

AERIAL LIFT TRUCK
SERVI-LIFT®—TELESCOPING
DESCRIPTION AND OPERATION

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that normally require the use of a pole derrick or similar equipment.

1.04 The following Bell System Practices and General Letters (GLs) will be considered supplements to this section:

SECTION	TITLE
627-700-201	Self-Supporting Cable
620-135 layer	Guarding of Work Locations
620-100-011 GL 75-05-003	} Minimum Approach Distances to Exposed Energized Power Conductors
GL 73-02-060	

1. GENERAL

1.01 This section covers the description and operation of the SERVI-LIFT, Model T-29-MC, aerial lift which is used to raise and support an employee and authorize tools and equipment to a working position aloft.

1.02 This section is reissued to include reference to minimum approach distances, to overhead energized power lines, to more clearly define maintenance responsibilities, to change platform entry and egress position, and to generally update the section. Since this is a general revision, arrows normally used to indicate changes have been omitted.

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1.03 The SERVI-LIFT, Model T-29-MC, aerial lift is adequate for placing cable, strand, and self-supporting cable if the load limits given in Section 627-700-201 on placing self-supporting cable are not exceeded. The aerial lift is not designed to withstand loads imposed by work operations

2. DESCRIPTION

2.01 The SERVI-LIFT, Model T-29-MC, aerial lift (Fig. 1) is a truck-mounted unit with a fiberglass platform and metal fly (upper boom), lower boom, and turret section. There are releasable hydraulic lock valves on the lower boom cylinder, a fail-safe brake on the rotation motor with release, and a provision for manual rotation and retraction. If loss of either hydraulic or electric power to the main unit should occur, an optional solenoid-operated valve connected to the truck battery and controlled by a switch in the platform will, when manually operated, relieve the lower boom cylinder lock valve and bring the booms down slowly to lower the platform to ground level.

2.02 The lift may be operated from either of two control positions. One control head is mounted in the basket. The other is located on the turret. The controls on the turret will override the platform controls in an emergency when the

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Fig. 1—SERVI-LIFT, Model T-29-MC, Aerial Lift

selector switch at the turret is in the "Ground Control" position. Each control head includes FLY IN—FLY OUT (for extending and retracting upper boom), ROTATION CW—ROTATION CCW (for rotating turret clockwise or counterclockwise), and BOOMS UP—BOOMS DOWN (for raising and lowering booms). Additional controls in the platform are: an engine START-STOP switch, a winch IN-OUT switch, and the emergency boom lowering switch. A control lever is located on the turret that is used to tilt the platform for forward boom stowage. A control pendant, located on the right front panel of the truck body, provides an engine START-STOP switch and a winch IN-OUT switch. The controls in the platform, on the turret, and the control pendant are shown in Fig. 2, 3, and 4.

2.03 The lower boom, upper boom, and rotation mechanism each have their separate power systems. The lower boom, powered electrohydraulically, can travel from below horizontal to near vertical and the upper boom, powered electromechanically, can extend 8 feet 6 inches. With the lower boom fully elevated and the upper boom fully extended, the platform height is 29 feet above ground. With the boom horizontal, the maximum side working distance (from side of truck) is approximately 15 feet. The turret, powered electromechanically, can be rotated in either direction an unlimited number of turns.

2.04 Electric power to operate the lift, power tools, and lights is provided by an AC generator driven by an auxiliary engine. The generator is an 8000-watt, 4-wire Y connected, 60-Hz 133-volt single phase, 230-volt 3-phase unit. Later model AC generators are 9000-watt with 125/230-volt output, equipped with separate taps for 115-volt outlets. The engine is a 2-cylinder, 4-cycle gasoline engine with electric starter and magneto ignition. All convenience outlets must be protected by a Ground Fault Interrupter Circuit to prevent potentially hazardous conditions when working with power tools. (See GL 73-02-060.)

2.05 Intercom speaker units are mounted in the platform and in the truck cab (Fig. 5). The unit in the cab is equipped with an ON-OFF VOLUME control and a PRESS-TO-TALK switch. The unit in the platform is designed for hands-free operation.

2.06 A hydraulically operated reel loader (see Fig. 6), located on the rear of the truck, will lift reels that measure up to 84 inches in diameter and 36 inches in width (418 reel) and weigh a maximum of 3000 pounds. The reel loader is used for placing reels into the truck bed for transporting and also for carrying reels in the pay out position. However, truck stability must be considered when carrying heavy reels on the loader since excessive weight on the loader will adversely affect steering when the truck is moving.

2.07 Spindle bars available with the reel loader are:

(a) A 2-inch spindle bar with bronze bearings, centering cones, a brake, and a reel clamp. Use for paying out strand, wire, and cable.

(b) A 2-inch spindle bar with locating collars. Use for loading and storing reels on the truck. **Do not use this loading bar for paying out strand, wire, or cable.**

2.08 The control lever for the reel loader is located on the outside of the left rear panel of the truck body. The reel loader is shown in Fig. 6 and the reel loader control lever is shown in Fig. 7.

2.09 A roller guide assembly mounts on a retractable and removable mast (see Fig. 8 and 9) which attaches to the right front corner of the truck for use in placing wire, cable, or strand. The wire or cable is fed from the cable reel through the roller guide assembly on the right-hand side of the turret and through the guide chute assembly. The lower section of the chute is fixed and the upper section swivels to maintain proper lead to the roller guide at the outboard end of the boom.

2.10 The powered tow-line drum is located inside the right-hand forward compartment of the truck body and contains 175 feet of a synthetic fiber tensioning line. The line is led through the compartment top, through a snatch block mounted forward (attached to the roller guide assembly), and up to the work location aloft. Straight line pulls up to 750 pounds at 42 feet per minute can be obtained. The drum may be disconnected to freewheel or may be removed. The shaft extension will accommodate standard wire reels or capstan. The tow line drum is shown in Fig. 10.

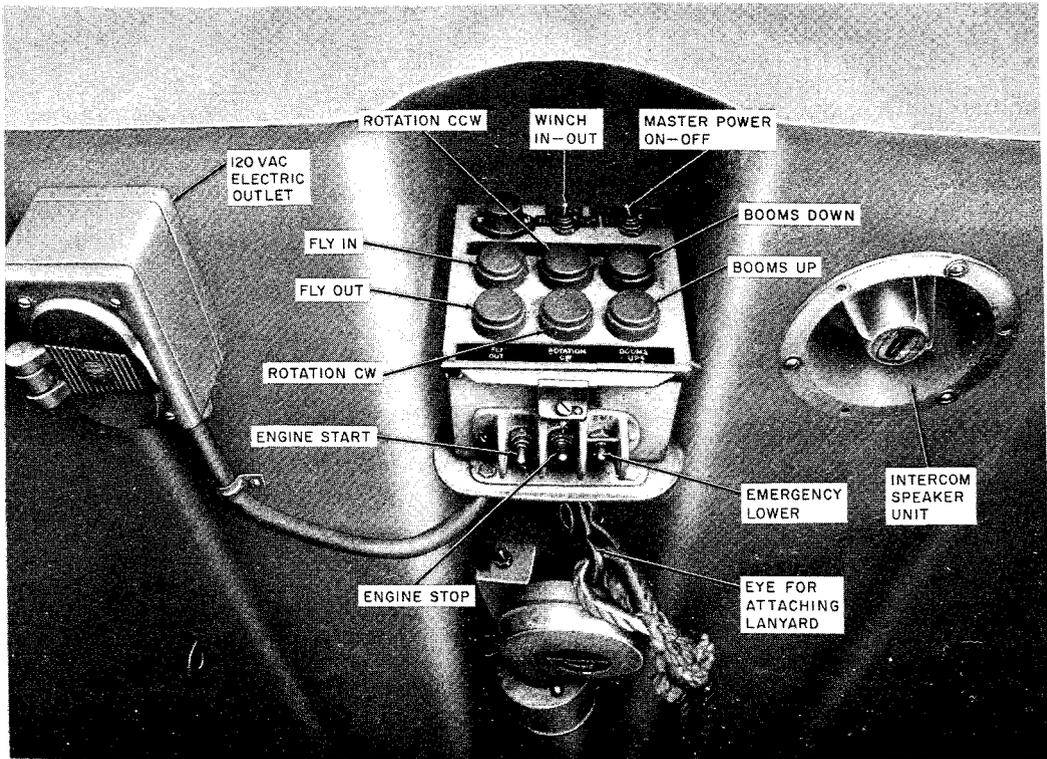


Fig. 2—Controls in Platform

3. PRECAUTIONS

3.01 Prior to each 8-hour shift, the lift and safety systems will be inspected as outlined in Part 6 of this section.

3.02 Before moving the truck at normal road speeds, be sure the lift is in the stowed position with the lower boom resting firmly on its support and the upper boom completely retracted as shown in Fig. 1. If the booms are not properly stowed, damage to the lift can result from road shock.

3.03 Enter and leave the platform only when it is in the position shown in Fig. 11. Use the control head located on the turret to position the basket for entry and to place the equipment

in the stowed position. To prevent damage to the leveling system from excessive down thrust or movement of the vehicle with the basket on the ground, ***the platform should be maintained 12 to 18 inches above the ground.***

3.04 The load in the platform shall be limited to one person and authorized tools and equipment. However, in no case will the load be allowed to exceed 350 pounds.

3.05 The operator must be constantly alert when operating the lift to avoid contact with power wires, interference with traffic, and any obstructions that might injure the worker or damage the equipment. The operator should always look in the direction of platform movement.

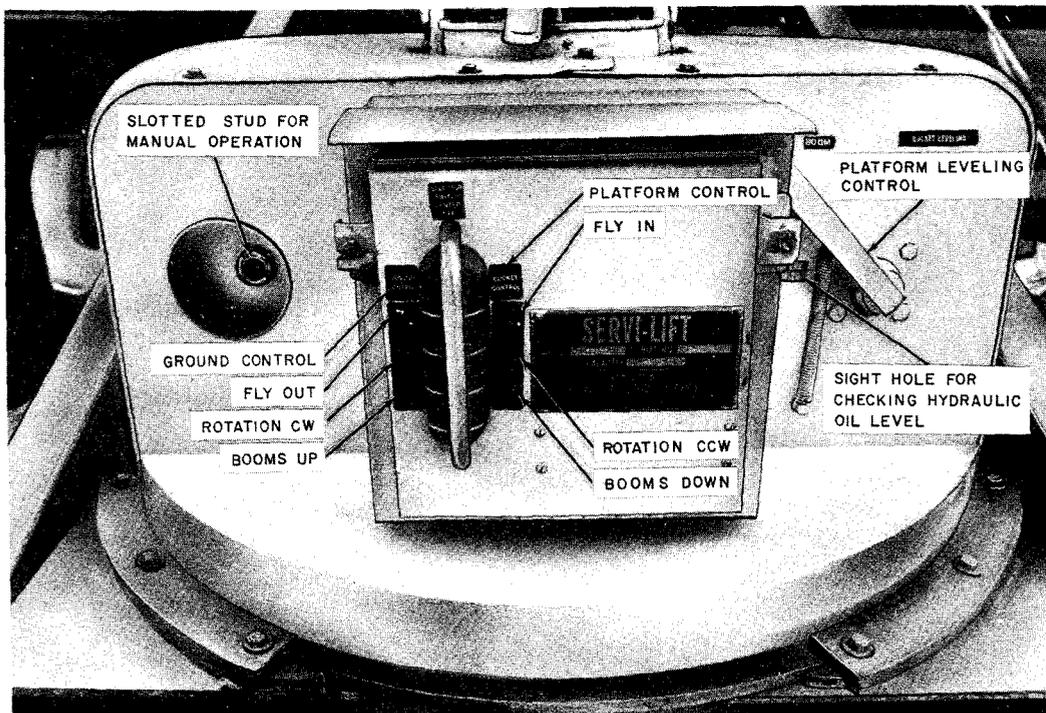


Fig. 3—Controls on Turret

3.06 The person assigned the responsibility of operating the lift must be thoroughly familiar with methods of operation. It is the responsibility of the operator to be sure that any signals which might be used will be understood by all persons concerned.



3.07 *The aerial lift does not provide electrical protection. Therefore, all safety precautions pertaining to working aloft shall be observed. At no time shall any part of the boom or equipment associated with it be brought closer than 3 feet to any energized power conductors. If the voltage exceeds 37,000 volts, this distance should be increased to a minimum of 6 feet.*

3.08 The standard safety headgear, body belt, and safety strap will be used by the operator. The safety strap shall be attached to the eye in the platform at all times while aloft.

3.09 If the lift should come in contact with an electric power conductor, the entire truck and its contents will become electrically energized. In such a case, no one should attempt to enter the truck or in any way come in contact with the truck or its contents. Anyone in the truck should remain there until the electrical contact has been broken unless an emergency arises and the following precautions are taken:

- (a) Before starting work in an area where the lift will be near electric power wires, place a pair of Insulating Gloves (with protectors) and a Insulating Blanket in the cab of the truck.

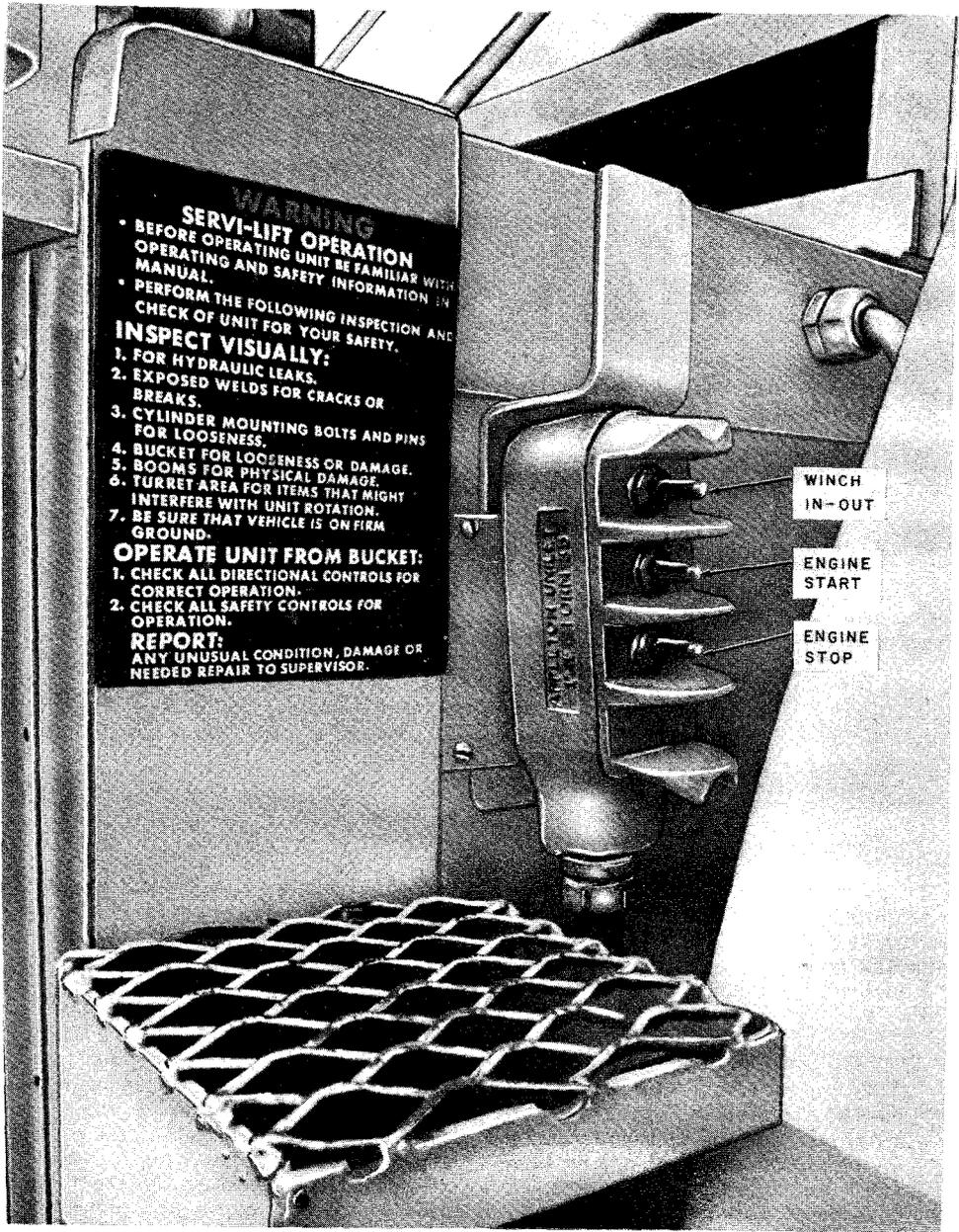


Fig. 4—Control Pendant

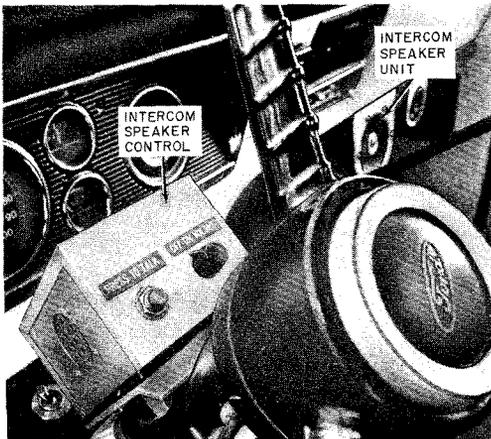


Fig. 5—Intercom—Speaker Unit and Controls in Truck Cab

(b) If contact with electric power is made and an emergency arises that makes it necessary to leave the truck, put on the insulating gloves and throw the insulating blanket on the ground. Jump off the truck onto the insulating blanket on the ground. Do not come in contact with grounded objects such as tree limbs, shrubbery, personnel standing on the ground, etc, until free and clear of contact with the truck.

(c) If it is necessary to reenter the truck, wear the insulating gloves and step from the insulating blanket to the truck, making sure there is no body contact with any grounded object.

3.10 The driver of the truck shall assure himself that no contact exists between the lift and any energized object, by observation and by communication with the operator, *each time he enters or leaves the truck*. If there is any doubt as to whether electrical contact exists, the driver must assume the truck is energized.

3.11 When the operator is in the platform, the driver of the truck shall not leave the cab unless the engine is stopped, the parking brake is set, the gear shift lever is in the park position (low or reverse gear if a manual transmission), and the Mico Brake Lock is set if the truck is so

equipped. Upon leaving the cab, the driver shall place wheel chocks against the rear wheels.

- (a) If the truck is on even ground, chocks shall be placed on both sides of one rear wheel.
- (b) If the truck is on an incline, the chocks shall be placed on the downgrade side of each rear wheel.

3.12 The operator should take care not to overreach or otherwise place himself in a position that might cause loss of balance. The operator should keep both feet on the floor of the platform while the lift is in use. Climbers will not be worn while working from a platform.

3.13 When it is necessary to move the truck with the operator aloft, truck movements shall be made only as the lift operator directs. The speed of the truck shall not exceed a slow walking pace. The operator should look in the direction of movement.

3.14 Placing operations should be carried out with the truck moving in the direction of traffic, where practical. The driver should avoid depressions or holes in the road which might cause a sudden lurch or a change in the inclination of the truck. Starts and stops should be made as smoothly as possible and the driver should be on the alert for commands from the operator.

3.15 *Do not attach cables, strand, wire, etc, to the platform or boom* except as outlined in sections which cover cable and strand placing methods using an aerial lift truck. Do not alter or modify the lift in any way.

3.16 When operating the aerial lift on crowned or inclined roads, the stability of the truck will be reduced. Exercise care under these conditions to prevent the truck from becoming unstable. Normally the driver will be able to detect instability by the feel of the truck steering and should warn the operator. To increase stability, operate the lift with the platform close to the truck and the booms as near in line with the truck as practical.

3.17 Do not attempt to make any switch adjustments, replace any fuses, or open any electrical connections on the lift electrical system unless the generator has been shut down and the operator is off the platform.

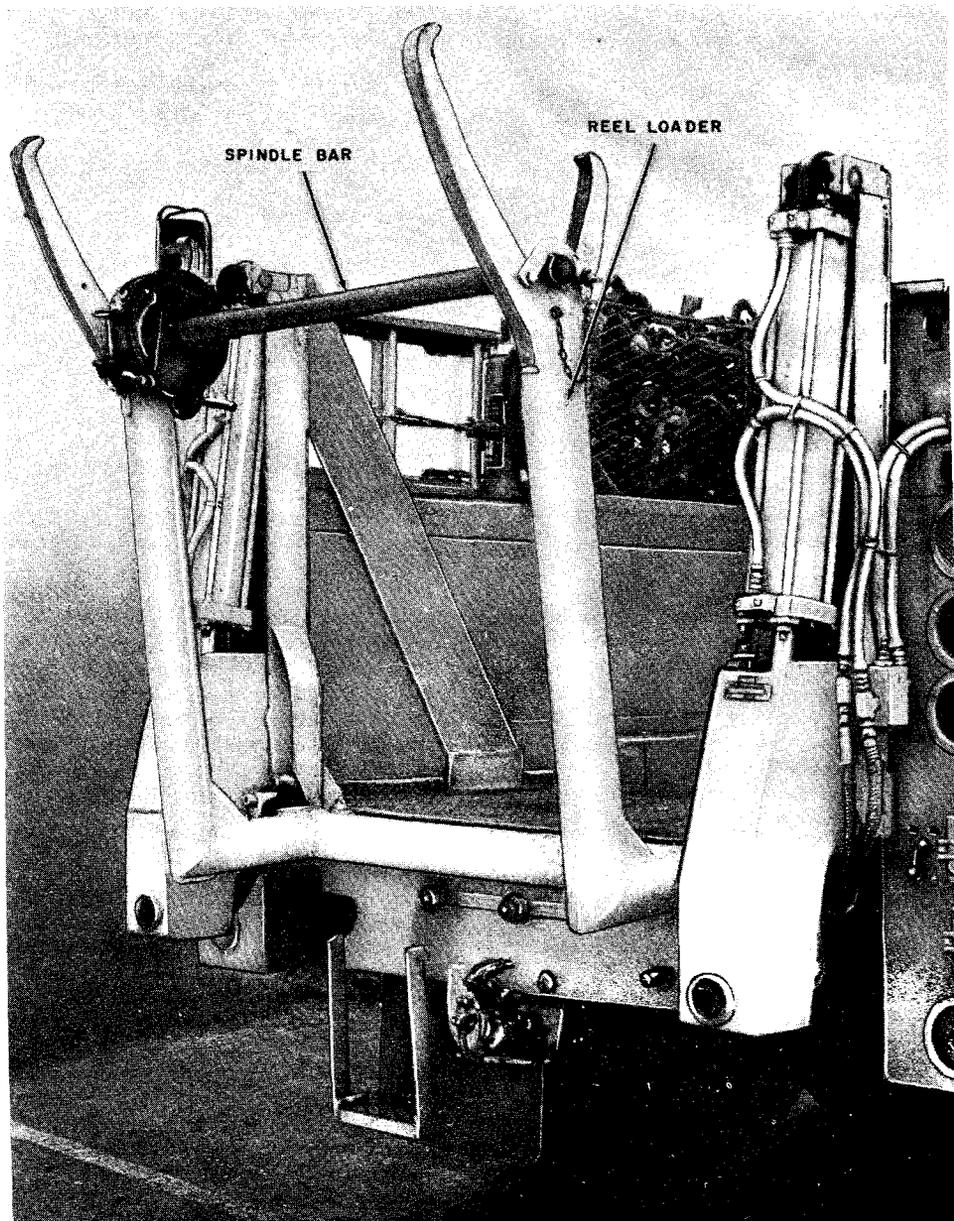


Fig. 6—Reel Loader

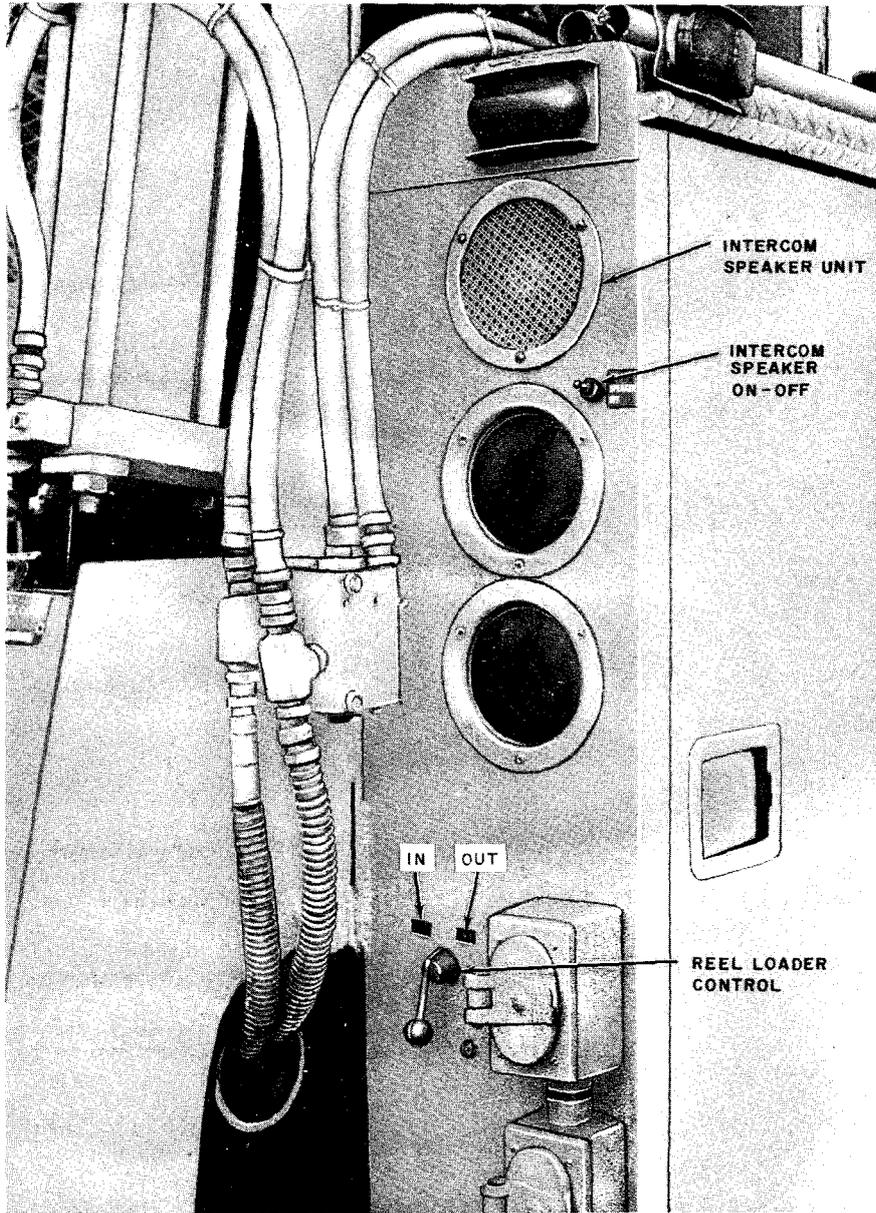


Fig. 7—Reel Loader Control

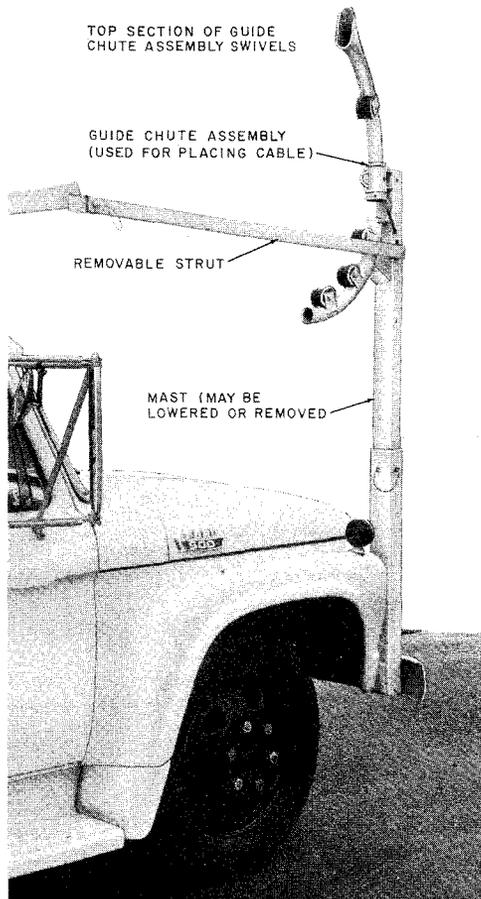


Fig. 8—Guide Chute Assembly (Found Only on Older Units)

3.18 When making adjustments or performing maintenance on any part of the aerial lift where movement of the machine could cause personal injury, stop the generator and take any additional precautions necessary to prevent movement of the lift.

3.19 Keep bystanders away from the aerial lift and clear of all work operations. Work locations must be guarded in accordance with Division 620 of the Bell System Practices.

4. OPERATION

4.01 Before placing the lift in operation, be sure that all equipment is in proper working condition. If strand or cable is to be placed, be sure to check roller guides and reel brake.

4.02 To place the lift in operation, start the auxiliary engine by operating the engine START-STOP switch on the control pendant. Allow the engine to warm up for a few minutes before operating the lift.

4.03 Position the platform for entry of the operator by using the controls on the turret. When the operator is on the platform, the controls on the turret will not be used except in an emergency.

4.04 Check that the intercom system is on and working before raising the platform. **Do not operate the lift if the intercom system is not working.**

4.05 When operating the lift, loads imposed on the boom must not exceed the safe operating capability of the equipment. When placing self-supporting cable using a moving aerial lift with the boom fully extended, the maximum allowable cable tension is 600 pounds. This load limit allows self-supporting cable to be placed in normal span lengths while maintaining minimum above-ground clearances. Since actual cable tension cannot be determined during the placing operation, above-ground clearance and span length limits have been determined that are equivalent to a cable tension of 600 pounds. (See Section 627-700-201 for detailed information.) For example, when placing 50-pair 22-gauge, self-supporting cable where the average pole attachment height is 19 feet and a minimum ground clearance of 15 feet must be maintained, the maximum span length is limited to 200 feet. With the same size self-supporting cable, the 19-foot pole attachment height, and a minimum allowable ground clearance of 10 feet, the maximum span length is limited to 300 feet. If lower ground clearances can be tolerated during the stringing operation, the aerial lift can be used for the stringing operation for longer spans. Prior to placing self-supporting cable with the aerial lift, the job should be surveyed to ensure safe, efficient use of the equipment.

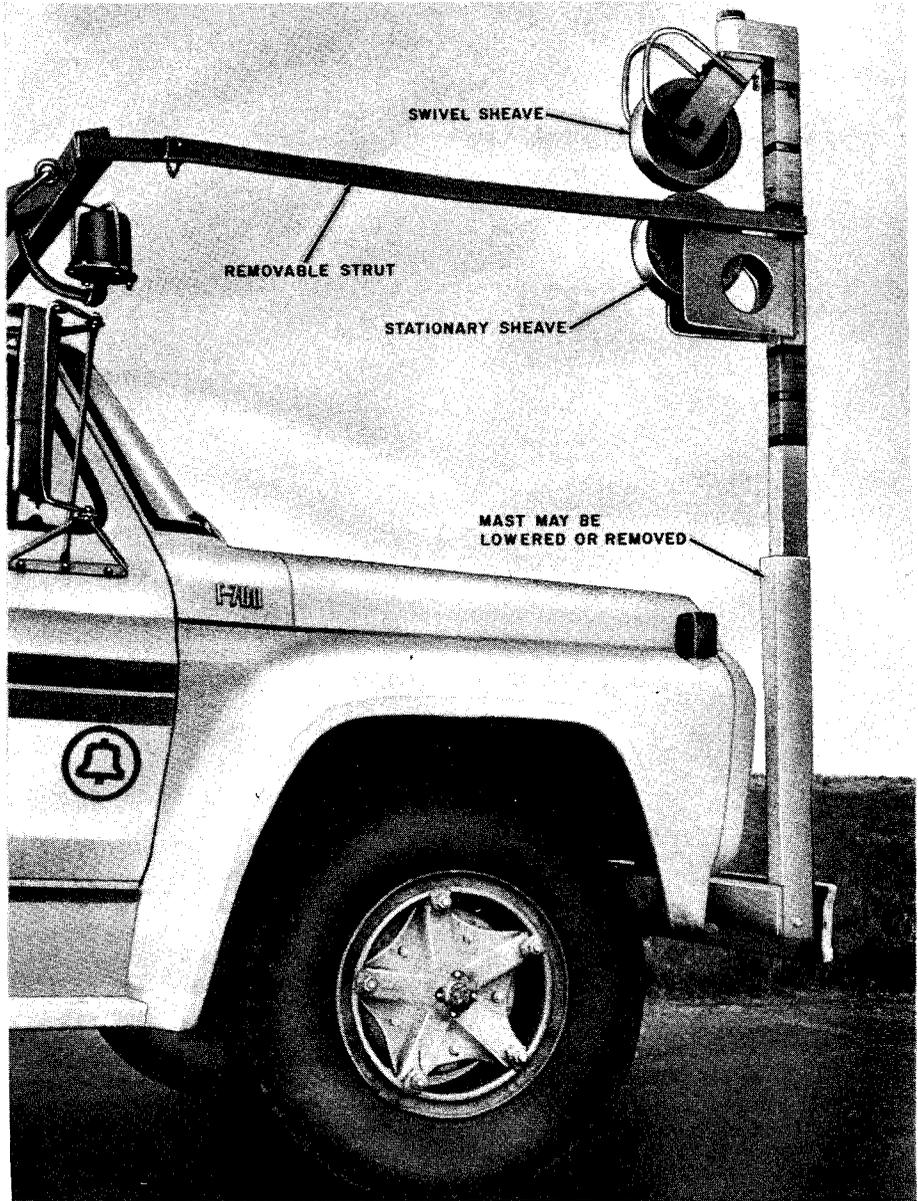


Fig. 9—Swivel Sheave Assembly

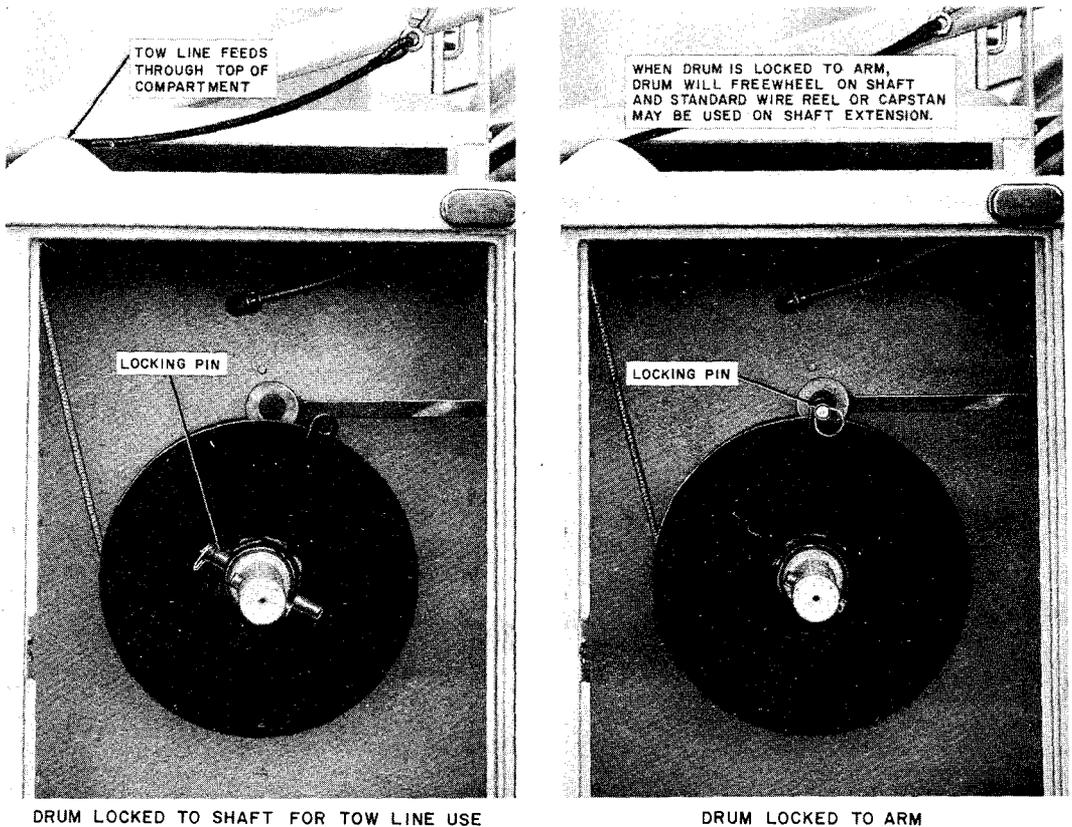


Fig. 10—Powered Tow Line Drum

4.06 After work operations aloft have been completed, the operator will leave the platform only after it has been placed as shown in Fig. 11. Tools and equipment used by the operator will be removed from the platform and the lift placed in the stowed position by using the controls on the turret.

5. EMERGENCY PROCEDURE

5.01 If the auxiliary engine should fail while the lift is in use, it will be necessary to lower the booms to a position that will allow the truck to be driven to a location where the auxiliary engine can be repaired. If the vehicle is equipped with an emergency lowering system, this may be

used to lower the booms. If not, the booms must be lowered manually. In all cases, rotation and retraction must be accomplished manually.

5.02 Before lowering the boom, study the situation to determine the procedure to be used for boom lowering and rotation that will keep the lift clear of wires, tree limbs, traffic, etc. Generally, the best method will be to first rotate the unit to clear obstructions and then lower the boom.

5.03 To rotate the boom manually, insert the screwdriver end of the handcrank (supplied as part of lift equipment) into the opening on the turret (see Fig. 3). Engage the crank in the slot

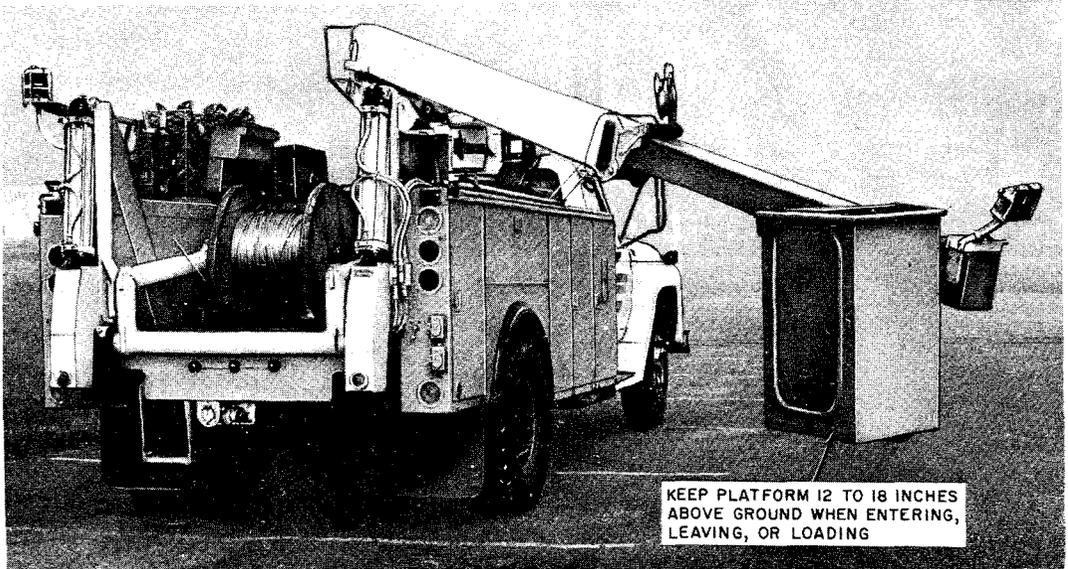


Fig. 11—Basket Positioned for Entering or Leaving

on the stud and turn the stud in the direction the boom is to be rotated.

5.04 To retract the upper boom or fly, insert the handcrank into the opening in the end of the extension motor. Turn the crank counterclockwise to retract the boom.

5.05 To manually lower the booms, turn out the adjusting screw to release oil from the elevating cylinder as required.

5.06 If the booms cannot be placed in the stowed position and the truck must be driven, place rope lashing from the booms to each side of the truck to lessen stress on the unit. **Drive slowly.**

6. MAINTENANCE AND INSPECTION ROUTINE

6.01 Daily—Operator: Prior to use each 8-hour shift, the operator or other qualified person

shall perform the following inspection and safety routines:

- (a) Motor vehicle safety systems shall be inspected, eg, brakes, lights, horn, wipers, etc.
- (b) Inspect all visible lines, hoses, fittings, cylinder heads, and packing for signs of oil leakage. Leakage of a few drops of oil per hour through a packing does not normally indicate trouble.
- (c) Inspect all hoses, lines, and wiring for signs of chafing or twisting.
- (d) Check the oil level in the auxiliary power supply engine and add oil as required.
- (e) An operational test of controls will be made to ensure that they are in safe working condition.
- (f) If the platform fails to maintain a vertical position when in the working position or becomes loose, or if the booms settle or fail to

operate properly, report the condition in accordance with local routine so the equipment can be repaired.

6.02 Weekly—Qualified Mechanic:

- (a) Change oil in auxiliary engine crankcase every 40 hours or once each week.
- (b) If the auxiliary engine is equipped with an oil filter, it should be replaced after 40 hours of use.
- (c) Inspect battery electrolyte; add distilled water as required.
- (d) Check the oil level in the hydraulic reservoir. This may be checked through the sight hole shown in Fig. 3.
- (e) Periodic maintenance and lubrication as recommended in the maintenance manual supplied by the equipment manufacturer.

6.03 Periodic—Qualified Mechanic:

- (a) Inspect all welds for cracks. The most critical locations are:
 - (1) Welds attaching end fittings to lower boom cylinder.

- (2) Weld joints under turret structure attaching inner turret tube to base structure.
 - (3) Weld joints between stabilizer torque shaft and arms.
 - (4) Weld joint attaching the lug to the plate attached to the bottom of the truck springs.
- (b) Check rotation gear adjustment, hydraulic system, electrical system, and switch adjustment. Also check connecting shafts, pins, and bolts as recommended in the manual supplied with the equipment by the manufacturer.

6.04 A thorough inspection shall be made by a qualified mechanic at intervals set by the manufacturer but not less than once a year. This inspection should cover all items as recommended by the manufacturer. In addition, a record must be maintained for each aerial lift. It will show the date of the inspection and the corrective action taken.

6.05 Proper lubrication and all maintenance checks recommended by the manufacturer are essential for safe, dependable operation of the aerial lift.