REEDRILL™

Part No. 0401928

Operator & Maintenance Manual

Auger Drill Series

270 / 330 / 500 / 600

Reedrill
3501 S. FM Hwy. 1417, Denison, TX 75020 P.O. Box 998, Sherman, TX 75091-0998
Telephone 1-800-854-9030 Telefax 1-800-582-6570 within U.S.A.

Parts Ordering & Product Support

REEDRILL™
The equipment–and the people–you trust

Use only genuine Reedrill parts in the maintenance, rebuild, or repair, of Reedrill machines. Reedrill shall have no liability as to any unauthorized modification of machines or parts and shall have no obligation or liability as to any machines or parts which have been improperly handled, or which have not been operated, maintained, or repaired according to Reedrill's furnished manuals, or other written instructions, or which are operated with other than genuine Reedrill parts.

Your cooperation in furnishing as much information as possible will assist us in filling your orders correctly and in the shortest possible time.

1. IDENTIFICATION OF THE MACHINE

Always furnish the **Reedrill** Model Number and Serial Number when ordering parts. This information is found on the machine nameplate. Rock Drills have the serial number stamped on the cylinder.

2. PART NUMBER AND DESCRIPTION

In addition to the Serial Number, always give the part number and description of each part ordered. If there is any doubt as to the correct part number and description, furnish a dimensioned sketch or return the part to be replaced, transportation charges prepaid.

3. SHIPMENT

Unless otherwise instructed, all shipments will be made via motor freight collect or **UPS** prepaid and charged on our invoice. Shipments cannot be made on open account until your credit has been approved by our Accounting Department.

MAILING ADDRESS
Reedrill
P. O. Box 998
Sherman, TX. 75091-0998

SHIPPING ADDRESS
Reedrill
3501 S. FM Hwy 1417
Denison, TX. 75020

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Telefax 1-800-582-6570
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or Telephone (903) 786-2981
Telefax (903) 786-6408

This safety alert symbol indicates important SAFETY MESSAGES in this manual. When you see this symbol, carefully read the message that follows and be alert to the possibility of personal injury or property damage.

WARNING:
Before Starting Engine, Study Operator's Manual

- **Practice All Safety Precautions**
- **Make Pre-Operations Check**
- **Learn Controls Before Operating**

It is your responsibility to understand and follow manufacturer's instructions on machine operation and service, and to observe pertinent safety precautions, laws, and regulations.

Drill Serial No. : _____

Date Drill Delivered: _____

Dealer : _____

Customer : _____

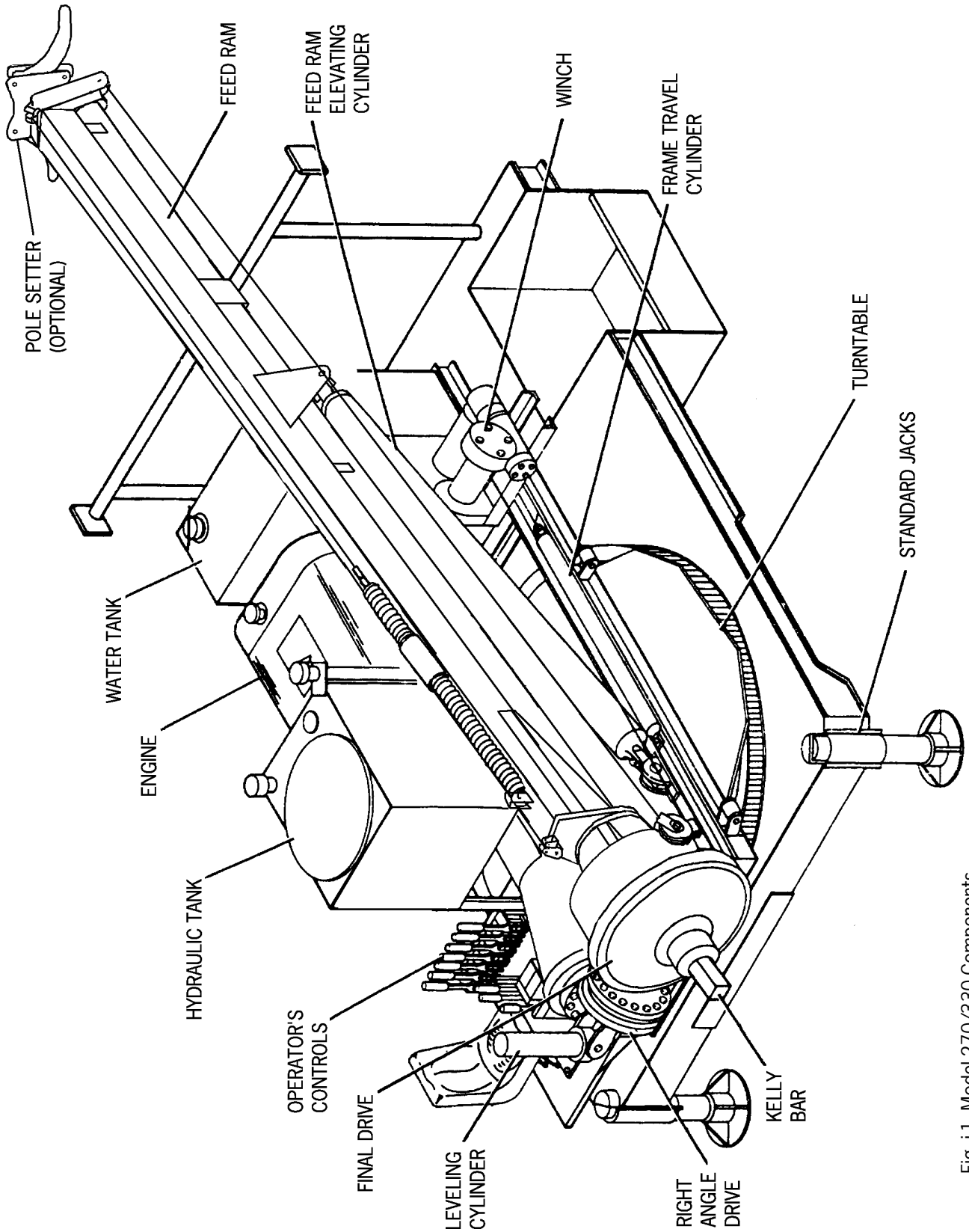

Fig. i-1 Model 270/330 Components

Model 270 & 330 with Outriggers

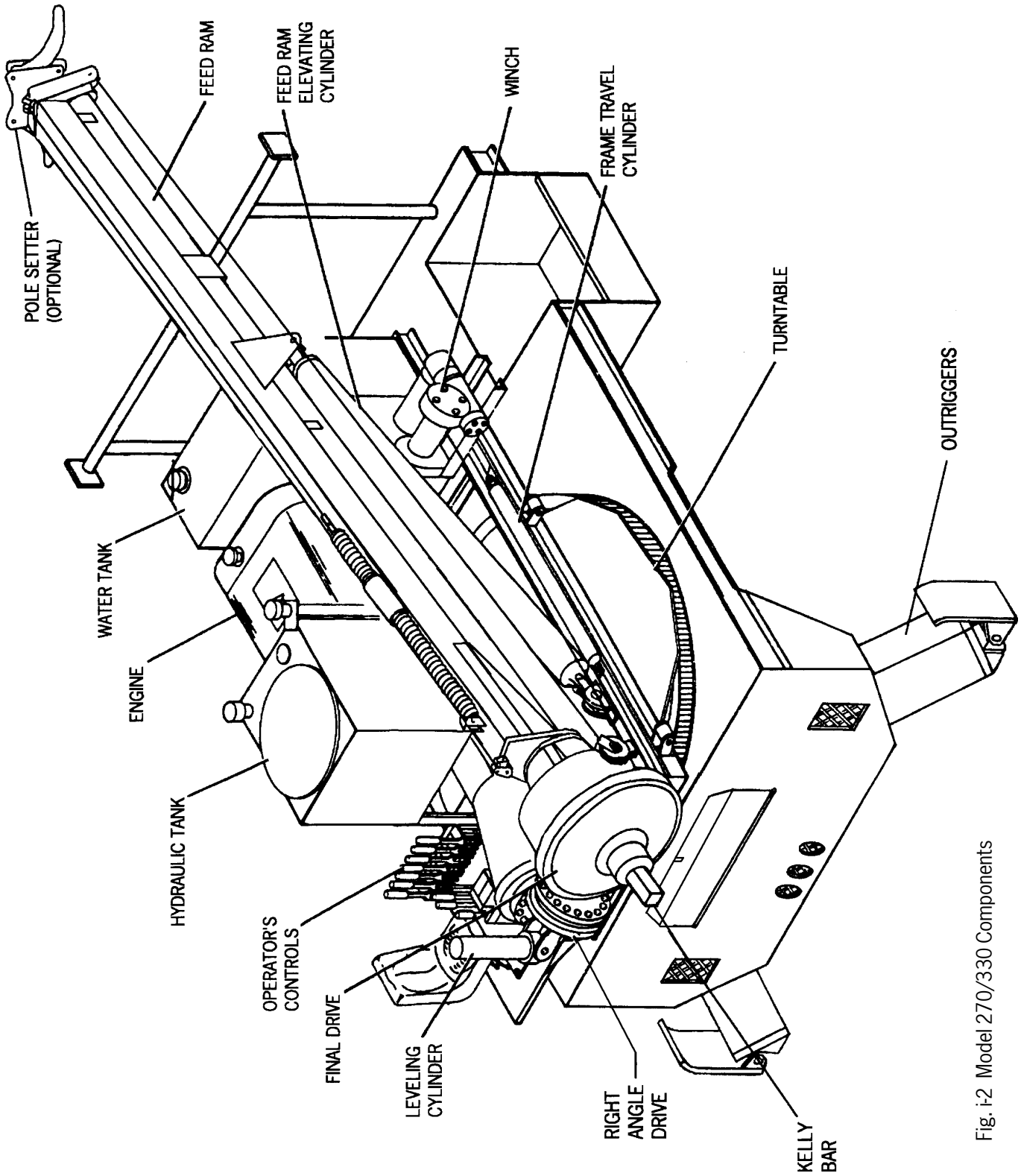

Fig. i-2 Model 270/330 Components

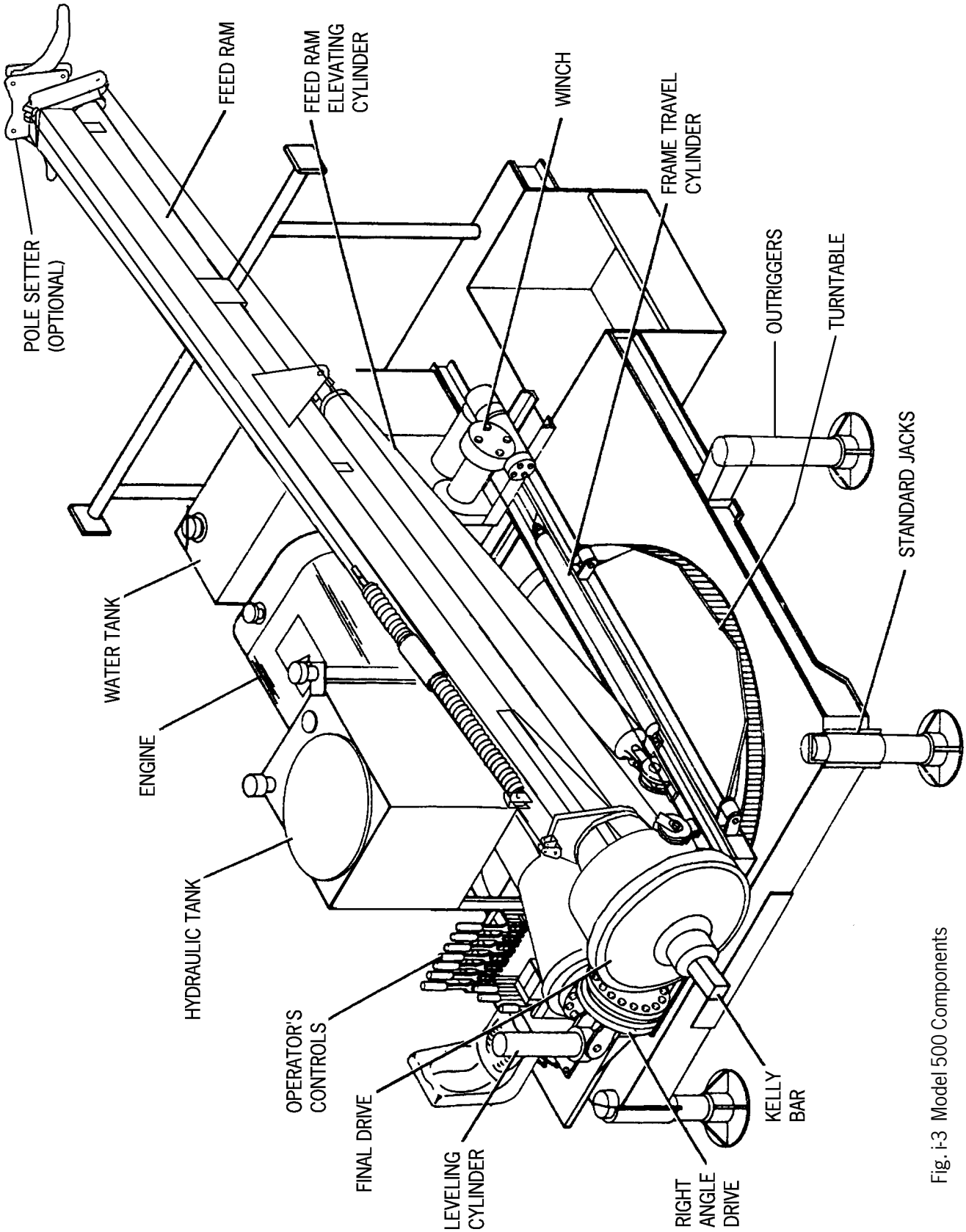

Fig. i-3 Model 500 Components

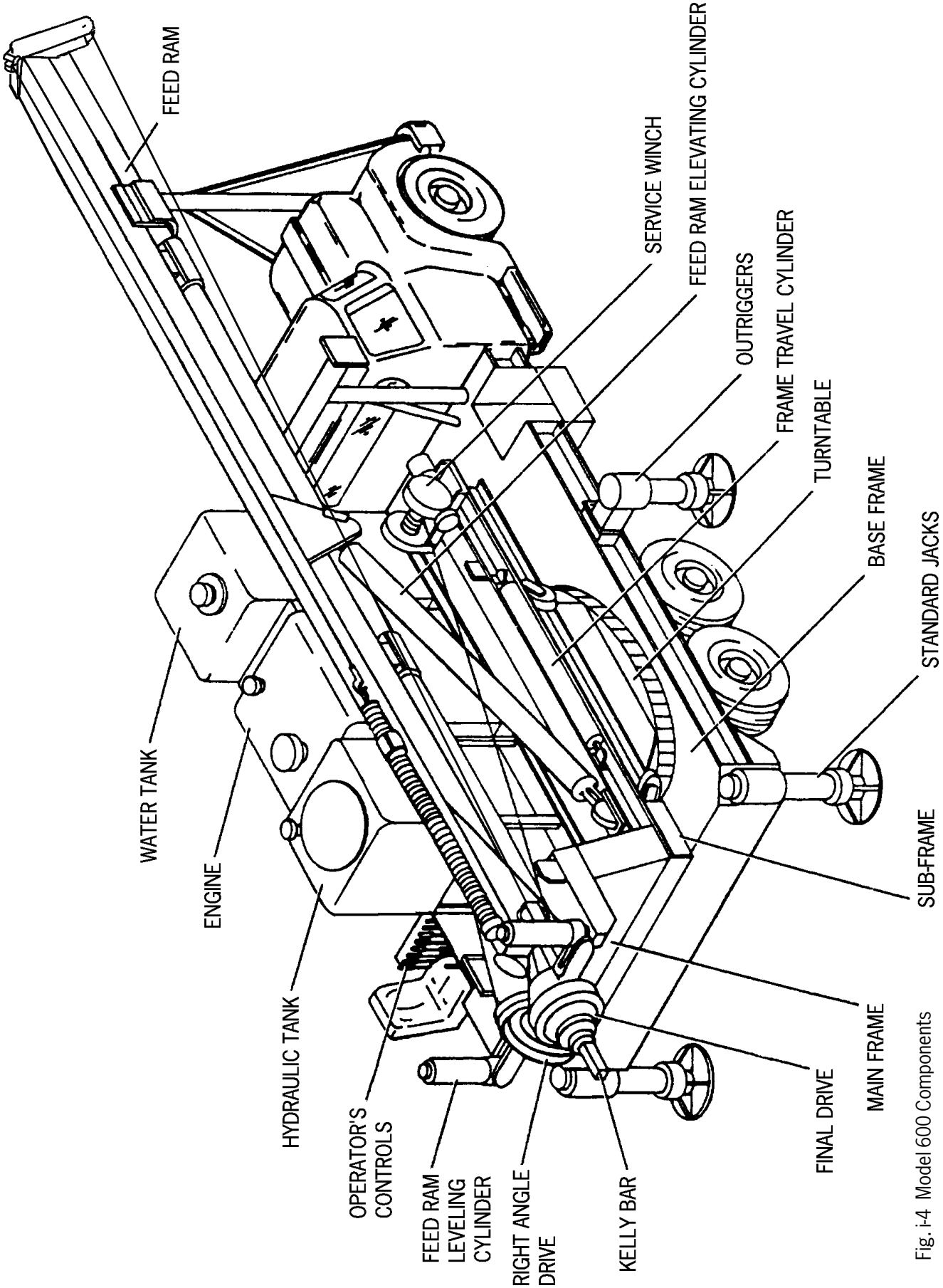

Fig. i-4 Model 600 Components

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Section 1

In this section and those that follow, the word:

DANGER means that severe injury or death will result from failure to follow instruction.
WARNING means that severe injury or death can result from failure to follow instruction.
CAUTION means that minor injury or property damage can result from failure to follow instructions.

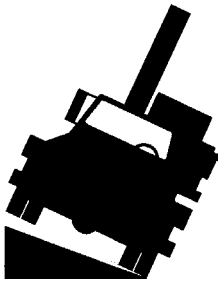
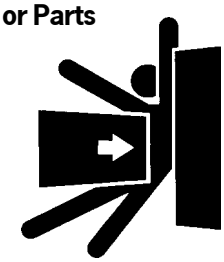
NOTE means that special attention should be given to the instruction.

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 **Reedrill at 1-800-258-0009**.

In this section and those that follow, the word:

DANGER	**means that severe injury or death will result from failure to follow instruction.**
WARNING	**means that severe injury or death can result from failure to follow instruction.**
CAUTION	**means that minor injury or property damage can result from failure to follow instruction.**
NOTE	**means that special attention should be given to the instruction.**

POTENTIAL HAZARD	EFFECT	PREVENTION
Electrical Contact 	**DANGER:** Will cause Serious Injury or Death.	Maintain minimum clearance from 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
Contaminated Air 	**DANGER:** Will cause Serious Injury or Death.	Do Not run machine 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 jacks and outriggers on truck mounted machines 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 auger until all people are clear of the area. Keep all personnel at least 15 ft. (4.6 m) from the Kelly Bar 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.

Before Operation

- **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.
- **Do** study this manual and fully understand the controls.
- **Do** be sure all safety guards are securely in place.
- **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.
- **Do** wear safety helmet and glasses when operating or working on machine.
- **Do** be sure all personnel are clear of the machine and work area before starting the engine or operating the machine.
- **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.
- **Do** keep the area within 15 feet of the Kelly Bar clear of personnel.
- **Do** attach safety chain when using towbar.
- **Do Not** leave tools or other loose objects on the engine compartment or drive mechanisms. They can be thrown with a powerful force.
- **Do Not** operate machine with:
  - A hydraulic leak
  - Damaged hydraulic hoses or fittings
  - Broken or damaged electrical wiring
  - Damaged or missing guards and shields

Operation

- **Do** provide sufficient ventilation when running the engine in an enclosed area. Exhaust gases contain carbon monoxide, a deadly poison, which is colorless and odorless.
- **Do** Keep work area clean and clear of mud, snow, ice, hand tools and other objects.
- **Do** engage brake systems before leaving the machine for any reason.
- **Do** be sure the feed ram (mast) is vertical from side to side with respect to the machine before lowering. Lower slowly to be sure feed ram (mast) will clear other parts of the machine and fit correctly in the feed ram (mast) rest.
- **Do** be sure the jacks and outriggers (if equipped) are retracted before moving the truck.
- **Do maintain minimum clearance from high voltage wires (see chart in this section).** Check with power company and local regulations for specific guidelines and safety information.
- **Do Not** wear loose clothing or jewelry; keep clothing and hands clear of moving parts.
- **Do Not** travel on steep inclines, soft or unstable ground, or close to unsupported excavations.
- **Do Not** move machine if it is in a potentially unstable position.
- **Do Not** move the machine with the Feed Ram (mast) raised. Always lower the Feed Ram and raise the jacks before moving the machine.
- **Do Not** drill near a "bootleg" hole or any hole that may contain explosives.

continued . . .

Operation (con't.)

- **Do Not** attempt to dig unless the jacks are firmly placed and set on a hard surface to eliminate the possibility of turning the truck and digger over.
- **Do Not** attempt to move the machine with a load suspended from the winch line. Always keep the Feed Ram 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.

Clearances from High Voltage Lines	
Voltage	**Minimum Clearance**
up to 50 kv	10 ft. (3 m)
over 50 to 75 kv	11 ft. (3.4 m)
over 75 to 125 kv	13 ft. (4 m)
over 125 to 175 kv	15 ft. (4.6 m)
over 175 to 250 kv	17 ft. (5.2 m)
over 250 to 370 kv	21 ft. (6.4 m)
over 370 to 550 kv	27 ft. (8.2 m)
over 550 to 1000 kv	42 ft. (12.8 m)

Table 1-1 Minimum safe distances from high voltage lines.

After Operation

- **Do** be sure machine is on level ground and all controls are in the NEUTRAL or OFF position.
- **Do** let engine idle for 3 - 5 minutes before shutting off engine.

Maintenance

- **Do** be sure machine and components are well supported before servicing or replacing parts.
- **Do** relieve pressure on hydraulic or pneumatic systems before loosening connections or parts.
- **Do** use only proper tools to make repairs or adjustments.
- **Do Not** service, perform maintenance, or make adjustments while machine is running.
- **Do Not** weld or grind near oil lines.
- **Do Not** smoke or use an open flame near batteries. Batteries can give off hydrogen which is a highly explosive gas.

Equipment Transfer

If all or part of the equipment is shipped to a new destination, always include a complete Operator's Manual or copy of the following topics from the Operator's Manual:

- Safety Section
- Pre-Start Checklist, engine start and shutdown procedures.
- Operating controls for auger drill and truck owners manual.

Section 2

Introduction

This manual contains detailed instructions, maintenance information, and technical data which the operator will need in order to properly operate the **Reedrill** Digger and to perform the various maintenance services that are required for keeping the equipment in good working condition at all times. Included herein are complete descriptions of each operating control and step-by-step instructions on how to start, operate, and stop the equipment, and recommended operator's maintenance procedures.

The maintenance procedures and service instructions in this manual are included as recommendations only and are based on normal equipment working conditions. Changes should be initiated by the user in order to compensate for other than normal conditions and to meet the working requirements of any specific job application.

By faithfully using this manual as a guide, and observing the instructions and recommendations, your **Reedrill** Digger will give you many years of dependable and efficient service at a minimum cost for operation.

Differences in Equipment

The major differences between these models is the depth and diameter of the digging capacity. These **Reedrill** Diggers are the same basic design, with larger components in the larger machines. The instruction material and technical data in this manual includes coverage of major differences in the models.

Engine and Power Train

Power from the 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 auger (kelly) bar.

An optional drive train is the hydrostatic transmission. The hydrostatic drive used in **Reedrill** products is of the closed loop type. This system uses a variable displacement pump with an over-center capability, which provides forward, neutral and reverse. This capability of the pump gives an infinite range of auger speeds from 0 RPM to the maximum attainable at full torque in both forward and reverse. The pump uses a hydro-mechanical servo control which is controlled by an electric input signal. A variable displacement piston motor drives into a speed reducer; power is then transmitted into the standard right angle and final drive assemblies.

Hydraulic System

Oil is furnished by a 54 gal. (204.6 L) or 82 gal. (310.8 L) tank to a gear pump. The pump is driven by a PTO off the transmission. The oil flow from the pump is controlled by self-centering valves, and system pressure is set at 1450 PSI (100 bar). A regeneration valve section is used on the feed ram. The oil is filtered through a filter in the return line to the tank. This system is highly effective and will give long life with minimum maintenance, provided the system is kept clean.

Section 3

Controls - Functions and Limitations

Engine Speed

Mechanical Engines

The foot pedal located directly by the operator's right foot 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.

Electronic Engines

The foot pedal is in the same location as for mechanical engines and the function is the same, except it is connected electronically instead of mechanically. The engine speed may also be controlled by a rocker switch on the instrument panel (see fig. 3-11). This allows engine RPM to be set without having to keep your foot on the foot pedal.

Auger (Kelly) Bar Rotation

CAUTION:
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.

NOTE **The Forward & Reverse Shuttle lever is used on machines with Funk transmissions only. Machines equipped with Allison transmissions or hydrostatic drive do not use this lever.**

The Forward & Reverse Shuttle lever controls the direction of rotation of the auger (kelly) bar on machines with Funk transmissions. By pulling the lever toward the operator, the bar will rotate in a forward direction. When pushed away from the operator against the safety lock, the transmission is in neutral. To engage reverse rotation, two hands will be required: one to disengage the lock and the other to push the control lever past the lock. When returning the control lever back to neutral, the lock will automatically reset. This ensures that reverse direction is not engaged accidentally. On machines equipped with Allison transmissions the direction of rotation of the Kelly bar is controlled by the transmission shifter.

Hydraulic Jacks

WARNING:
DO NOT attempt to dig unless the jacks (truck mounted machines only) 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 jacks and outriggers are retracted before moving the truck. BE SURE all personnel are clear of the jacks and outriggers before operating.

All jacks are controlled by valves in the valve bank and are labeled as to their function. All jacks should be extended before raising the feed ram from its transporting position. The unit may have either straight down rear jacks or straight down rear jacks and front outrigger-type jacks. Front outriggers are standard on Models 500 and 600.

Each jack has its own individual control. Jacks are extended, thus raising the machine by pushing the appropriate lever away from the operator; by pulling the lever toward the operator, the jacks are retracted. Outriggers are extended by pushing the appropriate lever and are retracted by pulling the lever.

Track mounted machines do not use jacks.

Gear Selector

CAUTION:
DO NOT engage a gear range or change from one range to another with the auger bar rotating. Only move the selector lever with the auger bar stationary. Failure to do so will cause extensive damage to the driveline.

To provide the best auger speed for the digging conditions, a 3 or 4-speed gearbox is provided (depending on transmission type). On machines equipped with hydrostatic drive there is no gearbox required. Full torque is available in all speed ranges in both forward and reverse.

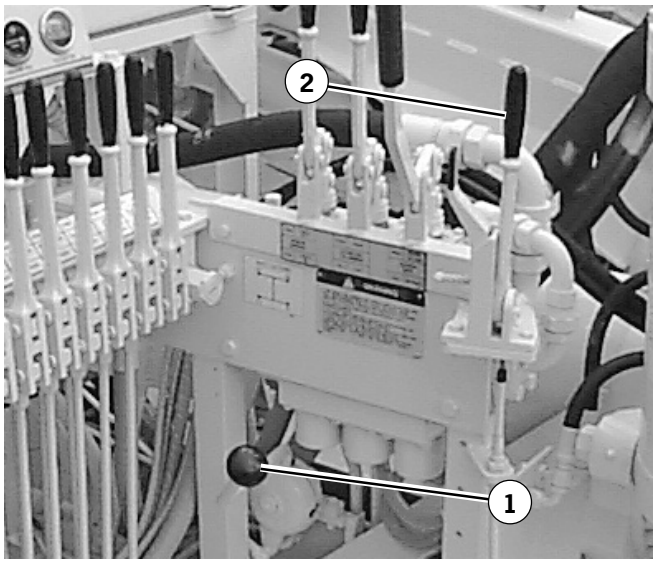


Fig. 3-1 Funk Transmission Shifter (early Model 330)
1. Gear Selector 2. Forward & Reverse Shuttle

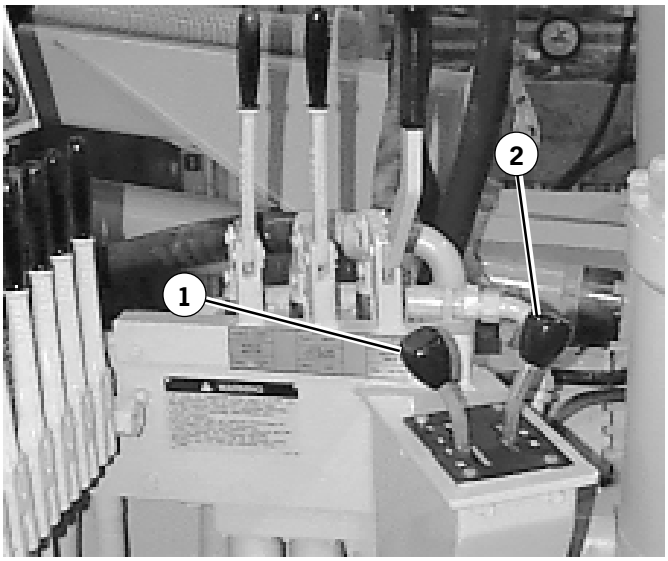


Fig. 3-2 Allison Transmission Shifter (early Model 330)
1. Gear Selector 2. Forward & Reverse Selector

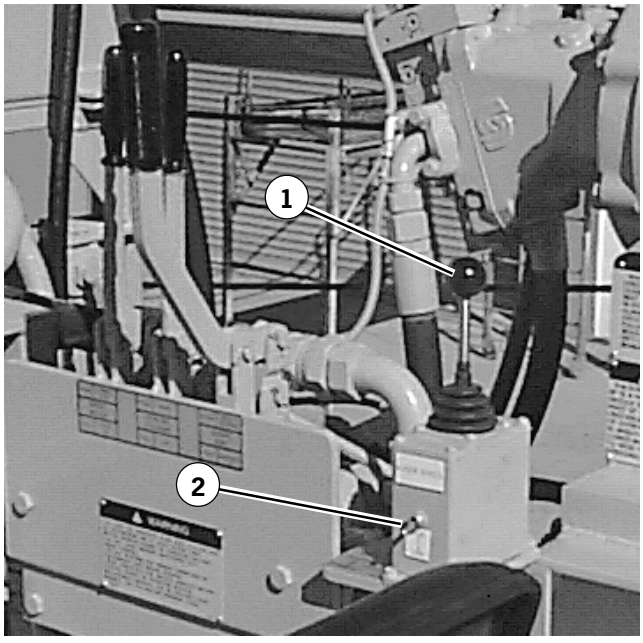


Fig. 3-3 Hydrostatic Control (early Model 600)
1. Forward-Neutral-Reverse Selector
2. High-Low Speed Switch

Feed Ram (Mast) Elevation

DANGER:
BEFORE RAISING MAST always check for overhead power lines or other obstructions.
DO NOT come within 10 feet (3 meters) of power lines.
This machine is not insulated.

CAUTION:
BEFORE LOWERING MAST be sure it is vertical from side-to-side with respect to the machine. Lower slowly to be sure feed ram (mast) will clear other parts of the machine and fit correctly in the headache rack, or equipment damage can result.

The feed ram (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 feed ram (mast) and pushing the lever away from the operator lowers the feed ram (mast). Both operations should be done 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 feed ram (mast) is vertical front to back.

Feed Ram (Mast) Side Leveling

The leveling cylinder positions the feed ram (mast) vertically from left to right. Pushing the control lever away from the operator moves the top of the feed ram to the right; pulling toward the operator moves the top of the feed ram 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 feed ram (mast) is in vertical. Model 600 employs two (2) leveling cylinders operated by a single control.

Auger Crowd

The auger bar and auger are raised and lowered by applying oil to the feed ram. This is accomplished by using the auger crowd control. Pushing the control lever away from the operator lowers the auger (kelly) bar and pulling the lever toward the operator raises the auger (kelly) bar. The lever is spring returned to the neutral position. The control valve has a second position on the lowering side which provides hydraulic regeneration. Regeneration takes the flow of oil exiting the bottom of the feed ram and adds it to the pump flow entering the top. The effect is like adding another pump to the system giving higher speeds going back into the hole.

Turntable (Swing)

WARNING:
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 jacks. Hitting the jacks with the auger can cause damage to the machine.

The turntable, which is hydraulically controlled, provides 240° 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 and pulling the lever toward the operator swings the auger to the left.

Frame Travel

Frame travel greatly expedites spotting the auger over the hole site. Pulling the control lever toward the operator extends the frame and pushing the lever away from the operator retracts the frame. In addition to spotting the auger, frame travel permits larger augers to be swung around the rear jacks. Always have the frame fully retracted before lifting any loads with the winch.

Winch

WARNING:
NEVER attempt to move the machine with a load suspended from the winch line. Always keep the feed ram 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.

The hydraulically driven winch has a safe load rating of 8,000 lbs. (3632 kg.), but the capacity is hydraulically limited to 5,000 lbs (2270 kg.). By pushing the control lever away from the operator, the winch will reel out (or pay out) cable, and by pulling the lever toward the operator, the winch will reel in (pull in) cable. When setting poles or using the winch for any type of heavy work, retract the frame fully, with the feed ram vertical, place the auger on the ground and apply some down pressure. Jacks should also 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.

Polesetter Extension (Option)

DANGER:
DO NOT operate machine within 10 feet (3 meters) of electric power lines. This machine is not insulated.

CAUTION:
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 polesetter 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.

Pole Aligner (Option)

When setting poles, the pole may be aligned by the use of the hydraulic pole aligner clamps. They are closed by pushing the control lever away from the operator and opened by pulling the lever toward the operator.

Tamp Control (Option)

The **Reedrill** digger 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 bulkhead quick-disconnects and does not perform a function until connected to an external hydraulic tool.

Auger Sizes

WARNING:
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 **Reedrill** diggers, **under ideal digging conditions (i.e.: Soft Dirt, NOT ROCK):**

270	56" (142 cm) diameter maximum
330 - 600	72" (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 Pedestal - Features

The operator's seat pedestal features a positive lock with an anti-sway control. It has spring power height adjustment and locks in place at one inch increments. It has a 360° swivel with infinite locking positions.

To Adjust:

1. Pull up on lever to swivel, push down to lock.
2. Loosen locknut and pull up lever to change seat height. Push down lever and tighten locknut to lock.

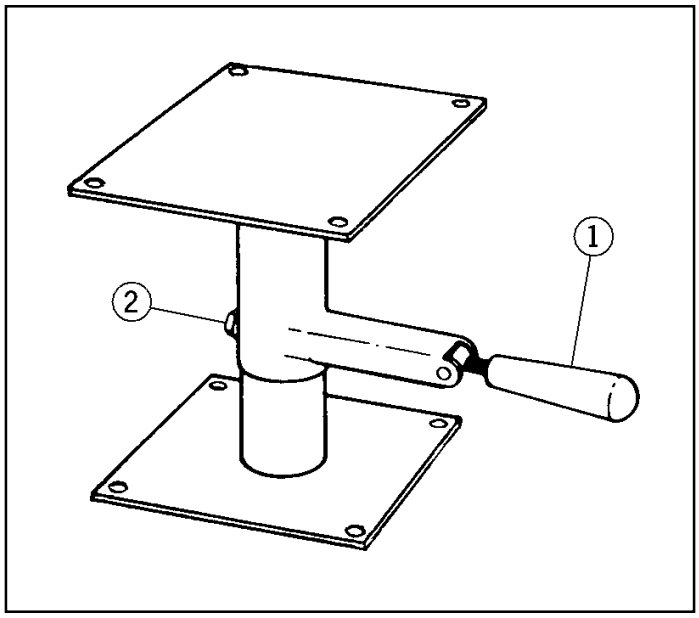


Fig. 3-4 Operator's Seat Pedestal
1. Swivel and height adjusting lever
2. Height Locknut

Model 270 Operator's Controls

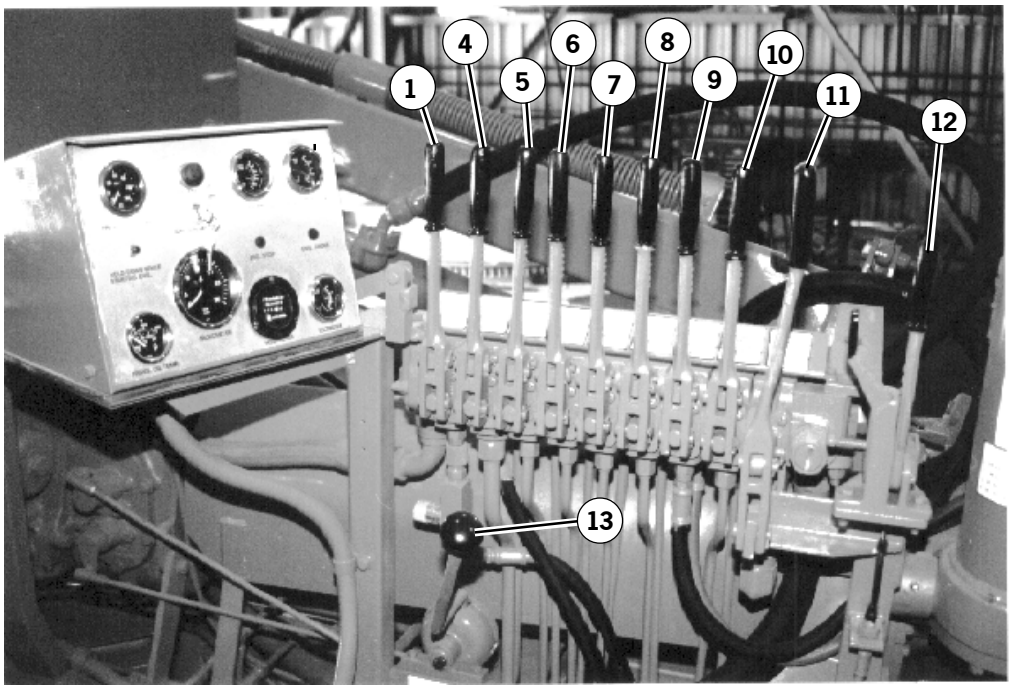


Fig. 3-5 Operator's Controls - Model 270 with Funk Transmission

1. Tamp (Hydraulic Tool)
2. Pole Aligner (optional)
3. Polesetter Extension (optional)
4. Winch
5. Left Rear Jack
6. Right Rear Jack
7. Turntable (Swing)
8. Frame Travel
9. Leveling Cylinder
10. Elevating Cylinder
11. Auger Crowd
12. Forward and Reverse Shuttle
13. Transmission Shifter

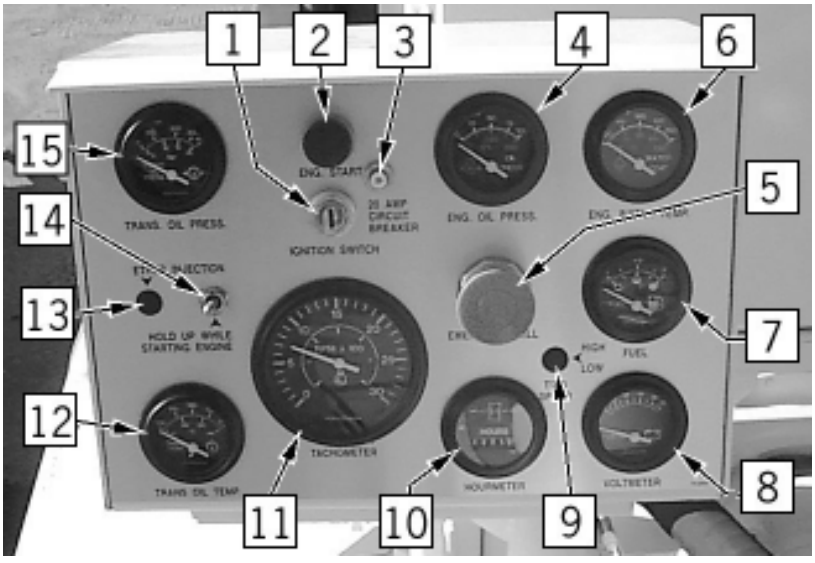


Fig. 3-6 Instrument Panel - common to all models with non-electronic engines.

1. Ignition Switch
2. Engine Start Button
3. Circuit Breaker Reset
4. Engine Oil Pressure
5. EMERGENCY STOP
6. Engine Water Temp.
7. Fuel Level
8. Voltmeter
9. (track machines only)
10. Hourmeter
11. Tachometer
12. Trans. Oil Temperature
13. Ether Switch (optional)
14. Oil Press. By-pass Switch
15. Trans. Oil Pressure

Early Model 330 & 500 Operator's Controls

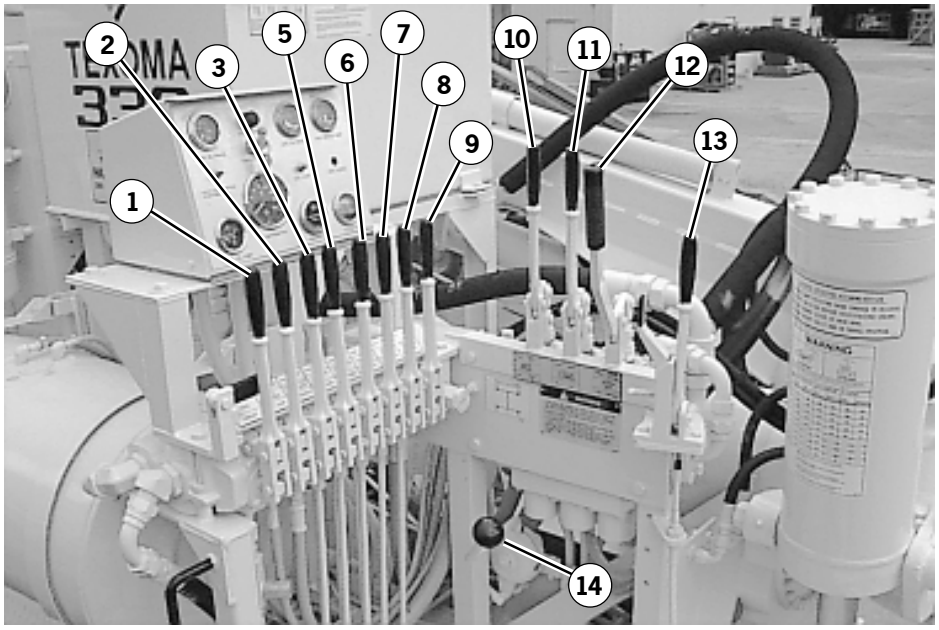


Fig. 3-7 Operator's Controls - Model 330 with Funk Transmission (early models)

1. Tamp Control (optional)
2. Pole Aligner (optional)
3. Polesetter Extension (optional)
4. Front Outrigger (Model 500)

4a. Left Front Jack Model 500)
4b. Right Front Jack (Model 500)

5. Left Rear Jack
6. Right Rear Jack
7. Turntable (Swing)
8. Frame Travel
9. Elevating Cylinder
10. Winch
11. Leveling Cylinder
12. Auger Crowd
13. Forward and Reverse Shuttle
14. Transmission Shifter

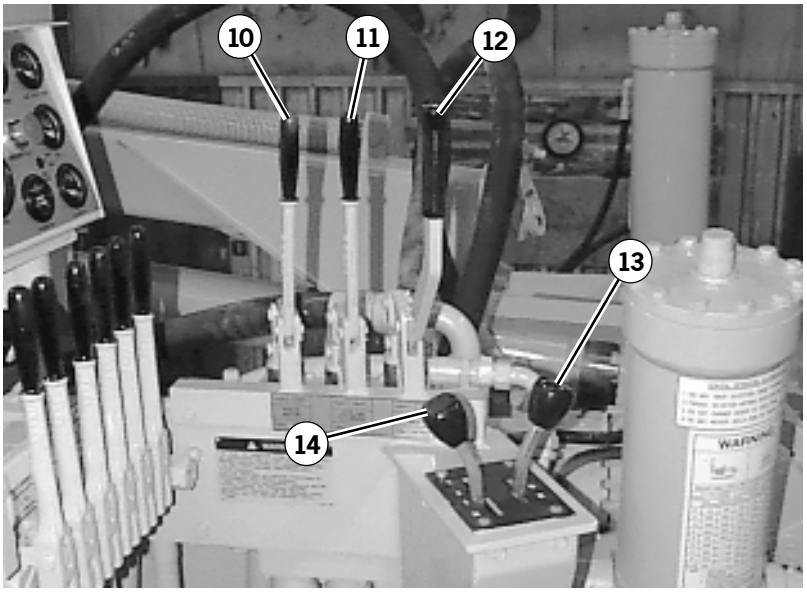


Fig. 3-7a Operator's Controls - Model 330 with Allison Transmission (early models)

10. Winch
11. Leveling Cylinder
12. Auger Crowd
13. Forward-Neutral-Reverse Selector
14. Gear Selector

Early Model 600 Operator's Controls

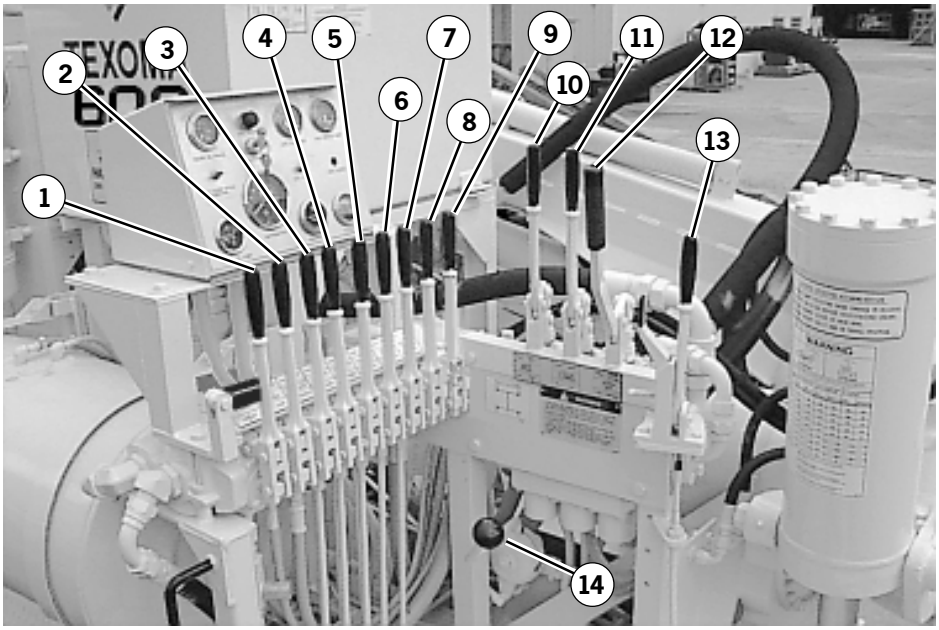


Fig. 3-8 Operator's Controls - Model 600 with Funk Transmission

1. Tamp Control (optional)
2. Front Outrigger
3. Left Front Jack
4. Right Front Jack
5. Left Rear Jack
6. Right Rear Jack
7. Turntable (Swing)
8. Frame Travel
9. Elevating Cylinder
10. Winch
11. Leveling Cylinder
12. Auger Crowd
13. Forward and Reverse Shuttle
14. Transmission Shifter

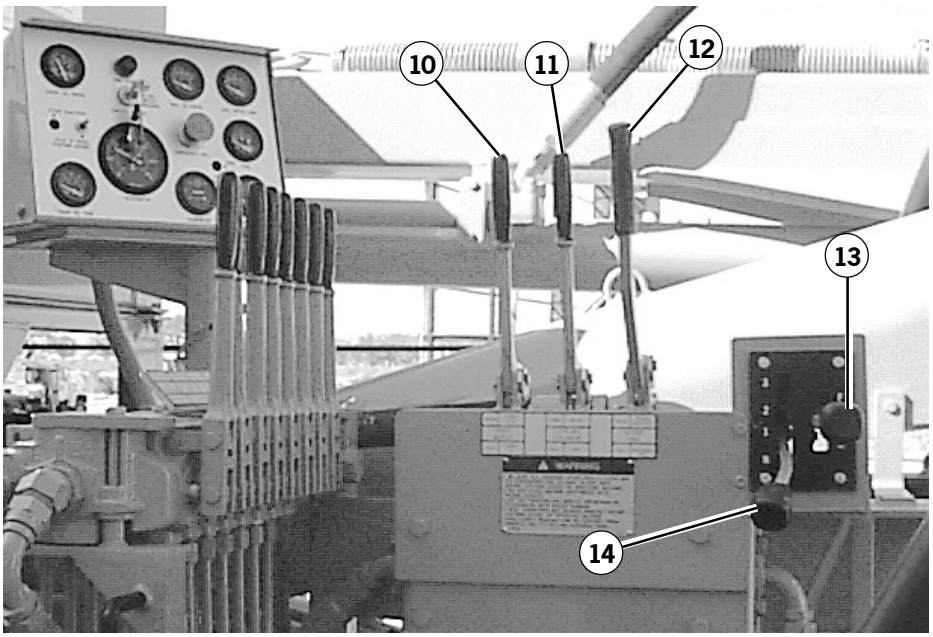


Fig. 3-8a Operator's Controls - Model 600 with Allison Transmission

10. Winch
11. Leveling Cylinder
12. Auger Crowd
13. Forward-Neutral-Reverse Selector
14. Gear Selector

Early Model 600T Operator's Controls

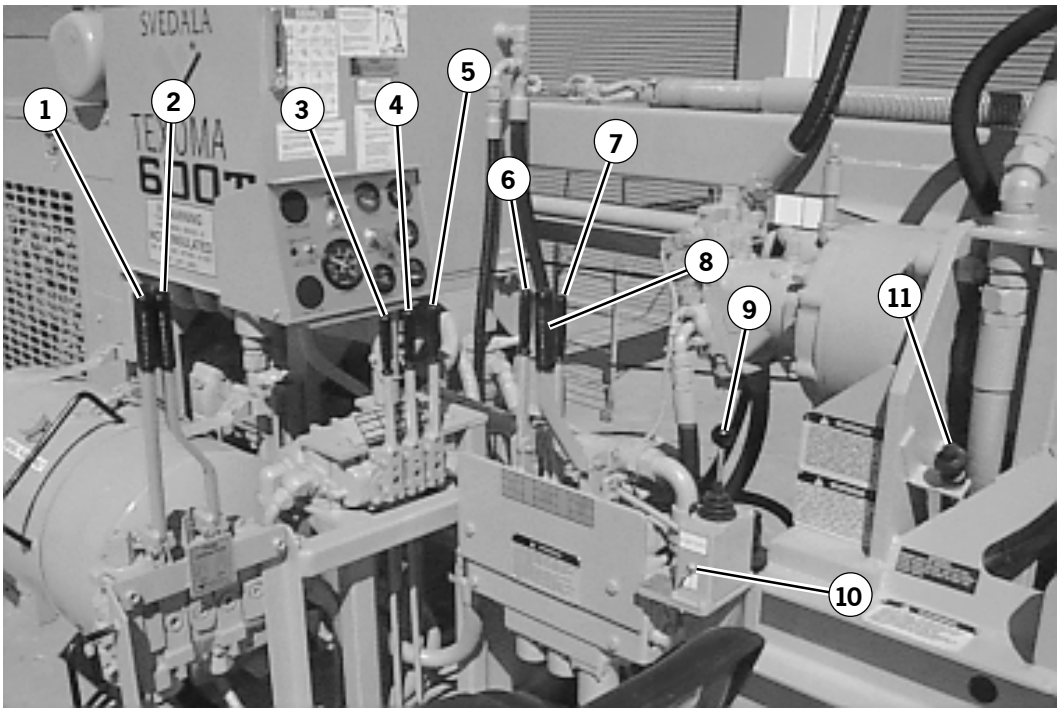


Fig. 3-9 Operator's Controls - Model 600T Hydrostatic

1. Tram Lever - Left Track
2. Tram Lever - Right Track
3. Turntable (Swing)
4. Frame Travel
5. Elevating Cylinder
6. Winch
7. Leveling Cylinder
8. Auger Bar
9. Hydrostatic Control
10. High-Low Auger Speed Switch
11. Engine Throttle

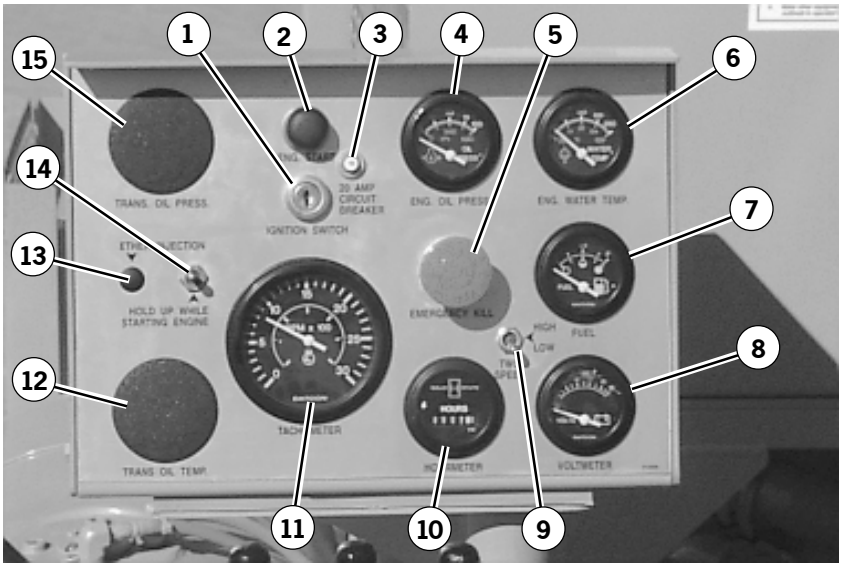


Fig. 3-9a Instrument Panel - Model 600T Hydrostatic with non-electronic engine.

1. Ignition Switch
2. Engine Start Button
3. Circuit Breaker Reset
4. Engine Oil Pressure
5. EMERGENCY STOP
6. Engine Water Temp.
7. Fuel Level
8. Voltmeter
9. High-Low Tram Switch
10. Hourmeter
11. Tachometer
12. Trans. Oil Temp. (optional)
13. Ether Switch (optional)
14. Oil Press. By-pass Switch
15. Trans. Oil Press. (optional)

Late Model 330 - 600 Operator's Controls

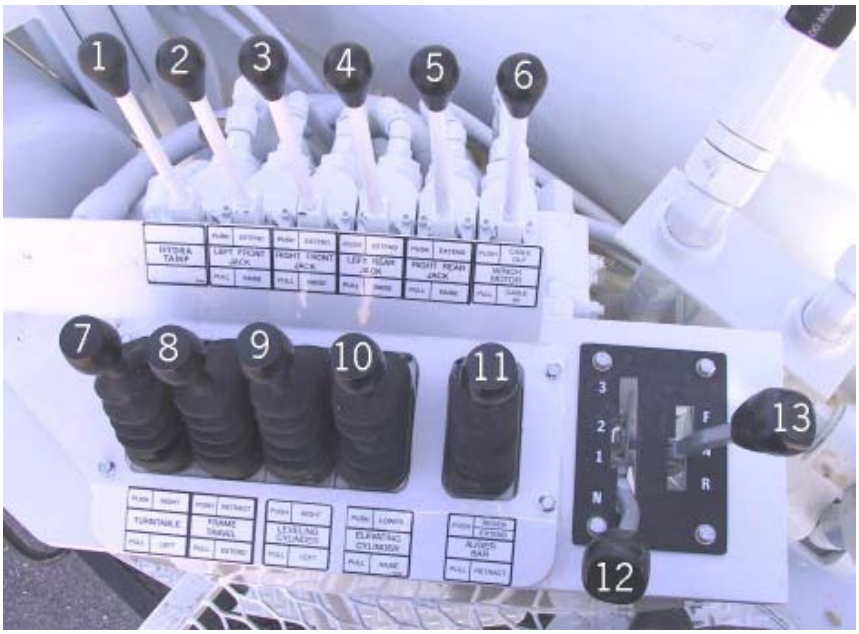


Fig. 3-10 Operator's Controls - Models 330 - 600 (late model)

1. Tamp Control (optional)
2. Left Front Jack
3. Right Front Jack
4. Left Rear Jack
5. Right Rear Jack
6. Winch Motor
7. Turntable Swing
8. Frame Travel (In - Out)
9. Leveling Cylinder
10. Elevating Cylinder Cylinder
11. Auger Crowd
12. Transmission Gear Selector
13. Forward-Neutral-Reverse Selector

NOTE **If optional Pole Aligner and Polesetter Extension are used, they would go between items 1 and 2.**

Electronic Engine Instrument Panel

Machines manufactured in 2003 and later are equipped with Tier II electronic engines. These engines meet the Tier II emission certification standards for the U.S. EPA and European Union Council (EU). The electronic instrument panel is linked to the Engine Control Unit (ECU). This allows the operator to monitor engine performance as well as to diagnose any trouble during engine operation. Refer to John Deere operator's manual for electronic engines for complete information and a listing of diagnostic codes.

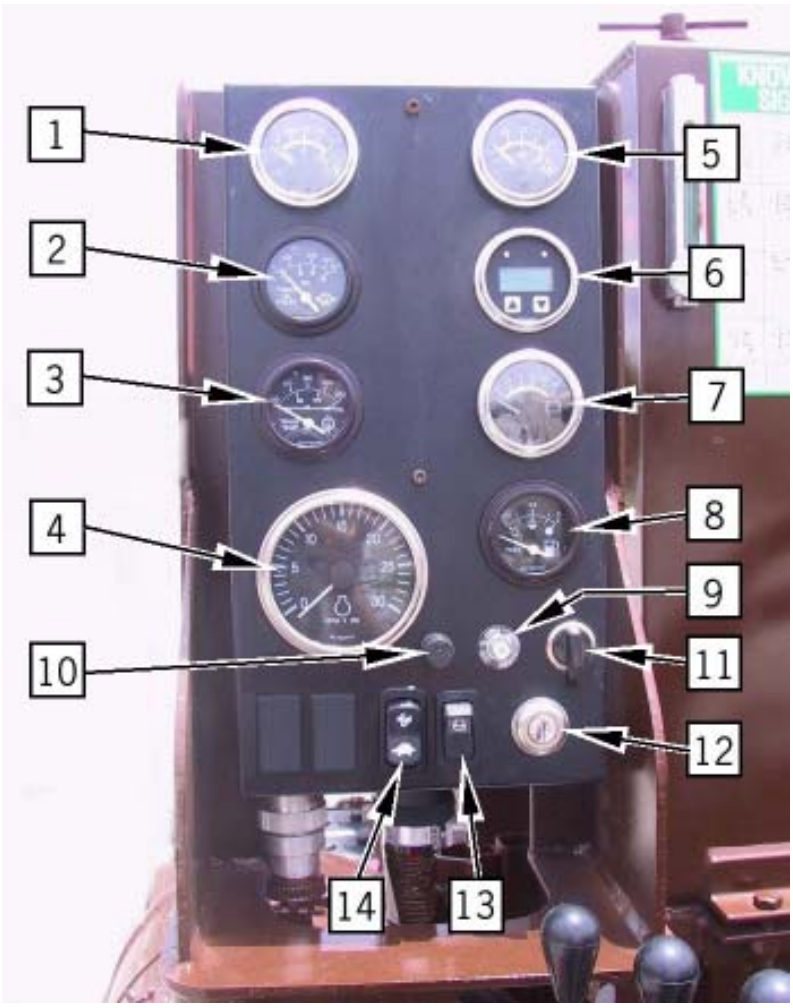


Fig. 3-11 Tier II Instrument Panel for John Deere 6068 Series Engine

1. Engine Water Temp.
2. Transmission Oil Press.
3. Transmission Oil Temp.
4. Tachometer
5. Engine Oil Pressure
6. Diagnostic Gage/Hourmeter
7. Voltmeter
8. Fuel Gage
9. 20 Amp. Circuit Breaker
10. 5 Amp Fuse Holder
11. 12 VDC Accessory
12. Ignition Switch
13. Shutdown Override Switch
14. Engine Throttle

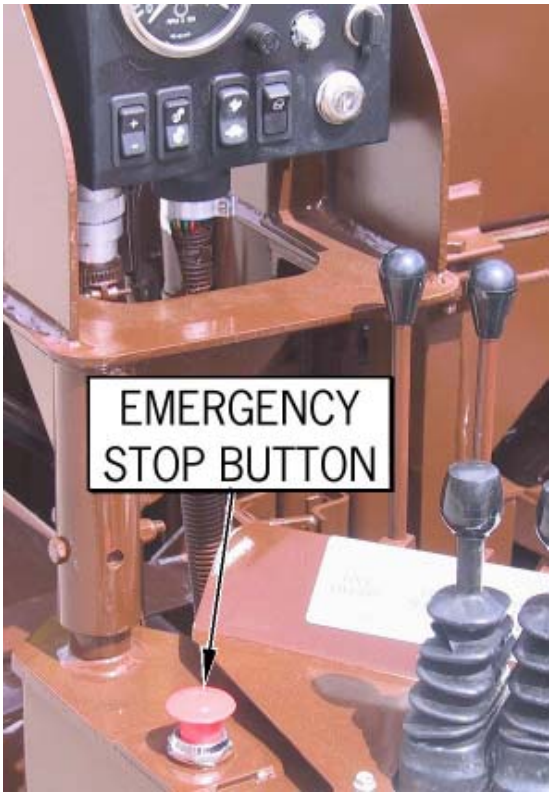


Fig 3-12 Emergency Stop Button - located to left of control levers and under instrument panel.

Electronic Engine Instrument Panel

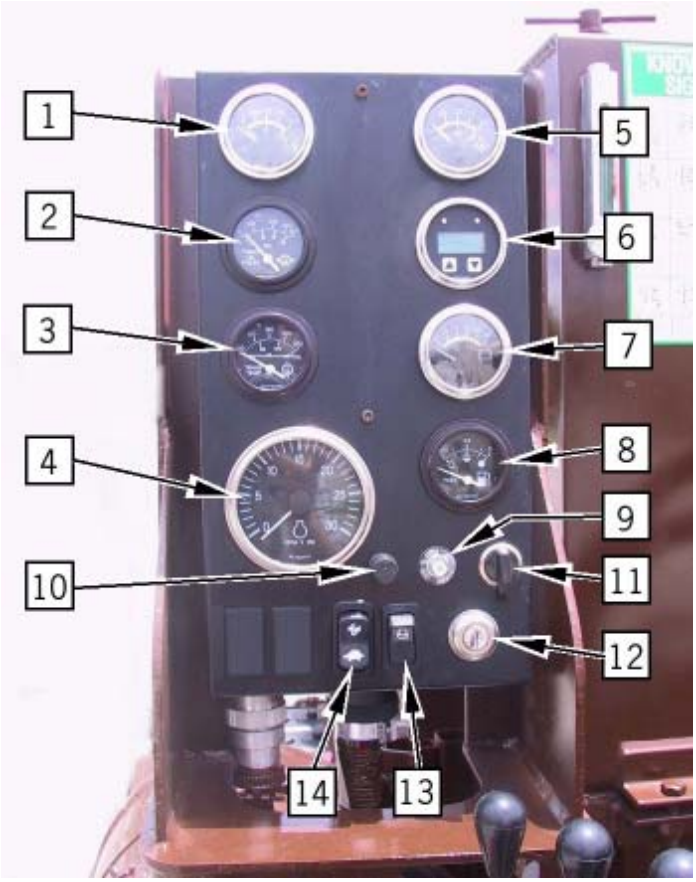


Fig. 3-11 Tier II Instrument Panel
for John Deere 6068 Series Engine
1. Engine Water Temp.
2. Transmission Oil Press.
3. Transmission Oil Temp.
4. Tachometer
5. Engine Oil Pressure
6. Diagnostic Gage/Hourmeter
7. Voltmeter
8. Fuel Gage
9. 20 Amp. Circuit Breaker
10. 5 Amp Fuse Holder
11. 12 VDC Accessory
12. Ignition Switch
13. Shutdown Override Switch
14. Engine Throttle

Engine Speed

The engine speed can be controlled in two ways:

1. Use the foot controlled accelerator pedal which is connected electronically to the engine.
2. Use the rocker switch (14) on the instrument panel. Press and hold the upper part of the switch (rabbit) and RPM will increase to max. setting (2200 RPM). Press and hold the lower part of the switch (turtle) and RPM will decrease to low idle setting (800 RPM). If you push and release the switch, RPM will increase or decrease in 25 RPM increments.

Engine Diagnostics

1. The diagnostic/hourmeter gauge (6) displays engine hours as well as list of other engine functions and diagnostic codes. The other functions and codes can be accessed by pressing the up and down arrows under the display window. See engine manual for a complete listing of functions and diagnostic codes. If the **amber light** on the left side of the gauge comes on, this indicates and abnormal condition, such as low engine oil pressure, etc. Use the diagnostic gauge to determine the trouble. If the **red light** on the right side of the gauge comes on, this signals the operator to **STOP ENGINE** as soon as safely possible. A condition exists that could cause damage to the engine.
2. The shutdown override switch (13) will enable the engine to run in 30 second increments for trouble shooting purposes. This will override the engine shutdown signal from the Electronic Control Unit (ECU).

Section 4

Machine Checkpoints

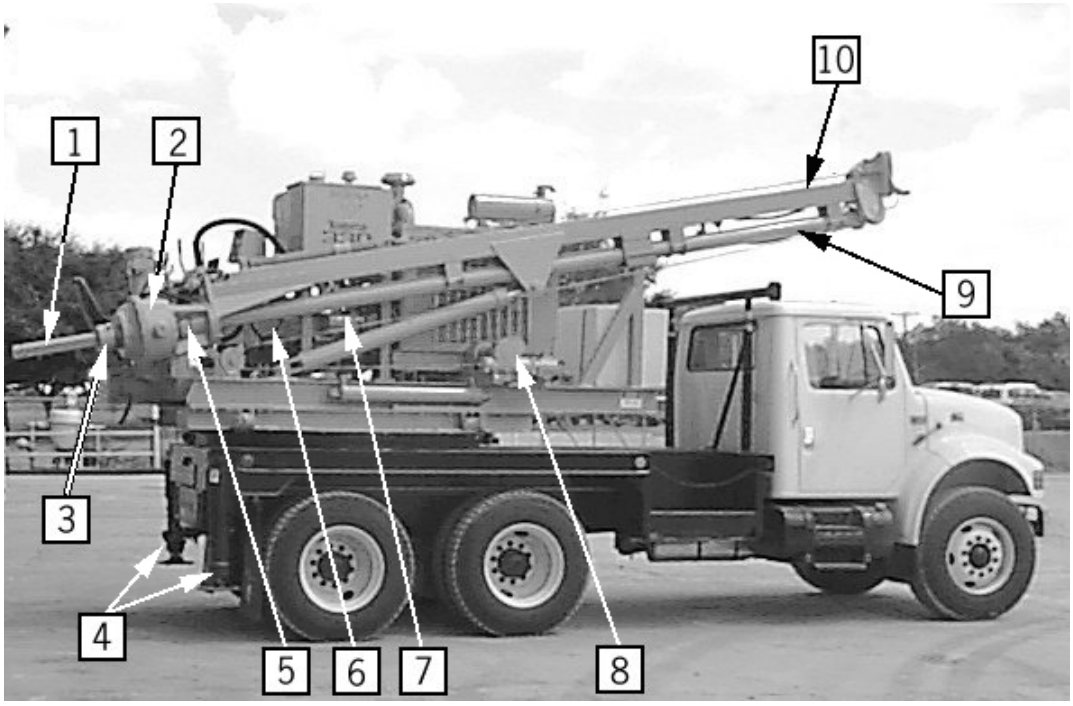


Fig. 4-1 Right Side Checkpoints - Model 330 shown

1. Kelly Bar
2. Final Drive
3. Lower Packing
4. Rear Jacks
5. Upper Packing
6. Driveline
7. Pump/Transmission
8. Winch
9. Feed Ram
10. Mast

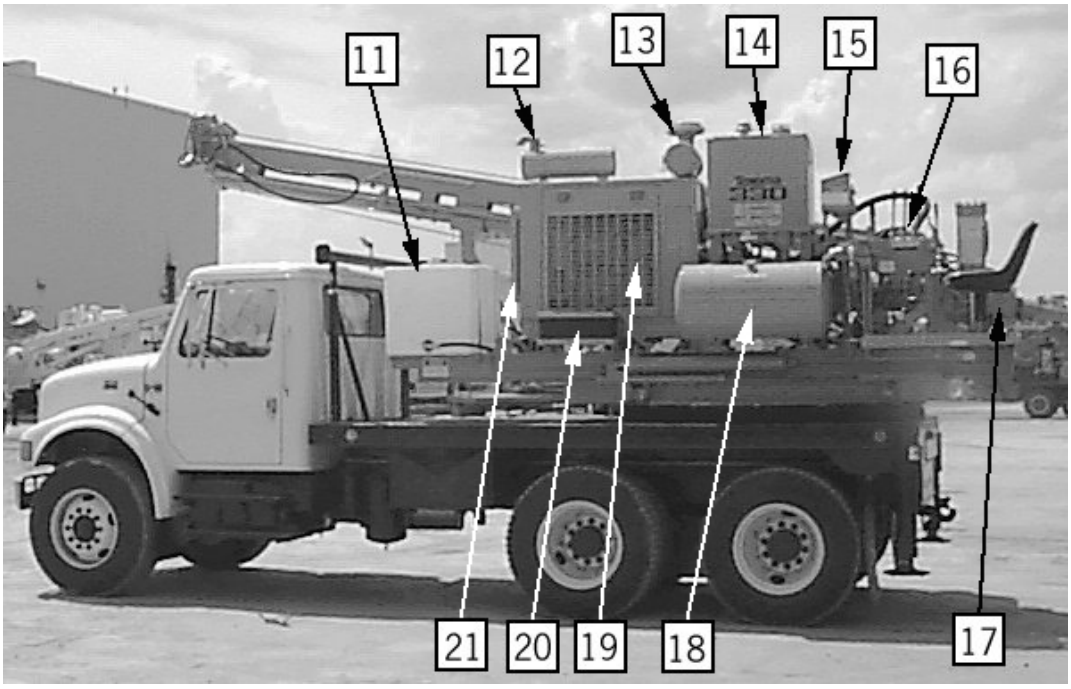


Fig. 4-1a Left Side Checkpoints - Model 330 shown

11. Water Tank
12. Muffler/Exhaust
13. Air Filter
14. Hydraulic Tank/Filter
15. Instrument Panel/Wiring
16. Hydraulic Valves
17. Right Angle Drive
18. Fuel Tank/Lines
19. Engine/Radiator
20. Battery/Connections
21. Oil Cooler/Lines

Although the digger is shipped from the factory ready for use, prior to placing the digger in use for the first time a thorough visual inspection should be made in order to detect any damage or losses which may have occurred during shipment.

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 **Fig's. 4-1 and 4-1a show general checkpoint locations, and may not be all inclusive. Older model machines and other models than shown may have components in different locations. 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 general working condition. Look for loose, missing, or damaged parts, especially making 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 cause a ruined ("dusted") 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 (does not apply to hydrostatic units) 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 feed ram gland for correct oil seepage at both the upper and lower packings (refer to Service Manual for details on adjustments).
13. Make a visual inspection of all gauges to see that there is no broken glass or loose wires.
14. Make sure the complete digger is greased at the required locations (refer to lubrication section).

Start-up Procedures

WARNING:
DO NOT operate machine before you have read and understood all warnings and cautions listed in section 1 of this manual.
CHECK for obstructions before moving machine.
DO NOT use ether (starting fluid) on engines equipped with air intake heaters or glow plugs.
Ether is highly flammable.

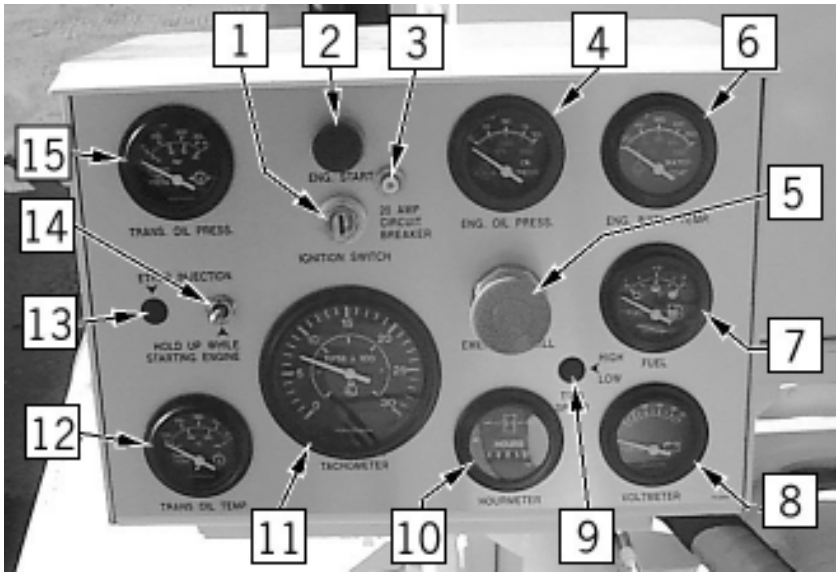


Fig. 4-2 Instrument Panel - common to all models with non-electronic engines

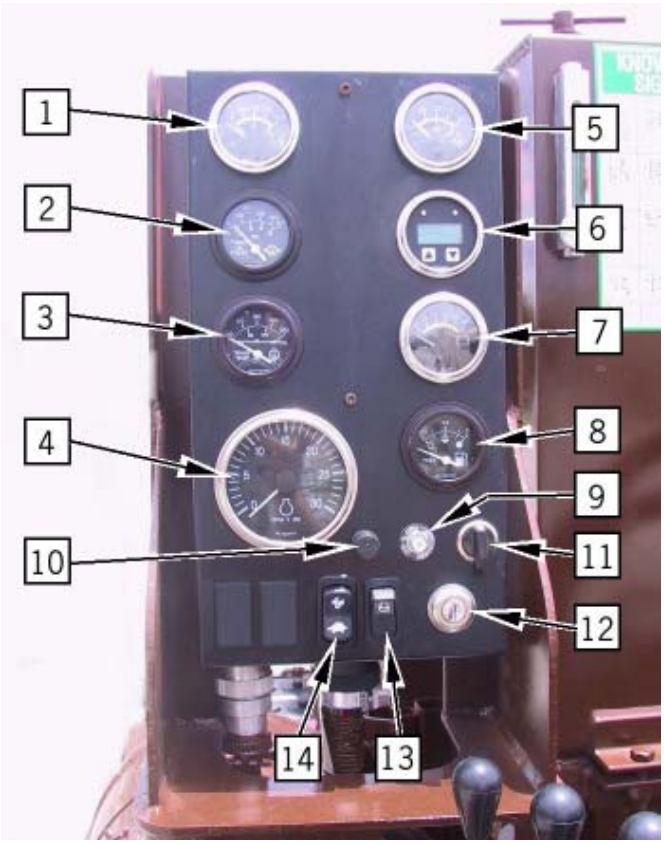
1. Ignition Switch
2. Engine Start Button
3. Circuit Breaker Reset
4. Engine Oil Pressure
5. EMERGENCY STOP
6. Engine Water Temp.
7. Fuel Level
8. Voltmeter
9. (track machines only)
10. Hourmeter
11. Tachometer
12. Trans. Oil Temperature
13. Ether Switch (optional)
14. Oil Press. By-pass Switch
15. Trans. Oil Pressure

Start-up Procedure (non-electronic engine)

1. Complete the Pre-start checklist BEFORE starting machine. If temperature is below 32° F (0°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 (1) to ON position.
4. Press and hold LOW ENGINE OIL PRESSURE OVERRIDE SWITCH (14) while pressing ENGINE START BUTTON (2). Keep foot off throttle. When engine starts, release start button, continue to hold override switch in until oil pressure builds up so engine will keep running when override switch is released.

NOTE **Do Not engage starting motor for more than 30 seconds. Wait two minutes before attempting to start again.**

5. Check all gauges for normal operation. If operation is not normal, stop engine and remedy the cause.
6. 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.



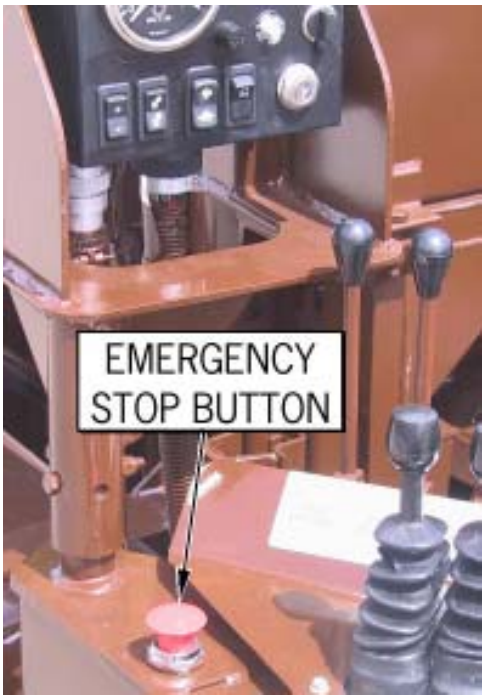


Fig 4-2b Emergency Stop Button - located to left of control levers and under instrument panel.

Fig. 4-2a Tier II Instrument Panel for John Deere Electronic Engine

1. Engine Water Temp.
2. Transmission Oil Press.
3. Transmission Oil Temp.
4. Tachometer
5. Engine Oil Pressure
6. Diagnostic Gage/Hourmeter
7. Voltmeter
8. Fuel Gage
9. 20 Amp. Circuit Breaker
10. 5 Amp Fuse Holder
11. 12 VDC Accessory
12. Ignition Switch
13. Shutdown Override Switch
14. Engine Throttle

Start-up Procedure (electronic engine)

1. Complete the Pre-start checklist BEFORE starting machine. If temperature is below 32° F (0°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 (12) clockwise to crank engine, when engine starts, release key to ON position.

NOTE **Do Not engage starting motor for more than 30 seconds. Wait two minutes before attempting to start again.**

4. Check all gauges 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.

Cold Start Procedure

CAUTION:
DO NOT use ether (starting fluid) on engines equipped with air intake heaters or glow plugs.
Ether is highly flammable.

- Consult engine operator manual for specific instructions regarding cold weather starting procedures and troubleshooting.
- Fully depress throttle after engaging starter. See chart below and use ether if needed. Use ether injection (if equipped) or have someone spray ether into engine air cleaner intake while cranking engine. Do not use excessive amounts of ether or engine damage will result.
- If engine does not start after three attempts, check the fuel supply system. Absence of blue or white exhaust smoke during cranking indicates no fuel is being delivered.
- After engine starts, be sure engine oil pressure is indicated on gauge.

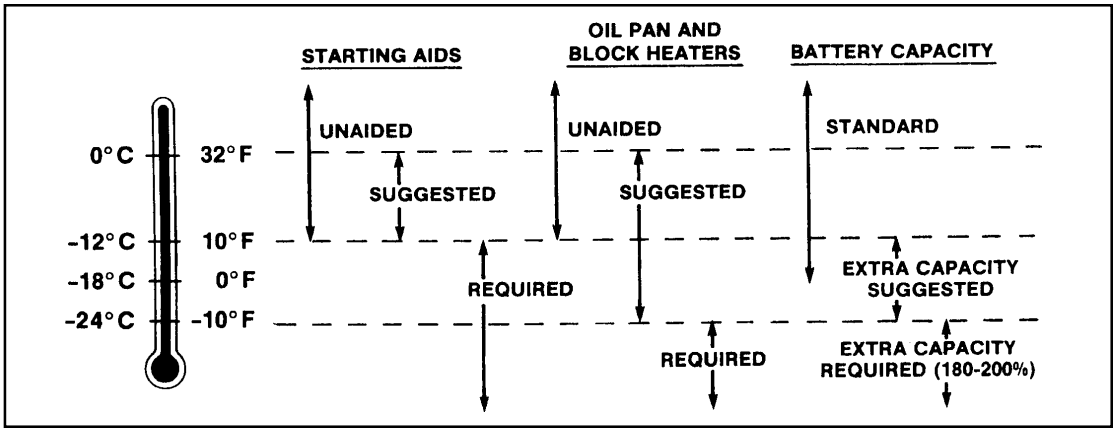


Table 4-1 Cold Weather Starting Aid Suggestion (ref. Cummins B Series Engines)

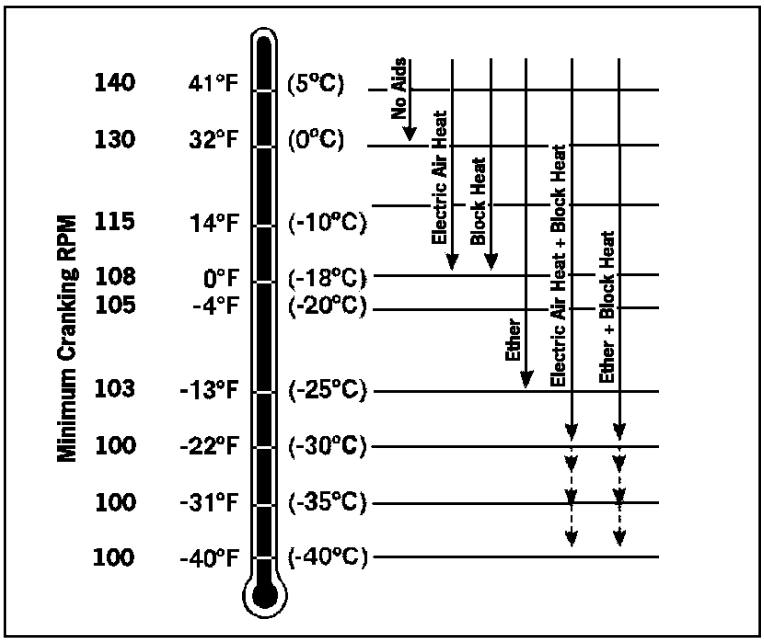


Table 4-2 Cold Weather Starting Aid Suggestion (ref. John Deere 6068 Series Engines - 6.8 L)

Shutdown Procedures (non-electronic engine)

Emergency Shutdown

1. Press the **RED Emergency Stop button** on the instrument panel 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

1. Lower the mast into the transport position.
2. Retract the in/out frame travel.
3. Raise the jacks and retract outriggers (if equipped).
4. Let the engine run at idle for at least two minutes and then shut off the engine.

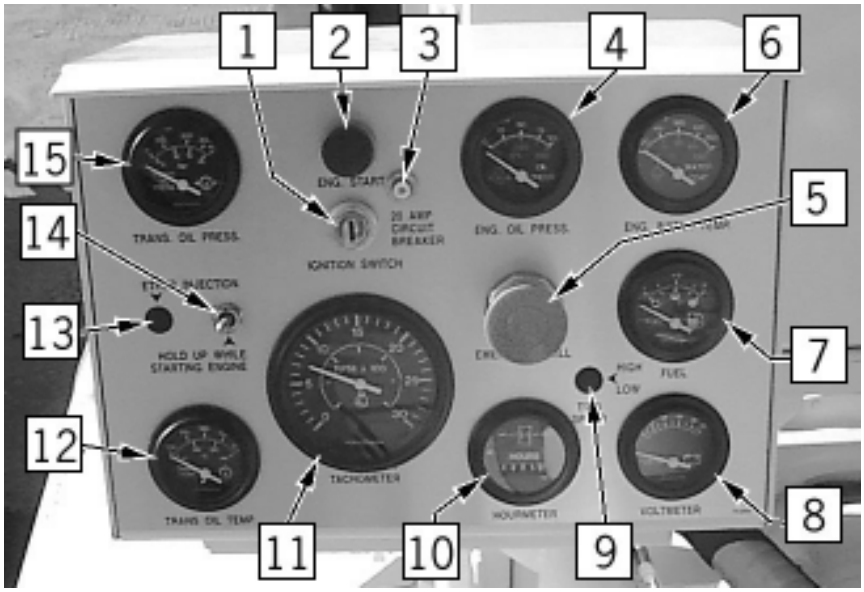


Fig. 4-2 Instrument Panel - common to all models with non-electronic engines

1. Ignition Switch
2. Engine Start Button
3. Circuit Breaker Reset
4. Engine Oil Pressure
5. EMERGENCY STOP
6. Engine Water Temp.
7. Fuel Level
8. Voltmeter
9. (track machines only)
10. Hourmeter
11. Tachometer
12. Trans. Oil Temperature
13. Ether Switch (optional)
14. Oil Press. By-pass Switch
15. Trans. Oil Pressure

Shutdown Procedures (electronic engine)

Emergency Shutdown

1. Press the **RED Emergency Stop button** under the instrument panel (fig. 4-2b) 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

1. Lower the mast into the transport position.
2. Retract the in/out frame travel.
3. Raise the jacks and retract outriggers (if equipped).
4. Let the engine run at idle for at least two minutes and then shut off the engine.

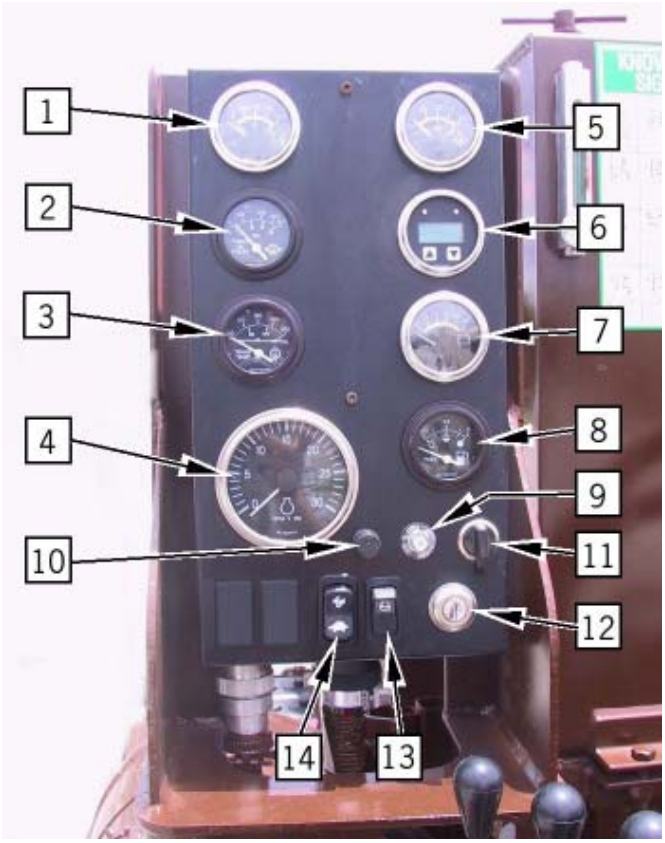


Fig. 4-2a Tier II Instrument Panel for John Deere Electronic Engine

1. Engine Water Temp.
2. Transmission Oil Press.
3. Transmission Oil Temp.
4. Tachometer
5. Engine Oil Pressure
6. Diagnostic Gage/Hourmeter
7. Voltmeter
8. Fuel Gage
9. 20 Amp. Circuit Breaker
10. 5 Amp Fuse Holder
11. 12 VDC Accessory
12. Ignition Switch
13. Shutdown Override Switch
14. Engine Throttle

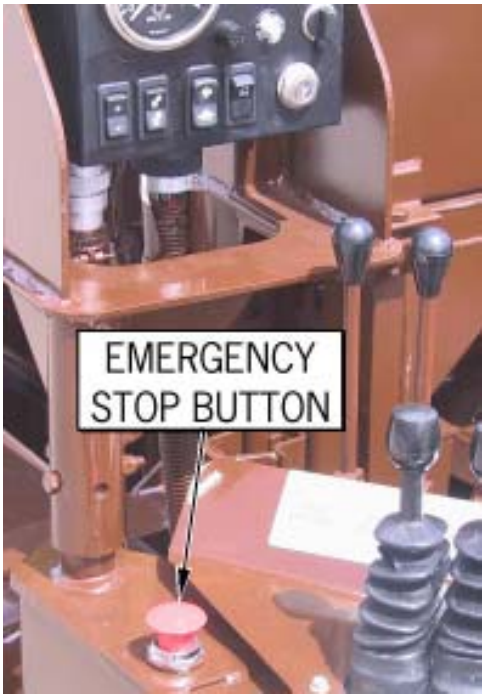


Fig 4-2b Emergency Stop Button - located to left of control levers and under instrument panel.

WARNING:
DO NOT move machine with feed ram (mast) raised. Always lower the mast and raise the jacks on truck mounted machines before moving the machine.
Machine can tip if moved with mast raised on uneven or unstable ground.

CAUTION:
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 auger (kelly) bar to push the truck or track in the event it becomes stuck. A bent auger bar will result.

Before moving the digger, 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 jacks and stop engine on truck mounted machines.

If travelling long distances, do not leave the auger on the kelly bar. This will cause premature wear on the kelly bar packing.

Track Mounted Machines

When moving track mounted machines:

1. Observe the same warnings for truck mounted machines, however, track mounted machines are not equipped with jacks.
2. Always tram machine with engine at full RPM. Pull the Hand Throttle out and lock at full RPM (see fig. 4-3).
3. For best visibility and safety, tram machine in same direction as operator's station whenever possible. Tramming machine in either direction activates the motion alarm to warn bystanders that machine is moving. DO NOT disconnect or defeat this warning alarm.

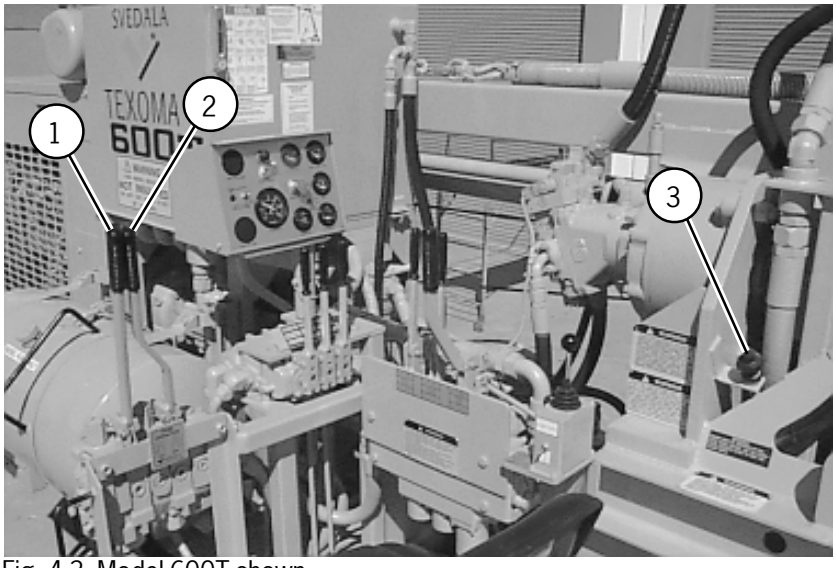


Fig. 4-3 Model 600T shown
1. Left Track Lever 2. Right Track Lever 3. Hand Throttle

Setting Up For Drilling

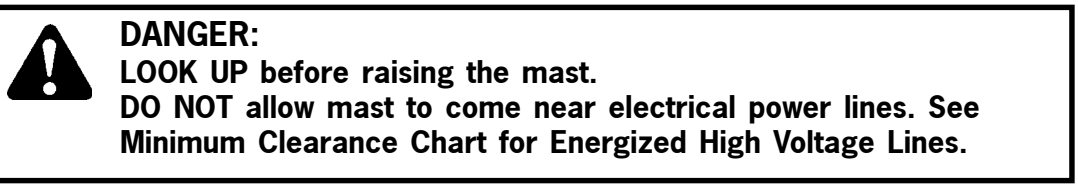
1. Start engine and allow time for it to warm up to ambient temperature, in extremely cold temperatures, machine should be allowed additional time to warm up (refer to "Cold Start Procedure" at the beginning of this section or consult engine manual).

   During all operations except actual drilling, the engine should be run at as low a speed as possible. Raising the feed ram (mast), side leveling, extending jacks, frame travel, turntable, and the small accessories should all be operated as close to engine idle as possible without "killing" the engine. Only the winch should have the full power of the engine available.

2. On truck mounted machines:
   DO NOT raise the machine, only lower jacks to the ground at this point.

   a. Extend the FRONT OUTRIGGERS left and right (if equipped).
   b. Lower the LEFT REAR JACK.
   c. Lower the LEFT FRONT JACK (if equipped) .
   d. Lower the RIGHT REAR JACK.
   e. Lower the RIGHT FRONT JACK .

3. After all jacks are lowered to the ground, you are ready to level the unit by pulling and pushing the appropriate jack levers. **DO NOT raise the truck tires off the ground.** Apply just enough pressure to take the weight off the truck springs.



4. 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 CONTROL LEVER to level the mast from side to side.
   - Check leveling indicator on the final drive for front to back leveling. If leveling is needed, use the ELEVATING CONTROL LEVER to level the mast from front to back.

5. Use your FRAME TRAVEL LEVER to move the frame in or out and the TURNTABLE SWING LEVER 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.

Clearances from High Voltage Lines	
Voltage	**Minimum Clearance**
up to 50 kv	10 ft. (3 m)
over 50 to 75 kv	11 ft. (3.4 m)
over 75 to 125 kv	13 ft. (4 m)
over 125 to 175 kv	15 ft. (4.6 m)
over 175 to 250 kv	17 ft. (5.2 m)
over 250 to 370 kv	21 ft. (6.4 m)
over 370 to 550 kv	27 ft. (8.2 m)
over 550 to 1000 kv	42 ft. (12.8 m)

Table 4-3 Minimum safe distances from high voltage lines.

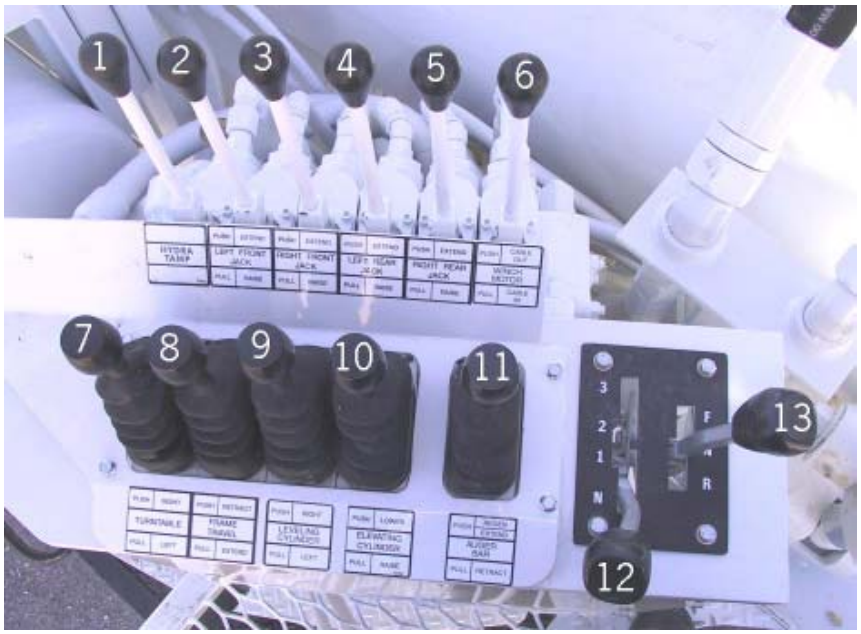


Fig. 4-3a Operator's Controls - Models 330 - 600 (late model)

1. Tamp Control (optional)
2. Left Front Jack
3. Right Front Jack
4. Left Rear Jack
5. Right Rear Jack
6. Winch Motor
7. Turntable Swing
8. Frame Travel (In - Out)
9. Leveling Cylinder
10. Elevating Cylinder Cylinder
11. Auger Crowd
12. Transmission Gear Selector
13. Forward-Neutral-Reverse Selector

NOTE **If optional Pole Aligner and Polesetter Extension are used, they would go between items 1 and 2.**

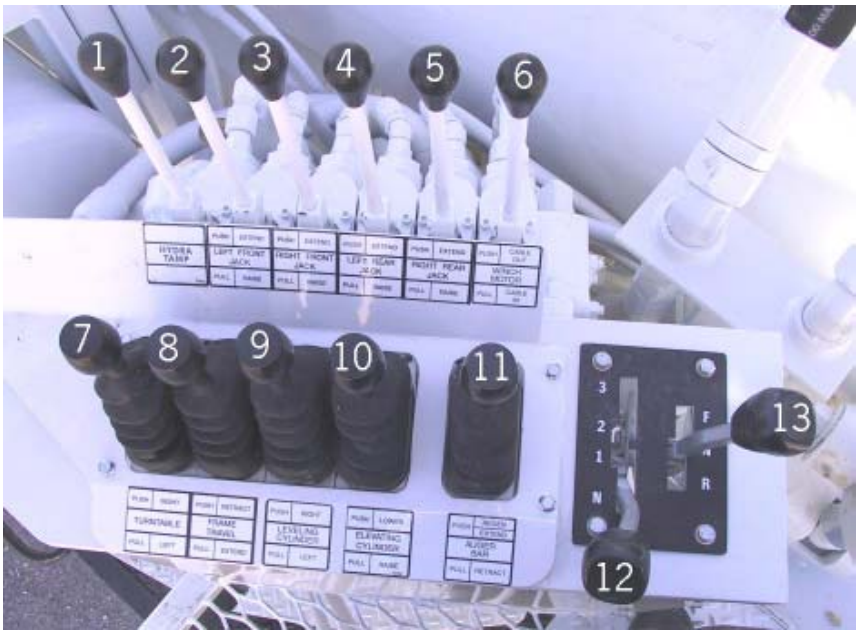


Fig. 4-3a Operator's Controls - Models 330 - 600 (late model)

1. Tamp Control (optional)
2. Left Front Jack
3. Right Front Jack
4. Left Rear Jack
5. Right Rear Jack
6. Winch Motor
7. Turntable Swing
8. Frame Travel (In - Out)
9. Leveling Cylinder
10. Elevating Cylinder Cylinder
11. Auger Crowd
12. Transmission Gear Selector
13. Forward-Neutral-Reverse Selector

NOTE **If optional Pole Aligner and Polesetter Extension are used, they would go between items 1 and 2.**

Drilling (machines with torque converter transmissions)

DANGER:
BE SURE and check for buried electrical or gas lines BEFORE you begin drilling.

WARNING:
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.

CAUTION:
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.

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.

Begin Drilling

1. Lower the auger bar by pushing the AUGER CROWD lever until the auger touches the ground.
2. Place the gear selector in the appropriate gear.
3. Place auger bar rotation in FORWARD and increase engine speed with the foot pedal. "Bump" the AUGER CROWD lever 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 lever, 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 CROWD lever. 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)

6. Try to anticipate the bottom of the hole when lowering, and the end of the feed ram stroke when hoisting so as to not unnecessarily shock 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.
7. 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 auger (kelly) bar.
8. In the event the auger gets overloaded and cannot be lifted with the auger crowd control, bring engine speed to idle, disengage clutch, shift the transmission into reverse, re-engage the clutch, and increase engine speed while hoisting with the crowd control. This will back the auger out of the hole. When the auger is clear, disengage the clutch, select the forward auger rotation and continue digging.
9. 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.**

10. 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, disengage the clutch, select the lower gear, engage the clutch, increase engine speed and continue digging again.

Shear Pin Assembly

The driveline consists of a drive shaft assembly which connects the transmission to the right angle drive. As an option, the driveline can be fitted with a shear pin assembly. The shear pin assembly is splined to the transmission output shaft and the drive shaft then bolts up to it.

Refer to fig. 4-4 for parts identification. As stated above, the shear pin assembly is splined to the transmission output shaft, the drive shaft then bolt to it. The assembly consists of an input hub (1) and an output hub (2) that are held together by means of a retainer plate (3) and six capscrews and nuts (8 & 9). If the auger gets stuck or hung up, the shear pin (6) provides the weak link and will break, thus preventing expensive damage to the final or right angle drive. Always keep spare shear pins on hand.

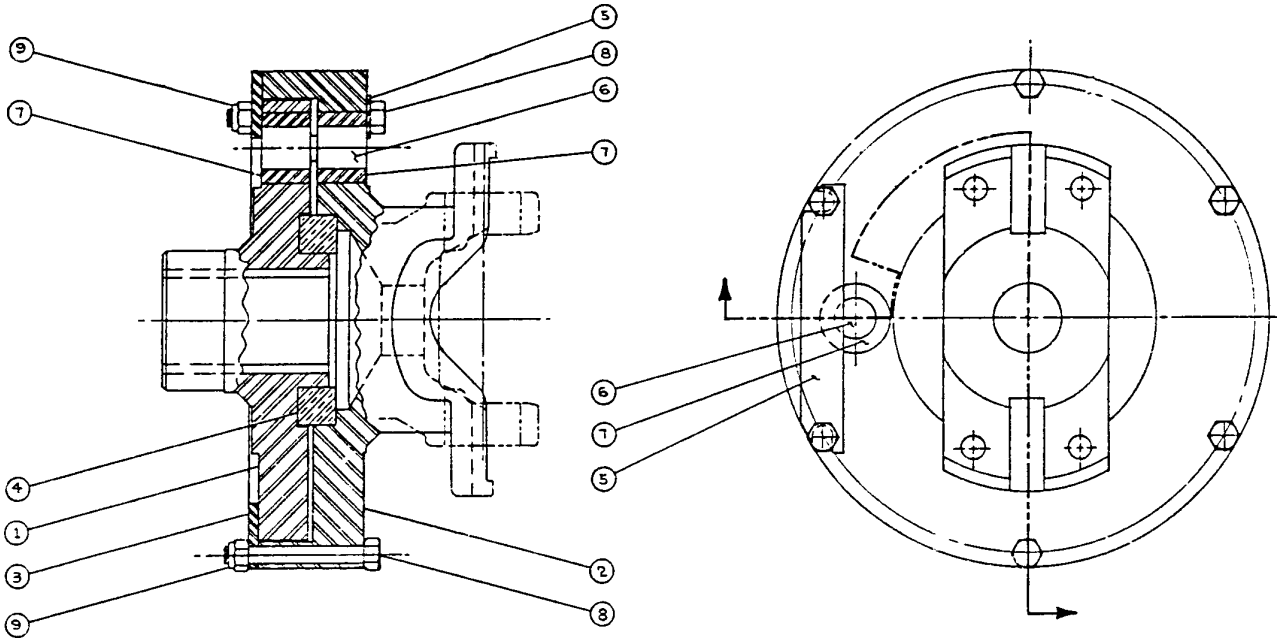


Fig. 4-4 Shear Pin Assembly (ref. 75586)

1. Input Hub
2. Output Hub
3. Retainer
4. Bronze Washer
5. Retainer, Shear Pin
6. Shear Pin
7. Bushing, Shear Pin (2)
8. Capscrew (6)
9. Elastic Stop Nut (6)

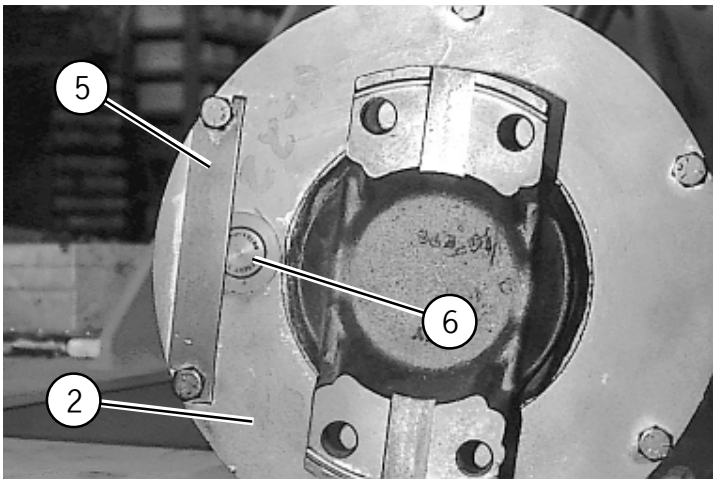


Fig. 4-4a Shear Pin Assembly

WARNING:
SHUT DOWN machine and remove key before making any repairs. Place an "Out of Service" tag on ignition switch. Disconnect battery cable for additional safety.
ALWAYS replace driveline guard after repair work to driveline has been completed .

Shear Pin Repair

If shear pin breaks, follow the steps below to replace with a new shear pin.

1. Look through the inspection hole in the driveline guard (fig. 4-4b) to be sure that the problem is with the shear pin. If the shear pin is broken, the input and output hubs will be out of alignment with respect to the shear pin.

NOTE **Later models have a access door cut into the driveline guard. This allows you to service the shear pin without removing the driveline guard.**

2. Remove driveline guard (if necessary).
3. Place transmission in neutral and rotate the input hub until the two halves of the shear pin are aligned.
4. Loosen the capscrews that hold the shear pin retainer and remove retainer. Drive out shear pin.
5. With shear pin removed the input hub should turn freely. Check to be sure it does, then line up shear pin bore and install new pin. Install shear pin retainer and tighten the two capscrews.
6. Install driveline guard.

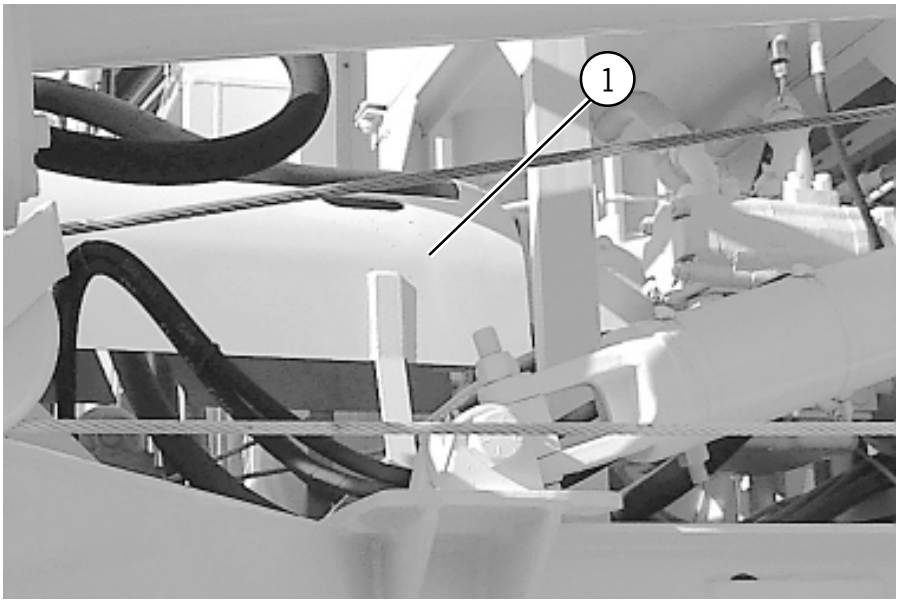


Fig. 4-4b Driveline Assembly
1. Driveline Guard

Drilling (machines with Hydrostatic Drive)

Follow the same procedures as for "Drilling (machines with torque converter transmissions)", the exception being, that there are no gears to shift. All drilling speeds and direction are controlled with the Hydrostatic Control Lever.

Hydrostatic Control Lever

The hydrostatic control provides forward, neutral, and reverse. Move the control lever until the desired auger speed is reached. The lever position changes the displacement of the hydraulic motor. Full torque is available at any position. If the auger stalls, move the control toward neutral; this will reduce the required horsepower to turn the auger and raise the torque. For reverse, simply push the control off center to the rear. The same speeds and torque are available in reverse as in forward.

High - Low Switch

Normally, drilling is done with the switch in LOW position. If you are drilling in soft ground with a small diameter auger you can place the switch in HIGH position. Place switch in HIGH for spinning dirt off auger.

Engine RPM

Engine should be at full RPM when drilling.

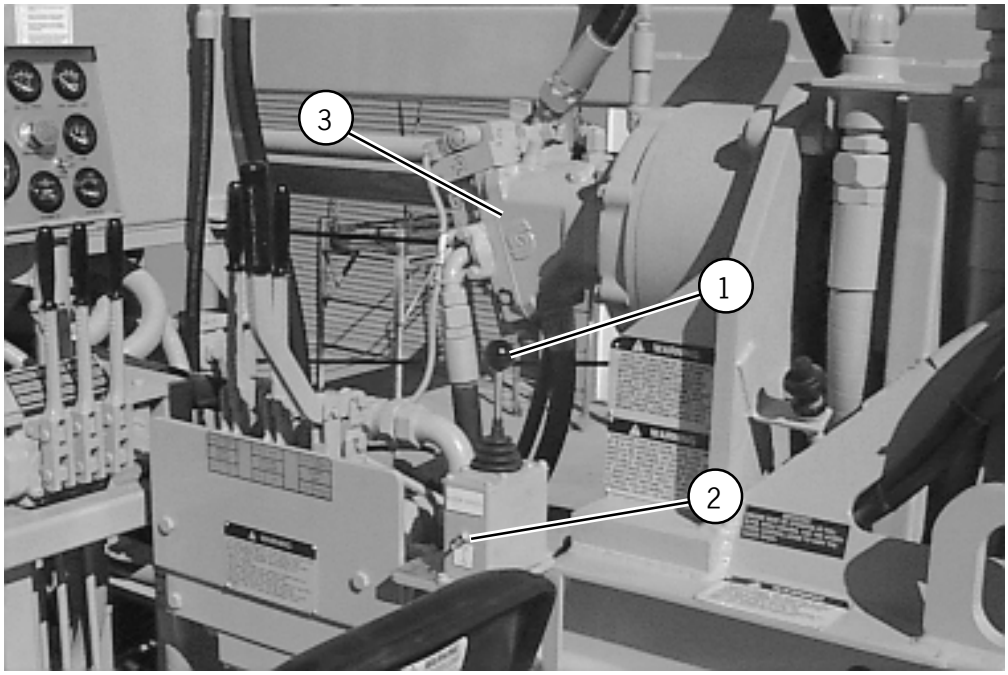


Fig. 4-5 Hydrostatic Controls - Model 600T shown
1. Hydrostatic Control - Forward-Neutral-Reverse
2. High-Low Switch
3. Hydraulic Motor

Auger, Teeth and Point

Inspection
Check auger bits and points for excessive wear or defects. Replace as necessary.

Removal and Installation
Figure 4-6 below, shows an auger with blade type teeth, retained by a roll pin. There are several types of teeth and points available to suit different drilling conditions. The opposite page shows the basic tooth styles and how they are replaced.

Contact your **Reedrill** distributor or factory office to obtain a copy of **Texoma Drilling Tools Catalog**. This catalog lists all of the augers, cutting tools and accessories available and detailed descriptions of their uses.

Auger Sizes
Model 270 - 56 in. max.

Model 330 - 600 - 72 in. max.

NOTE **The use of an auger larger than listed will void warranty of that machine.**

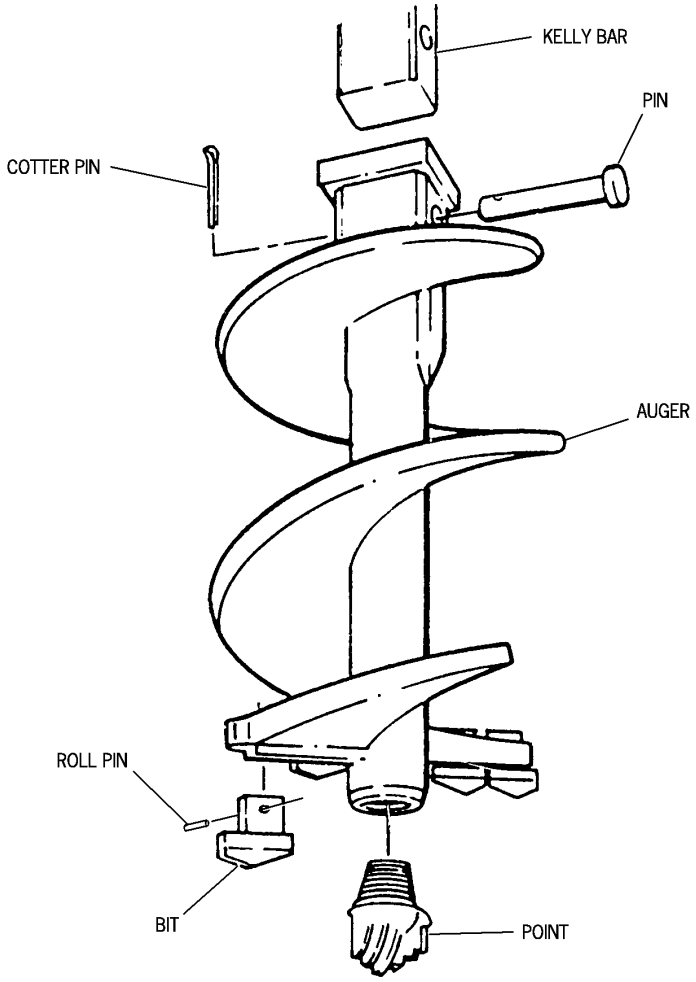


Figure 4-6 Auger assembly

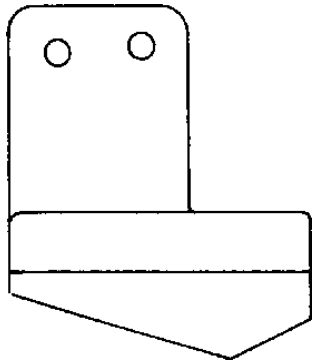


Fig. 4-7 Blade Type Tooth
Retained with roll pin or cotter pin.
Remove pin, then remove tooth.
Install new tooth and pin.
DO NOT hit carbide face with hammer.

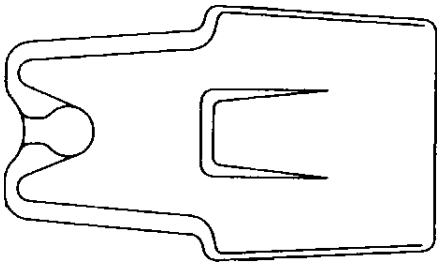


Fig. 4-8 Taper-Fit Tooth
Retained with "horseshoe nail" type fastener.
Drive out tooth with punch to remove.
Install new tooth, secure with "horseshoe nail" type fastener.
DO NOT hit carbide face with hammer.

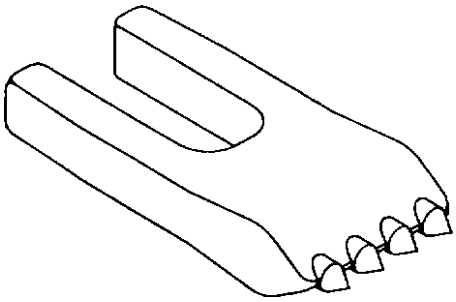


Fig. 4-9 TX-50 series ("Bear Claw") Type Tooth
Retained with rubber wedge.
Drive out tooth with punch to remove.
Install rubber wedge and install tooth.
DO NOT hit carbide tips with hammer.

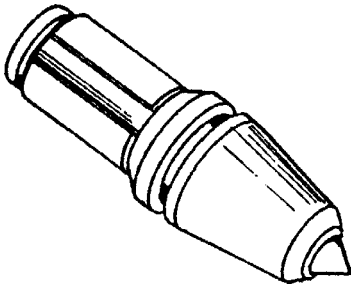


Fig. 4-10 Bullet Type Tooth
Retained with retainer ring.
Use C-123 bit puller (below) to remove.
Drive in tooth, retainer ring will hold tooth in place.
DO NOT hit carbide tip with hammer.

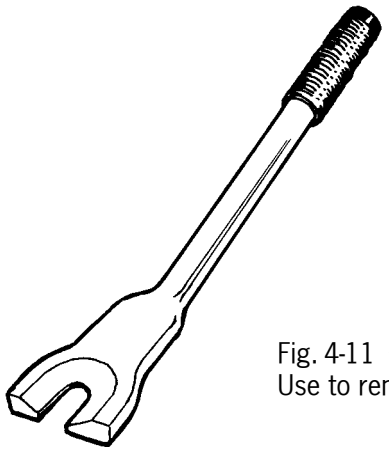


Fig. 4-11 C-123 Bit Puller (Part No. 29937)
Use to remove bullet type teeth.

Notes

Preventive Maintenance

Section 5

General Information

NOTE **See Service Manual for complete service and maintenance instructions**

This section contains recommended procedures, instructions, and technical data which the operator will need in order to perform necessary preventive maintenance. This information should be considered as recommendations only, and may be altered to suit conditions under which the digger is operated.

Equipment 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. An equipment lubrication diagram has been included to show the general location of all points which require periodic lubrication. This chart also lists various points and provides data such as quantities, types of lubricants recommended, and the recommended frequency of lubrication.

Care of Lubricants

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.

Lubrication Point Care

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.

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.

When the digger is in continual daily use, 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.

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:
  ASTM D5345 Pre-diluted coolant
  ASTM D4985 Coolant concentrate in a 40 to 60% mixture of concentrate with quality water.
- John Deere recommends John Deere COOL-GARD, which comes in pre-diluted or concentrate and contains the necessary coolant additives.

Change Intervals

- Drain and flush factory fill after 3 years or 3,000 hours of operation.
- If John Deere COOL-GARD **is not** used, change coolant every 2 years or 2,000 hours of operation.
- If John Deere COOL-GARD **is** used, change coolant every 5 years or 5,000 hours of operation.

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 (6.2 bar) 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.

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.

Preventive Maintenance

Equipment Cleanliness

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. The **Reedrill** Digger is designed for service under the most rugged conditions and will require a minimum amount of maintenance to assure its dependable operation for many years.

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 and stop engine and check oil level. Add 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° F (121° C). Shift into neutral and allow to cool.

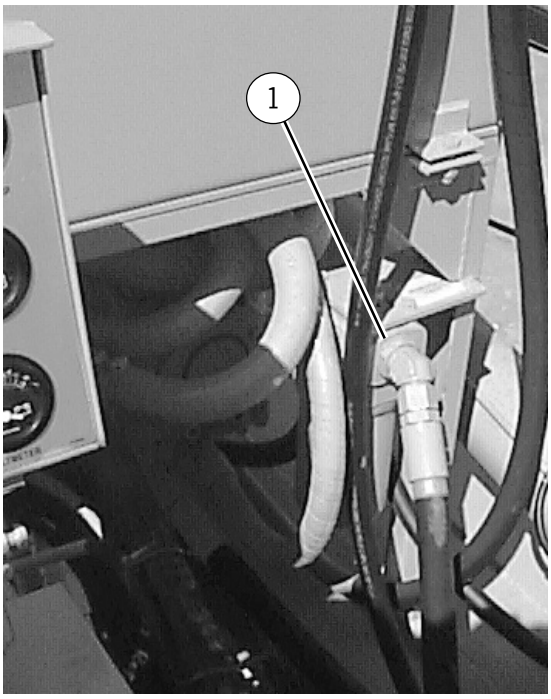


Fig. 5-1 Hydrostatic Filter Location
1. Hydrostatic Filter

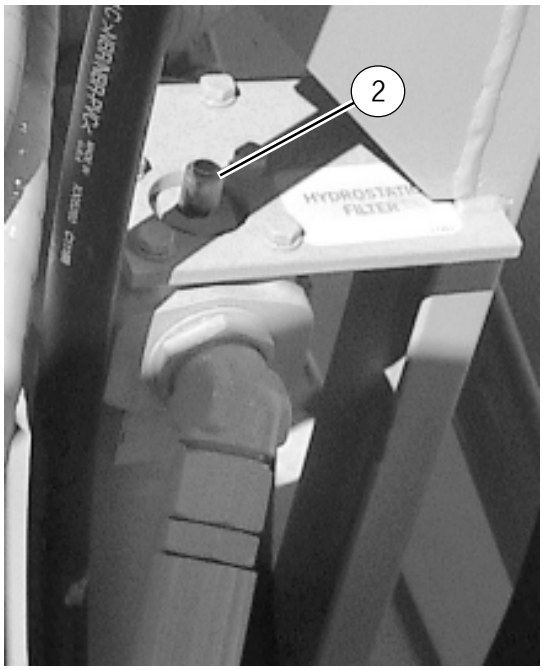


Fig. 5-1a Hydrostatic Filter
2. Filter Indicator

Hydraulic System

Machines equipped with hydrostatic drive have two (2) complete separate hydraulic systems, a **closed loop system for hydrostatic rotary drive**, and an **open loop system for all other functions**. Hydrostatic machines use 10W hydraulic oil with antiwear additives, resistant to rust, oxidation and foaming. When adding or checking oil, do not allow any type of contamination to enter the reservoir. Machines with torque converter drive have only the open loop system.

Hydrostatic Transmission (closed loop):

The hydrostatic drive is a precision power transmission, built for many years of trouble-free operation. Only one preventive maintenance step is necessary to ensure the life of this unit: **Cleanliness.** There is a 5-micron filter mounted under the hydraulic oil tank (fig. 5-1). The filter element should be changed after the first fifty (50) hours of operation and every 200 hours after, or when the indicator shows red.

Check indicator on hydrostatic filter daily (see fig. 5-1a). Replace filter when indicator is in change position. Check with transmission in neutral, engine at full RPM and oil temperature above 100° F (38° C).

Hydraulic System (open loop):

There is a filter on the return line mounted inside the oil reservoir (fig. 5-2). 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 RED zone. Check fluid level and add 10W hydraulic oil with antiwear additives, resistant to rust, oxidation and foaming if needed. **CLEANLINESS IS OF UTMOST IMPORTANCE.**

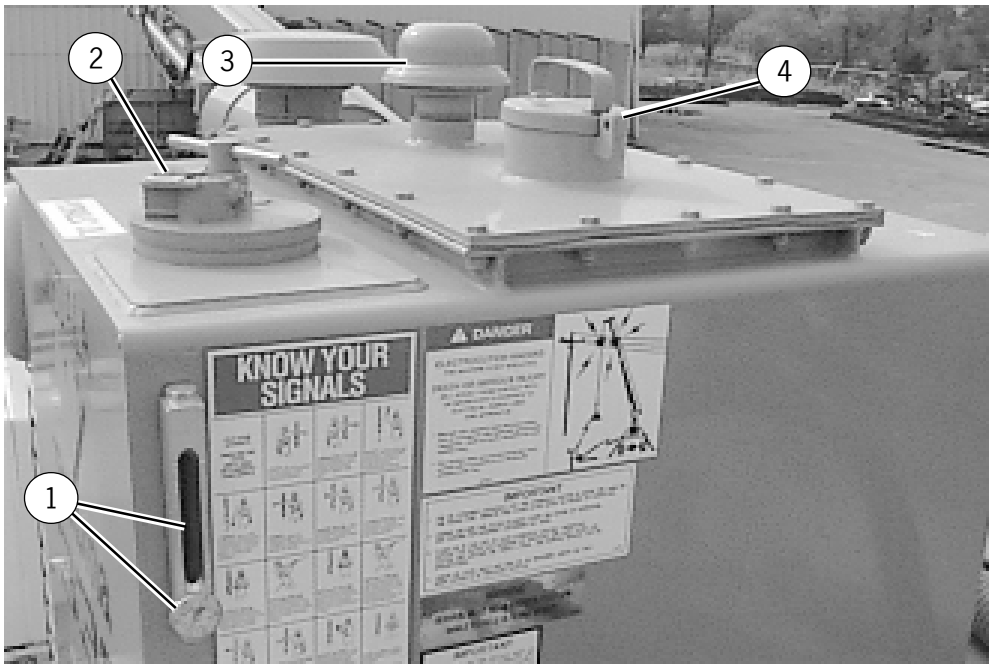


Fig. 5-2 Hydraulic Oil Reservoir

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

Engine Oils and Fuels

Break-In Oil

New John Deere engines are filled at the factory with break-in oil. Change the oil and filter after the first 100 hours of operation. After engine overhaul, fill with break-in oil.

If engine break-in oil is not available, use one of the following during the first 100 hours of operation:

- API Service Classification CD
- API Service Classification CC
- ACEA Specification E1

After Break-In

The following oils are recommended for normal use after break-in period:
(see table 5-1 for oil viscosity/temperature range)

- John Deere PLUS-50
- John Deere TORQ-GARD SUPREME
- Oils meeting ACEA Specification E5
- API Service Classification CI-4
- API Service Classification CH-4
- ACEA Specification E3
- ACEA Specification E4

Change Intervals

Change oil and filter every 250 hours.
If John Deere PLUS-50 or ACEA-E4/E5 is used, along with the specified John Deere filter, then the service interval is every 500 hours.

Diesel Fuel

Diesel fuel specified to EN 590 or ASTM D975 are recommended.
Cetane Number - Minimum of 45, greater than 50 is preferred.
Sulfur Content - less than 0.05% is preferred.

Bio-Diesel Fuel

Consult engine owner's manual.

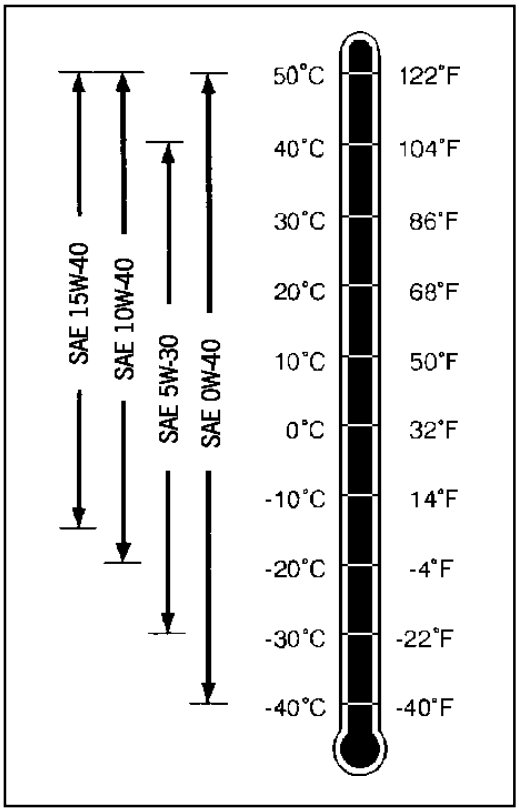


Table 5-1 Diesel Engine Oil

Section 6

Lubrication Chart

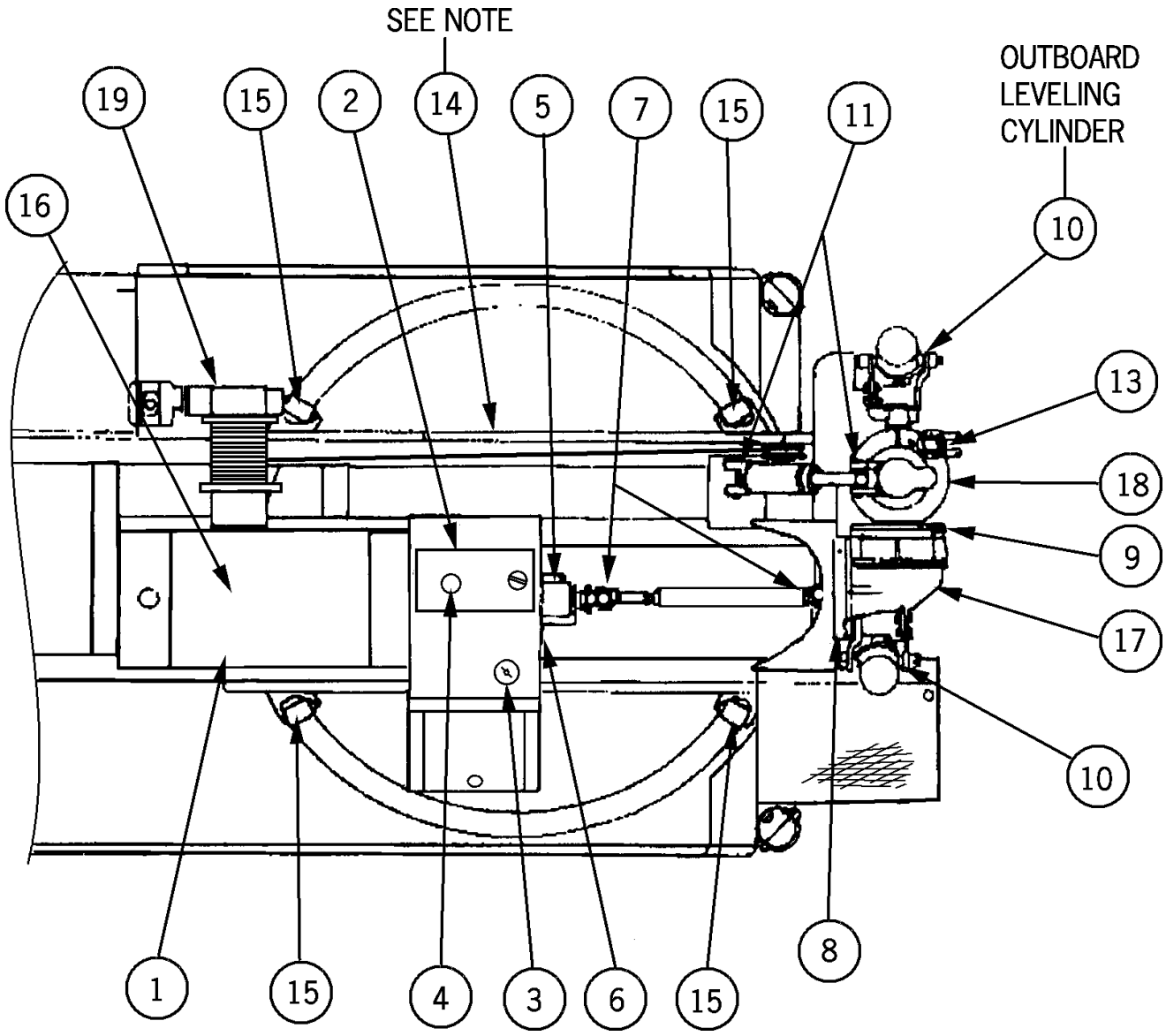


Fig. 6-1 Typical Machine Layout - Specific machines may vary slightly.
Outboard leveling cylinder is standard on Model 600, optional on all others.

NOTE **There is one lube point for the turntable center pin on Models 270 and 330. There are six lube points (3 per side) for the turntable center rollers on Models 500 and 600.**

Lubrication and Maintenance Requirements

REF.	DESCRIPTION	RECOMMENDED LUBRICANT	LUBE FREQUENCY	SPECIAL INSTRUCTIONS
1.	Engine Oil	Refer to engine operator's manual, see also Section 5.	Check Daily	Check level every 8 hours Change every 250 hours.
	New John Deere Engines have break-in oil - Change oil & filter after first 100 hours of operation.			
1a.	Engine Oil Filter	N/A	N/A	Replace every oil change.
1b.	Engine Coolant	Clean water with rust inhibitor and anti-freeze. Refer to engine operator's manual, see also Section 5.	Check Daily	Maintain 1" below top of tank. Change every 2 years.
1c.	Engine Air Cleaner (Dry Type)	N/A	Check Daily	Change every 250 hours or sooner if indicator shows a change requirement.
1d.	Engine Fuel Filter	N/A	N/A	Change every 250 hours.
2.	Hydraulic System	SAE 10W Hydraulic Oil Model 270 - 54 gal. (205 liters) 330 - 600 - 82 gal. (311 liters)	Check Daily	Check with mast lowered to mast rest. Clean tank and change oil annually.
3.	Hydraulic Filter (inside tank)	Reedrill P/N 30343	N/A	Change after first 50 hours, then every 200 hours or when indicator is in RED zone.
3a.	Hydraulic Strainer (inside tank)			Clean every 250 hours.
4.	Tank Breather	Reedrill P/N 16076	N/A	Clean every oil change.
5.	Transmission Assembly (Allison)	Caterpillar TO-4 John Deere J20 C, D Military Mil-Prf-2104G Allison C-4 * Dexron II equivalent - *see note below* Do Not use : Dexron III, Engine Oil, or any GL-5 oils. 7-1/2 Gal. (28.4 L) initial fill (dry). 5-1/2 Gal. (20.8 L) refill capacity.	Check Daily	Oil must be at operating temp., 180-200° F (82-93° C). Check with trans. in neutral, engine at idle. Open upper drain cock on side of transmission. Oil should seep out. If over full, drain to proper level. Change every 2000 hours or 6 months, whichever occurs first. Remove oil screen from sump and clean each oil change.
5a.	Transmission Assembly (Funk)	Same as above. 12 Qts. (11.4 L) initial fill (dry). 9 Qts. (8.5 L) refill capacity.	Check Daily	Oil must be at operating temp. Check with trans. in neutral, engine at idle. Stop engine, add oil to full mark on dipstick or until oil seeps out of opened drain cock. Change after first 50 hours, then every 500 hours.

NOTE *** Dexron II equivalent is acceptable; however it is not compatible with torque conerters or transmissions equipped with graphitic friction material clutch plates.**

Transmission Lubrication

Initial Fill

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. Shut down machine and check fluid level again. Add fluid to proper level. Repeat two or three times, until fluid level remains the same.

Funk Transmission - Adding/Checking Fluid Level

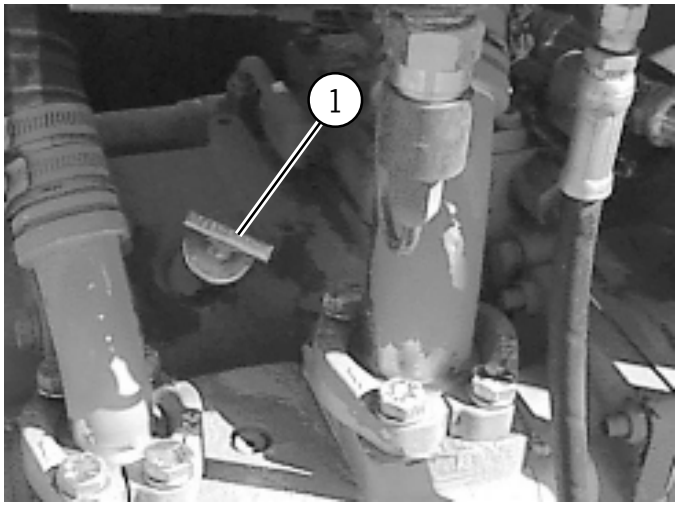


Fig. 6-2 Funk Transmission Model 12C704NO
1. Oil Fill Plug

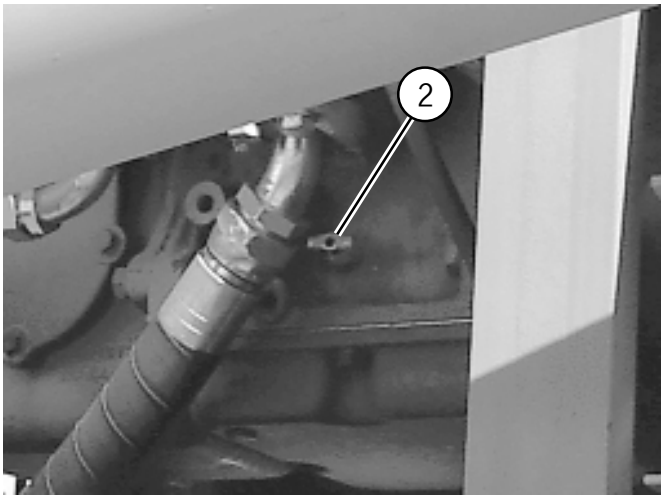


Fig. 6-3 Funk Transmission Model 12C704NO
2. Oil Level Drain Cock - open drain cock and fill transmission until oil drips out drain cock, then close.

Allison Transmission - Adding/Checking Fluid Level

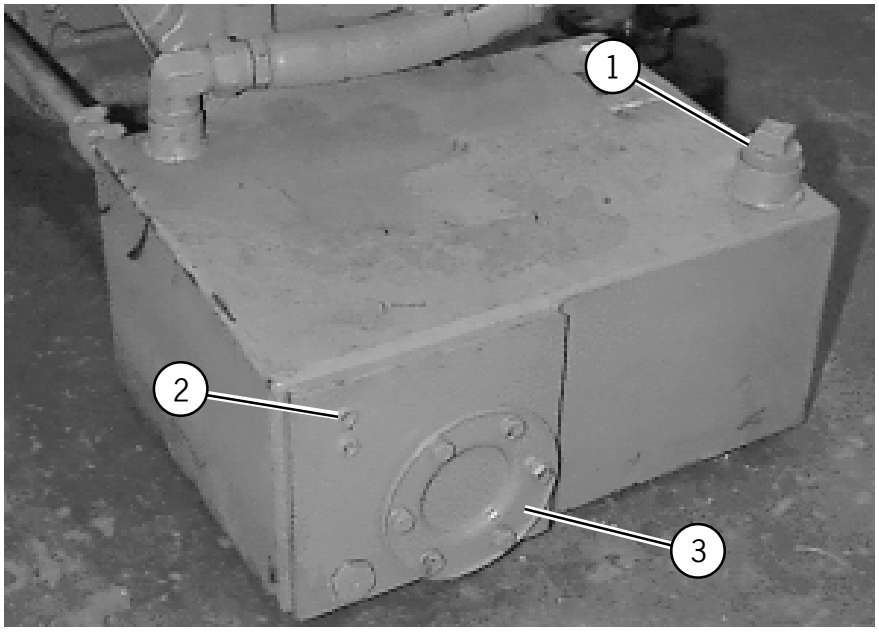


Fig. 6-4 Allison Transmission Model CRT-3331-3
1. Oil Fill Plug
2. Oil Level Plug (upper) - remove upper plug and fill transmission until oil is at bottom edge of hole, then install plug.
3. Oil Strainer Cover

Lubrication and Maintenance Requirements

REF.	DESCRIPTION	RECOMMENDED LUBRICANT	LUBE FREQUENCY	SPECIAL INSTRUCTIONS
5b.	Hydrostatic Units (Sundstrand)	SAE 10W Hydraulic Oil	Check Daily	Clean tank/Change annually.
5c.	Hydrostatic Oil Filter	Reedrill P/N 95974	N/A	Change after first 50 hours, then every 250 hours or when indicator shows "change".
5d.	Hydrostatic Units (Dynapower - early models only)	*Dexron II equivalent ATF	Check Daily	Check magnet on dipstick for metal particles. Change every 6 months.
6.	Transmission Oil Filter (Funk)	Reedrill P/N 20979	N/A	Change after first 50 hours, then every 500 hours.
7.	U-Joints	Multi-Purpose Grease	Daily - 3 Points	
8.	Mounting Ring	Multi-Purpose Grease	Daily - 5 Points	
9.	Intermediate Ring	Multi-Purpose Grease	Daily - 4 Points	
10.	Leveling Cylinder	Multi-Purpose Grease	Daily - 3 Points	6 points if equipped with outboard leveling cylinder.
11.	Elevating Cylinder	Multi-Purpose Grease	Daily - 3 Points	2 lower, 1 upper
12.	Sheave	Multi-Purpose Grease	Daily - 1 Point	
13.	Snatch Block	Multi-Purpose Grease	Daily - 1 Point	
14.	Turntable Center Pin	Multi-Purpose Grease	Daily - 1 Point	Models 270 and 330
14a.	Turntable Center Rollers	Multi-Purpose Grease	Daily - 6 Points	Models 500 and 600
15.	Turntable Outer Rollers	Multi-Purpose Grease	Daily - 8 Points	4 upper and 4 lower
16.	Turntable Drive	90W Gear Lube	Check Weekly	Do not overfill. (located under engine)
17.	Right Angle Drive	90W Gear Lube	Check Weekly	Change every 1000 hours.
18.	Final Drive	90W Gear Lube	Check Weekly	Change every 1000 hours.
19.	Winch Drive	90W Gear Lube	Check Weekly	Change every 1000 hours.

NOTE *** Dexron II equivalent is acceptable; however it is not compatible with torque conerters or transmissions equipped with graphitic friction material clutch plates.**

General Tightening Torque Specifications

Procedure No. 1-87 REVISION A

Torque Values: Bolts, Screws and Studs (Lubricated or Plated)
Tolerance Values in all cases to +5 % - 0 % of the Value listed below.
Note: K = .15 for plated or lubricated fasteners.

	Nominal Diameter	SAE Grade 5 ASTM A-449 Tightening Torque Ft. Lbs. (Nm) Newton meter	SAE Grade 8 Tightening Torque Ft. Lbs. (Nm) Newton meter
UNC	1/4	6 (8.2)	9 (12.2)
	5/16	13 (17.7)	18 (24.5)
	3/8	23 (31.3)	33 (44.9)
	7/16	35 (47.6)	55 (74.8)
	1/2	57 (77.5)	80 (108.8)
	9/16	82 (111.5)	115 (156.4)
	5/8	113 (153.7)	159 (216.2)
	3/4	200 (272)	282 (383.5)
	7/8	322 (437.9)	455 (618.8)
	1 also UNS	483 (656.9)	681 (926.2)
	1-1/8	596 (810.6)	966 (1313.8)
	1-1/4	840 (1142.4)	1363 (1853.7)
	1-3/8	1102 (1498.7)	1786 (2429)
	1-1/2	1462 (1988.3)	2371 (3224.6)
	1-3/4	1714 (2331)	
	2	2576 (3503.4)	
	2-1/4	3768 (5124.5)	
	2-1/2	5155 (7010.8)	
	2-3/4	6996 (9514.6)	
	3	9231 (12554.2)	
UNF	1/4	7 (9.5)	10 (13.6)
	5/16	14 (19)	20 (27.2)
	3/8	26 (35.4)	37 (50.3)
	7/16	40 (54.4)	60 (81.6)
	1/2	64 (87)	90 (122.4)
	9/16	91 (123.8)	128 (174.1)
	5/8	127 (172.7)	180 (244.8)
	3/4	223 (303.3)	315 (428.4)
	7/8	355 (482.8)	502 (682.7)
	1	528 (718.1)	746 (1014.6)
	1-1/8	668 (908.5)	1083 (1472.9)
	1-1/4	930 (1264.8)	1509 (2052.2)
	1-3/8	1254 (1705.4)	2034 (2766.2)
	1-1/2	1645 (2237.2)	2668 (3628.5)
UN	1-3/4	1879 (2555.4)	
	2	2857 (3885.5)	
	2-1/4	4127 (5612.7)	
	2-1/2	5726 (7787.4)	
	2-3/4	7693 (10462.5)	
	3	10064 (13687)	

Bolt Maintenance

WARNING:
BE SURE all bolts are tight and not damaged. Pay particular attention to critical areas, such as; feed ram, right angle drive pivot, final drive mounting, elevating and leveling cylinder pivots, or any areas where loose bolts could cause a component to fall and cause injury.

Retorque bolts after first 50 hours of machine operation. Retorque any bolts that are less than the specified value as listed in the Bolt Torque Specifications sheet or as specified on the assembly drawing. Pay particular attention to critical mounting areas, such as; feed ram, right angle drive pivot, final drive mounting, elevating and leveling cylinder pivots, or any areas where loose bolts could cause a component to fall and cause injury or machine damage.

Periodically inspect bolts for damage and replace as necessary. Check torque and retorque as required.

Bolt Grade Identification

Fig. 6-5 shows the common markings on bolt heads used on Reedrill/Texoma auger drills to identify what grade the bolt is. The grades shown are not all inclusive, but show what is commonly used on Reedrill/Texoma augers.

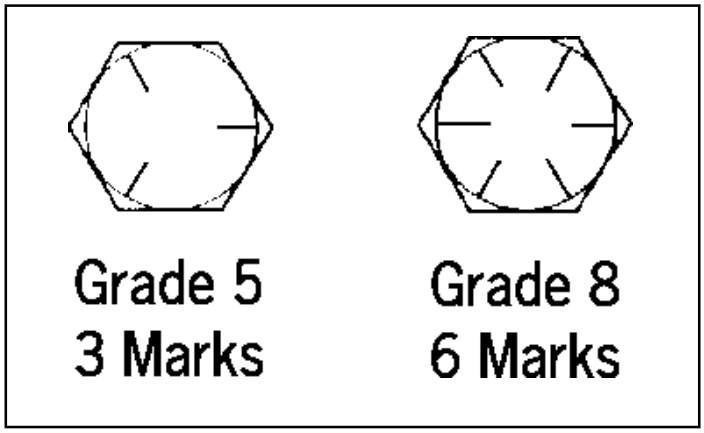


Fig. 6-5 Two commonly used bolt head markings

Maintenance Record

DATE	DESCRIPTION OF SERVICE PERFORMED	SERVICE PERFORMED BY:

Maintenance Record

DATE	DESCRIPTION OF SERVICE PERFORMED	SERVICE PERFORMED BY:

Maintenance Record

DATE	DESCRIPTION OF SERVICE PERFORMED	SERVICE PERFORMED BY:

Maintenance Record

DATE	DESCRIPTION OF SERVICE PERFORMED	SERVICE PERFORMED BY:

Maintenance Record

DATE	DESCRIPTION OF SERVICE PERFORMED	SERVICE PERFORMED BY:

Maintenance Record

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