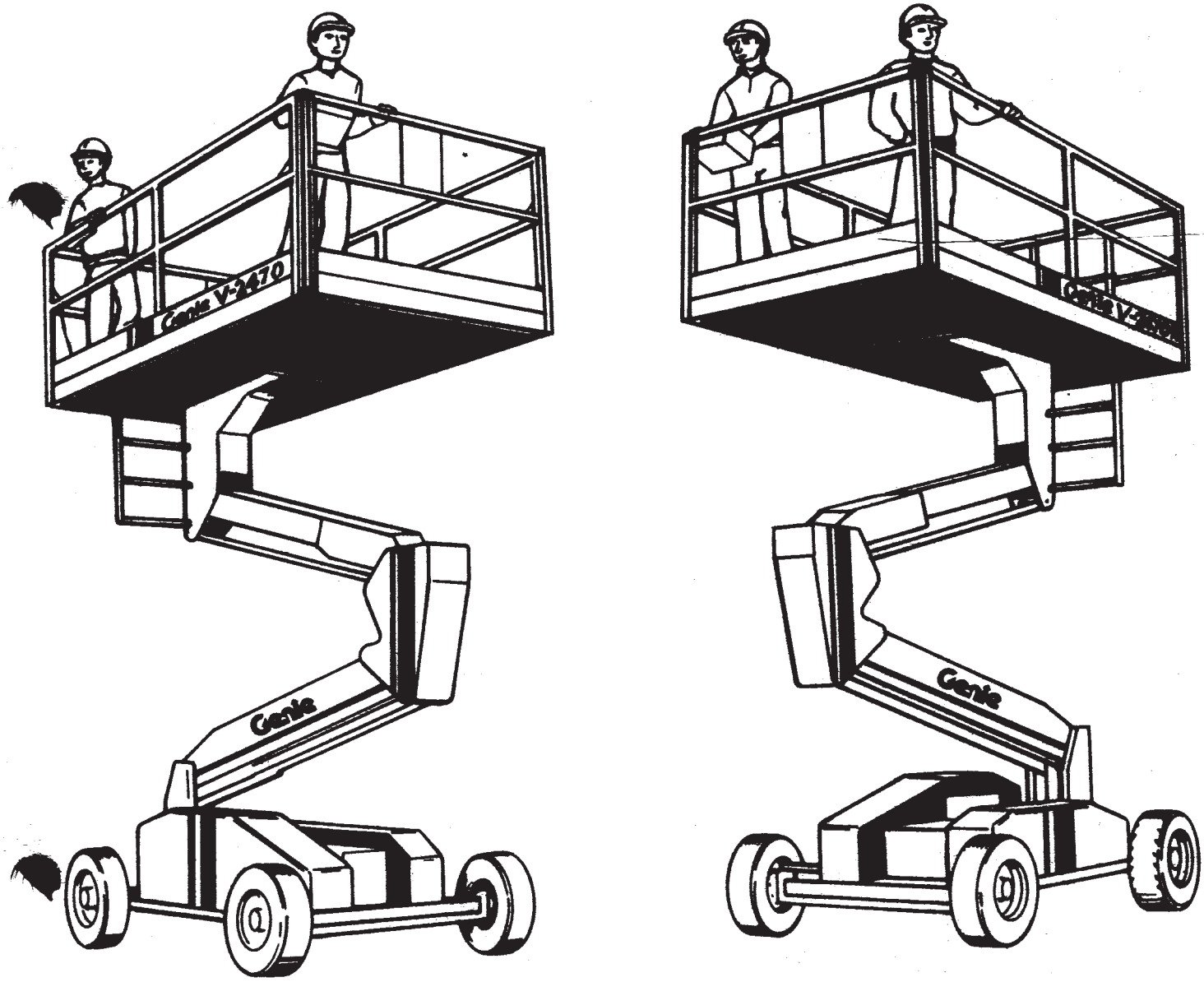
Genie

## V-2470 & V-2470RT

# VERTICAL LIFTS SERVICE AND PARTS MANUAL




Part No. 25184

## CONGRATULATIONS!

You now own the most stable and durable vertical lift on the market today--a Genie Vertical Lift. Genie takes pride in designing products that stand for quality, value, and service. You can be assured that your new Genie Vertical Lift will offer all of these.

This manual has been prepared to assist you with the initial unpacking and operation of your new Genie Vertical Lift. In addition, this manual will illustrate how to transport and troubleshoot the machine, as well as how to perform periodic maintenance.

We have tried to answer all possible questions and project any service situation that you might encounter. But, as with any publication of this type, we cannot guarantee that it is all inclusive. If you have a question or situation that has not been addressed in this manual, please contact us. WE RELY ON YOUR FEEDBACK!

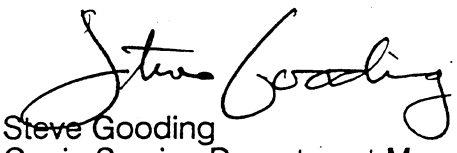
Write: GENIE INDUSTRIES
Attention: Service Manager
18340 North East 76th Street
P.O. Box 69
Redmond, WA 98073-0069

Call: Toll free, 800-426-8089
In Washington state (206) 881-1800

Once again, congratulations on the purchase of your new Genie Vertical Lift. We are confident it will provide you with quality, value and years of service.

Sincerely,

GENIE INDUSTRIES



Steve Gooding
Genie Service Department Manager

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# INTRODUCTION

## 1.1 PURPOSE

This manual provides instructions for the operation and maintenance of the Genie Vertical Lift models V-2470 & V-2470RT. After reading this manual be sure to keep it as a ready reference. If you require further information:


| | |
|---|---|
| Write: | GENIE INDUSTRIES<br>Attn: Customer Service Department<br>18340 N.E. 76th Street<br>P.O. Box 69<br>Redmond, WA 98073-0069 |
| Call: | Toll free, 800-426-8089<br>In Washington state (206) 881-1800 |
| Telex: | 152351 |
| Fax: | (206) 885-4638 |


We are happy to help you and answer any questions you may have about your Genie Vertical Lift.

All information, illustrations and product descriptions contained in this manual are valid at the time of publication.

Genie Industries reserves the right to make changes in design, additions to, or improvements on any Genie products without imposing any obligation upon itself to install them on previously manufactured products.

## 1.2 ITEM DESCRIPTION

### Physical

The Genie Vertical Lift V-2470 & V-2470RT are two person self-propelled, integral frame, elevating work platforms. The machines are capable of elevating personnel, along with their tools and materials, to a platform height of 24 ft. (7.3 m).

**V-2470**: Obstacle clearance is 6 in. (152 mm). High center clearance is 8.25 in. (210 mm). The V-2470 has a stowed height of 7 ft. 9 in. (2.4 m) and a chassis width of 70 in. (1.78 m).

**V-2470RT**: Obstacle clearance is 8.25 in. (210 mm). High center clearance is 10.75 in. (273 mm). The V-2470RT has a stowed height of 7 ft. 11 in. (2.41 m) and a chassis width of 74 in. (1.88 m).

### Power

Power for all machine functions on the Genie V-2470 is provided by stored electrical energy. Power for the machine functions on the Genie V-2470RT is provided by a dual fuel internal combustion engine. All machine functions (for both machines) are operated by a hydraulic pump. The pump supplies hydraulic oil to the machine function actuators (elevate cylinder, steering cylinder, and drive motors) allowing the machine to elevate, steer and drive.

### Movement

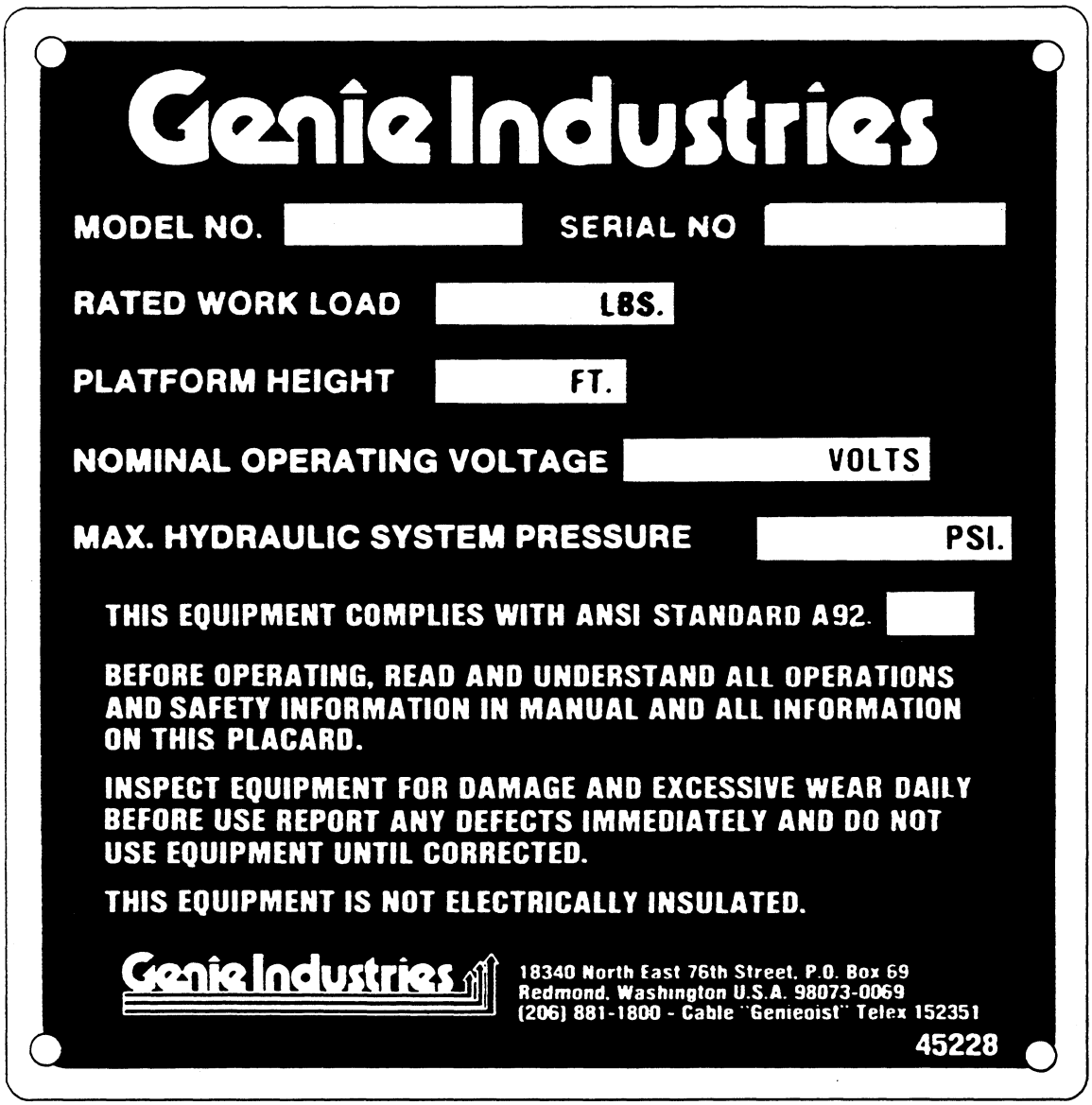
With the platform fully lowered, the machines have a variable drive speed of 0-3 mph (0-4.8 km/h). Drive speed decreases to 0.8 mph (1.3 km/h) when traveling with the platform elevated.

**V-2470**: Gradeability is 25%. When the wheels are turned to maximum in either direction, the Genie V-2470 has an outside turning radius of 16 ft. (4.9 m) and inside turning radius of 8 ft. (2.4 m).

**V-2470RT**: Gradeability is 35%. When the wheels are turned to maximum in either direction, the Genie V-2470RT has an outside turning radius of 17 ft. (5.2 m) and inside turning radius of 9 ft. (2.7 m).

**Note:** For a complete description of Genie Vertical Lift machine functions, refer to sections 3.6 and/or 3.7, Theory of Operation.

## 1.3 IDENTIFICATION




The identification plate (above) is attached to the base weldment (at the time of manufacture) of every Genie Vertical Lift. Refer to the following page for a complete description of each item listed on the plate.

**Model No.** V - 24 70

Refers to Vertical lifting mechanism configuration

Maximum Platform Height (feet)

Platform Width (inches)

**NOTE:** *The "RT" (Rough Terrain) designation on the Genie V-2470RT does not appear on the identification plate.*

## Serial No.

This number identifies a particular machine with reference to the original owner. This number should always be referred to when requesting information or ordering service parts for the machine.

## Rated Work Load

This is the maximum distributed platform capacity. It designates the maximum safe load which can be evenly distributed on the platform at any elevation.

## Platform Height

This is the maximum attainable platform height and is measured from level ground surface to the floor of the platform.

## Nominal Operating Voltage

The number stamped into this box designates the voltage at which the unit operates.

## Maximum Hydraulic System Pressure

This is the maximum achievable operating hydraulic pressure.

## ANSI

This is the standard of the AMERICAN NATIONAL STANDARD INSTITUTE (ANSI) the machine complies to.

## 1.4 OPERATION

The Genie V-2470 & V-2470RT are controlled from the platform control station. This control station consists of a DRIVE Forward/Reverse joystick, a DRIVE SPEED High/Low toggle switch (Genie V-2470 only), STEER Left/Right toggle switch, an ELEVATE Up/Down toggle switch, and on the Genie V-2470RT a START/CHOKE toggle switch.

To operate the machine, the operator turns the key switch to the PLATFORM position and pulls up on the red POWER On/Off button located on the ground control station. The operator may now enter the platform and pull up on the platform control station POWER On/Off button. The Genie V-2470 is now operational. Follow the above instructions for the Genie V-2470RT and add these simple steps: Select the desired fuel (on the ground control station), then actuate the Start/Choke toggle switch to the proper position. The Genie V-2470RT should now be operational.

The machine may then be driven to the work location, and the platform elevated to the task. The chassis may be repositioned while the platform is elevated by driving the machine to the desired position.

**IMPORTANT**: NEVER ELEVATE THE PLATFORM OR DRIVE THE MACHINE WITH THE PLATFORM ELEVATED UNLESS THE MACHINE IS ON A FIRM LEVEL SURFACE.

The ground control station provides controls for the elevate functions, and on the Genie V-2470RT, controls for START/CHOKE and FUEL Select.

In the event of a control circuit or hydraulic system power loss, the machine incorporates a manual lowering valve, located on the elevate cylinder.

At the end of each day the key switch should be turned off. The integral battery charger on the Genie V-2470 should be connected to the appropriate AC power source, and the fuel levels on the Genie V-2470RT should be checked.

**Note:** Refer to the Vertical Lift Operating Instructions in Section 3.3 for detailed instructions on Vertical Lift operation.

# SAFETY

## 2.1 MANDATORY PRECAUTIONS

Your safety is Genie's utmost concern. Please make certain each person operating or servicing the machine reads and understands all of the following precautions. Please do not hesitate to call our Customer Service department toll free at 800-426-8089 if you have any questions regarding the proper use or maintenance of this equipment.

Before using a Genie Vertical Lift, perform the preoperation inspection detailed in section 3.2.

**IMPORTANT:** DO NOT USE DAMAGED EQUIPMENT.

**WARNING:** FAILURE TO COMPLY WITH THE SAFETY REGULATIONS LISTED IN THIS SECTION MAY RESULT IN SERIOUS PERSONAL INJURY AND PROPERTY DAMAGE.

- o DO NOT change operating or safety systems.
- o DO NOT operate any machine on which DANGER, WARNING, CAUTION or instruction placards or decals are missing or illegible.
- o Only those personnel who have demonstrated that they understand safe and proper operation of the machine shall be authorized to operate the machine.
- o Never use the Genie Vertical Lift for any purpose other than positioning personnel, their tools and equipment.
- o Always familiarize yourself with the location and operation of ground control station.
- o Always close gate across entrance after mounting platform.
- o Always use safety belts and lanyards when occupying the platform. The belt should be positioned at the occupant's waist with the lanyard attached in the rear. *

- Never EXCEED THE RATED PLATFORM LOAD or elevate the platform with more than two persons aboard.
- Keep oil, mud and slippery substances cleaned off footwear and platform floor.
- DO NOT stand, sit or climb on the platform guard rail or gate.
- DO NOT attach overhanging loads or increase platform size.
- Never position ladders, steps or similar items on the unit to provide additional height or reach for any purpose.
- Always survey work area for surface hazards such as holes, drop offs, bumps and debris before elevating platform. Do not operate machine near pits, loading docks or other dropoffs.
- Before driving on floors, bridges, trucks and other surfaces, check allowable weight capacity of surfaces.
- Never elevate the platform or drive the machine while elevated unless the machine is on a firm, level surface.
- Always post a look-out and sound the horn when driving in areas where vision is obstructed.
- The operator is responsible for avoiding ground personnel and warning them not to work or walk under an elevated vertical lift.
- Never lower the platform unless the area below the platform and boom is clear of personnel and obstructions.
- Never lean a ladder against the platform or subject the platform to a horizontal or side force by pushing or pulling the platform.
- Always look up and around for overhead obstructions and electrical conductors. Do not operate the machine or position the platform within 10 ft. (3.1 m) of power lines or any other apparatus carrying up to 50,000 volts. One foot (.3 m) additional clearance is required for every additional 30,000 volts.

  **WARNING:** THIS MACHINE IS NOT ELECTRICALLY INSULATED.

- Never use the Genie Vertical Lift as a crane. This may result in structural damage or tipping.
- DO NOT tow the machine unless it is in free-wheel configuration and equipped with provisions for towing.
- DO NOT actuate the DRIVE joystick through Neutral to the opposite direction. Instead, return the lever to Neutral, stop, then proceed in the opposite direction.
- DO NOT change limit switch actuators, interlocks or relief valves from their recommended settings.
- Stow the machine, shut off the key switch and all POWER switches, and on a Genie V-2470RT, close each fuel tank valve before leaving the machine.
- DO NOT recharge batteries near sparks or open flame. Batteries being charged emit highly explosive hydrogen gas.
- Battery acid is corrosive. Wear protective clothing, gloves and safety glasses when servicing.
- **V-2470RT**: Never start the machine if you can smell liquid propane or gasoline.
- **V-2470RT**: Always refuel the machine in an open, well-ventilated area free of flame, smoke, sparks and fire.

* **As required by ANSI A92.6 1979 14.2.6:** "Personnel shall maintain a firm footing on the platform while working thereon unless they are secured by safety harness/lanyard devices fixed to manufacturer-approved hard points."

# OPERATING INSTRUCTIONS

## 3.1 UNPACKING

Upon delivery, it is important to promptly and correctly, unpack and inspect your new Genie Vertical Lift. Follow the steps listed below to unpack the machine. Prior to use, refer to section 3.2 and complete the preoperation inspection.

### Steps

1. Remove all restraints used to secure the machine to the transport vehicle.

2. Close the manual lowering valve located at the base of the elevate cylinder.

3. Ensure that the ramp upon which the machine will be driven is capable of withstanding the 5400 lb. (2449 kg) machine weight [add 200 lbs. (91 kg) for the optional slide deck].

4. On a Genie V-2470, connect the battery packs at the Anderson connectors on each side of the chassis.

5. Before driving the machine off of the transport vehicle, ensure that you understand the functions of the controls (refer to section 3.3, Operating Instructions). Turn the key switch on the ground control station to the PLATFORM position and, for a Genie V-2470RT, move the FUEL SELECT switch to the GAS position. Enter the platform and familiarize yourself with the platform control station. On the Genie V-2470RT, push the START/CHOKE toggle switch to the appropriate position to start the engine.

6. Push the DRIVE joystick in the direction of desired travel. To slow down the machine, move the DRIVE joystick toward the Neutral position. To stop, return the DRIVE joystick to the Neutral position.

## 3.2 PREOPERATION INSPECTION

**IMPORTANT**: IT IS ESSENTIAL THAT THE INFORMATION CONTAINED IN THIS SECTION BE READ AND UNDERSTOOD BEFORE ANY ATTEMPT IS MADE TO OPERATE THE MACHINE.

### Initial Inspection

Before a new Genie Vertical Lift is put into operation, it must be carefully inspected for any evidence of damage resulting from shipment. Use the following check list to detect defective, damaged or improperly installed parts.

### Inspection Prior To Use

Before operating the vertical lift each day, the following inspection should be performed to ensure maximum safety for the machine operator and others using the machine. It is recommended that each user inspect the vertical lift before operation even if the machine has already been put into service by another user. The most efficient method for inspecting your vertical lift is by conducting a brief, but thorough, walk-around inspection.

**IMPORTANT:** NEVER OPERATE A DEFECTIVE MACHINE. ANY DEFECT OR DAMAGE NOTED DURING THIS INSPECTION MUST BE CORRECTED BEFORE THE MACHINE IS USED.

### Steps

**IMPORTANT:** BEGIN THE PREOPERATION INSPECTION WITH THE MACHINE IN THE STOWED POSITION ON A FIRM LEVEL SURFACE.

1. **Overall cleanliness** - Check for hydraulic oil residue and foreign objects. Inspect the surface upon which the machine is resting for any indication of leaks.

2. **Front Tire and Wheel Assemblies** - Check for damaged, loose or missing parts. Look for worn spindles, defective components and hardware, and worn or damaged tires.

3. **Steering Assembly** - Check for damaged, loose or missing parts. Check for loose or bent tie rod. Inspect steering cylinders and hydraulic lines for leaks and proper installation.

4. **Chassis Covers** - Check for damaged, loose or missing parts. Ensure proper operation of latches and wing nuts.

5. **Fuel Tanks (V-2470RT)** - Check for damaged, loose or missing parts. Make sure that the tanks are secure and properly installed.

6. **Battery Charger (V-2470)** - Check for damaged, loose or missing parts. Ensure connecting terminals are secure and free of corrosion. Confirm charger operates properly when plugged into appropriate AC power source.

7. **Batteries** - Check for damaged, loose or missing vent caps. Ensure battery posts and connecting terminals are secure and free of corrosion. Ensure that the hold-down brackets are tight. Check batteries for state of charge, and (if appropriate) check electrolyte levels and specific gravity (between 1.20 and 1.25). Add only clean, distilled water to the battery after charging. Add water to a wet cell battery prior to charging only if it is dry.

8. **Ground Control Station** - Check for damaged, loose or missing parts and confirm that electrical connections are secure and corrosion free. Inspect wiring for insulation damage. Ensure all switches operate properly.

9. **Hydraulic Control Manifold and Hydraulic Power Unit (V-2470)** - Check for damaged, loose or missing parts. Inspect manifold, pump and hydraulic lines for leaks. Ensure motor and solenoid electrical connections are secure and free of corrosion.

10. **Hydraulic Control Manifold and Hydraulic Pump (V-2470RT)** - Check for damaged, loose or missing parts. Inspect manifold pump and hydraulic lines for leaks. Ensure solenoid electrical connections are secure and free of corrosion.

11. **Internal Combustion Engine (V-2470RT)** - Check for damaged, loose or missing parts. Ensure that the engine oil is at the proper level.

12. **Hydraulic Oil Reservoir** - Be sure that the machine is in the stowed position, then check for damaged, loose or missing parts. Ensure that the hydraulic oil level is at approximately the 180°F mark on the oil level/temperature indicator. Inspect the reservoir, oil filters, breather cap, and hydraulic lines for leaks.

13. **Drive Motor and Rear Wheel Assembly** - Check for damaged, loose or missing parts. Inspect drive torque hubs, hydraulic drive motors, drive brakes, and all hydraulic lines for damage and leaks. The torque hubs should be approximately one half full of 90 weight oil.

14. **Placards and Decals** - Ensure that all placards and decals are clean, unobstructed, legible, and in the proper location. Make sure the operating instructions are included at the platform.

15. **Elevate Assembly** - Check for security, damage, loose or missing parts. Make certain that all pivot pins and retaining clips for securing pivot pins are in place. Inspect elevate cylinder and hydraulic lines for leaks.

16. **Platform Assembly** - Check for damaged, loose or missing parts. Ensure that the platform entrance gate and guard rails and the safety belts/lanyards that you plan to use are in good working condition.

17. **Platform Control Station** - Check for damaged, loose or missing parts. Confirm electrical connections are secure and corrosion free. Inspect wiring for insulation damage. Ensure all switches operate properly.

    **IMPORTANT:** PERFORM ALL INSPECTION TESTS WHERE THE PLATFORM IS ELEVATED WITH THE MACHINE POSITIONED ON A FIRM LEVEL SURFACE.

18. **Elevate Function Test** - A test of the elevate function must be performed to ensure proper operation. The test should be executed first from the ground control station and then from the platform control station. The platform should be elevated to its maximum height, then fully lowered. Repair any defects.

19. **Manual Lowering Test** - A test of the manual lowering function must be performed to ensure proper operation. With the platform elevated, operate the manual lowering valve (located at the base of the elevate cylinder) until the platform is fully lowered. Repair any defects.

20. **Drive System Test** - A test of all drive functions must be performed after testing the manual lowering function. With the platform fully lowered, DRIVE Forward/Reverse speed should vary proportionally from zero to approximately 3 mph (4.8 km/h). With the platform elevated, DRIVE Forward/Reverse speed should vary proportionally from zero to a maximum of 0.8 mph (1.3 km/h).

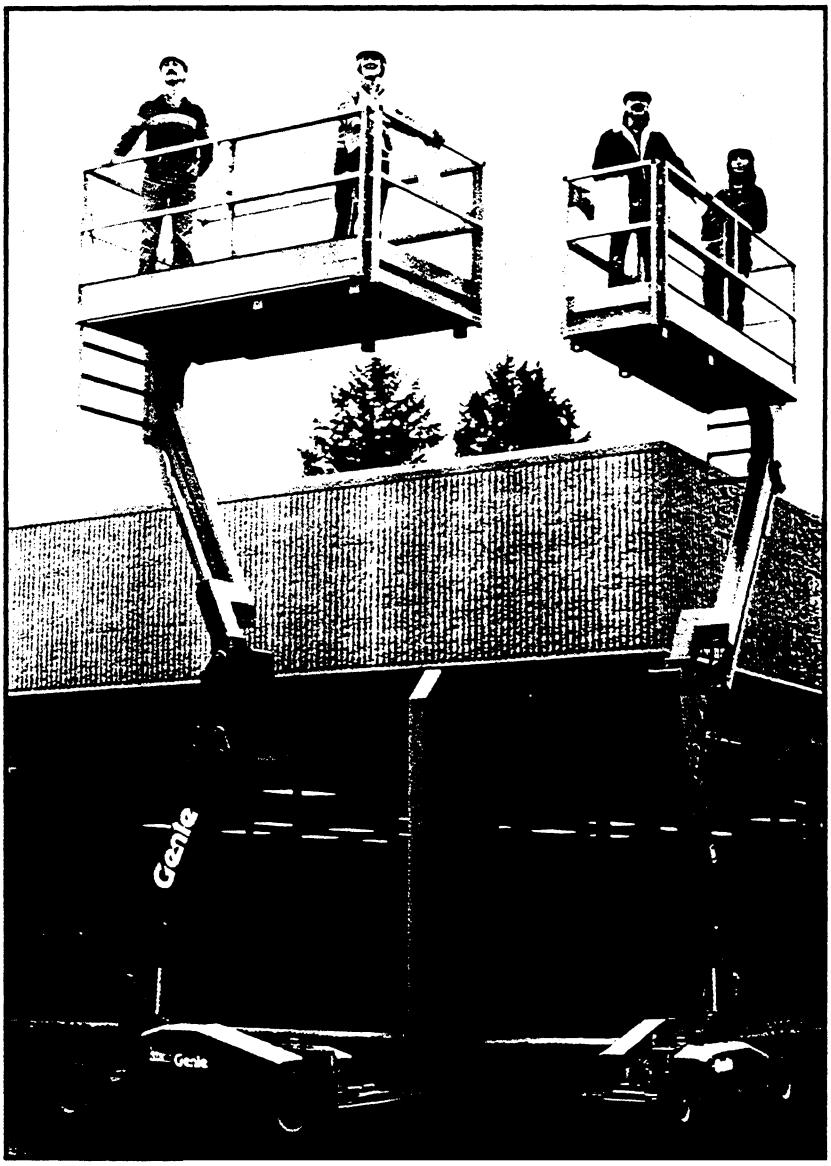
    **IMPORTANT:** DO NOT OPERATE THE MACHINE IF IT IS CAPABLE OF DRIVING FASTER THAN 0.8 mph (1.3 km/h) WITH THE PLATFORM ELEVATED (refer to section 4.5, Troubleshooting).

    Operate the STEER Left/Right function to ensure proper operation in both directions. Check that the drive brakes hold when the machine is driven up a grade and stopped. Do not operate the machine if the brakes do not hold. Repair any defects.

## 3.3 OPERATING INSTRUCTIONS

Refer to the following inserts for Genie V-2470 & V-2470RT Operating Instructions.

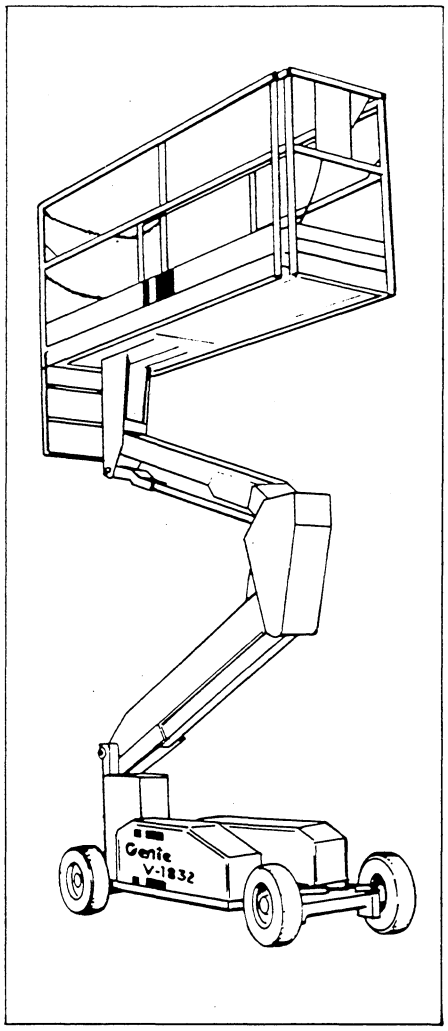
# GENIE VERTICAL LIFT
# (Models V-1832, V-1854 & V-2470)
# OPERATING INSTRUCTIONS



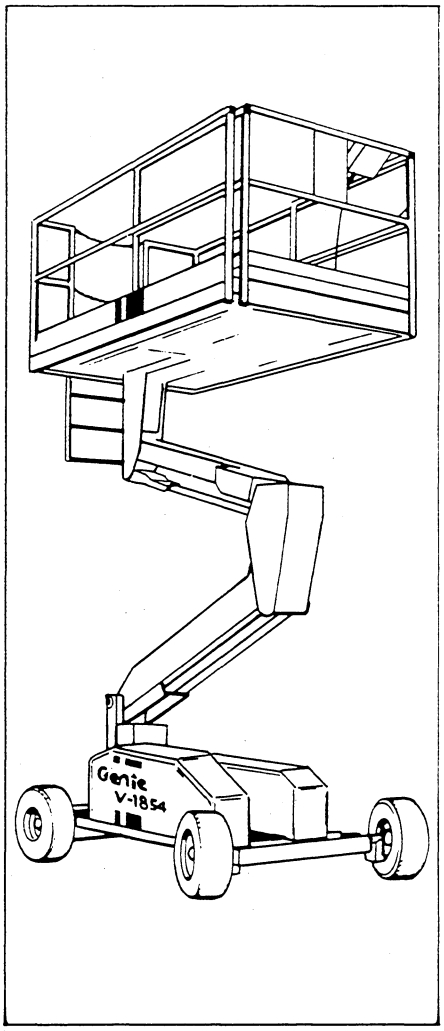

Part No. 20955

**CAUTION**

Understanding these Safety Rules and Operating Instructions is critical to the safe operation of Genie Vertical Lifts. Please study this brochure carefully, and make sure that all personnel using the Genie Vertical Lift read and understand it completely before using this equipment.




GENIE V-1832

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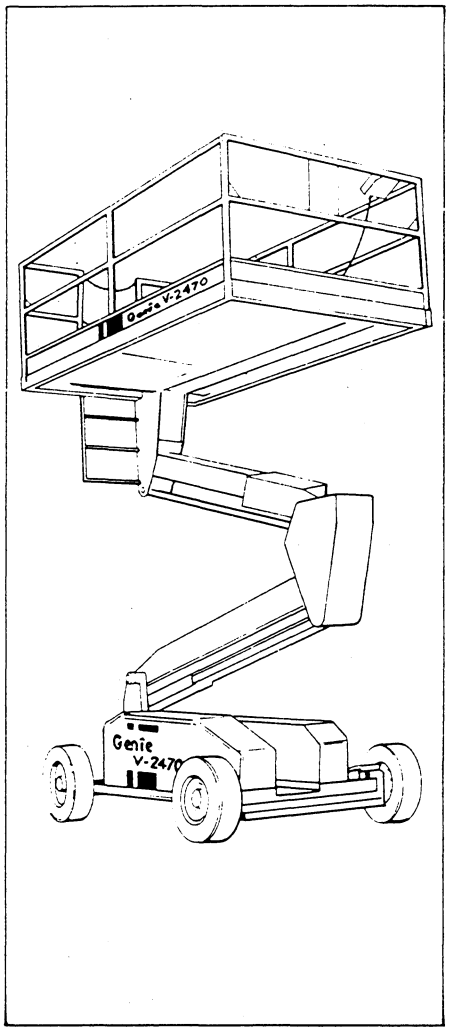
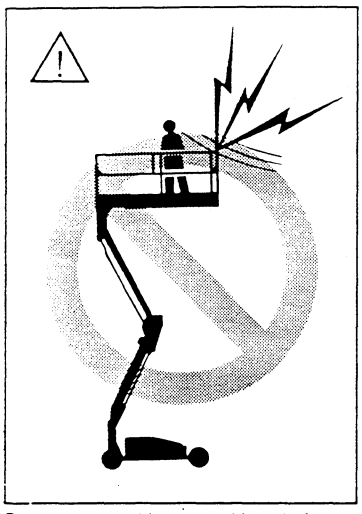



GENIE V-2470

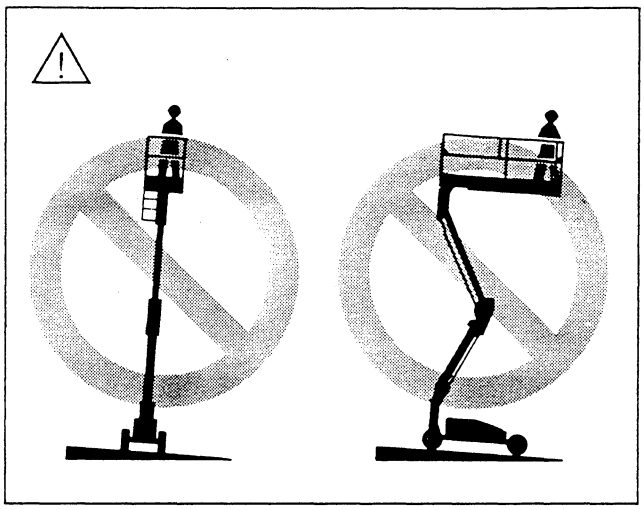
# SAFETY RULES & OPERATING INSTRUCTIONS

Read and understand these Safety Rules and Operating Instructions before operating the Genie Vertical Lift aerial platform. Do not permit anyone to use the machine who does not understand the material in this document. A duplicate set of these instructions is contained in a water-tight plastic tube on the platform and should be kept there at all times for operator reference.

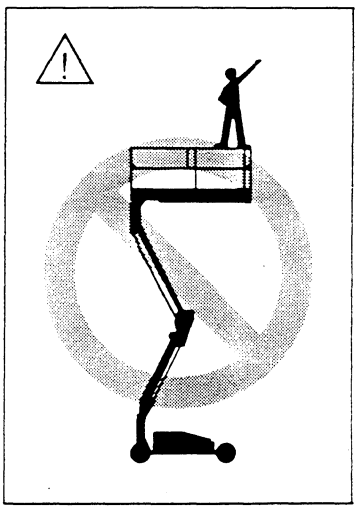
If there is anything you do not understand, or if you have questions regarding the operation of the Genie Vertical Lift, call Genie Industries in the U.S.A., 800/426-8089 or 206/881-1800, or telex 152351, or FAX 206/885-4638. In Canada call 800/663-4475 or 604/984-4242, or FAX 604/988-2662.



Do not use machine or position platform within 10 feet (3m) of power lines. This machine is not electrically insulated.



Do not raise platform unless machine is on firm level surface



Do not stand on guard rails. Securely place working loads on platform floor

# SAFETY RULES

- On a daily basis before using the Genie Vertical Lift, conduct a visual inspection and functional test as detailed on pages 4-5 of these operating instructions and on the operating instructions on the unit.
- Check the area in which the aerial platform is to be used for possible hazards such as drop-offs, holes, bumps and floor obstructions, debris, overhead obstructions and high voltage conductors.
- The aerial platform must be on a firm level surface before elevating the platform. Do not drive while elevated except on a firm level surface.
- Close platform access openings before operating the aerial platform.
- Batteries must be charged in an open, well-ventilated area free of flame, smoke, sparks, and fire.

  ⚠ Batteries emit an explosive gas during charging.

- Maintain firm footing on the platform floor. Do not sit, stand or climb on guard rails.
- Working loads must be securely placed on platform floor. Do not attach overhanging loads. Do not use ladders or scaffolding on or against the platform.
- Do not operate or position aerial platform within 10 feet (3m) of power lines.

  ⚠ This machine is not electrically insulated.

WARNING: FAILURE TO UNDERSTAND AND FOLLOW ALL SAFETY RULES AND OPERATING INSTRUCTIONS MIGHT RESULT IN SERIOUS INJURY OR DEATH.

# PRE-OPERATIONAL & SAFETY INSPECTION

**PRE-START**

- DO NOT OPERATE A DEFECTIVE MACHINE.
- Make a walk around check of machine before operating.
- Inspect for frayed control cables, hydraulic oil leaks, missing or loose bolts, proper tire pressure, missing or loose wheel lug nuts, weld or structural cracks and any other defects or missing parts.
- Check battery pack condition and hydraulic oil level.

**GROUND CONTROL TEST**

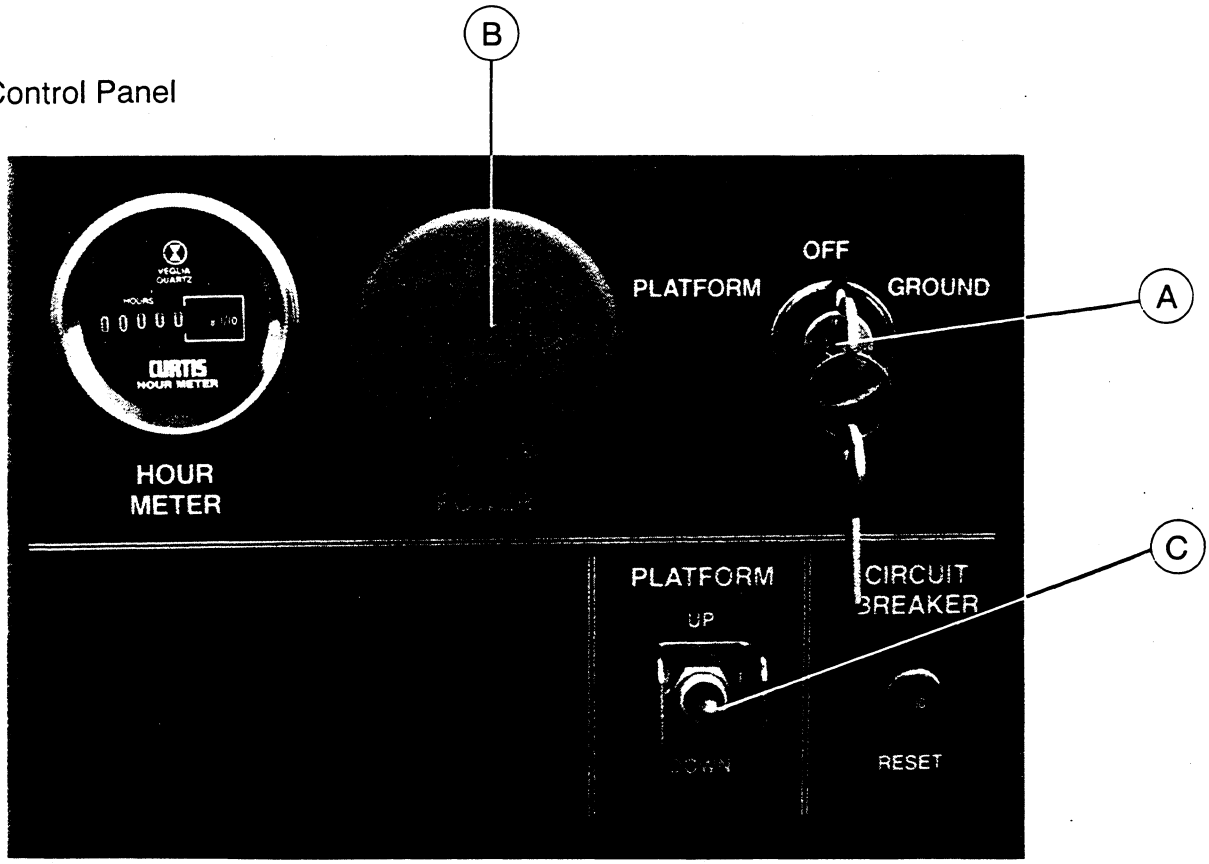
- DO NOT ELEVATE PLATFORM UNLESS MACHINE IS ON A FIRM LEVEL SURFACE.
- Make sure batteries are properly connected.
- Check overhead for personnel, electrical cables, lights and other obstructions before operating.
- Insert key in control switch (Photo 1, detail A) and rotate to GROUND.
- Pull out red POWER button. To stop all functions, push in red POWER button (Photo 1, detail B).
- Operate PLATFORM switch in both directions to ensure proper operation (Photo 1, detail C). Repair any defective functions.
- Switch key to PLATFORM (Photo 1, detail A).

**PLATFORM CONTROL TEST**

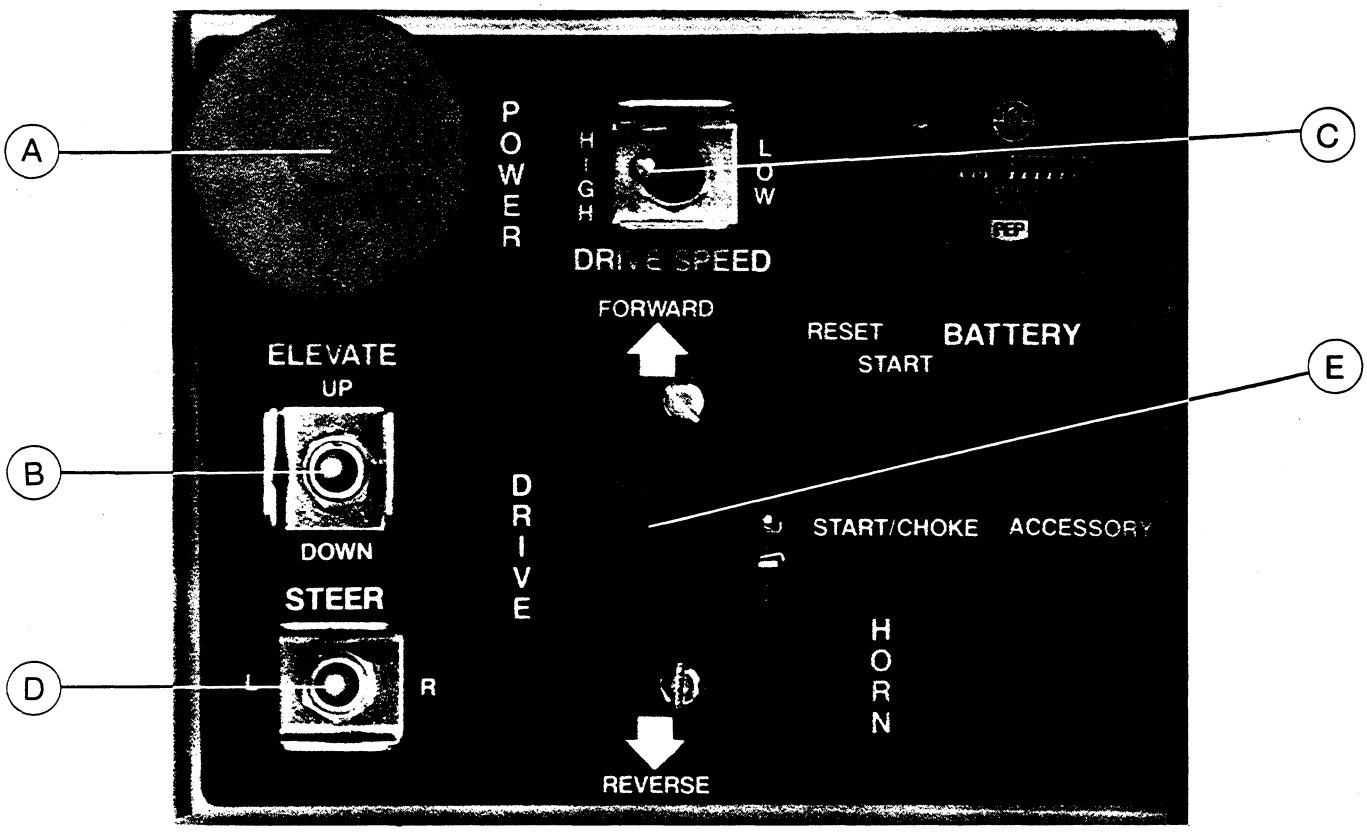
- DO NOT OPERATE A DEFECTIVE MACHINE.
- Check surface area for possible drop-offs, holes, bumps, floor obstructions and personnel before driving or steering. DO NOT ELEVATE PLATFORM UNLESS MACHINE IS ON A FIRM LEVEL SURFACE.
- Make sure platform access closure is closed completely.
- Pull out red POWER button. To stop all functions, push red POWER button (Photo 2, detail A).
- Operate horn. Repair if it does not sound.
- Operate ELEVATE switch in both directions to ensure proper operation (Photo 2, detail B).
- Switch DRIVE SPEED (Photo 2, detail C) to LOW.
- Operate STEER switch L (left) or R (right) (Photo 2, detail D). Repair any defective functions.
- Move DRIVE lever just off center in both FORWARD and REVERSE directions to ensure proper operation of each (Photo 2, detail E). Repair any defective functions. NOTE: LIFT MECHANICAL LOCK ON DRIVE LEVER TO MOVE FORWARD OR REVERSE.
- Switch DRIVE SPEED (Photo 2, detail C) to HIGH.
- Move DRIVE lever just off center in both FORWARD and REVERSE directions to ensure proper operation of each (Photo 2, detail E). Repair any defective functions.

Contact your authorized Genie Service Center for information regarding service and repairs.

— Ground Control Panel




? — Platform Control Panel



# OPERATING INSTRUCTIONS

BEFORE OPERATING MACHINE UNDERSTAND FUNCTIONS OF ALL CONTROLS

**EMERGENCY STOP**

- To deactivate elevate and drive control, push red POWER button (Photo 2, detail A). Operate all functions to test for proper shut down. Repair if any function operates with POWER button pushed in.

**RAISING AND LOWERING PLATFORM**

- DO NOT ELEVATE PLATFORM UNLESS MACHINE IS ON A FIRM LEVEL SURFACE.
- Check below and overhead for personnel, electrical cables, lights and other obstructions before raising or lowering platform.
- Make sure platform access closure is closed completely.
- Operate ELEVATE toggle switch UP or DOWN in desired motion direction (Photo 2, detail B).

**TRAVELING WITH PLATFORM DOWN**

- Maximum travel speed is attainable only when platform is down.
- Always check to be sure route is clear of persons and obstructions.
- Select HIGH or LOW drive speed to meet travel and safety conditions (Photo 2, detail C).
- To increase speed, move DRIVE lever slowly in desired direction of travel (Photo 2, detail E).
- To slow down to stop, move DRIVE lever slowly to center position (Photo 2, detail E).

**TRAVELING WITH PLATFORM UP**

- OPERATE ON FIRM LEVEL SURFACE ONLY.
- Always check to be sure route is clear of persons and obstructions.
- With platform up, machine travel speed is restricted.
- To increase speed, move DRIVE lever in desired direction of travel (Photo 2, detail E).
- To slow down or stop, move DRIVE lever slowly to center position (Photo 2, detail E).

**AUXILIARY LOWERING**

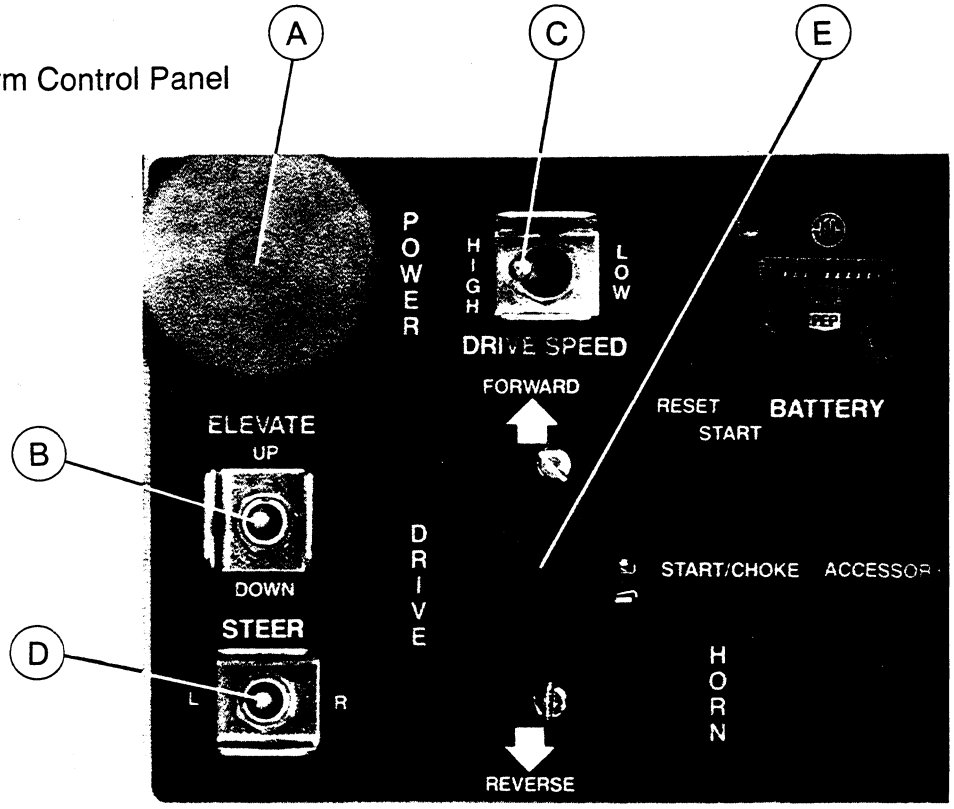
- IF PLATFORM FAILS TO DESCEND, NEVER CLIMB DOWN ELEVATE ASSEMBLY. Ask person on ground to actuate manual lowering valve to lower platform (Photo 3). The manual lowering valve is attached to the base of the elevate cylinder at the ground control station. Check for obstructions before lowering platform.

**SLIDE DECK (Accessory)**

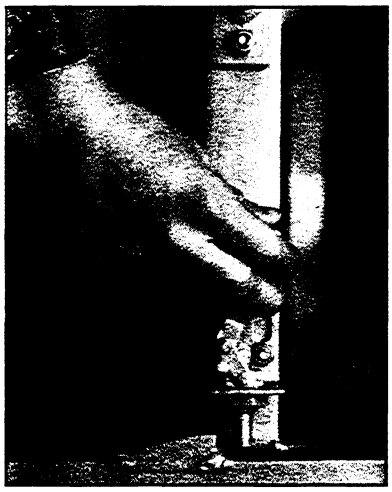
- Push down on slide deck latch (photo 4) until pin is completely disengaged.
- Grasp the slide deck handle (photo 5) and push out platform deck.
- Pull up on slide deck latch until pin is completely engaged to lock slide deck.

| MAXIMUM PLATFORM CAPACITY | | LOAD DISTRIBUTION | |
|---|---|---|---|
| MODEL | STANDARD PLATFORM (or optional slide deck retracted) | PLATFORM WITH OPTIONAL SLIDE DECK EXTENDED LOAD CAPACITY ON PLATFORM | LOAD CAPACITY ON EXTENSION DECK |
| V-1832 | 750 lbs. (335 kg) | 450 lbs. (200 kg) | 300 lbs. (135 kg) |
| V-1854 | 1000 lbs. (460 kg) | 700 lbs. (325 kg) | 300 lbs. (135 kg) |
| V-2470 | 1250 lbs. (570 kg) | 950 lbs. (435 kg) | 300 lbs. (135 kg) |

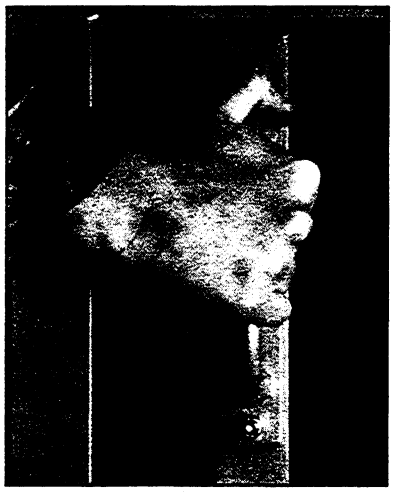
2 — Platform Control Panel




3 — Auxiliary Lowering



4 — Slide Deck Latch



5 — Slide Deck Handle

# TRANSPORT

## SECURING TO TRUCK OR TRAILER FOR ROAD TRANSIT

- Weight of Genie V-1832 is 3,800 lbs. Weight of Genie V-1854 is 4,000 lbs. Weight of Genie V-2470 is 5,200 lbs.
- Use chains or straps of ample load capacity.
- Always chock wheels on truck or trailer bed (see instructional decal on machine).
- Use tie points on chassis for anchoring down to truck or trailer bed (see instructional decal on machine).
- Turn off master power key and remove key before transporting (Photo 6).

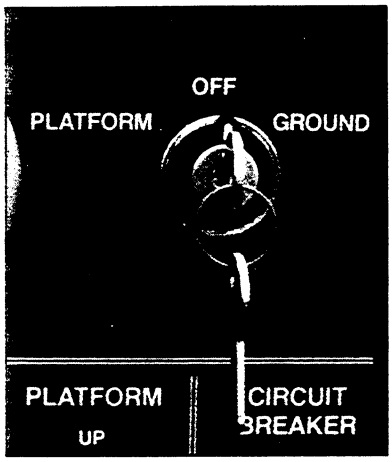
## MOVING A DISABLED MACHINE

To release brake:

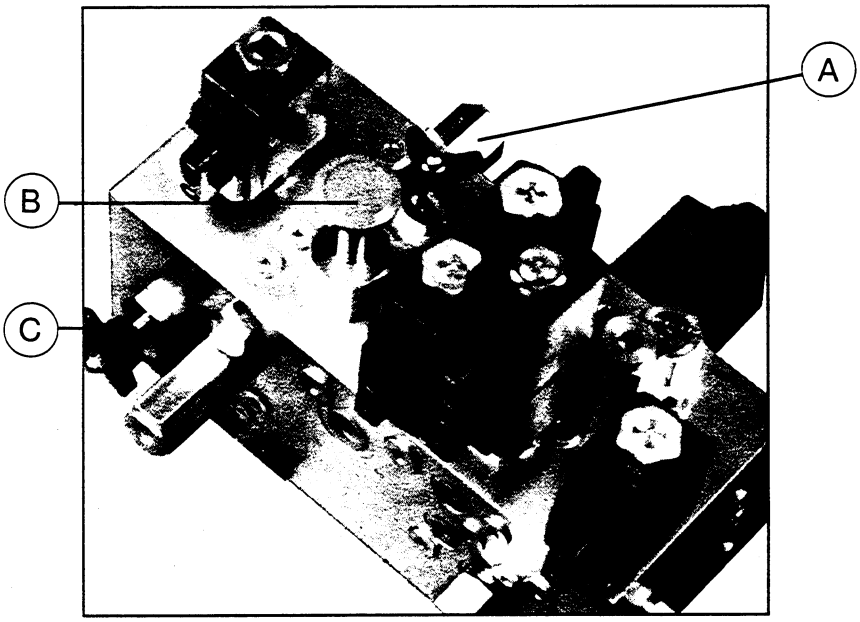
- Close brake isolator valve (Photo 7, detail A) by turning it clockwise.
- Pump the brake release pump (Photo 7, detail B) 5-10 times.
- Open drive motor loop valve (Photo 7, detail C) by turning it counterclockwise.

To re-engage brake:

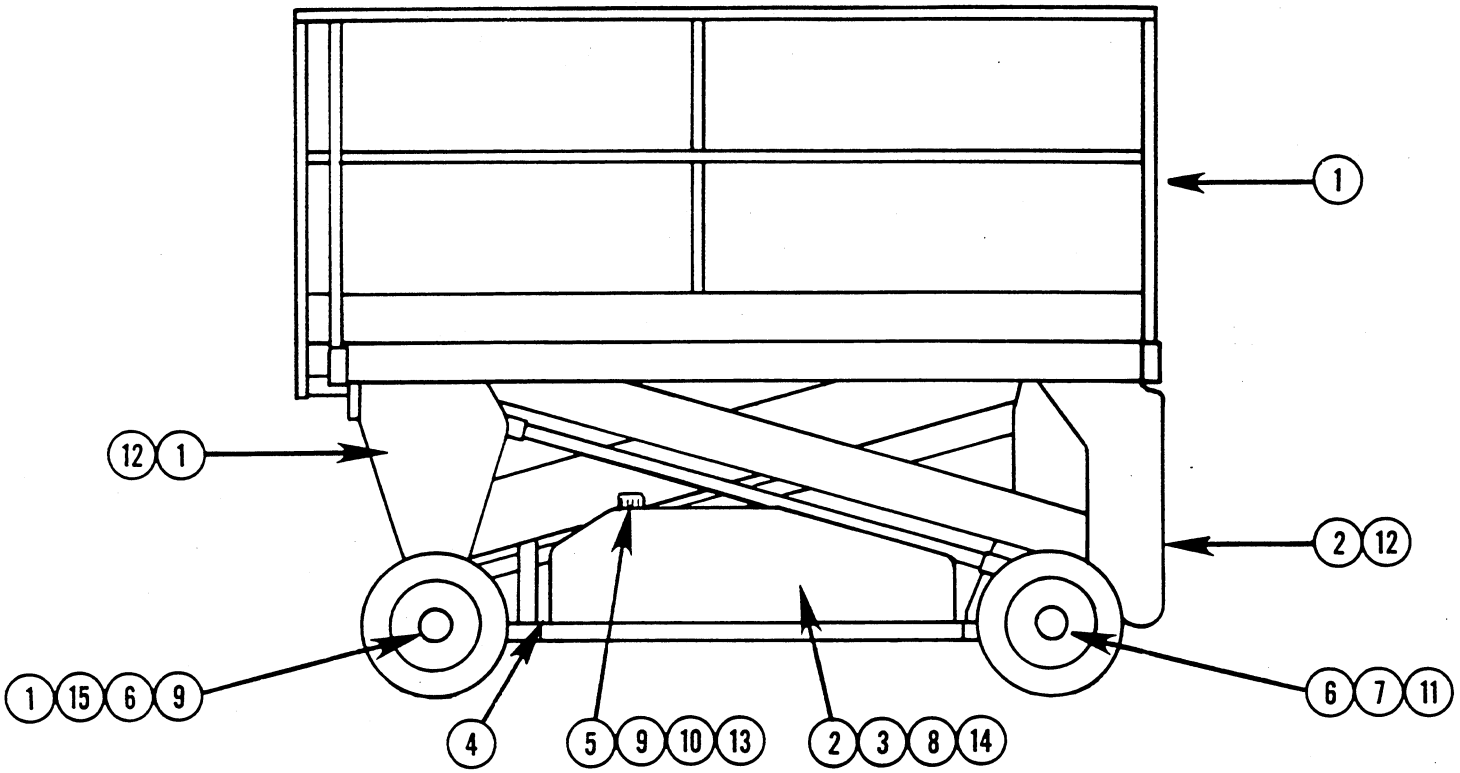
- Open brake isolator valve (Photo 7, detail A) by turning it counterclockwise.
- Close drive motor loop valve (Photo 7, detail C) by turning it clockwise.




6 — Master Power Key




7 — Brake Release




## Maintenance Schedule

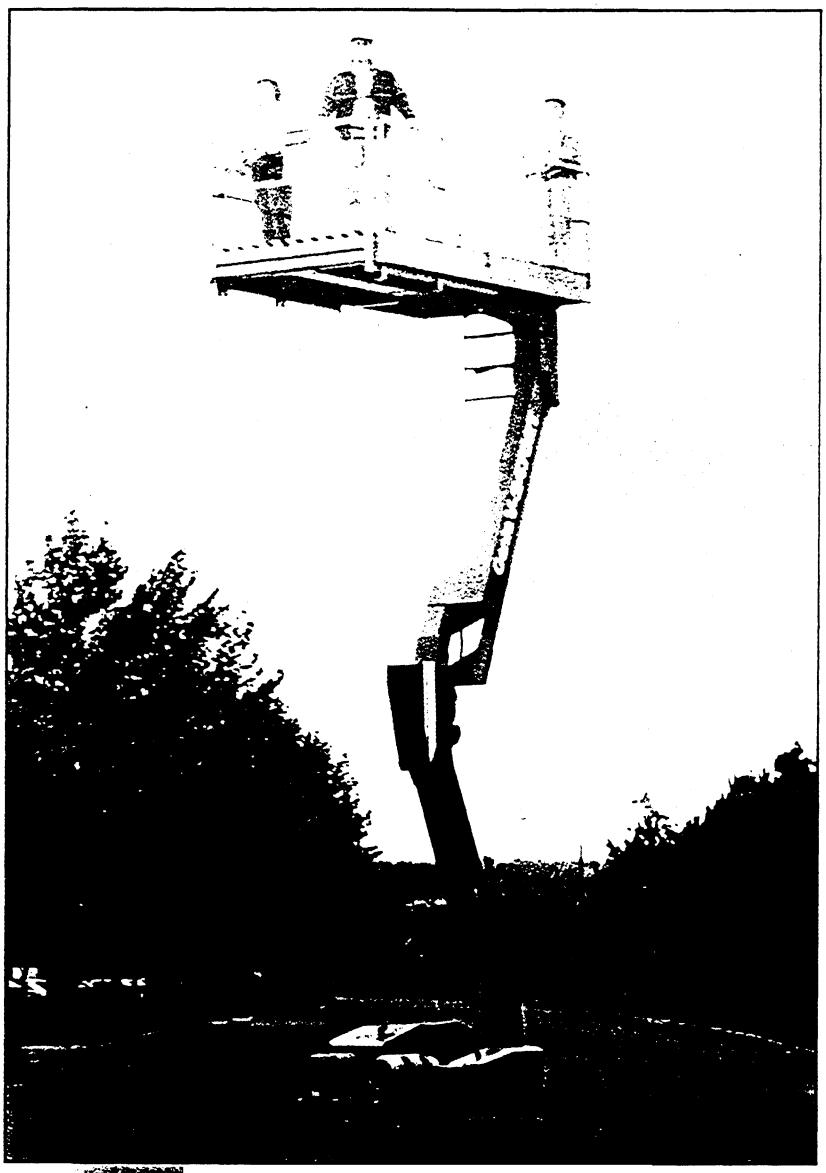
| SERVICE OPERATION | SERVICE INTERVAL | | | |
|---|---|---|---|---|
| | *Daily | * Monthly or Every 50 hours | * Every 6 months or Every 250 hours | * Every 2 yrs. or Every 1000 hrs. |
| (1) Inspect for physical damage | • | | | |
| (2) Inspect for hydraulic leaks | • | | | |
| (3) Check battery fluid level** | • | | | |
| (4) Charge batteries | • | | | |
| (5) Check hydraulic fluid level | • | | | |
| (6) Check lug nuts * | • | | | |
| (7) Check brake operation, bleed if necessary | • | | | |
| (8) Check battery condition** | | • | | |
| (9) Clean or replace hydraulic tank screen | | | • | |
| (10) Change hydraulic filter | | | • | |
| (11) Change oil in drive gear box (model V-2470 only) | | | • | |
| (12) Inspect all boom linkage pivot points for wear | | | • | |
| (13) Change hydraulic oil | | | | • |
| (14) Check electric motor brushes | | | | • |
| (15) Repack front axle bearings | | | | • |

* For complete list of required Maintenance Service consult Operating and Maintenance Manual.

** Applies to standard (non-maintenance-free) batteries only

# GENIE VERTICAL LIFT
# V-270RT

# OPERATING INSTRUCTIONS



Part No. 20956

**CAUTION**

Understanding these Safety Rules and Operating Instructions is critical to the safe operation of Genie Vertical Lifts. Please study this brochure carefully, and make sure that all personnel using the Genie Vertical Lift read and understand it completely before using this equipment.

Genie Industries

# SAFETY RULES & OPERATING INSTRUCTIONS

Read and understand these Safety Rules and Operating Instructions before operating the Genie Vertical Lift aerial platform. Do not permit anyone to use the machine who does not understand the material in this document. A duplicate set of these instructions is contained in a water-tight plastic tube on the platform and should be kept there at all times for operator reference.

If there is anything you do not understand, or if you have questions regarding the operation of the Genie Vertical Lift, call Genie Industries in the U.S.A., 800/426-8089 or 206/881-1800, or telex 152351, or FAX 206/885-4638. In Canada call 800/663-4475 or 604/984-4242, or FAX 604/988-2662.

# SAFETY RULES

- On a daily basis, before using the Genie Vertical Lift, conduct a visual inspection and functional test as detailed on pages 4, 5 and 6 of these operating instructions and on the operating instruction decal located on the platform.

- Check the area in which the Vertical Lift is to be used for possible hazards such as drop-offs, holes, bumps and floor obstructions, debris, overhead obstructions and high voltage conductors.

- The machine must be on a firm level surface before elevating the platform. Do not drive while elevated except on a firm level surface.

- Make sure platform entrance is properly closed before operating the Vertical Lift.

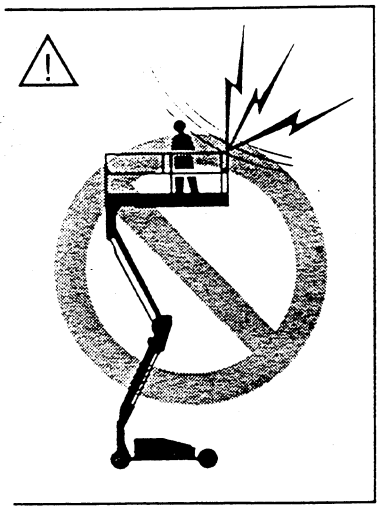
- Fasten occupants' safety belt lanyards to anchor points on platform. *

- Do not climb down the elevate assembly.

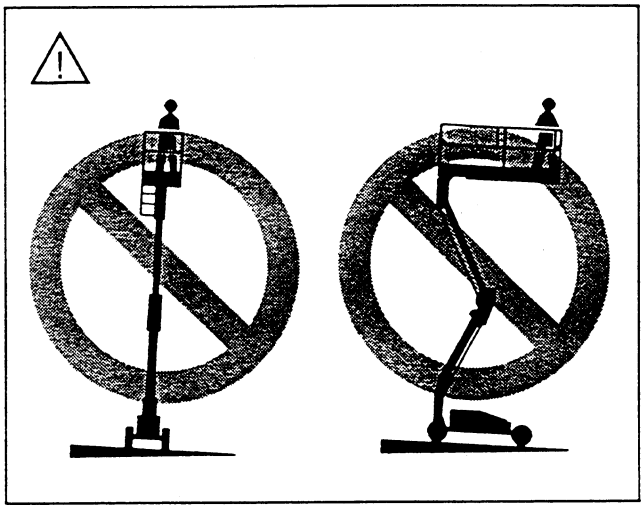
- Maintain a firm footing on the platform floor. Do not sit, stand or climb on guard rails or gate. *

- Working loads must be securely placed on platform floor. Do not attach overhanging loads. Do not use ladders or scaffolding on or against the platform. *

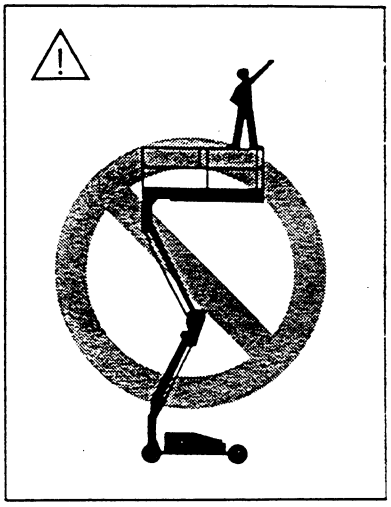
* As required by ANSI A92.6 1979 14.2.6.



'o not use machine or position platform
'ithin 10 feet (3m) of power lines.
his machine is not electrically insulated.



Do not raise platform unless
machine is on firm level surface.



Do not stand on guard rails. Securely place
working loads on platform floor.

# SAFETY RULES

- Do not operate or position the Vertical Lift within 10 ft. (3 m) of power lines.

  ⚠ THIS MACHINE IS NOT ELECTRICALLY INSULATED.

- Battery must be charged in an open, well-ventilated area free of flame, smoke, sparks and fire.

  ⚠ BATTERIES EMIT AN EXPLOSIVE GAS DURING CHARGING.

- Machine must be refueled in an open, well-ventilated area free of flame, smoke, sparks and fire.

  ⚠ LIQUID PROPANE & GASOLINE ARE EXTREMELY FLAMMABLE.

  ⚠ NEVER START THE MACHINE IF YOU CAN SMELL LIQUID PROPANE OR GASOLINE. AN EXPLOSION OR FIRE COULD RESULT!

**WARNING: FAILURE TO UNDERSTAND AND FOLLOW ALL SAFETY RULES AND OPERATING INSTRUCTIONS MIGHT RESULT IN SERIOUS INJURY OR DEATH.**

# PRE-OPERATIONAL & SAFETY INSPECTION

## PRE-START

- DO NOT OPERATE A DEFECTIVE MACHINE.
- Make walk-around check of machine before operating.
- Inspect for frayed control cables, hydraulic oil leaks, gasoline or liquid propane leaks, missing or loose bolts, proper tire pressure, missing or loose wheel lug nuts, weld or structural cracks and any other missing parts or defects.
- Check hydraulic oil level (Photo 1, detail A).

## GROUND CONTROL TEST

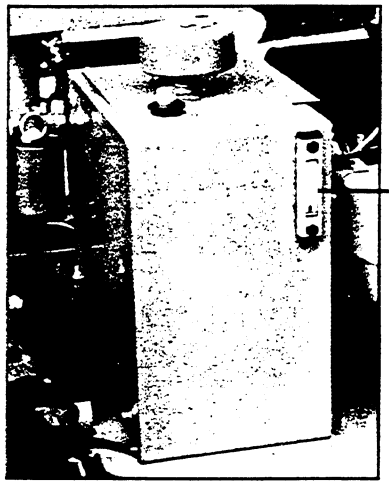
- DO NOT ELEVATE PLATFORM UNLESS MACHINE IS ON A FIRM LEVEL SURFACE.
- Check overhead for personnel, electrical cables, lights and other obstructions before operating.
- Insert key in key switch and turn to GROUND position (Photo 2, detail A).
- Pull out red POWER button. To stop all functions, push in red POWER button (Photo 2, detail B).
- WARNING! NEVER START MACHINE IF YOU CAN SMELL LIQUID PROPANE (LP) OR GASOLINE (GAS). AN EXPLOSION OR FIRE COULD RESULT!
- Select GAS or LP . If engine is cold, push engine start switch in START/CHOKE position. If engine is hot, push switch in START position (Photo 2, detail C).

  NOTE: 1. When it is very cold, always start engine on GAS and then switch to LP if required (Photo 2, detail D).
  2. If engine fails to start after 30 seconds, determine cause and wait one minute before recranking.
- Operate PLATFORM toggle switch UP then DOWN to ensure proper operation (Photo 2, detail E).

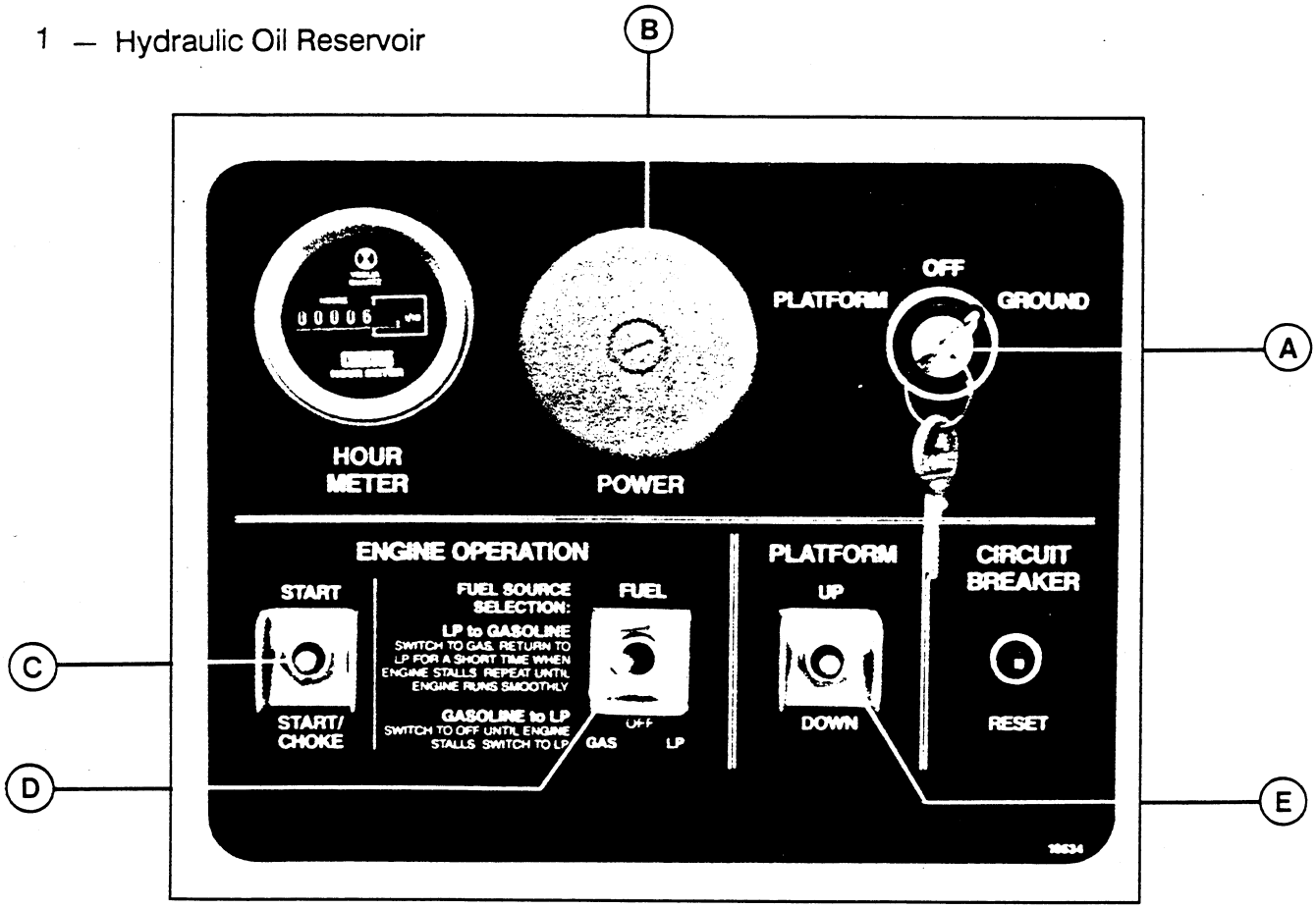
## FUEL REQUIREMENTS

- **Gasoline**: Unleaded Regular gasoline is preferred (Photo 3, detail A). Leaded Regular gasoline can be used, but its use may result in shorter maintenance intervals due to spark plug fouling, etc.
- **Liquid Propane (LP) Gas**: Clean, dry liquid propane gas from a bulk storage tank is preferred. Observe correct tank filling instructions (located on tank).

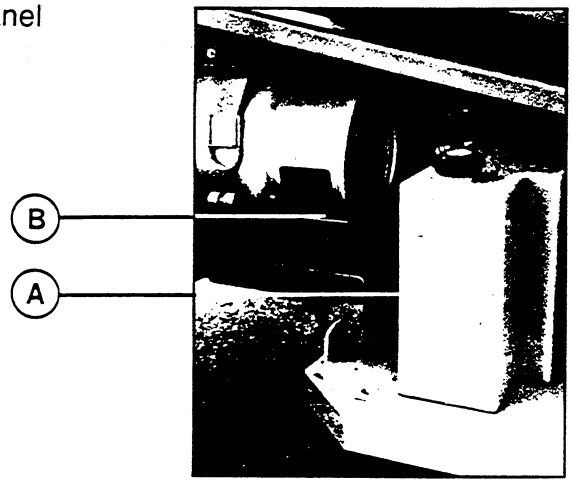
NOTE: Install the LP gas tank so that the mounting pin engages the hole in the tank handle (Photo 3, detail B) and both tank latches close properly. Improper installation may result in reduced engine performance.




1 — Hydraulic Oil Reservoir




2 — Ground Control Panel




3 — LP and Gasoline Tank Installation

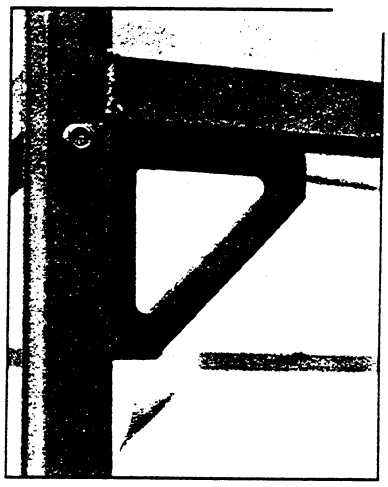
# PRE-OPERATIONAL & SAFETY INSPECTION (CONTINUED)

**FUEL SELECTION**

- When starting, select fuel (Photo 4, detail A) as detailed on page 4.
- To switch from GAS to LP. (engine running): Push FUEL selector switch from the GAS position to the center OFF position. When the engine hesitates, push the FUEL selector switch to the LP position (Photo 4, detail A).
- To switch from LP to GAS (engine running): Push FUEL selector switch back and forth from the LP position to the GAS position until the engine continues to run on GAS (Photo 4, detail A).
- Turn key switch to PLATFORM position (Photo 4, detail B).
- Repair any defects before operating machine.

**PLATFORM CONTROL TEST**

- DO NOT OPERATE A DEFECTIVE MACHINE.
- Check surface area for possible drop-off holes, bumps, floor obstructions and personnel before driving or steering. DO NOT ELEVATE PLATFORM UNLESS MACHINE IS ON A FIRM LEVEL SURFACE.
- Make sure platform entrance is properly closed.
- Fasten occupants' safety belt lanyards to anchor points on platform as required by ANSI A92.6 1979 14.2.6 (Photo 5).
- Pull out red POWER button. To stop functions, push in red POWER button (Photo 6, detail A).
- Operate horn. Repair if it does not sound (Photo 6, detail B).
- Start machine (Photo 6, detail C) as detailed on page 4.
- Operate ELEVATE toggle switch UP then DOWN to ensure proper operation (Photo 6, detail D). Repair any defects.
- Operate STEER toggle switch LEFT (L) and RIGHT (R) to ensure proper operation (Photo 6, detail E). Repair any defects.

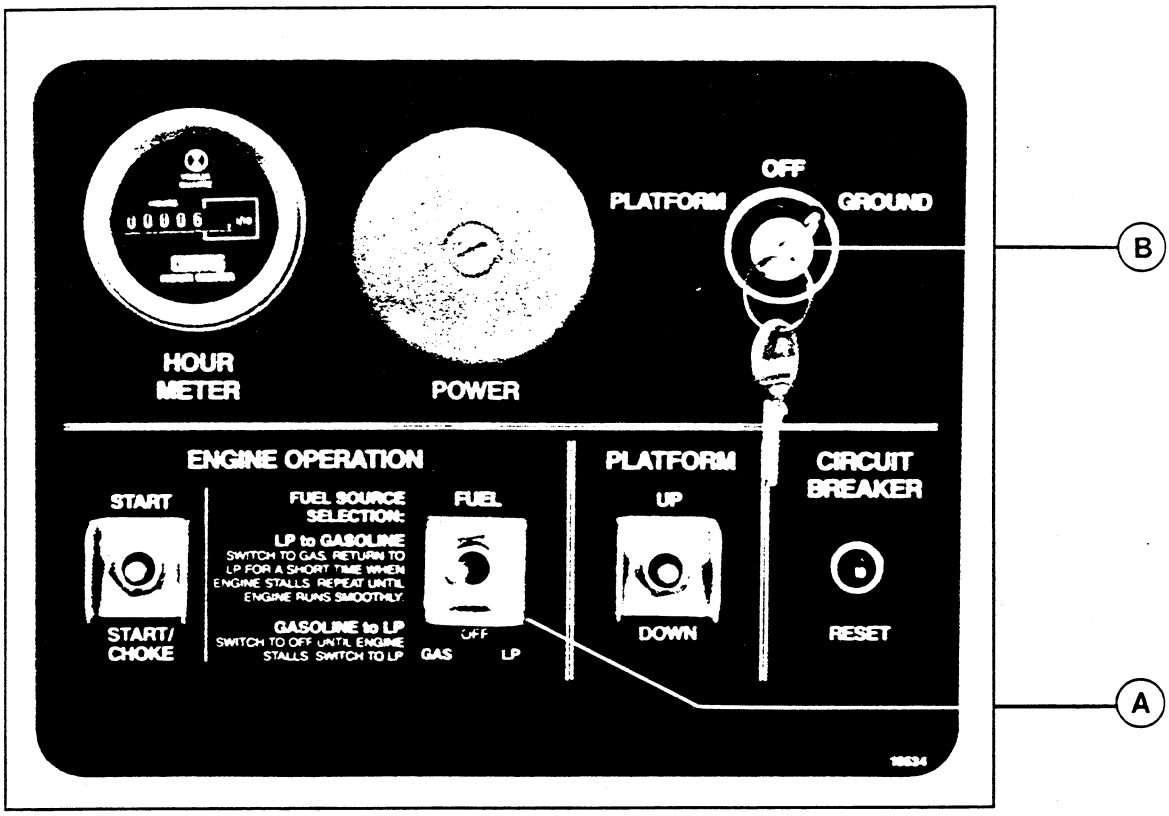


5 — Lanyard Anchor Point

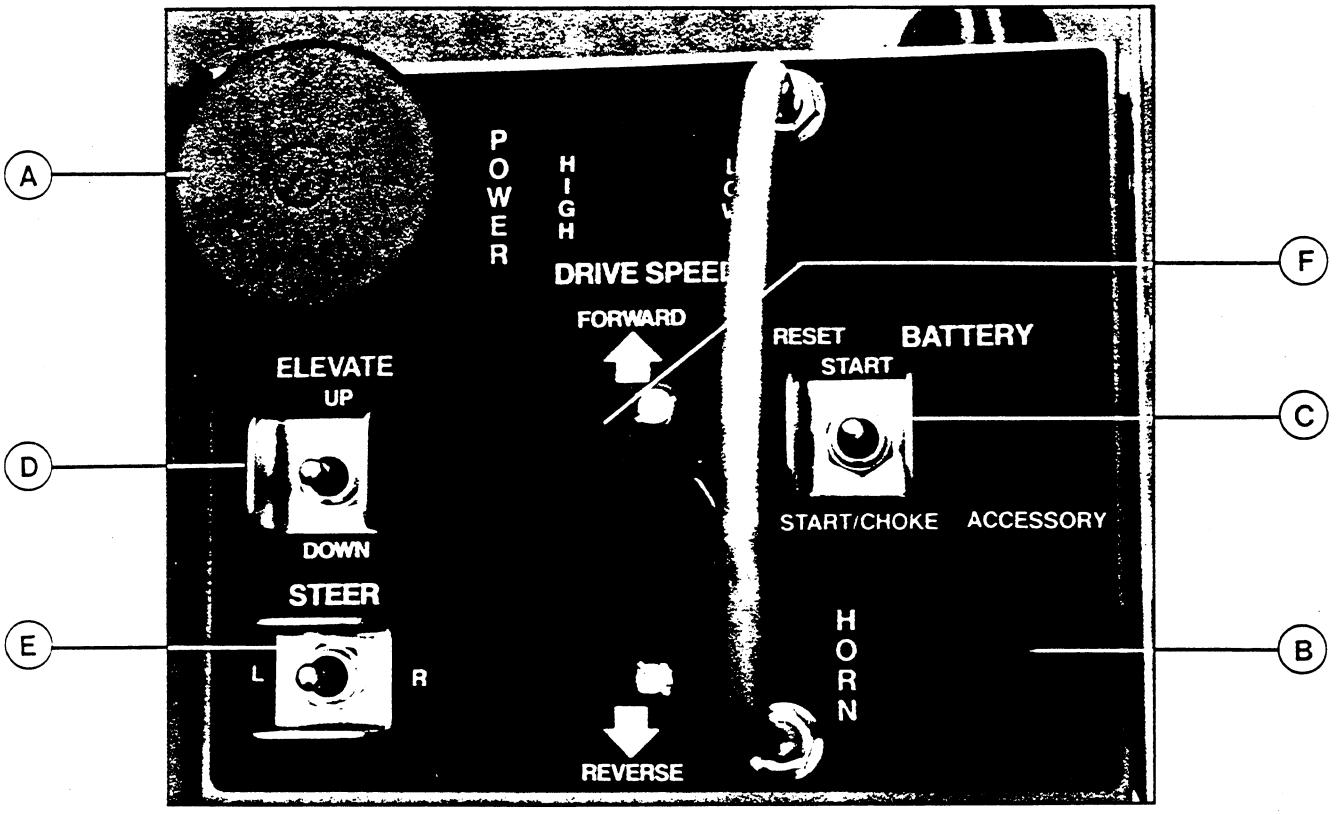
- Move DRIVE lever just off center in both FORWARD and REVERSE positions to ensure proper operation of each (Photo 6, detail F). Repair any defects.

NOTE: LIFT MECHANICAL LOCK ON DRIVE LEVER TO MOVE FORWARD OR REVERSE.

Contact your authorized Genie Service Center regarding service and repairs.




4 — Ground Control Panel




6 — Platform Control Panel

# OPERATING INSTRUCTIONS

BEFORE OPERATING MACHINE UNDERSTAND FUNCTIONS OF ALL CONTROLS

**EMERGENCY STOP**

- To deactivate ELEVATE, STEER, and DRIVE controls, push in red POWER button (Photo 7, detail A).
- Operate all functions to test for proper shut down.
- Repair if any function operates with POWER button pushed in.

**RAISING AND LOWERING PLATFORM**

- DO NOT ELEVATE PLATFORM UNLESS MACHINE IS ON A FIRM, LEVEL SURFACE.
- Check below and overhead for personnel, electrical cables, lights and other obstructions before raising or lowering platform.
- Make sure platform entrance is properly closed.
- Operate ELEVATE toggle switch UP or DOWN in desired direction (Photo 7, detail B).

**TRAVELING WITH PLATFORM DOWN**

- Maximum travel speed is attainable only when platform is down.
- Always check to be sure route is clear of persons and obstructions.
- To increase speed, move DRIVE lever slowly in desired direction of travel (Photo 7, detail C).
- To slow down or stop, move DRIVE lever slowly to center position (Photo 7, detail C).

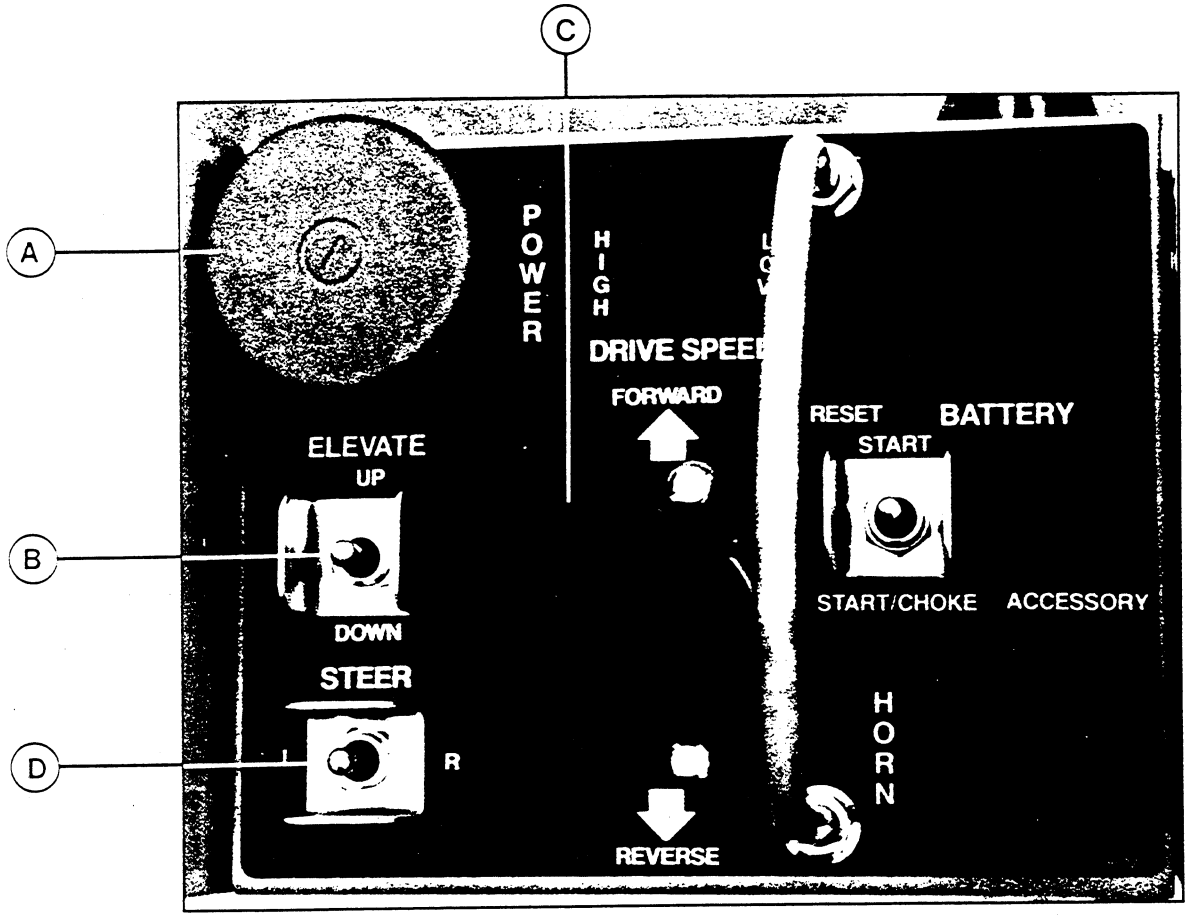
**TRAVELING WITH PLATFORM UP**

- OPERATE ON FIRM, LEVEL SURFACE ONLY.
- Always check to be sure route is clear of persons and obstructions.
- With platform up, machine travel speed is restricted by the drive speed limit switch (Photo 8).
- To increase speed, move DRIVE lever in desired direction of travel (Photo 7, detail C).
- To slow down or stop, move DRIVE lever slowly to center position (Photo 7, detail C).

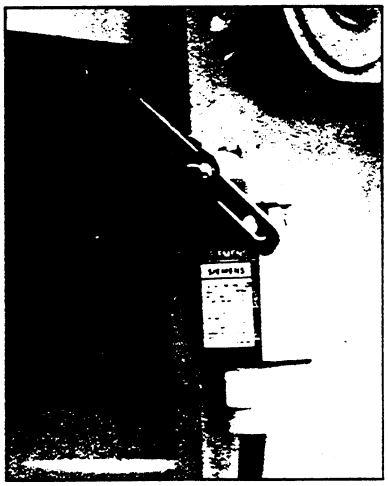
**STEERING**

- Always check to be sure area around wheels is clear of persons and obstructions.
- Operate STEER toggle switch LEFT (L) or RIGHT (R) as required (Photo 7, detail D).

NOTE: Steering is not self-centering. To return wheels to straight ahead position use STEER toggle switch.




7 — Platform Control Panel



8 — Drive Speed Limit Switch

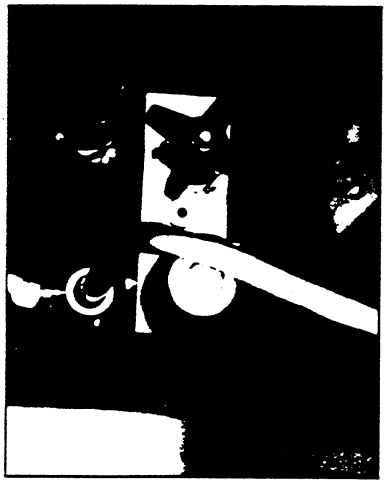
# OPERATING INSTRUCTIONS (CONTINUED)

## AUXILIARY LOWERING

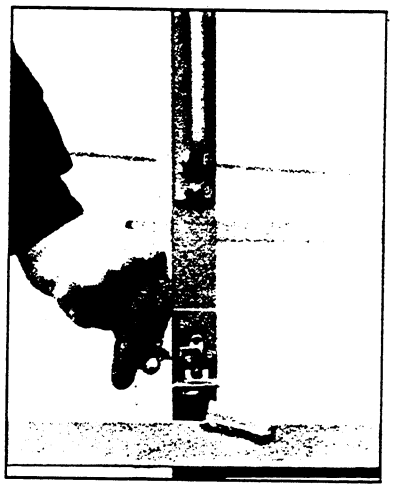
- IF PLATFORM FAILS TO DESCEND, NEVER CLIMB DOWN ELEVATE ASSEMBLY. Ask person on ground to actuate manual lowering valve to lower platform (Photo 9). The manual lowering valve is attached to the base of the elevate cylinder.
- Check for obstructions before lowering platform.

## SLIDE DECK (Accessory)

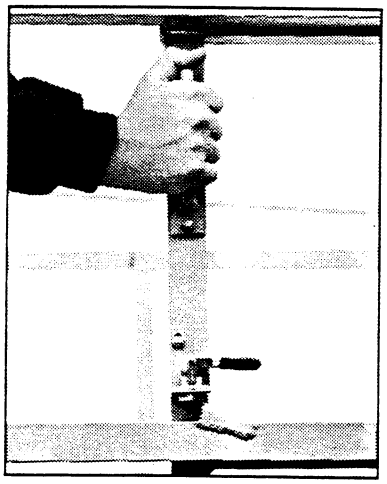
- Push down on slide deck latch (Photo 10) until pin is completely disengaged.
- Grasp the slide deck handle (Photo 11) and push out deck.
- Pull up on slide deck latch (Photo 12) until pin is completely engaged to lock slide deck.



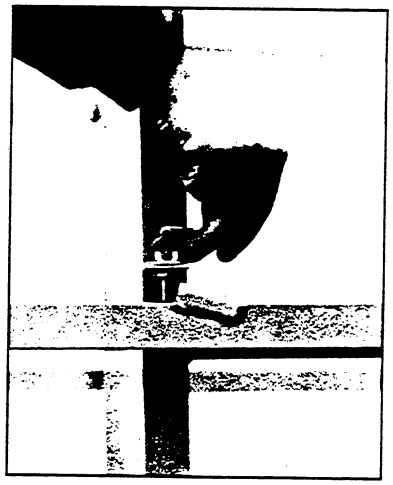
9 — Manual Lowering Valve



10 — Slide Deck Latch



11 — Slide Deck Handle



12 — Slide Deck Latch

| MAXIMUM PLATFORM CAPACITY | | LOAD DISTRIBUTION | |
|---|---|---|---|
| MODEL | STANDARD PLATFORM (or optional slide deck retracted) | PLATFORM WITH OPTIONAL SLIDE DECK EXTENDED LOAD CAPACITY ON PLATFORM | LOAD CAPACITY ON EXTENSION DECK |
| V-2470RT | 1250 lbs. (570 kg) | 950 lbs. (435 kg) | 300 lbs. (135 kg) |

# MAINTENANCE & ROUTINE SERVICE

## DAILY SERVICE CHECK

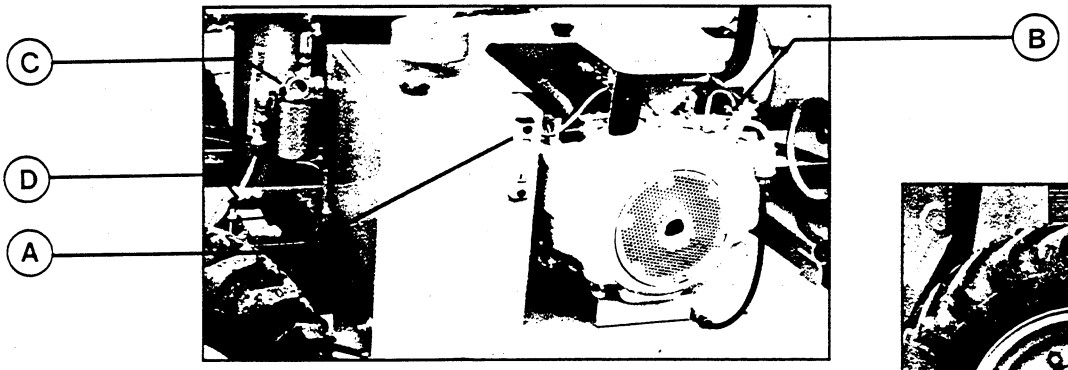
- Thoroughly inspect the entire machine for physical damage and wear. Repair any defects before operating the machine.
- Thoroughly inspect all hoses and hydraulic connections. Repair any defects.
- heck all electrical wires and cables for abrasions and proper connections.
- Check hydraulic fluid level (Photo 13, detail A).
- Check engine oil level (Photo 13, detail B). +
- Maintain tire pressure of 35 psi (Photo 14).
- Check lug nuts for tightness. Torque to 140-150 ft.-lbs (Photo 14).

## FIRST TWO WEEKS (25 HOURS)

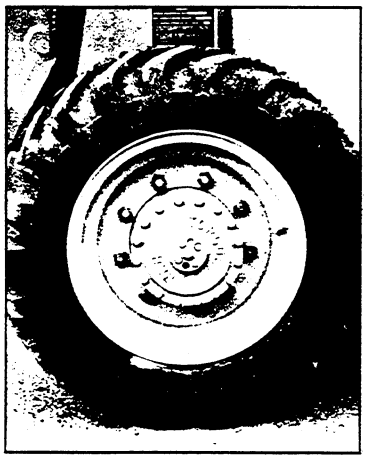
- Change engine oil filter (Photo 13, detail B). +
- Change engine crankcase oil (Photo 13, detail B). +
- Service engine air filter every 25 hours (Photo 13, detail B). *+

## FIRST MONTH (OR FIRST 50 HOURS)

- Change oil in drive gear boxes. Use EP-90 weight (Photo 14).
- Change hydraulic oil filters (Photo 13, detail C). *
- Check battery electrolyte level and clean battery tops and posts (Photo 13, detail D).
- Change engine oil filter every 50 hours (Photo 13, detail B). *+
- Change engine crankcase oil every 50 hours (Photo 13, detail B). *+




13 — Motor, Hydraulic Reservoir and Battery



14 — Wheel and Drive Installation

## EVERY SIX MONTHS (OR EVERY 250 HOURS)

- Inspect elevate assembly pivot points for signs of wear.
- Inspect steering and front end assembly for signs of wear.
- Check engine RPM. Set at 3100 to 3200 RPM (Photo 13, detail B).
- Change engine air filter (Photo 13, detail B). *+
- Clean engine crankcase breather valve (Photo 13, detail B). *+
- Check engine fuel filter (Photo 13, detail B). *+
- Change oil in drive gear boxes. Use EP-90 weight (Photo 14).
- Change hydraulic oil filters (Photo 13, detail C). *
- Service hydraulic reservoir, replace suction screens and filler breather (Photo 13, detail A). *

## EVERY TWO YEARS (OR EVERY 1000 HOURS)

- Repack front axle bearings. Use Texaco Marfax or equivalent multipurpose lithium grease.
- Change hydraulic oil. Use Shell Tellus T-46 or quivalent (Photo 13, detail A). *

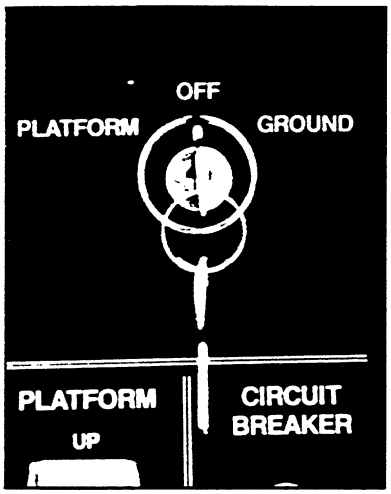
Refer to the engine manufacturer's operating manual for proper maintenance and service.
Extreme dust or temperature conditions will require more frequent servicing.

For complete list of required maintenance service consult Operating and Maintenance Manual.

# TRANSPORT

## SECURING TO TRUCK OR TRAILER FOR ROAD TRANSIT

- Weight of Genie V-2470RT is 5400 lbs (2450 kg).
- Use chains or straps of ample load capacity.
- Always chock wheels on truck or trailer bed (see instructional decal on machine).
- Use tie points on chassis for anchoring down to truck or trailer bed (see instructional decal on machine).
- Turn master power key switch to OFF position and remove key before transporting (Photo 15).




15 — Master Power Key Switch

## 3.4 GENIE V-2470 TRANSPORT

The Genie V-2470 may be transported by truck, ship or airplane. It is not recommended to ship by train due to possible shock or vibration damage. The machine is capable of climbing a 25% slope. We recommend driving the machine on to the truck bed or shipping vessel. If driving is impractical, the machine has free-wheeling capabilities to allow towing or winching into the shipping position.

The instructions listed below are designed to prevent any undue stress on the mechanical and hydraulic systems during transport. All transport loads should be carried through the tie down points on the chassis weldment and the tire blocking points.

**Steps**

1. Park the machine with the platform fully lowered. Ensure that the steering wheels are straight, and remove any material from the platform. Lock optional slide deck in retracted position.

2. The machine may now be driven or winched on to the transport vehicle.

   **A. Driving**: The machine is capable of driving onto the transport vehicle as long as the ramp* does not exceed a 25% grade.

   **NOTE:** *Maximum drive speed is available only when the platform is fully lowered, the drive speed control limit switch is in the held position, and the DRIVE SPEED High/Low toggle switch is in the High position.*

   **IMPORTANT**: DO NOT DRIVE THE MACHINE ON AN UNLEVEL SURFACE UNLESS THE PLATFORM IS FULLY LOWERED.

**B. Winching**: Before winching* the machine must be placed in the free-wheel configuration (see instructions on the next page).

**WARNING:** WHEN THE MACHINE IS IN THE FREE-WHEEL CONFIGURATION IT HAS NO BRAKING CAPABILITIES. BE SURE TO SECURE THE MACHINE TO PREVENT IT FROM ROLLING BEFORE PLACING THE MACHINE IN THE FREE-WHEEL CONFIGURATION.

Secure the winch cable to the tie down points on the chassis of the machine.

3. The wheels should be blocked from rolling by wood pieces nailed to the transport vehicle and binder chains used to prevent sideways and fore/aft movement.

4. If the machine was placed in the free-wheel configuration, be sure to re-engage the drive brakes after it has been secured in position for shipment. To re-engage the brakes, open the brake isolation valve and close the drive motor loop valve.

5. Secure the elevate assembly to its resting pad and open the manual lowering valve on the base of the elevate cylinder to prevent bouncing during transport.

6. Disconnect the batteries at the Anderson connectors on each side of the chassis.

7. Shut off the key switch and all POWER switches. Inspect unit thoroughly before shipping for loose or unsecured items.

* Ensure that the transport vehicle ramp, winch (if a winch is to be used) and winch cable are of sufficient strength to support the machine. The Genie V-2470 weighs approximately 5400 lbs. (2450 kg).

**NOTE:** *Add 200 lbs. (91 kg) for an optional slide deck.*

## How To Place The Machine In Free-Wheel Configuration

**WARNING:** WHEN THE MACHINE IS IN THE FREE-WHEEL CONFIGURATION IT HAS NO BRAKING CAPABILITIES. BE SURE TO SECURE THE MACHINE TO PREVENT IT FROM ROLLING BEFORE PLACING THE MACHINE IN THE FREE-WHEEL CONFIGURATION.

1. Chock the wheels to prevent the machine from rolling.
2. Close the brake isolator valve by turning the handle clockwise.
3. Pump the brake release pump five (5) to ten (10) times.
4. Open the drive motor loop valve by turning the handle counter clockwise. The brakes are now released--the machine is in the free-wheel configuration.

## 3.5 GENIE V-2470RT TRANSPORT

The Genie V-2470RT may be transported by truck, ship or airplane. It is not recommended to ship by train due to possible shock or vibration damage. The machine is capable of climbing a 35% slope. We recommend driving the machine on to the truck bed or shipping vessel. If driving is impractical, the machine has free-wheeling capabilities to allow towing or winching into the shipping position.

The instructions listed below are designed to prevent any undue stress on the mechanical and hydraulic systems during transport. All transport loads should be carried through the tie down points on the chassis weldment and the tire blocking points.

Steps

1. Park the machine with the platform fully lowered and retracted. Ensure that the steering wheels are straight, and remove any material from the platform. Lock optional slide deck in retracted position.

2. The machine may now be driven or winched on to the transport vehicle.

   A. **Driving**: The machine is capable of driving onto the transport vehicle as long as the ramp* does not exceed a 35% grade.

      **NOTE:** *Maximum drive speed is available only when the platform is fully lowered and the drive speed control limit switch is in the held position.*

      **IMPORTANT**: DO NOT OPERATE THE MACHINE ON AN UNLEVEL SURFACE UNLESS THE PLATFORM IS FULLY LOWERED.

B. **Winching**: Before winching* the machine must be placed in the free-wheel configuration (see instructions on the next page).

**WARNING:** WHEN THE MACHINE IS IN THE FREE-WHEEL CONFIGURATION IT HAS NO BRAKING CAPABILITIES. BE SURE TO SECURE THE MACHINE TO PREVENT IT FROM ROLLING BEFORE PLACING THE MACHING IN THE FREE-WHEEL CONFIGURATION.

Secure the winch cable to the tie down points on the chassis of the machine.

3. The wheels should be blocked from rolling by wood pieces nailed to the transport vehicle and binder chains used to prevent sideways and fore/aft movement.

4. If the machine was placed in the free-wheel configuration, be sure to re-engage the torque hubs after the machine is placed into position and secured for shipment. To re-engage the torque hubs, simply perform the steps (listed on the next page) in reverse order.

5. Secure the elevate assembly to its resting pad and open the manual lowering valve on the base of the elevate cylinder to prevent bouncing during transport.

6. Shut off the key switch and all POWER switches, and close each fuel tank valve. Inspect the machine thoroughly before shipping for loose or unsecured items.

* Ensure that the transport vehicle ramp, winch (if a winch is to be used) and winch cable is of sufficient strength to support the machine. The Genie V-2470RT weighs approximately 5400 lbs. (2450 kg).

**NOTE:** *Add 200 lbs. (91 kg) for an optional slide deck.*

## How To Place The Machine In Free-Wheel Configuration

**WARNING:** WHEN THE MACHINE IS IN THE FREE-WHEEL CONFIGURATION IT HAS NO BRAKING CAPABILITIES. BE SURE TO SECURE THE MACHINE TO PREVENT IT FROM ROLLING BEFORE PLACING THE MACHINE IN THE FREE-WHEEL CONFIGURATION.

1. Chock the wheels to prevent the machine from rolling.

2. The drive torque hubs must be disconnected (released). Remove the two 1/4 - 20 x 3/4 in. bolts that secure the disconnect cap to the cover of each drive torque hub.

3. Turn the disconnect cap over and re-install, making sure that the cap's nipple will contact the disconnect rod. Secure the disconnect cap to the cover with the two 1/4 - 20 x 3/4 in. bolts. The machine is now in the free-wheel configuration.

# 3.6 GENIE V-2470 THEORY OF OPERATION

## Energy Source

The Genie V-2470 vertical lift is powered by eight (8) 6 volt batteries connected in a series/parallel configuration to provide 24 volt DC power. Each battery is rated at 250 amp. hr. at a 20 hour rate.

## Charging System

A 24 volt, 35 amp. line compensating battery charger is used to recharge the battery pack after each day's use. The charger utilizes an electronic current limiting system which automatically controls the charge rate, depending on battery condition. The charge rate tapers off as the batteries approach full charge.

## Hydraulic System

The hydraulic system consists of ELEVATE Up/Down, STEER Left/Right and DRIVE Forward/Reverse. To power these functions the hydraulic system uses a hydraulic power unit incorporating a 24 volt electric motor and a two stage gear pump which delivers a total displacement of 6.5 gpm (24.6 liters per minute). A pump unloader valve is incorporated to regulate one stage of the pump. When pilot pressure to the unloader valve reaches a set pressure it will open, creating a flow path to the tank for the regulated pump stage. When the motor is supplied with 24 volts, it turns the pump to supply hydraulic oil to the hydraulic system directional control valves located on the chassis mounted hydraulic control manifold. When actuated, the directional control valves direct hydraulic oil to the hydraulic system actuators (elevate cylinder, steering cylinder, wheel drive motors and wheel drive brakes). A 3100 psi (21373 kPa) relief valve (located on the hydraulic control manifold) is used to prevent the hydraulic system from being over pressurized. To ensure that the steering system is always supplied with hydraulic oil, the hydraulic control manifold incorporates a priority flow divider. The priority flow divider ensures that the steering systems hydraulic oil requirement is met prior to supplying hydraulic oil to the drive system. Located on the hydraulic control manifold is a drive proportional control valve. The drive proportional control valve is used to control the speed of the DRIVE Forward/Reverse functions by regulating the flow of hydraulic oil in direct relation to the valves input voltage.

The ELEVATE Up/Down functions utilize one lifting cylinder. The ELEVATE Up function is accomplished by actuating the elevate up directional control valve (located on the hydraulic control manifold) thereby directing hydraulic oil to the elevate cylinder. The hydraulic control manifold incorporates a 3000 psi (20684 kPa) relief valve which prevents the elevate system from experiencing over pressurization. Another manifold, attached to the barrel end port of the cylinder, incorporates a down directional control valve, a manual lowering valve, flow control cartridge valve, and a check valve. The ELEVATE Down function is accomplished by actuating the down directional control valve, this allows a flow path for hydraulic oil to exit the cylinder causing it to retract. The manual lowering valve accomplishes the same tasks as the down directional control valve in the event of an electrical system failure. A pressure compensated flow control cartridge valve restricts the rate that the cylinder retracts by regulating the hydraulic oil exiting the cylinder. The check valve is used to maintain cylinder pressure and prevent free descent in the event of a hydraulic line failure.

The STEER Left/Right functions utilize one dual acting cylinder. The steering functions are accomplished by actuating the steering left and right, 3-position, 4-way, directional control valve (located on the hydraulic control cylinder), thereby directing hydraulic oil to the steering cylinder. Located on the hydraulic control manifold is a 1100 psi (7584 kPa) relief valve which prevents the steering system from being over pressurized.

The DRIVE Forward/Reverse functions uses two 7.1 cubic in. (116 $cm^3$) rotary drive motors, with 4.1:1 planetary torque hubs, and spring applied, hydraulically released brakes. The functions are accomplished by actuating the drive forward or reverse directional control valve (located on the hydraulic control manifold), thereby directing hydraulic oil to the drive brake shuttle valve (located in the hydraulic control manifold) and to the wheel drive motors. The shuttle valve directs hydraulic oil to the drive brakes releasing the brakes. The DRIVE functions use two counter balance valves (located on the hydraulic control manifold) to prevent the machine from exceeding the maximum drive speed and to aid in hydrodynamic braking. Located on the hydraulic control manifold is a series/parallel directional control valve. This valve gives the machine the capability of operating the drive functions in a low speed, high torque mode or in a high speed, low torque mode. When operating in Low range the valve creates a parallel path for hydraulic oil flowing to the wheel drive motors. This causes a low speed, high torque drive mode. When operating in High range the valve creates a series path for hydraulic oil flowing to the wheel drive motors. This causes a high speed, low torque drive mode.

## Electrical System

The electrical system consists of ELEVATE Up/Down, STEER Left/Right, and DRIVE Forward/Reverse. The electrical system uses stored electrical energy to power and control all machine functions. The electrical system can be divided into two categories the control circuit and the power circuit.

**The control circuit** incorporates the components and circuitry required to turn the machine on and off, or control other electrical devices. Components include the key switch, toggle switches, limit switches, POWER On/Off buttons, low voltage interrupt system (optional), diodes and solenoids. Since the control circuit typically conducts very low current, small diameter wire and multi-wire (19 conductor, 18 AWG) control cables are used, to connect the control circuit components.

**The power circuit** incorporates the components which convert stored electrical energy into a mechanical force to provide movement. Components include the batteries, electric motors and contacts. Since the power circuit must be able to conduct full operating current, heavy #2 and #4 welding cable is used to connect the power circuit components.

Before any machine functions can be operated, the key switch (located on the ground control station) must be turned to the appropriate PLATFORM or GROUND position and the POWER On/Off buttons must be pulled up. Turning the key switch to either position (PLATFORM or GROUND) and pulling up the POWER buttons completes a 24 volt circuit from the batteries to the printed circuit board located at the ground control station. At the printed circuit board current is used to energize a 24 volt control circuit master relay (located in the ground control station). The 24 volt control circuit master relay energizes a set of 24 volt contacts, which, when closed, completes a circuit supplying 24 volts from the batteries to the selected platform or ground control station actuators.

The ELEVATE Up/Down functions can be operated from either the platform control station or the ground control station by actuating the proper function control toggle switch. When the toggle switch is actuated a circuit is completed from the toggle switch to the 24 volt motor start relay and to the elevate up 24 volt directional control valve solenoid. The ELEVATE Down function is not a powered function and does not supply 24 volts to the motor start relay. When supplied with 24 volts, the motor start relay energizes a set of 24 volt contacts which when closed completes a circuit supplying 24 volts to the hydraulic power

unit. When energized, the 24 volt directional control valve solenoids activate their respective control valves. Whenever the above-mentioned actions are accomplished, the appropriate elevate function will operate.

The STEER Left/Right functions are operated from the platform control station by actuating the STEER toggle switch to the desired position. When actuated the toggle switch completes a circuit to the 24 volt motor start relay and to the 24 volt steer left or right directional control valve solenoid. When supplied with 24 volts the motor start relay energizes a set of 24 volt contacts which, when closed, completes a circuit supplying 24 volts to the hydraulic power unit. When energized, the 24 volt directional control valve solenoids activate their respective control valve. Whenever the above mentioned actions are accomplished, the appropriate steer function will operate.

The DRIVE Forward/Reverse functions are operated from the platform control station. The direction of the DRIVE Forward/Reverse functions are accomplished by actuating the drive proportional control joystick in either the Forward or Reverse position. When actuated the joystick completes a circuit to the 24 volt motor start relay, the 24 volt forward or reverse directional control valve solenoid, and the drive proportional control valve solenoid. When supplied with 24 volts the motor start relay energizes a set of 24 volt contacts which, when closed, completes a circuit supplying 24 volts to the hydraulic power unit. When energized the 24 volt directional control valve solenoids actuate their respective control valves. The speed of the DRIVE Forward/Reverse functions is controlled by the variable current supplied to the drive proportional control valve from the drive proportional control joystick. Whenever the above-mentioned functions are accomplished, the appropriate drive function will operate.

# 3.7 GENIE V-2470RT THEORY OF OPERATION

## Energy Source

The Genie V-2470RT vertical lift is powered by a dual fuel 24 horsepower internal combustion engine.

## Charging System

The internal combustion engine incorporates an integral flywheel mounted 12 volt-20 amp alternator and voltage regulator system.

## Hydraulic System

The hydraulic system consists of ELEVATE Up/Down, STEER Left/Right and DRIVE Forward/Reverse. To power these functions the hydraulic system uses a three stage gear pump that delivers a total flow displacement of 17.5 gpm (66.2 liters per minute).

The first pump stage is used to supply the ELEVATE function with hydraulic oil, providing a total flow displacement of 2.5 gpm (9.5 liters per minute).

The last two stages are used to supply the STEER and DRIVE functions with hydraulic oil, providing a total flow displacement of 15 gpm (56.8 liters per minute). A pump unloader valve is incorporated to regulate one stage of the pump. When pilot pressure to the unloader valve reaches a set pressure it will open, creating a flow path to the tank for the regulated pump stage.

When the internal combustion engine is operating, it turns the pump to supply hydraulic oil to the hydraulic system directional control valves located on the chassis mounted hydraulic control manifold. When actuated, the directional control valves direct hydraulic oil to the hydraulic system actuators (elevate cylinder, steering cylinder, wheel drive motors, and wheel drive brakes). Two 3000 psi (20684 kPa) relief valves (located on the hydraulic control manifold) are used to prevent the hydraulic system from being over pressurized. To ensure that the steering system is always supplied with hydraulic oil, the hydraulic control manifold

incorporates a priority flow divider. The priority flow divider ensures that the steering systems hydraulic oil requirement is met prior to supplying hydraulic oil to the elevate system. Located on the hydraulic control manifold is a drive proportional control valve. This valve is used to control the speed of the DRIVE Forward/Reverse functions by regulating the flow of hydraulic oil in direct relation to the valves input voltage.

The ELEVATE Up/Down functions utilize one lifting cylinder. The ELEVATE Up function is accomplished by actuating the elevate up directional control valve (located on the hydraulic control manifold) thereby directing hydraulic oil to the elevate cylinder. Another manifold, attached to the barrel end port of the cylinder, incorporates a down directional control valve, a manual lowering valve, flow control cartridge valve, and a check valve. The ELEVATE Down function is accomplished by actuating the down directional control valve, this allows a flow path for hydraulic oil to exit the cylinder causing it to retract. The manual lowering valve accomplishes the same tasks as the down directional control valve in the event of an electrical system failure. A pressure compensated flow control cartridge valve restricts the rate that the cylinder retracts by regulating the hydraulic oil exiting the cylinder. The check valve is used to maintain cylinder pressure and prevent free descent in the event of a hydraulic line failure.

The STEER Left/Right functions utilize one dual acting cylinder. The steering functions are accomplished by actuating the steering left and right, 3-position, 4-way, directional control valve (located on the hydraulic control cylinder), thereby directing hydraulic oil to the steering cylinder.

The DRIVE Forward/Reverse functions uses two 3.6 cubic in. (59 $cm^3$) rotary drive motors, with 24.85:1 planetary torque hubs, and spring applied, hydraulically released brakes. The functions are accomplished by actuating the drive forward or reverse directional control valve (located on the hydraulic control manifold), thereby directing hydraulic oil to the drive brake shuttle valve (located in the hydraulic control manifold) and to the wheel drive motors. The shuttle valve directs hydraulic oil to the drive brakes releasing the brakes. The DRIVE functions use two counter balance valves (located on the hydraulic control manifold) to prevent the machine from exceeding the maximum drive speed and to aid in hydrodynamic braking.

## Electrical System

The electrical system consists of ELEVATE Up/Down, STEER Left/Right, and DRIVE Forward/Reverse. The electrical system stored electrical energy to control all machine functions. The electrical system is divided into two categories: The control circuit and the power circuit.

**The control circuit** incorporates the components and circuitry required to turn the machine on and off, or control other electrical devices. Components include the key switch, toggle switches, limit switches, POWER On/Off buttons, low voltage interrupt system (optional), diodes and solenoids. Since the control circuit typically conducts very low current, small diameter (19 conductor, 18 AWG) wire and multi-wire control cables are used, to connect the control circuit components.

**The power circuit** incorporates the components which convert stored electrical energy into a mechanical force to provide movement. Components include the batteries, starter motor and contacts. Since the power circuit must be able to conduct full operating current, heavy #2 and #4 welding cable is used to connect the power circuit components.

Before any machine functions can be operated, the key switch (located on the ground control station) must be turned to the appropriate PLATFORM or GROUND position, the POWER On/Off buttons must be pulled up.

Turning the key switch to either position (PLATFORM or GROUND) and pulling up the POWER buttons completes a 12 volt circuit from the battery to the printed circuit board located at the ground control station. At the printed circuit board current is used to energize a 12 volt control circuit master relay (located in the ground control station). This relay energizes a set of 12 volt contacts which, when closed, completes a circuit supplying 12 volts from the battery to the selected platform or ground control station actuators. At this point the START/CHOKE toggle switch may be actuated.

The ELEVATE Up/Down functions can be operated from either the platform control station or the ground control station by actuating the ELEVATE toggle switch to the desired position. When the ELEVATE toggle switch is actuated a circuit is completed from the toggle switch to the 12 volt elevate up or down directional control valve solenoid. When energized, the 12 volt directional control valve solenoids actuate their respective control valves. Whenever the above-mentioned actions are accomplished, the appropriate elevate function will operate.

The STEER Left/Right functions are operated from the platform control station by actuating the STEER toggle switch to the desired position. When actuated, the STEER toggle switch completes a circuit to the 12 volt steer right or left directional control valve solenoid. When energized, the 12 volt directional control valve solenoids actuate their respective control valves. Whenever the above mentioned actions are accomplished, the appropriate steer function will operate.

The DRIVE Forward/Reverse functions are operated from the platform control station. The direction of the DRIVE Forward/Reverse function is accomplished by actuating the drive proportional control joystick in either the Forward or Reverse position. When actuated, the joystick completes a circuit to the 12 volt forward or reverse directional control valve solenoid and the drive proportional control valve solenoid. When energized, the 12 volt directional control valve solenoids actuate their respective control valves. The speed of the DRIVE Forward/Reverse functions is controlled by the variable current supplied to the drive proportional control valve from the drive proportional control joystick. Whenever the above-mentioned functions are accomplished, the appropriate drive function will operate.

# MAINTENANCE

## 4.1 Maintenance Schedule

To gain optimum performance from your Genie Vertical Lift, simply follow these routine maintenance and service procedures. Each procedure refers to both the Genie V-2470 & V-2470RT unless otherwise specified.

**Daily**

- Thoroughly inspect the entire machine for physical damage and wear. Complete the preoperation inspection detailed in section 3.2. Repair any defects before operating the machine.
- Check the electrolyte level on all batteries.**
- Check hydraulic fluid levels.
- Check brake operation.
- Maintain adequate tire pressure in air filled tires.
- Check lug nuts for tightness:

  **V-2470** (front and rear) - Torque to 45 ft. lbs. (61 Nm).

  **V-2470RT** - Front: Torque to 45 ft. lbs. (61 Nm).
  Rear: Torque to 140-150 ft. lbs. (189-203 Nm).
- **V-2470RT** - Check engine oil level.+

**First Two Weeks** Or After The First 25 Hours Of Use (V-2470RT Only)

- **V-2470RT** - Change the engine oil filter.+
- **V-2470RT** - Change the engine crankcase oil.+
- **V-2470RT** - Service the engine air filter every 25 hours.*+

**First Month** Or After The First 50 Hours Of Use

- Change the oil in the drive gear boxes. Use EP-90 weight.
- Change the hydraulic oil filters.*
- **V-2470RT** - Check engine rpm. Set at 3100 to 3200 rpm.*+

**Monthly** Or Every 50 Hours

- Check the electrolyte level on all batteries.** Clean all battery tops and posts.
- **V-2470RT** - Change the engine oil filter.*+
- **V-2470RT** - Change the engine crankcase oil.*+

**Every Six Months** Or Every 250 Hours

- Inspect the elevate assembly pivot points for signs of wear.
- Inspect the steering and front end assembly for signs of wear.
- Change the oil in the drive gear boxes. Use EP-90 weight.
- Change the hydraulic oil filters.*
- Service the hydraulic oil reservoir, replace suction screens and filler breather. *
- **V-2470RT** - Clean the engine cooling fins.
- **V-2470RT** - Check engine rpm. Set at 3100 to 3200 rpm.*+
- **V-2470RT** - Clean the engine crankcase breather valve.*+
- **V-2470RT** - Check the engine fuel filter.*+
- **V-2470RT** - Check spark plugs.*+
- **V-2470RT** - Replaced air cleaner element.*+

**Every Two Years** Or Every 1000 Hours

- o Repack the front axle bearings. Use Texaco Marfax (or equivalent multipurpose lithium grease).
- o Change the hydraulic oil. Use Shell Tellus T-46 (or equivalent).*
- o **V-2470** - Check electric motor brushes and field coils.

+ Refer to section 6.2, Manufacturers Appendices for specific engine maintenance and service information.

* Extreme dust or temperature conditions will require more frequent servicing.

** Applies to standard (non-maintenance-free) batteries only.

## 4.2 CONSUMABLE MATERIALS

| MATERIAL | DESCRIPTION | LOCATION |
|---|---|---|
| Hydraulic Oil | Shell Tellus T-46 | Hydraulic Oil Reservoir |
| Gear Oil | SAE 90 multipurpose Gear Lubricant, API service classification GL-5 | Drive Torque Hubs |
| Thread Adhesive | Loctite Removable Thread Locker 242 | Fasteners |
| Paint | Rudd 91-869, Blue<br>Rudd 91-841, Grey | Painted Surfaces |
| Wheel Bearing Grease | Texaco Marfax (or equivalent multi-purpose lithium grease) | Front Wheel Hubs |
| Motor Oil + | API service classification SF or SF/CC Oil.* | Engine Crankcase |
| Gasoline + | Unleaded regular gasoline preferred.* | Gasoline Tank |
| Liquid Propane + | Clean, dry liquid propane gas.* | Propane Tank |

* Refer to section 6.2, Manufacturers Appendices for specific oil and fuel requirements.

\+ V-2470RT only.

## 4.3 SPECIFICATIONS

The following page details specifications for Genie Vertical Lift models V-2470 & V-2470RT.

## Genie V-2470 & V-2470RT Specifications*

| MODEL | | V-2470 | V-2470RT |
|---|---|---|---|
| Height-working max. | U.S.-ft. | 31 | |
| | Metric-m | 9.45 | |
| Height-platform max. | U.S.-ft. | 24 | |
| | Metric-m | 7.31 | |
| Height-stowed | U.S.-ft. | 7'9" | 7'11" |
| | Metric-m | 2.36 | 2.41 |
| Width drive chassis | U.S.-in. | 70 | 74 |
| | Metric-m | 1.78 | 1.88 |
| Length-stowed | U.S.-ft. | 11 | |
| | Metric-m | 3.35 | |
| Lift capacity (evenly distributed) | U.S.-lbs. | 1250 | |
| | Metric-kg | 567 | |
| Wheelbase | U.S.-in. | 84 | |
| | Metric-m | 2.13 | |
| Turning radius (outside) | U.S.-ft. | 16 | 17 |
| | Metric-m | 4.87 | 5.18 |
| Turning radius (inside) | U.S.-ft. | 8 | 9 |
| | Metric-m | 2.44 | 2.74 |
| Power Source | | 24 volts DC | 24 hp Gas/LP |
| Batteries (included) | | (8) 6 volt Deep cycle | 12 volt DC |
| Travel speed-stowed | U.S.-mph | 0-3 | |
| | Metric-km/h | 0-4.8 | |
| Travel speed-raised** | U.S.-mph | 0-0.8 | |
| | Metric-km/h | 0-1.3 | |
| Controls-drive | | Proportional | |
| Platform dimensions (length × width) | U.S.-in. | 126 × 70 | 126 × 70 |
| | Metric-m | 3.20 × 1.78 | 3.20 × 1.78 |
| AC outlet in platform | | Standard | |
| Hydraulic pressure max. | U.S.-PSI | 3100 | 3000 |
| | Metric-kPa | 21373 | 20684 |
| Tires Front | U.S.-in. | 23×8.5×12 | 27×8.5×15 |
| | Metric-mm | 584×216×305 | 686×216×381 |
| Rear | U.S.-in. | Same as Front | 27×10.5×15 |
| | Metric-mm | | 686×267×381 |
| Gradeability**† | | 25% | 35% |
| Ground clearance obstacle/high center | U.S.-in. | 6/8.25 | 8.25/10.75 |
| | Metric-mm | 152/210 | 210/273 |
| Hydraulic oil reservoir capacity | U.S.-gal. | 8 | 17 |
| | Metric-l | 30.28 | 64.34 |
| Weight (gross)*** | U.S.-lbs. | 5400 | |
| | Metric-kg | 2449 | |

* All specifications are subject to change without notice.
** In lift mode (platform elevated), the machine is designed for operation on firm level surfaces only.
*** Add 200 lbs. (91 kg) for optional slide deck.
† Affected by battery condition on DC models.

## 4.4 TORQUE REQUIREMENTS

The purpose of this section is to allow the user to take prompt, effective action in the event an unacceptable condition is discovered during the inspection procedure. The table on the following page lists the standard torque values based on bolt diameters, grades, and lubricated or dry conditions.

## Torque Requirement Table

| Size | Threads Per Inch | Bolt Diameter D (In.) | Tensile Stress Area (Sq. In.) | SAE Grade 5 Bolts | | | SAE Grade 8 Bolts | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Clamp Load P (lb.) | Torque Dry K = 0.20 | Torque Lub. K = 0.15 | Clamp Load P (lb.) | Torque Dry K = 0.20 | Torque Lub. K = 0.15 |
| | | | | | In. Lb. | In. Lb. | | In. Lb. | In. Lb. |
| 4 | 40 | 0.1120 | 0.00604 | 380 | 8 | 6 | 540 | 12 | 9 |
| | 48 | 0.1120 | 0.00661 | 420 | 9 | 7 | 600 | 13 | 10 |
| 6 | 32 | 0.1380 | 0.00909 | 580 | 16 | 12 | 820 | 23 | 17 |
| | 40 | 0.1380 | 0.01015 | 610 | 18 | 13 | 920 | 25 | 19 |
| 8 | 32 | 0.1640 | 0.01400 | 900 | 30 | 22 | 1260 | 41 | 31 |
| | 36 | 0.1640 | 0.01474 | 940 | 31 | 23 | 1320 | 43 | 32 |
| 10 | 24 | 0.1900 | 0.01750 | 1120 | 43 | 32 | 1580 | 60 | 45 |
| | 32 | 0.1900 | 0.02000 | 1285 | 49 | 36 | 1800 | 68 | 51 |
| 1/4 | 20 | 0.2500 | 0.0318 | 2020 | 96 | 75 | 2860 | 144 | 108 |
| | 28 | 0.2500 | 0.0364 | 2320 | 120 | 86 | 3280 | 168 | 120 |
| | | | | | Ft. Lb. | Ft. Lb. | | Ft. Lb. | Ft. Lb. |
| 5/16 | 18 | 0.3125 | 0.0524 | 3340 | 17 | 13 | 4720 | 25 | 18 |
| | 24 | 0.3125 | 0.0580 | 3700 | 19 | 14 | 5220 | 25 | 20 |
| 3/8 | 16 | 0.3750 | 0.0775 | 4940 | 30 | 23 | 7000 | 45 | 35 |
| | 24 | 0.3750 | 0.0878 | 5600 | 35 | 25 | 7900 | 50 | 35 |
| 7/16 | 14 | 0.4375 | 0.1063 | 6800 | 50 | 35 | 9550 | 70 | 55 |
| | 20 | 0.4375 | 0.1187 | 7550 | 55 | 40 | 10700 | 80 | 60 |
| 1/2 | 13 | 0.5000 | 0.1419 | 9050 | 75 | 55 | 12750 | 110 | 80 |
| | 20 | 0.5000 | 0.1599 | 10700 | 90 | 65 | 14400 | 120 | 90 |
| 9/16 | 12 | 0.5625 | 0.1820 | 11600 | 110 | 80 | 16400 | 150 | 110 |
| | 18 | 0.5625 | 0.2030 | 12950 | 120 | 90 | 18250 | 170 | 130 |
| 5/8 | 11 | 0.6250 | 0.2260 | 14400 | 150 | 110 | 20350 | 220 | 170 |
| | 18 | 0.6250 | 0.2560 | 16300 | 170 | 130 | 23000 | 240 | 180 |
| 3/4 | 10 | 0.7500 | 0.3340 | 21300 | 260 | 200 | 30100 | 380 | 280 |
| | 16 | 0.7500 | 0.3730 | 23800 | 300 | 220 | 33600 | 420 | 320 |
| 7/8 | 9 | 0.8750 | 0.4620 | 29400 | 430 | 320 | 41600 | 600 | 460 |
| | 14 | 0.8750 | 0.5090 | 32400 | 470 | 350 | 45800 | 660 | 500 |
| 1 | 8 | 1.0000 | 0.6060 | 38600 | 640 | 480 | 51500 | 900 | 680 |
| | 12 | 1.0000 | 0.6630 | 42200 | 700 | 530 | 59700 | 1000 | 740 |
| 1 1/8 | 7 | 1.1250 | 0.7630 | 42300 | 800 | 600 | 68700 | 1280 | 960 |
| | 12 | 1.1250 | 0.8560 | 47500 | 880 | 660 | 77000 | 1440 | 1080 |
| 1 1/4 | 7 | 1.2500 | 0.9690 | 53800 | 1120 | 840 | 87200 | 1820 | 1360 |
| | 12 | 1.2500 | 1.0730 | 59600 | 1240 | 920 | 96600 | 2000 | 1500 |
| 1 3/8 | 6 | 1.3750 | 1.1550 | 64100 | 1460 | 1100 | 104000 | 2380 | 1780 |
| | 12 | 1.3750 | 1.3150 | 73000 | 1680 | 1260 | 118100 | 2720 | 2040 |
| 1 1/2 | 6 | 1.5000 | 1.4050 | 78000 | 1940 | 1460 | 126500 | 3160 | 2360 |
| | 12 | 1.5000 | 1.5800 | 87700 | 2200 | 1640 | 142200 | 3560 | 2660 |

**Grade 5**

**Grade 8**

# 4.5 TROUBLESHOOTING

**Page**

## Troubleshooting Introduction

The following section is designed to aid in the diagnosis of problems which may occur on a Genie Vertical Lift. A system of troubleshooting flow charts is used to diagnose problems ranging from defective solenoids to the need for pump replacement. To use this section, a technician should have the following basic hand tools and test equipment: a voltmeter, ohmmeter, pressure gauges, and flow meters.

Included in this section are twenty seven (27) troubleshooting flow charts which cover various machine defective conditions for both the Genie V-2470 & V-2470RT. These flow charts include several numbered tests, and test results (shaded boxes), which are used to direct the technician to the recommended machine repair. Bold framed boxes indicate that the flow chart continues on another page.

Before performing any machine tests the following safety precautions should be observed:

- Read and understand sections 3.6 and/or 3.7, Theory of Operation.
- Read and follow all the safety instructions listed in section 2.1, Mandatory Precautions, and as indicated by decals on the Genie Vertical Lift.
- When troubleshooting, make certain the machine is resting on a firm, smooth, level surface.
- When testing drive system defective conditions, make certain the machine is secured from rolling by chocking the front tires and by jacking the machine drive assembly off the ground before conducting any tests.
- Two persons will be needed to safely conduct some drive system defective condition tests.

This Troubleshooting section deals primarily with malfunctions or defective components. Therefore, make certain all correct operating procedures are performed prior to conducting any of the recommended tests.

It should be noted that various degrees of a particular function loss may occur. For example: "ELEVATE Up function inoperative". This should mean "Elevate cylinder will not extend with the same speed or power of a properly functioning machine."

**NOTE:** *Proper diagnosis of a problem can only be done with batteries which are fully charged (discharged batteries will result in sluggish operation) and, on the Genie V-2470RT, have the engine running (if possible).*

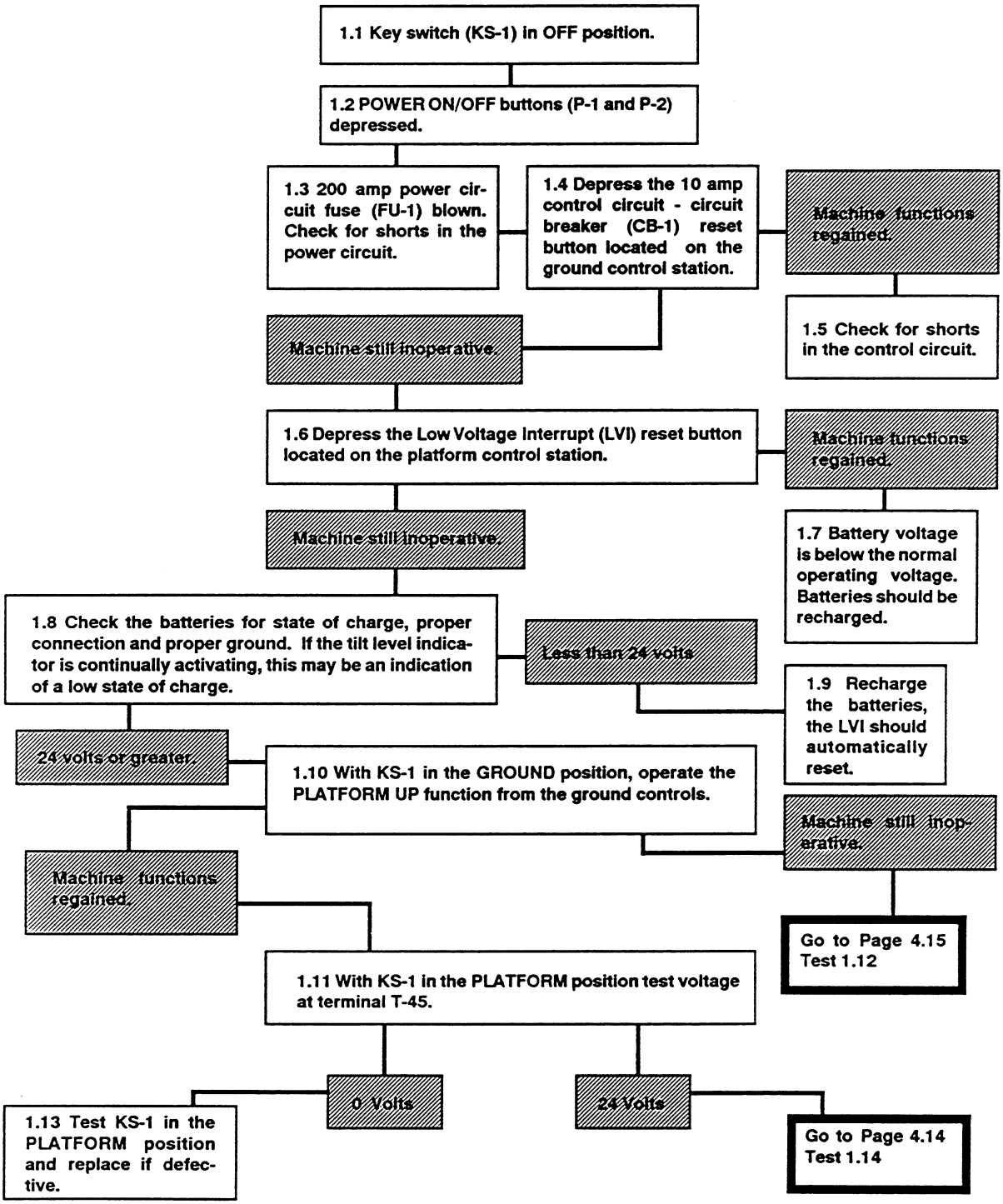
Throughout this Troubleshooting section, references are made to terminal numbers. For the exact location of these terminal points, refer to the electrical schematic and accompanying legend in section 5.2, Electrical Schematics & Diagrams.

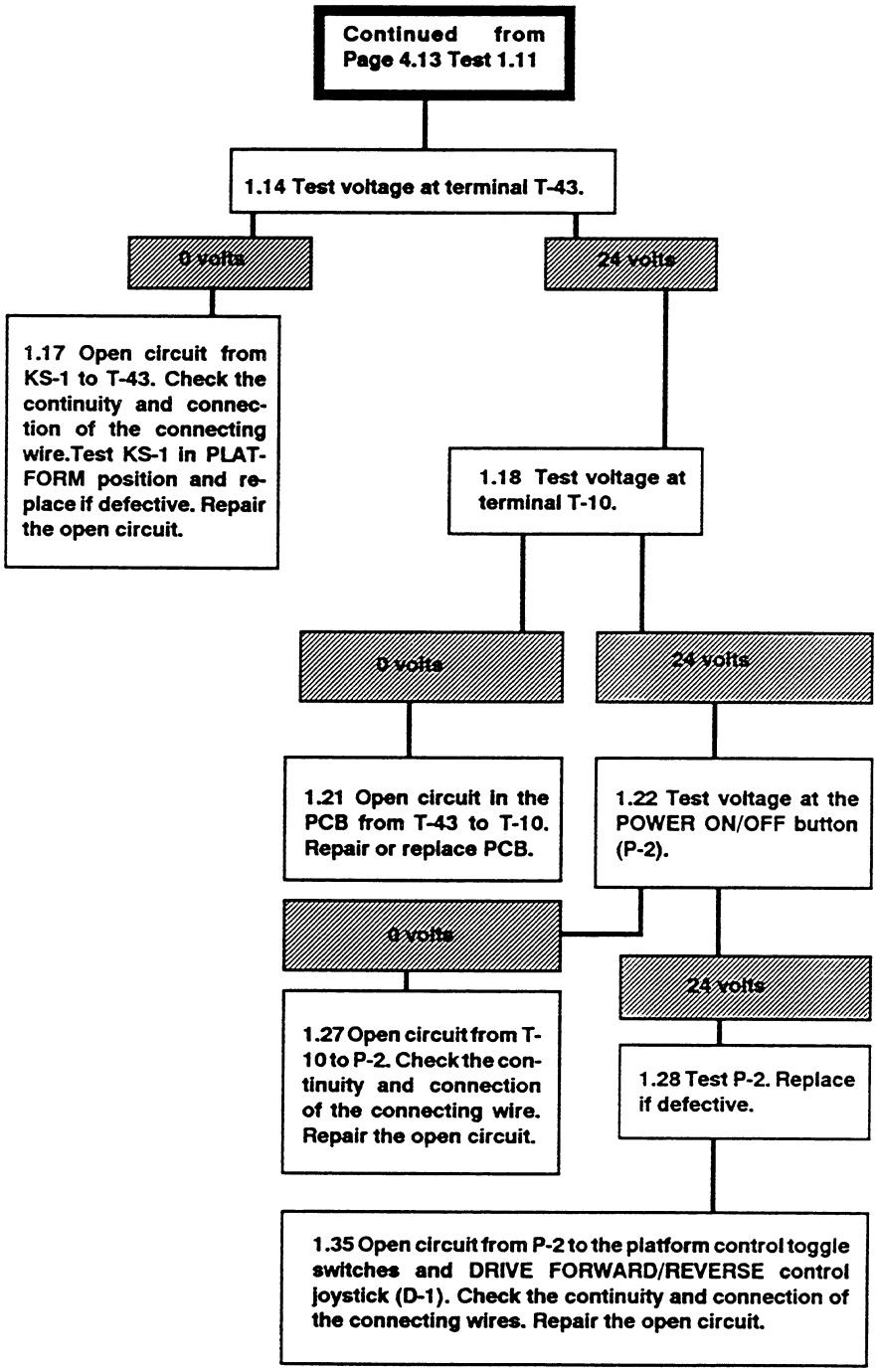
Pages 4.12 (V-2470) and 4.33 (V-2470RT) contain a list of problems which may occur due to component malfunctions. Refer to the flow chart which most accurately describes your problem. In multiple-problem cases, solve one problem at a time beginning with the lowest number.

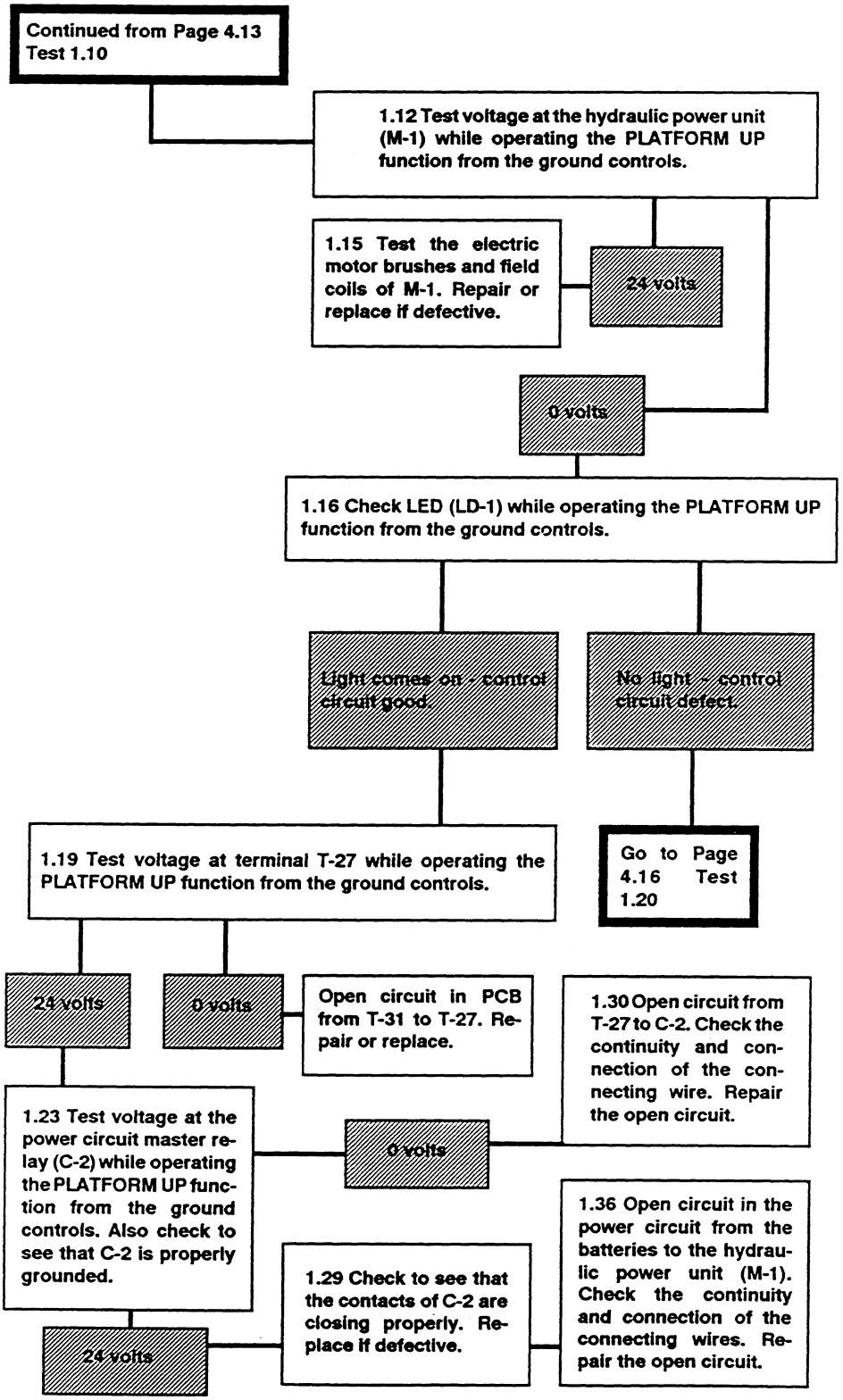
If you have any questions concerning this Troubleshooting section, you will be best served by referring to the defective condition flow chart number and machine test number when calling the Genie Service department toll free 800-426-8089.

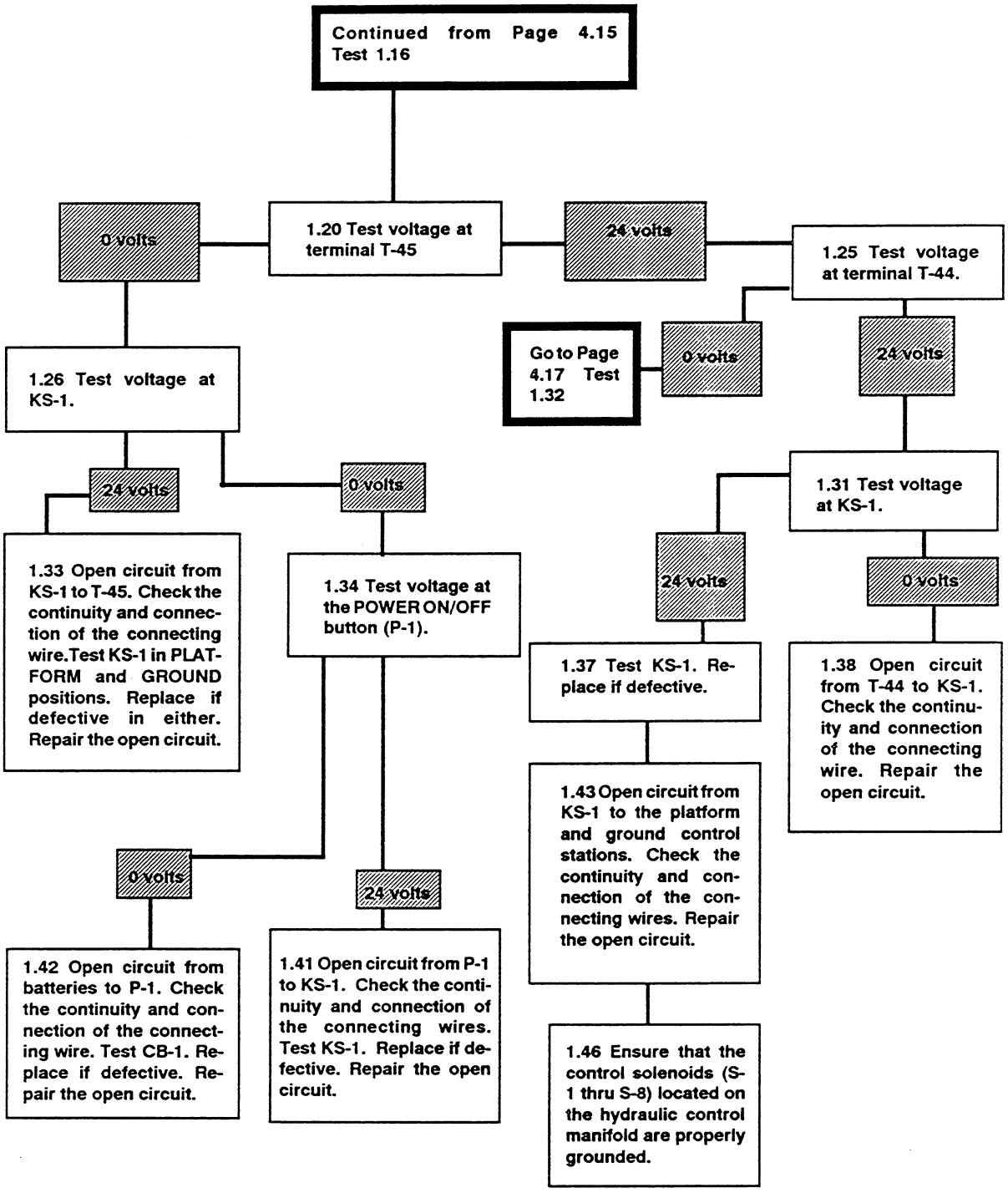
## Genie V-2470 Troubleshooting Flow Charts

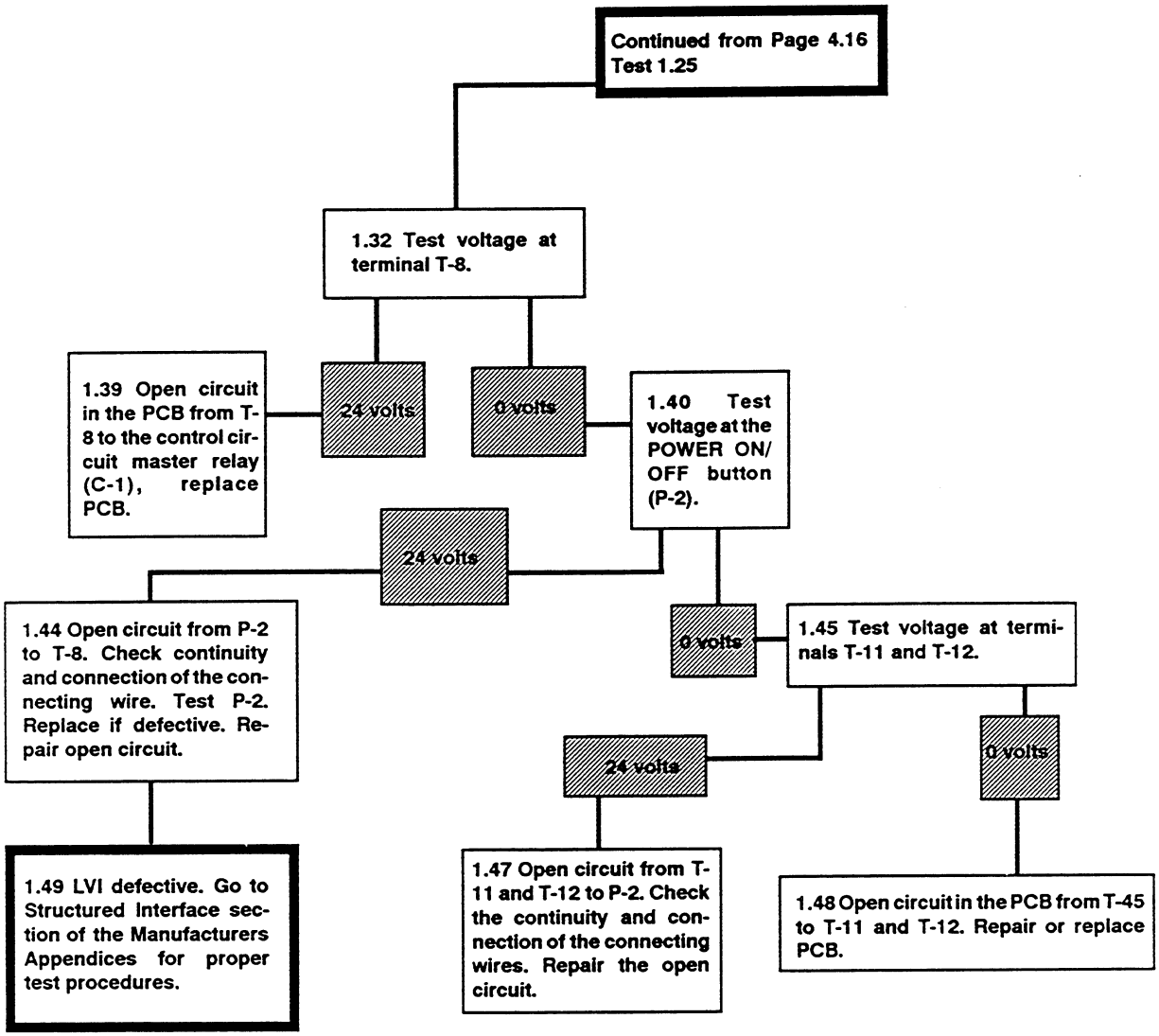
## 1. Machine will not lift, lower, drive or steer. All power functions lost. Electric motor will not start.



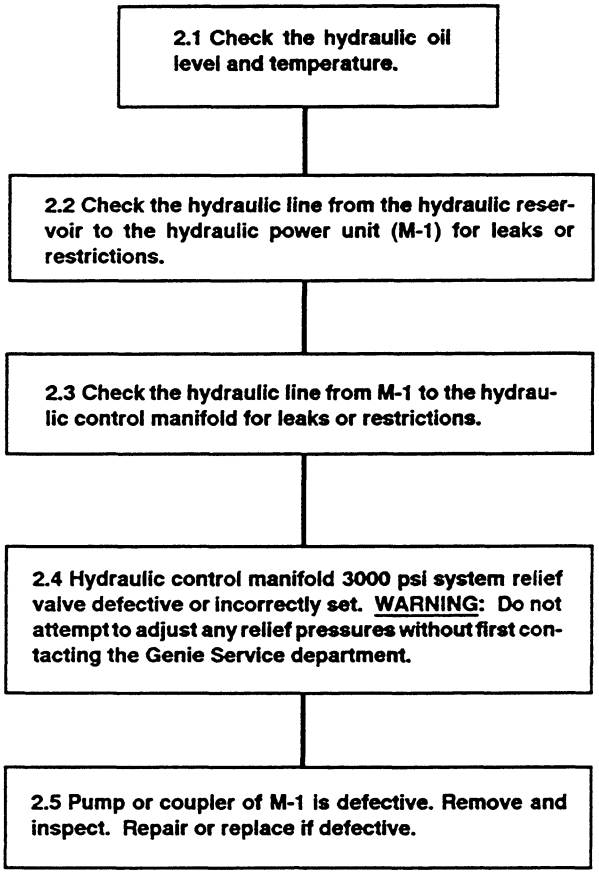

Continued from Page 4.13 Test 1.11
1.14 Test voltage at terminal T-43.
0 volts
24 volts
1.17 Open circuit from KS-1 to T-43. Check the continuity and connection of the connecting wire.Test KS-1 in PLATFORM position and replace if defective. Repair the open circuit.
1.18 Test voltage at terminal T-10.
0 volts
24 volts
1.21 Open circuit in the PCB from T-43 to T-10. Repair or replace PCB.
1.22 Test voltage at the POWER ON/OFF button (P-2).
0 volts
24 volts
1.27 Open circuit from T-10 to P-2. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.28 Test P-2. Replace if defective.
1.35 Open circuit from P-2 to the platform control toggle switches and DRIVE FORWARD/REVERSE control joystick (D-1). Check the continuity and connection of the connecting wires. Repair the open circuit.


Continued from Page 4.13 Test 1.10
1.12 Test voltage at the hydraulic power unit (M-1) while operating the PLATFORM UP function from the ground controls.
1.15 Test the electric motor brushes and field coils of M-1. Repair or replace if defective.
24 volts
0 volts
1.16 Check LED (LD-1) while operating the PLATFORM UP function from the ground controls.
Light comes on - control circuit good.
No light - control circuit defect.
1.19 Test voltage at terminal T-27 while operating the PLATFORM UP function from the ground controls.
Go to Page 4.16 Test 1.20
24 volts
0 volts
Open circuit in PCB from T-31 to T-27. Repair or replace.
1.30 Open circuit from T-27 to C-2. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.23 Test voltage at the power circuit master relay (C-2) while operating the PLATFORM UP function from the ground controls. Also check to see that C-2 is properly grounded.
0 volts
1.36 Open circuit in the power circuit from the batteries to the hydraulic power unit (M-1). Check the continuity and connection of the connecting wires. Repair the open circuit.
1.29 Check to see that the contacts of C-2 are closing properly. Replace if defective.
24 volts

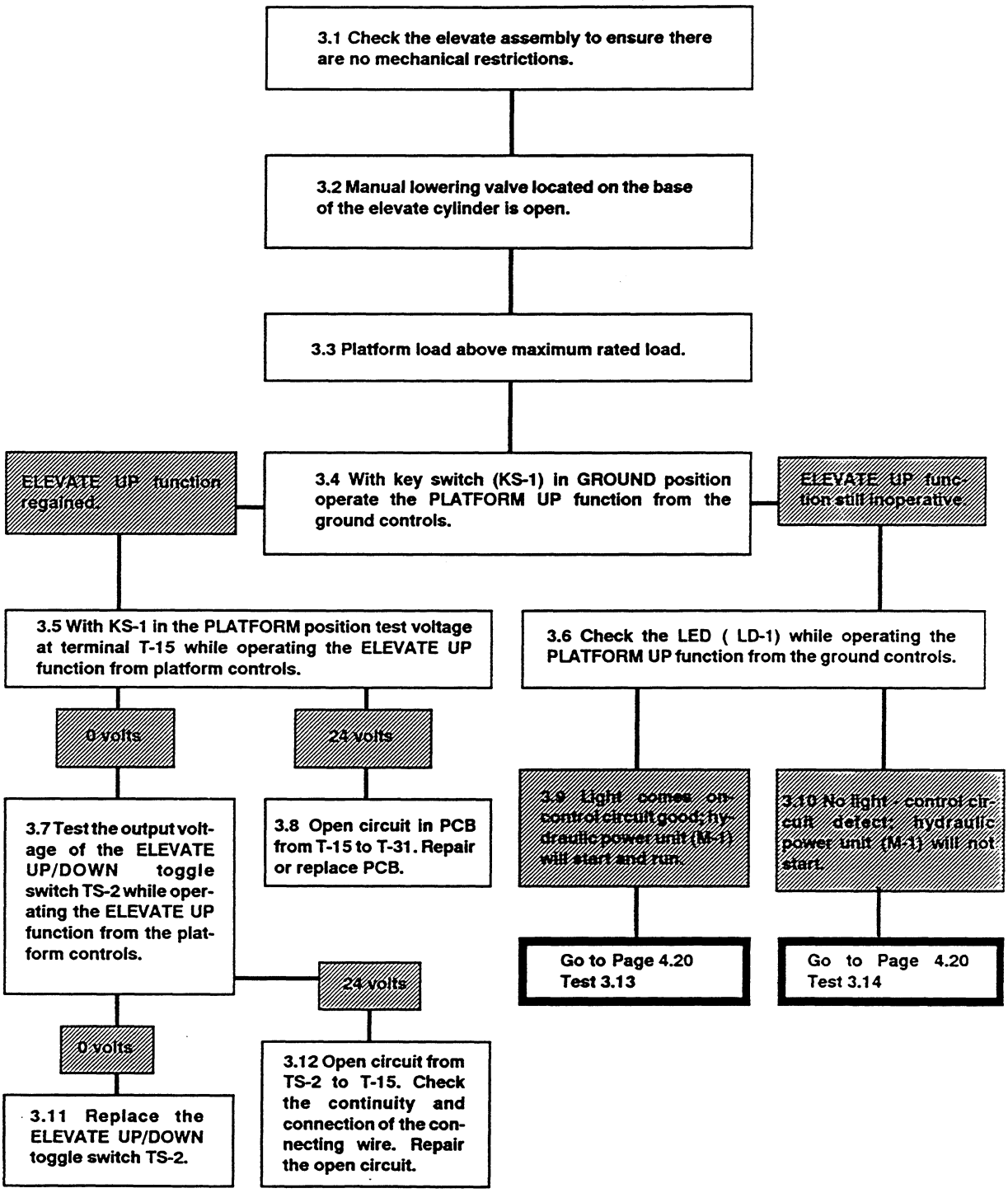

Continued from Page 4.15 Test 1.16
1.20 Test voltage at terminal T-45
0 volts
24 volts
1.25 Test voltage at terminal T-44.
Go to Page 4.17 Test 1.32
0 volts
24 volts
1.26 Test voltage at KS-1.
24 volts
0 volts
1.31 Test voltage at KS-1.
1.33 Open circuit from KS-1 to T-45. Check the continuity and connection of the connecting wire.Test KS-1 in PLATFORM and GROUND positions. Replace if defective in either. Repair the open circuit.
1.34 Test voltage at the POWER ON/OFF button (P-1).
24 volts
0 volts
1.37 Test KS-1. Replace if defective.
1.38 Open circuit from T-44 to KS-1. Check the continuity and connection of the connecting wire. Repair the open circuit.
0 volts
24 volts
1.43 Open circuit from KS-1 to the platform and ground control stations. Check the continuity and connection of the connecting wires. Repair the open circuit.
1.42 Open circuit from batteries to P-1. Check the continuity and connection of the connecting wire. Test CB-1. Replace if defective. Repair the open circuit.
1.41 Open circuit from P-1 to KS-1. Check the continuity and connection of the connecting wires. Test KS-1. Replace if defective. Repair the open circuit.
1.46 Ensure that the control solenoids (S-1 thru S-8) located on the hydraulic control manifold are properly grounded.

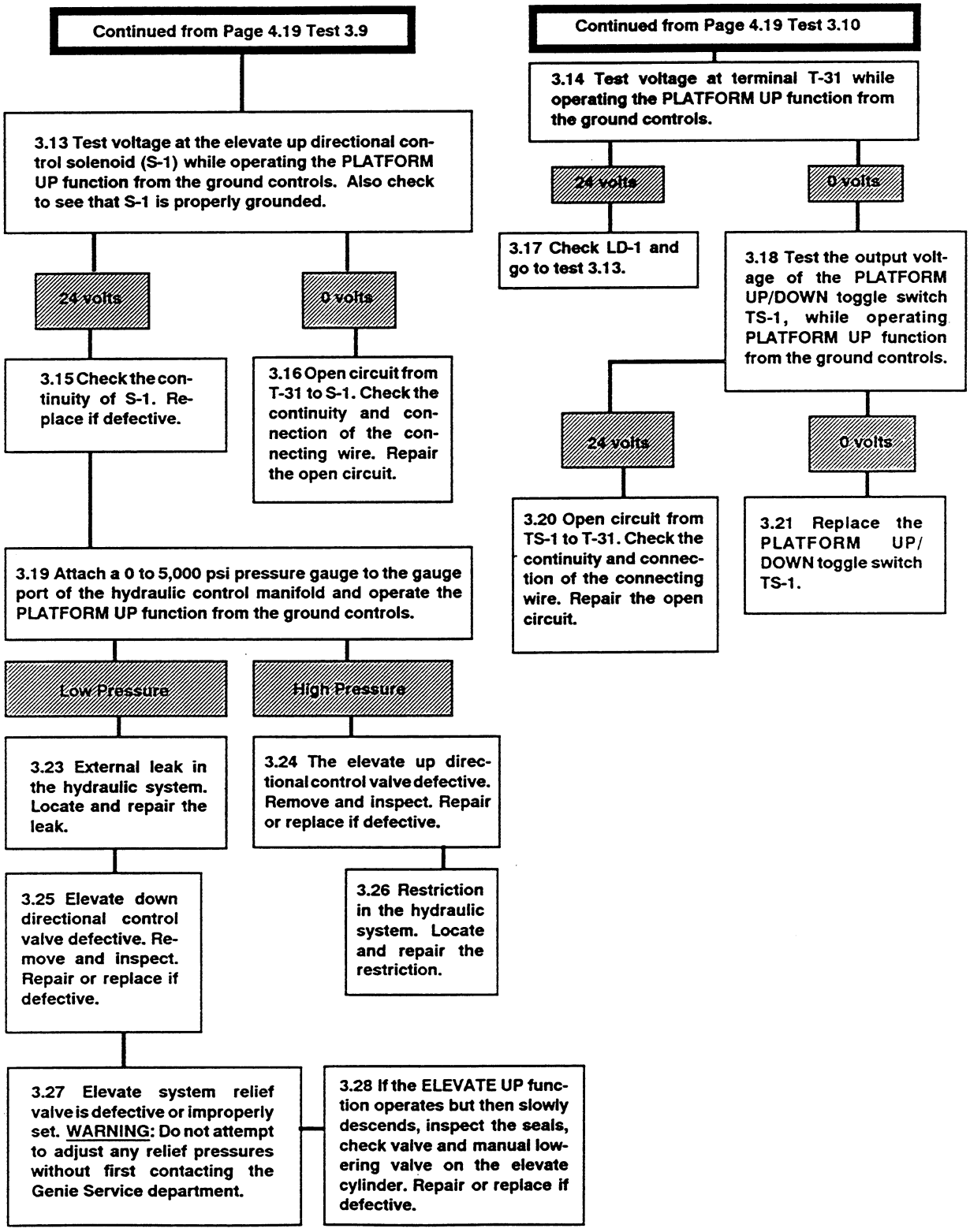

Continued from Page 4.16 Test 1.25
1.32 Test voltage at terminal T-8.
24 volts
0 volts
1.39 Open circuit in the PCB from T-8 to the control circuit master relay (C-1), replace PCB.
1.40 Test voltage at the POWER ON/ OFF button (P-2).
24 volts
1.44 Open circuit from P-2 to T-8. Check continuity and connection of the connecting wire. Test P-2. Replace if defective. Repair open circuit.
0 volts
1.45 Test voltage at terminals T-11 and T-12.
24 volts
0 volts
1.49 LVI defective. Go to Structured Interface section of the Manufacturers Appendices for proper test procedures.
1.47 Open circuit from T-11 and T-12 to P-2. Check the continuity and connection of the connecting wires. Repair the open circuit.
1.48 Open circuit in the PCB from T-45 to T-11 and T-12. Repair or replace PCB.

## 2. Machine will not lift, lower, drive or steer. All powered functions lost. Electric motor starts and runs.

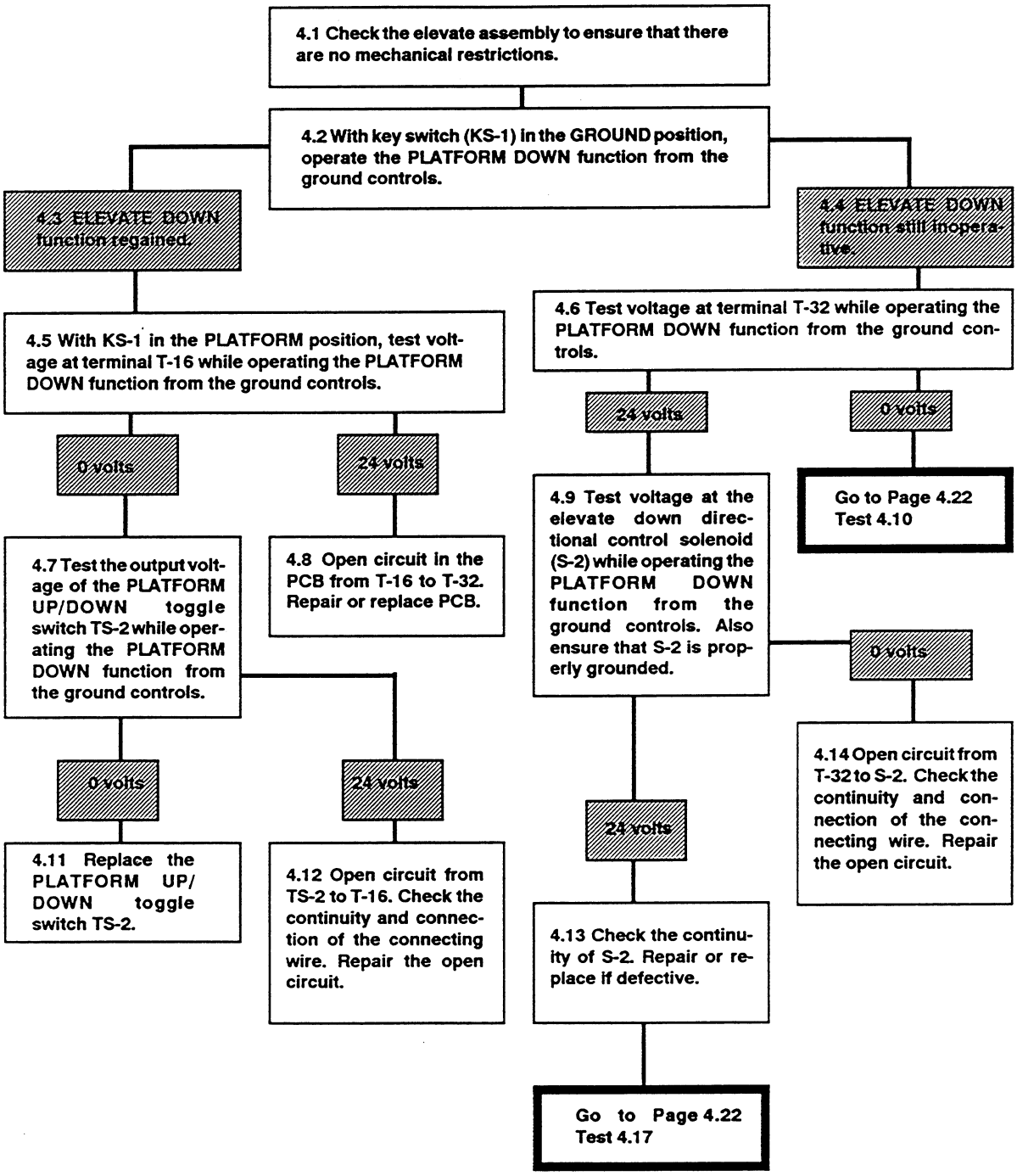


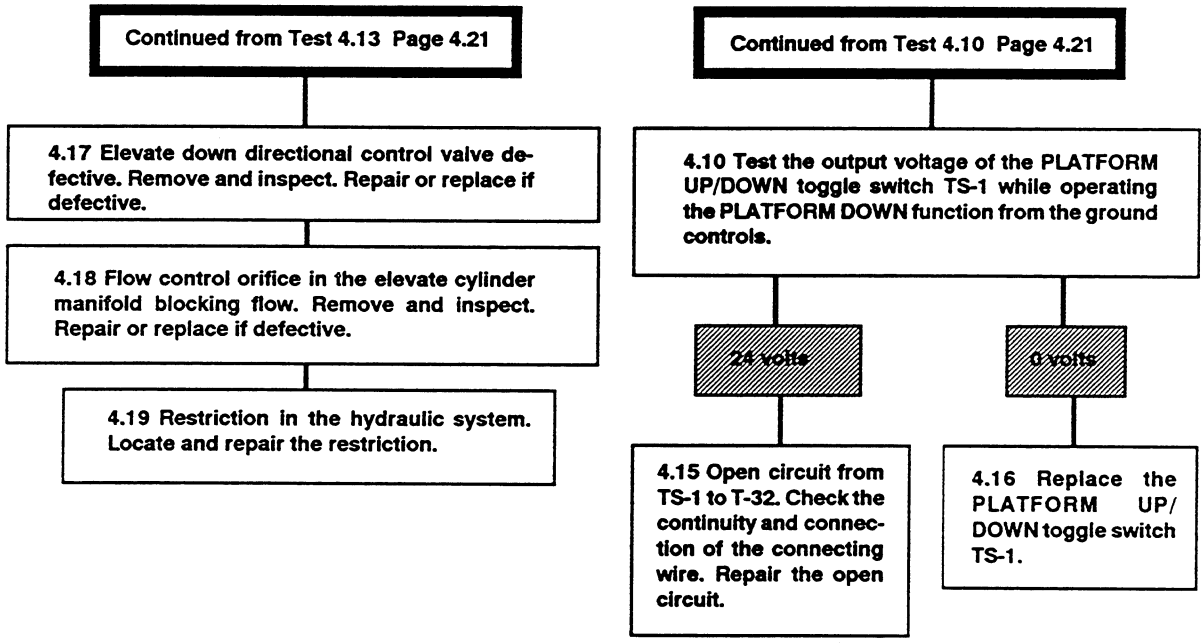
## 3. ELEVATE Up function inoperative.



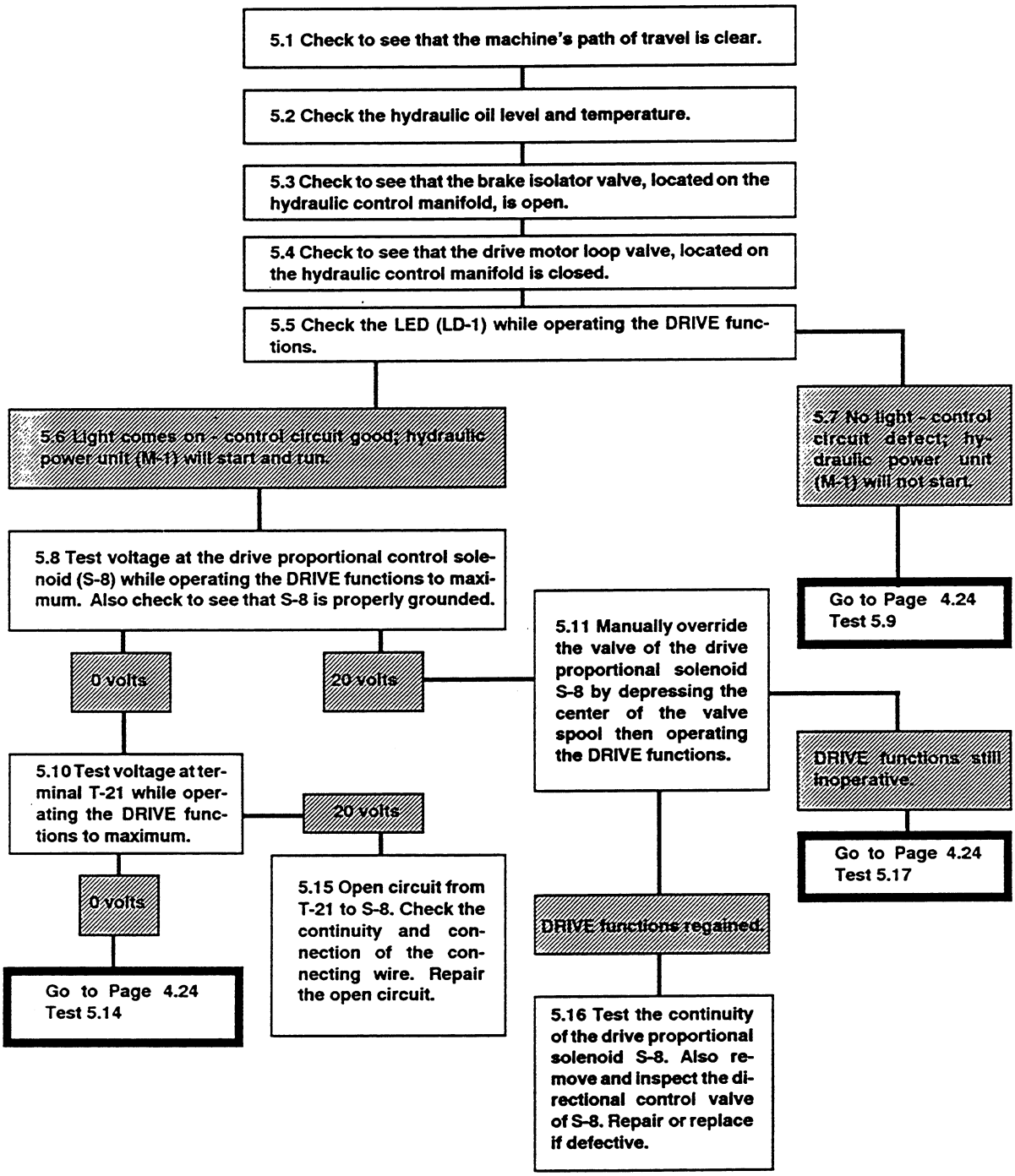

Continued from Page 4.19 Test 3.9
3.13 Test voltage at the elevate up directional control solenoid (S-1) while operating the PLATFORM UP function from the ground controls. Also check to see that S-1 is properly grounded.
24 volts
0 volts
3.15 Check the continuity of S-1. Replace if defective.
3.16 Open circuit from T-31 to S-1. Check the continuity and connection of the connecting wire. Repair the open circuit.
3.19 Attach a 0 to 5,000 psi pressure gauge to the gauge port of the hydraulic control manifold and operate the PLATFORM UP function from the ground controls.
Low Pressure
High Pressure
3.23 External leak in the hydraulic system. Locate and repair the leak.
3.24 The elevate up directional control valve defective. Remove and inspect. Repair or replace if defective.
3.25 Elevate down directional control valve defective. Remove and inspect. Repair or replace if defective.
3.26 Restriction in the hydraulic system. Locate and repair the restriction.
3.27 Elevate system relief valve is defective or improperly set. WARNING: Do not attempt to adjust any relief pressures without first contacting the Genie Service department.
3.28 If the ELEVATE UP function operates but then slowly descends, inspect the seals, check valve and manual lowering valve on the elevate cylinder. Repair or replace if defective.
Continued from Page 4.19 Test 3.10
3.14 Test voltage at terminal T-31 while operating the PLATFORM UP function from the ground controls.
24 volts
0 volts
3.17 Check LD-1 and go to test 3.13.
3.18 Test the output voltage of the PLATFORM UP/DOWN toggle switch TS-1, while operating PLATFORM UP function from the ground controls.
24 volts
0 volts
3.20 Open circuit from TS-1 to T-31. Check the continuity and connection of the connecting wire. Repair the open circuit.
3.21 Replace the PLATFORM UP/DOWN toggle switch TS-1.

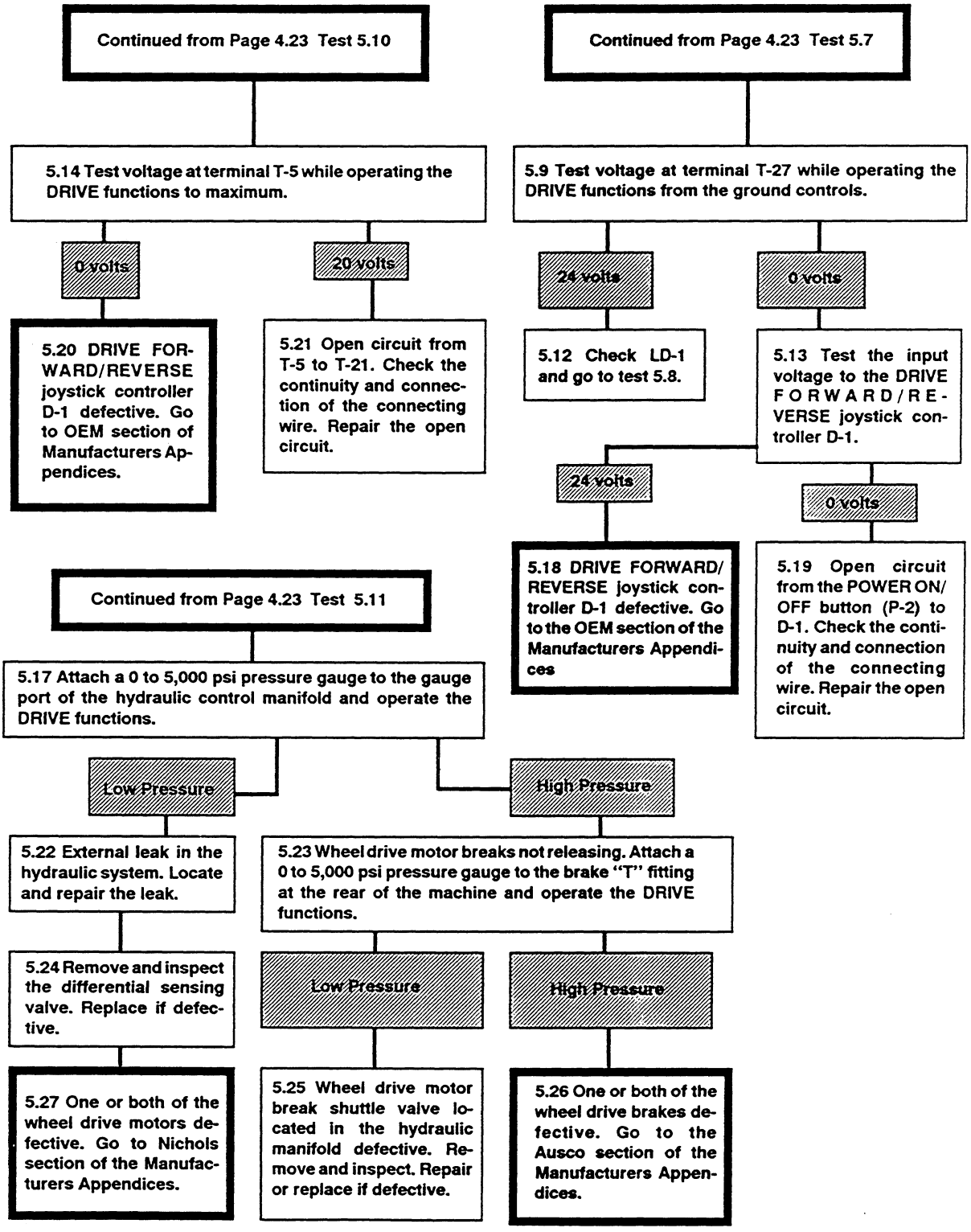
## 4. ELEVATE Down function inoperative.



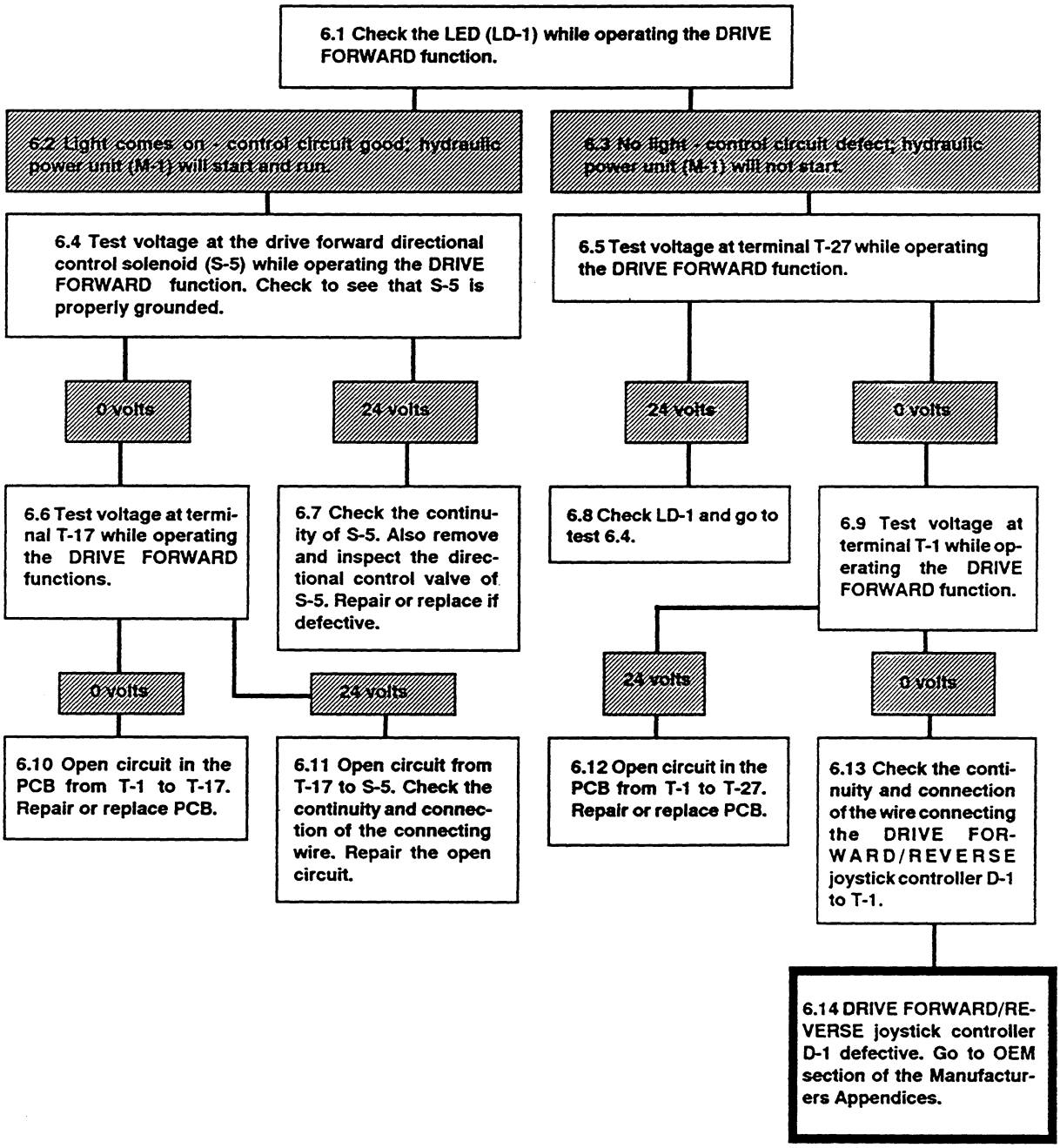

Continued from Test 4.13 Page 4.21
4.17 Elevate down directional control valve defective. Remove and inspect. Repair or replace if defective.
4.18 Flow control orifice in the elevate cylinder manifold blocking flow. Remove and inspect. Repair or replace if defective.
4.19 Restriction in the hydraulic system. Locate and repair the restriction.
Continued from Test 4.10 Page 4.21
4.10 Test the output voltage of the PLATFORM UP/DOWN toggle switch TS-1 while operating the PLATFORM DOWN function from the ground controls.
24 volts
0 volts
4.15 Open circuit from TS-1 to T-32. Check the continuity and connection of the connecting wire. Repair the open circuit.
4.16 Replace the PLATFORM UP/DOWN toggle switch TS-1.

## 5. Machine will not DRIVE Forward or Reverse.

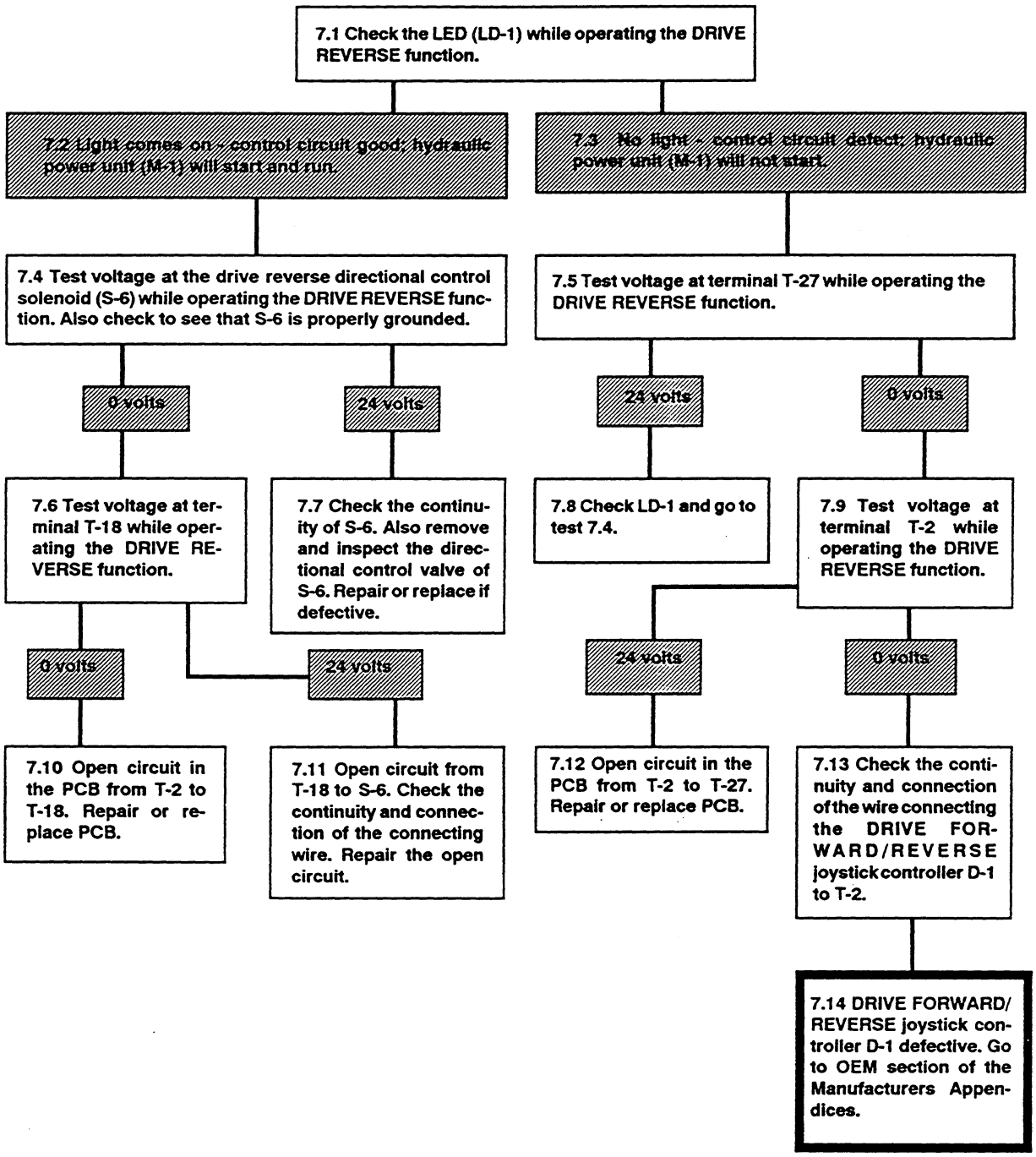



Continued from Page 4.23 Test 5.10
5.14 Test voltage at terminal T-5 while operating the DRIVE functions to maximum.
0 volts
20 volts
5.20 DRIVE FORWARD/REVERSE joystick controller D-1 defective. Go to OEM section of Manufacturers Appendices.
5.21 Open circuit from T-5 to T-21. Check the continuity and connection of the connecting wire. Repair the open circuit.
Continued from Page 4.23 Test 5.7
5.9 Test voltage at terminal T-27 while operating the DRIVE functions from the ground controls.
24 volts
0 volts
5.12 Check LD-1 and go to test 5.8.
5.13 Test the input voltage to the DRIVE FORWARD/REVERSE joystick controller D-1.
24 volts
0 volts
5.18 DRIVE FORWARD/REVERSE joystick controller D-1 defective. Go to the OEM section of the Manufacturers Appendices
5.19 Open circuit from the POWER ON/OFF button (P-2) to D-1. Check the continuity and connection of the connecting wire. Repair the open circuit.
Continued from Page 4.23 Test 5.11
5.17 Attach a 0 to 5,000 psi pressure gauge to the gauge port of the hydraulic control manifold and operate the DRIVE functions.
Low Pressure
High Pressure
5.22 External leak in the hydraulic system. Locate and repair the leak.
5.23 Wheel drive motor breaks not releasing. Attach a 0 to 5,000 psi pressure gauge to the brake "T" fitting at the rear of the machine and operate the DRIVE functions.
5.24 Remove and inspect the differential sensing valve. Replace if defective.
Low Pressure
High Pressure
5.27 One or both of the wheel drive motors defective. Go to Nichols section of the Manufacturers Appendices.
5.25 Wheel drive motor break shuttle valve located in the hydraulic manifold defective. Remove and inspect. Repair or replace if defective.
5.26 One or both of the wheel drive brakes defective. Go to the Ausco section of the Manufacturers Appendices.

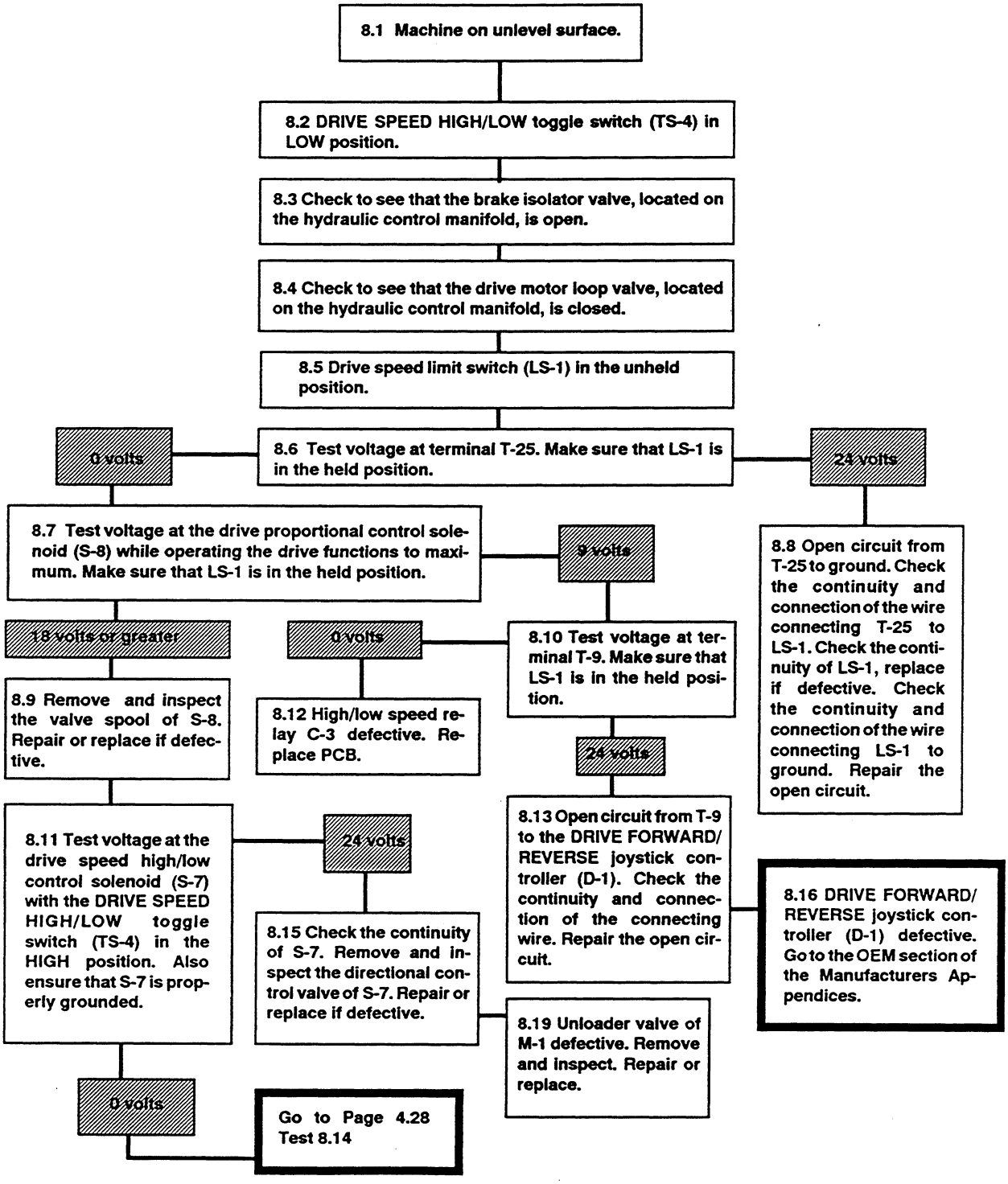
## 6. DRIVE Forward function inoperative.

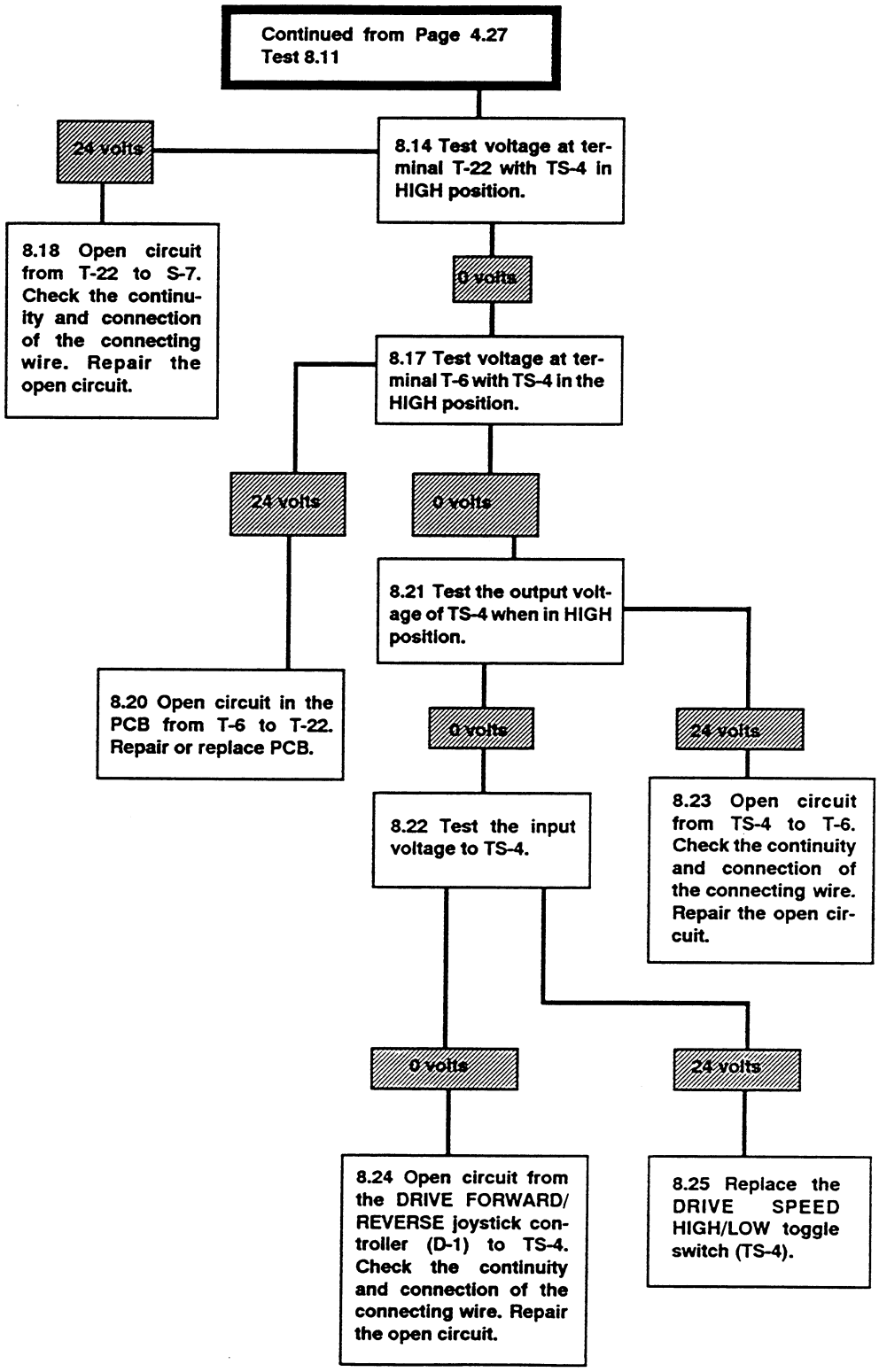


## 7. DRIVE Reverse function inoperative.

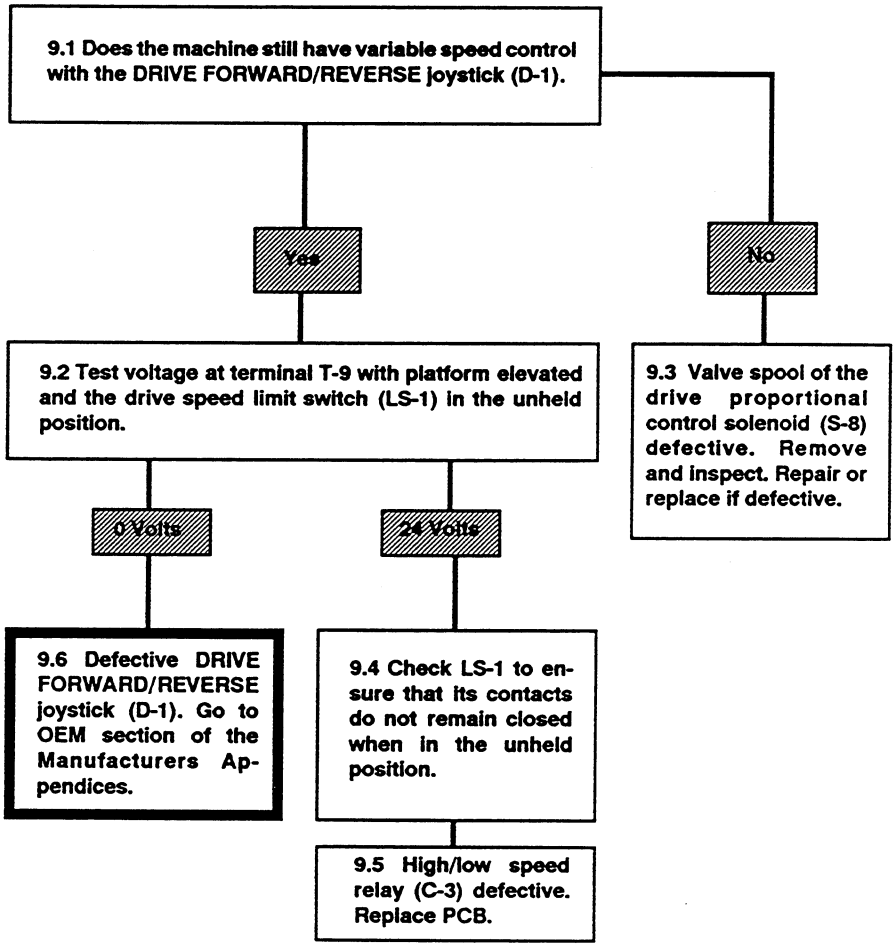


## 8. Machine will not drive at full speed.

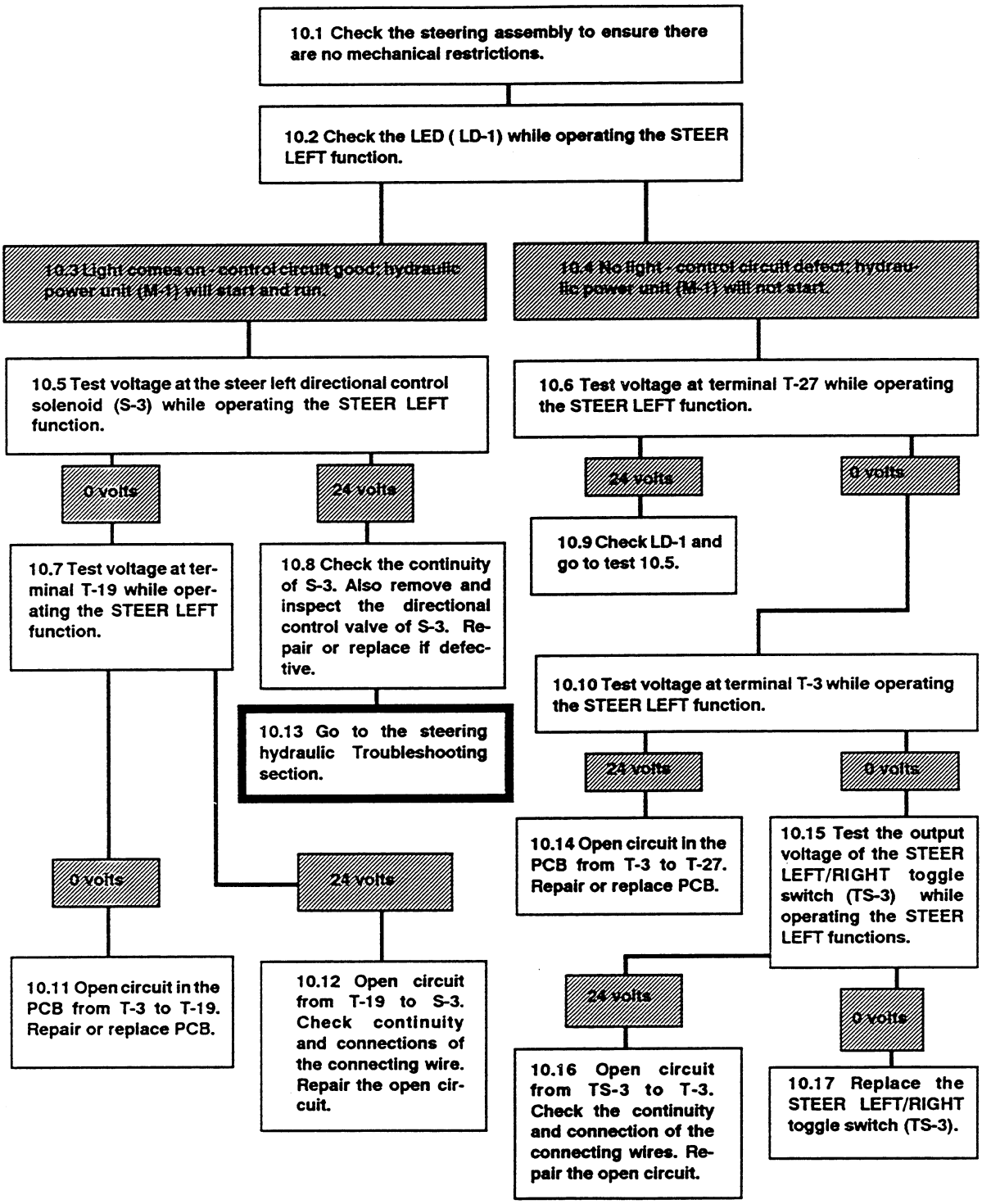



Continued from Page 4.27
Test 8.11
24 volts
8.14 Test voltage at terminal T-22 with TS-4 in HIGH position.
8.18 Open circuit from T-22 to S-7. Check the continuity and connection of the connecting wire. Repair the open circuit.
0 volts
8.17 Test voltage at terminal T-6 with TS-4 in the HIGH position.
24 volts
0 volts
8.21 Test the output voltage of TS-4 when in HIGH position.
8.20 Open circuit in the PCB from T-6 to T-22. Repair or replace PCB.
0 volts
24 volts
8.22 Test the input voltage to TS-4.
8.23 Open circuit from TS-4 to T-6. Check the continuity and connection of the connecting wire. Repair the open circuit.
0 volts
24 volts
8.24 Open circuit from the DRIVE FORWARD/ REVERSE joystick controller (D-1) to TS-4. Check the continuity and connection of the connecting wire. Repair the open circuit.
8.25 Replace the DRIVE SPEED HIGH/LOW toggle switch (TS-4).

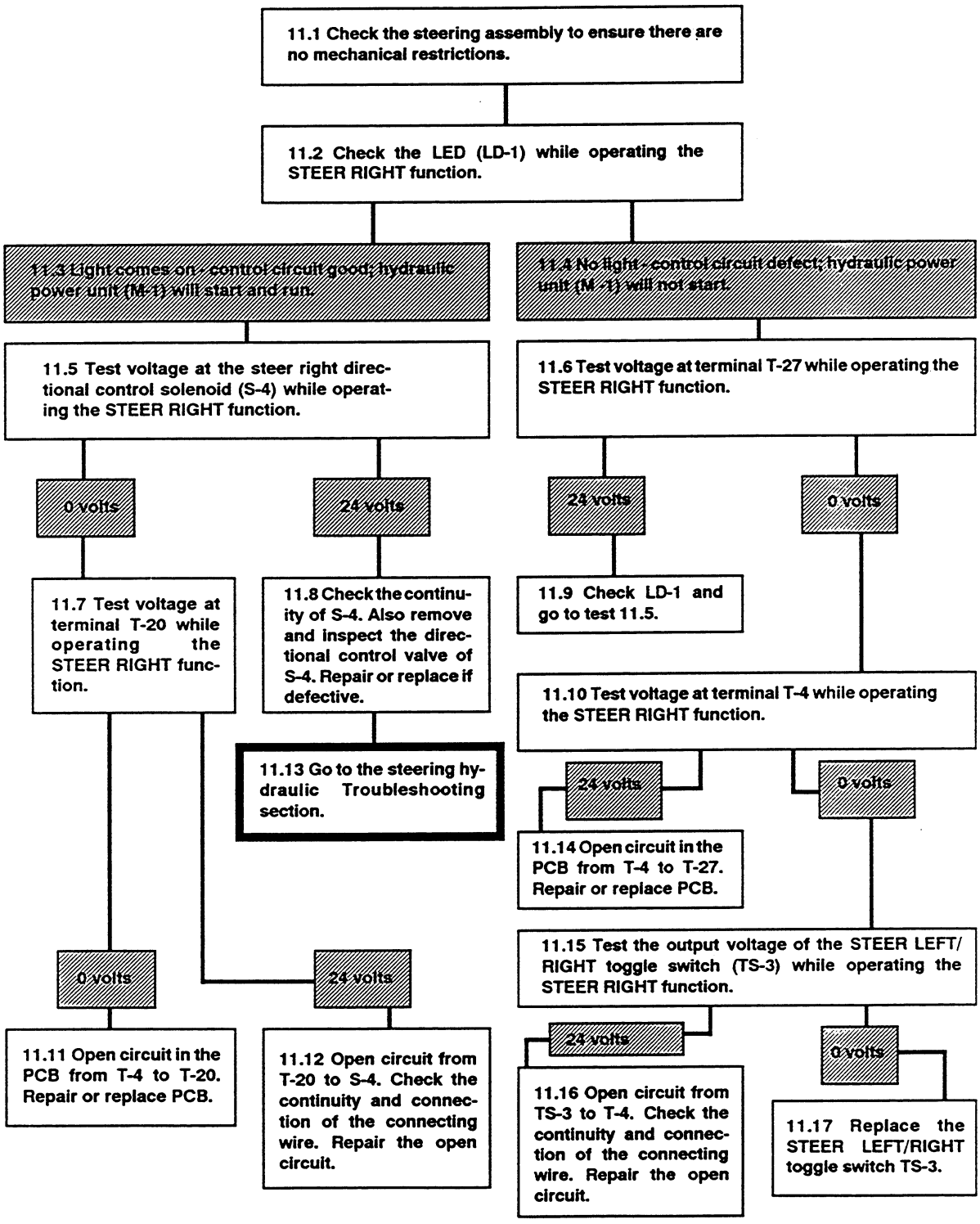
## 9. Drives at full speed with platform elevated.



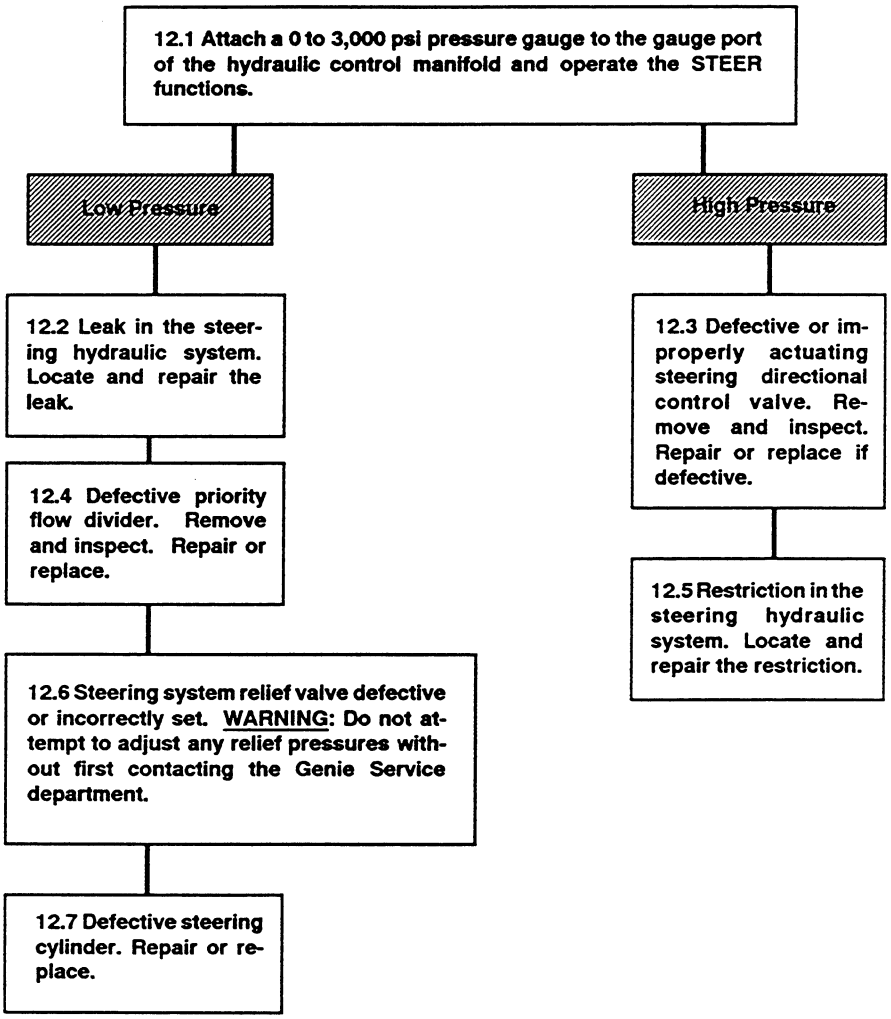
## 10. STEER Left function inoperative.



## 11. STEER Right function inoperative.

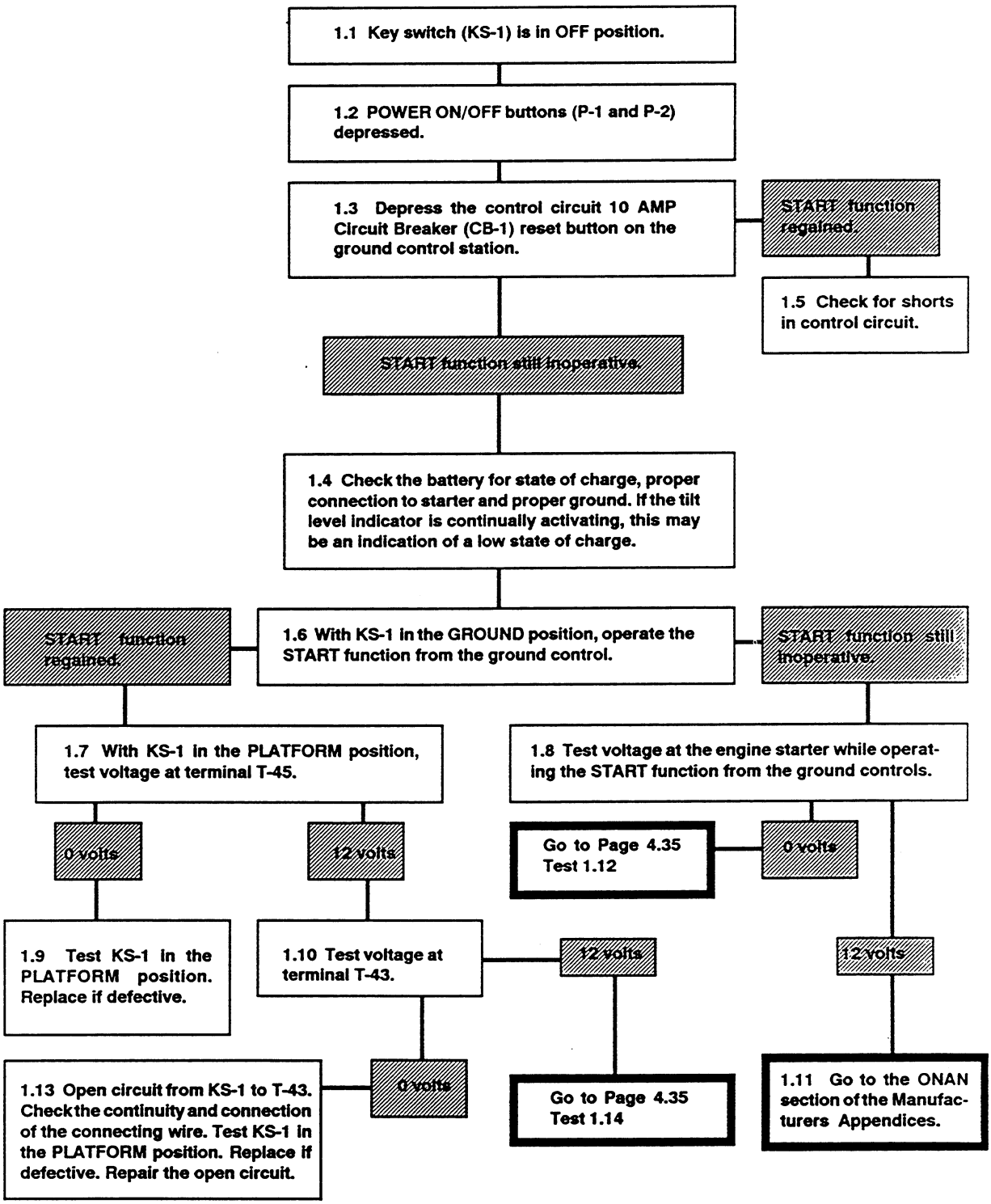


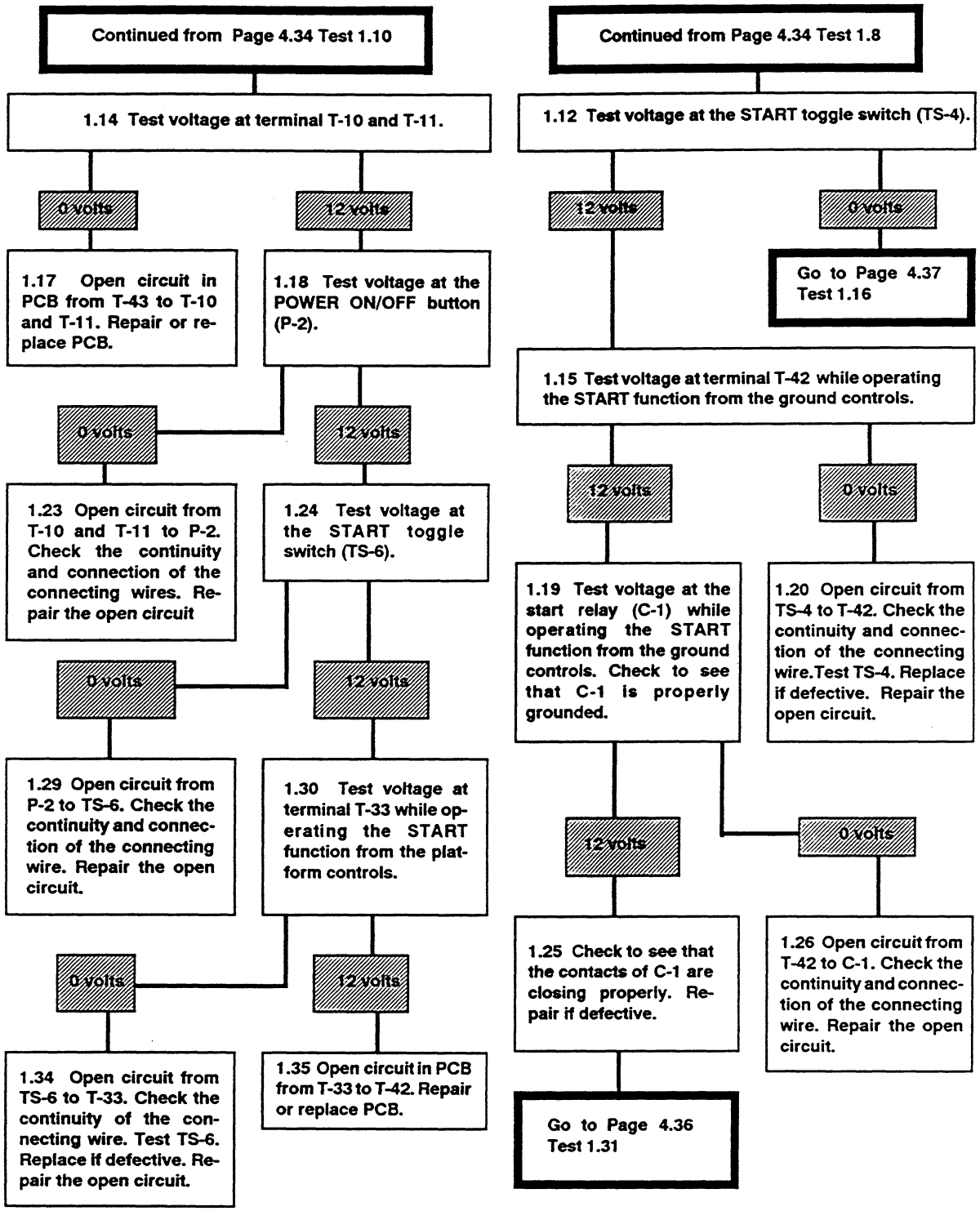
## 12. Steering functions lost (hydraulic section).

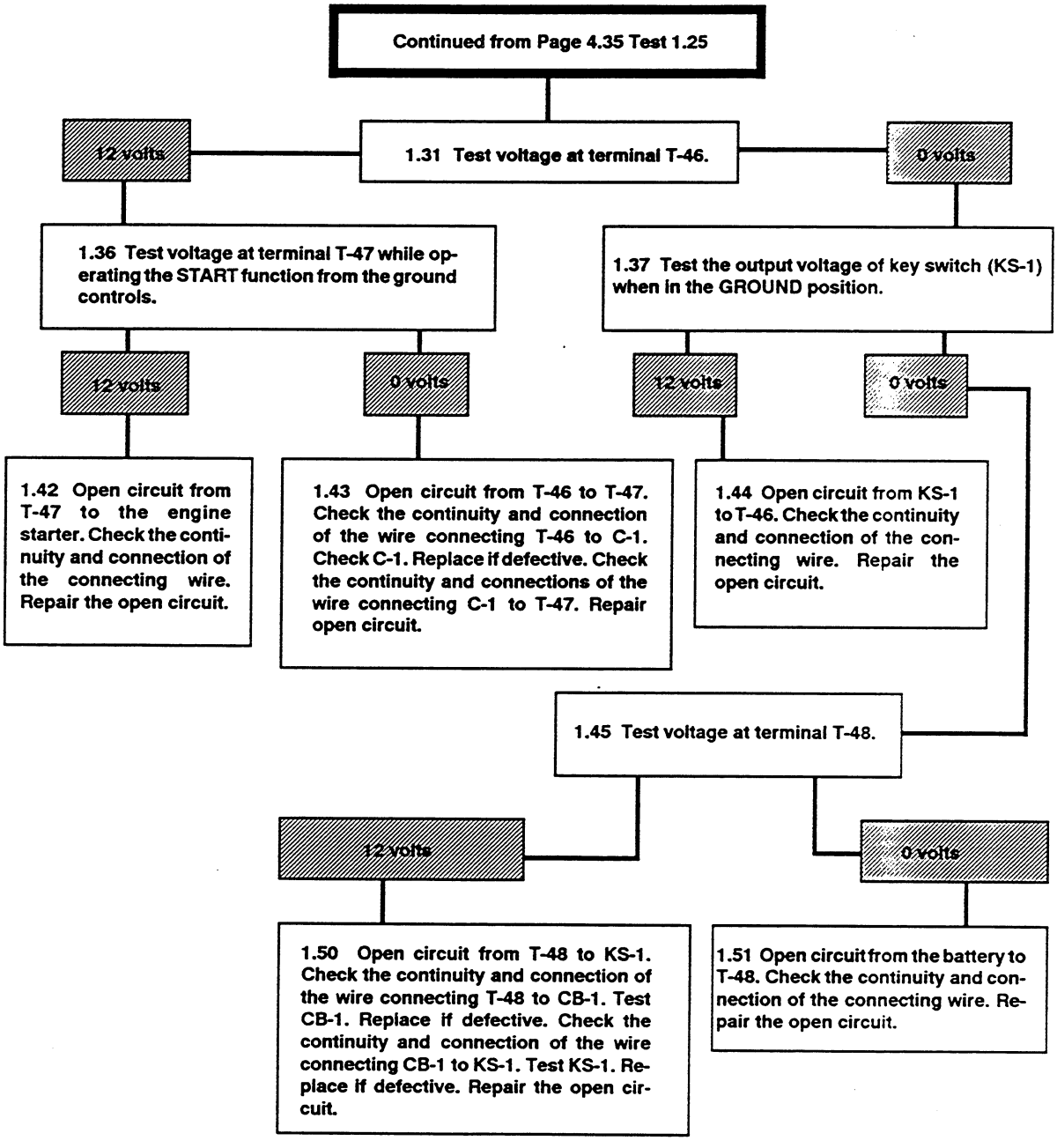


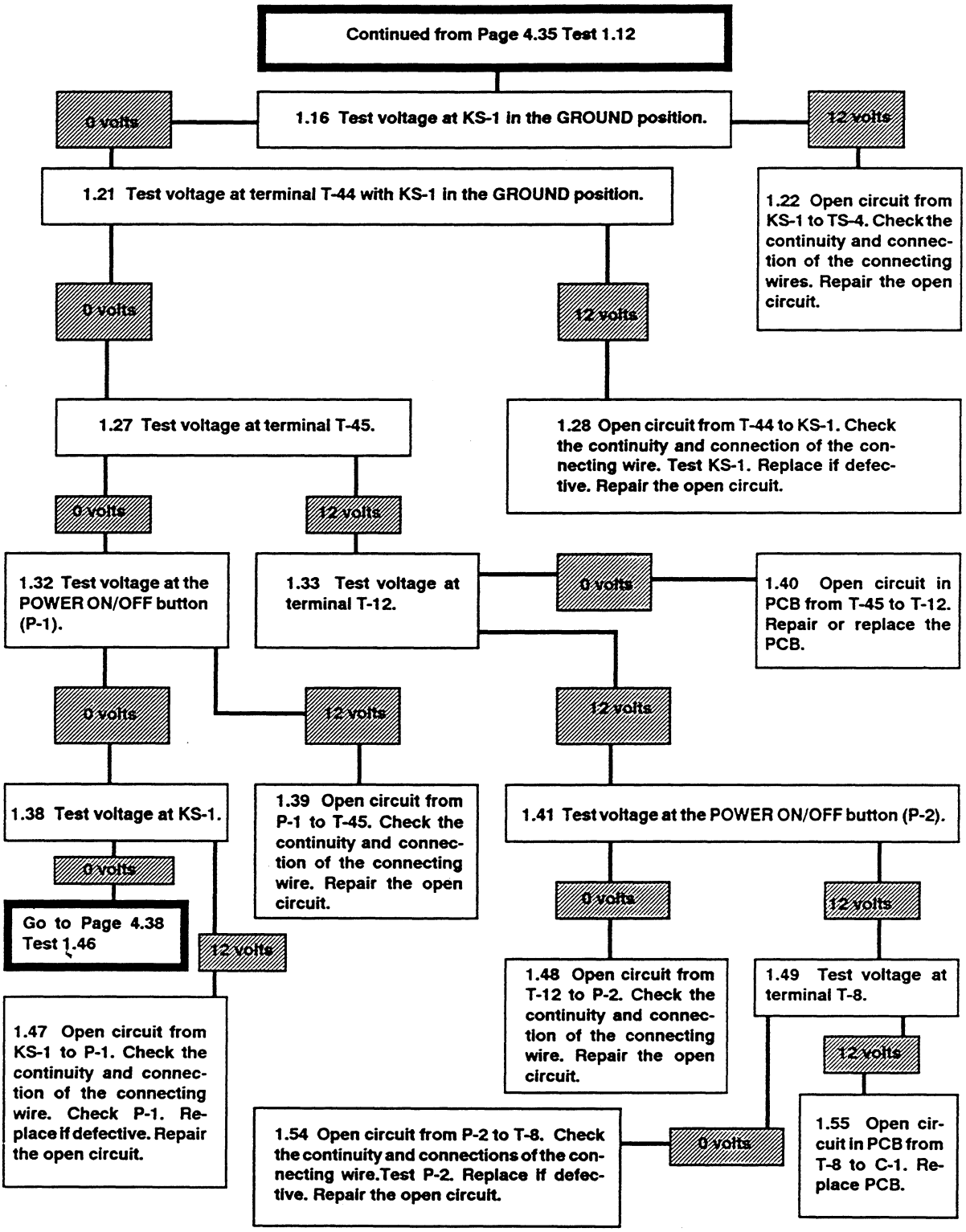
# Genie V-2470RT Troubleshooting Flow Charts

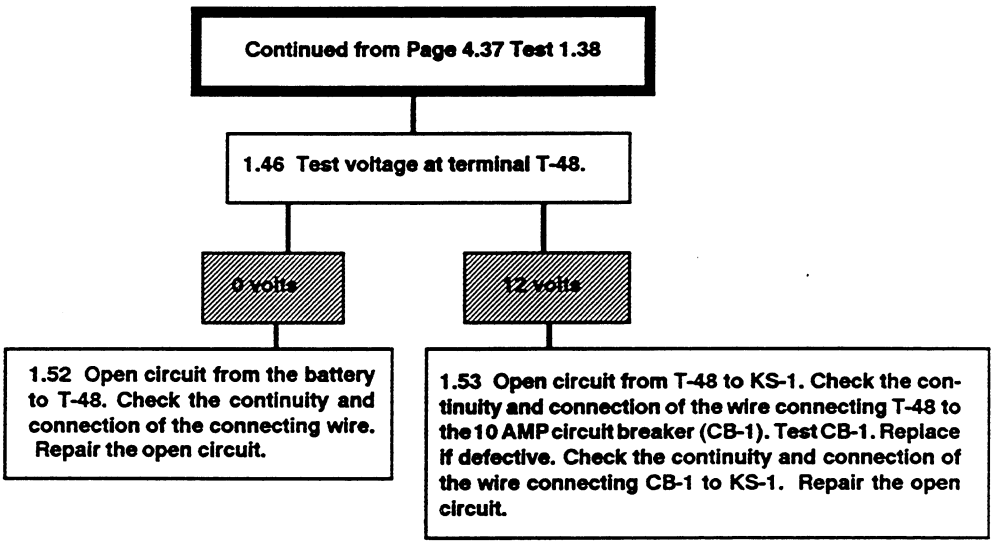
## 1. Engine does not crank over.



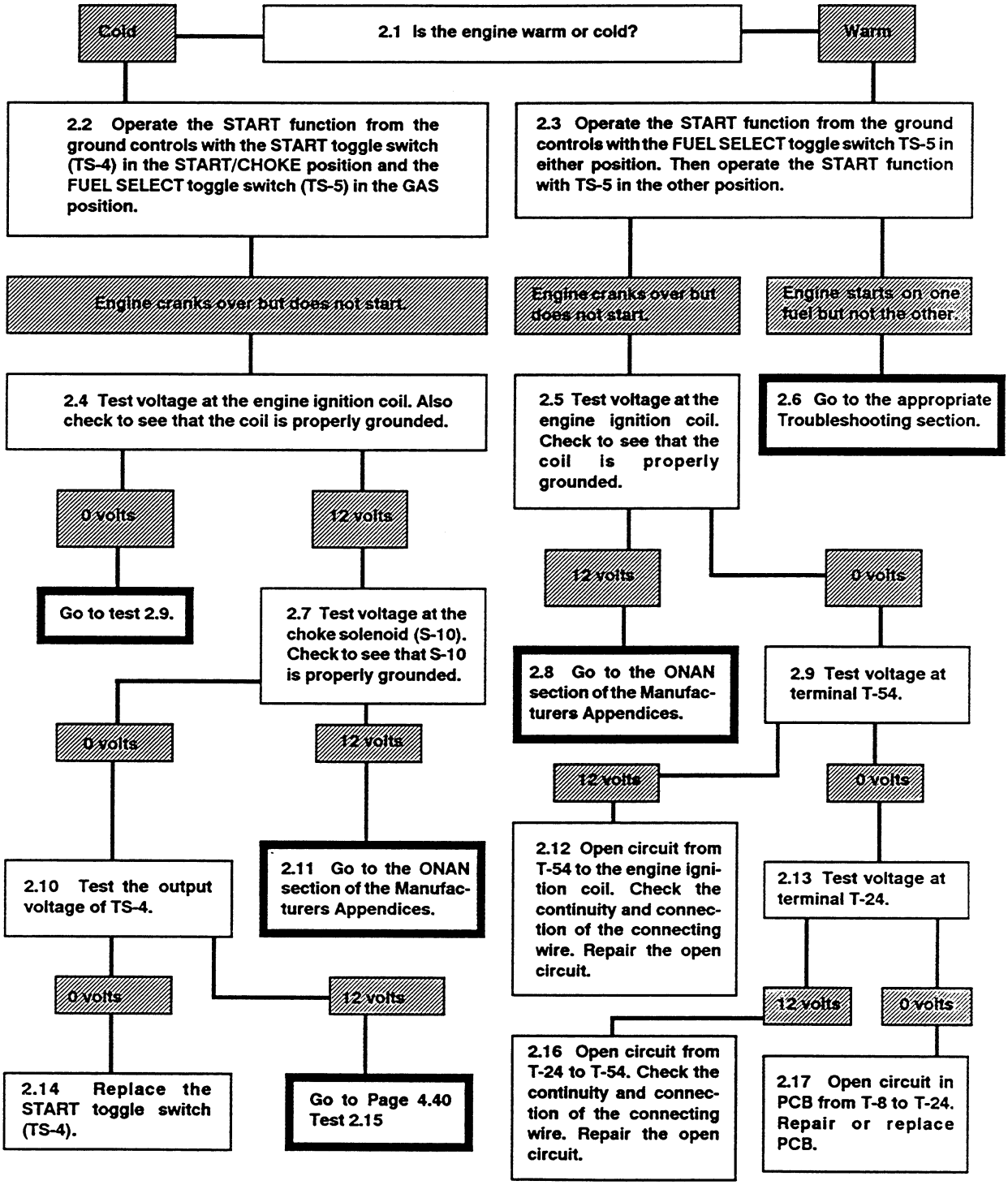

Continued from Page 4.34 Test 1.10
1.14 Test voltage at terminal T-10 and T-11.
0 volts
12 volts
1.17 Open circuit in PCB from T-43 to T-10 and T-11. Repair or replace PCB.
1.18 Test voltage at the POWER ON/OFF button (P-2).
0 volts
12 volts
1.23 Open circuit from T-10 and T-11 to P-2. Check the continuity and connection of the connecting wires. Repair the open circuit
1.24 Test voltage at the START toggle switch (TS-6).
0 volts
12 volts
1.29 Open circuit from P-2 to TS-6. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.30 Test voltage at terminal T-33 while operating the START function from the platform controls.
0 volts
12 volts
1.34 Open circuit from TS-6 to T-33. Check the continuity of the connecting wire. Test TS-6. Replace if defective. Repair the open circuit.
1.35 Open circuit in PCB from T-33 to T-42. Repair or replace PCB.
Continued from Page 4.34 Test 1.8
1.12 Test voltage at the START toggle switch (TS-4).
12 volts
0 volts
Go to Page 4.37 Test 1.16
1.15 Test voltage at terminal T-42 while operating the START function from the ground controls.
12 volts
0 volts
1.19 Test voltage at the start relay (C-1) while operating the START function from the ground controls. Check to see that C-1 is properly grounded.
1.20 Open circuit from TS-4 to T-42. Check the continuity and connection of the connecting wire.Test TS-4. Replace if defective. Repair the open circuit.
12 volts
0 volts
1.25 Check to see that the contacts of C-1 are closing properly. Repair if defective.
1.26 Open circuit from T-42 to C-1. Check the continuity and connection of the connecting wire. Repair the open circuit.
Go to Page 4.36 Test 1.31

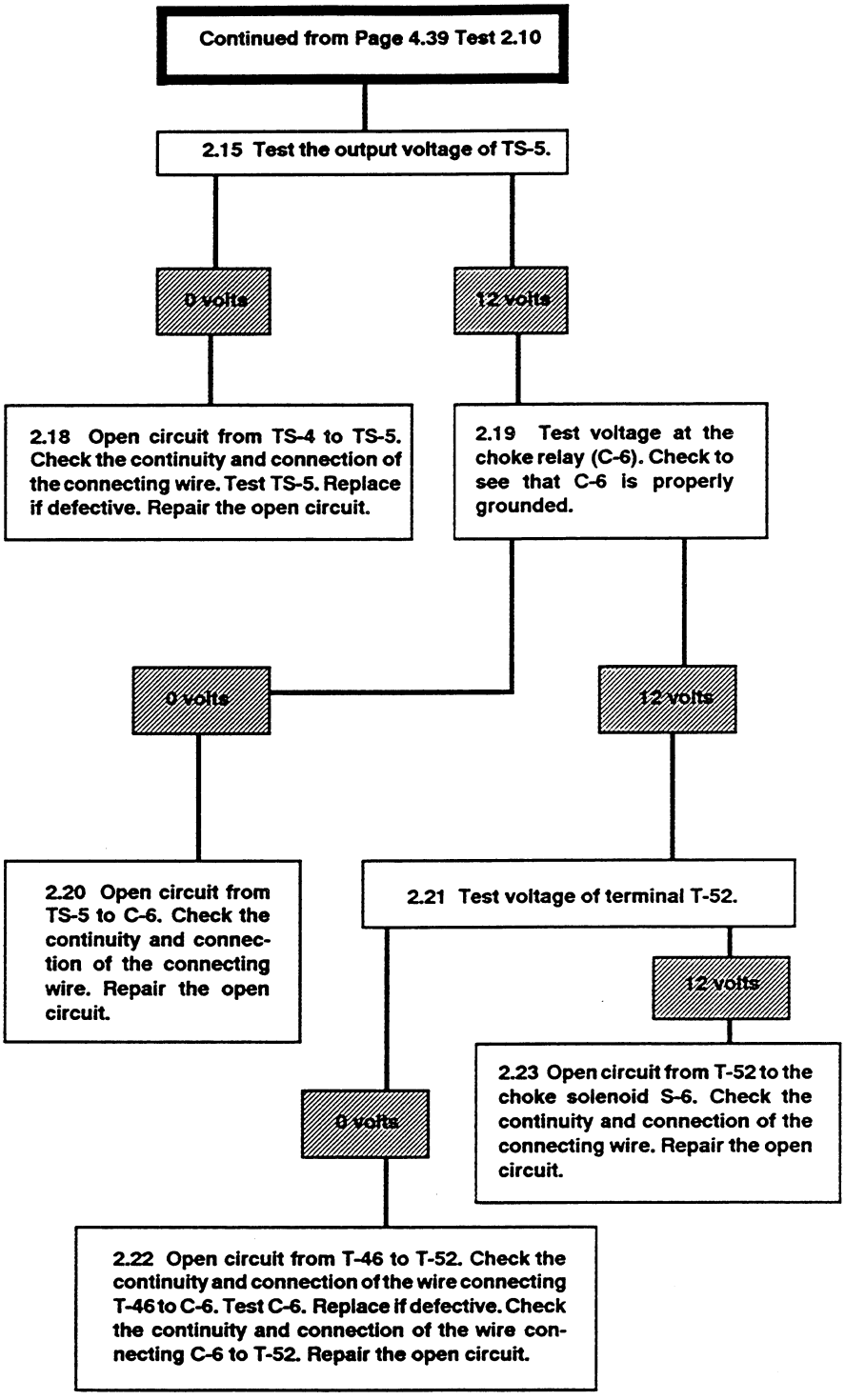

Continued from Page 4.35 Test 1.25
1.31 Test voltage at terminal T-46.
12 volts
0 volts
1.36 Test voltage at terminal T-47 while operating the START function from the ground controls.
1.37 Test the output voltage of key switch (KS-1) when in the GROUND position.
12 volts
0 volts
12 volts
0 volts
1.42 Open circuit from T-47 to the engine starter. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.43 Open circuit from T-46 to T-47. Check the continuity and connection of the wire connecting T-46 to C-1. Check C-1. Replace if defective. Check the continuity and connections of the wire connecting C-1 to T-47. Repair open circuit.
1.44 Open circuit from KS-1 to T-46. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.45 Test voltage at terminal T-48.
12 volts
0 volts
1.50 Open circuit from T-48 to KS-1. Check the continuity and connection of the wire connecting T-48 to CB-1. Test CB-1. Replace if defective. Check the continuity and connection of the wire connecting CB-1 to KS-1. Test KS-1. Replace if defective. Repair the open circuit.
1.51 Open circuit from the battery to T-48. Check the continuity and connection of the connecting wire. Repair the open circuit.


Continued from Page 4.35 Test 1.12
1.16 Test voltage at KS-1 in the GROUND position.
0 volts
12 volts
1.21 Test voltage at terminal T-44 with KS-1 in the GROUND position.
1.22 Open circuit from KS-1 to TS-4. Check the continuity and connection of the connecting wires. Repair the open circuit.
0 volts
12 volts
1.27 Test voltage at terminal T-45.
1.28 Open circuit from T-44 to KS-1. Check the continuity and connection of the connecting wire. Test KS-1. Replace if defective. Repair the open circuit.
0 volts
12 volts
1.32 Test voltage at the POWER ON/OFF button (P-1).
1.33 Test voltage at terminal T-12.
0 volts
1.40 Open circuit in PCB from T-45 to T-12. Repair or replace the PCB.
0 volts
12 volts
12 volts
1.38 Test voltage at KS-1.
1.39 Open circuit from P-1 to T-45. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.41 Test voltage at the POWER ON/OFF button (P-2).
0 volts
Go to Page 4.38 Test 1.46
12 volts
0 volts
12 volts
1.47 Open circuit from KS-1 to P-1. Check the continuity and connection of the connecting wire. Check P-1. Replace if defective. Repair the open circuit.
1.48 Open circuit from T-12 to P-2. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.49 Test voltage at terminal T-8.
12 volts
1.54 Open circuit from P-2 to T-8. Check the continuity and connections of the connecting wire.Test P-2. Replace if defective. Repair the open circuit.
0 volts
1.55 Open circuit in PCB from T-8 to C-1. Replace PCB.

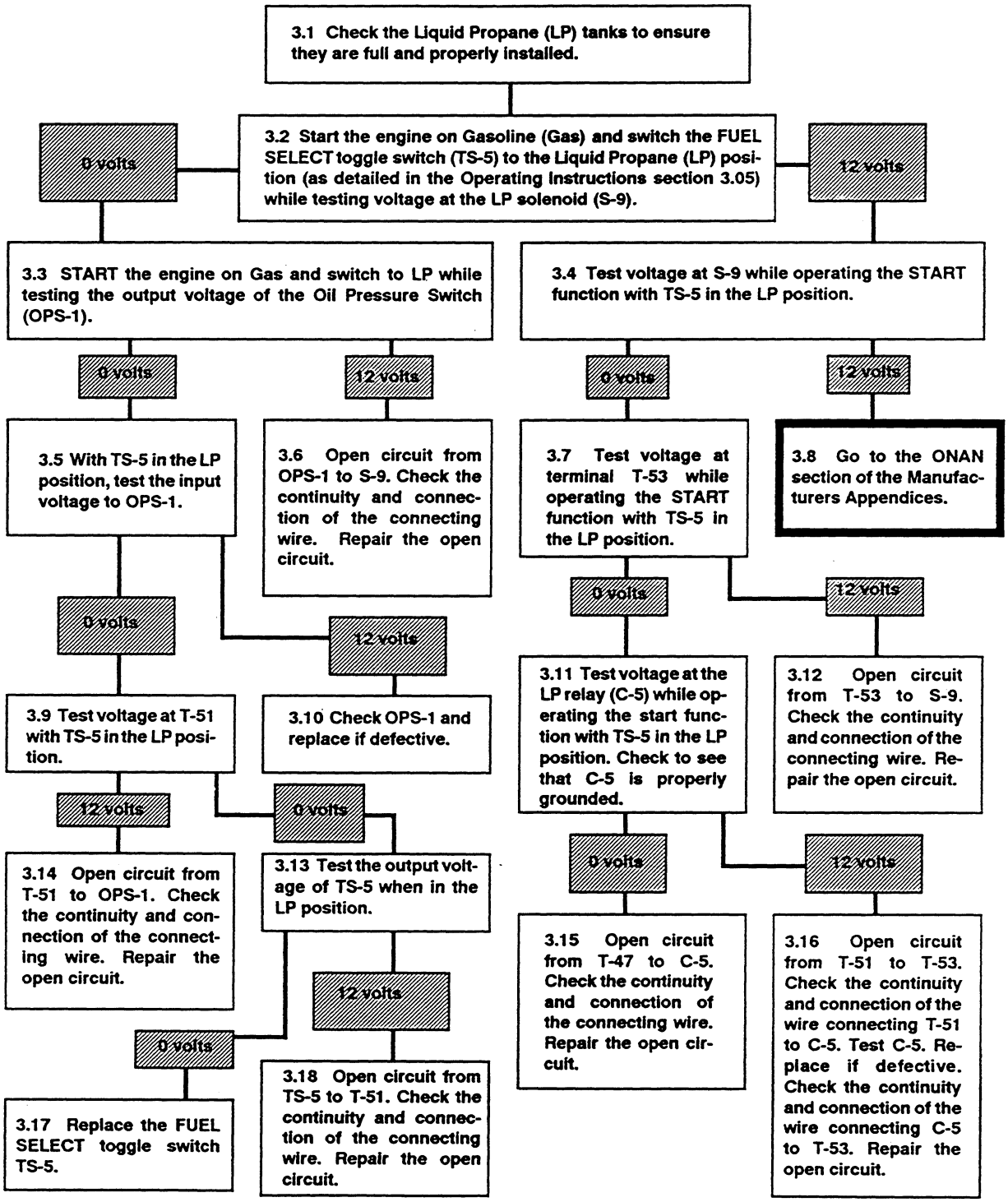

Continued from Page 4.37 Test 1.38
1.46 Test voltage at terminal T-48.
0 volts
12 volts
1.52 Open circuit from the battery to T-48. Check the continuity and connection of the connecting wire. Repair the open circuit.
1.53 Open circuit from T-48 to KS-1. Check the continuity and connection of the wire connecting T-48 to the 10 AMP circuit breaker (CB-1). Test CB-1. Replace if defective. Check the continuity and connection of the wire connecting CB-1 to KS-1. Repair the open circuit.

## 2. Engine cranks over but does not start.

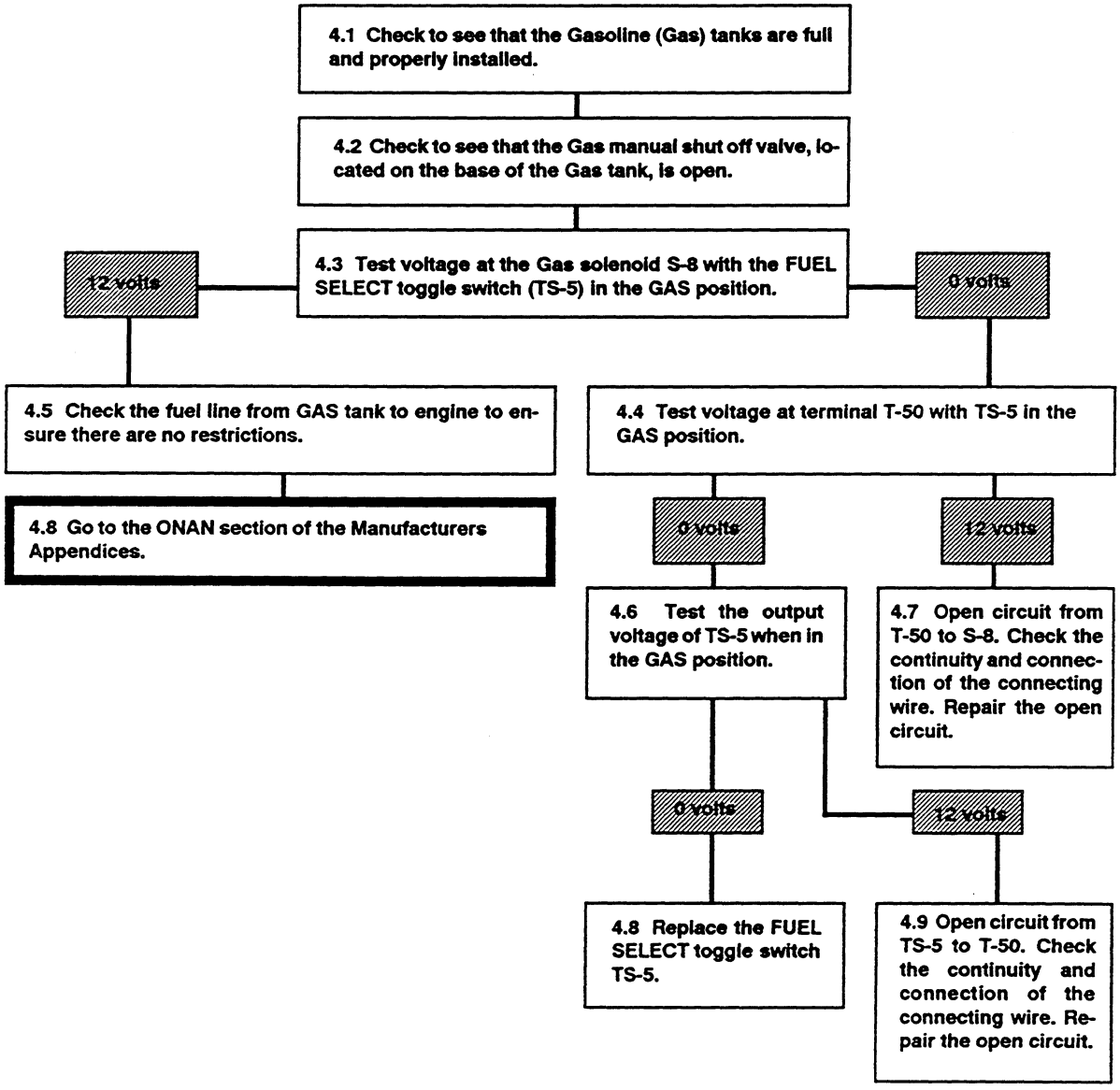



Continued from Page 4.39 Test 2.10
2.15 Test the output voltage of TS-5.
0 volts
12 volts
2.18 Open circuit from TS-4 to TS-5. Check the continuity and connection of the connecting wire. Test TS-5. Replace if defective. Repair the open circuit.
2.19 Test voltage at the choke relay (C-6). Check to see that C-6 is properly grounded.
0 volts
12 volts
2.20 Open circuit from TS-5 to C-6. Check the continuity and connection of the connecting wire. Repair the open circuit.
2.21 Test voltage of terminal T-52.
12 volts
2.23 Open circuit from T-52 to the choke solenoid S-6. Check the continuity and connection of the connecting wire. Repair the open circuit.
0 volts
2.22 Open circuit from T-46 to T-52. Check the continuity and connection of the wire connecting T-46 to C-6. Test C-6. Replace if defective. Check the continuity and connection of the wire connecting C-6 to T-52. Repair the open circuit.

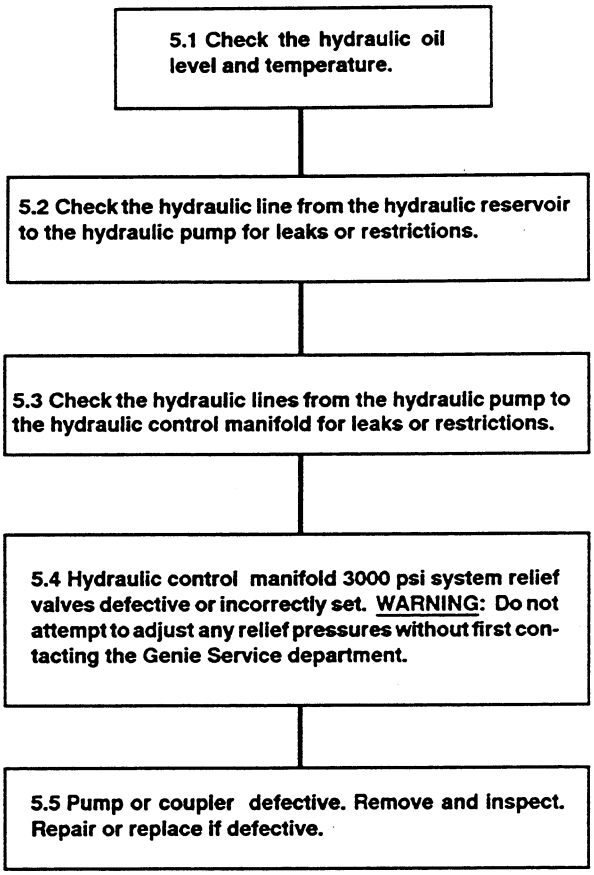
## 3. Engine starts on gasoline but not on liquid propane.



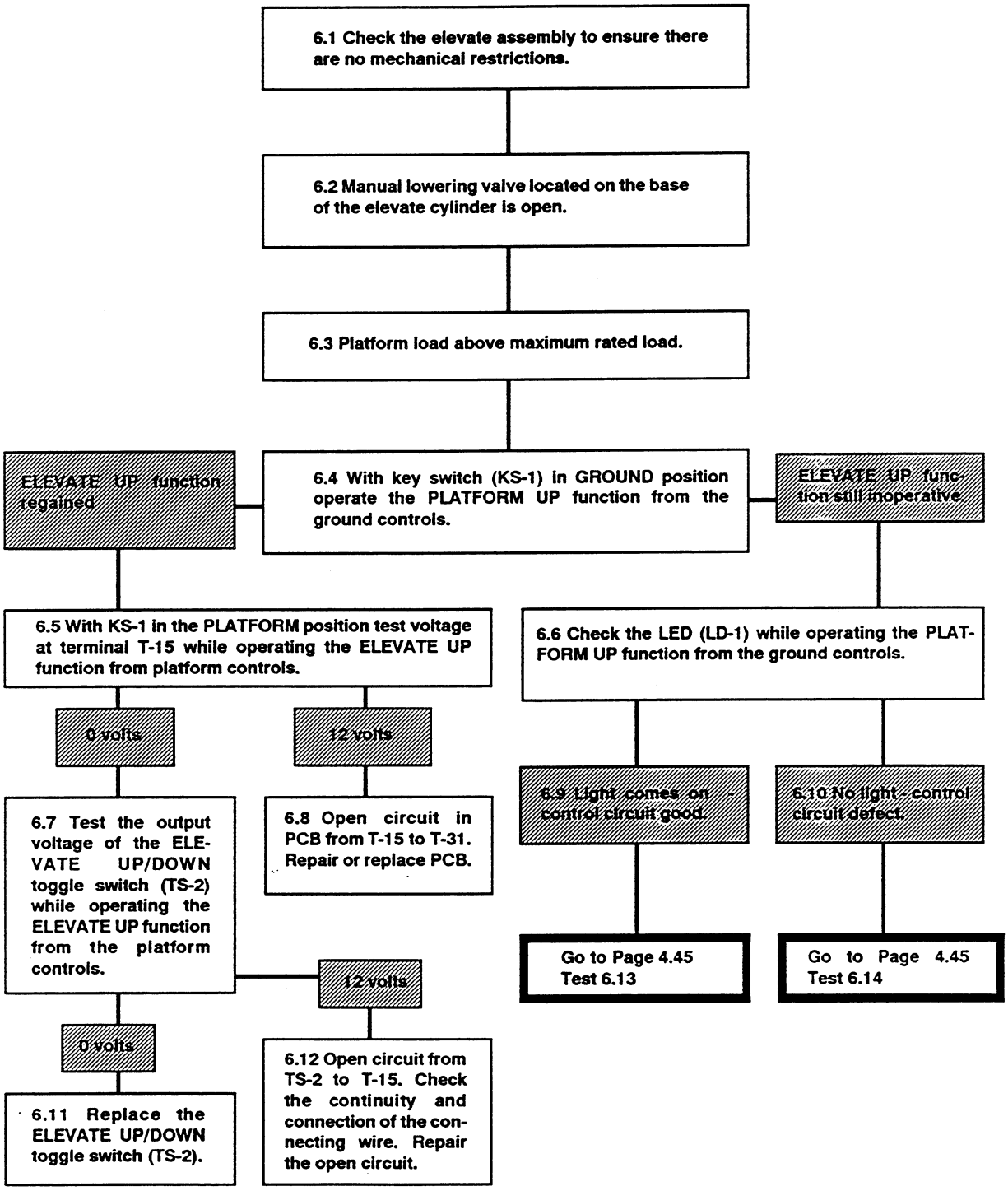
## 4. Engine starts on liquid propane but not on gasoline.

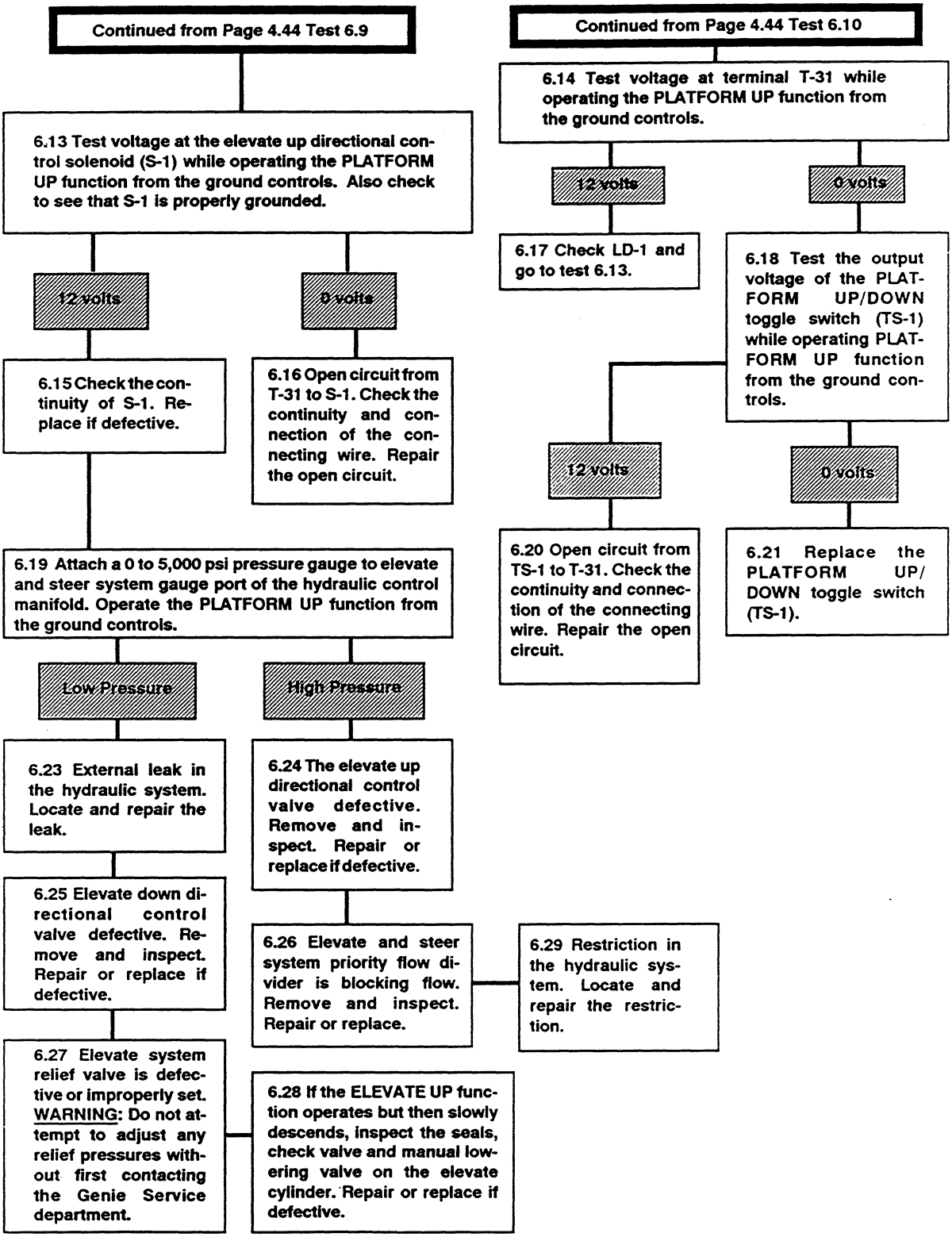


## 5. Machine will not lift, lower, drive or steer. All powered functions lost. Engine starts and runs.

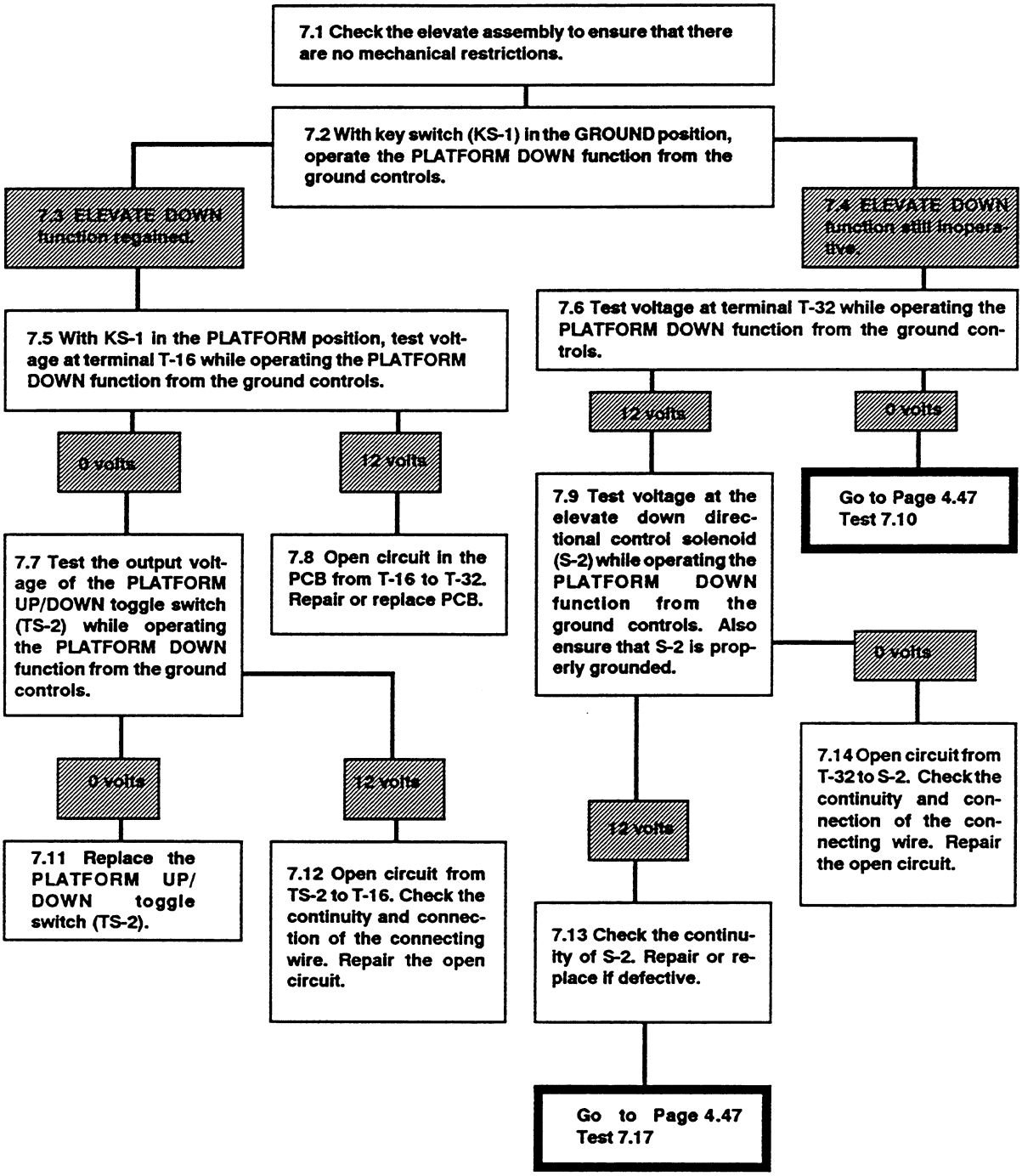


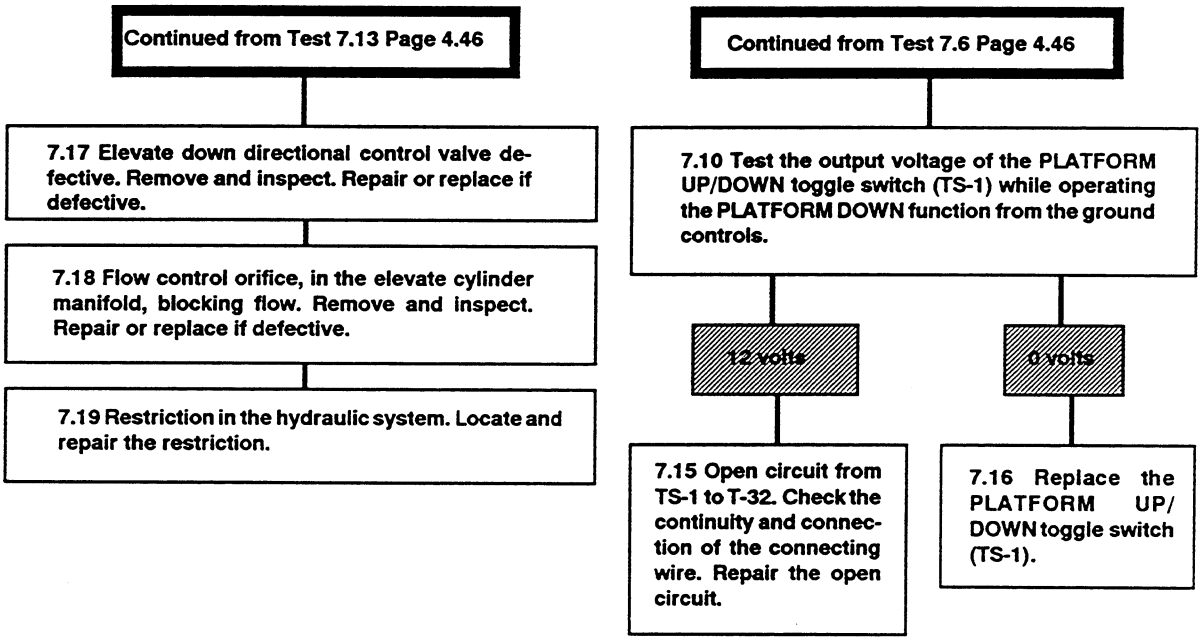
## 6. ELEVATE Up function inoperative.



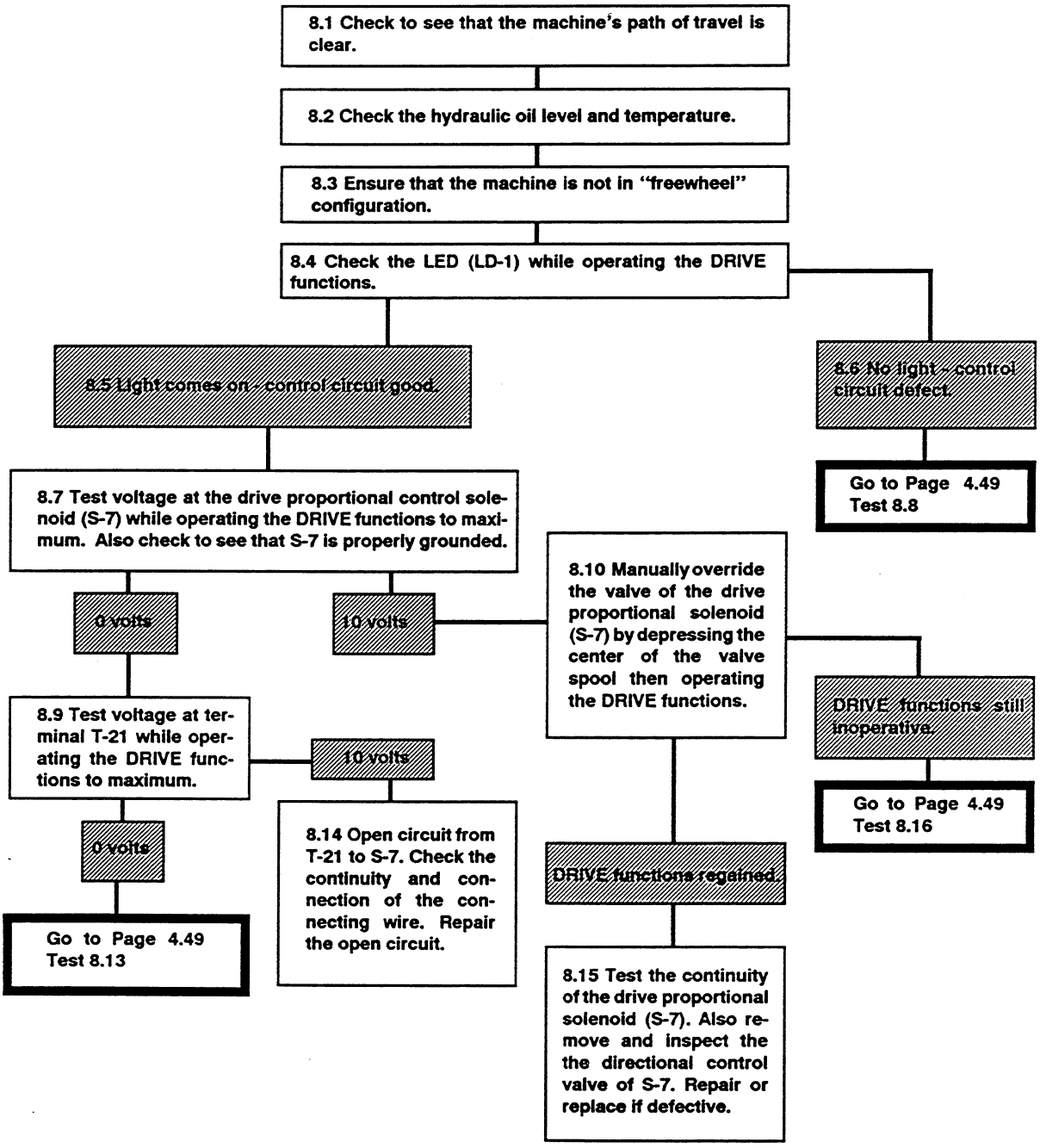

Continued from Page 4.44 Test 6.9
6.13 Test voltage at the elevate up directional control solenoid (S-1) while operating the PLATFORM UP function from the ground controls. Also check to see that S-1 is properly grounded.
12 volts
0 volts
6.15 Check the continuity of S-1. Replace if defective.
6.16 Open circuit from T-31 to S-1. Check the continuity and connection of the connecting wire. Repair the open circuit.
6.19 Attach a 0 to 5,000 psi pressure gauge to elevate and steer system gauge port of the hydraulic control manifold. Operate the PLATFORM UP function from the ground controls.
Low Pressure
High Pressure
6.23 External leak in the hydraulic system. Locate and repair the leak.
6.24 The elevate up directional control valve defective. Remove and inspect. Repair or replace if defective.
6.25 Elevate down directional control valve defective. Remove and inspect. Repair or replace if defective.
6.26 Elevate and steer system priority flow divider is blocking flow. Remove and inspect. Repair or replace.
6.29 Restriction in the hydraulic system. Locate and repair the restriction.
6.27 Elevate system relief valve is defective or improperly set. WARNING: Do not attempt to adjust any relief pressures without first contacting the Genie Service department.
6.28 If the ELEVATE UP function operates but then slowly descends, inspect the seals, check valve and manual lowering valve on the elevate cylinder. Repair or replace if defective.
Continued from Page 4.44 Test 6.10
6.14 Test voltage at terminal T-31 while operating the PLATFORM UP function from the ground controls.
12 volts
0 volts
6.17 Check LD-1 and go to test 6.13.
6.18 Test the output voltage of the PLATFORM UP/DOWN toggle switch (TS-1) while operating PLATFORM UP function from the ground controls.
12 volts
0 volts
6.20 Open circuit from TS-1 to T-31. Check the continuity and connection of the connecting wire. Repair the open circuit.
6.21 Replace the PLATFORM UP/DOWN toggle switch (TS-1).

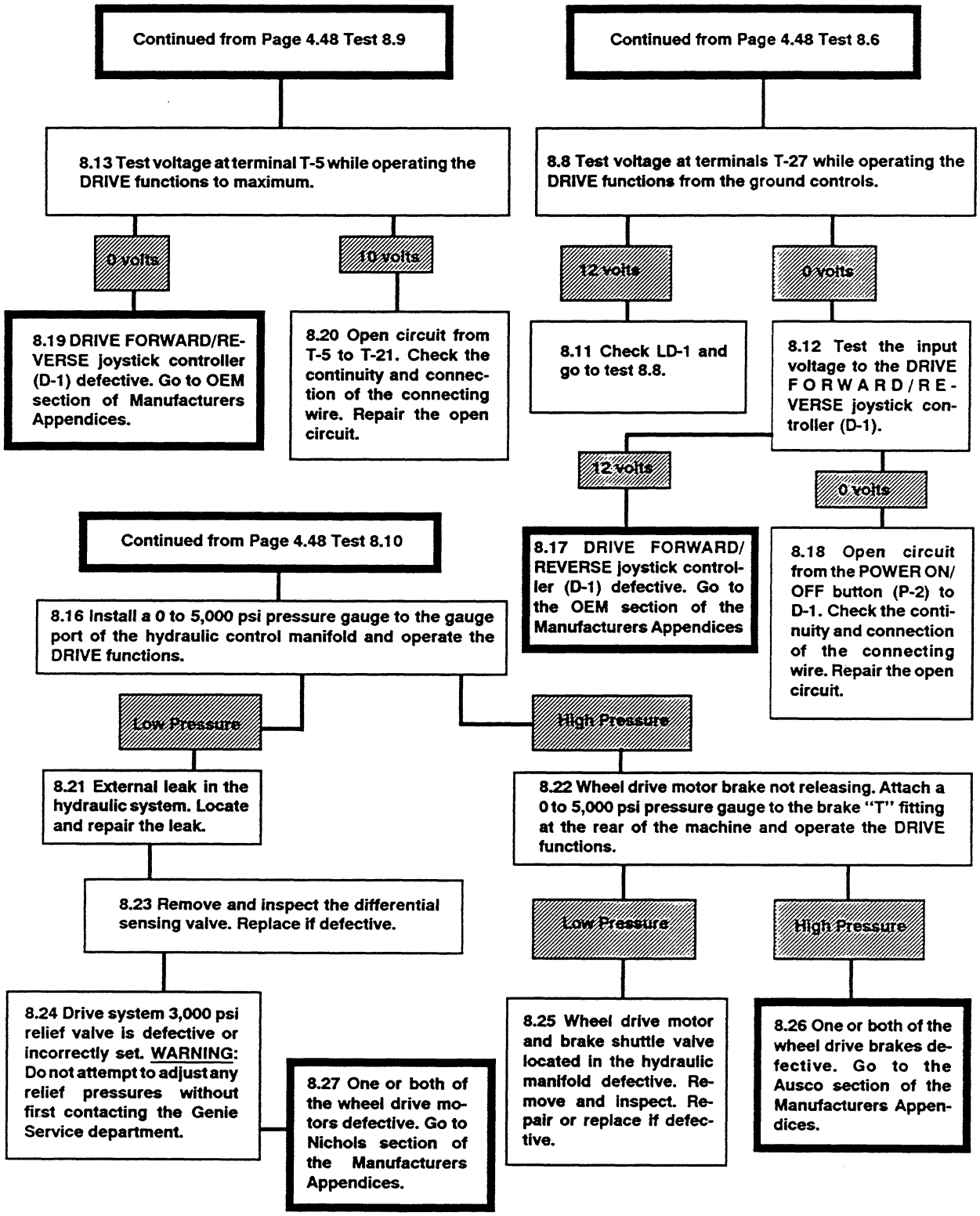
## 7. ELEVATE Down function inoperative.



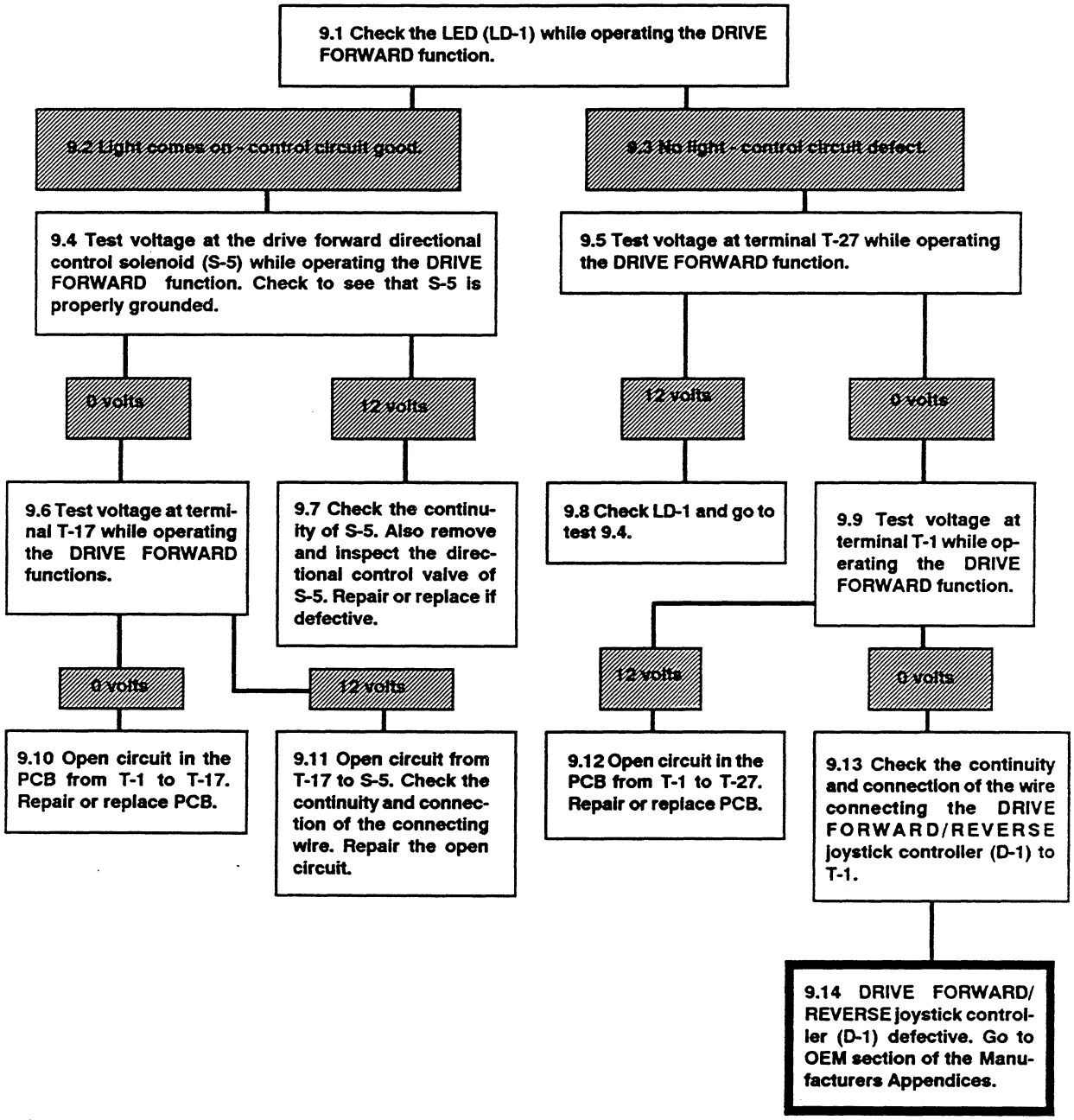

Continued from Test 7.13 Page 4.46
7.17 Elevate down directional control valve defective. Remove and inspect. Repair or replace if defective.
7.18 Flow control orifice, in the elevate cylinder manifold, blocking flow. Remove and inspect. Repair or replace if defective.
7.19 Restriction in the hydraulic system. Locate and repair the restriction.
Continued from Test 7.6 Page 4.46
7.10 Test the output voltage of the PLATFORM UP/DOWN toggle switch (TS-1) while operating the PLATFORM DOWN function from the ground controls.
12 volts
0 volts
7.15 Open circuit from TS-1 to T-32. Check the continuity and connection of the connecting wire. Repair the open circuit.
7.16 Replace the PLATFORM UP/DOWN toggle switch (TS-1).

## 8. Machine will not DRIVE Forward or Reverse.

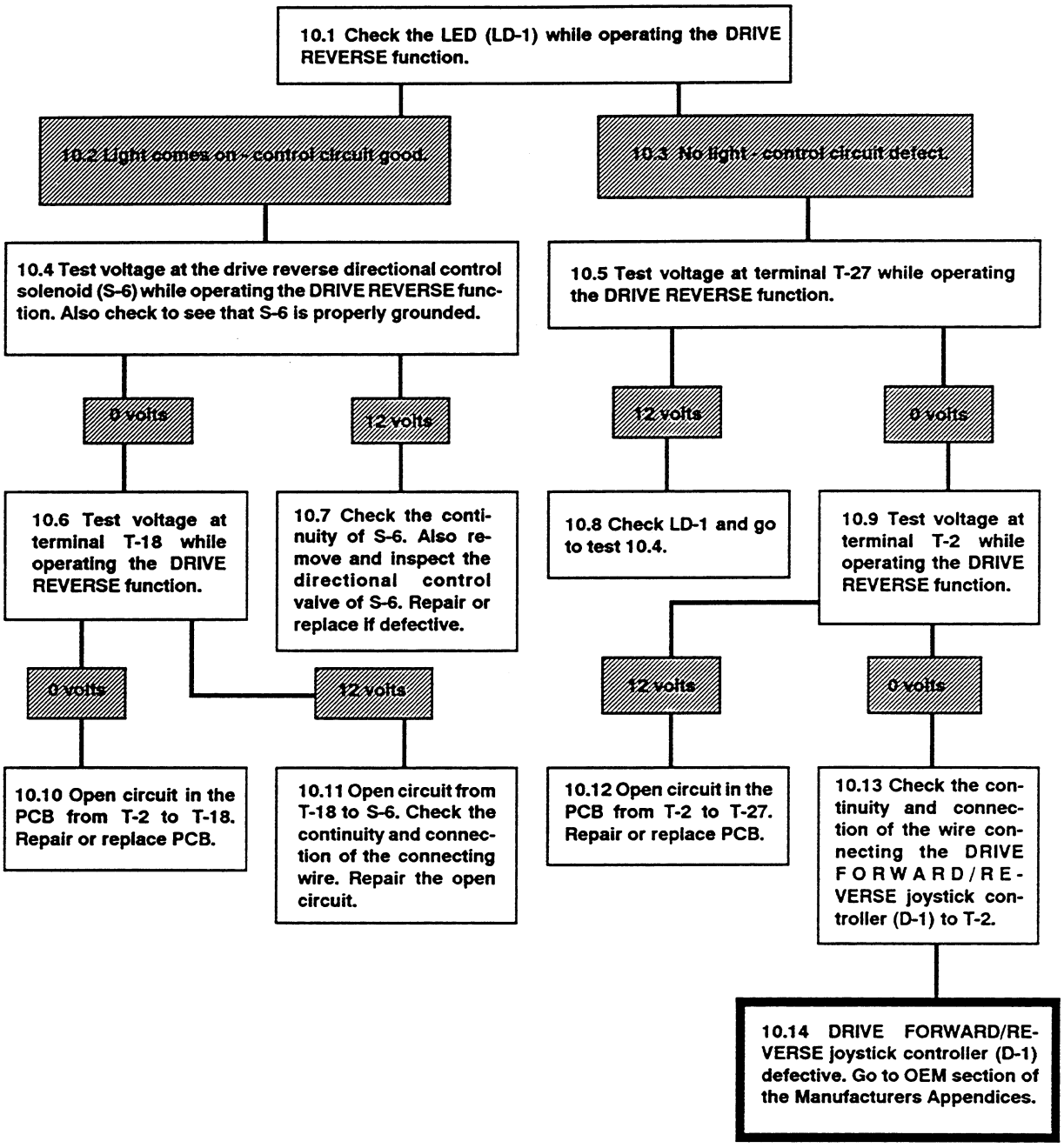



Continued from Page 4.48 Test 8.9
8.13 Test voltage at terminal T-5 while operating the DRIVE functions to maximum.
0 volts
10 volts
8.19 DRIVE FORWARD/REVERSE joystick controller (D-1) defective. Go to OEM section of Manufacturers Appendices.
8.20 Open circuit from T-5 to T-21. Check the continuity and connection of the connecting wire. Repair the open circuit.
Continued from Page 4.48 Test 8.6
8.8 Test voltage at terminals T-27 while operating the DRIVE functions from the ground controls.
12 volts
0 volts
8.11 Check LD-1 and go to test 8.8.
8.12 Test the input voltage to the DRIVE FORWARD/REVERSE joystick controller (D-1).
12 volts
0 volts
8.17 DRIVE FORWARD/REVERSE joystick controller (D-1) defective. Go to the OEM section of the Manufacturers Appendices
8.18 Open circuit from the POWER ON/OFF button (P-2) to D-1. Check the continuity and connection of the connecting wire. Repair the open circuit.
Continued from Page 4.48 Test 8.10
8.16 Install a 0 to 5,000 psi pressure gauge to the gauge port of the hydraulic control manifold and operate the DRIVE functions.
Low Pressure
High Pressure
8.21 External leak in the hydraulic system. Locate and repair the leak.
8.22 Wheel drive motor brake not releasing. Attach a 0 to 5,000 psi pressure gauge to the brake "T" fitting at the rear of the machine and operate the DRIVE functions.
8.23 Remove and inspect the differential sensing valve. Replace if defective.
Low Pressure
High Pressure
8.24 Drive system 3,000 psi relief valve is defective or incorrectly set. WARNING: Do not attempt to adjust any relief pressures without first contacting the Genie Service department.
8.27 One or both of the wheel drive motors defective. Go to Nichols section of the Manufacturers Appendices.
8.25 Wheel drive motor and brake shuttle valve located in the hydraulic manifold defective. Remove and inspect. Repair or replace if defective.
8.26 One or both of the wheel drive brakes defective. Go to the Ausco section of the Manufacturers Appendices.

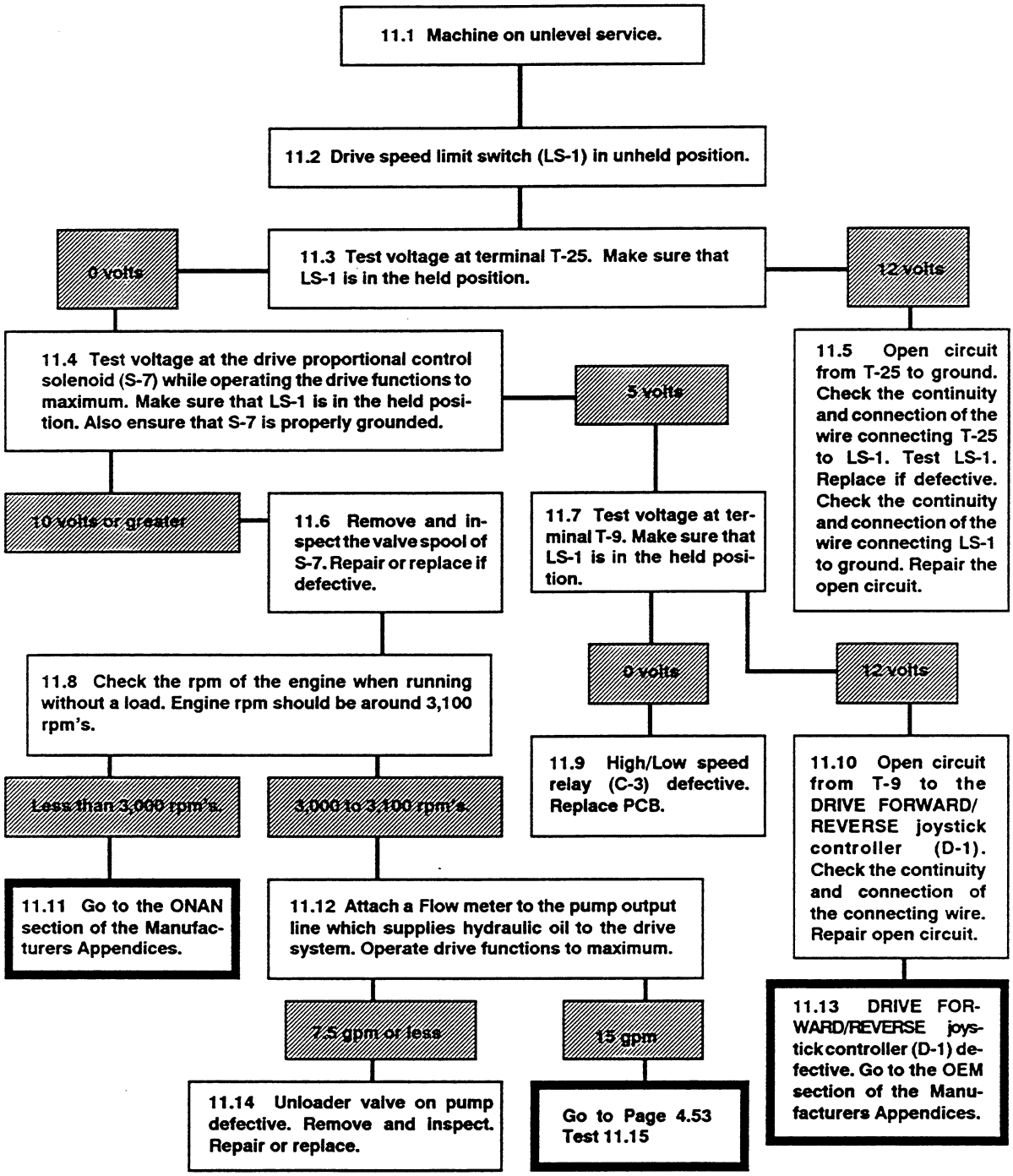
## 9. DRIVE Forward function inoperative.

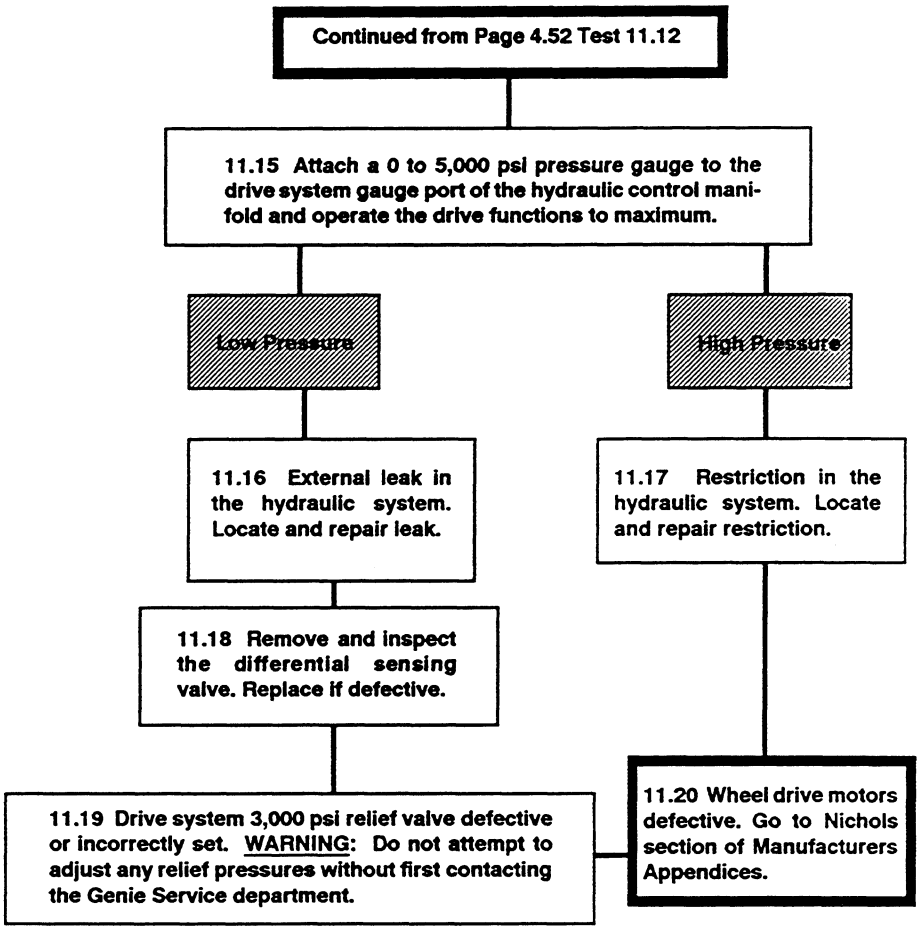


## 10. DRIVE Reverse function inoperative.

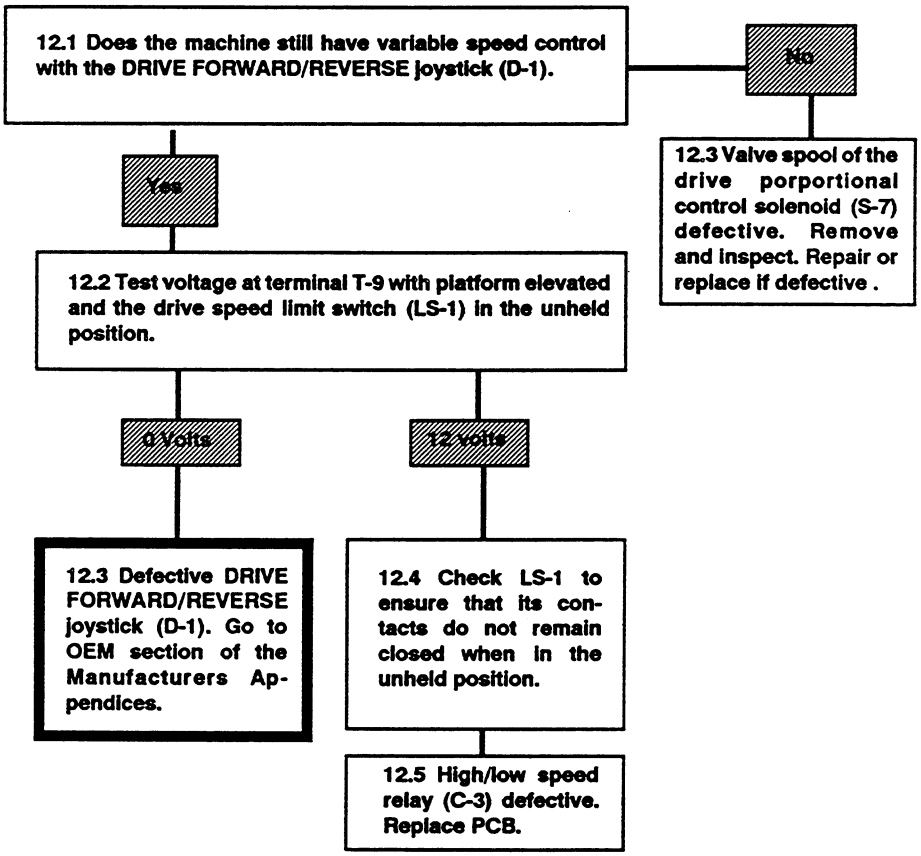


## 11. Machine will not drive at full speed.

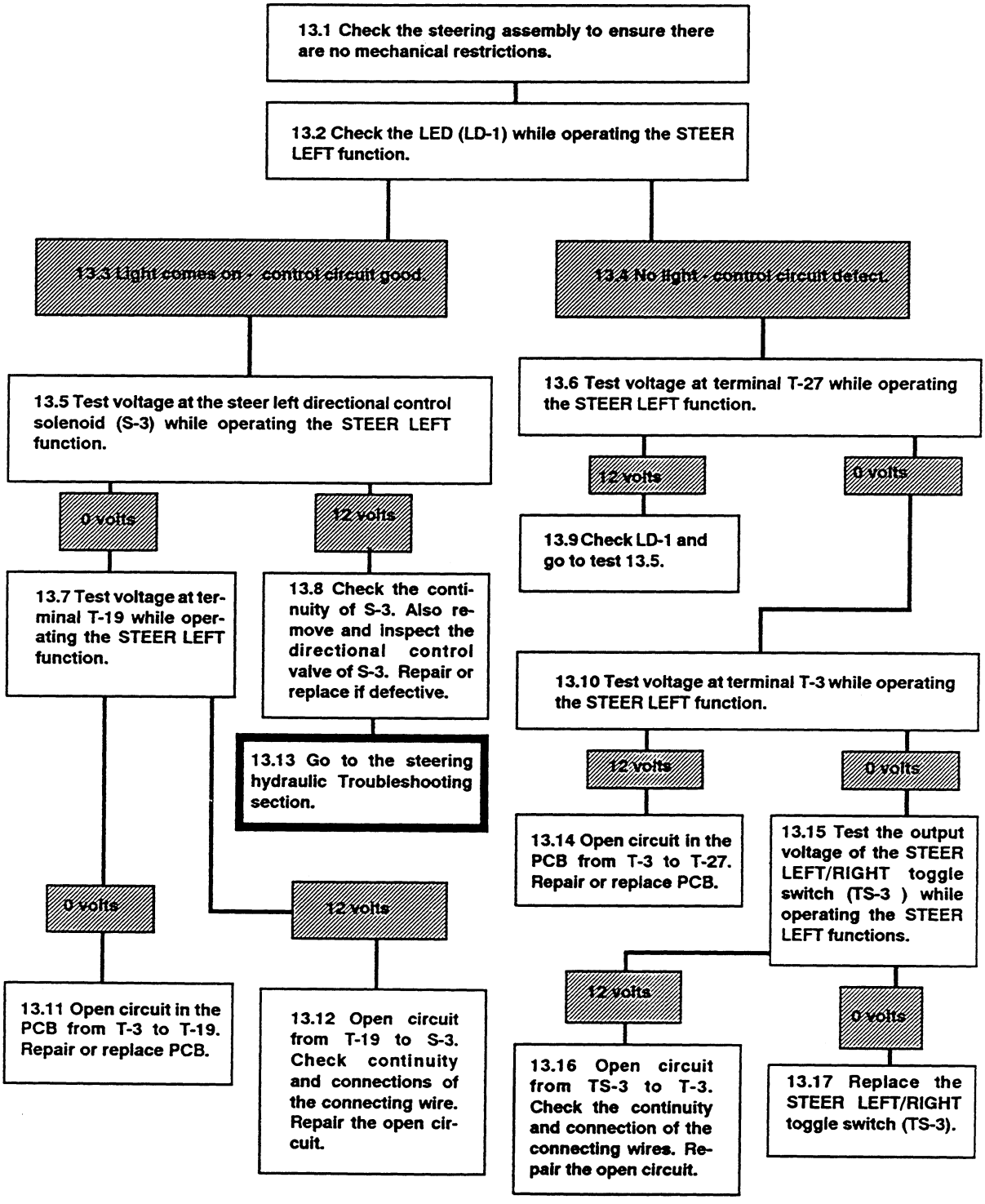



Continued from Page 4.52 Test 11.12
11.15 Attach a 0 to 5,000 psi pressure gauge to the drive system gauge port of the hydraulic control manifold and operate the drive functions to maximum.
Low Pressure
High Pressure
11.16 External leak in the hydraulic system. Locate and repair leak.
11.17 Restriction in the hydraulic system. Locate and repair restriction.
11.18 Remove and inspect the differential sensing valve. Replace if defective.
11.19 Drive system 3,000 psi relief valve defective or incorrectly set. WARNING: Do not attempt to adjust any relief pressures without first contacting the Genie Service department.
11.20 Wheel drive motors defective. Go to Nichols section of Manufacturers Appendices.

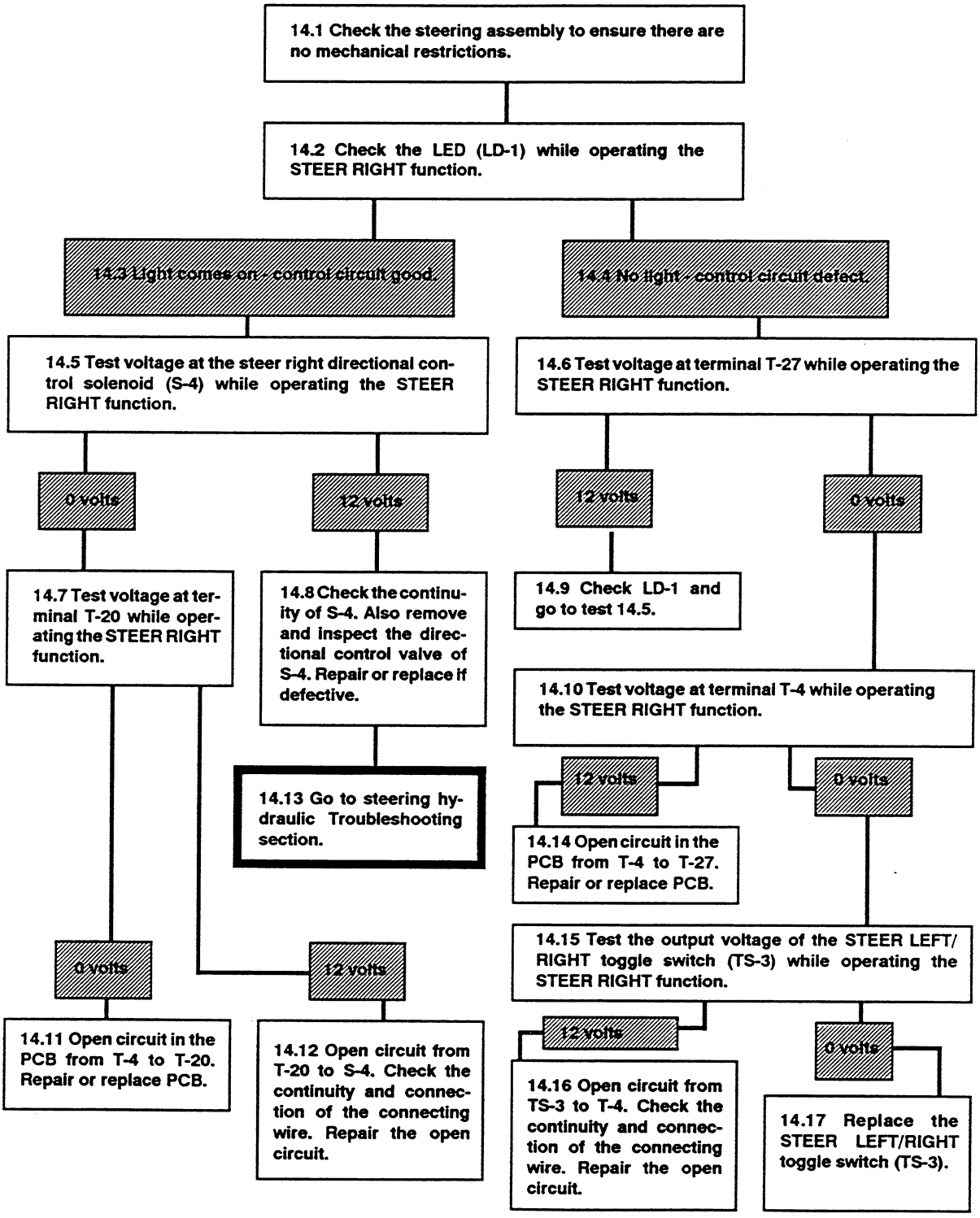
## 12. Machine drives at full speed with platform elevated.



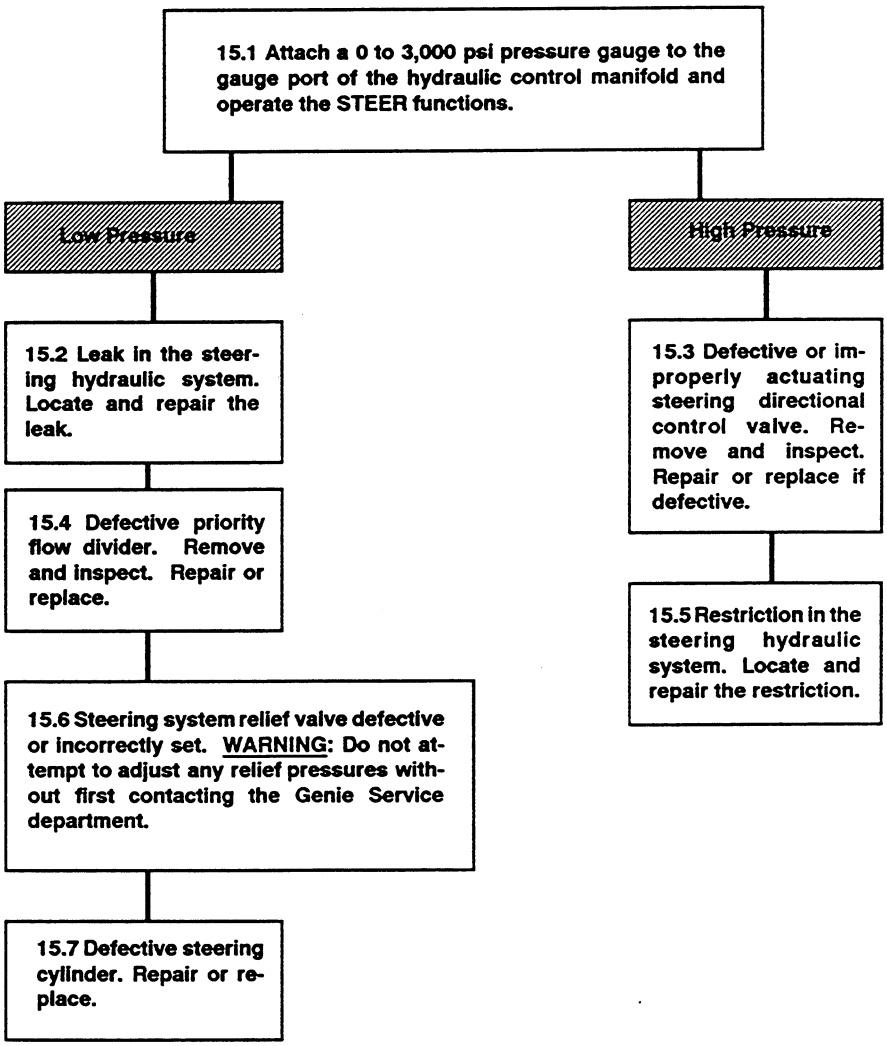
## 13. STEER Left function inoperative.



## 14. STEER Right function inoperative.



## 15. Steering functions lost (hydraulic section).



# MANUFACTURERS APPENDICES

# 6.1 GENIE V-2470 & GENIE V-2470RT COMPONENT LIST

This section will provide you with a brief description of the major Genie V-2470 & V-2470RT components. Each component on the list refers to Genie Vertical Lift models V-2470 & V-2470RT unless otherwise specified.

## V-2470RT POWER SYSTEM

| Component | Description |
|---|---|
| Engine | **V-2470RT** - Dual fuel internal combustion engine, 24 horsepower air cooled with 20 amp. flywheel alternator |

## DRIVE SYSTEM

| Component | Description |
|---|---|
| Drive torque hub | **V-2470** - 4.1:1 single planetary torque hub<br>**V-2470RT** - 24.85:1 double planetary torque hub |
| Drive brake | Spring-applied, hydraulically released brake |
| Drive hydraulic motor | **V-2470** - 7.1 cu. in. (116 $cm^3$) internally generated rotor<br>**V-2470RT** - 3.6 cu. in. (59 $cm^3$) internally generated rotor |

**DRIVE SYSTEM** Continued

| Component | Description |
|---|---|
| Wheel/tire | **V-2470** - 23 x 8.5 x 12 in. (584 x 216 x 305 mm) tubeless pneumatic<br>**V-2470RT** - 27 x 10.5 x 15 in. (686 x 267 x 381 mm)(rear), 27 x 8.5 x 15 in. (686 x 216 x 381 mm) tubeless pneumatic (front) |
| Steering cylinder | 2.5 in. (64 mm) bore x 5 in. (127 mm) stroke |

**ELEVATING SYSTEM**

| Component | Description |
|---|---|
| Elevate cylinder | 5 in. (127 mm) bore x 18 in. (457 mm) stroke |
| Manifold assembly (cylinder) | Lift cylinder control valve, cylinder mounted |
| Pivot bearings | Teflon filled glass composite (self-lubricating) |
| Pivot pins | Hard chrome plated and ground, high strength steel |

**HYDRAULIC SYSTEM**

| Component | Description |
|---|---|
| Control valves | **V-2470** - 24 volts DC, solenoid operated<br>**V-2470RT** - 12 volts DC, solenoid operated |
| Hydraulic hose | SAE-100R7 (thermal plastic) |
| Manifold assembly | Integrated hydraulic module |

**HYDRAULIC SYSTEM** Continued

| Component | Description |
|---|---|
| Drive/lift pump | **V-2470** - 2-stage unloading, 6.5 gpm, 750 psi (24.6 liters per minute, 5171 kPa)(both stages), 2.5 gpm, 3000 psi (9.5 liters per minute, 20684 kPa) (one stage)<br>**V-2470RT** - (3 section direct drive) 2-stage unloading, 15 gpm, 3100 psi (56.8 liters per minute, 21373 kPa) (first two sections). Single gear pump, 2.5 gpm, 3000 psi (9.5 liters per minute, 20684 kPa)(third section). |
| Oil filter | Full flow 10 micron return line filter with filter condition gauge |

**ELECTRICAL SYSTEM**

| Component | Description |
|---|---|
| Drive controller | Pulse-width modulation, variable current, 130HZ joystick |
| Systems logic board | Printed circuit board with diode and relay logic, and LED diagnostics |
| Machine function switches | Single pole double throw toggle, hermetically sealed |
| Key and master switches | Single switch and contact block actuator power assemblies, positive opening contact system |
| Control cables | Dual 19 conductor 18 gauge vinyl jacketed U.V. protected |
| Battery charger | **V-2470** - 115 volts AC 15 amp. input, 24 volts DC 35 amp. output, automatic<br>**V-2470RT** - 20 amp. 12 volt flywheel alternator with regulator |

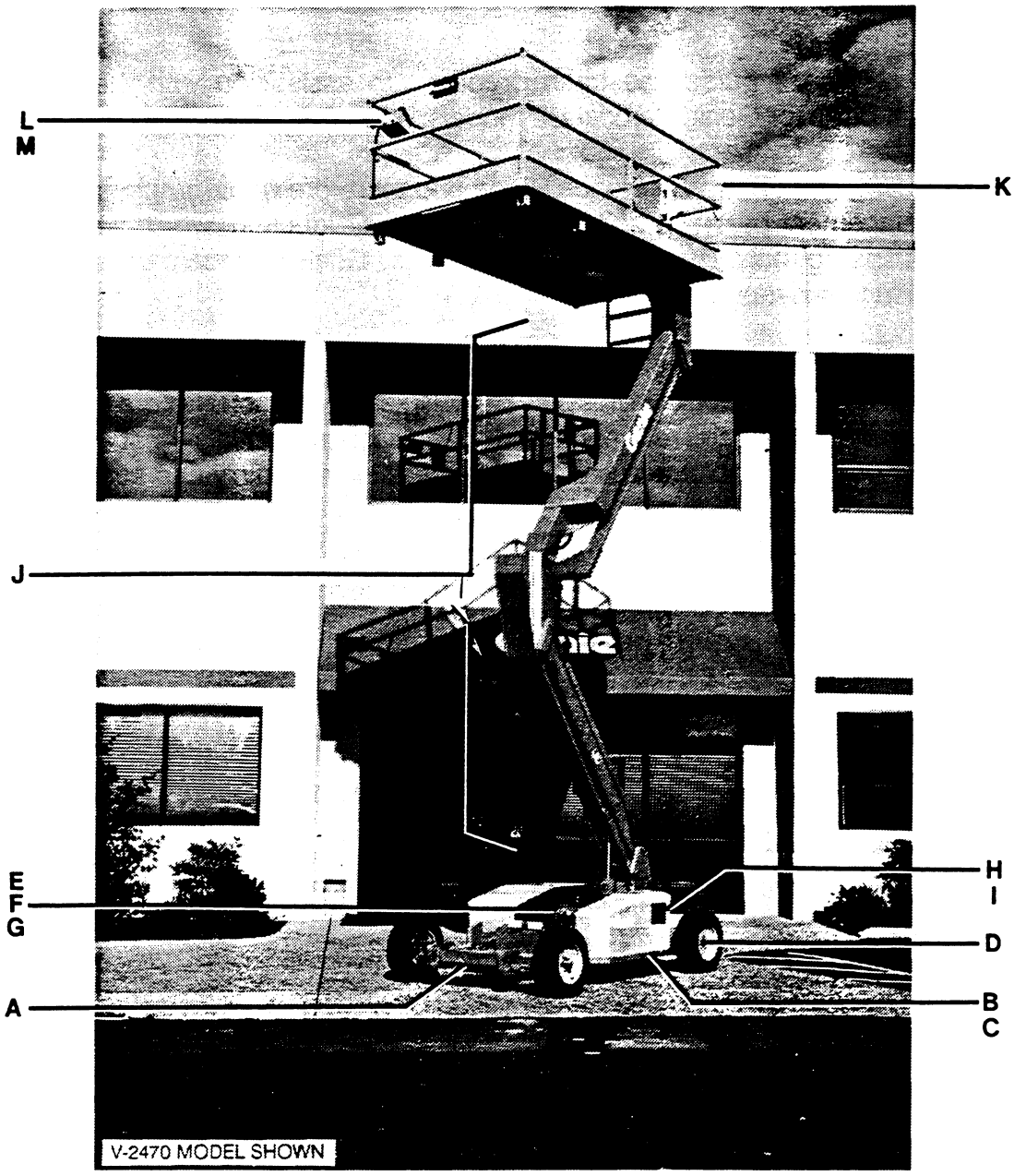
**ELECTRICAL SYSTEM** Continued

| Component | Description |
|---|---|
| Batteries | **V-2470** - Dual battery packs. Four (4) 6 volt deep draw batteries per pack, case size GC2H, 250 amp. hr.<br>**V-2470RT** - 12 volts DC 24 amp. hr. |
| Battery pack connectors | **V-2470** - 3-wire disconnect, 175 amp. 600 volt |
| Limit switches | Roller arm, sealed housing |
| Low voltage interrupt | **V-2470** - Voltage sensing interrupt with reset button and LED diagnostics |

## 5.3 PARTS REFERENCE GUIDE

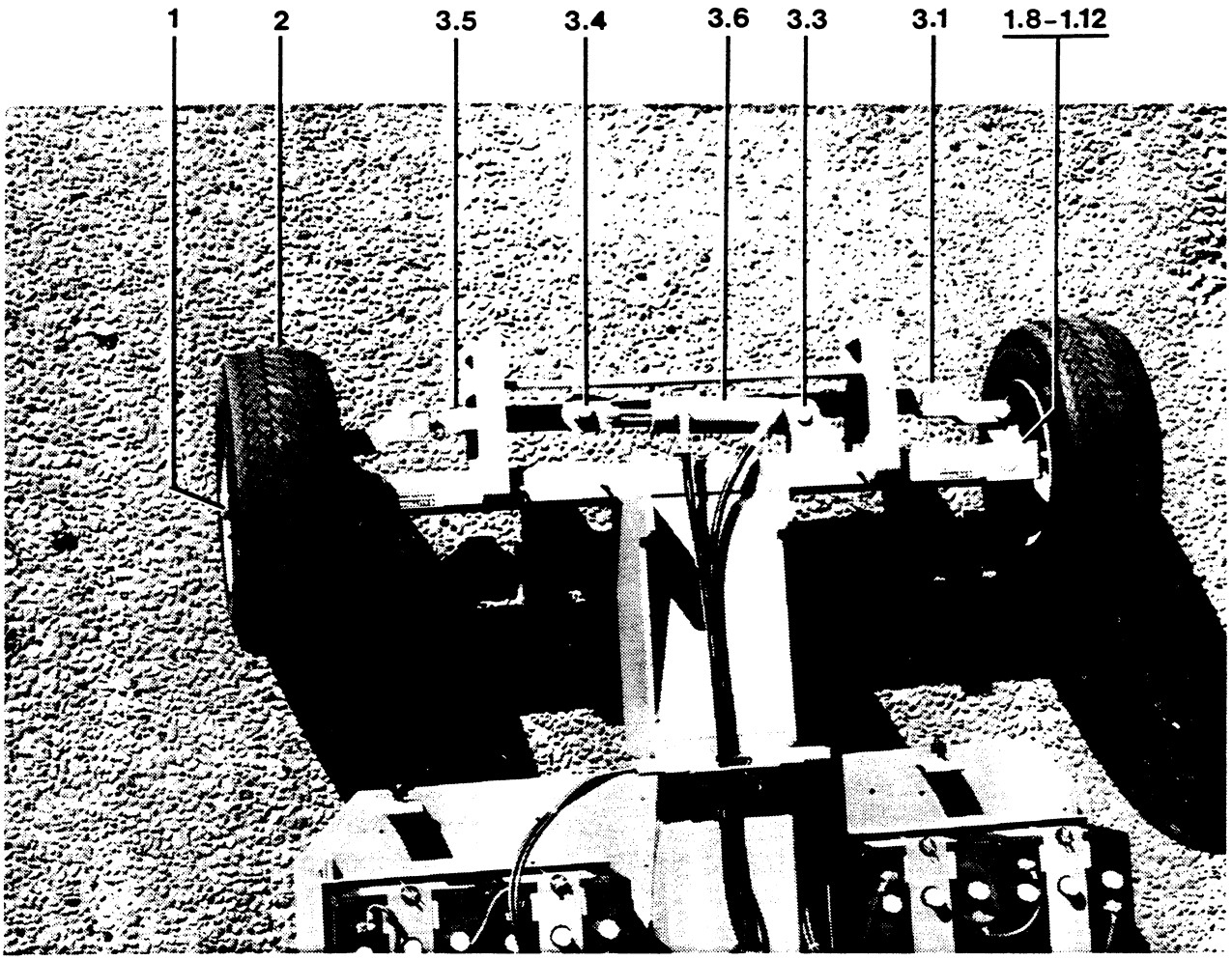
Refer to insert on following page for Genie V-2470 & V-2470RT Parts Reference Guide.

## CONTENTS



# CONTENTS

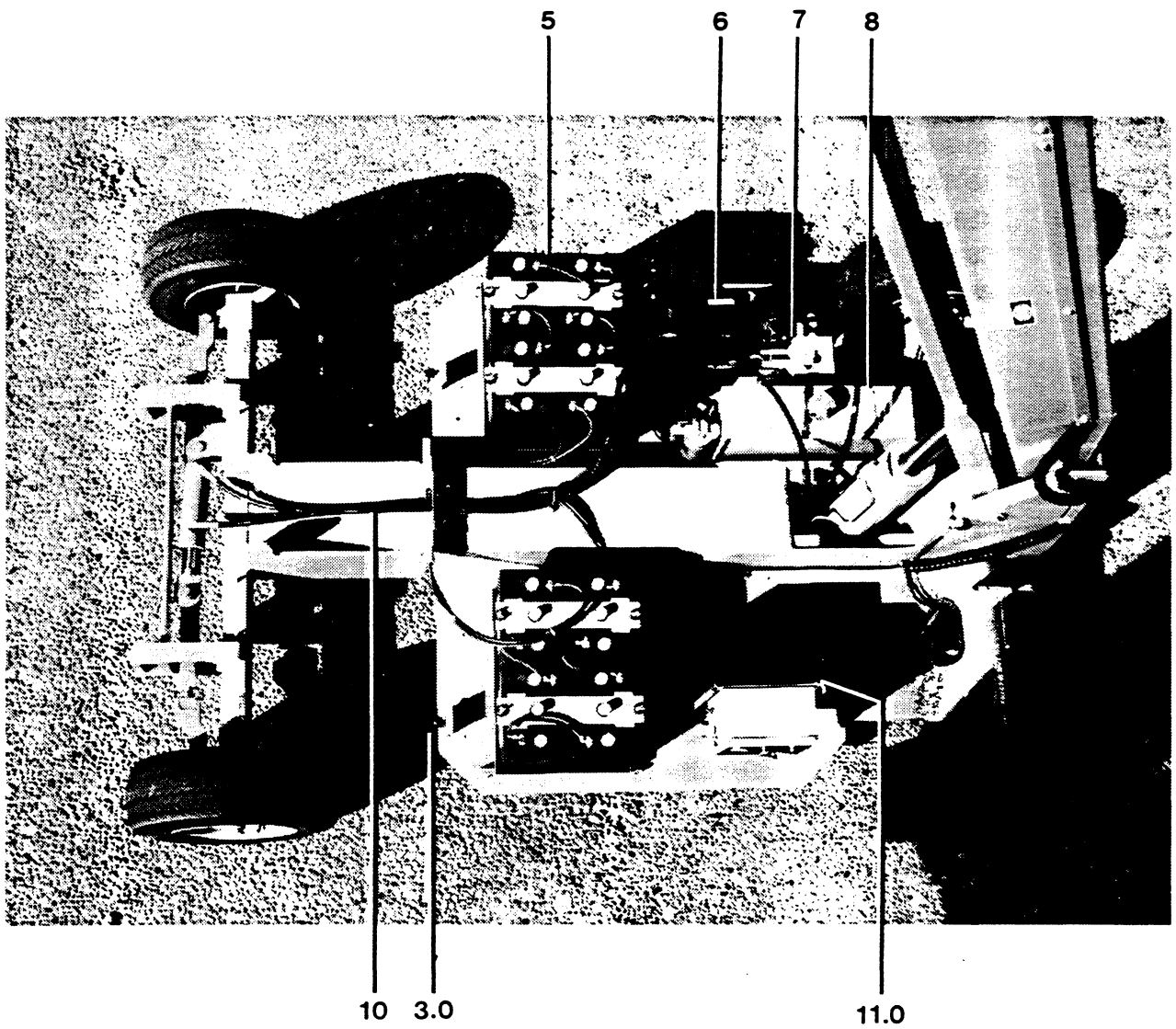
## FIGURE: A STEERING ASSEMBLY



## STEERING ASSEMBLY — Genie V-2470 & V-2470RT

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **A** | **1** | | **HUB / STEERING YOKE GROUPING** | |
| A | 1.1 | 22968 | NUT, LUG - 1/2 in. 60 DEG RHT - (FF OPTION) | 20 |
| A | 1.2 | 13047 | NUT, LUG - 1/2 in. 82 DEG X .562 RHT - (STANDARD) | 10 |
| A | 1.3 | 18928 | HUB - (INCLUDES SEALS AND BEARINGS) | 2 |
| A | 1.5 | 13079 | BUSHING, 1.25 x 1 x 1 in. - STR YOKE ARM | 2 |
| A | 1.6 | 18382 | BEARING, THRUST - 1.5 x 2 x .125 in. - YOKE PIN | 2 |
| A | 1.7 | 33267 | HUB & SPINDLE SET (LH YOKE WELDMENT ONLY P/N 33325) | 1 |
| A | 1.8 | 33267 | HUB & SPINDLE SET (RH YOKE WELDMENT ONLY P/N 33326) | 1 |
| A | 1.9 | 18978 | PIN - KING | 2 |
| A | 1.10 | 45072 | BEARING - 1.5 in. ID x 1.5 in. LONG - KING PIN | 4 |
| A | 1.11 | 6605 | BOLT - 3/8-16 x 3.5 in. HHCS PLTD GR-5 - KING PIN | 2 |
| A | 1.12 | 4828 | NUT, NYLOCK - 3/8-16 PLTD - KING PIN | 2 |
| **A** | **2** | | **WHEEL & TIRE GROUPING** | |
| A | 2.1 | 19227 | WHEEL & TIRE ASSEMBLY - V-2470 | 2 |
| A | 2.2 | 19275 | WHEEL & TIRE ASSEMBLY - STR WHL V-2470RT | 2 |
| A | 2.3 | 927429 | WHEEL & TIRE ASSEMBLY - FOAM FILLED STR WHL | 2 |
| A | 2.4 | 924987 | WHEEL & TIRE ASSEMBLY - FOAM FILLED | 4 |
| **A** | **3** | | **STEERING LINKAGE GROUPING** | |
| A | 3.1 | 19089 | CLEVIS WELDMENT - STEERING ASSY | 1 |
| A | 3.2 | 5361 | PIN - COTTER - .125 x 1.5 in. - PLTD | 3 |
| A | 3.3 | 19440 | PIN - CLEVIS | 3 |
| A | 3.4 | 19332 | NUT, JAM - 1-14 UNF - TIE ROD END | 1 |
| A | 3.5 | 18950 | TIE ROD WELDMENT - PNTD | 1 |
| A | 3.6 | 18548 | CYLINDER, HYDR - 2.5 in. BORE x 5 in. STK - STR | 1 |
| A | 3.7 | 19331 | NUT, NYLOCK - LOW PROFILE 1-14 UNF - STR CYL | 1 |
| A | 3.8 | 13775 | WASHER, FLAT - 1.063 x 2 x .134 in. - STR CYL | 1 |

## FIGURE: B CHASSIS MODULE - V-2470

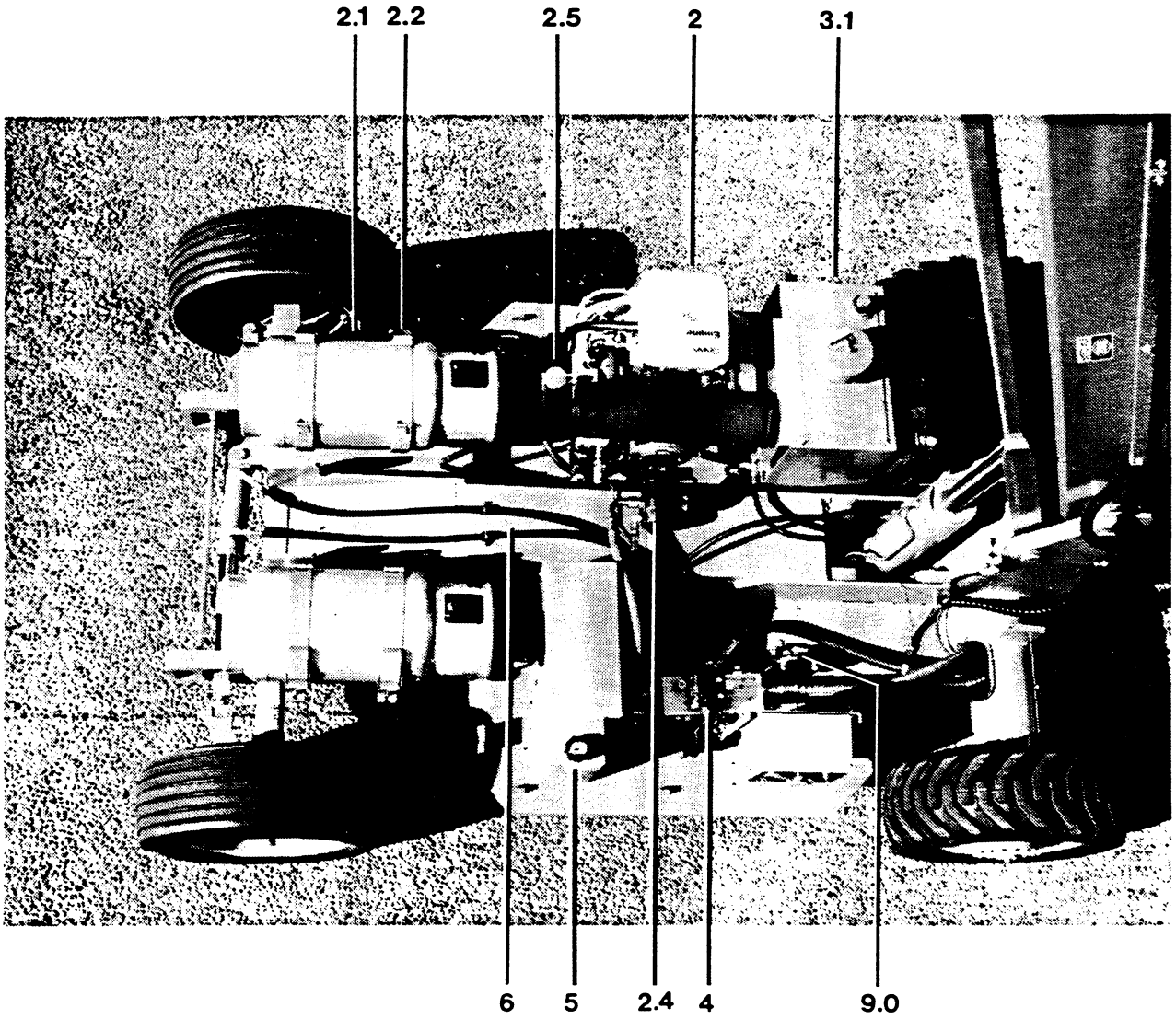


| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| B | 1.0 | 20177 | COVER, CHASSIS - LH - NS - V-2470 | 1 |
| B | 2.0 | 20176 | COVER, CHASSIS - RH - NS - V-2470 | 1 |
| B | 3.0 | 14634 | NUT, WING - 1/2-13 INJECT MOLDED | 4 |
| B | 4.0 | 1697 | TRIM, EDGE - COVERS - (BK ITEM - ORDER 6 in.) | |
| **B** | **5** | | **BATTERY GROUPING** | |
| B | 5.1 | 15916 | BATTERY, 255 AMP HR - W/SPILL PRF CAPS | 8 |
| B | 5.1 | 18494 | BATTERY, SEALED - 6V DC, 220 AMP HR - OPTION | 8 |
| B | 5.2 | 18983 | ROD, THREADED - 1-14 x 3.25 in. | 1 |
| B | 5.3 | 19175P | STRAP, BATTERY HOLD DOWN - PNTD | 4 |
| B | 5.4 | 19176 | BATTERY HOLD DOWN - (1.25 X 22.0 in. STL) - PNTD | 4 |
| B | 5.5 | 19177 | PAN, BATTERY WELDMENT - DYNO - PNTD | 2 |
| B | 5.6 | 19178 | PAN, BATTERY WELDMENT - LIBERTY - PNTD | 2 |
| B | 5.7 | 19231 | CABLE - BATTERY ASSY - (8.25 in.) | 4 |
| B | 5.8 | 19232 | CABLE - BATTERY ASSY - (10.5 in.) | 2 |
| B | 5.9 | 19519 | CABLE - BATTERY CONNECTOR ASSY. (30 in.) | 2 |
| B | 5.10 | 20774 | CABLE - BATTERY ASSY - (44 in.) | 1 |
| B | 5.11 | 45708 | BATTERY HOLD DOWN, HOOK - 10.5 in. | 8 |
| **B** | **6** | | **POWER UNIT ASSEMBLY GROUP** | **1** |
| B | 6.1 | 18535 | HYDRAULIC POWER UNIT, 24V DC - V-2470 | 1 |
| B | 6.2 | 18814 | MOTOR, 24V DC (POWER UNIT P/N18535) - V-2470 | 1 |
| B | 6.2.1 | 19454 | BRUSH SET, 8 PCS - (MOTOR P/N 18814) | 1 |
| B | 6.2.2 | 19455 | SPRING SET, 8 PCS - (MOTOR P/N 18814) | 1 |
| B | 6.3 | 19511 | PUMP - (POWER UNIT P/N 18535) - V-2470 | 1 |
| B | 6.3.1 | 21774 | VALVE, CHECK - (PUMP P/N 19511) | 1 |
| B | 6.3.2 | 19457 | VALVE, UNLOADER - (PUMP P/N 19511) | 1 |
| B | 6.3.3 | 21776 | SEAL KIT - (PUMP P/N 19511) | 1 |
| **B** | **7** | | **MANIFOLD GROUPING - V-2470 (REF FIG F)** | **1** |
| B | 7.1 | 18186 | MANIFOLD, HYDRAULIC - DRIVE SYSTEM - V-2470 | 1 |
| B | 7.2 | 19163P | BRACKET, HYDR MNFLD MOUNT - PNTD | 1 |
| B | 7.3 | 19265 | PAD, MANIFOLD MOUNT | 1 |
| **B** | **8** | | **HYDRAULIC RESERVOIR GROUPING - W/ COVER** | **1** |
| B | 8.1 | 27935P | HYDRAULIC RESERVOIR WLDMT - PNTD | 1 |
| B | 8.2 | 18372 | COVER, HYDRAULIC RESERVOIR - OBS | 1 |
| B | 8.3 | 21138 | FILTER ASSEMBLY - HYDR RESERVOIR - OBS | 1 |
| B | 8.4 | 45087 | FILTER, HYDR RETURN (FOR USE W/ 21138) | 1 |
| B | 8.5 | 21141 | FLUID LEVEL INDICATOR - HYDR RESERVOIR | 1 |
| B | 8.6 | 45157 | CAP, FILLER AND BREATHER ASSEMBLY - OBS | 1 |
| B | 8.7 | 45162 | STRAINER ASSEMBLY - HYDR RESERVOIR | 1 |

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **B** | **9** | | **HYDRAULIC RSVR GROUPING - NO COVER - NS** | **1** |
| B | 9.1 | 21830 | HYDRAULIC RESERVOIR WLDMT - PNTD - NEW | 1 |
| B | 9.2 | 21814 | FILTER ASSEMBLY - HYDR RESERVOIR - NEW | 1 |
| B | 9.3 | 21822 | FILTER, CANNISTER - HYDR RETURN - NEW | 1 |
| B | 9.4 | 21141 | FLUID LEVEL INDICATOR - HYDR RESERVOIR | 1 |
| B | 9.5 | 21815 | CAP, PRESSURIZED FILLER / BREATHER ASSY - NEW | 1 |
| B | 9.6 | 45162 | STRAINER ASSEMBLY - HYDRAULIC RESERVOIR | 1 |
| B | 9.7 | | FITTING GROUP - HYDRAULIC RESERVOIR | |
| B | 9.7.1 | 45167 | FITTING, ST BARBED - (3/4-14 NPTM) | 1 |
| B | 9.7.2 | 19504 | FITTING, ADAPTER - (.38-18 NPTM X .56-18 JIC) | 1 |
| B | 9.7.3 | 21816 | FITTING, CONNECTOR - (3/4-16 JIC X 3/4-14 NPTM) | 1 |
| B | 9.7.4 | 21838 | FITTING, NUT - SEAL - (3/4 NPTF) | 1 |
| **B** | **10** | | **HOSE GROUPING - V-2470** | |
| B | 10.1 | 1701 | HOSE - HYDR RSVR TO HYDR PUMP (BK ORDER 17 in.) | |
| B | 10.2 | 18622 | HOSE - DRIVE BRAKE TO BRAKE TEE | 1 |
| B | 10.3 | 19133 | HOSE - FNCT MNFLD TO STR CYL | 1 |
| B | 10.4 | 19134 | HOSE - FNCT MNFLD TO STR CYL | 1 |
| B | 10.5 | 19135 | HOSE - FNCT MNFLD TO LIFT CYL - EXTEND | 1 |
| B | 10.6 | 19136 | HOSE - LIFT CYL RTN TO TANK | 1 |
| B | 10.7 | 19138 | HOSE - RSVR DRAIN HOSE | 1 |
| B | 10.8 | 19147 | HOSE - HYDR RSVR TO FNCT MNFLD | 1 |
| B | 10.9 | 19148 | HOSE - FNCT MNFLD TO DRIVE BRAKE TEE | 1 |
| B | 10.10 | 20388 | HOSE - FNCT MNFLD TO DRIVE MOTOR | 2 |
| B | 10.11 | 20389 | HOSE - FNCT MNFLD TO DRIVE MOTOR | 2 |
| B | 10.12 | 20390 | HOSE - DRIVE BRAKE TO BRAKE TEE | 1 |
| B | 10.13 | 21066 | HOSE - HYDR POWER UNIT TO FNCT MNFLD | 1 |
| B | 11.0 | 47906 | CHARGER, 24V DC - 40 AMP, 110V AC | 1 |
| B | 11.0 | 47671 | CHARGER, 24V DC - 40 AMP, 220V-50HZ | 1 |
| B | 12.0 | 18963 | ALARM, 24V DC - INTERMITTENT TONE - NS | 1 |
| B | 13.0 | 18668 | INVERTER, 24V DC - 120V AC, 60HZ - OPTION - NS | 1 |
| B | 13.0 | 19496 | INVERTER, 24V DC - 220V AC, 50HZ - OPTION - NS | 1 |
| B | 14.0 | 45136 | LEVEL SENSOR - NS | 1 |
| B | 15.0 | 45212 | HORN, 24V DC - NS - V-2470 | 1 |
| B | 16.0 | 45383 | ALARM, 24V DC - BELL - NS | 1 |
| B | 17.0 | 45462 | ALARM, CHIME BELL - NS | 1 |

# NOTES

## FIGURE: C CHASSIS MODULE - V-2470RT

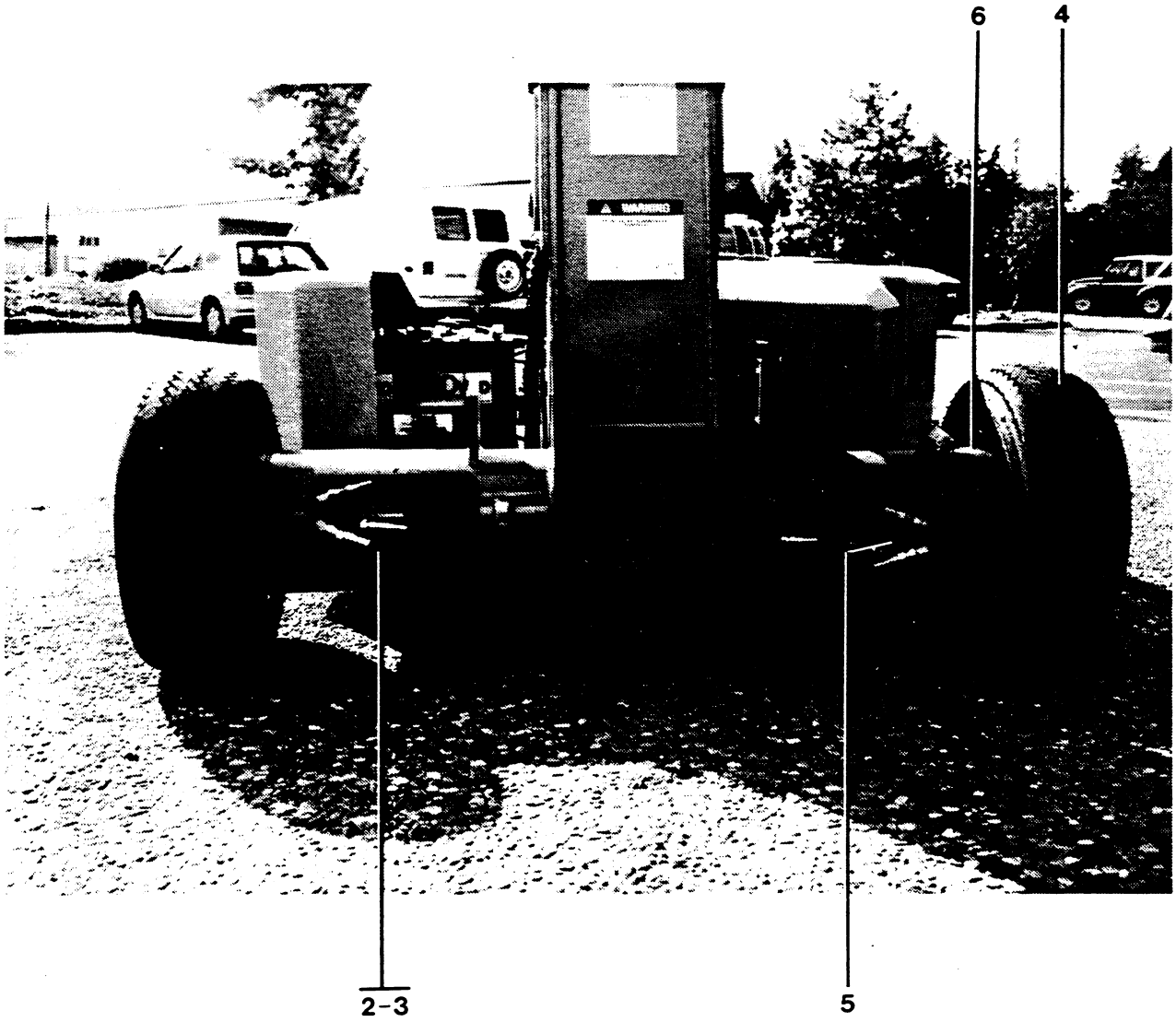


| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **C** | **1** | | **COVER GROUPING - NOT SHOWN** | **1** |
| C | 1.1 | 14634 | NUT, WING - 1/2-13 INJECT MOLDED | 4 |
| C | 1.2 | 20176 | COVER, CHASSIS - LH - V-2470RT | 1 |
| C | 1.3 | 21132 | COVER, ENGINE CHASSIS ASSY - RH - V-2470RT | 1 |
| C | 1.4 | 19953P | GRILL, EXHAUST SCREEN - (16 X 16 in.) - PNTD | 1 |
| C | 1.5 | 19954P | GRILL, TOP VENTILATION - PNTD | 1 |
| C | 1.6 | 1697 | TRIM, EDGE - ENGINE COVER (BK ITEM - ORDER 6 in.) | |
| **C** | **2** | | **ENGINE / LP TANK GROUPING** | **1** |
| | | | *FOR ADDITIONAL INFORMATION, REFER TO FIGURE E* | |
| C | 2.1 | 45576 | LP TANK ASSEMBLY | 2 |
| C | 2.2 | 45678P | BRACKET, LP TANK MOUNT - PNTD | 2 |
| C | 2.3 | 21393 | PUMP MOUNT - V-2470RT | 1 |
| C | 2.4 | 18536 | PUMP, 3 SECTION - "A" MOUNT - V-2470RT | 1 |
| C | 2.4.1 | 21771 | VALVE, CHECK - (PUMP P/N 18536) | 1 |
| C | 2.4.2 | 21772 | VALVE, UNLOADER - (PUMP P/N 18536) | 1 |
| C | 2.4.3 | 20544 | SEAL KIT - (PUMP P/N 18536) | 1 |
| C | 2.5 | 19952 | MUFFLER, EXHAUST - V-2470RT | 1 |
| **C** | **3** | | **HYDRAULIC TANK GROUPING** | **1** |
| C | 3.1 | 18828 | HYDRAULIC RESERVOIR WLDMT - PNTD | 1 |
| **C** | **4** | | **MANIFOLD GROUPING - V-2470RT** | **1** |
| C | 4.1 | 18660 | MANIFOLD, HYDRAULIC - V-2470RT | 1 |
| C | 4.2 | 19265 | PAD, MANIFOLD MOUNT | 1 |
| **C** | **5** | | **GAS TANK GROUPING** | **1** |
| C | 5.1 | 19515 | TANK, GASOLINE - MOLDED - 20 GALLON | 1 |
| C | 5.2 | 45874 | BAFFLE, TUBE - GAS TANK | 1 |
| **C** | **6** | | **HOSE GROUPING - V-2470RT** | **1** |
| C | 6.1 | 19654 | HOSE ASSY - FNCT MNFLD TO DRIVE MOTOR | 1 |
| C | 6.2 | 19655 | HOSE ASSY - FNCT MNFLD TO DRIVE MOTOR | 1 |
| C | 6.3 | 19656 | HOSE ASSY - DRIVE MOTOR TO DRIVE MOTOR | 1 |
| C | 6.4 | 19657 | HOSE ASSY - FNCT MNFLD TO HYDR RESERVOIR | 1 |
| C | 6.5 | 19658 | HOSE ASSY - HYDR PUMP TO FNCT MNFLD. | 1 |
| C | 6.6 | 19659 | HOSE ASSY - FNCT MNFLD TO STEERING CYL | 2 |
| C | 6.7 | 19661 | HOSE ASSY - FNCT MNFLD TO LIFT CYL | 1 |
| C | 6.8 | 19662 | HOSE ASSY - LIFT CYL RETURN TO HYDR TANK | 1 |
| C | 6.9 | 19663 | HOSE ASSY - PUMP TO FNCT MNFLD | 1 |
| C | 6.10 | 19664 | HOSE ASSY - FNCT MNFLD TO BRAKE TEE | 1 |

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| C | 6.11 | 19665 | HOSE - HYDR RESERVOIR TO HYDR PUMP (BK 10.5 in.) | |
| C | 6.12 | 20394 | HOSE ASSY - DRIVE BRAKE TO BRAKE TEE | 1 |
| C | 6.13 | 20438 | HOSE ASSY - DRIVE BRAKE TO DRIVE TEE | 1 |
| C | 7.0 | 18963 | ALARM, 24V DC - INTERMITTENT TONE - NS | 1 |
| C | 8.0 | 19270 | ALARM, 12V DC - WARBLE TONE - NS | 1 |
| C | 9.0 | 19145 | HORN, 12V DC - V-2470RT | 1 |
| C | 10.0 | 45136 | LEVEL SENSOR - NS | 1 |
| C | 11.0 | 45462 | ALARM, CHIME BELL - NS | 1 |

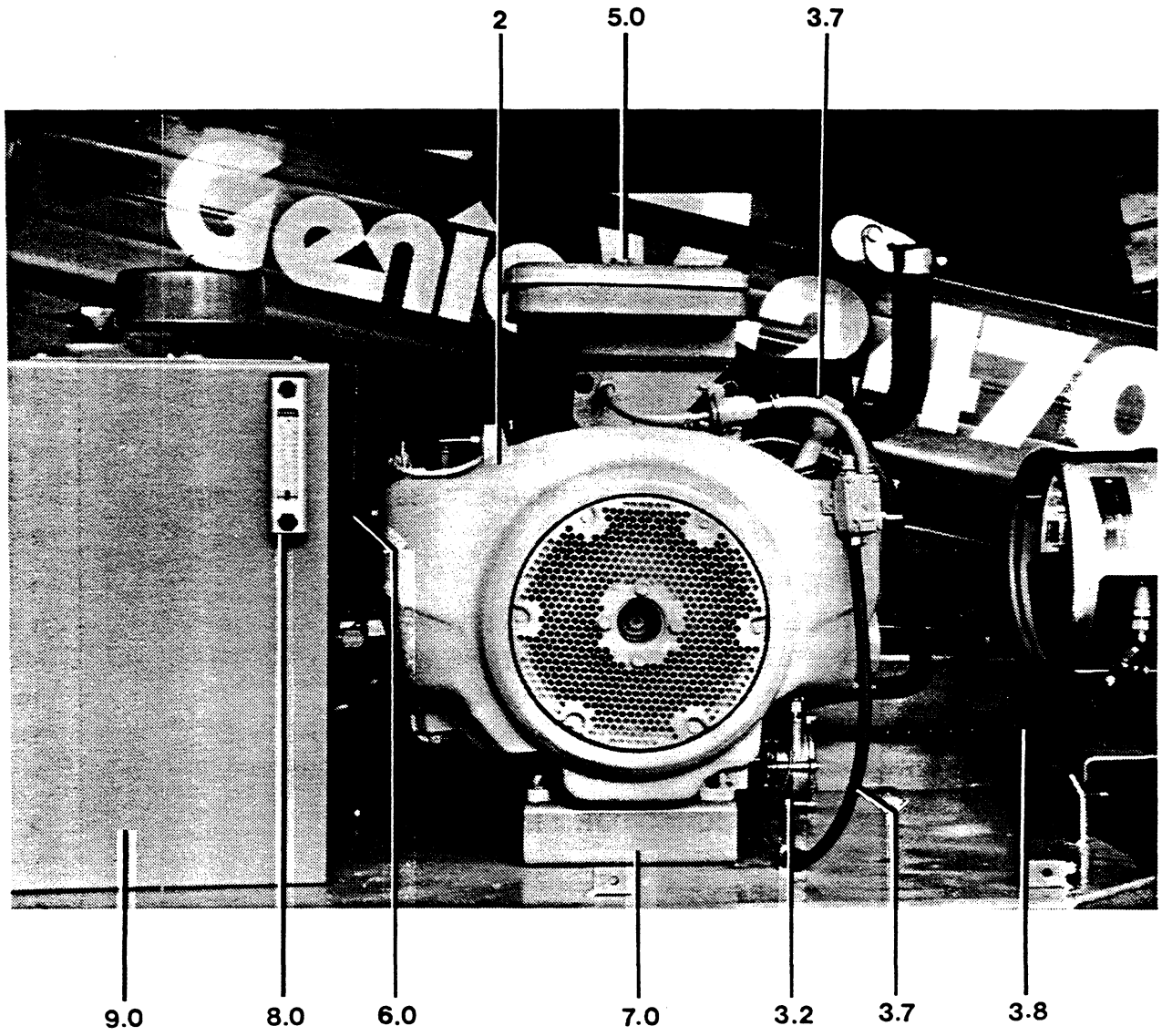
# NOTES

## FIGURE: D DRIVE ASSEMBLY



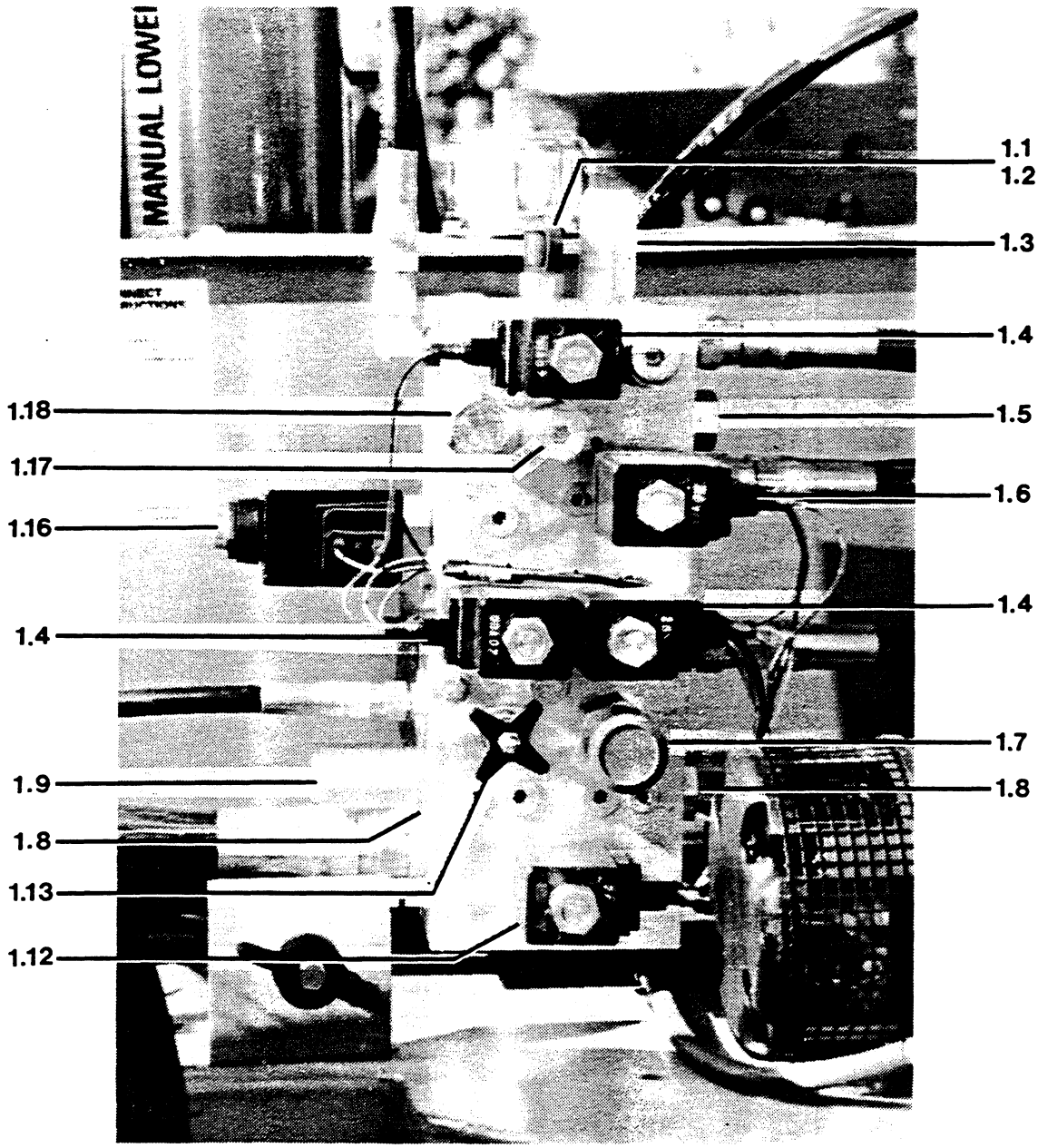
| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **D** | **1** | | **ITEMS NOT SHOWN** | |
| D | 1.1 | 20189 | BEACON, FLASHING | 1 |
| D | 1.2 | 18729P | BRACKET, BEACON MOUNT PNTD | 1 |
| D | 1.3 | 1698 | TRIM, EDGE - (BK ITEM - ORDER 36 in.) | |
| D | 1.4 | 18715 | SWITCH, LIMIT | 1 |
| D | 1.5 | 19344 | SWITCH, LIMIT - ARM | 1 |
| D | 1.6 | 20482 | CONTACT, LIMIT SWITCH - (LIMIT SWITCH P/N 18715) | 1 |
| D | 1.7 | 20091 | COVER, REAR AXLE - WLDMT - PNTD | 2 |
| **D** | **2** | | **DRIVE GROUPING - V-2470** | **1** |
| D | 2.1 | 18149P | WHEEL MOTOR & BRAKE ASSY - PNTD - V-2470 | 2 |
| D | 2.2 | 18518P | HUB, REAR WHEEL - PNTD | 2 |
| D | 2.3 | 19081P | ADAPTER, WHEEL MOTOR - PNTD | 2 |
| D | 2.4 | 19962 | TORQUE HUB - V-2470 | 2 |
| D | 2.5 | 19961 | MOTOR, HYDRAULIC - V-2470 | 1 |
| D | 2.5.1 | 19453 | SEAL KIT (MOTOR P/N 19961) | 1 |
| **D** | **3** | | **DRIVE GROUPING - V-2470RT** | **1** |
| D | 3.1 | 18150P | WHEEL MOTOR, BRAKE & GEAR BOX ASSY - PNTD V-2470RT | 2 |
| D | 3.2 | 19732 | TORQUE HUB - V-2470RT | 2 |
| **D** | **4** | | **WHEEL GROUPING** | **1** |
| D | 4.1 | 19276 | WHEEL & TIRE ASSEMBLY - RH DRIVE WHL | 1 |
| D | 4.2 | 19277 | WHEEL & TIRE ASSEMBLY - LH DRIVE WHL | 1 |
| D | 4.3 | 45109 | NUT, LUG - 5/8-18 90 DEG - REAR DRIVE WHL | 18 |
| D | 4.4 | 924985 | WHEEL & TIRE ASSEMBLY - FOAM FILLED LH DRIVE WHL | 1 |
| D | 4.5 | 927427 | WHEEL & TIRE ASSEMBLY - FOAM FILLED RH DRIVE WHL | 1 |
| **D** | **5** | | **HYDRAULIC MOTOR / BRAKE GROUP** | **1** |
| D | 5.1 | 19451 | BRAKE GROUP | 1 |
| D | 5.2 | 45554 | BRAKE, B MOUNT | 1 |
| D | 5.2.1 | 20483 | SEAL KIT (BRAKE P/N 19451) | 1 |
| D | 5.3 | 45552 | MOTOR, HYDR WHEEL DRIVE | 1 |
| D | 5.3.1 | 19584 | SEAL KIT (WHEEL MOTOR P/N 45552) | 1 |
| D | 5.4 | 19794 | GASKET - HYDR MOTOR / BRAKE ASSY | 1 |
| D | 5.5 | 19963 | NUT, WHEEL - 1.25 in. ID, 12 UNC | 1 |
| D | 6.0 | 6595 | PLUG, ELECTRICAL - DOMESTIC | 1 |

## FIGURE: E DRIVE INSTALLATION - V-2470RT



| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **E** | **1** | | **ITEMS NOT SHOWN** | |
| E | 1.1 | | GENERATOR GROUP - OPTION | 1 |
| E | 1.2 | 929803 | GENERATOR - 2000 WATT | 1 |
| E | 1.3 | 19647 | PULLEY KIT, MOTOR (INCL PULLEY & BOLT) - V-2470RT | 1 |
| E | 1.4 | 19651 | PULLEY KIT, GENERATOR - V-2470RT | 1 |
| E | 1.5 | 19648 | PULLEY, GENERATOR - (PULLEY KIT P/N 19651) | 1 |
| E | 1.6 | 19649 | BUSHING, GENERATOR - (PULLEY KIT P/N 19651) | 1 |
| E | 1.7 | 19650 | BELT, GENERATOR - (PULLEY KIT P/N 19651) | 1 |
| E | 1.8 | 21621 | GUARD - METAL, FOR INSIDE OF COVER | 1 |
| **E** | **2** | | **ENGINE GROUP - V-2470RT** | **1** |
| E | 2.1 | 21479 | ENGINE - ONAN T260 | 1 |
| E | 2.2 | 19272 | HOSE - LPG FUEL - 1/2 X 38.0 in. | 1 |
| E | 2.3 | 19489 | HOSE - GASOLINE FUEL - 1/4 X 31.0 in. | 1 |
| E | 2.4 | 21524 | PLUG - FEMALE, WIRE HARNESS | 1 |
| E | 2.5 | 21525 | TERMINAL, SPADE - ENGINE WIRE HARNESS PLUG | 6 |
| **E** | **3** | | **FUEL SYSTEM GROUP - V-2470RT** | **1** |
| E | 3.1 | 45806 | JET, MAIN - GAS | 1 |
| E | 3.2 | 45807 | REGULATOR - LPG | 1 |
| E | 3.3 | 45808 | VAPORIZOR - LPG | 1 |
| E | 3.4 | 45827 | SOLENOID, FUEL - GASOLINE | 1 |
| E | 3.5 | 45828 | SOLENOID, FUEL - LPG | 1 |
| E | 3.6 | 19487 | VALVE, FUEL LOCK | 1 |
| E | 3.7 | 19615 | GASOLINE LINE - (1/4 OD, SSTL) - V-2470RT | 1 |
| E | 3.8 | 20027 | HOSE ASSY - LP - V-2470RT - NS | 1 |
| E | 4.0 | 20284 | BRACKET, VAPORIZER WLDMT - PNTD | 1 |
| E | 5.0 | 19353 | FILTER, AIR | 1 |
| E | 6.0 | 20029 | HEAT SHIELD, ALU - V-2470RT | 1 |
| E | 7.0 | 19551 | ENGINE MOUNTING - DRILLED TUBE | 2 |
| E | 8.0 | 21141 | FLUID LEVEL INDICATOR - HYDR RESERVOIR | 1 |
| E | 9.0 | 18828 | HYDRAULIC RESERVOIR WLDMT - PNTD | 1 |

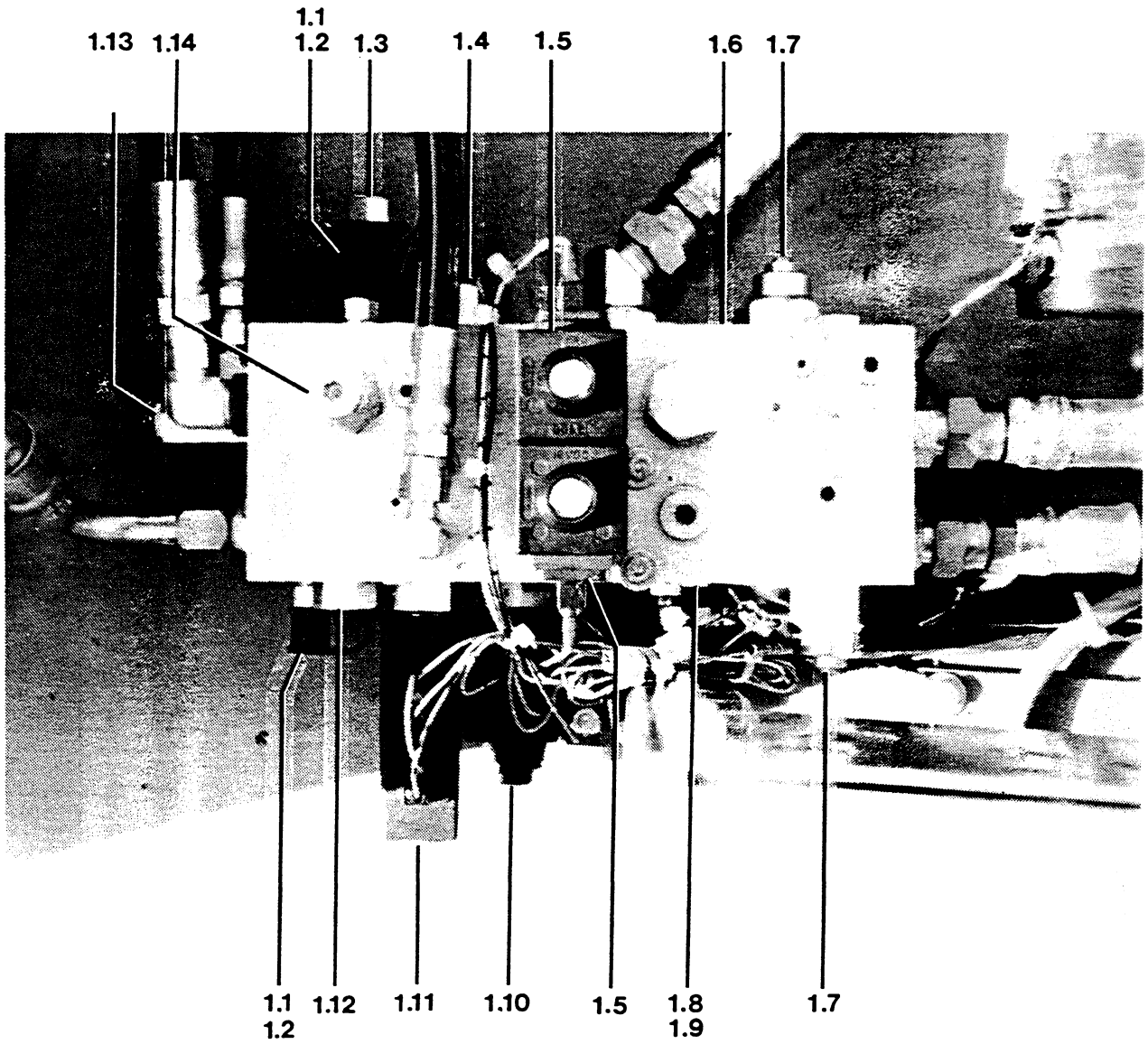
## FIGURE: F MANIFOLD ASSEMBLY - V-2470



## MANIFOLD ASSEMBLY - V-2470 Genie V-2470 & V-2470RT

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **F** | **1** | **18186** | **MANIFOLD, HYDRAULIC - DRIVE SYSTEM - V-2470** | **1** |
| F | 1.1 | 45642 | DIAGNOSTIC NIPPLE | 1 |
| F | 1.2 | 45643 | CAP, DUST | 1 |
| F | 1.3 | 18911 | VALVE, RELIEF - 3000 PSI | 1 |
| F | 1.4 | 45479 | VALVE, SOLENOID - 2 POS.-3 WAY | 3 |
| F | 1.5 | 18917 | VALVE, DIFFERENTIAL SENSING | 1 |
| F | 1.6 | 18914 | VALVE, SOLENOID - 3 PSN/4 WAY | 1 |
| F | 1.7 | 19345 | PUMP, HAND | 1 |
| F | 1.8 | 45481 | VALVE, CHECK | 2 |
| F | 1.9 | 18910 | VALVE, RELIEF - 1500 PSI | 2 |
| F | 1.10 | 45483 | VALVE, MINI SHUTTLE | 1 |
| F | 1.11 | 18918 | VALVE, NEEDLE - NS | 1 |
| F | 1.12 | 18913 | VALVE, SOLENOID - 2 PSN/4 WAY | 1 |
| F | 1.13 | 18919 | VALVE, NEEDLE | 1 |
| F | 1.14 | 18920 | SPRING, DRIVE MANIFOLD - NS | 1 |
| F | 1.15 | 18921 | ORIFICE - (MANIFOLD P/N 18186) V-2470 - NS | 1 |
| F | 1.16 | 45484 | VALVE, SOLENOID - PROPORTIONAL | 1 |
| F | 1.17 | 45485 | VALVE, RELIEF - 750 PSI | 1 |
| F | 1.18 | 19207 | VALVE, FLOW REGULATOR | 1 |
| F | 2.0 | 19265 | PAD, MANIFOLD MOUNT | 1 |
| F | 3.0 | 19163P | BRACKET, HYDR MNFLD MOUNT - PNTD | 1 |

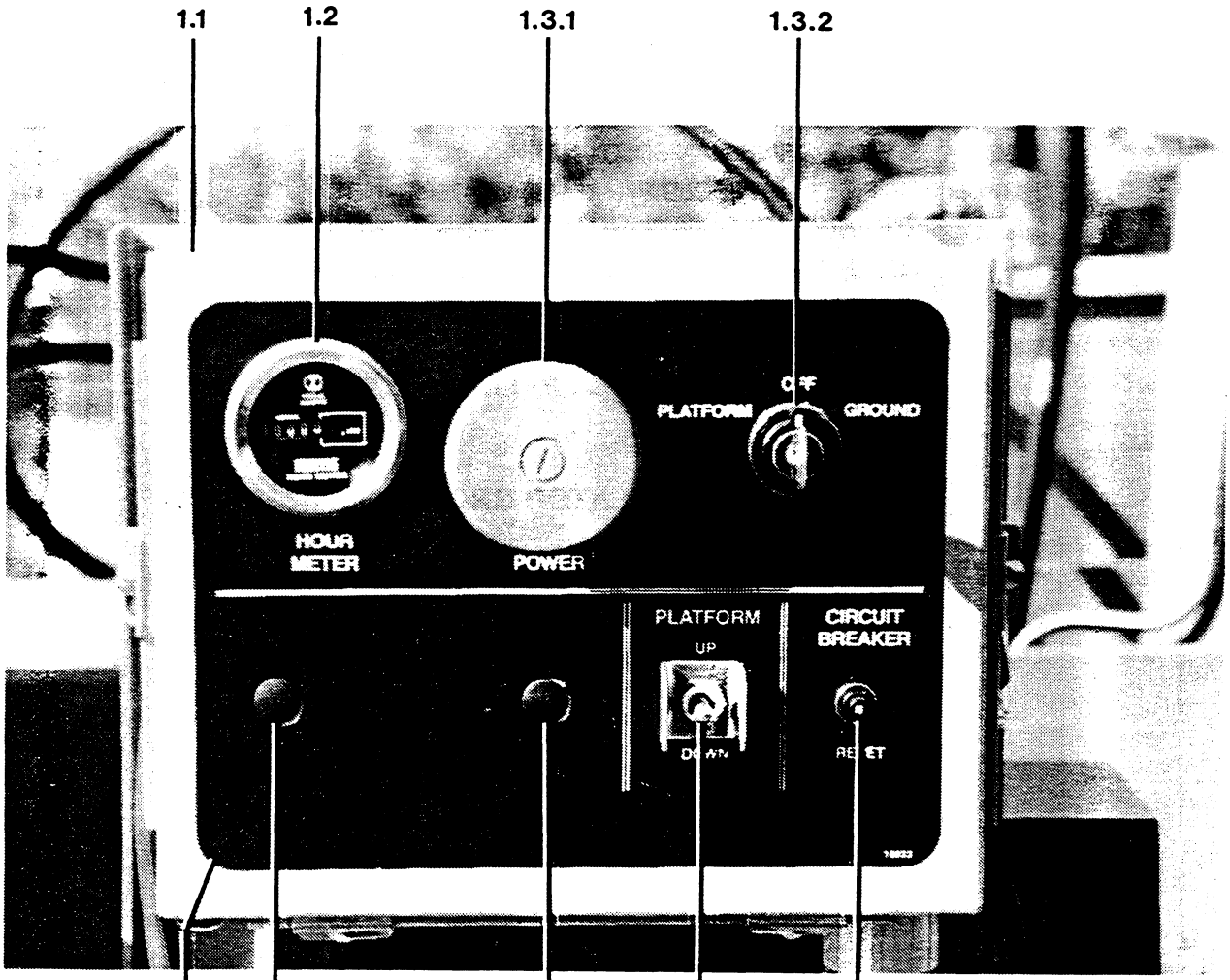
## FIGURE: G MANIFOLD ASSEMBLY - V-2470RT



## MANIFOLD ASSEMBLY - V-2470RT

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **G** | **1** | **18660** | **MANIFOLD, HYDRAULIC - V-2470RT** | **1** |
| G | 1.1 | 45642 | DIAGNOSTIC NIPPLE | 2 |
| G | 1.2 | 45643 | CAP, DUST | 2 |
| G | 1.3 | 19970 | VALVE, SOLENOID (HYDR MNFLD P/N 18660) | 1 |
| G | 1.4 | 19973 | VALVE, DIFFERENTIAL SENSING (HYDR MNFLD P/N 18660) | 1 |
| G | 1.5 | 19969 | VALVE, SOLENOID (HYDR MNFLD P/N 18660) | 2 |
| G | 1.6 | 45483 | VALVE, MINI SHUTTLE | 1 |
| G | 1.7 | 19967 | VALVE, COUNTERBALANCE (HYDR MNFLD P/N 18660) | 2 |
| G | 1.8 | 18920 | SPRING, DRIVE MANIFOLD - NS | 1 |
| G | 1.9 | 19974 | ORIFICE - (MANIFOLD P/N 18660) V-2470RT - NS | 1 |
| G | 1.10 | 19972 | SOLENOID, PROPORTIONAL (HYDR MNFLD P/N 18660) | 1 |
| G | 1.11 | 19971 | SOLENOID, 3 PSN / 4 WAY (HYDR MNFLD P/N 18660) | 1 |
| G | 1.12 | 19207 | VALVE, SOLENOID | 1 |
| G | 1.13 | 18911 | VALVE, RELIEF - 3000 PSI | 1 |
| G | 1.14 | 19968 | VALVE, RELIEF (HYDR MNFLD P/N 18660) | 1 |
| G | 2.0 | 19265 | PAD, MANIFOLD MOUNT | 1 |
| **G** | **3** | | **SHUTTLE ACCUMULATOR GROUP - NOT SHOWN** | |
| G | 3.1 | 21078 | ACCUMULATOR, SHUTTLE | 1 |
| G | 3.2 | 45455 | CLAMP - 2 3/4 in. RUBBER CUSHIONED | 2 |
| G | 3.3 | 21082 | HOSE ASSY - FNCT MNFLD M2 PORT TO ACCUMULATOR | 1 |
| G | 3.4 | 21083 | HOSE ASSY - FNCT MNFLD M1 PORT TO ACCUMULATOR | 1 |

## FIGURE: H GROUND CONTROL BOX - V-2470

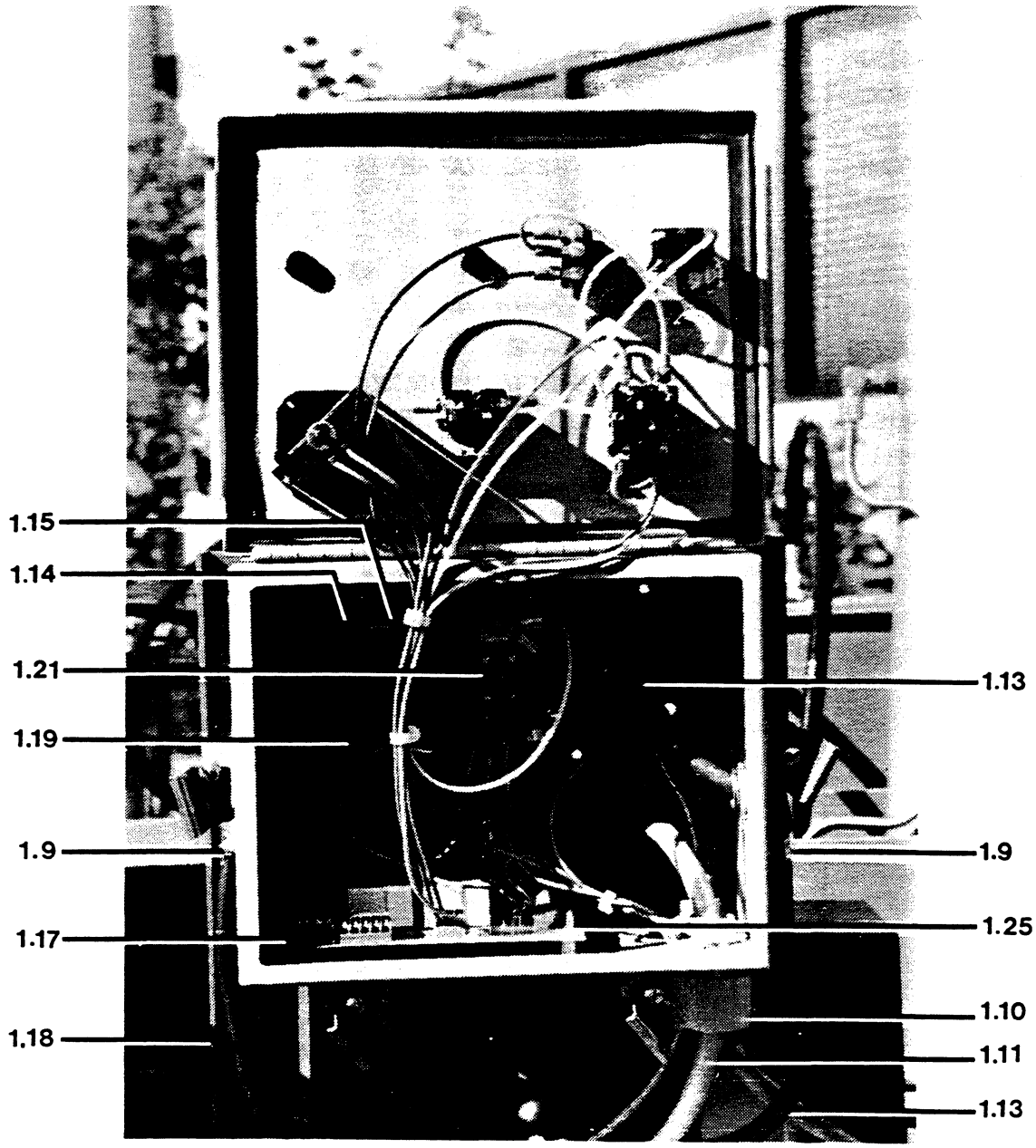



OUTSIDE VIEW

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **H** | **1** | | **CONTROL BOX GROUP - GROUND - V-2470** | **1** |
| H | 1.1 | 24471P | CONTROL BOX, GROUND - V-2470 | 1 |
| H | 1.2 | 13687 | HOUR METER, 24V DC - V-2470 | 1 |
| H | 1.2.1 | 45840 | PLUG, DOMED - 2 in. - NS | 1 |
| H | 1.3 | 45198 | KEY SWITCH GROUP - GRND STAT | 1 |
| H | 1.3.1 | 33321 | SWITCH, EMERGENCY STOP - PUSH BUTTON | 1 |
| H | 1.3.2 | 33574 | SWITCH, KEY - GROUND STATION | 1 |
| H | 1.3.2.1 | 21982 | KEYS - (PAIR) - GRND STAT KEY SWITCH | 1 |
| H | 1.3.3 | 45081 | CONTACT - N-O | 2 |
| H | 1.3.4 | 45082 | CONTACT - N-O W/ BASE | 1 |
| H | 1.3.5 | 45083 | CONTACT - N-C W/ BASE | 1 |
| H | 1.3.6 | 45084 | CONTACT - 2 N-O W/BASE | 1 |
| H | 1.4 | 375785 | CIRCUIT BREAKER, 10 AMP | 1 |
| H | 1.5 | 13037 | SWITCH, TOGGLE - SPDT MOMENTARY | 1 |
| H | 1.6 | 45105 | SWITCH GUARD, TOGGLE - ZINC | 1 |
| H | 1.7 | 45384 | PLUG - .5 in. DIA | 2 |
| H | 1.8 | 18533 | DECAL - GROUND CONTROL BOX - V-2470 | 1 |

*Continued on page 23*

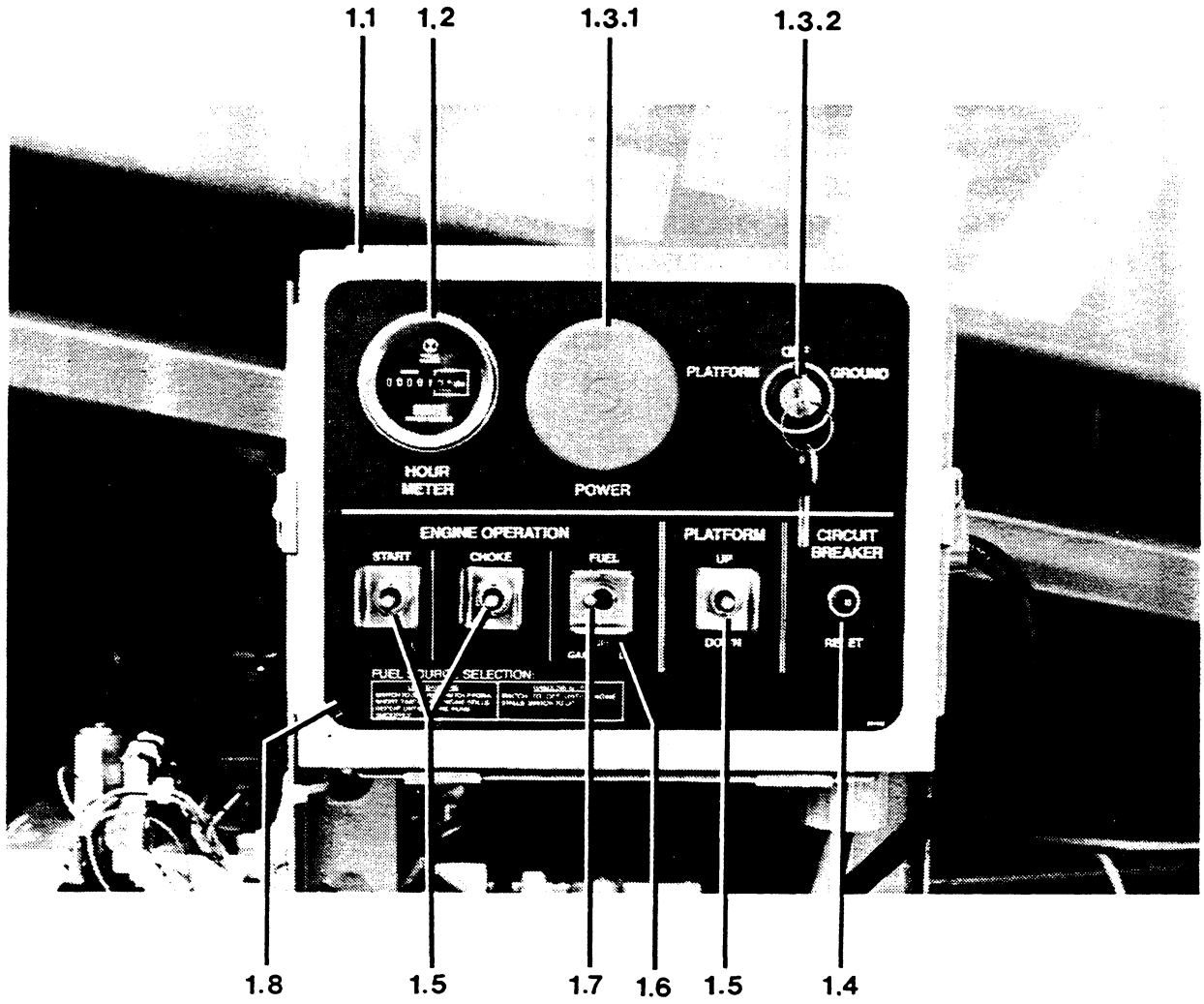
## FIGURE: H GROUND CONTROL BOX - V-2470




INSIDE VIEW

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| | | | *Continued from page 21* | |
| H | 1.9 | 14539 | CONNECTOR, 1/2 in. - GRND 90 DEG | 3 |
| H | 1.10 | 12960 | CONNECTOR, SQUEEZE - CABLE - XTRA LARGE | 2 |
| H | 1.11 | 35934 | WIRE CABLE -(BK - ORDER #18 GA/19 COND 114 in.) | |
| H | 1.12 | 15243 | PLUG, CAP - NYLON - .787 BLACK - NS | 1 |
| H | 1.13 | 19521 | CABLE ASSY - W/ BATTERY CONNECTOR | 2 |
| H | 1.14 | 19242 | CABLE ASSY - 91.00 in. LONG | 1 |
| H | 1.15 | 19839 | CABLE ASSY - 6.5 in. LONG | 1 |
| H | 1.16 | 19243 | CABLE ASSY - 2.50 in. LONG (2nd RELAY OPTION) - NS | 1 |
| H | 1.17 | 18148 | CIRCUIT BOARD, DRIVE - 24V DC - V-2470 | 1 |
| H | 1.18 | 45409 | STAND-OFF - PC BOARD | 4 |
| H | 1.19 | 19549 | RELAY, 24V DC - 80 AMP NOMINAL | 1 |
| H | 1.20 | 19815P | BRACKET, CONTACTOR MOUNT - PNTD | 1 |
| H | 1.21 | 18576 | FUSE - 200 AMP | 1 |
| H | 1.22 | 13105 | FUSE HOLDER | 1 |
| H | 1.23 | 20775 | WIRE ASSEMBLY, GRND | 1 |
| H | 1.24 | 20699 | WIRE, GRND - CONTROL BOX (DC) - V-2470 | 1 |
| H | 1.25 | 19058 | BRACKET, GROUND CONTROL BOX - WLDMT - PNTD | 1 |

## FIGURE: I GROUND CONTROL BOX - V-2470RT

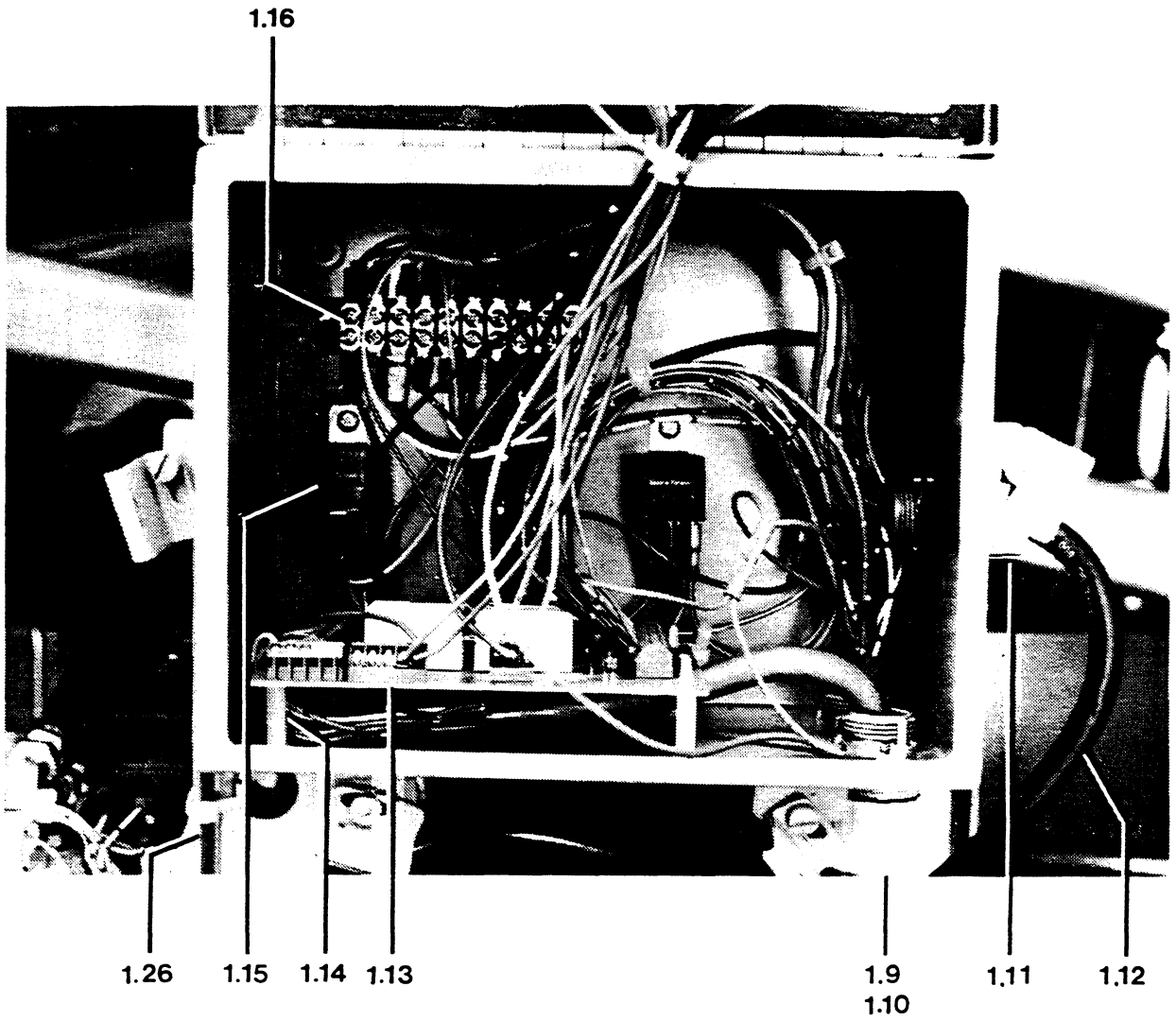



OUTSIDE VIEW

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| I | 1 | | **CONTROL BOX GROUP - GROUND - V-2470RT** | 1 |
| I | 1.1 | 19526 | CONTROL BOX, GROUND - V-2470RT | 1 |
| I | 1.2 | 19506 | HOUR METER, 12V DC - V-2470RT | 1 |
| I | 1.3 | 19626 | CONTROL BOX, GROUND - SWITCH GROUP - V-2470RT | 1 |
| I | 1.3.1 | 33321 | SWITCH, EMERGENCY STOP - PUSH BUTTON | 1 |
| I | 1.3.2 | 33574 | SWITCH, KEY - GROUND STATION | 1 |
| I | 1.3.2.1 | 45649 | KEYS - (PAIR) - GRND STAT KEY SWITCH | 1 |
| I | 1.3.3 | 45081 | CONTACT - N-O | 2 |
| I | 1.3.4 | 45084 | CONTACT - 2 N-O W/BASE | 1 |
| I | 1.3.5 | 45085 | CONTACT - 2 N-C W/BASE | 1 |
| I | 1.4 | 375785 | CIRCUIT BREAKER, 10 AMP | 1 |
| I | 1.5 | 13037 | SWITCH, TOGGLE - SPDT MOMENTARY | 3 |
| I | 1.6 | 45105 | SWITCH GUARD, TOGGLE - ZINC | 4 |
| I | 1.7 | 13038 | SWITCH, TOGGLE - DPDT MAINTAINED | 1 |
| I | 1.8 | 20409 | DECAL - GROUND CONTROL BOX - V-2470RT | 1 |

*Continued on page 27*

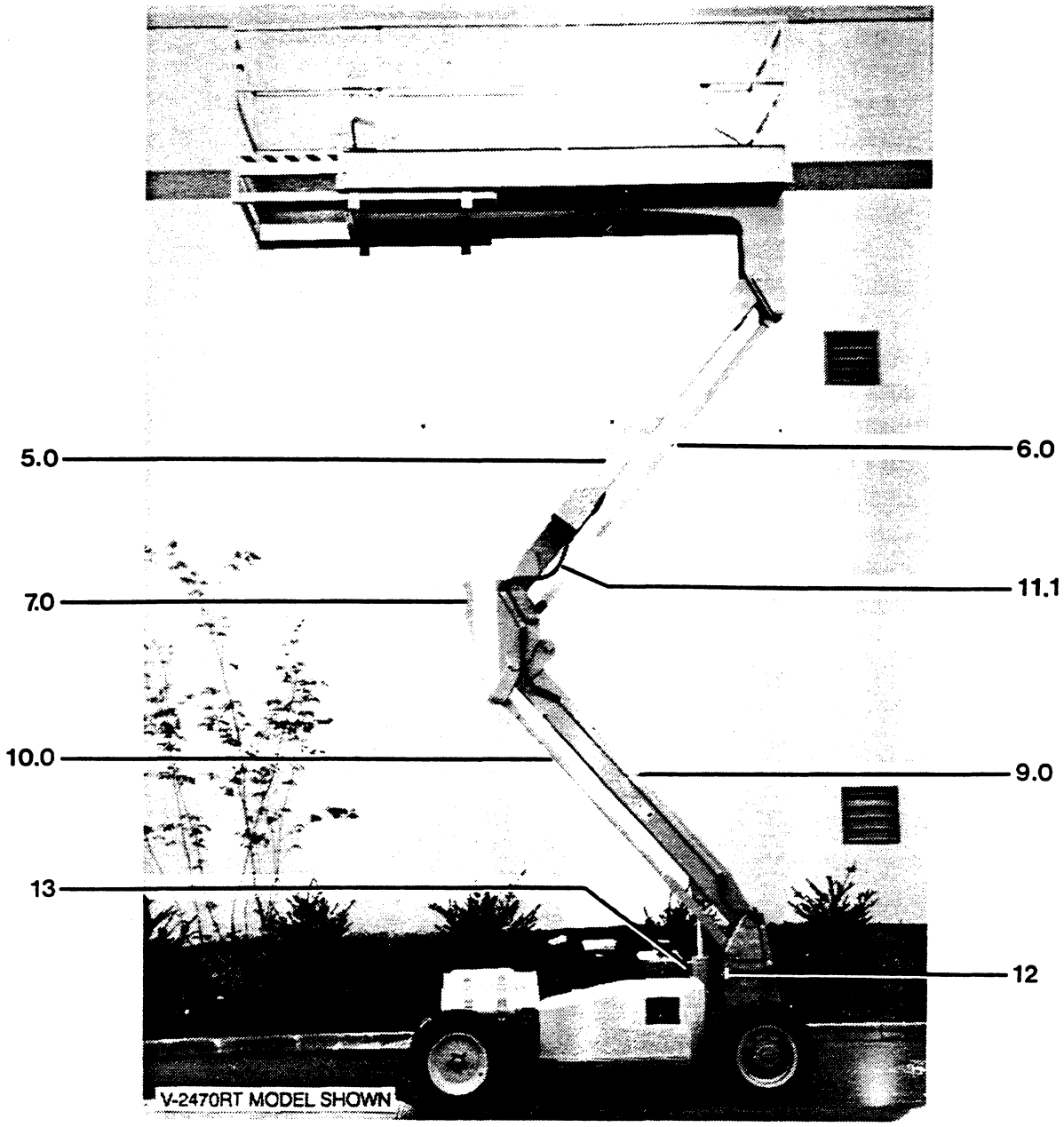
## FIGURE: I GROUND CONTROL BOX - V-2470RT




INSIDE VIEW

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| | | | *Continued from page 25* | |
| I | 1.9 | 35934 | WIRE CABLE -(BK - ORDER #18 GA/19 COND 53 in.) | |
| I | 1.10 | 12960 | CONNECTOR, SQUEEZE - CABLE - XTRA LARGE | 2 |
| I | 1.11 | 7057 | CONNECTOR, SQUEEZE - CABLE - LARGE | 1 |
| I | 1.12 | 19525 | ENGINE CABLE ASSY | 1 |
| I | 1.13 | 19474 | CIRCUIT BOARD, DRIVE - 12V DC - V-2470RT | 1 |
| I | 1.14 | 45409 | STAND-OFF - PC BOARD | 4 |
| I | 1.15 | 19274 | RELAY, 12V DC - SPST | 4 |
| I | 1.16 | 13098 | TERMINAL, STRIP - 10 POLE | 1 |
| I | 1.17 | 19627 | CABLE ASSY - BATTERY NEG TO GRND - (18 in.) | 1 |
| I | 1.18 | 19628 | CABLE ASSY - BATTERY POS TO STARTER - (38 in.) | 1 |
| I | 1.19 | 19629 | CABLE ASSY - ALTERNATOR TO BATTERY - (RED 75 in.) | 1 |
| I | 1.20 | 20217 | WIRE ASSY, GRND - ENGINE | 1 |
| I | 1.21 | 19234 | GROUND WIRE ASSEMBLY | 1 |
| I | 1.22 | 20149 | RELAY - TILT ALARM - NS | 1 |
| I | 1.23 | 16860 | RELAY SOCKET - NS | 1 |
| I | 1.24 | 45843 | SPRING, RELAY HOLD DOWN - NS | 1 |
| I | 1.25 | 15243 | PLUG, CAP - NYLON - .787 BLACK - NS | 3 |
| I | 1.26 | 19058 | BRACKET, GROUND CONTROL BOX - WLDMT - PNTD | 1 |

## FIGURE: J ELEVATE ASSEMBLY

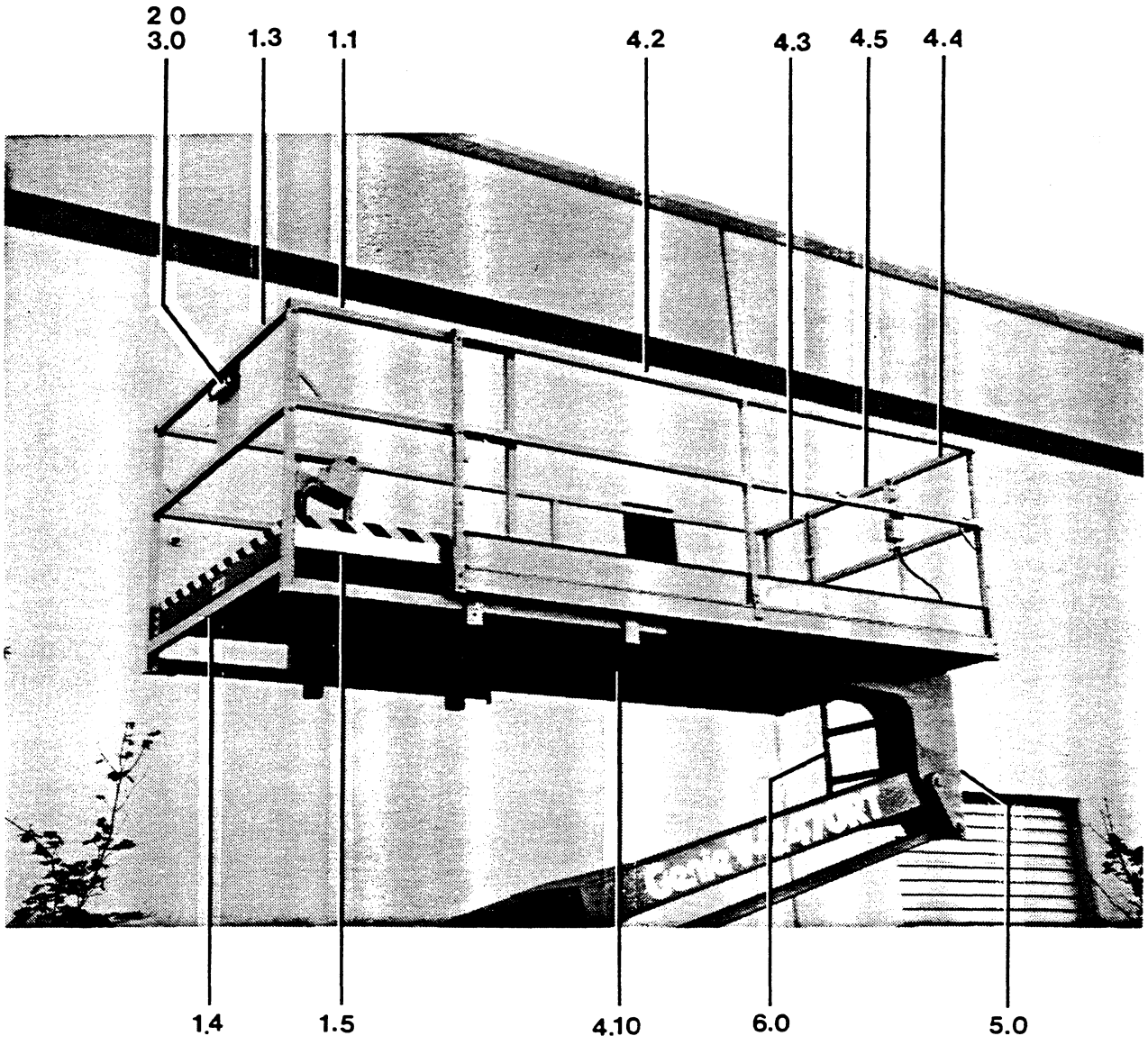


| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| J | 1.0 | 18841P | PLATFORM PIVOT WLDMT - PNTD | 1 |
| **J** | **2** | | **PIN GROUP - ELEVATE ASSY** | **1** |
| J | 2.1 | 18969 | PIN - UPPER ARM & MIDPIVOT | 2 |
| J | 2.2 | 18970 | PIN - LIFT CYLINDER - BASE | 1 |
| J | 2.3 | 18971 | PIN - LIFT CYLINDER - LOWER ARM | 1 |
| J | 2.4 | 18972 | PIN - LOWER LVL ARM - BASE PIVOT | 1 |
| J | 2.5 | 18973 | PIN - LOWER ARM - BASE PIVOT | 1 |
| J | 2.6 | 18974 | PIN - CONNECTING LINK | 2 |
| J | 2.7 | 18975 | PIN - LOWER ARM - MIDPIVOT | 1 |
| J | 2.8 | 18976 | PIN - LOWER LVL ARM - MIDPIVOT | 1 |
| J | 2.9 | 18977 | PIN - PLATFORM PIVOT | 2 |
| **J** | **3** | | **WASHER & SNAP RING GROUP - ELEVATE ASSY** | **1** |
| J | 3.1 | 18383 | RING, EXTERNAL SNAP - 1.5 in. DIA | 8 |
| J | 3.2 | 18384 | RING, EXTERNAL SNAP - 1.75 in. DIA | 4 |
| J | 3.3 | 18595 | WASHER, FLAT - 1.78 x 2.75 x .057 in. | 4 |
| J | 3.4 | 18596 | WASHER, FLAT - 1.56 x 2.5 x .061 in. | 8 |
| J | 3.5 | 18716 | RING, EXTERNAL SNAP - 2 in. DIA | 8 |
| J | 3.6 | 18717 | RING, EXTERNAL SNAP - 2.25 in. DIA | 4 |
| J | 3.7 | 18730 | WASHER, FLAT - 3.5 x 2.01 x .06 in. | 8 |
| J | 3.8 | 18731 | WASHER, FLAT - 3.5 x 2.27 x .06 in. | 4 |
| **J** | **4** | | **BEARING GROUP - ELEVATE ASSY - V-2470 Series** | **1** |
| J | 4.1 | 18238 | BEARING - 1.5 in. ID x 2 in. LONG | 4 |
| J | 4.2 | 18239 | BEARING - 1.75 in. ID x 2 in. LONG | 4 |
| J | 4.3 | 18241 | BEARING - 1.75 in. ID x 1.25 in. LONG | 4 |
| J | 4.4 | 18720 | BEARING - 2 in. ID x 1.5 in. LONG | 4 |
| J | 4.5 | 18721 | BEARING - 2 in. ID x 1 in. LONG | 4 |
| J | 4.6 | 18722 | BEARING - 2.25 in. ID x 1.5 in. LONG | 4 |
| J | 4.7 | 18723 | BEARING - 2 in. ID x 2 in. LONG | 8 |
| J | 4.8 | 18724 | BEARING - 2.25 in. ID x 2 in. LONG | 4 |
| J | 4.9 | 45071 | BEARING - 1.5 in. ID x 1.5 in. LONG | 8 |
| J | 5.0 | 21753P | UPPER ARM WLDMT - PNTD | 1 |
| J | 6.0 | 18756 | UPPER LEVELING ARM WLDMT | 1 |
| J | 7.0 | 18835P | MIDPIVOT WLDMT - PNTD | 1 |
| J | 8.0 | 18824 | CONNECTING LINK WLDMT - PNTD | 1 |
| J | 9.0 | 18806P | LOWER ARM WLDMT - PNTD | 1 |
| J | 10.0 | 18816 | LOWER LEVELING ARM WLDMT - PNTD | 1 |

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **J** | **11** | | **COVER GROUP - ELEVATE ASSY** | **1** |
| J | 11.1 | 45540 | PROTECTIVE COIL SLEEVE - (BK ORDER 140 in.) | |
| J | 11.2 | 18592P | COVER, CONTROL CABLE - LOWER ARM (56 in.) - PNTD | 2 |
| J | 11.3 | 18593P | COVER, CABLE - BASE TO MDPVT (12.0 in.) - PNTD | 5 |
| **J** | **12** | | **LIMIT SWITCH GROUP** | **1** |
| J | 12.1 | 28688 | SWITCH, LIMIT | 1 |
| J | 12.2 | 19344 | SWITCH, LIMIT - ARM | 1 |
| J | 12.3 | 19491 | CONTACT, LIMIT SWITCH - (LIMIT SWITCH P/N 18715) | 1 |
| **J** | **13** | | **HYDRAULIC CYLINDER GROUP - V-2470 Series** | **1** |
| J | 13.1 | 18168 | CYLINDER, HYDR - LIFT - V-2470 & V-2470RT | 1 |
| J | 13.2 | 19006 | TUBE ASSY - LIFT RETURN (CYL P/N 18168) | 1 |
| J | 13.3 | 14815 | ROLL PIN, .25 X 2.25 in. - (CYL P/N 18168) | 1 |
| J | 13.4 | 18151 | MANIFOLD, HYDR 24V DC (LIFT CYL P/N 18168) V-2470) | 1 |
| J | 13.5 | 18686 | MANIFOLD, HYDR 12V DC (LIFT CYL P/N 18168)V-2470RT | 1 |
| J | 13.6 | 45543 | VALVE, CHECK (HYDR MNFLD P/N 18151 & 18686) | 1 |
| J | 13.7 | 45544 | SOLENOID, 2 WAY 24V DC (MNFLD P/N 18151) - V-2470 | 1 |
| J | 13.8 | 45651 | VALVE, NEEDLE (HYDR MNFLD P/N 18151 & 18686) | 1 |
| J | 13.9 | 19060 | VALVE, FLOW REGULATOR (MNFLD P/N 18151 & 18686) | 1 |
| J | 13.10 | 19995 | SOLENOID, 2 WAY 12V DC (MNFLD P/N 18686) V-2470RT | 1 |

# NOTES

## FIGURE: K PLATFORM ASSEMBLY



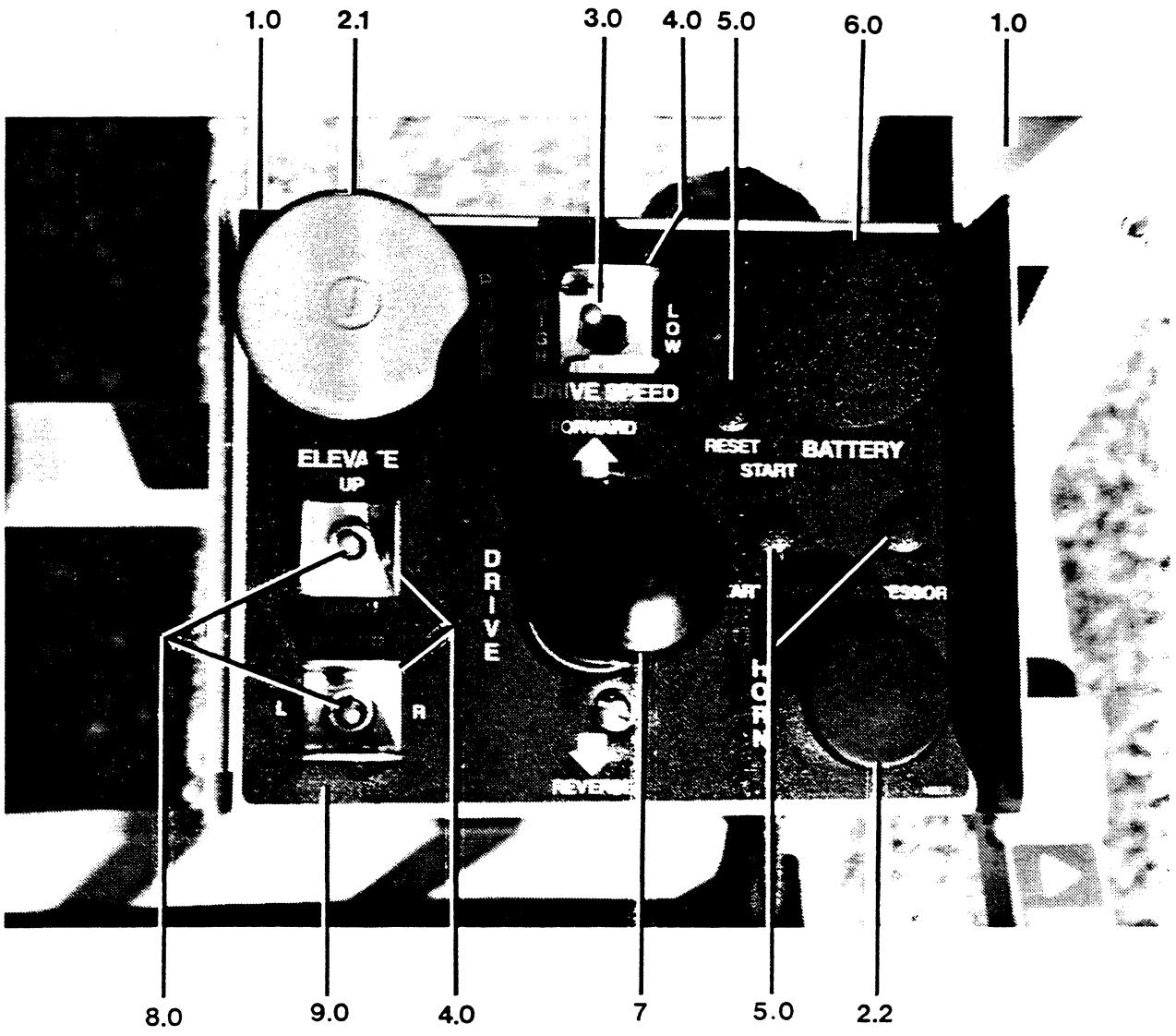
## PLATFORM ASSEMBLY — Genie V-2470 & V-2470RT

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **K** | **1** | | **PLATFORM EXTENSION GROUP** | **1** |
| K | 1.1 | 19541 | SIDE RAIL WELDMENT - LH PLAT EXT | 1 |
| K | 1.2 | 19542 | SIDE RAIL WELDMENT - RH PLAT EXT | 1 |
| K | 1.3 | 19475 | MIDRAIL WLDMT - PLAT EXT | 1 |
| K | 1.4 | 19479 | CROSS TUBE WELDMENT - PLAT EXT | 1 |
| K | 1.5 | 19086 | PAN, PLATFORM EXTENSION DECK | 1 |
| K | 1.6 | 18651P | HANDLE, PLATFORM - WLDMT - PNTD | 1 |
| K | 1.7 | 926048 | CLAMP - TOGGLE | 1 |
| K | 1.8 | 18461P | ANGLE, LOCK PIN MOUNT - PNTD | 1 |
| K | 1.9 | 18466P | STOP, PLATE - PLAT EXT - PNTD | 2 |
| K | 1.10 | 18467 | PAD, SQ SKID / GLIDE BLOCK - PLAT EXT | 2 |
| K | 1.11 | 18469 | PLATE, RETAINER - ROLLER WLDMT - PLAT EXT | 4 |
| K | 1.12 | 18529 | BEARING, ROLLER - BRZ .625 x 5 x 1 in. - PLAT EXT | 8 |
| K | 1.13 | 18465 | ROLLER - PLAT EXT | 4 |
| K | 1.14 | 18734 | BUTTON, WEAR - SLIDE DECK | 4 |
| K | 1.15 | 18556 | CAP, TUBE PLUG - 1.5 in. SQ x 16 GA BLACK | 4 |
| K | 1.16 | 1699 | TAPE, WARNING - (BK - ORDER 150 in. BLK & YELLOW) | |
| K | 2.0 | 6600 | TUBE, INSTRUCTION - 1.75 x 11.5 in. W/CAPS | 1 |
| K | 3.0 | 6653 | CLAMP - PLASTIC TUBE | 2 |
| **K** | **4** | | **PLATFORM / DECK GROUP** | **1** |
| K | 4.1 | 18997 | END RAIL WELDMENT - W/ DECAL PLATE - STND PLAT | 1 |
| K | 4.2 | 19007 | GUARD RAIL, SIDE WELDMENT - L & R SIDES | 2 |
| K | 4.3 | 19013 | GUARD RAIL, END WELDMENT - RH - (14.75 in. WIDE ) | 1 |
| K | 4.4 | 19012 | GUARD RAIL, END WELDMENT - LH - (23.19 in. WIDE ) | 1 |
| K | 4.5 | 18777 | GATE WELDMENT | 1 |
| K | 4.6 | 18775P | HINGE - 4 x 4 in. - PNTD | 1 |
| K | 4.7 | 18776P | HINGE, CLOSING - 4 x 4 in. - PNTD | 1 |
| K | 4.8 | 20036 | LATCH - SWING GATE | 1 |
| K | 4.9 | 20048 | SPACER, GATE LATCH - (P/N 20036) | 1 |
| K | 4.10 | 18939 | PLATFORM WELDMENT - PNTD | 1 |
| K | 4.11 | 18989 | PLATFORM DECKING, MIDDLE - (69.50 X 48.00 in.) | 1 |
| K | 4.12 | 18990 | PLATFORM DECKING, END - (69.50 X 48.00 in.) | 1 |
| K | 4.13 | 18991 | PLATFORM DECKING, END - (69.50 X 29.25 in.) | 1 |
| K | 4.14 | 20395 | SCREW - #10 X 1.5, PHTS SQ. DRIVE - DECK FASTENER | 27 |
| K | 4.15 | 18556 | CAP, TUBE PLUG - 1.5 in. SQ x 16 GA BLACK | 8 |
| K | 4.16 | 19205 | PAD, PLATFORM REST - .25 in. x 17.0 in. - POLY | 1 |

| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| K | 5.0 | 18841P | PLATFORM PIVOT WLDMT - PNTD | 1 |
| K | 6.0 | 18993 | LADDER WELDMENT - PNTD | 1 |
| **K** | **7** | | **POWER TO PLATFORM GROUP** | **1** |
| K | 7.1 | 19449P | BRACKET, AC POWER MOUNT - PNTD | 1 |
| K | 7.2 | 6825 | LOCK PIN, AC POWER BRACKET ASSY | 1 |
| K | 7.3 | 6993 | CORD, ELEC (BK ITEM ORDER 504 in. SJO 14-3) | |
| K | 7.4 | 7056 | CONNECTOR, SQUEEZE - CABLE - SMALL | 1 |
| K | 7.5 | 6935 | NUT, LOCK - ELECTRIC .5 in. | 1 |
| K | 7.6 | 45451 | T-BOX - DRILLED | 1 |
| K | 7.7 | 31153 | COVER, POWER OUTLET - DUPLEX | 1 |
| K | 7.8 | 31153 | POWER OUTLET, 15 AMP, 125V AC - DUPLEX | 1 |
| K | 7.9 | 8843 | PLUG, HOLE - KNOCK OUT | 4 |
| K | 7.10 | 19975 | POWER OUTLET, 220V AC - U.K. | 1 |

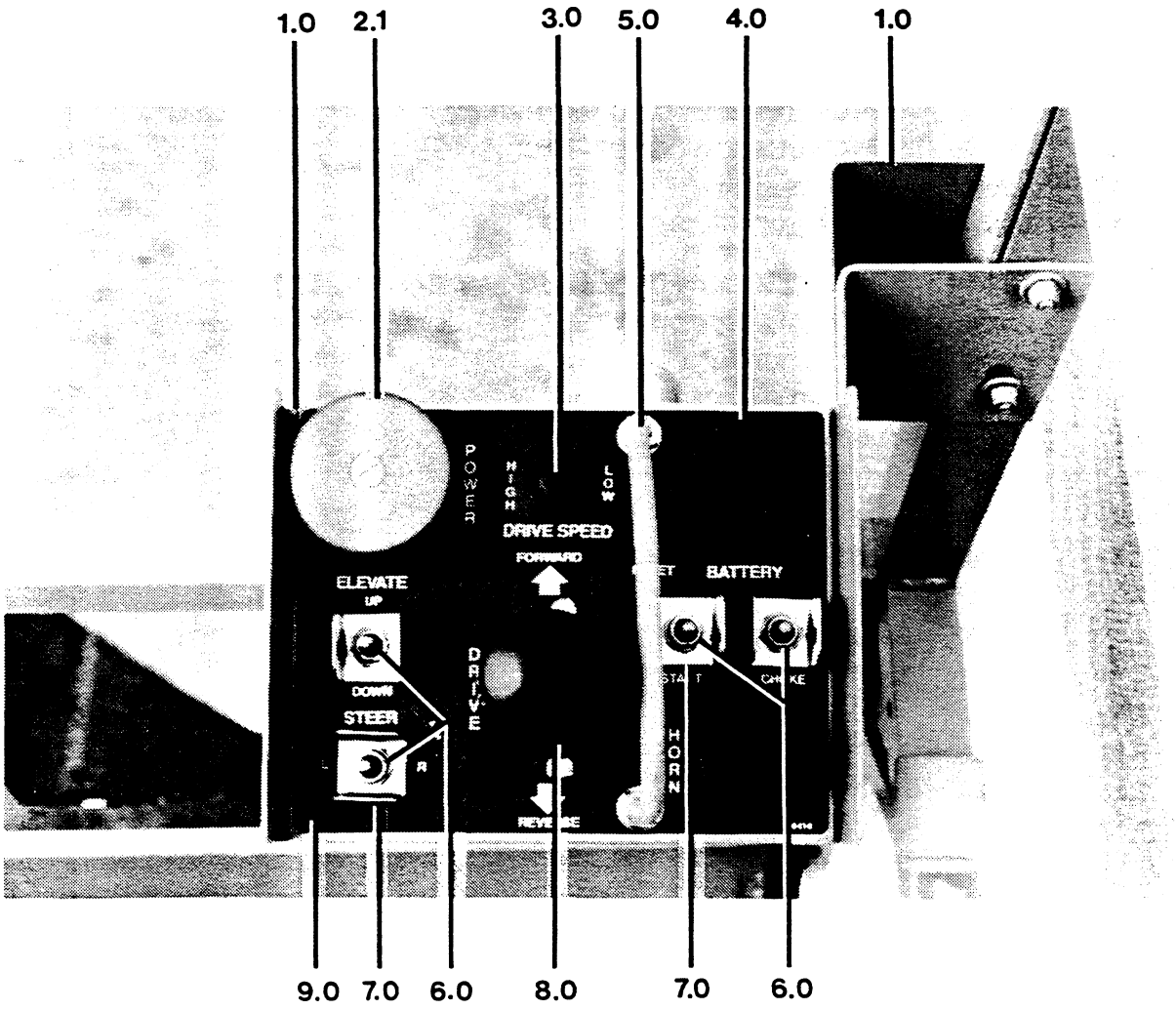
# NOTES

## FIGURE: L PLATFORM CONTROL BOX ASSEMBLY - V-2470



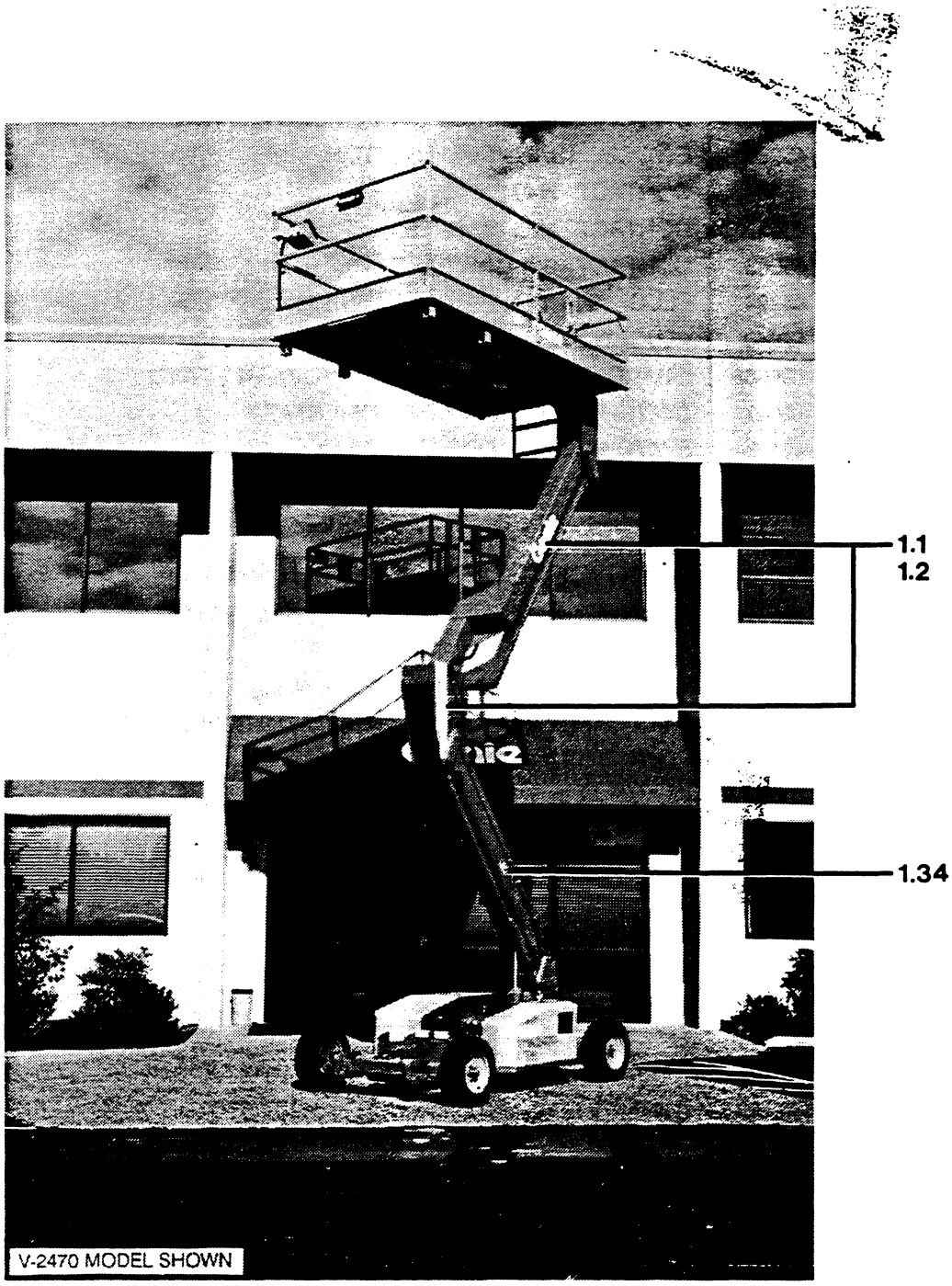
| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| L | 1.0 | 23872P | CONTROL BOX, PLATFORM - PNTD | 1 |
| **L** | **2** | **45199** | **SWITCH GROUP, PLATFORM** | **1** |
| L | 2.1 | 45078 | SWITCH, EMERGENCY STOP - PUSH BUTTON | 1 |
| L | 2.2 | 45080 | SWITCH, HORN - PUSH BUTTON | 1 |
| L | 2.3 | 45082 | CONTACT - N-O W/ BASE | 1 |
| L | 2.4 | 45081 | CONTACT - N-O | 1 |
| L | 2.5 | 45085 | CONTACT - 2 N-C W/BASE | 1 |
| L | 3.0 | 13091 | SWITCH, TOGGLE - DPST MAINTAINED | 1 |
| L | 4.0 | 45105 | SWITCH GUARD, TOGGLE - ZINC | 3 |
| L | 5.0 | 45384 | PLUG - .5 in. DIA | 3 |
| L | 6.0 | 45840 | PLUG, DOMED - 2 in. | 1 |
| **L** | **7** | **18144** | **JOYSTICK CONTROLLER, 24V DC - V-2470** | **1** |
| L | 7.1 | 21424 | HANDLE - UPPER CAP | 1 |
| L | 7.2 | 21425 | HANDLE - SPRING | 1 |
| L | 7.3 | 21429 | CLIP - RETAINING | 1 |
| L | 7.4 | 21426 | HANDLE - LOWER | 1 |
| L | 7.5 | 21428 | CLAMP, BOOT - JOYSTICK | 1 |
| L | 7.6 | 21427 | HANDLE - BOOT | 1 |
| L | 7.7 | 21430 | HANDLE - INTERLOCK TUBE | 1 |
| L | 7.8 | 21431 | GASKET, BASE - JOYSTICK | 1 |
| L | 7.9 | 21432 | BASE, CASTING - JOYSTICK | 1 |
| L | 7.10 | 21433 | SHAFT AND GEAR | 1 |
| L | 7.11 | 21436 | PC BOARD ASSY | 1 |
| L | 7.11.1 | 19718 | POTENTIOMETER | 1 |
| L | 7.12 | 21434 | SPRING, RETURN | 1 |
| L | 7.13 | 21435 | GEAR - SLAVE | 1 |
| L | 7.14 | 19712 | SWITCH, MICRO | 2 |
| L | 8.0 | 13037 | SWITCH, TOGGLE - SPDT MOMENTARY | 2 |
| L | 9.0 | 18522 | DECAL - PLAT CONTROL BOX - V-2470 | 1 |
| **L** | **10** | | **ADDITIONAL ITEMS NOT SHOWN** | |
| L | 10.1 | 18667 | CONNECTOR, SQUEEZE - CABLE, 1 in. - 90 DEG | 1 |
| L | 10.2 | 18665 | NUT, LOCK - ELECTRIC 1 in. | 1 |
| L | 10.3 | 1702 | HOSE, SHEATHING - (BK ORDER 74 in.) | |
| L | 10.4 | 35934 | WIRE CABLE -(BK - ORDER #18 GA/19 COND 714 in.) | |
| L | 10.5 | 19435P | BRACKET, CABLE CONNECTOR - PNTD | 1 |
| L | 10.6 | 45210 | INDICATOR, FUEL LEVEL - 22V DC - OPTION | 1 |
| L | 10.7 | 45211 | INTERRUPT, LOW VOLTAGE - W/IND - 22V DC - OPTION | 1 |
| L | 10.8 | 45385 | PLUG - 1.13 in. DIA (BACK SIDE) - NS | 1 |
| L | 10.9 | 18666 | CLAMP - 1 in. - RUBBER CUSHIONED | 8 |

## FIGURE: M PLATFORM CONTROL BOX ASSEMBLY - V-2470RT



| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| M | 1.0 | 23872P | CONTROL BOX - PLATFORM PNTD | 1 |
| **M** | **2** | **45199** | **SWITCH GROUP, PLATFORM** | **1** |
| M | 2.1 | 33321 | SWITCH, EMERGENCY STOP - PUSH BUTTON | 1 |
| M | 2.2 | 33575 | SWITCH, HORN - PUSH BUTTON | 1 |
| M | 2.3 | 45081 | CONTACT - N-O | 2 |
| M | 2.4 | 45082 | CONTACT - N-O W/ BASE | 1 |
| M | 2.5 | 45085 | CONTACT - 2 N-C W/BASE | 1 |
| M | 3.0 | 45384 | PLUG - .5 in. DIA | 2 |
| M | 4.0 | 45840 | PLUG, DOMED - 2 in. | 1 |
| M | 5.0 | 19966P | GUARD, PLAT CONTROL BOX - V-2470RT - PNTD | 1 |
| M | 6.0 | 13037 | SWITCH, TOGGLE - SPDT MOMENTARY | 4 |
| M | 7.0 | 45105 | SWITCH GUARD, TOGGLE - ZINC | 4 |
| M | 8.0 | 19285 | JOYSTICK CONTROLLER, 12V DC - V-2470RT | 1 |
| M | 9.0 | 20410 | DECAL - PLAT CONTROL BOX - V-2470RT | 1 |
| **M** | **10** | | **ADDITIONAL ITEMS NOT SHOWN** | |
| M | 10.1 | 18667 | CONNECTOR, SQUEEZE - CABLE, 1 in. - 90 DEG | 1 |
| M | 10.2 | 18665 | NUT, LOCK - ELECTRIC 1 in. | 1 |
| M | 10.3 | 1702 | HOSE, SHEATHING - (BK ORDER 74 in.) | |
| M | 10.4 | 35934 | WIRE CABLE -(BK - ORDER #18 GA/19 COND 653 in.) | |
| M | 10.5 | 45385 | PLUG - 1.13 in. DIA | 1 |
| M | 10.6 | 18666 | CLAMP - 1 in. - RUBBER CUSHIONED | 8 |

## FIGURE: N DECALS

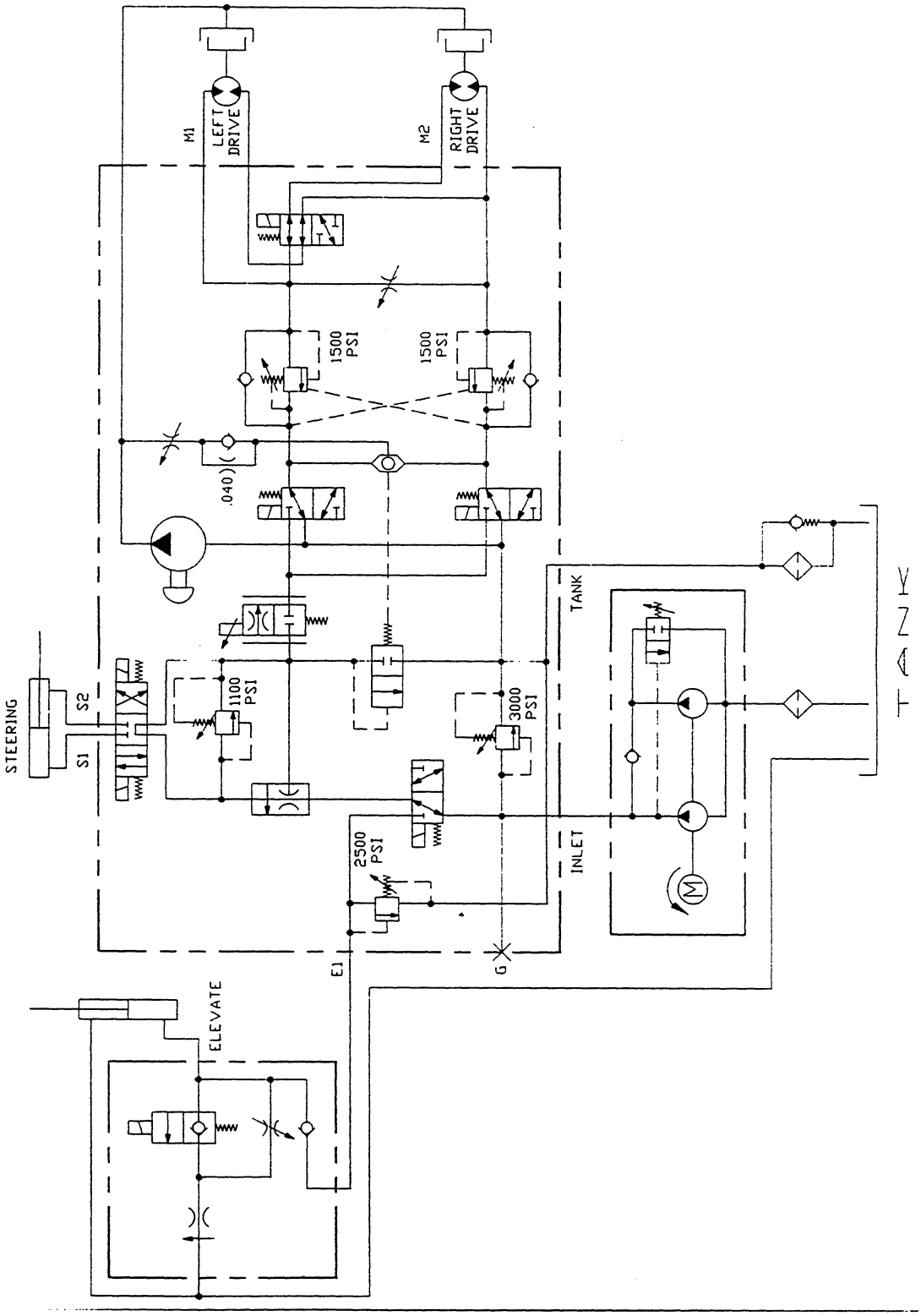


| Figure | Index Number | Part Number | Description | Qty Per Assy. |
|---|---|---|---|---|
| **N** | **1** | | **DECAL GROUP V-2470 & V-2470RT (EXCEPT AS NOTED)** | |
| N | 1.1 | 19204 | DECAL KIT - (AESTHETIC) - V-2470 | 1 |
| N | 1.2 | 20063 | DECAL KIT - (AESTHETIC) - V-2470RT | 1 |
| N | 1.3 | 21050 | DECAL KIT - (SAFETY/INSTRUCTIONAL) - V-2470 | 1 |
| N | 1.4 | 21051 | DECAL KIT - (SAFETY/INSTRUCTIONAL) - V-2470RT | 1 |
| N | 1.5 | 45228 | SERIAL PLATE (SPECIAL ORDER FROM FACTORY) | 1 |
| N | 1.6 | 12338 | DECAL - URETHANE FILLED TIRES | 4 |
| N | 1.7 | 1259 | TAPE, NON-SKID - (BK - ORDER 79 in.) | |
| N | 1.8 | 1699 | TAPE, WARNING - (BK - ORDER 30.5 in. BLK & YELLOW) | |
| N | 1.9 | 18522 | DECAL - PLAT CONTROL BOX - V-2470 | 1 |
| N | 1.10 | 18523 | DECAL - MAINTENANCE - V-2470 | 1 |
| N | 1.11 | 18524 | DECAL - BRAKE RELEASE LEVER - V-2470 | 1 |
| N | 1.12 | 18533 | DECAL - GROUND CONTROL BOX - V-2470 | 1 |
| N | 1.13 | 18683 | DECAL - OPERATING INSTRUCTIONS | 1 |
| N | 1.14 | 18684 | DECAL - GROUND CONTROL PRE-START - V-2470 | 1 |
| N | 1.15 | 18967 | DECAL - ELECTRICAL SCHEMATIC - V-2470 | 1 |
| N | 1.16 | 18968 | DECAL - HYDRAULIC SCHEMATIC - V-2470 | 1 |
| N | 1.17 | 19022 | DECAL - PRE-START OPERATING INSTRUCTIONS -V-2470RT | 1 |
| N | 1.18 | 19023 | DECAL - LOAD CAPACITY | 2 |
| N | 1.19 | 19024 | DECAL - MAINTENANCE SCHEDULE - V-2470RT | 1 |
| N | 1.20 | 19237 | DECAL - AIR FILLED TIRES | 4 |
| N | 1.21 | 19976 | DECAL - HYDRAULIC SCHEMATIC - V-2470RT | 1 |
| N | 1.22 | 19977 | DECAL - ELECTRICAL SCHEMATIC - V-2470RT | 1 |
| N | 1.23 | 20044 | DECAL - DO NOT STEP | 1 |
| N | 1.24 | 20409 | DECAL - GROUND CONTROL BOX - V-2470RT | 1 |
| N | 1.25 | 20410 | DECAL - PLAT CONTROL BOX - V-2470RT | 1 |
| N | 1.26 | 45861 | DECAL - GASOLINE TANK - V-2470RT | 1 |
| N | 1.27 | 916237 | DECAL - HYDRAULIC OIL ONLY | 1 |
| N | 1.28 | 916240 | DECAL - 120V AC, 15 AMP | 1 |
| N | 1.29 | 916241 | DECAL - CHARGE AFTER EACH SHIFT - V-2470 | 1 |
| N | 1.30 | 916251 | DECAL - MANUAL LOWER VALVE | 1 |
| N | 1.31 | 916260 | DECAL - SAFETY BELT ANCHOR | 4 |
| N | 1.32 | 916300 | DECAL - WARNING BEFORE OPERATING | 1 |
| N | 1.33 | 916972 | DECAL - TRANSPORT SECURE | 1 |
| N | 1.34 | 927864 | DECAL - STAY CLEAR | 2 |

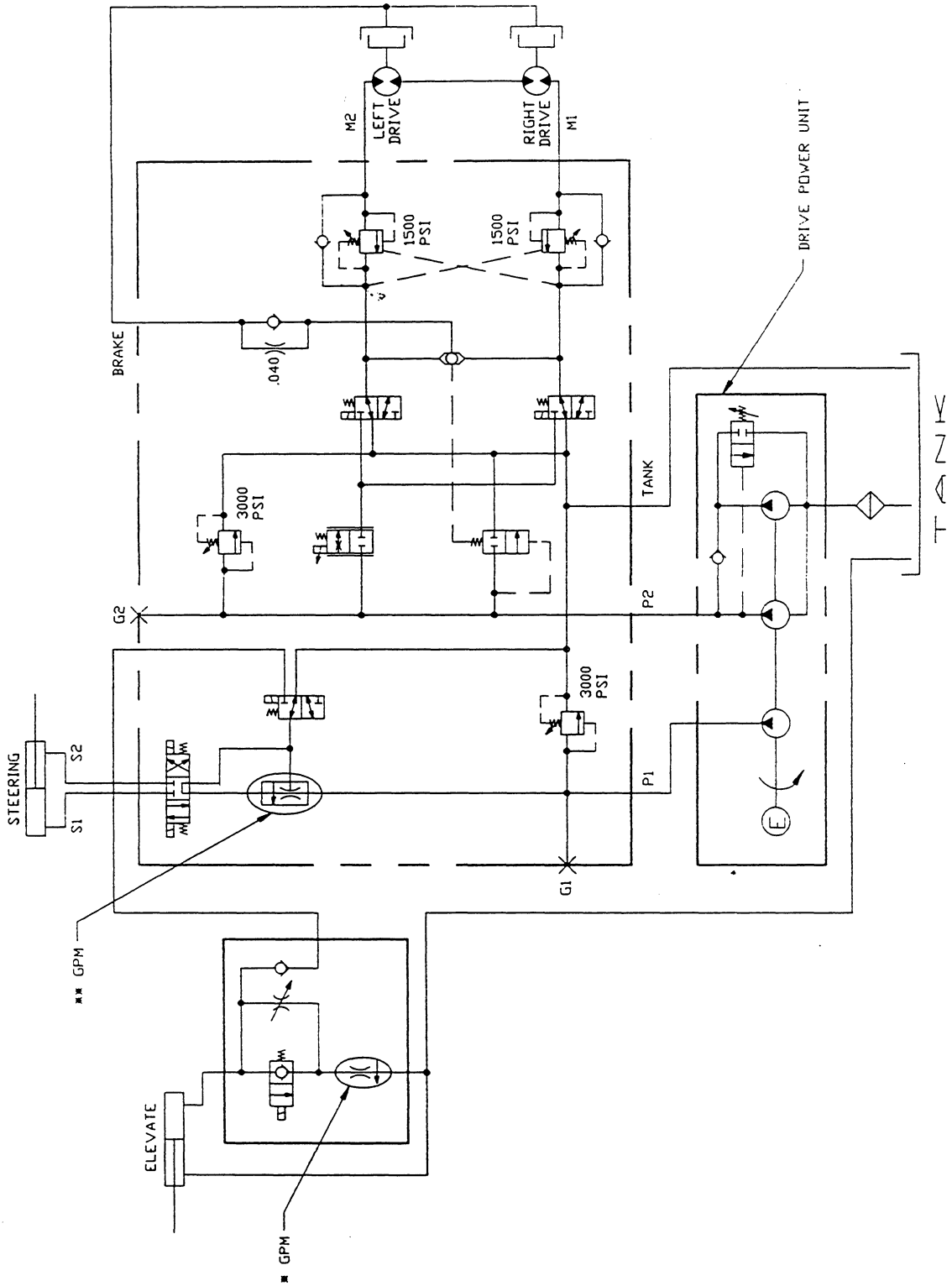
# SCHEMATICS AND DIAGRAMS

# 5.1 HYDRAULIC SCHEMATICS

## 1. Genie V-2470 Hydraulic Schematic

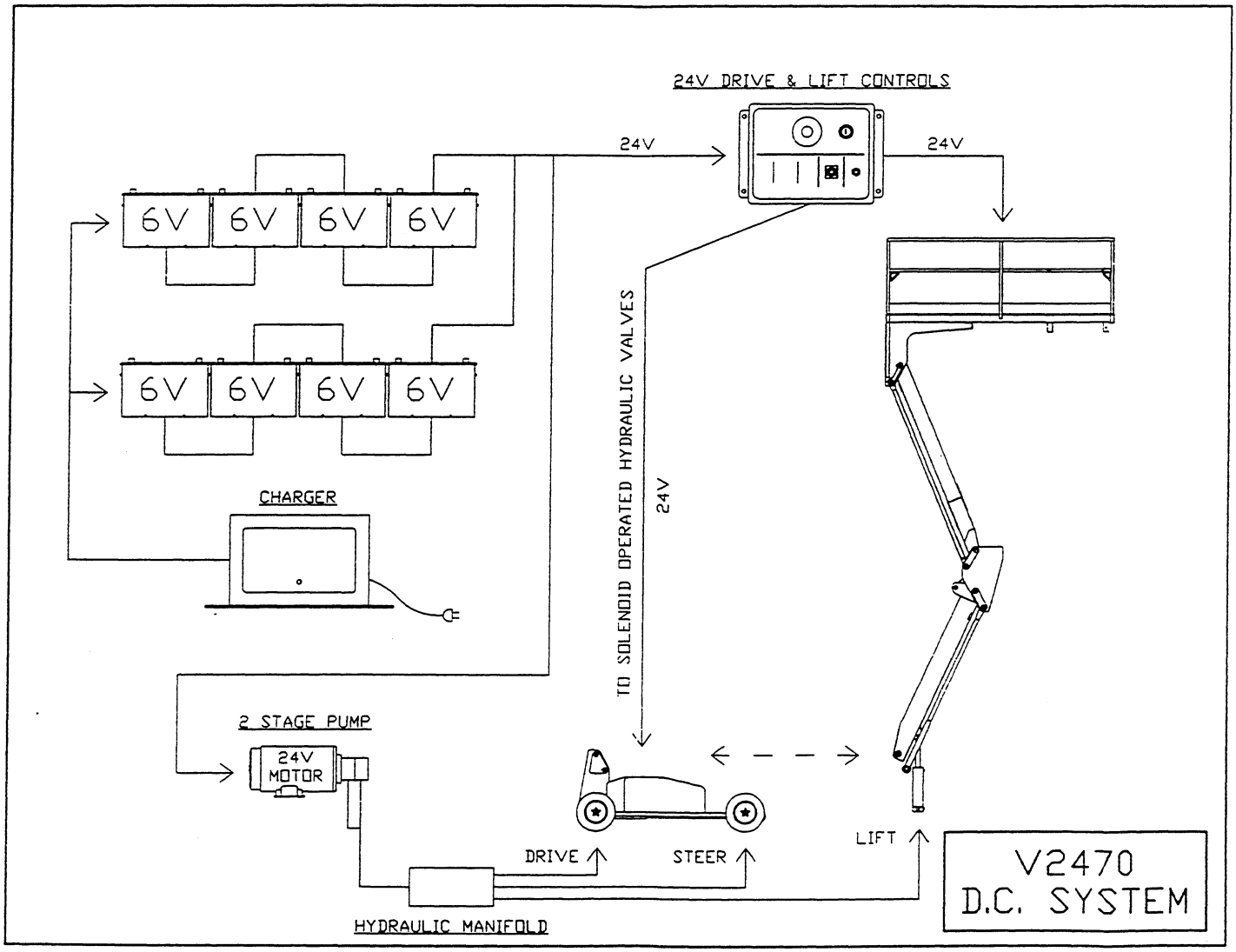


## 1. Genie V-2470RT Hydraulic Schematic

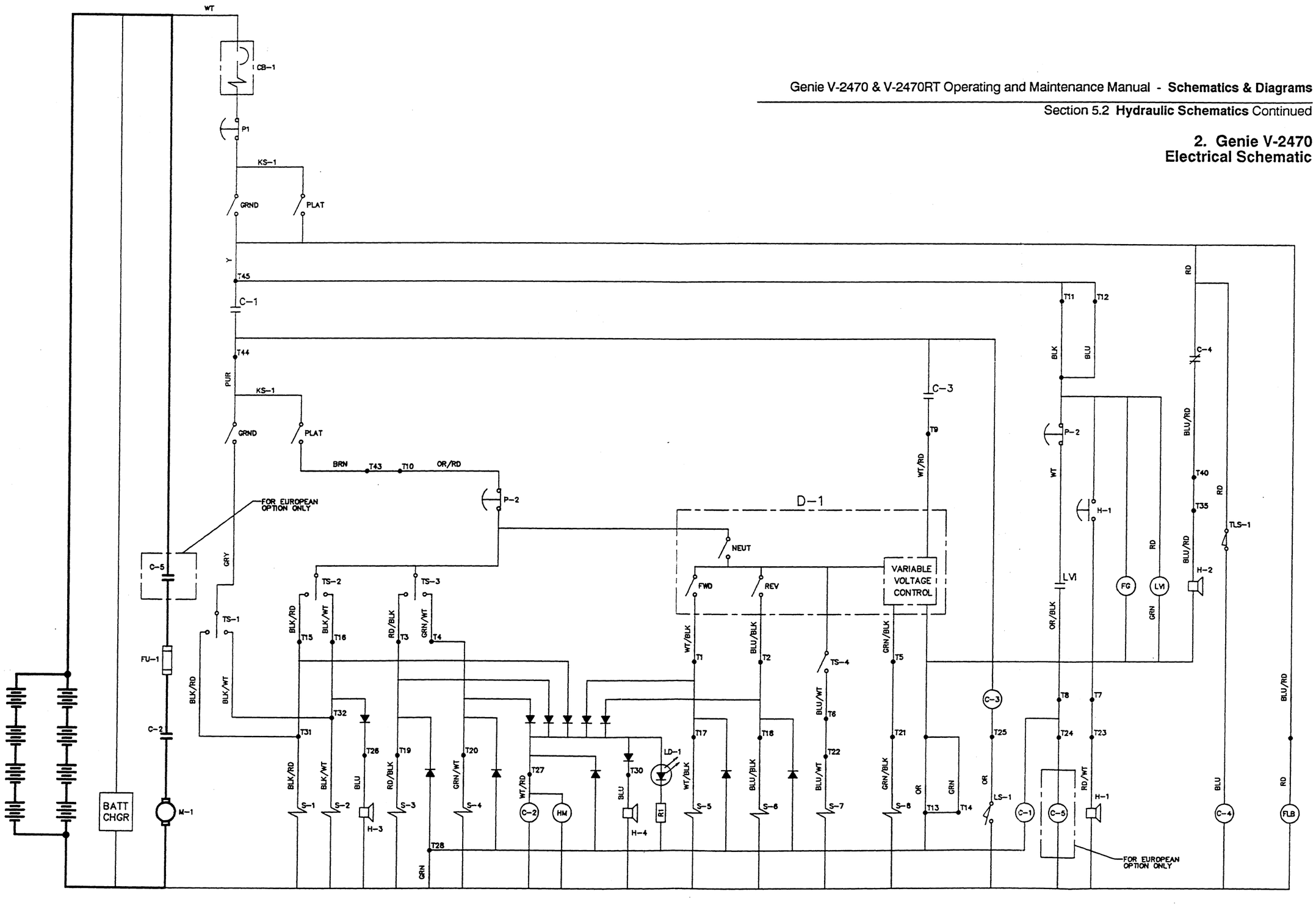


# 5.2 ELECTRICAL SCHEMATICS AND DIAGRAMS

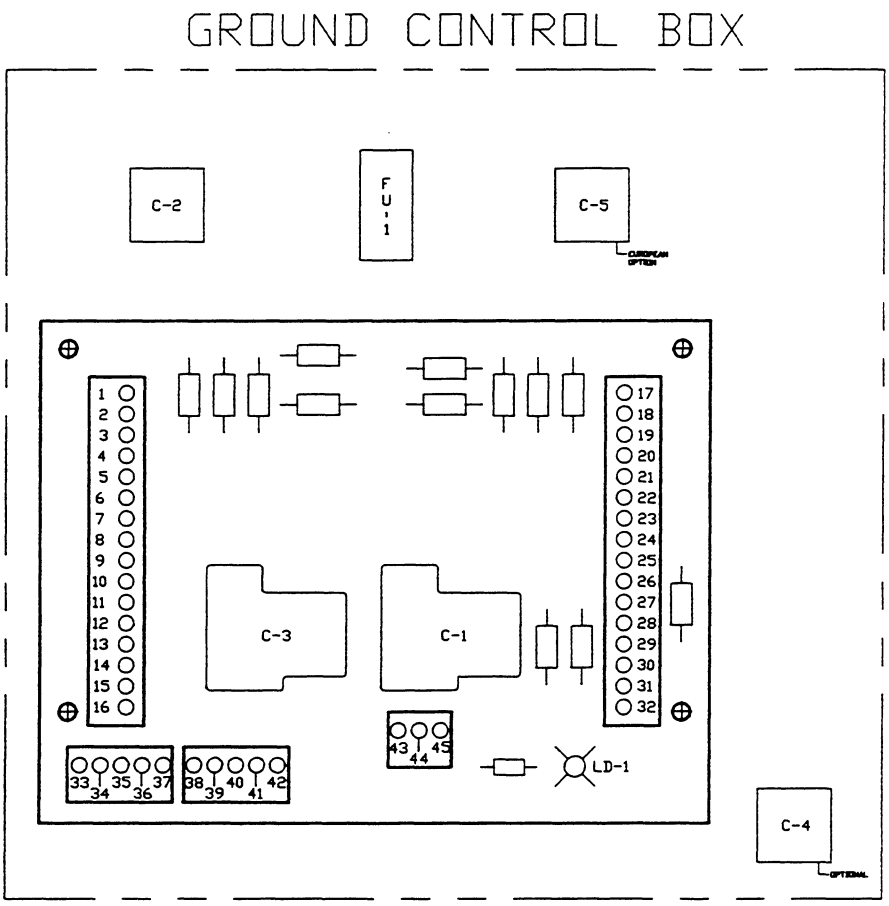
## 1. Genie V-2470 Electrical System Overview



## 2. Genie V-2470 Electrical Schematic

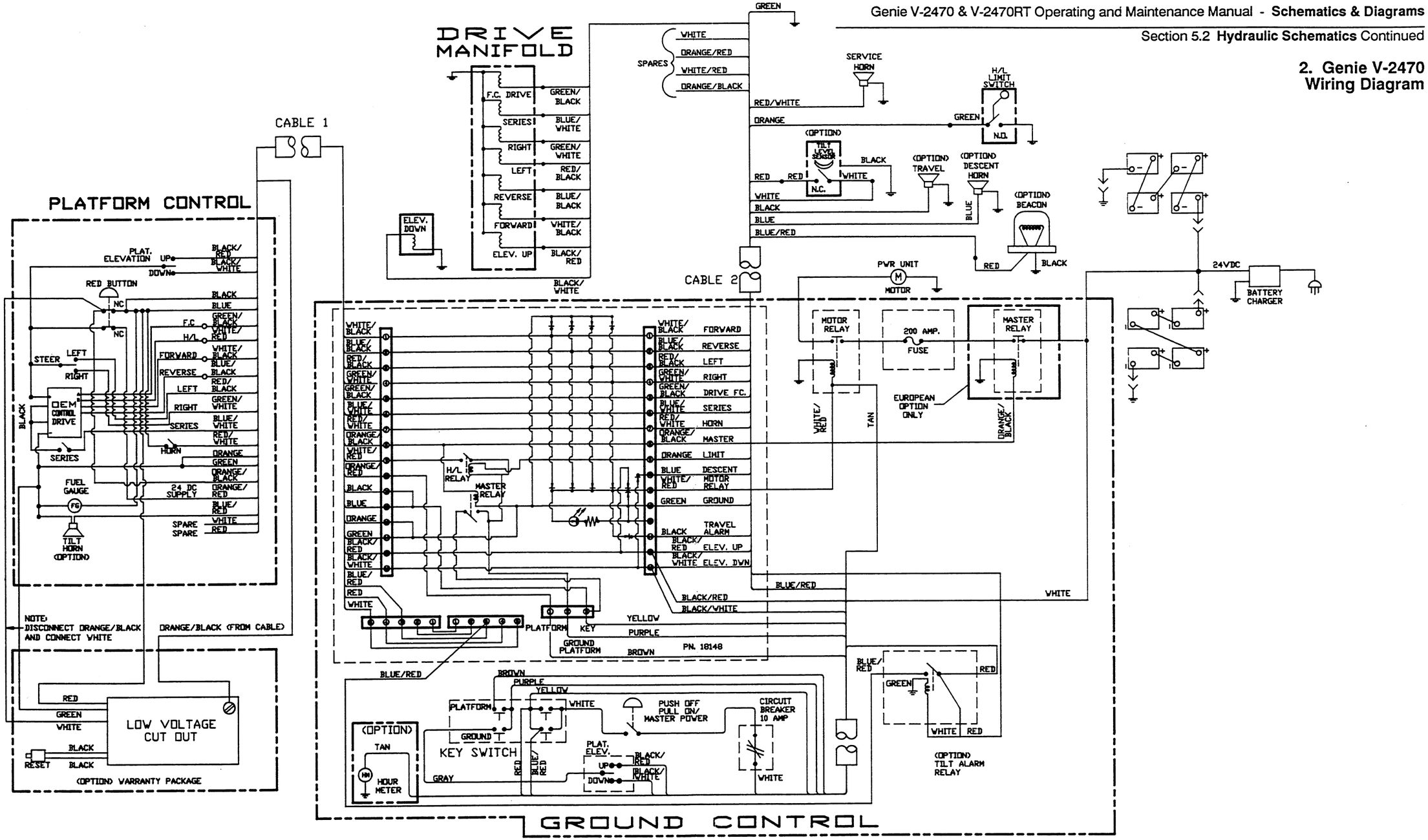


## 3. Genie V-2470 Electrical Schematic Legend

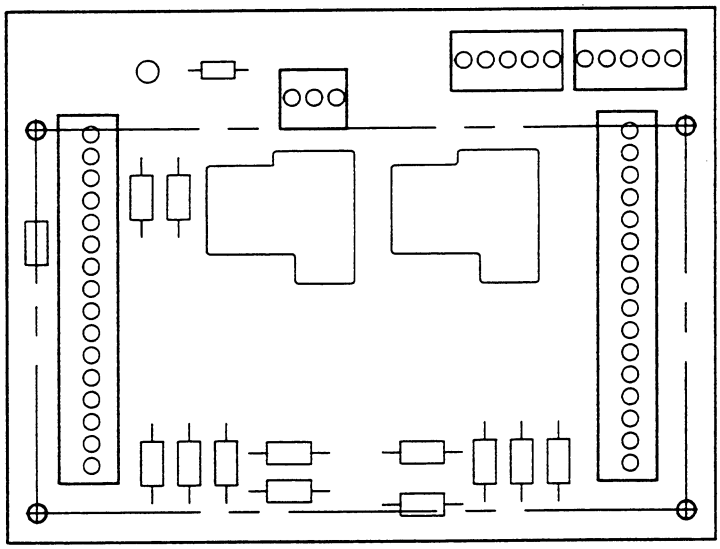


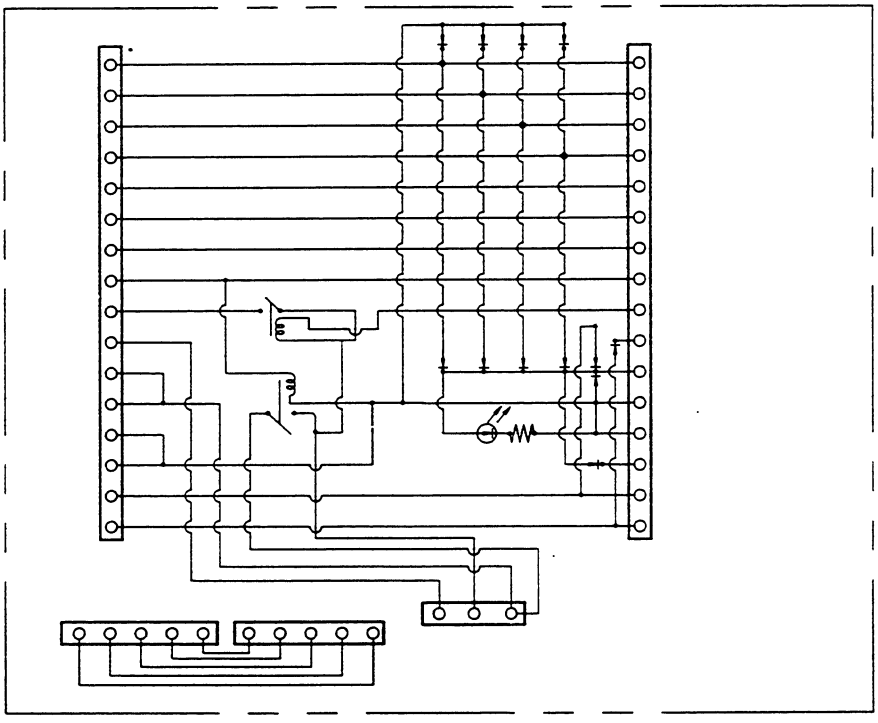

| | | |
|---|---|---|
| CB1 | CONTROL CIRCUIT 10 AMP CIRCUIT BREAKER | GROUND CONTROL STATION |
| C1 | 24 VOLT CONTROL CIRCUIT MASTER RELAY | GROUND CONTROL STATION |
| C2 | 24 VOLT POWER CIRCUIT MASTER RELAY | GROUND CONTROL STATION |
| C3 | 24 VOLT HIGH/LOW SPEED RELAY | GROUND CONTROL STATION |
| C4 | 24 VOLT TILT LEVEL ALARM RELAY (NC) | GROUND CONTROL STATION |
| C5 | 24 VOLT MOTOR START RELAY (EUROPEAN MODELS ONLY) | GROUND CONTROL STATION |
| D1 | DRIVE FORWARD/REVERSE PROPORTIONAL CONTROL JOYSTICK | PLATFORM CONTROL STATION |
| FG | FUEL GAUGE/BATTERY CHARGE INDICATOR | PLATFORM CONTROL STATION |
| FLB | OPERATING MACHINE FLASHING BEACON | CHASSIS |
| FU1 | 200 AMP POWER CIRCUIT FUSE | GROUND CONTROL STATION |
| H1 | SERVICE HORN BUTTON AND INDICATOR | PLATFORM CONTROL STATION/CHASSIS |
| H2 | TILT LEVEL INDICATOR | PLATFORM CONTROL STATION |
| H3 | ELEVATE SYSTEM DESCENT INDICATOR | CHASSIS |
| H4 | DRIVE SYSTEM TRAVEL INDICATOR | CHASSIS |
| HM | HOUR METER | GROUND CONTROL STATION |
| KS1 | KEY SWITCH - SELECT GROUND OR PLATFORM CONTROLS | GROUND CONTROL STATION |
| LD1 | CONTROL CIRCUIT LIGHT EMITTING DIODE | GROUND CONTROL STATION |
| LS1 | DRIVE SPEED LIMIT SWITCH (SHOWN WITH PLATFORM UP) | CHASSIS |
| LVI | LOW VOLTAGE INTERRUPT SYSTEM | PLATFORM CONTROL STATION |
| M1 | HYDRAULIC POWER UNIT MOTOR | CHASSIS |
| P1 | POWER ON/OFF BUTTON | GROUND CONTROL STATION |
| P2 | POWER ON/OFF BUTTON | PLATFORM CONTROL STATION |
| S1 | ELEVATE UP DIRECTIONAL CONTROL SOLENOID | HYDRAULIC MANIFOLD |
| S2 | ELEVATE DOWN DIRECTIONAL CONTROL SOLENOID | ELEVATE CYLINDER |
| S3 | STEER LEFT DIRECTIONAL CONTROL SOLENOID | HYDRAULIC MANIFOLD |
| S4 | STEER RIGHT DIRECTIONAL CONTROL SOLENOID | HYDRAULIC MANIFOLD |
| S5 | DRIVE FORWARD DIRECTIONAL CONTROL SOLENOID | HYDRAULIC MANIFOLD |
| S6 | DRIVE REVERSE DIRECTIONAL CONTROL SOLENOID | HYDRAULIC MANIFOLD |
| S7 | DRIVE SPEED HIGH/LOW CONTROL SOLENOID | HYDRAULIC MANIFOLD |
| S8 | DRIVE PROPORTIONAL CONTROL SOLENOID | HYDRAULIC MANIFOLD |
| T1-T45 | WIRING CONNECTION TERMINALS | GROUND CONTROL STATION |
| TLS1 | TILT LEVEL SENSOR | CHASSIS |
| TS1 | PLATFORM UP/DOWN TOGGLE SWITCH | GROUND CONTROL STATION |
| TS2 | ELEVATE UP/DOWN TOGGLE SWITCH | PLATFORM CONTROL STATION |
| TS3 | STEER LEFT/RIGHT TOGGLE SWITCH | PLATFORM CONTROL STATION |
| TS4 | DRIVE SPEED HIGH/LOW TOGGLE SWITCH | PLATFORM CONTROL STATION |

## 2. Genie V-2470 Wiring Diagram

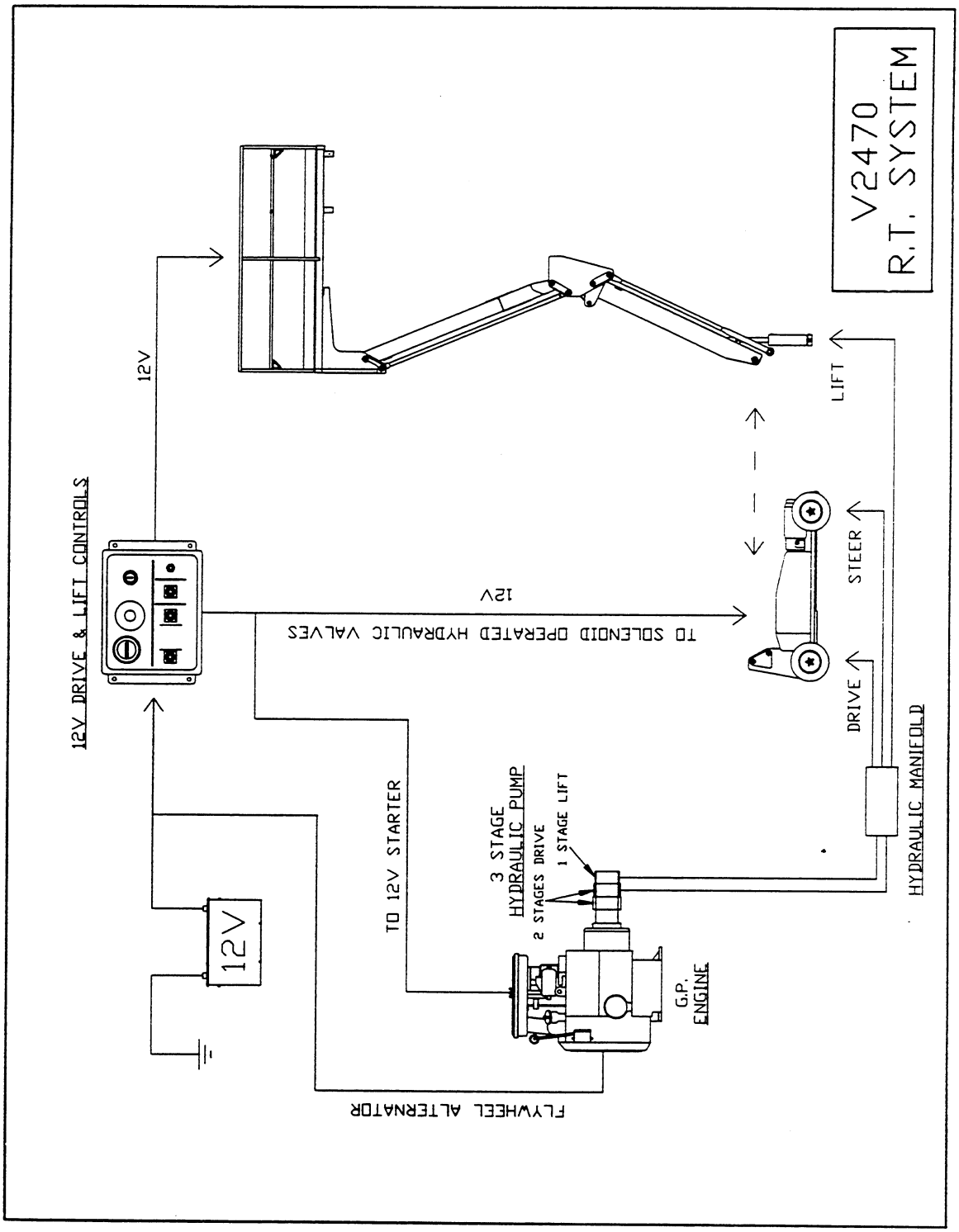


## 5. Genie V-2470 Printed Circuit Board Illustration & Diagram

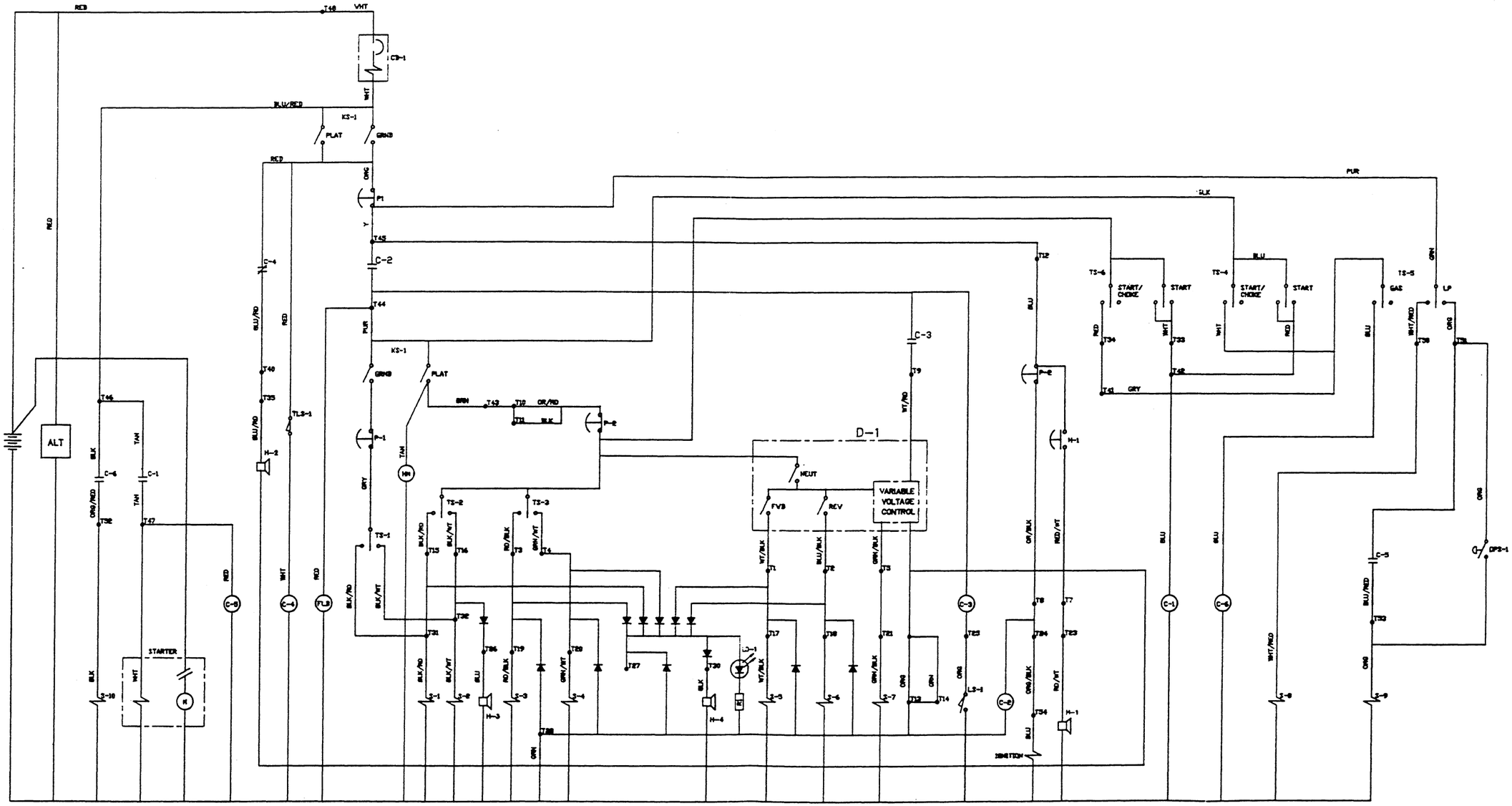




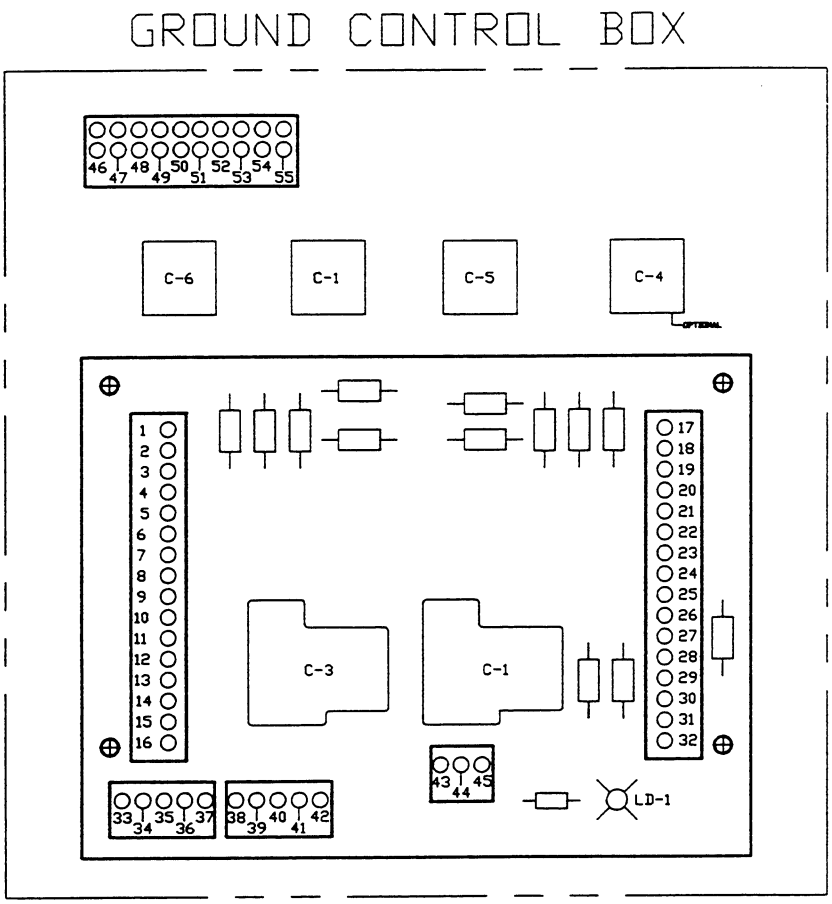
## 1. Genie V-2470RT Electrical System Overview



## 2. Genie V-2470RT Electrical Schematic

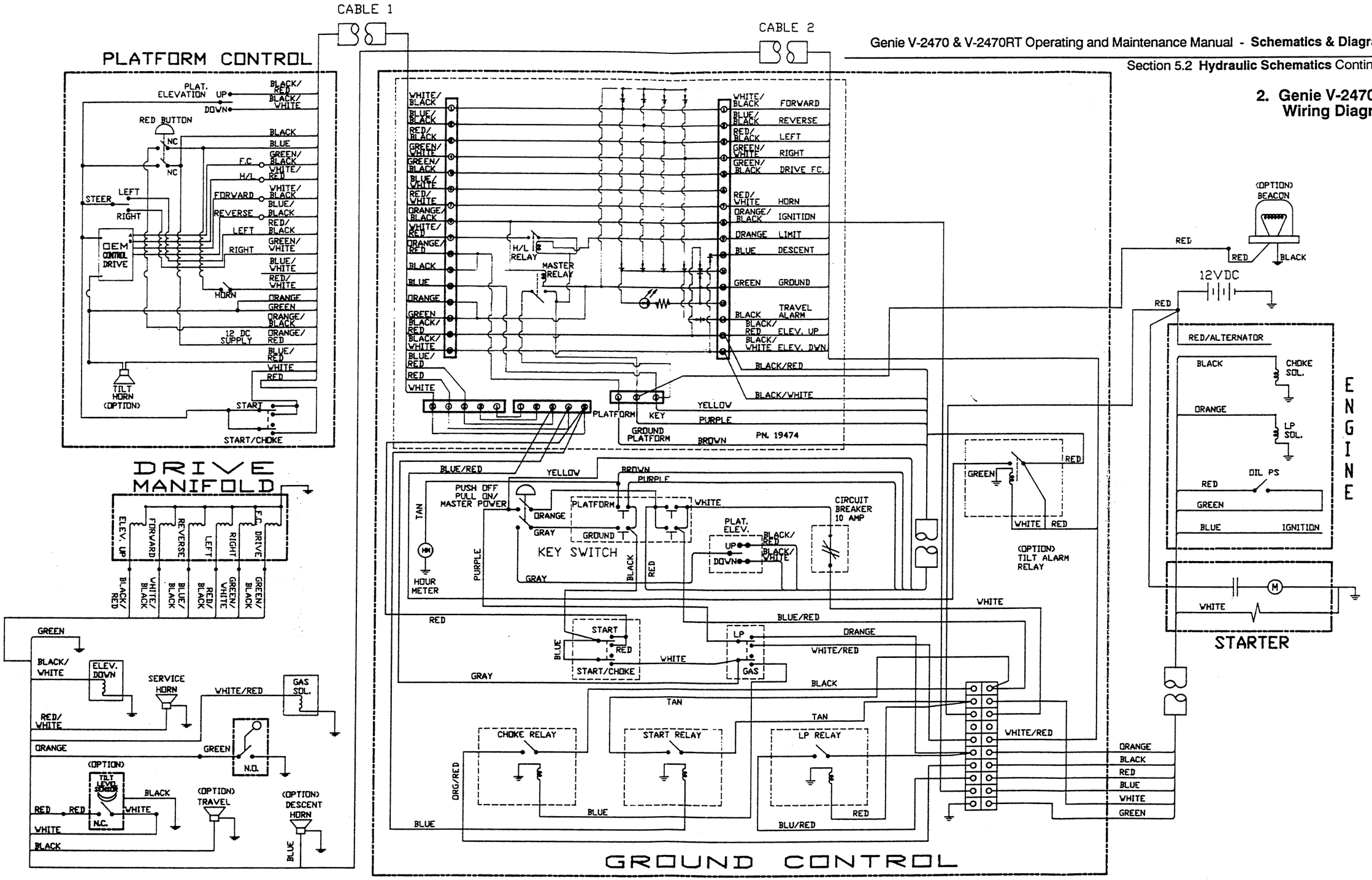


## 3. Genie V-2470RT Electrical Schematic Legend

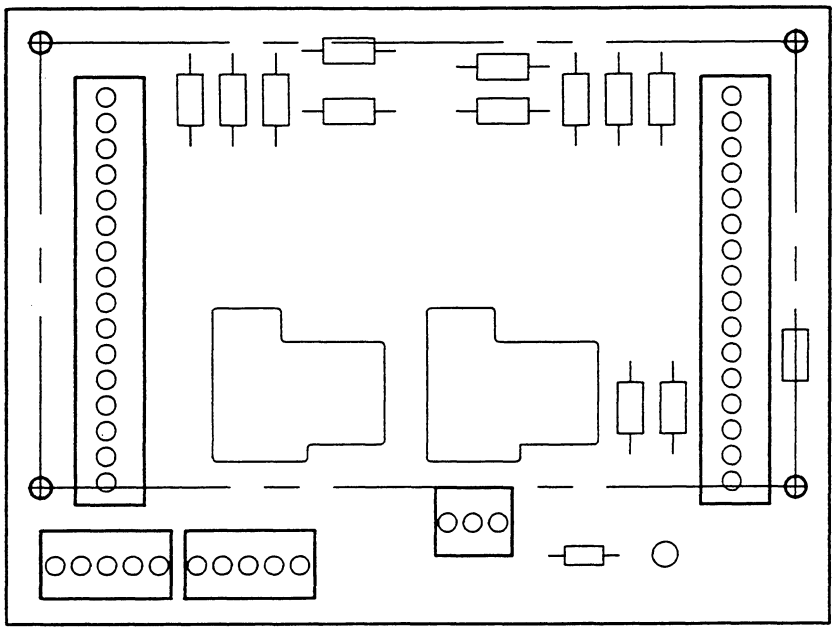


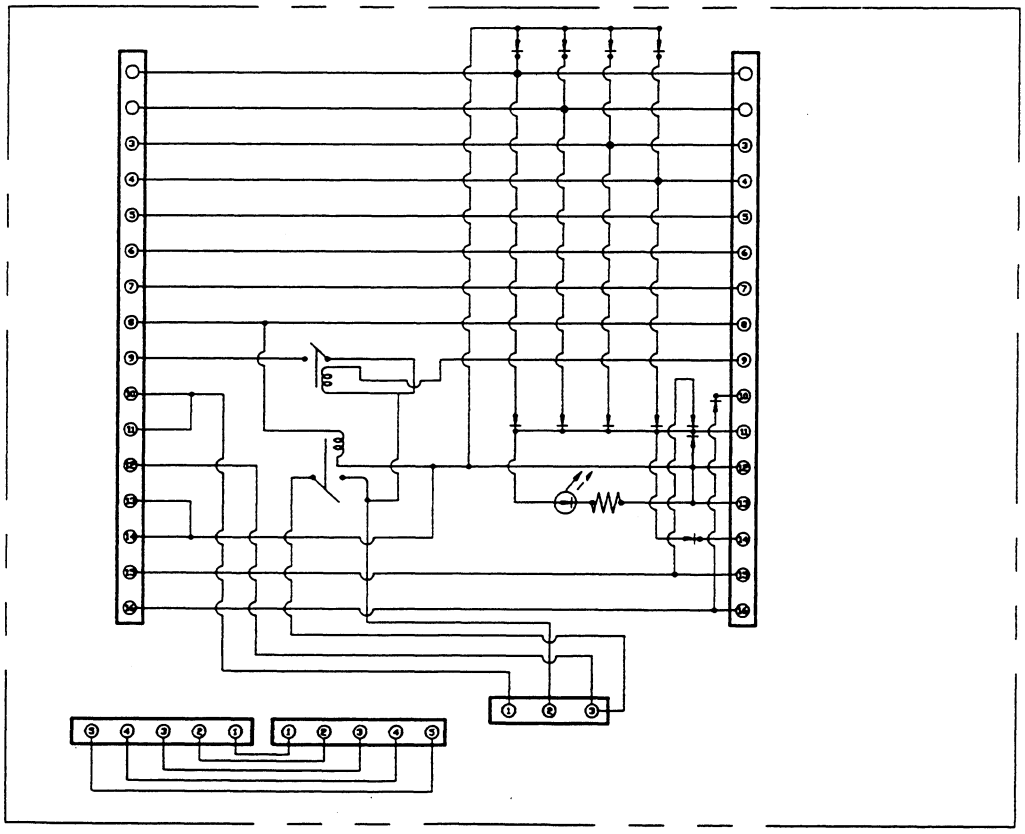

| | | |
|---|---|---|
| CB-1 | CONTROL CIRCUIT 10 AMP CIRCUIT BREAKER | GROUND CONTROL STATION |
| C-1 | 12 VOLT ENGINE START RELAY | GROUND CONTROL STATION |
| C-2 | 12 VOLT CONTROL CIRCUIT MASTER RELAY | GROUND CONTROL STATION |
| C-3 | 12 VOLT HIGH/LOW SPEED RELAY | GROUND CONTROL STATION |
| C-4 | 12 VOLT TILT LEVEL ALARM RELAY (NC) | GROUND CONTROL STATION |
| C-5 | 12 VOLT LIQUID PROPANE (LP) RELAY | GROUND CONTROL STATION |
| C-6 | 12 VOLT CHOKE RELAY | GROUND CONTROL STATION |
| D-1 | DRIVE FORWARD REVERSE PROPORTIONAL CONTROL JOYSTICK | PLATFORM CONTROL STATION |
| FLB | OPERATING MACHINE FLASHING BEACON | CHASSIS |
| H-1 | SERVICE HORN BUTTON AND INDICATOR | PLATFORM CONTROL STATION/CHASSIS |
| H-2 | TILT LEVEL INDICATOR | PLATFORM CONTROL STATION |
| H-3 | ELEVATE SYSTEM DESCENT INDICATOR | CHASSIS |
| H-4 | DRIVE SYSTEM TRAVEL INDICATOR | CHASSIS |
| HM | HOUR METER | GROUND CONTROL STATION |
| KS-1 | KEY SWITCH SELECT GROUND OR PLATFORM CONTROLS | GROUND CONTROL STATION |
| LD-1 | CONTROL CIRCUIT LIGHT EMITTING DIODE | GROUND CONTROL STATION |
| LS-1 | DRIVE SPEED (SHOWN WITH PLATFORM UP) LIMIT SWITCH | CHASSIS |
| LVI | LOW VOLTAGE INTERRUPT SYSTEM | PLATFORM CONTROL STATION |
| OPS-1 | OIL PRESSURE SENSOR SWITCH | INTERNAL COMBUSTION ENGINE |
| P-1 | POWER ON/OFF BUTTON | GROUND CONTROL STATION |
| P-2 | POWER ON/OFF BUTTON | PLATFORM CONTROL STATION |
| S-1 | ELEVATE UP DIRECTIONAL CONTROL SOLENOID | HYDRAULIC CONTROL MANIFOLD |
| S-2 | ELEVATE DOWN DIRECTIONAL CONTROL SOLENOID | ELEVATE CYLINDER |
| S-3 | STEER LEFT DIRECTIONAL CONTROL SOLENOID | HYDRAULIC CONTROL MANIFOLD |
| S-4 | STEER RIGHT DIRECTIONAL CONTROL SOLENOID | HYDRAULIC CONTROL MANIFOLD |
| S-5 | DRIVE FORWARD DIRECTIONAL CONTROL SOLENOID | HYDRAULIC CONTROL MANIFOLD |
| S-6 | DRIVE REVERSE DIRECTIONAL CONTROL SOLENOID | HYDRAULIC CONTROL MANIFOLD |
| S-7 | DRIVE PROPORTIONAL CONTROL SOLENOID | HYDRAULIC CONTROL MANIFOLD |
| S-8 | GASOLINE (GAS) SOLENOID | GASOLINE TANK |
| S-9 | LIQUID PROPANE (LP) SOLENOID | INTERNAL COMBUSTION ENGINE |
| S-10 | CHOKE SOLENOID | INTERNAL COMBUSTION ENGINE |
| T1-T55 | WIRING CONNECTION TERMINALS | GROUND CONTROL STATION |
| TLS-1 | TILT LEVEL SENSOR | CHASSIS |
| TS-1 | PLATFORM UP/DOWN TOGGLE SWITCH | GROUND CONTROL STATION |
| TS-2 | ELEVATE UP/DOWN TOGGLE SWITCH | PLATFORM CONTROL STATION |
| TS-3 | STEER LEFT/RIGHT TOGGLE SWITCH | PLATFORM CONTROL STATION |
| TS-4 | ENGINE START/START CHOKE TOGGLE SWITCH | GROUND CONTROL STATION |
| TS-5 | FUEL SELECT GAS/LP TOGGLE SWITCH | GROUND CONTROL STATION |
| TS-6 | ENGINE START/START CHOKE TOGGLE SWITCH | PLATFORM CONTROL STATION |

## 2. Genie V-2470RT Wiring Diagram

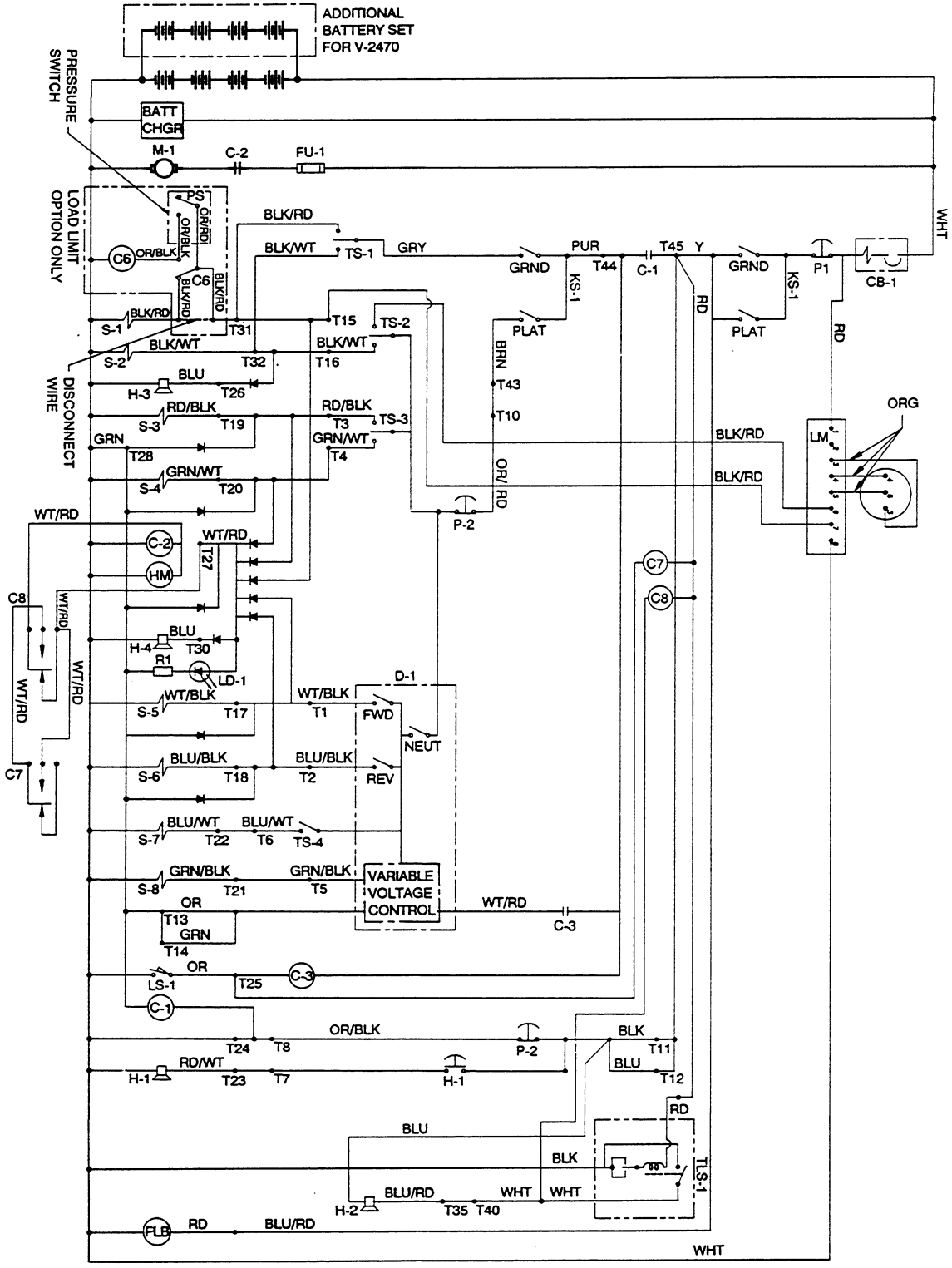


## 5. Genie V-2470RT Printed Circuit Board Illustration & Diagram

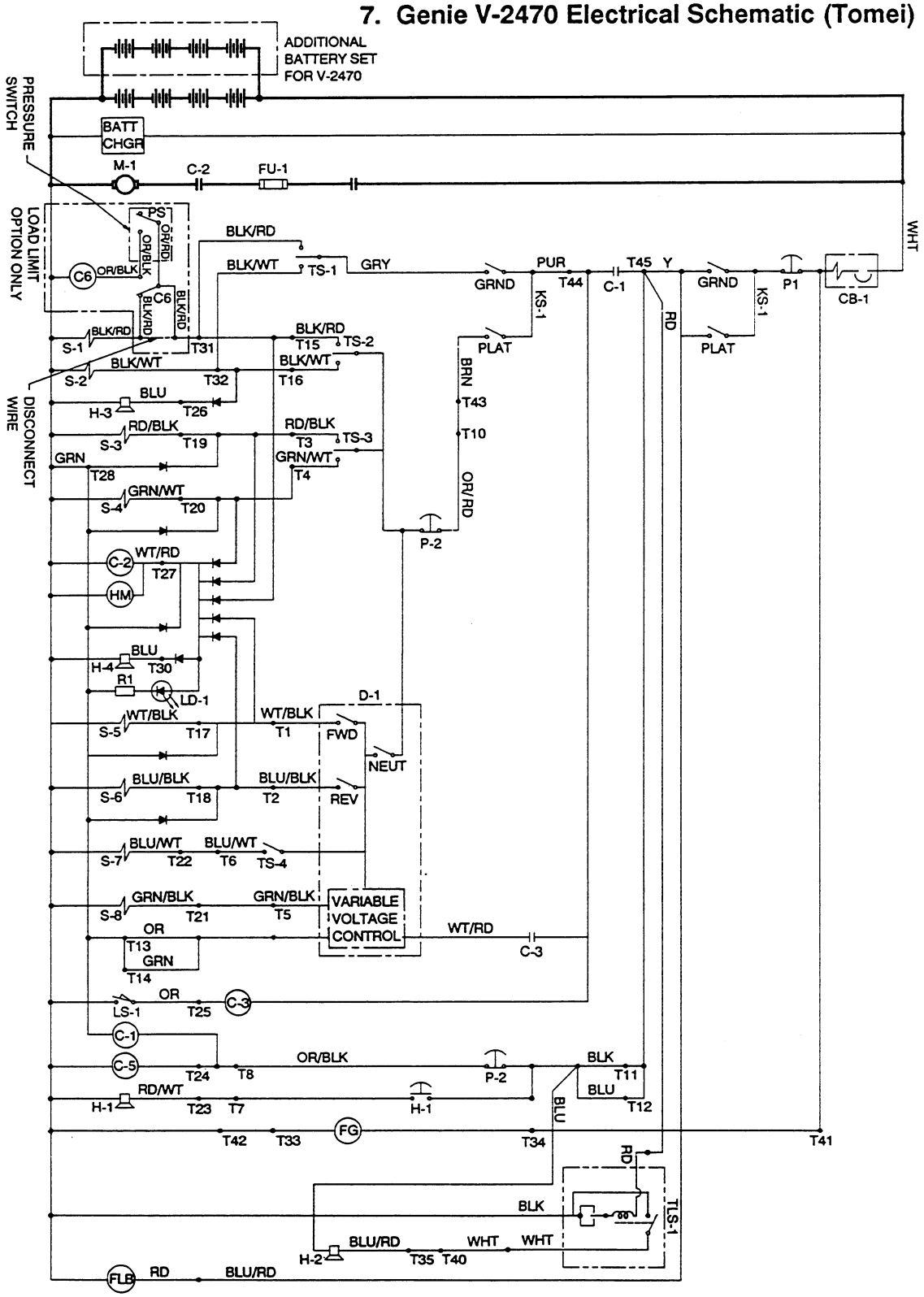




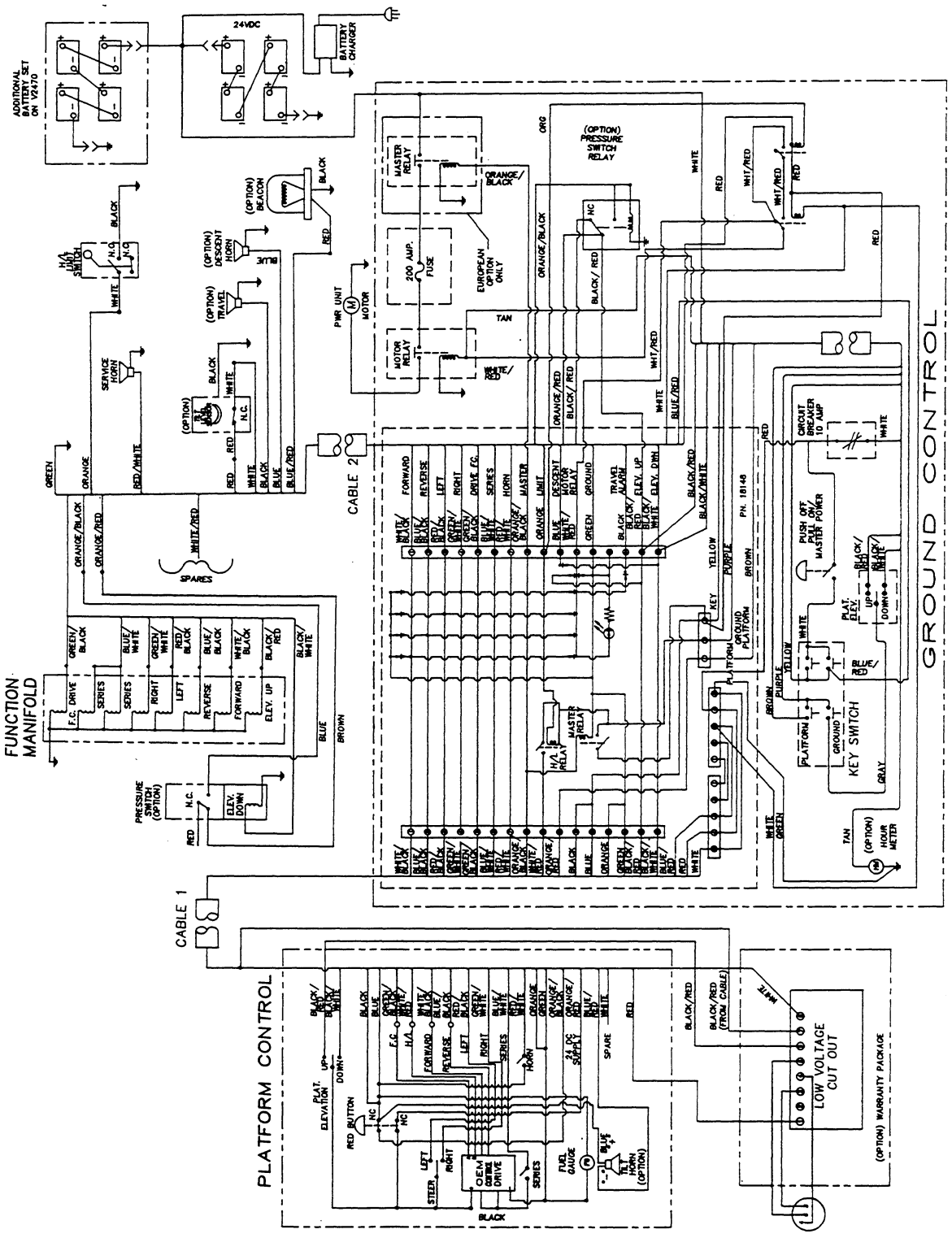
## 6. Genie V-2470 Electrical Schematic (Nishio)



## 7. Genie V-2470 Electrical Schematic (Tomei)



## 8. Genie V-2470 Wiring Diagram (Nishio)



## 9. Genie V-2470 Wiring Diagram (Tomei)