Genie Industries

Technical Publications

Genie® S-60

Service Manual

First Edition
Part No. 29751

TABLE OF CONTENTS

Scheduled Maintenance Inspections

Observe and Obey:

- ☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- ☑ Scheduled maintenance inspections shall be completed daily, quarterly, annually and every 2 years as specified on the maintenance inspection report.

⚠WARNING Failure to properly complete each inspection when required may result in death, serious injury or substantial machine damage.

- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating machine.
- ☑ Keep records on all inspections for three years.

About This Section

Schedule

There are four types of maintenance inspections that must be performed according to a schedule—daily, quarterly, annual, two year. To account for repeated procedures, the Maintenance Tables and the Maintenance Inspection Report have been divided into four subsections—A, B, C, D. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

Inspection	Table or Checklist
Daily	A
Quarterly	A + B
Annual	A + B + C
Two year	A + B + C + D

Maintenance Tables

The maintenance tables contained in this section provide summary information on the specific physical requirements for each inspection.

Complete step-by-step instructions for each scheduled maintenance procedure are provided in section 4, *Scheduled Maintenance Procedures.*

Maintenance Inspection Report

The maintenance inspection report contains checklists for each type of scheduled inspection.

Make copies of the Maintenance Inspection Report to use for each inspection. Store completed forms for three years.

A-4
Check the Engine Oil Level

Maintaining the proper engine oil level is essential to good engine performance and service life. Operating the machine at an improper oil level can damage engine components.

NOTICE Check the oil level with the engine off.

1 Check the oil level dipstick. Add oil as needed.

Ford Engine LSG 423		
Oil capacity (including filter)	5 quarts	4.7 liters

Ford Engine LSG 423 Oil viscosity requirements	
below 60F / 15.5C	5W-30
-10 to 90F / -23 to 32C	10W-30
above -10F / -23C	10W-40 or 10W-50
above 25F / -4C	20W-40 or 20W-50

Use oils meeting API classsification SF (labeled SF/CC or SF/CD) as they offer improved wear protection.

Deutz Engine F4L 1011		
Oil capacity (including filter)	11 quarts	10.5 liters

Deutz Engine F4L 1011 Oil viscosity requirements	
below 60°F / 15.5°C (synthetic)	5W-30
-10°F to 90°F / -23°C to 32°C	10W-40
above -4°F / -34°C	15W-40

Engine oil should have properties of API classification CC/SE, CD/SE, CC/SF or CD/SF grades.

A-5
Check the Engine Coolant Level - Gasoline/LPG Models

Maintaining the engine coolant at the proper level is essential to engine service life. Improper coolant level will affect the engine's cooling capability and damage engine components. Daily checks will allow the inspector to identify changes in coolant level that might indicate cooling system problems.

1 Check the fluid level in the coolant recovery tank. Add fluid as needed.

⊙ Result: The fluid level should be in the NORMAL range.

A-6
Check for Fuel Leaks

Failure to detect and correct fuel leaks will result in an unsafe condition. An explosion or fuel fire may cause death or serious injury.

⚠ DANGER Engine fuels are combustible. Inspect the machine in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

1 Open the shutoff valve on the liquid petroleum gas (LPG) tank by turning it counterclockwise.

Table B Procedures

B-1
Check the Engine Belt(s)

Maintaining the engine belt(s) is essential to good engine performance and service life. The machine will not operate properly with a loose or defective belt and continued use may cause component damage.

⚠WARNING Do not inspect while the engine is running. Remove the key to secure from operation.

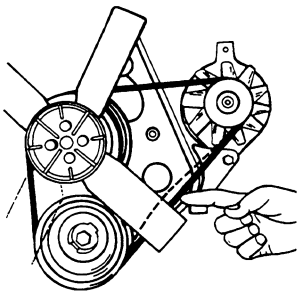
⚠CAUTION Beware of hot engine components. Contact with hot engine components may cause severe burns.

1 **Deutz Diesel models:** Remove front engine cover to access belt.

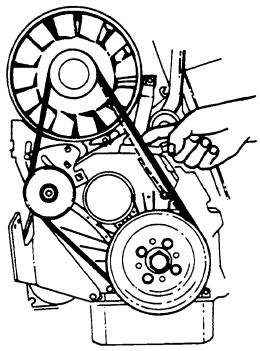
2 **All models:** Inspect the engine belt(s) for:

- cracking
- glazing
- separation
- breaks

3 Check the engine belt(s) for proper tension.



Ford engine



Deutz engine

Belt deflection - All models	3/8 inch to 1/2 inch 9mm to 12mm

B-2
Check the Radiator - Gasoline/LPG Models

Maintaining the radiator in good condition is essential for good engine performance. Operating a machine with a damaged or leaking radiator may result in engine damage. Also, restricting air flow through the radiator (i.e., dirt or debris) will affect the performance of the cooling system. A frequent check allows the inspector to identify changes in the condition of the radiator that might indicate cooling system problems.

⚠WARNING Do not inspect while the engine is running. Remove the key to secure from operation.

⚠CAUTION Beware of hot engine components. Contact with hot engine components may cause severe burns.

1 Inspect the radiator for leaks and physical damage.

2 Clean the radiator fins of debris and foreign materials.

B-3
Check the Oil Cooler and Cooling Fins - Deutz Diesel Models

Maintaining the oil cooler in good condition is essential for good engine performance. Operating a machine with a damaged oil cooler may result in engine damage. Also, restricting air flow through the oil cooler will affect the performance of the cooling system.

⚠WARNING Do not inspect while the engine is running. Remove the key to secure from operation.

⚠CAUTION Beware of hot engine components. Contact with hot engine components may cause severe burns.

B-19
Test the Foot Switch

A properly functioning foot switch is essential to safe machine operation. Machine functions should activate and operate smoothly as long as the foot switch is pressed down, and promptly stop when the foot switch is released. The foot switch will also shift the engine into high idle mode if the idle select is switched to the rabbit and foot switch symbol. An improperly functioning foot switch can cause an unsafe working condition and endanger platform and ground personnel.

NOTICE The engine should not start if the foot switch is pressed down.

1 Start the engine from the platform controls.

2 Without pressing down the foot switch, check the machine functions.

⊙ Result: The machine functions should **not** operate.

3 Press down the foot switch and operate the machine functions.

⊙ Result: The machine functions should operate.

B-20
Test the Engine Speed Select

A properly operating engine rpm select switch is essential to good engine performance and safe machine operation. There are three rpm settings.

Low idle (turtle symbol) mode allows the operator to control individual boom functions only. Drive functions do not operate at low idle.

High idle (rabbit symbol) mode allows the operator to control multiple boom and/or drive functions simultaneously. This setting maintains a consistent high idle and usually selected only when the generator option is being used.

The foot switch activated high idle (rabbit and foot switch symbols) mode should be used for normal machine operation. This selection activates high idle only when the foot switch is pressed down.

1 Pull out the Emergency Stop button to the ON position at both the ground and platform controls.

2 Start the engine from the ground controls. Then move the engine speed control switch to high idle (rabbit symbol) and hold in the ON position.

⊙ Result: The engine should change to high idle.

3 Release the engine speed control switch.

⊙ Result: The engine should return to low idle.

4 Turn the key switch to platform controls.

5 At the platform controls, move the engine speed control switch to high idle (rabbit symbol).

6 Re-engage the torque hubs by turning over the hub disconnect caps. Carefully remove the jack stands, lower the machine and remove the jack.

⚠WARNING Collision hazard. Failure to re-engage the torque hubs may result in death or serious injury and property damage.

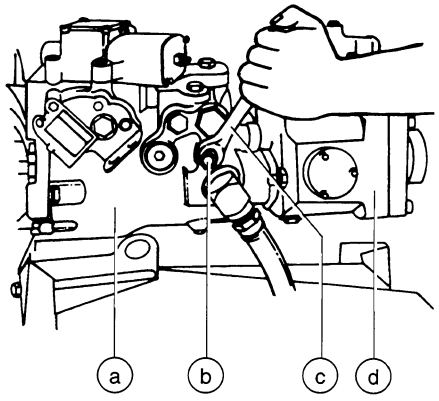
Steer wheels - 4WD models:

7 Chock the non-steering wheels to prevent the machine from rolling.

8 Position the lifting jack under the steering axle and center it between the steering wheels.

9 Lift the wheels off the ground and then place jack stands under the chassis for support.

10 Open the free wheel valve, located on the drive pump, by turning it counterclockwise two turns.



a drive pump
b free-wheel valve
c screwdriver or wrench
d lift pump

11 Manually rotate each steer wheel.

⊙ Result: Each steer wheel should rotate with minimal effort.

12 Close the free wheel valve (clockwise). Carefully remove the jack stands, lower the machine and remove the jack.

⚠WARNING Collision hazard. Failure to close the free-wheel valve may result in death or serious injury and property damage.

NOTICE On 2WD models, the free wheel valve should always remain closed.

C-4
Grease the Turntable Rotation Bearing and Rotate Gear

Yearly application of lubrication to the turntable bearing and rotate gear is essential to good machine performance and service life. Continued use of an improperly greased bearing and gear will result in component damage.

TABLE D PROCEDURES

D-3
Change the Fuel Lines

Maintaining the fuel lines in good condition is essential to safe operation and good engine performance. Failure to detect a worn, cracked or leaking fuel line may result in an unsafe operating condition, poor engine performance and component damage.

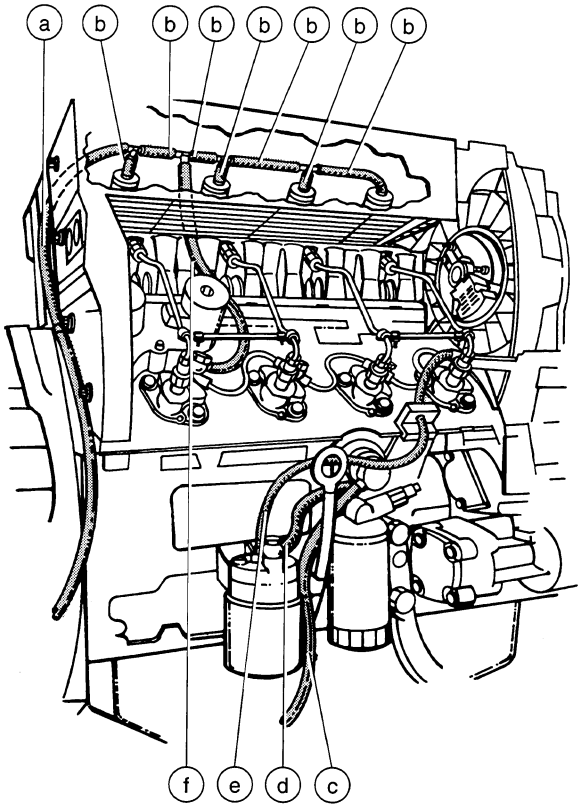
⚠ DANGER Engine fuels are combustible. Replace the fuel lines in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

NOTICE Perform this procedure with the engine off.

1 Close the manual fuel shutoff valve, located next to the fuel tank.

2 Remove and replace the fuel line hoses and clamps according to the following illustrations:

⚠ DANGER Fuel may be expelled under pressure. Wrap a cloth around fuel hoses to absorb leaking fuel before disconnecting them. Plug all open fuel lines.



Deutz Diesel models
- a hose from the injector to the fuel tank
- b hoses connecting injectors
- c hose from the fuel shutoff valve to the fuel pump
- d hose from the fuel pump to the fuel filter
- e hose from the fuel filter to the injection pump
- f hose from the injection pump to the injectors

Chart 2B

Engine Cranks Over But Will Not Start - Gasoline/LPG Models

Continuation of "good spark" fault path.

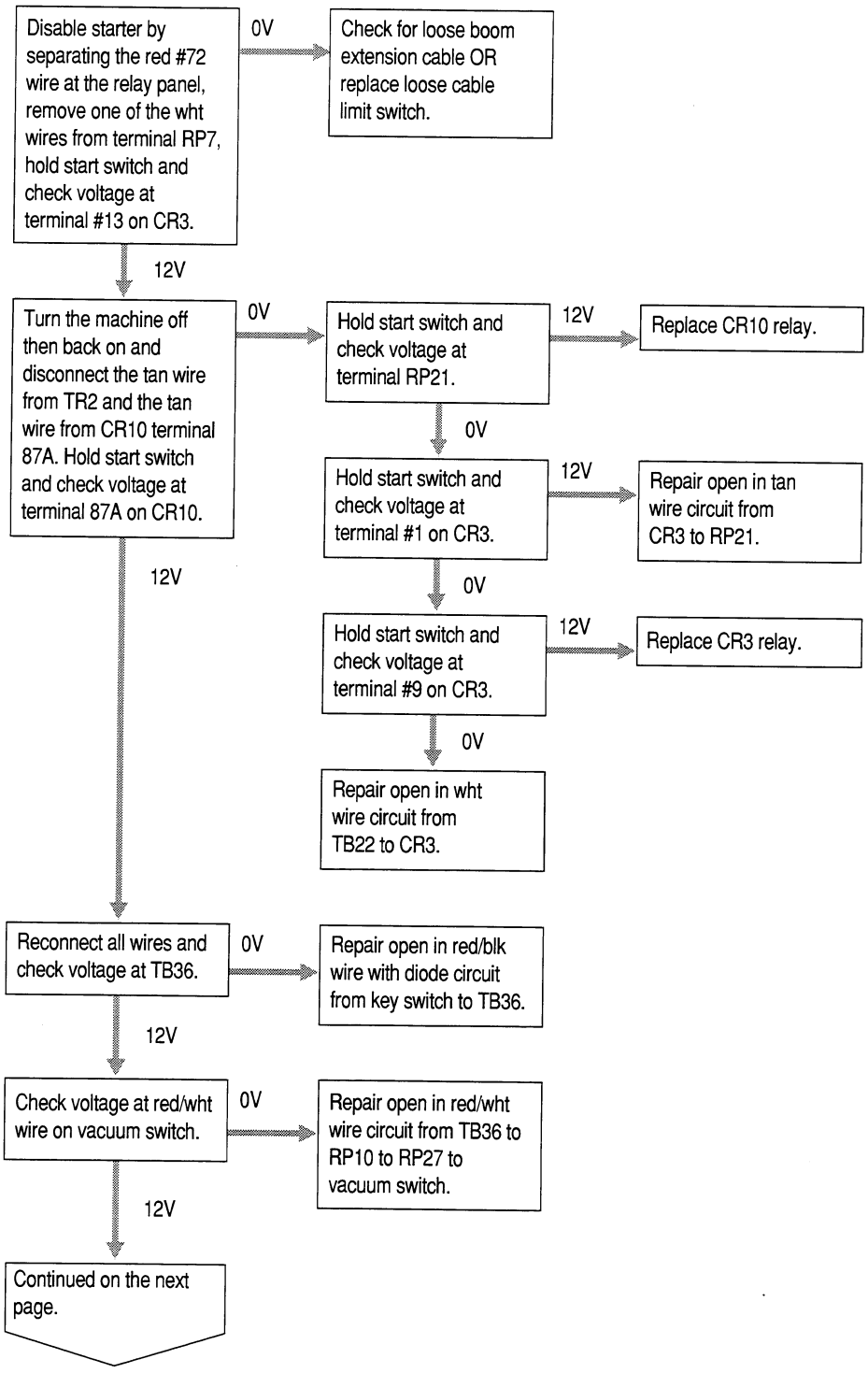


Chart 7

Engine Low Idle Inoperative - Gasoline/LPG Models

If low idle operates on LPG but not on gasoline, see Ford service manual for carburetor troubleshooting.

If low idle operates on gasoline but not on LPG, see Repair section for LPG regulator adjustments.

Be sure throttle linkage from governor to carburetor is not binding, see Repair section.

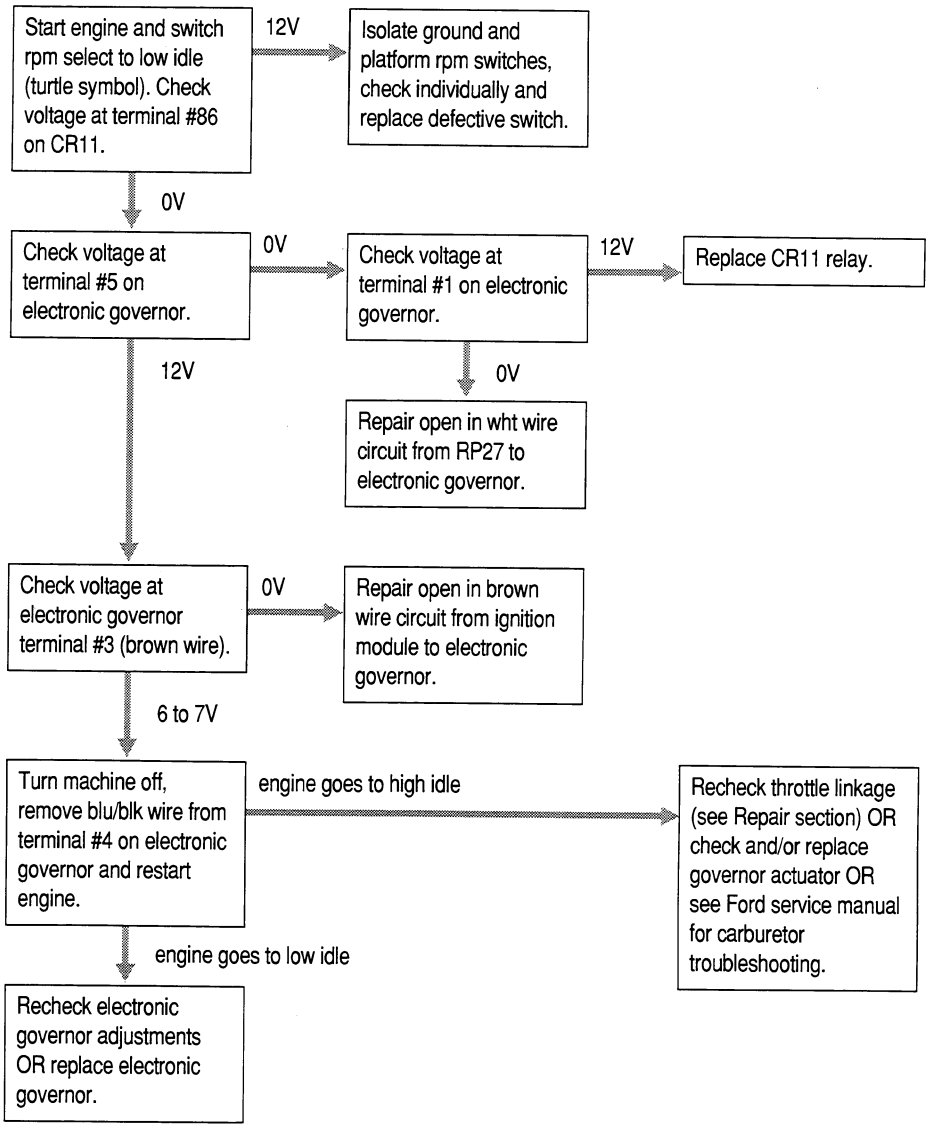


CHART 15

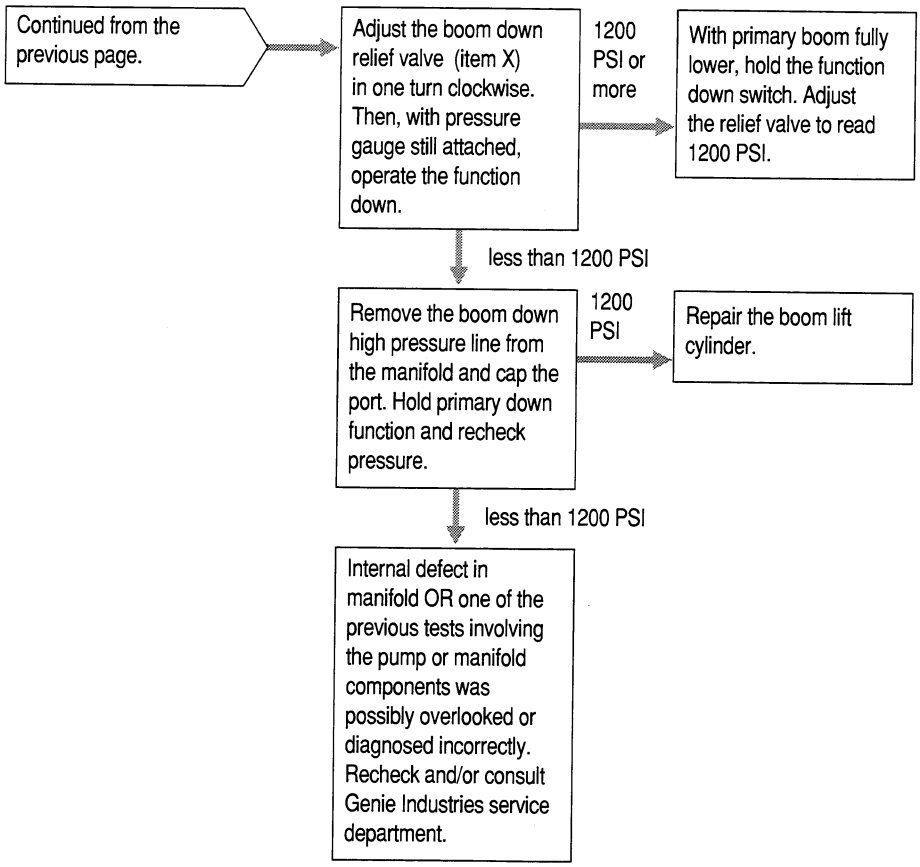

Continued from the previous page.
Adjust the boom down relief valve (item X) in one turn clockwise. Then, with pressure gauge still attached, operate the function down.
1200 PSI or more
With primary boom fully lower, hold the function down switch. Adjust the relief valve to read 1200 PSI.
less than 1200 PSI
Remove the boom down high pressure line from the manifold and cap the port. Hold primary down function and recheck pressure.
1200 PSI
Repair the boom lift cylinder.
less than 1200 PSI
Internal defect in manifold OR one of the previous tests involving the pump or manifold components was possibly overlooked or diagnosed incorrectly. Recheck and/or consult Genie Industries service department.

Chart 23

Platform Level Down Function Inoperative

Be sure all other functions operate normally.

If platform level down function operates normally from the ground controls but not from the platform controls, troubleshoot the platform control toggle switch. See Repair section.

If platform level down function operates normally from the platform controls but not from the ground controls, troubleshoot the ground control toggle switch. See Repair section.

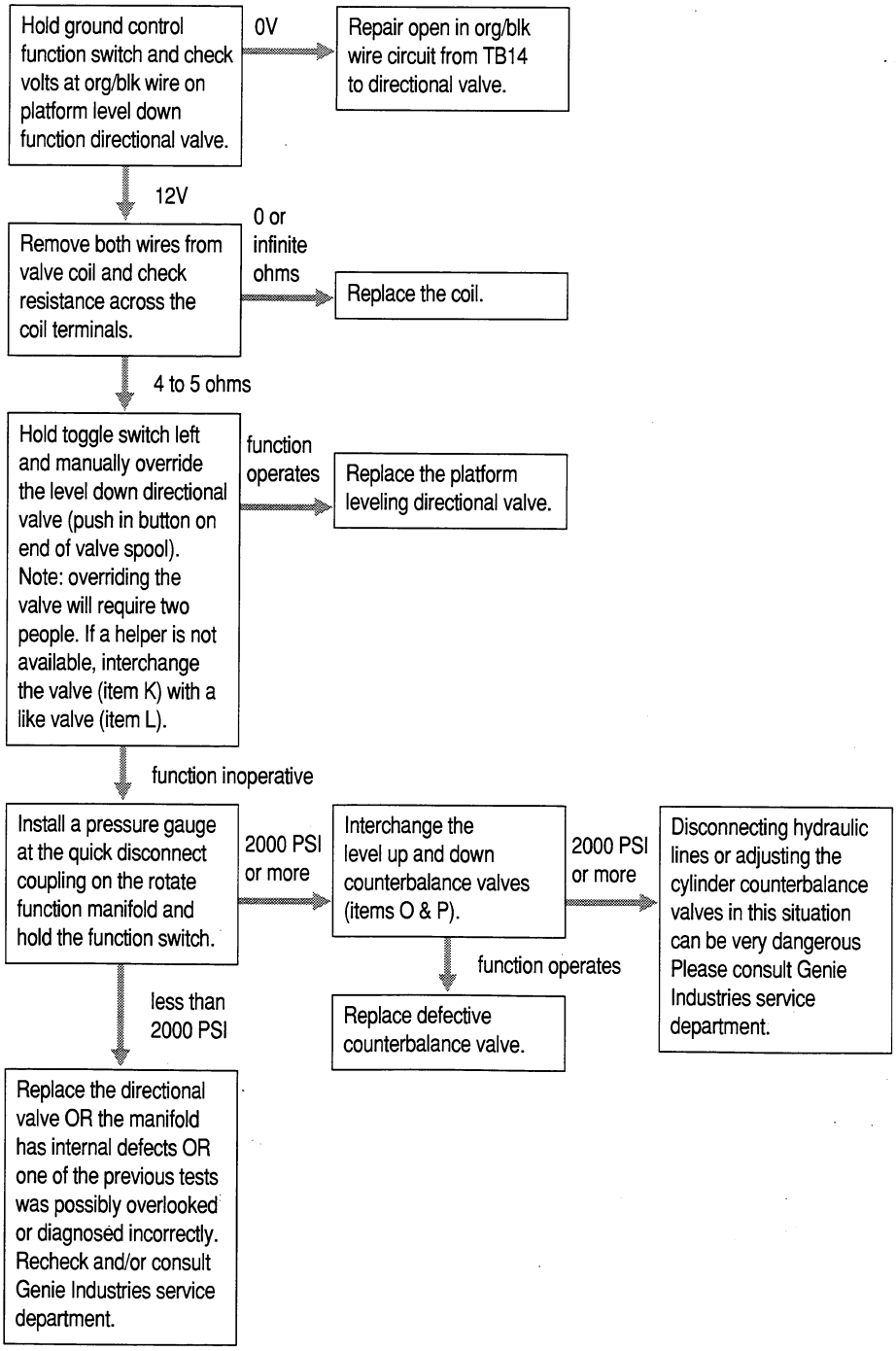
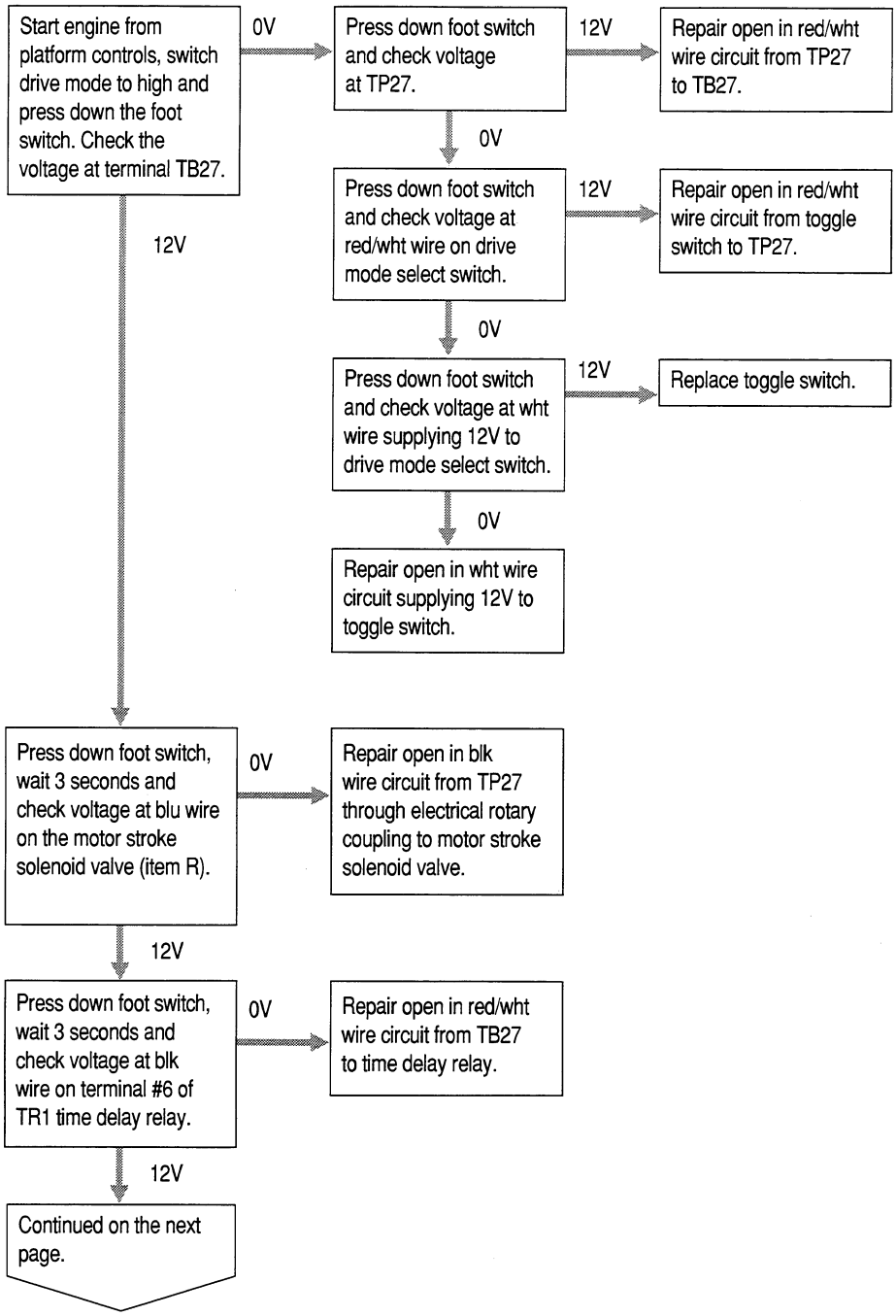


Chart 31

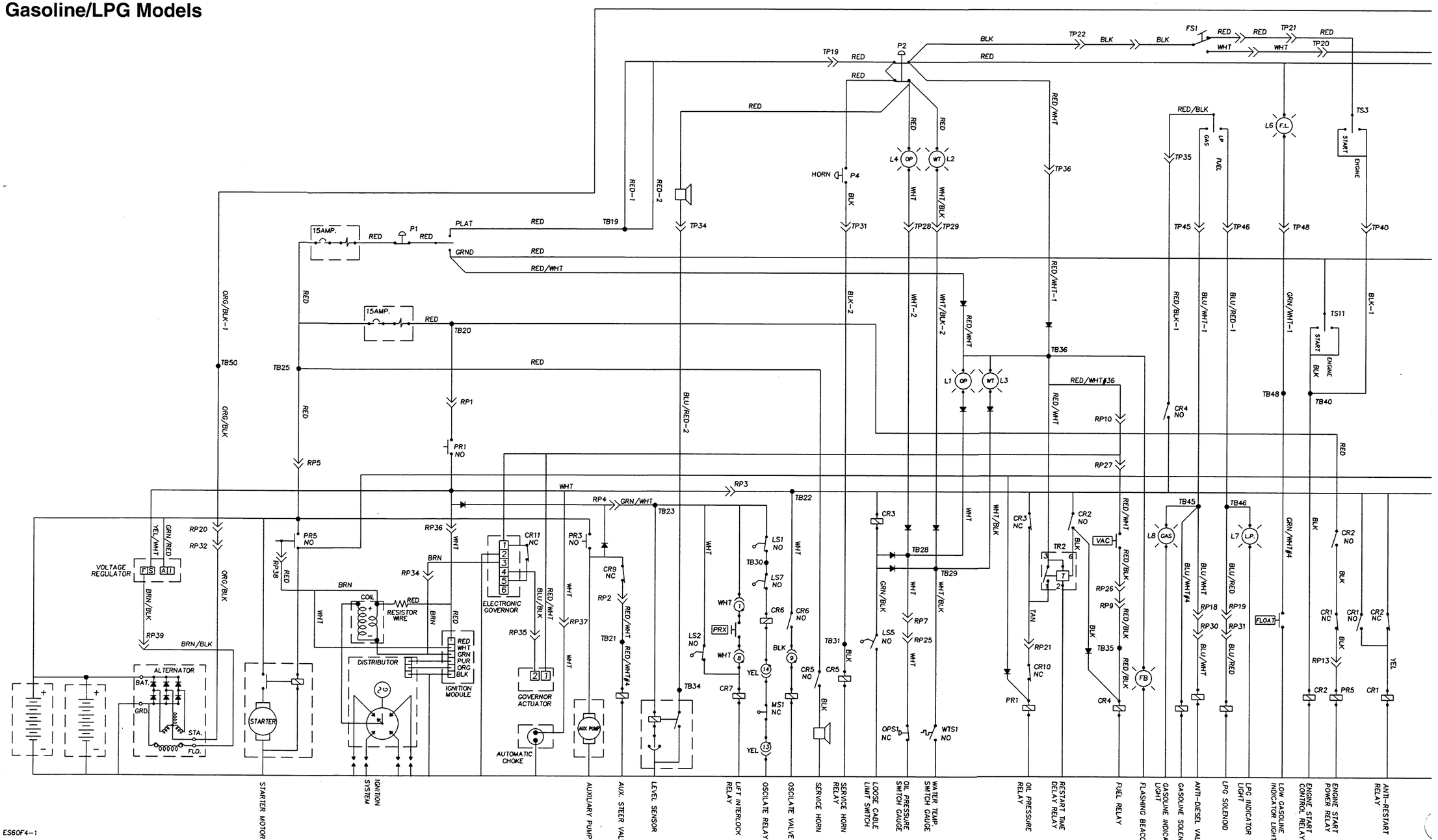
High Range Drive Function Inoperative

Be sure all other functions operate normally including drive low range (four wheel symbol).

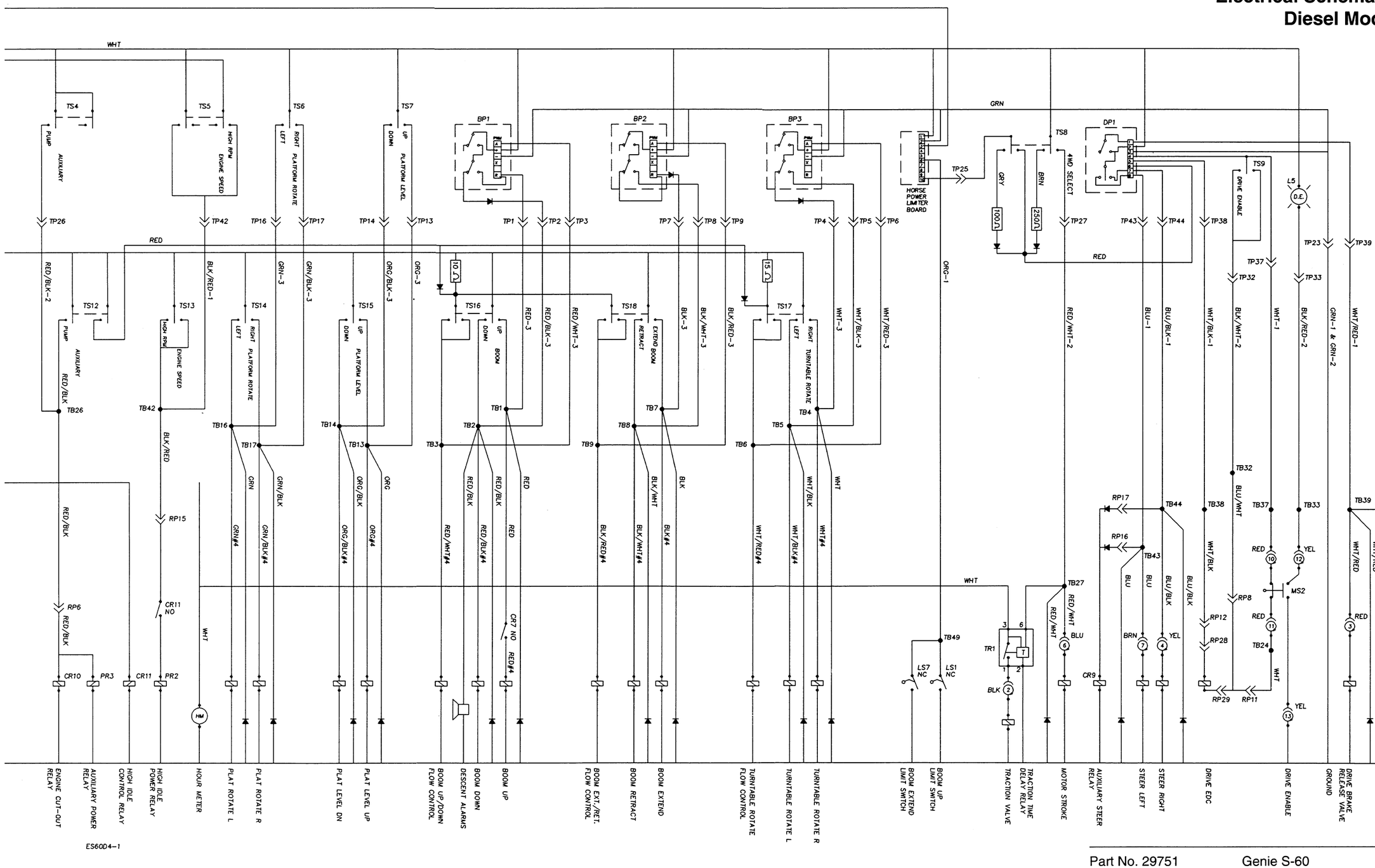
Be sure all drive manifold solenoid valve grounding wires are free of corrosion and have full continuity to ground.



Electrical Schematic - Gasoline/LPG Models



Electrical Schematic - Diesel Models



Repair Procedures

Observe and Obey:

- ☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.
- ☑ Immediately tag and remove from service a damaged or malfunctioning machine.
- ☑ Repair any machine damage or malfunction before operating the machine.

Before Repairs Start:

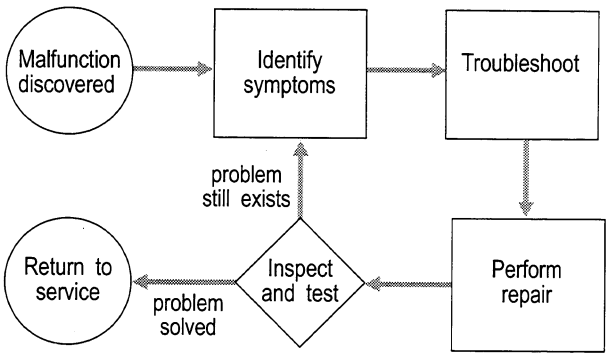
- ☑ Read, understand and obey the safety rules and operating instructions in the *Genie S-60 Operator's Manual.*
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.

About This Section

Most of the procedures in this section should only be performed by a trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem.

Perform disassembly procedures to the point where repairs can be completed. Then to re-assemble, perform the disassembly steps in reverse order.

General Repair Process



Symbols Legend

⚠DANGER Indicates the presence of a hazard that **will** cause death or serious injury.

⚠WARNING Indicates the presence of a hazard that **may** cause death or serious injury.

⚠CAUTION Indicates the presence of a hazard that **will** or **may** cause serious injury or damage to the machine.

NOTICE Indicates special operation or maintenance information.

⊙ Indicates that a specific result is expected after performing a series of steps.

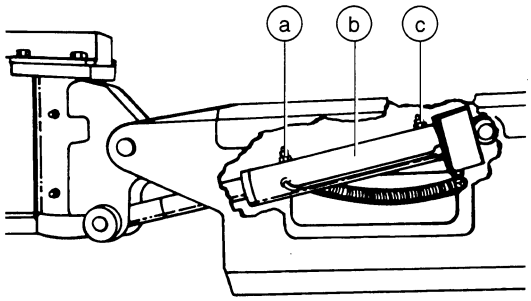
How to Bleed the Slave Cylinder

NOTICE Do not start the engine. Use auxiliary power for all machine functions in this procedure.

1 Raise the boom 5 feet (1.5m) off the ground, then extend the boom until the slave cylinder is accessible.

2 Move the manual platform level switch UP and DOWN through two platform leveling cycles, then hold the switch in the UP position until the slave cylinder is fully extended.

3 Open the top bleed valve on the slave cylinder, but do not remove it.



a top bleed valve
b slave cylinder
c bottom bleed valve

4 Hold the platform level switch in the DOWN position until the slave cylinder is fully retracted. Continue to hold the switch down for an additional 3 seconds.

5 Close the bleed valve. Then open the bottom bleed valve on the slave cylinder, but do not remove it.

6 Hold the platform level switch in the UP position until the slave cylinder is fully extended. Continue to hold the switch up for an additional 3 seconds.

7 Close the bottom bleed valve. Clean up any hydraulic oil that spilled.

8 Move the manual platform level switch up and down through two platform leveling cycles and inspect the bleed valves for leaks.

2-3 Platform Rotator

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 160 degrees. It is equipped with an internal gear ratio that will prevent platform movement in the event of a hydraulic line failure.

How to Remove the Platform Rotator

1 Remove the platform. See 2-1, *How to Remove the Platform.*

2 Support the platform rotator, but do not apply any lifting pressure.

3 Disconnect the hydraulic hoses from the platform rotator and cap them.

⚠CAUTION Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Remove the pin retainer from the slave cylinder rod-end pivot pin and the rotator pivot pin.

5 Use a soft metal drift to drive the pins out, then remove the platform rotator.

7 Use the crane to lift the boom to a horizontal position.

8 Remove the turntable end cover to access the master cylinder.

9 Disconnect and plug the platform leveling master cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠CAUTION Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

10 Remove the retainer plate on the master cylinder barrel-end pin. Lift the master cylinder barrel-end pin out of the mounting slots.

NOTICE The master cylinder can be removed with the lift cylinder.

11 Remove the fuel tank. See 11-2, *How to Remove the Fuel Tank.*

12 Remove the hydraulic tank. See 11-1, *How to Remove the Hydraulic Tank.*

13 From the engine side of the turntable, support the balance point of the boom lift cylinder with an overhead crane or similar lifting device.

⚠WARNING Crushing hazard. If the overhead crane is not properly attached, the lift cylinder may become unbalanced and fall when it is disconnected from the machine.

14 Remove the pin retainer fastener from the lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

15 With the lift cylinder being supported by the overhead crane, pull the cylinder towards the platform until it is half way out.

⚠CAUTION Component damage hazard. The electrical rotary coupler, cables and hydraulic hoses can be damaged if the lift cylinder is pulled across them.

16 Disconnect and plug the lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠CAUTION Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

17 Remove the lift cylinder.

6-7
Water Temperature and Oil Pressure Gauges

The water temperature gauge is an mechanical gauge, with adjustable limit contacts that are factory set. The contacts will close at 220° F (104° C). When the contacts close the engine will shut off to prevent damage and will not start until the temperature drops below the contact point. An over-temperature indicator light at the ground and platform controls should turn on when the contacts close.

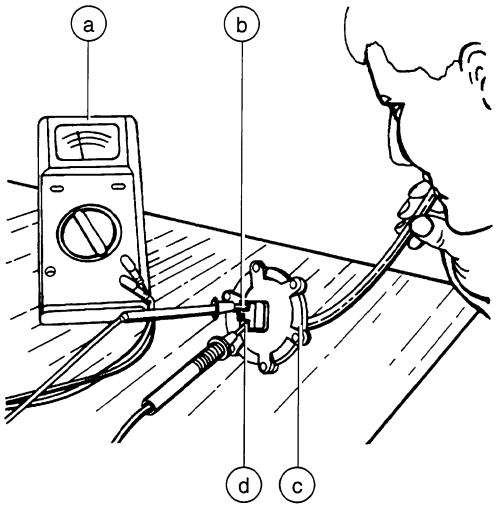
⚠CAUTION Component damage hazard. Do not crank the engine with the over-temperature light on.

The oil pressure gauge is an mechanical gauge, with adjustable limit contacts that are factory set. The contacts will close at 19 psi (1.3 bar). When the contacts close the engine will shut off to prevent damage. A low oil pressure indicator light at the ground and platform controls should turn on when the contacts close.

⚠CAUTION Component damage hazard. Do not continue to run the engine with the low oil pressure light on.

6-8
Vacuum Switch

How to Test the Vacuum Switch



a ohmmeter
b common terminal (SOL.)
c vacuum switch
d normally open terminal (ING.)

1 Connect the leads from an ohmmeter or continuity tester to the common and normally open terminals.

⊙ Result: There should be no continuity (infinite Ω).

2 Apply mild suction to the vacuum port.

⊙ Result: The switch should close and show full continuity (zero Ω).

⚠CAUTION Component damage hazard. Do not short the vacuum switch terminals to ground.

3 Disconnect the hydraulic hoses from the pumps and cap them.

⚠CAUTION Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

4 Support the pump and remove the two drive pump mounting bolts. Carefully remove the pump.

⚠CAUTION Component damage hazard. Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

How to Prime the Pump

1 **Gasoline/LPG models:** Disconnect the ignition coil wire and isolate it from ground.

Diesel models: Hold the manual fuel shutoff valve counterclockwise to the CLOSED position.

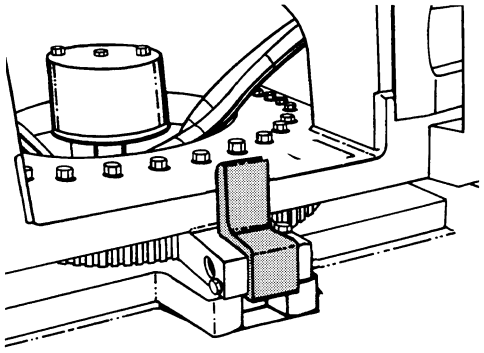
2 Crank the engine with the starter motor for 15 seconds.

Turntable Rotation Components

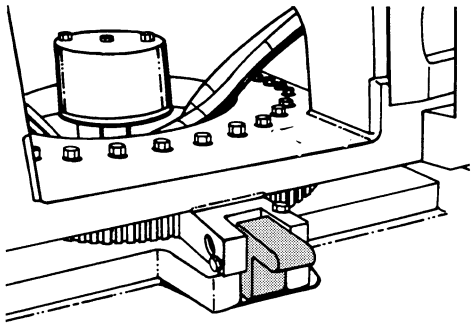
12-1
Rotation Hydraulic Motor

How to Remove the Rotation Hydraulic Motor

1 Secure the turntable from rotating with the turntable rotation lock.



Unlocked position

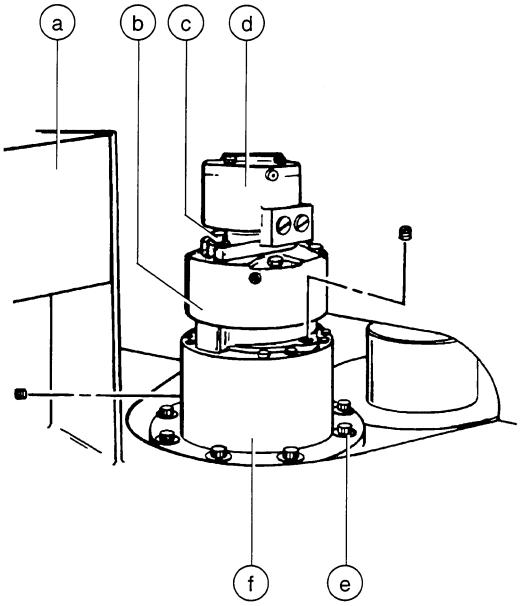


Locked position

2 Disconnect the hydraulic hoses from the motor and cap them.

⚠CAUTION Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

3 Remove the motor mounting bolts, then remove the motor from the brake.



a function manifold
b brake
c motor/brake mounting bolts
d motor
e torque hub mounting bolts
f torque hub

How to Remove the Turntable Rotation Brake or Torque Hub

Refer to Maintenance Procedures, C-5, *How to Replace the Torque Hub Oil.*