# 6010™ Tub Grinder

## Includes Track Option



*Manual 1: Operating Instructions*

DURATECH INDUSTRIES

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DURATECH®
Clearing the Way for a Better Tomorrow

# 6010™ Tub Grinder

## Includes Track Option

# Manual 1: Operating Instructions

DuraTech Industries International Inc. (DuraTech Industries) has made every effort to assure that this manual completely and accurately describes the operation and maintenance of the 6010™ Tub 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 unit.

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, and they should be located within easy access for periodic review.


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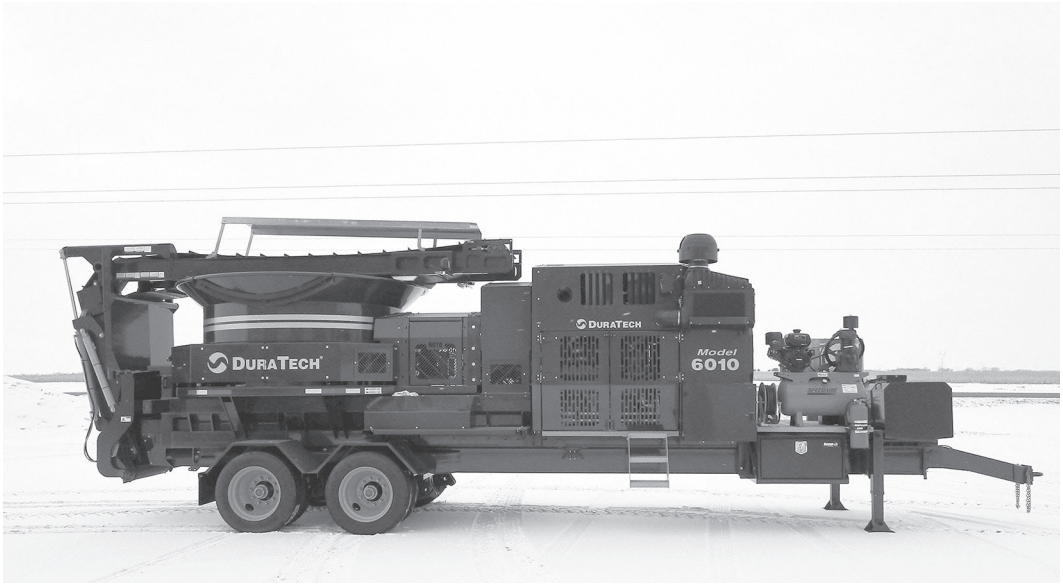


# Foreword

### 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.

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### Appropriate use of the unit

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.

### 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.



# 6010 TUB GRINDER Manual 1: Operators Instructions...1

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# 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 6010 DuraTech Tub 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.

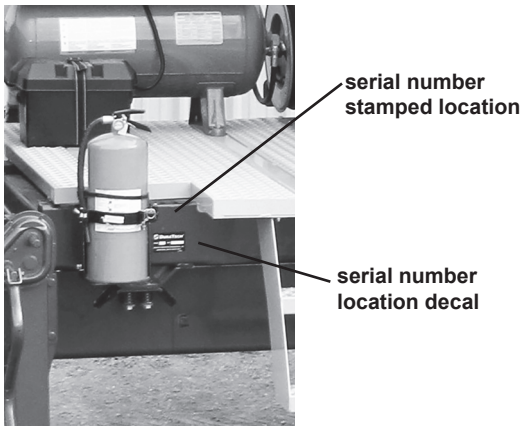
**SPECIAL NOTE:** When reference is made as to front, rear, left hand, or right hand of this machine, the reference is always made from standing at the rear end of the machine and looking toward the hitch.  Always use serial number and model number when referring to parts or problems. Please obtain your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

MODEL: 6010 DuraTech Tub Grinder  SERIAL NO. _____

# Serial Number Location

The serial number is located by fire extinguisher on the left hand side of the machine. If the serial number decal is missing, the number is also stamped into the frame above the decal location.

Please have the serial number handy when making inquiries regarding this machine.




# 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 6010 DuraTech Tub 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.
- 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 6010 DURATECH TUB 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 6010 DuraTech Tub 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 6010 DURATECH TUB 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 6010 DuraTech Tub 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 6010 DuraTech Tub 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 6010 DURATECH TUB 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 6010 DURATECH TUB 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 be 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. Yellow warning triangle/black graphical symbol, indicates what the hazard is.**<br>**Hazard Identification** |
|  | **2. Red circle-with-slash/black graphical symbol indicates a prohibited action to avoid the hazard.**<br>**Prohibited Action** |
|  | **3. Blue mandatory action circles/white graphical symbol - indicates an action to take to avoid the hazard.**<br>**Mandatory Action** |

## 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 6010 DURATECH TUB GRINDER when you are fatigued. Be alert - If you get tired while operating your 6010 DURATECH TUB 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 head with a hard hat to reduce the risk of injury from flying debris.

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

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

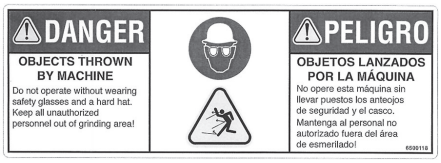
To reduce the risk of injury to your eyes never operate a **6010 DURATECH TUB GRINDER** unless wearing goggles or properly fitted safety glasses with adequate top and side protection.

Tractor noise may damage your hearing. Always wear sound barriers (ear plugs or ear mufflers) 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: OBJECTS THROWN BY MACHINE**
DO NOT OPERATE WITHOUT WEARING SAFETY GLASSES AND A HARD HAT.
KEEP UNAUTHORIZED PERSONNEL OUT OF THE GRINDING AREA



6500118

**DANGER: ROTATING PART HAZARD, STAY OUT OF TUB WHEN ENGINE IS RUNNING.**

1. KEEP OTHERS AWAY.

2. PLACE ALL CONTROLS IN NEUTRAL, STOP ENGINE, REMOVE KEY, AND WAIT FOR ALL MOVING PART TO STOP BEFORE SERVICING, ADJUSTING, REPAIRING, UNPLUGGING, OR ENTERING THE TUB FOR ANY REASON.

3. DISCONNECT DRIVELINE ON PTO MODELS.

6500212

**DANGER: ELECTROCUTION HAZARD**
TO PREVENT SERIOUS INJURY OR DEATH FROM ELECTROCUTION:

STAY AWAY FROM POWER LINES WHEN OPERATING BOOM LOADER, FOLDING AND RAISING CONVEYORS, AND TRANSPORTING ON ROADS.

THIS MACHINE IS NOT GROUNDED, ELECTROCUTION MAY OCCUR WITHOUT DIRECT CONTACT.

6500216

**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.**

6500425

**WARNING: FOR YOUR PROTECTION AND SAFETY OF OTHERS, FOLLOW THESE SAFETY RULES**

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.

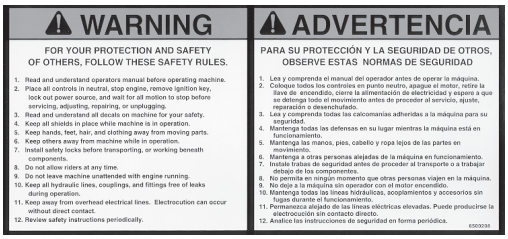
8. DO NOT ALLOW RIDERS AT ANY TIME.

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.




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.


6500214

**WARNING: THROWN OBJECT HAZARD, TO PREVENT SERIOUS INJURY OR DEATH DO NOT RAISE TUB WHEN ROTOR IS TURNING.**

1. DISENGAGE ROTOR AND ALLOW TO COME TO A COMPLETE STOP.
2. BE CERTAIN THAT ALL PERSONNEL ARE CLEAR OF MACHINERY AREA.
3. RAISE TUB TO FULL VERTICAL POSITION.
4. STOP ENGINE AND REMOVE KEY BEFORE APPROACHING TUB AND ROTOR AREA.


6500209

**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.


6500220

**WARNING: PINCH POINT STAY BACK**


6500339

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


6500043

**DO NOT OPERATE MACHINE UNLESS AN APPROVED FIRE EXTINGUISHER IS INSTALLED.**


6500497

KEEP WHEEL BOLTS TIGHT


6500042

## 1.4 Shielding

This Tub 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.

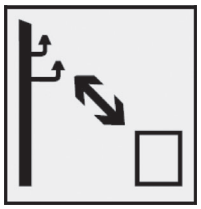
**WARNING:** Shields are installed for your protection and to keep material off machine parts. Do not operate this Tub Grinder without shields in place.

## 1.5 Tub Grinder safety review

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

Each and every aspect of the **DuraTech Industries 6010 DuraTech Tub 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 tub 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 in 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.



**Keep sufficient distance away from electrical power lines.**
**WARNING: Electrocution is possible when running this machine during an electric storm or heavy fog.**

- Allow no one on the  Tub Grinder at any time during operation.

**Never allow riders on the machine at any time.**

- 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 tub while the tub 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.

**Figure shows an object being hit as the hammer is on the upswing. A general pattern for where thrown objects may land is shown in Figure 1.2.**

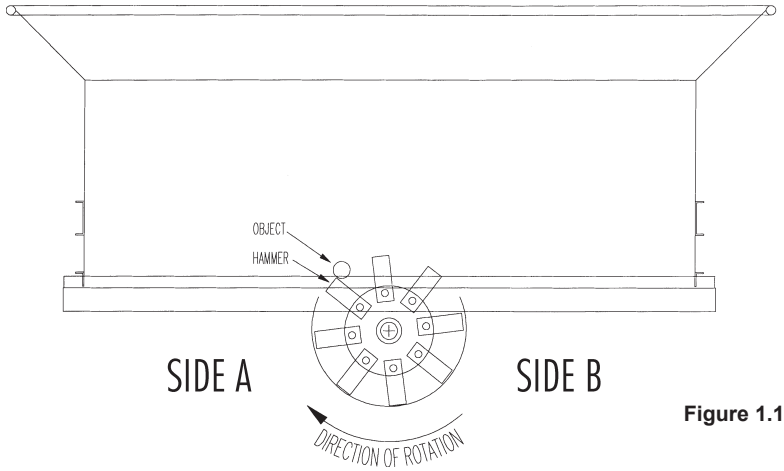
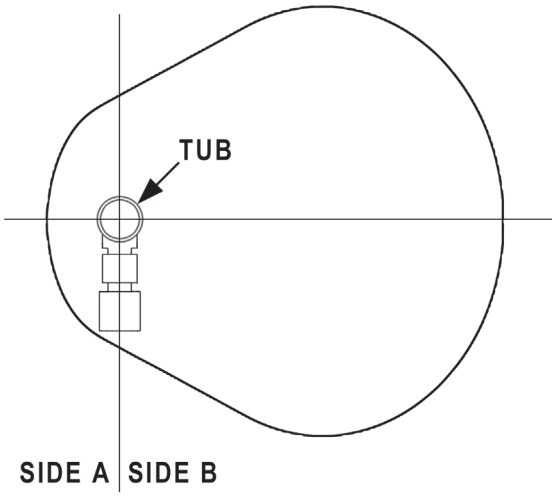



**Figure 1.1**

**NOTE:** The difference in the size of the area for side A versus side B. Side B is larger.

Dimensioning the size of this area is not practical. The distance a thrown object may travel is dependent on several conditions, including, but not limited to, rotor speed and diameter, condition of the hammers, style of hammers, object mass, object shape, amount of material in the tub, and how the hammer strikes the object.

**Figure 1.2**




The amount of material in the tub can dampen or stop the object's potential flight. Keeping the tub full will reduce the risks. Filling the tub at least 1/2 full before engaging tub rotation will reduce the risk. Using a geyser plate can help reduce thrown objects. A risk may arise when the tub is being emptied, such as at the end of the grind. Running the engine at slower speeds when starting or finishing the grind will also help, especially slowing down when emptying the tub. Keeping the tub covered with DuraTech Industries Tub Covers will also reduce the risk of potential injury or property damage. Use of a Tub Cover will not reduce the area over which thrown objects may fall, but it does reduce the percentage of objects thrown from the tub.

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

a) Place side B towards open areas, away from property and people.

b) Load the grinder from side A 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) If the optional tub cover is installed on the machine, the operator should keep the Tub Cover over the tub as much as possible while grinding. While grinding, the Tub Cover should be raised only when adding material to the tub, and then the Tub Cover should only be raised enough to allow the new materials to be placed in the tub.

## 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 tub, 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 Tub Grinder for any reason such as servicing, inspecting or unclogging the machine:

- Follow the normal shutdown procedure found in Section 3.6 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.
- Turn off the reciever power before working on the machine. Always disconnect the remote system before doing any maintence to prevent accidental operation of the machine.

**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.

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

**DO NOT PERFORM MAINTENANCE ON THE INTERIOR OF THE TUB DURING WET WEATHER CONDITIONS**

## 1.8 Personal protection equipment

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

## 1.9 Fire Prevention

Grinding with a tub 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.

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 tub 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 tub 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.

**NO SMOKING IN THIS AREA**

**DANGER! NO OPEN FLAMES IN THIS AREA**

**IMPORTANT: NEVER** leave the vicinity of the unit with the engine running**.**

PROPER OPERATION OF THE TUB 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.
- When filling the tub grinder during start-up begin by filling the front of the tub and avoid placing materials on the spinning rotor. When material begins to fall over the rotor, set the governor control on "Manual" and rotate the tub slowly while continuing to fill the tub. When the tub is 1/2 to 2/3 full, the governor control can be set to "auto" and grinding operations can resume normally. Do not allow the tub to stop for any significant amount of time with material over the rotor to minimize frictional heating.
- 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.

TUB 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.

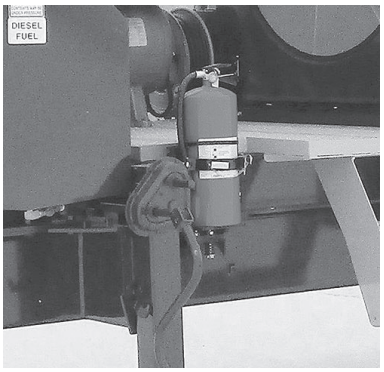

## 1.10 Fire Extinguishers

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 fuel tank. The extinguishers are ABC dry chemical extinguishers that are appropriate for use with all materials normally encountered on a tub 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 loose 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 tub, 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 tub 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 3.22 for more information about preparing the unit for transport.

# Section 2: Introduction

## 2.1 Description of the 6010 DuraTech Tub Grinders

The Tub 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, rotating tub, the electronic governor, the rotor and hammer assemblies, the tub chain and drive assemblies, as well as the belly and discharge conveyors assemblies.

Material is fed into the tub of the unit by appropriate means, such as a wheel loader. As the tub rotates, 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.

## 2.2 Electronic governor

The Wachendorf A6 control system will control the tub, rotary screen, discharge conveyor, engine, lights and loader (if equipped). The electronic governor has two modes of operation, Auto mode and Manual mode. The Auto mode is the preffered mode and should be used whenever possible.

This screen is located on the control panel of the 6010 DURATECH TUB GRINDER.

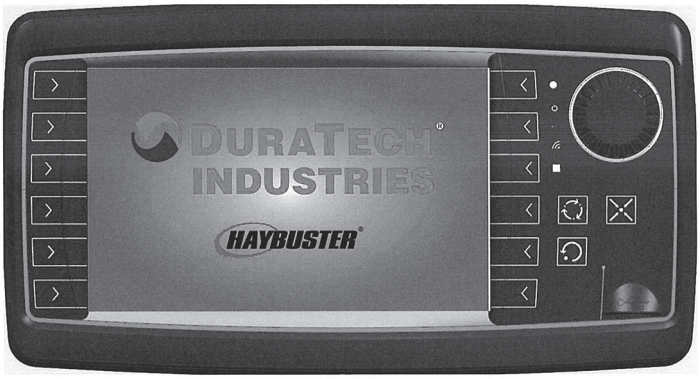
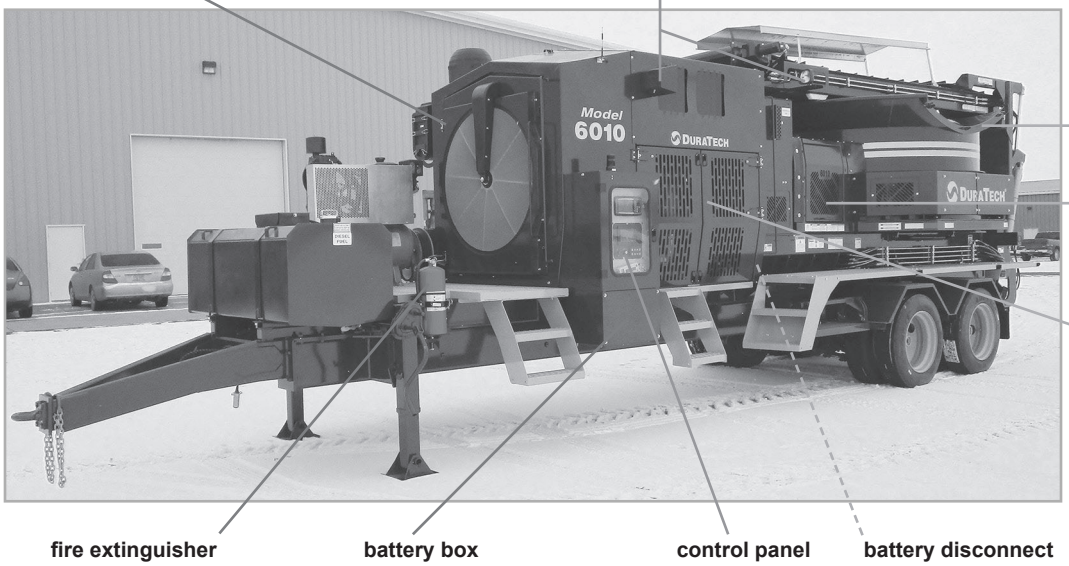
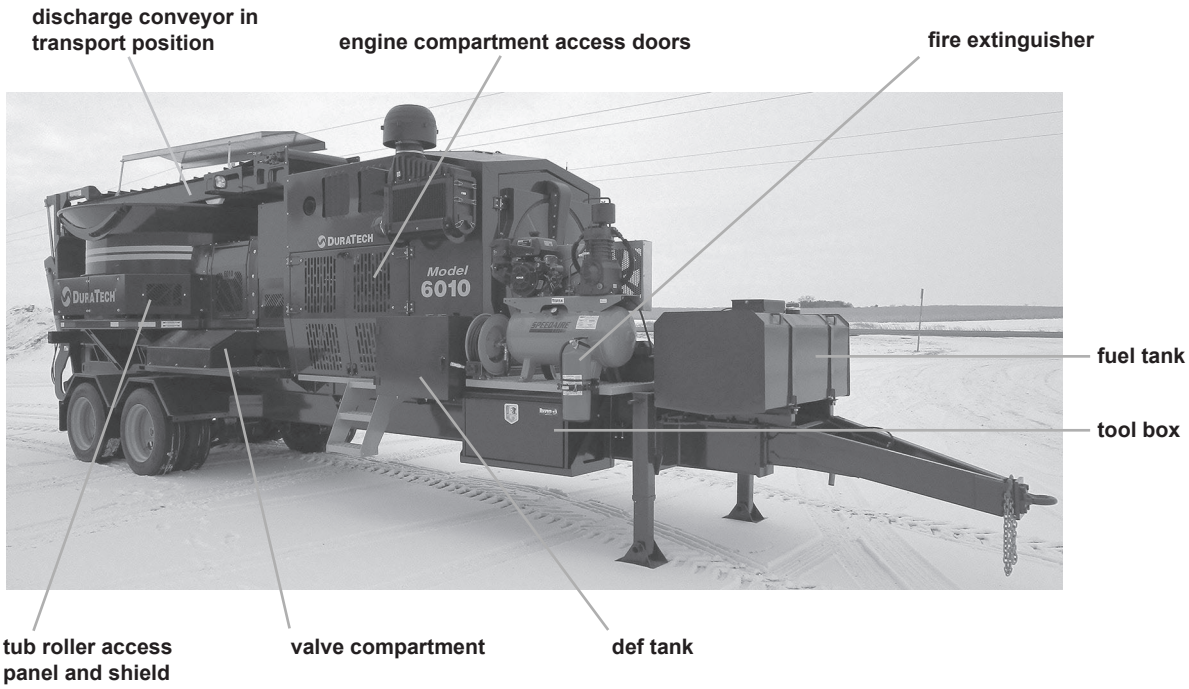



**figure 2.1 Wachendorf A6 control system**

**figures 2.2 & 2.3**
**major system components**



## 2.3 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. Note that power is off when the tub is raised. This prevents the operator from spinning the rotor while the tub is raised.

The “Engine Speed Detected” 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 lit during this time). When the “Clutch Engaged” symbol illuminates, the start button can be released. The controller will “bump” the wet clutch several times 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 starts in 5 minutes. If a 4$^{th}$ start is attempted, the “Timed Lockout” symbol will illuminate, and the wet clutch will not engage for 10 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 wet clutch will disengage when there is an oil pressure fault, or when the engine speed signal is lost.

## 2.4 Rotor

The rotor is the heart of the grinder. The standard rotor contains fixed hammers and is used for general grinding. Swinging hammers are available for use when grinding debris contaminated with tramp metal.

## 2.5 Screens

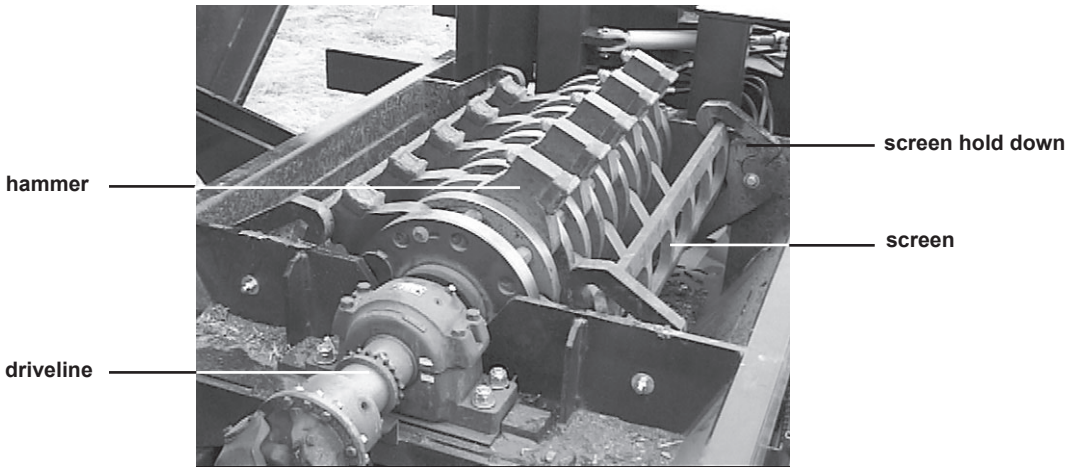
All DuraTech Industries tub grinders come equipped from the factory with two screens. The diameter of the screens are specified by the customer at the time of purchase.

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 1-1/2”, 2”, 3”, 4”, & 5” round hole, and 6”x 7” demolition screen. The 1-1/2” screen is made from 1/2” thick Hardox material; all other 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.

figure 2.4
driveline, rotor, and screens




## 2.6 Tub

Material to be ground is loaded into the tub using a wheel loader, or other suitable method. As the tub rotates, this material is fed to the rotor. The faster the tub rotates , the more material is exposed to the rotor, and the greater the load on the engine. The tub's rotation speed is controlled by the electronic governor. To reduce the amount of material thrown from the tub during operation, the tub should be kept 1/2 to completely full.

The 6010 DURATECH TUB GRINDER's tub can be tilted 90 degrees for access to the rotor, screens, and drive line. The tub has an electronic safety switch that will not allow the tub to be raised with the rotor turning. The switch provides feedback to the operator through two indicator lights which are located on the control panel. If the green indicator light is on, the operator may tilt the tub. Conversely, if the red indicator light is on, the safety switch will prevent the operator from tilting the tub.

## 2.7 Hydraulic cooler

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

## 2.9 The conveyor system

The conveyor system on the 6010 DURATECH TUB GRINDER consists of a belly auger and a discharge conveyor. The belly auger transfers the ground material from the rotor to the discharge conveyor. The discharge conveyor then moves the material away from the unit. The belly auger and discharge conveyor are run by three hydraulic motors which turn on and off with controls on the control panel or remote radio transmitter option. The discharge conveyor can be swung left or right, raised or lowered and can be folded or unfolded with the controls on the control panel, rear control keypad or the remote radio transmitter option.

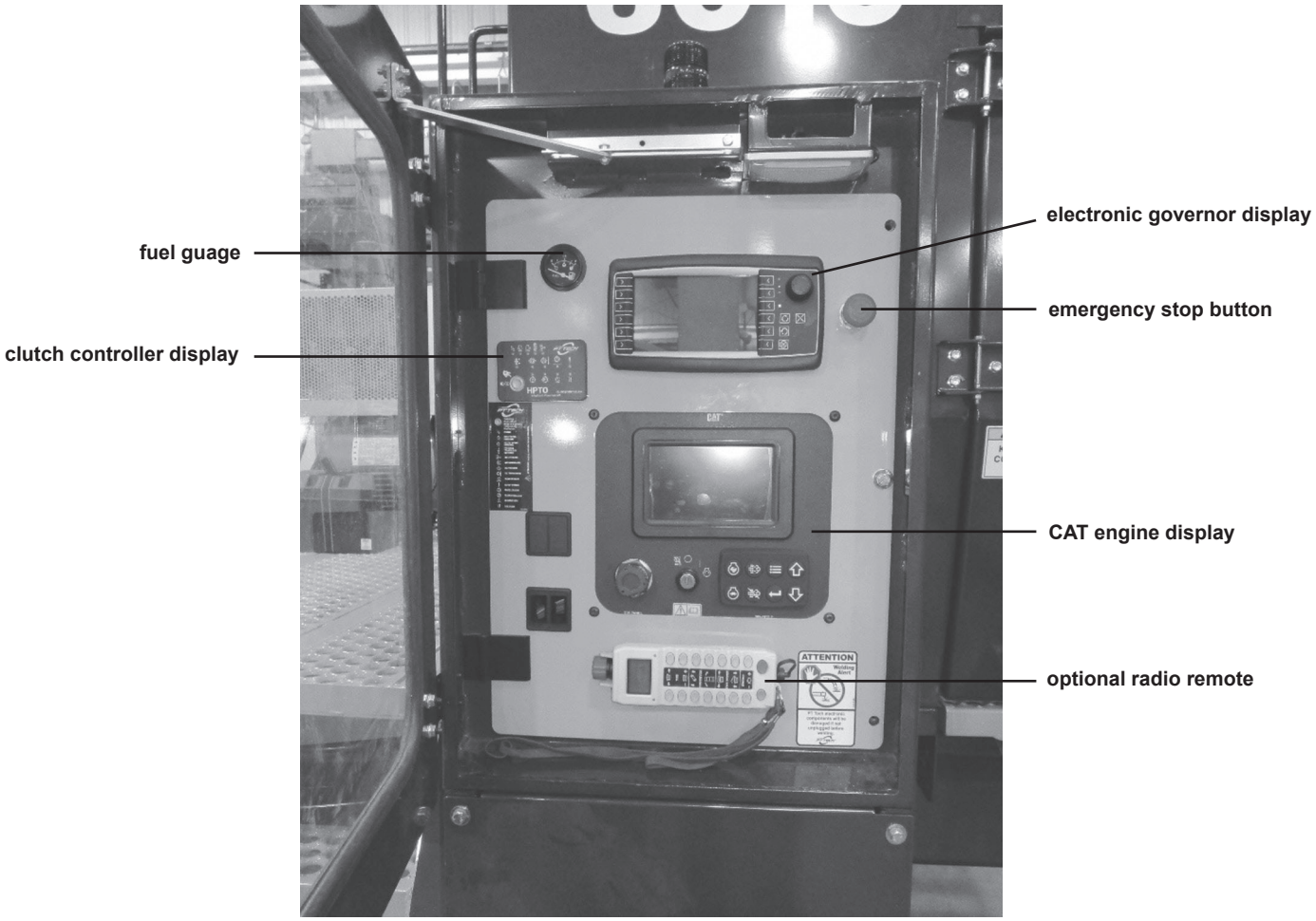
## 2.10 Tub cover (optional)

An optional tub cover may be added to the unit that helps to reduce the amount of material ejected from the tub while grinding. Duratech recommends using a tub cover when grinding in a high traffic area.

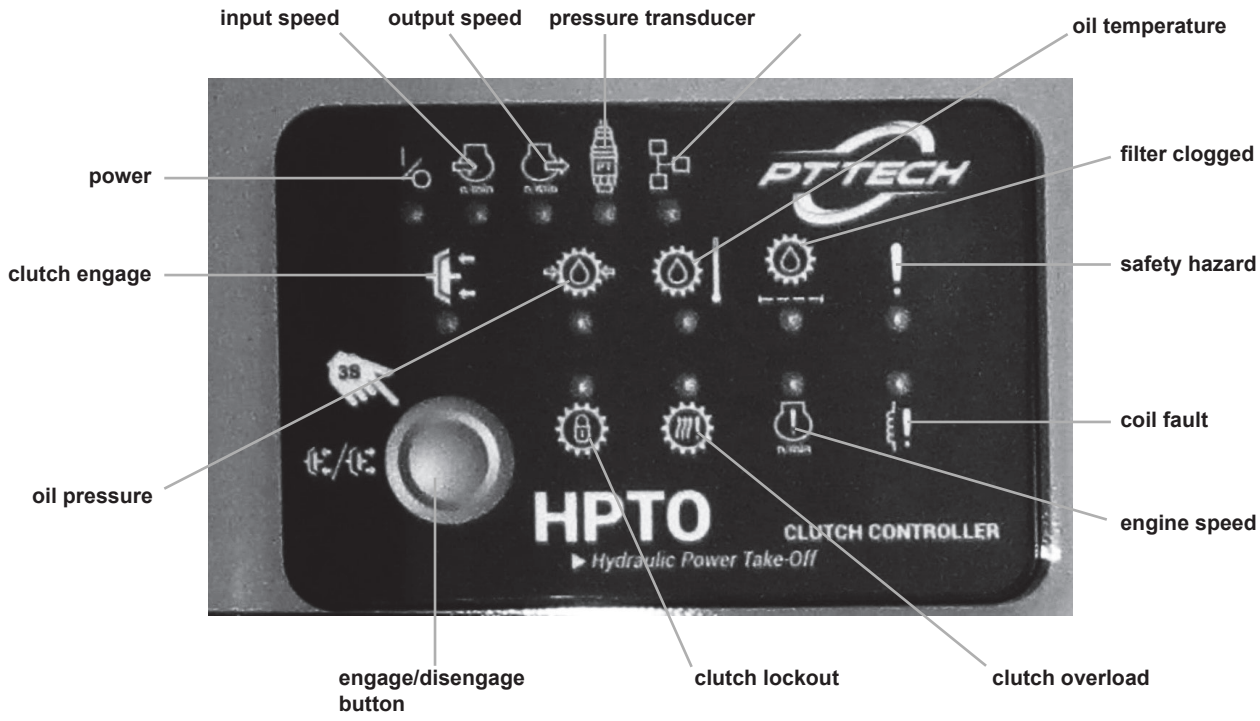
## 2.11 Control panel

The control panel is located on the left-hand side of the engine. Controls include a fuel gauge, clutch controller display and emergency kill switch. The CAT electronic engine display, keypad module, key switch and service tool. The electronic governor display also known as Wachendorf A6 control system.

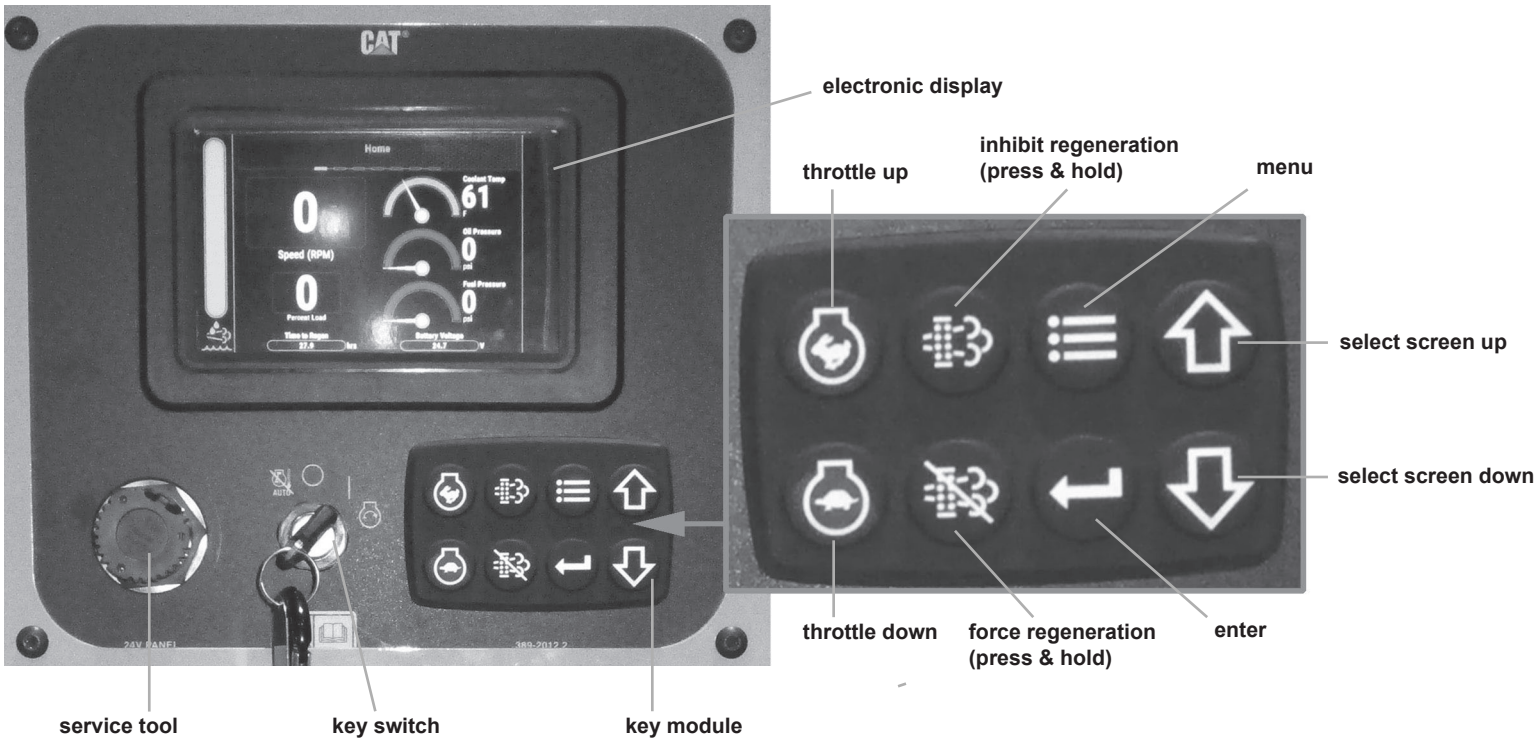
**figure 2.5**
**control panel**



## Clutch controller display



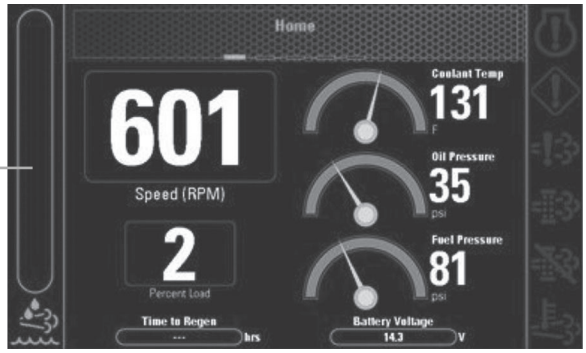

## CAT electronic display

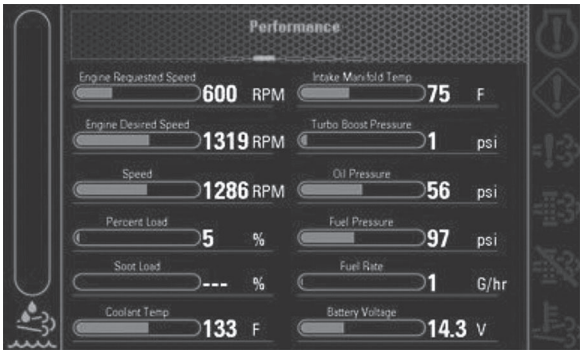


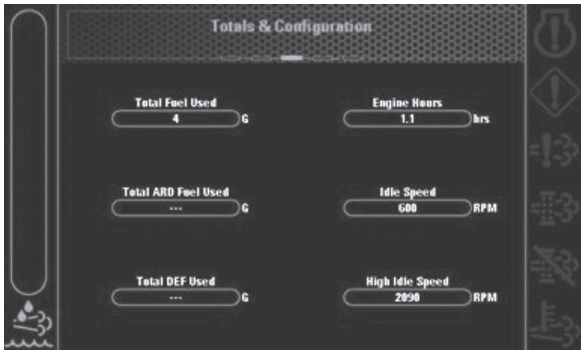
## CAT electronic engine display screens

The CAT electronic engine display has five different screens for checking and controlling the CAT engine. Home, performance, totals and configuration, settings and diagnostics.

def tank level





## 2.12 Other controls

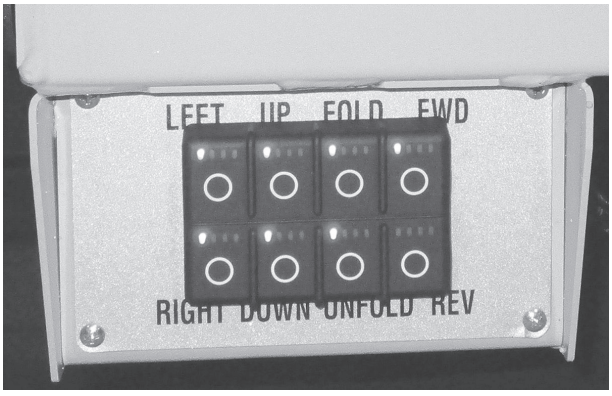
### 2.12a Radio remote control unit (optional)

The optional remote control transmitter unit allows the operator to remotely start and stop the tub, change tub directions of rotation, raise and lower conveyor, swing the conveyor left or right, operate the throttle and the tub cover in and out or raise it and lower it. (if equipped)

**NOTE:** See also section 3.8 and 3.9

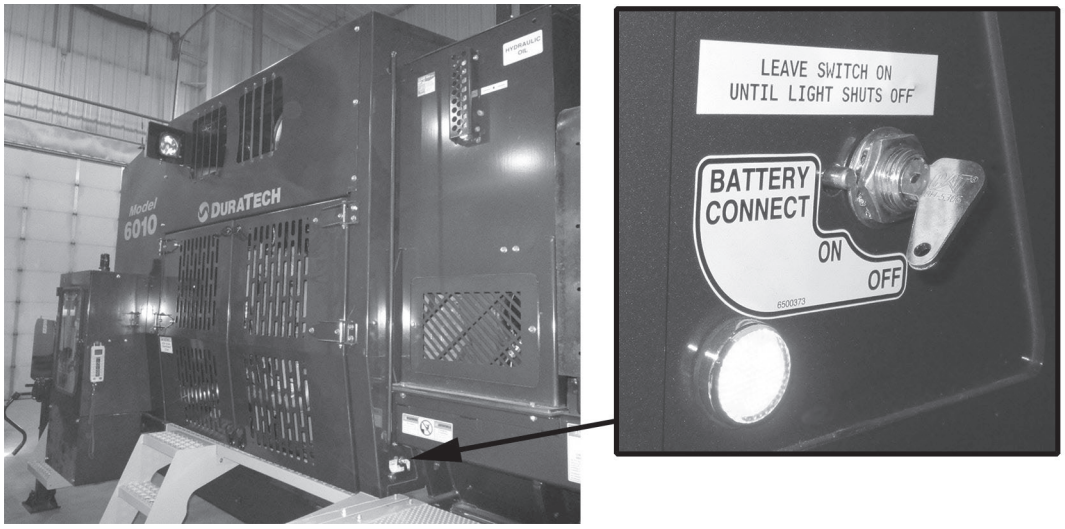
### 2.12b Rear conveyor controls

The discharge conveyor can also be controlled by using the rear control keypad. These controls can swing the conveyor left or right, lift it up or down, fold and unfold or change the direction of the belt forward or reverse.




### 2.12c 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.



# 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 6010 DuraTech Tub 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 6010 DURATECH TUB 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. Also check the screen hold downs for wear and tightness. 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 rotor bearing oil level.
- ❑ Check pressure rollers for proper bearing adjustment.
- ❑ Check diesel exhaust fluid level. (DEF)

## 3.2 Starting the Tub 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 3.16, "Operating the grinder using the remote radio option**"

## 3.3 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.

## 3.4 Throttle operation

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

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

## 3.5 Automatic engine shutdown system

The engine will automatically shut down if it overheats 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.

## 3.6 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 Tub Grinder under normal operation:

1. Disengage the tub drive.
2. Allow the conveyor belts to run until empty.
3. Lower engine rpm to idle, and disengage the wet clutch by pressing the rotor disengage button on the control panel.
4. After the rotor has stopped, disengage the conveyor drive.
5. 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.
6. Shut off the engine and remove the key.
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 3.16, "Operating the grinder using the remote radio option**"

## 3.7 Emergency shutdown procedure

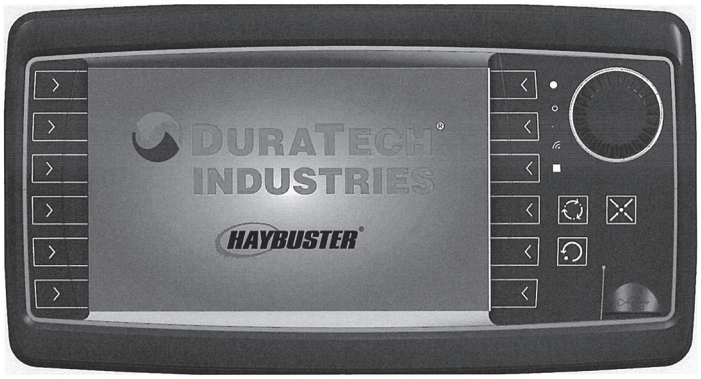
**IMPORTANT:** Emergency shutoff controls are for **EMERGENCY** use Only. **DO NOT** use the emergency shutoff controls for normal stopping procedure.

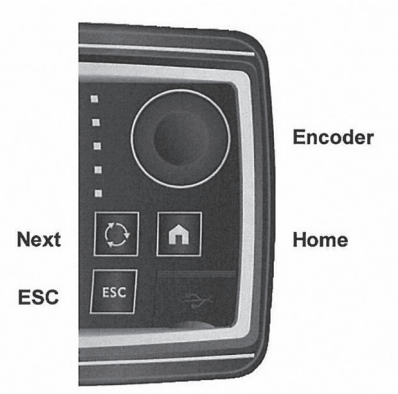
**NOTE:** The emergency stop button will have to be reset before restarting the engine.

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

**NOTE: See also section 3.16, "Operating the grinder using the remote radio option"**

## 3.8 Operation of the electronic governor




# Display

## Hardkeys:

### Next Button

- When the next button is pressed, the display changed to the next screen

### Home Button

- When the home button is pressed the display will go to the home screen.

### ESC Button

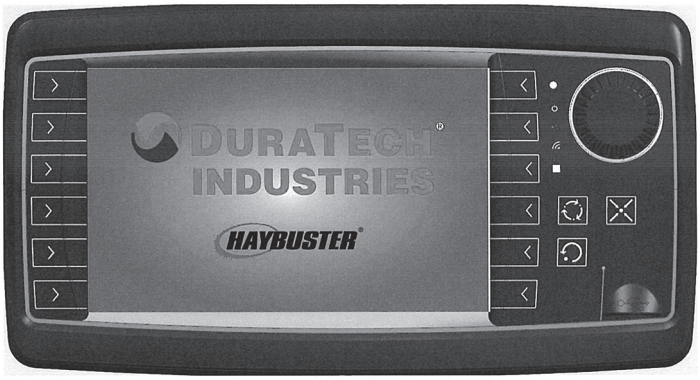
- When the ESC button is pressed the display will go back to the previous screen or view.

### Encoder

- When the encoder button is pressed the display will change screens. The encoder is also used for adjustments.

# Startup Screen

Screen will show up when power is applies to the display for approximently 10 seconds.



## Home Screen

Home Screen will show right after the loading screen, when the Home botton is pressed from any of the other pages, or pressing the next button or the encoder on the Active Faults screen.


Tub FWD/REV buttons will control the Tub FWD/REV outputs as described later **in section 3.9 Logic for the electronic govoner.**

- The Tub Speed gauge will indicate the Tub Speed output with a scale of 0-100.
    - When the Tub Speed button is pressed the Encoder knob will be linked to the Tub Speed setting and the Tub Speed icon will change to red in color.

- The Conveyor Speed gauge will indicate the Conveyor Speed output with a scale of 0-100.
    - When the Conveyor Speed button is pressed the Encoder knob will be linked to the Conveyor Speed setting and the Conveyor Speed icon will change to red in color.

- The Engine Load gauge will indicate the Engine Load setting with a scale of 0-100.
    - When the Engine Load button is pressed the Encoder knob will be linked to the Engine Load setting and the Engine Load icon will change to red in color.

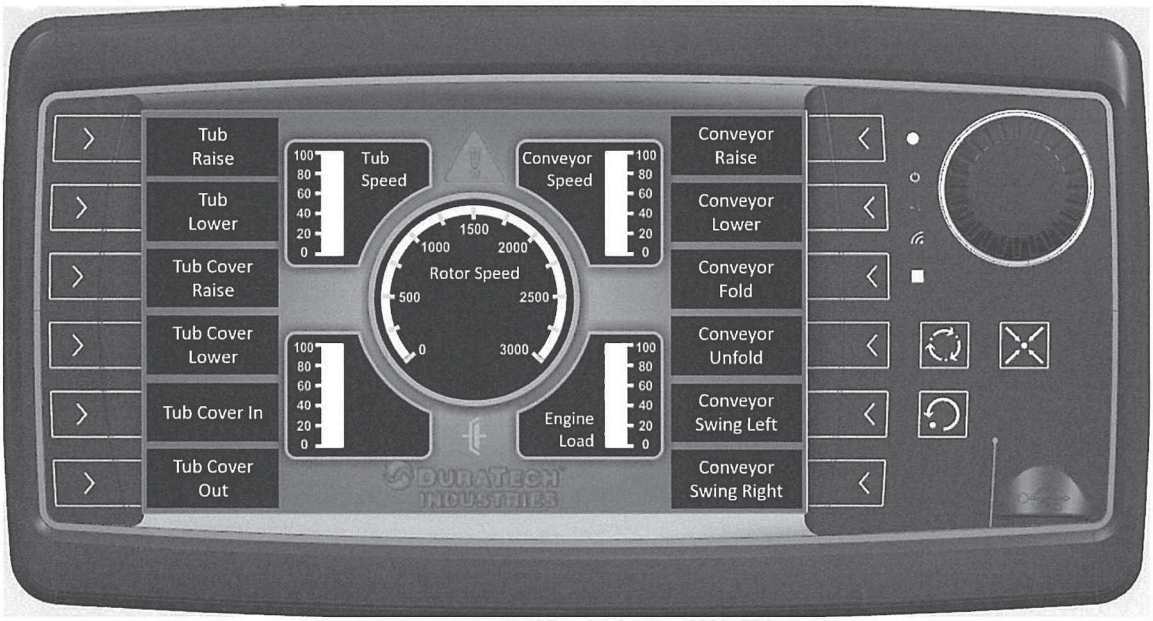
- If the Tub Speed, Conveyor Speed, and Engine Load buttons are not selected the Encoder knob will be linked to the Display Backlight setting.

- The Set Speed button will set the Rotor Speed Max as described later in this document and will be indicated by a blue arrow on the outside edge of the Rotor Speed gauge. The Rotor Speed Min will also be described later in this document and is indicated by the green arrow.

- The Rotor RPM gauge will display the Rotor RPM with a scale of 0-3,000.
- A fault icon will pop up anytime there is a fault triggered in the controller.
- The Clutch Icon indicates status of Clutch input
- If machine is configured as 6010
  - Conveyor FWD button will control the Conveyor FWD output as described later in this document.
  - "Grate height" label on bar graph will be hidden
  - When a button for one of the following functions is pressed the corresponding output will be turned ON in a maintained state and the button will change color. When the button is pressed while the output is ON, the output will turn OFF and the button will turn black in color.
    - Rotary Screen
    - Work Lights
    - Tub Lights
  - "Duratech Industries" logo is displayed.

## Manual Function Screen

The manual Fuction Screen will be accessed by pressing the next button or the encoder on the Home Screen.



- When a button for one of the following functions is pressed the corresponding output will be momentarily turned ON and the button will change color. When the button is released the output will be turned OFF
    - Tub Lights
    - Tub Raise
    - Tub Lower
    - Conveyor Raise
    - Conveyor Lower
    - Conveyor Fold
    - Conveyor Unfold
    - Conveyor Swing Left
    - Conveyor Swing Right

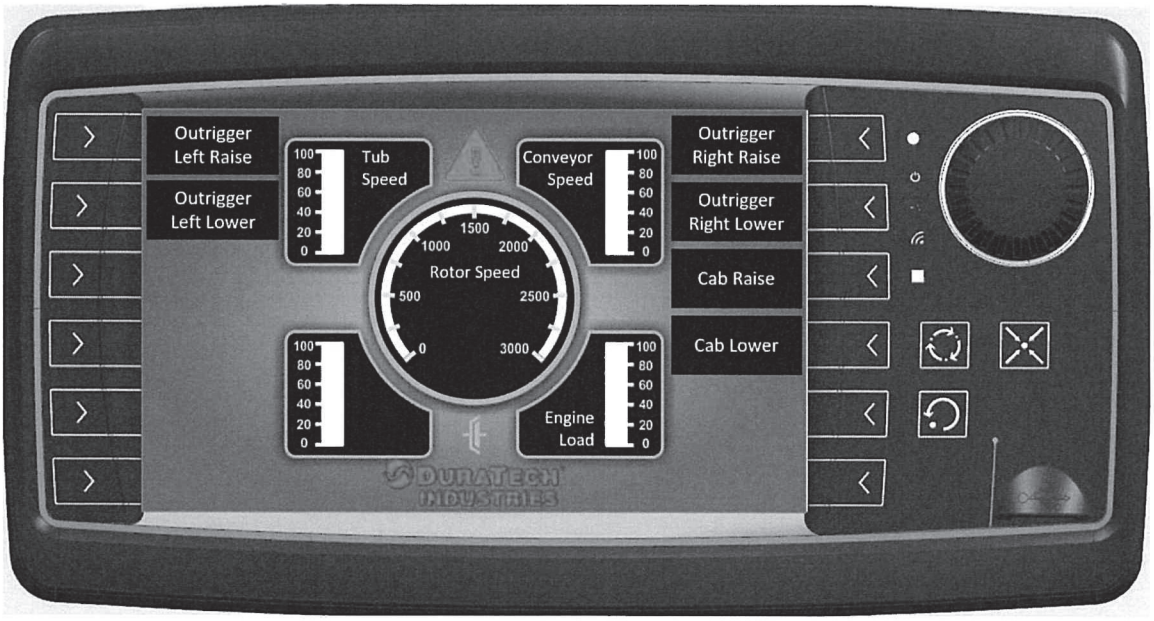
- Interlocks:
    - The Tub Raise output will be de-activated if there are pulses detected on the Rotor Speed input. An alarm window will show if the Tub Raise button is pressed while the function is locked out. If there are no pulses detected on the Rotor Speed input, the Tub Raise output will be activated after the Tilt Enable Timer expires. The Tilt Enable Time can be changed using the Service Tool.

- If machine is configured as 6010
    - "Grate height" label on bar graph will be hidden
    - When a button for one of the following functions is pressed the corresponding output will be momentarily turned ON and the button will change color. When the button is released the output will be turned OFF
        - Tub Cover Raise
        - Tub Cover Lower
        - Tub Cover In
        - Tub Cover Out
    - "Duratech Industries" Logo is displayed.

## If the 6010 DURATECH TUB GRINDER is equipped with a grapple loader

**Loader Function screen:**

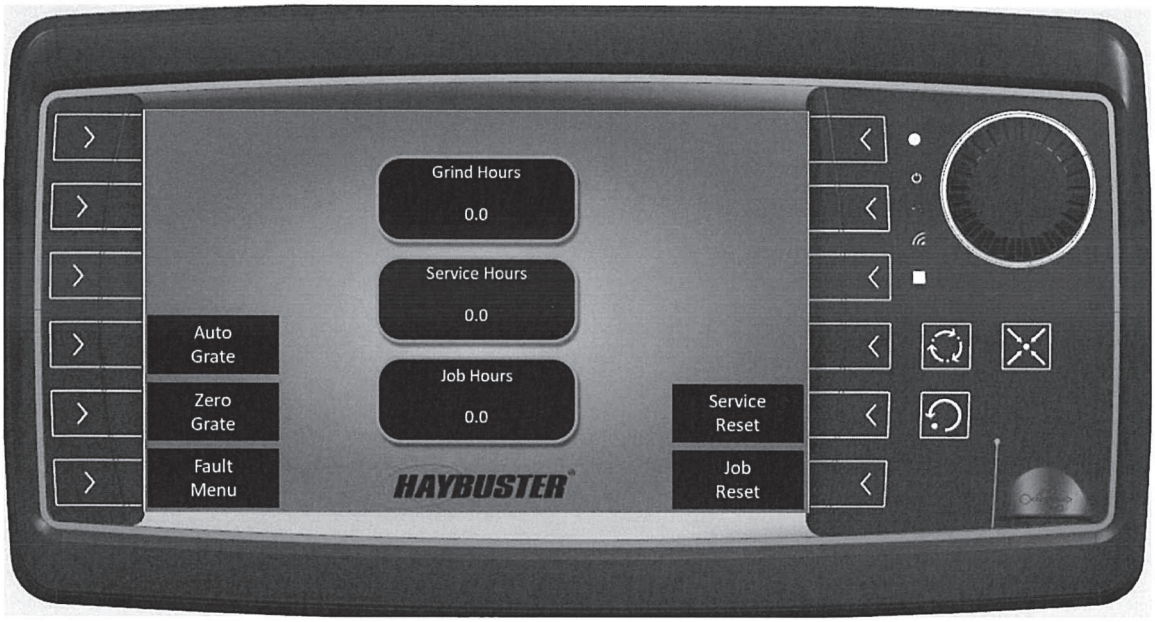
- The Loader Function screen will be accessed on the loader display (If equipped) by pressing the next button or the encoder on the Manual Functions screen.
- Screen function (Loader or Main) is detected the first time the display is connected and powered, and each time the OEM screen is accessed.
- There will be different layouts for different models of the machine.




- When a button for one of the following functions is pressed the corresponding output will be momentarily turned ON and the button will change color. When the button is released the output will be turned OFF.
  - Outrigger Left Raise
  - Outrigger Left Lower
  - Outrigger Right Raise
  - Outrigger Right Lower
  - Cab Raise
  - Cab Lower

- If machine is configured as 6010
  - "Grate height" label on bar graph will be hidden
  - "Duratech Industries" Logo is displayed.

**Hours screen:**
The Hours screen will be accessed by pressing the next button or the encoder on the Manual Function or Loader screen (if equipped).




- Pressing the Fault Menu button will take the operator to the Fault Screen page.

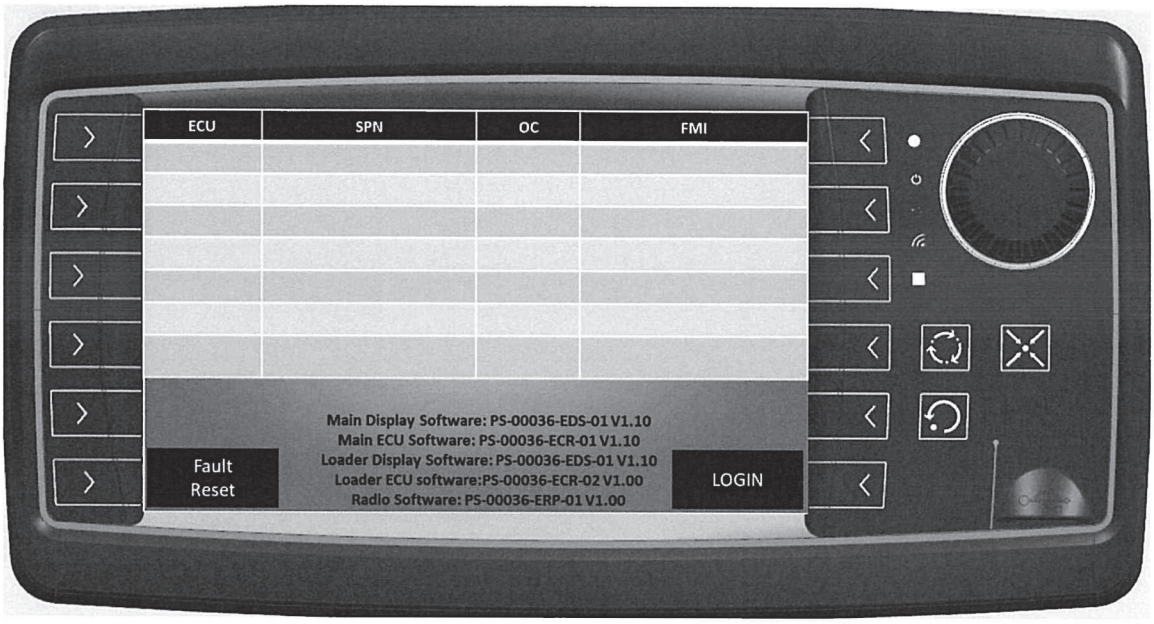
- The Grind Hours window will display the total number of hours the machine has run with the Clutch Input ON. The Grind Hours can be reset using the Service Tool.

- The Service Hours window will display the total number of hours the machine has run with the Clutch Input ON since the last Service Hours Reset. Pressing the Service Hours Reset button will reset the Service Hours window to zero.

- The Job Hours window will display the total number of hours the machine has run with the Clutch Input ON since the last Job Hours Reset. Pressing the Job Hours Reset button will reset the Job Hours window to zero.

- If machine is configured as 6010
  - Auto Grate button and Zero Grate button will be hidden
  - "Duratech Industries" Logo is displayed.

**Active Fault screen:**
The Active Fault screen will be accessed by pressing the next button or the encoder on the Hours screen.




- The Active Fault screen will display a table indicating the J1939 DM1 message fault codes. The fault codes will be displayed as numerical values unless otherwise specified in the **Fault Code Table (Section 6.3)**.
    - The ECU (electronic control unit) column indicates which controller the fault is coming from.
    - The SPN (suspect parameter number) column indicates what function has a fault.
    - The OC (occurrence count) column indicates how many times the fault has occurred.
    - The FMI (fault mode indicator) column indicates the reason for the fault.
- The Fault Reset button will reset all active faults.
- Pressing the LOGIN button will take the operator to the OEM Login page
- The Display and Controller Software version will be displayed on this page.
    - "Loader Display Software" and "Loader ECU Software" will only display if those devices are active.

## 3.9 Logic for the Electronic Governor

**Loader**

- If the Main ECU detects either the Loader display or Loader ECU on the CAN bus network, the Loader functions will be enabled.

**Auto/Manual Mode**

- The system has two modes of operation: Auto Mode and Manual Mode. The mode of operation can be toggled using the Auto/Manual button on the display.

**Tub**

- Tub Forward
  - **ON**
    If the Tub Forward button is pressed on the display or on the radio transmitter, and the Tub Forward output is de-active, and the Tub Reverse output is de-active, and either the Rotor Speed input is greater than zero, or the system is in Manual Mode:
    - Tub Forward output will be activated.
    - Tub Speed output will be ramped from minimum output to the output setting indicated by the display.
    - Tub Forward indicator on the display will change color from black to red.

  - **OFF**
    If the Tub Forward output is active, and the system is switched from Manual Mode to Auto Mode while the Rotor Speed input is zero, or the Tub Forward button is pressed, or the Tub Reverse button is pressed on the display or on the radio transmitter:
    - Tub Forward output will be de-activated.
    - Tub Speed output will be de-activated.
    - Tub Forward indicator on the display will change color from red to black.

    If the Rotor Speed input goes to zero when the Tub Forward output is active and the system is in Auto Mode:
    - Tub Forward output will be de-activated.
    - Tub Speed output will be de-activated.
    - Tub Forward indicator on the display will change color from red to black.
    - Speed Sensor Fault will be activated.

- **Warning**
  If the Tub Forward button is pressed on the display, and the Rotor Speed input equals zero, and the system is in Auto Mode:
  - The following alarm window will be shown on the display for 3 seconds:


  If the Tub Forward button is pressed on the display, and the Rotor Speed input equals zero, and the system is in Auto Mode, and the Speed Sensor Fault is active:
  - The following alarm window will be shown on the display for 3 seconds:

- Tub Reverse
  - **ON**
    If the Tub Reverse button is pressed on the display or on the radio transmitter, and the Tub Forward output is de-active, and the Tub Reverse output is de-active, and either the Rotor Speed input is greater than zero, or the system is in Manual Mode:
    - Tub Reverse output will be activated.
    - Tub Speed output will be ramped from minimum output to the output setting indicated by the display.
    - Tub Reverse indicator on the display will change color from black to red.

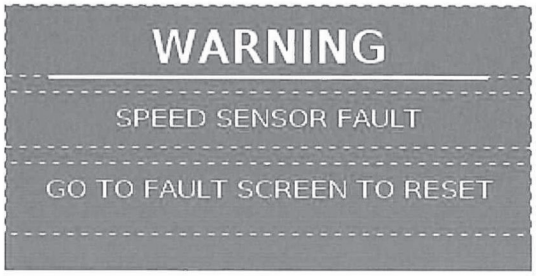
  - **OFF**
    If the Tub Reverse output is active, and the system is switched from Manual Mode to Auto Mode while the Rotor Speed input is zero, or the Tub Forward button is pressed, or the Tub Reverse button is pressed on the display or on the radio transmitter:
    - Tub Reverse output will be de-activated.
    - Tub Speed output will be de-activated.
    - Tub Reverse indicator on the display will change color from red to black.

    If the Rotor Speed input goes to zero when the Tub Reverse output is active and the system is in Auto Mode:
    - Tub Reverse output will be de-activated.
    - Tub Speed output will be de-activated.
    - Tub Reverse indicator on the display will change color from red to black.
    - Speed Sensor Fault will be activated.

  - **Warning**
    If the Tub Reverse button is pressed on the display or on the radio transmitter, and the Tub Reverse output is de-active, and the Rotor Speed input equals zero, and the system is in Auto Mode:
    - The following alarm window will be shown on the display for 3 seconds:

If the Tub Reverse button is pressed on the display or on the radio transmitter, and the Rotor Speed input equals zero, and the system is in Auto Mode, and the Speed Sensor Fault is active:

- The following alarm window will be shown on the display for 3 seconds:




- Tub Speed
  - The Tub Speed ramp rate and output current will have adjustable parameters in the Service Tool.

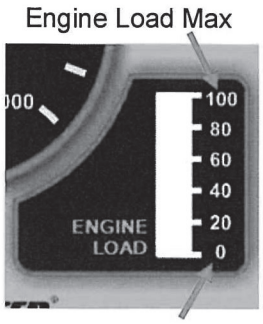
  - Manual Mode:
    - The Tub will operate in an open loop control mode and will not compensate for rotor rpm changes.
    - There will be a Tub Speed gauge on the display, and on the Radio transmitter to indicate the percentage of output from 0-100 percent.
    - The Tub Speed will be adjustable on Home Screen of the display, and by pressing the Tub Speed Increase and Tub Speed Decrease Buttons on the Radio Transmitter.
    - Pressing Tub Speed Increase or Tub Speed Decrease on the Radio Transmitter will increment the Tub Speed by 1. Holding the Shift Key will while pressing the Tub Speed Increase or Tub Speed Decrease buttons will increment the Tub Speed by 10.

  - Auto Mode:
    - The Tub will operate in a closed loop control mode and will compensate for rotor rpm changes.
    - The Tub Speed will be adjustable on Home Screen of the display, and on the Radio transmitter. This will be the maximum speed the Tub will operate at and is the same speed used in Manual Mode.
    - The Engine Load will be used to reduce the Tub Speed to provide an anti-stall function to the rotor. This setting will be adjustable on the Home Screen of the display and will be displayed as 0-100%.
    - Rotor Speed Max (Blue Arrow) is the setpoint at which the Tub starts to slow down. This is set using the Set Speed button on the display. This value will not be allowed to go

above the Set Speed Limit High RPM and below the Set Speed Limit Low RPM. These values can be changed with the Service Tool.

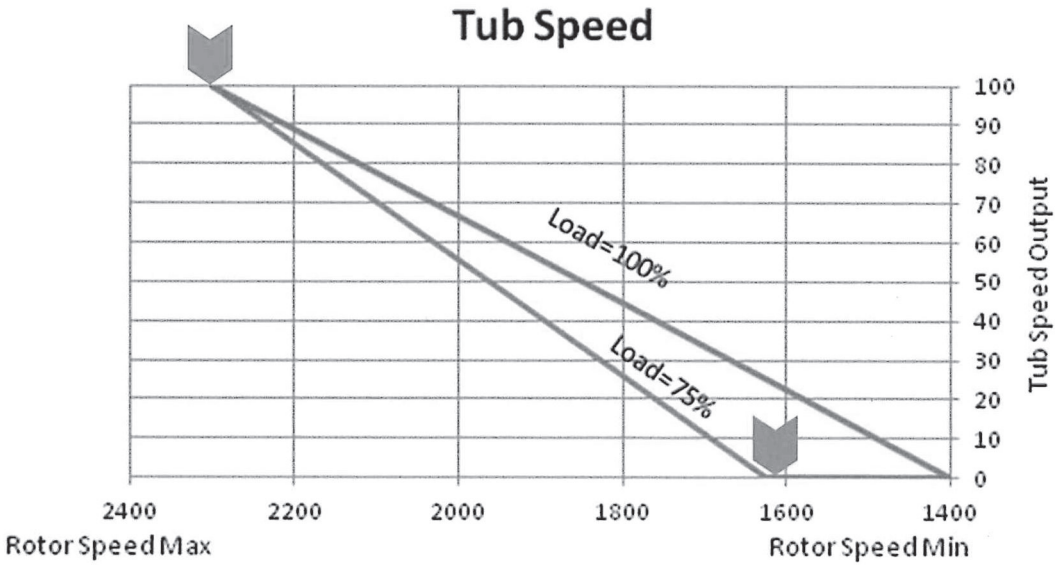
- If the Set Speed button is pressed when the Rotor Speed is less than the Set Speed Limit Low RPM:
  - The following alarm window will be shown on the display for 3 seconds.


- If the Set Speed button is pressed when the Rotor Speed is greater than the Set Speed Limit High RPM:
  - The following alarm window will be shown on the display for 3 seconds.




- Rotor Speed Min Limit is the RPM where the Tub will stop when the Engine Load is set to 100%.
- Rotor Speed Min (Green Arrow) is the setpoint the Tub will slow down to. If the Engine Load is set to less than 100%, the Tub will still start to slow down at the Rotor Speed Max setpoint but the Tub will be stopped at the Engine Load percentage between the Rotor Speed Max and the Rotor Speed Min Limit.
- Load Example:
  - Rotor Speed Max = 2,300 rpm
  - Rotor Speed Min Limit = 1,400 rpm
  - Engine Load Display = 75%

Calculate Engine Load RPM: 0.75 * (2300-1400) = 675 rpm
Calculate Rotor Speed Min: 2,300 – 675 = **1,625 rpm**



**Conveyor**

- Conveyor Forward
  - **ON**
    If the Conveyor Forward button is pressed on the display and the Conveyor Forward output is de-active, and the Conveyor Reverse output is de-active,
    - Conveyor Forward output will be activated.
    - Conveyor Forward indicator on the display will change color from black to red.
  - If the Conveyor Forward button is pressed on the keypad the Conveyor Forward output will be momentarily activated and the LED will change from red to green. When the Conveyor Forward button is released the output will be de-activated and the LED will change from green to red.
  - **OFF**
    If the Conveyor Forward output is active, and the Conveyor button is pressed on the display or on the rear keypad:
    - Conveyor Forward output will be de-activated.
    - Conveyor Forward indicator on the display will change color from red to black.
  - **Warning**
    If the Conveyor Fwd output is active, and the Speed Sensor Fault is active:
    - Conveyor Forward output will be de-activated after the Conveyor Speed Off Timer expires. The Conveyor Speed Off Time can be changed with the Service Tool.
    - Conveyor Forward indicator on the display will change color from red to black.
    - The following alarm window will be shown on the display while the countdown is active:

- Conveyor Speed
  - The Conveyor Speed ramp rate and output current will have adjustable parameters in the Service Tool.
  - There will be a Conveyor Speed gauge on the display and Radio Transmitter to indicate the percentage of output from 0-100 percent.
  - If machine is configured as 6010
    - The Conveyor Speed will be adjustable on Home Screen of the display.

- Conveyor Raise
  - When the Conveyor Raise button is pressed on the display, rear keypad, radio transmitter or Loader Joystick, the Conveyor Raise output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Conveyor Lower
  - When the Conveyor Lower button is pressed on the display, rear keypad, radio transmitter or Loader Joystick, the Conveyor Lower output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Conveyor Fold
  - When the Conveyor Fold button is pressed on the display or rear keypad, the Conveyor Fold output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Conveyor Unfold
  - When the Conveyor Unfold button is pressed on the display or rear keypad, the Conveyor Unfold output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Conveyor Swing Left
  - When the Conveyor Swing Left button is pressed on the display, rear keypad, radio transmitter or Loader Joystick, the Conveyor Swing Left output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Conveyor Swing Right
  - When the Conveyor Swing Right button is pressed on the display, rear keypad, radio transmitter or Loader Joystick, the Conveyor Swing Right output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

**Engine**

- Engine Speed Increase
  - When the Engine Speed Increase button is pressed on the radio transmitter, the main ECU will send an Engine Speed Increase CAN bus signal to the engine display.

- Engine Speed Decrease
  - When the Engine Speed Decrease button is pressed on the radio transmitter, the main ECU will send an Engine Speed Decrease CAN bus signal to the engine display.

- Engine Shutdown
  - When the E-Stop button on the transmitter is pressed, the Engine Shutdown output will turn OFF for 5sec.
  - When the lower red OFF button on the transmitter is pressed or the transmitter goes out of range or the transmitter loses connection for any other reason, the Engine Shutdown output will stay ON, keeping the engine running.

## If the 6010 DURATECH TUB GRINDER is equipped with a tub cover

**Tub Cover**

- Tub Cover In
  - When the Tub Cover In button is pressed on the display or radio transmitter, the Tub Cover In output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Tub Cover Out
  - When the Tub Cover Out button is pressed on the display or radio transmitter, the Tub Cover Out output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Tub Cover Raise
  - When the Tub Cover Raise button is pressed on the display or radio transmitter, the Tub Cover Raise output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

- Tub Cover Lower
  - When the Tub Cover Lower button is pressed on the display or radio transmitter, the Tub Cover Lower output will be turned ON momentarily and the indicator will change colors. When the button is released the output will be turned OFF.

## 3.10 Adjusting the tub's rotation speed

Tub rotation is controlled by the tub rotation function on the electronic governor's display on the control panel or the remote radio. The tub can be started, stopped, forward and reversed and rotation speed changed.

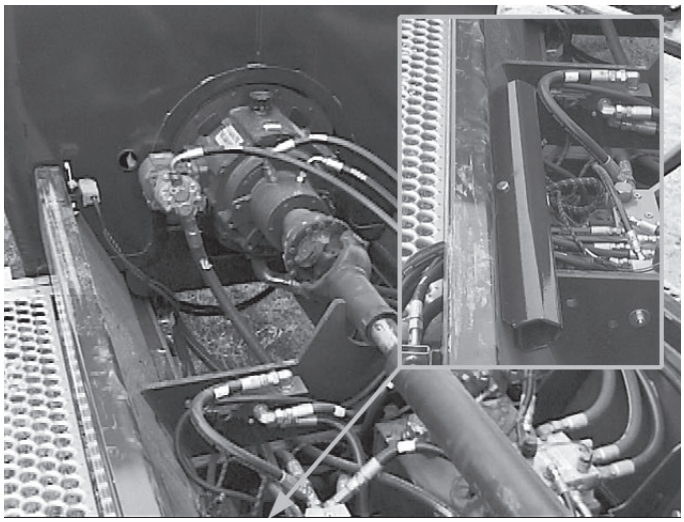
## 3.11 Raising the tub

**NOTE:** If the grinder becomes plugged or if the rotor requires maintenance, do not raise the platform with the tub full of material.

To raise the tub, perform the following steps:

1. Verify that the tub grinder is parked on level surface.
2. Disengage the clutch, and wait for the rotor to stop turning.
3. If your machine is equipped with a tub cover place tub cover in fully closed postion
4. As material in the tub may roll some distance, make sure the area on the right hand side of machine is clear of personnel and equipment. Shout the word "**CLEAR**".
5. The engine speed should be 1000 RPM.
6. Operate the tub tilt function on the electronic governor's display on the control panel to raise the tub.
7. Raise the tub fully, and install the safety stop on the hydraulic cylinder. The safety stop is located in its storage location on the inside of frame rail.

**NOTE:** The tub will not lift if the rotor is turning. Also, when the tub is raised, the clutch will not engage If the tub is full of material, the hydraulic cylinder will not raise the tub.



## 3.12 Lowering the tub

To lower the tub, perform the following steps:

1. Remove the safety stop on the hydraulic cylinder, and place safety stop in storage location on the inside of frame rail.
2. Clear the area of equipment and personnel.
3. Engine speed should be 1000 RPM.
4. Operate the tub tilt function on the electronic governor's display on the control panel to lower the tub.

## 3.13 Starting and stopping the belly auger and discharge conveyor ( REV. 02-20 )

The belly auger and discharge conveyor are on one circuit, so one control starts and stops both. The control is found on the control panel by the engine or on the keypad located on near the rear of the machine. If the machine is equipped with the remote-control transmitter option, this can also be used for running the belly auger and discharge conveyor. Belly auger and discharge conveyor should be started before the rotor is started and should be allowed to run until the rotor stops running.

## 3.14 Lifting the discharge conveyor

The discharge conveyor can be raised and lowered as needed using the conveyor function on the electronic governor's display on the control panel, the rear keypad or the remote-control transmitter if equipped.

## 3.15 Pivoting the discharge conveyor

The discharge conveyor can be swung left or right as needed using the function on the electronic governor's display on the control panel, the rear keypad or the remote-control transmitter if equipped.

**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.

## 3.16 Operating grinder using the Remote Radio Transmitter Option

### System overview

The **OMNEX Trusted Wireless TD1140/R260** is a portable, long range, programmable radio remote control system. Designed as a compact and easy-to-use product, this **Trusted Wireless** system puts complete control of your equipment where it's needed most, with the operator.

The **R260** receiver is designed to be powered from a 12VDC or 24VCD system. It features 19 solid state, high-side driver input/output controls and reliable E-Stop.

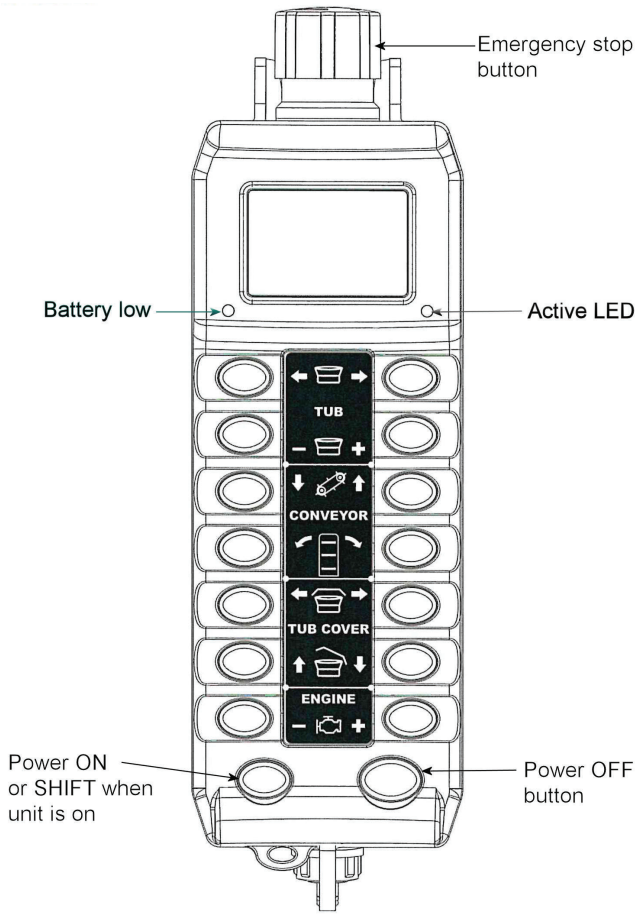
The **TD1140** has 14 buttons to provide flexibility to control the functions needed. The transmitter uses a battery pack for regular alkaline AA batteries.

### Transmitter Features:

- Radio Frequency: 2.4 GHz
- Battery: 2-AA
- E-Stop switch
- Tether connection

## 3.16a Remote Radio Transmitter layout:

The optional remote radio transmitter unit will allow the operator to remotely start and stop the tub, change the tubs direction or rotation to forward or reverse, raise and lower the discharge conveyor, swing the conveyor left and right, operate the engine throttle and perform and emergency stop. Also, if the 6010 DURATECH TUB GRINDER is equipped with a tub cover, the radio remote will operate the tub cover in and out or raise it and lower it. The remote radio transmitter has two indicator lights, low battery and active LED. The green button on the bottom right of transmitter is power ON or used as a SHIFT key when unit is on. The red button on the bottom left of the transmitter is power OFF.




**CAUTION:** Only clean the buttons or whole remote radio transmitter with a soft cloth lightly dampened with water.

DO NOT clean the buttons or whole remote radio transmitter with any sharp instruments or object that can cut or damage the button membrane or housing. DO NOT pour any liquids, use a hose, or pressured water directly on the remote radio transmitter. Consult with the supplier of your equipment if you are unsure if correct cleaning proscedures. Failure to follow cleaning procedures may result is equipment failure and serioud personal injury.

## 3.16b Replacing batteries and powering the remote radio transmitter

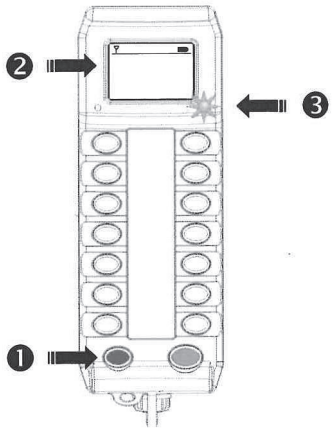
The battery compartment is located on the back lower half of the transmitter. Use a slotted screwdriver to remove the screw of the battery pack. Take battery pack out and slide the cover towards the pack tongue, lift and remove. Replace 2-AA batteries in the correct orientation embossed inside the battery pack. Slide the cover back on the battery pack and place battery pack back in transmitter with screw.

**WARNING:** When using "AA" batteries do not install backwards, charge, put in fire or mix with other battery types. May explode or leak causing injury. Keep the battery compartment dry to prevent corrosion. **Replace all batteries as a complete set and do not mix and match battery types.**

### Turning on the Transmitter

Press Power ON (1 green button. Refer to the light legend below for LED states.

At a minimum the display will briefly show a splash screen and display the RF link strength and battery status (2). Depending on the presence of a powered and paired receiver the display area may have have more information and the Communication LED may blink yellow (3.




Turn ON Transmitter

### Turning off the Transmitter

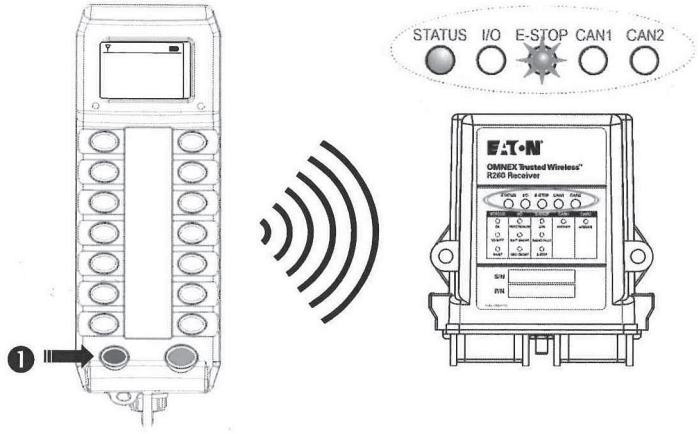
Press the red Power OFF button.

## 3.16c Transmitter Display Screens:

### Remote Radio start up

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

- Press and hold the Power ON (1) button until the display show the startup logo then release the ON button.
- The transmitter can take from 2-7 seconds to link with the R260.
- If the transmitter does not power refer to section **3.16b replacing batteries and powering the remote radio transmitter.**



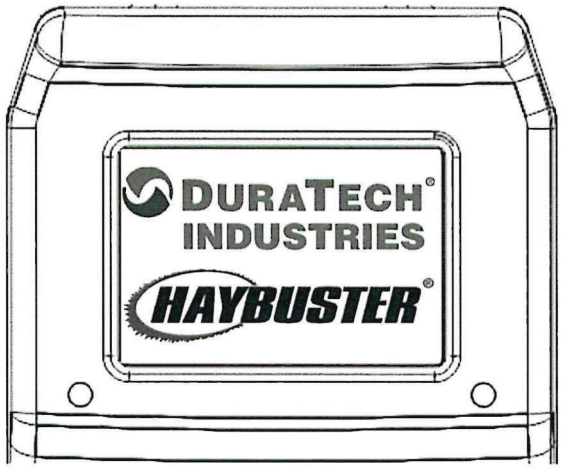

### The system is now ready for use

If the receiver's (E-STOP) light flashes GREEN the system is ready to use.

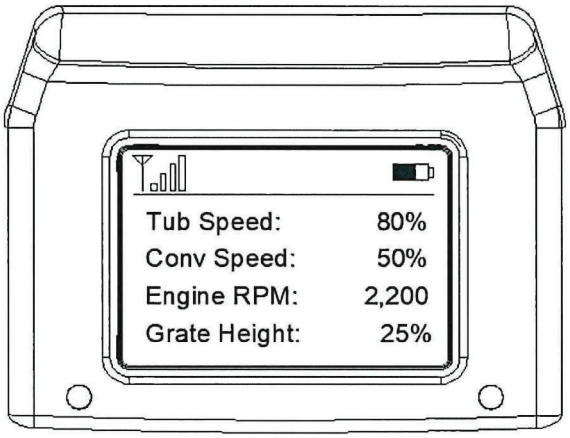
**NOTE:** As a battery savings feature the transmitter may shut itself off (and the receiver will transition all outputs to a safe state) after the configured transmitter timeout inactivity period.

Momentarily operating any button on the transmitter, including the (Power) button will restart the timeout monitoring.

Boot Screen – Will show on start up.




Home Screen (Page 1) – Will show after boot screen.




The following parameters will be displayed on the Home Screen.

- Tub Speed: 0-100%
- Conveyor Speed: 0-100%
- Engine RPM: 0-9,999

### Remote Radio Shutdown

Press the red Power OFF button on the transmitter. Place the transmitter in the storage location on the control panel.

## 3.16d Operations of the radio remote transmitter

| Indicators / Items | Description |
|---|---|
|  | Occurs whenever a function is pressed. Will also remain on momentarily on Power Up. |
|  | Transmitter is in Operating mode. (Data is sent to and received from R260) |
|  | Low Battery. (***Note:*** *Low batteries will last approximately 1 hour once the Low Battery light begins to flash).*<br>Action: Change or Recharge Batteries |
|  | An internal error is preventing the RCU from operating (When available, a specific error message is displayed on the screen.) |
| **Received Signal Strength**<br>(Top left corner of the display) |  Strong  Weak  No signal |
| **Out of range vibrate notification** | When the RCU moves out of radio range of the R260, the RCU vibrates to alert the operator.<br>Move the RCU closer to the R260 within radio range to re-link. |
| **Other vibration notifications** | Other vibration notifications can also be used (defined under application control) to alert the operator when warnings or alarms happen. |

## 3.17 Grinding

Before you begin grinding, start the machine and check the direction of the tub's rotation. Also check the electronic governor for proper operation.

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 for five minutes before grinding.

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 function to the forward position.
4. Engage the wet clutch by pressing the clutch start button in, and holding it in until the LCD Display changes to "Clutch engaging".

## 3.18 Grinding with tub cover

The Tub Cover is designed to deflect most objects thrown out of an Tub Grinder. The movable top cover does the deflecting, and the closer it is set to the tub, the more debris it will deflect. The Tub Cover can be rotated up and down, and the support frame can be rotated in towards the tub or out away from the tub. During normal grinding, keep the tub cover as close to the tub as practical. When emptying the tub, close the tub cover until it almost contacts the tub, providing coverage of most of the tub, and stopping most of the debris as the tub empties out.

## 3.19 Loading the tub

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

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

1. Engage the rotor as described above.
2. Fill the tub about halfway full of unground material before starting tub rotation.
3. Start tub in the forward direction by switching the electronic governor Engine(Auto) mode and switching tub direction to forward.
4. Place additional materials in the tub as needed.

## 3.20 If lodging occurs while grinding

Occasionally materials may lodge against the side of the tub and not feed down to the mill. If this occurs, reverse the tub direction briefly, and then start the tub in a forward direction again. This practice normally dislodges any materials.

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

## 3.21 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 tub with wet material.

## 3.22 Preparing the 6010 DURATECH TUB GRINDER for transport

To prepare the 6010 DURATECH TUB 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 the machine has folding flares, rotate the tub so the folding flares line up with the side of the machine.
3. If equipped with a magnetic roller, latch the discharge pan into the transport position.
4. Fold the discharge conveyor, and then raise the discharge conveyor into the transport position which is shown in figure 3.2 on the next page. When folding the conveyor, do not exceed an engine speed of 1000 RPM. Excessive engine RPM will cause the conveyor to fold too fast and may cause damage. Be certain that no power lines, branches, roof trusses, etc. will obstruct the folding operation of the conveyor.

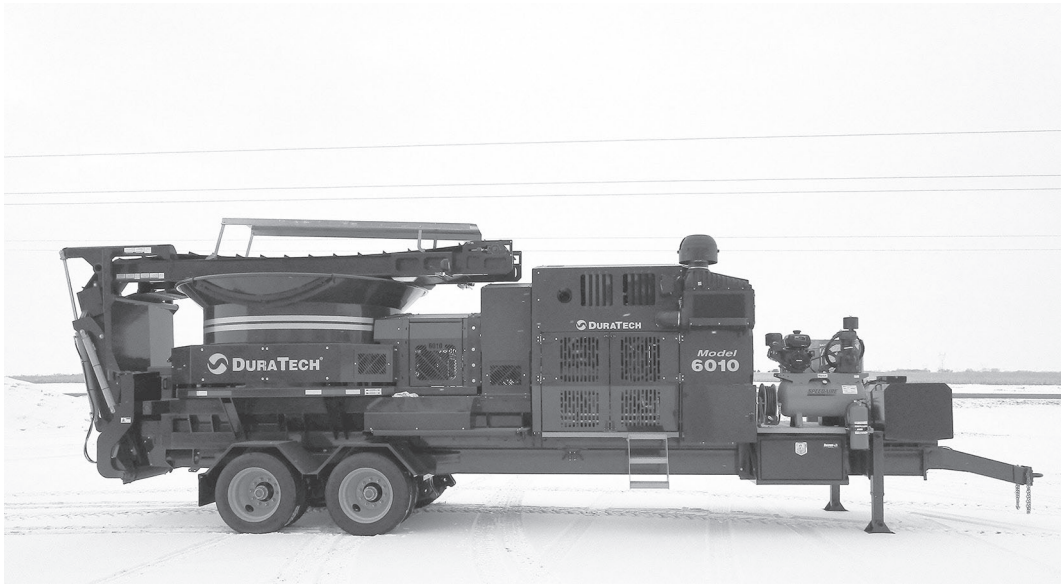
**CAUTION:** DO NOT MOVE TUB GRINDER without first securing the conveyor in transport position as shown in figure 3.2 on the next page

5. If your machine is equipped with a tub cover, then lower tub cover.
6. Shut down the engine using the normal shutdown procedure.
7. 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.
8. Remove all loose materials such as leaves, grass, and branches from the machine.

9. Raise the trailer landing gear and lock the handle in its storage position.
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 3.2**
**conveyor in the transport position**



## 3.23 Preparing the 6010 DURATECH TUB GRINDER for operation after transport

To prepare the 6010 DuraTech Tub 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 tub?
   - Position grinder to minimize the risk of thrown objects. For more information see section 1.6 on page 14.
2. Turn the battery disconnect switch to “ON”.
3. Perform pre-operation inspection of the tub grinder.
4. Start the engine.
5. Lower the conveyor fully.
6. Unfold the top section of the discharge conveyor until it is fully extended. When unfolding the conveyor, do not exceed an engine speed of 1000 RPM. Excessive engine RPM will cause the conveyor to fold too fast and may cause damage.
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.
9. Set tub cover to desired postion.

## 3.24 Preparing the 6010 DURATECH TUB GRINDER for storage

To prepare the 6010 DURATECH TUB GRINDER for storage, perform the following steps:

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

## 3.25 Removing the 6010 DURATECH TUB GRINDER from storage ( REV. 02-20 )

To remove the 6010 DURATECH TUB GRINDER from storage, perform the following steps:

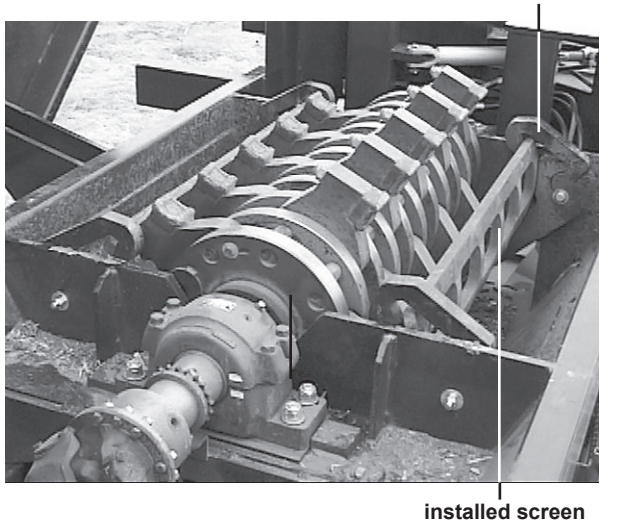
1. Perform a thorough pre-operation inspection as specified in Section 3.1 of this manual.

## 3.26 Installing a screen ( REV. 02-20 )

**CAUTION:** Follow normal shutdown procedure after tilting the tub and prior to performing any service work in the rotor area.

To install a screen, perform the following steps:

1. Raise the tub completely, and install the hydraulic cylinder lock.
2. Unlatch the screen hold-downs.
3. 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.
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, and latch the screen hold-downs.
9. Make sure all personnel and equipment are clear of the tub platform.
10. Remove the hydraulic cylinder lock, and lower the tub.



## 3.27 Adjusting the conveyor belt tension

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

Rollers on 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.

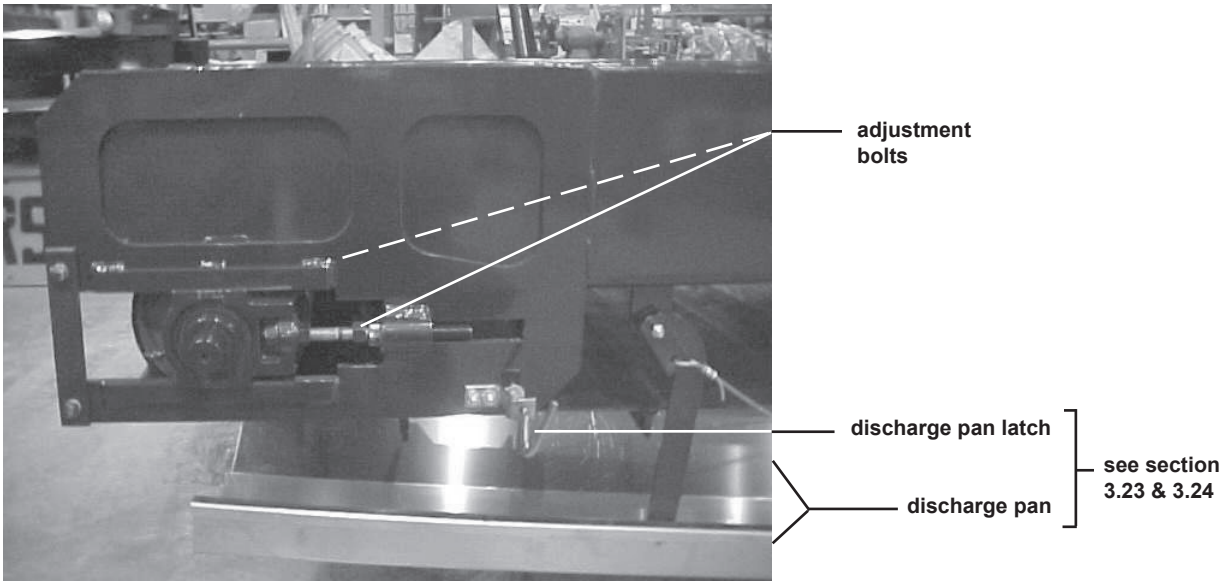



**figure 3.4**
**discharge conveyor belt adjusting bolts**

## 3.28 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 (figure 3.4). Increase tension by approximately 1/2 turn of the adjusting nut.
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.
6. Repeat steps 1-5 until proper tracking is achieved.

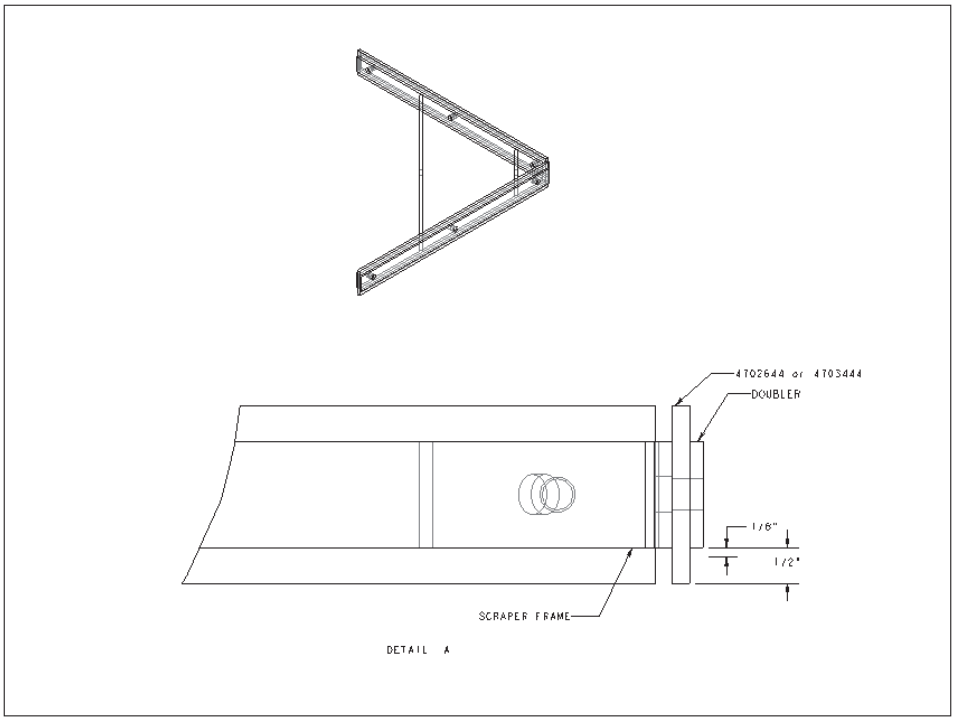
**C. If the belt is running to the left side, perform the following steps:**

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.
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.
6. Repeat steps 1-5 until proper tracking is achieved.

## 3.29 Belt scrapers on the discharge conveyors

Belt scrapers have a poly blade (pn# 4702644 for the belly or pn# 4703444 for the discharge) that wears down and needs to be flipped around or replaced. When the poly blades wear to within 1/8” of the scraper frame and doubler, either flip the poly blade around or replace with a new one.

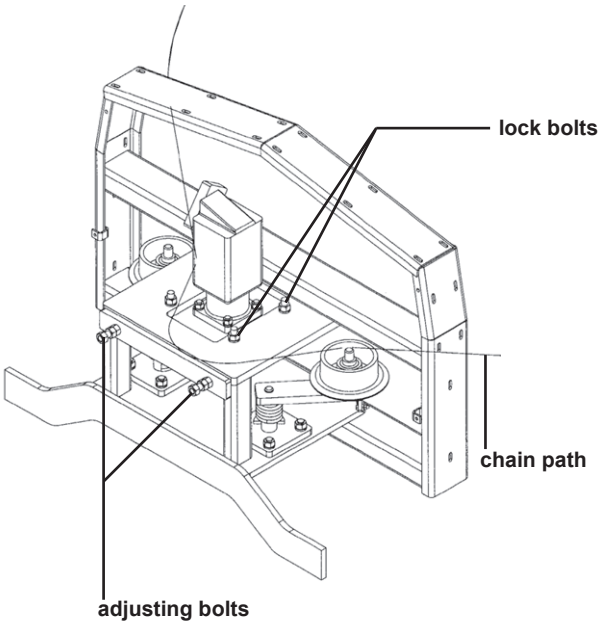
**Note**: the belt scrapers are located inside the belt.



## 3.30 Adjusting tub chain tension

To adjust the tub chain tension, perform the following steps:

1. Loosen (4) bolts holding motor mounting plate.
2. Turn (2) adjusting bolts to set chain tension.
3. Tighten the (4)bolts holding motor mounting plate.




## 3.31 Engaging wet clutch

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

**IMPORTANT:** **Never** engage the clutch when platform is raised.

To engage the wet clutch, perform the following steps:

1. Before starting engine, the rotor box should be cleared of all material.
2. Start the engine. Engine must be at 800-1100 rpm; the controller will not engage the wet clutch when engine speed is above 1100 rpm. The "POWER" LED and the "ENGINE RPM" LED will be illuminated.
3. Push the Clutch Start Button in for about 3 seconds. (The blue beacon light should be lit during this time). When the "CLUTCH ENGAGE" symbol illuminates, the Start Button can be released.

## 3.32 Disengaging the wet clutch

To disengage the wet clutch:

1. Empty the tub.
2. Reduce engine speed to below 1200 rpm.
3. Push the Clutch Start Button for 1 second. The wet clutch will disengage, and the "CLUTCH ENGAGED" symbol will not be illuminated.

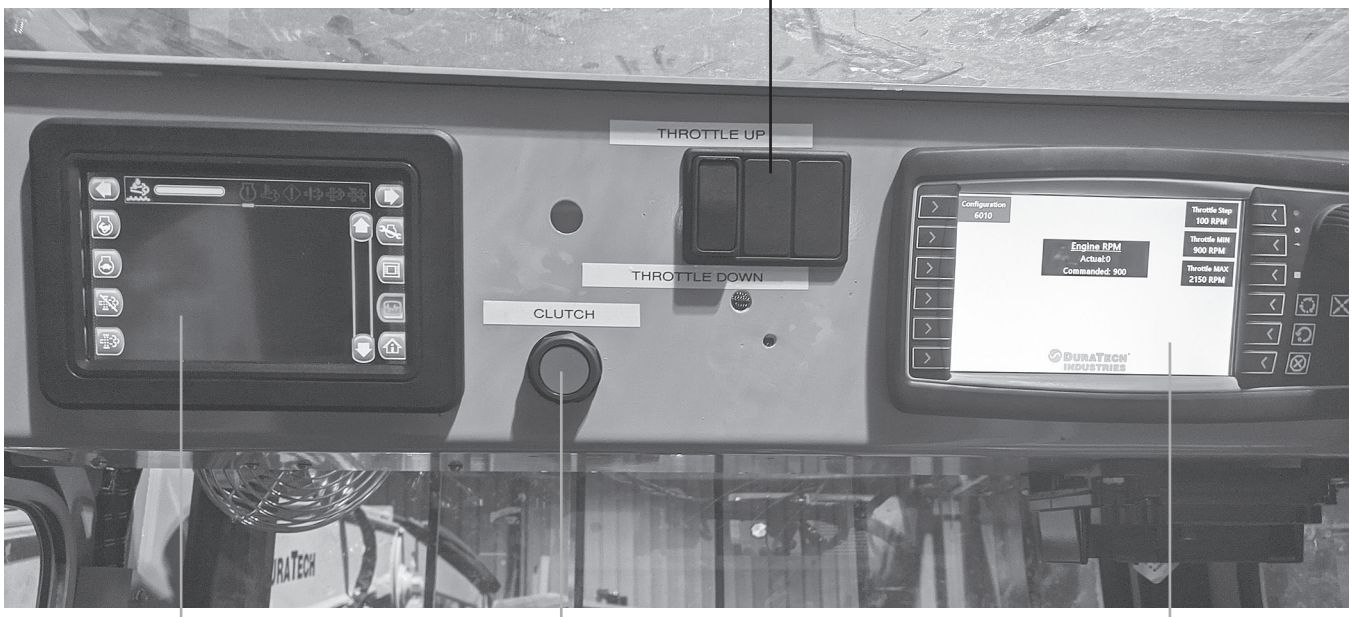
## 3.33 6010 Grapple Loader Option

An optional grapple loader is available for the 6010 Industrial Tub Grinder. This loader can be used to place most materials into the grinder's tub. From the loader's cab, the operator is able to see what is occurring in the tub.

Stabilizer legs are included with the optional loader, and their controls are located in the operator's cab with the controls for operating the loader. The stabilizer legs stabilize the loader during operation.


emergency stop

throttle up/down

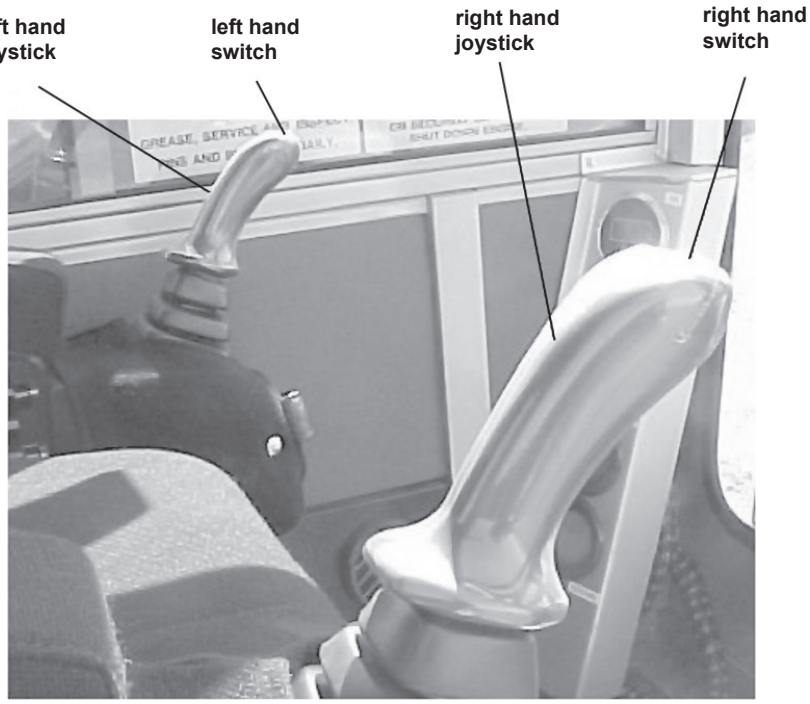


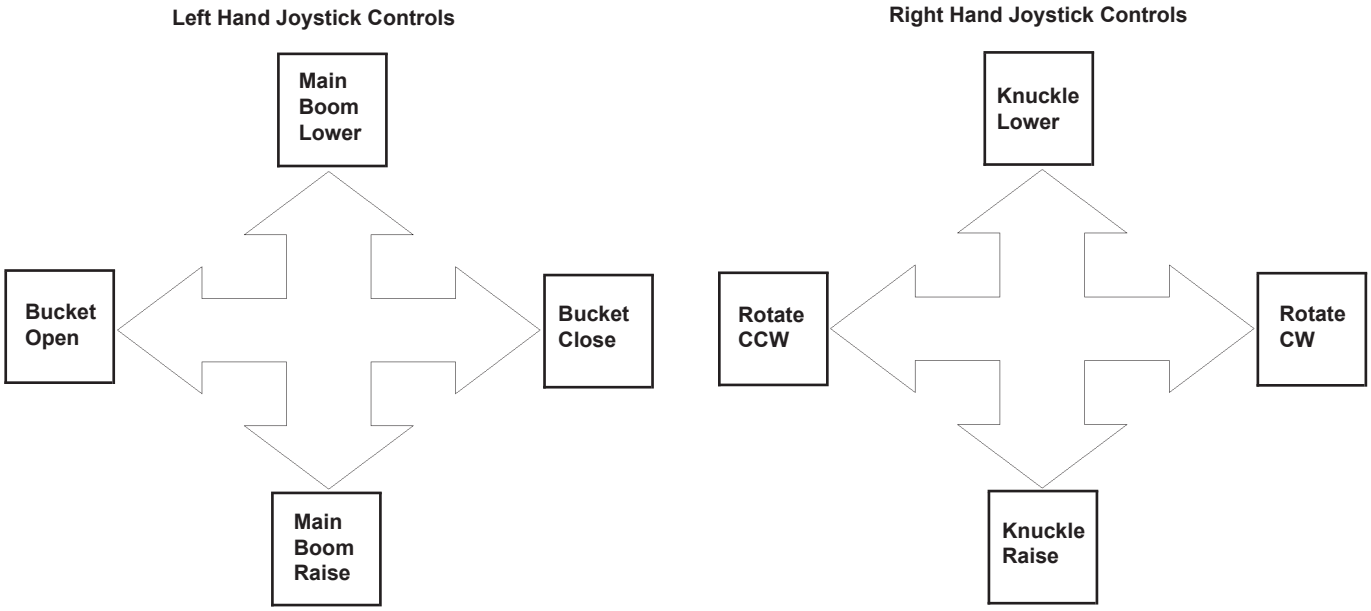

CAT engine display

clutch

electronic governor display

## Joystick Controls for 6010 Grapple Loader



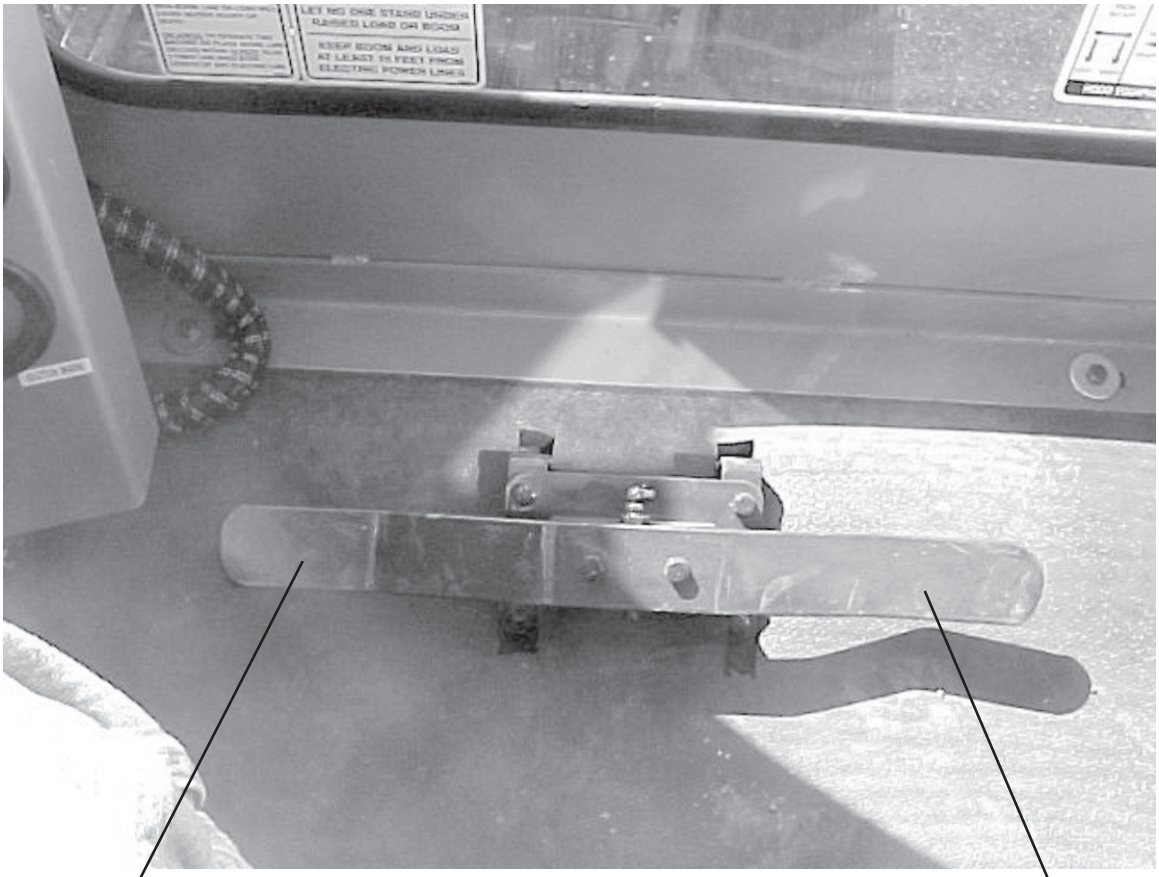

**Switches on the Joysticks**

With the Tub Cover: Left switch controls the IN/OUT. Right switch controls the UP/DOWN.

With no Tub Cover, the switches are used for the discharge ciconveyor: Left switch controls the UP/DOWN for the discharge conveyor.

Right switch controls the SWING LEFT/SWING RIGHT.

## Foot Controls



Rotates boom left

Rotates boom right

## 3.34 6010 Hydraulic Hammer Rod Puller (Optional)

### A. Operation

#### A. Rod Removal

**i.** Loosen bolts on rotor end-plate and rotate it.

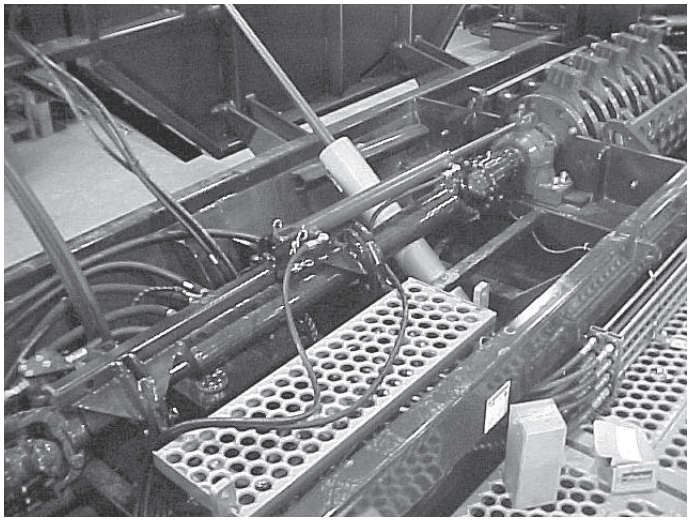
**ii.** Turn in eye-bolt, 4800600, into the end of rod to be pulled.

**iii.** Pin up the cylinder as in picture 1 and pin rod end to the eye-bolt.

**iv.** Retract the cylinder. If the rod does not move at first, use a 5 lb. hammer to tap on the rod and rotor plates to help loosen the rod.

**v.** Once the cylinder is fully retracted, unpin the cylinder mount from the base and extend the cylinder until the mount can be pinned in the 'rear' position.

**vi.** Retract cylinder and remove the rod.



**Picture 1**

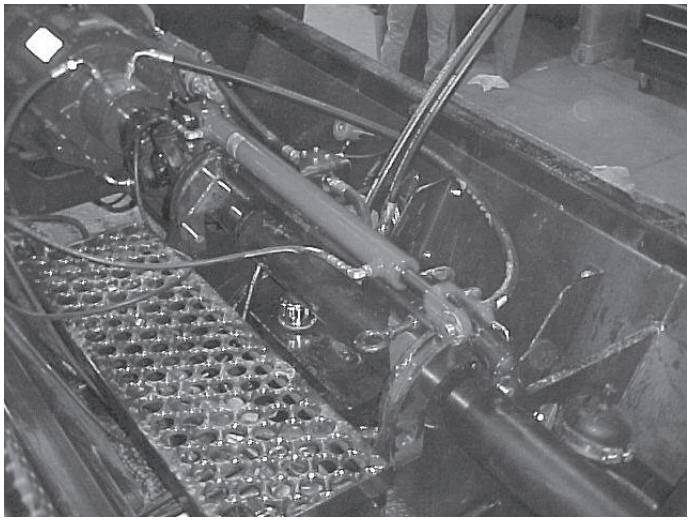
#### a. Rod Install

**i.** With the cylinder positioned as in picture 2 install the "cup" (4703973) on the end of the cylinder.

**ii.** With the rotor plates aligned and the rod inserted through at least two plates, position the cup over the end of the rod and extend the cylinder.

**WARNING:** Keep hands and feet away from the rod and cylinder while operating the cylinder. Stop cylinder function if a rotor plate must be aligned to accept rod!

**ix.** Adjust the cylinder mount to the 'front' position and continue pushing the rod the rest of the way. Rod will still need to be tapped in flush with the first plate.



**Picture 2**

**B. Storage**

**A. Cylinder**

**i.** Retract the cylinder and remove it from the rod puller frame.

**ii.** Pin the cylinder to the service step as shown in picture 3.

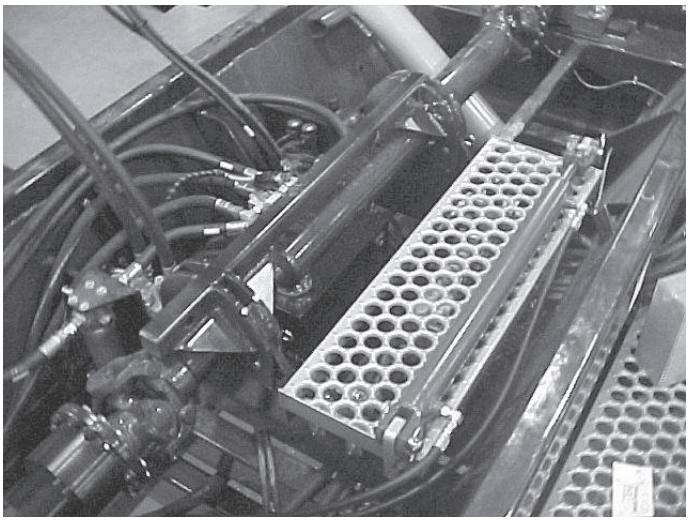
**B. Frame**

**i.** Remove the 4 pins from the rod puller frame and lift the puller frame assembly out of the main frame

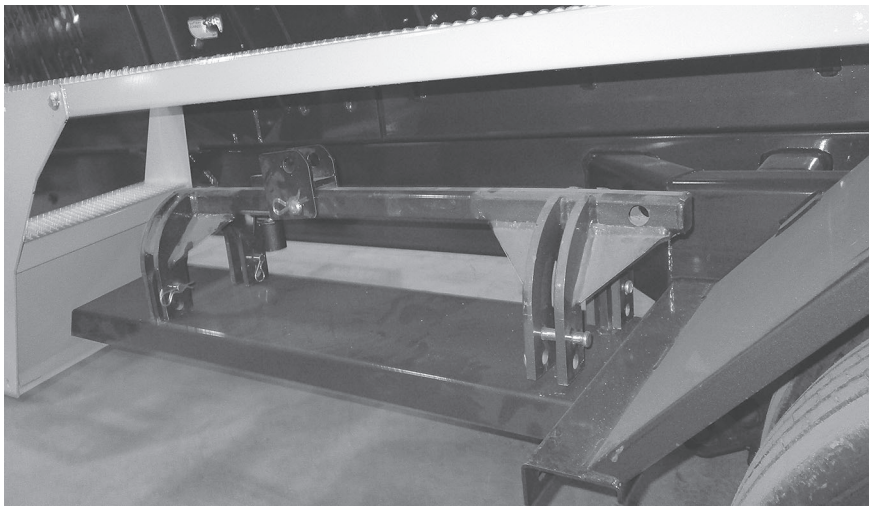
**ii.** The puller assembly can be stored on the bracket underneath the walkway.

**C. Harness/Hoses**

**i.** Tie down remote harness and hoses out of the way of the driveshaft and tub using wire ties or bungee cords.



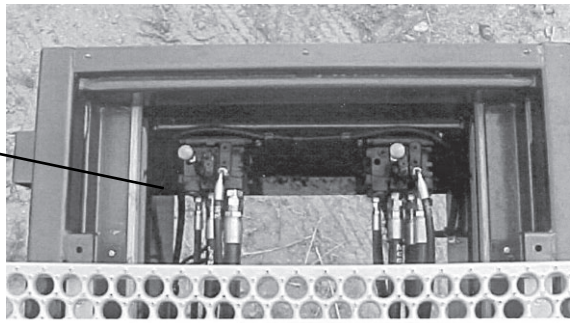
Picture 3



Hydraulic hammer rod puller storage

## 3.35 6010 Track Option


### 3.35a Running the 6010 Track using manual controls



**Manual Lever Controls (seen from above)**

The manual controls are located on the front of the 6010 Track. To move the 6010 Track using these controls, simply push the levers forward to go forward, pull the levers backward to go backwards, or for turning, operate one lever opposite the other.

### 3.35b Running the 6010 Track using the remote control

A remote control may be used instead of the manual levers. The remote control also has two joysticks on it to move the 6010 Track.


**Remote Control for the 6010 Track**

**STARTING THE ENGINE WITH THE REMOTE CONTROL**

1. Start the engine with radio/local switched to local.
2. Turn radio on.
3. Press and hold the start button next to the radio/local switch and switch radio/local switch to radio.
4. Depress the E-Stop button.
5. Twist E-Stop to release button and the green light on the remote will light up. (If green light does not come on retry above procedure)
6. Release the start button.

Remember the track speed **must** be set on low for a remote start up.

**ENGINE SPEEDS**

Tracks should be started in low and shifted to high.

## 3.35c 6010 Track Hydraulic Pressure Gauges

The tub circuit hydraulic pressure, conveyor hydraulic pressure and the auxiliary hydraulic pressure can be found on the left hand side of the machine below the tub drive door.


**tub drive pressure gauge**

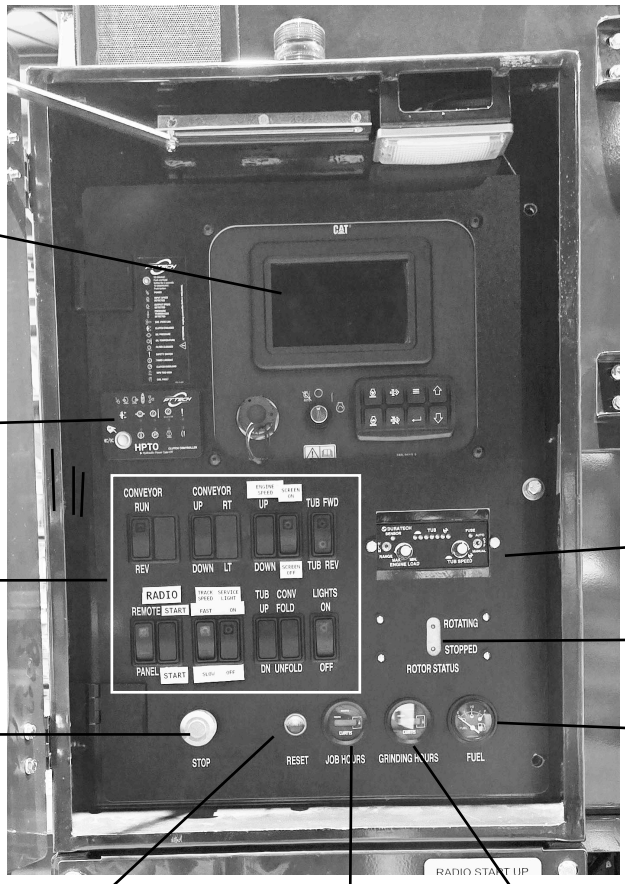
**auxiliary pressure gauge**

**conveyor drive pressure gauge**

## 3.35d CONTROL PANEL FOR THE 6010 TRACK

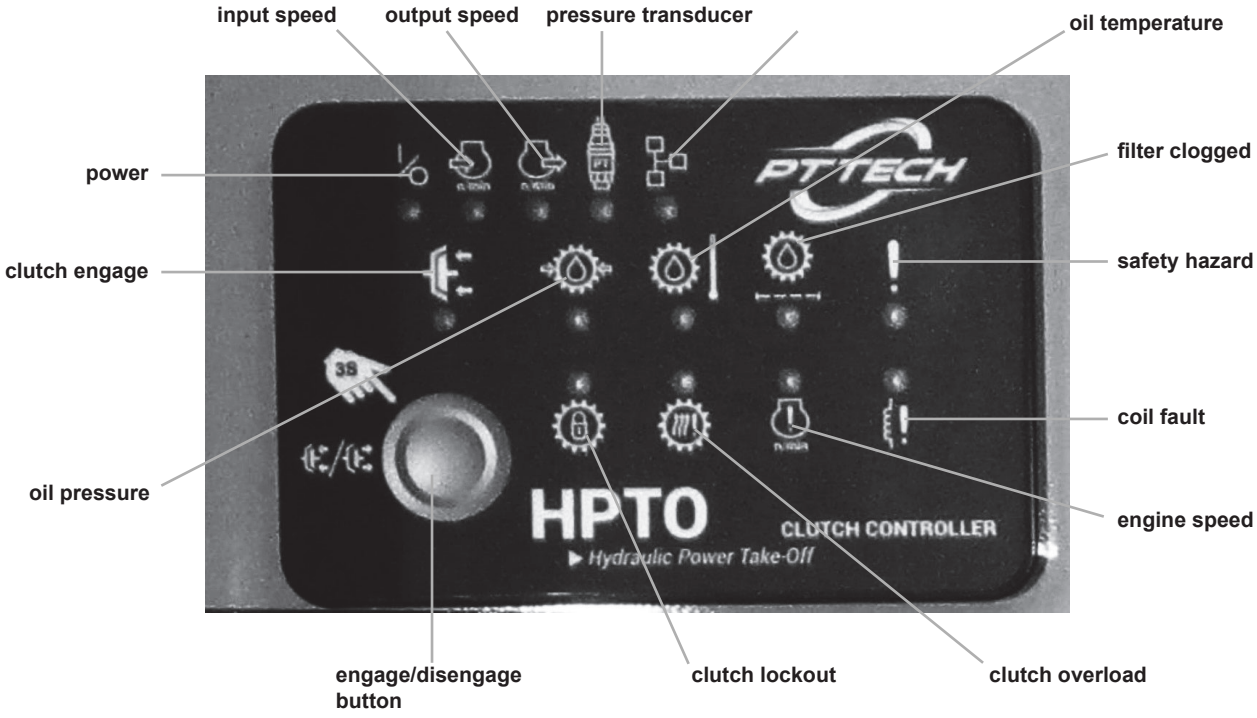
The control panel is located on the left hand side of the engine.

battery location

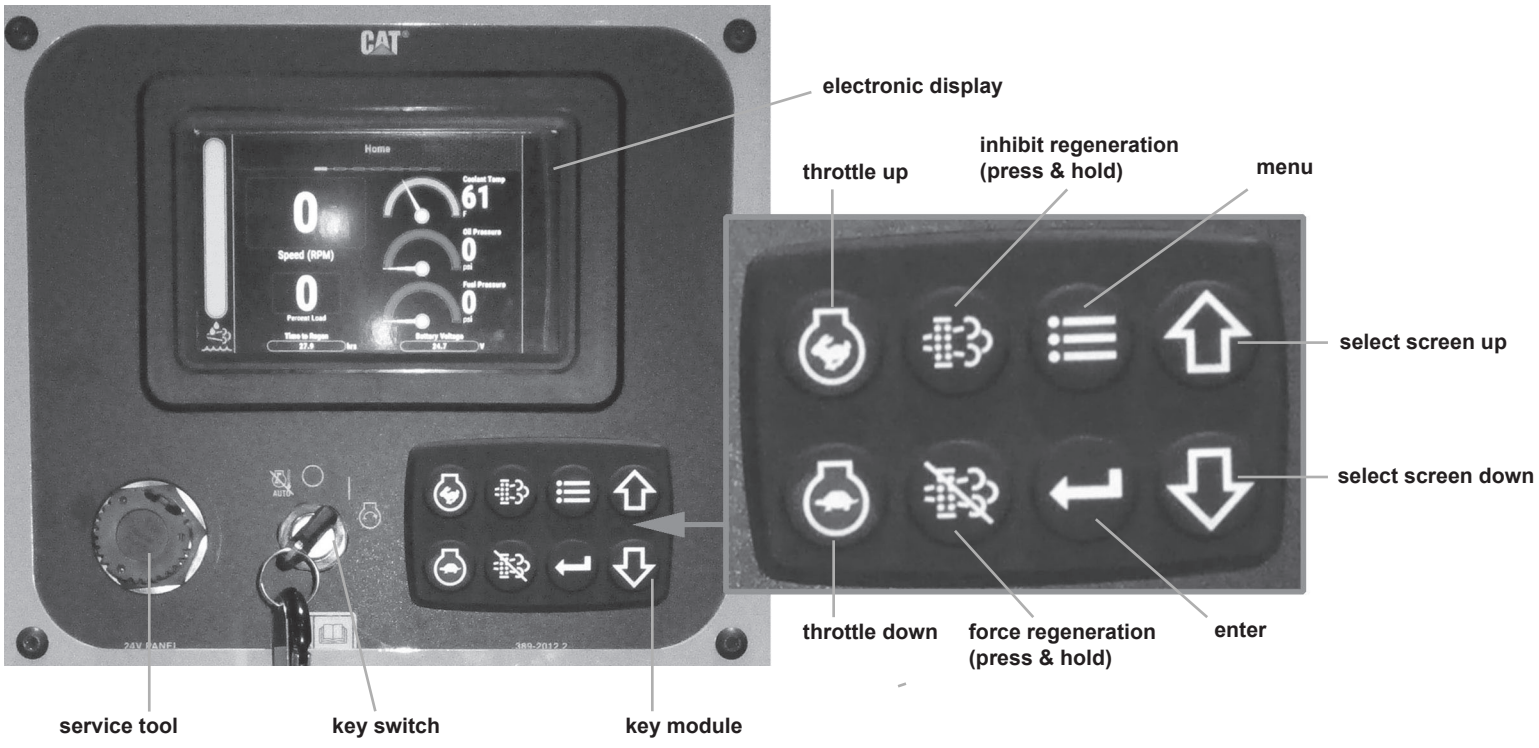



Controls on the control panel include; engine start, emergency kill switch, throttle, tub controls, conveyor on/off, conveyor positioning, rotor engage, clutch controller display, electronic governor, tub tilt, job hours reset button, job hours, grinding hours, fuel, CAT electronic display, track speed, service light, engine speed, and rotary screen on/off.

## Clutch controller display

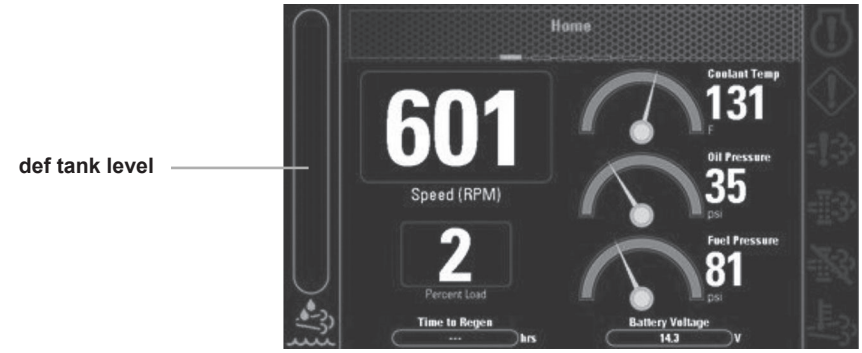


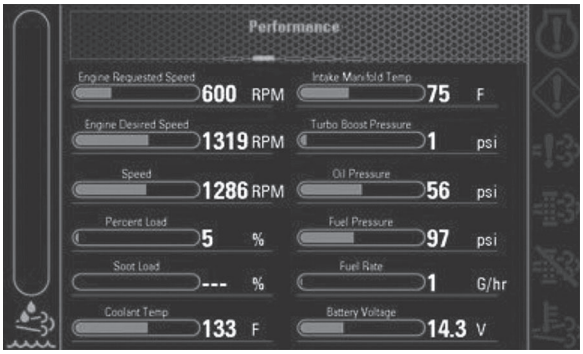

## CAT electronic display

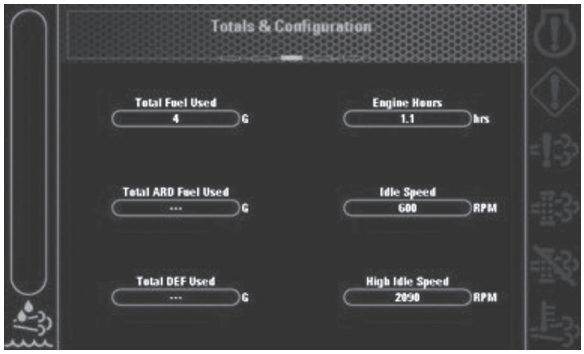


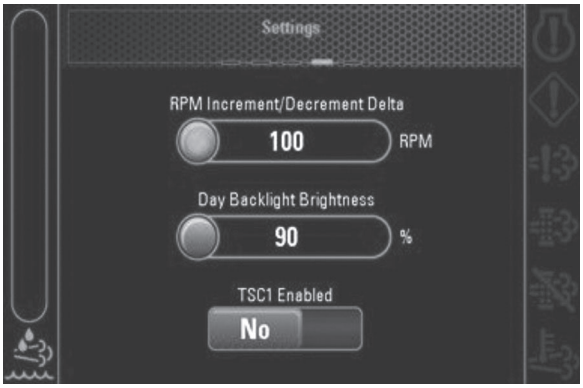
## CAT electronic engine display screens

The CAT electronic engine display has five different screens for checking and controlling the CAT engine. Home, performance, totals and configuration, settings and diagnostics.




## 3.36 6010 Track Electronic Governor

The Model RCB93 Electronic Governor regulates the speed at which the tub rotates. The electronic governor has two modes of operation, the Engine (Auto) mode and the Tub (Manual) mode. The Engine (Auto) mode is the preferred mode of operation and should be used whenever possible.

**IMPORTANT:** Except when calibrating or trouble shooting the electronic governor always use the Engine (Auto) mode of the electronic governor.

**Engine (Auto) Mode**

When the electronic governor is switched to the Engine (Auto) mode, it is monitoring the rotation speed of the engine. The hydraulic flow to the tub 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 tub rotation. With proper calibration, the engine will only lug down to its optimum horsepower RPM and the tub rotation 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. **See section 3.38 for calibration instructions.**

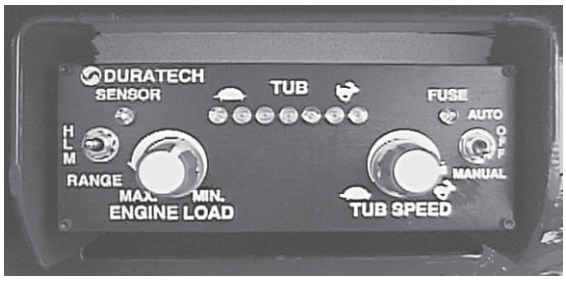



figure 2.1 model RCB93 electronic governor

**Tub (Manual) Mode**

In this mode the tub speed is constant and it will not change to match varying load conditions.

## 3.36a Parts of the 6010 Track Electronic Governor

**FUSE LIGHT**

This light is on when the key switch is receiving power.

**SENSOR LIGHT**

This light is on whenever the electronic governor is receiving an adequate input signal from the sensor. For the sensor light to work you must:

- Have the fluid clutch engaged.
- The engine running at grinding RPM.
- The Mode Switch must be switched to the engine (auto) or manual position.

**SPEED LIGHTS**

These lights provide a relative indication of how fast your tub should be turning based on the output signal that the electronic governor is sending to the electro-hydraulic valve when in engine (auto) mode.

**MODE SWITCH**

The mode switch has three possible positions.

The off position which turns the electronic governor off and two other positions which correspond to the tub (manual) and engine (auto) modes of operation.

In the “tub (manual)” position the tub will rotate at a constant speed based on the settings of the Tub Limit Knob (Tub Speed Knob).

The “engine (auto)” position uses all the functions of the Electronic Governor. The maximum tub speed will be limited by the Tub Limit Knob (Tub Speed Knob), and the engine load will be controlled by the Engine Load Knob.

**TUB LIMIT KNOB (TUB SPEED KNOB)**

This knob sets the maximum speed at which the tub will rotate in both the tub (manual) and engine (auto) modes. In the engine (auto) mode tub speed will vary between zero and this setting depending on the engine load.

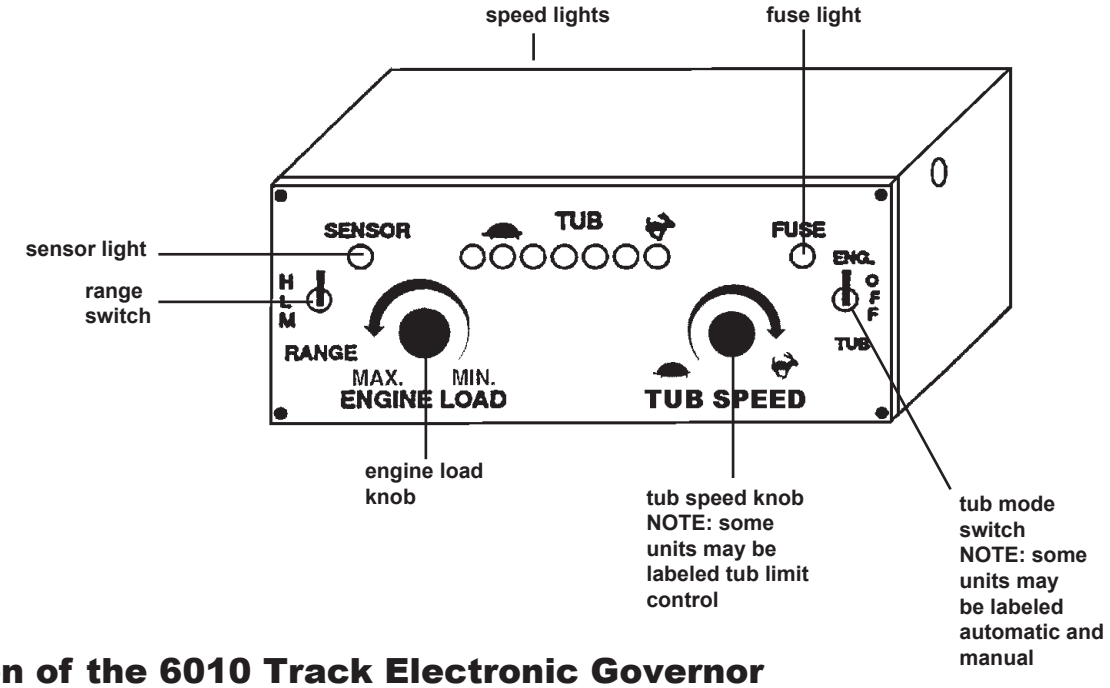
**ENGINE LOAD KNOB**

This knob is used only in engine (auto) mode. It controls the load placed on the engine. Turning the knob clockwise decreases engine load, and turning the knob counterclockwise increases the engine load.

**RANGE SWITCH**

This switch is a coarse adjustment for the engine load knob and can be switched to a H- high, M-medium or L-low setting.

figure 3.1
electronic governor
controls




## 3.37 Operation of the 6010 Track Electronic Governor

**Engine (Auto) mode**

**IMPORTANT:** Except when calibrating or trouble shooting the electronic governor always use the engine (auto) mode of the electronic governor.

In engine (auto) mode, the electronic governor monitors the rotation speed of the engine. The hydraulic flow to the tub drive mechanism is regulated in proportion to the engine speed. As the engine speed slows, the electronic governor decreases the hydraulic flow which slows down the tub's rotation. Conversely, as the engine speed increases, the electronic governor increases the hydraulic flow which speeds up the tub's rotation. This allows the electronic governor to automatically control the feed rate keeping the engine running within the governor's optimum power zone. When the load on the grinding rotor begins to lug the engine, the governor automatically reduces the tub's rotation speed in proportion to the load. The result is nearly a constant load on the engine, which maximizes the grinding efficiency.

The range of rotor speeds for which the electronic governor will regulate the hydraulic flow is determined by the setting of the engine load knob. For example, turning the engine load knob counter clockwise will increase the load on the engine by keeping the tub engaged to a lower engine RPM.

With proper calibration, the engine will only load down to its optimum horsepower RPM, and the tub's rotation speed will be varied proportionally to keep the engine at this RPM.

**Tub (Manual) mode**

In tub (manual) mode, the electronic governor performs as a simple tub speed control. In this mode the tub speed is constant and it will not change to match varying load conditions.

## 3.38 Calibration of the 6010 Track Electronic Governor

To calibrate the electronic governor, perform the following steps:

1. Begin calibration procedure with 6010 DURATECH TRACK TUB GRINDER Tub Grinder completely shutdown. Place the MODE switch in the OFF position and the RANGE switch in the H-High position. Rotate the TUB SPEED KNOB fully clockwise toward the rabbit position. Turn the ENGINE LOAD KNOB fully clockwise, and switch the MODE switch to ENGINE (Auto) Position.
2. Verify that wet clutch is disengaged. Inspect machine to verify that all personnel are clear of the machine.
3. Start engine and run the grinder at about 1/2 throttle to allow the hydraulic system to warm up before calibrating the RCB93 Electronic Governor.
4. When the system has reached operating temperature, throttle the engine to between 900 & 1100 RPM. Engage the rotor and tub drive then throttle up to 1800 RPM. The FUSE light and the SENSOR light should come on. The tub should not be rotating at this time. If the tub is rotating, read section 6.1 "Troubleshooting the electronic governor system" in this manual.
5. Slowly rotate the ENGINE LOAD KNOB counter-clockwise until the tub just begins to move. The tub should begin to rotate. If it does not begin to rotate, switch the range switch to M-Medium or L-Low and repeat as necessary.

**TEST:** Throttle the engine down and the tub should stop rotating, return the engine to 1800 RPM and the tub should start to rotate.

If the tub will not rotate, read section 6.1 "Troubleshooting the electronic governor system" in this manual.

## 3.39 Adjusting the 6010 Track tub rotation speed

Tub rotation is controlled by two components or remote radio. The tub is started, stopped and reversed by a switch on the control panel or the remote radio control and the tub's rotation speed is controlled by the tub limit knob (tub speed knob) on the electronic governor.

# 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.

# 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), electronic governor, HPTO Control Module, Omnex Radio Receiver (if equipped), and ABS Controller (if equipped).

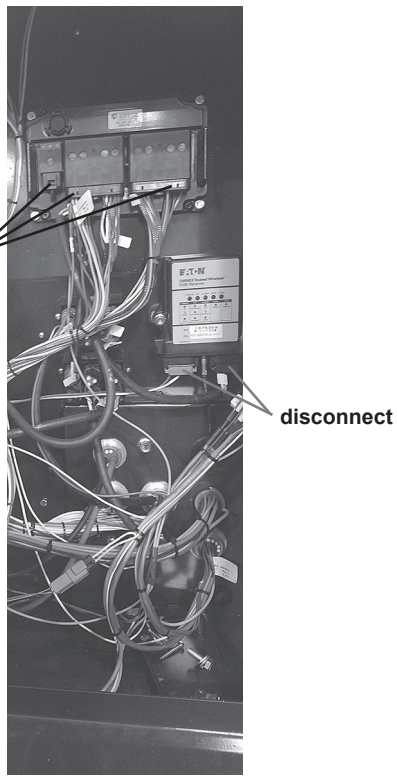
If at all possible, the component that is to be welded should be removed from the machine for welding. If removal of the component is not possible, the following procedure must be followed when welding on a machine that is equipped with electronic engine. This procedure is considered the safest and should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

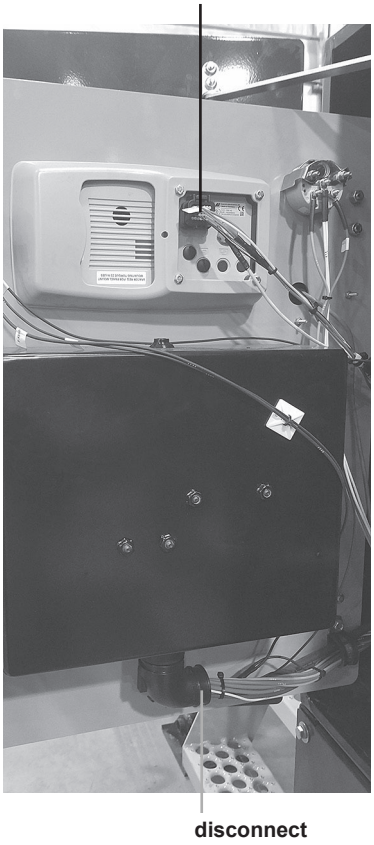
**NOTE:** Do not ground the welder to electrical components such as the ECM or sensors. Improper grounding can also damage the drive train bearings or hydraulic components. Clamp the ground cable from the welder to the component that will be welded. Place the clamp as close as possible to the weld. This 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 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. **See Pictures below.**
4. 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.

5. Protect the wiring harness from welding debris and spatter.
6. 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 6010 DuraTech Tub Grinder.

# LUBRICATION CHART

| STANDARD EQUIPMENT | | | | |
|---|---|---|---|---|
| **REF. NO.** | **LOCATION** | **NO. OF ZERKS** | **FREQUENCY** | **REFERENCE SECTION #** |
| **1** | Rotor bearings | 2 | Daily | 5.5 |
| **2** | Wet clutch, check oil level | | Daily | 5.7 |
| **3** | Hydraulic system, check oil level | | Daily | 5.6 |
| **4** | Tub chain idler pivot | 2 | Daily | |
| **5** | Wheel bearings, check oil level | | Daily | 5.8 |
| **6** | Roller chains | | 1. Daily in dusty conditions or as needed<br>2. Use graphite lubricant | 5.4 |
| **7** | Drive line | 5 | 40 Hours | |
| **8** | Tub rollers | 0 | Sealed | 5.4 |
| **9** | Discharge conveyor rollers | 4 | 40 Hours | |
| **10** | Discharge conveyor pivot | 2 | 40 Hours | |
| **10a** | Discharge conveyor fold pivot | 2 | 40 Hours | |
| **11** | Discharge conveyor lift pivot | 2 | 40 Hours | |
| **12** | Belly auger | 4 | 40 Hours | |
| **13** | Tub pivot, 90 deg tub tilt | 2 | 40 Hours | |
| **14** | Jack stands | 5 | 40 Hours | |
| **15** | Axles | 12 | 40 Hours | 5.8 |
| **16** | Radiator fan pulley | 1 | 40 Hours | |
| **18** | Wet clutch | 2 | 2 Shots per zerk<br>500 Hours | 5.7 |
| **19** | Tub pressure roller,inspect and repack | 2 | 1000 Hours | 5.4 |
| **20** | Clutch, change oil | | Annually | 5.7 |
| **OPTIONAL EQUIPMENT** | | | | |
| **21** | Vertical tub cover frame | 4 | 40 Hours | |
| **22** | Tub cover | 2 | 40 Hours | |

figure 5.1
tub chain idler
lubrication points

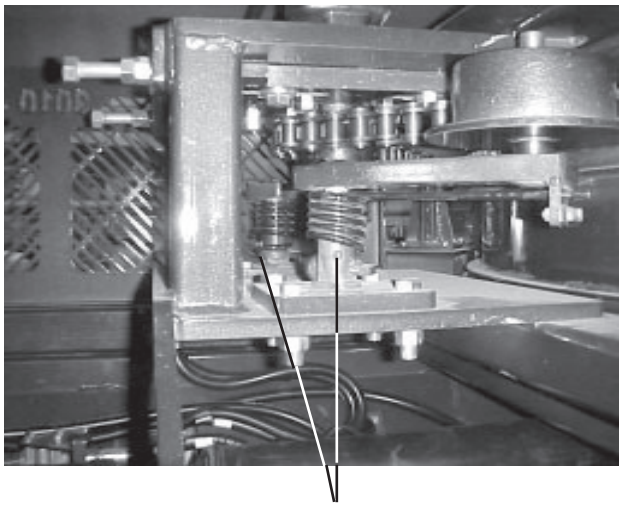



figure 5.2
drive line lubrication
points

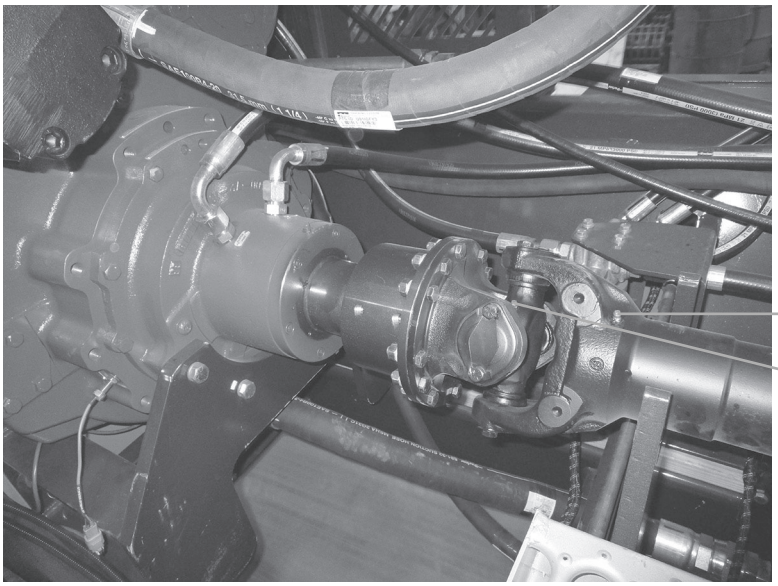



figure 5.3
discharge conveyor
lift, and discharge
conveyor pivot
lubrication points

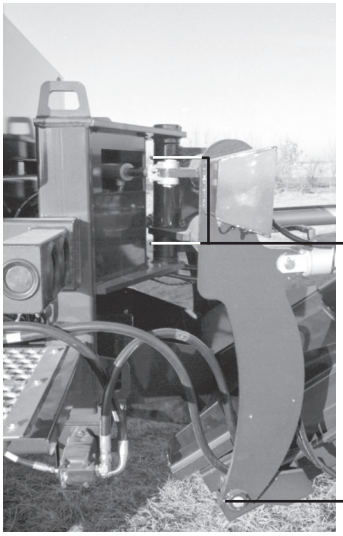


figure 5.4
conveyor fold pivot
lubrication point

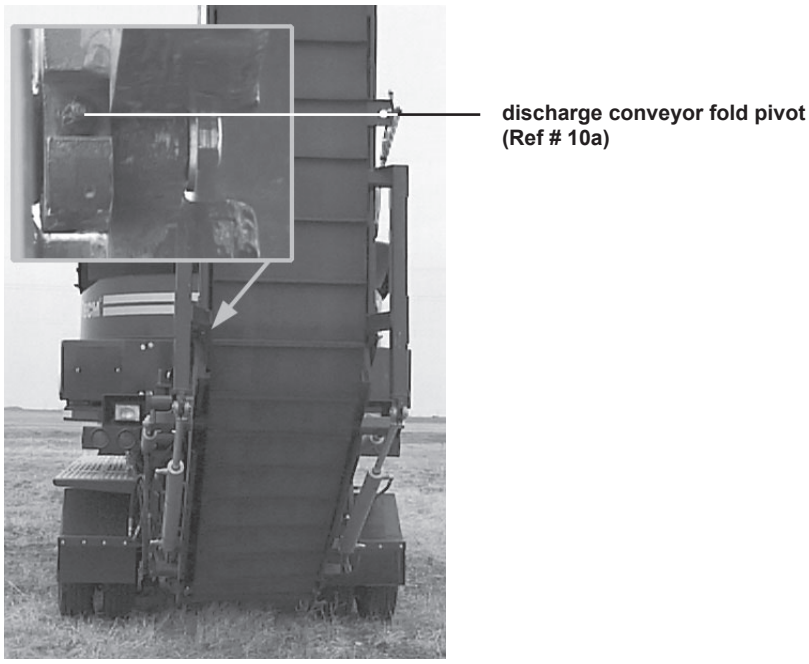



figure 5.5
discharge conveyor roller
lubrication point

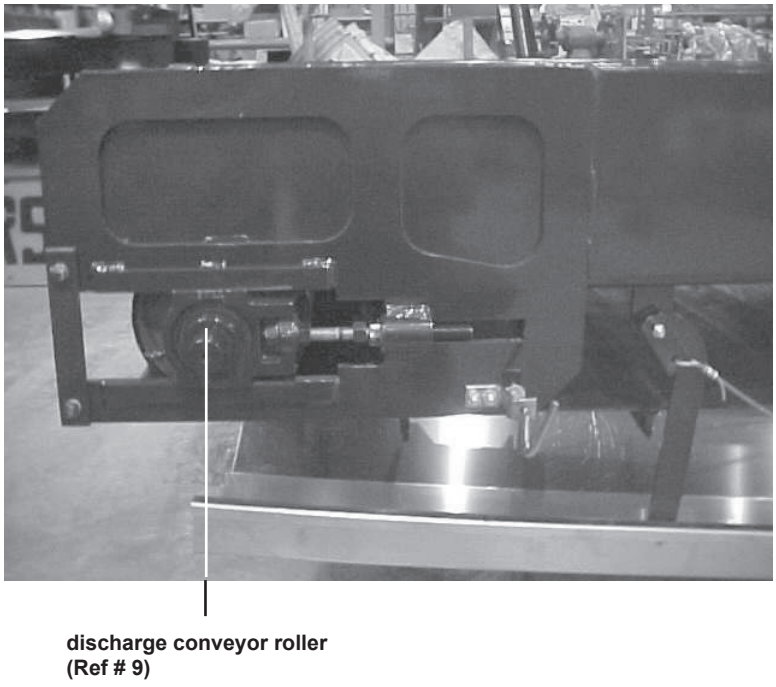


figure 5.6
belly auger and rotor bearing grease bank

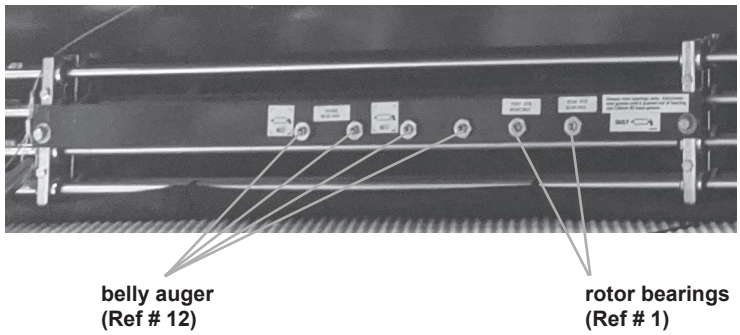



figure 5.7
tub pivot lubrication points

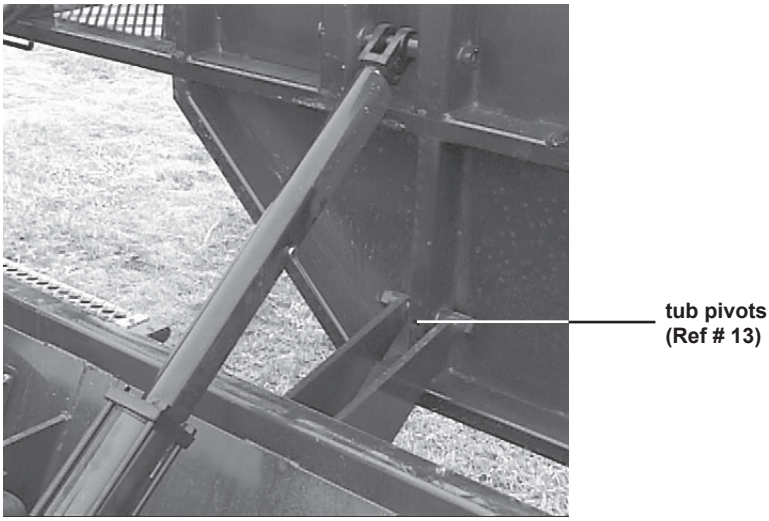



figure 5.8
radiator fan pulley lubrication point

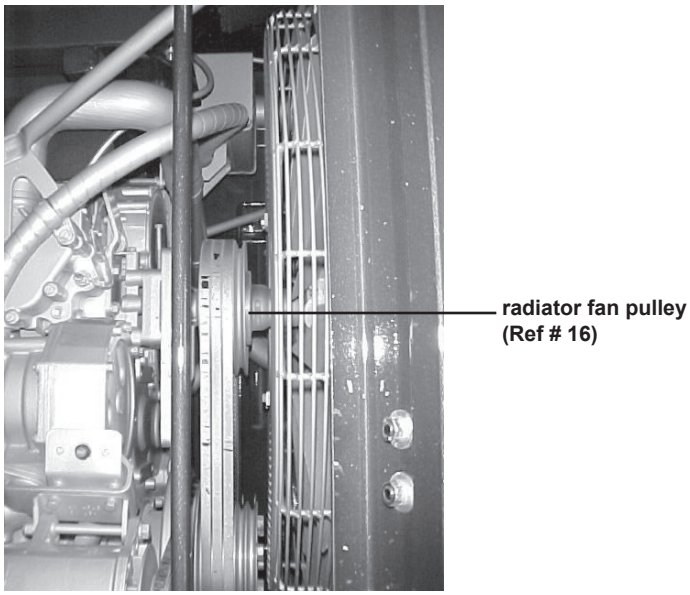
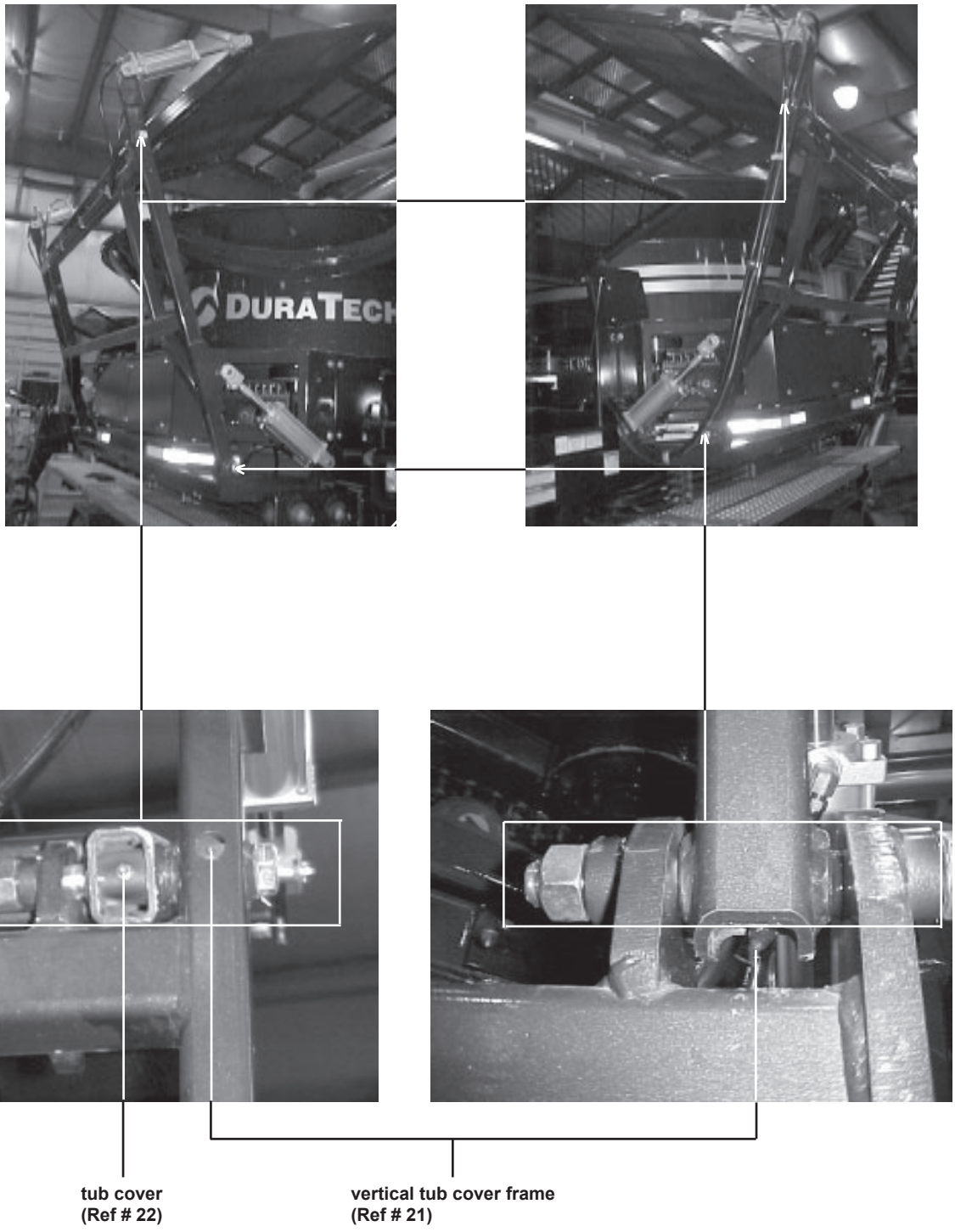
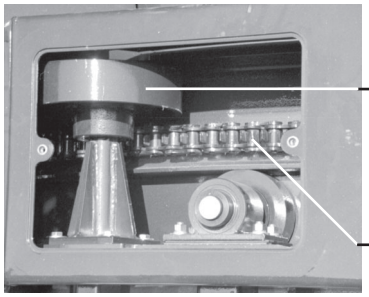


figure 5.9
optional tub cover
lubrication points



## 5.4 Pressure roller lubrication

The grinder has a pressure roller with tapered roller bearings. These bearings should be checked for lubrication every 1000 hours of operation or annually- whichever comes first. These bearings should be checked for proper adjustment daily.




## 5.5 Rotor bearing lubrication - Dodge Imperial ISAF Bearing lubrication

Imperial spherical roller bearings are lubricated at the factory with Mobilith A W2 grease for sizes up to 5". Mobilith AW2 is a superior industrial grease with a lithium complex thickener and highly refined base oil. If this grease is not available, us a compatible grease with these features:

NLGI Grade 2
Minimum dropping point 475 degrees
750 SUS @ 100 degrees

Recomended Greases:

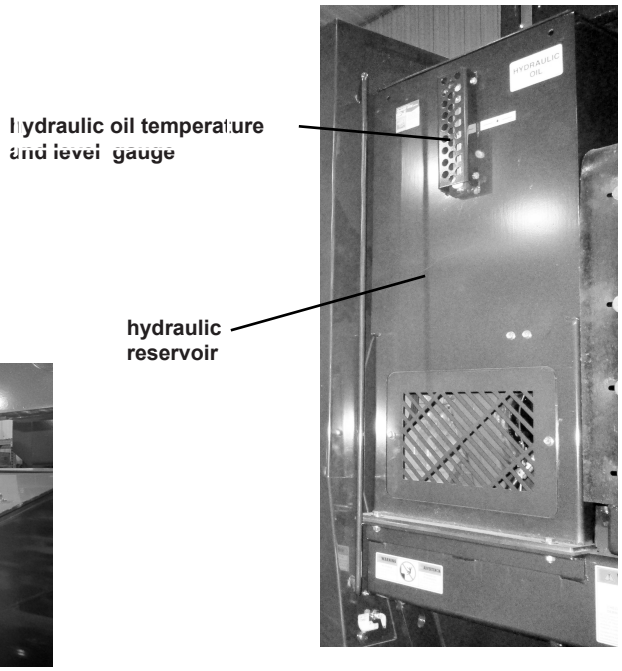
Mobilith AW2
Mobilith SHC220
Shell Alavania #2
Texico Premium RB

## 5.6 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 hydraulic oil and filters 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.





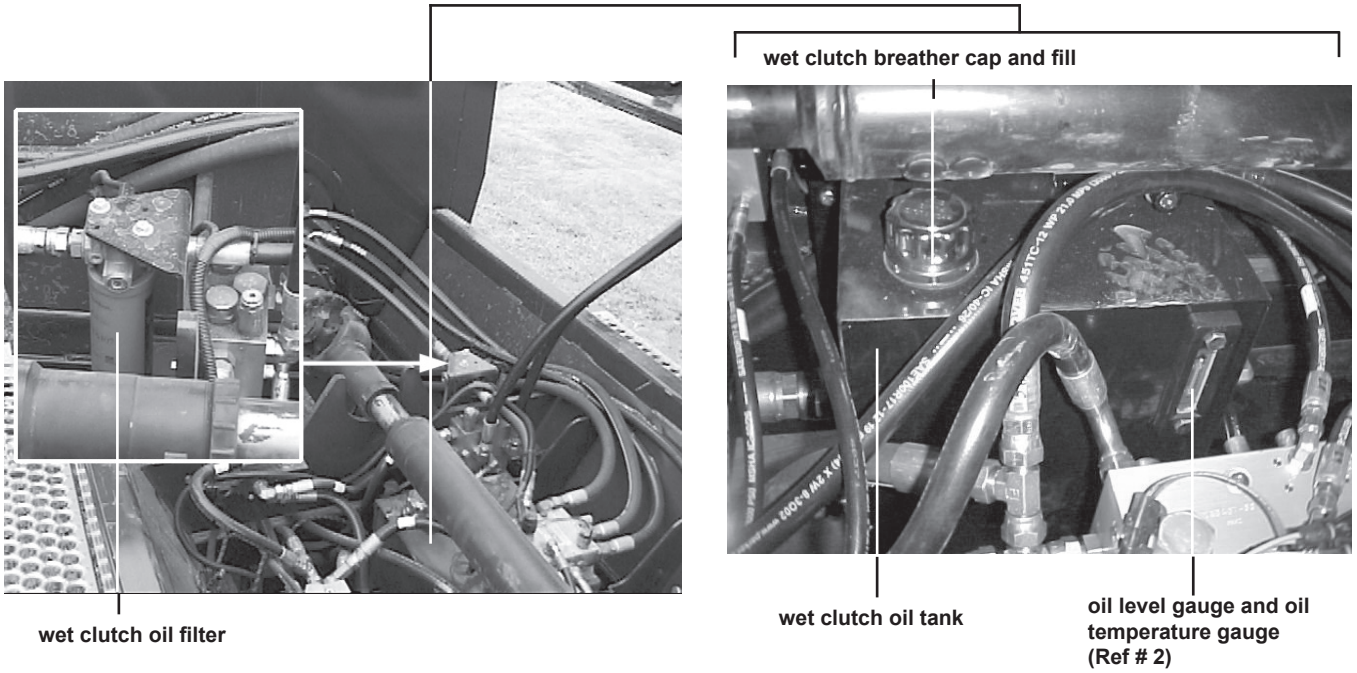

DuraTech Industries recommends using Cenex Qwiklift HTB if your machine has a Qwiklift decal on the hydraulic tank. Other acceptable fluids include Mobil 423, Farmland Super HTB, Conoco Hydroclear Power Tran Fluid or other similar fluids. If the hydraulic tank does not have this decal, then all of the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

## 5.7 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 424
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**

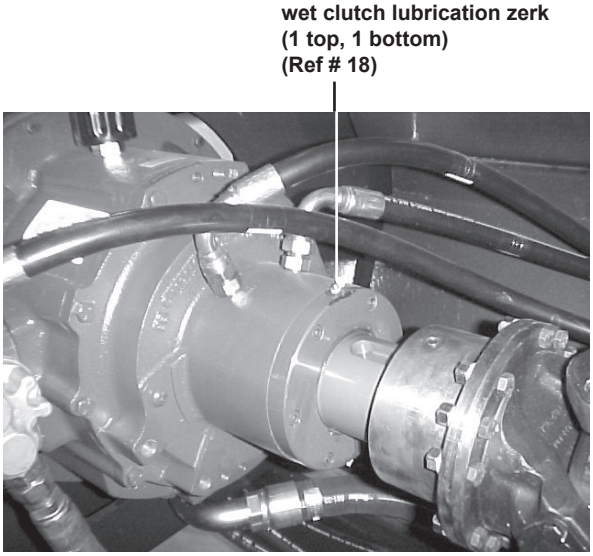
Phone: 1-800-662-4525

**Caterpillar TDTO SAE 30 or 10W**

Phone: 1-800-321-7332

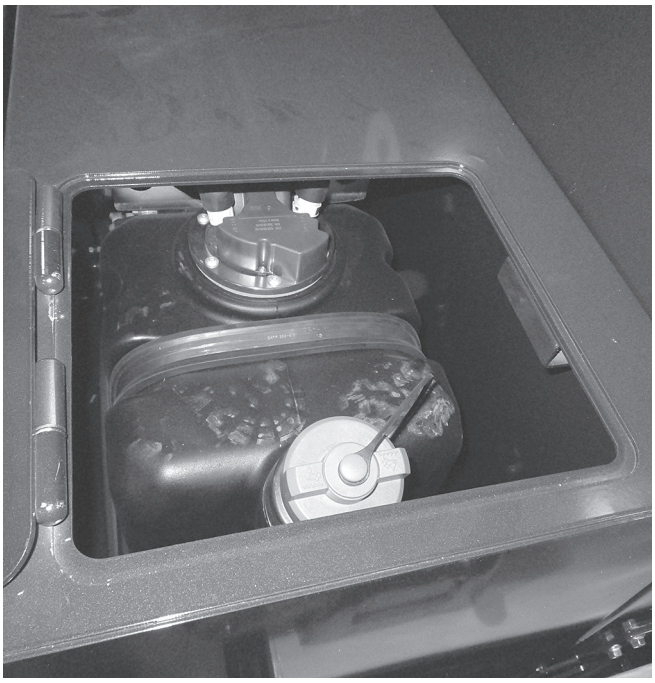
**Shell Donax TD of TD Low Vis**

Phone: 1-800-231-6950



## 5.8 Diesel Exhaust Fluid (DEF) Tank

The Diesel Exhaust Fluid (DEF) Tank is located by the engine on the opposite side from the control panel.

**CAUTION:** DEF contains urea. DO NOT get the substance in eyes. In case of contact, immediately flush eyes with large amounts of water for a minimum of 15 minutes. DO NOT take internally. In event DEF is ingested, contact physician immediately. Reference Materials Data Sheet (MSDS) for additional information.

**IMPORTANT:** Never put DEF in Diesel fuel tank, or Diesel fuel in DEF tank.

### General DEF Information

For Cat diesel engines that are equipped with SCR equipment, meeting the mandated exhaust emissions levels requires the use of Diesel Exhaust Fluid (DEF). DEF is the only fluid recommended by Caterpillar for use in SCR systems in Cat diesel engines. DEF is available commercially, and its manufacturer is regulated by the American Petroleum Institute (API) to assure all DEF meets stringent quality specifications as defines in “ISO 22241-1 – NOx Reduction Agent AUS 32 – Part 1: Quality Requirements.

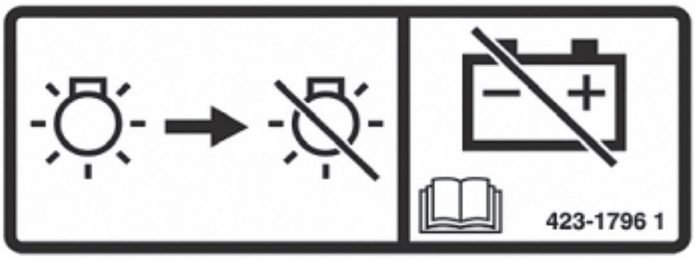
### Standards

For Cat engines and machines with DEF/SCR equipment used in the U.S., the use of API (American Petroleum Institute) certified diesel exhaust fluid is required.

**WARNING:** Use of fluids that are not recommended by Caterpillar can result in numerous problems including damage to DEF/SCR equipment.

## 5.8a DEF line purge requirement

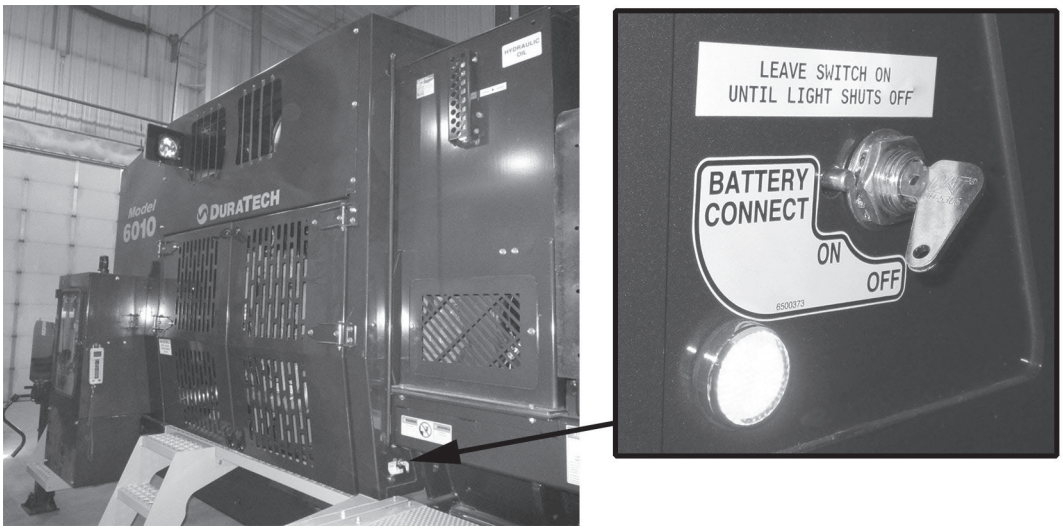
Following each engine shutdown, the ECU must be allowed to run the DEF pump for a short period of time. This is necessary to move the DEF fluid from the heated line back into the DEF tank. This purge cycle takes place with the ECU keyswitch input turn-off while the ECU unswitched power input remains connected.




### Wait to disconnect lamp

The Wait to Disconnect Lamp is an amber lamp located near the battery disconnect switch. This lamp is to notify the operator of the appropriate time to turn off the battery disconnect switch.

- If the lamp is on, leave the battery disconnect switch in the **ON** position.
- Battery Disconnect Delay decal is near the lamp for a reminder.
- Fault codes are logged if the battery disconnect switch is turned to the **OFF** position before the lamp is no longer illuminated.



## 5.8b Recommendations for machine storage

Machines in storage for periods longer than 18 months should have the DEF checked with a refractometer to ensure that the concentration remains between 29 and 35 weight percent. If the concentration is lower than 29 weight percent, the concentration may be raised by adding fresh DEF to the tank.

If adding DEF is required, add approximately 10% of the DEF tank volume and recheck with a refractometer. If it remains low, repeat this process until the concentration is between 29 and 35 weight percent.

**WARNING:** DEF will freeze in the tank at low ambient temperatures. To meet emissions standards, the DEF must be thawed and made available to the engine for operations within specified time limits. To achieve thawing, start engine and allow DEF to thaw.

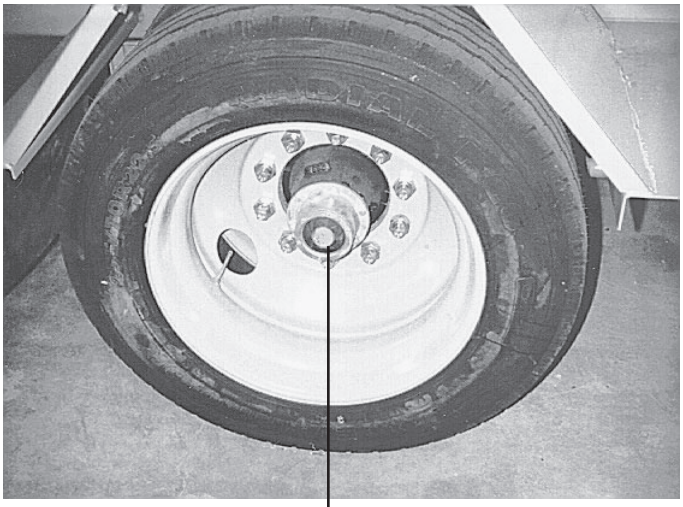
## 5.9 Axle, wheels and tires

**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.

## 5.10 Brake component lubrication

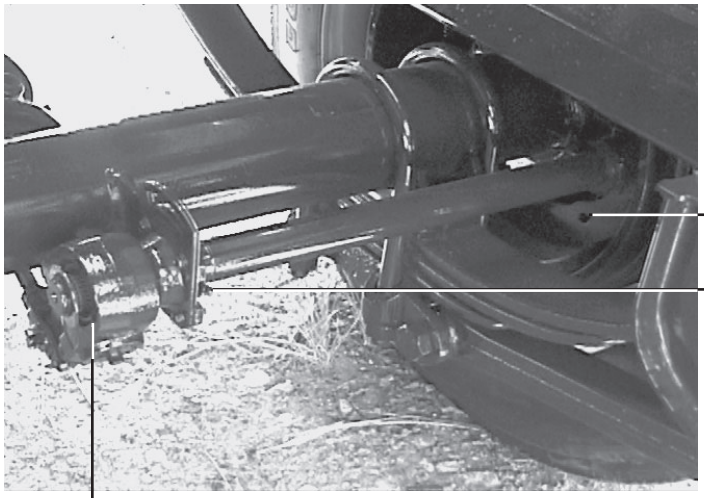
**CAUTION:** Care must be exercised when lubricating the camshaft bushings and anchor pins. Over lubrication could cause a safety problem as brake linings become saturated with lubricants.

**NOTE:** When reline 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.




## 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.

## 5.11 Dodge 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 SphericalRoller 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 dismounting 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.

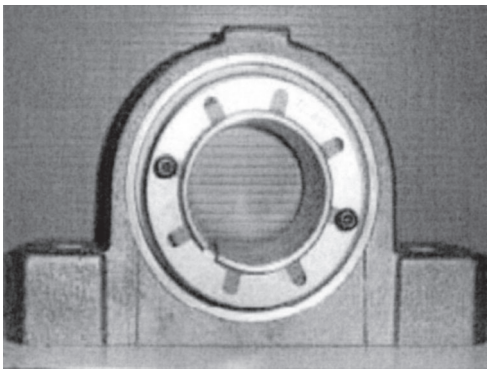
**INSPECTION**

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**



Picture 1

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.

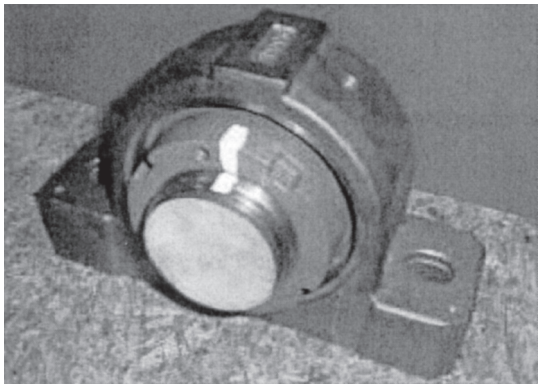
3. Proper locking of this unit to the shaft is based on turning the locknut clockwise a predetermined number of degrees shown for each bore size on Table 1. The turning of the locknut must start from a "ZERO reference point." This "ZERO reference point' is defined as the point when the clearance between 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.*

| SHAFT SIZE | BASIC BRG NO. | LOCKNUT ROTATION | |
|---|---|---|---|
| | | DEGREES | TURNS |
| 1 1/8 - 1 1/2 | 22208K | 280 +/- 25 | 3/4 to 7/8 turn |
| 1 5/8 - 1 3/4 | 22209K | 330 +/- 25 | 7/8 to 1 turn |
| 1 7/8 - 2 | 22210K | 330 +/- 25 | 7/8 to 1 turn |
| 2 3/16 - 2 1/4 | 22211K | 405 +/- 40 | 1 to 1-1/4 turns |
| 2 3/8 - 2 1/2 | 22213K | 405 +/- 40 | 1 to 1-1/4 turns |
| 2 11/16 - 3 | 22215K | 405 +/- 40 | 1 to 1-1/4 turns |
| 3 3/16 - 3 1/2 | 22218K | 495 +/- 40 | 1-1/4 to 1-1/2 turns |
| 3 11/16 - 4 | 22220K | 495 +/- 40 | 1-1/4 to 1-1/2 turn |
| 4 7/16 - 4 1/2 | 22222K | 450 +/- 40 | 1-1/8 to 1-3/8 turns |
| 4 15/16 - 5 | 22226K | 540 +/- 40 | 1-3/8 to 1-5/8 turns |
| 5 7/16 - 5 1/2 | 22228K | 540 +/- 40 | 1-3/8 to 1-5/8 turn |
| 5 15/16 - 6 | 22232K | 405 +/- 40 | 1 to 1-1/4 turns |
| 6 7/16 - 7 | 22236K | 450 +/- 40 | 1-1/8 to 1-3/8 turns |

**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.



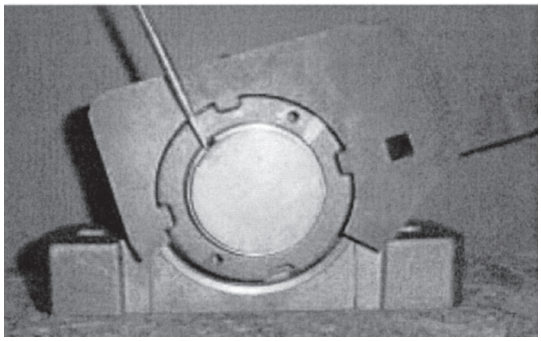
**Picture 2**

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.



**Picture 3**

7. Repeat steps 1 through 6 for the expansion bearing except immediately after Step 2 do the following:

**EXPANSION**

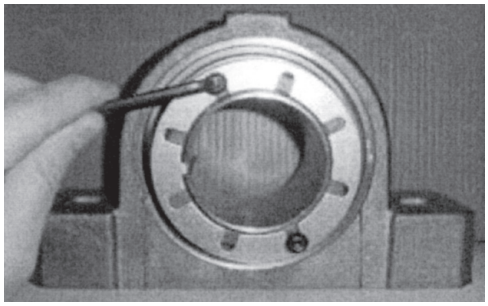
Pillow Blocks (Locknut facing outboard)

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 2)

**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.

**TABLE 2 - Cap Bolt Torque for ISAF Pillow Blocks (Non-Expansion & Expansion) (Grade 5 Bolts)**

| Bore Size (In.) | 2 Bolt Base | | 4 Bolt Base | |
|---|---|---|---|---|
| | Bolt Size | Torque Ft. - Lbs. | Torque Bolt Size | Ft-Lbs. |
| 1-7/16- 111/16 | 3/8-16 | 24-30 | - | - |
| 1-15/16-23/16 | 7/16-14 | 40-50 | - | - |
| 2-7/16-21/2 | 1/2-13 | 60-75 | 1/2-13 | 60-75 |
| 2-11/16-3 | 5/8-11 | 120-150 | 5/8-11 | 120-150 |
| 3-7/16-31/2 | 3/4-10 | 208-260 | 3/4-10 | 208-260 |
| 3-15/16-4 | - | - | 3/4-10 | 208-260 |
| 4-7/16-31/2 | - | - | 7/8-9 | 344-430 |
| 4-15/16-5 | - | - | 1-8 | 512-640 |
| 5-7/16-51/2 | - | - | 1-8 | 512-640 |
| 5-15/16-6 | - | - | 1-8 | 512-640 |
| 6-7/16-61/2 | - | - | 1-8 | 512-640 |
| 6-15/16-7 | - | - | 1-8 | 512-640 |

| Bore Size | Total Expansion (In.) | |
|---|---|---|
| | IP | ISAF |
| 11/8 - 11/2 | 3/16 | 7/32 |
| 15/8 -17/8 | 1/4 | 7/32 |
| 115/16 - 2 | 1/4 | 17/64 |
| 213/16 | 1/4 | 7/32 |
| 21/4 - 27/16 | 1/4 | 5/16 |
| 21/2 - 33/16 | 1/4 | 15/64 |
| 31/4 - 31/2 | 1/4 | 3/8 |
| 311/16 - 4 | 5/16 | 3/8 |
| 47/16 - 5 | 3/8 | 3/8 |
| 57/16 - 7 | N/A | 3/8 |

## 5.12 Hammermill maintenance

Visually examine the mill to see if any of the internal parts show excessive wear. These parts should include liners, 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 locking or retaining devices, hammers, screens, screen tracks and hold downs, main shaft, platform locking devices, hinges 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 tub and away from the mill. Foreign objects may result in personal injury or damage to the machine.

The hammers 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.

**WARNING:** The hammers have been heat treated, and any alteration of the hammers by heating, grinding, resurfacing or any other process can change the mechanical properties of the hammer and make it unsuitable or dangerous to use.

Because of the high capacity of the machine, the hammers will wear and must be considered expendable. Each fixed hammer has two (2) cutting edges and each swing hammer has two (2) cutting edges. For maximum life, it is suggested that hammers be rotated periodically to even out the wear over the entire rotor. If one end of a hammer is allowed to wear too long, one of the hammer'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 hammers and screens is loss of capacity, and added horse power requirements.

Hammer rods are case hardened to maximize wearability and toughness, although hammer rods must be considered expendable.

**NOTE:** Hammer and hammer rod life can be extended by keeping rotor rotating at 2000 RPM. Over powering or over feeding the rotor will cause the swinging hammers to lay back resulting in excessive wear on both the hammers and the rods.

## 5.13 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 fixed hammer tips in pairs, 180 degrees apart (same as with the swinging hammers, illustrations A & B figure 5.9).

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 on machines with fixed hammers, 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. **FIXED HAMMER TORQUE SPECIFICATIONS**

   For two-bolt tips with 5/8” NF grade 8 bolts and grade 8 lock nut, Torque to 190-210 ft.lbs (26-29 kg-m).

   For one-bolt tips with 7/8” NF grade 9 bolts and grade 9 toplock bolts, Torque to 509 ft. lbs (70 kg-m).
5. After 2 hours of grinding, retighten the bolts to the same torque values.
6. Periodically retighten the bolts to the same torque values.

## 5.14 Swinging hammer replacement and maintenance

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

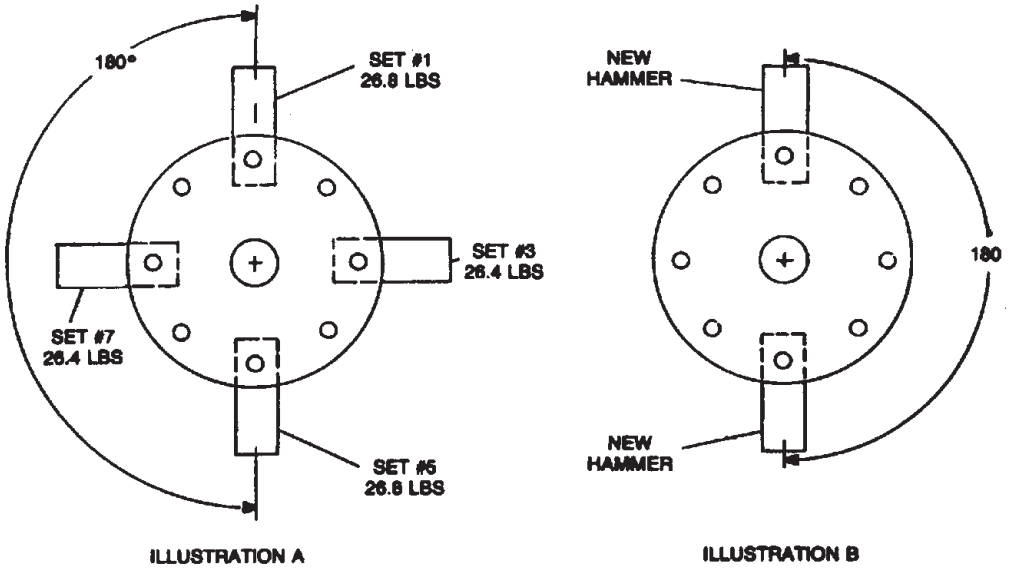
When installing or changing hammers, be sure to follow the hammer diagram carefully. Misplacement of the hammers could cause excessive vibration. We recommend that hammers be balanced in sets according to the rod on which they are to be installed. Sets of equal weight should be installed 180 degrees apart (See Illustration A). When replacing a worn or broken hammer with a new hammer always install a second new hammer 180° away from the first (see Illustration B). When starting the hammermill after installing a new set of hammers or turning corners, watch for unusual or excessive vibration. If any occurs, immediately shut off the mill. Determine the cause and correct it before starting the mill again.

To replace worn hammers on machines with swinging hammers, perform the following steps:

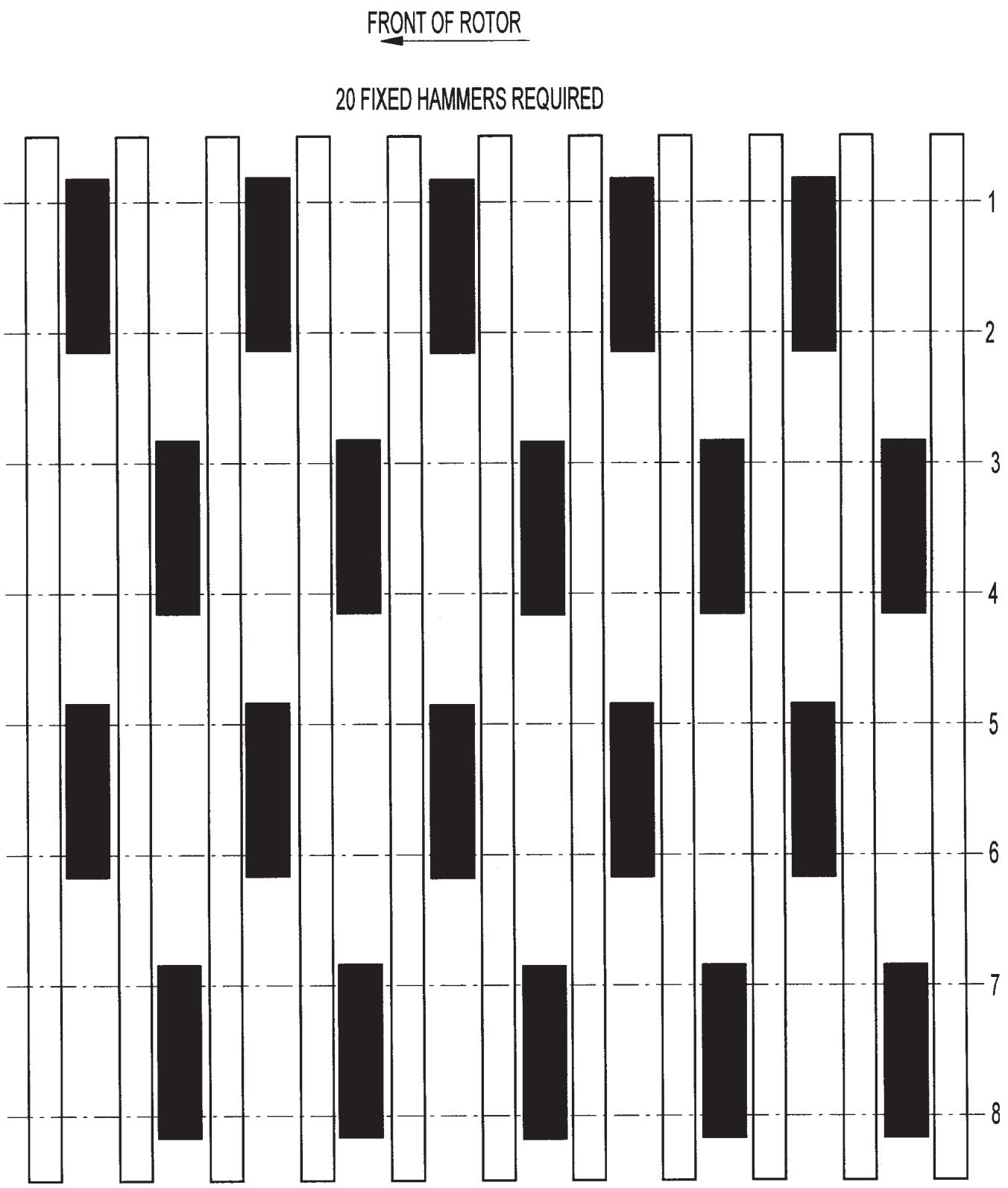
1. Follow the normal shutdown procedure which can be found in section 3.6 of this manual.
2. Loosen the four bolts at the front of the rotor which holds the hammer rod retainer plate in place.
3. Rotate the retainer plate to align holes allowing the hammer rods to be removed through the front of rotor.
4. Remove one row of hammers and replace individual hammers as necessary. Note the location of any spacers. See hammer spacing charts.
5. After all the hammers have been replaced, rotate the retainer plate to lock hammer rods in place, and tighten the four retainer plate bolts.

**IMPORTANT:** Care should be exercised when replacing only a few hammers and not the entire set. If one or more new hammers are inserted on a rod, the same number of new hammers should be inserted on the rod directly across the rotor. This will maintain a balanced rotor for vibration free operation.

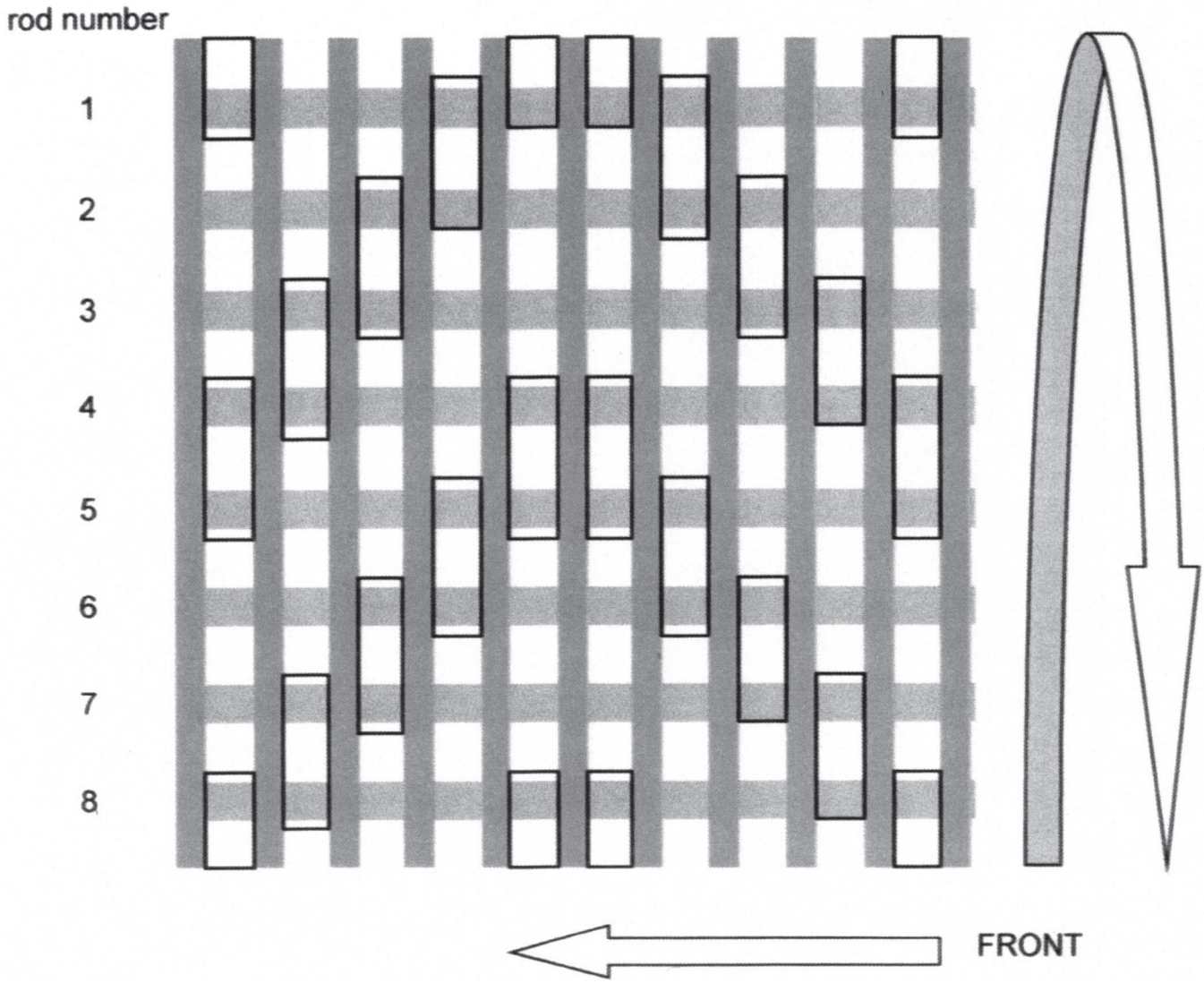
**figure 5.9**
**hammer replacement**
**illustrations A + B**



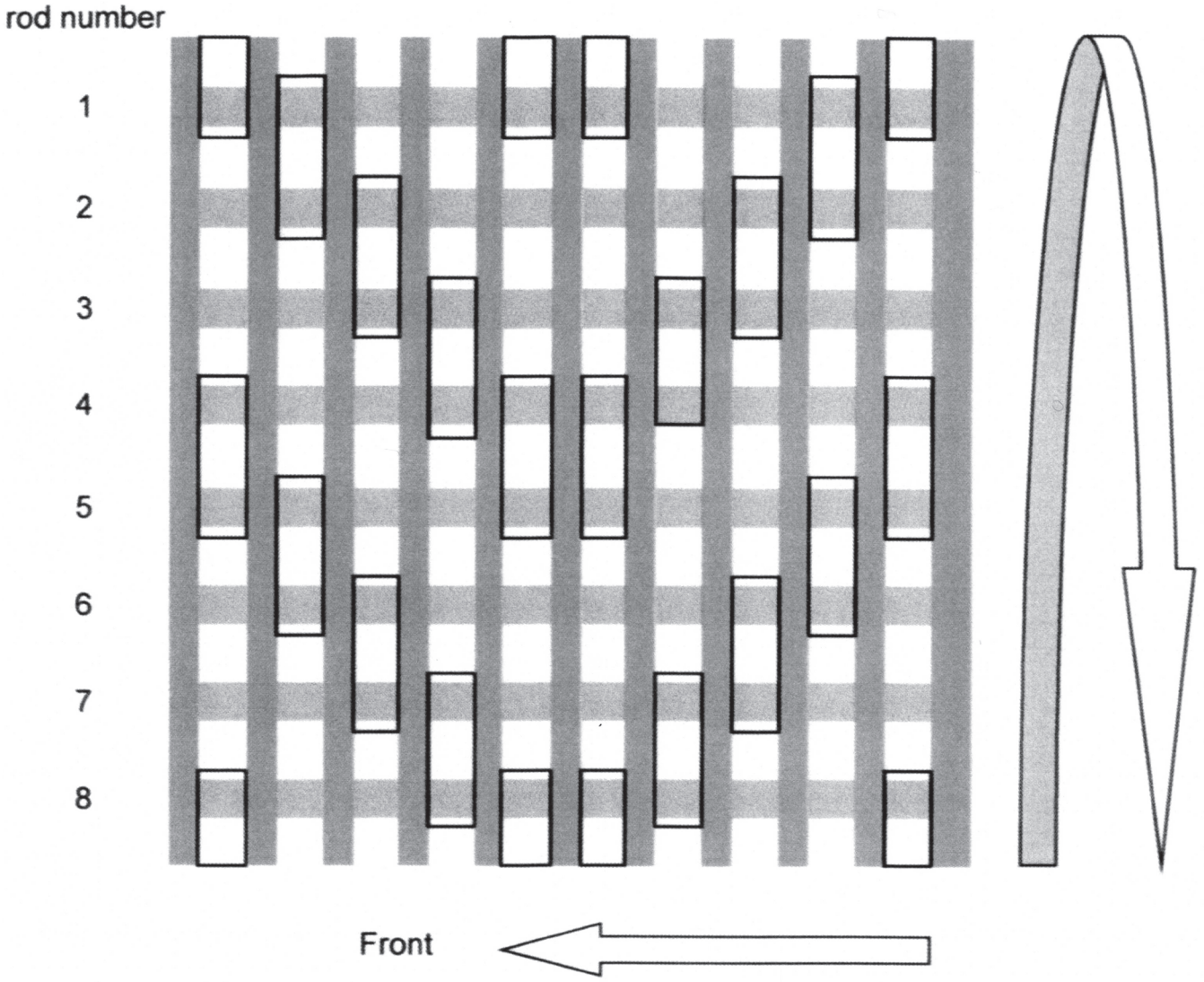
**FIXED HAMMERS SPACING CHART**



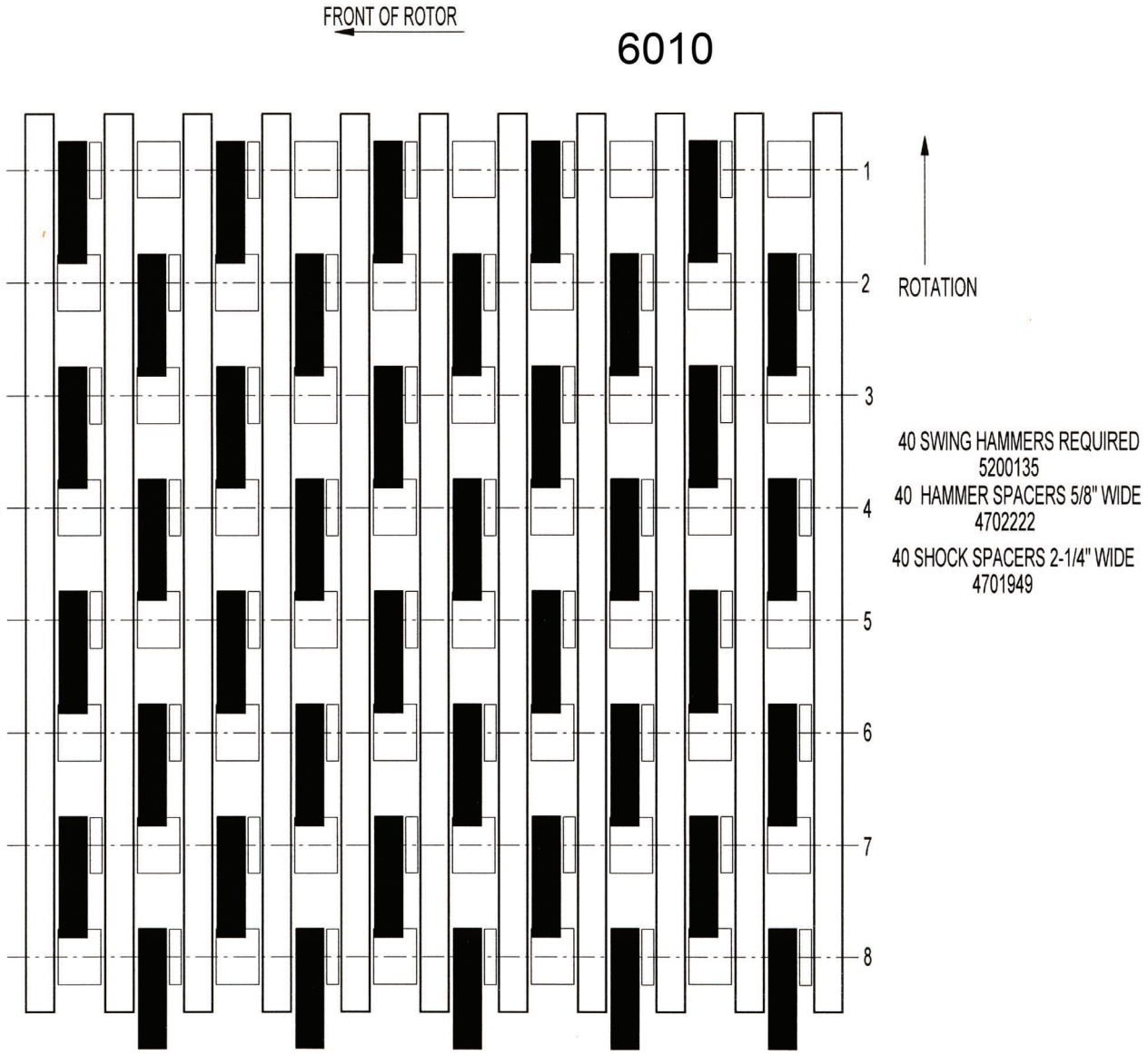
**FIXED V HAMMER PATTERN**



FIXED REVERSE V HAMMER PATTERN



**SWINGING HAMMERS SPACING CHART**



# Section 6: Troubleshooting the 6010 DURATECH TUB GRINDER

## 6.1 Troubleshooting the electronic governor system ( REV. 02-20 )

| ECU | SPN-FMI | Description |
|---|---|---|
| ECU1 | 52701-5 | Tub Forward Output: Open or Short to Ground |
| ECU1 | 52701-6 | Tub Forward Output: Short to Battery |
| ECU1 | 52702-5 | Tub Reverse Output: Open or Short to Ground |
| ECU1 | 52702-6 | Tub Reverse Output: Short to Battery |
| ECU1 | 52703-5 | Tub Speed Output: Open or Short to Ground |
| ECU1 | 52703-6 | Tub Speed Output: Short to Battery |
| ECU1 | 52704-5 | Conv Reverse Output: Open or Short to Ground |
| ECU1 | 52704-6 | Conv Reverse Output: Short to Battery |
| ECU1 | 52705-1 | Speed Sensor: Below Normal |
| ECU1 | 52706-5 | Conv Forward Output: Open or Short to Ground |
| ECU1 | 52706-6 | Conv Forward Output: Short to Battery |
| ECU1 | 52707-5 | Conv Raise Output: Open or Short to Ground |
| ECU1 | 52707-6 | Conv Raise Output: Short to Battery |
| ECU1 | 52708-5 | Conv Lower Output: Open or Short to Ground |
| ECU1 | 52708-6 | Conv Lower Output: Short to Battery |
| ECU1 | 52709-5 | Conv Fold Output: Open or Short to Ground |
| ECU1 | 52709-6 | Conv Fold Output: Short to Battery |
| ECU1 | 52710-5 | Conv Unfold Output: Open or Short to Ground |
| ECU1 | 52710-6 | Conv Unfold Output: Short to Battery |
| ECU1 | 52711-5 | Tub Raise Output: Open or Short to Ground |
| ECU1 | 52711-6 | Tub Raise Output: Short to Battery |
| ECU1 | 52712-5 | Tub Lower Output: Open or Short to Ground |
| ECU1 | 52712-6 | Tub Lower Output: Short to Battery |
| ECU1 | 52713-5 | Grate / Tub Cover Raise Output: Open or Short to Ground |
| ECU1 | 52713-6 | Grate / Tub Cover Raise Output: Short to Battery |
| ECU1 | 52714-5 | Grate / Tub Cover Lower Output: Open or Short to Ground |
| ECU1 | 52714-6 | Grate / Tub Cover Lower Output: Short to Battery |
| ECU1 | 52715-3 | Grate Sensor: Voltage Above Normal |
| ECU1 | 52715-4 | Grate Sensor: Voltage Below Normal |
| ECU1 | 52716-5 | Conveyor Speed Output: Open or Short to Ground |
| ECU1 | 52716-6 | Conveyor Speed Output: Short to Battery |
| ECU1 | 52717-5 | Conveyor Swing Left Output: Open or Short to Ground |
| ECU1 | 52717-6 | Conveyor Swing Left Output: Short to Battery |
| ECU1 | 52718-5 | Conveyor Swing Right Output: Open or Short to Ground |
| ECU1 | 52718-6 | Conveyor Swing Right Output: Short to Battery |
| ECU1 | 52719-5 | Radiator Screen Output: Open or Short to Ground |
| ECU1 | 52719-6 | Radiator Screen Output: Short to Battery |
| ECU1 | 52720-5 | Work Lights Output: Open or Short to Ground |
| ECU1 | 52720-6 | Work Lights Output: Short to Battery |
| ECU1 | 52721-5 | Tub Lights Output: Open or Short to Ground |
| ECU1 | 52721-6 | Tub Lights Output: Short to Battery |
| ECU1 | 52722-5 | Tub Cover In Output: Open or Short to Ground |
| ECU1 | 52722-6 | Tub Cover In Output: Short to Battery |
| ECU1 | 52723-5 | Tub Cover Out Output: Open or Short to Ground |
| ECU1 | 52723-6 | Tub Cover Out Output: Short to Battery |
| ECU1 | 52724-5 | Engine Shutdown Output: Open or Short to Ground |
| ECU1 | 52724-6 | Engine Shutdown Output: Short to Battery |
| ECU1 | 52725-31 | Clutch Fault |
| ECU1 | 52726-31 | Temp / Level Fault |
| | | |

| ECU | SPN-FMI | Description |
|---|---|---|
| ECU2 | 52801-5 | Cab Raise Output: Open or Short to Ground |
| ECU2 | 52801-6 | Cab Raise Output: Short to Battery |
| ECU2 | 52802-5 | Cab Lower Output: Open or Short to Ground |
| ECU2 | 52802-6 | Cab Lower Output: Short to Battery |
| ECU2 | 52803-5 | Left Outrigger Raise Output: Open or Short to Ground |
| ECU2 | 52803-6 | Left Outrigger Raise Output: Short to Battery |
| ECU2 | 52804-5 | Left Outrigger Lower Output: Open or Short to Ground |
| ECU2 | 52804-6 | Left Outrigger Lower Output: Short to Battery |
| ECU2 | 52806-5 | Right Outrigger Raise Output: Open or Short to Ground |
| ECU2 | 52806-6 | Right Outrigger Raise Output: Short to Battery |
| ECU2 | 52806-5 | Right Outrigger Lower Output: Open or Short to Ground |
| ECU2 | 52806-6 | Right Outrigger Lower Output: Short to Battery |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## 6.2 General Troubleshooting

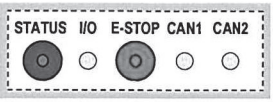
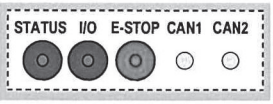
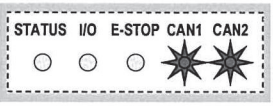
**general troubleshooting**

| PROBLEM | CAUSE | REMEDY |
|---|---|---|
| 1. No grinding capacity | 1. The screen is plugged.<br>2. The hammers or screens are badly worn.<br>3. Materials are too light or fluffy. | 1. Clean out the holes in the screen.<br>2. Replace or turn worn parts.<br>3. Mix the lighter material with heavier material.<br>4. Use a larger screen. |
| 2. The tub slows down or turns slowly. | 1. The electronic governor is not adjusted properly.<br>2. The electronic governor system malfunctions.<br>3. The hydraulic pressure is low. | 1. See the sections on the electronic governor in the operations section of this manual.<br>2. See Troubleshooting the electronic governor in this manual.<br>3. Look for internal leakage or wear in the orbit motor or pump. |
| 3. The machine vibrates excessively. | 1. A hammer is broken.<br>2. The rotor bearing is defective.<br>3. The driveline is worn or misaligned.<br>4. Foreign material is wrapped in the rotor.<br>5. The hammer pattern is incorrect. | 1. Replace the broken hammer. See page 57 for more information about replacing hammers.<br>2. Replace the rotor bearing.<br>3. Replace worn part or the complete driveline.<br>4. Remove the foreign material.<br>5. See page 57 for more information about replacing hammers. |
| 4. The engine looses excessive RPM's before the tub stops. | 1. The electronic governor is not adjusted properly. | 1. See the sections on the electronic governor in the operations section of this manual. |
| 5. The tub stalls. | 1. The tub hydraulic system, pressure relief valve is set too low.<br>2. The tub is overloaded due to wet or tough grinding materials.<br>3. Too much material in the tub.<br>4. The tub is binding.<br>5. The hydraulic oil is too hot causing electronic governor valve to bind. | 1. Readjust the pressure relief valve to 2,500 PSI max.<br>2. Reduce amount of material in tub or shift the hydraulic tub drive to low range.<br>3. Reduce the amount of material in tub.<br>4. Remove material buildup between the tub and the platform framework.<br>5. Reduce the load on the hydraulic system, or stop and allow the hydraulic oil to cool. |
| 7. The hydraulic oil overheats. | 1. Pressure relief valve in control valve set too low<br>2. The tub is overloaded.<br>3. Worn pump, control valve, hyd. motors, etc. | 1. Readjust the pressure relief valve to 2,500 PSI max.<br>2. Reduce the amount of material in the tub.<br>3. Rebuild or replace the hydraulic components as necessary. |

# 6.3 Troubleshooting the OMNEX Trusted Wireless TD1140/R260

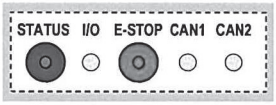
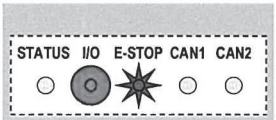
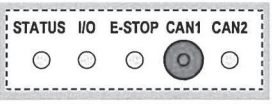
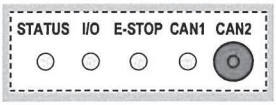
## Diagnostics – R260 Receiver

### Normal Operation

| | |
|---|---|
|  | **Transmitter is OFF**<br>If the transmitter is off, the receiver is operating properly. |
|  | **Transmitter is ON**<br>When the transmitter is turned on, the Link light (fast flashing) and E-Stop (GREEN) indicates the receiver is operating properly |
|  | **Transmitter is ON in Operation**<br>When a function is activated on the transmitter, the I/O light will turn on GREEN. This indicates the receiver is operating properly |
|  | **Transmitter is OFF**<br>When a latched function is activated then the transmitter is turned off, the IO light will stay on GREEN. If the system was intentionally designed this way, the receiver is operating properly, if not call for service. |
|  | **Transmitter is ON or OFF**<br>Activity on CAN a channel. Light is on when CAN running and will flash when message received or sent. Light is off when CAN is *not* present or disabled. |

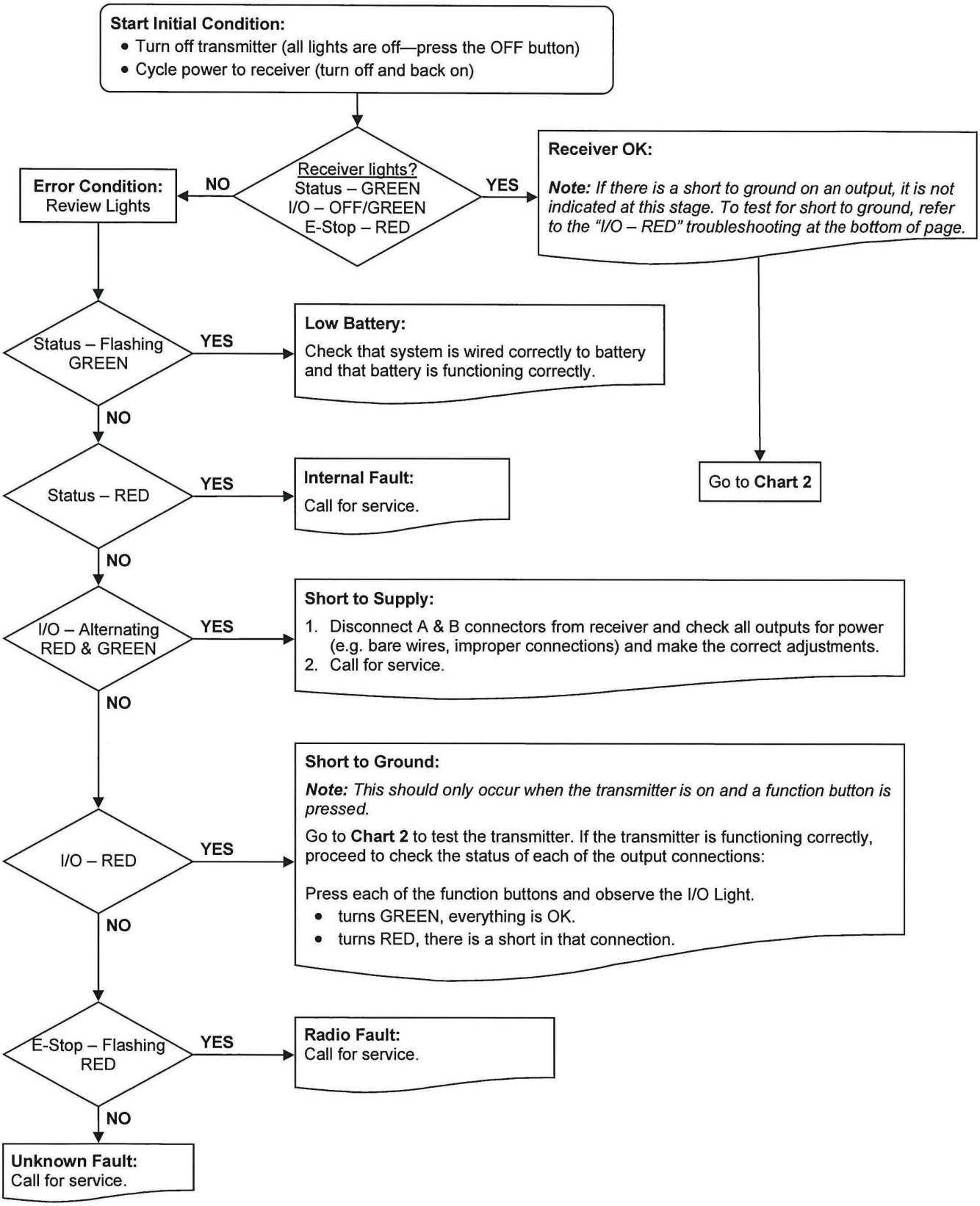
### Trouble Indicators

***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**<br>The reason is the transmitter is not communicating with the receiver. | Refer to **Troubleshooting Chart #3** for solutions |
|  | **Transmitter is ON or OFF**<br>Internal fault or PLC program is not loaded or stopped. | Recycle the Receiver power. Refer to **Troubleshooting Chart #1** for solutions. If the problem persists than contact Eaton Wireless Business Unit service providing part and serial number. |
|  | **Transmitter is ON**<br>A short to ground or excessive current draw on an output. 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.<br>• If GREEN, everything is OK.<br>• If RED, there is a short in that connection. |
|  | **Transmitter is ON**<br>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 ON or OFF**<br>CAN channel 1 is in fault. | Verify that the CAN 1 network is wired correctly. Check for; breaks, shorts, and network termination. If problem persists than contact Eaton Wireless Business Unit service providing part & serial number. |
|  | **Transmitter is ON or OFF**<br>CAN channel 2 is in fault. | Verify that the CAN 2 network is wired correctly. Check for; breaks, shorts, and network termination. If problem still persists than contact Eaton Wireless Business Unit service providing part & serial number. |

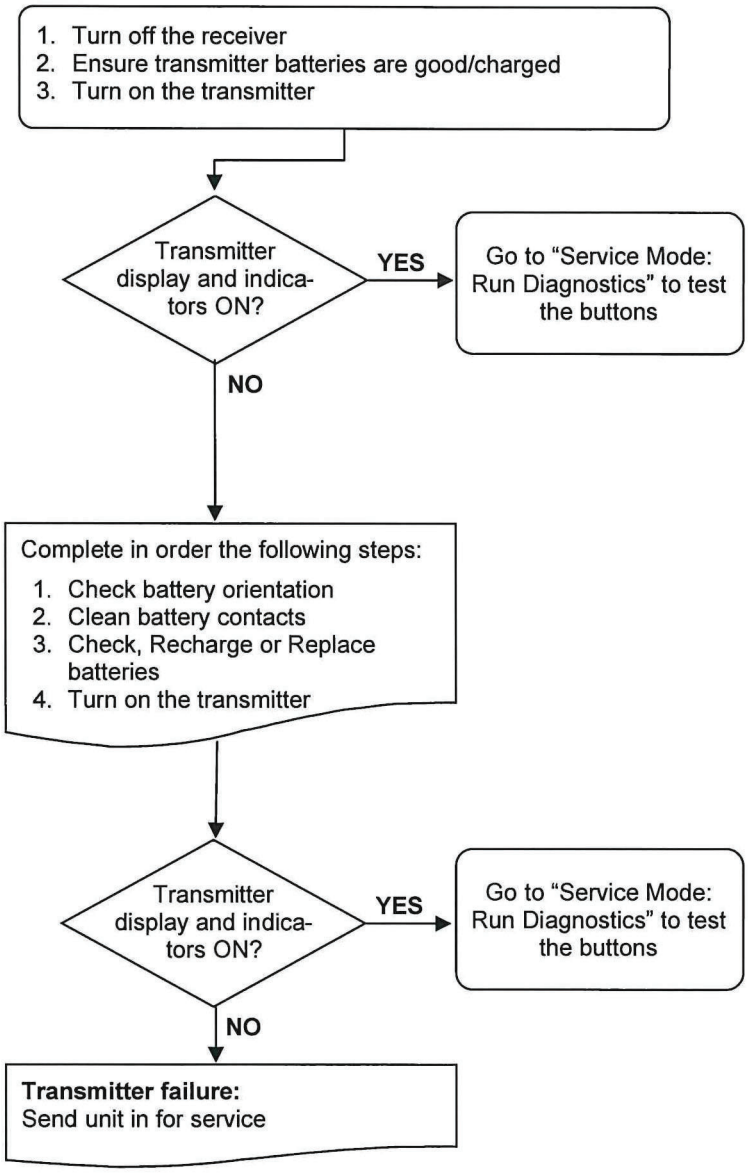
## Troubleshooting guide – Chart #1

### Test the Receiver—R260



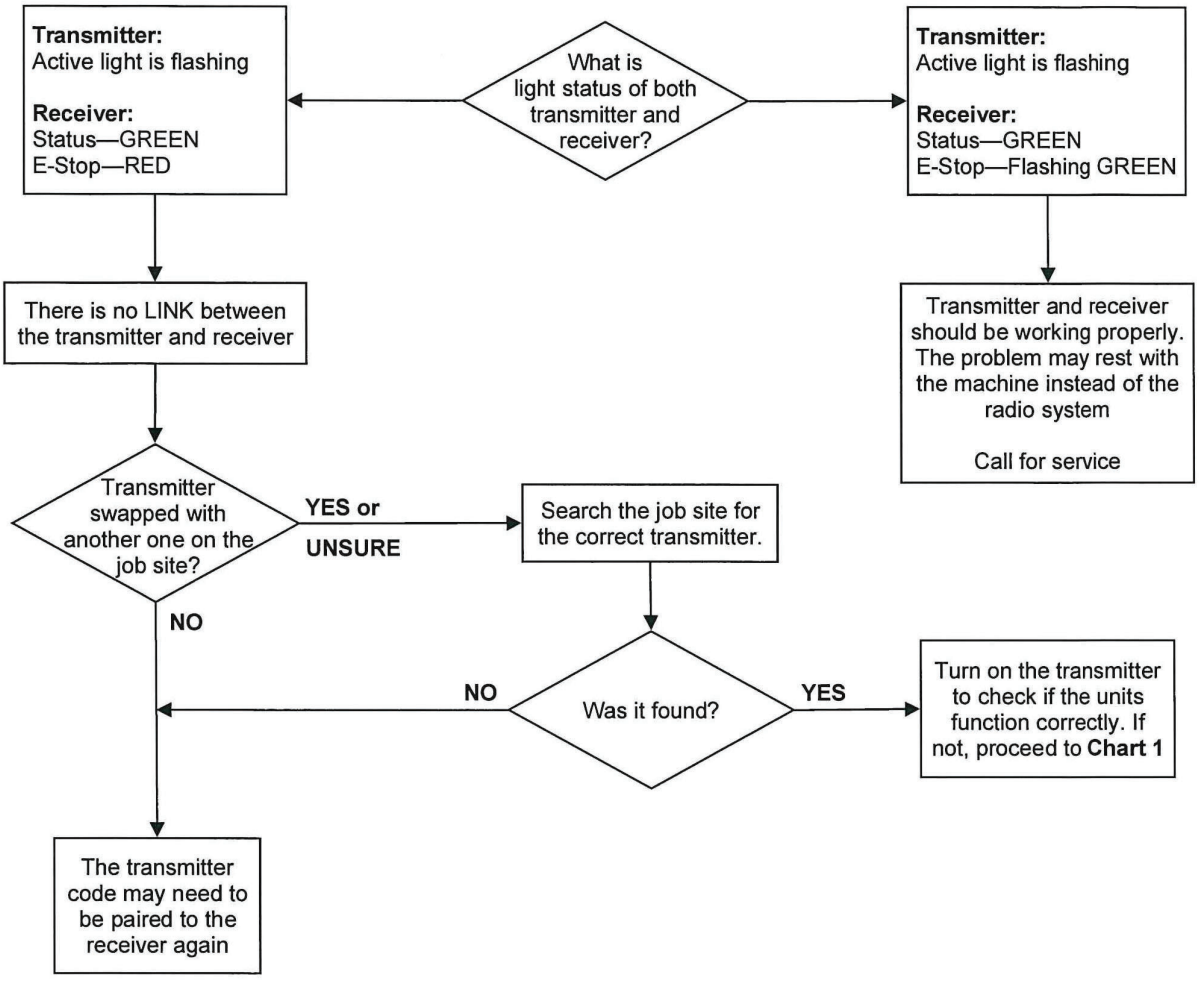
## Troubleshooting guide – Chart #2

### Test the Transmitter—TD1140



## Troubleshooting guide – Chart #3

### Testing the Transmitter / Receiver Communication



## Troubleshooting guide – Chart #4

### Considerations when Pairing

#### 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 Pairing/Configuration mode.

Possible issues could arise during Step 4, the teaching phase of pairing. 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 pairing phase, test the link by turning on the transmitter (note: the transmitter remains in service mode after pairing 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:** If possible 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.

**Reprogramming Tips:**

1. Be patient and deliberate when pressing the Power and E-Stop buttons in the correct order during power up in Configuration mode
2. Use a pointy instrument to depress the Setup button on the receiver (i.e. a pen) as the button is relatively small
3. Follow each step as laid out in the procedure
4. Never lay the receiver circuit board down on anything metallic (there are contact points on the back which could contact the metal and damage the receiver)

## 6.4 Troubleshooting the 6010 Track Electronic Governor System

1. When power is reaching the electronic governor the fuse light should be on.
   If this light fails to go on, check the fuse, the battery connections, the wiring harness, and the indicator lamp. If the fuse light is on, the wiring harness, battery connections, fuse and bulb are functioning correctly.

2. Check the TUB MODE operation of the electronic governor. With the engine and hydraulic systems at operating temperature, and the tub drive control valve in the forward position, throttle the engine up to 1800-2000 RPM.

With the mode switch in the tub position, the tub should be rotating. The speed of the tub can be varied by rotating the tub limit knob. The number of tub speed lights which are lit will vary with the setting of the tub limit knob.

If the number of tub speed lights lit varies as you rotate the tub limit knob, the manual portion of the controls are functioning correctly. Proceed to step 3.

If the manual portion is not working properly, proceed to trouble shooting table 6.1.

**table 6.1**
**troubleshooting the electronic governor in tub mode**

| PROBLEM | CAUSE | REMEDY |
|---|---|---|
| 1. The tub does not rotate but the electronic governor and the manual hydraulic valve are working properly. There is pressure to the orbit motor. | 1. The tub is binding.<br>2. There is too much material in tub.<br>3. The tub is overloaded due to wet or tough grinding material.<br>4. The pressure relief valve in the control valve set too low or is faulty. | 1. Remove the material causing problem.<br>2. Reduce the amount of material in the tub.<br>3. Check oil pressure. |
| 2. The tub does not rotate, but the valve is receiving 18 to 24 volts of DC power. There is no pressure to the orbit motor.Note: The valve refers to the valve where you disconnect the wiring harness. For more information see "Electronic governor hardware test" later in this section. | 1. The electric hydraulic valve (forward/reverse) is not engaged.<br>2. The valve assembly is dirty or faulty.<br>3. The solenoid is faulty. | 1. Engage the electric hydraulic valve.<br>2. Clean or replace the valve assembly.<br>3. Test the solenoid and replace as necessary. |
| 3. The tub does not rotate, and there is no voltage to the valve. | 1. There is no power to the electronic governor.<br>a. The electronic governor is switched off.<br>b. The fuse is blown.<br>c. The tub limit knob is set fully counterclockwise.<br>2. A wire in the wiring harness is broken.<br>3. The electronic governor is faulty. | 1. a. Switch the electronic governor mode switch to tub.<br>b. Replace the fuse.<br>c. Turn the tub speed knob clockwise.<br>2. Replace or repair the wiring harness.<br>3. Replace the electronic governor. |
| 4. The tub runs with the electronic governor switch off. Disconnect the wiring harness at the valve.<br>A. If the tub stops<br>B. If the tub keeps turning | 1A. The electronic governor is out of adjustment.<br>2.A The electronic governor is faulty.<br>1B. The valve override screw is adjusted in too far.<br>2.B The valve is faulty. | 1.A Readjust the electronic governor.<br>2.A Replace electronic governor.<br>1.B Adjust the override screw.<br>2.B Replace the valve. |
| 5. The tub speed can not be varied with the tub limit knob. | 1. Valve override is adjusted in too far.<br>2. The valve is stuck.<br>3. The solenoid is stuck.<br>4. The electronic governor is faulty. | 1. Adjust the override screw.<br>2. Clean or replace the valve assembly.<br>3. Test the solenoid and replace as necessary.<br>4. Replace the electronic governor. |

3. Checking the ENGINE MODE operation of the electronic governor. If the tub mode controls function correctly after following the tub mode trouble shooting check list, then follow the calibration instructions on page 28 of this manual. If the tub will not rotate, proceed to trouble shooting table 6.2.

**Table 6.2 troubleshooting the electronic governor's engine mode**

| PROBLEM | CAUSE | REMEDY |
|---|---|---|
| The tub will not rotate, and the sensor light is not lit. | 1. The sensor gap is out of adjustment.<br>2. There is a broken wire on the wiring harness.<br>3. The sensor is faulty.<br>4. The electronic governor is faulty. | 1. Readjust the sensor gap to 3/32". This is roughly the thickness of a nickel.<br>2. Repair or replace the wiring harness.<br>3. Test and replace the sensor as necessary.<br>4. Replace the electronic governor. |
| The tub will not rotate, and the sensor light is lit. | 1. The tub limit knob is turned fully counterclockwise.<br>2. The electric hydraulic valve (forward/reverse) is in the neutral position.<br>3. The electronic governor is faulty. | 1. Adjust the limit knob clockwise.<br>2. Engage the electric hydraulic valve.<br>3. Replace the electronic governor. |

## ELECTRONIC GOVERNOR HARDWARE TEST

**NOTE:** 6010 DURATECH TRACK TUB GRINDERs contain 24 volt systems.

1. Power source: 24 volts DC

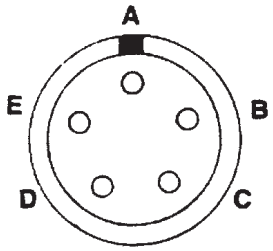
   Red wire + positive pin A wiring harness

   Black wire - Negative Pin B wiring harness

2. Test output voltage to valve DC

   Red wire + positive pin D wiring harness.

   Black wire - negative pin E. wiring harness.




**A - 24 volts DC ignition**
**B - Ground**
**C - Digital sensor signal***
**D - 0 to 24 volts ( + ) to valve**
**E - 0 ( - ) to valve**

Test the electronic governor with power supplied to the governor control box and the mode switch set to the tub position. The grinder does not need to be running for this test. Disconnect the wiring harness at the valve. With a voltmeter set for 24 volts DC, connect the red lead of the voltmeter to the red lead of the wiring harness and black lead to the black wire. Turn the tub limit knob until the left speed light (turtle) is on. The voltmeter should read approximately 6 volts. Turn the tub limit knob clockwise. As more speed lights light up, the voltage should increase. Turn the knob until the right speed light (Rabbit) is lit. The volt meter should now read a minimum of 18 volts.

3. Output voltage of sensor AC

   red wire - Pin C wiring harness

   Black wire - Pin B wiring harness.

Set the sensor gap to 3/32”.

Remove the wiring harness from the electronic governor.

With the engine at operating temperature and the clutch engaged, throttle the engine up to the desired engine RPM.

With volt meter set to AC volts, connect leads to pins B and C. The volt meter should read 2 to 3 volts AC .

## ELECTROHYDRAULIC VALVE COIL TEST

See the figure 7.3 for the location of the electro-hydraulic valve coil.

This test requires an accurate ohm meter. Disconnect the wiring harness leads at the valve coil. Set the meter to read ohms. Place one test lead from the meter on each of the two electrical connections of the valve coil. The reading should be 39-44 ohms for 24 Volt machines. If the reading is not in this range, replace the coil.

MANUAL OVERRIDE

NOTE: If there is an electrical failure with the machine, it may still be able to grind. Switch the electronic governor off. Remove the rubber end cap and loosen the jam nut on the electro-hydraulic valve. Start the machine and engage the tub drive.

**figure 7.2**
**electronic governor system**

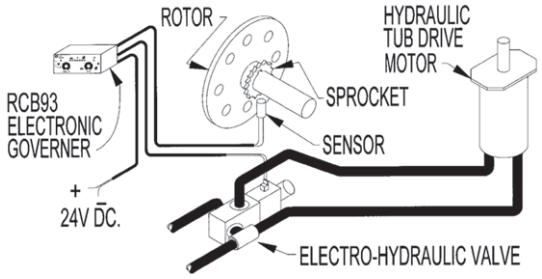
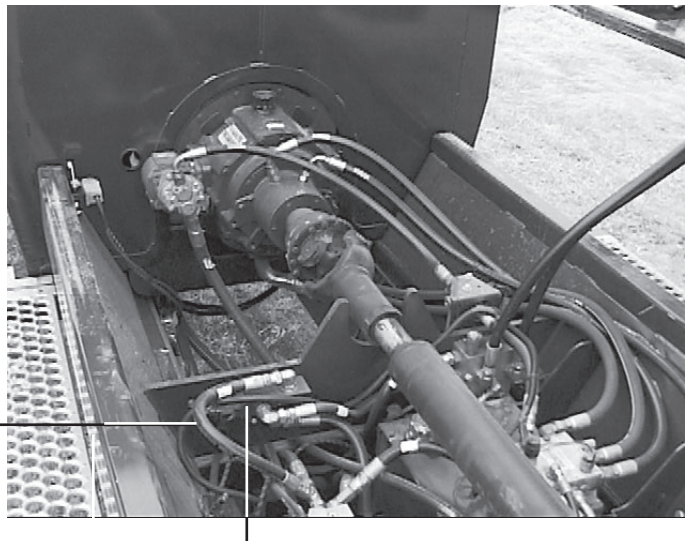



**figure 7.3**
**location of the electro-hydraulic valve**




**IMPORTANT! - DO NOT ENGAGE THE WET CLUTCH AT THIS TIME!**

Turn the adjusting stud clockwise until the tub rotates at the desired speed. Lock the jam nut on the adjusting stud and replace the rubber end cap on the electro-hydraulic valve. When the electro-hydraulic valve is adjusted in this manner, it will function only as a manual flow control. The grinder will now operate as it would if the electronic governor were switched to the tub (manual) mode. The tub speed will be constant and it will not change to match varying load conditions.

Contact your dealer for future repairs or replacement. When the problems are corrected, calibrate the electro-hydraulic valve.

# 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 6010 DURATECH TUB GRINDER

### General

| | |
|---|---|
| Weight w/ Pintle Hitch | 35,840 lbs. (16,257 kg)* |
| Weight w/ Fifth Wheel Hitch | 38,000 lbs. (17,237 kg)* |
| Transport Width | 8’ 6” (2.59 m) |
| Transport Height | 11’ (3.35 m) |
| Transport Length With Fifth Wheel | 42’ 9” (13 m) |
| Axles | (2) 22,500 lbs. (10,206 kg) |
| Tires | 255/70R22.5 |
| Fuel Capacity | 300 gallons (180 gallons with pintle hitch.) (1135.62 l or 681.37 l) |
| Hydraulic Oil Capacity | 90 gallons (340.69 l) |
| Lights | Clearance, and directional |

### Tub features

| | |
|---|---|
| Tub Width | 10’ (3.05 m) |
| Depth | 46” (117 cm) |
| Tub Diameter At Base | 8’ (2.44 m) |
| Tub Wall | 1/4” thick |
| Tub Floor | 3/8” thick AR Steel |
| Tub Drive | 120H chain single drive hydraulic motor |
| Service Access | 90° hydraulic tilting tub |
| Discharge Conveyor | 26’ (l) x 30”(w), hydraulic end driven cleated belt |
| Belly Auger | Twin 12” augers |
| Tub Speed Sensor | Electronic self-governing |

### Hammermill

| | |
|---|---|
| Rotor - Shaft Diameter | 6” stress proof steel |
| Rotor Length | 44” (111.76 cm) |
| Rotor Plates | 16” diameter x 1-1/2” thick |
| Feed Opening | 45” x 25” (114.3 cm x 63.5 cm) |
| Screen Area | 2403 sq. in. (1.55 sq. m) |
| Hammer Rods | (8) 1-1/2” diameter |
| Bearings | 4” grease bearings |
| Hammermill Drive | Direct drive through HPTO oil cooled clutch |

* Subject to change or unknown at time of printing

## Options

Radio remote that features the following commands; tub start-stop, tub forward-reverse, conveyor up-down, and emergency stop.

Air Compressor

Tub Cover

# 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 |
|---|---|---|
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DURATECH®

HAYBUSTER®

# *Delivery Report*

| | | | |
|---|---|---|---|
| Delivery Date | Machine Model | Serial No. | |
| Dealer Name | | Engine Serial No. | |
| Dealer Address | | Invoice No. | |
| Dealer City | | State | Zip |
| Dealer Email | | Phone | |

| | | |
|---|---|---|
| Customer Name | | |
| Customer Address | Phone | |
| Customer City | State | Zip |
| Customer Email | | |

The following items are to be checked as they are explained to the owner / operator at the time of delivery

- ☐ Explain the delivery packet and present the operators manual(s) to the owner / operator.
- ☐ Review and inspect the machine safety signs (decals) and the operator's manual.
- ☐ Advise the owner that the dealer is the source to obtain operator training, and information regarding the correct application of the machine to the job, as well as service and warranty information.
- ☐ Explain the capabilities and restrictions of the machine as it applies to the owner's application as defined in the operator's manual.
- ☐ Explain the operation of the controls and start up and shut down procedures of the engine and power transmission components of the machine.
- ☐ Explain rated lift or carrying capacity and loading and unloading procedures of the machine to maintain safety and stability of the machine.
- ☐ Explain proper folding, unfolding, and transporting procedures to the owner / operator.
- ☐ Explain recommended fueling procedures on engine equipped machines.
- ☐ Explain proper loading and unloading of materials from the tub or grinding chamber of the machine.
- ☐ Objects thrown by shredding or spinning rotors may represent a hazard to personnel and property in the area. Minimize risks by planning and by keeping personnel and property clear of hazaard area.
- ☐ Explain the availability and use of the tub cover to further reduce risks of thrown objects.
- ☐ Review maintenance and lubrication procedures with the operator / maintenance person as defined in the operators manual.
- ☐ Advise never to use the machine in an environment with explosive or flammable materials present.
- ☐ Explain warranty policy and limitations to the owner / operator.

## ⚠ Warning

**Misuse of the machine or modification or removal of the guards, safety devices, or control interlocks can cause injury or death.**

| | |
|---|---|
| **The above delivery information has been explained to me. I understand the operation and maintenance of this machine. I also acknowledge the warranty conditions and limitations as outlined.** | |
| **Owner / Operator Signature** | **Date** |
| **Dealer Representative Signature** | **Date** |


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Clearing the Way for a Better Tomorrow