Genie®
A TEREX BRAND

Service Manual

Serial Number Range

GTH-1048
GTH-1056

from GTH1007A-11443 to GTH1009A-14000

from GTH1007B-7101 to GTH1007B-7251

Part No. 123701
Rev G
March 2016

Introduction

Important

Read, understand and obey the safety rules and operating instructions in the appropriate Operator's Manual on your machine before attempting any maintenance procedure.

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 an authorized Genie dealer service center.

Compliance

Machine Design Life

Unrestricted with proper operation, inspection and scheduled maintenance.

Technical Publications

Genie 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 all other manuals.

Contact Us:

Internet: www.genielift.com
E-mail: awp.techpub@terex.com

Find a Manual for this Model

Go to http://www.genielift.com

Use the links to locate Service Manuals, Maintenance Manuals, Service and Repair Manuals, Parts Manuals and Operator's Manuals.

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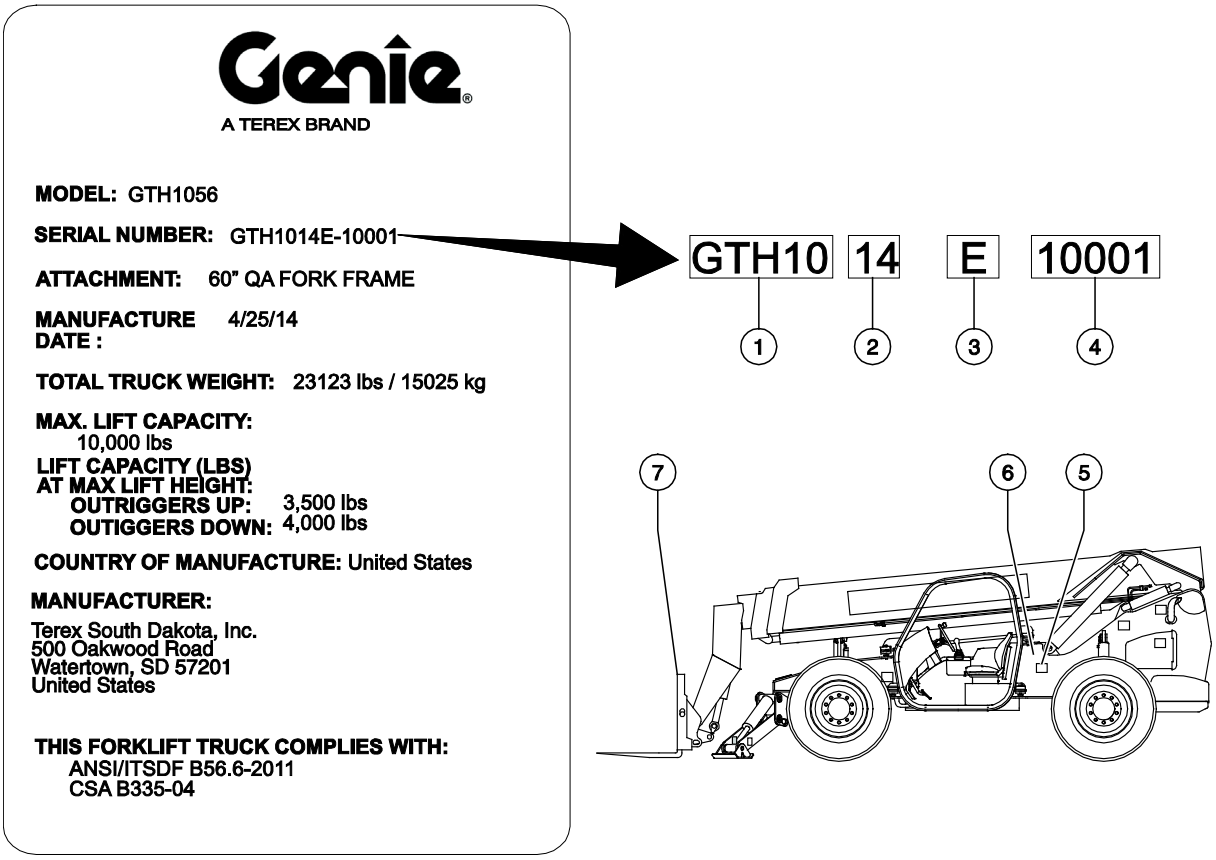
Revision History

Revision	Date	Section	Procedure / Page / Description
C	7/2012		Spec, Maint, Repair, Fault and Schematics
C1	3/2013		Spec, Maint and Schematics
D	6/2013		Fault
E	8/2013		Maint
F	9/2014	Spec	Hydraulic Oil
		Maint	ZF Transmission
		Fault	Deutz Fault Codes
		Schem	Telematics
F1	3/2015	Schem	Electrical and Hydraulic
F2	5/2015	Schem	Fuse Box Layout / Electrical
G	3/2016	All	Ending SN for GTH-1048 Ending SN for GTH-1056 for MM/SRM

Reference Examples:	**Electronic Version** Click on any content or procedure in the Table of Contents to view the update.
Section – Maintenance, B-3	
Section – Repair Procedure, 4-2	
Section – Fault Codes, All charts	
Section – Schematics, Legends and schematics	

Introduction

Serial Number Legend



1 Model
2 Model year
3 Facility code (for models manufactured in multiple facilities)
4 Sequence number
5 Serial label
6 Serial number (stamped on chassis)
7 Serial label (located inside fork frame)

Safety Rules



Danger

Failure to obey the instructions and safety rules in this manual and the appropriate Operator's Manual on your machine will result in 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 and worksite regulations
- 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 Indicates a imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.



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

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.



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 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.



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

Table of Contents

Introduction	**Introduction**	**ii**
	Important Information	ii
	Find a Manual for this Model	ii
	Revision History	iii
	Serial Number Legend	iv
Section 1	**Safety Rules**	**v**
	General Safety Rules	v
Section 2	**Specifications**	**1**
	Machine Specifications	1
	Performance Specifications	2
	Hydraulic Specification	3
	Hydraulic Component Specifications	6
	Manifold Component Specifications	7
	Air Conditioner Refrigerant Specifications	7
	John Deere 4045HF485 Engine Specifications	8
	Perkins 1104D-E44TA Engine Specifications	9
	Dana T20000 Transmission Specifications	10
	Dana Planetary 213 Drive Axle Specifications	10
	Hydraulic Hose and Fitting Torque Specifications	11
	Torque Procedure	12
Section 3	**Scheduled Maintenance Procedures**	**13**
	Introduction	13
	Pre-Delivery Preparation Report	16
	Maintenance Inspection Report	17
	Maintenance Inspection Report	18

Table of Contents

Checklist A Procedures 19
A-1 Inspect the Manuals and Decals 19
A-2 Perform Pre-operation Inspection 20
A-3 Perform Function Tests 20
A-4 Lubricate the Boom 21
A-5 Perform Engine Maintenance - All Models 21
A-6 Perform Transmission Maintenance 22
A-7 Perform 30 Day Service 22
A-8 Perform Axle Maintenance 23
A-9 Perform Engine Maintenance - John Deere Models 23
A-10 Perform Axle Maintenance 24
A-11 Perform Axle Maintenance 24
Checklist B Procedures 25
B-1 Inspect the Batteries 25
B-2 Inspect the Electrical Wiring 26
B-3 Check the Exhaust System 27
B-4 Inspect the Engine Air Filter 28
B-5 Inspect the Tires, Wheels and Lug Nut Torque 28
B-6 Perform Hydraulic Oil Analysis 29
B-7 Inspect the Fuel and Hydraulic Tank Cap Venting Systems 29
B-8 Check the Boom Wear Pads 30
B-9 Lubricate the Driveshaft 31
B-10 Perform Engine Maintenance - John Deere Models 32
Checklist C Procedures 33
C-1 Inspect and Lubricate the Sequencing Chains 33
C-2 Perform Engine Maintenance - John Deere Models 34
C-3 Perform Axle Maintenance 35
C-4 Perform Transmission Maintenance - Dana Models 35
C-5 Perform Engine Maintenance - Perkins Models 36
C-6 Perform Engine Maintenance - Perkins Models 36
C-7 Adjust the Boom Sequencing Chains 37
C-8 Perform Axle Maintenance 38
C-9 Perform Axle Maintenance 38

Table of Contents

Checklist D Procedures **39**
D-1 Inspect the Forks 39
D-2 Perform Transmission Maintenance - Dana Models 39
D-3 Replace Hydraulic Tank Return Filter Element 40
D-4 Perform Axle Maintenance 40
D-5 Perform Engine Maintenance - Perkins Models 41

Checklist E Procedures **42**
E-1 Test or Replace the Hydraulic Oil 42
E-2 Perform Engine Maintenance - John Deere Models 43
E-3 Perform Engine Maintenance - Perkins Models 43
E-4 Perform Engine Maintenance - Perkins Models 44
E-5 Perform Engine Maintenance - John Deere Models 44
E-6 Perform Engine Maintenance - Perkins Models 45

Section 4 **Repair Procedures** **46**
Introduction 46

Boom Components **48**
1-1 Boom Proximity Switch 48
How to Test a Proximity Switch 48
How to Adjust the Boom Angle Proximity Switch 49
How to Adjust the Boom Extend Proximity Switch 49
1-2 Boom 50
How to Replace the Boom Wear Pads 50
How to Remove the Lifting Fork Frame 50
How to Remove the Cable Bridge Assembly , GTH-1056 51
How to Replace the Retraction Chain 52
How to Replace the Extension Chains 55
How to Remove the Boom 57
How to Disassemble the Boom - GTH-1048 59
How to Disassemble the Boom - GTH-1056 61
1-3 Boom Lift Cylinder 64

Table of Contents

1-4 Boom Extension Cylinder 65
1-5 Fork Level Cylinder 66
1-6 Hydraulic Hoses 67
How to Replace the Fork Level and/or Auxiliary Cylinder Hoses, GTH-1048 67
How to Replace the Fork Level and/or Auxiliary Cylinder Hoses, GTH-1056 68
Operator's Compartment 71
2-1 Operator's Compartment 71
2-2 Machine Controls 73
How to Remove the Steering Column 73
How to Remove the Steering Wheel 73
How to Remove the Steer Orbitral 74
How to Remove the Joystick - Models with Single Joystick 74
How to Remove the Joystick - Models with Dual Joysticks 75
How to Remove the Brake Pedal Assembly 75
How to Remove the Gauge Cluster Assembly 76
How to Remove the Diagnostic Display 76
Fuel and Hydraulic Tanks 77
3-1 Fuel and Hydraulic Tanks 77
Engines 78
4-1 Engines 78
How to Repair the John Deere 4045T Engine 78
How to Repair the Perkins 1104D-E44TA Engine 78
How to Remove the Engine 78
4-2 Engine Fault Codes 79
Transmission 80
5-1 Transmission 80
How to Repair the Transmission 80
How to Remove the Transmission 80

Table of Contents

Hydraulic Pump 82
6-1 Hydraulic Pump 82
How to Test the Function Pump 82
How to Remove the Function Pump 83
How to Install the Function 84
How to Prime the Function Pump 84
How to Adjust the Function Pump Standby Pressure 85
How to Adjust the Function Pump Pressure Compensator 86

Manifolds 88
7-1 Primary Function Manifold Components - Models with Single Joystick 88
7-2 Primary Function Manifold Components - Models with Dual Joysticks 92
7-3 Secondary Function Manifold Components 96
7-4 Outrigger Manifold Components 98
7-5 Auxiliary Manifold Components (option) 100
7-6 Brake Manifold Components 101
7-7 AC Hydraulic Manifold Components 102
7-8 Valve Adjustments - Secondary Function Manifold 103
How to Set the Steer System Pressure 103
How to Set the Parking Brake System Pressure 104
How to Set the Differential Lock/Joystick System Pressure 105
How to Set the Rear Lock-up System Pressure 106
7-9 Valve Coils 107

Axle 109
8-1 Axles 109
How to Remove the Axle 109
How to Repair the Axle 109

Outriggers 110
9-1 Outriggers 110
How to Remove an Outrigger 110
How to Remove an Outrigger Cylinder 111

Table of Contents

Section 5	**Fault Codes**	**113**
	Introduction	113
	Diagnostic Display	**114**
	John Deere 4045HF485 Engine Fault Codes	**116**
	Perkins 1104 Engine Fault Codes	**123**
Section 6	**Schematics**	**126**
	Introduction	126
	Proximity Switch Legend	127
	Fuse Panel Layout	128
	Electrical Component Legend	129
	Wire Color Legend	130
	Electrical Symbol Legend	131
	Hydraulic Symbols Legend	132
	Electrical Schematics	**133**
	Electrical Schematic	134
	Hydraulic Schematics	**137**
	Hydraulic Schematic - Models with Single Joystick	138
	Hydraulic Schematic - Models with Dual Joystick	139

Specifications

Machine Specifications

Tires and wheels	
Tire size	14.00 x 24
Tire ply rating	12
Weight, rough terrain tire (air filled)	315 lbs 142.9 kg
Weight, rough terrain tire (foam filled)	967 ±35 lbs 439 ±16 kg
Weight, rock lug tire (foam filled)	1013 ±35 lbs 459 ±16 kg
Tire pressure (models with air-filled tires)	50 psi 3.45 bar
Lug nut torque	465 ft-lbs 630 Nm
Lug Pattern	10 x 13.189
Wheel diameter	24 in 60.1 cm
Wheel width	9 in 22.9 cm

Fluid capacities	
Fuel tank	35 gallons 132.5 liters
Hydraulic tank	44 gallons 166.5 liters
Hydraulic system (including tank)	55 gallons 208.2 liters

Specifications

Performance Specifications

Drive speed, maximum	18 mph 29 km/h
Draw bar pull	29,000 lbs 13,154 kg
Lift capacity, maximum	10,000 lbs 4545 kg

Boom function speeds, maximum	
GTH-1048	
Boom up	12 to 14 seconds
Boom down	13 to 15 seconds
Boom extend	16 to 18 seconds
Boom retract	15 to 17 seconds
Fork rotate	19 to 21 seconds
GTH-1056	
Boom up	17 to 19 seconds
Boom down	23 to 25 seconds
Boom extend	14 to 16 seconds
Boom retract	13 to 15 seconds
Fork rotate	3 to 6 seconds

Hydraulic Oil Specifications

Hydraulic Fluid Specifications	
Genie specifications require hydraulic oils which are designed to give maximum protection to hydraulic systems, have the ability to perform over a wide temperature range, and the viscosity index should exceed 140. They should provide excellent antiwear, oxidation prevention, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.	
Cleanliness level, minimum	ISO 15/13
Water content, maximum	250 ppm
Recommended Hydraulic Fluid	
Hydraulic oil type	Chevron Rando HD Premium
Viscosity grade	32
Viscosity index	200
Optional Hydraulic Fluids	
Mineral based	Shell Tellus S2 V 32 Shell Tellus S2 V 46 Shell Tellus S4 VX 32 Shell Shell Donax TG (Dexron III) Chevron 5606A
Biodegradable	Petro Canada Environ MV 46
Fire resistant	UCON Hydrolube HP-5046

Note: Genie specifications require additional equipment and special installation instructions for the approved optional fluids. Consult Genie Product Support before use.

NOTICE

Optional fluids may not have the same hydraulic lifespan and may result in component damage.

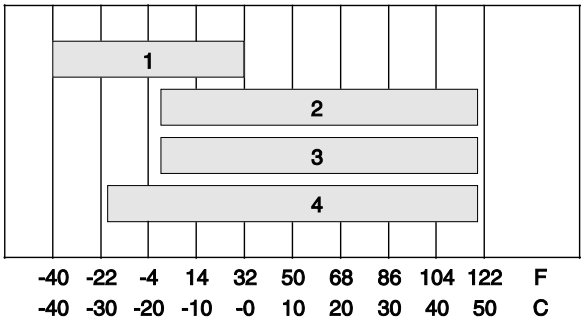
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond it's maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

NOTICE

Do not top off with incompatible hydraulic fluids. Hydraulic fluids may be incompatible due to the differences in base additive chemistry. When incompatible fluids are mixed, insoluble materials may form and deposit in the hydraulic system, plugging hydraulic lines, filters, control valves and may result in component damage.

Note: Do not operate the machine when the ambient air temperature is consistently above 120°F / 49°C.

Hydraulic Fluid Temperature Range



Ambient air temperature

1 Chevron hydraulic oil 5606A
2 Petro-Canada Environ MV 46
3 UCON Hydrolube HP-5046D
4 Chevron Rando HD premium oil MV

Specifications

Petro-Canada Environ MV 46 Fluid Properties

ISO Grade	46
Viscosity index	154
Kinematic Viscosity	
cSt @ 200°F / 100°C	8.0
cSt @ 104°F / 40°C	44.4
Flash point	482°F / 250°C
Pour point	-49°F / -45°C
Maximum continuous operating temperature	180°F / 82°C

UCON Hydrolube HP-5046 Fluid Properties

ISO Grade	46
Viscosity index	192
Kinematic Viscosity	
cSt @ 149°F / 65°C	22
cSt @ 104°F / 40°C	46
cSt @ 0°F / -18°C	1300
Flash point	None
Pour point	-81°F / -63°C
Maximum continuous operating temperature	189°F / 87°C

Shell Tellus S4 VX Fluid Properties

ISO Grade	32
Viscosity index	300
Kinematic Viscosity	
cSt @ 200°F / 100°C	9
cSt @ 104°F / 40°C	33.8
Brookfield Viscosity	
cSt @ -4°F / -20°C	481
cSt @ -13°F / -25°C	702.4
cSt @ -40°F / -40°C	2624
Flash point	>100
Pour point	-76°F / -60°C
Maximum continuous operating temperature	103°F / 75°C

Chevron Rando HD Premium Oil MV Fluid Properties

ISO Grade	32
Viscosity index	200
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C	 7.5 33.5
Brookfield Viscosity cP @ -4°F / -20°C cP @ -22°F / -30°C	 1040 3310
Flash point	375°F / 190°C
Pour point	-58°F / -50°C
Maximum continuous operating temperature	171°F / 77°C

Note: A hydraulic oil heating system is recommended when the ambient temperature is consistently below 0°F / -18°C.

Note: Do not operate the machine when the ambient temperature is below -20°F / -29°C with Rando HD Premium MV.

Chevron 5606A Hydraulic Oil Fluid Properties

ISO Grade	15
Viscosity index	300
Kinematic Viscosity cSt @ 200°F / 100°C cSt @ 104°F / 40°C cSt @ -40°F / -40°C	 5.5 15.0 510
Flash point	180°F / 82°C
Pour point	-81°F / -63°C
Maximum continuous operating temperature	124°F / 51°C

Note: Use of Chevron 5606A hydraulic fluid, or equivalent, is required when ambient temperatures are consistently below 0°F / -17°C unless an oil heating system is used.

NOTICE

Continued use of Chevron 5606A hydraulic fluid, or equivalent, when ambient temperatures are consistently above 32°F / 0°C may result in component damage

Specifications

Hydraulic Component Specifications

Function pump	
Type: variable displacement piston pump	
Displacement	0 to 3.66 cu in 0 to 60 cc
Flow rate @ 2400 rpm	38 gpm 144 L/min
Pump pressure, maximum	3190 psi 220 bar
Pressure compensator	3190 psi 220 bar
Standby pressure	464 psi 32 bar

Primary Function Manifold	
System relief valve pressure, maximum (measured at test port TP)	3500 psi 241 bar
Boom extend relief valve pressure, maximum	3500 psi 241 bar
Fork tilt relief valve pressure, maximum	3500 psi 241 bar
Flow regulator, Fork tilt circuit	14 gpm 53 L/min
Flow regulator, Sway circuit	2 gpm 7.5 L/min
Flow regulator, Pilot pressure bleed circuit	0.1 gpm 1.4 L/min
Secondary Function Manifold	
Steer relief valve pressure, maximum (measured at test port TS)	2500 psi 172 bar
Parking brake relief valve pressure, maximum (measured at test port TPB)	400 psi 27.5 bar
Diff lock relief valve pressure, maximum (measured at test port TJ)	400 psi 27.5 bar
Rear lock-up relief valve pressure, maximum (measured at test port TR)	50 psi 3.4 bar
Outrigger Manifold	
Flow regulator, Outrigger circuit	6 gpm 22.7 L/min

Specifications

Manifold Component Specifications

Plug torque	
SAE No. 2	50 in-lbs / 6 Nm
SAE No. 4	13 ft-lbs / 18 Nm
SAE No. 6	18 ft-lbs / 24 Nm
SAE No. 8	50 ft-lbs / 68 Nm
SAE No. 10	55 ft-lbs / 75 Nm
SAE No. 12	75 ft-lbs / 102 Nm

Air Conditioner Refrigerant Specifications

System Full Charge	
R134a	1 lb 14 oz

Specifications

John Deere 4045HF485 Engine

Displacement	275 cu. in 4.5 liters
Number of cylinders	4
Bore and Stroke	4.19 x 5 inches 106 x 127 mm
Horsepower	125 @ 2400 rpm 93.2 kW @ 2400 rpm
Firing order	1 - 3 - 4 - 2
Low idle	800 rpm
High idle	2400 rpm
Compression ratio	17:1
Valve clearances, cold	
Intake	0.14 in 0.36 mm
Exhaust	0.18 in 0.46 mm
Lubrication system	
Oil pressure (warm, at rated speed with full load)	60±25 psi 4.13±1.7 bar
Oil pressure (warm, at low idle)	15 psi 1 bar
Oil capacity (including filter)	14 quarts 13.2 liters
Oil viscosity requirements **Oil Type**	15W-40

Units ship with John Deere Engine Break-In Oil.
During the break-in period, add John Deere Engine Break-In Oil as needed to maintain the specified oil level.
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator's Manual on your machine.

Fuel requirement
For fuel requirements, refer to the engine Operator Manual for your engine.

Injection system	
Injection pump make	Stanadyne
Peak injection pressure	10,000 psi 690 bar
Alternator output	95A @ 14V DC
Battery Specifications	
Type	12V DC, Group C31
Quantity	1
Battery capacity, maximum	1000A
Reserve capacity @ 25A rate	200 Minutes
Engine coolant	
Capacity	7 gallons 26.5 liters

Perkins 1104D-E44TA Engine

Displacement	269 cu. in 4.4 liters
Number of cylinders	4
Bore and Stroke	4.13 x 5 inches 105 x 127 mm
Horsepower	125 @ 2400 rpm 93.2 kW @ 2400 rpm
Valve clearance, cold	
Intake	0.013 in 0.35 mm
Exhaust	0.013 in 0.35 mm
Firing order	1 - 3 - 4 - 2
Low idle	1000 rpm
High idle	2500 rpm
Compression ratio	16.2:1
Lubrication system	
Oil pressure at operating temperature	43 to 58 psi 2.9 to 4 bar
Oil capacity (including filter)	10 quarts 9.5 liters

Oil viscosity requirements

Unit ships with 15W-40. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Manual for your engine.

Fuel requirement

For fuel requirements, refer to the engine Operator Manual for your engine.

Fuel injection pressure, minimum	23700 psi 1635 bar
Starter motor	
Normal load	68A
Relay max	50A
Relay continuous	20A
Cranking speed	130 - 200 rpm
Battery Specifications	
Type	12V DC, Group C31
Quantity	1
Battery capacity, maximum	1000A
Reserve capacity @ 25A rate	200 Minutes
Engine coolant	
Capacity	4.6 gallons 17.4 liters
Type	Extended Life
Glow Plugs	
Initial load (0-4 sec)	20A (EA)
Continuous load (>4 sec)	15A (EA)
Alternator output	85A @ 14V DC

Specifications

Dana T20000 Transmission

Transmission Type	3 speed powershift converter
Speeds, Forward	3
Speeds, Reverse	3
Torque Converter	
Maximum input	3100 rpm
Size	12 inches
Lubrication	
Oil capacity	20 quarts 18.9 liters
Oil viscosity requirements	
Extreme operating temperatures may require the use of alternative transmission oils. For oil requirements, refer to the Dana T20000 Maintenance Manual.	
Dana T20000 Service Manual	
Genie part number	115025

Dana Planetary 213 Drive Axle

Steering	Integrated steer cylinder
Joints	Heavy duty double U-joints
Steering angle, maximum	45°
Front Axle Lubrication	
Front differential	15 quarts 14.2 liters
Axle planetary end (each)	2 quarts 1.9 liters
Rear Axle Lubrication	
Rear differential	15 quarts 14.2 liters
Axle planetary end (each)	2 quarts 1.9 liters
Oil viscosity requirements	
Differential	Chevron Supreme 80W90 LS
Planetary ends	Chevron Supreme 80W90 LS
For additional axle information, refer to the Dana 213 Axle Maintenance and Repair Manual	
Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok™ ORFS or 37° JIC fittings and hose ends. Genie specifications require that fittings and hose ends be torqued to specification when they are removed and installed or when new hoses or fittings are installed.

Seal-Lok™ Fittings

(hose end - ORFS)

SAE Dash Size	Torque
-4	10 ft-lbs / 13.6 Nm
-6	30 ft-lbs / 40.7 Nm
-8	40 ft-lbs / 54.2 Nm
-10	60 ft-lbs / 81.3 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	140 ft-lbs / 190 Nm
-24	180 ft-lbs / 245 Nm

JIC 37° Fittings

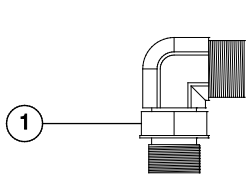
(swivel nut or hose connection)

SAE Dash Size	Thread Size	Flats
-4	7/16-20	2
-6	9/16-18	1 ¼
-8	3/4-16	1
-10	7/8-14	1
-12	1 1/16-12	1
-16	1 5/16-12	1
-20	1 5/8-12	1
-24	1 7/8-12	1

SAE O-ring Boss Port

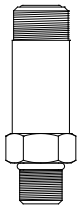
(tube fitting - installed into Aluminum)
(all types)

SAE Dash Size	Torque
-4	14 ft-lbs / 19 Nm
-6	23 ft-lbs / 31.2 Nm
-8	36 ft-lbs / 54.2 Nm
-10	62 ft-lbs / 84 Nm
-12	84 ft-lbs / 114 Nm
-16	125 ft-lbs / 169.5 Nm
-20	151 ft-lbs / 204.7 Nm
-24	184 ft-lbs / 249.5 Nm



Adjustable Fitting

1 jam nut



Non-adjustable fitting

SAE O-ring Boss Port

(tube fitting - installed into Steel)

SAE Dash Size		Torque
-4	ORFS / 37° (Adj) ORFS (Non-adj) 37° (Non-adj)	15 ft-lbs / 20.3 Nm 26 ft-lbs / 35.3 Nm 22 ft-lbs / 30 Nm
-6	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	35 ft-lbs / 47.5 Nm 29 ft-lbs / 39.3 Nm
-8	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	60 ft-lbs / 81.3 Nm 52 ft-lbs / 70.5 Nm
-10	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	100 ft-lbs / 135.6 Nm 85 ft-lbs / 115.3 Nm
-12	(All types)	135 ft-lbs / 183 Nm
-16	(All types)	200 ft-lbs / 271.2 Nm
-20	(All types)	250 ft-lbs / 339 Nm
-24	(All types)	305 ft-lbs / 413.5 Nm

Specifications

Torque Procedure

Seal-Lok™ fittings

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.

Note: The O-ring in Parker Seal Lok™ fittings and hose end are custom-size O-rings. They are not standard size O-rings. They are available in the O-ring field service kit (Genie part number 49612).

2 Lubricate the O-ring before installation.

3 Be sure the O-ring face seal 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. Refer to the appropriate torque chart in this section.

6 Operate all machine functions and inspect the hose, fittings and related components to confirm there are no leaks.

JIC 37° fittings

1 Align the tube flare (hex nut) against the nose of the fitting body (body hex fitting) and tighten the hex nut to the body hex fitting to hand tight, approximately 30 in-lbs / 3.4 Nm.

2 Using a permanent ink marker, make a reference mark on one the flats of the hex nut and continue the mark onto the body of the hex fitting. Refer to Illustration 1.

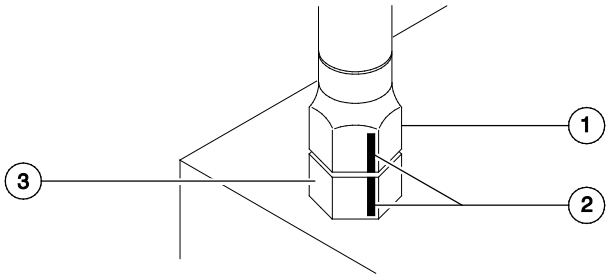


Illustration 1

1 hex nut
2 reference mark
3 body hex fitting

3 Working clockwise on the body hex fitting, make a second mark with a permanent ink marker to indicate the proper tightening position. Refer to Illustration 2.

Note: Use the JIC 37° Fitting table in this section to determine the correct number of flats, for the proper tightening position.

Note: The marks indicate the correct tightening positions have been determined. Use the second mark on the body hex fitting to properly tighten the joint after it has been loosened.

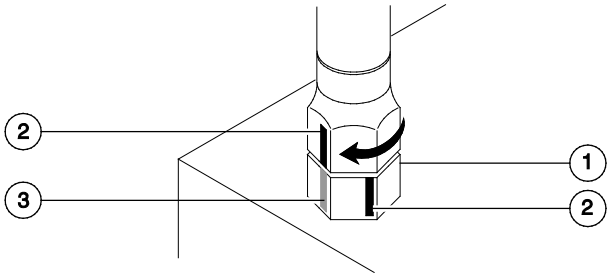


Illustration 2

1 body hex fitting
2 reference mark
3 second mark

4 Tighten the hex nut until the mark on the hex nut is aligned with the second mark on the body hex fitting.

5 Operate all machine functions and inspect the hose, fittings and related components to confirm there are no leaks.

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, semi-annually, annually and every 2 years as specified of the *Maintenance inspection Report*. The frequency and extent of periodic examinations and tests may also depend on national regulations.

⚠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 the machine.

☑ Use only Genie approved replacement parts.

☑ Machines that have been out of service for a period longer than 3 months must complete the quarterly inspection.

Machine Configuration:

☑ Unless otherwise specified, perform each procedure with the machine in the following configuration:

- Machine parked on a firm, level surface
- Boom in the stowed position
- Key switch in the off position with the key removed
- Wheels chocked

Scheduled Maintenance Procedures

About This Section

This section contains detailed procedures for each scheduled maintenance inspection.

Each procedure includes a description, safety warnings 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 Indicates a imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

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

☒ Indicates that an incorrect result has occurred after performing a series of steps.

Scheduled Maintenance Procedures

Maintenance Symbols Legend

Note: The following symbols have been used in this manual to help communicate the intent of the instructions. When one or more of the symbols appear at the beginning of a maintenance procedure, it conveys the meaning below.



Indicates that tools will be required to perform this procedure.



Indicates that new parts will be required to perform this procedure.



Indicates that dealer service will be required to perform this procedure.



Indicates that a cold engine will be required to perform this procedure.



Indicates that a warm engine will be required to perform this procedure.

Pre-delivery Preparation Report

The pre-delivery preparation report contains checklists for each type of scheduled inspection.

Make copies for each inspection. Store completed forms as required.

Maintenance Schedule

The *Scheduled Maintenance Procedures* section and the *Maintenance Inspection Report* have been divided into subsections. Use the following chart to determine which group(s) of procedures are required to perform a scheduled inspection.

Inspection	Checklist
Daily or every 8 hours	A
Quarterly or every 250 hours	A + B
Semi-annually or every 500 hours	A + B + C
Annually or every 1000 hours	A + B + C + D
Two-year or every 2000 hours	A + B + C + D + E

Maintenance Inspection Report

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

Make copies of the *Maintenance Inspection Repor*t to use for each inspection. Maintain completed forms for a minimum of 4 years or in compliance with your employer, jobsite and governmental regulations and requirements.

Pre-Delivery Preparation Report

Fundamentals

It is the responsibility of the owner or dealer to perform the Pre-delivery Preparation.

The Pre-delivery Preparation is performed prior to each delivery. The inspection is designed to discover if anything is apparently wrong with a machine before it is put into service.

A damaged or modified machine must never be used. If damage or any variation from factory delivered condition is discovered, the machine must be tagged and removed from service.

Repairs to the machine may only be made by a qualified service technician, according to the manufacturer's specifications.

Scheduled maintenance inspections shall be performed by qualified service technicians, according to the manufacturer's specifications and the requirements listed in the responsibilities manual.

Instructions

Use the operator's manual on your machine.

The Pre-delivery Preparation consists of completing the Pre-operation Inspection, the Maintenance items and the Function Tests.

Use this form to record the results. Place a check in the appropriate box after each part is completed. Follow the instructions in the operator's manual.

If any inspection receives an N, 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

Pre-delivery Preparation	Y	N	R
Pre-operation inspection completed			
Maintenance items completed			
Function tests completed			

Genie
A TEREX BRAND

Terex South Dakota, Inc USA
500 Oak Wood Road
PO Box 1150
Watertown, SD 57201-6150
(605) 882-4000

Genie UK
The Maltings, Wharf Road
Grantham, Lincolnshire
NG31- 6BH England
(44) 1476-584333

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

Inspector title

Inspector company

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 report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection(s) to perform.

☐	**Daily or every 8 hours**	**A**
☐	**Quarterly or every 250 hours**	**A + B**
☐	**Semi-annually or every 500 hours**	**A + B + C**
☐	**Annually or every 1000 hours**	**A + B + C + D**
☐	**Two-year or every 2000 hours**	**A + B + C + D + E**

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section 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

Checklist A		**Y**	**N**	**R**
A-1	Inspect the manuals and decals			
A-2	Pre-operation inspection			
A-3	Function tests			
A-4	Lubricate boom			
A-5	Engine maintenance			
A-6	Transmission			
Perform after 40 hours:				
A-7	30-day service			
Perform after 50 hours:				
A-8	Axle maintenance			
Perform after 100 hours:				
A-9	Engine maintenance			
A-10	Axle maintenance			
Perform after 200 hours:				
A-11	Axle maintenance			

Checklist B		**Y**	**N**	**R**
B-1	Batteries			
B-2	Electrical wiring			
B-3	Exhaust system			
B-4	Engine air filter			
B-5	Tires and wheels			
B-6	Hydraulic oil analysis			
B-7	Tank venting systems			
B-8	Boom wear pads			
B-9	Driveshaft			
B-10	Engine Maintenance			

Checklist C		**Y**	**N**	**R**
C-1	Inspect sequencing chains			
C-2	Engine maintenance			
C-3	Axle maintenance			
C-4	Transmission maintenance			
C-5	Engine maintenance			
C-6	Engine maintenance			
C-7	Adjust sequencing chains			
Perform every 700 hours				
C-8	Axle maintenance			
Perform every 800 hours:				
C-9	Axle maintenance			

Comments

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 report to use for each inspection.
- Select the appropriate checklist(s) for the type of inspection(s) to perform.

☐	**Daily or every 8 hours**	**A**
☐	**Quarterly or every 250 hours**	**A + B**
☐	**Semi-annually or every 500 hours**	**A + B + C**
☐	**Annually or every 1000 hours**	**A + B + C + D**
☐	**Two-year or every 2000 hours**	**A + B + C + D + E**

- Place a check in the appropriate box after each inspection procedure is completed.
- Use the step-by-step procedures in this section 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

Checklist D		**Y**	**N**	**R**
D-1	Forks			
D-2	Transmission			
D-3	Hydraulic return filter			
D-4	Axle maintenance			
D-5	Engine maintenance			

Checklist E		**Y**	**N**	**R**
E-1	Hydraulic oil			
E-2	Engine maintenance			
E-3	Engine maintenance			
Perform every 3000 hours:				
E-4	Engine maintenance			
Perform every 4500 hours or 60 months:				
E-5	Engine maintenance			
Perform every 12,000 hours:				
E-6	Engine maintenance			

Comments

A-1
Inspect the Manuals and Decals

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

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.

In addition, maintaining all of the safety and instructional decals 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 Check to make sure that the operator's and safety manuals are present and complete in the storage container on the platform.

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

⊙ Result: The operator's manual is appropriate for the machine and all manuals are legible and in good condition.

☒ Result: The operator's manual is not appropriate for the machine or all manuals are not in good condition or is illegible. Remove the machine from service until the manual is replaced.

3 Open the operator's manual to the decals inspection section. Carefully and thoroughly inspect all decals on the machine for legibility and damage.

⊙ Result: The machine is equipped with all required decals, and all decals are legible and in good condition.

☒ Result: The machine is not equipped with all required decals, or one or more decals are illegible or in poor condition. Remove the machine from service until the decals are replaced.

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

Note: Contact your authorized Genie distributor or Genie if replacement manuals or decals are needed.

Checklist A Procedures

A-2
Perform Pre-operation Inspection

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Completing a Pre-operation Inspection is essential to safe machine operation. The Pre-operation Inspection is a visual inspection performed by the operator prior to each work shift. The inspection is designed to discover if anything is apparently wrong with a machine before the operator performs the function tests. The Pre-operation Inspection also serves to determine if routine maintenance procedures are required.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

A-3
Perform Function Tests

Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Completing the function tests is essential to safe machine operation. Function tests are designed to discover any malfunctions before the machine is put into service. A malfunctioning machine must never be used. If malfunctions are discovered, the machine must be tagged and removed from service.

Complete information to perform this procedure is available in the appropriate operator's manual. Refer to the Operator's Manual on your machine.

A-4
Lubricate the Boom



Genie specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

Greasing the specified locations is essential for good machine performance and service life. Operating the machine with little or no grease may cause the machine to perform poorly and continued use may cause component damage.

1 Fully extend and raise the boom, then retract the boom, checking to insure it operates smoothly. There should be a light film of lubricant on wear pad contact surfaces.

⊙ Result: Boom operates smoothly and a thin film of lubricant is visible. Proceed to step 5.

⊠ Result: Boom does not extend or retract smoothly and no lubricant is visible on wear pad contact surfaces. Proceed to step 2.

2 Apply a thin layer of grease to the underside of the number 3 boom tube where it makes contact with the number 2 boom tube lower wear pads.

3 Apply a thin layer of grease to the underside of the number 2 boom tube where it makes contact with the number 1 boom tube lower wear pads.

4 Lubricate the top and side boom tube wear pads.

5 Return the boom to the stowed position.

Grease specification
EP NLGI 2 (lithium based) or equivalent
Lube-A-Boom grease, 7 lb pail (recommended) Genie part number 110147
Chevron Ultra-Duty EP 2 grease (alternate)

A-5
Perform Engine Maintenance - All Models



Engine specifications require that this procedure be performed daily or every 8 hours, whichever comes first.

- Engine oil level - check
- Coolant level - check/add
- Fuel system filter/water separator - drain
- Engine tightness - check or leaks
- Exhaust system - check for leaks

Required maintenance procedures and additional engine information is available in the Perkins 1100D Operation and Maintenance Manual OR the John Deere 4045HF485 Operator's Manual.

Perkins 1100D Operation and Maintenance Manual	
Genie part number	123702
John Deere 4045HF485 Operator's Manual	
Genie part number	123703

Checklist A Procedures

A-6
Perform Transmission Maintenance



Transmission specifications require that this procedure be performed every 8 hours or daily, whichever comes first.

- Transmission oil level - check/add*

Required maintenance procedures and additional transmission information is available in the Dana T20000 Maintenance Manual.

Dana T20000 Service Manual	
Genie part number	115025

A-7
Perform 30 Day Service



The 30 day maintenance procedure is a one-time sequence of procedures to be performed after the first 30 days or 40 hours of usage. After this interval, refer to the maintenance checklists for continued scheduled maintenance.

1 Perform the following maintenance procedures:

John Deere models:

- A-9 Perform Engine Maintenance - John Deere Models

All models:

- B-5 Inspect the Tires, Wheels and Lug Nut Torque
- D-2 Replace the Hydraulic Tank Return Filter Element

Checklist A Procedures

A-8
Perform Axle Maintenance



Axle specifications require that this procedure be performed every 50 hours or monthly, whichever comes first.

Required maintenance procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

A-9
Perform Engine Maintenance - John Deere Models



Engine specifications requires that this one-time procedure be performed after 100 hours of operation.

Required maintenance procedures and additional engine information is available in the John Deere 4045HF485 Operator's Manual.

John Deere 4045HF485 Operator's Manual	
Genie part number	123703

Checklist A Procedures

A-10
Perform Axle Maintenance



Axle specifications require that this one-time procedure be performed after 100 hours of operation.

Required maintenance procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

A-11
Perform Axle Maintenance



Axle specifications requires that this procedure be performed every 200 hours of operation.

Required maintenance procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

B-1 Inspect the Batteries



Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

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/burn hazard. Contact with electrically charged 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 Put on protective clothing and eye wear.

2 Remove the cover from the auxiliary power unit batteries located at the ground controls side of the machine.

Note: Perform the remaining steps on the auxiliary power unit batteries and the engine starting battery.

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

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

4 Be sure that the battery retainers and cable connections are tight.

5 Be sure that the battery separator wire connections are tight.

6 Fully charge the battery(s) and allow the battery(s) to rest at least 6 hours.

7 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.

8 Check the ambient air temperature and adjust the specific gravity reading for each cell as follows:

- Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
- Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.

⊙ Result: All battery cells display an adjusted specific gravity of 1.277 or higher. The battery is fully charged. Proceed to step 12.

☒ Result: One or more battery cells display a specific gravity of 1.217 or below. Proceed to step 9.

9 Perform an equalizing charge OR fully charge the battery(s) and allow the battery(s) to rest at least 6 hours.

Checklist B Procedures

10 Remove the battery vent caps and check the specific gravity of each battery cell with a hydrometer. Note the results.

11 Check the ambient air temperature and adjust the specific gravity reading for each cell as follows:

- Add 0.004 to the reading of each cell for every 10° / 5.5° C above 80° F / 26.7° C.
- Subtract 0.004 from the reading of each cell for every 10° / 5.5° C below 80° F / 26.7° C.

⊙ Result: All battery cells display a specific gravity of 1.277 or greater. The battery is fully charged. Proceed to step 12.

⊠ Result: The difference in specific gravity readings between cells is greater than 0.1 OR the specific gravity of one or more cells is less than 1.177. Replace the battery.

12 Check the battery acid level. If needed, replenish with distilled water to 1/8 inch / 3 mm below the bottom of the battery fill tube. Do not overfill.

13 Install the vent caps and neutralize any electrolyte that may have spilled.

B-2
Inspect the Electrical Wiring



Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

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

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

- Inside of the operator's compartment
- Underside of the chassis
- Inside engine compartment

2 Inspect for a lite, even coating of dielectric grease in the following locations:

- All harness connectors

Note: Do not apply excessive amounts of dielectric grease to harness connectors, pins or sockets.

Note: Do not apply dielectric grease to a engine ECU/ECM or engine harness connectors.

3 Start the engine and raise the boom so there is enough room to access and remove all the covers attached to the chassis.

4 Attach a lifting strap from an overhead crane to the boom. Support the boom. Do not apply any lifting pressure.

5 Remove all engine covers, hydraulic tank covers and chassis covers.

⚠ DANGER Crushing hazard. Death or serious injury could result if the boom should unexpectedly fall while working underneath the boom. Do not stand or work beneath a boom that is not properly supported.

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

- Engine
- Transmission
- Manifolds
- Chassis

7 Inspect for a lite, even coating of dielectric grease in all connections between the engine, transmission and the operator's compartment.

Note: Do not apply excessive amounts of dielectric grease to harness connectors, pins or sockets.

Note: Do not apply dielectric grease to a engine ECU/ECM or engine harness connectors.

8 Install all covers removed in step 5.

9 Remove the lifting strap from the overhead crane.

10 Start the engine and lower the boom to the stowed position. Turn the machine off.

B-3
Check the Exhaust System

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

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 Open the engine access cover.

2 Be sure that all fasteners are tight.

3 Inspect all welds for cracks.

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

5 Close the engine access cover.

Checklist B Procedures

B-4
Inspect the Engine Air Filter



Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

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.

Note: Perform this procedure with the engine off.

1 Release the latches on the front cover of the air cleaner assembly. Remove the cover.

2 Gently twist and pull out the external or primary filter element.

3 Remove the inner or secondary filter element.

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

5 Inspect the primary and secondary air filter elements. If needed, blow from the inside out using low pressure dry compressed air, or carefully tap out dust.

6 Install the secondary filter element first, then install the primary filter element.

7 Install the front cover onto the air cleaner assembly and secure the latches.

B-5
Inspect the Tires, Wheels and Lug Nut Torque



Genie specifications require that this procedure be performed every 250 hours or quarterly, whichever comes first.

Maintaining the tires and wheels, including proper wheel fastener torque, 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 could 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. Refer to Specifications, *Machine Specifications*.

4 Check the air pressure in each tire. Refer to Specifications, *Machine Specifications*.

Checklist B Procedures

B-6
Perform Hydraulic Oil Analysis



Genie specifications require that this procedure be performed every 250 hours or quarterly, whichever comes first.

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and a clogged suction strainer 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. For hydraulic oil specifications, Refer to Specifications, *Hydraulic Specifications*.

Note: 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. Refer to Maintenance Procedure, *Test or Replace the Hydraulic Oil*.

B-7
Inspect the Fuel and Hydraulic Tank Cap Venting Systems



Genie specifications require that this procedure be performed every 250 hours or quarterly, whichever comes first.

Perform this procedure more often if dusty conditions exist.

Free-breathing fuel and hydraulic tank caps are essential for good machine performance and service life. A dirty or clogged tank cap may cause the machine to perform poorly and continued use may cause component damage. Extremely dirty conditions may require that the caps be inspected more often.

⚠ 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.

Note: Perform this procedure with the engine off.

1 Remove the fuel filler cap from the tank.

2 Check for proper venting.

⊙ Result: Air passes through the fuel tank cap. Proceed to step 4.

⊠ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 3.

Note: When checking for positive tank cap venting, air should pass freely through the cap.

Checklist B Procedures

3 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 2.

4 Install the fuel tank cap onto the fuel tank.

5 Remove the breather cap from the hydraulic tank.

6 Check for proper venting. The cap is pressurized to 3 psi.

⊙ Result: Air passes through the breather cap. Proceed to step 8.

⊠ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 7.

Note: When checking for positive tank cap venting, air should pass freely through the cap.

7 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat this procedure beginning with step 6.

8 Install the breather cap onto the hydraulic tank.

B-8
Check the Boom Wear Pads



Genie specifications require that this procedure be performed every 250 hours of operation.

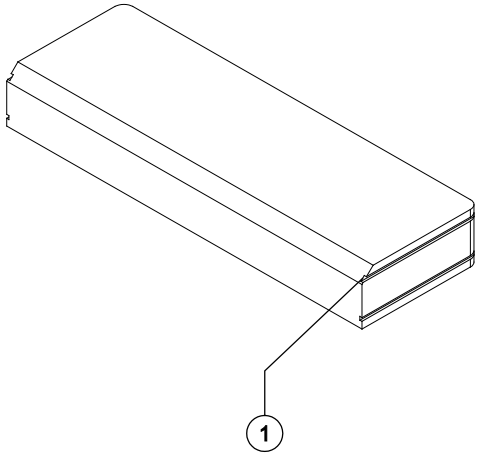
1 Extend the boom until the wear pads are accessible.

Note: It may be necessary to remove the wear pad retainer plates to expose the wear pads.

2 Inspect the end of each upper wear pad.

⊙ Result: The wear pad grooves are visible on the end of the wear pad.

⊠ Result: The grooves on the end of the wear pad are no longer visible. Replace both wear pads. Refer to the Repair Procedure, *How to Replace the Boom Wear Pads*.



1 wear pad groove

3 Repeat the procedure for the lower wear pads.

4 Measure each side wear pad.

⊙ Result: The measurement is within specification.

⊠ Result: The measurement is less than specification. Replace all side wear pads. Refer to the Repair Procedure, *How to Replace the Boom Wear Pads*.

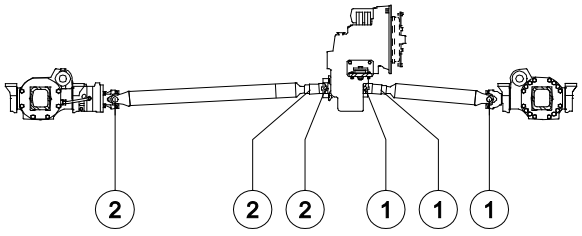
Boom Wear Pad Specifications	
Side wear pad thickness, minimum	3/8 inch 9.5 mm

B-9
Lubricate the Driveshaft

Genie requires that this procedure be performed every 250 hours or quarterly, whichever comes first.

Greasing the specified locations is essential for good machine performance and service life. Operating the machine with little or no grease may cause the machine to perform poorly and continued use may cause component damage.

1 Using a grease gun, thoroughly grease the driveshafts at each of the locations indicated in the illustration.



1 rear driveshaft
2 front driveshaft

Grease Specifications
Chevron Ultra-duty grease, EP NLGI 2 (lithium based) or equivalent

Checklist B Procedures

B-10
Perform Engine Maintenance - John Deere Models



Engine specifications require that this procedure be performed every 250 hours.

- Engine oil and filter - change

Required maintenance procedures and additional engine information is available in the John Deere 4045HF485 Operator's Manual.

John Deere 4045HF485 Operator's Manual	
Genie part number	123703

C-1
Inspect and Lubricate the Sequencing Chains



Genie specifications require that this procedure be performed every 500 hours or semi-annually, whichever comes first. In extremely dusty or hostile environments, it may be necessary to lubricate the chains more often.

Maintaining the sequencing chains in good condition is essential to safe operation and good machine performance. Failure to detect damage to the chains could result in a hazardous operating condition.

Environments in which Genie Telehandlers operate can vary widely from outdoor moisture and temperature extremes, to mildly corrosive or highly corrosive industrial atmospheres, in addition to abrasive exposures such as sand and grit.

In addition, dynamic shock loading can impose abnormal loads above the endurance limit of the chains. Examples of dynamic shock loading are:

- High velocity movement of load, followed by sudden abrupt stops.
- Carrying loads in suspension over irregular surfaces and rough terrain.
- Attempting to "inch" loads which are beyond the rated capacity of the vehicle.

The load cycles and environmental conditions make it impossible to predict chain life. It is therefore necessary to conduct regular inspections.

1 Park the machine on a firm level surface, level the boom and engage the parking brake.

2 Fully extend the boom.

3 Inspect the chains for the following conditions:

- Elongation
- BL666 chain - Measure 16 pitches of the extend chain for machines using BL666 chain.

Note: For identification, this chain typically measures 3/4 inch between pin centers when new.

Note: Both the extend and retract chains should be measured.

Note: Measurement should be taken in the area where the chain articulates most frequently over the sheaves.

⊙ Result: The distance measures 12.36 inches / 313mm or less. The chain is within specifications. Continue with inspection.

☒ Result: If the distance is greater than 12.36 inches / 313mm, the machine shall be removed from service until the chain is replaced.

Checklist C Procedures

Note: The boom chain's normal life expectancy can be expressed as a maximum percent of elongation of 3%.

- **Edge wear**:

  Check the chain for wear on the link plate edges caused by running back and forth over the sheave. The maximum reduction of material should not exceed 5%.

- **Cracked plates**:

  Check link side plates for any cracks. These are generally a sign of chain fatigue.

- **Turning pins**:

  Check the pins. The position of the riveting must be parallel with the top and bottom of the side plate.

If any of these conditions are discovered during the inspection, the chain must be replaced.

After inspection and before being returned to service, the chains must be lubricated with a quality chain lubricant.

Note: Do not use grease to lubricate chains.

The chain plates should be brushed with a wire brush prior to lubrication to clear the space between the plates.

The lubricant must penetrate the chain joint to prevent wear. Applying lubricant to the external surfaces will prevent rust, but the chains should be articulated to make sure the lubricant penetrates to the working surfaces between the pins and links.

Lubricant may be applied with a brush, sprayed or poured on, but the chain should be well flooded with lubricant and the boom should be extended and retracted to insure that the lubricant penetrates to the working surfaces. All excess lubricant should be wiped away from the external surfaces.

Note: Do not use solvents to remove excess lubricant.

C-2
Perform Engine Maintenance - John Deere Models



Engine specifications require that this procedure be performed every 500 hours or annually, whichever comes first.

Required maintenance procedures and additional engine information is available in the John Deere 4045HF485 Operator's Manual.

John Deere 4045HF485 Operator's Manual	
Genie part number	123703

Checklist C Procedures

C-3
Perform Axle Maintenance



Axle specifications require that this procedure be performed after 500 hours of operation.

Required maintenance procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

C-4
Perform Transmission Maintenance - Dana Models



Transmission specifications require that this procedure be performed every 500 hours or semi-annually, whichever comes first.

Required maintenance procedures and additional transmission information is available in the Dana T20000 Maintenance Manual.

Dana T20000 Service Manual	
Genie part number	115025

Checklist C Procedures

C-5
Perform Engine Maintenance - Perkins Models



Engine specifications require that this procedure be performed every 500 hours.

1104 Engine

- V-belts - inspect/adjust/replace

Required maintenance procedures and additional engine information is available in the Perkins 1104 Operation and Maintenance Manual OR the, Perkins 1204 Operation and Maintenance Manual.

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

C-6
Perform Engine Maintenance - Perkins Models



Engine specifications require that this procedure be performed every 500 hours or annually.

1104 Engine

- Engine oil and filter - change

API CH-4 or API CI-4 approved oil

- Fuel system primary filter (water separator) element - replace
- Fuel system secondary filter - replace
- Hoses and clamps - inspect/replace
- Radiator - clean

Required maintenance procedures and additional engine information is available in the Perkins 1104 Operation and Maintenance Manual.

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

C-7
Adjust the Boom Sequencing Chains

Genie specifications require that this procedure be performed every 500 hours or six months, whichever comes first.

1 Raise the boom to the horizontal position.

2 Extend the boom fully, then retract the boom approximately 1 inch / 25 mm.

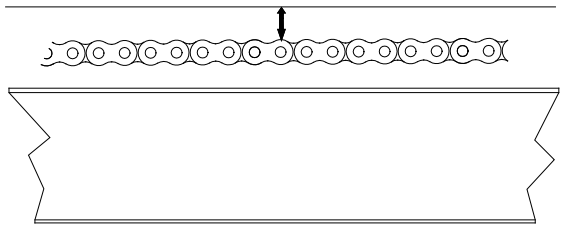
3 Tie a string line on each end of the chain, being sure to pull the string taut.

4 At the midpoint of the string, measure the distance between the string and the chain surface corresponding to the surface the string line is attached to.

⊙ Result: The distance is 0.25 to 0.5 inch / 6.35 to 12.7 mm. No adjustment to the chain is necessary. Proceed to step 8.

⊠ Result: The distance is less than a 0.25 inch / 6.35 mm OR is greater than 0.5 inch / 12.7 mm. The chain requires adjustment. Proceed to step 5.

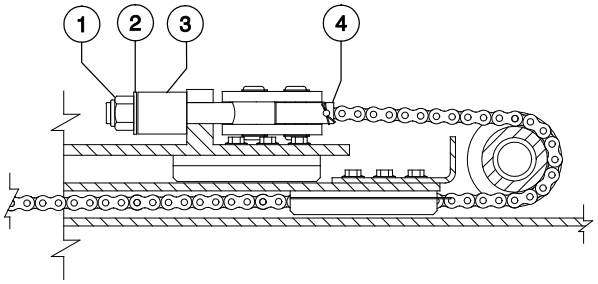
5 Working at the fork end of the large boom tube, locate the adjustable chain anchor on the top of the boom section.



6 Place an adjustable wrench across the flat part of the chain, just ahead of the chain anchor. Tighten the wrench onto the chain.

7 Using a 1 7/16 inch wrench, adjust the nut as required to tighten or loosen the chain. Repeat this procedure beginning with step 4 until the gap is between 0.25 to 0.5 inch / 6.35 to 12.7 mm.

Note: If the adjusting bolt runs out of threads before the chain tension is correct, the chain has stretched too far and the chain must be replaced.



1 nut
2 washer
3 spacer
4 chain anchor

8 Fully retract the boom.

9 Measure the gap between the washer and the spacer. The gap should be between 0.125 to 0.25 inch / 3.2 mm to 6.35 mm.

Checklist C Procedures

C-8
Perform Axle Maintenance



Axle specifications require that this procedure be performed every 700 hours of operation.

Required maintenance procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

C-9
Perform Axle Maintenance



Axle specifications require that this procedure be performed every 800 hours of operation.

Required maintenance procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

Checklist D Procedures

D-1
Inspect the Forks

Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first OR whenever permanent deformation of the forks is suspected.

Maintaining the lifting forks in good condition is essential to safe operation and good machine performance. Failure to detect damage to the forks could result in a hazardous operating condition.

1 Thoroughly clean the lifting forks.

2 Inspect the forks for the following:

- Surface cracks
- Straightness of the blade and shank
- Fork angle at 90 ± 3 degrees
- Relative height of fork tips shall not differ more than 3% of blade length

Fork	3% of blade length
48" forks	1.44 in
60" forks	1.8 in
72" forks	2.16 in

- Excessive wear to the forks, fork mount or legible markings

☒ Result: If any of the above criteria are not met, the fork shall be removed from service until it is repaired or replaced.



1 shank
2 blade

D-2
Perform Transmission Maintenance - Dana Models

Transmission specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

Required maintenance procedures and additional transmission information is available in the Dana T20000 Maintenance Manual.

Dana T20000 Service Manual	
Genie part number	115025

Checklist D Procedures

D-3
Replace Hydraulic Tank Return Filter Element



Genie specifications require that this procedure be performed every 1000 hours or annually, whichever comes first.

Perform this procedure more often if dusty conditions exist.

Replacement of the hydraulic filters 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.

Note: Perform this procedure with the engine off.

1 Start the engine. Raise the boom to allow access to the hydraulic tank.

2 Remove the fasteners securing the rear access cover and slide back.

3 Release the pressure in the oil reservoir by loosening the filler/breather cap.

4 Unscrew the return filter.

5 Install the new filter element.

6 Tighten the filler/breather cap.

7 Record the hours the filter element was replaced and keep with your maintenance records.

8 Start the engine.

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

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

11 Re-install the rear access cover.

D-4
Perform Axle Maintenance



Axle specifications require that this procedure be performed every 1000 hours of operation.

Required maintenance procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

D-5
Perform Engine Maintenance - Perkins Models



Engine specifications require that this procedure be performed every 1000 hours.

1104 Engine

- Engine valve lash - inspect/adjust

Required maintenance procedures and additional engine information is available in the Perkins 1104 Operation and Maintenance Manual.

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

Checklist E Procedures

E-1
Test or Replace the Hydraulic Oil



Genie specifications require that this procedure be performed every 2000 hours or every two years, whichever comes first.

Perform this procedure more often if dusty conditions exist.

Replacement or testing of the hydraulic oil is essential for good machine performance and service life. Dirty oil and a clogged suction strainer or hydraulic filters 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 frequently.

Note: 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 Component damage hazard. The engine must not be started with the hydraulic tank shut-off 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 Lower the boom to the stowed position.

2 Remove oil cap from top of hydraulic tank.

3 Using an approved hand-operated pump, drain the hydraulic tank into a suitable container. Refer to Specifications, *Hydraulic Specifications*.

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

4 Remove the drain plug from the rear of the tank.

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

6 Install the drain plug and securely tighten. Do not over tighten.

7 Fill the tank with hydraulic oil until the fluid level is in the center of the sight glass at the rear of the tank.

8 Clean up any oil that may have spilled.

Checklist E Procedures

E-2
Perform Engine Maintenance - John Deere Models



Engine specifications require that this procedure be performed every 2000 hours.

Required maintenance procedures and additional engine information is available in the John Deere 4045HF485 Operator's Manual.

John Deere 4045HF485 Operator's Manual	
Genie part number	123703

E-3
Perform Engine Maintenance - Perkins Models



Engine specifications require that this procedure be performed every 2000 hours.

1104 Engine

- Aftercooler core - inspect
- Alternator - inspect
- Engine mounts - inspect
- Starting Motor - inspect
- Turbocharger - inspect
- Water pump - inspect

Required maintenance procedures and additional engine information is available in the Perkins 1104 Operation and Maintenance Manual.

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

Checklist E Procedures

E-4
Perform Engine Maintenance - Perkins Models



Engine specifications require that this procedure be performed every 3000 hours.

1104 Engine

- Alternator Belt - Inspect/Adjust/Replace
- Fuel Injector - test/change

Required maintenance procedures and additional engine information is available in the Perkins 1104 Operation and Maintenance Manual.

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

E-5
Perform Engine Maintenance - John Deere Models



Engine specifications require that this procedure be performed every 4500 hours or 60 months, whichever comes first.

Required maintenance procedures and additional engine information is available in the John Deere 4045HF485 Operator's Manual.

John Deere 4045HF485 Operator's Manual	
Genie part number	123703

E-6
Perform Engine Maintenance - Perkins Models



Engine specifications require that this procedure be performed every 12,000 hours or every three years, whichever comes first.

1104 Engines

- Cooling System Coolant (Extended life coolant) - change

Required maintenance procedures and additional engine information is available in the Perkins 1104 Operation and Maintenance Manual.

Perkins 1104 Operation and Maintenance Manual	
Genie part number	117765

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 appropriate operator's manual on your machine.

☑ Be sure that all necessary tools and parts are available and ready for use.

☑ Use only Genie approved replacement parts.

☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.

Machine Configuration:

☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:

- Machine parked on a firm, level surface
- Boom in the stowed position
- 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 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 Indicates a imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, may cause minor or moderate injury.

NOTICE Indicates a potentially hazardous situation which, if not avoided, may result in property damage.

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

⊠ Indicates that an incorrect result has occurred after performing a series of steps.

Boom Components

1-1 Boom Proximity Switch

The boom angle switch is a proximity switch. This switch functions by sensing a change in the electromagnetic field of the switch, due to the introduction of metal into the field. A proximity switch is, simply, a metal detector.

The switch generates an electromagnetic field at the face of the switch. This field senses when steel has been moved close to the switch as well as when the steel has been moved away, which is how the switch contacts open and close.

These switches are of a fail-safe design. Should the switch or the switch wire circuit be faulty, the machine will not function outside its designed range of use.

The boom proximity switch is a component of the drive circuit and the chassis sway circuit. Both the drive and the chassis sway functions are disabled when the boom is raised to 60° or higher.

How to Test a Proximity Switch

1 Remove the switch from the machine. Do not disconnect the switch wire harness from the machine.

2 Start the engine.

3 Move the switch away from any ferrous or metallic object

⊙ Result: The light of the limit switch assembly is not illuminated.

4 Move the switch close to any ferrous or metallic object

⊙ Result: The light of the proximity switch assembly turns on. The switch is functioning correctly.

Boom Components

How to Adjust the Boom Angle Proximity Switch

The boom angle proximity switch is attached to a mounting bracket, located between the boom and the chassis directly beneath the boom pivot pin. The switch location is adjustable.

1 Start the engine.

2 Raise the boom to 60°. Confirm with a digital level.

3 Working at the pivot end of the boom, locate the boom angle proximity switch. Loosen the fasteners, securing the proximity switch assembly to the chassis, just enough to allow the bracket to move.

4 Move the proximity switch assembly until the light of the proximity switch turns on, then move the proximity switch assembly until the light of the proximity switch just turns off.

5 Securely tighten the fasteners. Do not over tighten.

6 Lower the machine to 55°.

⊙ Result: The light of the proximity switch assembly is illuminated.

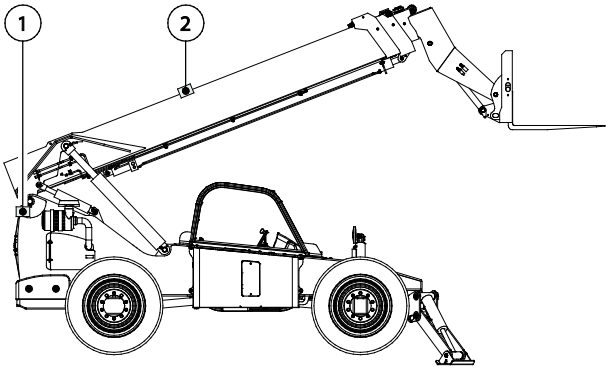
7 Raise the boom to 60°. Confirm with a digital level.

⊙ Result: The light of the proximity switch assembly is not illuminated. The proximity switch is properly calibrated.

☒ Result: The light of the proximity switch assembly is illuminated. The proximity switch is not calibrated correctly. Repeat this procedure beginning with step 4.

How to Adjust the Boom Extend Proximity Switch

The boom extend proximity switch assembly, used only on the GTH-1056, is secured to the top surface of the number 0 boom tube at the center of the boom. The proximity switch assembly is fixed in position and is not adjustable.



1 boom angle proximity switch
2 boom extend proximity switch (GTH-1056)

Boom Components

1-2 Boom

How to Replace the Boom Wear Pads

1 **Lower wear pads**: Using a lifting strap from an overhead crane or a fork lift of sufficient capacity, lift the boom tube just enough to remove the weight from the pads.

2 Remove the wear pad mounting fasteners and remove the wear pads from the boom.

3 Lubricate the wear surface of the new pads. Refer to Maintenance Procedure in the appropriate Service or Maintenance Manual for your machine, *Lubricate the Boom*.

Note: Do not lubricate the side wear pads.

4 Install the wear pads. Install and securely tighten the fasteners. Do not over tighten.

How to Remove the Lifting Fork Frame

1 With the boom in the stowed position, attach a lifting strap from an overhead crane to the top of the lifting fork frame at the front of the boom. Support the frame. Do not apply any lifting pressure.

2 Working from the rear of the frame, lift the spring-assisted handle of the lock securing the lower fork frame lock pin to the fork frame mount. Use a soft metal drift to remove the pin.

3 Using the overhead crane, lift and remove the fork frame from the boom.

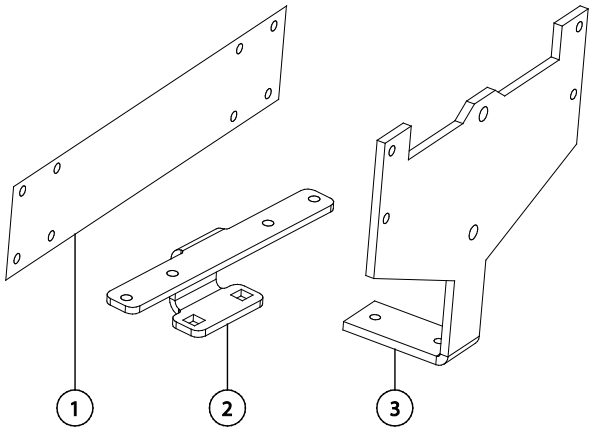
⚠ CAUTION Crushing hazard. The fork frame could fall if not properly supported when the lock pin is removed from the machine.

How to Remove the Cable Bridge Assembly , GTH-1056

Inside the four-section boom of the GTH-1056, a cable bridge is used to route hydraulic lines through the boom assembly to the fork level cylinder and auxiliary connections (if equipped). The three-section boom on the GTH-1048 does not require the use of a cable bridge.

1 Remove the inspection cover at the pivot end of the boom.

2 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.



1 cable bridge mount bracket
2 cable track mount bracket
3 cable bridge slider

3 Working at the pivot end of the boom, tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

4 Working at the pivot end of the boom, remove the fasteners securing the hose roller assembly to boom tube number 1. Remove the hose roller assembly from the boom.

5 Working at the fork end of the boom, remove the fasteners securing the cable track mount bracket to boom tube number 3.

6 Working at the fork end of the boom, remove the fasteners securing the cable bridge slider to the cable bridge. Remove the slider from the boom.

Note: Pay attention to how the hoses are routed before removing the slider from the boom.

Note: During reassembly, it may be helpful to use tape to secure the bolts to the cable bridge when installing the cable bridge slider.

7 Working at the fork end of the boom, securely attach the loose end of the cable track to the cable bridge using a cable tie or similar device.

8 Working at the pivot end of the boom, carefully remove the cable bridge from the boom.

Boom Components

How to Replace the Retraction Chain

Note: Perform this procedure on a firm, level surface with the boom in the stowed position and the wheels chocked.

1 Start the engine and allow the engine to idle.

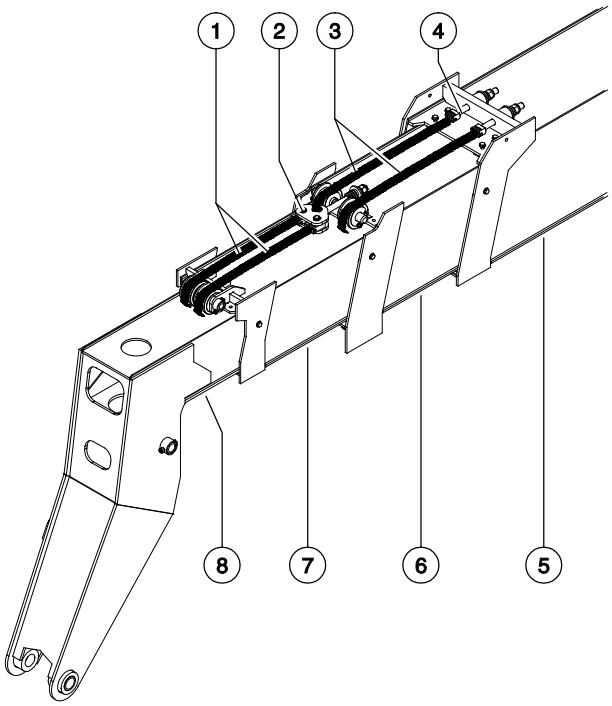
2 Raise the boom to a horizontal position.

3 Fully retract the boom.

4 Extend the boom approximately 1 inch / 2.5 cm.

5 Turn the machine off and remove the key from the key switch.

6 **GTH-1056**: Working at the fork end of the boom, loosen the fasteners securing the dual-chain tensioner to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioner free of the boom.



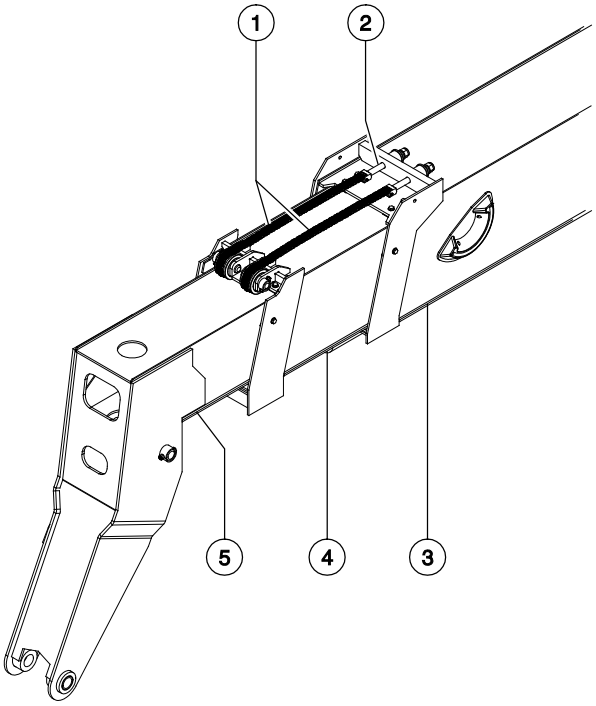
GTH-1056

1 tube 3 extension chains
2 dual-chain tensioner
3 tube 2 extension chains
4 single-chain tensioner
5 boom tube number 0
6 boom tube number 1
7 boom tube number 2
8 boom tube number 3

7 **GTH-1056**: Working at the fork end of the boom, loosen evenly the fasteners securing the single-chain tensioners to the top of boom tube number 0. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom.

Boom Components

8 **GTH-1048**: Working at the fork end of the boom, loosen the fasteners securing the single-chain tensioners to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom.



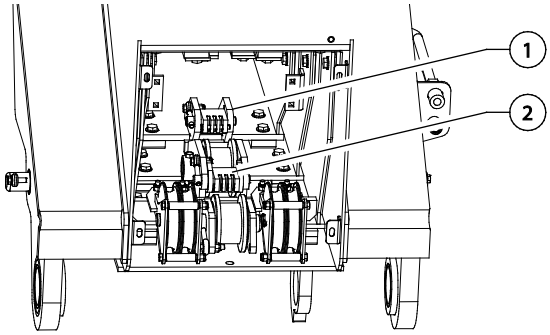
GTH-1048

1 extension chains
2 single-chain tensioner
3 boom tube number 1
4 boom tube number 2
5 boom tube number 3

9 Remove the inspection cover from the pivot end of the boom.

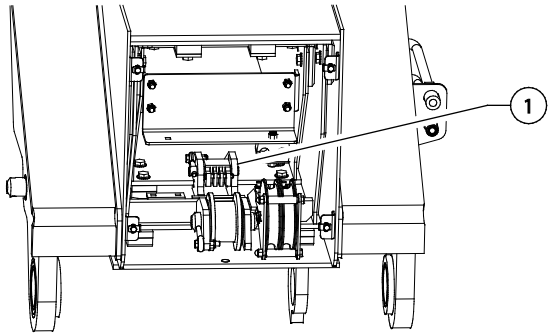
10 **GTH-1056**: Locate the two chain anchors of the boom retraction chains where they attach to the chain anchor mount at the lower side of boom tube 2 and 3.

GTH-1048: Locate the chain anchor of the boom retraction chain where it attaches to the chain anchor mount at the lower side of boom tube 3.



GTH-1056

1 chain anchor - boom tube number 3
2 chain anchor - boom tube number 2



GTH-1048

3 chain anchor

11 Select a chain anchor. Remove the fasteners securing the chain anchor pivot pin to the anchor mount of the boom tube. Remove the pivot pin and pull the chain anchor free of the mount.

Boom Components

12 Using a strap from an overhead crane, support the extend cylinder. Do not apply any lifting pressure

13 Working at the fork end of the boom, remove the fasteners securing the boom extend cylinder pivot pin to the boom.

14 Use a soft metal drift to remove the pivot pin. Lower the cylinder just enough for access to the chain anchor bolts.

15 Working at the fork end of the boom, securely connect a 30 foot / 10 m length of rope to the end of the chain. Securely tie off the other end of the rope to the boom structure.

16 Working at the pivot end of the boom, pull the chain out of the boom.

Note: Rope coming loose from the chain during removal may result in a difficult reassembly. Be sure the rope is securely attached to the chain and boom structure before pulling the chain out of the boom.

17 Remove the rope from the end of the chain and securely attach the rope to the new chain.

18 Working at the fork end of the boom, use the rope to carefully pull the chain through the boom just until the end of the chain is accessible. Remove the rope from the chain.

19 Working at the pivot end of the boom, install the chain anchor into the chain anchor mount. Secure the chain anchor to the mount using the pivot pin and fasteners removed in step 11. Securely tighten the fasteners. Do not over tighten.

20 Working at the pivot end of the boom, route the chain over the roller and install the chain onto the boom assembly using the pivot pin removed in step 11. Securely tighten the fasteners. Do not over tighten.

21 **GTH-1056**: Repeat this procedure, beginning with step 11, for the remaining chain anchor.

22 Install the inspection cover, removed in step 9, onto the boom. Install and securely tighten the fasteners. Do not over tighten.

23 **GTH-1056**: Working at the fork end of boom tube number 1, install the dual-chain tensioner into the tensioner mount. Install the mounting components, removed in step 6, and securely tighten the fasteners.

24 **GTH-1056**: Install the chain tensioners into the tensioner mount at the fork end of boom tube number 0. Install the mounting components, removed in step 7. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

25 **GTH-1048**: Install the chain tensioners into the tensioner mount at the fork end of boom tube number 1. Install the mounting components, removed in step 8. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

26 Adjust the chains. Refer to Maintenance Procedure, *Adjust the Boom Sequencing Chains*.

NOTICE Component damage hazard. Chains can be damaged if the boom is used while the chains are out of adjustment. Do not return the machine to use until the chains have been correctly adjusted.

How to Replace the Extension Chains

Note: Perform this procedure on a firm, level surface with the boom in the stowed position and the wheels chocked.

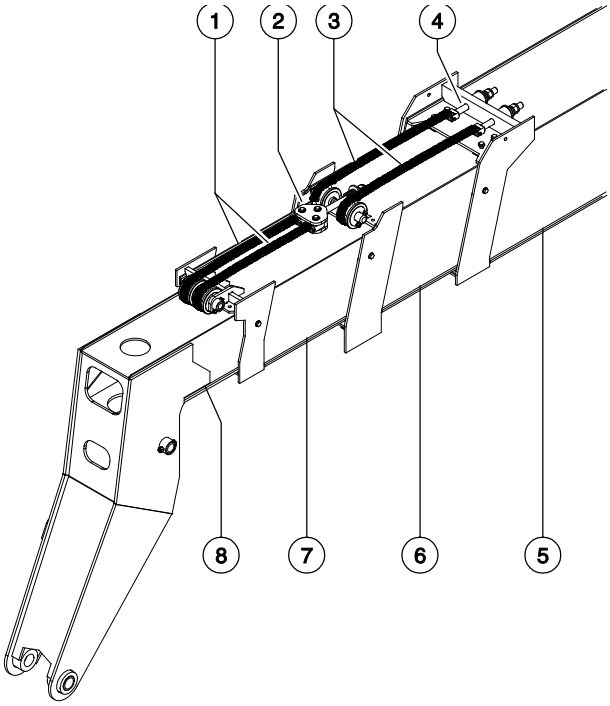
1 Start the engine and allow the engine to idle.

2 Raise the boom to a horizontal position.

3 Fully retract the boom.

4 Turn the machine off and remove the key from the key switch.

5 **GTH-1056**: Working at the fork end of the boom, loosen the fasteners securing the dual-chain tensioner to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioner free of the boom.



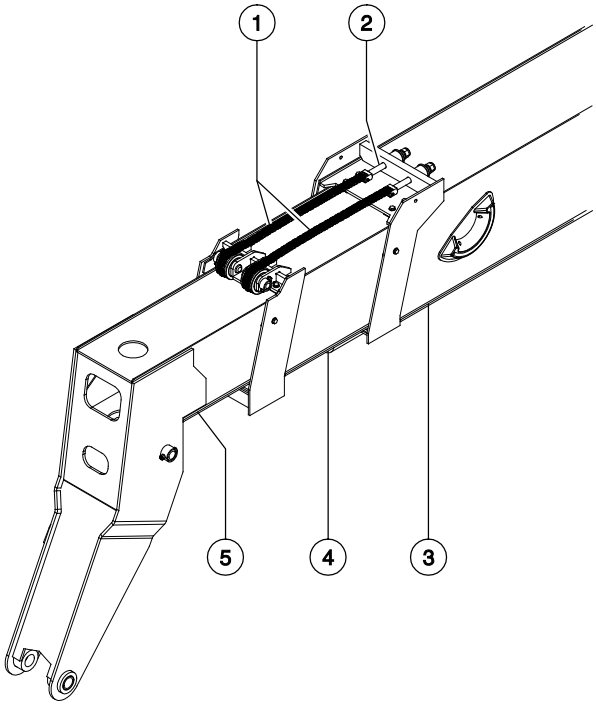
GTH-1056

1 tube 3 extension chains
2 dual-chain tensioner
3 tube 2 extension chains
4 single-chain tensioner
5 boom tube number 0
6 boom tube number 1
7 boom tube number 2
8 boom tube number 3

6 **GTH-1056**: Working at the fork end of the boom, loosen evenly the fasteners securing the single-chain tensioners to the top of boom tube number 0. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom.

Boom Components

7 **GTH-1048**: Working at the fork end of the boom, loosen the fasteners securing the single-chain tensioners to the top of boom tube number 1. After noting the orientation and assembly order of the components, remove the fasteners and pull the tensioners free of the boom.



GTH-1048

1 extension chains
2 single-chain tensioner
3 boom tube number 1
4 boom tube number 2
5 boom tube number 3

8 Select a chain tensioner. Remove the bow tie clip securing the chain anchor pin to the chain assembly. Remove the chain anchor pin from the assembly and remove the chain anchor from the tensioner assembly.

9 Repeat this procedure, beginning with step 8, for the other chains.

10 Working at the fork end of the boom, select a chain. Securely connect a 30 foot / 10 m length of rope to the end of the chain. Securely tie off the other end of the rope to the boom structure.

11 **GTH-1056**: Remove the inspection cover from the pivot end of the boom and locate the chain anchors of the extension chains at the top of boom tubes 2 and 3.

GTH-1048: Remove the inspection cover from the pivot end of the boom and locate the chain anchors of the extension chains at the top of boom tube 3.

12 Remove the fasteners securing the extension chain anchors to the boom tubes.

13 Working at the pivot end of the boom, pull the chain out of the boom.

Note: Rope coming loose from the chain during removal may result in a difficult reassembly. Be sure the rope is securely attached to the chain and boom structure before pulling the chain out of the boom.

14 On a workbench, remove the bow tie clip securing the chain anchor pin to the chain assembly. Remove the pin and chain anchor pin from the assembly.

15 Install the chain anchor, pin and clip onto the new chain.

16 Remove the rope from the end of the old chain and securely attach the rope to the new chain.

17 Working at the fork end of the boom, use the rope to carefully pull the chain through the boom just until the end of the chain is accessible.

18 Working at the pivot end of the boom and using the fasteners removed in step 12, install the chain anchor onto the boom tube. Securely tighten the fasteners. Do not over tighten.

19 Remove the rope from the chain and install the chain into the chain anchor of the tensioner assembly. Secure the chain to the chain anchor using the pin and clip removed in step 8.

20 Repeat this procedure, beginning with step 10, for the other chains.

21 Install the inspection cover, removed in step 8, onto the boom. Install and securely tighten the fasteners. Do not over tighten.

22 **GTH-1056**: Working at the fork end of boom tube number 1, install the dual-chain tensioner into the tensioner mount. Install the mounting components, removed in step 5, and securely tighten the fasteners.

23 **GTH-1056**: Install the chain tensioners into the tensioner mount at the fork end of boom tube number 0. Install the mounting components, removed in step 6. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

24 **GTH-1048**: Install the chain tensioners into the tensioner mount at the fork end of boom tube number 1. Install the mounting components, removed in step 7. Evenly tighten the chain tensioners to the top of the boom tube until they are securely tightened.

25 Adjust the chains. Refer to Maintenance Procedure, *Adjust the Boom Sequencing Chains*.

NOTICE Component damage hazard. Chains can be damaged if the boom is used while the chains are out of adjustment. Do not return the machine to use until the chains have been correctly adjusted.

How to Remove the 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 result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the lifting fork and frame. Refer to Repair Procedure, *How to Remove the Lifting Fork Frame.*

2 Attach a lifting strap from an overhead 10 ton / 10,000 kg crane to the fork end of the boom. Support the boom. Do not apply any lifting pressure.

3 Select a fork level cylinder. Remove the fasteners securing the fork level cylinder rod-end pivot pin to the boom.

4 Using a lifting strap from another overhead crane, support the rod-end of the fork level cylinder. Do not apply any lifting pressure.

5 Use a soft metal drift to remove the fork level cylinder pivot pin.

Boom Components

6 Lower the fork level cylinder onto the chassis.

⚠WARNING Crushing hazard. Keep hands clear of the cylinder manifold when lowering the cylinder.

7 Repeat this procedure beginning with step 3 for the other fork level cylinder.

8 Select a lift cylinder. Tag, disconnect and plug the hydraulic hoses at the lift cylinder manifold. Cap the fittings on the cylinder manifold.

9 Remove the fasteners securing the lift cylinder barrel-end pivot pin to the chassis.

10 Support and secure the barrel end of the lift cylinder to the boom.

11 Use a soft metal drift to remove the lift cylinder pivot pin.

12 Repeat this procedure beginning with step 8 for the other lift cylinder.

13 Tag, disconnect and plug the hydraulic hoses at the hydraulic hard line connections at the pivot end of the boom. Cap the fittings.

14 Using the overhead crane, raise the boom to a horizontal position.

⚠WARNING Crushing hazard. The lift cylinder will fall if not properly supported when the boom is raised.

15 Remove the fasteners securing the boom pivot pin to the chassis.

16 Use a soft metal drift to remove the boom pivot pin.

⚠DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pin is removed from the machine.

17 Carefully remove the boom assembly from the machine and place it on a structure capable of supporting it.

⚠DANGER Crushing hazard. The boom could become unbalanced and fall if not properly supported when removed from the machine.

NOTICE Component damage hazard. The weight of the boom assembly may crush the hydraulic hard lines under the boom. Use caution when placing the boom assembly onto a structure capable of supporting it.

How to Disassemble the Boom - GTH-1048

⚠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 result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the extension cylinder. Refer to Repair Procedure, *How to Remove the Extension Cylinder*.

2 *Remove the b*oom. Refer to Repair Procedure, *How to Remove the Boom*.

3 Select a lift cylinder. Remove the fasteners securing the lift cylinder rod-end pivot pin to the boom.

4 Using a lifting strap from an overhead crane, support the lift cylinder. Do not apply any lifting pressure.

5 Use a soft metal drift to remove the lift cylinder rod-end pivot pin. Remove the cylinder from the boom.

⚠WARNING Crushing hazard. The cylinder could become unbalanced and fall if not properly supported when removed from the machine.

6 Repeat this procedure beginning with step 3 for the other lift cylinder.

7 Remove the fastener securing the fork level cylinder rod-end pivot pin to the fork frame mount.

8 Use a soft metal drift to remove the rod-end pivot pin.

9 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

10 Tag, disconnect and plug the fork level cylinder hoses from the cylinder manifolds. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

11 Remove the fasteners securing the fork level cylinder barrel-end pivot pin to the boom.

12 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the boom.

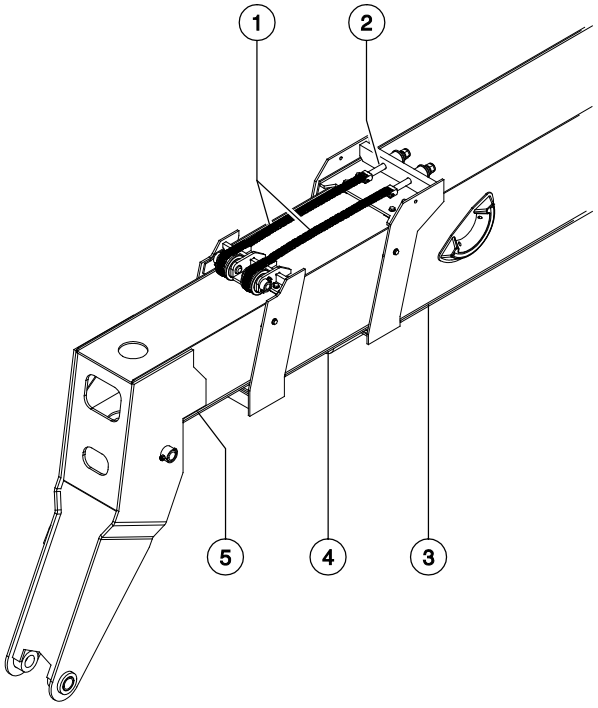
⚠WARNING Crushing hazard. The cylinder could fall if not properly supported when the pivot pin is removed from the machine.

13 Remove the inspection cover at the pivot end of the boom.

Boom Components

14 Remove the hose keepers from the hose roller assembly.

Note: The hose keepers ensure that the hoses do not jump off the hose rollers.



1 extension chains
2 single-chain tensioner
3 boom tube number 1
4 boom tube number 2
5 boom tube number 3

15 Working at the pivot end of the boom, remove the clamps securing the hoses to the inside of boom tube number 3.

16 Working at the fork end of the boom, remove the clamps securing the hoses to the inside of boom tube number 3.

17 Working at the pivot end of the boom, pull the fork level hydraulic hoses from the boom and lay them to the side.

18 Working at the pivot end of the boom, remove the fasteners securing the hose roller assembly to boom tube number 2. Remove the hose roller assembly from the boom.

19 Working at the fork end of the boom, loosen evenly, then remove, the fasteners securing the chain tensioners to the top of boom tube number 1.

20 Working at the fork end of the boom, remove the fasteners securing the extension chain rollers to the top of boom tube number 2. Remove the chain rollers from the boom.

21 Working at the pivot end of the boom, remove the fasteners securing the retraction chain block pivot pin to boom tube number 3. Remove the pivot pin. Remove the chain from the roller.

22 Working at the pivot end of the boom, remove the fasteners securing the retraction chain roller to boom tube number 2. Remove the chain roller from the boom.

23 Working at the fork end of the boom, remove the wear pads from boom tube number 2.

24 Support and slide boom tube number 3 out of boom tube number 2. Place boom tube number 3 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 3 could become unbalanced and fall when removed from the boom tube number 2 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

25 Working at the fork end of the boom, remove the wear pads from boom tube number 1.

26 Support and slide boom tube number 2 out of boom tube number 1. Place boom tube number 2 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 2 could become unbalanced and fall when removed from the boom tube number 1 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

How to Disassemble the Boom - GTH1056

⚠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 result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the extension cylinder. Refer to Repair Procedure, *How to Remove the Extension Cylinder*.

2 Remove the boom. Refer to Repair Procedure, *How to Remove the Boom*.

3 Select a lift cylinder. Remove the fasteners securing the lift cylinder rod-end pivot pin to the boom.

4 Using a lifting strap from an overhead crane, support the lift cylinder. Do not apply any lifting pressure.

5 Use a soft metal drift to remove the lift cylinder rod-end pivot pin. Remove the cylinder from the boom.

⚠WARNING Crushing hazard. The cylinder could become unbalanced and fall if not properly supported when removed from the machine.

6 Repeat this procedure beginning with step 3 for the other lift cylinder.

Boom Components

7 Remove the fastener securing the fork level cylinder rod-end pivot pin to the fork frame mount.

8 Use a soft metal drift to remove the rod-end pivot pin.

9 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

10 Tag, disconnect and plug the fork level cylinder hoses from the cylinder manifolds. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

11 Remove the fasteners securing the fork level cylinder barrel-end pivot pin to the boom.

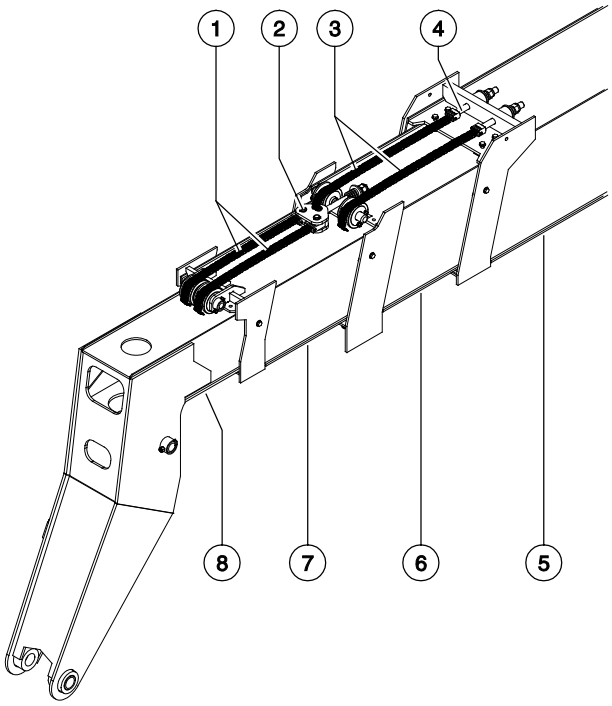
12 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the machine.

⚠WARNING Crushing hazard. The cylinder could fall if not properly supported when the pivot pin is removed from the machine.

13 Remove the inspection cover at the pivot end of the boom.

14 Working at the pivot end of the boom, remove the hose keepers from the hose roller assembly.

Note: The hose keepers ensure that the hoses do not jump off the hose rollers.



1 tube 3 extension chains
2 dual-chain tensioner
3 tube 2 extension chains
4 single-chain tensioner
5 boom tube number 0
6 boom tube number 1
7 boom tube number 2
8 boom tube number 3

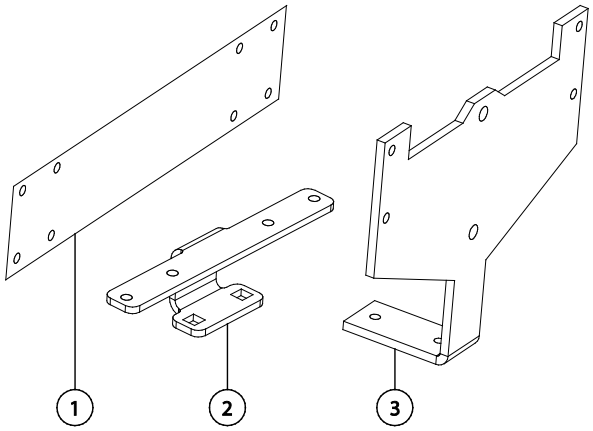
15 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.

16 Working at the pivot end of the boom, tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

Boom Components

17 Working at the pivot end of the boom, remove the fasteners securing the hose roller assembly to boom tube number 1. Remove the hose roller assembly from the boom.

18 Working at the fork end of the boom, remove the fasteners securing the cable track mount bracket to boom tube number 3.



1 cable bridge mount bracket
2 cable track mount bracket
3 cable bridge slider

19 Working at the fork end of the boom, remove the fasteners securing the cable bridge slider to the cable bridge. Remove the slider from the boom.

Note: Pay attention to how the hoses are routed before removing the slider from the boom.

Note: During reassembly, it may be helpful to use tape to secure the bolts to the cable bridge when installing the cable bridge slider.

20 Working at the fork end of the boom, securely attach the loose end of the cable track to the cable bridge using a cable tie or similar device.

21 Working at the pivot end of the boom, carefully remove the cable bridge from the boom.

22 Working at the fork end of the boom, remove the fasteners securing the dual-chain tensioner to the top of boom tube number 1.

23 Working at the fork end of the boom, remove the fasteners securing the extension chain rollers to the top of boom tube number 2. Remove the chain rollers from the boom.

24 Working at the pivot end of the boom, remove the fasteners securing the retraction chain block pivot pin to boom tube number 3. Remove the pivot pin.

25 Working at the fork end of the boom, remove the wear pads from boom tube number 2.

26 Support and slide boom tube number 3 out of boom tube number 2. Place boom tube number 3 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 3 could become unbalanced and fall when removed from the boom tube number 2 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

27 Working at the fork end of the boom, loosen evenly, then remove, the fasteners securing the chain tensioners to the top of boom tube number 0.

28 Working at the fork end of the boom, remove the fasteners securing the extension chain rollers to the top of boom tube number 1. Remove the chain rollers from the boom.

29 Working at the pivot end of the boom, remove the fasteners securing the retraction chain block pivot pin to boom tube number 2. Remove the pivot pin.

Boom Components

30 Working at the pivot end of the boom, remove the fasteners securing the chain roller to boom tube number 2. Remove the chain roller from the boom.

31 Working at the fork end of the boom, remove the wear pads from boom tube number 1.

32 Support and slide boom tube number 2 out of boom tube number 1. Place boom tube number 2 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 2 could become unbalanced and fall when removed from the boom tube number 1 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

33 Working at the pivot end of the boom, remove the fasteners securing the chain roller to boom tube number 1. Remove the chain roller from the boom.

34 Working at the fork end of the boom, remove the wear pads from boom tube number 0.

35 Support and slide boom tube number 1 out of boom tube number 0. Place boom tube number 1 on a structure capable of supporting it.

⚠WARNING Crushing hazard. Boom tube number 1 could become unbalanced and fall when removed from the boom tube number 0 if not properly supported and attached to the overhead crane.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

1-3 Boom Lift Cylinder

How to Remove the Lift Cylinder

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Attach a lifting strap from an overhead 10 ton / 10,000 kg crane to the fork end of the boom. Support the boom. Do not apply any lifting pressure.

2 Tag, disconnect and plug the hydraulic hoses at the lift cylinder manifold. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the rod end of the lift cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the fasteners securing the lift cylinder barrel-end pivot pin to the chassis.

5 Use a soft metal drift to remove the pivot pin.

6 Remove the fasteners securing the lift cylinder rod-end pivot pin to the boom.

7 Use a soft metal drift to remove the pivot pin.

⚠ DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pin is removed from the machine.

8 Using the overhead crane, raise the boom to a horizontal position. Remove the cylinder from the machine.

⚠ DANGER Crushing hazard. The cylinder will fall if not properly supported when removed from the machine.

1-4 Boom Extension Cylinder

How to Remove the Extension Cylinder

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Raise the boom to a horizontal position.

2 Tag, disconnect and plug the hydraulic hoses at the boom extension cylinder manifold. Cap the fittings.

⚠ 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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the center point of the boom extension cylinder. Support the cylinder. Do not apply any lifting pressure.

Boom Components

4 Remove the extension cylinder support loop from the underside of the boom.

Note: The extension cylinder support loop is located at the fork end of the boom.

5 Remove the fasteners securing the extension cylinder pivot pins to the boom.

6 Use a soft metal drift to remove both pivot pins. Remove the cylinder from the machine.

⚠ DANGER Crushing hazard. The boom will fall if not properly supported when the pivot pins are removed from the machine.

Note: During removal, the overhead crane strap will need to be adjusted for proper balancing.

1-5 Fork Level Cylinder

How to Remove the Fork Level Cylinder

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Remove the lifting fork frame. Refer to Repair Procedure, *How to Remove the Lifting Fork Frame*.

2 Remove the fastener securing the fork level cylinder rod-end pivot pin to the fork frame mount.

3 Use a soft metal drift to remove the pivot pin.

4 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

5 Tag, disconnect and plug the fork level cylinder hoses from the cylinder manifolds. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

6 Remove the fasteners securing the fork level cylinder barrel-end pivot pin to the boom.

7 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the machine.

⚠WARNING Crushing hazard. The cylinder could fall if not properly supported when the pivot pin is removed from the machine.

1-6 Hydraulic Hoses

How to Replace the Fork Level and/or Auxiliary Cylinder Hoses, GTH-1048

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Fully retract the boom.

2 Fully lower the tips of the lifting forks.

3 Remove the covers from the pivot end of the boom.

4 Attach a lifting strap from an overhead crane to the top of the lifting fork frame. Support the frame. Do not apply any lifting pressure.

5 Tag, disconnect and plug the fork level cylinder supply hoses at the cylinder manifold. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

6 Working near the center of the boom assembly, tag, disconnect and plug the hydraulic hoses from the hydraulic hard lines under boom tube number number 1. Cap the hard lines.

Boom Components

7 Securely connect a 30 feet / 10 m length of rope to each end of the hoses disconnected in steps 5 and 6. Securely tie off the other end of each section of rope to the boom structure.

8 Working at the pivot end of the boom, select one of the hoses. Pull the hose out of the boom.

Note: Rope coming loose from either end of the hose or the boom during hose removal may result in a difficult reassembly. Be sure each section of rope is securely attached to both the hose and the boom structure before pulling the hose out of the boom.

9 Remove the rope from each end of the hose. Discard the hose.

10 Securely install a section of rope onto each end of the new hose assembly.

11 Install the new hose assembly into the boom in the same manner the hose was removed. Using the rope, carefully pull the hose through the boom until each end is accessible.

12 Install both ends of the hose assembly onto the correct connection points. Torque to specification. Refer to Specifications.

13 Repeat this procedure for the remaining hose to be replaced, beginning with step 8.

14 Remove the lifting strap from the fork frame.

15 Install the cover onto the rear of the boom. Install and securely tighten the retaining fasteners.

How to Replace the Fork Level and/or Auxiliary Cylinder Hoses, GTH-1056

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

Replace the lower hoses:

1 Fully retract the boom.

2 Fully lower the tips of the lifting forks.

3 Remove the covers from the pivot end of the boom.

4 Attach a lifting strap from an overhead crane to the top of the lifting fork frame. Support the frame. Do not apply any lifting pressure.

5 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.

6 Tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

Boom Components

7 Working near the center of the boom assembly, tag, disconnect and plug the hydraulic hoses from the hydraulic hard lines under boom tube number number 1. Cap the hard lines.

8 Securely connect a 30 feet / 10 m length of rope to the end of each hose disconnected in steps 6 and 7. Securely tie off the other end of each section of rope to the boom structure.

9 Working at the pivot end of the boom, select one of the hoses. Pull the hose out of the boom.

Note: Rope coming loose from either end of the hose or the boom during hose removal may result in a difficult reassembly. Be sure each section of rope is securely attached to both the hose and the boom structure before pulling the hose out of the boom.

10 Remove the rope from the hose. Discard the hose.

11 Securely install a section of rope onto the correct end of the new hose assembly.

12 Install the new hose assembly into the boom by routing the hose under the roller at the pivot end of the boom. Using the rope, carefully pull the hose through the boom until the end is accessible.

13 Install both ends of the hose assembly onto the correct connection points. Torque to specification. Refer to Specifications.

14 Repeat this procedure for the remaining hose to be replaced, beginning with step 8.

15 Install the cable bridge rear mount bracket onto the cable bridge and the boom assembly. Securely tighten the fasteners. Do not over tighten.

16 Remove the lifting strap from the fork frame.

17 Install the cover onto the rear of the boom. Install and securely tighten the retaining fasteners.

Replace the upper hoses:

1 Fully retract the boom.

2 Fully lower the tips of the lifting forks.

3 Remove the covers from the pivot end of the boom.

4 Attach a lifting strap from an overhead crane to the top of the lifting fork frame. Support the frame. Do not apply any lifting pressure.

5 Working at the pivot end of the boom, remove the fasteners securing the cable bridge rear mount bracket to the boom assembly. Remove the bracket from the boom.

6 Tag, disconnect and plug the hydraulic hoses at the hard lines of the cable bridge. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

7 Return the cable bridge to its original position.

8 Working at the fork end of the boom, tag, disconnect and plug the fork level cylinder hoses at the cylinder manifolds. Cap the fittings.

9 **Models with auxiliary function**: Working at the fork end of the boom, tag, disconnect and plug the auxiliary hoses at the fittings. Cap the fittings.

Boom Components

10 Working at the fork end of the boom, remove the fasteners securing the cable bridge slider to the cable bridge. Remove the slider from the boom.

Note: Pay attention to how the hoses are routed before removing the slider from the boom.

Note: During reassembly, it may be helpful to use tape to secure the bolts to the cable bridge when installing the cable bridge slider.

11 Remove the fasteners securing the cable track to the cable track mount bracket.

12 Remove the fasteners securing the cable track mount bracket to the cable bridge. Remove the bracket from the boom.

13 Carefully pull the cable track through the opening at the front of boom until the hose connections are accessible.

14 Tag, disconnect and plug the affected hoses. Cap the fitting. Remove the hose from the cable track.

15 Install the new hose assembly and torque to specification. Refer to Specifications.

16 Install the cable bridge and cable track into the boom.

17 Install the cable track mount bracket and cable bridge slider. Securely tighten all fasteners. Do not over tighten.

18 Working at the pivot end of the boom, install the hydraulic hoses onto the hard lines of the cable bridge and torque to specification. Refer to Specifications.

19 Install the cable bridge mount bracket onto the cable bridge and the boom assembly. Securely tighten all fasteners. Do not over tighten.

20 Install the cover onto the rear of the boom. Install and securely tighten the retaining fasteners.

2-1 Operator's Compartment

How to Remove the Operator's Compartment

The operator's compartment is used to activate machine functions while sitting in the operator's drivers seat.

Within the operator's compartment there is a transmission column shifter, steering selector, 4-way controller, accelerator pedal, brake pedal and a differential lock switch. All of these components are replaceable.

For further information or assistance, consult the Genie Product Support.

⚠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 result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

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

3 Locate the secondary function manifold under the manifold inspection cover. Tag, disconnect and plug the hydraulic hoses at ports BP and BT of the secondary function manifold. Cap the fittings. Refer to *Secondary Function Manifold Components*.

4 Locate the brake manifold under the manifold inspection cover. Tag, disconnect and plug the hydraulic hose at the underside of the brake manifold. Cap the fitting. Refer to *Brake Manifold Components*.

5 Working under the dashboard, locate the hydraulic hose at port L of the steering orbitral.

6 Working at the front axle, locate the hydraulic hose connected to the front axle steer cylinder at the operator's compartment side of the machine. Tag, disconnect and plug the hydraulic hose. Cap the fitting.

7 Tag, disconnect and plug the hydraulic hoses at ports SUP, SUR and SUT of the secondary function manifold. Cap the fitting.

⚠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.

8 Tag, disconnect and plug the hydraulic hose at port SULS of the primary function manifold. Cap the fitting.

9 Tag, disconnect and plug the hydraulic hose at port JP of the secondary function manifold. Cap the fitting.

⚠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 Tag, disconnect and plug the hydraulic hoses at ports J1, J2, J3 and J4 of the primary function manifold. Cap the fittings.

Operator's Compartment

11 **Models with dual joystick**: Tag, disconnect and plug the hydraulic hoses at ports JT2, JT4, JS3 and JS1 of the primary function manifold. Cap the fittings.

12 Remove the fasteners securing the joystick mount to the operator's compartment. Remove the joystick assembly.

13 **Models with single joystick**: With the base of the joystick above the top of the hydraulic tank, tag disconnect and plug the hydraulic hose at port T of the joystick. Cap the fitting.

Note: Removing the hydraulic hose from port T of the joystick with the joystick below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the joystick if the joystick is below the hydraulic oil level in the hydraulic tank.

14 **Models with dual joystick**: Locate the tee fitting which joins together the hydraulic hoses from port T of both joysticks to the tank return hydraulic hose.

15 **Models with dual joystick**: With the tee fitting above the top of the hydraulic tank, tag, disconnect and plug the tank return hydraulic hose from the tee fitting. Cap the fitting.

Note: Removing the hydraulic hose from the tee fitting with the tee fitting below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the tee fitting if the tee fitting is below the hydraulic oil level in the hydraulic tank.

16 Working inside the chassis, tag and disconnect the wire harnesses at the connectors next to the operator's compartment.

17 Support and secure the operator's compartment to an adjustable table capable of supporting the weight and that will allow the operator's compartment to remain in an upright and stable position.

NOTICE Component damage hazard. Wrapping a strap around the cab and lifting using an overhead crane can put excessive pressure on the glass windows of the cab, causing the windows to break. Do not lift the cab using a strap from an overhead crane if the strap contacts the windows.

Note: Placing a wedge between the operator's compartment and the adjustable table may be required to keep the operator's compartment stable.

18 Remove the lower fasteners securing the operator's compartment to the chassis.

19 Remove the upper fasteners securing the operator's compartment to the chassis.

⚠WARNING Crushing hazard. The operator's compartment will fall if not properly supported when the fasteners are removed from the machine.

20 Slowly move the operator's compartment away from the chassis while feeding all loose hoses, cables and wires through the opening of the chassis.

NOTICE Component damage hazard. Hoses, cables and wires can be damaged if they are kinked or pinched.

Bolt torque specification	
Operator's cab mounting bolts	750 ft-lbs 1017 Nm

2-2 Machine Controls

How to Remove the Steering Column

1 Disconnect the battery from the machine.

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

2 Remove the fasteners securing the transmission control lever and turn signal shifter, if equipped, to the column. Carefully separate the lever from the column.

3 Remove the nut securing the key switch to the dash panel. Gently push the key switch through the opening.

4 Remove the fasteners securing the dash panel to the dashboard.

5 Carefully pull the dash panel towards the seat of the operator's compartment.

6 Tag and disconnect the wire harness from the componments of the dash panel. Remove the dash panel from the machine.

7 Loosen the two lower fasteners securing the dash frame to the operator's compartment.

8 Remove the two upper fasteners securing the dash frame to the operator's compartment.

9 Rotate the dash frame towards the seat of the operator's compartment.Remove the dashboard from the machine.

10 Tag and disconnect the ground wire of the steer column.

11 Support and secure the steer orbitral to the dash frame.

12 Remove the fasteners securing the steer column and steer orbitral to the dash frame.

13 Lower the steer orbitral and remove the steer column from the machine.

How to Remove the Steering Wheel

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

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

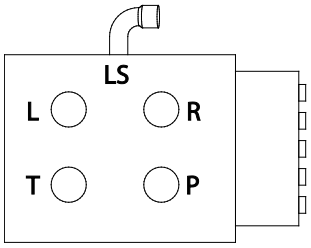
3 Remove the horn button from the steering wheel. Remove the nut securing the steering wheel to the column and remove the steering wheel.

Operator's Compartment

How to Remove the Steer Orbitral

1 Remove the steering column. Refer to Repair Procedure, *How to Remove the Steering Column*.

2 Working under the dashboard, locate the hydraulic hose at port L of the steering orbitral.



3 Follow the hydraulic hose from port L of the steer orbitral to its connection at the front axle of the machine. Tag, disconnect and plug the hydraulic hose at the front axle. Cap the fitting.

4 Tag, disconnect and plug the hydraulic hoses at ports SUP, SUR and SUT of the secondary function manifold. Cap the fitting.

⚠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 Tag, disconnect and plug the hydraulic hose at port SULS of the primary function manifold. Cap the fitting.

6 Slowly move the steer orbitral away from the dash frame while feeding all loose hoses through the opening of the chassis.

How to Remove the Joystick - Models with Single Joystick

1 Disconnect the battery from the machine.

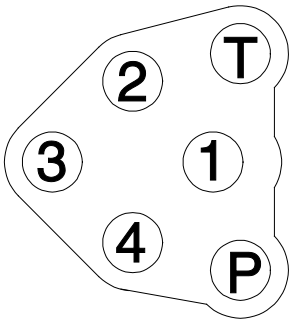
⚠WARNING Electrocution/burn hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.

2 Tag and disconnect the joystick wire harness from the machine.

3 Remove the fasteners securing the joystick mount panel to the side console.

4 Tag, disconnect and plug the hoses from ports 1, 2, 3, 4, P and T of the joystick. Cap the fittings.

Note: Removing the hydraulic hose from port T of the joystick with the joystick below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the port if the joystick is below the hydraulic oil level in the hydraulic tank.



5 Remove the fasteners securing the joystick to the mount panel. Remove the joystick.

How to Remove the Joystick - Models with Dual Joysticks

1 Disconnect the battery from the machine.

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

2 Remove the fasteners securing the joystick mount panel to the side console.

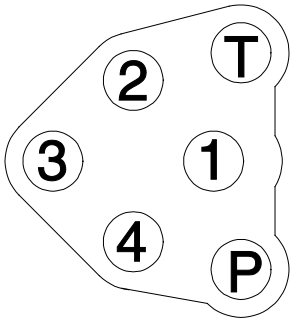
3 Tag and disconnect the joystick wire harness from the machine.

4 Tag, disconnect and plug the hoses from ports 1, 2, 3, 4 and P of the joystick. Cap the fittings.

5 Locate the tee fitting which joins together the hydraulic hoses from port T of both joysticks to the tank return hydraulic hose.

6 With the tee fitting above the top of the hydraulic tank, tag, disconnect and plug the tank return hydraulic hose from the tee fitting. Cap the fitting.

Note: Removing the hydraulic hose from port T of the joystick with the joystick below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not disconnect the hose from the port if the joystick is below the hydraulic oil level in the hydraulic tank.



7 Remove the fasteners securing the joystick to the mount panel. Remove the joystick.

How to Remove the Brake Pedal Assembly

1 Disconnect the battery from the machine.

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

2 Fully press and release the brake pedal a minimum of 10 times to release the hydraulic pressure in the brake system.

3 Tag, disconnect and plug the hydraulic hoses at ports BP and BT of the secondary hydraulic manifold. Cap the fittings.

⚠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 Follow the hydraulic hose from port A of the brake pedal manifold to the brake manifold. Tag, disconnect and plug this hydraulic hose at the brake manifold. Cap the fitting.

5 Remove the fasteners securing the brake pedal assembly to the dash frame.

6 Gently rotate the brake pedal in an upwards direction and slowly move the brake pedal assembly away from the dash frame while feeding all loose hoses through the opening of the chassis.

Operator's Compartment

How to Remove the Gauge Cluster Assembly

1 Disconnect the battery from the machine.

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

2 Remove the fasteners securing the transmission control lever to the column. Carefully separate the lever from the column.

3 Grasp the edge of the dash cluster and pull the cluster through the opening in the dashboard.

4 Tag and disconnect the wire harness from the dash cluster. Remove the dash cluster from the machine.

How to Remove the Gauge Cluster Assembly

1 Disconnect the battery from the machine.

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

2 Reach under the dashboard and gently loosen and remove the locknut securing the diagnostic display to the dashboard. Gently push the diagnostic display through the opening in the dashboard.

3 Tag and disconnect the wire harness from the diagnostic display. Remove the diagnostic display from the machine.

3-1
Fuel and Hydraulic Tanks

How to Remove the Fuel and Hydraulic Tank Assembly

⚠ 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. Never drain or store fuel in an open container due to the possibility of fire.

⚠ DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

1 Disconnect the battery from the machine.

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

2 Remove the battery from the machine.

3 Tag and disconnect the wire harness from the fuel level terminals.

4 Remove the filler cap from the hydraulic tank.

5 Place a drain pan or other suitable container under the hydraulic tank. Refer to Specifications, *Machine Specifications.*

6 Remove the drain plug from the hydraulic tank and completely drain the tank.

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

7 Remove the filler cap from the fuel tank.

8 Using an approved hand-operated pump, drain the fuel tank into a container of suitable capacity. Refer to Specifications, *Machine Specifications*.

⚠ DANGER Explosion and fire hazard. When transferring fuel, connect a grounding wire between the machine and pump or container.

Note: Be sure to only use a hand operated pump suitable for use with gasoline and/or diesel fuel.

9 Tag, disconnect and plug the fuel supply and return hoses. Cap the fittings.

10 Tag, disconnect and plug the supply and return hoses from the hydraulic tank. Cap the fittings.

11 Support and secure the tank assembly to an appropriate lifting device.

12 Remove the fasteners securing the tank assembly to the chassis. Remove the tank from the machine.

⚠ WARNING Crushing hazard. The tank assembly could become unbalanced and fall if not properly supported when removed from the machine.

Engines

4-1
Engines

How to Repair the John Deere 4045T Engine

Repair procedures and additional engine information is available in the John Deere 4045HF485 Operator's Manual, John Deere 4045T Workshop Manual, John Deere 4045T Alternator Manual and the John Deere 4045T Fuel Systems Manual.

John Deere 4045HF485 Operator's Manual	
Genie part number	123703
John Deere 4045T Workshop Manual	
Genie part number	108443
John Deere 4045T Alternator Manual	
Genie part number	108502
John Deere 4045T Fuel Systems Manual	
Genie part number	108503

How to Repair the Perkins 1104D-E44TA Engine

Repair procedures and additional engine information is available in the Perkins 1100 Operation and Maintenance Manual and the Perkins 1104 Service Manual and the Perkins 1100 Troubleshooting Manual.

Perkins 1100 Operation and Maintenance Manual	
Genie part number	123702
Perkins 1104 Service Manual	
Genie part number	117764
Perkins 1100 Troubleshooting Manual	
Genie part number	123583

How to Remove the Engine

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

All Models:

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

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

3 Remove the fasteners securing the engine access cover from the rear of the machine. Remove the cover from the machine.

4 **Perkins models**: Open the engine access cover at the tank side of the machine. Locate the fuel supply line where it is attached to the fuel filter/water separator.

Tag, disconnect and plug the fuel supply hose at the fuel filter/water separator. Cap the fitting.

Locate the fuel return hose connection just above the fuel filter/water separator.

Tag, disconnect and plug the fuel return hose at the fuel filter/water separator. Cap the fitting.

5 **John Deere models**: Open the engine access cover at the tank side of the machine. Locate the fuel supply line where it is attached to the fuel filter/water separator.

Tag, disconnect and plug the fuel supply hose at the fuel filter/water separator. Cap the fitting.

Open the engine access cover at the operator's compartment side of the machine. Locate the fuel return hose at the fuel pump.

Tag, disconnect and plug the fuel return hose at the fuel pump. Cap the fitting.

All Models:

6 Open the transmission access cover at the top of the machine. Locate the transmission cooler.

7 Tag, disconnect and plug the coolant hoses at the transmission cooler. Cap the fittings.

8 Tag and disconnect the engine wire harnesses near the operator's compartment.

9 Remove the air cleaner from the machine. Remove all intake and exhaust components which would interfere with the removal of the engine from the chassis.

10 Remove the fasteners securing the driveshaft to the transmission. Secure the bearing caps onto the universal joint of the driveshaft.

Note: Using adhesive tape to secure the caps to the universal joint may be helpful.

11 Remove the fasteners securing the engine tray to the chassis.

12 Support and secure the engine tray to a forklift of adequate capacity.

13 Remove the engine tray from the machine.

4-2
Engine Fault Codes

How to Retrieve Engine Fault Codes

When the engine Electronic Control Module (ECM) detects an abnormal operating condition, a fault code is immediately stored in the ECM memory. At the same time, a colored warning lamp is illuminated and the fault code is shown on the engine diagnostic display, is located on the dashboard in the operator's compartment.

To learn the specifics of and how to use the fault codes, refer to, Fault Codes Section.

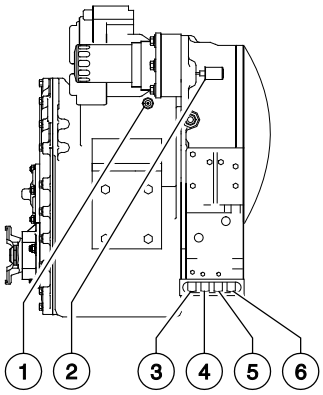
Transmission

5-1 Transmission

How to Repair the Transmission

Repair procedures and additional transmission information is available in the Dana T12000 Transmission Maintenance and Repair Manual and the Dana T20000 Maintenance Manual.

Dana T12000 Service Manual	
Genie part number	97489
Dana T20000 Service Manual	
Genie part number	115025



Dana T20000 transmission

1 transmission temperature sender (located opposite side of trans)
2 transmission pressure sender
3 transmission shift coil 'F' (drive forward function) (blue wire)
4 transmission shift coil 'R' (drive reverse function) (brown wire)
5 transmission shift coil '2' (gear reduction) (green wire)
6 transmission shift coil '1' (gear reduction) (yellow wire)

Note: refer to electrical schematic for additional transmission shift coil information.

How to Remove the Transmission

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

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

3 Place a drain pan or other suitable container under the hydraulic tank. Refer to Specifications, *Machine Specifications.*

4 Remove the drain plug from the hydraulic tank and completely drain the tank.

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

5 Tag, disconnect and plug the transmission oil cooler lines at the cooler. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

6 Tag, disconnect and plug the hydraulic pump high pressure line at the function manifold. Cap the fitting.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

7 Tag, disconnect and plug the hydraulic pump supply line at the pump. Cap the orifice on the pump.

8 Remove the fasteners securing the transmission mounting flange to the chassis.

9 Tag and disconnect the driveshafts from the transmission.

Note: To avoid damage to the driveshaft universal joints, secure the driveshafts to the chassis.

10 Tag and disconnect the wiring harness from the transmission.

11 Attach a lifting strap from an overhead crane to the center point of the transmission.

12 Remove the fasteners securing the transmission mounting flange to the chassis. Remove the transmission from the machine.

⚠DANGER Crushing hazard. The transmission will fall if not properly supported when removed from the machine.

Hydraulic Pump

6-1
Hydraulic Pump

How to Test the Function Pump

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Tag, disconnect and plug the high pressure hydraulic hose from the primary function manifold. Cap the fitting on the main 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.

Note: The high pressure hose is the smaller of the two hoses.

2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the high pressure hose disconnected in step 1.

3 Hold the manual fuel shut-off lever on the engine in the closed position.

4 Observe the pressure gauge while cranking the engine in one second intervals.

⊙ Result: If the pressure gauge reads 3190 psi / 220 bar, immediately stop. The pump is good.

☒ Result: If the pressure fails to reach 3190 psi / 220 bar, the pump needs to be adjusted OR or the pump or pump coupling is faulty and will need to be serviced or replaced.

NOTICE Component damage hazard. There is no relief valve in the hydraulic pump and the pump can be damaged if the pressure is allowed to exceed specification. When testing the pump, crank the engine in one second intervals until the correct pressure is confirmed. Do not over-pressurize the pump.

5 Remove the pressure gauge and install the high pressure hose onto the pump. Torque to specification. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications*.

⚠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.

How to Remove the Function Pump

⚠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 result in death or serious injury and significant component damage. Dealer service is strongly recommended.

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

Note: Perform this procedure with the engine off and cool.

1 Open the access door above the hydraulic tank.

2 Disconnect the battery from the machine.

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

3 Tag and disconnect the wire harness from the pump.

4 Tag and disconnect the case drain hose at the top of the pump. Cap the fitting on the pump.

Note: Placing the open end of the case drain hose below the hydraulic oil level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not lower the open end of the case drain hose to below the fluid level of the hydraulic tank until the hose is plugged.

5 Tag, disconnect and plug the large hydraulic pump supply hose at the pump. Cap the fitting on the pump.

Note: Placing the open end of the pump supply hose below the fluid level in the hydraulic tank will result in excessive hydraulic fluid leaking from the hose. Do not lower the open end of the pump supply hose to below the fluid level of the hydraulic tank until the hose is plugged.

6 Tag, disconnect and plug the high pressure hose at the pump. Cap the fitting 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.

7 Tag and disconnect the transmission cooler hoses at the transmission cooler. Cap the fittings.

⚠CAUTION Burn hazard. Contact with hot engine components may cause severe burns.

8 Remove the fasteners securing the pump to the transmission. Remove the pump from the machine.

Hydraulic Pump

How to Install the Function Pump

1 Carefully install the hydraulic pump onto the transmission. Install the fasteners and tighten to finger tight.

2 Torque the fasteners evenly to 85 ft-lbs / 115 Nm.

3 Install the smaller high pressure hose onto the pump outlet. Torque the fasteners to 27-37 ft-lbs / 37-50 Nm.

4 Install the larger low pressure hose onto the pump outlet. Install the hose retaining rings and fasteners. Torque the fasteners to 55-66 ft-lbs / 74-90 Nm.

5 Working at the case drain at the top of the pump, fill the pump with hydraulic fluid until the fluid is at the top of the case drain fitting.

6 Install the case drain hose onto the pump and torque to specification. Refer to Specifications, *Hydraulic Specifications*.

7 Securely install the wire harness onto the pump.

8 Check the level of the hydraulic fluid in the hydraulic tank. Add fluid if needed.

9 Prime the pump. Refer to Repair Procedure, *How to Prime the Function Pump*.

10 Start the engine and inspect for leaks.

11 Turn the machine off.

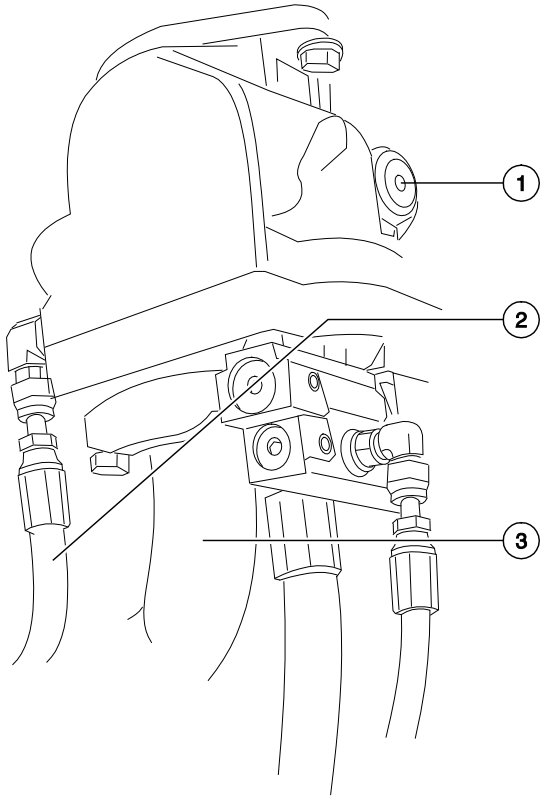
12 Adjust the pump pressure. Refer to Repair Procedures, *How to Adjust the Function Pump Standby Pressure* and *How to Adjust the Function Pump Pressure Pressure Compensator*.

How to Prime the Function Pump

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Install all hoses onto the hydraulic pump. Torque to specification.Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications*.

2 Locate the case drain filler plug at the side of the function pump.



1 case drain filler plug
2 case drain hose
3 hydraulic supply line (from tank)

3 Remove the plug and slowly fill the case drain port of the pump with hydraulic fluid until the oil level is even with the bottom of the hole. Install the plug and torque to 40 ft-lbs / 54 Nm.

4 Start the engine, allow the engine to run at low idle for 15 seconds then shut off the engine. Wait 15 seconds, then start the engine again. Allow the engine to run at low idle for 15 seconds and then shut off the engine.

5 Check for hydraulic leaks and clean up any oil that may have spilled.

How to Adjust the Function Pump Standby Pressure

1 Connect a 0 to 1000 psi / 0 to 100 bar pressure gauge to test port 'TP' on the primary function manifold. Refer to *Primary Function Manifold Components.*

2 Start the engine and allow the engine to run at low idle.

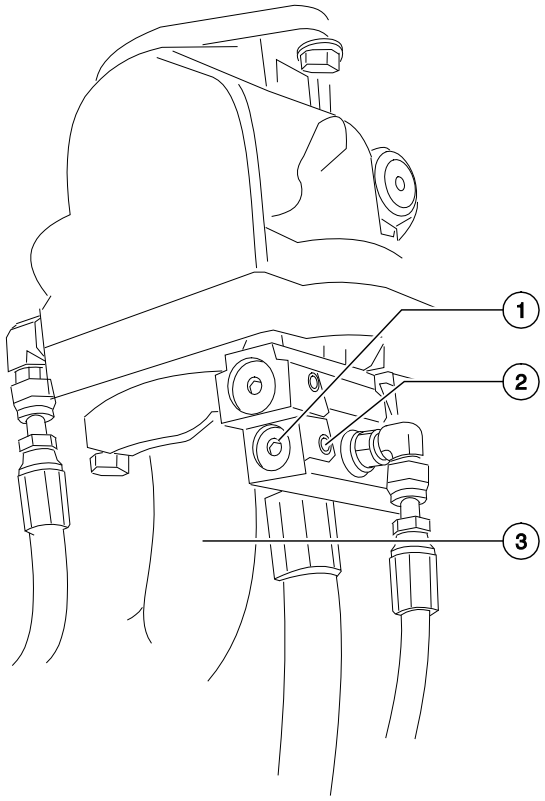
3 Observe the pressure reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly. Proceed to step 6.

☒ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. Proceed to step 4.

Hydraulic Pump

4 Loosen the set screw for the standby pressure adjustment screw.



1 standby pressure adjustment screw
2 set screw
3 hydraulic supply line (from tank)

5 Adjust the function pump standby pressure. Turn the adjustment screw clockwise to increase the pressure or counterclockwise to decrease the pressure. Tighten the set screw.

6 Turn the engine off and remove the pressure gauge.

⚠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.

How to Adjust the Function Pump Standby Pressure

Note: Two people will be required to perform this procedure.

1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to test port 'TP' on the primary function manifold. Refer to *Primary Function Manifold Components*.

2 Start the engine and allow the engine to run at low idle.

3 Fully retract the boom.

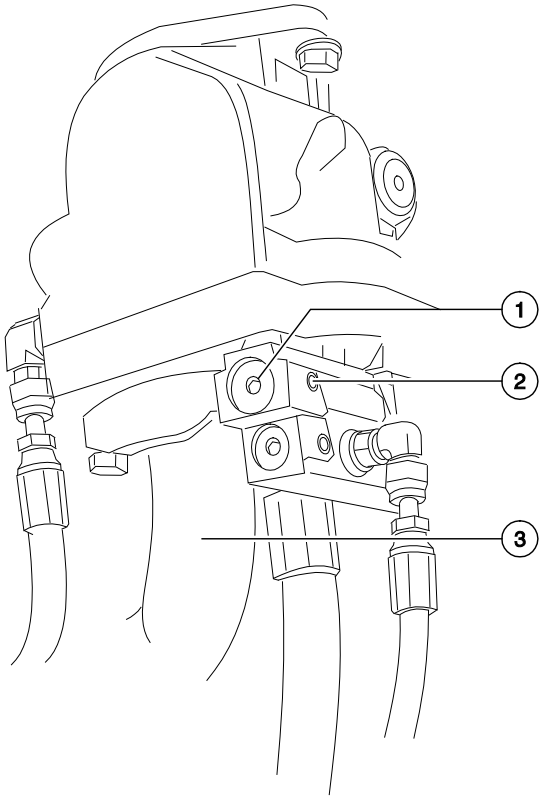
4 Continue to activate the boom retract function and observe the pressure reading on the pressure gauge.

⊙ Result: The pressure gauge reads 3190±50 psi / 220±3.4 bar. The pump is functioning correctly. Proceed to step 7.

⊠ Result: The pressure gauge fails to read 3190±50 psi / 220±3.4 bar. The pressure setting needs to be adjusted. Proceed to step 5.

Hydraulic Pump

5 Loosen the set screw for the pressure compensator adjustment screw.



1 pressure compensator adjustment screw
2 set screw
3 hydraulic supply line (from tank)

6 Adjust the pressure compensator pressure. Turn the adjustment screw clockwise to increase the pressure or counterclockwise to decrease the pressure. Tighten the set screw.

NOTICE Component damage hazard. Do not adjust the pressure compensator higher than specified.

7 Turn the engine off and remove the pressure gauge.

⚠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.

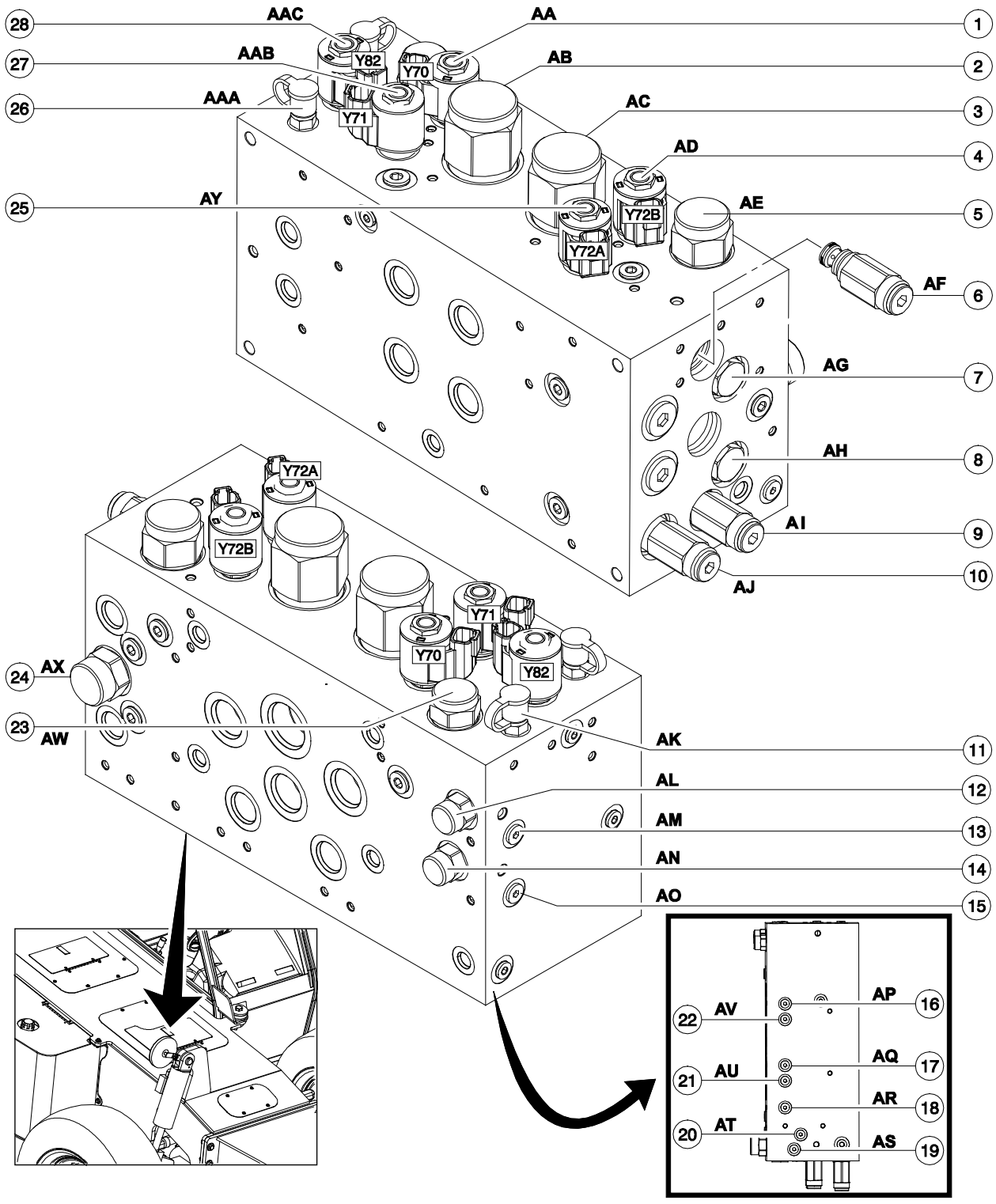
Manifolds

7-1
Primary Function Manifold Components - Models with Single Joystick

The primary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 4 way	AA	Function select -boom extend and sway left	20 ft-lbs / 27 Nm
2	Directional valve, 3 position 4 way, pilot operated	AB	Boom extend/retract	65-75 ft-lbs / 88-101 Nm
3	Directional valve, 3 position 4 way, pilot operated	AC	Boom up/down	65-75 ft-lbs / 88-101 Nm
4	Solenoid valve, 2 position 4 way	AD	Function select -boom down and fork tilt down	20 ft-lbs / 27 Nm
5	Directional valve, 3 position 4 way, pilot operated	AE	Fork tilt up/down	46-54 ft-lbs / 61-72 Nm
6	Relief valve, 3500 psi / 241 bar	AF	Fork tilt up relief	20 ft-lbs / 27 Nm
7	Check valve, pilot operated 100 psi / 6.9 bar	AG	Fork tilt down circuit	25 ft-lbs / 34 Nm
8	Check valve, pilot operated 100 psi / 6.9 bar	AH	Fork tilt up circuit	25 ft-lbs / 34 Nm
9	Relief valve, 3500 psi / 241 bar	AI	Fork tilt down relief	20 ft-lbs / 27 Nm
10	Relief valve, 3500 psi / 241 bar	AJ	System relief	25 ft-lbs / 34 Nm
11	Diagnostic nipple	AK	Test port 'LS'	
12	Flow regulator valve, 0.1 gpm / 0.4 L/min	AL	Load sense drain circuit	20 ft-lbs / 27 Nm
13	Check valve, 5 psi / 0.3 bar	AM	Sway right circuit	12-14 ft-lbs / 16-19 Nm
14	Priority flow regulator valve, 2 gpm / 7.6 L/min	AN	Sway left/right circuit	20 ft-lbs / 27 Nm
15	Check valve, 5 psi / 0.3 bar	AO	Sway left circuit	12-14 ft-lbs / 16-19 Nm

Manifolds


28
AAC
27
AAB
26
AAA
25
AY
24
AX
23
AW
AA
1
AB
2
AC
3
AD
4
AE
5
AF
6
AG
7
AH
8
AI
9
AJ
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AL
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AO
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Y82
Y70
Y71
Y72A
Y72B

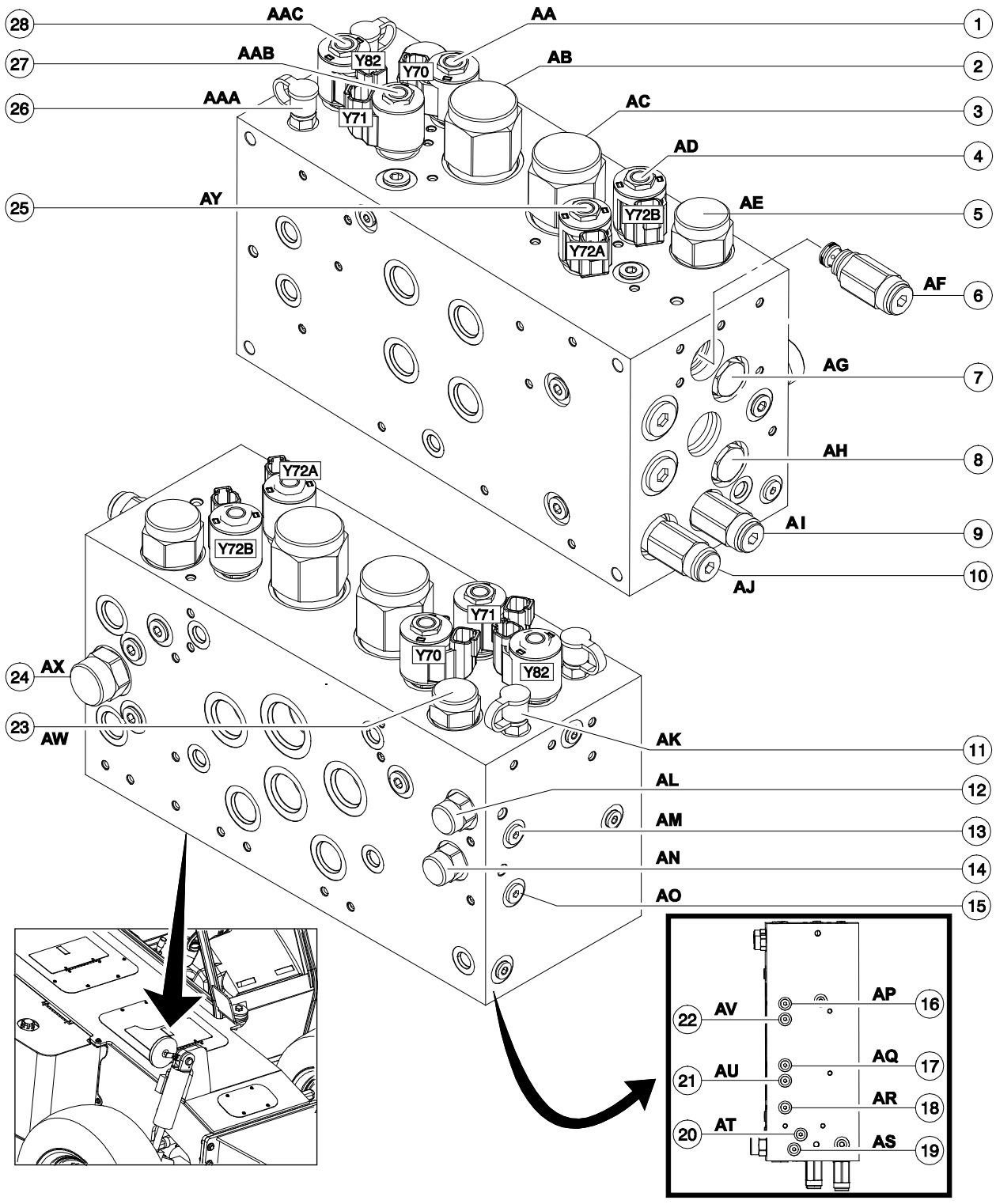
Manifolds

Primary Function Manifold Components - Models with Single Joystick

The primary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
16	Check valve, 5 psi / 0.3 bar	AP	Boom extend circuit	12-14 ft-lbs / 16-19 Nm
17	Check valve, 5 psi / 0.3 bar	AQ	Boom down circuit	12-14 ft-lbs / 16-19 Nm
18	Check valve, 5 psi / 0.3 bar	AR	Fork tilt up circuit	12-14 ft-lbs / 16-19 Nm
19	Check valve, 5 psi / 0.3 bar	AS	Steer left/right circuit	12-14 ft-lbs / 16-19 Nm
20	Check valve, 5 psi / 0.3 bar	AT	Fork tilt down circuit	12-14 ft-lbs / 16-19 Nm
21	Check valve, 5 psi / 0.3 bar	AU	Boom up circuit	12-14 ft-lbs / 16-19 Nm
22	Check valve, 5 psi / 0.3 bar	AV	Boom retract circuit	12-14 ft-lbs / 16-19 Nm
23	Directional valve, 3 position 4 way, pilot operated	AW	Sway left/right	33-37 ft-lbs / 45-50 Nm
24	Flow regulator valve, 14 gpm / 53 L/min	AX	Fork tilt up/down circuit	20 ft-lbs / 27 Nm
25	Solenoid valve, 2 position 4 way	AY	Function select -boom up and fork tilt up	20 ft-lbs / 27 Nm
26	Diagnostic nipple	AAA	Test port 'TP'	
27	Solenoid valve, 2 position 4 way	AAB	Function select -boom extend and sway right	20 ft-lbs / 27 Nm
28	Solenoid valve, 2 position 2 way	AAC	Function select - sway left/right	20 ft-lbs / 27 Nm

Manifolds


28
AAC
27
AAB
26
AAA
25
AY
24
AX
23
AW
Y82
Y70
Y71
Y72A
Y72B
AA
1
AB
2
AC
3
AD
4
AE
5
AF
6
AG
7
AH
8
AI
9
AJ
10
AK
11
AL
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AM
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AQ
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AR
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AS
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AT
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AU
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AV
22

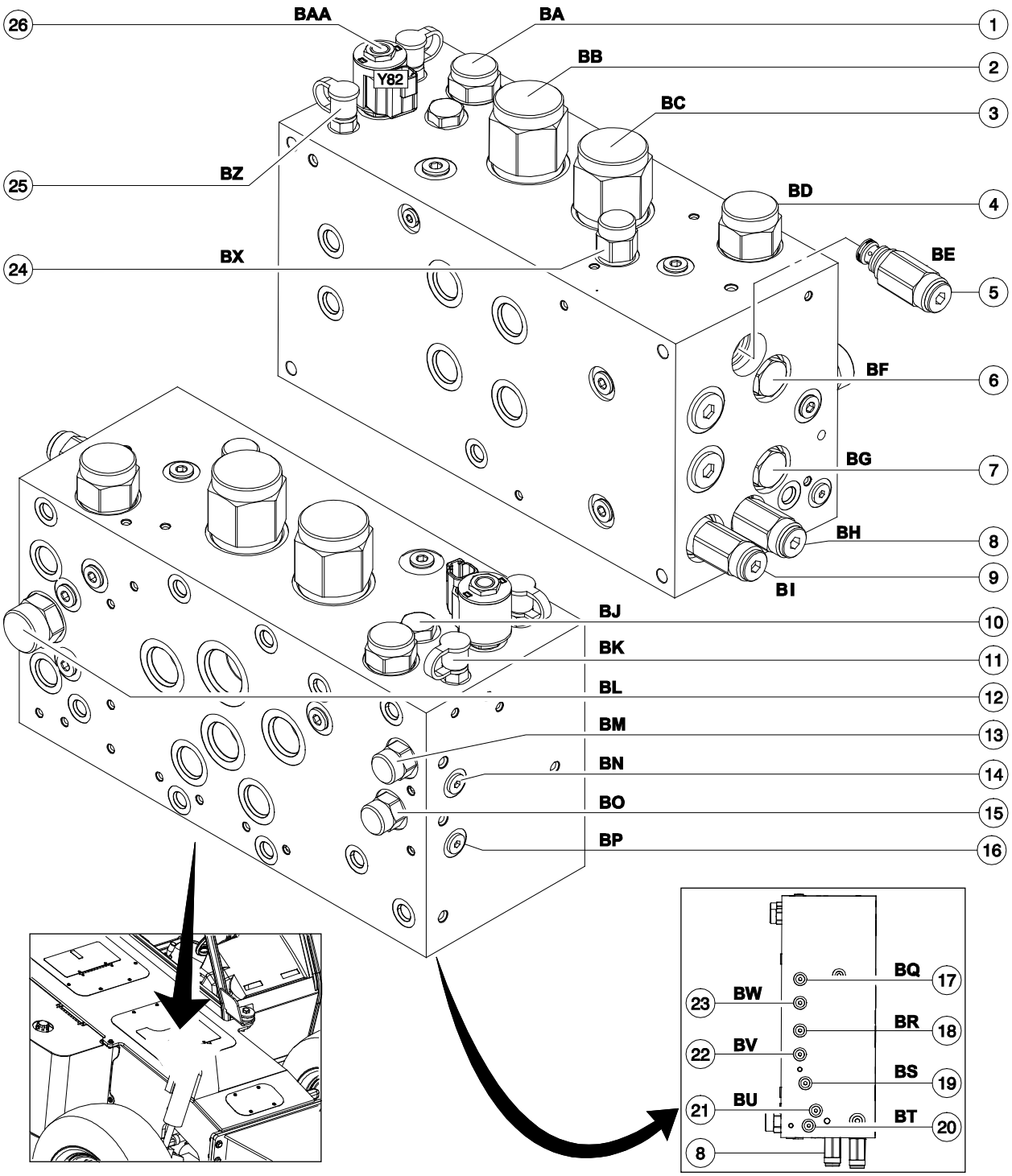
Manifolds

7-2
Primary Function Manifold Components - Models with Dual Joysticks

The primary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Directional valve, 3 position 4 way, pilot operated	BA	Sway left/right	33-37 ft-lbs / 45-50 Nm
2	Directional valve, 3 position 4 way, pilot operated	BB	Boom extend/retract	65-75 ft-lbs / 88-101 Nm
3	Directional valve, 3 position 4 way, pilot operated	BC	Boom up/down	65-75 ft-lbs / 88-101 Nm
4	Directional valve, 3 position 4 way, pilot operated	BD	Fork tilt up/down	46-54 ft-lbs / 61-72 Nm
5	Relief valve, 3500 psi / 241 bar	BE	Fork tilt up relief	20 ft-lbs / 27 Nm
6	Check valve, pilot operated 100 psi / 6.9 bar	BF	Fork tilt down circuit	25 ft-lbs / 34 Nm
7	Check valve, pilot operated 100 psi / 6.9 bar	BG	Fork tilt up circuit	25 ft-lbs / 34 Nm
8	Relief valve, 3500 psi / 241 bar	BH	Fork tilt down relief	20 ft-lbs / 27 Nm
9	Relief valve, 3500 psi / 241 bar	BI	System relief	25 ft-lbs / 34 Nm
10	Shuttle valve	BJ	Function select - sway left/right	20 ft-lbs / 27 Nm
11	Diagnostic nipple	BK	Test port 'LS'	x
12	Flow regulator valve, 14 gpm / 53 L/min	BL	Fork tilt up/down circuit	20 ft-lbs / 27 Nm
13	Flow regulator valve, 0.1 gpm / 0.4 L/min	BM	Pilot pressure drain circuit	20 ft-lbs / 27 Nm
14	Check valve, 5 psi / 0.3 bar	BN	Sway left circuit	12-14 ft-lbs / 16-19 Nm
15	Priority flow regulator valve, 2 gpm / 7.6 L/min	BO	Sway left/right circuit	20 ft-lbs / 27 Nm

Manifolds


26
BAA
Y82
BA
1
BB
2
BC
3
25
BZ
BD
4
24
BX
BE
5
BF
6
BG
7
BH
8
BI
9
BJ
10
BK
11
BL
12
BM
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BW
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BT
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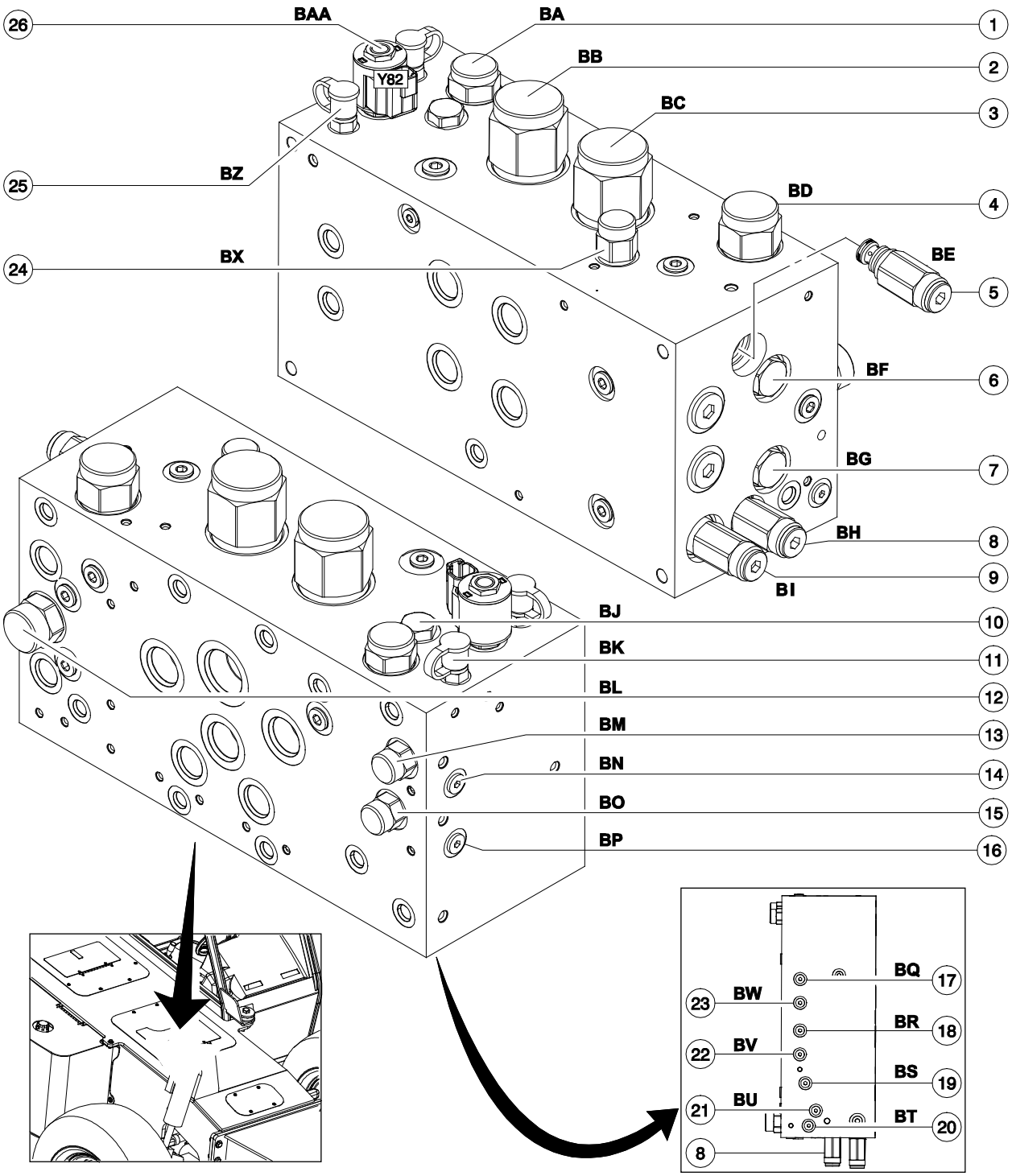
Manifolds

7-2
Primary Function Manifold Components - Models with Dual Joysticks

The primary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
16	Check valve, 5 psi / 0.3 bar	BP	Sway right circuit	12-14 ft-lbs / 16-19 Nm
17	Check valve, 5 psi / 0.3 bar	BQ	Boom extend circuit	12-14 ft-lbs / 16-19 Nm
18	Check valve, 5 psi / 0.3 bar	BR	Boom down circuit	12-14 ft-lbs / 16-19 Nm
19	Check valve, 5 psi / 0.3 bar	BS	Fork tilt down circuit	12-14 ft-lbs / 16-19 Nm
20	Check valve, 5 psi / 0.3 bar	BT	Steer left/right circuit	12-14 ft-lbs / 16-19 Nm
21	Check valve, 5 psi / 0.3 bar	BU	Fork tilt up circuit	12-14 ft-lbs / 16-19 Nm
22	Check valve, 5 psi / 0.3 bar	BV	Boom up circuit	12-14 ft-lbs / 16-19 Nm
23	Check valve, 5 psi / 0.3 bar	BW	Boom retract circuit	12-14 ft-lbs / 16-19 Nm
24	Directional valve, 2 position 2 way, pilot operated	BX	Fork tilt circuit	25 ft-lbs / 34 Nm
25	Diagnostic nipple	BZ	Test port 'TP'	
26	Solenoid valve, 2 position 2 way	BAA	Function select - sway left/right	20 ft-lbs / 27 Nm

Manifolds


26
BAA
BA
1
BB
2
Y82
BC
3
25
BZ
BD
4
24
BX
BE
5
BF
6
BG
7
BH
8
BI
9
BJ
10
BK
11
BL
12
BM
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BN
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BW
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BT
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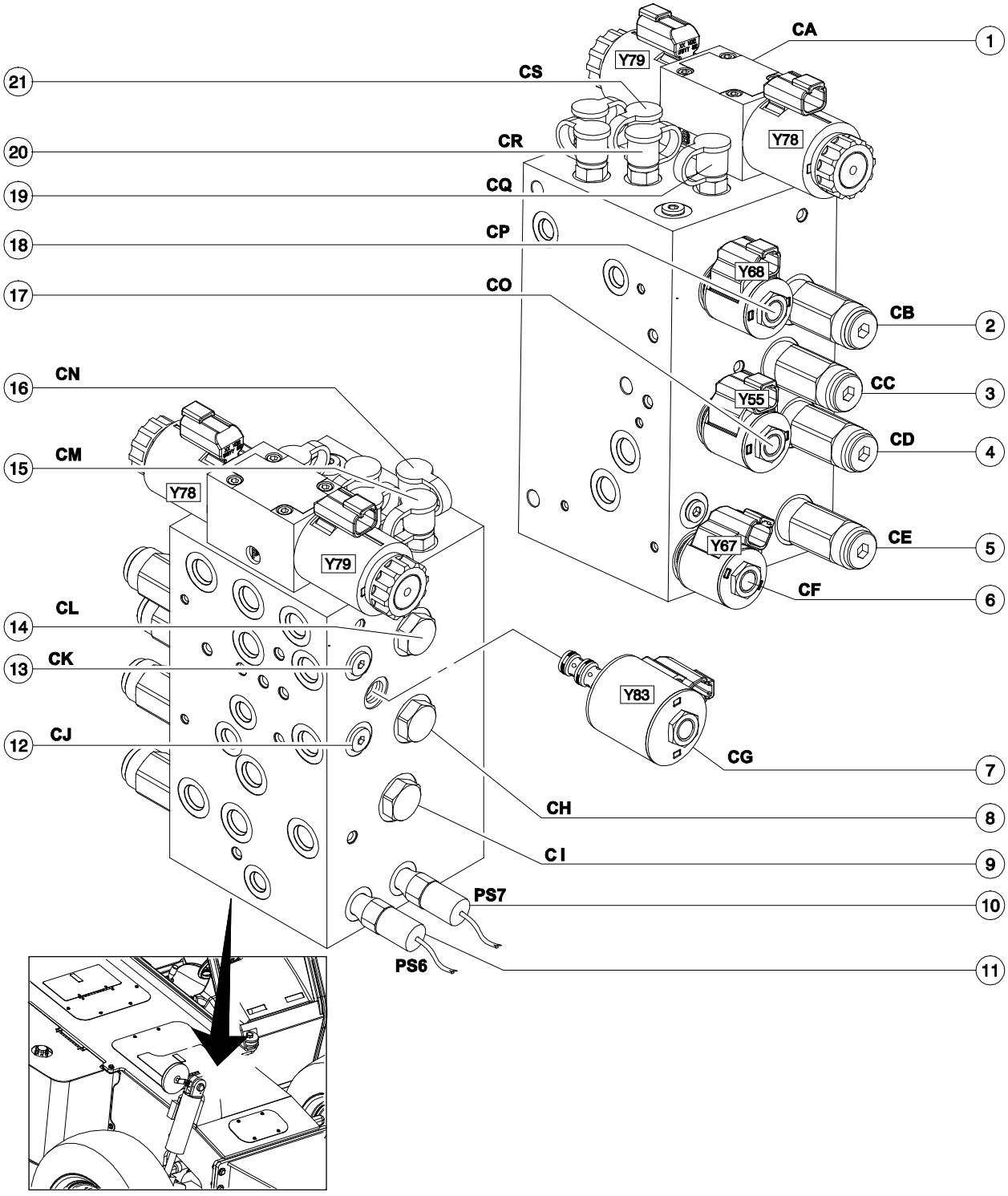
Manifolds

7-3
Secondary Function Manifold Components

The secondary function manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	DO3 valve, 3 position 4 way	CA	Steer left/right	60 in-lbs / 6.8 Nm
2	Pressure reducing/relief valve, 50 psi / 3.4 bar	CB	Rear lock-up circuit	25-27 ft-lbs / 34-37 Nm
3	Pressure reducing/relief valve, 400 psi / 27.5 bar	CC	Differential lock-up circuit	25-27 ft-lbs / 34-37 Nm
4	Pressure reducing/relief valve, 2500 psi / 172 bar	CD	Steer circuit	25-27 ft-lbs / 34-37 Nm
5	Pressure reducing/relief valve, 400 psi / 27.5 bar	CE	Drive brake circuit	25-27 ft-lbs / 34-37 Nm
6	Solenoid valve, 2 position 3 way	CF	Parking brake select	20 ft-lbs / 27 Nm
7	Solenoid valve, 2 position 4 way	CG	Rear axle fast oscillate select	25 ft-lbs / 34 Nm
8	Check valve, 4 psi / 0.3 bar	CH	Rear lock-up extend circuit	20 ft-lbs / 27 Nm
9	Check valve, 25 psi / 1.7 bar	CI	Drive brake circuit	20 ft-lbs / 27 Nm
10	Pressure switch, 350 psi / 24 bar	PS7	Low brake pressure	11 ft-lbs / 14.9 Nm
11	Pressure switch, 250 psi / 17.2 bar	PS6	Parking brake pressure	11 ft-lbs / 14.9 Nm
12	Orifice, 0.059 in / 1.5 mm	CJ	Rear lock-up extend circuit	
13	Orifice, 0.051 in / 1.3 mm	CK	Rear lock-up retract circuit	
14	Check valve, 4 psi / 0.3 bar	CL	Rear lock-up retract circuit	20 ft-lbs / 27 Nm
15	Diagnostic nipple	CM	Test port 'TB'	
16	Diagnostic nipple	CN	Test port 'TPB'	
17	Solenoid valve, 2 position 3 way	CO	Rear axle oscillate enable select	20 ft-lbs / 27 Nm
18	Solenoid valve, 2 position 3 way	CP	Differential lock-up select	20 ft-lbs / 27 Nm
19	Diagnostic nipple	CQ	Test port 'TJ'	
20	Diagnostic nipple	CR	Test port 'TS'	
21	Diagnostic nipple	CS	Test port 'TR'	

Manifolds


CA
1
Y79
21
CS
Y78
20
CR
19
CQ
18
CP
Y68
17
CO
CB
2
CC
3
Y55
CD
4
16
CN
15
CM
Y78
Y79
Y67
CE
5
CF
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PS7
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PS6
11

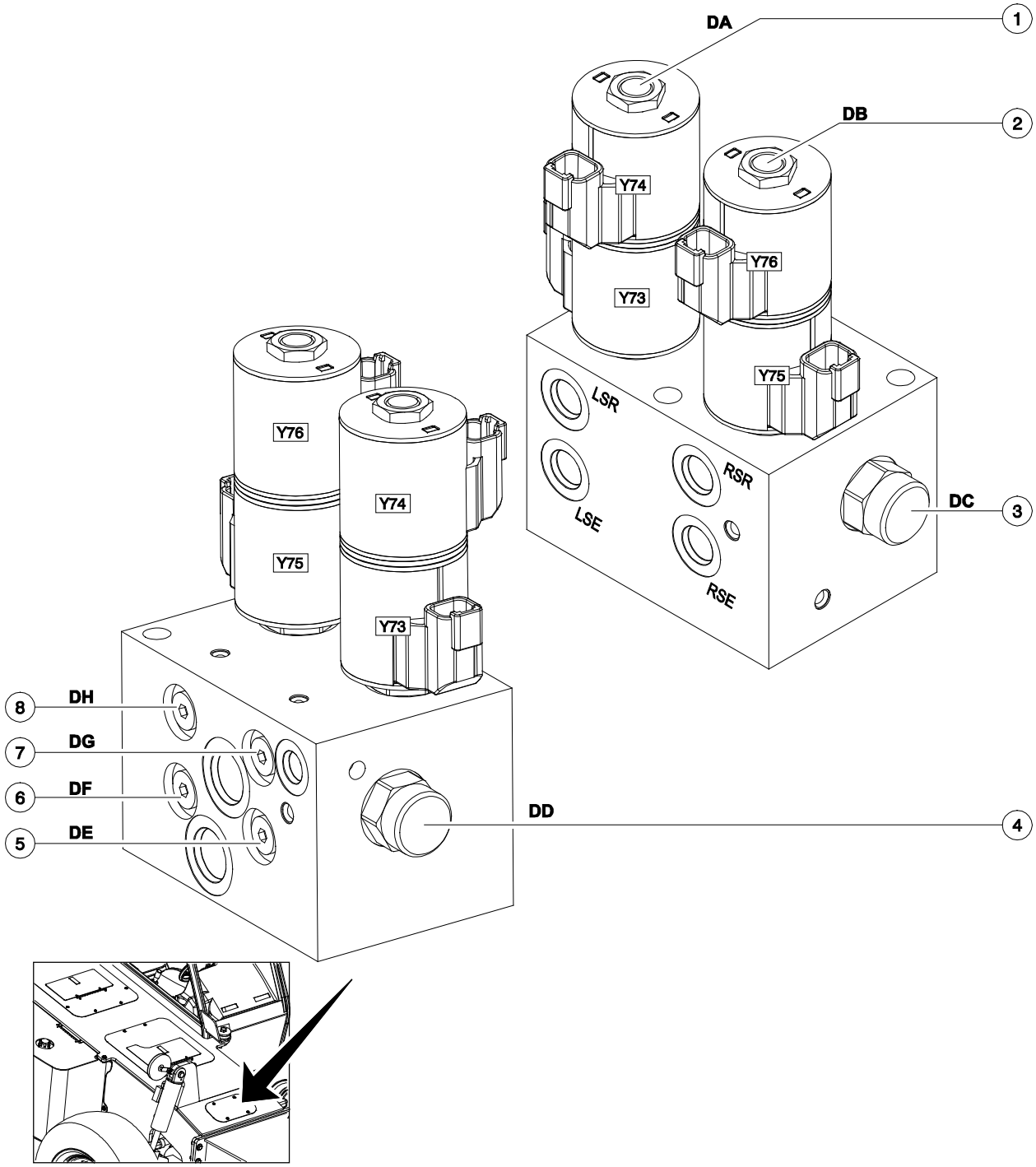
Manifolds

7-4
Outrigger Manifold Components

The outrigger manifold is located under the outrigger inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 3 position 4 way	DA	Left outrigger extend/retract	25 ft-lbs / 34 Nm
2	Solenoid valve, 3 position 4 way	DB	Right outrigger extend/retract	25 ft-lbs / 34 Nm
3	Flow regulator valve, 6 gpm / 22.7 L/min	DC	Right outrigger circuit	25 ft-lbs / 34 Nm
4	Flow regulator valve, 6 gpm / 22.7 L/min	DD	Left outrigger circuit	25 ft-lbs / 34 Nm
5	Check valve, 5 psi / 0.3 bar	DE	Left outrigger extend circuit	12-14 ft-lbs / 16-19 Nm
6	Check valve, 5 psi / 0.3 bar	DF	Right outrigger extend circuit	12-14 ft-lbs / 16-19 Nm
7	Check valve, 5 psi / 0.3 bar	DG	Left outrigger retract circuit	12-14 ft-lbs / 16-19 Nm
8	Check valve, 5 psi / 0.3 bar	DH	Right outrigger retract circuit	12-14 ft-lbs / 16-19 Nm

Manifolds

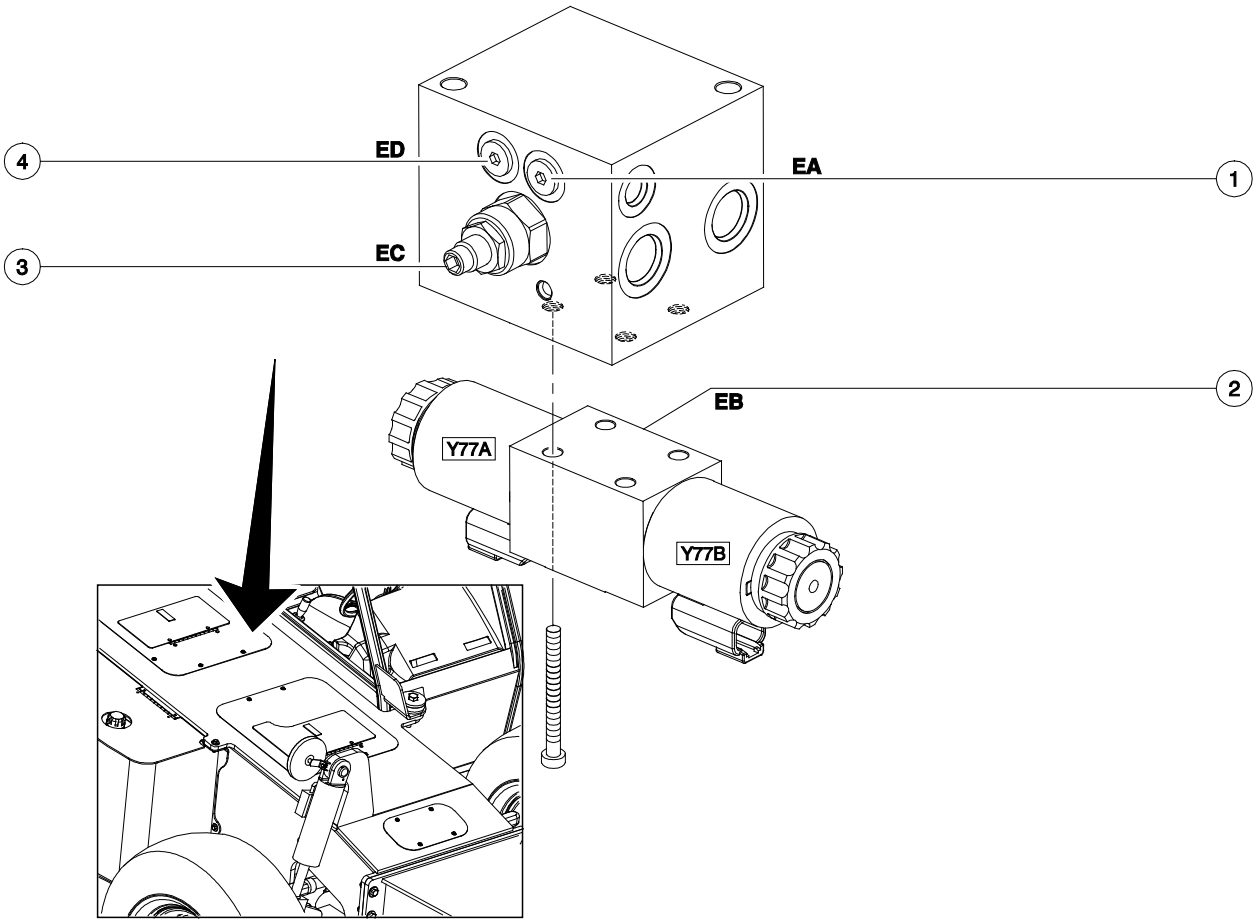

DA
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DB
2
Y74
Y76
Y73
Y75
LSR
RSR
LSE
RSE
DC
3
Y76
Y74
Y75
Y73
8
DH
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DG
6
DF
5
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DD
4

Manifolds

7-5
Auxiliary Manifold Components (option)

The auxiliary manifold is located under the transmission inspection cover.

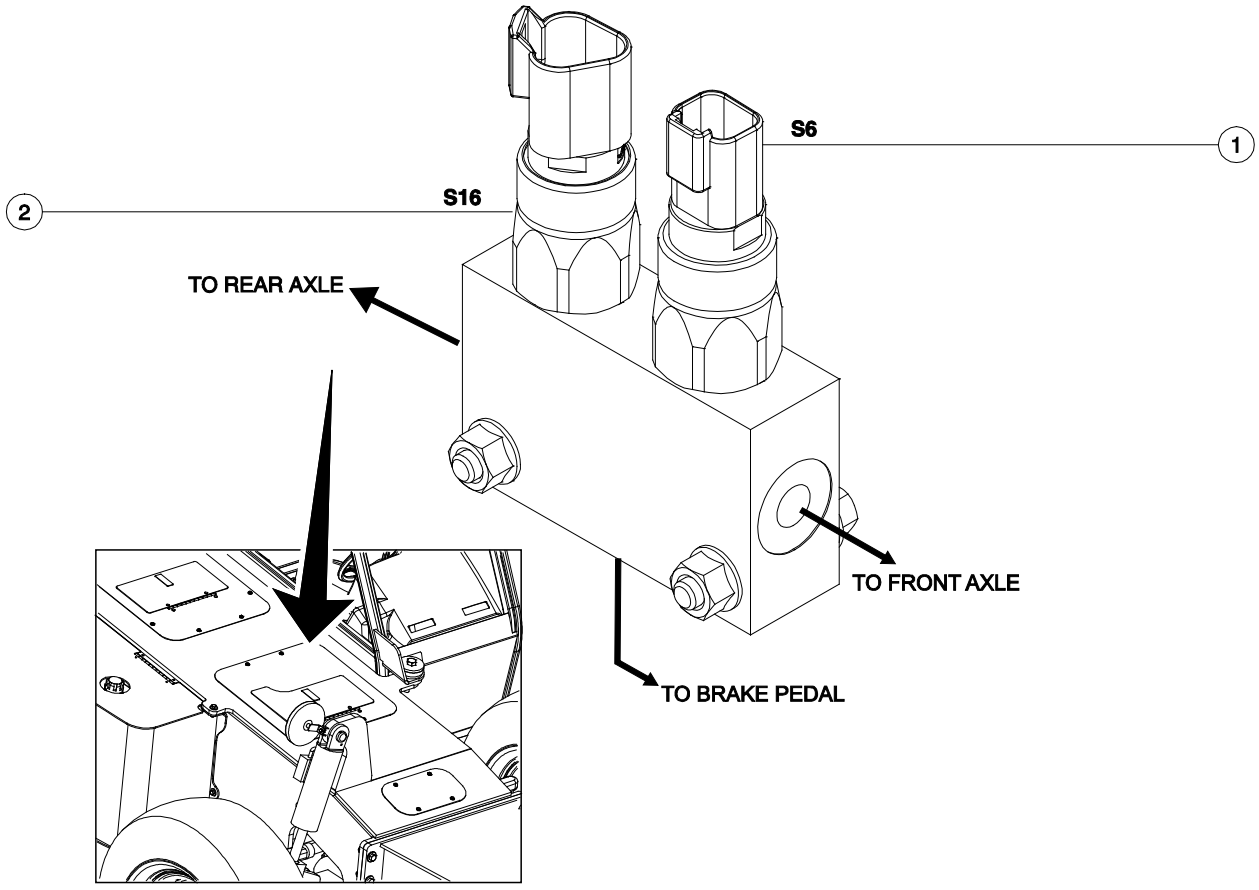
Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.3 bar	EA	Auxiliary 'A1' circuit	12-14 ft-lbs / 16-19 Nm
2	DO3 valve, 3 position 4 way	EB	Auxiliary function enable	60 in-lbs / 6.8 Nm
3	Flow regulator valve	EC	Function speed control	25 ft-lbs / 34 Nm
4	Check valve, 5 psi / 0.3 bar	ED	Auxiliary 'A2' circuit	12-14 ft-lbs / 16-19 Nm



7-6
Brake Manifold Components

The brake manifold is located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Pressure switch, 450 psi / 31 bar	PS4	Clutch cut-off pressure	11 ft-lbs / 14.9 Nm
2	Pressure switch, 50 psi / 3.4 bar	PS5	Brake light pressure (option)	11 ft-lbs / 14.9 Nm

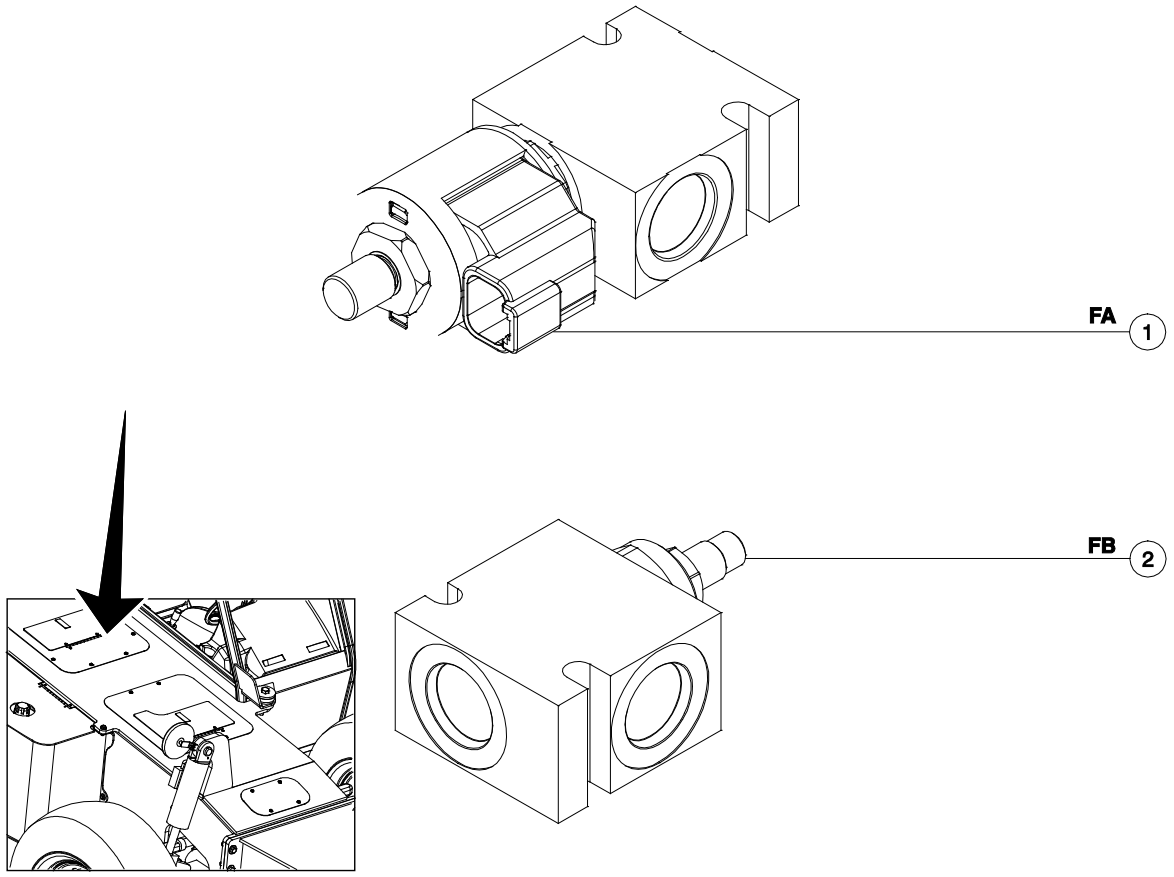


Manifolds

7-7
AC Hydraulic Manifold Components

The AC Hydraulic manifolds are located under the manifold inspection cover.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 2 way	FA	Controls motor	20 ft-lbs / 27.1 Nm
2	Flow control valve, 3 gpm/ 11.3 lpm	FB	Regulates flow	33-37 ft-lbs / 45-50 Nm



7-8 Valve Adjustments - Secondary Function Manifold

How to Set the Steer System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the secondary function manifold, refer to *Secondary Function Manifold Components.*

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. Refer to Repair Procedure, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠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 Install a 0 to 3500 psi / 0 to 250 bar pressure gauge into test port 'TS' at the top of the secondary function manifold. Refer to *Secondary Function Manifold Components*.

6 Start the engine. Allow the engine to idle.

7 Fully turn and hold the steering wheel in the left direction and allow the wheels to fully turn to the left. Continue holding the steering while observing the pressure reading on the pressure gauge.

⊙ Result: The pressure gauge reads 2500 psi / 172 bar. The pressure setting is correct. Proceed to step 12.

⊠ Result: The pressure gauge fails to read 2500 psi / 172 bar. The pressure setting needs to be adjusted. Proceed to step 8.

8 Turn the machine off. Hold the steer pressure reducing/relief valve with a wrench and remove the cap.

9 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

NOTICE Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

10 Install the relief valve cap.

11 Repeat this procedure beginning with step 6.

12 Turn the machine off. Remove the pressure gauge from the test port.

⚠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.

Manifolds

How to Set the Parking Brake System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the primary function manifold, Refer to Primary Function Manifold Components.

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. Refer to Repair Procedure, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠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 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TPB' at the top of the secondary function manifold, Refer to Secondary Function Manifold Components.

6 Start the engine. Allow the engine to idle.

⊙ Result: The pressure gauge reads 400 psi / 27.5 bar. The pressure setting is correct. Proceed to step 11.

⊠ Result: The pressure gauge fails to read 400 psi / 27.5 bar. The pressure setting needs to be adjusted. Proceed to step 7.

7 Turn the machine off. Hold the brake pressure reducing/relief valve with a wrench and remove the cap.

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

NOTICE Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat this procedure beginning with step 6.

11 Turn the machine off. Remove the pressure gauge from the test port.

⚠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.

How to Set the Differential Lock/Joystick System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the primary function manifold, Refer to Primary Function Manifold Components.

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. Refer to Repair Procedure, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠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 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TJ' at the top of the secondary function manifold, Refer to Secondary Function Manifold Components.

6 Start the engine. Allow the engine to idle.

⊙ Result: The pressure gauge reads 400 psi / 27.5 bar. The pressure setting is correct. Proceed to step 11.

⊠ Result: The pressure gauge fails to read 400 psi / 27.5 bar. The pressure setting needs to be adjusted. Proceed to step 7.

7 Turn the machine off. Hold the differential lock/joystick pressure reducing/relief valve with a wrench and remove the cap.

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

NOTICE Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat this procedure beginning with step 6.

11 Turn the machine off. Remove the pressure gauge from the test port.

⚠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.

Manifolds

How to Set the Rear Lock-up System Pressure

Note: Be sure that the hydraulic oil level is visible in the inspection glass of the hydraulic tank.

1 Install a 0 to 1000 psi / 0 to 100 bar pressure gauge into test port 'TP' at the top of the primary function manifold. Refer to Primary Function Manifold Components.

2 Start the engine. Allow the engine to idle after warming the engine to operating temperature.

3 Without operating any machine controls, observe the reading on the pressure gauge.

⊙ Result: The pressure gauge reads 450 ±25 psi / 31 ±1.7 bar. The pump is functioning correctly.

⊠ Result: The pressure gauge fails to read 450 ±25 psi / 31 ±1.7 bar. The pressure setting needs to be adjusted. Refer to Repair Procedure, *How to Adjust the Function Pump Pressure*.

4 Turn the machine off. Remove the pressure gauge from the test port.

⚠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 Install a 0 to 500 psi / 0 to 50 bar pressure gauge into test port 'TR' at the top of the secondary function manifold, Refer to Secondary Function Manifold Components.

6 Start the engine. Allow the engine to idle.

⊙ Result: The pressure gauge reads 50 psi / 3.4 bar. The pressure setting is correct. Proceed to step 11.

⊠ Result: The pressure gauge fails to read 50 psi / 3.4 bar. The pressure setting needs to be adjusted. Proceed to step 7.

7 Turn the machine off. Hold the rear lockup pressure reducing/relief valve with a wrench and remove the cap.

8 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure.

NOTICE Component damage hazard. Do not adjust the relief valve pressures higher than specifications.

9 Install the relief valve cap.

10 Repeat this procedure beginning with step 6.

11 Turn the machine off. Remove the pressure gauge from the test port.

⚠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.

7-9 Valve Coils

How to Test a Coil

A properly functioning coil provides an electromotive force which operates the solenoid valve. Critical to normal operation is continuity within the coil that provides this force field.

Since coil resistance is sensitive to temperature, resistance values outside specification can produce erratic operation. When coil resistance decreases below specification, amperage increases. As resistance rises above specification, voltage increases.

While valves may operate when coil resistance is outside specification, maintaining coils within specification will help ensure proper valve function over a wide range of operating temperatures.

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

1 Tag and disconnect the wiring from the coil to be tested.

2 Test the coil resistance.

⊙ Result: The resistance should be within specification, plus or minus 30%.

⊠ Result: If the resistance is not within specification, plus or minus 30%, replace the coil.

Valve Coil Resistance Specification

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 10°C that your air temperature increases or decreases from 68°F / 20°C.

Valve Coil Resistance Specification

Description	Specification
Solenoid valve, 2 position 4 way 12V DC with diode (schematic items AA, AD, AY, AAB and BAA)	8.9Ω
Solenoid valve, 2 position 2 way 12V DC with diode (schematic items AAC and EA)	8.9Ω
DO3 valve, 3 position 4 way 12V DC with diode (schematic items CA and EB)	5.6Ω
Solenoid valve, 2 position 2 way 12V DC with diode (schematic items FA)	8.8Ω
Solenoid valve, 2 position 3 way 12V DC with diode (schematic items CF, CO and CP)	8.9Ω
Solenoid valve, 2 position 4 way 12V DC with diode (schematic items CG)	7.3Ω
Solenoid valve, 3 position 4 way 12V DC with diode (schematic items DA and DB)	7.3Ω

Manifolds

How to Test a Coil Diode

Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

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

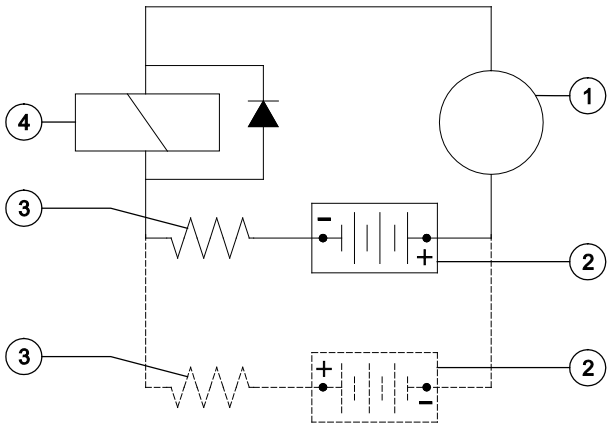
1 Test the coil for resistance. Refer to Repair Procedure, *How to Test a Coil*.

2 Connect a 10W resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Resistor 10Ω

Genie part number 27287

Note: The battery should read 9V DC or more when measured across the terminals.



1 multimeter
2 9v DC battery
3 10Ω resistor
4 coil

Note: Dotted lines in illustration indicate a reversed connection as specified in step 6.

3 Set a multimeter to read DC current.

Note: The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

4 Connect the negative lead to the other terminal on the coil.

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

⊠ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

8-1 Axles

How to Remove the Axle

⚠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 result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Chock the wheels.

2 Remove the fasteners securing the driveshaft to the transmission. Lower the end of the driveshaft to the ground.

3 Remove the fasteners securing the driveshaft to the axle. remove the driveshaft from the machine.

4 Loosen the lug nuts of both wheels on the axle to be removed. Do not remove the lug nuts.

5 Raise the end of the machine until the tires are off the ground. Place blocks under the chassis for support.

⚠DANGER Crushing hazard. The chassis will fall if not properly supported.

6 Remove the lug nuts. Remove the tire and wheel assembly from both ends of the axle.

7 Support and secure the axle to an appropriate lifting device.

8 Remove the fasteners securing the sway cylinder rod-end pivot pin to the chassis.

9 Use a soft metal drift to remove the pivot pin.

10 Remove the fasteners securing the axle to the chassis. Remove the axle from the machine.

⚠DANGER Crushing hazard. The axle will fall if not properly supported when the fasteners are removed from the machine.

Bolt torque specification	
Axle mounting bolts	380 ft-lbs 515 Nm

How to Repair the Axle

Repair procedures and additional axle information is available in the Dana 213 Axle Maintenance and Repair Manual.

Dana 213 Axle Maintenance and Repair Manual	
Genie part number	115026

Outriggers

9-1 Outriggers

How to Remove an Outrigger

1 Extend the outrigger until the pad just touches the ground. Do not rest the weight of the machine on the outrigger.

2 Tag, disconnect and plug the hydraulic supply hoses at the outrigger cylinder. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the barrel end of the fork level cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the fasteners securing the outrigger cylinder barrel-end pivot pin to the machine.

5 Use a soft metal drift to remove the outrigger cylinder barrel-end pivot pin. Lower the cylinder onto the outrigger.

⚠WARNING Crushing hazard. The cylinder may become unbalanced and fall if not properly supported when the pivot pin is removed from the machine.

6 Attach a lifting strap from an overhead crane to the outrigger assembly. Support the outrigger. Do not apply any lifting pressure.

7 Remove the fasteners securing the outrigger pivot pin to the machine.

8 Use a soft metal drift to remove the pivot pin. Remove the outrigger assembly from the machine.

⚠WARNING Crushing hazard. The outrigger will fall if not properly supported when the pivot pin is removed from the machine.

How to Remove an Outrigger Cylinder

Note: When removing a hose assembly or fitting, the O-ring (if equipped) on the fitting and/or hose end must be replaced. All connections must be torqued to specification during installation. Refer to Specifications, *Hydraulic Hose and Fitting Torque Specifications.*

1 Extend the outrigger until the pad just touches the ground. Do not rest the weight of the machine on the outrigger.

2 Tag, disconnect and plug the two hydraulic supply hoses at the outrigger cylinder. Cap the fittings.

⚠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 Component damage hazard. Hoses can be damaged if they are kinked or pinched.

3 Attach a lifting strap from an overhead crane to the barrel end of the outrigger cylinder. Support the cylinder. Do not apply any lifting pressure.

4 Remove the fasteners securing the outrigger cylinder barrel-end pivot pin to the chassis.

5 Use a soft metal drift to remove the pivot pin.

⚠WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed from the machine.

6 Raise the cylinder to a vertical position.

7 Remove the fasteners securing the outrigger cylinder rod-end pivot pin to the machine.

8 Use a soft metal drift to remove the pivot pin. Remove the cylinder from the machine.

⚠WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed from the machine.

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Fault Codes



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 procedure with the machine in the following configuration:
  - Machine parked on a firm, level surface
  - Boom in the stowed position
  - Key switch in the off position with the key removed
  - Wheels chocked

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.
- ☑ Read each appropriate fault code thoroughly. Attempting short cuts may produce hazardous conditions.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

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

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

Diagnostic Display

When the engine Electronic Control Module (ECM) detects an abnormal operating condition, a fault code is immediately stored in the ECM memory.

Models to Serial Number GTH1012-16291

The fault code is displayed on the engine diagnostic display which is located on the dashboard in the operator's compartment. This backlit LCD display allows the operator to view these fault codes, a description of the code and corrective action needed. When not being used to display fault codes, the display shows the many readouts of engine functions in both English and metric units.

Located at the upper corners of the diagnostic display are amber and red indicator lights. Depending on the severity of a detected engine fault, one of these lights will illuminate indicating an active engine fault:

Amber - **WARNING**

An amber colored light signals an abnormal engine condition which should be corrected as soon as possible.

Red - **STOP ENGINE**

A red colored light indicates an engine condition exists which requires the operator to shut down the engine as soon as possible. The ECM will, in some cases, automatically shut down the engine when the red light is displayed.

Access the Active Fault Codes:

NOTICE Component damage hazard. Ignoring active fault codes may result in engine damage.

1 During normal operation, engine parameters are visible in the diagnostic display. When an engine fault is detected, the engine parameters on display are immediately replaced with a WARNING message. Also on display are the SPN and FMI codes which are combined to show an engine fault code.

2 If the word "Next" appears at the bottom of the display, this indicates that additional active fault codes exist. Use the arrow keys to scroll to the next code.

3 Press the "Enter" key to acknowledge the active code and return to the engine parameter display.

Access the Stored Fault Codes:

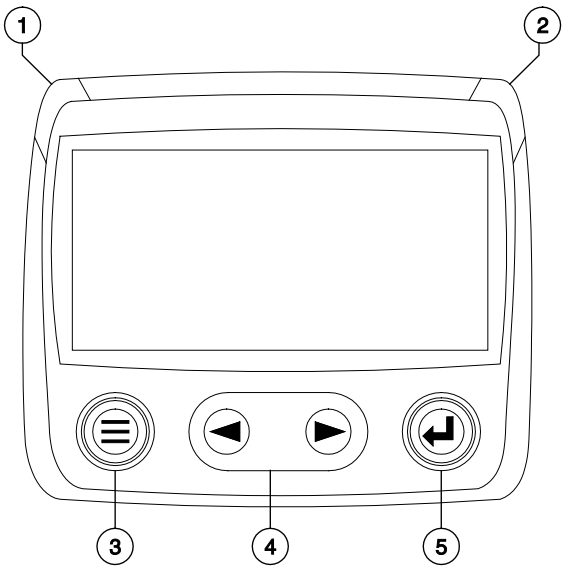
1 Turn the key switch to the on position. Do not start the engine.

2 Press the "Menu" key. Use the "Arrow" keys to scroll to "Stored Codes."

3 Press the "Enter" key to view the stored code.

4 If the word "Next" appears at the bottom of the screen, there are additional codes being stored. Use the "Arrow" key to scroll to the next stored code.

5 Press the "Menu" key to return to the main menu.



Diagnostic display (to Serial Number GTH1012-16291)

1 amber warning light
2 red stop engine light
3 menu key
4 arrow/scroll keys
5 enter key

Diagnostic Display

Models from Serial Number GTH1012-16292

The fault code is displayed on the LCD display which is located on the gauge cluster in the operator's compartment.

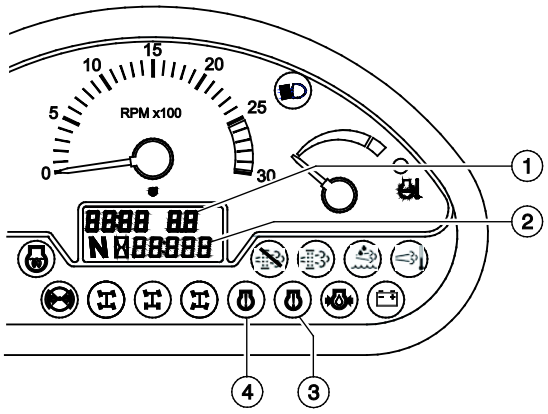
The gauge cluster also includes two warning lights.

They are an amber colored light which signals an abnormal engine condition which should be corrected as soon as possible and a red colored light which signals an engine condition which requres the operator to shut down the engine as soon as possible.

The ECM will, in some cases, automatically shut down the engine when the red light is displayed.

Active Fault Codes

Active Fault Codes will be displayed on the gauge cluster whenever a fault is detected. If multiple fault codes are detected, the fault codes will scroll on the display.



1 FMI Code
2 SPN Code
3 amber warning light
4 red stop engine light

All Models

Active Codes vs Stored Codes

Active fault codes, indicating an engine condition or conditions which have not been corrected, are displayed at the moment the fault is detected.

Stored fault codes are the cumulative history of fault codes which the ECM has detected. These fault codes may be recalled by service personnel at a later time even if the condition which caused the engine fault has ceased to exist.

Note: Additional hardware will be necessary to access stored codes on machines from serial number GTH1012-16292.

Decoding Fault Codes

The Suspect Parameter Number (SPN) and the Failure Mode Identifier (FMI), when combined, are the basis for an engine fault code. The SPN number indicates the affected component; the FMI number reveals the type of failure that has occurred. Comparing the combination of numbers to the fault code chart on the following pages will help to determine the exact engine fault and a corrective course of action. For additional information, refer to the engine operator's manual which came with your machine.

John Deere 4045HF485 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description	Corrective Action
000028	3	Throttle #3 Voltage Out of Range High	Check Sensor and Wiring
	4	Throttle #3 Voltage Out of Range Low	Check Sensor and Wiring
	14	Throttle #3 Voltage Out of Range	Contact Servicing Dealer
000029	3	Throttle #2 Voltage Out of Range High	Check Sensor and Wiring
	4	Throttle #2 Voltage Out of Range Low	Check Sensor and Wiring
	14	Throttle #2 Voltage Out of Range	Contact Servicing Dealer
000091	3	Throttle Voltage Out of Range High	Check Switch and Wiring
	4	Throttle Voltage Out of Range Low	Check Switch and Wiring
	14	Throttle Voltage Out of Range	Check Sensor and Wiring
00094	3	Fuel Pressure Voltage Out of Range High	Check Sensor and Wiring
	4	Fuel Pressure Voltage Out of Range Low	Check Sensor and Wiring
000097	3	Water in Fuel Voltage Out of Range High	Check Sensor and Wiring
	4	Water in Fuel Voltage Out of Range Low	Check Sensor and Wiring
	16	Water in Fuel Detected	Stop and Drain Water Separator
000100	1	Engine Oil Pressure Low-Most Severe	Check Oil Level
	3	Engine Oil Pressure Voltage Out of Range High	Check Sensor and Wiring
	4	Engine Oil Pressure Voltage Out of Range Low	Check Sensor and Wiring
	18	Engine Oil Pressure Low-Moderately Severe	Check Oil Level
	31	Oil Pressure Detected with Zero Engine Speed	Contact Servicing Dealer
000102	2	Manifold Air Pressure Sensor In-Range Failure	Contact Servicing Dealer
	3	Manifold Air Pressure Voltage Out of Range High	Contact Servicing Dealer
	4	Manifold Air Pressure Voltage Out of Range Low	Contact Servicing Dealer
000103	0	Turbocharger Speed High -Most Severe	Contact Servicing Dealer
	2	Turbocharger Speed Data Incorrect	Contact Servicing Dealer
	5	Turbocharger Harness Open Circuit	Contact Servicing Dealer
	6	Turbocharger Harness Shorted To Ground	Contact Servicing Dealer
	8	Turbocharger Speed Signal In-Range Failure	Contact Servicing Dealer
	31	Turbocharger Speed Signal Missing	Contact Servicing Dealer

John Deere 4045HF485 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description	Corrective Action
000105	0	Exhaust Gas Recirculation Air Temperature High - Most Severe	Check Air Cleaner, Aftercooler, or Room Temperature
	3	Exhaust Gas Recirculation Air Temperature Input Voltage Out of Range High	Check Sensor and Wiring
	4	Exhaust Gas Recirculation Air Temperature Input Voltage Out of Range Low	Check Sensor and Wiring
	15	Exhaust Gas Recirculation Air Temperature High - LeastSevere	Check Air Cleaner, Aftercooler, or Room Temperature
	16	Exhaust Gas Recirculation Air Temperature High-Moderately Severe	Check Air Cleaner, Aftercooler, or Room Temperature
000108	2	Barometric Air Pressure Sensor Signal Invalid	Contact Servicing Dealer
	31	Barometric Air Pressure Sensor Signal Invalid	Contact Servicing Dealer
000110	0	Engine Coolant Temperature High-Most Severe	Check Cooling System, Reduce Power
	3	Engine Coolant Temperature Input Voltage Out of Range - High	Check Sensor and Wiring
	4	Engine Coolant Temperature Input Voltage Out of Range - Low	Check Sensor and Wiring
	15	Engine Coolant Temperature High-Least Severe	Check Cooling System, Reduce Power
	16	Engine Coolant Temperature High - Moderately Severe	Check Cooling System, Reduce Power
	17	Engine Coolant Temperature Low-Least Severe	Check Cooling System
000111	1	Coolant Level Low	Check Operator's Manual
000157	3	Fuel Rail Pressure Voltage Out of Range High	Contact Servicing Dealer
	4	Fuel Rail Pressure Voltage Out of Range Low	Contact Servicing Dealer
	10	Fuel Rail Pressure Drops Too Fast	Contact Servicing Dealer
	17	Fuel Rail Pressure Not Developed	Contact Servicing Dealer
000158	17	Keyswitch Circuit Problem	Contact Servicing Dealer
000174	0	Fuel Temperature High-Most Severe	Add Fuel or Switch Fuel Tanks
	3	Fuel Temperature Voltage Out of Range High	Check Sensor and Wiring
	4	Fuel Temperature Voltage Out of Range Low	Check Senor and Wiring
	16	Fuel Temperature High-Moderately Severe	Add Fuel or Switch Fuel Tanks
000189	0	Engine Speed Derate	Check Fault Codes or Contact Servicing Dealer

John Deere 4045HF485 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description	Corrective Action
000190	0	Engine Speed High-Most Severe	Reduce Engine Speed
	16	Engine Speed High-Moderately Severe	Reduce Engine Speed
000412	0	Exhaust Gas Recirculation Temperature Input Voltage High-Most Severe	Contact Servicing Dealer
	3	Exhaust Gas Recirculation Temperature Voltage Out of Range High	Contact Servicing Dealer
	4	Exhaust Gas Recirculation Temperature Voltage Out of Range Low	Contact Servicing Dealer
	16	Exhaust Gas Recirculation Temperature Moderately Severe	Contact Servicing Dealer
000611	3	Electronic Injector Wiring Shorted to Power Source	Check Wiring
	4	Electronic Injector Wiring Shorted to Ground	Check Wiring
000620	3	5V Sensor Supply Voltage Out of Range High	Check Wiring
	4	5V Sensor Supply Voltage Out of Range Low	Check Wiring
000627	1	Electronic Injector Supply Voltage Low	Check Battery Voltage and Wiring
	16	ECU Power Supply Voltage High	Contact Servicing Dealer
	18	ECU Power Supply Voltage Low	Contact Servicing Dealer
000628	12	ECU Programming Error	Contact Servicing Dealer
000629	12	ECU Programming Error	Contact Servicing Dealer
	13	ECU Error	Contact Service Dealer
000636	2	Engine Position Sensor Noise	Check Sensor and Wiring
	5	Engine Position Sensor Current Low or Open Circuit	Contact Servicing Dealer
	6	Engine Position Sensor Current High or Grounded Circuit	Contact Servicing Dealer
	8	Engine Position Sensor Input Missing	Check Sensor and Wiring
	10	Engine Position Sensor Pattern Error	Check Sensor and Wiring
000637	2	Timing (Crank) Position Sensor Noise	Check Sensor and Wiring
	5	Timing (Crank) Position Sensor Current Low or Open Circuit	Contact Servicing Dealer
	6	Timing (Crank) Position Sensor Current High or Grounded Circuit	Contact Servicing Dealer
	7	Crank/Camshaft Position Out of Sync	Check Sensor and Wiring
	8	Crank Position Input Missing	Check Sensor and Wiring
	10	Crank Position Input Pattern Error	Check Sensor and Wiring

John Deere 4045HF485 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description	Corrective Action
000640	31	External Engine Protection Signal Not Recognized	Engine External Protection Unknown. Check Installation
000641	4	Turbocharger Actuator Disabled	Contact Servicing Dealer
	5	Turbocharger Actuator Current Low or Open Circuit	Contact Servicing Dealer
	12	Turbocharger Actuator Communication Error	Contact Servicing Dealer
	13	Turbocharger Learn Error	Contact Servicing Dealer
	16	Turbocharger Temperature High-Moderately Severe	Contact Servicing Dealer
000651	02	Cylinder #1 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #1 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #1 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #1 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #1 Injector QR Code String Error	Contact Servicing Dealer
000652	02	Cylinder #2 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #2 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #2 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #2 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #2 Injector QR Code String Error	Contact Servicing Dealer
000653	02	Cylinder #3 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #3 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #3 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #3 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #3 Injector QR Code String Error	Contact Servicing Dealer
000654	02	Cylinder #4 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #4 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #4 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #4 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #4 Injector QR Code String Error	Contact Servicing Dealer
000655	02	Cylinder #5 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #5 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #5 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #5 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #5 Injector QR Code String Error	Contact Servicing Dealer

John Deere 4045HF485 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description	Corrective Action
000656	02	Cylinder #6 Injector Part Number Not Recognized	Contact Servicing Dealer
	05	Cylinder #6 Electronic Injector Circuit Open	Check Injector Wiring or Injector Solenoid
	06	Cylinder #6 Electronic Injector Circuit Shorted	Check Injector Wiring or Injector Solenoid
	07	Cylinder #6 Electronic Injector Fuel Flow Low	Injector Failed or Flow Limiter Closed
	13	Cylinder #6 Injector QR Code String Error	Contact Servicing Dealer
000676	03	Glow Plug Relay Voltage High	Check Relay and Wiring
	04	Glow Plug Relay Voltage Low	Check Relay and Wiring
000898	09	Vehicle Speed or Torque Message Invalid	Contact Servicing Dealer
000970	31	Auxiliary Engine Shutdown Signal	Non Engine Fault. Check Other Shutdown Devices
000971	31	Auxiliary Engine Derate Signal	Non Engine Fault. Check Other Shutdown Devices
001079	03	Sensor Supply Voltage 3 Out of Range High	Check Wiring
	04	Sensor Supply Voltage 3 Out of Range Low	Check Wiring
001080	03	Fuel Rail Pressure Sensor Supply Voltage 2 Out of Range High	Check Wiring
	04	Fuel Rail Pressure Sensor Supply Voltage 2 Out of Range Low	Check Wiring
001109	31	Engine Protection System Approaching Shutdown	Check Fault Codes
001110	31	Engine Protection System Shutdown Engine	Check Fault Codes
001136	00	ECU Temperature High - Most Severe	Contact Servicing Dealer
	16	ECU Temperature High - Moderately Severe	Contact Servicing Dealer
001172	03	Turbo Compressor Inlet Temperature Input Voltage Out of Range High	Contact Servicing Dealer
	04	Turbo Compressor Inlet Temperature Input Voltage Out of Range Low	Contact Servicing Dealer
	16	Turbo Compressor Inlet Temperature High - Moderately Severe	Contact Servicing Dealer
001180	00	Turbo Turbine Inlet Temperature High-Most Severe	Contact Servicing Dealer
	16	Turbo Turbine Inlet Temperature High - Moderately Severe	Contact Servicing Dealer

John Deere 4045HF485 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description	Corrective Action
001209	02	Exhaust Pressure Incorrect	Contact Servicing Dealer
	03	Exhaust Pressure Sensor Voltage Out of Range High	Contact Servicing Dealer
	04	Exhaust Pressure Sensor Voltage Out of Range Low	Contact Servicing Dealer
001347	03	Fuel Pump Pressurizing Assembly #1 Sensor Voltage High	Contact Servicing Dealer
	05	Fuel Pump Pressurizing Assembly #1 Sensor Circuit Open, Shorted to Ground, or Overloaded	Check Pump Wiring
	07	Fuel Pump Assembly #1 Rail Pressure Contro Mismatch	Check Fuel Filter and Lines
001569	31	Engine Protection Derate	Check Fault Codes
002630	00	Exhaust Gas Recirculation Fresh Air Temperature High-Most Severe	Contact Servicing Dealer
	03	Exhaust Gas Recirculation Fresh Air Temperature Voltage Out of Range High	Contact Servicing Dealer
	04	Exhaust Gas Recirculation Fresh Air Temperature Voltage Out of Range Low	Contact Servicing Dealer
	15	Exhaust Gas Recirculation Fresh Air Temperature High-Least Severe	Contact Servicing Dealer
	16	Exhaust Gas Recirculation Fresh Air Temperature High-Moderately Severe	Contact Servicing Dealer
002659	02	Exhaust Gas Recirculation Flow/Temperature Mismatch	Contact Servicing Dealer
	15	Exhaust Gas Recirculation Flow Rate Above Normal	Contact Servicing Dealer
	17	Exhaust Gas Recirculation Flow Rate Below Normal	Contact Servicing Dealer
002790	16	Turbocharger Compressor Outlet Temperature High - Most Severe	Contact Servicing Dealer

John Deere 4045HF485 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description	Corrective Action
002791	02	Exhaust Gas Recirculation Valve Sensor Voltage Mismatch	Contact Servicing Dealer
	03	Exhaust Gas Recirculation Valve Sensor Voltage Out of Range High	Contact Servicing Dealer
	04	Exhaust Gas Recirculation Valve Sensor Voltage Out of Range Low	Contact Servicing Dealer
	05	Exhaust Gas Recirculation Valve Current Low or Open Circuit	Contact Servicing Dealer
	06	Exhaust Gas Recirculation Valve Current High or Grounded Circuit	Contact Servicing Dealer
	07	Exhaust Gas Recirculation Valve Not Responding or Out of Adjustment	Contact Servicing Dealer
	13	Exhaust Gas Recirculation Valve Out of Calibration	Contact Servicing Dealer
	14	Exhaust Gas Recirculation Valve Off	Contact Servicing Dealer
	31	Exhaust Gas Recirculation Valve Position Error	Contact Servicing Dealer
002795	07	Turbocharger Actuator Not Responding or Out Of Adjustment	Contact Servicing Dealer
	12	Turbocharger Actuator Bad Intelligent Device Or Component	Contact Servicing Dealer
523222	03	Sensor Supply Voltage #5 Out of Range High	Contact Servicing Dealer
	04	Sensor Supply Voltage #5 Out of Range Low	Contact Servicing Dealer
523229	03	Sensor Supply Voltage #4 Out of Range High	Contact Servicing Dealer
	04	Sensor Supply Voltage #4 Out of Range Low	Contact Servicing Dealer

Perkins 1104 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description
91	2	Incorrect throttle switch inputs
	3	Throttle position sensor: voltage above normal or shorted high
	4	Throttle position sensor: voltage below normal or shorted low
	8	Throttle position sensor: abnormal frequency, pulse width or period
100	3	Engine oil pressure sensor: voltage above normal or shorted high
	4	Engine oil pressure sensor :voltage below normal or shorted low
102	3	Boost pressure sensor voltage: voltage above normal or shorted high
	4	Boost pressure sensor voltage: voltage below normal or shorted low
	10	No 5V to sender
105	3	Intake manifold temperature sensor: temperature above normal or shorted high
	4	Intake manifold temperature sensor: temperature below normal or shorted low
105	3	Intake manifold air temperature open/short to battery positive (+)
	4	Intake manifold air temperature short to ground
110	3	Engine coolant temperature open/short to battery positive (+)
	4	Engine coolant temperature short to ground
157	3	Fuel rail pressure open/short to battery positive (+)
	4	Fuel rail pressure short to ground
168	0	System voltage high
	1	System voltage low
	2	ECM battery power intermittent/erratic
172	3	Air inlet temperature voltage high
	4	Air inlet temperature voltage low
174	2	Fuel temperature sensor: data erratic/intermittent or incorrect
190	8	Engine speed signal abnormal
	15	Engine speed: overspeed WARNING
190	0	Engine overspeed
626	5	Ether start aid current low
	6	Ether start aid current high
630	2	System parameters incorrect
631	2	Personality module mismatch
637	11	Engine timing calibration invalid
637	139	Engine timing calibration required
639	9	J1939 data link communications
	12	J1939 data link malfunction
651	2	Cylinder #1 injector data incorrect
	5	Cylinder #1 injector open circuit
	6	Cylinder #1 injector short
	7	Cylinder #1 injector not responding
652	2	Cylinder #2 injector data incorrect
	5	Cylinder #2 injector open circuit
	6	Cylinder #2 injector short
	7	Cylinder #2 injector not responding

Perkins 1104 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier

SPN	FMI	Description
653	2	Cylinder #3 injector data incorrect
	5	Cylinder #3 injector open circuit
	6	Cylinder #3 injector short
	7	Cylinder #3 injector not responding
654	2	Cylinder #4 injector data incorrect
	5	Cylinder #4 injector open circuit
	6	Cylinder #4 injector short
	7	Cylinder #4 injector not responding
678	3	8V DC supply short to battery positive (+)
	4	8V DC supply shorted to ground
723	8	Secondary engine speed signal abnormal
1188	5	Turbo wastegate drive current low
1196	9	Machine security system module non-communication
1347	5	Fuel rail pump output current low
	6	Fuel rail pump output current high
	7	Fuel rail pressure valve solenoid not responding
2882	2	Mode selector switch: data erratic/intermittent or incorrect
3509	3	5V DC power supply sensor short to battery positive (+)
	4	5V DC power supply sensor short to ground

Perkins 1100 Troubleshooting Manual	
Genie part number	123583

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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 in the appropriate operator's manual on your machine.
- ☑ 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.

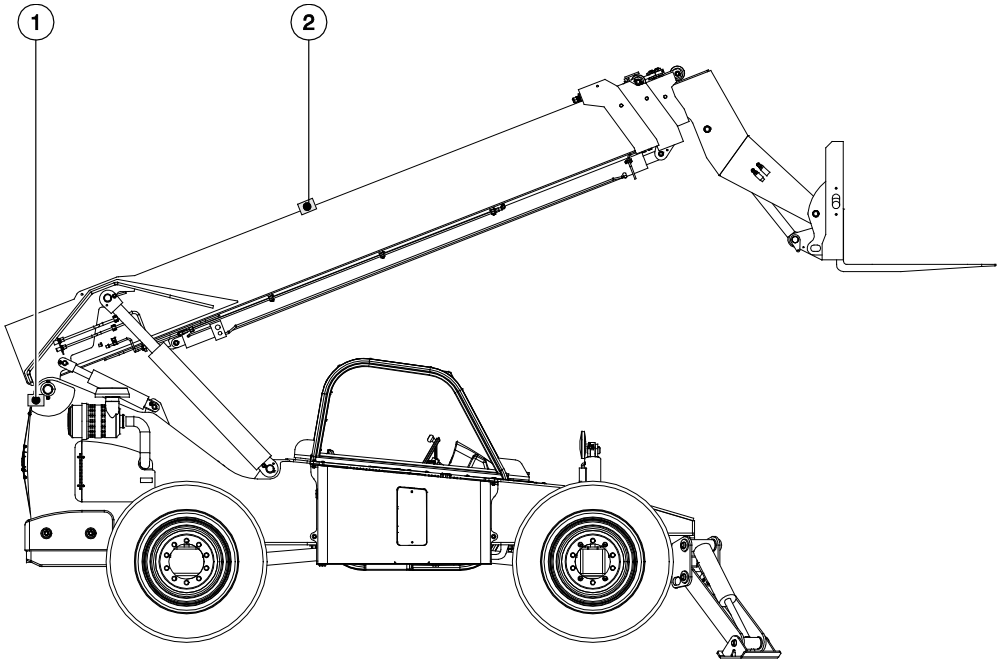
Electrical Schematics

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

Hydraulic Schematics

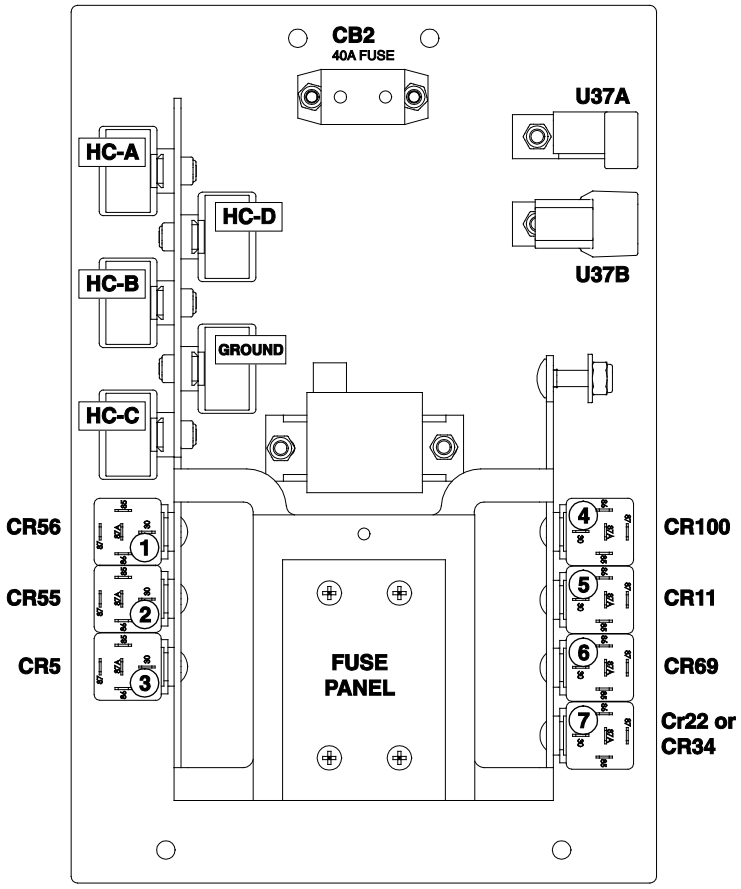
⚠WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

Proximity Switch Legend

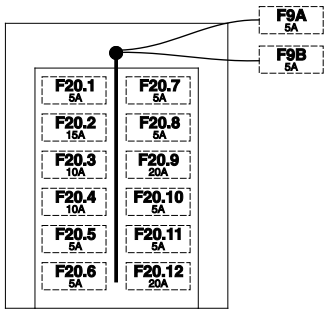


1 Boom Angle Proximity Switch PX2 (under boom pivot pin)
2 Boom Extend Proximity Switch PX1 (under plate at top of boom tube, GTH-1056 only)

Fuse Panel Layout



FUSE PANEL



F20.9, F20.10, F20.11 and F20.11 are for machine options, refer to electrical schematics.

PCB Board Fuse Panel located in the Cab

Electrical Component Legend

Item	Description
B1	**Battery**
CB2	**Circuit Breaker, 40A**
C5	**Capacitor, 4700mf**
CR	**Control relay**
CR5	Horn
CR11	Boom up
CR55	Drive reverse
CR56	Drive forward
CR69	Boom extend
CR88	Power
CR89	Parking brake
CR100	Sway enable
D1	**Alternator**
F	**Fuse**
F6	20A, Power to controls
F19	10A, ECM power
F20	Fuse block
FS2	**Throttle pedal**
G	**Gauge**
G3	Engine coolant temperature
G6	Hourmeter
G8	Diagnostic display
G11	Fuel level
G12	Tachometer
H	**Horn**
H2	Auto-style horn
H5	Multifunction alarm
KS1	**Key switch**

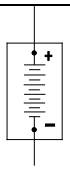
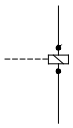
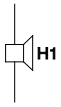
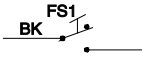
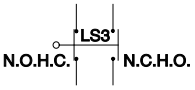
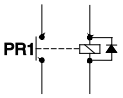
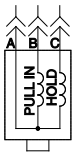
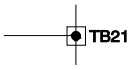
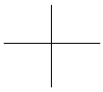
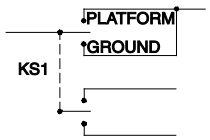
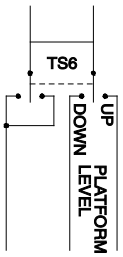
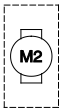
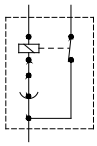
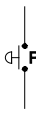
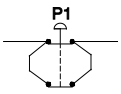
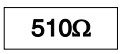
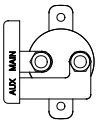
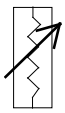
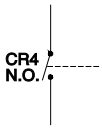
Item	Description
L	**Light**
L7	Low battery
L42	Engine oil pressure
L61	Back up light
L63	Low brake pressure
L64	Parking brake on
L71	Transmission oil pressure
L72	Transmission temperature
L73	Low fuel level
L74	4-wheel steer select
L75	Crab steer select
L76	2-wheel steer select
M	**Motor**
M3	Engine starter
M9	Heater fan motor
M10	Windshield wiper motor
M11	Cab circulation fan motor
M12	Windshield washer motor
PS	**Pressure switch**
PS4	Service brake
PS6	Parking brake
PS7	Low brake pressure
PS8	Sway
PX	**Proximity switch**
PX1	Boom extend
PX2	Boom angle
S	**Sensor**
S1	Engine coolant temperature
S2	Engine oil pressure
S11	Transmission oil temperature
S12	Transmission oil pressure
S13	Fuel level

Wire Color Legend

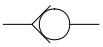
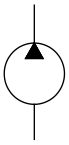
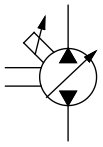
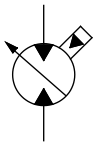
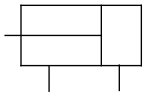
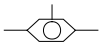
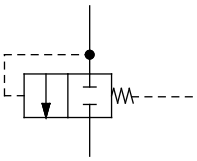
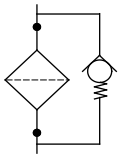
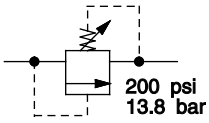
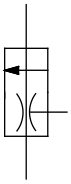
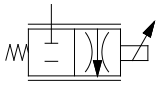
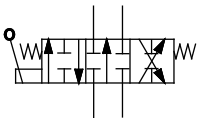
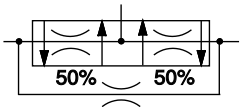
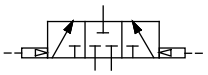
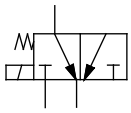
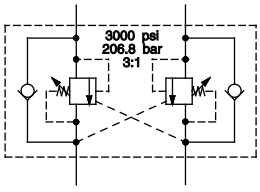
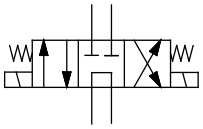
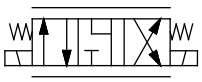
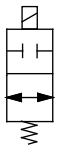
Item	Description
SW	**Switch**
SW23	Transmission control
SW24	Parking brake
SW34	Sway enable
SW35	Auxiliary control
SW39	Right outrigger
SW40	Left outrigger
SW42	Tilt enable
SW43	Steer select
SW44	Horn
SW77	Differential lock
U	**Electrical component**
U31	Engine ECM
U37	Diode
Y	**Valve coil**
Y5	Transmission reverse
Y6	Transmission forward
Y55	Rear axle oscillate enable
Y67	Parking brake release
Y68	Differential lock
Y70	Sway left enable
Y71	Sway right enable
Y72	Tilt
Y73	Right outrigger extend
Y74	Right outrigger retract
Y75	Left outrigger extend
Y76	Left outrigger retract
Y77	Auxiliary
Y78	4-wheel steer select
Y79	Crab steer select
Y80	Transmission "D"
Y81	Transmission "E"
Y82	Sway enable
Y83	Rear axle oscillate fast

Wire Color Legend	
Item	**Description**
BL	Blue
BL/BK	Blue/Black
BL/RD	Blue/Red
BL/WH	Blue/White
BK	Black
BK/RD	Black/Red
BK/WH	Black/White
BK/YL	Black/Yellow
BR	Brown
GR	Green
GR/BK	Green/Black
GR/WH	Green/White
RD	Red
RD/BK	Red/Black
RD/WH	Red/White
OR	Orange
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OR/RD	Orange/Red
WH	White
WH/BK	White/Black
WH/RD	White/Red

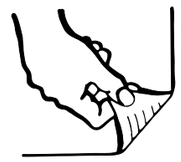
Electrical Symbol Legend

				
Battery	Coil, solenoid or relay	Horn or alarm	Flashing beacon	Gauge
				
Diode	Hour meter	LED	Fuse with amperage	Foot switch
				
T-circuits connect	Limit Switch	Power relay	Coil with suppression	Fuel or RPM solenoid
				
Connection - no terminal	T-circuits connect at terminal	Circuits crossing - no connection	Quick disconnect terminal	Circuit breaker with amperage
				
Key switch	Toggle switch DPDT	Toggle switch SPDT	Pump or Motor	Tilt sensor
				
Horn button - normally open	Emergency stop button - normally closed	Resistor with ohm value	Battery seperator	Gauge sending unit
				
Oil temperature switch normally open	Coolant temperature switch - normally open	Oil pressure switch normally closed	Control relay contact normally open	Diode starting aid, glow plug or flame ignitor

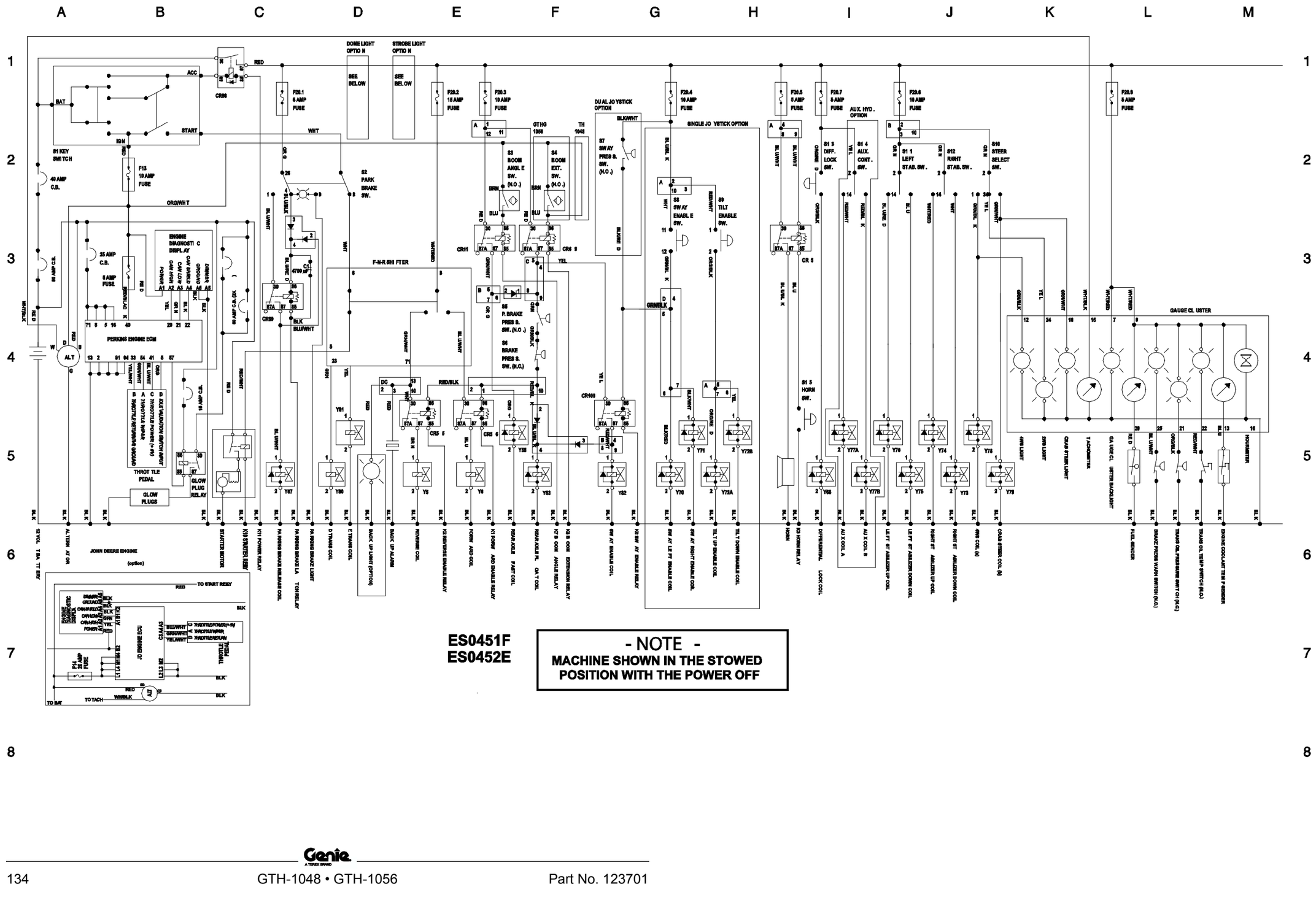
Hydraulic Symbols Legend

 Orifice with size	 Check valve	 Shut off valve	 Brake
 Pump, fixed displacement	 Pump, bi-directional variable displacement	 Motor, bi-directional	 Motor, 2 speed bi-directional
 Double acting cylinder	 Pump, prime mover (engine or motor)	 Shuttle valve. 2 position, 3 way	 Differential sensing valve
 Filter with bypass relief valve	 Relief valve with pressure setting	 Priority flow regulator valve	 Solenoid operated proportional valve
 Directional valve (mechanically activated)	 Flow divider/combiner valve	 Pilot operated 3 position, 3 way shuttle valve	 Solenoid operated 2 position, 3 way directional valve
 Counterbalance valve with pressure and pilot ratio	 Solenoid operated 3 position, 4 way directional valve	 Solenoid operated 3 position, 4 way proportional directional valve	 2 position, 2 way solenoid valve

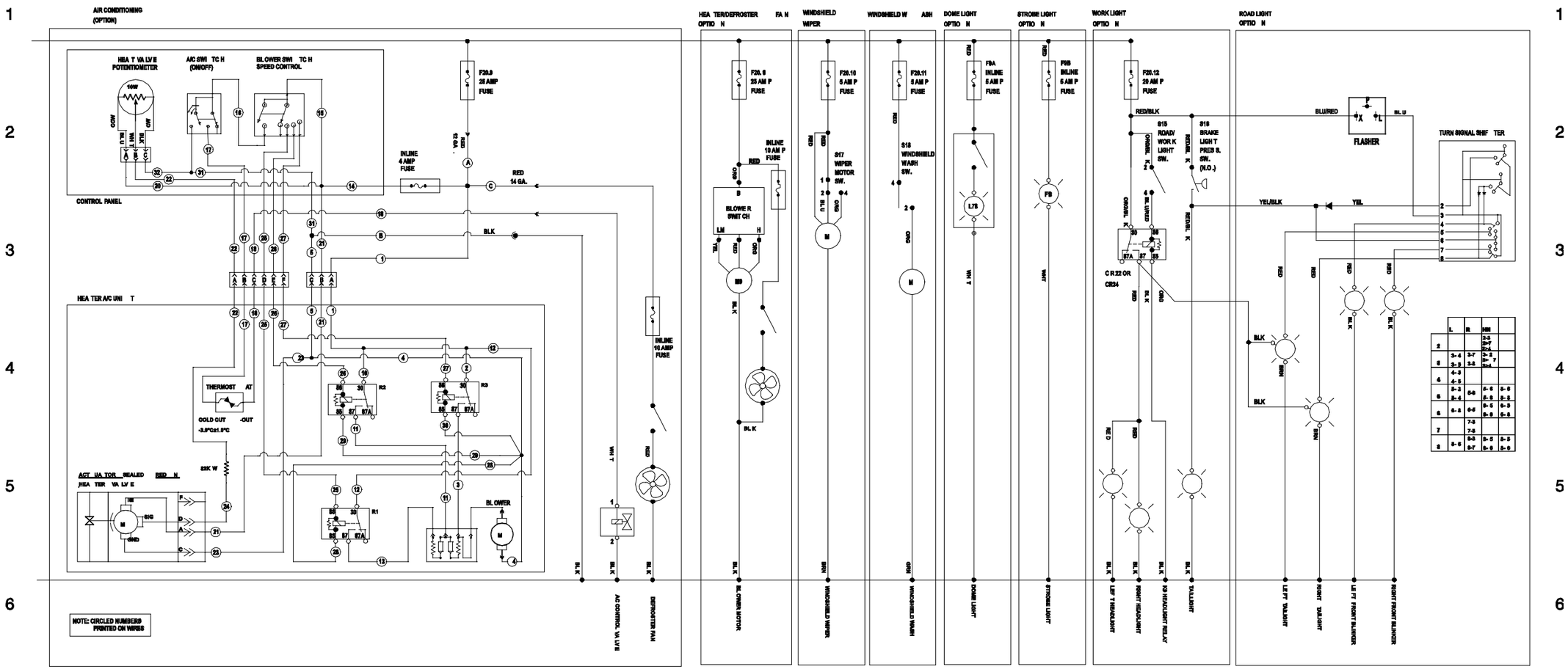
Electrical Schematic



Electrical Schematic



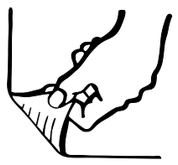
Electrical Schematic



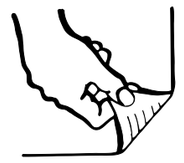
- NOTE -
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

ES0451F
ES0452E

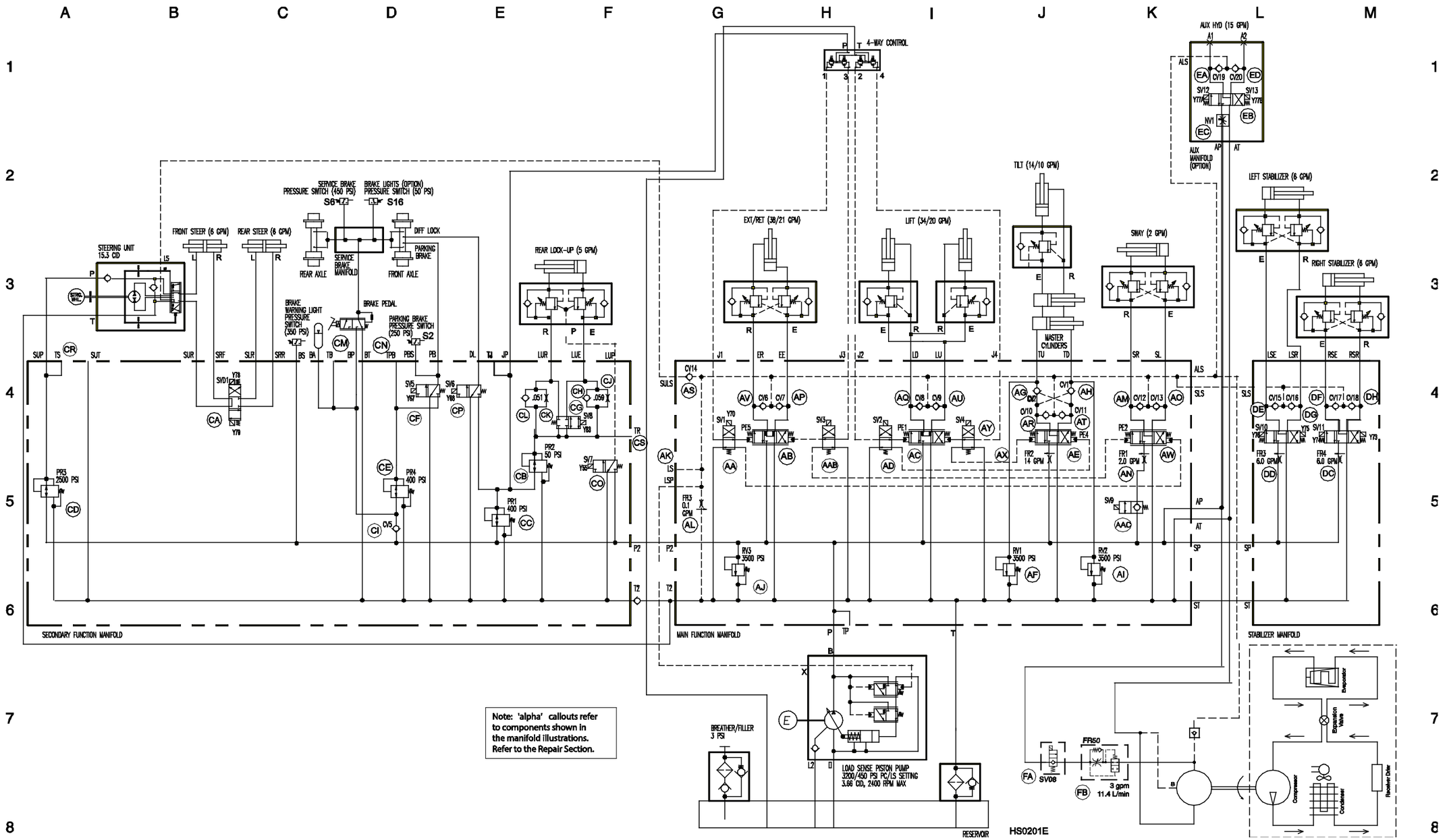
Electrical Schematic



Hydraulic Schematic - Models with Single Joystick

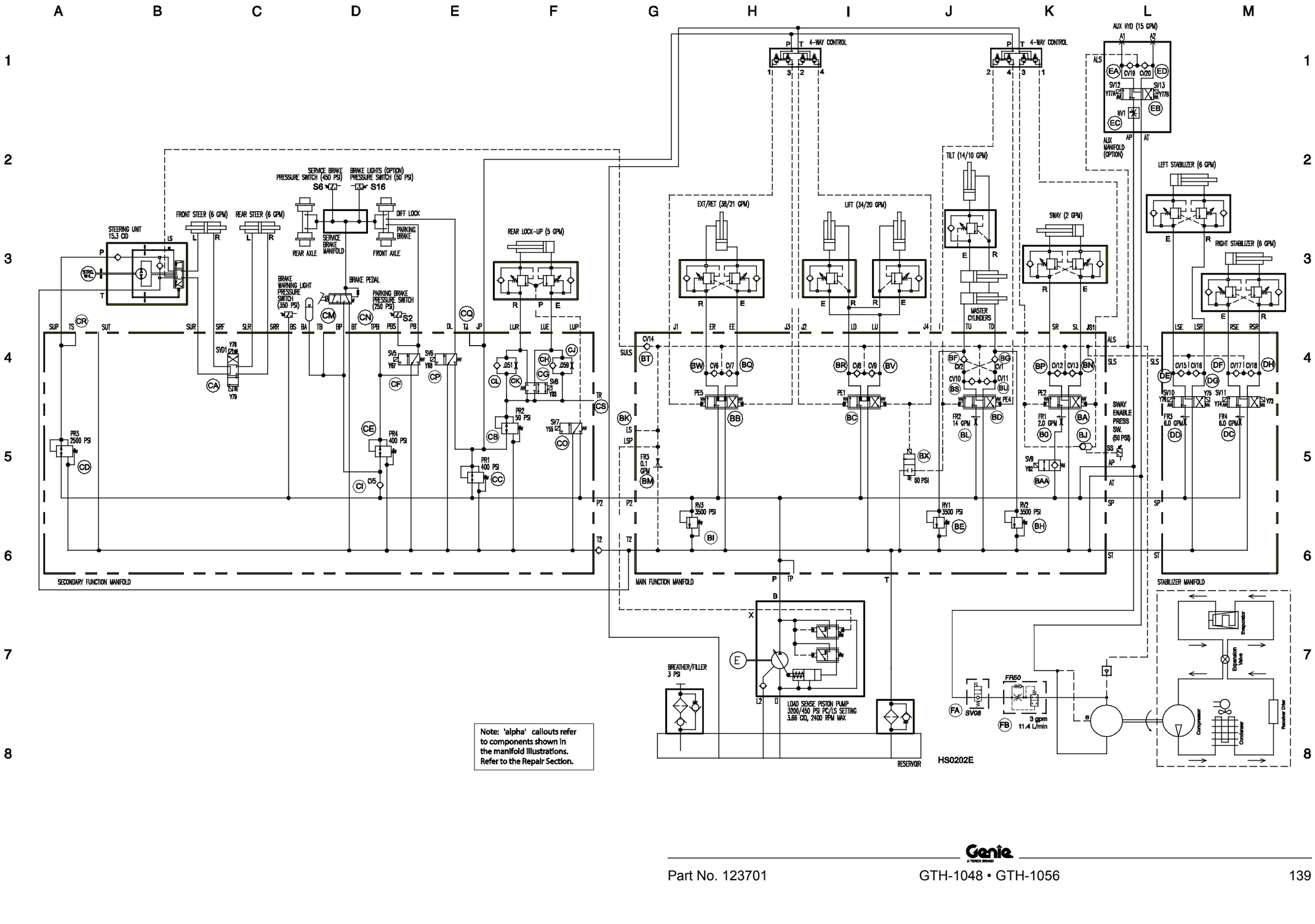


Hydraulic Schematic - Models with Single Joystick



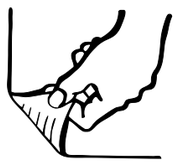
Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

Hydraulic Schematic - Models with Dual Joystick



Note: 'alpha' callouts refer to components shown in the manifold illustrations. Refer to the Repair Section.

Hydraulic Schematic - Models with Dual Joystick



California Proposition 65

Warning

The exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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