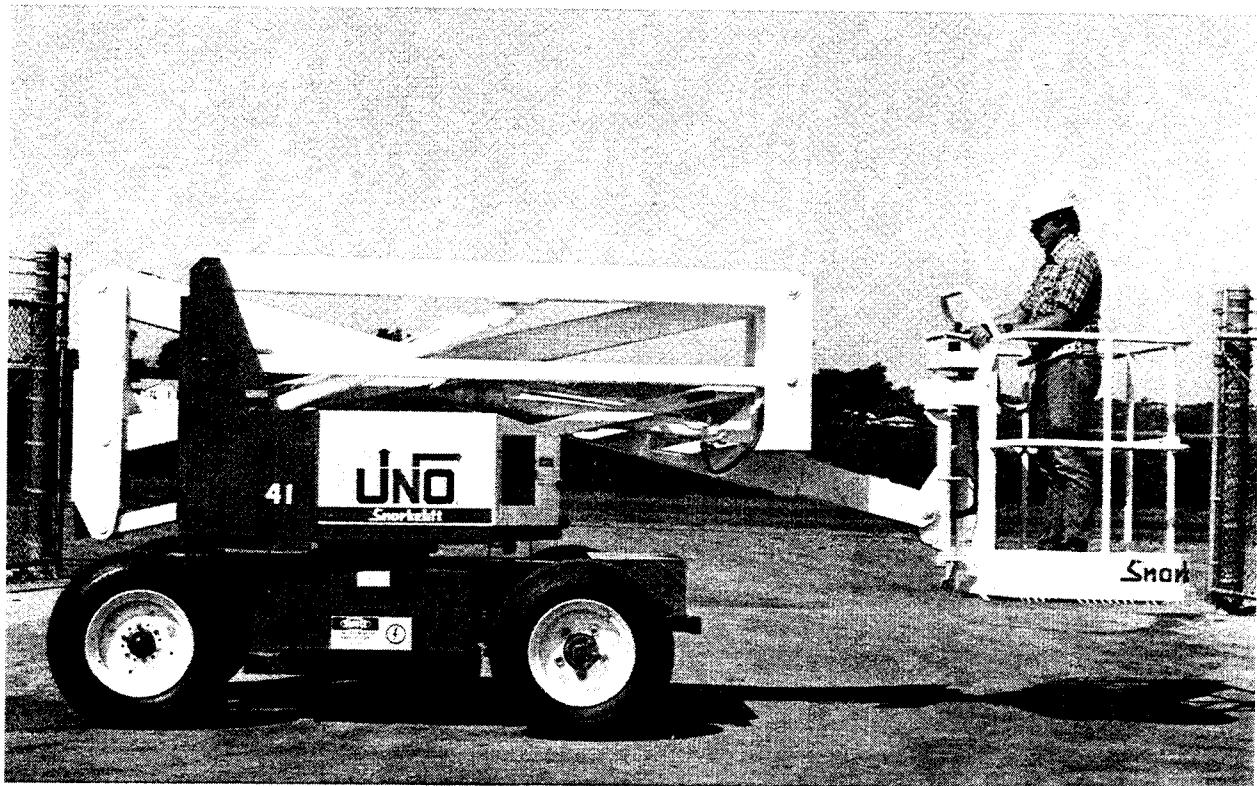


OPERATION AND MAINTENANCE MANUAL

“SNORKELIFT”

UNO-41E



Snorkel **ECONOMY**

A FIGGIE INTERNATIONAL COMPANY

ST. JOSEPH, MISSOURI

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UNO-41E OPERATION AND MAINTENANCE MANUAL

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⚡ DANGER

THE "SNORKELIFT" AERIAL WORK PLATFORM IS NON-INSULATED.

AVOID CONTACT WITH ELECTRICAL CONDUCTORS UP TO 300 VOLTS. MAINTAIN AT LEAST 10 FEET CLEARANCE FROM CONDUCTORS OF 300 TO 50,000 VOLTS.

If the platform or supporting structure or any other conductive part of the machine contacts a non-insulated high-voltage electrical conductor, the result may be **SERIOUS INJURY** or **DEATH** for persons on or near the unit.

If in contact with a live electrical conductor, the entire unit will be charged to the voltage of the conductor. If this happens the platform operator should remain on the machine and use caution to not contact any other structure or object within his reach. This includes the ground, adjacent buildings, poles, and any object not a part of the "Snorkelift". Such contact would make his body a conductor to the adjacent object creating an electrical shock hazard with possible **ELECTROCUTION** and **DEATH**. If the platform is in a position where the operator could leave the machine, he **MUST** do so by **JUMPING** so as to not be in contact with the machine and the ground at the same time.

Further, if in contact with a live conductor, the platform operator **MUST** warn others on the ground in the vicinity of the machine to **STAY AWAY** from the machine, since their body could, again, form the path for electricity to ground creating an electrical shock hazard with possible **ELECTROCUTION** and **DEATH**.

Under no circumstances shall any person on the ground attempt to operate the ground controls when the platform structure is in contact with electrical wires or if there is a danger of such contact.

Additionally, it **MUST** be a specific duty of the "Snorkelift" operator to warn others working in the area around the unit to be always aware of overhead wires and possible contact with them. The operator **MUST** also be ready to warn others on the ground and advise them to stay away from the "Snorkelift" when the situation demands.

Even if a wire is present that is supposed to be "de-energized", it should be treated as "LIVE" and given a wide berth. **"PLAY IT SAFE"**.

To assist in alerting personnel relative these electrical hazards, decals have been placed at strategic locations on each machine. Additional decals are available if it is desired to place them in other locations.

In conclusion, personnel working on or near the "Snorkelift" unit must be continuously aware of electrical hazards, recognizing that **SERIOUS INJURY** or **DEATH** could result if contact with an electrical wire does occur.

VOLTAGE RANGE (Phase to Phase)	MINIMUM SAFE APPROACH DISTANCE	
	(Feet)	(Meters)
0 to 300V	AVOID CONTACT	
Over 300V to 50KV	10	3.05
Over 50KV to 200KV	15	4.60
Over 200KV to 350KV	20	6.10
Over 350KV to 500KV	25	7.62
Over 500KV to 750KV	35	10.67
Over 750KV to 1000KV	45	13.72

The UNO-41E Snorkelift aerial platform incorporates built-in safety features, and has been factory tested for compliance with Snorkel-Economy specifications and industry standards. However, any personnel lifting device can be potentially dangerous in the hands of untrained or careless operators.

Training is vitally important and **MUST** be carefully supervised by a skilled, responsible party.

Training **MUST** include a thorough review of this manual and the UNO-41E Snorkelift machine, followed by supervised operating practice that simulates conditions and maneuvers expected in actual working situations.

An operator shall be considered "Qualified" **ONLY** after sufficient supervised training and practice proves him to have a demonstrated ability to control the UNO-41E Snorkelift smoothly, position it accurately, and assure that its assigned operation will be handled responsibly and **SAFELY**.

Observance of the following RULES will help to assure the safety of personnel and help to prevent needless "down" time because of damaged equipment.

- 1 Only "Qualified Operators" shall be permitted to operate the equipment.
- 2 "Qualified Operators" must be thoroughly familiar with all operating instructions and equipment capabilities and limitations.
- 3 All safety precautions **MUST** be strictly adhered to.
- 4 Repairs and adjustments shall be made **ONLY** by qualified trained personnel.
- 5 No modification shall be made to the equipment without prior written consent of Snorkel Engineering Department.
- 6 The UNO Snorkelift is to be elevated **ONLY** on firm, level surfaces.

CAUTION

DO NOT operate this equipment unless you are an "Assigned" & "Qualified Operator" and have read and thoroughly understand all information given in this Operation and Maintenance Manual, and on all CAUTION and WARNING signs on the unit.

Every person who maintains, inspects, tests or repairs these units, and every person supervising any of these functions, **MUST** be properly trained and **MUST** read and understand this entire manual. The manual **MUST** be kept available for ready reference in the storage container on the unit.

Costly repairs and down time can be prevented by following a regular maintenance program. Regular maintenance is the key to safe, trouble-free operation and extended machine life.

This manual provides information concerning lubrication, maintenance guidelines, and inspection procedures that will keep your Snorkelift in good operating condition.

Since work platforms are operated under many different conditions, it is difficult to define a single time schedule for lubrication that is appropriate for every machine. Recommended lubricating intervals are based on a unit running approximately fifty (50) hours a month as average normal use. It is understood that some units will see more use, others less, so it **MUST** be the user's responsibility to adjust lubricating requirements as necessary to meet individual conditions and usage.

Any alteration and/or modification of a unit must have written approval from the Engineering Department of Snorkel-Economy, A Figgie International Company.

Information contained in this manual concerns only current Snorkelift units, and the right is reserved to make changes at any time without obligation.

Should there be a question concerning anything covered in this manual, please contact the Snorkel-Economy Service Department, Elwood Kansas, telephone 1-800-255-0317 or 913-989-4481.

For additional information contact:

Snorkel-Economy
P O Box 4065
St Joseph Mo 64504-4065
Phone: 913-989-4481

MAXIMUM PLATFORM HEIGHT	40 FEET-10 INCHES
WORKING HEIGHT - NOMINAL	46 FEET-10 INCHES
HORIZONTAL REACH	23 FEET-7 INCHES
PLATFORM SIZE (STANDARD)	30 x 48 INCHES
WEIGHT (APPROXIMATE)	13,000 POUNDS
UNRESTRICTED PLATFORM CAPACITY	
STANDARD 30 x 48 ALUMINUM PLATFORM	500 POUNDS
OPTIONAL 30 x 60 ALUMINUM PLATFORM	500 POUNDS
TRAVEL SPEED	
STOWED	3.0 M.P.H.
ELEVATED	1.0 M.P.H.
TURNING DIAMETER (INSIDE)	13 FEET-0 INCHES
OVERALL LENGTH (STOWED)	15 FEET-10 ³ / ₄ INCHES
OVERALL WIDTH	5 FEET-11 ¹ / ₂ INCHES
OVERALL HEIGHT - (STOWED)	6 FEET-7 INCHES
WHEELBASE	72 INCHES
GROUND CLEARANCE	7 ¹ / ₂ INCHES
TIRES, (FOAM FILLED)	9.50-16.5, 8 PLY
ELECTRICAL SYSTEM	
PRIMARY	48 VOLT DC
SECONDARY	24 VOLT DC
BATTERIES	8 @ 6 VOLT, 220 AMP HOURS
HYDRAULIC SYSTEM MAX. PRESSURE	2,300 PSI

OSHA AND ANSI STANDARDS

The UNO-41E Snorkelift has been built in so far as we are aware, to conform with OSHA and ANSI Rules and Regulations.

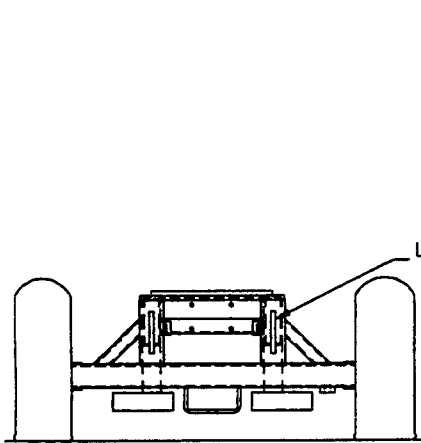
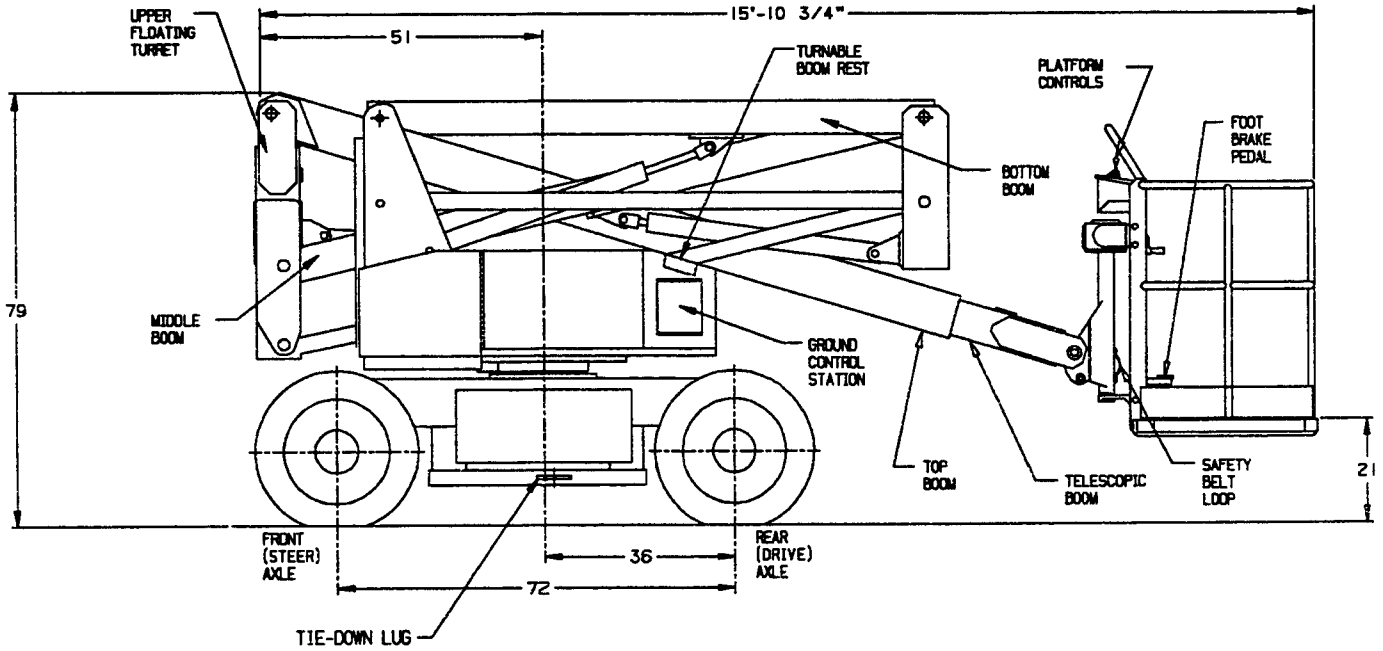
- OSHA Paragraph 1910.67 Title 29, C.F.R.
Vehicle-mounted Elevating and Rotating Work Platforms - Labor
- OSHA Paragraph 1926.556 Title 29, C.F.R.
Aerial Lifts - Construction
- ANSI Standard A92.5-1992
Boom-Supported Elevating Work Platforms
- CSA Standard CAN 3-B354.4-M82
Boom-Type Elevating Work Platforms

It is imperative that all owners and users of the UNO-41E Snorkelift read, understand and conform to these regulations. Ultimate compliance to OSHA regulations is the responsibility of the employer utilizing the equipment.

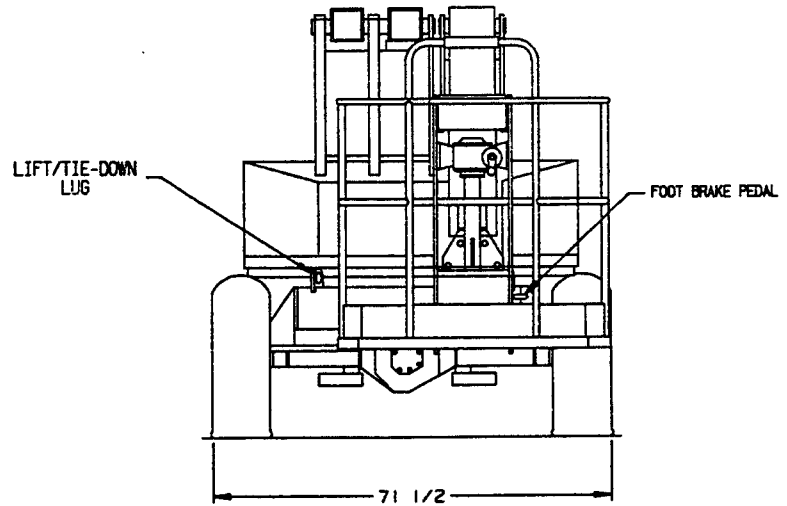
ANSI Standard A92.5-1992 clearly identifies requirements of all parties who may be involved with Boom-Supported Elevating Work Platforms.

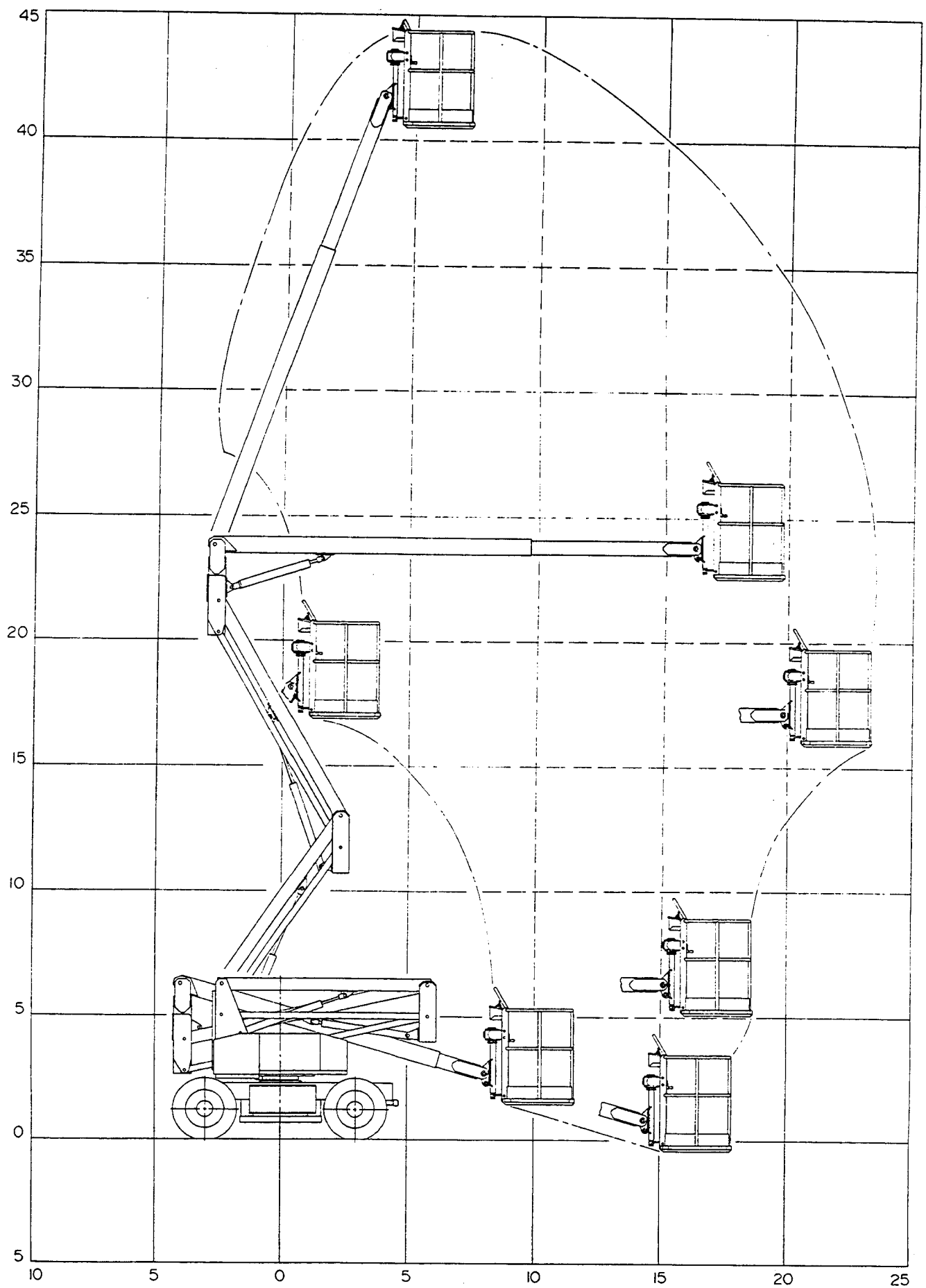
A reprint of the Responsibilities of Dealers, Installers, Owners, Users, Renters, Leasers and Operators is available from Snorkel-Economy dealers or from the factory at no cost upon request.

SNORKELIFT MODEL UNO-41E



FRONT VIEW
CHASSIS





This particular portion of the Operator's Manual contains information concerning the operating characteristics of the controls, time required to attain maximum platform attitude, unrestricted platform capacity and instructions on maintaining stability. These paragraphs should be referred to often. A good understanding of the equipment limitations and capabilities will assure maximum operating efficiency and minimize chances of hazardous operation.

UNRESTRICTED PLATFORM CAPACITY:

30 x 48 Aluminum Platform 500 Pounds
30 x 60 Aluminum Platform 500 Pounds

The platform capacity is the combined weight of all personnel, their tools and other equipment carried by the platform and within its floor dimensions.

The unrestricted platform capacity above, is applicable in all positions when on a firm, level surface, and includes an adequate safety margin as required by OSHA and ANSI. **DO NOT** diminish this safety factor by overloading. **DO NOT** carry loads from any point outside of the platform floor.

WARNING

Proper stability of unit is based on the standard unit and all of its components as supplied from the factory.

Modification of the unit, either the addition or removal of parts and/or weight, can greatly affect the platform stability and safety.

DO NOT under any circumstances remove any weight from the unit.

STEERING:

Steering is accomplished with a hydraulic cylinder. The steering axle is not self-centering, therefore, steer toggle switch direction **MUST** be reversed when turn is completed in order to return to straight line travel.

DRIVE:

Drive is accomplished with a D.C. electric motor and gear reduction unit that propels the rear axle. Battery power is supplied to the motor through a "Silicon Controlled Rectifier" (SCR) control system that provides variable voltage and direction control in response to drive controller lever operation at the platform.

DRIVE SPEED:

The rotating speed of the drive motor and resulting travel speed of the machine are affected by two factors:

- The voltage applied to the motor
- The torque level required for the motor to move the machine

When the batteries are fully charged and the machine is driven at full speed on a level, paved surface, the voltage and torque factors result in the following maximum travel speeds:

- Boom stowed on turntable boom rest:
3.0 MPH
- Boom elevated off turntable boom rest:
1.0 MPH

These speed ranges are interlocked through a limit switch that senses the top boom position at the turntable boom rest. Elevating the boom off the boom rest automatically causes a cutback in the maximum voltage available to the drive motor.

WARNING

The UNO-41E Snorkelift is to be elevated **ONLY** on firm level surfaces.

DO NOT tie back, block, or in any way override the operation of the boom limit switch. **NEVER** operate the UNO-41E Snorkelift in elevated boom positions unless the boom limit switch is functioning properly.

The SCR drive system does not automatically produce retarding (braking) action to prevent the machine from speeding up on downhill grades, nor does movement of the drive controller lever from full speed position to a reduced speed position cause the drive system to "force" the machine to slow down.

These characteristics are different than with proportional hydraulic drive systems used on some other machines, and therefore, different operating techniques are required. The operator must **DELIBERATELY** apply braking action when necessary to prevent the machine from traveling too fast, to force the machine to slow down, and to hold the machine stationary.

BRAKING:

Braking action occurs at the rear drive axle of the machine, and can be produced by three operating systems:

- Hydraulically applied brake calipers on a brake disc mounted to the axle pinion cause braking action proportional to the amount of effort applied by the operator to the FOOT BRAKE pedal in the platform.
- The electric drive motor causes reverse torque or braking action when the drive controller lever is moved in the color-coded direction opposite to the direction the chassis is moving. This is called "Plugging" the drive system.

Since plugging action of the drive system may not provide the smooth, variable braking control required in many driving situations, the operator should not use plugging as the normal braking system. USE THE FOOT BRAKE.

- Spring applied brake calipers on the brake disc mounted to the axle pinion provide high capacity holding action when the parking brake system is allowed to lock, and are fully released by hydraulic pressure when the operator puts the machine in "Drive" mode.

CAUTION

ALWAYS use the FOOT BRAKE pedal to hold the machine before releasing the parking brake to avoid unintentional movement.

ALWAYS use the FOOT BRAKE pedal to slow down and stop before allowing the parking brake to lock to avoid a sudden stop.

Note: See operating procedures sections for further information on the UNO-41E Snorkelift's drive and brake system controls.

BOOM OPERATING TIMES: (APPROXIMATE)

Bottom Boom

Raise cycle.....	25-30 seconds
Lower cycle	15-20 seconds

Middle Boom

Raise cycle.....	35-40 seconds
Lower cycle	25-30 seconds

Top Boom

Raise cycle.....	35-40 seconds
Lower cycle	25-30 seconds

Telescopic Boom

Extend cycle.....	35-40 seconds
Retract cycle	40-50 seconds

Turntable Swing

Full rotation cycle	70-80 seconds
---------------------------	---------------

Note: The above operating times are for typical maximum operating speeds with fully charged batteries and normal oil temperature.

TURNTABLE SWING:

Turntable swing, is limited to 360° non-continuous by rotation limit switches mounted on the turntable. Unit is also equipped with mechanical rotation stops.

PLATFORM ROTATION:

Platform rotation is accomplished with a manual rotator hand crank that provides rotation range of 150° total, (75° each side of center).

GROUND CONTROL STATION:

Master switches and controls for operating the UNO-41E Snorkelift from ground level are located on the left side of the turntable and include all unit functions controls with the exception of drive and steer controls.

1 GROUND/PLATFORM controls selector switch:

Three position toggle switch to select between Ground Controls or Platform Controls operation. Center position is "OFF" and de-activates both Ground or Platform Controls operation.

Note: Ground Controls position is momentary contact and the switch must be held in the (down) "GROUND" position to provide power to the other function switches.

2 BOOM SPEED CONTROL KNOB:

Rotary speed control knob to control speed of bottom and top boom raise/lower and extend/retract functions. Knob should be set toward "SLOW" position when beginning a boom movement function and the speed may be increased as desired during operation by slowly rotating knob toward "FAST" position.

Note: Booms may not move when the speed control knob is set to "SLOW" position. It this should occur slowly rotate knob toward "FAST" while simultaneously operating boom function switch.

3 TOP BOOM (Extend/Retract) switch:

Three position toggle switch to extend/retract top boom. To operate, move switch to desired function, EXTEND or RETRACT while holding the GROUND CONTROLS selector switch in the "GROUND" position. Release switches after completing desired movement of boom. Center position of switch is "OFF".

4 BOTTOM BOOM ELEVATION (Up/Down) switch:

Three position toggle switch to raise/lower bottom boom. To operate, move switch to desired function, UP or DOWN while holding the GROUND CONTROLS selector switch in the "GROUND" position. Release switches after completing desired movement of boom. Center position of switch is "OFF".

GROUND CONTROL STATION (Continued):

5 MIDDLE BOOM ELEVATION (Up/Down) switch:

Three position toggle switch to raise/lower middle boom. To operate, move switch to desired function, UP or DOWN while holding the GROUND CONTROLS selector switch in the "GROUND" position. Release switches after completing desired movement of boom. Center position of switch is "OFF".

6 TOP BOOM ELEVATION (Up/Down) switch:

Three position toggle switch to raise/lower Top boom. To operate, move switch to desired function, UP or DOWN while holding the GROUND CONTROLS selector switch in the "GROUND" position. Release switches after completing desired movement of boom. Center position of switch is "OFF".

7 BOOM ROTATION switch:

Three position toggle switch to rotate booms clockwise or counter-clockwise. To operate, move switch to desired function, CW or CCW rotation while holding the GROUND CONTROLS selector switch in the "GROUND" position. Release switches after completing desired movement of boom. Center position of switch is "OFF".

8 PLATFORM LEVEL (Up/Down) switch:

Three position toggle switch to level platform. To operate, move switch to desired function, UP or DOWN while holding the GROUND CONTROLS selector switch in the "GROUND" position. Release switches after leveling platform. Center position of switch is "OFF".

9 REMOTE BRAKE RELEASE button:

Remote operated push to operate button to release brakes during loading/unloading procedures for transporting unit.

10 BATTERY DISCONNECT switch:

Rotary switch to disconnect battery power when machine is not in use.

Note: Switch may be secured with padlock to prevent unauthorized use of machine.

PLATFORM CONTROL STATION:

Master switches and controls for operating the UNO-41E Snorkelift from the platform are located within the platform control box assembly. The platform control box cover placard indicates direction of handle or switch movement to accomplish desired function or movement of platform. For Platform Control Station controls to be operational, the CONTROLS SELECTOR switch at the Ground Control Station must be in "PLATFORM" position.

1 FOOT SWITCH:

Foot operated (Deadman) switch to provide power to the Platform Control Station function switches. Switch must be in the de-activated "UP" position to provide power to the function control switches.

2 BOOM/DRIVE SELECTOR switch:

Two position toggle switch to select between boom operation or drive function.

3 DRIVE controller:

One hand joystick controller to provide power to drive directional valve for forward or reverse drive. Move the handle toward the desired direction of travel as indicated on the control box placard.

Note: The drive control provides a signal that produces drive speed proportional to the amount of handle movement, (the greater the movement, the faster the speed).

When operating drive controller, move handle slowly and deliberately to produce smooth drive start and stop. Always return handle to center "OFF" position to allow unit to stop before reversing drive direction.

4 BOOM SPEED CONTROL KNOB:

Rotary speed control knob to control speed of bottom and top boom raise/lower and extend/retract functions. Knob should be set toward "SLOW" position when beginning a boom movement function and the speed may be increased as desired during operation by slowly rotating knob toward "FAST" position.

Note: Booms may not move when the speed control knob is set to "SLOW" position. If this should occur slowly rotate knob toward "FAST" while simultaneously operating boom function switch.

PLATFORM CONTROL STATION (Continued):

5 EMERGENCY STOP switch:

A red "mushroom-head" shaped button switch will shut off power to the platform controls when pushed in. The button will remain in until reset. To restore power to the operator's control console, simply pull button outward to reset. This switch should be pushed in when controls are not in use.

6 STEER switch:

Three position toggle switch to control direction of steering. To steer unit, move switch toward desired direction as indicated on the control box placard. The center position is maintained "OFF". Drive and steer functions can be operated separately or simultaneously.

Note: The steering axle is not self-centering, therefore, steer control direction **MUST** be reversed when turn is completed in order to return to straight line travel.

7 BOOM ELEVATION (Up/Down) switches:

Three position toggle switches to provide power to raise or lower the booms. To raise or lower booms, move switch toward desired direction as indicated on the control box placard. The center position is maintained "OFF".

8 BOOM ROTATION switch:

Three position toggle switch to rotate booms clockwise or counter-clockwise. To operate, move switch to desired function, "CW" or "CCW". Center position is "OFF".

9 PLATFORM LEVEL (Up/Down) switch:

Three position toggle switch to level platform. To operate, move switch to desired function, "UP" or "DOWN". Release switch after leveling platform. Center position of switch is "OFF".

10 BOOM (Extend/Retract) switch:

Three position toggle switch to extend/retract booms. To operate, move switch to desired function, "EXTEND" or "RETRACT". Release switch after completing desired movement of boom. Center position of switch is "OFF".

11 Operator's horn button – (Optional item):

This push button switch when depressed, sounds and audible horn.

OPERATOR'S INSPECTION

Before each day's operation of the work platform, the operator **MUST** perform the general inspection as outlined in the Daily Maintenance (Operator's Inspection) chart.

The purpose of the operator's inspection is to keep the equipment in proper working condition and to detect any signs of malfunction during normal operations between scheduled maintenance checks.

While it may not be the operator's responsibility to perform mechanical maintenance, they **MUST** be thoroughly familiar with this unit and know what is to be done to care for the unit properly since their own safety is involved.

Many costly maintenance jobs can be prevented through observance of the following by UNO-41E Snorkelift operators.

DAILY MAINTENANCE (OPERATOR'S INSPECTION)

COMPONENTS	SERVICE REQUIRED
Hydraulic Hand Pump	Check Operation
Foot Brake	Check Operation, Check Fluid Level
Electric Drive Motor	Check Operation
Bolts and Fasteners	Visually Inspect (Looseness)
Platform Gravity Gate	Visually Inspect (Operation)
Slide Pads	Visually Inspect (Boom Wear Marks)
Structural Damage & Welds	Visually Inspect (Weld Cracks, Dents)
Tires and Wheels	Inspect Condition, Check Inflation
Battery Fluid Level	Check Fluid Level
Battery Terminals	Visually Inspect (Corrosion)
Control Switches	Visually Inspect (Operation)
Wiring Harnesses	Visually Inspect (Installation, Condition)
Hydraulic Leaks	Visually Inspect (Hoses, Tubes)
Hydraulic Oil	Check Fluid Level

⚠CAUTION

DO NOT operate a UNO-41E Snorkelift that is known to be damaged or malfunctioning. Defective components or equipment malfunctions jeopardize the safety of the operator and other personnel, and can cause extensive damage to the unit. Remember, a poorly maintained unit could become the greatest operational hazard you may encounter.

GENERAL OPERATION:

ALWAYS operate the UNO-41E Snorkelift to provide the safest and most efficient use of the machine giving consideration to the following factors:

- 1 Electrical wires and installations.

⚠ DANGER

The UNO-41E Snorkelift is a **NON-INSULATED** work platform.

DO NOT operate near **ELECTRICAL** conductors. regard all conductors as being energized. (See page 1 for more explanation of electrical hazards).

- 2 Unrestricted platform capacity.

30 x 48 Aluminum Platform 500 Pounds
30 x 60 Aluminum Platform 500 Pounds

Platform capacity includes personnel, tools and equipment and is applicable with unit in all positions of operation.

- 3 Type of Terrain

The UNO-41E Snorkelift is to be elevated **ONLY** on firm level surfaces.

The UNO-41E Snorkelift has capability for fast travel speed and to drive over uneven surfaces and slopes, but it should be operated in such conditions **ONLY** with the platform in its **STOWED FOR TRAVEL** position:

- Top boom fully down on the turntable boom rest.
- Telescopic boom fully retracted.
- Platform centered at rear (drive) end of chassis.

⚠ WARNING

DO NOT drive on any slope with platform raised or extended.

DO NOT drive fast or on any slope unless platform is stowed at center of rear drive axle-end of chassis.

GENERAL OPERATION (Continued):

- 4 When driving on sloped surfaces, the operator must **DELIBERATELY** apply braking action to maintain control of the machine. A pedal-operated hydraulic **FOOT BRAKE** is provided at the right side of the platform control station.

The foot brake pedal **MUST** be used:

- To hold machine when parking brake is released.
- To prevent excessive speed on slopes.
- To slow down and stop before allowing parking brake to lock.

When "inching" the machine down a slope or in tight quarters, the best drive control technique is to apply just enough **FOOT BRAKE** pedal force to hold the machine, while at the same time applying enough drive power to make the machine move slowly.

Steep slopes (such as loading ramps) require additional driving precautions. See **DRIVING PROCEDURE** (page 16).

- 5 Operating clearance requirements.

When operating controls, care **MUST** be taken that the platform and boom system is not brought into contact with buildings, obstructions, electrical wires, or personnel near the machine.

When working in tight quarters, elevate the bottom and middle booms before rotating the turntable from **STOWED FOR TRAVEL** position. When both the bottom and middle booms are fully raised, the floating turrets are within the width dimensions of the machine producing zero tailswing.

Be aware that lowering either the bottom or middle booms will increase clearance requirements for the boom system, especially when working over obstructions where these components may not be visible from the platform.

⚠ CAUTION

NEVER operate drive or boom controls to move portions of the machine that are not visibly clear of surrounding obstructions.

GENERAL OPERATION (Continued):

6 Windy conditions.

CAUTION

DO NOT operate the Snorkelift when wind velocity or wind gusts exceed 25 MPH.

7 Actions that can cause jerking or lashing of the platform **MUST** be avoided.

- Start and stop hydraulic function movements with **BOOM SPEED** control knob turned to "SLOW", especially when operating at maximum working radius or maximum load.
- Operate **DRIVE CONTROL** lever smoothly and deliberately and apply **FOOT BRAKE** pedal force gradually to provide smooth starts and stops of the drive system.

OPERATION:

The following step-by step procedures are provided to guide users in the proper operation of the UNO-41E Snorkelift.

- 1 Close and latch all cowling access doors.
- 2 Turn battery disconnect switch to "ON" position.
- 3 Test each hydraulic function for proper operation at Ground Control Station by holding **CONTROLS SELECTOR** switch in the (down) "GROUND" position while actuating the function switches.

Note: Function controls are inoperative unless **CONTROLS SELECTOR** is simultaneously held down in the "GROUND" position. Also, boom functions may not move when rotary **BOOM SPEED** control knob is turned fully to SLOW position.

- 4 Place **CONTROLS SELECTOR** switch in the (up) "PLATFORM" position to allow operation from Platform Control Station.
- 5 Enter work platform attaching safety belt to loop provided on mounting pylon.
- 6 Place **FOOT SWITCH** in a position on platform floor that will be convenient for operation with the left foot and allow operation of the **FOOT BRAKE** pedal with the right foot.
- 7 Place **BOOM/DRIVE** selector switch in "BOOM" position.
- 8 Place **EMERGENCY STOP** button in "OPERATE" (pulled up) position.
- 9 Depress **FOOT SWITCH** to provide power to platform controls.
- 10 Operate hydraulic functions as desired using toggle switches to move the platform into position for elevated work or to move it to **STOWED FOR TRAVEL** position before driving to the work site.

Note: Operating speed of all hydraulic functions is controlled by rotary **BOOM SPEED** control knob on control box. For smoothest starts and stops, turn knob to "SLOW" before moving function switch. When operating near the end of each function's travel, reduce speed to avoid jerking or lashing of the platform.

OPERATION (Continued):

- 11 To place machine in DRIVE mode, first step on FOOT BRAKE pedal to prevent unintended movement when parking brake is released, then move BOOM/DRIVE selector switch to "DRIVE" position and depress FOOT SWITCH.

Note: The parking brake system is either fully released or fully locked, **IT DOES NOT** provide variable braking effort in coordination with the drive system.

The parking brake **RELEASES** when the foot switch is actuated and the selector switch is in "DRIVE" position.

The parking brake **LOCKS SUDDENLY**:

- When the foot switch is released.
 - When the selector is switched to "BOOM" position.
 - When the EMERGENCY STOP button is pushed down.
- 12 Actuate DRIVE CONTROL lever slowly and deliberately in color-coded direction necessary to drive forward or reverse as indicated by colored arrows on chassis. Gradually reduce force on FOOT BRAKE pedal while actuating DRIVE CONTROL lever to accelerate smoothly to a safe travel speed.

Orientation for Forward/Reverse drive direction and Left/Right steer direction is referenced to the steer axle being "front" and the drive axle "rear" from the operators viewpoint. To minimize confusion over these control directions, the platform must be moved to the **STOWED FOR TRAVEL** position at the rear (drive) end of the chassis.

Although it may sometimes be necessary for access to elevated work positions, driving the unit with the platform over the front (steer) end of the chassis should be **AVOIDED** since it makes the machine difficult to control from several stand points:

- Drive/Steer control movements and their resulting machine movements become physically in opposite directions.
- Sudden turns or stops produce much more severe reactions to platform occupants - especially when driving fast.
- The unit requires more turning space to prevent the platform from colliding with obstacles several feet beyond the path of the tires.

OPERATION (Continued):

- 13 Actuate STEER toggle switch in color-coded direction necessary to turn front (steer) wheels left or right as indicated by colored arrows on chassis.

Note: Steering action is not self-centering, therefore STEER switch **MUST** be actuated in opposite direction after making a turn to return to straight-line travel. Rotary speed control knob may be adjusted for fast or slow steering action as desired.

- 14 After driving to the desired location, slow down and stop using the FOOT BRAKE pedal. Then move SELECTOR switch to "BOOM" position to lock parking brake and allow operation of hydraulic functions to elevate the platform.
- 15 Emergency shutdown from the platform is accomplished by pressing the EMERGENCY STOP button. This switch interrupts power to all controls, stopping all functions including drive and locking the parking brake.

STOWING AND SECURING WORK PLATFORM:

At the end of each day's work, the following procedure should be followed to stow and secure the UNO-41E Snorkelift work platform.

- 1 Fully retract telescopic boom.
- 2 Rotate turntable to place platform at center of rear(drive) end of chassis.
- 3 Fully retract all boom lift cylinders to bring the unit to **STOWED FOR TRAVEL** position.
- 4 Place CONTROLS selector switch at Ground Control Station in the centered "OFF" position.
- 5 Turn battery disconnect switch to "OFF" position and secure with padlock.
- 6 Chock wheels.
- 7 Charge batteries in accordance with instruction placards.

CAUTION

If unit is to be transported, follow procedures outlined under **TRANSPORTING WORK PLATFORM** page 16 to assure safe loading and unloading procedures.

EMERGENCY OPERATION:

Use emergency operation procedures only in case of hydraulic pump/motor or electrical circuit failure and then only to get platform operator out of an emergency situation and down to ground.

EMERGENCY LOWERING PROCEDURES:

- 1 Open left hand cowling door for access to the hydraulic valve package and hand pump.

⚠CAUTION

BE SURE personnel and surrounding structures are clear of the area in the descending path of the booms and platform.

- 2 Open the manual bleed down valve on the **BOTTOM BOOM** lift cylinder and then push hard on the "DOWN" manual override on the bottom boom valve section to bring the bottom boom to stowed position.
- 3 Open the manual bleed down valve on the **MIDDLE BOOM** lift cylinder and then push hard on the "DOWN" manual override on the middle boom valve section to bring the middle boom to stowed position.
- 4 Open the manual bleed down valve on the **TOP BOOM** lift cylinder and then push hard on the "DOWN" manual override on the top boom valve section to bring the top boom to stowed position.

⚠CAUTION

Use extreme caution not to lower the booms or platform onto personnel, electrical wires or other obstructions near the machine.

- 5 **ALWAYS CLOSE** manual bleed down valves on boom lift cylinders immediately after use.

⚠CAUTION

If manual bleed down valve is left open, safety features of cylinder lock valve are by-passed and boom will descend in the event of hose failure. All boom bleed down valves **MUST** be closed after use to safeguard against this.

- 6 As an alternate means of emergency operation, to rotate turntable, lower booms or extend/retract top boom, push hard on appropriate manual override of the hydraulic valve package for the desired function while operating the hand hydraulic pump to bring the unit to the desired position.

OPERATING SAFETY CAUTIONS:

This section is designed to provide safety practices to be followed when using this work platform. All personnel assigned to work on or around the work platform **MUST** be thoroughly familiar with this and all other portions of the manual which relate to safe operation of the unit. Review this section often - it involves the safety of you and your fellow workers.

DRIVING THE UNIT:

- 1 Enter work platform and attach safety belt(s) to loop provided.
- 2 Secure tools and equipment that are in the platform to prevent possible shifting and injury to personnel in the platform.
- 3 Keep in mind overall height and overhang. Always make sure there is sufficient clearance before entering or moving under any overhead obstructions.
- 4 Always look in the direction of travel.
- 5 Use extreme caution when driving on soft, uneven, or sloped surfaces. Drive unit on these surfaces **ONLY** with platform in its **STOWED FOR TRAVEL** position, (see page 11).
- 6 Be aware of conditions around unit; Personnel, other equipment, tools, etc.
- 7 Drive unit slowly, unless conditions allow higher speeds.
- 8 **USE FOOT BRAKE** to control speed of unit on slopes and to come to a smooth stop, (see page 7).

GENERAL SAFETY CAUTIONS:

- 1 **USE EXTREME CAUTION** when operating in the vicinity of electrical wires. The entire work platform is **NON-INSULATED**.

⚠DANGER

SERIOUS INJURY or **DEATH** of platform operator or ground personnel can result from unit contacting live wires. Avoid contact with any object where a dangerous electrical potential may exist. (See page 1 for more explanation of electrical hazards).

- 2 **DO NOT** position UNO-41E Snorkelift at job site in such a manner as to jeopardize its stability. The UNO-41E Snorkelift is to be elevated **ONLY** on firm, level surfaces.

GENERAL SAFETY CAUTIONS (Continued):

- 3 If any equipment trouble is experienced during operation, **SHUT DOWN** until trouble is located and corrected. **DO NOT** operate unit with a known defect.
- 4 **DO NOT** use unit for any other purpose than to position personnel, their tools and equipment.
- 5 The unit is not designed for and must not be used as a crane.
- 6 Keep platform floor clear of unnecessary tools and equipment.
- 7 **DO NOT** exceed unrestricted platform capacity.
- 8 **DO NOT** carry loads from any point outside of the platform floor.
- 9 **DO NOT** operate UNO-41E Snorkelift in excessive wind conditions: (When wind or wind gusts exceed 25 MPH).
- 10 **DO NOT** attach wires, cables or other such items to platform.
- 11 Secure all accessories, containers, tools and other materials in the platform to prevent them from accidental falling or being kicked from the platform.
- 12 **DO NOT** use auxiliary scaffolding, ladders, or other such means to extend normal reach of the platform.
- 13 **DO NOT** allow unauthorized or unqualified persons to operate the work platform.
- 14 Personnel **MUST** be inside the platform while working aloft.
- 15 **DO NOT** enter or leave platform by walking the booms.
- 16 Use extreme caution if you leave the platform to transfer to an adjacent structure.
- 17 Always look in the direction you are moving the platform.
- 18 All personnel in platform **MUST** wear a safety belt. Secure safety belt to safety belt loop, **NEVER** to an adjacent object or structure.
- 19 If personnel are required in the area under the raised platform, Caution **MUST** be observed regarding possibility of falling tools or objects.
- 20 Always stop controls in neutral "OFF" position before operating in opposite direction. **DO NOT** jerk drive controller. Operate smoothly and deliberately to avoid jerky and erratic operation.
- 21 **DO NOT** modify unit in any way or attempt to "override" the safety features of the unit.

ELECTRICAL SYSTEM CAUTIONS:

- 1 **DO NOT** recharge batteries unless Electrolyte level has been checked. Operate charger in accordance with the battery charging instructions placard located on the drive control box cover.
- 2 **DO NOT** smoke or introduce a flame or spark in the charging area.

⚠ DANGER

Lead acid batteries generate highly explosive Hydrogen gas, especially during charging cycle. To avoid the possibility of an explosion, charge batteries only in a well ventilated area away from sparks or flame.

- 3 Use protective face and eye equipment when checking the condition of charging batteries.
- 4 Place battery disconnect switch in the "OFF" position before removing the drive control box cover.

⚠ WARNING

The drive control box contains high amperage electrical components that could result in serious injury if accidentally contacted. Remove drive control box cover **ONLY** for service by a qualified mechanic.

OPERATOR SAFETY CAUTIONS:

A **REQUIRED** safety precaution is to have a Ground Safety Operator or other qualified operating personnel in the immediate area of the work platform to provide assistance as needed to:

- 1 Warn of any obstructions or hazards that may not be obvious to the platform operator.
- 2 Watch for platform entering into a dangerous condition where stability can be jeopardized; Soft terrain, sloping surface, impending drop-off, etc.
- 3 Watch for loss of control by platform operator.

Any of these conditions **MUST** be called to the attention of the platform operator and may be sufficient reason to "de-activate" platform control and assume control from Ground Control Station.

**YOUR SAFETY IS YOUR
RESPONSIBILITY - THINK SAFETY**

Before loading, unloading, or hauling the UNO-41E Snorkelift on transport truck or trailer, the following information **MUST** be completely understood.

- 1 The UNO-41E Snorkelift weighs approximately 13,000 pounds. Loading ramps and carrier vehicles must have adequate capacity.
- 2 Loading with a fork lift is NOT recommended since no fork lift pockets are provided on the UNO-41E Snorkelift.
- 3 Winching is recommended for loading and unloading the UNO-41E Snorkelift.
- 4 A winch **MUST** be used to load and unload on ramps that exceed 20% grade incline, (2 feet vertical rise in 10 feet horizontal length), or when poor traction, uneven surfaces, stepped ramp transitions or uphill direction of platform and chassis make driving the machine hazardous, (see driving procedure).

WINCHING PROCEDURE:

- 1 Locate transport vehicle so that UNO-41E Snorkelift will not roll forward after being loaded.
- 2 Be sure the machine is centered with the loading ramps and carrier vehicle bed, and that the steering wheels are straight.
- 3 Attach the winch at the tie down lugs on the front (steer) end of chassis or to a clevis in the hole provided in the center steering arm.
- 4 Place the boom in its STOWED FOR TRAVEL position on the turntable boom rest, rotate the turntable so the platform is centered on the rear (drive) end of the chassis. Curl the platform up as far as possible with the level control.
- 5 Connect the remote parking brake release switch at the receptacle in the Ground Controls wiring box.

Note: The battery disconnect switch **MUST** be in "ON" position and the batteries must be sufficiently charged to operate the hydraulic power unit in order to release the parking brake.

- 6 Stand away from the machine as far as the remote release switch cord allows. Actuate the brake release switch to allow the winch to move the machine. Disconnect and stow the remote brake release after use.

DRIVING PROCEDURE:

If a winch is not available and the ramp incline is within the 20% grade capability of the machine, observe these precautions for driving unit up or down a steep ramp, providing surface conditions and machine direction are within guidelines below.

- 1 Enter work platform attaching safety belt(s) to loop provided.
- 2 Operate controls to fully lower the top boom onto the turntable boom rest, retract the telescopic boom and rotate the turntable so the platform is centered on the rear (drive) end of the chassis. Curl the platform up as far as possible with the level control.
- 3 The upper floating turret and front (steer) end of the chassis **MUST** be toward the "uphill" direction of the ramp with the platform toward the downhill direction. Be sure the machine is centered with the loading ramps and carrier vehicle bed, and that the steering wheels are straight.

WARNING

DO NOT drive the UNO-41E Snorkelift on any steep ramp with poor traction, uneven surfaces, steps, turns, or incline angle steeper than 20% grade (2 feet vertical rise in 10 feet horizontal length).

DO NOT drive the UNO-41E Snorkelift on a loading ramp with the platform positioned in the uphill direction, or with the front (steer) axle positioned in the downhill direction.

- 4 **KEEP YOUR FOOT ON THE FOOT BRAKE PEDAL.** Use the FOOT BRAKE to control speed when driving down a ramp (see page 11). If the drive system stalls when climbing a ramp, use the FOOT BRAKE to hold the machine **BEFORE** moving the drive control lever to neutral or releasing the foot switch.

WARNING

The Smooth braking control and immediate stopping capability required on steep grades will not be provided by the spring set parking brake or braking by "plugging" the "SCR" drive. **USE THE FOOT BRAKE.**

- 5 Drive the machine **STRAIGHT** through the grade transitions with minimal turning, and at a slow speed.

SECURING FOR TRANSPORT:

After the UNO-41E Snorkelift has been loaded onto transport vehicle, secure the machine to the carrier vehicle as follows:

- 1 Chock wheels. **DO NOT** rely on machines brakes.
- 2 Secure platform with blocking under floor support bars to prevent drift of extend and level cylinders during transport.

CAUTION

DO NOT tie down boom or platform unless firmly supported by blocking or by extending boom until firmly resting on carrier vehicle.

- 3 Place CONTROLS selector switch at Ground Control Station in the centered "OFF" position.
- 4 Turn battery disconnect switch to "OFF" position and secure with padlock.
- 5 Clear the platform of men and materials.
- 6 Secure the UNO-41E Snorkelift to the carrier vehicle. Use chassis tie down lugs/holes for attachment points. **DO NOT** use steering tie rods to secure tie downs.

Snorkel-Economy has established a Preventive Maintenance Schedule that includes Daily Maintenance (Operator's Inspection), 30 Day or 50 Hour (frequent) Maintenance and Yearly or 500 Hour (annual) Maintenance, to detect any defective, damaged or improperly secured parts and provide information regarding lubrication and other minor maintenance items.

The Maintenance Schedule following, outlines the requirements of these maintenance checks for each time interval. The Operator's Daily Maintenance and inspection **MUST** be performed by a trained operator. All other maintenance and inspections **MUST** be performed by a trained service technician **ONLY**.

Note that the 30 Day or 50 hour (frequent) and yearly or 500 hour (annual) Maintenance, require use of the Preventive Inspection Maintenance Checklist form from pages 22 and 23 of this manual to pinpoint all inspection items. Retain a copy of these forms for your records. They also require the use of the Placards and Decals Inspection Chart from pages 24 and 25 of this manual to locate all WARNING and CAUTION placards and decals on the unit.

All placards and decals **MUST** be in place and legible. Retain a copy of the inspection chart for your records.

Snorkel-Economy recommends that you make additional copies of both the Preventive Inspection Maintenance Checklist forms and the Placards and Decals Inspection Chart for your use in performing these inspections.

⚠CAUTION

Failure to perform the Preventive Maintenance at the intervals outlined in the Maintenance Schedule may result in a unit being operated with a defect that could result in **INJURY** or **DEATH** of the unit operator.

DO NOT allow a unit to be operated that has been found to be defective.

Repair all defects before returning the unit to service.

DAILY MAINTENANCE (Operator's Inspection)

COMPONENTS	SERVICE REQUIRED
Hydraulic Hand Pump	Check Operation
Foot Brake	Check Operation, Check Fluid Level
Electric Drive Motor	Check Operation
Bolts and Fasteners	Visually Inspect (Looseness)
Platform Gravity Gate	Visually Inspect (Operation)
Slide Pads	Visually Inspect (Boom Wear Marks)
Structural Damage & Welds	Visually Inspect (Weld Cracks, Dents)
Tires and Wheels	Inspect Condition, Check Inflation
Battery Fluid Level	Check Fluid Level
Battery Terminals	Visually Inspect (Corrosion)
Control Switches	Visually Inspect (Operation)
Wiring Harnesses	Visually Inspect (Installation, Condition)
Hydraulic Leaks	Visually Inspect (Hoses, Tubes)
Hydraulic Oil	Check Fluid Level

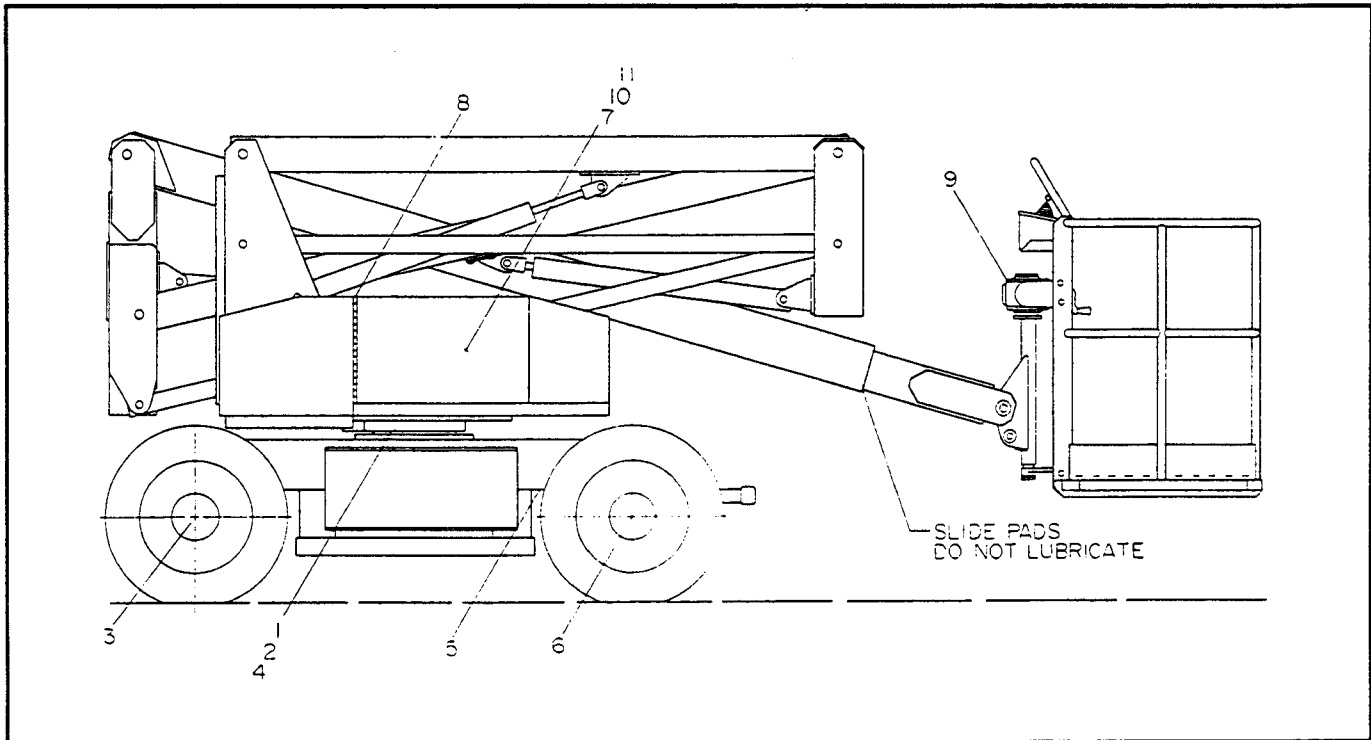
30 DAY OR 50 HOUR MAINTENANCE (Qualified Service Technician)

COMPONENTS	SERVICE REQUIRED	RECOMMENDED LUBRICANT OR FURTHER INSTRUCTIONS
Daily Maintenance	Perform Maintenance as Per Schedule	
Preventive Inspection Maintenance Checklist (pages 22 and 23)	Perform Inspection, Complete Form	Retain Copy of Checklist
Placards & Decals Inspection Chart (pages 24 and 25)	Perform Inspection, Complete Form	Retain Copy of Checklist
Batteries	Check Specific Gravity	1.260/1.275 at 80° F.
Charging System	Check Operation	
Door Hinges & Latches	Lubricate	SAE 10W Oil or Spray Lube
Foot Brake System	Check Operation, Pad Condition	
Parking Brake Calipers	Check Adjustment	Nominal Clearance .030"
Foot Brake Oil Reservoir	Check Fluid Level	Mobil DTE-11 or DTE-13
Rotation Bearing	Lubricate	Above 32° - Mobilplex EP#2 Below 32° - Mobilplex EP#1
Rotation Bearing Teeth & Pinion	Lubricate	Conoco Spray-N-Stay Gear Lubricant EP Heavy (or equivalent)
Tie Rods, U-Joints, Slip Joints	Lubricate	Conoco Super Lube
Drive Axle	Check Fluid Level, Fill if Low	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Drive Gear Reducer	Check Fluid Level, Fill if Low	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Swing Drive	Check Fluid Level, Fill if Low	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Platform Rotator Gear Box	Check Fluid Level, Fill if Low	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Platform Controllers	Check Smooth Operation & Speeds	
Hydraulic Return Filter	Check Condition	Replace if Dirty

YEARLY OR 500 HOUR MAINTENANCE (Qualified Service Technician)

COMPONENTS	SERVICE REQUIRED	RECOMMENDED LUBRICANT OR FURTHER INSTRUCTIONS
30 Day or 50 Hour Maintenance	Perform Maintenance as Per Schedule	
Hydraulic Oil Reservoir	Clean and Replace Fluid	Mobil DTE-11 or DTE-13
Hydraulic Return Filter	Replace	After 1st. 50 Hours, Thereafter at Recommended Interval
Hydraulic Pressures	Check Pressures	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Drive Axle	Replace Fluid	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Drive Gear Reducer	Replace Fluid	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Swing Drive	Replace Fluid	EP #80/90 Mobil Lube HD #API GL-5 or Equivalent
Platform Rotator Gear Box	Replace Fluid	
Wheel Bearings	Clean and Repack	Conoco Super Sta (or equivalent)

Illustration locates the lubrication points on the UNO-41E series Snorkelift.



LUBRICATION:

Specific lubricants as recommended by Snorkel-Economy, should be used in maintaining your unit. If in doubt regarding the use of lubricants other than those listed, contact Snorkel-Economy Customer Service Department, Elwood Kansas, for evaluation and recommendation.

Note: Refer to the above lubrication illustration for location of item numbers.

PRESSURE GUN APPLICATION:

Service all fittings as indicated in the Maintenance Schedule and lubrication illustration. Wipe away all excess lubricant from exposed surfaces. Over lubrication can collect dirt and foreign matter which acts as an abrasive. Lubrication of accessory equipment should be in accordance with the manufacturer's recommendations.

ROTATION BEARING - (ITEM 1):

Pressure gun lubricate bearing at recommended interval using lubricant as outlined in the maintenance schedule. Rotate while lubricating.

ROTATION GEAR TEETH & PINION - (ITEM 2):

Gear teeth and gear box pinion should be lubricated with a spray-on type open gear lubricant.

TIE RODS - (ITEM 3):

Lubricate at recommended interval using lubricant as outlined in the maintenance schedule.

SWING DRIVE, GEAR PRODUCTS OR HUB CITY MANUFACTURE - (ITEM 4):

To check oil level, remove check plug located on the side of the gear box. Unit is full if oil is level with bottom of fill hole or just starts to run out.

DRIVE GEAR REDUCER - (ITEM 5):

To check and fill the gear box:

- 1 Remove fill/check plug located on the side of the gear box.
- 2 Check that lubricant is level with bottom of fill port.
- 3 If low, fill until lubricant flows from port, reinstall plug.

DRIVE AXLE - (ITEM 6):

To check and fill the drive axle:

- 1 Remove fill/check plug located at the rear of the drive axle case.
- 2 Check that lubricant is level with bottom of fill port.
- 3 If low, fill until lubricant flows from port, reinstall plug.

HYDRAULIC OIL RESERVOIR - (ITEM 7):

The fluid level should be kept between the low and full marks on the dip stick, with all hydraulic cylinders fully retracted and the platform in the stowed for travel position. The pump/motor should be removed to allow the interior of the reservoir to be wiped out and cleaned each time the hydraulic oil is changed. The reservoir filler/breather cap should be removed and the cap cleaned with Kerosene, Fuel Oil, or other solvent at this time. It is absolutely necessary that only clean hydraulic oil is added.

CAUTION

If it becomes necessary to add or use a oil other than the recommended fluid, it is important that it be compatible and equivalent to the factory fill. Local oil suppliers can generally furnish this information. If questions still remain, contact Snorkel-Economy Customer Service Department, Elwood Kansas, for further information.

DOOR HINGES AND LATCHES - (ITEM 8):

After lubricating, remove any excess oil or over spray so it will not collect dirt and debris.

PLATFORM ROTATOR GEAR BOX - (ITEM 9):

To check oil and fill the rotary gear reducer.

- 1 Remove lube level check plug on rear of worm drive housing.
- 2 Check that lubricant is level with bottom of check plug.
- 3 If low on oil, remove fill plug on top side and add lubricant as required to bring oil level up to bottom lube level check plug.

RETURN FILTER - (ITEM 10):

On UNO-41E Snorkelift models, the hydraulic oil return filter is located near the hydraulic power unit.

The filter element is a spin on, throw-away type filter and should be changed after the initial break-in period (approximately 50 hours operation time).

Note: A by-pass relief within the filter base is provided and is set to by-pass at 15 PSI.

RETURN FILTER (Continued):

CAUTION

When changing the filter element, the oil inside of the filter element, should be examined for deposits of metal cuttings, which if present, could indicate excessive wear in some of the system components.

BATTERIES - (ITEM 12):

The UNO-41E Snorkelift is a battery powered, electro-hydraulic operated machine.

Batteries will have longer life if the electrolyte level is maintained and they are kept charged. The unit will have better operating characteristics with fully charged batteries.

In cold weather the battery should be maintained at full charge to keep from freezing. An extremely low or dead battery can freeze in cold weather. Make sure connections are clean and tight. Make sure charging equipment is operating properly.

The specific gravity of all battery cells should be check per the time interval on the maintenance schedule.

Note: To obtain proper specific gravity readings of batteries, they **MUST** be checked **ONLY** after they have been fully charged and allowed to "rest" at least 1 hour after charger shuts off. Using a calibrated hydrometer, check specific gravity for readings of 1.260/1.275 minimum at 80° F.

If readings from any cell should vary more than 50 gravity points (0.050), this indicates a bad cell and that battery should be replaced.

CAUTION

All persons assigned to maintenance of batteries **MUST** be aware of all OSHA regulations applicable.

Preventive Inspection Maintenance 30 Day or 50 Hour Checklist

[illegible]

CORRECTIVE ACTION REQUIRED

This image shows a single sheet of white paper with horizontal black ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slightly textured appearance and some minor discoloration or shadows along the edges, suggesting it might be a scan of a physical document. There is no handwriting or other markings on the page.

NOTE: If correction action is required on any item, attach sheet indicating problem and action taken.

All items have been properly checked and tested and found to be operating satisfactorily or necessary corrective action has been completed.

INSPECTED BY: _____ DATE: _____

Placards And Decals Inspection Chart (*)

Serial Number _____

OK	OK - No Service Required
✓	Corrective Action Required
X	Corrected, (Record description of corrective action).

(*) - Recommended also for Frequent and Annual inspection.

NO	PART #	DESCRIPTION	QTY	OK	✓	X
1.	0150506	Decal, UNO	2			
2.	0150505	Decal, Snorkelift	2			
3.	0150500	Decal, Brake Release	1			
4.	0323897	Decal, Danger - You Must Not Operate	1			
5.	0072276	Placard, Drive Wheel Nut Torque	2			
6.	0101384	Placard, Front Wheel Nut Torque	2			
7.	0151917	Decal, Directional Arrows Front	1			
8.	0323896	Decal, Electrocution Hazard	4			
9.	0150449	Decal, Battery Service	2			
10.	0073298	Placard, Foam Filled Tires	2			
11.	0150602	Decal, Descending Boom	3			
12.	0150603	Decal, Bleed Down Instructions	1			
13.	0151064	Placard, Serial Number	1			
14.	0070420	Placard, Manual Bleed Down	2			
15.	0151062	Decal, Model 41E	2			
16.	0323899	Decal, Danger - Electrocution Hazard	1			
17.	0150448	Decal, Body Belt	1			
18.	0150447	Decal, Brake Reservoir	1			

NO	PART #	DESCRIPTION	QTY	OK	✓	X
19.	0070418	Decal, Snorkelift	2			
20.	0090589	Placard, Platform Capacity 500 Pounds	1			
21.	0152044	Decal, Foot Brake Warning	1			
22.	0152045	Decal, Brake System Operation	1			
23.	0072531	Decal, Electrocution Hazard	1			
24.	0150601	Decal, Hand Pump (Left Hand Box)	1			
25.	0071927	Decal, Hydraulic Oil	1			
26.	0150519	Decal, Battery Charger Instructions	1			
27.	0150452	Decal, Directional Arrows Rear	1			
28.	0150451	Decal, High Amperage	1			
29.	0150446	Decal, 110 Volt Power Supply	1			
30.	0150899	Placard, Platform Control Box	1			
31A.	0151107	Placard, Ground Controls (Pre-1994 Units)	1			
31B.	0152624	Placard, Ground Controls (1994-Up Units ONLY)	1			
32.		Operation and Maintenance Manual - Model UNO-41E	1			
33.	0181562	Placard, ANSI (1994-Up Units ONLY)	1			

CORRECTIVE ACTION REQUIRED

[illegible]

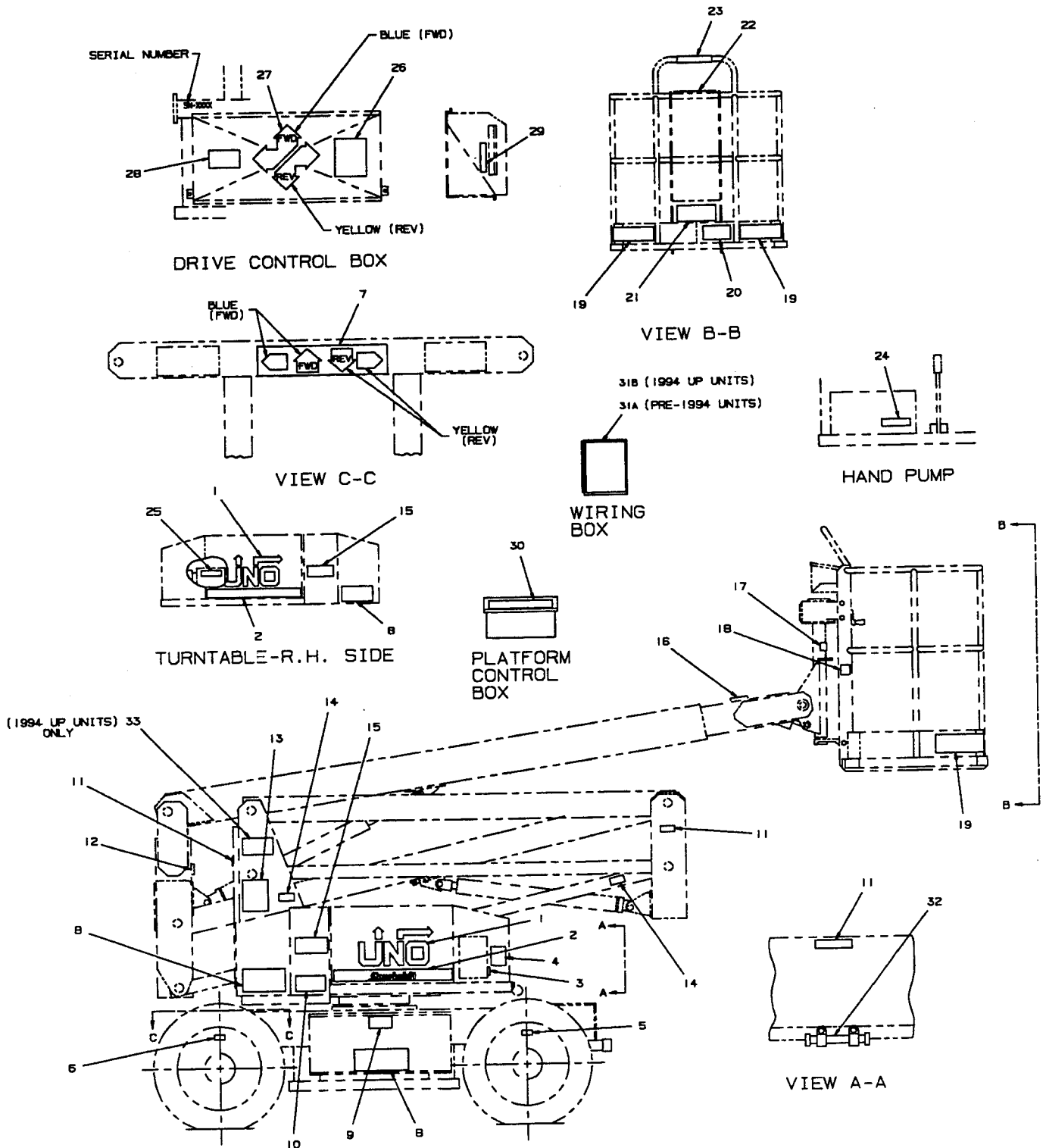
NOTE: Attach additional sheets if required.

All decals and placards have been checked and found to be in place or necessary corrective action has been completed.

INSPECTED BY: _____

DATE: _____

Placards And Decals Inspection Drawing



LIMITED WARRANTY

Snorkel-Economy, a Figgie International Company warrants each new machine manufactured and sold by it to be free from defects in material and workmanship for a period of one (1) year from date of delivery to a Customer or for one year after the machine has been placed in first service in a Dealer rental fleet, whichever comes first. Any part or parts which, upon examination by the Snorkel-Economy Service Department, are found to be defective, will be replaced or repaired, at the sole discretion of Snorkel-Economy, through its local Authorized Dealer at no charge.

Snorkel-Economy further warrants the structural components; specifically, the mainframe chassis, turntable, booms and scissor arms, of each new machine manufactured by it to be free from defects in material and workmanship for an additional period of four (4) years. Any such part or parts which, upon examination by the Snorkel-Economy Service Department, are found to be defective will be replaced or repaired by Snorkel-Economy through its local Authorized Dealer at no charge; however, any labor charges incurred as a result of such replacement or repair will be the responsibility of the Customer or Dealer.

The Snorkel-Economy Service Department must be notified within forty-eight (48) hours of any possible warranty situation during the applicable warranty period. Personnel performing warranty repair or replacement must obtain specific approval by Snorkel-Economy Service Department prior to performing any warranty repair or replacement.

Customer and Dealer shall not be entitled to the benefits of this warranty and Snorkel-Economy shall have no obligations hereunder unless the "Pre-Delivery and Inspection Report" has been properly completed and returned to the Snorkel-Economy Service Department within ten (10) days after delivery of the Snorkel-Economy product to Customer or Dealer's rental fleet. Snorkel-Economy must be notified, in writing, within ten (10) days, of any machine sold to a Customer from a Dealer's rental fleet during the warranty period.

At the direction of the Snorkel-Economy Service Department, any component part(s) of Snorkel-Economy products to be replaced or repaired under this warranty program must be returned freight prepaid to the Snorkel-Economy Service Department for inspection. All warranty replacement parts will be shipped freight collect from the Snorkel-Economy Service Department or from Snorkel-Economy's Vendor to Dealer or Customer.

REPLACEMENT PARTS WARRANTY

Any replacement or service part made or sold by Snorkel-Economy is not subject to the preceding **Limited Warranty** beyond the normal warranty period of the machine upon which the part was installed.

THIS WARRANTY EXCLUDES AND SNORKEL-ECONOMY DOES NOT WARRANT:

1. Engines, motors, tires and batteries which are manufactured by suppliers to Snorkel-Economy, who furnish their own warranty. Snorkel-Economy will, however, to the extent permitted, pass through any such warranty protection to the Customer or Dealer.
2. Any Snorkel-Economy product which has been modified or altered outside Snorkel-Economy's factory without Snorkel-Economy's written approval, if such modification or alteration, in the sole judgment of Snorkel-Economy's Engineering and/or Service Departments, adversely affects the stability, reliability or service life of the Snorkel-Economy product or any component thereof.
3. Any Snorkel-Economy product which has been subject to misuse, improper maintenance or accident. "Misuse" includes but is not limited to operation beyond the factory-rated load capacity and speeds. "Improper maintenance" includes but is not limited to failure to follow the recommendations contained in the Snorkel-Economy Operation, Maintenance, Repair Parts Manuals. Snorkel-Economy is not responsible for normal maintenance, service adjustments and replacements, including but not limited to hydraulic fluid, filters and lubrication.
4. Normal wear of any Snorkel-Economy component part(s). Normal wear of component parts may vary with the type application or type of environment in which the machine may be used; such as, but not limited to sandblasting applications.
5. Any Snorkel-Economy product that has come in direct contact with any chemical or abrasive material.
6. Incidental or consequential expenses, losses, or damages related to any part or equipment failure, including but not limited to freight cost to transport the machine to a repair facility, downtime of the machine, lost time for workers, lost orders, lost rental revenue, lost profits or increased cost.

This warranty is expressly in lieu of all other warranties, representations or liabilities of Snorkel-Economy, either expressed or implied, unless otherwise amended in writing by Snorkel-Economy's President, Vice President-Engineering, Vice President-Sales or Vice President-Marketing.

SNORKEL-ECONOMY MAKES NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THIS LIMITED WARRANTY. SNORKEL-ECONOMY MAKES NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND DISCLAIMS ALL LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO INJURY TO PERSONS OR PROPERTY.

The Customer shall make all warranty claims through its local Authorized Dealer and should contact the Dealer from whom the Snorkel-Economy product was purchased for warranty service. Or, if unable to contact the Dealer, contact the Snorkel-Economy Service Department for further assistance.

Effective January 1992

