

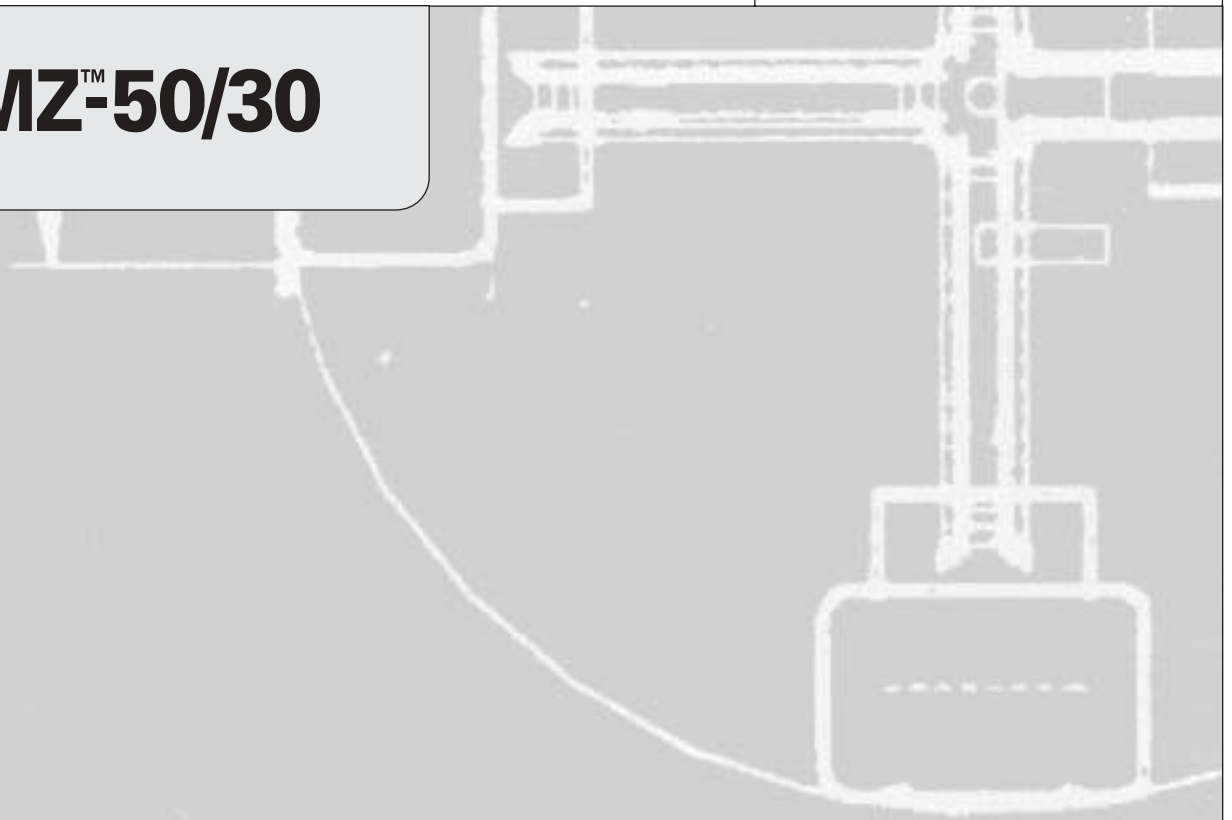
Genie®

Service Manual

Part No. 65162
Rev B
June 2005



TMZ™-50/30



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 or repair 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.

Technical Publications

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

Readers are encouraged to notify Genie of errors and send in suggestions for improvement. All communications will be carefully considered for future printings of this and all other manuals.


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65162 Rev B June 2005
First Edition, Second Printing

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 Printed on recycled paper

Printed in U.S.A.

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

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

▲ WARNING

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

▲ CAUTION

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

CAUTION

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

NOTICE

Green—used to indicate operation or maintenance information.



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



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

Workplace Safety

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



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



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



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



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



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

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REV B

Specifications

Machine Specifications

Batteries

DC models

Type	6V DC
Group	T-145
Quantity (models with drive) (option)	8
Quantity (models without drive)	4
Battery capacity	244AH
Reserve capacity @ 25A rate	530 minutes

Bi-fuel models

Type	6V DC
Group	T-145
Quantity	4
Battery capacity	244AH
Reserve capacity @ 25A rate	530 minutes

Engine models

Type	12V DC
Group	C31-1000
Quantity	1
Cold cranking ampere @ 0°F / -18°C	1000
Reserve capacity @ 25A rate	200 minutes

Fluid capacities

Hydraulic tank capacity	8 gallons 30.3 liters
Hydraulic system capacity (including tank)	10 gallons 37.9 liters

Trailer hitch load, maximum

ANSI and CSA models	200 lbs 91 kg
CE models	227 kg

For operational specifications, refer to the Operators Manual.

Tires and wheels

All models (before serial number T5099-006)

Tire size	ST225/75D-15
Load range	D
Tire pressure (cold)	65 psi 4.5 bar
Wheel lugs	5 @ 1/2 -20
Lug nut torque	80 ft-lbs 108 Nm

ANSI, CSA models (after serial number T5099-005)

Tire size	8-14.5-LT
Load range	F
Tire pressure (cold)	100 psi 6.9 bar
Wheel lugs	5 @ 1/2 -20
Lug nut torque	80 ft-lbs 108 Nm

CE models (after serial number T5099-005)

Tire size	215 R14C 112/110
Load range	C
Tire pressure (cold)	4.5 bar
Wheel lugs	5 @ M18 x 1.5
Lug bolt torque	260 Nm

Tongue jack jockey wheels

Tire size - pneumatic tire	4.10 / 3.50-4
Diameter	12 in 30.5 cm
Tire pressure, maximum (cold)	50 psi 3.4 bar

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



SPECIFICATIONS

REV B

Performance Specifications

Boom function speeds, maximum from ground controls (no weight in platform)

DC and Bi-fuel Models

Jib boom up	10 to 15 seconds
Jib boom down	13 to 18 seconds
Primary boom up	20 to 25 seconds
Primary boom down	15 to 20 seconds
Primary boom extend	15 to 20 seconds
Primary boom retract	15 to 20 seconds
Secondary boom up	20 to 25 seconds
Secondary boom down	13 to 18 seconds
Turntable rotate - 358°	55 to 60 seconds

Engine Models

Jib boom up	5 to 8 seconds
Jib boom down	4 to 7 seconds
Primary boom up	10 to 15 seconds
Primary boom down	8 to 13 seconds
Primary boom extend	10 to 15 seconds
Primary boom retract	10 to 15 seconds
Secondary boom up	12 to 17 seconds
Secondary boom down	9 to 14 seconds
Turntable rotate - 358°	30 to 40 seconds

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

Hydraulic Specifications

Hydraulic Oil Specifications

Hydraulic oil type	Chevron Rykon MV equivalent
ISO viscosity grade	Multi-viscosity
Viscosity index	200
Cleanliness level, minimum	15/13
Water content, maximum	200 ppm

Chevron Rykon MV oil is fully compatible and mixable with Shell Donax TG (Dexron III) oils.

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 have a minimum viscosity index of 150. They should provide excellent antiwear, oxidation, corrosion inhibition, seal conditioning, and foam and aeration suppression properties.

Optional fluids

Biodegradable	Petro Canada Premium ECO 46 Statoil Hydra Way Bio Pa 32 BP Biohyd SE-S
Fire resistant	UCON Hydrolube HP-5046 Quintolubric 822
Mineral based	Shell Tellus T32 Shell Tellus T46 Chevron Aviation A

NOTICE Use Chevron Aviation A hydraulic oil when in ambient temperatures consistently below 0°F / -17°C.

NOTICE Use Shell Tellus T46 hydraulic oil when oil temperatures consistently exceed 205°F / 96°C.

NOTICE Genie specifications require additional equipment and special installation instructions for the approved optional fluids. Consult the Genie Industries Service Department before use.

REV B

SPECIFICATIONS

Function pump (models without drive)

Type: single section gear pump

Displacement per revolution 0.244 cu in
4 cc

Flow rate 2.8 gpm
10.6 L/min

Hydraulic tank return line filter 10 micron

Function pump (models with drive) (option)

Type: 2 section pressure balanced gear pump

Displacement per revolution 0.488 cu in
8 cc

Flow rate 5.6 gpm
21.2 L/min

Hydraulic tank return line filter 10 micron

Auxiliary pump (engine-powered models)

Type: single section pressure balanced gear pump

Displacement per revolution 0.032 cu in
0.52 cc

Flow rate @ 2500 psi / 172 bar 0.6 gpm
2.27 L/min

Relief valve pressure 3700 psi
255 bar

Auxiliary pump (DC-powered models)

Type: single section hand pump

Displacement per stroke 0.6 cu in
9.8 cc

Pump manifold

System relief valve pressure 3000 psi
206.8 bar

Function manifold

Flow regulator 0.6 gpm
2.27 L/min

Drive manifold (before serial number TMZ5000-91)

Flow regulator 6 gpm
22.7 L/min

SPECIFICATIONS

REV B

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

Valve Coil Resistance

Description	Specification
Proportional valve, 12V DC (schematic items AB, AC, CA and DA)	4 to 6Ω
Proportional valve 12V DC (engine models)	4 to 6Ω
24V DC (DC models)	18 to 21Ω (schematic items BA and BB)
Solenoid valve, 2 position 2 way 10V DC (schematic item JD)	6 to 8Ω
Solenoid valve, 2 position 2 way 10V DC (engine models)	6 to 8Ω
20V DC (DC models)	26 to 28Ω (schematic item KD)

Valve Coil Resistance

Description	Specification
Solenoid valve, 2 position 3 way 10V DC (engine models) (schematic item BD)	6 to 8Ω
Solenoid valve, 2 position 3 way 20V DC (DC models) (schematic item BD)	26 to 28Ω
Solenoid valve, 2 position 3 way 10V DC (schematic items ED, EE, FE, FF, EI, GD and GI)	6 to 8Ω
Solenoid valve, 2 position 3 way 10V DC (schematic item FJ)	4 to 6Ω
Solenoid valve, 2 position 3 way 20V DC (schematic item HE)	26 to 28Ω
Solenoid valve, 2 position 3 way 20V DC (schematic item HJ)	18 to 20Ω
Solenoid valve, 3 position 4 way, 10V DC (schematic items EF, EG, EH, EL, EM, EO, FG, FH, FI, FM, FN and FP)	6 to 8Ω
Solenoid valve, 3 position 4 way 20V DC (schematic items HM and HN)	26 to 28Ω
Solenoid valve, 3 position 4 way 10V DC (schematic items JB and JC)	4 to 6Ω
Solenoid valve, 3 position 4 way 10V DC (engine models)	4 to 6Ω
20V DC (DC models)	18 to 20Ω (schematic items KB and KC)
Solenoid valve, 2 position 3 way 10V DC with manual over ride (schematic item GE)	6 to 8Ω
Solenoid valve, 2 position 3 way 20V DC with manual over ride (schematic item HF)	26 to 28Ω
Solenoid valve, 3 position 4 way 10V DC with manual over ride (schematic items GF, GG, GH and GO)	6 to 8Ω
Solenoid valve, 3 position 4 way 20V DC with manual over ride (schematic items HG, HH, HI and HP)	26 to 28Ω

REV B

SPECIFICATIONS

Machine Torque Specifications

Turntable rotate motor

M12 bolts, dry	60 ft-lbs
	81 Nm

Turntable rotate bearing

all bolts, lubricated
(refer to Maintenance Procedure D-2)

SPECIFICATIONS

REV B

Honda GX340K1 Engine

Displacement	20.6 cu in 337 cc
---------------------	----------------------

Number of cylinders	1
----------------------------	---

Bore & stroke	3.2 x 2.5 inches 82 x 64 mm
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Horsepower	11 hp @ 3600 rpm
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Low idle	1500 rpm
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High idle	2800 rpm
------------------	----------

Valve Clearance, cold

Intake	0.006 in 0.15 mm
--------	---------------------

Exhaust	0.008 in 0.20 mm
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Lubrication system	splash
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Oil capacity	0.32 quarts 0.3 liters
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Oil viscosity requirements

Temperature below 30°F / 0°C	5W-30
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-5°F to 85°F / -20°C to 29°C	10W-30
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Temperature above 50°F / 10°C	30W
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Use oils meeting API classification SG, SF as they offer improved wear protection. Units ship with 10W-40 SG.

Starter motor	12 V DC
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Cooling System	Forced air
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Ignition System

Spark plug type	BPR6ES (NGK)
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Spark plug gap	0.028 to 0.031 inches 0.7 to 0.8 mm
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Fuel tank capacity	1.6 gallons 6 liters
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REV B

SPECIFICATIONS

Hatz 1B30 Engine

Displacement	21.16 cu in 0.347 liters
Number of cylinders	1
Bore and stroke	3.15 x 2.72 inches 80 x 69 mm
Horsepower	6.25hp @ 3000 rpm
Compression ratio	22:1
Low idle	1500 rpm
High idle	2800 rpm
Governor	centrifugal mechanical

Valve clearance, cold

Intake	0.021 in 0.55 mm
Exhaust	0.025 in 0.65 mm

Lubrication system

Oil pressure @ 3000 rpm	36 psi 2.5 bar
Oil capacity (including filter)	1.16 quarts 1.1 liters

Oil viscosity requirements

Temperature below 60°F / 15.5°C (synthetic)	5W-30
-10°F to 90°F / -23°C to 32°C	10W-40
Temperature above -4°F / -34°C	15W-40

Engine oil should have properties of API classification CD, CE, CF or CG grades.
Units ship with 10W-40 SG/CC.

Fuel Injection system

Injection pump make	Hatz
Injection pump pressure	2600 to 2820 psi 179 to 194 bar
Fuel requirement	diesel number 2-D
Alternator output	14A @ 3000 rpm
Starter motor	12V DC
Cooling System	Forced air
Fuel tank capacity	1.3 gallons 5 liters

SPECIFICATIONS

REV B

Hydraulic Hose and Fitting Torque Specifications

Your machine is equipped with Parker Seal-Lok® 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)

SAE Dash size	Torque
-4	18 ft-lbs / 24.4 Nm
-6	27 ft-lbs / 36.6 Nm
-8	40 ft-lbs / 54.2 Nm
-10	63 ft-lbs / 85.4 Nm
-12	90 ft-lbs / 122 Nm
-16	120 ft-lbs / 162.7 Nm
-20	140 ft-lbs / 190 Nm
-24	165 ft-lbs / 223.7 Nm

SAE O-ring Boss Port (tube fitting - installed into Steel)

SAE Dash size	Torque
-4	16 ft-lbs / 21.7 Nm
-6	35 ft-lbs / 47.5 Nm
-8	60 ft-lbs / 81.3 Nm
-10	105 ft-lbs / 142.4 Nm
-12	140 ft-lbs / 190 Nm
-16	210 ft-lbs / 284.7 Nm
-20	260 ft-lbs / 352.5 Nm
-24	315 ft-lbs / 427.1 Nm

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.

NOTICE

The O-rings used in the Parker Seal Lok® fittings and hose ends are custom-size O-rings. They are not standard SAE size O-rings. They are available in the O-ring field service kit.



- 2 Lubricate the O-ring before installation.
- 3 Be sure that the face seal O-ring is seated and retained properly.
- 4 Position the tube and nut squarely on the face seal end of the fitting and tighten the nut finger tight.
- 5 Tighten the nut or fitting to the appropriate torque per given size as shown in the table.
- 6 Operate all machine functions and inspect the hoses and fittings and related components to confirm that there are no leaks.





SAE O-ring Boss Port (tube fitting - installed into Aluminum)

SAE Dash size	Torque
-4	11 ft-lbs / 14.9 Nm
-6	23 ft-lbs / 31.2 Nm
-8	40 ft-lbs / 54.2 Nm
-10	69 ft-lbs / 93.6 Nm
-12	93 ft-lbs / 126.1 Nm
-16	139 ft-lbs / 188.5 Nm
-20	172 ft-lbs / 233.2 Nm
-24	208 ft-lbs / 282 Nm

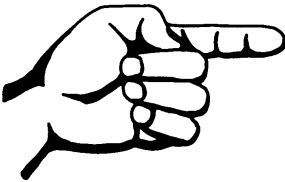
REV B

SPECIFICATIONS

SAE FASTENER TORQUE CHART											
• This chart is to be used as a guide only unless noted elsewhere in this manual •											
SIZE	THREAD	Grade 5 				Grade 8 				A574 High Strength Black Oxide Bolts	
		LUBED		DRY		LUBED		DRY		LUBED	
		in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
1/4	20	100	11.3	80	9	140	15.8	110	12.4	130	14.7
	28	90	10.1	120	13.5	120	13.5	160	18	140	15.8
		LUBED		DRY		LUBED		DRY		LUBED	
		ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
5/16	18	13	17.6	17	23	18	24	25	33.9	21	28.4
	24	14	19	19	25.7	20	27.1	27	36.6	24	32.5
3/8	16	23	31.2	31	42	33	44.7	44	59.6	38	51.5
	24	26	35.2	35	47.4	37	50.1	49	66.4	43	58.3
7/16	14	37	50.1	49	66.4	50	67.8	70	94.7	61	82.7
	20	41	55.5	55	74.5	60	81.3	80	108.4	68	92.1
1/2	13	57	77.3	75	101.6	80	108.4	110	149	93	126
	20	64	86.7	85	115	90	122	120	162	105	142
9/16	12	80	108.4	110	149	120	162	150	203	130	176
	18	90	122	120	162	130	176	170	230	140	189
5/8	11	110	149	150	203	160	217	210	284	180	244
	18	130	176	170	230	180	244	240	325	200	271
3/4	10	200	271	270	366	280	379	380	515	320	433
	16	220	298	300	406	310	420	420	569	350	474
7/8	9	320	433	430	583	450	610	610	827	510	691
	14	350	474	470	637	500	678	670	908	560	759
1	8	480	650	640	867	680	922	910	1233	770	1044
	12	530	718	710	962	750	1016	990	1342	840	1139
1.125	7	590	800	790	1071	970	1315	1290	1749	1090	1477
	12	670	908	890	1206	1080	1464	1440	1952	1220	1654
1.25	7	840	1138	1120	1518	1360	1844	1820	2467	1530	2074
	12	930	1260	1240	1681	1510	2047	2010	2725	1700	2304
1.5	6	1460	1979	1950	2643	2370	3213	3160	4284	2670	3620
	12	1640	2223	2190	2969	2670	3620	3560	4826	3000	4067

METRIC FASTENER TORQUE CHART																
• This chart is to be used as a guide only unless noted elsewhere in this manual •																
Size (mm)	Class 4.6 				Class 8.8 				Class 10.9 				Class 12.9 			
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm	in-lbs	Nm
5	16	1.8	21	2.4	41	4.63	54	6.18	58	6.63	78	8.84	68	7.75	91	10.3
6	19	3.05	36	4.07	69	7.87	93	10.5	100	11.3	132	15	116	13.2	155	17.6
7	45	5.12	60	6.83	116	13.2	155	17.6	167	18.9	223	25.2	1.95	22.1	260	29.4
	LUBED		DRY		LUBED		DRY		LUBED		DRY		LUBED		DRY	
	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm	ft-lbs	Nm
8	5.4	7.41	7.2	9.88	14	19.1	18.8	25.5	20.1	27.3	26.9	36.5	23.6	32	31.4	42.6
10	10.8	14.7	14.4	19.6	27.9	37.8	37.2	50.5	39.9	54.1	53.2	72.2	46.7	63.3	62.3	84.4
12	18.9	25.6	25.1	34.1	48.6	66	64.9	88	69.7	94.5	92.2	125	81	110	108	147
14	30.1	40.8	40	54.3	77.4	105	103	140	110	150	147	200	129	175	172	234
16	46.9	63.6	62.5	84.8	125	170	166	226	173	235	230	313	202	274	269	365
18	64.5	87.5	86.2	117	171	233	229	311	238	323	317	430	278	377	371	503
20	91	124	121	165	243	330	325	441	337	458	450	610	394	535	525	713
22	124	169	166	225	331	450	442	600	458	622	612	830	536	727	715	970
24	157	214	210	285	420	570	562	762	583	791	778	1055	682	925	909	1233





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Scheduled Maintenance Procedures



Observe and Obey:

- ☑ Maintenance inspections shall be completed by a person trained and qualified on the maintenance of this machine.
- ☑ Scheduled maintenance inspections shall be completed daily, quarterly and semi-annually as specified on the *Maintenance Inspection Report*.

AWARNING Failure to perform each procedure as presented and scheduled could result in 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.
- ☑ Keep records on all inspections for three years.
- ☑ Machines that have been out of service for a period longer than 3 months must complete the quarterly inspection.
- ☑ Unless otherwise specified, perform each maintenance procedure with the machine in the following configuration:
 - Machine disconnected from tow vehicle
 - Machine parked on a firm, level surface with the boom stowed and both latches secured
 - Key switch in the off position with the key removed
 - The red Emergency Stop button in the off position at both ground and platform controls
 - Wheels chocked and parking brake applied
 - All external AC power supply disconnected from the machine

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.



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



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



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



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



Green—used to indicate operation or maintenance information.

- ⦿ 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**NOTICE**

The following symbols have been used in this manual to help communicate the intent of the instructions. When one or more of the symbols appears 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 a cold motor or pump will be required to perform this procedure.



Indicates that dealer service 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 of the *Pre-delivery Preparation* report to use for each inspection. Store completed forms as required.

Maintenance Schedule

There are five types of maintenance inspections that must be performed according to a schedule—daily, quarterly, semi-annually, annually, and two year. The *Scheduled Maintenance Procedures Section and the Maintenance Inspection Report* have been divided into five subsections—A, B, C, D, and E. 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 or every 3000 miles / 4800 km	A + B
Semi-annually or every 500 hours or every 6000 miles / 9600 km	A + B + C
Annually or every 1000 hours or every 12,000 miles / 19,300 km	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 Report* to use for each inspection. Store completed forms for three years.

Pre-Delivery Preparation

Fundamentals

It is the responsibility of the 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, completed

N = no, unable to complete

R = repaired

Comments

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

Model

Serial number

Date

Machine owner

Inspected by (print)

Inspector signature

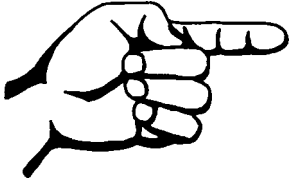
Inspector title

Inspector company



Genie Industries USA
18340 NE 76th Street
PO Box 97030
Redmond, WA 98073-9730
(425) 881-1800

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



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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 to be performed.

<input type="checkbox"/>	Daily or 8 hours Inspection:	A
<input type="checkbox"/>	Quarterly or 250 hours or 3000 mile / 4800 km Inspection:	A+B
<input type="checkbox"/>	Semi-annually or 500 hours or 6000 mile / 9600 km Inspection:	A+B+C
<input type="checkbox"/>	Annually or 1000 hours or 12,000 mile / 19,300 km Inspection:	A+B+C+D
<input type="checkbox"/>	Two year or 2000 hours Inspection:	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

Comments

Checklist A - Rev B	Y	N	R
A-1 Pre-operation inspect			
A-2 Function tests			
A-3 Engine maintenance (if equipped)			
A-4 Hitch maintenance - ANSI models			
A-5 Axle maintenance - ANSI models			
A-6 Axle maintenance - CE models			
A-7 Axle maintenance - CE models			
A-8 Engine maintenance - Honda models (if equipped)			
A-9 Axle maintenance - ANSI models			
A-10 Axle maintenance - CE models			

Perform after 40 hours:

A-11 Perform 30 day service			
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Perform every 50 hours:

A-12 Engine maintenance - Honda models (if equipped)			
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Perform every 100 hours:

A-13 Grease rotate bearing			
A-14 Engine maintenance - Honda models (if equipped)			

Checklist B - Rev B	Y	N	R
B-1 Batteries			
B-2 Electrical wiring			
B-3 Emergency Stop			
B-4 Key switch			
B-5 Auxiliary lowering			
B-6 Tires and wheels			
B-7 Tongue jack			
B-8 Parking brake			
B-9 Horn			
B-10 Flashing beacon (if equipped)			
B-11 Platform rotation (if equipped)			
B-12 Tank venting system			
B-13 Axle maintenance - ANSI models			
B-14 Hydraulic oil analysis			
B-15 Engine rpm			

Checklist C - Rev B

Y	N	R
C-1 Breather cap - models with optional oil		
C-2 Axle maintenance - ANSI models		
C-3 Hitch maintenance - CE models		

Checklist D - Rev B

Y	N	R
D-1 Boom wear pads		
D-2 Turntable bearing bolts		
D-3 Turntable bearing wear		
D-4 Hydraulic filter		
D-5 Axle maintenance - ANSI models		
D-6 Engine maintenance - Hatz models (if equipped)		

Checklist E - Rev B

Y	N	R
E-1 Hydraulic oil		
E-2 Engine maintenance - Honda models (if equipped)		



Checklist A Procedures

REV B

A-1 Perform Pre-operation Inspection

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-2 Perform Function Tests

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.

REV B

CHECKLIST A PROCEDURES

A-3 Perform Engine Maintenance (if equipped)



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

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information is available in the *Hatz 1B30 Engine Instruction Book* (Hatz part number 433 0802 01) OR the *Honda GX340 Engine Owner Manual* (Honda part number 31ZH9603).

Hatz 1B30 Instruction Book	
Genie part number	97363

Honda GX340 Owner's Manual	
Genie part number	97361

A-4 Perform Hitch Maintenance - ANSI Models



NOTICE Hitch specifications require that this procedure be performed daily.

Proper hitch maintenance, following the hitch manufacturer's maintenance schedule, is essential to good hitch performance and service life. Failure to perform the maintenance procedures can lead to poor hitch performance and component damage.

Required maintenance procedures and additional hitch information is available in the *Demco Model 91 Brake Actuators Owner/Operator Manual* (Demco part number BH20023).

Demco Model 91 Owner/Operator Manual	
Genie part number	84592

CHECKLIST A PROCEDURES

REV B

A-5 Perform Axle Maintenance - ANSI Models



NOTICE Axle specifications require that this procedure be performed, initially and following a wheel change, after the first 10, 25 and 50 miles.

Proper axle maintenance, following the axle manufacturer's maintenance schedule, is essential to good axle performance and service life. Failure to perform the maintenance procedures can lead to poor axle performance and component damage.

Required maintenance procedures and additional axle information is available in the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual	
Genie part number	84376

A-6 Perform Axle Maintenance - CE Models



NOTICE Axle specifications require that this procedure be performed initially after the first 50 km, or 50 km after a wheel change.

Proper axle maintenance, following the axle manufacturer's maintenance schedule, is essential to good axle performance and service life. Failure to perform the maintenance procedures can lead to poor axle performance and component damage.

Required maintenance procedures and additional axle information is available in the *Knott Axle Service Manual* (Knott part number P005).

Knott Axle Service Manual	
Genie part number	84443

REV B

CHECKLIST A PROCEDURES

A-7 Perform Axle Maintenance - CE Models



NOTICE Axle specifications require that this procedure be performed initially after the first 100 km.

Proper axle maintenance, following the axle manufacturer's maintenance schedule, is essential to good axle performance and service life. Failure to perform the maintenance procedures can lead to poor axle performance and component damage.

Required maintenance procedures and additional axle information is available in the *Knott Axle Service Manual* (Knott part number P005).

Knott Axle Service Manual

Genie part number 84443

A-8 Perform Engine Maintenance - Honda Models (if equipped)



NOTICE Engine specifications require that this one-time procedure be performed after one month or 20 hours, whichever comes first.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information is available in the *Honda GX340 Engine Owner Manual* (Honda part number 31ZH9603).

Honda GX340 Owner's Manual

Genie part number 97361

CHECKLIST A PROCEDURES

REV B

A-9 Perform Axle Maintenance - ANSI Models



NOTICE Axle specifications require that this procedure be performed initially at 200 miles.

Proper axle maintenance, following the axle manufacturer's maintenance schedule, is essential to good axle performance and service life. Failure to perform the maintenance procedures can lead to poor axle performance and component damage.

Required maintenance procedures and additional axle information is available in the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual	
Genie part number	84376

A-10 Perform Axle Maintenance - CE Models



NOTICE Axle specifications require that this procedure be performed 500 km after regreasing the wheel bearings.

Proper axle maintenance, following the axle manufacturer's maintenance schedule, is essential to good axle performance and service life. Failure to perform the maintenance procedures can lead to poor axle performance and component damage.

Required maintenance procedures and additional axle information is available in the *Knott Axle Service Manual* (Knott part number P005).

Knott Axle Service Manual	
Genie part number	84443

REV B

CHECKLIST A PROCEDURES

A-11 Perform 30 Day Service



The 30 day maintenance procedure is a onetime procedure to be performed after the first 30 days or 40 hours of usage. After this interval, refer to the maintenance tables for continued scheduled maintenance.

1 Perform the following maintenance procedures:

- A-13 Grease the Turntable Rotation Bearing and Rotate Gear
- B-8 Inspect the Parking Brake
- D-2 Check the Turnable Rotation Bearing Bolts
- D-4 Replace the Hydraulic Tank Return Filter

A-12 Perform Engine Maintenance - Honda Models (if equipped)



NOTICE

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

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information is available in the *Honda GX340 Engine Owner Manual* (Honda part number 31ZH9603).

Honda GX340 Owner's Manual

Genie part number

97361

CHECKLIST A PROCEDURES

REV B

A-13 Grease the Turntable Rotation Bearing and Rotate Gear

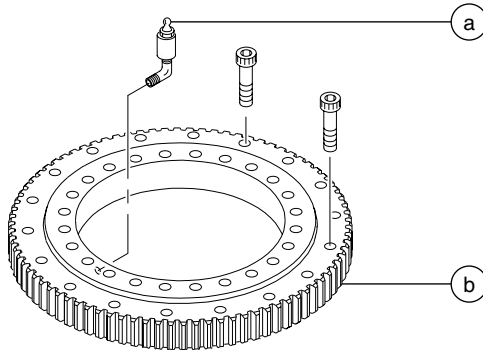


NOTICE Genie specifications require that this procedure be performed every 100 hours of operation.

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

- 1 Locate the grease fitting on the inside of the turntable rotation bearing.

NOTICE The grease fitting is best located through the bulkhead opening behind the function manifold.



a zerk fitting
b rotate bearing

- 2 Pump grease into the turntable rotation bearing. Rotate the turntable in increments of 4 to 5 inches / 10 to 13 cm at a time and repeat this step until the entire bearing has been greased.
- 3 Apply grease to each tooth of the drive gear located under the turntable.

Grease Specification

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

A-14 Perform Engine Maintenance - Honda Models (if equipped)



NOTICE Engine specifications require that this procedure be performed every 100 hours or semi-annually, whichever comes first. Perform this procedure more often if dusty conditions exist.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information is available in the *Honda GX340 Engine Owner Manual* (Honda part number 31ZH9603).

Honda GX340 Owner's Manual

Genie part number

97361

Checklist B Procedures

REV B

B-1 Inspect the Batteries



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

⚠ WARNING Electrocutation 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.

NOTICE Perform this procedure after fully charging the batteries.

NOTICE For a more accurate determination of battery condition, fully charge the batteries and allow the batteries to rest 24 hours before performing this procedure to allow the battery cells to equalize.

- 1 Put on protective clothing and eye wear.
- 2 Be sure that the battery cable connections are free of corrosion.
- 3 Be sure that the battery retaining fasteners and cable connections are tight.
- 4 Remove the battery vent caps from all batteries and check the specific gravity of each battery cell with a hydrometer.
 - ⦿ Result: If any battery cell displays a specific gravity of less than 1.026, the battery must be replaced.
- 5 Check the battery acid level of each battery. If needed, replenish with distilled water to the bottom of the battery fill tube. Do not overfill.
- 6 Install the battery vent caps.
- 7 Check each battery pack and verify that the batteries are wired correctly. Refer to the *Battery Connection Diagram* decal on the machine.
- 8 Inspect the battery charger plug and pigtail for damage or excessive insulation wear. Replace as required.

CHECKLIST B PROCEDURES

REV B

B-2 Inspect the Electrical Wiring



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

⚠ WARNING Electrocutation hazard. Contact with hot or live 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:
 - Turntable area
 - Ground controls
 - Function manifold wiring
 - Power unit wiring (DC and Bi-Fuel models)
 - Engine wiring
- 2 Inspect for a liberal coating of dielectric grease in the following locations:
 - Between the ground and platform controls
 - Between the ground and drive controls (if equipped)
 - All harness connectors
 - Level sensor
- 3 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 4 Raise the secondary boom until the platform is approximately 10 feet / 3 m off the ground.
- 5 Inspect the boom storage area for burnt, chafed and pinched cables.
- 6 Lower the boom to the stowed position and turn the machine off.
- 7 Inspect the following areas for burnt, chafed, corroded, pinched and loose wires:
 - Boom to platform cable harness
 - Primary, secondary and jib booms

REV B

CHECKLIST B PROCEDURES

B-3 Test the Emergency Stop

A properly functioning Emergency Stop is essential for safe machine operation. An improperly operating red Emergency Stop button will fail to shut off power and stop all machine functions, resulting in a hazardous situation.

- 1 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls. Pull out the red Emergency Stop button to the on position at the drive controls (if equipped).
- ⊙ Result: The power light should be on.
- 2 Push in the red Emergency Stop button to the off position at the ground controls.
- ⊙ Result: The engine (if equipped) should turn off. No machine functions should operate.
- 3 Pull out the red Emergency Stop button to the on position at the ground controls.
- 4 Push in the red Emergency Stop button to the off position at the platform controls.
- ⊙ Result: The engine (if equipped) should turn off. No machine functions should operate.
- 5 Pull out the red Emergency Stop button to the on position at the platform controls.
- 6 Push in the red Emergency Stop button to the off position at the drive controls (if equipped).
- ⊙ Result: The engine (if equipped) should turn off. No machine functions should operate.

B-4 Test the Key Switch

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

- 1 Pull out the red Emergency Stop button to the on position at both the ground and platform controls. Pull out the red Emergency Stop button to the on position at the drive controls (if equipped).
- 2 Turn the key switch to **platform control**.
- 3 Check the machine functions from the **ground controls**.
- ⊙ Result: The machine functions should **not** operate.
- 4 Check the machine functions from the **drive controls**.
- ⊙ Result: The drive functions should operate.
- 5 Turn the key switch to **ground control**.
- 6 Check the machine functions from the **platform controls**.
- ⊙ Result: The machine functions should **not** operate.
- 7 Check the machine functions from the **drive controls**.
- ⊙ Result: The drive functions should not operate.
- 8 Turn the key switch to the off position.
- ⊙ Result: No function should operate.

CHECKLIST B PROCEDURES

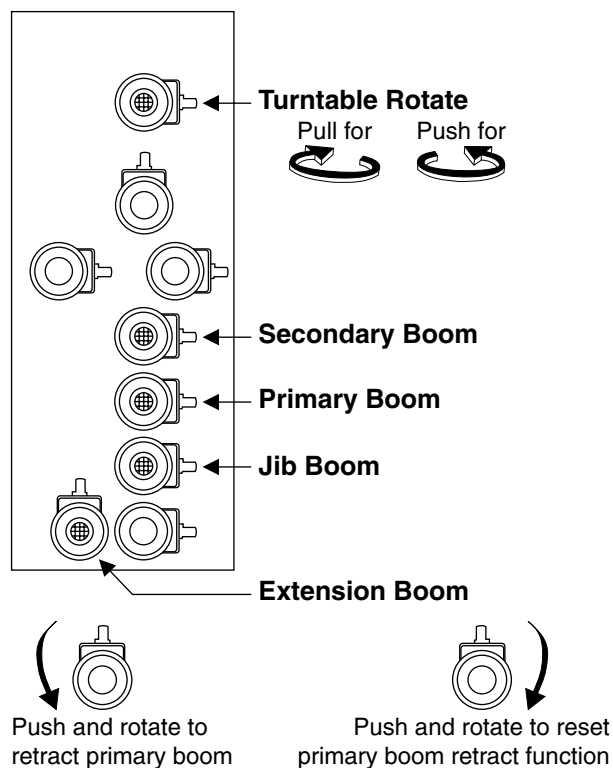
REV B

B-5 Test the Auxiliary Lowering

Testing the auxiliary lowering for malfunctions is essential for safe machine operation. An unsafe working condition exists if the auxiliary lowering function does not operate in the event of a main power loss.

DC Models:

- 1 Raise the primary, secondary and jib booms. Extend the primary boom.
- 2 Open the function manifold side turntable cover.
- 3 Locate the extension boom valve on the function manifold.



- 4 Push in and turn fully in a counter clockwise direction the knob at the center of the extension boom valve stem. Operate the hand pump with a push/pull motion.
- ⑥ Result: The extension boom retract function should operate.
- 5 Push in and turn fully in a clockwise direction the knob at the center of the extension boom valve stem to reset the valve.

NOTICE The valve spool must be reset for the primary boom extend function to operate.

- 6 Locate the primary boom valve on the function manifold.
- 7 Pull out and hold the knob at the center of the primary boom valve stem. Operate the hand pump with a push/pull motion.
- ⑥ Result: The primary boom down function should operate.
- 8 Release the knob.
- 9 Locate the secondary boom valve on the function manifold.
- 10 Pull out and hold the knob at the center of the secondary boom valve stem. Operate the hand pump with a push/pull motion.
- ⑥ Result: The secondary boom down function should operate.
- 11 Release the knob.
- 12 Locate the jib boom valve on the function manifold.

REV B

CHECKLIST B PROCEDURES

13 Pull out and hold the knob at the center of the jib boom valve stem. Operate the hand pump with a push/pull motion.

- ⊙ Result: The jib boom down function should operate.

14 Locate the turntable rotate valve on the function manifold.

15 Pull out and hold the knob at the center of the turntable rotate valve stem. Operate the hand pump with a push/pull motion.

- ⊙ Result: The turntable should rotate in a clockwise direction.

16 Push in and hold the knob at the center of the turntable rotate valve stem. Operate the hand pump with a push/pull motion.

- ⊙ Result: The turntable should rotate in a counterclockwise direction.

Bi-Fuel and Engine Models:

1 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls. Pull out the red Emergency Stop button to the on position at the drive controls (if equipped). Start the engine.

- ⊙ Result: The engine power light should be on.

2 Raise the primary, secondary and jib booms approximately 12 inches / 30 cm. Extend the primary boom approximately 12 inches / 30 cm.

3 Turn the engine off. Push in the red Emergency Stop button to the off position at the ground controls.

4 Pull out the red Emergency Stop button to the on position at the ground controls.

- ⊙ Result: The battery power light should be on.

5 Activate the lower function for the primary, secondary and jib booms and lower each boom approximately 6 inches / 15 cm.

- ⊙ Result: The boom lower functions should operate.

6 Activate the retract function for the boom extension and retract the boom approximately 6 inches / 15 cm.

- ⊙ Result: The boom retract function should operate.

7 Activate the turntable rotate function in both directions.

- ⊙ Result: The turntable rotate function should operate in both directions.

8 Turn the key switch to platform controls.

- ⊙ Result: The battery power light should be on.

9 Repeat steps 5 through 7 from the platform controls.

CHECKLIST B PROCEDURES

REV B

B-6 Inspect the Tires and Wheels (including lug nut or lug bolt torque)



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

- 1 Check the tire tread and sidewalls for cuts, cracks, punctures and unusual wear.
- 2 Check each wheel for damage, bends and cracked welds.
- 3 Check each lug nut or lug bolt for proper torque. Refer to Section 2, *Specifications*.
- 4 Check the air pressure of each tire. Refer to Section 2, *Specifications*.

B-7 Service the Tongue Jack



- 1 Remove the cap from the tongue jack and apply multipurpose grease to the internal gears and to the inner tube at the jack.
- 2 Lubricate the handle on both sides of the tube with a lightweight oil.
- 3 Check the tongue jack tires with an air pressure gauge and add air as needed. Refer to Section 2, *Specifications*.

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

REV B

CHECKLIST B PROCEDURES

B-8**Inspect the Parking Brake**

A properly functioning parking brake is essential to safe machine operation. An improperly functioning parking brake will prevent the operator from properly securing the machine when not in use.

NOTICE Perform this procedure on a firm, level surface.

NOTICE For adjustments: Refer to Repair Procedure 12-2, *How to Adjust the Parking Brake*.

- 1 Set the parking brake.
 - 2 Attempt to manually push the machine in both directions.
- ⊙ Result: The machine should not move.

NOTICE If there is movement in the brake cables, adjust the parking brake. See Repair procedure 12-2, *How to Adjust the Parking Brake*.

- 3 Visually inspect the parking brake cables and components for damage.

- 4 Confirm the following:
 - All brake cables are properly secured
 - Parking brake equalizer adjustment rod is properly secured
 - There is equal tension on the brake equalizer bracket
 - Brake cylinder is properly secured
 - Drive enable limit switch is properly set and secured
 - 5 Check the tension of the brake cables by manually pulling on each cable.
- ⊙ Result: The brake cables should be tight, with no movement in the lines.

NOTICE If the parking brake lines are too tight, the parking brake assembly will be difficult to apply. If the brake lines are too loose, the brake cylinder will not activate, the drive enable limit switch will not engage and the unit will not drive.

CHECKLIST B PROCEDURES

REV B

**B-9
Test the Horn**

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

- 1 Turn the key switch to platform control and pull out the Emergency Stop button to the on position at both the ground and platform controls.
- 2 Push down the horn button at the platform and drive controls.
 - ⊙ Result: The horn should sound.
- 3 Push down the horn button at the ground controls.
 - ⊙ Result: The horn should not sound.
- 4 Turn the key switch to ground control.
- 5 Push down the horn button at the ground controls.
 - ⊙ Result: The horn should sound.
- 6 Push down the horn button at the platform and drive controls.
 - ⊙ Result: The horn should not sound.

**B-10
Test the Flashing Beacon
(if equipped)**

The flashing beacon is used to alert operators and ground personnel of machine proximity and motion. The flashing beacon is located on the upper (primary) boom.

- 1 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls. Pull out the red Emergency Stop button to the on position at the drive controls (if equipped).
 - ⊙ Result: The beacons should flash.
- 2 Turn the key switch to platform controls.
 - ⊙ Result: The beacons should flash.

REV B

CHECKLIST B PROCEDURES

B-11 Test the Platform Rotation (if equipped)

Maintaining the platform rotator (if equipped) in good condition is essential for safe machine operation and good machine performance. The platform rotator is operated by manually turning the hand crank in either a clockwise or counterclockwise direction.

- 1 Turn the hand crank at the platform in the clockwise direction.
 - ⦿ Result: The platform should rotate to the right and operate smoothly without any hesitation or binding.
- 2 Turn the hand crank at the platform in the counterclockwise direction.
 - ⦿ Result: The platform should rotate to the left and operate smoothly without any hesitation or binding.

B-12 Inspect the Hydraulic Tank Cap Venting System



NOTICE

Genie requires that this procedure be performed quarterly or every 250 hours, whichever comes first. Perform this procedure more often if dusty conditions exist.

A free-breathing hydraulic tank cap is essential for good machine performance and service life. A dirty or clogged cap may cause the machine to perform poorly. Extremely dirty conditions may require that the cap be inspected more often.

- 1 Remove the breather cap from the hydraulic tank.
- 2 Check for proper venting.
 - ⦿ Result: Air passes through the breather cap.
 - ✗ Result: If air does not pass through the cap, clean or replace the cap. Proceed to step 3.

NOTICE

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

- 3 Using a mild solvent, carefully wash the cap venting system. Dry using low pressure compressed air. Repeat step 2.
- 4 Install the breather cap onto the hydraulic tank.

CHECKLIST B PROCEDURES

REV B

B-13

Perform Axle Maintenance - ANSI Models



NOTICE Axle specifications require that this procedure be performed quarterly or every 3000 miles, whichever comes first.

Proper axle maintenance, as specified in the axle manufacturer's maintenance schedule, is essential to good axle performance and service life. Failure to perform the maintenance procedures can lead to poor axle performance and component damage.

Required maintenance procedures and additional axle information is available in the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual
Genie part number 84376

B-14

Perform Hydraulic Oil Analysis



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

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

REV B

CHECKLIST B PROCEDURES

B-15 Check and Adjust the Engine RPM



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

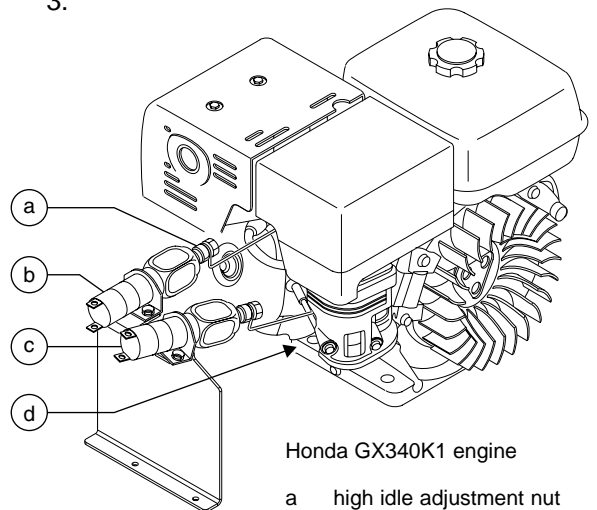
Honda GX340K1 Engine:

- 1 Remove the platform controls. Open the clamp on the back of the platform controls and slide the controls up and off of the platform.
- 2 **Before serial number T5002-25:** Connect an rpm gauge to the engine.
- 3 **Before serial number T5002-25:** Start the engine from the platform controls. Check the engine rpm on the gauge. Refer to Section 2, *Specifications*.

After serial number T5002-24: Start the engine from the platform controls. Press and hold the engine start button BN77 at the platform controls, and check the engine rpm on the diagnostic display at the side of the ground controls. Refer to Section 2, *Specifications*.

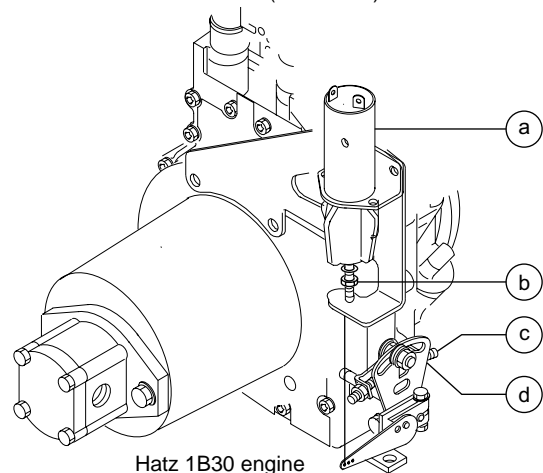
Skip to step 5 if the low idle rpm is correct.

- 4 **Honda models:** Locate the adjustment screw on the carburetor and turn the adjustment screw clockwise to increase the rpm or counterclockwise to decrease the rpm, and repeat this procedure beginning with step 3.
Hatz models: Loosen the low idle lock nut. Turn the low idle adjustment screw clockwise to increase the rpm or counterclockwise to decrease the rpm. Tighten the low idle lock nut, and repeat this procedure beginning with step 3.



Honda GX340K1 engine

- a high idle adjustment nut
- b high rpm solenoid
- c choke solenoid
- d low idle adjustment screw (not shown)



Hatz 1B30 engine

- a high rpm solenoid
- b high idle adjustment nut
- c low idle adjustment screw
- d low idle lock nut (not shown)

CHECKLIST B PROCEDURES

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5 **Before serial number T5002-25:** Press the function enable button and any boom function button, and check the engine rpm on the gauge. Refer to Section 2, *Specifications*.

After serial number T5002-24: Press the function enable button and any boom function button and hold the engine start button BN77 at the platform controls, and check the engine rpm on the diagnostic display at the side of the ground controls. Refer to Section 2, *Specifications*.

If high idle rpm is correct, disregard adjustment step 6.

6 **Honda models:** Loosen the nut on the solenoid. Turn the high idle adjustment nut counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the jam nut and repeat this procedure beginning with step 5.

Hatz models: Loosen the lock nut on the solenoid. Turn the high idle adjustment nut counterclockwise to increase the rpm or clockwise to decrease the rpm. Tighten the lock nut and repeat this procedure beginning with step 5.

Checklist C Procedures

REV B

C-1 Replace the Hydraulic Tank Breather Cap - Models with Optional Hydraulic Oil



The hydraulic tank is a vented-type tank. The breather cap has an internal air filter that can become clogged or, over time, can deteriorate. If the breather cap is faulty or improperly installed, impurities can enter the hydraulic system which may cause component damage. Extremely dirty conditions may require that the cap be inspected more often.

- 1 Remove and discard the hydraulic tank breather cap.
- 2 Install a new cap onto the tank.

C-2 Perform Axle Maintenance - ANSI Models



NOTICE

Axle specifications require that this procedure be performed every 6 months or 6000 miles, whichever comes first.

Required maintenance procedures and additional axle information is available in the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual
Genie part number 84376

C-3 Perform Hitch Maintenance - CE Models



NOTICE

Hitch specifications require that this procedure be performed semi-annually.

Proper hitch maintenance, following the hitch manufacturer's maintenance schedule, is essential to good hitch performance and service life. Failure to perform the maintenance procedures can lead to poor hitch performance and component damage.

Required maintenance procedures and additional axle information is available in the *Knott Axle Service Manual* (Knott part number P005).

Knott Axle Service Manual
Genie part number 84443

Checklist D Procedures

REV B

D-1

Check the Boom Wear Pads



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

NOTICE If the wear pads are within specification, refer to Repair Procedure 4-2, *How to Shim the Primary Boom*.

- 1 Extend the boom until the wear pads are accessible.
- 2 Measure the thickness of the top, side and bottom wear pads. If the wear pad is within specification, shim as necessary to obtain zero clearance and zero drag.

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

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

Boom wear pad specifications

Wear pad thickness, minimum	$\frac{7}{16}$ inch
	11 mm

REV B

CHECKLIST D PROCEDURES

D-2 Check the Turntable Rotation Bearing Bolts

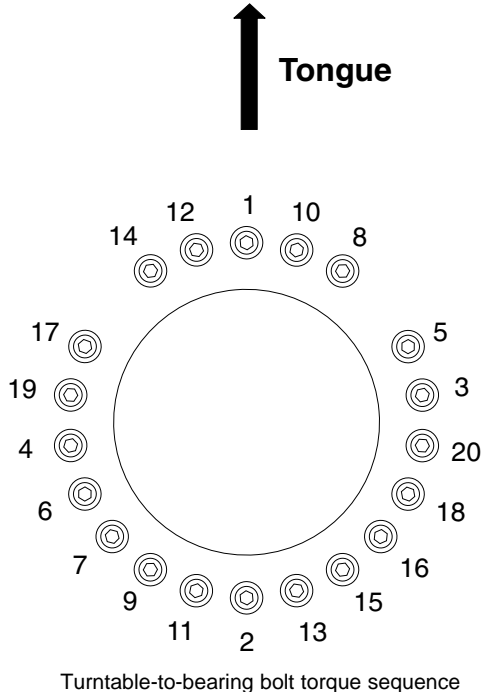


Maintaining proper torque on the turntable bearing bolts is essential to safe machine operation. Improper bolt torque could result in an unsafe operating condition and component damage.

- 1 Be sure that each turntable mounting (top) bolt is torqued in sequence to specification.

Turntable-to-bearing bolt torque specification

All bolts, lubricated	135 ft-lbs 183 Nm
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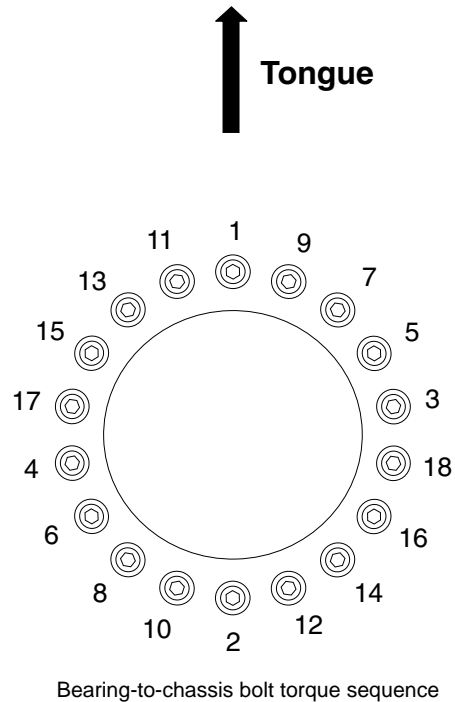
- 2 Check to ensure that each bearing mounting bolt and nut under the turntable is torqued in sequence to specification.

NOTICE

Use the bolt access hole located in the turntable behind the ground control box to hold the bolt while torquing the nut.

Bearing-to-chassis bolt torque specification

Bolts 1, 2, 9, 10, 15 and 16, lubricated	90 ft-lbs 122 Nm
All remaining bolts, lubricated	105 ft-lbs 142 Nm



CHECKLIST D PROCEDURES

REV B

D-3 Inspect for Turntable Bearing Wear



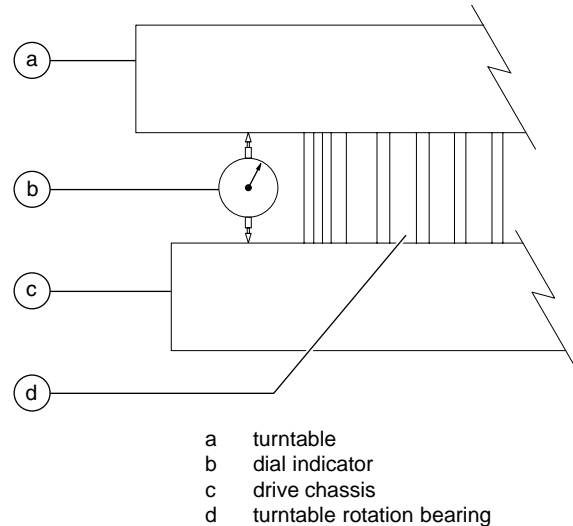
Periodic inspection of turntable bearing wear is essential to safe machine operation, good machine performance and service life. Continued use of a worn turntable bearing could create an unsafe operating condition, resulting in death or serious injury and component damage.

NOTICE Perform this procedure with the machine on a firm, level surface and the boom in the stowed position.

- 1 Grease the turntable bearing. See A-13, *Grease the Turntable Rotation Bearing and Rotate Gear*.
- 2 Torque the turntable bearing bolts to specification. See D-2, *Check the Turntable Rotation Bearing Bolts*.
- 3 Start the machine from the ground controls and raise the primary and secondary booms to full height. Do not extend the primary boom.
- 4 Place a dial indicator between the drive chassis and the turntable at a point that is directly under, or inline with, the boom and no more than 1 inch / 2.5 cm from the bearing.

NOTICE To obtain an accurate measurement, place the dial indicator no more than 1 inch / 2.5 cm from the turntable rotation bearing.

- 5 At the dial indicator, adjust it to "zero" the indicator.



- 6 Lower the secondary boom to the stowed position and lower the primary boom to a horizontal position. Fully extend the primary boom.
- 7 Note the reading on the dial indicator.
 - ⊙ Result: The measurement is less than 0.025 inch / 0.635 mm. The bearing is good.
 - ✗ Result: The measurement is more than 0.0249 inch / 0.634 mm. The bearing is worn and needs to be replaced.
- 8 Fully retract the primary boom. Raise the primary and secondary booms to full height. Visually inspect the dial indicator to be sure the needle returns to the "zero" position.
- 9 Remove the dial indicator and rotate the turntable 90°.
- 10 Repeat steps 4 through 9 until the rotation bearing has been checked in at least four equally spaced areas 90° apart.
- 11 Lower the primary and secondary booms to the stowed position and turn the machine off.
- 12 Remove the dial indicator from the machine.

REV B

CHECKLIST D PROCEDURES

D-4 Replace the Hydraulic Tank Return Filter



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

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

NOTICE The hydraulic filter is located at the hydraulic tank.

- 1 Clean the area around the hydraulic oil filter. Remove the filter with an oil filter wrench.

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

- 2 Apply a thin layer of fresh oil onto the gasket of the new oil filter.
- 3 Install the filter and tighten it securely by hand.

- 4 Use a permanent ink marker to write the date and number of hours from the hour meter on the new filter.
- 5 Clean up any oil that may have spilled during the replacement procedure. Properly discard the used filter.
- 6 Turn the key switch to ground controls and pull out the red Emergency Stop button to the on position at both the ground and platform controls.
- 7 Raise the platform approximately 3 ft / 1 m.
- 8 Inspect the filter and related components to be sure that there are no leaks.

CHECKLIST D PROCEDURES

REV B

D-5 Perform Axle Maintenance - ANSI Models



NOTICE Axle specifications require that this procedure be performed every 12 months or 12,000 miles, whichever comes first.

Required maintenance procedures and additional axle information is available in the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual
Genie part number 84376

D-6 Perform Engine Maintenance - Hatz Models (if equipped)



NOTICE Engine specifications require that this procedure be performed annually.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information is available in the *Hatz 1B30 Engine Instruction Book* (Hatz part number 433 0802 01).

Hatz 1B30 Instruction Book
Genie part number 97363

Checklist E Procedures

REV B

E-1 Test or Replace the Hydraulic Oil



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

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

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

1 Disconnect the battery pack from the machine.

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

2 Remove the drain plug from the hydraulic tank and allow all of the oil from the tank to drain into a suitable container. Refer to Section 2, *Specifications*.

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

- 3 Tag and disconnect the hydraulic hose from the return filter to the tank. Cap the fitting on the filter head.
- 4 Remove the return filter mounting fasteners. Lay the filter off to the side.
- 5 Remove the hydraulic tank mounting fasteners and remove the hydraulic tank from the machine.
- 7 Remove the suction strainer and clean it using a mild solvent.
- 8 Clean the inside of the tank using a mild solvent.
- 9 Install the suction strainer into the tank and securely tighten.
- 10 Install and tighten the hydraulic tank drain plug using a thread sealant on the threads. Torque to specification.

Torque specifications

Hydraulic tank drain plug, dry	75 in-lbs 8.5 Nm
Hydraulic tank drain plug, lubricated	56 in-lbs 6.3 Nm

CHECKLIST E PROCEDURES

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- 11 Install the hydraulic tank and install and tighten the hydraulic tank mounting fasteners. Torque to specification.

Torque specifications

Hydraulic tank mounting fasteners, dry	60 in-lbs 6.7 Nm
Hydraulic tank mounting fasteners, lubricated	45 in-lbs 5.1 Nm

- 12 Install the hydraulic filter head onto the machine and securely tighten the fasteners. Do not over tighten.
- 13 Install the hydraulic lines into the filter head and torque to specification. Refer to Section 2, *Specifications*.
- 14 Connect the battery pack to the machine.
- 15 Fill the hydraulic tank with hydraulic oil until the fluid is at the MAX mark on the tank. Do not overfill. Refer to Section 2, *Specifications*.
- 16 Activate the pump to fill the hydraulic system with oil and bleed the system of air.

CAUTION Component damage hazard. The pump can be damaged if operated without oil. Be careful not to empty the hydraulic tank while in the process of filling the hydraulic system.

- 17 Repeat steps 15 through 16 until the hydraulic system and tank are both full. Inspect for leaks.
- 18 Clean up any oil that may have spilled.

E-2 Perform Engine Maintenance - Honda Models (if equipped)



NOTICE Engine specifications require that this procedure be performed every two years.

Proper engine maintenance, following the engine manufacturer's maintenance schedule, is essential to good engine performance and service life. Failure to perform the maintenance procedures can lead to poor engine performance and component damage.

Required maintenance procedures and additional engine information is available in the *Honda GX340 Engine Owner Manual* (Honda part number 31ZH9603).

Honda GX340 Owner's Manual

Genie part number

97361

Repair Procedures



Observe and Obey:

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

Before Repairs Start:

- ☑ Read, understand and obey the safety rules and operating instructions in the *Genie TMZ-50/30 Operator's Manual*.
- ☑ Be sure that all necessary tools and parts are available and ready for use.
- ☑ Read each procedure completely and adhere to the instructions. Attempting shortcuts may produce hazardous conditions.
- ☑ Unless otherwise specified, perform each repair procedure with the machine in the following configuration:
 - Machine disconnected from tow vehicle
 - Machine parked on a firm, level surface with the boom stowed and both latches secured
 - Key switch in the off position with the key removed
 - The red Emergency Stop button in the off position at both ground and platform controls
 - Wheels chocked and parking brake applied
 - All external AC power supply disconnected from the machine

About This Section

Most of the procedures in this section should only be performed by a trained service professional in a suitably equipped workshop. Select the appropriate repair procedure after troubleshooting the problem. Perform disassembly procedures to the point where repairs can be completed. Then to re-assemble, perform the disassembly steps in reverse order.

Symbols Legend



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

▲ DANGER

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

▲ WARNING

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

▲ CAUTION

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

CAUTION

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

NOTICE

Green—used to indicate operation or maintenance information.

- ◎ Indicates that a specific result is expected after performing a series of steps.
- ☒ Indicates that an incorrect result has occurred after performing a series of steps.

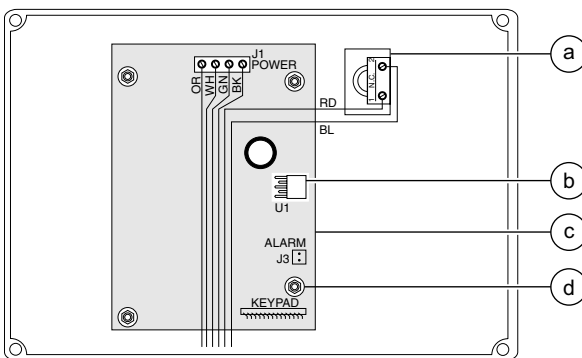
Platform Controls

REV B

Activating one or more buttons on the platform controls first sends a signal to the platform controls circuit board, then the ground controls printed circuit boards which ultimately activates a machine function. Keeping the platform controls clean and defect free is essential to safe machine operation.

The platform controls consists of a printed circuit board, Emergency Stop button, alarm and an overlay membrane decal. All of the components are replaceable.

For further information or assistance, consult the Genie Industries Service Department.



- a red Emergency Stop button P2
- b voltage regulator D7
- c platform controls circuit board U3
- d mounting fasteners

1-1 Circuit Board

How to Remove the Circuit Board

- 1 Tag and disconnect the platform controls wire harness from the harness connector at the platform pivot.
- 2 Remove the controls from the machine. Open the clamp on the back of the controls and slide the controls up and off of the platform. Place the control box on a work bench.
- 3 Remove the fasteners securing the cover to the control box. Open the box.
- 4 Tag and disconnect the wire connectors from the circuit board.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Use a grounded wrist strap at all times when handling printed circuit boards.

- 5 Remove the circuit board mounting fasteners and remove the circuit board from the box.

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PLATFORM CONTROLS

1-2 Membrane Overlay

How to Replace the Overlay

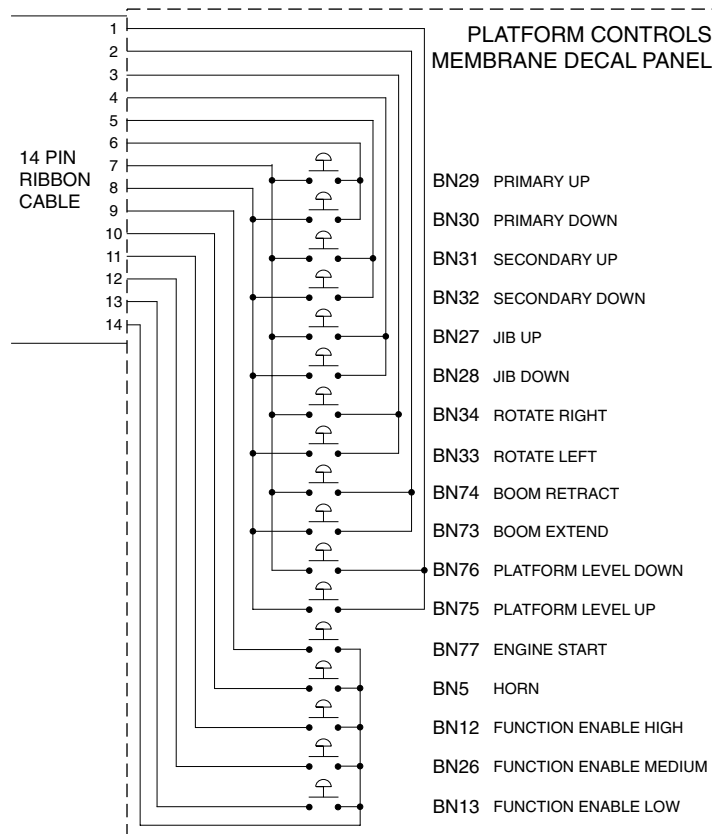
- 1 Tag and disconnect the platform controls wire harness from the harness connector at the platform pivot.
- 2 Remove the controls from the machine. Open the clamp on the back of the controls and slide the controls up and off of the platform. Place the control box on a work bench.
- 3 Loosen the control box lid retaining fasteners and open the lid.

- 4 Disconnect the large blue connector from the circuit board at the connection marked **KEYPAD** by sliding the connector parallel to the circuit board.

CAUTION Component damage hazard. The circuit board will become damaged if the wire harness and connector are disconnected without proper care. Do not pull upwards on the connector.

CAUTION Component damage hazard. The circuit board may become damaged if the weight from the control box lid pulls on the wire harness. Do not put any weight or strain on the wires.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Use a grounded wrist strap at all times when handling printed circuit boards.



PLATFORM CONTROLS

REV B

- 5 Install the lid onto the control box. Finger-tighten the retaining fasteners.
- 6 Starting at the upper corners of the touch pad, remove all layers of the key pad from the control box lid.

NOTICE The wire harness and large blue connector will interfere if removing the touch pad from the bottom.

- 7 Pull the large blue connector through the slot in the control box lid and discard the old touch pad. Remove any remaining sealant from the slot.
- 8 Using a mild solvent, clean the surface of the control box lid. Allow the surface to dry.

CAUTION Component damage hazard. The circuit board will become damaged if it comes in contact with solvent. Do not allow solvent to contact the circuit board.

- 9 Remove all the brown backing material from the new touch pad.
- 10 Insert the large blue connector from the new touch pad through the slot. Carefully align the low battery LED on the control box lid with the window in the new touch pad and lightly lay the touch pad onto the control box lid.

NOTICE Repositioning the touch pad is possible if the touch pad is lightly adhered to the lid. Do not apply any pressure to the touch pad.

- 11 When satisfied with the position of the touch pad, firmly press down the entire surface of the touch pad with your fingers.

- 12 Loosen the control box lid retaining fasteners and open the lid.

- 13 Using RTV-type sealant, completely seal the opening in the slot of the control box lid around the wire harness.

- 14 Apply dielectric grease to the pins on the circuit board at the connection marked **KEYPAD**.

- 15 Install the large blue connector onto the circuit board pins at the connection marked **KEYPAD**. Slide the connector parallel to the circuit board until the connector is pushed onto the circuit board pins no less than 0.2 inch / 5 mm.

NOTICE Be sure all pins are in the connector.

- 16 Install the lid onto the control box and tighten the retaining fasteners. Do not overtighten.

- 17 Install the control box onto the machine.

- 18 Using dielectric grease at the connection, securely connect the platform control wire harness to the harness connector at the platform pivot.

Platform Components

REV B

2-1 Platform

How to Remove the Platform

Models with Platform Rotate (option):

- 1 Support the platform with an appropriate lifting device.
- 2 Remove the fasteners securing the platform to the platform mount on the platform rotator assembly.

▲WARNING Crushing hazard. The platform may become unbalanced and fall if not properly supported by a lifting device when the fasteners are removed.

- 3 Lift and remove the platform from the mount.

Models without Platform Rotate:

- 1 Remove the platform controls from the platform control box mount. Release the clamp on the back of the platform control box and slide the controls up and off of the mount.
- 2 Support the platform with an appropriate lifting device.
- 3 Remove the toggle pin securing the platform to the platform mount.

▲WARNING Crushing hazard. The platform may become unbalanced and fall if not properly supported when the toggle pin is removed.

- 4 Lift and remove the platform from the mount.

2-2 Platform Rotator (if equipped)

The platform rotator is a manually-operated gear assembly used to rotate the platform 160 degrees.

How to Remove the Platform Rotator

- 1 Remove the platform. See 2-1, *How to Remove the Platform*.
- 2 Remove the platform controls from the platform control box mount. Release the clamp on the back of the platform control box and slide the controls up and off of the mount. Lay the platform controls off to the side.

▲CAUTION Component damage hazard. Cables can be damaged if they are kinked or pinched.

- 2 Support the platform rotator with an appropriate lifting device.
- 3 Remove the toggle pin securing the platform to the platform mount.

▲WARNING Crushing hazard. The platform rotator may become unbalanced and fall if not properly supported when the toggle pin is removed.

- 4 Lift the platform rotator off the platform mount.

PLATFORM COMPONENTS

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How to Adjust the Platform Rotator

The platform rotator is designed to allow the platform to slip in the event of striking an object to help prevent damage to the platform. If the platform rotator is too tight or seized, damage to the platform may occur. If the platform rotator is too loose, the platform may rotate side to side unexpectedly, resulting in a unsafe operating condition.

- 1 Raise the primary boom approximately 3 feet / 1 m.
- 2 Press the function enable button and the platform level button in the down direction until the platform is horizontal. Do not allow the platform to contact the ground.
- 3 Remove the platform controls from the platform control box mount. Release the clamp on the back of the platform control box and slide the controls up and off of the mount. Lay the platform controls off to the side.

CAUTION Component damage hazard. Cables can be damaged if they are kinked or pinched.

- 4 Remove the fasteners securing the platform box mount and gearbox cover to the platform rotate gearbox. Remove the mount and cover from the gearbox.
- 5 Locate the gear assembly retaining nut on the end of the platform pivot shaft. Loosen the nut just enough to allow the handle to rotate.
- 6 Tighten the locknut. Torque to specification.

Torque specification

Gear assembly retaining nut, dry	180 ft-lbs ±5 ft-lbs 244 Nm ±7 Nm
----------------------------------	--------------------------------------

- 7 Thoroughly grease the entire mechanical platform rotator assembly.
- 8 Operate the platform rotator and check for smooth operation.

How to Service the Platform Rotator

- 1 Remove the platform. See 1-1, *How to Remove the Platform*.
- 2 Remove the platform controls from the platform control box mount. Release the clamp on the back of the platform control box and slide the controls up and off of the mount. Lay the platform controls off to the side.

CAUTION Component damage hazard. Cables can be damaged if they are kinked or pinched.

- 3 Remove the fasteners securing the platform control box mount and gearbox cover to the top of the gearbox case. Remove the mount and cover.
- 4 Remove the four bolts securing the rotate handle shaft cover to the gearbox.
- 5 Remove the rotate handle shaft and pinion from the gearbox case.
- 6 Remove the gear assembly retaining nut from the top of the shaft.
- 7 Disassemble the gear assembly.

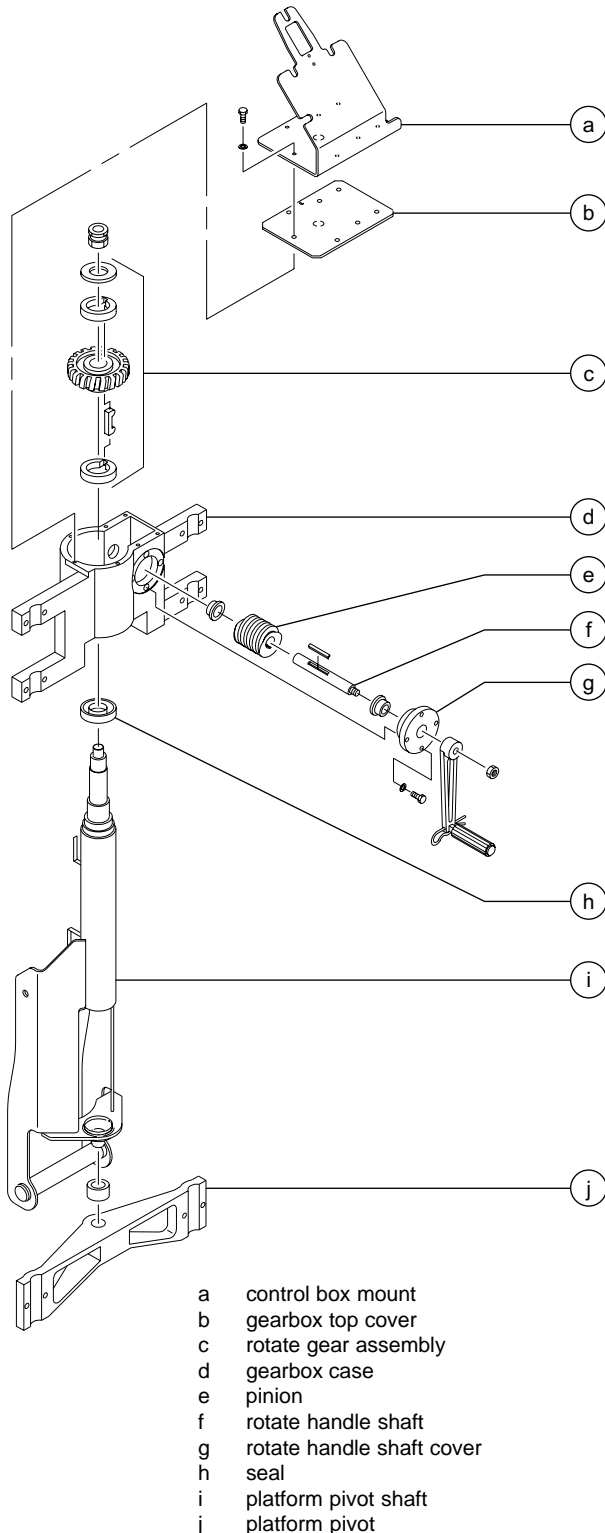
NOTICE For ease of reinstallation, note the removal order of each gear component.

- 8 Visually inspect the inside of the platform rotator for the following items:
 - Excessive wear
 - Broken or damaged parts
 - Rust or corrosion
 - Binding

NOTICE If any parts are lightly rusted or corroded, remove them and clean rust or corrosion off with a wire brush. If parts are worn, heavily rusted or corroded, replace them.

REV B

PLATFORM COMPONENTS



- 9 Thoroughly degrease and dry the gearbox case, covers, all gear components and the platform pivot shaft.
- 10 Install the gearbox case onto the platform pivot shaft.
- 11 Install gear assembly onto the platform pivot shaft in the reverse order of disassembly in step 7.
- 12 Install the gear assembly retaining nut onto the top of the shaft. Torque to specification.

Torque specification

Gear assembly retaining nut, dry	180 ft-lbs ±5 ft-lbs 244 Nm ±7 Nm
----------------------------------	--------------------------------------

- 13 Thoroughly and heavily lubricate each tooth of the gear using multipurpose grease. Rotate the gearbox case as required.

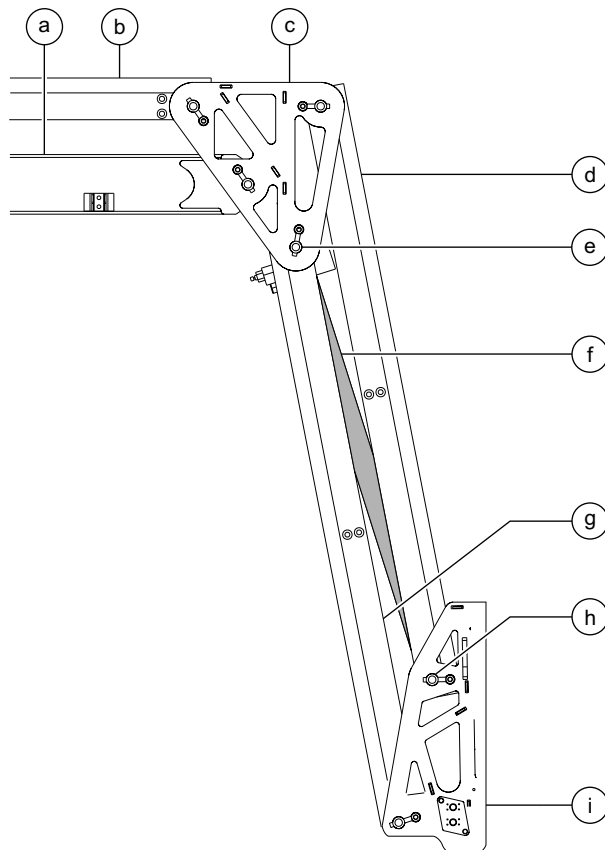
NOTICE When lubricating the gear, do not apply any grease to the remainder of the gear assembly components. Grease on the balance of the gear components may result in slippage and poor rotator performance.

- 14 Install the rotate handle shaft, pinion and associated components into the gearbox.
- 15 Thoroughly and heavily lubricate each tooth of the pinion using multipurpose grease.
- 16 Install the rotate handle shaft cover. Install and securely tighten the fasteners. Do not over tighten.
- 17 Install the platform control box mount and gearbox cover onto the top of the gearbox. Install and securely tighten the fasteners. Do not over tighten.

Jib Boom Components

REV B

3-1 Jib Boom



- a primary boom
- b primary linkage
- c jib boom mount
- d upper jib boom
- e jib boom cylinder barrel-end pivot pin
- f jib boom lift cylinder
- g lower jib boom
- h jib boom cylinder rod-end pivot pin
- i platform mount

How to Remove the Jib Boom

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

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the platform. See 2-1, *How to Remove the Platform*.
 - 2 **Models with Platform Rotate:** Remove the platform controls from the platform control box mount. Release the clamp on the back of the platform control box and slide the controls up and off of the mount.
 - 3 Tag and disconnect the platform control box pigtail from the platform controls wire harness connector at the side of the platform mount.
 - 4 Tag and disconnect the platform controls wire harness from the ground control box. Install the platform control box pigtail into the ground control box.
 - 5 Raise the jib boom approximately 3 feet / 1 m.
 - 6 Lower the jib boom until the platform mount rests on sawhorses or a work table of sufficient capacity.
 - 7 Disconnect the battery pack from the machine.
- WARNING** Electrocutation hazard. Contact with electrically charged circuits could result in death or serious injury. Remove all rings, watches and other jewelry.
- 8 Tag and disconnect the wires from the AC outlet box.

REV B

JIB BOOM COMPONENTS

- 9 Mark the location of each cable retaining plate in the upper jib boom.
- 10 Tag and remove the cable retaining plates from the upper jib boom.
- 11 Attach a lifting strap of suitable capacity from an overhead crane to the rod end of the jib boom lift cylinder.
- 12 Remove the pin retaining fastener from the jib boom lift cylinder rod-end pivot pin.
- 13 Using a soft metal drift, remove the jib boom lift cylinder rod-end pivot pin.

▲WARNING Crushing hazard. The jib boom lift cylinder could fall if not properly supported when the rod-end pivot pin is removed from the machine.

- 14 Attach a lifting strap of suitable capacity from an overhead crane to the upper jib boom.
- 15 Remove the pin retaining fastener from the upper jib boom pivot pin at the jib boom mount.
- 16 Using a soft metal drift, remove the upper jib pivot pin from the jib boom mount. Remove the upper jib boom.

▲WARNING Crushing hazard. The upper jib boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

- 17 Support and secure the platform mount.
- 18 Remove the pin retaining fastener from the lower jib boom pivot pin at the platform mount.
- 19 Using a soft metal drift, remove the lower jib boom pivot pin at the platform mount. Remove the platform mount from the machine.

▲WARNING Crushing hazard. The platform mount could become unbalanced and fall if not properly supported when the pivot pin is removed.

- 20 Tag, disconnect and plug the hydraulic hoses at the jib boom lift cylinder. Cap the fittings on the cylinder.

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

- 21 Tag and disconnect the wires from the jib boom lift cylinder solenoid valve.
- 22 Attach a lifting strap of suitable capacity from an overhead crane to the jib boom lift cylinder. Support the cylinder. Do not apply any lifting pressure.
- 23 Attach a lifting strap of suitable capacity from an overhead crane to the lower jib boom. Support the boom. Do not apply any lifting pressure.
- 24 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin.
- 25 Using a soft metal drift, remove the jib boom lift cylinder barrel-end pivot pin. Remove the jib boom lift cylinder from the machine.

▲WARNING Crushing hazard. The jib boom lift cylinder could become unbalanced and fall if not properly supported when the pivot pin is removed.

▲WARNING Crushing hazard. The lower jib boom could become unbalanced and fall if not properly supported when the pivot pin is removed.

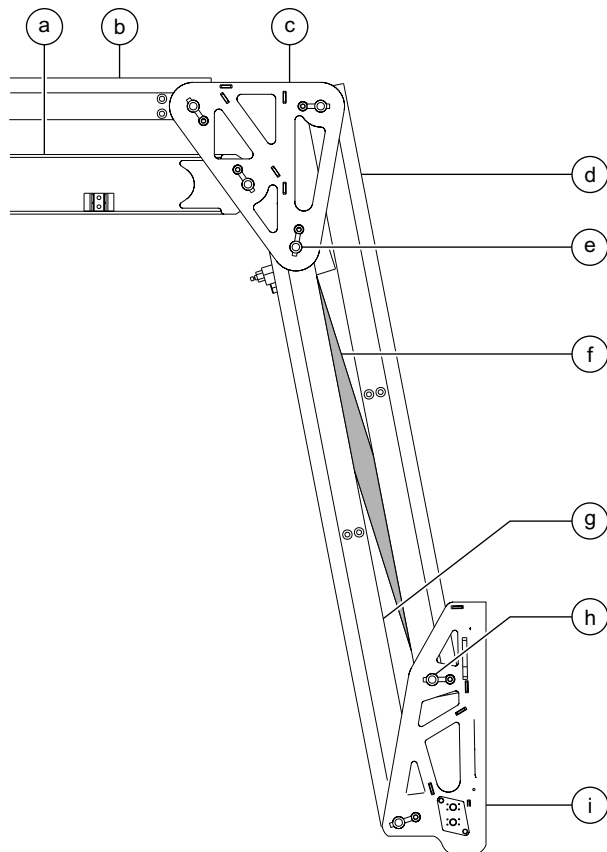
CAUTION Component damage hazard. Be careful not to damage the solenoid valve on the cylinder while removing the cylinder.

JIB BOOM COMPONENTS

REV B

3-2 Jib Boom Lift Cylinder

The jib boom lift cylinder raises and lowers the jib boom. The jib boom lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.



- a primary boom
- b primary linkage
- c jib boom mount
- d upper jib boom
- e jib boom cylinder barrel-end pivot pin
- f jib boom lift cylinder
- g lower jib boom
- h jib boom cylinder rod-end pivot pin
- i platform mount

How to Remove the Jib Boom Cylinder

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, Hydraulic Hose and Fitting Torque Specifications.

- 1 Raise the jib boom approximately 3 feet / 1 m.
- 2 Lower the jib boom until the platform mount rests on sawhorses or a work table of sufficient capacity.
- 3 Disconnect the battery pack from the machine.

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

- 4 Tag, disconnect and plug the hydraulic hoses at the jib boom cylinder. Cap the fittings on the cylinder.

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

- 5 Tag and disconnect the wires from the jib boom cylinder solenoid valve.

REV B

JIB BOOM COMPONENTS

- 6 Attach a lifting strap of suitable capacity from an overhead crane to the jib boom lift cylinder. Support the cylinder. Do not apply any lifting pressure.
- 7 Remove the pin retaining fastener from the jib boom cylinder rod-end pivot pin.
- 8 Using a soft metal drift, remove the jib boom cylinder rod-end pivot pin.

▲WARNING Crushing hazard. The jib boom cylinder could fall if not properly supported when the rod-end pivot pin is removed from the machine.

- 9 Attach a lifting strap of suitable capacity from an overhead crane to the lower jib boom. Support the boom. Do not apply any lifting pressure.
- 10 Remove the pin retaining fastener from the jib boom lift cylinder barrel-end pivot pin.
- 11 Using a soft metal drift, remove the jib boom cylinder barrel-end pivot pin. Remove the jib boom cylinder from the machine.

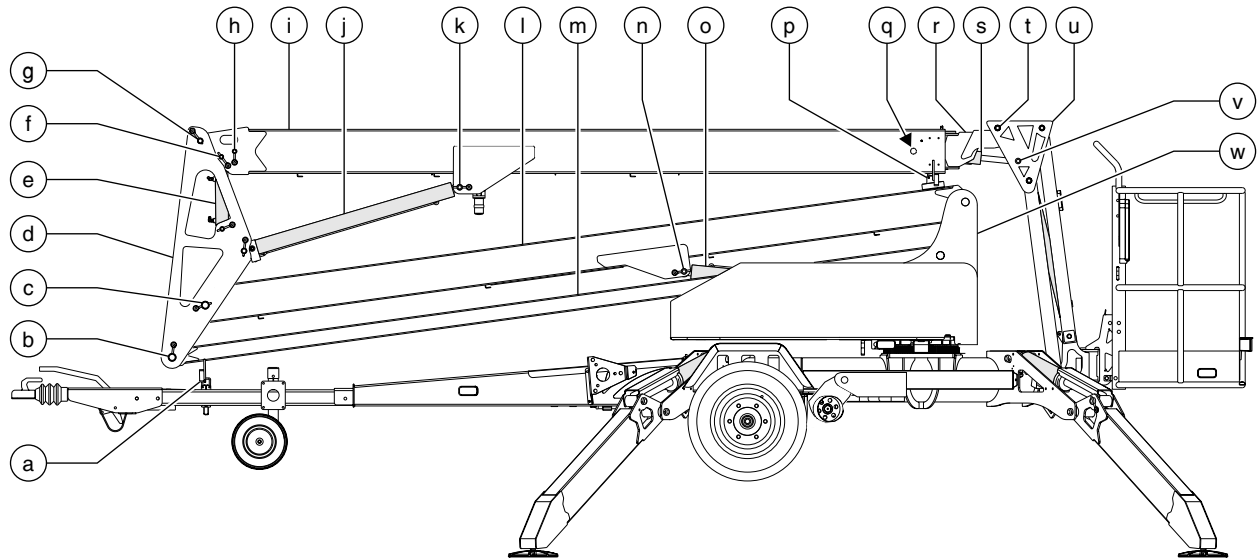
▲WARNING Crushing hazard. The jib boom cylinder could become unbalanced and fall if not properly supported when the barrel-end pivot pin is removed from the machine.

▲WARNING Crushing hazard. The lower jib boom could become unbalanced and fall if not properly supported when the pivot pin is removed from the machine.

CAUTION Component damage hazard. The solenoid valve can be damaged. Use caution when removing the cylinder from the machine.

Primary Boom Components

REV B



- | | | | |
|---|--|---|--|
| a | secondary boom hold-down latch | m | secondary boom link |
| b | secondary boom link pivot pin | n | secondary boom lift cylinder rod end pivot pin |
| c | secondary boom pivot pin | o | secondary boom lift cylinder |
| d | mid-pivot | p | primary boom hold-down latch |
| e | platform level master cylinder | q | platform level slave cylinder barrel end pivot pin
(hidden from view) |
| f | platform level master cylinder rod end pivot pin | r | extension boom |
| g | primary boom pivot pin | s | platform level slave cylinder |
| h | extension cylinder barrel end pivot pin | t | jib mount pivot pin |
| i | primary boom | u | jib mount |
| j | primary boom lift cylinder | v | platform level slave cylinder rod end pivot pin |
| k | primary boom lift cylinder rod end pivot pin | w | turntable |
| l | secondary boom | | |

REV B

PRIMARY BOOM COMPONENTS

4-1 Cable Track

The boom cable track guides cables and hoses running up the boom. It can be repaired link by link without removing the cables and hoses that run through it. Removing the entire boom cable track may be necessary when performing major repairs that involve removing the boom.

How to Remove the Cable Track

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

- 1 Disconnect the platform controls from the harness connector at the platform mount.
- 2 Tag and disconnect the platform controls wire harness at the platform mount.
- 3 Tag and disconnect the limit switch wire harness at the platform mount.
- 4 Tag and disconnect the wires from the AC outlet box.
- 5 Release the wire harnesses which are secured to the platform mount and the jib boom.

- 6 Pull all the harness cables through the jib boom and jib mount. Lay them off to the side of the primary boom.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

- 7 Tag, disconnect and plug the hydraulic hoses at the jib boom lift cylinder. Cap the fittings on the cylinder.

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

- 8 Tag, disconnect and plug the hydraulic hoses at the platform level slave cylinder. Cap the fittings on the cylinder.

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

- 9 Pull all the hoses through the jib mount. Lay them off to the side of the primary boom.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

PRIMARY BOOM COMPONENTS

REV B

- 10 Remove the retaining fasteners securing both cable track top covers to the primary boom. Remove both top covers from the boom.
- 11 Pull the hoses and cables through the cable bridge and cable track. Lay them off to the side.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

- 12 Remove the cable track hose router clamp from the platform end of the cable bridge.
- 13 Remove the cable bridge front end cover from the platform end of the primary boom.
- 14 Place blocks between the cable bridge and the cable track and secure them together.

AWARNING Crushing hazard. If the cable bridge and the cable track are not properly secured together, the combination could become unbalanced and fall when removed from the machine.

CAUTION Component damage hazard. The cable track can be damaged if it is twisted.

- 15 Attach a lifting strap from an overhead crane to the cable track.
- 16 Remove the mounting fasteners that secure the cable track to the boom.
- 17 Remove the cable track from the machine and place it on a structure capable of supporting it.

AWARNING Crushing hazard. The cable track could become unbalanced and fall if not properly attached to the overhead crane when removed from the machine.

How to Repair the Cable Track

CAUTION Component damage hazard. The cable track can be damaged if it is twisted.

- 1 Remove the fasteners securing both cable track top covers to the primary boom. Remove both covers from the boom.
- 2 Visually inspect the cable track and determine which 7-link section needs to be replaced.
- 3 Using a flat blade screwdriver, pry open the hinge bar on each link of the 7-link section, plus one more on each end making a total of 9 links.
- 4 Using a flat blade screwdriver at one side of the link to be replaced, separate the connection and open the joint slightly by sliding the link over the link pivot. Repeat for the other side of the link to separate the link sections.
- 5 Repeat step 4 for the other end of the section to be replaced.
- 6 Lift up the hoses and cables and carefully remove the damaged section of cable track.

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

- 7 Lift up the hoses and cables and carefully insert the new section of cable track.
- 8 Install the new section of cable track onto the existing track. Be sure the link pivot on both sides of the link are in place and that the track hinges correctly.
- 9 Securely lock the hinge bar for each link.
- 10 Operate the boom extend/retract function through a full cycle to ensure smooth operation of the new section of cable track.

REV B

PRIMARY BOOM COMPONENTS

4-2 Primary Boom

How to Shim the Primary Boom

- 1 Extend the boom until the wear pads are accessible.
- 2 Loosen the wear pad mounting fasteners.
- 3 Install the new shims under the wear pad to obtain zero clearance and zero drag.
- 4 Securely tighten the mounting fasteners. Do not over tighten.
- 5 Extend and retract the boom through an entire cycle. Check for tight spots that could cause binding or scraping.

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

How to Remove the Primary Boom

WARNING 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 required.

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the jib. See 3-1, *How to Remove the Jib Boom*.
- 2 Remove the cable track. See 4-1, *How to Remove the Cable Track*.
- 3 Remove the supports securing the cables to the bottom of the primary boom. Pull the cables through the primary boom and lay them off to the side of the mid pivot.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

NOTICE For ease of assembly, pay close attention to how the cables are routed when pulling the cables to the mid pivot.

PRIMARY BOOM COMPONENTS

REV B

- 4 Tag, disconnect and plug the hoses from the platform level master cylinder. Cap the fittings on the cylinder.

AWARNING 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 hoses from the primary boom extension cylinder. Cap the fittings on the cylinder.

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

- 6 Attach a lifting strap of suitable capacity from an overhead crane to the rod end of the primary lift cylinder. Support the cylinder. Do not apply any lifting pressure.
- 7 Remove the pin retaining fasteners from the primary lift cylinder rod end pivot pin.
- 8 Using a soft metal drift, remove the primary lift cylinder rod end pivot pin.

AWARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed.

- 9 Lower the cylinder onto the secondary boom.

- 10 Remove the pin retaining fasteners from the platform level master cylinder rod end pivot pin.

- 11 Using a soft metal drift, remove the platform level master cylinder rod end pivot pin.

- 12 Attach a lifting strap of suitable capacity from an overhead crane to the primary boom. Support the boom. Do not apply any lifting pressure.

CAUTION Component damage hazard. The cable track can be damaged if not protected when lifting the boom.

- 13 Remove the pin retaining fasteners securing the primary boom pivot pin.

- 14 Using a soft metal drift, remove the primary boom pivot pin.

DANGER Crushing hazard. The primary boom could become unbalanced and fall if not properly supported when the pin is removed.

- 15 Release the latch at the turntable end of the machine.

- 16 Remove the primary boom from the machine.

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

REV B

PRIMARY BOOM COMPONENTS

4-3 Boom Extension

How to Remove the Boom Extension

▲WARNING This procedure in this section 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 required.

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the jib. See 3-1, *How to Remove the Jib Boom*.
- 2 Tag, disconnect and plug the platform level slave cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

- 3 Tag, disconnect and plug the extension cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

NOTICE The connections to the extension cylinder are at the mid pivot end of the primary boom.

- 4 Remove the primary boom upper wear pad retaining fasteners. Remove the upper wear pads from the primary boom.
- 5 Remove the primary boom side wear pad retaining fasteners. Remove the side wear pads and shims from the primary boom.

NOTICE For ease of assembly, note the quantity and location of shims during disassembly.

- 6 Remove the primary boom lower wear pad retaining fasteners. Remove the lower wear pads from the primary boom.
- 7 Remove the pin retaining fasteners from the extension cylinder barrel end pivot pin.
- 8 Using a soft metal drift, remove the extension cylinder barrel end pivot pin.
- 9 Pull the extension boom approximately half way out of the primary boom.
- 10 Attach a lifting strap of suitable capacity from an overhead crane to the extension boom. Support the boom. Do not apply any lifting pressure.
- 11 Remove the boom extension from the primary boom. Set it on a suitable structure capable of supporting it.

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

PRIMARY BOOM COMPONENTS

REV B

How to Disassemble the Boom Extension

▲WARNING This procedure in this section 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 required.

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the boom extension from the primary boom. See 4-2, *How to Remove the Boom Extension*.
- 2 Attach a lifting strap of suitable capacity from an overhead crane to the jib mount.
- 3 Tag, disconnect and plug the platform level slave cylinder hydraulic hoses. Cap the fittings on the cylinder.

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

- 4 Remove the pin retaining fasteners from the platform level slave cylinder rod end pivot pin.
- 5 Place a wood block under the slave cylinder for support.
- 6 Using a soft metal drift, remove the platform level slave cylinder rod end pivot pin.

▲WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed.

- 7 Remove the pin retaining fasteners from the jib mount pivot pin.
- 8 Using a soft metal drift, remove the jib mount pivot pin. Remove the jib mount from the machine.

▲WARNING Crushing hazard. The jib mount will fall if not properly supported when the pivot pin is removed.

- 9 Remove the pin retaining fasteners from the platform level slave cylinder barrel end pivot pin.
- 10 Using a soft metal drift, remove the platform level slave cylinder barrel end pivot pin. Remove the cylinder.

▲WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed.

- 11 Remove the pin retaining fasteners from the extension cylinder rod end pivot pins.
- 12 Using a soft metal drift, remove the extension cylinder rod end pivot pins. Remove the cylinder.

▲WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed.

REV B

PRIMARY BOOM COMPONENTS

4-4 Primary Boom Lift Cylinder

How to Remove the Primary Boom Lift Cylinder

The primary boom lift cylinder raises and lowers the primary boom. The primary boom lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Disconnect the battery pack from the machine.

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

- 2 Tag, disconnect and plug the hydraulic hoses on the lift cylinder. Cap the fittings on the cylinder.

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

- 3 Attach a lifting strap of suitable capacity from an overhead crane to the lift cylinder.
- 4 Remove the pin retaining fasteners from the lift cylinder rod end pivot pin.
- 5 Using a soft metal drift, remove the lift cylinder rod end pivot pin.

▲WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed.

- 6 Lower the cylinder onto the secondary boom.
- 7 Remove the pin retaining fasteners from the lift cylinder barrel end pivot pin.
- 8 Using a soft metal drift, remove the lift cylinder barrel end pivot pin.

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

- 9 Carefully remove the cylinder from the machine.

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

4-5 Boom Extension Cylinder

How to Remove the Extension Cylinder

The boom extension cylinder extends and retracts the primary boom. The boom extension cylinder is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Disassemble the boom extension. See 4-3, *How to Disassemble the Boom Extension*.

REV B

PRIMARY BOOM COMPONENTS

4-6 Platform Leveling Cylinders

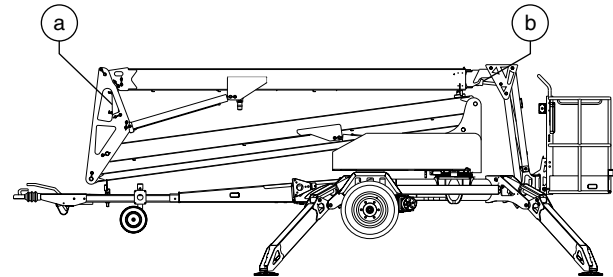
How to Remove the Master Cylinder

The master cylinder, located inside the mid pivot, acts as a pump for the slave cylinder, which is located at the platform end of the extension boom. The master cylinder operates in a closed-circuit hydraulic loop with the slave cylinder, keeping the platform level through the entire range of boom motion.

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

- 1 Tag, disconnect and plug the master cylinder hydraulic hoses. Cap the fittings on the cylinder.

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



a platform level master cylinder
b platform level slave cylinder

- 2 Remove the pin retaining fastener from the master cylinder barrel end pivot pin.
- 3 Using a soft metal drift, remove the master cylinder barrel end pivot pin.
- 4 Attach a lifting strap from an overhead crane to the lug on the rod end of the master cylinder.
- 5 Remove the pin retaining fastener from the rod end pivot pin.
- 6 Using a soft metal drift, remove the master cylinder rod end pivot pin. Remove the master cylinder from the machine.

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

PRIMARY BOOM COMPONENTS

REV B

How to Remove the Slave Cylinder

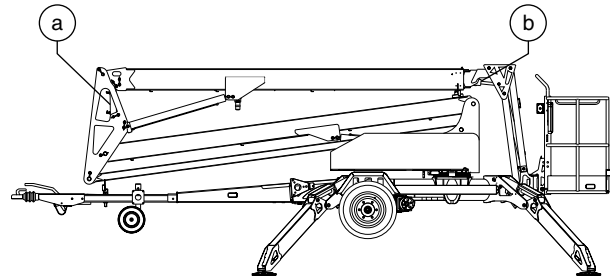
The slave cylinder, via a closed-circuit hydraulic loop, works in tandem with the master cylinder to maintain the platform in a level condition through the entire range of boom motion. The slave cylinder, located at the platform end of the extension boom, is equipped with counterbalance valves to prevent movement in the event of a hydraulic line failure.

NOTICE Before cylinder removal is considered to correct a malfunction, bleed the slave cylinder to be sure there is no air in the closed loop hydraulic circuit.

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

- 1 Extend the boom approximately 1 foot / 30 cm.
- 2 Tag, disconnect and plug the slave cylinder hydraulic hoses from the tee fittings on the jib manifold, and connect them together using a connector. Cap the fittings on the manifold.

AWARNING 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.



a platform level master cylinder
b platform level slave cylinder

- 3 Remove the pin retaining fastener from the slave cylinder rod end pivot pin. Do not remove the pin.
- 4 Remove the external retaining rings from the barrel end pivot pin.
- 5 Using a soft metal drift, remove the rod end pivot pin.
- 6 Using a soft metal drift, remove the barrel end pivot pin.
- 7 Carefully pull the cylinder out of the boom.

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

How to Bleed the Slave Cylinder

- 1 Raise the boom to a horizontal position.
- 2 Activate the platform level function in both up and down directions through two complete platform leveling cycles to remove any air that might be in the system.

The master cylinder acts as a pump for the slave cylinder. It is part of the closed loop hydraulic circuit that keeps the platform level through the entire range of boom motion. The master cylinder is located inside the mid pivot.

Secondary Boom Components

REV B

5-1 Secondary Boom

How to Remove the Secondary Boom

▲WARNING 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 required.

Follow the disassembly steps to the point required to complete the repair. Then re-assemble the secondary boom by following the disassembly steps in reverse order.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Remove the primary boom. See 4-2, *How to Remove the Primary Boom*.
- 2 Tag, disconnect and plug the hydraulic hoses on the primary boom lift cylinder. Cap the fittings on the cylinder.

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

- 3 Attach a lifting strap of suitable capacity from an overhead crane to the primary boom lift cylinder. Raise the cylinder to a vertical position.
- 4 Remove the pin retaining fasteners from the primary boom lift cylinder barrel end pivot pin.
- 5 Using a soft metal drift, remove the primary boom lift cylinder barrel end pivot pin. Remove the primary boom lift cylinder from the machine.

▲WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed.

- 6 Tag, disconnect and plug the hydraulic hoses on the platform level master cylinder. Cap the fittings on the cylinder.

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

- 7 Attach a lifting strap of suitable capacity from an overhead crane to the platform level master cylinder.
- 8 Remove the pin retaining fasteners from the platform level master cylinder barrel end pivot pin.
- 9 Using a soft metal drift, remove the platform level master cylinder barrel end 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.

SECONDARY BOOM COMPONENTS

REV B

10 Remove the cable supports securing the cables and hoses to the mid pivot. Pull the cables through the mid pivot and lay them off to the side of the secondary boom.

CAUTION Component damage hazard. Cables and hoses can be damaged if they are kinked or pinched.

NOTICE For ease of assembly, pay close attention to how the cables and hoses are routed when removed from the cable support.

11 Attach a lifting strap of suitable capacity from an overhead crane to the mid pivot. Support the mid pivot. Do not apply any lifting pressure.

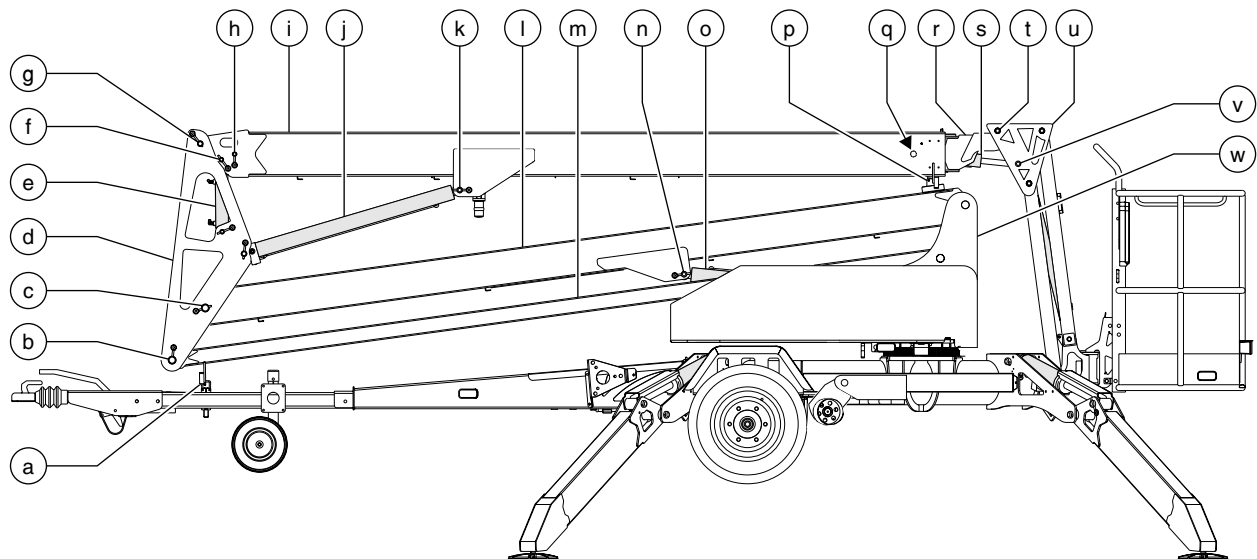
12 Attach a lifting strap of suitable capacity from an overhead crane to the secondary boom. Support the boom. Do not apply any lifting pressure.

13 Remove the pin retaining fasteners from the secondary boom pivot pin at the mid pivot.

14 Using a soft metal drift, remove the secondary boom pivot pin.

WARNING Crushing hazard. The secondary boom could become unbalanced and fall if not properly supported when the pin is removed.

15 Remove the pin retaining fasteners from the secondary link pivot pin at the mid pivot.



a secondary boom hold-down latch
 b secondary boom link pivot pin
 c secondary boom pivot pin
 d mid-pivot
 e platform level master cylinder
 f platform level master cylinder rod end pivot pin
 g primary boom pivot pin
 h extension cylinder barrel end pivot pin
 i primary boom
 j primary boom lift cylinder
 k primary boom lift cylinder rod end pivot pin
 l secondary boom

m secondary boom link
 n secondary boom lift cylinder rod end pivot pin
 o secondary boom lift cylinder
 p primary boom hold-down latch
 q platform level slave cylinder barrel end pivot pin (hidden from view)
 r extension boom
 s platform level slave cylinder
 t jib mount pivot pin
 u jib mount
 v platform level slave cylinder rod end pivot pin
 w turntable

REV B

SECONDARY BOOM COMPONENTS

16 Using a soft metal drift, remove the secondary link pivot pin. Remove the mid pivot from the machine.

▲ DANGER Crushing hazard. The mid pivot could become unbalanced and fall if not properly supported when the pin is removed.

▲ DANGER Crushing hazard. The mid pivot could become unbalanced and fall if not properly supported when removed from the machine.

17 Raise the secondary boom to a horizontal position.

18 Attach a lifting strap of suitable capacity from an overhead crane to the secondary boom lift cylinder.

19 Remove the pin retaining fasteners from the lift cylinder rod end pivot pin.

20 Using a soft metal drift, remove the lift cylinder rod end pivot pin. Lower the cylinder onto the secondary link.

▲ WARNING Crushing hazard. The cylinder will fall if not properly supported when the pivot pin is removed.

21 Remove the supports securing the cables and hoses to the bottom of the secondary boom.

22 Remove the pin retaining fasteners from the secondary boom pivot pin.

23 Using a soft metal drift, remove the secondary boom pivot pin. Remove the boom from the machine.

▲ DANGER Crushing hazard. The secondary boom could become unbalanced and fall if not properly supported when the pin is removed.

24 Attach a lifting strap of suitable capacity from an overhead crane to the secondary boom lift cylinder. Raise the cylinder approximately 1 foot / 30 cm.

25 Rotate the rod end of the secondary boom lift cylinder approximately 90°.

26 Lower the cylinder onto the turntable.

27 Release the secondary boom hold-down latch.

28 Attach a lifting strap of suitable capacity from an overhead crane to the secondary link. Raise the secondary link to a horizontal position.

29 Open the covers at both sides of the machine.

30 Remove the pin retaining fasteners from the secondary link pivot pin.

31 Using a soft metal drift, remove the secondary link pivot pin. Remove the secondary link from the machine.

▲ DANGER Crushing hazard. The secondary link could become unbalanced and fall if not properly supported when the pin is removed.

SECONDARY BOOM COMPONENTS

REV B

5-2 Secondary Boom Lift Cylinder

How to Remove the Secondary Boom Lift Cylinder

The secondary boom lift cylinder raises and lowers the secondary boom. The secondary boom lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.

NOTICE When removing a hose assembly or fitting, the O-ring on the fitting and/or hose end must be replaced and then torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

- 1 Raise the secondary boom to a horizontal position.
- 2 Disconnect the battery pack from the machine.

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

- 3 Attach a lifting strap of suitable capacity from an overhead 5 ton / 5000 kg crane to the mid pivot.
- 4 Attach a lifting strap of suitable capacity from an overhead crane to the rod end of the secondary boom lift cylinder.
- 5 Remove the pin retaining fasteners from the lift cylinder rod-end pivot pin.

- 6 Use a soft metal drift to remove the lift cylinder rod-end pivot pin.

WARNING Crushing hazard. The cylinder may fall if not properly supported when the pivot pin is removed.

- 7 Lower the cylinder onto the turntable.
- 8 Tag, disconnect and plug the hydraulic hoses on the lift cylinder. Cap the fittings on the cylinder.

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

- 9 Remove the fasteners securing the ground control box to the control box mount.
- 10 Lay the ground control box off to the side.

CAUTION Component damage hazard. Use caution when removing the ground control box so as not to damage the wire harness or connectors.

- 11 Remove the pin retaining fasteners from the lift cylinder barrel-end pivot pin.
- 12 Place a rod through the barrel-end pivot pin and twist to remove the pin. Remove the cylinder from the machine.

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

Engines

REV B

6-1 RPM Adjustment

Refer to Maintenance Procedures, B-14
Check and Adjust the Engine RPM

6-2 Pump Coupler

The pump coupler connects the engine crankshaft to the hydraulic pump.

How to Remove the Pump Coupler

NOTICE Do not damage the crankshaft key or the rubber spacer when disassembling the pump coupler.

- 1 Remove the fasteners securing the hydraulic pump to the engine bell housing.
- 2 Pull the hydraulic pump assembly away from the bell housing to access the pump coupler.
- 3 Locate the pump coupler set screw.
- 4 Loosen the set screw. Slide the pump coupler off the pump shaft.
- 5 Remove the bell housing mounting fasteners. Remove the bell housing from the engine.
- 6 Loosen the set screw on the engine side pump coupler.
- 7 Slide the pump coupler off of the engine shaft.

How to Install the Pump Coupler

CAUTION Component damage hazard. Be sure that the crankshaft key and the rubber spacer are not damaged prior to the installation of the pump coupler assembly.

- 1 Align the engine side of the pump coupler over the crankshaft key and slide it onto the crankshaft.
- 2 Apply Loctite® removable thread sealant to the engine side pump coupler set screw and tighten. Torque to specification.
- 3 Install the bell housing mounting fasteners.
- 4 Install the hydraulic pump side coupler onto the hydraulic pump shaft.
- 5 Apply Loctite® removable thread sealant to the hydraulic side pump coupler set screw and tighten. Torque to specification.
- 6 Install the pump coupler rubber spacer.
- 7 Install the hydraulic pump bell housing.
- 8 Tighten the hydraulic pump mounting fasteners.

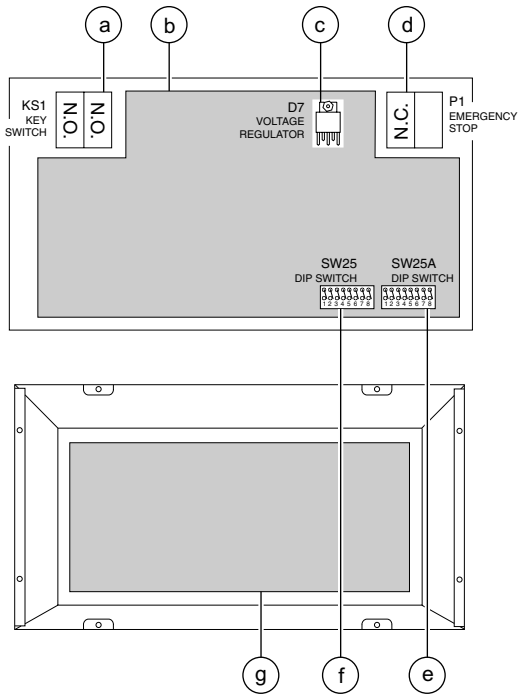
Torque specification

Pump coupler set screw, dry	15 ft-lbs 20.3 Nm
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Ground Controls

REV B

The ground controls contain 2 printed circuit boards: the wire harness connector board and the CPU/display board. On the exterior, membrane switches, incorporated into an overlay decal, are used to activate the various machine functions.



- a key switch KS1
- b CPU/display circuit board U22
- c voltage regulator D7
- d Emergency Stop button P1
- e DIP switch SW25A
- f DIP switch SW25
- g connector circuit board U21

7-1 CPU Circuit Board

The CPU circuit board controls all machine functions.

How to Remove the CPU Circuit Board

- 1 Disconnect the battery pack from the machine.

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

- 2 Remove the four lid retaining fasteners from the ground control box. Open the lid.
- 3 Tag and disconnect all wiring from the CPU circuit board.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Use a grounded wrist strap at all times when handling printed circuit boards.

- 4 Remove the CPU circuit board mounting fasteners and remove the CPU circuit board.

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GROUND CONTROLS

7-2 Connector Circuit Board

The connector circuit board connects the wire harness to the CPU circuit board using several cables.

How to Remove the Connector Circuit Board

- 1 Disconnect the battery pack from the machine.

▲WARNING Electrocutation 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 wire harness connectors from the ground control box.
- 3 Remove the four lid retaining fasteners from the ground control box. Open the lid.
- 4 Tag and disconnect all wiring from the connector circuit board.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Use a grounded wrist strap at all times when handling printed circuit boards.

- 5 Remove the connector circuit board mounting fasteners and remove the connector circuit board.

GROUND CONTROLS

REV B

7-3 Software Configuration

The TMZ-50/30 can be adjusted to different configurations by changing the combination of DIP switch settings. The DIP switch is located on the CPU circuit board, found inside the top of the ground control box. Programming for all configurations of the Genie TMZ-50/30 is contained in the EPROM, which is installed onto the CPU circuit board.

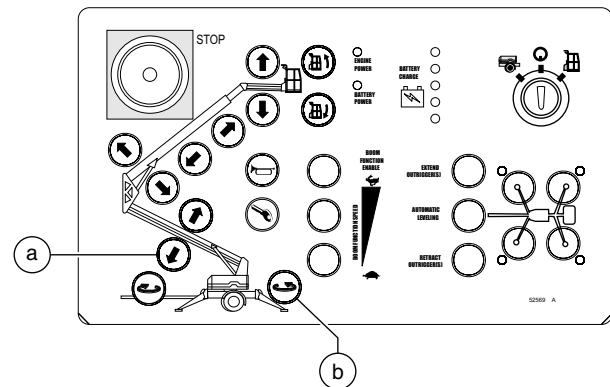
How to Determine the DIP Switch Configuration

NOTICE A diagnostic display was incorporated into the ground controls after serial number T5002-24. The following procedure will not apply to machines before serial number T5002-25.

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

- 2 Press and hold both the secondary down button and the turntable rotate counterclockwise button at the ground controls.
- ⊙ Result: The DIP switch settings will appear in the diagnostic display.

NOTICE The display will show each toggle of the DIP switch in numerical order from 1 through 16, and whether the toggle is in the on position (01) or off position (00). For example, 0401 shown in the diagnostic display indicates that the fourth toggle is in the on position.



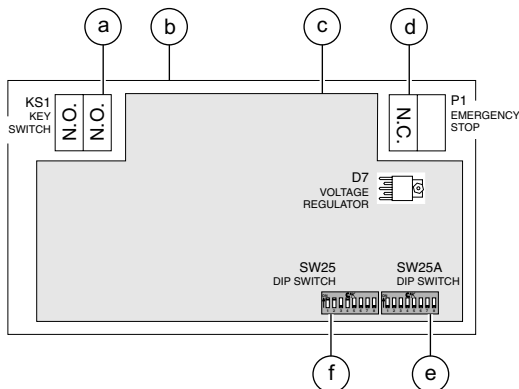
- a secondary down
b turntable rotate counterclockwise

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GROUND CONTROLS

How to Set the DIP Switch

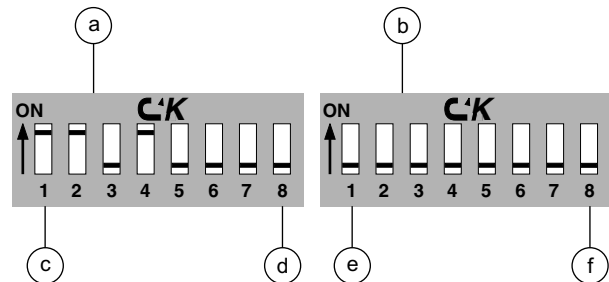
- 1 Turn the key switch to the off position and push in the red Emergency Stop button to the off position at both the ground and platform controls.
- 2 Remove the fasteners securing the top to the ground controls box and open the ground control box.
- 3 Rotate the top of the ground control box to the position shown in the following illustration to correctly identify the configuration of the DIP switch settings.



- a key switch KS1
- b ground control lid
- c CPU/display circuit board U22
- d Emergency Stop P1
- e DIP switch SW25A
- f DIP switch SW25

- 4 Locate the DIP switch on the circuit board. Move the DIP switch settings to correspond with the configuration of the machine options. Refer to the *DIP Switch Legend* on the next page.

NOTICE Although both DIP switches have toggles marked from 1 through 8, the CPU recognizes them as a single DIP switch with 16 toggles and reads the toggles switch positions from left (position 1) to right (position 16).



- a DIP switch SW25
- b DIP switch SW25A
- c position 1
- d position 8
- e position 9
- f position 16

- 5 Close the lid and install the fasteners.

GROUND CONTROLS

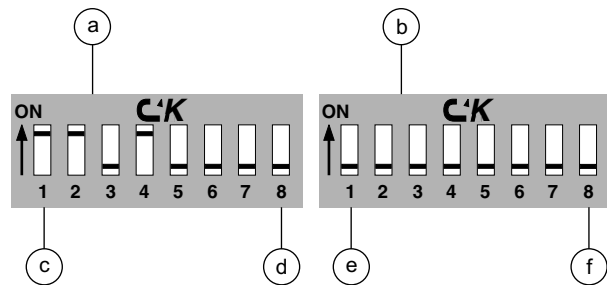
REV B

**DIP Switch Legend
(models with GREEN circuit boards)**

Toggle	Description	Position
1	Drive (option)	
	enabled	Off
	disabled	On
2	Hour meter/flashing beacon	
	enabled	On
	disabled	Off
3	Not used	Off
4	Valve coils	
	DC or Bi-Fuel models	Off
	Engine models	On
5	Platform level	
	ANSI models	Off
	CE models	On
6	Audible alarm for Drive option	
	enabled	On
	disabled	Off
7 - 16	Not used	Off

**DIP Switch Legend
(models with BLUE circuit boards)**

Toggle	Description	Position
1	Drive (option)	
	enabled	Off
	disabled	On
2	Hour meter/flashing beacon	
	enabled	On
	disabled	Off
3	Batteries	
	DC or Bi-Fuel models	Off
	Engine models	On
4	Valve coils	
	DC or Bi-Fuel models	Off
	Engine models	On
5	Platform level	
	ANSI models	Off
	CE models	On
6	Audible alarm for Drive option	
	enabled	On
	disabled	Off
7	Engine (if equipped)	
	Gasoline	Off
	Diesel	On
8	Machine power	
	DC	Off
	Bi-Fuel	On
	Engine	On
9 - 16	Not used	Off



- a DIP switch SW25
- b DIP switch SW25A
- c position 1
- d position 8
- e position 9
- f position 16

REV B

GROUND CONTROLS

7-4 Membrane Overlay

How to Replace the Overlay

- 1 Disconnect the battery pack from the machine.

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

- 2 Loosen the control box lid retaining fasteners and open the lid.

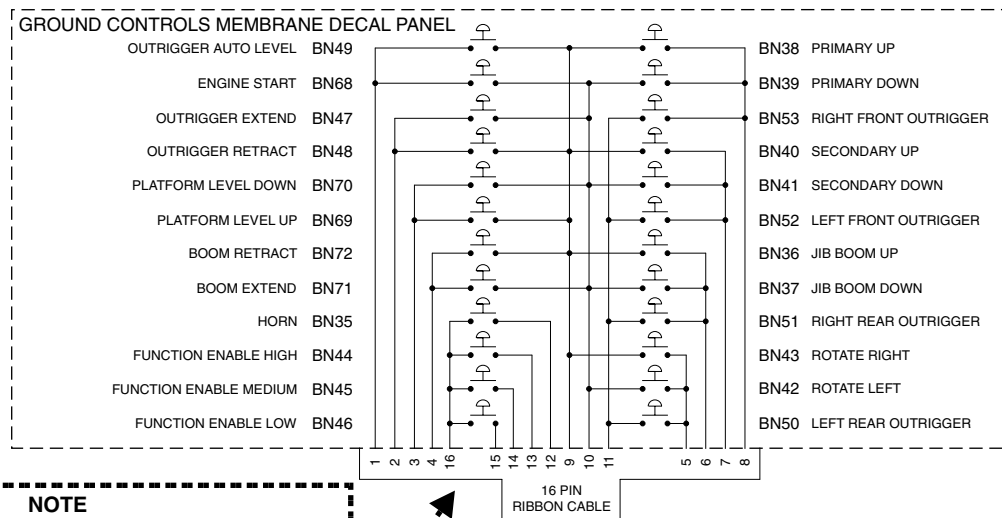
- 3 Disconnect the large blue connector from the circuit board at the connection marked **KEYPAD** by sliding the connector parallel to the circuit board.

CAUTION Component damage hazard. The circuit board will become damaged if the wire harness and connector are disconnected without proper care. Do not pull upwards on the connector.

CAUTION Component damage hazard. The circuit board may become damaged if the weight from the control box lid pulls on the wire harness. Do not put any weight or strain on the wires.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Use a grounded wrist strap at all times when handling printed circuit boards.

- 4 Install the lid onto the control box. Finger-tighten the retaining fasteners.



NOTE
 THE RANDOM ORDER OF THE 16-PIN RIBBON CONNECTOR IS DONE ONLY TO SHOW THE WIRE CIRCUITS. ON THE MACHINE, THE WIRES OF THE RIBBON CABLE, WHERE THEY CONNECT WITH THE CIRCUIT BOARD ARE IN NUMERIC ORDER FROM 1 TO 16.
 THE CIRCUIT BOARD IS MARKED AT ONE END OF THE BOARD-TO-CABLE CONNECTION WITH THE NUMBER "1." CAREFULLY INSPECT THE CIRCUIT BOARD TO LOCATE THE NUMBER 1 WIRE OF THE RIBBON CABLE.



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- 5 Starting at the upper corners of the touch pad, remove all layers of the touch pad from the control box lid.

NOTICE The wire harness and large blue connector will interfere if removing the touch pad from the bottom.

- 6 Pull the large blue connector through the slot in the control box lid and discard the old touch pad. Remove any remaining sealant from the slot.
- 7 Using a mild solvent, clean the surface of the control box lid. Allow the surface to dry.

CAUTION Component damage hazard. The circuit board will become damaged if it comes in contact with solvent. Do not allow solvent to contact the circuit board.

- 8 Remove all the brown backing material from the new touch pad.
- 9 Insert the large blue connector from the new touch pad through the slot. Carefully align the battery power LED on the control box lid with the window in the new touch pad and lightly lay the touch pad onto the control box lid.

NOTICE Repositioning the touch pad is possible if the touch pad is lightly adhered to the lid. Do not apply any pressure to the touch pad.

- 10 When satisfied with the position of the touch pad, firmly press down the entire surface of the touch pad with your fingers.
- 11 Loosen the control box lid retaining fasteners and open the lid.
- 12 Using RTV-type sealant, completely seal the opening in the slot of the control box lid around the wire harness.
- 13 Apply dielectric grease to the pins on the circuit board at the connection marked **KEYPAD**.

- 14 Install the large blue connector onto the circuit board pins at the connection marked **KEYPAD**. Slide the connector parallel to the circuit board until the connector is pushed onto the circuit board pins no less than 0.2 inch / 5 mm.

NOTICE Be sure all pins are in the connector.

- 15 Install the lid onto the control box and tighten the retaining fasteners. Do not overtighten.

7-5 Level Sensor

One level sensor monitors the incline of the turntable after the outriggers are deployed and the machine is level. The Electronic Control Module (ECM) is programmed to deactivate lift functions and activate an alarm when a signal is received from the level sensor, making the operator aware of a potentially hazardous situation.

The tilt alarm sounds when the incline of the chassis exceeds 1.5° in any direction. The tilt level sensor is located below the ground control box.

How to Install and Calibrate the Tilt Level Sensor

⚠ DANGER Tip-over hazard. Failure to install or calibrate the level sensor as instructed could result in the machine tipping over causing death or serious injury. Do not install or calibrate the level sensor other than specified in this procedure.

- 1 Perform this procedure with the machine on a firm, level surface that is free of obstructions.

REV B

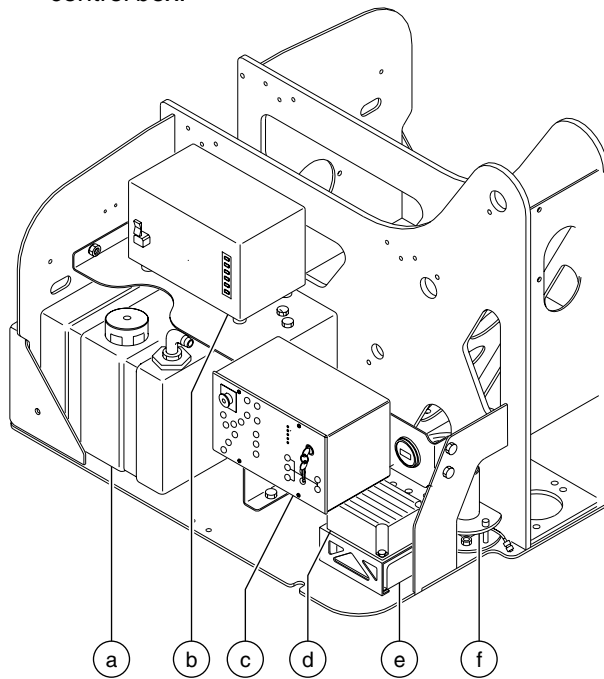
GROUND CONTROLS

- 2 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls. Pull out the red Emergency Stop button to the on position at the drive controls (if equipped).
- ⊙ Result: The power light should be on.
- 3 Push and hold the auto level button. Push and hold the extend outrigger button.
- ⊙ Result: The outriggers will lower and adjust to level the machine and raise the wheels slightly off the ground. Use a digital level to confirm that the machine is level.
- 4 Turn the key switch to the off position.
- 5 Locate the tilt level sensor behind the ground control box.

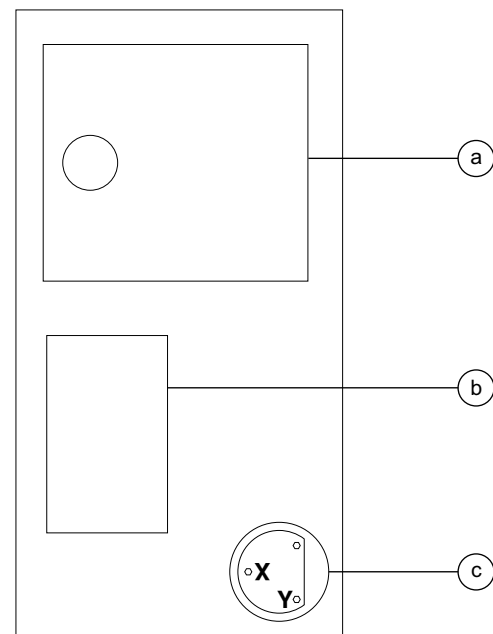
If you are not installing a new level sensor, proceed to step 11.

- 6 Tag and disconnect the wire harness from the tilt level sensor.
- 7 Remove the fasteners securing the level sensor to the machine. Remove the level sensor from the machine.
- 8 Install the new level sensor onto the machine with the "X" on the level sensor housing closest to the ground control box, as shown in the illustration below. Install and securely tighten the level sensor retaining fasteners.

⚠ DANGER Tip-over hazard. The level sensor must be installed with the "X" on the level sensor base closest to the ground control box. Failure to install the level sensor as instructed could result in the machine tipping over causing death or serious injury.



- a hydraulic tank
- b battery charger (if equipped)
- c ground control box
- d voltage converter (if equipped)
- e motor controller (if equipped)
- f level sensor



- a hydraulic tank
- b ground control box
- c level sensor

GROUND CONTROLS

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- 9 Connect the wire harness to the level sensor.
- 10 Tighten the level sensor adjusting fasteners until the bubble in the top of the level sensor is centered in the calibration circles.
- 11 Turn the key switch to ground control.

Adjust the side-to-side axis:

- 12 Set a multimeter to read DC voltage.
- 13 Without disconnecting the wire harness from the level sensor, connect the negative lead of the multimeter to the black wire at the level sensor.
- 14 Without disconnecting the wire harness from the level sensor, connect the positive lead of the multimeter to the yellow wire at the level sensor.
- 15 Adjust the "Y" axis (side-to-side) to 2.5V DC. Tap the top of the level sensor lightly with fingers after each turn of an adjusting nut.

⚠ DANGER Tip-over hazard. Do not adjust the potentiometers on the bottom of the level sensor or calibrate the level sensor other than specified in this procedure. Failure to calibrate the tilt level sensor as instructed will cause the machine to tip over resulting in death or serious injury.

NOTICE Be sure there are threads showing through the top of each adjusting nut.

- 16 Disconnect the positive lead.

Adjust the front-to-back axis:

- 17 Without disconnecting the wire harness from the level sensor, connect the positive lead of the multimeter to the blue wire at the level sensor.

- 18 Adjust the "X" axis (front-to-back) to 2.5V DC. Tap the top of the level sensor lightly with fingers after each turn of an adjusting nut.

⚠ DANGER Tip-over hazard. Do not adjust the potentiometers on the bottom of the level sensor or calibrate the level sensor other than specified in this procedure. Failure to calibrate the tilt level sensor as instructed will cause the machine to tip over resulting in death or serious injury.

NOTICE Be sure there are threads showing through the top of each adjusting nut.

- 19 Disconnect the positive and negative leads.
- 20 Apply Sentry Seal to the adjusting nuts.

Test the machine:

- 21 Raise the primary, secondary and jib booms approximately 12 inches / 30 cm.
 - ⦿ Result: The tilt sensor alarm should not sound.
- 22 Press down one side of the tilt sensor and place the tilt sensor test tool under one of the posts.
 - ⦿ Result: The alarm, located in the platform, should sound at 180 beeps per minute after 1 second. The interlock display light should flash.
- 23 Test all machine functions.
 - ⦿ Result: The primary boom up, secondary boom up, jib boom up and boom extend functions should not operate. The primary boom down, secondary boom down, jib boom down, boom retract and turntable rotate functions should operate normally.
- 24 Turn the key switch to platform control.
- 25 Test all machine functions.
 - ⦿ Result: The primary boom up, secondary boom up, jib boom up and boom extend functions should not operate. The primary boom down, secondary boom down, jib boom down, boom retract and turntable rotate functions should operate normally.

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GROUND CONTROLS

7-6 Interacter Battery Charger

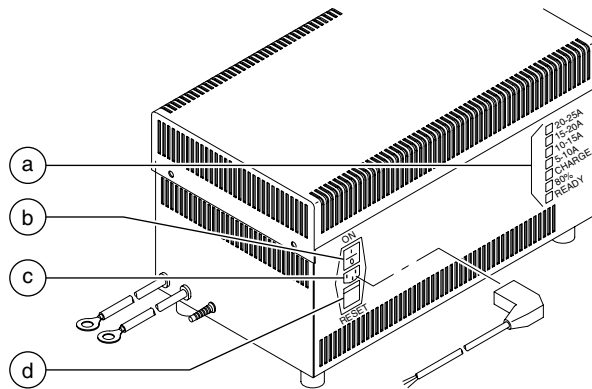
The Interacter 24/25 battery charger, used on machines before serial number T5003-117, is a three-stage, microprocessor-controlled 24V 25A charger, with short circuit and reverse battery protection, constant current, and constant voltage with temperature compensated charging voltage.

There is no need to switch off the charger once the batteries are charged, as the charger senses the condition of the batteries and automatically switches into a float or standby mode.

The charger is protected with a 10A slow blowing fuse, located behind a small panel just below the AC input connector.

There are 7 LEDs on the front panel, any combination of which indicates the state of battery charge or charger operating condition. Listed in the next column, in order from top to bottom as seen on the charger case, is an explanation of what these LEDs indicate.

When using the charger, be sure the AC supply circuit is grounded.



- a LEDs
- b on/off switch
- c AC input connector
- d fuse panel

Callout	LED	Description
20-25A	Red	Illuminates when charge current is 80% of chargers nominal rating.
15-20A	Red	Illuminates when charge current is 60% of chargers nominal rating.
10-15A	Red	Illuminates when charge current is 40% of chargers nominal rating.
5-10A	Red	Illuminates when charge current is 20% of chargers nominal rating.
<p>NOTE: If the batteries are fully discharged, all of the above listed LEDs will illuminate at the same time; if the batteries are not fully discharged, not all will illuminate.</p>		
Charge	Red	Illuminates when battery is connected correctly and AC power is present. LED turns off when battery reaches first voltage limit.
80%	Yellow	Illuminates during charging when timer is running; battery voltage is held constant at this while this LED is on, minimum one hour OR one hour plus half time required to reach first voltage limit.
Ready	Green	Illuminates at end of charging cycle, indicating batteries are charged and ready for use, and will remain on as long as AC power and batteries remain connected, maintaining charger in float or standby mode. <p>NOTE: If the Green LED flashes constantly at the end of the charge, this indicates an override timeout fault condition, which happens if the charge cycle is not completed within 18 hours of charge start, after which the charger will not output any current. This is caused by a charger low output current fault OR a shorted cell in a battery.</p>

Current settings	Normal	Liquid	Gel
First voltage limit	29V	31V	28V
Float / Standby	27.6V	27.7V	27.5V

GROUND CONTROLS

REV B

How to Install a Circuit Board

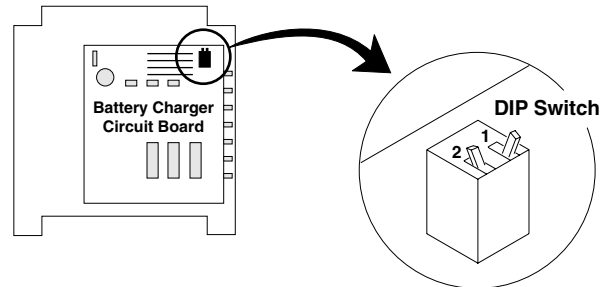
- 1 Disconnect the battery pack from the machine.

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

- 2 Disconnect all external AC power supply from the machine.
- 3 Remove the fasteners securing the cover to the top of the battery charger. Remove the cover.
- 4 Locate the circuit board. Tag and disconnect all circuit board wiring.
- 5 Remove the circuit board.
- 6 Install the new circuit board into the battery charger. Securely install all circuit board wiring.
- 7 Set the DIP switch. Determine the type of batteries being used on the machine. Then, using the following chart, set the toggles of the DIP switch accordingly.

CAUTION Component damage hazard. Incorrectly setting the DIP switch may result in decreased battery life. Use caution when programming the circuit board.

NOTICE 'Gel' setting will increase battery life while decreasing the amount of cycles for the machine. 'Normal' setting will decrease the battery life, while increasing the amount of cycles for the machine.



DIP switch location

- 8 Install the cover onto the battery charger. Install and securely tighten the fasteners. Do not over tighten.

DIP settings	Normal	Liquid	Gel
Toggle 1	OFF	OFF	ON
Toggle 2	ON	OFF	OFF

If not operating correctly, check the following:

- Good power supply at the AC power source
- Use only #12 AWG heavy-duty extension cord
- Power cable firmly connected to the AC input plug or fitted into the AC input connector
- Faulty fuse (120V models) or faulty circuit breakers (230V models)
- Correct wiring at the batteries:
 - Red charger wire to battery positive
 - Black charger wire to battery negative

CAUTION Component damage hazard. This charger is designed to sense battery condition and automatically switch off when the batteries are fully charged. To avoid overcharging and possible battery damage should the charger fail to turn off, disconnect the AC supply from the charger if the machine will be unattended for more than 24 hours.

REV B

GROUND CONTROLS

7-7 Lester Battery Charger

North America models: The Lester 19740 battery charger, used on machines after serial number T5003-116, is a 24V 25A charger. Designed for use with wet (liquid filled) batteries, this self-regulating charger is equipped with built-in line voltage compensation which supplies consistent DC output even when the AC supply voltage varies by as much as 10%.

This 120V AC charger is equipped with and protected by a 30A fuse, located on the charger face plate next to the AC input plug.

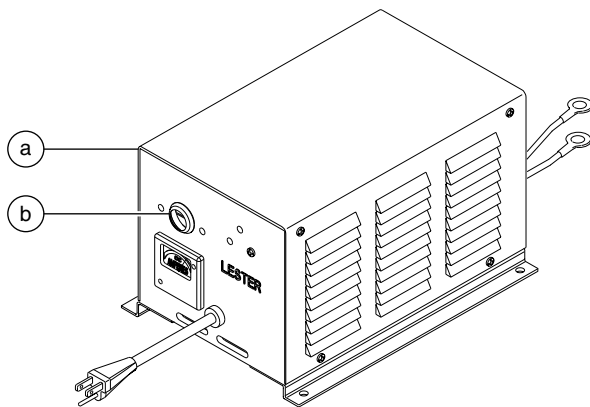
Worldwide models: The Lester 22310 battery charger, used on machines after serial number T5003-116, is a 24V 20A charger. Designed for use with wet (liquid filled) batteries, this self-regulating charger is equipped with built-in line voltage compensation which supplies consistent DC output even when the AC supply voltage varies by as much as 10%.

This charger, which automatically adjusts to operate on 110V or 220V AC, is equipped with and protected by three circuit breakers, located on the face plate next to the AC input connector. Two 8A circuit breakers are used on the input side of the charger circuit; one 45A circuit breaker is used on the output side.

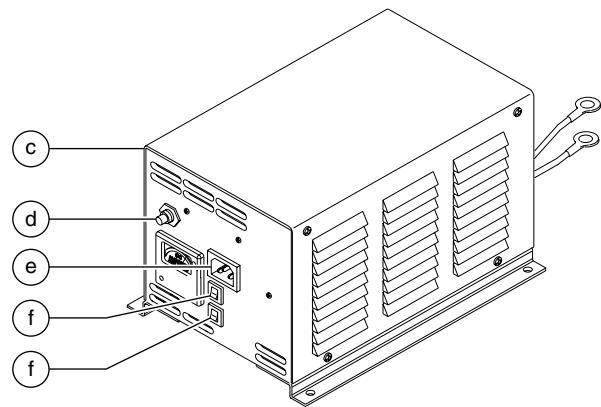
If not operating correctly, check the following:

- Good power supply at the AC power source
- Use only #12 AWG heavy-duty extension cord
- Power cable firmly connected to the AC input plug or fitted into the AC input connector
- Faulty fuse (19740 models) or faulty circuit breakers (22310 models)
- Correct wiring at the batteries
 - Red or White charger wire to battery positive
 - Black charger wire to battery negative

CAUTION Component damage hazard. These chargers are designed to sense battery condition and automatically switch off when the batteries are fully charged. To avoid overcharging and possible battery damage should the charger fail to turn off, disconnect the AC supply from the charger if the machine will be unattended for more than 24 hours.



a North America model
b 30A fuse (output)



c Worldwide model
d 45A circuit breaker (output)
e AC input connector
f 8A circuit breaker (input)

Hydraulic Pumps

REV B

8-1 Function Pump

The TMZ-50/30 is equipped with one, two or four hydraulic pumps, depending on how the machine is configured.

Engine models: The hydraulic pump(s) are attached to the engine. Engine models with Drive option are equipped with two pumps; Engine models without Drive are equipped with one.

DC models: The hydraulic pump(s) are attached to the DC motor assembly, located between the battery packs. DC models with Drive option are equipped with two pumps; DC models without Drive are equipped with one.

Bi-Fuel models: The hydraulic pumps are attached to both the engine and the hydraulic motor assembly, located between the battery packs. Bi-Fuel models with Drive option are equipped with four pumps; Bi-Fuel models without Drive are equipped with two.

NOTICE When removing a hose assembly or fitting, the fitting and/or hose end must be torqued to specification during installation. Refer to Section 2, *Hydraulic Hose and Fitting Torque Specifications*.

How to Test the Hydraulic Pump

NOTICE This procedure will require two people.

- 1 Tag, disconnect and plug the high pressure hydraulic hose from the hydraulic 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

- 2 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the high pressure port on the pump.

- 3 **Gasoline engine models:** Turn the manual fuel shutoff knob to the off position.

Diesel engine models: Hold the manual fuel shutoff lever in the closed position.

- 4 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both the ground and platform controls. Pull out the red Emergency Stop button to the on position at the drive controls (if equipped).

- 5 **Engine models:** Observe the pressure gauge while cranking the engine using the key switch at the engine.

DC models: Observe the pressure gauge while activating any boom function from the ground controls.

- ⊕ Result: If the pressure gauge reads 3000 psi / 207 bar, immediately stop. The pump is good.

- ⊗ Result: If the pressure fails to reach 3000 psi / 207 bar, the pump or the coupling is bad and will need to be serviced or replaced.

CAUTION Component damage hazard. The hydraulic pump can be damaged if the pressure exceeds 3000 psi / 207 bar.

- 6 Remove the pressure gauge and reconnect the hydraulic hose. Torque to specification.

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.

REV B

HYDRAULIC PUMPS

How to Remove the Hydraulic Pump

- 1 Tag, disconnect and plug the hydraulic hoses from 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.

- 2 Remove the pump mounting fasteners. Carefully remove the pump.

8-2 Hydraulic Power Unit - DC Models

How to Remove the Hydraulic Power Unit

- 1 Disconnect the battery pack from the machine.

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

- 2 Tag, disconnect and plug the hydraulic hoses from the pump on the hydraulic power unit.

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

- 3 Tag and disconnect the power cables from the hydraulic motor assembly.
- 4 Remove the power unit mounting fasteners. Remove the power unit from the machine.

Manifolds

REV B

9-1

Pump Manifold Components - Models with Drive (option) (before serial number T5000-91)

The pump manifold is located next to the function manifold under the function manifold side cover.

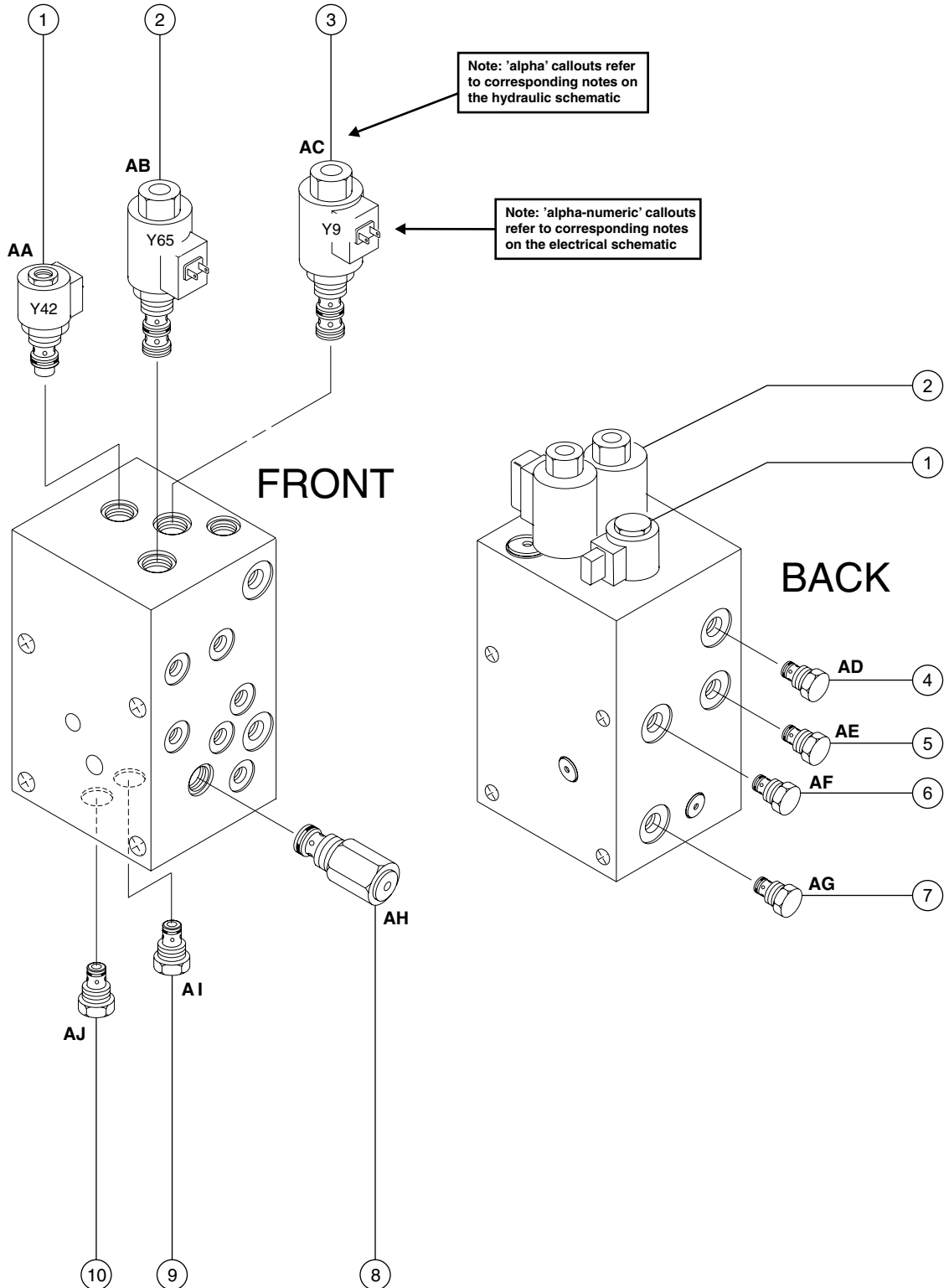
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (item AA)			4-5 ft-lbs / 5-7 Nm
—	Coil nut (items AB and AC)			5-7 ft-lbs / 7-9 Nm
1	Solenoid valve, 2 position 3 way	AA	Boom function select	18-20 ft-lbs / 24-27 Nm
2	Proportional valve	AB	Boom functions	25-27 ft-lbs / 34-36 Nm
3	Proportional valve	AC	Drive functions	25-27 ft-lbs / 34-36 Nm
4	Check valve	AD	Prevents flow from DC power unit from entering port (P2)	18-20 ft-lbs / 24-27 Nm
5	Check valve	AE	Prevents flow from engine pump from entering port (P4)	18-20 ft-lbs / 24-27 Nm
6	Check valve	AF	Prevents flow from DC power unit from entering port (P1)	18-20 ft-lbs / 24-27 Nm
7	Check valve	AG	Prevents flow from engine pump from entering port (P3)	18-20 ft-lbs / 24-27 Nm
8	Relief valve, 3000 psi / 206.8 bar	AH	System Relief	18-20 ft-lbs / 24-27 Nm
9	Check valve	AI	Prevents flow from pump section #2 from entering pump section #1	18-20 ft-lbs / 24-27 Nm
10	Check valve	AJ	Prevent flow from pump section #1 from entering pump section #2	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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MANIFOLDS



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9-2**Pump Manifold Components -
Models with Drive (option) (after serial number T5000-90)**

The pump manifold is located next to the function manifold under the function manifold side cover.

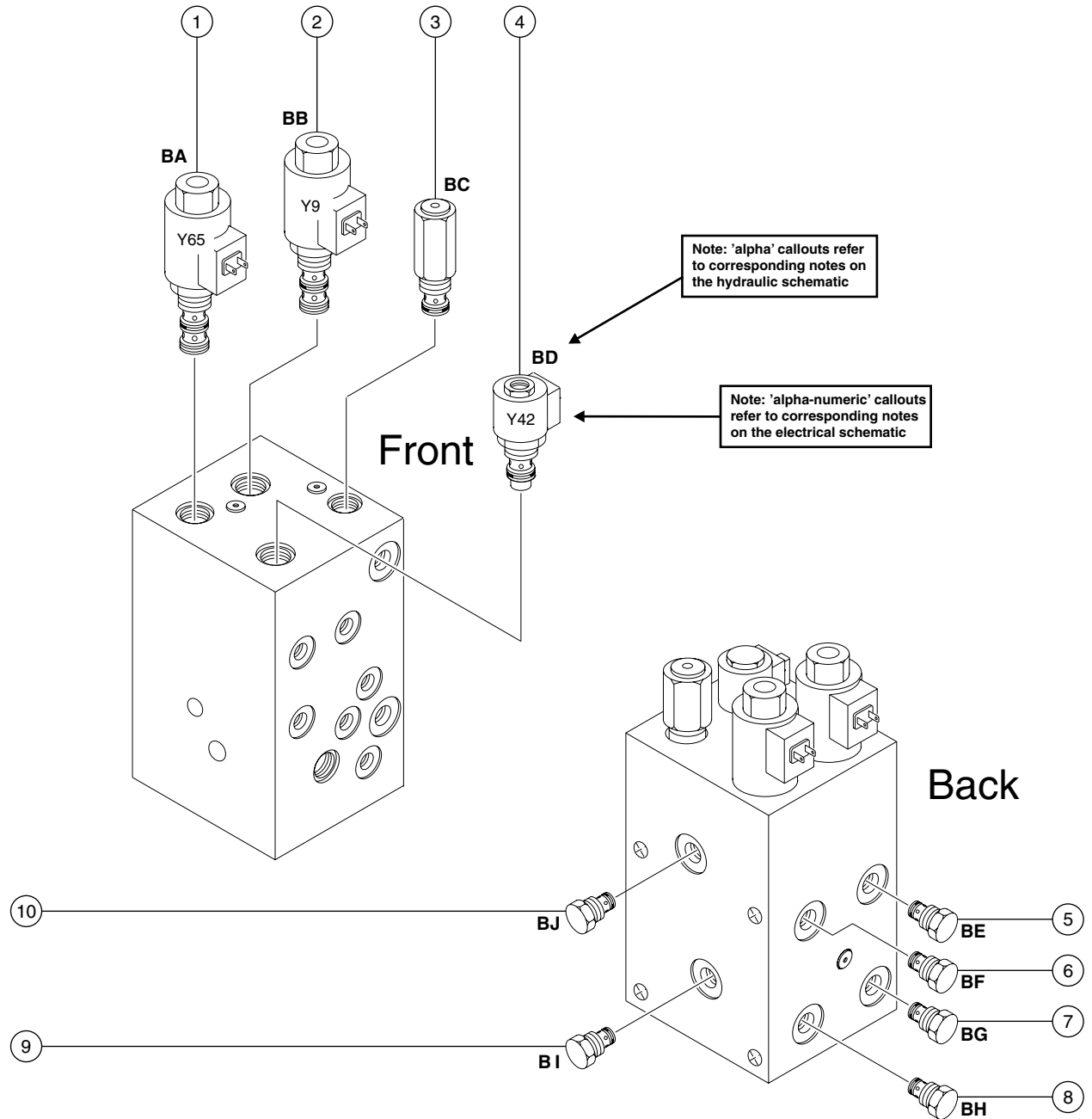
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (item BD)			4-5 ft-lbs / 5-7 Nm
—	Coil nut (items BA and BB)			5-7 ft-lbs / 7-9 Nm
1	Proportional valve	BA	Drive functions	25-27 ft-lbs / 34-36 Nm
2	Proportional valve	BB	Boom functions	25-27 ft-lbs / 34-36 Nm
3	Relief valve, 3000 psi / 206.8 bar	BC	System relief	18-20 ft-lbs / 24-27 Nm
4	Solenoid valve, 2 position 3 way	BD	Boom function select	18-20 ft-lbs / 24-27 Nm
5	Check valve	BE	Prevents flow from DC power unit from entering port (P2)	18-20 ft-lbs / 24-27 Nm
6	Check valve	BF	Prevents flow from DC power unit from entering port (P1)	18-20 ft-lbs / 24-27 Nm
7	Check valve	BG	Prevents flow from engine pump from entering port (P4)	18-20 ft-lbs / 24-27 Nm
8	Check valve	BH	Prevents flow from engine pump from entering port (P3)	18-20 ft-lbs / 24-27 Nm
9	Check valve	BI	Prevents flow from pump section #2 from entering pump section #1	18-20 ft-lbs / 24-27 Nm
10	Check valve	BJ	Prevent flow from pump section #1 from entering pump section #2	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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9-3**Pump Manifold Components -
Models without Drive (before serial number T5000-91)**

The pump manifold is located next to the function manifold under the function manifold side cover.

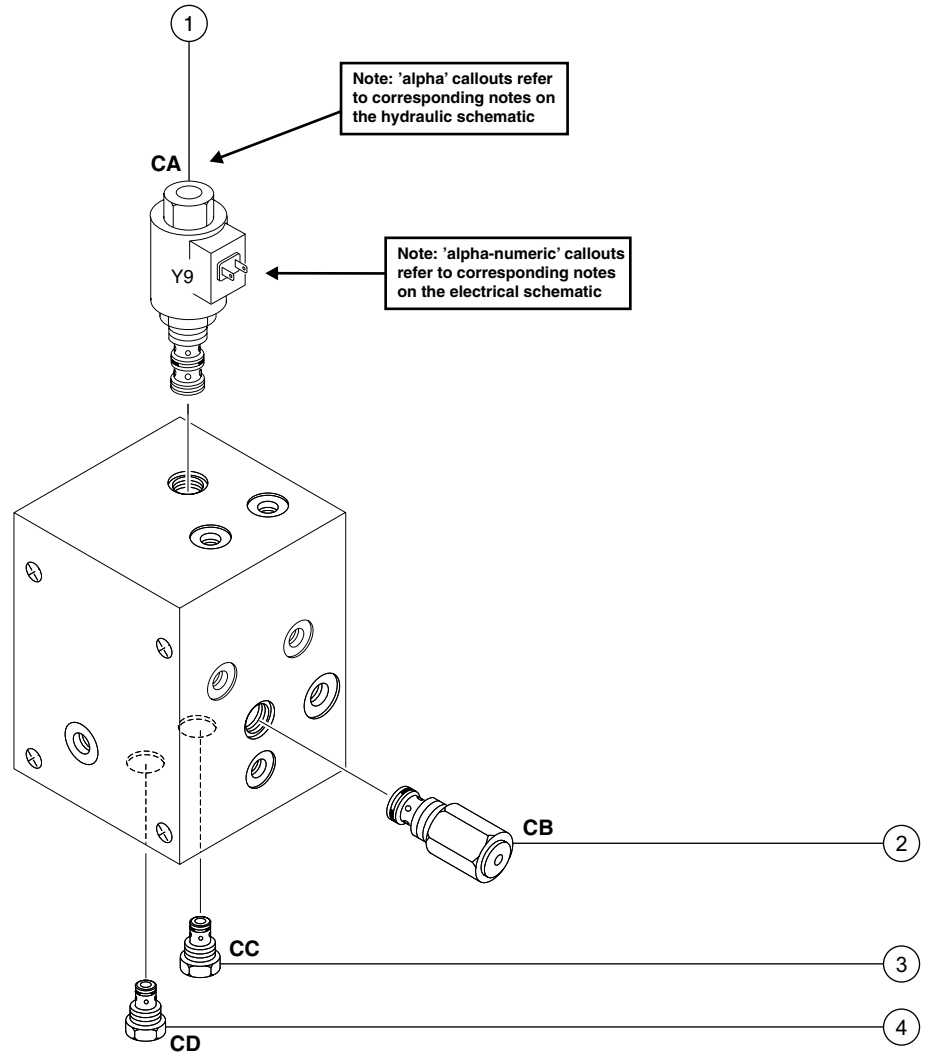
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (item CA)			5-7 ft-lbs / 7-9 Nm
1	Proportional valve (engine models)	CA	All functions	25-27 ft-lbs / 34-36 Nm
2	Relief valve, 3000 psi / 206.8 bar	CB	System relief	18-20 ft-lbs / 24-27 Nm
3	Check valve	CC	Prevents flow from DC power unit to engine pump	18-20 ft-lbs / 24-27 Nm
4	Check valve	CD	Prevents flow from engine pump to DC power unit	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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9-4**Pump Manifold Components -
Models without Drive (after serial number T5000-90)**

The pump manifold is located next to the function manifold under the function manifold side cover.

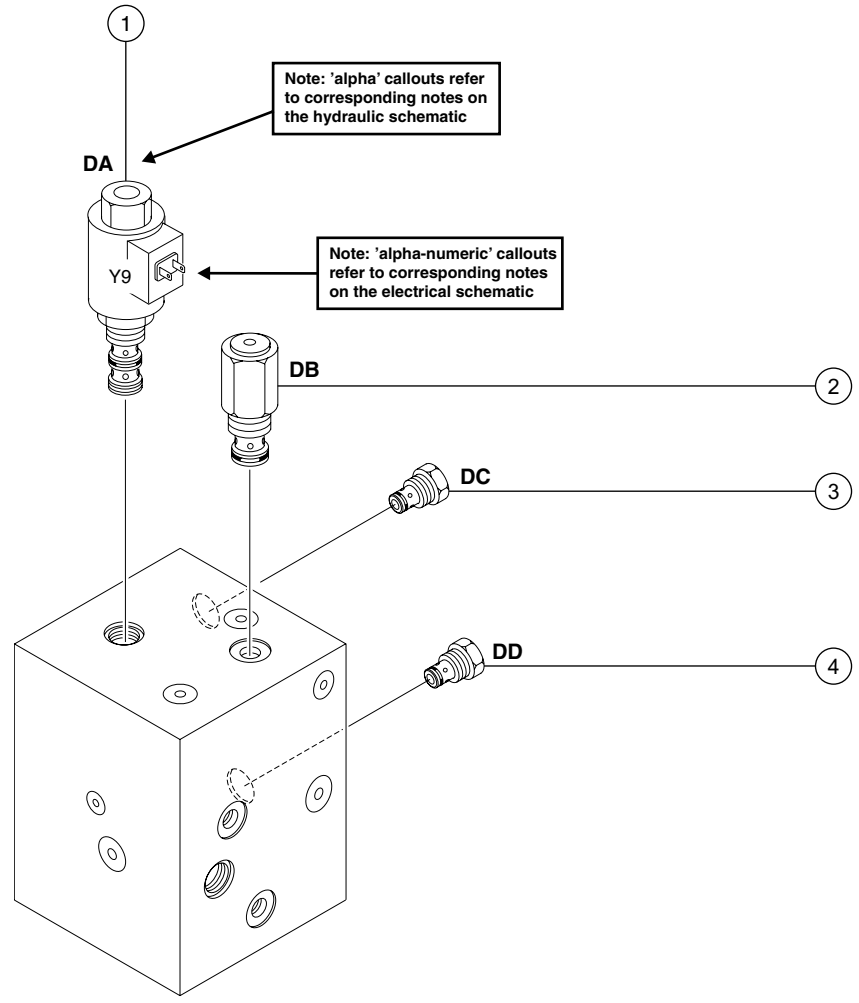
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (item DA)			5-7 ft-lbs / 7-9 Nm
1	Proportional valve (engine models)	DA	All functions	25-27 ft-lbs / 34-36 Nm
2	Relief valve, 3000 psi / 206.8 bar	DB	System relief	18-20 ft-lbs / 24-27 Nm
3	Check valve	DC	Prevents flow from DC power unit to engine pump	18-20 ft-lbs / 24-27 Nm
4	Check valve	DD	Prevents flow from engine pump to DC power unit	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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9-5**Function Manifold Components -
Engine and Bi-Fuel Models (before serial number T5000-91)**

The function manifold is located next to the engine under the engine side cover.

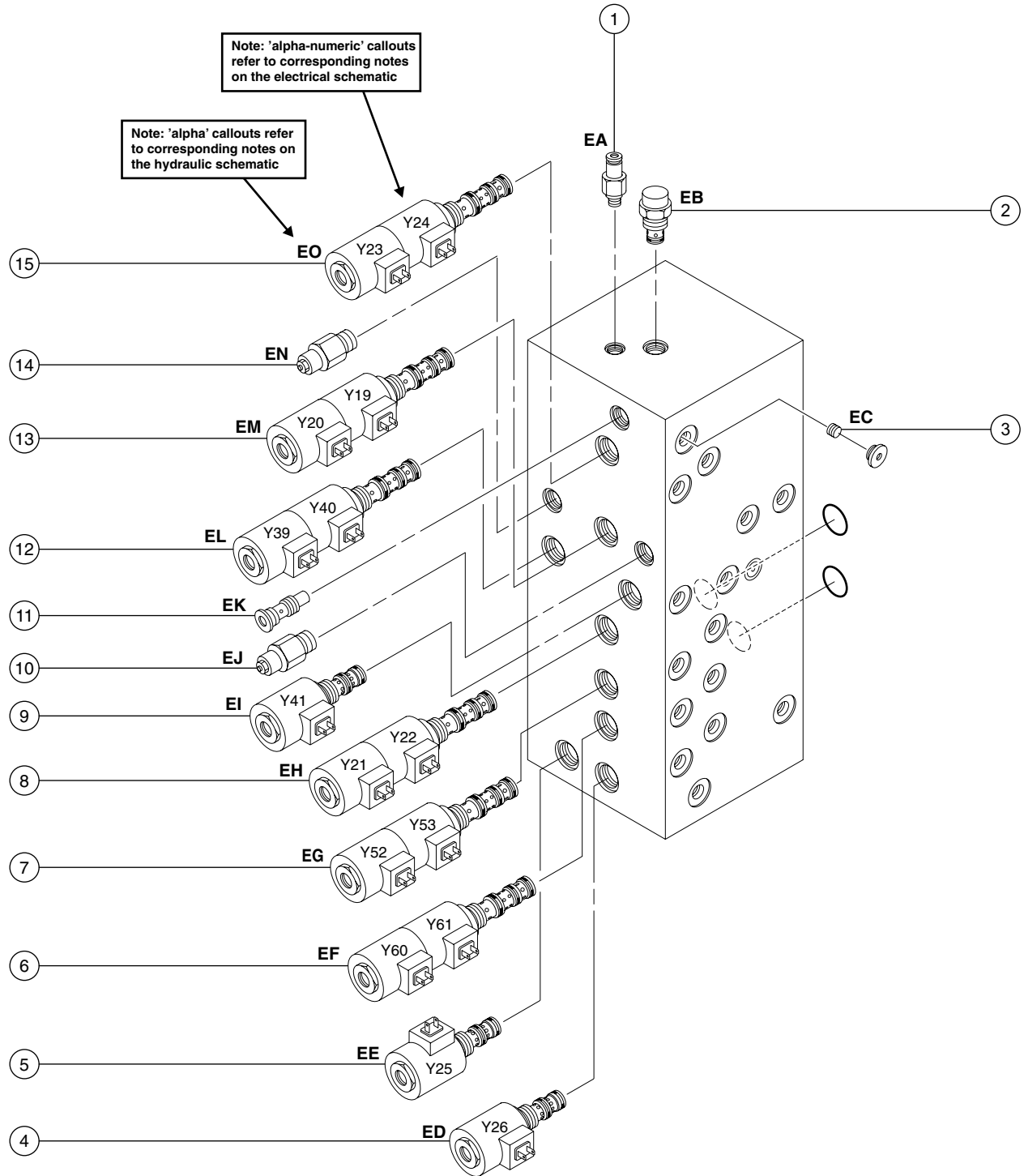
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (items ED, EE, EF, EG, EH, EI, EL, EM and EO)			4-5 ft-lbs / 5-7 Nm
1	Diagnostic nipple	EA	Testing	
2	Flow regulator valve 0.6 gpm / 2.27 L/min	EB	Turntable rotate circuit	18-20 ft-lbs / 24-27 Nm
3	Orifice - Plug, 0.025 inch / 0.64mm	EC	Turntable rotate circuit	18-20 ft-lbs / 24-27 Nm
4	Solenoid valve, 2 position 3 way	ED	Primary boom extension	18-20 ft-lbs / 24-27 Nm
5	Solenoid valve, 2 position 3 way	EE	Primary boom retract	18-20 ft-lbs / 24-27 Nm
6	Solenoid valve, 3 position 4 way	EF	Jib boom up/down	18-20 ft-lbs / 24-27 Nm
7	Solenoid valve, 3 position 4 way	EG	Primary (upper) boom up/down	18-20 ft-lbs / 24-27 Nm
8	Solenoid valve, 3 position 4 way	EH	Secondary (lower) boom up/down	18-20 ft-lbs / 24-27 Nm
9	Solenoid valve, 2 position 3 way	EI	Regenerative circuit for outriggers	18-20 ft-lbs / 24-27 Nm
10	Counterbalance valve	EJ	Platform level up	30-35 ft-lbs / 41-47 Nm
11	Shuttle valve	EK	Turntable rotate brake circuit	4-5 ft-lbs / 5-7 Nm
12	Solenoid valve, 3 position 4 way	EL	Outriggers up/down	18-20 ft-lbs / 24-27 Nm
13	Solenoid valve, 3 position 4 way	EM	Platform level up/down	18-20 ft-lbs / 24-27 Nm
14	Counterbalance valve	EN	Platform level down	30-35 ft-lbs / 41-47 Nm
15	Solenoid valve, 3 position 4 way	EO	Turntable rotate left/right	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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9-6**Function Manifold Components -
Engine and Bi-Fuel Models (after serial number T5000-90)**

The function manifold is located next to the engine under the engine side cover.

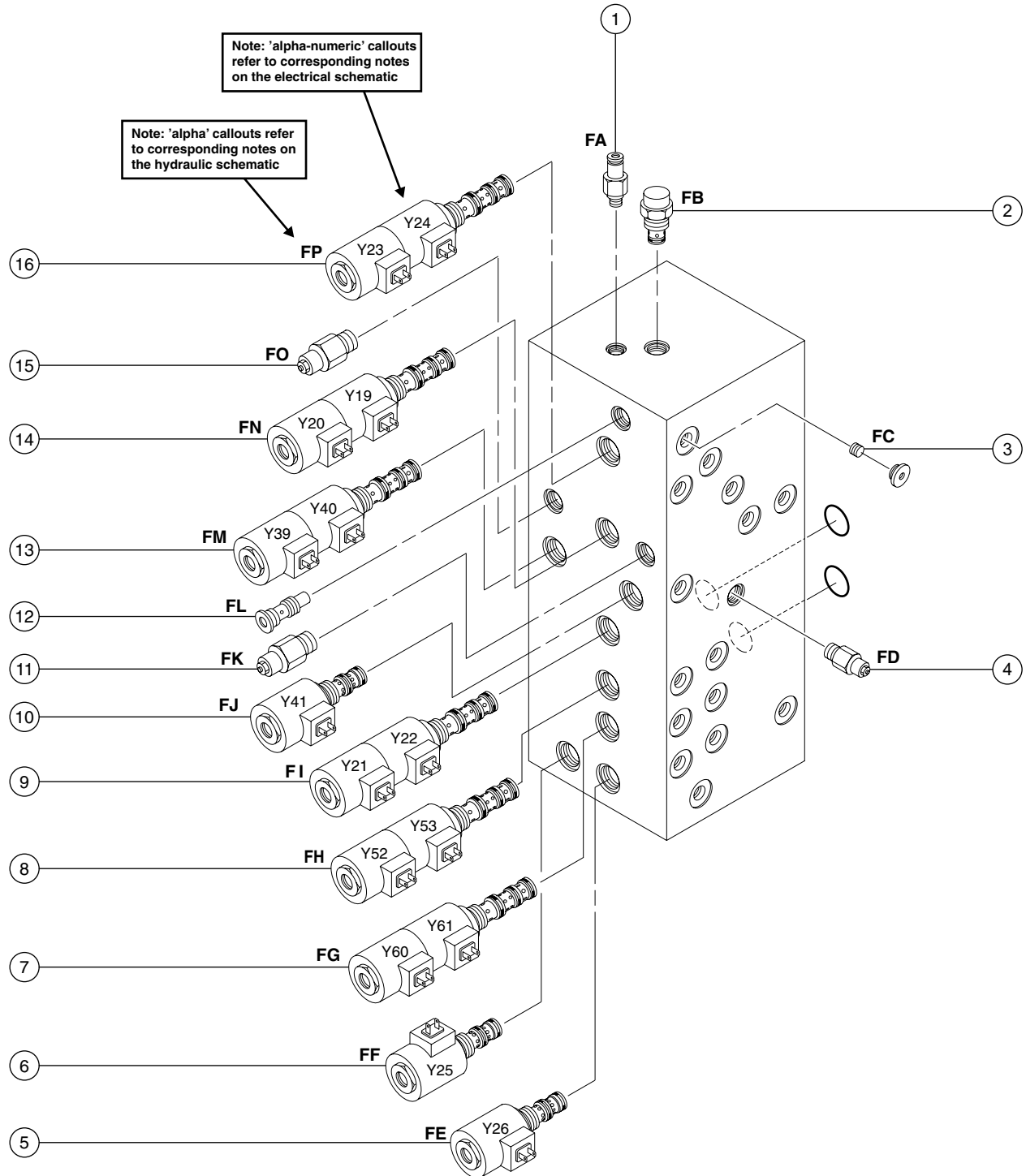
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (items FE, FF, FG, FH, FI, FM, FN and FP)			4-5 ft-lbs / 5-7 Nm
—	Coil nut (item FJ)			5-7 ft-lbs / 7-9 Nm
1	Diagnostic nipple	FA	Testing	
2	Flow regulator valve 0.6 gpm / 2.27 L/min	FB	Turntable rotate circuit	18-20 ft-lbs / 24-27 Nm
3	Orifice - Plug, 0.025 inch / 0.64 mm ...	FC	Turntable rotate circuit	
4	Pilot operated check valve	FD	Outrigger down circuit	30-35 ft-lbs / 41-47 Nm
5	Solenoid valve, 2 position 3 way	FE	Primary boom extension	18-20 ft-lbs / 24-27 Nm
6	Solenoid valve, 2 position 3 way	FF	Primary boom retract	18-20 ft-lbs / 24-27 Nm
7	Solenoid valve, 3 position 4 way	FG	Jib boom up/down	18-20 ft-lbs / 24-27 Nm
8	Solenoid valve, 3 position 4 way	FH	Primary (upper) boom up/down	18-20 ft-lbs / 24-27 Nm
9	Solenoid valve, 3 position 4 way	FI	Secondary (lower) boom up/down	18-20 ft-lbs / 24-27 Nm
10	Solenoid valve, 2 position 3 way	FJ	Regenerative circuit for outriggers	25-27 ft-lbs / 34-36 Nm
11	Counterbalance valve	FK	Platform level up	30-35 ft-lbs / 41-47 Nm
12	Shuttle valve	FL	Turntable rotate brake circuit	4-5 ft-lbs / 5-7 Nm
13	Solenoid valve, 3 position 4 way	FM	Outriggers up/down	18-20 ft-lbs / 24-27 Nm
14	Solenoid valve, 3 position 4 way	FN	Platform level up/down	18-20 ft-lbs / 24-27 Nm
15	Counterbalance valve	FO	Platform level down	30-35 ft-lbs / 41-47 Nm
16	Solenoid valve, 3 position 4 way	FP	Turntable rotate left/right	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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9-7**Function Manifold Components -
DC Models (before serial number T5000-91)**

The function manifold is located under the function manifold side cover.

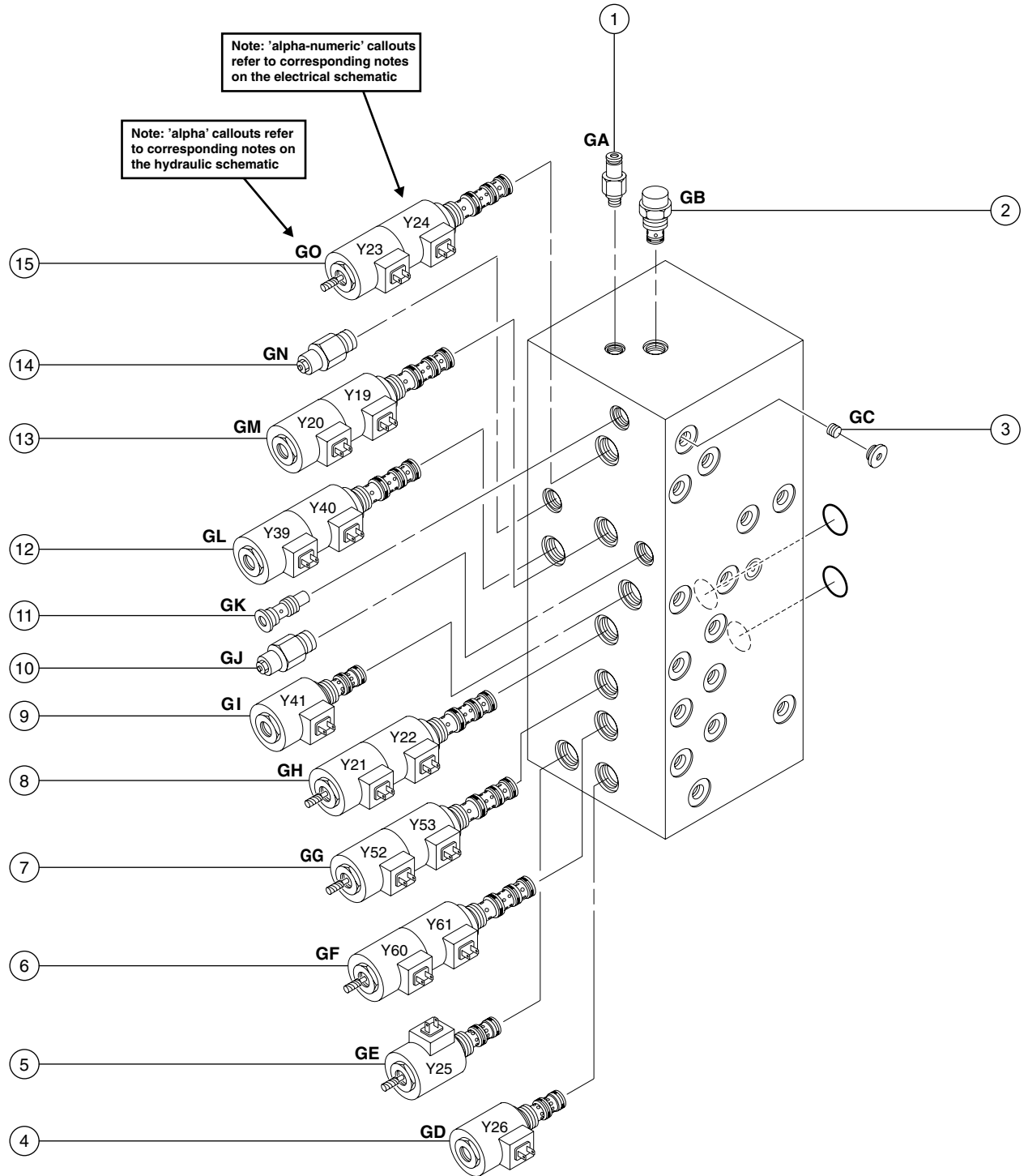
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (items GD, GE, GF, GG, GH, GI, GL, GM and GO)			4-5 ft-lbs / 5-7 Nm
1	Diagnostic nipple	GA	Testing	
2	Flow regulator valve 0.6 gpm / 2.27 L/min	GB	Turntable rotate circuit	18-20 ft-lbs / 24-27 Nm
3	Orifice - Plug, 0.025 inch / 0.64 mm ...	GC	Turntable rotate circuit	
4	Solenoid valve, 2 position 3 way	GD	Primary boom extension	18-20 ft-lbs / 24-27 Nm
5	Solenoid valve, 2 position 3 way with manual over ride	GE	Primary boom retract	18-20 ft-lbs / 24-27 Nm
6	Solenoid valve, 3 position 4 way with manual over ride	GF	Jib boom up/down	18-20 ft-lbs / 24-27 Nm
7	Solenoid valve, 3 position 4 way with manual over ride	GG	Primary (upper) boom up/down	18-20 ft-lbs / 24-27 Nm
8	Solenoid valve, 3 position 4 way with manual over ride	GH	Secondary (lower) boom up/down	18-20 ft-lbs / 24-27 Nm
9	Solenoid valve, 2 position 3 way	GI	Regenerative circuit for outriggers	18-20 ft-lbs / 24-27 Nm
10	Counterbalance valve	GJ	Platform level up	30-35 ft-lbs / 41-47 Nm
11	Shuttle valve	GK	Turntable rotate brake circuit	4-5 ft-lbs / 5-7 Nm
12	Solenoid valve, 3 position 4 way	GL	Outriggers up/down	18-20 ft-lbs / 24-27 Nm
13	Solenoid valve, 3 position 4 way	GM	Platform level up/down	18-20 ft-lbs / 24-27 Nm
14	Counterbalance valve	GN	Platform level down	30-35 ft-lbs / 41-47 Nm
15	Solenoid valve, 3 position 4 way with manual over ride	GO	Turntable rotate left/right	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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9-8**Function Manifold Components -
DC Models (after serial number T5000-90)**

The function manifold is located next to the engine under the engine side cover.

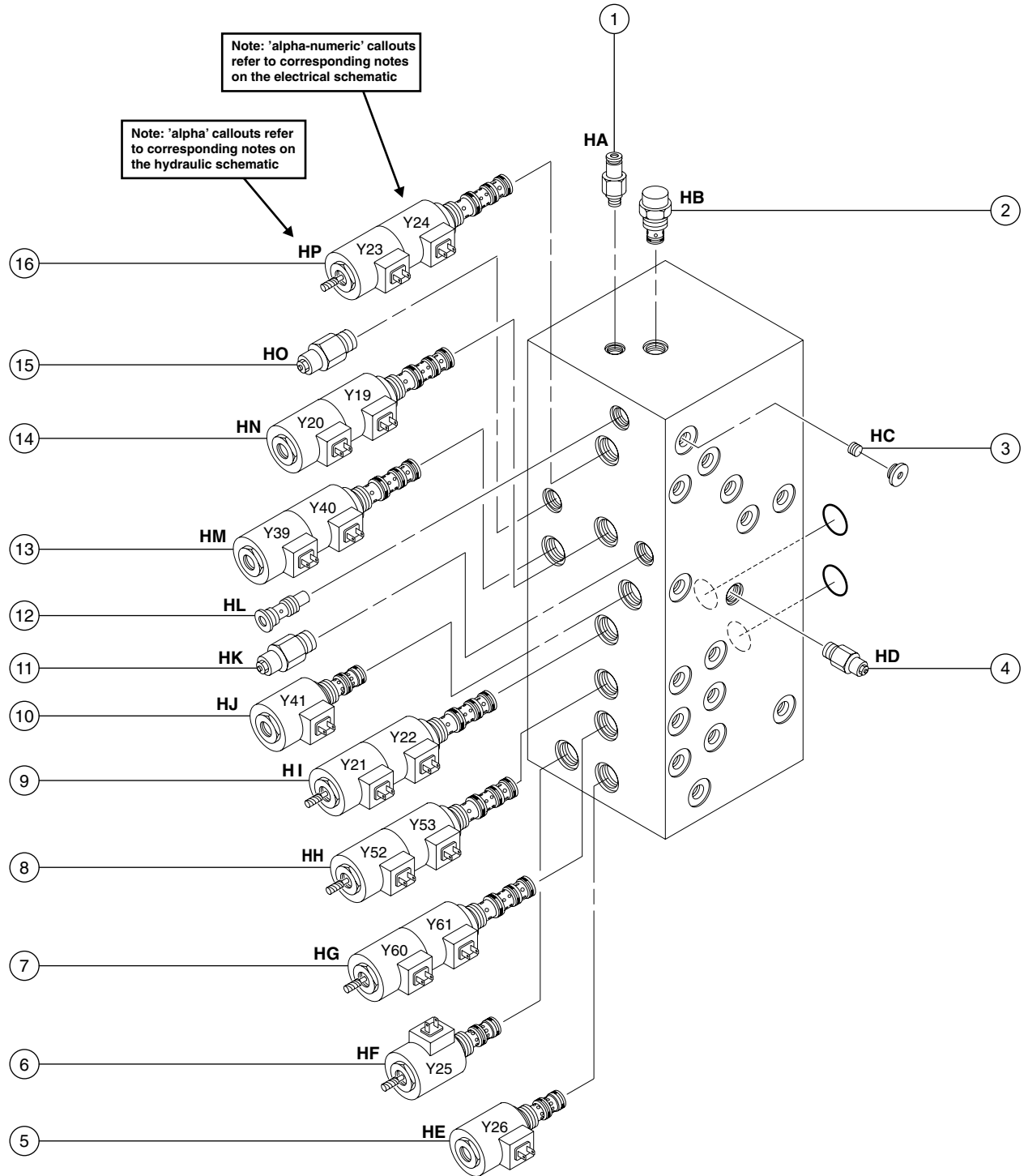
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (items HE, HF, HG, HH, HI, HM, HN and HP)			4-5 ft-lbs / 5-7 Nm
—	Coil nut (item HJ)			5-7 ft-lbs / 7-9 Nm
1	Diagnostic nipple	HA	Testing	
2	Flow regulator valve 0.6 gpm / 2.27 L/min	HB	Turntable rotate circuit	18-20 ft-lbs / 24-27 Nm
3	Orifice - Plug, 0.025 inch / 0.64mm ...	HC	Turntable rotate circuit	
4	Pilot operated check valve	HD	Outrigger down circuit	30-35 ft-lbs / 41-47 Nm
5	Solenoid valve, 2 position 3 way	HE	Primary boom extension	18-20 ft-lbs / 24-27 Nm
6	Solenoid valve, 2 position 3 way with manual over ride	HF	Primary boom retract	18-20 ft-lbs / 24-27 Nm
7	Solenoid valve, 3 position 4 way with manual over ride	HG	Jib boom up/down	18-20 ft-lbs / 24-27 Nm
8	Solenoid valve, 3 position 4 way with manual over ride	HH	Primary (upper) boom up/down	18-20 ft-lbs / 24-27 Nm
9	Solenoid valve, 3 position 4 way with manual over ride	HI	Secondary (lower) boom up/down	18-20 ft-lbs / 24-27 Nm
10	Solenoid valve, 2 position 3 way	HJ	Regenerative circuit for outriggers	18-20 ft-lbs / 24-27 Nm
11	Counterbalance valve	HK	Platform level up	30-35 ft-lbs / 41-47 Nm
12	Shuttle valve	HL	Turntable rotate brake circuit	4-5 ft-lbs / 5-7 Nm
13	Solenoid valve, 3 position 4 way	HM	Outriggers up/down	18-20 ft-lbs / 24-27 Nm
14	Solenoid valve, 3 position 4 way	HN	Platform level up/down	18-20 ft-lbs / 24-27 Nm
15	Counterbalance valve	HO	Platform level down	30-35 ft-lbs / 41-47 Nm
16	Solenoid valve, 3 position 4 way with manual over ride	HP	Turntable rotate left/right	18-20 ft-lbs / 24-27 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

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9-9 Drive Manifold Components (before serial number T5000-91)

The drive manifold is located on the axle at the ground controls side of the machine.

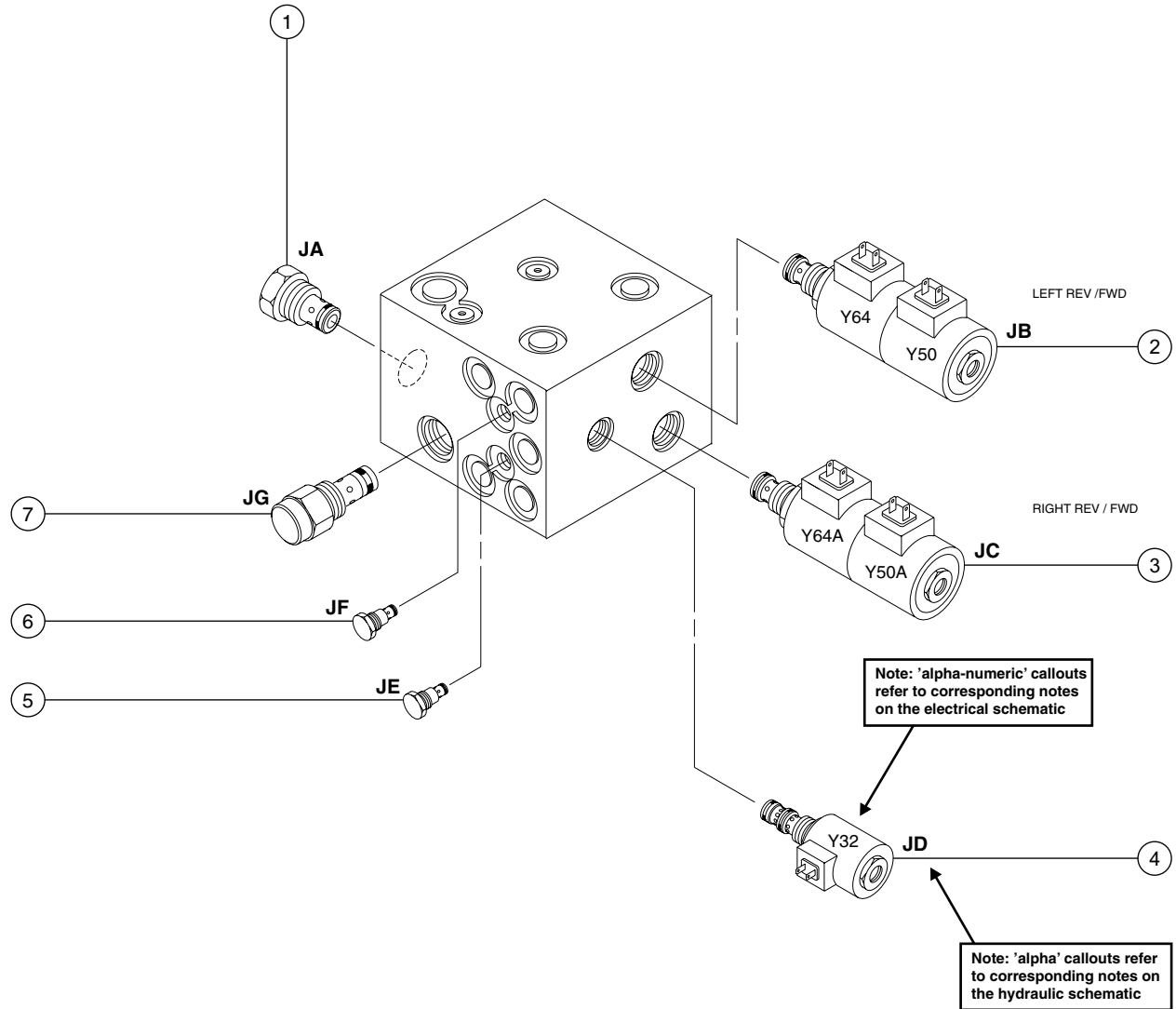
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (item JD).....			4-5 ft-lbs / 5-7 Nm
—	Coil nut (items JB and JC)			5-7 ft-lbs / 7-9 Nm
1	Check valve, 70 psi / 4.8 bar	JA	Tank return circuit	12-14 ft-lbs / 17-19 Nm
2	Solenoid valve, 3 position 4 way	JB	Controls the ground controls side drive motor in forward and reverse ...	25-27 ft-lbs / 34-36 Nm
3	Solenoid valve, 3 position 4 way	JC	Controls the function manifold side drive motor in forward and reverse ...	25-27 ft-lbs / 34-36 Nm
4	Solenoid valve, 2 position 2 way	JD	Drive motor cylinder circuit	18-20 ft-lbs / 24-27 Nm
5	Check valve	JE	Drive motor cylinder circuit	12-14 ft-lbs / 17-19 Nm
6	Check valve	JF	Drive motor cylinder circuit	12-14 ft-lbs / 17-19 Nm
7	Flow regulator valve, 6 gpm / 22.7 L/min	JG	Controls flow from drive motors back to tank	25-27 ft-lbs / 34-36 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

REV B

MANIFOLDS



MANIFOLDS

REV B

9-10

Drive Manifold Components (after serial number T5000-90)

The drive manifold is located on the axle at the ground controls side of the machine.

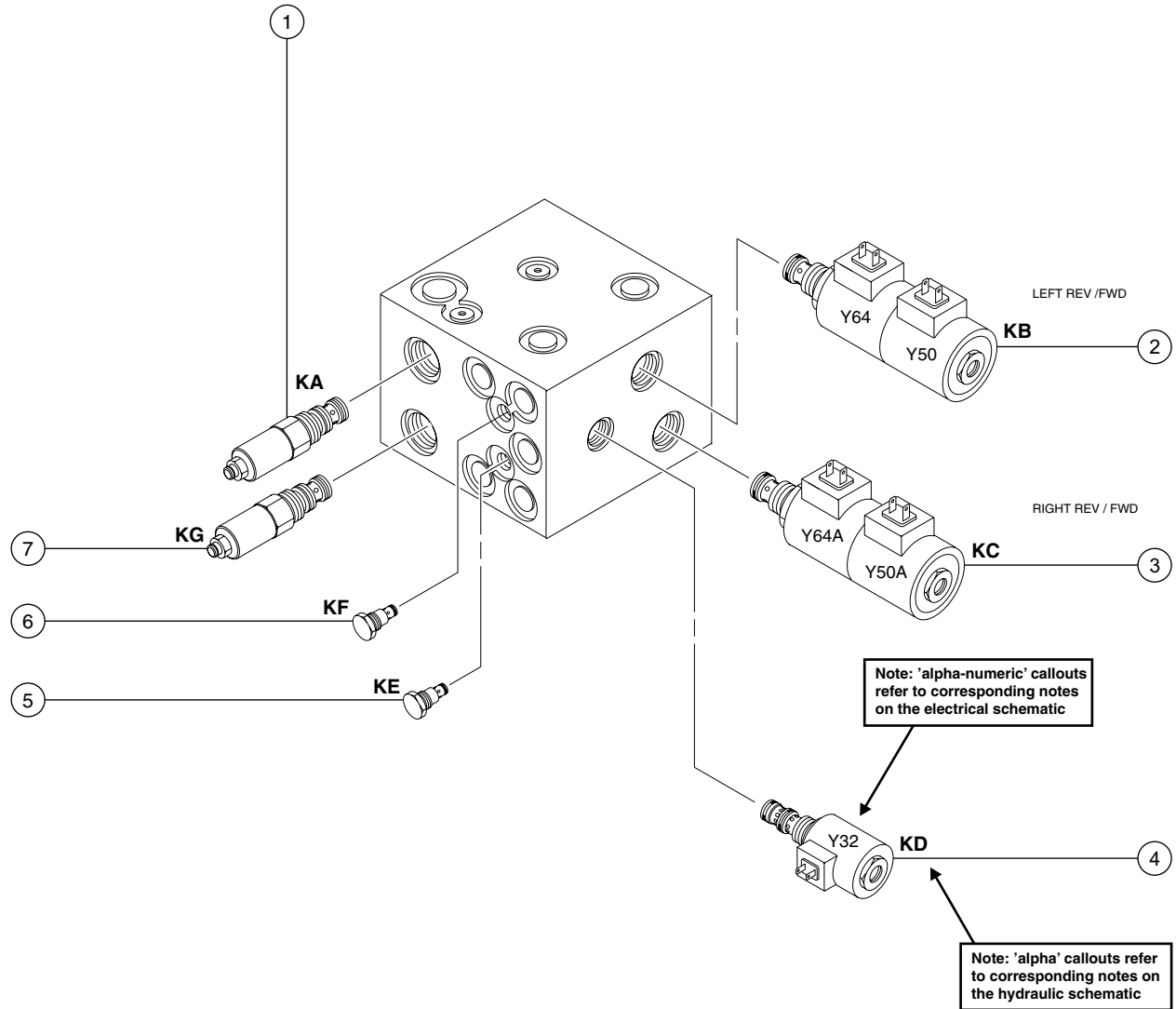
Index No.	Description	Schematic Item	Function	Torque
—	Coil nut (item KD)			4-5 ft-lbs / 5-7 Nm
—	Coil nut (items KB and KC)			5-7 ft-lbs / 7-9 Nm
1	Counterbalance valve	KA	Ground controls (left) side drive motor	30-35 ft-lbs / 41-47 Nm
2	Solenoid valve, 3 position 4 way	KB	Controls the ground controls side drive motor in forward and reverse ...	25-27 ft-lbs / 34-36 Nm
3	Solenoid valve, 3 position 4 way	KC	Controls the function manifold side drive motor in forward and reverse ...	25-27 ft-lbs / 34-36 Nm
4	Solenoid valve, 2 position 2 way	KD	Drive motor cylinder circuit	18-20 ft-lbs / 24-27 Nm
5	Check valve	KE	Drive motor cylinder circuit	12-14 ft-lbs / 17-19 Nm
6	Check valve	KF	Drive motor cylinder circuit	12-14 ft-lbs / 17-19 Nm
7	Counterbalance valve	KG	Ground controls (left) side drive motor	30-35 ft-lbs / 41-47 Nm

How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

REV B

MANIFOLDS



MANIFOLDS

REV B

9-11**Counterbalance Valve Manifold Components**

The counterbalance valve manifold is located on the function manifold side of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Counterbalance valve	LA	Outrigger extend circuit (before serial number T5000-91)	30-35 ft-lbs / 41-47 Nm
2	Counterbalance valve	LB	Outrigger retract circuit (before serial number T5000-91)	30-35 ft-lbs / 41-47 Nm
3	Counterbalance valve	LC	Outrigger extend circuit (after serial number T5000-90)	30-35 ft-lbs / 41-47 Nm

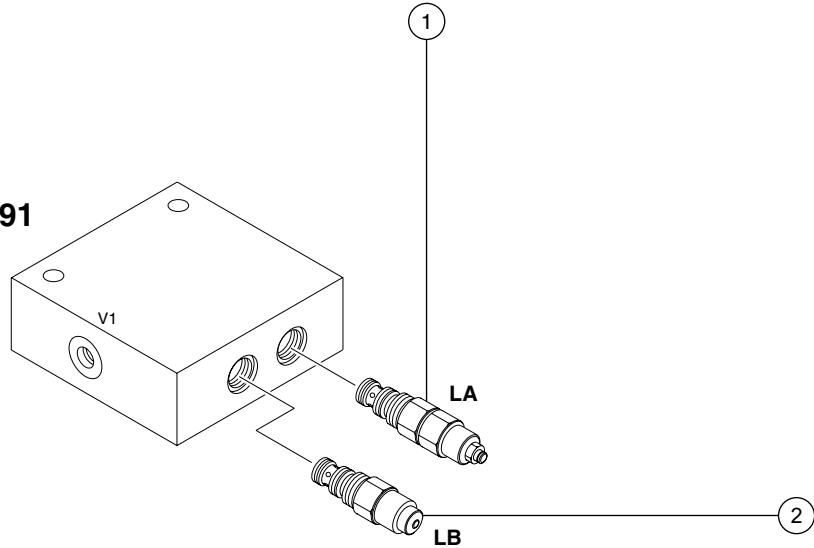
How to Install a Valve Cartridge

- 1 Dip the cartridge in clean oil to lube the O-rings.
- 2 Screw the cartridge in by hand until the top O-ring is met, then torque to specification.
- 3 If required, install the valve coil(s) onto the valve stem. Install the coil nut onto the valve stem and torque to specification.

REV B

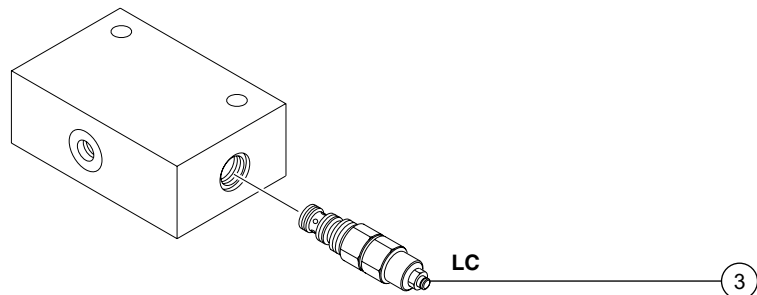
MANIFOLDS

Before serial number T5000-91



Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic

After serial number T5000-90



MANIFOLDS

REV B

9-12 Valve Adjustments - Pump Manifold

How to Adjust the System Relief Valve

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

- 1 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold.
- 2 Press and hold the function enable button and press the primary boom retract button. Observe the pressure reading on the pressure gauge. Refer to Section 2, *Specifications*.
- 3 Turn the machine off. Hold the relief valve (item AH, BC, CB or DB) and remove the cap.
- 4 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

⚠ DANGER Tip-over hazard. Do not adjust the relief valve higher than specified.

- 5 Repeat steps 2 through 4 to confirm the relief valve pressure.6-5

REV B

MANIFOLDS

9-13 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.

⚠ WARNING Electrocutation 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 wire harness 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

Description	Specification
Proportional valve, 12V DC (schematic items AB, AC, CA and DA)	4 to 6Ω
Proportional valve 12V DC (engine models)	4 to 6Ω
24V DC (DC models)	18 to 21Ω (schematic items BA and BB)
Solenoid valve, 2 position 2 way 10V DC (schematic item JD)	6 to 8Ω
Solenoid valve, 2 position 2 way 10V DC (engine models)	6 to 8Ω
20V DC (DC models)	26 to 28Ω (schematic item KD)

Valve Coil Resistance

Description	Specification
Solenoid valve, 2 position 3 way 10V DC (engine models) (schematic item BD)	6 to 8Ω
Solenoid valve, 2 position 3 way 20V DC (DC models) (schematic item BD)	26 to 28Ω
Solenoid valve, 2 position 3 way 10V DC (schematic items ED, EE, FE, FF, EI, GD and GI)	6 to 8Ω
Solenoid valve, 2 position 3 way 10V DC (schematic item FJ)	4 to 6Ω
Solenoid valve, 2 position 3 way 20V DC (schematic item HE)	26 to 28Ω
Solenoid valve, 2 position 3 way 20V DC (schematic item HJ)	18 to 20Ω
Solenoid valve, 3 position 4 way, 10V DC (schematic items EF, EG, EH, EL, EM, EO, FG, FH, FI, FM, FN and FP)	6 to 8Ω
Solenoid valve, 3 position 4 way 20V DC (schematic items HM and HN)	26 to 28Ω
Solenoid valve, 3 position 4 way 10V DC (schematic items JB and JC)	4 to 6Ω
Solenoid valve, 3 position 4 way 10V DC (engine models)	4 to 6Ω
20V DC (DC models)	18 to 20Ω (schematic items KB and KC)
Solenoid valve, 2 position 3 way 10V DC with manual over ride (schematic item GE)	6 to 8Ω
Solenoid valve, 2 position 3 way 20V DC with manual over ride (schematic item HF)	26 to 28Ω
Solenoid valve, 3 position 4 way 10V DC with manual over ride (schematic items GF, GG, GH and GO)	6 to 8Ω
Solenoid valve, 3 position 4 way 20V DC with manual over ride (schematic items HG, HH, HI and HP)	26 to 28Ω



MANIFOLDS

REV B

How to Test a Coil Diode

Genie incorporates spike suppressing diodes in all of its coils. 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 Electrocutation 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. See 9-13, *How to Test a Coil*.
- 2 Connect a 10Ω 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.

NOTICE The battery should read 9V DC or more when measured across the terminals.

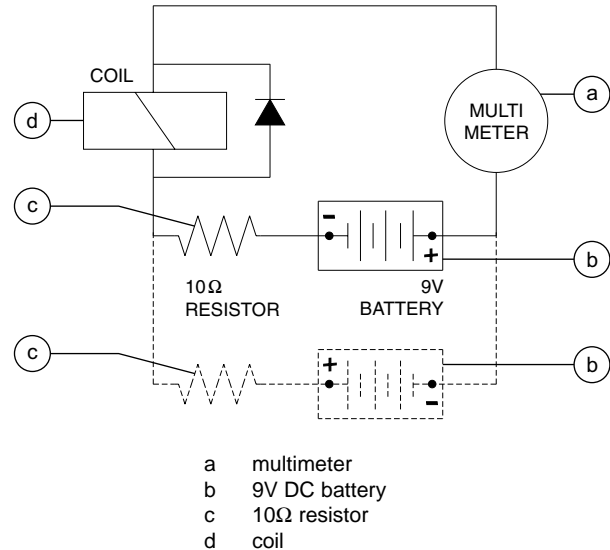
Resistor, 10Ω
Genie part number 27287

- 3 Set a multimeter to read DC amperage.

NOTICE The multimeter, when set to read DC amperage, should be capable of reading up to 800 mA.

- 4 Connect the negative lead to the other terminal on the coil.

NOTICE If testing a single-terminal coil, connect the negative lead to the internal metallic ring at either end of the coil.



Note: Dotted lines in illustration indicate a reversed connection as specified in step 6

- 5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V 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.

REV B

Hydraulic Tank

10-1 Hydraulic Tank

The primary functions of the hydraulic tank are to cool and deaerate the hydraulic fluid during operation. The tank has an internal strainer filter for oil supply to the pump, and an external line filter for oil being returned to the tank.

How to Remove the Hydraulic Tank

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

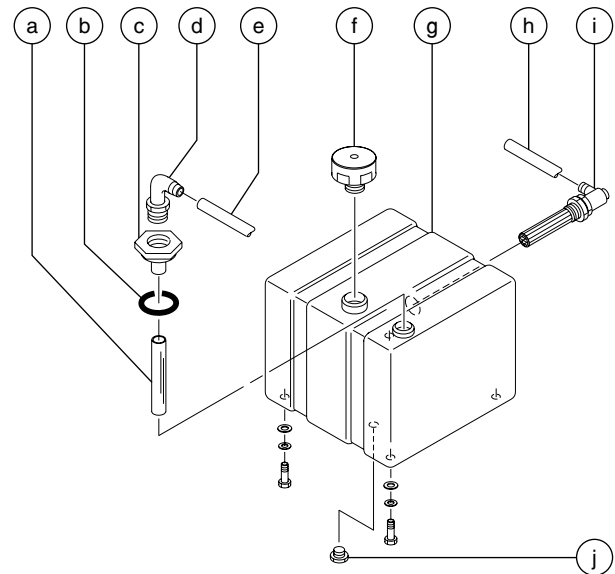
NOTICE Perform this procedure with the boom in the stowed position.

- 1 Disconnect the battery pack from the machine.

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

- 2 Remove the drain plug from the hydraulic tank and allow all of the oil from the tank to drain into a suitable container. Refer to Section 2, *Specifications*.

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



- a return tube
- b gasket
- c bulkhead fitting
- d 90° elbow
- e return hose from filter
- f breather cap
- g hydraulic tank
- h supply hose to pump
- i strainer assembly
- j drain plug

- 3 Tag and disconnect the hydraulic hose from the return filter to the tank. Cap the fitting on the filter head.
- 4 Remove the return filter mounting fasteners. Lay the filter off to the side.
- 5 Remove the hydraulic tank mounting fasteners and remove the hydraulic tank from the machine.

Axle Components

REV B

11-1 Axle

How to Remove the Axle

ANSI models:

- 1 Lower the outriggers and adjust to level the machine and raise the wheels off the ground.
- 2 Disconnect the secondary brake cables at the tension equalizer.
- 3 Pull the cables free of the trailer.
- 4 **Hydraulic brakes:** Tag, disconnect and plug the hydraulic brake line and brake hose assembly from the back of the hub. Cap the fitting. Clean up any brake fluid that may have spilled.
Electric brakes: Remove the parking brake cable and the electric brake cable from the back of the hub.
- 5 Repeat step 4 for the other side.
- 6 Support and secure the axle assembly to an appropriate lifting device.
- 7 Remove the axle mounting fasteners and remove the axle from the machine.

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

NOTICE When the axle is installed, the brakes should be bled. Refer to the appropriate brake manufacturer's manual that was shipped with your Genie TMZ.

CE models:

- 1 Lower the outriggers and adjust to level the machine and raise the wheels off the ground.
- 2 Disconnect the secondary brake cables at the tension equalizer.
- 3 Support and secure the axle assembly to an appropriate lifting device.
- 4 Remove the axle mounting fasteners and remove the axle from the machine.

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

REV B

AXLE

11-2 Hub and Bearings

How to Remove the Hub and Bearings

- 1 Loosen the wheel lug nuts. Do not remove them.
 - 2 Lower the outriggers and adjust to level the machine and raise the wheels off the ground.
 - 3 Remove the lug nuts, then remove the tire and wheel assembly.
 - 4 Remove the dust cap.
 - 5 Remove the cotter pin, then the castle nut.
 - 6 Pull the hub off of the spindle. The washer and outer bearing should fall loose from the hub.
 - 7 Place the hub on a flat surface and gently pry the bearing seal out of the hub. Remove the rear bearing.
- NOTICE** When replacing a wheel bearing, both the inner and outer bearings, including the pressed-in races, must be replaced.
- 8 Pack both bearings with clean, fresh grease.
 - 9 Place the large inner bearing into the rear of the hub.
 - 10 Install a new bearing grease seal into the hub by pressing it evenly into the hub until it is flush.
- NOTICE** Always replace the bearing grease seal when removing the hub.
- 11 Slide the hub onto the spindle.
- CAUTION** Component damage hazard. Do not apply excessive force or damage to the lip of the seal may occur.
- 12 Place the outer bearing into the hub.
- 13 Install the washer and castle nut.
- 14 Tighten the spindle nut until resistance is felt when rotating the hub by hand.
- 15 Loosen the castle nut until the first slot on the castle nut lines up with the hole in the spindle.
- NOTICE** Do not loosen the castle nut more than 1/4 turn.
- 16 Install a new cotter pin. Bend the cotter pin to lock it in place.
- 17 Install the dust cap.
- 18 Install the tire and wheel assembly. Torque the wheel lug nuts or lug bolts to specification. Refer to Section 2, *Specifications*.

Trailer Components

REV B

12-1 Trailer Brakes

Hydraulic Brake System - ANSI Models

Repair procedures and additional axle information is available in the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual
Genie part number 84376

Electrical Brake System - ANSI Models

Repair procedures and additional axle information is available in the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual
Genie part number 84376

Mechanical Brake System - CE Models

Repair procedures and additional axle information is available in the *KNOTT Axle Service Manual* (KNOTT part number P005).

KNOTT Axle Service Manual
Genie part number 84443

12-2 Parking Brake

How to Adjust the Parking Brake

ANSI models:

- 1 Adjust the brakes. Refer to the *Dexter Axle Operation Maintenance Service Manual* (Dexter part number LIT-001-00).

Dexter Axle Operation Maintenance Service Manual
Genie part number 84376

- 2 Chock the wheels.
 - 3 Release the parking brake.
 - 4 Loosen the set screw at the side of the parking brake handle.
 - 5 Adjust the handle just to the point where it is difficult to apply the parking brake, then rotate the top of the parking brake handle counterclockwise one full turn.
 - 6 Tighten the set screw. Do not over tighten.
 - 7 Engage the parking brake. Attempt to move the machine.
- ⊙ Result: The parking brake should prevent the machine from moving. If the parking brake does not prevent the machine from moving, repeat this procedure beginning with step 1.

CE models:

Required maintenance procedures and additional axle information is available in the *KNOTT Axle Service Manual* (KNOTT part number P005).

KNOTT Axle Service Manual
Genie part number 84443

Outriggers

REV B

13-1 Outrigger Components

How to Remove an Outrigger

Outriggers are essential to safe machine operation and machine stability. Operating a machine with a damaged or improperly operating outrigger will result in death or serious injury.

- 1 Lower the outrigger to be removed just until it touches the ground. Do not rest the entire weight of the outrigger on the ground.

Outriggers at the Platform end:

- 2 Tag and disconnect the electrical wiring at the tail light.
- 3 Remove the tail light mounting fasteners. Remove the tail light from the machine.

All outriggers:

- 4 Remove the outrigger limit switch mounting fasteners at the foot pad. Do not disconnect the wiring.
- 5 Remove the limit switch and cable assembly from the chassis end of the outrigger.
- 6 Remove the pin retaining fasteners from the outrigger pivot pin.
- 7 Attach a lifting strap of suitable capacity from an overhead crane to the pivot end of the outrigger.

- 8 Place a 2 x 4 x 10 inch / 5 x 10 x 25 cm wooden block between the outrigger cylinder rod and the outrigger mounting arm.
- 9 Remove the pin retaining fasteners from the outrigger cylinder rod-end pivot pin.
- 10 Use a soft metal drift pin to remove the rod-end pivot pin. Rest the cylinder on the block.
- 11 Use a soft metal drift pin to remove the outrigger pivot pin.

CAUTION Crushing hazard. The outrigger may fall when the outrigger pivot pin is removed if it is not properly supported.

- 12 Remove the outrigger from the machine.

OUTRIGGERS

REV B

13-2 Outrigger Cylinder

How to Remove an Outrigger Cylinder

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

- 1 Extend the outrigger just until the pad touches the ground. Do not rest the entire weight of the outrigger on the ground.
- 2 Remove the cylinder guard mounting fasteners from the rod end of the outrigger cylinder. Remove the cylinder guard from the cylinder.
- 3 Tag, disconnect and plug the hydraulic hoses from the cylinder. Cap the fittings on the cylinder.

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

- 4 Tag and disconnect the wiring from the solenoid valve on the cylinder.

- 5 Attach a lifting strap of suitable capacity from an overhead crane to the lug on the rod end of the cylinder.
- 6 Remove the pin retaining fasteners from the outrigger cylinder rod end pivot pin.
- 7 Use a soft metal drift to remove the outrigger cylinder rod end pivot pin.
- 8 Raise the cylinder to a vertical position.
- 9 Remove the pin retaining fasteners from the outrigger cylinder barrel-end pivot pin.
- 10 Use a soft metal drift to remove the outrigger cylinder barrel-end pivot pin.
- 11 Remove the cylinder from the machine.

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

CAUTION Component damage hazard. Use caution when removing the cylinder to avoid damage to the solenoid valve.

Drive Components (option)

REV B

The drive option allows the machine operator to move the TMZ-50/30 into another position without having to use a tow vehicle to do so. This option package includes drive controls, a brake cylinder, and a drive motor and cylinder for each axle wheel.

When a drive function is activated at the drive control box, a signal is sent to one or more of the drive manifold valve coils, enabling the machine to move. The drive controls will function only when the machine is in the stowed position.

Pressing the drive function enable button will activate the drive cylinders which in turn moves both drive motors into contact with the axle tires. At the same time, the parking brake is released via the parking brake cylinder located under the chassis. Moving the joystick in the desired direction will activate the drive motors which moves the machine.

Returning the joystick to the neutral position will disable the drive and steer function. Releasing the drive function enable button reactivates the parking brake to secure the machine from moving, and returns the drive cylinders to the stowed position.

14-1 Drive Motor

How to Remove a Drive Motor

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

- 1 Remove the drive wheel retaining fasteners.
- 2 Remove the drive wheel.
- 3 Tag, disconnect and plug the hydraulic hoses from the drive motor. 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 Remove the drive motor mounting fasteners. Remove the drive motor from the machine.

DRIVE COMPONENTS (OPTION)

REV B

How to Remove a Drive Motor Cylinder

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

- 1 Tag, disconnect and plug the hose at the cylinder. Cap the fitting.

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

- 2 Remove the return spring from the clevis pin at the rod end of the cylinder.
- 3 Support and secure the drive motor with to a suitable lifting device.
- 4 Remove the cotter pin from the clevis pin at the rod end of the cylinder.

NOTICE Always replace the cotter pin with a new one when removing one from the machine.

- 5 Place a block under the rod end of the cylinder for support.
- 6 Remove the rod end clevis pin.

CAUTION Crushing hazard. The drive motor assembly may fall if not properly supported when the clevis pin is removed.

- 7 Remove the cotter pin at the clevis pin at the barrel end of the cylinder.

NOTICE Always replace the cotter pin with a new one when removing one from the machine.

- 8 Remove the barrel end cotter pin.

NOTICE Always replace the cotter pin with a new one when removing one from the machine.

- 9 Remove the barrel-end clevis pin. Remove the drive motor cylinder from the machine.

REV B

DRIVE COMPONENTS (OPTION)

14-2 Drive Control Box Circuit Board

Activating the joystick or a button of the overlay membrane decal first sends a signal to the drive controls circuit board, then the ground controls printed circuit boards which ultimately activates a machine function. The drive/steer and outrigger functions can only be operated when the machine is in the stowed position.

The drive controls consists of a printed circuit board, Emergency Stop button, joystick and an overlay membrane decal. All of the components are replaceable.

Keeping the drive controls clean and defect free is essential to safe machine operation. For further information or assistance, consult the Genie Industries Service Department.

How to Remove the Circuit Board

- 1 Tag and disconnect the drive controls wire harness from the ground control box.
- 2 Remove the controls from the machine. Open the clamp on the back of the controls and slide the controls up and off of the platform. Place the control box on a work bench.
- 3 Remove the fasteners securing the cover to the control box. Open the box.
- 4 Tag and disconnect the wire connectors from the circuit board.

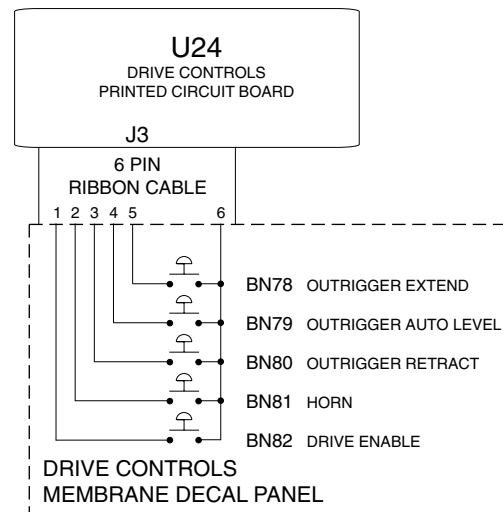
CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Use a grounded wrist strap at all times when handling printed circuit boards.

- 5 Remove the circuit board mounting fasteners and remove the circuit board from the box.

14-3 Membrane Overlay

How to Replace the Overlay

- 1 Tag and disconnect the drive controls wire harness from the ground control box.
- 2 Remove the controls from the machine. Open the clamp on the back of the controls and slide the controls up and off of the platform. Place the control box on a work bench.
- 3 Loosen the control box lid retaining fasteners and open the lid.



DRIVE COMPONENTS (OPTION)

REV B

- 4 Disconnect the blue connector from the circuit board at the connection marked **KEYPAD** by sliding the connector parallel to the circuit board.

CAUTION Component damage hazard. The circuit board will become damaged if the wire harness and connector are disconnected without proper care. Do not pull upwards on the connector.

CAUTION Component damage hazard. The circuit board may become damaged if the weight from the control box lid pulls on the wire harness. Do not put any weight or strain on the wires.

CAUTION Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Use a grounded wrist strap at all times when handling printed circuit boards.

- 5 Install the lid onto the control box. Finger-tighten the retaining fasteners.
- 6 Starting at the lower corners of the touch pad, remove all layers of the key pad from the control box lid.

NOTICE The wire harness and blue connector will interfere if removing the touch pad from the top.

- 7 Pull the blue connector through the slot in the control box lid and discard the old touch pad. Remove any remaining sealant from the slot.
- 8 Using a mild solvent, clean the surface of the control box lid. Allow the surface to dry.

CAUTION Component damage hazard. The circuit board will become damaged if it comes in contact with solvent. Do not allow solvent to contact the circuit board.

- 9 Remove all the brown backing material from the new touch pad.

- 10 Insert the blue connector from the new touch pad through the slot. Carefully align the **AUTOMATIC LEVELING LED** on the control box lid with the window in the new touch pad and lightly lay the touch pad onto the control box lid.

NOTICE Repositioning the touch pad is possible if the touch pad is lightly adhered to the lid. Do not apply any pressure to the touch pad.

- 11 When satisfied with the position of the touch pad, firmly press down the entire surface of the touch pad with your fingers.

- 12 Loosen the control box lid retaining fasteners and open the lid.

- 13 Using RTV-type sealant, completely seal the opening in the slot of the control box lid around the wire harness.

- 14 Apply dielectric grease to the pins on the circuit board at the connection marked **KEYPAD**.

- 15 Install the blue connector onto the circuit board pins at the connection marked **KEYPAD**. Slide the connector parallel to the circuit board until the connector is fully pushed onto the circuit board pins.

NOTICE Be sure all pins are in the connector.

- 16 Install the lid onto the control box and tighten the retaining fasteners. Do not overtighten.

- 17 Install the control box onto the machine.

- 18 Using dielectric grease at the connection, securely connect the drive controls wire harness to the ground control box.

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 repair procedure with the machine in the following configuration:
 - Machine disconnected from tow vehicle
 - Machine parked on a firm, level surface with the boom stowed and both latches secured
 - Key switch in the off position with the key removed
 - The red Emergency Stop button in the off position at both ground and platform controls
 - Wheels chocked and parking brake applied
 - All external AC power supply disconnected from 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.
- ☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

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

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

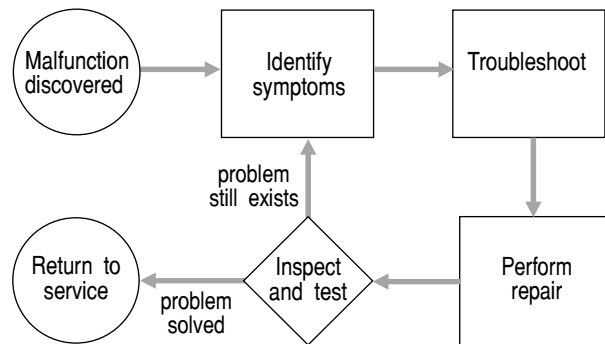
⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

FAULT CODES

About This Section

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

General Repair Process



LED Diagnostic Readout

A diagnostic display was incorporated into the side of the ground controls after serial number T5002-24.

The diagnostic readout displays numerical codes that provide information about the machine operating status and about malfunctions. The numbers will blink with fault codes and the 4 dashes will remain on during normal operation.

The codes listed in the Fault Code Chart describe malfunctions and can aid in troubleshooting the machine by pinpointing the area or component affected.

Fault Code Chart

(after serial number T5002-24)

REV A

Fault Code	Fault	Condition	Possible Cause	Solution
— — — —		Normal operation		
0001	Safety circuit fault	Outriggers up, no retract structure switches	Faulty switches OR faulty harness OR faulty circuit board	Repair or replace switches or harness OR replace CPU board
0003	Down only mode	Lift and rotate functions disabled	Machine out of level OR low battery voltage OR faulty outrigger switches	Level machine OR charge batteries OR replace outrigger switches OR consult Genie Industries Service Department
0007	Level sensor always high	Control box receiving too much voltage from level sensor	Faulty level sensor	Replace level sensor
0008	Level sensor always low	Control box receiving too little voltage from level sensor	Open or short in level sensor circuit	Repair power supply circuit to level sensor OR repair ground circuit from level sensor OR replace level sensor
0009	Level sensor fault	Machine out of level	Machine out of level OR faulty wire harness OR faulty level sensor OR faulty circuit board	Level machine OR repair or replace wire harness or connections OR replace outrigger switches OR consult Genie Industries Service Department
0010	ECM/platform communications fault	Machine functions inoperative	Faulty control cable OR faulty circuit board	Repair or replace control cable OR replace circuit boards
0011	Platform key pad fault	Machine functions inoperative	Platform controls has stuck or faulty button	Replace platform key pad or touch pad OR replace circuit boards
0012	ECM/drive communications fault	No drive communication	Open or short in control cable OR faulty circuit boards	Repair or replace control cable OR replace circuit boards
0013	Drive controls fault	Drive has stuck key	Short in membrane decal OR faulty platform circuit board	Replace membrane decal OR replace platform circuit board



Continued on next page

FAULT CODE CHART (AFTER SERIAL NUMBER T5002-24)

REV A

Fault Code	Fault	Condition	Possible Cause	Solution
0014	Drive controls fault	Drive has stuck joystick	Joystick activated at power up OR faulty joystick	Repair wire circuit from joystick to drive circuit board OR replace drive joystick OR replace drive circuit board
0015	Ground keypad fault	Machine functions inoperative	Ground controls has stuck or faulty button	Replace ground key pad or touch pad OR replace circuit boards
0021	Lower boom up coil fault	Secondary (lower) up valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0022	Lower boom up coil fault	Secondary (lower) up valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0023	Lower boom down coil fault	Secondary (lower) down valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0024	Lower boom down coil fault	Secondary (lower) down valve coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0025	Upper boom up coil fault	Primary (upper) up valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0026	Upper boom up coil fault	Primary (upper) up valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0027	Upper boom down coil fault	Primary (upper) down valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0028	Upper boom down coil fault	Primary (upper) down valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0029	Outrigger up coil fault	Outrigger up valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0030	Outrigger up coil fault	Outrigger up valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board

REV A

FAULT CODE CHART (AFTER SERIAL NUMBER T5002-24)

Fault Code	Fault	Condition	Possible Cause	Solution
0031	Outrigger down coil fault	Outrigger down valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0032	Outrigger down coil fault	Outrigger down valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0033	Outrigger regen coil fault	Outrigger regen valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0034	Outrigger regen coil fault	Outrigger regen valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0035	Left front outrigger coil fault	LF outrigger valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0036	Left front outrigger coil fault	LF outrigger valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0037	Right front outrigger coil fault	RF outrigger valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0038	Right front outrigger coil fault	RF outrigger valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0039	Left rear outrigger coil fault	LR outrigger valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0040	Left rear outrigger coil fault	LR outrigger valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0041	Right rear outrigger coil fault	RR outrigger valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0042	Right rear outrigger coil fault	RR outrigger valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0043	Pump coil fault	Pump enable coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board



Continued on next page

FAULT CODE CHART (AFTER SERIAL NUMBER T5002-24)

REV B

Fault Code	Fault	Condition	Possible Cause	Solution
0044	Pump coil fault	Pump enable coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0045	Rotate right (clockwise) coil fault	Rotate right valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0046	Rotate right (clockwise) coil fault	Rotate right valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0047	Rotate left (counterclockwise) coil fault	Rotate left valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0048	Rotate left (counterclockwise) coil fault	Rotate left valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0049	Jib up coil fault	Jib up valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0050	Jib up coil fault	Jib up valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0051	Jib down coil fault	Jib down coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0052	Jib down coil fault	Jib down coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0053	Platform forward coil fault	Platform forward coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0054	Platform forward coil fault	Platform forward coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0055	Platform reverse coil fault	Platform reverse coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0056	Platform reverse coil fault	Platform reverse coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board

REV B

FAULT CODE CHART (AFTER SERIAL NUMBER T5002-24)

Fault Code	Fault	Condition	Possible Cause	Solution
0057	Beacon fault	Flashing beacon open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0058	Beacon fault	Flashing beacon short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0059	Extend out coil fault	Extend out coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0060	Extend out coil fault	Extend out coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0061	Extend in coil fault	Extend in coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0062	Extend in coil fault	Extend in coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0063	Drive coil fault	Drive coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0064	Drive coil fault	Drive coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0065	Drive coil fault	Right drive forward coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0066	Drive coil fault	Right drive forward coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0067	Drive coil fault	Left drive forward coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0068	Drive coil fault	Left drive forward coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0069	Drive coil fault	Right drive reverse coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board



Continued on next page

FAULT CODE CHART (AFTER SERIAL NUMBER T5002-24)

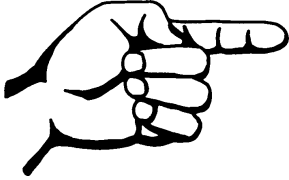
REV B

Fault Code	Fault	Condition	Possible Cause	Solution
0070	Drive coil fault	Right drive reverse coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0071	Drive coil fault	Left drive reverse coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0072	Drive coil fault	Left drive reverse coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0073	Lift coil fault	Lift activate coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0074	Lift coil fault	Lift activate coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0075	Engine coil fault	Engine throttle coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0076	Engine coil fault	Engine throttle coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0077	Engine coil fault	Engine starter coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0078	Engine coil fault	Engine starter coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0079	Engine coil fault	Engine stop coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0080	Engine coil fault	Engine stop coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0085	Spare output fault	Spare output '0' open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board

REV B

FAULT CODE CHART (AFTER SERIAL NUMBER T5002-24)

Fault Code	Fault	Condition	Possible Cause	Solution
0086	Spare output fault	Spare output '0' short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0087	Engine coil fault	Engine choke coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0088	Engine coil fault	Engine choke coil short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0089	Spare output fault	Spare output '2' open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0090	Spare output fault	Spare output '2' short	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board
0091	Proportional valve coil fault	Proportional valve coil open	Coil not connected to wire harness OR open circuit OR faulty circuit board	Restore connection OR replace circuit board
0092	Proportional valve coil fault	Proportional valve coil shorted	Short in wire harness OR faulty circuit board	Repair faulty wiring OR replace circuit board



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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. An illustration legend precedes each group of drawings.

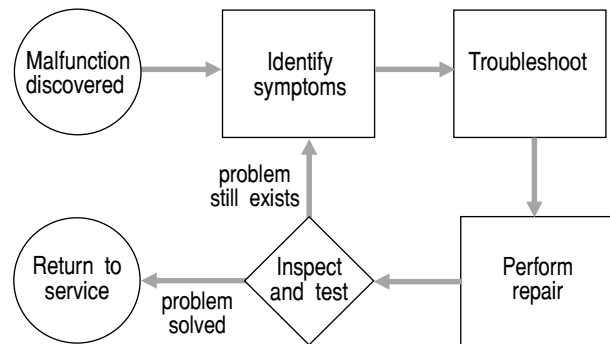
Electrical Schematics

⚠WARNING Electrocutation 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.

General Repair Process



Electrical Component and Wire Color Legends

REV A

ABBREVIATION LEGEND	
Item	Description
B	B1 = One 12V battery B5 = Four 6V batteries
BN	Button BN5 = Horn BN12 = Function enable high BN13 = Function enable low BN26 = Function enable medium BN27 = Jib boom up BN28 = Jib boom down BN29 = Primary up BN30 = Primary down BN31 = Secondary up BN32 = Secondary down BN33 = Rotate left BN34 = Rotate right BN35 = Horn BN36 = Jib boom up BN37 = Jib boom down BN38 = Primary up BN39 = Primary down BN40 = Secondary up BN41 = Secondary down BN42 = Rotate left BN43 = Rotate right BN44 = Function enable high BN45 = Function enable medium BN46 = Function enable low BN47 = Outrigger extend BN48 = Outrigger retract BN49 = Outrigger auto level BN50 = Left rear outrigger BN51 = Right rear outrigger BN52 = Left front outrigger BN53 = Right front outrigger BN68 = Engine start BN69 = Platform level up BN70 = Platform level down BN71 = Boom extend BN72 = Boom retract BN73 = Boom extend BN74 = Boom retract BN75 = Platform level up BN76 = Platform level down BN77 = Engine start BN78 = Outrigger extend BN79 = Outrigger autolevel BN80 = Outrigger retract BN81 = Horn BN82 = Drive enable
CB2	30A Circuit breaker, controls
CR	Control relay CR1 = Engine start CR4 = High idle CR8 = Ignition / fuel cutoff CR50 = Power supply to converter U14
D	Power supply D1 = Alternator D7 = Voltage regulator
EN	Enclosure EN1 = Platform control box EN2 = Ground control box EN7 = Drive control box
F	Fuse F6 = 275A, Function F9 = Alternator F11 = 175A, Engine starter
FB1	Flashing beacons (option)
G	Gauge G6 = Hour meter G7 = Battery charge indicator (option)
H	Horn or alarm H2 = Horn H5 = Multifunction alarm
JC5	Drive joystick
KS	Key switch KS1 = Main KS3 = Engine

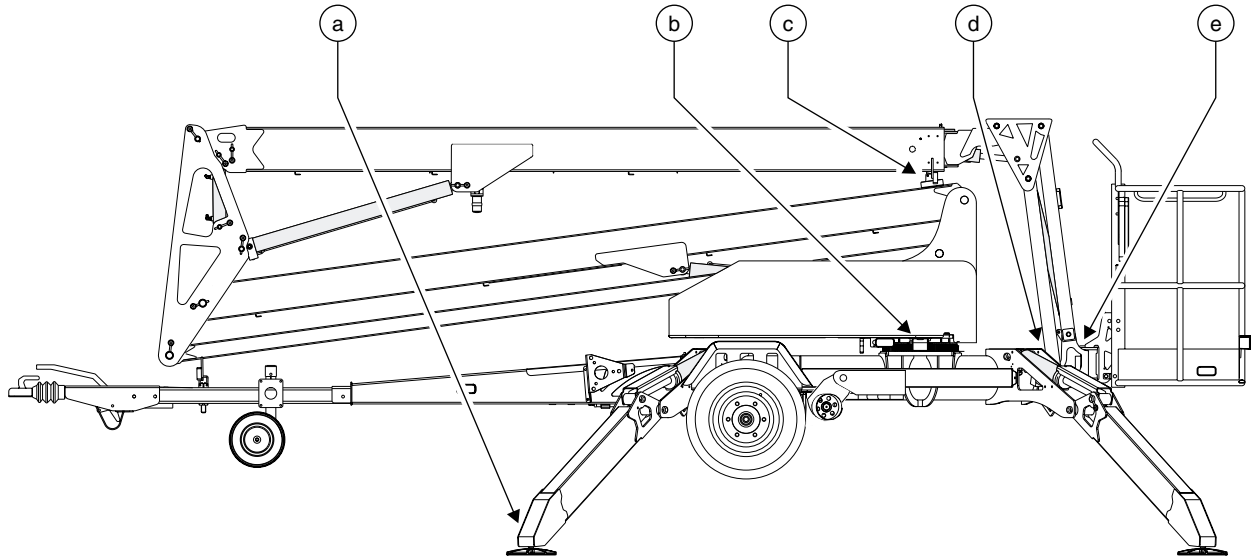
WIRE COLOR LEGEND	
Color	Description
BK	Black
BL	Blue
GN	Green
OR	Orange
RD	Red
WH	White
YL	Yellow

ABBREVIATION LEGEND	
Item	Description
L	Light or LED L12 = Left front outrigger L13 = Right front outrigger L14 = Left rear outrigger L15 = Right rear outrigger L46 = Low battery indicator L48 = Machine level
LS	Limit switch LS2 = Primary boom up LS11 = Jib boom down LS12 = Left front outrigger LS13 = Right front outrigger LS14 = Left rear outrigger LS15 = Right rear outrigger
M	Motor M3 = Engine starter M5 = Hydraulic power unit
N.C.	Normally closed
N.C.H.O.	Normally closed held open
N.O.	Normally open
N.O.H.C.	Normally open held closed
P	Power switch P1 = Emergency Stop button at ground controls P2 = Emergency Stop button at platform controls P3 = Emergency Stop button at drive controls
Q	Solenoid Q3 = High idle Q7 = Choke Q8 = Fuel cutoff
QD	Quick disconnect QD1 = Primary battery disconnect QD3 = Control cable at platform QD4 = Control cable at ground QD7 = Auxiliary disconnect QD9 = Cable to drive controls
S7	Level sensor
SW	Switch SW2 = Engine oil pressure SW28 = Engine cylinder head temp
U	Electronic component U3 = Platform controls circuit board U9 = Battery charger U14 = Voltage divider U21 = Connector circuit board U22 = CPU/display circuit board U23 = Engine circuit board U24 = Drive controls circuit board
Y	Valve coil Y9 = Proportional (function) Y19 = Platform down Y20 = Platform up Y21 = Lower lift cylinder down Y22 = Lower lift cylinder up Y23 = Turntable rotate left Y24 = Turntable rotate right Y25 = Boom retract Y26 = Boom extend Y32 = Drive Y33 = Left rear outrigger Y34 = Right rear outrigger Y35 = Left front outrigger Y36 = Right front outrigger Y39 = Outrigger retract Y40 = Outrigger extend Y41 = Outrigger regen Y42 = Lift/drive select Y50 = Drive forward Y52 = Upper lift cylinder down Y53 = Upper lift cylinder up Y60 = Jib boom retract Y61 = Jib boom extend Y64 = Drive reverse Y65 = Proportional (drive)



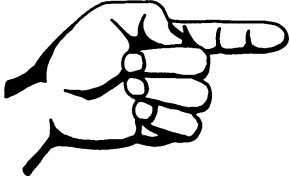
Limit Switch Legend

REV A



Limit Switch Legend

- a outrigger limit switch
 - left front LS12
 - right front LS13
 - left rear LS14
 - right rear LS15
- b turntable rotate limit switch LS27
- c primary boom up limit switch LS2
- d jib boom LS11 (before serial number T5000-91)
- e jib boom LS11 (after serial number T5000-90)



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Electrical Symbols Legend

REV A



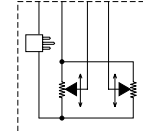
Battery



Solenoid



Limit switch



Level sensor



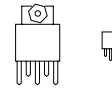
Battery charger



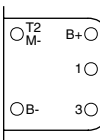
Temperature switch



Solenoid valve



Voltage regulator



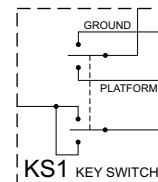
Motor controller



DIP switch



Control relay



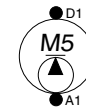
Key switch



Fuse



Pressure switch



Motor



Light or LED



Voltage divider



Button



Horn or Alarm



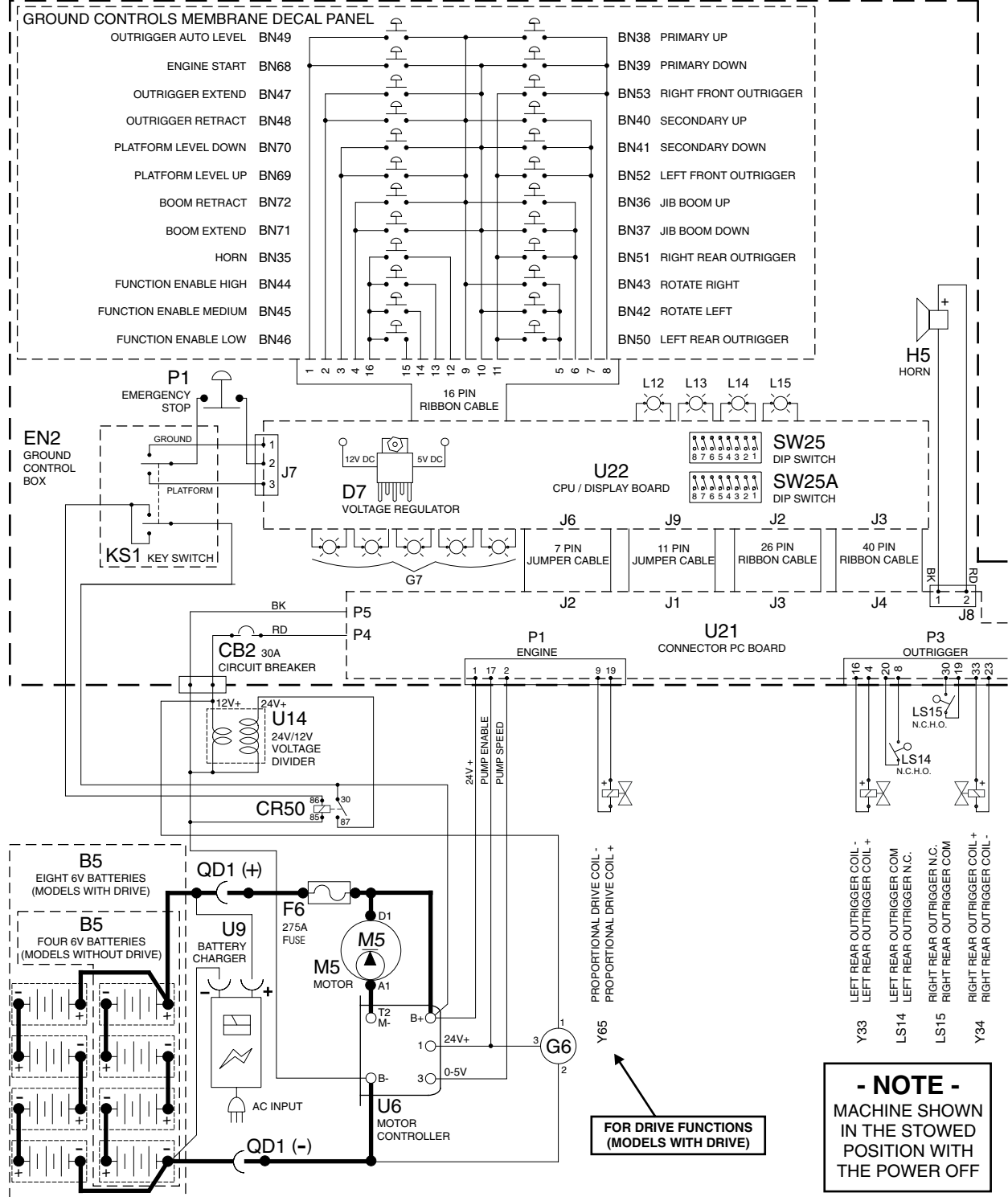
Circuit breaker

Electrical Schematic

DC Models
(before serial number T5000-91)

REV B

Part 1 of 2



ES0198C
ES0203A



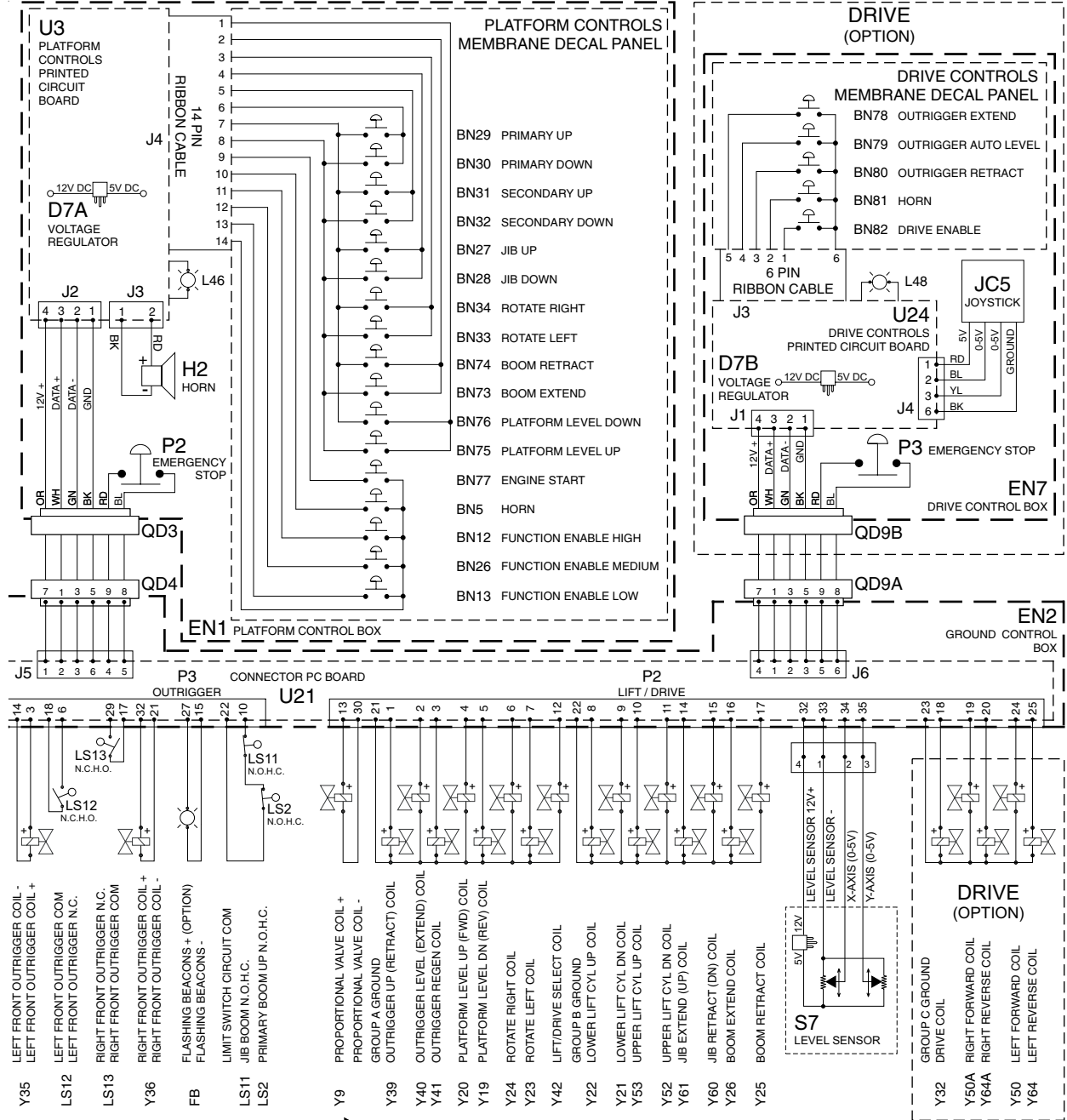
Electrical Schematic

DC Models

(before serial number T5000-91)

Part 2 of 2

REV B



**FOR DRIVE FUNCTIONS
(MODELS WITH DRIVE)**

**- NOTE -
MACHINE SHOWN
IN THE STOWED
POSITION WITH
THE POWER OFF**

ES0198C
ES0203A



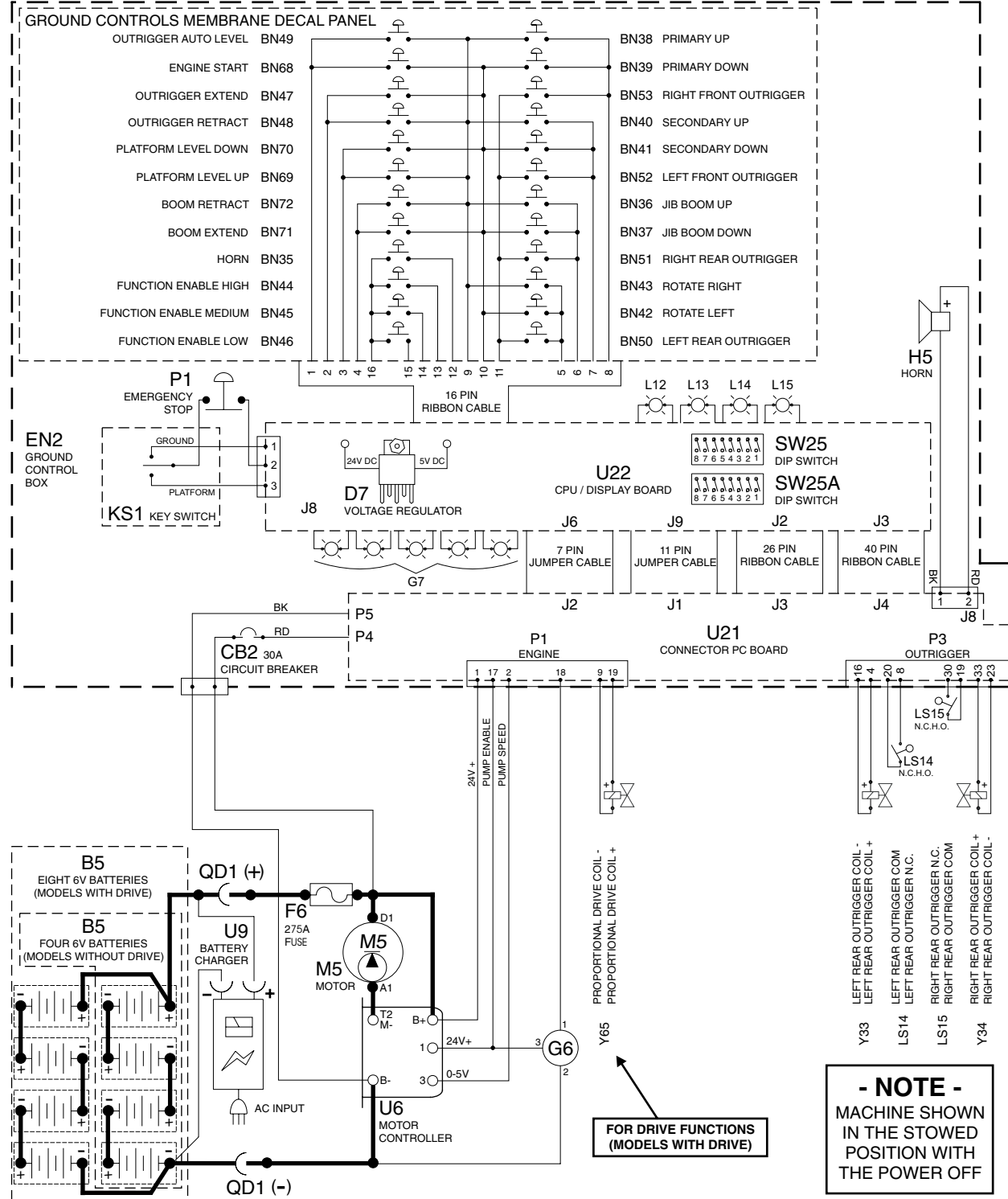
Electrical Schematic

DC Models

REV A

(from serial number T5000-91 to T5002-24)

Part 1 of 2



ES0215B
ES0220B



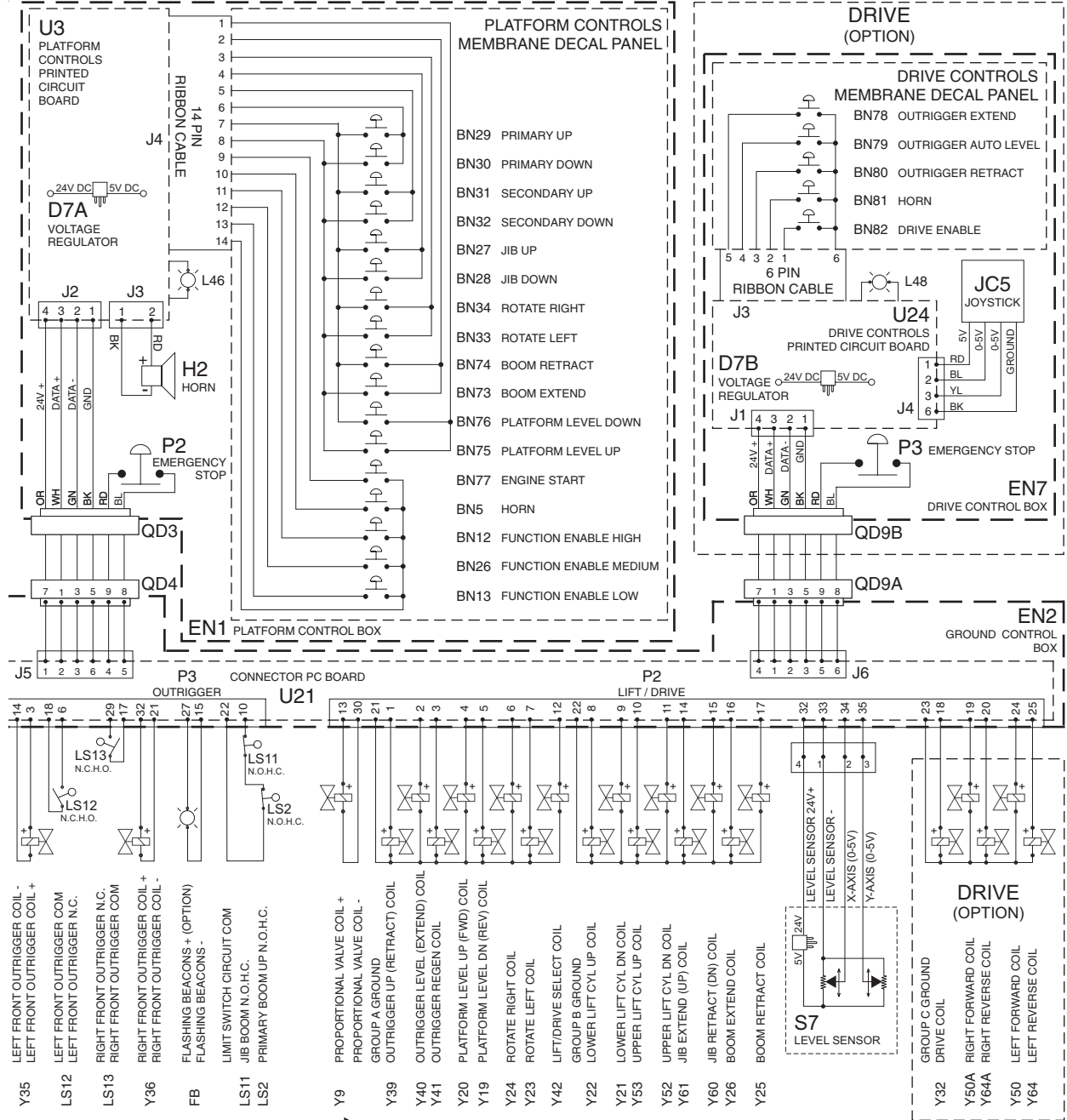
Electrical Schematic

DC Models

(from serial number T5000-91 to T5002-24)

Part 2 of 2

REV A



**FOR DRIVE FUNCTIONS
(MODELS WITH DRIVE)**

**- NOTE -
MACHINE SHOWN
IN THE STOWED
POSITION WITH
THE POWER OFF**

ES0215B
ES0220B



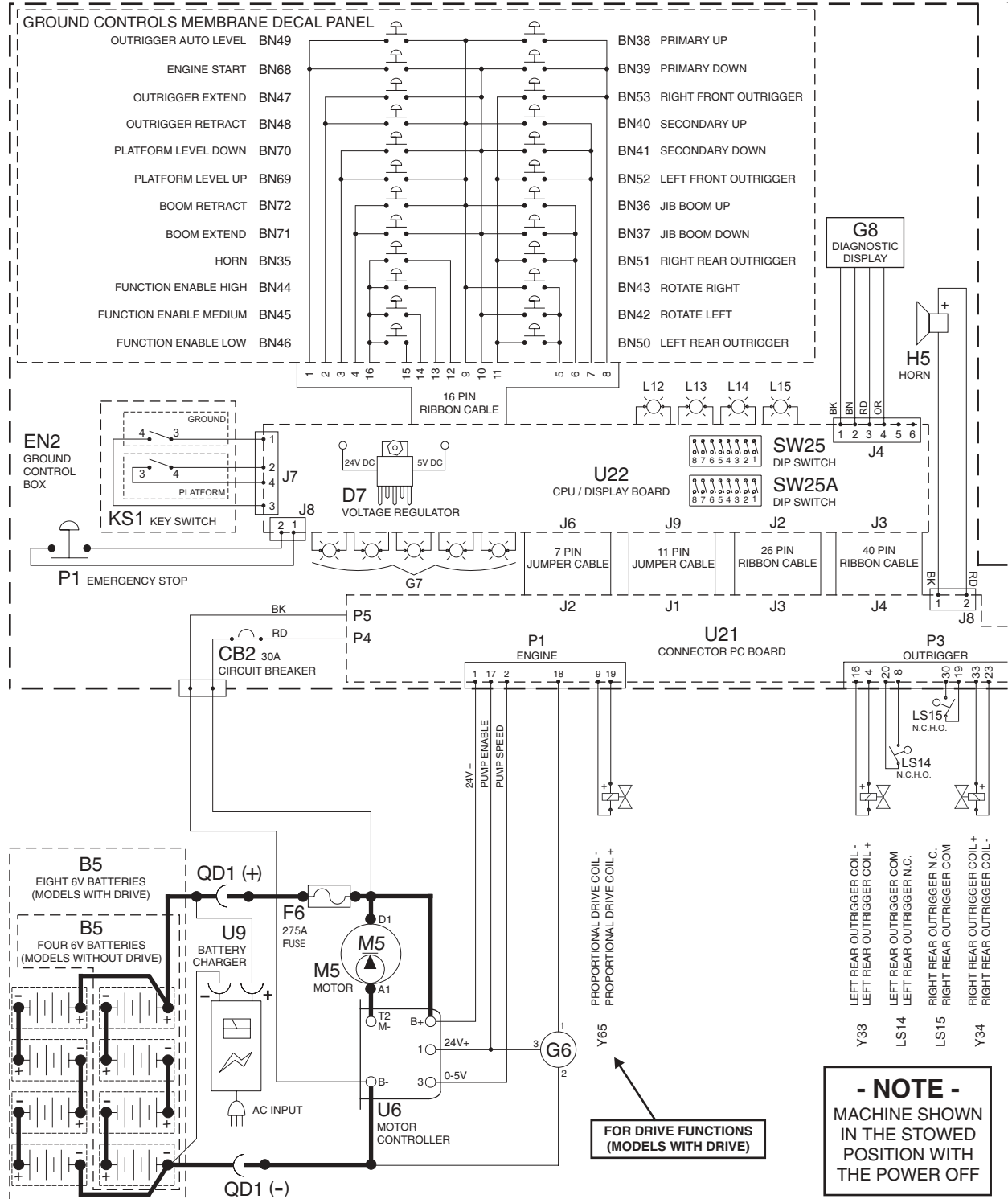
Electrical Schematic

DC Models

REV A

(from serial number T5002-25 to TMZ5003-228)

Part 1 of 2



ES0230A
ES0235A



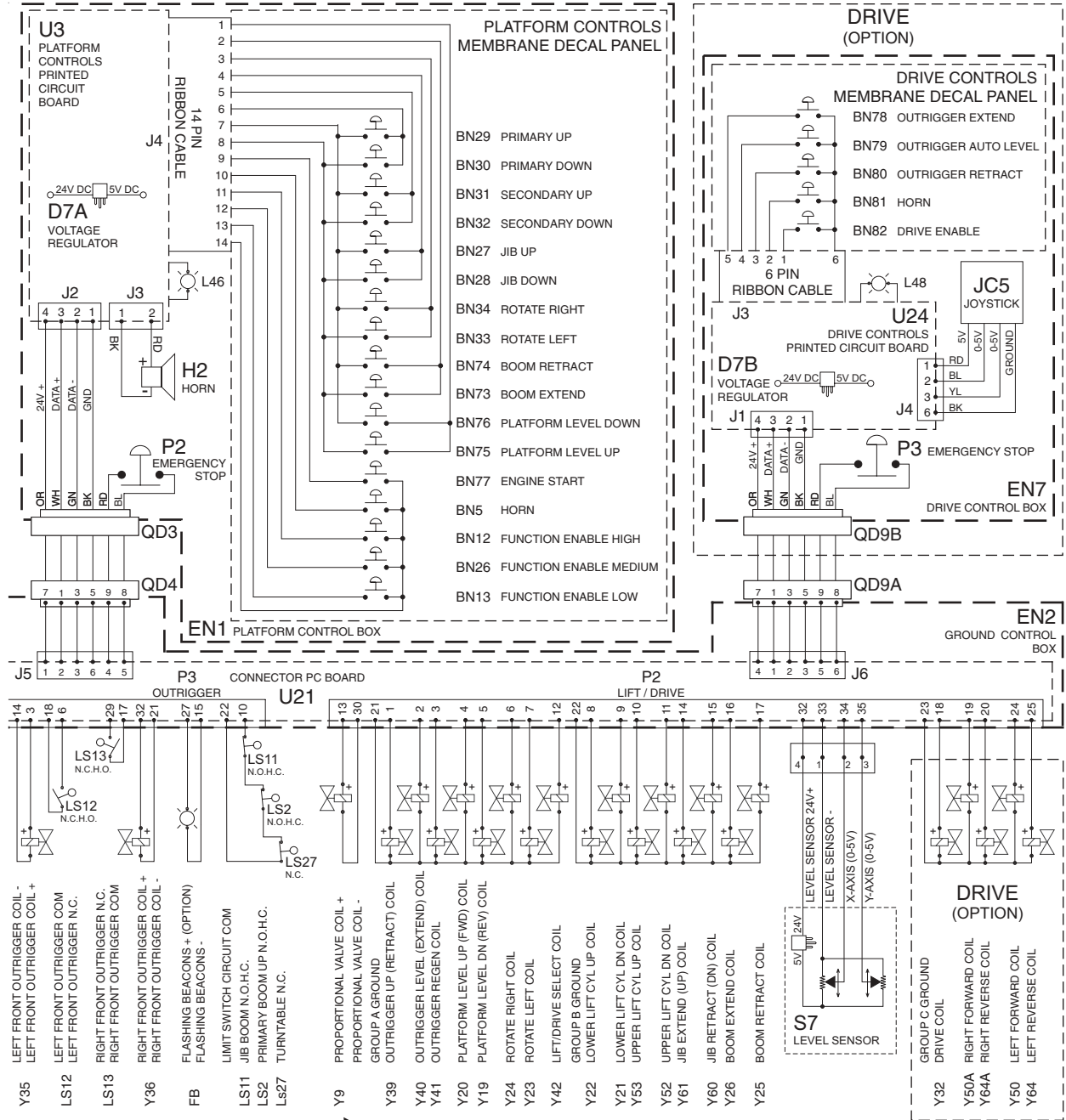
Electrical Schematic

DC Models

(from serial number T5002-25 to TMZ5003-228)

Part 2 of 2

REV A



FOR DRIVE FUNCTIONS (MODELS WITH DRIVE)

- NOTE -
MACHINE SHOWN
IN THE STOWED
POSITION WITH
THE POWER OFF

ES0230A
ES0235A

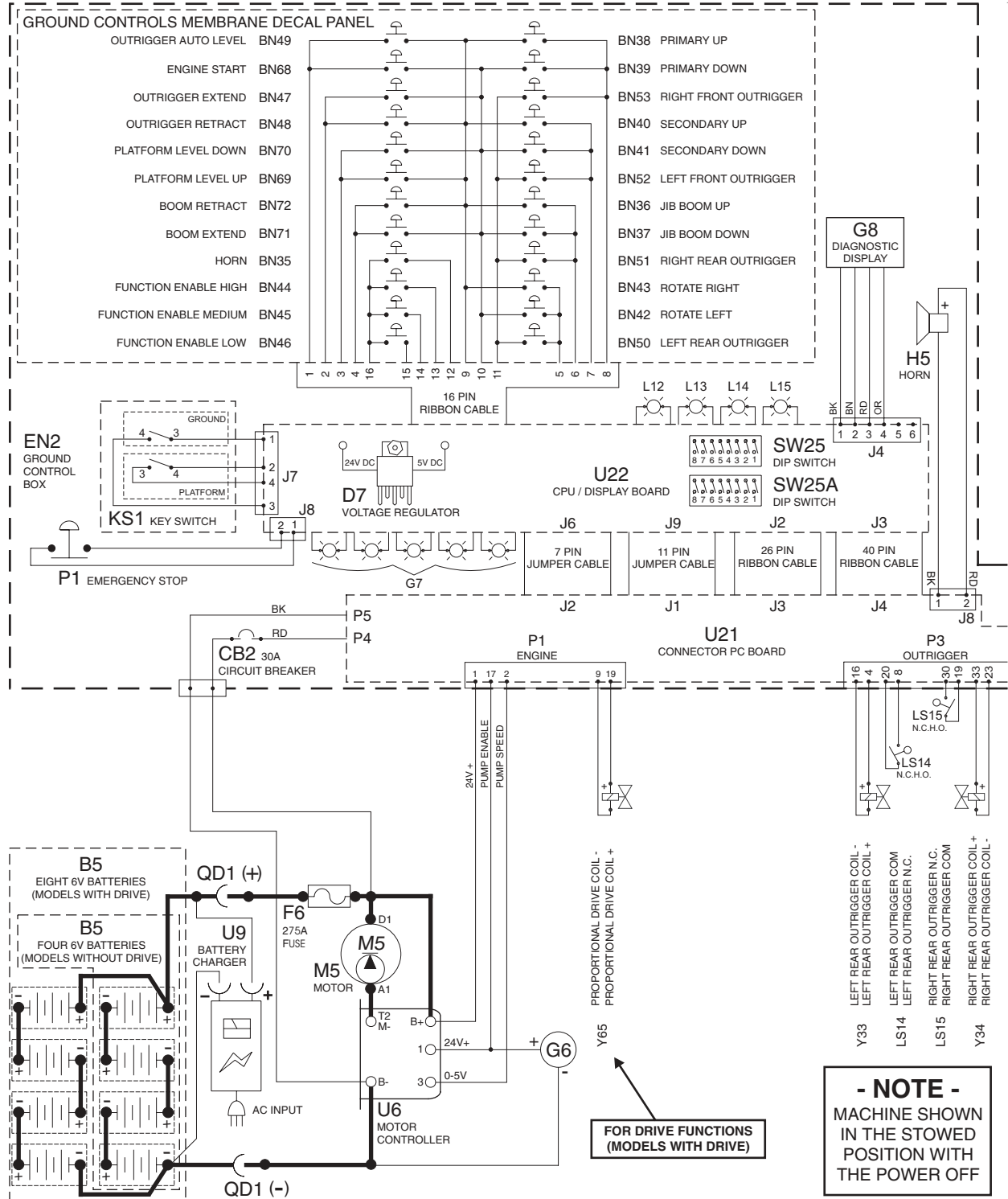


Electrical Schematic

DC Models
(after serial number TMZ5003-228)

REV A

Part 1 of 2



ES0230B
ES0235B



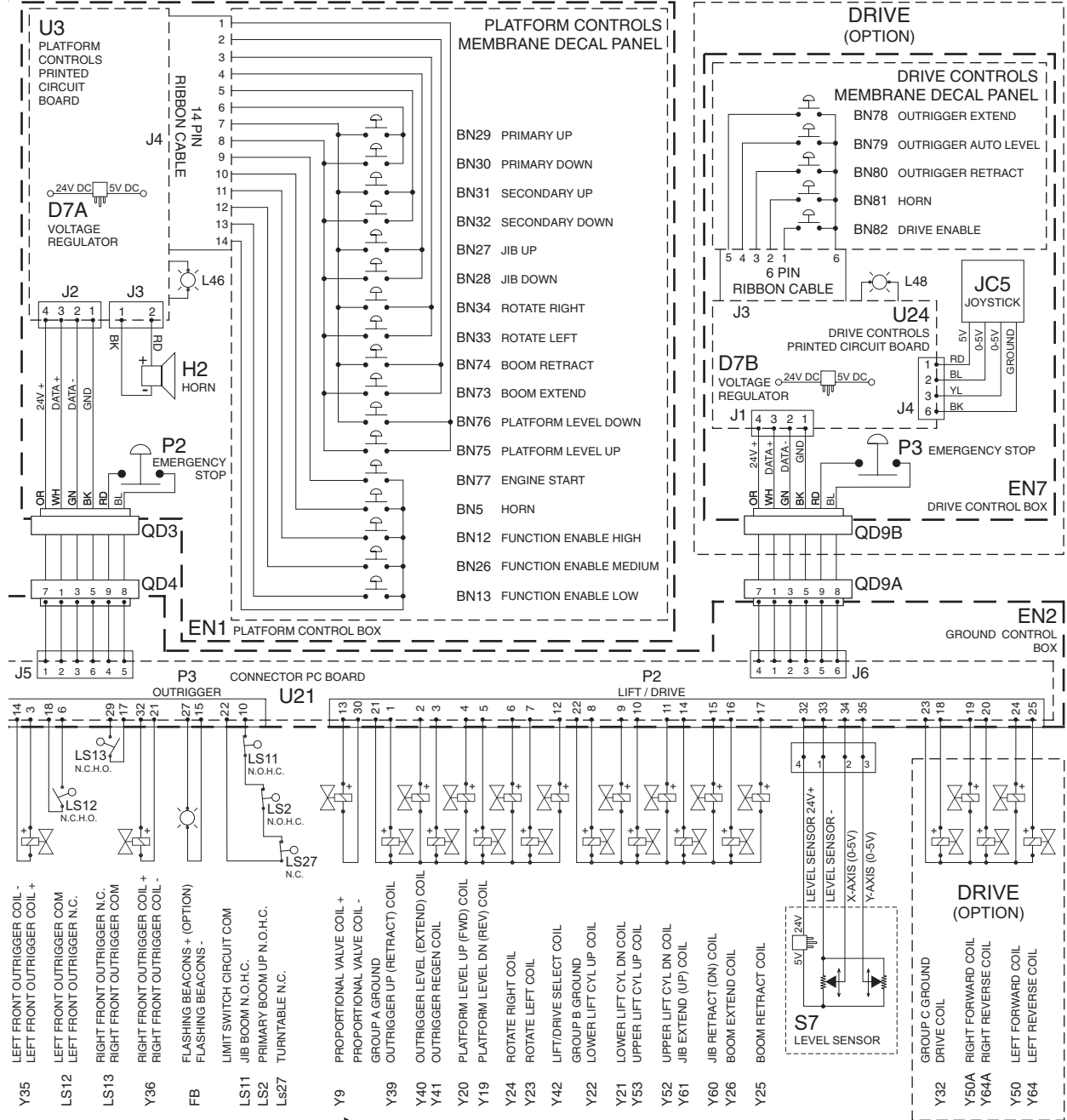
Electrical Schematic

DC Models

(after serial number TMZ5003-228)

Part 2 of 2

REV A



**FOR DRIVE FUNCTIONS
(MODELS WITH DRIVE)**

**- NOTE -
MACHINE SHOWN
IN THE STOWED
POSITION WITH
THE POWER OFF**

ES0230B
ES0235B

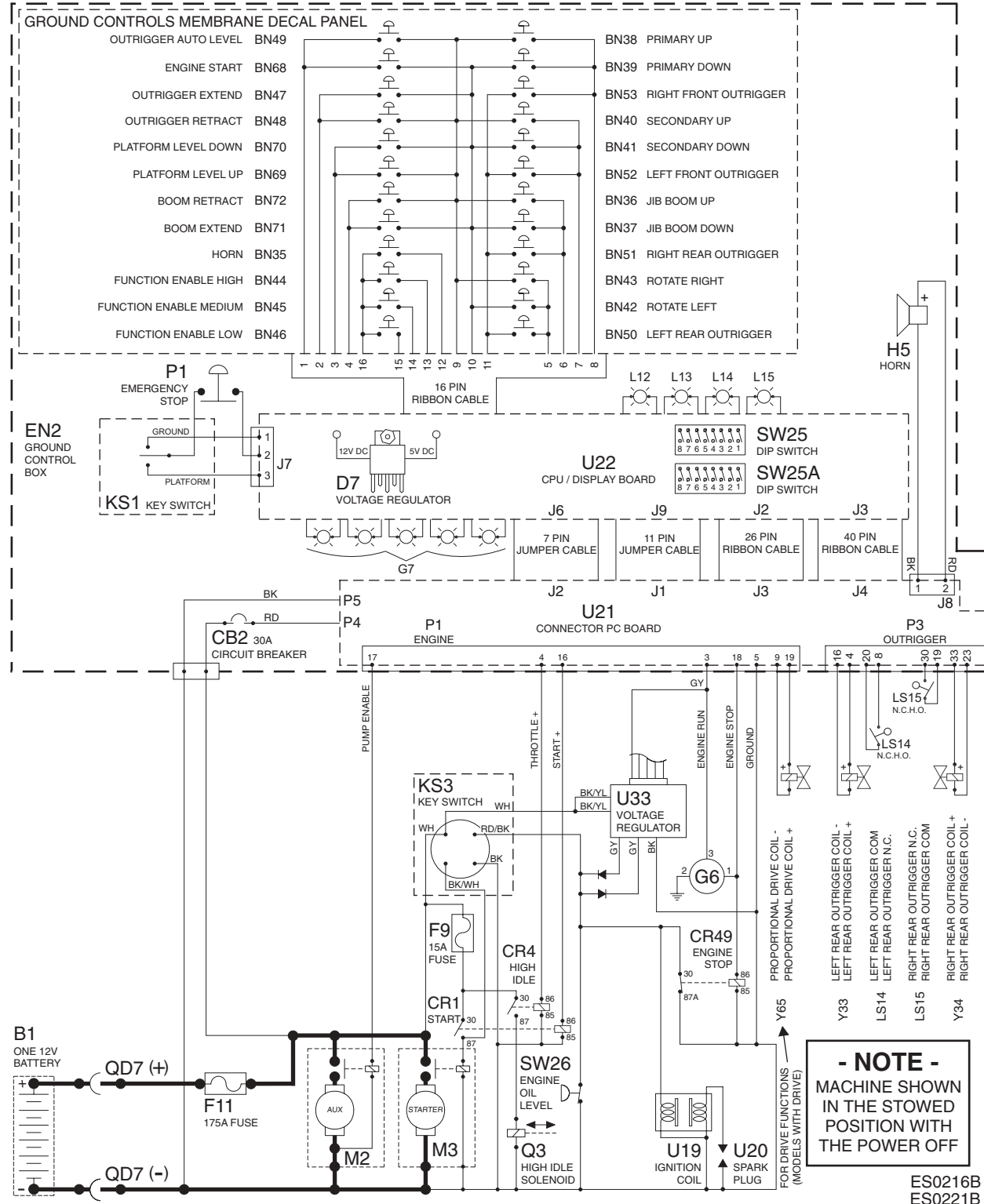


Electrical Schematic

Gasoline Models
(before serial number T5000-91)

REV B

Part 1 of 2



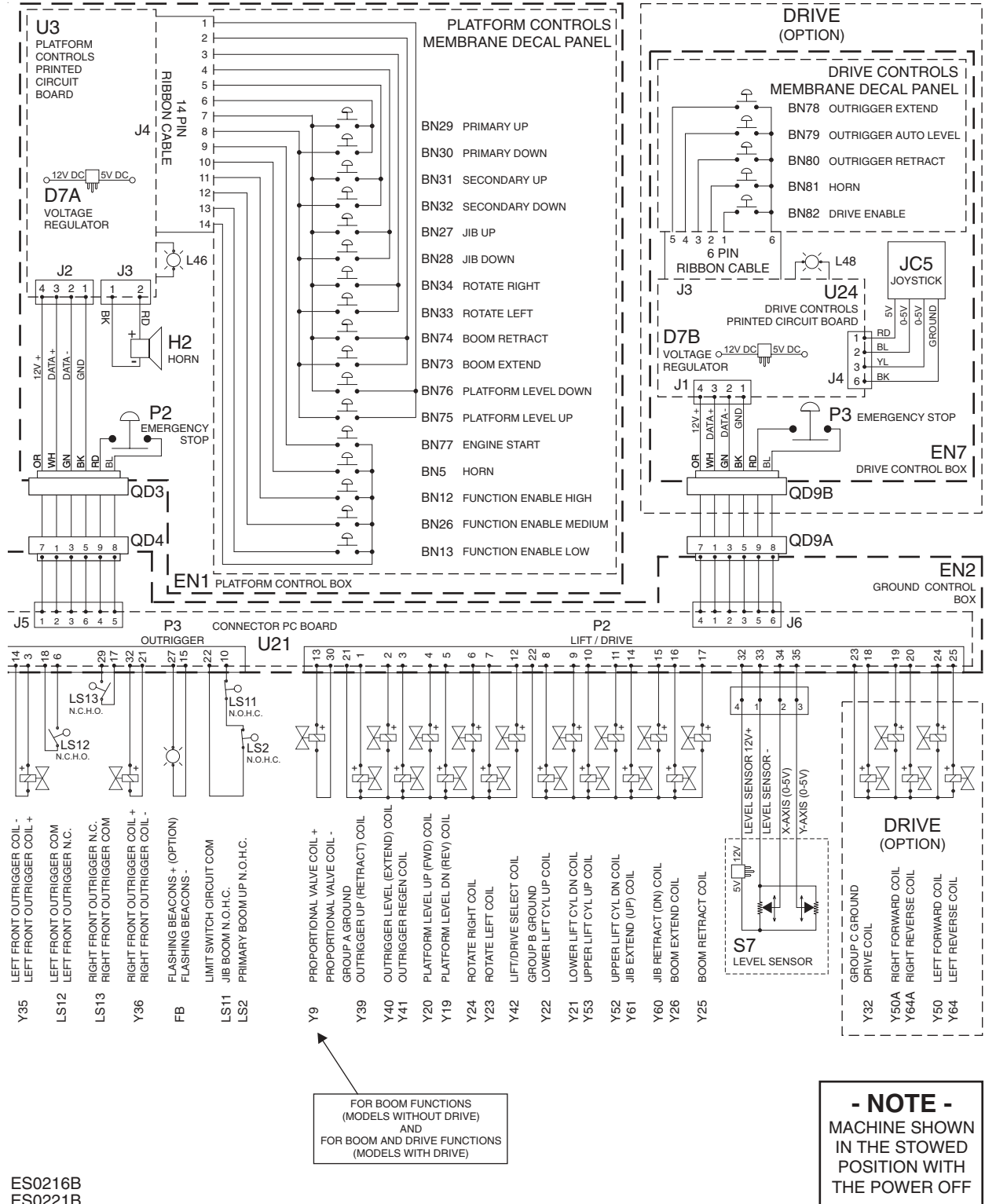
Electrical Schematic

Gasoline Models

(before serial number T5000-91)

Part 2 of 2

REV B



ES0216B
ES0221B

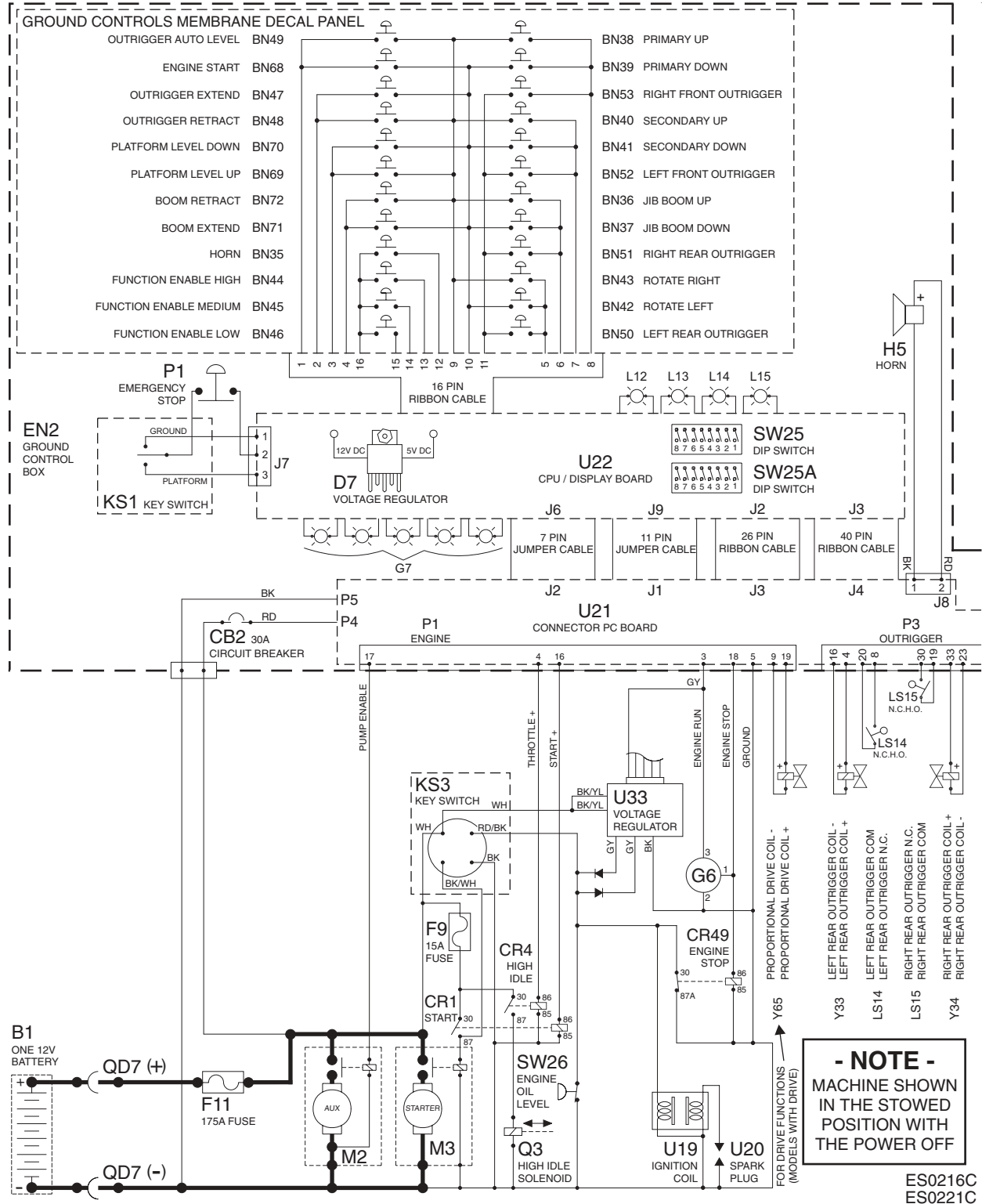


Electrical Schematic

Gasline Models
(from serial number T5000-91 to T5002-24)

REV A

Part 1 of 2



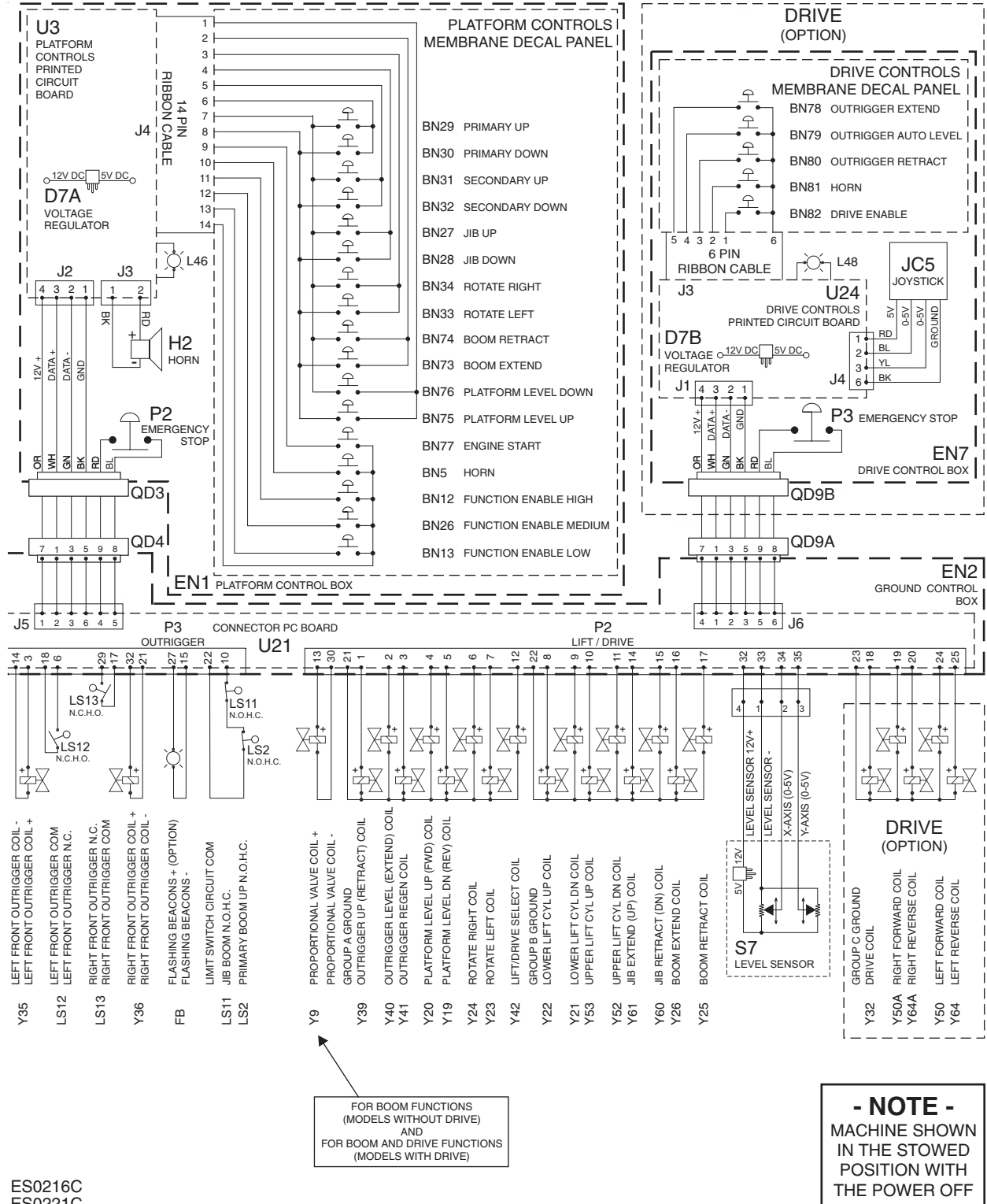
Electrical Schematic

Gasoline Models

(from serial number T5000-91 to T5002-24)

Part 2 of 2

REV A



ES0216C
ES0221C



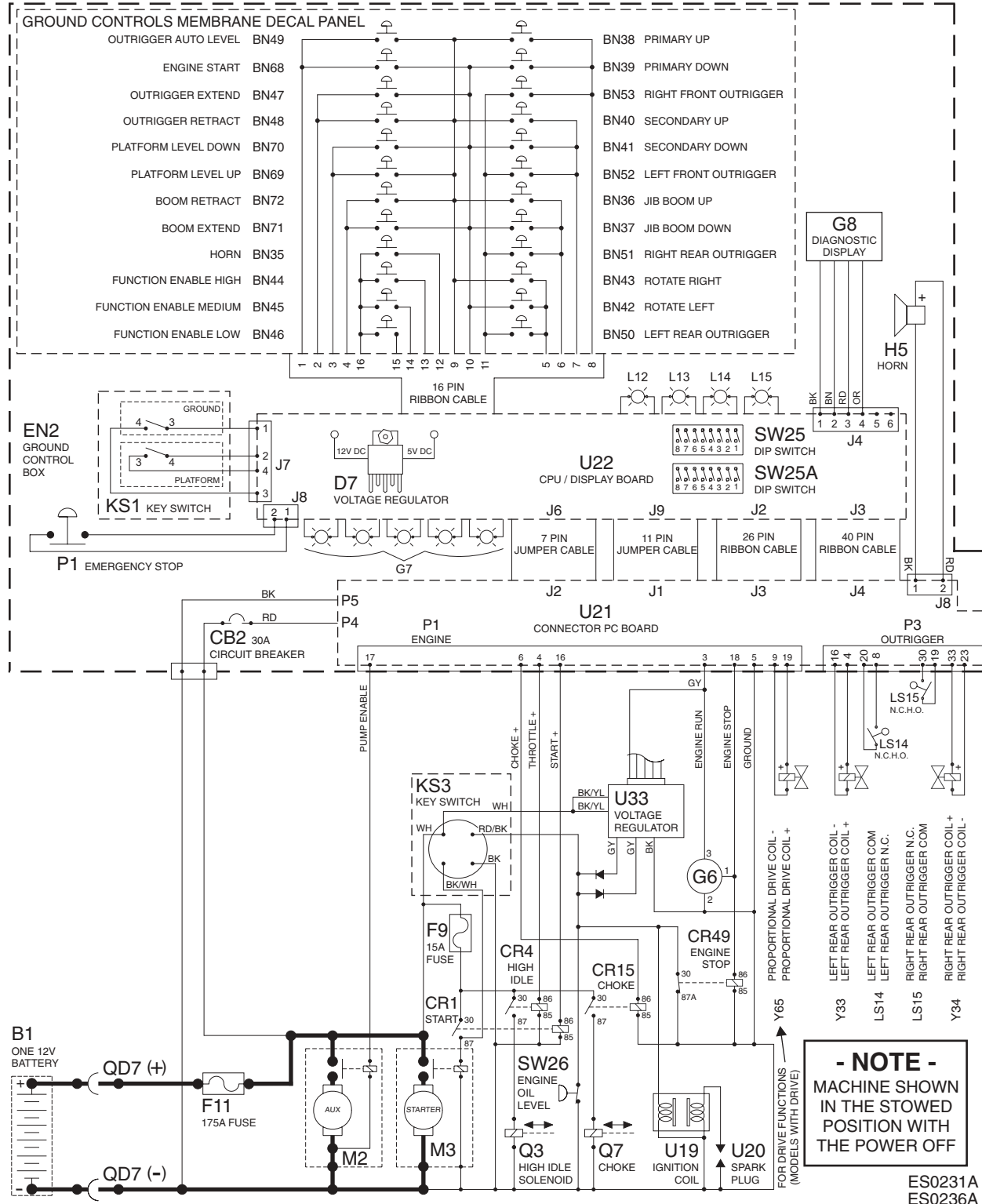
Electrical Schematic

Gasoline Models

(from serial number T5002-25 to TMZ5003-228)

REV A

Part 1 of 2



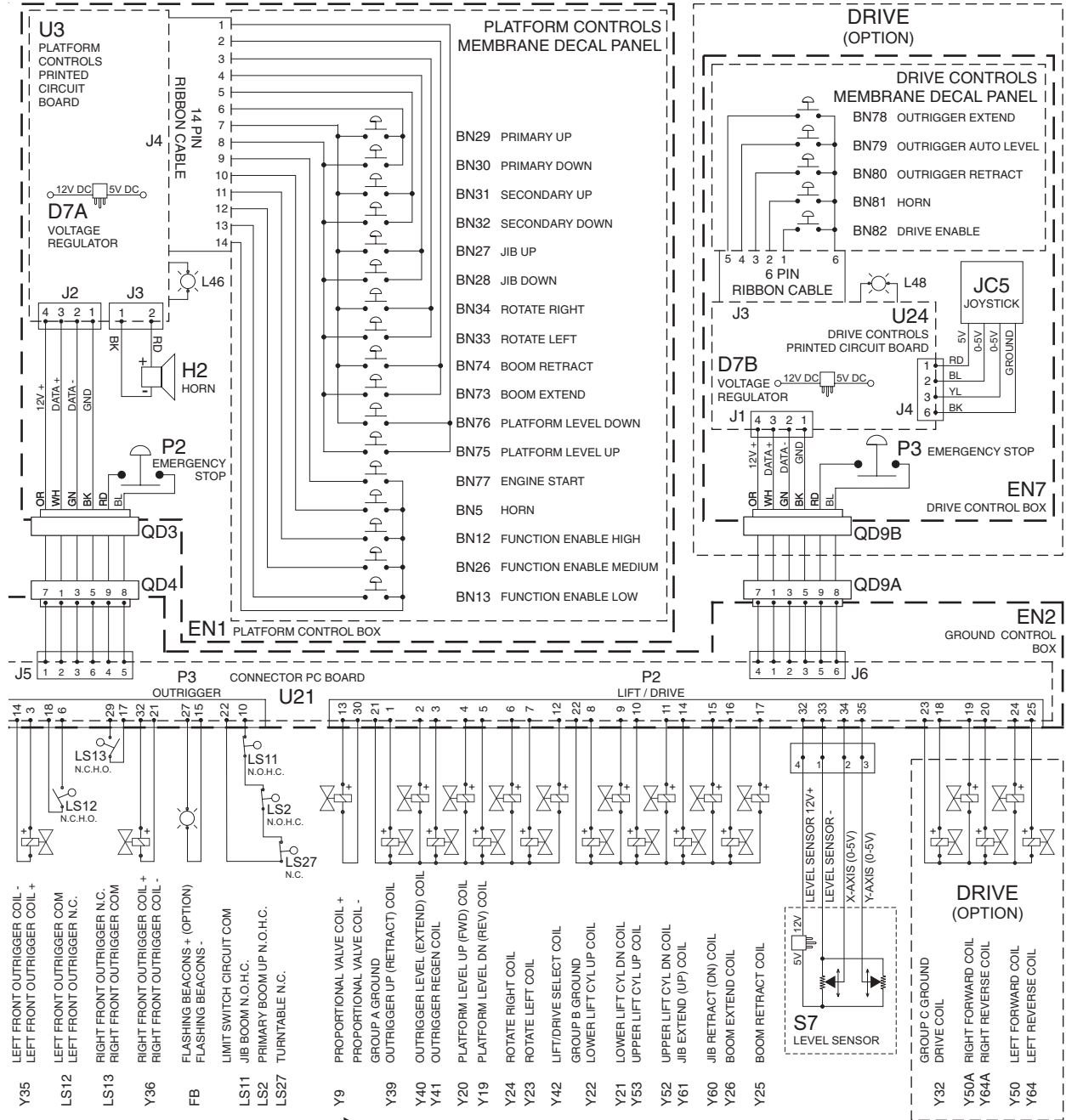
Electrical Schematic

Gasoline Models

(from serial number T5002-25 to TMZ5003-228)

Part 2 of 2

REV A



FOR BOOM FUNCTIONS (MODELS WITHOUT DRIVE) AND FOR BOOM AND DRIVE FUNCTIONS (MODELS WITH DRIVE)

- NOTE -
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

ES0231A
ES0236A

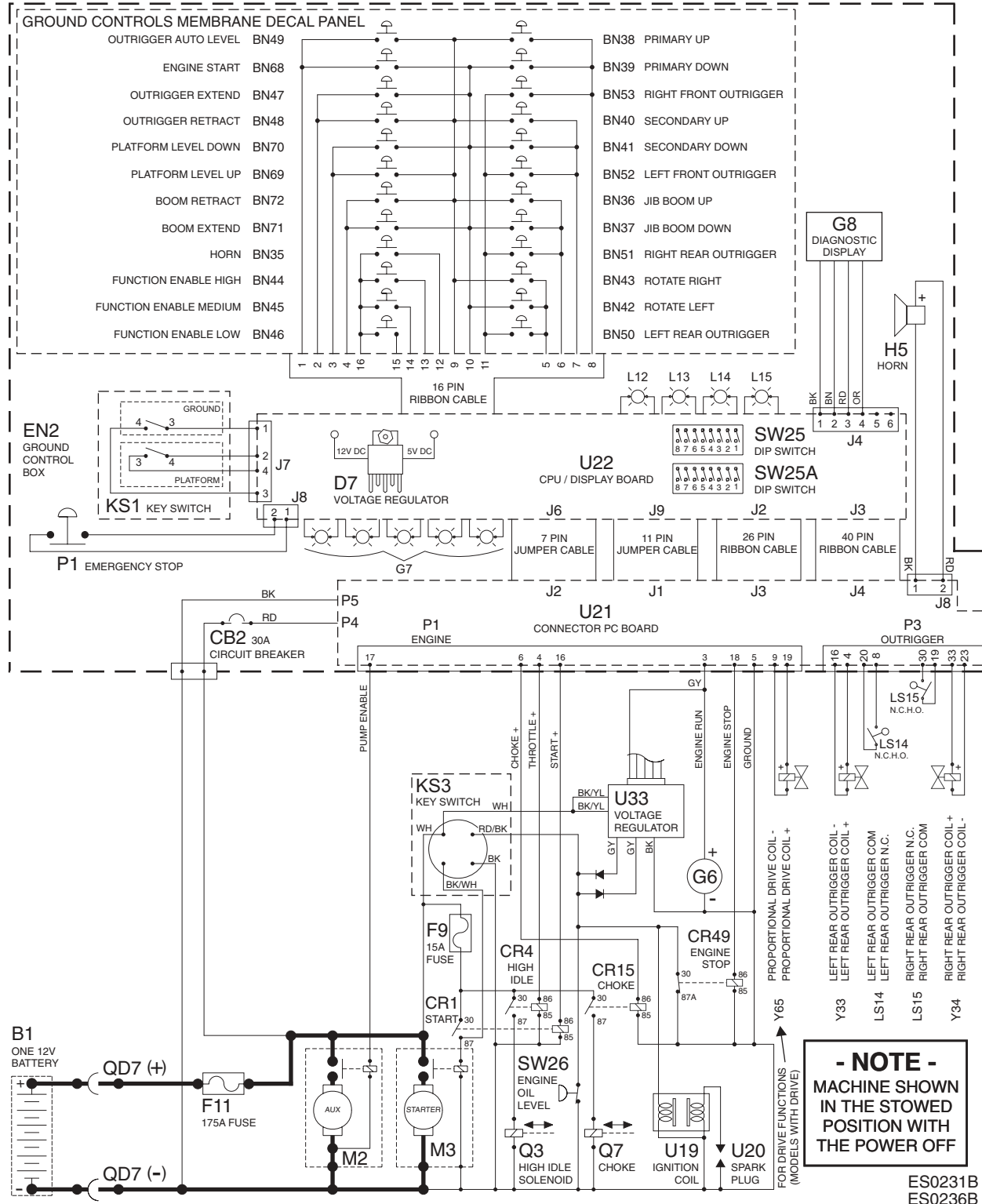


Electrical Schematic

Gasoline Models
(after serial number TMZ5003-228)

REV A

Part 1 of 2



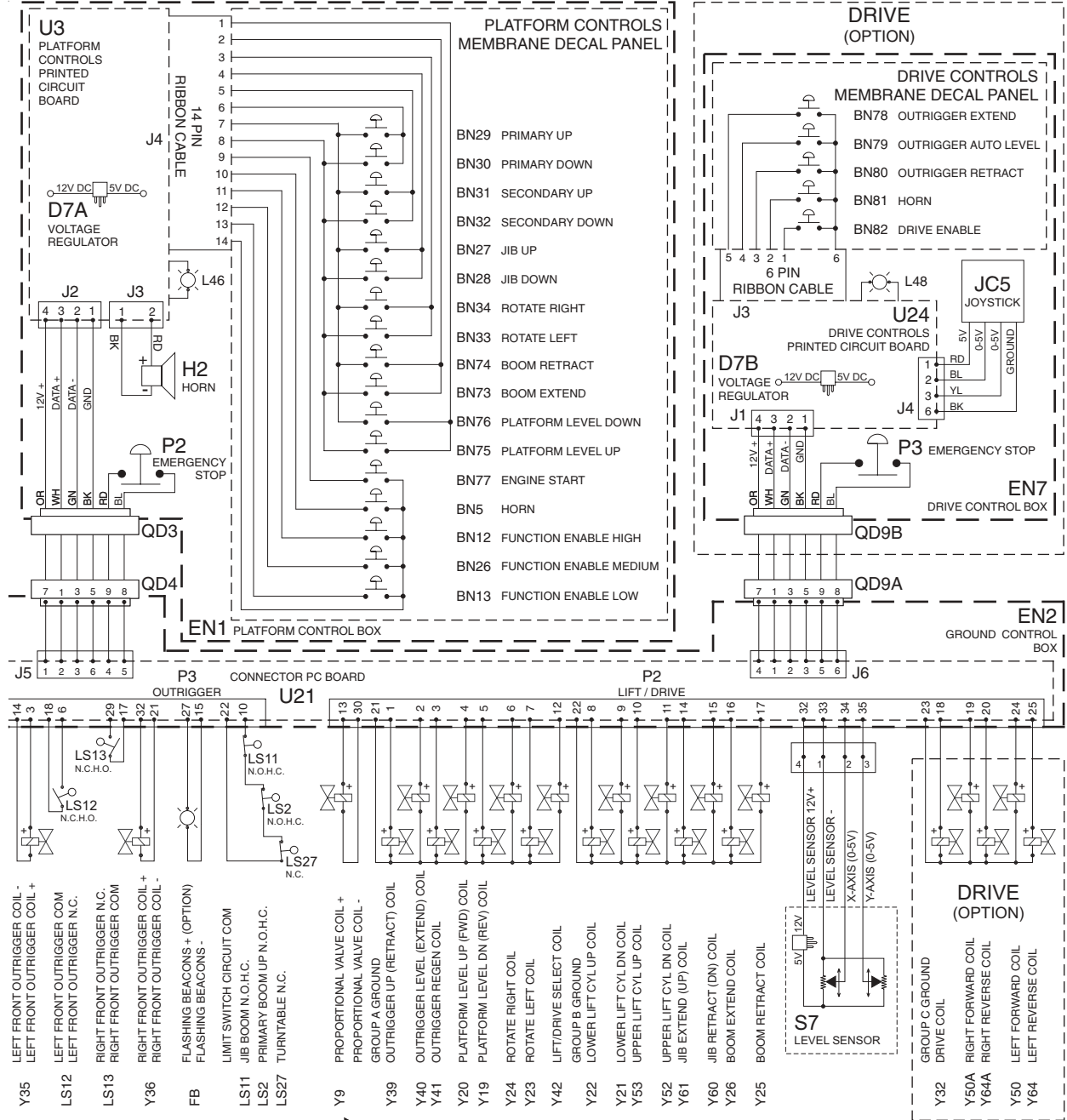
Electrical Schematic

Gasoline Models

(after serial number TMZ5003-228)

Part 2 of 2

REV A



FOR BOOM FUNCTIONS (MODELS WITHOUT DRIVE) AND FOR BOOM AND DRIVE FUNCTIONS (MODELS WITH DRIVE)

- NOTE -
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

ES0231B
ES0236B

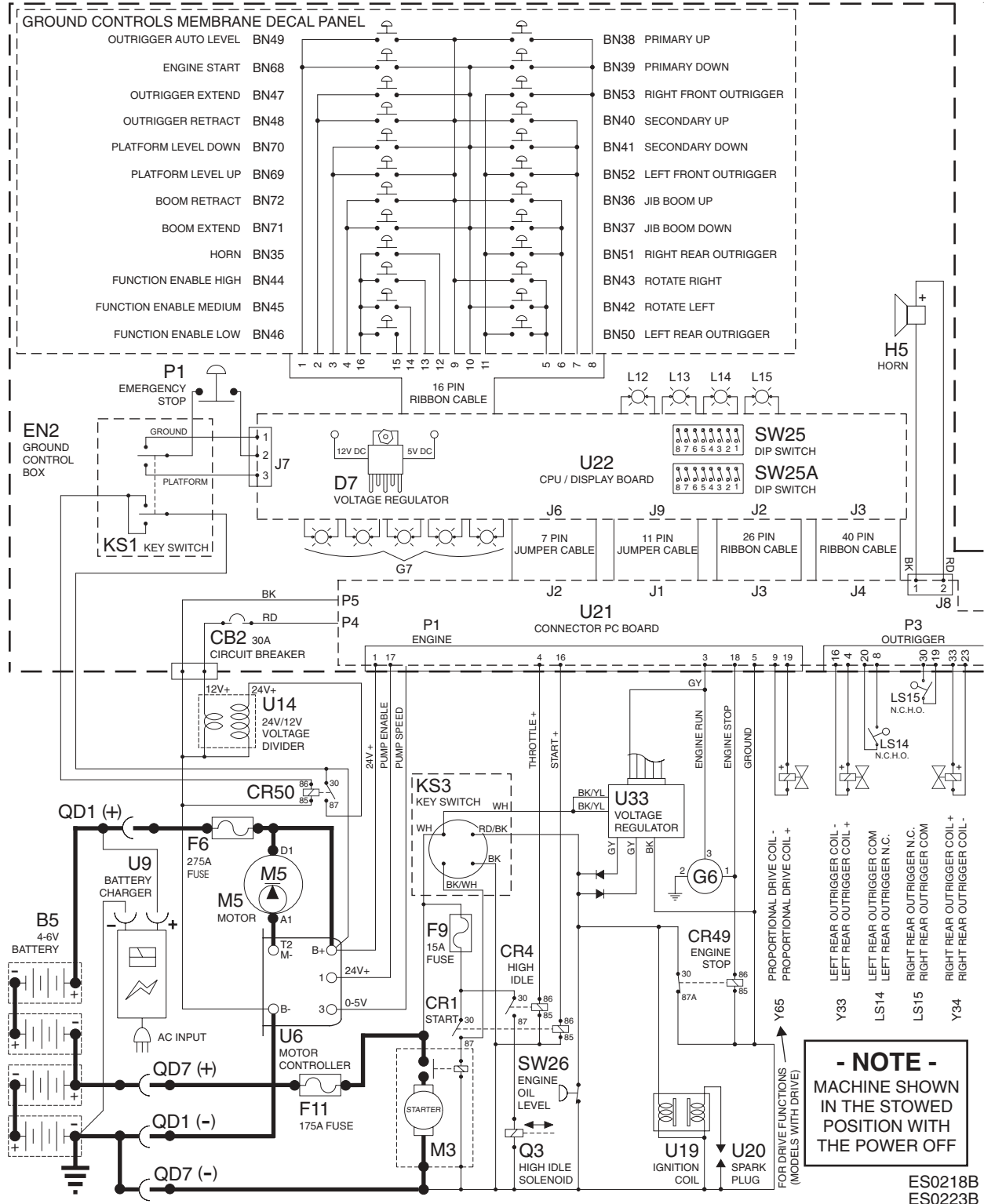


Electrical Schematic

Gasoline Bi-Fuel Models
(before serial number T5000-91)

REV B

Part 1 of 2



ES0218B
ES0223B



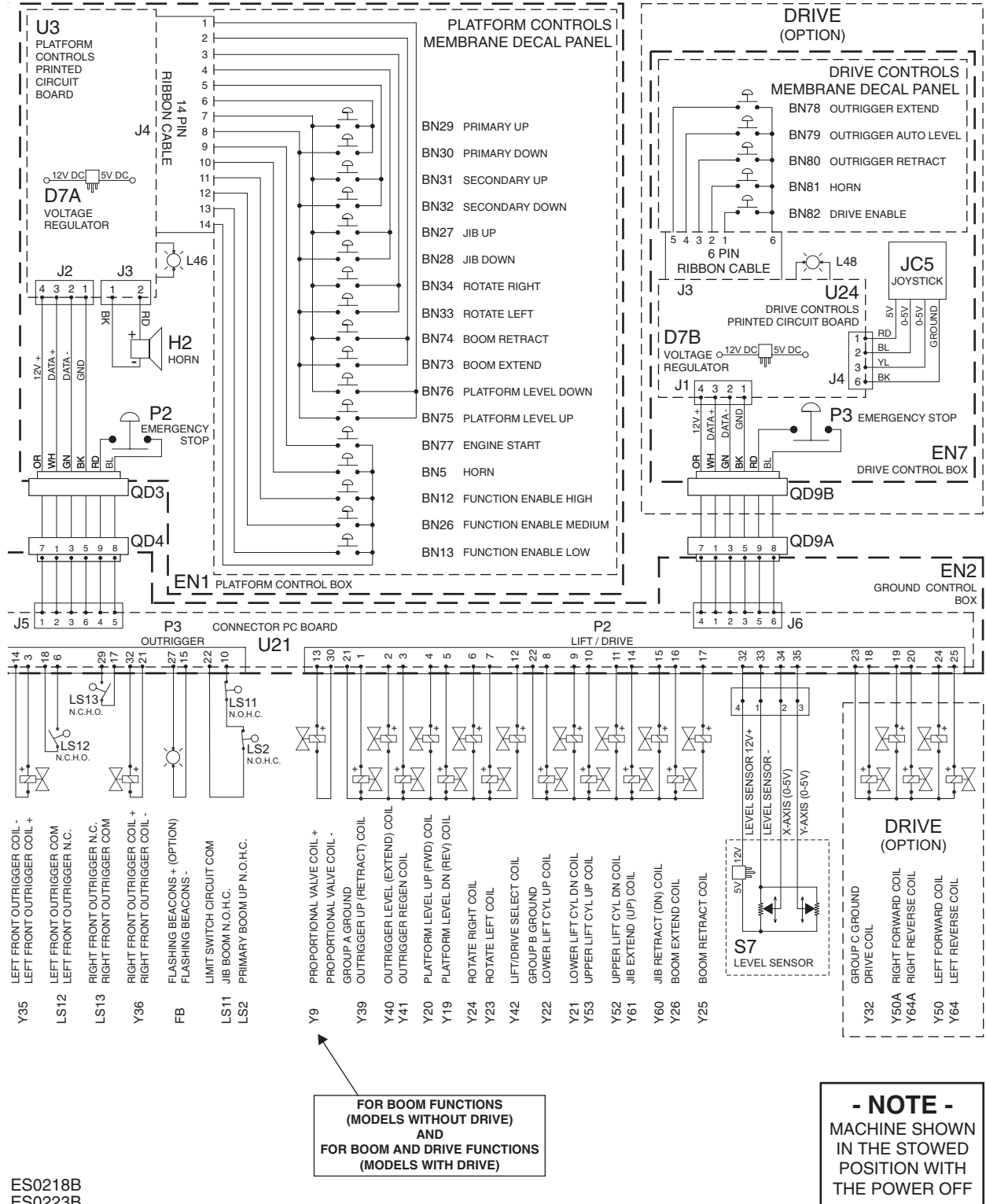
Electrical Schematic

Gasoline Bi-Fuel Models

(before serial number T5000-91)

Part 2 of 2

REV B



ES0218B
ES0223B

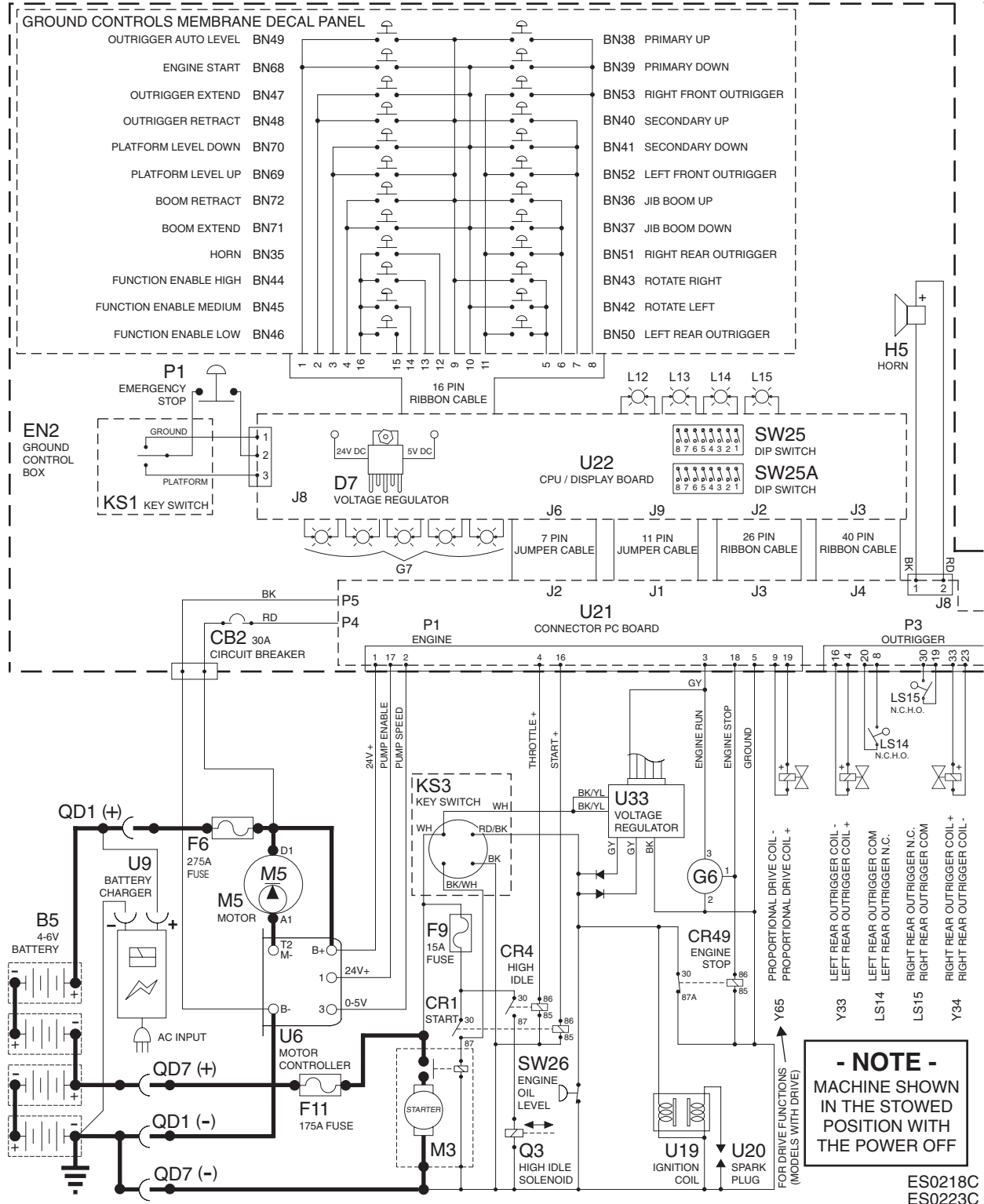


Electrical Schematic

Gasoline Bi-Fuel Models
(from serial number T5000-91 to T5002-24)

REV A

Part 1 of 2



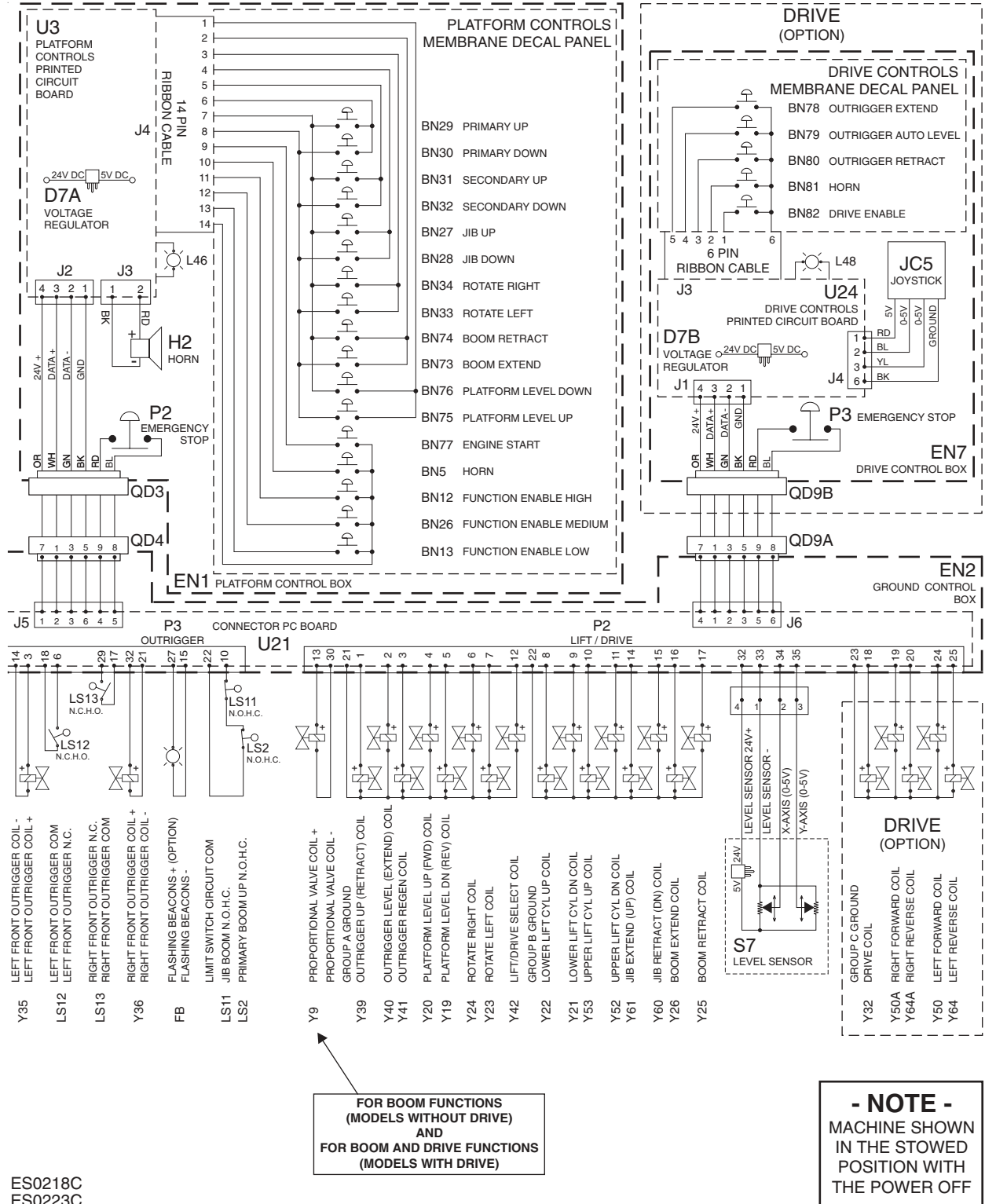
Electrical Schematic

Gasoline Bi-Fuel Models

(from serial number T5000-91 to T5002-24)

Part 2 of 2

REV A



ES0218C
ES0223C

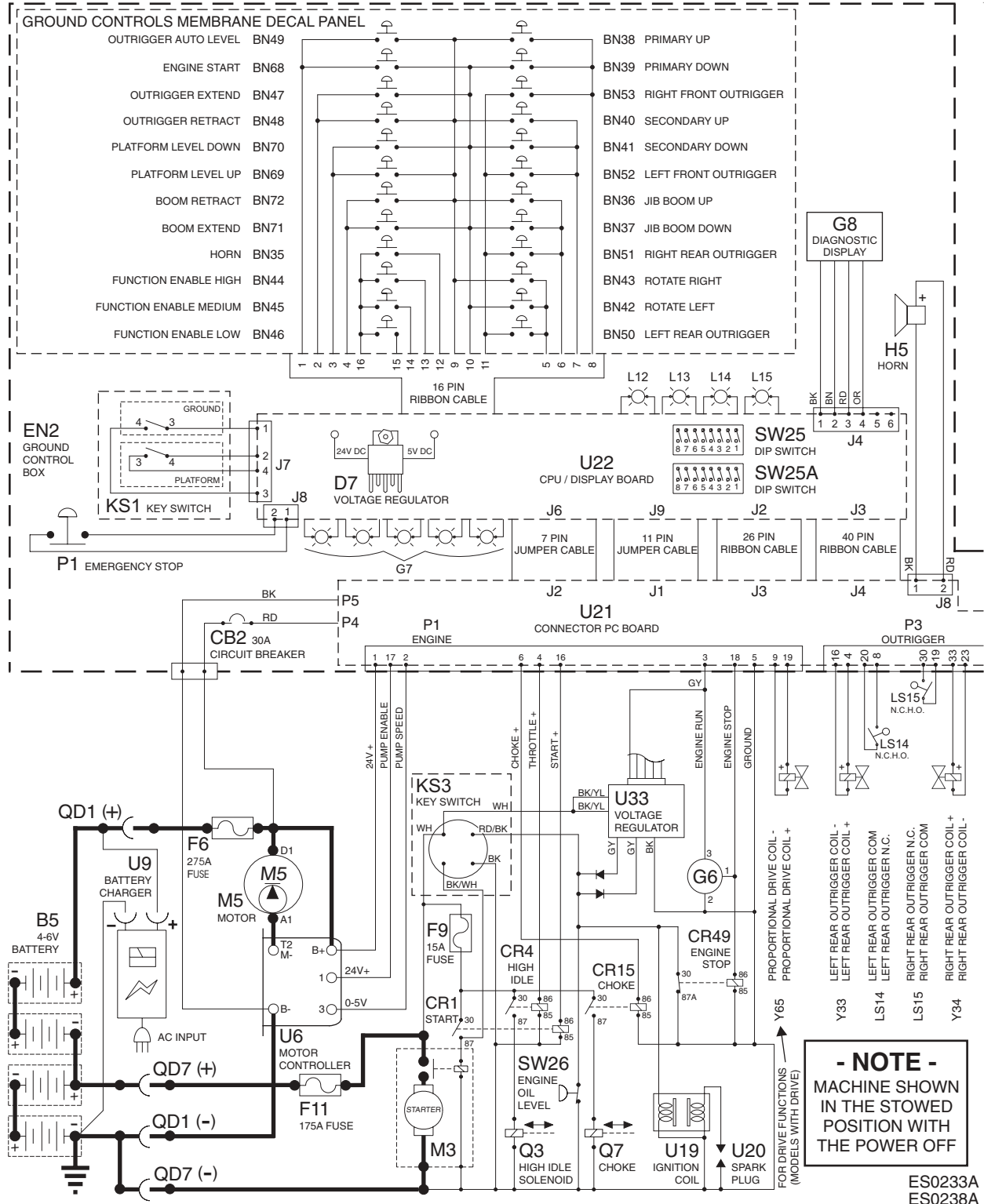


Electrical Schematic

Gasoline Bi-Fuel Models
(from serial number T5002-25 to TMZ5003-228)

REV A

Part 1 of 2



ES0233A
ES0238A



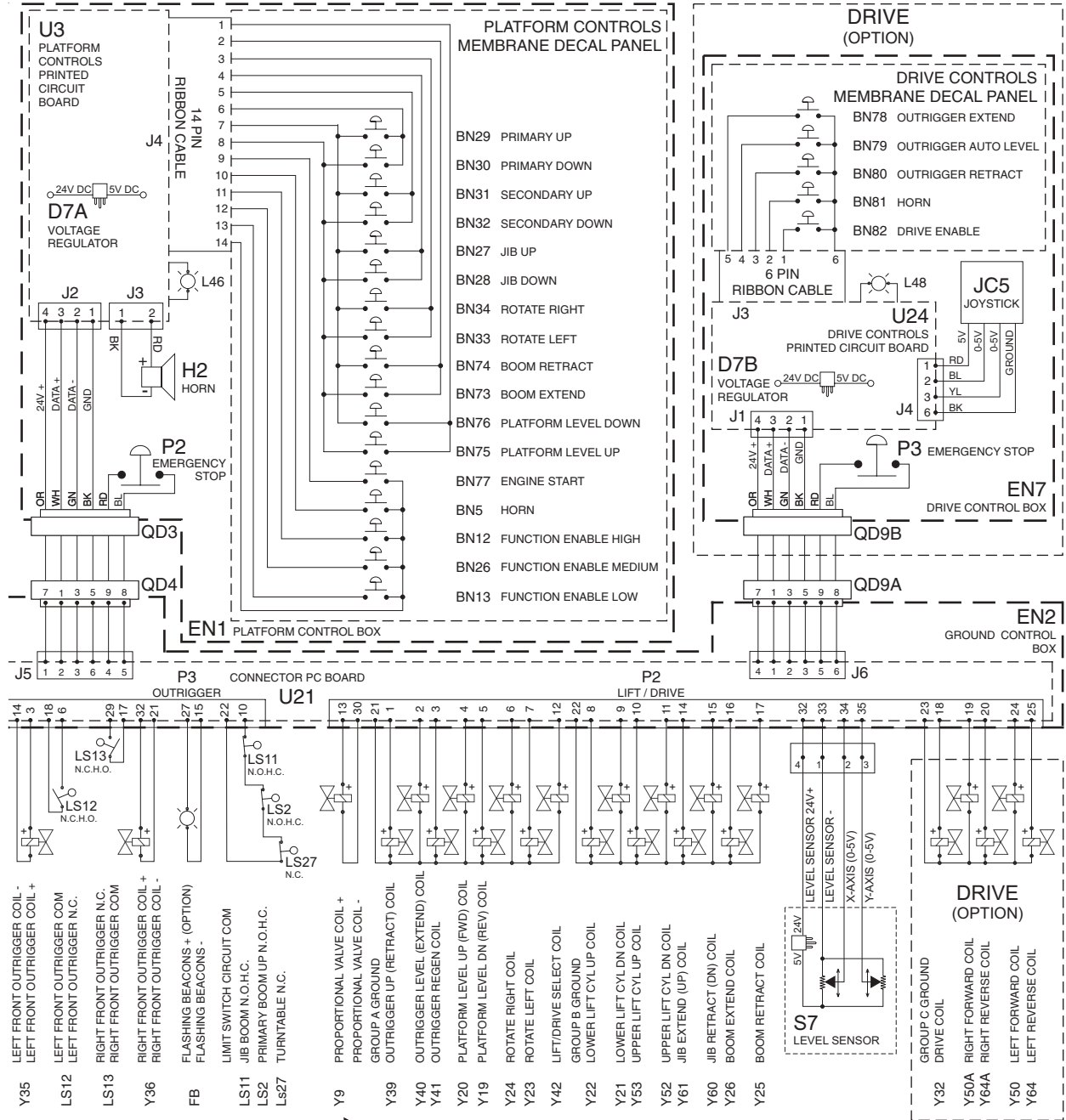
Electrical Schematic

Gasoline Bi-Fuel Models

(from serial number T5002-25 to TMZ5003-228)

Part 2 of 2

REV A



**FOR BOOM FUNCTIONS
(MODELS WITHOUT DRIVE)
AND
FOR BOOM AND DRIVE FUNCTIONS
(MODELS WITH DRIVE)**

**- NOTE -
MACHINE SHOWN
IN THE STOWED
POSITION WITH
THE POWER OFF**

ES0233A
ES0238A

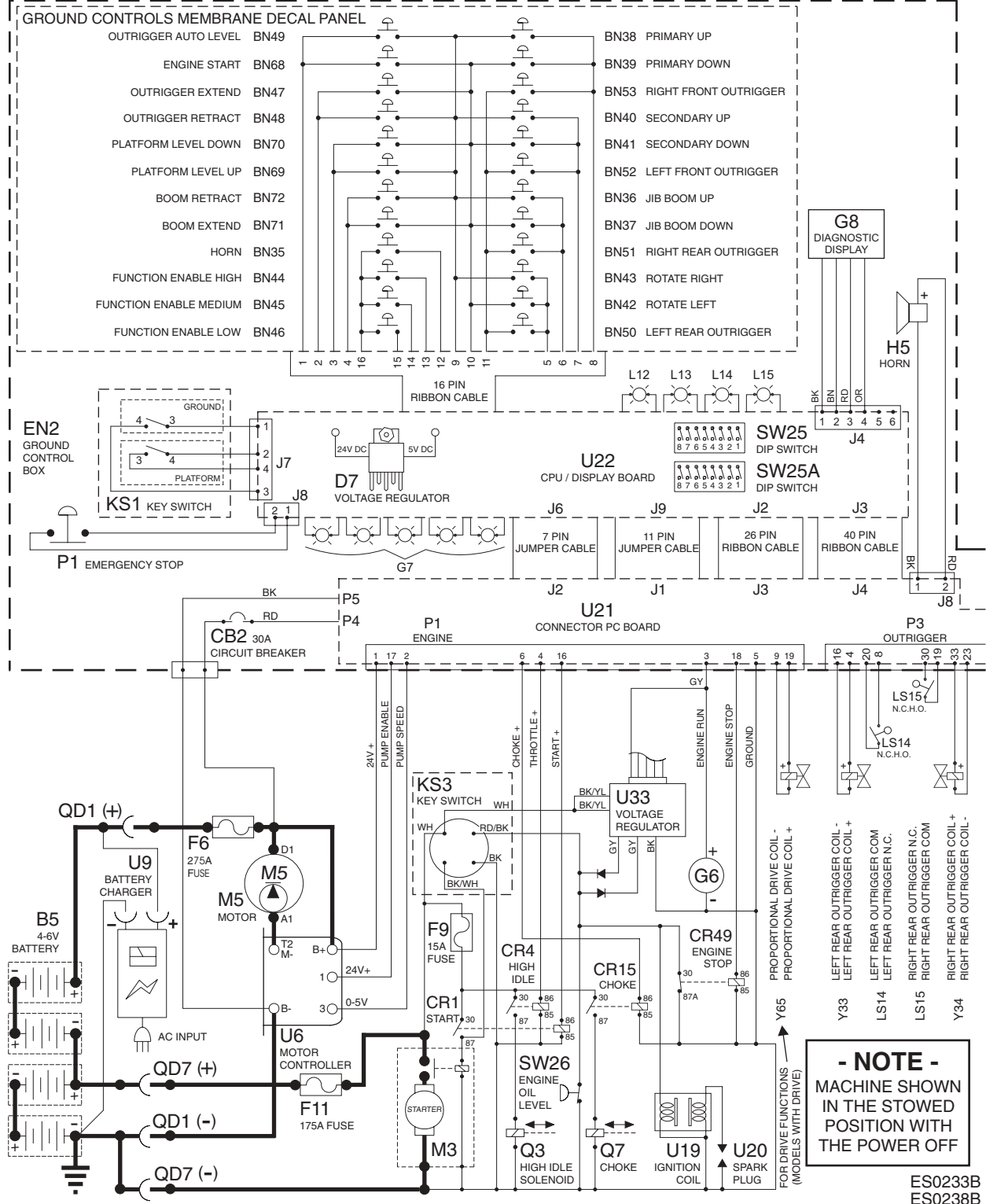


Electrical Schematic

Gasoline Bi-Fuel Models
(after serial number TMZ5003-228)

REV A

Part 1 of 2



ES0233B
ES0238B

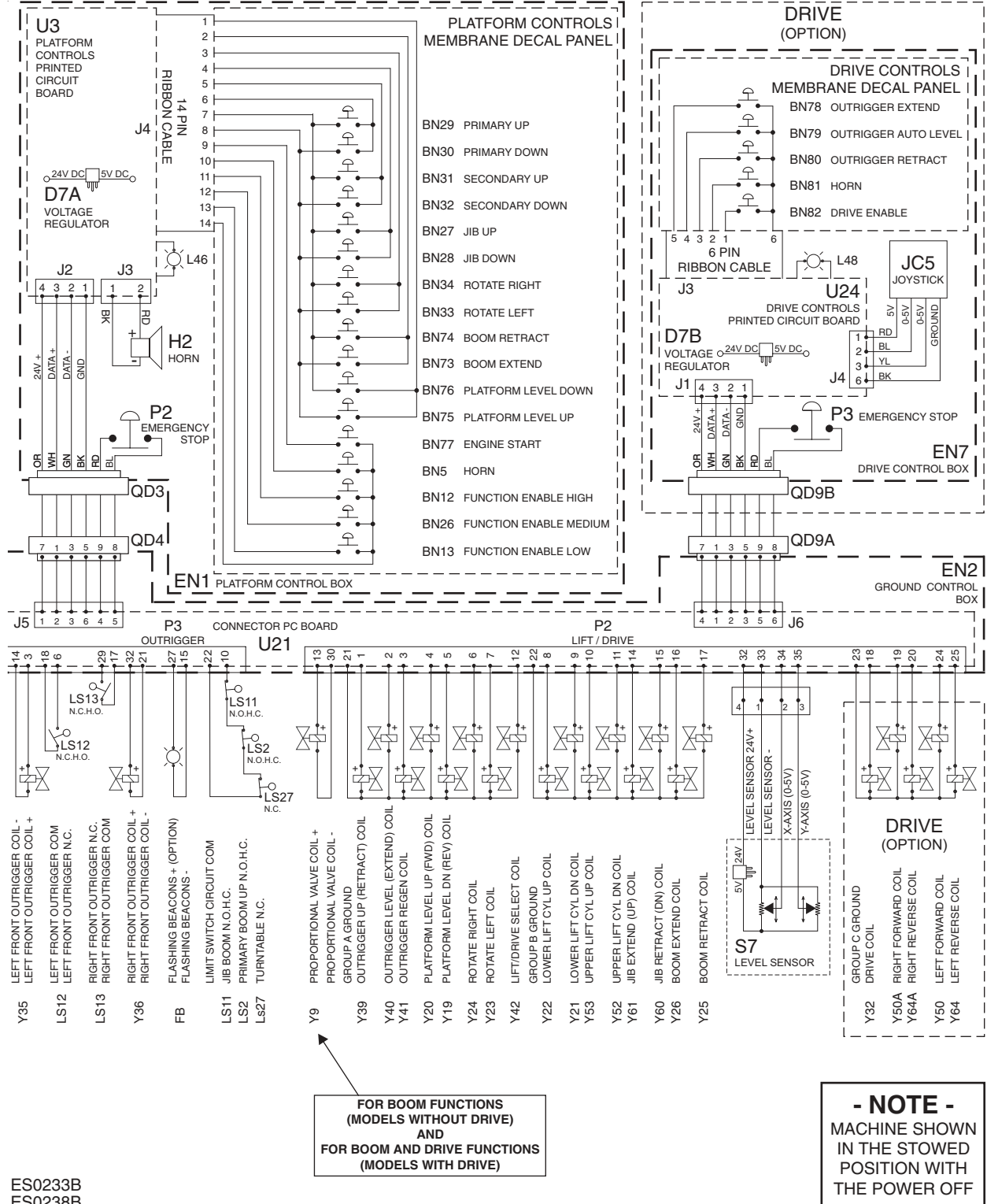


REV A

Electrical Schematic

Gasoline Bi-Fuel Models (after serial number TMZ5003-228)

Part 2 of 2



ES0233B
ES0238B

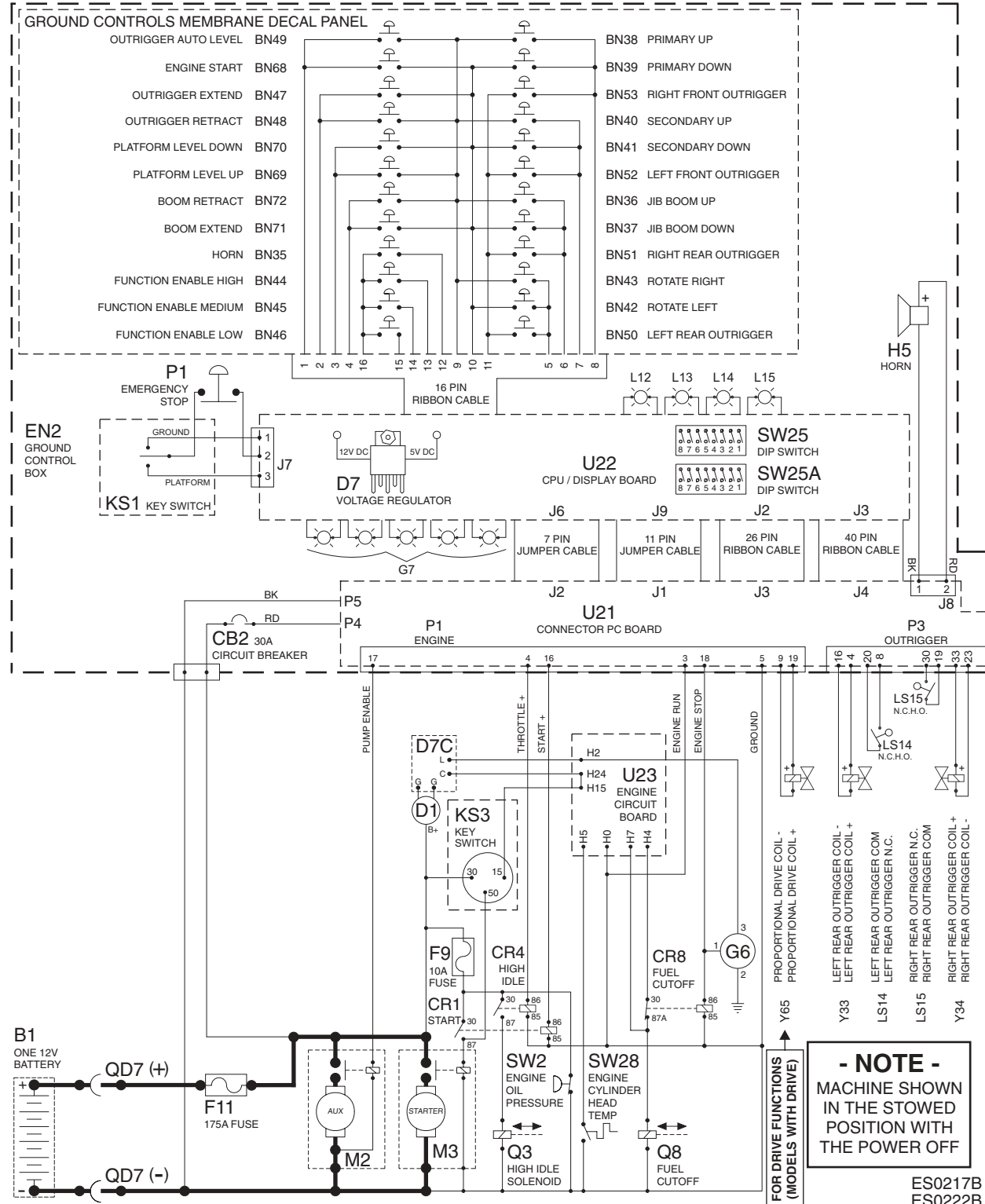


Electrical Schematic

Diesel Models
(before serial number T5000-91)

REV B

Part 1 of 2



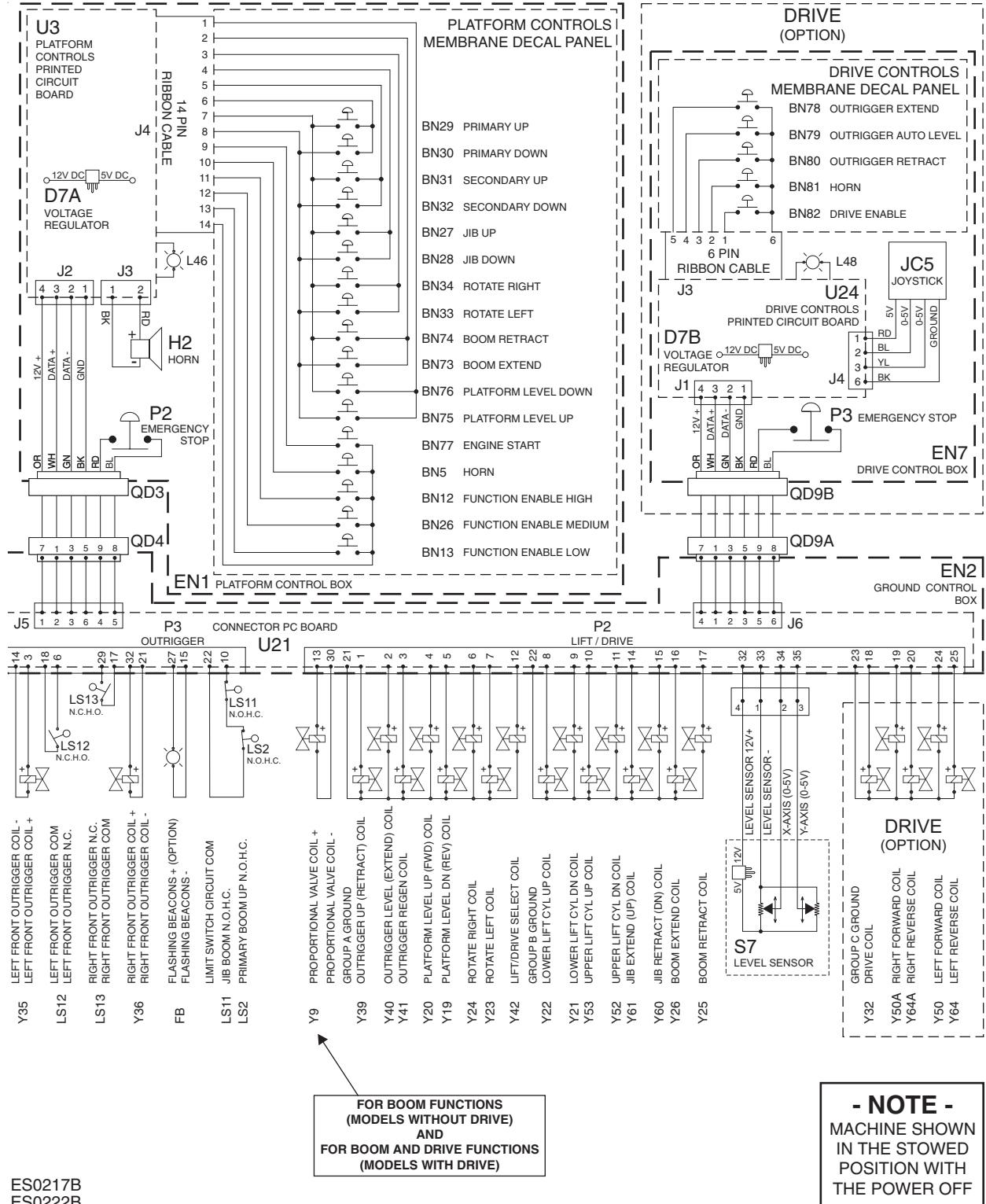
Electrical Schematic

Diesel Models

(before serial number T5000-91)

Part 2 of 2

REV B



ES0217B
ES0222B



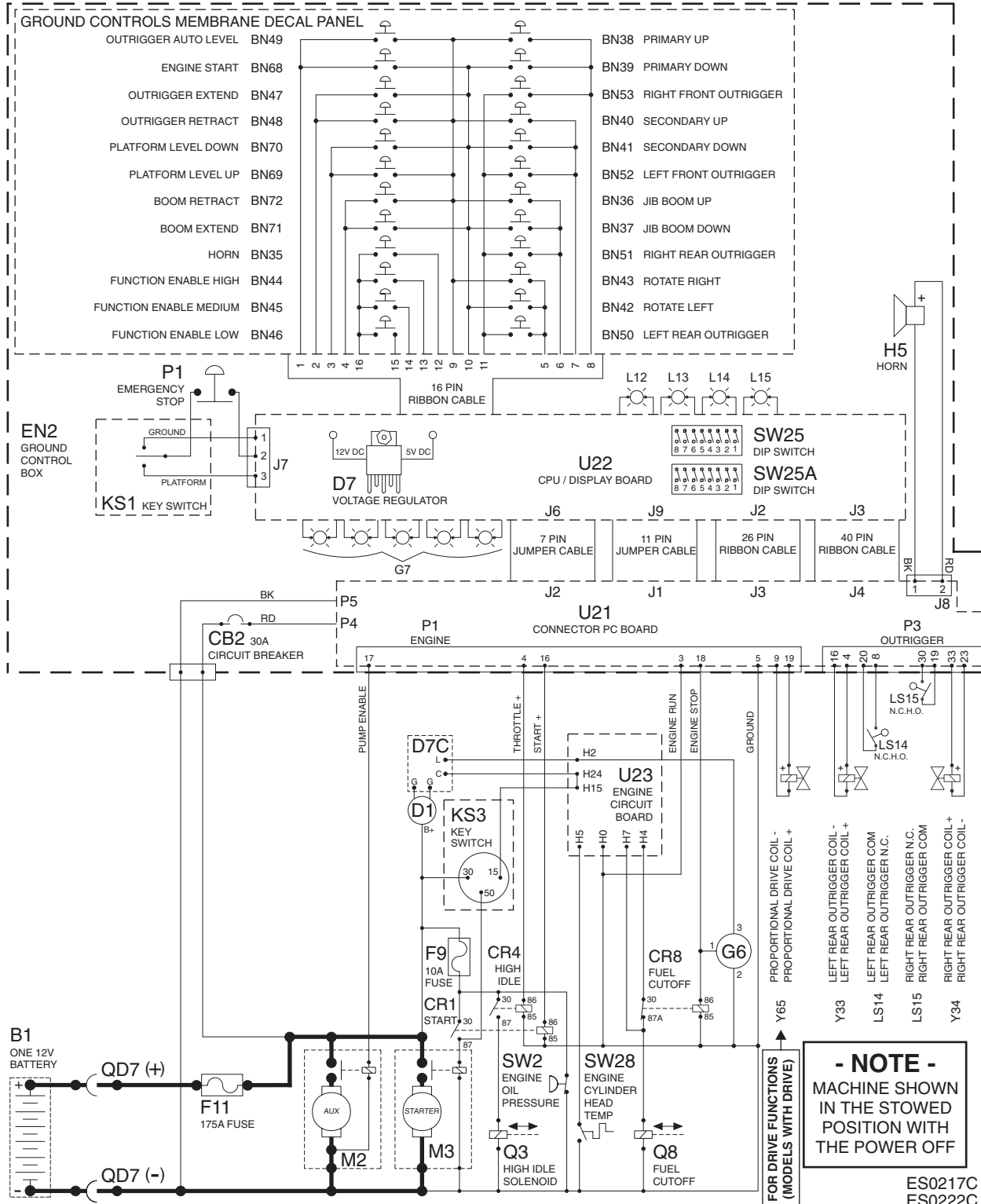
Electrical Schematic

Diesel Models

(from serial number T5000-91 to T5002-24)

REV A

Part 1 of 2



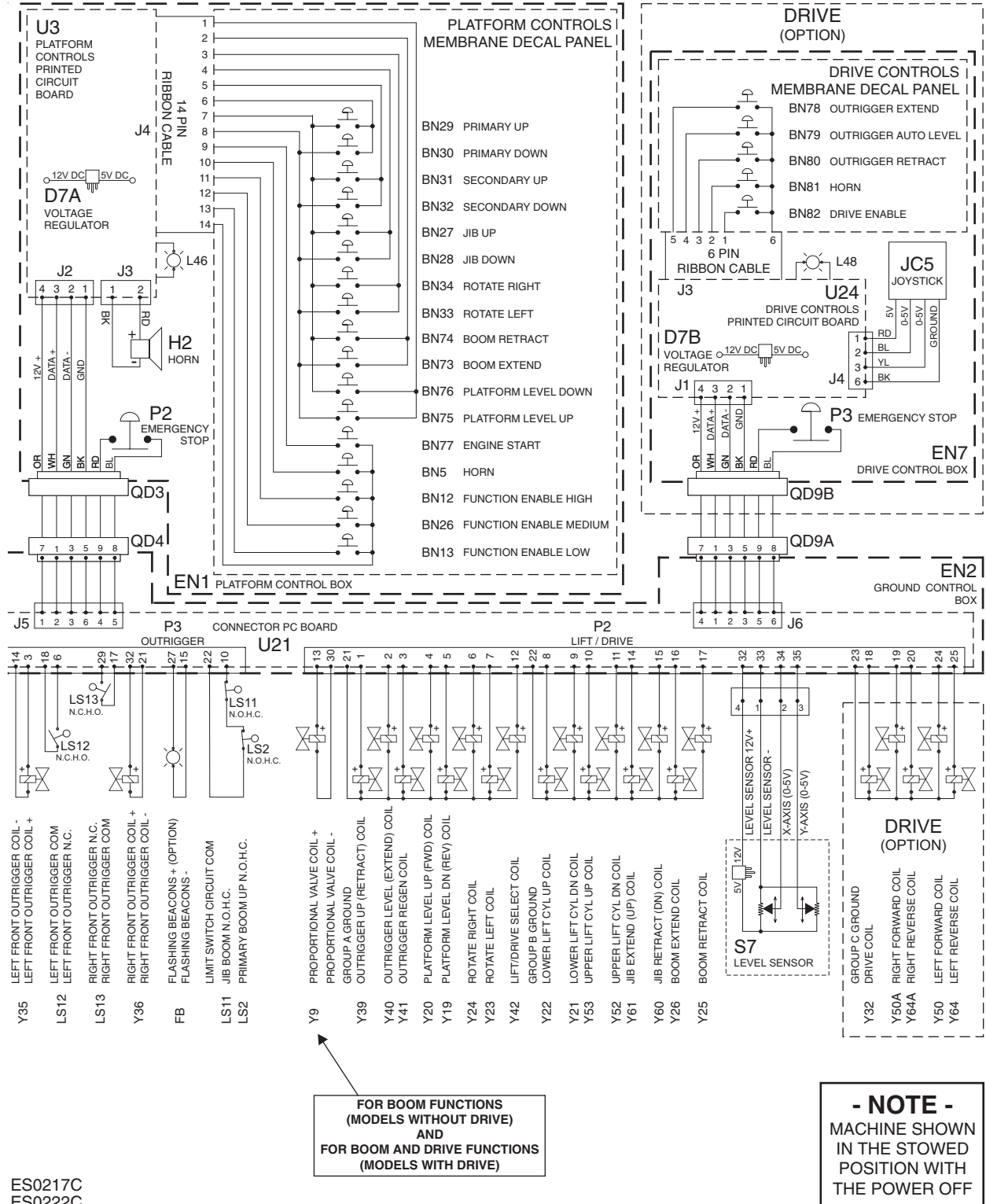
Electrical Schematic

Diesel Models

(from serial number T5000-91 to T5002-24)

Part 2 of 2

REV A



ES0217C
ES0222C



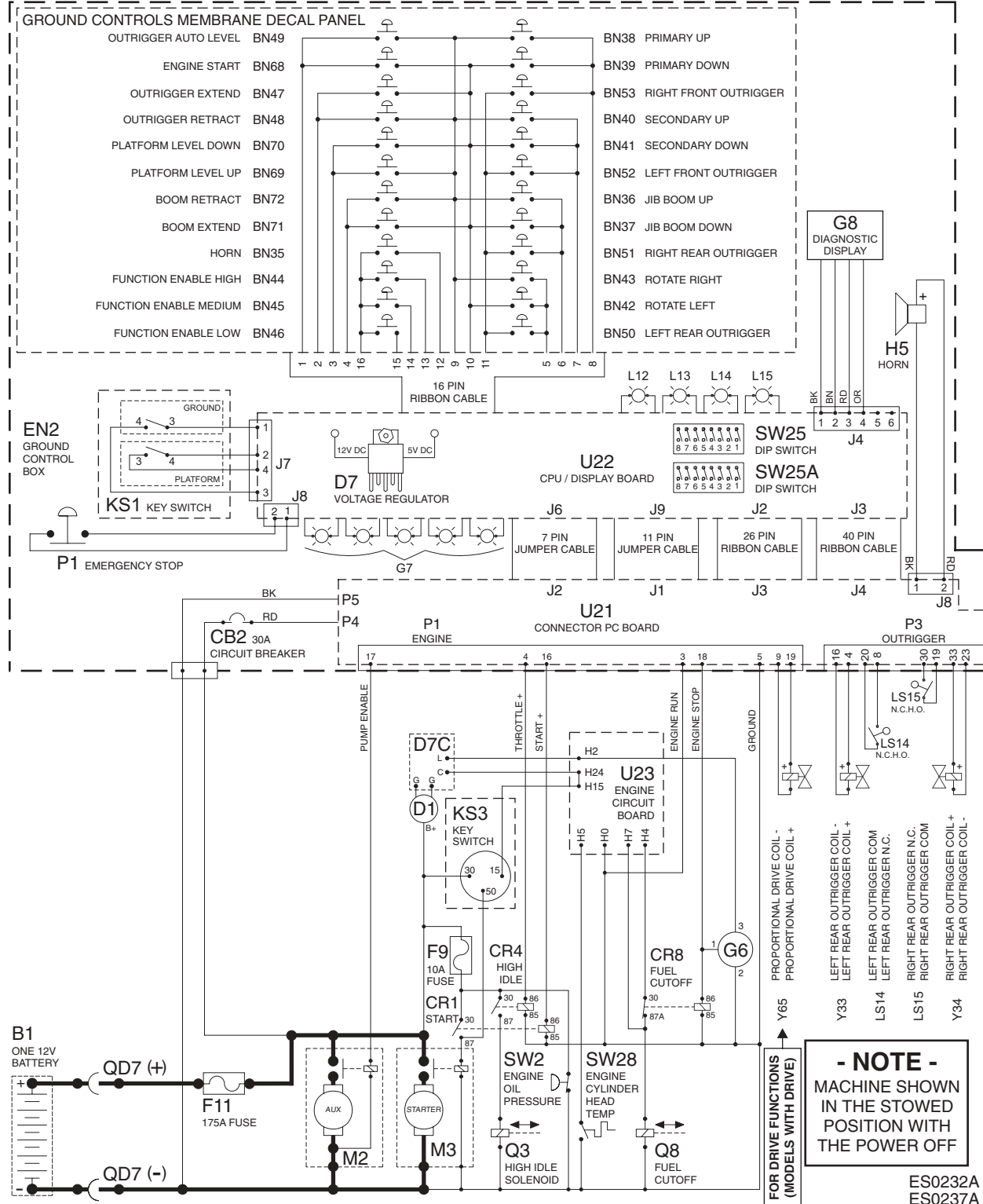
Electrical Schematic

Diesel Models

(from serial number T5002-25 to TMZ5003-228)

REV A

Part 1 of 2



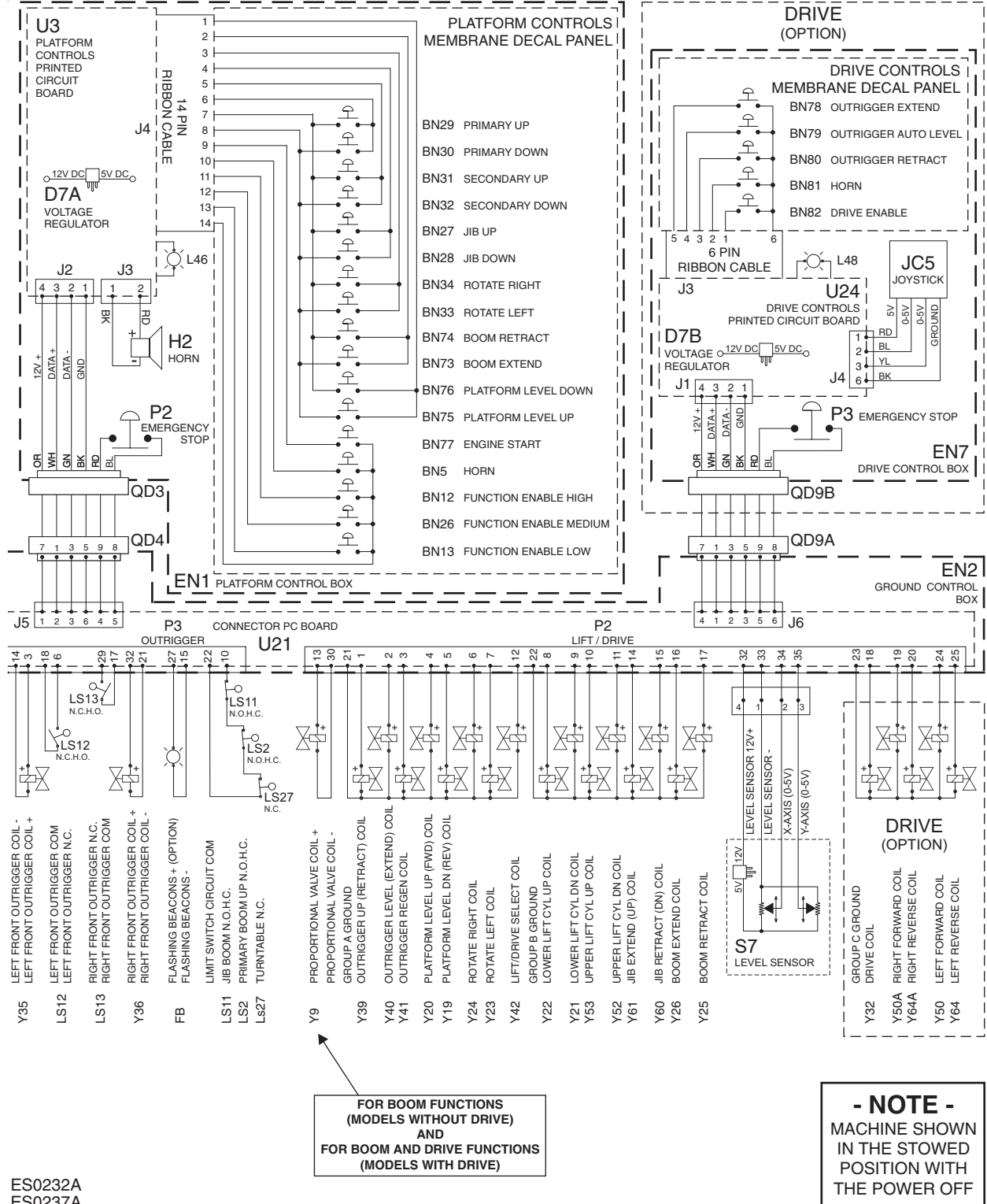
Electrical Schematic

Diesel Models

(from serial number T5002-25 to TMZ5003-228)

Part 2 of 2

REV A



ES0232A
ES0237A

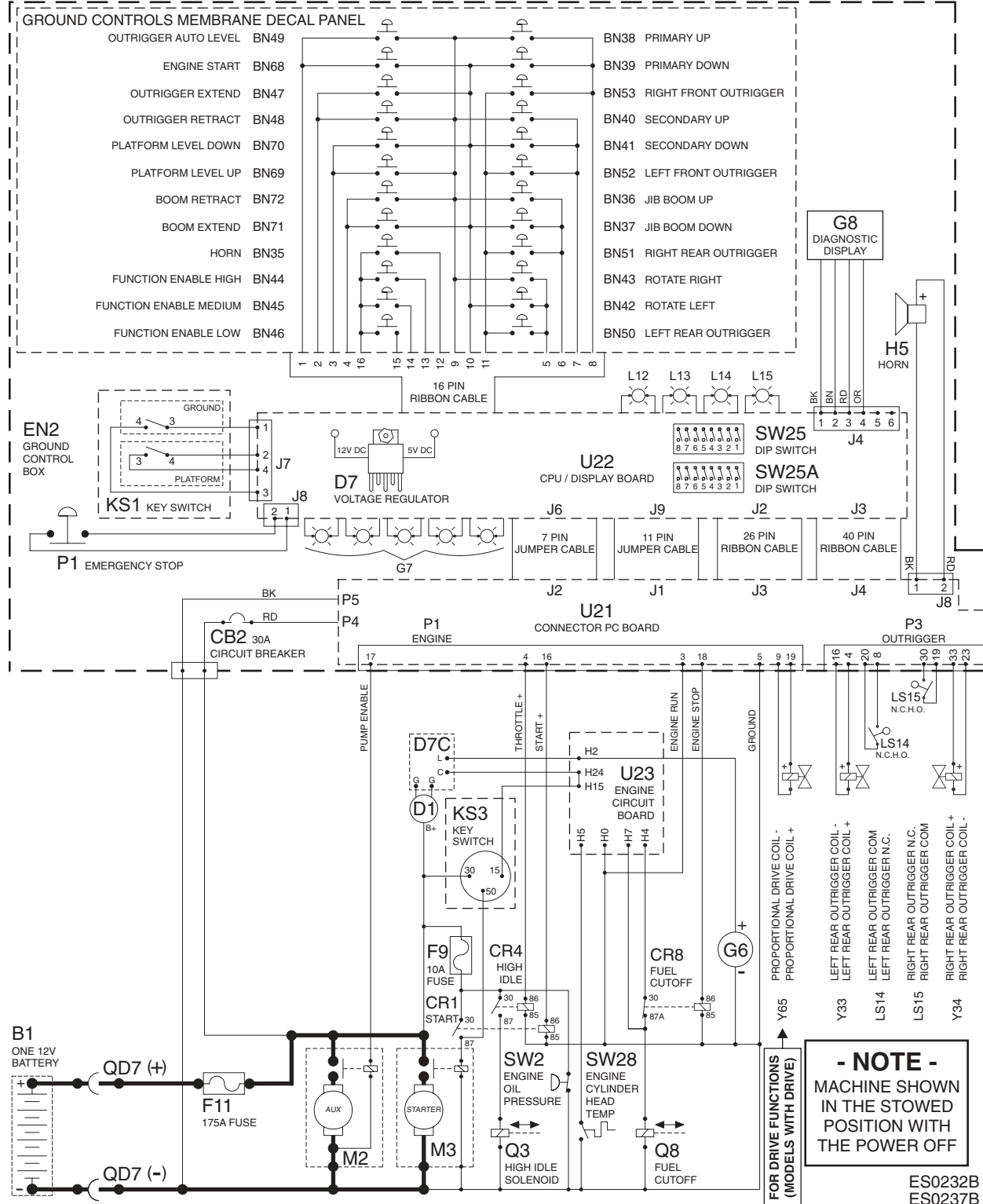


Electrical Schematic

Diesel Models
(after serial number TMZ5003-228)

REV A

Part 1 of 2



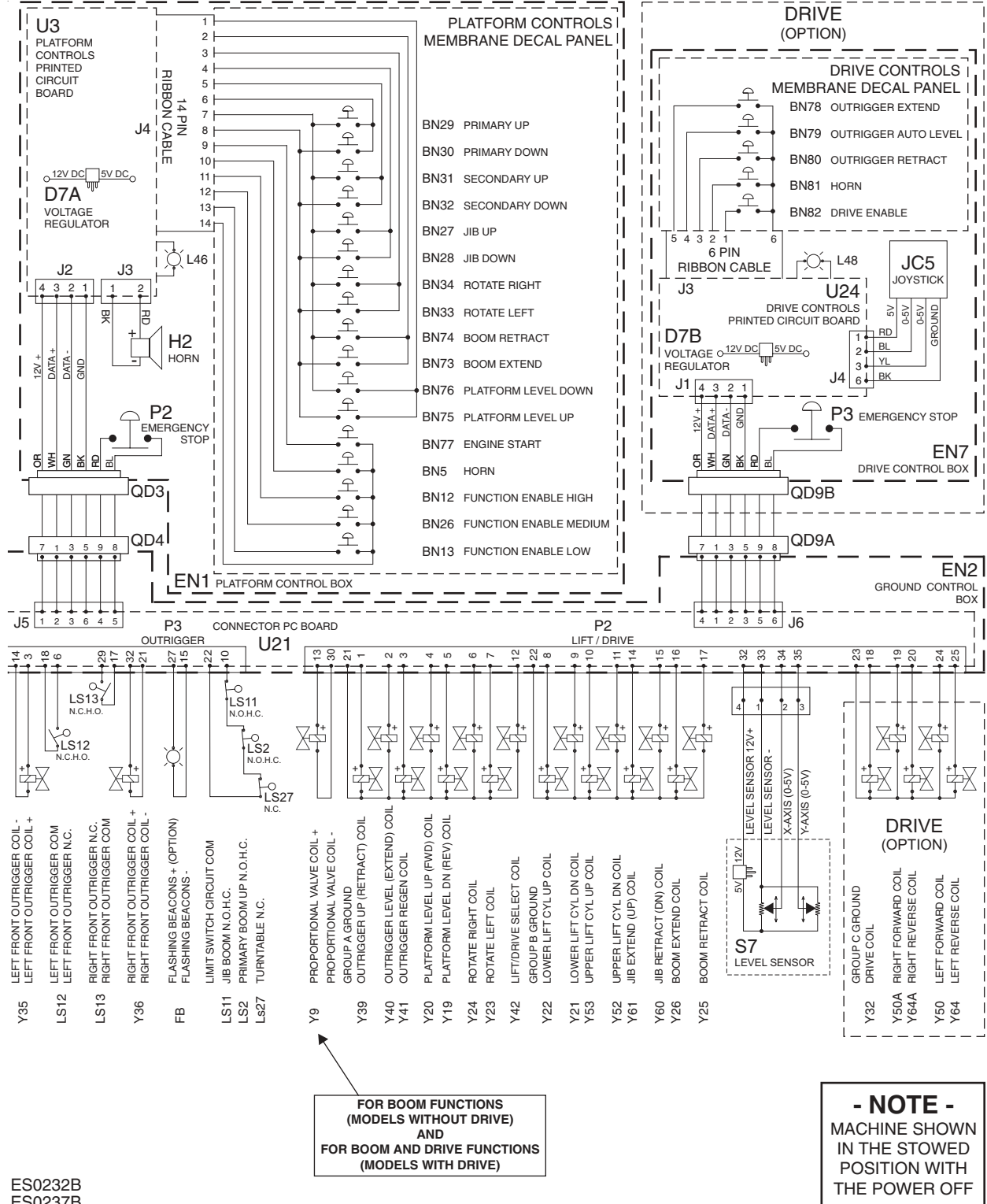
Electrical Schematic

Diesel Models

(after serial number TMZ5003-228)

Part 2 of 2

REV A



ES0232B
ES0237B

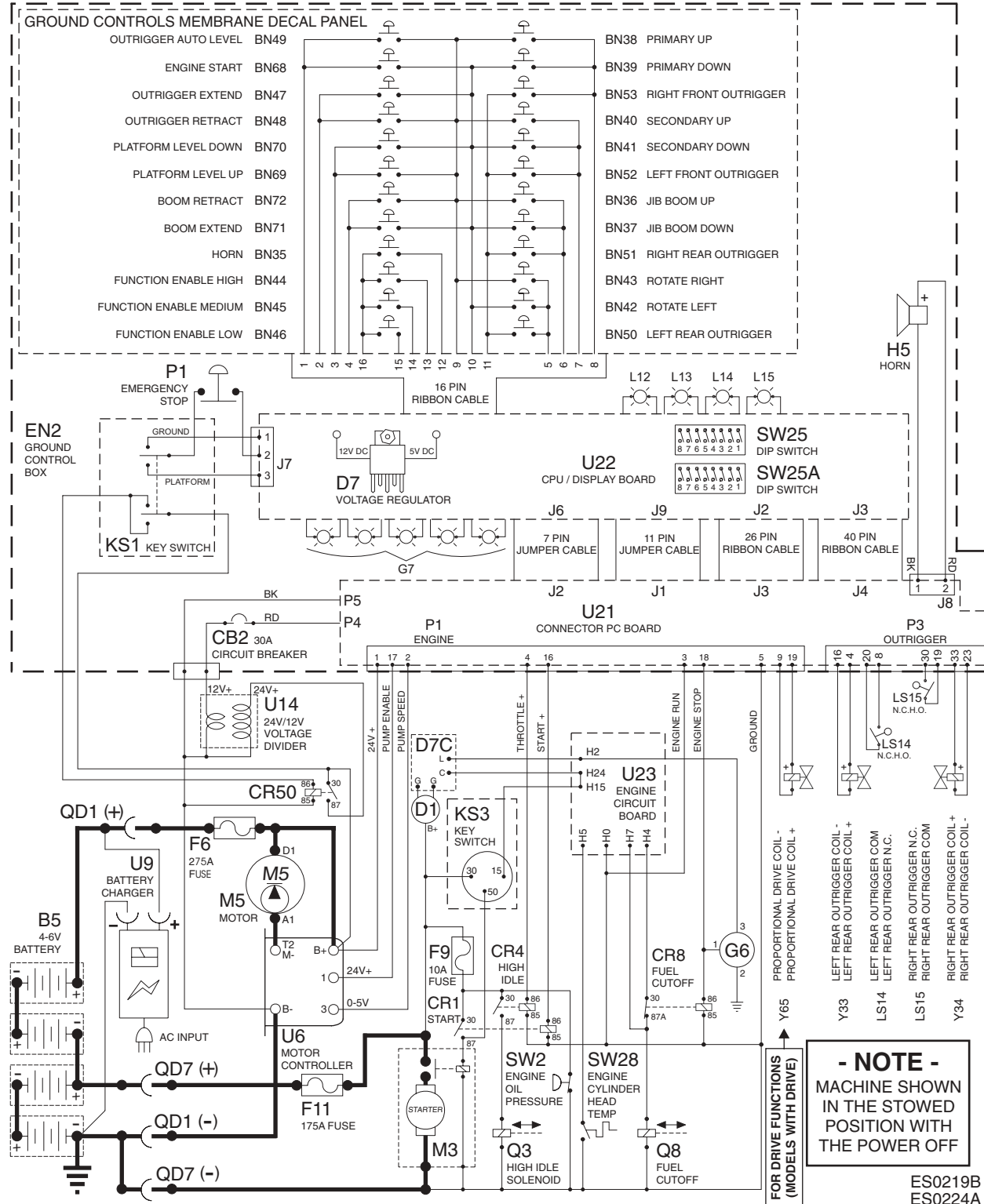


Electrical Schematic

Diesel Bi-Fuel Models
(before serial number T5000-91)

REV B

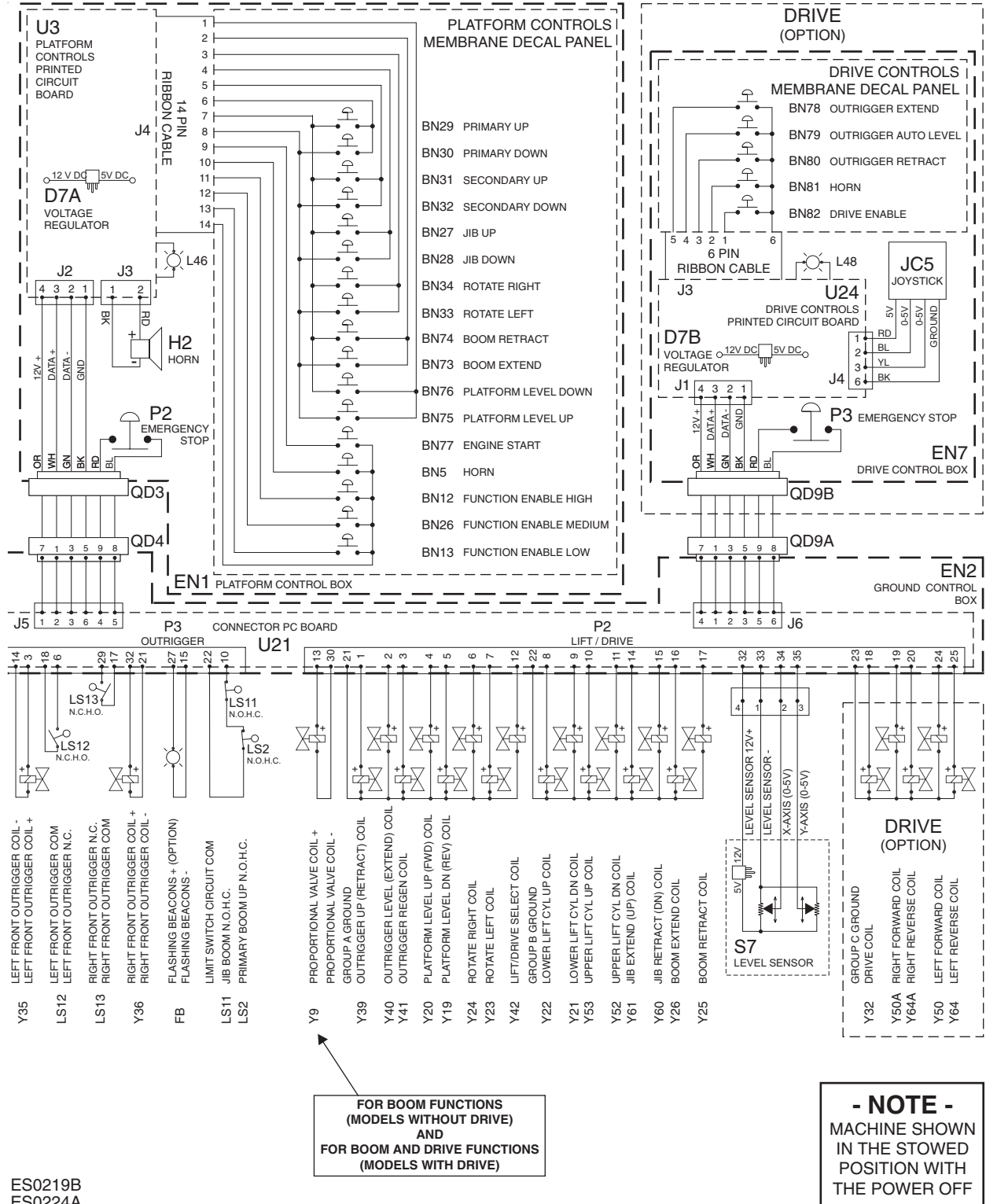
Part 1 of 2



Electrical Schematic

Diesel Bi-Fuel Models
(before serial number T5000-91)
Part 2 of 2

REV B



ES0219B
ES0224A

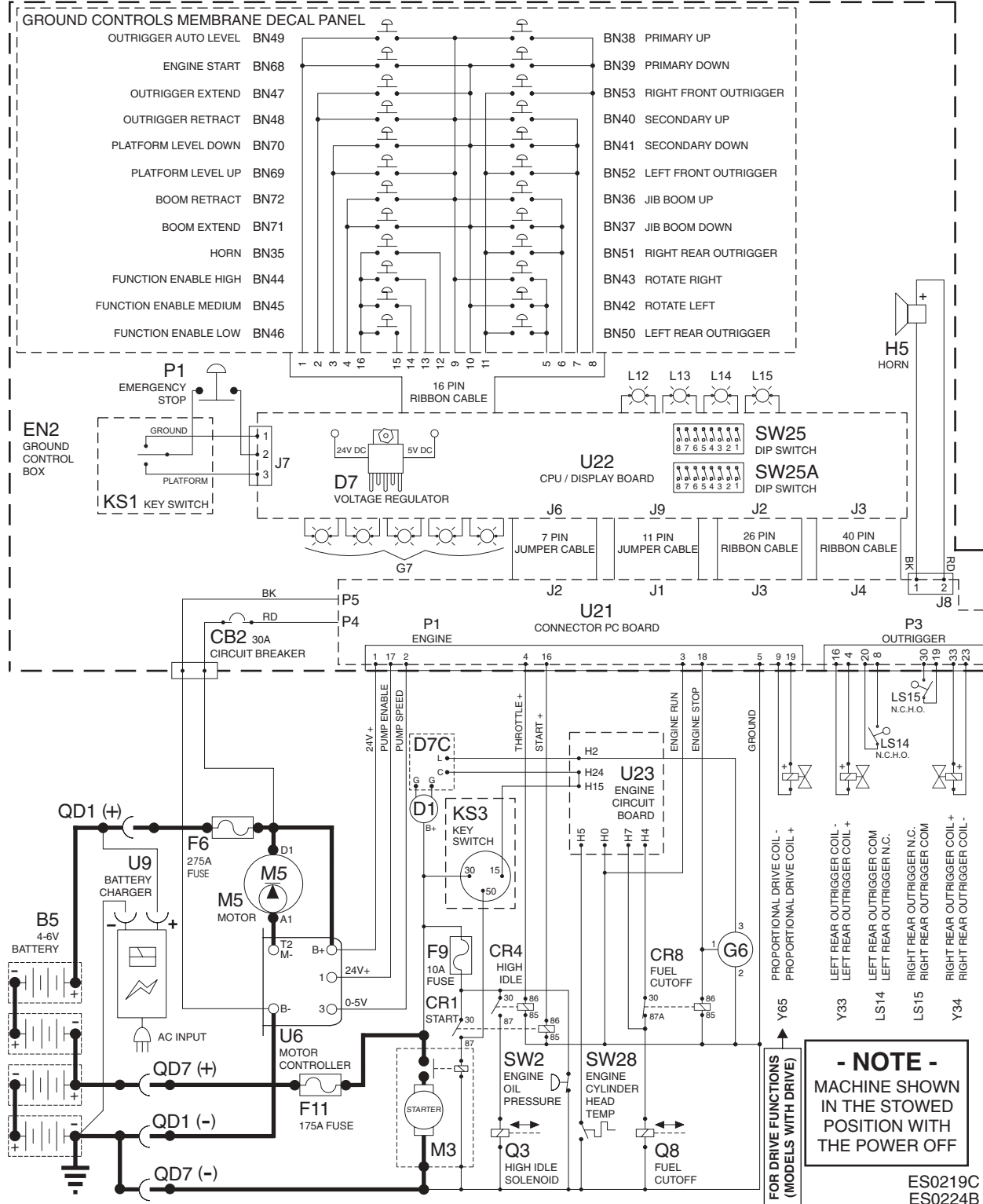


Electrical Schematic

Diesel Bi-Fuel Models
(from serial number T5000-91 to T5002-24)

REV A

Part 1 of 2



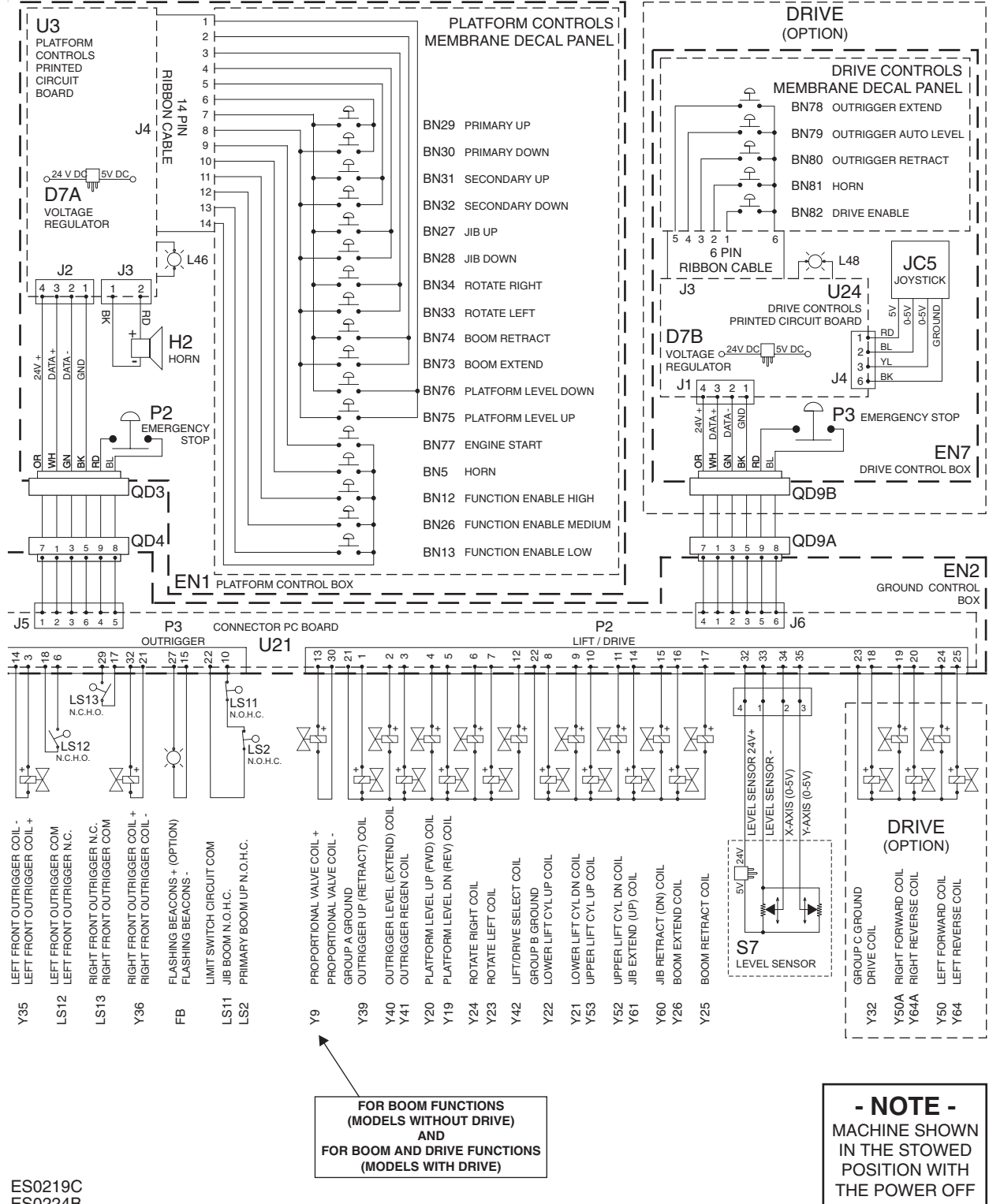
Electrical Schematic

Diesel Bi-Fuel Models

(from serial number T5000-91 to T5002-24)

Part 2 of 2

REV A



FOR BOOM FUNCTIONS (MODELS WITHOUT DRIVE) AND FOR BOOM AND DRIVE FUNCTIONS (MODELS WITH DRIVE)

- NOTE -
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

ES0219C
ES0224B

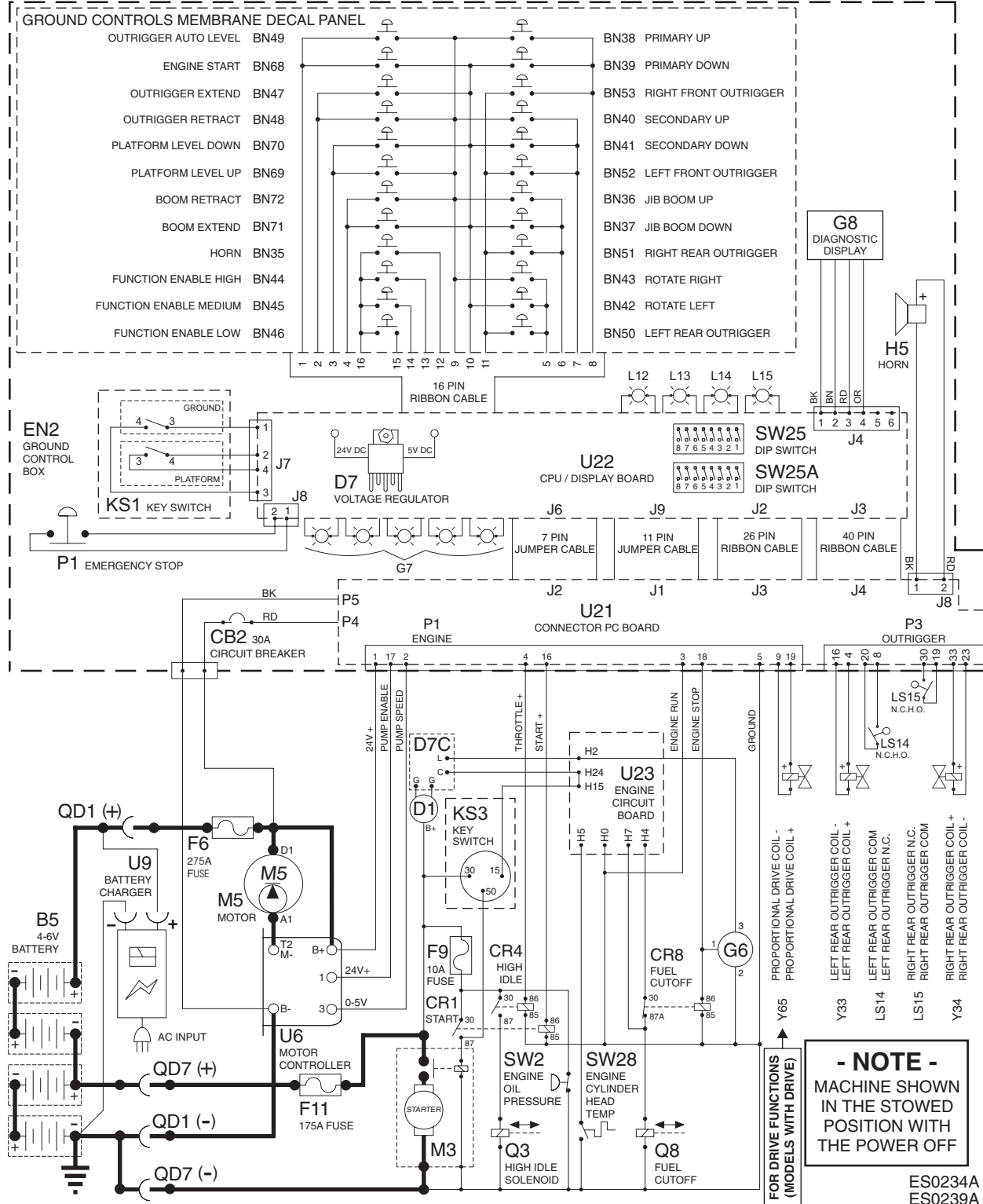


Electrical Schematic

Diesel Bi-Fuel Models
(from serial number T5002-25 to TMZ5003-228)

REV A

Part 1 of 2



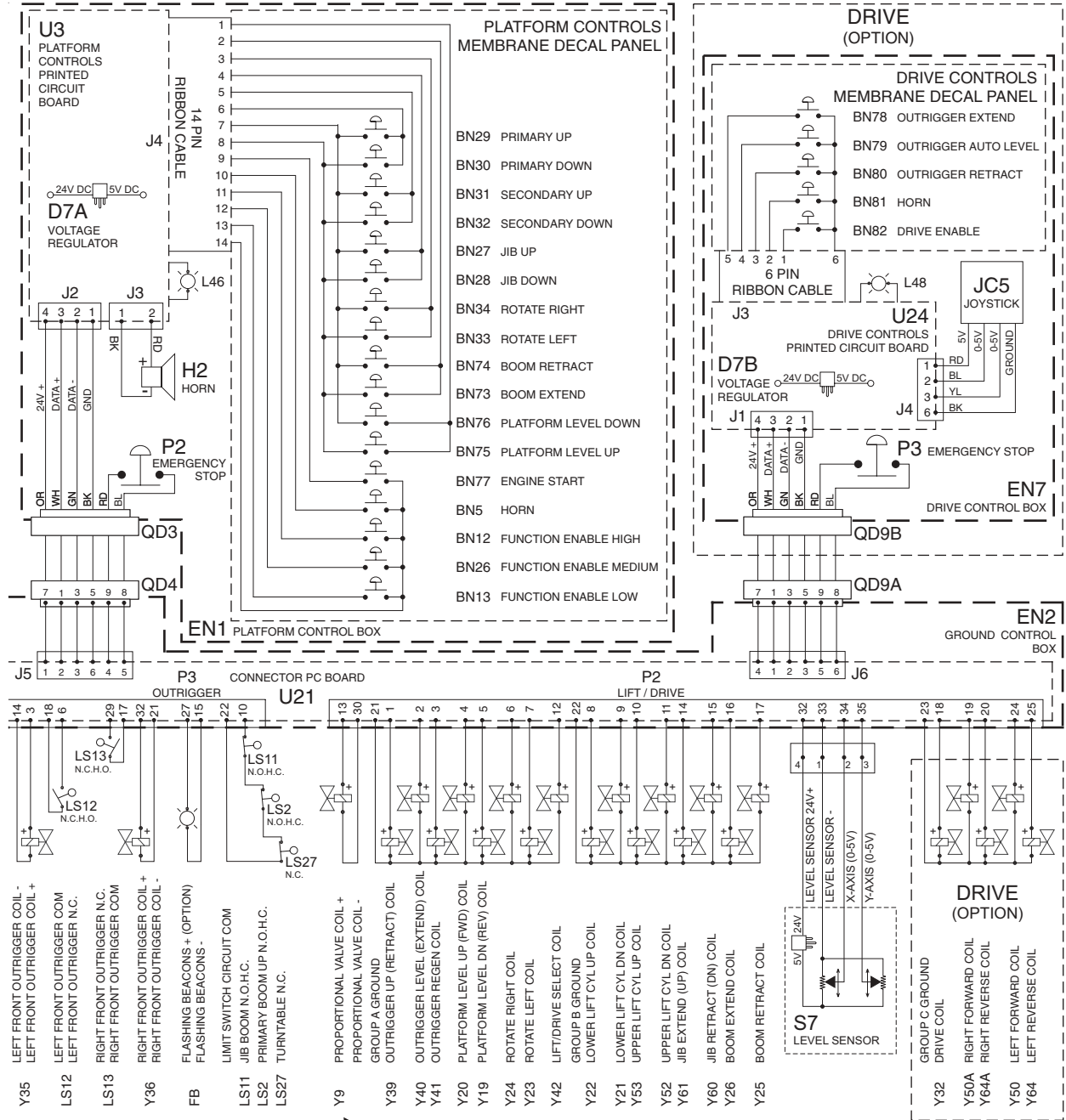
Electrical Schematic

Diesel Bi-Fuel Models

(from serial number T5002-25 to TMZ5003-228)

Part 2 of 2

REV A



FOR BOOM FUNCTIONS (MODELS WITHOUT DRIVE) AND FOR BOOM AND DRIVE FUNCTIONS (MODELS WITH DRIVE)

- NOTE -
MACHINE SHOWN IN THE STOWED POSITION WITH THE POWER OFF

ES0234A
ES0239A

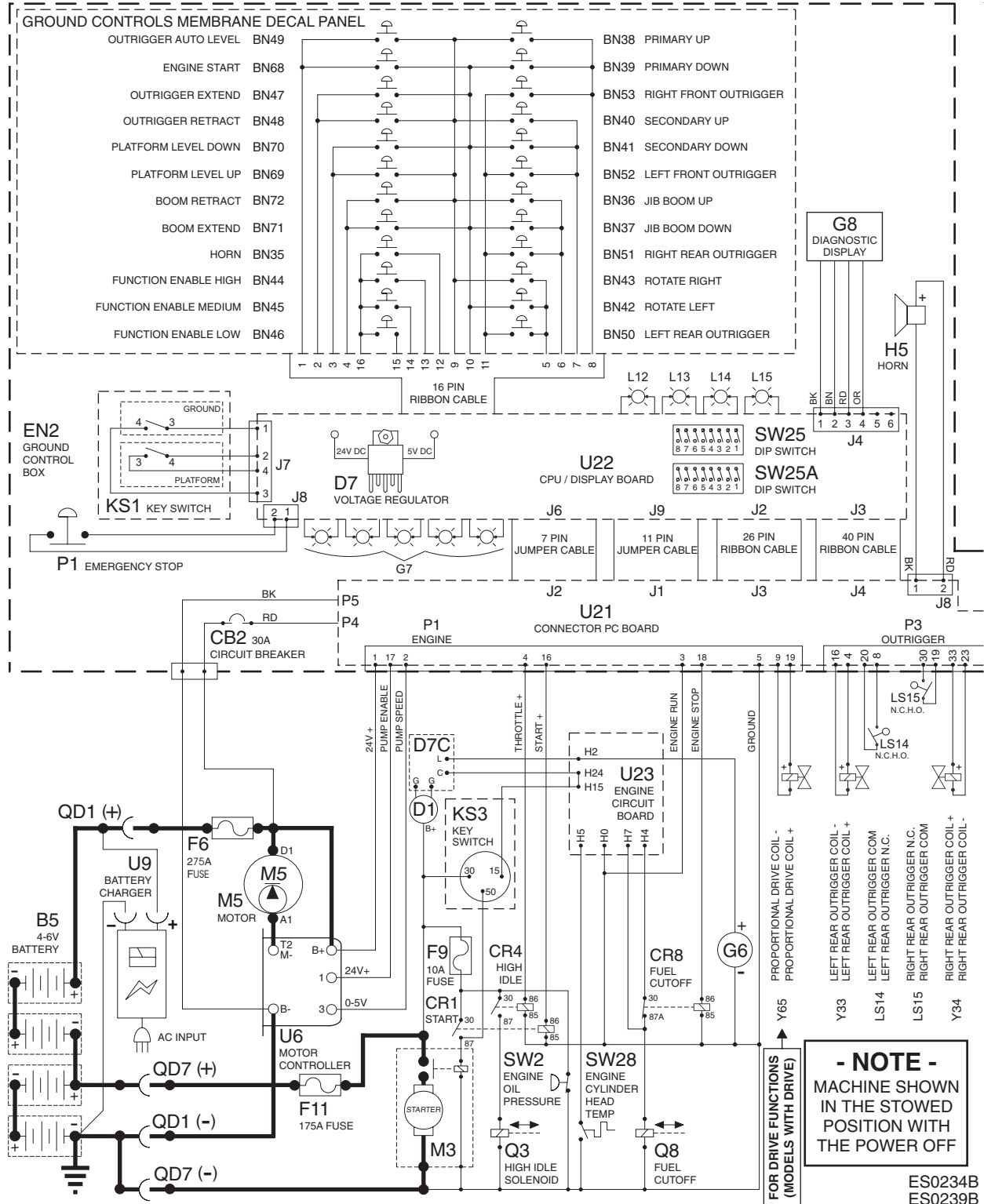


Electrical Schematic

Diesel Bi-Fuel Models
(after serial number TMZ5003-228)

REV A

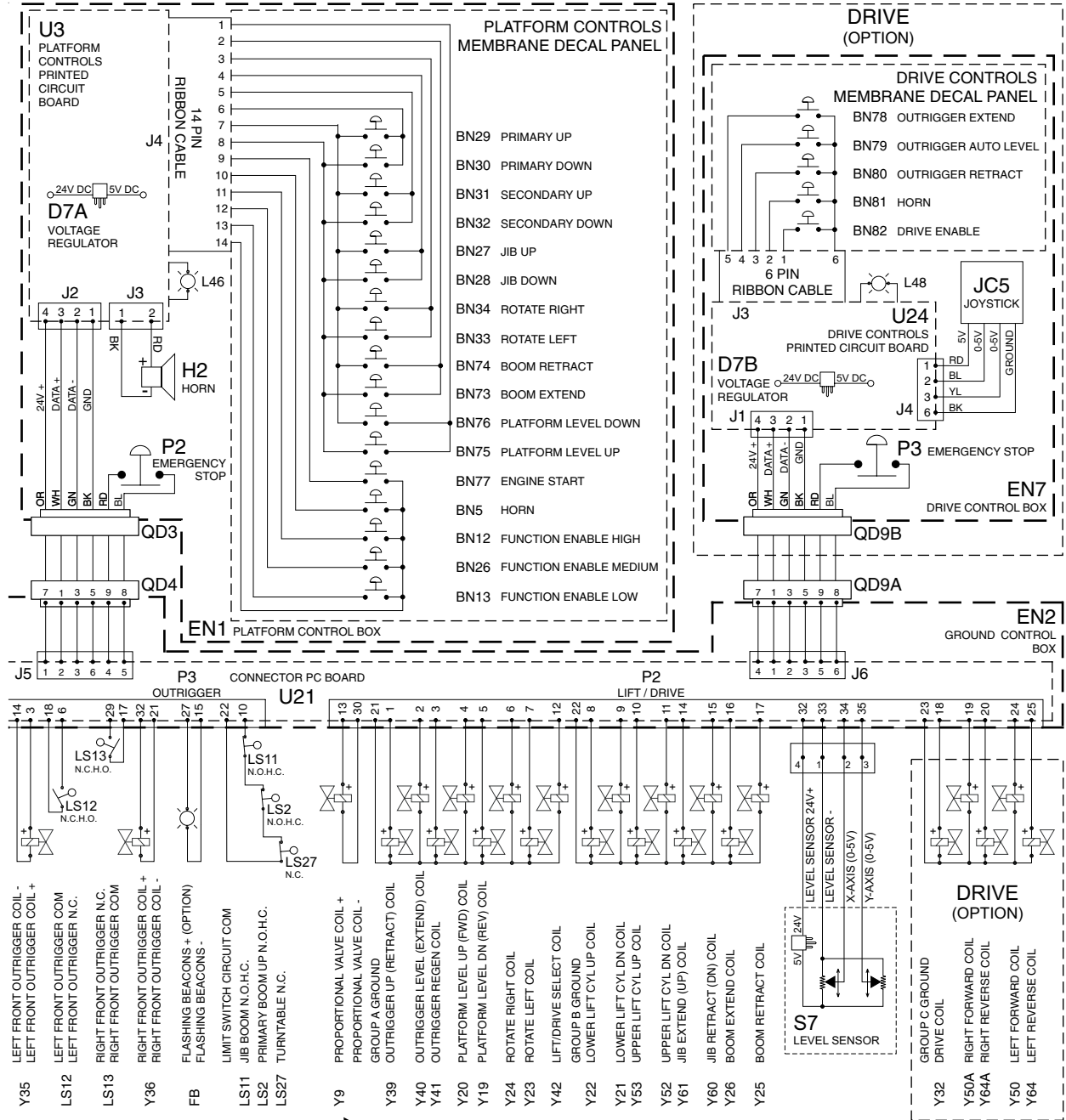
Part 1 of 2



REV A

Electrical Schematic

Diesel Bi-Fuel Models
(after serial number TMZ5003-228)
Part 2 of 2

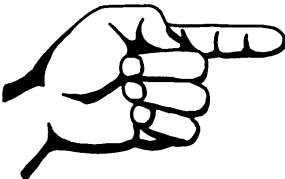


FOR BOOM FUNCTIONS
(MODELS WITHOUT DRIVE)
AND
FOR BOOM AND DRIVE FUNCTIONS
(MODELS WITH DRIVE)

- NOTE -
MACHINE SHOWN
IN THE STOWED
POSITION WITH
THE POWER OFF

ES0234B
ES0239B



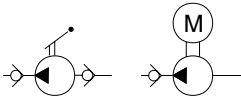


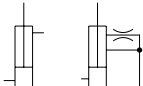
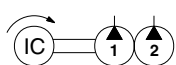


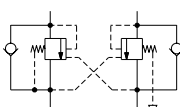
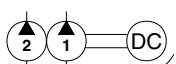


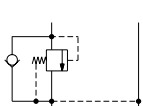



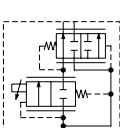

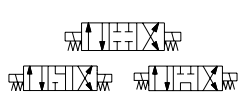







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Hydraulic Symbols Legend

REV B

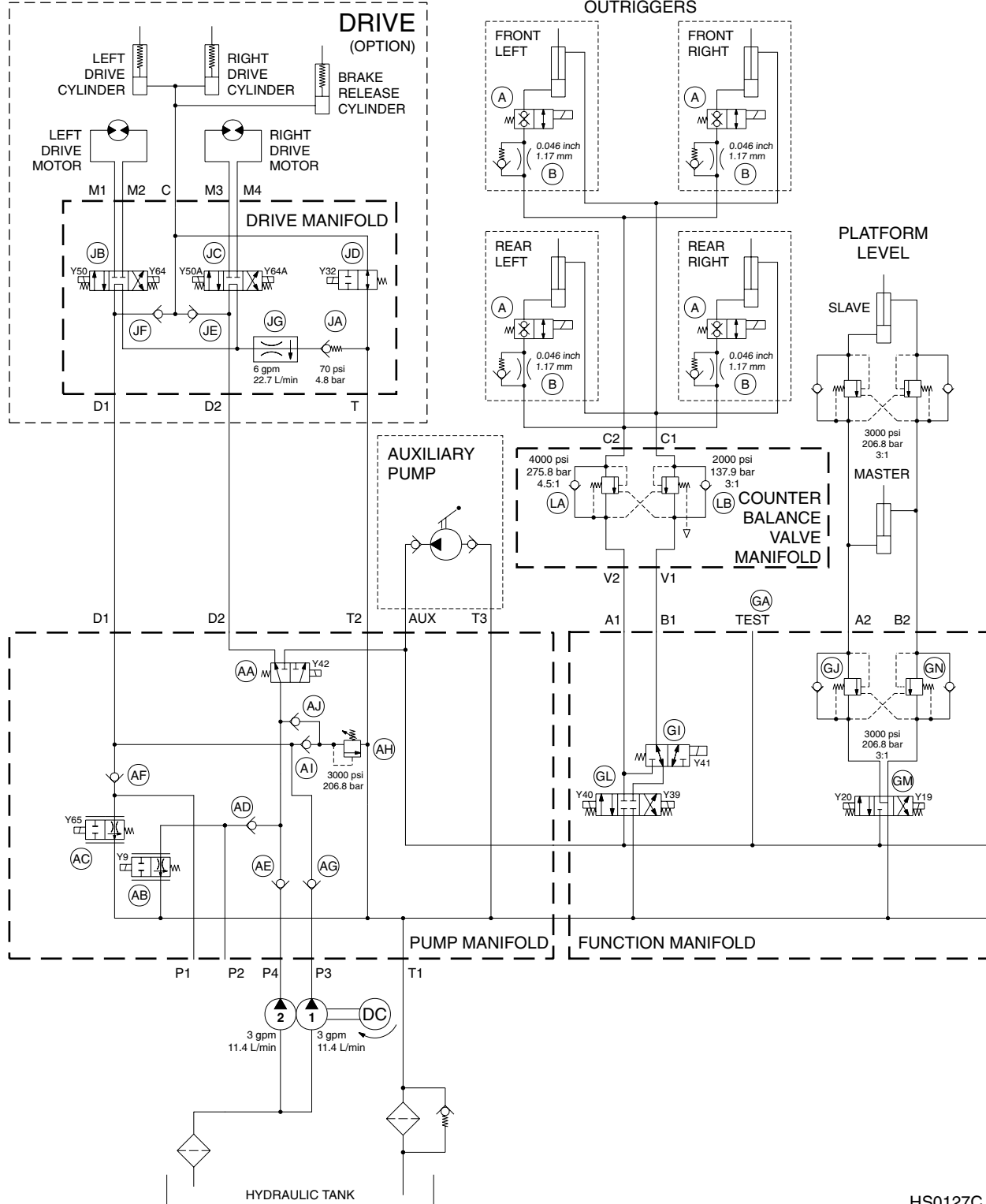
 <p>Filter</p>	 <p>Single acting cylinder</p>	 <p>Auxiliary pump/power unit</p>	 <p>Bi-directional motor</p>
 <p>Check valve</p>	 <p>Dual acting cylinder</p>	 <p>Engine powered pump(s)</p>	 <p>Brake</p>
 <p>Pilot-operated check valve</p>	 <p>Counterbalance valve</p>	 <p>Battery powered pump(s)</p>	 <p>Shuttle valve</p>
 <p>Relief valve</p>	 <p>Counterbalance valve</p>	 <p>Orifice with size</p>	 <p>Priority flow regulator</p>
 <p>Proportional valve</p>	 <p>Proportional valve</p>	 <p>Solenoid operated 2 position 3 way directional valve</p>	 <p>Solenoid operated 3 position 4 way directional valve</p>
 <p>Solenoid operated 2 position 2 way directional valve</p>	 <p>Solenoid operated 2 position 3 way directional valve with manual over ride</p>	 <p>Solenoid operated 3 position 4 way directional valve with manual over ride</p>	

Hydraulic Schematic

DC Models with Drive Option
(before serial number T5000-91)

REV B

Part 1 of 2



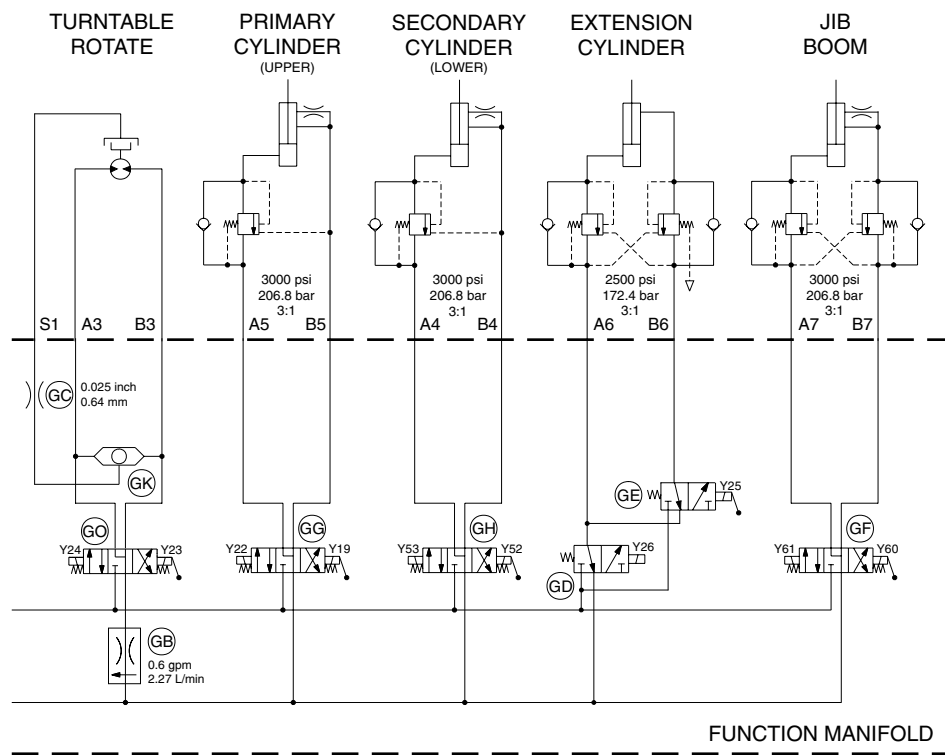
HS0127C



REV B

Hydraulic Schematic

DC Models with Drive Option
(before serial number T5000-91)
Part 2 of 2

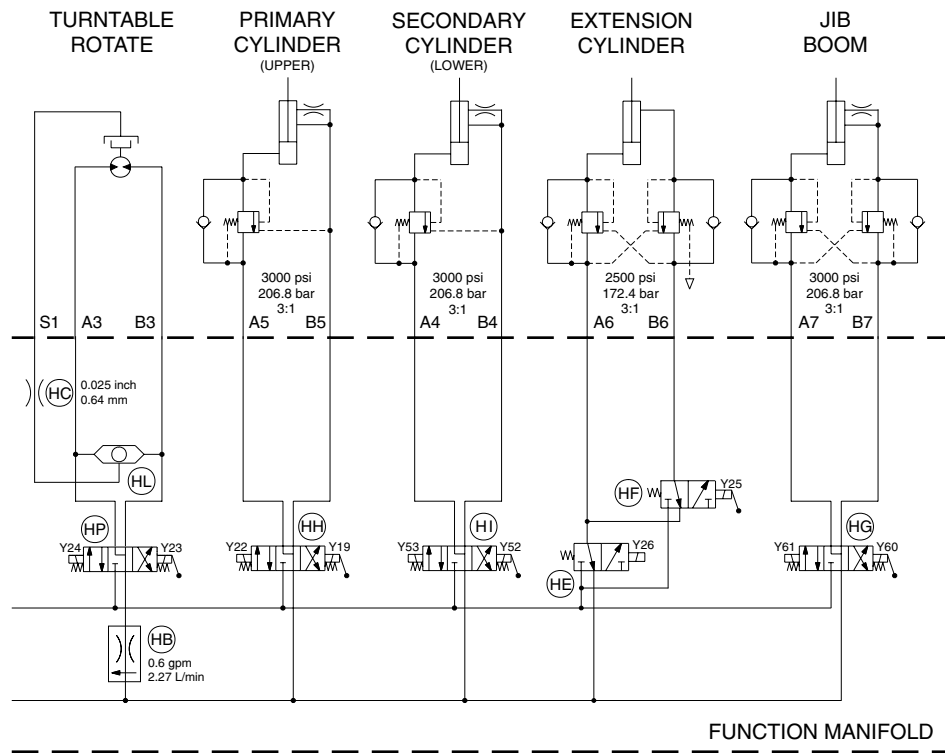


HS0127C

REV A

Hydraulic Schematic

DC Models with Drive Option
(after serial number T5000-90)
Part 2 of 2

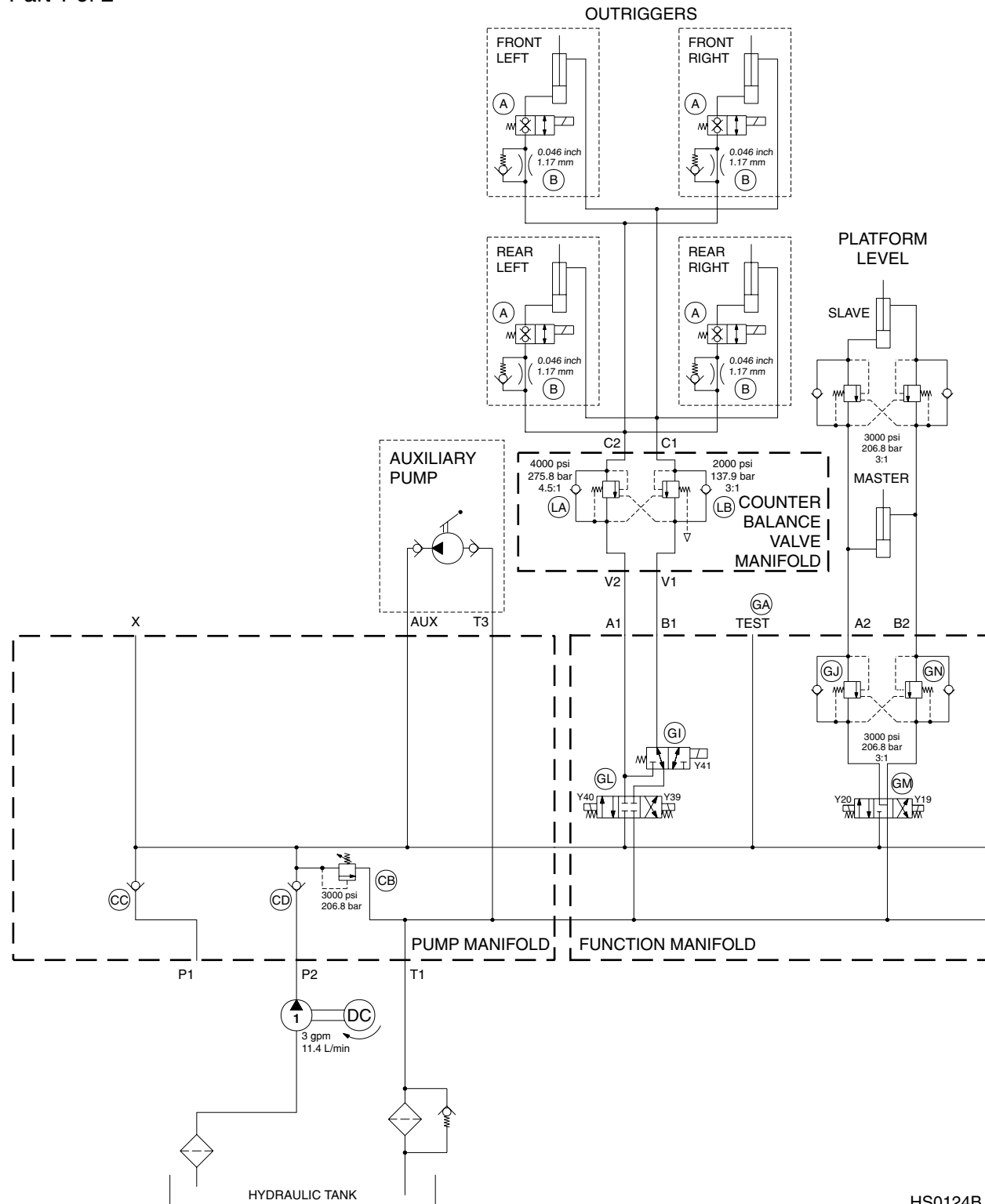


HS0137D

Hydraulic Schematic

DC Models without Drive Option
(before serial number T5000-91)
Part 1 of 2

REV B



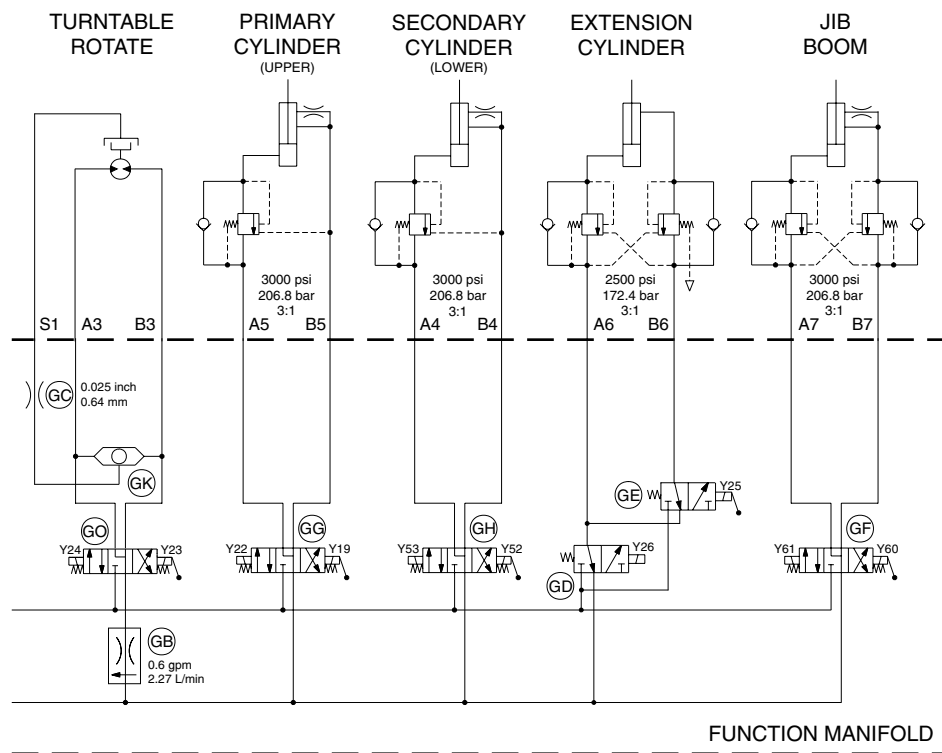
HS0124B



REV B

Hydraulic Schematic

DC Models without Drive Option
(before serial number T5000-91)
Part 2 of 2

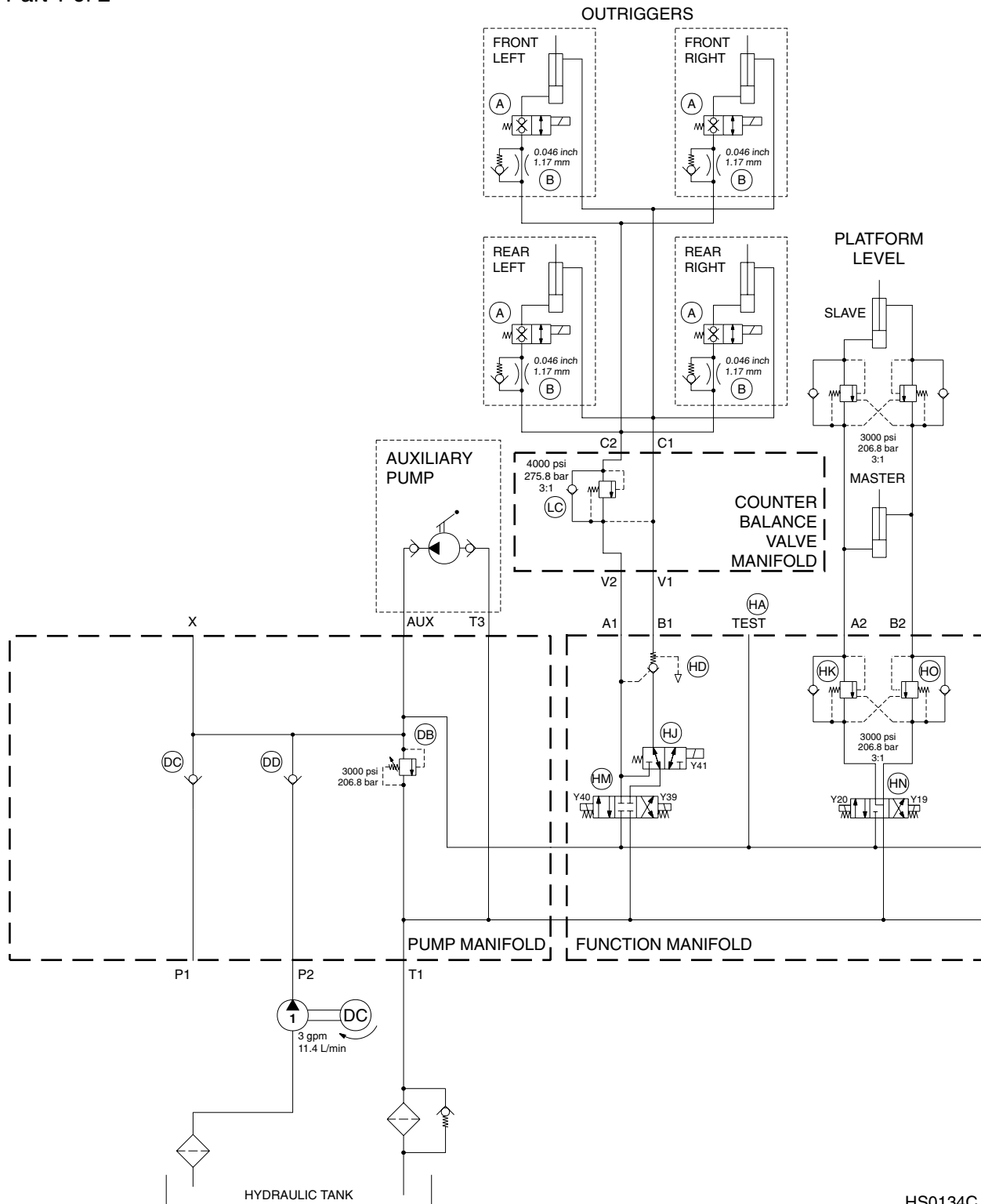


HS0124B

Hydraulic Schematic

DC Models without Drive Option
 (after serial number T5000-90)
 Part 1 of 2

REV A



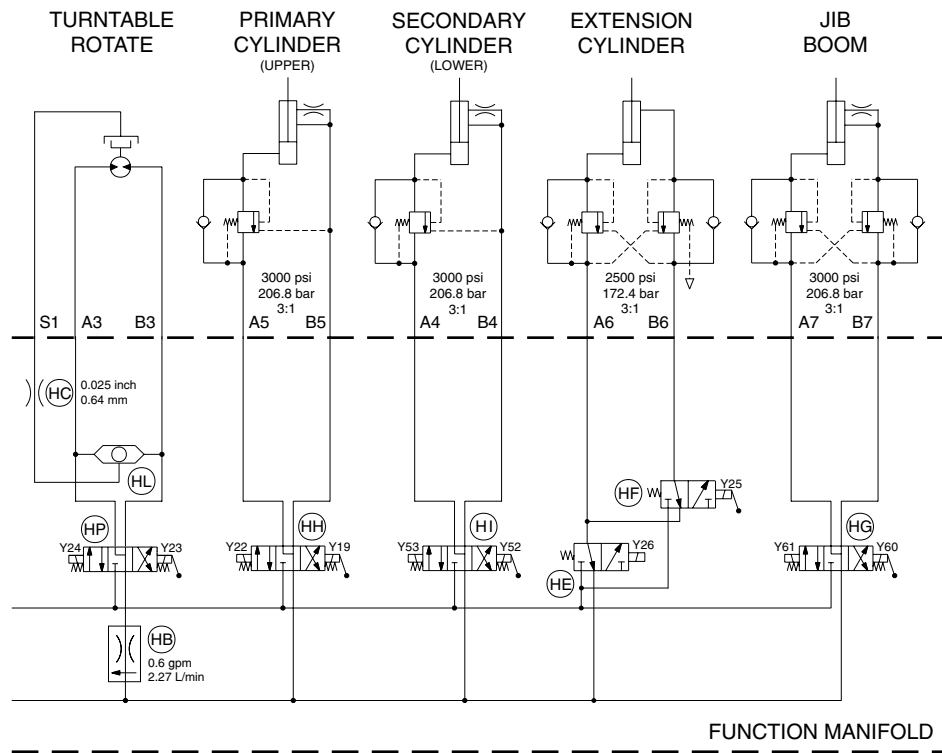
HS0134C



REV A

Hydraulic Schematic

DC Models without Drive Option
(after serial number T5000-90)
Part 2 of 2



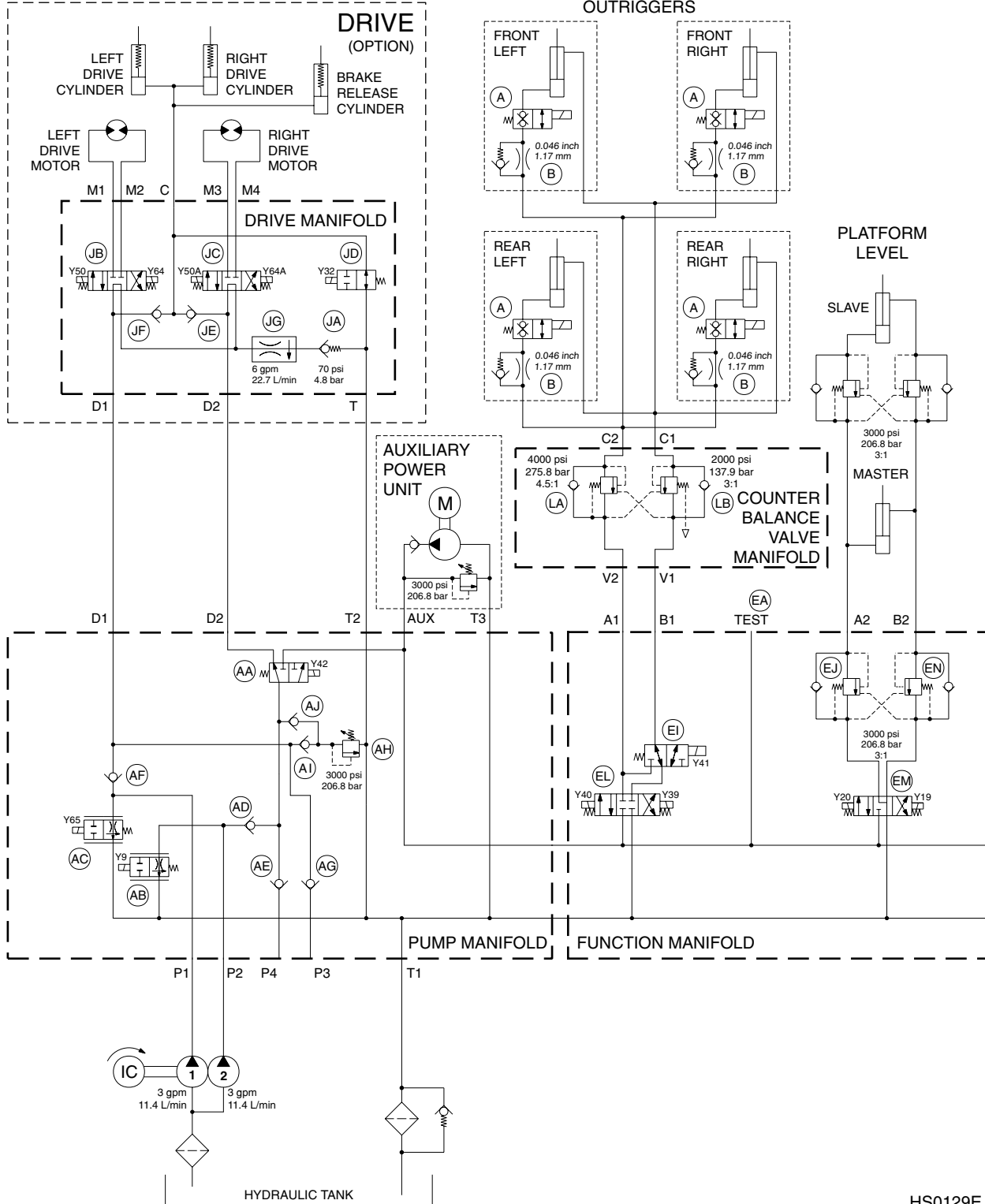
HS0134C

Hydraulic Schematic

Engine-only Models with Drive Option
(before serial number T5000-91)

REV B

Part 1 of 2



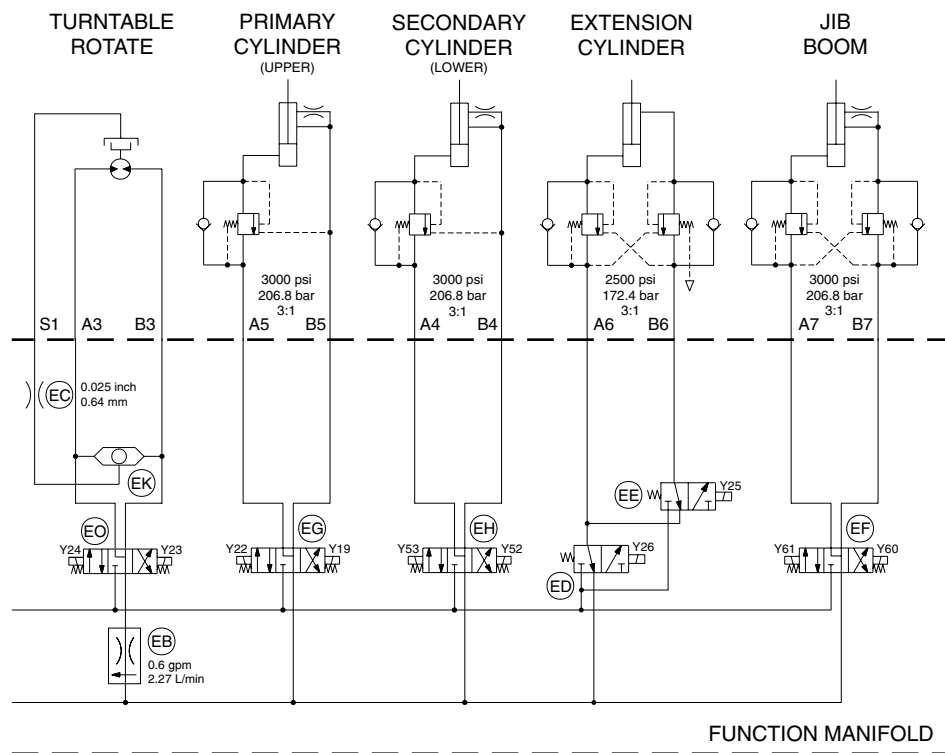
HS0129E



REV B

Hydraulic Schematic

Engine-only Models with Drive Option
(before serial number T5000-91)
Part 2 of 2



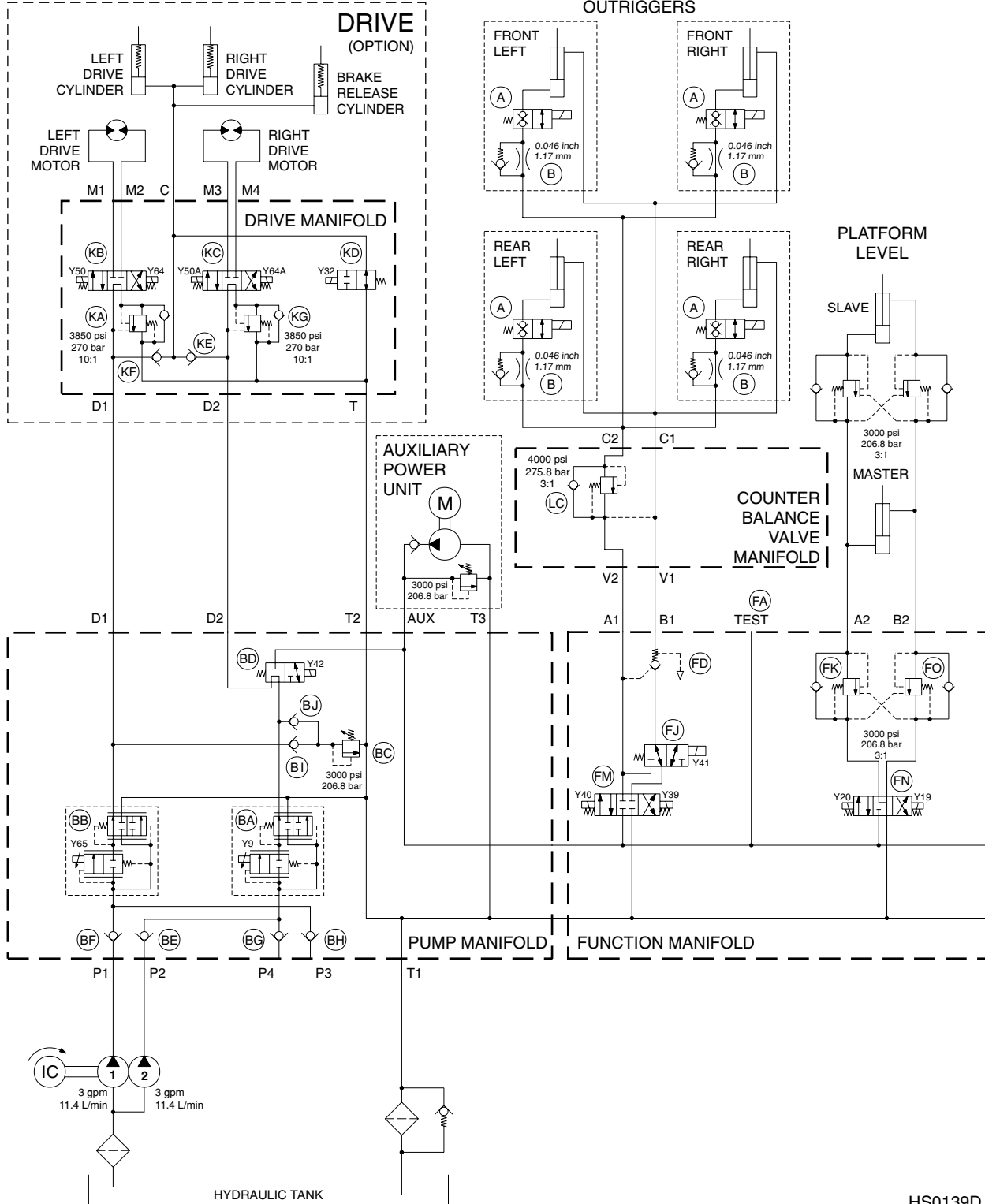
HS0129E

Hydraulic Schematic

Engine-only Models with Drive Option
(after serial number T5000-90)

REV A

Part 1 of 2



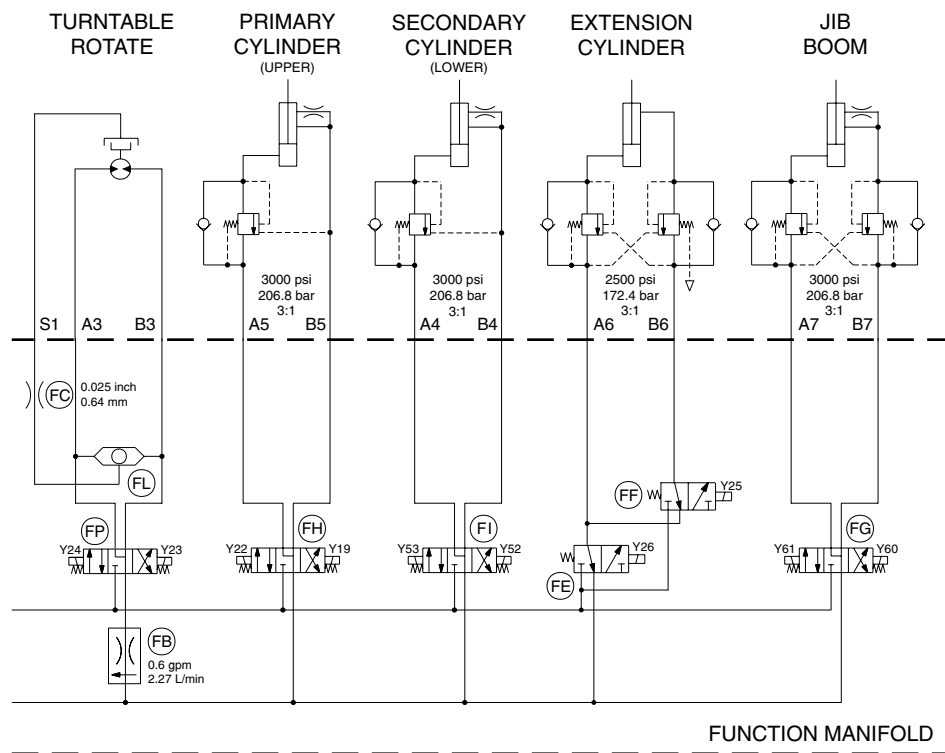
HS0139D



REV A

Hydraulic Schematic

Engine-only Models with Drive Option
(after serial number T5000-90)
Part 2 of 2

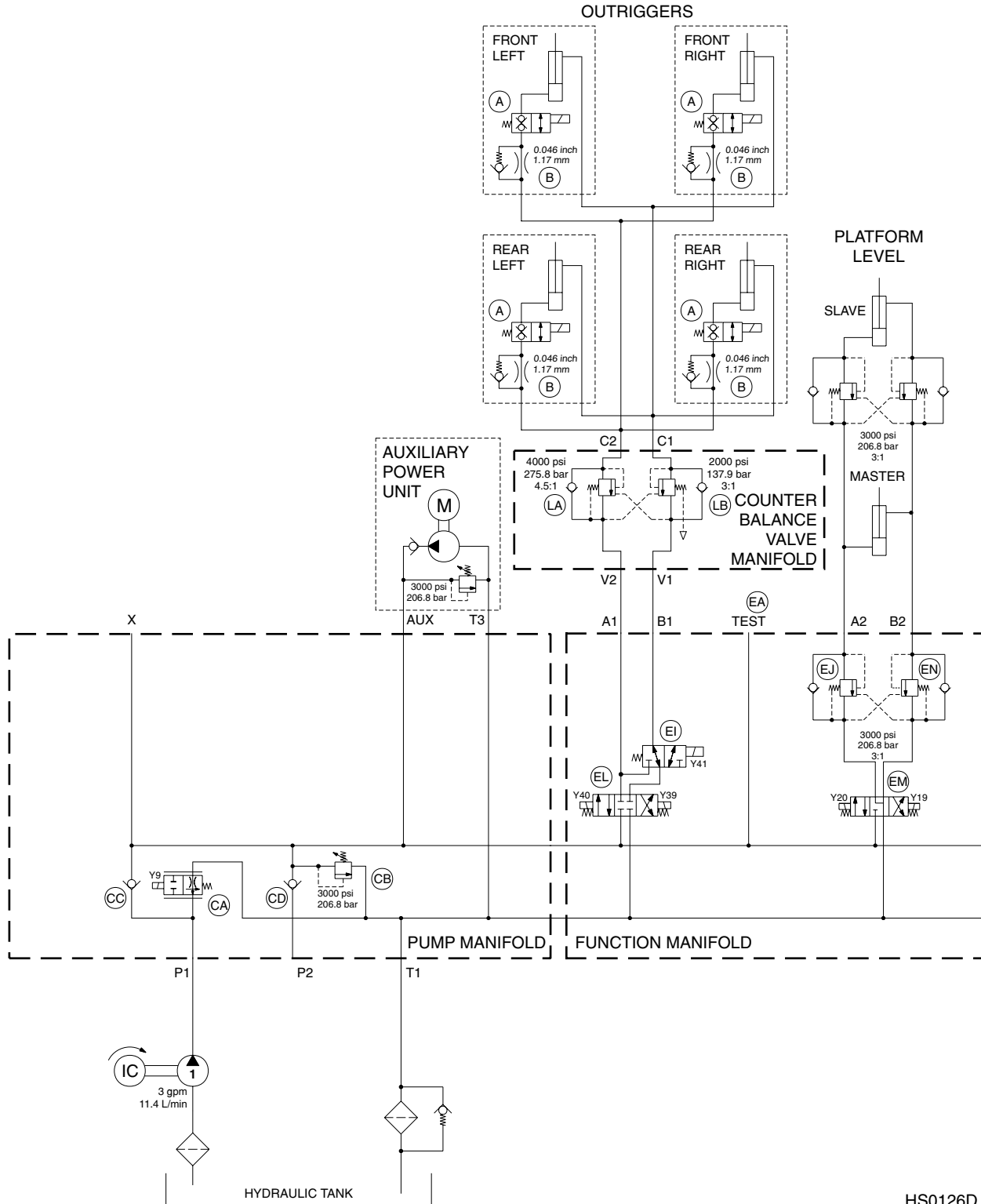


HS0139D

Hydraulic Schematic

Engine-only Models without Drive Option
 (before serial number T5000-91)
 Part 1 of 2

REV B



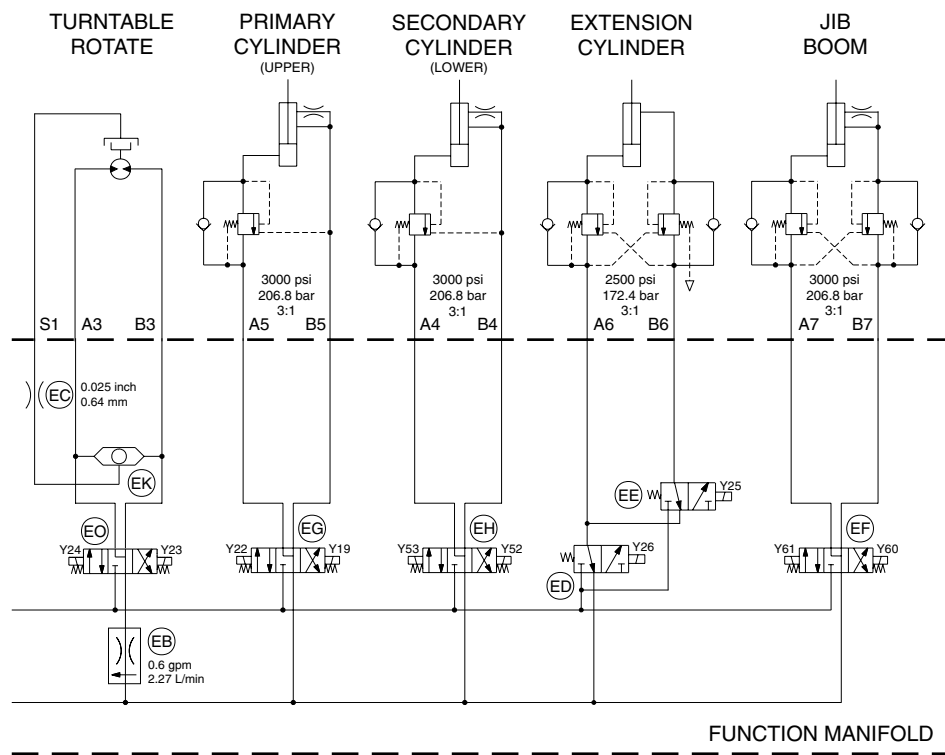
HS0126D



REV B

Hydraulic Schematic

Engine-only Models without Drive Option
(before serial number T5000-91)
Part 2 of 2

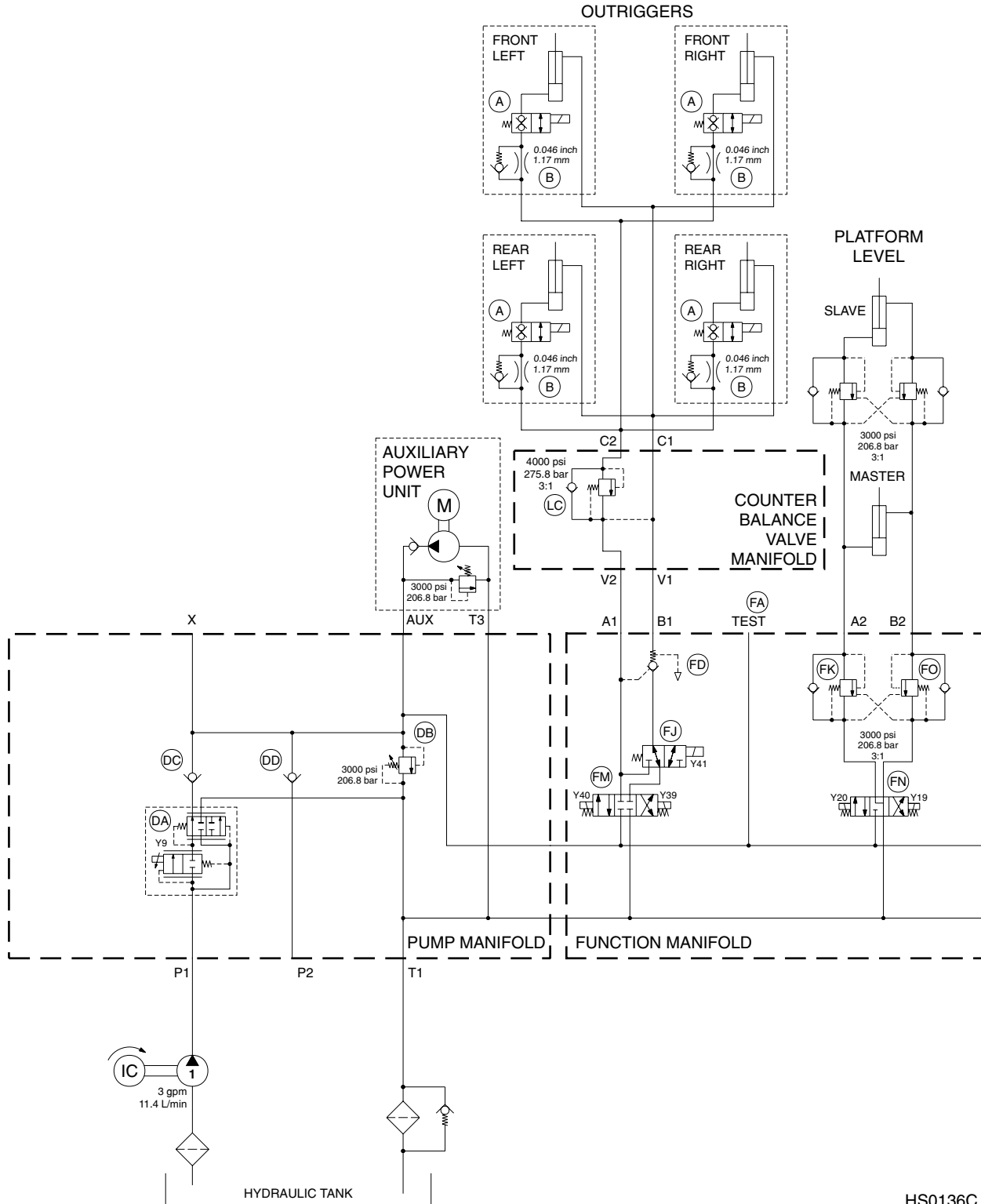


HS0126D

Hydraulic Schematic

Engine-only Models without Drive Option
 (after serial number T5000-90)
 Part 1 of 2

REV A



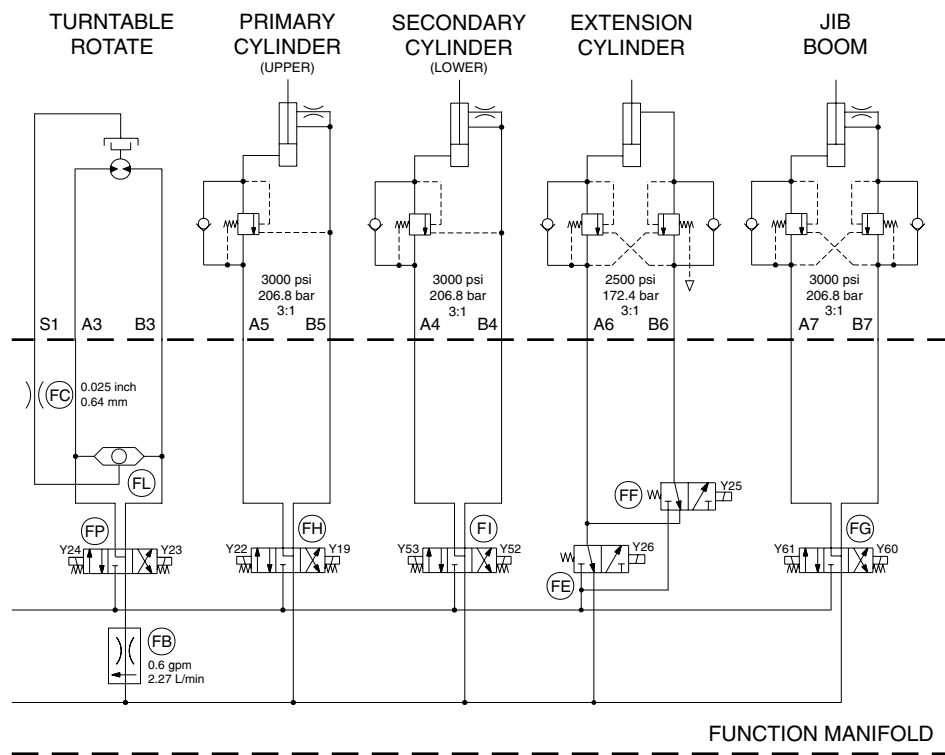
HS0136C



REV A

Hydraulic Schematic

Engine-only Models without Drive Option
(after serial number T5000-90)
Part 2 of 2



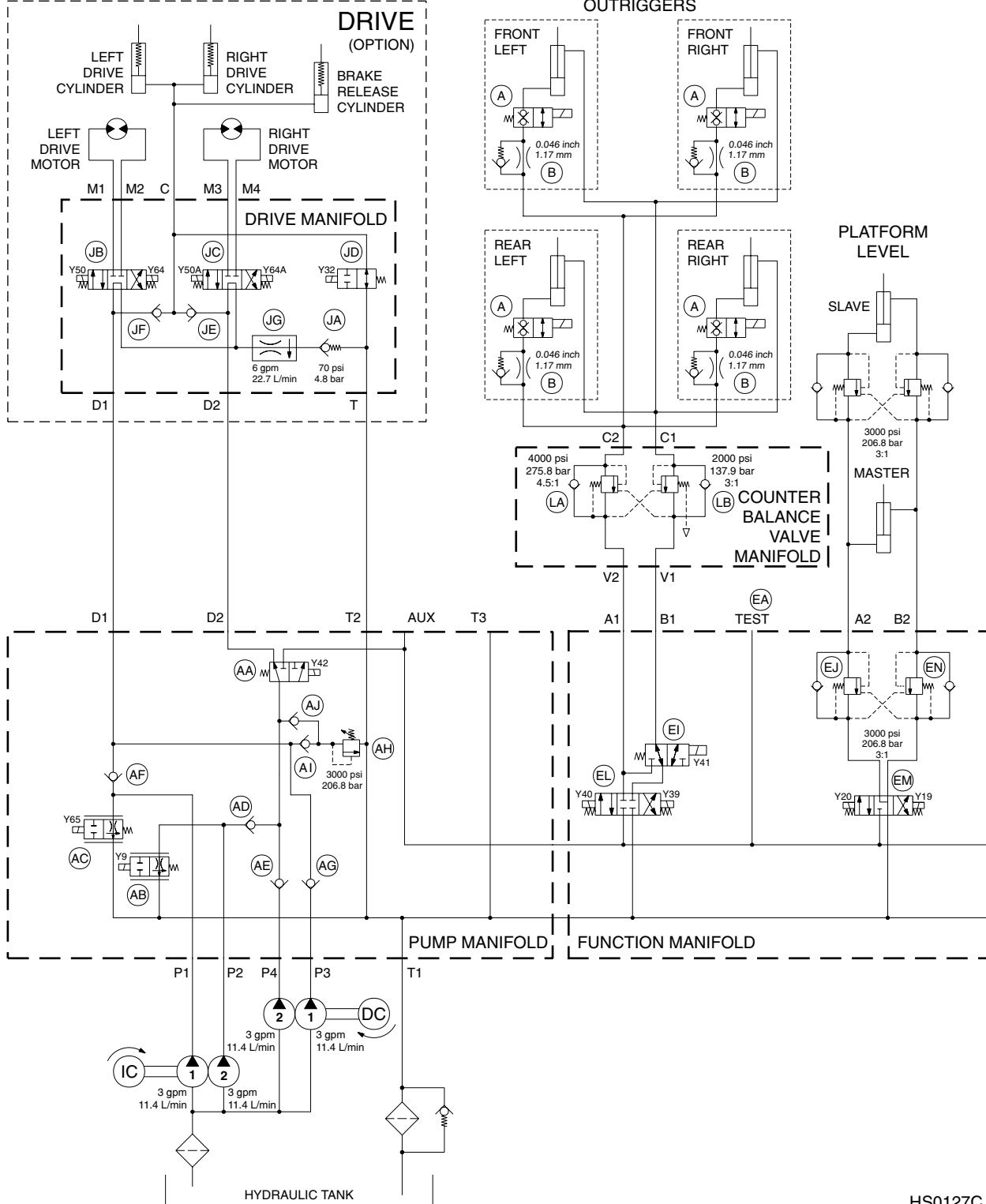
HS0136C

Hydraulic Schematic

Bi-Fuel Models with Drive Option
(before serial number T5000-91)

REV B

Part 1 of 2



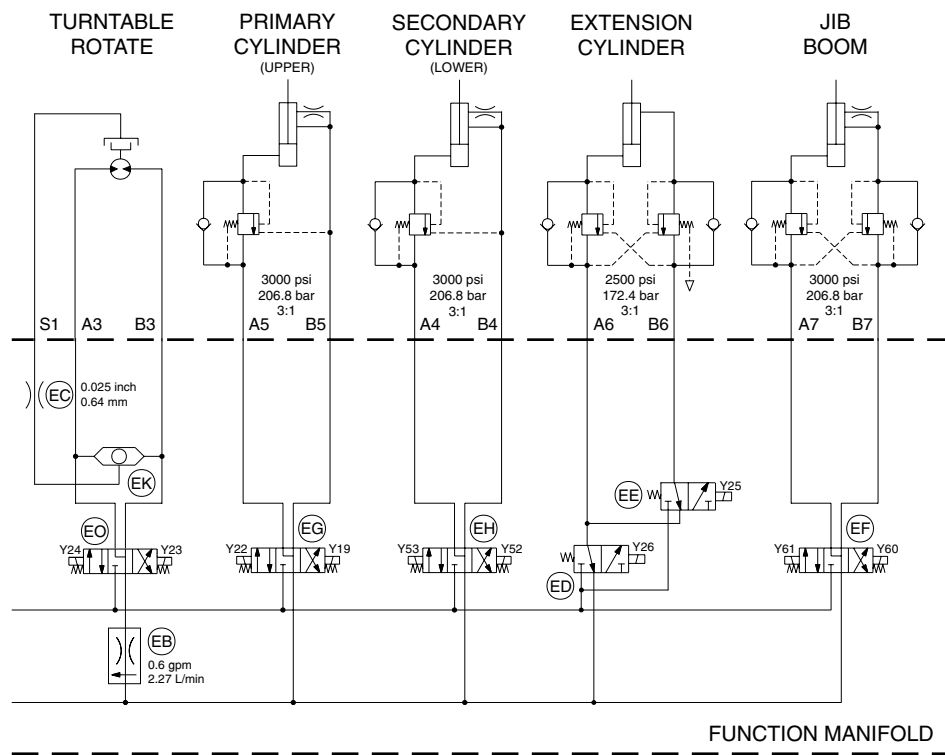
HS0127C



REV B

Hydraulic Schematic

Bi-Fuel Models with Drive Option
(before serial number T5000-91)
Part 2 of 2



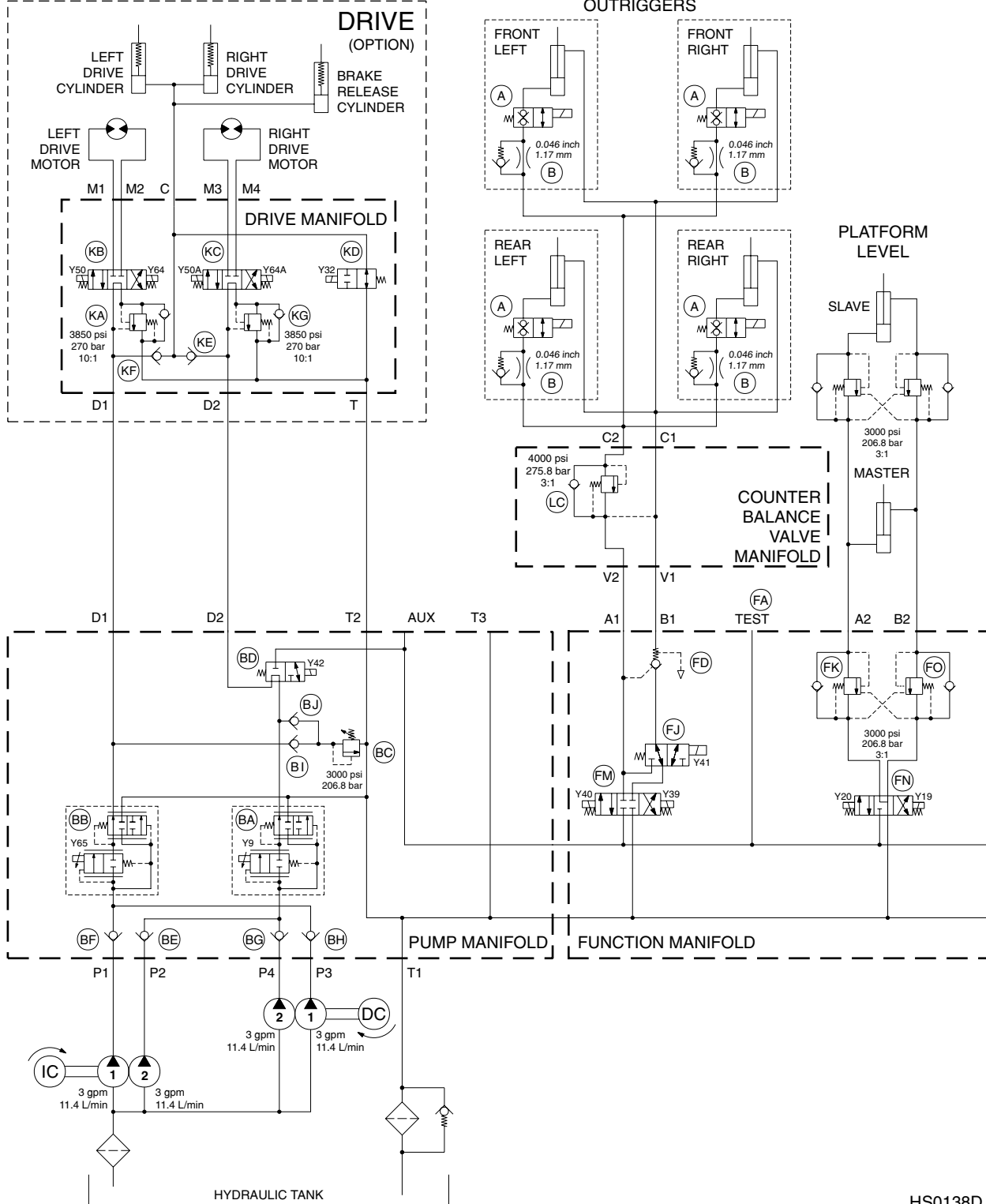
HS0127C

Hydraulic Schematic

Bi-Fuel Models with Drive Option
(after serial number T5000-90)

REV A

Part 1 of 2



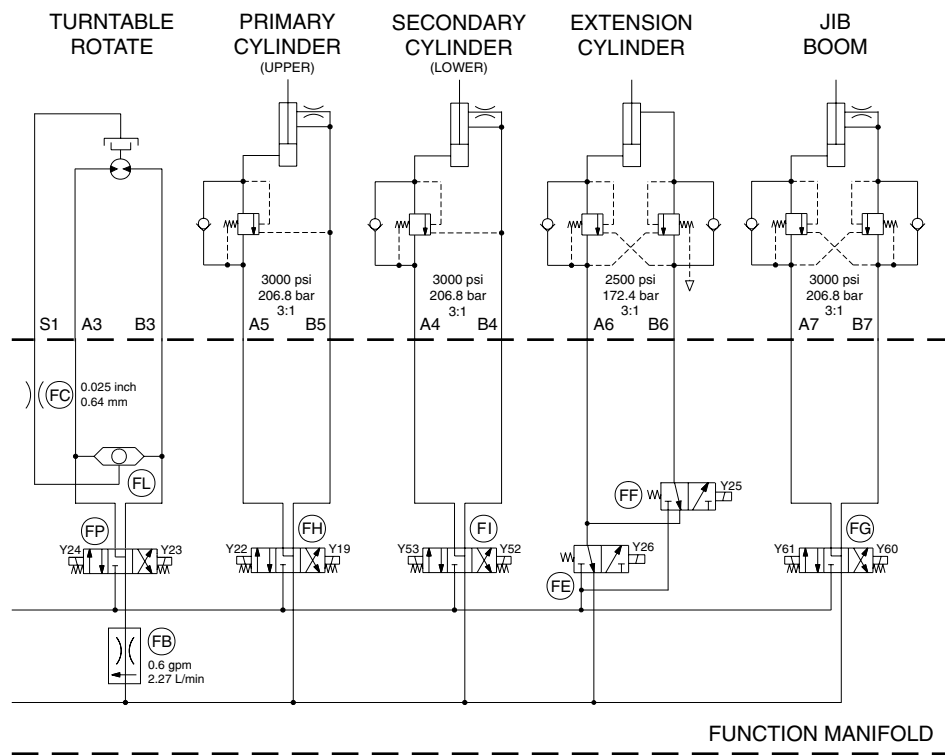
HS0138D



REV A

Hydraulic Schematic

Bi-Fuel Models with Drive Option
(after serial number T5000-90)
Part 2 of 2

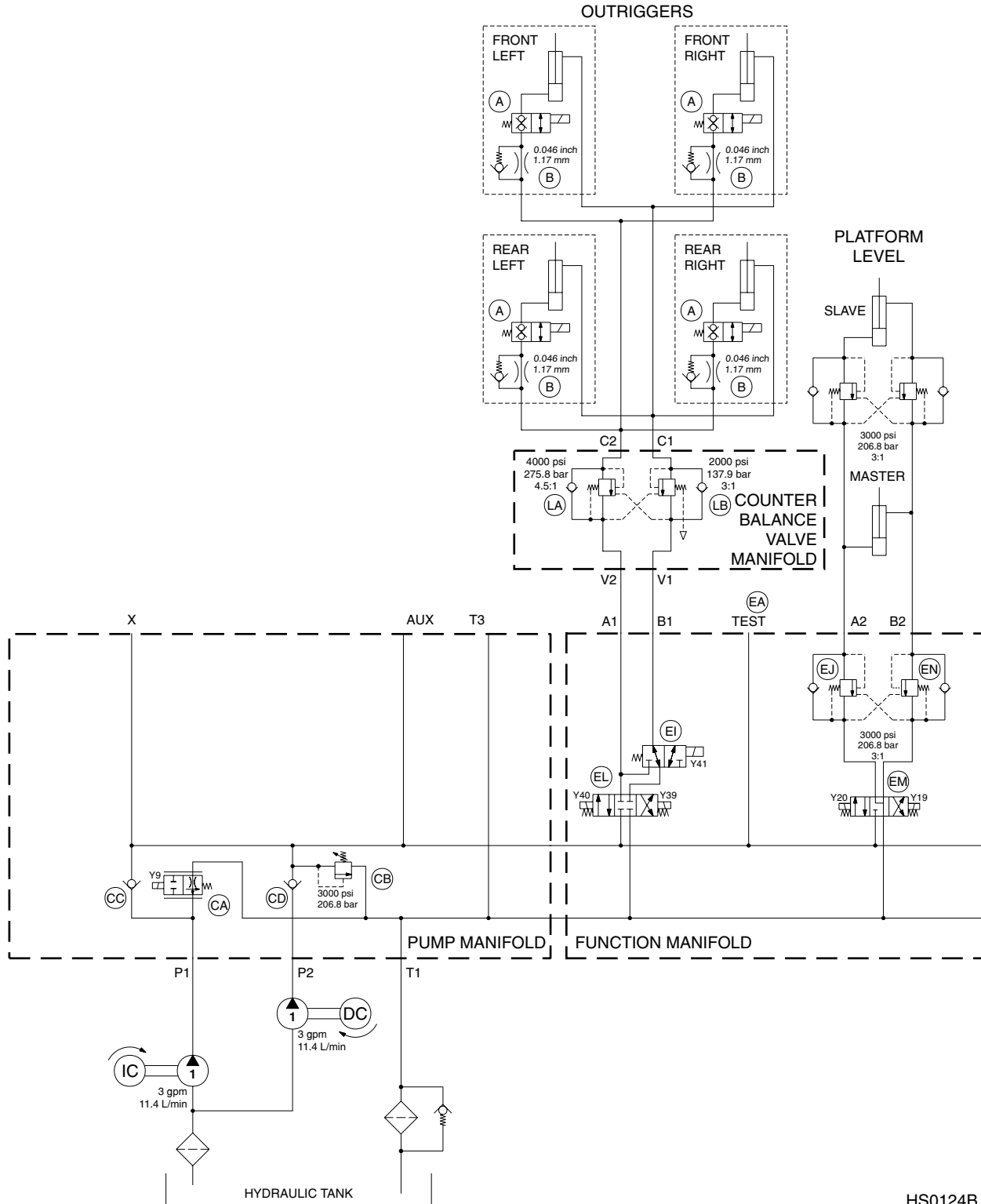


HS0138D

Hydraulic Schematic

Bi-Fuel Models without Drive Option
(before serial number T5000-91)
Part 1 of 2

REV B



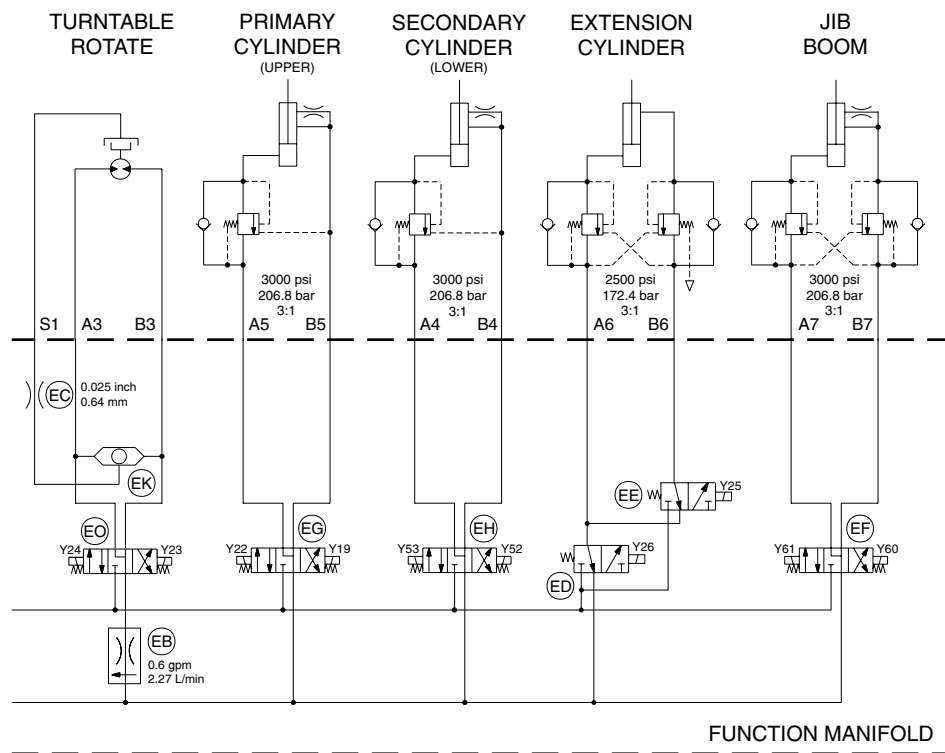
HS0124B



REV B

Hydraulic Schematic

Bi-Fuel Models without Drive Option
(before serial number T5000-91)
Part 2 of 2

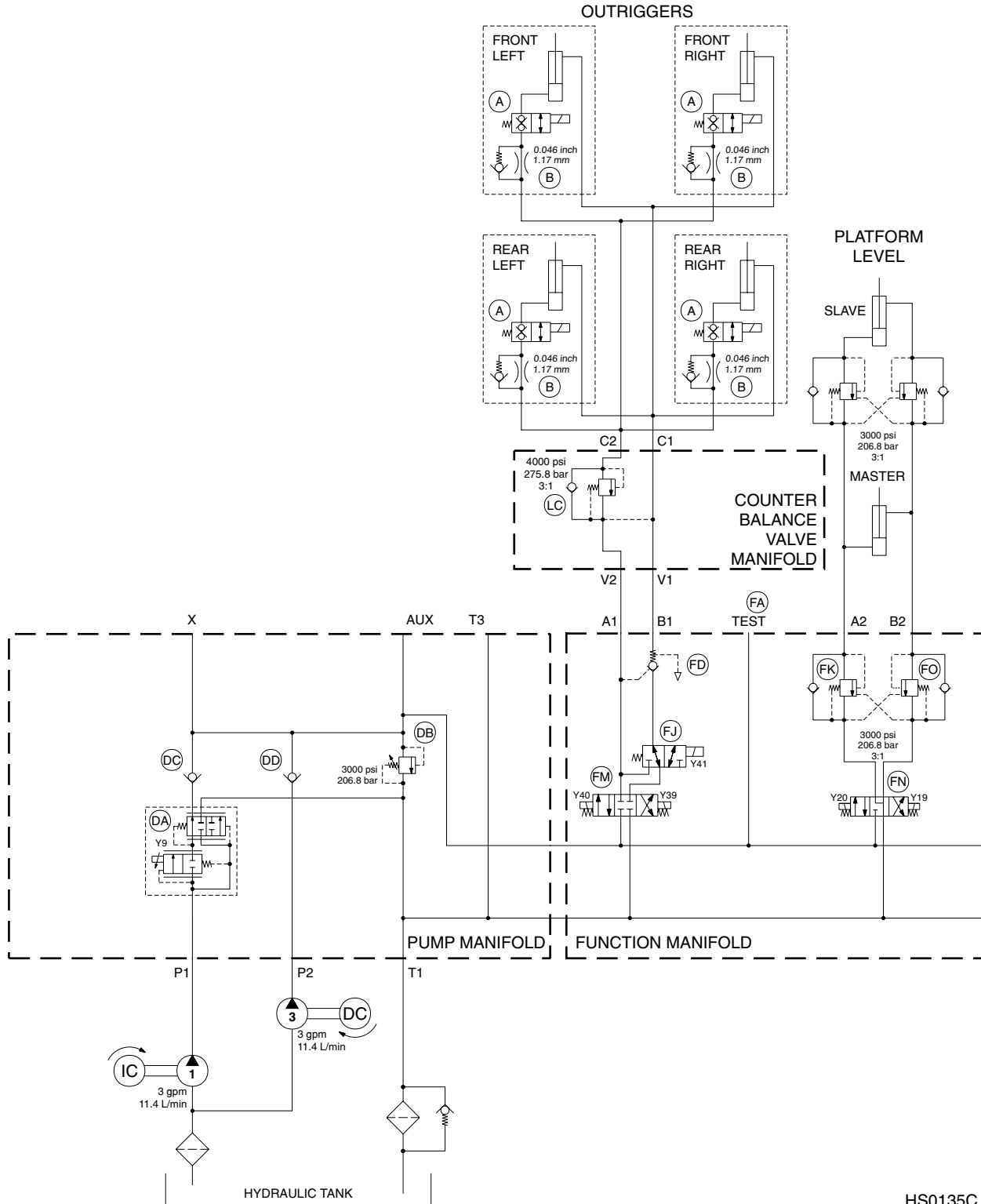


HS0124B

Hydraulic Schematic

Bi-Fuel Models without Drive Option
 (after serial number T5000-90)
 Part 1 of 2

REV A



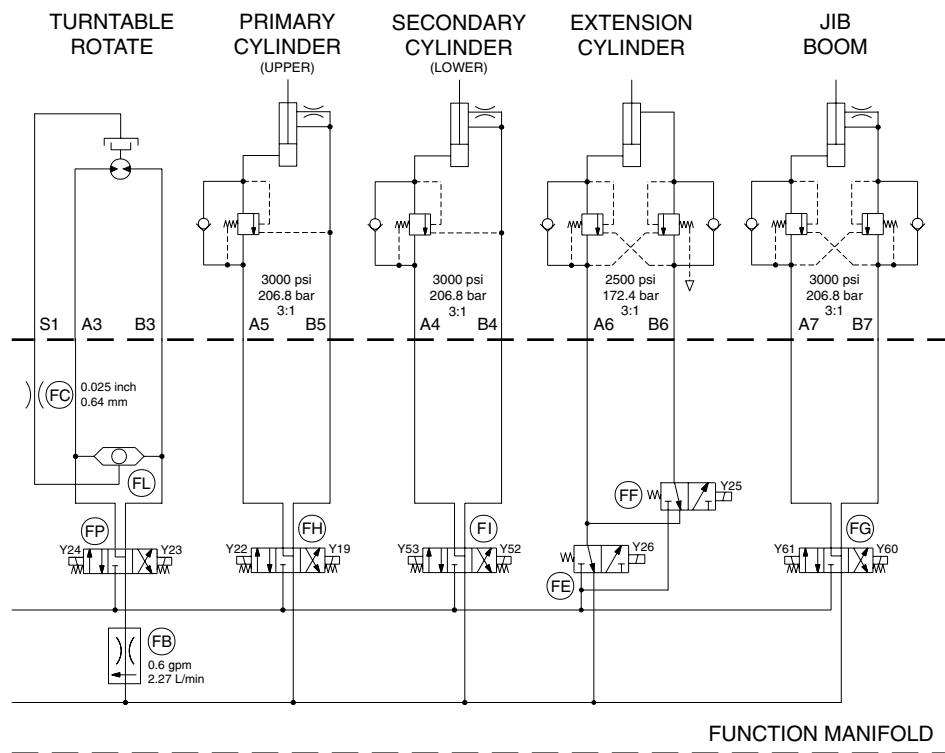
HS0135C



REV A

Hydraulic Schematic

Bi-Fuel Models without Drive Option
(after serial number T5000-90)
Part 2 of 2



HS0135C

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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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