



9564TM

Horizontal Grinder

Manual 1: Operating Instructions





 **DURATECH[®]**
Clearing the Way for a Better Tomorrow



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Horizontal Grinder

Manual 1:

Operating Instructions

DuraTech Industries International Inc. (DuraTech) has made every effort to assure that this manual completely and accurately describes the operation and maintenance of the 9564TM Horizontal Grinders as of the date of publication. DuraTech reserves the right to make updates to the machine from time to time. Even in the event of such updates, you should still find this manual to be appropriate for the safe operation and maintenance of your unit.

This manual, as well as materials provided by component suppliers to DuraTech are all considered to be part of the information package. Every operator is required to read and understand these manuals, and they should be located within easy access for periodic review.

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Clearing the Way for a Better Tomorrow



FOREWORD



Foreword

All personnel must read and understand before operating unit

DuraTech Industries International Inc. (DuraTech Industries) has made every effort to assure that this manual completely and accurately describes the operation and maintenance of this Industrial Grinder as of the date of publication. DuraTech Industries reserves the right to make updates to the machine from time to time. Even in the event of such updates, you should still find this manual to be appropriate for the safe operation and maintenance of your machine.

This manual, as well as materials provided by component suppliers to DuraTech Industries are all considered to be part of the information package. Every operator is required to read and understand these manuals. All manuals should be located within easy access for troubleshooting and periodic review.

Appropriate use of the unit

This Horizontal Grinder is designed to grind wood waste and other materials, including: grass clippings, leaves, pallets, construction and demolition debris, tree branches and tree trunks.

It is **NOT** designed to grind rocks, steel, concrete, or the like.

Operator protection

As with all machinery, care needs to be taken by the operator in order to insure the safety of the operator and those in the surrounding area.



WARNING: Operators and those observing the operation of the Industrial Grinder are required to wear head, eye, and ear protection. No loose clothing is allowed.



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Horizontal Grinder

Manual 1:

Operating Instructions



Introduction

This Industrial Grinder is designed to grind wood waste and other materials, including grass clippings, leaves, pallets, construction and demolition debris, tree branches and tree trunks. It is **NOT** designed to grind rocks, steel, concrete, or the like.

Purpose

The purpose of this owner's manual is to explain maintenance requirements, safety, and routine adjustments for the most efficient operation of your 9564DuraTech Horizontal Grinder. There is also a trouble shooting section that may help in case of problems in the field. Any information not covered in this manual may be obtained from your dealer.



SPECIAL NOTE: When reference is made as to front, rear, left hand, or right hand of this machine, the reference is always made from standing at the rear end of the machine and looking toward the hitch. Always use serial number and model number when referring to parts or problems. Please obtain your serial number and write it below for your future reference.

MODEL: 9564 DuraTech Horizontal Grinder SERIAL NO.

How to use this manual

Manual organization

This manual is organized into the following parts:

- **Manual 1: Operating instructions** explain how to set up, use and maintain the 9564 DuraTech Horizontal Grinder.
- **Manual 2: Parts reference** contains diagrams of each assembly with the number of each part identified. A key on the facing page contains a description of the part and the quantity used.



Operator responsibilities

- The operator is responsible for his or her own safety.
- The operator is responsible for the safety of all others in the area.
- The operator is responsible for respecting the property of all in the vicinity of the area of work.
- Review "Dealer Responsibilities," to verify that the machine has been prepared for use.
- Note the important safety information in the Foreword and in Section 1, "Safety."
- Thoroughly review sections 1 through 3 which explain normal operation of the machine, and section 4 and 5 which explain maintenance requirements. These sections will function as a textbook during the dealer-conducted training course that is required before use of the unit.
- When all primary operators have read the operating instructions and understand all information concerning the safe operation of the unit, the dealer will be required to sign the User Training Verification Form found in the 9564 DURATECH HORIZONTAL GRINDER documentation packet.



NOTE: This form requires both the dealer's signature and the customer's signature. The dealer is responsible for returning the signed form to DuraTech Industries.

- Manuals for certain third-party components are provided separately. The operator must also be familiar with their contents.
- Keep copies of all manuals in a readily-accessible location for future reference.



Section 1: Safety

Thank you for taking the time to read the operation and maintenance manual for the DuraTech Industries 9564 DuraTech Horizontal Grinder. Because your safety and that of others is of the utmost importance, you should familiarize yourself with this entire manual before operating this unit.

The 9564 DURATECH HORIZONTAL GRINDER incorporates a number of third party products. For example, the engine, and fluid clutch are third party products. More information about the operation and care of these products can be found in each product's respective manual(s). Before operating this unit, you should familiarize yourself with these manuals as well.

Safety is an ongoing job requirement, and DuraTech Industries has made every effort to make sure that the 9564 DuraTech Horizontal Grinder provides operator security and comfort. DuraTech Industries encourages you to bring to our attention as quickly as possible any suggestions you may have concerning the safety of the equipment. DuraTech Industries is dedicated to enhancing the safety of the DuraTech Industries 9564 DuraTech Horizontal Grinder.

This unit is supplied with an operation and maintenance manual and this manual should be kept with the unit for periodic review by operational personnel.

Operators of the 9564 DURATECH HORIZONTAL GRINDER are recommended to wear head, eye, and ear protection as well as clothing appropriate for the application. Individuals with loose clothing, unrestrained long hair, jewelry, or other accessories which may hang loosely away from the body should not be allowed on or near the machine.



WARNING: FAILURE TO COMPLY WITH SAFETY INSTRUCTIONS THAT FOLLOW WITHIN THIS MANUAL COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH. BEFORE ATTEMPTING TO OPERATE THIS MACHINE, CAREFULLY READ ALL INSTRUCTIONS CONTAINED WITHIN THIS MANUAL.

THIS MACHINE IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THOSE EXPLAINED IN THE OPERATOR'S MANUAL, ADVERTISING LITERATURE OR OTHER DURATECH INDUSTRIES WRITTEN MATERIAL PERTAINING TO THE 9564 DURATECH HORIZONTAL GRINDER.

1.1 Safety-alert symbols

Decals are illustrated in **Manual 2: Parts Reference**.

The safety decals located on your machine contain important and useful information that will help you operate your equipment safely.

To assure that all decals remain in place and in good condition, follow the instructions below:

- Keep decals clean. Use soap and water - not mineral spirits, adhesive cleaners and other similar cleaners that will damage the decal.
- Replace all damaged or missing decals. When attaching decals, surface temperature of the machine must be at least 40° F (5° C). The surface must also be clean and dry.
- When replacing a machine component to which a decal is attached, be sure to also replace the decal.
- Replacement decals can be purchased from your DuraTech dealer.



DuraTech Industries uses industry accepted ANSI standards in labeling its products for safety and operational characteristics.



Safety-Alert Symbol

Read and recognize safety information. Be alert to the potential for personal injury when you see this safety-alert symbol.

DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.



DANGER:
Signal word - White Lettering/Red Background
Safety Alert Symbol - White Triangle/Red Exclamation Point

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.



WARNING:
Signal word - Black Lettering/Orange Background
Safety Alert Symbol - Black Triangle/Orange Exclamation Point

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.



CAUTION:
Signal word - Black Lettering/Yellow Background
Safety Alert Symbol - Black Triangle/Yellow Exclamation Point

This manual uses the symbols to the right to denote important safety instructions and information.

The **DANGER**, **WARNING** and **CAUTION** symbols are used to denote conditions as stated in the text above. Furthermore, the text dealing with these situations is surrounded by a box with a white background, will begin with **DANGER**, **WARNING**, or **CAUTION**.

The **INFORMATION** symbol is used to denote important information or notes in regards to maintenance and use of the machine. The text for this information is surrounded by a box with a light grey background, and will begin with either **IMPORTANT** or **NOTE**.





1.2 Operator - personal equipment

THE OPERATOR

Physical Condition

You must be in good physical condition and mental health and not under the influence of any substance (drugs, alcohol) which might impair vision, dexterity or judgment.

Do not operate a 9564 DURATECH HORIZONTAL GRINDER when you are fatigued. Be alert - If you get tired while operating your 9564 DURATECH HORIZONTAL GRINDER, take a break. Fatigue may result in loss of control. Working with any industrial equipment can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating

Proper Clothing



Clothing must be sturdy and snug-fitting, but allow complete freedom of movement. Avoid loosefitting jackets, scarfs, neckties, jewelry, flared or cuffed pants, unconfined long hair or anything that could become entangled with the machine.



Protect your hands with gloves when handling parts. Heavyduty, nonslip gloves improve your grip and protect your hands.



Good footing is very important. Wear sturdy boots with nonslip soles. Steel-toed safety boots are recommended.



To reduce the risk of injury your head never operate a 9564 DURATECH HORIZONTAL GRINDER unless wearing a hard hat.



To reduce the risk of injury to your eyes never operate a 9564 DURATECH HORIZONTAL GRINDER unless wearing goggles or properly fitted safety glasses with adequate top and side protection.




Noise may damage your hearing. Always wear sound barriers (ear protection) to protect your hearing. Continual and regular users should have their hearing checked regularly.



1.3 Machine safety labels


The safety decals located on your machine contain important information that will help you operate your equipment. Become familiar with the decals and their locations.

 **DANGER: ELECTROCUTION HAZARD**

TO PREVENT SERIOUS INJURY OR DEATH FROM ELECTROCUTION:
STAY AWAY FROM POWER LINES WHEN OPERATING BOOM LOADER, FOLDING AND RAISING CONVEYOR, AND TRANSPORTING ON ROADS.
THIS MACHINE IS NOT GROUNDED, ELECTROCUTION MAY OCCUR WITHOUT DIRECT CONTACT.

	⚠ DANGER ELECTROCUTION HAZARD	⚠ PELIGRO PELIGRO DE ELECTROCUCIÓN
	<small>To prevent serious injury or death from electrocution: Stay away from power lines when operating boom loader, folding and raising conveyor, and transporting on roads. This machine is not grounded, electrocution may occur without direct contact.</small>	<small>Para evitar lesiones graves o la muerte por electrocución: Manténgase alejado de las líneas de electricidad al operar el cargador con brazo de izado, las cintas transportadoras de plegado e izado y el transporte por caminos. Esta máquina no tiene conexión a tierra y puede producirse la electrocución sin contacto directo.</small>

6500216


 **DANGER: ROTATING PARTS WITHIN CAN KILL OR DISMEMBER. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING, UNLOADING, OR INSPECTING MACHINE.**

⚠ DANGER

ROTATING PARTS WITHIN CAN KILL OR DISMEMBER
WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING, UNLOADING OR INSPECTING MACHINE

6500082

6500082

 **DANGER: THROWN OBJECT HAZARD**
KEEP AWAY

- TO PREVENT SERIOUS INJURY OR DEATH THROWN OBJECT:
- STAY AWAY FROM DISCHARGE AREA DURING OPERATION. KEEP OTHERS AWAY.
- DO NOT POINT DISCHARGE TOWARD PEOPLE, ANIMALS OR PROPERTY.

⚠ DANGER




THROWN OBJECT HAZARD
KEEP AWAY

- To prevent serious injury or death from thrown object:
- Stay away from discharge area during operation. Keep others away.
- Do not point discharge toward people, animals or property.

6500221

6500221


 **WARNING: FOR YOUR PROTECTION KEEP ALL SHIELDS IN PLACE AND SECURED WHILE MACHINE IS OPERATING. MOVING PARTS WITHIN CAN CAUSE SEVERE PERSONAL INJURY.**

⚠ WARNING **⚠ ADVERTENCIA**

FOR YOUR PROTECTION KEEP ALL SHIELDS IN PLACE AND SECURED WHILE MACHINE IS OPERATING. MOVING PARTS WITHIN CAN CAUSE SEVERE PERSONAL INJURY.

PARA ASEGURAR SU PROTECCION, MANTENGA TODOS LOS PROTECTORES EN SU LUGAR Y ASEGURADOS MIENTRAS LA MAQUINA ESTE OPERANDO. LAS PIEZAS MOVILES INTERNAS PUEDEN CAUSAR LESIONES PERSONALES GRAVES.

6500040

 **WARNING: CHECK FOR FIRES, CLEAN OFF DEBRIS, SWITCH OFF BATTERY**

NEVER LEAVE THIS MACHINE UNATTENDED UNTIL ALL POTENTIAL FIRE DEBRIS IS REMOVED, NO FIRE OR SMOLDERING EXISTS, AND THE BATTERY IS SWITCHED OFF. REMOVE ALL FLAMMABLE DEBRIS FROM ENGINE, SHIELDING, CONTROL PANEL, UNDER MACHINE AND ANYWHERE MATERIAL IS COLLECTED.

DURATECH INDUSTRIES IS NOT RESPONSIBLE FOR FIRES CAUSED BY HAZARDS LEFT TO SMOLDER OR BURN, OR IMPROPER SHUTDOWN PROCEDURES.

⚠ WARNING



CHECK FOR FIRES, CLEAN OFF DEBRIS, SWITCH OFF BATTERY

NEVER leave this machine unattended until all potential fire debris is removed, no fire or smoldering exists, and battery is switched off. Remove all flammable debris from engine, shielding, control panel, under machine and anywhere material is collected.

DURATECH INDUSTRIES IS NOT RESPONSIBLE FOR FIRES CAUSED BY HAZARDS LEFT TO SMOLDER AND BURN, OR IMPROPER SHUTDOWN PROCEDURES.

6500425

6500425



WARNING: NO RIDERS
SERIOUS INJURY COULD RESULT FROM RIDING ON THE MACHINE.

OTHERS, READ AND UNDERSTAND OPERATORS MANUAL BEFORE OPERATING MACHINE.

1. READ AND UNDERSTAND OPERATORS MANUAL BEFORE OPERATING MACHINE.

2. PLACE ALL CONTROLS IN NEUTRAL, STOP ENGINE, REMOVE IGNITION KEY, LOCK OUT POWER SOURCE, AND WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING, ADJUSTING, REPAIRING, OR UNPLUGGING.



3. READ AND UNDERSTAND ALL DECALS ON MACHINE FOR YOUR SAFETY.

4. KEEP ALL SHIELDS IN PLACE WHILE MACHINE IS IN OPERATION.

5. KEEP HANDS, FEET, HAIR, AND CLOTHING AWAY FROM MOVING PARTS.

6. KEEP OTHERS AWAY FROM MACHINE WHILE IN OPERATION.

7. INSTALL SAFETY LOCKS BEFORE TRANSPORTING, OR WORKING BENEATH COMPONENTS.

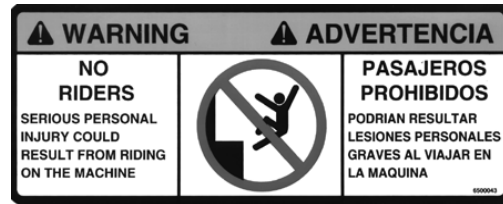
8. DO NOT ALLOW RIDERS AT ANY TIME.

9. DO NOT LEAVE MACHINE UNATTENDED WHILE ENGINE IS RUNNING.

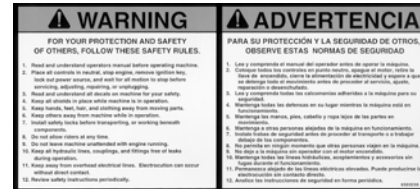
10. KEEP ALL HYDRAULIC LINES, COUPLINGS, AND FITTINGS FREE OF LEAKS DURING OPERATION.

11. KEEP AWAY FROM OVERHEAD ELECTRICAL LINES. ELECTROCUTION CAN OCCUR WITHOUT DIRECT CONTACT.

12. REVIEW SAFETY INSTRUCTIONS PERIODICALLY.




6500043



6500208



 **WARNING: TO PREVENT SERIOUS INJURY OR DEATH:**

DO NOT WALK UNDER CONVEYOR AT ANY TIME. STAY CLEAR OF CONVEYOR DURING OPERATION, RAISING, AND LOWERING. LOWER CONVEYOR FULLY BEFORE SERVICING.

KEEP OTHERS AWAY.


	WARNING	ADVERTENCIA
	OVERHEAD CONVEYOR HAZARD	PELIGRO DE CINTA TRANSPORTADORA ELEVADA
	To prevent serious injury or death: Do not walk under conveyor at any time. Stay clear of conveyor during operation, raising, and lowering. Lower conveyor fully before servicing. Keep others away.	Para evitar lesiones graves o la muerte: No camine por debajo de la cinta transportadora en ningún momento. Manténgase alejado de la cinta transportadora durante el funcionamiento, el ascenso y el descenso. Baje completamente la cinta transportadora antes de proceder al servicio. Manténgase alejado a otras personas.

6500118

 **WARNING: WAIT FOR ALL MOVEMENT TO STOP. FAILURE TO USE CAUTION COULD RESULT IN SERIOUS INJURY OR DEATH.**

WARNING	ADVERTENCIA
WAIT FOR ALL MOVEMENT TO STOP	ESPERE A QUE CESE TODO EL MOVIMIENTO
FAILURE TO USE CAUTION COULD RESULT IN SERIOUS INJURY OR DEATH	EL NO EJERCER PRECAUCION PODRIA RESULTAR EN LESIONES GRAVES O LA MUERTE

6500110

 **WARNING: HIGH-PRESSURE FLUID HAZARD, TO PREVENT SERIOUS INJURY OR DEATH:**

- RELIEVE PRESSURE ON SYSTEM BEFORE REPAIRING OR ADJUSTING OR DISCONNECTING.
- WEAR PROPER HAND AND EYE PROTECTION WHEN SEARCHING FOR LEAKS. USE WOOD OR CARDBOARD INSTEAD OF HANDS.
- KEEP ALL COMPONENTS IN GOOD REPAIR.


WARNING	
	
HIGH-PRESSURE FLUID HAZARD	
To prevent serious injury or death:	
<ul style="list-style-type: none"> Relieve pressure on system before repairing or adjusting or disconnecting. Wear proper hand and eye protection when searching for leaks. Use wood or cardboard instead of hands. Keep all components in good repair. 	

6500220

 **WARNING: PINCH POINT STAY BACK.**

	WARNING
	PINCH POINT STAY BACK

6500339

 **CAUTION: KEEP ENGINE COMPARTMENT CLEAN.**

CAUTION
KEEP ENGINE COMPARTMENT CLEAN

6500315



1.4 Shielding

This Horizontal Grinder is equipped with heavy-duty shielding at major points of potential injury. All Shields should be kept in place during operation. Bodily injury may occur if the unit is operated without shields.



WARNING: Shields are installed for your protection and to keep material off machine parts. Do not operate this Horizontal Grinder without shields in place.

1.5 Horizontal Grinder safety review



WARNING: Before attempting to operate your Horizontal Grinder, carefully read and follow instructions given below and contained elsewhere in this manual.

Each and every aspect of the **DuraTech Industries 9564 DuraTech Horizontal Grinder** should be reviewed by each operator on a frequent basis. Safety systems are in place that result in direct operator security.

- Keep all foreign objects such as rocks, pieces of metal and other incompressibles out of the hopper and away from the mill. Foreign objects may result in personnel injury or damage to the machine. A foreign object is any object which the unit is not designed to grind.
- Allow only responsible, properly instructed and certified individuals to operate machines. Carefully supervise trainee operators.
- **Never operate the unit without all safety features, including shields, in place and in operating condition.**
- Make no modifications to this equipment unless specifically requested or recommended by DuraTech Industries.
- Tighten or replace any loose or cracked bolts, chains, hoses or connections.
- Check overhead for electrical power lines or other obstructions and be certain there is adequate clearance.
- Allow no one on the Horizontal Grinder at any time during operation.
- Unauthorized personnel should stay out of the grinding area.
- Always perform the pre-operation inspection before operating this machine.
- Ensure rotor is at a complete stop, engine is shut down, and the ignition key is removed before any performing any maintenance.
- **Never grab rope, cable, twine or similar material hanging out of hopper while the horizontal grinder is running.**
- **Never enter the conveyor pivot area when the engine is running.**

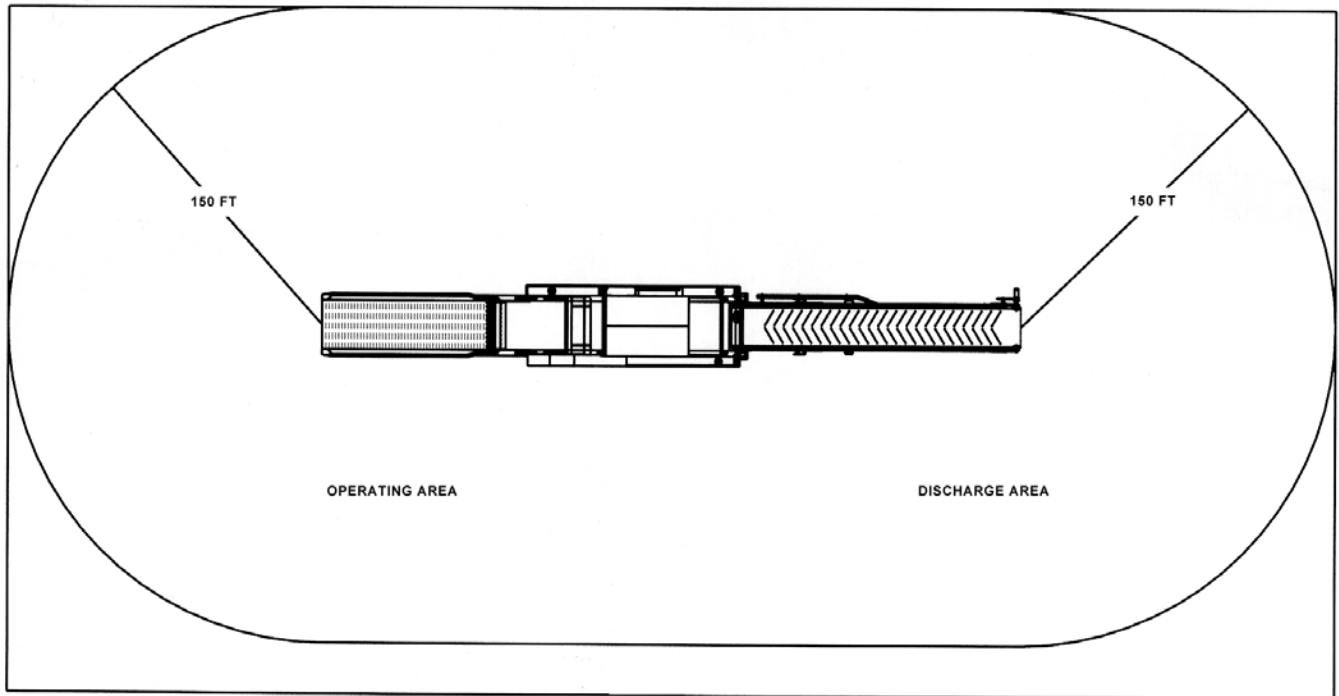


WARNING: Loose clothing, necklaces and similar items are easily caught in moving parts. Avoid the use of these items if possible. Keep long hair confined. Keep hands, feet and clothing away from power driven parts.



1.6 Thrown objects and operator safety

An operational characteristic of all grinders is that objects may be thrown out of the hopper. Thrown objects may present a safety hazard to persons in the area. This section is to inform the operator of this characteristic, and what can be done to reduce the risk of injury to the operator and persons in the area. Keep all observers away from the machine.



WARNING: To minimize the potential risk of injury or property damage, the operator must:

- a) Place the front of the machine towards open areas, away from property and people.
- b) Load the grinder from the side, not the front, with a loader equipped with an enclosed cab.
- c) Keep observers and unauthorized personnel out of the area.
- d) Wear a hard hat, safety glasses, and ear protection at a minimum, and require that any other persons in the area are similarly equipped.
- e) Keep the front table raised when grinding except when long materials prevent it.



1.7 Service and maintenance



CAUTION: The stored up energy in the rotor causes it to rotate long after the clutch has been disengaged. Before performing any maintenance on the machine or getting into the hopper, be sure rotor and all moving parts have come to a complete stop. Shut off engine and remove the key.

Before working on or near the Horizontal Grinder for any reason such as servicing, inspecting or unclogging the machine:

- Follow the normal shutdown procedure found on page 25 of this manual.
- If the unit is still attached to a towing vehicle, place the towing vehicle's transmission in park and set the parking/emergency brake.
- Relieve all pressure in the hydraulic system before disconnecting hydraulic lines or performing work on the system. Make sure all connections are tight and the hoses and lines are in good condition before applying pressure to the system.

When replacing any part on your Horizontal Grinder, be sure to use only DuraTech Industries authorized parts.



WARNING: Hydraulic fluid escaping under pressure can be invisible and have enough force to penetrate the skin. When searching for a suspected leak, use a piece of wood or a cardboard rather than your hands. If injured, seek medical attention immediately to prevent serious infection or reaction.

1.8 Personal protection equipment

Operators and authorized observers of the Horizontal Grinder are recommended to wear head, eye, and ear protection. No loose clothing is allowed.

1.9 Fire Prevention

Grinding with a horizontal grinder produces a large amount of potentially combustible material. The risks of fire can be significantly reduced with proper operating and maintenance procedures. This does include frequent removal of dust, debris, and other combustible materials.



If grinding dry material have a water source available to suppress a fire. If grinding extremely dry materials, wet them down to suppress dust and prevent fires.

Most of the products that are ground are dry and the grinding process can produce fine, dusty material. The grinding process can produce heat and the spinning rotor will circulate air within the grinding chamber. For a fire to start, fuel, oxygen and heat in sufficient quantity, must be present. During normal operation and with a properly maintained horizontal grinder, the material being ground will move through the grinding chamber so quickly that it doesn't have a chance to heat up sufficiently to start a fire. Also, the rapid rate that a horizontal grinder can pile material will quickly smother small hot spots that might occur during normal grinding operations. Keeping the material moving through the machine and across the top of the rotor is important to keep frictional heating of the material to a minimum.



NEVER leave the vicinity of the unit with the engine running.

PROPER OPERATION OF THE HORIZONTAL GRINDER:

- Do not grind materials any finer than necessary. Finely ground materials will produce more dust and increase the risk of fire. If finely ground materials are required, it is better to grind the materials coarse first with large opening screens installed in the grinder and then regrind them to the desired consistency by installing smaller opening screens in the grinder. Be especially cautious when grinding materials that can burn easily.
- Do not smoke when working with combustible materials.

REMOVAL AND CLEANING INSTRUCTIONS:

- Clean the engine compartment daily or more often if conditions require it be done more frequently. When cleaning the engine compartment, always clean the top of the engine and the areas around exhaust manifolds, exhaust plumbing and turbochargers.
- Check the rotor box for debris built up around the rotor. Remove material that may be packed tight near the bearings, on shaft or other rotating components because it will become hot due to friction.
- At shutdown, always clean and remove all dust, debris, or combustible material off the entire grinder. Use high-pressure air or water if necessary. Always move the grinder and all other equipment away from the ground material pile before leaving the job site in case of smoldering combustion in the ground material.

GRINDER MAINTENANCE:

- Repair any fuel or hydraulic leaks as quickly as they are discovered. Clean up spills immediately. Fuel or oil soaked materials can contribute significantly to the rapid spreading of a fire once it has begun.
- Inspect all electrical wiring periodically. Any chafed or damaged wires should be repaired immediately. Keep all electrical connections tight to prevent arcs or sparks.
- Contact between the rotor and any stationary component of the grinding chamber such as contact between the hammers and the screens must be corrected immediately.



1.10 Fire Extinguishers

Fire extinguishers are provided on these DuraTech grinders in the unlikely event that a fire does start on the grinder. An extinguisher is located on both sides of the machine near the rear of the machine. The extinguishers are ABC dry chemical extinguishers that are appropriate for use with all materials normally encountered on a horizontal grinder.

If a fire does start, **CALL THE LOCAL FIRE DEPARTMENT IMMEDIATELY.** Then, use the fire extinguisher if you feel confident that you can extinguish the fire. A 10# extinguisher will last about 15-20 seconds and a 20# extinguisher will last about 20-24 seconds, so they will not stop a large fire.



When using a fire extinguisher, use the P A S S method:

- Approach the fire with the wind at your back.
- **Pull the pin,**
- **Aim the spout,**
- **Squeeze the trigger, and**
- **Sweep along the base of the fire from about 6-8 feet away.**



fire extinguisher location


Read the label on your extinguisher now, most extinguishers have descriptions of this method, and an estimated working time.

If an extinguisher is only partially used, the dry chemical will jam in the seals, allowing the extinguisher to lose its pressure charge in less than an hour, making it useless to you. It must be recharged before placing it back on the machine. Have the extinguisher recharged today; a fire will not wait for you to recharge your extinguisher tomorrow!

Fire extinguishers should be inspected and recharged by a professional at least annually to keep them at optimum performance! A “verification of service” collar that confirms the month and year of service should be attached to the neck of the container to confirm when the extinguisher was last serviced.


1.11 Important safety reminders

Always follow basic safety precautions when using this unit to reduce the risk of injury.



IMPORTANT: NEVER perform maintenance in the hopper, under the machine, on the conveyor, or other moving part of the machine without first shutting off the engine and removing the key.

Unauthorized personnel should stay out of the grinding area. Flying debris can injure inattentive personnel.



IMPORTANT: NEVER climb on the machine, crawl under the machine, or enter the hopper when the engine is running or the machine is in operation.

1.12 Towing

Check all lights, brakes and hitch connections before towing. Check your state laws regarding the use of lights, safety chains, moving wide loads on public roads, and other possible requirements.

Use caution when traveling on public roads, rough or winding roads, or steep terrain.

See Section 3.23 for more information about preparing the unit for transport.



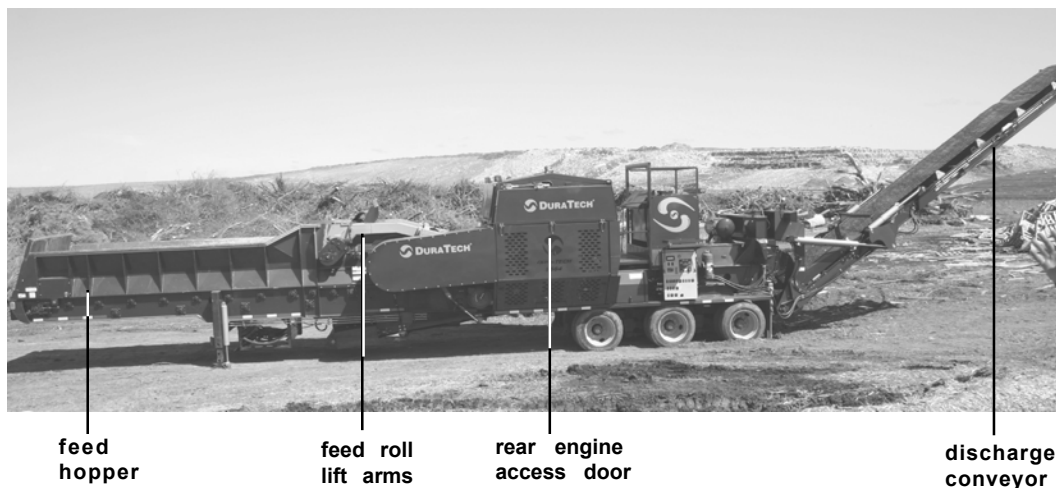
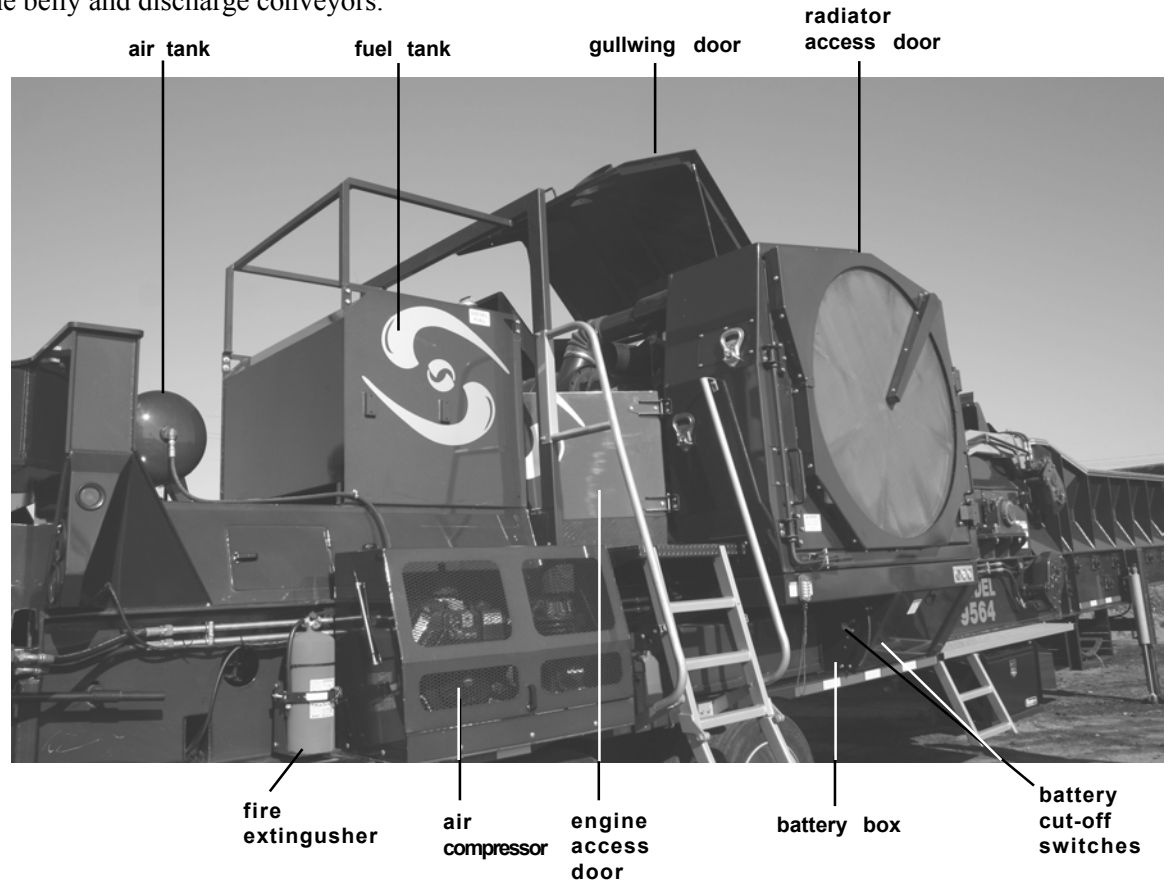
Section 2: Introduction

2.1 Description of the 9564 DuraTech Horizontal Grinders

The Horizontal Grinder is designed to grind wood waste, green waste, construction and demolition debris, tree branches and trunks, compostables and mulch. The unit incorporates a number of basic features including the engine, electronic engine controls, feed floor, the PLC, the rotor and hammer assemblies, the feed wheel, as well as the belly and discharge conveyors assemblies.

Material is fed into the hopper of the unit by appropriate means, such as a wheel loader. As the feed floor and feed wheel rotate, the material is exposed to the rotating hammers. The hammers then grind the material before the material is discharged by the belly and discharge conveyors.

figures 2.1 & 2.2
major system
components





2.2 Control panel

The control panel is located on the left hand side of the engine. Controls on the control panel include; engine start, emergency kill switch, throttle, conveyor on/off, conveyor positioning, rotor engage button, rotor disengage button, feed floor and feed roll speed/direction, table position, roller position, jack position, radio selector, and screen position. The control panel has a Cat control panel which monitors the engine. There is also a fuel gauge.

figure 2.3
Cat control panel
(Cat panel tier III)

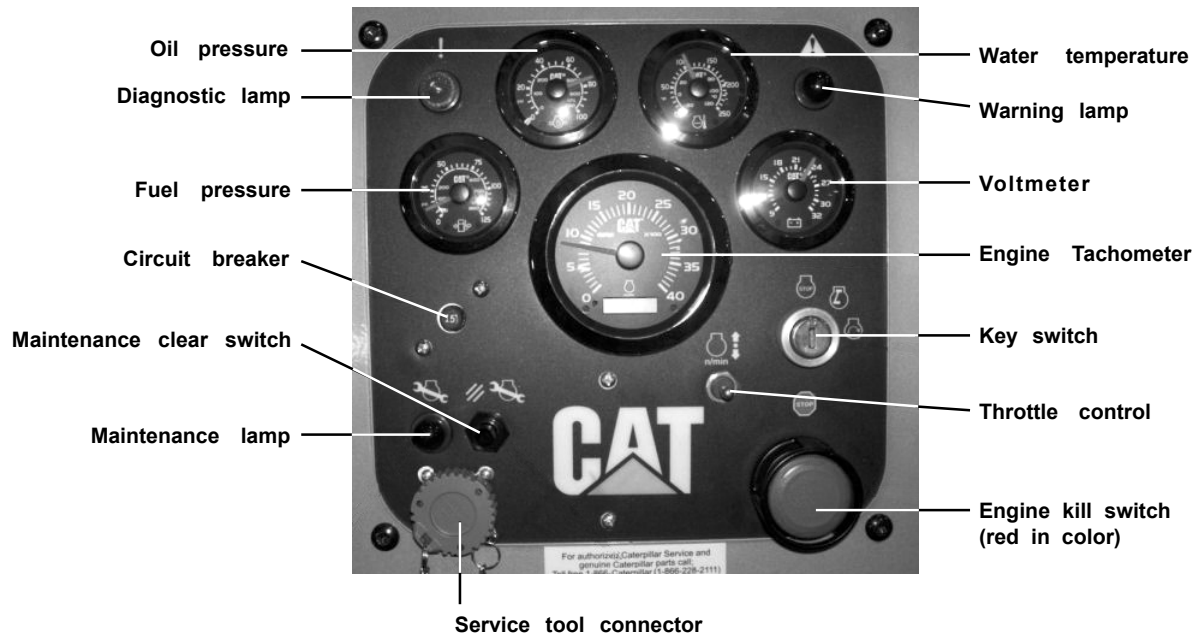




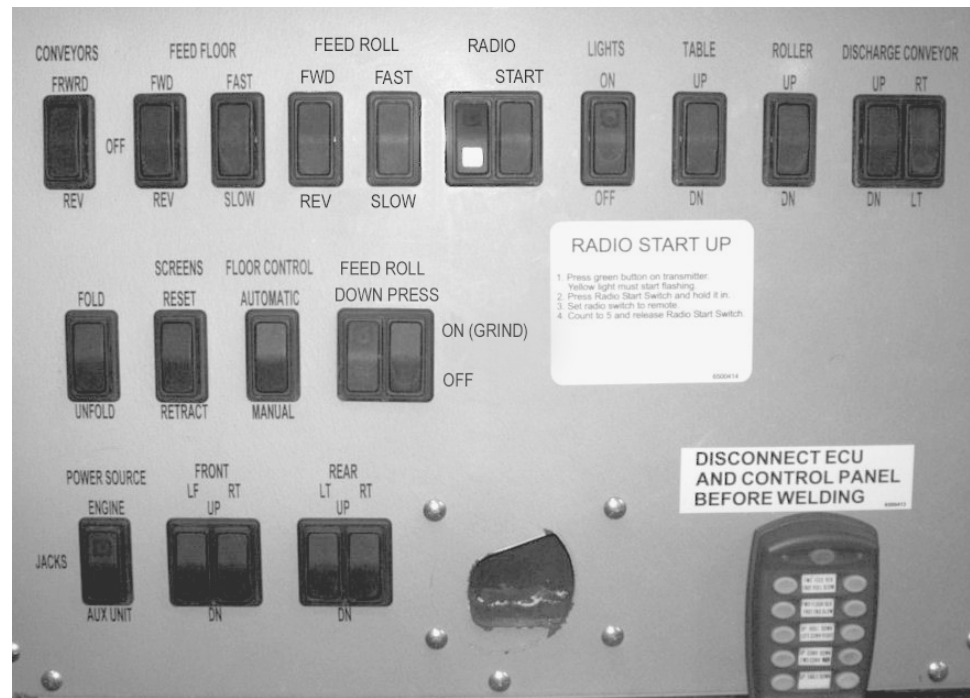
figure 2.4
control panel
(Cat panel tier II)

feed control
display
screen and
input
switches

HPTO clutch
controller

fuel gauge

Cat panel





2.3 Feed Control

The Feed Control regulates the speed at which the floor + wheel rotate. The feed control has two modes of operation, the Auto Mode and the Manual Mode. The Auto Mode is the mode of operation which is used while grinding. The Manual Mode is used only when the rotor is not turning (maintenance).



IMPORTANT: Except when performing maintenance or doing a cold weather start up always use the Auto Mode of the feed control.

Floor Control Auto Mode

When the feed control is switched to the Auto Mode, it is monitoring the rotation speed of the engine. The hydraulic flow to the feed floor drive mechanism is regulated proportionally to the engine speed. When the engine begins to lug down, the hydraulic oil flow is reduced which in turn slows down the floor. With proper calibration, the engine will only lug down to its optimum horsepower RPM and the floor speed will be varied proportionally to keep the engine at this RPM. The result is a nearly constant load on the engine, which will maximize grinding efficiency.

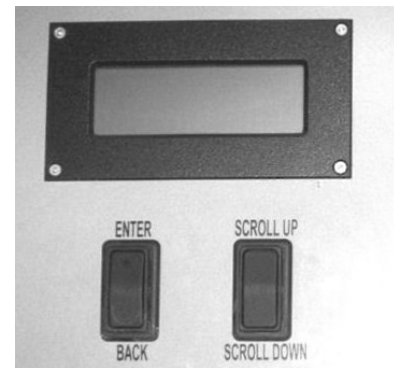


figure 2.5 feed control display screen

Floor Control Manual Mode

In this mode the feed floor and feed wheel run independent of the engine speed. This mode cannot be used for grinding and is intended for maintenance or cold weather start up use only. The floor control mode will default to Auto as soon as the clutch is engaged.



2.4 Wet clutch

The HPTO Hydraulic Power Take-off is a totally enclosed wet hydraulic clutch that requires no adjustment throughout its wear life. During a torque spike, the wet clutch will act as a torque limiter by slipping to absorb the shock load.

The controller contains the preprogrammed settings for how the HPTO will function during startup. The “Power” LED will illuminate when power is received from the ignition switch.

The “Input Speed” LED illuminates when the engine is spinning.

To engage the wet clutch, set engine speed below 1100 RPM, and press the Clutch Start Button for 3 seconds (the blue beacon light should be flashing during this time). When the “Clutch Engaged” symbol illuminates, the start button can be released. The controller will slowly engage the wet clutch while bringing the rotor up to speed.

If the engine speed is above 1100 RPM, the “RPM Too High” symbol will illuminate, and the wet clutch will not engage. Reduce engine speed below 1100 rpm and try again.

To disengage the wet clutch, press the Clutch Start Button. If engine speed is above 1200 RPM, the “RPM Too High” symbol will illuminate. Reduce engine speed below 1200 RPM and try again.

The controller will allow 3 failed starts in a row. After the third failed attempt, the “Timed Lockout” symbol will illuminate, and the wet clutch will not engage for 5 minutes. The engine must remain running for the controller to count down the 5 minutes.

The blue beacon light will flash during startup, and during some fault conditions. If the oil gets too hot, the light will flash, the “Oil Temperature” symbol will illuminate, but the wet clutch will stay engaged. The operator must disengage the wet clutch, and allow the system to cool off. With a plugged oil filter, the “Filter Clogged” symbol will illuminate. The operator must disengage the wet clutch, shut the engine off, and change the filter (4400073). The clutch will automatically disengage after 5 minutes if the operator does not disengage the clutch.

The wet clutch will disengage when there is an oil pressure fault, or when the engine speed signal is lost.

2.5 Remote control option

The optional radio remote control unit allows the operator to:

- Start/stop, and reverse the feed roll and feed floor direction.
- Increase/decrease the feed roll speed.
- Increase/decrease engine speed.
- Raise/lower the feed roll, discharge conveyor, and front table.
- Swing the discharge conveyor left to right.
- Start/stop the conveyors.
- E-stop to shut the engine off.



NOTE: See also section 3.18, “Operating the grinder using the remote radio option.”



2.6 The conveyor system

The conveyor system on the 9564 DURATECH HORIZONTAL GRINDER consists of a belly conveyor and a discharge conveyor. The belly conveyor transfers the ground material from the rotor to the discharge conveyor. The discharge conveyor then moves the material away from the unit. The conveyors are run by two hydraulic orbit motors which are turned on and off with one control switch. This switch is located at the control panel. Both conveyors travel forward, while only the belly conveyor reverses. The discharge conveyor can be raised or lowered from the control panel. The discharge conveyor can also be swung left or right using the controls on the control panel. The discharge conveyor can also be folded for transport from the conveyor controls located on the control panel.

2.7 Hydraulic cooler

The hydraulic system has a radiator to disperse excess heat. It is mounted alongside the engine radiator, and can be accessed via the radiator access panel.

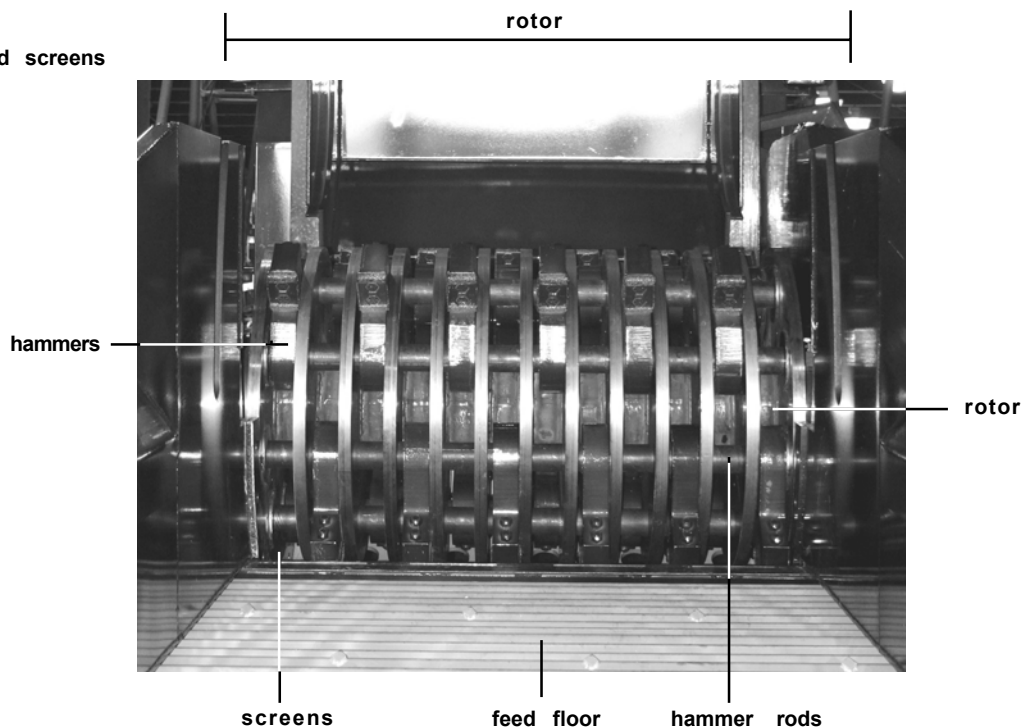
2.8 Wet clutch cooler

The hydraulic clutch system has a radiator to dissipate excess heat. It is mounted alongside the engine radiator, and can be accessed via the radiator access panel.

2.9 Rotor

The rotor is the heart of the grinder. The standard rotor contains fixed hammers and is used for general grinding.

figure 2.6
driveline, rotor, and screens





2.10 Screens

All DuraTech Industries Horizontal Grinders come equipped from the factory with two screens. The diameter of the screens are specified by the customer at the time of purchase.

Any combination of hole sizes may be used to alter the coarseness of the output material. The coarseness of the ground material is determined by the size of the screen holes. As the size of the screen holes becomes larger, the coarseness of the ground material increases.

Round perforated screens are available with 2", 3", & 4" round hole, and 4" x 7" and 6" x 9" demolition screens. All screens are 1" thick steel.

Note: If a combination of screens with different hole diameters are used, the screen with the smallest hole diameter is normally placed on the down swing side of rotor.

2.11 Feed Floor and Feed Wheel

Material to be ground is loaded into the hopper using a wheel loader, or other suitable method. As the floor + wheel rotate, this material is fed to the rotor. The faster the floor + wheel rotates, the more material is exposed to the rotor, and the greater the load on the engine. The speed is controlled by the feed control.

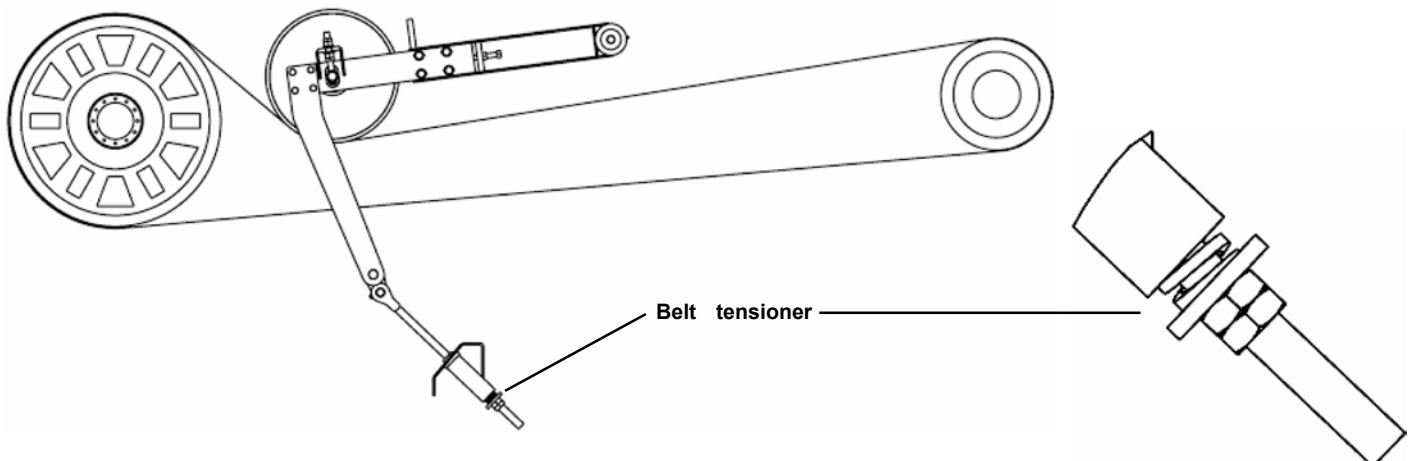
2.12 Front table

The 9564 DURATECH HORIZONTAL GRINDER has a folding front table which folds down to extend the bed length for longer materials, and folds up to decrease the threat of thrown objects.

2.13 Belt Drive and Belt Tensioner

The DuraTech 9564 Horizontal Grinder utilizes two 5 band 8V belts to transfer power from the engine to the rotor. These belts are tightened by a belt tensioner which utilizes a spring to maintain tension.

figure 2.7
belt tensioner





2.14 Battery disconnect switch

The battery disconnect switch is used to connect and disconnect the main battery cable to the machine. When the machine is not in use, it should be disconnected.

figure 2.8
battery disconnect switch



battery disconnect switch



Section 3: Operation

3.1 Pre-operation inspection

Read and have a thorough understanding of the operator's manual, especially the sections pertaining to machine operation and safety. Also make sure that anyone who will assist you in the operation or maintenance of this machine understands how the machine operates.

Before operating the 9564 DURATECH HORIZONTAL GRINDER, perform an inspection that includes the following items. As each task is performed, check or initial the adjacent box.

- Check lubrication points and lubricate as recommended in the general maintenance section of this manual.
- Make sure that the machine is properly adjusted. Procedures for making adjustments to various 9564 DURATECH HORIZONTAL GRINDER components can be found later in this section.
- Check engines oil level and coolant level, and add or change as necessary. Also look for oil or coolant leaks and repair as necessary.
- Check the hydraulic oil level, and add or change the hydraulic oil as necessary. Also look for leaks in the hydraulic system.
- Check the air cleaner service indicator. If the red indicator is visible, service the air cleaner.
- Check for buildup of debris around the radiator, turbocharger, manifolds, air intake and moving parts. Remove the debris before operating the unit.
- Inspect belts for cracks, breaks, or other damage.
- Inspect wiring for loose connections and for worn or frayed wires.
- Check the fuel supply, and drain any water from the water separator.
- Visually examine the rotor to see if any parts show excessive wear. These parts include shaft, plates, rods, hammers and movable plate. Replace or repair any worn parts before operating the unit.
- Check the screens for wear. Replace or repair any worn parts before operating the unit.
- Visually examine the rotor bearings and the mounting bolts and check all bearings for wear. Replace or repair any worn parts before operating the unit.
- Make sure that all shields and guards are in place and in operating condition.
- Check clutch oil level.
- Check oil level in gearboxes.
- Check floor wear guards for excessive wear, replace if necessary.



3.2 Starting the Horizontal Grinder



NOTE: The engine will start easier at cool temperatures by use of a starting aid. A block heater or other means can be used to warm the engine.

NOTE: Do not crank the engine for more than 30 seconds. Allow the starter motor to cool for two minutes before cranking again.

Check engine manufacturers recommendations for starting the engine, and follow their recommendations where applicable.

Check for **DO NOT OPERATE** or similar warning tags. Do not move any controls if such tags are on the machine.

To start the engine, perform the following steps:

1. Perform the pre-operation inspection.
2. Turn the battery disconnect switch to “ON”.
3. Shout the word “CLEAR”.
4. Turn the key to the start position and release it when the engine starts.
5. If the oil pressure does not rise within ten seconds after starting, stop the engine and make the necessary repairs.
6. Reduce the engine speed to a low idle. Allow the engine to idle for 3 to 5 minutes, or until the water temperature gauge indicator has begun to rise. The engine should run smoothly at low idle.
7. Make another walk-around inspection checking the engine and hydraulic system for fluid leaks.
8. Follow the engine manufacturers recommendations for the care and maintenance of a new engine.



NOTE: See also section 3.18, “Operating the grinder using the remote radio option”

3.3 Cold weather start-up

If the temperature is below 30 degrees it is important to follow a cold weather start up procedure to allow the engine and hydraulic system sufficient time to warm up before grinding. Warm-up procedure may have to be extended for extremely cold temperatures.

1. Idle engine for 5 minutes.
2. Turn the floor control to manual.
3. Adjust the feed roll speed to 25%.
4. Turn the feed roll on FWD and allow to run for five minutes while gradually increasing the speed to 100%, keep the roll on.
5. Adjust the feed floor speed to 25%.
6. Turn the feed floor on FWD and allow to run for five minutes while gradually increasing the speed to 100%, keep the floor on.
7. Turn the conveyors on FWD and allow to run 3 minutes.
8. Gradually bring engine up to 1500 RPM while performing this start-up procedure.



3.4 If the engine fails to start

If the engine doesn't start on the first try, perform the following steps:

1. Wait two minutes before attempting to restart.
2. Shout the word "CLEAR".
3. Do not run the starter for more than 30 seconds.
4. If the engine fails to start, contact a qualified diesel mechanic for further advice.

3.5 Throttle operation

To increase throttle speed push and hold the throttle switch up.

To decrease throttle speed, push and hold the throttle switch down.

3.6 Automatic engine shutdown system

The engine will automatically shut down if it overheats, engine coolant level is inadequate, or if engine oil pressure is inadequate. If this happens, perform the following steps:

1. Check the engine oil level.
2. Inspect the radiator, rotating screen, and clean if necessary.
3. Check tension and condition of the fan and rotating screen belts.
4. Allow engine to cool and check the coolant level.
5. Attempt to restart engine following the normal starting procedure.
6. If the engine will not continue running, contact a qualified mechanic.

3.7 Normal shutdown procedure



NOTE: Stopping the engine immediately after it has been working under load can result in overheating and accelerated wear of the engine components. Allow the engine to cool down before stopping. Avoiding hot engine shutdowns will maximize turbocharger, shaft, and bearing life.

Use the following procedure to shut down the **Horizontal Grinder** under normal operation:

1. Allow the conveyor belts to run until empty.
2. Lower engine rpm to idle. The clutch will automatically disengage once the rotor RPM falls below 600 RPM.
3. After the rotor has stopped, disengage the conveyor drive.
4. Follow the engine manufacturer's recommendations for cooling the engine; generally, this consists of running the engine at 1/2 speed or idle for 5 minutes.



5. Shut off the engine and remove the key.
6. Never leave the machine unattended until all potential fire debris is removed, no fire or smoldering exists, and battery is switched off.
7. Turn the battery disconnect switch to “OFF”.
8. Note the service hour meter reading, and perform periodic maintenance as required.
9. Repair any leaks, perform minor adjustments, tighten loose bolts, etc.

NOTE: See also section 3.18, “Operating the grinder using the remote radio option”

3.8 Emergency shutdown procedure



IMPORTANT: Emergency shutoff controls are for **EMERGENCY** use Only. **DO NOT** use the emergency shutoff controls for normal stopping procedure.

NOTE: The emergency stop button will have to be reset before restarting the engine.

1. Push in emergency stop button located on the control panel (large red button), and remove key.

NOTE: See also section 3.18, “Operating the grinder using the remote radio option”

3.9 Parts of the feed control

Display Screen

The display allows the operator to toggle through various screens and monitor the machine functions as well as to trouble-shoot.

Enter/Back Switch

The Enter/Back switch is used to enter and exit different screens on the display.

Scroll Up/Down Switch

The scroll up/down switch allows the operator to perform operation within each screen.

Screens:

Four screens are used to interact with the operator during the operation of the grinder.

FWD	Conveyors	
FWD	Feed Roll	
FWD	Feed Floor	
	Floor Control	OFF



Conveyors	REV
Feed Roll	REV
Feed Floor	REV
Floor Control	OFF

- As you start the conveyors, Feed Roll and Feed Floor using the switches on the main panel, the screen will indicate the direction they are traveling.
- This screen also indicates the Floor control on / off selection.
- The rotor must be stopped to select Floor Control Off.
- Using the up and down switches on the main control panel, you can view other informational screens.

Feed Roll RPM	0%
Feed Floor RPM	0%
Rotor RPM	0

- Using the switches on the main control panel, you can change the speed of the Feed Roll and Feed Floor. These speeds are based on a percent, 0% is minimum speed and 100% will be max speed for the Feed Roll and Feed Floor Forward. The Reverse speed will be 50%.
- Rotor RPM will tell you if the rotor is moving and the speed in RPM.

Rotor	Machine	Job
Hours =	0	0
Min =	0	0
Enter to	Clear Job	Hours

- This screen will show you the Machine hours and the Job hours.
- The Job Hours are resetable by using the ENTER switch on the main control panel.

**Press ENTER to
Change Machine
Settings**

- Pressing ENTER in this screen will allow you to make changes to the Grinding Modes, Contrast of the Screen, the Back Lighting of the Screen, RPM Set Point, and allow you to Reset to the Original Factory settings.



3.10 Operation of the feed control

Automatic (Grinding) Mode

In automatic mode, the floor control monitors the rotational speed of the rotor. The hydraulic flow to the feed floor drive is regulated in proportion to the rotor speed. As the rotor slows, the floor control decreases the hydraulic flow which slows down the floor speed. Conversely, as the engine speed increases, the electronic governor increases the hydraulic flow which increases the floor speed. This allows the feed control to control the feed rate keeping the engine running within its optimum power zone. When the load on the rotor begins to lug the engine, the feed control automatically reduces the floor's speed in proportion to the load. The result is a more constant load on the engine, which maximizes the grinding efficiency.

The floor speed is adjustable from 0-100%. The floor will decrease in speed until the rotor reaches the RPM set point. The RPM set point is a set point that is adjustable within machine settings. Once the rotor RPM falls to the set point the feed floor and feed wheel will both reverse for a set amount of time and begin moving forward if the rotor RPM is above the set point. The floor and roll both reverse to move material away from the rotor so that the engine can recover. The floor will also reverse if the pressure in the floor's hydraulic circuit becomes too high; when the pressure becomes too high the floor reverses to clear the objects from its path and then begins forward movement.

The feed roll speed is also adjustable from 0-100%. The roll speed, unlike the floor, is not proportional to the rotor speed. The roll will reverse when the rotor falls to the RPM set point and the feed roll also reverses if the pressure within its hydraulic circuit becomes too high.

The direction of travel for the floor and the roll can be selected on the control panel or by using the optional remote control. The forward direction is when the roll and floor are feeding material into the rotor. The floor and roll will not begin movement until the rotor has reached the rpm set point.

Manual (Maintenance) Mode

The floor and roll can operate in the manual mode. In the manual mode the floor and roll are able to operate without the rotor turning. It is used for maintenance purposes and cannot be used for grinding, if the clutch is engaged and the rotor begins to turn, the controller will switch to the automatic (grinding) mode and the floor and roll will quit turning.

Setting the floor and roll speed

The feed roll and feed floor speed needs to be set to maximize the grinding efficiency of the 9564 Horizontal Grinder, speeds are adjustable from 0-100%. The chart below is to be used as a reference.

RECOMMENDED SPEEDS FOR FEED FLOOR AND FEED ROLL PRODUCT

	MILL SCRAP/ PALLETS	REGRIND	YARD WASTE/ BRUSH	LAND CLEARING	LARGE TREES/ LOGS
FLOOR%	100	85	75	70	45
ROLL%	100	85	75	70	45

RECOMMENDED STARTING SET POINTS ONLY. OPTIMAL SPEED FOR FLOOR AND ROLL MUST BE DETERMINED BY OPERATOR AND WILL BE AFFECTED BY MOISTURE CONTENT, SCREEN SIZE, AND MATERIAL BEING PROCESSED.



It is important to realize that these speeds are recommended starting points only and that the speeds will need to be adjusted as grinding conditions change. For the most efficient use of machine capacity and time set the floor and roll so that they are traveling as fast as they can without excessively lugging the engine down and reversing the floor and roll because the rotor has fallen below the RPM set point. If you are constantly reversing the floor and roll because the rotor is falling below the RPM set point slow the floor and roll down.

The material being ground (size, moisture content, etc.), sizes of screens, and condition of tips and screens will all affect the floor and roll speed.

Changing the grinding mode:

Two grinding modes are available: standard and logs. The different modes have different reversal times for the floor and roll as well as different rpm points at which the floor and roll begin moving forward.

Standard mode: The standard mode is the default mode and will be the most commonly used mode. In the standard mode the floor and roll reverse for three seconds when the rotor rpm drops below the adjustable rotor set point. When the rotor speed rises 10 rpm above the set point the floor and roll begin moving forward. The default mid rotor rpm set point is 850 rpm.

Log Mode: In the log mode the floor and roll will reverse for one second when the rotor speed falls below the rotor rpm set point. Once the rotor speed has risen 120 rpm over the mid rotor rpm set point the floor and roll will begin moving forward. Using the log mode on larger logs is ideal because the shorter reversal time keeps the log beneath the feed roll; this eliminates the need for the roll to climb back up on top of the log.

To change the grinding mode scroll down until you come to this screen:

**Press ENTER to
Change Machine
Settings**

Pressing enter will bring you to the following screen:

**Press ENTER To
Change The
Grinding Mode**

Pressing enter again will bring you to the following screen:

**Use The Up/Down
To Adjust Grinding
Mod: Standard**

Press back to exit.



Changing the Rotor mid rpm Set Point

The rpm set point is adjustable and can be changed by scrolling down through the machine settings screens until you reach the following screen:

**Press ENTER to
Change The RPM
Set Point**

Press enter to access the following screen:

**Use The UP / DOWN
To Adjust Feed Floor
Start Based on Rotor
RPM = 860**

- Using the Up switch on the main control panel will increase the kick out set point for the Feed Floor and Feed Roll to reverse, and using the Down switch on the main control panel will decrease the kick out set point for the Feed Floor and Feed Roll to reverse.
- To leave this screen, use the Back switch on the main control panel.

The default mid rpm set point is 850 rpm.



3.11 Raising the feed roll

The roll must be raised to inspect the rotor and perform maintenance on the rotor.



WARNING: Always lock the roll into place if it is raised

To raise the roll, perform the following steps:

1. Verify that the grinder is parked on level surface.
2. Disengage the clutch, and wait for the rotor to stop turning.
3. Operate the feed roll up switch on the control panel to raise the roll.
4. Raise the roll fully, and install the safety lock. The safety lock is located in its storage location on the back of the rotor box

3.12 Lowering the feed roll

To lower the roll, perform the following steps:

1. Remove the safety lock and place safety lock in storage location on the back of the rotor box.
2. Clear the area of equipment and personnel.
3. Operate the feed roll down switch on the control panel to lower the roll.

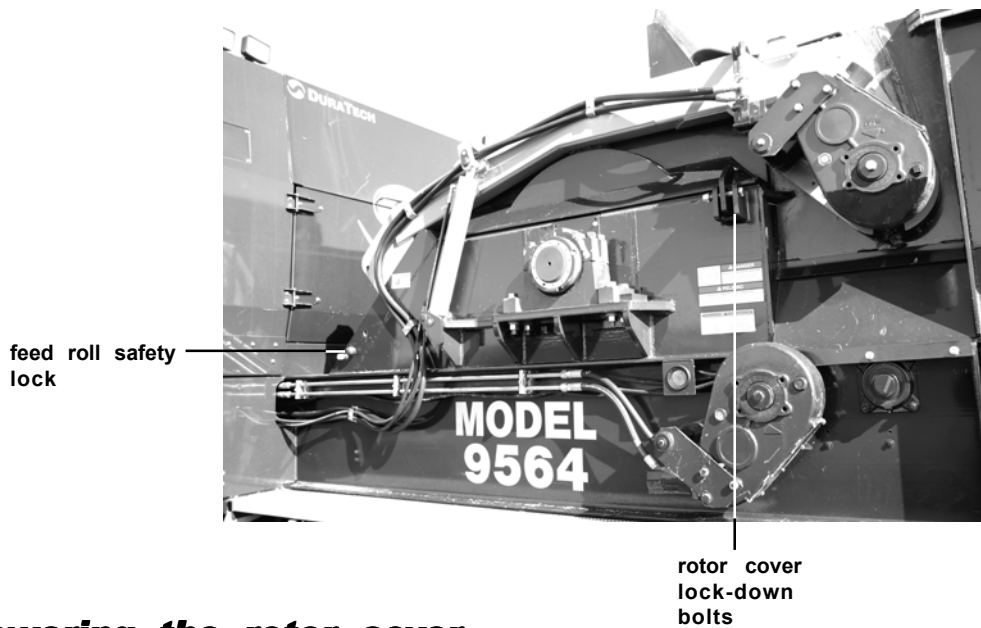
3.13 Raising the rotor cover

It is necessary to raise the rotor cover when removing the hammers and hammer rods. The rotor can also be removed when the rotor cover is in the raised position. To raise the rotor cover, perform these steps:

1. Remove the bolts from the rotor cover lock downs.
2. Insert bolts into the rotor cover lifting points.
3. Operate the feed roll up switch on the control panel to raise the roll and the cover.
4. Raise the roll and cover fully, install the safety lock. The safety lock is located in its storage location on the back of the rotor box.

rotor cover lifting points





3.14 Lowering the rotor cover

To lower the rotor cover, perform the following steps:

1. Remove the safety lock, and place safety lock in storage location on the back of the rotor box.
2. Clear the area of equipment and personnel
3. Operate the feed roll down switch on the control panel to lower the roll and cover.
4. Remove the bolts from the rotor cover lifting points.
5. Insert the bolts into the rotor cover lock downs.

3.15 Lifting the discharge conveyor

The discharge conveyor can be raised or lowered as needed. There is one set of controls for raising and lowering the conveyor located in the operator panel.

NOTE: See also section 3.18, “Operating the grinder using the remote radio option”

3.16 Folding and unfolding the discharge conveyor

Unfold the discharge conveyor before lowering the conveyor from the transport position, unfolding the conveyor with the conveyor lowered may cause the conveyor to unfold too quickly and cause damage. When folding and unfolding the discharge conveyor be aware of overhead power lines and obstructions.



3.16 Pivoting the discharge conveyor

The conveyor can be swung left or right as needed by controls located in the control panel.

NOTE: The conveyor controls are set in reference to machine left and machine right.



CAUTION: Make sure that no one is between the conveyor and the main frame before pivoting the conveyor.

NOTE: See also section 3.18, “Operating the grinder using the remote radio option”

3.17 Starting and stopping the conveyors

The belly and discharge conveyors are on separate circuits but are controlled by the same switch. Pressing conveyors forward will start both the belly and discharge conveyors moving forward. Pressing forward again will stop the belly and discharge conveyors from moving forward. The belly conveyor can be reversed by pressing and holding the reverse button on the control panel. If the conveyor is reversed to remove debris on the conveyor the material will exit the conveyor at the front of the conveyor below the machine and a trap door will spring open to allow the material to exit. If the door opens return the door to the down position before grinding.

A sensor monitors the pressure on the belly conveyor circuit. If the pressure becomes too high and triggers the sensor the feed floor and feed roll will reverse to allow the belly conveyor to discharge the material from the conveyor. If the pressure does not fall below the limit in 10 seconds the conveyors will stop, a fault code will be displayed on the screen, and the feed roll and feed floor will stop. The conveyor will need to be inspected to determine what is causing the high pressure and the fault will need to be cleared. The feed floor, feed roll, and conveyors will need to be restarted.

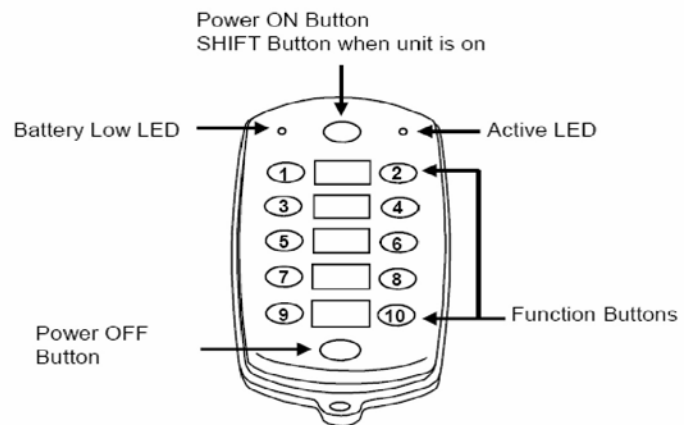
3.18 Operating the grinder using the remote radio option

Using the Omnex Origa remote radio transmitter

The Remote/Local switch located on the control panel will switch from manual to remote control. Switch to remote when remote control is desired.

The transmitter will:

- Stop the engine. (E-stop)
- Start, stop and reverse the feed floor and roll.
- Raise and lower the feed roll.
- Increase and decrease the feed roll speed.
- Raise and lower the front table.
- Raise, lower, and swing the conveyor.
- Start and stop the conveyor.
- Increase and decrease engine speed.



Omnix Origa Transmitter



LED indicators

The yellow LED indicator is located on the upper right hand side of the radio transmitter. This LED indicates that the controller is powered up and transmitting. Light may be solid or flashing depending on mode. During normal operation this LED is flashing.

The red LED indicator is located on the upper left hand side of the radio transmitter. This LED flashes slowly to indicate the transmitter has less than twenty percent of battery capacity remaining.

When both the red and yellow LEDs are on, the transmitter is in configuration/program mode.

Mode of operation

The Omnex Origa system has several modes of operation. The mode preset for DuraTech Industries is:

1. The Power ON (green) button powers up the transmitter. Output 9 on the receiver is energized when the Power ON button is pressed. (see diagrams in section 6.3, on page 103)
2. All functions are shut off when the Power OFF button (red button) is pressed. When the radio is restarted, all functions will be off. The transmitter will stay on until the Power OFF button is pressed.

NOTE: The engine will also be shut off when the Power OFF button is pressed and the remote/local switch is set on radio.

Remote radio start up

To begin using the remote radio, perform the following steps:

1. Press the green (power on) button on the transmitter. The yellow LED should start flashing to indicate that the transmitter is transmitting.
2. Press the Radio start switch on the control panel and hold it in.
3. Set the radio switch on the control panel to "REMOTE".
4. Count to 5 and release the Radio start switch.

Radio shutdown (switching back to local)

1. Set the radio switch on the control panel to "LOCAL".
2. Press red button on the transmitter, and set the in the storage location on the control panel.



3.19 Feed roll down pressure

Additional down pressure can be applied to the feed roll by the hydraulic cylinders attached to the feed roll lift arm. With the down pressure in the off position the feed roll valve is in a “float” position and the roll is allowed to move up and down over the material in the hopper, the down pressure in this mode is supplied by the weight of the roll and its supporting structure. With the down pressure on additional down pressure is supplied by the hydraulic cylinders. This additional down pressure allows the roll to compress less dense material and helps the roll grab onto logs and harder material easier. Down pressure is applied only when the floor and roll are moving forward and the rotor is above the RPM set point.



Never apply down pressure by selecting the momentary feed roll down switch when grinding.

3.20 Grinding

Before you begin grinding, start the machine and watch for unusual or excessive vibration. If any occur, immediately shut off the power. Determine the cause and correct it before starting the grinder again.

In cold weather, warm up the machine using the cold weather start-up procedure as described in section 3.3.

To begin grinding, perform the following steps:

1. Start the engine as described in “Starting the Grinder.”
2. Unfold the discharge conveyor and set it to the desired height.
3. Engage the conveyor run switch to the forward position.
4. Set the feed floor + feed roll speed as desired levels.
5. Engage the wet clutch by pressing the clutch start button in, and holding it in until the LCD Display changes to “Clutch engaging”. Do not increase engine RPM until clutch is fully engaged.
6. Set the feed floor and feed roll direction to forward.
7. Turn the feed roll down pressure “On”.

Grinding with the front table

The front table is designed to deflect objects thrown directly out of the front of the grinder when in the up position and is used to increase the length of the bed when grinding long material. The table can also be raised while grinding to assist in feeding longer materials into the hopper. Operate the grinder with the table in the up position when grinding material that does not require the operator to have the table lowered for longer material. If the table is lowered do not walk or drive directly in front of the grinder.



Loading the hopper



IMPORTANT: Never drop a large object or objects into the hopper from a high level. Ease the material over the edge and down into the hopper carefully.

Material to be ground should be placed directly into the hopper. The best method for filling the hopper is:

1. Engage the rotor as described above.
2. Feed material into the hopper from the side of the machine.
3. Do not over fill hopper, this will lead to bridging of materials.
4. Place additional materials in the hopper as needed.

If lodging occurs while grinding

Occasionally materials may lodge against the side of the hopper and not feed into the mill. If this occurs, reverse the floor + roll direction briefly, and then start the floor + roll in a forward direction again. This practice normally dislodges any materials.



CAUTION: Never attempt to dislodge material inside the hopper when machine is in operation by manually pushing materials down. **TO PREVENT SERIOUS INJURY OR DEATH, STAY OUT OF THE HOPPER WHEN THE MACHINE IS IN OPERATION!**

Placing material on the floor behind the lodged material also helps push it through the mill. Occasionally material may need to be rolled by reversing the roll and running the floor forward to dislodge it.

Grinding wet material

Wet material is the toughest material for any grinder to handle. If possible, try to mix the wet materials with drier materials before grinding. When grinding wet material, deposit small quantities on a more frequent basis rather than filling the hopper with wet material.

3.21 Operation of hydraulic jacks and auxiliary hydraulic unit

The 9564 DuraTech Horizontal Grinder is equipped with a DC powered auxiliary hydraulic unit which enables the operator to operate the front jacks and the screen reset function without the engine started. To operate the front jacks select either aux unit or engine. If the engine is selected flow is received from a pump attached to the clutch, if aux is selected flow is received from the DC power unit. The engine must be running for the jacks to operate if engine is selected, the engine does not need to be running if aux is selected. The rear jacks receive their oil from the pump attached to the clutch and the engine must be running for them to operate.



3.22 Preparing the 9564 DURATECH HORIZONTAL GRINDER for transport

To prepare the 9564 DURATECH HORIZONTAL GRINDER for transport over public roads, perform the following steps:

1. Be sure all loose parts such as screens, hammer rods, or extra hammers are properly stowed.
2. If equipped with a magnetic roller, latch the discharge pan into the transport position.
3. Fold the discharge conveyor, and then raise the discharge conveyor into the transport position which is shown in figure 3.1 below. Be certain that no power lines, branches, roof trusses, etc. will obstruct the folding operation of the conveyor.



CAUTION: DO NOT MOVE HORIZONTAL GRINDER without first securing the conveyor in transport position as shown in figure 3.1 below.

4. Raise the table to the up position
5. Verify that the semi-tractor is properly coupled to the grinder hitch, and that the trailer wiring harness and air brake lines are properly connected to the semi-tractor.
6. Remove all loose materials such as leaves, grass, and branches from the machine.
7. Raise the rear jacks and lock into position.
8. Raise the front jacks and lock into position.
9. Shut down the engine using the normal shutdown procedure.
10. Check the lights and the brakes for proper function.
11. Check local ordinances regarding restrictions for machine travel on local roads.

Read Section 1.12 “Towing” in the “Safety” section in this manual.

figure 3.1





3.23 Preparing the 9564 DURATECH HORIZONTAL GRINDER for operation after transport

To prepare the 9564 DuraTech Horizontal Grinder for operation after transport, perform the following steps:

1. Check the location.
 - Are there power lines, branches, roof trusses, etc. that will obstruct the unfolding operation of the conveyor and the loading operation of the hopper?
 - Position grinder to minimize the risk of thrown objects. For more information see section 1.6 on page 11.
2. Turn the battery disconnect switch to “ON”.
3. Perform pre-operation inspection of the grinder.
4. Start the engine.
5. Unfold the conveyor..
6. Lower the discharge conveyor.
7. If equipped with a magnetic roller, unlatch the discharge pan and set it to a “working position”.
8. Raise the conveyor to operating height.

3.24 Preparing the 9564 DURATECH HORIZONTAL GRINDER for storage

To prepare the 9564 DURATECH HORIZONTAL GRINDER for storage, perform the following steps:

1. Change the hydraulic oil and filter every 500 hours of operation.
2. To prevent rust and make inspection easier, thoroughly clean the machine.
3. Check for loose or worn chains, belts, sprockets and pulleys.
4. Check the condition of bearings.
5. Make sure that the batteries are fully charged before storing the unit, and turn the battery disconnect switch to “OFF”.
6. Change the engine oil and filter.



3.25 Removing the 9564 DURATECH HORIZONTAL GRINDER from storage

To remove the 9564 DURATECH HORIZONTAL GRINDER from storage, perform the following steps:

1. Perform a thorough pre-operation inspection as specified in Section 3.1 (page 23) of this manual.

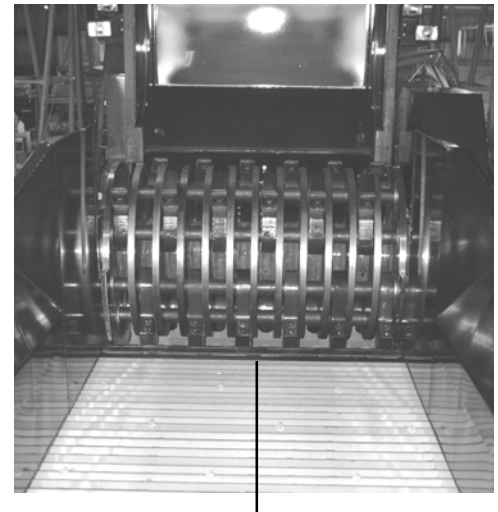
3.26 Installing a screen



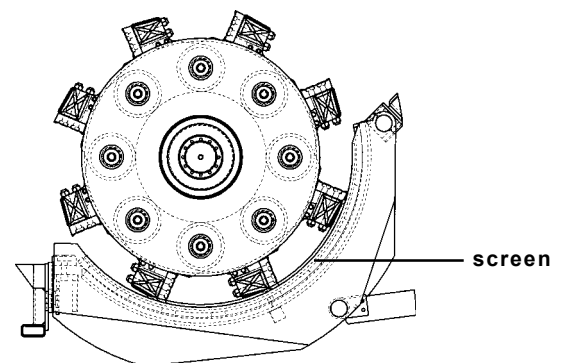
CAUTION: Follow normal shutdown procedure prior to performing any service work in the rotor area.

To install a screen, perform the following steps:

1. Raise the rotor cover completely, and install the safety lock. The 9564 utilizes two screens, both of which can be installed or removed from the rear of the rotor box
2. Screens may be lifted from or placed in the machine with a hoist or lifting device.
4. Securely attach the screen to the lifting device with a sturdy chain or nylon sling. Stuck screens can require a force many times their weight to lift them free of the grinder. The two screens can be chained together. This allows for easier removal of both screens.
5. Use only pry bars to guide the screens in and out of the machine. The screens are very heavy and could easily cause injury if the screen moves suddenly or is inadvertently dropped.
6. Clear all material from the screen track before installing a new screen.
7. Install the new screen using the lifting device and pry bars as explained above.
8. Make certain that the screen fits completely in place.
9. Make sure all personnel and equipment are clear of rotor cover.
10. Remove the safety lock, and lower the roll and cover.
11. Lock cover into place.



installed screen





3.27 Screen break away system

The 9564 DuraTech Horizontal Grinder is equipped with a break away screen system. This break away system is designed to minimize the damage to the grinder when it encounters incompressible objects such as rocks and steel. The break away screen utilizes a screen rack which pivots upon a point at the top of the rotor box and four shear bolts which hold the screen rack in place. If the rotor propels an object into the anvil with enough force to shear the bolts the screen rack will pivot away from the rotor, leaving a void for the incompressible object to fall into. A sensor determines that the screen rack has broken away and it stops the conveyors, sends the engine to idle, disengages the rotor, and reverses the feed roll and feed floor for a set amount of time and then shuts them off.

To reset the screen rack the operator must:

1. Raise the feed roll and lock in the raised position.
2. Let the engine cool down, stop the engine, and follow the lock out/tag out procedure.
3. Remove all dirt, mud, and debris from raised screen rack location.
4. Press the screen reset switch on the control panel (engine must be off for this function to work). Reset the screens until the shear bolt holes on the screen rack and the shear bolt holes on the frame align. If the holes cannot be aligned with the cylinders the rack may need to be helped into place with a lifting device.
5. Place four $\frac{3}{4}$ " X 4" GR 8 bolts (DuraTech p/n 4800491) into the shear bolt locations, secure bolts with $\frac{3}{4}$ " GR 8 top lock flange nuts (DuraTech p/n 4900160). There are six holes, place the bolts in the two center holes and the two outside holes. Torque to 380 ft-lbs.
6. Retract the screen reset cylinders, the cylinders must be fully retracted or the sensor will indicate that the screens are still broke away.

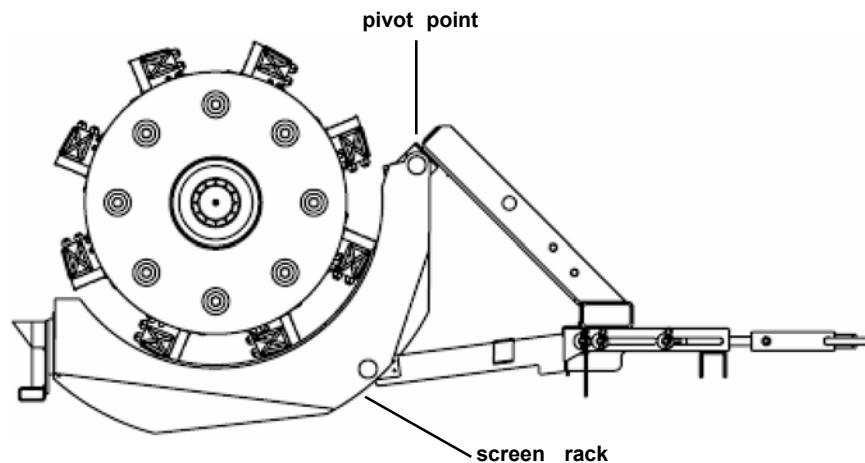


Figure 1 Screen rack in the grinding position

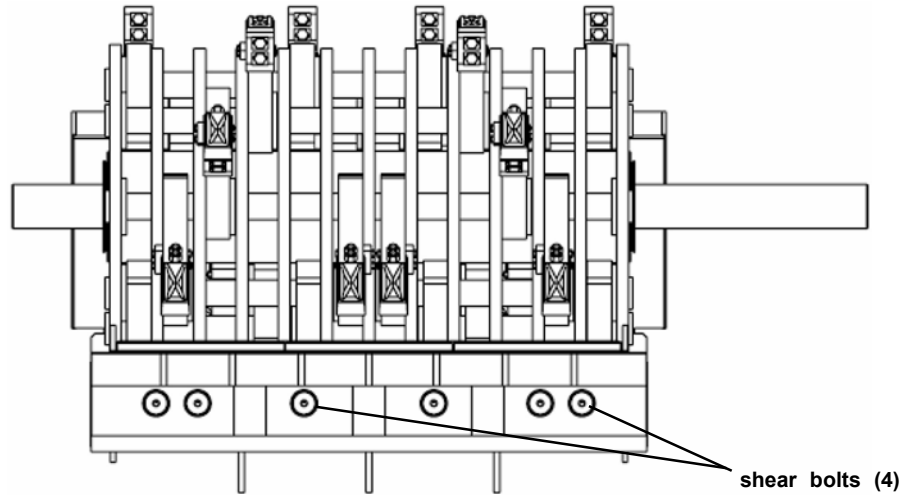


Figure 2 Front view of screen rack in up position and shear bolt locations. (there are six bolt holes; use only four shear bolts)

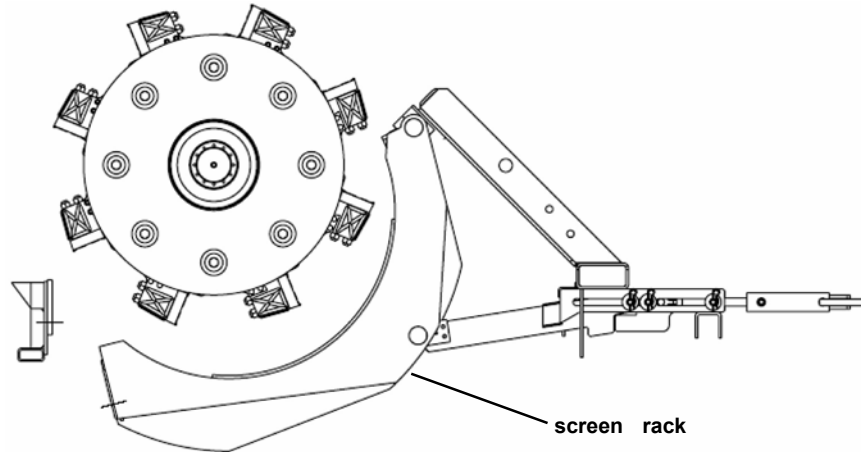


Figure 3 Screen rack in the broke away position



IMPORTANT: The rotor cannot be engaged with the screens broke away; the screens must be reset into place before operating the machine.



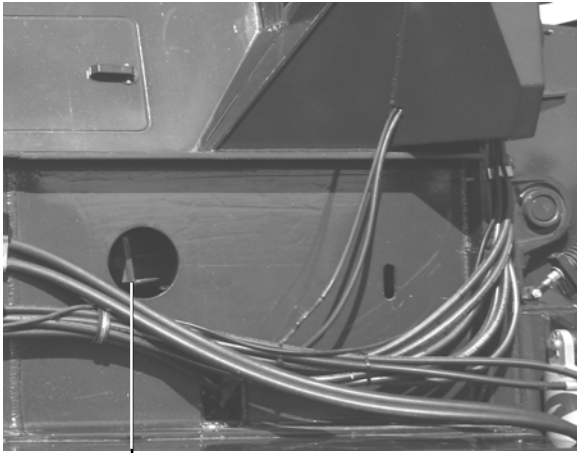
3.28 Adjusting the conveyor belt tension



IMPORTANT: Do not overtighten conveyor belts. Use only enough tension to eliminate belt slippage.

Both rollers on the belly conveyor and the discharge conveyor are adjustable to allow for belt stretch and tracking. If the conveyor belt slows down or stops during operation, slippage may be the cause. To eliminate slippage, tighten the adjusting bolts on the conveyor equally. This will increase the conveyor belt's tension and help to keep the belt centered on the rollers.

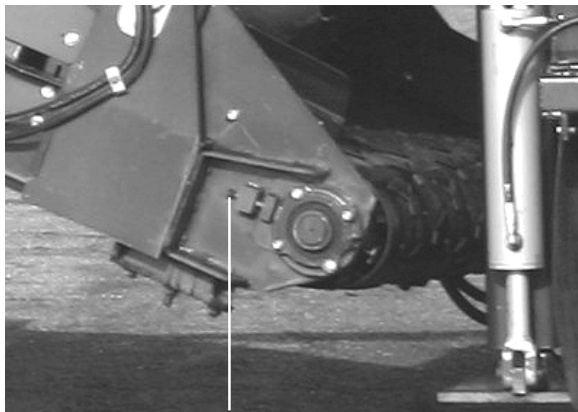
- When adjusting the belt tension on the belly conveyor, use the tail pulley to increase the tension. Only use the adjustment on the head pulley to adjust the tracking.
- When adjusting the tension on the discharge conveyor, use the head pulley to increase the tension. Use the tail pulley to adjust the tracking.



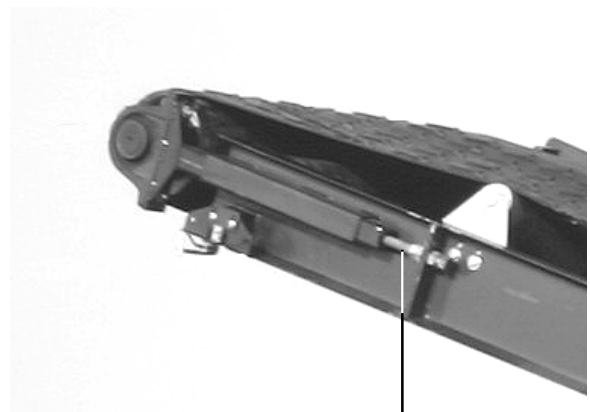
belly conveyor head pulley tensioning bolts



belly conveyor tail pulley tensioning bolts



discharge conveyor tail pulley tensioning bolts



discharge conveyor head pulley tensioning bolts



3.29 Adjusting the conveyor belt tracking

A. When a new belt is installed, use only genuine DuraTech Industries parts.

1. Begin by adjusting the drive roller so that the mounting bearings are the same distance from the end of the conveyor frame. This ensures that the roller centerline is square with conveyor frame. Adjust the idler roller bolts so that they are equal on both sides of the conveyor.

B. If the belt is running to the right side, perform the following steps:

1. Adjust the idler roller adjustment bolt on the right side of the conveyor. Increase tension by approximately 1/2 turn of the adjusting nut when adjusting the belly belt and adjust the drive roller when adjusting the discharge.
2. Make certain that all personnel are clear of machine and the start engine. Engage the hydraulic conveyor drive switch.
3. Observe conveyor belt tracking from a safe location.
4. If further adjustment is required, disengage hydraulic conveyor drive switch and shut down the machine using the normal shutdown procedure.
5. Some adjustment of the drive roller may be required if no improvement is noted by adjusting the idler roller tension. On the belly belt, adjustment to the idler motor may be necessary if no improvement is noted by adjusting the drive roller on the discharge conveyor.
6. Repeat steps 1-5 until proper tracking is achieved.

C. If the belt is running to the left side, perform the following steps:

1. Adjust the idler roller tension bolt on the left side of the conveyor. Increase the tension by approximately 1/2 turn of the adjusting nut when adjusting the belly belt and adjust the drive roller when adjusting the discharge.
2. Make certain that all personnel are clear of machine and start engine. Engage the hydraulic conveyor drive switch.
3. Observe the tracking of the conveyor belt from a safe location.
4. If further adjustment is required, disengage hydraulic conveyor drive switch and shutdown using the normal shutdown procedure.
5. Some adjustment of the drive roller may be required if no improvement is noted by adjusting the idler roller tension. On the belly belt, adjustment to the idler motor may be necessary if no improvement is noted by adjusting the drive roller on the discharge conveyor.
6. Repeat steps 1-5 until proper tracking is achieved.

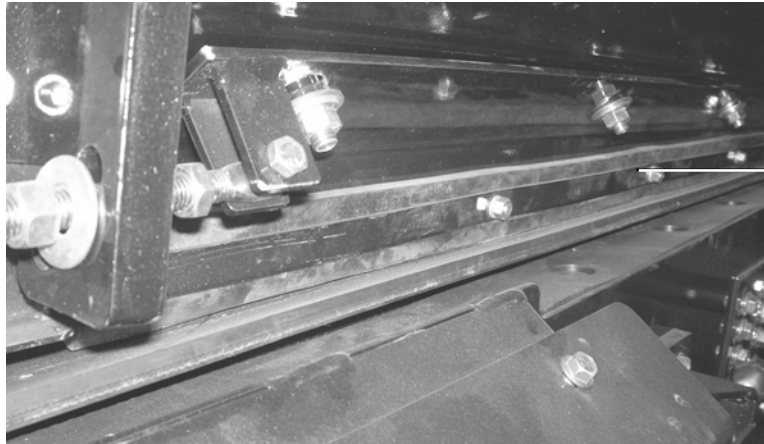
D. Additional tracking information.

1. Both Belts utilize return rollers. Make sure the return rollers are perpendicular to Belts. If the rollers are not running perpendicular to the Belt it can cause the Belt to track to the side.
2. The discharge conveyor utilizes stud rollers at two locations, one near the fold location on the top side and another near the tail pulley on the bottom. Observe these rollers to ensure they are turning.



3.30 Adjustable belly belt seals

1. Always make sure the belt seals are (pn # 7101052) are in contact with the belt.
2. When adjusting the belt seal as it wears down, push belt seal down so that it comes in contact with the belt again.

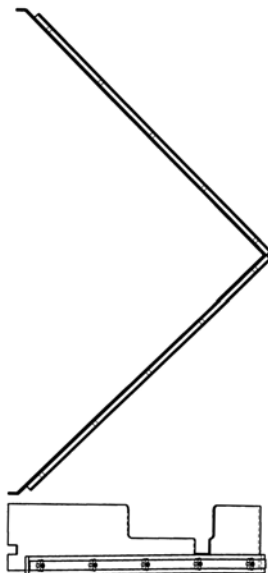


belly belt seals

3.31 Belt scrapers on belly and discharge conveyors

The belt scraper has a rubber blade (pn# 7101064) that wears down and needs to be flipped around or replaced. When the blades wear to within 1/8" of the scraper frame and doubler, either flip the rubber blade around or replace with a new one. The belt scraper is designed to prevent larger objects getting into the tail pulley.

Note: the belt scrapers is located inside the belt.

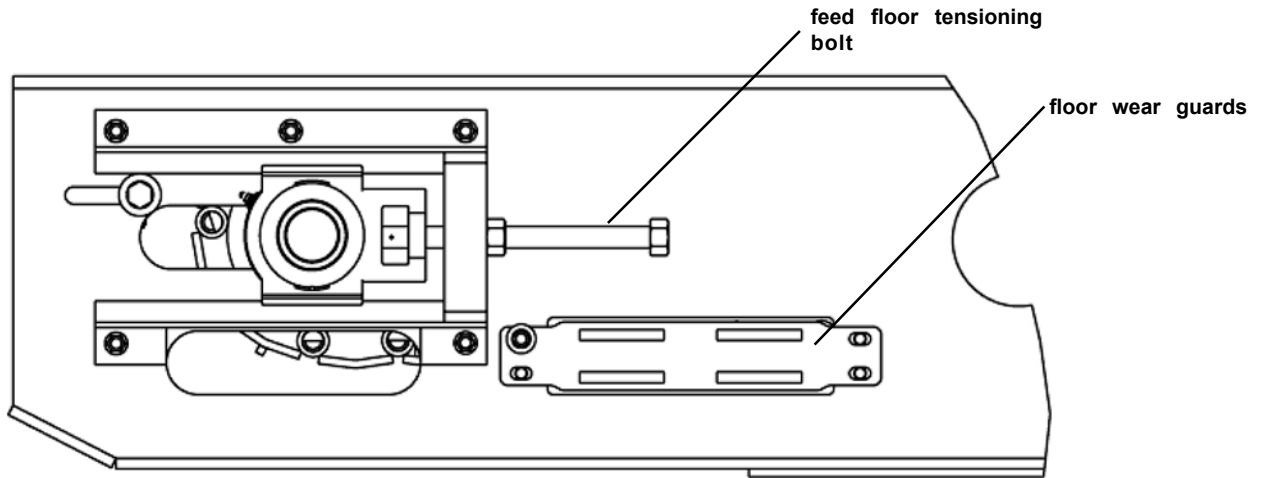




3.32 Adjusting the feed floor tension and the feed floor wear guards

The feed floor tension is set by adjusting the two take up bearings at the front of the floor. The floor should be adjusted so that there is not excessive droop between the return rollers on the bottom. Do not over tighten. To adjust the tension on the floor:

1. Loosen the lock nut on the threaded rod.
2. Turn the threaded rod clockwise to push the take up bearing towards the front of the grinder.
3. Measure the distance between the take-up bearing and the take up frame, **both sides should be equal.**
4. Tighten the lock nut to lock the bearing into position.



The wear guards keep the floor centered and prevent the floor from wearing on the grinder frame. These are wear items and need to be inspected weekly for excessive wear, they should be replaced when the guard is worn to the point that the floor can rub on the frame.

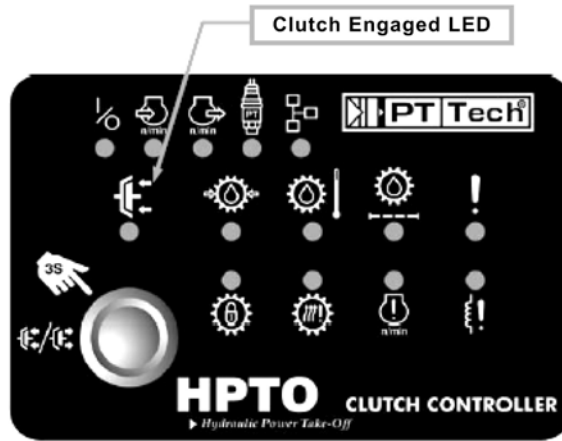
3.33 Engaging wet clutch



IMPORTANT: Read and have a thorough understanding of the wet clutch operators manual.

IMPORTANT: Never engage the clutch when feed roll is raised.

1. Start the engine, the engine must be between 700-1100 rpm; the controller will not engage the clutch when engine speed is above 1100 rpm. The “POWER” LED, “INPUT SPEED DETECTED” LED, and the “PRESSURE TRANSDUCER DETECTED” LED should be illuminated.
2. Push the clutch engage button for three seconds, the “CLUTCH ENGAGED” LED will blink as the clutch is being engaged. Once the clutch is fully engaged the “CLUTCH ENGAGED” LED will be illuminated steadily. At this point engine speed can be increased and normal machine operation can take place.

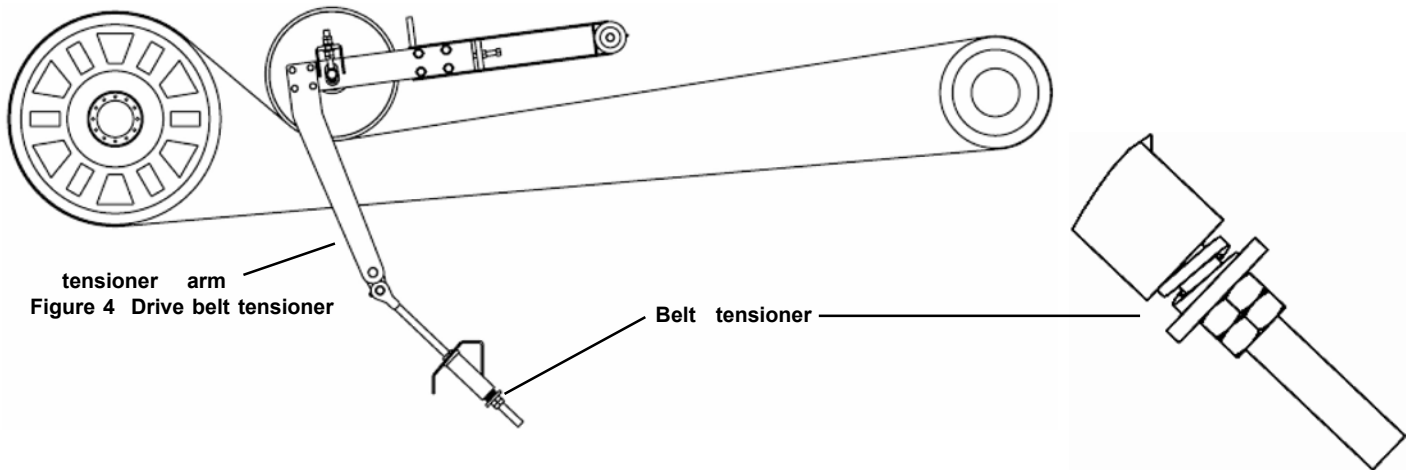


3.34 Disengaging the wet clutch

To disengage the wet clutch:

1. Empty the hopper.
2. Send the engine to idle, the clutch will automatically disengage when the rotor reaches 600 rpm.

3.35 Installing new belts



IMPORTANT: New belts will stretch. Keep a close watch on tension adjustment during the first 10 hours of operation with a new belt.

1. Remove the outside arm from tensioner assembly.
2. Slide new belts over the two sheaves.
3. Reassemble the arm to the tensioner assembly.
4. Apply tension to the assembly by compressing spring with the 1" nut.
5. Compress the spring only until the washer and tube are within 1/2".



6. Next start the engine and engage the rotor, idle the engine at 1400 rpm.
7. Check the tracking of the belts; if they do not track correctly use the tracking adjustments on the tensioner roll arm.
8. Continue to compress the spring with the rotor turning until the washer and tube are in contact with one another.
9. Use extreme caution around moving belts when adjusting the tracking.

Adjusting the belt tension.

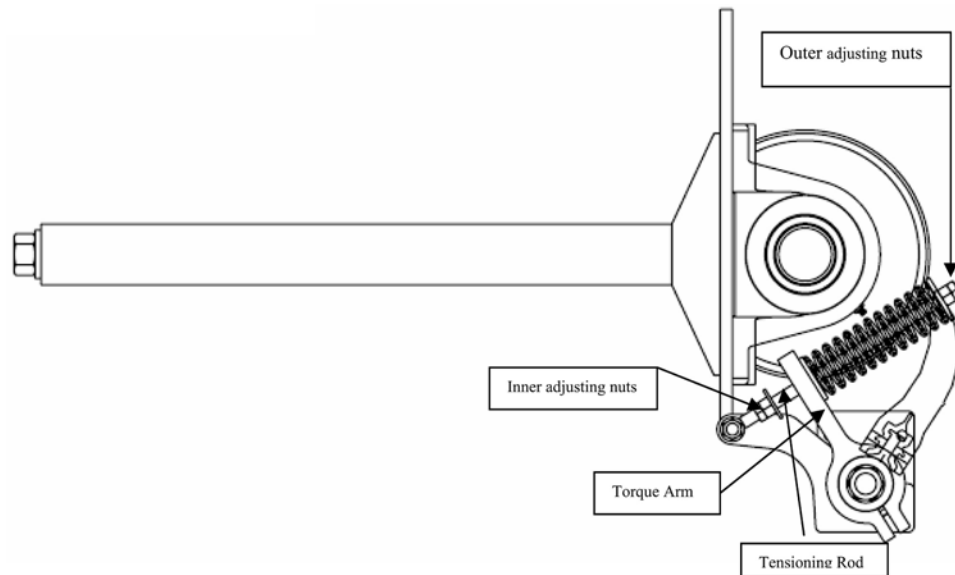
Always adjust the belt tension with the clutch engaged and the rotor turning with no load. Compress the spring until the washer and tube are within 1/4" of one another. The tension should not need to be adjusted on a regular basis

3.36 Belly conveyor belt scraper

The belly conveyor on the 9564 DuraTech Horizontal Grinder is equipped with a belt scraper. The belt scraper is used to remove wet sticky material that adheres to the belt. It is important to not use the scraper when grinding materials with nails or screws which may penetrate the conveyor belt and damage the scraper.

To set the operating tension on the belt scraper

1. Compress the spring to 5" by tightening the outer adjusting nuts.
2. Turn inner adjusting nuts away from the torque arm to allow for the movement of the tensioning rod.



To back the tension off of the scraper

1. Turn the outer adjusting nuts to the end of the tensioning rod.
2. Tighten the inner adjusting nuts up against the torque arm and continue to tighten until the scraper has backed away from the belt 1/2" or more.

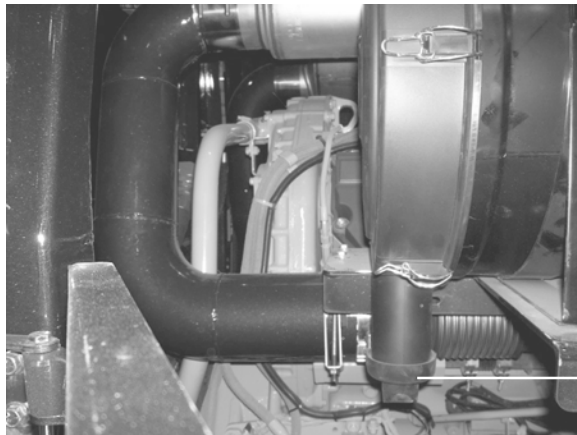
The scraper assembly can also be removed entirely if the operator wishes to.



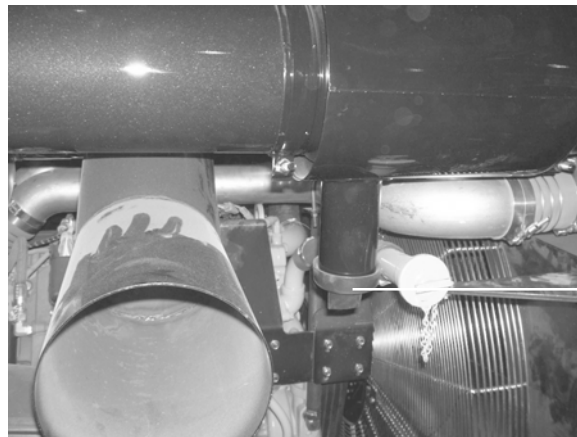
Section 4: Engine Maintenance

Engine oil level, engine coolant level, air filters, and fan belt tension should be checked daily. All debris, and combustible or ignitable material should be cleared from the engine compartment daily or more often as conditions warrant. When cleaning the engine compartment, pay particular attention to the top of the engine. Follow the engine manufacturer's recommendations for the replacement of parts and fluids, and follow the manufacturer's recommended maintenance schedule. Engine specifications should be found in the Operation and Maintenance manual for the engine.

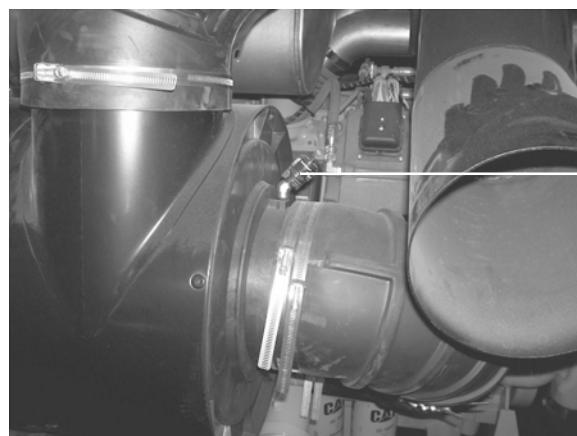
Dust cups on air cleaners and pre-cleaners must be cleaned daily. Always check restriction indicators on aircleaners.



air cleaner dust cup



pre-cleaner dust cup



air restriction indicator



Section 5: General Maintenance



WARNING: Before servicing machine, read the Service and Maintenance section of the Safety Instructions.



IMPORTANT: If for any reason arc welding is to be done, always ground rotor to frame of machine to prevent arcing in bearings.

5.1 Welding Procedure

Welding on a machine that is equipped with an Electronic Engine.

Proper welding procedures are necessary in order to avoid damage to the computerized equipment. Computerized equipment includes but is not limited to the following; the Engine Control Module (ECM), PLC, HPTO Control Module, Omnex Radio Receiver (if equipped), and ABS Controller (if equipped).

If at all possible, the component that is to be welded should be removed from the machine for welding. If removal of the component is not possible, the following procedure must be followed when welding on a machine that is equipped with electronic engine. This procedure is considered the safest and should provide minimum risk of electronic component damage.



NOTE: Do not ground the welder to electrical components such as the ECM or sensors. Improper grounding can also damage the drive train bearings or hydraulic components. Clamp the ground cable from the welder to the component that will be welded. Place the clamp as close as possible to the weld. This will help reduce the possibility of damage.



1. Stop the engine. Turn the battery disconnect switch to the OFF position.
2. Disconnect the negative battery cable from the battery.
3. Disconnect the connectors from the computerized equipment which are not located within the control panel listed on the previous page. Move each harness to a position that will not allow the harness to accidentally move back and make contact with any of the connector pins.
4. Disconnect the bulkheads from the control panel.
5. Connect the welding ground cable directly to the part that will be welded. Place the ground cable as close as possible to the weld in order to reduce the possibility of welding current damage to the bearings, hydraulic components, electrical components, and ground straps.



NOTE: If the electrical/electronic components are used as a ground for the welder, or electrical/electronic components are located between the welder ground and the weld, current flow from the welder could damage the components.

6. Protect the wiring harness from welding debris and spatter.
7. Use standard techniques to weld the materials.

5.2 Batteries

Check the condition of the batteries to insure that the electrolyte level is correct. Make sure that the terminals and cables are not corroded, and that the battery is held in place properly. Also make sure there is no arcing or grounding by the terminals.

The system uses two 12 volt batteries in series to produce a 24 volt system for the engine.



CAUTION: Hydrogen gas given off by a battery is explosive. Keep sparks and flames away from the battery. Before connecting or disconnecting a battery charger, turn the charger off. Make last connection and first disconnection at a point away from the battery. Always connect the NEGATIVE(-) cable last and disconnect the NEGATIVE(-) cable first.

5.3 Lubrication



CAUTION: Always shut off machine before adjusting or lubricating. When grinder is operated during cold weather, all lubrication should be performed after bearings are at operating temperatures.

Since a full bearing with a slight leakage is the best protection against entrance of foreign material, bearings operating in the presence of dust and water should contain as much grease as speed will permit. At higher speed ranges, too much grease will cause the bearings to overheat.





Abnormal bearing temperature during high speed operation may indicate faulty lubrication. The normal temperature may range from cool to warm to the touch. If a bearing is too hot to touch for more than a few seconds and the bearing is leaking grease excessively, there is too much grease in the bearing. High bearing temperatures with no grease showing at the seals, particularly if the bearing seems noisy, usually indicates too little grease. Normal temperature and slight showing of grease at the seals indicate proper lubrication.

The Lubrication Chart is a general guide for “relubrication”. Certain conditions may require a change of lubrication periods as dictated by experience.

A heavy-duty, general-purpose, lithium-based grease is recommended for lubricating the 9564 DuraTech Horizontal Grinder.

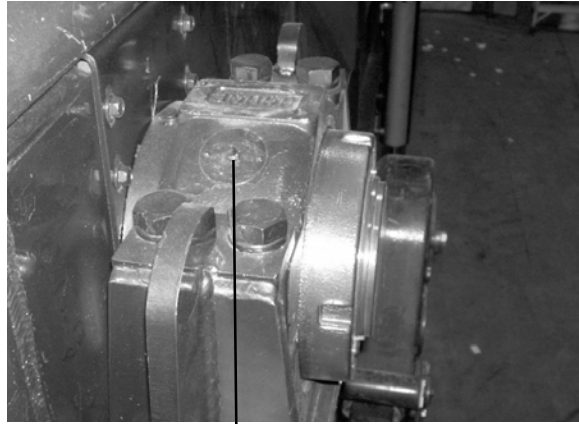
The rotor bearings require a specific grease as called out in the decal below. This decal is located by each rotor bearing.

<p>Grease rotor bearings every 20 hours with Mobilith AW2 or Shell Alvania #2</p> <p>If substitute grease must be used use a Lithium #2 base. Administer 6-8 pumps</p> <p>from a grease gun. Bearing should purge a small amount of grease while</p> <p>running, do not over grease, this will cause overheating within the bearing.</p>	 20 
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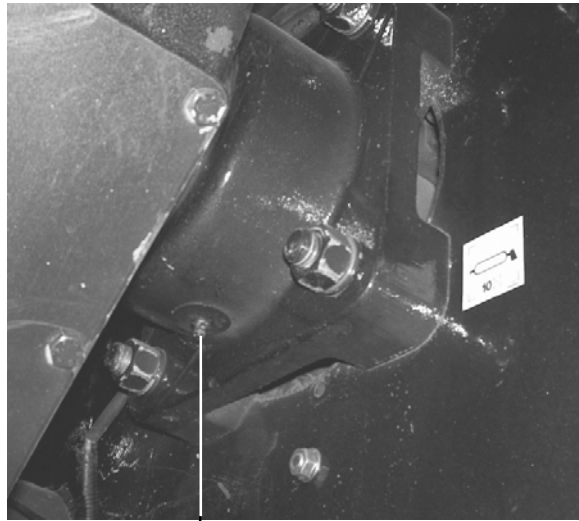


LUBRICATION CHART

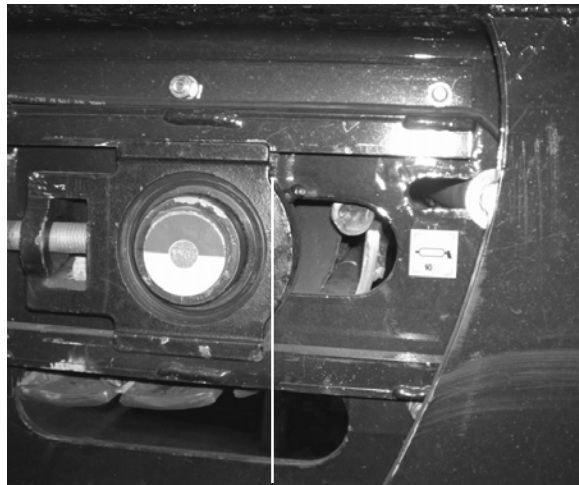
STANDARD EQUIPMENT				
REF. NO.	LOCATION	NO. OF ZERKS	FREQUENCY	REFERENCE SECTION #
1	Rotor brg, grease	2	20Hours	5.5
2	Wet clutch, check oil level		Daily	5.7
3	Hydraulic system, check oil level		Daily	5.6
4	Feed roller bearings	2	10 Hours	
5	Wheel bearings, check oil level		Daily	5.8
6	Feed floor drive and tensioner roll bearings	4	10 Hours	5.4
7	Feed roll lift cyl	4	40 Hours	
8	Feed roll + roller cover pivot	4	40 Hours	5.4
9	Discharge conveyor pulley bearings	4	10 Hours	
10	Discharge conveyor pivot	2	40 Hours	
10a	Discharge conveyor fold pivot + cyl	4	40 Hours	
11	Discharge conveyor lift pivot + cyl	4	40 Hours	
12	Belly conveyor pulley bearings	4	10 Hours	
13	Front table cylinders + pivot	6	40 Hours	
14	Jack stands		40 Hours oil	
15	Axles	12	40 Hours	5.8
16	Radiator fan pulley	1	250 Hours	
17	Belt tensioner	1	40 Hours	5.5
18	Belt scraper	2	Monthly	5.7
19	Gear boxes, check oil level	2	Daily	5.4
20	Radiator pivots	2	Annually	
21	Clutch, change oil		Annually	5.7



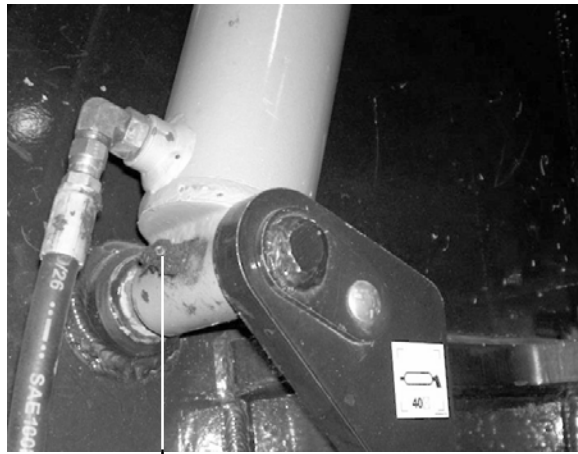
rotor bearings (ref # 1)



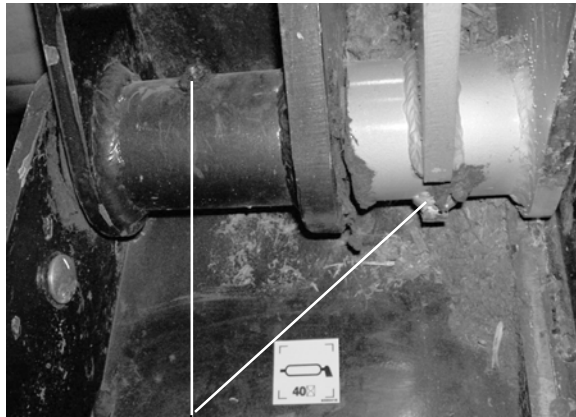
feed floor drive bearings (ref # 6)



feed floor tensioner bearings (ref # 6)



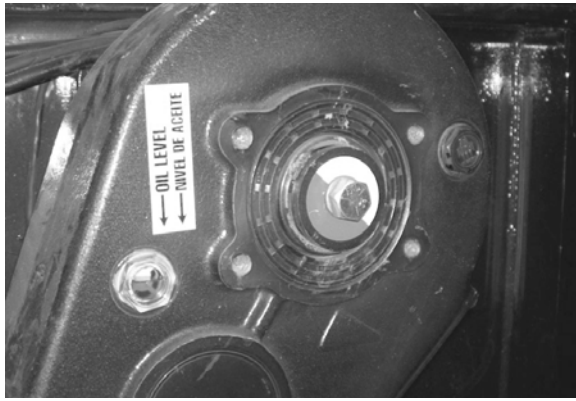
lower feed roll lift cylinder zerks (ref # 7)



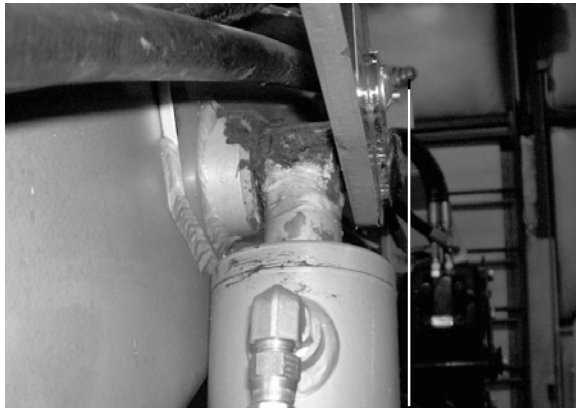
feed roll and rotor cover pivot (ref # 8)



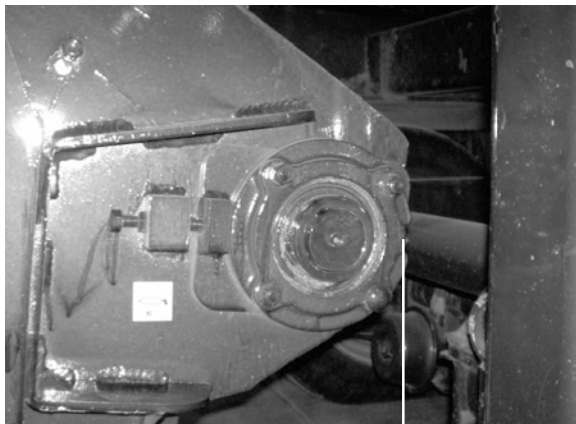
feed roll gear boxes



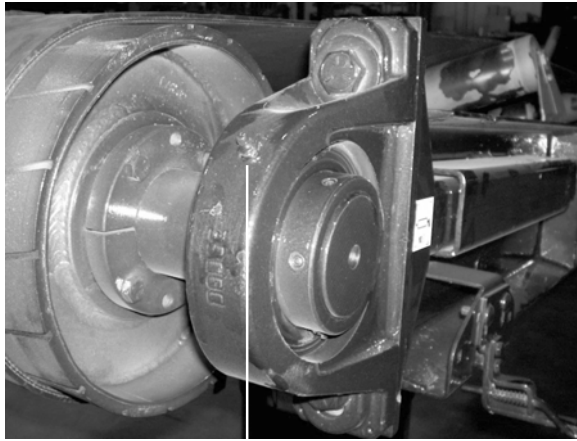
feed floor gearbox



upper feed roll lift cylinder zerks (ref # 7)



discharge conveyor tail pulley (ref # 9)



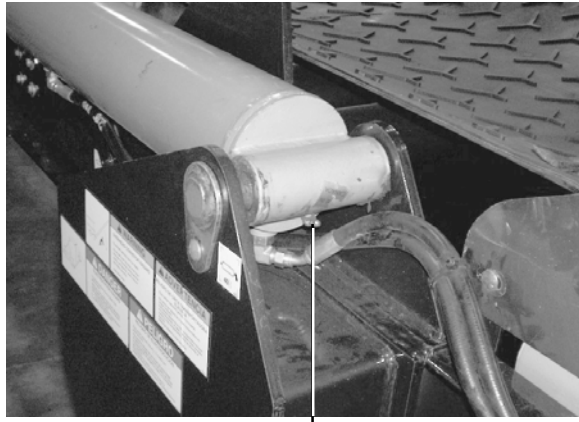
discharge conveyor head pulley (ref # 9)



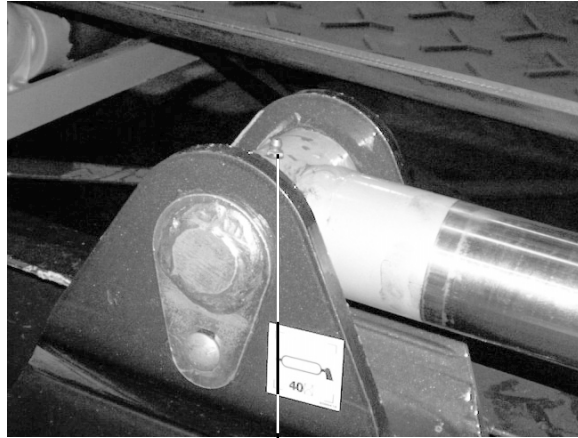
discharge conveyor raise/lower pivot (ref # 10)



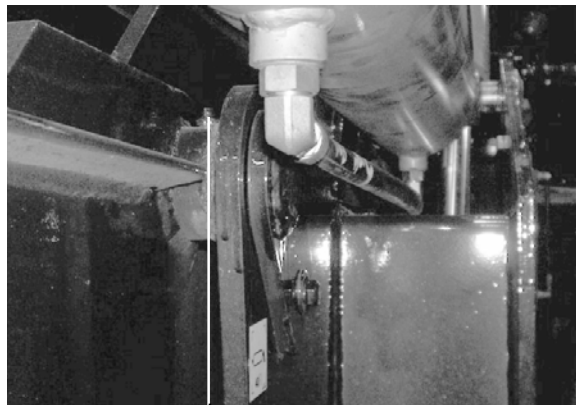
discharge conveyor left/right pivot (ref #10)



lower discharge conveyor fold cylinder (ref # 10a)



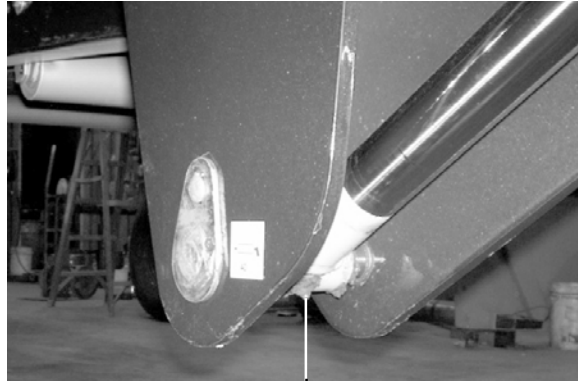
upper discharge conveyor fold cylinder (ref # 10a)



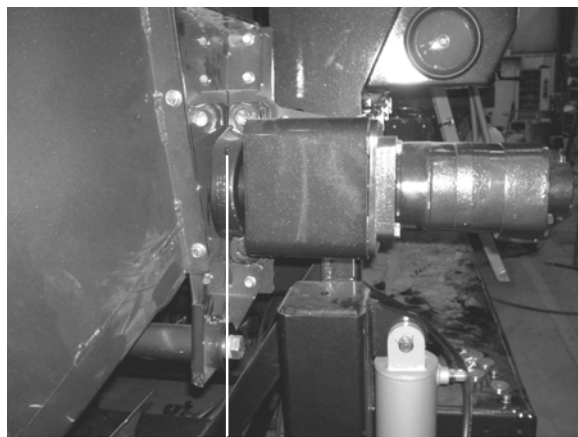
discharge conveyor fold pivot (ref # 10a)



upper discharge conveyor lift cylinder (ref # 11)



lower discharge conveyor lift cylinder (ref # 11)



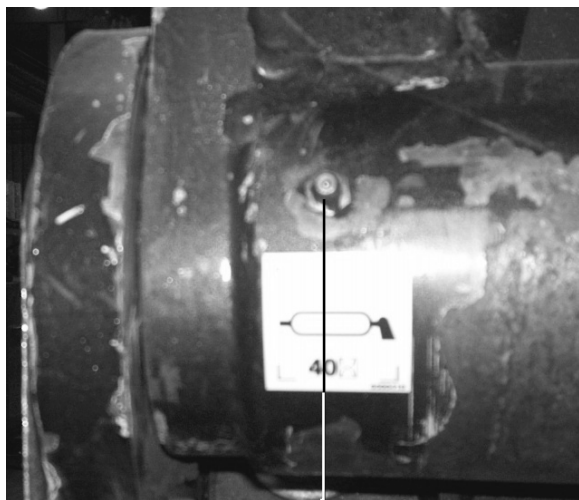
belly conveyor head pulley (ref # 12)



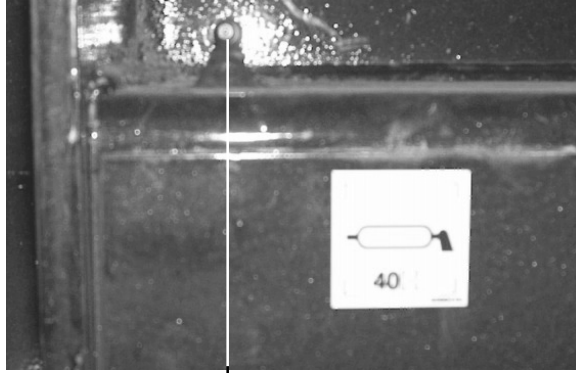
feed roll bearings (ref # 4)



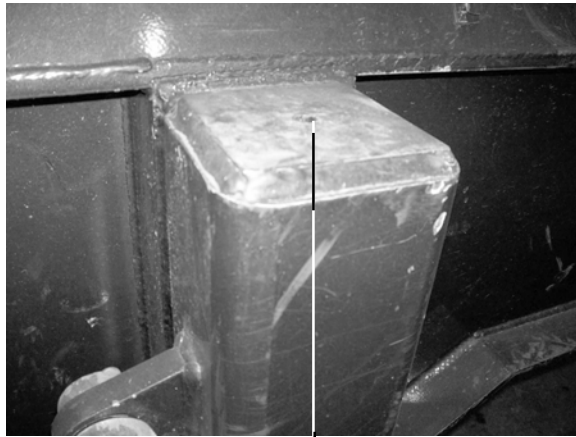
belly conveyor tail pulley bearing (ref # 12)



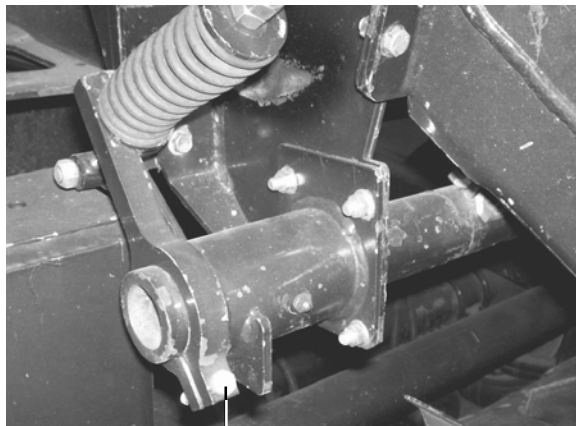
front table pivot (ref # 13)



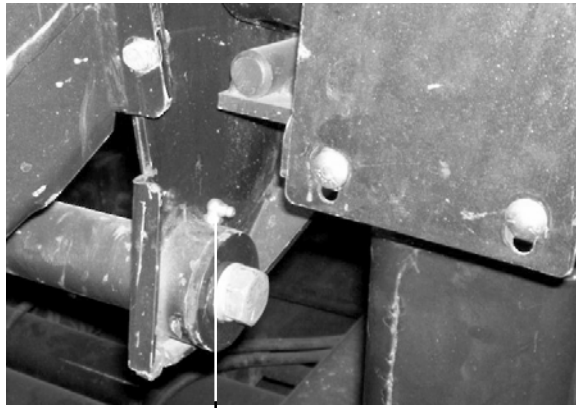
front table pivot cylinder (ref # 13)



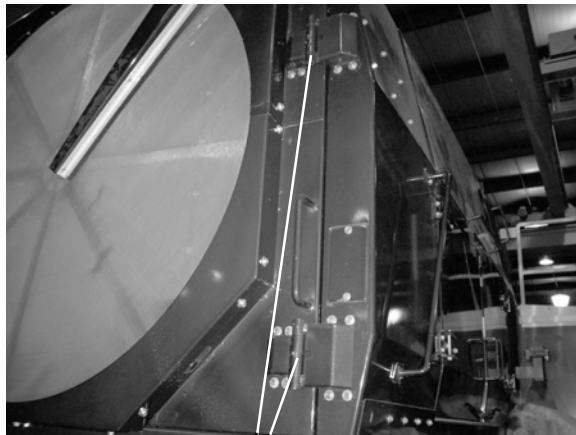
jack stands (ref # 14)



left hand belt scraper zerk (ref # 18)



right hand belt scraper zerk (ref #18)



radiator pivots (ref # 20)



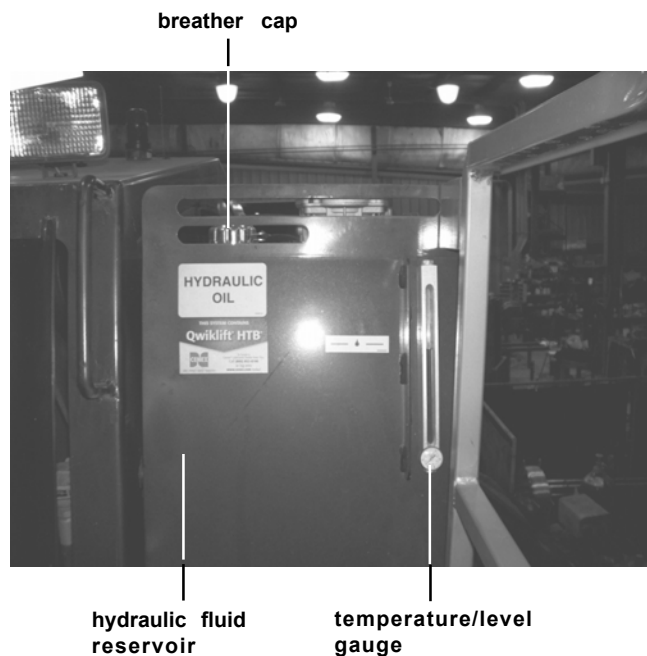
5.4 Hydraulic system



CAUTION: Lack of proper hydraulic oil level in the reservoir tank will cause system to heat under continuous running. Check the hydraulic oil level daily and replace as necessary.

The in tank hydraulic oil filters should be changed after the first 10 hours of operation. Change hydraulic oil and filters after the first 100 hours of operation. Thereafter, change hydraulic oil filters every 500 hours and change the hydraulic oil at least every 1000 hours of operation. Change the in tank oil filter if the oil filter pressure gauge indicates a plugged filter

Check the hydraulic oil regularly, and if the oil has a burnt smell or milky appearance, change it immediately.



DuraTech Industries recommends using Cenex Qwiklift HTB if your machine has a Qwiklift decal on the hydraulic tank. Other acceptable fluids include Mobil 423, Farmland Super HTB, Conoco Hydroclear Power Tran Fluid or other similar fluids. If the hydraulic tank does not have this decal, then all of the above fluids are acceptable.

A temperature and level switch is located within the oil tank. If the hydraulic oil exceeds 185 degrees or the oil or the oil level drops, the PLC will send the engine to idle, disengage the clutch, and stop the feed roll, floor, and conveyors. A “low hydraulic oil level/ high hydraulic oil temp” message will be displayed on the screen. Check the oil temp + level to correct the problem. Press “Enter” to clear the faults.



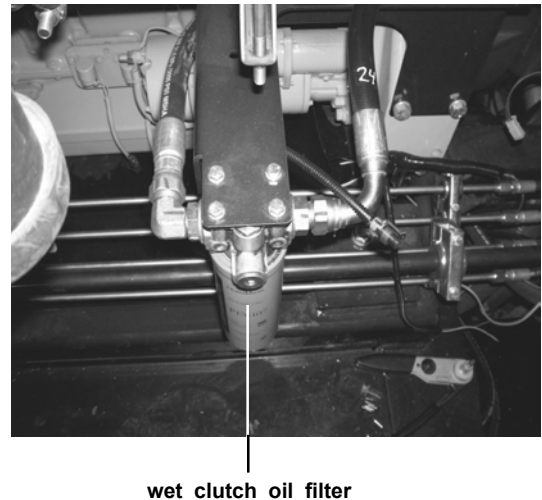
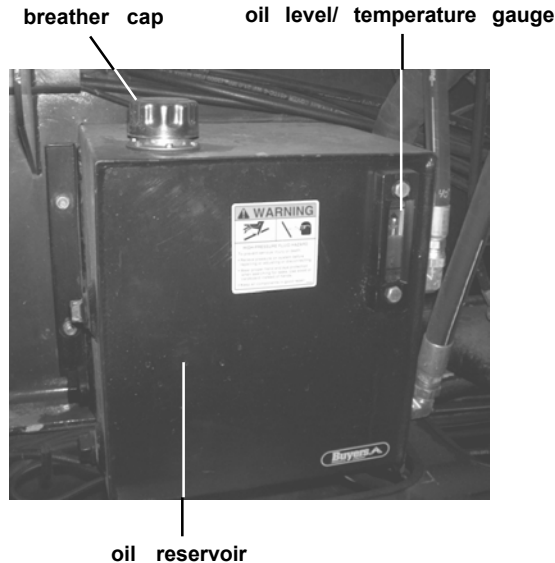


5.5 Wet clutch system

Change the clutch oil after the first 100 hours of use. Thereafter, change the clutch oil, oil filter, and breather cap every 500 hours of use, annually, or if the oil color changes, whichever comes first.

Note: Drain cooler and tank when changing oil.

Change the oil filter (4400073) if the clutch is disengaged due to high oil pressure.



The clutch contains at least 15 gallons of oil. **Only the following oils are approved by PT TECH for use in the HPTO system.**

Mobilfluid 424 is preferred oil of choice.

When the clutch will be operating in environmental conditions where the ambient air temperature is below 15 degrees F for extended periods of time, it is recommended by PT TECH that a cold climate oil be used.

Warm Climate Oils (when ambient temperature is greater than 15 degrees F)

1. Mobilfluid LT
2. Caterpillar TDTO (SAE 30 ONLY)
3. Shell Donax TD (TD ONLY)
4. Vermeer VMF Ultra Gold

Cold Climate Oils (When ambient temperature is below 15 degrees F)

1. Mobilfluid 424
2. Caterpillar TDTO (10W ONLY)
3. Shell Donax TD low vis



NOTE: DO NOT USE ANY OTHER OILS, OR CLUTCH LIFE WILL BE SHORTENED.

Wet clutch is to be serviced and inspected after 5000 hours of operation – contact your dealer for details.

To locate retail oil sales locations in your local area, use the phone number provided below.

Mobilfluid 424 or LT

Phone: 1-800-662-4525

Caterpillar TDTO SAE 30 or 10W

Phone: 1-800-321-7332

Shell Donax TD or TD Low Vis

Phone: 1-800-231-6950



5.6 Axle, wheels and tires

TIRE PRESSURE

Set the tire pressure according to the manufacturer's specifications. The appropriate tire pressure can be found on the sidewall of the tire.

WHEEL BEARINGS

The wheels have tapered roller bearings in an oil bath. Each hub is equipped with a transparent oil cap which has an oil level indicator mark that allows for easy checking of the oil level. The oil level should be checked daily during the pre-operation inspection. This lubrication method assures long bearing life with proper maintenance of the oil level. When adding or replacing oil in the wheel bearings, use SAE 80W-90 HYPOID GEAR OIL.



oil level indicator
(Ref # 5)

AIR BRAKES

The air brakes should be inspected periodically by a qualified air brake technician.

5.7 Brake component lubrication



CAUTION: Care must be exercised when lubricating the camshaft bushings and anchor pins. Over lubrication could cause a safety problem as brake linings become saturated with lubricants.

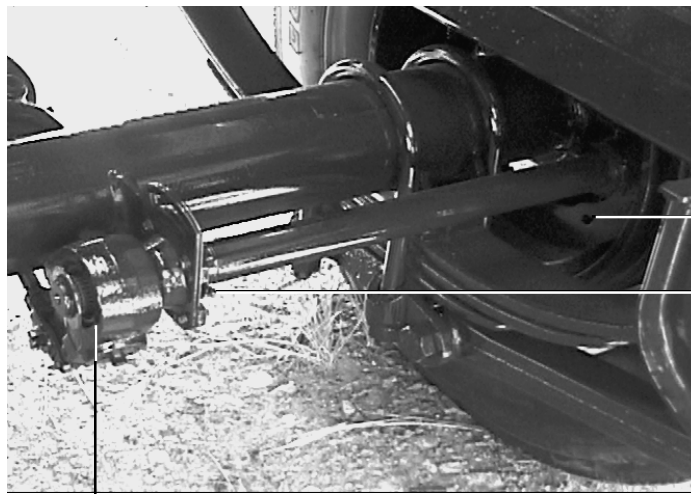


NOTE: When relined shoe linings become saturated with grease, replace with new shoe and lining assemblies.

A schedule for the periodic lubrication of brake components should be established by the operator on the basis of past experience and the severity of operating conditions.

GUIDELINES

- **For camshaft roller journals:** Lubricate with high temperature anti-seize grease.
- **For anchor pins:** Lubricate with high temperature anti-seize grease.
- **For manual slack adjusters:** Lubricate with NLGI Grade 2.
- **For automatic slack adjusters:** Lubricate with ASA manufacturer's recommended lubricant.



camshaft bushings zerks

slack adjuster zerk

FREQUENCY OF SERVICE

Camshaft roller journals, anchor pins, slack adjusters every 25,000 to 30,000 miles or every six months depending on severity of operating conditions. (For off highway use: service every 4 months depending on severity of operating conditions)

SUGGESTED PREVENTATIVE MAINTENANCE

- **Every 1,000 miles:** Check oil level in wheel hub and inspect wheel for leaks.
- **Every 15,000 miles:** Check brake adjustment. Repack wheel bearings (grease application).
- **Every 25,000 to 30,000 miles:** Check lining wear and estimate reline time. Inspect camshaft, camshaft spider bushing and camshaft support bracket bushing for any signs of wear. Lubricate brake actuating components.
- **Every 100,000 miles, once a year, or at brake reline:** Replace wheel bearing lubricating oil (if applicable). Check brake air chambers and slack adjusters. Inspect brake rollers, roller shafts, anchor pins and bushings and replace if necessary.



5.8 Rotor bearing Installation



WARNING: To ensure the rotor is not unexpectedly started, turn off and lock out or tag the power sources before proceeding. Failure to observe these precautions could result in bodily injury.



NOTE: Bearing housing caps and bases are not interchangeable and must be matched with mating half. Install the non-expansion bearing first.

Instruction Manual For IMPERIAL Adapter Mounted DODGE ISAF

Pillow Blocks and IP Unitized Spherical Roller Bearing Pillow Blocks, Flanges, Piloted Flanges & Take Ups

GENERAL INFORMATION

DODGE ISAF and IP Spherical Roller Bearing mounted units incorporate a unique way of seating, mounting, and dismantling the unit to and from the shaft. The patented sealing system (Pat. #5,908,249) has proven effective in protecting the internal bearing components, due to its constant pressure, while suit allowing a full + or 1 degree of misalignment.. The patented IMPERIAL system (Pat. #5,489.156) pulls the bearing on the adapter based upon a predetermined clockwise rotation of the locknut. Dismounting is accomplished via counterclockwise rotation of the locknut. Keep in mind that the thread on the locknut as well as on the adapter is a left hand thread.



WARNING: To ensure that drive is not unexpectedly started, turn off and lock out or tog power source before proceeding. Failure to observe these precautions could result in bodily Injury.

INSPECTION

Inspect shaft. Ensure that the shaft is smooth, straight, clean, and within commercial tolerance. Inspect unit. Do not allow unit to be exposed to any dirt or moisture.



Keep weight off bearing during mounting via a sling or jacks



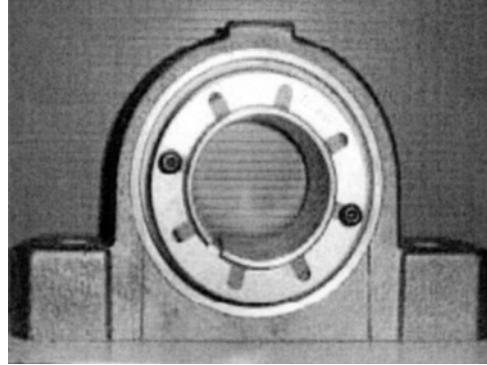
WARNING: Because of the possible danger to persons(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be used in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. The instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided. and are neither provided by Baldor Electric nor are the responsibility of Baldor Electric. This Unit and its associated equipment must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved.



MOUNTING

Install the non expansion unit first.

1. Apply a coating of light oil or other rust inhibitor to the adapter area of the shaft.
2. Before mounting bearing to shaft, remove lockplate from bearing and turn locknut counterclockwise one to two turns to allow adapter to expand fully. The unit is now shaft ready. Slide the bearing to the desire position on the shaft.
3. Proper locking of this unit to the shaft is based on turning the locknut clockwise a predetermined number of degrees shown for each bore size on Table 1. The turning of the locknut must start from a "ZERO reference point." This "ZERO reference point" is defined as the point when the clearance between adapter sleeve, shaft and bearing bore has been removed, and all surfaces are in metal to metal contact
 - 3A. To reach the 'ZERO Reference Point,' rotate locknut clockwise, using both hands, as tight as possible. When mounting bearings with shaft sizes 3 15/16" and larger the following TEST must be performed. *As a test to insure you have reached the "ZERO Reference Point" tap on the face of the nut with a hammer and attempt to rotate the nut using both hands. If the nut will not rotate then you have reached the 'ZERO Reference Point' and you should proceed to step 4. if you can rotate the nut, using both hands, then you have not reached the true 'ZERO Reference Point,' and should repeat step 3A until 'ZERO Reference Point' is obtained.*



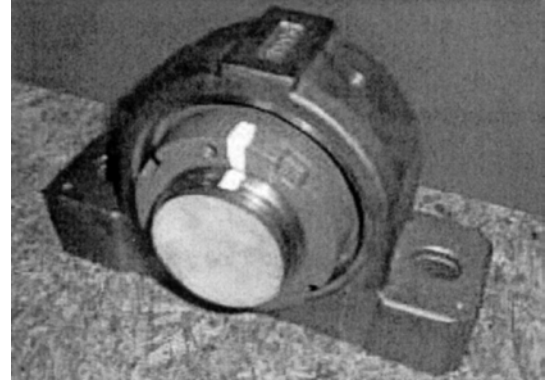
Picture 1



NOTE: All Weight Must Be Removed From The Bearing When Obtaining The "ZERO Reference Point."

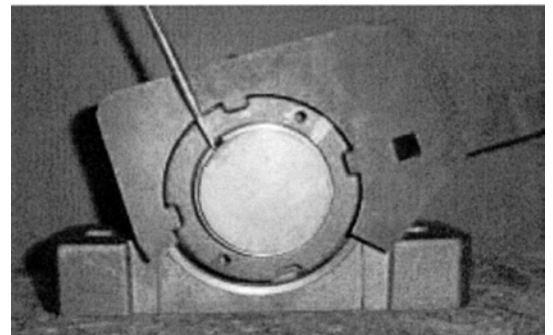


4. Once “ZERO reference point” is reached, scribe a line through both locknut face and adapter face (Picture 2). Then continue to tighten the locknut (Picture 3) by turning it clockwise using hammer and drift or spanner by the appropriate rotation angle shown on Table 1. Proper mounting has been achieved when the scribed line on the locknut has rotated from the scribed line on the adapter face by the angle shown on Table 1. To reach the full rotation of the locknut, the use of hammer blows onto spanner or drift may be needed for proper mounting. Rotate nut 1-5/8 turns.



Picture 2

5. a) Slide lockplate over shaft and align tang of lockplate with slot in adapter sleeve.
b) Find a locknut hole that aligns with a lockplate hole. If the closest locknut hole is beyond a lockplate hole, then tighten, not loosen, the locknut to meet a lockplate hole
c) Insert lockwasher and tighten button head screws to lock assembly. (Ref. Picture 4)
6. Bolt down pillow block or flange unit to the structure.
7. Repeat steps 1 through 6 for the expansion bearing except immediately after Step 2 do the following:



Picture 3

EXPANSION

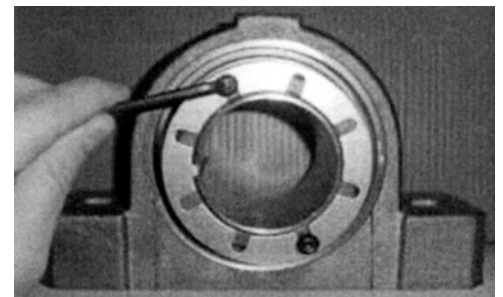
Pillow Blocks (Locknut facing outboard)

Align pillow block housing mounting holes with substructure mounting holes. Push insert as far as possible in the direction of the fixed bearing. If bearing locknut is facing toward fixed bearing, position float bearing insert in center of housing.

NOTE: This is necessary because in the process of mounting, bearing is being drawn toward locknut. **Also remember to keep weight off of bearing.**

NOTE: Use hardened washers and properly torqued bolts to obtain sufficient clamp force between the bearing block and the mounting structure.

Picture 4



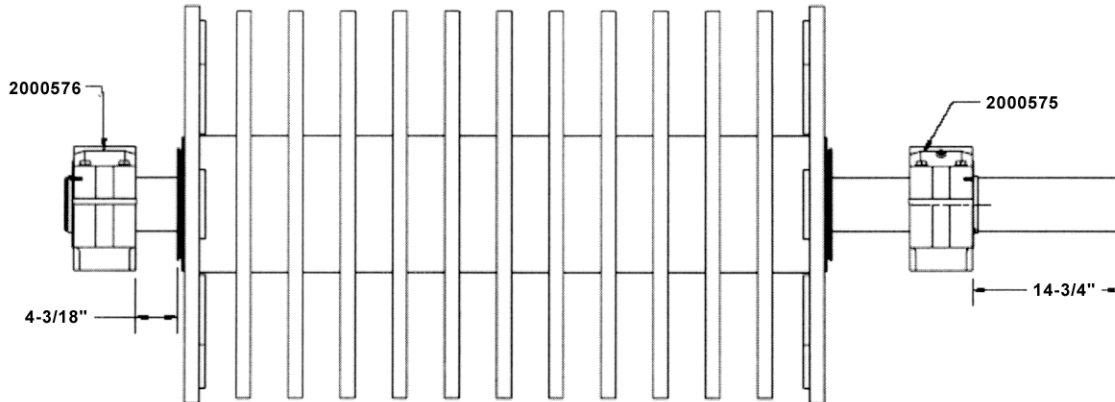


ISAF:

For 2 Bolt and 4 Bolt Pillow Blocks: 1) Remove bearing cap 2) Remove stabilizing ring; 3) Reassemble cap on base, 4) Torque cap bolts to recommended torque values. (Table 3)

DISMOUNTING

1. Remove weight off bearing via a sling or jacks.
2. Remove mounting bolts from bearing.
3. Remove button head screws and lockplate from the adapter nut.
4. Using a spanner wrench turn the locknut counterclockwise until the bearing unit is Pushed off the adapter sleeve sufficiently to permit the release of the adapter sleeve from the shaft.





5.9 **Hammermill maintenance**

Visually examine the mill to see if any of the parts show excessive wear. These parts should include rotor discs and the holes in the discs that support the rods. Enlarged holes can cause rods to break or bend. Also check rods, rod retainers, hammers, screens, screen rack, main shaft, side cutters, hammer bits or anything else that could wear and perhaps fail and causing damage to the hammermill and/or personnel if not properly maintained. The bearings and motor alignment should also be checked along with mounting bolts to insure a firm foundation and reduced vibration.



CAUTION: Keep all foreign objects out of the hopper and away from the mill. Foreign objects may result in personal injury or damage to the machine.

The hammer bits are designed to grind products such as wood waste, green waste, construction and demolition debris, tree branches and trunks, compostables and mulch that may be reduced in size in a hammermill. The hammers are not designed to grind or crush hard materials such as coal, minerals, metals, rock, or other incompressibles, which will cause parts to fail. These materials must never be allowed to enter a hammermill.

The hammers have been designed and manufactured to provide the best compromise between hardness for good wearing qualities and strength for dependability and resistance to breakage.

Because of the high capacity of the machine, the hammer bits will wear and must be considered expendable. Each hammer has two (2) cutting edges. For maximum life, it is suggested that hammer bits be rotated periodically to even out the wear over the entire rotor. If one end of a bit is allowed to wear too long, one of the bit's cutting edges will be lost.

Screens also have two (2) cutting edges. When cutting edges become rounded, the screen can be turned end for end exposing the new cutting edges. The results of badly worn hammer bits and screens is loss of capacity, and added horse power requirements.



5.10 Fixed hammer maintenance and replacement



CAUTION: Disengage the driveline clutch. Shut off the engine. Remove the key before working on the rotor.



IMPORTANT: The bolts on the hammer tips should be checked periodically for proper torque. Torque ratings for two bolt tips are listed below.

When replacing hammer tips, We recommend the following:

- A. Always replace hammer tips in pairs, 180 degrees apart.
- B. Tips placed 180 degrees apart should be the same weight.
- C. When starting the hammermill after installing a new set of tips or after turning the tips to expose new faces, watch for unusual or excessive vibration. If any is noticed, shut off the hammermill. Determine the cause and correct it before starting the mill again.

To replace the hammer tips, perform the following steps:

1. Be sure to disengage the clutch, shut down the engine, and remove the key.
2. Identify the tips to be removed, then loosen and remove the bolts and tips.
3. Rotate or replace tips. Use new bolts and lock nuts when replacing tips.
4. **HAMMER TORQUE SPECIFICATIONS**

For two-bolt tips with 7/8" NF grade 9 bolts and grade 9 toplock bolts, Torque to 535 ft. lbs.

5. After 2 hours of grinding, retighten the bolts to the same torque values.
6. Periodically retighten the bolts to the same torque values.

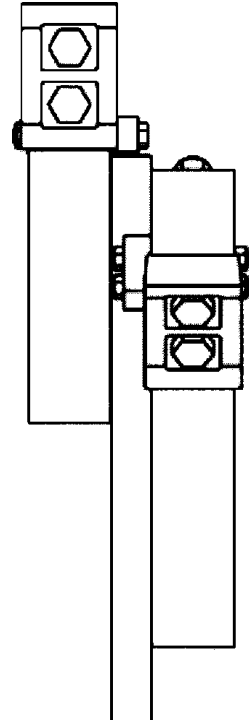


5.11 Secondary cutter installation



CAUTION: Disengage the wet clutch, shut off the engine and remove the key before working on the rotor.

The 9564 DuraTech Horizontal Grinder is equipped with secondary cutters on the rotor. The secondary cutters remove material which passes through the space between two hammer bits. Secondary cutters have two cutting edges and can be flipped to expose the opposite cutting edge. Install secondary cutters on the side of the tool holder which is next to the rotor plate.

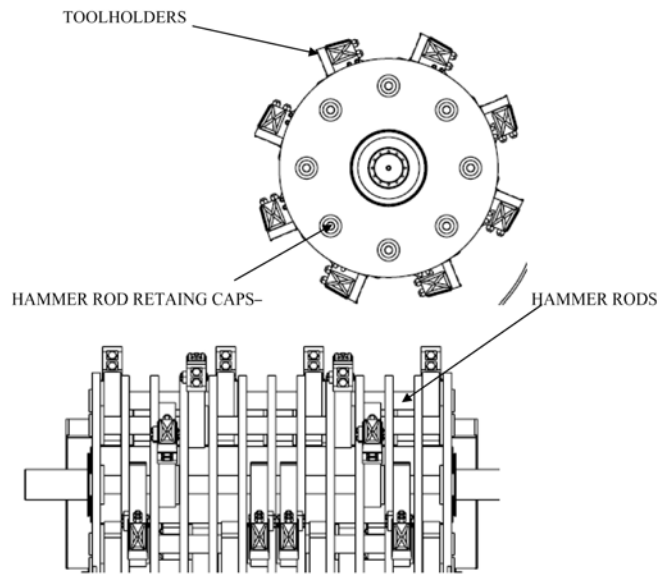


IMPORTANT: When installing secondary cutters always install a second cutter 180 degrees away from the first.



5.12 Pulling hammer rods and replacing toolbars

To remove hammer rods first remove the hammer rod retaining caps. Each hammer rod has a 7/8 NC threaded hole on each end, place a lifting eye in the right hand end and pull the shaft out with a loader or excavator. Shafts will remove easier if the rotor is free of mud and excess debris buildup; also spray shafts with a lubricant to aid in removal. Support the tool holders as shafts are removed to prevent the tool holders from falling onto the screen area and injuring personnel.



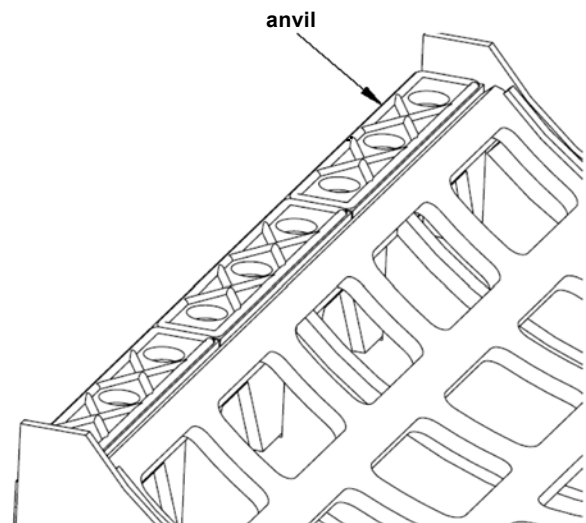
IMPORTANT: When removing tool holders secure the rotor from turning with a lifting device. Removal of tool holders will cause the rotor to become unbalanced and it will begin to rotate if not held in place.



WARNING: Serious injury or death can occur if rotor is not secured by a lifting device while removing tool holders.

5.13 Replacing the anvil

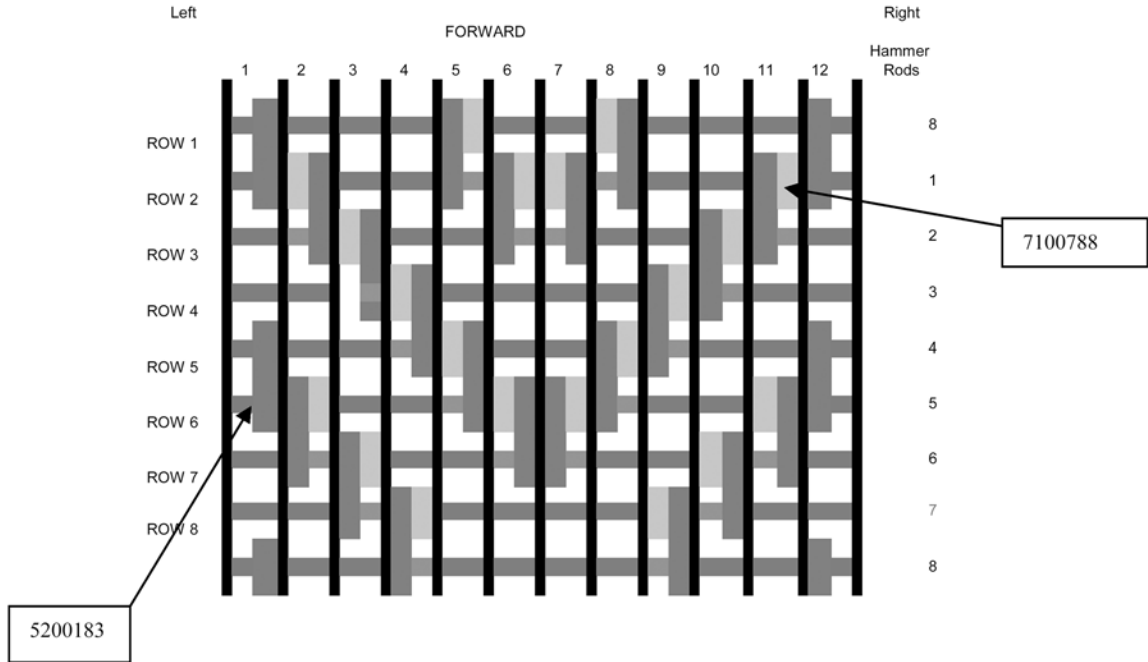
The 9564 DuraTech Horizontal Grinder has a replaceable three section anvil which is attached to the screen rack. This anvil is designed to absorb the impact of material thrown by the rotor and over time can wear out. This anvil is hard surfaced and can be removed to have the hard surfacing replaced or the anvil itself can be replaced. Three 7/8" bolts attach each anvil section to the screen rack. Remove the bolts and then remove each section of the anvil. The anvil also holds the screens into place; the screens can be removed from the front of the rotor by removing the anvil.





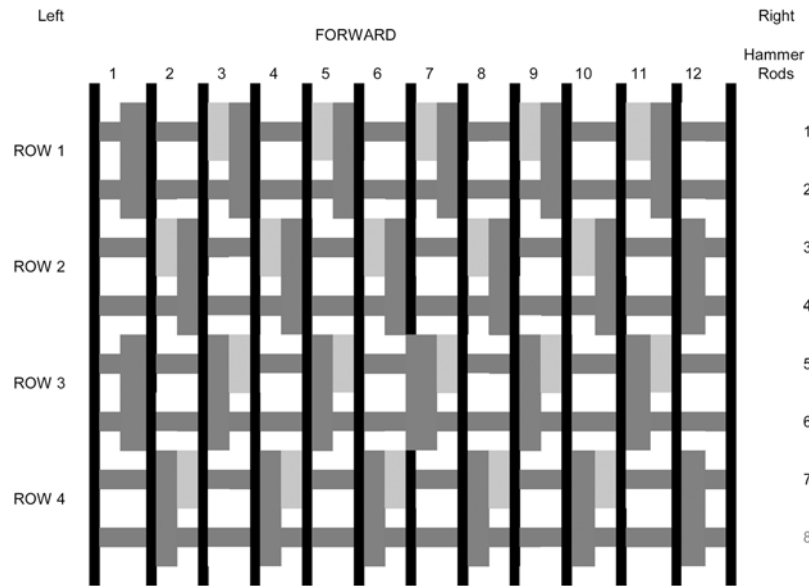
Tool holder spacing chart for a V pattern

24 tool holders require (5200183), 20 tool spacers required (7100788)



Tool holder spacing chart for a straight pattern

24 tool holders require (5200183), 20 tool spacers required (7100788)



IMPORTANT: When removing tool holders secure the rotor from turning with a lifting device. Removal of tool holders will cause the rotor to become unbalanced and it will begin to rotate if not held in place.



WARNING: Serious injury or death can occur if rotor is not secured by a lifting device while removing tool holders.





Section 6: Troubleshooting the 9564 DURATECH HORIZONTAL GRINDER


6.1 troubleshooting the PT Tech clutch

INDICATED FAULT	PROBLEM	SOLUTIONS
<p>I/O <u>Power LED fault</u></p>		
<p>The "Power LED" should be illuminated when the Engine Ignition Switch/Key is in every position other than the OFF position. If this is not the case, check the following items:</p>		
<p>Power LED not illuminated.</p>	<p>Controller not receiving switched power from the ignition switch.</p>	<ul style="list-style-type: none"> ❑ Check 5 amp fuse located in the wiring harness leading to pin 8 of the Grey "A" receptacle on the Master Unit. Make sure that this fuse is not blown. ATTENTION: this fuse must be replaced with a 5-amp fuse only. The use of any fuse greater than 5 amps will void the warranty by leaving the controller electrically unprotected. ❑ With the Engine Ignition Key in every position (other than OFF) check the wire connected to pin 1 of the Grey "A" receptacle on the Master Unit for voltage. If no voltage is found, check for a cut wire or check Engine Ignition Key terminal connections. ❑ Check that the wire connected to pin 8 of the Grey "A" receptacle on the Master Unit is connected directly to the positive (+) terminal of the battery with no break in the wire. ❑ Check that the wire connected to pin 7 of the Grey "A" receptacle on the Master Unit is connected directly to the negative (-) terminal of the battery with no break in the wire. ❑ Check that the wire connected to pin 1 of the Grey "A" receptacle on the Master Unit is not losing momentary power while the engine is cranking.
<p>Power LED flashing in rhythm.</p>	<p>Controller receiving power below 20 volts. (Clutch will not engage with this condition.)</p>	<ul style="list-style-type: none"> ❑ Check the condition of the battery. If necessary connect a battery charger to the machine's battery and charge to a minimum of 24 volts.
<p>Power LED randomly flickering.</p>	<p>Bad battery ground.</p>	<ul style="list-style-type: none"> ❑ Check that the wire connected to pin 7 of the Grey "A" receptacle on the



		Master Unit is connected directly to the negative (-) terminal of the battery with no break in the wire.
 <p><u>INPUT Speed Detected LED Indicator</u> While the engine is running the "INPUT Speed Detected LED" must be illuminated steady. If this is not the case, check the following items:</p>		
INPUT Speed Detected LED not illuminated or randomly flickering.	Controller not receiving signal from INPUT Speed Pickup.	<input type="checkbox"/> Check the speed pickup that is installed in the HPTO unit at the location labeled "INPUT SPEED". Screw in the speed pickup until it stops, then back out <u>2-1/2 turns</u> . While tightening locknut, make sure that the speed pickup does not move. <input type="checkbox"/> Check the wire running from the speed pickup to the Master Unit to insure that the wire is not cut. <i>This wire must be shielded wire.</i> <input type="checkbox"/> Check that the bare metal wire (drain) is connected at pin 12 of the Grey "A" receptacle on the Master Unit and connected at the speed pickup end. The bare wire should NOT be frame grounded. <input type="checkbox"/> Remove speed pickup and check probe end to make certain it is not damaged. <input type="checkbox"/> Replace speed pickup with a new one.
 <p><u>OUTPUT Speed Detected LED Indicator</u> While the output shaft of the HPTO unit is spinning the "OUTPUT Speed Detected LED" must be illuminated steady. If this is not the case, check the following items:</p>		
OUTPUT Speed Detected LED not illuminated or randomly flickering.	Controller not receiving signal from the OUTPUT Speed Pickup.	<input type="checkbox"/> Check the speed pickup that is installed in the HPTO unit at the location labeled "OUTPUT SPEED". Screw in the speed pickup until it stops, then back out <u>2-1/2 turns</u> . While tightening locknut, make sure that the speed pickup does not move. <input type="checkbox"/> Check the wire running from the speed pickup to the Master Unit to insure that the wire is not cut. <i>This</i>



		<p>wire must be shielded wire.</p> <ul style="list-style-type: none"> ❑ Check that the bare metal wire (drain) is connected at pin 3 of the Black "B" receptacle on the Master Unit and connected at the speed pickup end. The bare wire should NOT be frame grounded. ❑ Remove speed pickup and check probe end to make certain it is not damaged. ❑ Contact PT Tech to order a replacement speed pickup.
<div style="display: flex; align-items: flex-start;">  <div> <p><u>Pressure Transducer</u> <u>Detected LED Fault</u></p> <p>When the engine ignition switch in the on position and the controller powered on, the "PRESSURE TRANSDUCER DETECTED" LED should be illuminated.</p> </div> </div>		
<p>Power LED on the controller is illuminated but the Pressure Transducer LED is not illuminated.</p>	<p>Controller is not receiving a good signal from the pressure transducer.</p>	<ul style="list-style-type: none"> ❑ Check the wires running to the pressure transducer mounted in the HPTO hydraulic manifold at the location stamped "PS/PT". ❑ Turn the ignition key to the run position (do not start the engine). With a volt meter check the voltage of the RED wire connected to pin 10 of the Black "B" receptacle on the Master Unit. The voltage should read approximately 12 volts DC. If not, check wiring or replace Master Unit. ❑ Turn the ignition key to the run position (do not start the engine). With a volt meter check the voltage of the WHITE wire connected to pin 12 of the Black "B" receptacle on the Master Unit. The voltage should read no less than 0.8 volts DC. If not, check wiring or replace pressure transducer. ❑ Consult PT Tech to order a replacement Pressure Transducer.



Clutch will not engage

After pushing and holding the “Engage/Disengage Button” (start button) for 3 seconds, the clutch will not engage. If the clutch will not engage, check the following items:

Clutch “Engage/Disengage” LED not illuminated after holding start button for 3 seconds.


Clutch not engaging.

- Check that the voltage stamped on the side of the coil is 24 volts and matches that of the equipments voltage supply. ***The system voltage must be 24 volts. IF the equipment system voltage is 12 volts, then contact PT Tech.***
- The Power LED, Pressure Transducer LED, and the INPUT Speed Detected LED must be illuminated steady (not flickering). If not, the clutch will not engage. *Refer to those sections of the Troubleshooting section of this manual.*
- The controller must be receiving a minimum of 20 volts DC from the positive terminal of the battery to pin 8 of the Grey “A” receptacle on the Master Unit. While cranking the engine, if the machine battery is not fully charged, the voltage may drop below 20 volts and cause the controller to behave erratically.





<p>Clutch “Engage/Disengage” LED is flashing after holding start button for 3 seconds, but clutch does not engage after at least 30 seconds.</p>	<p>Clutch not engaging and Oil Pressure LED is flashing.</p>	<ul style="list-style-type: none"> ❑ Check that the voltage stamped on the side of the coil is 24 volts and matches that of the equipments voltage supply. The system voltage must be 24 volts. IF the equipment system voltage is 12 volts, then contact PT Tech. ❑ Check for any oil leaks or a low fluid level in the reservoir. ❑ Install a flow meter in the “clutch” hose (not the lube hose). Engage the clutch and monitor the flow meter. While attempting to engage the clutch the flow in the clutch hose should not exceed 0.5 GPM for any extended period of time. If excess flow is detected contact PT Tech for assistance.
<div style="display: flex; align-items: center;"> <p><u>OIL PRESSURE</u></p> </div> <p>Check the following items:</p>		
<p>OIL PRESSURE LED illuminated steady <u>AND</u> Pressure Transducer LED is NOT illuminated.</p>	<p>There is a problem with the Pressure Transducer.</p>	<ul style="list-style-type: none"> ❑ Refer to the Troubleshooting Section titled, “Pressure Transducer Detected LED Fault”.
<p>OIL PRESSURE LED illuminated steady.</p>	<p>There is currently an oil pressure fault in the system.</p> <p>SHUT DOWN THE ENGINE IMMEDIATELY and check the following items.</p> <p>The oil pressure fault will prevent clutch engagement.</p>	<ul style="list-style-type: none"> ❑ Check all hoses for leaks. ❑ Check reservoir fluid level. ❑ Check oil filter. ❑ Check cooler for a leak. ❑ Install a 0-1000 psi pressure gauge with an SAE #4 o-ring fitting into the manifold at the location stamped “GP1”. With the engine running, and the clutch either engaged or disengaged, the dial on the pressure gauge should read at least 260psi. If this condition is true then there is a PWM valve problem, a pressure transducer problem, or a wiring problem. ❑ Install a 0-300 psi pressure gauge with an SAE #4 o-ring fitting into the manifold at the location stamped “GP2”. With the engine running and the clutch DISENGAGED, the dial on the pressure gauge should read 225psi. If this condition is not true than there is a problem with the PWM valve. The pressure in the GP2 port should be 225psi when the clutch is disengaged and fully engaged. It is normal during the process of


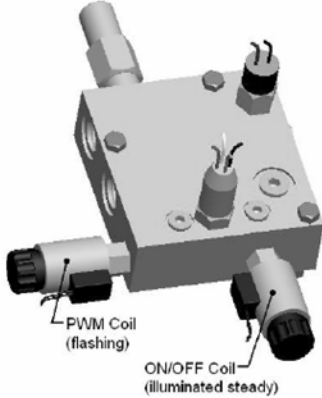


		<p>engaging (with the CLUTCH ENGAGE LED flashing) for the pressure at the GP2 port to be low and slowly increase during the process of engaging.</p> <ul style="list-style-type: none"> <input type="checkbox"/> With the pressure gauge connected and the engine running, check the controller display to see if the "PRESSURE TRANSDUCER DETECTED LED" is illuminated. If the pressure gauge indicates that the pressure is good but the LED is off, then the pressure transducer may be bad or there is a problem with the wiring. <input type="checkbox"/> Check for possible sources of contamination in the system.
<p>OIL PRESSURE LED flashing.</p>	<p>There was a pressure loss while the clutch was engaged or in the process of engaging.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Push the Engage/Disengage Button for 1 second. If there is still a pressure fault, then the LED will illuminate steady and stop flashing. Refer to Troubleshooting Section titled, "OIL PRESSURE LED illuminated steady". <input type="checkbox"/> If after pushing the Engage/Disengage Button for 1 second, the LED goes out, then there is no longer a pressure fault problem and the clutch can be engaged. <input type="checkbox"/> Check that the Pressure Transducer LED is not turned off. <input type="checkbox"/> Check that the Power ON/OFF LED is not flashing. <input type="checkbox"/> Check to make certain that both 24 volt coils are connected to the valve at the manifold. <input type="checkbox"/> Check for any oil leaks or a low fluid level in the reservoir. <input type="checkbox"/> Check for possible sources of contamination in the system.
<p> <u>OIL TEMPERATURE</u></p> <p>Check the following items:</p>		
<p>OIL TEMPERATURE LED illuminated steady.</p>	<p>HPTO oil system temperature has exceeded 200°F.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Check the cooler for debris that may be blocking the flow of air across the

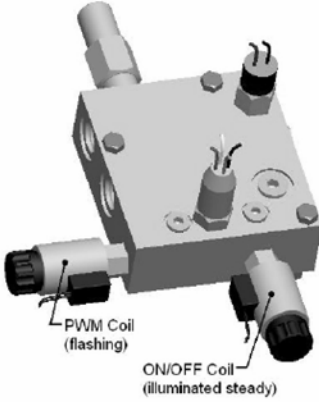




		<p>cooler.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check that the drain line on the bottom of the HPTO housing flows directly to the reservoir with no loops or slopes in the drain line that would prevent oil from gravity flowing back to the reservoir. <input type="checkbox"/> Check that the breather on top of the HPTO housing is clean and replaced with every oil change. <input type="checkbox"/> Check that the capacity of the cooler meets PT Tech specifications. <input type="checkbox"/> Check the continuity across the pressure switch leads. If the temperature of the oil is below 200°F, then there should be continuity across the leads. <input type="checkbox"/> Check that there are no cut wires leading from the controller to the temperature switch. <input type="checkbox"/> Contact PT Tech to order a replacement temperature switch.
 <u>FILTER CLOGGED</u>		
<p>Check the following items:</p>		
OIL FILTER LED illuminated steady.	The HPTO oil filter is clogged.	<ul style="list-style-type: none"> <input type="checkbox"/> Shutdown engine and replace spin-on oil filter.
	The HPTO filter was just replaced and an oil filter fault is still being indicated.	<ul style="list-style-type: none"> <input type="checkbox"/> Check the continuity across the filter switch leads. If the filter has just been changed then there should be continuity across the leads. <input type="checkbox"/> Check that there are no cut wires leading from the controller to the filter switch. <input type="checkbox"/> Contact PT Tech to order a replacement filter switch.
 <u>SAFETY SWITCH</u>		
<p>Check the following items:</p>		
SAFETY SWITCH LED illuminated.	There is a safety switch fault on the machine preventing the clutch from engaging.	<ul style="list-style-type: none"> <input type="checkbox"/> Trace the wire from pins 1 & 4 of the Grey "A" receptacle on the Master Unit to the safety switch on the equipment. If no safety switch is present, then connect the two wires together so the controller is receiving power at pin 4 when the system is






		<p>powered on.</p> <ul style="list-style-type: none"> ❑ If a safety switch is present, insure that it is receiving power and in good working order. ❑ Check that the wire connected to pin 4 of the Grey "A" receptacle on the Master Unit is not cut.
<p> <u>COIL FAULT</u></p> <p>Check the following items:</p>		
<p>COIL FAULT LED is flashing.</p>	<p>Problem with the PWM coil or wires in the manifold at location stamped PBFB/RBAP.</p>  <p>PWM Coil (flashing) ON/OFF Coil (illuminated steady)</p>	<ul style="list-style-type: none"> ❑ Check that the wires from pins 7 & 9 of the Grey "A" receptacle on the Master Unit are neither cut nor connected together. ❑ Check that the voltage stamped on the side of the coil is 24 volts matching that of the equipment's voltage supply. The stampings on the side of the coil MUST match the equipments voltage source. ❑ Make sure all wires are pushed all of the way into the connectors at the Master Unit. ❑ Disconnect the coil from the wiring harness. Using an Ohmmeter, check the resistance across the two wires coming from the coil. The two wires at the coil may need to be cut in order to take this reading. They should be as follows: <ul style="list-style-type: none"> 24 volt (silver) coil = 29.3 ohms +/- 1 ohm. 24 volt (black) coil = 26.2 ohms +/- 1 ohm.
<p>COIL FAULT LED is illuminated steady.</p>	<p>Problem with the ON/OFF coil or wires in the manifold at the location stamped DMDA.</p>	<ul style="list-style-type: none"> ❑ Check that the wires from pins 7 & 10 of the Grey "A" receptacle on the Master Unit are neither cut nor connected together, thus creating a dead short. ❑ Check that the voltage stamped on the side of the coil is 24 volts matching that of the equipment's voltage supply. The stampings on the side of the coil MUST match the equipments voltage source. ❑ Make sure all wires are pushed all of the way into the connectors at the Master Unit. ❑ Disconnect the coil from the wiring



		<p>harness. Using an Ohmmeter, check the resistance across the two wires coming from the coil. <i>The two wires at the coil may need to be cut in order to take this reading.</i> They should be as follows:</p> <p>24 volt (silver) coil = 29.3 ohms +/- 1 ohm</p> <p>24 volt (black) coil = 26.2 ohms +/- 1 ohm</p>
<p> <u>RPM TOO HIGH, while attempting engagement</u></p>		
<p>RPM TOO HIGH LED illuminated steady.</p>	<p>While attempting to engage the clutch, the engine (input) speed is above 1100 RPM.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Check engine idle and lower speed below 1100 RPM, LED should go out.
	<p>Engine speed IS below 1100 RPM, yet the LED is illuminated.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Refer to Troubleshooting Section titled, "Input Speed Detected LED Indicator".
<p>RPM TOO HIGH LED is flashing.</p>	<p>While attempting to engage the clutch, the engine (input) speed was intentionally increased above 1100 RPM.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Do not attempt to increase engine speed while the clutch is in the process of engaging. <input type="checkbox"/> Push the Engage/Disengage Button for 1 second to clear the LED fault. Push and hold the Engage/Disengage Button for 3 seconds to engage the clutch.
	<p>While attempting to engage the clutch, the engine (input) speed signal was lost for more than 2 seconds or the engine stalled.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Refer to Troubleshooting Section titled, "Input Speed Detected LED Indicator". <input type="checkbox"/> Push the Engage/Disengage Button for 1 second to clear the LED fault. Push and hold the Engage/Disengage Button for 3 seconds to engage the clutch.
<p> <u>TOO HIGH, while attempting to disengage</u></p>		
<p>RPM TOO HIGH LED illuminated steady.</p>	<p>While attempting to disengage the clutch, the engine (input) speed is above 1200 RPM.</p>	<ul style="list-style-type: none"> <input type="checkbox"/> Check engine idle and lower speed below 1200 RPM, LED should go out.



	Engine speed IS below 1200 RPM, yet the LED is illuminated.	<input type="checkbox"/> Refer to Troubleshooting Section titled, "Input Speed Detected LED Indicator".
 <u>RPM TOO HIGH, while fully engaged</u>		
RPM TOO HIGH LED is flashing.	This is normal functionality. While clutch was engaged, the speed of the engine dropped below 500 rpm, the controller will attempt to disengage the clutch before the engine comes to a complete stall due to a jammed or locked rotor (cutter-head). Most likely something in the rotor caused a shock load to occur in the system.	<input type="checkbox"/> Refer to Controller Functions Section titled, "RPM TOO HIGH, while fully engaged". <input type="checkbox"/> ATTENTION: Once the clutch is disengaged, shut off the engine and clear any jammed object from the rotor (cutter-head) before attempting to reengage the clutch. <input type="checkbox"/> Push the Engage/Disengage Button for 1 second to clear the LED fault. Push and hold the Engage/Disengage Button for 3 seconds to engage the clutch.
 <u>TIMED LOCKOUT</u>		
TIMED LOCKOUT LED illuminated steady.	This is a normal condition under certain cases.	<input type="checkbox"/> Refer to Controller Functions Section titled, "TIMED LOCKOUT".
	TIMED LOCKOUT LED will not turn off after 5 minutes of being illuminated.	<input type="checkbox"/> Engine must remain running for 5 minutes for the lockout timer to continue to count down. If the engine is turned off, the lockout timer will stop counting down and restart once the engine is restarted. <i>By keeping the engine running the HPTO lubrication oil will cool the friction disc pack most efficiently.</i>
 <u>CLUTCH OVERLOAD</u>		
CLUTCH OVERLOAD LED illuminated steady.	This is a normal condition under certain cases.	<input type="checkbox"/> Refer to Controller Functions Section titled, "CLUTCH OVERLOAD".
	Controller will not engage.	<input type="checkbox"/> Wait for "CLUTCH OVERLOAD LED" to go out, then re-attempt clutch engagement.
	Too great a difference between clutch input (engine) speed and clutch output speed while attempting to engage clutch or while fully engaged.	<input type="checkbox"/> Refer to Troubleshooting Section titled, "Input Speed Detected LED Fault" AND "Output Speed Detected LED Fault". <input type="checkbox"/> Turn off engine and check rotor



		<p>(cutter head) for a jam conditions. Rotor may be partially jammed and preventing a complete system startup.</p> <ul style="list-style-type: none"> ❑ If the rotor rotates freely, verify that the "Output Speed Detected LED" is illuminating once the output shaft of the clutch starts turning. If not, refer to Troubleshooting Section titled, "Output Speed Detected LED Fault". ❑ Check machine driveline components for a problem. ❑ Clutch may be worn out. Consider hours of operation, as clutch may need to be rebuilt.
<p>CLUTCH OVERLOAD LED flashing randomly.</p>	<p>Too great a difference between clutch input (engine) speed and clutch output speed while the clutch is fully engaged. This may indicate that there is abnormal slippage occurring between the input speed (engine) and output speed of the clutch (rotor).</p>	<ul style="list-style-type: none"> ❑ Refer to Controller Functions Section titled, "CLUTCH OVERLOAD". ❑ Refer to Troubleshooting Section titled, "Input Speed Detected LED Fault" AND "Output Speed Detected LED Fault". ❑ Turn off engine and check rotor (cutter head) for a jam conditions. Rotor may be partially jammed. ❑ Check machine driveline components for a problem. ❑ Clutch may be worn out. Consider hours of operation, as clutch may need to be rebuilt.
<p><u>Clutch Disengages Unexpectedly</u></p> <p>The controller will automatically disengage the clutch for six reasons.</p>		
	<ol style="list-style-type: none"> 1. If there is a pressure fault while the clutch is engaged. 2. If the controller loses a signal from the pressure transducer. 3. If the controller loses a signal from the input or output speed pickup. 4. If clutch was engaged with an oil temperature fault for 	<ol style="list-style-type: none"> 1. Refer to Troubleshooting Section titled, "Oil Pressure". 2. Refer to Troubleshooting Section titled, "Pressure Transducer Detected LED Fault". 3. Refer to Troubleshooting Section titled, "Input Speed Detected Fault" or "Output Speed Detected Fault". 4. Refer to the Controller Functions Section titled, "Fault - Oil Temperature".



	<p>more than 15 minutes.</p> <p>5. If the clutch was engaged with an oil filter fault for more than 15 minutes.</p> <p>6. If the clutch was overloaded while engaged. See "Controller Functions" Section.</p> <p>7. If the engine speed dropped below 500 rpm during a shockload jam condition.</p>	<p>5. Refer to the Controller Functions Section titled, "Fault – Filter Clogged".</p> <p>6. Refer to the Controller Functions Section titled, "Clutch Overload".</p> <p>7. Refer to the Controller Functions Section titled, "Fault – RPM too high, while fully engaged".</p>
<p><u>Beacon Light not flashing</u></p> <p><i>ATTENTION: do not allow the system to run with a burned out beacon light. This light is necessary to warn the operator of critical clutch conditions. Contact PT Tech for bulb replacement.</i></p>		
<p>Beacon light not flashing.</p>	<p>While holding the "Engage/Disengage Button" to engage the clutch, the beacon light is not flashing during the 3-second hold time.</p>	<p><input type="checkbox"/> Beacon light is burned out and must be replaced.</p> <p><input type="checkbox"/> Check wires leading to the beacon light and make certain they are not cut or shorted out.</p>



6.2 General Troubleshooting

general troubleshooting

PROBLEM	CAUSE	REMEDY
1. No grinding capacity.	<ol style="list-style-type: none"> 1. The screen is plugged. 2. The hammers or screens are badly worn. 3. Materials are too light or fluffy. 	<ol style="list-style-type: none"> 1. Clean out the holes in the screen. 2. Replace or turn worn parts. 3. Mix the lighter material with heavier material or place heavier. 4. Use a larger screen.
2. Conveyors are stalling or causing a pressure fault.	<ol style="list-style-type: none"> 1. Conveyors are plugged. 2. Conveyors are rubbing on frame. 	<ol style="list-style-type: none"> 1. Unplug conveyors. 2. Adjust the belt tracking.
3. The machine vibrates excessively.	<ol style="list-style-type: none"> 1. A hammer is broken. 2. The rotor bearing is defective. 3. Foreign material is wrapped in the rotor. 4. The hammer pattern is incorrect. 	<ol style="list-style-type: none"> 1. Replace the broken hammer. See page 72 for more information about replacing hammers. 2. Replace the rotor bearing. 3. Remove the foreign material. 4. Remove hammers + shanks + weigh.
4. The engine looses excessive RPM's before the floor stops.	<ol style="list-style-type: none"> 1. The feed control is not adjusted properly. 	<ol style="list-style-type: none"> 1. See the section on the feed control in the operations section of this manual.
5. The hydraulic oil overheats.	<ol style="list-style-type: none"> 1. Oil cooler fins are plugged with debris. 2. Rotating screen on front of radiator is plugged. 3. Engine fan belts are slipping. 4. Oil level is low. 	<ol style="list-style-type: none"> 1. Blow out cooler fins. 2. Remove debris from rotating screen. See section on rotating screen below. 3. Tighten fan belts.
6. Rotating screen on front of radiator is not staying clean.	<ol style="list-style-type: none"> 1. Metal seal and plastic brush on suction tube are not close enough to allow suction air to remove debris. 2. Suction tube is plugged with debris. 3. Excessive debris is being deposited screen. 	<ol style="list-style-type: none"> 1. Adjust plastic brush so that it scrapes on screen; adjust the metals seal so that there is no more than 1/4" clearance between the screen and the seal. 2. Remove the suction tube and unplug. 3. Reposition grinder so wind blows material away from rotating screen.
7. The engine overheats.	<ol style="list-style-type: none"> 1. Cooler fins are plugged with debris. 2. Rotating screen on front of radiator is plugged. 3. Engine fan belts are slipping. 	<ol style="list-style-type: none"> 1. Blow out cooler fins. 2. Remove debris from rotating screen. See section on rotating screen above. 3. Tighten fan belts.



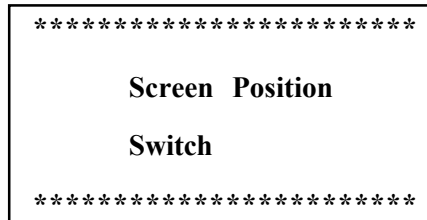
6.3 Troubleshooting the feed control and electronic monitoring system (PLC)

A programmable logic controller (PLC) is the brains behind the DuraTech 9564 Horizontal Grinder. This system is the feed control and also controls and monitors other function on the machine. It is comprised of two modules and one display unit. The display unit will display numerous screens which indicate the functions of the machine and it can also aid in diagnostics of problems. The modules have numerous LED lights which can also be helpful when doing troubleshooting.

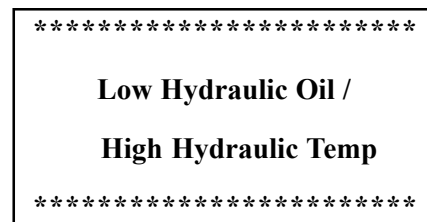
The display screen is on the upper left hand corner of the control panel while the two modules are located within the control panel. To access the modules remove the two 3/8” bolts on the right hand side of the control panel and swing the front door open. Two switches are located below the screen; scroll up/down and enter/back. These two switches are used to navigate through the display.

Fault display screens:

If a fault occurs it will be indicated on the display screen, the fault display screens as well as how the machine reacts are shown below:



- A Screen Position Switch Fault will cause the following actions:
 - o The engine will be sent to idle and the clutch will be disengaged
 - o The conveyor will be stopped
 - o Feed Floor and Feed Roll will reverse for a set amount of time and then turn off



- Low Hydraulic Oil or High Hydraulic Temp Switch
 - o This switch is a temperature and level switch. You will need to check the oil level and the temperature to see which one is causing the fault. There is a 1 second delay to buffer any level or temperature spikes.
 - o A Low Hydraulic Oil or High Hydraulic Temp Fault will cause the following actions:
 - After a 10 second delay the conveyor will be stopped
 - The engine will be sent to idle and the clutch will be disengaged
 - Feed Floor and Feed Roll will reverse for a set amount of time and then turn off



PT Clutch Fault

- PT Clutch Fault
 - o You will receive this fault if the PT Clutch has one of the following problems:
 - High clutch temperature
 - Clogged Filter
 - o A PT Clutch Fault will cause the following actions:
 - The grinder will operate for five minutes
 - 15 seconds before the clutch disengages, the Feed Floor and Feed Roll reverse
 - The engine will be sent to idle and the clutch will be disengaged
 - The conveyor will stop when engine is sent to idle.

**Rotor Cover
Switch!!**

- Rotor Cover Switch
 - o You will receive this fault if the Rotor Cover is open when trying to start the machine, or while the rotor is turning.
 - o A Rotor Cover switch fault, when trying to start the rotor will cause the following action:
 - The Feed Floor and Feed Roll will not be turned on and the clutch will not be allowed to engage.
 - o A Rotor Cover switch fault with rotor engaged will cause the following actions:
 - The Feed Floor and Feed Roll will reverse for a set amount of time and then turn off.
 - The engine will be sent to idle and the clutch will be disengaged.



**Belly Conveyor
 PSI Switch**

- Belly Conveyor Pressure Switch
 - o You will receive this fault if the Belly Conveyor pressure exceeds 2,750 PSI for 10 seconds, or if the wire is disconnected from the switch.
 - o A Belly Conveyor pressure switch fault will cause the following actions:
 - Belly Conveyor will stop
 - The Feed Floor and Feed Roll will reverse for a set amount of time and will not be turned on.

**Feed Roll
 PSI Switch**

- Feed Roll Pressure Switch
 - o You will receive this fault if the Feed Roll pressure exceeds 2,750 PSI for 20 seconds or if the wire is disconnected from the switch.
 - o A Feed Roll pressure switch fault will cause the following action:
 - The Feed Roll will reverse for three seconds and will not be turned on

Rotor Pulse Pickup

- Rotor Pulse Pickup Fault
 - o The Rotor Pulse pick up fault will appear when the rotor RPM drops below the low set point or loss of signal from the pulse pickup.
 - o If the rotor rpm falls below the bottom set point for three seconds, the clutch disengages and the Feed Roll and Feed Floor will have to be manually turned back on.



Feed Floor
PSI Switch

- Feed Floor Pressure Switch
 - o You will receive this fault if the Feed Floor pressure exceeds 2,750 PSI for 20 seconds or if the wire is disconnected from the switch.
 - o A Feed Floor pressure switch fault will cause the following action:
 - The Feed Floor will reverse for three seconds and will not be turned on

Output Name
Output is: Off
Output is Open: No
Output is Short: No

- The output fault screen
 - o You will receive a fault if one of the outputs has an open or short.
 - o You will see the following output names called out:
 - Feed Roll FWD
 - Feed Roll REV
 - Feed Floor FWD
 - Feed Floor REV
 - Belly CON FWD
 - Clutch Disengage
 - Blocking Valve
 - Feed Roll Down
 - Feed Roll Up
 - Clutch Disengage Switch



**Press ENTER to Clear
Faults!! If a output
Has a open or a
Short Cycle POWER!!!!**

- The main fault screen
 - o When there is a fault, the fault that occurred will stay on for 5 seconds before it will change to the next fault or the main fault screen will appear. The faults will continue to show until the problem is solved and the fault is cleared.
 - o You will need to press Enter to clear a fault unless the fault is on an output, then you will have to cycle power to the controller.

In addition to the fault display screens shown above the PLC also has a fault counter display screen available, this screen will give you the number of faults that have occurred.

Belly Conv PSI	0
Feed Roll PSI	0
Feed Floor PSI	0
Rotor Cover SW	0

Feed Floor PSI	0
Rotor Cover SW	0
Mid Rotor RPM	0
Low Rotor RPM	0

- By using the Up / Down switch you will get additional faults.
- To leave this screen, use the Back switch on the main control panel.
- The following are descriptions of what causes the faults:
 - o The Belly Conveyor PSI fault will count the number of times the belly conveyor pressure switch is activated.
 - o The Feed Roll PSI fault will count the number of times the feed roll pressure switch is activated
 - o The Feed Floor PSI fault will count the number of times the feed floor pressure is activated.
 - o The Rotor Cover fault will count the number of times the rotor cover switch is activated.
 - o The Mid Rotor RPM will count the number of times the rotor RPM drops below the mid set point.
 - o The Low Rotor RPM will count the number of times the rotor RPM drops below the low set point.



To access the fault display screen, follow these steps:

1. Scroll down until the screen below is displayed, press enter.

**Press ENTER to
Change Machine
Settings**

- Pressing ENTER in this screen will allow you to make changes to the Grinding Modes, Contrast of the Screen, the Back Lighting of the Screen, RPM Set Point, check the number of faults, and allow you to Reset to the Original Factory Settings.

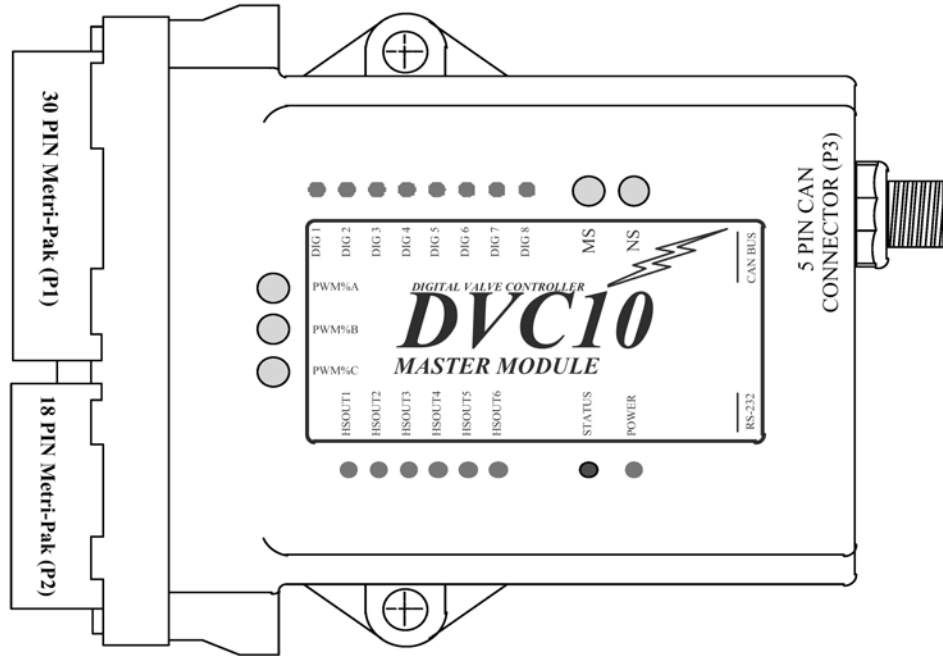
2. Scroll down until the screen below is displayed, press enter again.

**Press ENTER to
Check Number
Of Faults**

The two control modules (DVC 10 and DVC 50) located within the control panel both receive inputs and send outputs. The inputs are sent by the operator via the remote control or the control panel; inputs can also be relayed via sensors on the machine. Outputs are sent from the modules to machine coils on the hydraulic valves or switches. The LED lights on the modules indicate the status of the inputs and outputs. An overview of the LED's for each module is below:



I/O Table DVC10:



I/O LIST DVC10					
INPUT	FUNCTION	INPUT	FUNCTION	OUTPUT	FUNCTION
DIG1	Feed Floor Forward	UNI-1	Rotor RPM	PWM%A	Feed Floor
DIG2	Feed Floor Reverse	UNI-2	Under Speed Off	HSOUT1	Feed Floor Forward
DIG3	Feed Roll Forward	UNI-3	Feed Roll Speed Up	HSOUT2	Feed Floor Reverse
DIG4	Belly Conveyor PSI Switch	ANA-1	Feed Roll Speed Down	PWM%B	Feed Roll
DIG5	Feed Roll PSI Switch	ANA-2	Feed Floor Speed Up	HSOUT3	Feed Roll Forward
DIG6	Feed Floor PSI Switch	ANA-3	Feed Floor Speed Down	HSOUT4	Feed Roll Reverse
DIG7	Feed Roll Reverse	-		PWM%C	NC
DIG8	Under Speed On	-		HSOUT5	Belly Conveyor Forward
-		-		HSOUT6	Clutch Remote Disengage

Input functions in gray do not have any lights indicating their usage.

LED INDICATORS DVC10		
NAME	NO FAULT	FAULT
POWER	SOLID GREEN	<ul style="list-style-type: none"> • BLINKING GREEN = INPUT VOLTAGE >30VDC • OFF = INPUT VOLTAGE <8VDC
STATUS	OFF	NOT USED
MODULE STATUS (MS)	SOLID GREEN	<ul style="list-style-type: none"> • FLASHING GREEN = DEVICE IN STANDBY STATE • FLASHING RED = POWER SUPPLY OUT OF RANGE • SOLID RED = NOT USED • FLASHING RED/GREEN = DEVICE IS IN SELF-TEST
NETWORK STATUS (NS)	SOLID GREEN	<ul style="list-style-type: none"> • FLASHING GREEN = DEVICE ON-LINE BUT HAS NOT CONNECTED TO OTHER MODULES • FLASHING RED = ONE OR MORE CONNECTIONS ARE IN A TIMED-OUT STATE • SOLID RED = AN ERROR HAS BEEN DETECTED ON THE CANBUS THAT WILL NOT ALLOW THE MODULE TO COMMUNICATE
DIG 1 - 8	GREEN WHEN ON	NA
HSOUT 1 - 6	SOLID GREEN WHEN ON	<ul style="list-style-type: none"> • 1-BLINK/SECOND = OPEN CIRCUIT • 4-BLINK/SECOND = SHORT CIRCUIT
PWM A - C	SOLID RED TO SOLID GREEN WHEN ON RED=0% GREEN=100%	<ul style="list-style-type: none"> • FLASHING RED = SHORT CIRCUIT • FLASHING GREEN = OPEN CIRCUIT



Fault Code Overview

DVC 10 Fault/Blink Codes

Power Light- If the power light is on continuously, the DVC 10 is receiving the proper power from the power supply. If the power light is blinking green, the power supply is supplying the DVC 10 with more than 30 VDC. If the power light is off, the power supply is supplying the DVC 10 with less than 8 VDC.

NS Light- The NS light monitors the communication line between the controller and other modules. If the NS light is continuously green, the communication network is fine. If the NS light is flashing green, the module is not communicating with any of the other modules on the network. If the NS light is flashing red, one or more of the modules on the communication network are not communicating. If the NS light is solid red, there is something wrong with the network that is not allowing the module to communicate with the other modules on the network.

MS Light- The MS light monitors the status of the DVC10 module. If the MS light is solid green, the module is working fine. If the MS light is flashing green, the module is in a standby mode. If the MS light is flashing red, the power supply to the module is out of range and the operator should refer back to the power light to further determine the problem. If the MS light is flashing red then green, the module is in self-test/programming mode and will not be able to operate anything on the machine.

Dig 1 Light- If the Dig 1 light is solid green, the Feed Floor Forward input is on.

Dig 2 Light- If the Dig 2 light is solid green, the Feed Floor Reverse input is on.

Dig 3 Light- If the Dig 3 light is solid green, the Feed Roll Forward input is on.

Dig 4 Light- If the Dig 4 light is solid green, the Belly Conveyor PSI switch input is on.

Dig 5 Light- If the Dig 5 light is solid green, the Feed Roll PSI switch input is on.

Dig 6 Light- If the Dig 6 light is solid green, the Feed Floor PSI switch input is on.

Dig 7 Light- If the Dig 7 light is solid green, the Feed Roll Reverse input is on.

Dig 8 Light- If the Dig 8 light is solid green, the Floor Control On input is on.

HSOUT1 Light- If the HSOUT1 light is green, the Feed Floor Forward coil is on. If the light blinks 1 blink/sec, the wires to the Feed Floor Forward coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.

HSOUT2 Light- If the HSOUT2 light is green, then the Feed Floor Reverse coil is on. If the light blinks 1 blink/sec then the wires to the Feed Floor Reverse coil are broken or not connected. If the light blinks 4 blinks/sec then the wires to the coil are shorted.

HSOUT3 Light- If the HSOUT3 light is green, the Feed Roll Forward coil is on. If the light blinks 1 blink/sec, the wires to the Feed Roll Forward coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.

HSOUT4 Light- If the HSOUT4 light is green, the Feed Roll Reverse coil is on. If the light blinks 1 blink/sec, the wires to the Feed Roll Reverse coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.



HSOUT5 Light- If the HSOUT5 light is green, the Belly Conveyor Forward coil is on. If the light blinks 1 blink/sec, the wires to the Belly Conveyor Forward coil are broken or not connected. If the light blinks 4 blinks/sec, then the wires to the coil are shorted.

HSOUT6 Light- If the HSOUT6 light is green, the Clutch Remote Disengage coil is on. If the light blinks 1 blink/sec, the wires to the Clutch Safety Switch coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.

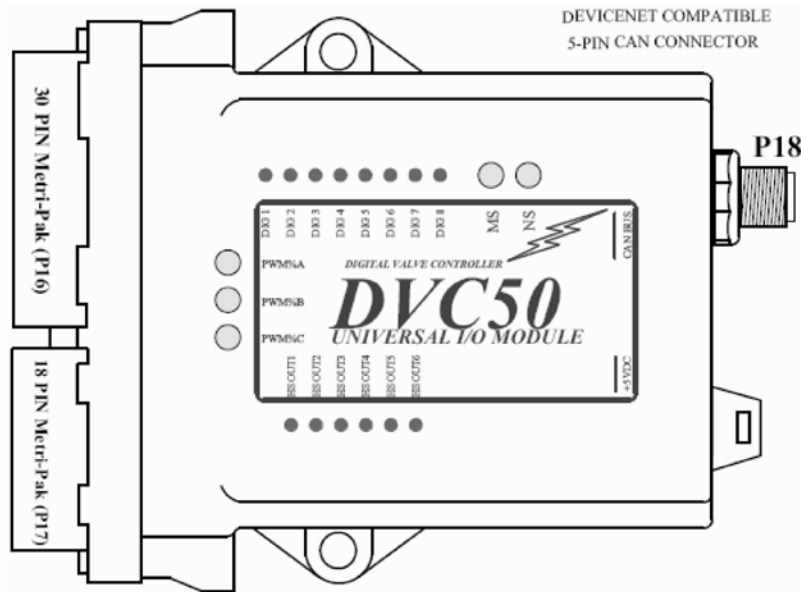
PWM%A Light-If the PWM%A light is on, the proportional output to the Engine Speed Increase coil is active. The PWM%A light will vary in color from red to green depending on how close you are to having your full output. If the output is turned on to its max current setting, the light will be green and if the output is at the min current setting, it will be red. From the min setting to the max setting the light will vary in color proportionally until the output turns off, and the light turns off. If the light is flashing red, the low side to the coil is shorted to power. If the light is flashing green the wire is broken and not making contact or the wire is not connected.

PWM%B Light-If the PWM%B light is on, the proportional output to the Engine Speed Decrease coil is active. The PWM%B light will vary in color from red to green depending on how close you are to having your full output. If the output is turned on to its max current setting, the light will be green and if the output is at the min current setting, it will be red. From the min setting to the max setting the light will vary in color proportionally until the output turns off, and the light turns off. If the light is flashing red, the low side to the coil is shorted to power. If the light is flashing green, the wire is broken and not making contact or the wire is not connected.

PWM%C Light-Not Used



I/O Table DVC50:



I/O LIST DVC50					
INPUT	FUNCTION	INPUT	FUNCTION	OUTPUT	FUNCTION
DIG1	Engine Speed Increase	A/P-1	Feed Roll Down PSI	PWM%A	Engine Speed Increase
DIG2	Engine Speed Decrease	A/P-2	Rotor Cover	HSOUT1	Clutch Safety Switch
DIG3	Clutch Fault from Beacon			HSOUT2	Feed Roll Down
DIG4	Hydraulic Low Level / Temp	ANA-1	NC	PWM%B	Engine Speed Decrease
DIG5	Screen Position Switch	ANA-2	NC	HSOUT3	Feed Roll Up
DIG6	Feed Roll Up	ANA-3	NC	HSOUT4	Feed Roll Block
DIG7	Feed Roll Down	ANA-4	NC	PWM%C	NC
DIG8	Conveyors Forward	-		HSOUT5	NC
-		-		HSOUT6	NC

Input functions in gray do not have any lights indicating their usage.

LED INDICATORS DVC50		
NAME	NO FAULT	FAULT
POWER	SOLID GREEN	<ul style="list-style-type: none"> • BLINKING GREEN = INPUT VOLTAGE >30VDC • OFF = INPUT VOLTAGE <8VDC
STATUS	OFF	NOT USED
MODULE STATUS (MS)	SOLID GREEN	<ul style="list-style-type: none"> • FLASHING GREEN = DEVICE IN STANDBY STATE • FLASHING RED = POWER SUPPLY OUT OF RANGE • SOLID RED = NOT USED • FLASHING RED/GREEN = DEVICE IS IN SELF-TEST
NETWORK STATUS (NS)	SOLID GREEN	<ul style="list-style-type: none"> • FLASHING GREEN = DEVICE ON-LINE BUT HAS NOT CONNECTED TO OTHER MODULES • FLASHING RED = ONE OR MORE CONNECTIONS ARE IN A TIMED-OUT STATE • SOLID RED = AN ERROR HAS BEEN DETECTED ON THE CANBUS THAT WILL NOT ALLOW THE MODULE TO COMMUNICATE
DIG 1 - 8	GREEN WHEN ON	NA
HSOUT 1 - 6	SOLID GREEN WHEN ON	<ul style="list-style-type: none"> • 1-BLINK/SECOND = OPEN CIRCUIT • 4-BLINK/SECOND = SHORT CIRCUIT
PWM A - C	SOLID RED TO SOLID GREEN WHEN ON RED=0% GREEN=100%	<ul style="list-style-type: none"> • FLASHING RED = SHORT CIRCUIT • FLASHING GREEN = OPEN CIRCUIT



DVC 50 Fault/Blink Codes

Power Light- If the power light is on continuously, the DVC 50 is receiving the proper power from the power supply. If the power light is blinking green, the power supply is supplying the DVC 50 with more than 30 VDC. If the power light is off, the power supply is supplying the DVC 50 with less than 8 VDC.

NS Light- The NS light monitors the communication line between the controller and other modules. If the NS light is continuously green, the communication network is fine. If the NS light is flashing green, the module is not communicating with any of the other modules on the network. If the NS light is flashing red, one or more of the modules on the communication network are not communicating. If the NS light is solid red, there is something wrong with the network that is not allowing the module to communicate with the other modules on the network.

MS Light- The MS light monitors the status of the DVC50 module. If the MS light is solid green, the module is working fine. If the MS light is flashing green, the module is in a standby mode. If the MS light is flashing red, the power supply to the module is out of range and the operator should refer back to the power light to further determine the problem. If the MS light is flashing red then green, the module is in self-test/programming mode and will not be able to operate anything on the machine.

Dig 1 Light- If the Dig 1 light is solid green, the Engine Speed Increase input is on.

Dig 2 Light- If the Dig 2 light is solid green, the Engine Speed Decrease input is on.

Dig 3 Light- If the Dig 3 light is solid green, the Clutch Fault from Beacon input is on.

Dig 4 Light- If the Dig 4 light is solid green, the Hydraulic low level/Temp input is on.

Dig 5 Light- If the Dig 5 light is solid green, the Screen Position Switch input is on.

Dig 6 Light- If the Dig 6 light is solid green, the Feed Roll Up input is on.

Dig 7 Light- If the Dig 7 light is solid green, the Feed Roll Down input is on.

Dig 8 Light- If the Dig 8 light is solid green, the Conveyors Forward input is on.

HSOUT1 Light- If the HSOUT1 light is green, a signal is being sent to the clutch safety switch. If the light blinks 1 blink/sec, the wires to the clutch safety switch coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.

HSOUT2 Light- If the HSOUT2 light is green, then the Feed Roll Down coil is on. If the light blinks 1 blink/sec, the wires to the Feed Roll Down coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.

HSOUT3 Light- If the HSOUT3 light is green, the Feed Roll Up coil is on. If the light blinks 1 blink/sec, the wires to the Feed Roll Up coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.

HSOUT4 Light- If the HSOUT4 light is green, then the Feed Roll Blocking coil is on. If the light blinks 1 blink/sec, the wires to the Feed Roll Blocking coil are broken or not connected. If the light blinks 4 blinks/sec, the wires to the coil are shorted.

HSOUT5 Light- Not Used

HSOUT6 Light- Not Used



PWM%A Light-If the PWM%A light is on, the proportional output to the Engine Speed Increase coil is active. The PWM%A light will vary in color from red to green depending on how close you are to having your full output. If the output is turned on to its max current setting, the light will be green and if the output is at the min current setting, it will be red. From the min setting to the max setting the light will vary in color proportionally until the output turns off, and the light turns off. If the light is flashing red, the low side to the coil is shorted to power. If the light is flashing green the wire is broken and not making contact or the wire is not connected.

PWM%B Light-If the PWM%B light is on, the proportional output to the Engine Speed Decrease coil is active. The PWM%B light will vary in color from red to green depending on how close you are to having your full output. If the output is turned on to its max current setting, the light will be green and if the output is at the min current setting, it will be red. From the min setting to the max setting the light will vary in color proportionally until the output turns off, and the light turns off. If the light is flashing red, the low side to the coil is shorted to power. If the light is flashing green, the wire is broken and not making contact or the wire is not connected.

PWM%C Light-Not Used



troubleshooting reference table

PROBLEM	CAUSE	REMEDY
Feed roll and feed floor reverse excessively in unison	Rotor RPM dropping below MID Rotor RPM set point. Belly conveyor pressure is rising above 2750 psi and falling back below 2750 psi.	Decrease the feed roll and feed floor speed, the engine is being lugged excessively. If the engine is not being lugged, check the fault counter screen to see if the Mid Rotor RPM is accumulating faults. If it is check the speed pickup. Belly conveyor is either plugged or rubbing on an object. Unplug if necessary. Check the tracking and look for evidence of rubbing on the belt.
Feed Roll reverses and then goes forward	Pressure above 2750 psi in circuit.	This is normal during grinding, as the roll encounters an object it cannot move forward it will pressure out and reverse to roll the object. If it is happening excessively decrease the roll speed.
Feed Floor reverses and then goes forward	Pressure above 2750 psi in circuit.	This is normal during grinding, as the floor encounters an object it cannot move forward it will pressure out and reverse to roll the object. If it is happening excessively decrease the floor speed.
Engine is sent to idle and the clutch is disengaged	Screen have broke away Low hydraulic oil/high hydraulic oil temperature PT Tech clutch fault Rotor cover switch	Check screens, if they have broken away reset them. If screens have not broken away check screen sensor. The yellow LED light on the back of the sensor will be illuminated if the screens are broke away. If the screens are not broke away and the light is illuminated check for objects in front of the sensor. Make sure screen reset cylinders are retracted. Check hydraulic oil level and temperature on sight gauge. Will be triggered by a high clutch oil temp or clogged filter. Refer to the PT Tech troubleshooting section. Check rotor cover to ensure that the locking bolts are in place. If bolts are in place check the sensor, the yellow LED light should be illuminated, if not adjust or replace sensor.
Feed Roll and Feed Floor reverse and stop	Belly conveyor pressure exceeded 2750 psi for more than 10s.	Inspect conveyor to determine what has caused the conveyor to run at high pressure.
Feed Roll reverses and stops	Feed Roll pressure exceeded 2750 psi for more than 20s.	Roll should reverse so this should not occur, if it does the check to see if the wires are going to the correct coil (press Roll reverse and the roll should reverse) HSOUT4 on the DVC 10 should illuminate.
Feed Floor reverses and stops	Feed floor pressure exceeded 2750 psi for more than 20s.	Floor should reverse so this should not occur, if it does the check to see if the wires are going to the correct coil (press Floor reverse and the floor should reverse) HSOUT2 on the DVC 10 should illuminate.
Conveyors stop	Screen have broke away Low hydraulic oil/high hydraulic oil temperature PT Tech clutch fault Belly conveyor pressure is	Check screens, if they have broken away reset them. If screens have not broken away check screen sensor. The yellow LED light on the back of the sensor will be illuminated if the screens are broke away. If the screens are not broke away and the light is illuminated check for objects in front of the sensor. Check hydraulic oil level and temperature on sight gauge. Will be triggered by a high clutch oil temp or clogged filter. Refer to the PT Tech troubleshooting section. Belly conveyor is either plugged or rubbing on an

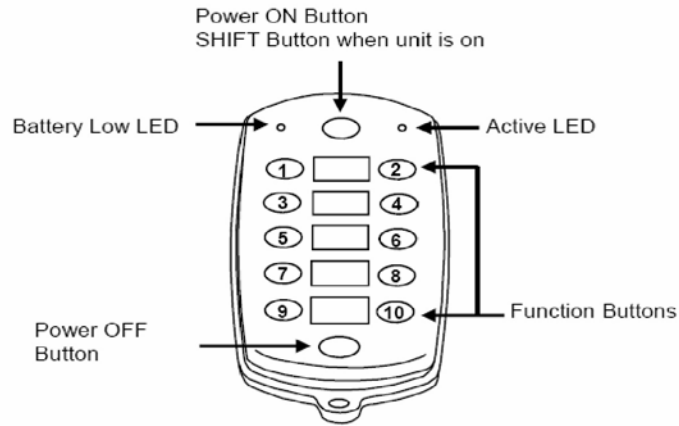


troubleshooting reference table

	above 2750 psi for 10s.	object. Unplug if necessary. Check the tracking and look for evidence of rubbing on the belt.
Display is stuck on opening screen: <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p style="text-align: center;">Duratech</p> <p style="text-align: center;">Software Version 1.0</p> </div>		Cycle power
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p style="text-align: center;">***** Rotor Pulse Pickup *****</p> </div>	Rotor rpm has dropped below 600 rpm for greater than 2.5 seconds.	Normal when engine is sent to idle, causes the clutch to disengage. If clutch disengages unexpectedly and the engine is not sent to idle check the rotor speed pickup.
Outputs faults screen is displayed <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p><i>Output Name</i></p> <p>Output is: Off</p> <p>Output is Open: No</p> <p>Output is Short: No</p> </div>	Output is open Output is short	The output which is open will show on the display screen. An open output indicates that the signal being sent from the PLC is not reaching the output. The open circuit can be created by a broken wire or a poor connection. Fix the open circuit and cycle power. The output which is short will show on the display screen. A shorted output indicates that the signal being sent from the PLC is being sent to ground. This can be caused by a broken or frayed wire coming into contact with a ground source. Fix the short circuit and cycle power.
Will not accept an input	Fault has occurred	Check to display to see which fault has occurred and fix
Feed roll and feed floor will not move without the rotor engaged	Floor control is on automatic	Switch floor control to manual



6.4 Omnex Wireless Remote Control: Troubleshooting and operation guide



Maintenance / Welding

DISCONNECT THE RADIO RECEIVER BEFORE WELDING on the machine the receiver is connected to. Failure to disconnect will result in the destruction of the radio receiver.

Special Functions

The system has 3 programs (A,B,C), selectable by the setup button (SW2) on the receiver. The programs control the behavior of the outputs as described below. The default is Program C.

Program A:

Outputs 1 and 2 are maintained/normally off/2 second delay interlocked with paired output. If an output is ON and the corresponding button is pressed again, the output will turn OFF.
 Outputs 3 to 18 are momentary/normally off/interlocked with paired output.
 Output 19 is on when any outputs 5-10, 13-18 are on.

Program B:

Outputs 1 and 2 are momentary/normally off/2 second delay interlocked with paired output.
 Outputs 3 to 18 are momentary/normally off/interlocked with paired output.
 Output 19 is on when any outputs 5-10, 13-18 are on.

Program C:

Outputs 1 and 2 are momentary/normally off/2 second delay interlocked with paired output.
 Outputs 3 to 18 are momentary/normally off/interlocked with paired output.
 Output 19 is momentary on with Shift + Button 9.

To select the program:

1. Take off the cover from the receiver. Power it on and ensure it is in e-stop state (The transmitter should be off)
2. Press the SW2 button once. One of the first three lights will go green indicating the active program:
 - Program A = ESTOP light (first from the left)
 - Program B = FUNCTION/FAULT light (second from the left)
 - Program C = LINK light (third from the left)
3. Cycle through available programs by pressing the same button (SW2). When the desirable program is selected, put back the cover on the receiver.

The [Shift] Function

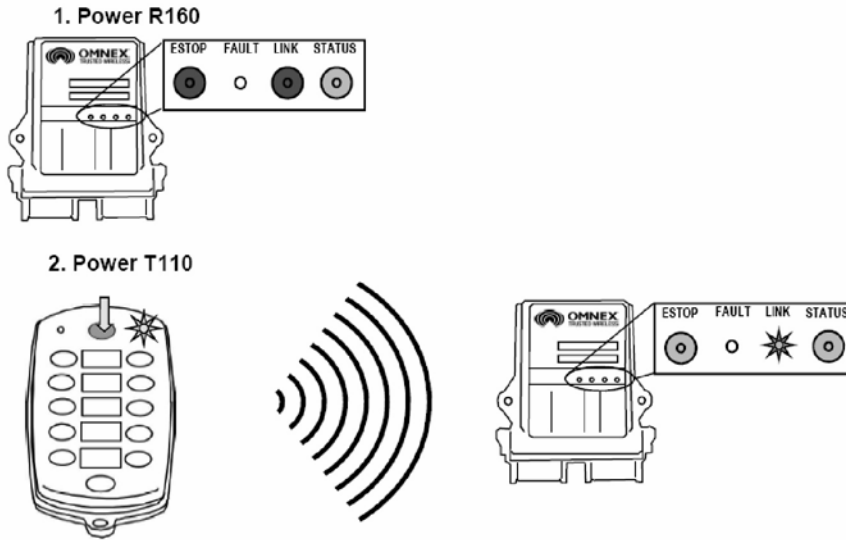
Outputs 1-10 are controlled by the T110 [Function] buttons "1-10". Outputs 11-19 are controlled by holding the T110 [Shift] button and pressing the [Function] buttons "1-9" (the GREEN Power [ON] button acts as the [Shift] button when the T110 is on).

Select program "B" for the DuraTech 9564 Horizontal Grinder



Test the Transmitter / Receiver Link

Follow these steps to ensure that there is a radio link between the transmitter and receiver.
Refer to the **Light Legend** below for diagram details



NOTE: The transmitter will shut itself off (and the receiver will then shut off all outputs) after 10 minutes of inactivity as a battery saving feature. Momentarily operating any button on the transmitter, including the [Power] button will restart the 10 minute timer.

Out of Range/Loss of Signal:

The Range of the OMNEX ORIGA is approximately 1,200'. Under certain circumstances, such as low or dead batteries, loss of signal can occur within that distance. In the event that loss of signal occurs, the transmitter will shut off, and the engine will be shut off by the engine kill circuit.



Download ID Code (Use in case of Link Test failure)

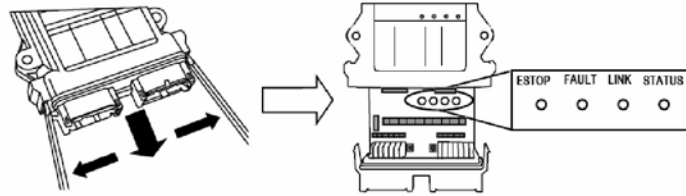
Follow these steps to download the transmitter's unique ID Code into the receiver. This will allow the receiver to establish a radio link with a specific transmitter. Refer to **Trouble Shooting Chart #4** for Tips and Considerations

NOTE: It is necessary to download the ID Code when replacing either the transmitter or the receiver.

1. Opening the R160 Case

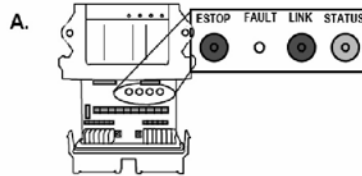
The cap is held on by two plastic tabs at opposing sides, which can be unlatched as shown using a screwdriver. Once the cap is free, the R160 can slide open.

Use a small slotted screwdriver to press the Side Tabs inward.



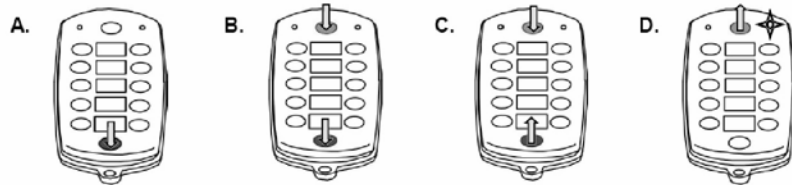
2. Power R160

A. Supply power to the receiver. The (E-Stop) light will come on RED and the (Link) light will come on GREEN and the (Status) light will come on GREEN



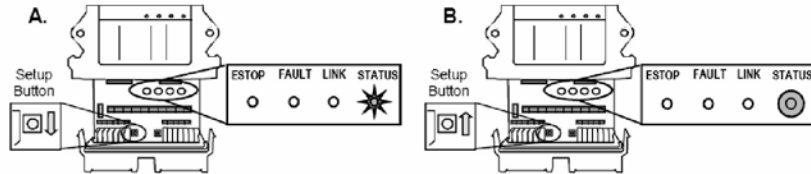
3. Power T110 into Configuration Mode

- A. Press and Hold Power [OFF]
- B. Press and Hold Power [ON]
- C. Release Power [OFF] button
- D. Release Power [ON] button



4. Put R160 into Setup Mode

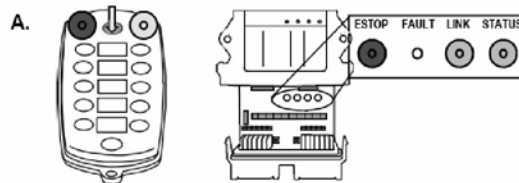
- A. Press & hold [Setup] button until (Status) light goes from slow flash to fast flash
- B. Release [Setup] button. (Status) light goes to solid GREEN, (Link) light turns off



NOTE: If left idle in Setup Mode for over 30 seconds, the receiver will time out. The (Link) light and (Status) light will flash RED rapidly. To return to Setup Mode, repeat step 4.

5. Send Code

- A. Press Power [ON] button to send code



Once the ID Code has been downloaded, the RED (Battery) light and the YELLOW (Active) light on the transmitter will go out. The (Link) light on the receiver will change from GREEN to RED.

NOTE: When replacing the receiver cover, ensure the cover snaps completely into place to create a weather proof seal around the base of the receiver.

Light Legend	Solid	Slow Flash	Fast Flash	Red Light	Green Light	Yellow Light	Alternating Red & Green Light

DMAN-2491-131 (Rev 3)

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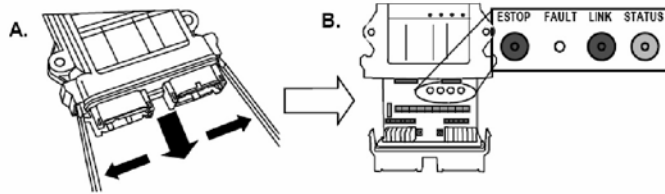


Changing Start Up and Shutdown Configuration

The T110/R160 system has 3 available startup and shutdown modes that can be configured with the following steps.

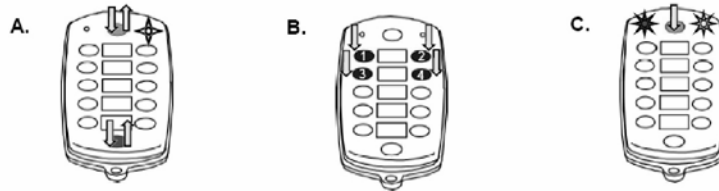
1. Opening the R160 Case and Power R160

- A. The cap is held on by two plastic tabs at opposing sides, which can be unlatched as shown using a screwdriver. Once the cap is free, the R160 can slide open.
- B. Supply power to the receiver. The (E-Stop) light and the (Link) light will come on RED and the (Status) light will come on GREEN



2. Power T110 into Configuration Mode & Enter Configuration Password

- A. Power T110 into configuration mode by following Step #3 from **Download ID Code**
- B. Press function buttons in order 3, 1, 4, 2
- C. Press Power [ON] button



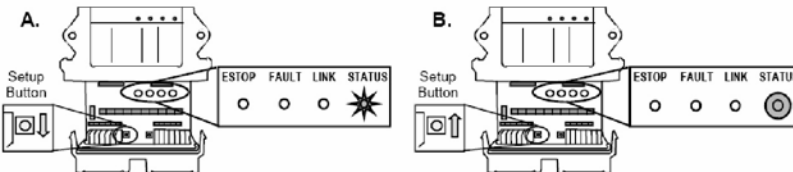
3. Enter Start Up and Shut Down Code

Enter the 10-digit Configuration Code associated with one of the following startup and shutdown modes:

ON / OFF Mode	1188888888	ON normal. OFF when T110 / R160 link is lost.	DEFAULT
Secure Mode	4188888888	ON by entering the "3, 1, 4, 2" password on the T110 and pressing the GREEN [Power] button. OFF when T110 / R160 link is lost.	
Auto Power Down Mode	5188888888	ON normal. OFF when T110 / R160 link is lost or after 10 minutes of being idle.	

4. Put R160 into Setup Mode

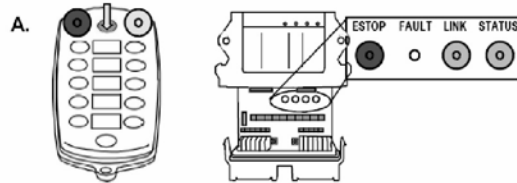
- A. Press & hold [Setup] button until (Status) light goes from slow flash to fast flash
- B. Release [Setup] button. (Status) light goes to solid GREEN, (Link) light turns off



NOTE: If left idle in Setup Mode for over 30 seconds, the receiver will time out. The (Link) light and (Status) light will flash RED rapidly. To return to Setup Mode, repeat step 4.

5. Send Code

- A. Press Power [ON] button to send code



Once the ID Code has been downloaded, the RED (Battery) light and the YELLOW (Active) light on the transmitter will go out. The (Link) light on the receiver will change from GREEN to RED.

Light Legend	Solid	Slow Flash	Fast Flash	Red Light	Green Light	Yellow Light	Alternating Red & Green Light
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DMAN-XXXX-XX (Rev x.x)

www.omnexcontrols.com

call toll free: 1-800-663-8806



Diagnostics—T110 Transmitter

Indicator Lights	Description	Solution
	Occurs when ever a function is pressed. Will also remain on momentarily on Power Up.	N/A
	Transmitter is in Download mode.	To take it out of Download mode turn transmitter off and turn it back on again.
	Transmitter is in Operating mode.	N/A
	Low Battery.	Change Batteries <i>Note: Low batteries will last approximately 8 hours once the Low Battery light begins to flash. Replace batteries during next break.</i>
	Fast Flash for approx. 10 seconds indicates T110 failure.	Send the unit in for service.
	Stuck button detected.	Toggle the buttons a few times. Call for service. Send the unit in for service.
	On Power Down Unit is still powered, likely due to an on function or stuck button.	Toggle the buttons a few times. Call for service. Send the unit in for service.
	Transmitter is in Configuration mode.	To take it out of Configuration mode turn transmitter off and turn it back on again.
	Transmitter is downloading ID Code.	Wait for approximately 5 seconds. Once the download is complete the transmitter will automatically shut off.

Light Legend	Solid	Slow Flash	Fast Flash	Red Light	Green Light	Yellow Light	Alternating Red & Green Light
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DMAN-XXXX-XX (Rev x.x)

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call toll free: 1-800-663-8806



Diagnostics - R160 Receiver

Normal Operation

	Transmitter is OFF If the transmitter is off, the receiver is operating properly.
	Transmitter is ON When the transmitter is turned on, the Link light (fast flashing) and E-Stop (GREEN) indicates the receiver is operating properly
	Transmitter is in Operation When a function is activated on the transmitter, the Fault light will turn on GREEN. This indicates the receiver is operating properly
	Transmitter is OFF When a latched function is activated then the transmitter is turned off, the Fault light will stay on GREEN. If the system was intentionally designed this way, the receiver is operating properly, if not call for service.

Trouble Indicators

Note: In some cases, the indicator lights will be different depending on whether the transmitter is on or off. Please note the transmitter status in the "Description" column for each case.

Indicator Lights	Description	Solution
	Transmitter is ON The reason is the transmitter is not communicating with the receiver.	Refer to Troubleshooting Chart #3 for solutions
	Transmitter is ON A low battery condition has been detected.	To detect intermittent conditions caused by poor or corroded ground or power circuits, the GREEN light will continue to flash for 30 seconds after the condition has been removed.
	Transmitter is ON An internal fault with the E-Stop has been detected.	Inspect E-Stop wiring for short circuit. Disconnect E-Stop wire as close to the receiver output as possible. If the Status light changes to: <ul style="list-style-type: none"> • GREEN, a short occurs after disconnection point. • Stays flashing RED, send it in for service .
	Transmitter is ON A short to ground or excessive current draw on an output. It is most likely caused by a wiring fault.	Ensure transmitter is functioning properly, check status of each output connection: Press each function button and observe Fault Light. <ul style="list-style-type: none"> • If GREEN, everything is OK. • If RED, there is a short in that connection.
	Transmitter is ON The E-Stop output has been connected with one of the other outputs	Follow the wire and check for connections with other wires, disconnect to see if condition clears. If not, call for service.
	Transmitter is OFF A wiring short to the battery has been detected.	Refer to Troubleshooting Chart #1 for solutions
	Transmitter is OFF The receiver has detected an internal fault.	Refer to Troubleshooting Chart #1 for solutions
	Transmitter is OFF Blown fuse detected.	Refer to Page 6 for instructions on how to open the receiver case to access fuse. Check wiring for shorts or bare spots. If fuses continue to blow, call for service.
	Transmitter is ON A setup failure has occurred.	Either hold the Setup button for 5 seconds to return to Setup mode or cycle power to return to the normal operating mode.
	Transmitter is OFF The receiver is powered incorrectly.	Most likely cause of this condition is that an output wire or the E-Stop wire has been connected to the power supply while the power wire is disconnected from the power supply.

Light Legend	Solid	Slow Flash	Fast Flash	Red Light	Green Light	Yellow Light	Alternating Red & Green Light

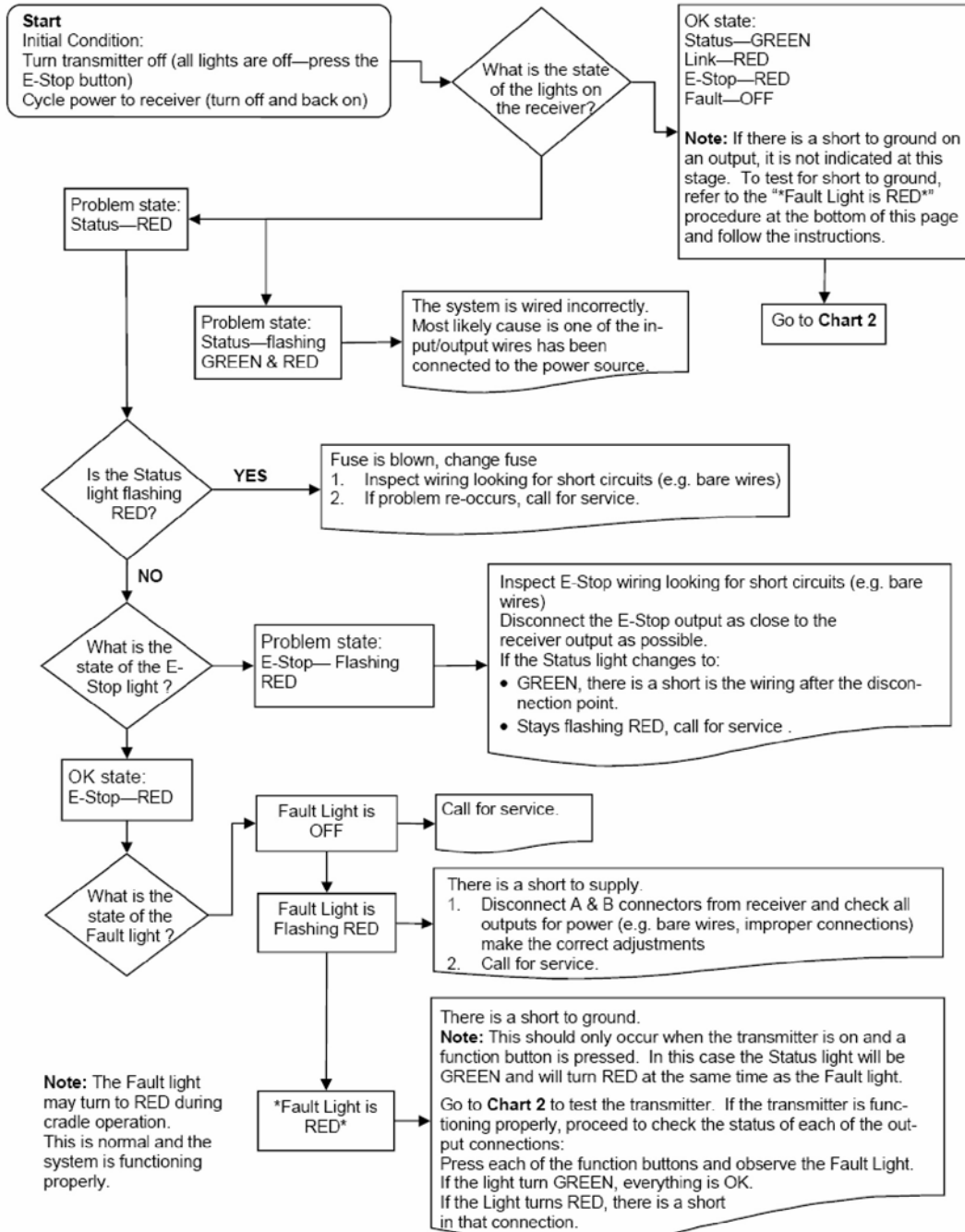
DMAN-XXXX-XX (Rev x x)

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Test the Receiver—R160



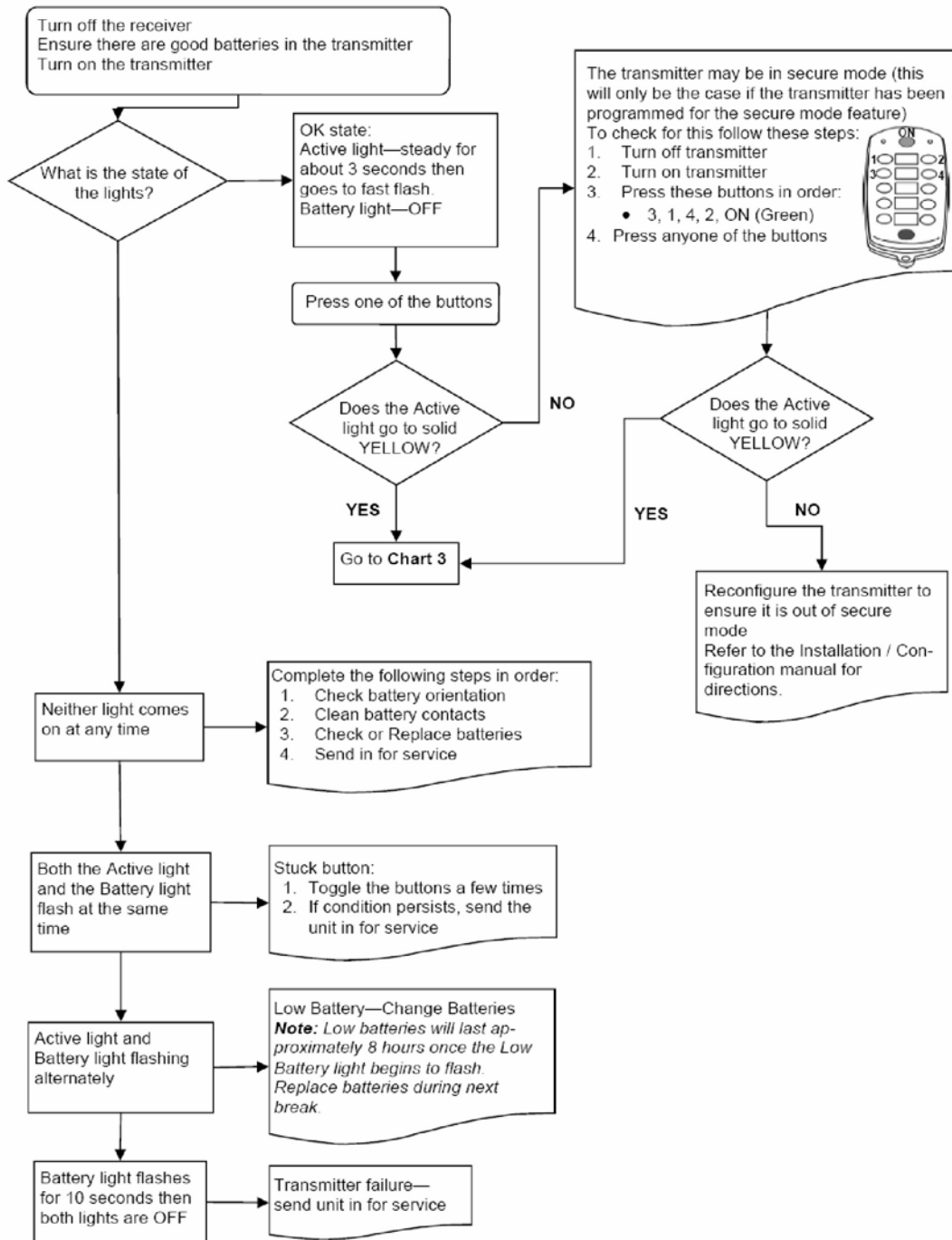
DMAN-XXXX-XX (Rev x.x)

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Test the Transmitter—T110



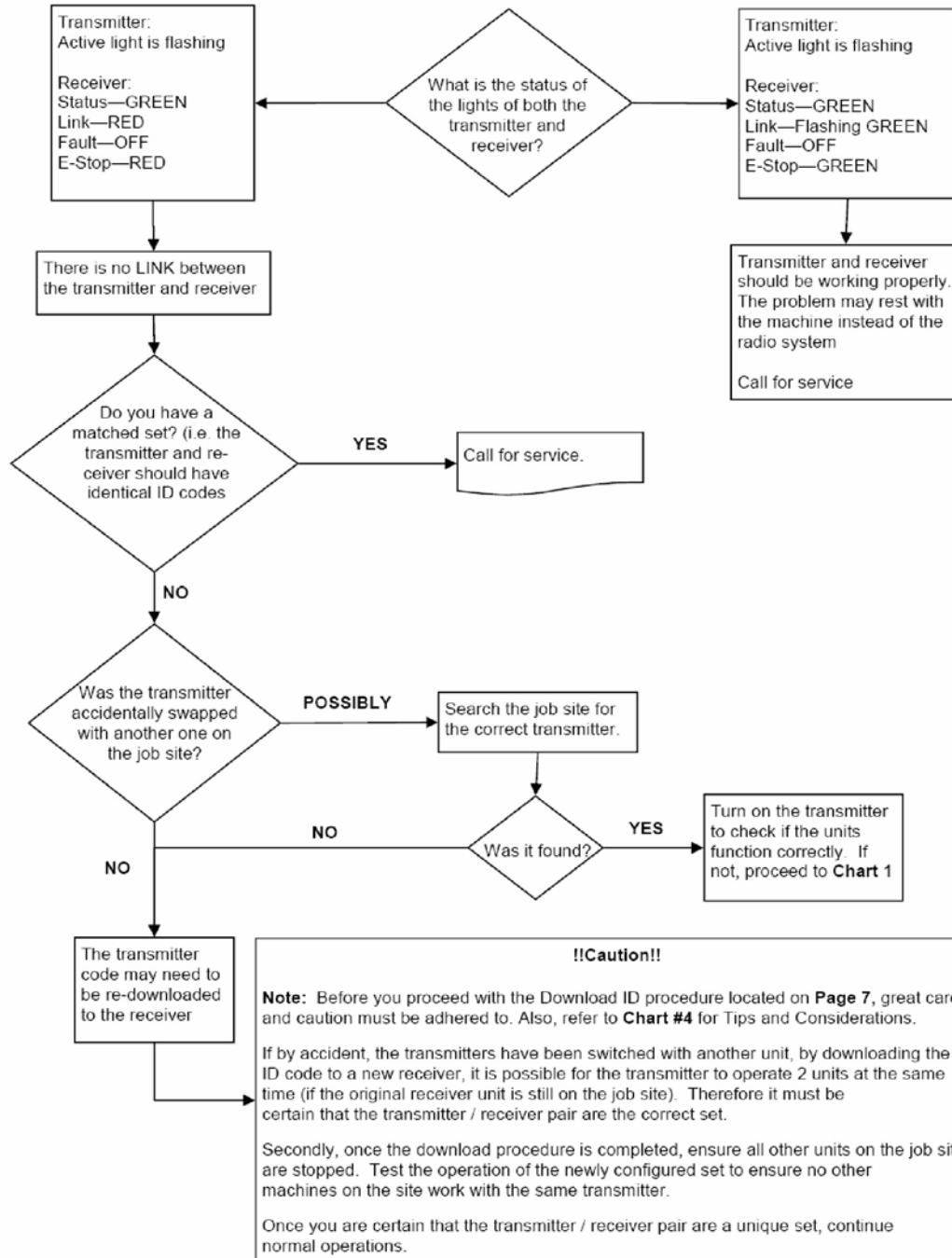
DMAN-XXXX-XX (Rev x.x)

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Testing the Transmitter / Receiver Communication



**Considerations when Downloading the ID****Potential downloading issues**

If testing of the receiver and transmitter both show the system as working (Chart 1 & 2), then the transmitter and receiver will both go into Download/Configuration mode.

Possible issues could arise during Step 4, the download phase of reprogramming. In this case there are 2 symptoms to look for:

1. The Link light on the receiver will not turn GREEN when the power switch is toggled on the transmitter to download
2. The receiver will "time out" indicating that it didn't receive a signal from the transmitter within the 30 seconds from the time the receiver was put into Setup Mode.

If all indications appear normal during the download phase, test the link by turning on the transmitter (note: the transmitter shuts off after transmitting the ID code in Step 4)

1. If the Link light on the receiver doesn't turn GREEN, the receiver didn't receive all of the information that was sent from the transmitter.

Possible Solutions

1. Try the Downloading steps again
2. If this doesn't correct the problem, send both the transmitter and receiver in for service.

Note: you could try to determine whether the fault lies with the transmitter or receiver by completing the Reprogramming procedure with a different transmitter. If this step works, then the fault lies with the original transmitter. If not, the fault may lie with the receiver.

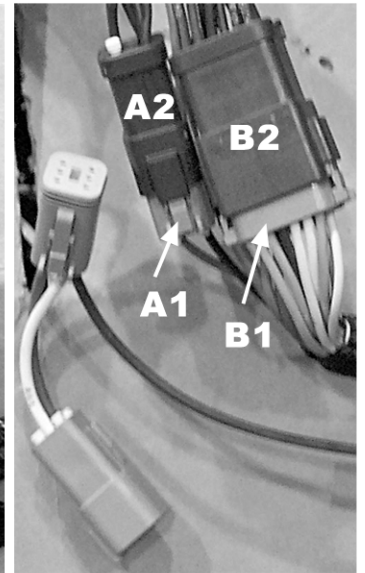
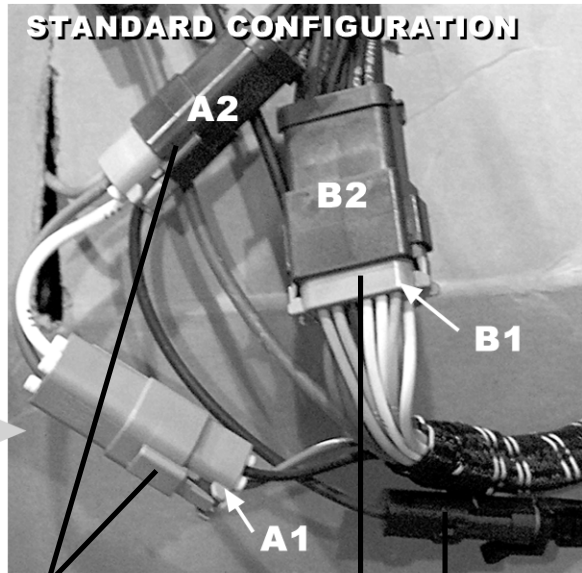
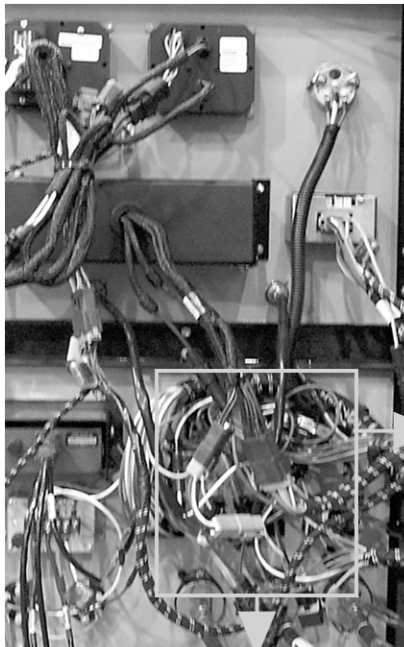
REPLACING BATTERIES

Install batteries by removing the battery cover using a slotted screwdriver and inserting 4 "AA" Alkaline batteries. Orientation for batteries is embossed inside the battery housing.



6.5 Troubleshooting The Caterpillar Engine

Caterpillar engine Duratech wiring bypass connections

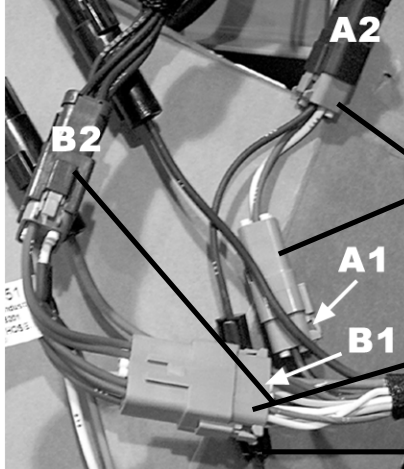


jumper wire set "A"
(6 pin connectors)

O45 connector

above graphic shows
Duratech wiring removed
for Caterpillar engine
diagnosis

OPTIONAL CONFIGURATION



jumper wire set "A"
(6 pin connectors)

jumper wire set "B" (12 pin connectors)
(note: there are 2-12 pin connectors in the optional configuration.)

O45 connector



NOTE: That the wires for connectors A2 and B2 come out of the ignition switch section of the panel.

Several connections are made to connect the Duratech wiring to the Caterpillar wiring.

If the Caterpillar engine requires troubleshooting, the Duratech connections can be removed during the diagnosis.

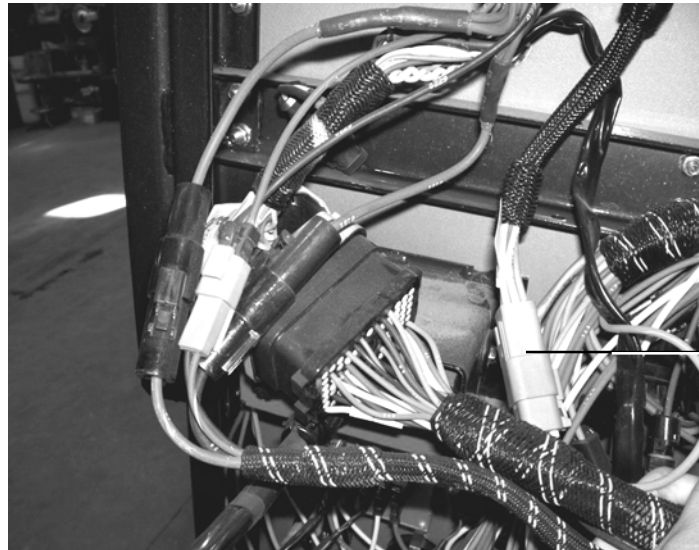
Jumper wire set "A" is standard on all machines; jumper wire set "B" is used with certain options only, and is **NOT** used on all machines.

To remove Duratech wiring for Caterpillar engine diagnosis in a system with the 'STANDARD CONFIGURATION', disconnect both "A" six pin connectors and reconnect "A1" to "A2". For a system with the "OPTIONAL CONFIGURATION" disconnect both "A" six pin connectors and both "B" 12 pin connectors, then reconnect "A1" to "A2" and "B1" to "B2".

There is a 15 Amp fuse or circuit breaker in Caterpillar wiring near the starter.



6.6 Troubleshooting the Caterpillar C9 and C15 Tier III engine and the Caterpillar C27 Tier II engine



One connector is used to connect the DuraTech wiring harness to the Caterpillar wiring.

If the Caterpillar engine requires troubleshooting, the DuraTech connection can be removed during the diagnosis. To remove the DuraTech wiring for Caterpillar engine diagnoses disconnect connection A.

There is a 15 Amp fuse or circuit breaker in the Caterpillar wiring harness near the starter





Appendix A: Warranty

DuraTech Industries International Inc. warrants to the original purchaser for 1 year from purchase date that this product will be free from defects in material and workmanship when used as intended and under normal maintenance and operating conditions. This warranty is limited to the replacement of any defective part or parts if DuraTech Industries is notified within thirty (30) days of failure.

This warranty shall become void if in the judgment of DuraTech Industries International, Inc. the machine has been subject to misuse, negligence, alterations, damaged by accident or lack of required normal maintenance, or if the product has been used for a purpose for which it was not designed.

All claims for warranty must be made through the dealer which originally sold the product and all warranty adjustments must be made through same.

This warranty does not apply to tires, bearings, batteries, engines, or any other trade accessories not manufactured by DuraTech Industries International Inc. Buyer must rely solely on the existing warranty, if any, of these respective manufacturers.

DuraTech Industries International Inc., shall **not** be held liable for damages of any kind, direct, contingent, or consequential to property under this warranty. DuraTech Industries International Inc., cannot be held liable for any damages resulting from causes beyond its control. DuraTech Industries International Inc., shall **not** be held liable under this warranty for rental costs or any expense or loss for labor or supplies.

DuraTech Industries International Inc., reserves the right to make changes in material and/or designs of this product at any time without notice.

This warranty is void if any unauthorized modifications or alterations are made to the machine.

This warranty is void if DuraTech Industries International Inc. does not receive a valid warranty registration card at its office in Jamestown, North Dakota, USA, within 10 days from date of original purchase.

All other warranties made with respect to this product, either expressed or implied, are hereby disclaimed by DuraTech Industries International Inc.



Appendix B: SPECIFICATIONS

MODEL 9564 DURATECH HORIZONTAL GRINDER

MACHINE DIMENSIONS

Transport Length	53 ft. (15.18 m)
Transport Width	11 ft. 10 in. (2.59 m)
Transport Height	13 ft. 5 in. (4.09 m)

WEIGHT / AXLE / SUSPENSION

Spacing	57-1/2 in. (1.46 m)
5th Wheel Weight	33,750 lbs. (15,308.74 kg)
Total Axle Weight	57,750 lbs. (26,195 kg)
Total Weight	91,500 lbs. (41,503.7 kg)

DRIVE SYSTEM

Engine	Caterpillar C-27 Tier II 950 HP Diesel Engine
Clutch	HPTO 15 TD Wet Clutch
Fuel Capacity	380 Gallons (1440 L)
Fuel Consumption	45.7 gal./hr. (179.8 L/hr)
Hydraulic Oil Capacity	145 Gallons (548.9 L)
Rotor Drive	10 Groove 8V

FEED SYSTEM

Hopper Capacity	315 Cubic Ft. (8.91 cu. m)
Hopper Width	61-1/2 in. (156.2 cm) Bottom, 74 in. (187.7 cm) Top
Hopper Length	248 in. (629.9 cm) Door Up 300 in. (762 cm) Door Down
Hopper Depth	35 in. (88.9 cm)
Feed Opening	61-1/2 in. X 40 in. (156.2 cm x 106.6 cm)
Feed Height	96 in. (234.8 cm)

GOVERNING SYSTEM

Electric (PLC)	Programmable Logic Controller
Hydraulic Drives	Two Load Sensing Pumps



HAMMERMILL

Rotor Shaft Size	5-7/16 in. (13.81 cm)
Rotor Width	64 in. (162.6 cm)
Rotor Speed	1125 RPM
Tip Swing Diameter	50-3/4 in. (126.9 cm)
Number of Tips	24
Cylinder Mid Plates	1-1/2 in. (3.81 cm) Thick x 39 in. (99.06 cm) Diameter
Cylinder End Plates	1-1/2 in. (3.81 cm) Thick x 40 in. (101.06 cm) Diameter T-1 material
Weight	12,100 lbs. (5488.47 kg)
Hammer Rod Size	3-1/4 in. (8.26 cm)

FEED WHEEL

Rotor Diameter	42 in. (106.9 cm)
Drive	Dual Orbit Motor / Double Reduction Gearboxes

SCREENS

Screen Area	4,340 sq. in. (11,023.6 sq. cm)
Thickness	1 in. (2.54 cm)
Hole Sizes	Available in a variety of sizes

BELLY CONVEYOR

Length	28-1/2 ft. (8.69 m)
Width	54 in. (137.2 cm)

STACKING CONVEYOR

Length	30.5 ft. (9.3 m)
Width	48 in. (121.9 cm)
Oscillating	40 Degree side-to-side
Stacking Height	22' (6.71 m) @ 30 Degree Incline

OPTIONS

Air Compressor

Magnetic Roller

The PLC (Programmable Logic Controller) regulates feed rate based on rotor speed. Feed rate is proportional to rotor speed. Maximum feed rate is adjustable. Hammermill weight consists of shaft, hammer rods, bits, hardware, and tool holders.



Appendix C: Operator Training Form

The following personnel, by their signature, certify that they have read this manual in its entirety and comprehend its instructions. Only personnel so qualified are allowed to operate this unit.

Printed Name	Review Date	Signature

