

SECTION 01

OPERATING INSTRUCTIONS

OPERATING INSTRUCTIONS ASPEN AERIALS BRIDGE ACCESS UNIT

Model UB50
Serial Number 10184 & 10185
Montana Department of Transportation

NOTICE TO OPERATORS

- **IMPORTANT!** THIS UNIT IS A COMPLICATED DEVICE THAT REQUIRES SKILL AND ALERTNESS FROM THE OPERATORS IN ORDER TO OBTAIN THE MAXIMUM USEFULNESS FROM THIS MACHINE. TO OPERATE THIS MACHINE YOU MUST BE TRAINED IN SAFE AND PROPER OPERATING PROCEDURES.

- **WARNING!** THIS UNIT IS EQUIPPED WITH A LIMIT SYSTEM OVERRIDE FEATURE. IT IS TO BE USED TO RETRIEVE BOOMS AND PERSONNEL FROM UNDER THE BRIDGE IN **AN EMERGENCY SITUATION ONLY (ELECTRICAL MALFUNCTION). NEVER MOVE BOOMS & TURNTABLES OUTSIDE THE NORMAL OPERATIONAL ENVELOPE UNDER ANY CIRCUMSTANCE!** THE UNIT'S LIMIT SYSTEM IS OVERRIDDEN WHEN THIS HANDLE IS DEPRESSED. INSTABILITY OF UNIT AND OVERLOADING OF COMPONENTS CAN OCCUR FROM IMPROPER USE OF THE OVERRIDE SYSTEM.

- WARNING! THIS UNIT IS EQUIPPED WITH AN EXTENDABLE WALKWAY PLATFORM. THIS WALKWAY MUST BE KEPT CLEAN AT ALL TIMES. ALL DIRT AND DEBRIS MUST BE REMOVED FROM THE FLOOR AND CONTACT SURFACES PRIOR TO TELESCOPING THE INNER SECTION OF THE WALWAY. FAILURE TO KEEP THE FLOOR AND CONTACT SURFACES CLEAN MAY RESULT IN STRUCTURAL DAMAGE AND VOID THE WARRANTY.

- WARNING! WALKWAY MUST BE FULLY EXTENDED TO USE THE 1,500LB CAPACITY. LOAD MUST BE DISTRIBUTED TO A MAXIMUM OF 750LB PER SECTION.

- **WARNING!** THIS UNIT IS NOT INSULATED! DO NOT EXCEED THE MINIMUM SAFE APPROACH DISTANCE TO ENERGIZED POWER LINES AND PARTS AS STATED IN THE "AMERICAN NATIONAL STANDARDS INSTITUTE" STANDARD FOR "VEHICLE-MOUNTED BRIDGE INSPECTION AND MAINTENANCE DEVICES" (ANSI/SIA A92.8).

- **NOTICE!** ASPEN AERIALS INC. SHALL IN NO EVENT BE RESPONSIBLE OR LIABLE FOR INJURIES (INCLUDING DEATH), DAMAGES, OR OTHER LOSS CAUSED BY OR IN ANY WAY ARISING OUT OF MODIFICATIONS, ALTERATIONS, OR UNAUTHORIZED REPAIRS MADE TO ITS PRODUCTS OR EQUIPMENT BY PURCHASER OR OTHERS, OR FOR MISAPPLICATIONS, NEGLIGENCE, ACCIDENT, OVERLOADING OR IMPROPER USE BY PURCHASER OR OTHERS. ANY MODIFICATION, ALTERATION, OR UNAUTHORIZED REPAIR MADE TO THE PRODUCT OR EQUIPMENT IS AT YOUR OWN RISK AND WILL VOID THE WARRANTY OF YOUR BRIDGE INSPECTION UNIT.

NOTICE TO OPERATORS

1. An “INSPECTION” of this unit is required prior to daily use. An “ INSPECTION CHECKLIST” must be used during this process.

2. An operating instruction manual must always be in or with this unit.

3. Do not permit **“anyone”** to operate this unit without proper training.

4. During operation, trained/qualified persons must be present at the controls.

5. Do not operate this unit if there are any known deficiencies.

6. Do not operate this unit without properly performing the recommended scheduled maintenance and inspections as stated in the manufacturer’s service manual.

7. Do not let any part of this unit come in contact with the bridge structure.

8. Do not try to defeat or bypass any of this unit’s safety devices and systems.

9. Do not operate this unit in winds exceeding 35 miles per hour (56 KM/H).

10. Do not use this unit for any purpose other than what it is designed for.

11. Do not transport this unit unless the axle locks are disengaged, components are secured, unit systems are turned off and the PTO/hydraulic pump is turned off.

12. Operation of the controls must be performed smoothly and evenly. Abrupt starts and stops may cause excessive wear and tear on the equipment.

13. Do not exceed the rated capacity of the platform “600 Pounds”.

14. Operators must read and observe all “WARNING” and “OPERATIONAL” placards.

15. If a function (booms or turrets) stops working, you have probably reached a limit that keeps the machine within a safe operating envelope. It may be necessary to reverse that function to regain movement.

16. Stay away from any obstructions at the intended work site that could affect unit operations and do not drive over objects larger than 3” high while axle locks are engaged.

17. Work zone (traffic control) policies and procedures are the responsibility of the end user.

18. “OSHA APPROVED” personal fall arrest system must be worn when operating this unit.

19. A fall protection program must be maintained as set forth by local, state and federal law and must be followed when operating this unit.

20. All applicable safety requirements must be followed when operating this unit.

STUDY THE SAFETY SECTION OF THIS CHAPTER BEFORE ANY ATTEMPT AT OPERATION. A MISTAKE MADE WHEN OPERATING EQUIPMENT SUCH AS THIS CAN CAUSE SERIOUS INJURY OR DAMAGE. THESE SAFETY DIRECTIVES ARE THE RESULT OF YEARS OF REVIEW OF THE MOST COMMON BRIDGE ACCESS UNIT OPERATING ERRORS OR FAULTS. IT IS IMPORTANT TO AVOID UNSAFE OR IMPROPER OPERATING PRACTICES AND PROCEDURES.

ALWAYS INSPECT THIS UNIT BEFORE OPERATION.

This manual has been prepared in accordance with ANSI A92.8, American National Standards for Vehicle-Mounted Bridge Inspection and Maintenance Devices. To obtain a copy of these standards, contact the Scaffold Industry Association, Inc., 14039 Sherman Way, Suite 100, Van Nuys, CA 91405-2599, phone 818-782-2012, fax 818-786-3027.

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Training

Foreword

A bridge-access machine has many features and functions. Certain boom movements are mechanically restricted, for stability reasons. Boom deployment must follow a prescribed pattern, not only to achieve the most effective positioning, but also to prevent damage to the unit.

For these reasons, it is necessary for the operator to study the procedures set forth in this manual and be attentive during operation of the unit. The operator should know the various boom articulation limits, and know how to properly resume operation if a limit device is tripped. A skilled operator can maneuver the machine into and under highly complex bridge structures with complete safety. An unskilled operator will be unable to obtain full usefulness of the machine and risks harming the equipment through misuse.

Crew Training

Safe operation of bridge access machines requires attention to several factors, of which all are of equal importance. A comprehensive training program will include these topics:

- Thorough operator orientation.
- Inspection and care of the bridge access machine.
- Knowledge of the operating limits and safety stops built into the machine.

A number of accidents with equipment such as this involve misuse by the operator. Taking “short-cuts” with procedures or attempting to use the equipment in a manner it was never designed for, account for many personnel injuries. Probably the single most important safety element is the operator’s decision to work within the “rules.”

Operator Orientation

No person should be permitted to operate a bridge access machine without first having been trained in its use. Training must be systematic and thorough. The training should include these points:

1. Read, and be familiar with the contents of the Operation and Maintenance Manual.
2. Know the location and function of all the controls on the unit.
3. Know and observe the posted capacity of the unit. Read the Danger, Warning, and Caution labels that pertain to the various operating modes and conditions.
4. Know how to conduct a thorough pre-operation inspection of the unit and what to look for at each checkpoint.
5. Know the operating sequence of the unit, especially the holding valve testing.

An individual who has been trained on one brand of equipment is not qualified to operate other bridge access machines. Machines from other manufacturers vary as to capacity and operating characteristics.

Training should be conducted with the entire crew that would normally operate the unit. By learning the operational aspects of the equipment together, the crew will function as a safer group. This becomes particularly important in the event of an emergency. A crew that has been trained as a group will be able to react faster and with more cooperation. Even though emergencies may never occur, the crew that has reviewed their procedures together will be best equipped to cope with all situations.

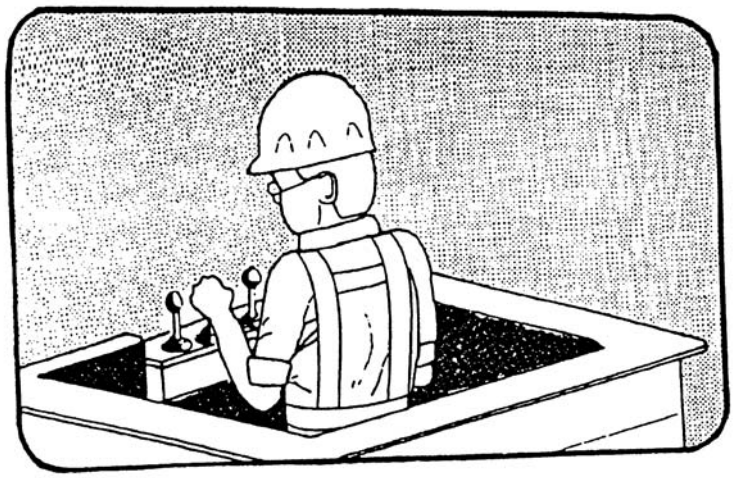
Do not minimize the importance of operator training. A good training program will result in less equipment downtime, and more importantly, will help prevent serious or fatal injuries to personnel.

Personnel who are in training to become unit operators should run the equipment under the supervision of a qualified, seasoned operator.

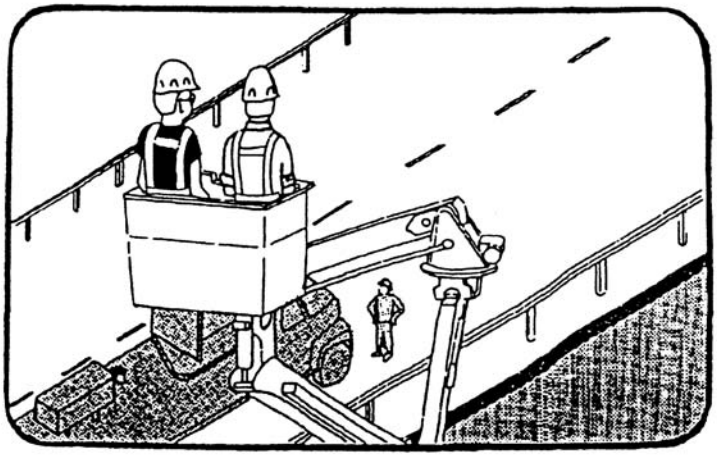
Aspen Aerials And ANSI A92.8 Standards Regarding Retraining.

Individuals who are not continuously employed as operators on the model or a unit having identical controls, and have not operated for ninety (90) days, shall have their proficiency and knowledge of operating reviewed for competency by a qualified person.

Safety Procedures

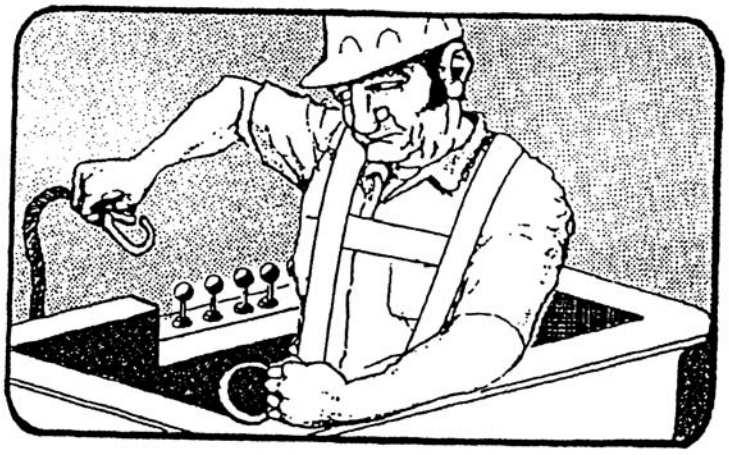


Know the location and function of ALL controls on the unit. You should be able to go immediately to whatever control is required.

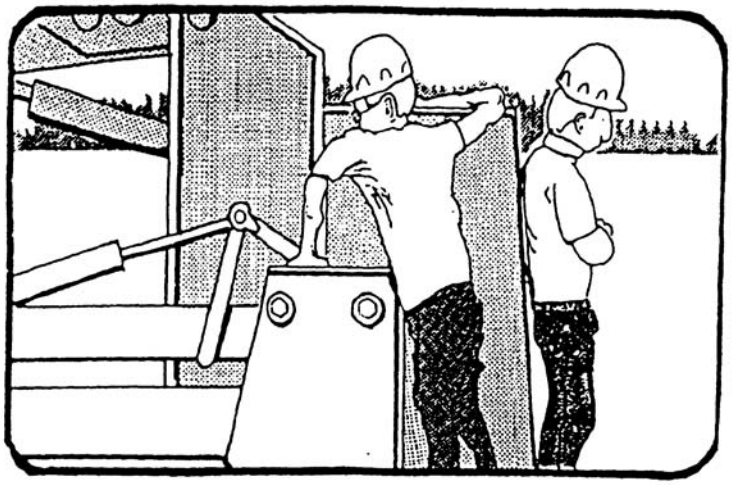


Operators should demonstrate a complete cycle of operation with emphasis on the boom holding valve tests. Remember that the controls should be handled smoothly.

Safety Procedures

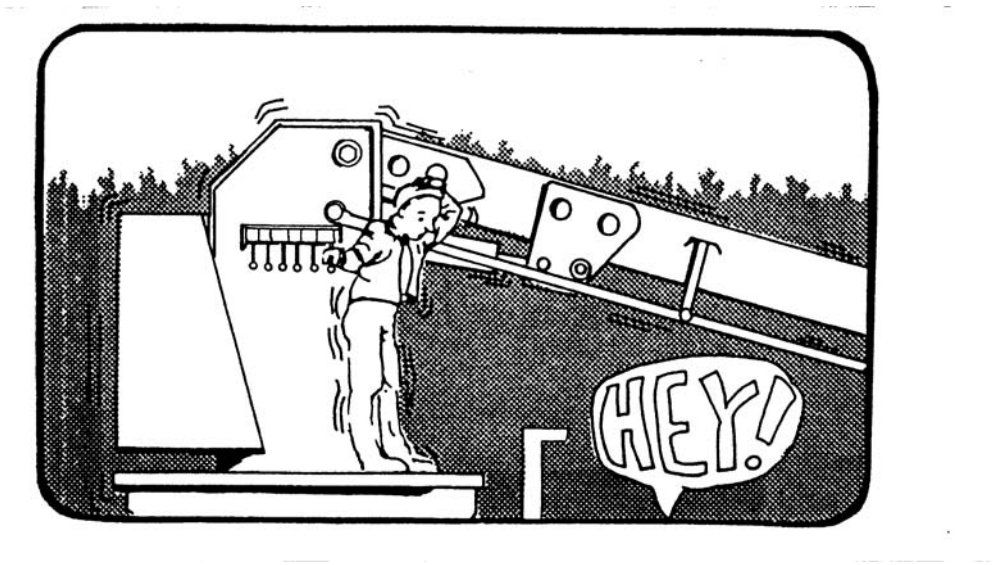


Using a personal fall arrest system is required in all bridge access machines. If a mishap causes platform tipping, you won't be taking a fall.

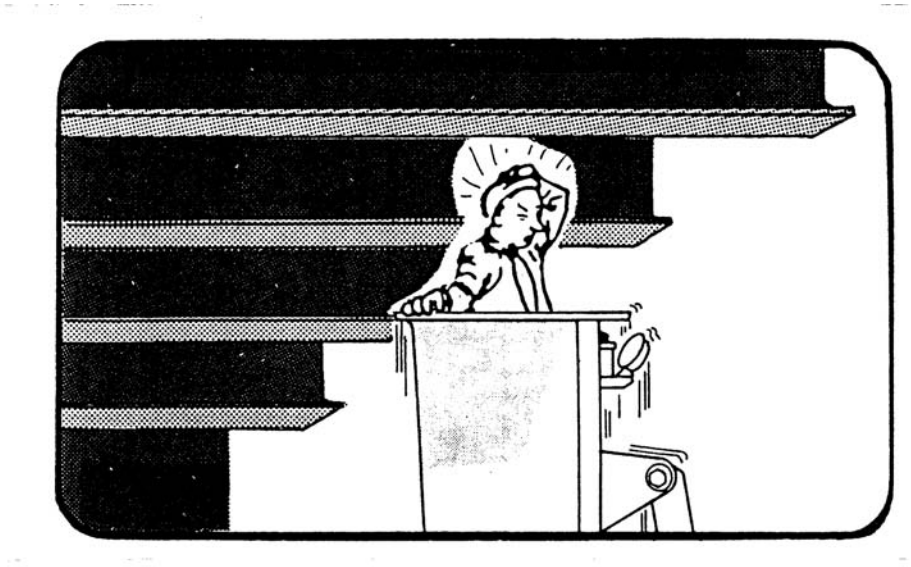


Make a careful inspection before putting the unit into use. Use a checklist and don't allow yourself to be distracted.

Safety Procedures

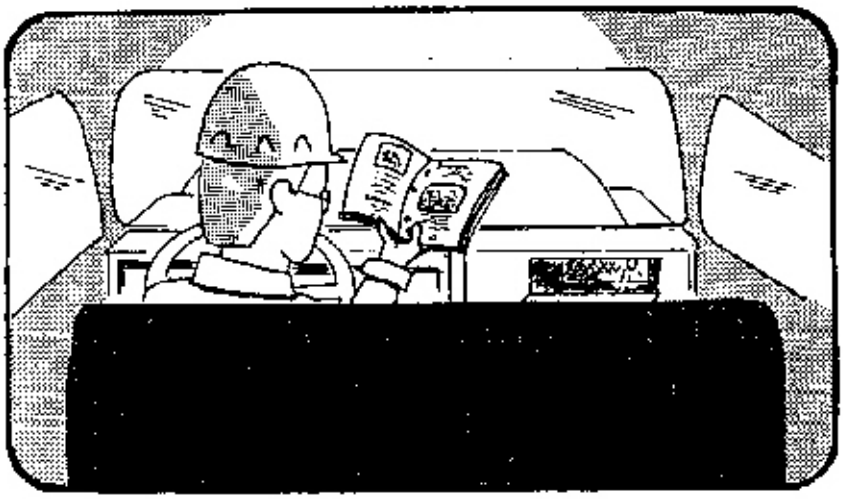


Use smooth “feathering” movements on the controls. Jerky, sudden stops and starts are hard on the equipment and upsetting to persons in the platform.

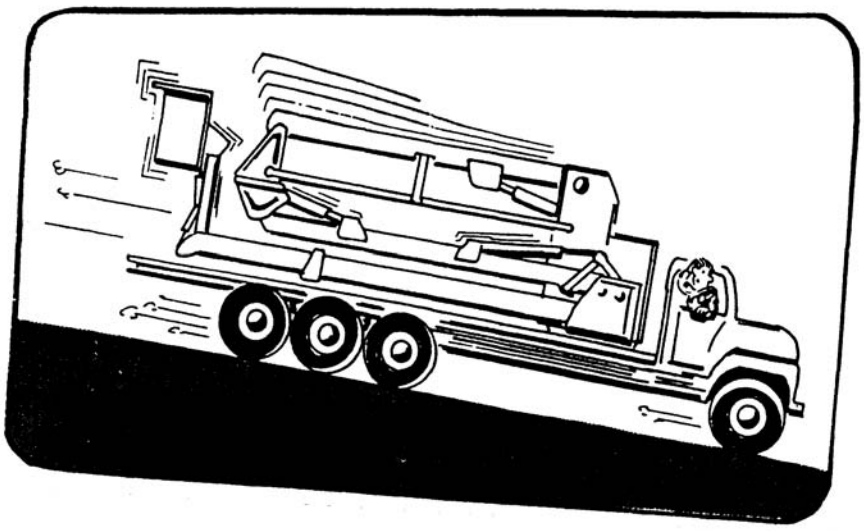


Be sure to look in the direction the platform is moving when maneuvering under the bridge structure.

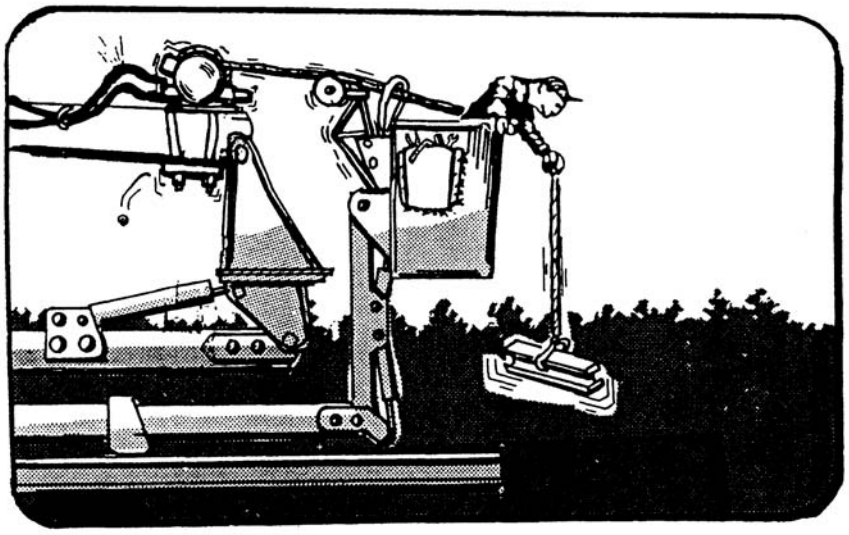
Safety Procedures



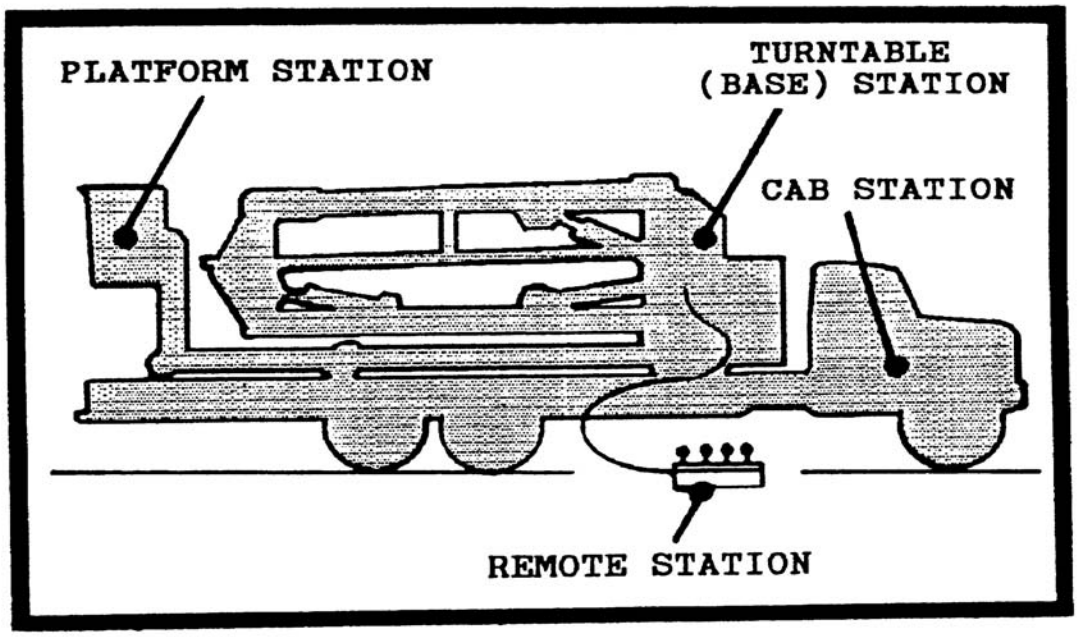
The operating instruction booklet should always be with the unit and available for ready reference.



Make sure the boom assembly is tied down before taking the vehicle on the highway.



Unauthorized alterations of the unit will void the warranty and possibly cause structural failure. Use the equipment as it was designed to be used.



BRIDGE ACCESS UNIT PRE-OPERATION INSPECTION CHECKLIST

INSPECTION DATE:_____
INSPECTION PERFORMED BY: _____
OPERATORS: _____, _____
COMMENTS: _____
_____

MAIN ENGINE COMPARTMENT:	**OK**	**COMMENT**
Engine oil:		
Coolant:		
Washer fluid:		
Power Steering fluid:		
Transmission fluid:		
PTO & hydraulic pump:		Do weekly check with creeper!
Drive belts:		

- START THE TRUCK ENGINE AND ENGAGE THE PTO
- MAKE SURE PARKING BRAKE IS ENGAGED
- TURN ON UNIT POWER SYSTEMS

CAB INSPECTION:	**OK**	**COMMENT**
Hour meter / odometer reading:		
Decals:		
Air pressure:		
Oil pressure:		
Air filter indicator:		
12 volt charging system:		
Braking system:		
Unit power light & switch:		
PTO indicator light and system:		
Two speed system:		
Axle lock lights:		
Strobe lights:		
Engine kill system:		
Tag axle system & pressure (test):		
Intercom system:		
Lights: 4 ways, head, turn, tail:		
Fuel level:		
Horn:		

Unit Inspection

***WALK AROUND INSPECTION*: (proceed around the unit in a clockwise direction)**

	OK	COMMENT
Lights: 4 ways, head, turn, tail:		
Strobes, beacons or sign board:		
Transmission fluid:		Engine running!
Axles and suspension (front/rear):		
Tires (front/ rear):		Do weekly check with tire gauge!
Axle lock structures (front/rear):		
Axle lock switches (front/rear):		
Hydraulic pump & hoses:		
Electrical switches & cables:		
Air hoses, outlets:		
Body boxes:		
Ladders and rails:		
Counterweights & switches:		
Brakes (slack adjusters)		
Drive line:		

AUXILIARY ENGINE:	OK	COMMENT
Hour meter (located at T-1):		
Fuel filter, oil level & oil press:		
Coolant:		
Switches, wires, connections:		
Hydraulic pump & hoses:		

GENERATOR:	OK	COMMENT
Operational test:		
Electrical wires & connections:		
Circuit breakers and outlets:		
Instrument panel and meters:		

HYD. TANK & OIL COOLER:	OK	COMMENT
Oil level and gauge:		
Filter and gauge:		
Structure:		
Hydraulic hoses:		
Electrical switches & cables:		

AIR COMPRESSOR:	OK	COMMENT
Operational test:		
Air system hoses & valves:		
Electrical switches & cables:		
Gauges:		
Oil Level:		

Unit Inspection

COMPONENT CHECKLIST:

*See component checklist explanations:	T-1	B-1	T-2	B-2	B-3	CATRAC B-3 TELE	B-4	PLAT-FORM
1. Cylinder	////////		////////					
2. Cylinder Anchor								
3. Structure								
4. Hydraulic Lines & Fittings								
5. Electrical Cables								
6. Pivot Pin								
7. Rotations: Gear, Bearing, Gearbox, Brake, Motor		////////// ////////		////////// ////////	////////// ////////	////////////// //////////////	////////// //////////	////////// //////////
8. Limit Switches		////////						
9. Pressure Filter		////////	///////	////////	////////	//////////	//////////	////////
10. Hydraulic Valves; Unit, Axle lock, Dump		////////// ////////	//////// //////	////////// ////////	////////// ////////	////////////// //////////////	////////// //////////	////////// //////////
11. Leveling Rods				////////	////////	//////////		////////
12. Boom/Platform Rests	///////	////////	///////	////////		//////////	////////	
13. Boom /Platform Tie-down	///////	////////	///////			//////////	////////	
14. Decals								
15. Platform Heaters	///////	////////	///////	////////	////////	//////////	////////	
16. Outlets; 12 volt, 110 volt	///////	////////	///////	////////	////////	//////////	////////	
17. Air Hose Outlet	///////	////////	///////	////////	////////	//////////	////////	
18. Platform Controls	///////	////////	///////	////////	////////	//////////	////////	
19. Leveling System	///////	////////	///////	////////	////////	//////////		

(Shaded boxes don't apply to that area of the unit)

**COMPONENT CHECK LIST EXPLANATIONS:*

COMPONENT:	WHAT TO LOOK FOR:
1. Cylinder	leaks, scoring, rust pitting, cracks at pivot points
2. Cylinder Anchor	visible cracks or damage, rusting
3. Structure	visible cracks or damage, rusting
4. Hydraulic Lines & Fittings	oil leaks, chaffing, kinks, abrasions
5. Electrical Cables	loose or broken wires and connections, chaffing, abrasions
6. Pivot Pin	visible cracks or damage, rusting
7. Rotation: Gear, Bearing, Gearbox, Brake, Motor (T-1 and T-2)	wear, damage, oil leaks, broken bolts
8. Limit Switches	bent switch arms, loose wire connections, LED functions
9. Pressure Filter	oil leaks, check the indicator gauge
10. Hydraulic Valves; Unit, Axlelock, Dump	free movement of the handles, return to neutral position when released, oil leaks, wiring connections secure
11. Leveling Rods	cracks at pivot points, damage to rods
12. Boom and Platform Rests	nylon wear pad secure, cracks, damage to structure
13. Boom Tie-down Device	damage to nylon strap or ratchet
14. Decals	unreadable, missing or damaged decals
15. Platform Heaters	broken switches or wires, secured to platform
16. Outlets; 12 volt, 110 volt	damaged or broken wires, secure to platform, broken covers
17. Air Hose Outlet	damage to hoses, coupling, regulator, and gauge
18. Platform Controls	proper operation of all functions, damage to components
19. Leveling System	hydraulic line; wire or switch; secure to the platform
20. Other:	

Unit Inspection

OPERATIONS CHECK AND HOLDING VALVE TEST:

THIS OPERATIONS CHECK "MUST" BE PERFORMED PRIOR TO OPERATING THE UNIT.

The truck should still be running with the PTO engaged, set the truck RPM to the high idle position. Make sure that the platform leveling switch is in manual before you step on the foot switch.

1. Remove the boom/platform tie down device.
2. Engage axle locks, then the sliding counterweight (Red axle lock engage indicator will light).
3. Place the unit/axle lock selector switch to the "UNIT" position.
4. Test the air compressor.
5. Raise B-2 & B-3 up.
6. Raise B-1, approximately one foot above the boom rests.
7. Lower B-4 to a level position.
8. Unstow the platform to a level position.
9. Test the engine kill system at the T-1 location. Leave truck engine off.
10. NOW PERFORM THE HOLDING VALVE TEST, WATCH FOR BOOM DRIFT.
    - *Operate B-1 to the "DOWN" position for five seconds.
    - *Operate B-2 to the "DOWN" position for five seconds.
    - *Operate B-3 to the "OPEN" position for five seconds.
    - *Operate B-4 to the "DOWN" position for five seconds.
11. Raise the platform rests and lock them into place.
12. Start the auxiliary engine then use it to stow the unit.
13. Select the backup/generator switch to the "backup position".
14. Lower B-1 tightly into the rests (about 900 psi on the hydraulic gauge at T-1).
15. Stow the platform with the switch in the manual mode. Leave the switch selected to manual.
16. Raise B-4 into the stowed position.
17. Place the unit/axle lock selector switch to the "AXLE LOCK" position.
18. Disengage the sliding counterweight and then the axle locks (Green axle lock disengage indicator will light).
19. Select the backup/generator switch to the "generator position".
20. Test the basket heaters.
21. Test the engine kill system at the platform for the auxiliary engine. Press the engine kill button again to turn off the red engine kill light so the truck engine can later be started.
22. Test the intercom system at all locations then turn them off.
23. Install the boom/platform tie down device.
24. Turn off the auxiliary engine key and turn off unit systems including items in the truck cab.

WARNING: **IF ANY BOOM MOVEMENT IS DETECTED DURING THE HOLDING VALVE TEST, PERFORM THE TEST AGAIN TO VERIFY WHICH BOOM IS DRIFTING. THE PROBLEM HOLDING VALVE(S) MUST BE REPLACED BEFORE THE UNIT IS PUT INTO SERVICE.**

IF A DEFECT IS FOUND DURING THE INSPECTION OR OPERATIONS TEST THE UNIT MUST NOT BE USED UNTIL THE DEFECT(S) ARE CORRECTED.

Unit Controls

Controls

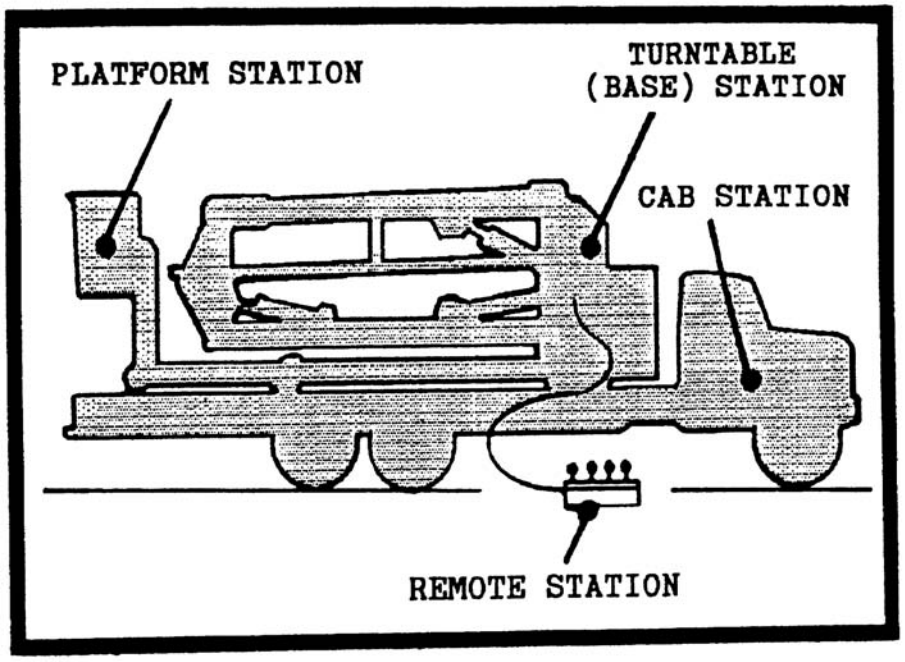
The illustration below shows a typical bridge access machine and its control stations.

The controls at the base (turntable, T-1) are dominant, in that any control demand from the platform controls can always be overridden by the operator at the turntable (T-1).

The selector switch at the turntable permits either operation of the axle locks only, or the booms only, but not both at the same time.

All boom functions may be operated simultaneously.

It is best to allow the hydraulic system several minutes of warm-up with the pump running before operating the unit.



Unit Controls

Control Function

Controls at the Cab

Vehicle operation – (Refer to truck manufacturer's operator's manual.)

Power take-off switch – Engages and disengages the power take-off.

Unit power switch – Provides power to the bridge access machine's electrical systems.

Intercom station – Controls for turning intercom system on/off and setting volume.

Strobe light switch – Turns on unit's strobe lights to improve visibility of unit.

Engine Stop switch – Stops the truck and auxiliary engine. Red indicator light comes on. Must be pushed again to restart engines.

Axle lock indicator lights – Shows condition of axle locks. Green - shows fully disengaged, vehicle safe to drive. Red - shows fully engaged, booms may be deployed over side of bridge.

PTO Hour Meter – Shows the hours of operation of the unit. (not the truck)

Controls at Turntable One

Unit/axle lock selector switch – Selects either axle lock operation or boom operation.

Controls activation footswitch – Activates the valve control levers at the base.

Override lever – Use in emergencies only, enables the built-in boom stops to be overridden.

Platform/Walkway leveling switch – Selects manual or automatic

Platform Level Switch- used to Stow/ Unstow Platform when Manual Leveling

Front axle lock control switch – Engages or disengages the front axle lock mechanisms.

Rear axle lock control switch – Engages or disengages the rear axle lock mechanisms.

Extendible counterweight control switch – Extends the counterweight to the most stable operating position or retracts it to the normal stowed position for road travel.

Emergency Kill button – Stops the truck and auxiliary engine. Red indicator light comes on. Must be pushed again to restart engines.

110volt generator switch – Engages or disengages the 110 volt generator.

Air compressor switch – Engages or disengages the compressed air system.

Boom #1 control lever – Raises or lowers boom #1.

Rotation #1 control lever – Rotates the entire boom assembly in a clockwise or counter-clockwise direction.

Boom #2 control lever – Raises or lowers boom #2.

Unit Controls

Controls at Turntable One "continued"

Rotation #2 control lever – Rotates the 2nd and 3rd booms in either a clockwise or counter-clockwise direction.

Boom #3 control lever – Opens or closes boom #3.

Extension boom control lever – Extends or retracts the 3rd boom (or walkway) telescoping section.

Boom #4 control lever – Opens or closes boom #4 (when installed).

Boom #4 extension lever – Extends boom #4 (when installed).

Leveling control switches – controls automatic and manual platform leveling function. Allows the stowing and un-stowing of platform when inspection booms are installed and also allows for automatic or manual leveling of the walkway.

Intercom station – Controls for turning intercom system on/off and setting volume.

Axle lock indicator lights – Shows condition of axle locks. Green - shows fully disengaged, vehicle safe to drive. Red - shows fully engaged, booms may be deployed over side of bridge.

Radio Controls at the Platform (also on remote control panel)

Power on/off switch – Activates the radio control panel via the Red ¼ turn switch

Controls activation footswitch – When activated with the inspection booms installed, will enable the radio controls.

Joystick enable button – Must be activated to enable the radio controls when the walkway is installed, or when using the radio remotely.

Boom #1 control stick – Raises or lowers boom #1.

Rotation #1 control stick – Rotates entire boom assembly in either a clockwise or counter-clockwise direction.

Boom #2 control stick – Raises or lowers boom #2.

Rotation #2 control stick – Rotates the 2nd and 3rd booms in either a clockwise or counter-clockwise direction.

Boom #3 control stick – Opens or closes boom #3.

Boom #3 extension control stick – Extends or retracts the 3rd boom telescoping section.

Boom #4 control stick – Opens or closes boom #4.

Boom #4 extension control stick – Extends boom #4.
(Note: Always retract boom #4 prior to maneuvering the unit back from its underbridge location.)

100% or 50% range switch – Provides choice of operating speeds.

Emergency Kill button provides a quick means of stopping the vehicle *and* auxiliary engine.
-Separate Button from the Radio Controls-

Operation

Preview of Operations

The following series of diagrams and pictures is intended to familiarize the reader with the various controls, features, and operating positions of the bridge access machine. ***However, do not attempt to operate the unit merely by referring to these photos.*** Use the step-by-step operating procedures and refer to the photos simply for supplemental information.

Due to optional and custom features, your machine at hand may be slightly different than the unit shown here. Familiarize yourself with the unit by comparing these photographs with your bridge access machine.

Study the sequence of pictures showing the bridge access machine in progressive steps of operation ending with the unit fully in place under the bridge. These pictures are intended to convey the “out - down - under” boom configuration which is the key to reaching locations under the bridge.

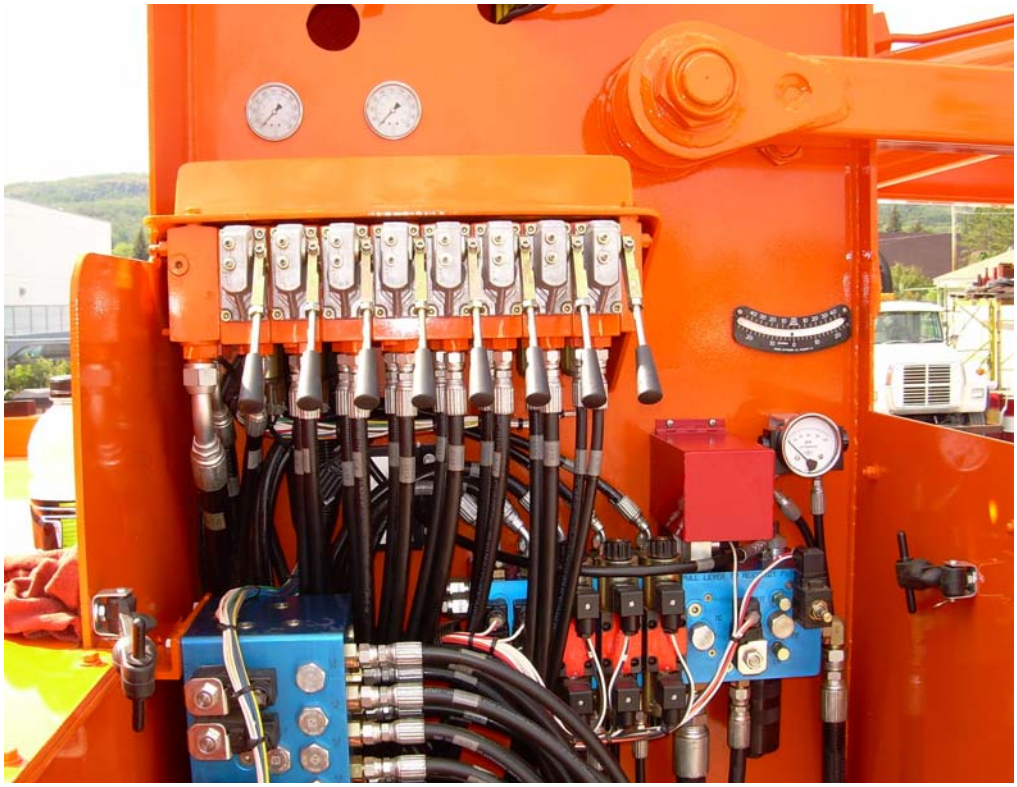


CAB STATION

Operation



CAB STATION INTERCOM

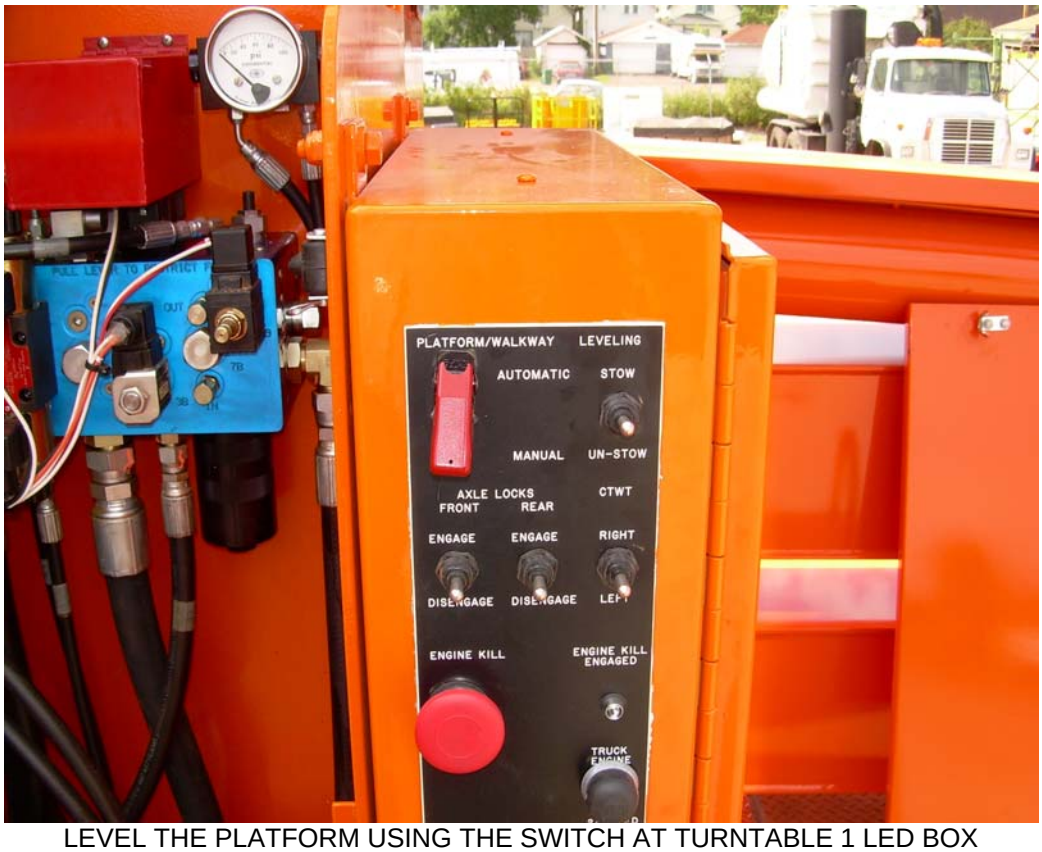


T-1 STATION

Operation



UNIT IS PARKED AT THE BRIDGE SITE, AXLE LOCKS ARE ENGAGED AND SLIDING COUNTERWEIGHT IS EXTENDED, BOOM #4 IS LOWERED SLIGHTLY



LEVEL THE PLATFORM USING THE SWITCH AT TURNTABLE 1 LED BOX

Operation



RELEASE THE BOOM TIE DOWN DEVICE



LOWER THE BASKET RESTS

Operation



BOOM #4 IS LOWERED AND EXTENDED



FROM THE PLATFORM AND BOOM #4 IS RAISED TO A POSITION SLIGHTLY HIGHER THAN THE BOTTOM OF BOOM THREE

Operation



BOOM #1 HAS BEEN RAISED SUFFICIENTLY FOR THE BOOM ASSEMBLY TO CLEAR THE BOOM RESTS (NOT HIGH ENOUGH TO CAUSE INTERFERENCE WITH LEVELING LINKAGE RODS). BEGIN ROTATING TURNTABLE #2 CLOCKWISE



TURNTABLE #2 IS BEING ROTATED CLOCKWISE AND TURNTABLE #1 IS ROTATED COUNTER-CLOCKWISE. THIS WILL PLACE BOOM #1 PERPENDICULAR TO BRIDGE RAIL AND BOOMS #2 AND #3 PARALLEL TO THE BRIDGE RAIL

Operation



CONTINUE TO OPERATE TURNTABLE #1 AND TURNTABLE #2 UNTIL BOOM #1 IS FULLY PERPENDICULAR TO RAIL AND BOOMS #2 AND #3 ARE PARALLEL TO BRIDGE RAIL



OPEN BOOMS #2 AND #3

Operation



BOOMS #2 AND #3 HAVE NOW BEEN OPERATED TO “OPEN” SUFFICIENTLY TO ENABLE PLATFORM TO BE POSITIONED UNDER THE BRIDGE DECK



TURNTABLE #2 IS BEING ROTATED CLOCKWISE TO BRING BOOMS #3 AND #4 TO THE DESIRED POSITION UNDER THE BRIDGE



TURNTABLE #2 HAS BEEN ROTATED CLOCKWISE TO POSITION BOOM #3 UNDER THE BRIDGE. BOOM #3 HAS BEEN EXTENDED TO REACH WORK LOCATION. BOOM #4 MAY NOW BE RAISED, LOWERED OR EXTENDED AS DESIRED



BOOM #4 MAY NOW BE RAISED AND LOWERED



BOOM #4 MAY NOW BE TELESCOPED IN AND OUT



BOOMS MAY NOW BE MOVED INTO THE DESIRED POSITION

Operation



BOOMS #3 & #4 MAY BE TELSCOPED OUT ALONG SIDE OF THE BRIDGE

Operation

PRE-OPERATION CHECKLIST

Note: Work zone (traffic control) policies and procedures are the sole responsibility of the owner.

1. Position the vehicle parallel to and near the bridge rail at the intended work location.
2. Select the power source:
   A. Operating the unit with the vehicle engine:
      - Make sure that the truck parking brake is set.
      - Start vehicle engine.
      - Turn on unit power switch in cab.
      - Engage the power take off.

   B. Operating the unit with the auxiliary engine:
      - Make sure that the truck parking brake is set.
      - Turn on the unit power switch in cab.
      - Start the auxiliary engine.
3. At turret #1 location, turn on the communication system and adjust the volume.
4. At turret #1 location, place the unit/axle lock selector switch to the "AXLE LOCK" position. Engage the front and rear axle locks.
5. At turret #1 deploy the sliding counterweight in the proper direction to allow unit operation in the desired direction (either passenger or drivers side use). The indicator light illuminates when all locks are engaged and counterweight is completely deployed.
6. Remove the boom / platform tie down device.
7. Place the unit/axle lock selector switch to the "UNIT" position.
8. Close B-2.
9. Close B-3(walkway).
10. Raise B-1, 12" inches above the boom rests. CAUTION: DO NOT RAISE THE BOOM #1 TOO HIGH AS TO DAMAGE THE T-1 TO T-2 LEVELING ARM LINKAGE RODS.
11. Lower the platform rests to the deck.
12. Lower B-4 (if installed).
13. Un-stow the basket by placing the leveling switch in the manual mode and holding the stow/un-stow toggle in the un-stow position. Leveling control switch can now be placed into the automatic position
14. Place the unit/axle lock selector switch to the "AXLE LOCK" position.
15. PERFORM THE HOLDING VALVE TEST AS FOLLOWS:

- Operate B-1 control valve handle to the "DOWN" position for five seconds.
- Operate B-2 control valve handle to the "DOWN" position for five seconds.
- Operate B-3(walkway) control valve handle to the "OPEN" position for five seconds.
- Operate B-4 (if installed) control valve handle to the "DOWN" position for five seconds.

WARNING:
IF ANY BOOM MOVEMENT WAS NOTED DURING THE HOLDING VALVE TEST, THE UNIT MUST NOT BE USED UNTIL THE PROBLEM IS CORRECTED

16. Start the auxiliary engine (preheat this engine prior to starting).
17. Test the engine shutdown system; an engine shutdown switch is located at each operator's panel. To restart the truck engine or auxiliary engine, the shutdown switch must be operated a second time.
18. Turn off the key switch for the auxiliary engine.

WARNING:
THE ENGINE SHUTDOWN SYSTEM MUST BE TESTED BEFORE DEPLOYING THE BOOMS. IF THE ENGINE SHUTDOWN SYSTEM IS DEFECTIVE, THE PROBLEM MUST BE CORRECTED BEFORE THE UNIT IS OPERATED.

Operation

Passenger Side Use: DEPLOYMENT

1. At the truck cab, set the truck parking brake.
2. At the truck cab location, turn the ignition switch to the on position and start the truck.
3. At the truck cab, turn on the unit power switch.
4. At the truck cab, turn on the intercom.
5. At the truck cab, select and engage the power source (truck PTO or auxiliary engine).
6. At the truck cab, engage the two speed by pushing the two speed button.
7. At turret #1, turn on the intercom and adjust the volume.
8. At turret #1, place the unit/axle lock selector switch to the "AXLE LOCK" position.
9. At turret #1, engage front and rear axle locks. Hold toggle switch until hydraulic pressure gauge for unit reaches approximately 2,200 psi.
10. At turret #1, engage the sliding counterweight to the drivers side of the truck by pushing the toggle switch to "Right" while momentarily holding the sliding counterweight unstow button. Once the amber stow light goes off, release the unstow button and the counterweight will continue to travel. The red axlelock engage light illuminates when both the axlelocks and sliding counterweight are in the proper position.
11. Remove the boom tie down device.
12. At turret #1, place the unit/axle lock selector switch to the "UNIT" position.
13. At turret #1, raise boom #1 about 12 inches.
14. Lower the platform rests.
15. At turret #1, lower boom #1 into the boom rests.
16. At turret #1, lower boom #4 (if installed).
17. At turret #1, level the basket by putting the leveling switch to the manual position depress the foot switch and hold the stow/un-stow toggle switch in the un-stow position. After the platform has moved to the level position place the leveling switch to the automatic mode.
18. Board the platform.
19. Turn on the "power" using the Red ¼ turn switch on the Radio Controls
20. Turn on the intercom and adjust the volume.
21. Operate boom #4 control (if installed) to raise boom #4 up until the bottom of the platform is slightly higher than the bottom of boom three.
22. Operate boom #1 control to raise the boom assembly to clear objects, about 12" inches above the rests. It is important to be constantly aware of the position of boom #2 so that it is not rotated or raised into the leveling linkage rods connecting the turntables.
23. Operate rotation #2 control clockwise to rotate booms #2 and #3 (walkway) out to the side a few feet away from the cab of the truck.
24. Operate boom #1 control to adjust the height of the booms to clear any obstructions.
25. Operate rotation #2 control clockwise and rotation #1 control counter clockwise until boom #1 is positioned 90 degrees to the bridge and boom #2 and #3 (walkway) are parallel.
26. Operate boom #2 down and #3 (walkway) open until boom #2 is vertical and boom #3 (walkway) is horizontal. Boom #3 (walkway) may now be operated to provide clearance. The platform will automatically level as boom #2, #3 or #4 are moved.
27. Operate rotation #2 clockwise to rotate the platform under the bridge.
28. The Boom #3 (walkway) may now be telescoped in and out as necessary to reach the desired location.
29. Boom #3 (walkway) and #4 (if installed) may be used to raise or lower the platform.

NOTE:
The truck engine RPM must be in the low setting before moving the unit during bridge operation. Vehicle speeds must not exceed 1 ½ mile per hour when the booms are deployed.

Operation

Passenger Side Use

STOWING

1. Retract both telescoping booms completely.
2. Operate rotation #2 control counter-clockwise until booms #2 and 3 are parallel to the bridge.
3. Operate boom #2 and #3 controls to totally raise both booms.
4. Operate boom #4 control to adjust for proper clearance.
5. Operate boom #1 control to adjust for proper clearance.
6. Operate rotation #2 control counter-clockwise and rotation #1 clockwise simultaneously until boom #2 is about 3 feet from truck cab.
7. Operate rotation #1 clockwise until it automatically stops.
8. Operate rotation #2 counterclockwise until it automatically stops, booms should be directly over the boom rests.
9. Operate boom #1 control down; this will lower the booms into the rests.
10. Adjust boom #4 to provide safe exiting of the platform.
11. EXIT THE PLATFORM (BASKET).
12. At turret #1, stow the basket by placing the leveling switch in the manual position depress the foot switch and hold the stow/un-stow toggle in the stow position until the platform is fully stowed.
13. At turret #1, raise boom #4 completely.
14. At turret #1, raise boom #1 about 12 inches.
15. Lift and secure the platform rests.
16. At turret #1, lower boom #1 into the rests.
17. Install boom tie down.
18. At turret #1, place the unit/axle lock selector switch to the “AXLE LOCK” position.
19. At turret #1, disengage sliding counterweight by holding the toggle switch to the “Left” position. The sliding counterweight will stop when it reaches the stowed position and the amber stow light will illuminate.
20. At turret #1, disengage the front and rear axle locks with the toggle switch. The green disengage light will illuminate at turret #1 and inside truck cab.
21. Shut down the power source.
22. Shut down all unit operating systems at the platform, turret #1 and truck cab.

Operation

Drivers Side Use: DEPLOYMENT

1. At the truck cab, set the truck parking brake.
2. At the truck cab location, turn the ignition switch to the on position and start the truck.
3. At the truck cab, turn on the unit power switch.
4. At the truck cab, turn on the intercom.
5. At the truck cab, select and engage the power source (truck PTO or auxiliary engine).
6. At the truck cab, engage the two speed by pushing the two-speed button.
7. At turret #1, turn on the intercom and adjust the volume.
8. At turret #1, place the unit/axle lock selector switch to the "AXLE LOCK" position.
9. At turret #1, engage front and rear axle locks. Hold toggle switch until hydraulic pressure gauge for unit reaches approximately 2,200 psi
10. At turret #1, engage the sliding counterweight to the passenger side of the truck by pushing the toggle switch to "Left" while momentarily holding the sliding counterweight unstow button. Once the amber stow light goes off, release the unstow button and the counterweight will continue to travel. The red axlelock engage light illuminates when both the axlelocks and sliding counterweight are in the proper position.
11. Remove the boom tie down device.
12. At turret #1, place the unit/axle lock selector switch to the "UNIT" position.
13. At turret #1, raise boom #1 about 12 inches.
14. Lower both of the platform rests.
15. At turret #1, lower boom #1 into the boom rests.
16. At turret #1, lower boom #4.
17. At turret #1, level the basket by putting the leveling switch to the manual position depress the foot switch and hold the stow/un-stow toggle switch in the un-stow position. After the platform has moved to the level position place the leveling switch to the automatic mode.
18. Board the platform.
19. Turn on the "power" using the red ¼ turn switch on the Radio Controls.
20. Turn on the intercom and adjust the volume.
21. Operate boom #4 control to raise boom #4 up so boom #4 and the platform is slightly higher than the bottom of boom three.
22. Operate boom #1 control to raise the boom assembly to clear objects, about 12" inches above the rests. It is important to be constantly aware of the position of boom #2 so that it is not rotated or raised into the leveling linkage rods connecting the turntables.
23. Operate rotation #1 control clockwise until rotation #2 can be operated in the clockwise direction without moving the boom structures into traffic on the right side of the truck.
24. Operate boom #1 to adjust the height of the boom assemblies to clear any obstructions.
25. Operate rotation #2 control clockwise and rotation #1 clockwise until boom #1 is positioned 90 degrees to the bridge and boom #2 and #3 are parallel to the bridge.
26. Operate boom #2 down and #3 open until boom #2 is vertical and boom #3 is horizontal. Boom #3 may now be operated to provide clearance. The platform will automatically level as boom #2, #3 or #4 are moved.
27. Operate rotation #2 clockwise to rotate the platform under the bridge.
28. The platform may now be telescoped in and out as necessary to reach the desired location.
29. Boom #3 and #4 control may be used to raise or lower the platform.

NOTE:

The truck engine RPM must be in the low setting before moving the unit during bridge operation.

Vehicle speeds must not exceed 1 ½ mile per hour when the booms are deployed.

Operation

Drivers Side Use

STOWING

1. Retract both telescoping booms completely.
2. Operate rotation #2 control counter-clockwise until booms #2 and #3 are parallel to the bridge.
3. Operate boom #2 and #3 controls to totally raise both booms.
4. Operate boom #4 control to adjust for proper clearance.
5. Operate boom #1 control to adjust for proper clearance.
6. Operate rotation #2 control counter-clockwise until it stops automatically. Watch for proper clearance of the booms and leveling rods.
7. Operate rotation #1 control counter-clockwise until the booms are over the boom rest.
8. Operate boom #1 down, this will lower the booms into the rests.
9. Adjust boom #4 to provide safe exiting of the platform.
10. Turn off all platform controls and exit platform.
11. At turret #1, stow the basket by placing the leveling switch in the manual position depress the foot switch and hold the stow/un-stow toggle in the stow position until the platform is fully stowed
12. At turret #1, raise boom #4 completely.
13. At turret #1, raise boom #1 about 12 inches.
14. Lift and secure the platform rests.
15. At turret #1, lower boom #1 into the rests.
16. Install boom tie down.
17. At turret #1, place the unit/axle lock selector switch to the “AXLE LOCK” position.
18. At turret #1, disengage sliding counterweight by holding the toggle switch to the “Right” position. The sliding counterweight will stop when it reaches the stowed position and the amber stow light will illuminate.
19. At turret #1, disengage the front and rear axle locks with the toggle switch. The green disengage light will illuminate at turret #1 and truck cab.
20. Shut down the power source.
21. Shut down all unit operating systems at the platform, turret #1 and truck cab.

Operation

Preview of Operations

The following series of diagrams and pictures is intended to familiarize the reader with the various controls, features, and operating positions of the bridge access machine. ***However, do not attempt to operate the unit merely by referring to these photos.*** Use the step-by-step operating procedures and refer to the photos simply for supplemental information.

Due to optional and custom features, your machine at hand may be slightly different than the unit shown here. Familiarize yourself with the unit by comparing these photographs with your bridge access machine.

Study the sequence of pictures showing the bridge access machine in progressive steps of operation ending with the unit fully in place under the bridge. These pictures are intended to convey the “out - down - under” boom configuration which is the key to reaching locations under the bridge.



PARK UNIT AT THE BRIDGE, ENGAGE AXLE LOCKS AND RELEASE BOOM TIE DOWN DEVICE



TAKE OUT THE PLATFORM CONTROL BOX

Operation



BOARD THE PLATFORM



RAISE B1 TO ALLOW CLEARANCE FROM THE DECK AND ROTATE T2 CLOCKWISE AND T1 COUNTER CLOCKWISE



CONTINUE TO ROTATE



CONTINUE TO ROTATE UNTIL THE PLATFORM IS NEXT TO THE BRIDGE RAIL

Operation



OPEN B2 (THE PLATFORM WILL LEVEL AS B2 IS OPENED)



B-2 FULLY OPENED



THE PLATFORM MAY NOW BE ROTATED UNDER THE BRIDGE (T2 CLOCKWISE)



PLATFORM UNDER THE BRIDGE

Operation



T2 BEING ROTATE CLOCKWISE TO BRING PLATFORM FORWARD



PLATFORM ALONG SIDE THE BRIDGE

Operation

Auxiliary Engine: Emergency Hydraulic Backup

The auxiliary engine is designed to operate as an emergency power source to provide hydraulic flow to operate the booms and axle locks. The truck transmission PTO driven hydraulic pump is considered the primary power source of hydraulic flow however the auxiliary engine is designed to provide hydraulic flow if the truck mounted system is not available. The auxiliary engine is diesel driven and draws fuel from the truck-mounted fuel tank.
Note: The auxiliary engine is not designed to run the hydraulic pump and the generator at the same time. The operator must select (via a toggle switch) what function he wants to run.

- The unit power switch in the truck cab must be turned on before the auxiliary engine can provide flow to the unit.
- The key switch for preheating and starting the auxiliary engine is located at turntable #1.
- For cold weather operation, turn on the ignition key for the auxiliary engine to the left, allow the coil inside the key station to heat up (about 30 seconds) then turn unit over until it starts.
- The selector switch must be in the backup position (hydraulic mode).

AC Power System

The Auxiliary engine also operates a 110 volt AC generator. The generator will operate any time the unit power switch is on, the auxiliary engine is running and the selector switch at Turntable #1 is in the generator mode.
There is 110 volt outlets located at the truck deck, right side. There are also two 110 volt outlets in the platform.
Note: The auxiliary engine is not designed to run the hydraulic pump and the generator at the same time. The operator must select (via a toggle switch) what function he wants to run.

NOTE

Do not operate the auxiliary engine hydraulic pump at the same time the truck PTO is engaged!
If both hydraulic pumps are sending hydraulic flow to the unit the unit functions may become abrupt and difficult to control.

Air Compressor System (hydraulically driven)

The hydraulically driven air compressor control switch is located at turntable #1. The compressor will operate any time that the truck transmission pump is engaged, unit power switch is turned on in the truck cab and the compressor switch at turntable #1 is selected to the on position.

Operation

Automatic Platform Leveling System

The platform is designed to remain level during the operation of the booms by way of a hydraulic rotary actuator.

This system will automatically level the platform any time the platform leveling switch located at turntable #1 is in the automatic position and:

- The radio controls are operated and boom two is opened more than10 degrees.
- The foot switch is depressed at turntable #1 control station.

Manual Override Platform Leveling.

A platform leveling control valve is mounted at the Turret 1 control station to be used for manual operation.



Caution: The leveling valve is fully proportional, and quick movement of the valve handle will cause faster movement of the platform. It is important that when engaging manual operation of the leveling valve it is controlled in such a way as to allow slow and deliberately smooth movement of the platform.

Operation

Operating Parameters for Manual Override

If 12 volt power “is” available:

1. Locate the leveling valve at T-1. Note: a decal at the valve guard for operation.
2. The operator at Turntable One control station must position the Leveling toggle switch to Manual.
3. The operator at Turntable One control station must depress the control activation foot switch.
4. As the boom(s) are moved, manually operate the leveling valve in the platform to maintain a level position until it is safe to exit the platform.

If 12 volt power “is not” available:

1. Locate the leveling valve at Turntable One control station. Note: Instructions are written on or near a decal at the valve.
2. The operator at Turntable One control station must position the leveling switch to manual.
3. As the boom(s) are being moved, the operator at Turntable One control station must manually operate the leveling valve . Communication and direction from a trained operator in the platform is important to maintain a level position until it is safe to exit the platform.



Operation

Automatic Function Stops

Automatic limit switches are installed on several of the unit's functions to prevent movement of the booms into positions that could cause unsafe operation. If the unit is operated in such a manner that a limit switch is tripped, that function will be stopped. ***TO RESUME OPERATION IT WILL BE NECESSARY TO REVERSE THE FUNCTION THAT CAUSED THE LIMIT SWITCH TO TRIP, OR OPERATE ANOTHER FUNCTION THAT COULD RE-ACTUATE THE LIMIT SWITCH TO ALLOW CONTINUED TRAVEL.***

The functions that have built-in limit stops are described below:

Rotation #1 (turntable one)
Limited to a total movement of 255 degrees.

Rotation #2 (turntable two)
Limited to 112 degrees each side of boom #1 (total of 224 degrees) when the 2nd boom is opened beyond 30 degrees with the telescope boom retracted.

Rotation #2 (continued)
Limited to 90 degrees each side of boom #1 (total of 180 degrees) when the 2nd boom is opened beyond 50 degrees with the telescope boom extended.

2nd, 3rd, and 4th Boom Movements
Limited to that range of movement in which the automatic platform leveling system is able to maintain a level platform condition.

Explanation of the Limit Switch Condition Map (see diagram)

Because of the built-in safety features on this unit the operator may occasionally experience a stoppage, which he perceives as a malfunction of the equipment. Actually, such stoppages will generally be due to having exceeded the permissible travel for a particular function and causing its limit switch to trip.

A limit switch condition map is provided on the cover of the control circuit junction box on the main turret. Since a mechanical limit switch, a mercury limit switch, or both govern all functions, it is helpful to know which particular switch is preventing function operation so that the function may be quickly restored. A function may be governed by several limit switches, or just one. Mechanical switches are represented by the standard "make-break" switch symbol; mercury switches are identified by the capsule-shaped symbol.

NOTE

DO NOT ATTEMPT TO TRIP, ACTUATE, MOVE, OR ADJUST THE MERCURY SWITCHES.

Operation

Explanation of the Limit Switch Condition Map (continued)

A vertical row of red function LED's appears along the left edge of the map. Each red LED is labeled with the functions that are stopped when that LED is lit.

In order for a function to operate, a path of lighted amber LED's must exist from the right hand edge "positive" bus across to the left hand edge vertical row of red LED's.

As long as the function can find a path to the red LED, even if it must move up or down a row to an alternate path, the function will operate. If a function fails to find a complete path, it will stop and the red function LED will light.

Solutions for Function Stoppages

Once a function stop occurs and the red LED is lit, check the amber LED's in that functions path(s), starting at the right hand side. If an unlit amber LED is encountered, operate the control as stated at the unlit LED to obtain the lighted condition.

This Led map may be checked prior to operation, by having someone manually trip the limit switch "whip" to make sure the amber LED is being activated If the amber LED is off, tripping the switch will turn it on if the LED is on, tripping the switch should turn it off.

If manually tripping a switch does not activate that amber LED, repair or replace the switch, or check the wiring from the switch to the junction box.

NOTE

THE "AXLE LOCK" RED LED IS NORMALLY ON DURING UNIT OPERATION. THIS WILL NOT PREVENT ANY FUNCTION RESPONSE EXCEPT DISENGAGEMENT OF AXLE LOCKS. THE "UNIT" RED LED WILL REMAIN ON UNTIL THE CONTROL ACTUATOR FOOTSWITCH IS DEPRESSED OR A CONTROLLER IN THE PLATFORM IS OPERATED.

SUPPLEMENT: NBB RADIO CONTROLS

To make the unit ready for use, insert the battery into the battery compartment. To remove the battery, depress the pin and push out the battery. The power supply to the transmitter is activated with the EMERGENCY STOP switch (when depressed, the EMERGENCY STOP switch can also be secured by removing the key cap). The green LED on the transmitter control panel must flash regularly. Commands can now be input by means of the controls. The operating period with a charged battery is approximately 8 hours with the transmitter in continuous use.
When the red “Battery” indicator lamp lights up, the battery is nearing exhaustion. The transmitter can be operated for approximately 15 minutes more in this condition. During this time, bring the unit to be controlled to a safe position and install a new battery. Removal of the battery interrupts the radio link. As a result, the master switch for the unit to be controlled must be switched on again. Charge the discharged battery with the charger supplied.
NBB Controls recommends that the transmitter be left on at the end of each day to fully discharge the battery. The next day, start with a fully charged battery and place the discharged battery in the charger.

BATTERY CHARGER:

Steady green LED light: The battery charger is ready for use. Place the battery in the charger.
If the battery is totally discharged, the yellow LED flashes slowly during pre-charging.
Steady yellow LED light: The battery will now be charged.
Quickly flashing yellow LED light: The charging process is finished.
Do not use the charger other than in dry rooms having a min-max temperature range of 0-40 degrees Celsius, 32-104 degrees Fahrenheit! A charged battery is a concentrated energy source. Never store a charged battery in a toolbox or location where it could be short-circuited by metal components (even a key in your pocket can cause a short circuit).

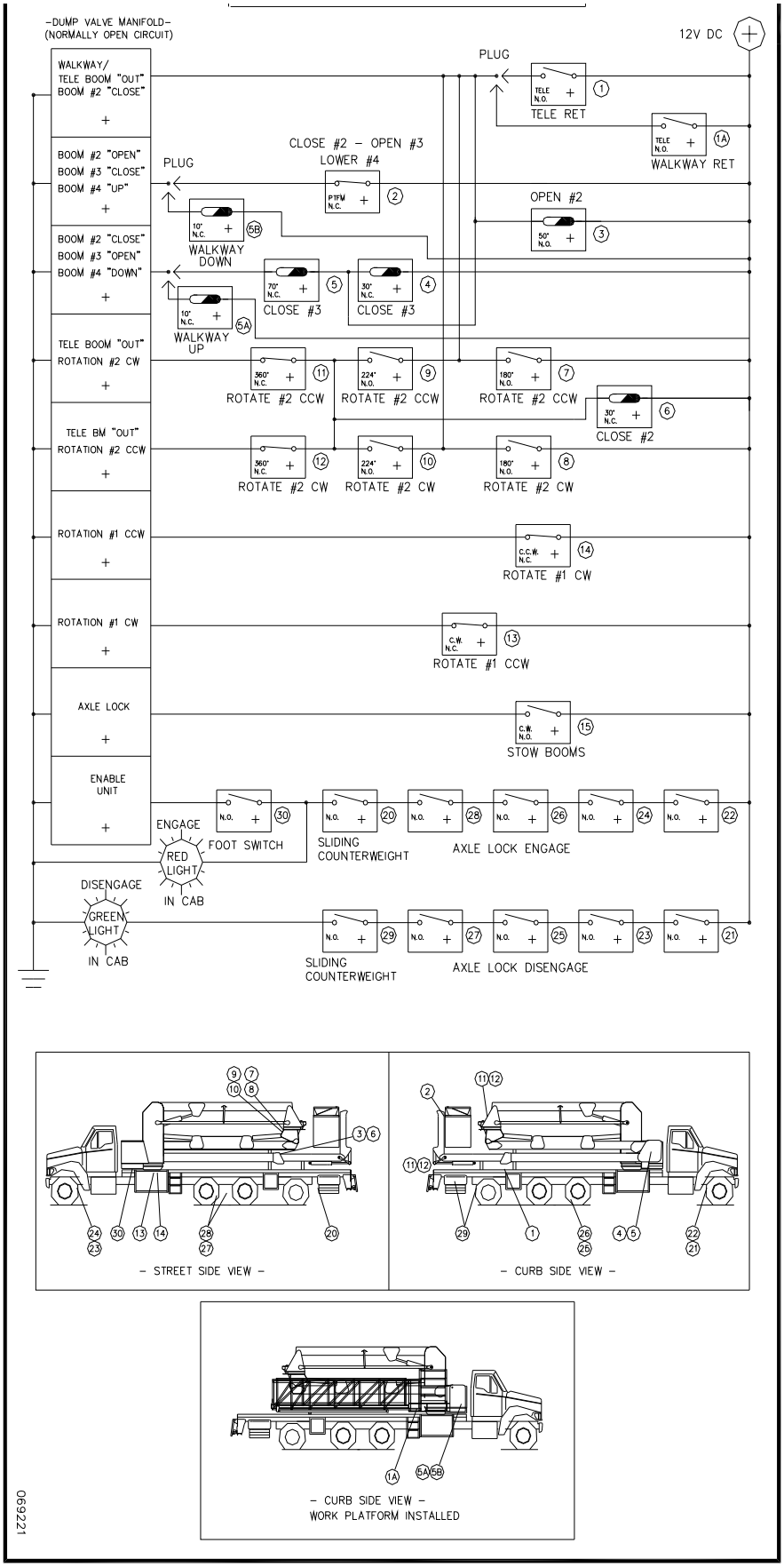
RECEIVER:

The receiver is connected to the unit with a multi-pin connecting cable. Please observe the instructions issued by the manufacturer of the unit to be controlled. **NBB Controls recommends this connection to be made via a central, well accessible, multi-pin plug connector to make possible a quick and clear fault diagnosis in the service case and to remove the receiver without an expenditure of assembly.**

The power supply of the receiver is generally affected by the connection cable.

- **Never expose the receiver to a high pressure cleaning jet. This applies to the transmitter also.**
- **The receiver should always be fixed vertically at the outside panel of the switching cabinet (The antenna should always reach over the top of the panel).**
- **It is necessary to make sure that the antenna is not totally shielded by metal parts.**

In general, the antenna should always be mounted in such a way so that the antenna is still visible with each change of position of the transmitter.


-DUMP VALVE MANIFOLD-
(NORMALLY OPEN CIRCUIT)
12V DC
WALKWAY/
TELE BOOM "OUT"
BOOM #2 "CLOSE"
BOOM #2 "OPEN"
BOOM #3 "CLOSE"
BOOM #4 "UP"
BOOM #2 "CLOSE"
BOOM #3 "OPEN"
BOOM #4 "DOWN"
TELE BOOM "OUT"
ROTATION #2 CW
TELE BM "OUT"
ROTATION #2 CCW
ROTATION #1 CCW
ROTATION #1 CW
AXLE LOCK
ENABLE
UNIT
PLUG
TELE RET
WALKWAY RET
CLOSE #2 - OPEN #3
LOWER #4
OPEN #2
WALKWAY
DOWN
CLOSE #3
CLOSE #3
WALKWAY
UP
ROTATE #2 CCW
ROTATE #2 CCW
ROTATE #2 CCW
CLOSE #2
ROTATE #2 CW
ROTATE #2 CW
ROTATE #2 CW
ROTATE #1 CW
ROTATE #1 CCW
STOW BOOMS
ENGAGE
FOOT SWITCH
RED
LIGHT
IN CAB
DISENGAGE
GREEN
LIGHT
IN CAB
SLIDING
COUNTERWEIGHT
AXLE LOCK ENGAGE
SLIDING
COUNTERWEIGHT
AXLE LOCK DISENGAGE
- STREET SIDE VIEW -
- CURB SIDE VIEW -
- CURB SIDE VIEW -
WORK PLATFORM INSTALLED
069221

Operating problem checklist UB 50,60

Because of built - in safety features on this unit, the operator may occasionally experience a Stoppage which may be perceived as a malfunction of the equipment. Actually, such stoppage Will generally be due to having tripped an interlock on one of the various control circuits. **Consult the following checklist if such a stoppage occurs.**

- IF A PROBLEM OCCURS -

PROBLREM	POSSIBLE CAUSE
NO CONTROL RESPONSE	MASTER SWITCH IN CAB NOT :ON: OR THE IGNITION IS :OFF: POWER SWITCH ON REMOTE CONTROL PANEL IS NOT :ON: UNIT/AXLE LOCK SELECTOR NOT IN CORRECT POSITION. CONTROL SELECTOR SWITCH NOT SELECTED TO CORRECT POSITION.
NO AXLE LOCK RESPONSE	UNIT MUST BE IN STOWED POSITION TO ACTIVATE THE AXLE LOCKS. UNIT/AXLE LOCK SELECTOR VALVE NOT IN CORRECT POSITION.
NO BOOM RESPONSE	AXLE LOCK NOT FULLY ENGAGED. UNIT/AXLE LOCK SELECTOR VALVE NOT IN CORRECT POSITION.
BOOM CONTROL DO NOT RESPOND	BOOMS OR PLATFORM HAVE REACHED THE LIMITS OF THEIR TRAVEL OR A LIMIT SWITCH HAS BEEN TRIPPED. *SEE AUTOMATIC BOOM* STOPS *DECAL.*
BOOM #1 WILL NOT RESPOND	BOOM HAS REACHED ITS UP OR DOWN TRAVEL LIMITATION.
BOOM #2 WILL NOT OPEN	PLATFORM HAS REACHED ITS UPWARD LEVELING LIMITS AND HAS STOPPED THE BOOM. BOOM HAS REACHED ITS OPEN OR CLOSED TRAVEL LIMITATION.
BOOM #2 WILL NOT CLOSE	BOOM #2 WILL NOT CLOSE PAST 50 DEG IF BOOM #3 IS PAST 30 DEG. BOOM #2 WILL NOT CLOSE PAST 50 DEG UNTIL EXTENSION BOOM IS RETRACTED.
BOOM #3 WILL NOT RESPOND	PLATFORM HAS REACHED ITS UPWARD LEVELING LIMITS AND HAS STOPPED THE BOOM. BOOM HAS REACHED ITS OPEN OR CLOSED TRAVEL LIMITATION.
BOOM #3 WILL NOT OPEN PAST 30 DEG.	BOOM #2 MUST BE OPENED BEYOUND 50 DEG TO PERMIT BOOM #3 TO OPEN TO 70 DEG.
NO EXTENSION BOOM RESPONSE	TURNTABLE #2 HAS BEEN ROTATED BEYOND 90 DEG. EITHER SIDE OF BOOM #1. BOOM #2 HAS NOT BEEN OPENED SUFFICIENTLY (50 DEG OR MORE).
ROTATION #1 WILL NOT RESPOND	TURNTABLE #1 HAS REACHED ITS TRAVEL LIMITATIONS.
ROTATION #2 WILL NOT RESPOND	WHEN EXTENSION BOOM IS EXTENDED, ROTATION IS LIMITED TO 90 DEG. EITHER SIDE OF BOOM #1. WHEN EXTENSION BOOM IS RETRACTED AND ROTATION # 2 IS LIMITED TO 112 DEG EITHER SIDE OF BOOM #1.
BOOM #4 WILL NOT RESPOND	BOOM 4 WILL NOT GO UP WHEN PLATFORM LEVELING SYSTEM HAS REACHED ITS UPWARD LEVELING LIMITS. BOOM #4 HAS REACHED IT OPEN OR CLOSED TRAVEL LIMITS.

Information For Training

Inspection Procedures

INSPECTIONS are a required function under ANSI A92.8-1993. INSPECTIONS are performed according to a checklist and certain records of these inspections must be kept.

Three types of inspections are required: “Pre-Operation”, "Frequent" and “Annual”.

The forms for performing these inspections are included in this section of the manual.

Pre-Operation
Before use each day or at the beginning of each shift, the mobile unit shall be given a visual inspection is and functional test. A daily inspection checklist must be followed when performing this inspection.

Frequent Inspection
Frequent inspection and tests shall be conducted on the mobile unit:

-- When it has been in service for three months or up to 200 hours, whichever comes first.
-- Prior to operation after the unit has been out of service for a period longer than three months.

The inspection shall be made by a person qualified as a mechanic on the specific make and model of unit. The inspection shall include all items specified by the manufacturer for a frequent inspection. A frequent inspection check list must be followed when performing this inspection.

Written records of the frequent inspections shall be retained for a minimum of three years. Records shall include the date of the inspection, the name and signature of the person(s) accomplishing the inspection, a description of any deficiencies found, corrective action accomplished including the date, identification, and signature of the person(s) performing any required repairs.

Annual Inspection

Twelve (12) months from the date of the prior annual inspection or not to exceed 1,000 hours of operation form the prior annual inspection, whichever occurs first, an annual inspection shall be performed. Inspections shall be performed by a person(s) qualified as a mechanic on this specific make and model of unit. The inspection shall include all items specified by the manufacture for the annual inspection.

Prior to the operation, all malfunctions and problems identified shall be corrected and further inspection, if necessary, shall be accomplished.

A written record of the annual inspection shall be retained for as long as the unit is owned (lifetime). The record shall include the name and signature of the person(s) accomplishing the inspection, a description of any deficiencies found, any corrective action accomplished, including the date, identification, and signature of the person(s) performing and required repairs shall be recorded.

Information For Training

Equipment Storage

Mobile hydraulic equipment tends to deteriorate when stored, or not used for extended periods of time. Storage for a period of several months will almost certainly produce some deterioration of the equipment. In warm, moist climates rust will form on unprotected ferrous metal surfaces very quickly and water may collect in some structural pockets. In dry climates, gaskets will begin to shrink during long periods of non-use, and lubricants will lose their effectiveness. Condensation may occur in fluid reservoirs and other components and elastomeric parts will tend to incur a "set" and lose elasticity.
One of the most noticeable effects of prolonged periods of non-use is the deformation of seals. By its nature, hydraulic equipment generally has a number of heavy, cylindrical actuators. A considerable amount of weight is on the ram, or piston, of the various actuators. As these components are allowed to rest in one position for a period of time, the seals on the piston will tend to flatten along the loaded side.

Protective Measures:

- If it is known that equipment will be stored for a month or more, some steps should be taken to preserve the equipment.
- The best preservative is to fully cycle (operate) the equipment weekly if even for a short time.
- Exposed bare metal surfaces should be coated with a light grease or oil. This includes cylinder rods, shafts, gears, linkages, and unpainted parts.
- Fluid reservoirs should be topped off to allow as little air space as possible, to limit the effects of condensation.
- When stored out door exposed rubber or neoprene parts should be covered or wrapped with an ultra-violet resistant covering to shield the parts from exposure to the sun. Lacking such covering, a coating of petroleum jelly will help.
- Electrical connectors should be unplugged and each side of the connector sprayed with one of the various aerosol products designed for protecting electrical connections. After spraying, plug the connectors back together.
- Switch panels and control panels should be covered to prevent direct intrusion of rain or moisture, yet allow air to circulate over the panel when stored out door.
- Personnel platforms and platform controls should be covered to prevent the accumulation of water when stored out door.

Maintenance Periods

Maintenance is regularly scheduled cleaning, adjustment, replacement, and lubrication of equipment with the intention of preventing breakdowns and prolonging equipment life. Aspen Aerials has established eight regular maintenance intervals based on operating hours. These intervals may be converted to a calendar schedule, however it is recommended that the intervals listed here be considered as the normal schedule. The user should increase the frequency of these intervals if a unit is exposed to particularly harsh operating conditions, or if used beyond the 8-hour workday.

- Every 40 Hours = compares to weekly interval
- Every 150 Hours = compares to monthly interval
- Every 200 Hours = compares to 3 month interval
- Every 500 Hours = compares to 6-month interval
- Every 1,000 Hours = compares to annual interval
- Every 2,000 Hours = compares to 2-year interval
- Every 5,000 Hours = compares to 5-year interval
- Every 10,000 Hours = compares to 10-year interval

These scheduled maintenance periods occur at the operating hour intervals indicated throughout the life of the unit.

40 Hour Maintenance (Weekly)

- Lubricate unit as indicated on lubrication guide.
- Visually inspect all mounting bolts.
- Visually inspect all hydraulic hoses and electrical wires for defects and proper adjustment. Make sure all chaff protection devises are properly positioned and secured.
- Wipe grease fittings clean. Wipe off any excess oil or grease seepage from surfaces where found.
- Make complete operational test of all systems (stop/start, engine kill, etc.) and check system operating pressure.

150 Hour Maintenance (Monthly)

- Lubricate unit as indicated on lubrication guide.
- Make complete operational test of all systems (stop/start, engine kill, etc.) and check system operating pressure.
- Perform the services indicated under the 40-hour service interval.

200 Hour Maintenance (3 Month)

- Perform a frequent inspection as set forth in the Aspen Aerials frequent inspection forms provide in the parts and service manual.

Maintenance Periods

500 Hour Maintenance (Six Months)

- Lubricate unit as indicated on lubrication guide.
    - Check the condition of the return filter, and replace the element if the filter status indicator is at the yellow/red zone.
    - Make complete operational test of all accessory systems (stop/start, engine kill, etc.) and check system operating pressure.
    - Perform the services indicated under the 150-hour service interval.

1000 Hour Maintenance (Annual)

- Remove and test the rotation brake as indicated in the brake test procedure.
- Replace the pressure filter.
- Replace the return filter.
- Take a sample of the hydraulic fluid and inspect for emulsified moisture or suspended dirt. If the sample is found to be contaminated, replace the fluid.
- Lubricate unit as indicated on lubrication guide.
- Perform the services indicated under the 500 hour service interval and additionally.
- Make complete operational test of all systems (stop/start, engine kill, etc.) and check operating pressure. Replace relief valves as needed to maintain operating pressure within 10% of prescribed value.
- Perform an annual inspection as set forth in the Aspen Aerials annual inspection form provided in the parts and service manual.

2000 Hour Maintenance (Two Years)

- Perform the services indicated under the 1000 hour service interval and additionally:

5000 Hour Maintenance (Five Years)

- Perform the services indicated under the 2000 hour service interval and additionally:
- Replace the hydraulic fluid and thoroughly clean inside of the reservoir tank also clean the suction strainer located at the bottom of the reservoir tank.
- On boom three telescoping section, clean and lubricate the boom roller bearing assemblies. Readjust the boom roller bearings as may be necessary.

- Make complete operational test of all systems (stop/start, engine kill, etc.) and check system operating pressure.
- Truck chassis and tires must be in good operating condition. If there is any visible tire damage or if tires are more that 5 years old, they should be inspected by a qualified tire specialist. If required, they must be replaced with tires of proper load range rating.

10000 Hour Maintenance (10 Years)

- Manufactures recommend repairs and required pin replacements. Contact Aspen Aerials for further requirements.
- Perform the services indicated under the 5000-hour service interval.

Relief Valves

The hydraulic systems of all units are protected from over-pressure by relief valves.
The **main relief valve** is set at 2750 psi, which is 150 psi higher than the normal operating pressure of the unit and is intended to protect the pump(s) from damage in the event of a blockage in the pressure line. The main relief valve is located in the main pressure hose between the pump(s) and the control valve(s).

Control Valve Relief Settings

Some functions are protected by individual relief valves. These relief valves are installed at the work port of that function(s) control valve section, and are referred to as "port relief's." The port relief valves are located on four sections of the main valve. Boom one down is set at 900psi, both directions of the rotations on and two are set at 1500psi, and telescope out is set at 1500psi.
The inlet relief at the main valve regulates the unit operating pressure. The inlet relief is set at 2650psi which is 100psi lower than the main relief valve setting. The axle lock pressure is regulated by thru the main relief and will see 2750psi.

Minimum Safe Approach Distance (M.S.A.D):

Before the commencement of operation near electrical power lines, the person responsible for the job shall notify the owners of the electrical power lines or their authorized representatives, provide them with all pertinent information and request their cooperation in minimizing risk associated with operating in proximity to such lines.

DO NOT MANEUVER MACHINE OR PERSONNEL INSIDE PROHIBITED ZONE. "SEE THE DECAL LOCATED AT T-1, BASKET AND INSIDE OF THE TRUCK CAB FOR M.S.A.D INFORMATION.

Lubrication

General Information

This lubrication guide is intended to apply under normal operating conditions. If the unit is used extensively or operated in a particularly harsh environment, the user may wish to alter those lubricating procedures to suit the abnormal conditions. In all cases, sound mechanical practices should be the guide when adopting other than normal procedures.

Proper lubrication is an important factor in ensuring trouble-free operation and long mechanical life of the equipment. Checking lubricant status should be stressed in any periodic inspection of the unit.

It should be remembered that excess lubricant left on exposed surfaces tends to collect dirt particles that may result in high wear rates, especially of bearings. Before applying a lubricant, a fitting or surface should always be wiped clean. This will insure that dirt is not carried into the mechanism where it will cause harm. **After applying the lubricant, wipe any excess away**.

Aspen Aerials units are lubricated at the factory with high quality lubricants that have proven to be most satisfactory. If a substitute to the recommended lubricants is made, the specifications of the intended substitute should be checked to be sure it would provide adequate service.

The following lubricants will be necessary to service the aerial device:

- **Grease** - General Purpose, NLGI #2, EP. Suggested lubes Mobilgrease XHP 222, Shell Alvania EP 2, Lubriplate 1200-2.
- **Grease** - General Purpose, NLGI #0, EP. Suggested lubes - Mobilux EP 0, Shell Alvania EP 0.
- **Grease** - Open gear compound, NLGI #3 EP. Suggested lubes - Gulf Lube-cote #3, Texaco Texclad #2, Lubriplate Gear Shield extra heavy.
- **Oil** - Multipurpose Gear, 85W-140. Suggested lubes - Mobilube HD 85W-140, Shell Spirax HD 85W-140.
- **Oil** - General Purpose, 20W, ordinary machine oil.
- **Liquid Graphite** - Recommended product is “Slip-Plate,” a superior paint-on type lubricant. Contains graphite and Teflon in a paint base.

The following table provides general information on the recommended lubricants and lists acceptable alternate brands.

Recommended Lubricant Type	**SAE No.**	**Service Class**	**MIL Spec**	**Description of Desired Product**	**Suitable Types (*Preferred Product)**
Open gear compound (rotation gears)		NLGI #3 EP	MIL-L-18458	Tacky, extreme pressure water-repellent, open gear lubricant	*Texaco Texclad, Gulf Lube-Cote #3, Lubriplate Gear Shield Ex. Heavy
Enclosed gear compound (gearboxes)		NLGI #0 EP	MIL-L-19701	Semi-fluid, mild extreme pressure, water-repellent gear lubricant	*Shell Alvania EP 0, Mobilix EP 0

Recommended Lubricant Type	SAE No.	Service Class	MIL Spec	Description of Desired Product	Suitable Types (*Preferred Product)
Gen. Purpose lubricating grease (bearings, pivots)		NLGI #2	MIL-L-16908	Extreme pressure, water-repellent multi-purpose grease	*Shell Darina 2, Mobilgrease Special Lubriplate 1200-2
Gen. Purpose lubricating oil (misc. pivot points)	20W		MIL-L-6086B	Medium weight industrial and mechanical lubricating oil	*Shell Vitrea 22, Mobilfluid 423, Lubriplate 3-V
Liquid graphite (extendible tube sections)			MIL-L-23398A	Liquid, fast-drying, paint-on, graphite slide lubricant	Superior Graphite Co. “Slip-plate”

Lubrication Procedure:

Bearing, rotation - The ambient temperature when lubricating this bearing should be above 45 degrees F. Use a hand grease gun and NLGI #2 general-purpose grease. *Do not use a high-pressure grease applicator, as there is a possibility of blowing the bearing dirt seal out of place.* Apply 1 pump of grease; rotate the boom 15 degrees and stop. Apply 1 pump of grease, and rotate the boom 15 degrees again. Repeat this grease-rotate-grease procedure until you have rotated through two complete turns. This will insure the grease has reached the balls all the way around the bearing. Grease the bearing every 200 operating hours.
Bearing, boom pivots - Using a hand grease gun and NLGI #2 general-purpose grease, apply 2-3 pumps at the zerk on the pin housing every 150 operating hours. Remove any excess grease from around pin ends.
Bearing, cylinder - Use a hand grease gun and NLGI #2 general-purpose grease. Apply 2 pumps at the zerk located on the cylinder anchor at each end every 150 operating hours. Wipe off excess.
Gear, rotation - Use the open-gear compound grease. Apply by hand or with brush to full circumference of rotation gear. Check every 40 operating hours (weekly) and apply as needed. Wipe away excess lube. The zerk is on the worm housing. Pump in NLGI #0 grease until some grease begins to ooze out of the seal around the pinion on the bottom of the gearbox or out the breather. Lubricate this gearbox every 750 operating hours.
Leveling rods - Apply 1-2 pumps of NLGI #2 grease to the zerk at the end of each leveling rod connecting the upper and lower turntables.
Platform hanger - A zerk is located on each side of the top of the platform hanger bracket. Apply 1 pump of NLGI #2 grease every 750 operating hours.
Platform leveling cylinders - Apply several drops of 20W oil to the bushing at each end of the leveling cylinder(s) at 750 operating hour intervals.
Stabilizers - Axle lock assemblies - Use NLGI #2 grease in all the zerks found on the front and rear lock assemblies every 150 operating hours.
Sliding counterweight shaft- Remove the boots on each side of the ball screw nut located above the counterweight. Apply a liberal amount of grease to the shaft on each side of the nut. Using Lubriplate 1200-2 80 hr**.** operating hours or 20 cycles.

Lubrication Table

No	Item	Fitting Type	Recommended Lubricant	Interval in Hours	Directions
1	Turntable Drive Gear box	Zerk	NLGI #0	750	Grease comes out breather-vent.
2	Turntable Bearing(s)	Zerk	Gen. Purpose NLGI 2 Grease	150	Rotate turntable through one complete revolution while greasing.
3	Boom #1 Pivot Pin	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
4	Turntable #2 Pivot Pin	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
5	Boom #2 Pivot Pin	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
6	Boom #3 Pivot Pin	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
7	Boom #1 Cylinder Pivot	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends.
8	Boom #2 Cylinder Pivot	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
9	Boom #3 Cylinder Pivot	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends.
10	Linkage Rod Ends	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
11	Turntable Gear	None	Open Gear Compound	50	Apply evenly to entire toothed surface of gear.
12	Boom #3 Linkage	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
13	Control Valve Linkage Pivots	None	Gen. Purpose 20W Oil	750	Apply one to two drops at each pivot point.

No	Item	Fitting Type	Recommended Lubricant	Interval in Hours	Directions
14	Platform Linkage	Zerk	Gen. Purpose NLGI 2 Grease	1500	Remove pivot pins and pack bearing liners by hand.
15	Front & Rear Axle Locks	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
16	Boom #4 Pivot	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
17	Platform Cylinder Pivot	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends.
18	Platform Pivot	Zerk	Gen. Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.
19	Roller Assemblies	Zerk	Gen. Purpose NLGI 2 Grease	1500	Pump until excess grease appears around pivot ends. Remove excess lube.
20	Side Roller Assemblies	Zerk	Gen. Purpose 20W Oil	750	Apply one to two drops at each bearing inner race.
21	Extension Boom Section(s)	None	Paint-on Graphite	1500	Coat extending surfaces evenly
22	Rear Axle Lock Slide Bar	None	Paint-on Graphite	1500	Coat extending surfaces evenly
23	Wear Pad Path	None	Paint-on Graphite	1500	Coat extending surfaces evenly with brush.
24	Sliding counterweight	None	Lubriplate 1200-2	80 hr. or / as needed	Apply grease on shaft of counterweight.
25					
26	Idler Link	Zerk	Gen Purpose NLGI 2 Grease	150	Pump until excess grease appears around pivot ends. Remove excess lube.