TEREX

AUGER DRILL
330 SERIES

OPERATOR'S MANUAL

This Operator's Manual MUST BE READ prior to operating your 330 SERIES Terex Texoma Auger Drill.

PRINTED IN THE USA
Original Instructions in English

Terex South Dakota **608689 02/2014**

Terex South Dakota, Inc.
500 Oakwood Road
Watertown, SD 57201

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INTRODUCTION

OWNERS, USERS AND OPERATORS

Thank you for choosing Terex South Dakota equipment for your application. User safety is our number one priority and this is best achieved by our joint efforts.

As equipment users and operators, you make a major contribution to safety if you:

1. Comply with OSHA, federal, state, ANSI, local and your company regulations.
2. Read, understand and follow the instructions in this manual and other manuals supplied with this vehicle.
3. Only allow trained operators, directed by informed and knowledgeable supervision, to run the unit.

If there is anything in this manual that is not clear or you believe should be added, please send your comments to:

Manager of Publications
Terex South Dakota, Inc.
500 Oakwood Road
Watertown, South Dakota 57201

You may also contact us by phone at: (605) 882-4000

This is the safety alert symbol. It is used in this manual to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

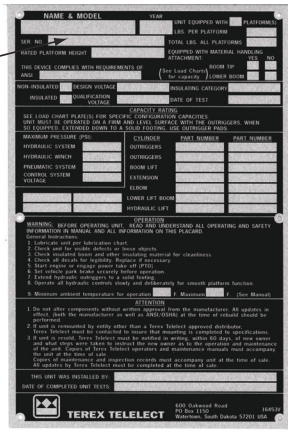
This manual contains important information on the safe use of your Terex South Dakota equipment. Your failure to read, understand and follow all safety rules, warnings and instructions will unnecessarily expose you and others to dangerous situations. For your safety and the safety of those around you, you **must** operate your Terex South Dakota equipment as instructed in this manual.

This manual shall be stored on the vehicle for access by the operator. The Operators manual is required to be stored on the vehicle by ANSI and OSHA regulations.

PRODUCT IDENTIFICATION

The serial number is located on the ID plaque. It may be located on the turntable, pedestal or lower boom, depending on options and features. The serial number of the vehicle will be different than the serial number for the booms. Please refer to the boom serial number when contacting Terex South Dakota for service and parts information. Refer to the ID plaque for capacity and dielectric information.

Serial Number



INTENDED USE

This machine is intended to be used to perform drilling operations. If equipped with material handling features it may be used to lift material only within its rated capacity. Use of this product in any other way is prohibited and contrary to its intended use.

BULLETIN DISTRIBUTION AND COMPLIANCE

It is the owners responsibility to comply with all bulletins issued by Terex South Dakota or the vehicle manufacturer. Safety of product users is of paramount importance to Terex South Dakota. Various bulletins are used by Terex South Dakota to communicate important safety and product information to dealers and machine owners. The information contained in bulletins is tied to specific machines using the machine model number and serial number. Distribution of these bulletins is based on the most current owner on record along with their associated dealer, so it is important to register your machine and keep your contact information up to date and changes in ownership. To ensure safety of personnel and the reliable continued operation of your machine, be sure to comply with the action indicated in bulletins.

CONTACTING THE MANUFACTURER

At times it may be necessary to contact the manufacturer of this machine. When you do, be ready to supply the model number and serial number of your machine, along with your name and contact information. At minimum, the manufacturer should be contacted for:

- Accident Reporting
- Questions regarding product applications and safety
- Standards and regulations compliance information
- Questions regarding product modifications
- Current owner updates, such as changes in machine ownership or changes in your contact information (See Transfer of Machine Ownership below)

TRANSFER OF MACHINE OWNERSHIP

If you are not the original owner of this machine please provide the following information when ownership changes:

- Model
- Serial number
- New owner information
  - Company name
  - Address
  - City, State & Zip code
  - Contact person
  - Phone number
- Vehicle VIN number

This information will insure that you are the owner on record for this machine and you will receive applicable notices and advisories in a timely manner.

You can mail information on changes in ownership to Terex South Dakota, Inc, 500 Oakwood Road, PO Box 1050, Watertown, SD 57201 or email the information to: utilities.warranty@terex.com.

SAFETY

The operator is the single most important factor for safety when using any piece of equipment. Learn to operate your Terex South Dakota equipment in a safe manner.

NOTE: The best method to protect yourself and others from injury or death is to use common sense. If you are unsure of any operation, do not continue until you are satisfied that it is safe to proceed.

HAZARD CLASSIFICATION SYSTEM

This machine contains safety signs to assist in hazard recognition and prevention. The hazard classification system is a multi-tier system used to alert you to potential personal injury hazards. Signal words used with the safety alert symbol indicate a specific level of severity of the potential hazard. To help you recognize important safety information, we have identified **warnings** and **instructions** that directly impact on safety.

This is the safety alert symbol. It is used in this manual to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Danger: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

Danger is always used with the safety alert symbol and white letter on red background.

Warning: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

Warning is always used with the safety alert symbol and black letters on orange background.

Caution: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

Caution is used with the safety alert symbol and black letters on yellow background.

PROPERTY DAMAGE MESSAGES

The signal word NOTICE, shown without the safety alert symbol, is used to address specific practices or draw attention to supplemental information that is not related to personal injury.

Notice: Indicates information considered important, but not hazard related (e.g., messages related to property damage).

Notice does not use the safety alert symbol and text is white italic letters on blue background.

In addition to maintenance and operating instructions in this manual, the operator must read and understand all the instructions in the following safety guidelines.

1. Study all safety messages. Remember and apply them on the job.
2. Modifications to this Terex South Dakota equipment from the original design specifications without written permission from Terex South Dakota are strictly forbidden. A modification may compromise the safety of the Terex South Dakota equipment, subjecting users to serious injury or death. Any such modification will void any remaining warranty.
3. Terex South Dakota reserves the right to change, improve, modify or expand features of its equipment at any time. Specifications, model or equipment are subject to change without notice and without incurring any obligations to change, improve, modify or expand features of previously delivered equipment.
4. Comply with manufacturer’s instructions and requirements of current OSHA regulations and ANSI standards.

GENERAL SAFETY GUIDELINES

1. The use of this Auger Drill is subject to certain potential dangers that cannot be protected against by mechanical means. Only the exercise of intelligence, care, and common sense can eliminate these dangers. It is essential to have competent, careful operators who are physically and mentally fit, and thoroughly trained in the safe operation of this Auger Drill. Learn, understand and practice safe use of all equipment and controls - before operating this Auger Drill.
2. Never exceed the rated load capacity. Know the total weight of the object(s) to be handled. Stay within the limits shown on the load capacity chart.
3. Do not operate this Auger Drill if any interlock or safety device is malfunctioning.
4. Do not bypass or remove any interlock or safety device.
5. Do not operate if Auger Drill is not functioning properly, or has leaks, get repaired before further use.
6. Never operate the Auger Drill control while standing on the ground. Always operate mast and digging controls while on the vehicle.
7. Keep the vehicle free of obstructions that may interfere with the controls or personnel who may have to operate them in an emergency. Keep deck clear for safe access, maintain all steps and grab handles.
8. When operating this Auger Drill, if you become aware of any dangerous condition or hear any unusual noises such as grinding, cranking or grating sounds, STOP in position. DO NOT move or operate the Auger Drill until the problem has been diagnosed and resolved.
9. Be sure all personnel know the proper procedure to follow in case of an emergency.
10. Do not operate the Auger Drill in an electrical storm.
11. Hydraulic oil is flammable. A hydraulic leak may create a mist of oil, which is conductive and explosive.
12. Perform all scheduled maintenance required.
13. Be sure of footing when entering, exiting and working on the unit, use 3-point access when required.

BEFORE OPERATION

1. Survey the conditions of the work area. Identify situations such as soft ground, ditches, drop offs, holes, debris, overhead obstructions, electrical conductors, underground utilities, stored fuels, toxic dust and gases.
2. “Call Before You Dig!” Call 811, if available in your area and locate all under ground utilities before drilling.
3. Do notify the owner of overhead or underground power lines before digging. Be sure to comply with all local regulations regarding safe operating distances from power lines.
4. Do study this manual and fully understand the controls.
5. Do be sure all safety guards are securely in place.
6. Do be sure all nameplates and decals pertaining to safety, operation, and maintenance are in place and not damaged. Replace any damaged or missing nameplates or decals.
7. Plan the job (tailgate session) and clear the area of bystanders.
8. The vehicle must be securely parked, set parking brakes and chock wheels.
9. Stabilize the vehicle before any operation is performed.
10. Do not lower outriggers unless you can see that all ground personnel and bystanders are clear of the outrigger path of movement and its ground contact point. Lower all outriggers onto solid footing.
11. Do not place outriggers on ice as slippage may occur regardless of solid footing. Operation on snow or slippery surfaces requires extra care during set up to ensure Auger Drill and vehicle have sufficient traction to prevent sliding.
12. Ground and/or barricade the vehicle per OSHA and your company rules.
13. Ensure sufficient lighting at job site to accomplish task safely.
14. Do wear safety helmet and glasses when operating or working on machine.
15. Do be sure all personnel are clear of the machine and work area before starting the engine or operating the machine.
16. Perform controls inspection before beginning operation. Do not operate with malfunctioning controls.
17. Do maintain metal to metal contact between fuel tank and fuel nozzle when filling fuel tank. This will prevent static sparks and the possibility of fire and explosion.
18. Do not leave tools or other loose objects on the bed, engine compartment, or drive mechanisms. They can be thrown with a powerful force.
19. Inspect winch line for damage and hook for safety latch and damage. (if equipped)
20. Maintain minimum approach distance.
21. Barricade or cover any overhead electrical lines that may be a potential contact during operation.
22. Inspect and maintain personal protective equipment.
23. Be sure operators manuals is in the vehicle.

DURING OPERATION

OPERATION

1. Do not run engine in an enclosed area. Exhaust gases contain carbon monoxide, a deadly poison, which is colorless and odorless.
2. Keep work area clean and clear of mud, snow, ice, hand tools and other objects.
3. Engage brake systems before leaving the machine for any reason.
4. Be sure the mast is perpendicular with respect to the machine before lowering. Lower slowly to be sure mast will clear other parts of the machine and fit correctly in the mast rest.
5. Do not wear loose clothing or jewelry; keep clothing and hands clear of moving parts.
6. Do not move machine if it is in a potentially unstable position.
7. Do not drill near a "bootleg" hole or any hole that may contain explosives.
8. Keep the area within 15 feet (4.6 m) of the kelly bar or auger clear of personnel.

BOOM FUNCTIONS

1. Never operate the Auger Drill unless you know the location, function, and operation of all the controls, including emergency and accessory operation.
2. Avoid abrupt starts, stops and reversal of direction. Operate all controls slowly for smooth motion.
3. Keep hands off all moving parts to avoid injury.
4. Do not allow ground personnel to stand or walk under a suspended load.
5. If the vehicle is setup on a slope, use extreme caution. Stability may be affected.
6. Do not allow ground personnel to be in contact with the vehicle or attached apparatus.

DIGGING

1. Never dig until all the underground utilities (such as, electrical lines, gas lines and other lines) have been identified and marked. Call your local “Call before you Dig” hotline or the national number 811, if available in your area, for assistance.
2. Before lowering the digger/auger, clear the area of all ground personnel.
3. Never corkscrew the auger; the force exerted can exceed the load capacity.

AFTER OPERATION

- Be sure all controls are in the NEUTRAL or OFF position.
- Let engine idle for 3-5 minutes before shutting off engine.

ELECTRICAL HAZARDS

- This unit is not insulated against any voltage.
- Do not contact any power lines.
- Maintain proper clearance from all power lines.

ELECTRICITY OBEYS NO LAW, BUT ITS OWN.

1. Electricity is an ever-present danger when using a Auger Drill near power lines. Follow all OSHA, ANSI, state, federal, and company rules and regulations when working near energized power lines.
2. Always maintain proper clearance from energized power lines.
3. Never allow ground personnel to come in contact with the Auger Drill, vehicle or vehicle attachments while in operation in the vicinity of overhead or buried electrical power lines.

CLEARANCES FROM HIGH VOLTAGE LINES	
VOLTAGE	**MINIMUM CLEARANCE**
0 to 50 kv	10 ft. (3 m)
50 to 200 kv	15 ft. (4.6 m)
200 to 350 kv	20 ft. (6.1 m)
350 to 500 kv	25 ft. (7.6 m)
500 to 750 kv	35 ft. (10.7 m)
750 to 1000 kv	45 ft. (13.7 m)

MINIMUM SAFE DISTANCES FROM HIGH VOLTAGE LINES.

ACCESSORIES

1. Only use hydraulic tools equipped with orange hoses marked NON-CONDUCTIVE. The hoses must be kept clean and dry and must be inspected for damage before use.
2. All accessories must be inspected, maintained and operated with the same care and safety rules that apply to the Auger Drill.
3. Do not use hoses having less than 2750 PSI (18.96 MPa) working pressure ratings.
4. Hydraulic tools selected for use with this Auger Drill should be open-center type and operate satisfactorily at 1500 PSI (10.34 MPa) and 8 GPM (30 LPM).
5. Do not use lower hydraulic tools when booms, auger or kelly bar are near energized lines.

MATERIAL HANDLING

1. Do not attempt to move the machine with a load suspended from the winch line. Always keep the Mast vertical and the auger on the ground when lifting a load. Do not swing with a suspended load. Failure to heed this warning may cause serious damage and/or personnel injuries
2. Do not permit personnel to be under loads being lifted.
3. Do not use winch to raise personnel off the ground.
4. Do not allow rope to contact energized power lines.
5. Inspect the winch rope daily. Do not operate with a damaged or frayed rope.
6. Use a sling. Do not use the winch rope as a sling.
7. Use only hooks with a safety latch.
8. Do not overload. The load chart supplied with each Auger Drill gives the machine capacity.
9. Know the platform weight of the load you are lifting. Do not guess.
10. Lifting the load will cause deflection in the Auger Drill. Allow adequate clearance when applying and removing the load.
11. Use snatch block to drag items to the mast. Do not exceed capacity.

TRAVELING

1. Never travel with the mast raised.
2. Store mast properly in the rest with all sections fully retracted.
3. Keep all tools or other items properly stored on the vehicle while traveling. Otherwise, they may fall onto roadway.
4. Fully retract the outriggers. Store the outrigger pads and wheel chocks.
5. Do not travel with Auger Digger engine running.
6. Secure operators platform and ladder for travel (See Operators Seat Pedestal section).
7. Attach safety chain when towing.
8. Follow the vehicle manufacturer's instructions for operating the vehicle.

Drive Carefully!

MAINTENANCE

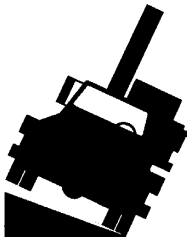
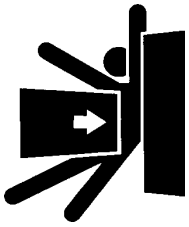
1. Only authorized and qualified personnel with complete knowledge of this Auger Drill shall be allowed to perform maintenance on this Auger Drill.
2. Replace all illegible decals.
3. Do not search for hydraulic leaks with your hands or any other part of your body.
4. All hoses must meet or exceed the working pressure as stated in the maintenance manual.
5. Do not use replacement components that are not equal to the original components.
6. Before doing any work on the hydraulic system, secure the booms and outriggers. Release any hydraulic pressure before attempting repairs or disassembly of hoses, valves, cylinders or any other hydraulic components.
7. Fuel or oil spill may require notification or appropriate Federal, State, or Local officials.
8. Use only proper tools to make repairs or adjustments.
9. Do not service, perform maintenance, or make adjustments while machine is running.
10. Do not weld or grind near oil lines, batteries, fuel tanks or lines.
11. Do not smoke or use an open flame near batteries. Batteries can give off hydrogen which is a highly explosive gas.
12. Do not operate the Auger Drill after adjustments or repairs until all guards have been reinstalled, trapped air removed from the hydraulic system, safety devices reactivated, and maintenance equipment removed.
13. The subframe, outriggers and mounting to the vehicle must be inspected following the frequent and periodic inspection intervals for fastener tightness, damaged components and weld inspections.
14. Inspect, maintain, and operate the vehicle following the vehicle manufacturer’s guidelines.

EQUIPMENT TRANSFER

If all or part of the equipment is shipped to a new destination, always include a Operator's Manual.

OVERVIEW OF POTENTIAL HAZARDS

The Auger Drill is a heavy moving machine with a mast capable of extending its reach vertically and horizontally. Like all moving objects and reach extending devices, there are potential hazards associated with its use. These hazards will be minimized if the machine is properly inspected and maintained. The operators should read this manual and have been trained to use the machine in an appropriate and safe manner. Should any questions arise concerning the maintenance or operation of the machine contact Terex South Dakota.

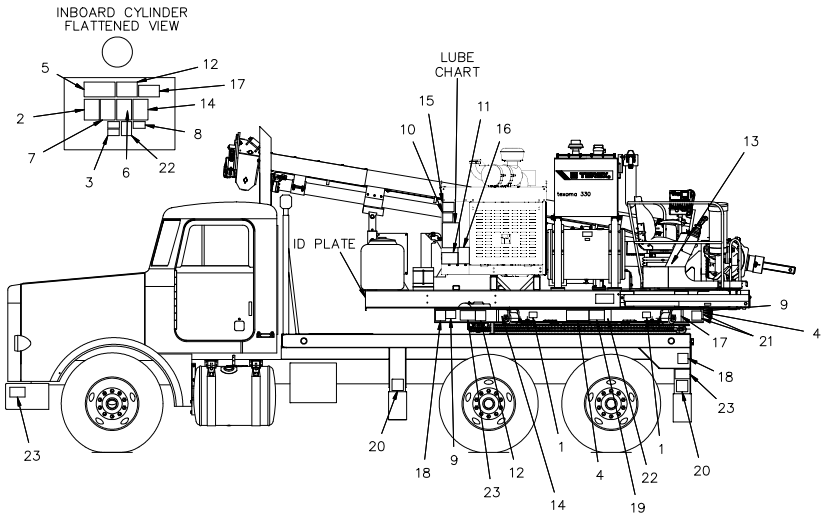
Electrical Contact 	DANGER: Will cause Serious Injury Maintain minimum clearance from or Death.	Maintain minimum clearance from overhead high voltage power lines. Refer to "Minimum Clearance for High Voltage Lines" chart in this section. Do not dig near underground power lines. Machine is NOT insulated and provides no protection incase of electrical contact.
Contaminated Air 	DANGER: Will cause Serious Injury or Death.	Do not run engine in an area without good ventilation.
Unit Overturn 	WARNING: Can Cause Serious Injury or Death.	Do not travel on steep inclines or crosswise to grades. Do not travel on soft or unstable ground or close to unsupported excavations. Do not move machine with mast raised. Always extend outriggers before using auger. Always place auger on ground when lifting a load with the winch.
Moving Load or Parts 	WARNING: Can Cause Serious Injury or Death.	Do not unstow, move or stow mast or auger until all people are clear of the area. Keep all personnel at least 15 ft. (4.6 m) from the Kelly Bar or auger when it is operating. Do not lubricate or service while machine is running.
High Pressure Air or Fluid 	WARNING: Can Cause Serious Injury or Death.	Relieve pressure on hydraulic and pneumatic systems before loosening hoses or connections. Do not check for leaks with your hand.

SAFETY RELATED DECALS

Safety signs are designed and fitted to the product to warn of possible dangers, and MUST be replaced immediately if they become unreadable or lost. If the product is repaired and parts have been replaced on which safety signs were fixed, be sure new safety signs are fitted before the product is put into service.

Use mild soap and water to clean safety signs - DO NOT use solvent based cleaners, as they may damage the safety sign material.

Operating this equipment without all safety and control decals in place can be hazardous.



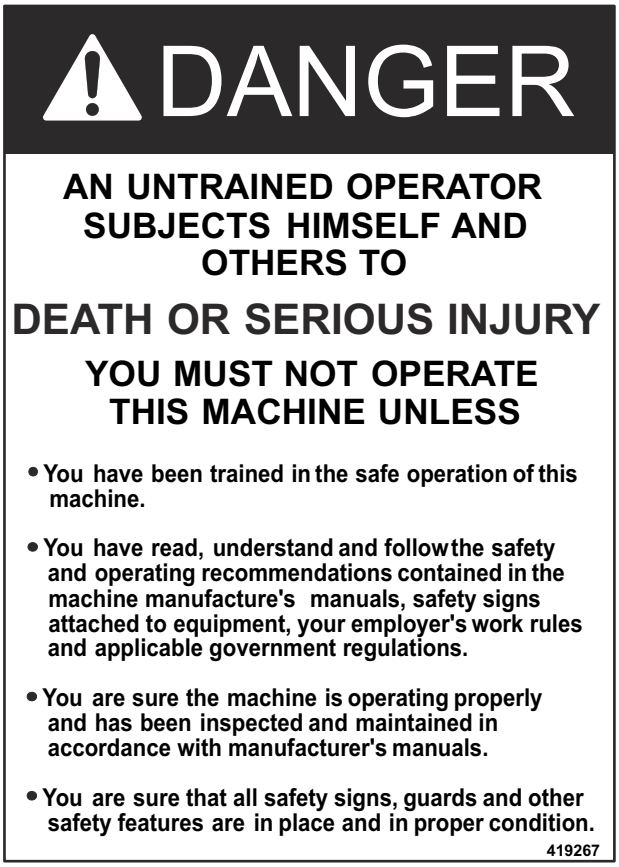
NOTE: * Use decal 419272 when all booms are steel (not insulated) or have not been dielectrically tested.

ITEM #	DECAL	QTY	PART #
1.	CRUSHING	4	90195
2.	UNTRAINED OPERATOR	1	419267
3.	OUTRIGGER - CRUSHING - DO NOT OPERATE	1	419268
4.	ELECTROCUTION HAZARD - KEEP CLEAR	3	419271
5. *	ELECTROCUTION HAZARD - NOT INSULATED	1	419272
6.	OBEY	1	419273
7.	TWO - BLOCKING	1	419276
8.	ANSI WARNING, DD	1	485894
9.	FALL HAZARD	3	T428885
10.	ENTANGLEMENT, FAN	2	T428893
11.	EXPLOSION	1	T428896
12.	INJECTION HAZARD	3	T428898
13.	ROTATING SHAFT	2	T429406
14.	MODIFICATION OR ALTER.	2	T429445
15.	HOT PRESSURIZED FLUID	2	T429449
16.	NOTICE, DO NOT WELD	2	T429489
17.	FALLING OBJECT	3	T430183
18.	CRUSH HAZARD, TRUCK	4	T430185
19.	ELECTROCUTION HAZARD	2	T430257
20.	WARNING, CRUSH HAZARD	4	T430776
21.	DANGER, FLYING OBJECTS	3	T430779
22.	WARNING, LOCATE UTILITIES	3	T430861
23.	ELECTROCUTION HAZARD	6	T430863

1.


DANGER
CRUSHING INJURY
IS POSSIBLE
WHILE MACHINE
IS IN OPERATION
90195A

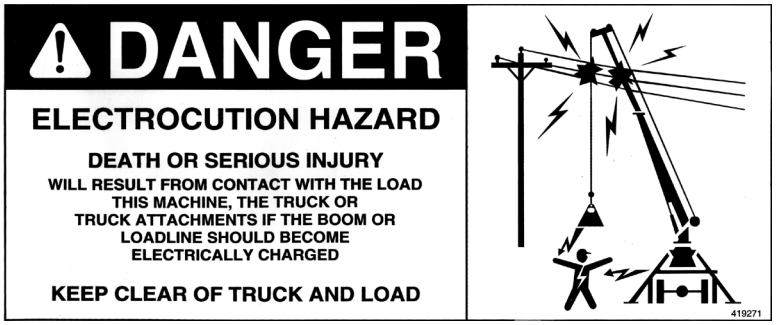
2.


DANGER
AN UNTRAINED OPERATOR
SUBJECTS HIMSELF AND
OTHERS TO
DEATH OR SERIOUS INJURY
YOU MUST NOT OPERATE
THIS MACHINE UNLESS
• You have been trained in the safe operation of this machine.
• You have read, understand and follow the safety and operating recommendations contained in the machine manufacture's manuals, safety signs attached to equipment, your employer's work rules and applicable government regulations.
• You are sure the machine is operating properly and has been inspected and maintained in accordance with manufacturer's manuals.
• You are sure that all safety signs, guards and other safety features are in place and in proper condition.
419267

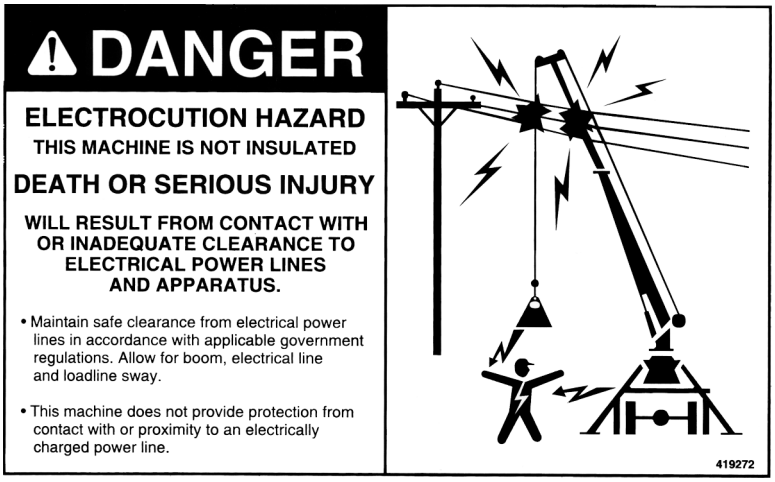
3.


DANGER
OUTRIGGER CONTACT
WILL CAUSE
SERIOUS CRUSHING INJURY
• Do not operate any outrigger unless you or a signal person can see that personnel and obstructions are clear of the outrigger and its contact point.
419268A

4.


DANGER
ELECTROCUTION HAZARD
DEATH OR SERIOUS INJURY
WILL RESULT FROM CONTACT WITH THE LOAD
THIS MACHINE, THE TRUCK OR
TRUCK ATTACHMENTS IF THE BOOM OR
LOADLINE SHOULD BECOME
ELECTRICALLY CHARGED
KEEP CLEAR OF TRUCK AND LOAD
419271

5.


DANGER
ELECTROCUTION HAZARD
THIS MACHINE IS NOT INSULATED
DEATH OR SERIOUS INJURY
WILL RESULT FROM CONTACT WITH
OR INADEQUATE CLEARANCE TO
ELECTRICAL POWER LINES
AND APPARATUS.
• Maintain safe clearance from electrical power lines in accordance with applicable government regulations. Allow for boom, electrical line and loadline sway.
• This machine does not provide protection from contact with or proximity to an electrically charged power line.
419272

6.

⚠ DANGER

FAILURE TO OBEY THE FOLLOWING WILL RESULT IN

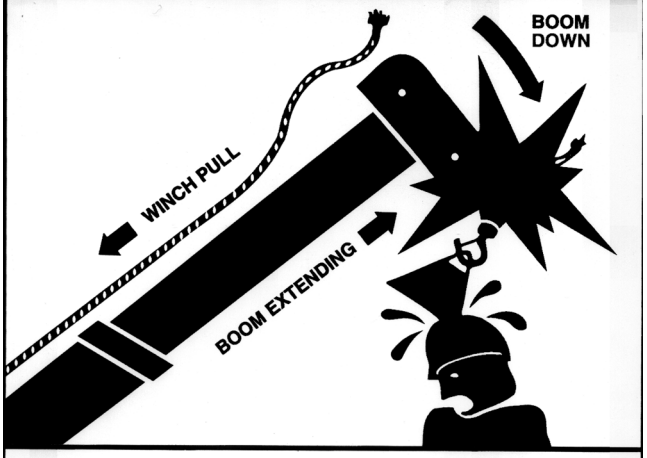
DEATH OR SERIOUS INJURY

- For stationary operation, vehicle must be securely parked, driveline disengaged, and Digger Derrick properly stabilized prior to operation.
- To avoid tip-over, all outriggers must be properly extended on a solid level surface.
- Operate all controls slowly and smoothly and make sure controls are returned to neutral after desired operation.
- Never operate the machine with personnel under boom or load.
- Keep load under boom tip. Do not side load boom or drag loads. Avoid free swinging loads.
- Keep at least 4 wraps of loadline on winch drum.
- Never move the vehicle until the booms, auger and outriggers are in properly stowed postion and secured.
- Top Controls are required when working from platform on structures with energized lines or components.
- Refer to the operator's manual for complete instructions. If missing, replace manual.

419273A

7.

⚠ DANGER



TWO BLOCKING THE MACHINE WILL RESULT IN

DEATH OR SERIOUS INJURY

Do not allow the hook block to contact the boom tip by hoisting up, extending or lowering the boom.

419276

8.

⚠ WARNING

FAILURE TO FOLLOW PROPER PROCEDURES

Could Result In
DEATH OR SERIOUS INJURY

If YOU sell, install, offer for use, use, operate or maintain this Digger Derrick:

You MUST COMPLY with the requirements of: American National Standards Institute A10.31, National Electric Safety Code, and OSHA

485894

9.

⚠ WARNING

Fall Hazard

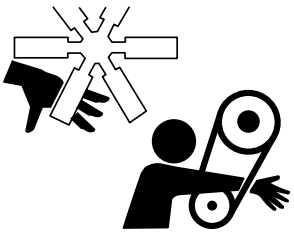
Death or serious injury can result from falling.

Use the access system provided when servicing the machine.

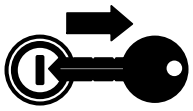
428885

10.

WARNING



Entanglement Hazard
Rotating parts can cause personal injury.



Keep away from fan and belt when engine is running. Stop engine before servicing.

428893

11.

DANGER

Explosion / Burn Hazard
Will cause death, burns or blindness due to ignition of explosive gases or contact with corrosive acid.

Keep all open flames and sparks away. Wear personal protective equipment, including face shield, gloves and long sleeve shirt.

READ MANUALS
Read all manuals prior to operation.

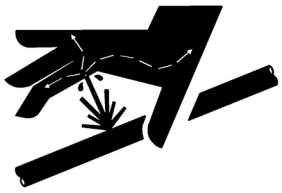
DO NOT OPERATE equipment if you do not understand the informationin the manuals.

Consult your supervisor, the owner or the manufacturer.

428896

12.

WARNING



INJECTION HAZARD
Escaping fluid under pressure can penetrate skin, causing serious injury.

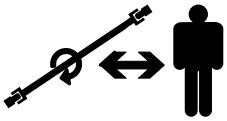
Relieve pressure before disconnecting hydraulic lines. Keep away from leaks and pin holes. Use a piece of cardboard or paper to search for leaks. Do not use hand.

Fluid injected into skin must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene will result.

T428898A

13.

WARNING



Entanglement Hazard

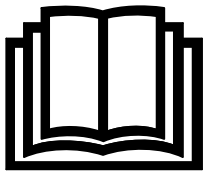
Death or serious injury can result from contact with rotating drivelines.

Keep clear of rotating drivelines. Switch off engine before performing service. Do not operate with guard removed.

429406

14.

WARNING



Improper operation or maintenance can result in serious injury or death.

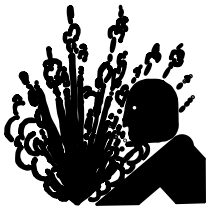
Read and understand operator's manual and all safety signs before using or maintaining machine.

If you do not understand the information in the manuals, consult your supervisor, the owner or the manufacturer.

429445

15.

WARNING



Burn Hazard

Hot pressurized fluid can cause severe burns.

Allow to cool before opening.

429449

16.

NOTICE

DO NOT WELD

DO NOT WELD ON ANY PART OF THIS MACHINE WITHOUT FOLLOWING THE INSTRUCTIONS IN THE SERVICE MANUAL.

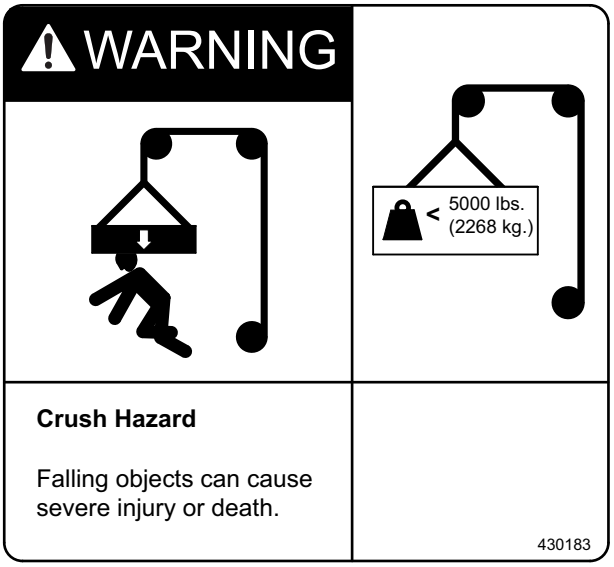
1. Stop the engine. Turn the switched power to the OFF position.
2. Disconnect the negative battery cable from the battery. If a battery disconnect switch is provided, open the switch.
3. Disconnect all electrical connectors from the engine ECM. Move the harness to a position that will not allow the harness to accidentally move back and make contact with any of the ECM pins.
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 bearings, hydraulic components, electrical components, and ground straps.

Note: If 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 severely damage the component.

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

429489

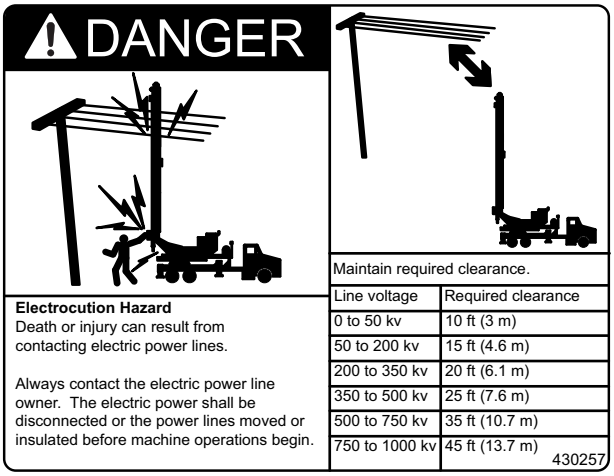
17.


WARNING
< 5000 lbs.
(2268 kg.)
Crush Hazard
Falling objects can cause severe injury or death.
430183

18.


DANGER
Crush Hazard
Death or serious injury can result from contact with moving machine.
Keep clear of moving machine.
430185

19.


DANGER
Electrocution Hazard
Death or injury can result from contacting electric power lines.
Always contact the electric power line owner. The electric power shall be disconnected or the power lines moved or insulated before machine operations begin.
Maintain required clearance.
Line voltage | Required clearance
0 to 50 kv | 10 ft (3 m)
50 to 200 kv | 15 ft (4.6 m)
200 to 350 kv | 20 ft (6.1 m)
350 to 500 kv | 25 ft (7.6 m)
500 to 750 kv | 35 ft (10.7 m)
750 to 1000 kv | 45 ft (13.7 m)
430257

20.


WARNING
Crush Hazard
Serious injury can result from contact with moving jacks.
Keep clear of moving jacks.
430776

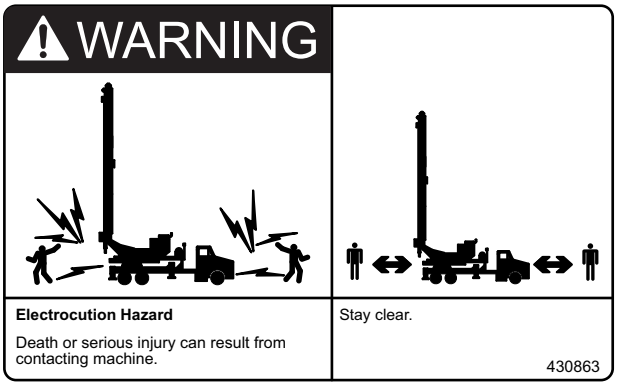
21.


DANGER
Flying Object Hazard
Death or serious injury can result from contact with flying objects.
Keep clear of auger.
430779

22.


WARNING
Electricity, Or Gas Explosion Can Kill.
ONE-CALL
Locate Utilities
CALL 1-888-258-0808
430861

23.


WARNING
Electrocution Hazard
Death or serious injury can result from contacting machine.
Stay clear.
430863

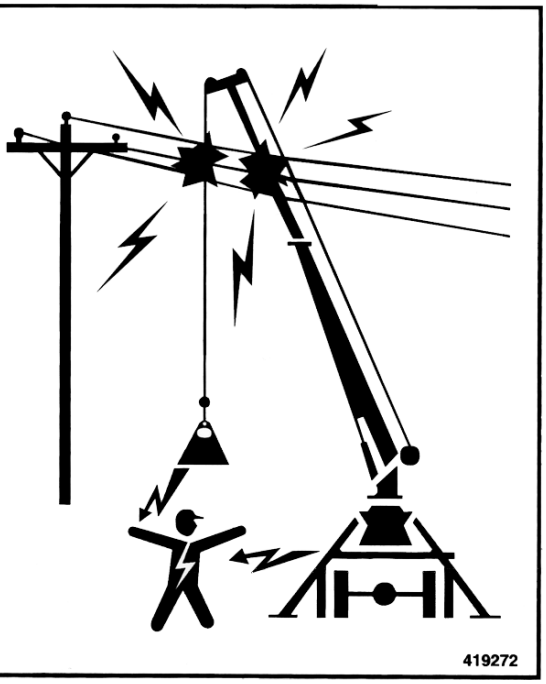
ELECTRICAL INSULATION

This unit is not insulated against any voltage. Do not contact power lines.
Maintain proper clearance from all power lines.

DANGER

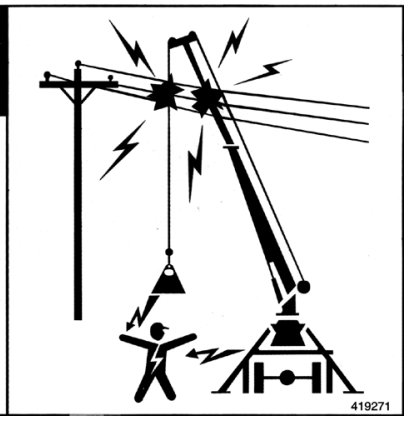
ELECTROCUTION HAZARD
THIS MACHINE IS NOT INSULATED
DEATH OR SERIOUS INJURY
WILL RESULT FROM CONTACT WITH OR INADEQUATE CLEARANCE TO ELECTRICAL POWER LINES AND APPARATUS.

- Maintain safe clearance from electrical power lines in accordance with applicable government regulations. Allow for boom, electrical line and loadline sway.
- This machine does not provide protection from contact with or proximity to an electrically charged power line.

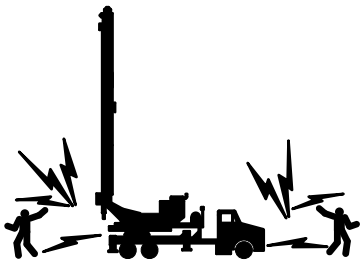


DANGER

ELECTROCUTION HAZARD
DEATH OR SERIOUS INJURY
WILL RESULT FROM CONTACT WITH THE LOAD THIS MACHINE, THE TRUCK OR TRUCK ATTACHMENTS IF THE BOOM OR LOADLINE SHOULD BECOME ELECTRICALLY CHARGED
KEEP CLEAR OF TRUCK AND LOAD

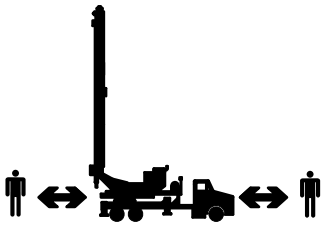


WARNING



Electrocution Hazard

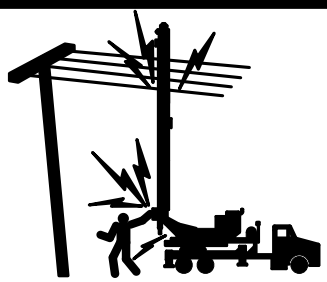
Death or serious injury can result from contacting machine.



Stay clear.

430863

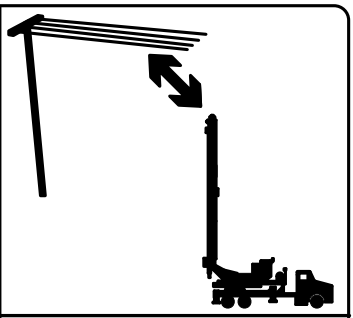
DANGER



Electrocution Hazard

Death or injury can result from contacting electric power lines.

Always contact the electric power line owner. The electric power shall be disconnected or the power lines moved or insulated before machine operations begin.



Maintain required clearance.

Line voltage	Required clearance
0 to 50 kv	10 ft (3 m)
50 to 200 kv	15 ft (4.6 m)
200 to 350 kv	20 ft (6.1 m)
350 to 500 kv	25 ft (7.6 m)
500 to 750 kv	35 ft (10.7 m)
750 to 1000 kv	45 ft (13.7 m)

430257

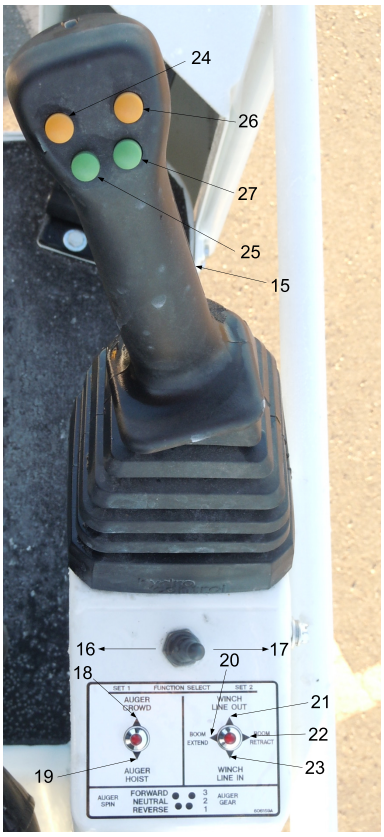
SECTION 1

OPERATION GUIDELINES

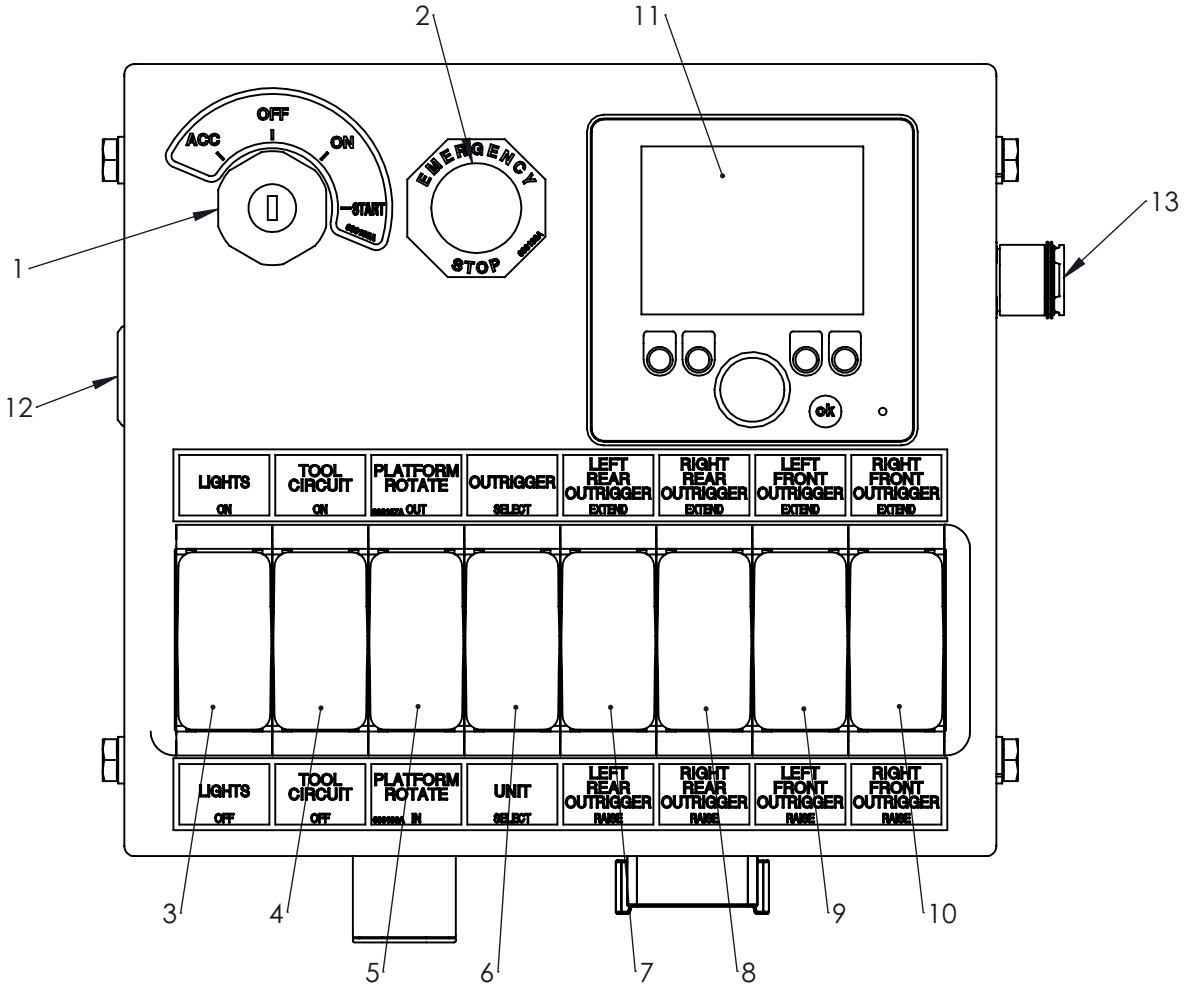
NOMENCLATURE

MODEL 330 COMPONENTS

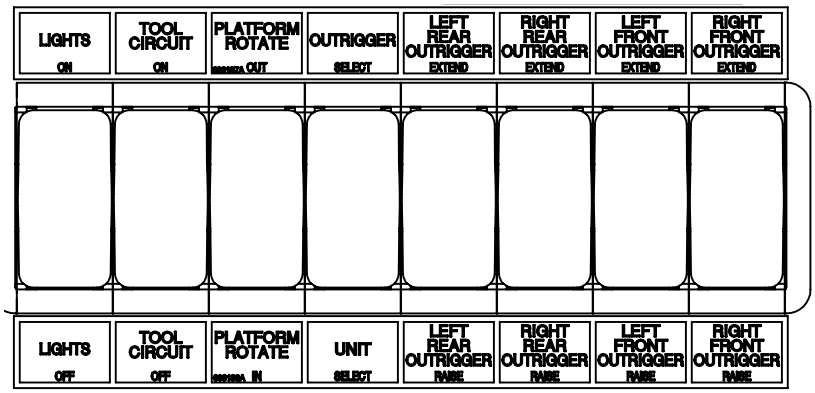
OPERATOR'S CONTROLS



1.	Function Set 1	15.	Joystick Enable (backside of joystick)
2.	Function Set 2	16.	Function Set 1
3.	Frame Travel Retract	17.	Function Set 2
4.	Turntable Swing CCW	18.	Auger Crowd
5.	Frame Travel Extend	19.	Auger Hoist
6.	Turntable Swing CW	20.	Boom Extend
7.	Mast Level Left	21.	Winch Line Out
8.	Mast Lower	22.	Boom Retract
9.	Mast Level Right	23.	Winch Line In
10.	Mast Raise	24.	Auger Forward Shift
11.	Release	25.	Auger Reverse Shift
12.	Clamp	26.	Auger Speed Shift Up
13.	Horn	27.	Auger Speed Shift Down
14.	Water		



1.	Ignition Switch	8.	Right Rear Outrigger
2.	Emergency Stop	9.	Left Front Outrigger
3.	Accessory (Lights)	10.	Right Front Outrigger
4.	Tool Circuit	11.	Controls Display/Diagnostics
5.	Platform Rotate	12.	Power Outlet, 12V
6.	Outrigger Unit Selector	13.	Diagnostic Port
7.	Left Rear Outrigger		



ACCESSORY (LIGHTS)

This is option switch for special lights or other accessory.

TOOL CIRCUIT

The Auger Drill can be equipped with an auxiliary, hydraulic circuit for use with hydraulic tools, such as a tamper. As supplied, this circuit terminates at the rear of the machine with two quick-disconnects and connects an external hydraulic tool.

PLATFORM ROTATE

Rotates platform to better see drilling operation.

OUTRIGGER UNIT SELECTOR

Unit outrigger selector switches between outrigger operation and all other unit operations. This is to prevent accidental movement during all other unit operations.

LEFT/RIGHT REAR/FRONT OUTRIGGER

Do not attempt to raise the mast unless the outriggers, if equipped, are firmly placed and set on a hard surface, and be sure the truck tires remain firmly on the ground to eliminate the possibility of turning the truck and digger over. Be sure the outriggers are retracted before moving the truck.

Watch the outriggers being moved and BE SURE all personnel are clear of the outriggers before operating.

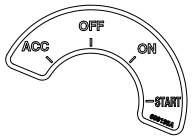
Outriggers are controlled by valves in the valve bank and are labeled as to their function. All outriggers be extended before raising the mast from its transporting position. The unit may have either straight rear outriggers or both rear and front outriggers.

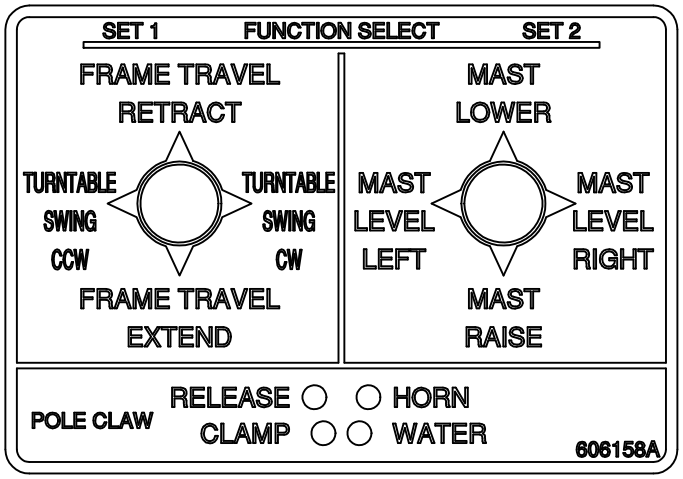
Each outrigger has its own individual control. Outriggers are extended by pushing the appropriate lever and are retracted by pulling the lever.

12V POWER

	12 volt power for accessories.

IGNITION SWITCH

	Ignition switch to run accessories and run the auger.



FRAME TRAVEL (FUNCTION SET 1)

Frame travel allows spotting the auger over the hole site. Pulling the control lever toward the operator extends the frame away from the vehicle and pushing the lever away from the operator retracts the frame. In addition to spotting the auger, frame travel permits augers to be swung around the rear outriggers. Always have the frame fully retracted before lifting any loads with the winch (if equipped).

TURNTABLE SWING (FUNCTION SET 1)

	USE CARE when swinging over the side of the truck with large, heavy, or heavily loaded augers. Depending on terrain, instability could be experienced. When on any degree of side incline, do not swing the auger to the downhill side.

AT ALL TIMES, be careful when swinging over the side of the truck making sure the auger is clear of the outriggers. Hitting the outriggers with the auger can cause damage to the machine.

Be aware of the tail swing when rotating. It may be wider than the vehicle.

The turntable provides 240 degrees of swing to allow digging on either side, as well as at the rear of the truck. Pushing the control lever away from the operator swings the auger to the right (CCW) and pulling the lever toward the operator swings the auger to the left (CW).

MAST ELEVATION (FUNCTION SET 2)

LOOK UP before raising the mast.

Do not allow mast to come near electrical power lines. See Minimum Clearance Chart for Energized High Voltage Lines.

BEFORE LOWERING MAST be sure to line arrow (see picture below) on right angle with arrow on frame to the machine. Lower slowly to be sure mast will clear other parts of the machine and fit correctly in the rest, or equipment damage can result.

CLEARANCES FROM HIGH VOLTAGE LINES	
VOLTAGE	**MINIMUM CLEARANCE**
0 to 50 kv	10 ft. (3 m)
50 to 200 kv	15 ft. (4.6 m)
200 to 350 kv	20 ft. (6.1 m)
350 to 500 kv	25 ft. (7.6 m)
500 to 750 kv	35 ft. (10.7 m)
750 to 1000 kv	45 ft. (13.7 m)

MINIMUM SAFE DISTANCES FROM HIGH VOLTAGE LINES.

The mast is elevated to a vertical working position from the near horizontal transporting position by means of the elevating cylinder. Pulling the lever toward the operator raises the mast and pushing the lever away from the operator lowers the mast. Operate cautiously so as to not jar or bounce the machine. The lever is spring returned to the neutral position. The bubble mounted on the final drive indicates when the mast is vertical front to back.

MAST SIDE LEVELING (FUNCTION SET 2)

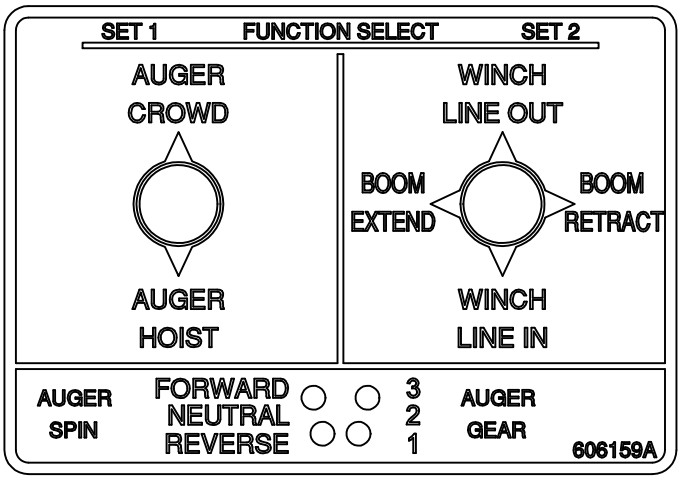
The leveling cylinder positions the mast vertically from left to right. Pushing the control lever away from the operator moves the top of the mast “RIGHT” away from the operator; pulling toward the operator moves the top of the mast to the “LEFT” (toward the operator). The lever is spring returned to the neutral position. A bubble level mounted on the leveling cylinder bracket indicates when the mast is vertical. The mast must be returned to centered position before stowing.

POLE ALIGNER (CLAW) (OPTIONAL) BUTTONS ON LEFT JOYSTICK

When setting poles, the pole may be aligned by the use of the hydraulic pole guide clamps. The clamps are closed and opened by pushing the pole claw buttons on left joystick.

HORN AND WATER (BUTTONS ON LEFT JOYSTICK)

Horn button is used just like for a vehicle and the water button is used for cleaning off auger or putting water in hole to keep dust down. Push and hold buttons down for use.



AUGER CROWD (FUNCTION SET 1)

The kelly bar and auger are raised and lowered by using the auger bar control. The lever is spring returned to the neutral position. Pushing the control lever away from the operator to the first position lowers the kelly bar and pulling the lever toward the operator raises the kelly bar. The control valve has a second position on the lowering side (extend) when pushed full stroke, which provides hydraulic regeneration. The effect increases the speed going back into the hole.

SERVICE WINCH (OPTIONAL) FUNCTION SET 2

NEVER attempt to move the machine with a load suspended from the winch line. Always keep the mast vertical and the auger on the ground when lifting a load.

Do not swing with a suspended load. Failure to heed this warning may cause serious personal injuries and/or machine damage.

Side pull only from snatch block to prevent damage and mast and cable or overturn unit.

The hydraulically driven winch has capacity is 5,000 lbs. (2270 kg.). By pushing the control lever away from the operator, the winch will pay out cable, and by pulling the lever toward the operator, the winch will pull in cable. When setting poles or using the winch for any type of heavy work, retract the frame fully, with the mast vertical, place the auger on the ground and apply some down pressure. Outriggers must be set in their extended down position. When using the winch to drag an object to the digger, use the snatch block at the top of the final drive.

BOOM EXTENSION (OPTIONAL) FUNCTION SET 2

LOOK UP before raising the mast.

Do not allow mast to come near electrical power lines. See Minimum Clearance Chart for Energized High Voltage Lines.

Do not attempt to carry poles on boom. Failure to heed this warning may cause personal injuries or machine damage. Damage caused to the machine will not be covered by warranty.

NEVER use polesetter boom as a crane.

The boom extension is extended by pushing the control lever away from the operator and pulling the lever toward the operator retracts the extension. Always let cable off the winch when extending to prevent damage to either the winch cable or the cable take-up spring.

AUGER SPIN AND GEAR (BUTTONS ON RIGHT JOYSTICK)

FORWARD (button up) is used to dig, NEUTRAL is used to stop rotation and REVERSE (button down) is used to back out the auger. Gear buttons used for the speed of transmission, button up for 3 and button down for 2 and 1.

ENABLE BUTTON

The Enable button is located on backside of both joysticks. It is used to run all the joystick functions other than the buttons.U

FOOT THROTTLE

The foot pedal is located directly by the operator's right foot. It controls the engine speed and hence the speed of all other functions. Push the pedal toward the floor to increase engine speed. The pedal is spring returned to low engine speed.

The engine speed may also be controlled by a throttle switch on the engine control panel. This allows engine RPM be set without having to keep your foot on the foot pedal.

GEAR SELECTOR

IMPORTANT: Do not engage a gear range or change from one range to another with the kelly bar rotating. Only move the selector lever with the kelly bar stationary. Failure to do so will cause extensive damage to the driveline.

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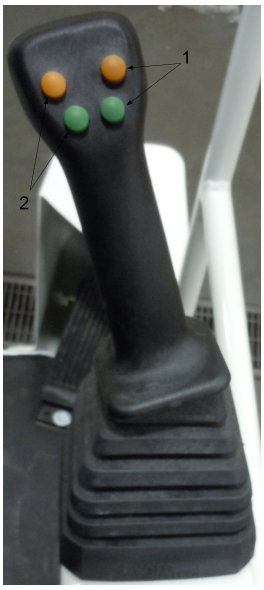


1.	Transmission Gear Selector
2.	Forward-Neutral-Reverse Selector

KELLY BAR ROTATION

IMPORTANT: Do not attempt to change the direction of rotation of the Kelly bar with the engine above idling speed or extensive damage to the drive train will result.

On machines equipped with Allison transmissions the direction of rotation of the Kelly bar is controlled by the FORWARD-NEUTRAL-REVERSE SELECTOR.

FORWARD to dig.

NEUTRAL to stop rotation.

REVERSE to back out auger.

AUGER SIZES

The use of large augers under certain terrain conditions can cause a loss of stability and control. Operate with extreme caution.

The use of an auger larger than listed could void warranty.

Listed below are the maximum size augers to be used on Terex Texoma Auger Drill, under ideal digging conditions (i.e.: Soft Dirt, NOT ROCK):

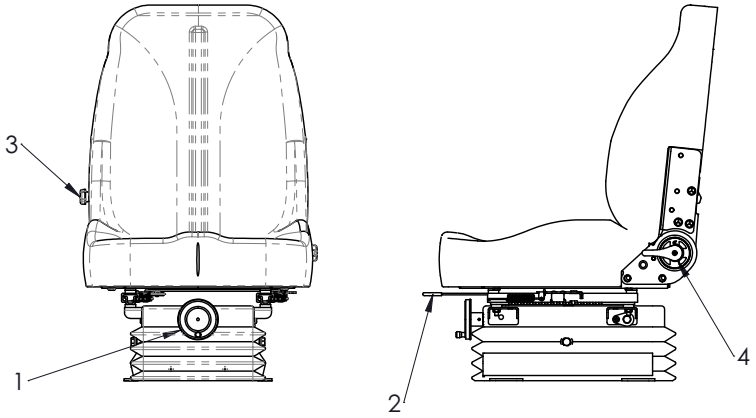
330. . . . . 72 in. (183 cm.) diameter maximum

When using larger sizes of auger, spin off the dirt at the lowest speed possible. All augers have some amount of imbalance and a spin off speed which is too high will cause discomfort to the operator and cause premature wear on the digger.

OPERATOR'S SEAT

To Adjust:

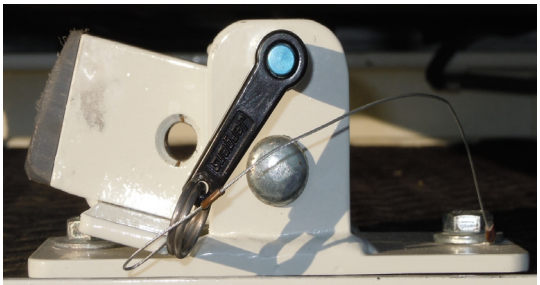
1. Pull pin to swivel seat into either “operate” or “stored” position, replace pin to lock seat into position.
2. Ratchet lever up and down to desire seat height.
3. Push spring loaded lever to adjust seat forward or backwards.



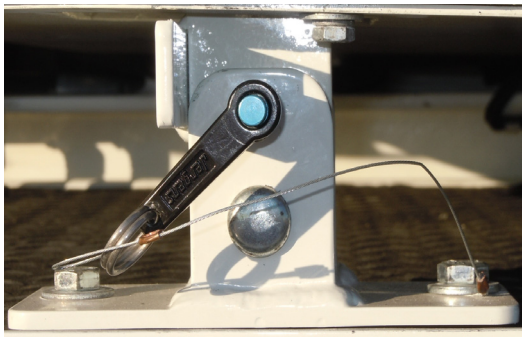
OPERATOR'S SEAT PEDESTAL

1.	Height Adjusting Lever
2.	Forward-Back Adjusting Lever
3.	Lumbar Lever
4.	Backrest Tilt Lever

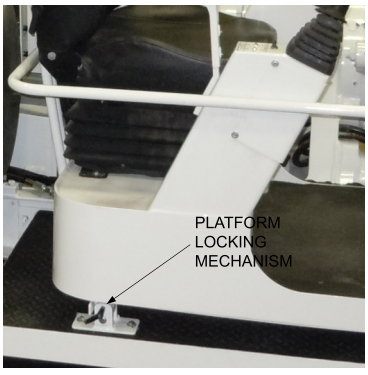
5. Platform lock mechanism (shown below) is for supporting and locking rotating platform in stowed position during travel. Platform must be rotated completely back in place for the locking mechanism holes to line up for the pin. Lock the control platform over truck bed for transport.



UNLATCHED (FREE TO ROTATE PLATFORM)



LATCHED (TRANSPORT POSITION)



PRE-OPERATION

DAILY PRE-OPERATION CHECKS

RIGHT SIDE CHECKPOINTS

1.	Kelly Bar	8.	Winch
2.	Final Drive	9.	Auger Crowd Cylinder
3.	Lower Packing	10.	Mast
4.	Rear Outriggers	11.	Muffler/Exhaust
5.	Upper Packing	12.	Hydraulic Control Box
6.	Driveline	13.	Oil Cooler/Lines
7.	Pump/Transmission	14.	Electric Control Box

LEFT SIDE CHECKPOINTS

15.	Water Tank (optional)	19.	Right Angle Drive
16.	Air Filter	20.	Fuel Tank/Lines
17.	Hydraulic Tank/Filter	21.	Engine
18.	Control Display	22.	Battery/Connections

Prior to placing the digger in use daily a thorough visual inspection should be made in order to detect any damage or losses which may have occurred during travel.

To ensure that the digger is kept in good operational condition, it should be systematically inspected before starting on a job and again after the job is completed. In addition, the operator should always be on the alert during operation in order to detect any trouble which might occur. Any trouble discovered during operations should be noted by the operator for correction at the earliest possible time. The operator should stop the digging operation immediately if a defect is discovered which could result in loss of control and personnel injury and/or machine damage if operations were continued.

PRE-START INSPECTION

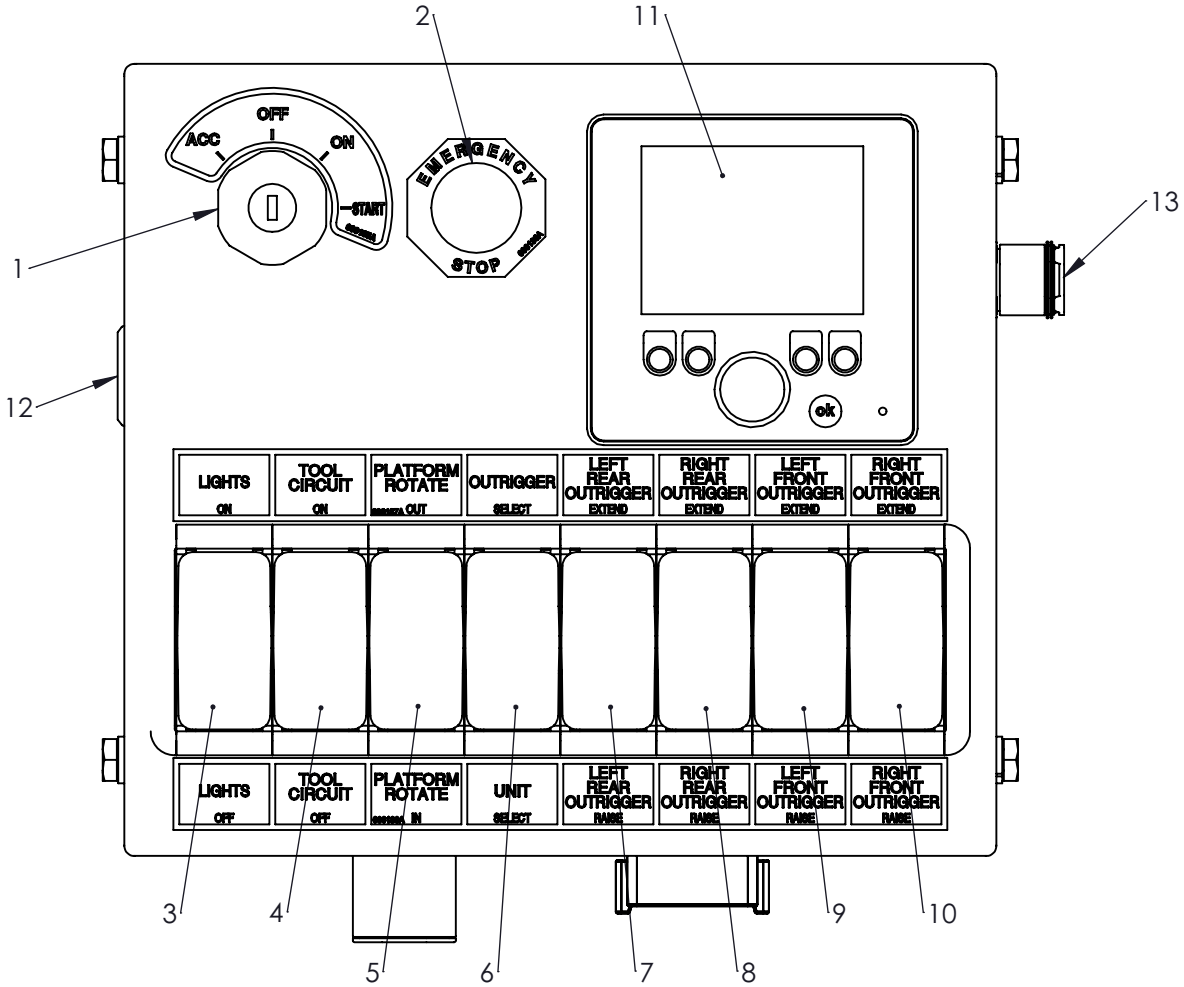
NOTE: The figures show general checkpoint locations, and may not be all inclusive. These photo's are intended as a guide for inspection and general location of major components.

1. Make a thorough visual inspection of the digger and see that it is in good working condition. Look for loose, missing, or damaged parts, make sure all guards are in good condition and are securely in place. Never operate without all guards correctly installed.
2. Check the fuel system, examine fuel tank and make sure there are no loose hose or line connections and all caps are on tight. Check tank for damage that could cause leaks.
3. Check the exhaust system for cracks, breaks, loose or missing clamps or caps.
4. Check the engine air intake system. Inspect the air cleaner and hoses for leaks, making sure all joints are tight. Leaks in the air ducting between the engine and cleaner can a ruin engine.
5. Check all electrical wiring for insulation cracks, breaks, or other signs of damage. Check for loose connections and signs of scorching which could indicate overheating or short circuits.
6. Check the alternator. Make sure it is securely fastened and check for the correct belt tension.
7. Check hydraulic oil reservoir for damage making sure there are no leaks and the reservoir is full to the correct level (refer to LUBRICATION SECTION).
8. Inspect the hydraulic pump for signs of leaks.
9. Check radiator and hoses for leaks. Check that radiator is filled to the correct level.
10. Check transmission and torque converter for correct oil level and any signs of leakage (refer to lubrication section).
11. Check the right angle drive and final drive for correct oil level and any signs of leakage (refer to lubrication section).
12. Check the mast gland for correct oil seepage at both the upper and lower packings (refer to Service Manual for details on adjustments).
13. Check controls for proper movement, that they return to neutral.
14. Make sure the complete digger is greased at the required locations (refer to LUBRICATION SECTION).

START-UP PROCEDURES

1. Complete the Pre-start checklist BEFORE starting machine. If temperature is below 32 degrees F (0 degrees C), it may be necessary to use cold starting aids (refer to "COLD START PROCEDURE").
2. Be sure all controls are in the OFF or NEUTRAL position and parking brake is set on truck mounted machines. Be sure EMERGENCY STOP button is pulled out.
3. Turn Ignition Switch to START position. Keep foot off throttle.

   NOTE: Do not engage starting motor for more than 30 seconds. Wait two minutes before attempting to start again.
4. Pan through all control display screens for normal operation. If operation is not normal, stop engine and remedy the cause.
5. Allow engine to operate at or below 1200 RPM for two minutes at no load to assure proper lubrication. Extend this to four minutes when temperature is below freezing.



1.	Ignition Switch	8.	Right Rear Outrigger
2.	Emergency Stop	9.	Left Front Outrigger
3.	Accessory (Lights)	10.	Right Front Outrigger
4.	Tool Circuit	11.	Controls Display/Diagnostics
5.	Platform Rotate	12.	Power Outlet, 12V
6.	Outrigger Unit Selector	13.	Diagnostic Port
7.	Left Rear Outrigger		

ENGINE SHUTDOWN PROCEDURES

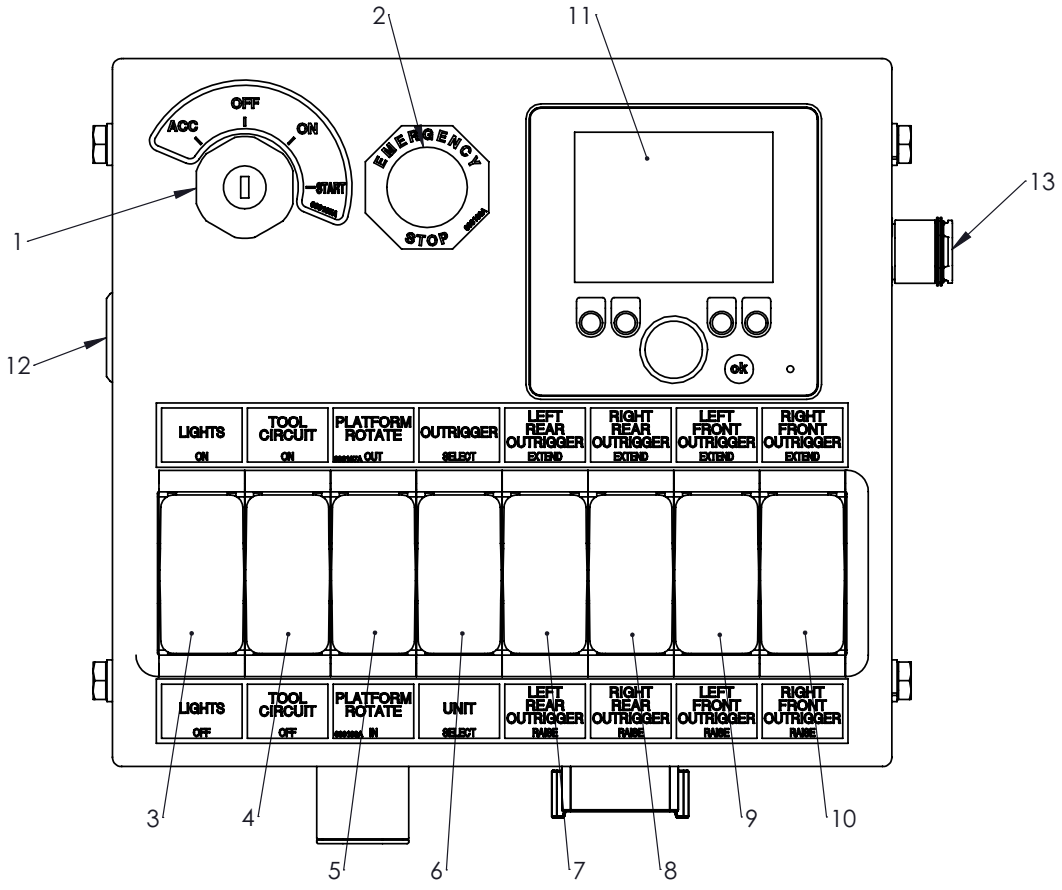
EMERGENCY SHUTDOWN

1. Press the RED EMERGENCY STOP button to stop engine.
2. Pull EMERGENCY STOP button to reset.
3. If the reason for emergency shutdown was due to mechanical failure, make sure all repairs have been properly made before restarting machine.

NORMAL SHUTDOWN

See storing for travel if machine will be moved.

1. Lower the mast into the transport position.
2. Retract the in/out frame travel.
3. Raise the outriggers (if equipped).
4. Rotate control platform to transport position than lock platform with locking pin. (See Operators Seat Pedestal section)
5. Let the engine run at idle for at least two minutes and then shut off the engine.



1.	Ignition Switch	8.	Right Rear Outrigger
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3.	Accessory (Lights)	10.	Right Front Outrigger
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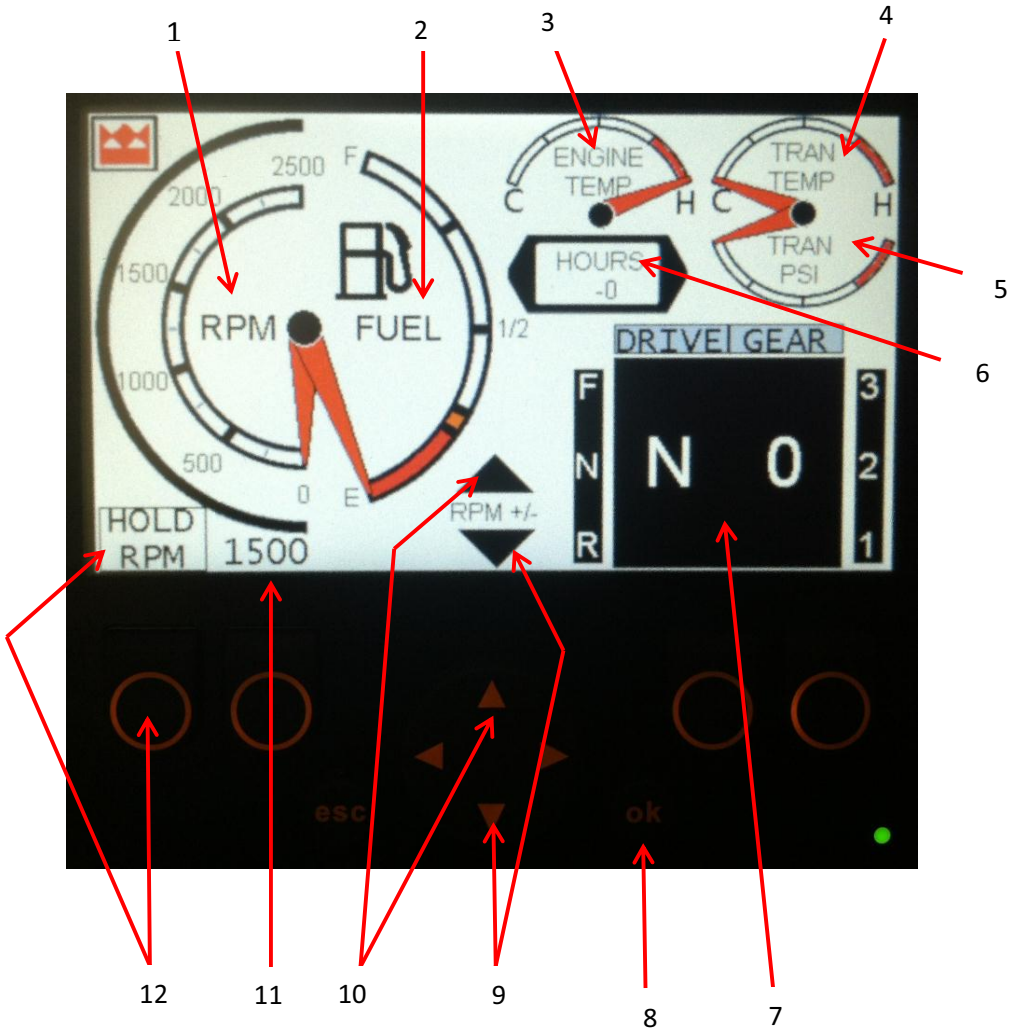
5.	Platform Rotate	12.	Power Outlet, 12V
6.	Outrigger Unit Selector	13.	Diagnostic Port
7.	Left Rear Outrigger		

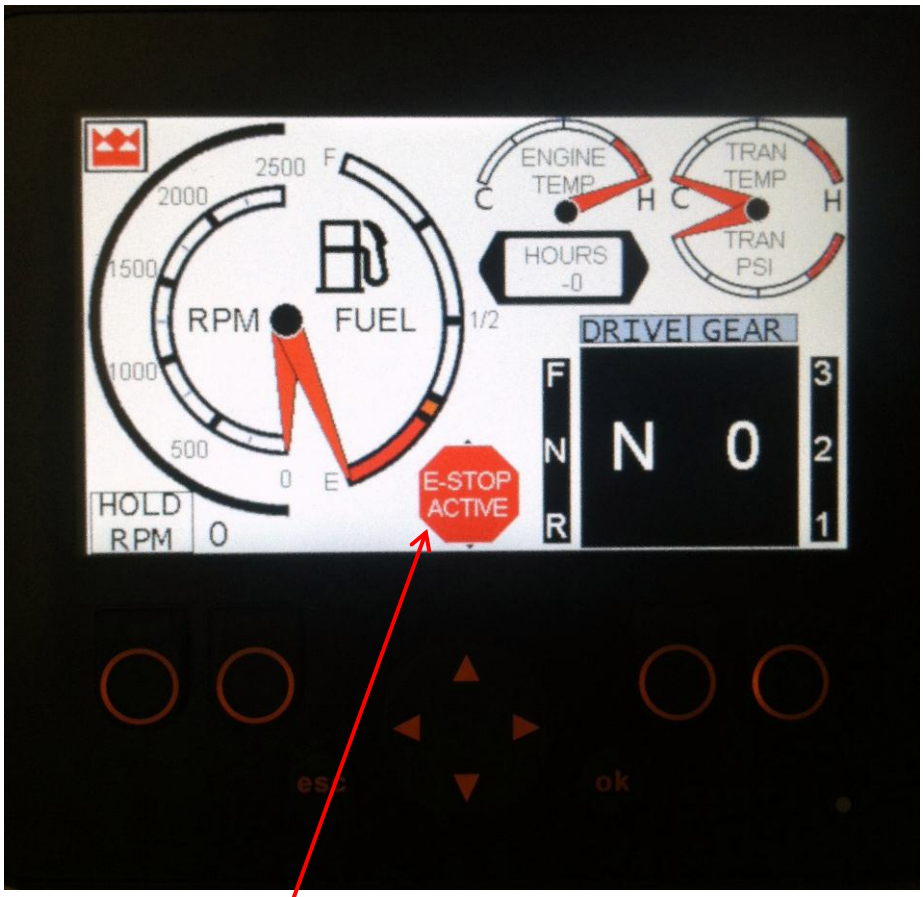
CONTROL SCREEN NAVIGATION

HOME PAGE



1. Engine Tachometer
2. Fuel Gauge (Diesel)
3. Engine Temperature (°F)
4. Transmission Temperature (°F)
5. Transmission Pressure (PSI)
6. Engineer Hour Meter
7. Transmission Range
8. ‘OK’ Button - Press to scroll to next information page
9. When in cruise control press arrow down to manually decrease ENG RPM
10. When in cruise control press arrow up to manually increase ENG RPM
11. Digital readout of ENG RPM
12. Press button to engage cruise control. Press button again or tap foot throttle to disengage cruise control

HOME PAGE CONTINUED



1

1. Engine E-Stop Notification - on when E-Stop button is pushed in on control panel

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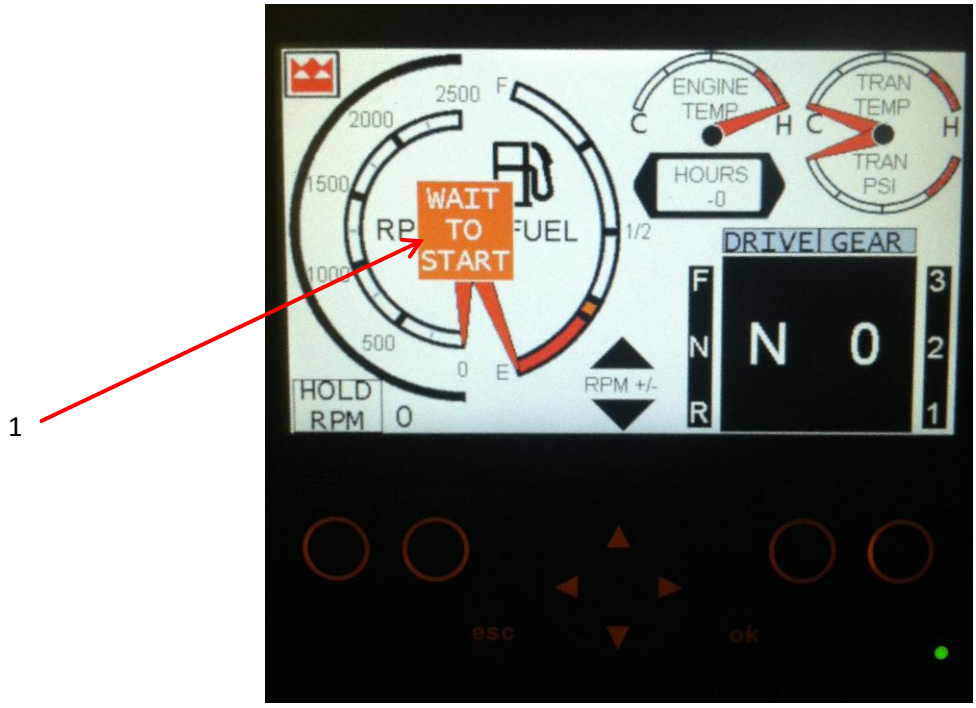

1. Engine Glow Plug Indicator - on while glow plugs are warming

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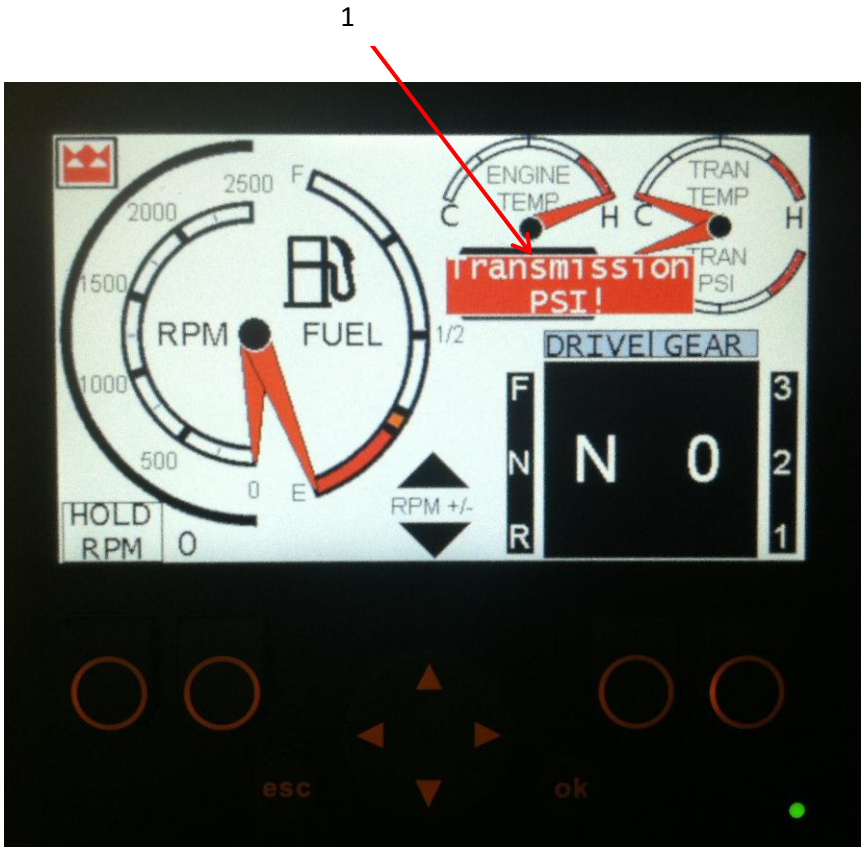

1. Transmission Over Pressurized Warning Lamp

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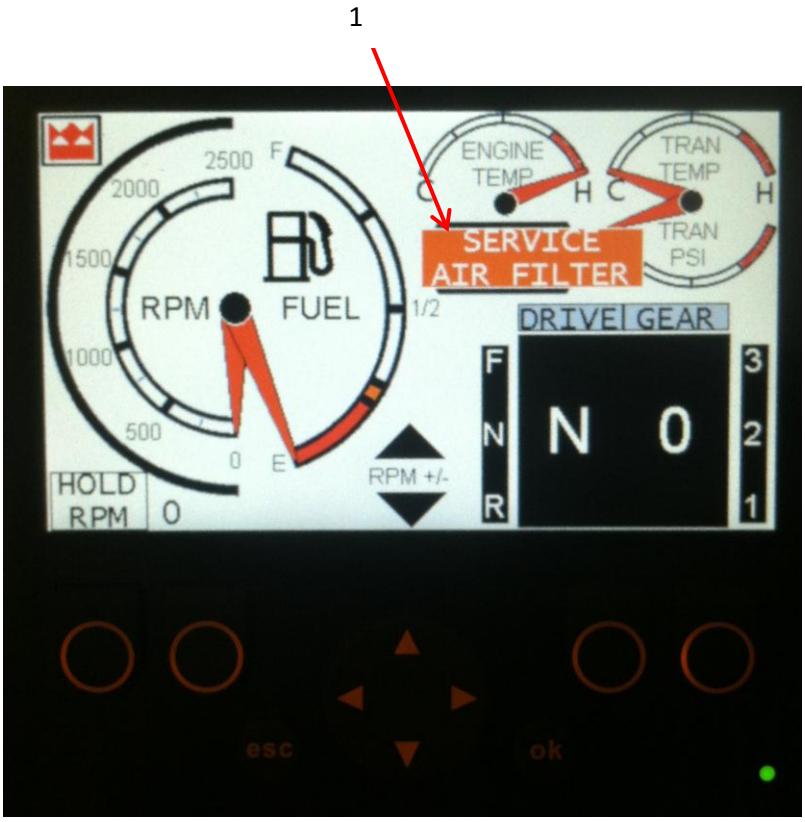

1. Engine Air Filter Restriction Indicator - On when ENG detects restricted airflow

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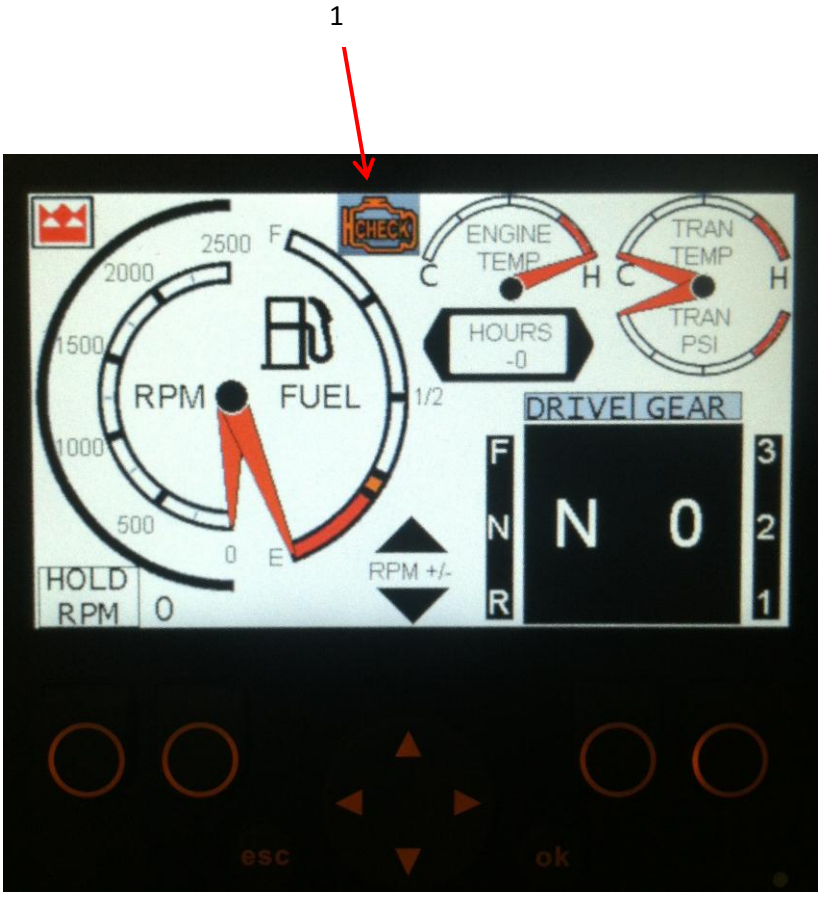
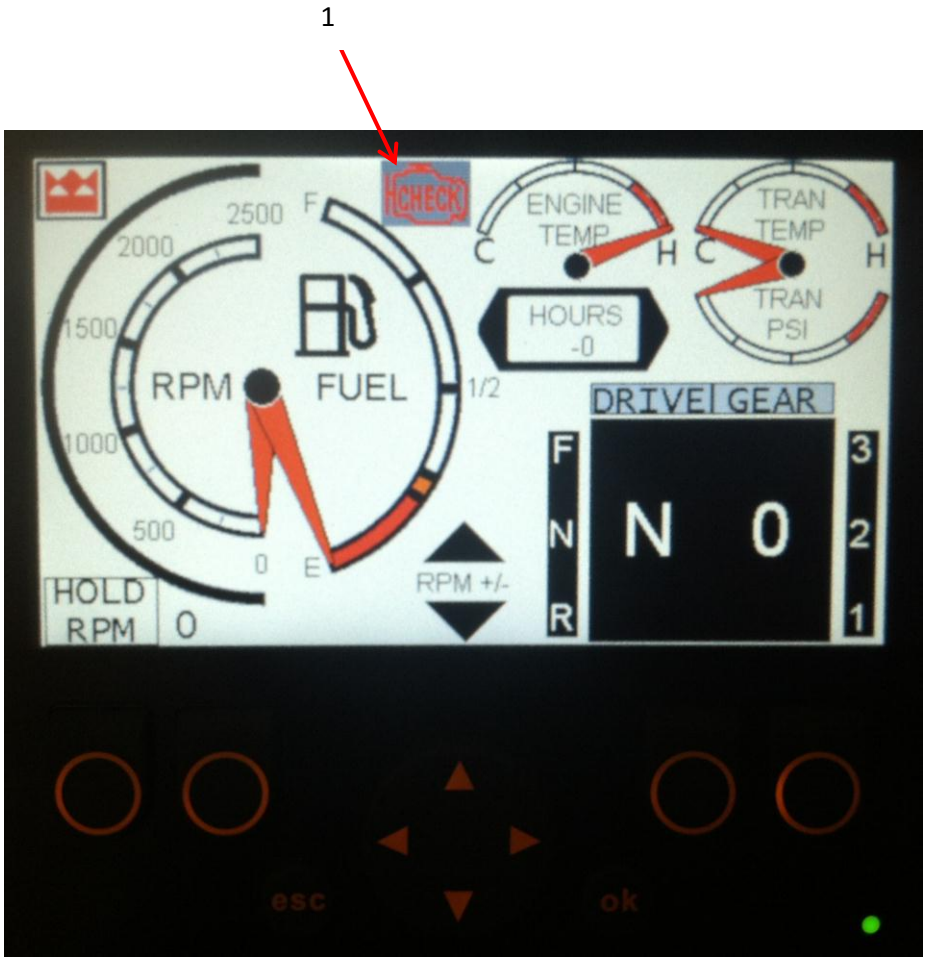


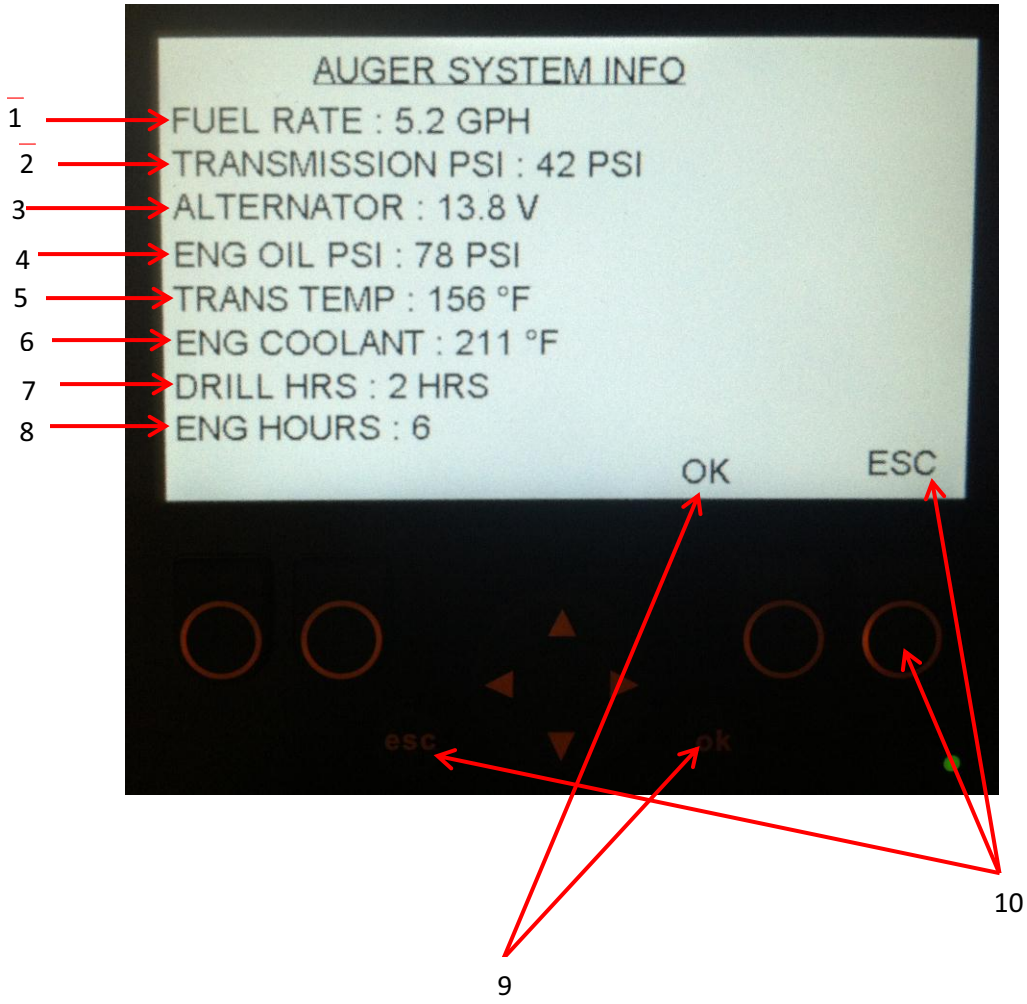
1. Engine Caution Indicator - See ‘Active Engine Diagnostic Trouble Code Screen For Fault Code Information’

HOME PAGE CONTINUED



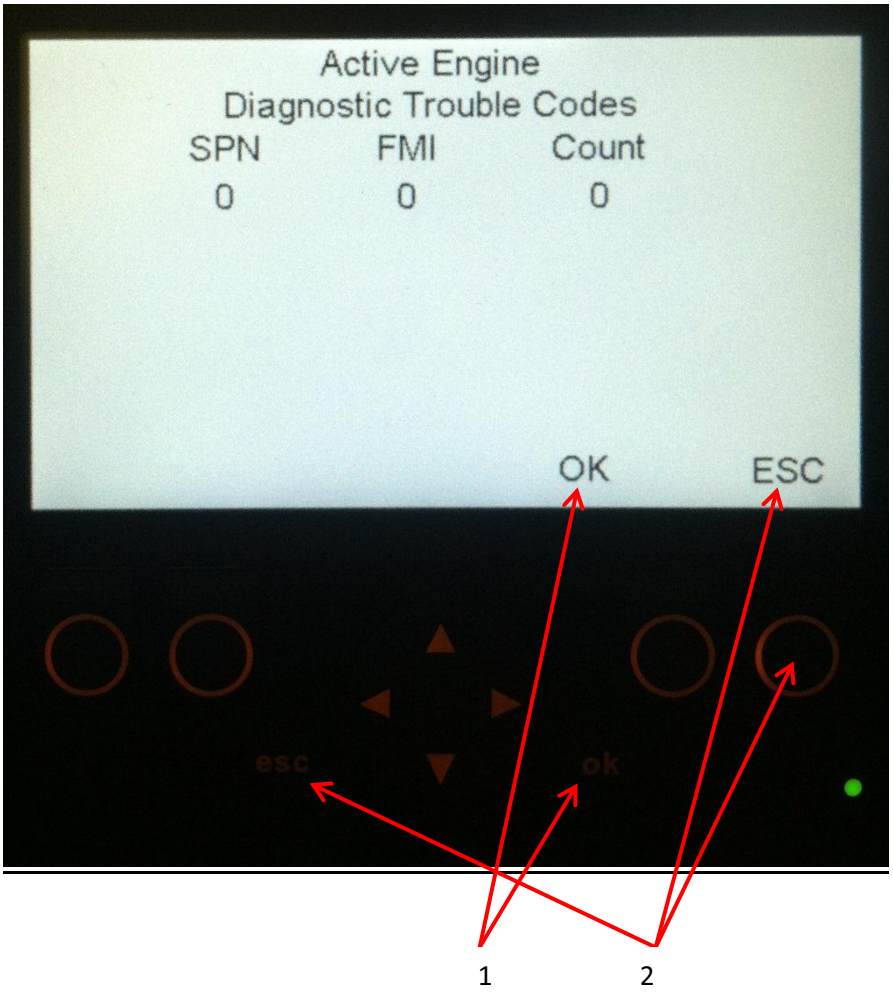
1. Engine Warning Indicator - See ‘Active Engine Diagnostic Trouble Code Screen For Fault Code Information’

AUGER SYSTEM INFORMATION PAGE



1. Fuel Rate Monitor - Indicates engines fuel consumption rate in gallons per hour
2. Transmission PSI - Pressure reading of auger transmission
3. Alternator - Voltage output reading from engine alternator
4. ENG Oil PSI - Engine Oil Pressure in pounds per square inch
5. Trans Temp - Temperature of auger transmission in F°
6. Engine Coolant - Engine Coolant Temp in F°
7. Drill Hours - Display of hours counted only while transmission is in ‘F’ gear
8. ENG Hours - Current hours on engine
9. OK - Press ‘OK’ to scroll to next page
10. ESC - Press ESC button or button directly below ESC graphic to return to the Home Menu

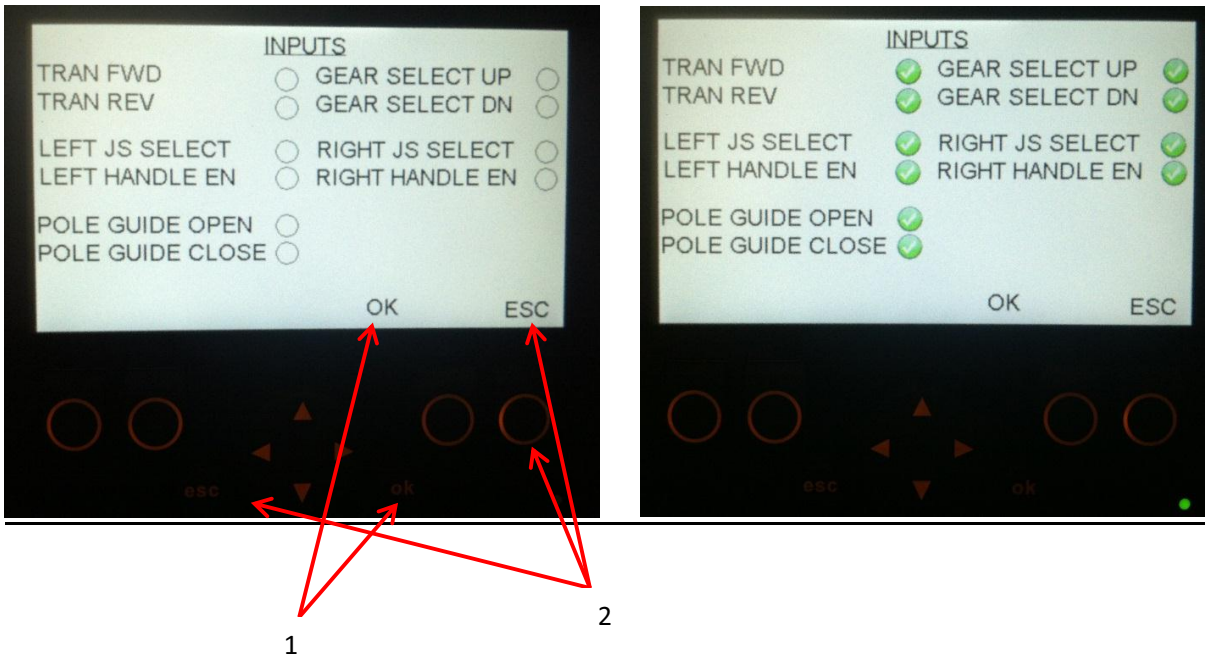
ACTIVE ENGINE DIAGNOSTIC TROUBLE CODES



1. OK - Press ‘OK’ to scroll to next page
2. ESC - Press ESC button or button directly below ESC graphic to return to the Home Menu

NOTE: This page displays any fault codes directly sent from the engine can data. If there is an engine malfunction this page can be helpful to the engine technician in diagnosing any faulty engine condition. A qualified technician should be able to use the ‘SPN’ and ‘FMI’ values to troubleshoot engine. The count value indicates how many times the engine has detected a fault.

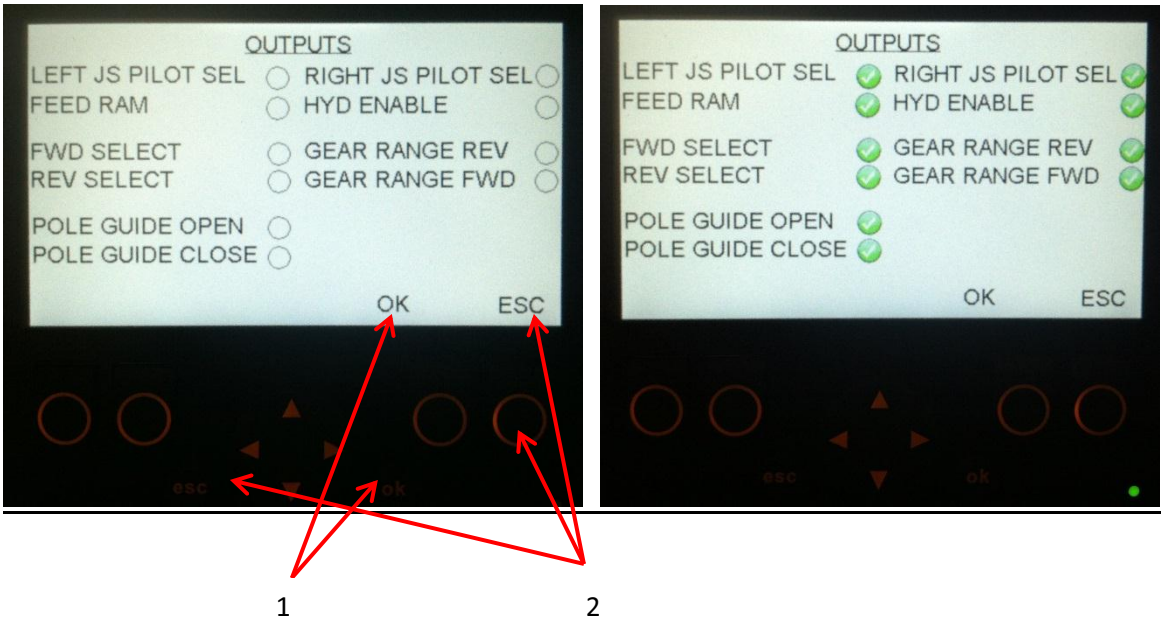
DIGITAL INPUTS DISPLAY PAGE



1. OK - Press ‘OK’ to scroll to next page
2. ESC - Press ESC button or button directly below ESC graphic to return to the home menu

NOTE: The digital input display page is a useful diagnostic page used to identify any faulty switches or other inputs into the control system. When the controllers sees the input turn ‘ON’, a green check mark will appear indicating that the switch is operating properly. If a green check mark does not display after turning ‘ON’ a switch this would indicate a switch failure or a wiring failure. For troubleshooting assistance reference schematic (Terex P/N: 609902).

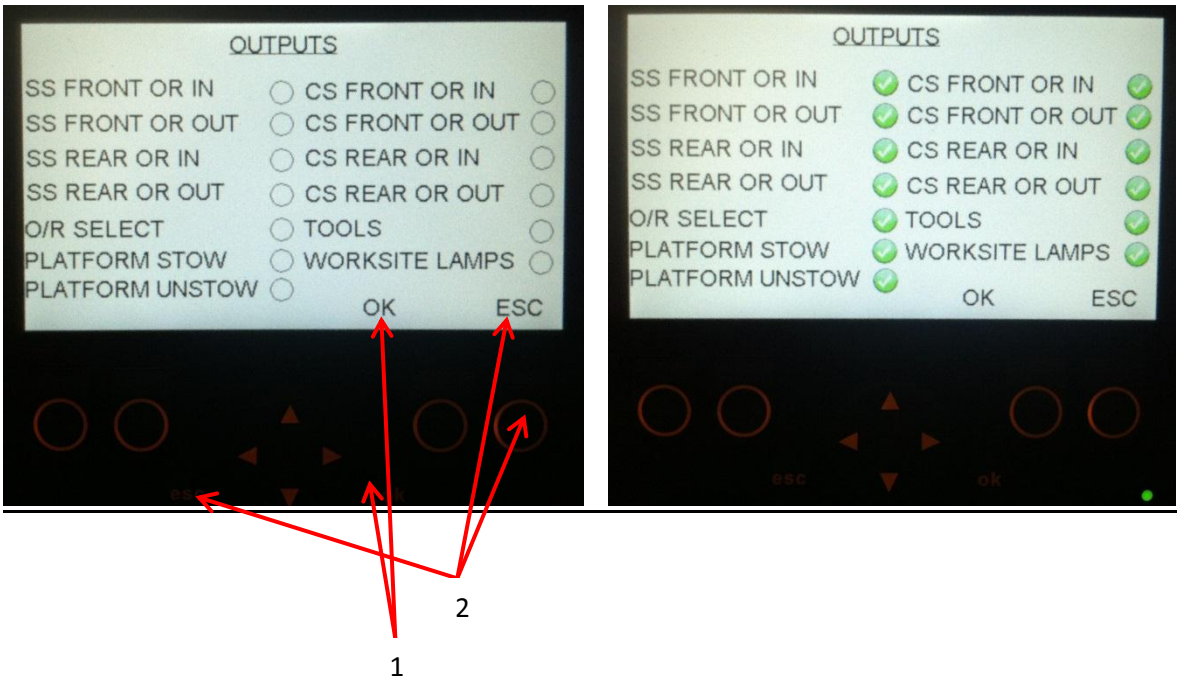
DIGITAL OUTPUTS DISPLAY PAGE



1. OK - Press ‘OK’ to scroll to next page
2. ESC - Press ESC button or button directly below ESC graphic to return to the Home Menu

NOTE: The digital output display page is a useful diagnostic page used to identify any faulty outputs out of the auger control system. When the auger control system turns an output ‘ON’, a green check mark will appear indicating that the output is operating properly. If a green check mark does not display after turning ‘ON’ a function this would indicate an output failure or a wiring failure. If a failure does occur verify on the digital inputs page that the controllers is seeing the input turn on. For troubleshooting assistance reference schematic (Terex P/N: 609902). If the outputs do turn on and the associated function does not operate this would indicate a mechanical or hydraulic failure of the associated component.

DIGITAL OUTPUTS DISPLAY PAGE 2



1. OK - Press 'OK' to scroll to next page
2. ESC - Press ESC button or button directly below ESC graphic to return to the Home Menu

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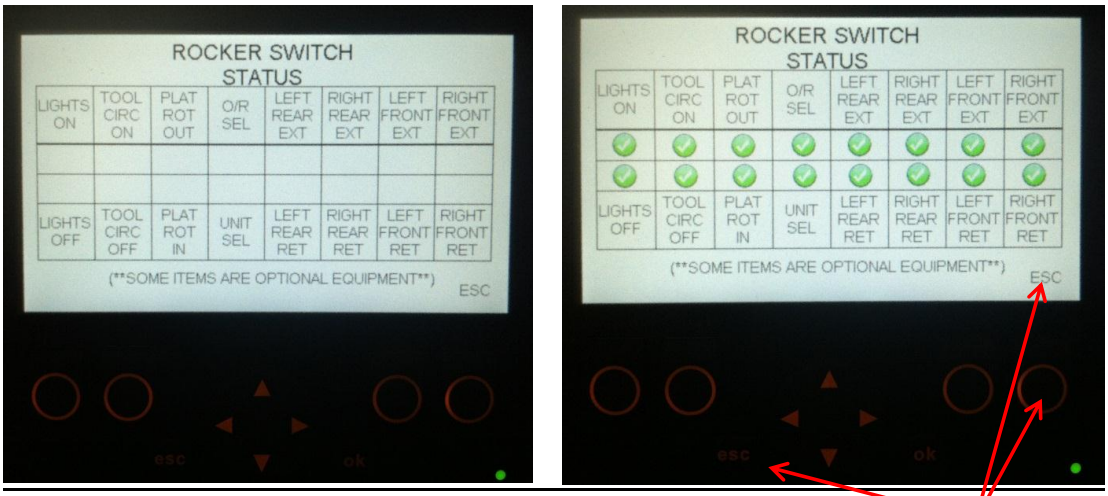
ROCKER SWITCH STATUS DISPLAY



ROCKER PANEL SWITCHES

1. ESC - Press ESC Button or button directly below ESC graphic to return to the Home Menu

   NOTE: By pressing Rocker Switch a green check mark will display indicating that the rocker switch is functioning.

   NOTE: Not all machines will have options listed.

JOB SITE SURVEY

Before locating the vehicle in position to work, make a complete survey of the job site. During the survey, some of the items to look for include the following:

1. Ambient conditions including temperature.
2. Consider the slope of the ground:
3. Determine if the ground is firm enough to support the Auger Drill. If the ground is not firm enough, use pads under the outriggers and crib as needed to distribute the load.
4. If the vehicle must be parked on a slope, chock the wheels, and work off the up hill side of the vehicle.
5. Look for ditches, drop-offs, holes, and debris.
6. Overhead utility and power lines.
7. If grass or shrubs will be underneath when the vehicle is setup, cover grass or shrubs with dirt to prevent a fire.
8. Mark all underground Utilities, such as sewer and water lines, electrical lines, gas lines, and other lines. Before any digging is to be done. Call your local "**Call Before You Dig**" hotline or the National hotline 811, if available in your area, to have all underground utilities marked before digging.
9. Determine the vehicle position needed to accomplish the work safely. If it is not safe to proceed use another method or setup.

OPERATING TEMPERATURE RANGE

The ambient operating temperature range of the unit is given on the ID plate. Operation at the extremes of the temperature range requires extra precautions.

See COLD START PROCEDURE for temperature range and starting aids required for engine.

Cold weather operation of the hydraulic system below 10 degrees F requires:

- The hydraulic system must be filled with hydraulic fluid having a pour point suitable for the temperature.
- The hydraulic system must be properly warmed up:

  •Operate the pump at idling speed to allow the oil to warm up gradually. Cold, thick, sluggish oil may not move fast enough and will starve the pump, thus causing severe damage.

  •Circulate the oil through the outrigger system by cycling each outrigger several times before setting up for operation.

  •Circulate the oil through the system by cycling each function slowly before operation.

  •The addition of oil heaters may be required.
- Operate the functions slowly to prevent jerking and shock loads.
- Functions may operate sluggish and not be as responsive, so allow more time and distance when starting and stopping movements.

Hot weather operation above 100 degrees F (38 degrees C) may require intermittent operation to allow the oil to cool or the addition of oil coolers. Do not exceed an oil temperature of 150 degrees F (66 degrees C).

JOB SITE SETUP

Use the following procedure after the vehicle is in position at the work site:

1. Turn on the warning lights, and barricade, if working on a road, divert traffic if required.
2. Place vehicle transmission in neutral, set the brakes, and chock the wheels.
3. Set the signs, warning lights, and barricades in accordance with OSHA, ANSI, state, and company rules and regulations.
4. When work is to be performed near power lines, ground and/or barricade vehicle, using an approved grounding cable clamped to a static line or neutral, or use drive or screw type ground rod to ground truck, according to your company policy. Maintain minimum approach distance to lines.
5. Follow starting procedure.
6. Before operation in cold weather (below 10 degrees Fahrenheit/-12 degrees Celsius), run the hydraulic system at low engine speed to allow the oil to warm up so it flows properly, to avoid starving the pump and causing damage. Cycle each function; outriggers, mast, auger, digger, pole guide and winch several times with no load before use to circulate warmed oil.

SETTING THE OUTRIGGERS

Before lifting the mast, all outriggers must be lowered firmly to the ground on a surface that can support the load, and kept there until all work is complete and the Auger Drill is stowed for travel. The stability of the Auger Drill depends on:

- The gross weight of the vehicle.
- Boom position.
- Load being lifted.
- The slope of the ground in the work area.
- If the ground is firm enough to support the load imposed.
- The condition of the truck tires, axles, outriggers and outrigger pads or cribbing if used.

All contribute to proper stability, because these conditions are widely variable the operator must exercise good judgment and caution when setting the outriggers before using the Auger Drill. If the vehicle is not level the capacity of the unit may be reduced.

When lowering the outriggers, use the following procedures:

- Units with one set of outriggers behind the rear axles on rear axle mounts, extend the outriggers until the weight of the vehicle is off the springs. Rear tires must remain on the ground.

SETTING UP ON A SOFT SURFACE

The operator must determine how firm the ground is and if the unit can be safely set up and used. If the ground is too soft to support the outrigger load, the outriggers must be placed on large outrigger pads. Make certain the outrigger pad is centered on the pad.

SETTING UP FOR OPERATION ON SNOW AND ICE

Operation on snow and ice adds an additional problem due to the slippery conditions. Normal traction is greatly reduced. Just as you need to maintain traction to walk and drive, it is required to keep Auger Drill in a stable position. Rotating and moving the booms may cause the truck to jerk and move. If the unit is not set up securely the truck can slide on ice and snow while operating. When planning your work remember that driving in snow causes snow dust to be deposited on all surfaces. The outriggers and outrigger pads will get snow covered and slippery. Also, as you put pressure on snow, the snow packs down and turns to ice. The person setting the unit up for operation has the entire responsibility for a stable position. The person on the site is the only one who can evaluate the conditions and terrain.

Proper set up requires:

- Outriggers do not slide on the outrigger pads during use.
- Outrigger pads do not slide on the ground during use.
- Set the parking brakes.
- Chock wheels as required, to prevent movement down hill. Evaluate chock location to prevent the truck pivoting around one chock.
- Set units with one set of outriggers so all tires are on the ground.
- Evaluate the terrain to determine the most flat and level set up position.
- Set up truck so if the truck does move slightly, the result isn't catastrophic.
- Follow Operators manual for set up instructions. Do not place outriggers on Ice as slippage may occur regardless of solid footing.

To properly set up you may need to:

- Remove snow and ice down to bare ground to prevent sliding and to evaluate the support available. Don't set outriggers on a manhole cover or the edge of a slope or drop off.
- If setting up on or partially on a road, move as far as required into the street or road so if the truck does move, the tires and outriggers will not slide into the ditch or other hazards.
- Choose a location for the truck that gives the best stability for the work to be done.
- Come back later, to do the work, if the roads are not cleared sufficiently.
- Use traction aids under the tires and outriggers such as sand and gravel or mats.
- Operate the unit smoothly by "feathering" the controls, not jerking the levers.

OPERATING PROCEDURES

SETTING UP FOR DRILLING

1. Park the vehicle, place in neutral and set the parking brakes.
2. Check wheels.
3. Start engine and allow time for it to warm up to operating temperature. In extremely cold temperatures, machine should be allowed additional time to warm up (refer to COLD START PROCEDURE at the beginning of this section or consult engine manual).

   During all operations except actual drilling, the engine should be run at as low a speed as possible. Raising the mast, side leveling, extending outriggers, frame travel, turntable, and the small accessories should all be operated as close to engine idle as possible without "killing" the engine. Only the auger should have the full power of the engine available.
4. On truck mounted machines:

   NOTE: Do not raise the machine, only lower outriggers to the ground at this point.

   a. Lower the LEFT REAR OUTRIGGER.

   b. Lower the LEFT FRONT OUTRIGGER (if equipped).

   c. Lower the RIGHT REAR OUTRIGGER.

   d. Lower the RIGHT FRONT OUTRIGGER (if equipped).
5. After all outriggers are lowered to the ground, you are ready to level the unit by pulling and pushing the appropriate outrigger levers. Do not raise the truck tires off the ground. Apply just enough pressure to take the weight off the truck springs.

LOOK UP before raising the mast.

Do not allow mast to come near electrical power lines. See Minimum Clearance Chart for Energized High Voltage Lines.

CLEARANCES FROM HIGH VOLTAGE LINES	
VOLTAGE	**MINIMUM CLEARANCE**
0 to 50 kv	10 ft. (3 m)
50 to 200 kv	15 ft. (4.6 m)
200 to 350 kv	20 ft. (6.1 m)
350 to 500 kv	25 ft. (7.6 m)
500 to 750 kv	35 ft. (10.7 m)
750 to 1000 kv	45 ft. (13.7 m)

MINIMUM SAFE DISTANCES FROM HIGH VOLTAGE LINES

6. Raise the mast to vertical position by pulling on the ELEVATING CONTROL LEVER.
   - Check leveling indicator on the right angle drive for side to side leveling. If leveling is needed, use the LEVELING CYLINDER JOYSTICK FUNCTION to level the mast from side to side.
   - Check leveling indicator on the mast for front to back leveling. If leveling is needed, use the ELEVATING CYLINDER JOYSTICK FUNCTION to level the mast from front to back.
7. Use your FRAME TRAVEL JOYSTICK FUNCTION to move the frame in or out and the TURNTABLE JOYSTICK FUNCTION to line up with the drill stake. After you line the auger point up with the drill stake and before you start to drill, check to make sure the unit is level in order to maintain a plumb hole. Make any adjustments required before starting to drill.

WHILE DRILLING (MACHINES WITH TORQUE CONVERTER TRANSMISSIONS)

Be sure and check for buried electrical or gas lines BEFORE you begin drilling. Contact local “Call before you dig” or 811, if available in your area.

Do not begin drilling operations until you are satisfied that you understand all the controls and their functions.

Be sure all personnel are clear of the machine and work area before starting engine or operating machine.

Be sure no tools or other loose objects are left on the engine or drive mechanisms. They could be thrown by this equipment with powerful force.

Keep operator's platform free of tools, oil, grease, mud, snow, or ice.

AUGER SPEED

The selection of the proper gear is very important to the drilling operation and life of the digger. The gears should be selected with regard to the size of the auger and digging conditions. Larger diameter augers and hard digging conditions require slower operating speeds. Therefore, start digging with the highest gear usable without stalling the torque converter or "lugging" the engine.

Do not use low gear or reverse with the engine at full power (speed). If higher auger speed is required, use a higher gear and control the speed with the engine foot throttle.

BEGIN DRILLING

1. Lower the kelly bar by pushing the AUGER BAR joystick until the auger touches the ground.
2. Shift gear to the appropriate gear.
3. Shift kelly bar rotation in FORWARD and increase engine speed with the foot pedal. "Bump" the AUGER CROWD joystick to crowd the auger into the ground while rotating. Use only enough engine speed to dig the hole. After several "bumps" of the AUGER CROWD joystick, the auger should be loaded with dirt. An auger is considered "loaded" when dirt is to the top flighting.
4. Decrease the engine speed and raise the auger out of the hole by pulling the AUGER BAR joystick. Keep the engine speed just high enough to provide the necessary power. When the auger clears the ground, stop raising the auger and increase engine speed until the dirt is thrown off the auger.
5. Decrease engine speed and lower the auger back into the hole and repeat the process until the hole is to the required depth.

DRILLING (MACHINES WITH TORQUE CONVERTER TRANSMISSIONS)

1. Try to anticipate the bottom of the hole when lowering, and the end of the mast stroke when hoisting so you do not shock load the machine. Also, do not hold the auger crowd control in the lowering position after the auger hits bottom. This will raise the truck and may shift the digger off the hole.
2. When digging extra depth, dig the first three to five feet slowly and easily; then continue at normal speed. This helps stabilize the auger and bar thus eliminating bar slap inside the barrel. Also dig more easily when approaching maximum depth so that "snags" in the hole will not run the risk of a bent kelly bar.
3. In the event the auger gets overloaded and cannot be lifted with the auger crowd control, bring engine speed to idle, shift the transmission into reverse and increase engine speed while hoisting with the crowd control. This will back the auger out of the hole. When the auger is clear, select the forward auger rotation and continue digging.
4. For efficient digging, the bit point and cutting teeth should be kept sharp at all times. If hard digging is encountered, such as sandstone, limestone, frozen ground, etc. the auger speed should be reduced and down pressure put on the auger to allow the auger to cut its way. Excessive speeds cause undue wear on auger teeth and may damage the drive train if the auger should become stuck.

   NOTE: The Shear Pin Assembly is an option installed in the drive line to take the shock and reduce wear or breakage to the right angle and final drive gears when the auger gets stuck or hung up.
5. When the auger gets stuck while drilling so that the transmission is "stalled out" (i.e.: full torque is applied at zero speed) DO NOT DISENGAGE THE CLUTCH OR SHIFT THE TRANSMISSION TO NEUTRAL WITH THE ENGINE AT FULL SPEED. THIS IS IMPORTANT! If not heeded, broken final drive gears can result. When a stall condition is encountered, reduce the engine speed until the torque is relieved and then reduce the down load on the auger until it starts to turn again. Increase engine speed again and continue digging. If the engine continues to "stall" with little down force, then a lower transmission gear should be selected. With the engine at low idle, select the lower gear, increase engine speed and continue digging again.

HANDLING AND SETTING POLES

Once the pole hole is dug to the required depth, it is ready to accept the pole. Make sure soil is packed tight at bottom of hole, using a tamper (see Recommended Tamp section).

Before hooking the pole, two things must be determined:

- Weight of the pole.
- Length of the pole.
- Sheave height
- This will vary with the drill depth and pole setter package the Terex Texoma 330 is equipped with.
- With the mast vertical after you have drilled to the depth you are going to set the pole.
- Extend the polesetter extension, when you are ready to set a pole, then let off of the winch cable as you are extending the polesetter extension and take cable in when you retract.
- Before picking up the pole make sure the mast is over center to the rear 5-8 degree to ensure the sheave to pole is a straight pick.
- Open the pole claws and when you have hoisted the pole up to where they meet pole claws, close the polesetter claws around the pole, do not clamp tightly around the pole this is a guide only, the weight of the pole is to always be hoisted with the winch only.

When setting a pole with the Terex Texoma 330, never place the pole to where you will raise the pole over the operator's platform. Always place the butt of the pole to the operator's side and the long end of the pole to the curb side of the feed ram.

NEVER pick the long end of the pole over the operators platform.

Place a sling or butt chain (not the winch line) on the pole above the balance point. The longer the pole, the closer the sling or butt chain must be to the balance point. If the pole is properly hooked before raising the pole, there should be little need to align the gains or cross arms once the pole is positioned.

Serious injury or death will result if vehicle and load become electrically charged from boom contact with energized conductors and the operator is standing on or is in contact with the ground. Operate controls from operators platform while on vehicle only.

Before raising the pole, verify the mast is at the proper angle and properly hooked to support the weight of the pole; also make sure the winch line is perpendicular and vertical with the pole. This limits the amount the pole can move when it is being raised off the ground. Raise the pole slowly.

When the pole is controlled, it can be positioned directly over the hole. Make sure all ground personnel are aware of any pole contact with energized lines and the requirements before contacting pole.

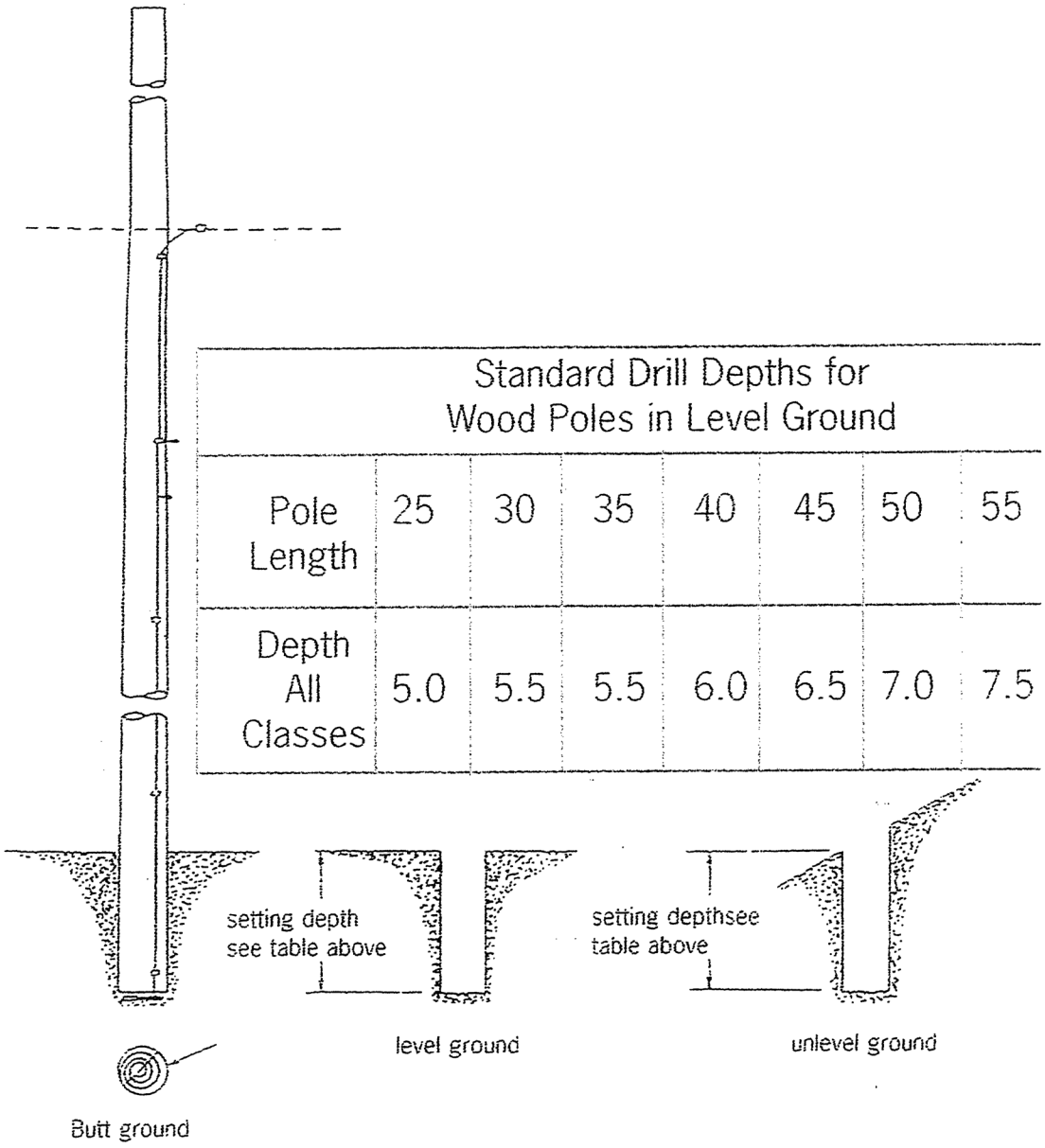
If pole or mast are near energized lines the ground personnel must not contract the vehicle or pole. Only handle the pole with proper personnel protective equipment and insulating tools.

If the pole needs to be rotated to align gains or cross arms, slack off slightly on the winch line so the pole can be turned. The ground person must use PPE and insulated tools if near energized lines.

Have a crew member give directions for plumbing the pole. When the pole is properly plumbed, hold it in position with boom while replacing and tamping the soil around the pole.

After the pole is tamped, release the winch line and remove sling from pole.

5,000 LB MAX WINCH CAPACITY DECAL



Standard Drill Depths for Wood Poles in Level Ground

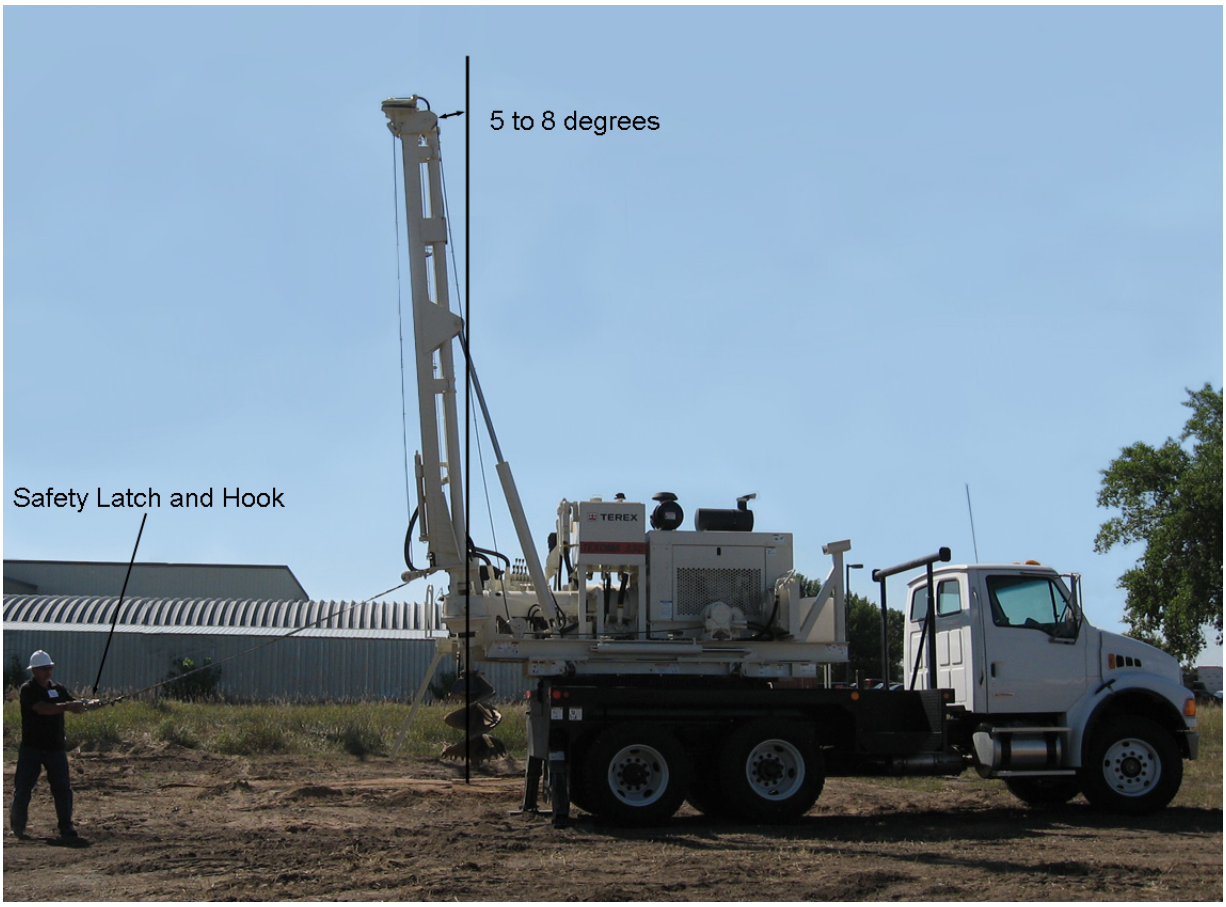
Pole Length	25	30	35	40	45	50	55
Depth All Classes	5.0	5.5	5.5	6.0	6.5	7.0	7.5

NOTE: These are typical depths, soil conditions will determine actual depth needed.

Before handling or setting poles:

> Never transport poles on the Terex Texoma Auger Drill.

- The operator should ensure the pre-operation procedures have been checked.
- The vehicle is properly positioned.
- The outriggers are firmly in place.

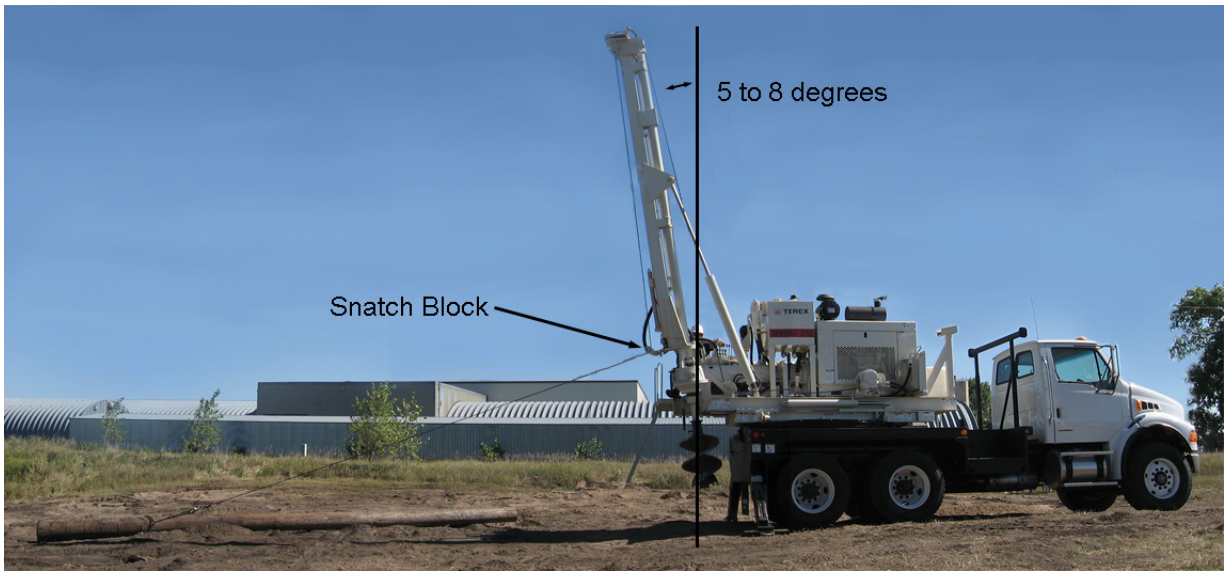


Before picking up the pole:

- Check the safety latch of the hook.
- Check the wire rope for bad spots and that it is wound straight on the winch drum.
- Make sure the mast of the drill is over center to the rear 5-8 degrees.
- Position pole so it is located initially lifted on opposite side of mast.

Handling poles:

- Use snatch block on lower mast to move poles up to the unit. Do not pull poles from top of mast sheave.



- Place a sling or butt chain (not the winch line) on the pole above the balance point. Raise the pole slowly.

Setting a pole:

- Never place the pole to where you will raise the pole over the operator’s platform.
- Always place the butt of the pole to the operator’s side and the long end of the pole to the curb side of the mast.

NEVER lift the pole over the operator’s platform.

Positioning the pole into the hole:

- Open the pole claw arms to allow the pole to enter.
- Raise the pole with the winch line into vertical position until you can clamp around the pole with the pole claws.
- Close the pole claws arms around the pole.

Do not clamp the pole claws tightly around the pole. The pole claw is a guide only. The pole is to be lifted and held by the winch.

HYDRAULIC POLE CLAW (OPTIONAL)

Open the pole claw arms to allow the pole, retained by the winch line. To come into the claw area and close claws around pole. Do not clamp pole only contain it to control the top. The winch line does all the lifting. Then close the arms around the pole so it is contained and controlled but not clamped tight. With this completed, the pole can be set into the hole.

OPEN POSITION

CLOSED POSITION

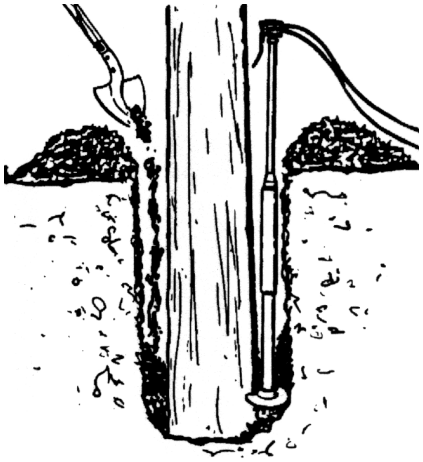
Use pole claw arms as guides only. They should not be clamped tightly to the pole or used to lift the pole. Use the winch line to lift the pole.

RECOMMENDED USE OF HYDRAULIC TAMP

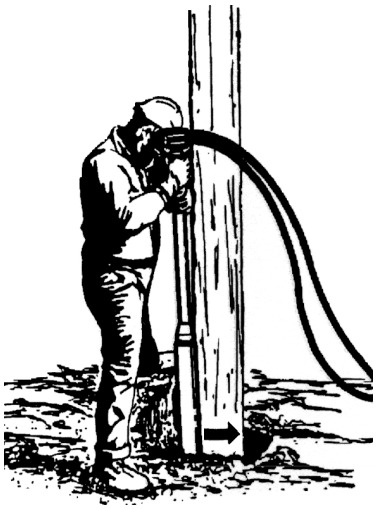
After the pole is inserted and plumbed, recommend one crew member shovels dirt in around the pole and another begins tamping from the bottom of the hole. For even compaction, make sure the dirt is tamped as the hole is filled. This ensures having a uniformly tamped pole, leaving a minimum amount of excess material.

If the tamp is leaned in the direction of travel, it will tend to “walk” itself around the pole.

ELECTROCUTION HAZARD: When the boom is supporting the pole in or near energized lines, the tamp operator must wear suitable insulating gloves, sleeves, shoes, and hard hat. If the vehicle becomes electrically charged the tool and pole may be energized. Serious injury or death will result from contact with this equipment or vehicle should it become electrically charged.



GRADUALLY FILL THE HOLE WHILE TAMPING



WALKING THE TAMP AROUND THE HOLE

RECOMMENDED PROCEDURE FOR REMOVING POLES

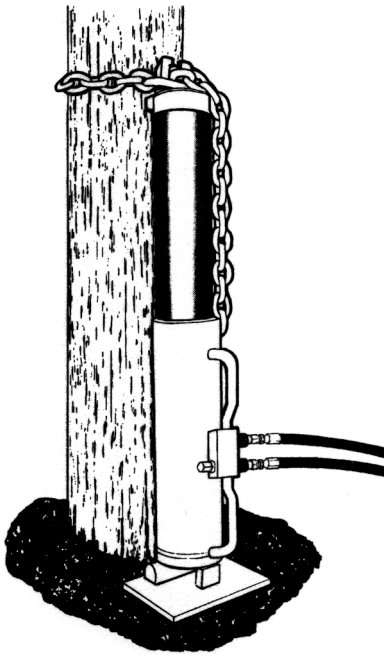
The Terex Texoma Auger Drill must never be used to pull poles or other objects imbedded in the ground. The load imposed is an undetermined force that can damage the equipment and endanger operators and ground personnel, causing serious injury or death.

The load imposed by poles embedded in the ground are on unknown weight. Never attempt to loosen or lift poles with the boom extension, rotation or winch, use a pole puller designed for the task.

Maintain control of poles and objects at all times. Sudden changes in loads can cause the object to break, or loosen the rigging, or fall.

HYDRAULIC POLE PULLER (OPTIONAL)

The hydraulic pole puller is a large hydraulic cylinder used for removing a pole or butts.

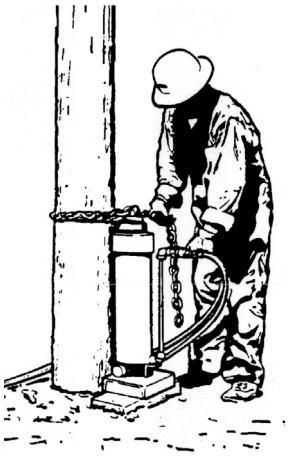


HYDRAULIC POLE PULLER

The pole puller is equipped with a heavy-duty steel base and a slotted head for attaching a chain loop.

SETTING UP AND USING THE POLE PULLER

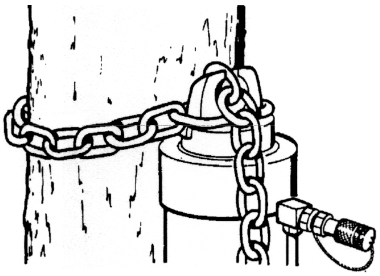
1. The steel base of the pole puller must be set on a firm level surface before operation. Shovel out a level surface if necessary. If the ground is soft, use a broad footpad or cribbing under the pole puller.



RECOMMENDED PLACEMENT OF POLE PULLER

Do not hook chain and pole puller together using the chain as a choker chain around the pole. Both ends of the chain must be attached to the pole puller ram.

2. Place the pole puller on the side of the pole away from the boom, so the force exerted does not result in a side pull on the Auger Drill.
3. Drop the eye of pulling chain on the slotted head of the pole puller ram, loop the chain snugly around the pole, and insert the chain end in the slot on the pole puller ram. Make sure the chain is not kinked or twisted.



RECOMMENDED ATTACHMENT OF POLE PULLER

PLACE THE CHAIN LOOP SQUARE AROUND POLE. THE EYE RING GOES OVER THE EARS OF THE POLE PULLER.

4. Attach auxiliary hose from vehicle to the correct coupler on the pole puller. Pull on each hose to make sure they are fully engaged with the coupler to prevent damage to the pole puller.
5. Wrap a sling around the pole above the center of gravity of the pole and attach the winch line hook to the sling and snug up the winch line. Activate the pole puller by slowly operating the control valve. To contain the pole but not clamp.

STAND CLEAR! (Pole puller is capable of developing 40,000 to 60,000 pounds of force./178,000 to 267,000 N)

6. After each pull is made, take up on the winch line and reposition the mast, if necessary, to maintain control of the pole.
7. Because the pole is tapered, it may be necessary to lengthen the chain around the pole to prevent difficulty in removing the chain.

8. If the pole butt is loosened or if it is necessary to retract the pole puller to take a new grip or snug up the winch line, be sure to hold the pole puller upright while retracting. This prevents the pole puller from toppling over and scratching or damaging the cylinder rod.
9. The Auger Drill should always be used to keep the pole vertical until it is completely removed from the hole and the pole puller is removed.
10. In extreme cases of pole removal, holes may be dug directly along side the pole to loosen the soil and assist the pole puller.
11. Do not use the Auger Drill boom or winch to loosen the pole.

WINCH

Electrocution Hazard exists when any winch line contacts energized source.

Serious injury or death can result if electrical contact is made with a contaminated synthetic rope or a wire rope.

This type of contact can electrically charge the rope, the load, and the vehicle.

The following instructions outline the proper method of hydraulic winch operation.

Winch line speed should be controlled by metering the control valve with the winch control lever. Move the winch control lever in the desired direction using a slow smooth movement of the control lever. Abrupt lowering or raising of loads will cause shock loads and sudden changes in truck balance. When lifting heavy loads, use slow winch line speeds.

Increased engine speeds may be used for paying out or taking up the unloaded winch line or extremely light loads.

Continuous operation of the winch under high speeds and/or heavy loads may cause overheating of the winch gearbox or brake.

The winch is equipped with a brake on “WINCH DOWN”. When lowering loads and stopping the winch line movement, if a continued creeping down of the winch line is observed the brake may need repair or adjustment.

Adjust the winch line as the mast is raised or lowered so the line does not pull tight.

- Use only hooks with a safety latch.

SAFETY LATCH CLOSED

SAFETY LATCH OPEN

5,000 LB MAX WINCH CAPACITY DECAL

CONNECTION WHEN NOT IN USE

WINCH OPERATION (OPTION)

Ropes used on this Auger Drill must meet or exceed the following requirements and as noted on the load capacity chart:

- Wire ropes (other than rotation resistant type) must have a minimum breaking strength of 17,500 pounds (7,900 kg).

Inspect the winch line, hook, and hook latch before lifting any loads (see Maintenance sections).

Do not shock load the winch line. Shock loading is a jerking or snatching of the winch line or a sudden change in tension from a relaxed state or low load to high load. Start and stop the load slowly to avoid shock loading. Do not lift loads that exceed the capacities indicated on the load capacity chart or the safe working load of the winch line.

Observe the following six rules on winch lines and loads.

1. The winch is designed for straight-line pulls. The boom must be vertical over the load so the winch line is making a vertical pull. Do not side load, as it can damage the mast or rope and cause it to break.
2. Four wraps must be maintained on the winch drum during lifting operations.
3. Do not allow ground personnel to ride the winch line or load.
4. Maintain proper clearance between energized conductors and boom tip, winch line, hook, and load.
5. Do not wrap the winch line back on itself. Use an appropriate sling.
6. To drag load to the Auger Drill use the match block on the base of the mast.

STRINGING THE WINCH LINE

Properly attach the winch line to the drum with attachments furnished.

The first layer (wrap) around the winch drum must be put on closely and tightly. The initial winding (load) should be approximately 50 pounds (23 kg). This prevents subsequent wraps from sliding down between turns when tension is applied.

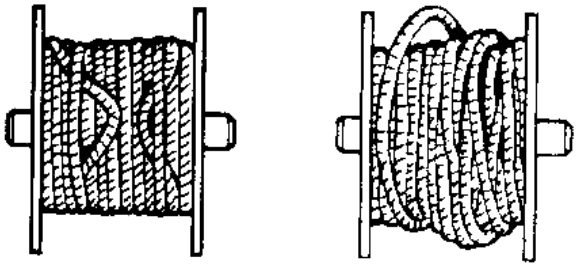
A down haul weight and hook with a latch should be attached to the free end of the winch line. This allows the winch line to drop easily to meet the reach of the crewman on the ground.

All winch line hooks used shall be equipped with a latch. Winch line hooks without a latch can cause serious injury or death.

DOWN HAUL WEIGHT

When winding the winch line onto the drum with no load, make sure it is wound level.

Trapped loops can damage the winch line or cause a load to drop on the next winch pay out operation.



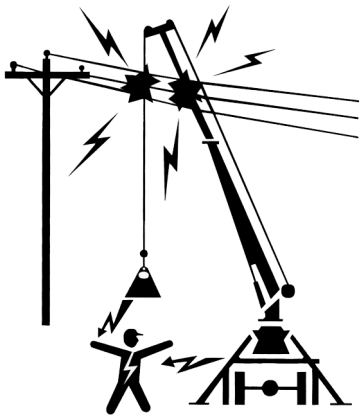
WINCH DRUMS WITH TRAPPED LOOPS

Always keep the winch line wound level and tight on the boom winch drum.

ELECTROCUTION HAZARD

This unit does not provide any insulation. The operator must maintain clearance from all energized lines. Contact with any energized lines will energize the entire vehicle and load.

ELECTROCUTION HAZARD: When the boom is supporting the pole in or near energized lines, the tamp operator MUST wear suitable insulating gloves, sleeves, and hard hat. The tool hoses may be reinforced with wire braid and will become energized if the vehicle becomes electrically charged. Serious injury or death will result from contact with this equipment or vehicle should it become electrically charged.



ELECTROCUTION HAZARDS FROM OVERHEAD LINES

If permissible, de-energize the lines and test to verify lines are not energized.

Serious injury or death will result from such contact or if inadequate clearance is not maintained. Electrocution hazards from overhead lines.

Do not set, install or remove poles in, near, or among energized lines without taking the following precautions:

1. Ground the vehicle.
2. Always maintain proper clearance from energized power lines. The Auger Drill cannot protect you from phase-to-phase or phase-to-ground contact. Allow for sag, sway, or rocking. Boom tip contains conductive materials.
3. Assign a spotter whose only responsibility is to spot the pole and boom for the operator.
4. All personnel must wear suitable insulating gloves, sleeves, and hard hats. Personnel must not allow any non insulated part of their body to contact the pole, vehicle, or other equipment.
5. Pole must be covered with insulating shields and pole cap.
6. Energized lines must be covered with insulating shields.
7. Direct contact with insulated poles and lines must be avoided.
8. Never allow ground personnel to come in contact with the Auger Drill, vehicle, or vehicle attachments while in operation near energized power lines.
9. While on the vehicle, the operator must not create a connection between the vehicle and ground.

MOVING THE MACHINE

Before moving the Auger Drill, raise the auger and align arrows on top of right angle drive to align mast with mast rest. Lower the mast into the mast rest. Raise all outriggers and stop engine on truck mounted machines.

Do not move machine with mast raised. Always lower the mast and raise the outriggers on truck mounted machines before moving the machine.

Machine can tip if moved with mast raised.

BE SURE mast is aligned with mast rest when lowering to avoid equipment damage.

Align arrows on top of right angle drive to be sure mast is aligned properly when lowering to mast rest.

NEVER use the kelly bar to push the truck in the event it becomes stuck. A bent kelly bar will result.

If travelling on public roads or more than very short distances between holes at one site, do not leave the auger on the kelly bar. This will cause premature wear on the kelly bar packing.

SECTION 2

MAINTENANCE GUIDELINES

NOTE: See Service Manual for complete service and maintenance instructions.

PREVENTIVE MAINTENANCE

In order that the operator may be sure the digger is ready for operation at any time, a regular program of preventive maintenance should be adopted. The maintenance program should be established on the basis of the operator and/or maintenance personnel performing the work, when the equipment will be idle and during extended periods when the equipment will be in storage.

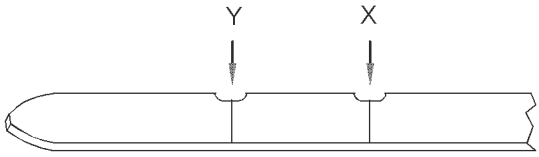
It is recommended that a program of daily service requirements be established with preventive maintenance being performed on a "BEFORE, DURING and AFTER operation schedule.

One of the most important procedures in any maintenance program should be to make sure it is kept clean, for not only will it look better, it will run better too! Washing metal surfaces frequently, and keeping it painted will prevent rusting and corrosion. It is also much easier to detect cracks, bends or other damage that may be hidden under layers of dirt and grime. Therefore, the digger should be washed and cleaned thoroughly at least once each week during normal operation. Keep your Terex Auger Drill clean to make maintenance and inspection easier.

ENGINE AND POWER TRAIN

Power from the Auger Drill engine is transmitted to a torque converter and shuttle transmission to provide forward and reverse directions. Output of the shuttle is transmitted to a 3 or 4-speed range transmission and then through a universal drive shaft into a right angle drive gearbox, final drive gearbox, and kelly bar.

ENGINE OIL



(Y) “MIN” MARK (X) “MAX” MARK

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

NOTE: Ensure that the engine is either level or that the engine is in the normal operating position in order to obtain a true level indication.

NOTE: After the engine has been switched OFF, wait for ten minutes in order to allow the engine oil to drain to the oil pan before checking the oil level.

1. Maintain the oil level between the “ADD” mark (Y) and the “FULL” mark (X) on the engine oil dipstick. Do not fill the crankcase above the “FULL” mark (X).

   NOTE: Operating your engine when the oil level is above the “FULL” mark could cause your crankshaft to dip into the oil. The air bubbles created from the crankshaft dipping into the oil reduces the oil’s lubricating characteristics and could result in the loss of power.

2. Remove the oil filler cap and add oil, if necessary. Clean the oil filler cap. Install the oil filler cap.

AIR CLEANER - DRY TYPE

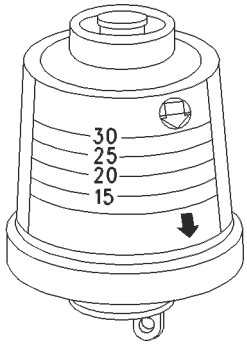
Under normal conditions, dry-type filters should be serviced every 250 hours of operation. Extreme conditions will require daily service. Element can be best cleaned by blowing compressed air from inside out. Do not apply air closer than two inches (5 cm.) and do not use more than 90 PSI (.62 MPa) of pressure. Do not damage gasket surface or bend element. Cleaning can only be done a few times as the element will finally clog and restrict air flow. The element must then be replaced.

Some engines may be equipped with a different service indicator.

Some engines are equipped with a differential gauge for inlet air pressure.The differential gauge for inlet

air pressure displays the difference in the pressure that is measured before the air cleaner element and the pressure that is measured after the air cleaner element. As the air cleaner element becomes dirty, the pressure differential rises. If your engine is equipped with a different type of service indicator, follow the OEM recommendations in order to service the air cleaner service indicator.

The service indicator may be mounted on the air cleaner element or in a remote location.



SERVICE INDICATOR

Observe the service indicator. The air cleaner element should be cleaned or the air cleaner element should be replaced when one of the following conditions occur:

- The yellow diaphragm enters the red zone.
- The red piston locks in the visible position.

TEST THE SERVICE INDICATOR

Service indicators are important instruments.

- Check for ease of resetting. The service indicator should reset in less than three pushes.
- Check the movement of the yellow core when the engine is accelerated to the engine rated speed. The yellow core should latch at the greatest vacuum that is attained.

If the service indicator does not reset easily, or if the yellow core does not latch at the greatest vacuum, the service indicator should be replaced. If the new service indicator will not reset, the hole for the service indicator may be restricted.

The service indicator may need to be replaced frequently in environments that are severely dusty.

ELECTRICAL SYSTEM

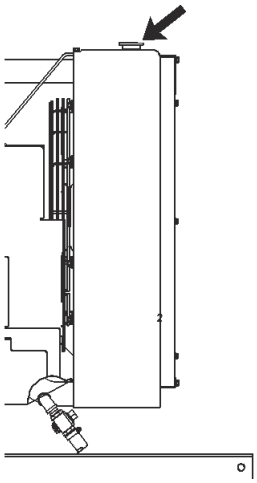
So far as electrical system maintenance is concerned, the operator's primary responsibility is restricted to making sure the wiring remains in good condition and the battery is filled and kept charged. Repair and replacement of worn or damaged parts must be done by an experienced mechanic.

COOLING SYSTEM MAINTENANCE

The engine's cooling system is designed to provide adequate cooling during normal operating conditions. Engine overheating can become the primary cause for extensive repair work, lost operating time, and possibly result in the eventual and complete engine and/or transmission failure. Cooling system maintenance should therefore hold an important place in the digger maintenance program. Refer to engine owner's manual for specific recommendations.

- Always use a coolant conditioner (unless coolant contains conditioner).
- Do not use automotive types of coolant.
- Do not use cooling system sealing additives.
- Use coolant that meets the following specifications:
- Commercial long life coolants that meet the Caterpillar Engine Coolant Specification -1 (Caterpillar EC-1)
- Cat DEAC (Diesel Engine Antifreeze/Coolant)
- Commercial heavy-duty coolant/antifreeze

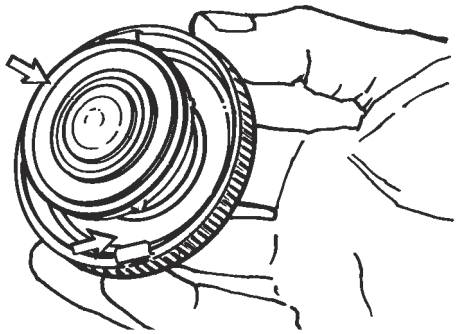
Check the coolant level when the engine is stopped and cool.



COOLING SYSTEM FILLER CAP

Pressurized System: Hot coolant can cause serious burns. To open the cooling system filler cap, stop the engine and wait until the cooling system components are cool. Loosen the cooling system filler cap slowly in order to relieve the pressure.

1. Remove the cooling system filler cap slowly in order to relieve pressure.
2. Maintain the coolant level within 13 mm (0.5 inch) of the bottom of the filler pipe. If the engine is equipped with a sight glass, maintain the coolant level to the proper level in the sight glass.



TYPICAL FILLER CAP GASKETS

3. Clean the cooling system filler cap and check the condition of the filler cap gaskets. Replace the cooling system filler cap if the filler cap gaskets are damaged. Reinstall the cooling system filler cap.
4. Inspect the cooling system for leaks.

ENGINE OILS AND FUELS

Follow the engine manufacturers recommendations for maintenance and also for all fluids and change intervals if different then below.

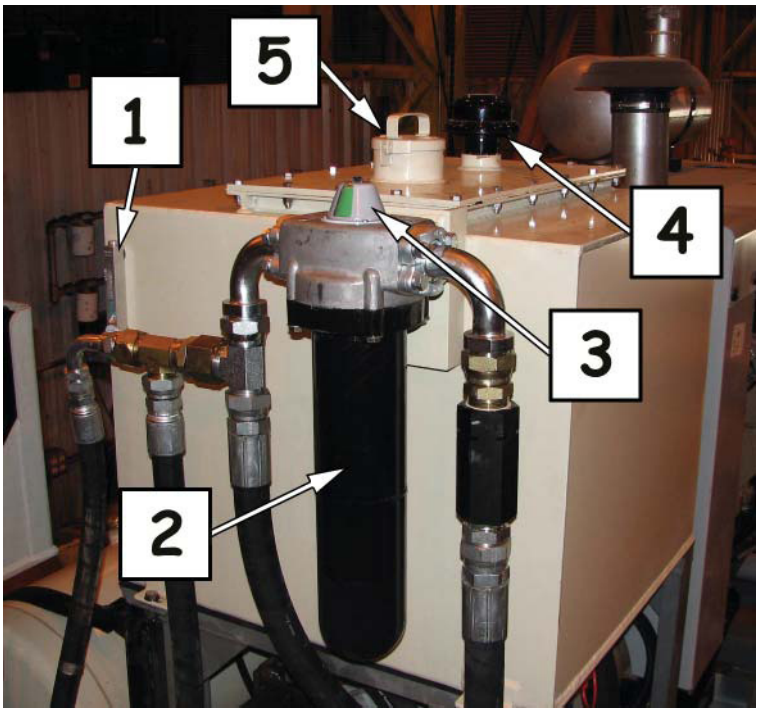
ENGINE OIL AND FILTER - CHANGE (CG-4 OIL)

CG-4 engine oil may be used. If this grade of engine oil is used, a 250 hour service interval is required for the engine oil and the engine oil filter.

HYDRAULIC SYSTEM (OPEN LOOP)

Oil is furnished by a 82 gal. (310.8 L) tank to a gear pump. The pump is driven by a PTO off the Auger Drill transmission. The oil flow from the pump is controlled by self-centering valves, and system pressure is set at 1500 PSI (10.34 MPa). The oil is filtered through a filter in the return line to the tank. This system will give long life with minimum maintenance, provided the system is kept clean.

The filter element should be changed after the first fifty (50) hours of operation and every 200 hours after or when indicator is in the YELLOW zone. Check fluid level and add 10W ISO32 hydraulic oil with antiwear additives, resistant to rust, oxidation and foaming if needed. CLEANLINESS IS OF UTMOST IMPORTANCE.



HYDRAULIC OIL RESERVOIR

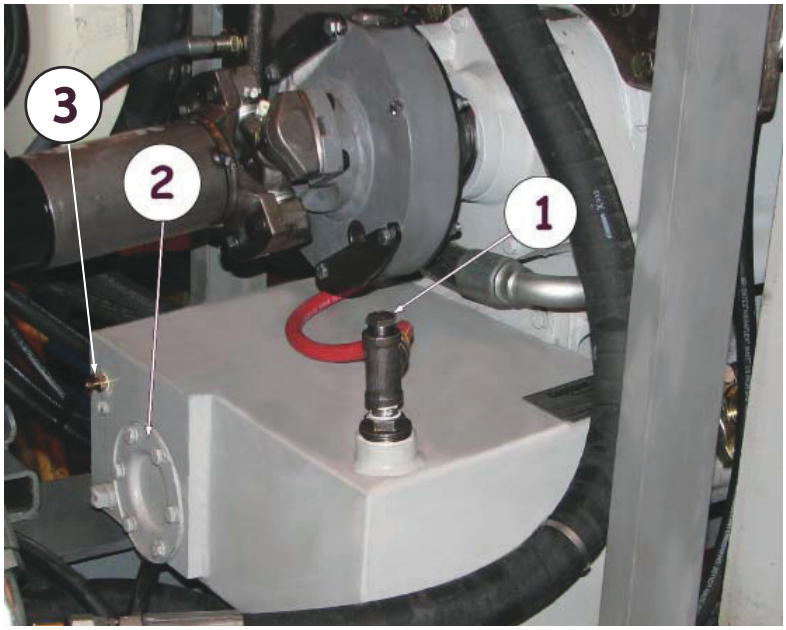
1.	Hydraulic Fluid Temperature & Level Indicator	4.	Breather
2.	Hydraulic Filter	5.	Fill Cap
3.	Hydraulic Filter Indicator		

TRANSMISSION

This unit requires very little preventive maintenance. The clutches are self adjusting and pressure is internally regulated. Before operation, the operator should start the engine and run for two minutes to allow oil to circulate. Check oil level with transmission in NEUTRAL and engine at IDLE. Add oil if necessary, refer to lubrication chart for oil specifications. Do not overfill and stop operation if any leak is detected. Repair leak and fill with oil before using. Do not operate at temperatures above 250 degrees F (121 degrees C). Shift into neutral and allow to cool.

When filling either transmission for the first time after rebuild or if a new unit is installed, fill to proper level, then run transmission for a couple minutes to fill torque converter. Shutdown machine and check fluid level again. Add fluid to proper level. Repeat two or three times, until fluid level remains the same.

ALLISON TRANSMISSION–ADDING/CHECKING FLUID LEVEL



ALLISON TRANSMISSION MODEL 3331-3-TC 320

1.	Dipstick and Oil Fill
2.	Oil Strainer Cover
3.	Oil Level Plug

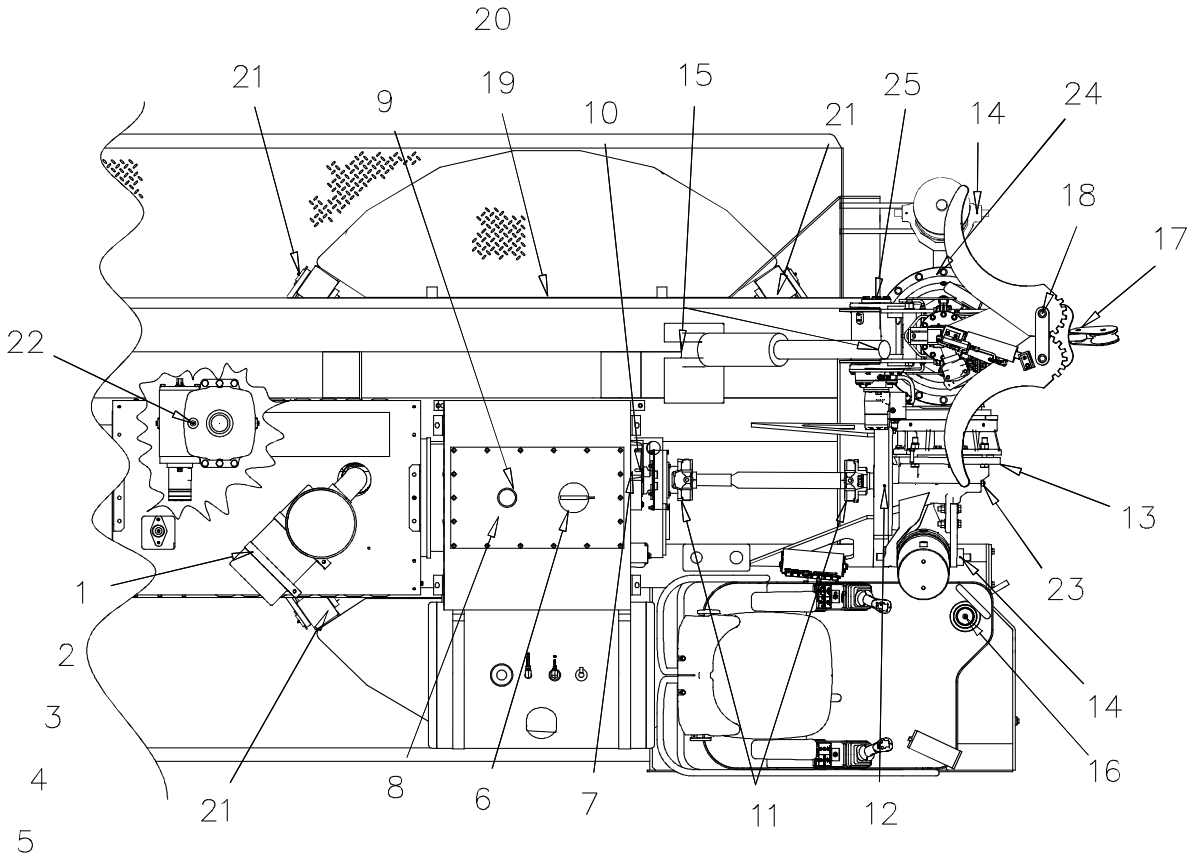
LUBRICATION

Determination of when oil changes are made, filter elements are to be cleaned and/or replaced, and when lubrication of equipment is required should be based on the severity of operation. The recommended lubricating instructions provided herein are based upon normal operation, and should be varied in accordance with the hours of operation, climate, and digging conditions.

Keep all lubricants and oils in closed containers. Store them in a clean, dry place protected from excessive heat. Make sure no dirt, water or other foreign matter becomes mixed with lubricants. Lubricating equipment and containers should be kept clean and ready for use.

Before lubricating, or filling hydraulic fluids, the fittings, caps, and filler plugs should be thoroughly cleaned to prevent contamination. After lubrication and filling, remove any excess spills. After lubrication and filling, make a thorough check of all lines, connections and fittings for signs of leaks.

LUBRICTION CHART



TYPICAL MACHINE LAYOUT - SPECIFIC MACHINES MAY VARY SLIGHTLY.

REF	DESCRIPTION	RECOMMENDED LUBRICAN	LUBE FREQUENCY	SPECIAL INSTRUCTIONS
1.	Engine Oil	See engine operator's manual	Check Daily	Check level every 8 hours Change every 250 hours.
2.	Engine Oil Filter	See manual	N/A	Change every oil change.
3.	Engine Coolant	Distilled water and Anti-Freeze, refer to engine operator's manual.	Check Daily	Maintain 1 in. below top of tank. Change every 2 years.
4.	Engine Air Cleaner	See manual	Check Daily	Change every 250 hours or sooner if indicator shows a change requirement.
5.	Engine Fuel Filter	See manual	N/A	Change every 250 hours.
6.	Hydraulic System	ISO 32 Hydraulic Oil 330 - 92 gal. (348 liters)	Check Daily	Check with mast lowered to mast rest. Clean tank and change oil annually.
7.	Hydraulic Filter	See manual	N/A	Change every 200 hours or when indicator is in yellow.
8.	Hydraulic Strainer	N/A	N/A	Clean every 250 hours.
9.	Tank Breather	See manual	N/A	Clean every oil change.
10.	Transmission Assembly (Allison)	Allison C-4 Dexron II	Check Daily	Oil must be at operating temp.,180-200 degrees F. Check with trans in neutral and engine idle, open upper drain port on side of trans, oil should seep out. Drain to proper level change every 2000 hours or 6 months clean oil screen in sump when changed.
11.	U-Joints	Multi-Purpose Grease	Daily - 3 Points	
12.	Mounting Ring	Multi-Purpose Grease	Daily - 5 Points	
13.	Intermediate Ring	Multi-Purpose Grease	Daily - 4 Points	
14.	Leveling Cylinder(s)	Multi-Purpose Grease	Daily - 3 Points	6 points if equipped with outboard cylinder.
15.	Elevating Cylinder	Multi-Purpose Grease	Daily - 3 Points	2 lower, 1 upper
16.	Pivot Pin	Multi-Purpose Grease	Daily - 1 Point	Option
17.	Snatch Block	Multi-Purpose Grease	Daily - 1 Point	Option
18.	Pole Claw	Multi-Purpose Grease	Daily - 4 Point	Option
19.	Turntable Center Pin	Multi-Purpose Grease	Daily - 1 Points	
20.	Turntable Center Rollers	Multi-Purpose Grease	Daily - 6 Points	
21.	Turntable Outer Rollers	Multi-Purpose Grease	Daily - 8 Points	4 upper, 4 lower
22.	Turntable Drive	EP 90W Gear Lube	Check Weekly	Do not overfill
23.	Right Angle Drive	EP 90W Gear Lube	Check Weekly	Change every 1000 hours.
24.	Final Drive	EP 90W Gear Lube	Check Weekly	Change every 1000 hours
25.	Winch Drive	EP 90W Gear Lube	Check Weekly	Change every 1000 hours

NOTE: Multi purpose grease is NGLI #2 lithium or calcium based grease.

ENGINE MAINTENANCE INTERVAL SCHEDULE

Daily
Alternator Belt - Inspect/Adjust/Replace
Cooling System Coolant Level - Check
Driven Equipment - Check
Engine Air Cleaner Service Indicator - Inspect
Engine Air Precleaner - Check/Clean
Engine Oil Level - Check
Fuel System Primary Filter/Water Seperator - Drain
Hoses and Clamps - Inspect/Replace
V-Belts - Inspect/Adjust/Replace
Walk - Around Inspection

Every 50 Service Hours or Weekly
Fuel Tank Water and Sediment - Drain

Every 250 Service Hours
Cooling System Coolant Sample (Level 1) - Obtain
Engine Oil Sample - Obtain
Engine Oil and Filter - Change

Initial 500 Service Hours
Engine Valve Lash - Inspect/Adjust

Every 500 Service Hours
Fan Clearance - Check
V-Belts - Inspect/Adjust/Replace

Every 500 Service Hours or 2 Months
Crankcase Breather (Canister) - Replace

Every 500 Service Hours or 1 Year
Battery Electrolyte Level - Check
Cooling System Supplemental Coolant Additive- (SCA) - Test/Add
Engine Air Cleaner Element (Dual Element) - Clean/Replace
Engine Air Cleaner Element (Single Element) - Replace
Engine Oil and Filter - Change
Fuel System Primary Filter (Water Seperator) - Element - Replace
Fuel System Secondary Filter - Replace
Radiator - Clean

Every 1000 Service Hours
Engine Valve Lash - Inspect/Adjust

Every 2000 Service Hours
Aftercooler Core - Inspect
Belt Tensioner - Inspect
Exhaust Manifold - Inspect
Starting Motor - Inspect
Turbocharger - Inspect
Water Pump - Inspect

Every 2000 Service Hours or 1 Year
Alternator - Inspect
Engine Mounts - Inspect

Every Year
Cooling System Coolant Sample (Level 2) - Obtain

Every 3000 Service Hours
Alternator Belt - Inspect/Adjust/Replace

Every 3000 Service Hours or 2 Years
Cooling System Coolant (DEAC) - Change
Cooling System Water Temperature Regulator - Replace

Every 4000 Service Hours
Aftercooler Core - Clean/Test

Every 6000 Service Hours or 3 Years
Cooling System Coolant Extender (ELC) - Add

Every 12000 Service Hours or 6 Years
Cooling System Coolant (ELC) - Change

SEE ENGINE MAINTENANCE MANUAL FOR ADDITIONAL INFORMATION

APPENDIX - A

STANDARDS AND REGULATIONS

In addition to the operational instructions provided herein, various standards and governmental regulations must be followed in the use and operation of your Terex South Dakota unit.

ANSI STANDARDS

ANSI standards that are applicable to the operation and maintenance of your unit:

1. ANSI A92.2 (latest revision) Vehicle Mounted Elevating and Rotating Cable Placers,
2. ANSI A10.31 (latest revision) digger derricks - Safety Requirements, Definitions and Specifications (A partial extraction is included in this appendix),
3. ANSI C2, Part 4 (latest revision) (National Electric Safety Code®) Rules for the Operation of Electric Supply and Communication Lines and Equipment,
4. ANSI Z133.1 (latest revision) Safety Requirements for Tree Pruning, Trimming, Repairing, or Removal.

For complete, current copies of ANSI standards, you must annually write to the following:

American National Standards Institute
11 West 42nd Street
New York, NY 10036

Copies of the standards can also be found on the Internet at:

www.ansi.org

OSHA REGULATIONS

OSHA regulations that are applicable to the operation and maintenance of your unit:

1. OSHA Subpart V, Power Transmission and Distribution,
2. OSHA 1910.67, Vehicle Mounted Elevating and Rotating Cable Placers,
3. OSHA 1910.268, Telecommunications,
4. OSHA 1910.269, Electrical Power Generation, Transmission and Distribution,
5. OSHA Subpart M, Fall Protection,
6. OSHA 1910.147, The Control Of Hazardous Energy (Lockout/Tagout),
7. OSHA Subpart S, Electrical,
8. OSHA 1910.333, Selection and use of work practices.
9. OSHA Subpart CC, - Cranes and Derricks in Construction

For complete, current copies of OSHA regulations, you must annually write to the following or contact your OSHA Regional Office.

Technical Data Center
Frances Perkins Department Of Labor Building
Room N2439
200 Constitution Avenue
Washington, DC 20210

Copies of the standards can also be found on the Internet at:

www.osha.gov.

These are not all inclusive of the applicable codes, standards, or regulations. It is your responsibility and your employer's responsibility to identify and comply with applicable codes, standards and regulations.

The information provided herein is accurate as of the date your Terex South Dakota unit was manufactured. You must comply with the codes, standards and regulations as they are updated over time. It is your employer's responsibility to obtain copies and comply with all standards and regulations.

OSHA EXCERPTS: (CLEARANCE DISTANCE)

The following are excerpts from OSHA Standards. They are not complete and do not cover all safety work rules.

Partial excerpt from Subpart S - Electrical: (02-01-1998 Edition)

1910.333 Selection and use of work practices.

(c), (i) Unqualified person.

(A) When an unqualified person is working in an elevated position near overhead lines, the location shall be such that the person and the longest conductive object he or she may contact cannot come closer to any unguarded, energized overhead line than the following distances:

1. For voltages to ground 50kV or below - 10 feet (3.05 m);
2. For voltages to ground over 50kV - 10 feet (3.05 m) plus four inches (101.6 mm) for every 10kV over 50kV.

(B) When an unqualified person is working on the ground in the vicinity of overhead lines, the person may not bring any conductive object closer to unguarded, energized overhead lines than the distances given in paragraph (c)(3)(i)(A) of this section.

NOTE: For voltages normally encountered with overhead power line, objects which do not have an insulating rating for the voltage involved are considered to be conductive.

Excerpt from OSHA subpart V - Power Transmission and Distribution (11-14-1990 Edition)

1926.950 General Requirements (c) Clearances. The provisions of paragraph© (1) or (2) of this section shall be observed.

(1) No employee shall be permitted to approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in Table V-1, unless:

(i) The employee is insulated or guarded from the energized part (gloves or gloves with sleeves rated for the voltage involved shall be considered insulation of the employee from the energized part), or

(ii) The energized part is insulated or guarded from him and any other conductive object at different potential, or

(iii) The employee is isolated, insulated, or guarded from any other conductive object(s), as during live-line bare-hand work.

(2)(i) The minimum working distance and minimum clear hot stick distances stated in Table V-1 shall not be violated. The minimum clear hot stick distance is that for the use of line-line tools held by lineman when performing live-line work.

(e)(15) The minimum clearance distances for live-line bare-hand work shall be as specified in Table V-2. These minimum clearance distances shall be maintained from all grounded objects and from lines and equipment at a different potential than that to which the insulated Cable Placer is bonded unless such grounded objects or other lines and equipment are covered by insulated guards. These distances shall be maintained when approaching, leaving and when bonded to the energized circuit.

ALTERNATING CURRENT MINIMUM DISTANCES	
Voltage Range (Phase-to-Phase) Kilovolt	Minimum Working and Clear Hot Stick Distances
2.1 to 15	2 ft. 0 in. (0.61 m)
15.1 to 35	2 ft. 4 in. (0.71 m)
35.1 to 46	2 ft. 6 in. (0.76 m)
46.1 to 72.5	3 ft. 0 in. (0.91 m)
72.6 to 121	3 ft. 4 in. (1.02 m)
138 to 145	3 ft. 6 in. (1.07 m)
161 to 169	3 ft. 8 in. (1.12m)
230 to 242	5 ft. 0 in. (1.52 m)
345 to 362	1 7 ft. 0 in. (2.13 m)
500 to 552	1 11 ft. 0 in. (3.35 m)
700 to 765	1 15 ft. 0 in. (4.57 m)

TABLE V-1

MINIMUM CLEARANCE DISTANCES FOR LIVE-LINE BARE-HAND WORK (ALTERNATING CURRENT)		
Voltage Range (Phase-to-Phase) Kilovolt	Distance in Feet and Inches for Maximum Voltage	
	Phase-to-Ground	Phase-to-Phase
2.1 to 15	2 ft. 0 in. (.61m)	2 ft. 0 in. (.61m)
15.1 to 35	2 ft. 4 in. (.71m)	2 ft. 4 in. (.71m)
35.1 to 46	2 ft. 6 in. (.76m)	2 ft. 6 in. (.76m)
46.1 to 72.5	3 ft. 0 in. (.91m)	3 ft. 0 in. (.91m)
72.6 to 121	3 ft. 4 in. (1.02m)	4 ft. 6 in. (1.37m)
138 to 145	3 ft. 6 in. (1.07m)	5 ft. 0 in. (1.52m
161 to 169	3 ft. 8 in. (1.12m)	5 ft. 6 in. (1.68m
230 to 242	5 ft. 0 in. (1.52m)	8 ft. 4 in. (2.54m)
345 to 362	1 7 ft. 0 in. (2.13m)	1 13 ft. 4 in.(4.06m)
500 to 552	1 11 ft. 0 in. (3.35m)	1 20 ft. 0 in.(6.1m)
700 to 765	1 15 ft. 0 in. (4.57m)	1 31 ft. 0 in.(9.45m)

TABLE V-2

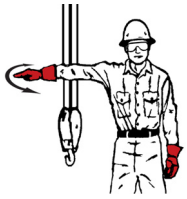
NOTE: Table V-1 - 1 For 345-362kv, 500-552kvb and 700-765kv, the minimum working distance and the minimum clear hot stick distance may be reduced provided that such distances are not less than the shortest distance between the energized part and a grounded surface.

NOTE: Table V-2 - 1 For 345-362kv, 500-552kv and 700-765kv, the minimum clearance distance may be reduced provided the distances are not made less than the shortest distance between the energized part and a grounded surface.

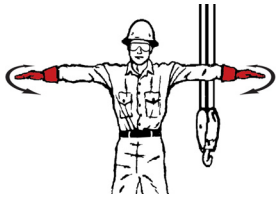
OSHA Subpart CC

Depending on the work being performed operation near power lines must follow OSHA 1926.1408 and 1409. This includes maintaining at least 20 foot (6.1m) clearance up to 50 feet (15.2m) depending on the voltage. All personnel must be trained of the hazards when working near or on power lines.

STANDARD HAND SIGNALS

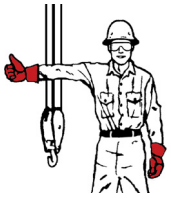


STOP. With arm extended horizontally to the side, palm down, arm is swung back and forth.

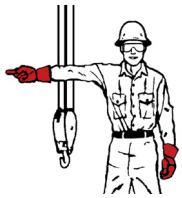


EMERGENCY STOP. With both arms extended horizontally to the side, palms down, arms are swung back and forth.

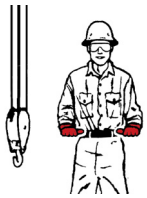
HOIST. With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.



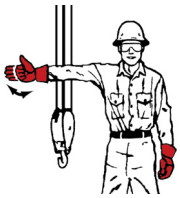
RAISE BOOM. With arm extended horizontally to the side, thumb points up with other fingers closed.



SWING. With arm extended horizontally, index finger points in direction that boom is to swing.



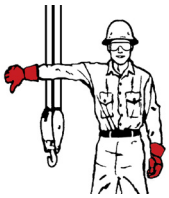
RETRACT TELESCOPING BOOM. With hands to the front at waist level, thumbs point at each other with other fingers closed.



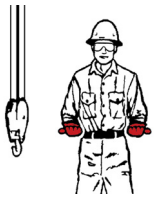
RAISE THE BOOM AND LOWER THE LOAD. With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.

DOG EVERYTHING. Hands held together at waist level.

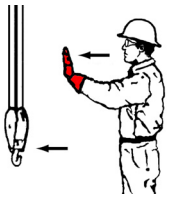
LOWER. With arm and index finger pointing down, hand and finger make small circles.



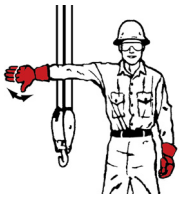
LOWER BOOM. With arm extended horizontally to the side, thumb points down with other fingers closed.



EXTEND TELESCOPING BOOM. With hands to the front at waist level, thumbs point outward with other fingers closed.

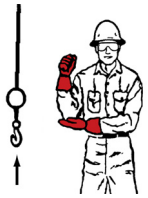


TRAVEL/TOWER TRAVEL. With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.

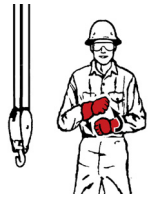


LOWER THE BOOM AND RAISE THE LOAD. With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.

MOVE SLOWLY. A hand is placed in front of the hand that is giving the action signal.



USE AUXILIARY HOIST (WHIPLINE). With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.



CRAWLER CRANE TRAVEL, BOTH TRACKS. Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation toward body indicates travel backward.

USE MAIN HOIST. A hand taps on top of the head. Then regular signal is given to indicate desired action.

CRAWLER CRANE TRAVEL, ONE TRACK. Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.

TROLLEY TRAVEL. With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.

APPENDIX - B

RESPONSIBILITIES

ANSI A10.31-2006 (PARTIAL)

Table of Contents:

7. RESPONSIBILITIES OF DEALERS AND INSTALLERS

7.1 General Responsibilities. Each dealer or installer as applicable shall comply with the requirements of this section.

7.2 Vehicle Specifications. Each dealer or installer, or both, who sells a digger derrick shall inform the owner or user, or both, of the manufacturer's minimum vehicle specifications.

7.3 Vehicle Weight Distribution. The installer shall be responsible for the weight distribution of the completed mobile unit in accordance with the requirements of the digger derrick and the applicable regulations. Allowance shall be made for the weight of readily removable tools and material specified by the user.

7.4 Manuals. Upon delivery of the equipment to the owner or user, the dealer or installer shall provide the manuals as required by Paragraph 6.4 of this standard and manuals for auxiliary equipment added by the installer.

7.5 Installations. The installer shall comply with Sections 5 and 6 of this standard relating to proper installation and shall follow the instructions of the manufacturer. In the event the original manufacturer no longer exists, an equivalent entity may provide these instructions. The installer of a digger derrick shall meet the following requirements before the mobile unit is placed in operation:

(1) Complete successful stability tests in accordance with the requirements of 4.5.1, 4.5.2 and 4.5.3.

(2) Complete operational and visual tests in accordance with the requirements of 6.6.1 and 6.6.2.

(3) Complete appropriate electrical tests required in 5.4.3 of this standard. For insulated digger derricks, the installer shall assure conformance to the Qualification test requirements of 5.3.2, either by obtaining certification of the test and performing a periodic test after installation, or by performing the Qualification test.

(4) Measure and post the travel height of the mobile unit in a location that is readily visible to the vehicle operator.

(5) Comply with all requirements of the applicable Federal Motor Vehicle Safety Standards in effect at the time of installation when installing a digger derrick on a chassis that is a highway vehicle.

(6) Certification as a manufacturer (alteration, intermediate or final) of a motor vehicle under the Federal Motor Vehicle Safety Standards is required.

7.6 Quality Assurance. The installer shall have a documented quality assurance program that will ensure compliance with this standard.

7.7 Welding. All welds made by the installer, whose failure could result in motion of the digger derrick, shall meet the Structural Welding Code ANSI/AWS D1.1/D1.1M and ANSI/AWS D1.2/D1.2M. The installer shall establish applicable welding quality assurance procedures for all welded joints and assemblies. If nondestructive testing is designated, the particular method used shall be in accordance with ANSI/AWS B1.10.

7.8 Training. The dealer or installer shall offer training or training materials that aid owners, renters, lessors or lessees and users in the operation, inspection, testing and maintenance of the digger derrick. This training or training materials shall be offered initially and subsequently on request.

7.9 Dealer or Installer as User. Whenever a dealer or installer directs personnel to operate a digger derrick (inspecting, sales demonstrations or any form of use), the dealer or installer shall assume the responsibilities of users as specified in Section 9 of this standard. All personnel authorized to operate the digger derrick shall have been trained.

7.10 Rated Load Capacity Charts. Upon completion of the stability test(s), as required in Section 4.5.1, the installer shall permanently attach appropriate rated load capacity charts, visible to the operator at the controls. Rated load capacity charts shall be provided by the manufacturer, or by the installer at the specific instruction of the manufacturer. The rated working load of the winch line may limit the maximum capacity of the digger derrick.

Rated load capacity charts shall include the number of platforms, platform rating, the options included and the winch line rated working load (see Section 9.6).

8. RESPONSIBILITIES OF OWNERS

8.1 General Responsibilities. Each owner shall comply with the requirements of this section. The following responsibilities pertain to the owner's inspection, testing, maintenance, modification, training and transfer of ownership. These activities shall be performed by a qualified person(s).

8.2 Inspection and Testing Classifications.

8.2.1 Initial Inspection and Test. Prior to initial use, all new or modified mobile units shall be inspected and tested to ensure compliance with the provisions of this standard. Verification by the manufacturer, the installer or an equivalent entity(s), meets this requirement.

8.2.2 Regular Inspection and Test. The inspection procedure for mobile units is divided into two classifications based upon the intervals at which inspections and tests shall be performed. The owner shall set intervals in accordance with the manufacturer's recommendations. Such intervals are dependent upon component function and exposure to wear and deterioration as well as other agents that adversely affect component life. Two classifications are designated:

(1) Frequent Inspection and Test. Daily (or at the start of each work shift) to monthly intervals.

(2) Periodic Inspection and Test. One to twelve month intervals.

8.2.3 Frequent Inspection and Test. Items determined by the owner in accordance with the manufacturer's recommendations for each specific digger derrick shall be inspected for defects

Prior to first use during each work shift the operator shall perform the following tests and inspections:

(1) Operating controls and associated mechanisms for conditions interfering with proper operation.

(2) Visual and audible safety devices for malfunction.

(3) Hydraulic or pneumatic systems for observable deterioration or excessive leakage.

(4) Fiberglass and other insulating components for visible damage or contamination.

(5) Missing or illegible operational and instructional markings.

(6) Electrical systems of/or related to the digger derrick for malfunction, signs of excessive deterioration, dirt and moisture accumulation.

(7) Visual inspection of bolts, pins, and other fasteners for loose, deformed or missing fasteners and other locking devices.

(8) Winch lines for any area of gross damage or deterioration that would result in appreciable loss of original strength.

Any suspected items shall be carefully examined or tested and a determination made by a qualified person as to whether they constitute a safety hazard.

All unsafe items shall be replaced or repaired before use.

8.2.4 Periodic Inspection and Test. An inspection of the mobile unit shall be performed at the intervals defined in 8.2.2, depending upon its activity, severity of service and environment or as specifically indicated below. (These inspections shall include the requirements of 8.2.3):

(1) Structural members for deformation, cracks or corrosion.

(2) Parts, such as pins, bearings, shafts, gears, rollers, locking devices, chains, chain sprockets, wire and synthetic ropes, and sheaves for wear, cracks or distortion.

(3) Hydraulic and pneumatic relief valve settings.

(4) Hydraulic system for proper oil level.

(5) Hydraulic and pneumatic fittings, hoses, and tubing for evidence of leakage, abnormal deformation or excessive abrasion.

(6) Compressors, pumps, motors and generators for loose fasteners, leaks, unusual noises or vibrations, loss of operating speed and excessive heating.

(7) Hydraulic and pneumatic valves for malfunction and visible cracks in the external valve housing, leaks and sticking spools.

(8) Visually inspect any vacuum prevention systems and verify function of such systems on digger derricks that have a sheave height or platform height greater than 50 feet. 8.3 Inspection and Test Records.

(9) Hydraulic and pneumatic cylinders and holding valves for malfunction and visible damage.

(10) Hydraulic and pneumatic filters for cleanliness and the presence of foreign material in the system indicating other component deterioration.

(11) Electrical systems and components for deterioration or wear including those not readily visible on a frequent inspection.

(12) Performance test of all boom movements.

(13) Condition and tightness of bolts and other fasteners, as specified by the manufacturer.

(14) Welds, as specified by the manufacturer.

(15) Legible and proper identification, operational and instructional markings.

(16) If the digger derrick is rated as an insulated device, the electrical insulating components and system(s) shall be thoroughly inspected for lack of cleanliness and other conditions that compromise insulation.

(17) The digger derrick shall be tested for compliance with the rating of the digger derrick in accordance with one of the applicable methods and procedures as outlined in Section 5.4.3 of this standard.

(18) The digger derrick shall be dielectrically tested after repair or modification of any component that crosses the insulating system(s) in accordance with Section 5.4.3.

(19) An insulated replacement boom shall be tested by the supplier to ensure conformance to Section 5.3.3 of this standard.

Any suspected items shall be carefully examined or tested and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be replaced or repaired before use.

8.3 Inspection Records and Test Records.

(1) Items to be inspected shall be designated to the operator or other authorized person making frequent inspections. Records of frequent inspections need not be made. However, where a safety hazard is found, it shall be reported in writing to a person responsible for the corrective action and that report and a record of the correction shall be maintained for a period of five years, or as required by applicable regulations.

(2) Written, dated and signed reports and records shall be made of periodic inspections and tests and retained for a period of five years or as required by applicable regulations.

8.4 Maintenance. The owner shall determine maintenance and frequency of maintenance in accordance with the manufacturer's recommendations. Welding repairs of components or welds, designated as critical in the manufacturer's manual, shall be made in accordance with the manufacturers recommendations. Should the original manufacturer no longer exist an equivalent entity may determine the required procedure.

8.4.1 Maintenance Training. The owner shall provide training for maintenance personnel in inspection and maintenance of the digger derrick in accordance with the manufacturer's recommendations and Section 8 of this standard.

8.5 Modifications. No modifications or additions that affect the stability, mechanical, hydraulic or electrical integrity or the safe operation of the digger derrick shall be made without the written approval of the manufacturer. If such modifications or changes are made, the capacity, operation and maintenance instruction markings shall be changed accordingly. In no case shall the safety factors be reduced below those specified in this standard or below the manufacturers design safety factors, whichever are greater. Should the original manufacturer no longer exist, an equivalent entity may approve required modification.

8.6 Weight Distribution. The owner shall specify to the installer the payload and its distribution as well as complete vehicle specifications when the owner supplies the vehicle. Changes in loading or additions made to the mobile unit after the final acceptance that affect weight distribution shall meet applicable regulations by governmental agencies. In no case shall axle loads of the fully loaded vehicle exceed the Gross Axle Weight Ratings (GAWR) assigned by the manufacturer.

NOTE: Any change in weight distribution may adversely affect stability.

8.7 Transfer of Ownership. When a change in ownership of a digger derrick occurs, it shall be the responsibility of the seller to provide the manufacturer's manual(s) for that digger derrick to the purchaser. It is the responsibility of the purchaser to notify the manufacturer of the unit model and serial number and the name and address of the new owner within 60 days.

8.8 Markings. The markings on the digger derrick shall not be removed, defaced or altered. All missing or illegible markings shall be promptly replaced.

8.9 Parts. When parts or components are replaced they shall be identical in specification and function to the original digger derrick parts or components or shall provide an equal or greater factor of safety.

8.10 Safety Bulletins. Owners shall comply with safety related bulletins as received from the manufacturer, dealer or installer.

8.11 Manuals. The owner shall ensure that the operating manual(s) is stored on the mobile unit.

8.12 Training, Retraining, and Familiarization of Operators.

8.12.1 Owner as a Renter or Lessor. An owner functioning as a renter or lessor shall have the same responsibilities as specified under Section 11 of this standard.

8.12.2 General Training. Only personnel who have received general instructions regarding the inspection, application and operation of digger derricks, including recognition and avoidance of hazards associated with their operation, shall operate a digger derrick. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

(1) The purpose and use of manuals.

(2) That operating manuals are an integral part of the digger derrick and must be properly stored on the vehicle when not in use.

(3) A pre-start inspection.

(4) Responsibilities associated with problems or malfunctions affecting the operation of the digger derrick.

(5) Factors affecting stability.

(6) The purpose of placards and decals.

(7) Workplace inspection.

(8) Applicable safety rules and regulations, such as Part 4, ANSI/ IEEE C2, National Electrical Safety Code (applies to utility workers as defined in ANSI/IEEE C2). The above standard is an example; other industries using digger derricks have safety rules pertinent to that industry.

(9) Authorization to operate.

(10) Operator warnings and instructions.

(11) Actual operation of the digger derrick. Under the direction of a qualified person, the trainee shall operate the digger derrick for a sufficient period of time to demonstrate proficiency in the actual operation of the digger derrick.

(12) Proper use of personal fall protection equipment when the digger derrick is equipped with a platform(s).

8.12.3 Retraining. The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.

8.12.4 Familiarization. When an operator is directed to operate a digger derrick they are not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues:

(1) The location of the manuals.

(2) The purpose and function of all controls.

(3) The safety devices and operating characteristics specific to the digger derrick.

9. RESPONSIBILITY OF USERS

9.1 General Responsibilities. Each User shall comply with the requirements of this section.

9.2 Personnel. Only trained and authorized personnel shall be permitted to operate the digger derrick.

9.3 Training, Retraining, and Familiarization of Operators.

9.3.1 General Training. Only personnel who have received general instructions regarding the inspection, application and operation of digger derricks, including recognition and avoidance of hazards associated with their operation, shall operate a digger derrick. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

(1) The purpose and use of manuals.

(2) That operating manuals are an integral part of the digger derrick and must be properly stored on the vehicle when not in use.

(3) A pre-start inspection.

(4) Responsibilities associated with problems or malfunctions affecting the operation of the digger derrick.

(5) Factors affecting stability.

(6) The purpose of placards and decals.

(7) Workplace inspection.

(8) Applicable safety rules and regulations, such as Part 4, ANSI/ IEEE C2, National Electrical Safety Code (applies to utility workers as defined in ANSI/IEEE C2). The above standard is an example; other industries using digger derricks have safety rules pertinent to that industry.

(9) Authorization to operate.

(10) Operator warnings and instructions.

(11) Actual operation of the digger derrick. Under the direction of a qualified person, the trainee shall operate the digger derrick for a sufficient period of time to demonstrate proficiency in the actual operation of the digger derrick.

(12) Proper use of personal fall protection equipment when the digger derrick is equipped with a platform(s).

9.3.2 Retraining. The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.

9.3.3 Familiarization. When an operator is directed to operate a digger derrick they are not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues:

(1) The location of the manuals.

(2) The purpose and function of all controls.

(3) Safety devices and operating characteristics specific to the digger derrick.

9.4 Application. The employer and assigned operator shall ensure that the digger derrick is used only for intended applications as defined in the operating manual, and that recognized safety practices are observed.

9.5 Alterations. Altering or disabling of safety devices, guards or interlocks if so equipped shall be prohibited.

9.6 Winch Line Rated Load. The user shall specify to the installer the winch line rated working load to be noted on the Rated Load Capacity Chart (see Section 7.10).

10. RESPONSIBILITIES OF OPERATORS

10.1 General Responsibilities. Each operator shall comply with the requirements of this section.

10.2 Operation. When operating the digger derrick from the lower controls, the operator shall stand or sit at the control station provided. Operation of the lower controls from any position other than prescribed control stations shall not be permitted. Remote controls shall be used such that the operator is not placed in the electrical path between the unit and the ground.

During operation of the digger derrick all platform occupants shall use appropriate fall protection connected to the digger derrick at the platform position.

Operation of a digger derrick with platform occupant(s) requires the use of capacities different from those of the rated load capacity chart for the digger derrick. When operating a digger derrick with occupied platform(s) and simultaneously using material handling components, operation shall be in accordance with requirements for combined use (see 4.5.3).

NOTE: Winch ropes are not insulated. When operating a digger derrick with the platform occupied, it shall not be used for digging holes, setting screw anchors or handling poles. When the platform is occupied, the winch line of the digger derrick shall only be used for raising or lowering equipment to the worker's position and material handling shall be limited in accordance with the manufacturer's load capacity chart provided for combined use. Combined platform and material handling load shall not exceed 3,000 pounds.

When operating a digger derrick with a platform but no top controls, the operator shall not leave the lower controls unattended when personnel are aloft in the platform.

10.3 Work Platform. The operator shall not use railings, planks, ladders or any other device in or on the work platform for achieving additional working height or reach.

10.4 Brakes. The vehicle parking brake(s) shall be set at all times that the boom is elevated.

10.5 Loading. Any loading which includes a horizontal load shall be avoided unless the mobile unit is designed for that application.

10.6 Observations. Observations during operation for any defects shall be conducted on an ongoing basis.

10.6.1 Pre-Start Inspection. Items determined by the owner in accordance with the manufacturer's recommendations for each specific digger derrick shall be inspected for defects prior to each day's operation. The operator shall perform the following tests and inspections once daily, prior to first use:

(1) Operating controls and associated mechanisms for conditions interfering with proper operation.

(2) Visual and audible safety devices for malfunction.

(3) Hydraulic or pneumatic systems for observable deterioration or excessive leakage.

(4) Fiberglass and other insulating components for visible damage or contamination.

(5) Missing or illegible operational and instructional markings.

(6) Electrical systems of/or related to the digger derrick for malfunction, signs of excessive deterioration, dirt and moisture accumulation.

(7) Visual inspection of bolts, pins and other fasteners for loose, deformed or missing fasteners and other locking devices.

(8) Winch lines for any area of gross damage or deterioration that would result in appreciable loss of original strength. Any suspected items shall be carefully examined or tested and a determination made by a qualified person as to whether they constitute a safety hazard. All unsafe items shall be replaced or repaired before use.

10.7 Work site. Before the digger derrick is used the worksheet shall be surveyed for hazards such as:

(1) Untamped earth fills or soft ground.

(2) Ditches.

(3) Drop-offs and excessive slopes.

(4) Debris.

(5) Overhead obstructions and electrical conductors.

(6) Weather conditions.

(7) Presence of unauthorized persons.

10.8 Precautions. Before and during each use the operator shall:

(1) Check for overhead obstructions and electrical conductors.

(2) Ensure that the load on the platform and/or load lifting devices are in accordance with the manufacturer's platform capacity and/or rated load capacity.

(3) Ensure that outriggers and stabilizers are used if the manufacturer's instructions require their use.

(4) Use outrigger pads when necessary to provide firm footing.

(5) On units equipped with steel type platforms, ensure that guard rails are properly installed and the gates are closed.

(6) When using a platform, ensure proper use of fall protection equipment.

10.9 Personnel. Only trained and authorized personnel shall be permitted to operate the digger derrick.

10.10 Training, Retraining and Familiarization of Operators.

10.10.1 General Training. Only personnel who have received general instructions regarding the inspection, application and operation of digger derricks, including recognition and avoidance of hazards associated with their operation, shall operate a digger derrick. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

(1) The purpose and use of manuals.

(2) That operating manuals are an integral part of the digger derrick and must be properly stored on the vehicle when not in use.

(3) A pre-start inspection.

(4) Responsibilities associated with problems or malfunctions affecting the operation of the digger derrick.

(5) Factors affecting stability.

(6) The purpose of placards and decals.

(7) Workplace inspection.

(8) Applicable safety rules and regulations, such as Part 4, ANSI/ IEEE C2, National Electrical Safety Code (applies to utility workers as defined in ANSI/IEEE C2). The above standard is an example; other industries using digger derricks have safety rules pertinent to that industry.

(9) Authorization to operate.

(10) Operator warnings and instructions.

(11) Actual operation of the digger derrick. Under the direction of a qualified person, the trainee shall operate the digger derrick for a sufficient period of time to demonstrate proficiency in the actual operation of the digger derrick.

(12) Proper use of personal fall protection equipment when the digger derrick is equipped with a platform(s).

10.10.2 Retraining. The operator shall be retrained, when so directed by the user, based on the user’s observation and evaluation of the operator.

10.10.3 Familiarization. When an operator is directed to operate a digger derrick they are not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues:

(1) The location of the manuals.

(2) The purpose and function of all controls.

(3) Safety devices and operating characteristics specific to the digger derrick.

11. RESPONSIBILITIES OF RENTERS, LESSORS OR LESSEES

11.1 General Responsibilities. Each renter or lessor or lessee shall comply with the requirements of the applicable section or sections below.

11.1.1 Lessor or Lessee as Dealer or Installer. When a lessor or lessee uses the digger derrick as a dealer or installer they shall have the same responsibilities as specified under Section 7 of this standard.

11.1.2 Lessor or Lessee as Owner. When a lessor or lessee uses the digger derrick as an owner they shall have the same responsibilities as specified under Section 8 of this standard.

11.1.3 Lessor or Lessee as User. When a lessor or lessee uses the digger derrick as a user they shall have the same responsibilities as specified under Section 9 of this standard.

11.1.4 Lessor or Lessee as Operator. When a lessor or lessee uses the digger derrick as an operator they shall have the same responsibilities as specified under Section 10 of this standard.

11.2 Ownership Duties. The renter or lessor shall carry out the duties of ownership specified in this standard, which are not assigned to the renting entity or lessee as the user.

11.3 Obligations. Upon delivery each renter or lessor of a digger derrick shall provide the operators manual. This manual shall be stored on the mobile unit.

11.4 Training. The renter or lessor shall offer training or training materials that aid the renting entity or lessee in the operation, inspection, testing and maintenance of the digger derrick. This training shall be offered initially and subsequently on request.

11.4.1 General Training. Only personnel who have received general instructions regarding the inspection, application and operation of digger derricks, including recognition and avoidance of hazards associated with their operation, shall operate a digger derrick. Such items covered shall include, but not necessarily be limited to, the following issues and requirements:

(1) The purpose and use of manuals.

(2) That operating manuals are an integral part of the digger derrick and must be properly stored on the vehicle when not in use.

(3) A pre-start inspection.

(4) Responsibilities associated with problems or malfunctions affecting the operation of the digger derrick.

(5) Factors affecting stability.

(6) The purpose of placards and decals.

(7) Workplace inspection.

(8) Applicable safety rules and regulations, such as Part 4, ANSI/ IEEE C2, National Electrical Safety Code (applies to utility workers as defined in ANSI/IEEE C2). The above standard is an example; other industries using digger derricks have safety rules pertinent to that industry.

(9) Authorization to operate.

(10) Operator warnings and instructions.

(11) Actual operation of the digger derrick. Under the direction of a qualified person, the trainee shall operate the digger derrick for a sufficient period of time to demonstrate proficiency in the actual operation of the digger derrick.

(12) Proper use of personal fall protection equipment when the digger derrick is equipped with a platform(s).

11.4.2 Retraining. The operator shall be retrained, when so directed by the user, based on the user's observation and evaluation of the operator.

11.4.3 Familiarization. When an operator is directed to operate a digger derrick they are not familiar with, the operator, prior to operating, shall be instructed regarding the following items and issues:

(1) The location of the manuals.

(2) The purpose and function of all controls.

(3) Safety devices and operating characteristics specific to the digger derrick.

11.5 Communications. In the event the manufacturer or installer provides the renter or lessor manuals, bulletins or other materials for the information of the user of a digger derrick, the renter or lessor shall pass them on to the user without any undue delay.

SURVEY OF JOB SITE

Appendix (This Appendix is not part of American National Standard A10.31-2006 - but is included for information only.)

Construction and electrical workers are subject to certain hazards that cannot be eliminated by mechanical means and must be controlled by care, common sense and intelligence. Terex South Dakota realizes the importance of safety and strongly recommends that prior to commencing any operation, the employer make a survey of the conditions of the site to determine the hazards and the kind and number of safeguards that the employer will install.

The survey should include, but not be limited to, the following:

(1) Safe access and movement
- (a) Work areas
- (b) Walkways, runways and passageways
- (c) Ladders, stairways and elevators
- (d) Protection for floor and roof openings
- (e) Illumination

(2) Vehicles
- (a) Roads
  - (1) Turn space
  - (2) Parking area
  - (3) Mud areas
- (b) Materials storage areas and dump areas
- (c) Signs and signals to route vehicles on the job
- (d) Maintenance and repairs of vehicles

(3) Utilities and service
- (a) Location of temporary buildings
- (b) Location and identification of high-voltage lines (identify by signs; move, de-energize or erect barrier to prevent contact)
- (c) Location of sanitary facilities and drinking water

(4) Scheduling work for safety
- (a) Providing hard hats, life belts, goggles, work vests and the like on the job
- (b) Establishing liaison among contractors to prevent congestion among trades
- (c) Providing temporary flooring, safety nets and scaffolding where required

(5) Work Procedures
- (a) Space
- (b) Equipment such as cranes, hoists, elevators and trucks
- (c) Rigging procedures
- (d) Personal protective equipment

(6) Tools and equipment
- (a) Repair, maintenance and care
- (b) Inspection
- (c) Supplies of tools for each job

(7) Workers and foremen
- (a) Job assignment
- (b) Training and supervision
- (c) Number of workers
- (d) Plans for maintaining interest in safety:
  - (1) Safety bulletins, record charts and posters
  - (2) Recognition for groups or individuals
  - (3) Investigation and reporting on reportable accidents
  - (4) Knowledge of safety orders
  - (5) Safety meetings
  - (6) Specific safety instructions for new employees
- (e) Establishment of provisions to take immediate action to correct unsafe conditions or acts
- (f) First aid and medical treatment of injuries

APPENDIX - B