 68.

5) Oil Cooler

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance.

The oil cooler should be checked daily for dirt and other buildup that would restrict the air flow. The paving conditions will determine how often the oil cooler requires cleaning. If severe conditions exist or there are a lot of air-born contaminates the oil cooler will require more attention. Any fluid leaking from any engine compartment component, hose or tube may find its way into the oil cooler.

Remove any dirt or debris that will restrict air flow through the oil cooler. Spray water from a garden hose from the bottom side of the oil cooler to the top to remove any dirt or grit that may have settled between the oil cooler fins.

Check for damaged hoses and loose or damaged hose clamps. Replace as required. Check the oil cooler for leaks and the core for damaged or bent fins. Clean and repair as required.

6) Suction Filters

The suction filters should be removed and replaced every 500 hours of operation. To replace filters:

1) Clean the cover and top of reservoir to prevent dirt from falling into the hydraulic reservoir.

2) Remove screws and lift the cover from the reservoir to gain access to the filters. (Figure 6 - 5)

3) Lift off springs and cups from the top of filters and then remove filters from reservoir.

4) Install new filters into reservoir.

5) Check the condition of cover gasket . If gasket is damaged, install a new one.

NOTICE

Severe pump damage will occur if the strainer cover is not sealed properly. Air will be drawn into the system causing pump cavitation.

6) Install cups and springs onto the top of filters.

7) Install the cover using Loctite “Ultra-Blue” sealant (P/N 45995-001-30).

8) Pressurize reservoir to 10 psi air pressure and check suction lines for leaks. Loosen fittings while under pressure to purge lines.

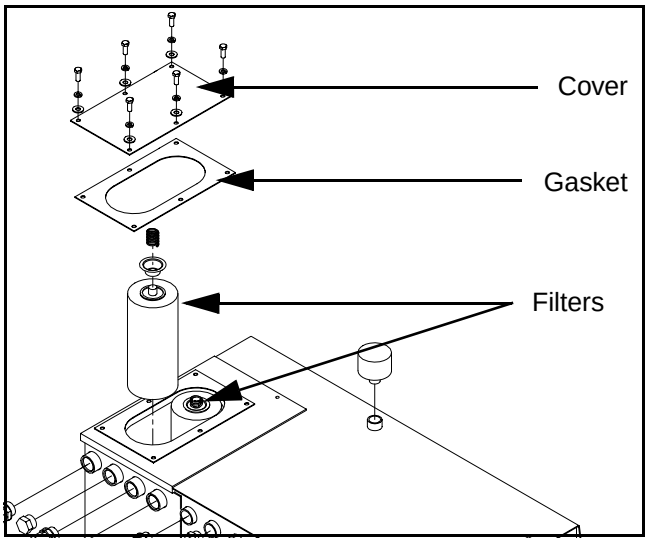


Figure 6 - 5 Suction Filters

7) Auxiliary Pump Supercharge Filter

The 300 Series has a spin-on filter that filters oil returning from the vibrator system before directing it to the auxiliary pump or, if the auxiliary pump does not require oil, back to the reservoir. This filter is commonly referred to as the “supercharge filter”. The filter is equipped with an indicator that operates in the green zone when the filter is in good condition and operates in the red zone when the filter is dirty. The indicator should be checked every 40 hours with the engine at full throttle. Do not wait for the indicator to move into the red zone before replacing the filter. The filter should be replaced every 500 hours or when the indicator is operating in the red zone, which ever comes first. (Figure 6 - 6)

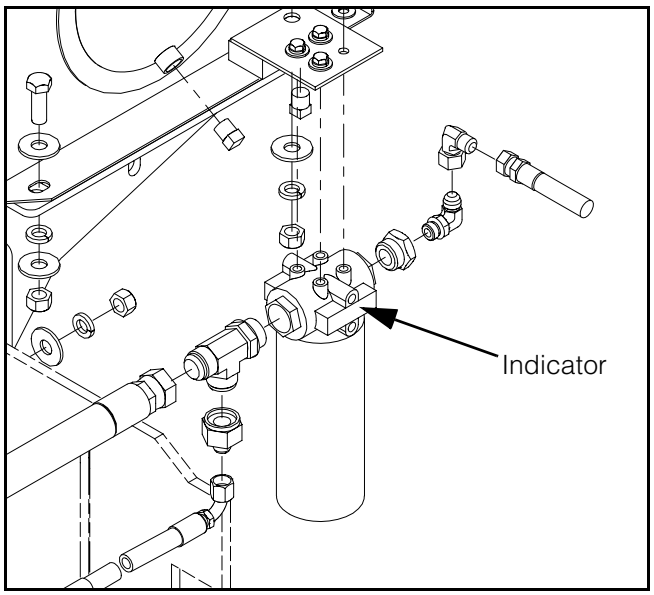


Figure 6 - 6 Supercharge Filter

8) Hydraulic Lines and Components

Check all hoses, tubes, and components for leaks, damage, or loose fittings. Check the ground for signs of fluid leakage. Spots of oil soaked dust may indicate a slow leaking hydraulic component. These leaks should be identified and fixed before operating the equipment.

9) Air Restriction Indicator

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance.

The engine air cleaner is equipped with an indicator that trips red when it needs service. The indicator should be checked daily to ensure proper servicing. (Figure 6 - 7)

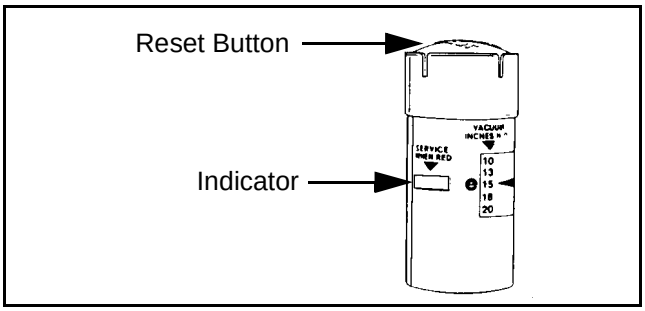


Figure 6 - 7 Air Restriction Indicator

Service the filter element when the red indicator flag is visible in the window.

After the air cleaner has been serviced, push the button to reset the service indicator.

10) Air Filter

Running the paver with an air cleaner that needs replacement does not allow the engine to get the proper amount of air to burn the fuel properly, which reduces engine horsepower and fuel efficiency. (Figure 6 - 8)

NOTICE

Never operate a paver without an air cleaner. Intake air must be filtered to prevent dirt and debris from entering the engine and causing serious and expensive damage.

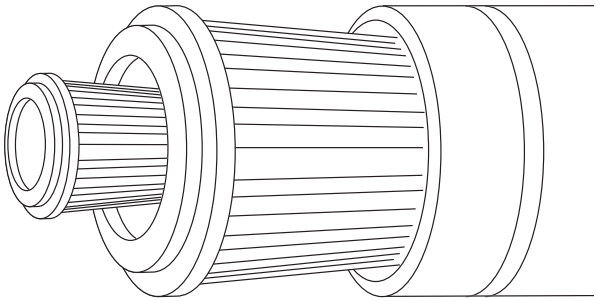


Figure 6 - 8 Engine Air Filter

When servicing an air cleaner take precautions not to allow any of the dirt or contamination that would happen to fall off the old element to remain in the filter housing or pass into the air inlet of the engine. Dirt and contamination are one of the biggest reasons for engine wear. Improper cleaning of old air cleaner elements can damage the element and allow dirt and contamination to pass directly into an engine.

Cedarapids does not recommend that air filter elements be cleaned in any way. When the air restriction indicator is operating in the red area the primary element must be replaced. The safety element must be replaced after three primary element changes.

NOTICE

Do not beat, shake, or use high pressure compressed air to remove dirt from an element. These methods can make small cuts in the element material which will allow dirt to enter the engine causing serious and expensive damage to the engine.

Periodic Maintenance

Engine Air Inlet Connections

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance.

Inspect the inlet piping for cracked hoses, loose clamps, or punctures that can allow dirt and debris to enter the engine. Tighten or replace parts as necessary to make sure the air inlet system does not leak. (Figure 6 - 9)

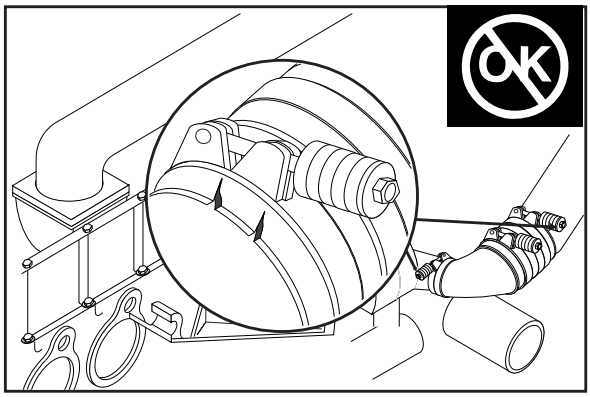


Figure 6 - 9 Air Inlets

The air inlet system includes the piping from the air cleaner to the turbocharger and the piping from the turbo charger to the after cooler or inlet manifold depending on model.

11) Engine Oil

Engine Oil Level

Never operate the engine with the oil level below the “L” (Low) mark or above the “H” (High) mark on the engine oil dipstick. (Figure 6 - 10) Wait at least 5 minutes after shutting off the engine to check the oil. This allows time for the oil to drain to the oil pan.

Periodic Maintenance

NOTICE

The engine must be level when checking the oil level to be sure the measurement is correct.

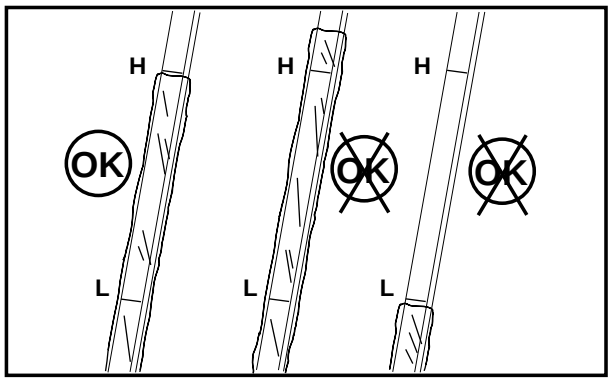


Figure 6 - 10 Checking Engine Oil Level

Changing Engine Oil

Engine oil and filter should be changed at least every 250 hours of operation. Shorter intervals may be required due to operational conditions. Severe conditions require more frequent maintenance.

NOTICE

Drain the oil only when it is hot and the contaminants are in suspension.
(Figure 6 - 11)

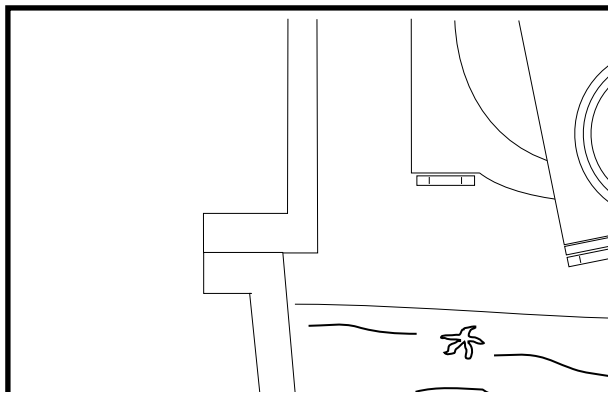


Figure 6 - 11 Oil Contaminants in Suspension

Operate the engine until the engine coolant temperature reaches 60°C [140°F]. Shut the engine off. Remove the oil drain plug and **drain oil into a container.**

⚠CAUTION

Hot oil can cause personal injury.

Protect the environment: handling and disposal of used engine oil can be subject to federal, state and local law regulation. Use authorized waste disposal facilities, including civic sites and garages providing authorized facilities for the receipt of used engine oil. If in doubt, contact your local authorities or the EPA for guidance as to proper handling of used engine oil.

Refer to the engine manuals for the recommended type and grade of oil to be used.

12) Engine Oil Filter

Engine oil and filter should be changed at least every 250 hours of operation. Shorter intervals may be required due to operational conditions. Severe conditions require more frequent maintenance.

Use the appropriate replacement filter for your engine. See your Cedarapids dealer to be sure you are getting the correct oil filter.

Refer to Engine Service and Maintenance manuals for recommended change interval and instructions.

13) Engine Coolant

The coolant level must be checked daily. (Figure 6 - 12)

⚠WARNING

Do not remove the radiator cap from a hot engine. Wait until the temperature is below 50°C [120°F] before removing the pressure cap. Failure to do so can result in personal injury from heated coolant spray or steam. Remove the filler cap slowly to relieve coolant system pressure.

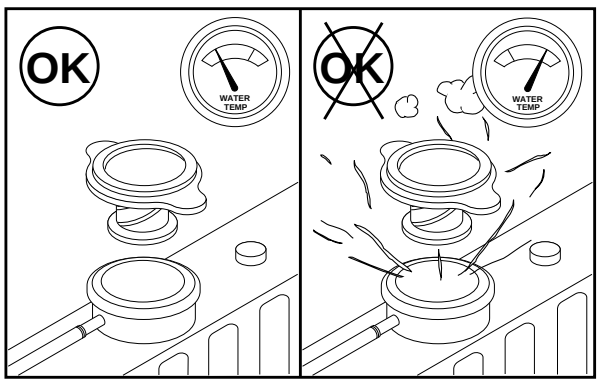


Figure 6 - 12 Hot Coolant Hazard

NOTICE

Do not add cold coolant to a hot engine. Engine castings can be damaged. Allow the engine to cool to below 50°C [120°F] before adding coolant.

Fill the cooling system with coolant to the bottom of the fill neck in the radiator with a 50/50 mixture of antifreeze and clean water. (Figure 6 - 13)

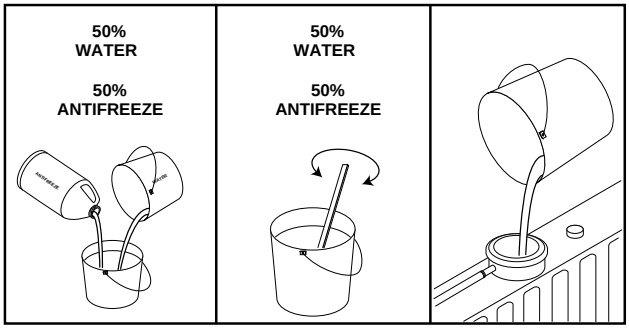


Figure 6 - 13 Adding Engine Coolant

Important: Do not overfill the radiator. Overfilling does not leave room for thermal expansion. Excess coolant will be forced out of the overflow. (Figure 6 - 14)

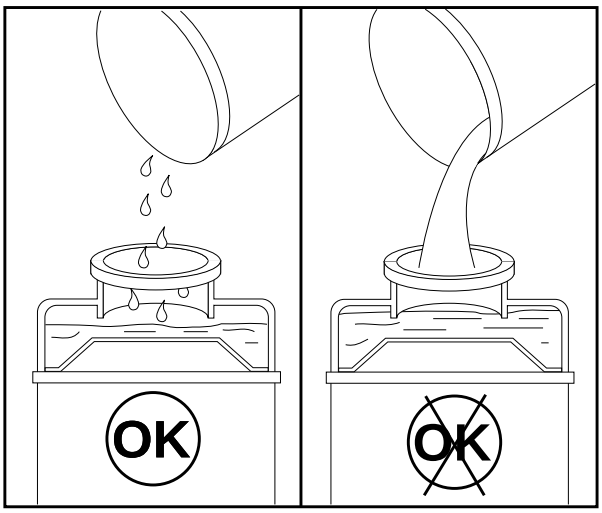


Figure 6 - 14 Do Not Overfill Radiator

Periodic Maintenance

14) Engine Belt

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance.

Visually inspect the drive belt. Check the belt for intersecting cracks. Transverse (across the belt width) cracks are acceptable. Longitudinal (direction of belt length) cracks that intersect with transverse cracks are not acceptable. Replace the belt if it is frayed or has pieces of material missing. (Figure 6 - 15)

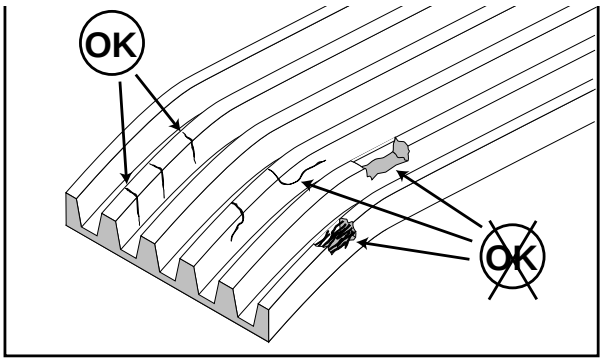


Figure 6 - 15 Engine Drive Belt Damage

Measure the drive belt deflection at the longest span of the belt. (Figure 6 - 16)

Maximum Deflection for the Cummins 6BTA engines is 3/8 to 1/2 inch [9.5 to 12.7mm].

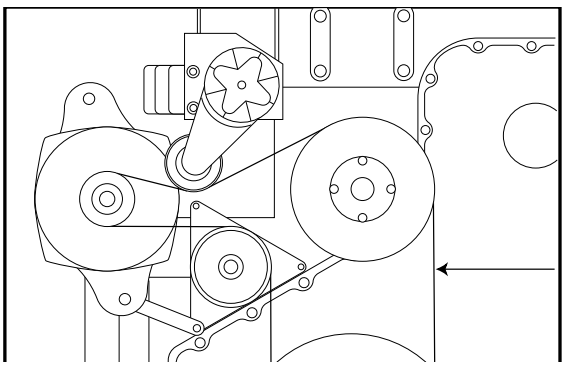


Figure 6 - 16 Checking Belt Tension

15) Radiator

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance.

The exterior of the radiator should be checked daily for dirt and other buildup that would restrict the air flow. Paving conditions will determine how often the radiator requires cleaning. If severe conditions exist or there are a lot of air-born contaminates the radiator will require more attention. Any fluid leaking from any engine compartment component, hose or tube may find its way into the radiator. When cleaning, check between the radiator and other components for buildup.

Check for damaged hoses and loose or damaged hose clamps. (Figure 6 - 17) Replace as required. Check the radiator for leaks in the upper and lower radiator sections. Check the radiator core for damaged or bent fins. Clean and repair as required.

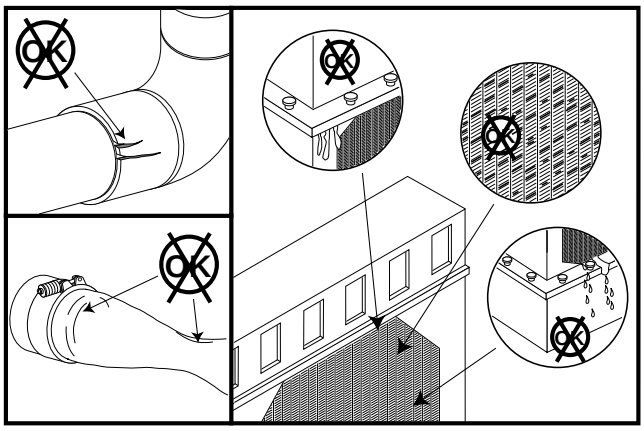


Figure 6 - 17 Radiator Damage

Periodic Maintenance

16) Cooling Fan

⚠WARNING

Personal injury can result from a fan blade failure. Pulling or prying on the fan can damage the fan blade and cause fan failure.

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance unless specifically instructed to the contrary in this manual.

A visual inspection of the cooling fan is required daily. Check for cracks and bent or loose blades. Check the fan to make sure it is securely mounted. Tighten the bolts if necessary. Replace any fan that is damaged.

17) Battery

The battery fluid level should be checked to ensure it is at the correct level.

⚠WARNING

Do Not allow open flames or sparks near batteries. Battery fumes are highly explosive.

⚠WARNING

Sulfuric acid in batteries is a poison and could cause severe burns. Avoid contact with skin, eyes, and clothes. When you work around batteries, protect eyes and face from battery fluid and explosion.

Checking battery fluid levels

The battery fluid level should be checked to ensure it is at the correct level. If necessary fill the battery with clean water to bring the fluid level up to the bottom of the neck of each battery cell.
(Figure 6 - 18)

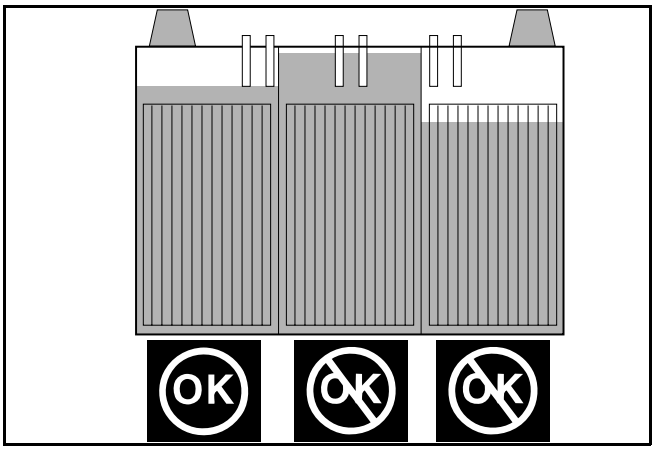


Figure 6 - 18 Battery fluid levels

⚠CAUTION

When removing the battery cables, always remove the negative terminal first then the positive terminal. This will reduce the chance of sparking.

The battery terminals should be checked for corrosion buildup and tightness of connection. If necessary remove the terminal cable and clean both the battery cable connector and the battery terminal. Reinstall the positive battery cable connector first then the negative and tighten securely. Loose or corroded connections are a prime source of starting problems and other electrical problems.

Periodic Maintenance

Cleaning Batteries

Make sure all the battery caps are on tight before cleaning the battery. Allowing dirt or baking soda solution into the battery will destroy the battery.

Batteries should be kept clean at all times. Wipe the outside of the battery with a cloth to remove dirt and grime.

Make sure the vent holes in the battery caps are kept open at all times to allow gas to escape from inside the battery.

To clean the battery cable and terminals, remove the battery cables and clean them with a wire brush. Soak the cables and wash the terminals in a solution of baking soda and water. Rinse the cables, battery, and battery compartment with clean water.

Checking Specific Gravity

Refer to the instructions included with your tester for specific instructions on how to use your tester.

Under normal temperature conditions, a fully charged battery will have a corrected specific gravity reading of 1.26. If the reading is below 1.2, the battery should be charged.

In very warm weather the full charged reading should be 1.225. In very cold weather the full charged reading should be 1.28.

If a battery becomes drained and has a specific gravity reading below 1.15, jump starting the engine will put a heavy load on the battery and the charging system which could damage the alternator. If the specific gravity reading is below 1.15, charge the battery before using it to start the engine.

Storing Batteries

If the paver will be stored for more than 30 days, remove the batter. Make sure the battery is full charged and store the battery in a cool place.

When the battery is stored outside of the paver or while the battery is being charged, never set the battery on a concrete or dirt floor. The battery should be placed on wooden blocks.

18)Tire Pressure

Tire pressure for all paver tires should be maintained at 32 psi. The drive tires can be filled with calcium chloride and water in accordance with Table 6 - 2, if necessary, for operational conditions. This capacity puts tires to 75% full.

Tire Size	18.4 x 26
Calcium	246 lbs
Water	586 lbs
US Gallons	70.3
Total Weight	823 lbs

Table 6 - 2 Tire fluid capacity

Apply Loctite 272 to threads of lug nuts. Torque lug nuts to 267 ft.-lbs.

19) Frame Raise Eccentric

The paver frame raise eccentric should be greased every 500 hours of operation. (Figure 6 - 19)

Some frame raise eccentric plain bearings were assembled with Dow Corning G-N Metal Assembly Paste (P/N 49999-222) and had pipe plugs installed instead of grease fittings.

If a plain bearing is disassembled, re-assemble with Dow Corning G-N Metal Assembly Paste (P/N 49999-222).

If any frame raise eccentric bearing has pipe plugs, remove them, install grease fittings and grease at the 500 hour interval.

Periodic Maintenance

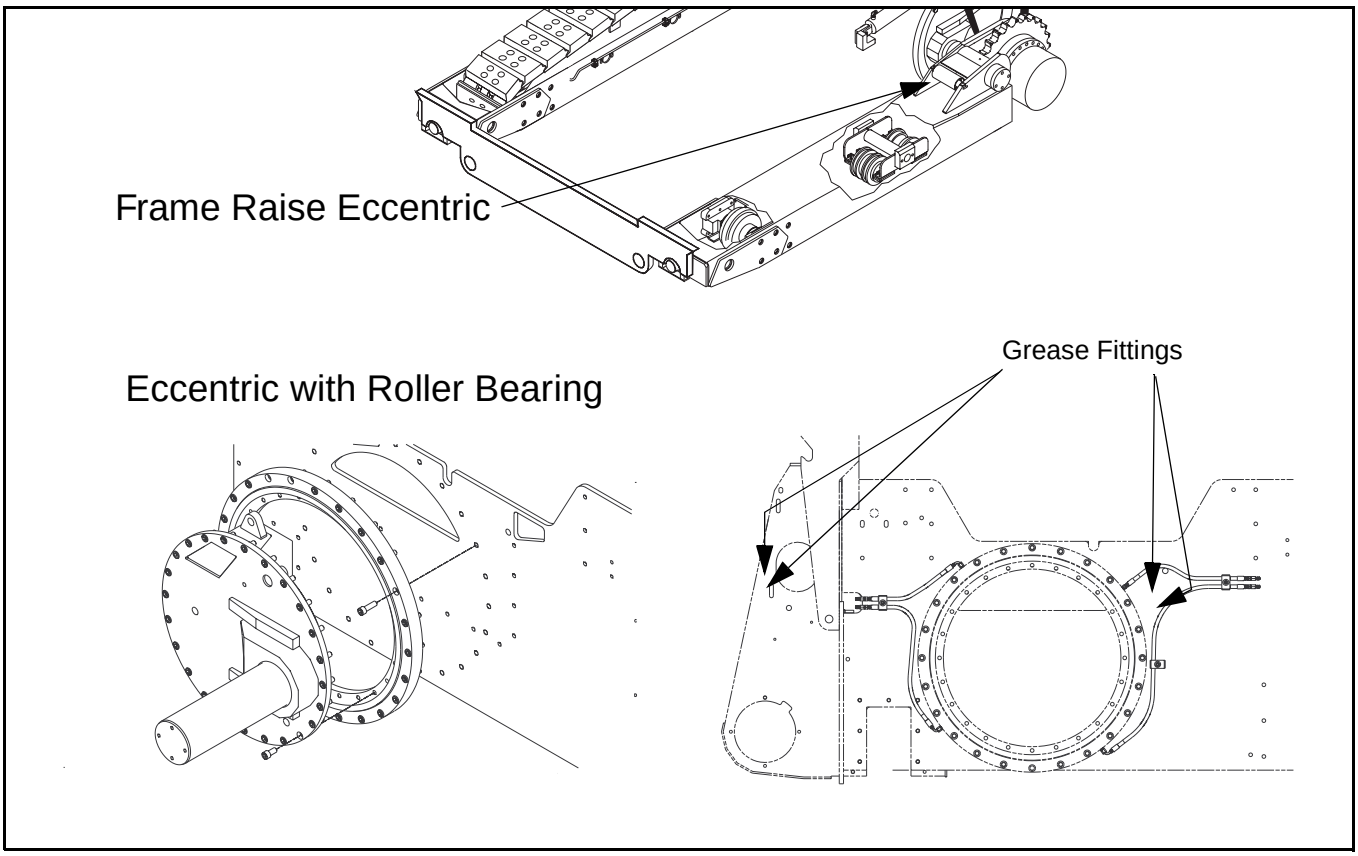


Figure 6 - 19 Frame Raise Lubrication

20) Steel Track Tension

The track tension on Track Pavers can be adjusted to provide the desired track tension. The track has an automatic recoil system that allows the tracks to recoil if an impact is encountered then return to previous adjustment point.

Checking steel track tension

Set the brake switch to ON, travel lever/switch to NEUTRAL and speed dial to MIN (0) before performing checks.

The track tension should be visually checked every day before and during paver operation. If the track looks like it may be getting loose, it can be tested by placing a board or straight edge on the track between the front idler and the first top roller. If the gap between the bottom of the board and the top edge of the track is greater than 3/4", the track tension must be adjusted. (Figure 6 - 20)

NOTICE

Perform track tension checks and adjustments when the paver is at operating temperature. Adjusting track tension when the paver is cold could lead to over-tensioning of the track.

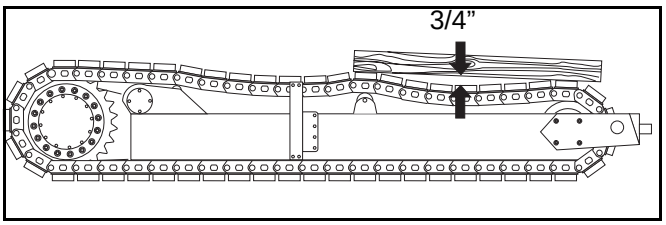
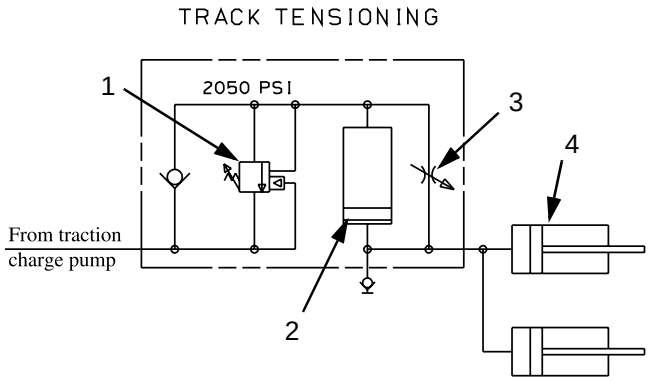


Figure 6 - 20 Checking Steel Track Tension

Periodic Maintenance

The Track Paver uses a tension cylinder mounted above the final drive that maintains a constant volume of pressurized oil to the track adjusting cylinders. When the track encounters an obstacle, the system is designed to allow the tensioning idler to recoil, rather than stretch or break the track. When the obstacle is cleared the system returns to the previous track tension adjustment.

The track tensioning cylinder consists of a cylinder with a rodless piston, a needle valve, and a counterbalance valve. (Figure 6 - 21) The piston keeps the oil from the idler tensioning cylinders separated from the main oil supply. When the track encounters an obstacle it forces oil from the idler cylinders into the bottom side of the tensioning cylinder. When the obstruction is cleared, pressurized oil from the traction charge pump forces the tensioning cylinder down which forces the idler cylinders to move back to the original position.



1 - Counterbalance valve
2 - Tensioning cylinder
3 - Needle valve
4 - Idler tension cylinders

Figure 6 - 21 Steel Track tension hydraulic circuit

The needle valve is used during track tensioning to bring the volume of oil on the bottom side of the tensioning cylinder back to the proper level. The counterbalance valve allows oil flow freely from to discharge to tank from the top side of the tension cylinder when the track encounters an obstacle.

Steel Track over-pressurizing

If the track adjusting system is over-pressurizing during operation the following procedure must be performed. It is a good idea to perform this check once each season to verify the tensioning cylinder is in good condition.

NOTICE

Do not run the paver while the system is over-pressurized. Running with an over-pressurized system could damage the track and sprockets.

1) Disconnect the line from the “T” port on the track tension cylinder. Install a plug into the disconnected line. (Figure 6 - 22)

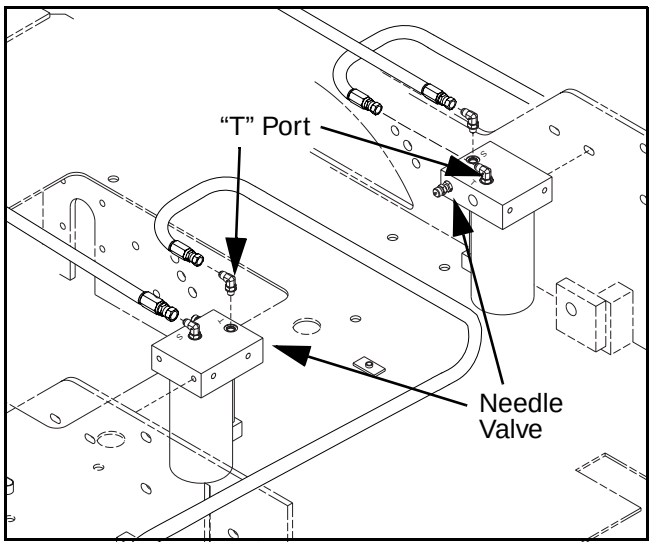


Figure 6 - 22 Adjusting steel track tension

2) Attach a drain line to the “T” port and run the other end into a bucket.

3) Close the needle valve by rotating clockwise.

4) Start the engine and run at full throttle.

Periodic Maintenance

5) If the track was tensioned properly, no oil will flow into the bucket.

6) If only a small amount of oil drains into the bucket, the piston and counterbalance valve are working properly and the track will be properly tensioned.

7) If oil continues to flow into the bucket, the piston or counterbalance valve is leaking and must be repaired.

8) Turn the engine off and reconnect the hydraulic line to the “T” port.

Tightening Steel Track

1) Start the engine.

2) Drive the paver forward very slowly.

⚠WARNING

Be very careful when reaching over the moving track. Keep feet and loose clothing away from the moving track and rollers.

3) Open the needle valve slowly to allow the track to retension. (Figure 6 - 22)

4) Close needle valve

5) Stop paver.

Steel Track Relief Pressure

In addition to adjusting the track tension, the track relief pressure should be checked at least once each season. Refer to the Paver Technical Manual for information on checking track relief pressure.

21) Rubber Track Tension

The tracks on Rubber-Track Pavers (Figure 6 - 23) do not require periodic adjustment. They are self-adjusted by applying a pre-set hydraulic pressure supplied by the auxiliary pump to the tensioning cylinders. The tracks have an automatic system that allows them to recoil and return to tension if a severe impact is encountered. If tracks appear loose, troubleshoot the track hydraulic system (see Section 5).

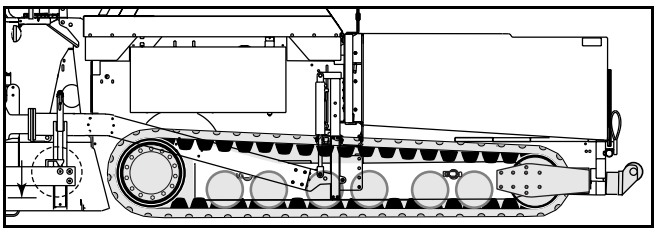


Figure 6 - 23 Rubber Track

Rubber Track Maintenance

The rubber track is designed to be virtually maintenance free. Proper cleaning at the end of each paving day will maintain trouble free operation. However, neglect of the rubber tracks can be expensive.

22) Track Pivot

The track pivot should be lubricated every 40 hours of operation. (Figure 6 - 24) The rear pivot has a grease fitting and the front pivot should be lubed with heavy grade oil.

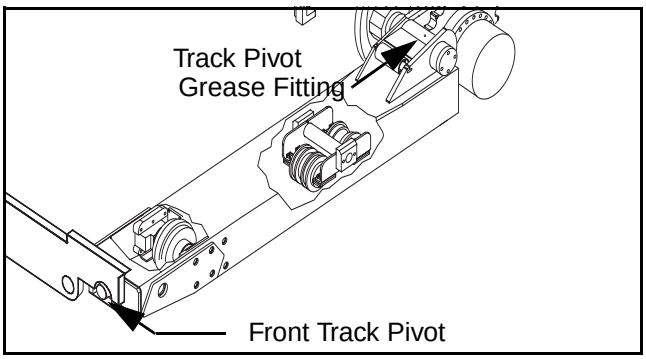


Figure 6 - 24 Track Pivot

Periodic Maintenance

23) Fire Extinguisher

The fire extinguisher should be inspected every 250 hours to ensure the extinguisher is fully charged and has not been damaged.

24) Horn

It is essential that the horn is maintained in working order at all times for safety reasons. Before starting the engine each day the horn should be sounded to ensure it is in working order.

25) Pump Drive Belts

⚠WARNING

Turn off engine & remove key before performing any inspections or maintenance.

NOTICE

Do not overtighten belts. Overtightening belts can cause premature belt and/or bearing failure.

NOTICE

Make sure the belt tension gauge is used correctly. Pushine the wrong end of the tester onto the belt will give an incorrect belt tension reading.

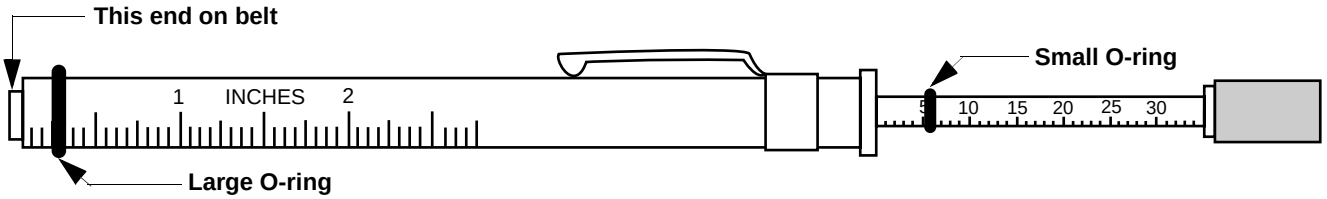


Figure 6 - 25 Belt Tension Tester

Tension Checking Procedure

1) Raise Hood

2) Loosen belt access covers.

3) Position the bottom of the large O-ring on the tester at the deflection indicated in Table 6 - 3. Set the small O-ring on the tester to zero.

		Force	Deflection
*At Operating Temperature	Min	18 lbs/8.2 kg	1/4” 6.4 mm
	Max	20 lbs/9.1 kg	
Cold Equipment	Min	8 lbs/ 3.6 kg	
	Max	10 lbs/4.5 kg	

Table 6 - 3 Pump Belt Tension Settings

4) Locate the midpoint on the belt and place the belt end of the tester onto the belt.

Periodic Maintenance

NOTICE

The tension tester must be inserted perpendicular to the belt to accurately measure belt tension.

5) For correct placement and use of tester, refer to (Figure 6 - 26), (Figure 6 - 27), (Figure 6 - 28), and (Figure 6 - 29). Place the tester on the belt perpendicular to the belt. Mark the tester at the point where the tester meets the top of the access cover. It may be necessary to place a straight edge over the belt access hole to accurately mark this position.

Figure 6 - 27 Tester Used Correctly (side view)

Figure 6 - 26 Tester Used Correctly (top view)

Figure 6 - 28 Tester Used Incorrectly

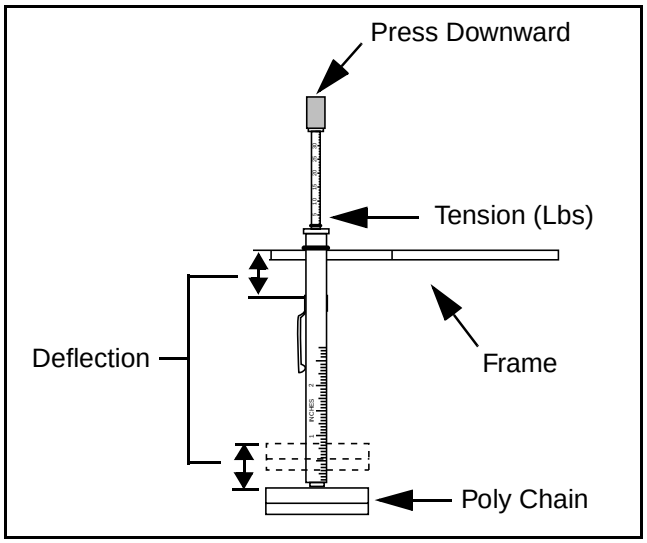


Figure 6 - 29 Testing Poly Chain Belts

6) Set the large O-ring 1/4” (6.4 mm) above the mark. (Figure 6 - 25)

7) Push on the yellow tipped plunger until the bottom of the large O-ring is level with the straightedge.

8) Remove the tester and read the belt deflection force in pounds at the small O-ring. Compare this with the value in (Table 6 - 3). If the force is outside the listed limits the belt should be retensioned.

Poly Chain Belts

Poly chain belts are designed to provide years of reliable service without stretching. As a result, adjusting the belt tension is **rarely required**. Do not adjust the poly chain belts unless they test below the Minimum setting found in Table 6 - 3.

Tension values for poly chain belts are temperature-sensitive. When installing belts, either new or used, adjust the belts for an 8 to 10 lb setting at 1/4 in deflection when the belts are cold. After the machine is at normal operating temperature (minimum of 2 hours of continuous paving operation), use the values listed in Table 6 - 3.

Periodic Maintenance

NOTICE

Check poly chain belt tension only after the **entire** machine is at operating temperature (minimum of two hours of continuous paving operation).

Do not adjust the belts until they test below the MINIMUM setting when the machine is at normal operating temperatures. Adjusting the belts to the values in Table 6 - 3 when the belts are cold will result in rapid belt failure and possibly damage to pump bearings. Adjust up to (but not exceeding) the MAX setting when the machine is at normal operating temperature.

All poly chain adjustments are to be made at 1/4 inch deflection. For correct placement and use of tester, refer to (Figure 6 - 26), (Figure 6 - 27), (Figure 6 - 28), and (Figure 6 - 29).

26) Depth Cranks

The screed depth crank assemblies have two lubrication points on each, one on the threaded link and the other on the screed depth crank bearing housing. These should be lubricated every 40 hours of operation. Table 6 - 30 One to two pumps from a hand grease gun is all that is necessary.

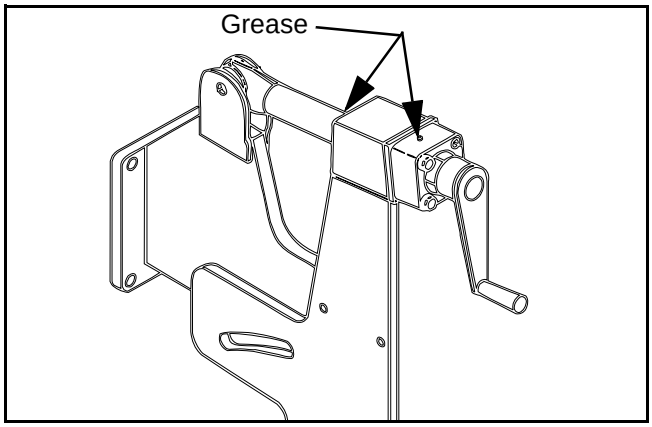


Figure 6 - 30 Depth Crank Lubrication

Periodic Maintenance

27) Vibrator Bearings

The vibrator assemblies have four lubrication points, one on each vibrator bearing. The grease fittings are remote plumbed to the upper lip of the screed frames. They should be lubricated every 8 hours of operation. One to two pumps from a hand grease gun is all that is necessary. (Figure 6 - 31)

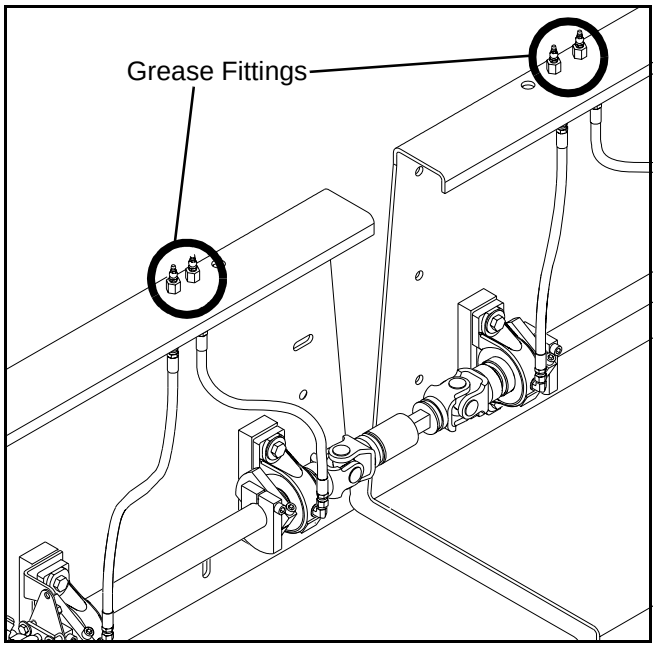


Figure 6 - 31 Vibrator Lubrication

28) Crown Control

The crown control has two lubrication points one on each turnbuckle assembly. They should be lubricated every 40 hours of operation. One to two pumps from a hand grease gun is all that is necessary. (Figure 6 - 32)

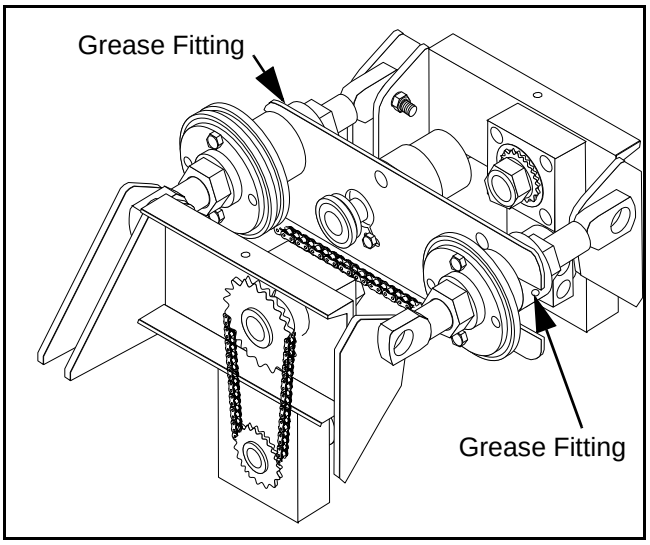


Figure 6 - 32 Crown Control Lubrication

29) Match Height Assembly

The match height assemblies have two lubrication points on each, one on the threaded link and the other on the match height bearing housing. These should be lubricated every 40 hours of operation. One to two pumps from a hand grease gun is all that is necessary.

30) Extension Slope Assembly

The extending screed slope assemblies have two lubrication points on each, one on the threaded link and the other on the slope shaft bearing housing. These should be lubricated every 40 hours of operation. One to two pumps from a hand grease gun is all that is necessary.

31) Final Drive Oil

The final drive planetary oil level should be checked during the first 40 hours of operation and replaced at 150 hours of operation. Drain, flush and refill every 1000 hours of normal operation.

To check the oil level, rotate the drive until the fill plug is straight up and the level check plug is 90 degrees down from the fill plug. Remove the level check plug. The oil level should be even with the bottom of the level check plug hole. If the oil level is low remove the fill plug and add oil to bring the level up to the bottom of the level check plug hole. (Figure 6 - 33)

NOTICE

Verify there is no hydraulic oil in the final drive housing before adding gear oil. Hydraulic oil in this housing indicates leakage from the brake or hydraulic drive motor.

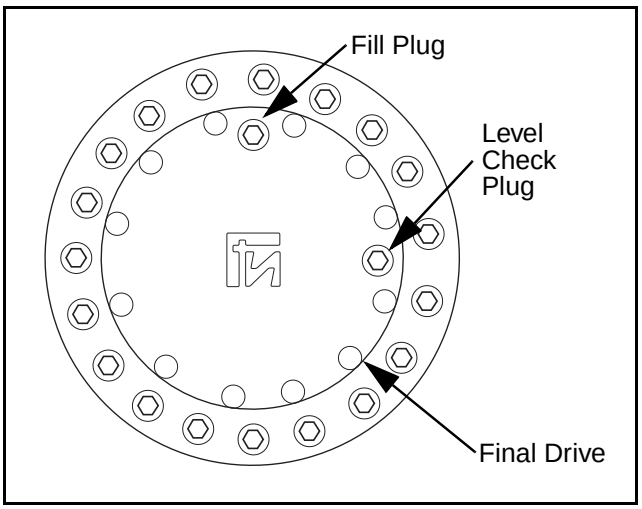


Figure 6 - 33 Checking Final Drive Oil Level

Use 80W-90 Gear Oil when adding or replacing final drive oil. Typical brands: Amoco Multipurpose gear Lube 80W-90, Texaco Multipurpose Gear Lube 80W-90, Mobilube HD 80W-90, Exxon Gear Oil GX 80W-90, Shell Spirax HD 80W-90. An ISO Grade 150 EP oil can be substituted for those given above.

32) Steering Bogie Alignment

It is normal for the bogie wheel to get slightly out of alignment during normal operation. Driving with misaligned bogie wheels can make steering difficult and increase wear of the bogie tire. (Figure 6 - 34)

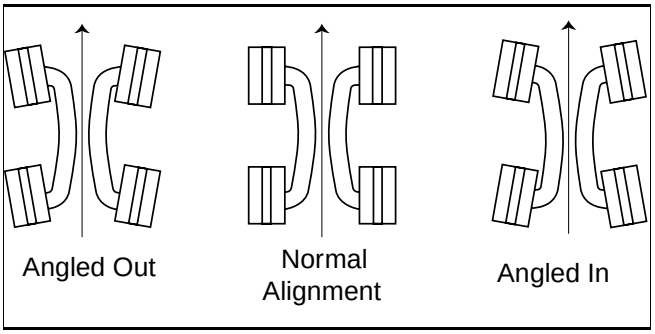


Figure 6 - 34 Bogie Wheel Alignment

If the bogie wheels are angled in or out the wheels will need to be realigned. Realigning the bogie wheels is accomplished without the use of any tools and can be performed any time the paver is parked.

To synchronize the steering bogies:

1) Stop the paver and run the engine at full throttle.

2) Turn the steering wheel to the left or right until a resistance is felt. Continue turning the steering wheel for 1 to 2 more revolutions.

3) Turn steering wheel back to the center position and continue paving.

Periodic Maintenance

33) Steering Linkage

Lubricate the steering linkage rod ends every 250 hours. (Figure 6 - 35)

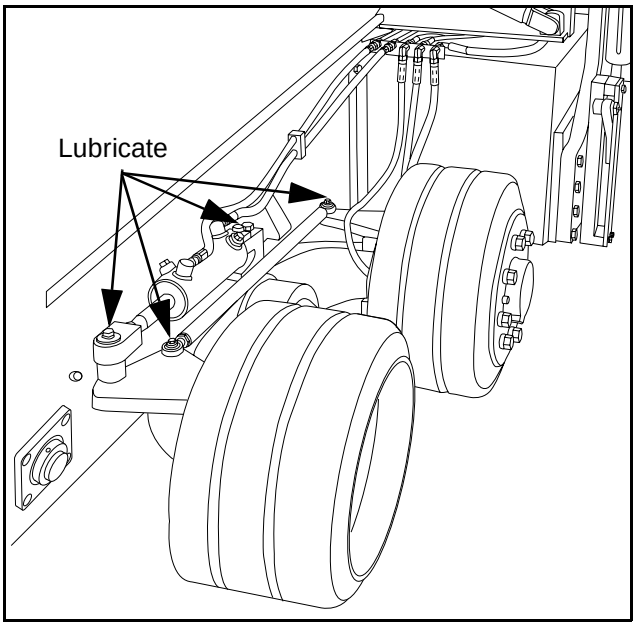


Figure 6 - 35 Steering linkage lubrication

The steering linkage, rod ends, bushings, bearings and cylinders should be checked seasonally for adjustment and possible wear.

34) Bogie Beam Bearings

The bogie beam bearings should be lubricated every 250 hrs.

35) Front Wheel Bearings

The wheel and pivot bearings should be checked and repacked with Lithium base, type EP, Grade 2 grease yearly.

36) Bogie Wheel Toe-in

Wheel alignment and amount of tow-in should be adjusted as necessary. Normal amount of tow-in required is approximately 1/16 to 1/8 inch. (Figure 6 - 36)

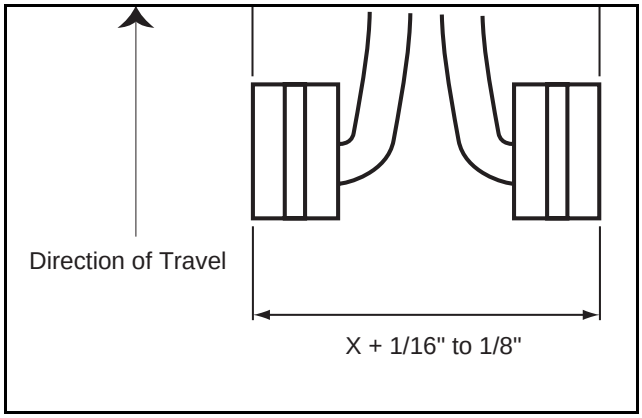


Figure 6 - 36 Bogie Wheel Toe-in

37) Conveyor Slat Chains

The conveyor chain should be adjusted when 1 inch (25 mm) of sag is visable between the bottom of the paver frame and the top of the conveyor chain. Adjust the chains so the top of the chain is even with the bottom of the frame. (Figure 6 - 37)

NOTICE

Over tightening the chains increases wear on the conveyor chain, front idlers, drive sprockets and all bearings.

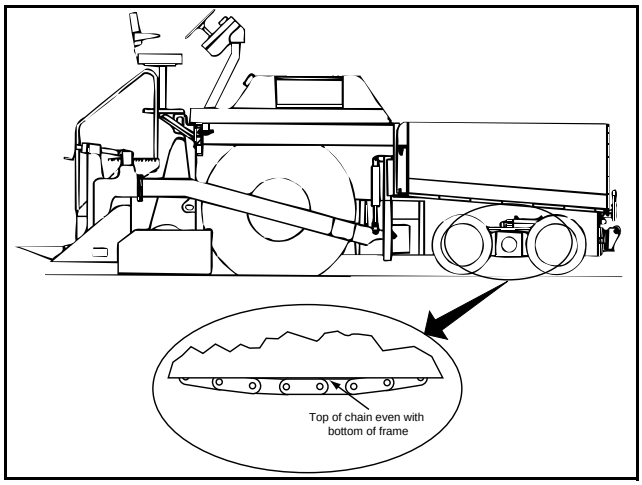


Figure 6 - 37 Conveyor Chain Tension

Periodic Maintenance

⚠WARNING

Turn off engine & remove key before performing the following inspections or maintenance.

To adjust the conveyor chains:

1) Release the locking rod between the dual adjuster. (Figure 6 - 38)

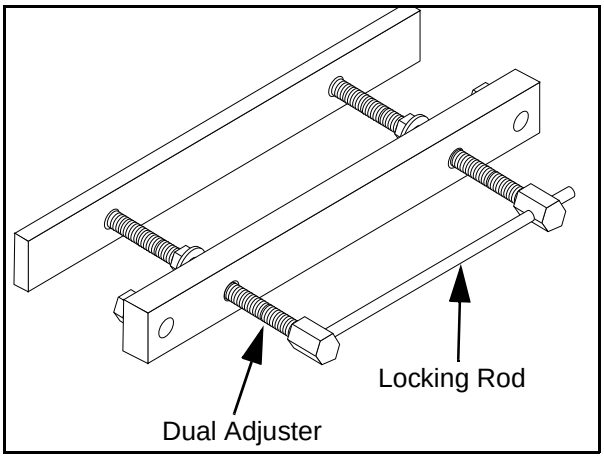


Figure 6 - 38 Conveyor Chain Adjuster

2) Using the locking rod or a wrench, rotate the left adjuster 1/2 turn.

3) Rotate the right adjuster 1/2 turn.

4) Repeat procedure of adjusting the left and then the right until the top of the conveyor chain is even with the bottom of the frame.

5) Install the locking rod after finished adjusting.

38) Conveyor Bearings

The four conveyor bearings on each conveyor should be lubricated every 8 hours of operation with Lithium base, type EP, Grade 2 grease. Two front conveyor bearing fittings on each side are near the bogie wheels or track idler. (Figure 6 - 39) The inner (Figure 6 - 40) and outer (Figure 6 - 41) rear conveyor bearing fittings are mounted on the front and back of the rear bulkhead.

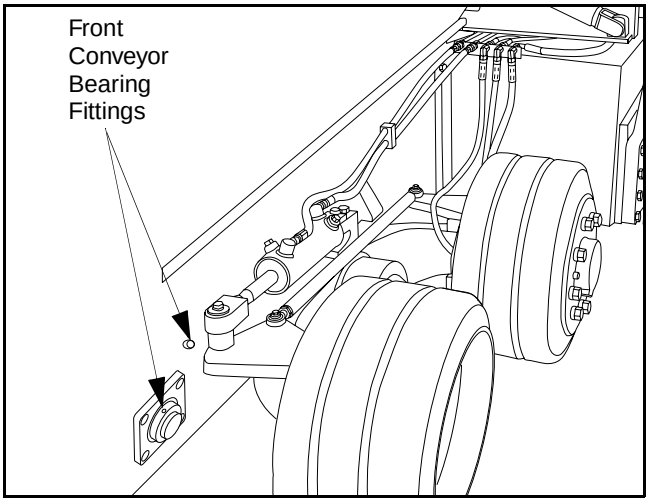


Figure 6 - 39 Front Conveyor Fittings

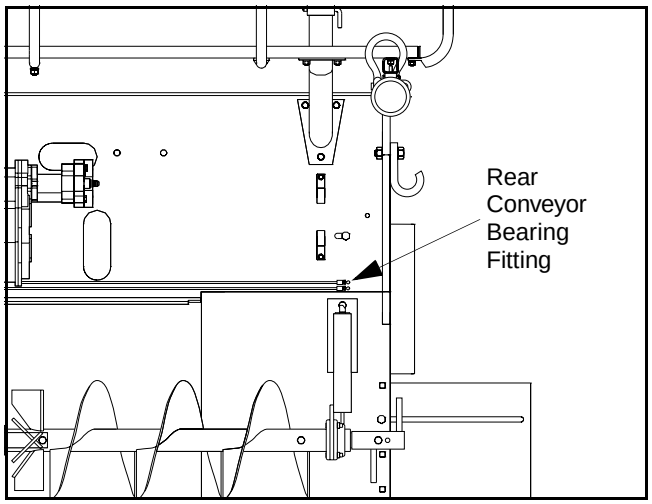


Figure 6 - 40 jRear Inner Conveyor Fittings

Periodic Maintenance

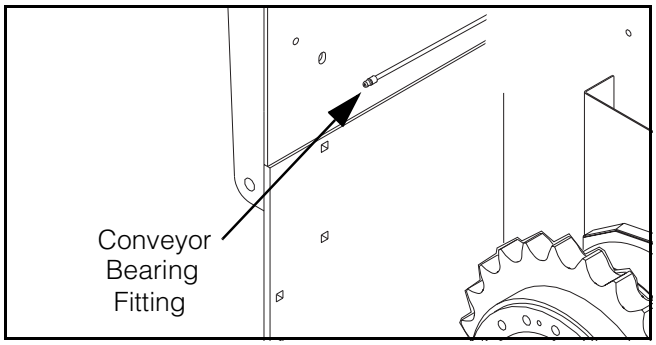


Figure 6 - 41 Rear Outer Conveyor Fittings

39) Auger Bearings

The spreading auger bearings should be lubricated every 8 hours of operation with Lithium base, type EP, Grade 2 grease. (Figure 6 - 42)

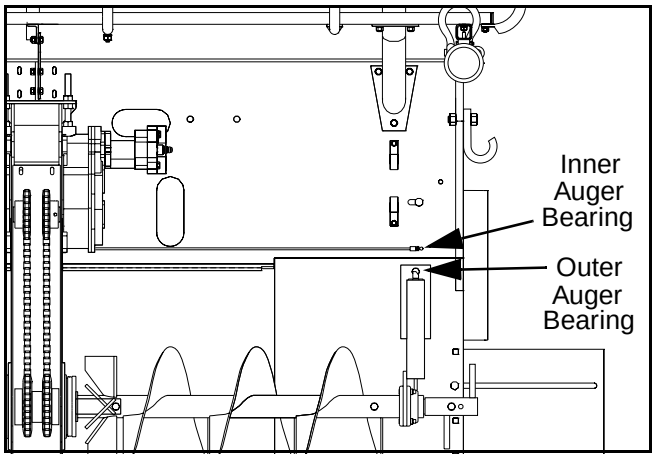


Figure 6 - 42 Spreading Auger Bearings

40) Feeder Drive Chains

The feeder drive chains should be checked every 40 hours of operation. Check the drive chains for proper tension and wear. Clean the housing and lubricate the chains and spacer with fuel oil from the spray-down hose or with SAE 10 motor oil. A small amount of oil may be left in the housing for lubrication between checks even though the housing is not oil tight.

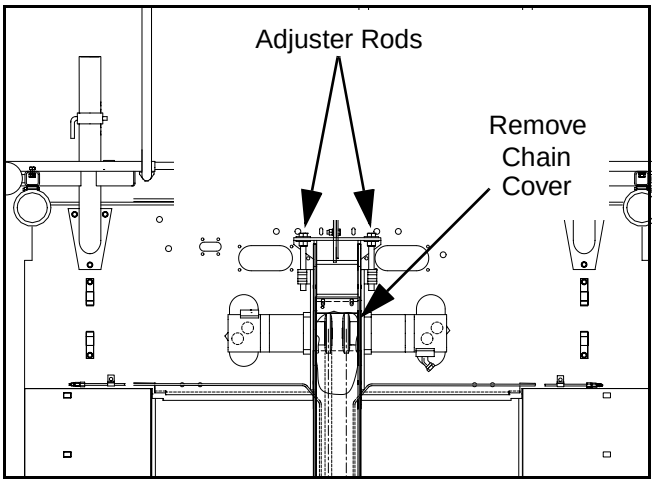


Figure 6 - 43 Adjusting feeder drive chain

⚠WARNING

Turn off engine & remove key before performing the following inspections or maintenance.

1) Remove the cap screws holding the spreading auger drive chain cover. Pull the cover back and off. (Figure 6 - 43)

2) Loosen the jam nuts on the drive chain adjuster rods.

3) Using the adjuster rods, remove the slack from the chain, but do not over tighten. At the correct tension, the chain should move slightly under thumb pressure.

4) After both chains have been tensioned properly, tighten the jam nuts. Replace the cover.

Periodic Maintenance

41) Conveyor Drive

The conveyor drive is a direct mounted hydraulic motor with a chain drive sprocket attached. (Figure 6 - 44)

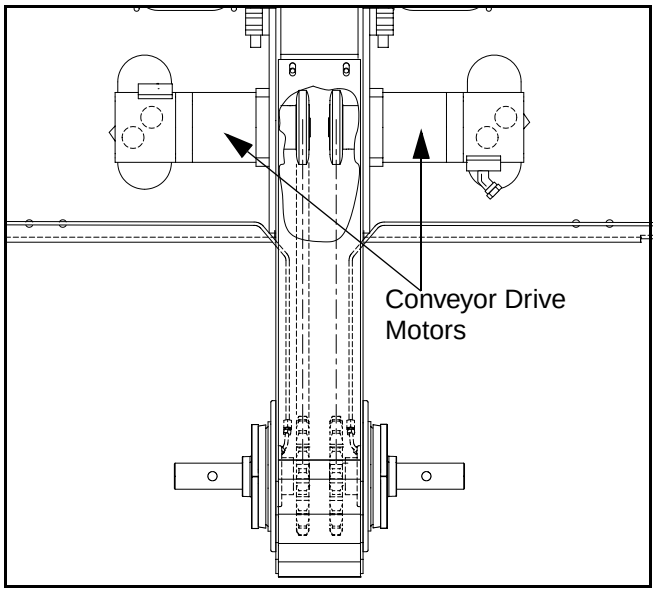


Figure 6 - 44 Conveyor Drive

42) Hood Raise Reservoir

The hood raise reservoir oil level should be checked periodically. Use AW 68 hydraulic oil in the hood raise reservoir. (Figure 6 - 45)

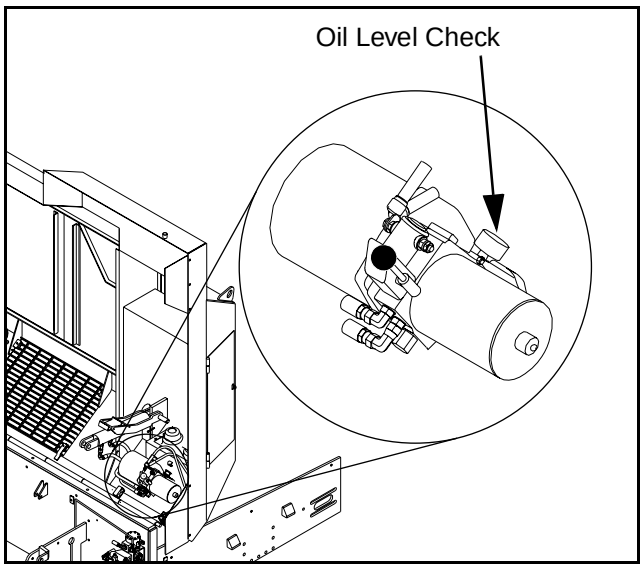


Figure 6 - 45 Hood Raise Reservoir

43) Operator Console Pivot Bearings

The operator console pivot should be lubricated every 250 hours of operation. (Figure 6 - 46)

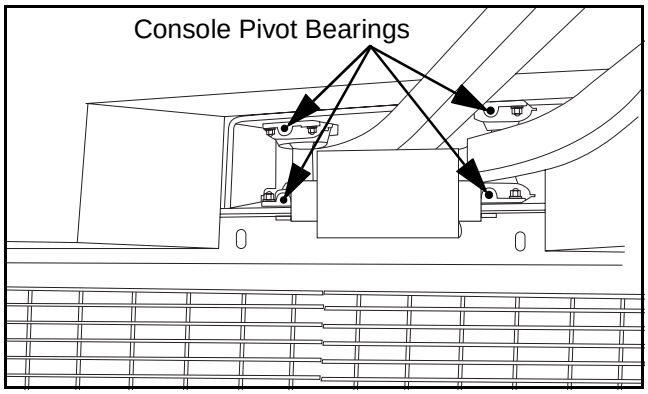


Figure 6 - 46 Operator Console Pivot Bearings

44) Tow Arm Nose Roller

The tow arm pull point roller should be lubricated every 8 hours of operation. (Figure 6 - 47)

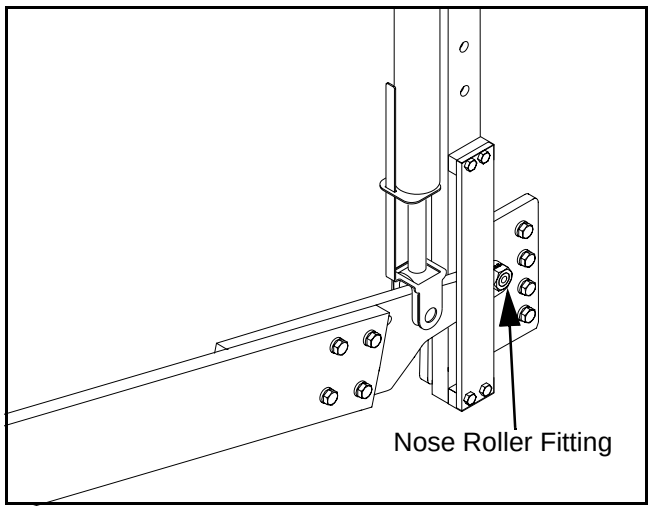


Figure 6 - 47 Tow Arm Nose Roller

Periodic Maintenance

45) Slope Beam Rod Ends

The slope beam rod ends should be lubricated every 250 hours of operation. (Figure 6 - 48)

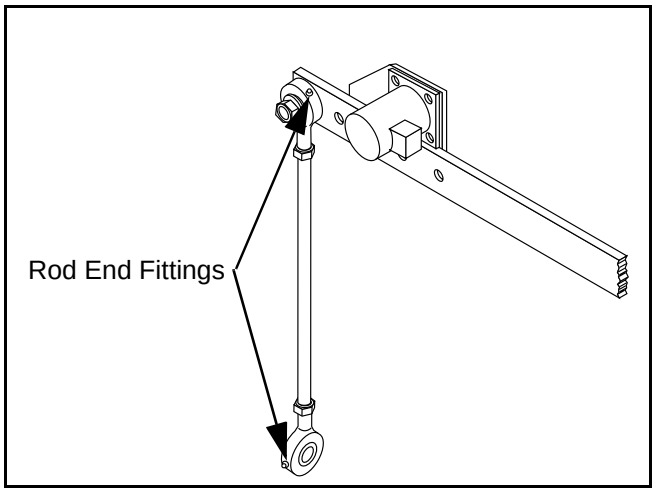


Figure 6 - 48 Slope Beam Rod Ends

46) Truck Hitch

The truck hitch should be cleaned as part of the daily cleaning to remove any asphalt that has collected on the truck hook or rollers. Spray the truck hook and rollers with diesel fuel during spraydown.

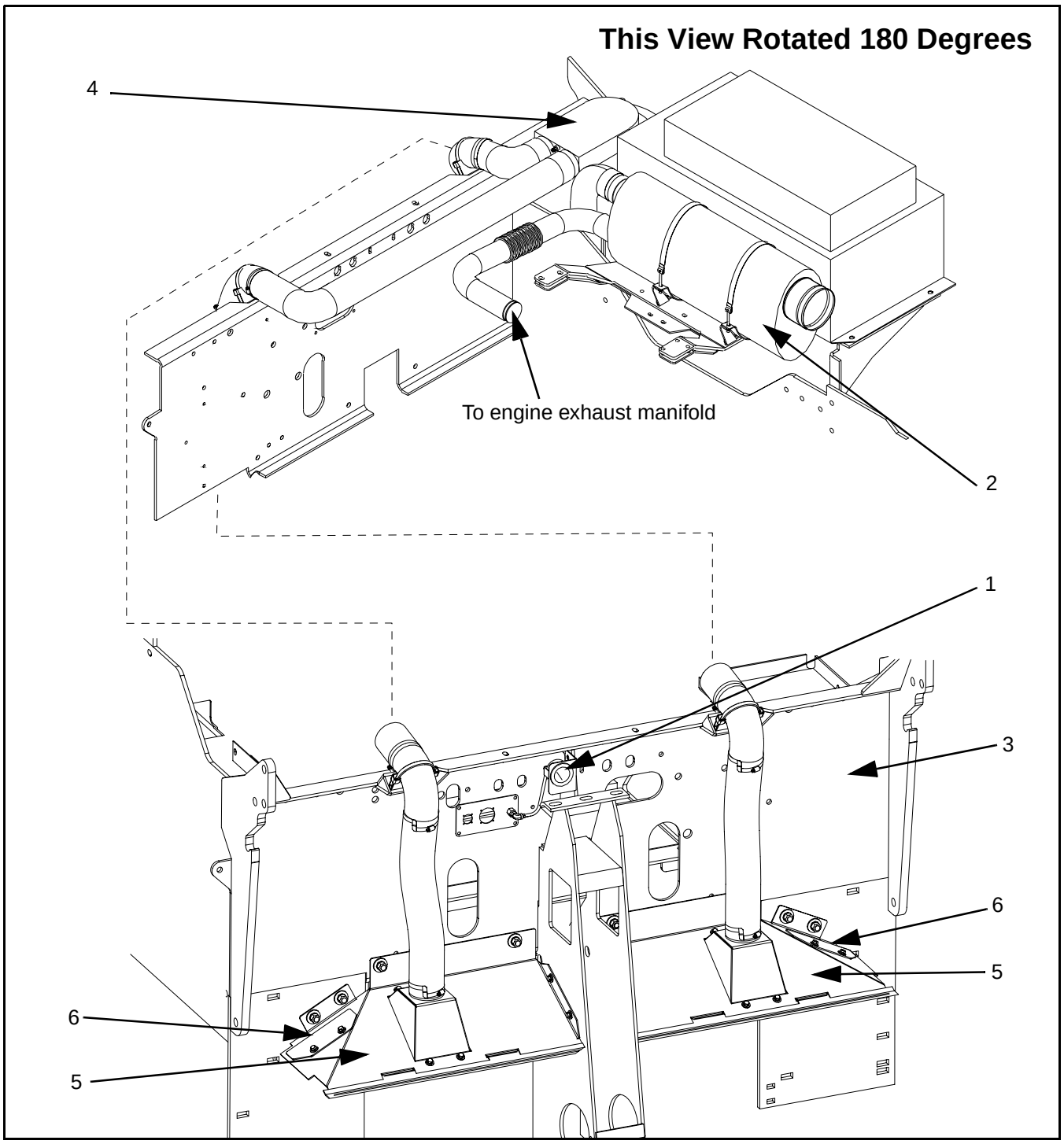
47) Fume Recovery System

The fume recovery system vacuum indicator should be checked each day before beginning operation. With the engine running at full throttle, the vacuum indicator should register a reading. When the vacuum indicator reading is too low, components of the fume recovery system require maintenance. Refer to (Table 6 - 4) for troubleshooting information.

Problem	Cause	Remedy
Low vacuum reading	Low hydraulic pressure to fume recover fan motor.	Refer to paver hydraulic schematic
	Damaged, collapsed or disconnected fume recovery hoses between fume recovery fan and muffler.	Repair, replace, or reconnect hoses
	Plugged or collapsed fume recovery hoses between fume recovery fan and muffler.	Clean or replace fume recovery hoses.
High vacuum reading	Plugged fume recovery hoses between fume recovery fan and fume recovery hoods.	Clean or replace fume recovery hoses.
Visible fumes escaping from hoods	Fume recovery system not operating properly.	Ensure fume recovery system is completely installed. Check vacuum indicator system.

Table 6 - 4 Fume Recovery System Troubleshooting

Periodic Maintenance



1 - Vacuum Indicator
2 - Muffler
3 - Paver Rear Bulkhead
4 - Fan
5 - Fixed Fume Recovery Hood Section
6 - Proportional Feed Sensor Mounting Hole

Figure 6 - 49 Fume Recovery System Components (Typical View)

Periodic Maintenance

Fume Recovery System Repair

1) Check hoses and tubes for cracks, cuts, dents, or collapsed spots. Cuts or cracks may be repairable with duct tape. Repair or replace tubes as needed (Figure 6 - 49).

2) Check interior surfaces of hoses and tubes for asphalt buildup. Clean tubes and hoses by soaking in solvent and brushing clean. Hoses and tubes may be more economically replaced than cleaned.

3) Disassemble the fan for cleaning using the following procedure (Figure 6 - 50):

   a) Disconnect tubes from left and right hoods and to muffler.

   b) Disconnect hose to vacuum indicator.

   c) Remove four bolts retaining inlet manifold to fan assembly and remove inlet manifold.

   d) Lift off fan housing.

   e) Remove bolt and two washers retaining fan wheel to motor shaft.

   f) Remove fan plate by removing four bolts.

4) The parts removed in the previous step can all be cleaned by soaking in solvent and cleaning with a brush.

5) Reassemble fan in reverse order. When installing fan wheel, use Loctite 242 on the bolt and torque to 110 in-lb.

NOTICE

Fan housing is sealed with RTV silicone.

At least once each year, the system should be thoroughly inspected to ensure proper operation.

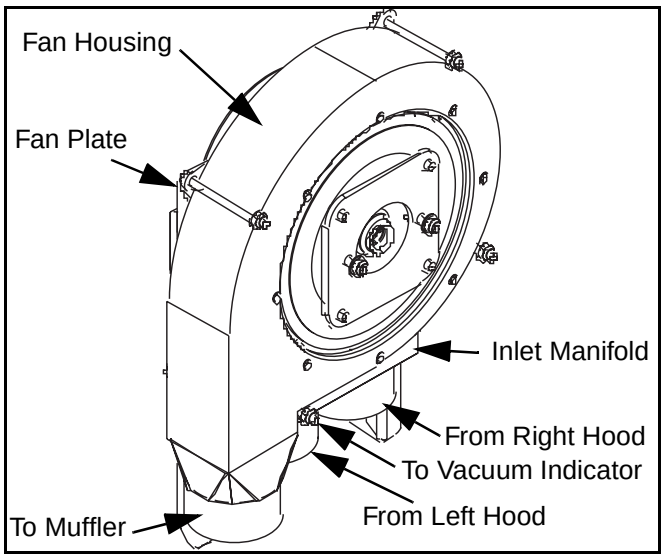


Figure 6 - 50 Fume Recovery Fan Disassembly

6) With the engine warmed up, lower the screed and run the engine at full throttle.

7) Read the vacuum from the vacuum indicator mounted on the rear bulkhead. If the reading is low or has no reading, the fume recovery tubing may be dirty, plugged, collapsed, damaged, or disconnected.

8) Record the vacuum reading and any required maintenance in (Table 6 - 5).

Periodic Maintenance

Table 6 - 5 Fume Recovery System Maintenance Log

Date	Vacuum Indicator Reading	Maintenance Performed /Notes

Corrective Maintenance

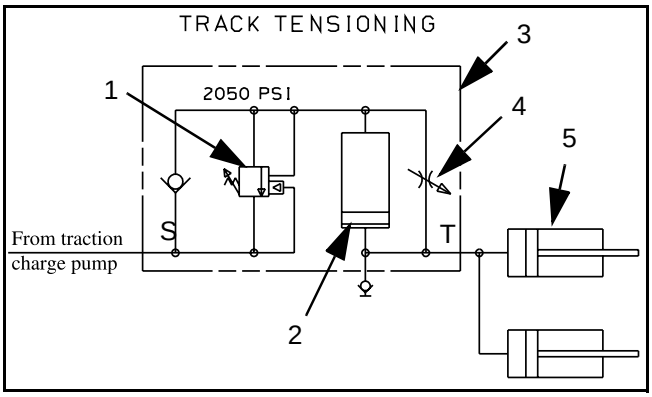
Steel Track

The track is designed to be virtually maintenance free. Proper cleaning and lubrication at the end of each paving day will maintain trouble free operation. However, neglect of the tracks can be expensive. Every time paver is cleaned, the track pins should be sprayed with light oil to lubricate them preventing them from rusting and binding.

The track paver uses a tension cylinder mounted above the final drive that maintains a constant volume of pressurized oil to the track adjusting cylinders. When the track encounters an obstacle, the system allows the tensioning idler to recoil rather than stretch or break the track. When the obstacle is cleared the system returns to the previous track tension adjustment.

The track tensioning cylinder assembly consists of a cylinder with a rodless piston, a needle valve, and a counterbalance valve. (Figure 6 - 21) The piston keeps the oil from the idler tensioning cylinders separated from the main oil supply. When the track encounters an obstacle, it forces oil from the idler cylinders into the bottom side of the rodless cylinder. When the obstruction is cleared, pressurized oil from the traction charge pump forces the tensioning cylinder down which forces idler cylinders to move back to original position.

The needle valve is used during track tensioning to bring the volume of oil on the bottom side of the rodless cylinder back to the proper level. The counterbalance valve allows oil to flow freely from the top side of the rodless cylinder to the tank when the track encounters an obstacle.



1 - Counterbalance valve
2 - Rodless piston cylinder
3 - Tensioning cylinder assy.
4 - Needle valve
5 - Idler tension cylinders

Figure 6 - 51 Track tension hydraulic circuit

Steel Track Tensioning

If the track looks like it may be getting loose, it can be tested by placing a board or straight edge on the track between the front idler and the first top roller. If the gap between the bottom of the board and the top edge of the track is greater than 3/4”, the track tension must be adjusted. (Figure 6 - 52)

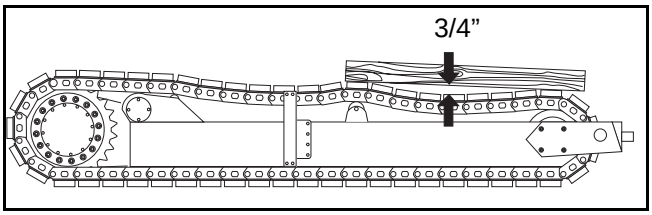


Figure 6 - 52 Checking track tension

NOTICE

Perform track tension checks and adjustments when the paver is at running temperature. Adjusting track tension when the paver is cold could lead to over-tensioning of the track.

Steel Track

Adjust track tension as follows:

1) Start the engine.

2) Open the needle valve slowly to allow the track to retension. (Figure 6 - 54)

3) Drive the paver forward and backward slowly.

⚠WARNING

Be very careful when reaching over the moving track. Keep feet and loose clothing away from the moving track and rollers.

4) Stop the paver and close needle valve.

5) A properly tensioned track should have a 3/8” to 1/2” gap between a straightedge and the track. (Figure 6 - 53)

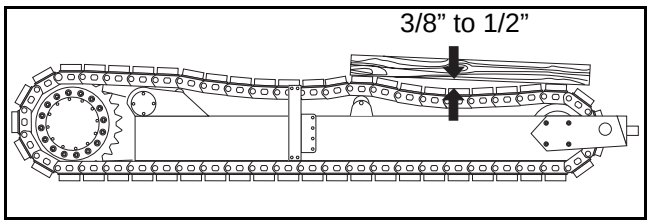


Figure 6 - 53 Proper Track Tension

⚠WARNING

Overtightening the track can cause serious damage to the track, idler or drive.

Steel Track over-pressurizing

If the track adjusting system is over-pressurizing during operation, the following procedure must be performed. It is a good idea to perform this check once each season to verify the tensioning cylinder is in good condition.

NOTICE

Do not run the paver while the system is over-pressurized. Running with an over-pressurized system could damage the track and sprockets.

1) Disconnect the line from the “T” port on the track tension cylinder. Install a plug into the disconnected line. (Figure 6 - 54)

2) Attach a drain line to the “T” port and run the other end into a bucket.

3) Close the needle valve by rotating clockwise.

4) Start the engine and run at full throttle.

5) If the track was tensioned properly, no oil will flow into the bucket.

6) If only a small amount of oil drains into the bucket, the piston and counterbalance valve are working properly and track will tension properly.

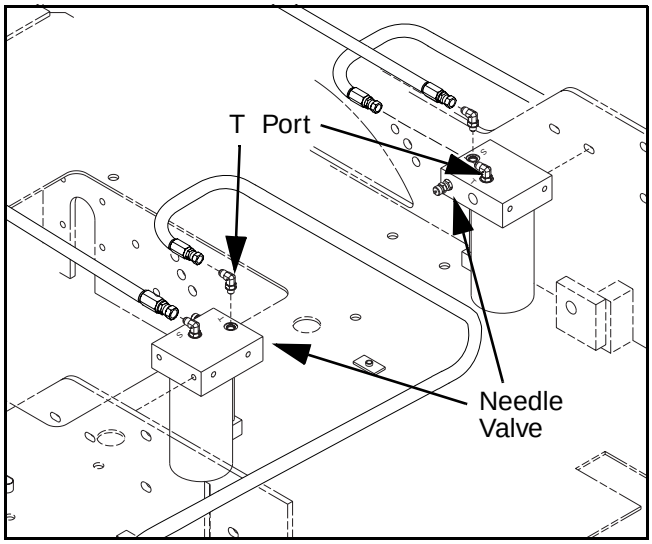


Figure 6 - 54 Bottoming Tension Cylinder

7) If oil continues to flow into the bucket, the piston or counterbalance valve is leaking and must be repaired.

8) Turn the engine off and reconnect the hydraulic line to the “T” port.

Steel Track Relief Pressure

In addition to adjusting the track tension, the track relief pressure should be checked at least once each season. Refer to the Paver Technical Manual for information on checking track relief pressure.

Steel Track Installation

⚠WARNING

When installing or removing the track, keep hands and feet out from under the track/paver.

⚠CAUTION

When disconnecting oil line in the following step, allow oil pressure to bleed off by loosening hose end first. When all pressure has been vented, remove oil line.

1) Disconnect the track tensioning oil line from the “T” port on the track tensioning cylinder. (Figure 6 - 54)

2) Jack up the track frame until the track can be slid under the bogies. Support the paver with blocking capable of supporting the weight of the paver.

3) Place boards between the sprocket and upper roller as shown. This elevates the track allowing it to clear the upper roller while driving the track toward the idler. (Figure 6 - 55)

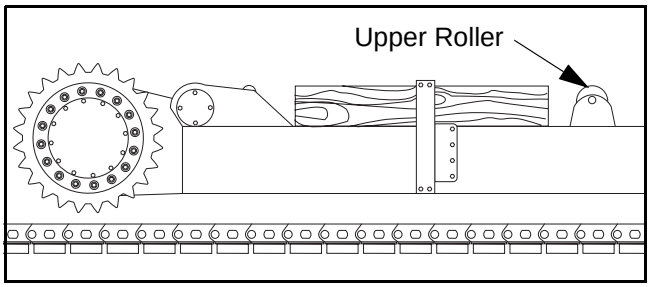


Figure 6 - 55 Place board between sprocket and roller

4) Place the track under the paver with the end of the track marked OPEN positioned on the sprocket as shown and the other end stretched out in front of paver. (Figure 6 - 56)

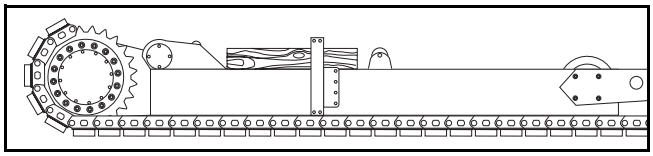


Figure 6 - 56 Roll out track

5) Start the engine and rotate the sprocket until the end of the track marked OPEN just touches the front idler. (Figure 6 - 57)

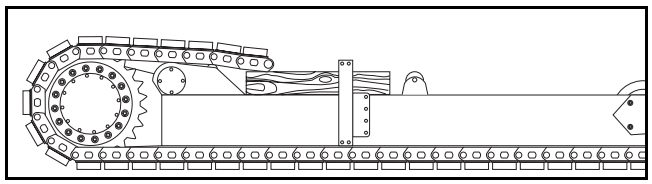


Figure 6 - 57 Rotate sprocket to install track

6) Use a come-a-long or hoist to lift and draw the track ends together. (Figure 6 - 58)

7) Place blocks under the track assembly as shown to support loose track end.

Steel Track

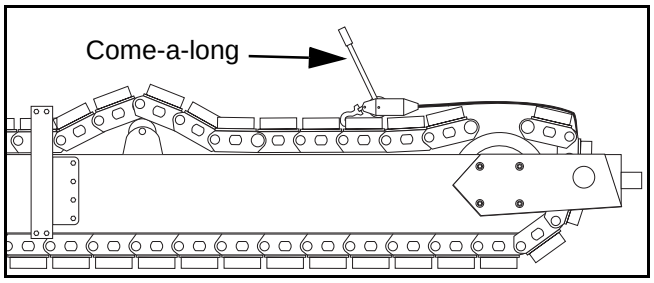


Figure 6 - 58 Pull track ends together

8) Remove paint from interlocking ribs of master link and lightly grease contact surfaces. Clean bolt holes and threads, and apply anti-seize or grease to track shoe bolts.

9) Connect the ends of the track by installing the master link pin. (Figure 6 - 59)

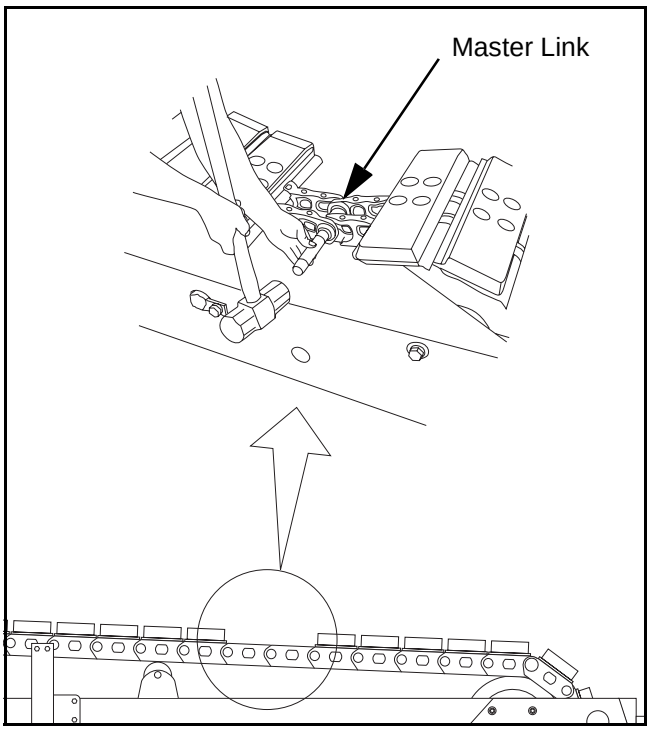


Figure 6 - 59 Connecting Master Link

10) Once the master link is connected, apply Loctite to bolts and install track pads. (Figure 6 - 60)

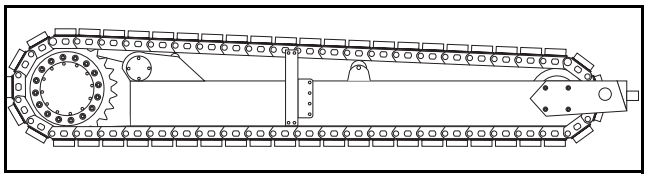


Figure 6 - 60 Install track pad

Steel Track Removal

To remove the track assembly, perform Track Installation procedures in reverse order.

Replacing Steel Track Drive Sprockets

When sprocket teeth are worn, the sprocket can be replaced or turned around to restore sprocket teeth to new condition. Perform the following procedure if sprocket replacement is necessary.

1) Rotate the track until the master link is positioned on the sprocket.

2) Disconnect the track tensioning oil line from the “T” port on the track tension cylinder. (Figure 6 - 54)

NOTICE

After splitting the track, do not remove it completely. Position the track so it will not interfere with sprocket removal.

3) Split the track and pull ends away from sprocket. (Figure 6 - 61)

4) Remove cap screws securing sprocket and remove sprocket from hub assembly.

5) Clean sprocket cap screws and bolt holes and apply Loctite to cap screws.

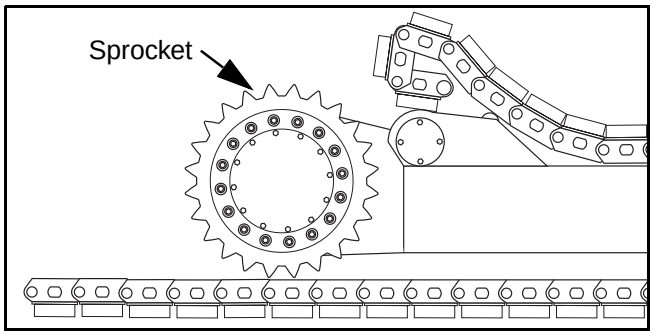


Figure 6 - 61 Remove link pin to separate track

6) Place new or rebuilt sprocket onto hub assembly and secure with cap screws. If desired, the old sprocket can be turned around to utilize the opposite side of teeth.

7) Connect the track as shown in the Track Installation Procedure.

Repairing Oscillating Bogie Rollers

There are four oscillating bogie assemblies which support the weight of the paver on each side. Each bogie contains two rollers which are oil-filled and sealed. These rollers should not require attention for entire life of the bearings and oil seals inside.

When a paver has been in service for a long period of time the roller bearings will begin to wear. Severely worn bearings will cause operating problems. At least once each season, each roller should be relieved of all loading and checked for end play, which indicates bearing wear. If roller bearings are worn out (excessive wobbling), the roller assembly should be replaced.

Accumulation of dust and dirt on the roller is an indication that a roller is leaking. If this is detected, the roller should be removed and repaired as described in the following instructions. Do not delay this repair otherwise the roller bearings may be operating without lubrication which will quickly destroy the bearings.

Steel Track

1) Break the track as described in the previous section.

2) Jack up track frame until the track is completely off the ground and install safety blocks capable of supporting the weight of the paver.

3) Remove cap screw and pull the oscillator shaft out. Bogie should fall down to the track.

⚠CAUTION

Roller should be disassembled in a clean environment. Do not allow dirt to contaminate bearings and seals inside roller.

4) Remove four lock screws which secures the roller to the bogie. (Figure 6 - 62)

5) Remove shaft housing cap.

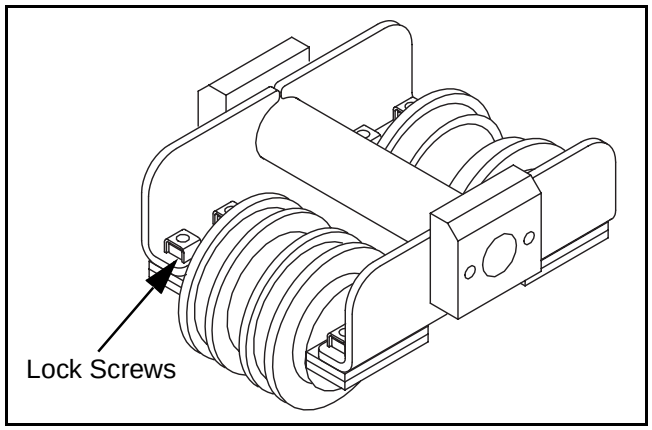


Figure 6 - 62 Track roller

NOTICE

Observe the positioning of the seals while removing, the new seals will need to be installed in the same manner.

6) Remove polished metal seal and both rubber seals. Drain oil and stand the roller on end with the open end up. Pour one pint of fresh oil along the flat portion of the shaft.

   Note: Rollers are factory-filled with Mobil Glygoyle 30 synthetic oil. Mineral oils are not compatible, so do not mix.

7) Install new seals.

8) Install shaft housing cap and secure to bogie frame with four lock screws.

9) Install bogie assembly in track frame.

10) Reconnect track as described in previous section.

Rubber Track

The rubber track is designed to be virtually maintenance free. Proper cleaning at the end of each paving day will maintain trouble free operation. However, neglect of the rubber tracks can be expensive.

Rubber Track Tension

The tracks on rubber track pavers (Figure 6 - 63) do not require periodic adjustment. They are self-adjusted by applying a pre-set hydraulic pressure supplied by the auxiliary pump to the tensioning cylinders. The tracks have an automatic system that allows them to recoil and return to tension if an impact is encountered. If tracks appear loose, troubleshoot the track hydraulic system (see Section 5).

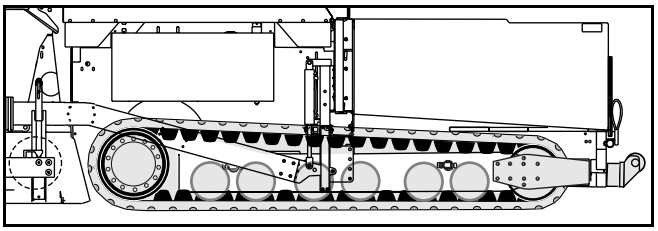


Figure 6 - 63 Rubber Track

Rubber Track Removal and Installation

⚠WARNING

When installing or removing the track, keep hands and feet out from under the track/paver.

Removal

Release the track tension by:

1) Shut off engine and remove key from ignition.

2) Loosen jam nut on track tension valve discharge cartridge (Figure 6 - 64).

3) Insert an allen wrench into the adjusting screw, slowly turn it counter-clockwise to open the shut-off valve and release hydraulic pressure.

4) If the track does not go slack, insert a porta-power between the track frame nose plate and the track (Figure 6 - 65) (protecting track from damage by inserting a block of wood or steel plate between ram and track).

5) Extend porta-power to loosen track.

6) Remove porta-power.

Rubber Track

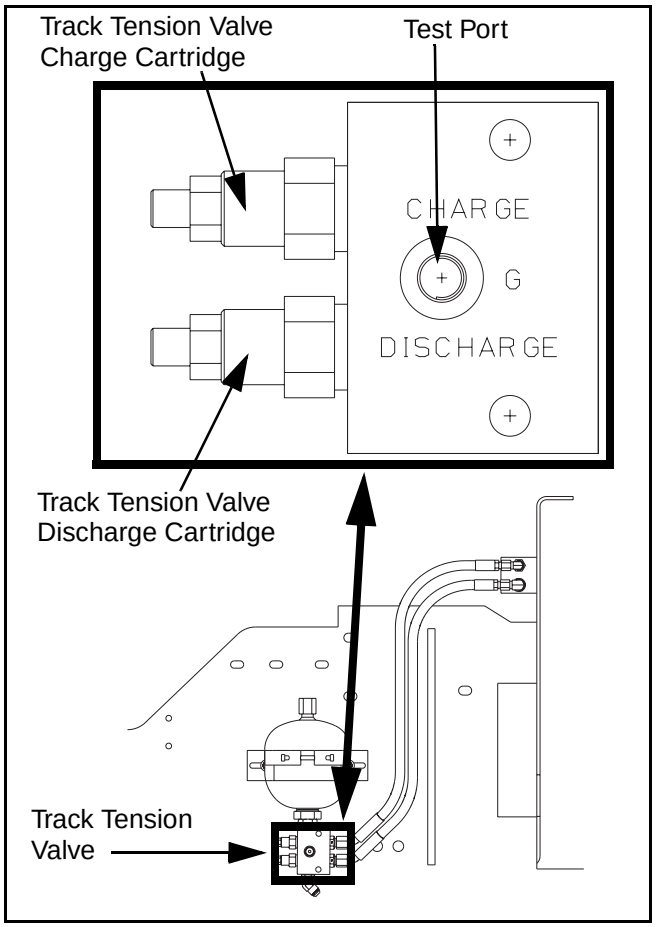


Figure 6 - 64 Release Rubber Track Tension

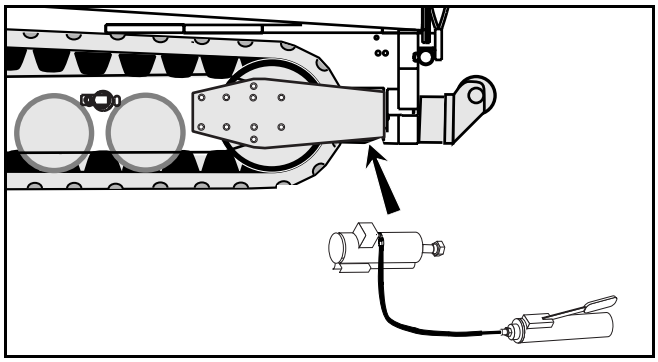


Figure 6 - 65 Insert Porta-Power

7) Jack up track frame until the track will slide out from under the bogies. Support paver with blocking capable of supporting its entire weight.

8) Un-bolt and remove screed pull arm. (Figure 6 - 66)

9) Un-bolt slope beam rod from tow point cylinder mounting assembly.

10) Un-bolt tow point cylinder mounting assembly from track frame. Swing assembly out of the way and secure to paver. If desired, disconnect hydraulic hoses to cylinder, plug to prevent contamination, and set assembly aside.

11) Un-bolt and remove outer half of drive wheel. Be sure to leave the two bolts holding the inner drive wheel onto hub.

12) Un-bolt and remove outer front idler nose plate.

13) Rubber track may now be pulled off track frame.

Rubber Track

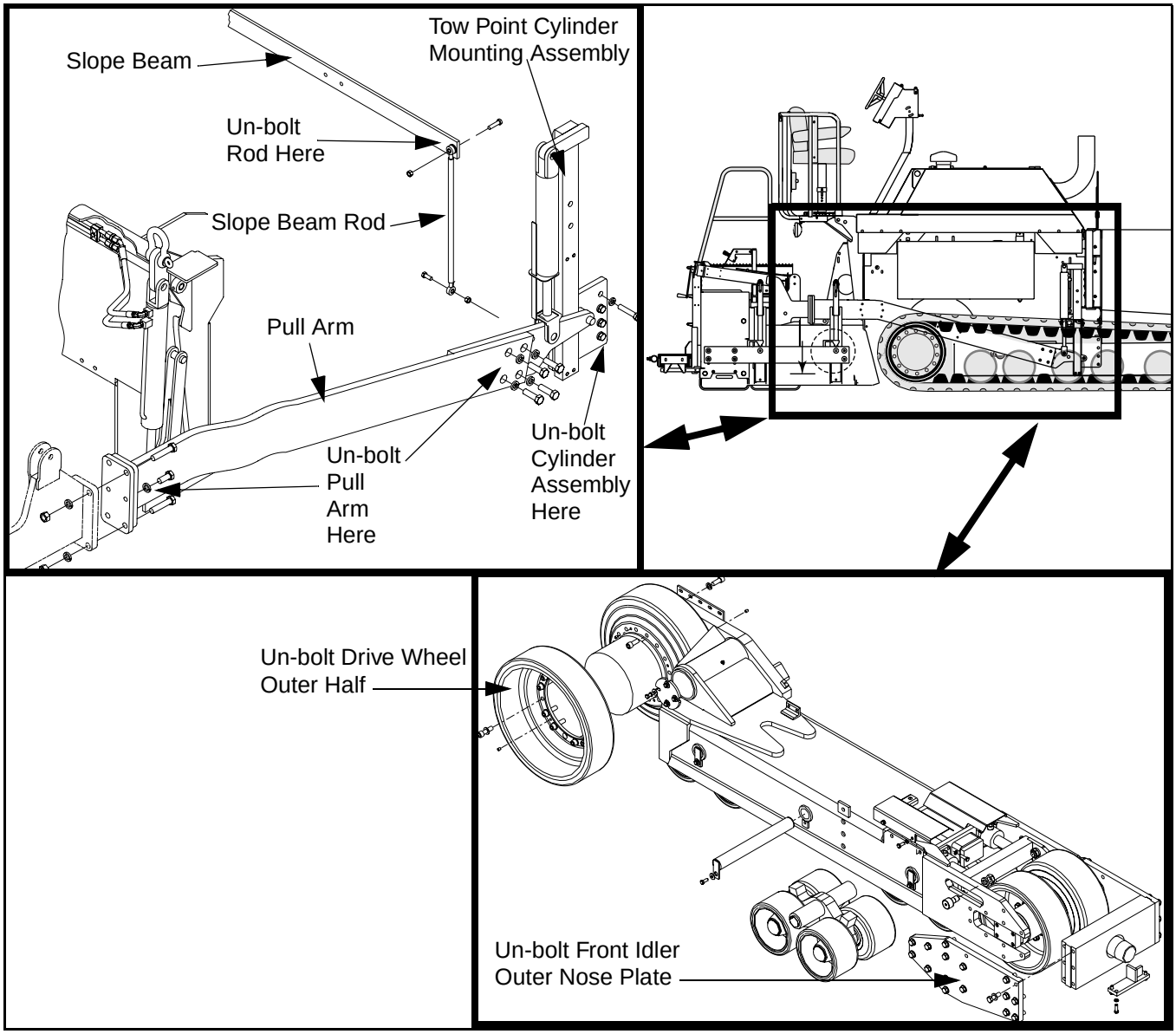


Figure 6 - 66 Rubber Track Removal

Rubber Track

Rubber Track Installation

1) With track removed as described above, clean track frame and wheels of debris, dirt, and asphalt build-up.

2) Slide track onto frame making sure center lugs are in alignment between bogie wheels and front idler.

3) Install front idler outer nose plate (Figure 6 - 66).

4) Install outer half of drive wheel.

5) Install tow point cylinder mounting assembly on track frame. If hydraulic hoses were disconnected, re-connect to the appropriate fittings.

6) Install slope beam rod back onto tow point cylinder mounting assembly.

7) Install screed pull arm.

8) Insert an allen wrench into the adjusting screw on tension release valve cartridge (Figure 6 - 64). Slowly turn it clockwise until the valve seats.

9) Tighten jam nut on valve cartridge.

10) Track is now ready to be re-tensioned.

Rubber Track Re-tensioning

1) Start engine and run at idle.

2) Set brakes to ON and allow the track tensioning system to charge itself.

3) The track tensioning cylinders should extend and the track should tighten.

4) If the track does not tighten or the system does not operate properly, see Section 5 for troubleshooting procedures.

Repairing Rubber Track Bogie Wheels

There are four oscillating bogie wheel assemblies (two on each side) which support the weight of the paver. Each assembly contains four bogie wheels which are fitted with tapered roller bearings packed with roller bearing grease and sealed to prevent the entry of dirt and debris. The bogie wheels should not require attention for the entire life of the bearings and seals.

When a paver has been in service for a long period of time, the roller bearings will begin to wear. Severely worn bearings will cause operating problems. At least once each season, each bogie assembly should be relieved of all loading and each wheel checked for end play. Each bogie wheel should not have any end play, but a preload of .002” - .004”.

Bogie Wheel Assembly Removal

To remove the bogie wheel assemblies for repair or replacement of parts:

1) Perform the procedureSee “Rubber Track Removal and Installation” on page 37. of this section to relieve rubber track tension. Also see (Figure 6 - 64) and (Figure 6 - 65).

NOTICE

It is not necessary to completely remove the track to service the bogie wheel assemblies. The paver must only have the track tension relieved and be raised off the ground far enough for the assemblies to clear the bottom of the track frame and the track center lugs.

⚠WARNING

When removing the bogie wheel assemblies, keep hands and feet clear from between the track and wheel assemblies.

2) Remove shaft from track frame that holds center bogie wheel assembly to frame (Figure 6 - 67). This will allow the assembly to drop onto the track.

3) Remove the bogie wheel assembly by drawing it out over the center lugs of the track.

4) Remove the front and rear bogie wheel assemblies, as described above.

NOTICE

If the track has been removed, each individual bogie wheel assembly may be removed without first removing the center assembly.

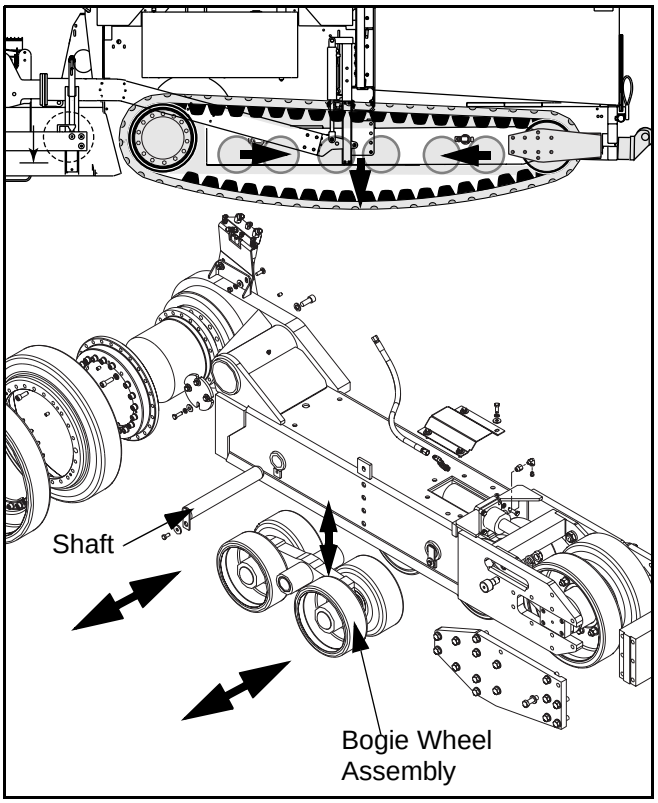


Figure 6 - 67 Bogie Wheel Assembly Removal

Bogie Wheel Assembly Installation

To install bogie wheel assemblies after they have been removed from track frame, simply reverse the process listed inSee “Bogie Wheel Assembly Removal” on page 42. of this section.

Bogie Wheel Bearing Replacement

If it is determined that bearing replacement is necessary, proceed with the following:

Disassembly

1) Remove bogie wheel assembly as described above. SeeSee “Bogie Wheel Assembly Removal” on page 42. and (Figure 6 - 68) below.

2) Remove grease cap (12).

3) Bend back locking tab on lock washer (10) and remove bearing nut (11).

NOTICE

If bearings are to be re-used, keep cups and cones in matched sets as originally installed.

4) Slide bogie wheel (3) off hub. The keyed flat washer(9), outer bearing cup (7) and cone (6) will be removed with the wheel as will the inner bearing cup (5).

5) Remove inner bearing cone (4) and shaft seal (8).

6) Clean all parts with mineral spirits solvent, inspect for damage, and replace as necessary.

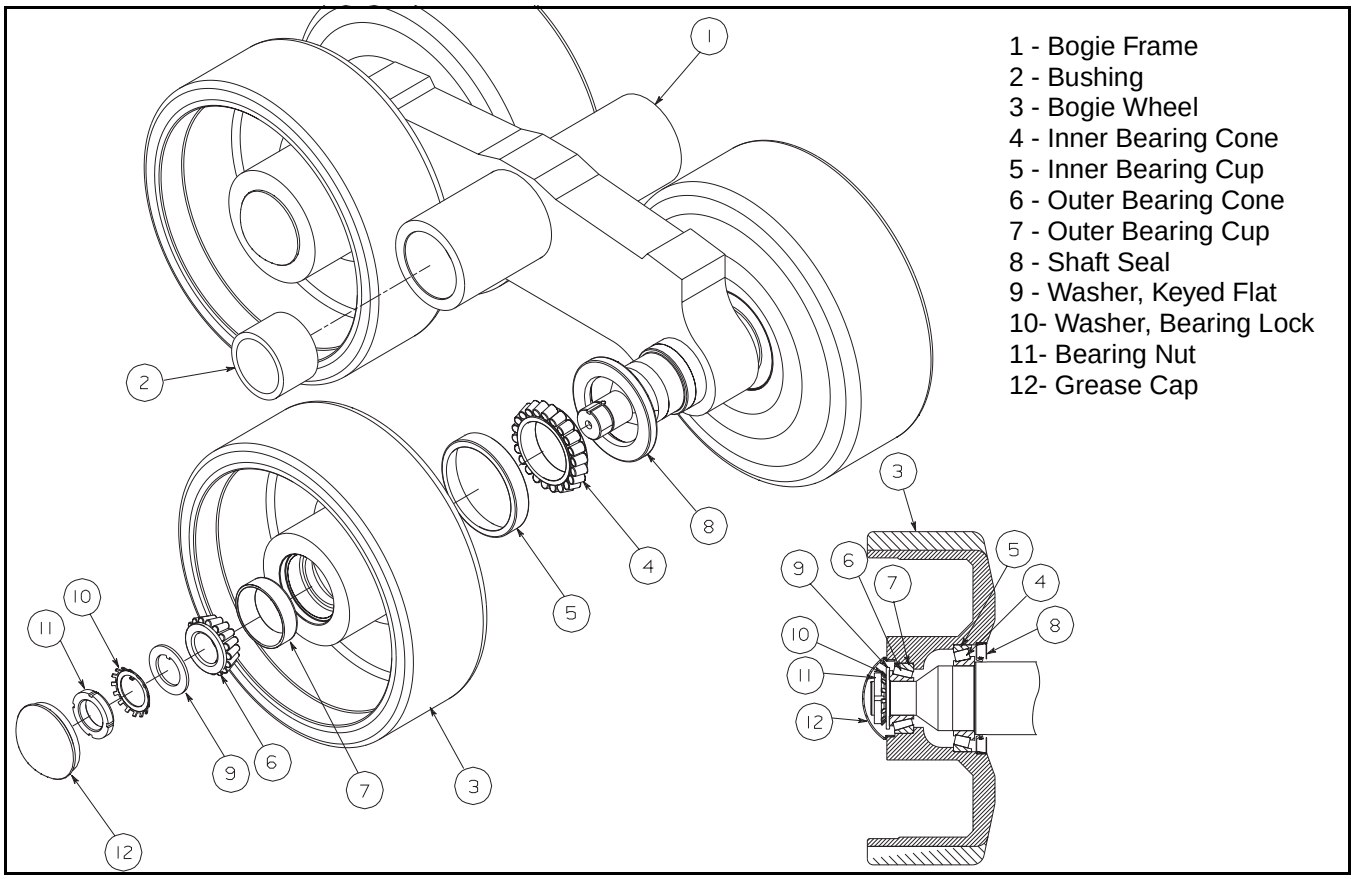


Figure 6 - 68 Bogie Wheel Bearings

Assembly

The following procedure is for establishing the proper bearing setting (.002” - .004” preload) on the bogie wheels. Refer to (Figure 6 - 68):

1) Pack inner (4) and outer (6) bearing cones with grease and set aside.

2) If inner cup (5) and/or outer cup (7) are to be new, install them at this time by pressing into bogie wheel housing (3) as shown.

3) Slide inner cone (4), packed with grease, into the inner cup (5) and then install the shaft seal (8) by pressing into bogie wheel housing (3) as shown.

4) Lubricate lip of seal with a small amount of oil or grease.

5) Slide bogie wheel onto shaft making sure not to damage lip of seal. This step is best done with the bogie frame (1) turned so the shaft is in a vertical position.

6) Pack the cavity between the bearings with grease.

7) Slide outer cone (6), packed with grease, onto shaft.

8) Slide keyed flat washer (9) and bearing lock washer (10) onto shaft.

9) Install bearing nut (11) and tighten to 50 ft/lbs while rotating bogie wheel. This will seat the bearings.

10) Loosen bearing nut until it is finger tight.

NOTICE

Take care not to unseat bearings when bearing nut is loosened.

11) Tighten bearing nut to 32 ft/lbs while rotating bogie wheel.

12) Select one of the locking tabs on the bearing lock washer (10) that is closest to a slot on the bearing nut, and either tighten or loosen nut to align the slot and tab.

13) Bend locking tab into slot on bearing nut to lock it in place.

14) Install grease cap (12) into bogie wheel housing.

Repeat steps 1 through 14 above for each bogie wheel.

Repairing Rubber Track Front Idler Assembly

The front track idlers, (one on each side), provide the mechanism to maintain tension on the tracks. Each idler assembly consists of two idler wheels bolted to the idler housing, a shaft with tapered roller bearings surrounded by a multi-part frame that acts as a push bar and guide to keep the idler aligned in the track frame. The front idler bearings should not have any end play, but a preload of .001” - .003”.

Front Idler Assembly Removal

To remove front idler assembly from the track frame:

1) Perform the procedure See “Rubber Track Removal and Installation” on page 37. of this section.

NOTICE

It is necessary to completely remove the track to allow the front idler to be removed from track frame.

2) Remove front nose plate pivot retaining bracket (4) from the paver frame.

3) Once the track is removed from machine, remove front nose plate (3).

4) Remove cam rollers (6) from idler assembly plates.

5) The front idler assembly (5) may now be slid forward out of the slots in track frame and lifted from the machine.

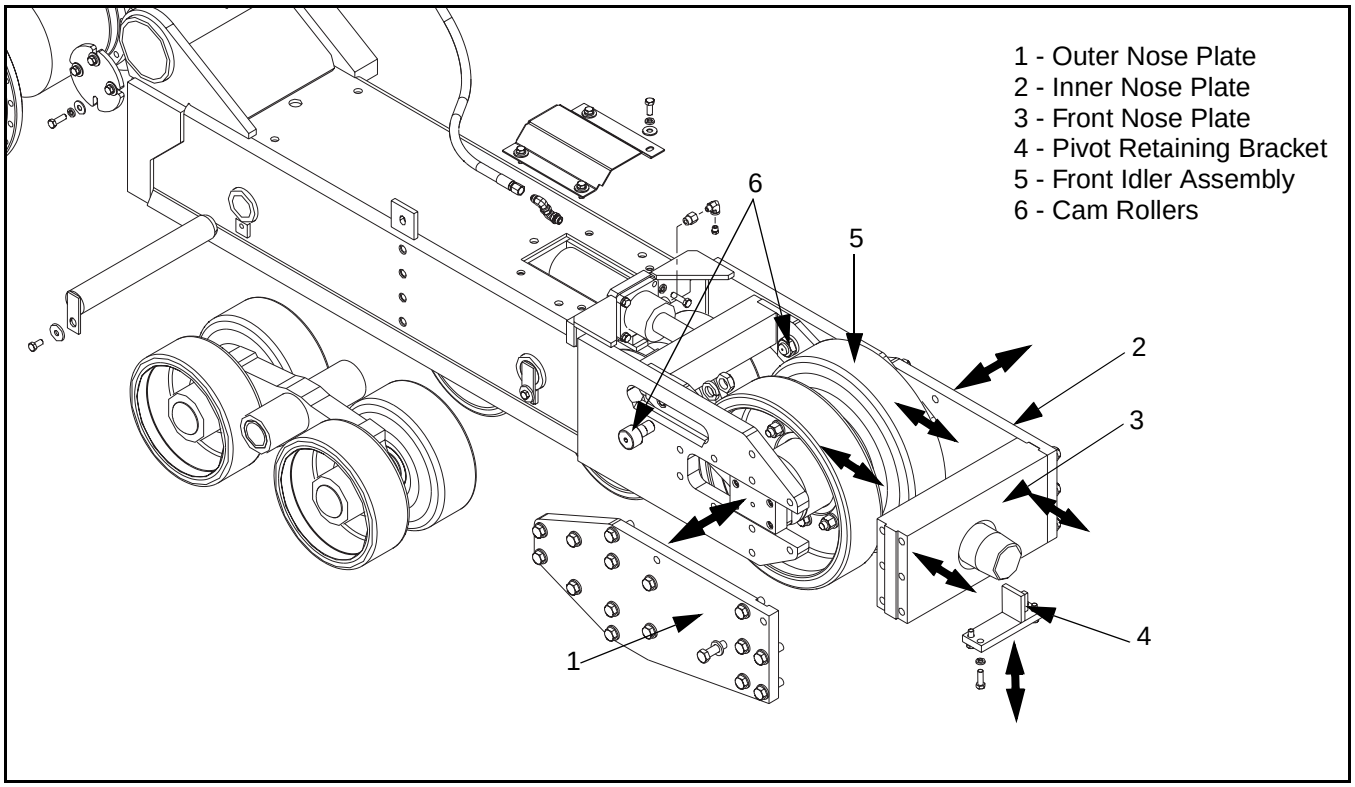
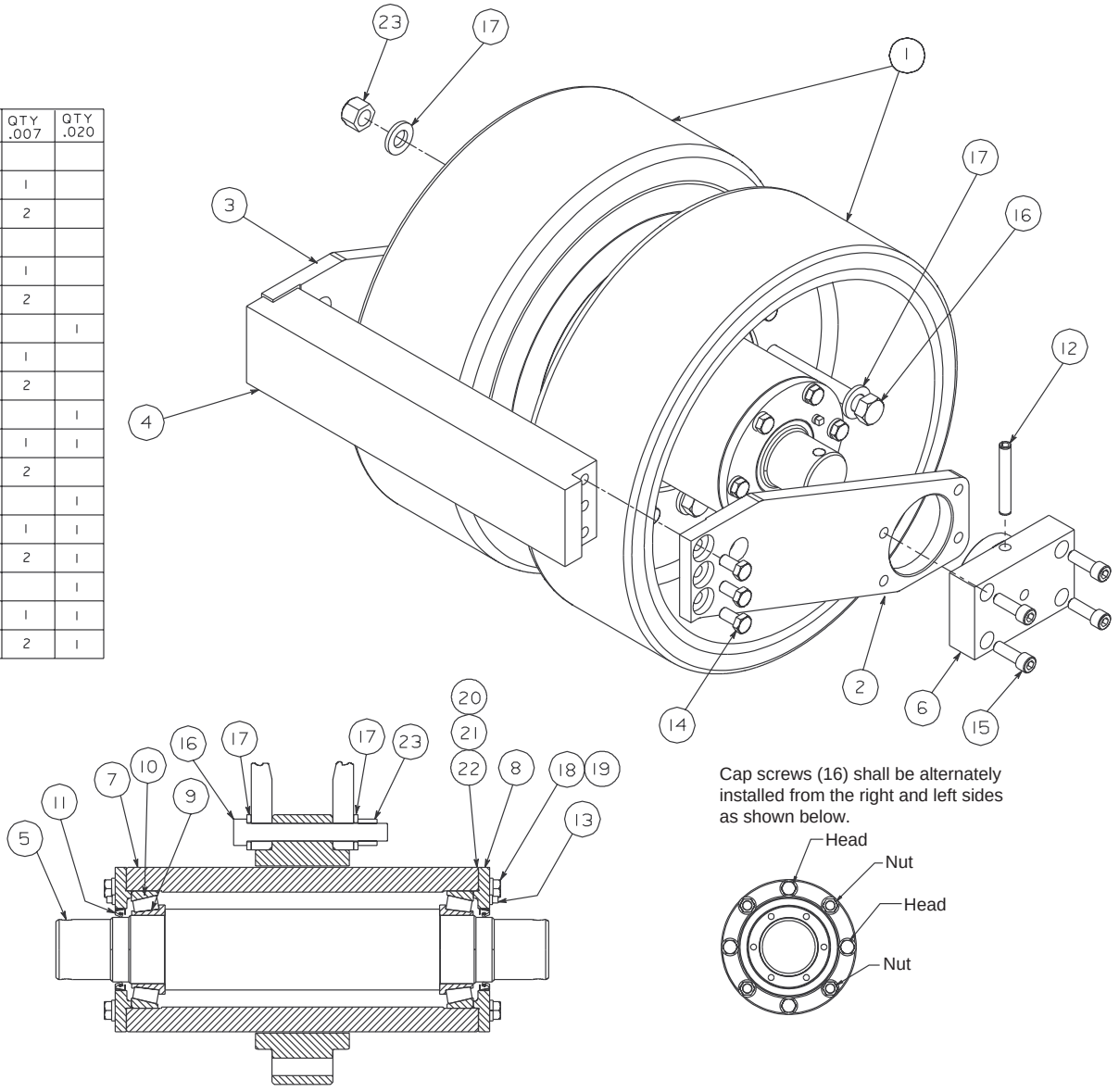


Figure 6 - 69 Front Idler Assembly Removal

Front Idler Assembly Repair

If it is determined that bearing replacement is necessary, proceed with the following: (Figure 6 - 70)

SHIM STACK	QTY .005	QTY .007	QTY .020
.010	2		
.012	1	1	
.014		2	
.015	3		
.017	2	1	
.019	1	2	
.020			1
.022	3	1	
.024	2	2	
.025	1		1
.027		1	1
.029	3	2	
.030	2		1
.032	1	1	1
.034		2	1
.035	3		1
.037	2	1	1
.039	1	2	1



Cap screws (16) shall be alternately installed from the right and left sides as shown below.

1 - Idler Wheel
2 - Outer Side Plate
3 - Inner Side Plate
4 - Push Bar
5 - Idler Shaft
6 - Slider Block
7 - Idler Housing
8 - Bearing Cover
9 - Bearing Cone
10- Bearing Cup
11- Seal
12- Roll Pin
13- Pipe Plug
14- Cap Screw
15- Cap Screw
16- Cap Screw - Grade 9
17- Hardened Flat Washer
18- Cap Screw
19- Lock Washer
20- Shim - .007”
21- Shim - .005”
22- Shim - .020”
23- Hex Lock Nut - Grade 9

Figure 6 - 70 Front Idler Assembly Repair

Rubber Track

Disassembly

1) Remove front idler assembly as described above. SeeSee “Front Idler Assembly Removal” on page 45. of this section.

2) Drive roll pins (12) out of slide blocks (6).

3) Remove slide blocks (6) from shaft (5).

4) Remove and disassemble side plates (2) and (3) from push bar (4).

5) Remove bearing caps (8) from each side of idler housing (7). Seals (11) will remain in caps.

NOTICE

If bearings are to be re-used, keep cups and cones in matched sets as originally installed.

6) Tap one end of shaft (5) with soft hammer or block of wood to remove bearing cup (10) from the opposite end. Shaft will then come out of idler housing (7) with bearing cones (9) still on shaft.

7) Using a punch, remove the remaining bearing cup from the idler housing.

8) At this time, if the idler wheels (1) need to be replaced, remove them from idler housing (7) by removing cap screws (16), lock nuts (23), and hardened flat washers (17).

9) Clean all parts with mineral spirits solvent, inspect for damage, and replace as necessary.

Bearing Replacement

Refer to (Figure 6 - 70) and the following procedure:

NOTICE

Use Loctite 272 thread compound on all cap screws.

1) Pack bearing cones (9) with grease and set aside.

2) Install new seals (11) into each bearing cap (8) and set aside.

3) Press bearing cones onto shaft (5) and set aside.

4) Press one bearing cup (10) into idler housing.

5) Install one bearing cap (8) onto idler housing and tighten cap screws (18).

6) Slide shaft, with bearings, into idler housing taking care not to damage seal in bearing cap. This step is best done with the idler housing turned so the shaft is inserted in a vertical position.

NOTICE

The shaft must be free to rotate.

7) Press the other bearing cup into idler housing.

8) Install the other bearing cap with seal (and without shims 20-21-22) onto idler housing.

9) Install two cap screws (18) 180° from each other and tighten in 90° increments. As the two cap screws are tightened, keep the others finger tight to prevent the bearing cap from flexing as it puts pressure on the bearings.

10) While turning the shaft with a torque wrench, continue the tightening until a sudden rapid rise in the torque is seen, then stop.

11) Measure and record the torque reading as the baseline rolling torque. You will need this reading later.

12) Turn the shaft again as above, and continue tightening the two cap screws until a 20 to 55 in/lb increase in rolling torque is achieved.

13) Using either a taper gage or a feeler gage, measure and record the gap, in thousandths of an inch, between the bearing cap and the idler housing. Perform this measurement by the two cap screws 180° apart described above.

14) Average these two measurements.
Example - One measurement is .022” and the other is .032”.
.022” + .032” = .054” divided by 2 = .027”
.027” is the thickness of shim stack needed.
Refer to the table in (Figure 6 - 70) for combinations to make up the proper thickness shim stack.

15) Remove the bearing cap, install the shim stack, and re-assemble tightening all cap screws to specified torques.

16) Rotate the shaft, measure and record the rolling torque once again. This torque value should be 20 to 55 in/lb greater than the baseline rolling torque recorded in step 11.

17) If this torque value is not achieved, repeat steps 9 through 16.

Assembly

Refer to (Figure 6 - 70) and the following procedure to re-assemble the front idler assembly after bearing replacement:

NOTICE

Use Loctite 272 thread compound on all cap screws unless otherwise noted.

1) If idler wheels (1) have been removed from idler housing (7), install cap screws (16) using G-N assembly paste P/N 49999-222, hardened washers (17), and lock nuts (23).

NOTICE

Tighten lock nuts (23) to 250 ft/lb. **Do Not** use impact wrench on these nuts.

2) Slide side plates (2) and (3) over ends of shaft.

3) Install push bar (4) to side plates and leave cap screws (14) finger tight.

4) Install slider blocks (6) through side plates and onto shaft (5) aligning each roll pin hole in block with hole in shaft.

5) Install roll pins (12) into slider blocks and drive through holes in shaft until flush with edge of blocks.

6) Rotate, if necessary, slider blocks to align cap screw holes with holes in side plates.

7) Install cap screws (15) and tighten to specified torque.

8) Tighten side plate-to-push bar cap screws to specified torque.

Front idler assembly is now ready to be installed back onto track frame.

Front Idler Assembly Installation

Refer to (Figure 6 - 69) and the following procedure to install assembled front idler in track frame:

NOTICE

Use Loctite 272 thread compound on all cap screws.

1) Lift front idler assembly and position slider blocks in slots in track frame with push bar toward the rear.

2) Slide assembly rearward until holes in side plates line up with slots in track frame.

3) Install cam rollers into holes in side plates through slots in track frame and tighten to specified torque.

4) Install front nose plate.

5) Track may now be installed per See “Rubber Track Installation” on page 40..

Rubber Track Drive Wheel Replacement

When replacement of rubber track drive wheels becomes necessary, use the following procedure:

Removal

1) Follow the instructions in Rubber Track Installation & Removal on page 5 of this section for removing the outer drive wheel and track.

2) Once outer drive wheel and track are removed, remove the two remaining cap screws which hold the inner drive wheel to the drive motor hub (Figure 6 - 71) and slide wheel off hub.

Installation

1) Slide inner drive wheel onto drive motor hub.

2) Secure inner drive wheel to motor hub with two cap screws 180° apart from each other, use Loctite 272 and torque to 404 ft.-lbs.

3) Install track and outer drive wheel per instructions in Rubber Track Installation on page 7 of this section.

NOTICE

Outer drive wheel must be installed with the two larger holes 180° apart from each other aligned and slid over the two cap screws retaining the inner drive wheel.

4) Install remaining drive wheel bolts, use Loctite 272 and torque to 404 ft.-lbs.

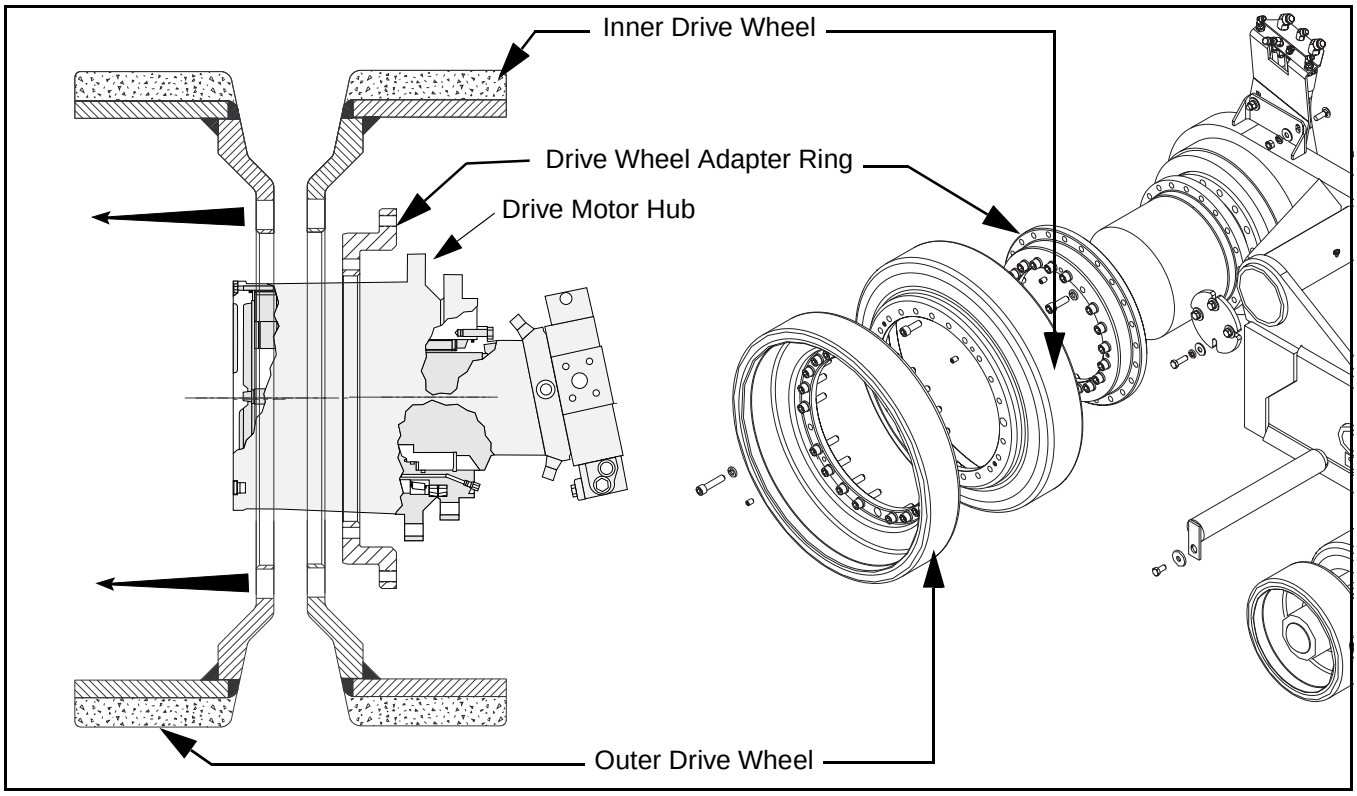


Figure 6 - 71 Drive Wheel Replacement

Slat Conveyors

Replacing Slat Conveyor Liners

Liners are bolted to the hopper bed to provide a wearing surface over which the mix is carried. If slat liners are worn out, chances are the chains are as well; inspect and replace or adjust as needed. (Refer to Slat Conveyor Tensioning.)

1) Detach screed from tractor. Make sure all electrical cables and hydraulic hoses are disconnected before pulling tractor away (Refer to Screed Section of this manual).

2) Elevate the paver to allow an adequate amount of safe working space under the tractor so the liner nuts can be reached. Support the paver with blocking equipment capable of supporting the weight of the paver.

3) Remove outer front and center front skirt boards. (Figure 6 - 72)

4) Remove outer rear and inner rear skirt boards.

5) Loosen slat conveyor chain take-ups.

6) Remove pin from chain link and break each chain at a point just below the rear drive sprockets.

7) Pull the top section of each slat conveyor forward through the hopper. Place slat conveyors on the ground in front of the paver. The return portion of each conveyor (underside of paver) need not be moved unless the slats and chains are to be inverted.

8) Unbolt and replace all liner panels which are worn out.

9) Reinstall all parts by reversing the disassembly procedure and perform the Slat Conveyor Tensioning procedure.

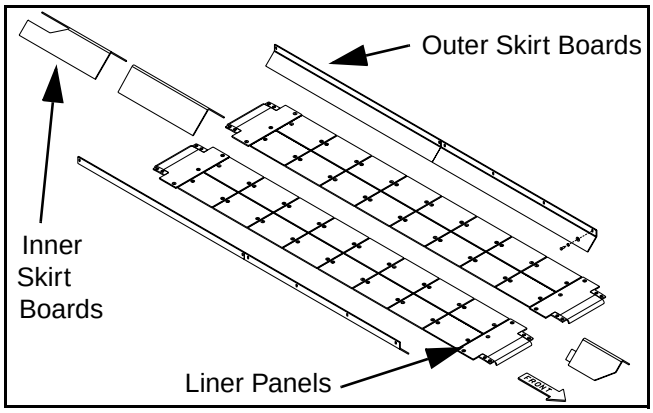


Figure 6 - 72 Replacing hopper liners

Inverting Slat Bars

The slat conveyors consist of two continuous chains linked together by a series of bars. When a slat bar becomes warn on one side the slat bar can be removed and turned over to allow use of the other side.

Spreading Augers

Cast Augers

Pavers are equipped with cast auger sections. Cast augers provide long service life without the need to resurface the augers as they wear. When the augers are worn, replace the auger sections with new bolt-on sections. (Figure 6 - 73)

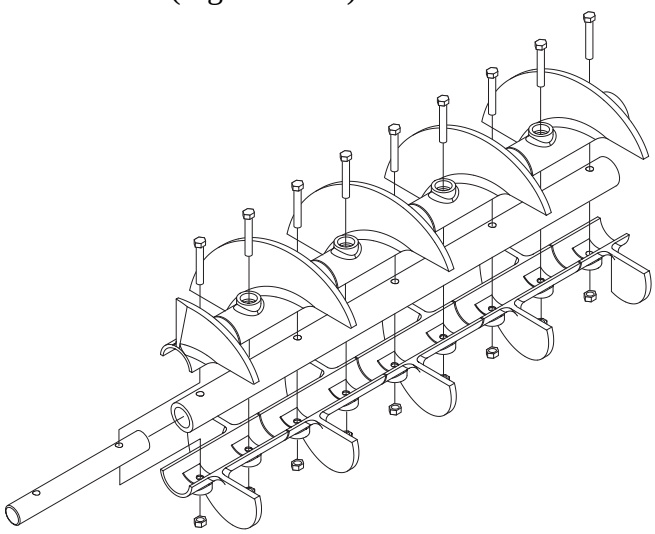


Figure 6 - 73 Replacing cast auger sections

Re-facing Lined Augers

When augers are severely worn they can be re-faced with special contoured liners made from Ni-hard alloy. The application of these liners restore the augers to near new condition. To apply genuine Cedarapids Ni-hard liners proceed as follows:

1) Remove auger from paver.

2) Clean auger sections as well as possible, particularly in the weld areas.

3) Use several C-clamps and attach the pieces of liner to the auger face starting at the drive chain end as shown (Figure 6 - 74). By starting at this end, the main wear surface of the section will be covered and any small area not covered will be at the discharge end. Adjust liner pieces to extend 1/8” above the edges of the auger flight as shown (Figure 6 - 75). Be sure the first piece applied is accurately aligned so the remaining liners will fit properly along the flight.

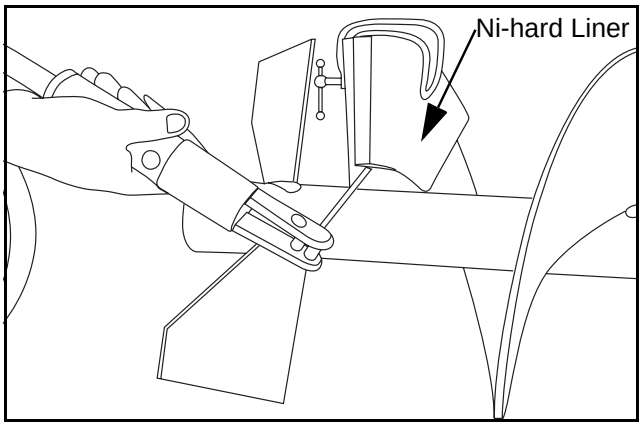


Figure 6 - 74 Installing liners

4) Use a low hydrogen weld rod and make a continuous weld along the inside edge “A”. (Figure 6 - 75)

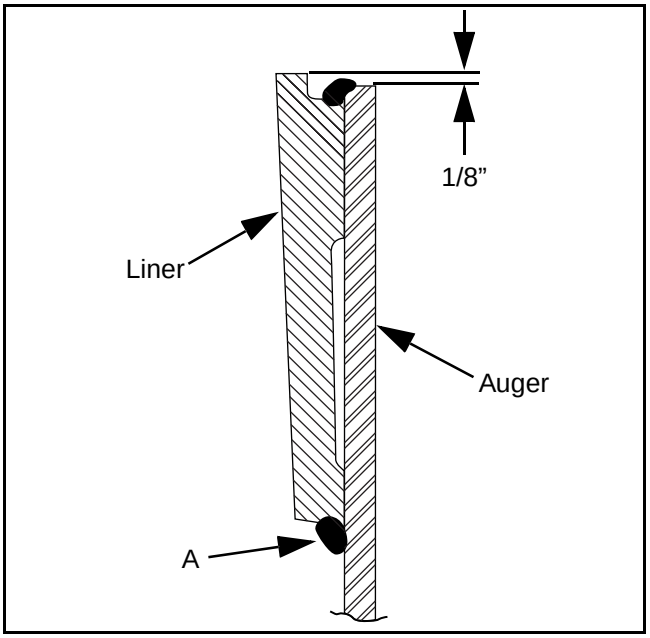


Figure 6 - 75 Liner cross-section

5) Make welds at each of the two pockets “B”. (Figure 6 - 76)

Spreading Augers

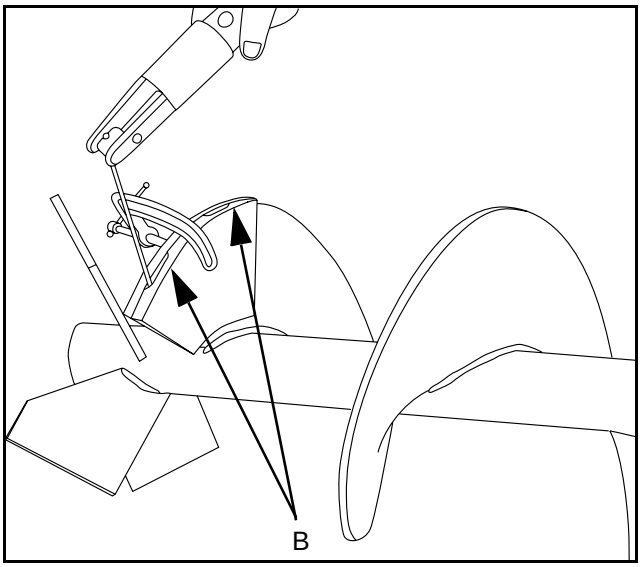


Figure 6 - 76 Installing Liners

6) On the first and last liners of each flight make a weld at the exposed edge for extra strength “C”. (Figure 6 - 77)

NOTICE

The small cracks which develop in the liners from the welding process are normal and should not be considered defects

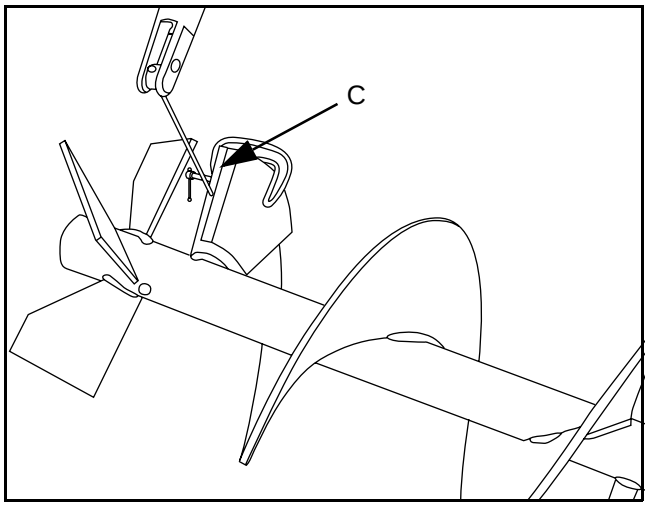


Figure 6 - 77 First and last liners require extra weld

Re-lining Auger Shafts

When paving with materials that are extremely abrasive, the auger shafts will show severe wear; lining segments can be welded on to the auger shafts to prevent shaft wear. These segments are made of mild steel instead of Ni-hard material for easier application. The rate of shaft wear is never as great as that of the auger flight facing.

Machine Storage Preparation

The following procedures are recommended for conditioning the Cedarapids paver for storage.

1) Run all material completely out of the machine.

2) Thoroughly clean the complete machine to remove all asphalt.

3) Park machine in a shed or well drained area. (Preferably on boards to keep tires or tracks out of mud or standing water.)

4) Perform Periodical Maintenance items listed on the periodic maintenance chart found in this manual.

5) Thoroughly grease all bearings and bushings. Grease all adjustment bolts on paver and screed.

6) Winterize radiator with Anti-freeze to 40° below zero.

7) Hang screed on safety cables and retract all hydraulic cylinders so cylinder rods are not exposed.

8) Remove batteries, feed controllers and grade/ slope controllers. Store in heated area. Store batteries on wood, not concrete.

9) Be sure all panel lids and covers are in place. Close tightly to prevent water entry. (Tape around electric panel door to seal).

10) Enclose consoles in protective cover. Leave bottom of wrap open to prevent condensation inside. Cover exhaust.

11) Remove all books and literature from tool boxes and store inside office or with other stored components.

12) Refer to engine manufacturer's specifications for protection of engine.

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Appendix A - Torque Specs

Torque Charts

The following pages contain charts for use as guides when tightening bolts and nuts. These specifications should be followed unless specific torques are given elsewhere in this manual.

Standard Torque Chart

Table A - 1 is a list of recommended torque values for standard bolts. Use this torque chart to avoid overstressing standard nuts and bolts used on Cedarapids equipment. These specifications should be followed unless specific torques are given. Cedarapids uses Grades 2, 5, and 8. The maximum torque values are based on 75% of the specified minimum proof strength of the bolt steel in order to provide a safety factor. The term “lube” applies to cadmium plating and/or application of thread lubricants. Hardened washers should always be used, regardless of whether standard nuts or lock nuts are employed.

Metric Torque Chart

Table A - 2 is a list of torque values recommended for metric bolts. The maximum torque values are based on 75% of the specified minimum proof strength. The term “lube” includes the application of thread lubricants, cadmium plating and the use of hardened washers regardless of whether standard or lock nuts are used.

Torque Charts

		S.A.E Grade 2			S.A.E Grade 5			S.A.E Grade 8		
dia. (inches)	pitch (thread/in.)	Torque (ft-lbs)		Clamp Load (lbs)	Torque (ft-lbs)		Clamp Load (lbs)	Torque (ft-lbs)		Clamp Load (lbs)
		Dry	Lube		Dry	Lube		Dry	Lube	
1/4	20	5	4	1310	8	6	2020	12	9	2860
1/4	28	6	5	1500	10	7	2320	14	11	3270
5/16	18	11	9	2160	17	13	3340	25	19	4710
5/16	24	12	10	2390	19	15	3690	27	21	5220
3/8	16	20	15	3190	31	24	4940	44	34	6970
3/8	24	23	17	3620	35	27	5590	49	38	7900
7/16	14	32	25	4380	49	38	6770	70	54	9560
7/16	20	36	27	4890	55	42	7560	78	60	10680
1/2	13	49	38	5850	75	58	9040	106	82	12770
1/2	20	55	42	6590	85	65	10190	120	92	14390
9/16	12	70	54	7500	109	84	11600	150	115	16380
9/16	18	79	60	8370	121	93	12940	170	130	18270
5/8	11	97	75	9320	150	115	14400	210	160	20340
5/8	18	110	85	10560	170	130	16320	240	180	23040
3/4	10	170	130	13770	265	200	21290	375	285	30060
3/4	16	190	145	15380	295	225	23770	415	320	33570
7/8	9	165	125	11430	425	330	29450	605	465	41580
7/8	14	180	140	12590	470	360	32440	665	510	45810
1	8	245	190	14990	640	495	38630	905	695	54540
1	14	270	210	16400	700	540	42260	990	765	59670
1-1/8	7	350	270	18880	790	610	42340	1285	990	68670
1-1/8	12	395	305	21180	890	685	47500	1440	1110	77040
1-1/4	7	495	380	23980	1120	860	53770	1815	1395	87210
1-1/4	12	550	425	26550	1240	950	59550	2010	1545	96570
1-3/8	6	655	500	28580	1465	1130	64100	2380	1830	103950
1-3/8	12	745	570	32540	1670	1285	72980	2710	2085	118350
1-1/2	6	865	665	34770	1945	1495	77970	3160	2430	126450
1-1/2	12	975	750	39120	2190	1685	87740	3555	2735	142290
1-3/4	5	1370	1055	47020	2285	1755	78370	4985	3835	170990
2	4.5	2060	1585	61870	3435	2640	103120	7500	5765	225000
2-1/4	4.5	3015	2320	80430	5025	3865	134060	10960	8435	292500
2-1/2	4	4125	3170	99000	6875	5285	165000	15000	11530	360000
2-3/4	4	5590	4300	122010	9320	7165	203360	17790	13680	388230
3	4	7385	5680	147750	12310	9470	246260	23500	18080	470130

Table A - 1: Torque Values for Standard Hardware

Torque Charts

		Property Class = 8.8				Property Class = 10.9				Property Class = 12.9			
dia (mm)	pitch (mm)	Dry		Lube		Dry		Lube		Dry		Lube	
		(ft-lbs)	N-M	(ft-lbs)	N-M	(ft-lbs)	N-M	(ft-lbs)	N-M	(ft-lbs)	N-M	(ft-lbs)	N-M
10	1.5	37	50	29	39	53	72	41	56	62	84	48	65
10	1.25	39	53	30	41	56	76	43	58	66	89	51	69
12	1.75	65	88	50	68	93	126	71	96	109	148	83	113
12	1.25	71	96	55	75	101	137	78	106	119	161	91	123
14	2	104	141	80	108	148	201	114	155	173	235	133	180
14	1.5	112	152	86	117	160	217	123	167	187	254	144	195
16	2	161	218	124	168	230	312	177	240	269	365	207	280
16	1.5	172	233	132	179	246	334	189	256	287	389	221	300
18	2.50	230	312	177	240	318	431	245	332	372	504	286	388
18	1.5	258	350	199	270	357	484	275	348	418	567	321	435
20	2.5	325	441	250	339	450	610	346	469	525	712	404	548
20	1.5	360	488	277	376	499	677	384	521	583	791	448	607
22	2.5	443	601	341	462	613	831	471	639	716	971	551	747
22	1.5	486	659	374	507	673	913	518	702	786	1066	605	820
24	3	562	762	432	586	777	1054	598	811	908	1231	698	946
24	2	612	830	471	639	847	1149	652	884	990	1342	762	1033
27	3	823	1116	633	858	1139	1544	876	1188	1331	1805	1024	1389
27	2	889	1205	683	926	1229	1667	945	1281	1436	1947	1105	1498

Table A - 2: Torque Values for Metric Hardware

Torque Charts

Electrical Schematics

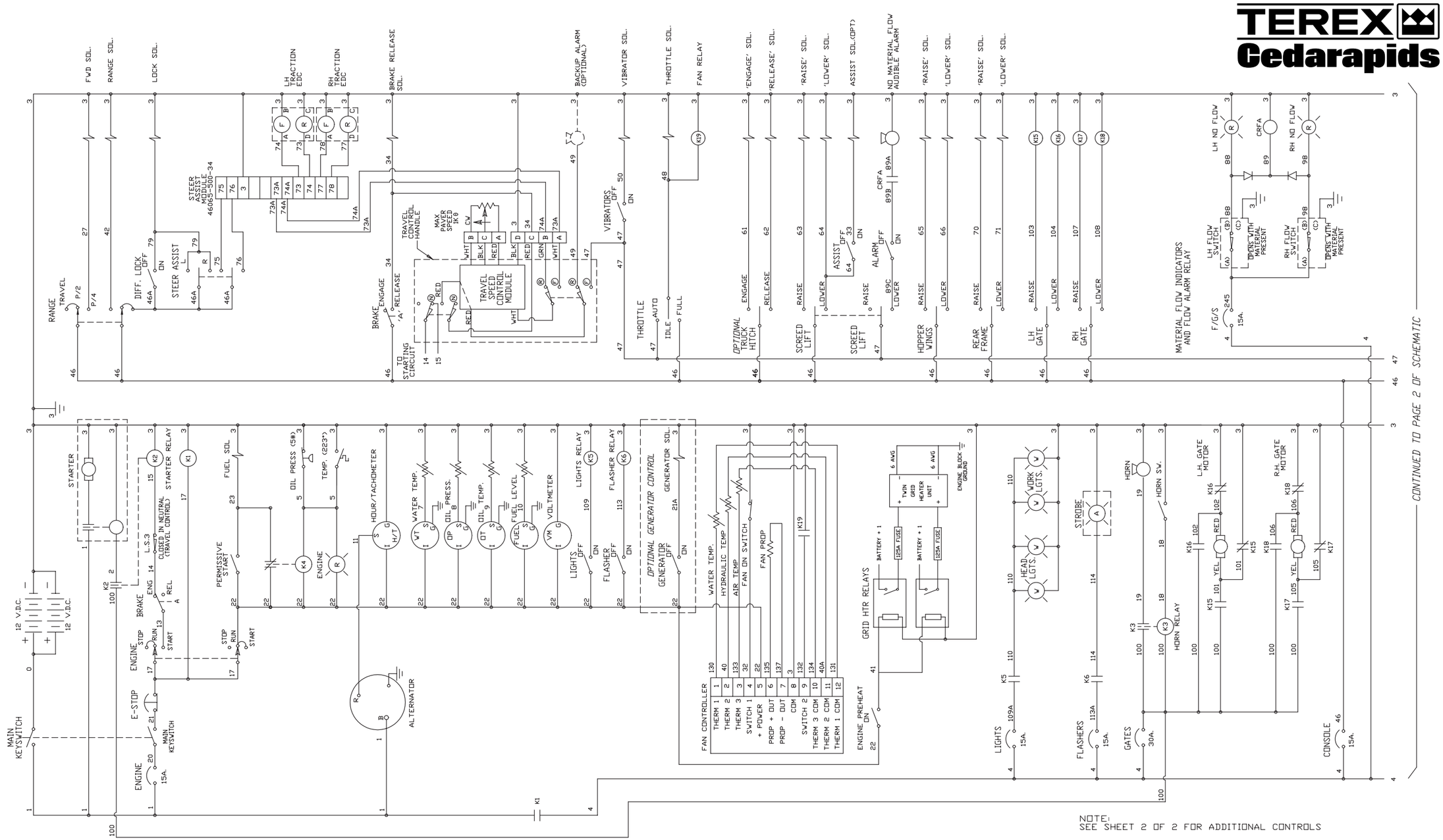
Appendix B - Electrical Schematics

Electrical Schematics

The following pages contain The electrical schematics for the various configurations of the 300 Series Pavers

Electrical Schematics

TEREX Cedarapids



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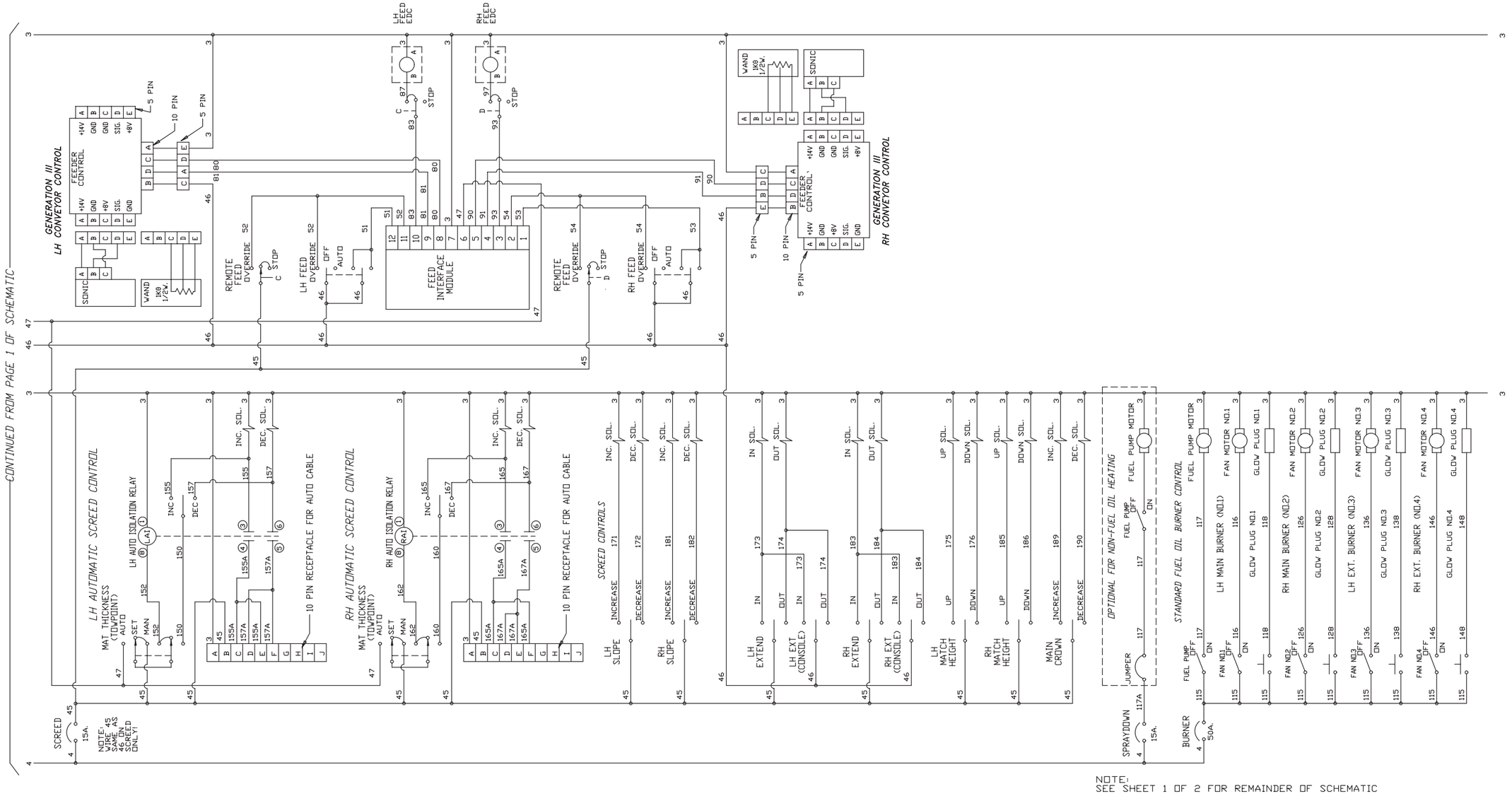
352 Paver
Electrical Schematic
9704-417-33b, 9704-417-34b, 9704-417-35d



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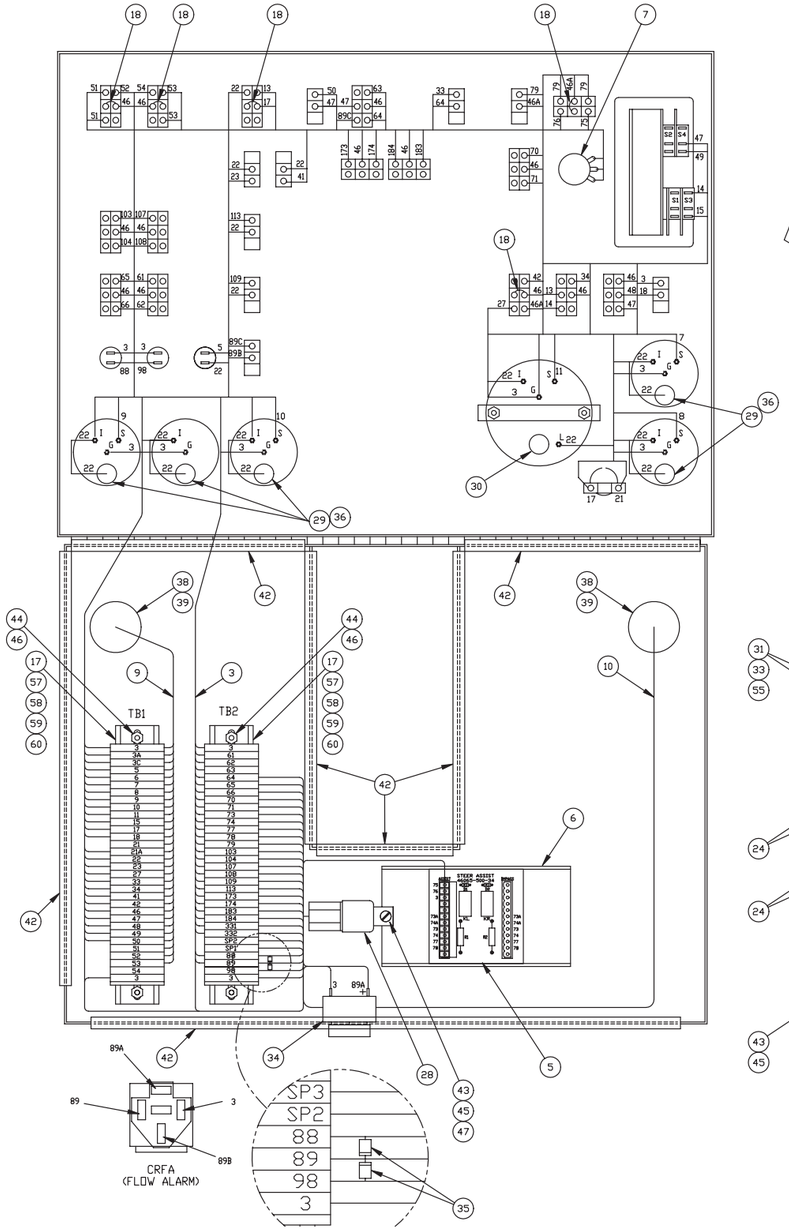
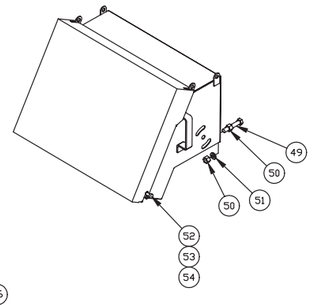
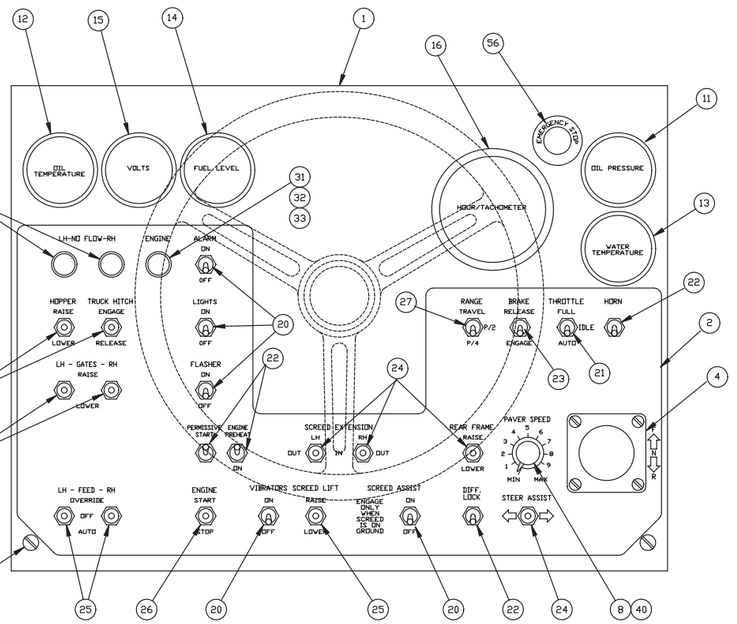
352 Paver
Electrical Schematic
9704-417-33b, 9704-417-34b, 9704-417-35d

TEREX Cedarapids







ITEM		PART NO./ PATTERN NO.	DESCRIPTION	REQ.
46		07438-022	WASHER-#8 SHKP LK SINT	4
47		07440-23	HEX NUT- #10NF	2
48		07440-008	HEX NUT #8 NC	4
49		07383-075	CAPSCREW, 1/2-NC X 2-3/4"	2
50		07012-027	HEX NUT 1/2"NC	4
51		07014-005	LOCK WASHER 1/2"	2
52		07455-012	SHOULDER SCREW- 3/8" X 5/8"	2
53		07012-024	HEX NUT- 5/16"NC	2
54		07014-002	LOCK WASHER- 5/16"	2
55		46270-500-37	LENS- AMBER JEWLED	2
56		46085-401-46	E-STOP- MUSHROOM BUTTON	1
57			END BARRIER AB #1492-EB3	2
58			RAIL- AB #199DR1	28"
59			TERM. GND- AB #1492-WG4	4
60		46260-005-32	MARKER- AB #1492-SM6-12 (100/CARD)	.8
61				
62				
63				
64				

ITEM		PART NO./PATTERN NO.	DESCRIPTION	REQ.
1		09704-505-96	CONSOLE- RUBBER TIRE	1
2		04494-105-25	EMBLEM-RUBBER TIRE	1
3		09704-376-31	HARNESS-RUBBER TIRE CONSOLE	1
4		46065-500-40	CONTROLLER- HANDLE	1
5		46065-500-34	MODULE- STEER ASSIST	1
6		46015-001-24	SNAPTRAC-PVC	1
7		09704-416-36	POTMETER- SPEED	1
8		46075-500-05	KNOB-1" DIA	1
9		09704-411-29	CABLE-LH	1
10		09704-411-30	CABLE-RH	1
11		45865-002-41	GAUGE- OIL PRESSURE	1
12		45865-003-16	GAUGE- OIL TEMP	1
13		45865-003-17	GAUGE- WATER TEMP	1
14		45915-012-08	GAUGE- FUEL LEVEL	1
15		46225-001-24	METER- VOLTMETER 12VDC	1
16		46225-010-17	METER- TACH/HOUR	1
17			TERM. AB #1492-W4	60
18		46260-501-03	JUMPER- SWITCH BLOCK	5
19				
20		46200-009-06	SWITCH- TOGGLE 1TL1-2	5
21		46200-009-08	SWITCH- TOGGLE 2TL1-1	1
A 22		46200-009-11	SWITCH- TOGGLE 1TL1-6	4
23		46200-009-18	SWITCH- TOGGLE 2TL;1-3	1
24		46200-009-21	SWITCH- TOGGLE 2TL1-7	8
25		46200-009-40	SWITCH- TOGGLE 2TL1-5	3
26		46200-009-41	SWITCH- TOGGLE 2TL1-50	1
B 27		46200-009-62	SWITCH- TOGGLE 2TL1-10	1
28		46325-002-43	RELAY- AUTOMOTIVE	1
29		46270-005-09	LIGHT KIT- METER	5
30		46270-005-10	LIGHT KIT- 12VDC	1
31		46270-002-44	LAMP- 14VDC	3
32		46270-500-36	LENS- RED JEWELED	1
33		46061-500-62	SOCKET	3
34		46010-001-29	ALARM- SIGNAL	1
35		46955-001-43	DIODE- 600V 6A	2
36		46275-001-02	WIRE- LUG-14/16 EYE	5
37		07437-135	MACH SCREW- 1/4"NC X 3/4"	2
38		46026-015-14	CONNECTOR-1 1/4" 90DEG.	2
39		46195-001-04	LOCKNUT	2
40		45890-100-06	SEAL NUT- 3/8"NEF X 32 28	1
41		45890-100-29	NUT- 1/4" SELF RETAINING	2
42		45890-800-31	EDGING - 1/16" -B-2-ALUM	4.7'
43		07504-066	MACH SCREW- #10-32 X 1/2"	2
44		07504-052	MACH SCREW- #8-32 X 1/2"U	4
45		07438-023	WASHER-#10 SHKP LK	2

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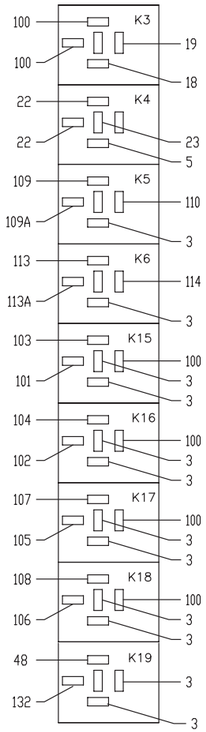
Electrical Schematic
9704-417-33b, 9704-417-34b, 9704-417-35d

TEREX Cedarapids



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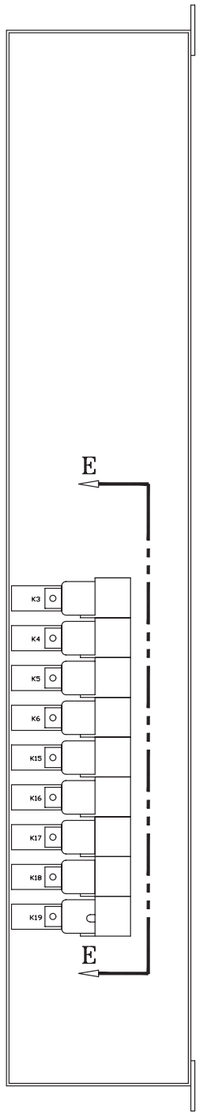
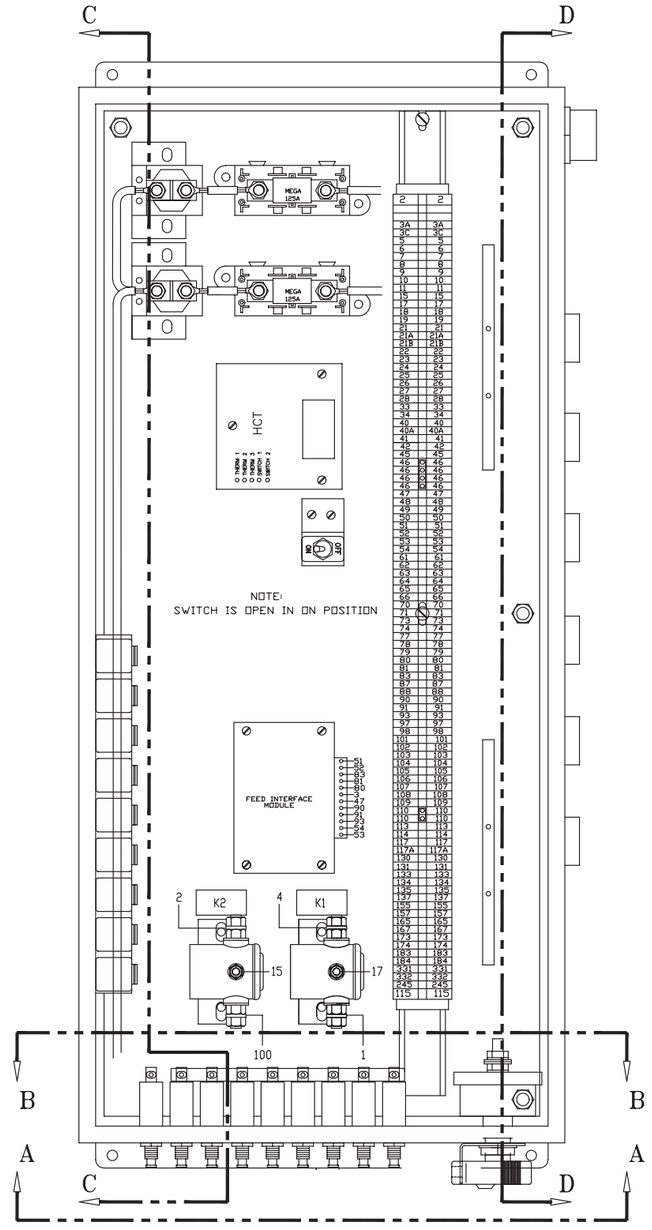
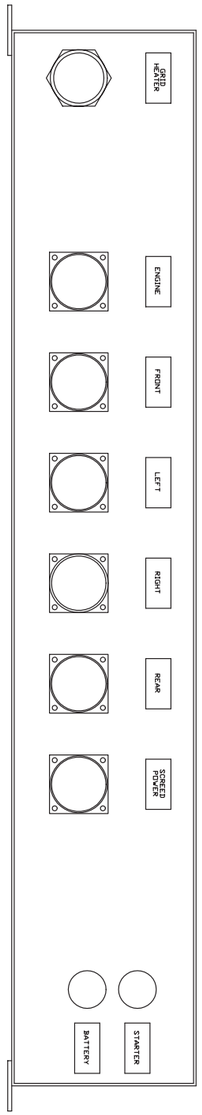
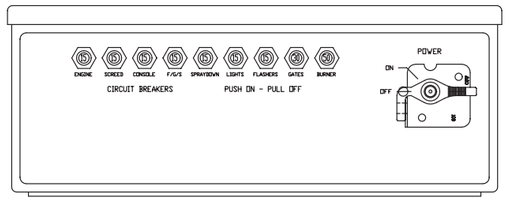


VIEW C–C

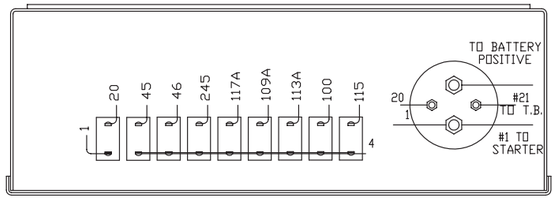




VIEW D–D



VIEW A–A



VIEW B–B

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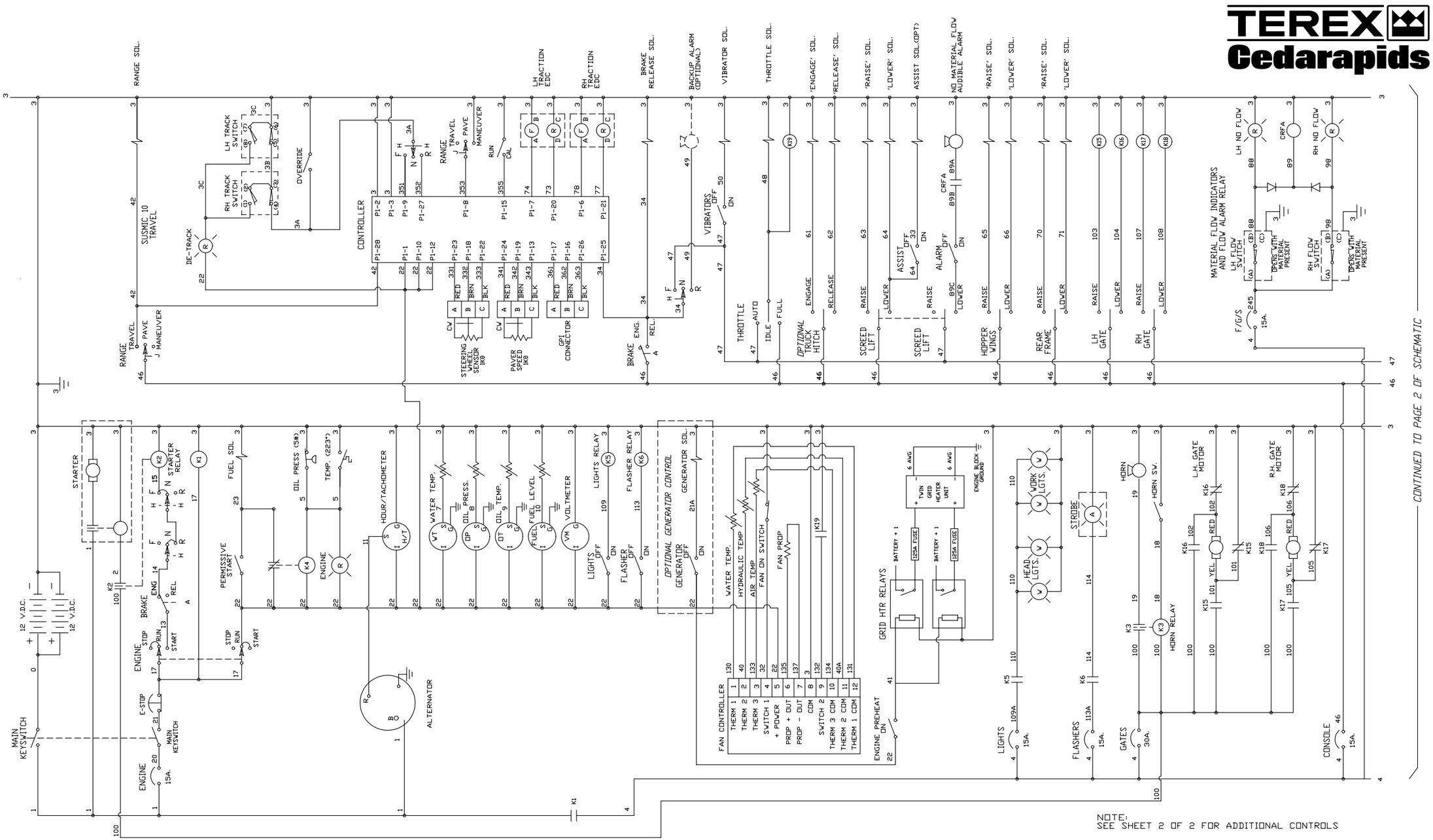
352 Paver
Electrical Schematic
9704-417-33b, 9704-417-34b, 9704-417-35d

TEREX Cedarapids



NOTE:
SEE SHEET 2 OF 2 FOR ADDITIONAL CONTROLS

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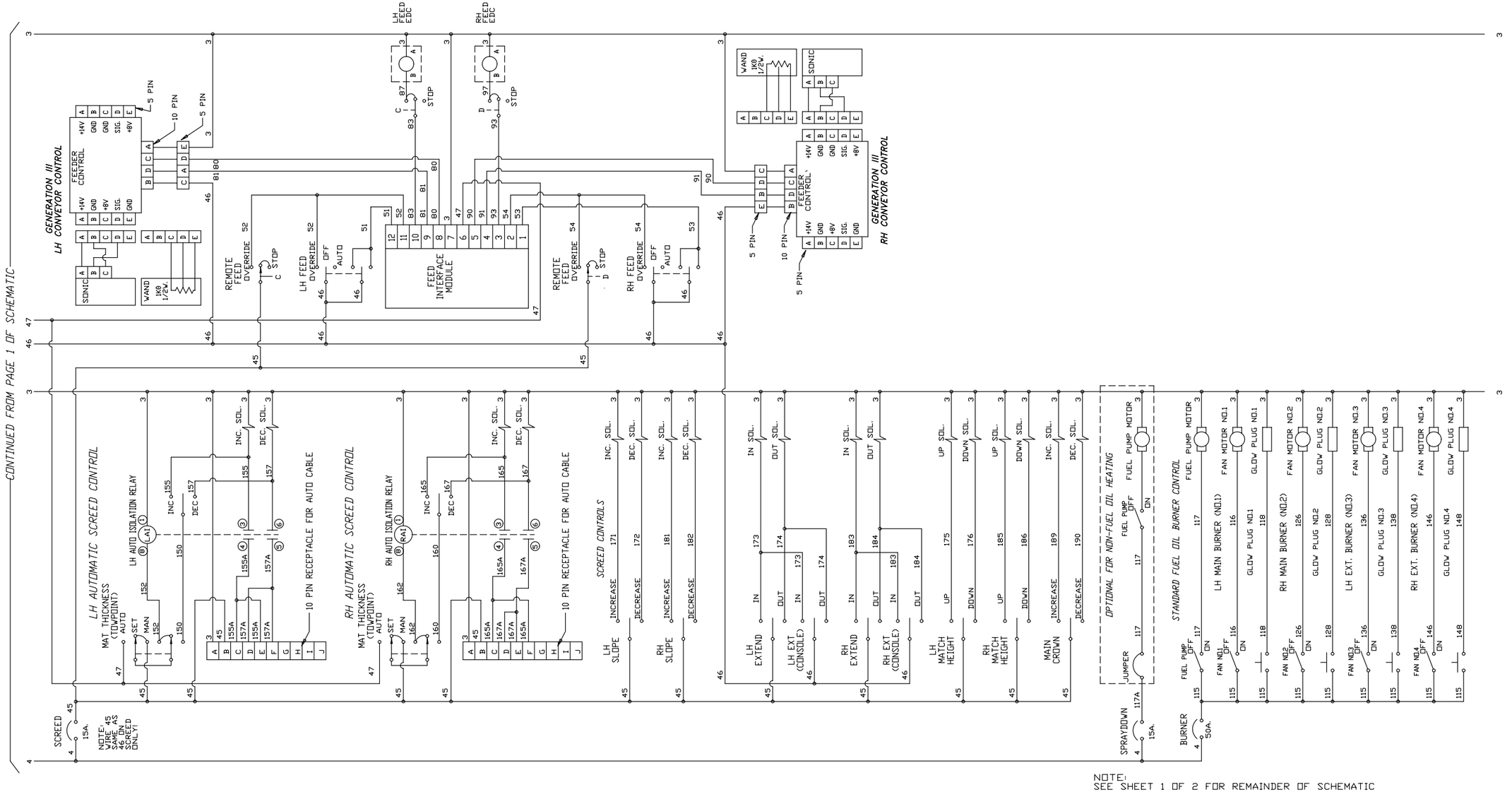
362 Paver
Electrical Schematic
9704-417-46b, 9704-417-47b, 9704-417-35d

TEREX Cedarapids



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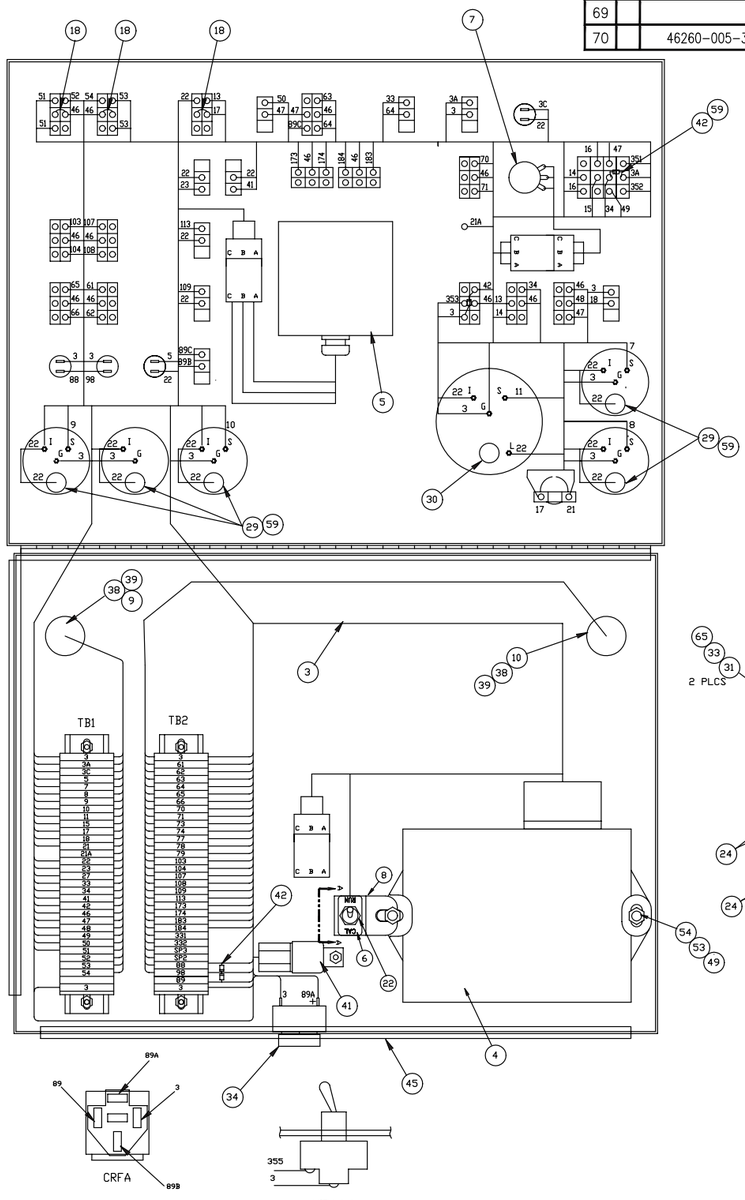
362 Paver
Electrical Schematic
9704-417-46b, 9704-417-47b, 9704-417-35d

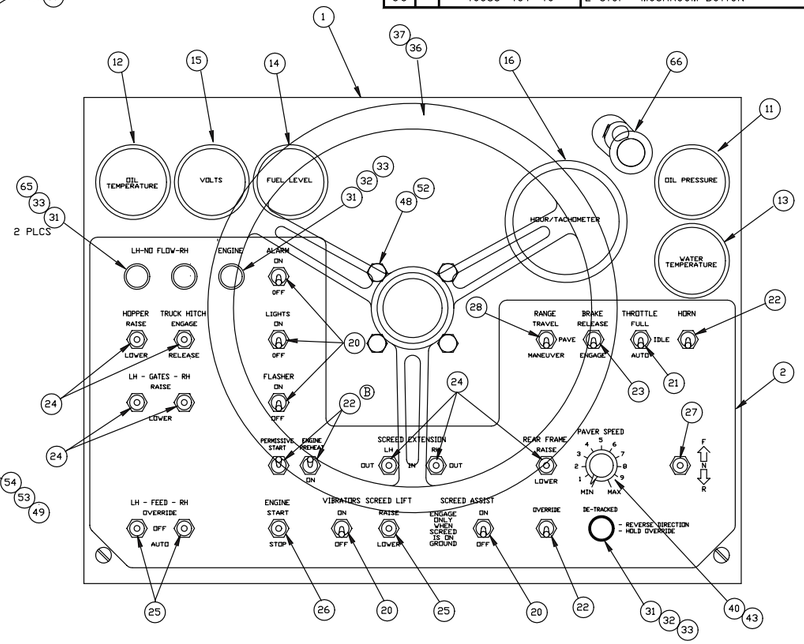
TEREX Cedarapids

ITEM		PART NO./ PATTERN NO.	DESCRIPTION	REQ.
67			END BARRIER AB #1492-EB3	2
68			RAIL- AB #199DR1	28"
69			TERM. GND- AB #1492-WG4	4
70		46260-005-32	MARKER- AB #1492-SM6-12 (100/CARD)	.8

ITEM		PART NO./ PATTERN NO.	DESCRIPTION	REQ.
46		07504-066	MACH SCREW- #10-32 X 1/2"	1
47		07504-052	MACH SCREW- #8-32 X 1/2"U	4
48		07383-034	CAPSCREW- 3/8"NC X 1/2"	4
49		07383-022	CAPSCREW- 5/16"NC X 1"	2
50		07437-135	MACH SCREW- 1/4"NC X 3/4"	2
51		07014-017	WASHER- 5/16"	2
52		07014-003	WASHER- 3/8" LOCK	4
53		07014-002	WASHER- 5/16" LOCK	2
54		07012-024	HEX NUT- 5/16"NC	4
55		07438-023	WASSHER- #10 SHKP LK	1
56		07438-022	WASHER-#8 SHKP LK SINT	4
57		07440-23	HEX NUT- #10NF	1
58		07440-008	HEX NUT #8 NC	4
59		46275-001-02	WIRE LUG- 14/16 EYE	9
60		07383-075	CAPSCREW, 1/2-NC X 2-3/4"	2
61		07012-027	HEX NUT 1/2"NC	4
62		07014-005	LOCK WASHER 1/2"	2
63		07455-012	SHOULDER SCREW- 3/8" X 5/8"	2
64		07014-002	LOCK WASHER- 5/16"	2
65		46270-500-37	LENS- AMBER JEWLED	2
66		46085-401-46	E-STOP- MUSHROOM BUTTON	1

ITEM	Ⓑ/Ⓐ	PART NO./PATTERN NO.	DESCRIPTION	REQ.	
1		09704-505-97	CONSOLE- TRACK	1	
2		04494-105-27	EMBLEM-TRACK	1	Ⓐ
3		09704-376-32	HARNESS-TRACK CONSOLE	1	
4		46061-525-22	CONTROLLER- TRACK STEERING	1	
5		46061-525-21	SENSOR- STEER	1	
6		04418-857	EMBLEM-CAL/RUN	1	
7		09704-416-50	POTMETER- SPEED	1	Ⓑ
8		09704-416-48	BRACKET-SWITCH MOUNT	1	
9		09704-411-29	CABLE-LH	1	
10		09704-411-30	CABLE-RH	1	
11		45865-002-41	GAUGE- OIL PRESSURE	1	
12		45865-003-16	GAUGE- OIL TEMP	1	
13		45865-003-17	GAUGE- WATER TEMP	1	
14		45915-012-08	GAUGE- FUEL LEVEL	1	
15		46225-001-24	METER- VOLTMETER 12VDC	1	
16		46225-010-17	METER- TACH/HOUR	1	
17			TERM. AB #1492-W4	60	
18		46260-501-03	JUMPER- SWITCH BLOCK	3	
19					
20		46200-009-06	SWITCH- TOGGLE 1TL1-2	5	
21		46200-009-08	SWITCH- TOGGLE 2TL1-1	1	
22		46200-009-11	SWITCH- TOGGLE 1TL1-6	4	
23		46200-009-18	SWITCH- TOGGLE 2TL;1-3	1	
24		46200-009-21	SWITCH- TOGGLE 2TL1-7	7	
25		46200-009-40	SWITCH- TOGGLE 2TL1-5	3	
26		46200-009-41	SWITCH- TOGGLE 2TL1-50	1	
27		46200-009-62	SWITCH- TOGGLE 4TL1-10D	1	
28		46200-009-63	SWITCH- TOGGLE 2TL1-1A	1	
29		46270-005-09	LIGHT KIT- METER	5	
30		46270-005-10	LIGHT KIT- 12VDC	1	
31	Ⓑ	46270-002-44	LAMP- 14VDC	4	
32	Ⓑ	46270-500-36	LENS- RED JEWELED	2	
33	Ⓑ	46061-500-62	SOCKET	4	
34		46010-001-29	ALARM- SIGNAL	1	
35		46010-600-09	EMBLEM- STEERING WHEEL	1	
36	Ⓐ	09704-502-98	WHEEL- STEERING	1	
37		45259-517-07	NUT- 7/8"	2	
38		46026-015-14	CONNECTOR-1 1/4" 90DEG.	2	
39		46195-001-04	LOCKNUT	2	
40		46075-500-05	KNOB- 1" DIA	1	
41		46325-002-43	RELAY- AUTOMOTIVE	1	
42		46955-001-43	DIODE- 600V 6A	4	
43		45890-100-06	SEAL NUT- 3/8"NEF X 32 28	1	
44		45890-100-29	NUT- 1/4" SELF RETAINING	2	
45		45890-800-31	EDGING - 1/16" -B-2-ALUM	4.7'	





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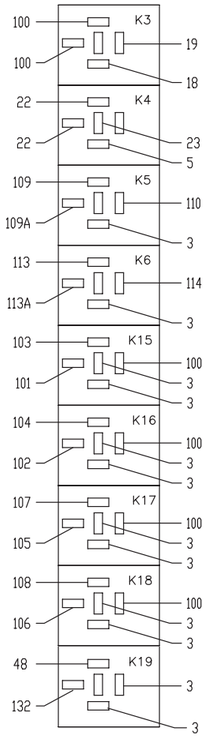
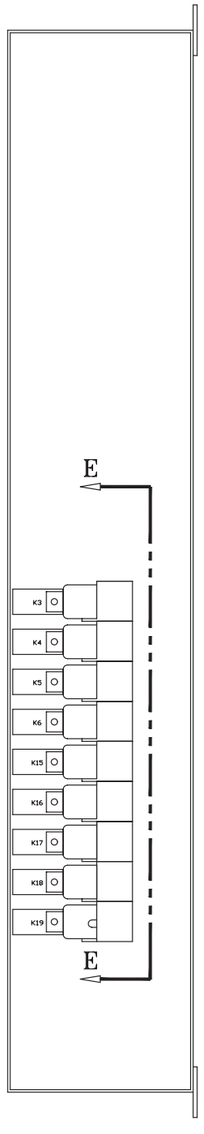
362 Paver
Electrical Schematic
9704-417-46b, 9704-417-47b, 9704-417-35d

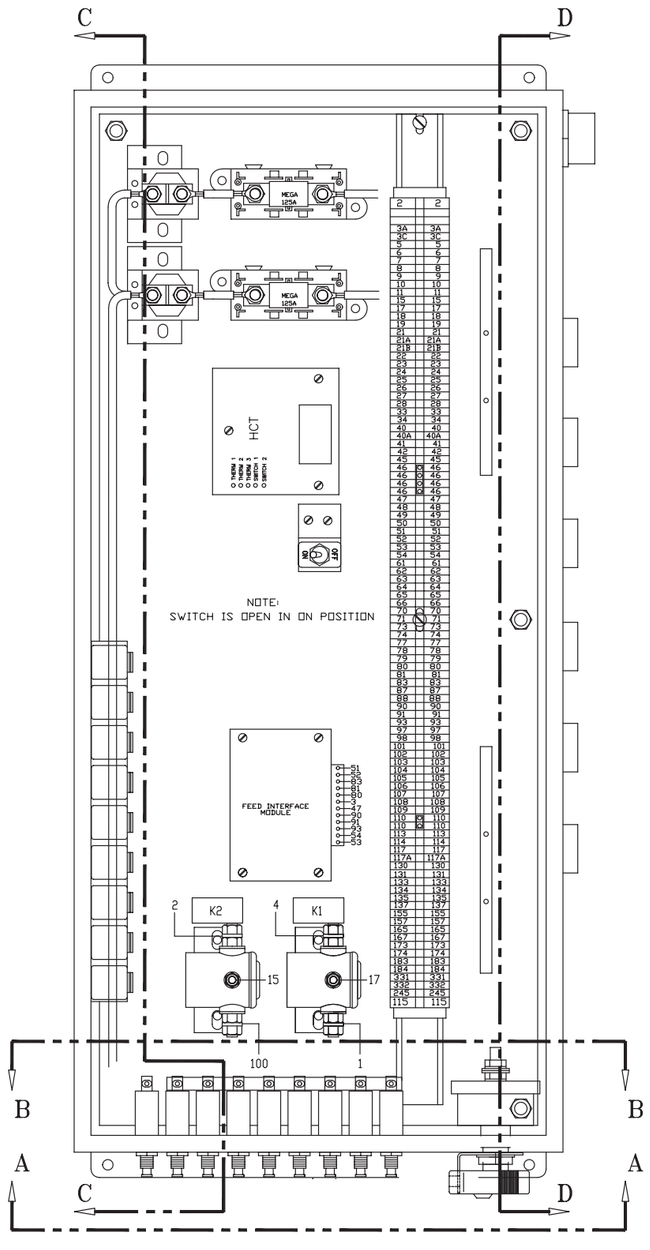
TEREX Cedarapids

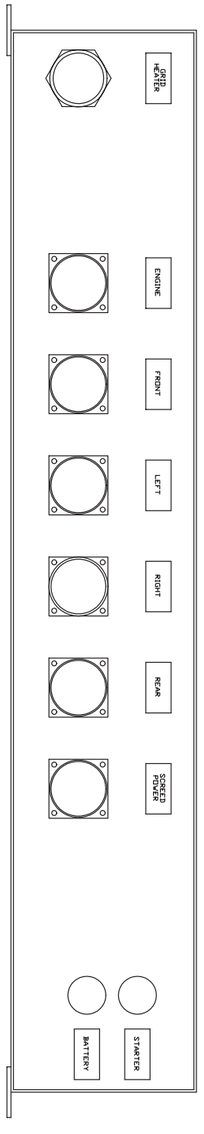


VIEW E-E

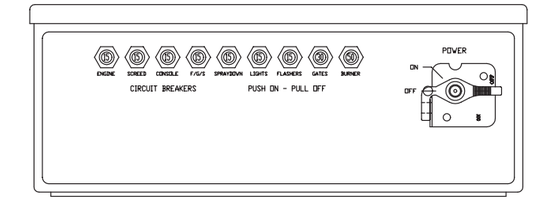


VIEW C-C

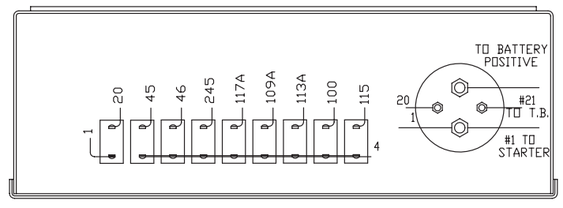




VIEW D-D



VIEW A-A



VIEW B-B

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362 Paver
Electrical Schematic
9704-417-46b, 9704-417-47b, 9704-417-35d

Hydraulic Schematics

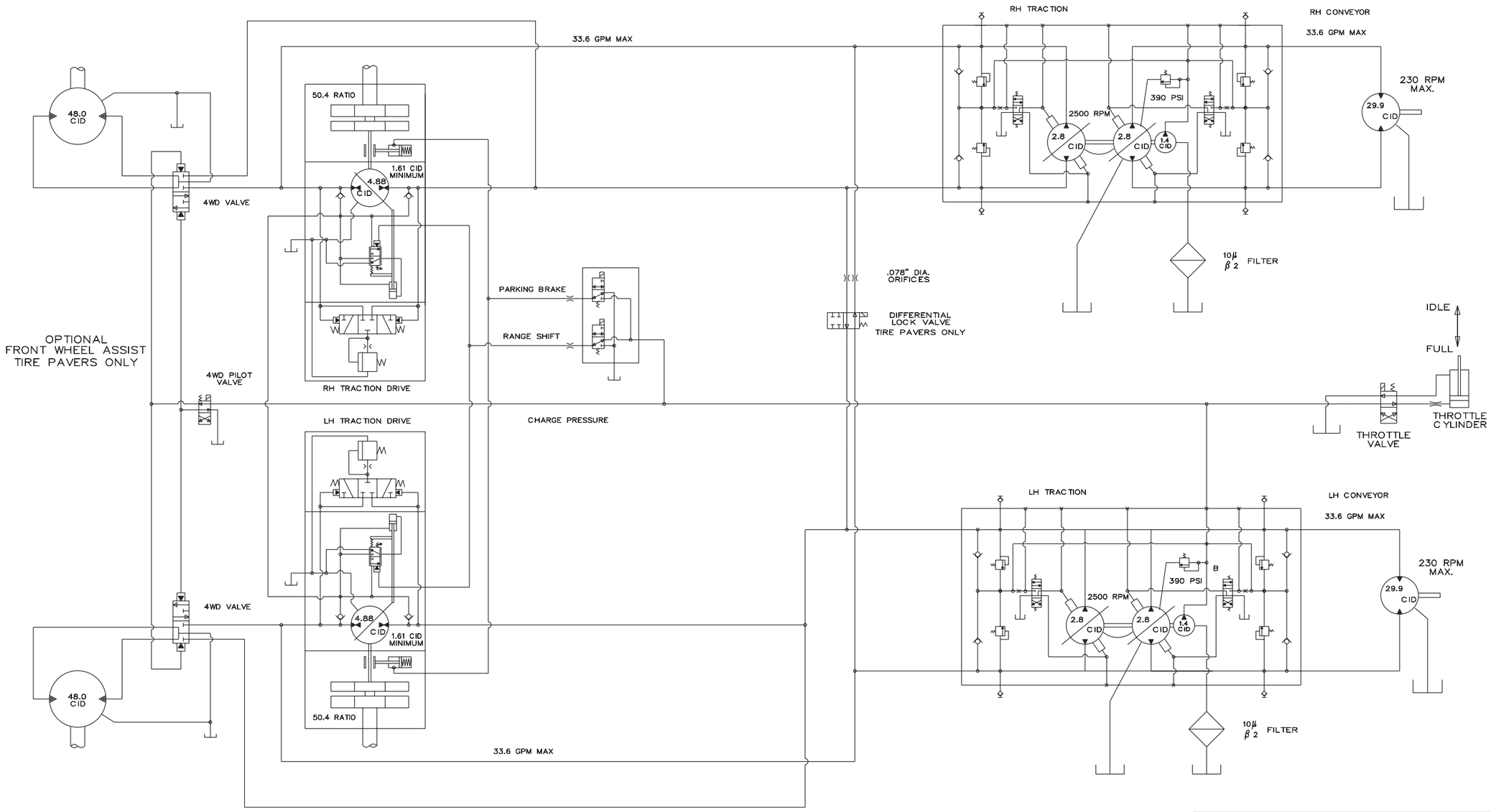
Appendix C - Hydraulic Schematics

Hydraulic Schematics

The following pages contain The hydraulic schematics for the various configurations of the 300 Series Pavers

Hydraulic Schematics

TEREX Cedarapids



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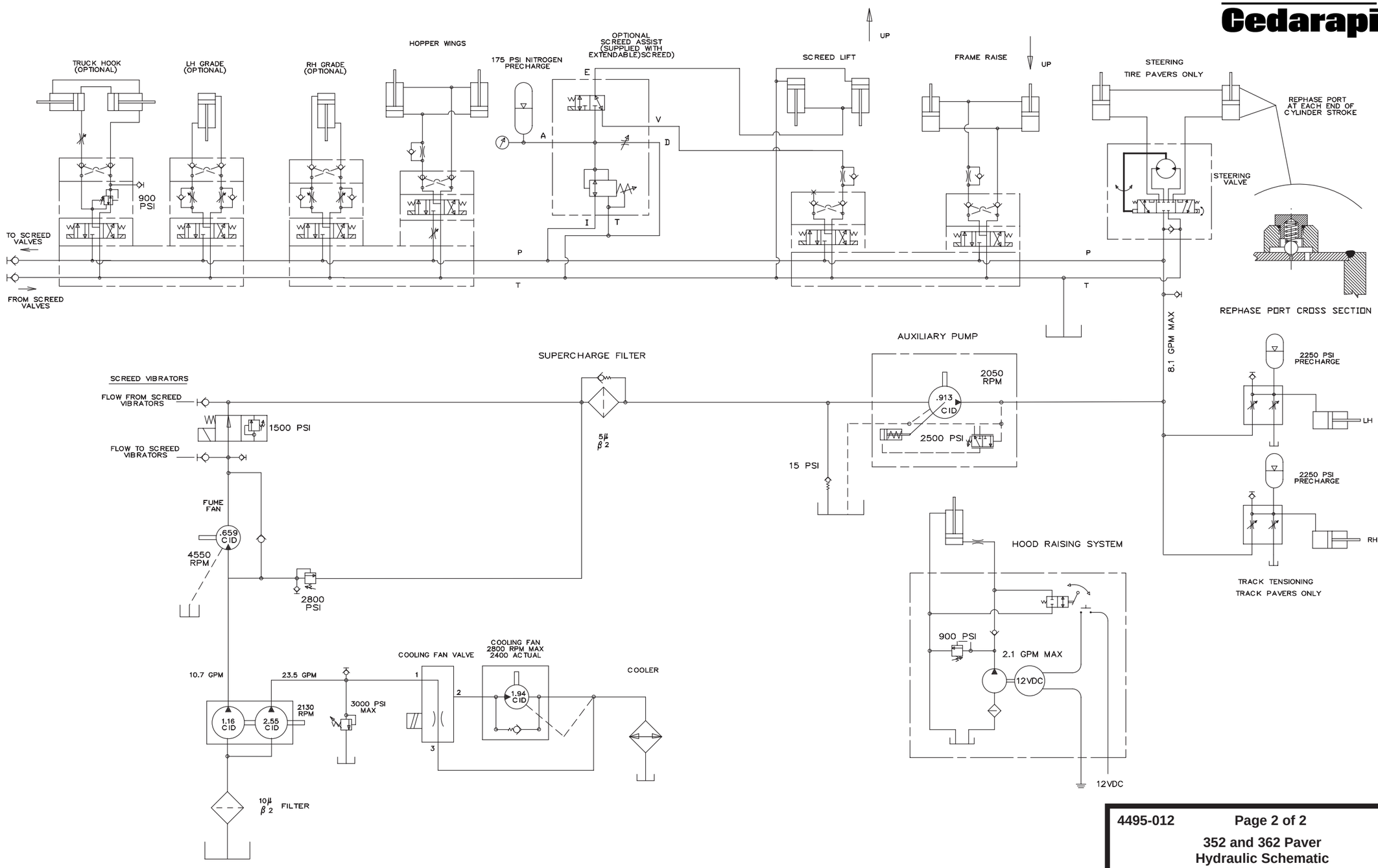
352 and 362 Paver
Hydraulic Schematic
9704-663-02

TERREX Cedarapids



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352 and 362 Paver
Hydraulic Schematic
9704-663-02