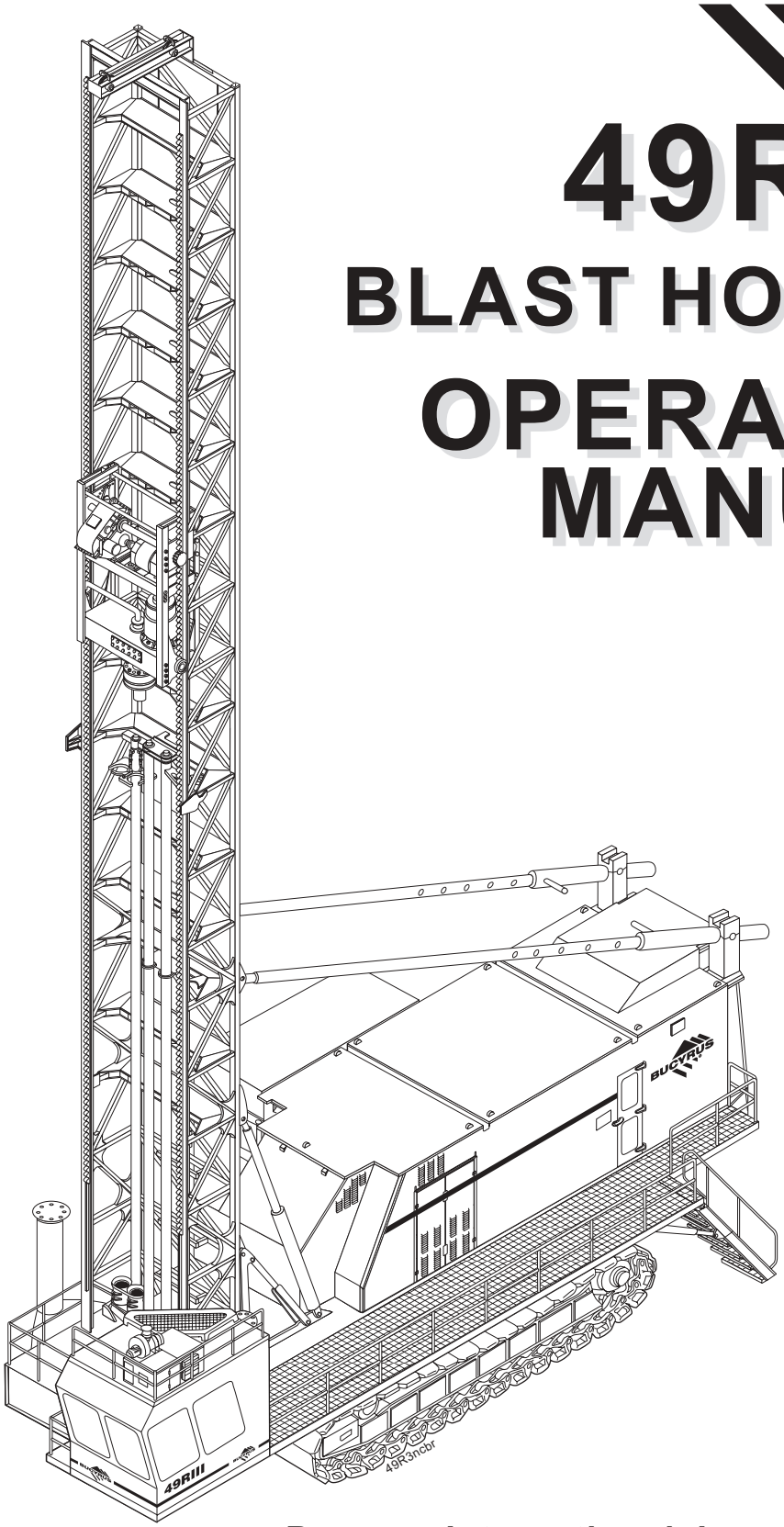
BUCYRUS®

49RIII

BLAST HOLE DRILL

OPERATOR'S MANUAL



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FIRE PREVENTION CONSIDERATIONS

Always have a “charged” fire extinguisher on hand and know how to use it. Inspect and service the extinguisher as indicated on its instruction plate.

DO NOT smoke while handling flammables or when near batteries.

Inspect all lines, tubes, and hoses carefully. Tighten all connections to their recommended torque specification. See Section 4 of this manual for the Scheduled Maintenance recommendations and the Walk Around Inspection procedure.

Repair or replace loose or damaged lines, tubes, and hoses as soon as possible.

Make certain that all clamps, guards, and shields are replaced correctly so as to prevent vibration and the chafing of parts during operation.

DO NOT carry flammable fluids such as gasoline or solvents on board the machine.

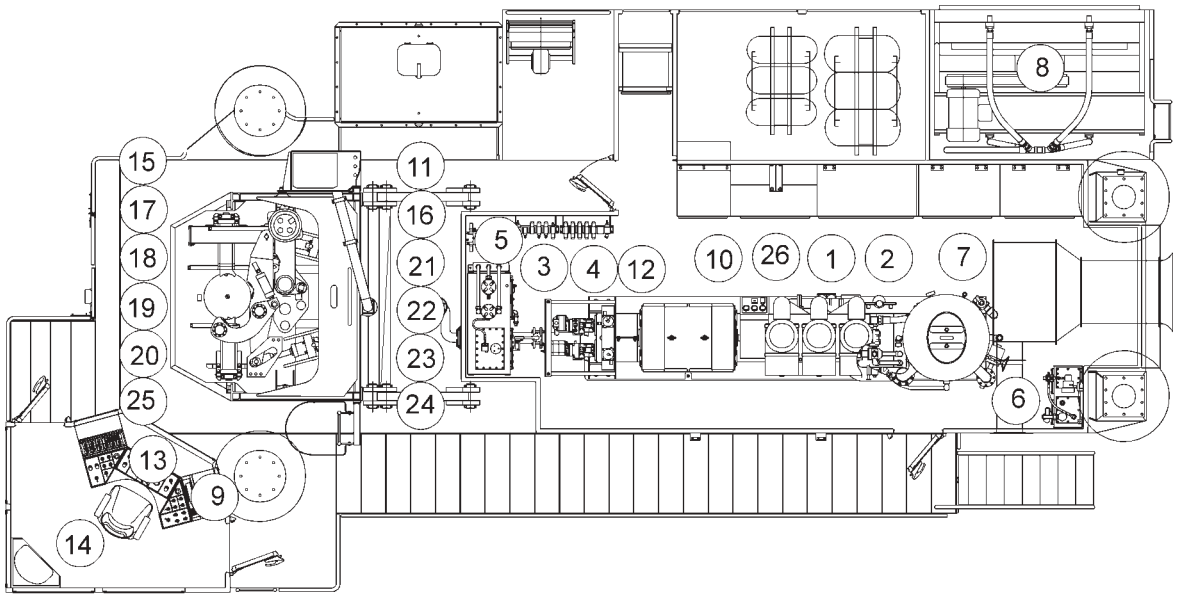
DO NOT over-bend or strike pressurized lines or hoses. DO NOT install bent or damaged lines, tubes, or hoses. Replace them immediately.

DO NOT start the machine or move any of the controls if a warning tag is attached to the controls or the start panel.

Keep all cleaning rags properly stored. DO NOT discard them into a pile on board.

Keep all structural frame compartments, walkways, and work areas clean and free of lubricant residue.

NEVER weld, burn, or perform service on the machine alone.



8. Inspect the compressor radiator and fan. Check for signs of deterioration or damage to hoses, valves, fittings, etc. Check for leaks at all joints. Check the radiator core for blockage by dust, dirt, leaves, paper, etc. and clean as necessary

9. Check the operator's display terminal for any faults.

10. Inspect the machinery house for general cleanliness. Clean all dirt and debris from the machinery house.

NOTE: Do not use compressed air to clean the machinery house. Compressed air will only move the dirt around. Use a vacuum cleaner to remove the dirt from the machine. Failure to clean the inside of the machinery house will cause damage to many of the components located there.

11. Inspect the auxiliary winch and auxiliary winch line.

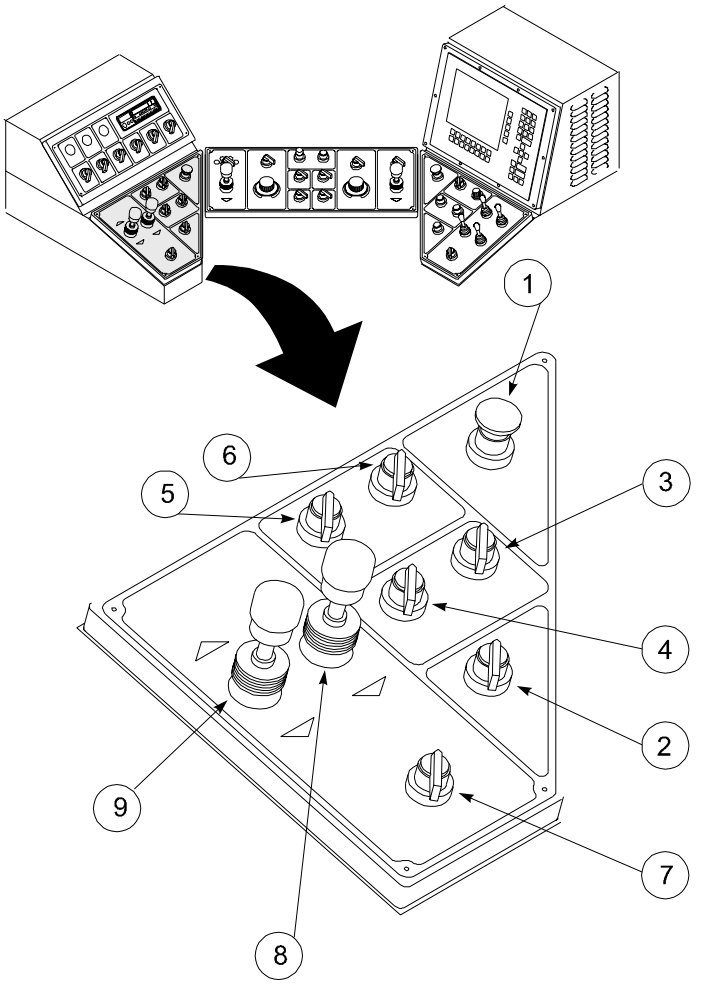
12. Check the oil level in the pump drive gearbox. Fill with recommended oil to the proper level.

13. Check all controls for free operation. Return all controls to the OFF or SET position.

14. Inspect the operator's cab for housekeeping and cleanliness. Clean dirt and debris from the cab. Clean the windows to give full visibility for proper operation.

NOTE: Do not use compressed air to clean the operator's cab. Compressed air will only move the dirt around. Use a vacuum cleanertoremove the dirt from the cab.

PROPEL CONTROL PANEL



1. Emergency Stop Pushbutton
2. Propel Speed Selector Switch
3. Compressor Stop Pushbutton
4. Compressor Vemt/Drill Switch
5. HVAC Mode Selector Switch
6. HVAC Fan Speed Selector Switch
8. Propel RH Crawler Jotstick
9. Propel LH Crawler Joystick

PROPEL CONTROL PANEL - OVERVIEW

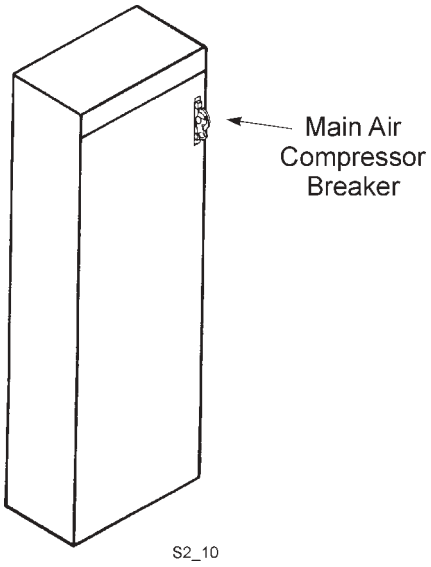
EMERGENCY STOP PUSH-BUTTON (Optional)

The emergency stop push-button (1) is a large red mushroom head push-button switch. Depressing the push-button will cause the power to the machine from the power source to be disconnected. The push-button is tied to the power source ground check circuit.

PROPEL SPEED SELECTOR SWITCH

This two-position switch (2) is used to set the propel speed. In the SLOW position, the propel is in the low speed range (about 30% of maximum). This position is used when maneuvering in tight spots and in drilling patterns. NORMAL position is used when moving from one site to another.

CONTROLS LOCATED ON LOW VOLTAGE START CABINET

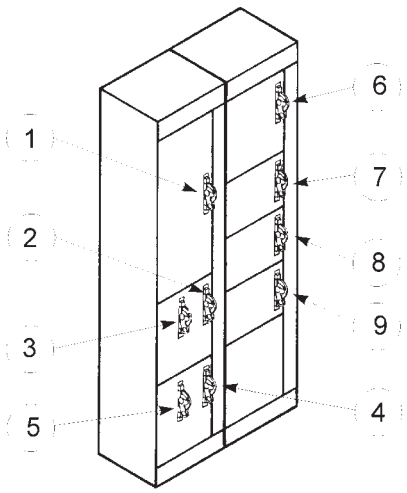


The low voltage start cabinet contains the breaker for the main compressor. Turning the breaker to the ON position will activate the compressor circuits, allowing the compressor to be started.

TYPICAL LOW VOLTAGE START CABINET

CONTROLS LOCATED ON LOW VOLTAGE CABINET

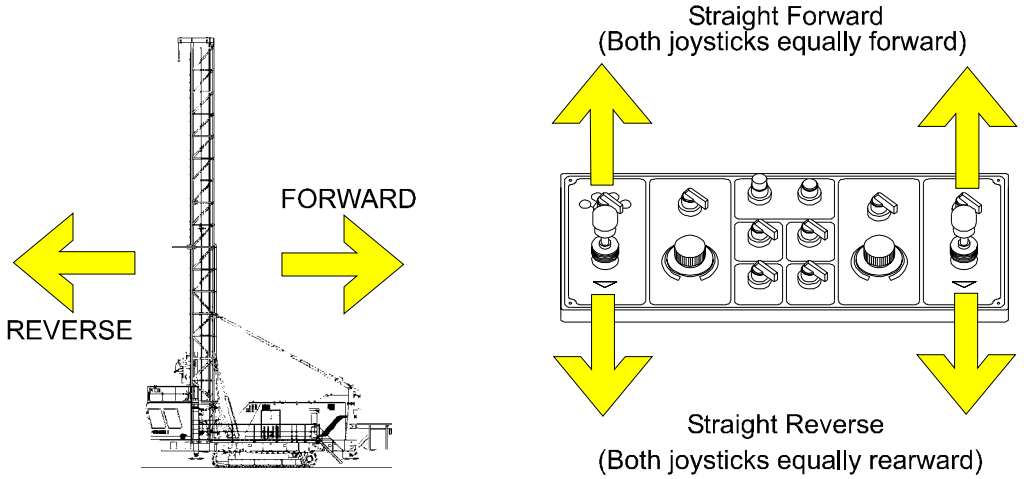
The low voltage cabinet contains most of the breakers for the auxiliary equipment on the drill. Because of the variations of equipment supplied on a particular drill, a list of typical controls which might appear on the cabinet is shown in figure.



1. Auxiliary Power Breaker
2. Cable Reel Hydraulic Motor Breaker
3. Oil Cooler Motor Breaker
4. Hoist/Pulldown Motor Blower Breaker
5. Rotary Motor Blower Breaker
6. House Pressure Fan Breaker
7. Radiator Fan Motor Breaker
8. Lighting Control Transformer Breaker
9. Operator's Cab Air Conditioner Breaker

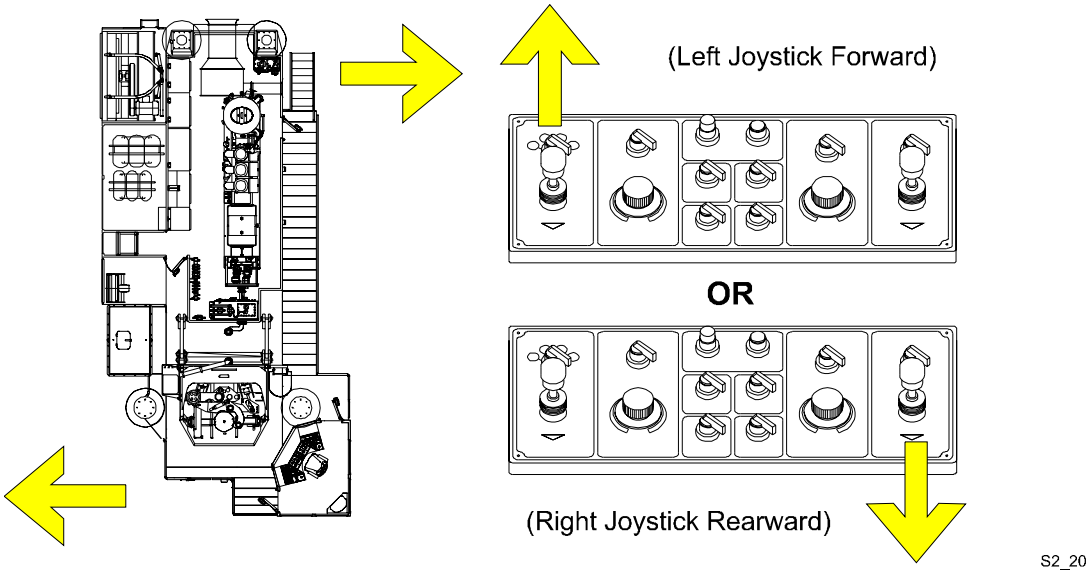
TYPICAL LOW VOLTAGE CABINET

brakes, then move both joysticks slowly forward. Speed is increased as the levers are moved forward. To propel straight in reverse pull both joysticks slowly to the rear. Speed is increased as the levers are pulled.



STRAIGHT PROPEL

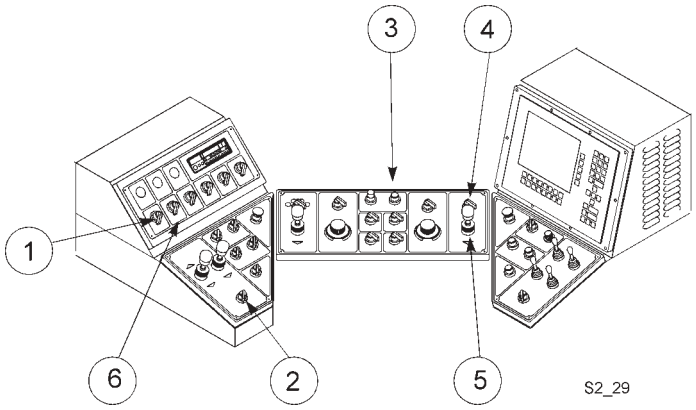
6. To make a gradual forward right turn, leave the right joystick in neutral and operate the left joystick forward.



GRADUAL RIGHT HAND TURN

winch joystick, located on the main control panel, forward. As the mast reaches an angle of 70 degrees it will begin to go over center and tend to come into the vertical position by itself. Care should be used once the mast has gone over center since the speed of the mast will increase sharply.

CAUTION: The mast joystick should be moved away from and returned to the neutral position very slowly. Sudden starts and stops can be damaging to the mast and hydraulic system. Be extremely cautious as the mast approaches 70 degrees as once the mast goes over center only a very slight movement of the joystick is necessary to cause motion in the mast.



1. Mast Lock Switch
2. Operating Mode Selector Switch
3. Drill/Propel “ON” Pushbutton
4. Winch/Mast Selector Switch
5. Mast Joystick
6. Mast Brace Lock Switch

MAST RAISING/LOWERING CONTROLS

NOTE: Pay close attention to the hoses, wires and cables that run between the mast support and the mast to prevent damage to the machine as the mast is being raised. Have a helper watch from a safe position on the left side of the machine as the mast is going up.

3. Once the mast is vertical, move the mast lock switch to the LOCK position to lock the mast in the vertical position. Return the lever to the neutral position when the latch is in position. Blinking (Mast Pins Out) on operator’s display terminal operator’s display screen will disappear when mast is locked in position. Turn the mast brace lock switch to the LOCKED position to secure the mast and brace in the vertical position.

NOTE: When moving the mast for angle hole drilling, on machines with mast lengths of 65 ft (19.8 m) or more, the drill pipe must be stored in the racks and the rotary head lowered to its lowest position.

4. If the mast is to be set up for angle drilling move the A-frame lock switch and the mast brace lock switch to the UNLOCK position to release the A-frame front leg lock pin and mast brace lock pins. The readout (A-frame Pins Out and Mast Brace Pin Out) will show up on the bottom of operator’s display screen of the operator’s display terminal.

10. Repeat the procedure for additional lengths of pipe.

11. Unloading the pipe is the reverse of the procedure used for loading the pipe.

DRILL TOOL STRING ASSEMBLY

The tool string consists of one or more sections of drill pipe, a stabilizer (drill collar) and a bit. In assembling the tool string, the stabilizer is the first item installed, then comes a section of drill pipe and finally the bit.

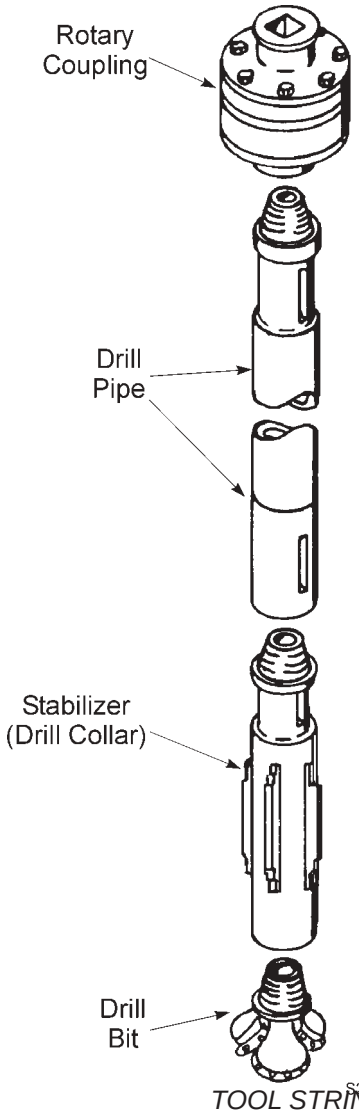
To install the stabilizer proceed as follows:

1. Place the stabilizer to be installed in a position so as to be accessible to the auxiliary winch line. Clean and lubricate the threads and shoulders on each end of the stabilizer. Install a lifting bell on the pin (upper) end of the stabilizer and lift it onto the drilling deck with the auxiliary winch line. Securely block the stabilizer horizontally on blocking sufficient enough to place the stabilizer 8-10 inches above the drill deck. Remove the auxiliary winch line.

2. Remove the guide bushing from the hole in the drill deck. Place the guide bushing on the upper end of the stabilizer with the tapered end of the bushing toward the lower (box) end of the stabilizer. Reattach the auxiliary winch line to the lifting bell.

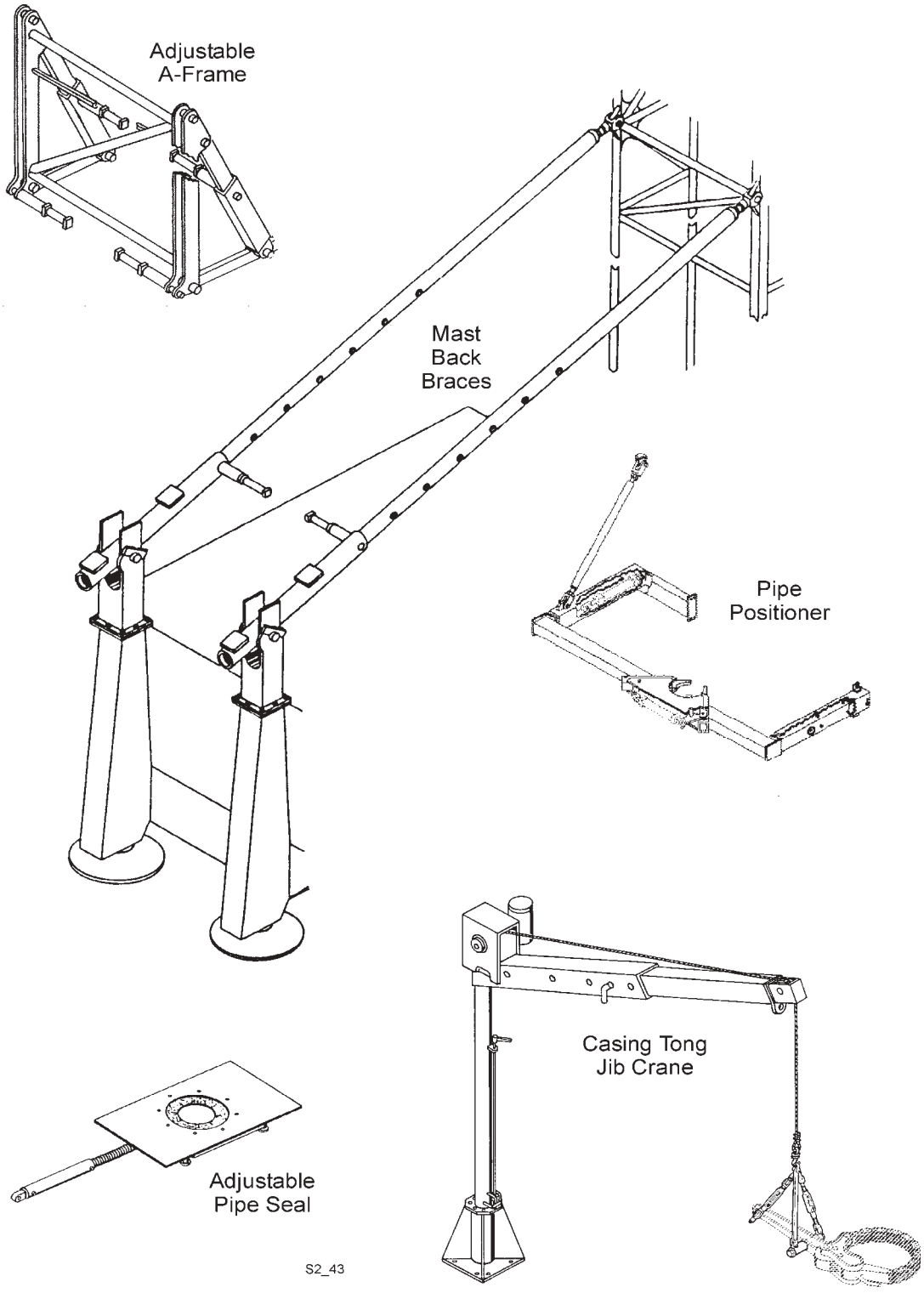
3. Install the stabilizer and drill bushing in the hole in the drill deck. Make sure the drill bushing is seated properly. Lower the stabilizer until the slots in the stabilizer are aligned with the tool wrenches. Extend the tool wrenches to hold the stabilizer in place.

4. Remove the auxiliary winch line from the stabilizer and secure it out of the way. Remove the lifting bell from the stabilizer and store it.



TOOL STRING

ANGLE DRILLING



ANGLE DRILLING EQUIPMENT

3. Once the tool string has been removed and the hole reamed, it must now be cleaned out. Reaming the hole loosens cuttings that have become lodged in the side of the hole. These cuttings, and most of the cuttings generated during reaming will fall to the bottom of the hole. This filling of the hole may reduce the actual depth of the hole significantly, so it is necessary to remove these cuttings from the hole. To do this, release the hoist brake and turn the hoist/pulldown rheostat slowly in the pulldown mode.

Leave the air on and the tool string turning at 25-30 RPM. When the bit reaches the point where the cuttings have accumulated on the bottom of the hole, these cuttings will be forced out of the hole. When the cuttings have been cleaned out of the bottom of the hole, the bit will contact the undrilled formation at the bottom of the hole and stop penetrating. Once the flow of cuttings out of the hole stops and the tool string stops penetrating, the hole is clean.

4. After cleaning the hole the tool string may be raised to the top. Turning the hoist/pulldown rheostat control in the HOIST direction and the hoist/pulldown speed selector switch in the HOIST HIGH position will hoist the tool string.

ENDING THE HOLE (MULTIPLE PIPE SECTIONS)

Reaming the hole with multi-section tool strings is the same as reaming with single pipe section strings. The reaming procedure must be done in stages as the pipe sections are removed.

While removing the drill pipe the cuttings dislodged from the sides of the hole and the cuttings generated by reaming will fall to the bottom of the hole. To effectively clean the hole, it would be necessary to reassemble the tool string and lower it to the bottom of the hole. This is not desirable as it is time consuming. One method to eliminate the need to clean the hole is to overdrill the depth and allow cuttings to fill the hole to the desired finishing depth. Experience in this area will show how much to overdrill the hole. A good practice is to overdrill the hole by 1 to 2 feet (0.3 to 0.6 m) over the estimated finished hole depth. This way, if the estimate is wrong, the hole will be 1 to 2 feet (0.3 to 0.6 m) too deep. This can easily be corrected by a few shovels full of cutting thrown into the hole. Underestimating, on the other hand will require that the tool string be reassembled and the hole cleaned.

DRILLING DIFFICULT FORMATIONS

For the purpose of explanation, the drilling procedure given in the DRILLING section of the manual assumes that drilling takes place in consistent, consolidated rock formation. Unfortunately, not all drilling is in this type of formation. This section of the Operator's Manual will detail, in general, some typical drilling difficulties encountered.

The main cause of difficult drilling are unconsolidated material or wet sticky material. Unconsolidated