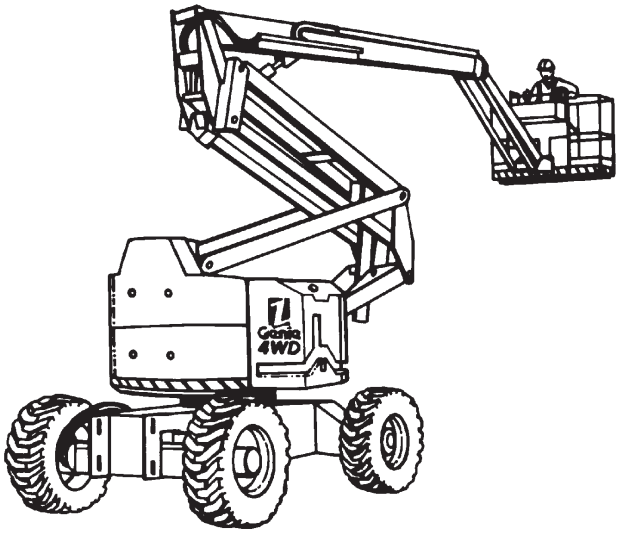
Genie Industries

Technical Publications

Genie® Z-60/34

Service Manual

(from serial number 1090 to 4000)



Second Edition, First Printing (Rev A1)
Part No. 52856
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Genie® Z-60/34

Important

Read, understand and obey the safety rules and operating instructions in the *Genie Z-60/34 Operator's Manual* before attempting any maintenance or repair procedure.

This service manual covers the Genie Z-60/34 2WD and 4WD models introduced in 1998.

This manual provides detailed scheduled maintenance information for the machine owner and user. It also provides troubleshooting and repair procedures for qualified service professionals.

Basic mechanical, hydraulic and electrical skills are required to perform most procedures. However, several procedures require specialized skills, tools, lifting equipment and a suitable workshop. In these instances, we strongly recommend that maintenance and repair be performed at a Genie dealer service center.

Genie Industries has endeavored to deliver the highest degree of accuracy possible. However, continuous improvement of our products is a Genie policy. Therefore product specifications are subject to change without notice.

Readers are encouraged to notify Genie of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this and other manuals. Please write or fax to the Technical Publications team:

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Safety Rules



Danger

Failure to obey the instructions and safety rules in this manual and the *Genie Z-60/34 Operator's Manual* will cause death or serious injury.

Many of the hazards identified in the operator's manual are also safety hazards when maintenance and repair procedures are performed.

Do Not Perform Maintenance Unless:

- ☑ You are trained and qualified to perform maintenance on this machine.
- ☑ You read, understand and obey:
  - manufacturer's instructions and safety rules
  - employer's safety rules
  - applicable governmental regulations
- ☑ You have the appropriate tools, lifting equipment and a suitable workshop.

SAFETY RULES

Personal Safety

Any person working on or around a machine must be aware of all known safety hazards. Personal safety and the continued safe operation of the machine should be your top priority.



Read each procedure thoroughly. This manual and the decals on the machine use signal words to identify the following:



Safety alert symbol–used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Red–used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Orange–used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Yellow with safety alert symbol–used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

CAUTION Yellow without safety alert symbol–used to indicate the presense of a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE Green–used to indicate operation or maintenance information.



Be sure to wear protective eye wear and other protective clothing if the situation warrants it.



Be aware of potential crushing hazards such as moving parts, free swinging or unsecured components when lifting or placing loads. Always wear approved steel-toed shoes.

Workplace Safety



Be sure to keep sparks, flames and lighted tobacco away from flammable and combustible materials like battery gases and engine fuels. Always have an approved fire extinguisher within easy reach.



Be sure that all tools and working areas are properly maintained and ready for use. Keep work surfaces clean and free of debris that could get into machine components and cause damage.



Be sure that your workshop or work area is properly ventilated and well lit.



Be sure any forklift, overhead crane or other lifting or supporting device is fully capable of supporting and stabilizing the weight to be lifted. Use only chains or straps that are in good condition and of ample capacity.



Be sure that fasteners intended for one time use (i.e., cotter pins and self-locking nuts) are not reused. These components may fail if they are used a second time.



Be sure to properly dispose of old oil or other fluids. Use an approved container. Please be environmentally safe.

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Specifications

Machine Specifications

Stowed dimensions	2WD/Ind	2WD/RT 4WD/RT
Length	26 ft 7.92 m	26 ft 7.92 m
Width	7 ft 2.13 m	7 ft 6 in 2.29 m
Height	8 ft 1 in 2.46 m	8 ft 4 in 2.54 m
Weight	21900 lbs 9934 kg	22055 lbs 10004 kg
Ground clearance	9 in 22.9 cm	12 in 30.5 cm
Operational dimensions		
Maximum platform height	60 ft 18.3 m	60 ft 18.3 m
Maximum horizontal reach	34 ft 10.36 m	34 ft 10.36 m
Maximum turntable tailswing	0	0
Wheelbase	7 ft 11 in 2.41 m	7 ft 9 in 2.36 m
Minimum turning circle, outside	26 ft 10 in 8.2 m	38 ft 10 in 11.8 m
Minimum turning circle, inside	8 ft 2.3 m	22 ft 6.7 m
Turntable rotation	continuous	continuous
Platform rotation	180°	180°
Platform dimensions	**6 ft** (Standard)	**8 ft*** (Optional)
Length	6 ft 1.83 m	8 ft 2.44 m
Width	30 in 76.2 cm	36 in 91.4 cm
Maximum capacity	500 lbs 227 kg	500 lbs 227 kg

* 8 ft platform not available for 2WD/Ind machines.

Tires and wheels	Industrial (Ind)	Rough Terrain (RT)
Tire size	32x12-15NHS 300-15NHS	15-19.5NHS
Tire ply rating	20	12
Load range	L	F
Tire contact area	73 sq in 470 sq cm	68 sq in 439 sq cm
Overall tire diameter	32.9 in 83.6 cm	40 in 102 cm
Tire pressure	110 psi 7.58 bar	60 psi 4.14 bar
Wheel diameter	15.2 in 38.6 cm	19.5 in 49.5 cm
Wheel width	9.75 in 24.8 cm	12.25 in 31 cm
Wheel lugs	9 @ 5/8-18	9 @ 5/8-18
Lug nut torque	125 ft-lbs 169.5 Nm	125 ft-lbs 169.5 Nm
Fluid capacities		
Fuel tank		20 gallons 76 liters
LPG tank		33.5 pounds 15.2 kg
Hydraulic tank		45 gallons 170 liters
Hydraulic system (including tank)		53 gallons 201 liters
Drive torque hub		40 fl oz 1.2 liters
Turntable rotation torque hub		8 fl oz 0.24 liters

Continuous improvement of our products is a Genie policy. Product specifications are subject to change without notice.

PERFORMANCE SPECIFICATIONS

Performance Specifications

Drive speeds, maximum	2WD	4WD
Boom stowed, high range Gasoline/LPG models	3.5 mph 5.6 km/h 40 ft/7.8 sec 12.2m/7.8 sec	4.5 mph 7.2 km/h 40 ft/6.1 sec 12.2m/6.1 sec
Boom stowed, high range Deutz diesel models	3.0 mph 4.8 km/h 40 ft/9.1 sec 12.2m/9.1 sec	3.9 mph 6.3 km/h 40 ft/7 sec 12.2m/7 sec
Boom raised or extended All models	0.6 mph 1 km/h 40 ft/40 sec 12.2m/40 sec	0.6 mph 1 km/h 40 ft/40 sec 12.2m/40 sec

Gradeability (boom stowed)	2WD	4WD
Industrial	30%	NA
Rough terrain	20%	35%

Boom function speeds, maximum from platform controls	
Jib boom up	15 to 25 seconds
Jib boom down	15 to 25 seconds
Primary boom up	35 to 45 seconds
Primary boom down	50 to 60 seconds
Primary boom extend	20 to 30 seconds
Primary boom retract	15 to 25 seconds
Secondary boom up	40 to 50 seconds
Secondary boom down	30 to 40 seconds
Turntable rotate - 360°	130 to 140 seconds
Platform rotate - 180°	7 to 10 seconds
Platform level up	30 to 40 seconds
Platform level down	15 to 25 seconds

Hydraulic Specifications

Hydraulic fluid	Dexron equivalent
Drive pump	
Type: bi-directional variable displacement piston pump	
Displacement	0 to 31.5 gallons per minute 0 to 119 liters per minute
Maximum drive pressure	3500 psi 241.3 bar
Charge pressure	250 psi 17 bar
Medium pressure filter	10 micron
Medium pressure filter bypass pressure	50 psi 3.4 bar
Drive manifold	
Brake relief pressure	290 psi 20 bar

Steer end drive motors	**4WD models**
Displacement per revolution	2.14 cu in 35.1cc
Non-steer end drive motors	
Displacement per revolution	
low range	2.8 cu in 45.9 cc
high range	0.16 cu in 2.6 cc

Function pump	
Type: pressure balanced gear	
Displacement - static	0.98 cu in 16 cc
Displacement - 2600 rpm	10.2 gallons per minute 0 to 38.6 liters per minute
Hydraulic tank circuit return line filter	10 micron with 25 psi (1.7 bar) bypass
Function manifold	
Function relief valve pressure	2400 psi 165.5 bar
Primary boom down relief valve pressure	1800 psi 124 bar
Primary boom extend	1200 psi 82.7 bar
Secondary boom down relief valve pressure	1600 psi 110 bar
Steer/oscillate flow regulator	3 gallons per minute 11.4 liters per minute
Auxiliary pump	
Type: fixed displacement gear pump	
Displacement - static	0.152 cu in 2.5 cc
Displacement - 2600 rpm	1.4 gallons per minute 5.3 liters per minute
Auxiliary pump relief pressure	2400 psi 165.5 bar

SPECIFICATIONS

Ford Engine LRG-425 EFI

Displacement	153 cu in 2.5 liters
Number of cylinders	4
Bore & stroke	3.78 x 3.4 inches 96.01 x 86.36 mm
Horsepower	
gross intermittent	97
continuous	82
horsepower @ 2500 rpm	70
Firing order	1 - 3 - 4 - 2
Low idle	1600 rpm
High idle	2500 rpm
Compression ratio	9.4:1
Compression pressure (approx.) Pressure (psi) of lowest cylinder must be at least 75% of highest cylinder	
Valve clearances - collapsed tappet	0.035 to 0.055 inches 0.889 to 1.397 mm
Lubrication system	
Oil pressure (operating temp. @ 2000 rpm)	40 to 60 psi 2.75 to 4.1 bar
Oil capacity (including filter)	5 quarts 4.7 liters
Oil viscosity requirements	
Temperature below 60°F / 15.5°C	5W-30
-10°F to 90°F / -23°C to 32°C	10W-30
Temperature above -10°F / -23°C	10W-40 to 10W-50
Temperature above 20°F / -6.6°C	20W-40 or 20W-50
Use oils meeting API classification SG (labeled SG/CC or SG/CD) as they offer improved wear protection. Units ship with 10W-40 SG/CC.	

Starter motor	
Normal engine cranking speed	200 to 250 rpm
Current draw, normal load	140-200A
Current draw, maximum load	800A
Current draw, minimum	60-80A
Maximum circuit voltage drop while starting (normal temperature)	0.5V DC
Brush length, new	0.66 in 16.8 mm
Brush length wear limit	0.25 in 6.35 mm
Maximum commutator run-out	0.005 inches 0.127 mm
Battery	
Type	12V, Group 31
Quantity	1
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Electronic fuel pump	
Fuel pressure, static	64 psi 4.4 bar
Fuel flow rate	0.58 gpm 2.18 liters per minute
Ignition System	
Spark plug type	Motorcraft AWSF-52C
Spark plug gap	0.042 to 0.046 inches 1.07 to 1.18 mm
Engine coolant	
Capacity	11 1/2 quarts 10.9 liters
Alternator	
Output	95A, 14.5V

SPECIFICATIONS

Deutz Engine F4L 1011F

Displacement	166.7 cu in 2.732 liters
Number of cylinders	4
Bore and stroke	3.58 x 4.13 inches 91 x 105 mm
Horsepower	56 @ 3000 rpm
Firing order	1 - 3 - 4 - 2
Compression ratio	18.5:1
Compression pressure	362 to 435 psi 25 to 30 bar
Low idle	1200 rpm
High idle	2200 rpm
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.012 in 0.3 mm
Exhaust	0.020 in 0.5 mm
Lubrication system	
Oil pressure	26 to 87 psi 1.8 to 6.0 bar
Oil capacity (including filter)	11 quarts 10.5 liters
Oil viscosity requirements	
Temperature below 60°F / 15.5°C (synthetic)	5W-30
-10°F to 90°F / -23°C to 32°C	10W-40
Temperature 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.	
Injection system	
Injection pump make	OMAP
Injection pump pressure	4351 psi 300 bar
Injector opening pressure	3626 psi 250 bar
Fuel requirement	diesel number 2-D
Alternator output	55A, 14V
Starter motor	
Current draw, no load	90A
Brush length, new	0.7480 in 19mm
Brush length, minimum	0.5 in 12.7 mm
Battery	
Type	12V, Group 31
Quantity	1
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Fan belt deflection	$^3/_8$ to $^1/_2$ inch 9 to 12 mm

SPECIFICATIONS

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok® O-ring face seal fittings and hose ends. Machines that utilize Parker Seal-Lok® O-ring face seal fittings and hose ends require that the fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

Hydraulic Hose and Fitting Torque Specifications

SAE O-ring Boss Port - tube fitting				**Seal-Lok® -** hose end		
SAE Dash Size	Installing into...	ft. lbs.	Nm	SAE Dash Size	ft. lbs.	Nm
-4	Aluminum	11	14.9	-4	18	24.4
	Steel	16	21.7	-6	27	36.6
-6	Aluminum	23	31.2	-8	40	54.2
	Steel	35	47.5	-10	63	85.4
-8	Aluminum	40	54.2	-12	90	122
	Steel	60	81.3	-16	120	162.7
-10	Aluminum	69	93.6	-20	140	190
	Steel	105	142.4	-24	165	223.7
-12	Aluminum	93	126.1			
	Steel	140	190			
-16	Aluminum	139	188.5			
	Steel	210	284.7			
-20	Aluminum	172	233.2			
	Steel	260	352.5			
-24	Aluminum	208	282			
	Steel	315	427.1			

Torque Procedure

1 Replace the O-ring. The O-ring must be replaced anytime the seal has been broken. The O-ring cannot be re-used if the fitting or hose end has been tightened beyond finger tight.

NOTICE The O-rings used in the Parker Seal Lok® fittings and hose ends are a custom-size O-ring. They are not a standard SAE size O-ring. They are available in the O-ring field service kit (Genie part no. 49612).

2 Lubricate the O-ring before installation.

3 Be sure that the face seal O-ring is seated and retained properly.

4 Position the tube and nut squarely on the face seal end of the fitting and tighten the nut finger tight.

5 Tighten the nut or fitting to the appropriate torque per given size as shown in the table above.

6 Operate all machine functions and inspect the hoses and fittings and related components to be sure that there are no leaks.

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 cause death, serious injury or substantial 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

The 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.

Maintenance Tables

Table A		Tools are required	New parts required	Warm engine required	Cold engine required	Dealer service suggested
A-1	Inspect the Manuals					
A-2	Inspect the Decals and Placards					
A-3	Inspect for Damage, Loose or Missing Parts					
A-4	Check the Engine Oil Level					
A-5	Check the Engine Coolant Level - Gasoline/LPG Models					
A-6	Check for Fuel Leaks					
A-7	Check the Hydraulic Oil Level					
A-8	Check for Hydraulic Leaks					
A-9	Check the Tire Pressure					
A-10	Test the Oscillate Lock-out, Oscillating Models					
A-11	Test the Platform and Ground Controls					
A-12	Test the Auxiliary Power Operation					
A-13	Test the Tilt Sensor					
A-14	Test the Limit Switches					

Table A, continued		Tools are required	New parts required	Warm engine required	Cold engine required	Dealer service suggested
Every 100 hours, perform the following two engine maintenance procedures.						
A-15	Replace the Engine Oil and Filter - Gasoline/LPG Models					
A-16	Replace the Engine Air Filter					

Table B

B-1	Check the Engine Belt					
B-2	Check the Radiator - Gasoline/LPG Models					
B-3	Check the Oil Cooler and Cooling Fins - Deutz Diesel Models					
B-4	Check the Exhaust System					
B-5	Check the Battery					
B-6	Check the Hydraulic Tank Filter Condition Indicator					
B-7	Inspect the Electrical Wiring					
B-8	Inspect the Tires and Wheels (including lug nut torque)					
B-9	Confirm the Proper Brake Configuration					
B-10	Check the Torque Hub Oil Level and Fastener Torque					
B-11	Check and Adjust the Engine RPM					
B-12	Test the Key Switch					

MAINTENANCE TABLES

Table B, continued		Tools are required	New parts required	Warm engine required	Cold engine required	Dealer service suggested
B-13	Test the Emergency Stop Buttons					
B-14	Test the Ground Control Override					
B-15	Test the Platform Self-leveling					
B-16	Test the Horn					
B-17	Test the Foot Switch					
B-18	Test the Engine Idle Select					
B-19	Test the Fuel Select Operation - Gasoline/LPG Models					
B-20	Test the Drive Enable System					
B-21	Test the Drive Brakes					
B-22	Test the Drive Speed - Stowed Position					
B-23	Test the Alarm Package - Optional Equipment					
B-24	Perform Hydraulic Oil Anaysis See D-1 *Test or Replace the Hydraulic Oil*					
Every 500 hours, perform the following engine maintenance procedure.						
B-25	Replace the Engine Oil and Filter - Deutz Diesel Models					

MAINTENANCE TABLES

Table C		Tools are required	New parts required	Warm engine required	Cold engine required	Dealer service suggested
C-1	Check the Primary Boom Wear Pads					
C-2	Check the Turntable Rotation Bearing Bolts					
C-3	Check the Free-wheel Configuration					
C-4	Grease the Turntable Rotation Bearing and Rotate Gear					
C-5	Replace the Torque Hub Oil					
C-6	Replace the Hydraulic Tank Return Filter					
C-7	Replace the Drive Loop Hydraulic Filter					
C-8	Replace the Diesel Fuel Filter/Water Separator - Deutz Diesel Models					
C-9	Replace the Gasoline Fuel Filters - Gasoline/LPG Models					
C-10	Replace the PCV Valve - Gasoline/LPG Models					
C-11	Replace the Spark Plugs - Gasoline/LPG Models					
C-12	Check and Adjust the Air/LPG Mixture - Gasoline/LPG Models					
C-13	Check the Engine Valve Clearances - Deutz Diesel Models					

MAINTENANCE TABLES

Table D		Tools are required	New parts required	Warm engine required	Cold engine required	Dealer service suggested
D-1	Test or Replace the Hydraulic Oil					
D-2	Change or Recondition the Engine Coolant - Gasoline/LPG Models					
D-3	Change the Fuel Hoses					
D-4	Check the Engine Valve Clearance - Gasoline/LPG Models					
D-5	Check the Engine Cylinder Compression - Gasoline/LPG Models					
D-6	Clean the PCV Hose and Fittings - Gasoline/LPG Models					
D-7	Check the Fuel Injection Pump and Injectors - Deutz Diesel Models					
D-8	Check the Toothed Belt - Deutz Diesel Models					
D-9	Replace the Timing Belt - Gasoline/LPG Models					
D-10	Grease the Steer Axle Wheel Bearings - 2WD Models					

Maintenance Inspection Report

Model

Serial number

Date

Hour meter

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

Instructions

- Make copies of this page to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection to be performed.

☐	**Daily Inspection: A**
☐	**Quarterly Inspection: A+B**
☐	**Annual Inspection: A+B+C**
☐	**2 Year Inspection: A+B+C+D**

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the maintenance tables in this section and the step-by-step procedures in section 4 to learn how to perform these inspections.
- If any inspection receives an “N”, tag and remove the machine from service, repair and re-inspect it. After repair, place a check in the “R” box.

Legend

Y = yes, acceptable

N = no, remove from service

R = repaired

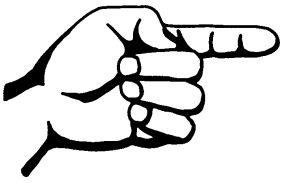
Comments

Checklist A	**Y**	**N**	**R**
Refer to Table A			
A-1 Manuals			
A-2 Decals and placards			
A-3 Damage, loose or missing parts			
A-4 Engine oil level			
A-5 Engine coolant-Gas/LPG			
A-6 Fuel leaks			
A-7 Hydraulic oil level			
A-8 Hydraulic leaks			
A-9 Tire pressure			
A-10 Oscillate Lock-out			
A-11 Platform and ground controls			
A-12 Auxiliary power			
A-13 Tilt sensor			
A-14 Limit switches			
Perform every 100 hours:			
A-15 Replace engine oil and filter-Gas/LPG			
A-16 Replace air filter			

Checklist B	**Y**	**N**	**R**
Refer to Table B			
B-1 Engine belt			
B-2 Check radiator-Gas/LPG			
B-3 Oil cooler and fins-Diesel			
B-4 Exhaust system			
B-5 Battery			
B-6 Hydraulic tank filter			
B-7 Electrical wiring			
B-8 Tires and wheels			
B-9 Brake configuration			
B-10 Torque hub oil level			
B-11 Engine RPM			
B-12 Key Switch			
B-13 Emergency Stop			
B-14 Ground control override			
B-15 Platform leveling			
B-16 Horn			
B-17 Foot switch			
B-18 Engine idle select			
B-19 Fuel select-Gas/LPG			
B-20 Drive enable system			
B-21 Drive brakes			
B-22 Drive speed-stowed			
B-23 Alarm package			
B-24 Hydraulic oil analysis			
Perform every 500 hours:			
B-25 Replace engine oil and filter-Deutz			

Checklist C	**Y**	**N**	**R**
Refer to Table C			
C-1 Boom wear pads			
C-2 Turntable bearing bolts			
C-3 Free-wheel configuration			
C-4 Grease rotation bearing			
C-5 Torque hub oil			
C-6 Hydraulic tank filter			
C-7 Drive loop hydraulic filter			
C-8 Fuel filter-Deutz diesel			
C-9 Fuel filters-Gas/LPG			
C-10 PCV valve-Gas/LPG			
C-11 Spark plugs-Gas/LPG			
C-12 Air/LPG mixture			
C-13 Valves-Deutz diesel			

Checklist D	**Y**	**N**	**R**
Refer to Table D			
D-1 Hydraulic oil			
D-2 Engine coolant-Gas/LPG			
D-3 Change fuel hoses			
D-4 Valves-Gas/LPG			
D-5 Compression-Gas/LPG			
D-6 PCV hose-Gas/LPG			
D-7 Fuel injection-Deutz			
D-8 Toothed belt-Deutz			
D-9 Timing belt-Gas/LPG			
D-10 Steer axle bearings, 2WD models			



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Scheduled Maintenance Procedures



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 perform each procedure as presented and scheduled may cause death, serious injury or substantial 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.
- ☑ Unless otherwise specified, perform each maintenance procedure with the machine in the following configuration:
  - Machine parked on a flat, level surface
  - Boom in stowed position
  - Turntable rotated with the boom between the non-steering wheels
  - Turntable secured with the turntable rotation lock
  - Key switch in the OFF position with the key removed
  - Wheels chocked

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

Each procedure includes a description, safety information and step-by-step instructions.

Symbols Legend



Safety alert symbol–used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Red–used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Orange–used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Yellow with safety alert symbol–used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

CAUTION Yellow without safety alert symbol–used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE Green–used to indicate operation or maintenance information.

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

Table A Procedures

A-1
Inspect the Manuals

Maintaining the operator's and safety manuals in good condition is essential to safe machine operation. Manuals are included with each machine and should be stored in the container provided in the platform. An illegible or missing manual will not provide safety and operational information necessary for a safe operating condition.

1 Check to be sure that the storage container is present and in good condition.

2 Check to make sure that the operator's, responsibilities and safety manuals are present and complete in the storage container in the platform.

3 Examine the pages of each manual to be sure that they are legible and in good condition.

4 Always return the manuals to the storage container after use.

NOTICE Contact your authorized Genie distributor or Genie Industries if replacement manuals are needed.

A-2
Inspect the Decals and Placards

Maintaining all of the safety and instructional decals and placards in good condition is mandatory for safe machine operation. Decals alert operators and personnel to the many possible hazards associated with using this machine. They also provide users with operation and maintenance information. An illegible decal will fail to alert personnel of a procedure or hazard and could result in unsafe operating conditions.

1 Refer to the *Decals* section in the appropriate *Genie Z-60/34 Operator's Manual* and use the decal list and illustrations to determine that all decals and placards are in place.

2 Inspect all decals for legibility and damage. Replace any damaged or illegible decal immediately.

NOTICE Contact your authorized Genie distributor or Genie Industries if replacement decals are needed.

A-3
Inspect for Damage, Loose or Missing Parts

Daily machine condition inspections are essential to safe machine operation and good machine performance. Failure to locate and repair damage, and discover loose or missing parts may result in an unsafe operating condition.

1 Inspect the entire machine for damage and improperly installed or missing parts including:

- Electrical components, wiring and electrical cables
- Hydraulic hoses, fittings, cylinders and manifolds
- Fuel and hydraulic tanks
- Drive and turntable rotation motors and drive torque hubs
- Axle components
- Boom components and wear pads
- Dents or damage to machine
- Tires and wheels
- Engine and related components
- Limit switches
- Alarms, horn and beacon (if equipped)
- Nuts, bolts and other fasteners
- Platform entry mid-rail or gate
- Cracks in welds or structural components
- Compartment covers and latches

TABLE A PROCEDURES

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 with an improper oil level can damage engine components.

NOTICE Check the oil level with the engine off.

1 Check the oil dipstick. Add oil as needed.

⊙ Result: The oil level should be in the "safe" zone.

Ford LRG-425 EFI Engine **Oil capacity (including filter)**	4.5 quarts 4.3 liters

Ford LRG-425 EFI Engine **Oil viscosity requirements**	
below 60°F / 15.5°C	5W-30
-10°F to 90°F / -23°C to 32°C	5W-30
above -10°F / -23°C	5W-30
above 25°F / -4°C	10W-30

Use oils meeting API classification SH or SG.
Units ship with 10-40 CC/SG.

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

Deutz F4L 1011F Engine **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, SF/CC or SF/CD grades.
Units ship with 10-40 CC/SG.

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 at the FULL mark.

⚠WARNING Bodily injury hazard. Fluids in the radiator are under pressure and extremely hot. Use caution when removing cap and adding fluids.

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 Explosion and fire hazard. 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 A PROCEDURES

2 Perform a visual inspection around the following areas. An LPG detector may be necessary to locate LPG leaks.

Gasoline/LPG models:

- LPG tank, hoses and fittings, solenoid shutoff valve, LPG regulator and throttle body
- Gasoline tank, manual shutoff valve, fuel pump, fuel filters, fuel rail and fuel injectors, hoses and fittings and throttle body

Deutz Diesel models:

- Fuel tank, shutoff valve, hoses and fittings, fuel pump, fuel filter, fuel injection pumps and fuel injectors

⚠DANGER Explosion and fire hazard. If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

A-7
Check the Hydraulic Oil Level

Maintaining the hydraulic oil at the proper level is essential to machine operation. Improper hydraulic oil levels can damage hydraulic components. Daily checks allow the inspector to identify changes in oil level that might indicate the presence of hydraulic system problems.

1 Be sure that the boom is in the stowed position, then visually inspect the sight gauge located on the side of the hydraulic oil tank.

⊙ Result: The hydraulic oil level should be within the top 2 inches (5 cm) of the sight gauge.

Hydraulic oil specifications

Hydraulic oil type	Dexron equivalent
Tank capacity	45 gallons 170 liters
Hydraulic system (including tank)	53 gallons 201 liters

TABLE A PROCEDURES

A-8
Check for Hydraulic Leaks

Detecting hydraulic fluid leaks is essential to operational safety and good machine performance. Undiscovered leaks can develop into hazardous situations, impair machine functions and damage machine components.

⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin.

1 Inspect for hydraulic oil puddles, dripping or residue on or around the following areas:

- Hydraulic tank– fittings, hoses, and turntable surface
- Engine compartment–hydraulic filters, fittings, hoses, pumps, filter and turntable surface
- All hydraulic cylinders
- All hydraulic manifolds
- Primary, secondary and jib booms
- The underside of the turntable
- The underside of the drive chassis
- Ground area under the machine

A-9
Check the Tire Pressure

NOTICE This procedure does not need to be performed on machines equipped with the foam-filled tire option.

⚠WARNING Bodily injury hazard. An over-inflated tire can explode and could cause death or serious injury.

⚠WARNING Tip-over hazard. Do not use temporary flat tire repair products.

To safeguard maximum stability, achieve optimum machine handling and minimize tire wear, it is essential to maintain proper pressure in all air-filled tires.

1 Check each tire with an air pressure gauge and add air as needed.

Tire Specifications	Industrial	Rough terrain
Tire size	32x12-15NHS 300-15NHS	15-19.5NHS
Pressure	110 psi 7.59 bar	60 psi 4.14 bar

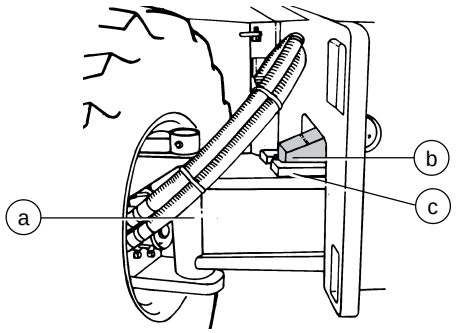
TABLE A PROCEDURES

A-10
Test the Oscillate Lock-out (oscillating axle models)

Proper axle oscillation lock-out when the primary boom is raised, extended or the turntable rotated is essential to safe machine operation. If the lock-out wedges do not extend when the primary boom is raised, extended or the turntable rotated, the stability of the machine is compromised and it may tip over.

1 Start the engine and raise the primary boom approximately 2 feet (61 cm).

⊙ Result: The oscillation lock-out wedges should fully extend.



a steer axle
b oscillate lock out wedge
c lock out wedge stop

2 Lower the primary boom to the stowed position.

⊙ Result: The oscillation lock-out wedges should fully retract.

3 Extend the primary boom approximately 2 ft (61 cm).

⊙ Result: The oscillation lock-out wedges should fully extend.

4 Fully retract the primary boom.

⊙ Result: The oscillation lock-out wedges should fully retract.

5 Raise the secondary boom approximately 2 feet (61 cm).

⊙ Result: The oscillation lock-out wedges should fully extend.

6 Lower the secondary boom to the stowed position.

⊙ Result: The oscillation lock-out wedges should fully retract.

7 Rotate the turntable so that the primary boom moves to one side of the drive chassis.

⊙ Result: The oscillation lock-out wedges should fully extend when the primary boom moves past either of the non-steering wheels.

8 Rotate the turntable back to the stowed position with the primary boom between the non-steering wheels.

⊙ Result: The oscillation lock-out wedges should fully retract when the primary boom is between the non-steering wheels.

A-11
Test the Platform and Ground Controls

Testing the machine functions and the Emergency Stop buttons for malfunctions is essential for safe machine operation. An unsafe working condition exists if any function fails to operate properly or either Emergency Stop button fails to stop all the machine functions and shut off the engine. Each function should activate, operate smoothly and be free of hesitation, jerking and unusual noise.

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

2 Start the engine from the ground controls.

3 Do not hold the function enable switch to either side. Attempt to activate each boom and platform function toggle switch.

⊙ Result: All boom and platform functions should **not** operate.

4 Hold the function enable switch to either side and activate each boom and platform function toggle switch.

⊙ Result: All boom and platform functions should operate through a full cycle. Descent alarm (if equipped) should sound while the boom is lowering.

5 Push in the Emergency Stop button to the OFF position.

⊙ Result: No function should operate, the engine should stop.

NOTICE Machines equipped with Platform Level Control Disable Function: The platform level function will not operate when the boom is raised or extended past the drive speed limit switches.

NOTICE Deutz Diesel models: All functions should stop immediately. The engine will shut off after 2 to 3 seconds.

6 Start the engine from the platform controls.

7 Do not press down on the footswitch.

8 Attempt to activate each machine function.

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

9 Press down on the footswitch and activate each machine function.

⊙ Result: All machine functions should operate through a full cycle.

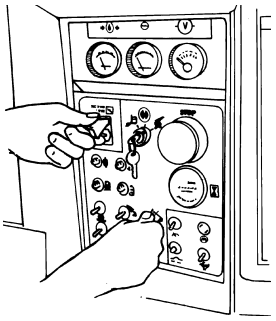
A-12
Test the Auxiliary Power Operation

Detection of auxiliary power system malfunctions is essential for safe machine operation. An unsafe working condition exists if the auxiliary powered functions do not operate in the event of a main power loss. When operating the machine on engine power, selecting auxiliary power will stop the engine immediately. Auxiliary power is designed for short term use only, and excessive use will result in battery drain and component damage.

1 Turn the key switch to ground control and pull out the Emergency Stop button to the ON position at the ground controls.

2 Lift the red auxiliary power switch cover.

3 Simultaneously hold the auxiliary power switch ON and activate each boom function toggle switch.



NOTICE To conserve battery power, test each function through a partial cycle.

⊙ Result: All boom functions should operate.

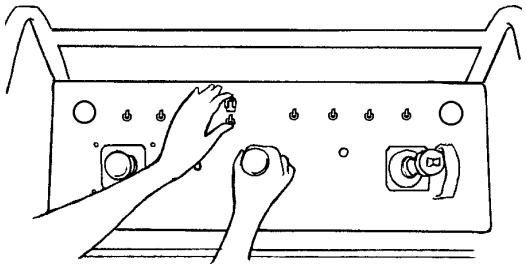
4 Turn the key switch to platform control.

5 Pull out the Emergency Stop button to the ON position at the platform controls, then press down the foot switch.

6 Lift the red auxiliary power switch cover.

TABLE A PROCEDURES

7 Simultaneously hold the auxiliary power switch ON and activate each function control handle or toggle switch.



NOTICE To conserve battery power, test each function through a partial cycle.

⊙ Result: All boom and steer functions should operate. Drive functions should not operate with auxiliary power.

A-13
Test the Tilt Sensor

The tilt sensor sounds an alarm located in the platform when the incline of the turntable exceeds the rating on the serial plate.

NOTICE Select a level test area. The tilt alarm should not be sounding prior to the test.

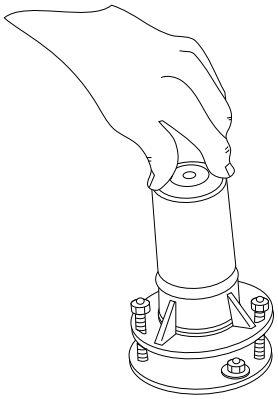
1 Open the ground controls side turntable cover.

2 Turn the keyswitch to platform controls and pull out the red Emergency Stop buttons out to the ON position at both the ground and platform controls.

3 Locate the tilt sensor next to the ground control box.

4 Press down on one side of the tilt sensor.

⊙ Result: The alarm, located in the platform, should sound.



⚠WARNING Tip-over hazard. The alarm should be heard at the ground controls. If you can't hear the alarm at the ground controls, replace the alarm in the platform.

A-14
Test the Limit Switches

Drive Limit Switches

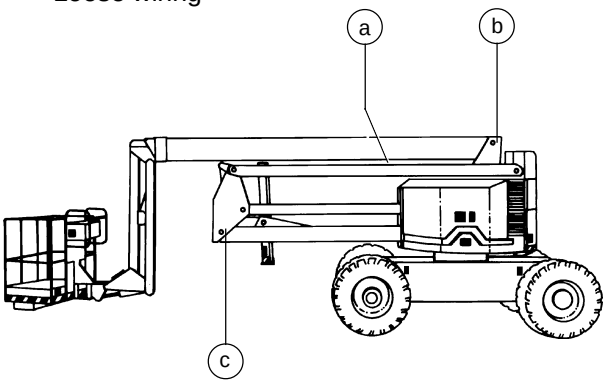
The drive limit switches are used to restrict drive speed when the primary boom is raised or extended, and to signal the oscillate cylinder to extend the lock-out wedges (oscillating axle equipped machines). An improperly functioning drive limit switch will allow the machine to operate in an unsafe position.

1 With the engine off and the boom in the stowed position, visually inspect the primary boom drive limit switch for the following:

· Broken or missing actuator arm

· Missing fasteners

· Loose wiring



a lift interlock limit switch (LS2) (hidden from view)
b primary boom drive limit switch (LS1)
c secondary boom limit switch (LS4)

2 Manually activate the primary boom drive limit switch.

⊙ Result: The primary boom drive limit switch arm should move freely and spring return to center. A distinct click should be felt and heard.

3 Locate the secondary boom drive limit switch located at the platform end of the lower secondary boom.

4 Visually inspect the secondary boom drive limit switch for the following:

· Broken or missing actuator arm

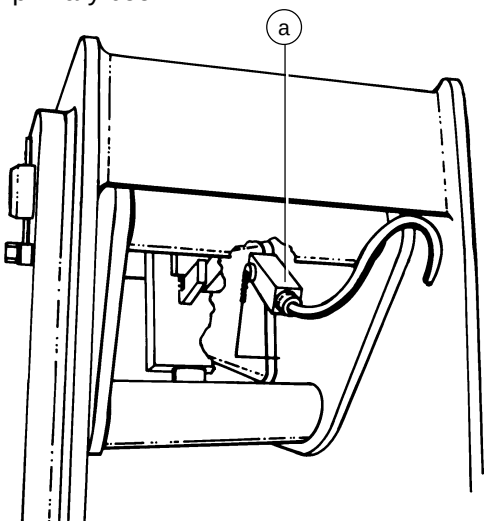
· Missing fasteners

· Loose wiring

5 Manually activate the secondary boom drive limit switch.

⊙ Result: The secondary boom drive limit switch arm should move freely and spring return to center. A distinct click should be felt and heard.

6 Locate the primary boom extend drive limit switch located inside the pivot end of the primary boom.



a primary boom extend limit switch (LS3)

7 Visually inspect the primary boom extend drive limit switch located at the pivot end of the primary boom. Inspect for the following:

· Broken or missing actuator arm

· Missing fasteners

· Loose wiring

8 Start the engine from the ground controls and extend the primary boom approximately 2 feet (0.6 m).

9 Turn the engine off.

TABLE A PROCEDURES

10 Manually activate the primary boom extend drive limit switch.

⊙ Result: The primary boom extend drive limit switch arm should move freely and spring return to center. A distinct click should be felt and heard.

11 Start the engine from the platform controls and fully retract the primary boom.

12 Move the lift/drive select switch to the drive position (if equipped).

13 Press down the footswitch and slowly move the drive control handle to the full drive position.

⊙ Result: The machine should move at normal drive speeds.

14 Move the lift/drive select switch to the lift position (if equipped).

15 Press down the footswitch. Then raise the primary boom approximately 2 feet (61 cm).

16 Move the lift/drive select switch to the drive position (if equipped).

17 Press down the footswitch and slowly move the drive control to the full drive position.

⊙ Result: The maximum achievable drive speed with the primary boom raised should not exceed 1 foot per second (0.3 meters per second).

⚠WARNING Tip-over hazard. If the drive speed with the primary boom raised or extended or the secondary boom raised exceeds 1 foot per second (0.3 meters per second), immediately tag and remove the machine from service.

18 Move the lift/drive select switch to the lift position (if equipped).

19 Lower the primary boom to the stowed position. Then extend the primary boom approximately 2 feet (61 cm).

20 Move the lift/drive select switch to the drive position (if equipped).

21 Press down the footswitch and slowly move the drive control handle to the full drive position.

⊙ Result: The maximum achievable drive speed with the primary boom extended should not exceed 1 foot per second (0.3 meters per second).

⚠WARNING Tip-over hazard. If the drive speed with the primary boom raised or extended or the secondary boom raised exceeds 1 foot per second (0.3 meters per second), immediately tag and remove the machine from service.

22 Move the lift/drive select switch to the lift position (if equipped).

23 Fully retract the primary boom. Then raise the secondary boom approximately 2 feet (61 cm).

24 Move the lift/drive select switch to the drive position (if equipped).

25 Press down the footswitch and slowly move the drive control handle to the full drive position.

⊙ Result: The maximum achievable drive speed with the secondary boom raised should not exceed 1 foot per second (0.3 meters per second).

26 Move the lift/drive select switch to the lift position (if equipped).

27 Lower the secondary boom to the stowed position.

Drive Speed, maximum, raised or extended	
All models	1 foot per second 0.3 meter per second

TABLE A PROCEDURES

Drive Enable Limit Switch

The drive enable limit switch is located in the electrical rotary coupler. The switch activates a signal light to inform the operator in the platform that the primary boom is past either of the non-steering wheels and stops drive movement unless the drive enable override switch is used. An improperly functioning drive enable limit switch will allow the machine to operate in an unsafe position.

1 Start the engine from the platform controls. Then rotate the turntable to the left until the primary boom is past the left non-steering wheel.

⊙ Result: The drive enable indicator light should be on. Drive function should not operate until the drive enable override switch is activated.

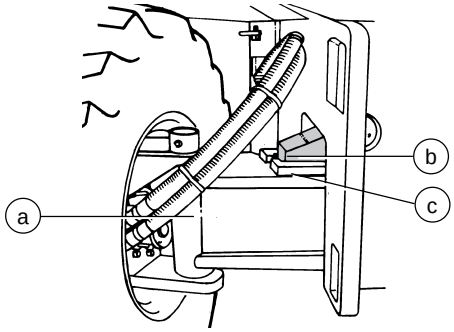
2 Rotate the turntable to the right until the primary boom is past the right non-steering wheel.

⊙ Result: The drive enable indicator light should be on. Drive function should not operate until the drive enable override switch is activated.

Rotation Oscillate Lock-out Limit Switch (oscillating axle models)

The rotation oscillate lock-out switch is located inside of the electrical rotary coupler. The switch signals the oscillate cylinder to extend the lock-out wedges when the primary boom is rotated past either of the non-steering wheels. An improperly functioning rotation oscillate lock-out switch will allow the machine to operate in an unsafe position.

1 Start the engine from the platform controls. Then rotate the turntable to the left until the primary boom is past the left non-steering wheel.



a steer axle
b oscillating lock-out wedge
c lock-out wedge stop

⊙ Result: The oscillate cylinder should fully extend the lock-out wedges against the wedge stops.

2 Rotate the turntable to the right until the primary boom is past the right non-steering wheel.

⊙ Result: The oscillate cylinder should fully extend the lock-out wedges against the wedge stops.

TABLE A PROCEDURES

Lift Interlock Limit Switch

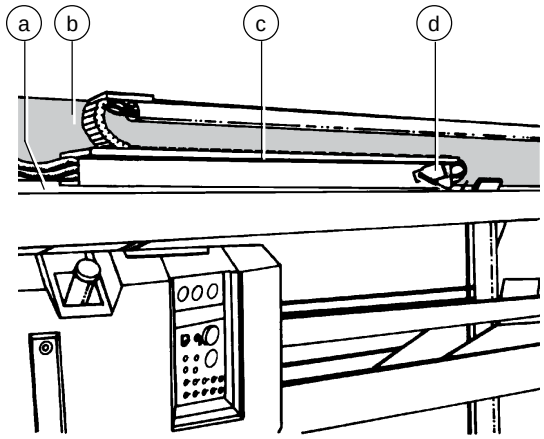
On oscillating axle equipped machines, the lift interlock switch stops the primary boom from being raised if the oscillate lock-out wedges are not fully extended. An improperly functioning lift interlock switch will allow the machine to operate in an unsafe position.

1 With the engine off and the boom in the stowed position, visually inspect the lift interlock limit switch for the following:

· Broken or missing actuator arm

· Missing fasteners

· Loose wiring



a lift interlock switch (hidden from view)
b primary boom
c cable track
d drive limit switch

2 Using auxiliary power, raise the primary boom past the lift interlock limit switch.

⊙ Result: When the primary boom passes the lift interlock limit switch, the primary boom should stop and not be able to continue to raise because the auxiliary power will not extend the oscillating lock-out wedges.

A-15
Replace the Engine Oil and Filter - Gasoline/LPG Models

NOTICE Ford engine specifications require that this procedure be performed every 100 hours. Perform this procedure more often if dusty conditions exist or the machine is subjected to extended low idle operation.

Periodic replacement of the engine oil and filter is essential to good engine performance. Operating the machine with an improper oil level or neglecting periodic oil and filter changes can damage engine components. A daily check of machine hours against the hours noted on the oil filter will allow the inspector to anticipate and perform oil and filter changes at the 100 hour interval.

NOTICE Perform this procedure after warming the engine to normal operating temperature.

⚠CAUTION Bodily injury hazard. Beware of hot engine parts and oil. Contact with hot engine oil and/or engine parts may cause severe burns.

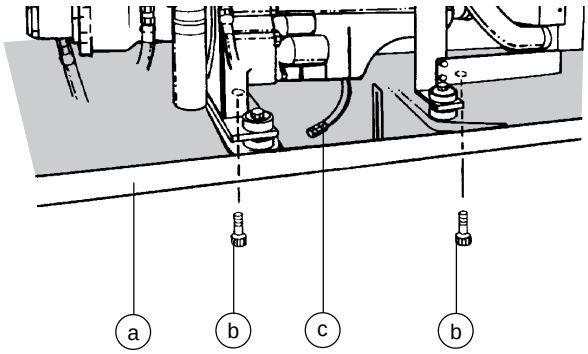
1 Remove the oil filler cap located on the valve cover.

2 Pull the oil drain hose out from underneath the engine.

3 Open the valve on the oil pan and allow all of the oil from the engine to drain into a suitable container. See capacity specifications.

4 Close the valve on the oil pan.

5 Remove the 2 engine pivot plate retaining bolts. Then swing the engine out away from the machine to access the oil filter.



a engine pivot plate
b pivot plate retaining bolts
c oil drain hose

6 Place a container under the oil filter.

7 Use an oil filter wrench and remove the filter.

8 Apply a thin layer of oil to the new oil filter gasket (Genie part no. 52581). Then install the filter and tighten it securely by hand.

9 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter.

10 Fill the engine with new oil per specifications and install the filler cap. See capacity specifications.

11 Start the engine from the ground controls. Allow the engine to run for 30 seconds, then turn the engine off.

12 Check the oil filter, oil pan drain hose and drain valve for leaks.

13 Swing the engine pivot plate back to its original position and install the 2 engine pivot plate retaining bolts.

14 Check the engine oil level dipstick. Add oil if needed.

Ford LRG-425 EFI Engine Oil capacity (including filter)	4.5 quarts 4.3 liters

Ford LRG-425 EFI Engine Oil viscosity requirements	
below 60°F / 15.5°C	5W-30
-10°F to 90°F / -23°C to 32°C	5W-30
above -10°F / -23°C	5W-30
above 25°F / -4°C	10W-30

Use oils meeting API classification SH or SG.
Units ship with 10-40 CC/SG.

A-16
Replace the Engine Air Filter

NOTICE Engine specifications require that this procedure be performed every 100 hours. Perform this procedure more often if dusty conditions exist.

Maintaining the engine air filter in good condition is essential to good engine performance and service life. Failure to perform this procedure can lead to poor engine performance and component damage.

NOTICE Perform this procedure with the engine off.

1 Raise the turntable cover. Support and secure the open cover with an overhead crane or forklift. Do not lift the cover.

⚠CAUTION Crushing hazard. Due to its heavy weight, do not attempt to support the cover by hand.

CAUTION Component damage hazard. Protect the cover from damage by using carpet or padding on the crane or forklift forks.

TABLE A PROCEDURES

2 Remove the upper retaining clip from the gas strut at the cover end.

3 Gently pry the strut pivot socket off of the ball stud on the cover. Protect the strut cylinder rod from damage.

4 Remove the retaining ring from the end cap of the air filter canister.

5 Remove the end cap from the air cleaner canister.

6 Remove the air filter retaining fastener, then remove the filter.

7 Clean the inside of the canister and the gasket with a damp cloth.

8 Insert the new filter and install the mounting fastener.

9 Replace the end cap on the canister, then install the retaining ring.

NOTICE Be sure that the arrows on the air cleaner end cap point in the UP direction.

10 Install the gas strut onto the ball stud on the cover. Then install the retaining clip on the gas strut.

Air filters - Genie part numbers	
Ford LRG-425 EFI Engine	27916
Deutz F4L 1011F Engine	27916

Table B Procedures

B-1
Check the Engine Belt

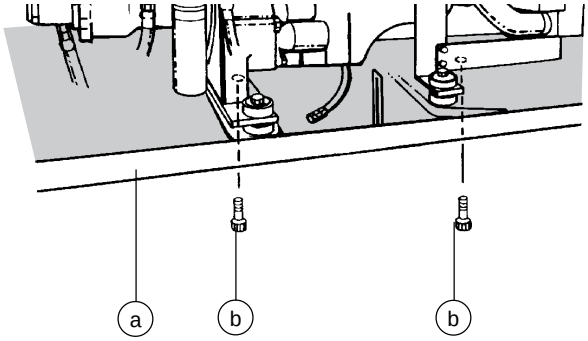
Maintaining the engine belt is essential to good engine performance and service life. The machine will not operate properly with a loose or defective belt and continued use may cause component damage.

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

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

Deutz Diesel models:

1 Remove the 2 engine pivot plate retaining bolts. Then swing the engine out away from the machine to access the front engine access cover mounting fasteners.



a engine pivot plate
b pivot plate retaining bolts

2 Remove the front engine access cover mounting fasteners.

All models:

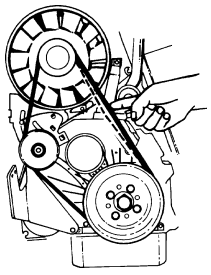
3 Inspect the engine belt for:
- Cracking
- Glazing
- Separation
- Breaks

4 Replace belt if any damage is found.

NOTICE Ford LRG-425 EFI engines are equipped with a serpentine belt and incorporate a self adjusting pulley tensioner. No adjustment is required.

Deutz Diesel models:

5 Check the engine belt for proper tension.



Deutz Diesel engine

6 Install the front engine access cover.

7 Swing the engine in to its original position and install the 2 engine pivot plate retaining bolts.

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

Engine belts - Genie part numbers	
Deutz Diesel models	32698
Gasoline/LPG models	52580

TABLE B PROCEDURES

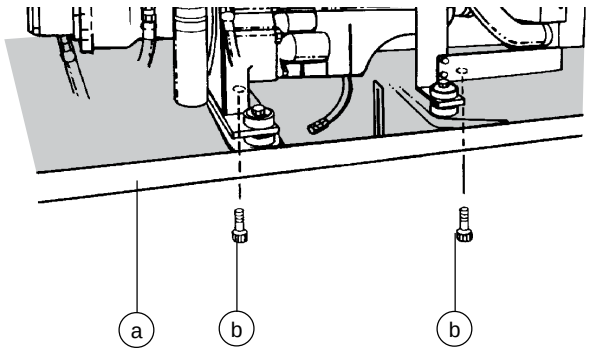
B-2
Check the Radiator - Gasoline/LPG Models

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 Bodily injury hazard. Do not inspect while the engine is running. Remove the key to secure from operation.

⚠CAUTION Bodily injury hazard. Beware of hot engine parts and coolant. Contact with hot engine parts and/or coolant may cause severe burns.

1 Remove the 2 engine pivot plate retaining bolts. Then swing the engine out away from the machine to access the radiator.



a engine pivot plate
b pivot plate retaining bolts

2 Inspect the radiator for leaks and physical damage.

3 Clean the radiator fins of debris and foreign materials.

4 Swing the engine back to its original position and install the 2 engine pivot plate retaining bolts.

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.

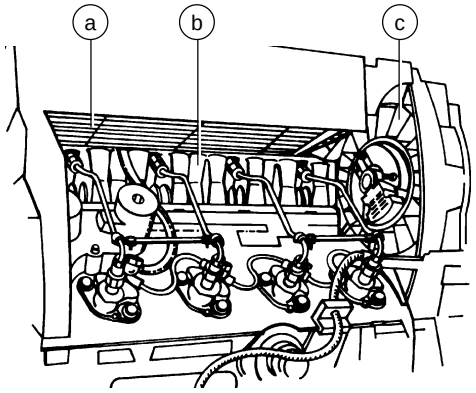
⚠WARNING Bodily injury hazard. Do not inspect while the engine is running. Remove the key to secure from operation.

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

Oil Cooler

1 Remove the fasteners from the engine side cover, then remove the cover.

2 Inspect the oil cooler for leaks and physical damage.



a oil cooler
b cylinder head cooling fins
c fan blower fins

3 Clean the oil cooler of debris and foreign material.

Cooling and Fan Blower Fins

4 Inspect the fan blower fins for physical damage.

5 Clean the fan blower fins of debris and foreign material.

6 Inspect the head cooling passages and fins for physical damage or foreign material, using a flashlight.

7 Clean the cylinder head cooling passages of debris and foreign material.

8 Install the engine side cover.

9 Swing the engine back to its original position and install the 2 engine pivot plate retaining bolts.

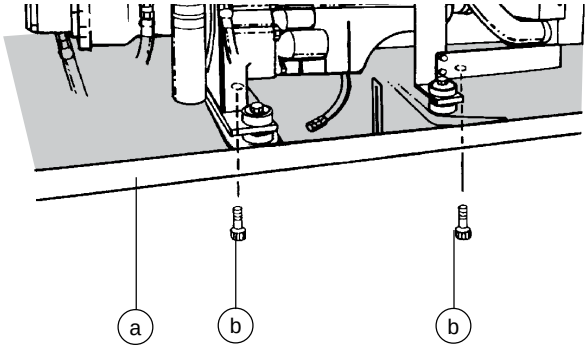
B-4
Check the Exhaust System

Maintaining the exhaust system is essential to good engine performance and service life. Running the engine with a damaged or leaking exhaust system can cause component damage and unsafe operating conditions.

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

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

1 **Deutz Diesel models:** Remove the 2 engine pivot plate retaining bolts. Then swing the engine out away from the machine to access the exhaust system.



a engine pivot plate
b pivot plate retaining bolts

2 **All models:** Be sure that all nuts and bolts are tight.

3 Inspect all welds for cracks.

4 Inspect for exhaust leaks; i.e., carbon buildup around seams and joints.

5 **Deutz Diesel models:** Swing the engine back to its original position and install the 2 engine pivot plate retaining bolts.

TABLE B PROCEDURES

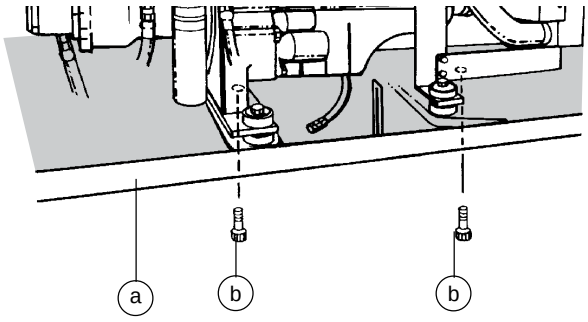
B-5
Check the Battery

Proper battery condition is essential to good engine performance and operational safety. Improper fluid levels or damaged cables and connections can result in engine component damage and hazardous conditions.

⚠WARNING Electrocution hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

⚠WARNING Bodily injury hazard. Batteries contain acid. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

1 Remove the 2 engine pivot plate retaining bolts. Then swing the engine out away from the machine to access the battery.



a engine pivot plate
b pivot plate retaining bolts

1 Put on protective clothing and eye wear.

2 Be sure that the battery cable connections are free of corrosion.

3 Be sure that the battery hold downs and cable connections are tight.

4 Remove the battery vent caps and check the specific gravity with a hydrometer.

5 Check the battery acid level. If needed, replenish with distilled water to the battery fill tube. Do not overfill.

6 Install the vent caps.

NOTICE Adding terminal protectors and a corrosion preventative sealant will help eliminate corrosion on the battery terminals and cables.

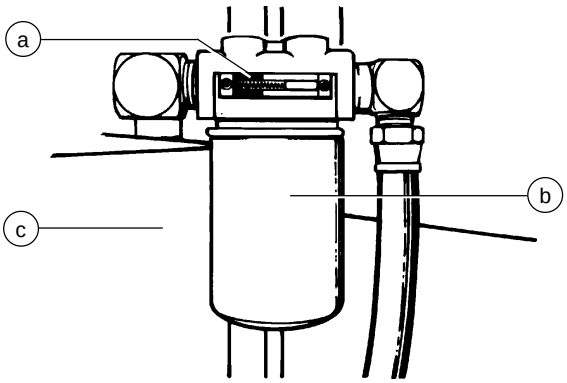
B-6
Check the Hydraulic Tank Return Filter Condition Indicator

Maintaining the hydraulic tank return filter in good condition is essential to good system performance and safe machine operation. The filter condition indicator will show when the hydraulic flow is bypassing a clogged filter. If the filter is not frequently checked and replaced, impurities will remain in the hydraulic system and cause component damage.

1 Start the engine from the platform controls.

2 Move the engine speed control switch to high idle (rabbit symbol).

3 Inspect the filter condition indicator.



a filter condition indicator
b filter
c hydraulic tank

⊙ Result: The filter should be operating with the plunger in the green area. If the display shows the plunger in the red area, this indicates that the hydraulic filter is being bypassed and the filter should be replaced. See C-6, *Replace the Hydraulic Tank Return Filter.*

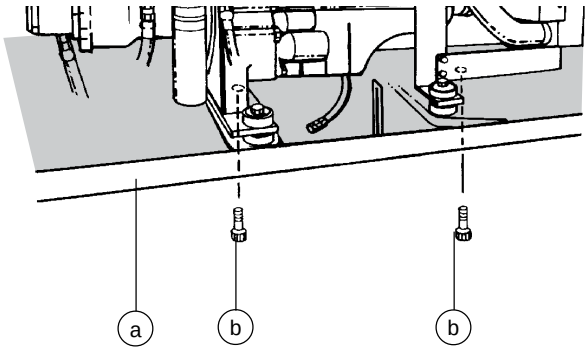
B-7
Inspect the Electrical Wiring

Maintaining electrical wiring in good condition is essential to safe operation and good machine performance. Failure to find and replace burnt, chafed, corroded or pinched wires could result in unsafe operating conditions and may cause component damage.

⚠WARNING Electrocution hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Open the engine side turntable cover.

2 Remove the 2 engine pivot plate retaining bolts and swing the engine out away from the machine to access the wiring.



a engine pivot plate
b pivot plate retaining bolts

3 Inspect the following areas for burnt, chafed, corroded and loose wires:

- Engine wiring harness
- Turntable wiring

4 Open the ground controls side turntable cover.

5 Inspect the following areas for burnt, chafed, corroded and loose wires:

- Inside of the ground control box
- Function manifold wiring

6 Start the engine from the ground controls and raise the secondary boom above the turntable covers.

7 Inspect the turntable area for burnt, chafed and pinched cables.

8 Lower the boom into the stowed position and turn the engine off.

9 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:

- Cable track on the primary boom
- Cables on the primary, secondary and jib booms
- Inside of the platform control box

B-8
Inspect the Tires and Wheels (including lug nut torque)

Maintaining the tires and wheels in good condition is essential to safe operation and good performance. Tire and/or wheel failure could result in a machine tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

⚠WARNING Bodily injury hazard. An over-inflated tire can explode and may cause death or serious injury.

⚠WARNING Tip-over hazard. Do not use temporary flat tire repair products.

1 Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.

2 Check each wheel for damage, bends and cracked welds.

3 Check each lug nut for proper torque.

TABLE B PROCEDURES

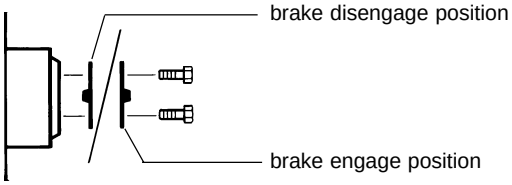
4 Check the pressure in each air-filled tire.

Tires and wheels	Industrial	Rough terrain
Tire size	32x12-15 NHS 300-15NHS	15-19.5NHS
Tire ply rating	20	12
Tire pressure	110 psi 7.58 bar	60 psi 4.14 bar
Wheel lugs	9 @ 5/8-18	9 @ 5/8-18
Lug nut torque, dry	125 ft-lbs 169.5 Nm	125 ft-lbs 169.5 Nm
Lug nut torque, lubricated	94 ft-lbs 127.4 Nm	94 ft-lbs 127.4 Nm

B-9 Confirm the Proper Brake Configuration

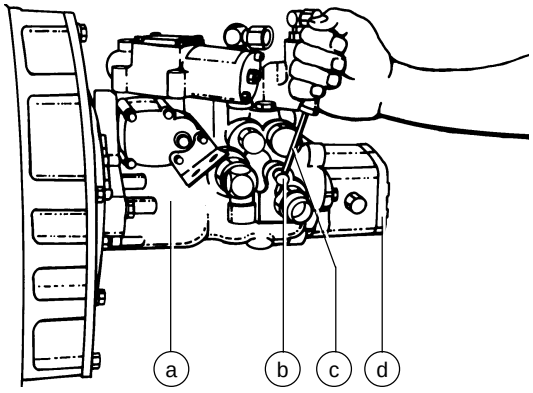
Proper brake configuration is essential to safe operation and good machine performance. Hydrostatic brakes and hydraulically-released, spring-applied individual wheel brakes can appear to operate normally when they are actually not fully operational.

1 Check each torque hub disconnect cap to be sure it is in the engaged position.



2 Be sure the free-wheel valve on the drive pump is closed (clockwise).

NOTICE The free-wheel valve is located on the side of the drive pump.



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

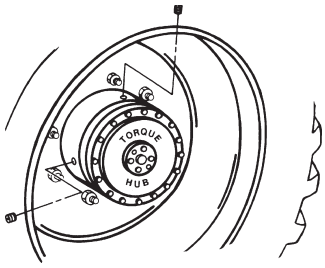
NOTICE The free-wheel valve should always remain closed.

B-10
Check the Torque Hub Oil Level and Fastener Torque

Failure to maintain proper torque hub oil levels may cause the machine to perform poorly and continued use may cause component damage.

Drive Torque Hubs

1 Drive the machine to rotate the hub until the plugs are located one on top and the other at 90 degrees.



2 Remove the plug located at 90 degrees and check the oil level.

⊙ Result: The oil level should be even with the bottom of the plug hole.

3 If necessary, remove the top plug and add oil until the oil level is even with the bottom of the side plug hole.

4 Apply pipe thread sealant to the plug, and then install it in the torque hub.

5 Check the torque hub mounting fasteners. Torque the fasteners to 160 ft-lbs / 217 Nm.

6 Repeat this procedure for each drive torque hub.

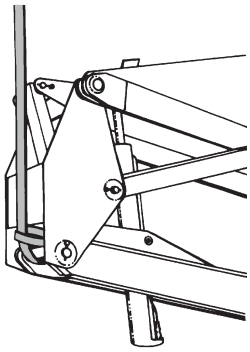
Drive Torque Hub Oil	
Capacity	40 fluid ounces 1.2 liters

Type: SAE 90 multipurpose hypoid gear oil - API service classification GL5

Turntable Rotate Torque Hub

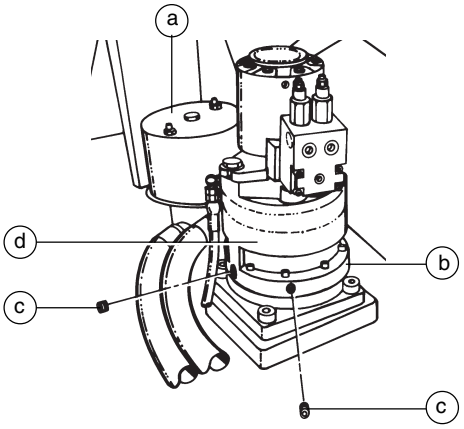
1 Raise the secondary boom until the platform end of the lower secondary boom arm is 8 feet (2.4 m) off the ground.

2 Attach the lifting strap from an overhead crane to the platform end of the lower secondary boom arm for support. Do not lift.



3 Remove the plug located on the side of the hub and check the oil level.

⊙ Result: The oil level should be even with the bottom of the plug hole.



a eletrical rotary coupler
b torque hub
c plug
d brake

TABLE B PROCEDURES REV B

4 If necessary, add oil until the oil level is even with the bottom of the side plug hole, then re-install the plug into the hub.

Turntable Rotate Torque Hub Oil	
Capacity	8 fluid ounces 0.24 liters

TypeSAE 90 multipurpose hypoid gear oil - API service classification GL5

5 Check the turntable torque hub fasteners. Torque the fasteners to 160 ft-lbs / 217 Nm.

B-11 Check and Adjust the Engine RPM

Maintaining the engine rpm at the proper setting for both low and high idle is essential to good engine performance and service life. The machine will not operate properly if the rpm is incorrect and continued use may cause component damage.

Gasoline/LPG Models:

NOTICE The engine rpm is controlled by the ECM and can only be adjusted by re-programming the ECM. If rpm adjustment or service is required, please contact Genie Industries Service Department OR your local Ford dealer.

Gasoline/LPG models	
Low idle	1600 rpm
High idle	2500 rpm

Deutz Diesel models:

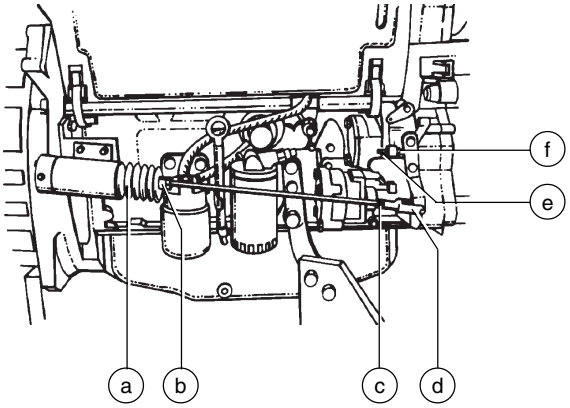
NOTICE This procedure will require two people.

1 Connect an rpm gauge to the engine, and then start the engine from the ground controls.

⊙ Result: Low idle should be 1500 rpm.

Skip to step 4 if the low idle rpm is correct.

2 Loosen the low idle lock nut, then turn the low idle adjustment screw clockwise to increase the rpm or counterclockwise to decrease the rpm. Tighten the low idle lock nut and recheck the rpm.



a solenoid boot
b high idle adjustment nut
c yoke lock nut
d yoke
e low idle adjustment screw
f low idle lock nut

3 Move the function enable toggle switch to the high idle (rabbit symbol) position at the ground controls.

⊙ Result: High idle should be 2300 rpm.

If high idle rpm is correct, disregard adjustment step 4.

4 Loosen the yoke lock nut, then turn the high idle adjustment nut and solenoid boot counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the yoke lock nut and recheck the rpm.

NOTICE Be sure the solenoid fully retracts when activating high idle.

Deutz Diesel models	
Low idle	1500 rpm
High idle	2300 rpm

B-12
Test the Key Switch

Proper key switch action and response is essential to safe machine operation. The machine can be operated from the ground or platform controls and the activation of one or the other is accomplished with the key switch. Failure of the key switch to activate the appropriate control panel could cause a hazardous operating situation.

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

2 Turn the key switch to ground control, start the engine and then turn the key switch to **platform control**.

3 Check any machine function from the **ground controls**.

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

4 Turn the key switch to ground control.

5 Check any machine function from the **platform controls**.

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

6 Turn the key switch to the OFF position.

⊙ Result: The engine should stop and no functions should operate.

NOTICE Deutz Diesel models: All functions should stop immediately. The engine will shut off after 2 to 3 seconds.

B-13
Test the Emergency Stop Buttons

Properly functioning Emergency Stop buttons are essential for safe machine operation. An improperly operating Emergency Stop button will fail to shut off power and stop all machine functions, resulting in a hazardous situation for ground and platform personnel.

NOTICE As a safety feature, selecting and operating the ground controls will override the platform controls, including the platform Emergency Stop button.

1 Start the engine from the ground controls.

2 Push down the Emergency Stop button to the OFF position.

⊙ Result: The engine should shut off and no machine functions should operate.

NOTICE **Deutz Diesel models:** All functions should stop immediately. The engine will shut off after 2 to 3 seconds.

3 Start the engine from the platform controls.

4 Push down the Emergency Stop button to the OFF position.

⊙ Result: The engine should shut off and no machine functions should operate.

NOTICE The ground Emergency Stop button will stop all machine operation, even if the key switch is switched to platform control.

TABLE B PROCEDURES

B-14
Test the Ground Control Override

A properly functioning ground control override is essential to safe machine operation. The ground control override function is intended to allow ground personnel to operate the machine from the ground controls whether or not the Emergency Stop button on the platform controls is in the ON or OFF position. This function is particularly useful if the operator at the platform controls cannot return the boom to the stowed position.

1 Push in the platform Emergency Stop button to the OFF position.

2 Start the engine from the ground controls.

3 At the ground controls, operate each boom function through a partial cycle.

⊙ Result: All boom functions should operate.

B-15
Test the Platform Self-leveling

Automatic platform self-leveling throughout the full cycle of boom raising and lowering is essential for safe machine operation. The platform is maintained at level by the platform leveling slave cylinder which operates in a closed loop hydraulic circuit with the master cylinder located at the base of the boom.
A platform self-leveling failure creates an unsafe working condition for platform and ground personnel.

1 Start the engine from the ground controls and lower the boom into the stowed position.

2 Hold the function enable toggle switch to either side and adjust the platform to a level position using the platform level toggle switch.

3 Raise and lower the primary boom through a full cycle.

⊙ Result: The platform should remain level at all times to within ±5 degrees.

B-16
Test the Horn

A functional horn is essential to safe machine operation. The horn is activated at the platform controls and sounds at the ground as a warning to ground personnel. An improperly functioning horn will prevent the operator from alerting ground personnel of hazards or unsafe conditions.

1 Turn the key switch to platform control and pull out the Emergency Stop button to the ON position at both the ground and platform controls.

2 Push down the horn button at the platform controls.

⊙ Result: The horn should sound.

NOTICE If necessary, the horn can be adjusted to obtain the loudest volume by turning the adjustment screw near the wire terminals on the horn.

B-17
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 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 Turn the keyswitch to platform controls and pull out the Emergency Stop button to the ON position at both the ground and platform controls.

2 Press down the footswitch and attempt to start the engine by moving the start toggle switch to either side.

⊙ Result: The engine should **not** start.

3 Do not press down the footswitch and attempt to start the engine.

⊙ Result: The engine should start.

4 Do not press down the footswitch. Check the machine functions.

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

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

⊙ Result: The machine functions should operate.

B-18
Test the Engine Idle Select

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

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

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

Foot switch activated high idle (rabbit and foot switch symbols) 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 function enable toggle switch to the high idle (rabbit symbol) position and hold in the ON position.

⊙ Result: The engine should change to high idle.

3 Release the function enable toggle 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 idle control switch to high idle (rabbit symbol). Do not press down the footswitch.

⊙ Result: The engine should change to high idle.

6 Move the engine idle control switch to low idle (turtle symbol).

⊙ Result: The engine should change to low idle.

7 Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).

⊙ Result: The engine should **not** change to high idle.

8 Press down the foot switch.

⊙ Result: The engine should change to high idle.

TABLE B PROCEDURES

B-19
Test the Fuel Select Operation - Gasoline/LPG Models

The ability to select and switch between gasoline and LPG fuels as needed is essential to safe machine operation. A fuel selection can be made when the engine is running or not. Switching malfunctions and/or the failure of the engine to start and run properly in both fuel modes and through all idle speeds can indicate fuel system problems that could develop into a hazardous situation.

NOTICE Perform this test after checking the gasoline and LPG fuel levels, and warming the engine to normal operating temperature.

1 Move the fuel select switch to gasoline and then move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).

2 Start the engine from the platform controls and allow it to run at low idle.

3 Press down the foot switch to allow the engine to run at high idle.

⊙ Result: The engine should start promptly and operate smoothly in low and high idle.

4 Release the foot switch and shut the engine off by pushing the Emergency Stop button in to the OFF position.

5 Move the fuel select switch to LPG.

6 Restart the engine and allow it to run at low idle.

7 Press down the foot switch to allow the engine to run at high idle.

⊙ Result: The engine should start promptly and operate smoothly in low and high idle.

NOTICE The engine may hesitate momentarily and then continue to run on the selected fuel if the fuel source is switched while the engine is running.

B-20
Test the Drive Enable System

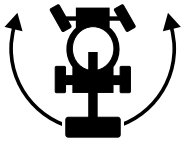
Proper drive enable system operation is essential to safe machine operation. When the boom is past the non-steering wheels, drive movement is stopped and the indicator light turns on. The drive enable switch must be to either side to reactivate the drive function and should inform the operator that the machine will move in the opposite direction that the drive and steer controls are moved. An improperly functioning drive enable system may allow the machine to be moved into an unsafe position.

1 Start the engine from the platform controls.

2 Move the lift/drive select switch to the lift position (if equipped).

3 Press down the footswitch.

4 Rotate the turntable until the primary boom moves past one of the non-steering wheels.



⊙ Result: The drive enable indicator light should come on and remain on while the boom is anywhere in the range shown.

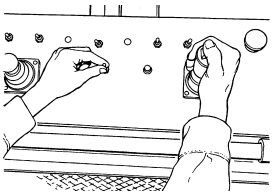


5 Move the lift/drive select switch to the drive position (if equipped).

6 Move the drive control handle off center.

⊙ Result: The drive function should **not** operate.

7 Move and hold the drive enable toggle switch to either side and slowly move the drive control handle off center.



⚠CAUTION Collision hazard. Always use the color-coded direction arrows on the platform control panel and the drive chassis to identify which direction the machine will travel.

⊙ Result: The drive function should operate.

8 Rotate the turntable in the opposite direction until the primary boom is past the other non-steering wheel.

⊙ Result: The drive enable indicator light should come on and remain on while the boom is anywhere in the range shown.

9 Repeat steps 6 and 7.

B-21
Test the Drive Brakes

Proper brake action is essential to safe machine operation. The drive brake function should operate smoothly, free of hesitation, jerking and unusual noise. Hydrostatic brakes and hydraulically-released individual wheel brakes can appear to operate normally when they are actually not fully operational.

⚠WARNING Collision hazard. Be sure that the machine is not in free-wheel or partial free-wheel configuration. Refer to B-9 in this section, *Confirm the Proper Brake Configuration*.

NOTICE Select a test area that is firm, level and free of obstructions.

1 Mark a test line on the ground for reference.

2 Start the engine from the platform controls.

3 Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch), then lower the boom into the stowed position.

4 Choose a point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the test line.

5 Bring the machine to top drive speed before reaching the test line. Release the drive joystick when your reference point on the machine crosses the test line.

6 Measure the distance between the test line and your machine reference point.

Braking: high range, paved surface	
Stopping distance	4 to 6 ft 1.2 to 1.8 m

NOTICE The brakes must be able to hold the machine on any slope it is able to climb.

B-22
Test the Drive Speed - Stowed Position

Proper drive function movement is essential to safe machine operation. The drive function should respond quickly and smoothly to operator control. Drive performance should also be free of hesitation, jerking and unusual noise over the entire proportionally controlled speed range.

NOTICE Select a test area that is firm, level and free of obstructions.

1 Create start and finish lines by marking two lines on the ground 40 feet (12.2 m) apart.

2 Start the engine from the platform controls.

TABLE B PROCEDURES

3 Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch), then lower the boom into the stowed position.

4 Choose a point on the machine; i.e., contact patch of a tire, as a visual reference for use when crossing the start and finish lines.

5 Bring the machine to top drive speed before reaching the start line. Begin timing when your reference point on the machine crosses the start line.

6 Continue at full speed and note the time when the machine reference point crosses the finish line.

Drive speed: stowed position, high range	**2WD**	**4WD**
Gasoline/LPG models	40 ft/7.8 sec 12.2m/7.8 sec	40 ft/6.1 sec 12.2m/6.1 sec
Deutz Diesel models	40 ft/9.1 sec 12.2m/9.1 sec	40 ft/7 sec 12.2m/7 sec

B-23
Test the Alarm Package - Optional Equipment

The alarm package includes:

- Travel alarm
- Descent alarm
- Flashing beacon

Alarms and a beacon are installed to alert operators and ground personnel of machine proximity and motion. The alarm package is installed on the turntable covers.

NOTICE The alarms and beacon will operate with the engine running or not running.

1 Turn the key switch to ground control and pull out the Emergency Stop button to the ON position at both the ground and platform controls.

⊙ Result: The flashing beacon should be ON and flashing.

2 Move the function enable switch to either side and activate the primary boom toggle switch in the DOWN position, hold for a moment and then release it.

⊙ Result: The descent alarm should sound when the switch is held down.

3 Move the function enable switch to either side and activate the secondary boom toggle switch in the DOWN position, hold for a moment and then release it.

⊙ Result: The descent alarm should sound when the switch is held down.

4 Turn the key switch to platform control.

⊙ Result: The flashing beacon should be ON and flashing.

B-24
Perform Hydraulic Oil Analysis

See D-1, *Test or Replace the Hydraulic Oil.*

B-25
Replace the Engine Oil and Filter - Deutz Diesel Models

NOTICE Engine specifications require that this procedure be performed every 500 hours. Perform this procedure more often if dusty conditions exist or if the machine is operated in hot climates.

Periodic replacement of the engine oil and filter is essential to good engine performance. Operating the machine with an improper oil level or neglecting periodic oil and filter changes can damage engine components. A frequent check of elapsed machine hours against the hours noted on the oil filter will allow the inspector to anticipate and perform oil and filter changes at the 500 hour interval.

NOTICE Perform this procedure after warming the engine to normal operating temperature.

⚠CAUTION Bodily injury hazard. Beware of hot engine parts and oil. Contact with hot engine oil and/or engine parts may cause severe burns.

1 Remove the oil filler cap located above the dipstick.

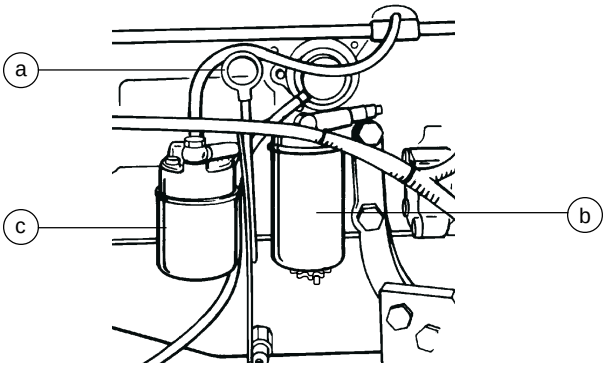
2 Remove the oil pan drain plug located on the bottom of the oil pan and allow all of the oil from the engine to drain into a suitable container. See capacity specifications.

NOTICE Do not remove the drain plug located on the side of the oil pan.

3 Install the drain plug in the oil pan.

4 Place a suitable container under the oil filter.

5 Use an oil wrench and remove the oil filter.



a engine oil level dipstick
b fuel filter/water separator
c oil filter

6 Apply a thin layer of oil to the gasket of the new filter (Genie part no. 49924). Then install the filter and tighten it securely by hand.

7 Use a permanent ink marker to write the date and number of hours from the hour meter on the oil filter.

8 Fill the engine with new oil per specifications and install the oil filler cap.

9 Start the engine from the ground controls. Allow the engine to run for 30 seconds then turn the engine off.

10 Check the oil filter and oil pan drain plug for leaks.

11 Check the engine oil level dipstick. Add oil if needed.

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

Deutz Engine F4L 1011F Oil viscosity requirements	
Temperature below 60°F / 15.5°C (synthetic)	5W-30
-10°F to 90°F / -23°C to 32°C	10W-40
Temperature 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.
Units shipped with 10-40 CC/SG

Table C Procedures

C-1
Check the Primary Boom Wear Pads

Maintaining the primary boom wear pads in good condition is essential to safe machine operation. Wear pads are placed on boom tube surfaces to provide a low friction, replaceable wear pad between moving parts. Improperly shimmed wear pads or continued use of extremely worn wear pads may result in component damage and unsafe operating conditions.

1 Start the engine from the ground controls, then extend the primary boom 1 foot (30 cm).

2 Measure each wear pad. Replace the wear pad if it is less than $^{9}/_{16}$ inch. If the wear pad is not less than $^{9}/_{16}$ inch, shim as necessary to obtain zero clearance and zero drag.

3 Extend and retract the primary boom through the entire range of motion to check for tight spots that may cause binding or scraping of the boom.

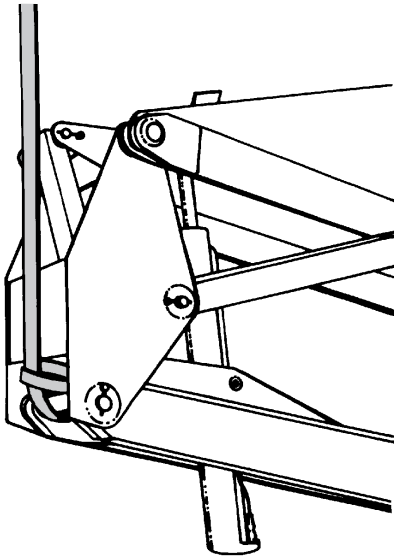
NOTICE Always maintain squareness between the primary boom inner and outer tubes.

C-2
Check the Turntable Rotation Bearing Bolts

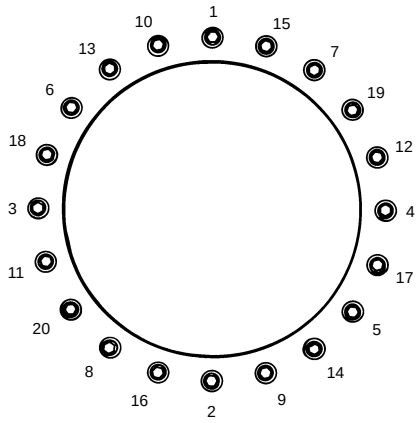
Maintaining proper torque on the turntable bearing bolts is essential to safe machine operation. Improper bolt torque could result in an unsafe operating condition and component damage.

1 Raise the secondary boom until the platform end of the lower secondary boom arm is 8 feet (2.4 m) off the ground.

2 Attach the lifting strap from an overhead crane to the platform end of the lower secondary boom arm for support. Do not lift.

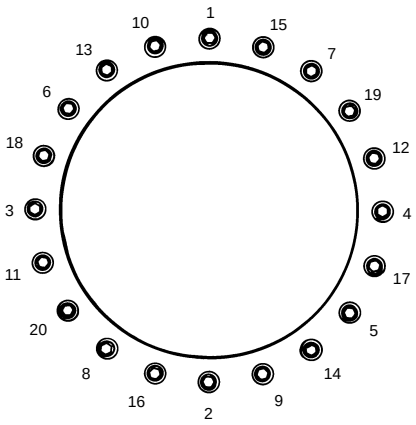


3 Check to ensure that each turntable bearing bolt is torqued in specified order to 210 foot-pounds (285 Newton meters).



4 Remove the strap from the lower secondary boom arm. Then lower the secondary boom to the stowed position.

5 Check to ensure that each bearing mounting bolt under the drive chassis is torqued in specified order to 210 foot-pounds (285 Newton meters).



C-3 Check the Free-wheel Configuration

Proper use of the free-wheel configuration is essential to safe machine operation. The free-wheel configuration is used primarily for towing. A machine configured to free-wheel without operator knowledge may cause death or serious injury and property damage.

⚠WARNING Collision hazard. Select a work site that is firm and level.

CAUTION Component damage hazard. If the machine must be towed, do not exceed 2 mph (3.2 km/h).

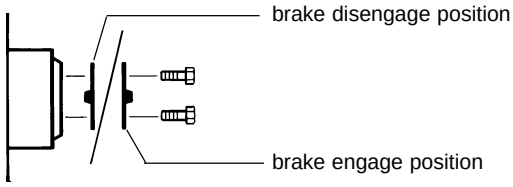
Non-steering wheels: All models

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

2 Center a lifting jack of ample capacity (20,000 lbs/9072 kg) under the drive chassis between the non-steer tires.

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

4 Disengage the torque hubs by turning over the torque hub disconnect caps on each non-steer wheel hub.



5 Manually rotate each non-steering wheel.

⊙ Result: Each non-steering wheel should rotate with minimum effort.

6 Re-engage the torque hubs by turning over the hub disconnect caps. Rotate each wheel to check for engagement. Lift the machine and remove the jack stands.

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

Steer wheels: 4WD models

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

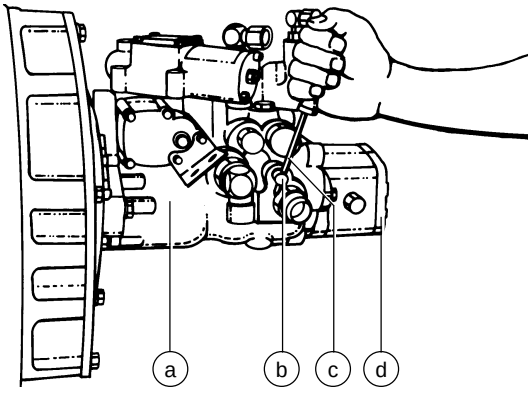
8 Center a lifting jack of ample capacity (20,000 lbs/9072 kg) under the drive chassis between the steer tires.

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

TABLE C PROCEDURES

10 Locate the free wheel valve on the bottom of the drive pump.

11 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
d lift pump

12 Manually rotate each steer wheel.

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

13 Close the free wheel valve on the drive pump by turning it clockwise.

14 Lift the machine and remove the jack stands.

NOTICE 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.

1 Locate the grease fitting on the platform end of the engine side bulkhead.

2 Pump grease into the turntable rotation bearing. Rotate the turntable in increments of 4 to 5 inches (10 to 13 cm) at a time and repeat this step until the entire bearing has been greased.

3 Apply grease to each tooth of the drive gear, located under the turntable.

Oil type	Multipurpose grease

C-5
Replace the Torque Hub Oil

Replacing the torque hub oil is essential for good machine performance and service life. Failure to replace the torque hub oil at yearly intervals may cause the machine to perform poorly and continued use may cause component damage.

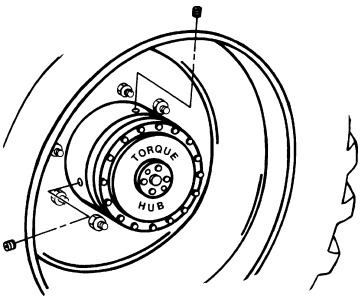
Non-steer torque hubs:

1 Select the non-steer torque hub to be serviced. Then drive the machine until one of the two plugs is at the lowest point.

2 Remove both plugs and drain the oil.

TABLE C PROCEDURES

3 Drive the machine until one plug is at the top and the other is at 90 degrees.



4 Fill the hub with oil from the top hole until the oil level is even with the bottom of the side hole. Then re-install the plugs.

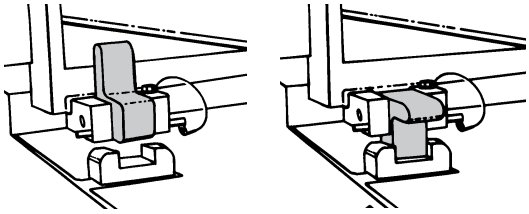
5 Repeat steps 1 through 4 for the other non-steer torque hub.

Oil capacity per hub	40 fluid ounces 1.2 liters

Type: SAE 90 multipurpose hypoid gear oil - API service classification GL5

Turntable Rotate Torque Hub

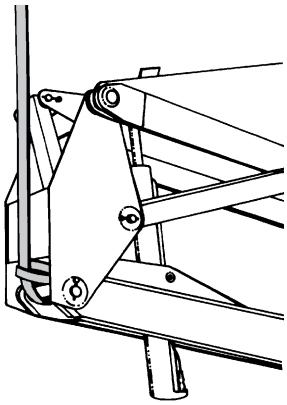
1 Secure the turntable from rotating with the turntable rotation lock.



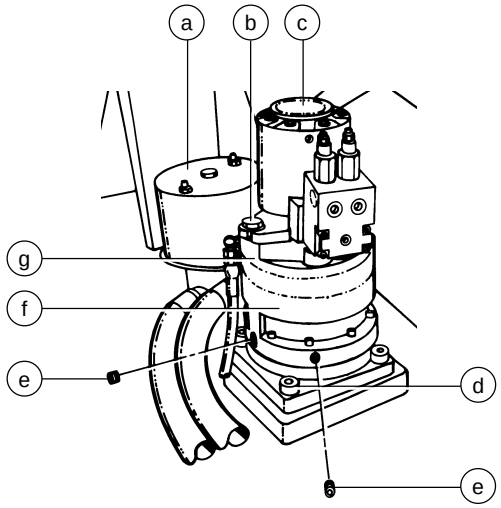
unlocked locked

2 Raise the secondary boom until the platform end of the lower secondary boom arm is 8 feet (2.4m) off the ground.

3 Attach the lifting strap from an overhead crane to the platform end of the lower secondary boom arm for support. Do not lift.



4 Remove the motor/brake mounting bolts, and then remove the motor and brake from the torque hub and set them to the side.



a electrical rotary coupler
b motor/brake mounting bolt
c motor
d torque hub mounting bolt
e plug
f torque hub
g brake

5 Remove the torque hub mounting bolts, and then remove the torque hub from the machine.

TABLE C PROCEDURES

6 Remove the plug from the side of the torque hub. Then drain the oil from the hub.

7 Install the torque hub. Torque the hub mounting bolts to 180 foot-pounds (244 Newton meters).

8 Install the brake and motor onto the torque hub.

9 Fill the hub with oil from the side hole until the oil level is even with the bottom of the hole. Then install the plug.

Capacity	8 fluid ounces 0.24 liters

Type: SAE 90 multipurpose hypoid gear oil - API service classification GL5

C-6
Replace the Hydraulic Tank Return Filter

Replacement of the hydraulic tank return filter is essential for good machine performance and service life. A dirty or clogged filter may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

NOTICE Perform this procedure with the engine off.

1 Place a suitable container under the hydraulic tank return filter.

2 Remove the filter with an oil filter wrench.

3 Apply a thin layer of oil to the new oil filter gasket.

4 Install the new filter (Genie part no. 46014) and tighten it securely by hand. Clean up any oil that may have spilled during the installation procedure.

5 Start the engine from the ground controls.

6 Inspect the filter and related components to be sure that there are no leaks.

C-7
Replace the Drive Loop Hydraulic Filter

Replacing the drive loop hydraulic filter is essential to good machine performance and service life. A dirty or clogged filter may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

⚠CAUTION Bodily injury hazard. Beware of hot oil. Contact with hot oil may cause severe burns.

NOTICE Perform this procedure with the engine off.

1 Open the engine side turntable cover and locate the drive loop hydraulic filter mounted near the pump.

2 Remove the filter housing by using a wrench on the nut provided on the bottom of the housing.

3 Remove the filter element from the housing.

4 Inspect the housing seal and replace it if necessary.

5 Install the new filter (Genie part no. 20880) and hand tighten the housing onto the filter head. Clean up any oil that may have spilled during the installation procedure.

6 Start the engine from the ground controls.

7 Inspect the filter assembly to be sure that there are no leaks.

8 Clean up any oil that may have spilled during the installation procedure.

C-8
Replace the Diesel Fuel Filter/Water Separator - Deutz Diesel Models

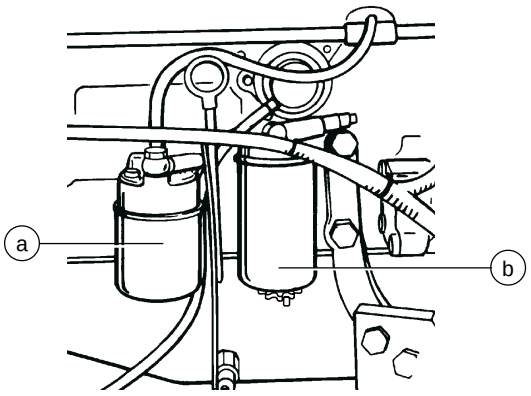
Replacing the diesel fuel filter is essential to good engine performance and service life. A dirty or clogged filter may cause the engine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Replace the fuel filter 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 At the fuel pump, disconnect and plug the fuel hose that goes to the fuel tank.

2 Remove the fuel filter with a filter wrench.



a oil filter
b fuel filter/water separator

Prime the fuel pump:

3 Fill the new filter (Genie part no. 29560) with fresh diesel fuel and apply a thin layer of oil or diesel fuel to the new fuel filter gasket.

4 Install the new filter and tighten it securely by hand. Clean up any diesel fuel that might have spilled during the procedure.

5 Connect the fuel hose from the tank to the fuel pump.

6 Start the engine from the ground controls, then inspect the fuel filter for leaks.

⚠DANGER Explosion and fire hazard. If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

TABLE C PROCEDURES

C-9
Replace the Gasoline Fuel Filters - Gasoline/LPG Models

Replacing the gasoline fuel filter is essential to good engine performance and service life. A dirty or clogged filter may cause the engine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the filter be replaced more often.

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Replace the fuel filter 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 Locate the fuel pre-filter behind the ground control box.

2 Turn the manual shutoff valve, located at the fuel tank, to the CLOSED position.

3 At the pre-filter, disconnect the fuel hose that goes to the fuel tank.

4 Disconnect and plug the fuel hose from the fuel pre-filter to the fuel pump, then remove the pre-filter.

5 Install the new fuel pre-filter (Genie part no. 52179) and connect the fuel hoses to the filter.

6 Clean up any fuel that may have spilled during the installation procedure.

7 Remove the 2 engine pivot plate retaining bolts. Then swing the engine out and away from the machine to access the fuel pressure regulator/filter.

8 Locate the fuel pressure regulator/filter installed on the engine mounting leg.

9 Disconnect the hoses from the fuel pressure regulator/filter.

⚠DANGER Explosion and fire hazard. Electronic Fuel Injection (EFI) systems operate at a very high pressure. Fuel may be expelled under pressure if the hoses are removed too quickly. Loosen the fuel lines very slowly to allow the fuel pressure to dissipate gradually. Wrap a cloth around fuel hoses to absorb leaking fuel before disconnecting them.

10 Remove the fuel pressure regulator/filter mounting fasteners. Then remove the regulator/filter from the engine mounting leg.

11 Install the new fuel pressure regulator/filter (Genie part no. 52567) onto the engine mounting leg and install the hoses to the regulator/filter.

CAUTION Component damage hazard. Be sure the correct regulator/filter is installed or component damage may occur.

12 Turn the manual shutoff valve, located at the fuel tank, to the OPEN position.

13 Start the machine from the ground controls, then inspect the fuel filters and hoses for leaks.

⚠DANGER Explosion and fire hazard. If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

Fuel filters - Genie part numbers

Fuel pre-filter	52179
Fuel pressure regulator/filter	52567

TABLE C PROCEDURES

C-10
Replace the PCV Valve - Gasoline/LPG Models

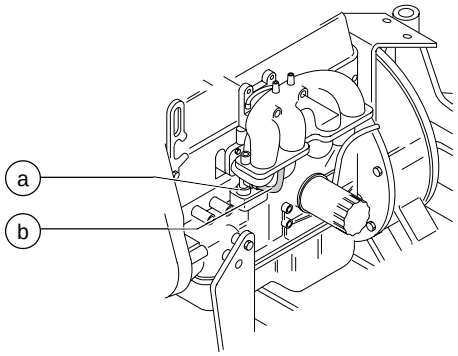
Yearly replacement of the PCV valve is essential to good engine performance. A malfunctioning PCV valve can impair crankcase ventilation and may cause engine damage.

NOTICE Perform this procedure with the engine off.

1 Open the engine side turntable cover.

2 Remove the 2 engine pivot plate retaining bolts and swing the engine out away from the machine to access the PCV valve.

3 Locate the PCV valve on the engine under the intake manifold.



a PCV valve
b PCV valve hose

4 Remove the hose from the PCV valve, then remove the valve.

5 Install the new PCV valve. Connect the hose.

C-11
Replace the Spark Plugs - Gasoline/LPG Models

Periodic replacement of the spark plugs is essential to good engine performance and service life. Worn, loose or corroded spark plugs will cause the engine to perform poorly and may result in component damage.

NOTICE Perform this procedure with the engine off.

1 Remove the 2 engine pivot plate retaining bolts and swing the engine out away from the machine to access the spark plugs.

2 Label, then disconnect the plug wires from the spark plugs by grasping the handle on the spark plug boot. Do not pull on the plug wire.

3 Blow out any debris around spark plugs.

4 Remove all the spark plugs from the engine.

5 Adjust the gap on each new spark plug.

6 Install the new spark plugs, then connect the wires. Be sure that each spark plug wire is attached to the correct spark plug.

Spark plug specifications

Spark plug type	Motorcraft AWSF-52C
Spark plug gap	0.042 to 0.046 inches 1.07 to 1.18 mm
Spark plug torque	5 to 10 foot-pounds 7 to 14 Nm

TABLE C PROCEDURES

C-12
Check and Adjust the Air/LPG Mixture - Gasoline/LPG Models

Maintaining the proper air-to-fuel mixture during LPG operation is essential to good engine performance.

⚠DANGER Explosion and fire hazard. Engine fuels are combustible. Perform this procedure in an open, well-ventilated area away from heaters, sparks, flames and lighted tobacco. Always have an approved fire extinguisher within easy reach.

NOTICE The engine should be warmed to normal operating temperature before performing this procedure.

1 Move the fuel select switch to LPG fuel and start the engine from the ground controls.

2 Locate the high idle mixture adjustment screw on the throttle body elbow that attaches to the air cleaner.

3 Loosen the lock nut on the high idle mixture adjustment screw.

4 Load the system by activating the primary boom retract function, then move the function enable toggle switch to the high idle (rabbit symbol) position.

5 Adjust the high idle adjustment screw to obtain an air-to-fuel mixture ratio of 13.0:1 to 13.2:1, using an exhaust gas analyzer.

NOTICE Preliminary setting is 1/4 inch of threads showing. Measure from top of lock nut to top of adjustment screw.

NOTICE If an exhaust gas analyzer is not available, adjust to obtain peak or optimum rpm.

6 Hold the adjustment screw and tighten the lock nut.

7 Return the function enable toggle switch to the center position.

8 Locate the low idle mixture adjustment screw on the LPG regulator.

9 Adjust the low idle mixture adjustment screw to obtain an air-to-fuel mixture ratio of 13.0:1 to 13.2:1.

NOTICE Preliminary setting: turn low idle adjustment screw clockwise all the way in. Turn low idle adjustment screw counterclockwise 2 3/4 turns.

C-13
Check the Engine Valve Clearances - Deutz Diesel Models

Complete information to perform this procedure is available in the *Deutz FL 1011F Workshop Manual* (Deutz Number 0297 7195).
Genie part number 52229.

Table D Procedures

D-1
Test or Replace the Hydraulic Oil

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and suction strainers may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require oil changes to be performed more often.

NOTICE The machine uses Dexron equivalent hydraulic oil. Before replacing the hydraulic oil, the oil may be tested by an oil distributor for specific levels of contamination to verify that changing the oil is necessary. **If the hydraulic oil is not replaced at the two year inspection, test the oil quarterly. Replace the oil when it fails the test.**

NOTICE Perform this procedure with the boom in the stowed position.

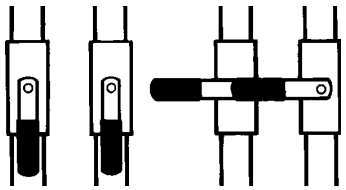
NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 **Gasoline/LPG models:** Turn the valve on the LPG tank clockwise to the OFF position. Then slowly disconnect the hose from the LPG tank.

2 **Gasoline/LPG models:** Open the clamps from the LPG tank straps and remove the LPG tank from the machine.

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

4 Close the two hydraulic shutoff valves located at the hydraulic tank.



open closed

CAUTION Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the CLOSED position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

5 Place a suitable container underneath the hydraulic tank. See capacity specifications below.

6 Remove the drain plug from the hydraulic tank.

7 Completely drain the tank into a suitable container. See capacity specifications.

8 Tag, disconnect and plug the two suction hoses that are attached to the hydraulic tank shutoff valves.

9 Disconnect and plug the T-fitting located at the return filter with the 2 hoses connected to it. Cap the fitting on the return filter housing.

10 Disconnect and plug the supply hose for the auxiliary power unit. Cap the fitting on the hydraulic tank.

11 Remove the retaining fasteners from the hydraulic tank hold down straps. Remove the straps from the hydraulic tank.

12 Remove the ground controls side turntable cover. See 6-1, *How to Remove a Turntable cover.*

TABLE D PROCEDURES

13 Support the hydraulic tank with 2 lifting straps. Place one lifting strap at each end of the tank and attach the lifting straps to an overhead crane.

14 Remove the hydraulic tank from the machine.

⚠WARNING Crushing hazard. The hydraulic may become unbalanced and fall if it is not properly supported and secured to the overhead crane.

15 Remove the suction strainers from the tank and clean them using a mild solvent.

16 Rinse out the inside of the tank using a mild solvent.

17 Install the suction strainers using a thread sealant on the threads.

18 Install the drain plug using a thread sealant on the threads.

19 Install the hydraulic tank onto the machine.

20 Install the two suction hoses and the supply hose for the auxiliary power unit.

21 Fill the tank with hydraulic oil until the level is within the top 2 inches (5 cm) of the sight gauge. Do not overfill.

22 Clean up any oil that may have spilled and open the hydraulic tank valves.

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

NOTICE The pump needs to be primed before starting the engine. See Repair procedure 11-2, *How to Prime the Pump.*

NOTICE Always use pipe thread sealant when installing the drain plug.

NOTICE Use only Dexron quivalent hydraulic fluid.

Hydraulic system	
Hydraulic tank capacity	45 gallons 170 liters
Hydraulic system capacity (including tank)	53 gallons 200.6 liters
Hydraulic fluid	Dexron equivalent

D-2
Change or Recondition the Engine Coolant - Gasoline/LPG Models

Replacing or reconditioning the engine coolant is essential to good engine performance and service life. Old or dirty coolant may cause the engine to perform poorly and continued use may cause engine damage. Extremely dirty conditions may require coolant to be changed more frequently.

⚠CAUTION Bodily injury hazard. Beware of hot engine parts and coolant. Contact with hot engine parts and/or coolant will cause severe burns.

NOTICE Perform this procedure with the engine off and cooled.

1 Remove the 2 engine pivot plate retaining bolts and swing the engine out away from the machine.

2 Put on protective clothing and eye wear.

3 Disconnect the coolant return hose at the radiator and drain the coolant return tank into a suitable container.

4 Slowly remove the radiator cap from the radiator.

⚠CAUTION Bodily injury hazard. Allow any pressure to dissipate gradually before removing the radiator cap.

5 Open the drain valve on the radiator and allow all the coolant to drain into a suitable container.

6 After all the coolant has drained, close the drain valve. Connect the coolant return hose to the radiator.

7 Open the drain valve on the engine block and allow the coolant to drain into a container. After the fluid is drained, close the drain valve.

8 Replace all coolant hoses and clamps.

9 Fill the radiator with the proper coolant mixture (anti-freeze and water) for your climate until it is full.

10 Fill the coolant recovery tank to the NORMAL range.

11 Clean up any coolant spilled during this procedure.

12 Start the engine from the ground controls, run it for 30 seconds, and then turn it off.

13 Inspect for leaks and then check the fluid level in the coolant recovery tank. Add water if needed.

14 Start the engine from the ground controls and let it run until it reaches normal operating temperature.

15 Turn the engine off.

16 Allow engine to cool and check the fluid level in the coolant recovery tank. Add water if needed.

Ford Engine	11.5 quarts
Coolant capacity	10.9 liters

TABLE D PROCEDURES

D-3
Change the Fuel Hoses

Maintaining the fuel hoses in good condition is essential to safe operation and good engine performance. Failure to detect a worn, cracked or leaking fuel hose may cause an unsafe operating condition.

⚠ DANGER Explosion and fire hazard. 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.

CAUTION Component damage hazard. Be sure the fuel hoses are routed the same way the original hoses were.

NOTICE Perform this procedure with the engine off and the keyswitch in the OFF position.

1 Remove the 2 engine pivot plate retaining bolts and swing the engine out away from the machine.

2 Place a suitable container under the engine pivot plate.

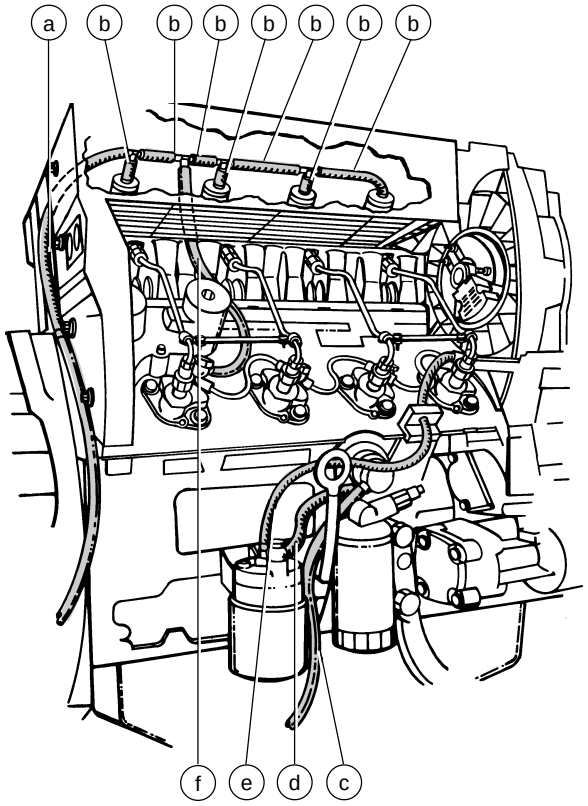
3 **Gasoline/LPG Models:** At the fuel pressure regulator/filter, disconnect the fuel hose to the fuel tank and drain the fuel tank into the container.

Diesel Models: At the fuel pump, disconnect the fuel hose to the fuel tank and drain the fuel tank into the container.

Diesel models:

4 Remove and replace all of the fuel line hoses and clamps according to the following illustration:

⚠ DANGER Explosion and fire hazard. Fuel Injection systems operate at a very high pressure. Fuel may be expelled under pressure if the hoses are removed too quickly. Loosen the fuel lines very slowly to allow the fuel pressure to dissipate gradually. Wrap a cloth around fuel hoses to absorb leaking fuel before disconnecting them.



Deutz Diesel models

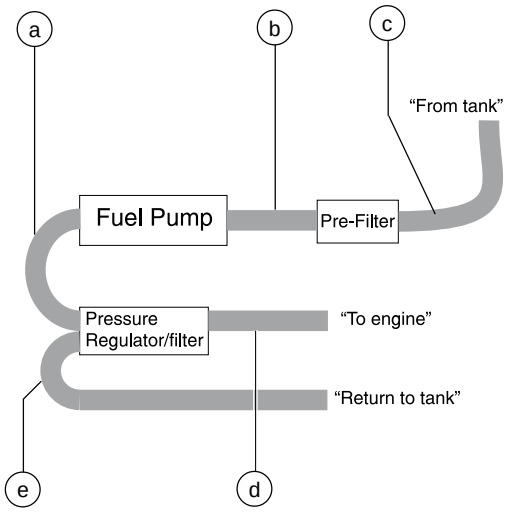
a hose from the injector to the fuel tank
b hoses connecting injectors
c hose from the fuel shutoff valve to the fuel pump
d hose from the fuel pump to the fuel filter
e hose from the fuel filter to the injection pump
f hose from the injection pump to the injectors

Gasoline/LPG Models:

⚠DANGER Explosion and fire hazard. Electronic Fuel Injection (EFI) systems operate at a very high pressure. Fuel may be expelled under pressure if the hoses are removed too quickly. Loosen the fuel lines very slowly to allow the fuel pressure to dissipate gradually. Wrap a cloth around fuel hoses to absorb leaking fuel before disconnecting them.

5 Locate the fuel pressure regulator/filter and the fuel pump on the engine pivot plate behind the engine.

6 Remove and replace all of the fuel hoses and clamps according to the following hose routing diagram:



Gasoline/LPG models
- a high pressure hose from fuel pump to regulator/filter
- b hose from fuel pre-filter to fuel pump
- c hose from fuel tank to fuel pre-filter
- d high pressure hose from regulator/ filter to engine
- e hose from regulator/filter to tank

7 Clean up any fuel that may have spilled during this procedure.

8 Start the engine from the ground controls, then inspect the fuel filter and hoses for leaks.

⚠DANGER Explosion and fire hazard. If a fuel leak is discovered, keep any additional personnel from entering the area and do not operate the machine. Repair the leak immediately.

D-4
Check the Engine Valve Clearance - Gasoline/LPG Models

Complete information to perform this procedure is available in the *Ford LRG-425 EFI 2.5 Liter Industrial Engine Service Manual* (Ford number: FPP-194-303). Genie part number 52695.

D-5
Check the Engine Cylinder Compression - Gasoline/LPG Models

Complete information to perform this procedure is available in the *Ford LRG-425 EFI 2.5 Liter Industrial Engine Service Manual* (Ford number: FPP-194-303). Genie part number 52695.

TABLE D PROCEDURES

D-6
Clean the PCV Hose and Fittings - Gasoline/LPG Models

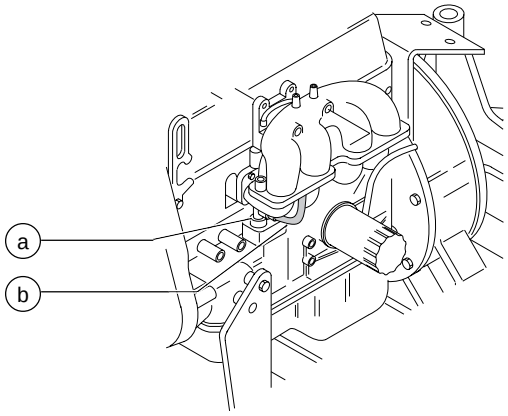
Maintaining PCV hoses is essential to good engine performance. Improperly functioning PCV hoses will fail to ventilate the crankcase and continued use of neglected hoses could result in component damage.

NOTICE Perform this procedure with the engine off.

1 Open the engine side turntable cover.

2 Remove the 2 engine pivot plate retaining bolts and swing the engine out away from the machine to access the PCV valve.

3 Locate the PCV valve and hose under the intake manifold.



a PCV valve
b PCV valve hose

4 Disconnect the hose from the PCV valve, then disconnect the hose from the engine.

5 Clean the hose with a mild cleaning solvent.

6 Dry the hose and inspect it for cracks and damage. Replace the hose if it is damaged.

D-7
Check the Fuel Injection Pump and Injectors - Deutz Diesel Models

Complete information to perform this procedure is available in the *Deutz FL 1011F Workshop Manual* (Deutz number: 0297 7195).
Genie part number 52229.

D-8
Check the Toothed Belt - Deutz Diesel Models

Complete information to perform this procedure is available in the *Deutz FL 1011F Operation Manual* (Deutz number: 0297-7343).
Genie part number 52883.

D-9
Replace the Timing Belt - Gasoline/LPG Models

Complete information to perform this procedure is available in the *Ford LRG-425 EFI 2.5 Liter Industrial Engine Service Manual* (Ford number: FPP-194-303). Genie part number 52695.

D-10
Grease the Steer Axle Wheel Bearings - 2WD Models

Maintaining the steer axle wheel bearings is essential for safe machine operation and service life. Operating the machine with loose or worn wheel bearings may cause an unsafe operating condition and continued use may result in component damage. Extremely wet or dirty conditions or regular steam cleaning and pressure washing of the machine may require that this procedure be performed more often.

1 Loosen the wheel lug nuts. Do not remove them.

2 Block the non-steering wheels, then center a lifting jack under the steer axle.

3 Raise the machine 6 inches (15 cm) and place blocks under the drive chassis for support.

4 Remove the lug nuts, then remove the tire and wheel assembly.

5 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.

⊙ Result: There should be no side to side or up and down movement.

Skip to step 11 if there is no movement.

6 Remove the dust cap mounting fasteners, then remove the dust cap from the hub.

7 Remove the cotter pin from the castle nut.

8 Tighten the castle nut to 35 foot-pounds (47 Nm) to seat the bearings.

9 Loosen the castle nut, then re-tighten to 8 foot-pounds (11 Nm).

10 Check for wheel bearing wear by attempting to move the wheel hub side to side, then up and down.

⊙ Result: If there is side to side or up and down movement, continue to step 12 and replace the wheel bearings with new ones.

NOTICE When replacing a wheel bearing, both the inner and outer bearings, including the pressed-in races, must be replaced.

⊙ Result: If there is no side to side or up and down movement, continue with step 12 and grease the wheel bearings.

11 Remove the dust cap mounting fasteners, then remove the dust cap from the hub.

12 Remove the cotter pin from the castle nut.

13 Remove the castle nut.

14 Pull the hub off of the spindle. The washer and outer bearing should fall loose from the hub.

15 Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.

16 Pack both bearings with clean, fresh grease.

17 Place the large inner bearing into the rear of the hub.

18 Install a new bearing grease seal into the hub by pressing it evenly into the hub until it is flush.

NOTICE Always replace the bearing grease seal when removing the hub.

19 Slide the hub onto the yoke spindle.

CAUTION Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.

20 Place the outer bearing into the hub.

21 Install the washer and castle nut.

22 Tighten the slotted nut to 35 foot-pounds (47 Nm) to seat the bearings.

TABLE D PROCEDURES

23 Loosen the castle nut, then re-tighten to 8 foot-pounds (11 Nm).

24 Install a new cotter pin. Bend the cotter pin to lock it in.

25 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to 125 foot-pounds (169.5 Nm).

Troubleshooting Flow Charts



Observe and Obey:

- ☑ Troubleshooting and 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.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - · Machine parked on a flat level surface
  - · Boom in stowed position
  - · Turntable rotated with the boom between the non-steering wheels
  - · Turntable secured with the turntable rotation lock
  - · Key switch in the OFF position with the key removed
  - · Wheels chocked

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the *Genie Z-60/34 Operator's Manual.*
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropiate flow chart thoroughly. Attempting shortcuts may produce hazardous conditions.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

⚠DANGER Crushing hazard. When testing or replacing any hydraulic component, always support the structure and secure it from movement.

⚠DANGER Electrocution hazard. Contact with electrically charged circuits may result in death or serious injury. Remove all rings, watches and other jewelry.

⚠WARNING 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.

NOTICE Perform all troubleshooting on a firm level surface.

NOTICE Two persons will be required to safely perform some troubleshooting procedures.

TROUBLESHOOTING FLOW CHARTS

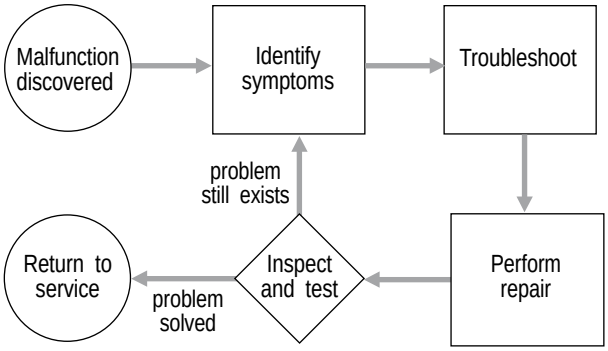
About This Section

When a malfunction is discovered, the flow charts in this section will help a service professional pinpoint the cause of the problem. To use this section, basic hand tools and certain pieces of test equipment are required—voltmeter, ohmmeter, pressure gauges.

The location of terminals mentioned in this section can be found on the appropriate electrical or hydraulic schematics provided in Section 6, *Schematics*.

Since various degrees of a particular function loss may occur, selecting the appropriate flow chart may be troublesome. When a function will not operate with the same speed or power as a machine in good working condition, refer to the flow chart which most closely describes the problem.

General Repair Process



Fault codes

The ECM constantly monitors the engine by the use of sensors on the engine. The ECM also uses signals from the sensors to initiate sequential fuel injection and make constant and instaneaous changes to ignition timing, fuel delivery and throttle position to maintain the engine's running condition at its highest efficiency while at the same time keeping exhaust emissions to a minimum. When a sensor fails or returns signals that are outside of set parameters, the ECM will store a fault code in memory that relates to the appropriate sensor and will turn on the Check Engine Light. See Repair Section, *How to Retrieve Engine Fault Codes.* Use the Fault Code Chart on the following pages to aid in identifying the fault.

Fault Codes

Fault Code	Problem	Cause	Solution
11	--	--	Normal operation.
12	Throttle Position (TP) sensor low voltage.	Faulty TP sensor OR sensor wires shorted shorted to ground or poor terminal connection.	Check for poor terminal connections or shorted wires from the TP sensor to the ECM OR replace the TP sensor.
14	Manifold Absolute Pressure (MAP) sensor low voltage.	Faulty MAP sensor OR sensor wires shorted to ground or poor terminal connection.	Check for poor terminal connections OR wires shorted to ground OR replace MAP sensor.
21	Engine speed exceeded 4000 RPM.	Obstruction in throttle body OR faulty ECM.	Check for obstructions in the throttle body that could cause binding of the throttle assembly OR replace ECM.
22	Throttle Position (TP) sensor high voltage.	The ECM senses a signal from the TP sensor that is greater than 4.9V DC OR the TP sensor wiring is shorted to ground OR there is a poor terminal connection OR the TP sensor is bad.	Check for poor terminal connections or shorted wires from the TP sensor to the ECM OR replace the TP sensor.
24	Manifold Absolute Pressure (MAP) sensor high voltage.	Faulty MAP sensor OR sensor wires shorted to ground or poor terminal connection.	Check for poor terminal connections or shorted wires from the MAP sensor to the ECM to ground OR replace MAP sensor.
31	Fuel pump low voltage.	Voltage to fuel pump is greater than or equal to 2V DC below ignition voltage.	Test the fuel pump relay, see the Repair Section OR check for poor terminal connection from the fuel pump relay to fuel pump OR replace the fuel pump.
32	Heated Oxygen (HO^2) sensor low voltage.	Water in the fuel, misfiring cylinder, plugged fuel filter OR the HO^2 sensor wiring is shorted to ground OR there is a poor terminal connection OR the HO^2 sensor is bad.	Check for water in the fuel, misfiring cylinder or pugged fuel filter OR check for poor terminal connections or shorted wires from the HO^2 sensor to the ECM to ground OR replace HO^2 sensor.
33	Engine Coolant Temperature (ECT) sensor high voltage.	Engine is overheating OR sensor wires shorted to ground or poor terminal connections OR ECT sensor is bad	Check engine coolant level OR check for shorted wires or poor terminal connections from the ECT sensor to the ECM OR replace the ECT sensor.

FAULT CODES

Fault Code	Problem	Cause	Solution
35	Intake Air Temperature (IAT) sensor high voltage.	IAT sensor signal is greater than or equal to 4.93V DC for at least 3 seconds.	Check for poor terminal connections or shorted wires from the IAT sensor to the ECM to ground OR replace IAT sensor.
41	Fuel pump high voltage.	Fuel pump is receiving voltage when the ECM is not sending the signal to the fuel pump to turn ON.	Test the fuel pump relay, see the Repair Section OR check for poor terminal connections from the fuel pump relay to fuel pump OR replace the ECM.
42	Heated Oxygen (HO^2) sensor high voltage.	A leaking or malfunctioning fuel injector, misfiring cylinder, faulty TP sensor or contamination from fuel OR use of improper thread sealant on sensor threads OR sensor wires shorted to ground or poor terminal connections OR HO^2 sensor is bad.	Test for a leaking or malfunctioning fuel injector, misfiring cylinder or bad TP sensor. Remove HO^2 sensor and check condition of sensor for contamination OR check for poor terminal connections or shorted wires from the HO^2 sensor to the ECM to ground OR replace HO^2 sensor.
43	Engine Coolant Temperature (ECT) sensor low voltage.	ECM detects a excessively low signal voltage from the ECT sensor.	Check engine coolant level OR check for shorted wires or poor terminal connections from the ECT sensor to the ECM OR replace the ECT sensor.
45	Intake Air Temperature (IAT) sensor low voltage.	ECM detects a excessively low signal voltage from the IAT sensor.	The IAT sensor shares the same ground wire as the ECT and MAP sensors. Check for shorted wires or poor terminal connections from the IAT sensor to the ECT and MAP sensors to the ECM OR replace the IAT sensor.
51	Low oil pressure.	Bad oil pressure switch, wires shorted to ground or not enough engine oil.	Check engine oil level OR check for shorted wires or poor terminal connections from the oil pressure switch to the ECM OR replace the oil pressure switch.

FAULT CODES

Fault Code	Problem	Cause	Solution
52	Crankshaft Position (CKP) sensor senses extra or missing pulses.	The CKP and CMP sensors work together; if one is bad, the other one won't work correctly and causes the ECM to detect a fault. The ECM uses the signal pulses from the CKP and CMP sensors to initiate sequential fuel injection.	Check for shorted wires or poor terminal connections from the CKP and CMP sensors to the ECM OR replace the CKP or CMP sensor.
53	Camshaft Position (CMP) sensor senses unknown pattern.	The CMP and CKP sensors work together; if one is bad, the other one won't work correctly and causes the ECM to detect a fault. The ECM uses the signal pulses from the CKP and CMP sensors to initiate sequential fuel injection.	Check for shorted wires or poor terminal connections from the CKP and CMP sensors to the ECM OR replace the CKP or CMP sensor.
54	ECM Fault - Illegal Operation.	The ECM received an illegal instruction signal from one or more of the sensors and has gone into a default program and then return to normal operation.	Replace the ECM.
55	ECM - Illegal Interuption.	The ECM received an illegal interruption signal from one or more engine sensors and has gone into a default program and then return to normal operation.	Replace the ECM.
56	ECM - Computer Operating Properly (COP) failure	Under normal operation the ECM will store numbers into memory. If this does not happen, it will reset itself and set fault code 56.	Replace the ECM.
61	System voltage low.	Battery supply voltage to the ECM is 8V DC or less.	Check battery and/or alternator condition OR check for shorted wires or poor terminal connections from the battery to the ECM.
62	System voltage high.	Battery supply voltage to the ECM is 18V DC or more.	Check battery and/or alternator condition OR check for shorted wires or poor terminal connections from the battery to the ECM.

Chart 1

Engine Will Not Crank Over

Be sure the key switch is in the appropriate position.

Be sure that both Emergency Stop buttons are pulled out to the ON position.

Be sure the circuit breakers are not tripped.

Be sure the battery is fully charged.

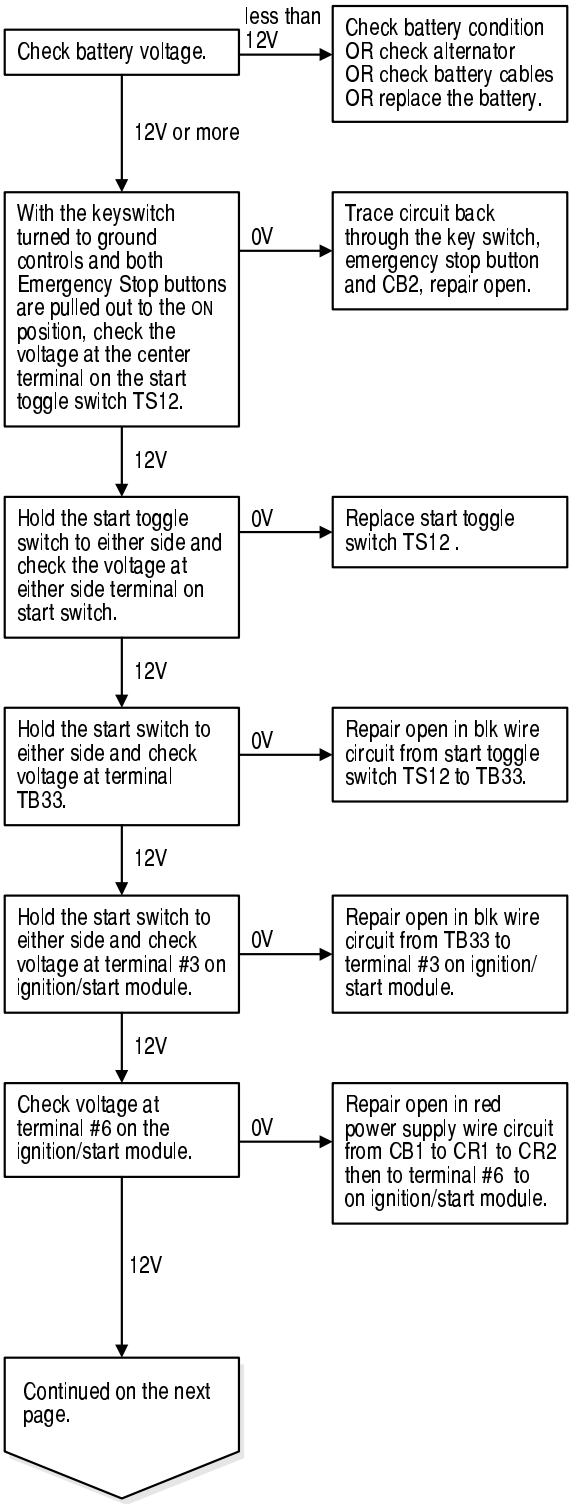


CHART 1

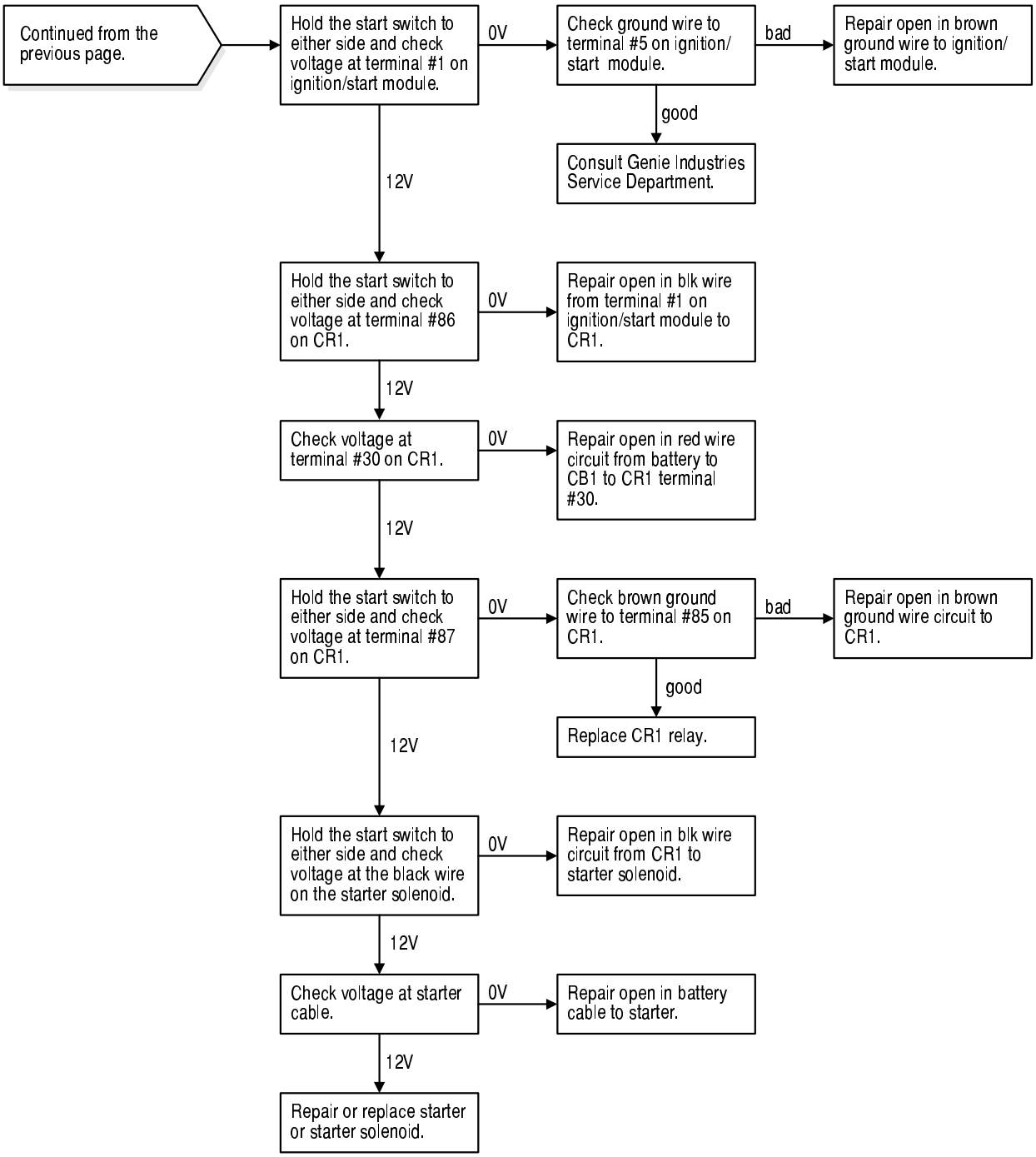

Continued from the previous page.
Hold the start switch to either side and check voltage at terminal #1 on ignition/start module.
0V
Check ground wire to terminal #5 on ignition/ start module.
bad
Repair open in brown ground wire to ignition/ start module.
good
Consult Genie Industries Service Department.
12V
Hold the start switch to either side and check voltage at terminal #86 on CR1.
0V
Repair open in blk wire from terminal #1 on ignition/start module to CR1.
12V
Check voltage at terminal #30 on CR1.
0V
Repair open in red wire circuit from battery to CB1 to CR1 terminal #30.
12V
Hold the start switch to either side and check voltage at terminal #87 on CR1.
0V
Check brown ground wire to terminal #85 on CR1.
bad
Repair open in brown ground wire circuit to CR1.
good
Replace CR1 relay.
12V
Hold the start switch to either side and check voltage at the black wire on the starter solenoid.
0V
Repair open in blk wire circuit from CR1 to starter solenoid.
12V
Check voltage at starter cable.
0V
Repair open in battery cable to starter.
12V
Repair or replace starter or starter solenoid.

Chart 2

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

Be sure to check the engine oil level and fill as needed.

Be sure to check fuel levels and the engine coolant level.

Be sure that the radiator overflow tank is at the FULL mark.

Perform following tests in gasoline mode only.

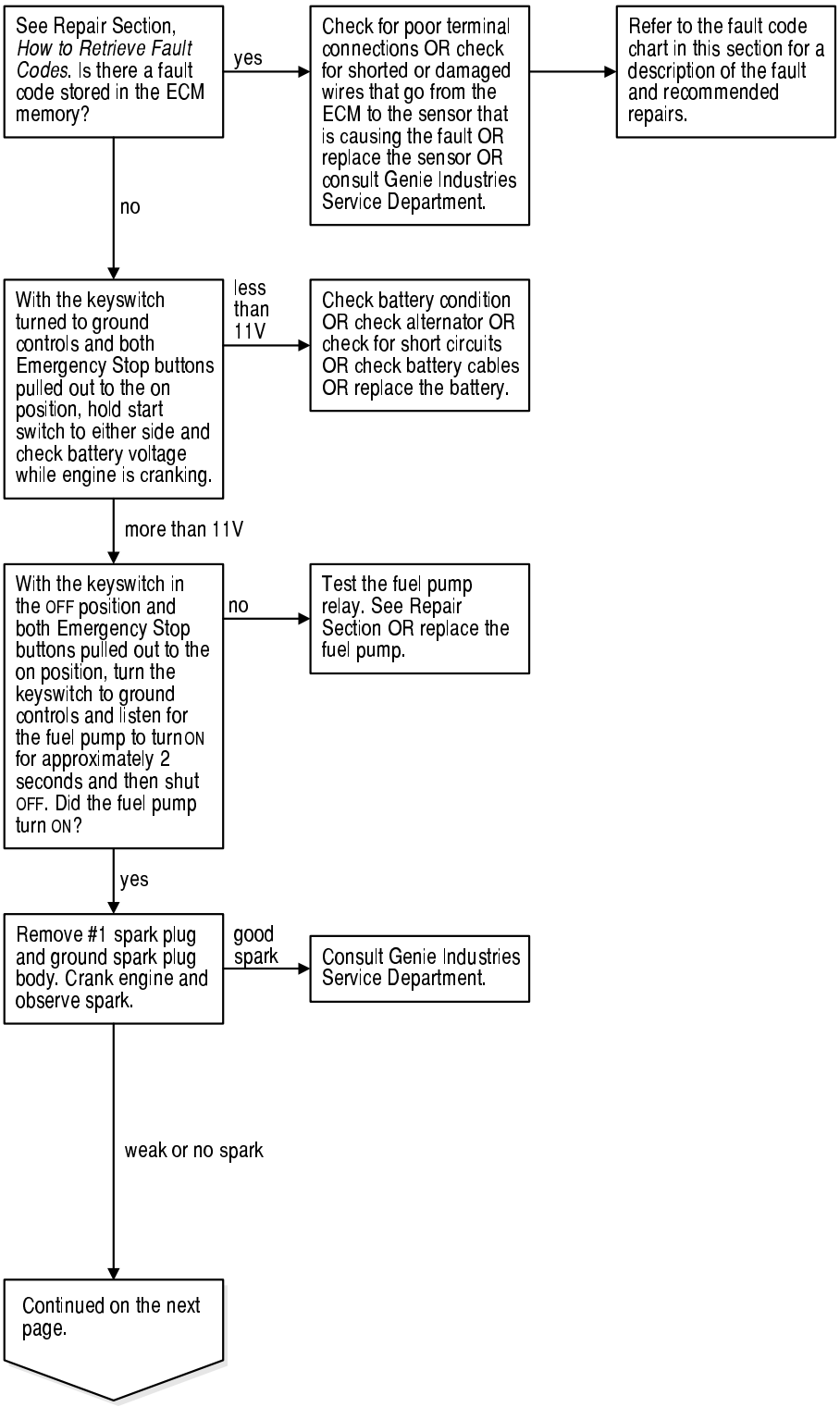


CHART 2

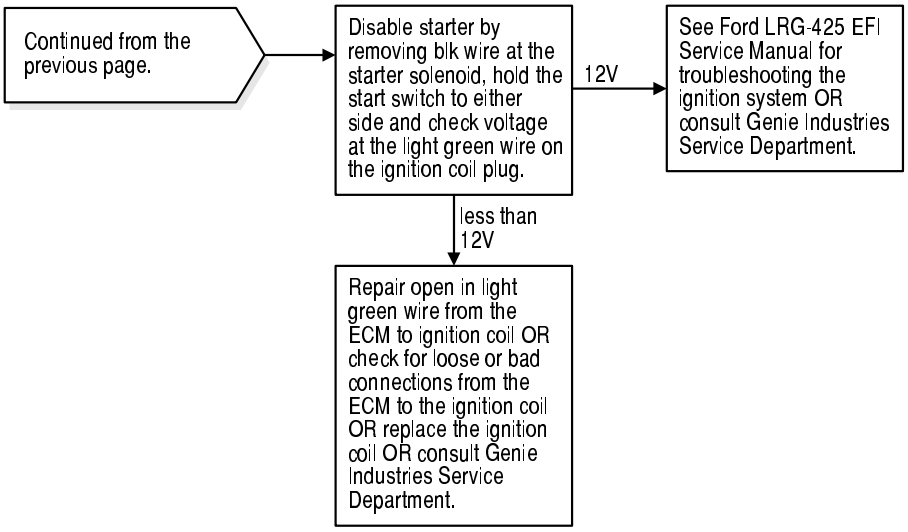

Continued from the previous page.
Disable starter by removing blk wire at the starter solenoid, hold the start switch to either side and check voltage at the light green wire on the ignition coil plug.
12V
See Ford LRG-425 EFI Service Manual for troubleshooting the ignition system OR consult Genie Industries Service Department.
less than 12V
Repair open in light green wire from the ECM to ignition coil OR check for loose or bad connections from the ECM to the ignition coil OR replace the ignition coil OR consult Genie Industries Service Department.

Chart 2A

Engine Runs While Cranking Then Dies

Be sure that all vacuum hoses are connected and show no signs of damage.

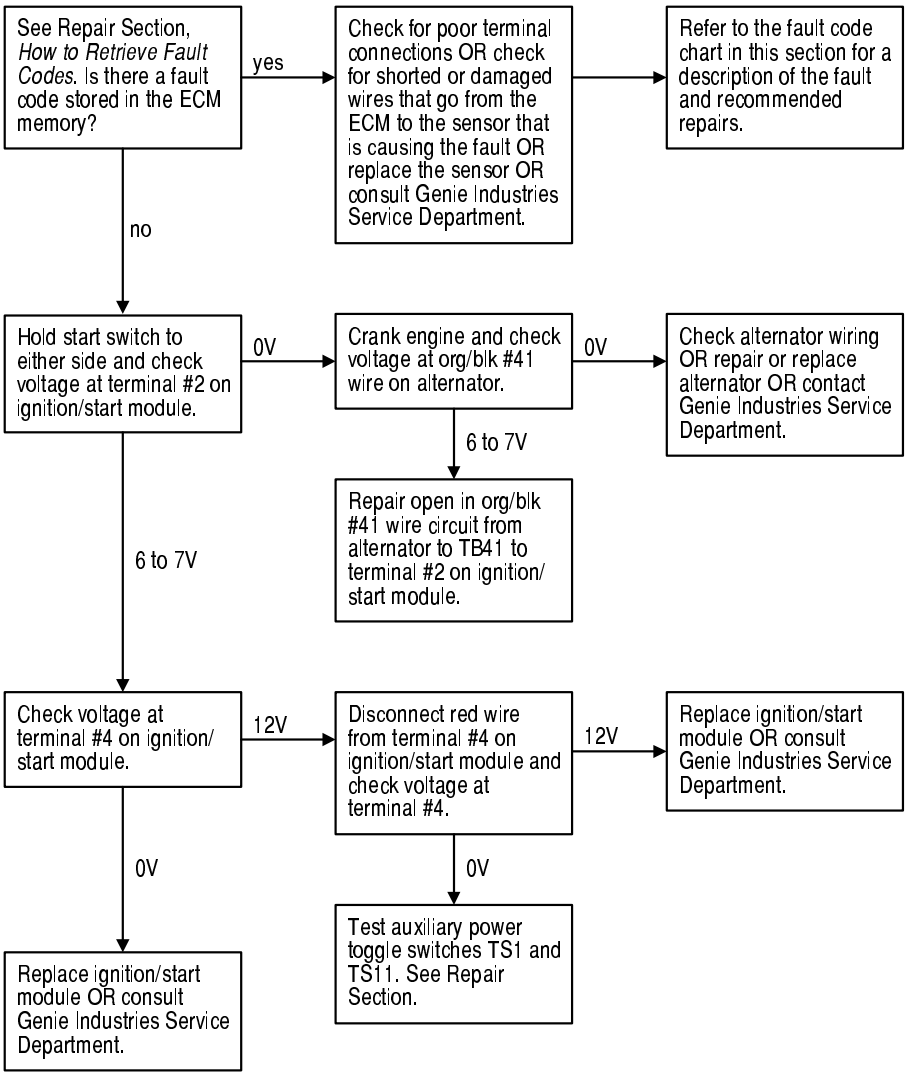


Chart 3

Engine Cranks Over But Will Not Start - Deutz Diesel Models

Be sure to check the engine oil level and fill as needed.

Be sure to check fuel level.

Be sure that the battery is fully charged.

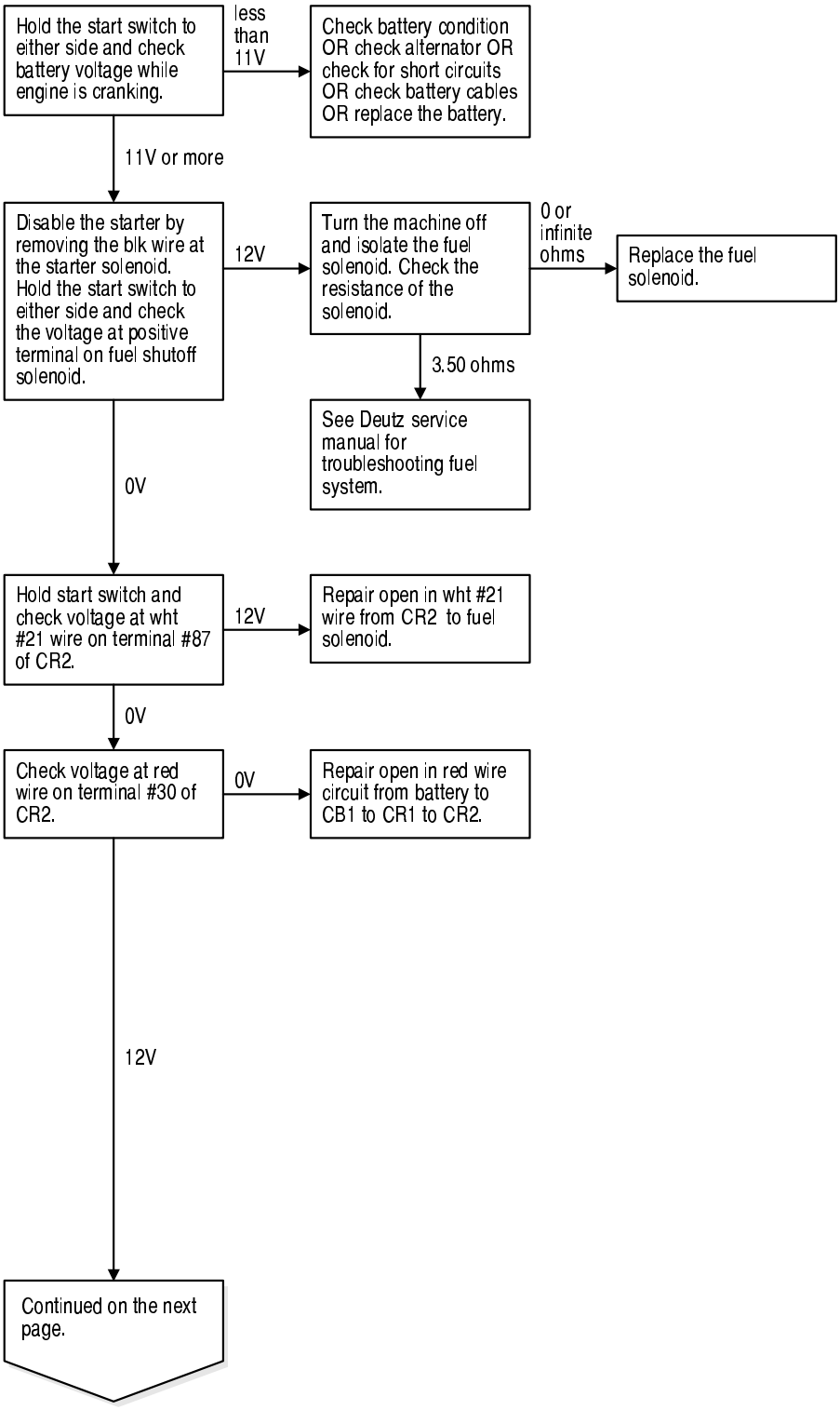


CHART 3

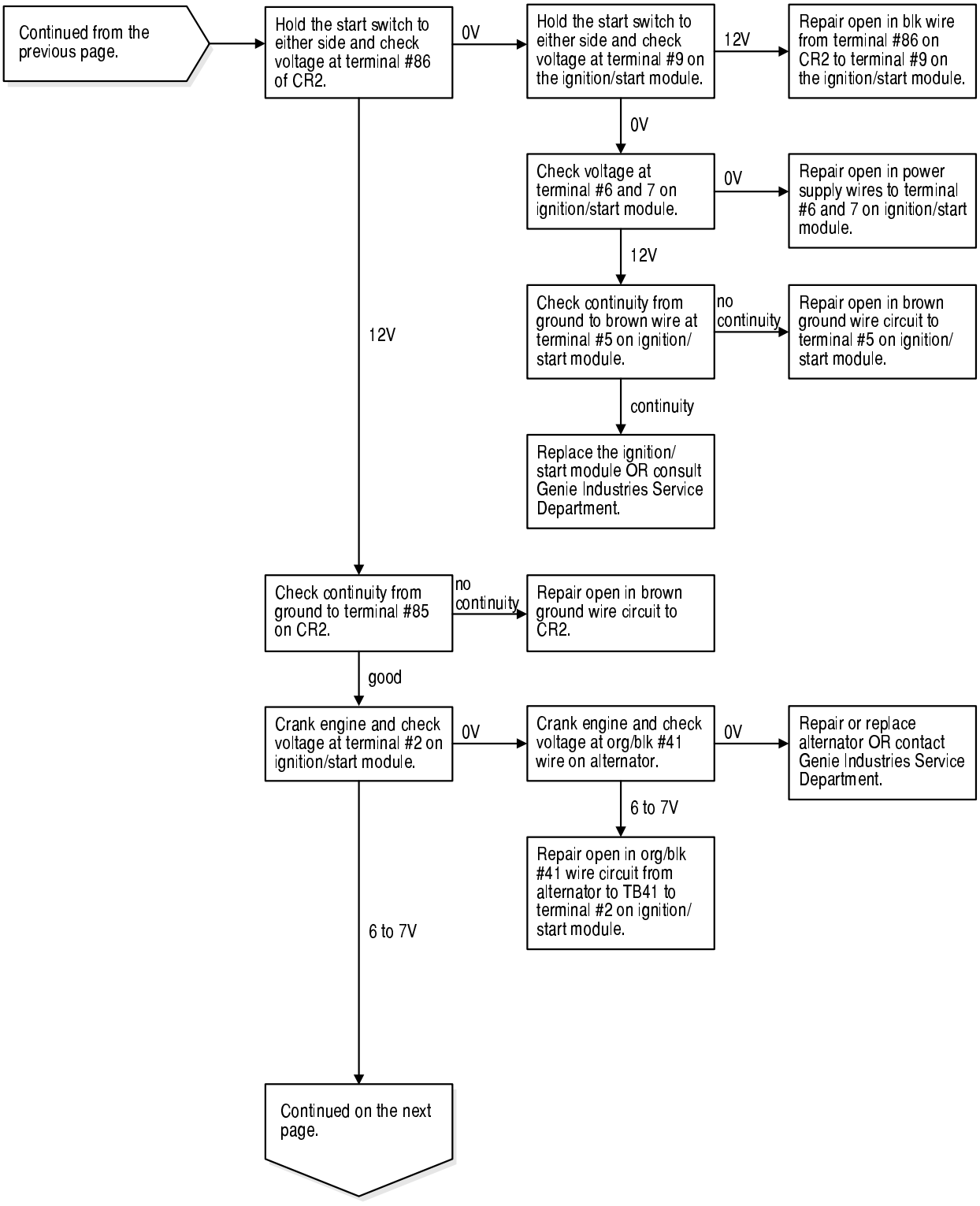

Continued from the previous page.
Hold the start switch to either side and check voltage at terminal #86 of CR2.
0V
Hold the start switch to either side and check voltage at terminal #9 on the ignition/start module.
12V
Repair open in blk wire from terminal #86 on CR2 to terminal #9 on the ignition/start module.
0V
Check voltage at terminal #6 and 7 on ignition/start module.
0V
Repair open in power supply wires to terminal #6 and 7 on ignition/start module.
12V
Check continuity from ground to brown wire at terminal #5 on ignition/ start module.
no continuity
Repair open in brown ground wire circuit to terminal #5 on ignition/ start module.
continuity
Replace the ignition/ start module OR consult Genie Industries Service Department.
12V
Check continuity from ground to terminal #85 on CR2.
no continuity
Repair open in brown ground wire circuit to CR2.
good
Crank engine and check voltage at terminal #2 on ignition/start module.
0V
Crank engine and check voltage at org/blk #41 wire on alternator.
0V
Repair or replace alternator OR contact Genie Industries Service Department.
6 to 7V
Repair open in org/blk #41 wire circuit from alternator to TB41 to terminal #2 on ignition/ start module.
6 to 7V
Continued on the next page.

CHART 3

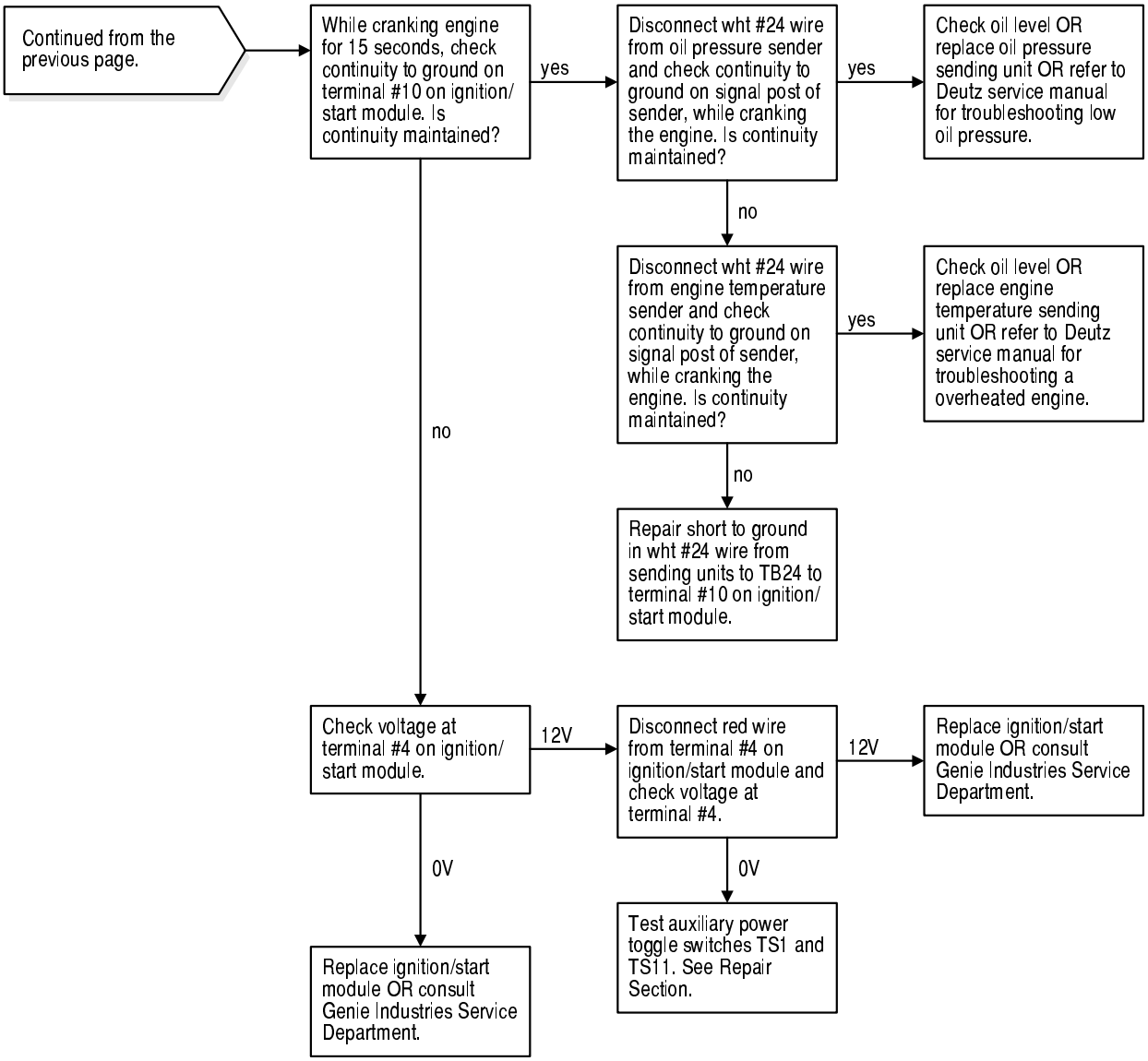

Continued from the previous page.
While cranking engine for 15 seconds, check continuity to ground on terminal #10 on ignition/ start module. Is continuity maintained?
yes
Disconnect wht #24 wire from oil pressure sender and check continuity to ground on signal post of sender, while cranking the engine. Is continuity maintained?
yes
Check oil level OR replace oil pressure sending unit OR refer to Deutz service manual for troubleshooting low oil pressure.
no
Disconnect wht #24 wire from engine temperature sender and check continuity to ground on signal post of sender, while cranking the engine. Is continuity maintained?
yes
Check oil level OR replace engine temperature sending unit OR refer to Deutz service manual for troubleshooting a overheated engine.
no
Repair short to ground in wht #24 wire from sending units to TB24 to terminal #10 on ignition/ start module.
no
Check voltage at terminal #4 on ignition/ start module.
12V
Disconnect red wire from terminal #4 on ignition/start module and check voltage at terminal #4.
12V
Replace ignition/start module OR consult Genie Industries Service Department.
0V
Test auxiliary power toggle switches TS1 and TS11. See Repair Section.
0V
Replace ignition/start module OR consult Genie Industries Service Department.

Chart 4

Engine Will Not Start On LPG, But Will Start On Gasoline - Gasoline/LPG Models

Be sure fuel select switch is switched to LPG.

Be sure the valve on the LPG tank is fully opened.

Be sure to check LPG fuel level.

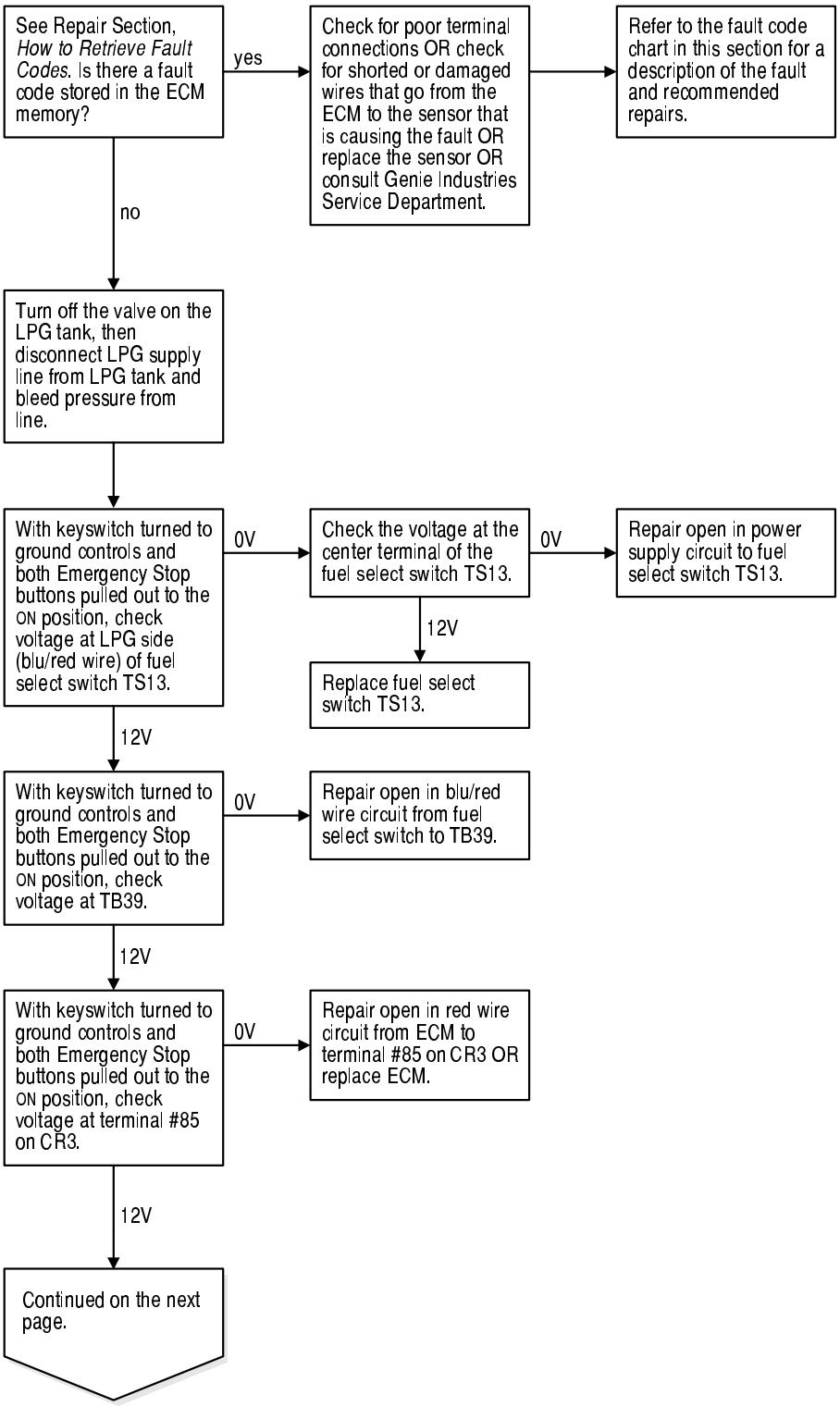


CHART 4

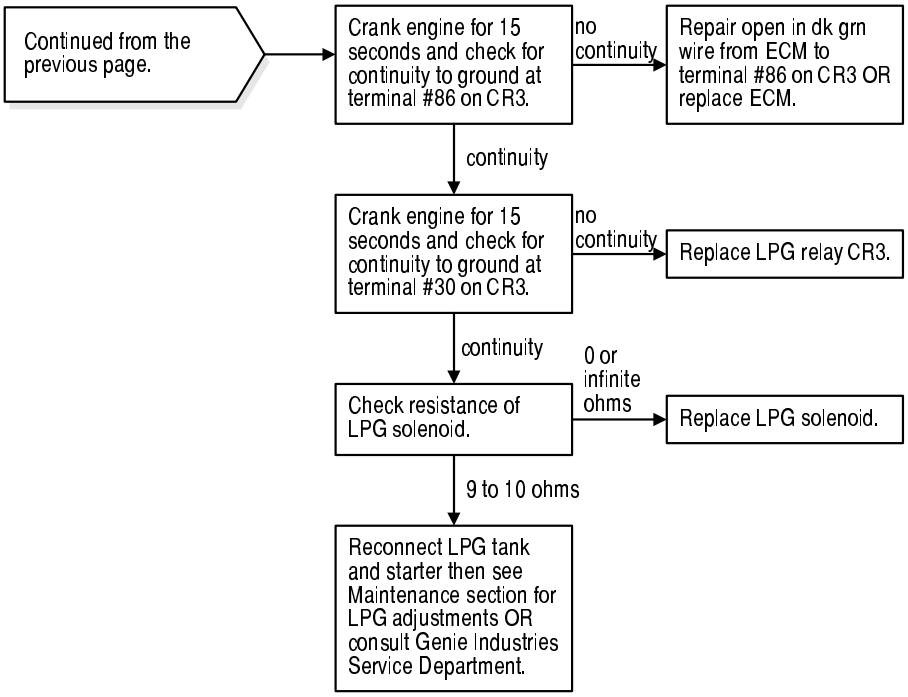

Continued from the previous page.
Crank engine for 15 seconds and check for continuity to ground at terminal #86 on CR3.
no continuity
Repair open in dk grn wire from ECM to terminal #86 on CR3 OR replace ECM.
continuity
Crank engine for 15 seconds and check for continuity to ground at terminal #30 on CR3.
no continuity
Replace LPG relay CR3.
continuity
Check resistance of LPG solenoid.
0 or infinite ohms
Replace LPG solenoid.
9 to 10 ohms
Reconnect LPG tank and starter then see Maintenance section for LPG adjustments OR consult Genie Industries Service Department.

Chart 5

Engine Will Not Start On Gasoline, But Will Start On LPG - Gasoline/LPG Models

Be sure fuel select switch is switched to gasoline.

Be sure to check gasoline fuel level.

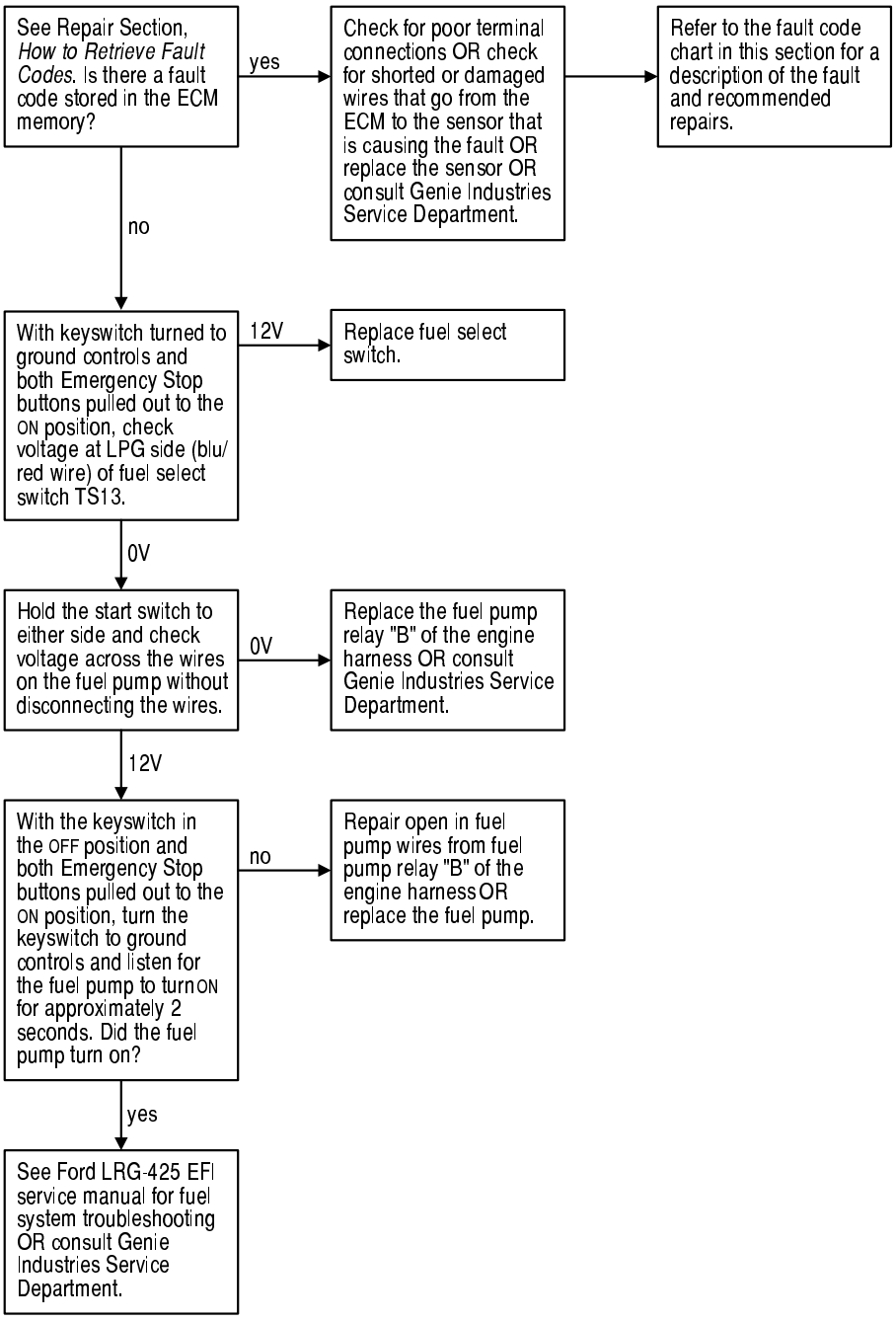


Chart 6

Engine High Idle Inoperative - Gasoline/LPG Models

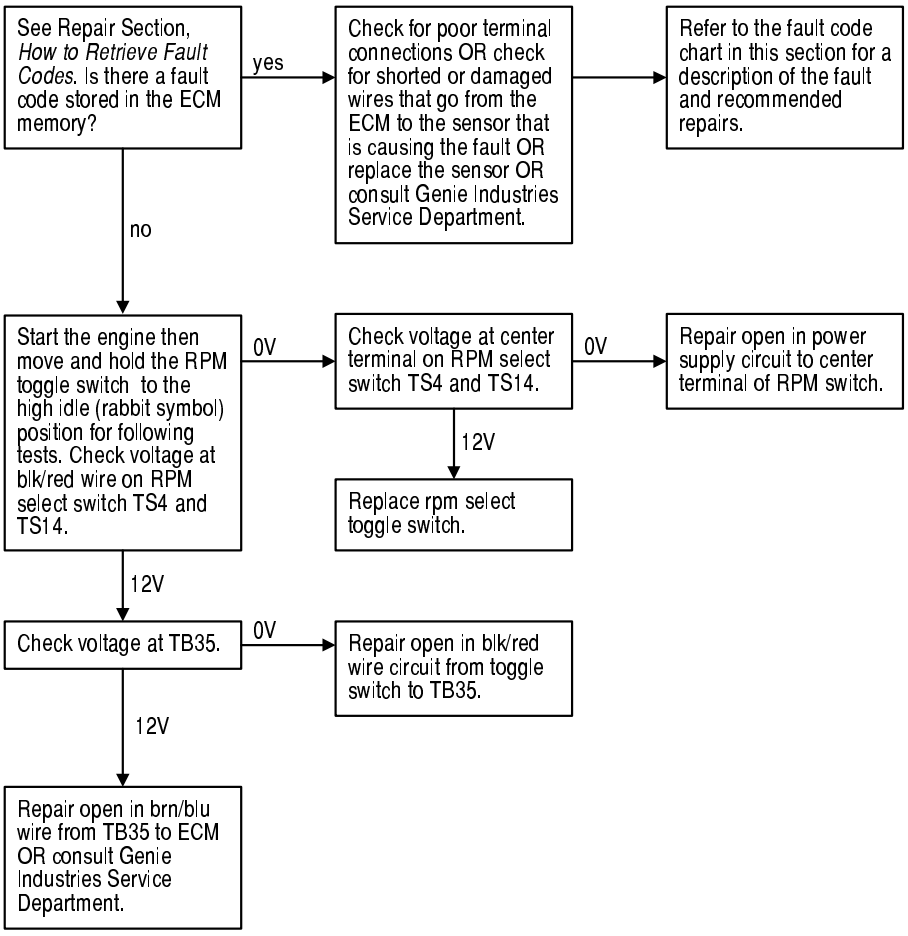


Chart 7

Engine Low Idle Inoperative - Gasoline/LPG Models

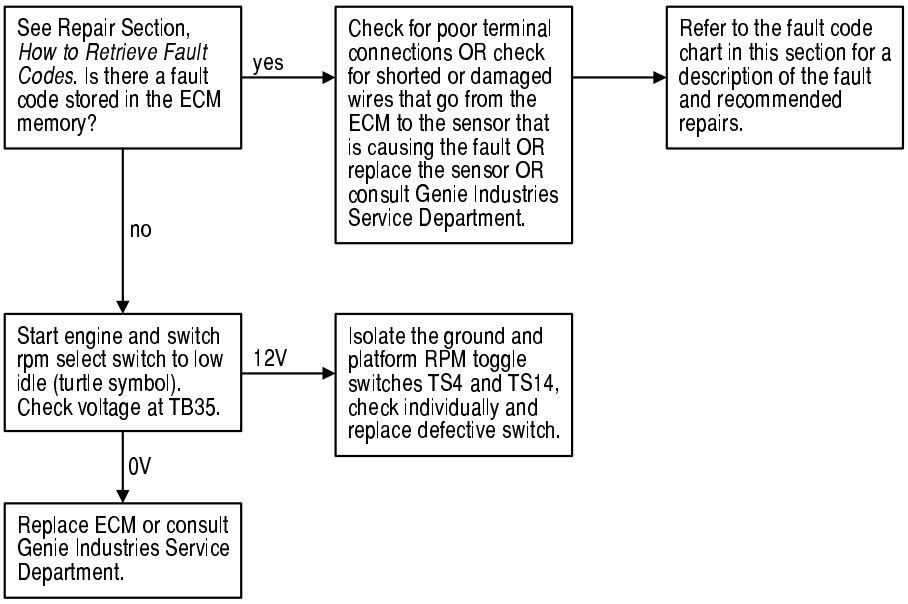


Chart 8

Engine High Idle Inoperative - Deutz Diesel Models

Be sure mechanical linkage is not binding or defective.

Be sure 2-speed solenoid grounding wires are free of corrosion and have full continuity to ground.

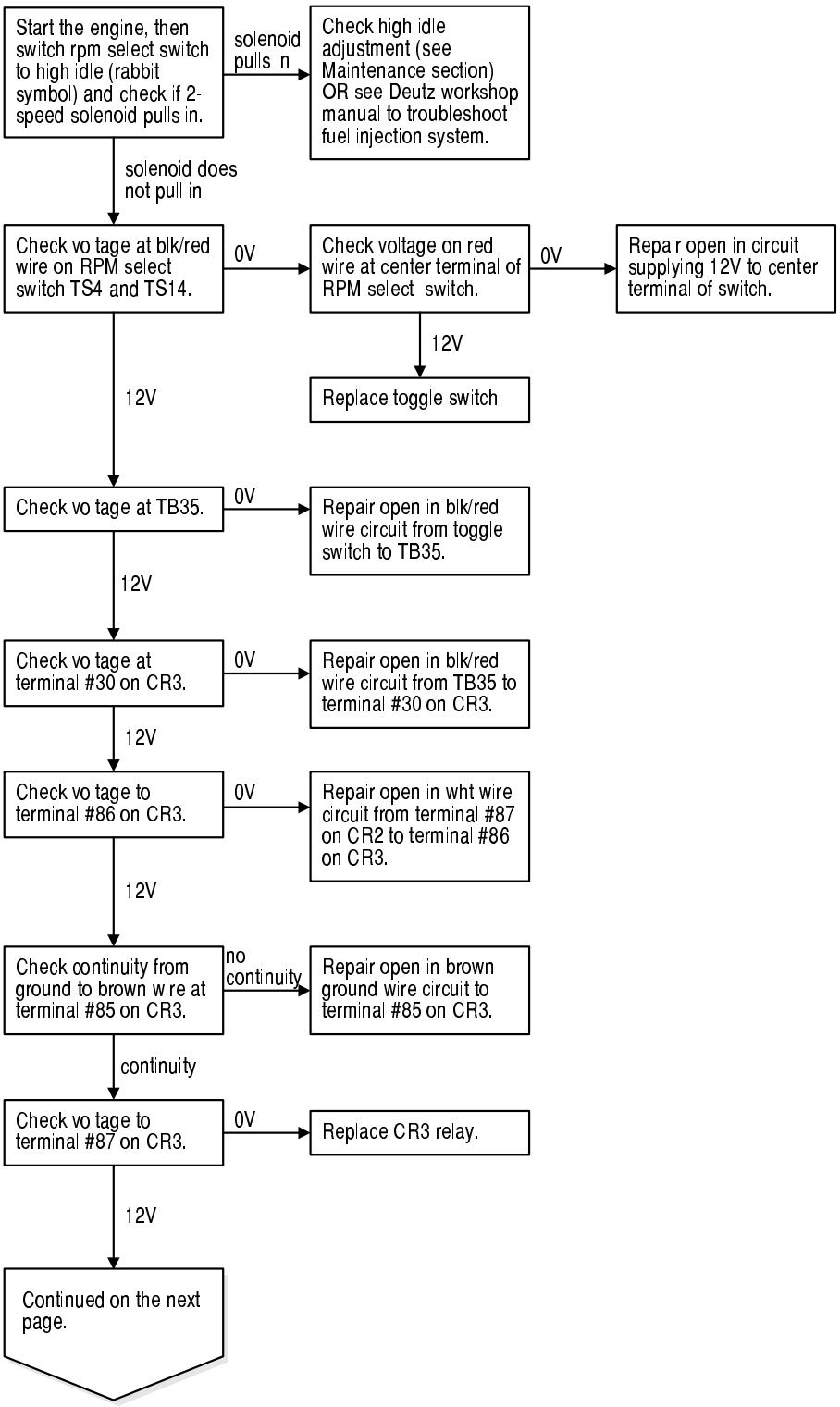


CHART 8

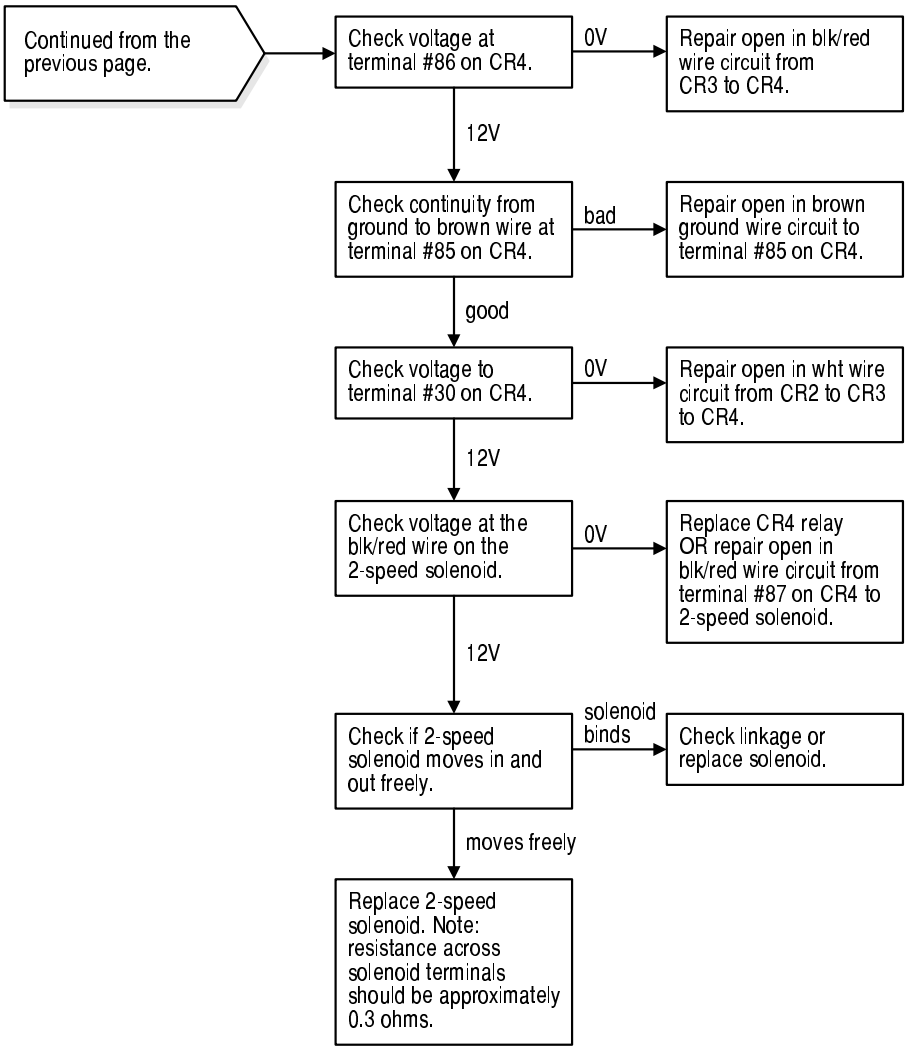

Continued from the previous page.
Check voltage at terminal #86 on CR4.
0V
Repair open in blk/red wire circuit from CR3 to CR4.
12V
Check continuity from ground to brown wire at terminal #85 on CR4.
bad
Repair open in brown ground wire circuit to terminal #85 on CR4.
good
Check voltage to terminal #30 on CR4.
0V
Repair open in wht wire circuit from CR2 to CR3 to CR4.
12V
Check voltage at the blk/red wire on the 2-speed solenoid.
0V
Replace CR4 relay OR repair open in blk/red wire circuit from terminal #87 on CR4 to 2-speed solenoid.
12V
Check if 2-speed solenoid moves in and out freely.
solenoid binds
Check linkage or replace solenoid.
moves freely
Replace 2-speed solenoid. Note: resistance across solenoid terminals should be approximately 0.3 ohms.

Chart 9

Engine Low Idle Inoperative - Deutz Diesel Models

Check if mechanical linkage from 2-speed solenoid to fuel injection system is binding or defective.

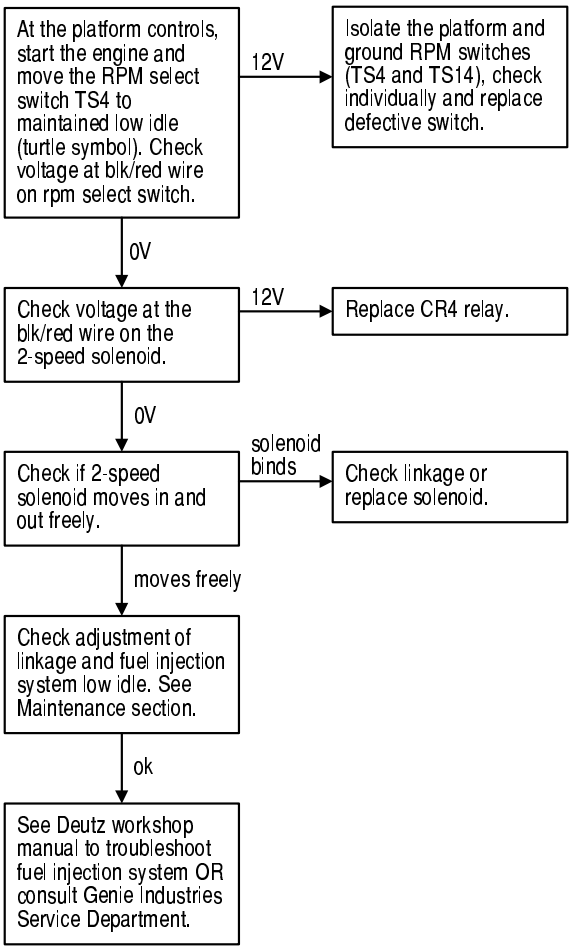


Chart 10

All Functions Inoperative, Engine Starts and Runs

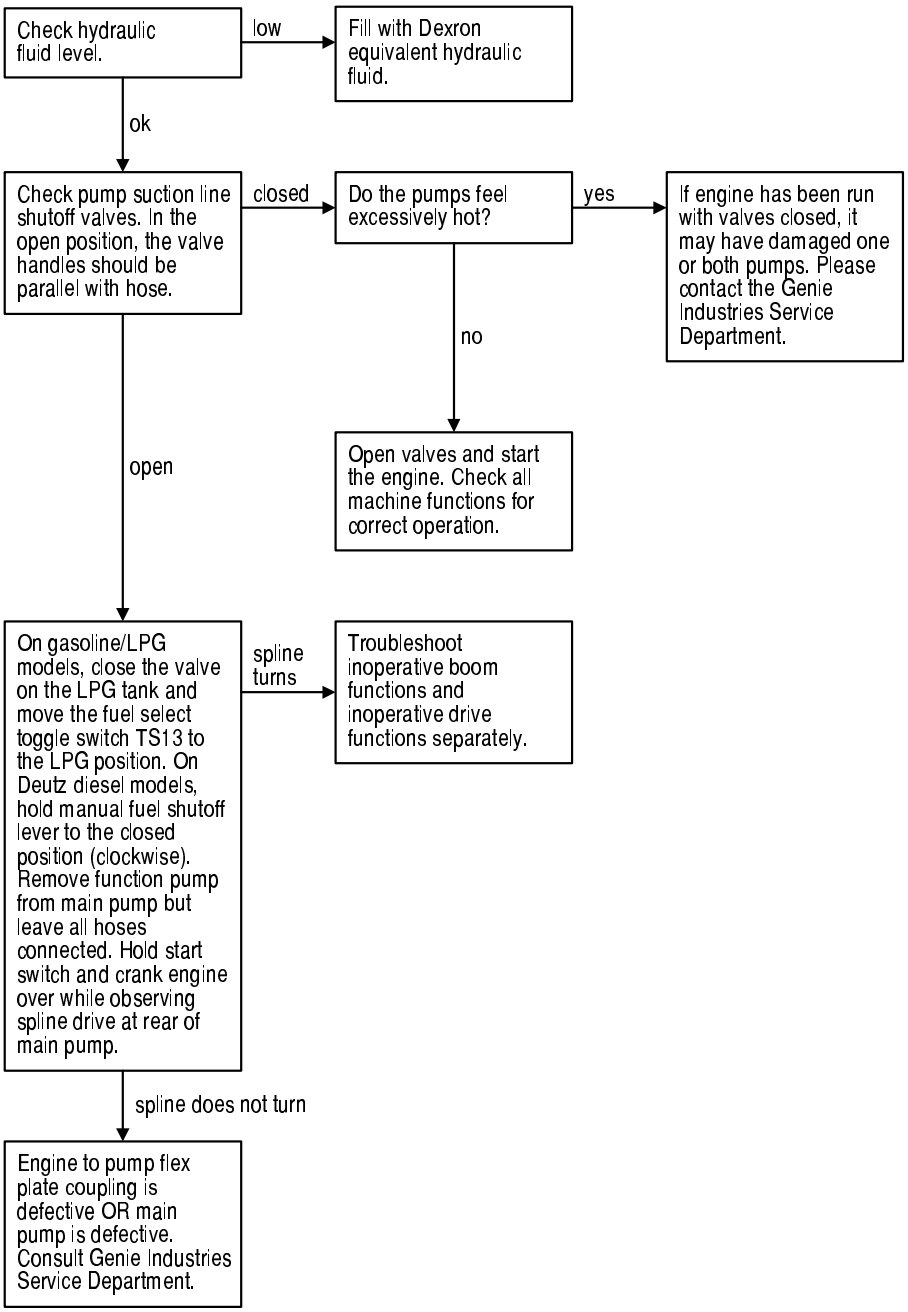


Chart 11

All Lift and Steer Functions Inoperative, Drive Functions Operational

Be sure the hydraulic suction line shutoff valve for the lift/steer pump is in the OPEN position.

Be sure all grounding wires for the hydraulic manifold valves are free of corrosion and have full continuity to ground.

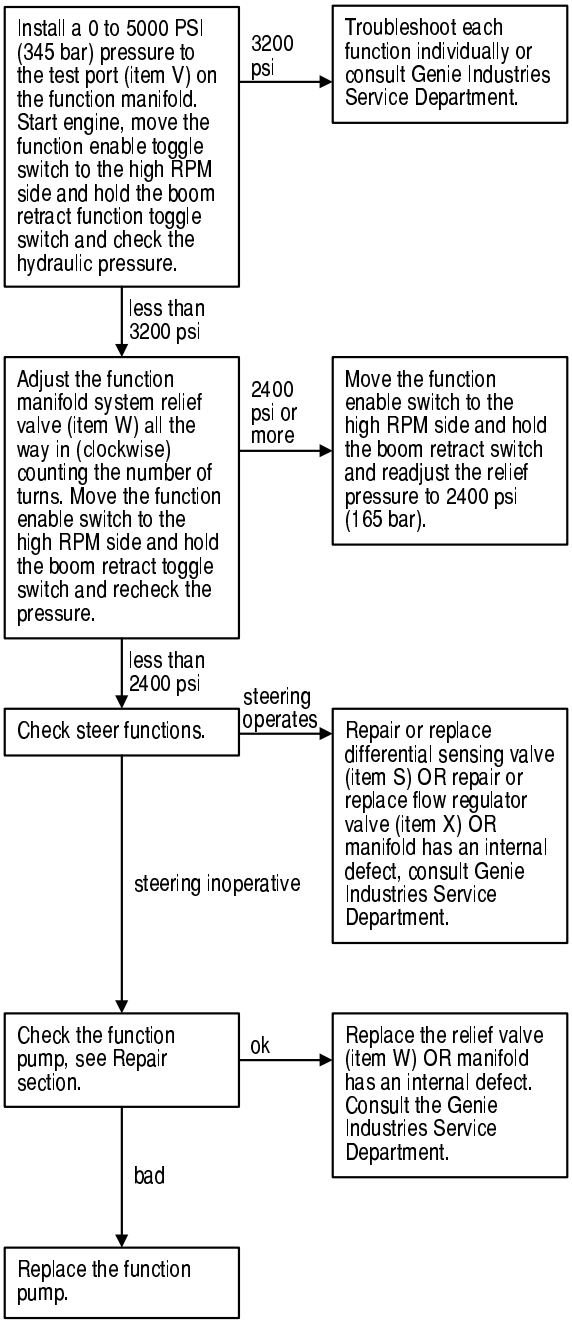


Chart 12

Ground Controls Inoperative, Platform Controls Operate Normally

Be sure all other functions operate normally, including the platform controls.

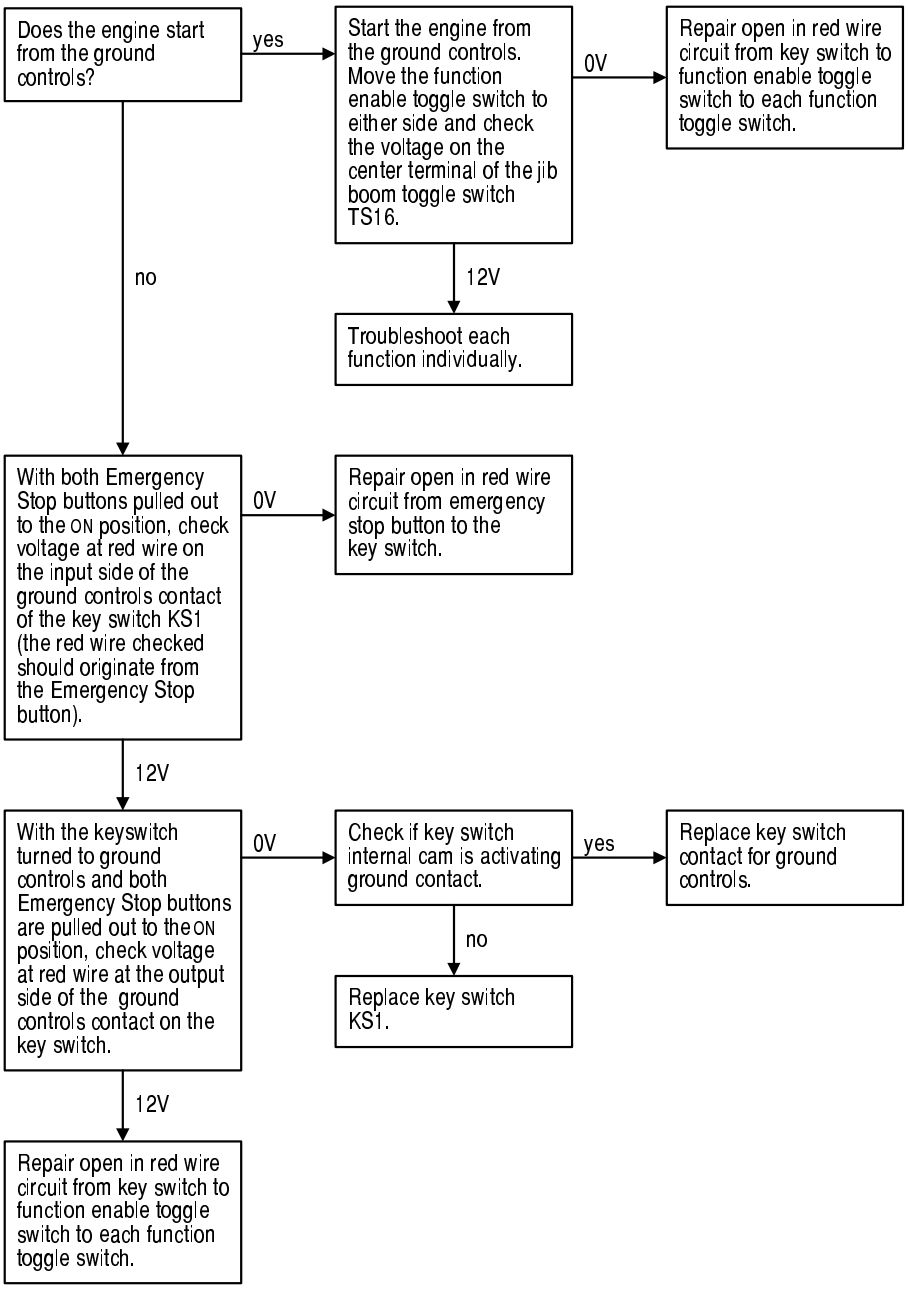


Chart 13

Platform Controls Inoperative, Ground Controls Operate Normally

Be sure all cables from ground control box through the cable track are in good condition with no kinks or abrasions.

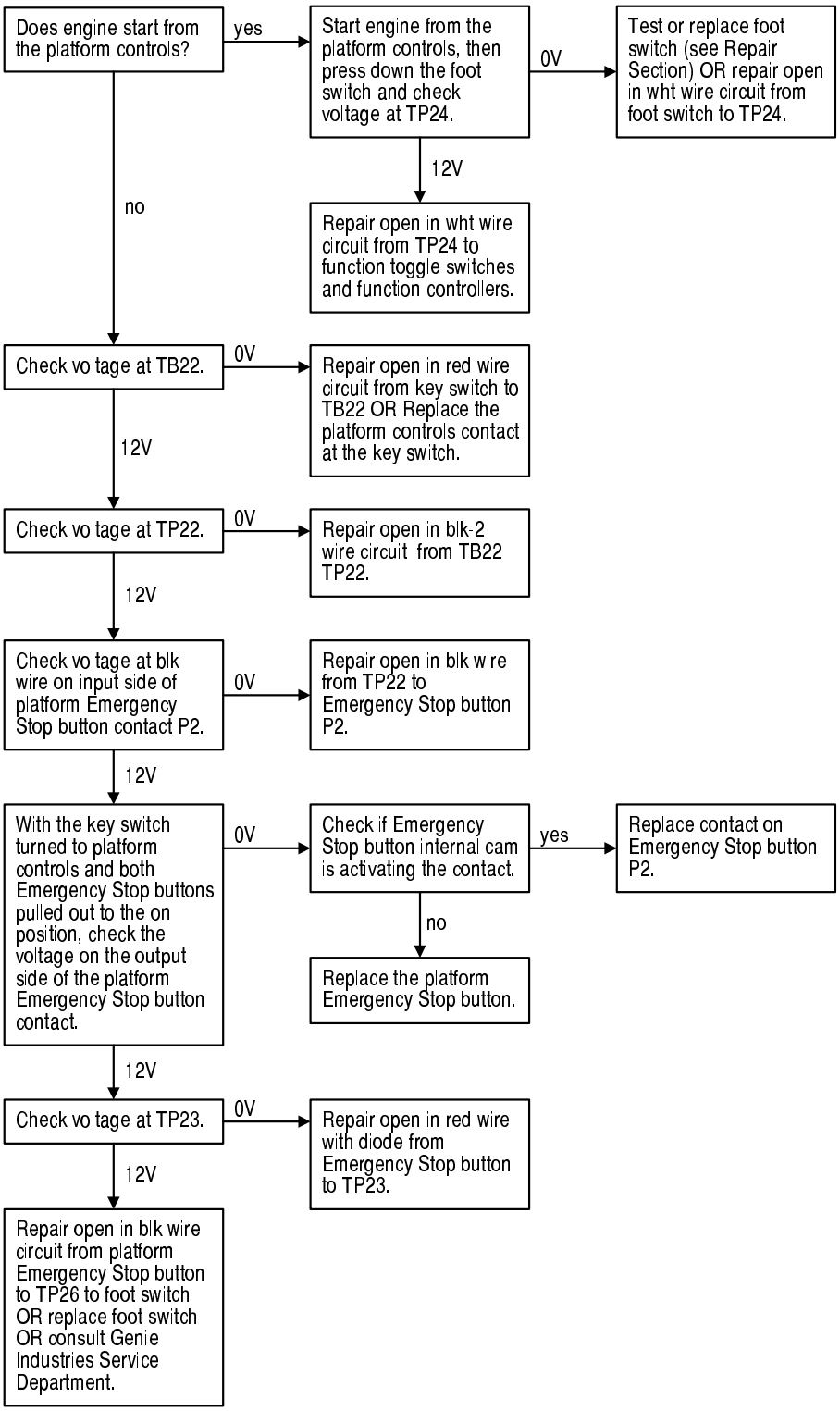


Chart 14

Primary Boom Up Function Inoperative

Be sure all other functions operate normally.

Be sure LS2 limit switch is being activated when the primary boom is in the stowed position.

If primary boom raises approximately 2 feet (0.6 m) and stops, refer to Chart 33.

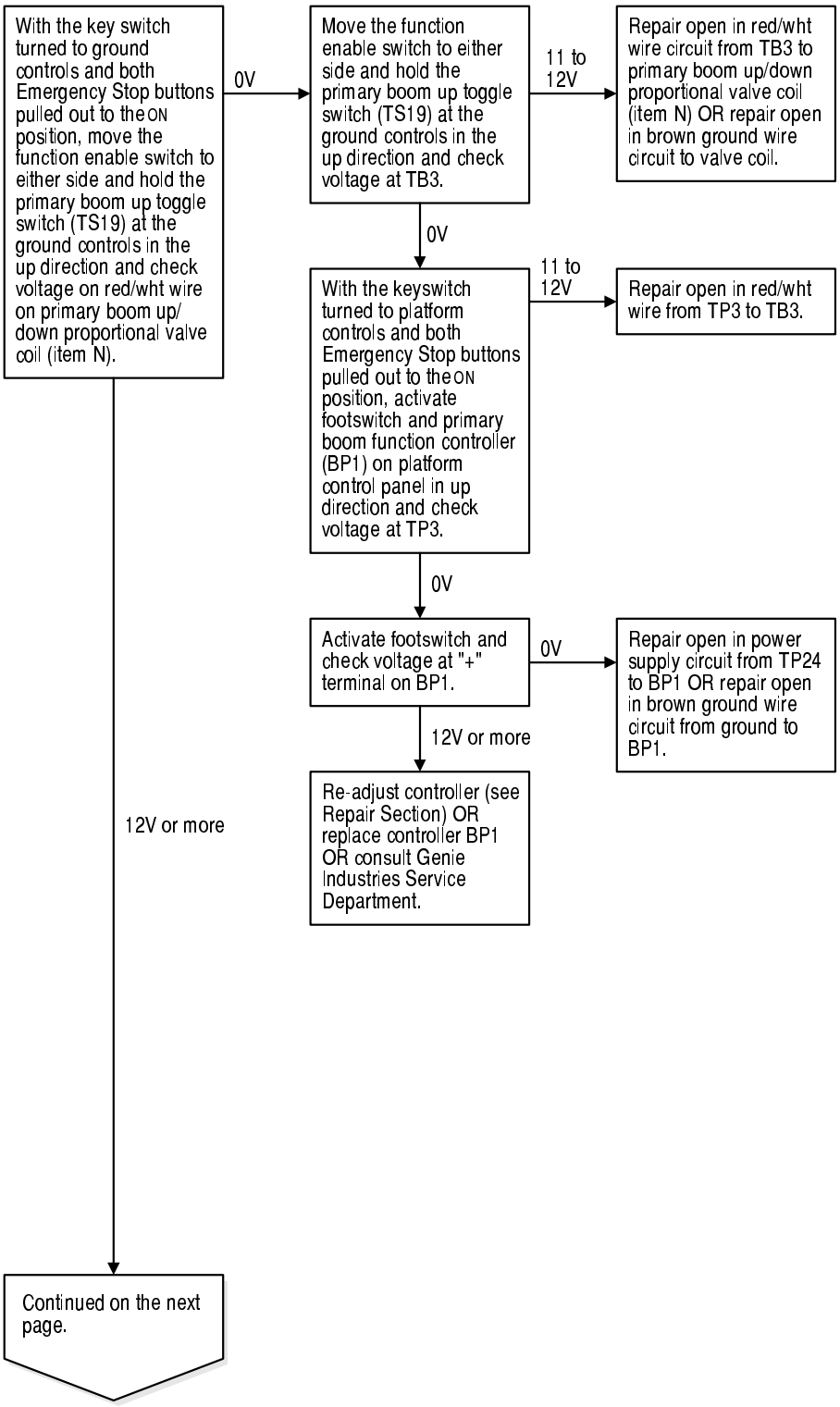


CHART 14

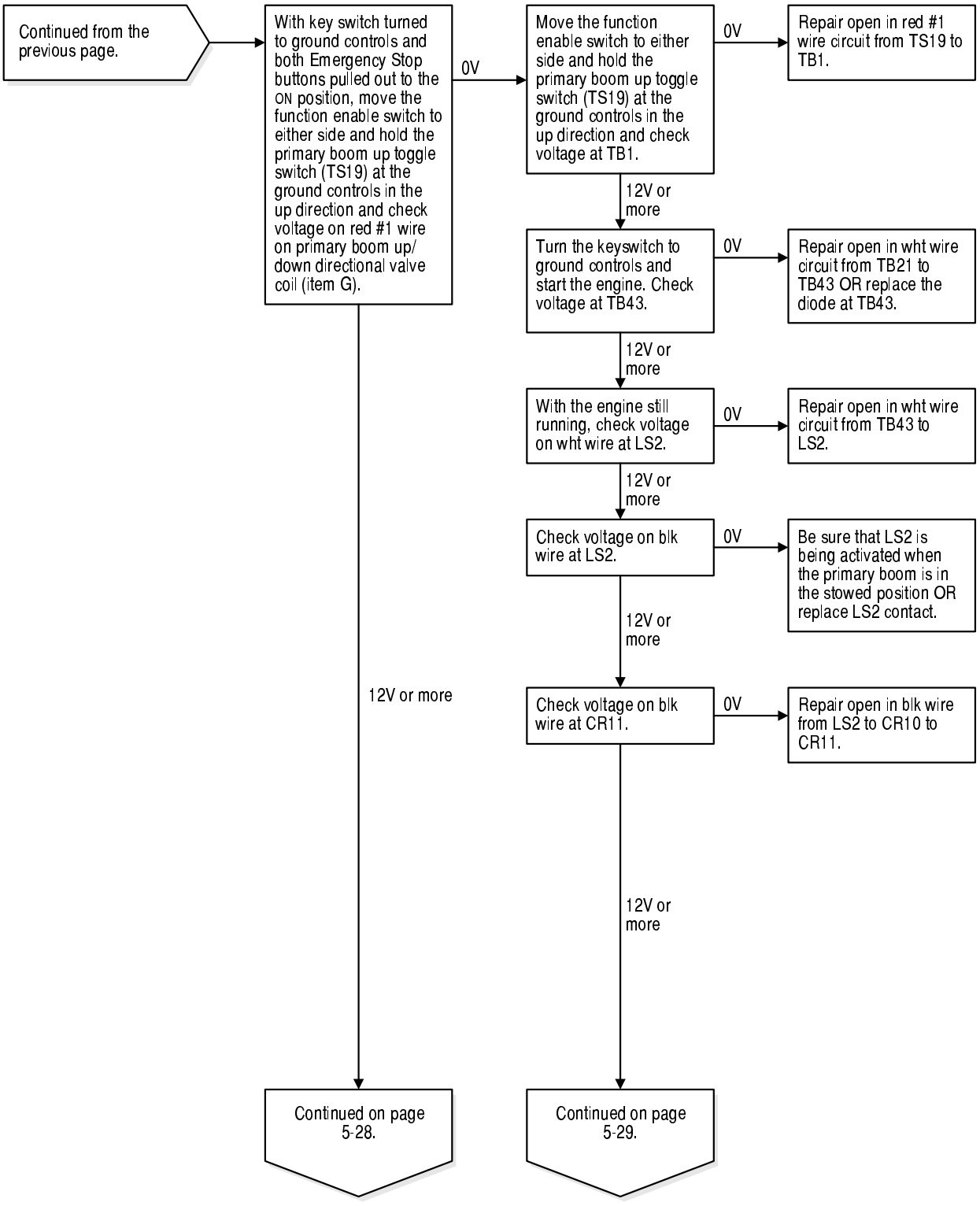

Continued from the previous page.
With key switch turned to ground controls and both Emergency Stop buttons pulled out to the ON position, move the function enable switch to either side and hold the primary boom up toggle switch (TS19) at the ground controls in the up direction and check voltage on red #1 wire on primary boom up/ down directional valve coil (item G).
0V
Move the function enable switch to either side and hold the primary boom up toggle switch (TS19) at the ground controls in the up direction and check voltage at TB1.
0V
Repair open in red #1 wire circuit from TS19 to TB1.
12V or more
Turn the keyswitch to ground controls and start the engine. Check voltage at TB43.
0V
Repair open in wht wire circuit from TB21 to TB43 OR replace the diode at TB43.
12V or more
With the engine still running, check voltage on wht wire at LS2.
0V
Repair open in wht wire circuit from TB43 to LS2.
12V or more
Check voltage on blk wire at LS2.
0V
Be sure that LS2 is being activated when the primary boom is in the stowed position OR replace LS2 contact.
12V or more
12V or more
Check voltage on blk wire at CR11.
0V
Repair open in blk wire from LS2 to CR10 to CR11.
12V or more
Continued on page 5-28.
Continued on page 5-29.

CHART 14

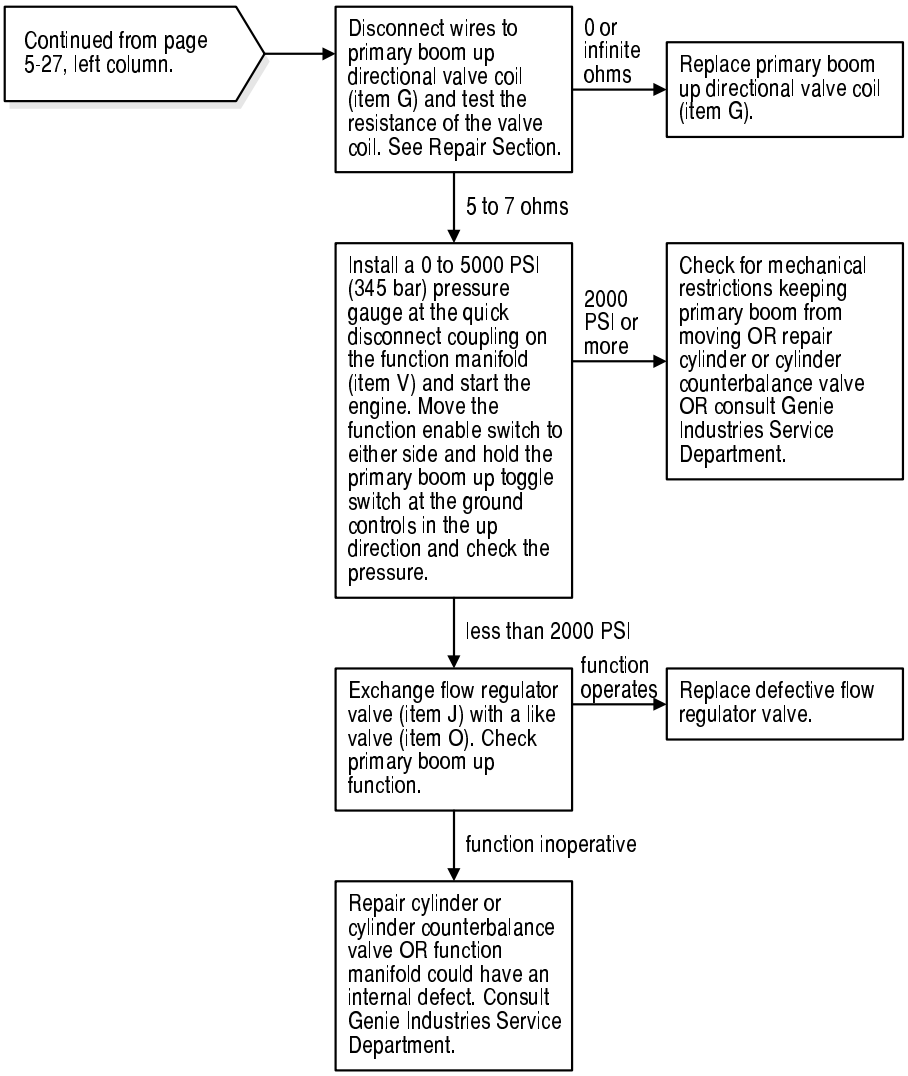

Continued from page 5-27, left column.
Disconnect wires to primary boom up directional valve coil (item G) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace primary boom up directional valve coil (item G).
5 to 7 ohms
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the function manifold (item V) and start the engine. Move the function enable switch to either side and hold the primary boom up toggle switch at the ground controls in the up direction and check the pressure.
2000 PSI or more
Check for mechanical restrictions keeping primary boom from moving OR repair cylinder or cylinder counterbalance valve OR consult Genie Industries Service Department.
less than 2000 PSI
Exchange flow regulator valve (item J) with a like valve (item O). Check primary boom up function.
function operates
Replace defective flow regulator valve.
function inoperative
Repair cylinder or cylinder counterbalance valve OR function manifold could have an internal defect. Consult Genie Industries Service Department.

CHART 14

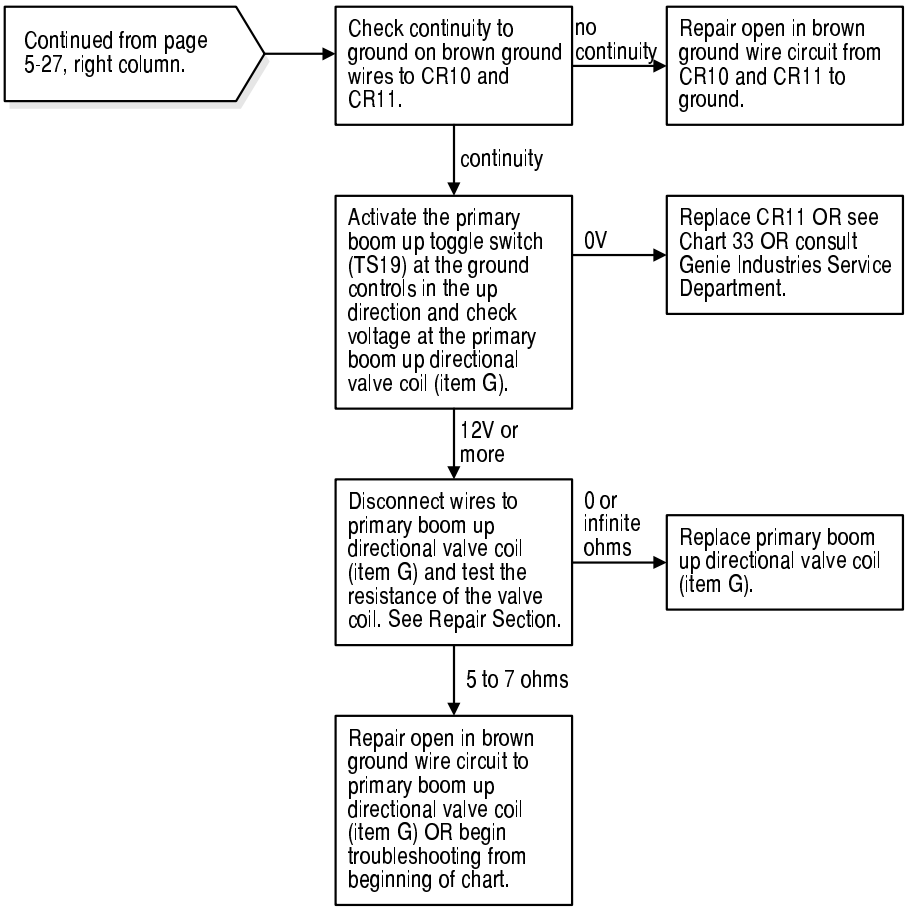

Continued from page 5-27, right column.
Check continuity to ground on brown ground wires to CR10 and CR11.
no continuity
Repair open in brown ground wire circuit from CR10 and CR11 to ground.
continuity
Activate the primary boom up toggle switch (TS19) at the ground controls in the up direction and check voltage at the primary boom up directional valve coil (item G).
0V
Replace CR11 OR see Chart 33 OR consult Genie Industries Service Department.
12V or more
Disconnect wires to primary boom up directional valve coil (item G) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace primary boom up directional valve coil (item G).
5 to 7 ohms
Repair open in brown ground wire circuit to primary boom up directional valve coil (item G) OR begin troubleshooting from beginning of chart.

Chart 15

Primary Boom Down Function Inoperative

Be sure all other functions operate normally.

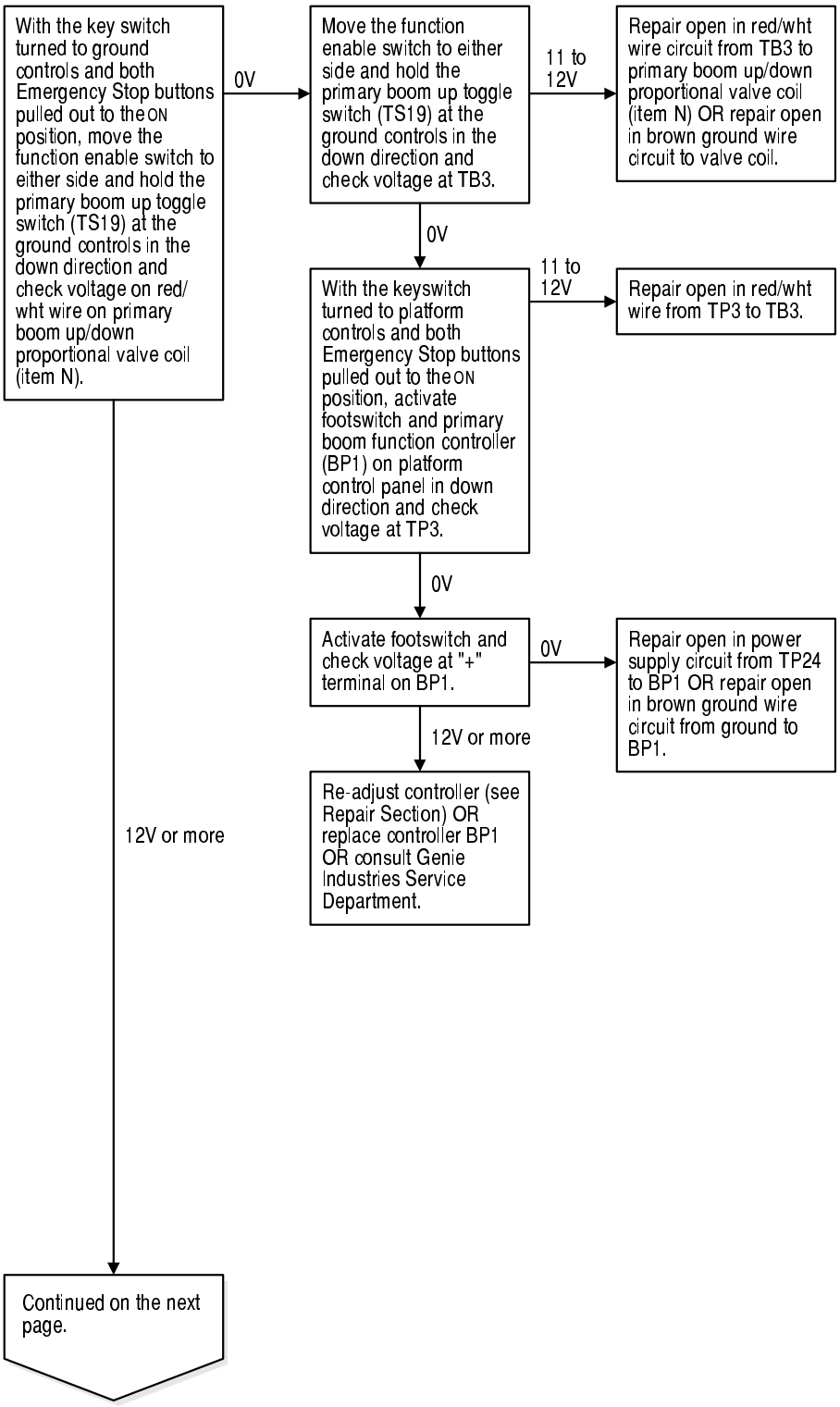


CHART 15

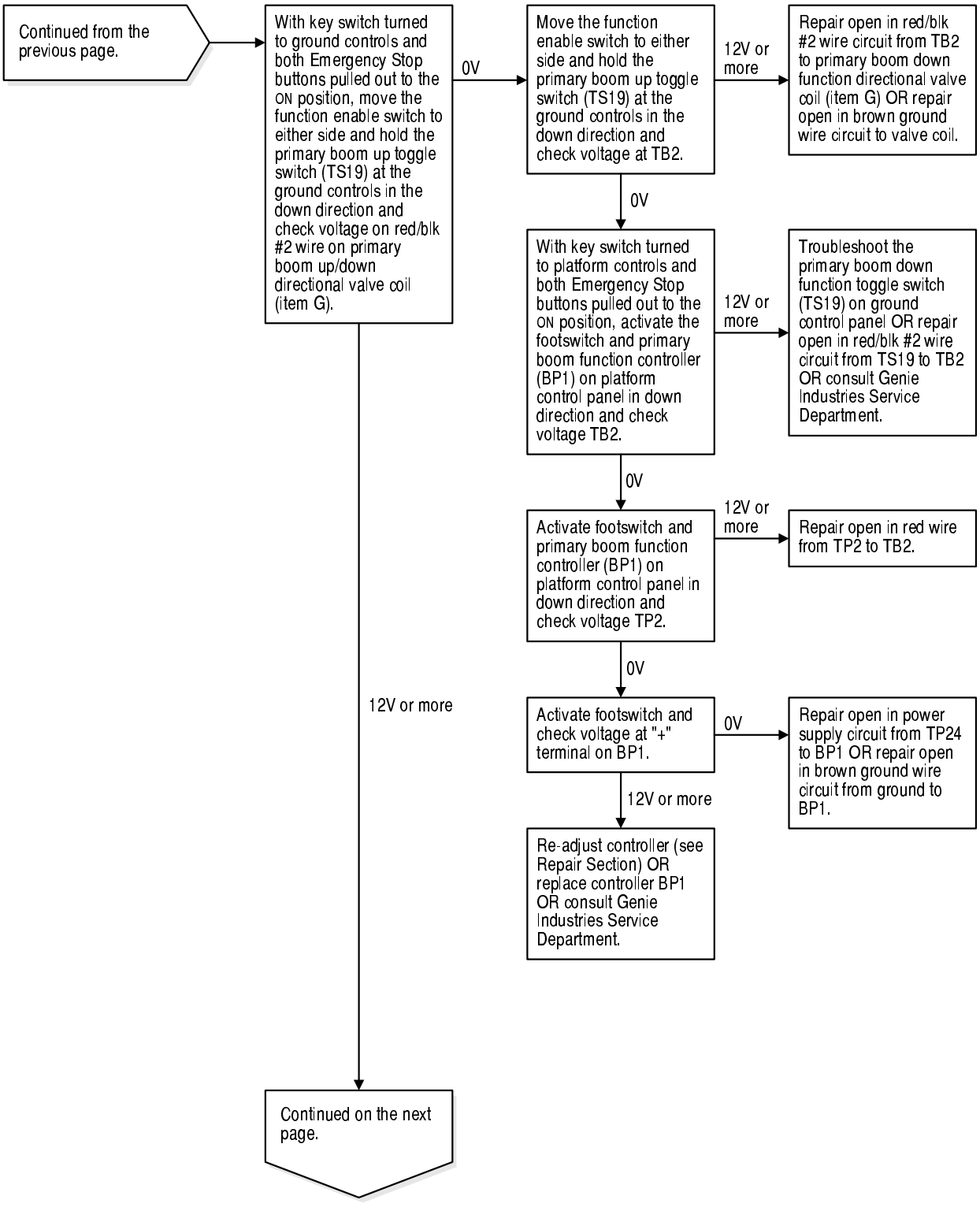

Continued from the previous page.
With key switch turned to ground controls and both Emergency Stop buttons pulled out to the ON position, move the function enable switch to either side and hold the primary boom up toggle switch (TS19) at the ground controls in the down direction and check voltage on red/blk #2 wire on primary boom up/down directional valve coil (item G).
0V
Move the function enable switch to either side and hold the primary boom up toggle switch (TS19) at the ground controls in the down direction and check voltage at TB2.
12V or more
Repair open in red/blk #2 wire circuit from TB2 to primary boom down function directional valve coil (item G) OR repair open in brown ground wire circuit to valve coil.
0V
With key switch turned to platform controls and both Emergency Stop buttons pulled out to the ON position, activate the footswitch and primary boom function controller (BP1) on platform control panel in down direction and check voltage TB2.
12V or more
Troubleshoot the primary boom down function toggle switch (TS19) on ground control panel OR repair open in red/blk #2 wire circuit from TS19 to TB2 OR consult Genie Industries Service Department.
0V
Activate footswitch and primary boom function controller (BP1) on platform control panel in down direction and check voltage TP2.
12V or more
Repair open in red wire from TP2 to TB2.
0V
Activate footswitch and check voltage at "+" terminal on BP1.
0V
Repair open in power supply circuit from TP24 to BP1 OR repair open in brown ground wire circuit from ground to BP1.
12V or more
Re-adjust controller (see Repair Section) OR replace controller BP1 OR consult Genie Industries Service Department.
12V or more
Continued on the next page.

CHART 15

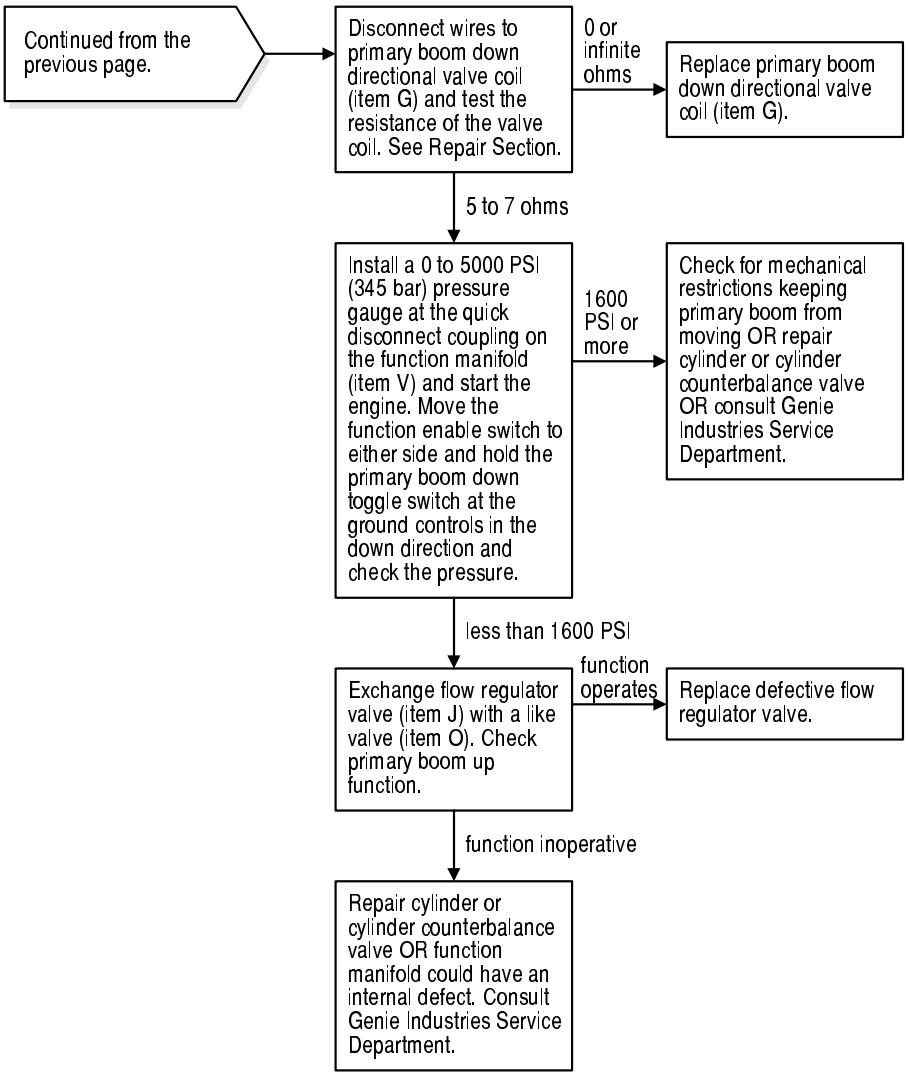

Continued from the previous page.
Disconnect wires to primary boom down directional valve coil (item G) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace primary boom down directional valve coil (item G).
5 to 7 ohms
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the function manifold (item V) and start the engine. Move the function enable switch to either side and hold the primary boom down toggle switch at the ground controls in the down direction and check the pressure.
1600 PSI or more
Check for mechanical restrictions keeping primary boom from moving OR repair cylinder or cylinder counterbalance valve OR consult Genie Industries Service Department.
less than 1600 PSI
Exchange flow regulator valve (item J) with a like valve (item O). Check primary boom up function.
function operates
Replace defective flow regulator valve.
function inoperative
Repair cylinder or cylinder counterbalance valve OR function manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 16

Secondary Boom Up Function Inoperative

Be sure all other functions operate normally.

Be sure LS2 limit switch is being activated when the secondary boom is in the stowed position.

If secondary boom raises approximately 2 feet (0.6 m) and stops, refer to Chart 33.

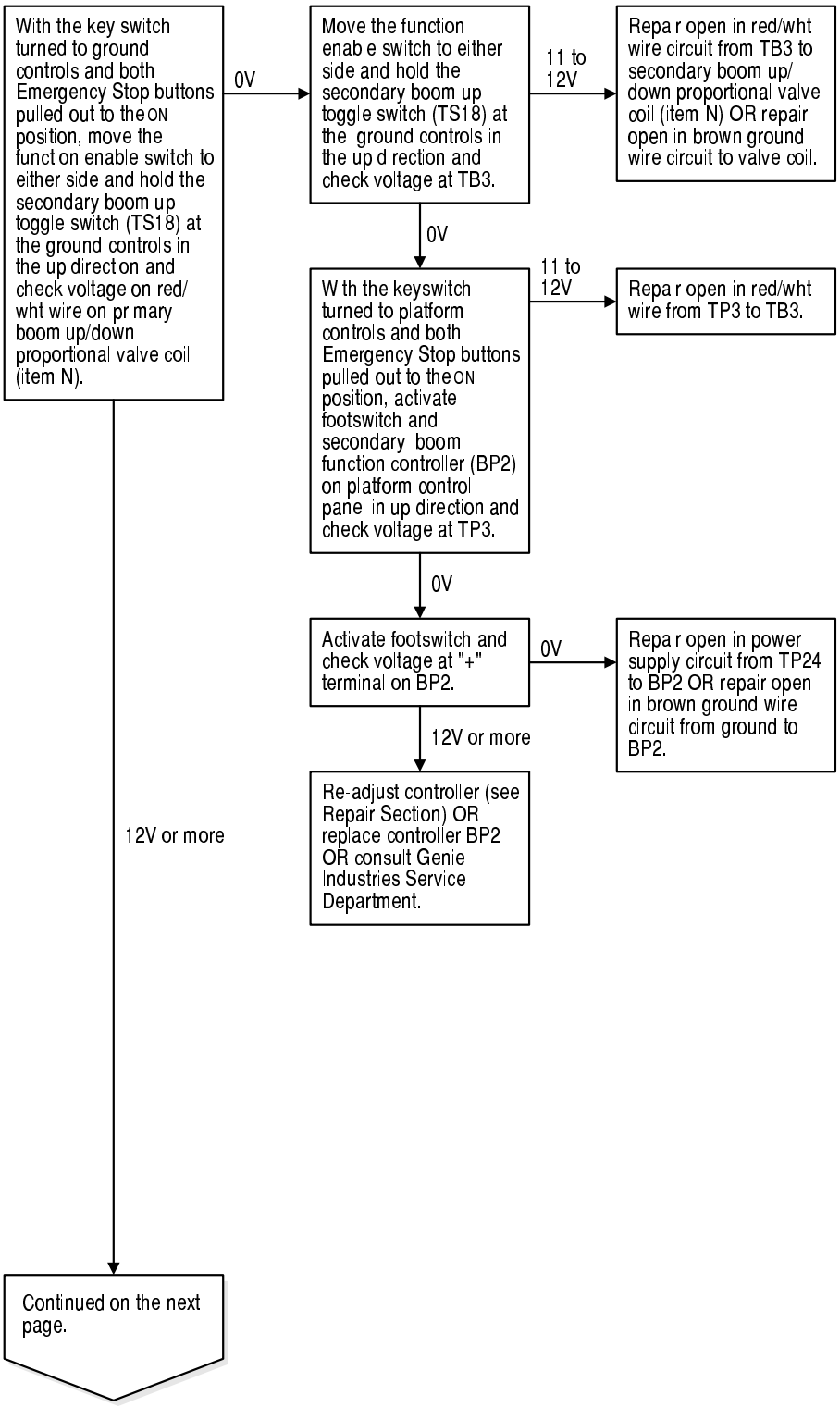


CHART 16

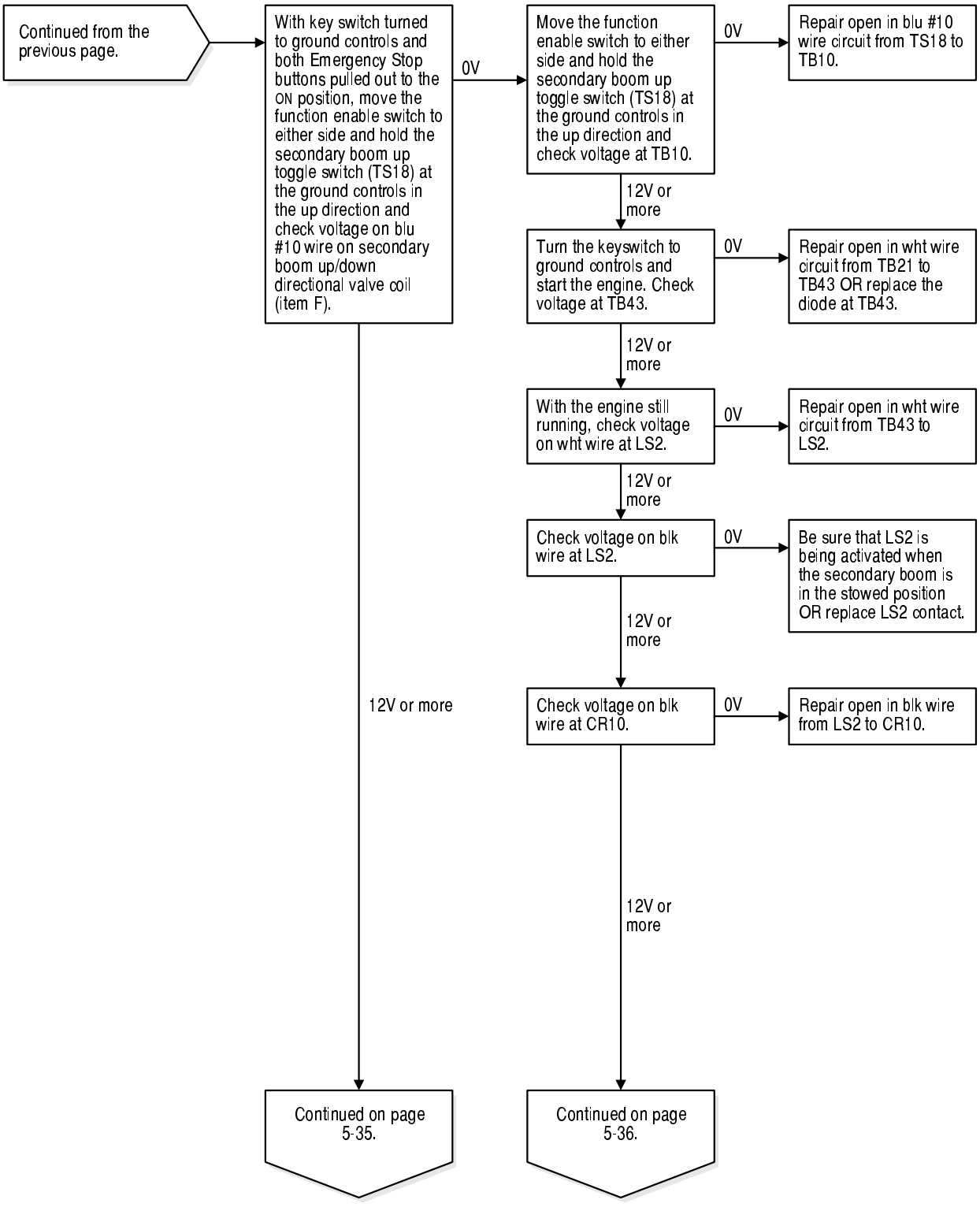

Continued from the previous page.
With key switch turned to ground controls and both Emergency Stop buttons pulled out to the ON position, move the function enable switch to either side and hold the secondary boom up toggle switch (TS18) at the ground controls in the up direction and check voltage on blu #10 wire on secondary boom up/down directional valve coil (item F).
0V
Move the function enable switch to either side and hold the secondary boom up toggle switch (TS18) at the ground controls in the up direction and check voltage at TB10.
0V
Repair open in blu #10 wire circuit from TS18 to TB10.
12V or more
Turn the keyswitch to ground controls and start the engine. Check voltage at TB43.
0V
Repair open in wht wire circuit from TB21 to TB43 OR replace the diode at TB43.
12V or more
With the engine still running, check voltage on wht wire at LS2.
0V
Repair open in wht wire circuit from TB43 to LS2.
12V or more
Check voltage on blk wire at LS2.
0V
Be sure that LS2 is being activated when the secondary boom is in the stowed position OR replace LS2 contact.
12V or more
12V or more
Check voltage on blk wire at CR10.
0V
Repair open in blk wire from LS2 to CR10.
12V or more
Continued on page 5-35.
Continued on page 5-36.

CHART 16

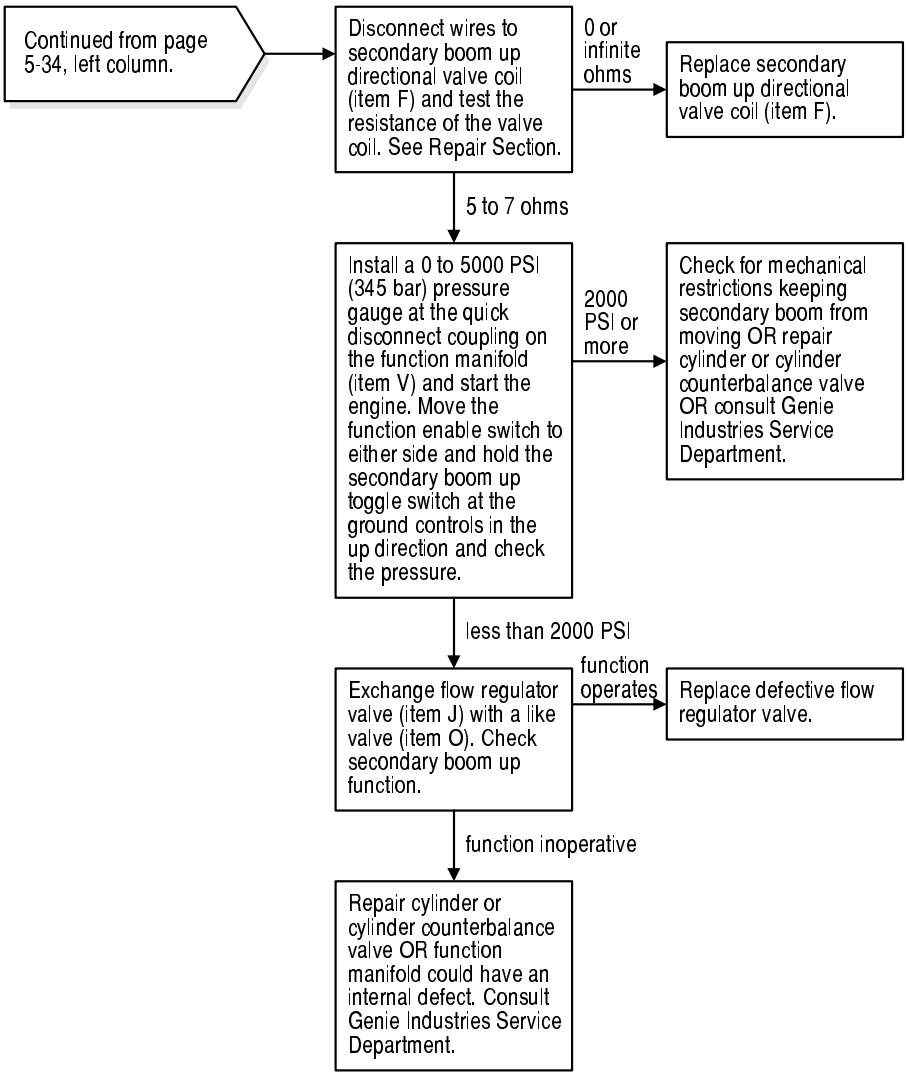

Continued from page 5-34, left column.
Disconnect wires to secondary boom up directional valve coil (item F) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace secondary boom up directional valve coil (item F).
5 to 7 ohms
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the function manifold (item V) and start the engine. Move the function enable switch to either side and hold the secondary boom up toggle switch at the ground controls in the up direction and check the pressure.
2000 PSI or more
Check for mechanical restrictions keeping secondary boom from moving OR repair cylinder or cylinder counterbalance valve OR consult Genie Industries Service Department.
less than 2000 PSI
Exchange flow regulator valve (item J) with a like valve (item O). Check secondary boom up function.
function operates
Replace defective flow regulator valve.
function inoperative
Repair cylinder or cylinder counterbalance valve OR function manifold could have an internal defect. Consult Genie Industries Service Department.

CHART 16

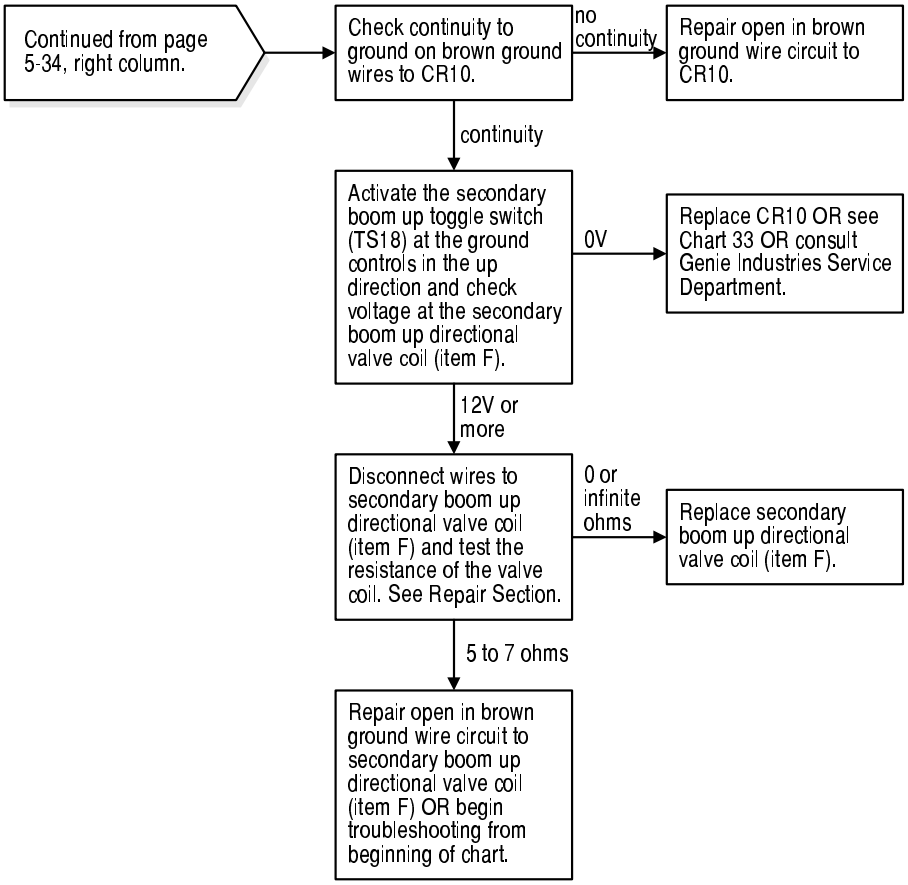

Continued from page 5-34, right column.
Check continuity to ground on brown ground wires to CR10.
no continuity
Repair open in brown ground wire circuit to CR10.
continuity
Activate the secondary boom up toggle switch (TS18) at the ground controls in the up direction and check voltage at the secondary boom up directional valve coil (item F).
0V
Replace CR10 OR see Chart 33 OR consult Genie Industries Service Department.
12V or more
Disconnect wires to secondary boom up directional valve coil (item F) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace secondary boom up directional valve coil (item F).
5 to 7 ohms
Repair open in brown ground wire circuit to secondary boom up directional valve coil (item F) OR begin troubleshooting from beginning of chart.

Chart 17

Secondary Boom Down Function Inoperative

Be sure all other functions operate normally.

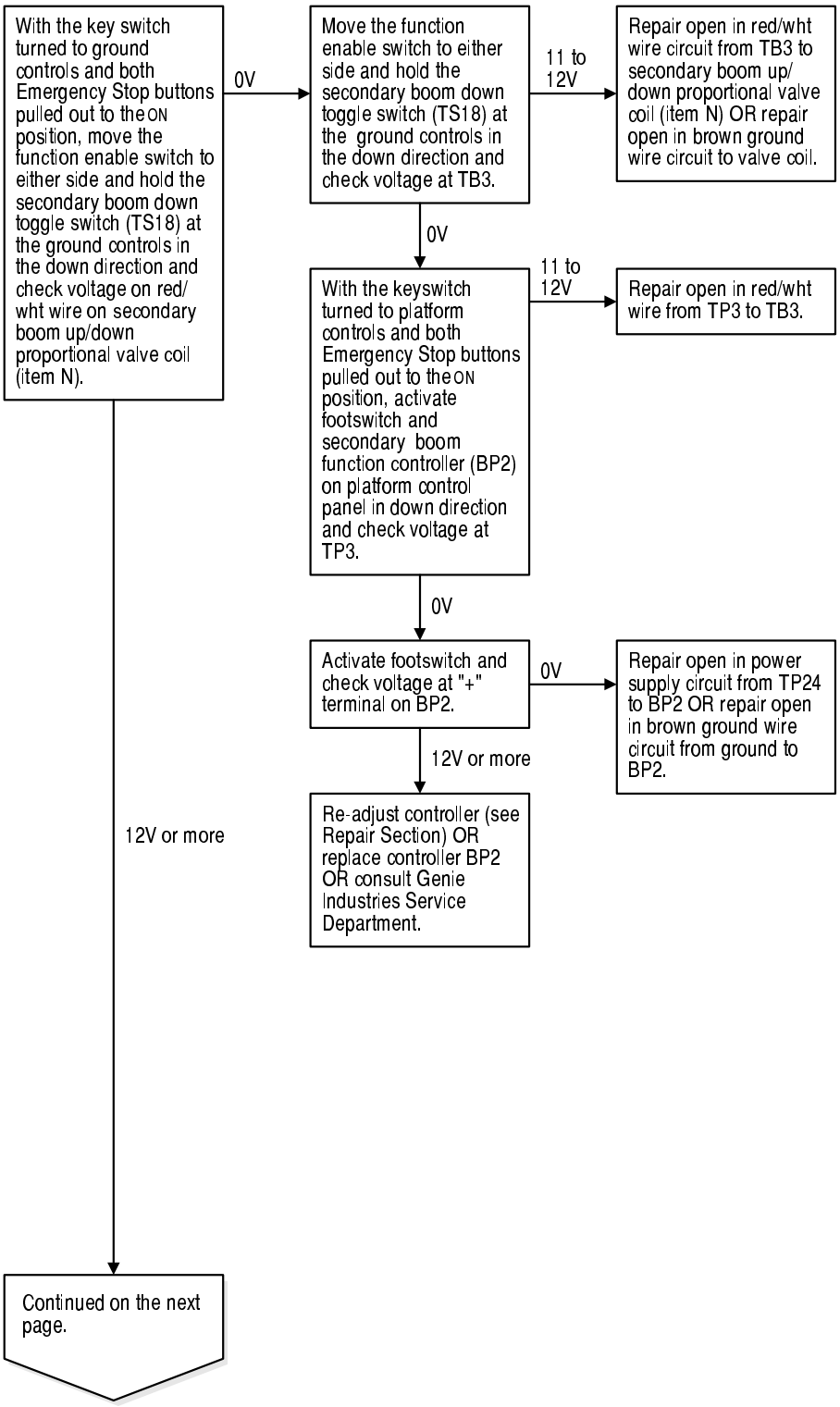


CHART 17

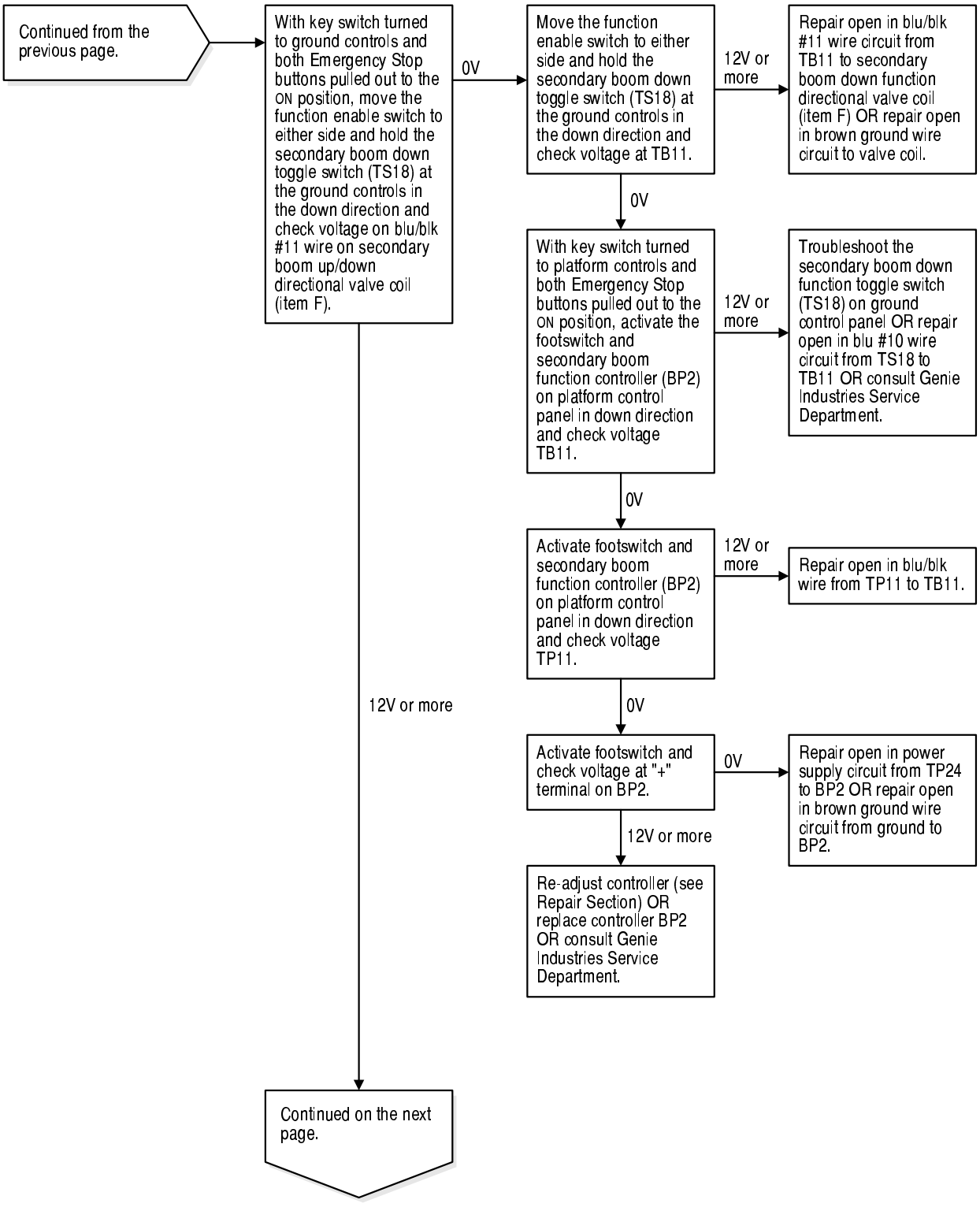

Continued from the previous page.
With key switch turned to ground controls and both Emergency Stop buttons pulled out to the ON position, move the function enable switch to either side and hold the secondary boom down toggle switch (TS18) at the ground controls in the down direction and check voltage on blu/blk #11 wire on secondary boom up/down directional valve coil (item F).
0V
Move the function enable switch to either side and hold the secondary boom down toggle switch (TS18) at the ground controls in the down direction and check voltage at TB11.
12V or more
Repair open in blu/blk #11 wire circuit from TB11 to secondary boom down function directional valve coil (item F) OR repair open in brown ground wire circuit to valve coil.
0V
With key switch turned to platform controls and both Emergency Stop buttons pulled out to the ON position, activate the footswitch and secondary boom function controller (BP2) on platform control panel in down direction and check voltage TB11.
12V or more
Troubleshoot the secondary boom down function toggle switch (TS18) on ground control panel OR repair open in blu #10 wire circuit from TS18 to TB11 OR consult Genie Industries Service Department.
0V
Activate footswitch and secondary boom function controller (BP2) on platform control panel in down direction and check voltage TP11.
12V or more
Repair open in blu/blk wire from TP11 to TB11.
0V
12V or more
Activate footswitch and check voltage at "+" terminal on BP2.
0V
Repair open in power supply circuit from TP24 to BP2 OR repair open in brown ground wire circuit from ground to BP2.
12V or more
Re-adjust controller (see Repair Section) OR replace controller BP2 OR consult Genie Industries Service Department.
Continued on the next page.

CHART 17

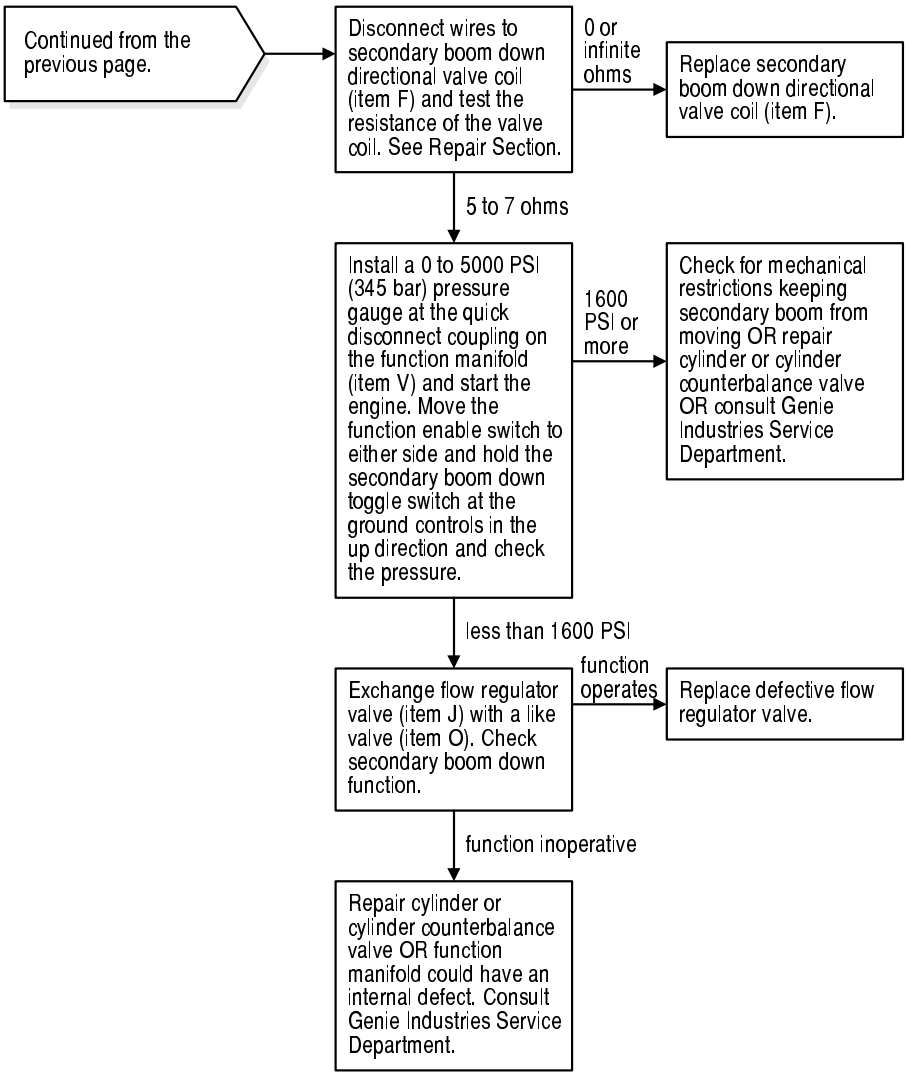

Continued from the previous page.
Disconnect wires to secondary boom down directional valve coil (item F) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace secondary boom down directional valve coil (item F).
5 to 7 ohms
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the function manifold (item V) and start the engine. Move the function enable switch to either side and hold the secondary boom down toggle switch at the ground controls in the up direction and check the pressure.
1600 PSI or more
Check for mechanical restrictions keeping secondary boom from moving OR repair cylinder or cylinder counterbalance valve OR consult Genie Industries Service Department.
less than 1600 PSI
Exchange flow regulator valve (item J) with a like valve (item O). Check secondary boom down function.
function operates
Replace defective flow regulator valve.
function inoperative
Repair cylinder or cylinder counterbalance valve OR function manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 18

Primary Boom Extend Function Inoperative

Be sure all other functions operate normally.

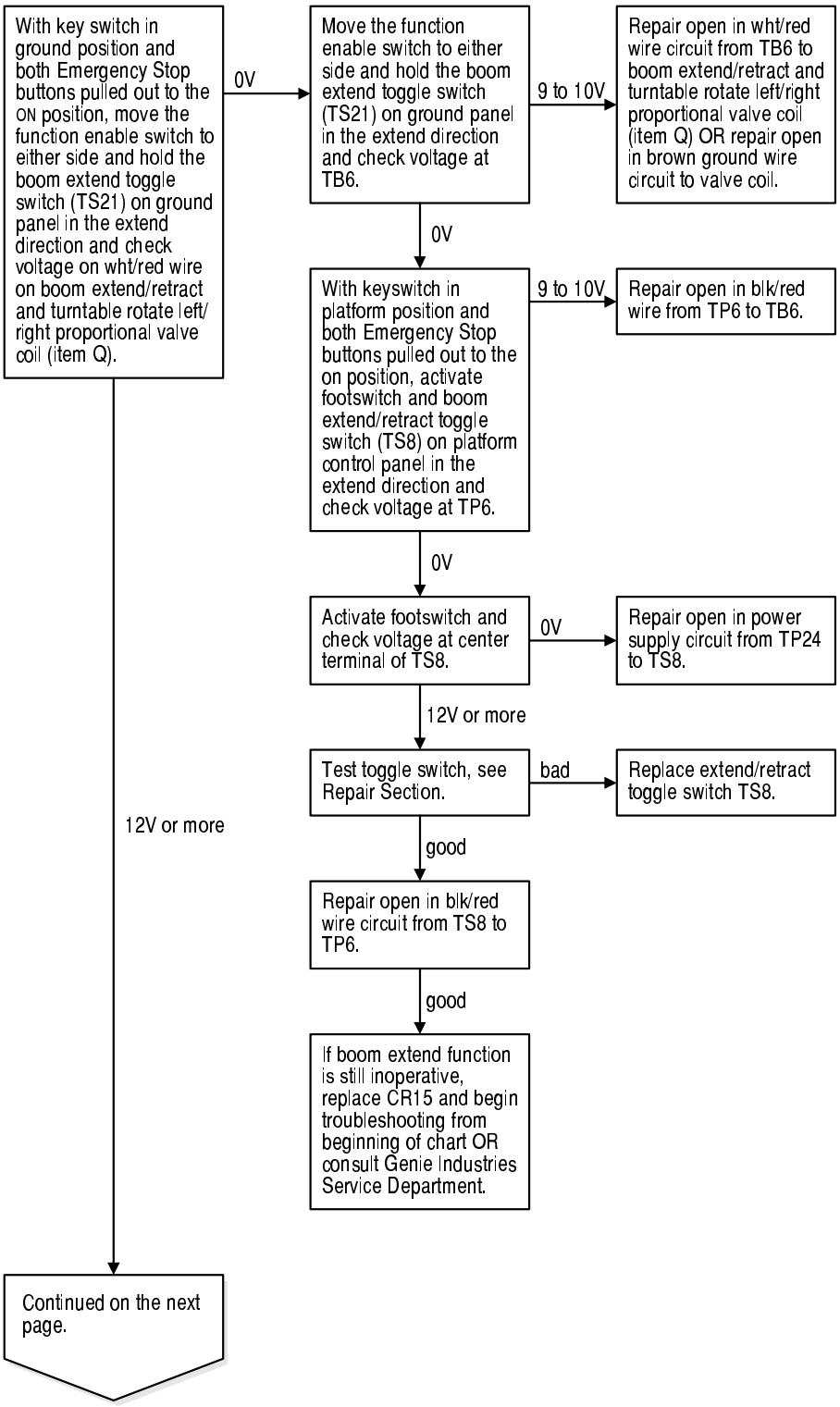


CHART 18

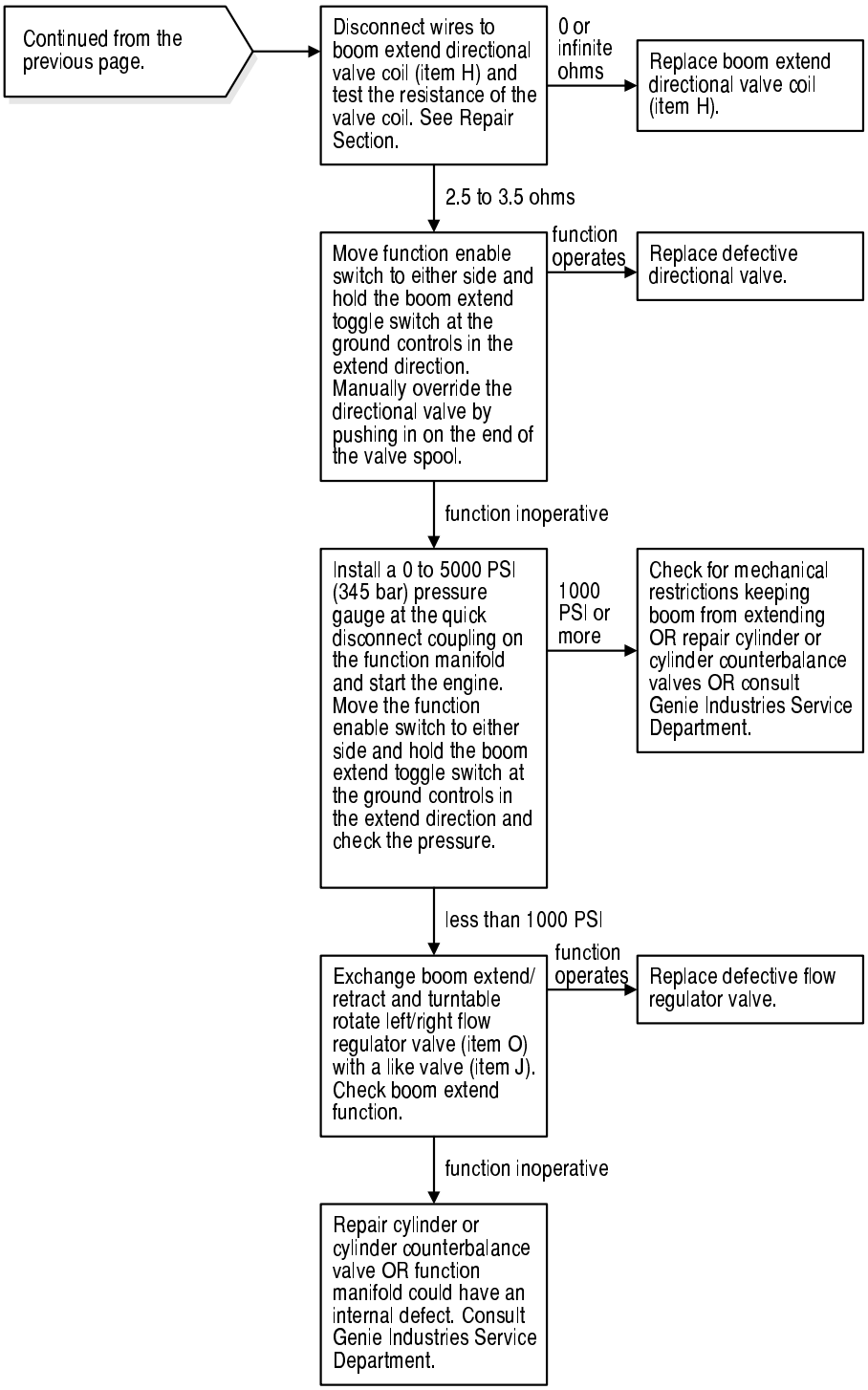

Continued from the previous page.
Disconnect wires to boom extend directional valve coil (item H) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace boom extend directional valve coil (item H).
2.5 to 3.5 ohms
Move function enable switch to either side and hold the boom extend toggle switch at the ground controls in the extend direction. Manually override the directional valve by pushing in on the end of the valve spool.
function operates
Replace defective directional valve.
function inoperative
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the function manifold and start the engine. Move the function enable switch to either side and hold the boom extend toggle switch at the ground controls in the extend direction and check the pressure.
1000 PSI or more
Check for mechanical restrictions keeping boom from extending OR repair cylinder or cylinder counterbalance valves OR consult Genie Industries Service Department.
less than 1000 PSI
Exchange boom extend/ retract and turntable rotate left/right flow regulator valve (item O) with a like valve (item J). Check boom extend function.
function operates
Replace defective flow regulator valve.
function inoperative
Repair cylinder or cylinder counterbalance valve OR function manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 19

Primary Boom Retract Function Inoperative

Be sure all other functions operate normally.

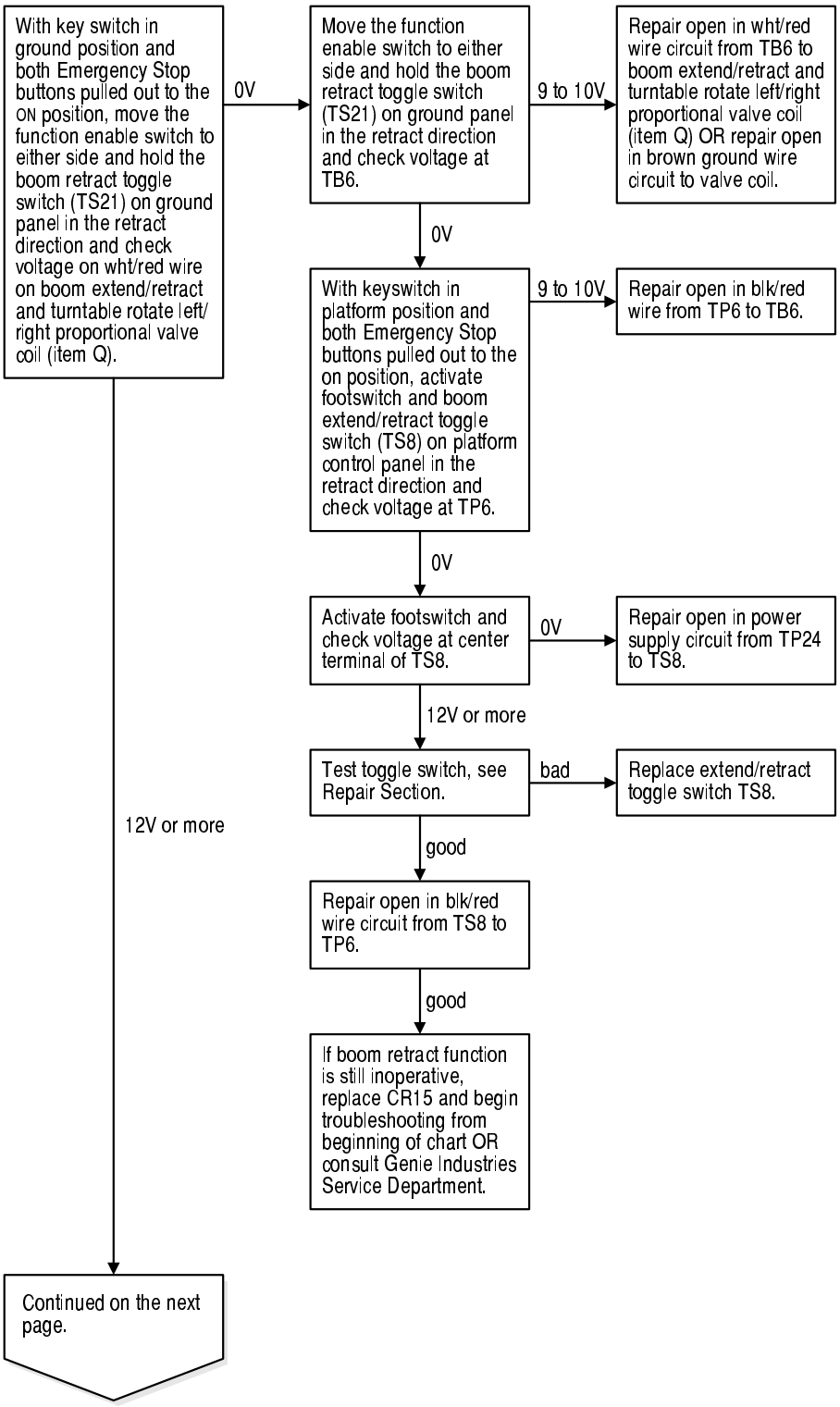


CHART 19

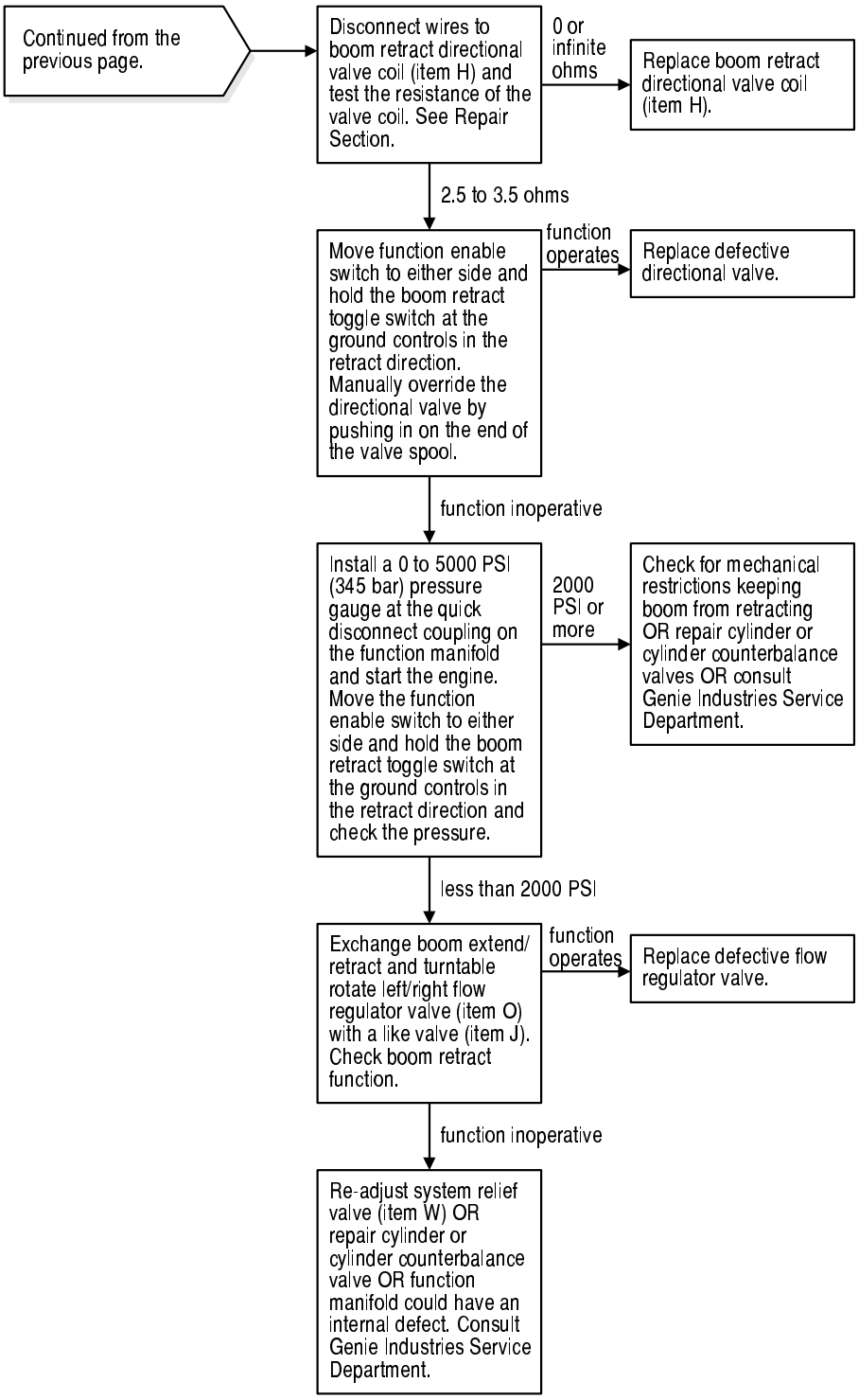

Continued from the previous page.
Disconnect wires to boom retract directional valve coil (item H) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace boom retract directional valve coil (item H).
2.5 to 3.5 ohms
Move function enable switch to either side and hold the boom retract toggle switch at the ground controls in the retract direction. Manually override the directional valve by pushing in on the end of the valve spool.
function operates
Replace defective directional valve.
function inoperative
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the function manifold and start the engine. Move the function enable switch to either side and hold the boom retract toggle switch at the ground controls in the retract direction and check the pressure.
2000 PSI or more
Check for mechanical restrictions keeping boom from retracting OR repair cylinder or cylinder counterbalance valves OR consult Genie Industries Service Department.
less than 2000 PSI
Exchange boom extend/ retract and turntable rotate left/right flow regulator valve (item O) with a like valve (item J). Check boom retract function.
function operates
Replace defective flow regulator valve.
function inoperative
Re-adjust system relief valve (item W) OR repair cylinder or cylinder counterbalance valve OR function manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 20

Turntable Rotate Left Function Inoperative

Be sure all other functions operate normally.

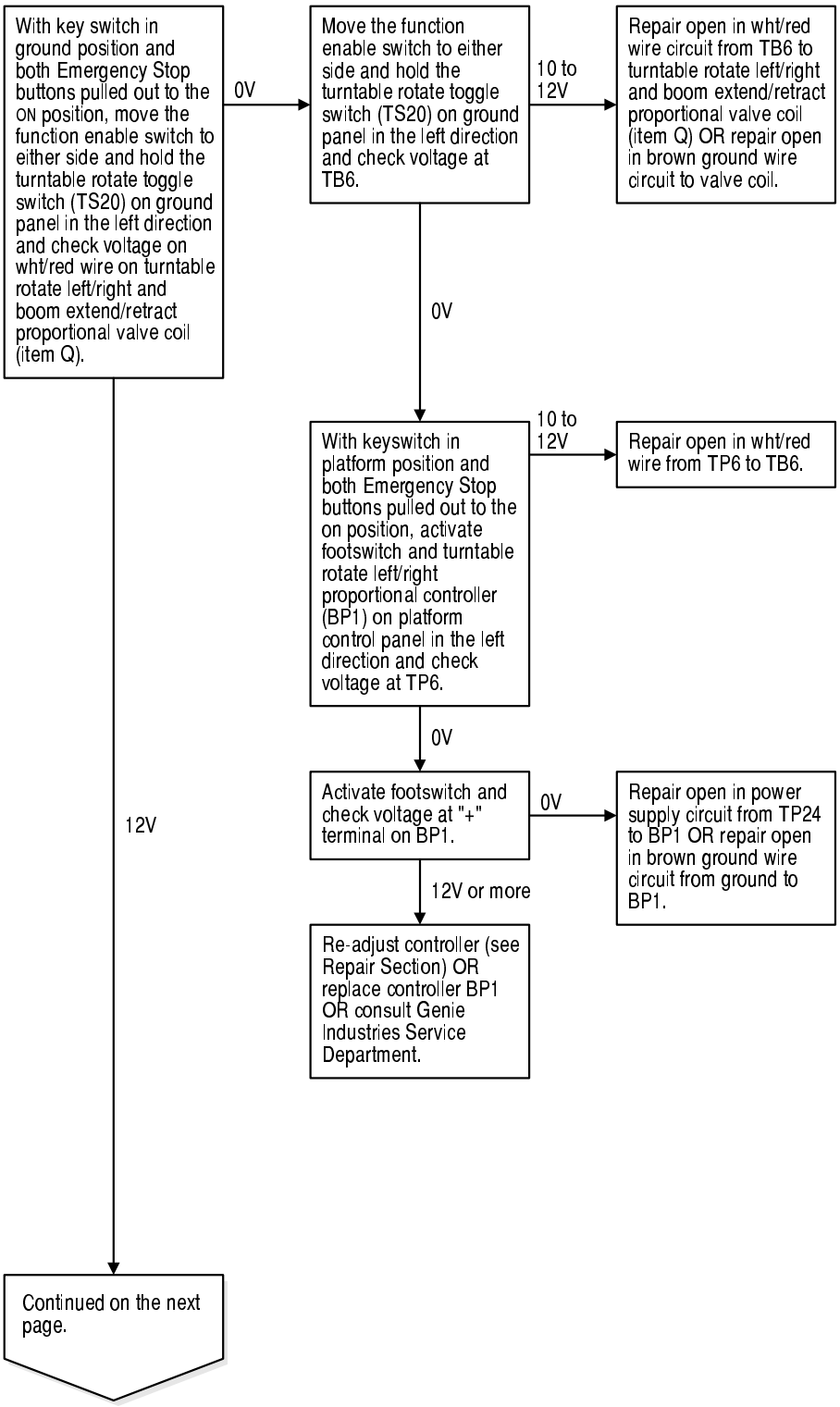


CHART 20

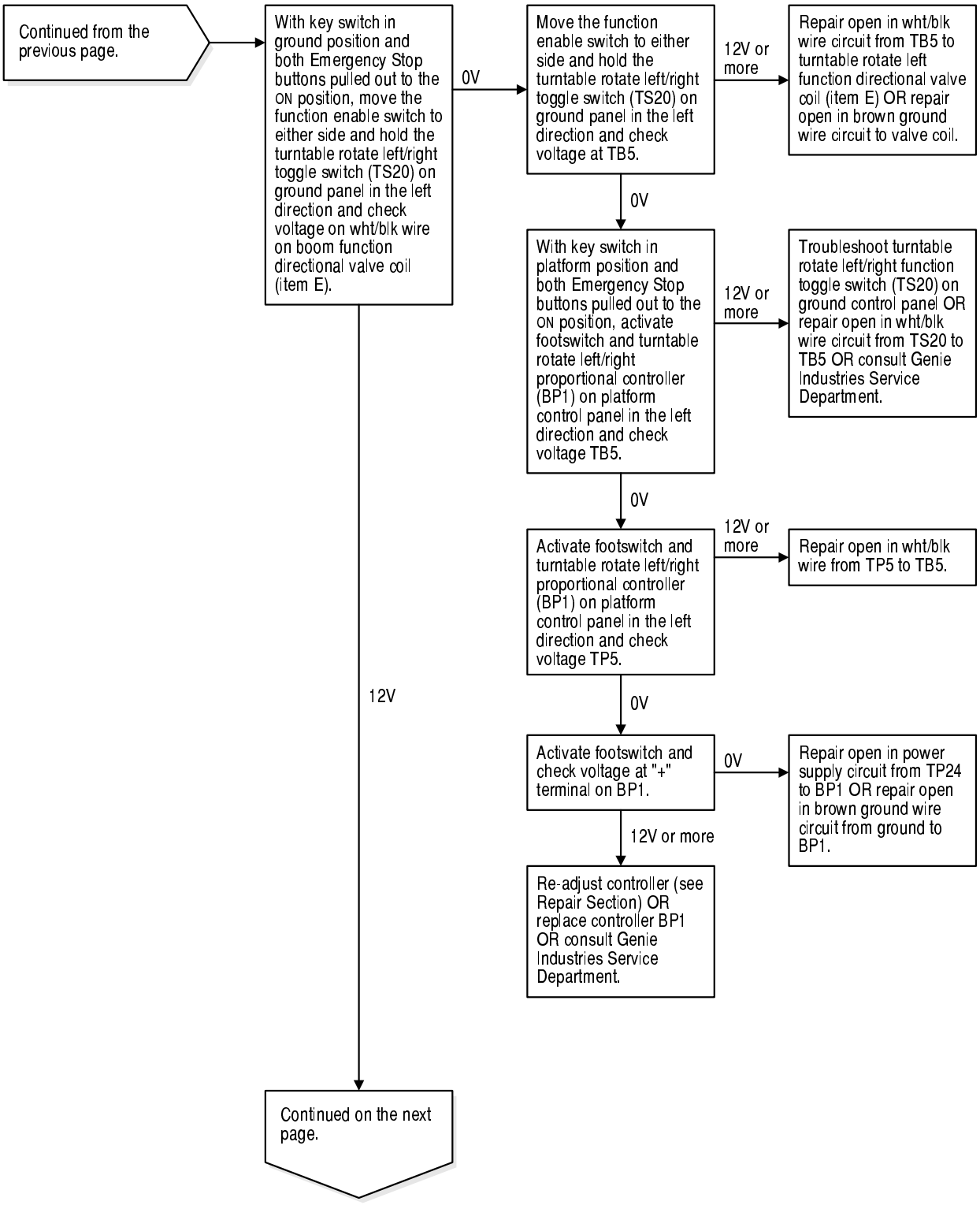

Continued from the previous page.
With key switch in ground position and both Emergency Stop buttons pulled out to the ON position, move the function enable switch to either side and hold the turntable rotate left/right toggle switch (TS20) on ground panel in the left direction and check voltage on wht/blk wire on boom function directional valve coil (item E).
0V
Move the function enable switch to either side and hold the turntable rotate left/right toggle switch (TS20) on ground panel in the left direction and check voltage at TB5.
12V or more
Repair open in wht/blk wire circuit from TB5 to turntable rotate left function directional valve coil (item E) OR repair open in brown ground wire circuit to valve coil.
0V
With key switch in platform position and both Emergency Stop buttons pulled out to the ON position, activate footswitch and turntable rotate left/right proportional controller (BP1) on platform control panel in the left direction and check voltage TB5.
12V or more
Troubleshoot turntable rotate left/right function toggle switch (TS20) on ground control panel OR repair open in wht/blk wire circuit from TS20 to TB5 OR consult Genie Industries Service Department.
0V
Activate footswitch and turntable rotate left/right proportional controller (BP1) on platform control panel in the left direction and check voltage TP5.
12V or more
Repair open in wht/blk wire from TP5 to TB5.
0V
Activate footswitch and check voltage at "+" terminal on BP1.
0V
Repair open in power supply circuit from TP24 to BP1 OR repair open in brown ground wire circuit from ground to BP1.
12V or more
Re-adjust controller (see Repair Section) OR replace controller BP1 OR consult Genie Industries Service Department.
12V
Continued on the next page.

CHART 20

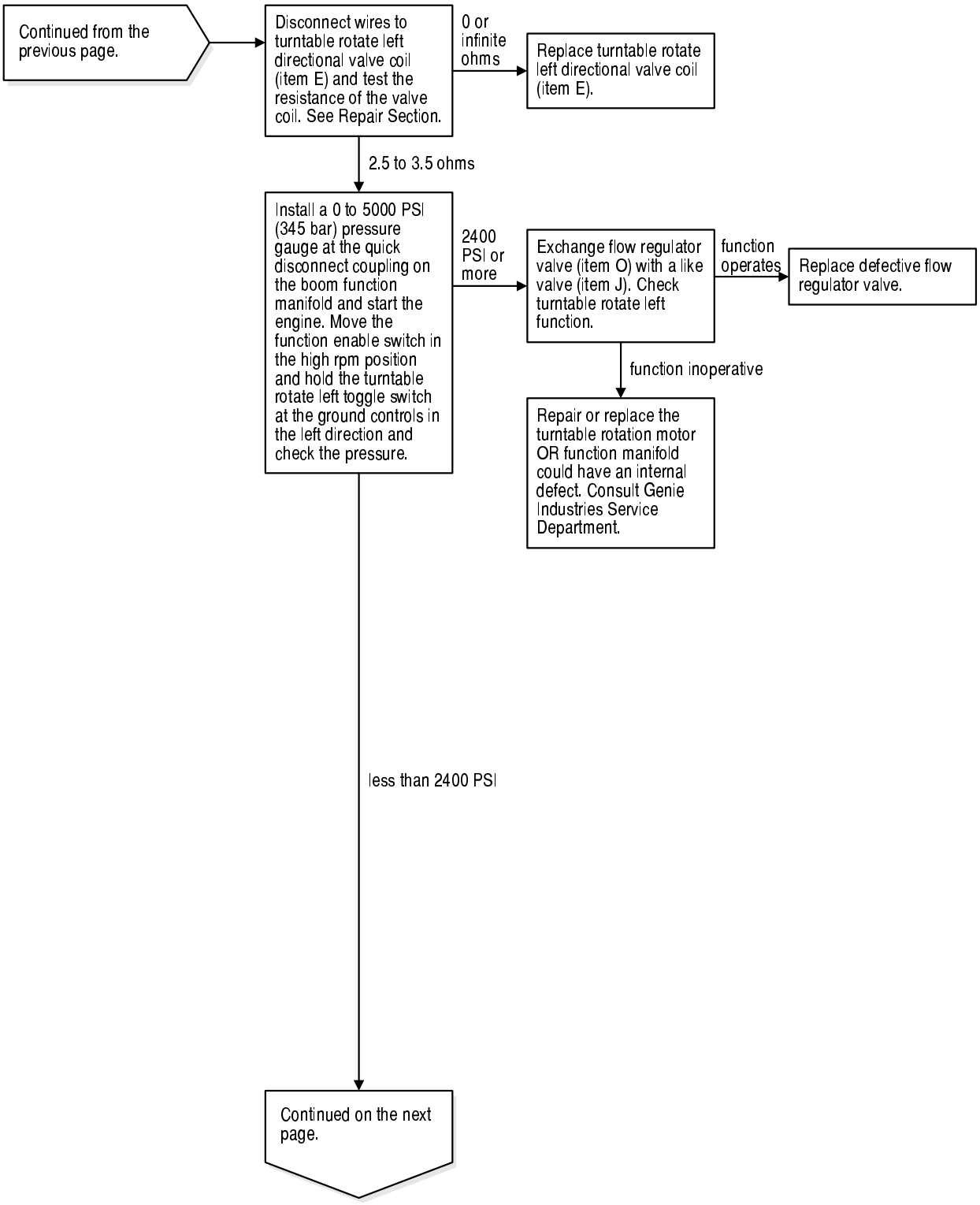

Continued from the previous page.
Disconnect wires to turntable rotate left directional valve coil (item E) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace turntable rotate left directional valve coil (item E).
2.5 to 3.5 ohms
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the boom function manifold and start the engine. Move the function enable switch in the high rpm position and hold the turntable rotate left toggle switch at the ground controls in the left direction and check the pressure.
2400 PSI or more
Exchange flow regulator valve (item O) with a like valve (item J). Check turntable rotate left function.
function operates
Replace defective flow regulator valve.
function inoperative
Repair or replace the turntable rotation motor OR function manifold could have an internal defect. Consult Genie Industries Service Department.
less than 2400 PSI
Continued on the next page.

CHART 20

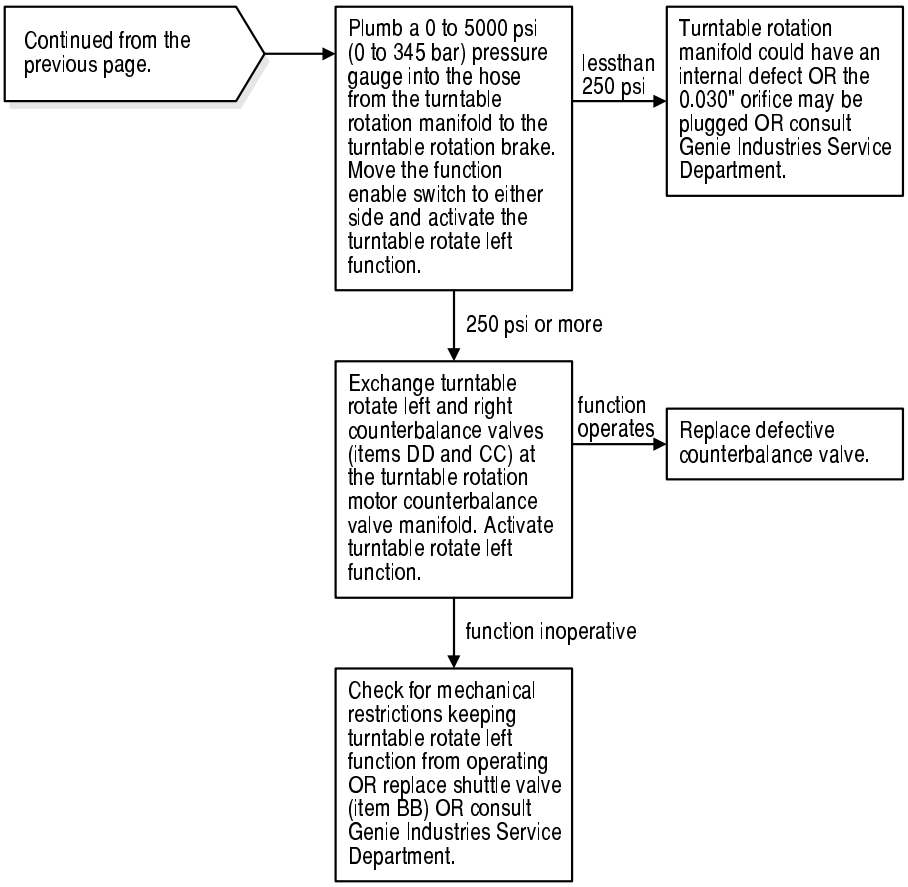

Continued from the previous page.
Plumb a 0 to 5000 psi (0 to 345 bar) pressure gauge into the hose from the turntable rotation manifold to the turntable rotation brake. Move the function enable switch to either side and activate the turntable rotate left function.
lessthan 250 psi
Turntable rotation manifold could have an internal defect OR the 0.030" orifice may be plugged OR consult Genie Industries Service Department.
250 psi or more
Exchange turntable rotate left and right counterbalance valves (items DD and CC) at the turntable rotation motor counterbalance valve manifold. Activate turntable rotate left function.
function operates
Replace defective counterbalance valve.
function inoperative
Check for mechanical restrictions keeping turntable rotate left function from operating OR replace shuttle valve (item BB) OR consult Genie Industries Service Department.

Chart 21

Turntable Rotate Right Function Inoperative

Be sure all other functions operate normally.

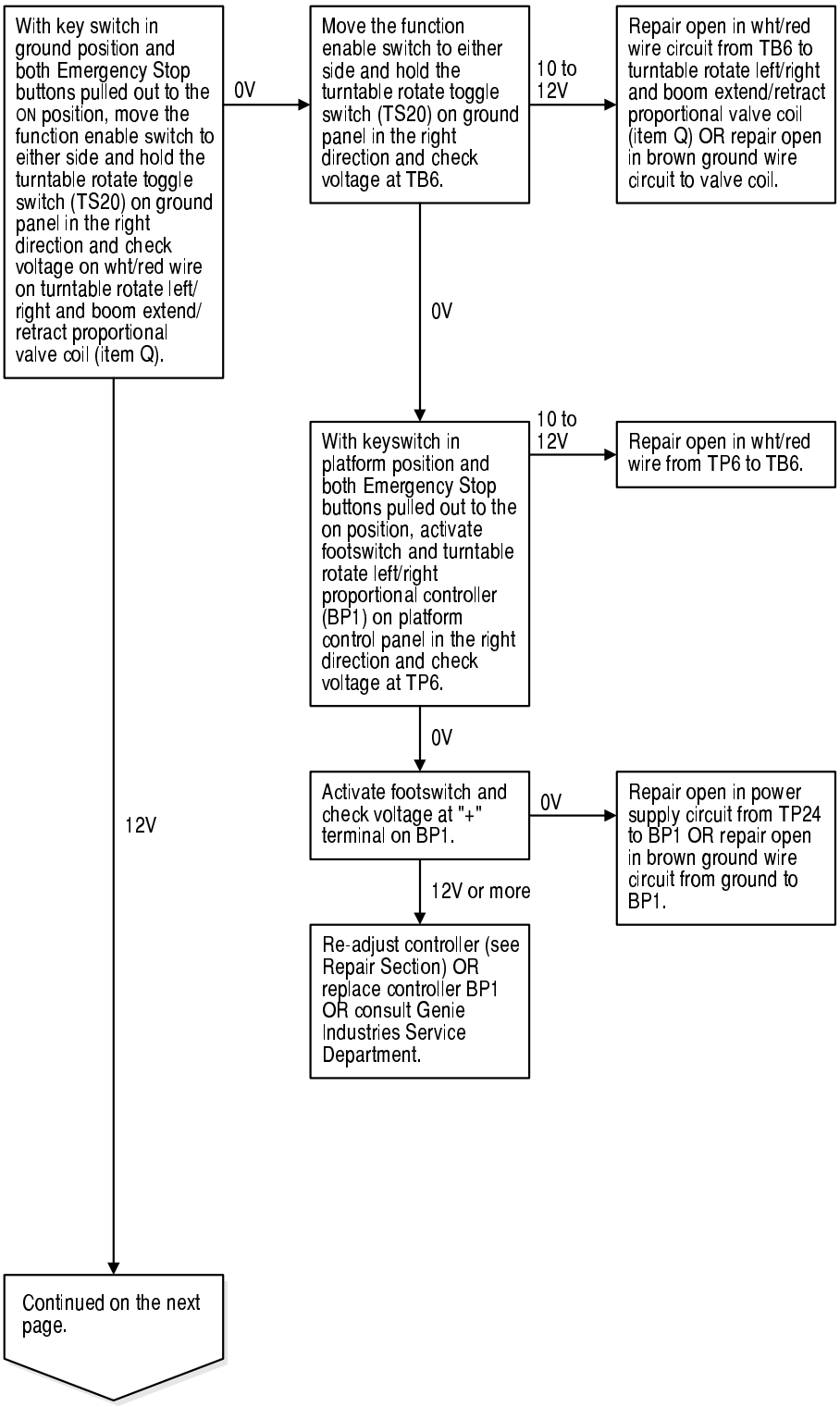


CHART 21

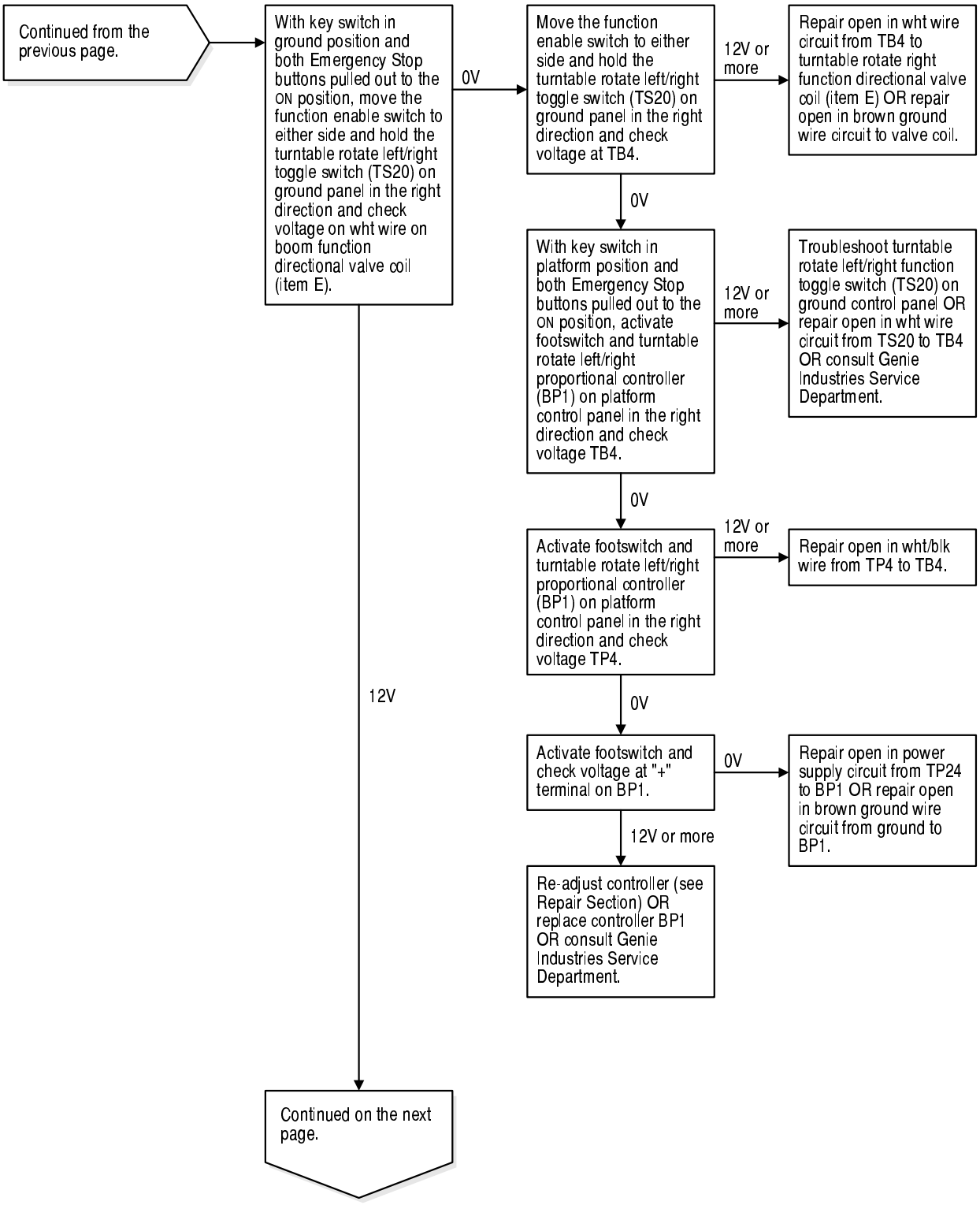

Continued from the previous page.
With key switch in ground position and both Emergency Stop buttons pulled out to the ON position, move the function enable switch to either side and hold the turntable rotate left/right toggle switch (TS20) on ground panel in the right direction and check voltage on wht wire on boom function directional valve coil (item E).
0V
Move the function enable switch to either side and hold the turntable rotate left/right toggle switch (TS20) on ground panel in the right direction and check voltage at TB4.
12V or more
Repair open in wht wire circuit from TB4 to turntable rotate right function directional valve coil (item E) OR repair open in brown ground wire circuit to valve coil.
0V
With key switch in platform position and both Emergency Stop buttons pulled out to the ON position, activate footswitch and turntable rotate left/right proportional controller (BP1) on platform control panel in the right direction and check voltage TB4.
12V or more
Troubleshoot turntable rotate left/right function toggle switch (TS20) on ground control panel OR repair open in wht wire circuit from TS20 to TB4 OR consult Genie Industries Service Department.
0V
Activate footswitch and turntable rotate left/right proportional controller (BP1) on platform control panel in the right direction and check voltage TP4.
12V or more
Repair open in wht/blk wire from TP4 to TB4.
0V
Activate footswitch and check voltage at "+" terminal on BP1.
0V
Repair open in power supply circuit from TP24 to BP1 OR repair open in brown ground wire circuit from ground to BP1.
12V or more
Re-adjust controller (see Repair Section) OR replace controller BP1 OR consult Genie Industries Service Department.
12V
Continued on the next page.

CHART 21

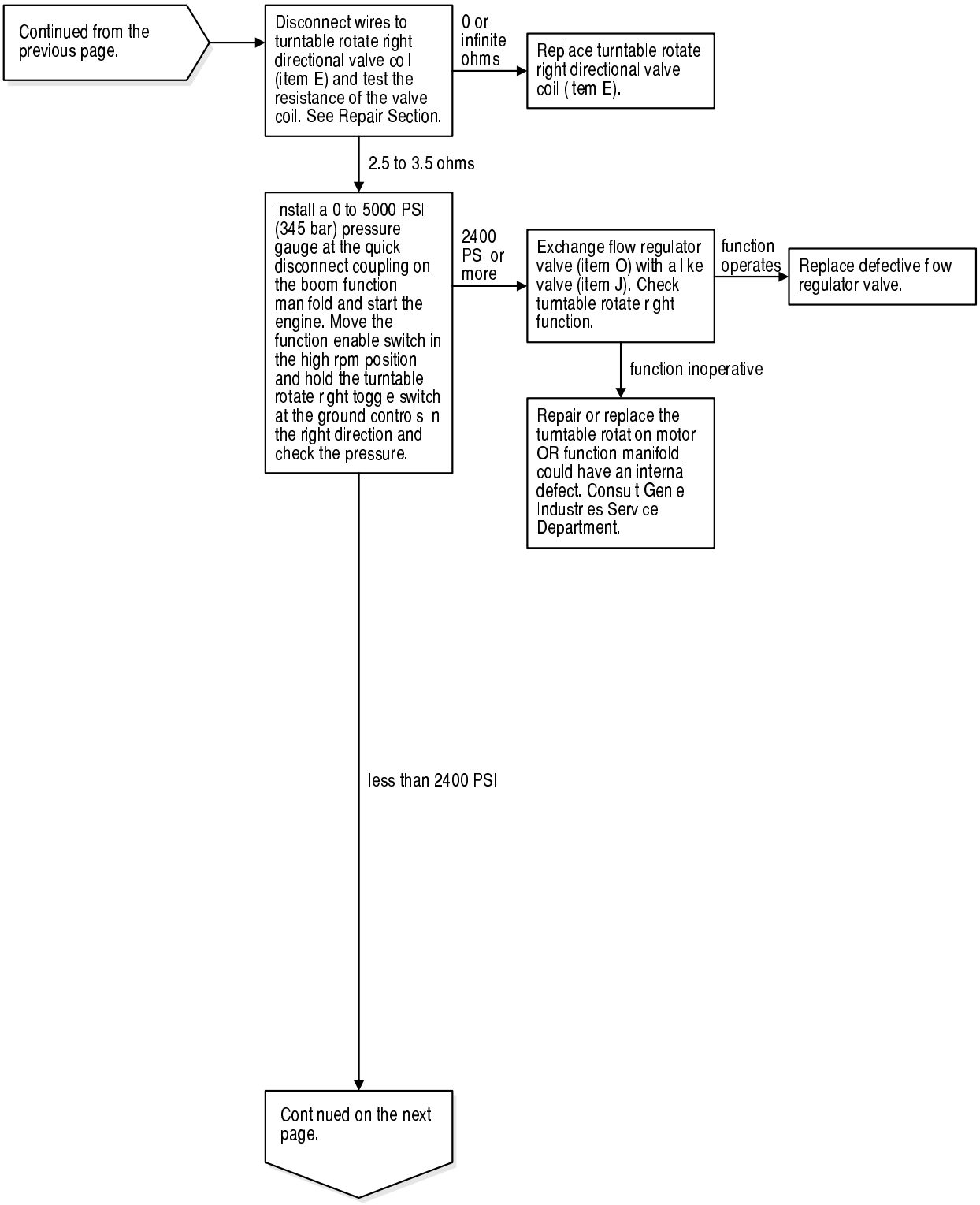

Continued from the previous page.
Disconnect wires to turntable rotate right directional valve coil (item E) and test the resistance of the valve coil. See Repair Section.
0 or infinite ohms
Replace turntable rotate right directional valve coil (item E).
2.5 to 3.5 ohms
Install a 0 to 5000 PSI (345 bar) pressure gauge at the quick disconnect coupling on the boom function manifold and start the engine. Move the function enable switch in the high rpm position and hold the turntable rotate right toggle switch at the ground controls in the right direction and check the pressure.
2400 PSI or more
Exchange flow regulator valve (item O) with a like valve (item J). Check turntable rotate right function.
function operates
Replace defective flow regulator valve.
function inoperative
Repair or replace the turntable rotation motor OR function manifold could have an internal defect. Consult Genie Industries Service Department.
less than 2400 PSI
Continued on the next page.

CHART 21

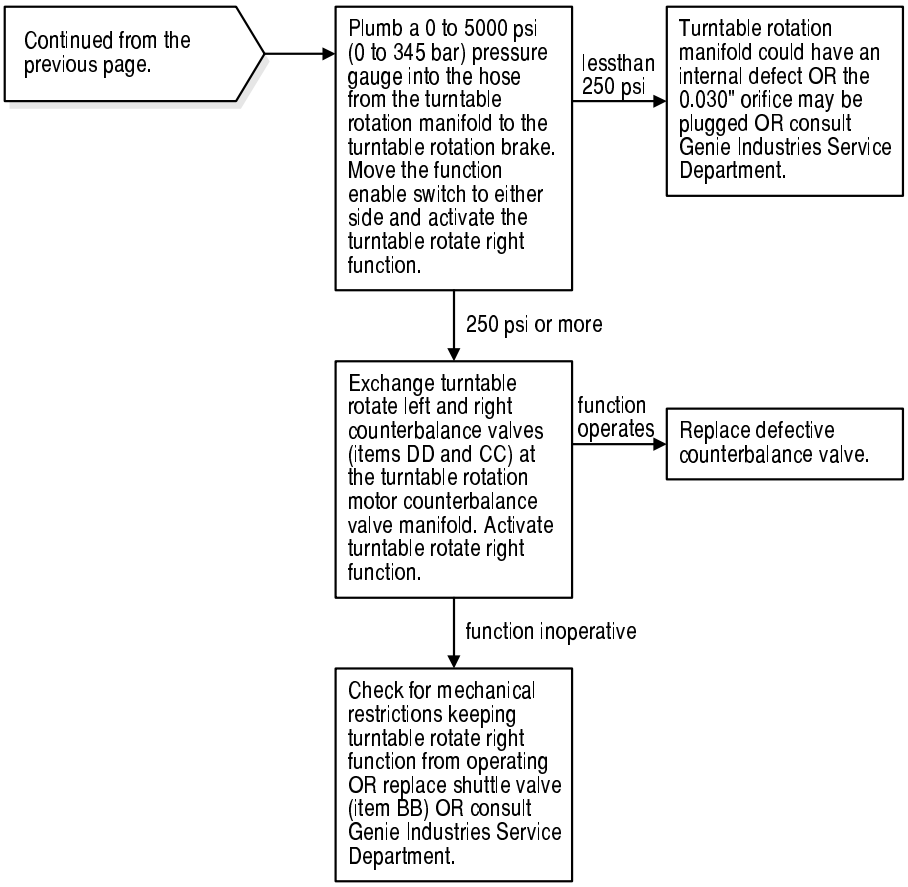

Continued from the previous page.
Plumb a 0 to 5000 psi (0 to 345 bar) pressure gauge into the hose from the turntable rotation manifold to the turntable rotation brake. Move the function enable switch to either side and activate the turntable rotate right function.
lessthan 250 psi
Turntable rotation manifold could have an internal defect OR the 0.030" orifice may be plugged OR consult Genie Industries Service Department.
250 psi or more
Exchange turntable rotate left and right counterbalance valves (items DD and CC) at the turntable rotation motor counterbalance valve manifold. Activate turntable rotate right function.
function operates
Replace defective counterbalance valve.
function inoperative
Check for mechanical restrictions keeping turntable rotate right function from operating OR replace shuttle valve (item BB) OR consult Genie Industries Service Department.

Chart 22

All Platform Leveling Functions Inoperative

Be sure all other functions operate normally.

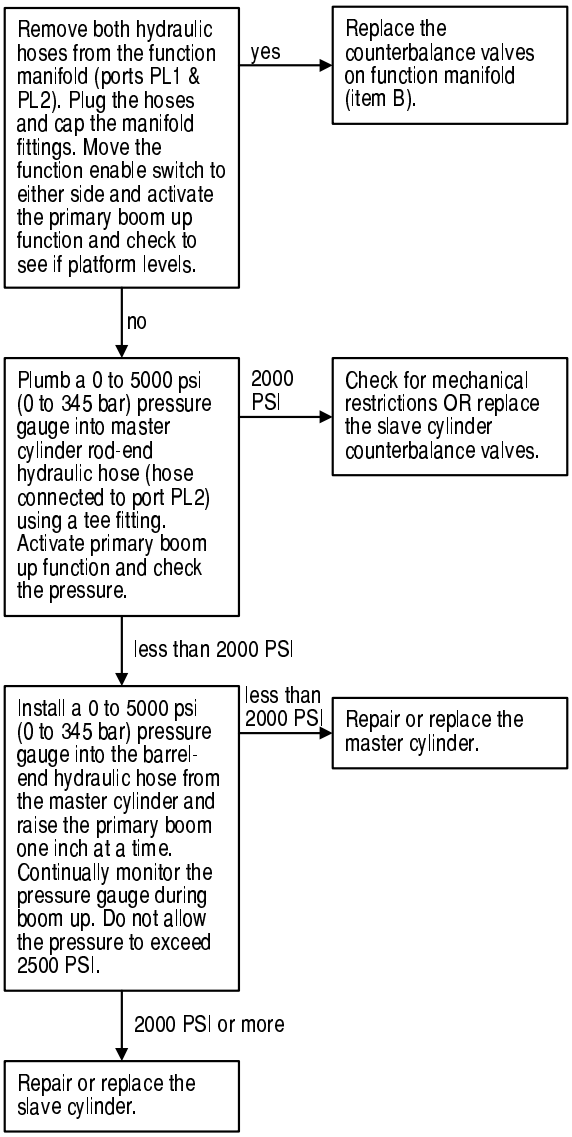


Chart 23

Platform Level Up Function Inoperative

Be sure all other functions operate normally.

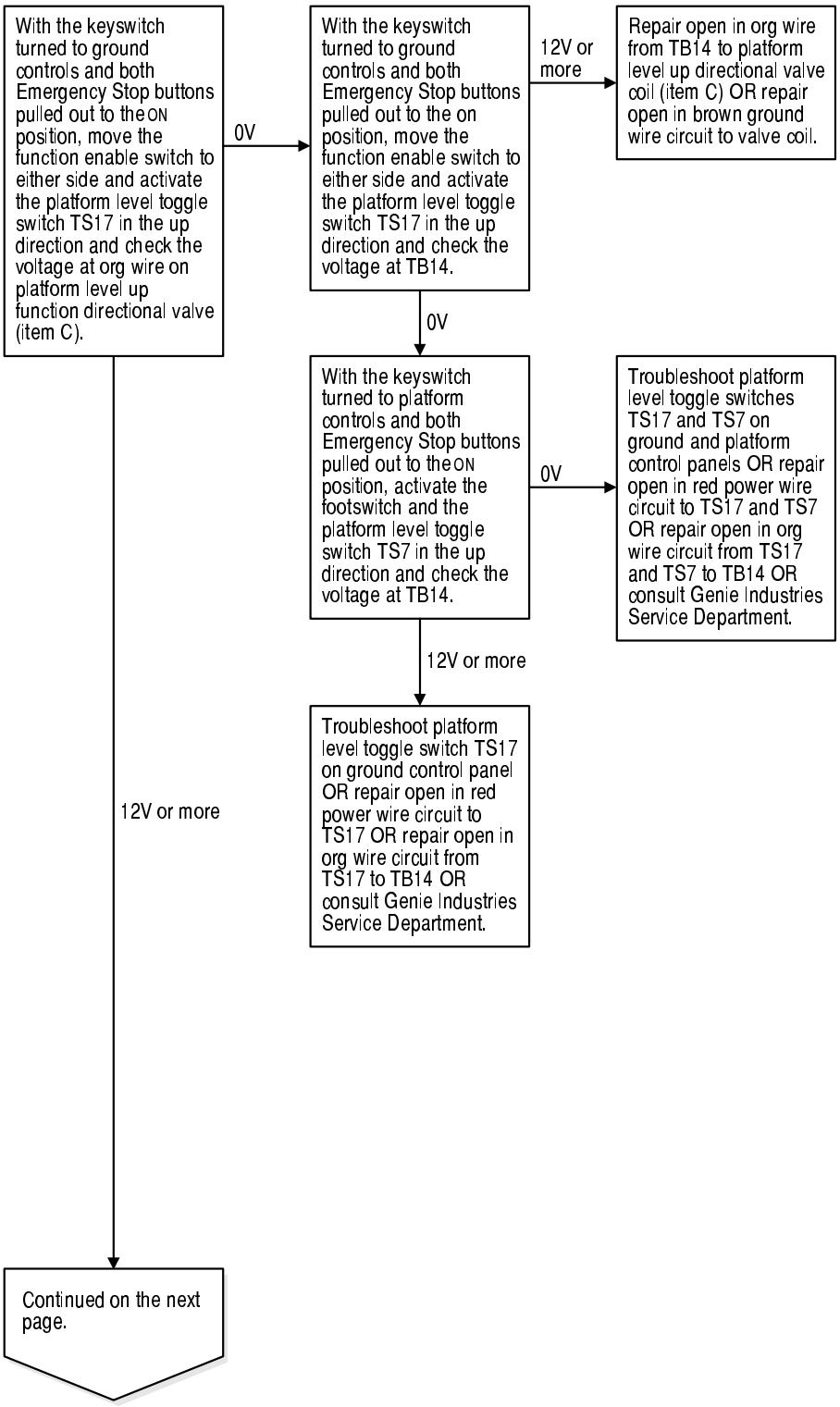


CHART 23

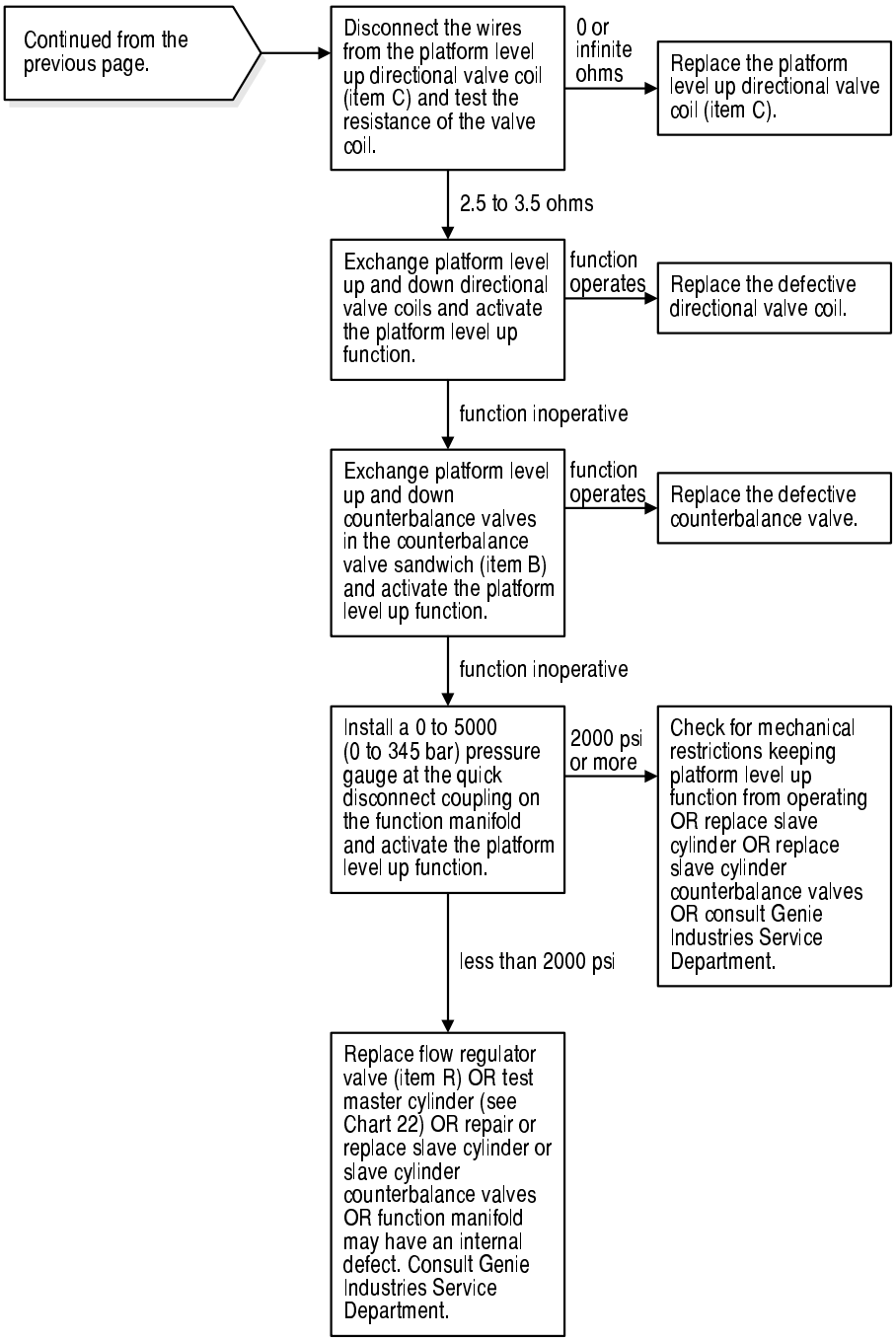

Continued from the previous page.
Disconnect the wires from the platform level up directional valve coil (item C) and test the resistance of the valve coil.
0 or infinite ohms
Replace the platform level up directional valve coil (item C).
2.5 to 3.5 ohms
Exchange platform level up and down directional valve coils and activate the platform level up function.
function operates
Replace the defective directional valve coil.
function inoperative
Exchange platform level up and down counterbalance valves in the counterbalance valve sandwich (item B) and activate the platform level up function.
function operates
Replace the defective counterbalance valve.
function inoperative
Install a 0 to 5000 (0 to 345 bar) pressure gauge at the quick disconnect coupling on the function manifold and activate the platform level up function.
2000 psi or more
Check for mechanical restrictions keeping platform level up function from operating OR replace slave cylinder OR replace slave cylinder counterbalance valves OR consult Genie Industries Service Department.
less than 2000 psi
Replace flow regulator valve (item R) OR test master cylinder (see Chart 22) OR repair or replace slave cylinder or slave cylinder counterbalance valves OR function manifold may have an internal defect. Consult Genie Industries Service Department.

Chart 24

Platform Level Down Function Inoperative

Be sure all other functions operate normally.

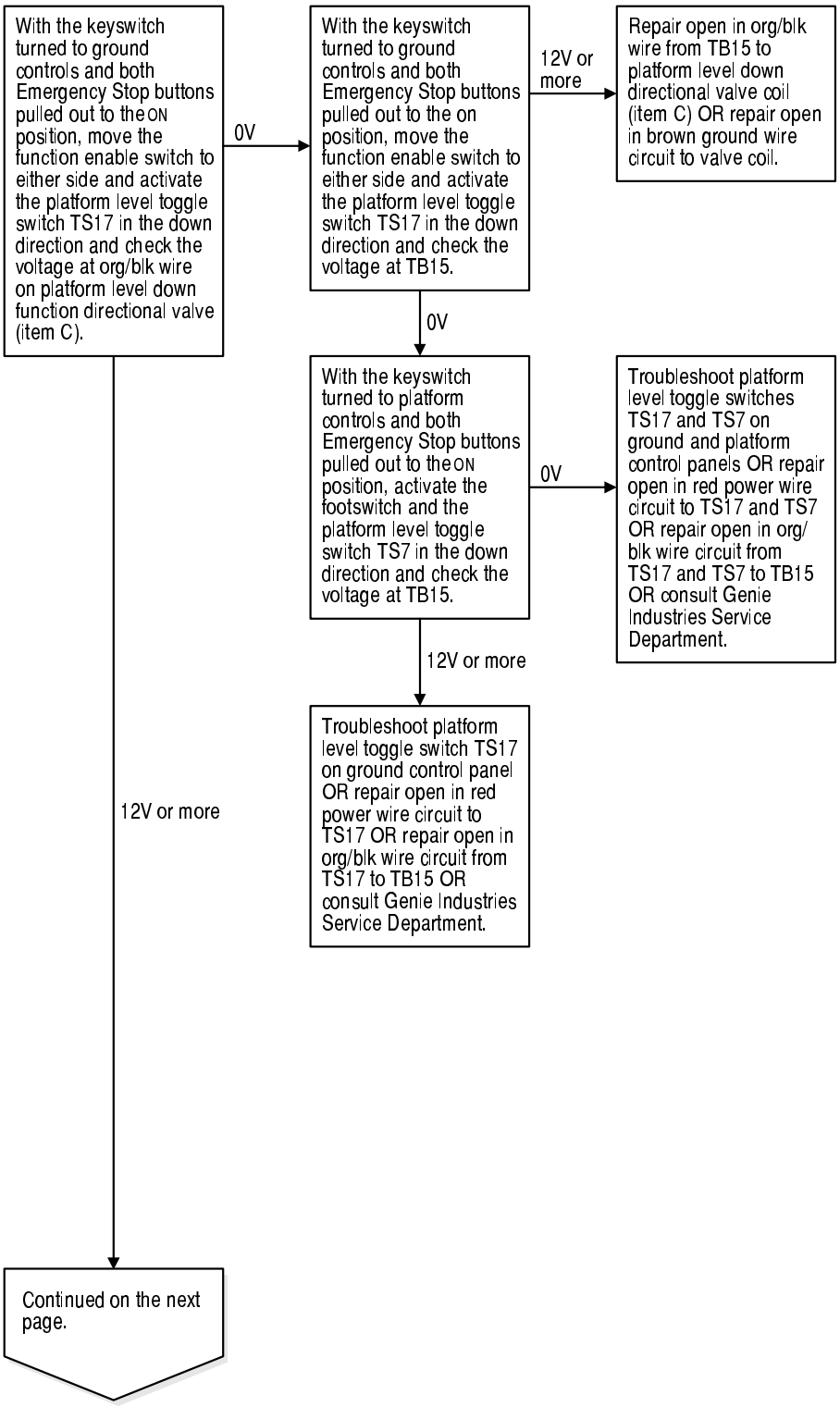


CHART 24

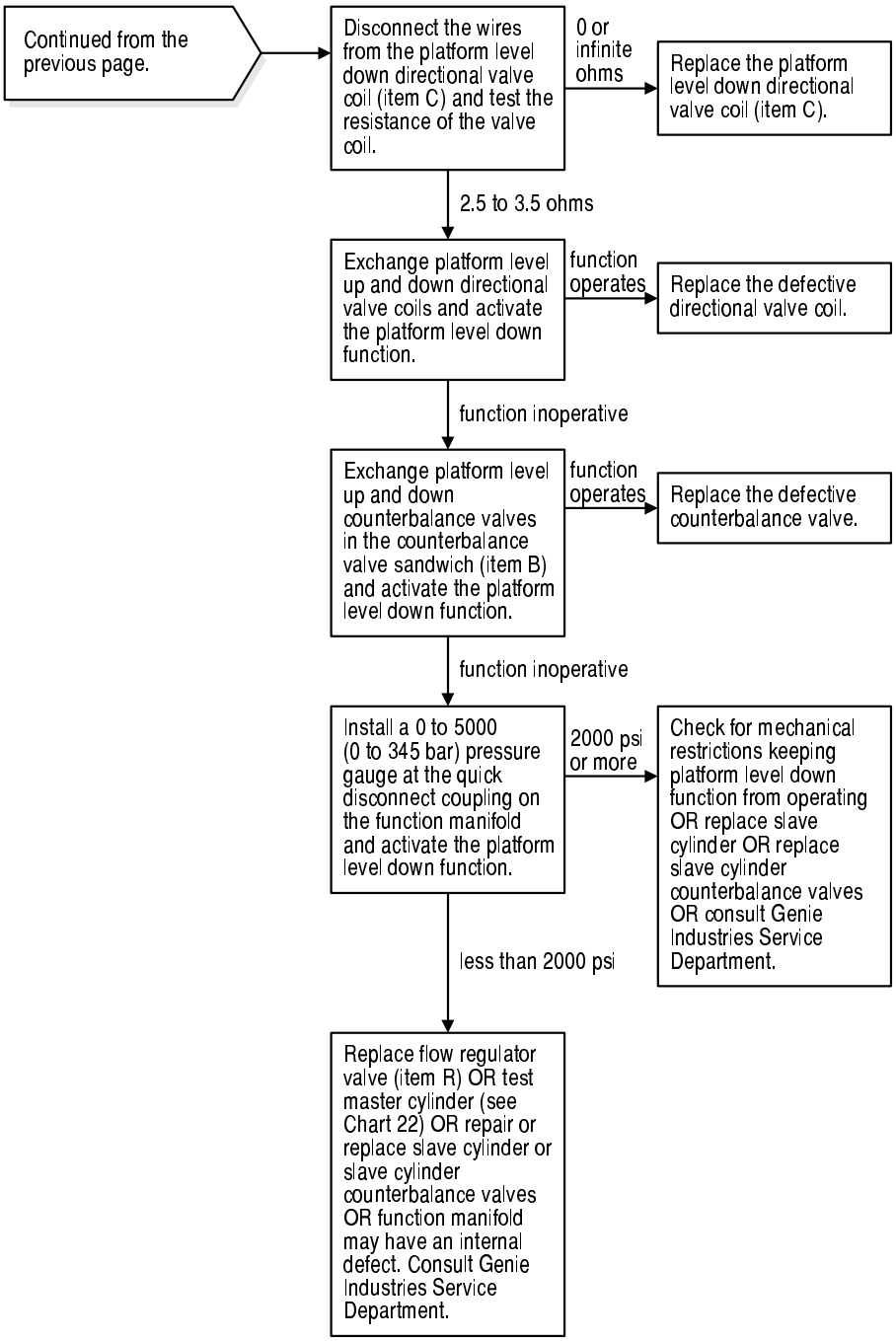

Continued from the previous page.
Disconnect the wires from the platform level down directional valve coil (item C) and test the resistance of the valve coil.
0 or infinite ohms
Replace the platform level down directional valve coil (item C).
2.5 to 3.5 ohms
Exchange platform level up and down directional valve coils and activate the platform level down function.
function operates
Replace the defective directional valve coil.
function inoperative
Exchange platform level up and down counterbalance valves in the counterbalance valve sandwich (item B) and activate the platform level down function.
function operates
Replace the defective counterbalance valve.
function inoperative
Install a 0 to 5000 (0 to 345 bar) pressure gauge at the quick disconnect coupling on the function manifold and activate the platform level down function.
2000 psi or more
Check for mechanical restrictions keeping platform level down function from operating OR replace slave cylinder OR replace slave cylinder counterbalance valves OR consult Genie Industries Service Department.
less than 2000 psi
Replace flow regulator valve (item R) OR test master cylinder (see Chart 22) OR repair or replace slave cylinder or slave cylinder counterbalance valves OR function manifold may have an internal defect. Consult Genie Industries Service Department.

Chart 25

Platform Rotate Left Function Inoperative

Be sure all other functions operate normally.

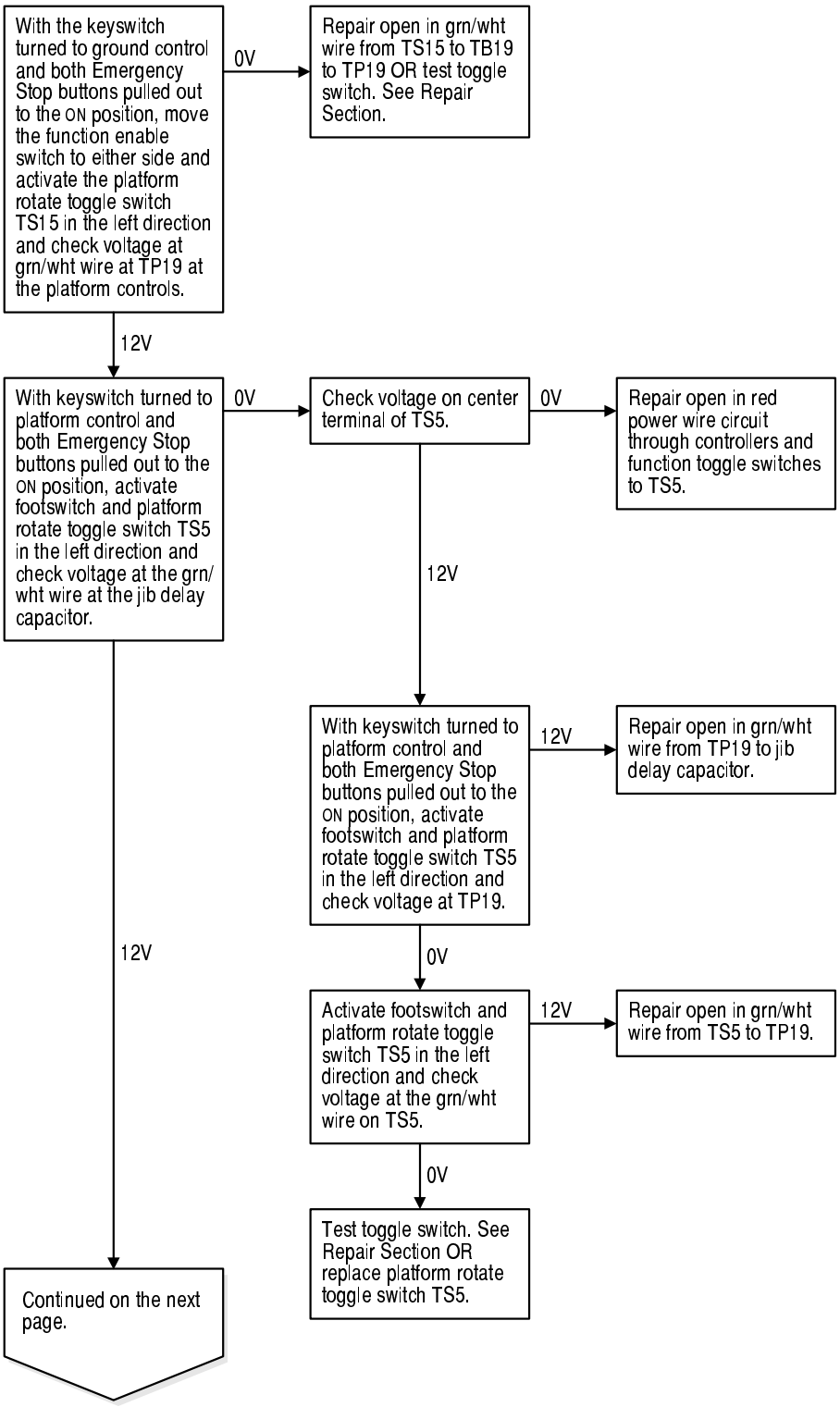


CHART 25

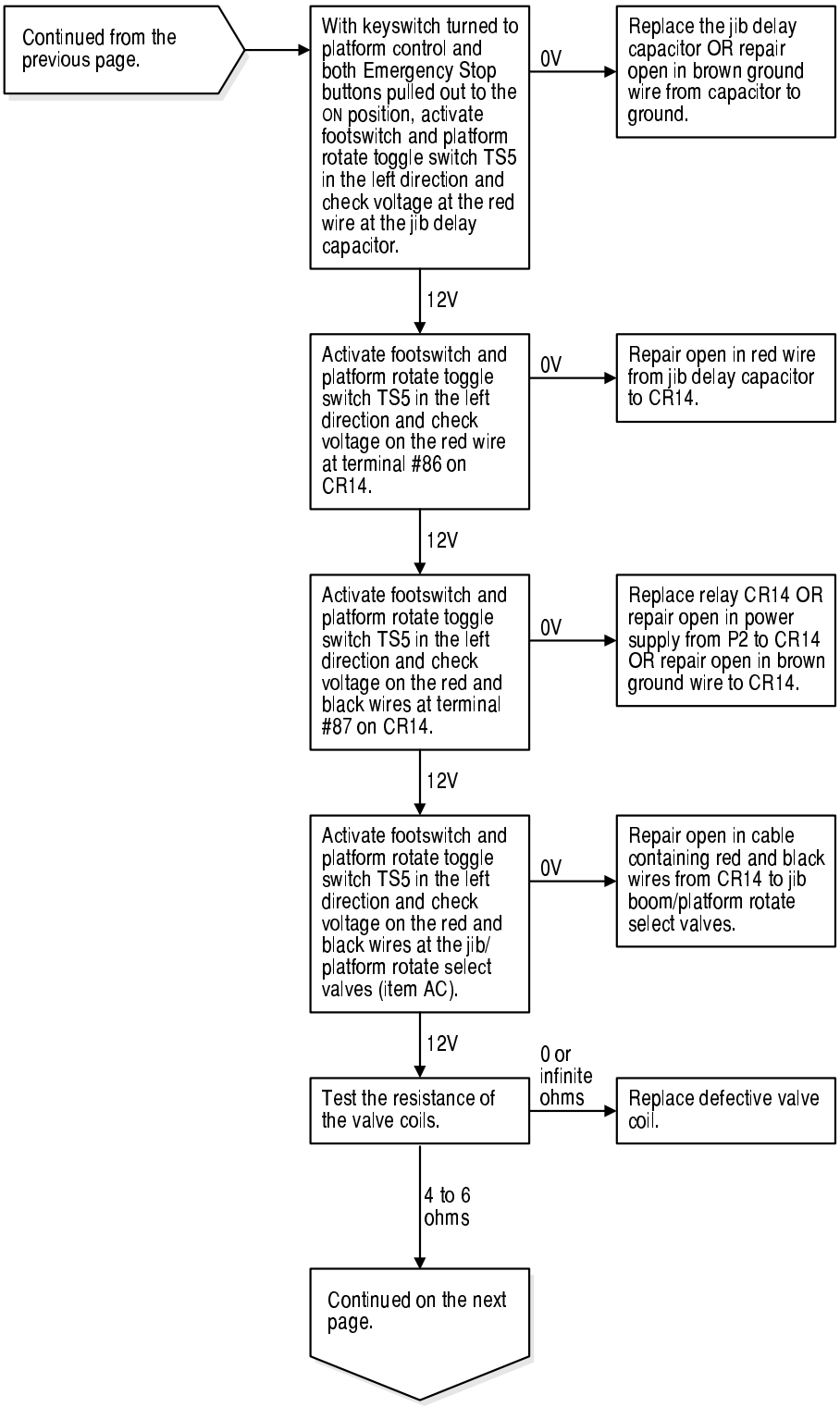

Continued from the previous page.
With keyswitch turned to platform control and both Emergency Stop buttons pulled out to the ON position, activate footswitch and platform rotate toggle switch TS5 in the left direction and check voltage at the red wire at the jib delay capacitor.
0V
Replace the jib delay capacitor OR repair open in brown ground wire from capacitor to ground.
12V
Activate footswitch and platform rotate toggle switch TS5 in the left direction and check voltage on the red wire at terminal #86 on CR14.
0V
Repair open in red wire from jib delay capacitor to CR14.
12V
Activate footswitch and platform rotate toggle switch TS5 in the left direction and check voltage on the red and black wires at terminal #87 on CR14.
0V
Replace relay CR14 OR repair open in power supply from P2 to CR14 OR repair open in brown ground wire to CR14.
12V
Activate footswitch and platform rotate toggle switch TS5 in the left direction and check voltage on the red and black wires at the jib/ platform rotate select valves (item AC).
0V
Repair open in cable containing red and black wires from CR14 to jib boom/platform rotate select valves.
12V
Test the resistance of the valve coils.
0 or infinite ohms
Replace defective valve coil.
4 to 6 ohms
Continued on the next page.

CHART 25

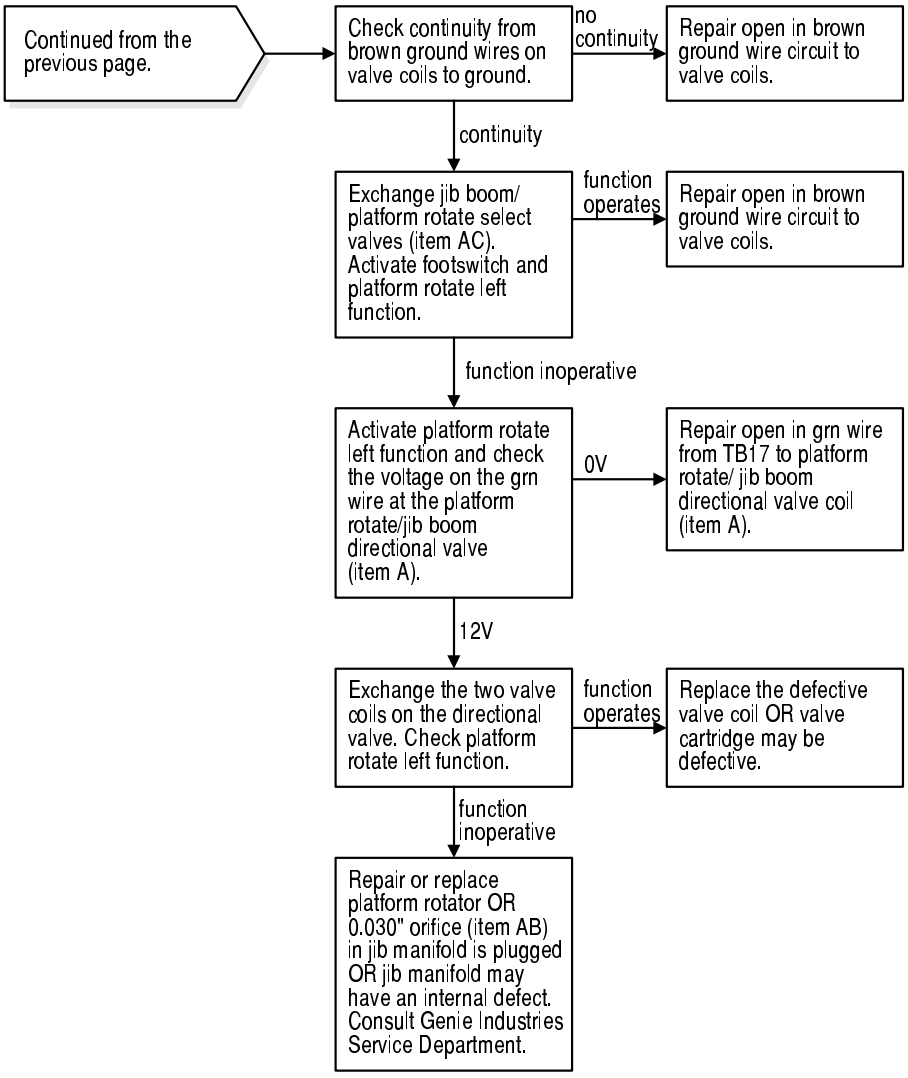

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Check continuity from brown ground wires on valve coils to ground.
no continuity
Repair open in brown ground wire circuit to valve coils.
continuity
Exchange jib boom/ platform rotate select valves (item AC). Activate footswitch and platform rotate left function.
function operates
Repair open in brown ground wire circuit to valve coils.
function inoperative
Activate platform rotate left function and check the voltage on the grn wire at the platform rotate/jib boom directional valve (item A).
0V
Repair open in grn wire from TB17 to platform rotate/ jib boom directional valve coil (item A).
12V
Exchange the two valve coils on the directional valve. Check platform rotate left function.
function operates
Replace the defective valve coil OR valve cartridge may be defective.
function inoperative
Repair or replace platform rotator OR 0.030" orifice (item AB) in jib manifold is plugged OR jib manifold may have an internal defect. Consult Genie Industries Service Department.

Chart 26

Platform Rotate Right Function Inoperative

Be sure all other functions operate normally.

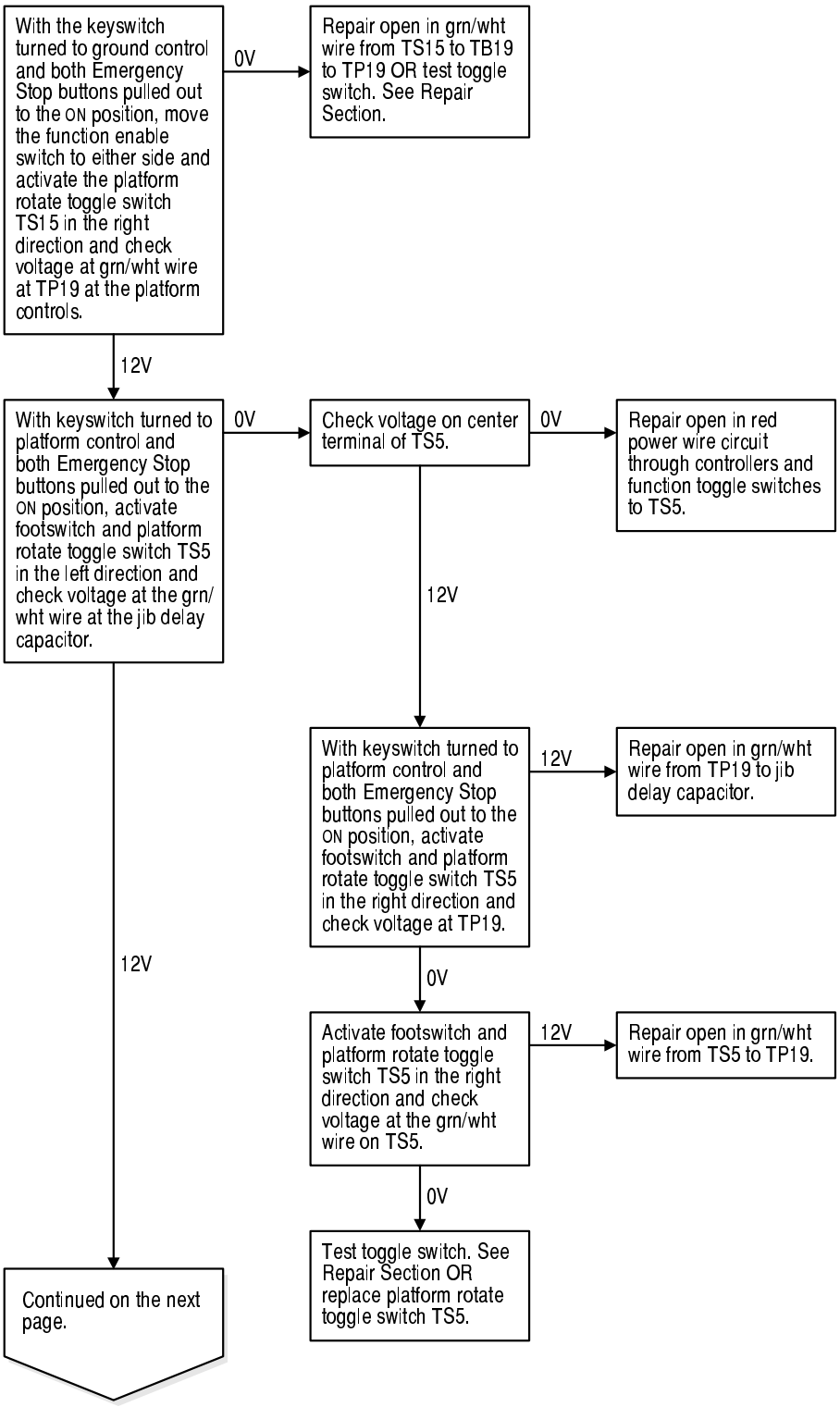


CHART 26

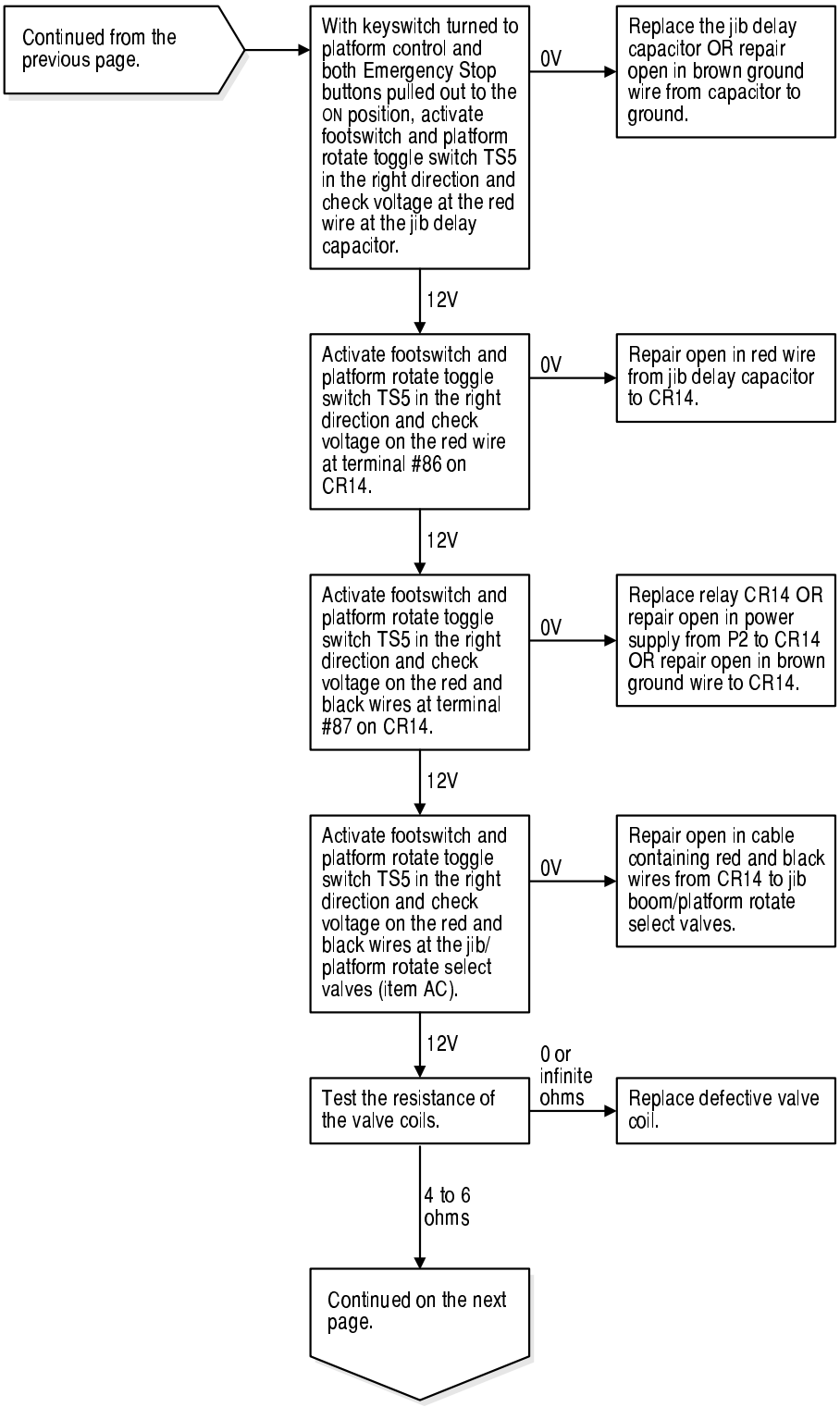

Continued from the previous page.
With keyswitch turned to platform control and both Emergency Stop buttons pulled out to the ON position, activate footswitch and platform rotate toggle switch TS5 in the right direction and check voltage at the red wire at the jib delay capacitor.
0V
Replace the jib delay capacitor OR repair open in brown ground wire from capacitor to ground.
12V
Activate footswitch and platform rotate toggle switch TS5 in the right direction and check voltage on the red wire at terminal #86 on CR14.
0V
Repair open in red wire from jib delay capacitor to CR14.
12V
Activate footswitch and platform rotate toggle switch TS5 in the right direction and check voltage on the red and black wires at terminal #87 on CR14.
0V
Replace relay CR14 OR repair open in power supply from P2 to CR14 OR repair open in brown ground wire to CR14.
12V
Activate footswitch and platform rotate toggle switch TS5 in the right direction and check voltage on the red and black wires at the jib/ platform rotate select valves (item AC).
0V
Repair open in cable containing red and black wires from CR14 to jib boom/platform rotate select valves.
12V
Test the resistance of the valve coils.
0 or infinite ohms
Replace defective valve coil.
4 to 6 ohms
Continued on the next page.

CHART 26

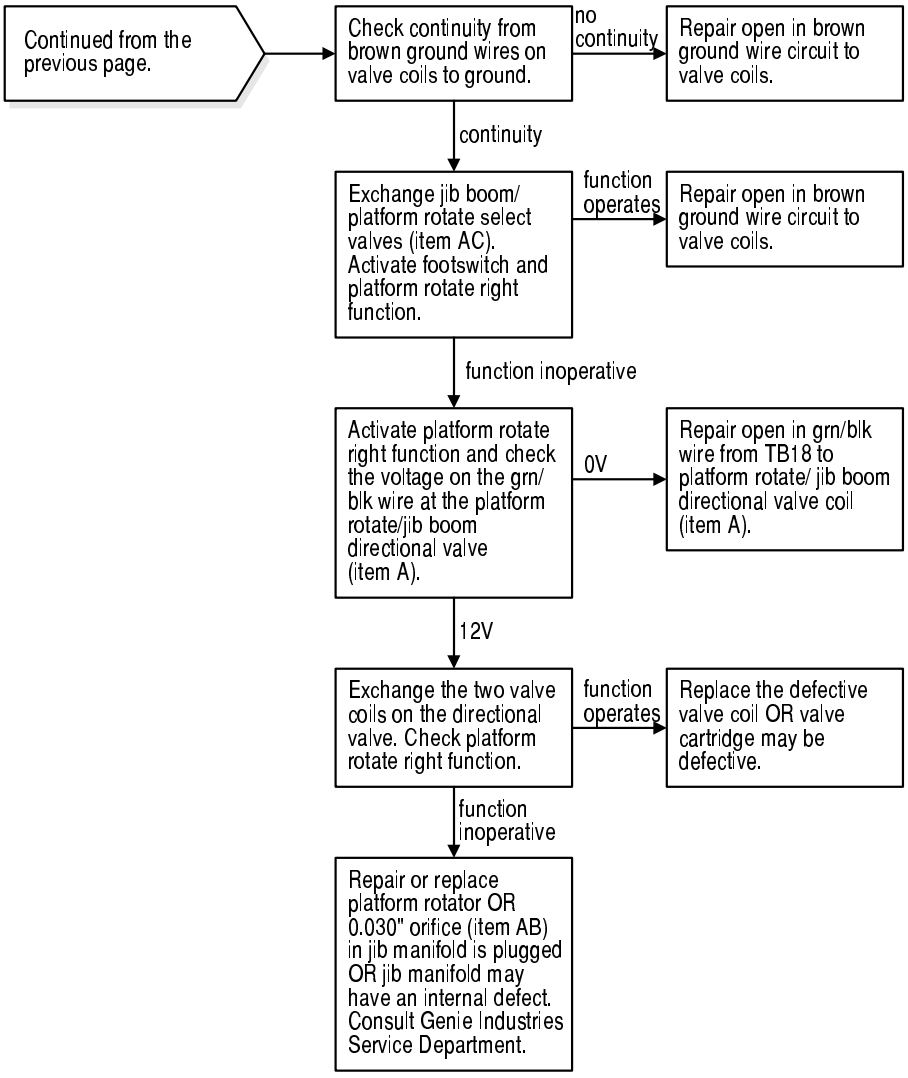

Continued from the previous page.
Check continuity from brown ground wires on valve coils to ground.
no continuity
Repair open in brown ground wire circuit to valve coils.
continuity
Exchange jib boom/ platform rotate select valves (item AC). Activate footswitch and platform rotate right function.
function operates
Repair open in brown ground wire circuit to valve coils.
function inoperative
Activate platform rotate right function and check the voltage on the grn/ blk wire at the platform rotate/jib boom directional valve (item A).
0V
Repair open in grn/blk wire from TB18 to platform rotate/ jib boom directional valve coil (item A).
12V
Exchange the two valve coils on the directional valve. Check platform rotate right function.
function operates
Replace the defective valve coil OR valve cartridge may be defective.
function inoperative
Repair or replace platform rotator OR 0.030" orifice (item AB) in jib manifold is plugged OR jib manifold may have an internal defect. Consult Genie Industries Service Department.

Chart 27

Jib Boom Up Function Inoperative

Be sure all other functions operate normally.

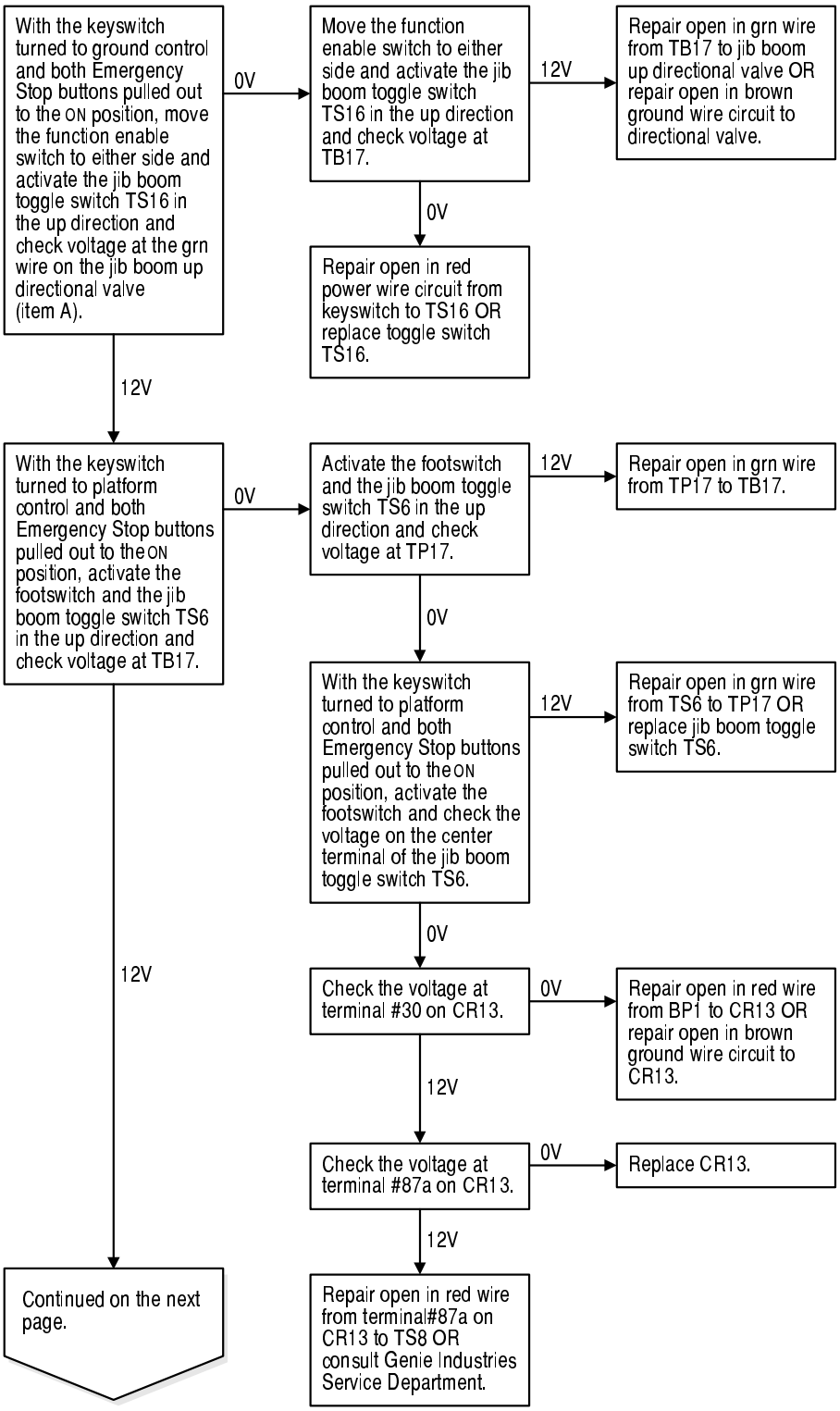


CHART 27

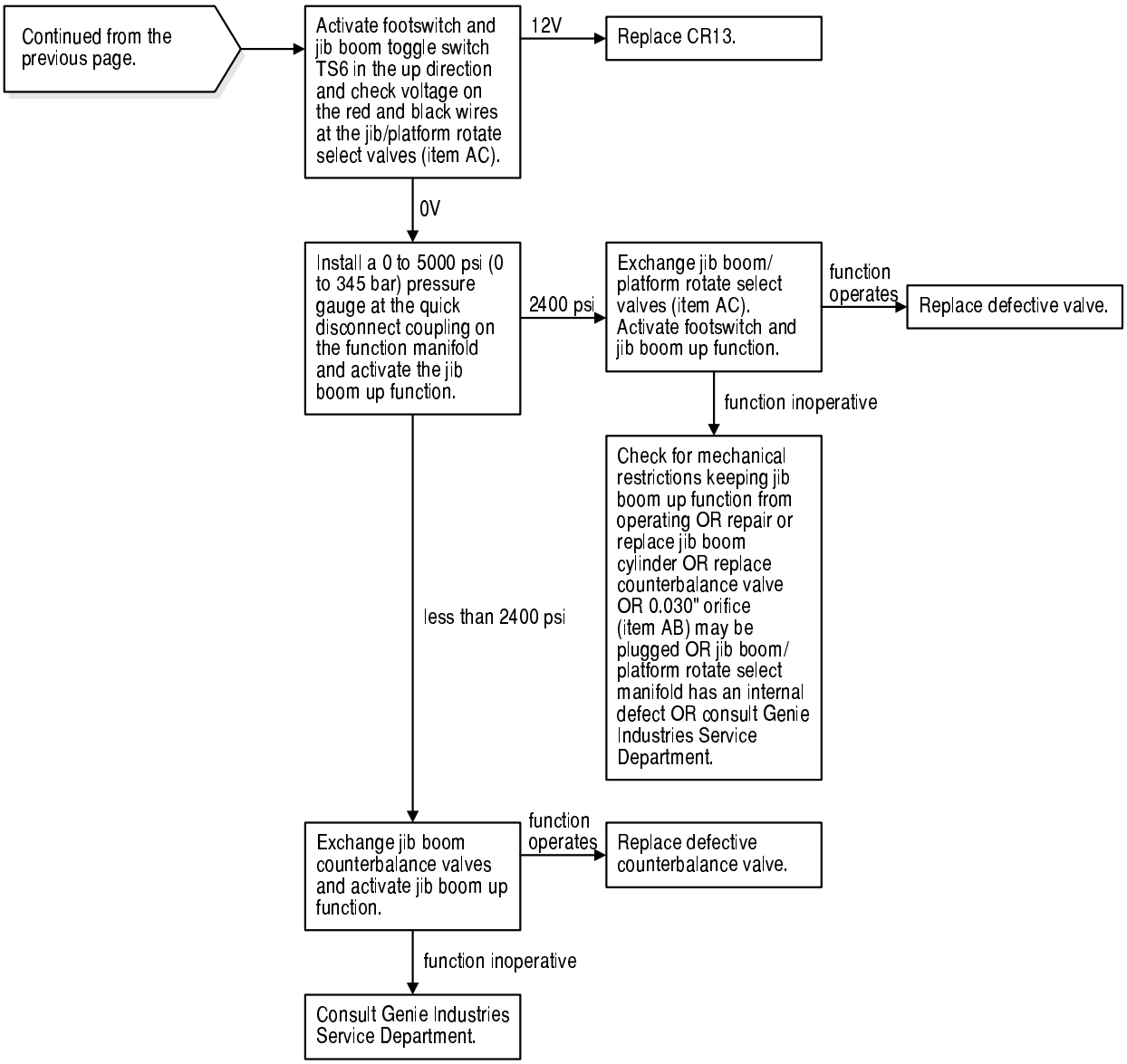

Continued from the previous page.
Activate footswitch and jib boom toggle switch TS6 in the up direction and check voltage on the red and black wires at the jib/platform rotate select valves (item AC).
12V
Replace CR13.
0V
Install a 0 to 5000 psi (0 to 345 bar) pressure gauge at the quick disconnect coupling on the function manifold and activate the jib boom up function.
2400 psi
Exchange jib boom/ platform rotate select valves (item AC). Activate footswitch and jib boom up function.
function operates
Replace defective valve.
function inoperative
Check for mechanical restrictions keeping jib boom up function from operating OR repair or replace jib boom cylinder OR replace counterbalance valve OR 0.030" orifice (item AB) may be plugged OR jib boom/ platform rotate select manifold has an internal defect OR consult Genie Industries Service Department.
less than 2400 psi
Exchange jib boom counterbalance valves and activate jib boom up function.
function operates
Replace defective counterbalance valve.
function inoperative
Consult Genie Industries Service Department.

Chart 28

Jib Boom Down Function Inoperative

Be sure all other functions operate normally.

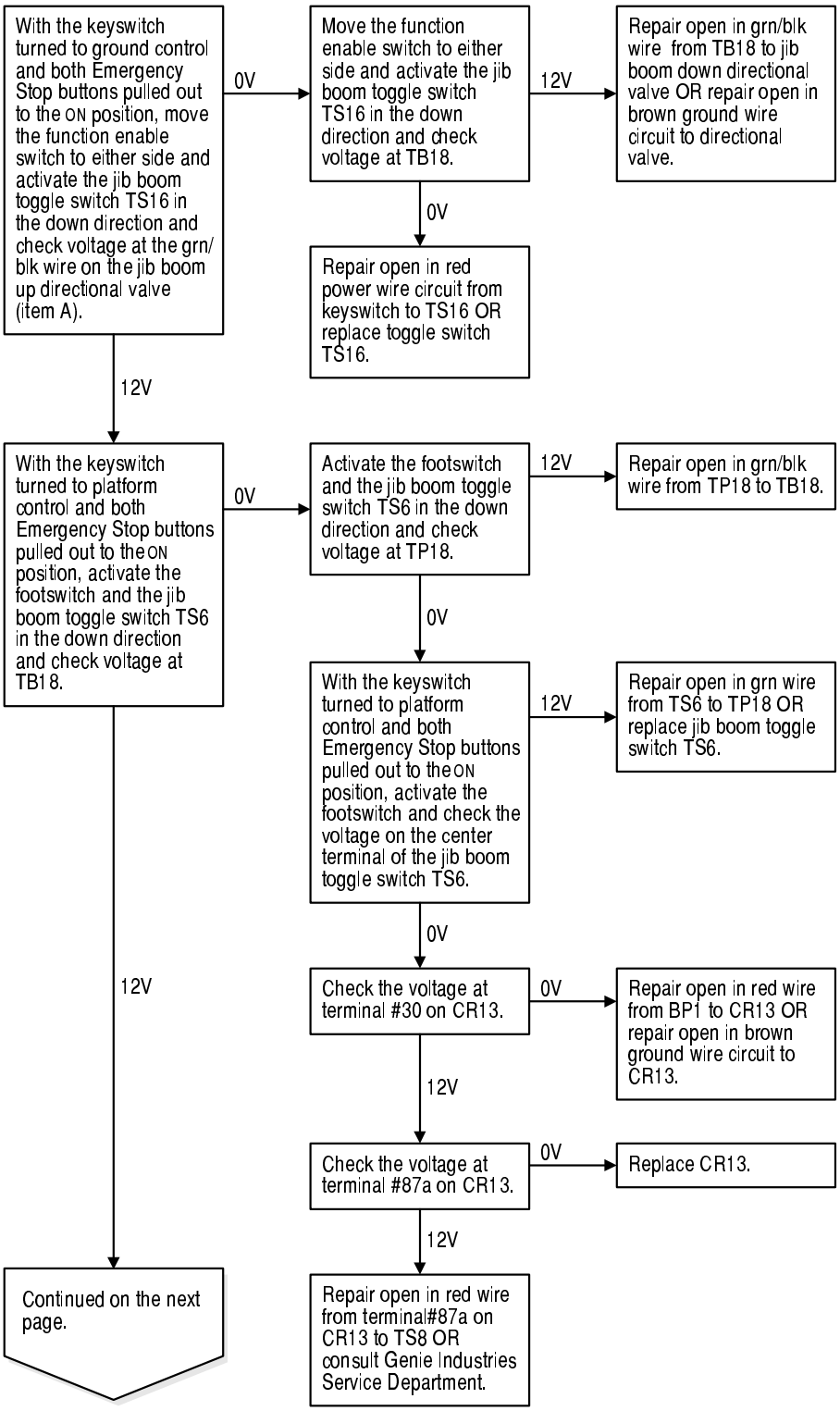


CHART 28

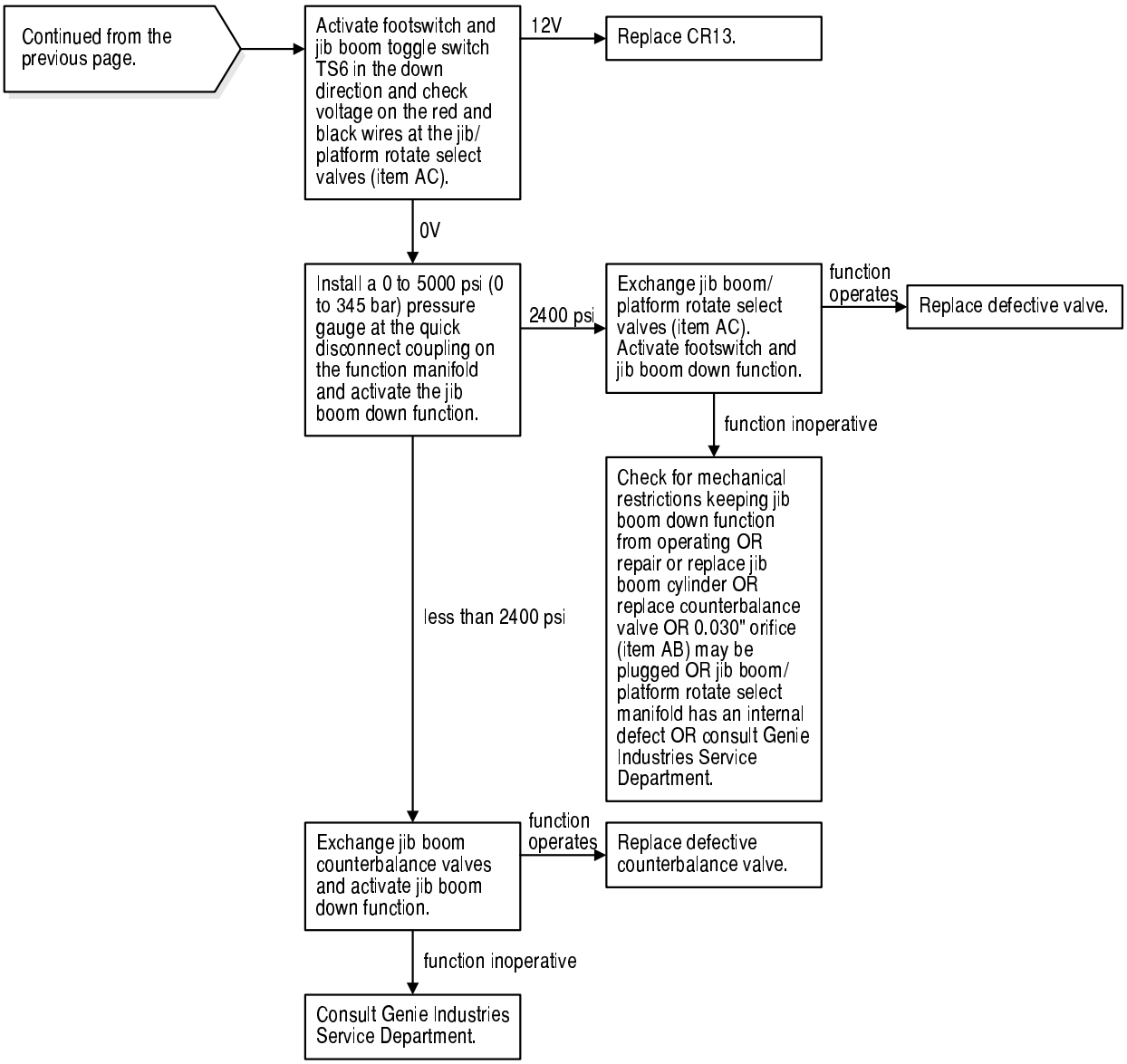

Continued from the previous page.
Activate footswitch and jib boom toggle switch TS6 in the down direction and check voltage on the red and black wires at the jib/ platform rotate select valves (item AC).
12V
Replace CR13.
0V
Install a 0 to 5000 psi (0 to 345 bar) pressure gauge at the quick disconnect coupling on the function manifold and activate the jib boom down function.
2400 psi
Exchange jib boom/ platform rotate select valves (item AC). Activate footswitch and jib boom down function.
function operates
Replace defective valve.
function inoperative
Check for mechanical restrictions keeping jib boom down function from operating OR repair or replace jib boom cylinder OR replace counterbalance valve OR 0.030" orifice (item AB) may be plugged OR jib boom/ platform rotate select manifold has an internal defect OR consult Genie Industries Service Department.
less than 2400 psi
Exchange jib boom counterbalance valves and activate jib boom down function.
function operates
Replace defective counterbalance valve.
function inoperative
Consult Genie Industries Service Department.

Chart 29

Steer Left Function Inoperative - Non Oscillating Models

Be sure all other functions operate normally.

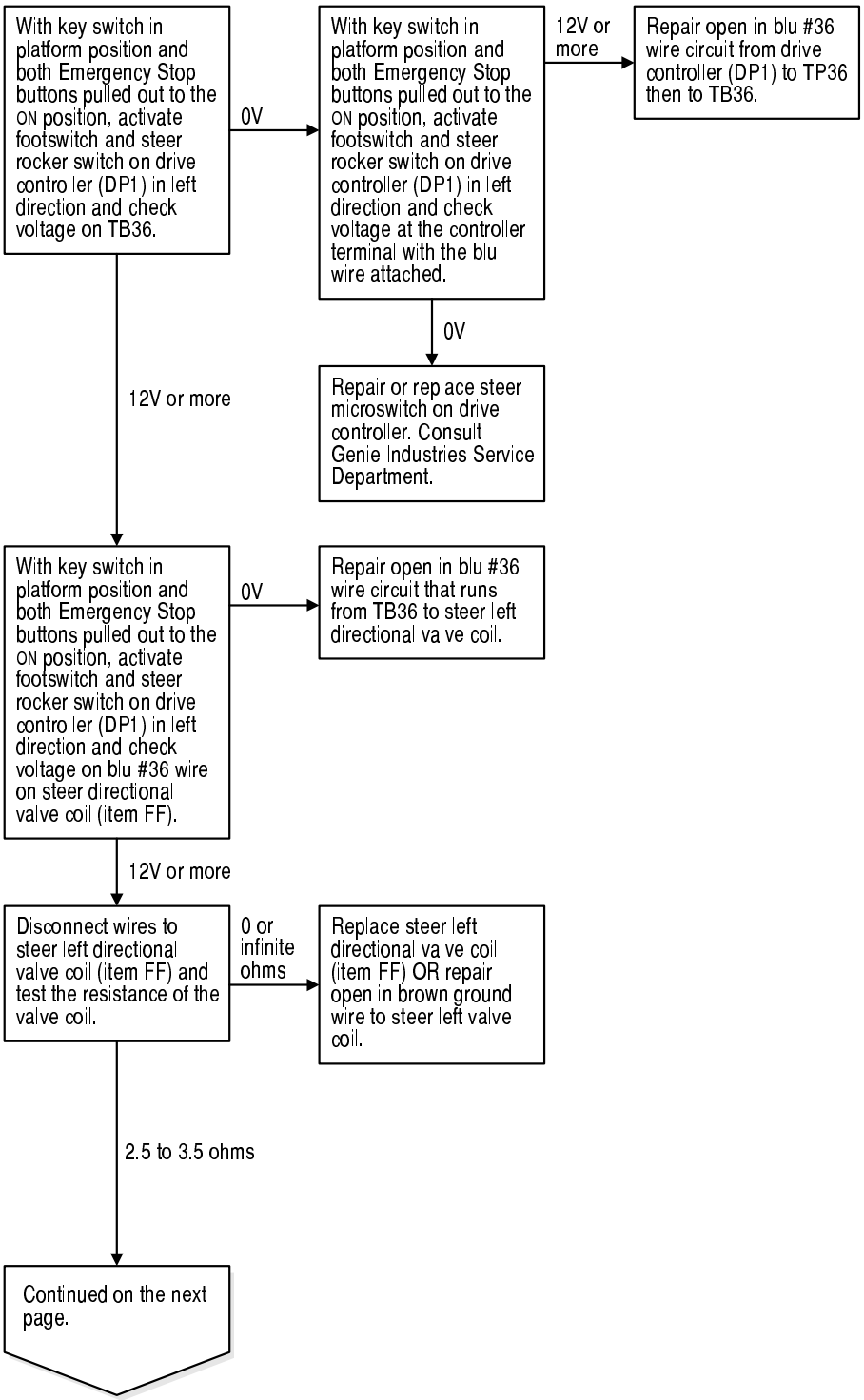


CHART 29

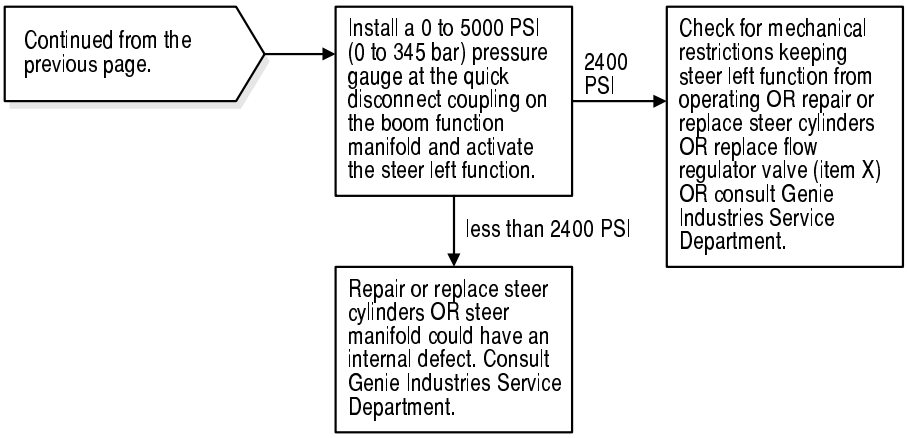

Continued from the previous page.
Install a 0 to 5000 PSI (0 to 345 bar) pressure gauge at the quick disconnect coupling on the boom function manifold and activate the steer left function.
2400 PSI
Check for mechanical restrictions keeping steer left function from operating OR repair or replace steer cylinders OR replace flow regulator valve (item X) OR consult Genie Industries Service Department.
less than 2400 PSI
Repair or replace steer cylinders OR steer manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 30

Steer Right Function Inoperative - Non Oscillating Models

Be sure all other functions operate normally.

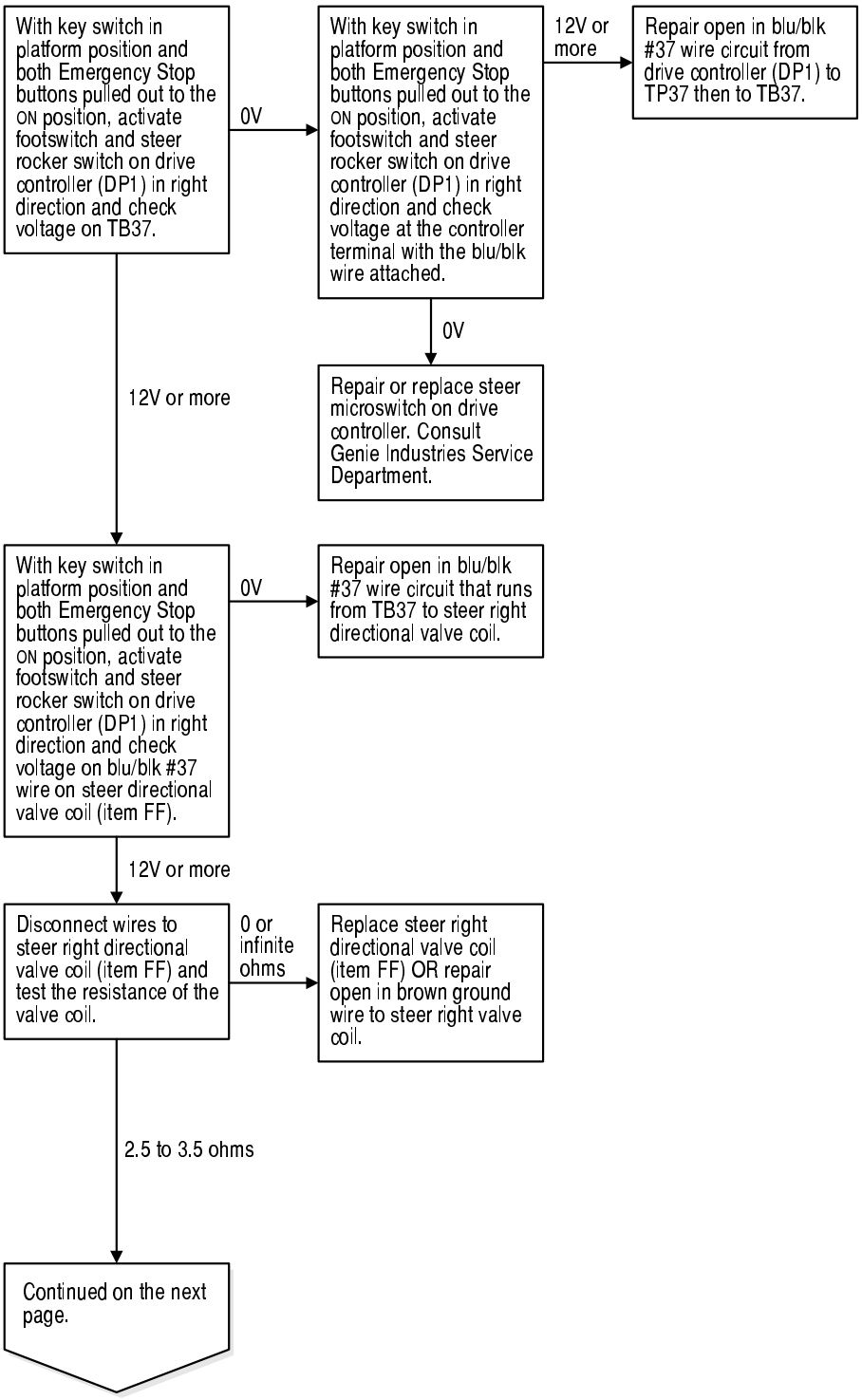


CHART 30

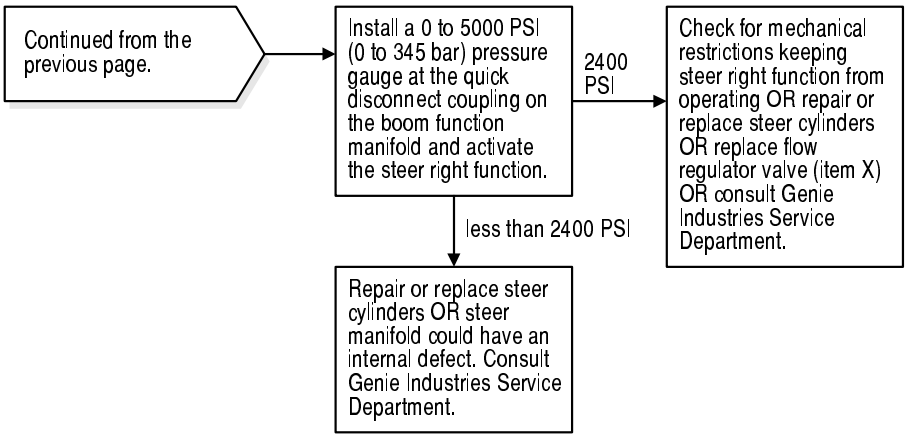

Continued from the previous page.
Install a 0 to 5000 PSI (0 to 345 bar) pressure gauge at the quick disconnect coupling on the boom function manifold and activate the steer right function.
2400 PSI
Check for mechanical restrictions keeping steer right function from operating OR repair or replace steer cylinders OR replace flow regulator valve (item X) OR consult Genie Industries Service Department.
less than 2400 PSI
Repair or replace steer cylinders OR steer manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 31

Steer Left Function Inoperative - Oscillating Models

Be sure all other functions operate normally.

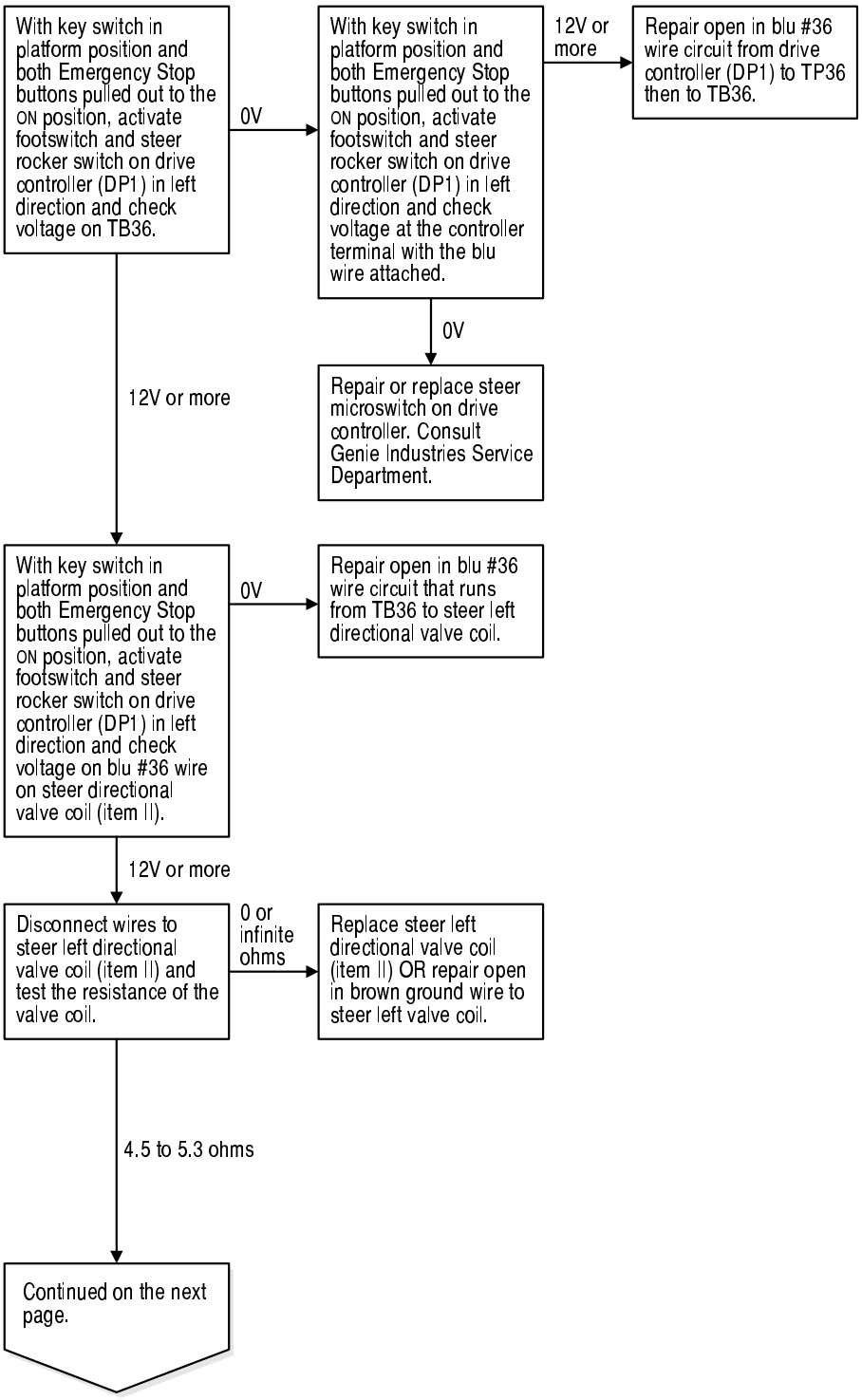


CHART 31

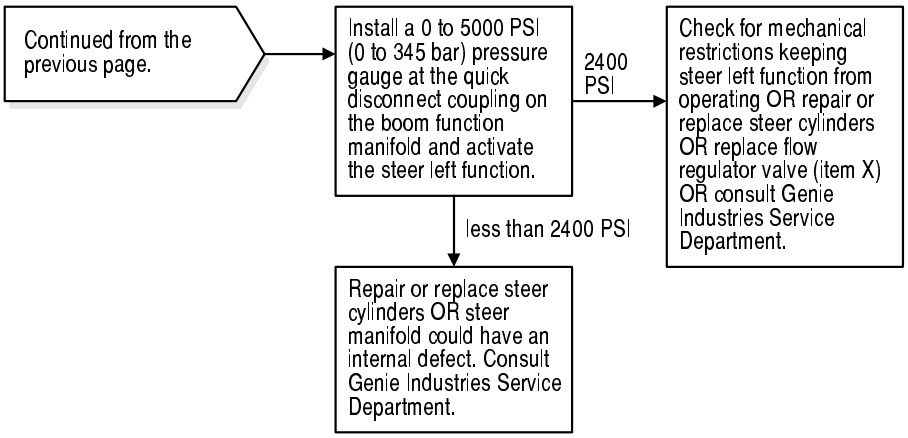

Continued from the previous page.
Install a 0 to 5000 PSI (0 to 345 bar) pressure gauge at the quick disconnect coupling on the boom function manifold and activate the steer left function.
2400 PSI
Check for mechanical restrictions keeping steer left function from operating OR repair or replace steer cylinders OR replace flow regulator valve (item X) OR consult Genie Industries Service Department.
less than 2400 PSI
Repair or replace steer cylinders OR steer manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 32

Steer Right Function Inoperative - Oscillating Models

Be sure all other functions operate normally.

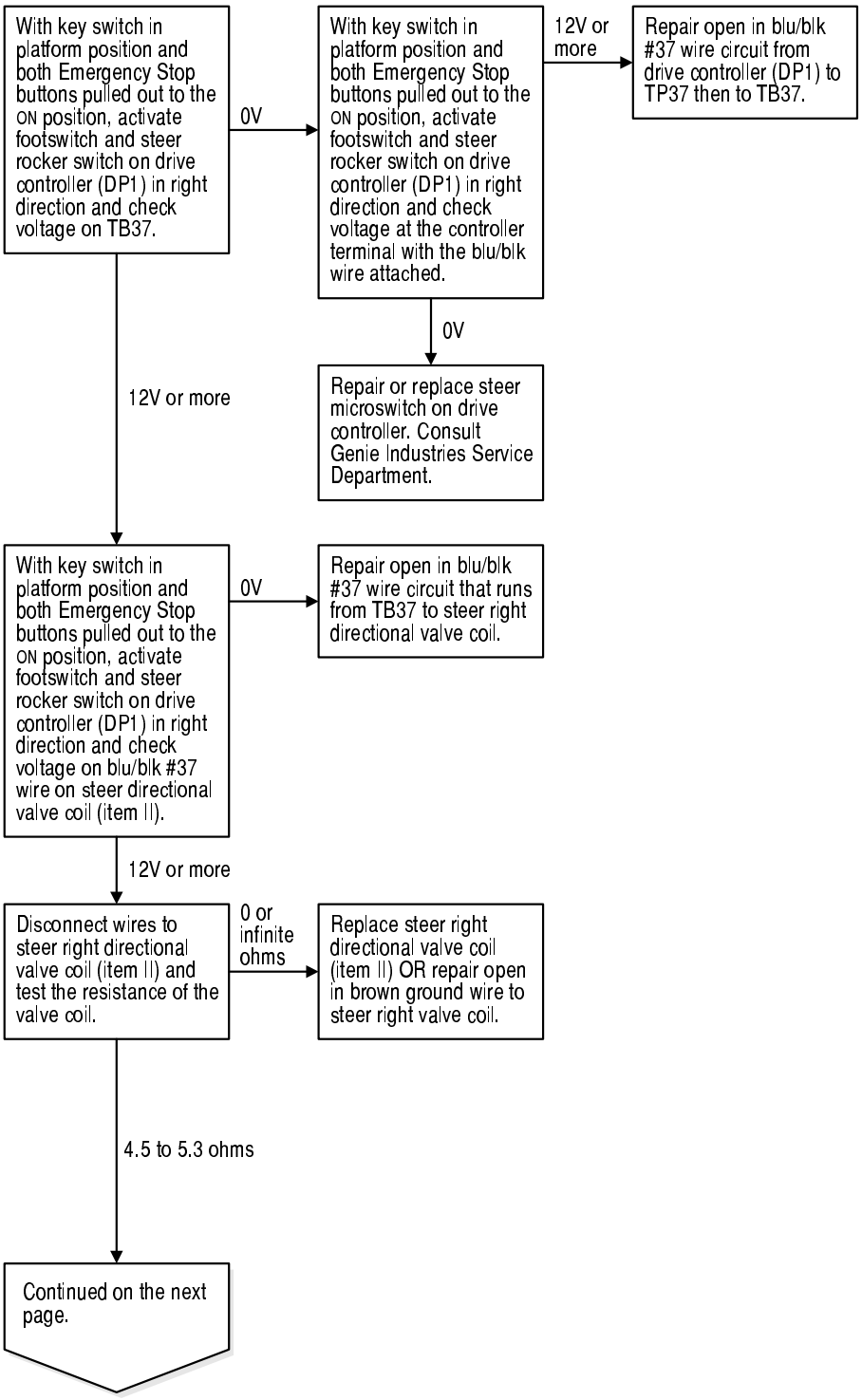


CHART 32

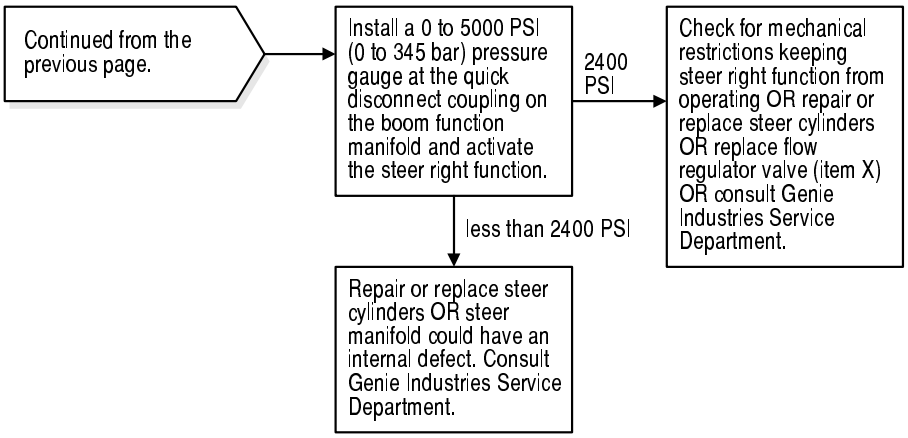

Continued from the previous page.
Install a 0 to 5000 PSI (0 to 345 bar) pressure gauge at the quick disconnect coupling on the boom function manifold and activate the steer right function.
2400 PSI
Check for mechanical restrictions keeping steer right function from operating OR repair or replace steer cylinders OR replace flow regulator valve (item X) OR consult Genie Industries Service Department.
less than 2400 PSI
Repair or replace steer cylinders OR steer manifold could have an internal defect. Consult Genie Industries Service Department.

Chart 33

Oscillate Function Inoperative

Be sure all other function operate normally.

Be sure that the machine is on a firm level surface.

Be sure that the oscillate cylinder is clean and clear of all debris.

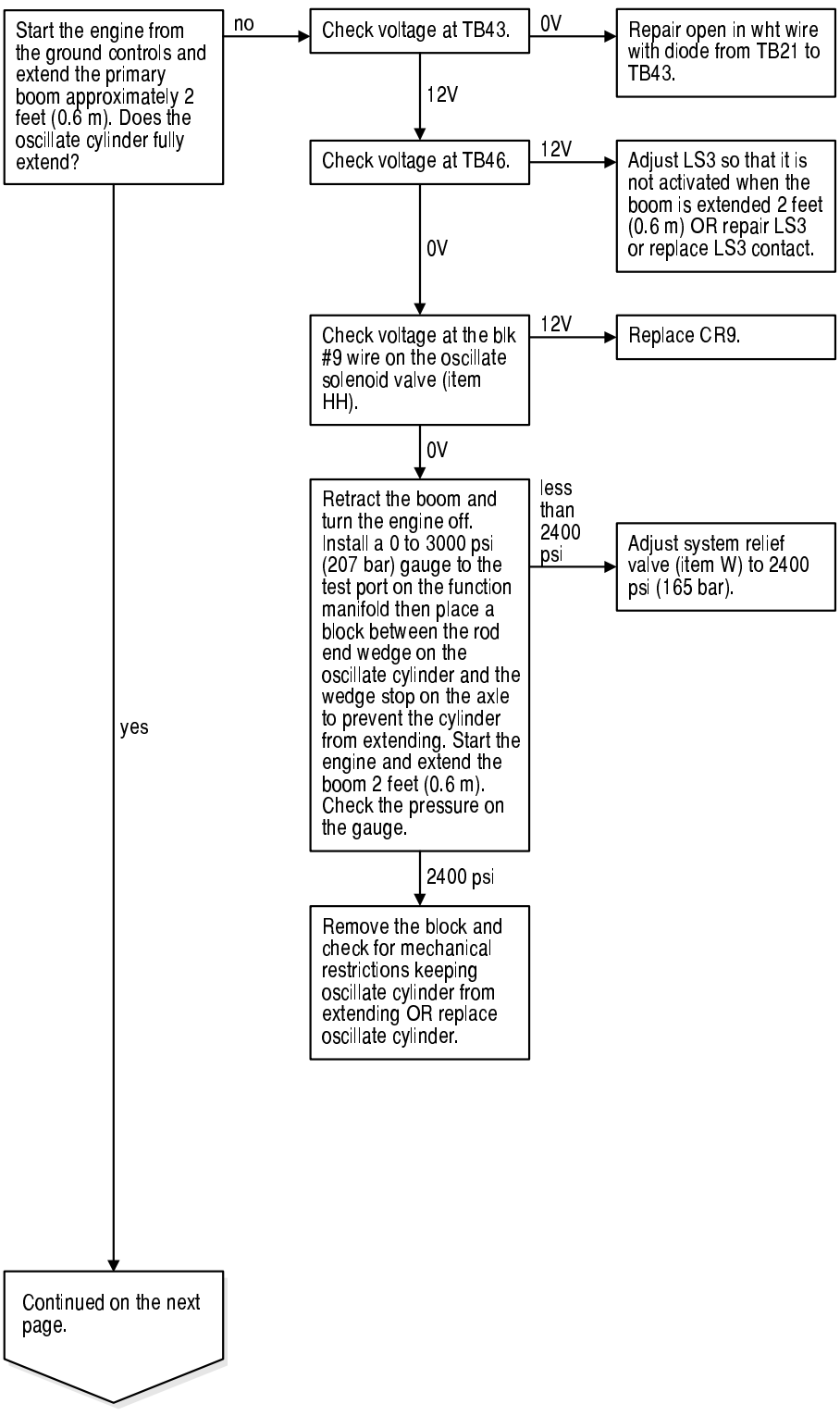


CHART 33

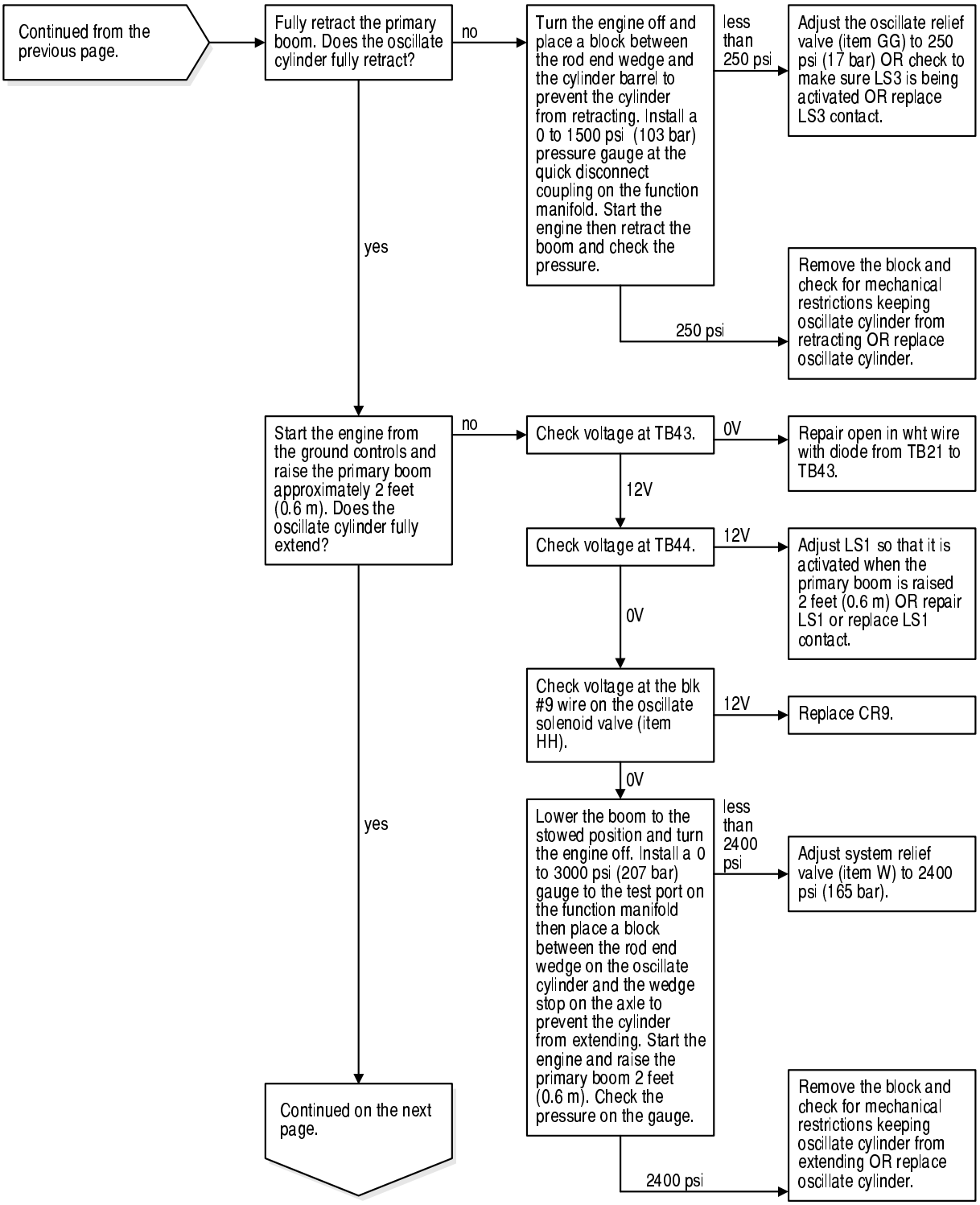

Continued from the previous page.
Fully retract the primary boom. Does the oscillate cylinder fully retract?
no
Turn the engine off and place a block between the rod end wedge and the cylinder barrel to prevent the cylinder from retracting. Install a 0 to 1500 psi (103 bar) pressure gauge at the quick disconnect coupling on the function manifold. Start the engine then retract the boom and check the pressure.
less than 250 psi
Adjust the oscillate relief valve (item GG) to 250 psi (17 bar) OR check to make sure LS3 is being activated OR replace LS3 contact.
250 psi
Remove the block and check for mechanical restrictions keeping oscillate cylinder from retracting OR replace oscillate cylinder.
yes
Start the engine from the ground controls and raise the primary boom approximately 2 feet (0.6 m). Does the oscillate cylinder fully extend?
no
Check voltage at TB43.
0V
Repair open in wht wire with diode from TB21 to TB43.
12V
Check voltage at TB44.
12V
Adjust LS1 so that it is activated when the primary boom is raised 2 feet (0.6 m) OR repair LS1 or replace LS1 contact.
0V
Check voltage at the blk #9 wire on the oscillate solenoid valve (item HH).
12V
Replace CR9.
0V
yes
Lower the boom to the stowed position and turn the engine off. Install a 0 to 3000 psi (207 bar) gauge to the test port on the function manifold then place a block between the rod end wedge on the oscillate cylinder and the wedge stop on the axle to prevent the cylinder from extending. Start the engine and raise the primary boom 2 feet (0.6 m). Check the pressure on the gauge.
less than 2400 psi
Adjust system relief valve (item W) to 2400 psi (165 bar).
2400 psi
Remove the block and check for mechanical restrictions keeping oscillate cylinder from extending OR replace oscillate cylinder.
Continued on the next page.

CHART 33

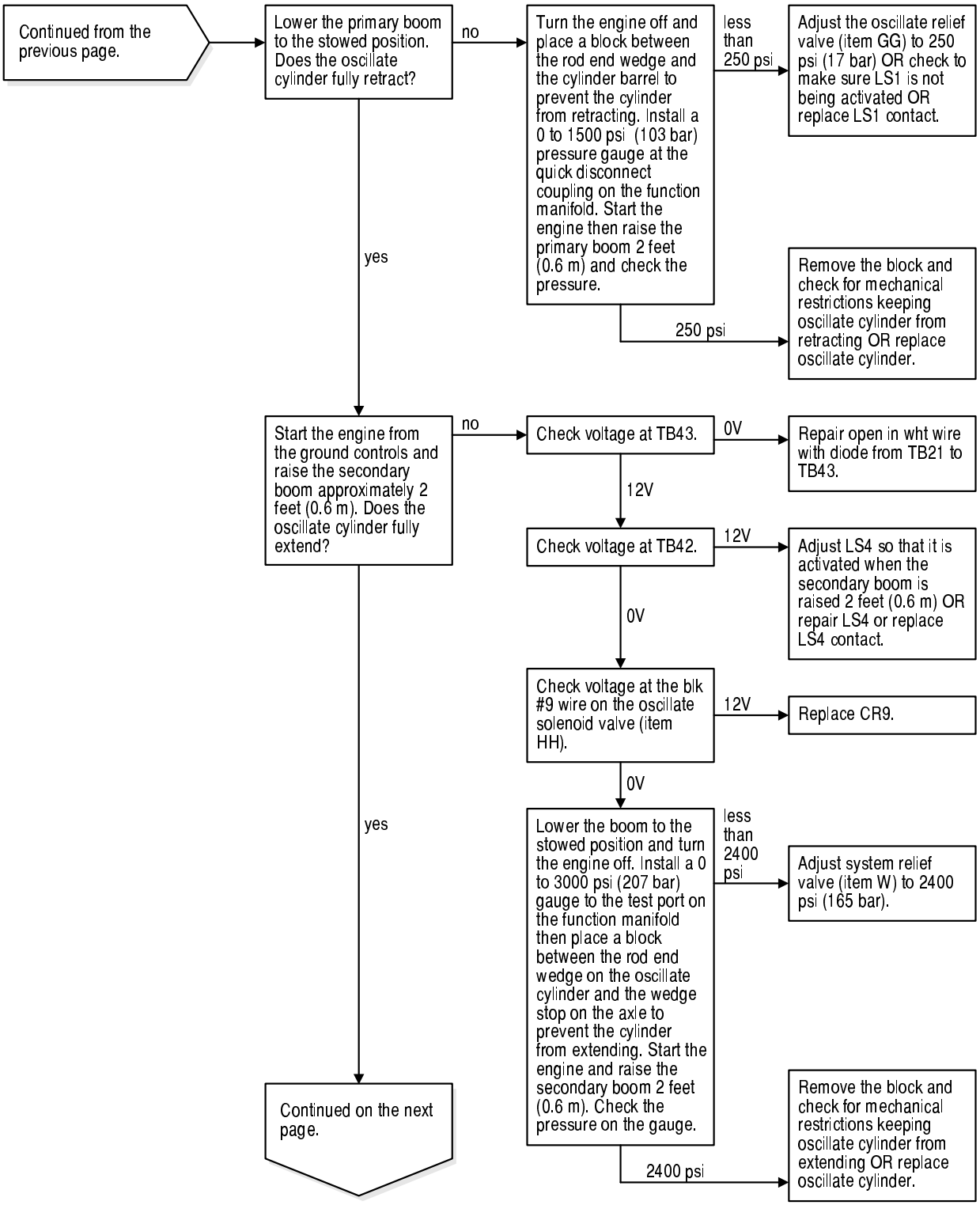

Continued from the previous page.
Lower the primary boom to the stowed position. Does the oscillate cylinder fully retract?
no
Turn the engine off and place a block between the rod end wedge and the cylinder barrel to prevent the cylinder from retracting. Install a 0 to 1500 psi (103 bar) pressure gauge at the quick disconnect coupling on the function manifold. Start the engine then raise the primary boom 2 feet (0.6 m) and check the pressure.
less than 250 psi
Adjust the oscillate relief valve (item GG) to 250 psi (17 bar) OR check to make sure LS1 is not being activated OR replace LS1 contact.
250 psi
Remove the block and check for mechanical restrictions keeping oscillate cylinder from retracting OR replace oscillate cylinder.
yes
Start the engine from the ground controls and raise the secondary boom approximately 2 feet (0.6 m). Does the oscillate cylinder fully extend?
no
Check voltage at TB43.
0V
Repair open in wht wire with diode from TB21 to TB43.
12V
Check voltage at TB42.
12V
Adjust LS4 so that it is activated when the secondary boom is raised 2 feet (0.6 m) OR repair LS4 or replace LS4 contact.
0V
Check voltage at the blk #9 wire on the oscillate solenoid valve (item HH).
12V
Replace CR9.
0V
yes
Lower the boom to the stowed position and turn the engine off. Install a 0 to 3000 psi (207 bar) gauge to the test port on the function manifold then place a block between the rod end wedge on the oscillate cylinder and the wedge stop on the axle to prevent the cylinder from extending. Start the engine and raise the secondary boom 2 feet (0.6 m). Check the pressure on the gauge.
less than 2400 psi
Adjust system relief valve (item W) to 2400 psi (165 bar).
2400 psi
Remove the block and check for mechanical restrictions keeping oscillate cylinder from extending OR replace oscillate cylinder.
Continued on the next page.

CHART 33

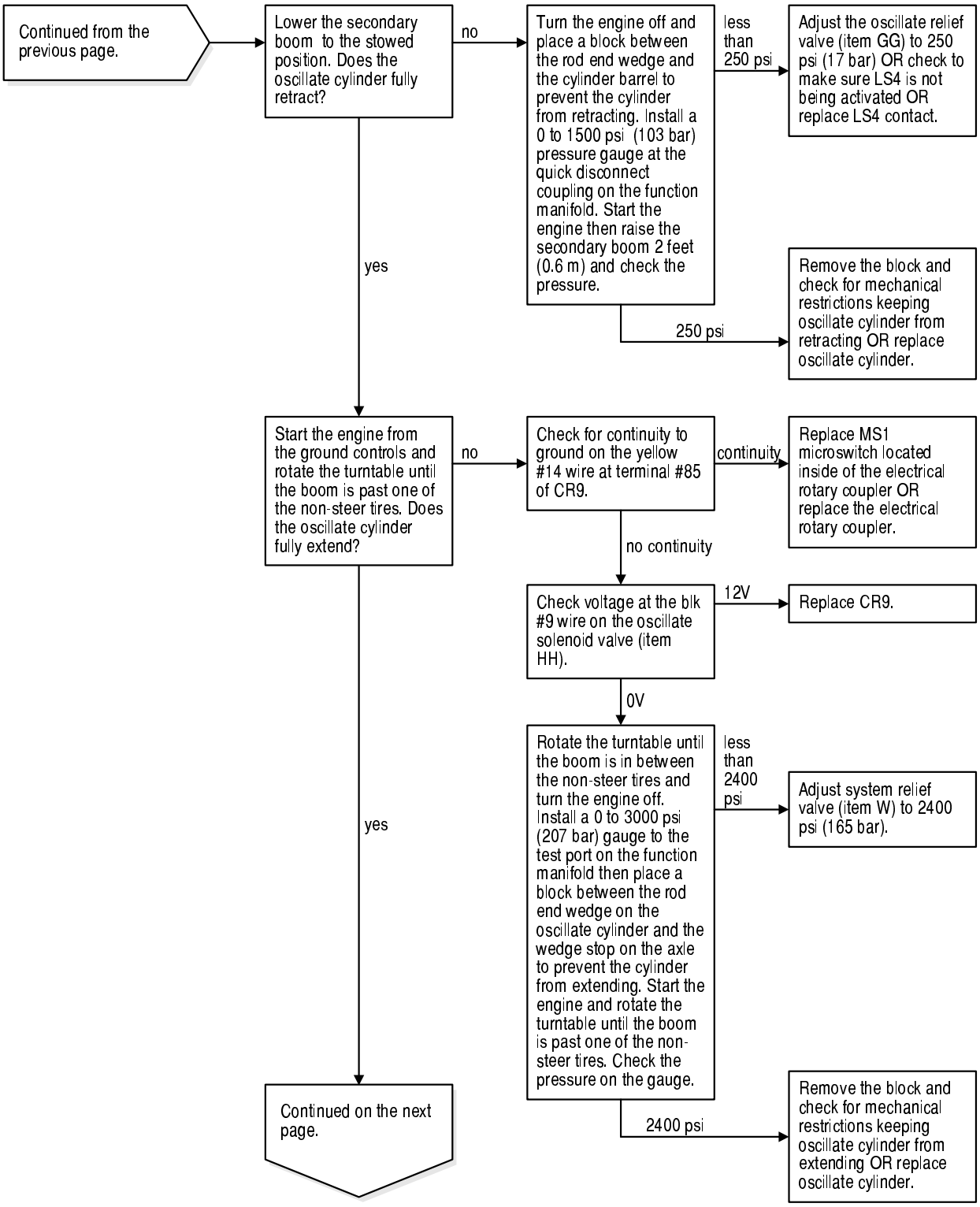

Continued from the previous page.
Lower the secondary boom to the stowed position. Does the oscillate cylinder fully retract?
no
Turn the engine off and place a block between the rod end wedge and the cylinder barrel to prevent the cylinder from retracting. Install a 0 to 1500 psi (103 bar) pressure gauge at the quick disconnect coupling on the function manifold. Start the engine then raise the secondary boom 2 feet (0.6 m) and check the pressure.
less than 250 psi
Adjust the oscillate relief valve (item GG) to 250 psi (17 bar) OR check to make sure LS4 is not being activated OR replace LS4 contact.
250 psi
Remove the block and check for mechanical restrictions keeping oscillate cylinder from retracting OR replace oscillate cylinder.
yes
Start the engine from the ground controls and rotate the turntable until the boom is past one of the non-steer tires. Does the oscillate cylinder fully extend?
no
Check for continuity to ground on the yellow #14 wire at terminal #85 of CR9.
continuity
Replace MS1 microswitch located inside of the electrical rotary coupler OR replace the electrical rotary coupler.
no continuity
Check voltage at the blk #9 wire on the oscillate solenoid valve (item HH).
12V
Replace CR9.
0V
Rotate the turntable until the boom is in between the non-steer tires and turn the engine off. Install a 0 to 3000 psi (207 bar) gauge to the test port on the function manifold then place a block between the rod end wedge on the oscillate cylinder and the wedge stop on the axle to prevent the cylinder from extending. Start the engine and rotate the turntable until the boom is past one of the non-steer tires. Check the pressure on the gauge.
less than 2400 psi
Adjust system relief valve (item W) to 2400 psi (165 bar).
2400 psi
Remove the block and check for mechanical restrictions keeping oscillate cylinder from extending OR replace oscillate cylinder.
yes
Continued on the next page.

CHART 33

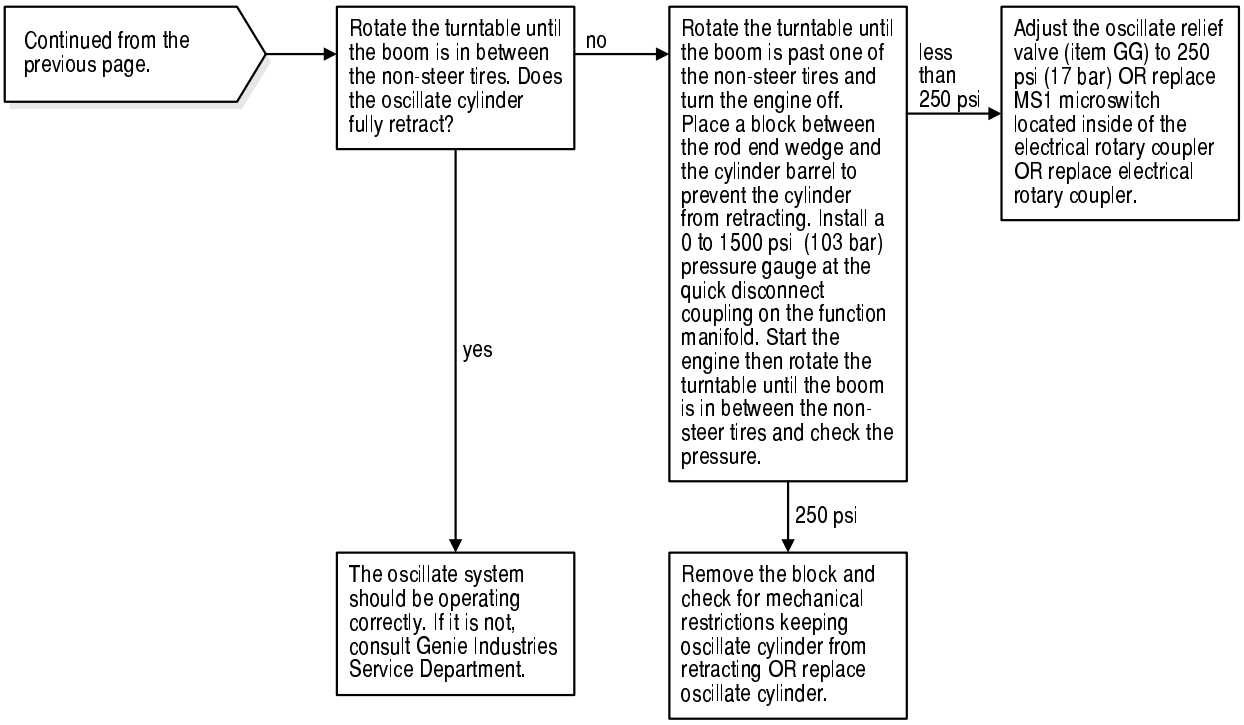

Continued from the previous page.
Rotate the turntable until the boom is in between the non-steer tires. Does the oscillate cylinder fully retract?
no
Rotate the turntable until the boom is past one of the non-steer tires and turn the engine off. Place a block between the rod end wedge and the cylinder barrel to prevent the cylinder from retracting. Install a 0 to 1500 psi (103 bar) pressure gauge at the quick disconnect coupling on the function manifold. Start the engine then rotate the turntable until the boom is in between the non-steer tires and check the pressure.
less than 250 psi
Adjust the oscillate relief valve (item GG) to 250 psi (17 bar) OR replace MS1 microswitch located inside of the electrical rotary coupler OR replace electrical rotary coupler.
yes
250 psi
The oscillate system should be operating correctly. If it is not, consult Genie Industries Service Department.
Remove the block and check for mechanical restrictions keeping oscillate cylinder from retracting OR replace oscillate cylinder.

Chart 34

All Drive Functions Inoperative, All Other Functions Operate Normally

Be sure the rpm toggle switch is in the footswitch activated high idle position.

Be sure the hydraulic tank shut off valves are in the OPEN position.

Be sure machine is not in the free wheel configuration.

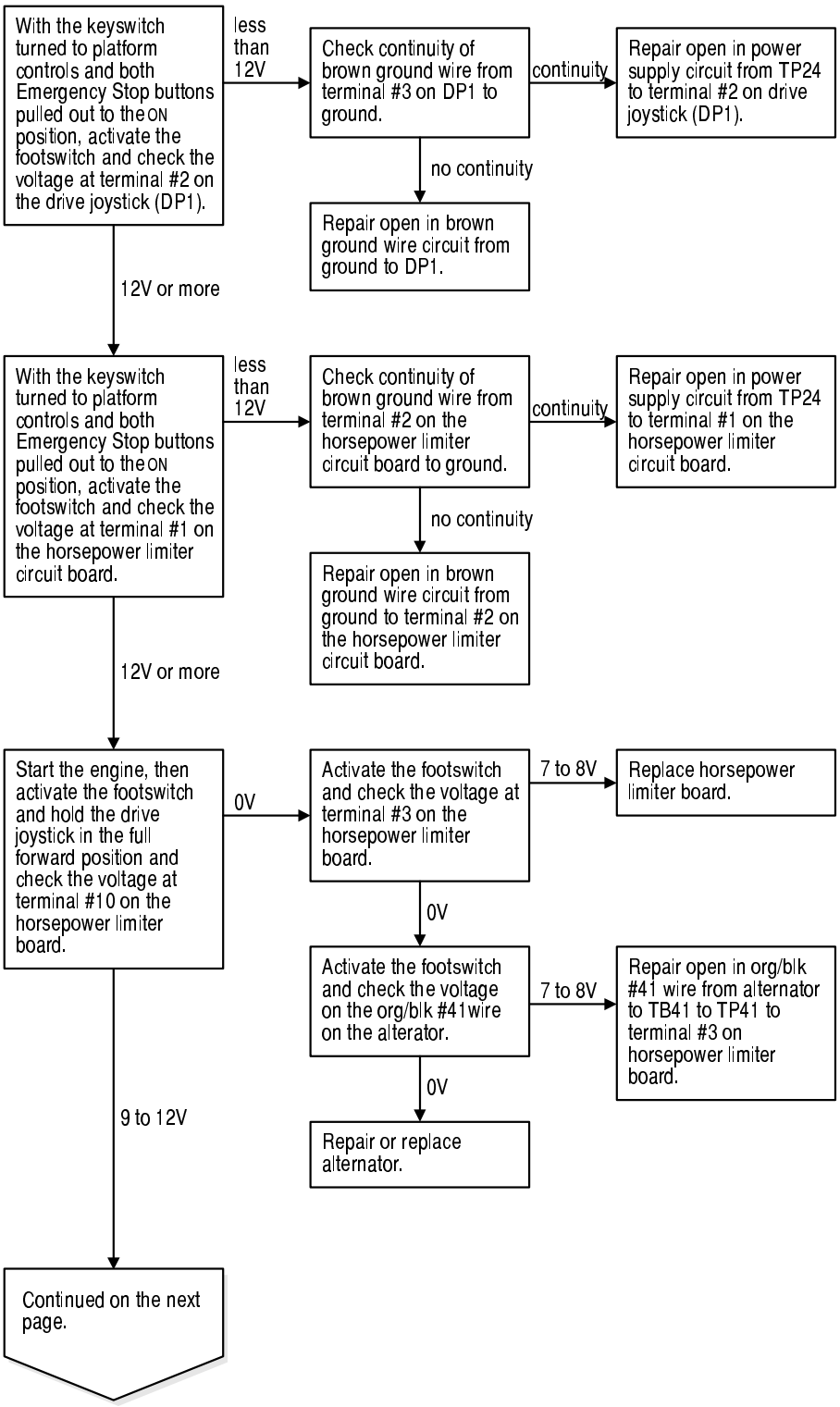


CHART 34

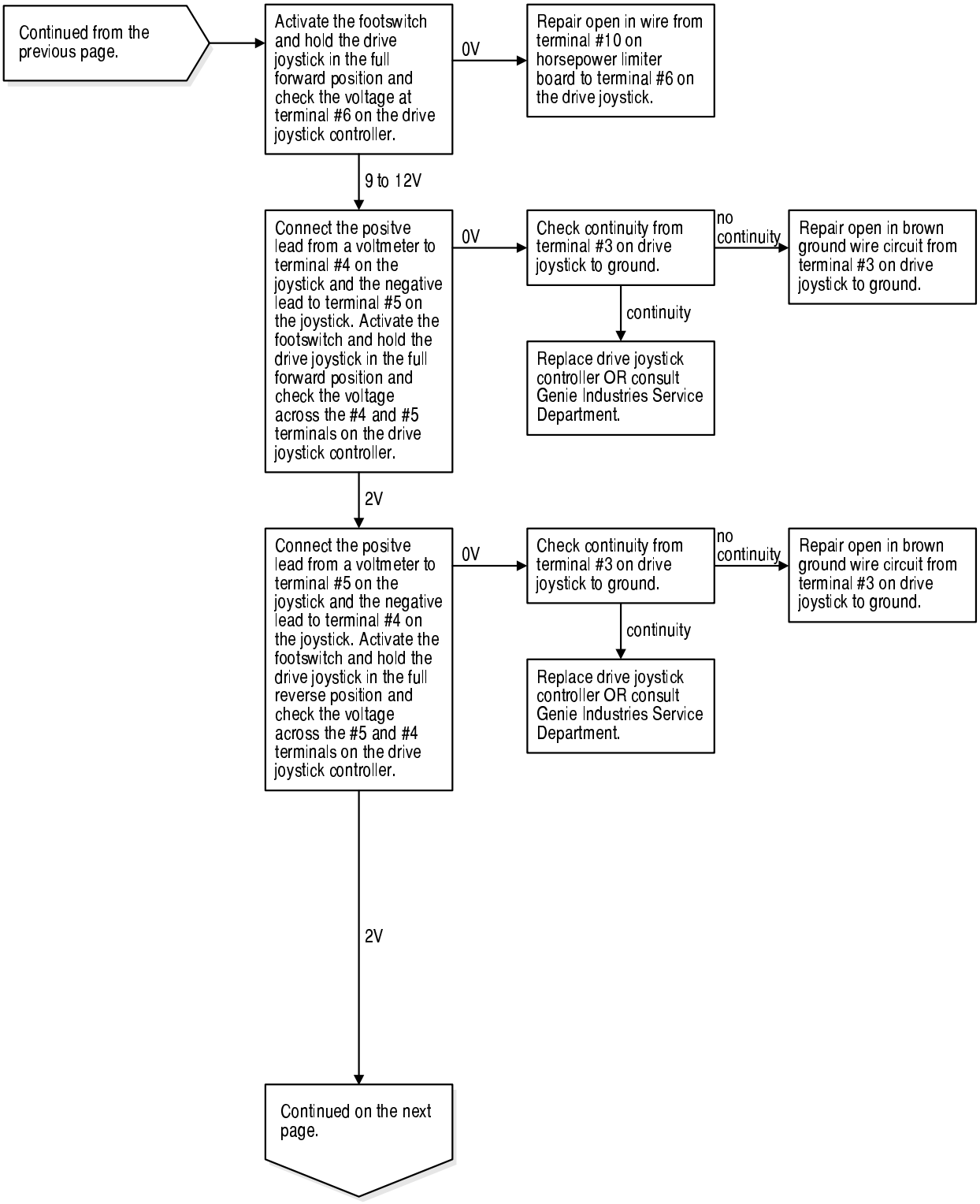

Continued from the previous page.
Activate the footswitch and hold the drive joystick in the full forward position and check the voltage at terminal #6 on the drive joystick controller.
0V
Repair open in wire from terminal #10 on horsepower limiter board to terminal #6 on the drive joystick.
9 to 12V
Connect the positve lead from a voltmeter to terminal #4 on the joystick and the negative lead to terminal #5 on the joystick. Activate the footswitch and hold the drive joystick in the full forward position and check the voltage across the #4 and #5 terminals on the drive joystick controller.
0V
Check continuity from terminal #3 on drive joystick to ground.
no continuity
Repair open in brown ground wire circuit from terminal #3 on drive joystick to ground.
continuity
Replace drive joystick controller OR consult Genie Industries Service Department.
2V
Connect the positve lead from a voltmeter to terminal #5 on the joystick and the negative lead to terminal #4 on the joystick. Activate the footswitch and hold the drive joystick in the full reverse position and check the voltage across the #5 and #4 terminals on the drive joystick controller.
0V
Check continuity from terminal #3 on drive joystick to ground.
no continuity
Repair open in brown ground wire circuit from terminal #3 on drive joystick to ground.
continuity
Replace drive joystick controller OR consult Genie Industries Service Department.
2V
Continued on the next page.

CHART 34

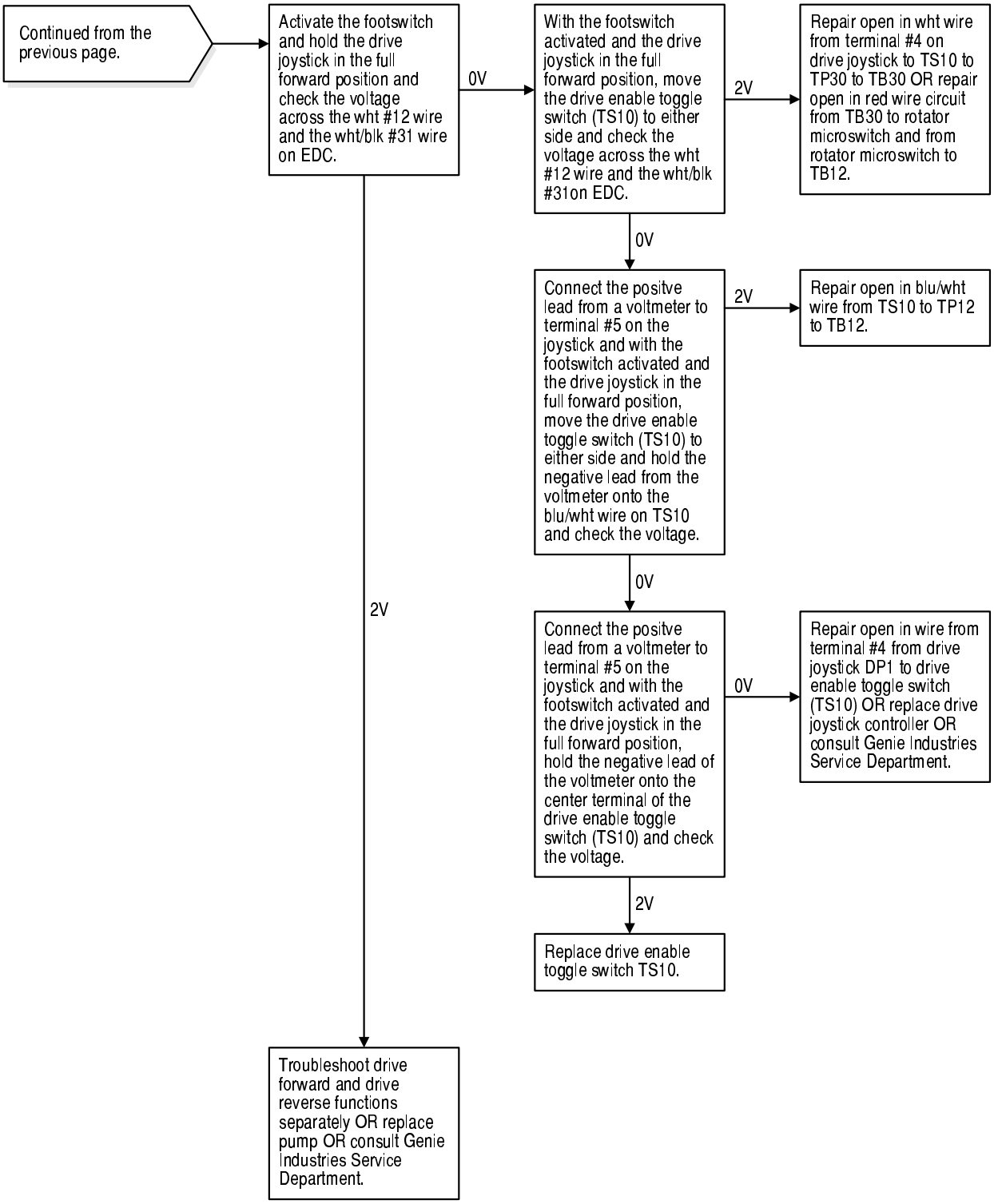

Continued from the previous page.
Activate the footswitch and hold the drive joystick in the full forward position and check the voltage across the wht #12 wire and the wht/blk #31 wire on EDC.
0V
With the footswitch activated and the drive joystick in the full forward position, move the drive enable toggle switch (TS10) to either side and check the voltage across the wht #12 wire and the wht/blk #31on EDC.
2V
Repair open in wht wire from terminal #4 on drive joystick to TS10 to TP30 to TB30 OR repair open in red wire circuit from TB30 to rotator microswitch and from rotator microswitch to TB12.
0V
Connect the positve lead from a voltmeter to terminal #5 on the joystick and with the footswitch activated and the drive joystick in the full forward position, move the drive enable toggle switch (TS10) to either side and hold the negative lead from the voltmeter onto the blu/wht wire on TS10 and check the voltage.
2V
Repair open in blu/wht wire from TS10 to TP12 to TB12.
0V
Connect the positve lead from a voltmeter to terminal #5 on the joystick and with the footswitch activated and the drive joystick in the full forward position, hold the negative lead of the voltmeter onto the center terminal of the drive enable toggle switch (TS10) and check the voltage.
0V
Repair open in wire from terminal #4 from drive joystick DP1 to drive enable toggle switch (TS10) OR replace drive joystick controller OR consult Genie Industries Service Department.
2V
Replace drive enable toggle switch TS10.
2V
Troubleshoot drive forward and drive reverse functions separately OR replace pump OR consult Genie Industries Service Department.

Chart 35

Drive Forward Or Reverse Function Inoperative

Be sure all other functions operate normally including drive in opposite direction of malfunction.

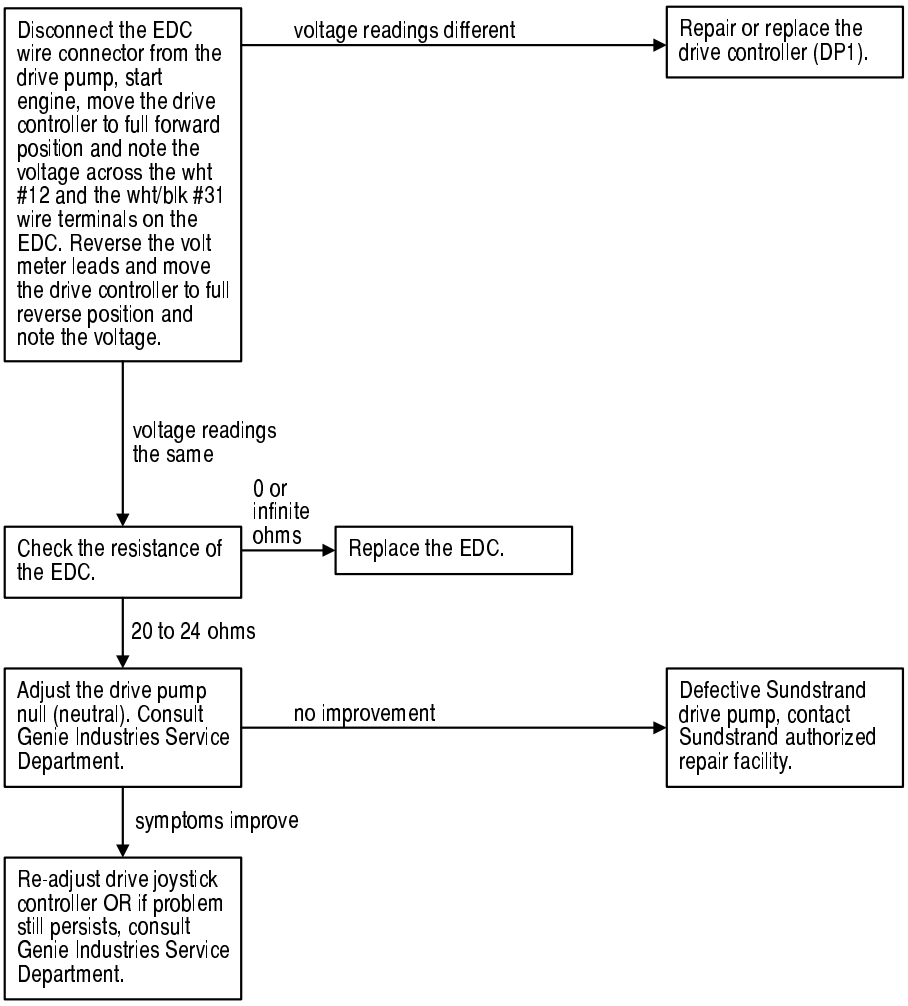


Chart 36

Traction Function Inoperative

Be sure all other functions operate normally.

Any type of traction problem, consult Genie Industries Service Department.

Chart 37

Machine Will Not Drive At Full Speed

Be sure all other functions operate normally.

Be sure the machine is not raised above or extended beyond the drive limit switches.

Be sure the primary boom drive limit switch is clear of any debris and is not activated when the boom is in the stowed position.

Be sure the secondary boom drive limit switch is clear of any debris and is not activated when the boom is in the stowed position.

Be sure that the primary boom extend drive limit switch arm is being activated when the boom is fully retracted.

Be sure the wiring to limit switches is intact and show no sign of damage or corrosion.

Be sure the free-wheel valve is closed on the drive pump.

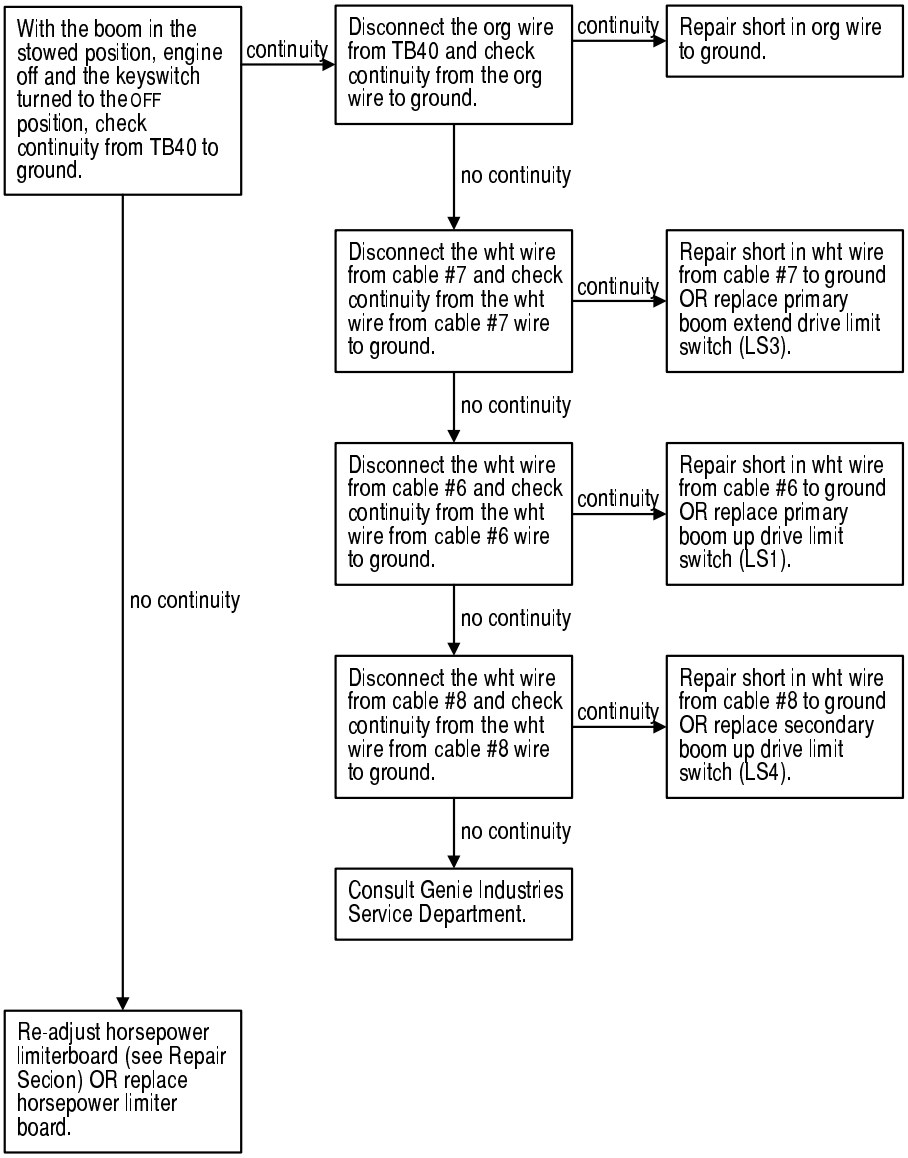


Chart 38

Machine Drives At Full Speed With Platform Raised or Extended

Be sure primary boom drive limit switch is being activated by the cam on the primary boom when the primary boom is raised.

Be sure secondary boom drive limit switch is being activated by the cam on the compression link when the secondary boom is raised.

Be sure that the primary boom extend drive limit switch is not being held down or being activated when the primary boom is extended.

Be sure the wiring to limit switches is intact and show no sign of damage or corrosion.

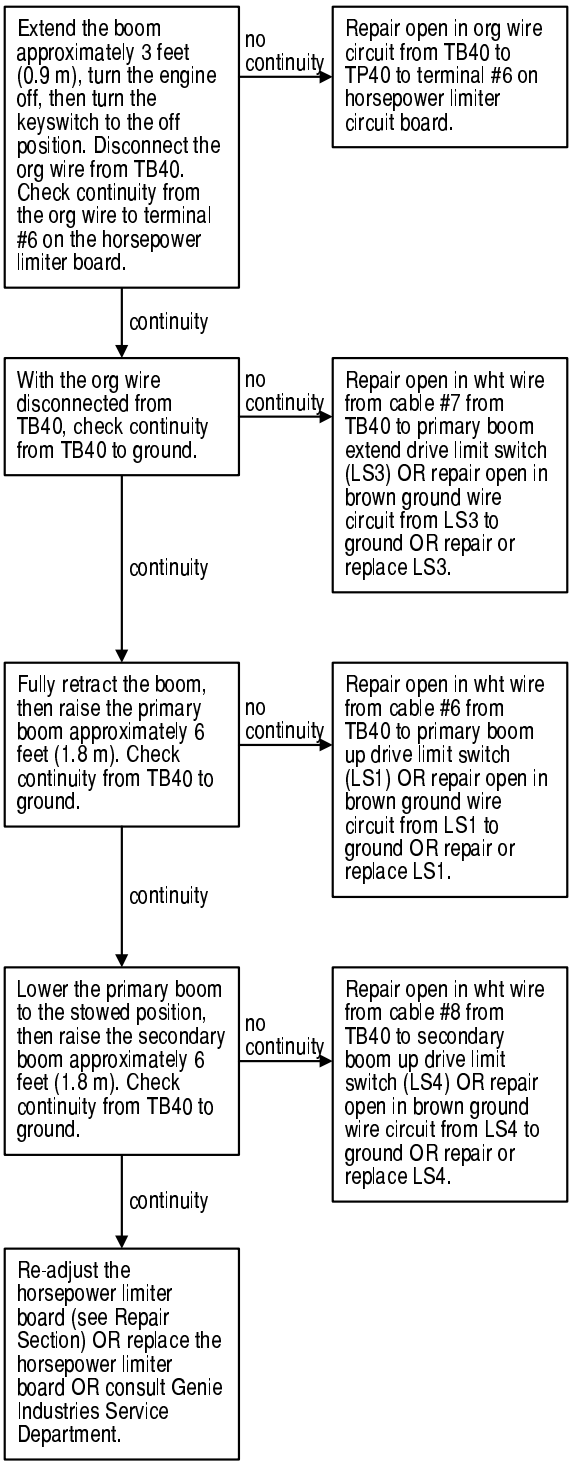


Chart 39

Drive Enable System Is Malfunctioning

Be sure the boom is in the stowed position.

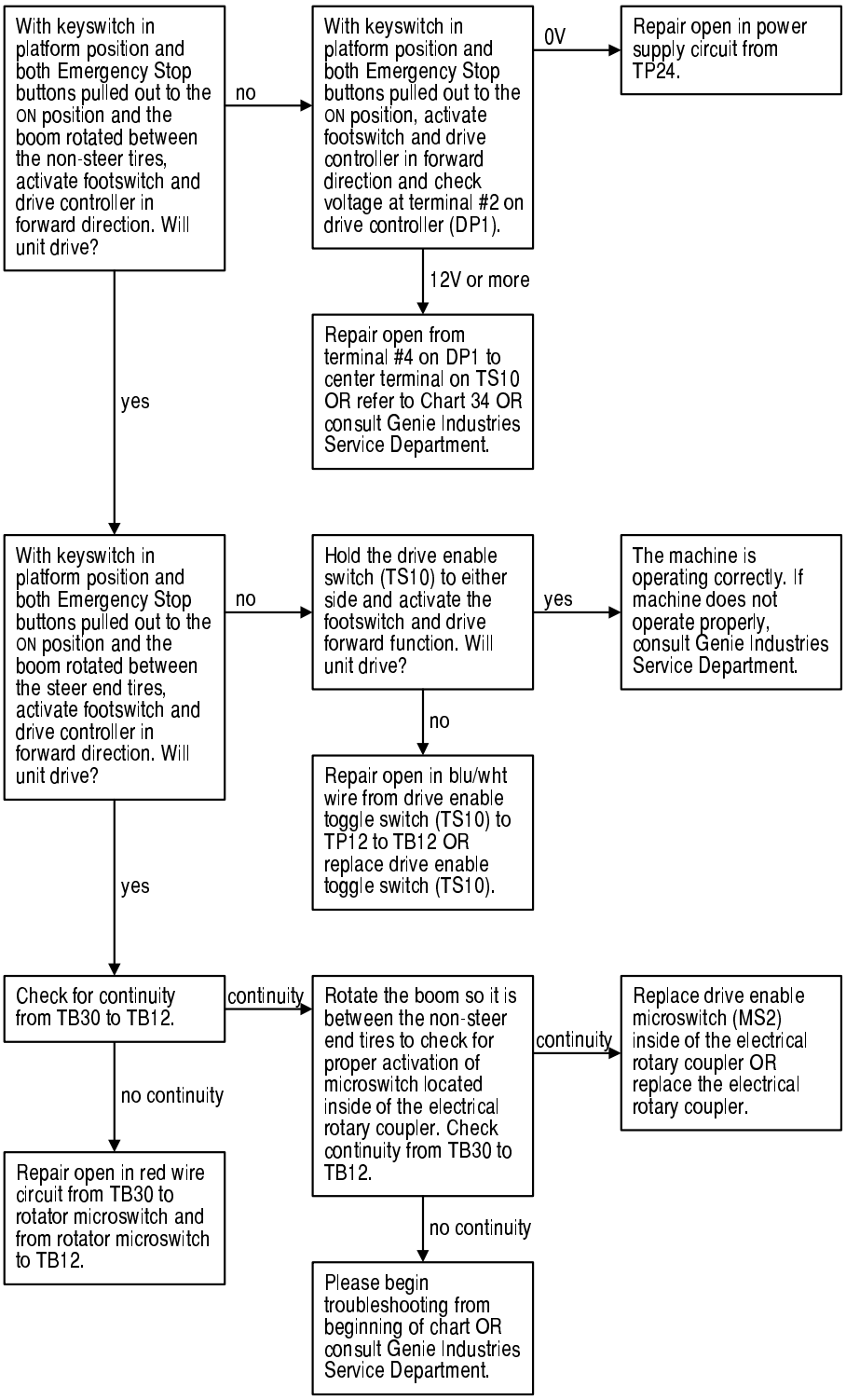


Chart 40

Auxiliary Functions Inoperative

Be sure all other functions operate normally.

Be sure key switch is in the appropriate position and both Emergency Stop buttons are pulled out to the ON position.

Be sure engine is not running when using auxiliary power.

Note: Operating auxiliary power with the engine running should immediately kill the engine.

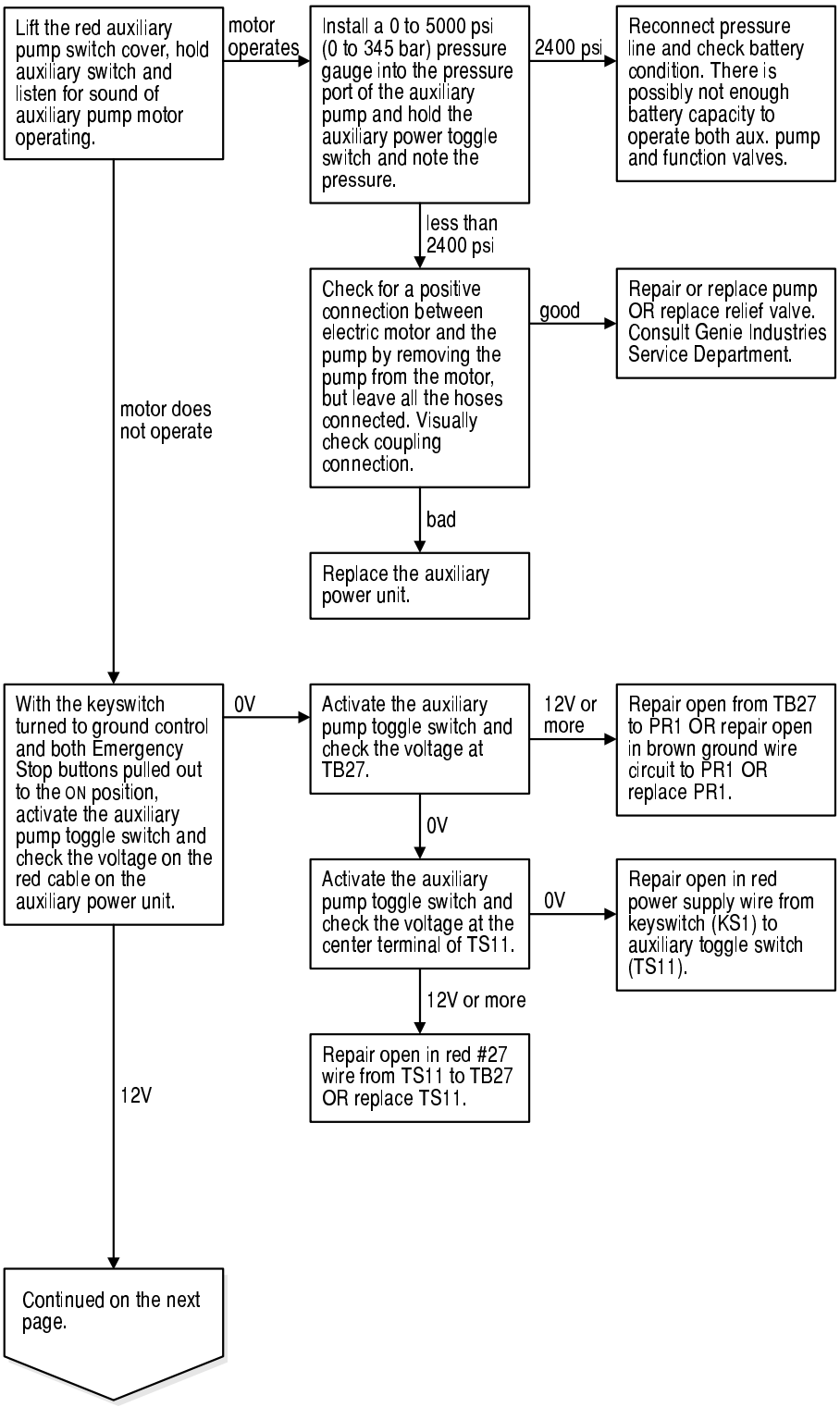
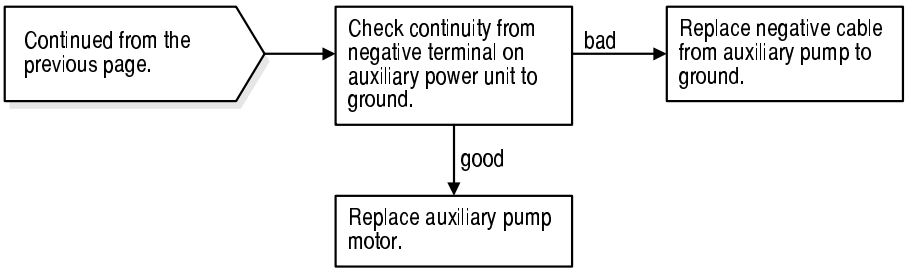
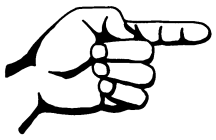


CHART 40


Continued from the previous page.
Check continuity from negative terminal on auxiliary power unit to ground.
bad
Replace negative cable from auxiliary pump to ground.
good
Replace auxiliary pump motor.



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Schematics

Observe and Obey:

- ☑ Troubleshooting and 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 Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions printed in the *Genie Z-60/34 Operator's Manual.*
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section. An illustration legend precedes each group of drawings.

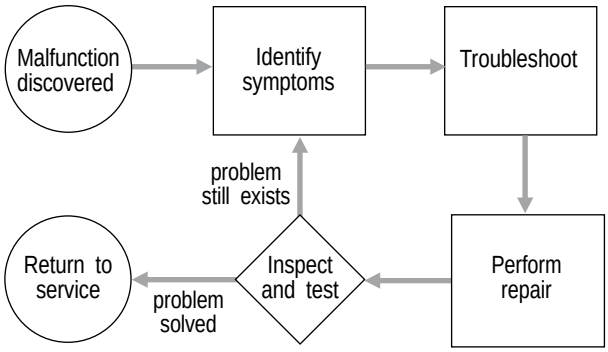
Electrical Schematics

⚠WARNING Electrocution hazard. Contact with electrically charged circuits may result in death or serious injury. Remove all rings, watches and other jewelry.

Hydraulic Schematics

⚠WARNING 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.

General Repair Process



Electrical Components

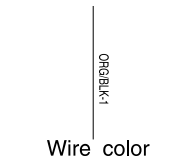
Item	Description	Genie Part Part Number	Manufacturer	Manufacturer Part Number	Qty
BAT	Battery, 100 CCA, 12V DC	30143	Trojan	C31XH-2	1
BP1	Joystick controller, Dual axis	53073	OEM Controls	EJS5DM11179	1
BP2	Joystick controller, Single axis	24495	OEM Controls	EMS4M6883	1
CB1, CB2	Circuit breaker	24018	ETA	45-700-IG1-P10	2
CR1, 2, 3, 5, 8, CR9, 10, 11, 15 (Gas/LPG)	Relay, SPDT, 12V DC	34052	Potter-Brumfield	VF4-15F11-CO5	9
CR1through 5, CR8, 9, 10, 11 (Diesel)	Relay, SPDT, 12V DC	34052	Potter-Brumfield	VF4-15F11-CO5	9
CR13 and 14	Relay, SPDT, 12V DC	19274	Potter-Brumfield	VF4-15F11-CO5	2
Diode	Diode, 6 amp, 200 PIV	45782	Motorola	MOTMR752	28
DP1	Joystick controller-Drive	20424	OEM Controls	MCH1159AD1386	1
FB	Flashing beacon	20189	ECCO Electronic Controls	6400A-GEN	1
FS1	Footswitch	13482	Linemaster Switch Corp.	632-S	1
H1	Alarm, Warble tone	19270	Floyd Bell Inc.	MW-09-616-Q	1
H2	Horn, 12V DC, 130 dB	19145	Sparton Engineered Prod.	7431A-24823-5	1
H3	Alarm, intermittent	18963	Floyd Bell Inc.	XB-09-630-Q	1
H4	Alarm, chime tone	45462	Floyd Bell Inc.	CH-09-525-Q	1
HM	Hourmeter	19506	ENM Corporation	T40A4508	1
KS1	Contact - Keyswitch, N.O.	45081	Telemecanique	ZB2-BE101	2
L1	LED - Red, 12V DC	32335	Arctolectric Corp.	LE177C39007	1
LS1, 2, 3	Contact - Limit switch	19491	Telemecanique	XESP2051	3
Level sensor	Level sensor, 4.5°	44586	Power Comp. of Midwest	LS36	1
P1, P2	Contact, N.C.	29732	Telemecanique	ZB2-BE102	4
P3	Contact, N.O.	45081	Telemecanique	ZB2-BE101	1

This list continues on the next page.

ELECTRICAL COMPONENTS

Item	Description	Genie Part Part Number	Manufacturer	Manufacturer Part Number	Qty
PR1	Relay, 12V DC continuous	27155	Stancor	70-902	1
R1	Resistor, 100Ω 25 watt	27116	Dale	RH25-100R-1%	1
R2	Resistor, 250Ω 25 watt	27117	Dale	RH5-250-1%	1
R3	Resistor, 10Ω 25 watt	27287	Dale	RH25-10R-1%	1
R4	Resistor, 12Ω 25 watt	43576	Dale	RH25-12R-1%	1
TS1, TS11, TS22 (Gas/LPG)	Toggle switch, DPST 2 position momentary	13480	Microswitch Control Inc.	2NT1-8	3
TS1, TS11 (Diesel)	Toggle switch, DPST 2 position momentary	13480	Microswitch Control Inc.	2NT1-8	2
TS2, 6, 10, 12, 14, 16, (Gas/LPG)	Toggle switch, SPDT 3 position momentary	13037	Microswitch Control Inc.	1NT1-7	6
TS2, 6, 10, 12, 14, 16, 21, 22 (Diesel)	Toggle switch, SPDT 3 position momentary	13037	Microswitch Control Inc.	1NT1-7	8
TS9, 20	Toggle switch, DPST 2 position maintained	27378	Microswitch Control Inc.	2NT1-3	2
TS13 (Gas/LPG)	Toggle switch, DPST 2 position maintained	27378	Microswitch Control Inc.	2NT1-3	1
TS4	Toggle switch, DPDT 3 position maintained	13038	Microswitch Control Inc.	2NT1-1	1
TS5, 7, 8, 15, 17 18, 19, 20, 21	Toggle switch, DPDT 3 position momentary	16397	Microswitch Control Inc.	2NT1-7	9

Electrical Symbols Legend



Wire color with cable number



Terminal



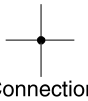
Quick disconnect terminal



T-circuits connect at terminal



T-circuits connect

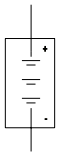


Connection no terminal

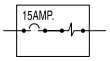


Circuits crossing no connection

Diode



Battery



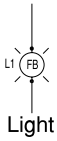
Circuit breaker



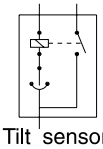
Solenoid or relay coil



Horn



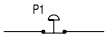
Light



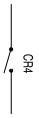
Tilt sensor



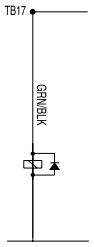
Limit switch normally closed held open



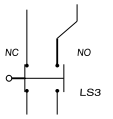
Emergency Stop button normally closed



Relay contact normally open



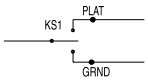
Ground supression circuit



Limit switch



Limit switch normally open held closed



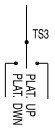
Key switch



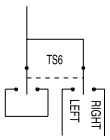
Horn button normally open



Relay panel contactor



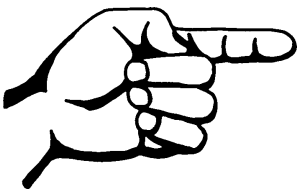
Toggle switch SPDT



Toggle switch DPDT

Abbreviation Legend

LABEL	DESCRIPTION
BAT	Battery
BP	Proportional controller
CB	Circuit breaker
CR	Control relay
DP	Drive proportional controller
FB	Flashing beacon
FS	Foot switch
H	Horn or Alarm
HM	Hour meter
KS	Keyswitch
L	LED
LS	Limit switch
P	Power switch
PR	Power relay
R	Resistor
TB	Terminal base location
TP	Terminal platform location
TS	Toggle switch



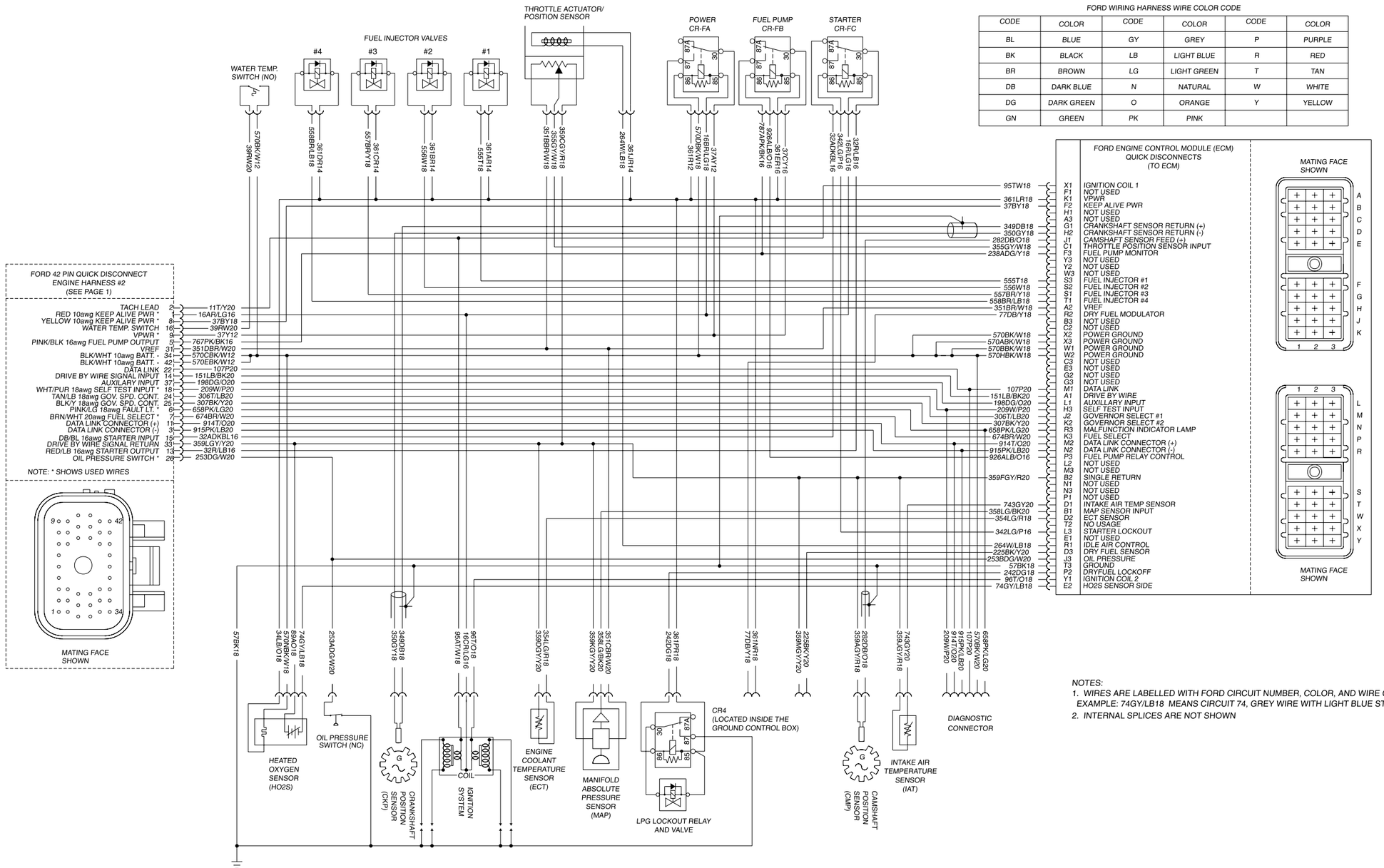
Ford LRG-425 EFI
Engine Wire Harness

N M L K J I H G F E D C B A

1 2 3 4 5 6 7 8

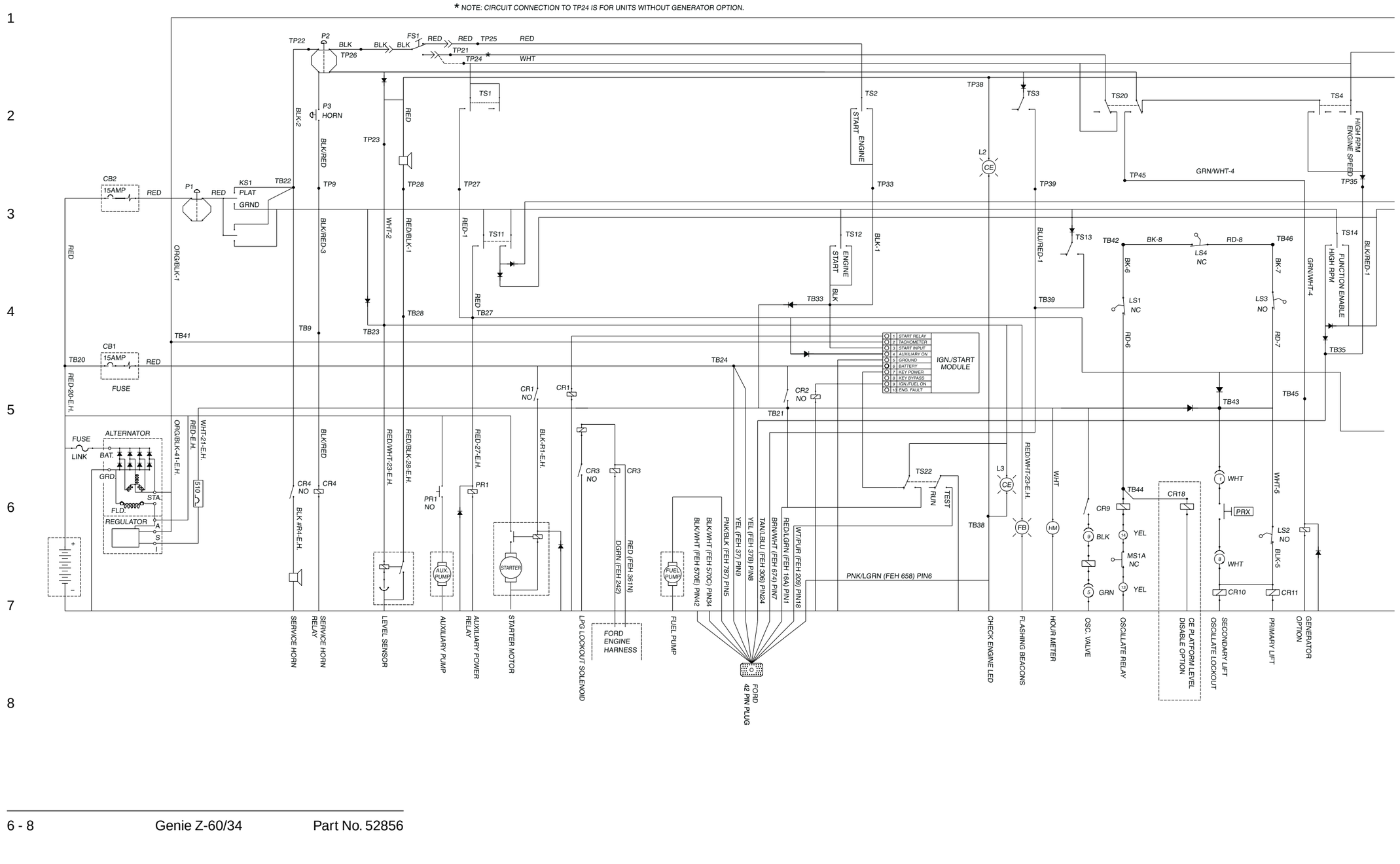
FORD WIRING HARNESS WIRE COLOR CODE

CODE	COLOR	CODE	COLOR	CODE	COLOR
BL	BLUE	GY	GREY	P	PURPLE
BK	BLACK	LB	LIGHT BLUE	R	RED
BR	BROWN	LG	LIGHT GREEN	T	TAN
DB	DARK BLUE	N	NATURAL	W	WHITE
DG	DARK GREEN	O	ORANGE	Y	YELLOW
GN	GREEN	PK	PINK		

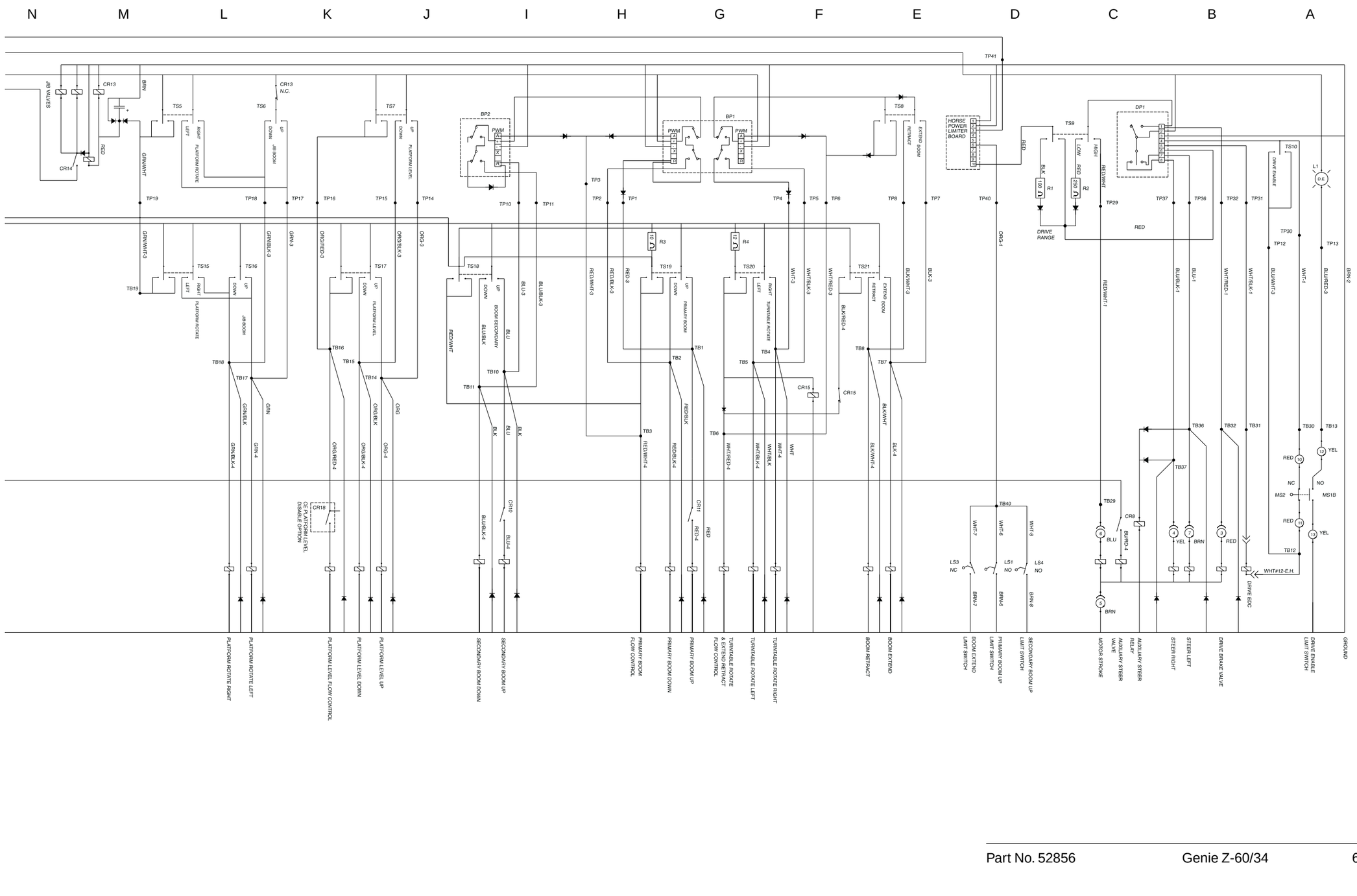


NOTES:
1. WIRES ARE LABELLED WITH FORD CIRCUIT NUMBER, COLOR, AND WIRE GUAGE
   EXAMPLE: 74GY/LB18 MEANS CIRCUIT 74, GREY WIRE WITH LIGHT BLUE STRIPE, 18 GUAGE WIRE
2. INTERNAL SPLICES ARE NOT SHOWN

Electrical Schematic- Gasoline/LPG Models

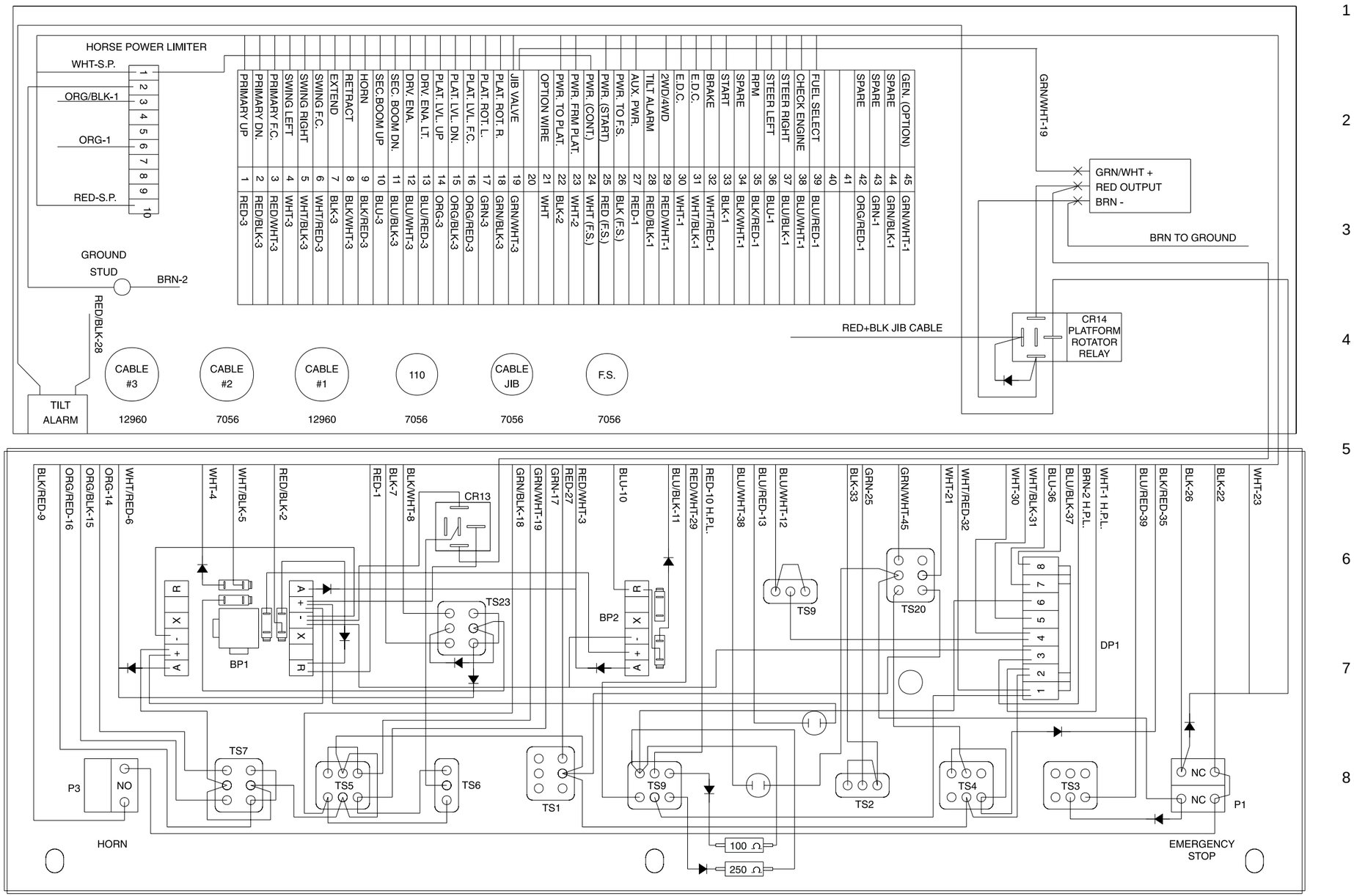


Electrical Schematic- Gasoline/LPG Models

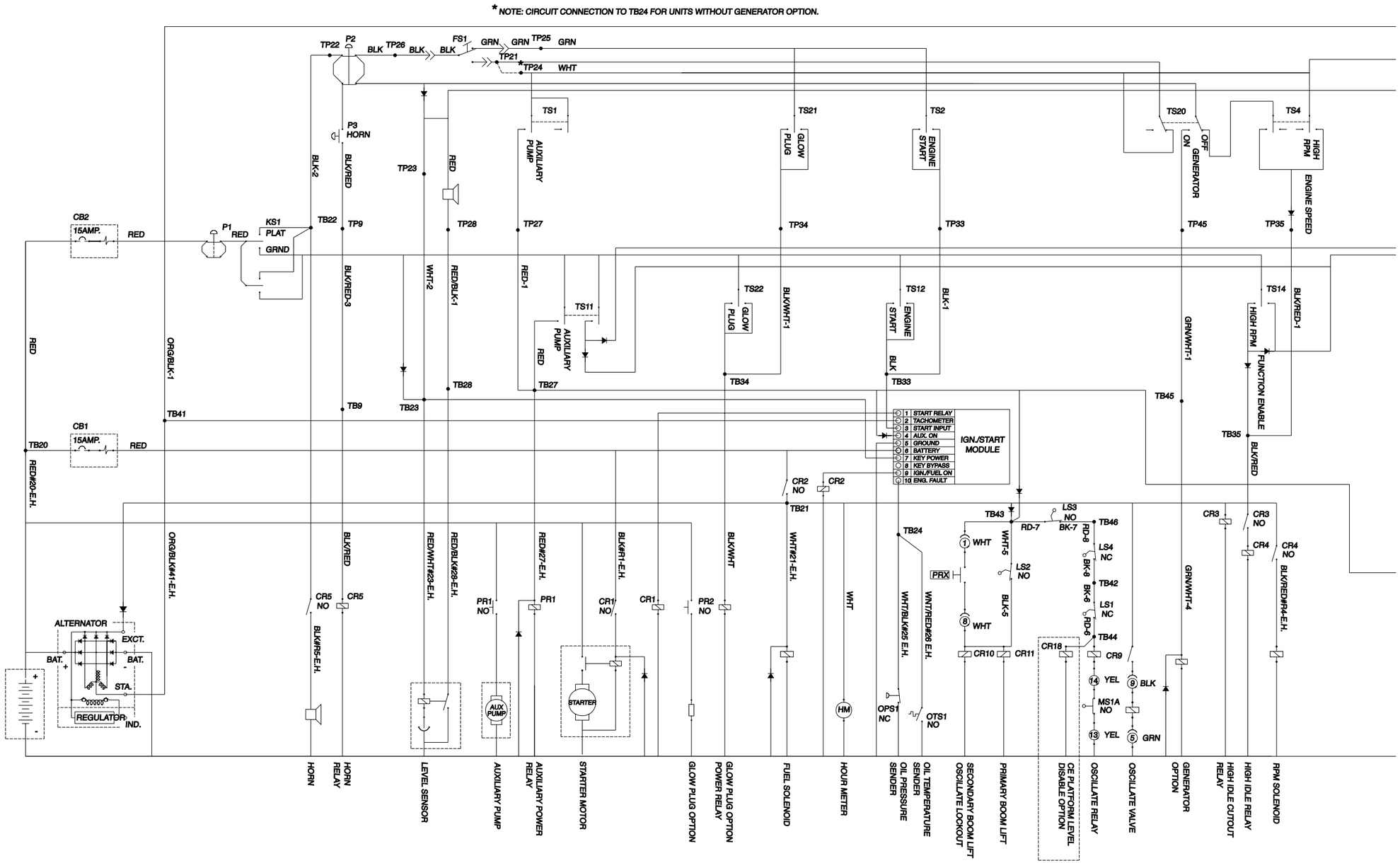


Ground Control Box Wiring Diagram- Gasoline/LPG Models

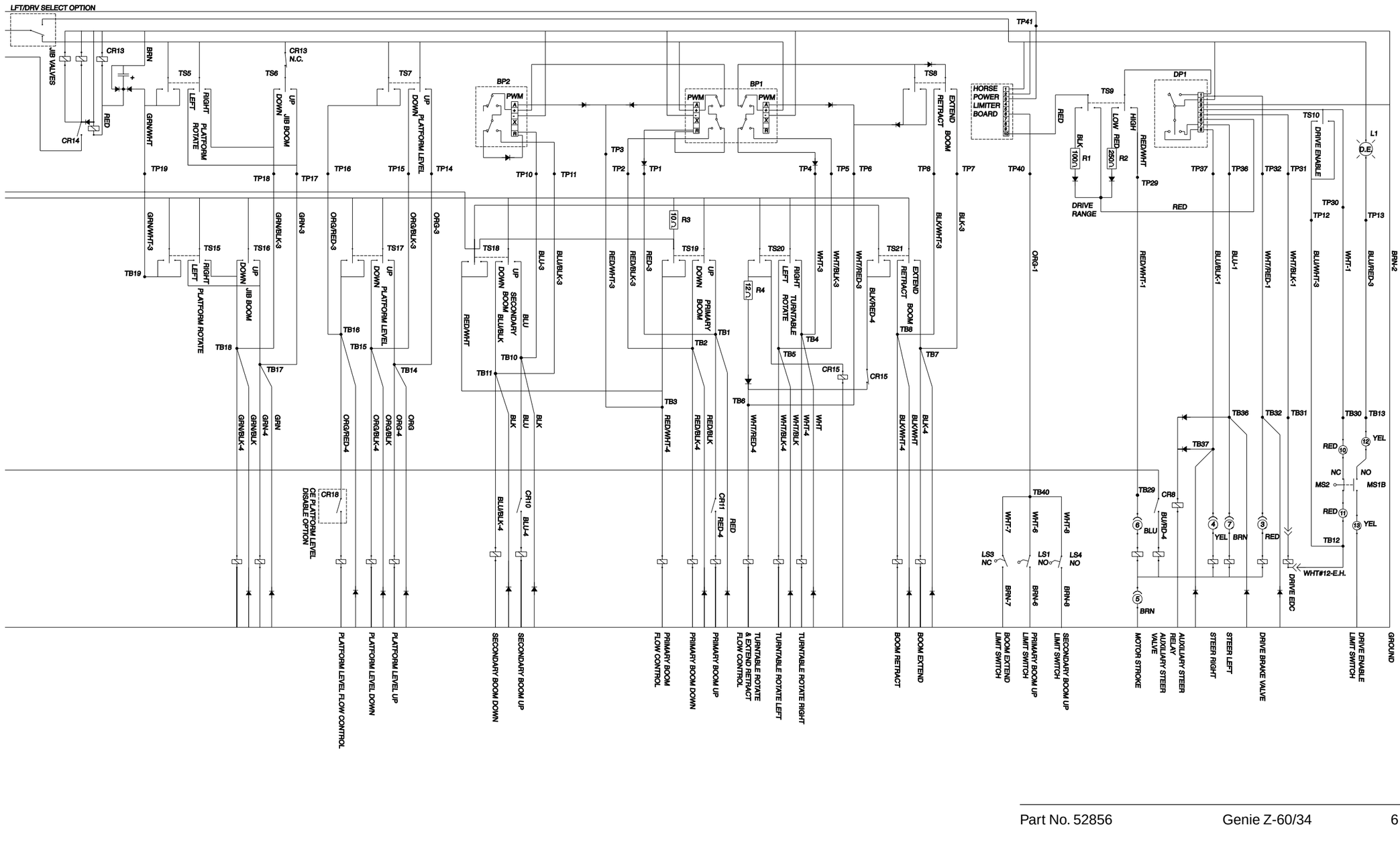
Platform Control Box Wiring Diagram- Gasoline/LPG Models



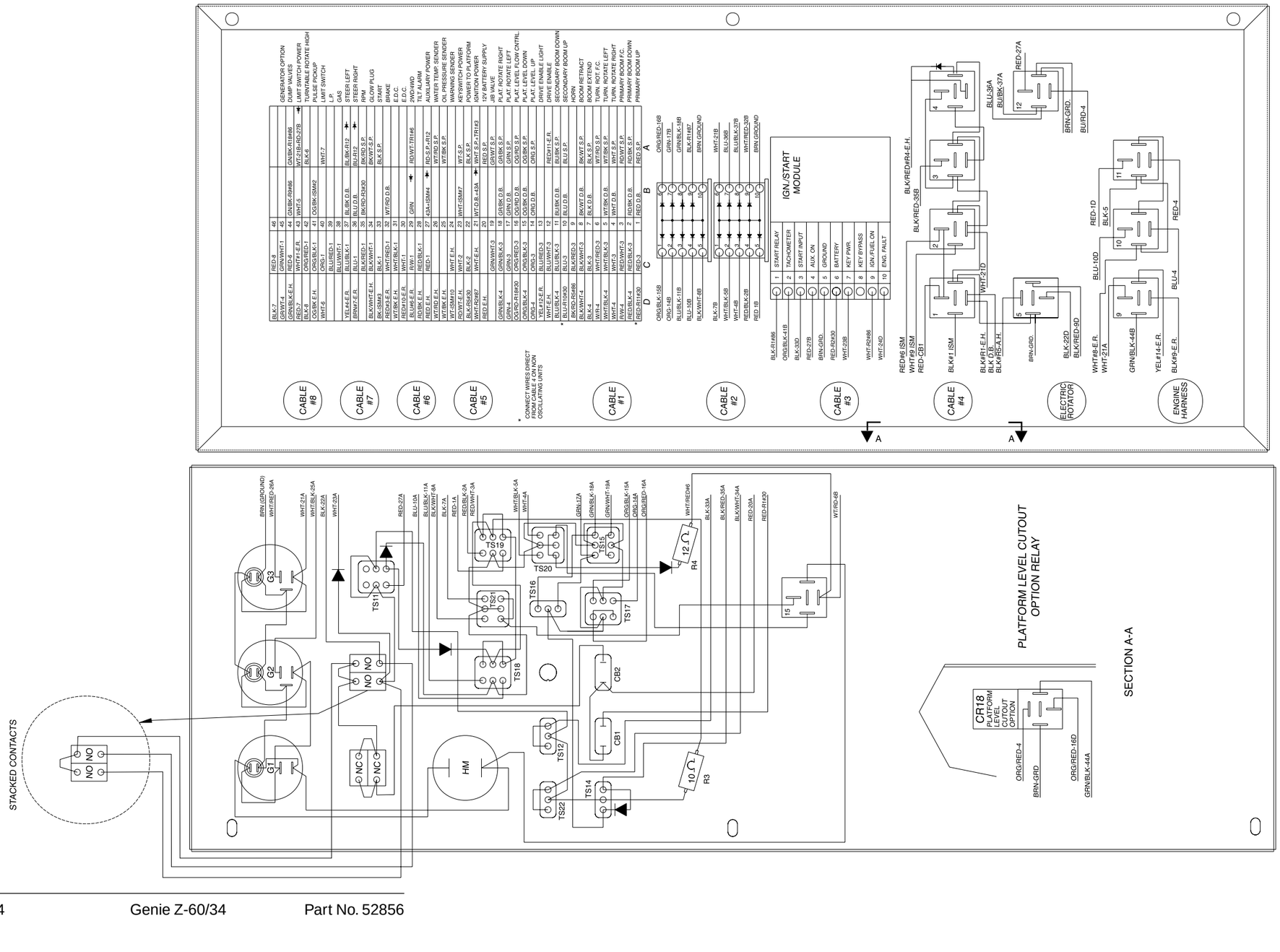
Electrical Schematic- Diesel Models



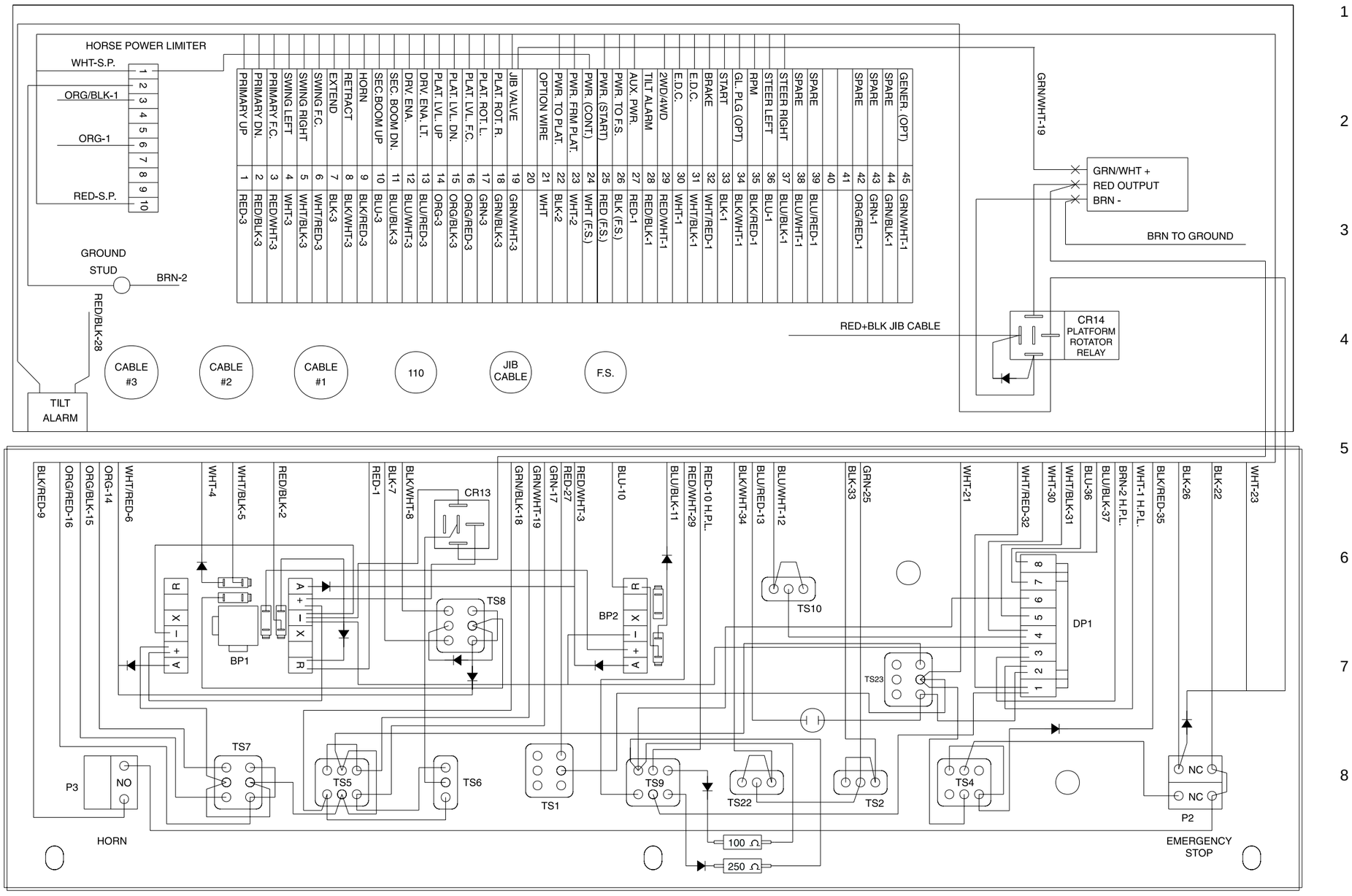
Electrical Schematic- Diesel Models

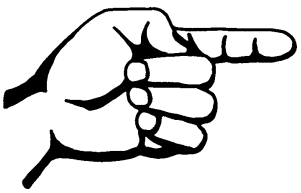


Ground Control Box Wiring Diagram- Diesel Models



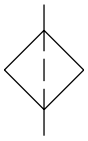
Platform Control Box Wiring Diagram- Diesel Models

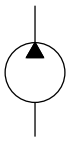


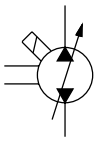


Hydraulic Symbols Legend

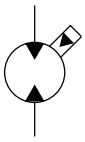

Pressure gauge


Filter


Fixed displacement pump

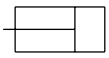

Bi-directional, variable displacement pump


Bi-directional motor


2-speed, bi-directional motor



Pump prime mover (engine or motor)


Cylinder

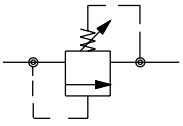

Accumulator

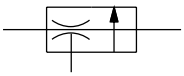


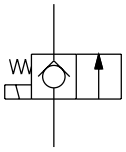
Orifice with size

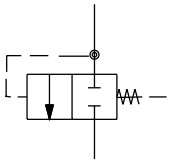

Variable orifice or shut-off valve

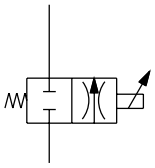

Check valve

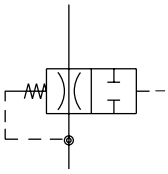

Relief valve

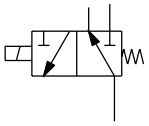

Priority flow divider

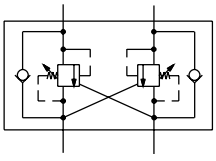

Solenoid operated dump valve

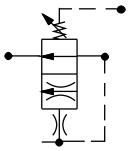

Differential sensing valve

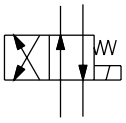

Solenoid operated proportional valve

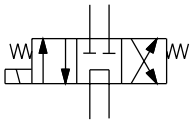

Flow regulator valve

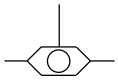

Solenoid operated 2 pos., 3 way, directional valve

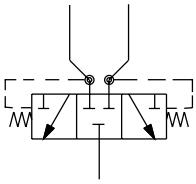

Counterbalance valve

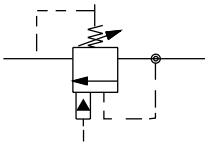

Pilot operated flow control valve

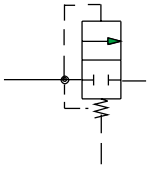

Solenoid operated 2 pos., 4 way, directional valve

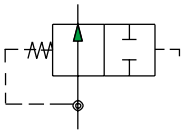

Solenoid operated 3 pos., 4 way, directional valve (DO1)


2 pos., 3 way, shuttle valve

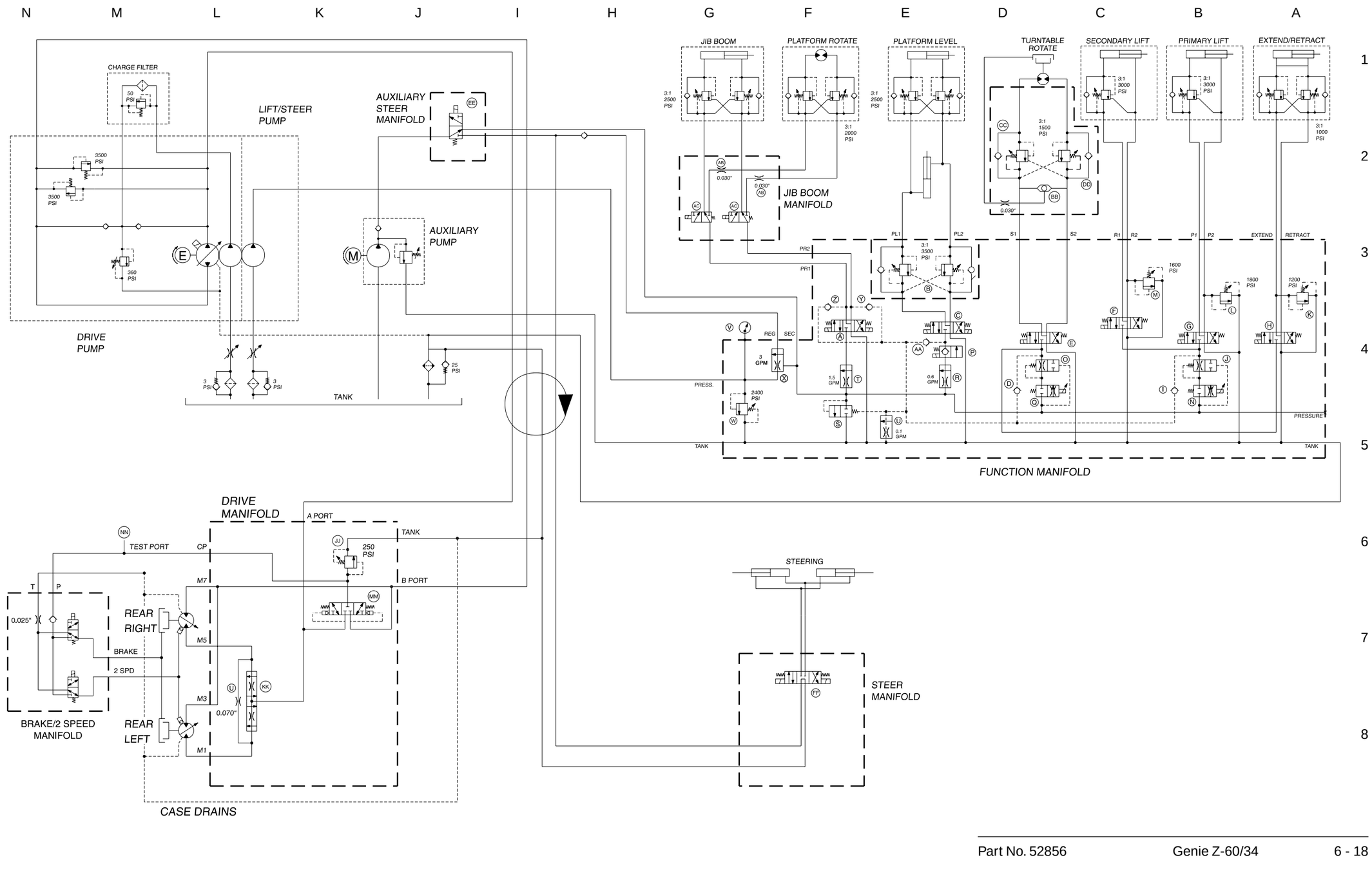

3 pos., 4 way, directional valve


Sequencing valve

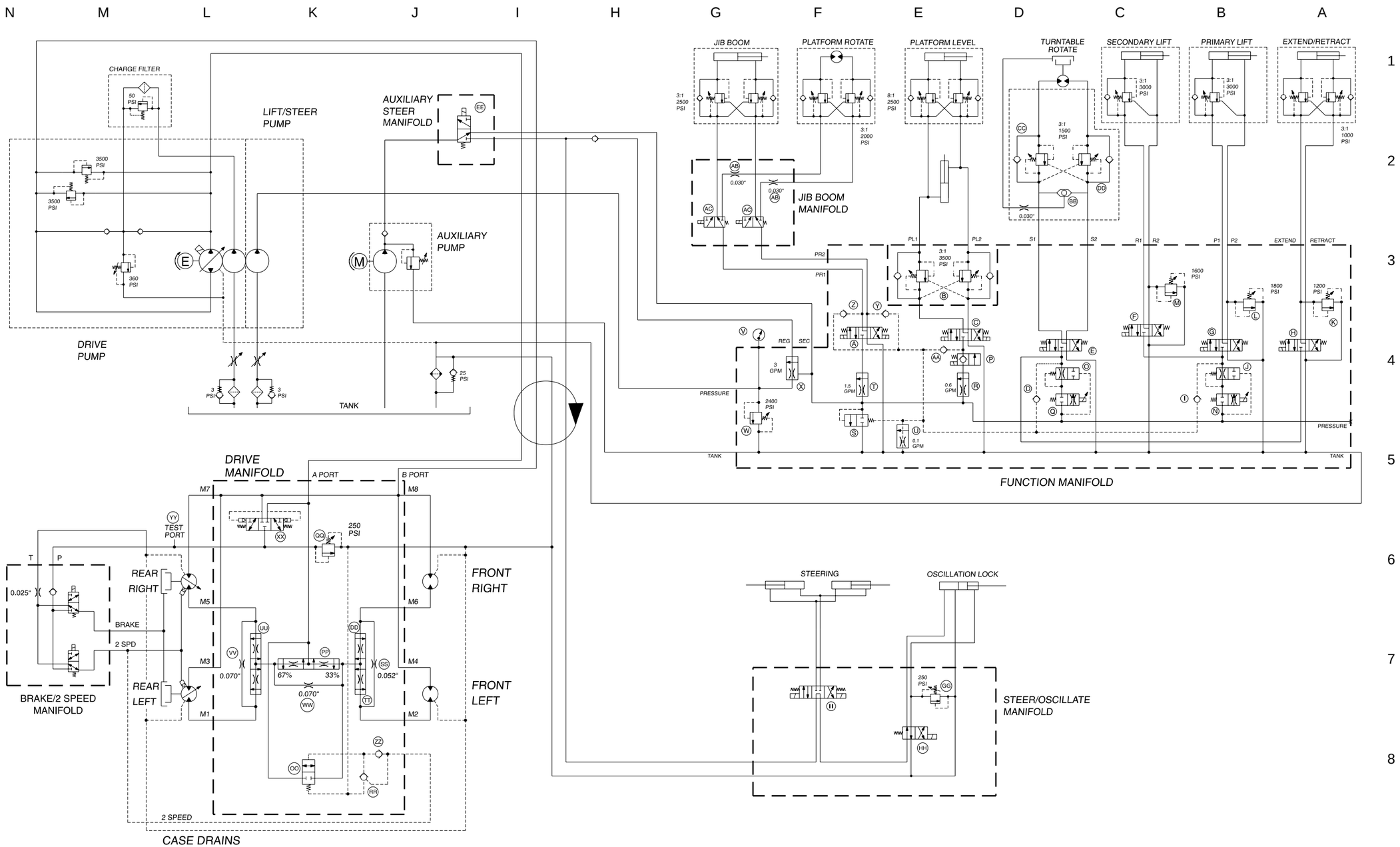

Unloader valve


Pressure compensating valve

2WD Hydraulic Schematic



4WD Hydraulic Schematic



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 Z-60/34 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.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
  - · Machine parked on a flat, level surface
  - · Boom in stowed position
  - · Turntable rotated with the boom between the non-steering wheels
  - · Turntable secured with the turntable rotation lock
  - · Key switch in the OFF position with the key removed
  - · Wheels chocked

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.

Symbols Legend

Safety alert symbol–used to alert personnel to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER Red–used to indicate the presence of an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠WARNING Orange–used to indicate the presence of a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION Yellow with safety alert symbol–used to indicate the presence of a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

CAUTION Yellow without safety alert symbol–used to indicate the presence of a potentially hazardous situation which, if not avoided, may result in property damage.

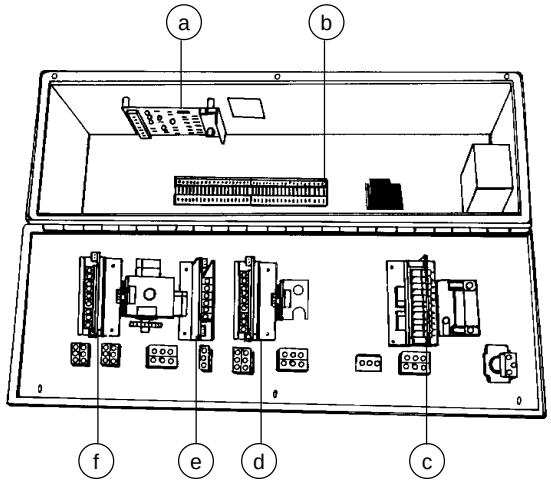
NOTICE Green–used to indicate operation or maintenance information.

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

Platform Controls

1-1 Joystick Controllers

Maintaining joystick controllers at the proper settings is essential to safe machine operation. Every joystick controller should operate smoothly and provide proportional speed control over its entire range of motion.



Platform control box
- a horsepower limiter board
- b terminal strip
- c drive proportional controller
- d secondary boom proportional controller
- e primary boom proportional controller
- f turntable rotate proportional controller

Primary Boom Up/Down Controller Adjustments

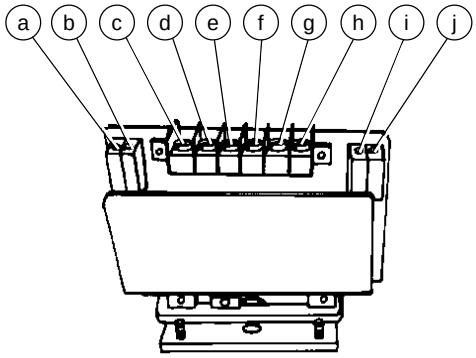
NOTICE Do not adjust the joystick controllers unless the static battery voltage is above 12V DC and the alternator is operating properly with 13.6 to 14.5V DC output.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Check the battery condition with a volt meter. The reading should be 12V DC or more to accurately adjust the controller.

2 Turn the key switch to platform control and pull out the Emergency Stop button to the ON position at both the ground and platform controls. Do not start the engine.

3 Open the platform control box lid and locate the primary boom up/down controller.



- a ramp rate adjustable trimpot
- b lo range adjustable trimpot
- c terminal "R" activates hi range
- d (not used)
- e terminal "X" (not used)
- f terminal "-" ground
- g terminal "+" positive
- h terminal "A" proportional output
- i threshold adjustable trimpot
- j hi range adjustable trimpot

4 Set the preliminary ramp rate: Turn the trimpot adjustment screw counterclockwise 15 turns or until you hear a repeated click.

5 Connect the red (+) lead from a volt meter to the “A” terminal on the controller printed circuit board. Connect the black (-) lead to ground.

6 Set the threshold: Press down the foot switch, then slowly move the control handle off center until the moment a voltage reading appears. Adjust the voltage to 4.4V DC. Turn the threshold trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

7 Set the hi range: Press down the foot switch, then move the control handle all the way to the UP position. Adjust the voltage to 6.5V DC. Turn the hi range trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

8 Set the lo range: Press down the foot switch, then move the control handle all the way to the DOWN position. Adjust the voltage to 6V DC. Turn the lo range trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

9 Start the engine and move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol). Lower the primary boom to the stowed position.

NOTICE Engine should be at normal operating temperature.

10 Start a timer and record how long it takes for the primary boom to fully raise. Adjust the hi range trimpot to achieve a 35 to 45 second cycle time. Turn the hi range trimpot adjustment screw clockwise to increase the speed or counterclockwise to decrease the speed.

11 Start a timer and record how long it takes for the boom to fully lower. Adjust the lo range trimpot to achieve an 50 to 60 second cycle time. Turn the lo range trimpot adjustment screw clockwise to increase the speed or counterclockwise to decrease the speed.

NOTICE If the function cycle time is not achievable, check the relief valve pressure. See 11-2, *Valve Adjustments - Function Manifold.*

12 Turn the engine OFF.

13 Pull out the Emergency Stop button to the ON position.

14 Press down the foot switch and then move the control handle all the way to the UP position. Record the maximum voltage reading.

15 Start the engine.

16 Start a timer and simultaneously move the control handle all the way to the UP position. Note how long it takes to reach the maximum voltage recorded in step 14. This is the ramp rate.

17 Set the ramp rate: turn the trimpot to obtain a 2 to 3 second ramp speed. Turn the trimpot clockwise to increase the time or counterclockwise to decrease the time.

Boom up/down specifications	
Threshold	4.4V DC
Primary boom up - hi range	6.5V DC
Cycle time	35 to 45 seconds
Primary boom down - lo range	6V DC
Cycle time	50 to 60 seconds
Ramp rate	2 to 3 seconds

Secondary Boom Up/Down Controller Adjustments

NOTICE Do not adjust the joystick controllers unless the static battery voltage is above 12V DC and the alternator is operating properly with 13.6 to 14.5V DC output.

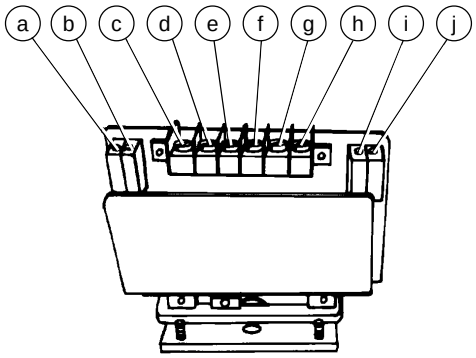
⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Check the battery condition with a volt meter. The reading should be 12V DC or more to accurately adjust the controller.

2 Turn the key switch to platform control and pull out the Emergency Stop button to the ON position at both the ground and platform controls. Do not start the engine.

PLATFORM CONTROLS

3 Open the platform control box lid and locate the secondary boom up/down controller.



a ramp rate adjustable trimpot
b lo range adjustable trimpot
c terminal "R" activates hi range
d (not used)
e terminal "X" (not used)
f terminal "-" ground
g terminal "+" positive
h terminal "A" proportional output
i threshold adjustable trimpot
j hi range adjustable trimpot

4 Set the preliminary ramp rate: Turn the trimpot adjustment screw counterclockwise 15 turns or until you hear a repeated click.

5 Connect the red (+) lead from a volt meter to the “A” terminal on the controller printed circuit board. Connect the black (-) lead to ground.

6 Set the threshold: Press down the foot switch, then slowly move the control handle off center until the moment a voltage reading appears. Adjust the voltage to 4.3V DC. Turn the threshold trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

7 Set the hi range: Press down the foot switch, then move the control handle all the way to the UP position. Adjust the voltage to 8.5V DC. Turn the hi range trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

8 Set the lo range: Press down the foot switch, then move the control handle all the way to the DOWN position. Adjust the voltageto 8.5V DC. Turn the lo range trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

9 Start the engine and move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol). Lower the secondarty boom to the stowed position.

NOTICE Engine should be at normal operating temperature.

10 Start a timer and record how long it takes for the secondary boom to fully raise. Adjust the max-out trimpot to achieve a 40 to 50 second cycle time. Turn the hi range trimpot adjustment screw clockwise to increase the speed or counterclockwise to decrease the speed.

11 Start a timer and record how long it takes for the secondary boom to fully lower. Adjust the dual range trimpot to achieve an 30 to 40 second cycle time. Turn the hi range trimpot adjustment screw clockwise to increase the speed or counterclockwise to decrease the speed.

NOTICE If the function cycle time is not achievable, check the relief valve pressure. See 11-2, *Valve Adjustments - Function Manifold.*

12 Turn the engine off.

13 Pull out the Emergency Stop button to the ON position.

14 Press down the foot switch and then move the control handle all the way to the UP position. Record the maximum voltage reading.

15 Start the engine.

16 Start a timer and simultaneously move the control handle all the way to the UP position. Note how long it takes to reach the maximum voltage recorded in step 14. This is the ramp rate.

17 Set the ramp rate: turn the trimpot to obtain a 2 to 3 second ramp speed. Turn the trimpot clockwise to increase the time or counterclockwise to decrease the time.

Secondary boom up/down specifications	
Threshold	4.3V DC
Secondary boom up - hi range	8.5V DC
Cycle time	40 to 50 seconds
Secondary boom down - lo range	8.5V DC
Cycle time	30 to 40 seconds
Ramp rate	2 to 3 seconds

Turntable Rotation Controller Adjustments

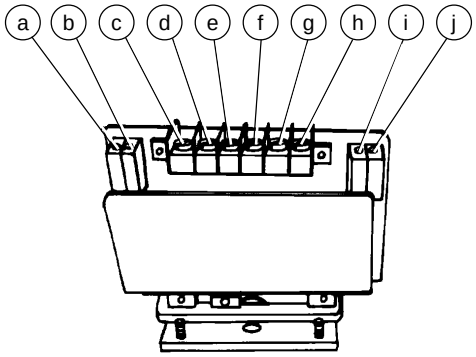
NOTICE Do not adjust the joystick controllers unless the static battery voltage is above 12V DC and the alternator is operating properly with 13.6 to 14.5V DC output.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

1 Check the battery condition with a volt meter. The reading should be 12V DC or more to accurately adjust the controller.

2 Turn the key switch to platform control and pull out the Emergency Stop button to the ON position at both the ground and platform controls. Do not start the engine.

3 Open the platform control box lid and locate the turntable rotation controller. Refer to the platform control box illustration, page 7-2.



a ramp rate adjustable trimpot
b lo range adjustable trimpot
c terminal "R" (not used)
d (not used)
e terminal "X" (not used)
f terminal "-" ground
g terminal "+" positive
h terminal "A" proportional output
i threshold adjustable trimpot
j hi range adjustable trimpot

4 Set the preliminary ramp rate: Turn the trimpot adjustment screw counterclockwise 15 turns or until you hear a repeated click.

5 Connect the red (+) lead from a volt meter to the “A” terminal on the controller printed circuit board. Connect the black (-) lead to ground.

6 Set the threshold: Press down the foot switch, then slowly move the control handle off center until the moment a voltage reading appears. Adjust the voltage to 3V DC. Turn the threshold trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

7 Set the hi range: Press down the foot switch, fully retract the boom, then move the control handle all the way to the left or right. Adjust the voltage to 5.8V DC. Turn the hi range trimpot adjustment screw clockwise to increase the voltage or counterclockwise to decrease the voltage.

PLATFORM CONTROLS

8 Start the engine and move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol). Rotate the turntable to the FULL RIGHT position.

NOTICE Engine should be at normal operating temperature.

9 Start a timer and record how long it takes the turntable to rotate to the FULL LEFT position. Adjust the max-out trimpot to achieve a 130 to 140 second cycle time. Turn the hi range trimpot adjustment screw clockwise to increase the speed or counterclockwise to decrease the speed.

Turntable rotation specifications

Threshold	3V DC
Turntable rotation - hi range	5.8V DC
Cycle time	130 to 140 seconds
Ramp rate	3 seconds

1-2 Horsepower Limiter Board

The horsepower limiter board is responsible for governing drive pump output. It senses engine rpm from the alternator. The horsepower limiter board senses drops in rpm normally due to increased drive resistance (rough terrain or incline), and decreases voltage to the drive controller which in turn decreases voltage to the drive pump, thereby reducing pump output to maintain optimum engine rpm and horsepower. Three adjustments are required for optimum performance.

How to Adjust the Horsepower Limiter Board

NOTICE The engine rpm must be correct before performing this procedure. See Maintenance Procedure B-11, *Check and Adjust the Engine RPM.*

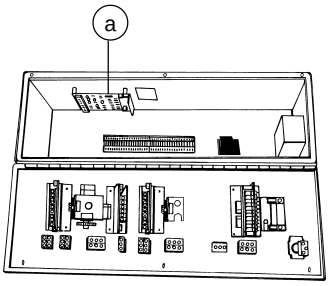
NOTICE Do not adjust the horsepower limiter board unless the static battery voltage is above 12V DC and the alternator is operating properly with 12.5 to 14.5V DC output.

NOTICE **Gasoline/LPG models:** Perform this procedure in gasoline mode.

1 Remove the fasteners from the platform control box lid.

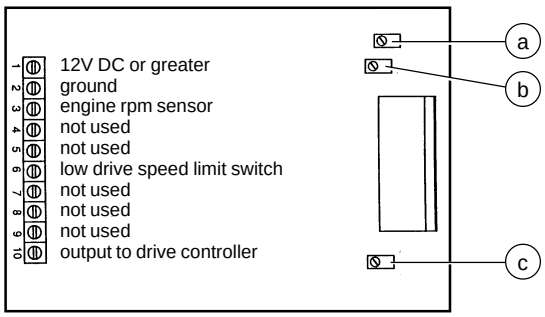
2 Open the control box lid and locate the horsepower limiter board.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.



Platform control box
a horsepower limiter board

3 Connect the black (-) lead from a DC volt meter to the no. 2 terminal, and the red (+) lead to the no. 10 terminal.



Horsepower limiter board

a "A" potentiometer maximum voltage output to the controller in the stowed position

b "B" potentiometer maximum voltage output to the drive controller in the boom raised position

c "C" potentiometer reaction rate or how fast the voltage output reacts to the change in engine rpm

4 Start the engine from the platform controls.

5 Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).

6 Press down the foot switch and adjust the "A" potentiometer counterclockwise to increase voltage or clockwise to decrease voltage.

"A" potentiometer specifications - all models	
Voltage setting	10.5 to 11.5V DC

7 Move the engine idle control switch to low idle (turtle symbol).

8 Press down the foot switch and then adjust the "C" potentiometer to obtain a 0.1V DC to 0.5V DC voltage reading.

9 Move the engine idle control switch to foot switch activated high idle (rabbit and foot switch symbol).

10 Press down the foot switch and re-adjust the "A" potentiometer to the previous voltage setting in step 6.

11 Be sure that the boom is in the stowed position, then drive the machine and observe how the engine rpm reacts to drive control handle movement. If the engine surges or hunts, adjust the "C" potentiometer counterclockwise until surging is minimized.

NOTICE Under an extreme load, an excessive counterclockwise adjustment to the "C" potentiometer will cause the engine to stall. The "C" potentiometer adjustment is a compromise between engine stability (surging) and engine rpm droop.

12 Disconnect the volt meter.

13 Raise the primary boom above horizontal.

14 Drive the machine for 40 feet (12 m) and record the elapsed time. Repeat this step in the opposite drive direction.

PLATFORM CONTROLS

15 Adjust the "B" potentiometer to obtain the correct raised drive speed of 1 foot per second (0.31 m per second). Turn the "B" potentiometer counterclockwise to increase voltage or clockwise to decrease voltage.

16 Close the platform control box lid and install the fasteners.

Drive speed: stowed position, high range	2WD	4WD
Gasoline/LPG models	40 ft/7.8 sec 12.2m/7.8 sec	40 ft/6.1 sec 12.2m/6.1 sec
Deutz Diesel models	40 ft/9.1 sec 12.2m/9.1 sec	40 ft/7 sec 12.2m/7 sec
Booms raised or extended, all models		40 ft/40 sec 12.2m/40 sec

1-3 Foot Switch

How to Test the Foot Switch

NOTICE Perform this procedure with the keyswitch in the OFF position.

1 Turn the keyswitch to the OFF position and separate the wiring quick disconnect plug from the platform toe board.

2 Remove the foot switch guard mounting fasteners from the platform.

3 Remove the foot switch mounting fasteners that attach the foot switch to the footswitch guard.

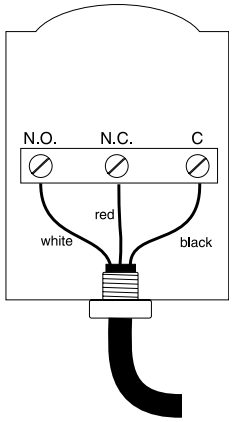
4 Remove the cover plate from the bottom of the foot switch to access the foot switch wire terminals.

5 Do not press down the foot switch. Connect the leads from an ohmmeter or continuity tester to each terminal combination listed and check for continuity.

Test	Desired result
N.C. to C	continuity (zero Ω)
N.C. to N.O.	no continuity (infinite Ω)
C to N.O.	no continuity

3 Press down the foot switch. Connect the leads from an ohmmeter or continuity tester to each terminal combination listed below and check for continuity.

Test	Desired result
N.C. to C	no continuity (infinite Ω)
N.C. to N.O.	no continuity
C to N.O.	continuity (zero Ω)



1-4 Resistors

The resistors are used on 4WD machines to maintain low range drive speed. The resistors are located in the platform control box.

NOTICE Refer to the schematic legends for resistor locations and values.

How to Test the Resistors

1 Turn the key switch to the OFF position.

2 Disconnect either end of one of the wires connected to the resistor to be tested.

3 Connect the leads from an ohmmeter to each end or wiring of the resistor being tested.

4 Compare the ohmmeter reading with the resistance rating printed on the resistor.

1-5 Toggle Switches

Toggle switches used for single function switching are single pole double throw (SPDT) switches. Dual function switching requires a double pole double throw (DPDT) switch.

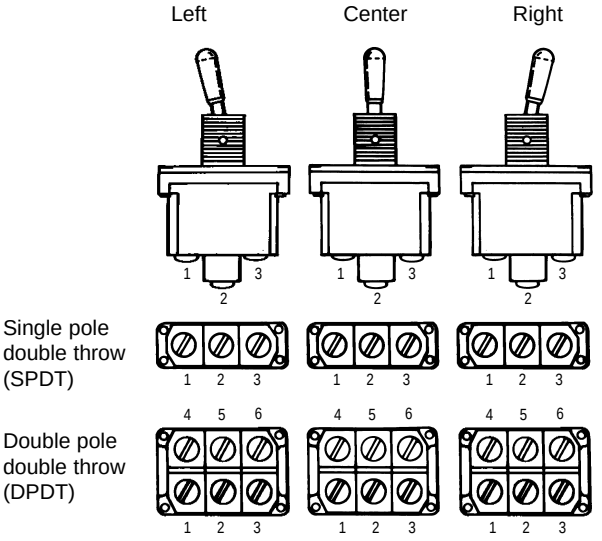
How to Test a Toggle Switch

NOTICE Continuity is the equivalent of 0 to 3 ohms. A simple continuity tester may not accurately test the switch.

This procedure covers fundamental switch testing and does not specifically apply to all varieties of toggle switches.

1 Turn the key switch to the OFF position. Tag and disconnect all wiring from the toggle switch to be tested.

2 Connect the leads of an ohmmeter to the switch terminals in the following combinations listed below to check for continuity.



Test	Desired result
Left position	
terminal 1 to 2, 3, 4, 5 & 6	no continuity (infinite Ω)
terminal 2 to 3	continuity (zero Ω)
terminal 2 to 4, 5 & 6	no continuity
terminal 3 to 4, 5 & 6	no continuity
terminal 4 to 5 & 6	no continuity
terminal 5 to 6	continuity
Center position	There are no terminal combinations that will produce continuity (infinite Ω)
Right position	
terminal 1 to 2	continuity (zero Ω)
terminal 1 to 3, 4, 5 & 6	no continuity (infinite Ω)
terminal 2 to 3, 4, 5 & 6	no continuity
terminal 3 to 4, 5 & 6	no continuity
terminal 4 to 5	continuity
terminal 4 to 6	no continuity
terminal 5 to 6	no continuity

Platform Components

2-1 Platform

How to Remove the Platform

1 Separate the footswitch quick disconnect plug from the platform toe board.

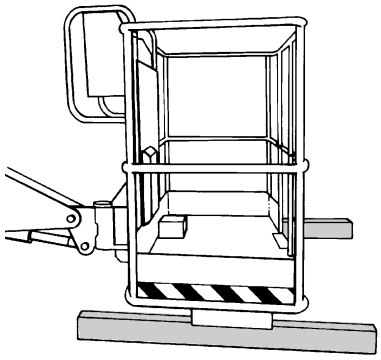
2 Open the platform control box.

3 Remove the platform control box mounting fasteners. Then lower the control box and set it aside.

NOTICE If your machine is equipped with an airline to platform option, the airline must be disconnected from the platform before removal.

5 Raise the jib boom slightly and place blocks under the platform mounting weldment. Then lower the jib boom until the platform is resting on the blocks just enough to support the platform.

NOTICE Do not rest the entire weight of the boom on the blocks.



6 Remove the platform mounting fasteners and remove the platform from the machine.

⚠WARNING Crushing hazard. The platform may become unstable and fall if it is not properly supported.

2-2 Platform Leveling Slave Cylinder

The slave cylinder and the rotator pivot are the two primary supports for the platform. The slave cylinder keeps the platform level through the entire range of boom motion. It operates in a closed-circuit hydraulic loop with the master cylinder. The slave cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

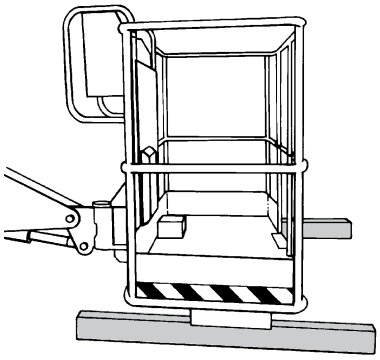
How to Remove the Slave Cylinder

NOTICE Before cylinder removal is considered to correct a malfunction, bleed the slave cylinder to be sure there is no air in the closed loop hydraulic circuit.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Adjust the platform to a level position.

2 Raise the jib boom slightly and place blocks under the platform mounting weldment. Then lower the jib boom until the platform is resting on the blocks just enough to support the platform.



3 Support the slave cylinder with an appropriate lifting device. Protect the cylinder rod from damage.

4 Remove the pin retaining fasteners from both the barrel-end and rod-end pivot pins. Do not remove the pins.

5 Use a soft metal drift to remove the barrel-end pivot pin.

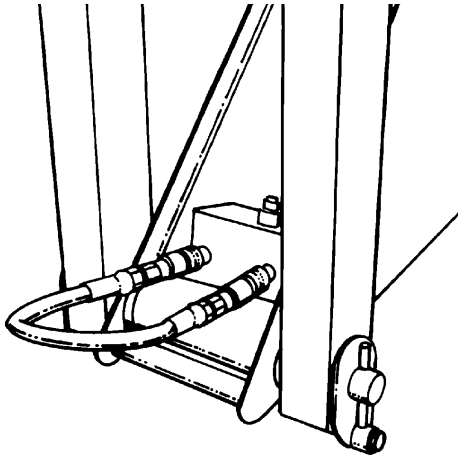
6 Tag and disconnect the hydraulic hoses from the slave cylinder and connect them together with a connector. Cap the fittings on the slave cylinder.

⚠WARNING 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.

7 Use a soft metal drift to remove the rod-end pivot pin. Then remove the slave cylinder from the machine.

How to Bleed the Slave Cylinder

1 Connect a hydraulic hose between the two test ports at the barrel end of the slave cylinder.



2 Start the engine from the ground controls and raise the jib boom to a horizontal position.

3 Hold the function enable toggle switch to either side and move the platform level switch up and down through two platform leveling cycles to remove any air that might be in the system.

4 Turn the engine OFF.

5 Remove the hydraulic hose from the test ports. Move the platform level switch up and down through a platform leveling cycle and inspect the test ports for leaks.

2-3 Platform Rotator

The platform rotator is a hydraulically activated helical gear assembly used to rotate the platform 90 degrees.

How to Remove the Platform Rotator

CAUTION Component damage hazard. Mark the platform mounting weldment and the rotator flange before removing the platform mounting weldment. The platform mounting weldment must be replaced in the exact same position on the rotator flange as it was before removal. If a new platform rotator is installed or the platform rotator is disassembled, proper alignment can be achieved by rotating the rotator all the way to the left and then installing the platform mounting weldment all the way in the left position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

PLATFORM COMPONENTS

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

2 Tag, disconnect and plug the hydraulic hoses from the "V1" and "V2" ports on the platform rotator counterbalance valve manifold. Cap the fitting on the manifold.

⚠WARNING 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 Support the platform mounting weldment with an appropriate lifting device, but do not apply any lifting pressure.

4 Remove the six mounting bolts from the platform mounting weldment, then remove the center bolt and slide the platform mounting weldment off of the platform rotator.

⚠WARNING Crushing hazard. The platform mounting weldment may become unbalanced and fall if it is not properly supported.

5 Support the platform rotator. Do not apply any lifting pressure.

6 Support the platform leveling slave cylinder. Protect the cylinder rod from damage.

7 Remove the pin retaining fasteners from the slave cylinder rod-end pivot pin and the slave cylinder barrel-end pivot pin. Do not remove the pins.

8 Use a soft metal drift to remove the barrel-end pivot pin.

9 Tag, disconnect and plug the hydraulic hoses from the slave cylinder. Cap the fittings on the cylinder.

⚠WARNING 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 Pull the hoses up through the platform rotator.

CAUTION Component damage hazard. Hoses can be damaged if they are kinked or pinched.

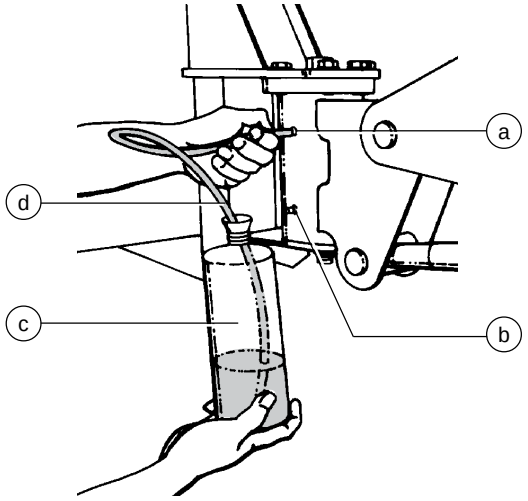
11 Remove the pin retainer from the slave cylinder rod-end pivot pin and the rotator pivot pin.

12 Use a soft metal drift to drive both pins out, then remove the platform rotator from the machine.

How to Bleed the Platform Rotator

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

1 Connect a clear hose to the top bleed valve. Place the other end of the hose in a container to collect any discharge.



a top bleed valve
b bottom bleed valve
c container
d clear hose

2 Open the top bleed valve, but do not remove it.

3 Start the engine from the ground controls.

4 Hold the platform rotate switch to the right for approximately 5 seconds, then release it. Repeat this three times.

⚠WARNING Crushing hazard. Keep clear of the platform during rotation.

5 Hold the platform rotate switch to the left for approximately 5 seconds, then release it.

6 Fully rotate the platform to the left and continue holding the platform rotate switch until air stops coming out of the bleed valve. Immediately release the platform rotate switch and close the top bleed valve.

7 Rotate the platform to the right until it is centered.

8 Connect the clear hose to the bottom bleed valve and open it.

9 Rotate the platform to the right and continue holding the platform rotate switch until air stops coming out of the bleed valve.

⚠WARNING Crushing hazard. Keep clear of the platform during rotation.

10 Close the bottom bleed valve and remove the hose.

11 Turn off the engine and clean up any hydraulic oil that may have spilled.

12 Start the engine from the ground controls. Rotate the platform full right, then full left and inspect the bleed valves for leaks.

Jib Boom Components

3-1
Jib Boom

How to Remove the Jib Boom

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

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

2 Remove the platform mounting weldment, the platform leveling slave cylinder and the platform rotator. See 2-3, *How to Remove the Platform Rotator*.

3 Support the platform pivot weldment with an appropriate lifting device.

4 Remove the pin retaining fasteners from the platform pivot weldment to jib boom pivot pin. Use a soft metal drift to remove the pin, then remove the platform pivot weldment from the jib boom.

⚠CAUTION Crushing hazard. The platform pivot weldment may become unbalanced and fall when it is removed from the machine if it is not properly supported.

5 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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.

6 Remove the pin retaining fasteners from the jib boom lift cylinder barrel-end pivot pin. Do not remove the pin.

7 Tag, disconnect and plug all the hydraulic hoses from the jib boom manifold. Cap the fittings on the manifold.

8 Tag and disconnect the wiring from the jib boom manifold.

⚠WARNING 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.

9 Pull the hydraulic hoses up through the jib boom lift cylinder mounting bracket.

CAUTION Component damage hazard. Hoses can be damaged if they are kinked or pinched.

10 Remove the cable cover from the side of the jib boom.

11 Attach a lifting strap from an overhead crane to the jib boom.

12 Use a soft metal drift to remove the jib boom lift cylinder barrel-end pivot pin.

13 Remove the pin retaining fasteners from the jib boom pivot pin. Use a soft metal drift to remove the pin, then remove the jib boom from the primary boom.

⚠WARNING Crushing hazard. The jib boom may become unbalanced and fall when it is removed from the machine if it is not properly attached to the overhead crane.

14 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

15 Remove both of the jib boom leveling links from the primary boom.

16 Attach a lifting strap from an overhead crane to the lug on the rod end of the jib boom lift cylinder.

17 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin, then remove the jib boom lift cylinder from the primary boom.

⚠WARNING Crushing hazard. The jib boom lift cylinder may become unbalanced and fall when it is removed from the machine if it is not properly attached to the overhead crane.

3-2
Jib Boom Lift Cylinder

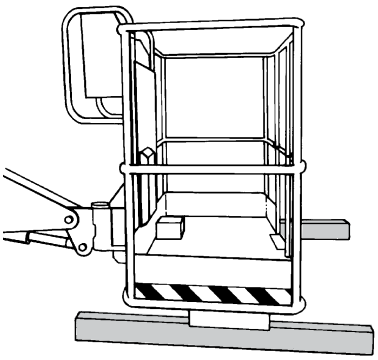
How to Remove the Jib Boom Lift Cylinder

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the jib boom slightly and place blocks under the platform mounting weldment for support. Then lower the jib boom until the platform is resting on the blocks.

NOTICE Do not rest the entire weight of the boom on the blocks.



2 Remove the pin retaining fasteners from the jib boom lift cylinder rod-end pivot pin. Do not remove the pin.

3 Remove the pin retaining fasteners from the platform leveling slave cylinder barrel-end pivot pin. Do not remove the pin.

4 Remove both of the jib boom leveling links from the machine.

5 Tag, disconnect and plug the jib boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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.

6 Attach a lifting strap from an overhead crane to the lug on the rod end of the jib boom lift cylinder.

7 Remove the pin retaining fasteners from the jib boom lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the barrel-end pivot pin.

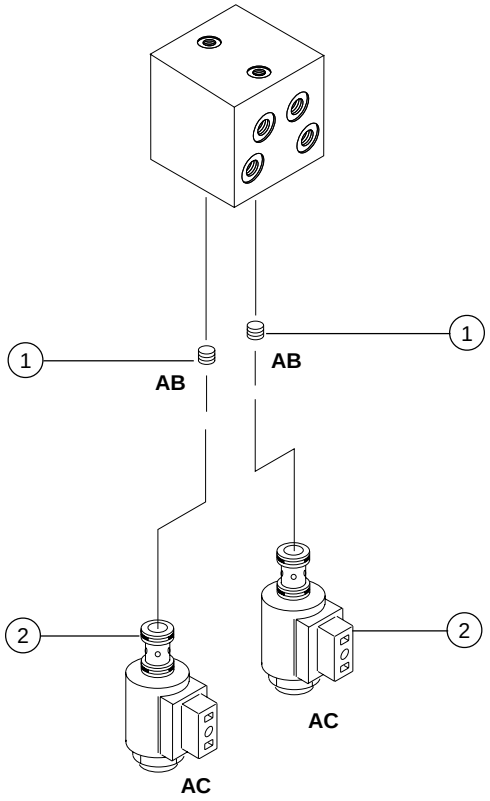
JIB BOOM COMPONENTS

8 Use a soft metal drift to remove the jib boom lift cylinder rod-end pivot pin. Remove the jib boom lift cylinder from the machine.

⚠WARNING Crushing hazard. The jib boom lift cylinder may become unbalanced and fall when it is removed from the machine if it is not properly attached to the overhead crane.

3-3
Jib Boom / Platform Rotate Manifold Components

1	Orifice, 0.030 inch (0.76 mm)	AB	Platform rotate circuit	
2	2 position 3 way valve	AC	Platform rotate select	8-10 ft-lbs / 11-14 Nm



How to Check the Resistance of a Valve Coil

1 Turn the key switch to the OFF position and disconnect the wires from the valve coil to be tested.

2 Connect the leads from an ohmmeter to the valve coil terminals.

Valve coil specification	
2 position 3 way solenoid valve (schematic item AC)	5Ω

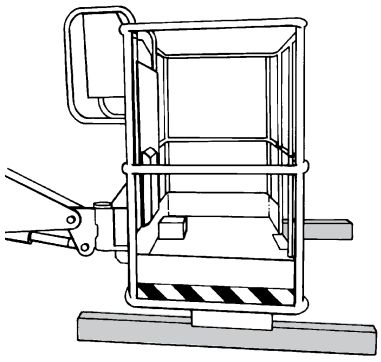
Primary Boom Components

4-1
Cable Track

How to Remove the Cable Track

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the jib boom slightly and place blocks under the platform mounting weldment. Then lower the jib boom until the platform is resting on the blocks just enough to support the platform.



NOTICE Do not rest the entire weight of the boom on the blocks.

2 Separate the foot switch quick disconnect plug from the platform toe board.

3 Open the platform control box.

4 Remove the platform control box mounting fasteners. Then lower the control box and set it aside.

NOTICE If your machine is equipped with an airline to platform option, the airline must be disconnected from the platform before removal.

5 Remove the platform control box mounting fasteners.

6 Tag, disconnect and plug the hydraulic hoses from the platform leveling slave cylinder. Cap the fittings on slave cylinder.

⚠WARNING 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.

7 Pull the slave cylinder hydraulic hoses out of the protective sheath.

8 Tag and disconnect the wiring from the jib manifold.

9 Remove the cable clamp from the platform rotator.

10 Remove the cable cover from the side of the jib boom.

11 Tag, disconnect and plug the hydraulic hoses from the jib boom manifold. Cap the fittings on the jib boom manifold.

⚠WARNING 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.

12 Remove the hose clamps from the top of the jib boom.

13 Remove the hose and cable clamp from the primary boom at the pivot end.

14 Remove the retaining fastener from the cable track tube at the platform end of the primary extension boom.

15 Remove the fasteners from the side panel on the lower cable track, then remove the panel. Pull all of the cables out of the channel.

16 Place blocks between the lower cable track and the upper cable track tube and secure them together.

⚠WARNING Crushing hazard. If the lower cable track and upper cable track tube are not properly secured together, the cable track may become unbalanced and fall when it is removed from the machine.

17 Attach a lifting strap from an overhead crane to the cable track.

18 Remove the cable track guide fasteners from the platform end of the primary boom.

19 Remove the cable track mounting fasteners that attach the lower cable track to the primary boom.

20 Remove the cable track from the machine and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The cable track may become unbalanced and fall if it is not properly attached to the overhead crane.

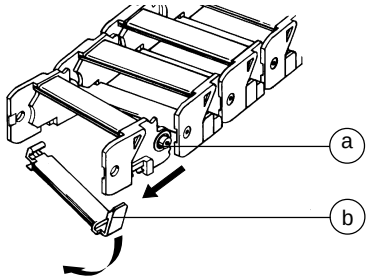
CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

CAUTION Component damage hazard. The primary boom cable track can be damaged if it is twisted.

How to Repair the Primary Boom Cable Track

⚠CAUTION Component damage hazard. The primary boom cable track can be damaged if it is twisted.

NOTICE A 7 link repair section of cable track is available through the Genie Industries Service Parts Department (Genie part no. 58919).



a link separation point
b lower clip

1 Use a slotted screwdriver to pry down on the lower clip.

2 To remove a single link, open the lower clip and then use a screw driver to pry the link to the side. Repeat steps 1 and 2 for each link.

4-2 Primary Boom

How to Shim the Primary Boom

NOTICE Measure each wear pad. Replace the pad if it is less than $^{7}/_{16}$ inch (11 mm) thick. If the pad is more than $^{7}/_{16}$ inch (11 mm) thick, perform the following procedure.

1 Extend the primary boom 10 inches (25 cm).

2 Remove the wear pad mounting fasteners.

3 Install the new shims under the wear pad to obtain zero clearance and zero drag.

4 Use a round punch to align the shim to the wear pad. Install the mounting fasteners.

5 Extend and retract the primary boom through an entire cycle. Check for tight spots that could cause scraping or binding.

NOTICE Always maintain squareness between the primary boom outer and inner tubes.

How to Remove the Primary Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could cause death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

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

2 Remove the jib boom. See 3-1, *How to Remove the Jib Boom*.

3 Remove the hose and cable clamp from the upper mid-pivot.

4 Remove the primary boom drive speed limit switch from the upper mid-pivot at the pivot end of the primary boom. Do not disconnect the wiring.

5 Remove the primary extension boom drive speed limit switch mounted on the inside of the pivot end of the primary boom.

6 Remove the side panel from the cable track to access the cable track mounting fasteners.

7 Place blocks between the lower cable track and the upper cable track tube and secure them together.

⚠WARNING Crushing hazard. If the lower cable track and upper cable track tube are not properly secured together, the cable track may become unbalanced and fall when it is removed from the machine.

8 Attach a lifting strap from an overhead crane to the cabletrack.

9 Remove the cable track guide fasteners from the platform end of the primary boom.

10 Remove the cable track mounting fasteners that attach the lower cable track to the primary boom.

11 Remove the cable track from the machine and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The cable track may become unbalanced and fall if it is not properly attached to the overhead crane.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

CAUTION Component damage hazard. The primary boom cable track can be damaged if it is twisted.

12 At the engine side of the upper mid-pivot, remove the retaining fasteners from the master cylinder rod-end pivot pin. Use a slide hammer to remove the pin.

13 Pull the master cylinder back and secure it from moving.

14 Tag, disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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.

15 Attach a 5 ton (4,536 kg) overhead crane to the center point of the primary boom. Lift the primary boom enough to access the primary boom lift cylinder rod-end pivot pin.

16 Attach a similar lifting device to the primary boom lift cylinder.

17 Place a 24 inch (61 cm) long block of wood across the lower secondary boom leveling links to support the primary boom lift cylinder.

18 Remove the pin retaining fasteners from the primary boom lift cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

⚠WARNING Crushing hazard. The primary boom lift cylinder and the primary boom will fall if they are not properly supported.

19 Lower the rod end of the primary boom lift cylinder onto the support block placed across the lower secondary boom leveling links.

20 Remove the pin retaining fasteners from the primary boom pivot pin.

21 Remove the primary boom pivot pin with a soft metal drift, then carefully remove the primary boom from the machine and place it on a structure capable of supporting it.

⚠DANGER Crushing hazard. If the overhead crane is not properly attached, the boom may become unbalanced and fall when it is removed from the machine.

How to Disassemble the Primary Boom

NOTICE Complete disassembly of the primary boom is only necessary if the outer or inner primary boom tubes must be replaced. The extension cylinder can be removed without completely disassembling the primary boom. See 4-4, *How to Remove the Extension Cylinder*.

1 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.

2 Place blocks under the extension cylinder for support.

3 Remove the cotter pin from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

4 Remove and label the wear pads from the platform end of the primary boom.

NOTICE Pay careful attention to the location and amount of shims used with each wear pad.

5 Support and slide the extension boom and extension cylinder out of the platform end of the primary boom.

⚠WARNING Crushing hazard. The extension boom may become unbalanced and fall when it is removed from the primary boom if is not properly supported.

6 Remove the external snap rings from the extension cylinder rod-end pivot pins. Use a soft metal drift to remove the pins.

7 Support and slide the extension cylinder out of the platform end of the extension boom.

8 Remove and label the wear pads from the extension boom.

NOTICE Pay careful attention to the location and amount of shims used with each wear pad.

PRIMARY BOOM COMPONENTS

4-3
Primary Boom Lift Cylinder

How to Remove the Primary Boom Lift Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could cause death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the primary boom enough to access the primary boom lift cylinder rod-end pivot pin.

2 Attach a 5 ton (4,536 kg) overhead crane to the primary boom for support. Do not lift the boom.

3 Place a 24 inch (61 cm) long block of wood across the lower secondary boom leveling links to support the primary boom lift cylinder when the rod-end pivot pin is removed.

4 Support the rod end of the primary boom lift cylinder with an appropriate lifting device.

5 Remove the pin retaining fasteners from the primary boom lift cylinder rod-end pivot pin. Then use a soft metal drift to remove the pin.

6 Lower the rod end of the cylinder onto the block that was placed on the lower secondary boom leveling links. Then lower the primary boom onto the boom rest.

7 Raise the secondary boom enough to access the primary boom lift cylinder barrel-end pivot pin.

8 Tag, disconnect and plug the hydraulic hoses from the primary boom lift cylinder. Cap the fittings on the cylinder.

⚠WARNING 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.

9 Place another 24 inch (61 cm) long block of wood across the lower secondary boom leveling links to support the primary boom lift cylinder when the barrel-end pivot pin is removed.

10 Support the barrel end of the primary boom lift cylinder with an appropriate lifting device.

11 Remove the pin retaining fasteners from the primary boom lift cylinder barrel-end pivot pin. Then use a soft metal drift to remove the pin.

12 Lower the barrel end of the cylinder onto the block that was placed on the lower secondary boom leveling links. Then lower the secondary boom onto the boom rest.

13 Carefully pull the lift cylinder toward the platform end of the secondary boom.

14 Support and secure the cylinder to an appropriate lifting device.

⚠WARNING Crushing hazard. The primary boom lift cylinder may fall when it is removed from the machine if it is not properly supported and secured to the lifting device.

4-4 Primary Boom Extension Cylinder

The primary boom extension cylinder extends and retracts the primary boom extension tube. It can only be removed from the platform end of the primary boom. The extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Primary Boom Extension Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could cause death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE Perform this procedure with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

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

2 Remove the jib boom. See 3-1, *How to Remove the Jib Boom*.

3 Extend the primary boom approximately 5 feet (1.5 m) until the extension cylinder rod-end pivot pins are accessible.

4 Remove the extension boom end cap mounting fasteners.

5 Place blocks under the extension cylinder for support.

6 Remove the external snap rings from the extension cylinder rod-end pivot pins. Use a soft metal drift to remove the pins.

7 If the function is operational, use auxiliary power to extend the extension cylinder until the rod-end clears the end of the extension tube.

8 Tag, disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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.

9 Place blocks under the barrel end of the extension cylinder for support.

10 Remove the cotter pin from the extension cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

11 Support and slide the extension cylinder out of the extension boom from the platform end.

⚠WARNING Crushing hazard. The extension cylinder may become unbalanced and fall when it is removed from the extension boom if it is not properly supported.

CAUTION Component damage hazard. Be careful not to damage the counterbalance valves on the primary boom extension cylinder when removing the cylinder from the primary boom.

PRIMARY BOOM COMPONENTS

4-5
Platform Leveling Master Cylinder

The master cylinder acts as a pump for the slave cylinder. It is part of the closed circuit hydraulic loop that keeps the platform level through the entire range of boom motion. The master cylinder is located inside the upper mid-pivot at the base of the primary boom.

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could cause death or serious injury and significant component damage. Dealer service is strongly recommended.

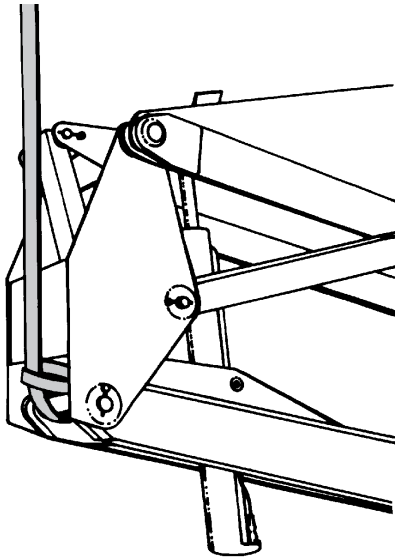
NOTICE Perform this procedure with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the pin retaining fasteners from the master cylinder rod-end pivot pin. Use a soft metal drift to remove the pin.

2 Raise the secondary boom until the upper mid-pivot is above the turntable covers.

3 Attach the lifting strap from an overhead crane to the platform end of the lower secondary boom arm for support. Do not lift.



4 Tag, disconnect and plug the hydraulic hoses from the master cylinder. Cap the fittings on the cylinder.

⚠WARNING 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.

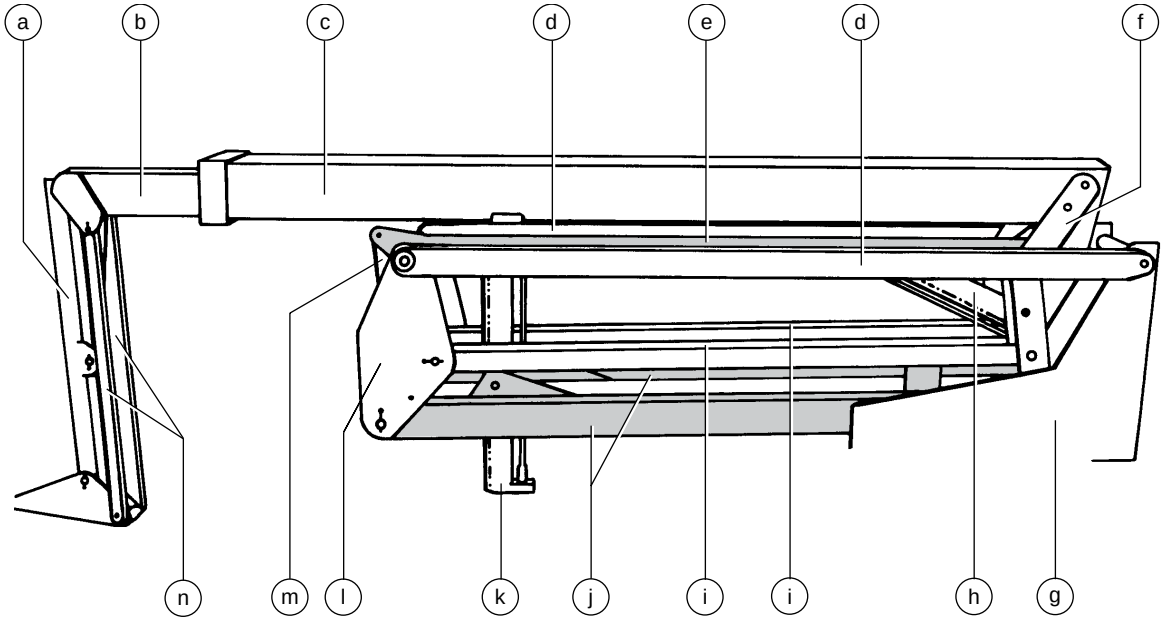
5 Attach a lifting strap from an overhead crane to the lug on the rod end of the master cylinder.

6 Remove the pin retaining fasteners from the master cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin.

7 Lower the master cylinder down and out of the upper mid-pivot and remove it from the machine.

⚠WARNING Crushing hazard. The master cylinder may become unbalanced and fall when it is removed from the machine if it is not properly attached to the overhead crane.

Secondary Boom Components



Secondary Boom
- a jib boom
- b extension tube
- c primary boom
- d upper leveling link
- e upper secondary boom
- f upper mid-pivot
- g turntable pivot
- h primary boom lift cylinder
- i lower leveling link
- j lower secondary boom
- k secondary boom lift cylinder
- l lower mid-pivot
- m compression link
- n jib boom leveling link

5-1 Secondary Boom

How to Disassemble the Secondary Boom

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could cause death or serious injury and significant component damage. Dealer service is strongly recommended.

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in the reverse order.

SECONDARY BOOM COMPONENTS

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

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

2 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.

3 Remove all four pin retaining fasteners from the two upper leveling link pivot pins. Do not remove the pins.

4 Attach a lifting strap from an overhead crane at the center of the engine side upper leveling link.

5 Remove the engine side upper leveling link from the machine. Repeat this step for the ground controls side upper leveling link.

⚠WARNING Crushing hazard. The leveling link may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

6 Remove the pin retaining fasteners from the compression link at the upper secondary boom. Use a soft metal drift to remove the pin.

7 Attach a securing strap from the upper mid-pivot to upper leveling link pivot pin mounting tube, to secure the upper mid-pivot from moving.

8 Attach a 5 ton (4,536 kg) overhead crane to the center of the upper secondary boom.

9 Remove the lift interlock limit switch from the inside of the upper secondary boom.

10 Remove the mounting fasteners from the secondary boom lift cylinder rod-end pivot pin mounting bracket.

11 Remove the pin retaining fasteners from both upper mid-pivot to upper secondary boom pivot pins. Use a soft metal drift to remove the pins.

⚠WARNING Crushing hazard. The upper mid-pivot may fall when the pins are removed if the upper mid-pivot is not properly secured.

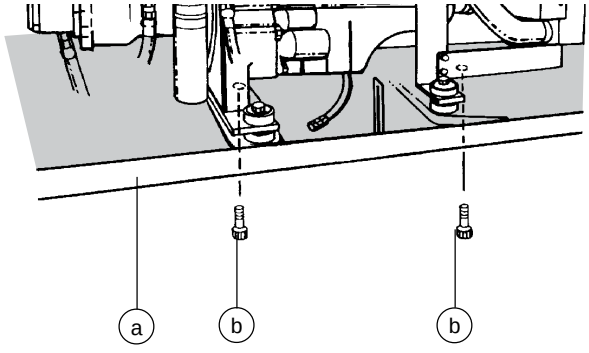
12 Remove the pin retaining fasteners from the lower mid-pivot to upper secondary boom pivot pin.

13 Use a soft metal drift to remove the lower mid-pivot to upper secondary boom pivot pin, then remove the upper secondary boom from the machine.

⚠WARNING Crushing hazard. The upper secondary boom may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

14 Remove both turntable covers. See 6-1, *How to Remove a Turntable Cover*.

15 Remove the 2 engine pivot plate retaining bolts. Then swing the engine out away from the machine.



a engine pivot plate
b pivot plate retaining bolts

16 Disconnect the battery cables.

⚠WARNING Electrocution hazard. Contact with hot or live circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

17 Remove the battery hold down fasteners, then remove the battery.

⚠WARNING Bodily injury hazard. Batteries contain acid. Avoid spilling or contacting battery acid. Neutralize battery acid spills with baking soda and water.

18 **Gasoline/LPG models:** Remove the mounting fasteners from the 3 relays mounted to the engine side bulkhead.

19 **Gasoline/LPG models:** Remove the mounting fasteners from the ECM mounted to the engine side bulkhead.

20 Remove the mounting fasteners from both of the turntable bulkheads, then remove both turntable bulkheads.

21 Remove the hydraulic tank. See 12-2, *How to Remove the Hydraulic Tank*.

22 Attach a lifting strap from an overhead crane to the lug on the primary boom lift cylinder, then lift the primary boom lift cylinder to a vertical position.

23 Tag, disconnect and plug the primary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

24 Remove the pin retaining fasteners from the primary boom lift cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin, then remove the cylinder from the machine.

⚠WARNING Crushing hazard. The primary boom lift cylinder may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

25 Tag, disconnect and plug the secondary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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.

26 Attach a lifting strap from an overhead crane to the lug on the rod end of the secondary boom lift cylinder.

27 Remove the pin retaining fasteners from the secondary boom lift cylinder pivot pins. Use a slide hammer to remove the pins, then remove the secondary boom lift cylinder from the machine.

⚠WARNING Crushing hazard. The secondary boom lift cylinder may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

28 Attach a securing strap from the lower mid-pivot to the lower secondary boom, to secure the lower mid-pivot from moving.

29 Number each electrical cable and its entry location at the platform control box.

30 Open the platform control box.

31 Label and disconnect each wire of the cables that enter the platform control box.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

32 Pull all of the cables out of the platform control box.

33 Pull all of the electrical cables out of the cable track. Do not pull out the hydraulic hoses.

SECONDARY BOOM COMPONENTS

34 Tag, disconnect and plug the platform rotator and slave cylinder hydraulic hoses at the union, located near the upper mid-pivot.

⚠WARNING 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.

35 Remove the hose and cable covers from both of the lower secondary boom leveling links.

36 Tag, disconnect and plug the master cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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.

37 Attach a lifting strap from an overhead crane to the lug on the rod end of the master cylinder.

38 Remove the pin retaining fasteners from the master cylinder barrel-end pivot pin. Use a soft metal drift to remove the pin. Then remove the master cylinder from the machine.

⚠WARNING Crushing hazard. The master cylinder may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

39 Attach a lifting strap from an overhead crane to the upper mid-pivot, then remove the securing strap from the upper mid-pivot.

40 Pull all of the hoses and cables out of the upper mid-pivot.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

41 Remove the secondary boom drive limit switch mounting fasteners from the lower secondary boom. Do not disconnect the wiring.

42 Pull all of the hoses and cables out of the lower mid-pivot and lay them off to the side.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

43 Place blocks under each of the lower secondary boom leveling links for support at the turntable pivot end.

44 Remove the pin retaining fasteners from both of the upper mid-pivot to lower secondary boom leveling link pivot pins. Use a soft metal drift to remove the pins, then remove the upper mid-pivot from the machine.

⚠WARNING Crushing hazard. The upper mid-pivot may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

45 Attach a lifting strap from an overhead crane to the center of the engine side lower secondary boom leveling link.

46 Remove the pin retaining fasteners from the engine side lower leveling link pivot pin at the lower mid-pivot.

47 Use a soft metal drift to remove the pin, then remove the engine side lower secondary boom leveling link from the machine.

⚠WARNING Crushing hazard. The engine side lower secondary boom leveling link may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

48 Attach a lifting strap from an overhead crane to the center of the ground controls side lower secondary boom leveling link.

49 Remove the pin retaining fasteners from the ground controls side lower leveling link pivot pin at the lower mid-pivot.

50 Use a soft metal drift to remove the pin, then remove the ground controls side lower secondary boom leveling link from the machine.

⚠WARNING Crushing hazard. The ground controls side lower secondary boom leveling link may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

51 Attach a lifting strap from an overhead crane to the compression link.

52 Remove the pin retaining fasteners from the compression link pivot pin at the lower secondary boom. Use a soft metal drift to remove the pin, then remove the compression link from the machine.

⚠WARNING Crushing hazard. The compression link may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

53 Attach a 5 ton (4,536 kg) overhead crane to the lower mid-pivot.

54 Remove the pin retaining fasteners from the lower secondary boom pivot pin at the lower mid-pivot. Use a soft metal drift to remove the pin, then remove the lower mid-pivot from the machine.

⚠WARNING Crushing hazard. The lower mid-pivot may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

55 Remove the hose and cable covers from the lower secondary boom.

56 Attach a 5 ton (4,536 kg) overhead crane to the center point of the lower secondary boom.

57 Remove the pin retaining fasteners from the lower secondary boom pivot pin at the turntable pivot. Use a soft metal drift to remove the pin, then remove the lower secondary boom from the machine.

⚠WARNING Crushing hazard. The lower secondary boom may become unbalanced and fall when it is removed from the machine if it is not properly supported by the overhead crane.

5-2 Secondary Boom Lift Cylinder

The secondary boom lift cylinder raises and lowers the secondary boom. The secondary boom lift cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

How to Remove the Secondary Boom Lift Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could cause death or serious injury and significant component damage.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Attach a lifting strap from an overhead crane to the lug on the rod end of the secondary boom lift cylinder.

SECONDARY BOOM COMPONENTS

2 Tag, disconnect and plug the secondary boom lift cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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 mounting fasteners from the secondary boom lift cylinder rod-end pivot pin mounting bracket.

4 Remove the retaining fasteners from the secondary boom lift cylinder pivot pins. Use a slide hammer to remove the pins, then remove the cylinder from the machine.

⚠WARNING Crushing hazard. The secondary boom lift cylinder may become unbalanced and fall when it is removed from the machine if is not properly supported by the overhead crane.

Turntable Covers

6-1 Turntable Covers

How to Remove a Turntable Cover

1 Raise the turntable cover. Support and secure the open cover with an overhead crane or forklift. Do not lift the cover.

⚠CAUTION Crushing hazard. Due to its heavy weight, do not attempt to support the cover by hand.

CAUTION Component damage hazard. Protect the cover from damage by using carpet or padding on the crane or forklift forks.

2 Remove the upper and lower retaining clips from the gas strut.

3 Gently pry the strut pivot sockets off of the ball studs and remove the strut. Protect the strut cylinder rod from damage.

NOTICE Mark the location of the hinge support bracket on the bulkhead to ensure proper cover alignment during installation.

4 Remove the cover hinge bolts that fasten the hinge support bracket to the bulkhead.

5 Carefully lift and remove the cover from the machine.

⚠WARNING Bodily injury hazard. Safety decals are essential to safe machine operation. Failure to replace all safety and instructional decals could result in death or serious injury. If a turntable cover must be replaced, be sure that all appropriate safety and instructional decals are applied to the new cover.

⚠WARNING Crushing hazard. The turntable cover may become unbalanced and fall if it is not properly supported and secured to an appropriate lifting device.

NOTICE Alignment adjustments may be necessary when a new cover is installed.

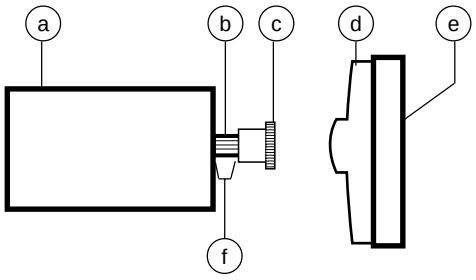
Deutz Engine F4L 1011F

7-1 RPM Adjustment

Refer to Maintenance Procedures, B-12, *Check and Adjust the Engine RPM.*

7-2 Flex Plate

The flex plate acts as a coupler between the engine and the pump. It is bolted to the engine flywheel and has a splined center to drive the pump.



a pump
b pump shaft
c pump coupler
d flex plate with raised spline
e engine flywheel
f 7/16 inch gap

How to Remove the Flex Plate

1 Disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.

2 Support the drive pump with an appropriate lifting device. Then remove all of the pump mounting plate to engine bell housing bolts.

3 Carefully pull the pump away from the engine and secure it from moving.

4 Remove the flex plate mounting fasteners, then remove the flex plate from the engine flywheel.

How to Install the Flex Plate

1 Install the flex plate onto the engine flywheel with the raised spline towards the pump. Torque the flex plate mounting bolts to 34 ft-lbs (46 Nm).

2 Install the pump coupler onto the pump shaft with the set screw toward the pump. Leave a 7/16 inch (11 mm) gap between the pump coupler and pump end plate.

3 Apply Loctite® removable thread sealant to the pump coupler set screw. Torque the set screw to 45 ft-lbs (61 Nm).

CAUTION Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.

4 Install the pump and torque the pump mounting plate fasteners to 34 ft-lbs (46 Nm).

7-3 Oil Temperature and Oil Pressure Gauges

The oil temperature gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will close at approximately 300° F (149° 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. Temperature will be indicated when the keyswitch is ON and the Emergency Stop button is pulled out to the ON position.

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

The oil pressure gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will open at approximately 7 psi (0.48 bar). When the contacts close, the engine will shut off to prevent damage. Oil pressure will be indicated when the engine is running.

CAUTION Component damage hazard. Do not crank the engine with the low oil pressure light on.

How to Remove the Oil Temperature or Oil Pressure Gauge Sending Units

NOTICE Perform this procedure with the engine off.

1 **Oil temperature switch:** Remove the fasteners from the engine side cover, then remove the cover.

2 Disconnect the wiring from the desired switch.

3 Remove the switch from the engine block, and then install the new switch. Do not over tighten.

⚠CAUTION Burn hazard. Contact with hot engine fluids or components may cause severe burns

NOTICE Always use pipe thread sealant when installing a switch.

Oil temperature switch specifications	
Torque	8-18 ft-lbs 11-24 Nm
Hex size	$^{13}/_{16}$ inch
Temperature switch point	300° F (149° C)

Oil pressure switch specifications	
Torque	8-18 ft-lbs 11-24 Nm
Hex size	$1^{1}/_{16}$ inch
Oil pressure switch point	7 psi 0.48 bar

Ford LRG-425 EFI Engine

8-1 Timing Adjustment

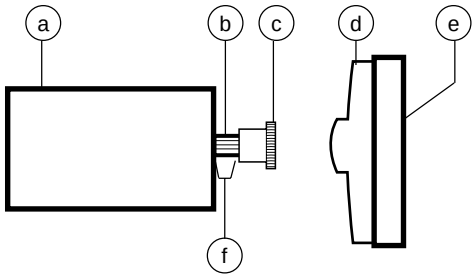
NOTICE The ignition timing is controlled by the ECM and can only be adjusted by re-programming the ECM. If timing adjustment or service is required, please contact Genie Industries Service Department OR your local Ford dealer.

8-2 RPM Adjustment

Refer to Maintenance Procedures, B-11, *Check and Adjust the Engine RPM*.

8-3 Flex Plate

The flex plate acts as a coupler between the engine and the pump. It is bolted to the engine flywheel and has a splined center to drive the pump.



a pump
b pump shaft
c pump coupler
d flex plate with raised spline
e engine flywheel
f 1/16 inch gap

Flex Plate Removal

1 Disconnect the wiring plug at the electronic displacement controller (EDC), located on the drive pump.

2 Support the drive pump with an appropriate lifting device. Then remove all of the pump mounting plate to engine bell housing bolts.

3 Carefully pull the pump away from the engine and secure it from moving.

CAUTION Component damage hazard. Hoses can be damaged if they are kinked or pinched.

4 Remove the flex plate mounting fasteners, then remove the flex plate from the engine fly wheel.

How to Install the Flex Plate

1 Install the flex plate onto the engine flywheel with the raised spline towards the pump. Torque the flex plate mounting bolts to 34 ft-lbs (46 Nm).

2 Install the pump coupler onto the pump shaft with the set screw towards the pump. Leave a 1/16 inch (1.5 mm) gap between the pump coupler and pump end plate.

3 Apply Loctite® removable thread sealant to the pump coupler set screw. Torque the set screw to 45 ft-lbs (61 Nm).

CAUTION Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.

4 Install the pump and torque the pump mounting plate fasteners to 34 ft-lbs (46 Nm).

8-4
Water Temperature and Oil Pressure Gauges

The water temperature gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will close at approximately
230° F (110° 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. Temperature will be indicated when the keyswitch is ON and the Emergency Stop button is pulled out to the ON position.

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

The oil pressure gauge is an electrical gauge. The sending unit has limit contacts that are factory set. The contacts will open at approximately 8 psi (0.55 bar). When the contacts close, the engine will shut off to prevent damage. Oil pressure will be indicated will be indicated when the engine is running.

CAUTION Component damage hazard. Do not crank the engine with the low oil pressure light on.

How to Remove the Water Temperature or Oil Pressure Gauge Sending Units

NOTICE Perform this procedure with the engine off.

1 Remove the 2 engine pivot plate retaining bolts. Then swing the engine out away from the machine to access the water temperature and oil pressure sending units.

2 Open the engine side cover and locate the water temperature and oil pressure switches.

3 Disconnect the wiring from the desired switch.

4 Remove the switch from the engine block, and then install the new switch. Do not over tighten.

⚠CAUTION Burn hazard. Contact with hot engine fluids or components may cause severe burns

NOTICE Always use pipe thread sealant when installing a switch.

Water temperature switch specifications	
Torque	8-18 ft-lbs 11-24 Nm
Hex size	$^{13}/_{16}$ inch
Temperature switch point	230° F (110° C)

Oil pressure switch specifications	
Torque	8-18 ft-lbs 11-24 Nm
Hex size	$1^{1}/_{16}$ inch
Oil pressure switch point	8 psi 0.55 bar

Ground Controls

9-1 Control Relays

Relays used for single function switching are single pole double throw (SPDT) relays.

How to Test a Single Pole Double Throw Relay

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could cause death or serious injury. Remove all rings, watches and other jewelry.

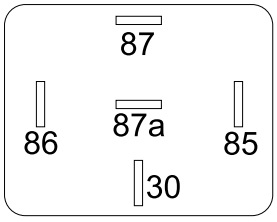
1 Label and then disconnect all the wiring from the relay to be tested.

2 Connect the leads from an ohmmeter or continuity tester to each terminal combination and check for continuity. Terminals 85 and 86 represent the coil and should not be tested in any other combination.

Test	Desired result
terminal 85 to 86 without resistor	85 to 95Ω
terminal 85 to 86 with resistor	75 to 85Ω
terminal 87 to 87a & 30	no continuity (infinite Ω)
terminal 87a to 30	continuity (zero Ω)

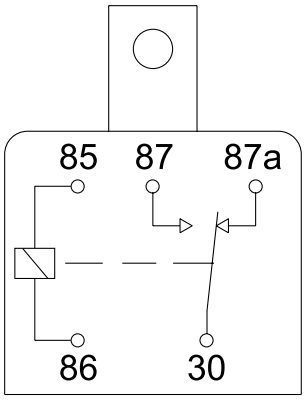
3 Connect 12V DC to terminal 85 and a ground wire to terminal 86, then test the following terminal combinations.

Test	Desired result
terminal 87 to 87a & 30	no continuity (infinite Ω)
terminal 87 to 30	continuity (zero Ω)

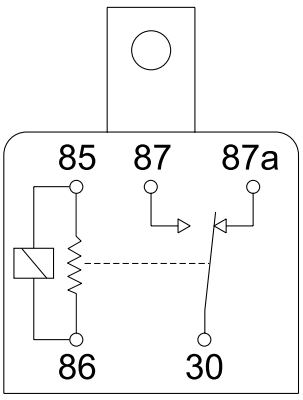


terminal no. 87a - N.C.
terminal no. 85 - ground
terminal no. 30 - common
terminal no. 86 - coil
terminal no. 87 - N.O.

Control Relay Schematic - without resistor



Control Relay Schematic - with resistor



9-2
Toggle Switches

See 1-5, *Toggle Switches*.

9-3
Wago® Components

How to Remove a Wago® Component

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could cause death or serious injury. Remove all rings, watches and other jewelry.

NOTICE A small screwdriver is provided and should be used when removing a Wago® component. This screwdriver is located in the operator's manual storage box in the platform.

1 Label the wiring from the component to be removed.

2 Locate the removal tab on the bottom or top side of the component.

3 Use a small narrow flat blade screwdriver to push in and release the wire from the component.

4 Use the small narrow flat blade screwdriver to gently pry up on the tab of the component and remove it.

9-4
Resistors

How to Test the Resistor

The resistor is used to maintain proper control of boom function speeds. A 10 ohm resistor reduces voltage to the primary boom and secondary boom proportional valves. A 15 ohm resistor reduces the voltage to the turntable rotate proportional valve.

NOTICE Refer to the schematic legends for resistor locations and values.

1 Turn the key switch to the OFF position.

2 Disconnect either end of one of the wires connected to the resistor to be tested.

3 Connect the leads from an ohmmeter to each end or wiring of the resistor being tested.

4 Compare the ohmmeter reading with the resistance rating printed on the resistor.

9-5
Engine Fault Codes - Gasoline/ LPG Models

How to Retrieve Engine Fault Codes

When a engine malfunction is detected by the Electronic Control Module (ECM), a fault code is recorded and the check engine light will turn ON at the ground and platform controls. Use the following procedure to retrieve the engine fault code to determine the engine malfunction.

NOTICE Perform this procedure with the keyswitch in the OFF position.

1 Open the ground controls side turntable cover.

2 Open the ground control box and locate the run/ test toggle switch inside of the ground control box.

GROUND CONTROLS

3 Pull out the ground controls red Emergency Stop button to the ON position.

4 Hold the run/test toggle switch to the test position and turn the keyswitch to the ground controls position.

⊙ Result: The check engine light should turn on. The check engine light should begin to blink.

5 Continue to hold the run/test toggle switch in the test position and count the blinks.

NOTICE Fault codes are two digits. The check engine light will blink the first digit of a two digit code then will pause for 1.2 seconds and then blink the second digit. For example: the check engine light blinks 5 consecutive times then pauses for 1.2 seconds and then blinks 1 time. That would indicate code 51.

7 Refer to the Troubleshooting Section for definition of engine fault codes.

NOTICE Once a fault code has been retrieved and the repair has been completed, the ECM memory must be reset to clear the fault code from the ECM. See 9-5, *How to Clear Engine Fault Codes.*

How to Clear Engine Fault Codes from the ECM

NOTICE Perform this procedure with the engine off and the keyswitch in the OFF position.

1 Open the engine side turntable cover and locate the battery.

2 Disconnect the negative battery cable from the battery for a minimum of 5 minutes.

⚠WARNING Electrocution hazard. Contact with electrically charged circuits could cause death or serious injury. Remove all rings, watches and other jewelry.

3 Connect the negative battery cable to the battery.

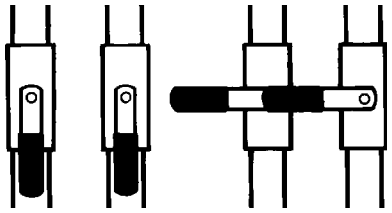
Hydraulic Pumps

10-1 Lift/Steer Pump

How to Remove the Lift/Steer Pump

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Close the two hydraulic tank valves located at the hydraulic tank.



CAUTION Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the CLOSED position or component damage will occur.
If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

2 Tag, disconnect and plug the lift/steer pump hydraulic hoses. Cap the fittings on the pump.

⚠WARNING 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 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.

10-2 Drive Pump

The drive pump is a bi-directional variable displacement piston pump. The pump output is controlled by the electronic displacement controller (EDC), located on the pump. The only adjustment that can be made to the pump is the neutral or null adjustment. Any internal service to the pump should only be performed at an authorized Sundstrand-Sauer service center. Call Genie Industries Service Department to locate your local authorized service center.

How to Remove the Drive Pump

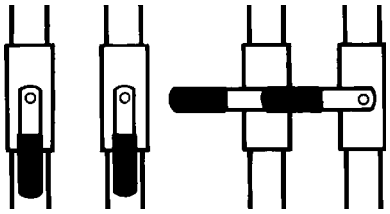
CAUTION Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Disconnect the electrical connection at the electronic displacement controller (EDC) located on the drive pump.

HYDRAULIC PUMPS

2 Close the two hydraulic tank valves located at the hydraulic tank.



open closed

CAUTION Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the CLOSED position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

3 Tag and disconnect and plug the hydraulic hoses from the drive and lift/steer pumps. Cap the fittings on the pumps.

⚠WARNING 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 with a lifting device and remove the two drive pump mounting fasteners.

5 Carefully pull the drive pump out until the pump coupler separates from the flex plate.

6 Remove the drive pump from the machine.

CAUTION Component damage hazard. The hydraulic pump may become unbalanced and fall if it is not properly supported.

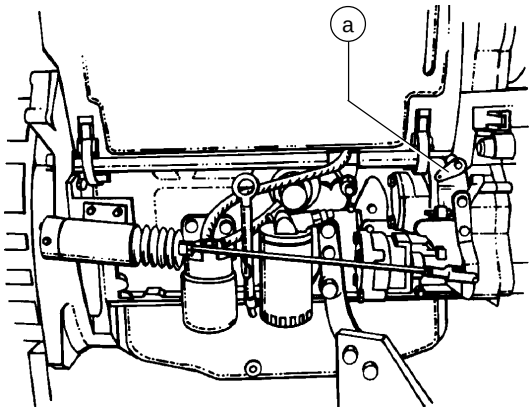
CAUTION Component damage hazard. Be sure to open the two hydraulic tank valves and prime the pump after installing the pump.

How to Prime the Pump

1 Connect a 0 to 600 psi (0 to 41 bar) pressure gauge to the test port on the drive pump.

2 **Gasoline/LPG models:** Close the valve on the LPG tank then disconnect the hose from the tank. Then move the fuel select switch to the LPG position.

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

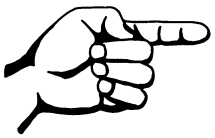


a manual fuel shutoff valve

3 Crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi (22 bar).

4 **Gasoline/LPG models:** Connect the LPG hose to the LPG tank and open the valve on the tank.

5 Start the engine from the ground controls and check for hydraulic leaks.



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Manifolds

11-1
Function Manifold Components

The function manifold is located behind the ground control box.

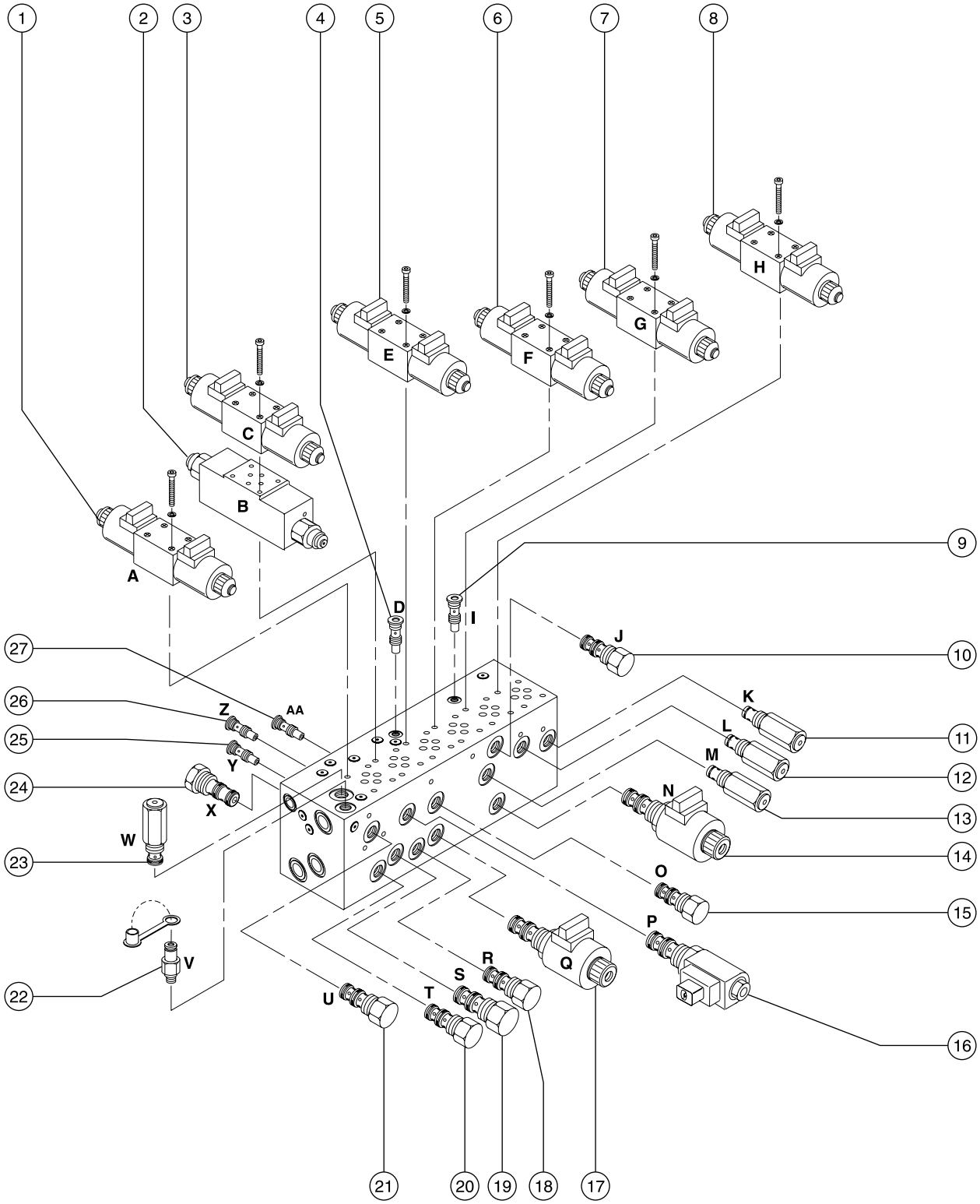
Index No.	Description	Schematic Item	Function	Torque
1	3 position 4 way D03 valve	A	Jib boom up/down and platform rotate left/right	30-35 in-lbs / 3-4 Nm
2	Counter balance sandwich valve manifold	B	Platform level up/down	
3	3 position 4 way D03 valve	C	Platform level up/down	30-35 in-lbs / 3-4 Nm
4	Check valve	D	Differential sensing circuit, turntable rotate left/right and primary boom extend/retract	11-13 ft-lbs / 15-18 Nm
5	3 position 4 way D03 valve	E	Turntable rotate left/right	30-35 in-lbs / 3-4 Nm
6	3 position 4 way D03 valve	F	Secondary boom up/down	30-35 in-lbs / 3-4 Nm
7	3 position 4 way D03 valve	G	Primary boom up/down	30-35 in-lbs / 3-4 Nm
8	3 position 4 way D03 valve	H	Primary boom extend/retract	30-35 in-lbs / 3-4 Nm
9	Check valve	I	Differential sensing circuit, primary and secondary boom	11-13 ft-lbs / 15-18 Nm
10	Flow regulator valve	J	Primary and secondary boom (prevents overflowing the proportional valve)	10-12 ft-lbs / 14-16 Nm
11	Relief valve, 1200 psi (83 bar)	K	Primary boom extend	25-30 ft-lbs / 34-41 Nm
12	Relief valve, 1800 psi (124 bar)	L	Primary boom down	25-30 ft-lbs / 34-41 Nm
13	Relief valve, 1600 psi (110 bar)	M	Secondary boom down	25-30 ft-lbs / 34-41 Nm
14	Proportional solenoid valve	N	Primary and secondary boom up/down	10-12 ft-lbs / 14-16 Nm
15	Flow regulator valve	O	Turntable rotate left/right and primary boom extend/retract (prevents overflowing the proportional valve)	10-12 ft-lbs / 14-16 Nm
16	Normally closed poppet valve 2 position 3 way	P	Platform level circuit	25-30 ft-lbs / 34-41 Nm

This list continues. Please turn the page

Plug Torque Specifications

Description	Hex size	Torque
SAE No. 2	1/8	50 in-lbs / 6 Nm
SAE No. 4	3/16	13 ft-lbs / 18 Nm
SAE No. 6	1/4	18 ft-lbs / 24 Nm

MANIFOLDS


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MANIFOLDS

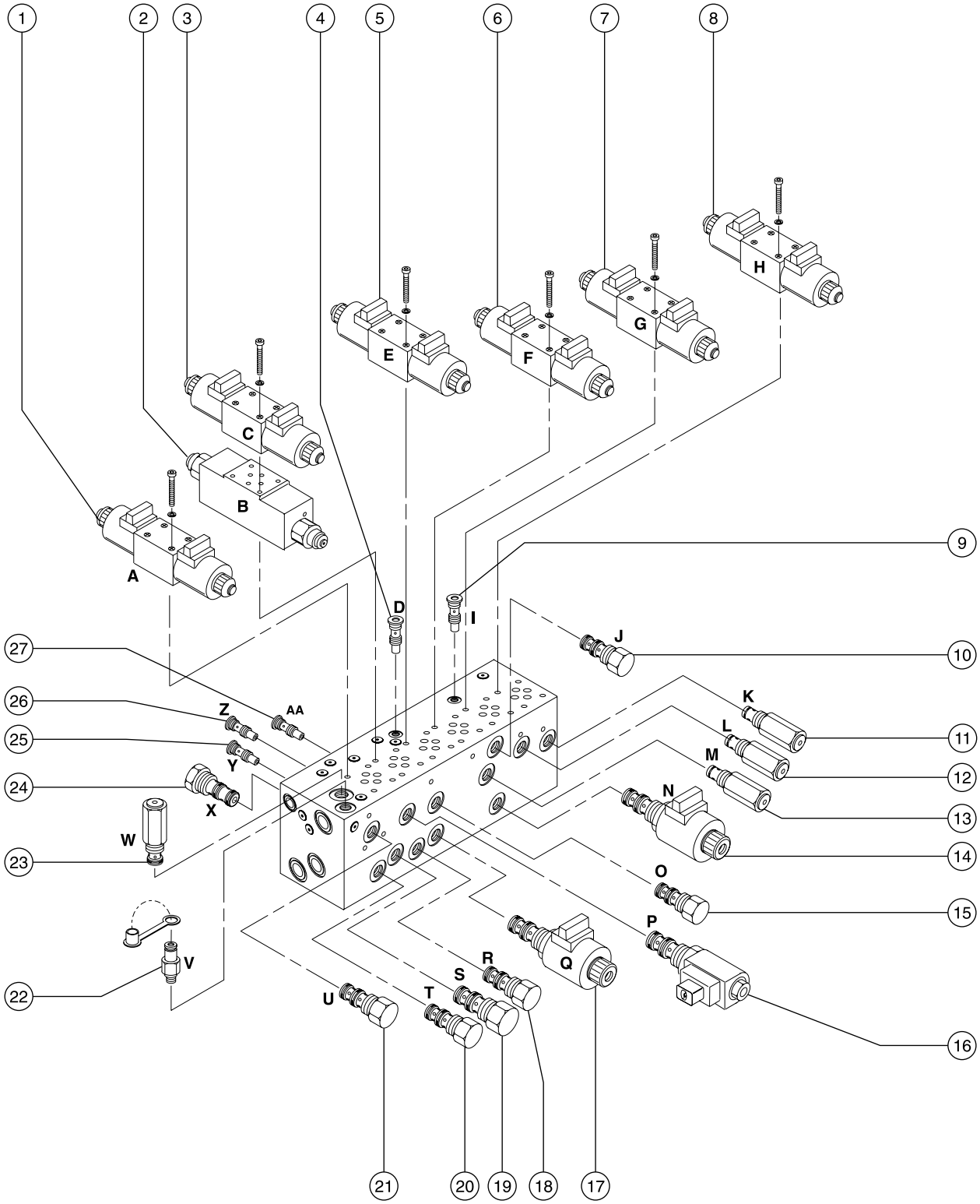
Function Manifold Components, continued

Index No.	Description	Schematic Item	Function	Torque
17	Proportional solenoid valve	Q	Turntable rotate left/right and primary boom extend/retract	10-12 ft-lbs / 14-16 Nm
18	Flow regulator valve, 0.6 gpm (2.3 l/min)	R	Platform level circuit	10-12 ft-lbs / 14-16 Nm
19	Differential sensing valve	S	Meters flow to functions	10-12 ft-lbs / 14-16 Nm
20	Flow regulator valve, 1.5 gpm (5.7 l/min)	T	Platform rotate/jib boom circuit	10-12 ft-lbs / 14-16 Nm
21	Flow regulator valve, 0.1 gpm (0.38 l/min)	U	Bleeds off differential sensing valves to tank	10-12 ft-lbs / 14-16 Nm
22	Diagnostic nipple	V	Testing	
23	Relief valve, 2400 psi (165 bar)	W	System relief	35-40 ft-lbs / 47-54 Nm
24	Priority flow regulator valve, 3 gpm (11.4 l/min)	X	Steering circuit	10-12 ft-lbs / 14-16 Nm
25	Check valve	Y	Differential sensing circuit, jib boom down/platform rotate right	11-13 ft-lbs / 15-18 Nm
26	Check valve	Z	Differential sensing circuit, Jib boom up/platform rotate left	11-13 ft-lbs / 15-18 Nm
27	Check valve	AA	Differential sensing circuit, Platform level	11-13 ft-lbs / 15-18 Nm

Plug Torque Specifications

Description	Hex size	Torque
SAE No. 2	1/8	50 in-lbs / 6 Nm
SAE No. 4	3/16	13 ft-lbs / 18 Nm
SAE No. 6	1/4	18 ft-lbs / 24 Nm

MANIFOLDS


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MANIFOLDS

11-2 Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi (0 to 345 bar) pressure gauge to the test port (item 22) on the function manifold.

2 Start the engine from the ground controls.

3 Hold the function enable switch to the HIGH IDLE position and activate and hold the retract switch with the boom fully retracted. Observe the pressure reading on the pressure gauge.

System relief valve specifications

Pressure	2400 psi 165 bar

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item 23, function manifold).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

6 Repeat steps 2 through 5 and recheck relief valve pressure.

How to Adjust the Primary Boom Down Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi (0 to 345 bar) pressure gauge to the test port (item 22) on the function manifold.

2 Start the engine from the ground controls.

3 Hold the function enable switch to the HIGH IDLE position and activate and hold the primary boom down switch with the primary boom fully lowered. Observe the pressure reading on the pressure gauge.

Primary boom down relief valve specifications

Pressure	1800 psi 124 bar

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item 12, function manifold).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

6 Repeat steps 2 through 5 and recheck relief valve pressure.

How to Adjust the Primary Boom Extend Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi (0 to 345 bar) pressure gauge to the test port (item 22) on the function manifold.

2 Start the engine from the ground controls.

3 Hold the function enable switch to the HIGH IDLE position and activate and hold the primary boom extend switch with the primary boom fully extended. Observe the pressure reading on the pressure gauge.

Primary boom extend relief valve specifications	
Pressure	1200 psi 83 bar

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item 11, function manifold).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

6 Repeat steps 2 through 5 and recheck relief valve pressure.

How to Adjust the Secondary Boom Down Relief Valve

NOTICE Perform this procedure with the boom in the stowed position.

1 Connect a 0 to 5000 psi (0 to 345 bar) pressure gauge to the test port (item 22) on the function manifold.

2 Start the engine from the ground controls.

3 Hold the function enable switch to the HIGH IDLE position and activate and hold the secondary boom down switch with the secondary boom fully lowered. Observe the pressure reading on the pressure gauge.

Secondary boom down relief valve specifications	
Pressure	1600 psi 110 bar

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item 13, function manifold).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the relief valve cap.

⚠WARNING Tip-over hazard. Do not adjust the relief valve higher than specified.

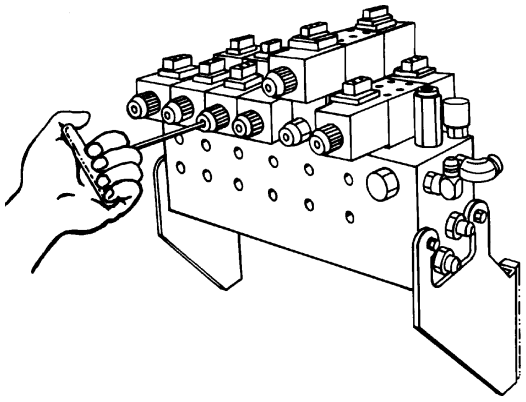
6 Repeat steps 2 through 5 and recheck relief valve pressure.

MANIFOLDS

How to Override a Valve

A hydraulic valve may need to be manually overridden to troubleshoot a malfunction. The proportional boom functions (primary boom, secondary boom, extend/retract and turntable rotate) use a variable position proportional valve and a three position directional valve. Example: one position for boom up, one position for neutral and one position for boom down. The platform rotate, jib boom and platform level functions use only three position valves. The three position valves and the proportional valves can be manually overridden. To identify the manifold valves see 11-1, *Function Manifolds,* in this section.

1 Push the button on the end of the valve in ¼ inch (6mm).



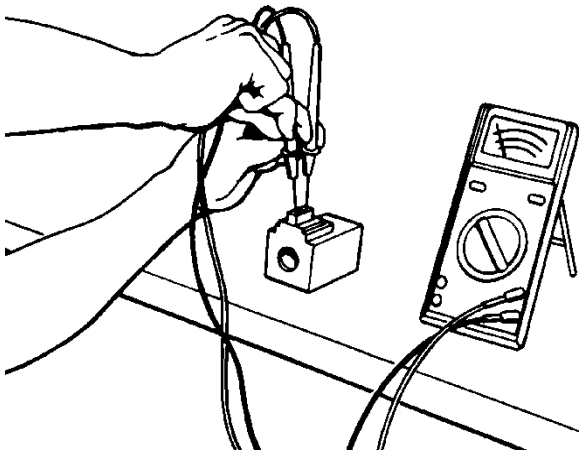
2 Move the ground control function switch for the function being overridden to operate function.

⚠WARNING Collision hazard. Impact with moving boom components could cause death or serious injury. Use extreme caution when overriding a machine function. Identify the direction of machine movement before overriding a valve.

How to Check the Resistance of a Valve Coil

1 Turn the key switch to the OFF position and disconnect the wires from the valve coil to be tested.

2 Connect the leads from an ohmmeter to the valve coil terminals.

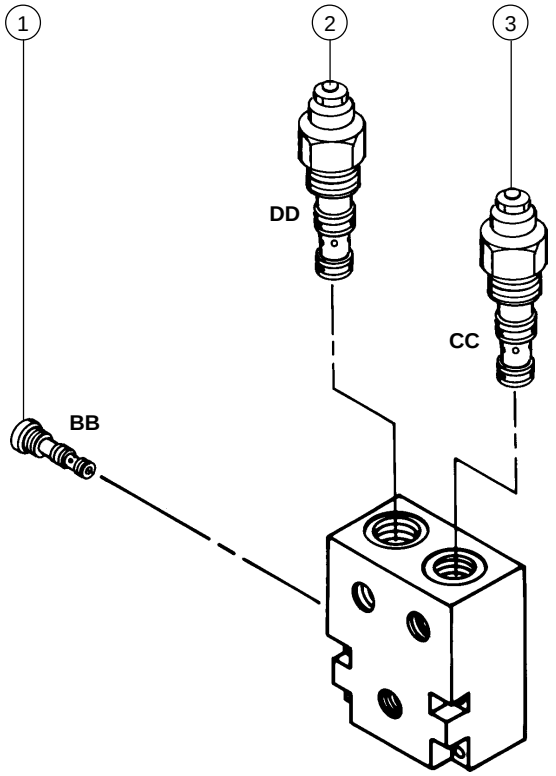


Valve coil specifications	
Proportional solenoid valve, 12V (schematic items N and Q)	4 to 5Ω
3 position 4 way directional valve, 10V (schematic items A, C, E, F, G and H)	2.5 to 3.2Ω
2 position 3 way solenoid valve, 10V (schematic item P)	7 to 9Ω

11-3
Turntable Rotation Manifold Components

The turntable rotation manifold is mounted to the turntable rotation motor located in the boom storage compartment.

Index No.	Description	Schematic Item	Function	Torque
1	Shuttle valve 2 position 3 way	BB	Turntable rotation brake release	10-13 ft-lbs / 14-18 Nm
2	Counterbalance valve	CC	Turntable rotate right	35-40 ft-lbs / 47-54 Nm
3	Counterbalance valve	DD	Turntable rotate left	35-40 ft-lbs / 47-54 Nm

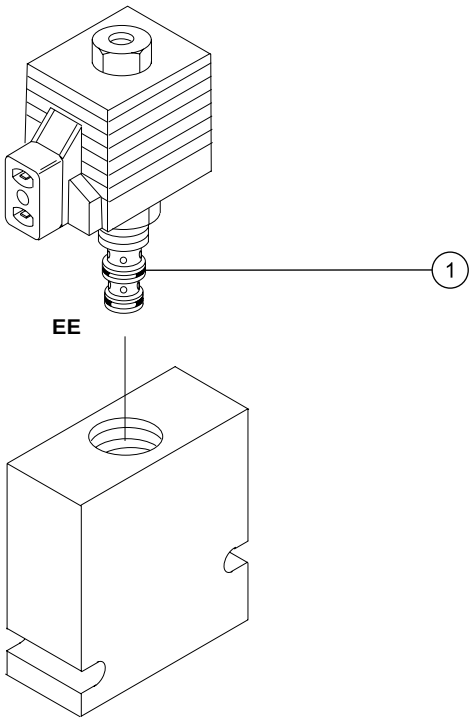


MANIFOLDS

11-4
Auxiliary Steer Manifold Components, Non-oscillating Models

The auxiliary steer manifold is mounted to the auxiliary pump

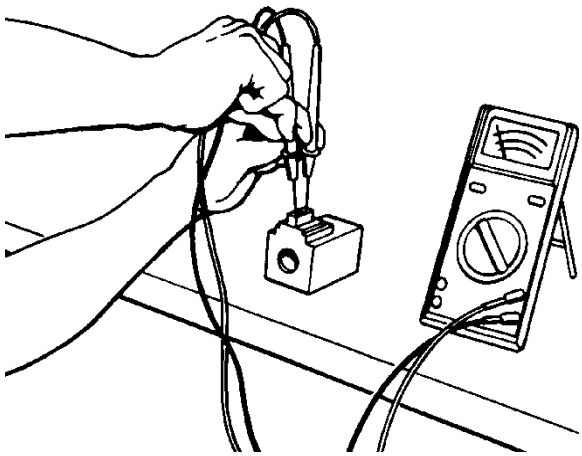
Index No.	Description	Schematic Item	Function	Torque
1	2 position 3 way solenoid valve	EE	Enables steer left/right function while using auxiliary power	30-35 in-lbs / 3-4 Nm



How to Check the Resistance of a Valve Coil

1 Turn the key switch to the OFF position and disconnect the wires from the valve coil to be tested.

2 Connect the leads from an ohmmeter to the valve coil terminals.

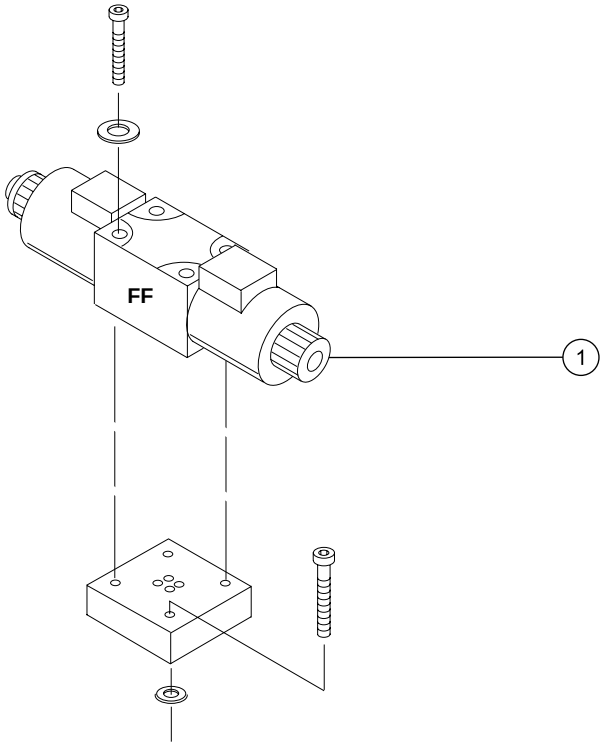


Valve coil specifications	
2 position 3 way solenoid valve, 10V (schematic item EE)	4 to 6Ω

11-5
Steer Manifold Components, Non-oscillating Models

The steer manifold is mounted inside the drive chassis at the steer end.

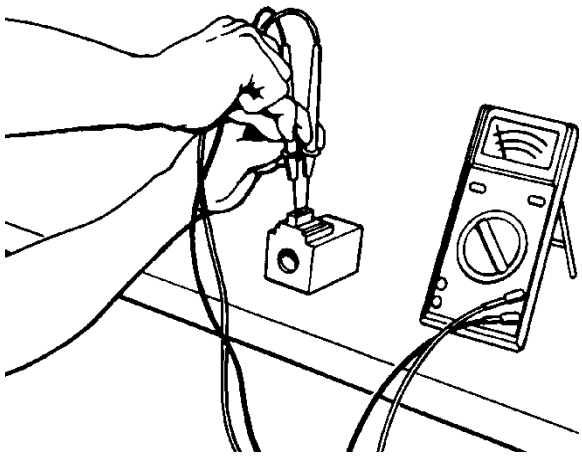
Index No.	Description	Schematic Item	Function	Torque
1	3 position 4 way D03 valve	FF	Steer left/right	30-35 in-lbs / 3-4 Nm



How to Check the Resistance of a Valve Coil

1 Turn the key switch to the OFF position and disconnect the wires from the valve coil to be tested.

2 Connect the leads from an ohmmeter to the valve coil terminals.



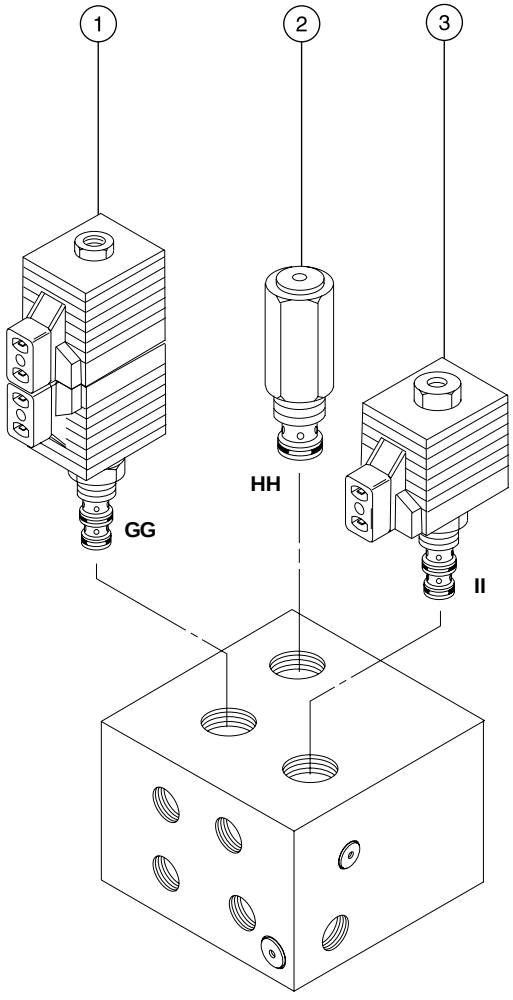
Valve coil specifications	
3 position 4 way D03 valve, 10V (schematic item FF)	2.5 to 3.2Ω

MANIFOLDS

11-6
Steer/Oscillate Manifold Components, Oscillating Models

The steer/oscillate manifold is mounted inside the drive chassis at the steer end.

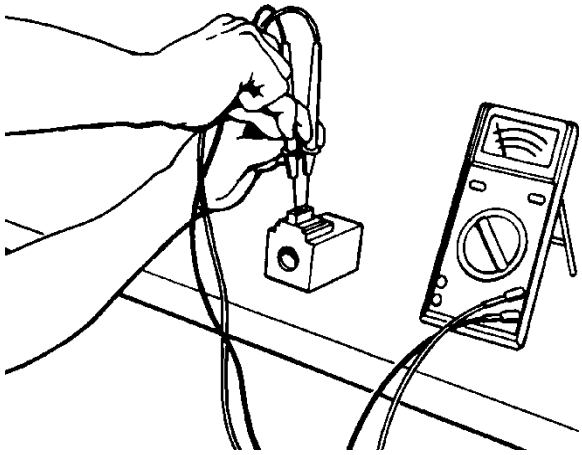
Index No.	Description	Schematic Item	Function	Torque
1	3 position 4 way solenoid valve	GG	Steer left/right	30-35 in-lbs / 3-4 Nm
2	Relief valve, 250 psi (17.2 bar)	HH	Sequencing	10-12 ft-lbs / 14-16 Nm
3	2 position 4 way solenoid valve	II	Oscillate circuit	30-35 in-lbs / 3-4 Nm



How to Check the Resistance of a Valve Coil

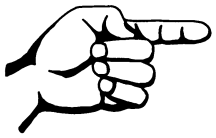
1 Turn the key switch to the OFF position and disconnect the wires from the valve coil to be tested.

2 Connect the leads from an ohmmeter to the valve coil terminals.



Valve coil specifications	
3 position 4 way solenoid valve, 10V (schematic item GG)	4.5 to 5.3Ω
2 position 4 way solenoid valve, 10V (schematic item II)	4.5 to 5.3Ω

MANIFOLDS



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MANIFOLDS

11-7
2WD Drive Manifold Components

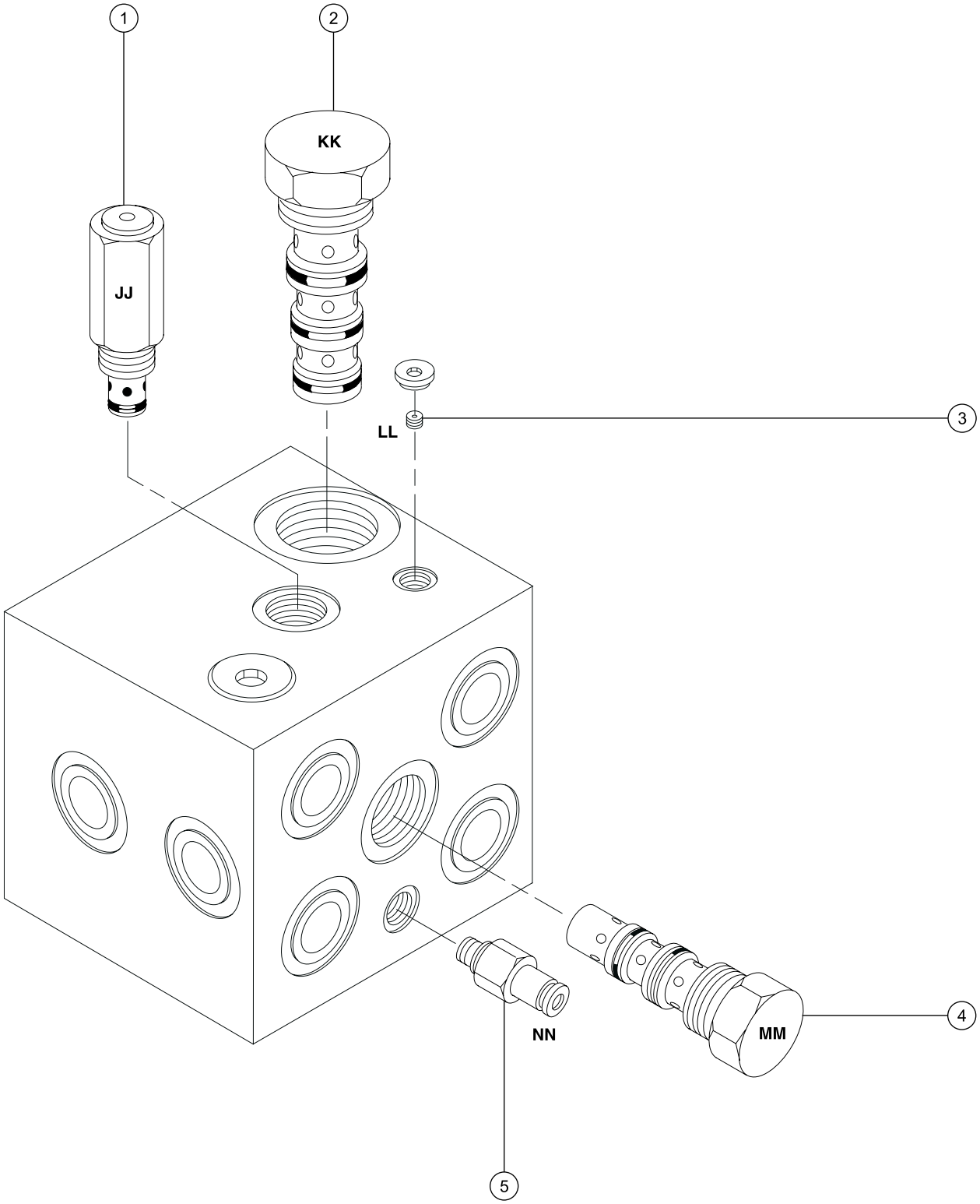
The drive manifold is mounted inside the drive chassis at the non-steer end.

Index No.	Description	Schematic Item	Function	Torque
1	Relief valve, 250 psi (17.2 bar)	JJ	Charge pressure circuit	10-12 ft-lbs / 14-16 Nm
2	Flow divider/combiner valve	KK	Controls flow to drive motors in forward and reverse	25-30 ft-lbs / 34-41 Nm
3	Orifice, 0.070 in (1.78 mm)	LL	Drive circuit	
4	Shuttle valve, 3 position 3 way	MM	Charge pressure circuit that gets hot oil out of low pressure side of drive pump and allows low pressure flow path for brake release and 2-speed motor shift	15-18 ft-lbs / 20-24 Nm
5	Diagnostic fitting	NN	Testing	

Plug Torque Specifications

SAE No. 8	5/16	50 ft-lbs / 68 Nm
SAE No. 10	9/16	55 ft-lbs / 75 Nm
SAE No. 12	5/8	75 ft-lbs / 102 Nm

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11-8
Valve Adjustments, 2WD Drive Manifold

How to Adjust the Charge Pressure Relief Valve

1 Connect a 0 to 600 psi (0 to 41 bar) pressure gauge to the test port (item 5) located on the drive manifold.

2 Start the engine from the platform controls.

3 Drive the machine slowly in either direction and observe the pressure reading on the pressure gauge.

4 Turn the engine off. Hold the charge pressure relief valve and remove the cap (item 1).

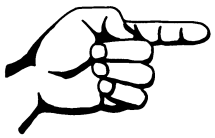
5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the valve cap.

6 Restart the engine. Drive the machine in either direction and recheck the valve pressure.

7 Turn the engine off, then remove the pressure gauge.

Charge Pressure Relief valve specifications

Pressure	250 psi 17.2 bar



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MANIFOLDS

11-9
4WD Drive Manifold Components

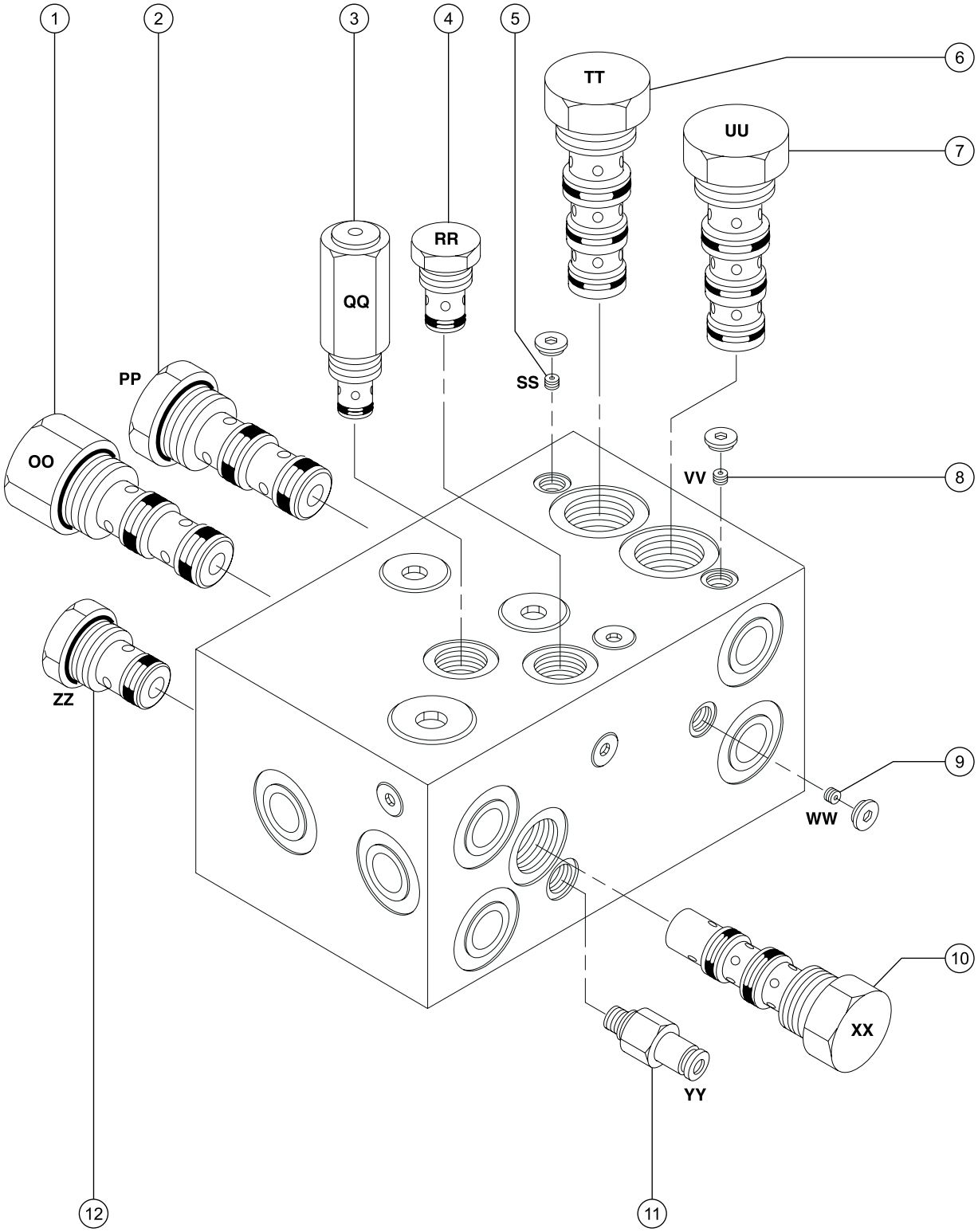
The drive manifold is mounted inside the drive chassis at the non-steer end.

Index No.	Description	Schematic Item	Function	Torque
1	Directional valve, 2 position 2 way	OO	High speed divider bypass N.C. Pilot to open	25-30 ft-lbs / 34-41 Nm
2	Flow divider/combiner valve	PP	Controls flow to flow divider/combiner valves 6 and 7	25-30 ft-lbs / 34-41 Nm
3	Relief valve, 250 psi (17.2 bar)	QQ	Charge pressure circuit	10-12 ft-lbs / 14-16 Nm
4	Check valve, pilot to close	RR	Works in conjunction with Index no. 12 in the high speed divider bypass circuit	10-12 ft-lbs / 14-16 Nm
5	Orifice - plug, 0.052 inch (1.32 mm)	SS	Front drive motor circuit	
6	Flow divider/combiner valve	TT	Controls flow to steer end drive motors in forward and reverse	25-30 ft-lbs / 34-41 Nm
7	Flow divider/combiner valve	UU	Controls flow to non-steer end drive motors in forward and reverse	25-30 ft-lbs / 34-41 Nm
8	Orifice, 0.070 in (1.78 mm)	VV	Rear drive motor circuit	
9	Orifice, 0.070 in (1.78 mm)	WW	Equalizes pressure on both sides of flow divider combiner valve Index no. 2	
10	Shuttle valve, 3 position 3 way	XX	Charge pressure circuit that gets hot oil out of low pressure side of drive pump and allows low pressure flow path for brake release and 2-speed motor shift	15-18 ft-lbs / 20-24 Nm
11	Diagnostic fitting	YY	Testing	
12	Check valve	ZZ	Works in conjunction with Index no.4 in the high speed divider bypass circuit	10-12 ft-lbs / 14-16 Nm

Plug Torque Specifications

Description	Hex size	Torque
SAE No. 2	1/8	50 in-lbs / 6 Nm
SAE No. 4	3/16	13 ft-lbs / 18 Nm

MANIFOLDS



MANIFOLDS

11-10
Valve Adjustments, 4WD Drive Manifold

How to Adjust the Charge Pressure Relief Valve

1 Connect a 0 to 600 psi (0 to 41 bar) pressure gauge to the test port (item 11) located on the drive manifold.

2 Start the engine from the platform controls.

3 Drive the machine slowly in either direction and observe the pressure reading on the pressure gauge.

4 Turn the engine off. Hold the charge pressure relief valve and remove the cap (index 3).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Then install the valve cap.

6 Restart the engine. Drive the machine in either direction and recheck the valve pressure.

7 Turn the engine off, then remove the pressure gauge.

Charge Pressure Relief valve specifications

Pressure	250 psi 17.2 bar

Fuel and Hydraulic Tanks

12-1 Fuel Tank

How to Remove the Fuel Tank

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

⚠DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

1 Turn the manual fuel shutoff valve to the CLOSED position.

2 Remove the tank side turntable cover. See 6-1, *How to Remove a Turntable Cover*.

3 Disconnect, drain and plug the supply and return fuel lines. Cap the fuel return fitting on the fuel tank.

4 Remove the retaining fasteners from the fuel tank hold down straps. Remove the straps from the fuel tank.

5 Support the fuel tank with 2 lifting straps. Place one lifting strap at each end of the tank and attach the lifting straps to an overhead crane.

6 Remove the fuel tank from the machine.

⚠WARNING Crushing hazard. The fuel tank may become unbalanced and fall if it is not properly supported and secured to the overhead crane.

NOTICE Clean the fuel tank and inspect for rust and corrosion before installing.

12-2 Hydraulic Tank

The primary functions of the hydraulic tank are to cool, clean and deaerate the hydraulic fluid during operation. The hydraulic tank has a 45 gallon (170 liters) capacity and an oil level gauge with a temperature indicator. It utilizes internal suction strainers for the pump supply suction lines and has an external return line filter with condition indicator.

How to Remove the Hydraulic Tank

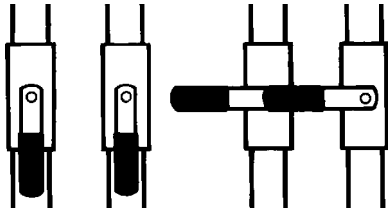
CAUTION Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the fuel tank. See 12-1, *How to Remove the Fuel Tank.*

FUEL AND HYDRAULIC TANKS

2 Close the two hydraulic shutoff valves located at the hydraulic tank.



CAUTION Component damage hazard. The engine must not be started with the hydraulic tank shutoff valves in the CLOSED position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

3 Remove the drain plug from the hydraulic tank.

4 Completely drain the tank into a suitable container. See capacity specifications.

5 Tag, disconnect and plug the two suction hoses that are attached to the hydraulic tank shutoff valves.

6 Disconnect and plug the T-fitting located at the return filter with the 2 hoses connected to it. Cap the fitting on the return filter housing.

7 Disconnect and plug the supply hose for the auxiliary power unit. Cap the fitting on the hydraulic tank.

8 Remove the retaining fasteners from the hydraulic tank hold down straps. Remove the straps from the hydraulic tank.

9 Support the hydraulic tank with 2 lifting straps. Place one lifting strap at each end of the tank and attach the lifting straps to an overhead crane.

10 Remove the hydraulic tank from the machine.

⚠WARNING Crushing hazard. The hydraulic tank may become unbalanced and fall if it is not properly supported and secured to the overhead crane.

11 Remove the suction strainers from the tank and clean them using a mild solvent.

12 Rinse out the inside of the tank using a mild solvent.

13 Install the suction strainers using a thread sealant on the threads.

14 Install the drain plug using a thread sealant on the threads.

15 Install the hydraulic tank onto the machine.

16 Install the two suction hoses and the supply hose for the auxiliary power unit.

17 Fill the tank with hydraulic oil until the level is within the top 2 inches (5 cm) of the sight gauge. Do not overfill.

18 Clean up any oil that may have spilled and open the hydraulic tank valves.

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

NOTICE Always use pipe thread sealant when installing the drain plug.

NOTICE Use only Dexron equivalent hydraulic fluid.

Hydraulic system	
Hydraulic tank capacity	45 gallons 170 liters
Hydraulic system capacity (including tank)	53 gallons 201 liters
Hydraulic fluid	Dexron equivalent

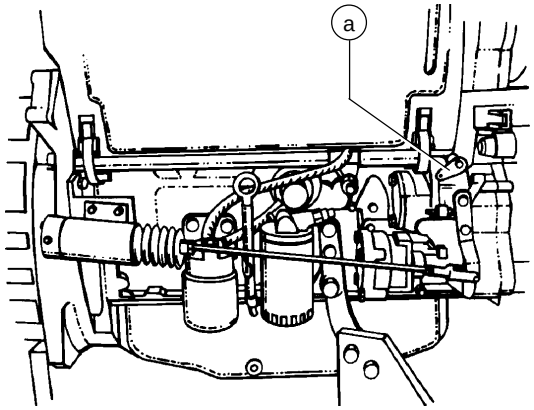
How to Prime the Pump

CAUTION Component damage hazard. Be sure that the hydraulic tank shutoff valves are in the OPEN position before priming the pump. The engine must not be started with the hydraulic tank shutoff valves in the CLOSED position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

1 Connect a 0 to 600 psi (0 to 41 bar) pressure gauge to the test port on the drive pump.

2 **Gasoline/LPG models:** Close the valve on the LPG tank then disconnect the hose from the tank. Then move the fuel select switch to the LPG position.

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



a manual fuel shutoff valve

3 Crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 320 psi (22 bar).

4 **Gasoline/LPG models:** Connect the LPG hose to the LPG tank and open the valve on the tank.

5 Start the engine from the ground controls and check for hydraulic leaks.

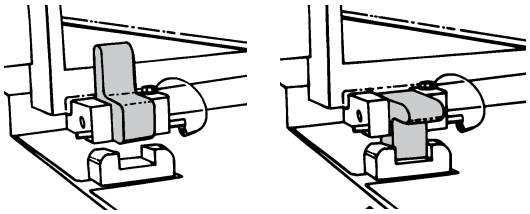
Turntable Rotation Components

13-1
Turntable Rotation Hydraulic Motor

How to Remove the Rotation Hydraulic Motor

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

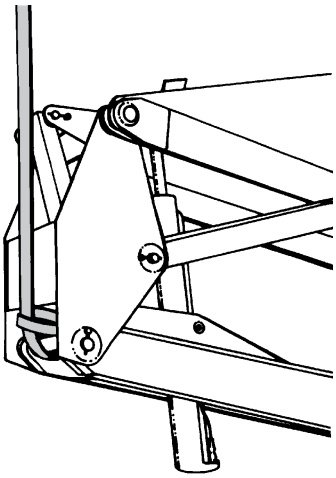
1 Secure the turntable from rotating with the turntable rotation lock.



unlocked locked

2 Raise the secondary boom until the platform end of the lower secondary boom arm is approximately 8 feet (2.4 m) off the ground.

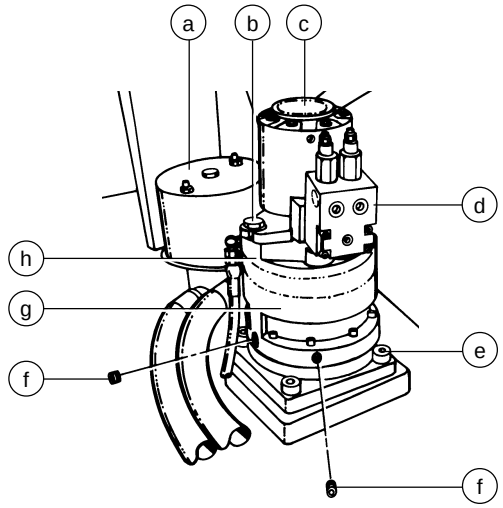
3 Attach a lifting strap from an overhead crane to the platform end of the lower secondary boom arm for support. Do not lift it.



4 Tag, disconnect and plug the hydraulic hoses from the brake and turntable rotation manifold. Cap the fittings on the brake and turntable rotation manifold.

⚠WARNING 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.

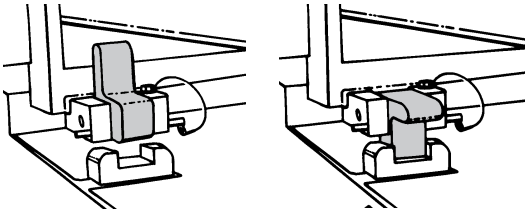
5 Remove the motor/brake mounting fasteners, then remove the motor from the brake.



a electrical rotary coupler
b motor/brake mounting bolts
c motor
d turntable rotation manifold
e torque hub mounting bolt
f plug
g torque hub
h brake

How to Remove the Turntable Rotation Brake or Torque Hub

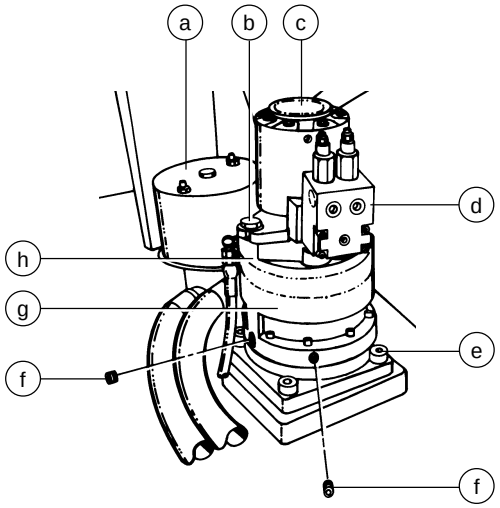
1 Secure the turntable from rotating with the turntable rotation lock.



unlocked locked

2 Remove the motor/brake mounting bolts, and then remove the motor and brake from the torque hub and set them to the side.

CAUTION Component damage hazard. Hoses can be damaged if they are kinked or pinched.



a electrical rotary coupler
b motor/brake mounting bolts
c motor
d turntable rotation manifold
e torque hub mounting bolt
f plug
g torque hub
h brake

3 Remove the torque hub mounting bolts, and then use an appropriate lifting device to remove the torque hub from the machine.

⚠WARNING Crushing hazard. The turntable rotate torque hub may become unbalanced and fall when it is removed from the machine if it is not properly supported.

4 Remove the plug from the side of the torque hub. Then drain the oil from the hub.

5 Install the torque hub. Torque the hub mounting bolts to 180 foot-pounds (244 Newton meters).

6 Install the brake and motor onto the torque hub.

TURNTABLE ROTATION COMPONENTS

7 Fill the hub with oil from the side hole until the oil level is even with the bottom of the hole. Apply pipe thread sealant to the plugs, and then install the plugs.

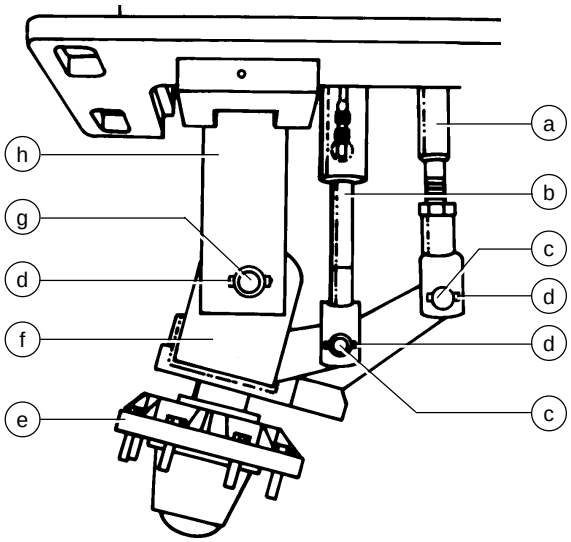
Turntable rotate torque hub	
Capacity	8 fluid ounces 0.24 liters
Type: SAE 90 multipurpose hypoid gear oil - API service classification GL5	

2WD Steering Axle Components

14-1
Yoke and Hub

How to Remove the Yoke and Hub

1 Remove the pin retaining fasteners from the steering cylinder and the tie rod pivot pins.



a tie rod
b steering cylinder
c pivot pin
d retaining bolt
e hub
f yoke
g yoke pivot pin
h axle

2 Loosen the wheel lug nuts. Do not remove them.

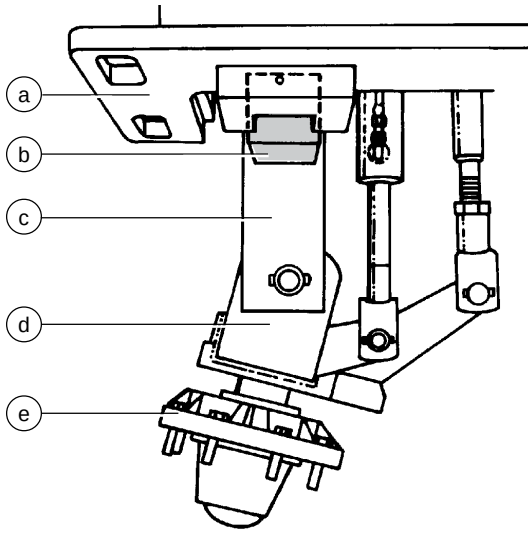
3 Block the non-steering wheels, and then center a lifting jack of ample capacity under the steering axle.

4 Raise the machine approximately 10 inches (25.4 cm) and place blocks under the chassis for support.

5 Remove the lug nuts, then the tire and wheel assembly.

6 Remove the pin retaining fasteners from the yoke pivot pin.

7 **Oscillating axle equipped models:** Place a block between the oscillate cylinder lock-out wedge and the chassis on the same side as the yoke/hub being serviced.



a chassis
b block
c oscillating axle
d yoke
e hub

8 Support and secure the yoke/hub assembly to a lifting jack.

9 Use a soft metal drift to drive the yoke pivot pin down and out.

10 Remove the yoke/hub assembly from the machine.

⚠CAUTION Crushing hazard. The yoke/hub assembly may become unbalanced and fall when the yoke pivot pin is removed if it is not properly supported and secured to the lifting jack.

Torque specifications

Lug nut	125 ft-lbs 169.5 Nm

2WD STEERING AXLE COMPONENTS

How to Remove the Hub and Bearings

1 Loosen the wheel lug nuts. Do not remove them.

2 Block the non-steering wheels and place a lifting jack of ample capacity under the steering axle.

3 Raise the machine and place blocks under the chassis for support.

4 Remove the lug nuts. Then remove the tire and wheel assembly.

5 Remove the dust cap mounting fasteners and remove the dust cap.

6 Remove the cotter pin and castle nut.

7 Pull the hub off the spindle. The washer and outer bearing should fall loose from the hub.

8 Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.

How to Install the Hub and Bearings

NOTICE When replacing a wheel bearing, both the inner and outer bearings including the pressed-in races must be replaced.

1 Be sure that both bearings are packed with grease.

2 Place the large inner bearing into the rear of the hub.

3 Press the bearing seal evenly into the hub until it is flush.

4 Slide the hub onto the yoke spindle.

CAUTION Component damage. Do not apply excessive force or damage to the lip of the seal may occur.

5 Place the outer bearing into the hub.

6 Install the washer and castle nut.

7 Tighten the castle nut to 35 foot-pounds (47 Nm) to seat the bearing.

8 Loosen the castle nut , then re-tighten to 8 foot-pounds (11 Nm).

9 Install a new cotter pin. Bend the cotter pin to lock it in.

10 Install the dust cap, then the tire and wheel assembly. Torque the wheel lug nuts to 125 foot-pounds (169.5 Nm).

14-2 Steering Cylinders

How to Remove a Steering Cylinder

There are two identical steering cylinders that work in parallel. They are part of the same hydraulic circuit, but move in opposite directions. The tie rod maintains equal movement of the tires.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Tag, disconnect and plug the hydraulic hoses from the steering cylinder. Cap the fittings on the cylinder.

⚠WARNING 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.

2 Remove the pin retaining fasteners from the rod-end pivot pin and the barrel-end pivot pin. Then remove the pivot pin from each end of the steering cylinder.

3 Remove the steering cylinder from the machine.

14-3 Tie Rod

How to Remove the Tie Rod

1 Remove the pin retaining fasteners from the pivot pins from each end of the tie rod. Then remove the pins.

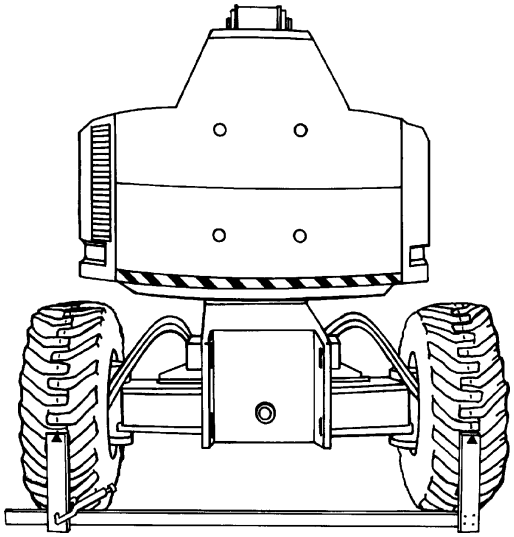
2 Remove the tie rod.

How to Perform the Toe-in Adjustment

NOTICE Perform this procedure on a firm level surface. Block the non-steering tires and be sure that the machine is in the stowed position.

1 Straighten the steer wheels.

2 Measure the steer tires, front to front and back to back, using a measuring fixture .



3 Center a lifting jack of ample capacity under the steering axle, then raise the machine.

4 Loosen the jam nut on the adjustable end of the tie rod.

5 Remove the pin retaining fasteners from the pivot pin at the adjustable end of the tie rod.

6 Slide the tie rod off the yoke and adjust it by turning the end.

NOTICE One turn on the adjustable end equals approximately 1/8 inch (3.2 mm) change in the front and rear measurements.

7 Slide the tie rod onto the yoke. Install the pivot pin, then install the pin retaining fasteners.

8 Tighten the jam nut against the tie rod.

9 Lower the machine and recheck the front and back measurements (step 2). If further adjustment is needed, repeat steps 3 through 8.

Toe-in specification	0 ± 1/8 inch (6.35 mm)

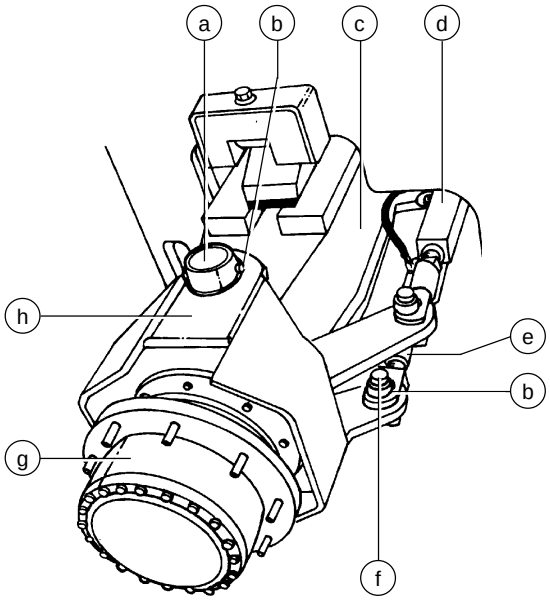
4WD Steering Axle Components

15-1
Yoke and Hub

How to Remove the Yoke and Hub

The yoke installation utilizes bushings and a thrust washer that may require periodic replacement. The yoke must be removed before the torque hub can be removed. The wheel motor on 4WD models is an integral part of the torque hub.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*



a yoke pivot pin
b retaining bolt
c oscillating axle
d tie rod
e steering cylinder
f pivot pin
g torque hub
h yoke

1 Remove the pin retaining fasteners from the steering cylinder and the tie rod pivot pins.

2 Tag, disconnect and plug the hydraulic hoses from the drive motor. Cap the fittings on the drive motor.

⚠WARNING 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 Loosen the wheel lug nuts. Do not remove them.

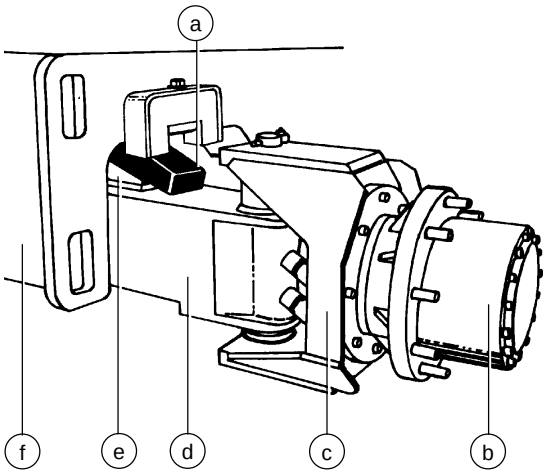
4 Block the non-steering wheels, and then center a lifting jack of ample capacity under the steering axle.

5 Raise the machine approximately 10 inches (25.4 cm) and place blocks under the chassis for support.

6 Remove the lug nuts, then remove the tire and wheel assembly.

7 Remove the pin retaining fasteners from the yoke pivot pin.

8 Place a block between the oscillate cylinder lock-out wedge and the chassis on the same side as the yoke/torque hub being serviced.



a block
b torque hub
c yoke
d oscillating axle
e lock-out wedge
f chassis

9 Support and secure the yoke/torque hub assembly to a lifting jack.

10 Use a soft metal drift to drive the yoke pivot pin down and out.

⚠CAUTION Crushing hazard. The yoke/torque hub assembly may become unbalanced and fall when the yoke pivot pin is removed if it is not properly supported and secured to the lifting jack.

11 Place the yoke/torque hub assembly on a flat surface with the torque hub down.

12 Remove the torque hub fasteners that attach the yoke to the torque hub. Remove the yoke weldment from the torque hub.

Torque specifications	
Lug nut	125 ft-lbs 169.5 Nm
Torque hub mounting bolts	120 ft-lbs 163 Nm

15-2 Steering Cylinders

How to Remove a Steering Cylinder

This procedure is the same as the 2WD procedure. See repair procedure 14-2, *How to Remove a Steering Cylinder*.

15-3 Tie Rod

How to Remove the Tie Rod

This procedure is the same as the 2WD procedure. See Repair Procedures 14-3, *How to Remove the Tie Rod*.

How to Perform the Toe-in Adjustment

This procedure is the same as the 2WD procedure. See Repair Procedures 14-3, *How to Perform the Toe-in Adjustment*.

Oscillating Axle Components

16-1 Oscillating Axle Lock-out Cylinder

The oscillating axle lock-out cylinder extends the lock-out wedges between the chassis and the oscillating axle when the boom is raised, extended or the turntable is rotated. The cylinder slides from side to side in a track on the oscillating axle and uses an externally mounted proximity switch to detect when the lock-out wedges are fully extended.

How to Remove the Oscillating Axle Lock-out Cylinder

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

NOTICE Perform this procedure on a firm level surface with the boom in the stowed position.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the drive chassis cover from the steer end of the machine.

2 Tag, disconnect and plug the oscillating axle lock-out cylinder hydraulic hoses. Cap the fittings on the cylinder.

⚠WARNING 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 proximity switch mounting fasteners from the oscillating axle lock-out cylinder.

4 Remove the retaining fasteners from the wedge block on the rod end of the oscillating axle lock-out cylinder, then slide the wedge block to the right as far as possible.

5 Slide the oscillating axle lock-out cylinder to the left, then remove the cylinder.

Non-steering Axle Components

17-1 Drive Motor

How to Remove a Drive Motor

CAUTION Component damage hazard. Repairs to the motor should only be performed by an authorized Sundstrand-Sauer dealer.

CAUTION Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the non-steer axle cover fasteners, then remove the covers to access the drive motors.

2 Tag, disconnect and plug the hydraulic hoses from the drive motor. Cap the fittings on the drive motor.

⚠WARNING 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 drive motor mounting fasteners.

4 Guide the drive motor shaft out of the brake and then remove the drive motor from the machine.

17-2 Torque Hub

How to Remove a Drive Torque Hub

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation.
Refer to Section Two, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the drive motor. See 17-1, *How to Remove a Drive Motor*.

2 Tag, disconnect and plug the hydraulic hose from the brake. Then remove the hydraulic fitting and the bleed valve.

⚠WARNING 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 Loosen the wheel lug nuts. Do not remove them.

4 Block the steering wheels, then center a lifting jack under the non-steering axle. Raise the machine and place blocks under the chassis for support.

5 Remove the wheel lug nuts, then the tire and wheel assembly.

6 Place a second lifting jack under the torque hub for support and secure the torque hub to the lifting jack.

7 Remove the torque hub mounting bolts that attach the torque hub to the non-steer axle.

NON-STEERING AXLE COMPONENTS

8 Remove the torque hub from the non-steer axle.

⚠CAUTION Crushing hazard. The torque hub may become unbalanced and fall if it is not properly supported and secured to the lifting jack.

Torque specifications

Lug nut,		
dry	125 ft-lbs	169.5 Nm
lubricated	94 ft-lbs	127.4 Nm
Torque hub mounting bolts,		
dry	120 ft-lbs	163 Nm
lubricated	90 ft-lbs	122 Nm
Drive motor mounting bolts,		
dry	75 ft-lbs	102 Nm
lubricated	56 ft-lbs	76 Nm

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