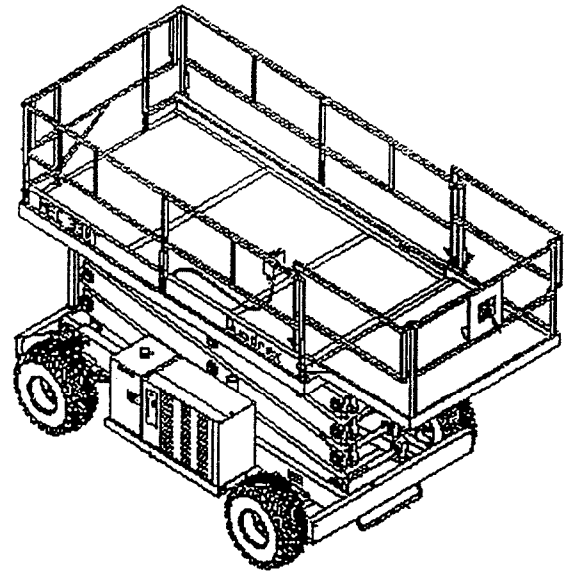
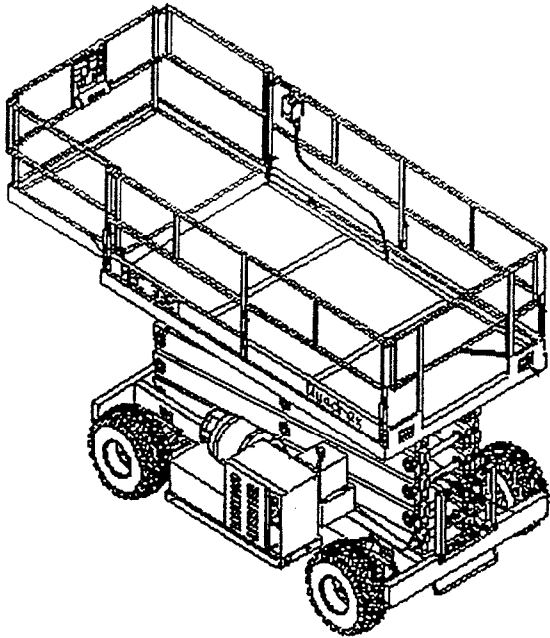


# Quadrex RT



## Operation and Safety Manual

## FORWARD

The purpose of this manual is to provide users with the operating procedures essential for the promotion of proper machine operation for its intended purpose. It is important to over-stress proper machine usage. All information in this manual should be **READ** and **UNDERSTOOD** before any attempt is made to operate this machine. **YOUR OPERATING MANUAL IS YOUR MOST IMPORTANT TOOL** - keep it with the machine. REMEMBER THAT ANY EQUIPMENT IS ONLY AS SAFE AS THE OPERATOR.

**BECAUSE THE MANUFACTURER HAD NO DIRECT CONTROL OVER MACHINE APPLICATION AND OPERATION, PROPER SAFETY PRACTICES ARE THE RESPONSIBILITY OF THE USER AND ALL OPERATING PERSONNEL.**

**ALL INSTRUCTIONS IN THIS MANUAL ARE BASED ON THE USE OF THE MACHINE UNDER PROPER OPERATING CONDITIONS, WITH NO DEVIATIONS FROM THE ORIGINAL DESIGN. ANY ALTERATIONS AND/OR MODIFICATION OF THE MACHINE IS STRICTLY FORBIDDEN WITHOUT EXPRESS WRITTEN APPROVAL FROM MAYVILLE ENGINEERING COMPANY, INC.**

**All procedures herein are based on the use of the machine under proper operating conditions, with no deviations from original design intent as per ANSI regulations.**

### Read and Comply

The ownership, use, service and/or maintenance of this machine is subject to various federal, state and local laws and regulations. It is the responsibility of the owner/user to be knowledgeable of these laws and regulations and to comply with them. Owner/user/operator must be familiar with Sections 6, 7, 8, 9 and 10 of ANSI A92.6 Standard. These sections contain the responsibilities of the owners, users, operators, lessors and lessees concerning safety, training, inspection, maintenance, application and operation.

## WARNING

**ANY MODIFICATION OF THIS MACHINE WITHOUT THE EXPRESS WRITTEN CONSENT OF THE MANUFACTURER IS PROHIBITED. DO NOT REPLACE ANY COMPONENT OR PART WITH ANYTHING OTHER THAN ORIGINAL MEC REPLACEMENT PARTS WITHOUT THE MANUFACTURERS CONSENT.**



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## WARNING

**DO NOT PERFORM PRELIMINARY INSTALLATIONS, OPERATE, SERVICE, REPLACE, ADJUST OR MAINTAIN EQUIPMENT ON THIS MACHINE UNTIL YOU HAVE THOROUGHLY READ AND UNDERSTOOD THE SAFETY SECTION OF THIS MANUAL, AND HAVE READ AND UNDERSTOOD ALL SECTIONS OF THIS MANUAL THAT APPLY TO THE JOB YOU ARE DOING ON THIS MACHINE.**

**FAILURE TO COMPLY WITH ALL WARNINGS POSTED ON THIS MACHINE AND WRITTEN IN THIS MANUAL COULD CAUSE DEATH, SERIOUS INJURY OR PROPERTY DAMAGE.**



## WARNING

FAILURE TO COMPLY WITH SAFETY PRECAUTIONS LISTED IN THIS SECTION MAY RESULT IN MACHINE DAMAGE, PERSONAL INJURY OR DEATH AND IS A SAFETY VIOLATION.

- REMOVE ALL RINGS, WATCHES, AND JEWELRY WHEN PERFORMING ANY MAINTENANCE.
- DO NOT WEAR LONG HAIR UNRESTRAINED, OR LOOSE FITTING CLOTHING AND NECKTIES WHICH ARE APT TO BECOME CAUGHT ON OR ENTANGLED IN EQUIPMENT.
- OBSERVE AND OBEY ALL WARNINGS AND CAUTIONS ON MACHINE AND IN SERVICE MANUAL.
- KEEP OIL, GREASE, WATER ETC. WIPED FROM STANDING SURFACES AND HAND HOLDS.
- NEVER WORK UNDER AN ELEVATED PLATFORM UNTIL SAFETY PROPS HAVE BEEN ENGAGED OR PLATFORM HAS BEEN SAFELY RESTRAINED FROM ANY MOVEMENT BY BLOCKING OR OVERHEAD SLING.
- BEFORE MAKING ADJUSTMENTS, LUBRICATING OR PERFORMING ANY OTHER MAINTENANCE, SHUT OFF ALL POWER CONTROLS.
- BATTERY SHOULD ALWAYS BE DISCONNECTED DURING REPLACEMENT OF ELECTRICAL COMPONENTS.
- KEEP ALL SUPPORT EQUIPMENT AND ATTACHMENTS STOWED IN THEIR PROPER PLACE.
- USE ONLY APPROVED, NONFLAMMABLE CLEANING SOLVENTS.

## - FALL PROTECTION NOTICE -

The **Guardrail** System around the perimeter of the platform is the **fall protection system** for self-propelled elevating work platforms per the American National Standards Institute ANSI/SIAA92.6 Standard. It is **prohibited** to use an Aerial Work Platform manufactured by Mayville Engineering Company, Inc. with any portion, or all, of the guardrails **removed**.

Lanyard anchorage points on this type of equipment are not required to conform to the applicable ANSI/SIA Standard.

However, if anchorage points for lanyard attachments are required by site authorities, or other regulations, the anchorage points on all equipment manufactured by Mayville Engineering Company, Inc. are recommended to be used for **work positioning restraints** of personnel only. Lanyard lengths are to be determined by operator/owner to restrict the operator to the confines within the **Guardrail** System.



### WARNING

USE OF FALL ARREST SYSTEM ATTACHED TO ANCHORAGE POINTS ON MOBILE EQUIPMENT MAY CAUSE MACHINE TO TIP RESULTING IN SERIOUS INJURY OR DEATH.

# 1. SAFETY

Following are definitions of labeling you might encounter on aerial platforms.

**▲ CAUTION**

**CAUTION** - Hazards or unsafe practices which **COULD** result in minor personal injury or product damage.

**▲ WARNING**

**WARNING** - Hazards or unsafe practices which **COULD** result in severe personal injury or death.

**▲ DANGER**

**DANGER** - Immediate hazards which **WILL** result in severe personal injury or death.

## GENERAL OPERATING RULES, SAFETY AND LIMITATIONS

MEC designs the 25/33 RT work platforms to be safe and reliable. They are rugged and maneuverable, but must be used only for purposes and in ways intended. That is to raise personnel, tools, and necessary equipment to overhead work areas.

- The owner/user/operator of the machine should not accept operation responsibility until this manual has been read and operation of the machine, under the supervision of an experienced and qualified operator, has been completed. Owner/user/operator must be familiar with sections, 6, 7, 8, 9 and 10 of ANSI A92.6-1990. These sections contain the responsibilities of the owner, users, operators, lessors and lessees concerning safety, training, inspection, maintenance, application and/or operation. If there is a question on application and/or operation, Mayville Engineering Co., Inc. should be consulted.
- Respect your machine; do not neglect or misuse it.
- Inspect your machine before using. Do not use machine if it is not working properly in any way.
- Check job site for unsafe working conditions. Do not operate on uneven or soft terrain. Do not raise platform if machine is on an incline.
- Use machine only for purposes for which it was designed.
- Never take chances. Do not use machine if your physical or mental capabilities are limited due to illness or tiredness, or if you are taking over the counter or prescription drugs which might impair or limit your mental or physical capabilities.
- Do not exceed the load capacity of the platform.
- Do not smoke while charging the batteries.
- Do not enter or exit platform while machine is in motion.
- An operator of any type of work platform is subject to

certain hazards that cannot be protected by mechanical means. It is therefore essential that operators be competent, careful, physically and mentally fit and thoroughly trained in safe operation of this machine.

- It is imperative that MAYVILLE ENGINEERING be notified immediately of any incident involving a MEC product. Even if no injury or property damage is evident, the factory should be contacted by telephone and provided with all necessary details.

It should be noted that failure to notify the Manufacturer of an incident involving a MEC product within 48 hours of such an occurrence may void any warranty consideration on that particular machine.

**▲ DANGER**

**DO NOT OPERATE MACHINE NEAR POWER LINES. THE PLATFORM AND ENCLOSURES ARE NOT INSULATED.**

**PERSONNEL SHALL ALWAYS STAND ON THE FLOOR OF THE PLATFORM, NOT ON LADDERS, PLANKS, RAILINGS, BOXES OR OTHER DEVICES FOR A WORK POSITION.**

**THIS MACHINE IS NOT INTENDED TO BE USED AS A FORKLIFT, CRANE, OR TO PUSH OR PULL ANOTHER OBJECT.**

**AVOID CONTACT WITH MOVING OR STATIONARY OBJECTS. THOROUGHLY CHECK CLEARANCES. DO NOT USE MACHINE AS A SUPPORT FOR AN OVERHEAD STRUCTURE.**

**IT IS PROHIBITED TO TAKE ON ANY ADDITION, SUCH AS SIGNBOARDS, THAT WOULD INCREASE WIND LOADING.**

**FAILURE TO FOLLOW THIS WARNING WILL CAUSE DEATH OR PERSONAL INJURY.**

## OPERATOR QUALIFICATIONS

All MEC aerial work platforms must be operated and maintained by qualified personnel only!

To qualify for operation and maintenance of this unit, an individual must read and thoroughly understand this manual and undergo training by a competent instructor. If a proposed operator or maintenance person fails to understand any segment of this manual, his or her supervisor can clarify the misunderstanding through written correspondence or a phone call to:

Mayville Engineering Co., Inc.  
 Aerial Work Platforms  
 715 South Street  
 Mayville, WI 53050 USA  
 Phone: 920-387-4500 or 800-387-4575  
 FAX: 920-387-5817

## SAFETY FEATURES

### 1. Automatic Parking Brake

The automatic parking brake, found on both rear wheels, is spring set and hydraulically released. Hydraulic pressure that builds up in the system during either travel or steering operations acts with the brake hydraulic cylinder to release the brake and allow the rear wheels to rotate. Cylinder actuation also relieves tension in the brake springs. When travel or steering operations stop, hydraulic pressure is removed from the brake cylinder, and the springs compress to reset the brakes. A flow control orifice is incorporated into the brake hydraulic system, to control the rate at which hydraulic fluid exhausts from the cylinder as the brakes reset; thus avoiding harsh braking action.

### 2. Emergency Stop Pushbuttons or Rocker Switch Guards

Red, mushroom head, emergency stop pushbuttons or rocker switch guards are located both on the platform control console and on the lower, left side control panel. Depressing either pushbutton or rocker switch guard immediately shuts down the machine, by turning off the engine.

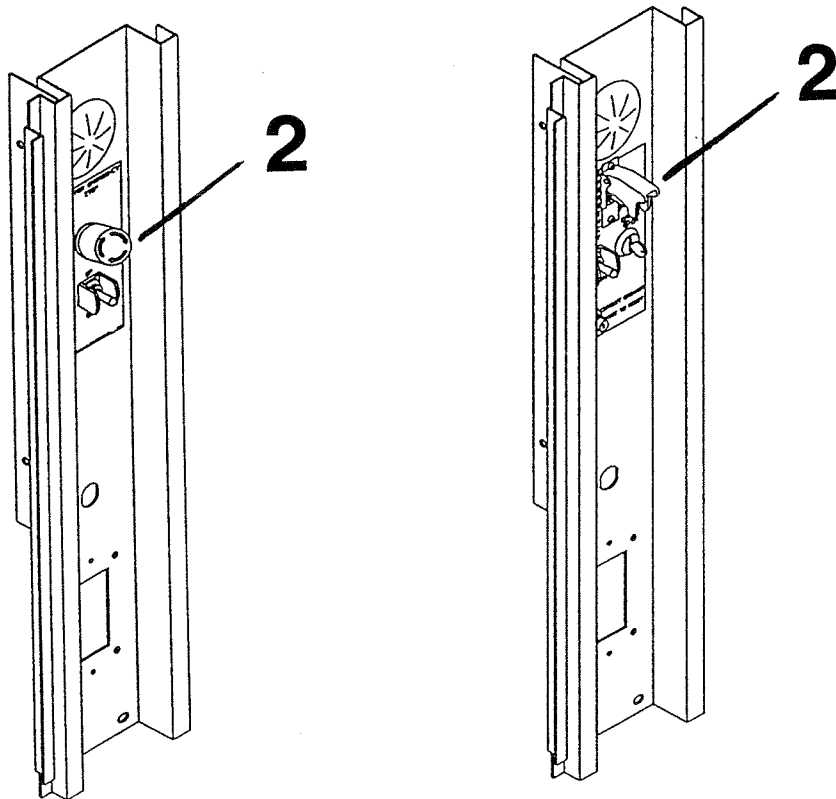


Fig. 1-1 Control Panel

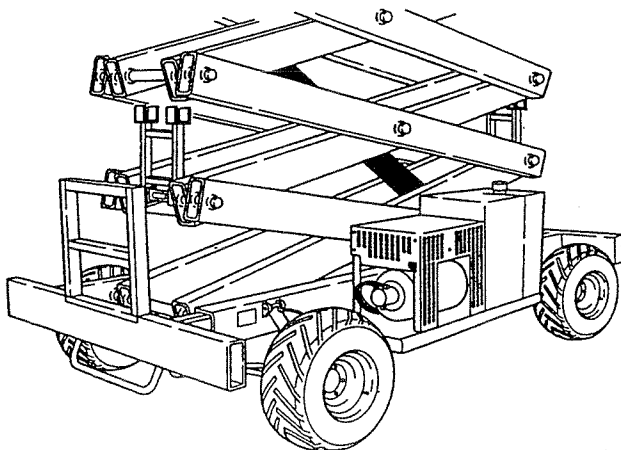


## MAINTENANCE LOCKS

<b>▲ WARNING</b>
<b>MAINTENANCE LOCKS MUST BE INSTALLED</b> when maintaining or servicing machine with platform fully or partially extended.
Working through beams on scissors lifting device creates a hazardous situation which could cause death or personal injury.
<b>FOLLOW MAINTENANCE LOCKS PROCEDURE!</b>

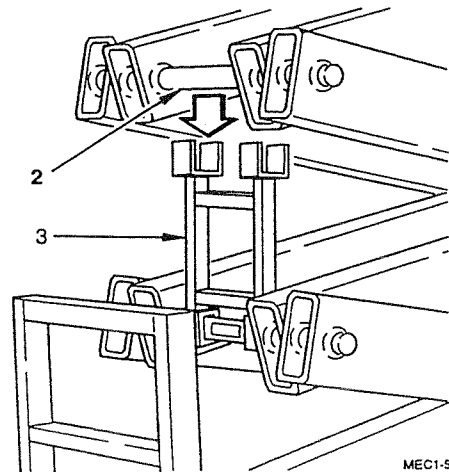
The maintenance locks (Fig. 1-2 and 1-3) are used to mechanically hold the scissor lifting mechanism open a prescribed amount to permit maintenance work to be performed within the lifting scissor beams in relative safety. Never trust the hydraulic cylinder alone to keep the platform aloft while reaching through the lifting beams. Position the maintenance locks using the following procedure:

1. Remove all loads from platform.
2. Raise platform high enough to allow the maintenance locks to swing upward and outward, and to clear the pivot pins on which they will rest.
3. Swing the maintenance locks into place, so the proper pivot pin is aligned with the upper saddles of the locks. Hold this position and carefully lower the platform until the pivot pins are resting securely on the locks.



MEC1-4

Fig. 1-2 Positioning Maintenance Locks



MEC1-5

Fig. 1-3 Maintenance Locks in Place

<b>WARNING</b>
<b>DO NOT SERVICE EXTENDED OR PARTIALLY EXTENDED MACHINE UNTIL THE PRECEDING PROCEDURE IS ACCOMPLISHED.</b>

#### 4. Emergency Platform Lowering

A raised platform can be lowered safely, even after loss of engine power or failure in the hydraulic system, using this feature. A pull cable, accessible at the lower front of the machine, is used to open a manually operated hydraulic valve in the lift cylinder circuit (Fig. 1-4). Through this valve, hydraulic fluid is exhausted from the lower end of the lift cylinder back to tank. A flow control orifice is incorporated in the circuit to limit the lowering speed to a safe rate.

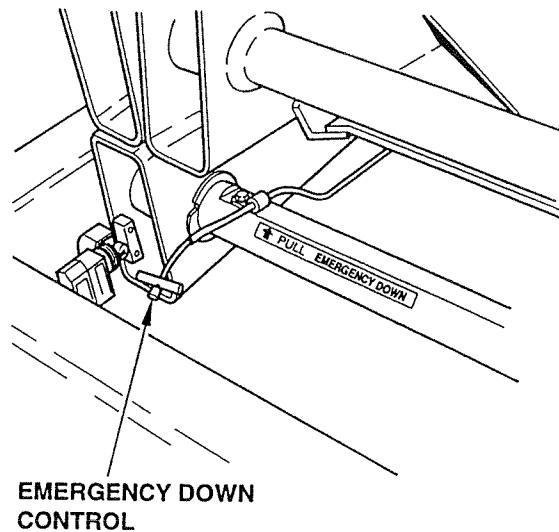


Fig. 1-4 Emergency Down Control

#### 5. Tip Protection System

A tip sensor device is incorporated in the machine, which is set to detect when the machine is tipped to a 4 1/2 degree angle. When a 4 1/2 degree tip angle exists, the tip sensor will activate and warn the operator of an unsafe, out of level condition. When the platform is 10 ft. or below, the warning lamp in the upper control box will light to indicate the out of level condition, plus lift will be disabled. When the platform is above 10 ft., the warning lamp on the upper control box will light, the alarm horn will sound, plus lift and drive will be disabled. The machine must be lowered and repositioned to a more level surface or be leveled using hydraulic outriggers (optional).

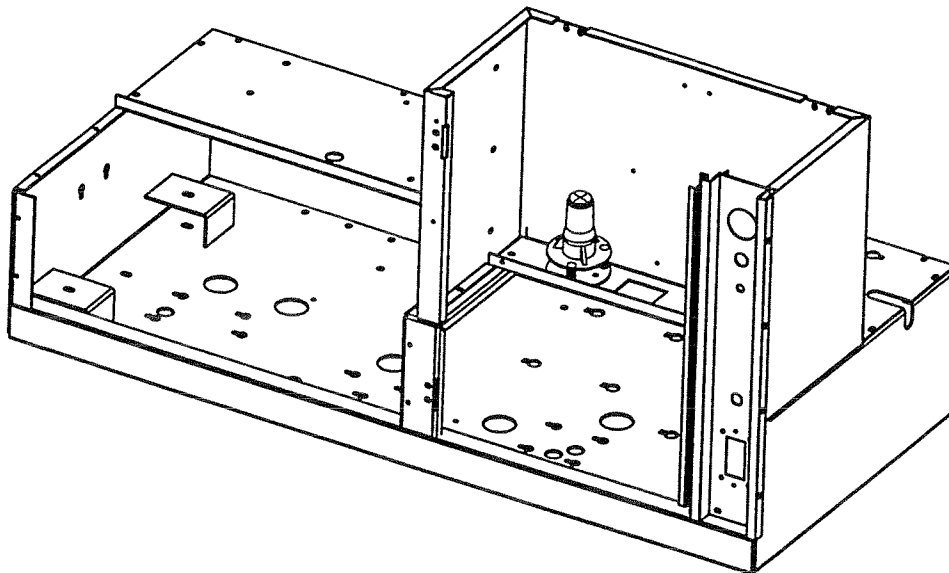


Fig. 1-5

## 2. INTRODUCTION

### GENERAL DESCRIPTION

The Models 25RT and 33RT Aerial Work Platforms (Fig. 2-1) are designed for travel over rough terrain, and up and down grades. The platform on each model is raised and lowered by a hydraulic cylinder through a scissor-type mechanism. Platform raising and lowering can be controlled either from the lower left side control panel or from the platform control console. In most cases, however, the platform is raised and lowered from the lower left side control panel only for maintenance purposes. The purpose of this unit is to raise personnel, tools, and necessary equipment to overhead work areas.

The principle difference between models is in the maximum platform heights (33 vs. 25 ft.). Both models feature four-wheel drive, having a hydraulic drive motor at each wheel. Steering is accomplished with the front wheels. Brakes are located on the rear wheels only.

The principal options available for the machines are: hydraulic outriggers; a roll-out platform extension (48 in.); and a hydraulically powered, 2000 w, 115 v generator set.

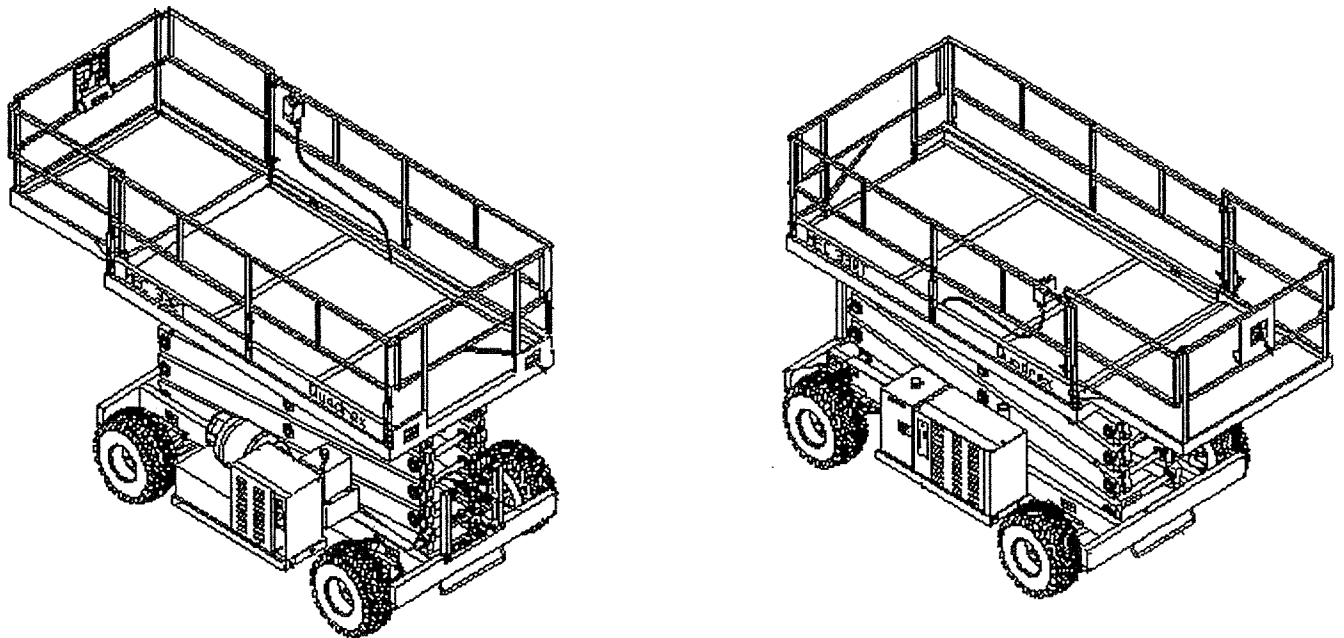


Fig. 2-1 Quadrex RT

## EQUIPMENT LITERATURE

The unit is shipped with the following literature, which is inserted into the manual case located on the front rail.

- Material Safety Data Sheet (P/N 6535)
- Quadrex RT Operating and Safety Manual (P/N 7539)
- ANSI/SAI Manual of Responsibilities (P/N 7822)
- Dealer Pre-delivery Inspection Form
- Warranty Registration Card (P/N 5524)
- EMI Safety Manual (P/N 7004)

Replacement Literature can be ordered by contacting the factory. To help us serve you, please be prepared to provide the complete publication name and part number (P/N).

## PRE-DELIVERY DEALER INSPECTION

### Preliminary Unpacking Instructions

1. Maintenance locks must be engaged prior to inspecting or servicing the unit and when platform is extended.
2. Remove all packing materials and inspect unit for damage during shipment. If any damage is found, please note it on the freight bill and report it to the shipper.
3. Every machine is fully assembled when shipped from the factory. All fluids are included, the levels must be checked and added as required before initial use. Perform the Walk-A-Round inspection, checking for any possible operation deficiencies. Have any deficiencies corrected before using the machine. During the check, record any missing or incorrectly located Safety Decals. Order and install before use. All Safety Decals must be affixed to the unit in its proper location. See decal layout.
4. Check each item in Quarterly Inspection Schedule as inspection is performed. If any item is found to be "N/O", make the necessary corrections and check the "R/P" box.
5. Reset both EMERGENCY STOP switches.
6. Press Circuit Breaker on lower panel to reset in case breaker has been tripped.

### NOTE

File Warranty Claim according to policies and procedures which are listed in publication #5638 Aerial Work Platforms Policies, Procedures and Parts Catalog.

## LOADING AND UNLOADING

1. Common sense planning must be applied to control the movement of the machine when lifting it with a crane.
2. Transport vehicle must be parked on a level surface.
3. Transport vehicle must be secure to prevent rolling while machine is being loaded.
4. Vehicle capacity, loading equipment and surfaces must be capable of supporting machine weight and meet ANSI/OSHA Standards. The platform of the machine must remain fully lowered during all loading and transport procedures.
5. The machine must be secured to the transport vehicle with chains or straps of ample load capacity.

## PREPARING FOR TOWING OR WINCHING THE MACHINE

### CAUTION

To avoid possible damage to the drive motors, tow the machine only for very short distances and at maximum speed of 5 mph.

To tow or winch the machine, the brakes must be released. This can be done hydraulically, by initiating either a steering action or by actuating the drive motors. While the brakes are released, engage the locking mechanism by pulling on the actuating cable (Fig. 2-2). Maintain tension on the pull cable while returning the drive control or steering control to the "off" position. The locking mechanism will then hold the brakes in the disengaged position.

If it is not possible to actuate the drive motors or steering system, the brakes must be released by turning the brake spring adjusting bolt counterclockwise until spring tension is relieved.

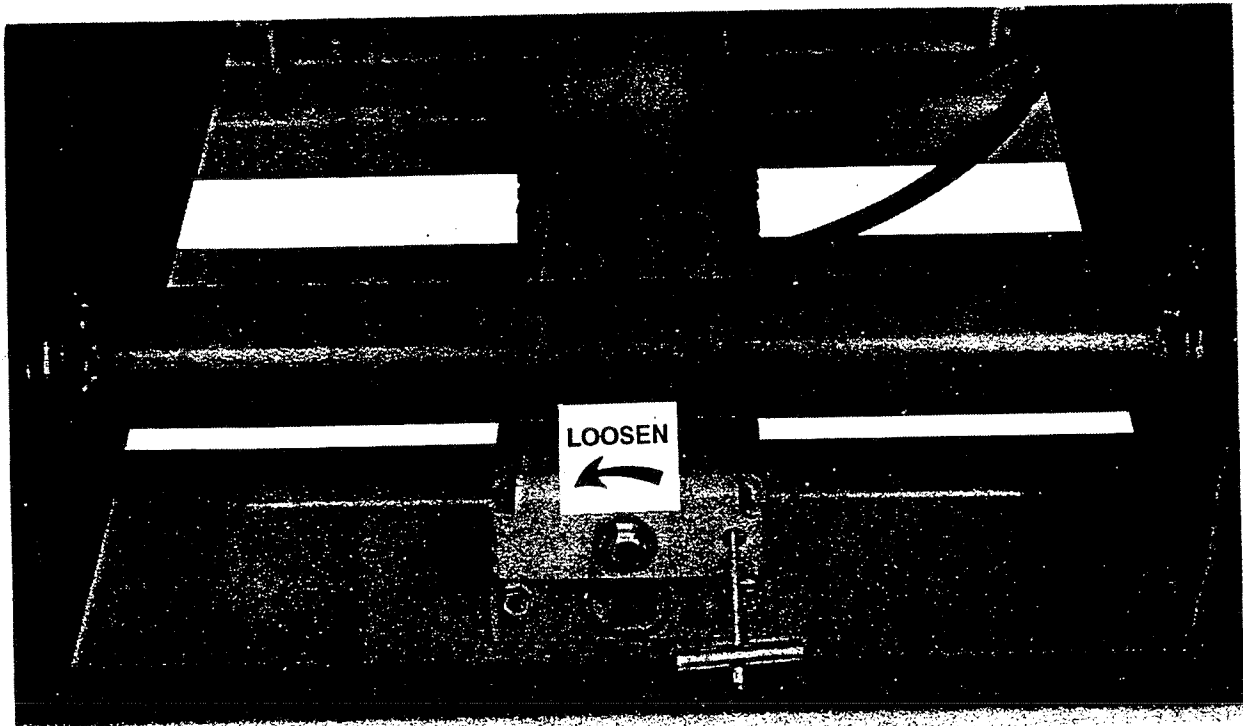


Fig. 2-2 Brake Release Actuating Cable and Brake Spring Adjusting Bolt

## QUADREX RT HOIST POINTS

When using a crane to hoist the machine to a specific location, the lifting device (rated for 7300# or above) must be all the way through the base frame tubes (Fig. 2-3). It is up to the crane operator on how to sling the machine and distribute the weight evenly.

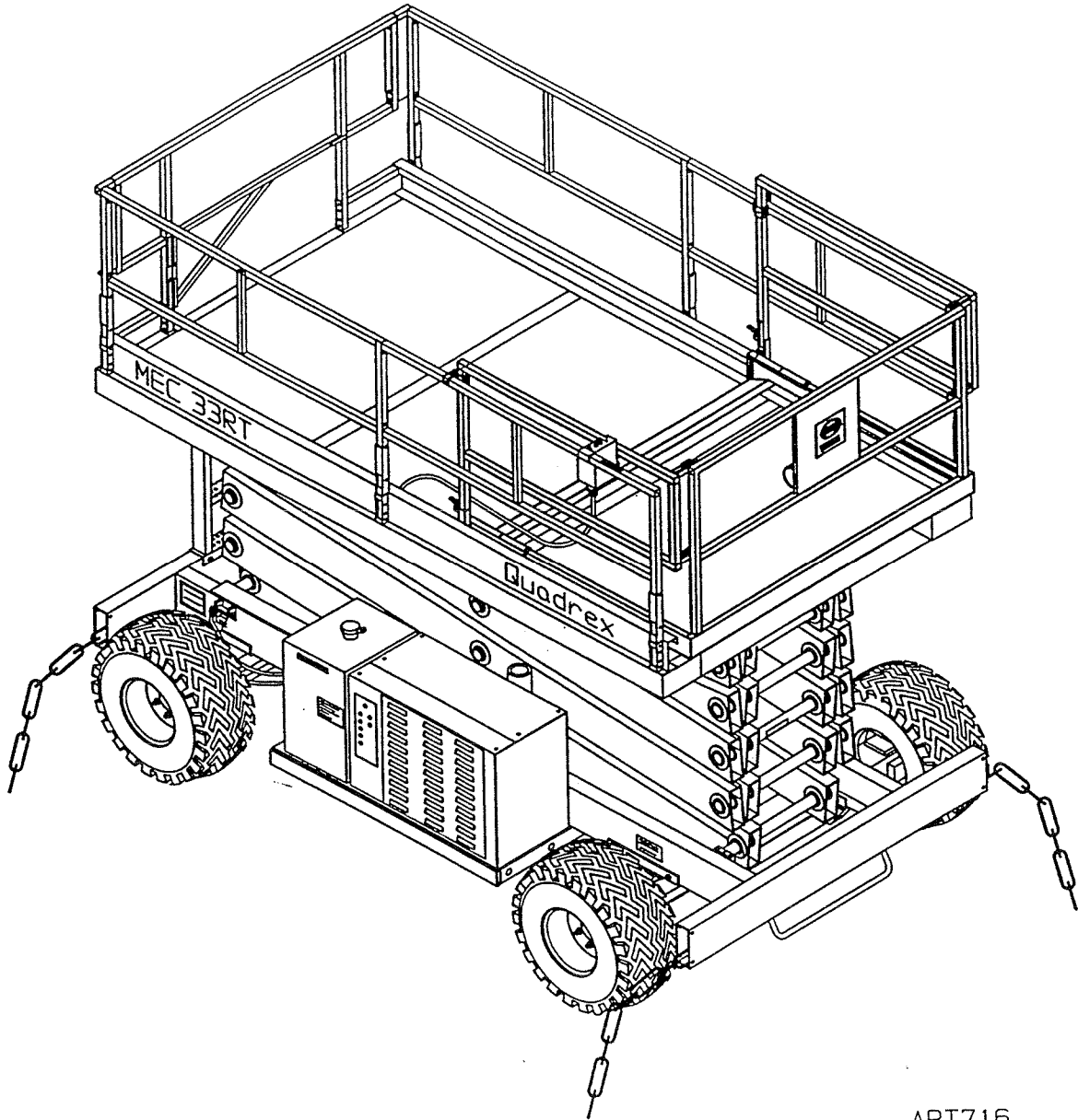


Fig. 2-3 Hoist Points

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## PRINCIPLES OF OPERATION

### 1. Power Source

The machine is powered by a 23 hp., 3 cylinder, liquid cooled, dual fuel engine. The fuel can be either gasoline or LPG. Switching from one fuel to the other is easily accomplished, using a switch provided on the lower right side control panel. Platform raising and lowering, travel and steering are all accomplished using hydraulic power. This power is furnished by a hydraulic pump which is driven by the engine. The optional 115 volt generator is also driven hydraulically.

### 2. Axle Position Locks

The rear axle is articulated. This provides for better traction while traveling, by keeping the rear wheels in contact with the driving surface while on uneven surfaces. As soon as travel is stopped, however, the axle is held in place by hydraulic cylinders which are located just inside of each rear wheel. With the drive motor system shut off, hydraulic pressure is constantly applied to each end of both cylinders by stopping hydraulic fluid flow. The cylinders then apply a rigid force against the axle. Locking the rear axle in position in this way helps to stabilize the work platform.

### 3. Brake System

The brakes are drum type brakes. They are spring set and hydraulically released. Only the two rear wheels are equipped with brakes. Hydraulic pressure to release the brakes is applied to the brake cylinder each time that either the travel motors or the steering system is actuated. Spring force resets the brakes when the travel motors or steering system are deactuated. This design insures that the brakes are set while the platform is raised and being used for normal purposes.

## FLOOR LOADING PRESSURE

In certain field applications, there is a need to specify the weight and rated work load of a machine in terms of "Floor Loading Pressure." There are two basic measurements on this subject that must be considered: **Local Concentrated Pressure** and **Overall Uniform Pressure**.

### Local Concentrated Pressure

This measurement is of concern in conditions where the floor surface (i.e. tile floor) on which the machine is being used needs to be protected from indentations or breaking due to high pressure being exerted on a relatively small area. This pressure is extremely high, especially for solid or monofilled tires, since the harder the tire, the smaller the footprint.

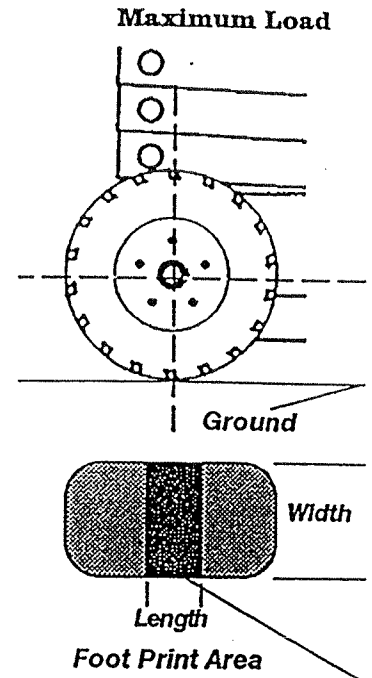
**Local Concentrated Pressure** is based on:

- (1) The maximum load exerted on one tire of the machine.
- (2) The actual measured footprint area of the particular tire.

$$\text{Foot Print} = \text{Length} \times \text{Width}$$

$$\text{PSI} = \frac{[\text{GVW} + \text{Rated Load}] + \text{Foot Print}}{4 \text{ (Tires)}}$$

$$\text{PSF} = \text{PSI} \times 144$$



### Overall Uniform Pressure

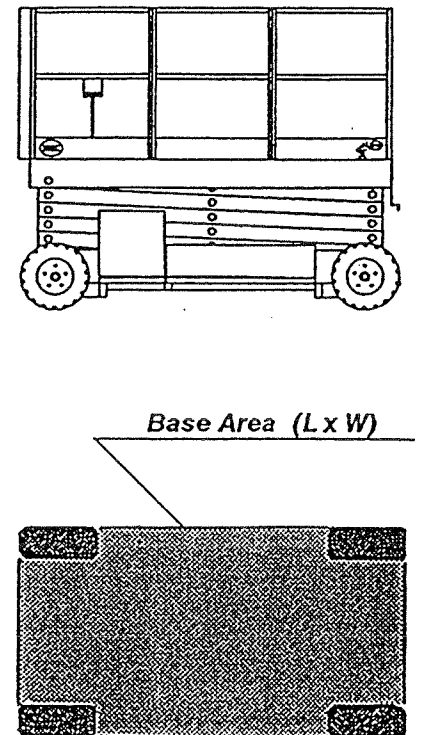
This pressure is of concern in conditions where the machine(s) is being used on a beam supported floor or surface. The machine's overall uniform pressure requires checking to ensure it does not exceed the maximum allowable pressure the floor can support. Maximum allowable pressure is determined by the architect or structural engineer, and therefore, cannot be exceeded for reasons of public safety.

**Overall Uniform Pressure** is calculated based on:

- (1) Combined load of machine's GVW, plus rated load.
- (2) Machine's base area. The base area is defined as the area of the base or the area drawn by lines to the outside of the tires as projected onto the ground; whichever is greater.

$$\text{PSI} = \frac{\text{GVW} + \text{Rated Loaded}}{\text{Base Area}}$$

$$\text{PSF} = \text{PSI} \times 144$$





# SPECIFICATIONS

Pertinent specifications for the machine are provided in the following table.

MODEL	Rough Terrain	
	25RT	33RT
<b>HEIGHT</b>		
Work Height	31' (9.5n)	39' (11.8n)
Platform Height (Max.)	25' (7.62n)	33' (10.06n)
Platform Height (Min.)**	54.5" (1.38n)	62.5" (1.6n)
Overall Height	89' (2.5n)	107' (2.7n)
Guardrail Height	42' (1.07n)	42' (1.07n)
<b>LOAD CAPACITY</b>	1750# (795kg)	1250# (567kg)
<b>SPEED</b>	38/45 0-3 mph Proportional Control	
Lift/Lower Travel		
<b>GRADEABILITY*</b>	40%	40%
<b>TURNING RADIUS</b> (Wall to Wall)		
Inside	75" (1.91n)	75" (1.91n)
Outside	175" (4.45n)	175" (4.45n)
<b>DIMENSIONS</b>		
Platform Size	74" x 132" (1.89n x 3.35n)	74" x 132" (1.89n x 3.35n)
Overall Length	138" (3.5n)	138" (3.5n)
Overall Width	86" (2.18n)	86" (2.18n)
Wheel Base	75.5" (1.92n)	75.5" (1.92n)
Ground Clearance	88.5" (2.25n)	88.5" (2.25n)
Rollout Ext. Plat.	48" long (1.22n) (Adds 23 sq. ft. of platfrm work space)	
Axle Pivot Distance	9.5" (24n)	9.5" (24n)
<b>GROSS WEIGHT (Approx.)</b>	6950" (3152kg)	7300" (3311kg)
<b>HYDRAULIC TANK CAPACITY</b>	24 U.S. Gallons (91 Liters)	
<b>FUEL CAPACITY</b>	16 U.S. Gallons (61 Liters)	
<b>POWER</b>	23 HP Kubota Liquid Cooled - Gas	
<b>DRIVE AXLE</b>	Four Wheel Drive Pivoting Rear Axle Front Wheel Steering	
<b>TIRE SIZE</b>	Super Terra Grip - Pneumatic 26" x 12" x 12" Filled With Tirebyte II Tire Sealant	
<b>MAX. HYDRAULIC PRESSURE</b>		
Main	3000 PSI	3000 PSI
Lift	2000 PSI	2200 PSI
Steer	1500 PSI	1500 PSI
W/Generator	1900 PSI	1900 PSI
<b>VOLTAGE</b>	12VDC	12VDC

\*\*ADD 6" TO THIS DIMENSION TO OBTAIN STOW HEIGHT.

# 3. OPERATION

## PREPARATION FOR USE

### 1. Preparing for Initial Use


Every machine is fully assembled when shipped from the factory. All fluids except gasoline are included. The gasoline tank must be filled with the recommended grade of gasoline (unleaded regular). The LPG tank is shipped approximately 1/2 full. The levels of all other fluids (engine coolant, engine oil and hydraulic oil) must be checked and fluids added as required before initial machine use. Check tire pressures, and inflate to the recommended pressure of 50 psi if necessary. Apply a small amount of EP90 gear oil to the steering and brake pivot points described in the Lubrication topic presented later in this manual.

Thoroughly inspect the machine for any damage that may have occurred during shipment. Immediately notify the shipper of any such damage - it is the shipper's responsibility. Also check for loose hardware, fluid leaks, structural defects and other possible operating deficiencies. Have any such deficiencies corrected before using the machine.

### 2. Preparation for Daily Operation

Prior to each day's use, perform the following checks and procedures:

- A. Visually inspect the machine for structural damage, fluid leaks, worn or damaged tires, frayed or worn electrical insulation, and cut or weakened hydraulic lines. Have necessary repairs made as soon as possible - DO NOT operate the machine unless you are certain that it can be done with absolute safety.

 <b>WARNING</b>
<b>Do not use your hands to check hydraulic hoses for leaks. Escaping fluids under pressure can be invisible and can penetrate the skin, causing serious injury. Use a piece of cardboard to check for leaks. If hydraulic fluid is injected into your skin, see a doctor at once! Injected fluid must be removed surgically by a doctor who is familiar with this type of injury, or gangrene may result.</b>

- B. Check all fluid levels and add fluids of the proper types as required.
- C. Check tire pressures. Keep tires evenly inflated to 50 psi.
- D. Perform all scheduled routine maintenance according to the maintenance chart presented in this manual.
- E. Clean the machine of any accumulated grease and/or lubricating oil. Such accumulations can pose a safety hazard, as well as a fire potential.

## OPERATING CONTROLS

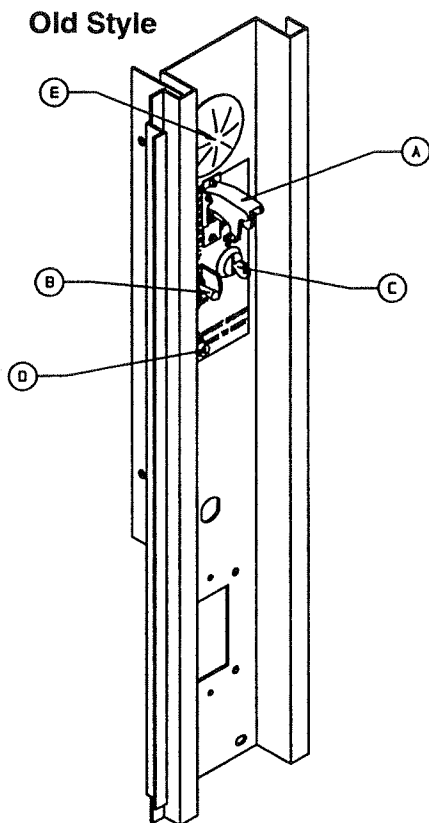
### 1. General

Operating controls are in three locations on the machine: lower left side panel (Fig. 3-1); lower right side panel (Fig. 3-2); and platform control console (Fig. 3-3). Descriptions of the individual controls are presented below.

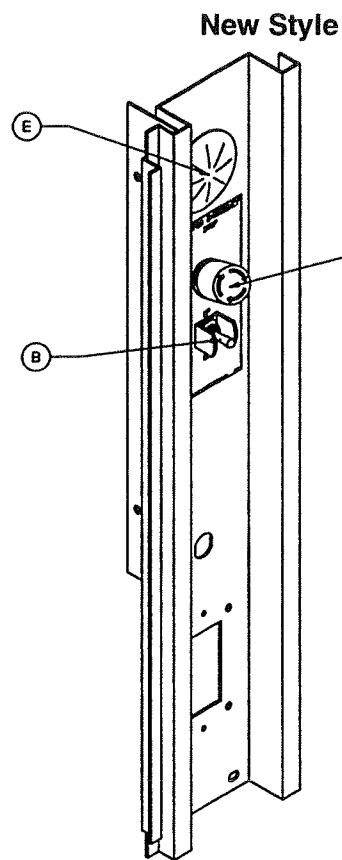
### 2. Lower Left Side Control Panel

This panel contains the following devices:

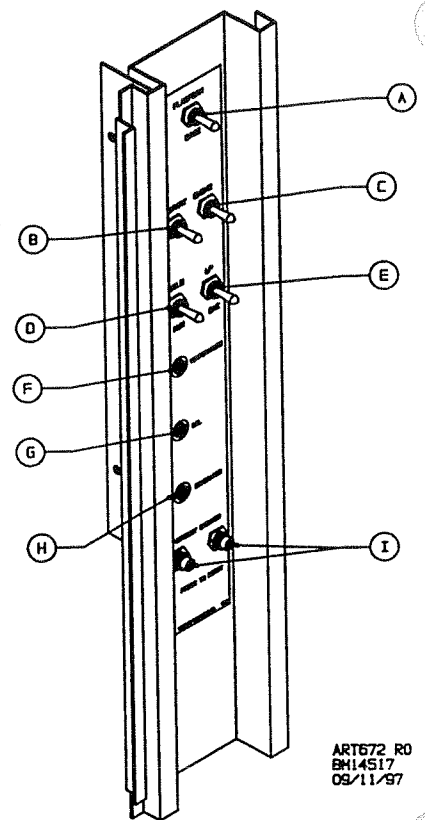
- A. EMERGENCY STOP Push-Button or Rocker Switch Guard - can be pushed "in" to shut down the engine if an operating situation calls for doing so. Must be pulled "out" in order to start the engine and to operate the machine.
- B. PLATFORM UP/DOWN Selector - with engine running and "base" operation selected, use this selector to raise and lower the work platform.
- C. Main Keyswitch (ON-OFF) - controls application of primary electrical power to the entire machine. Turn switch "off" and remove key at the end of each day's operation.
- D. Circuit Breaker - this 5-amp circuit breaker protects the primary electrical circuit. It will extend out when tripped, and can be reset by simply pushing it inward.
- E. Engine Hourmeter - displays accumulated engine operating hours. Does not function while engine is turned off.



**Fig. 3-1**  
**Lower Left Side**



**Lower Left Side**



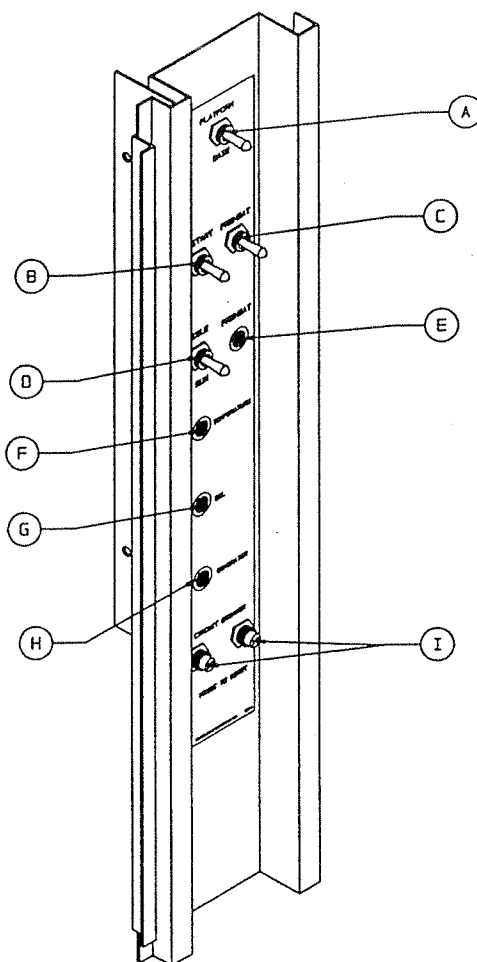
**Fig. 3-2**  
**Lower Right Side**

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### 3. Lower Right Side Control Panel

This panel (Fig. 3-2) contains the following controls and indicators:

- A. PLATFORM-BASE-OFF Selector - used to select location from which machine can be controlled. In the BASE position, the various devices on the lower control panels are functional; devices on the platform control console are nonfunctional. In the PLATFORM position, the opposite is true. The OFF position disables the controls at both the base and platform locations.
- B. START Switch - push "up" to start engine. Note that BASE control must be selected, main keyswitch must be ON and "fuel" selector must be in either the GAS or the LPG position for the engine to start.
- C. CHOKE Switch - push "up" to actuate engine carburetor choke solenoid valve. Engine must be choked when starting cold on either LPG or gasoline.
- D. IDLE-RUN Selector - use this control to select engine running speed. Place in IDLE position to start engine; and in RUN position to operate the platform from the lower left side panel, or for any other occasion requiring high engine speeds.
- E. LP-OFF-GAS Selector - the OFF position de-energizes the electrical shut-off valves for both fuel types. The GAS and LP positions are self-explanatory; choose the fuel that you wish the engine to run on using this selector.
- F. TEMPERATURE Indicator - glows when engine coolant temperature reaches 230 F.
- G. OIL Indicator - glows when engine oil pressure drops to an unsafe level. The OIL indicator on the platform control console will also light.
- H. GENERATOR Indicator - glows when optional generator is operating.
- I. CIRCUIT BREAKERS - will activate when the respective circuits experience an overload. Reset by pushing "in".



**Fig. 3-3 Diesel Lower Right Side**

**4. Diesel Lower Right Side Control Panel**

This panel (Fig. 3-3) contains the following controls and indicators:

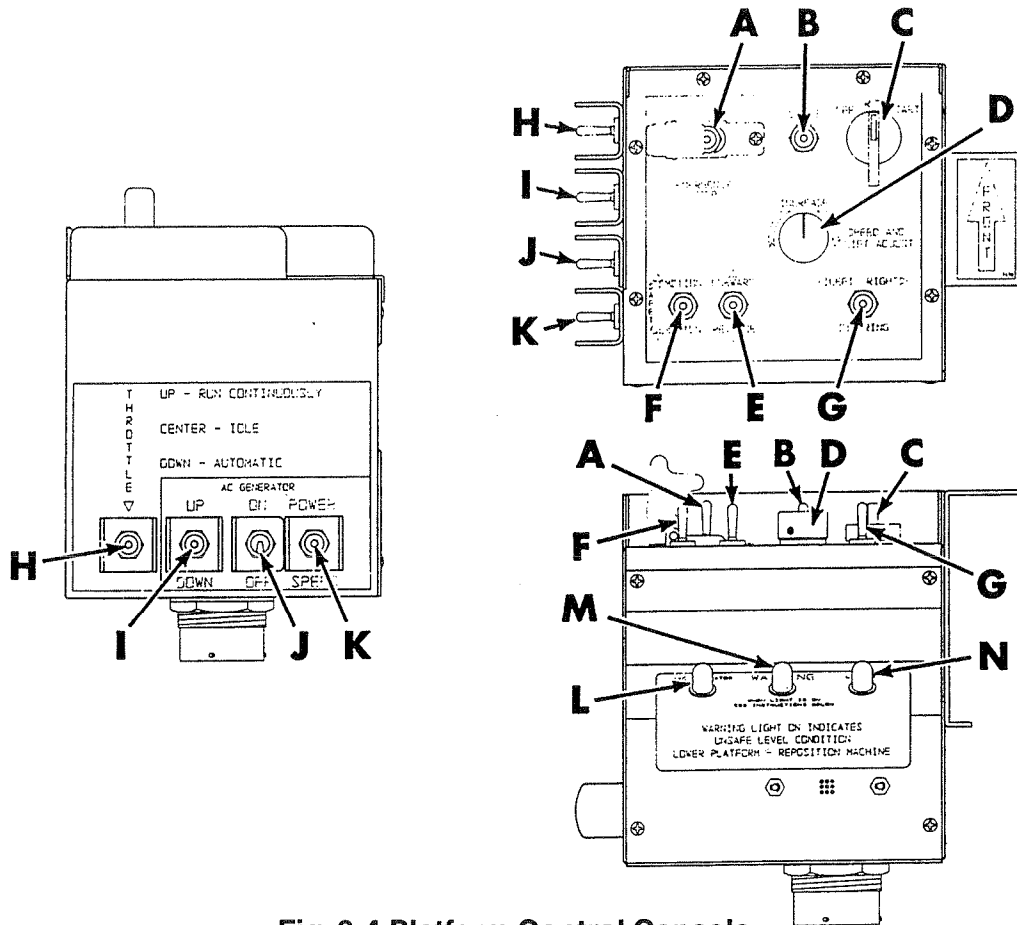
- A. PLATFORM-BASE-OFF Selector - in the PLATFORM position, the upper control box assembly is completely activated. In BASE position, all throttle control at the upper control box is deactivated. The OFF position disables the controls at both base and platform locations.
- B. START Switch - push "up" to start engine. Note the Key Switch on the upper control box must be in the "RUN" position to start the engine from the base controls.
- C. PRE-HEAT Switch - push "up" to "Pre-heat" position to energize the engine pre-heat system.
- D. IDLE-RUN Selector - use this control to select engine running speed. Place in the IDLE position to start engine and in the RUN position to operate the platform from the lower left side panel, or for any other occasion requiring high engine speeds.
- E. PRE-HEAT INDICATOR LAMP - illuminates when the Pre-heat switch is in the "ON" position and engine is NOT ready for starting.
- F. TEMPERATURE INDICATOR - glows when engine coolant temperature reaches 230F.
- G. OIL INDICATOR - glows when engine oil pressure drops to an unsafe level. The OIL indicator on the platform control console will also light.
- H. GENERATOR INDICATOR - glows when optional generator is operating.
- I. CIRCUIT BREAKERS - will activate when the respective circuits experience an overload. Reset by pushing "in."

## 5. Platform Control Console

This panel contains the following controls and indicators.

### NOTE

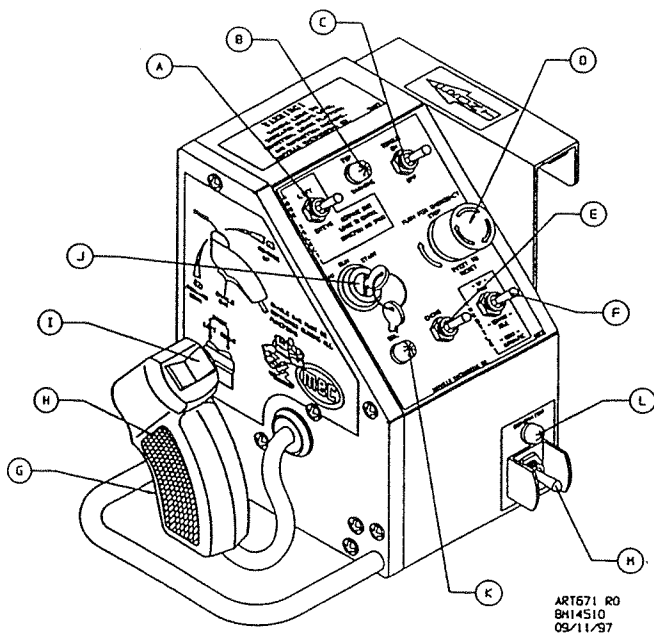
The **PLATFORM-BASE-OFF** selector on the lower right side control panel must be in the **PLATFORM** position in order for the following controls to be functional.



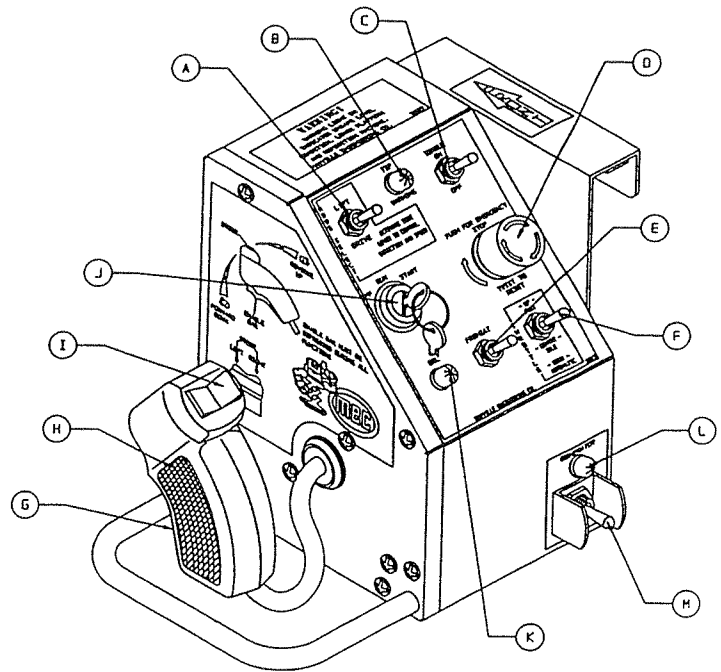
**Fig. 3-4 Platform Control Console**

- A. **EMERGENCY STOP** Rocker Switch Guard - can be pushed to the "right" and "down" to shut down the engine if an operating situation calls for doing so. Must be pulled "up" and to the "left" along with moving toggle switch to the "left" in order to start the engine and to operate the machine. Note that this rocker switch guard is in series with the **EMERGENCY STOP** control on the lower left side panel. Both must be in "out" position to resume operation, but only one has to be "down" to stop the engine.
- B. **CHOKE** Switch - push "up" to actuate engine carburetor choke solenoid valve. Engine may have to be choked when starting cold on either LPG or gasoline.
- C. Engine **START-RUN-OFF** Selector - hold selector in the **START** position to start the engine. When released, selector returns to **RUN** position. Must be in the **RUN** position for normal machine operation. Select **OFF** position to shut engine down.
- D. **SPEED AND LIFT ADJUST** Control - this potentiometer provides infinite control of travel speed and platform raising speed (as selected) between "off" and maximum designed speed. Arrow indicates direction of speed **INCREASE**.

- E. FORWARD-REVERSE Selector - use to control direction of machine travel, as indicated.
- F. MOTION Switch - engage this switch before any function in the upper control can work. If the MOTION switch is released, all functions will stop.
- G. STEERING LEFT-RIGHT Selector - hold this selector in the indicated position to steer the machine left or right. Selector returns to center (off) position when released.
- H. THROTTLE Selector - located on the side of the console. Engine runs continuously at maximum rpm when selector is in UP position and at idle speed with selector in CENTER position. With selector in DOWN-AUTOMATIC position, engine will run at high speed each time a function (travel, steering, etc.) is activated and will return to idle speed (following a short delay) when the function is deactivated.
- I. Platform UP-DOWN Selector - hold in indicated position to raise or lower the work platform. Selector returns to center (off) position when released. Use SPEED AND LIFT ADJUST control potentiometer in conjunction with this selector to vary raising speed. Lowering speed is constant, as determined by design of the flow control orifice in lift cylinder circuit.
- J. GENERATOR ON-OFF Selector - use to turn optional 115 volt generator on and off. Selector positions are self-explanatory.
- K. POWER-SPEED Selector - place in indicated position to select travel mode to suit terrain. Selector remains in position when released. In Power position, travel motor hydraulic circuitry control valves are configured to provide a combination of high pressure and low flow to the motors, causing the motors to turn slowly but with high torque. In the Speed position, the motor circuitry changes to increase flow and reduce pressure to the motors, allowing the motors to turn at a faster rate but with less torque.
- L. GENERATOR indicator - glows whenever the optional 115 volt generator is operating.
- M. WARNING indicator - glows whenever tip sensor is turned on (machine is off level by at least 4.5 degrees).
- N. LOW OIL indicator - glows when engine oil pressure drops to unsafe level. The OIL indicator on the lower right side control panel will also light.



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**Fig. 3-4 Dual Fuel**

**Diesel**

**JOYSTICK UPPER CONTROL BOX CONTROLS AND INDICATORS**

- A. **MODE SELECT SWITCH** - lift position allows joystick control handle to raise and lower platform. Drive position allows joystick control handle to control steering and propulsion of machine, such as moving the machine to another location.
- B. **WARNING INDICATOR** - will illuminate when machine is out of level by 4 1/2 degrees in any direction. (Refer to item 4).
- C. **TORQUE ON/OFF SWITCH** - on position provides more power for driving, particularly up an incline (up to 40% gradeability). Ground speed is limited to approximately 1/2 of full with torque on. Normal speed in the off position.
- D. **EMERGENCY STOP SWITCH** - press red cap to activate. All electrical power is turned off and all hydraulic power is shut down. To reset, turn red cap of switch 1/4 turn clockwise until the cap "pops" out.
- E. **CHOKE SWITCH** - push up to activate choke solenoid. Engine may have to be choked when starting cold on either LPG or gasoline. **PRE-HEAT Switch (Diesel)** - push "up" to "Pre-heat" position to energize the engine pre-heat system.
- F. **THROTTLE SELECT SWITCH** - engine runs continuously at maximum RPM when selector is in the up position, and at idle speed in the center position. With the selector in the down position (auto-matic), engine will run at high speed whenever a function (travel, steer, etc.) is activated, and return to idle (after a short delay) when the function is deactivated.
- G. **ENABLE BAR** - must be pressed to activate control capabilities of the joystick. If the bar is released, movement of the machine (drive mode) will cease or movement of the platform (lift mode) will cease.

- H. JOYSTICK CONTROL HANDLE (DRIVE) - controls direction of movement with mode select switch in the drive position. Depressing the enable bar and moving the handle towards the front of the control box causes the machine to move backwards. The handle returns to center (neutral) position when released. Ground speed is proportional - the further the handle is moved away from the center (neutral) the faster the machine moves.  
JOYSTICK CONTROL HANDLE (LIFT) - controls movement of platform with mode select switch in lift position. Depressing the enable bar and moving the handle towards the rear of the control box causes the platform to lift. Depressing the enable bar and moving the handle towards the front of the control box will cause the platform to lower. Handle returns to center (neutral) when released. Rate of lift is proportional - the further the handle is moved from center (neutral) position, the faster the rate of lift. The rate of decent is fixed - the platform lowers at same rate regardless of handle position.
- I. STEERING THUMB SWITCHES - controls steering angle of front wheels. Front wheels turn left when left side of rocker switch is pressed. Front wheels turn right when right side of rocker switch is pressed. Switch will return to neutral when released. Wheels will remain in position attained until switch is pressed to moved them to a different position.
- J. ENGINE START KEY SWITCH - selector must be held in the start position to start engine. When released, selector returns to the run position. Selector must be in the run position for normal machine operation. Selector will not return to the start position until cycled through the off position (anti-restart). Select off position for engine shutdown.
- K. LOW OIL INDICATOR - glows when oil pressure drops to an unsafe level. Engine fuel supply will be shut off when oil pressure is at an unsafe level.
- L. GENERATOR INDICATOR - glows whenever the optional 115 volt generator is operating.
- M. GENERATOR ON/OFF SELECTOR - used to turn optional 115 volt generator on and off. Selector positions are self explanatory.

### STARTING PROCEDURE FOR DIESEL ENGINE

The engine can be started (or stopped) from either the lower right side control panel (Fig. 3-3) or the platform control console (Fig. 3-4). Place the PLATFORM-BASE-OFF selector (Fig. 3-3) in the appropriate position. Then proceed as follows:

1. Insert key into switch in the platform control console.
2. Place engine speed selector in IDLE position.
3. Place key switch in the "run" position.
4. Hold the Pre-heat switch in the "up" position until the Pre-heat indicator lamp goes out, while continuing to hold the Pre-heat switch in the "up" position, place key switch in the start position and hold until engine starts. Release key switch and Pre-heat switch as soon as engine starts. The engine MUST be Pre-heated before starting. Pre-heat times are listed below:

#### Ambient Temperature

Above 50 F (23 C)  
50 F (10 C) to 23 F (-5 C)  
Below 23 F (-5 C)  
Limit of continuous use

#### Preheating Time

Approx. 5 seconds  
Approx. 10 seconds  
20 seconds  
20 seconds

#### NOTE

**Do not allow engine to crank for more than 15 seconds continuously. If engine fails to start within 15 seconds, return START selector to "off" and allow at least one minute for starter to cool before attempting to start engine again.**



## STARTING THE ENGINE FOR DUAL FUEL

The engine can be started (or stopped) from either the lower right side control panel (Fig. 3-2) or the platform control console (Fig. 3-4). Place the PLATFORM-BASE-OFF selector (Fig. 3-2) in the appropriate position. Then proceed as follows:

1. Insert key and turn master keyswitch ON.
2. Choose desired fuel using GAS-LP-OFF selector.
3. Place engine speed selector in IDLE position.

### NOTE

**Do not allow engine to crank for more than 15 seconds continuously. If engine fails to start within 15 seconds, return START selector to "off" and allow at least one minute for starter to cool before attempting to start engine again.**

4. Place engine START selector in START position and hold it until engine starts. If starting a cold engine, simultaneously hold CHOKE switch in CHOKE position. Release START selector and CHOKE switch as soon as engine is running.

## PLATFORM OPERATION USING BASE CONTROLS

1. Start engine using procedure outlined above.
2. At lower left side control panel (Fig. 3-1) place PLATFORM UP-DOWN selector in UP position. Watch carefully for overhead obstructions as platform raises.

### NOTE

**If platform fails to stop for any reason after releasing PLATFORM UP-DOWN selector, immediately push in the EMERGENCY STOP pushbutton. Notify your supervisor, or someone in Maintenance, that the condition occurred.**

3. Release PLATFORM UP-DOWN selector when desired platform height is reached.
4. To lower platform, hold PLATFORM UP-DOWN selector in DOWN position.

## EMERGENCY LOWERING OF PLATFORM

In the event of engine, hydraulic or electrical failure, a raised platform can be lowered using the manual means provided. Pulling the hand cable (Fig. 1-4) attached to a manually actuated hydraulic valve will open the valve, allowing hydraulic oil to exhaust from the piston (lower) end of the platform lift cylinder back to the reservoir. A built-in flow control limits the lowering speed of the platform when this lowering method is used.

## MACHINE OPERATION FROM PLATFORM CONTROL CONSOLE

1. General  
To operate from the platform control console, the PLATFORM-BASE-OFF selector (Fig. 3-2) must be placed in the PLATFORM position, and the master keyswitch must be ON. The engine can then be started using the controls on the platform control console, if not started previously from the lower right side control panel.

## 2. Entering the Platform

Enter the platform only from the rear, using the ladder provided. Note that the platform is spring loaded, and will swing shut as soon as it is released. Use care in entering and exiting the platform, to avoid slipping or being injured by the access gate swinging shut. Never exit the platform while platform or machine are in motion.

### NOTE

**Place the THROTTLE control selector in the DOWN-AUTOMATIC position for normal machine operation.**

## 3. Machine Travel

- A. At the platform control console, select the desired direction of travel using the FORWARD-REVERSE selector. Note that the MOTION switch is located next to the direction selector.
- B. Select SPEED on the POWER-SPEED selector and turn the SPEED AND LIFT ADJUSTMENT control knob for the desired speed.
- C. To travel over rough terrain or up or down an incline, place the POWER-SPEED selector in the POWER position. Select direction using the FORWARD-REVERSE selector as before.
- D. When any mode of travel is initiated, the brakes release automatically. The brakes reset automatically when the FORWARD-REVERSE selector is returned to "off".

## 4. Steering

Steering is accomplished using the STEERING LEFT-RIGHT selector. The directions are clearly marked. The selector returns to "off" when released.

## 5. Platform Raising and Lowering

The PLATFORM UP-DOWN selector is used to choose the direction of platform movement. The SPEED AND LIFT ADJUST control varies the raising speed between zero and the maximum designed speed, permitting the platform to be "inched" as the final working height is reached, or when near an obstruction. Lowering time is fixed at 35 seconds, from fully raised to fully lowered position.

## 6. Optional Generator

Push generator selector switch to on. The engine will then run constantly at high speed, which is required for full generator output. The generator is powered by a hydraulic motor which, in turn, is supplied by the engine-driven hydraulic pump.

## EXTENDED OR RETRACTING EXTENDED PLATFORM

### **WARNING**

**Do not use extended platform without railings in place and lock pins completely engaged in lock channel holes.**

1. Move lock lever down to release pin (2) on each side of extended platform railing from lock channel.
2. Pull rail handle (3) out of handle clip (4) on each side of platform and rotate handle up to level.
3. Push or pull on both rail handles (3) to extend or retract platform to desired position.
4. Make sure lock pin (2) is aligned with hole in lock channel (5) and pull lock lever (1) up to engage pin in channel. Be sure lock pin is fully engaged.
5. Rotate each rail handle (3) down and press into handle clip (4).

## STOWING AND ERECTING PLATFORM RAILINGS

1. Remove safety snap pins from side railing and lock assembly.
2. Lift railing so top railing support (2) clears other top rail and swing rear of side railing to the front.
3. Lift side railing off hinge brackets. Lay railing down on platform with extension handle toward front and hinge brackets down on floor.
4. Repeat preceding steps to remove other railing.
5. Pull top rail of front railing toward you and lay down on top of side railings.
6. Remove safety snap pins (1) from outside of rear railing and pull top rail toward you and lay railing down on platform floor.
7. Pull up on both hinge locks (2) in vertical posts of side railing. Pull on top rail and lay railing down on top of other railings.
8. Reassemble railings by following the reverse order of this procedure. Make sure all Safety snap pins, hinge locks and railing supports are securely engaged and/or locked in place.

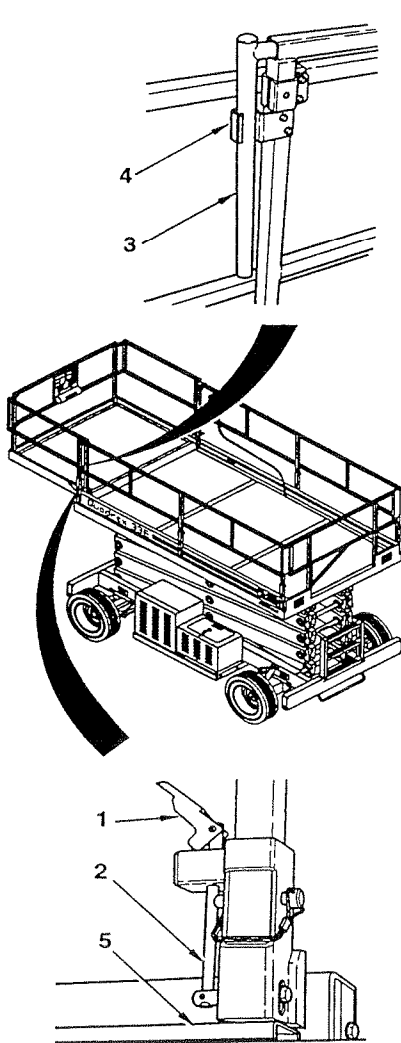


Fig. 3-4 Extended Platform Lock Assemblies

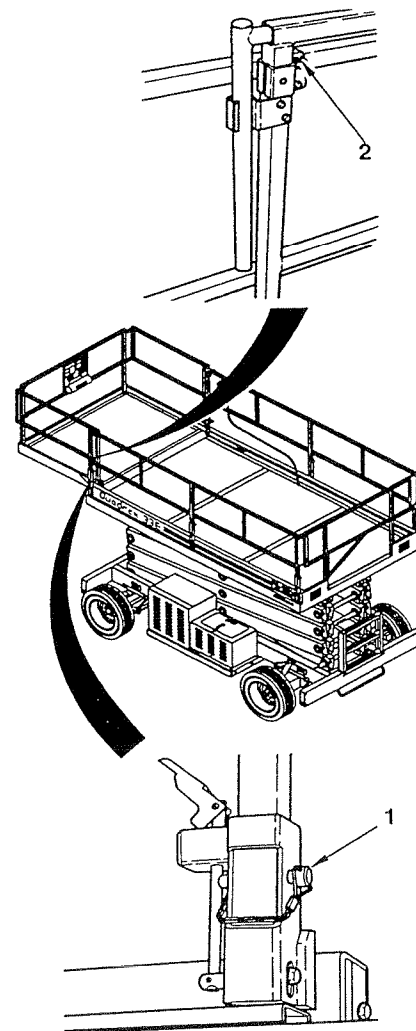
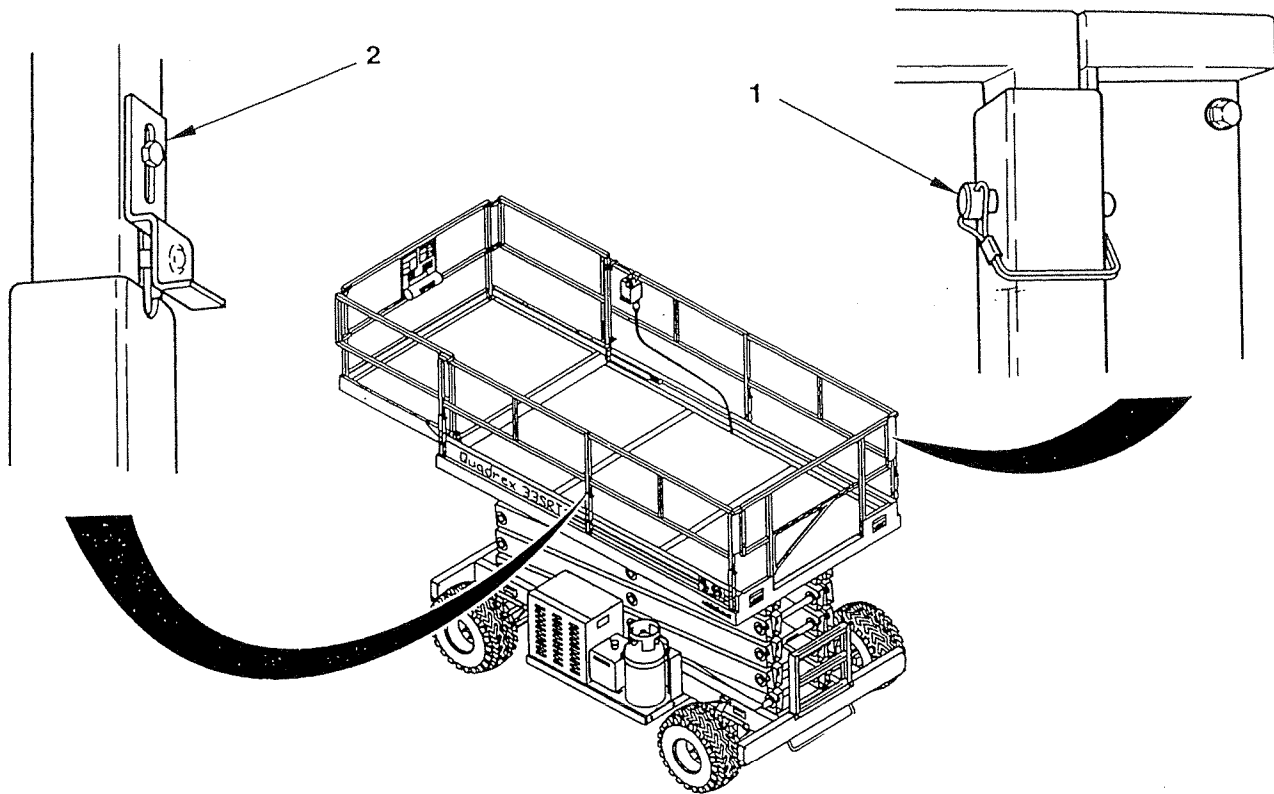


Fig. 3-5 Safety Snap Pins and Railing Supports - Extended Platform



**Fig. 3-6 Safety Snap Pins and Hinge Locks - Standard Platform**

## SWITCHING FUEL TYPES

The engine is designed to run on either gasoline or LPG. Switching from one fuel type to the other can be accomplished only from the base, using the LP-OFF-GAS selector on the lower right side control panel. Make the switch while the engine is running.

While the engine is running, place the LP-OFF-GAS selector in the OFF position. When the engine begins to “hesitate,” immediately place the selector in the position (GAS or LP) corresponding to the new fuel. It is important that the “old” fuel be consumed by the engine before introducing the “new” fuel.

## MACHINE SHUTDOWN

1. Lower the platform fully.
2. If the engine has been operating at high speed, allow it to idle for a few minutes. This way, the engine temperature will drop somewhat and will equalize throughout the engine block.
3. Shut off the engine by placing the START selector in the “off” position.
4. Place the LP-OFF-GAS selector (Fig. 3-2) in the OFF position. This de-energizes both fuel shut off valves.
5. Shut off the master keyswitch and remove the key.

## 4. MAINTENANCE

### NOTE

Refer to Engine Owner's Manual for engine maintenance instructions.

### GENERAL

This machine requires only a minimum of routine, preoperational maintenance. Required visual inspections are described in the following topic. These inspections must be made without fail, and all necessary corrections made before operating the machine. Fluid level checks and periodic lubrication comprise the remaining routine, pre-operation, maintenance. These topics are covered below.



## WARNING

Check engine coolant level only after engine has cooled. You should be able to touch the radiator without discomfort before removing the radiator cap. If radiator cap is removed while the coolant is at normal operating temperature, pressure within the coolant system will force hot liquid out through the filler opening, and possibly cause severe scalding.

### FLUID LEVEL CHECKS

#### 1. Engine Coolant Level

- Slowly remove radiator cap, allowing any trapped pressure to escape safely.
- Note level of coolant in the radiator. Coolant should cover the radiator core. If not, add antifreeze of the brand presently used in the coolant system, or a mixture of antifreeze and water in the recommended proportion (50/50 mixture).



## WARNING

Stop engine before filling.

#### 2. Gasoline

Fill the gasoline tank (Fig. 4-4) to the bottom of the neck, with clean lead-free regular gasoline. Use all necessary precautions regarding the handling of gasoline.

#### 3. Hydraulic Fluid

- Make sure machine is parked on a level surface, and the platform is fully lowered.
- Stop engine.
- Clean filler cap and surrounding area of all dirt and other contaminants; and then remove filler cap (Fig. 4- 2).
- Check to be sure that fluid level in the tank is approximately two (2) inches below the top of the tank.
- If hydraulic fluid level is low, add oil (conforming to MIL SPEC. 0-5606) to bring it to the prescribed level.

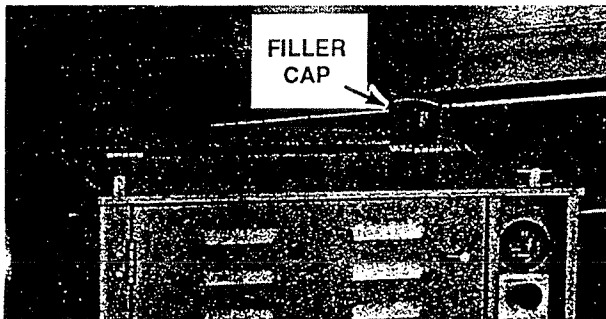


Fig. 4-1 Gasoline Tank Filler

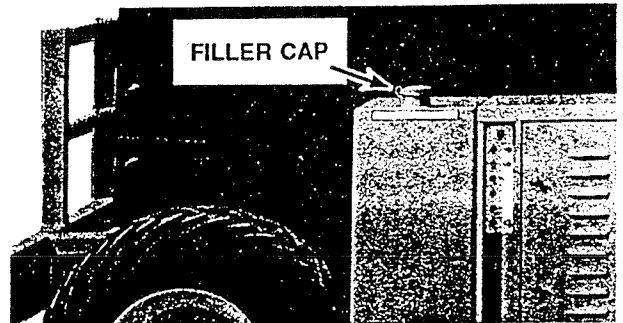


Fig. 4-2 Hydraulic Tank Filler

## 4. Changing LPG Tank

### NOTE

The replacement tank must contain fuel manufactured to Natural Gas Processors Association Specification HD-5. No other LPG fuel is recommended for use in this engine.

- A. Close LPG fuel shut off valve (Fig. 4-3).
- B. Start engine (on LPG fuel) and allow it to run until it stops, thereby purging the fuel lines of fuel.
- C. Disconnect fuel line from shut off valve.
- D. Release tank strap latches (Fig. 4-3) and carefully lift tank from its bracket.
- E. Place new tank on bracket, aligning holes in tank collar with pins on front of mounting bracket.
- F. Secure tank strap latches.
- G. Connect fuel line to fuel shut off valve on tank.
- H. Open fuel shut off valve.
- I. Use soap water solution to check fuel line connection at shut off valve for leaks. Immediately correct any leak, by further tightening connection.

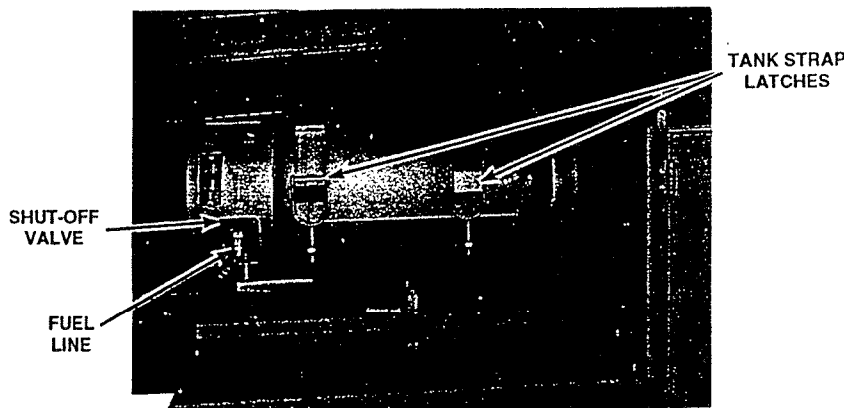


Fig. 4-3 LPG Tank

## TIRE INFLATION

### NOTE

Applies only to machine with pneumatic tires.

Tire inflation pressure must be maintained at recommended tire manufacturers specifications (located on tire sidewall). Check tire pressure daily, before each operating shift. Low tire inflation pressure not only accelerates tire wear, but more importantly, can have an adverse affect on machine stability. It is also important to keep the inflation pressures equal in all four tires.

## INSPECTION AND LUBRICATION

### 1. Structural Inspection

- A. Check machine for bent structural members. (Beams, main frame, platform, pivot pins, etc.). Machines which have been overloaded could have bent members and fatigued pivot pins. Replace all bent members and pins to insure a safe operating machine.
- B. Check bushings in scissor beams for broken or cracked welds. Replace beams if bushing welds are cracked or bushings are elongated.

### 2. Lubrication

Besides changing engine oil (see engine service manual), the only periodic lubrication required is to oil the steering and brake pivot points once a week. Apply a few drops of EP90 gear oil to each pivot point (Fig. 4-4 and Fig. 4-5).

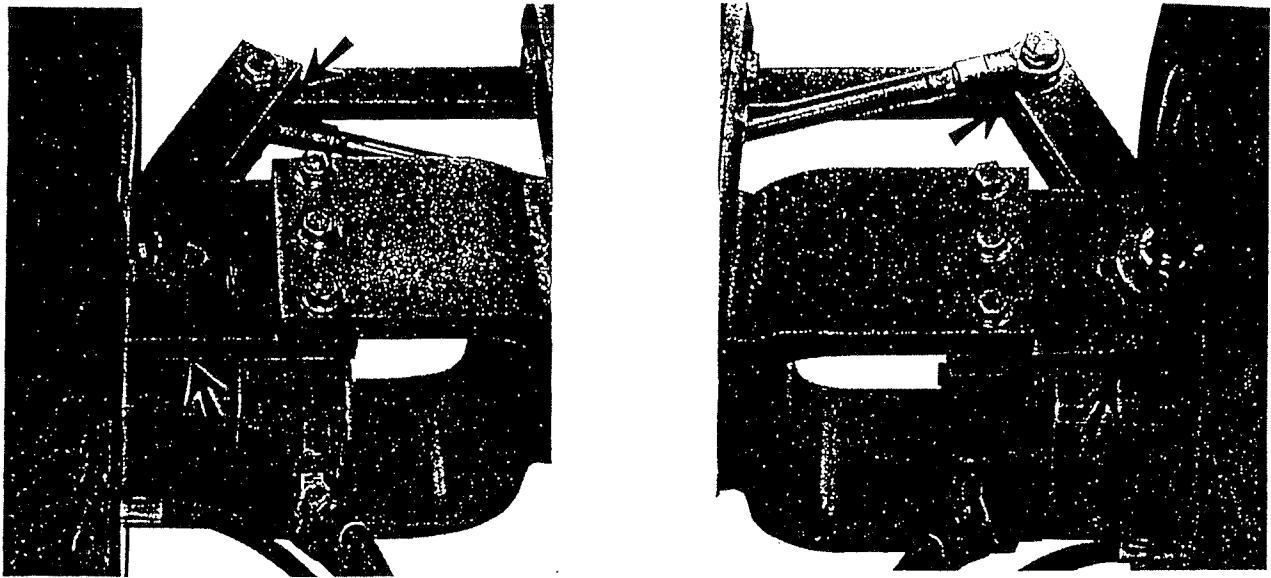


Fig. 4-4 Steering Linkage

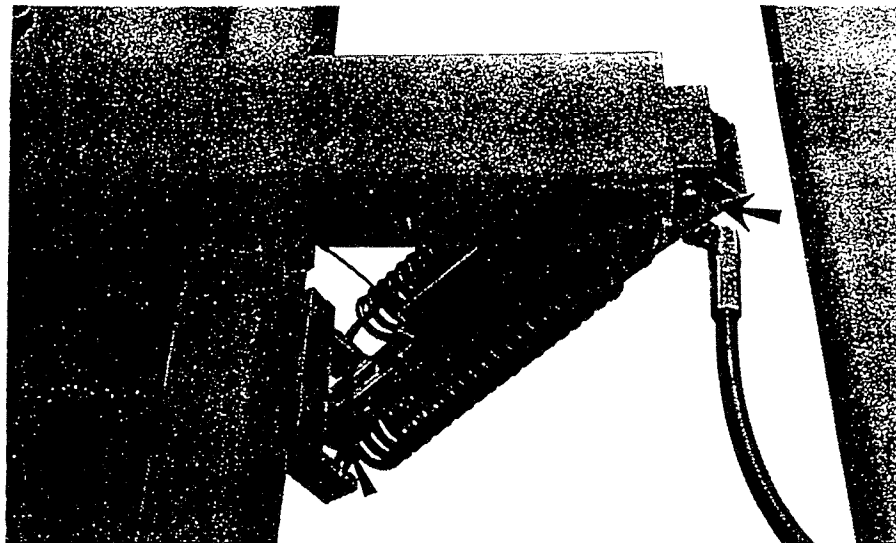


Fig. 4-5 Brake Linkage



## WARNING

All pivot areas of scissors and lift cylinder must be checked for wear. A loud scraping noise indicates that the D.U. bearings are damaged and need replacing. Failure to do so will result in extensive damage to structural members and bushings which would create a hazardous condition and could result in injury or death to personnel.

COMPONENT	TIME INTERVAL			
	DAILY	WEEKLY	6 MONTHS	1 YEAR
<b>Battery</b>				
1. Check Wiring	X			X
2. Check Fluid Level	X			X
3. Clean Battery Connections		X		X
4. Coat Terminals		X		X
<b>Hydraulic System</b>				
1. Check for Leaks	X			X
2. Check Fluid Level		X		X
3. Inspect Commutator and Brushes			X	X
4. Check Hoses	X			X
5. Check Fittings		X		X
6. Replace Oil Filter				X
<b>Scissor System</b>				
1. Check for Damage	X			X
<b>Drive and Lift Mechanism</b>				
1. Oil Steering Pivot Points			X	X
2. Oil Brake Pivot Points			X	X
3. Grease Rear Spindles			X	X
<b>Main Frame</b>				
1. Check Structure		X		X
2. Check Pivot Points				X
3. Check All Fasteners	X			X
<b>Control System</b>				
1. Check Terminal and Plugs		X		X
2. Check Cords		X		X
<b>Safety Decals*</b>				
1. Add if missing	X			X
2. Replace if illegible	X			X
<b>Platform</b>				
1. Entry Gate	X			X
2. Railing Secure in Pockets	X			X
3. All Fasteners Secure	X			X
<b>Fuel System</b>				
1. Check for Leaks (LPG or Gasoline)	X			X
2. Check Hoses	X			X

**Inspection and Lubrication Schedule.**



**Battery**

- 1. Check Wiring
- 2. Check Fluid Level

**Hydraulic System**

- 1. Check for Leaks
- 2. Check Hoses

**Scissor System**

- 1. Check for Damage
- 2. Check Snap Rings

**Platform**

- 1. Entry Gate
- 2. Pivot Bar and Roller
- 3. Railings Secure in Pockets
- 4. Safety Decals

**Keep log as follows:**

- 1. Inspect components
- 2. Check boxes if components OK or make repairs
- 3. Initial Boxes

**Key:**

- B=Battery
- H=Hydraulic System
- S=Scissor System
- P=Platform




MONTH																	
DAY			7				14						21				28
INIT.																	
B-1																	
2																	
H-1																	
2																	
S-1																	
2																	
P-1																	
2																	
3																	
4																	
5																	
MONTH																	
DAY			7				14						21				28
INIT.																	
B-1																	
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INIT.																	
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S-1																	
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P-1																	
2																	
3																	
4																	
5																	

**COMPONENT**

Check and Initial Every 15 Hours of Use, or Weekly

	MONTH												
	DAY												
	INITIAL												
<b>Battery</b>													
1. Clean Battery													
2. Coat Terminals													
<b>Hydraulic System</b>													
1. Check Fluid Level													
2. Inspect Commutator and Brushes*	Date Last Checked _____												
3. Check Fittings													
<b>Scissor System</b>													
1. Check for Damage													
<b>Drive and Lift Mechanism</b>													
1. Check All Fasteners													
<b>Main Frame</b>													
1. Check Structure													
<b>Control System</b>													
1. Check Terminals and Plugs													
2. Check Cords													

\* Check every 6 months

			
<b>Bolts</b>	<b>Grade 2</b>	<b>Grade 5</b>	<b>Grade 8</b>
1/4-20	49 in. lbs.	76 in. lbs.	9 ft. lbs.
5/16-18	8 ft. lbs	13 ft. lbs.	18 ft. lbs.
3/8-16	15 ft. lbs.	23 ft. lbs.	33 ft. lbs.
7/16-14	24 ft. lbs.	37 ft. lbs.	52 ft. lbs.
1/2-13	37 ft. lbs.	57 ft. lbs.	80 ft. lbs.

Grade markings for bolts grades 2, 5, and 8 are based on SAE J429. Markings may be raised or depressed (manufacturer's option).

**NOTE**

**Any bolt replacement should be of the same grade or greater than original bolt.  
Any questions, call factory for verification.**

## QUADREX MODELS 25RT AND 33RT DUAL FUEL AERIAL WORK PLATFORM WALK-A-ROUND INSPECTION

The Walk-a-round Check shall be performed by the operator prior to using the unit for the first time of the day or by a new operator even if the unit has been used during any part of the day. The Walk-a-round Check is critical to ensuring the safe operation of the platform.

When performing the Walk-a-round Check, visually inspect for obvious damage to the specific part of the unit including loose or missing fasteners, frayed, broken or leaking hydraulic lines, and worn, broken or frayed insulation on power cables. Also, check for bent structural members (beams, frame, platform, etc.). A machine which has been overloaded will have bent structural members and fatigued pivot pins. Begin the check standing at the center of the rear of the unit. The number of the check in the listing matches a corresponding number in an illustration to help the operator understand and locate the check to be performed.

1. Capacity Decals on Rear of Platform (Fig. 4-6). Check that two decals are in place on rear edge of platform floor - one at each corner - and are intact and legible.
2. Maintenance Lock. Check lock for secure attachment to pivot pin collar and is not bent. Check receiver channels for damage. Check that decal is in place on side of pivot pin collar and is legible.
3. Broken Welds on Scissor Pivot Collars. Check for broken welds on scissors where each pivot pin collar is attached.

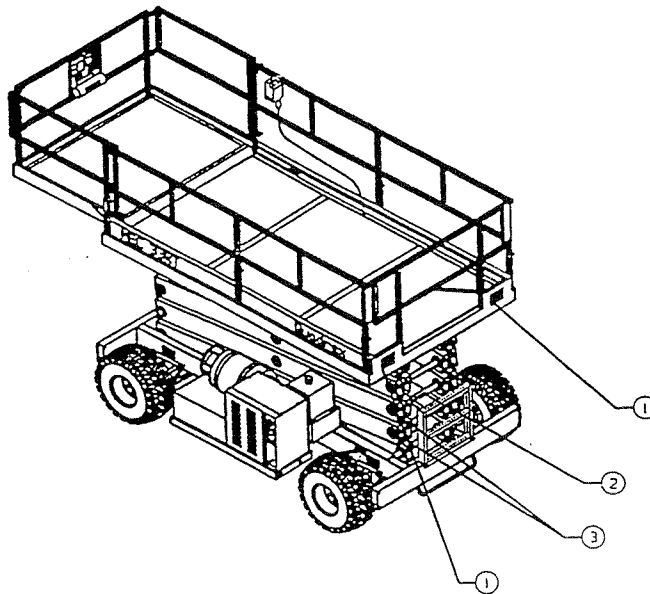
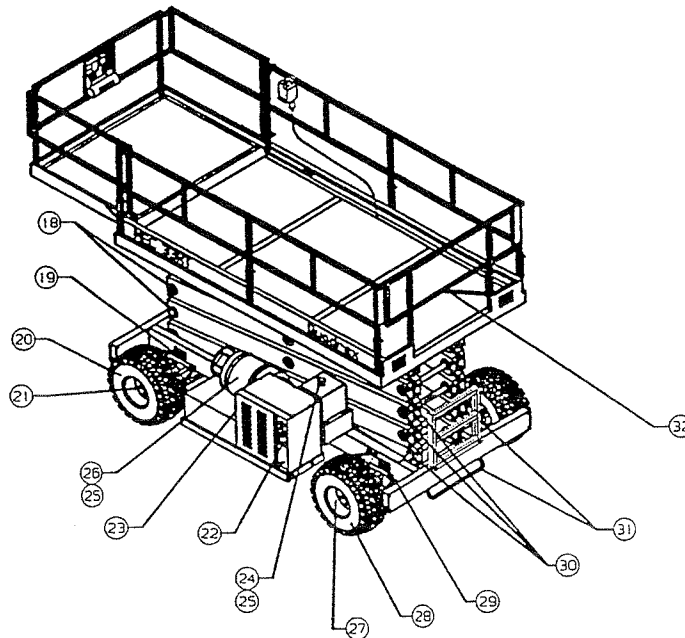


Fig. 4-6 Quadrex RT Full Machine

18. Broken or Missing Retaining Rings on Scissor Pivot Pins (Fig. 4-8) - check for missing or broken retaining rings on exposed ends of pivot pins.
19. Tire Pressure Decal on Frame - check that decal is in place on frame behind tire and is legible.
20. Tire Condition - check tire inflation pressure is correct. Check for excessive wear and damage to tire.
21. Wheel Condition - check wheel for bent rim and loose or missing lug nuts. **Weekly** - Torque nuts to 75-85 ft. lbs. (102-115 Nm).
22. Lower Control Panel - check for obvious damage to switches, indicators and guards. Check that three decals are in place on the control box and are legible.
23. LPG Warning Decal - check that decal is in place on cabinet next to gasoline tank and is legible.
24. Gasoline Tank Fuel Level - gasoline should be just below filler neck.
25. Fuel Leaks - check for any visible, audible or smell of fuel leaks.
26. LPG Tank Fuel Level - gage should indicate a level appropriate for task(s) to be performed.
27. Wheel Condition - check wheel for bent rim and loose or missing lug nuts. **Weekly** - Torque nuts to 75-85 ft. lbs. (102-115 Nm).
28. Tire Condition - check tire inflation pressure is correct. Check for excessive wear and damage to tire.
29. Tire Pressure Decal on Frame - check that decal is in place on frame behind tire and is legible.
30. Broken or Missing Retaining Rings on Scissor Pivot Pins (Fig. 4-8) - check for missing or broken retaining rings on exposed ends of pivot pins.
31. Rear Steps - check rear steps on bumper for obvious damage and loose or missing fasteners. Check bottom step for security and broken welds.
32. Rear Gate - check rear gate for loose or missing fasteners and obvious damage. Check that latch is secure and operates properly.



4. Broken or Missing Retaining Rings on Scissor Pivot Pins (Fig. 4-7) - check for missing or broken retaining rings on exposed ends of pivot pins.
5. Tire Pressure Decal on Frame - check that decal is in place on frame behind the tire and is legible.
6. Tire Condition - check tire inflation pressure is correct. Check for excessive wear and damage to tire.
7. Wheel Condition - check wheel for bent rim and loose or missing lug nuts.  
Weekly - Torque nuts to 75-85 ft. lbs. (102-115 Nm).
8. Engine Oil Level - oil level should be between L mark and F mark.
9. Battery Water Level - Weekly - water should be up the spilt ring. Use only distilled water.
10. Hydraulic Fluid Level - Weekly - fluid level should be three inches below top of filler neck.
11. Tire Condition - check tire inflation pressure is correct. Check for excessive wear and damage to tire.
12. Wheel Condition - check wheel for bent rim and loose or missing lug nuts. Weekly - Torque nuts to 75-85 ft. lbs. (102-115m).
13. Tire Pressure Decal on Frame - Check that decal is in place on frame behind tire and is legible.
14. Broken or Missing Retaining Rings on Scissor Pivot Pins - check for missing or broken retaining rings on exposed ends of pivot pins.
15. Maintenance Lock - check lock for secure attachment to pivot pin collar and is not bent. Check receiver channels for damage. Check that decal is in place on side of pivot pin collar and is legible.
16. Emergency Down Decal - check that emergency down decal is in place on bottom pivot pin beside EMERGENCY DOWN control and is legible.
17. Broken Welds on Scissors Pivot Collars - check for broken welds on scissors where each pivot pin collar is attached.

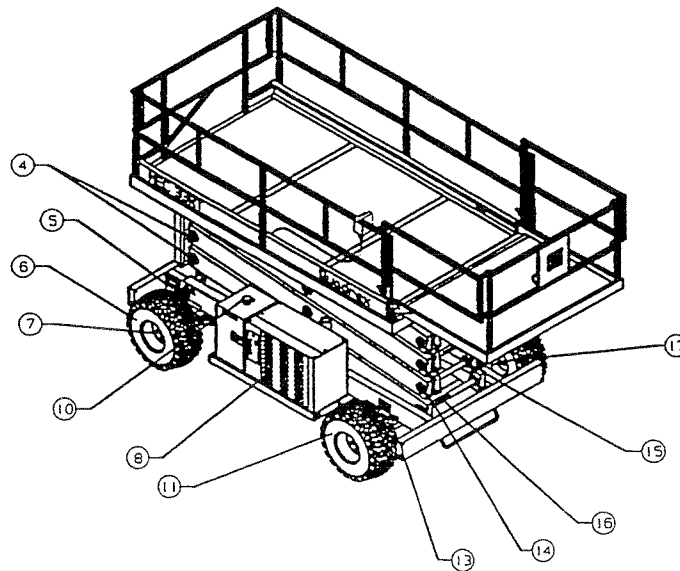


Fig. 4-7 Quadrex RT Full Machine

## MOUNT PLATFORM

33. Platform Railings (Fig. 4-9) - check all railings for secure and proper installation and obvious damage. Check that top rail is not bent to a height of less than 39 inches.
34. Decals on Panel on Front Rail - check that four decals are in place on panel of front platform railing and all four are intact and legible.
35. Manual Tube - check that all manuals are in tube on front railing.
36. Upper Control Box Assembly - check for obvious damage to switches, indicators and guards. Check that four decals are in place on the control box and are legible.
37. Raise EMERGENCY STOP cover and place switch to left position.

## DISMOUNT FROM PLATFORM

38. Check Operation of EMERGENCY DOWN control using lower control panel:
  - A. Turn keyswitch 90 degrees to the right.
  - B. Raise EMERGENCY STOP switch cover and place switch in up or top position.
  - C. Place PLATFORM/BASE switch to BASE position.
  - D. Place FUEL SELECTION switch to GAS or LPG position as desired.
  - E. Place START/STOP switch in START position and hold until engine starts.
  - F. Place UP/DOWN switch in UP position and hold to raise platform 10 to 15 ft. above you. Release switch.
  - G. Pull EMERGENCY DOWN control out and hold. Platform should lower all the way.

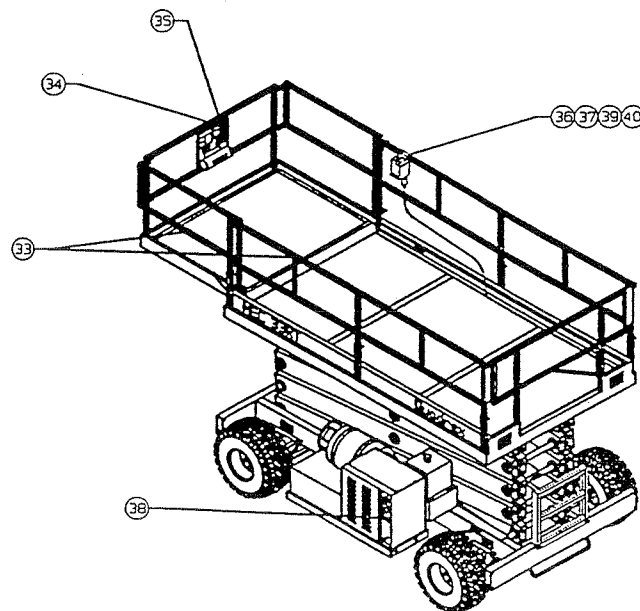


Fig. 4-9 Quadrex RT Full Machine

- H. Press EMERGENCY STOP - unit shuts down quickly and completely.
- I. Raise EMERGENCY STOP switch cover and place switch in up or top position.
- J. Place PLATFORM/BASE switch to PLATFORM position.

#### MOUNT PLATFORM

- 39. Test upper control box assembly controls and indicators:
  - A. Steer left and right
  - B. Drive forward/reverse in slow, medium and fast with torque off.
  - C. Operate brakes on a grade.
  - D. Drive forward/reverse in slow and medium with torque on.
  - E. Check fast drive speed cutout when platform is raised.



## WARNING

**ALL PIVOT AREAS OF SCISSORS AND LIFT CYLINDER MUST BE CHECKED FOR WEAR. A LOUD SCRAPING NOISE MEANS THE D.U. BEARINGS ARE DAMAGED AND NEED REPLACING. FAILURE TO DO SO WILL RESULT IN EXTENSIVE DAMAGE TO STRUCTURAL MEMBERS AND BUSHINGS WHICH WOULD CREATE A HAZARDOUS CONDITION AND COULD RESULT IN INJURY OR DEATH TO PERSONNEL.**

- G. Raise platform to full extension using slow and fast speeds.
  - H. Lower platform to full compression.
  - I. Emergency stop working properly (unit shuts down quickly and completely).
40. Raise EMERGENCY STOP switch cover and place switch in left position.

## SERVICING, REPLACEMENT AND ADJUSTMENTS

This section contains three basic maintenance functions:

**SERVICING** describes items to be checked and serviced when necessary, on a daily basis, or prior to using the unit after it has been out of service for a period of time.

**REPLACEMENT** describes the proper method for removal and installation of replaceable components in case of failure.

**ADJUSTMENT** describes any adjustments necessary to ensure proper operation of the unit or adjustments required after the replacement of components, if necessary.

### 1. Hydraulic System

#### A. General Information

The following are important points to keep in mind when working on the hydraulic system or its components:

- (1) All mechanical devices have limits of strength and durability. To avoid failure of hydraulic components, pressure relief valves are included in the drive, steering and platform raise circuits.
- (2) Keep the hydraulic fluid as clean as possible during storage and use. Add fluid to the reservoir only through the filler opening, using a clean funnel. Never use a cloth to strain the fluid, since cloth tends to release lint and lint in the fluid can plug fine passages in the components. Failure of a hydraulic system component will most likely result in contamination of the hydraulic fluid. If a failure occurs, drain and flush the entire system, and replace the filter cartridge. Remove suction line strainer (clean by washing in solvent).
- (3) After disassembly, wash all metal parts in a clean, mineral-based solvent. Thoroughly clean all internal passages.
- (4) Discard all o-rings and seals, regardless of the reason for removing them. Install new o-rings and seals during reassembly. Use a small amount of petroleum jelly to hold o-rings in place during assembly.
- (5) Make certain that all hydraulic connections are tight following component installation. A loose pressure line will allow fluid to escape. A loose suction line will allow air to enter the system. Air in the system can result in noisy or erratic operation, and even cause component damage.

#### B. Maintenance

Three basic maintenance procedures have the greatest impact on hydraulic system performance, efficiency and life span. These three are:

- (1) Change filter at the recommended intervals.
- (2) Keep fluid at the proper level in the reservoir at all times.
- (3) Keep line connections tight, but not to the point of distortion. Air must be excluded from the system.

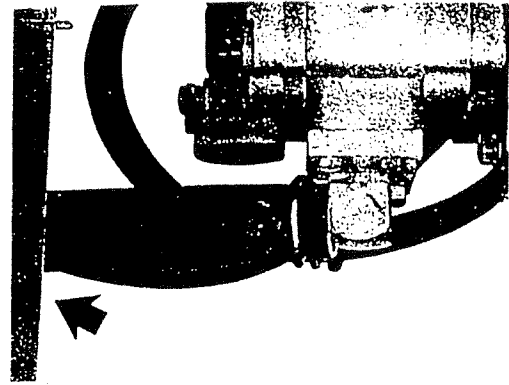
#### C. Hydraulic System Bleeding

The hydraulic system is self-bleeding. After the system has been drained, such as during the replacement of a hydraulic system component, actuate the platform full up and down for six cycles and recheck the reservoir fluid level each time after lowering. Add fluid as required.





**Fig. 4-10 Spin On Hydraulic Filter**



**Fig. 4-13 Location Suction Line Strainer**

**D. Spin-On Filter Replacement**

The spin-on filter in the hydraulic system should be changed yearly (Fig. 4-10)

**E. At each hydraulic oil change interval, remove and clean the suction line strainer**

**F. Check and Fill Hydraulic Reservoir**

Inspect oil level in hydraulic reservoir by unscrewing reservoir filler cap Fig. 4-2. Oil level should be 2 inches below the top of the tank. Fill reservoir with hydraulic fluid conforming to MIL. SPEC. 0-5606.

**G. Hydraulic Pump Replacement**

(1) Remove hydraulic hoses from pump.

**NOTE**

**The high pressure line may still be under pressure and fluid will squirt out when line is disconnected. Do not reuse fluid, as it may be contaminated.**

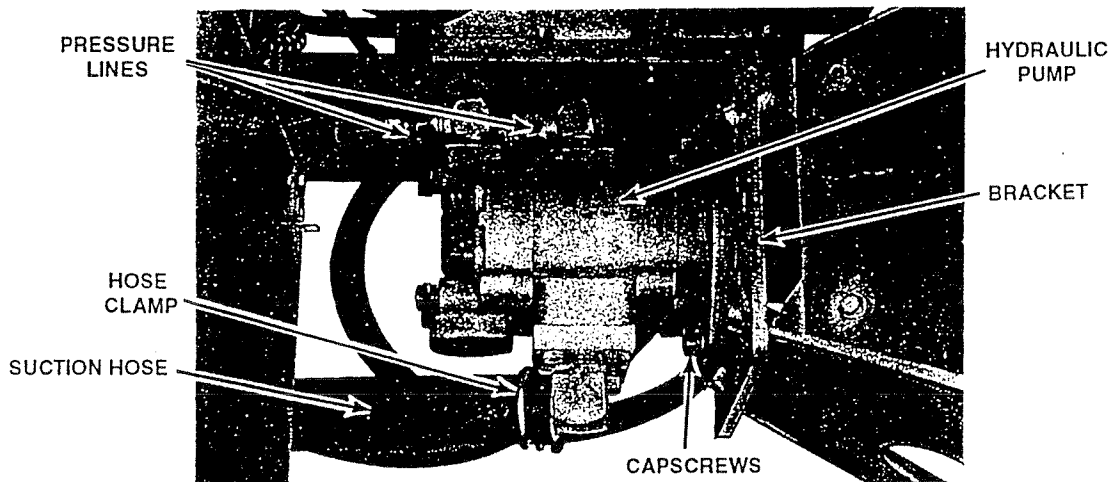
(2) Remove two cap screws and nuts securing pump to bracket Fig. 4-12.

(3) Remove pump from bracket.

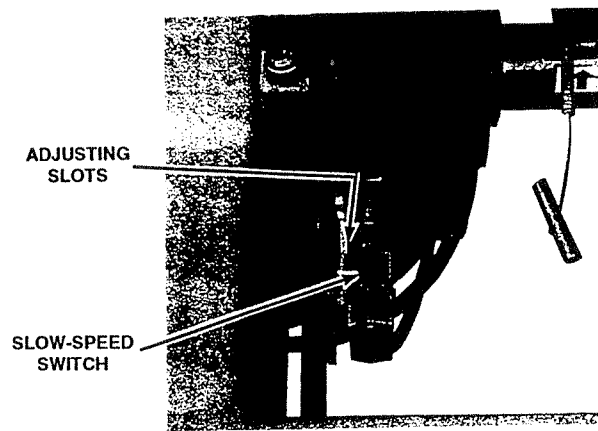
**NOTE**

**When reinstalling pump, grease spline with a high pressure grease.**

(4) Install pump and connect hoses.




**Fig. 4-12 Hydraulic Pump.**



**Fig. 4-13. Slow Down Limit Switch**

2. Slow-Speed Switch Adjustment
  - A. Raise platform approximately six (6) feet.
  - B. Adjust switch in or out to activate circuit at this height (Fig. 4-13). Slow-speed valve will be energized when platform reaches this height, allowing machine to travel in slow speed only.

#### **BRAKE ADJUSTMENT**

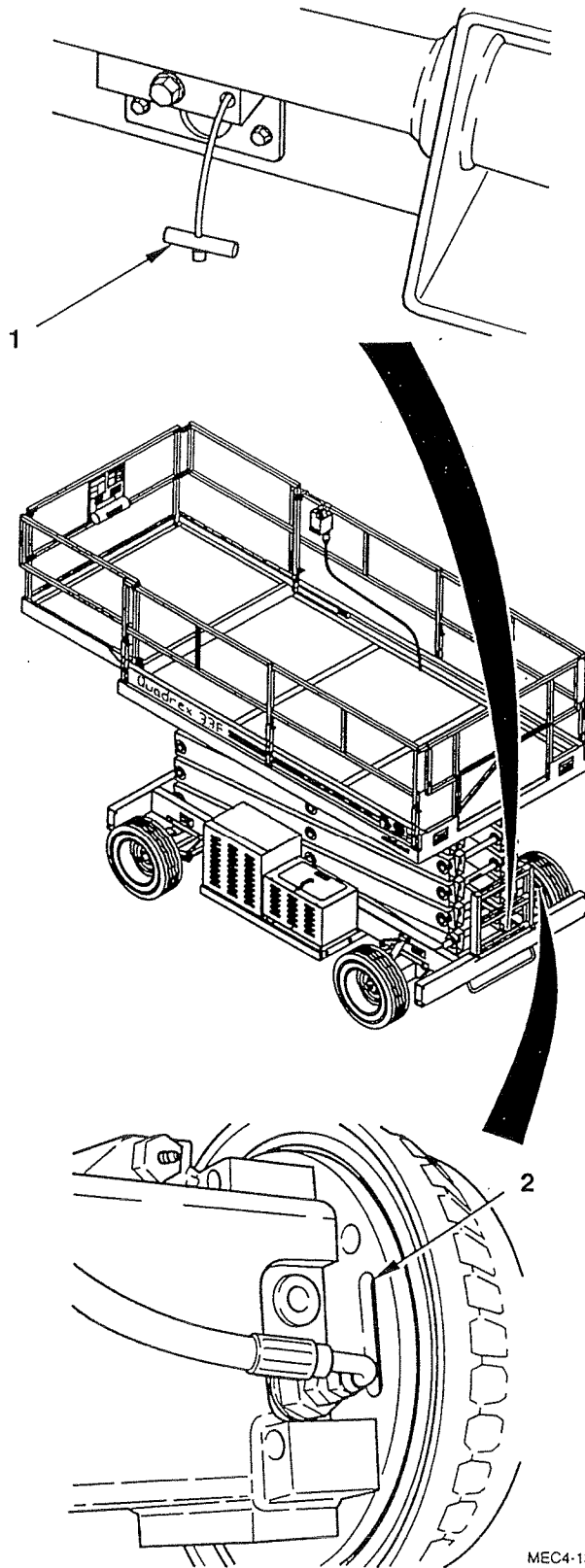
 <b>WARNING</b>
<p><b>THIS PROCEDURE REQUIRES THAT BRAKES BE INOPERABLE WHILE IN DRIVE MODE. ONLY PERFORM THIS PROCEDURE ON A LEVEL SURFACE WITH ENOUGH CLEARANCE IN FRONT OF MACHINE SO IT WILL ROLL TO A STOP OR WITH A BARRIER TO STOP THE UNIT.</b></p>

1. Person A removes upper control box assembly from platform and prepares to drive unit forward while walking beside unit. Person A sets controls for slowest possible ground speed - Slow Speed, Torque switch to off, and Throttle Control to idle.
2. When person A drives unit forward, person B pulls manual brake release ring out to release brakes. Person A releases controls and lets unit coast to a stop.
3. Raise machine enough that ALL tires and wheels are not touching the floor.
4. Using a standard automotive brake adjustment tool, insert one end of tool in vertical slot (2) behind rear axle. Engage tool blade between stars and pry to turn star wheel.
5. Tighten star wheel until star wheel cannot be moved anymore. Then loosen star wheel about 20 clicks or graduations of the star.

#### **NOTE**

**The machine is designed to have the brake on whenever it is not being driven. Properly adjusted brakes should hold machine on an incline which it is capable of climbing.**

6. Lower machine to floor and drive unit to test brakes. Repeat procedure as necessary to obtain proper adjustment.



MEC4-13

**Fig. 4-14 Brake Adjustment**

## LPG FUEL SYSTEM

### **WARNING**

**Before disconnecting any line or component in the LPG fuel system, make sure that all the fuel trapped between the tank and the engine has been used up. To insure this, close the shut off valve on the LPG tank (Figure 13) and then start the engine on LPG. Allow the engine to run until the trapped fuel has been consumed and the engine stops. The trapped fuel is under pressure, and opening any connection in the system will allow the gas to escape at high velocity. The escaping gas can cause severe eye injury, or can propel a fitting or hose at a velocity sufficient to cause bodily injury. Use extreme care when performing maintenance work on the LPG maintenance system.**

If replacement of a component is necessary, use the Parts Catalog figures as a guide. After replacing a component and/or reconnecting a line, test the connection for leaks using an LPG Leakage Tester or equal device. Correct any leakage before returning the machine to operation.

### **Gasoline Fuel System**

If replacement of a gasoline fuel system component is necessary, use the Parts Catalog figures as a guide. Refer to the Engine Service Manual for information on the carburetor and intake manifold.

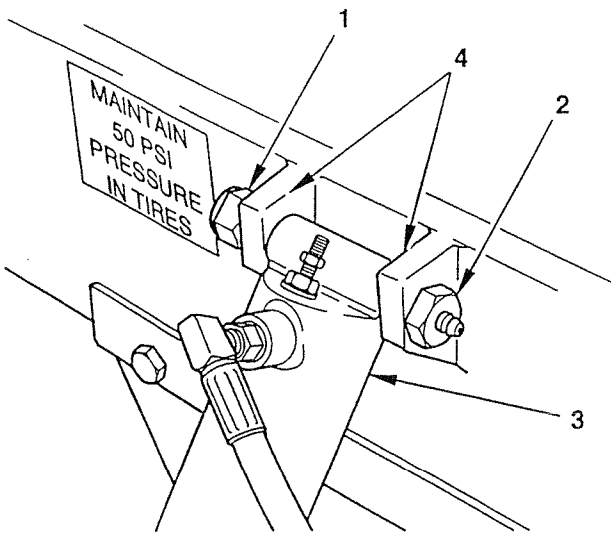
## **BLEEDING AXLE LOCK HYDRAULIC SYSTEM**

### **NOTE**

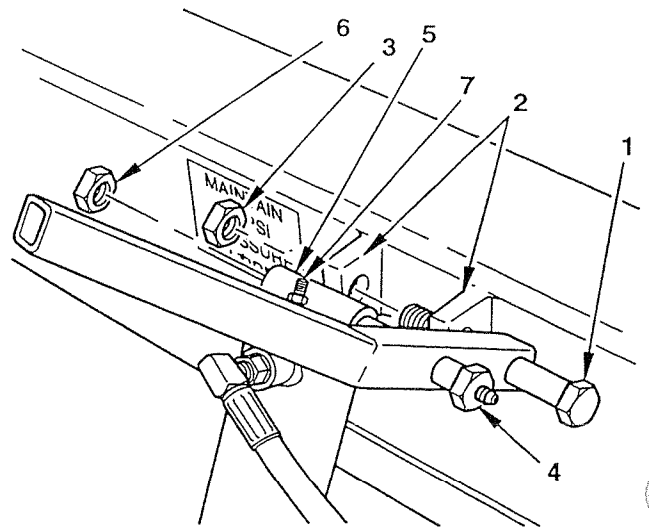
**A special tool is needed to perform this procedure. A drawing of tool with all pertinent information is provided in Figure 4-15. Also, a 5/8" dia. x 5-1/4" long bolt and matching nut and a 3/16" inside diameter x 12 feet long black rubber hose are needed.**

1. Remove lock nut and upper cylinder pin (2) and pull axle locking cylinder (3) out of brackets (4).
2. Insert bolt (1) through bottom hole of tool and through brackets (2) and install a 5/8" nut (3). Do not overtighten nut, tool should pivot freely on pin.
3. Insert upper cylinder pin (4) through upper hole of tool and through upper end (5) of cylinder. Secure with lock nut (6). Do not overtighten lock nut, tool should pivot freely on pin.
4. Jack machine up so that ALL tires are off the ground and remove rear tires.
5. Install one end of a black rubber hose (3/16" inside dia. x 12 ft. long) into filler neck of hydraulic fluid tank. Install other end of hose on bleed valve (7) on top of the cylinder. Open bleed valve.
6. Person A removes upper control box assembly from platform and prepares to drive the unit forward. Person A Sets controls for the slowest possible speed, Slow Speed, Torque switch to Off and Throttle Control to Idle.
7. While Person A drives unit forward, person B pulls up on bleed tool and pushes down on bleed tool. Person B cycles lock cylinder up and down until all air is expelled and only oil comes out. Person B closes bleed valve. Person A releases control switches to stop unit.
8. Repeat this procedure to bleed other lock cylinder.

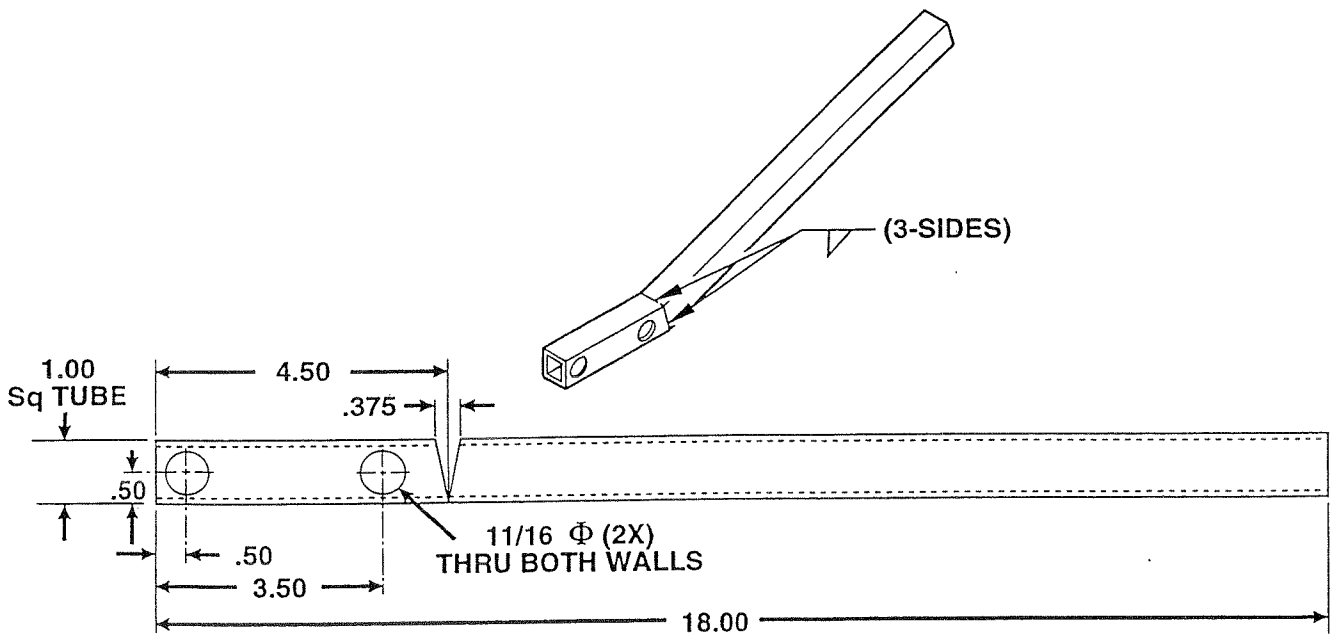
9. Remove hose from bleed valve (7) and raise to a height above hydraulic tank. Secure hose to platform and let fluid drain into hydraulic tank.
10. Align bolt hole in upper end (5) of lock cylinder as best as possible with holes in brackets (2) using bleed tool. Remove lock nut (6) and upper cylinder pin (4) from lock cylinder and bleed tool.
11. Remove nut (3) and bolt (1) from brackets (2) and bleed tool.
12. Place top of lock cylinder (3) between brackets (4) and install upper cylinder pin (2) and secure with lock nut (1).
13. Install rear tires and lower machine to ground.



**Fig. 4-15 Axle Lock Parts**

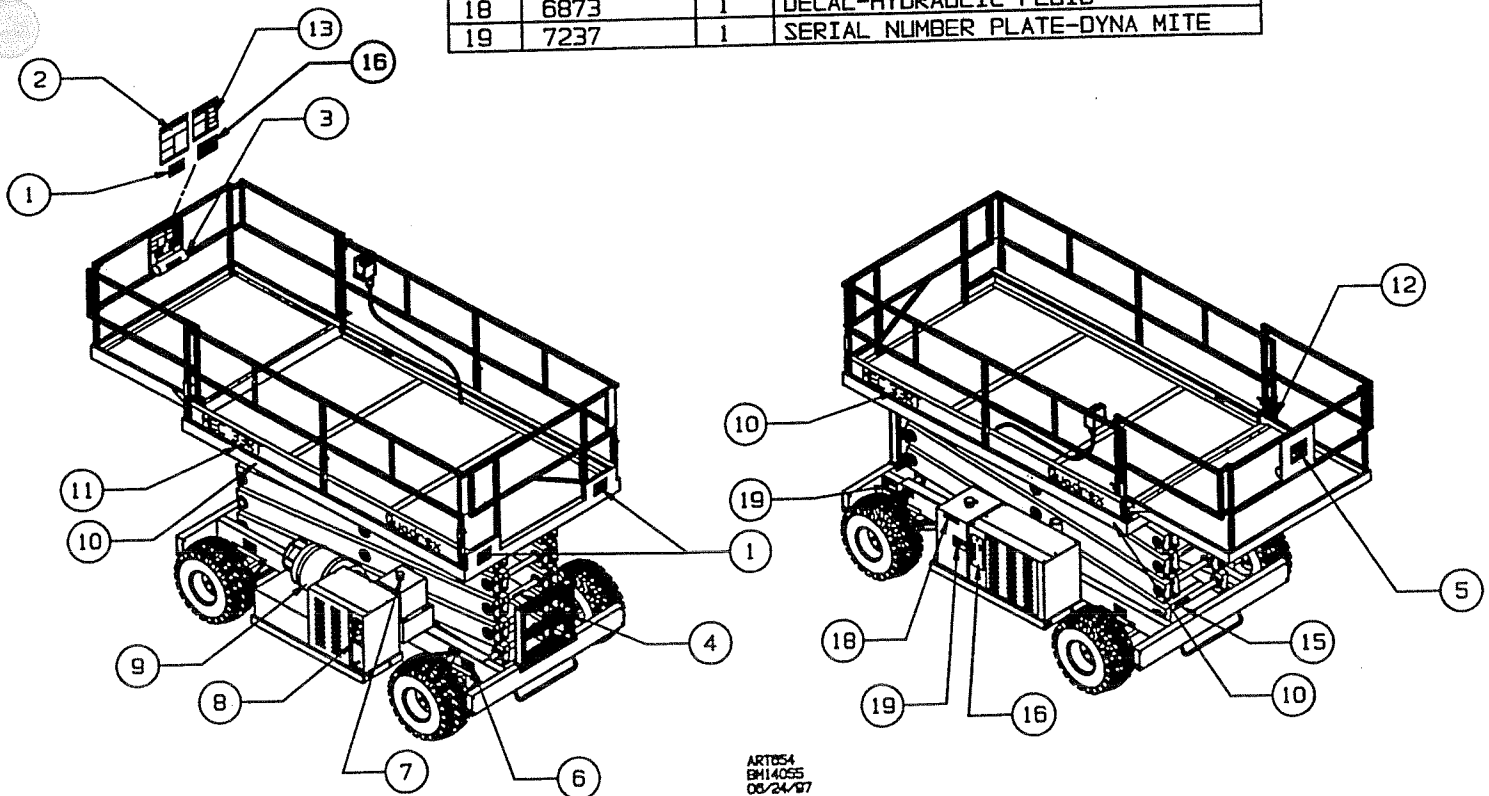


**Fig. 4-16 Bleed Tool Mounting**



**Fig. 4-17 Axle Lock Cylinder Bleed Tool**

ITEM	PART NO.	QTY.	DESCRIPTION
1	7522	3	DECAL-CAPACITY 1250#
2	7527	1	DECAL - CAUTION
3	7253	1	DECAL-MANUAL CASE
4	6794	2	MAINTENANCE LOCK
5	8811	1	DECAL LOGO
6	8502	4	DECAL-TIRE PRESSURE
7	6872	1	DECAL-GASOLINE
8	8674	1	DECAL - BASE LIFT CONTROL
9	6948	1	DECAL-LPG INSTRUCTION
10	8402	16ft	DECAL-RAIL STRIPE-SHIP 150' ROLL
11	8801	2	DECAL-MODEL NUMBER QUADREX 33RT
12	7685	2	DECAL-PLATFORM LOCK
13	7523	1	DECAL-CAUTION ELEC/TIP HAZARDS
14	7686	1	DECAL-LOCK WARNING
15	6557	1	DECAL-EMERGENCY DOWN
16	7420	1	DECAL-ENGINE COMPARTMENT
17	6912	1	DECAL-FUEL CHANGE OVER
18	6873	1	DECAL-HYDRAULIC FLUID
19	7237	1	SERIAL NUMBER PLATE-DYNA MITE



ART054  
 BH14055  
 08/24/87

Fig. 4-18 Decal Replacement

**Major Alterations/Repairs Record**

Signature

Date

Model: \_\_\_\_\_ Performed By: \_\_\_\_\_

Repair/  
Alteration

Date: \_\_\_\_\_ Approved By: \_\_\_\_\_

---

**Part numbers included:**

**Description of Repair/Alteration:**

**Results/Conclusions:**

Reproduce form as needed. Save completed forms for future reference.

**Examination/Test Record**

Signature

Date

Model: \_\_\_\_\_ Performed By: \_\_\_\_\_

Examination/  
Test

Date: \_\_\_\_\_ Approved By: \_\_\_\_\_

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**Description of Examination/Test:**

**Results/Conclusions:**

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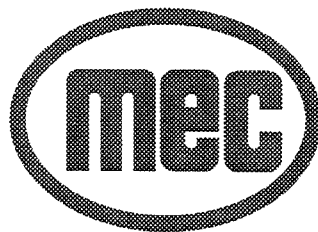
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NOTES

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## **Limited Owner Warranty**

Mayville Engineering Company, Inc. (MEC) warrants its equipment to the original purchaser against defects in material and/or workmanship under normal use and service for one (1) year from date of registered sale or date the unit left the factory if not registered. MEC further warrants the structural weldments of the main frame and scissor arms as defined in MEC's current Warranty Policy & Procedures, to be free from defects in material or workmanship for five (5) years from date of registered sale or date unit left the factory if not registered. Excluded from such warranty is the battery(s) which carries a ninety (90) day warranty from described purchase date and prorated thereafter up to one (1) year. Warranty claims within such warranty period shall be limited to repair or replacement, at MEC's option, of the defective part in question and labor to perform the necessary repair or replacement based on MEC's then current flat rate, provided the defective part in question is shipped prepaid to MEC and is found upon inspection by MEC to be defective in material and/or workmanship. Mayville Engineering Company, Inc. shall not be reliable for any consequential, incidental or contingent damages whatsoever. Use of other than factory authorized parts, misuse, improper maintenance or modification of the equipment voids this warranty. The foregoing warranty is exclusive and in lieu of all other warranties, express or implied. All such other warranties, including implied warranties of merchantability and of fitness for a particular purpose are hereby excluded. No Dealer, Sales Representative, or other person purporting to act on behalf of MEC is authorized to alter the terms of this warranty, or in any manner assume on behalf of MEC any liability or obligation which exceeds MEC's obligations under this warranty.



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