Genie®
A TEREX BRAND

Service and Repair Manual

	Serial Number Range
GS™-3384	from GS8413-42181 to GS8415-42382 from GS8416F-42383 to GS8416F-45499 from GS84F-45500 to GS84F-45999 from GS84D-101 to GS84D-400
GS™-3390	
GS™-4390	
GS™-5390	from GS9013-48427 to GS9015-51063 from GS9016F-51064 to GS9016F-53299 from GS90F-53300 to GS90F-55999 from GS90D-101 to GS90D-3200

This manual includes:
Repair procedures
Fault Codes
Electrical and
Hydraulic Schematics

For detailed maintenance procedures, refer to the appropriate Maintenance Manual for your machine.

Part No. 1272222GT
Rev B1
June 2021

Introduction

Important

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

This manual provides troubleshooting and repair procedures for qualified service professionals.

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

Compliance

Machine Classification

Group A/Type 2, 3 as defined by ISO 16368

Machine Design Life

Unrestricted with proper operation, inspection and scheduled maintenance.

Technical Publications

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

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

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1272222GT Rev B, October 2020

First Edition, Second Printing

Revision History

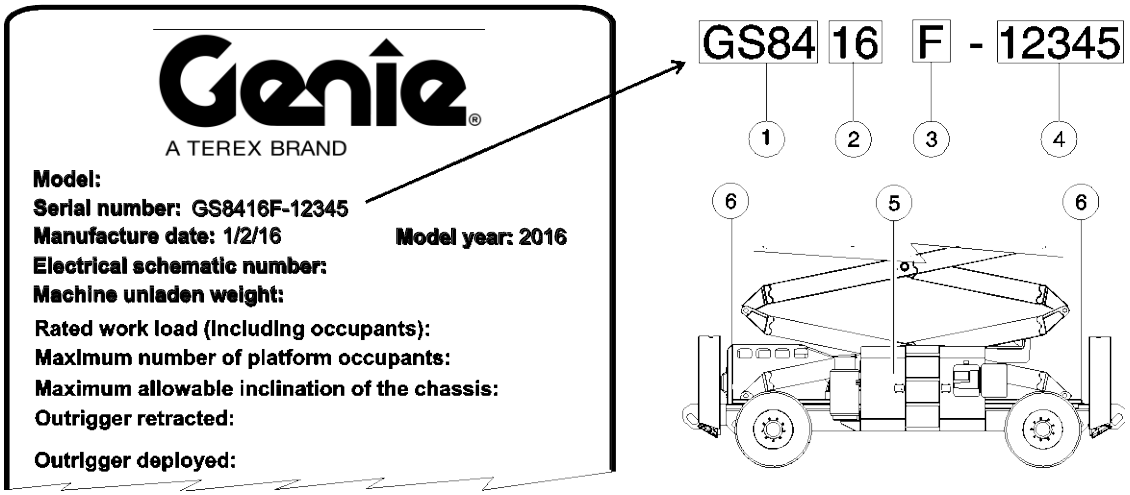
Revision	Date	Section	Procedure / Page / Description
A	3/2016		Initial Release
A1	9/2016	Introduction	Serial Number Legend
A2	5/2017	Specifications	Machine Specifications
B	8/2020	Cover	Add ending serial break
		Repair	Engine Fault Codes
		Schematics	Electrical schematics
B1	6/2021	Repair	9-1

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

Introduction

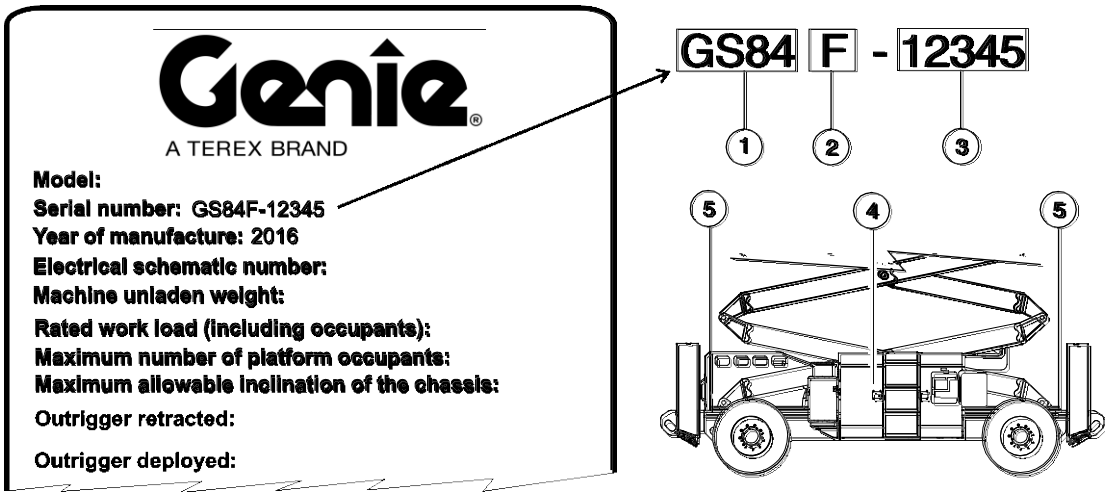
Serial Number Legend

To August 31, 2016



1 Model
2 Model year
3 Facility code
4 Sequence number
5 Serial label (located inside cover)
6 Serial number (stamped on chassis)

From September 1, 2016



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Safety Rules

Danger

Failure to obey the instructions and safety rules in this manual and the appropriate Operator's Manual on your machine will result in death or serious injury.

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

Do Not Perform Maintenance Unless:

☑ You are trained and qualified to perform maintenance on this machine.

☑ You read, understand and obey:

- manufacturer's instructions and safety rules
- employer's safety rules and worksite regulations
- applicable governmental regulations

☑ You have the appropriate tools, lifting equipment and a suitable workshop.

Safety Rules

Personal Safety

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

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

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

⚠ DANGER Indicates a imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

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

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

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

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

Workplace Safety

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

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

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

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

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

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

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

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Specifications

Machine Specifications

Fluid capacities	
Hydraulic tank	30 gallons 114 liters
Hydraulic system (including tank) GS-3384 and GS-3390	37.5 gallons 142 liters
Hydraulic system (including tank) GS-4390	38.25 gallons 145 liters
Hydraulic system (including tank) GS-5390	38.75 gallons 147 liters
Fuel tank Deutz D 2.9 L4, Ford MSG-425	20 gallons 76 liters
Fuel tank Deutz D2011 L03i to serial number GS84F-45518 and GS90F-54370	30 gallons 114 liters
Fuel tank Deutz D2011 L03i from serial number GS84F-45519 and GS90F-54371	20 gallons 20 liters
Tires and wheels	
High Flotation, air-filled and foam-filled (all models)	
Tire size	33/16LL500
Tire ply rating	10
Tire diameter x Tire width	33 in x 16 in 83.8 cm x 41 cm
Wheel diameter x width	19.5 in x 14 in 49.5 cm x 35.6 cm
Weight, foam filled	419 lbs (+/- 10 lbs) 190 kg (+/- 4.5 kg)
Weight, air-filled	157 lbs 71.2 kg
Pressure, air-filled	38 psi 2.6 bar

Rough Terrain, foam-filled (GS-90)	
Tire size	LSW 305-546 NHS
Tire ply rating	10
Tire weight, new foam-filled (minimum) (Rough terrain)	265 lbs 120 kg
Tire diameter x width	33 in x 12 in 83.8 cm x 30 cm
Rough Terrain, foam-filled (GS-84)	
Tire size	51S3D1-16.5 NHS
Tire ply rating, minimum	8
Tire diameter x width	30.8 in x 10.4 in 78.2 cm x 26.4 cm
Weight, new foam-filled (minimum) (Rough terrain)	224 lbs 101.6 kg
Weight, new foam-filled (minimum) (Rough terrain, non-marking)	228 lbs 103.4 kg
Tires and wheels	
Wheel lugs	9 @ 5/8-18
Lug nut torque, dry	125 ft-lbs 169.5 Nm
Lug nut torque, lubricated	94 ft-lbs 127.4 Nm

Specifications

Performance Specifications

Drive speed, maximum (GS-90)	
Platform stowed	5 mph 40 ft / 5.5 sec 8 km/h 12.2 m / 5.5 sec
Platform raised	0.7 mph 40 ft / 39 sec 1.1 km/h 12.2 m / 39 sec
Drive speed, maximum (GS-84)	
Platform stowed	4 mph 40 ft / 6.8 sec 6.4 km/h 12.2 m / 6.8 sec
Platform raised	0.7 mph 40 ft / 39 sec 1.1 km/h 12.2 m / 39 sec
Braking distance, maximum	
High range on paved surface	60 in 152.4 cm
Gradeability	See Operator's Manual

Function speed, maximum from platform controls (with maximum rated load in platform)	
GS-3384 and GS-3390	
Platform up	40 to 50 seconds
Platform down	24 to 34 seconds
GS-4390	
Platform up	42 to 52 seconds
Platform down	34 to 44 seconds
GS-5390	
Platform up	50 to 60 seconds
Platform down	44 to 54 seconds

Hydraulic Oil Specifications

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

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

NOTICE

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

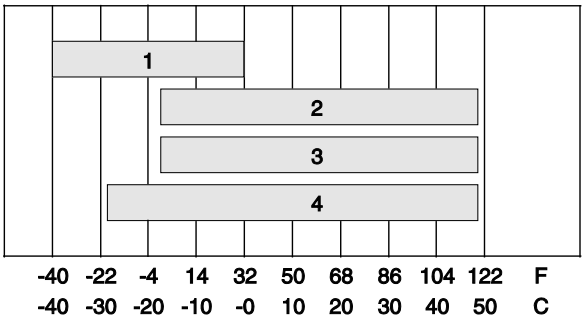
Note: Extended machine operation can cause the hydraulic fluid temperature to increase beyond its maximum allowable range. If the hydraulic fluid temperature consistently exceeds 200°F / 90°C an optional oil cooler may be required.

NOTICE

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

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

Hydraulic Fluid Temperature Range



Ambient air temperature

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

Specifications

Chevron Rando HD Premium Oil MV Fluid Properties

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

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

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

Chevron 5606A Hydraulic Oil Fluid Properties

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

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

NOTICE

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

Petro-Canada Environ MV 46 Fluid Properties

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

UCON Hydrolube HP-5046 Fluid Properties

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

Shell Tellus S4 VX Fluid Properties

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

Specifications

Hydraulic Component Specifications

Drive Pump	
Type: bi-directional variable displacement piston pump	
Flow rate @ 2500 rpm	0 to 32.5 gpm 0 to 123 L/min
Drive pressure, maximum	3750 psi 258.6 bar
Charge Pump	
Type	Gerotor
Flow rate @ 2500 rpm	9.1 gpm 34.4 L/min
Charge pump pressure	325 psi 22.4 bar
Function Pump	
Type	gear pump
Displacement	0.98 cu in 16 cc
Flow rate @ 2500 rpm	10.6 gpm 40.1 L/min
Hydraulic tank return line filter	10 micron with 25 psi / 1.7 bar bypass
Auxiliary power unit	
Relief valve	3700 psi 255 bar

Function manifold	
System relief valve pressure, maximum, GS-3384 and GS-3390	2700 to 2900 psi 186 to 200 bar
System relief valve pressure, maximum, GS-4390 and GS-5390	2900 to 3100 psi 200 to 214 bar
Steer relief valve pressure, GS-3384	2700 to 2900 psi 186 to 200 bar
Steer relief valve pressure, GS-3390, GS-4390 and GS-5390	1950 to 2250 psi 135 to 155 bar
Proportional valve flow regulator	0.1 gpm 0.4 L/min
Drive manifold	
Hot oil relief pressure	280 psi 19 bar
Drive Motors	
Displacement (2 speed motor)	0.54 to 1.52 cu in 8.8 to 25 cc
Drive hubs	
Fluid capacity	26 fl oz 769 cc
Fluid type: SAE 90 multipurpose hypoid gear oil API service classification GL5	
Installation torque, lubricated	180 ft-lbs 244 Nm

Specifications

Oscillate manifold (GS-90) (option)	
System relief valve pressure, maximum	3500 psi 241 bar
Float relief valve pressure	900 psi 62 bar
Oscillate flow regulator	1 gpm 3.8 L/min
Generator manifold (option)	
Relief valve	2400 psi 165.5 bar
Flow rate, maximum	4.3 gpm 16.3 L/min
Welder manifold (option)	
Relief valve	270 psi 18.6 bar
Hydraulic motor (welder option)	
Displacement	1.28 cu in 21 cc

Manifold Component Specifications

Plug torque	
SAE No. 2	36 in-lbs / 4 Nm
SAE No. 4	10 ft-lbs / 13 Nm
SAE No. 6	14 ft-lbs / 19 Nm
SAE No. 8	38 ft-lbs / 51 Nm
SAE No. 10	41 ft-lbs / 55 Nm
SAE No. 12	56 ft-lbs / 76 Nm

Specifications

Ford MSG-425 EFI Engine

Displacement	153 cu in 2.5 liters
Number of cylinders	4
Bore and Stroke	3.5 x 3.9 inches 89 x 100 mm
Horsepower	60 @ 2500 rpm 44 kW @ 2500 rpm
Firing order	1 - 3 - 4 - 2
Low function idle (computer controlled)	1600 rpm 53.3 Hz
High function idle (computer controlled)	2500 rpm 83.3 Hz
Compression ratio	9.7:1
Compression pressure (approx.)	
Pressure (psi or bar) of lowest cylinder must be at least 75% of highest cylinder	
Lubrication system	
Oil pressure (operating temperature @ 2500 rpm)	29 to 39 psi 2 to 2.7 bar
Oil capacity (including filter)	6.7 quarts 6.4 liters
Oil Pressure switch	
Oil pressure switch point	7 to 9 psi 0.48 to 0.62 bar
Oil viscosity requirements	
Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Handbook on your machine.	
Electronic fuel pump	
Fuel pressure, static	60 psi 4.1 bar
Fuel flow rate	0.43 gpm 1.6 L/min
Fuel requirement	
For fuel requirements, refer to the engine Operator Manual for your engine.	
Ignition system	
Spark plug type	Motorcraft AYFS-32Y-R
Spark plug gap	0.049 to 0.053 inches 1.25 to 1.35 mm
Engine coolant	
Capacity	10 quarts 9.5 liters
Cylinder head temperature sending unit	
Fault code set temperature	280°F 138°C
Engine shut-down temperature	300°F 149°C
Starter motor	
Normal engine cranking speed	200 to 250 rpm
Current draw, no load	140-200A
Current draw, maximum load	800A
Alternator	
Alternator output	95A, 13.8V DC
Battery	
Type	12V DC, Group 31
Quantity	1
Cold cranking ampere @ 0°F	1000A
Reserve capacity @ 25A rate	200 minutes

Specifications

Deutz D2011 L03i Engine

Displacement	142 cu in 2.33 liters
Number of cylinders	3
Bore and Stroke	3.7 x 4.4 inches 94 x 112 mm
Horsepower	49 @ 2800 rpm 36 kW @ 2800 rpm
Firing order	1 - 2 - 3
Low idle **Frequency**	1500 rpm 313 Hz
High idle **Frequency**	2500 rpm 522 Hz
Compression ratio	19:01
Governor	centrifugal mechanical
Valve clearance, cold	
Intake	0.012 to 0.016 in 0.3 to 0.4 mm
Exhaust	0.020 to 0.024 in 0.5 to 0.6 mm
Fuel injection system	
Injection pump make	Bosch
Injection pump pressure, maximum	15000 psi 1034 bar
Injector opening pressure	3046 psi 210 bar
Fuel requirement	
For fuel requirements, refer to the engine Operator Manual for your engine.	

Lubrication system	
Oil pressure	20 to 44 psi 1.4 to 3 bar
Oil capacity (including filter)	9.5 quarts 9 liters
Oil capacity (including filter)	7.35 quarts 7 liters
Oil viscosity requirements	
Unit ships with 15W-40. Extreme operating temperatures may require the use of alternative engine oils. For oil requirements, refer to the Engine Operator Manual for your engine.	
Oil temperature switch	
Temperature switch point	300°F 149°C
Oil Pressure switch	
Oil pressure switch point	22 psi 1.5 bar
Starter motor	
Current draw, no load	90A
Brush length, minimum	0.27 in 12.7 mm
Battery	
Type	12V DC, Group 31
Quantity	1
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	60A @ 14V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

Specifications

Deutz D 2.9 L4 Engine

Displacement	177 cu in 2.9 liters
Number of cylinders	4
Bore and Stroke	3.6 x 4.3 inches 92 x 110 mm
Horsepower	48.8 @ 2600 rpm 37 kW @ 2600 rpm
Firing order	1 - 3 - 4 - 2
Low idle	1500 rpm 1500 Hz
High idle	2500 rpm 2500 Hz
Compression ratio	18.4:1
Compression pressure	362 to 435 psi 25 to 30 bar
Governor	electronic
Lubrication system	
Oil pressure (@ 2000 rpm)	40 to 60 psi 1.4 to 3 bar
Oil capacity (including filter)	9.4 quarts 9 liters

Oil viscosity requirements	**Low ash oil required**
-22° F to 86° F/ -30° C to 30° C	5W-30 (synthetic)
-4° F to 90° F / -20° C to 32° C	10W-40
Above 23° F / -5° C	20W-50

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

Oil temperature switch	
Temperature switch point	257°F 125°C
Oil Pressure switch	
Oil pressure switch point	20 psi 1.4 bar
Engine coolant	
Capacity	10 quarts 9.4 liters
Fuel injection system	
Injection pump make	Bosch
Injection pump pressure, maximum	15000 psi 1034 bar
Injector opening pressure	3046 psi 210 bar

Fuel requirement

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

Specifications

Deutz D 2.9 L4 Engine, continued	
Starter motor	
Current draw, normal load	250A to 400A
Brush length, new	0.72 in 18.5 mm
Brush length, minimum	0.27 in 7 mm
Battery	
Type	12V DC
Quantity	1
Cold cranking ampere	1000A
Reserve capacity @ 25A rate	200 minutes
Alternator output	95A @ 14V DC
Fan belt deflection	3/8 to 1/2 inch 9 to 12 mm

Specifications

Hydraulic Hose and Fitting Torque Specifications

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

Seal-Lok™ Fittings

(hose end - ORFS)

SAE Dash Size	Torque
-4	18 ft-lbs / 25 Nm
-6	30 ft-lbs / 41 Nm
-8	40 ft-lbs / 55 Nm
-10	60 ft-lbs / 81 Nm
-12	85 ft-lbs / 115 Nm
-16	110 ft-lbs / 150 Nm
-20	150 ft-lbs / 205 Nm
-24	230 ft-lbs / 315 Nm

JIC 37° Fittings

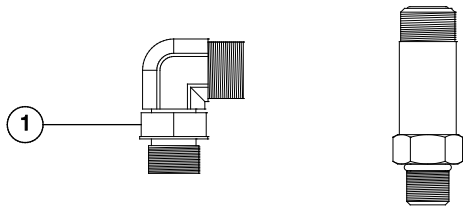
(swivel nut or hose connection)

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

SAE O-ring Boss Port

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

SAE Dash Size	Torque
-4	14 ft-lbs / 19 Nm
-6	23 ft-lbs / 31,2 Nm
-8	36 ft-lbs / 49 Nm
-10	62 ft-lbs / 84 Nm
-12	84 ft-lbs / 114 Nm
-16	125 ft-lbs / 169,5 Nm
-20	151 ft-lbs / 204,7 Nm
-24	184 ft-lbs / 249,5 Nm



Adjustable Fitting

1 jam nut

Non-adjustable fitting

SAE O-ring Boss Port

(tube fitting - installed into Steel)

SAE Dash Size		Torque
-4	ORFS / 37° (Adj) ORFS (Non-adj) 37° (Non-adj)	15 ft-lbs / 20,3 Nm 26 ft-lbs / 35,3 Nm 22 ft-lbs / 30 Nm
-6	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	35 ft-lbs / 47,5 Nm 29 ft-lbs / 39,3 Nm
-8	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	60 ft-lbs / 81,3 Nm 52 ft-lbs / 70,5 Nm
-10	ORFS (Adj / Non-adj) 37° (Adj / Non-adj)	100 ft-lbs / 135,6 Nm 85 ft-lbs / 115,3 Nm
-12	(All types)	135 ft-lbs / 183 Nm
-16	(All types)	200 ft-lbs / 271,2 Nm
-20	(All types)	250 ft-lbs / 339 Nm
-24	(All types)	305 ft-lbs / 413,5 Nm

Torque Procedure

Seal-Lok™ fittings

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

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

2 Lubricate the O-ring before installation.

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

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

5 Tighten the nut or fitting to the appropriate torque. Refer to the appropriate torque chart in this section.

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

JIC 37° fittings

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

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

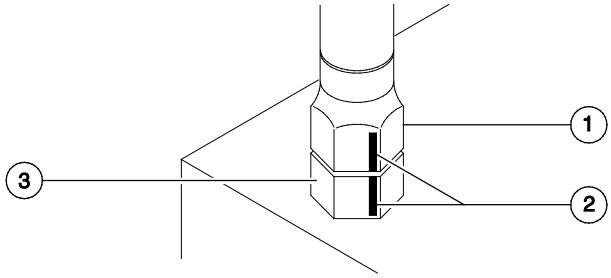


Illustration 1

1 hex nut
2 reference mark
3 body hex fitting

Specifications

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

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

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

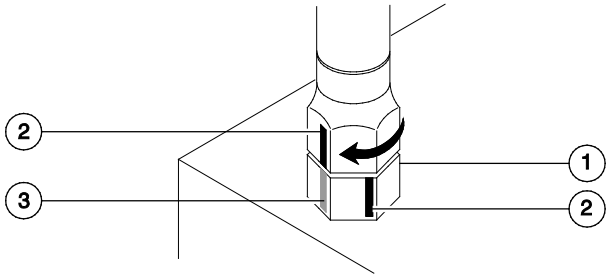


Illustration 2

1 body hex fitting
2 reference mark
3 second mark

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

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

Repair Procedures

Observe and Obey:

☑ Repair procedures shall be completed by a person trained and qualified on the repair of this machine.

☑ Immediately tag and remove from service a damaged or malfunctioning machine.

☑ Repair any machine damage or malfunction before operating the machine.

Before Repairs Start:

☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.

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

☑ Use only Genie approved replacement parts.

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

Machine Configuration:

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

- Machine parked on a firm, level surface
- Key switch in the off position with the key removed
- The red Emergency Stop button in the off position at both the ground and platform controls
- Wheels chocked
- All external AC power supply disconnected from the machine
- Platform in the stowed position

Repair Procedures

About This Section

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

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

Symbols Legend

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

⚠DANGER Indicates a imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

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

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

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

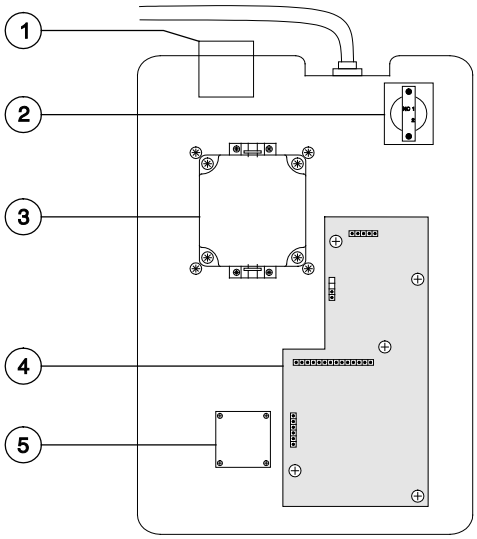
⊠ Indicates that an incorrect result has occurred after performing a series of steps.

Platform controls

The platform controls, used to activate machine functions from the platform or while standing on the ground, contain a printed circuit board, joystick, decal membrane pad, buttons and LEDs. All of these components are replaceable.

The function speed parameters in the Electronic Control Module are easily adjusted by moving the joystick, pressing a button or activating a toggle switch in a specific order when the ECM is in the programming mode (PS showing in the diagnostic display window).

For further information or assistance, consult Genie Product Support.



1 alarm H1
2 red Emergency Stop button P2
3 joystick controller JC1
4 circuit board U3
5 platform up/down and outrigger up/down toggle switch TS21

1-1 Circuit Board

How to Remove the Platform Controls Circuit Board

1 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

2 Loosen the platform control box lid retaining fasteners. Open the control box lid.

3 Visually locate the circuit board mounted to the inside of the platform control box lid.

4 Secure the control box lid in a level position.

5 Tag and disconnect the wire connectors from the red Emergency Stop button.

6 Tag and disconnect the wire harness connectors from the platform controls circuit board.

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

NOTICE Component damage hazard. Electrostatic discharge (ESD) can damage printed circuit board components. Maintain firm contact with a metal part of the machine that is grounded at all times when handling printed circuit boards OR use a grounded wrist strap.

Note: Depress the locking tab to disconnect the wire harness from the circuit board.

7 Carefully remove the platform controls circuit board fasteners.

8 Carefully remove the platform controls circuit board from the platform control box.

Platform Components

2-1 Platform

How to Remove the Platform

⚠WARNING Bodily injury hazard. The procedures in this section require 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.

Note: Perform this procedure with the platform in the stowed position and the platform extension deck(s) fully retracted and locked in position.

1 Start the engine from the ground controls and raise the platform approximately 18 feet / 5.5 m from the ground.

2 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

Note: Be sure that the safety arm is locked in the vertical position.

3 Lower the platform onto the safety arm. Turn the machine off.

⚠WARNING Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

NOTICE Component damage hazard. The link set cross tube can be damaged if excessive force is applied. Do not continue to lower the platform after the safety arm makes contact with the cross tube.

4 Cut the zip ties that secure the power to platform wiring to the bottom of the platform.

NOTICE Component damage hazard. Be sure not to cut the power to platform wiring.

5 Cut the zip ties that secure the platform controls wiring to the bottom of the platform.

NOTICE Component damage hazard. Be sure not to cut the power to platform wiring.

6 Start the engine from the ground controls.

7 Raise the platform slightly and return the safety arm to the stowed position.

8 Lower the platform to the stowed position. Turn the machine off.

9 Locate the quick disconnect for the platform controls under the platform at the steer end of the machine.

10 Tag and disconnect the platform controls from the control cable at the steer end of the machine.

11 Remove the platform control box from the platform and lay it off to the side.

12 Remove the mounting fasteners that hold the platform controls quick disconnect plug to the platform.

13 Lay the platform controls wiring off to the side.

NOTICE Component damage hazard. The platform controls wiring can be damaged if it is kinked or pinched.

14 Remove the AC power to platform outlet bracket mounting fasteners.

15 Remove the AC outlet box and bracket from the platform and lay them off to the side. Do not disconnect the wiring.

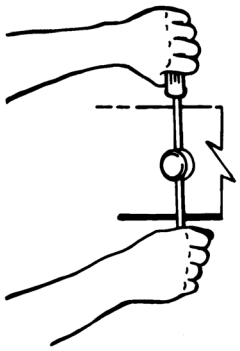
NOTICE Component damage hazard. The AC power to platform wiring can be damaged if it is kinked or pinched.

Platform Components

Note: If your machine is equipped with an air line to platform option, the air line must be disconnected from the platform before removal.

16 Remove the pin retaining fasteners from the platform centering links located under the platform on both sides of the machine. Do not remove the pins.

17 Place a rod through the platform centering link pin and twist to remove the pin. Rest the platform centering link on the scissor arm.



18 Repeat step 17 for the platform centering link pivot pin on the other side of the machine.

19 Place a lifting strap from an overhead crane under the platform at the steer end of the machine for support. Do not apply any lifting pressure.

NOTICE Component damage hazard. The platform railings can be damaged if used to lift the platform. Do not attach the lifting straps to the platform railings.

20 Place a lifting strap from a second overhead crane under the platform at the non-steer end of the machine for support. Do not apply any lifting pressure.

NOTICE Component damage hazard. The platform railings can be damaged if used to lift the platform. Do not attach the lifting straps to the platform railings.

21 Remove the pin retaining fasteners from each platform slider block pivot pin. Do not remove the pins.

22 Use a slide hammer to remove each platform slider block pivot pin.

⚠WARNING Crushing hazard. The platform will fall when the platform slider block pivot pins are removed if not properly supported by the overhead cranes.

23 Secure the platform slider blocks to the platform to prevent them from sliding out of the channel when the platform is removed from the machine.

24 Carefully lift the platform off of the machine and place it on a structure capable of supporting it.

⚠DANGER Crushing hazard. The platform will become unbalanced and fall when it is removed from the machine if not properly supported by the overhead cranes.

⚠WARNING Bodily injury hazard. The platform slider blocks could fall out from under the platform if they are not secured to the platform.

Platform Components

2-2
Platform Extension Deck

How to Remove the Platform Extension Deck

Note: Perform this procedure with the platform in the stowed position and the platform extension deck(s) fully retracted and locked in position.

Note: If the machine is equipped with the dual extension deck option, repeat this procedure for the other platform extension deck.

1 Steer end extension deck: Remove the platform controls from the platform and lay them off to the side of the machine.

2 Remove the retaining pins from the four black plastic railing guides. Lower the railing guides in the down direction.

3 Remove the mounting fasteners from the platform extension deck stop brackets at both sides of the deck.

Note: The platform extension deck stop brackets are located above the platform V-roller wheels.

4 At the platform extension deck to be removed, position a fork lift with the forks even with the bottom of the platform extension deck.

5 Lift the platform extension deck lock handle.

6 Carefully slide the platform extension deck out until the platform extension deck makes contact with the carriage on the forklift.

7 Attach a strap from the platform extension deck railings to the carriage on the forklift to help support the platform extension deck.

8 Remove the three V-roller and extension deck lock bracket mounting fasteners from the extension deck at the tank side of the machine.

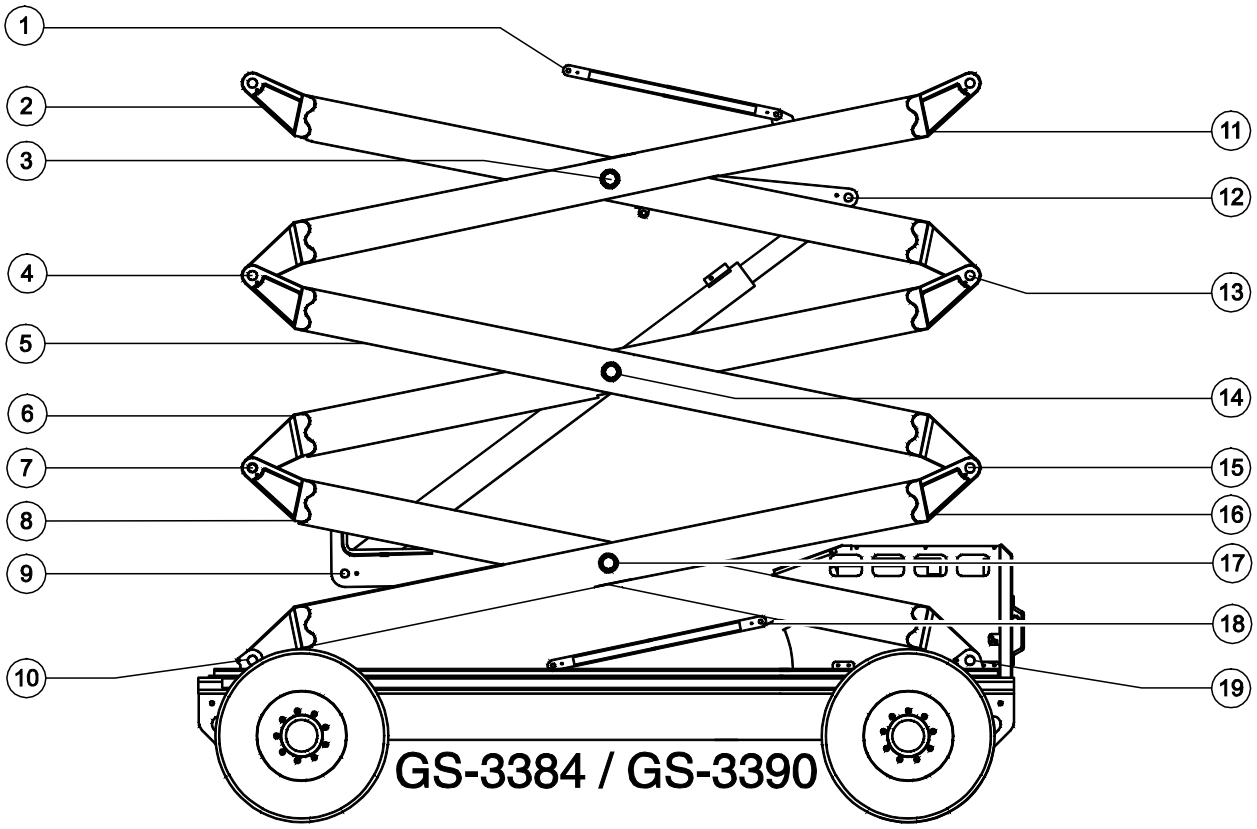
9 Carefully pull the V-roller and extension deck lock assembly out of the extension deck.

10 Remove the fasteners from the roller wheels located under the platform extension deck. Remove the roller wheels.

11 Carefully slide the platform extension deck out of the platform and place it on a structure capable of supporting it.

⚠WARNING Crushing hazard. The platform extension will become unbalanced and fall when removed from the machine if not properly supported and secured to the forklift.

Scissor Components



1 Platform centering link
2 Number 3 inner arm
3 Number 3 center pivot pin (Qty. 2)
4 Number 3 pivot pin (non-steer end)
5 Number 2 outer arm
6 Number 2 inner arm
7 Number 2 pivot pin (non-steer end)
8 Number 1 inner arm
9 Lift cylinder barrel-end pivot pin
10 Number 1 pivot pins (non-steer end)
11 Number 3 outer arm
12 Lift cylinder rod-end pivot pin
13 Number 3 pivot pin (steer end)
14 Number 2 center pivot pin (Qty. 2)
15 Number 2 pivot pin (steer end)
16 Number 1 outer arm
17 Number 1 center pivot pin (Qty. 2)
18 Chassis centering link
19 Number 1 pivot pins (steer end)

Scissor Components

3-1
Scissor Assembly, GS-3384 and 3390

How to Disassemble the Scissor Assembly

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Remove the platform. Refer to Repair Procedure, *How to Remove the Platform.*

2 Remove the cables from the platform centering link (index #1) at the hydraulic tank side of the machine.

3 Remove the pin retaining fasteners from the lift cylinder rod-end pivot pin (index #12). Do not remove the pin.

4 Attach a lifting strap from an overhead crane to the lifting eye at the rod end of the lift cylinder.

5 Use a soft metal drift to remove the lift cylinder rod-end pivot pin (index #12). Lower the rod end of the lift cylinder down onto the number 2 inner arm (index #6).

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

6 Tag, disconnect and plug the hydraulic hoses from 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.

7 Cut the zip ties attaching the hydraulic hoses to the lift cylinder. Lay the hoses out of the way.

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

8 Remove the cables from the number 2 inner arm (index #6) and lay the cables off to the side.

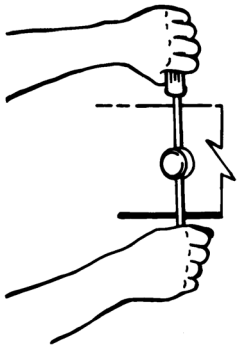
NOTICE Component damage hazard. Cables can be damaged if they are kinked or pinched.

9 Remove the pin retaining fasteners from the cable tray pivot pin at the number 3 inner arm (index #2).

Scissor Components

10 Place a rod through the cable tray pivot pin and twist to remove the pin. Lower the cable tray down.

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



11 Secure both ends of the number 3 inner and outer arms (index #2 and #11) together with a strap or other suitable device.

12 Attach a lifting strap from an overhead crane to the number 3 inner and outer arms (index #2 and #11) at the steer end of the machine. Do not apply any lifting pressure.

13 Attach a lifting strap from an overhead crane to the number 3 inner and outer arms (index #2 and #11) at the non-steer end of the machine. Do not apply any lifting pressure.

14 Remove the pin retaining fasteners from both number 3 pivot pins (index #4) at the non-steer end of the machine. Do not remove the pins.

15 Remove the pin retaining fasteners from both number 3 pivot pins (index #13) at the steer end of the machine. Do not remove the pins.

16 Use a slide hammer to remove both number 3 pivot pins (index #4) from the non-steer end of the machine.

17 Use a slide hammer to remove both number 3 pivot pins (index #13) from the steer end of the machine.

18 Carefully remove the number 3 inner and outer arms (index #2 and #11) from the machine.

⚠WARNING Crushing hazard. The number 3 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

19 Secure the non-steer end of the number 2 inner and outer arms (index #5 and #6) and the non-steer end of the number 1 inner and outer arms (index #8 and #16) together with a strap or other suitable device.

20 Attach a lifting strap from an overhead crane to the number 1 outer arm (index #16) at the non-steer end of the machine. Do not apply any lifting pressure.

21 Remove the pin retaining fasteners from the number 1 pivot pins (index #10) at the non-steer end of the machine.

22 Use a slide hammer to remove both number 1 pivot pins (index #10) from the non-steer end of the machine.

23 Carefully lift the number 1 outer arm at the non-steer end approximately 15 inches / 40 cm.

24 Place a 6 x 6 x 32 inch / 15 x 15 x 80 cm long block across both sides of the chassis under the barrel end of the lift cylinder.

Scissor Components

25 Lower the number 1 outer arm (index #16) onto the block.

⚠WARNING Crushing hazard. Keep hands clear of moving parts when lowering the arms onto the block.

26 Attach a lifting strap from an overhead crane to the lifting eyes on the lift cylinder.

27 Remove the lift cylinder barrel-end pivot pin retaining fasteners.

28 Use a soft metal drift to remove the lift cylinder barrel-end pivot pin (index #9).

29 Carefully remove the lift cylinder from the machine.

⚠WARNING Crushing hazard. The lift cylinder could become unbalanced and fall when it is removed from the machine if not properly supported by the overhead crane.

30 Carefully lift the number 1 outer arm (index #16) approximately 2 inches / 5 cm and remove the block.

31 Lower the number 1 outer arm (index #16) onto the slide blocks.

⚠WARNING Crushing hazard. Keep hands clear of moving parts when lowering the arms onto the block.

32 Secure the number 1 outer arm (index #16) to the slide blocks.

33 Remove the strap installed in step 19.

34 Support the cable tray with an overhead crane.

35 Remove the pin retaining fasteners from the cable tray pivot pin at the cross tube of the number 2 inner arm (index #6).

36 Place a rod through the cable tray pivot pin and twist to remove the pin. Lower the cable tray onto the number 1 inner arm (index #8).

⚠WARNING Crushing hazard. The cable tray may fall if not properly supported by the overhead crane.

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

37 Secure both ends of the number 2 inner and outer arms (index #5 and #6) together with a strap or other suitable device.

38 Attach a lifting strap from an overhead crane to the number 2 inner and outer arms (index #5 and #6) at the steer end of the machine. Do not apply any lifting pressure.

39 Attach a lifting strap from an overhead crane to the number 2 inner and outer arms (index #5 and #6) at the non-steer end of the machine. Do not apply any lifting pressure.

40 Remove the pin retaining fasteners from both number 1 pivot pins (index #10) at the non-steer end of the machine. Do not remove the pins.

41 Remove the pin retaining fasteners from both number 1 pivot pins (index #19) at the steer end of the machine. Do not remove the pins.

42 Use a slide hammer to remove both number 1 pivot pins (index #10) from the non-steer end of the machine.

43 Use a slide hammer to remove both number 2 pivot pins (index #15) from the steer end of the machine.

44 Carefully remove the number 2 inner and outer arms (index #5 and #6) from the machine.

⚠WARNING Crushing hazard. The number 2 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

45 Remove the cables from the number 1 inner arm (index #8).

46 Secure both ends of the number 1 inner and outer arms (index #8 and #16) together with a strap or other suitable device.

47 Attach a lifting strap from an overhead crane to the number 1 inner and outer arms (index #8 and #16) at the steer end of the machine. Do not apply any lifting pressure.

48 Attach a lifting strap from an overhead crane to the number 1 inner and outer arms (index #8 and #16) at the non-steer end of the machine. Do not apply any lifting pressure.

49 Remove the pin retaining fasteners from both chassis centering link pivot pins (index #18) at the number 1 inner arm.

50 Place a rod through each chassis centering link pivot pin and twist to remove the pin. Rest the centering links on the chassis.

51 Remove the pin retaining fasteners from the number 1 inner arm slide blocks (index #19) at the steer end of the machine.

52 Use a slide hammer to remove the number 1 inner arm slide block pivot pins (index #19).

53 Use a slide hammer to remove the number 1 outer arm slide block pivot pins (index #19) at the non-steer end of the machine.

54 Carefully remove the number 1 inner and outer arms (index #8 and #16) from the machine.

⚠WARNING Crushing hazard. The number 1 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

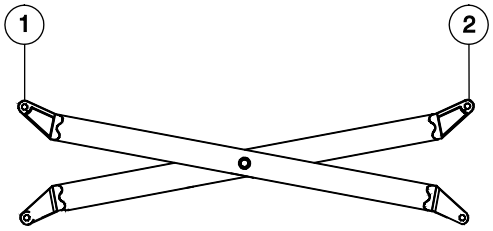
Scissor Components

How to Disassemble a Scissor Arm Pair

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Attach a lifting strap from an overhead crane to the end of the outer arm.

Note: Attach the lifting strap to the end of the scissor arm that has the casting pointing upwards.



1 outer arm
2 inner arm

2 Attach a lifting strap from a second overhead crane to the end of the inner arm.

Note: Attach the lifting strap to the end of the scissor arm that has the casting pointing upwards.

3 Raise the scissor arms with the overhead cranes approximately 12 inches / 30 cm.

4 Place a 12 inch / 30 cm block under the center of the scissor arm pair. Lower the scissor arm pair onto the block.

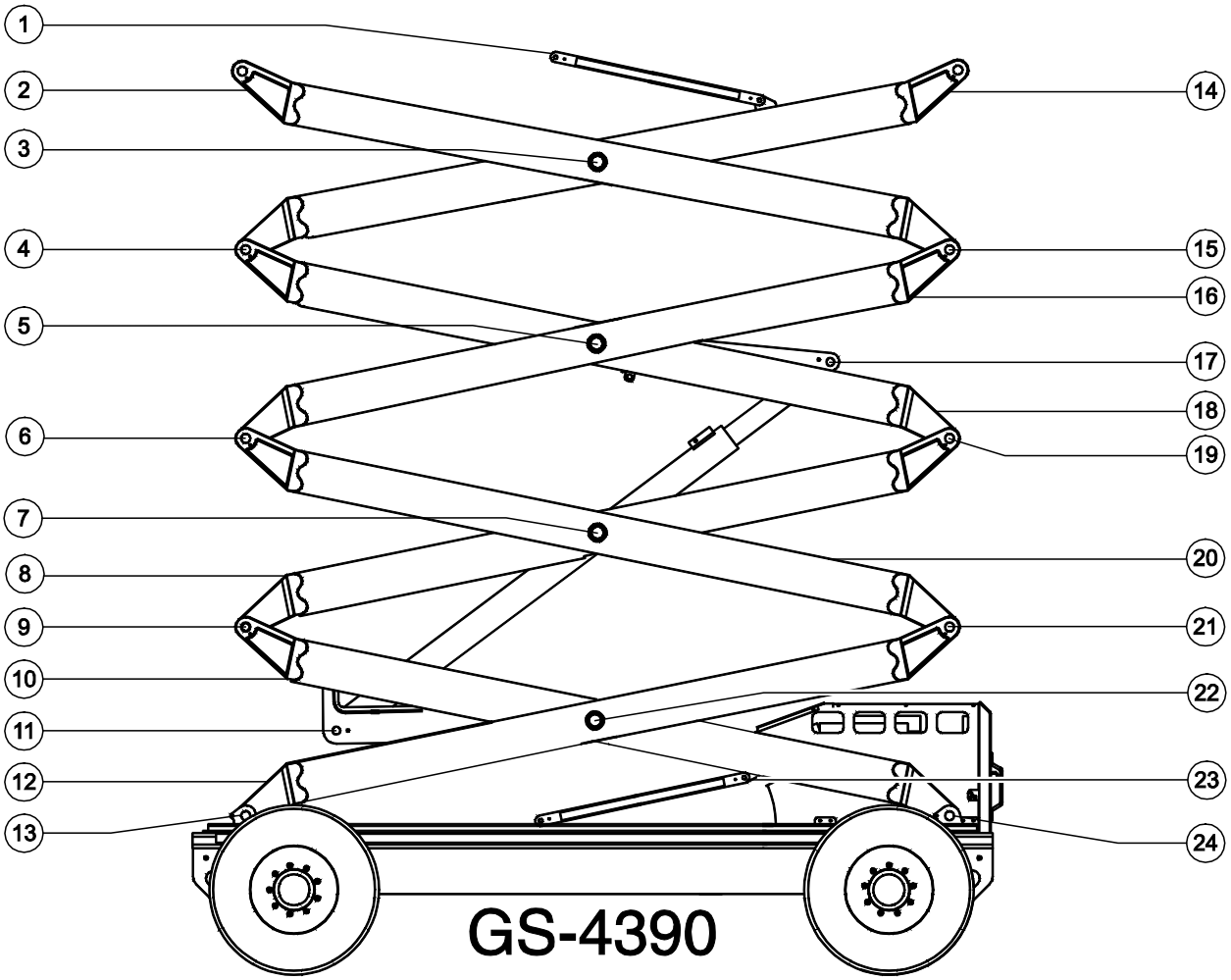
5 Remove the external snap rings from both center pivot pins.

6 Use a soft metal drift to remove both center pins.

7 Carefully separate the scissor arm pair.

⚠WARNING Crushing hazard. The scissor arms could become unbalanced and fall if not properly supported by the overhead cranes.

Scissor Components



Non-steer End Steer End

1 Platform centering link
2 Number 4 outer arm
3 Number 4 center pivot pin (Qty. 2)
4 Number 4 pivot pin (non-steer end)
5 Number 3 center pivot pin (Qty. 2)
6 Number 3 pivot pin (non-steer end)
7 Number 2 center pivot pin (Qty. 2)
8 Number 2 inner arm
9 Number 2 pivot pin (non-steer end)
10 Number 1 inner arm
11 Lower lift cylinder barrel-end pivot pin
12 Number 1 outer arm
13 Number 1 pivot pins (non-steer end)
14 Number 4 inner arm
15 Number 4 pivot pin (steer end)
16 Number 3 outer arm
17 Lower lift cylinder rod-end pivot pin
18 Number 3 inner arm
19 Number 3 pivot pin (steer end)
20 Number 2 outer arm
21 Number 2 pivot pin (steer end)
22 Number 1 center pivot pin (Qty. 2)
23 Chassis centering link
24 Number 1 pivot pins (steer end)

Scissor Components

3-2
Scissor Assembly, GS-4390

How to Disassemble the Scissor Assembly

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Remove the platform. Refer to Repair Procedure, *How to Remove the Platform.*

2 Remove the cables from the platform centering link (index #1) at the hydraulic tank side of the machine.

3 Remove the cables from the number 4 inner arm (index #14) and lay the cables off to the side.

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

4 Secure both ends of the number 4 inner and outer arms (index #14 and #2) together with a strap or other suitable device.

5 Attach a lifting strap from an overhead crane to the number 4 inner and outer arms (index #14 and #2) at the steer end of the machine. Do not apply any lifting pressure.

6 Attach a lifting strap from an overhead crane to the number 4 inner and outer arms (index #14 and #2) at the non-steer end of the machine. Do not apply any lifting pressure.

7 Remove the pin retaining fasteners from both number 4 pivot pins (index #4) at the non-steer end of the machine. Do not remove the pins.

8 Remove the pin retaining fasteners from both number 4 pivot pins (index #15) at the steer end of the machine. Do not remove the pins.

9 Use a slide hammer to remove both number 4 pivot pins (index #4) from the non-steer end of the machine.

10 Use a slide hammer to remove both number 4 pivot pins (index #15) from the steer end of the machine.

11 Carefully remove the number 4 inner and outer arms (index #14 and #2) from the machine.

⚠WARNING Crushing hazard. The number 4 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

12 Remove the pin retaining fasteners from the lift cylinder rod-end pivot pin (index #17). Do not remove the pin.

13 Attach a lifting strap from an overhead crane to the lifting eye at the rod end of the lift cylinder.

Scissor Components

14 Use a soft metal drift to remove the lift cylinder rod-end pivot pin (index #17). Lower the rod end of the lift cylinder down.

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

15 Block the steer end wheels and center a lifting jack of ample capacity under the non-steer end of the drive chassis.

16 Loosen the wheel lug nuts on one of the non-steer wheels. Do not remove them.

17 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

⚠WARNING Crushing hazard. The chassis will fall if not properly supported.

18 Remove the wheel lug nuts. Remove the tire and wheel assembly.

19 Tag, disconnect and plug the hydraulic hoses from 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.

20 Cut the zip ties attaching the hydraulic hoses to the lift cylinder. Lay the hoses out of the way.

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

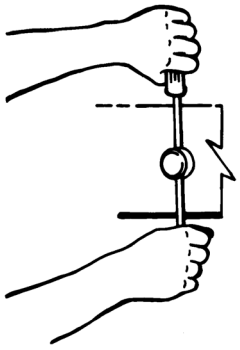
21 Remove the cables from the number 3 inner arm (index #18) and lay the cables off to the side.

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

22 Remove the pin retaining fasteners from the cable tray pivot pin at the number 3 inner arm.

23 Place a rod through the cable tray pivot pin and twist to remove the pin. Lower the cable tray down.

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



24 Secure both ends of the number 3 inner and outer arms (index #18 and #16) together with a strap or other suitable device.

25 Attach a lifting strap from an overhead crane to the number 3 inner and outer arms (index #18 and #16) at the steer end of the machine. Do not apply any lifting pressure.

26 Attach a lifting strap from an overhead crane to the number 3 inner and outer arms (index #18 and #16) at the non-steer end of the machine. Do not apply any lifting pressure.

27 Remove the pin retaining fasteners from both number 3 pivot pins (index #6) at the non-steer end of the machine. Do not remove the pins.

Scissor Components

28 Remove the pin retaining fasteners from both number 3 pivot pins (index #19) at the steer end of the machine. Do not remove the pins.

29 Use a slide hammer to remove both number 3 pivot pins (index #6) from the non-steer end of the machine.

30 Use a slide hammer to remove both number 3 pivot pins (index #19) from the steer end of the machine.

31 Carefully remove the number 3 inner and outer arms (index #18 and #16) from the machine.

⚠WARNING Crushing hazard. The number 3 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

32 Secure the non-steer end of the number 2 inner and outer arms (index #8 and #20) and the non-steer end of the number 1 inner and outer arms (index #10 and #12) together with a strap or other suitable device.

33 Attach a lifting strap from an overhead crane to the number 1 outer arm (index #12) at the non-steer end of the machine. Do not apply any lifting pressure.

34 Remove the pin retaining fasteners from the number 1 pivot pins (index #13) at the non-steer end of the machine.

35 Use a slide hammer to remove both number 1 pivot pins (index #13) from the non-steer end of the machine.

36 Carefully lift the number 1 outer arm at the non-steer end approximately 15 inches / 40 cm.

37 Place a 6 x 6 x 32 inch / 15 x 15 x 80 cm long block across both sides of the chassis under the barrel end of the lift cylinder.

38 Lower the number 1 outer arm (index #12) onto the block.

⚠WARNING Crushing hazard. Keep hands clear of moving parts when lowering the arms onto the block.

39 Attach a lifting strap from an overhead crane to the lifting eyes on the lift cylinder.

40 Remove the lift cylinder barrel-end pivot pin retaining fasteners.

41 Use a soft metal drift to remove the lift cylinder barrel-end pivot pin (index #11).

42 Carefully remove the lift cylinder from the machine.

⚠WARNING Crushing hazard. The lift cylinder could become unbalanced and fall when it is removed from the machine if not properly supported by the overhead crane.

43 Carefully lift the number 1 outer arm (index #12) approximately 2 inches / 5 cm and remove the block.

44 Lower the number 1 outer arm (index #12) onto the slide blocks.

⚠WARNING Crushing hazard. Keep hands clear of moving parts when lowering the arms onto the block.

45 Secure the number 1 outer arm (index #12) to the slide blocks.

Scissor Components

46 Remove the strap installed in step 32.

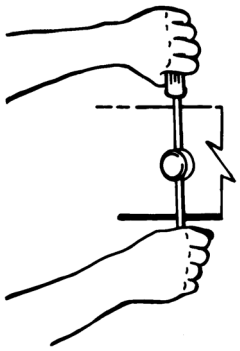
47 Support the cable tray with an overhead crane.

48 Remove the pin retaining fasteners from the cable tray pivot pin at the cross tube of the number 2 inner arm (index #8).

49 Place a rod through the cable tray pivot pin and twist to remove the pin. Lower the cable tray onto the number 1 inner arm (index #10).

⚠WARNING Crushing hazard. The cable tray may fall if not properly supported by the overhead crane.

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



50 Secure both ends of the number 2 inner and outer arms (index #8 and #20) together with a strap or other suitable device.

51 Attach a lifting strap from an overhead crane to the number 2 inner and outer arms (index #8 and #20) at the steer end of the machine. Do not apply any lifting pressure.

52 Attach a lifting strap from an overhead crane to the number 2 inner and outer arms (index #8 and #20) at the non-steer end of the machine. Do not apply any lifting pressure.

53 Remove the pin retaining fasteners from both number 2 pivot pins (index #9) at the non-steer end of the machine. Do not remove the pins.

54 Remove the pin retaining fasteners from both number 2 pivot pins (index #21) at the steer end of the machine. Do not remove the pins.

55 Use a slide hammer to remove both number 2 pivot pins (index #9) from the non-steer end of the machine.

56 Use a slide hammer to remove both number 2 pivot pins (index #21) from the steer end of the machine.

57 Carefully remove the number 2 inner and outer arms (index #8 and #20) from the machine.

⚠WARNING Crushing hazard. The number 2 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

58 Remove the cables from the number 1 inner arm (index #10).

59 Secure both ends of the number 1 inner and outer arms (index #10 and #12) together with a strap or other suitable device.

60 Attach a lifting strap from an overhead crane to the number 1 inner and outer arms (index #10 and #12) at the steer end of the machine. Do not apply any lifting pressure.

Scissor Components

61 Attach a lifting strap from an overhead crane to the number 1 inner and outer arms (index #10 and #12) at the non-steer end of the machine. Do not apply any lifting pressure.

62 Remove the pin retaining fasteners from both chassis centering link pivot pins (index #23) at the number 1 inner arm.

63 Place a rod through each chassis centering link pivot pin and twist to remove the pin. Rest the centering links on the chassis.

64 Remove the pin retaining fasteners from the number 1 inner arm slide blocks (index #24) at the steer end of the machine.

65 Use a slide hammer to remove the number 1 inner arm slide block pivot pins (index #24).

66 Use a slide hammer to remove the number 1 outer arm slide block pivot pins (index #24) at the non-steer end of the machine.

67 Carefully remove the number 1 inner and outer arms (index #10 and #12) from the machine.

⚠WARNING Crushing hazard. The number 1 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

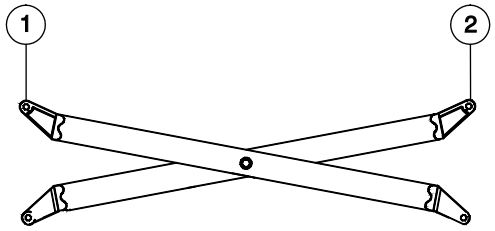
Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

How to Disassemble a Scissor Arm Pair

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Attach a lifting strap from an overhead crane to the end of the outer arm.

Note: Attach the lifting strap to the end of the scissor arm that has the casting pointing upwards.



1 outer arm
2 inner arm

2 Attach a lifting strap from a second overhead crane to the end of the inner arm.

Note: Attach the lifting strap to the end of the scissor arm that has the casting pointing upwards.

3 Raise the scissor arms with the overhead cranes approximately 12 inches / 30 cm.

Scissor Components

4 Place a 12 inch / 30 cm block under the center of the scissor arm pair. Lower the scissor arm pair onto the block.

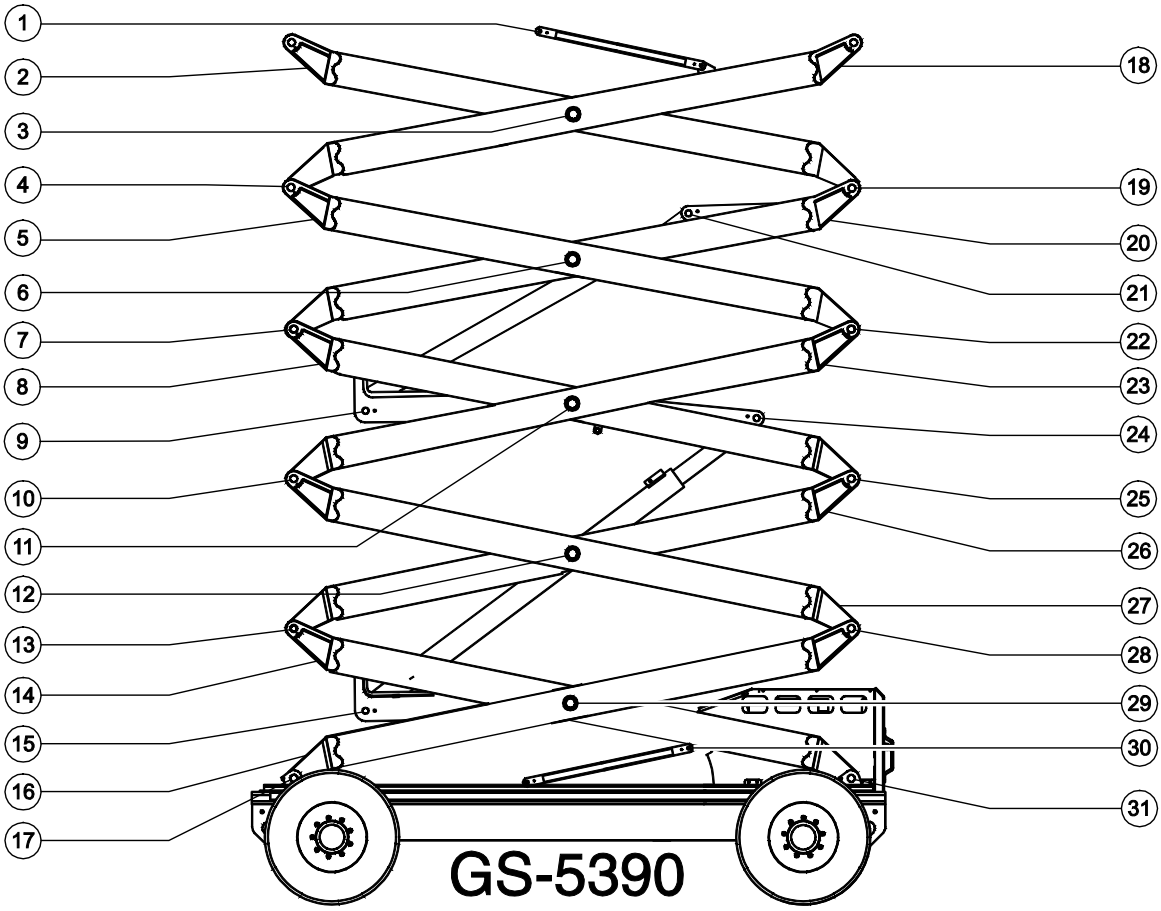
5 Remove the external snap rings from both center pivot pins.

6 Use a soft metal drift to remove both center pins.

7 Carefully separate the scissor arm pair.

⚠WARNING Crushing hazard. The scissor arms could become unbalanced and fall if not properly supported by the overhead cranes.

Scissor Components



Non-steer End Steer End

1 Platform centering link
2 Number 5 inner arm
3 Number 5 center pivot pin (Qty. 2)
4 Number 5 pivot pin (non-steer end)
5 Number 4 outer arm
6 Number 4 center pivot pin (Qty. 2)
7 Number 4 pivot pin (non-steer end)
8 Number 3 inner arm
9 Upper lift cylinder barrel-end pivot pin
10 Number 3 pivot pin (non-steer end)
11 Number 3 center pivot pin (Qty. 2)
12 Number 2 center pivot pin (Qty. 2)
13 Number 2 pivot pin (non-steer end)
14 Number 1 inner arm
15 Lower lift cylinder barrel-end pivot pin
16 Number 1 outer arm
17 Number 1 pivot pins (non-steer end)
18 Number 5 outer arm
19 Number 5 pivot pin (steer end)
20 Number 4 inner arm
21 Upper lift cylinder rod-end pivot pin
22 Number 4 pivot pin (steer end)
23 Number 3 outer arm
24 Lower lift cylinder rod-end pivot pin
25 Number 3 pivot pin (steer end)
26 Number 2 inner arm
27 Number 2 outer arm
28 Number 2 pivot pin (steer end)
29 Number 1 center pivot pin (Qty. 2)
30 Chassis centering link
31 Number 1 pivot pins (steer end)

3-3
Scissor Assembly, GS-5390

How to Disassemble the Scissor Assembly

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Remove the platform. Refer to Repair Procedure, *How to Remove the Platform.*

2 Remove the cables from the platform centering link (index #1) and upper cable bridge at the hydraulic tank side of the machine.

3 Remove the cables from the number 5 inner arm (index #2) and lay the cables off to the side.

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

4 Secure both ends of the number 5 inner and outer arms (index #2 and #18) together with a strap or other suitable device.

5 Attach a lifting strap from an overhead crane to the number 5 inner and outer arms (index #2 and #18) at the steer end of the machine. Do not apply any lifting pressure.

6 Attach a lifting strap from an overhead crane to the number 5 inner and outer arms (index #2 and #18) at the non-steer end of the machine. Do not apply any lifting pressure.

7 Remove the pin retaining fasteners from both number 5 pivot pins (index #4) at the non-steer end of the machine. Do not remove the pins.

8 Remove the pin retaining fasteners from both number 5 pivot pins (index #19) at the steer end of the machine. Do not remove the pins.

9 Use a slide hammer to remove both number 5 pivot pins (index #4) from the non-steer end of the machine.

10 Use a slide hammer to remove both number 5 pivot pins (index #19) from the steer end of the machine.

11 Carefully remove the number 5 inner and outer arms (index #2 and #18) from the machine.

⚠WARNING Crushing hazard. The number 5 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

12 Remove the pin retaining fasteners from the upper lift cylinder rod-end pivot pin (index #21). Do not remove the pin.

13 Attach a lifting strap from an overhead crane to the lifting eye at the rod end of the upper lift cylinder.

Scissor Components

14 Use a soft metal drift to remove the upper lift cylinder rod-end pivot pin (index #21). Lower the rod end of the upper lift cylinder down.

⚠WARNING Crushing hazard. The upper lift cylinder could fall when the upper lift cylinder rod-end pivot pin is removed if not properly supported by the overhead crane.

15 Remove the cables from the number 4 inner arm (index #20) and lay the cables off to the side.

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

16 Secure both ends of the number 4 inner and outer arms (index #20 and #5) together with a strap or other suitable device.

17 Attach a lifting strap from an overhead crane to the number 4 inner and outer arms (index #20 and #5) at the steer end of the machine. Do not apply any lifting pressure.

18 Attach a lifting strap from an overhead crane to the number 4 inner and outer arms (index #20 and #5) at the non-steer end of the machine. Do not apply any lifting pressure.

19 Remove the pin retaining fasteners from both number 4 pivot pins (index #7) at the non-steer end of the machine. Do not remove the pins.

20 Remove the pin retaining fasteners from both number 4 pivot pins (index #22) at the steer end of the machine. Do not remove the pins.

21 Use a slide hammer to remove both number 4 pivot pins (index #7) from the non-steer end of the machine.

22 Use a slide hammer to remove both number 4 pivot pins (index #22) from the steer end of the machine.

23 Support the rod end of the upper lift cylinder with a suitable lifting device.

24 Carefully remove the number 4 inner and outer arms (index #20 and #5) from the machine while guiding the rod end of the upper lift cylinder out of the scissor arms.

⚠WARNING Crushing hazard. The number 4 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

NOTICE Component damage hazard. The upper lift cylinder may fall if not properly supported when the number 4 inner and outer arms are removed.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

25 Lower the rod end of the upper lift cylinder onto the cross tube of the number 3 inner arm (index #8).

26 Tag, disconnect and plug the hydraulic hoses from the upper 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.

27 Remove the zip ties securing the hydraulic hoses to the upper lift cylinder.

28 Remove the pin retaining fasteners from the lower cylinder rod-end pivot pin (index #24).

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

Scissor Components

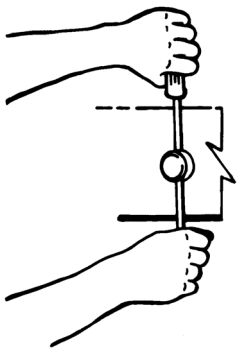
30 Carefully lower the rod end of the lower lift cylinder onto the engine cover.

31 Remove the cables and hydraulic hoses from the number 3 inner arm (index #8) and lay the cables and hoses off to the side.

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

32 Remove the pin retaining fasteners from the cable tray pivot pin at the number 3 inner arm (index #8) on the hydraulic tank side of the machine.

33 Place a rod through the cable tray pivot pin and twist to remove the pin. Lower the cable tray down.



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

34 Remove the pin retaining fasteners from the hose tray pivot pin at the number 3 inner arm (index #11) on the ground controls side of the machine.

35 Place a rod through the hose tray pivot pin and twist to remove the pin. Lower the hose tray down.

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

36 Secure both ends of the number 3 inner and outer arms (index #8 and #23) together with a strap or other suitable device.

37 Attach a lifting strap from an overhead crane to the number 3 inner and outer arms (index #8 and #23) at the steer end of the machine. Do not apply any lifting pressure.

38 Attach a lifting strap from an overhead crane to the number 3 inner and outer arms (index #8 and #23) at the non-steer end of the machine. Do not apply any lifting pressure.

39 Remove the pin retaining fasteners from both number 3 pivot pins (index #10) at the non-steer end of the machine. Do not remove the pins.

40 Remove the pin retaining fasteners from both number 3 pivot pins (index #25) at the steer end of the machine. Do not remove the pins.

41 Use a slide hammer to remove both number 3 pivot pins (index #10) from the non-steer end of the machine.

42 Use a slide hammer to remove both number 3 pivot pins (index #25) from the steer end of the machine.

43 Carefully remove the number 3 inner and outer arms (index #8 and #23) and upper lift cylinder from the machine.

⚠WARNING Crushing hazard. The number 3 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

Scissor Components

44 Secure the non-steer end of the number 2 inner and outer arms (index #26 and #27) and the non-steer end of the number 1 inner and outer arms (index #14 and #16) together with a strap or other suitable device.

45 Attach a lifting strap from an overhead crane to the number 1 outer arm (index #16) at the non-steer end of the machine. Do not apply any lifting pressure.

46 Remove the pin retaining fasteners from the number 1 pivot pins (index #17) at the non-steer end of the machine.

47 Use a slide hammer to remove both number 1 pivot pins (index #17) from the non-steer end of the machine.

48 Carefully lift the number 1 outer arm at the non-steer end approximately 15 inches / 40 cm.

49 Place a 6 x 6 x 32 inch / 15 x 15 x 80 cm long block across both sides of the chassis under the barrel end of the lift cylinder.

50 Lower the number 1 outer arm (index #16) onto the block.

⚠WARNING Crushing hazard. Keep hands clear of moving parts when lowering the arms onto the block.

51 Attach a lifting strap from an overhead crane to the lifting eyes on the lift cylinder.

52 Remove the lift cylinder barrel-end pivot pin retaining fasteners.

53 Use a soft metal drift to remove the lift cylinder barrel-end pivot pin (index #15).

54 Carefully remove the lift cylinder from the machine.

⚠WARNING Crushing hazard. The lift cylinder could become unbalanced and fall when it is removed from the machine if not properly supported by the overhead crane.

55 Carefully lift the number 1 outer arm (index #16) approximately 2 inches / 5 cm and remove the block.

56 Lower the number 1 outer arm (index #16) onto the slide blocks.

⚠WARNING Crushing hazard. Keep hands clear of moving parts when lowering the arms onto the block.

57 Secure the number 1 outer arm (index #16) to the slide blocks.

58 Remove the strap installed in step 44.

59 Support the cable tray with an overhead crane.

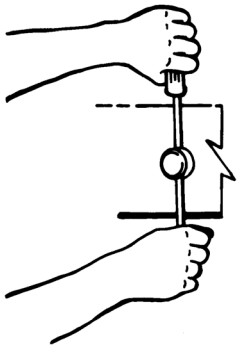
60 Remove the pin retaining fasteners from the cable tray pivot pin at the cross tube of the number 2 inner arm (index #26).

Scissor Components

61 Place a rod through the cable tray pivot pin and twist to remove the pin. Lower the cable tray onto the number 1 inner arm (index #14).

⚠WARNING Crushing hazard. The cable tray may fall if not properly supported by the overhead crane.

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



62 Secure both ends of the number 2 inner and outer arms (index #26 and #27) together with a strap or other suitable device.

63 Attach a lifting strap from an overhead crane to the number 2 inner and outer arms (index #26 and #27) at the steer end of the machine. Do not apply any lifting pressure.

64 Attach a lifting strap from an overhead crane to the number 2 inner and outer arms (index #26 and #27) at the non-steer end of the machine. Do not apply any lifting pressure.

65 Remove the pin retaining fasteners from both number 2 pivot pins (index #13) at the non-steer end of the machine. Do not remove the pins.

66 Remove the pin retaining fasteners from both number 2 pivot pins (index #28) at the steer end of the machine. Do not remove the pins.

67 Use a slide hammer to remove both number 2 pivot pins (index #13) from the non-steer end of the machine.

68 Use a slide hammer to remove both number 2 pivot pins (index #28) from the steer end of the machine.

69 Carefully remove the number 2 inner and outer arms (index #26 and #27) from the machine.

⚠WARNING Crushing hazard. The number 2 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

70 Remove the cables from the number 1 inner arm (index #14).

71 Secure both ends of the number 1 inner and outer arms (index #14 and #16) together with a strap or other suitable device.

72 Attach a lifting strap from an overhead crane to the number 1 inner and outer arms (index #14 and #16) at the steer end of the machine. Do not apply any lifting pressure.

73 Attach a lifting strap from an overhead crane to the number 1 inner and outer arms (index #14 and #16) at the non-steer end of the machine. Do not apply any lifting pressure.

74 Remove the pin retaining fasteners from both chassis centering link pivot pins (index #30) at the number 1 inner arm.

Scissor Components

75 Place a rod through each chassis centering link pivot pin and twist to remove the pin. Rest the centering links on the chassis.

76 Remove the pin retaining fasteners from the number 1 inner arm slide blocks (index #31) at the steer end of the machine.

77 Use a slide hammer to remove the number 1 inner arm slide block pivot pins (index #31).

78 Use a slide hammer to remove the number 1 outer arm slide block pivot pins (index #31) at the non-steer end of the machine.

79 Carefully remove the number 1 inner and outer arms (index #14 and #16) from the machine.

⚠WARNING Crushing hazard. The number 1 inner and outer arms could become unbalanced and fall when they are removed from the machine if not properly supported by the overhead crane.

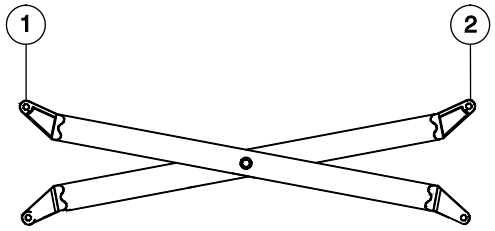
Note: If further disassembly of the scissor arm pair is required, refer to Repair Procedure, *How to Disassemble a Scissor Arm Pair.*

How to Disassemble a Scissor Arm Pair

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

1 Attach a lifting strap from an overhead crane to the end of the outer arm.

Note: Attach the lifting strap to the end of the scissor arm that has the casting pointing upwards.



1 outer arm
2 inner arm

2 Attach a lifting strap from a second overhead crane to the end of the inner arm.

Note: Attach the lifting strap to the end of the scissor arm that has the casting pointing upwards.

3 Raise the scissor arms with the overhead cranes approximately 12 inches / 30 cm.

4 Place a 12 inch / 30 cm block under the center of the scissor arm pair. Lower the scissor arm pair onto the block.

5 Remove the external snap rings from both center pivot pins.

6 Use a soft metal drift to remove both center pins.

7 Carefully separate the scissor arm pair.

⚠WARNING Crushing hazard. The scissor arms could become unbalanced and fall if not properly supported by the overhead cranes.

3-4
Wear Pads

How to Replace the Platform Scissor Arm Wear Pad

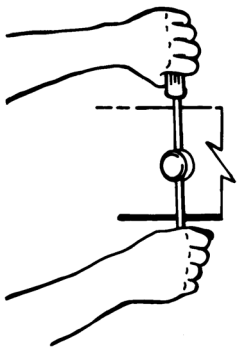
1 Place a lifting strap from an overhead crane under the platform at the steer end of the machine for support. Do not attach the lifting straps from the overhead crane to the platform railings.

2 Place a lifting strap from a second overhead crane under the platform at the non-steer end of the machine for support. Do not attach the lifting straps from the overhead crane to the platform railings.

3 Lift the platform slightly using the overhead cranes just enough to take the pressure off the platform slide block pivot pins.

4 Remove the pin retaining fasteners from each platform centering link pivot pin at the platform.

5 Place a rod through each platform centering link pivot pin and twist to remove the pin. Rest the centering links on the scissor arms.



Scissor Components

6 Remove the pin retaining fasteners from each platform slide block pivot pin. Do not remove the pins.

7 Use a slide hammer to remove each platform slide block pivot pin.

⚠WARNING Crushing hazard. The platform will fall when the platform slider block pivot pins are removed if not properly supported by the overhead cranes.

8 Move each slide block towards the center of the platform and carefully remove each platform slide block from the platform.

9 Remove the retaining fasteners from the wear pads on the slide blocks. Remove the wear pads.

10 Install the new wear pads onto the scissor arm slide blocks.

11 Install the slide blocks onto the platform.

12 Align the holes in the slide blocks with the holes in the scissor arms.

13 Install the slide block pivot pins and the pin retaining fasteners.

14 Attach the platform centering links to the platform and install the platform centering link pivot pins and the pin retaining fasteners.

How to Replace the Chassis Scissor Arm Wear Pads

Note: If removing the steer end slide blocks, the engine top and side covers need to be removed first. Proceed to step 1.

Note: If removing the non-steer end slide blocks, proceed to step 11.

1 Start the engine from the ground controls and raise the platform approximately 18 feet / 5.5 m from the ground.

2 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

Note: Be sure that the safety arm is locked in the vertical position.

3 Lower the platform onto the safety arm. Turn the machine off.

⚠WARNING Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

NOTICE Component damage hazard. The link set cross tube can be damaged if excessive force is applied. Do not continue to lower the platform after the safety arm makes contact with the cross tube.

4 Release the latches on the engine tray and fully slide the engine tray out.

5 Insert a 6 inch / 15 cm screwdriver or rod into the engine tray lock hole located near the engine tray roller wheels to prevent the engine tray from moving.

Scissor Components

6 Remove the retaining fasteners from the top engine cover plate. Remove the plate from the machine.

7 Loosen the retaining fasteners from each side engine cover plate. Remove the engine side cover plates from the machine.

8 Start the engine from the ground controls.

9 Raise the platform slightly and return the safety arm to the stowed position.

10 Lower the platform to the stowed position.

11 Secure the ends of the scissor arms together at both ends of the machine with a tie down strap or other appropriate device.

12 Attach a lifting strap from an overhead crane to the end of the scissor arms that need the slide blocks removed.

13 Raise the scissor arms using the overhead crane just enough to take the pressure off the slide block pivot pins.

14 Remove the pin retaining fasteners from the chassis slide block pivot pin.

15 Use a slide hammer to remove the chassis slide block pivot pin. Remove the slide block from the machine by sliding it out the end of the slider channel.

⚠WARNING Crushing hazard. The platform will fall when the platform slide block pivot pins are removed if it is not properly supported by the overhead cranes.

16 Remove the retaining fasteners from the wear pads on the slide blocks. Remove the wear pads.

17 Install the new wear pads onto the scissor arm slide blocks.

18 Install the slide blocks onto the chassis.

19 Align the holes in the slide blocks with the holes in the scissor arms.

20 Install the slide block pivot pins and the pin retaining fasteners.

21 Repeat steps 12 through 20 for the remaining scissor arm wear pads.

22 Install the top engine cover plate.

23 Tighten the engine side cover plate fasteners.

24 Close and latch the engine slide out tray.

25 Lower the platform to the stowed position.

Scissor Components

3-5 Lift Cylinders

The lift cylinders are double acting hydraulic cylinders. The GS-3384, GS-3390 and GS-4390 use one lift cylinder; the GS-5390 uses two. Each lift cylinder is equipped with a counterbalance valve to prevent movement in the event of a hydraulic line failure.

How to Remove the Lift Cylinder - GS-3384, GS-3390 and GS-4390

⚠WARNING Bodily injury hazard. The counterbalance valve in the lift cylinder is factory set. Do not attempt to adjust the counterbalance valve. Attempting to adjust the counterbalance valve could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Start the engine from the ground controls and raise the platform approximately 18 feet / 5.5 m from the ground.

2 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

Note: Be sure that the safety arm is locked in the vertical position.

3 Lower the platform onto the safety arm. Turn the machine off.

⚠WARNING Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

NOTICE Component damage hazard. The link set cross tube can be damaged if excessive force is applied. Do not continue to lower the platform after the safety arm makes contact with the cross tube.

4 Support the platform using a 5 ton / 5000 kg overhead crane. Do not apply lifting pressure at this time.

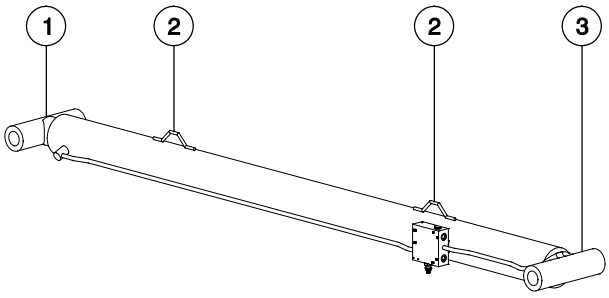
5 Tag, disconnect and plug the hydraulic hoses from the lift cylinder. Cap the fittings on the cylinder.

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

6 Cut the zip ties attaching the hydraulic hoses to the lift cylinder. Lay the hoses out of the way.

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

7 Attach a lifting strap from an overhead crane or similar lifting device to the lifting eye at the rod end of the lift cylinder for support.



1 rod end
2 lifting eye
3 barrel end

8 Attach a lifting strap from a second overhead crane or similar lifting device to the lifting eye at the barrel end of the lift cylinder for support.

9 Remove the lift cylinder rod-end pivot pin retaining fastener. Use a soft metal drift to remove the pin.

⚠ CAUTION Crushing hazard. The lift cylinder will fall unless it is properly supported.

10 Carefully lower the cylinder onto the cross tube of the number 2 inner arm. Protect the cylinder rod from damage.

NOTICE Component damage hazard. The counterbalance valve on the lift cylinder can be damaged if it is allowed to come in contact with the scissor arm cross tube.

11 Remove the lift cylinder barrel-end pivot pin retaining fastener. Use a soft metal drift to remove the pin.

Note: Use of the overhead crane may be required for the pin to clear the link set.

⚠ CAUTION Crushing hazard. The lift cylinder will fall unless it is properly supported.

12 Carefully pull the lift cylinder out the non-steer end of the machine through the scissor arms. Remove the lift cylinder from the machine.

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

Scissor Components

How to Remove the Lift Cylinder - GS-5390

⚠WARNING Bodily injury hazard. The counterbalance valve in the lift cylinder is factory set. Do not attempt to adjust the counterbalance valve. Attempting to adjust the counterbalance valve could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

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

1 Start the engine from the ground controls and raise the platform approximately 18 feet / 5.5 m from the ground.

2 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

Note: Be sure that the safety arm is locked in the vertical position.

3 Lower the platform onto the safety arm. Turn the machine off.

⚠WARNING Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

NOTICE Component damage hazard. The link set cross tube can be damaged if excessive force is applied. Do not continue to lower the platform after the safety arm makes contact with the cross tube.

4 Support the platform using a 5 ton / 5000 kg overhead crane. Do not apply lifting pressure at this time.

5 Tag, disconnect and plug the hydraulic hoses from the lift cylinder. Cap the fittings on the cylinder.

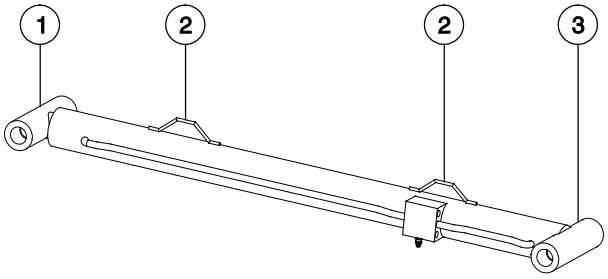
⚠WARNING Bodily injury hazard. This procedure requires specific repair skills, lifting equipment and a suitable workshop. Attempting this procedure without these skills and tools could result in death or serious injury and significant component damage. Dealer service is strongly recommended.

6 Lower Lift Cylinder: Cut the zip ties attaching the hydraulic hoses to the lift cylinder. Lay the hoses out of the way.

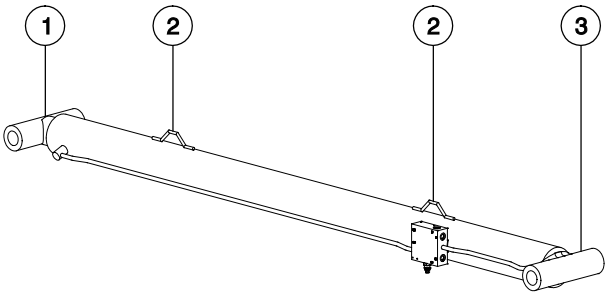
NOTICE Component damage hazard. Hoses can be damaged if they are kinked or pinched.

Scissor Components

7 Attach a lifting strap from an overhead crane or similar lifting device to the lifting eye at the rod end of the lift cylinder for support.



upper cylinder



lower cylinder

1 rod end
2 lifting eye
3 barrel end

8 Attach a lifting strap from a second overhead crane or similar lifting device to the lifting eye at the barrel end of the lift cylinder for support.

9 Remove the lift cylinder rod-end pivot pin retaining fastener. Use a soft metal drift to remove the pin.

⚠ CAUTION Crushing hazard. The lift cylinder will fall unless it is properly supported.

10 Carefully lower the cylinder to a horizontal position. Protect the cylinder rod from damage.

NOTICE Component damage hazard. The counterbalance valve on the lift cylinder can be damaged if it is allowed to come in contact with the scissor arm cross tube.

11 Remove the lift cylinder barrel-end pivot pin retaining fastener. Use a soft metal drift to remove the pin.

Note: Use of the overhead crane may be required for the pin to clear the link set.

⚠ CAUTION Crushing hazard. The lift cylinder will fall unless it is properly supported.

12 Carefully pull the lift cylinder out the non-steer end of the machine through the scissor arms. Remove the lift cylinder from the machine.

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

Engines

4-1 RPM Adjustment

Deutz D2011L03i models:

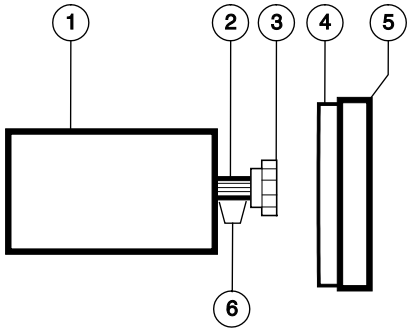
Refer to Maintenance Procedure in the appropriate Service or Maintenance Manual for your machine, *Check and Adjust the Engine RPM*.

Ford MSG-425 and Deutz D 2.9 L4 Models:

Note: The engine rpm is controlled by the ECM and can only be adjusted by reprogramming the ECM. If rpm adjustment or service is required, please contact Genie Product Support OR your local Ford or Deutz dealer.

4-2 Flex Plate

The flex plate acts as a coupler between the engine and the pump. It is bolted to the engine flywheel and has a splined center to drive the pump.



1 pump
2 pump shaft
3 coupler
4 flex plate
5 flywheel
6 7/16 inch / 11 mm gap - Deutz models
0.080 inch / 2 mm gap - Ford models

How to Remove the Flex Plate - Ford Models

1 Release the latches on the engine tray and fully slide the engine tray out.

2 Insert a 6 inch / 15 cm screwdriver or rod into the engine tray lock hole located near the engine tray roller wheels to prevent the engine tray from moving.

3 Tag and disconnect the exhaust gas sensor in the exhaust pipe adjacent to the engine exhaust manifold.

4 Remove the exhaust pipe, located between the exhaust manifold and muffler, from the machine.

5 Remove the medium pressure filter assembly from the muffler mount and lay it to the side.

6 Remove the muffler and muffler mount assembly from the machine.

7 Center a lifting jack under the engine oil pan.

8 Place a wood block between the lifting jack and the engine oil pan.

NOTICE Component damage hazard. The engine oil pan can become damaged if the engine is raised with the lifting jack without the wood block between the lifting jack and the engine oil pan.

9 Remove the fasteners securing the bell housing to the slide out tray.

10 Raise the engine slightly with the lifting jack to take the pressure off the rubber vibration isolators under the bell housing. Remove the rubber vibration isolators.

11 Attach a lifting strap from an overhead crane to the pump and bell housing assembly for support. Do not apply any lifting pressure.

12 Remove all of the bell housing to engine fasteners.

13 Carefully pull the pump and bell housing away from the engine and secure it from moving.

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

14 Remove the flex plate mounting fasteners, then remove the flex plate from the engine flywheel.

How to Remove the Flex Plate - Deutz Models

1 Release the latches on the engine tray and fully slide the engine tray out.

2 Insert a 6 inch / 15 cm screwdriver or rod into the engine tray lock hole located near the engine tray roller wheels to prevent the engine tray from moving.

3 Remove the hose clamp from the air cleaner hose that connects to the engine.

4 Remove the air filter mounting fasteners. Remove the air filter from the engine and lay it off to the side.

5 Remove the exhaust pipe clamp from the exhaust pipe support bracket.

6 Attach a lifting strap from an overhead crane to the pump assembly for support. Do not lift it.

7 Remove all of the pump mounting plate to engine fasteners.

8 Carefully pull the pump assembly away from the engine and secure it from moving.

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

9 Remove the flex plate mounting fasteners, then remove the flex plate from the engine flywheel.

Engines

How to Install the Flex Plate

1 Install the flex plate onto the engine flywheel with the raised spline towards the pump.

2 **Ford models:** Torque the flex plate mounting bolts in sequence to 14 ft-lbs / 19 Nm.

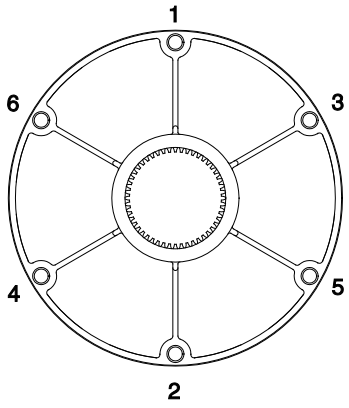
Deutz models: Torque the flex plate mounting bolts in sequence to 28 ft-lbs / 38 Nm.

NOTICE

Component damage hazard. To secure the flex plate to engine flywheel, engine specifications require that the fasteners be tightened in a specific order and that the torque used to tighten the mounting fasteners be increased gradually, or in steps.

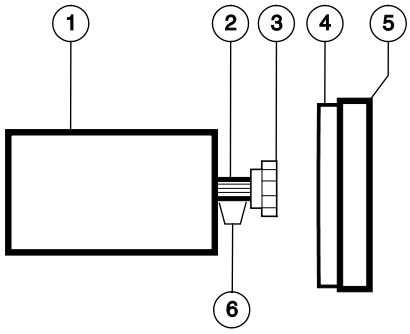
3 **Ford models:** Torque the flex plate mounting bolts in sequence to 20 ft-lbs / 27 Nm.

Deutz models: Torque the flex plate mounting bolts in sequence to 40 ft-lbs / 54 Nm.



Flex plate bolt torque sequence

4 Install the pump coupler onto the pump shaft with the set screw toward the pump. Leave the appropriate gap between coupler and pump end plate for your engine.



1 pump
2 pump shaft
3 coupler
4 flex plate
5 flywheel
6 7/16 inch / 11 mm gap

5 Apply Loctite® removable thread sealant to the pump coupler set screw. Torque the set screw to 61 ft-lbs / 83 Nm.

6 **Deutz models:** Install the pump and bell housing assembly. Torque the bell housing mounting bolts labeled "C" in sequence to 28 ft-lbs / 38 Nm.

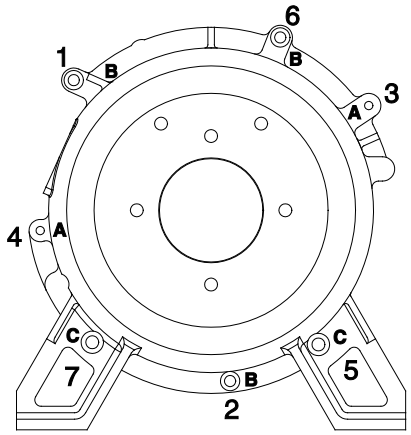
Ford models: Install the pump and bell housing assembly. Torque the bell housing mounting bolts labeled "A" and "B" in sequence to 28 ft-lbs / 38 Nm and the mounting bolts labeled "C" to 49 ft-lbs / 66 Nm.

NOTICE

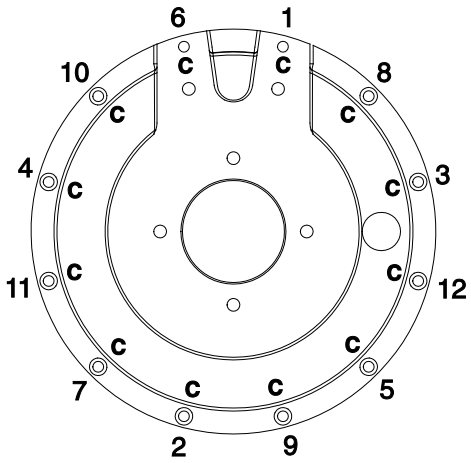
Component damage hazard. When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

NOTICE

Component damage hazard. Do not force the drive pump during installation or the flex plate teeth may become damaged.



Ford bell housing bolt torque sequence



Deutz bell housing bolt torque sequence

7 **Deutz models:** Torque the bell housing mounting bolts labeled "C" in sequence to 40 ft-lbs / 54 Nm.

Ford models: Torque the bell housing mounting bolts labeled "A" and "B" in sequence to 40 ft-lbs / 54 Nm and the mounting bolts labeled "C" to 70 ft-lbs / 95 Nm.

8 **Ford models:** Install the air cleaner mount bracket onto the bell housing. Install the fasteners and torque to 28 ft-lbs / 38 Nm.

4-3
Engine Fault Codes - Ford MSG-425 Models

How to Retrieve Engine Fault Codes

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

Refer to Fault Code Section, *How to Retrieve Ford Engine Fault Codes*. Use the Fault Code Chart to aid in identifying the fault.

Engines

4-4
Engine Fault Codes - Deutz D 2.9 L4 Models

How to Retrieve Engine Fault Codes

The ECM constantly monitors the engine by the use of sensors on the engine. The ECM also uses signals from the sensors to initiate sequential fuel injection and make constant and instantaneous changes to ignition timing, fuel delivery and throttle position to maintain the engine's running condition at its highest efficiency while at the same time keeping exhaust emissions to a minimum. When a sensor fails or returns signals that are outside of set parameters, the ECM will store a fault code in memory that relates to the appropriate sensor. One or more fault LED's will illuminate on the display located at the ground control box. The active fault code will also be displayed on the LCD screen.

If a fault occurs that does not result in an engine shutdown, the engine rpm will go into limp home mode resulting in the loss of high rpm.

Refer to Fault Code Section, *How to Retrieve Active Engine Fault Codes* for your specific engine model. Use the Fault Code Chart to aid in identifying the fault.

5-1 Auxiliary Platform Lowering

In the event of an engine failure, activating the backup manual lowering and manual lowering enable switches will lower the platform when the red Emergency Stop buttons are pulled out to the on position at both the ground and platform controls. The auxiliary down switches/buttons are located at the ground control panel. There is no adjustment required.

One 12V DC battery is used to start the engine, power the auxiliary pump and the ECM. The battery is located behind the ground control door assembly.

5-2 Controller Adjustments

All machine function speeds are determined by the percentage of total ECM voltage output. The speeds of the following machine functions may be adjusted to compensate for wear in the hydraulic pump and drive motors.

- Stowed drive speed
- High torque drive speed
- Raised drive speed
- Platform lift speed
- Platform lower speed
- Steer speed
- Platform settling speed

For further information or assistance, consult Genie Product Support.

⚠ DANGER Tip-over hazard. Do not adjust the lift and/or drive speed higher than specified in this procedure. Setting drive speed greater than specifications could cause the machine to tip over resulting in death or serious injury.

⚠ DANGER Tip-over hazard. This procedure must only be performed by a trained service professional. Attempting this procedure without the necessary skills could result in death or serious injury.

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

Ground Controls

How to Determine the Revision Level

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

⊙ Result: The revision level of the ECM will appear in the LED display window.

How to Adjust the Stowed Drive Speed

⚠ DANGER Tip-over hazard. Do not adjust the lift and/or drive speed higher than specified in this procedure. Setting drive speed greater than specifications could cause the machine to tip over resulting in death or serious injury.

1 Pull out the red Emergency stop button to the on position at the platform controls.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Turn the key switch to ground controls.

4 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

6 Use the yellow platform down arrow to scroll to max fwd high speed drive.

⊙ Result: MAX FWD HIGH SPEED drive is showing in the diagnostic display window.

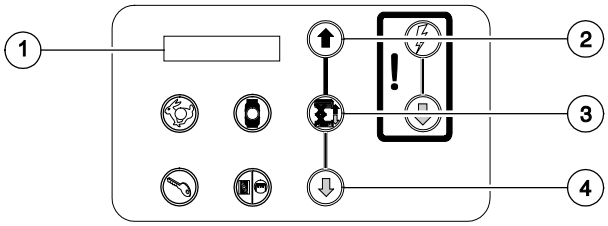
7 Press the lift function enable button.

8 Press the yellow platform down button to decrease the drive speed or press the blue platform up button to increase the drive speed. Refer to Specifications, *Performance Specifications.*

Note: The performance achieved should always be within specifications.

9 Press the lift function enable button.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

10 Press the lift function enable button.

11 Use the yellow platform down arrow to scroll to max rev high speed drive.

⊙ Result: MAX REV HIGH SPEED drive is showing in the diagnostic display window.

12 Press the lift function enable button.

13 Press the yellow platform down button to decrease the drive speed or press the blue platform up button to increase the drive speed. Refer to Specifications, *Performance Specifications.*

Note: The performance achieved should always be within specifications.

14 Press the lift function enable button.

15 Push in the ground controls red Emergency Stop button to the off position.

16 Check the stowed drive speed of the machine. Refer to Maintenance Procedure in the appropriate Service or Maintenance Manual for your machine, *Test the Drive Speed - Stowed Position*.

How to Adjust the High Torque Drive Speed

⚠ DANGER Tip-over hazard. Do not adjust the lift and/or drive speed higher than specified in this procedure. Setting drive speed greater than specifications could cause the machine to tip over resulting in death or serious injury.

Note: On machines with software revision B1 or lower, high torque drive speeds in forward and reverse are simultaneously adjusted, resulting in both directions of travel operating at the same speed.

On machines with software revision C0 or higher, the high torque forward drive speed and the high torque reverse drive speed may be adjusted independent of one another. Refer to Repair Procedure, *How to Determine the Revision Level*.

1 Pull out the red Emergency stop button to the on position at the platform controls.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Turn the key switch to ground controls.

4 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

6 Use the yellow platform down arrow to scroll to max fwd high torque drive.

⊙ Result: MAX FWD HIGH TORQUE DRIVE is showing in the diagnostic display window.

7 Press the lift function enable button.

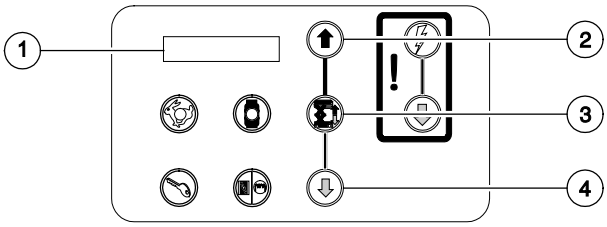
Ground Controls

8 Press the yellow platform down button to decrease the drive speed or press the blue platform up button to increase the drive speed. Refer to Specifications, *Performance Specifications.*

Note: The performance achieved should always be within specifications.

9 Press the lift function enable button.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

10 Press the lift function enable button.

11 Use the yellow platform down arrow to scroll to max rev high torque drive.

⊙ Result: MAX REV HIGH TORQUE DRIVE is showing in the diagnostic display window.

12 Press the lift function enable button.

13 Press the yellow platform down button to decrease the drive speed or press the blue platform up button to increase the drive speed. Refer to Specifications, *Performance Specifications.*

Note: The performance achieved should always be within specifications.

14 Press the lift function enable button.

15 Push in the ground controls red Emergency Stop button to the off position.

How to Adjust the Raised Drive Speed

⚠ DANGER Tip-over hazard. Do not adjust the lift and/or drive speed higher than specified in this procedure. Setting drive speed greater than specifications could cause the machine to tip over resulting in death or serious injury.

Note: On machines with software revision B1 or lower, raised drive speeds in forward and reverse are simultaneously adjusted, resulting in both directions of travel operating at the same speed.

On machines with software revision C0 or higher, the raised forward drive speed and the raised reverse drive speed may be adjusted independent of one another. Refer to Repair Procedure, *How to Determine the Revision Level*.

Note: The GS-5390 will not drive with the platform raised above 30 feet / 9.1 m.

1 Pull out the red Emergency stop button to the on position at the platform controls.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Turn the key switch to ground controls.

4 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

6 Use the yellow platform down arrow to scroll to max fwd raised drive speed.

⊙ Result: MAX FWD RAISED DRIVE SPEED is showing in the diagnostic display window.

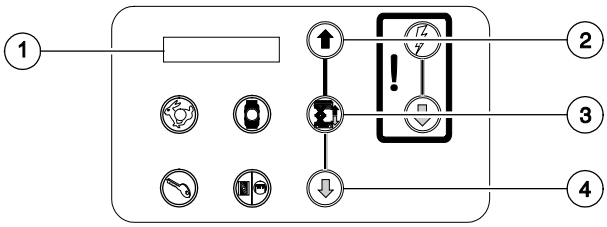
7 Press the lift function enable button.

8 Press the yellow platform down button to decrease the drive speed or press the blue platform up button to increase the drive speed. Refer to Specifications, *Performance Specifications.*

Note: The performance achieved should always be within specifications.

9 Press the lift function enable button.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

10 Press the lift function enable button.

11 Use the yellow platform down arrow to scroll to max rev raised drive speed.

⊙ Result: MAX REV RAISED DRIVE SPEED is showing in the diagnostic display window.

12 Press the lift function enable button.

13 Press the yellow platform down button to decrease the drive speed or press the blue platform up button to increase the drive speed. Refer to Specifications, *Performance Specifications.*

Note: The performance achieved should always be within specifications.

14 Press the lift function enable button.

15 Push in the ground controls red Emergency Stop button to the off position.

16 Check the raised drive speed of the machine. Refer to Maintenance procedure in the appropriate Service or Maintenance Manual for your machine, *Test the Drive Speed - Raised Position*.

Ground Controls

How to Adjust the Lift Speed

⚠ DANGER Tip-over hazard. Do not adjust the lift and/or drive speed higher than specified in this procedure. Setting drive speed greater than specifications could cause the machine to tip over resulting in death or serious injury.

1 Pull out the red Emergency stop button to the on position at the platform controls.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Turn the key switch to ground controls.

4 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

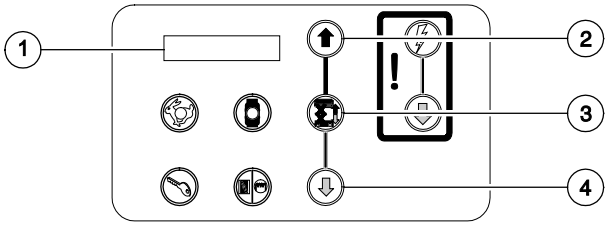
⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

6 Use the yellow platform down arrow to scroll to lift speed.

⊙ Result: MAX LIFT SPEED is showing in the diagnostic display window.

7 Press the lift function enable button.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

8 Press the yellow platform down button to decrease the maximum lift speed or press the blue platform up button to increase the maximum lift speed. Refer to Specifications, *Performance Specifications*.

Note: The performance achieved should always be within specifications.

9 Press the lift function enable button.

10 Push in the ground controls red Emergency Stop button to the off position.

11 Check the lift speed of the machine. Refer to Specifications, *Performance Specifications*.

How to Adjust the Platform Lower Speed

1 Pull out the red Emergency stop button to the on position at the platform controls.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Turn the key switch to ground controls.

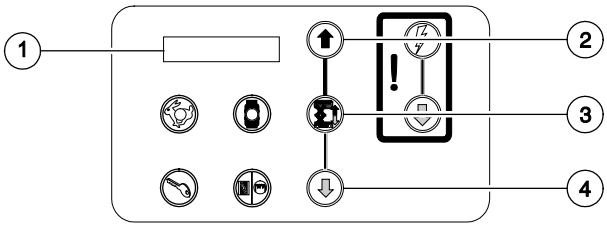
4 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

6 Use the yellow platform down arrow to scroll to descent speed.

⊙ Result: MAX DESCENT SPEED is showing in the diagnostic display window.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

7 Press the lift function enable button.

8 Press the yellow platform down button to decrease the platform descent speed or press the blue platform up button to increase the platform descent speed. Refer to Specifications, *Performance Specifications*.

Note: The performance achieved should always be within specifications.

9 Press the lift function enable button.

10 Press in the ground controls red Emergency Stop button to the off position.

11 Check the lower speed of the machine. Refer to Specifications, *Performance Specifications*.

Ground Controls

How to Adjust the Platform Settling Speed

1 Pull out the red Emergency stop button to the on position at the platform controls.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Turn the key switch to ground controls.

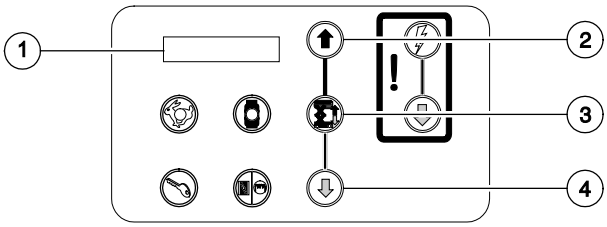
4 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

6 Use the yellow platform down arrow to scroll to settling speed.

⊙ Result: MAX SETTLING SPEED is showing in the diagnostic display window.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

7 Press the lift function enable button.

8 Press the yellow platform down button to decrease the platform settling speed or press the blue platform up button to increase the platform settling speed.

NOTICE

Component Damage Hazard. The Platform Settling Speed is intended to slow the rate of platform descent just before the reaching the stowed position. Adjust the Platform Settling Speed until the Platform Settling Speed percentage is 3 to 5 points less than the Platform Lowering Speed percentage.

9 Press the lift function enable button.

10 Push in the ground controls red Emergency Stop button to the off position.

How to Adjust the Steer Speed

1 Pull out the red Emergency stop button to the on position at the platform controls.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Turn the key switch to ground controls.

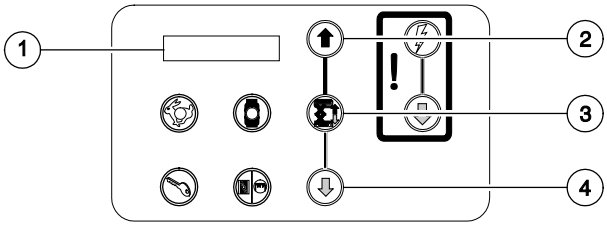
4 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

6 Use the yellow platform down arrow to scroll to steering speed.

⊙ Result: STEERING SPEED is showing in the diagnostic display window.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

7 Press the lift function enable button.

8 Press the yellow platform down button to decrease the steering speed or press the blue platform up button to increase the steering speed.

9 Press the lift function enable button.

10 Push in the ground controls red Emergency Stop button to the off position.

5-3 Software Configuration

The Electronic Control Module (ECM) contains programming for all configurations of the GS-84 and GS-90. Machines can be adjusted to a different configuration using the buttons at the ground controls. To determine the software revision level, refer to Repair Procedure, *How to Determine the Revision Level*.

Machine Option Definitions

Descent Delay: This option halts descent when the down limit switch is activated. All controls must be released for 4 to 6 seconds before descent is re-enabled. Required for AS and CE models.

Motion Alarm: The motion alarm will sound when activating a function.

Motion Beacons: The flashing beacons operate only when activating a function.

Overload: This cuts out all functions when the platform overload pressure switch is tripped. The red Emergency Stop button must be cycled before any function can be resumed. Required for AS and CE models.

Sim Operation: When enabled, this allows some machine functions to be activated simultaneously. Required to be disabled for AS and CE models.

Beacons: When installed on the machine, the flashing beacons operate continuously when the key switch is turned to ground or platform controls and both red Emergency Stop buttons are pulled out to the on position.

Ground Controls

Outriggers: When installed on the machine, the outrigger option must be enabled.

Oscillating Axle: When installed on the machine, the oscillating axle option must be enabled.

Generator, 3kW: If drive or lift function is operated while the generator is ON, the generator will turn OFF while the function is operating. After stopping the function, the generator will turn back ON.

Generator, 12kW: The drive function is deactivated when the generator is turned ON. When the generator is turned off, the drive function will remain deactivated for 4 seconds. After the 4 second delay, the drive function will be available. If any other function is operated while the generator is ON, the generator will turn OFF while the function is operating. After stopping the function, the generator will turn back ON.

ANSI and CSA models with all software revisions:

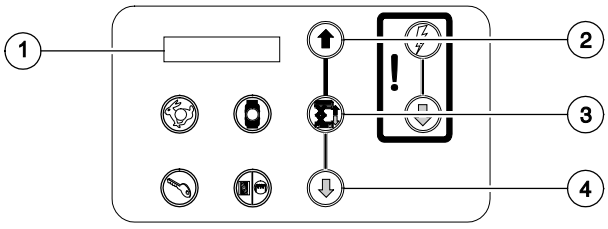
1 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both ground and platform controls.

⊙ Result: The revision level of the ECM will appear in the LED display window. Note the result.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

4 Use the yellow platform down arrow to scroll to select model.

⊙ Result: SELECT MODEL is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

⊙ Result: GS68 DUAL FUEL is showing in the diagnostic display window.

6 **GS-84 models with gasoline/LPG power:** Use the yellow platform down arrow to scroll to GS84 DUAL FUEL.

GS-84 models with diesel power: Use the yellow platform down arrow to scroll to GS84 DIESEL.

GS-90 models with gasoline/LPG power: Use the yellow platform down arrow to scroll to GS90 DUAL FUEL.

GS-90 models with diesel power: Use the yellow platform down arrow to scroll to GS90 DIESEL.

7 Press the lift function enable button to activate the model/power option.

⊙ Result: SELECT MODEL is showing in the diagnostic display window.

8 Use the yellow platform down arrow to scroll to select options.

⊙ Result: SELECT OPTIONS is showing in the diagnostic display window. The ECM is now in programming mode.

9 Press the lift function enable button.

⊙ Result: DESCENT DELAY is showing in the diagnostic display window. Press the lift function enable button to activate or deactivate the descent delay option.

10 Use the yellow platform down arrow to scroll to motion alarm.

⊙ Result: MOTION ALARM is showing in the diagnostic display window.

11 Press the lift function enable button to activate or deactivate the motion alarm option OR use the yellow platform down arrow to scroll to motion beacon.

⊙ Result: MOTION BEACON is showing in the diagnostic display window.

12 Press the lift function enable button to activate or deactivate the motion beacon option.

Note: For this option to function correctly, the machine must be equipped with flashing beacons.

13 **Models with platform overload (option):** Use the yellow platform down arrow to scroll to overload.

⊙ Result: OVERLOAD ON is showing in the diagnostic display window.

⊠ Result: OVERLOAD OFF is showing in the diagnostic display window. Press the lift function enable button to activate the overload option.

14 Use the yellow platform down arrow to scroll to sim operation.

⊙ Result: SIM OPERATION ON is showing in the diagnostic display window.

⊠ Result: SIM OPERATION OFF is showing in the diagnostic display window. Press the lift function enable button to activate the sim operation option.

Note: For all models except AS and CE models, the sim operation option should be activated or in the on position.

15 Use the yellow platform down arrow to scroll to beacons option.

⊙ Result: BEACONS OFF is showing in the diagnostic display window. Press the lift function enable button to activate or deactivate the beacons option.

Note: For this option to function, the machine must be equipped with flashing beacons.

16 Use the yellow platform down arrow to scroll to generator option.

⊙ Result: GENERATOR OFF is showing in the diagnostic display window. Press the lift function enable button to activate or deactivate the generator option.

Note: For this option to function correctly, the machine must be equipped with the required generator components.

17 Use the yellow platform down arrow to scroll to outriggers option.

⊙ Result: OUTRIGGERS OFF is showing in the diagnostic display window. Press the lift function enable button to activate or deactivate the outrigger option.

Note: For this option to function correctly, the machine must be equipped with the required outrigger components.

Ground Controls

ANSI and CSA models with all software revisions:

18 Use the yellow platform down arrow to scroll to return to the main menu.

⊙ Result: RETURN TO MAIN MENU is showing in the diagnostic display window.

19 Press the lift function enable button.

⊙ Result: SELECT OPTIONS is showing in the diagnostic display window.

20 Push in the ground controls red Emergency Stop button to the off position.

AS and CE models with all software revisions:

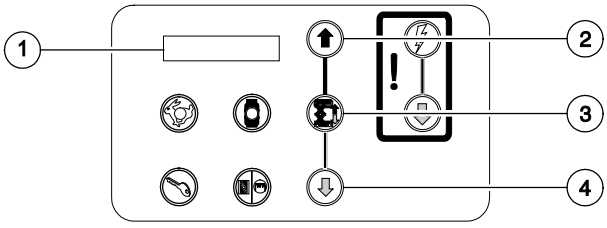
1 Turn the key switch to ground control and pull out the red Emergency Stop button to the on position at both ground and platform controls.

⊙ Result: The revision level of the ECM will appear in the LED display window. Note the result.

2 Push in the ground controls red Emergency Stop button to the off position.

3 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: TUNE SPEEDS is showing in the diagnostic display window.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

4 Use the yellow platform down arrow to scroll to select model.

⊙ Result: SELECT MODEL is showing in the diagnostic display window. The ECM is now in programming mode.

5 Press the lift function enable button.

⊙ Result: GS68 DUAL FUEL is showing in the diagnostic display window.

6 **GS-84 models with gasoline/LPG power**: Use the yellow platform down arrow to scroll to GS84 DUAL FUEL.

GS-84 models with diesel power: Use the yellow platform down arrow to scroll to GS84 DIESEL.

GS-90 models with gasoline/LPG power: Use the yellow platform down arrow to scroll to GS90 DUAL FUEL.

GS-90 models with diesel power: Use the yellow platform down arrow to scroll to GS90 DIESEL.

7 Press the lift function enable button to activate the model/power option.

⊙ Result: SELECT MODEL is showing in the diagnostic display window.

8 Use the yellow platform down arrow to scroll to select options.

⊙ Result: SELECT OPTIONS is showing in the diagnostic display window. The ECM is now in programming mode.

9 Press the lift function enable button.

⊙ Result: DESCENT DELAY ON is showing in the diagnostic display window.

⊠ Result: DESCENT DELAY OFF is showing in the diagnostic display window. Press the lift function enable button to activate the descent delay option.

Note: For AS and CE models, the descent delay option should be activated or in the on position.

10 Use the yellow platform down arrow to scroll to motion alarm.

⊙ Result: MOTION ALARM is showing in the diagnostic display window.

11 Press the lift function enable button to activate or deactivate the motion alarm option OR use the yellow platform down arrow to scroll to motion beacon.

⊙ Result: MOTION BEACON is showing in the diagnostic display window.

12 Press the lift function enable button to activate or deactivate the motion beacon option.

Note: For this option to function correctly, the machine must be equipped with flashing beacons.

13 Use the yellow platform down arrow to scroll to overload.

⊙ Result: OVERLOAD ON is showing in the diagnostic display window.

⊠ Result: OVERLOAD OFF is showing in the diagnostic display window. Press the lift function enable button to activate the overload option.

Note: For CE models, the overload option should be activated or in the on position.

14 Use the yellow platform down arrow to scroll to sim operation.

⊙ Result: SIM OPERATION OFF is showing in the diagnostic display window.

⊠ Result: SIM OPERATION ON is showing in the diagnostic display window. Press the lift function enable button to deactivate the sim operation option.

Note: For AS and CE models, the sim operation option should be deactivated or in the off position.

15 Use the yellow platform down arrow to scroll to beacons option.

⊙ Result: BEACONS OFF is showing in the diagnostic display window. Press the lift function enable button to activate or deactivate the beacons option.

Note: For this option to function, the machine must be equipped with flashing beacons.

16 Use the yellow platform down arrow to scroll to generator option.

⊙ Result: GENERATOR OFF is showing in the diagnostic display window. Press the lift function enable button to activate or deactivate the generator option.

Note: For this option to function correctly, the machine must be equipped with the required generator components.

17 Use the yellow platform down arrow to scroll to outriggers option.

⊙ Result: OUTRIGGERS OFF is showing in the diagnostic display window. Press the lift function enable button to activate or deactivate the outrigger option.

Note: For this option to function correctly, the machine must be equipped with the required outrigger components.

CE models with all software revisions:

18 Use the yellow platform down arrow to scroll to return to the main menu.

⊙ Result: RETURN TO MAIN MENU is showing in the diagnostic display window.

19 Press the lift function enable button.

⊙ Result: SELECT OPTIONS is showing in the diagnostic display window.

20 Push in the ground controls red Emergency Stop button to the off position.

Ground Controls

5-4
Level Sensor - Models without Outriggers

The Electronic Control Module (ECM) is programmed to deactivate the lift and drive functions and activate an alarm when a signal is received from the level sensor.

The tilt alarm sounds when the incline of the chassis exceeds 2° to the side, or 3° to the front or rear.

How to Install and Calibrate the Level Sensor - Models without Outriggers

⚠ DANGER Tip-over hazard. Failure to install or calibrate the level sensor as instructed will compromise machine stability and cause the machine to tip over, resulting in death or serious injury. Do not install or calibrate the level sensor other than specified in this procedure.

Note: Perform this procedure with the machine on a firm, level surface and the platform in the stowed position. Use a digital level to confirm.

1 Remove the platform controls from the platform.

If you are not installing a new level sensor, proceed to step 9.

2 Push in the platform red Emergency Stop button to the off position.

3 Remove the ground control panel retaining fasteners and open the panel.

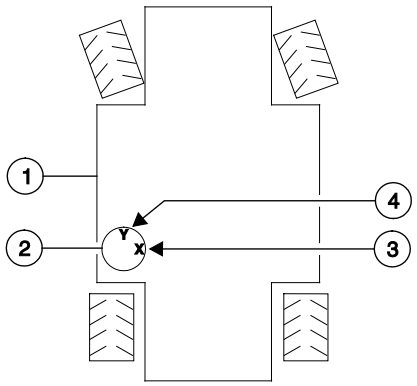
4 Locate the level sensor behind the ground control panel.

5 Tag and disconnect the wire harness from the level sensor.

6 Remove the level sensor retaining fasteners and remove the level sensor from the machine.

7 Install the new level sensor onto the machine with the "Y" on the level sensor base closest to the steer end of the machine. Install and tighten the level sensor retaining fasteners.

⚠ DANGER Tip-over hazard. The tilt level sensor must be installed with the "Y" on the level sensor base closest to the steer end of the machine. Failure to install the tilt level sensor as instructed could result in the machine tipping over causing death or serious injury.



Level sensor - models without outriggers

1 chassis
2 level sensor
3 "X" indicator
4 "Y" indicator

8 Connect the wire harness to the level sensor.

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

10 Tighten the level sensor adjusting fasteners until the bubble in the top of the level sensor is centered in the circles.

Note: Be sure there are threads showing through the top of the adjusting fasteners.

⊙ Result: The tilt sensor alarm should not sound.

11 Center a lifting jack under the drive chassis at the ground controls side of the machine.

12 Raise the machine approximately 4 inches / 10 cm.

13 **Models with RT tires:** Place a 2.59 x 10 x 10 inch / 6.58 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine.

Models with flotation tires: Place a 2.72 x 10 x 10 inch / 6.91 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine.

14 Lower the machine onto the blocks.

15 Raise the platform approximately 16 feet / 5 m.

⊙ Result: The tilt sensor alarm should not sound.

⊠ Result: The drive function and the lift function will not operate and the tilt alarm will sound at 180 beeps per minute. Turn the level sensor adjusting nuts just until the level sensor alarm does not sound.

16 Lower the platform to the stowed position.

17 Raise the machine slightly.

18 Remove the blocks from under both wheels.

19 Lower the machine and remove the jack.

20 Center a lifting jack under the drive chassis at the engine side of the machine.

21 Raise the machine approximately 4 inches / 10 cm.

22 **Models with RT tires:** Place a 3 x 10 x 10 inch / 7.62 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine.

Models with flotation tires: Place a 3.15 x 10 x 10 inch / 8 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine.

23 Lower the machine onto the blocks.

24 Raise the platform approximately 16 feet / 5 m.

⊙ Result: The drive function and the lift function will not operate and the tilt alarm will sound at 180 beeps per minute.

⊠ Result: The level sensor alarm does not sound. Adjust the level sensor until the alarm just begins to sound.

25 Lower the platform to the stowed position.

26 Push in the red Emergency Stop button to the off position at both the ground and platform controls.

27 Turn the key switch to the off position.

28 Raise the machine slightly.

29 Remove the blocks from under both wheels.

30 Lower the machine and remove the jack.

Ground Controls

5-5
Level Sensor - Models with Outriggers

The Electronic Control Module (ECM) is programmed to deactivate the lift and drive functions and activate an alarm when a signal is received from the level sensor.

When the outriggers are stowed, the tilt alarm sounds when the incline of the chassis exceeds 2° to the side.

When the outriggers are deployed, the tilt alarm sounds when the incline of the chassis exceeds 0.8° to the side.

At all times, the tilt alarm sounds when the incline of the chassis exceeds 3° to the front or rear.

How to Install the Outrigger Level Sensor - Models with Outriggers

⚠ DANGER Tip-over hazard. Failure to install or calibrate the level sensor as instructed will compromise machine stability and cause the machine to tip over, resulting in death or serious injury. Do not install or calibrate the level sensor other than specified in this procedure.

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

1 Remove the platform controls from the platform.

2 Remove the ground control panel retaining fasteners and open the panel.

3 Locate the level sensor behind the ground control panel.

4 Disconnect the platform controls from the machine at the platform.

5 Open the large ground control panel door and locate the Electronic Control Module (ECM) wire harness to platform controls wire harness connection below the ground controls.

6 Tag and disconnect the platform controls wire harness from the ECM wire harness.

7 Securely connect the platform controls to the ECM wire harness.

If you are not installing a new level sensor, proceed to step 12.

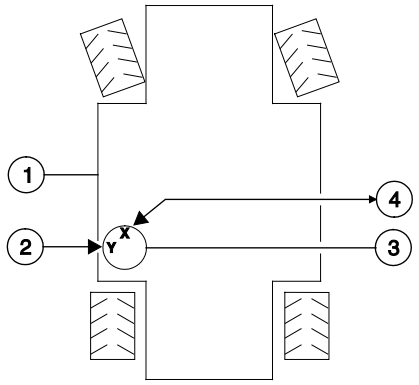
Install the level sensor:

8 Tag and disconnect the wire harness from the level sensor.

9 Remove the level sensor retaining fasteners and remove the level sensor from the machine.

10 Install the new level sensor onto the machine with the "X" on the level sensor base towards the steer end of the machine. Install and tighten the level sensor retaining fasteners.

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



Level sensor - models with outriggers

1 chassis
2 "Y" indicator
3 level sensor
4 "X" indicator

11 Connect the wire harness to the level sensor.

12 Turn the key switch to platform controls and pull out the red Emergency Stop button to the on position at both ground and platform controls. Start the engine.

13 Set a multimeter to read DC voltage.

Adjust the side-to-side axis:

14 Without disconnecting the wire harness from the level sensor, connect the negative lead of the multimeter to the black wire at the level sensor.

15 Without disconnecting the wire harness from the level sensor, connect the positive lead of the multimeter to the yellow wire at the level sensor.

16 Adjust the side-to-side axis of the level sensor until the multimeter reads 2.5V DC. Tap the top of the level sensor lightly with fingers after each turn of an adjusting nut.

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

17 Disconnect the positive lead of the multimeter from the level sensor wire harness

Adjust the front-to-back axis:

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

19 Adjust the front-to-back axis of the level sensor until the multimeter reads 2.43V DC. Tap the top of the level sensor lightly with fingers after each turn of an adjusting nut.

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

20 Disconnect the positive and negative leads.

21 Apply Sentry Seal to the adjusting nuts.

22 Push in the platform red Emergency Stop button to the off position.

23 Press and hold the auto level button and press and hold the left front outrigger button. Pull out the red Emergency Stop button to the on position at the platform controls.

24 Continue to hold the auto level button and left front outrigger button for approximately 3 seconds or until a beep is heard.

25 Push in the platform red Emergency Stop button to the off position.

Ground Controls

Confirm the side-to-side level sensor setting:

26 Center a lifting jack under the drive chassis at the ground control side of the machine.

27 Raise the machine approximately 6 inches / 15 cm.

28 **Models with RT tires:** Place a 3 x 10 x 10 inch / 7.62 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine.

Models with flotation tires: Place a 3.15 x 10 x 10 inch / 8 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine.

29 Lower the machine onto the blocks.

30 Pull out the red Emergency stop button to the on position at the platform controls. Start the engine.

31 Raise the platform approximately 16 feet / 5 m.

⊙ Result: The platform stops raising and the tilt alarm will sound at 180 beeps per minute.

⊠ Result: The platform does not stop raising and the tilt alarm does not sound. The level sensor must be replaced. Repeat this procedure beginning with step 9.

Note: For reference only, the output of the level sensor should be approximately 1.7V DC. To confirm, connect the positive lead of a multimeter to the yellow wire at the level sensor, and the negative lead to the black wire.

32 Raise the machine slightly.

33 Remove the blocks from under both wheels.

34 Lower the machine and remove the jack.

35 Center a lifting jack under the drive chassis at the tank side of the machine.

36 Raise the machine approximately 6 inches / 15 cm.

37 **Models with RT tires:** Place a 3 x 10 x 10 inch / 7.62 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine

Models with flotation tires: Place a 3.15 x 10 x 10 inch / 8 x 25 x 25 cm thick steel block under both wheels at the ground controls side of the machine.

38 Lower the machine onto the blocks.

39 Raise the platform approximately 16 feet / 5 m.

⊙ Result: The platform stops raising and the tilt alarm will sound at 180 beeps per minute.

⊠ Result: The platform does not stop raising and the tilt alarm does not sound. The level sensor must be replaced. Repeat this procedure beginning with step 9.

Note: For reference only, the output of the level sensor should be approximately 3.3V DC. To confirm, connect the positive lead of a multimeter to the yellow wire at the level sensor, and the negative lead to the black wire.

40 Lower the platform to the stowed position.

41 Raise the machine slightly.

42 Remove the blocks from under both wheels.

43 Lower the machine and remove the jack.

Confirm the front-to-back level sensor setting:

44 Center a lifting jack under the drive chassis at the steer end of the machine.

45 Raise the machine approximately 6 inches / 15 cm.

46 **Models with RT tires:** Place a 4.36 x 10 x 10 inch / 11.07 x 25 x 25 cm thick steel block under both wheels at the steer end of the machine

Models with flotation tires: Place a 4.58 x 10 x 10 inch / 11.63 x 25 x 25 cm thick steel block under both wheels at the steer end of the machine.

47 Lower the machine onto the blocks.

48 Raise the platform approximately 16 feet / 5 m.

⊙ Result: The platform stops raising and the tilt alarm will sound at 180 beeps per minute.

⊠ Result: The platform does not stop raising and the tilt alarm does not sound. The level sensor must be replaced. Repeat this procedure beginning with step 9.

Note: For reference only, the output of the level sensor should be approximately 1.5V DC. To confirm, connect the positive lead of a multimeter to the blue wire at the level sensor, and the negative lead to the black wire.

49 Lower the platform to the stowed position.

50 Raise the machine slightly.

51 Remove the blocks from under both wheels.

52 Lower the machine and remove the jack.

53 Center a lifting jack under the drive chassis at the non-steer end of the machine.

54 Raise the machine approximately 6 inches / 15 cm.

55 **Models with RT tires:** Place a 4.36 x 10 x 10 inch / 11.07 x 25 x 25 cm thick steel block under both wheels at the steer end of the machine

Models with flotation tires: Place a 4.58 x 10 x 10 inch / 11.63 x 25 x 25 cm thick steel block under both wheels at the steer end of the machine.

56 Lower the machine onto the blocks.

57 Raise the platform approximately 16 feet / 5 m.

⊙ Result: The platform stops raising and the tilt alarm will sound at 180 beeps per minute.

⊠ Result: The platform does not stop raising and the tilt alarm does not sound. The level sensor must be replaced. Repeat this procedure beginning with step 9.

Note: For reference only, the output of the level sensor should be approximately 3.4V DC. To confirm, connect the positive lead of a multimeter to the blue wire at the level sensor, and the negative lead to the black wire.

58 Lower the platform to the stowed position.

59 Raise the machine slightly.

60 Remove the blocks from under both wheels.

61 Lower the machine and remove the jack.

62 Turn the key switch to the off position.

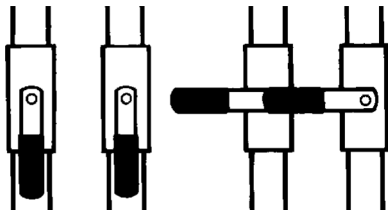
Hydraulic Pump

6-1 Lift/Steer Pump

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

How to Remove the Lift/Steer Pump

1 Locate the three hydraulic tank valves at the hydraulic tank. Close the valves.



open closed

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

Note: The hydraulic tank shutoff valves can be accessed from under the hydraulic tank tray.

2 Release the latches on the engine tray and fully slide the engine tray out.

3 Insert a 6 inch / 15 cm screwdriver or rod into the engine tray lock hole located near the engine tray roller wheels to prevent the engine tray from moving.

4 Tag, disconnect and plug the hydraulic hoses from the lift/steer pump . Cap the fittings on the pump.

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

5 Remove the pump mounting fasteners. Carefully remove the pump.

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

6-2
Drive Pump

The drive pump is a bi-directional variable displacement piston pump. The pump output is controlled by the electronic displacement controller (EDC), located on the pump. The only adjustment that can be made to the pump is the neutral or null adjustment. Any internal service to the pump should only be performed at an authorized service center. Contact Genie Product Support to locate your local authorized service center.

How to Remove the Drive Pump

NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

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

1 Remove the lift/steer pump. Refer to Repair Procedure, *How to Remove the Lift/Steer Pump*.

2 Disconnect the electrical connections at the Electronic Displacement Controller (EDC) located on the drive pump.

3 Tag, disconnect and plug the hydraulic hoses from the drive pump. Cap the fittings on the pump.

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

4 Support the drive pump with a suitable lifting device and remove the two drive pump mounting fasteners.

5 Carefully pull the drive pump out until the pump coupler separates from the flex plate.

6 Remove the drive pump from the machine.

NOTICE Component damage hazard. The pump(s) may become unbalanced and fall if not properly supported.

NOTICE Component damage hazard. When installing the pump, do not force the pump coupler into the flexplate or damage to the pump shaft seal may occur.

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

Note: Before installing the pump, verify proper pump coupler spacing. Refer to Repair Procedure, *How to Install Flex Plate.*

Hydraulic Pump

How to Prime the Drive Pump

NOTICE

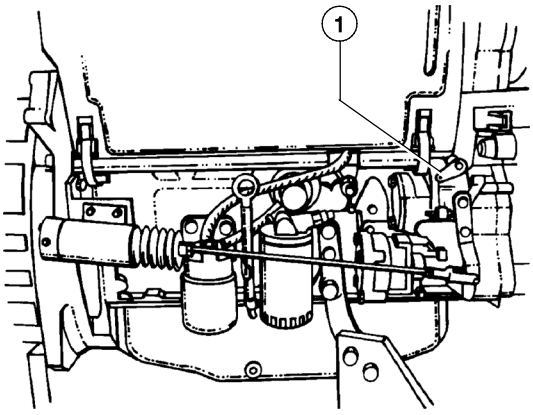
Component damage hazard. The engine must not be started with the hydraulic tank shut-off valves in the closed position or component damage will occur. If the tank valves are closed, remove the key from the key switch and tag the machine to inform personnel of the condition.

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to either diagnostic nipple on the drive manifold.

2 Turn the key switch to ground controls and pull out the red Emergency Stop buttons to the on position at both platform and ground controls.

3 **Ford models:** Close the valve on the LPG tank, then disconnect the hose from the tank (if equipped). Move the fuel select toggle switch at the ground controls to the LPG position.

Deutz D2011 L031models: Hold the manual fuel shutoff lever clockwise in the closed position.



1 manual fuel shutoff valve

4 Crank the engine with the starter motor for 15 seconds, wait 15 seconds, then crank the engine an additional 15 seconds or until the pressure reaches 325 psi / 22.4 bar.

5 **Ford models:** Connect the hose to the LPG tank and open the valve (if equipped). Move the fuel select toggle switch at the ground controls to the gasoline position.

Deutz D2011 L03i models: Release the manual fuel shutoff lever.

6 Start the engine from the ground controls. Check for hydraulic leaks.

How to Adjust the Pump Neutral

Models with Eaton Pumps:

1 Raise the drive wheels off the ground and set the chassis on blocks.

2 Locate the pump at the rear of the engine. Tag and disconnect the wire harness from the Electronic Displacement Controller (EDC) coils at the pump.

3 Locate the pump neutral adjustment screw at the top of the solenoid valve body at the pump.

4 Tee a 0 to 1000 psi / 0 to 75 bar pressure gauge into the hydraulic line at the smaller filter port at the rear of the pump.

5 Start and run the engine at low idle.

6 Loosen the lock nut of the pump neutral adjustment screw at the top of the EDC.

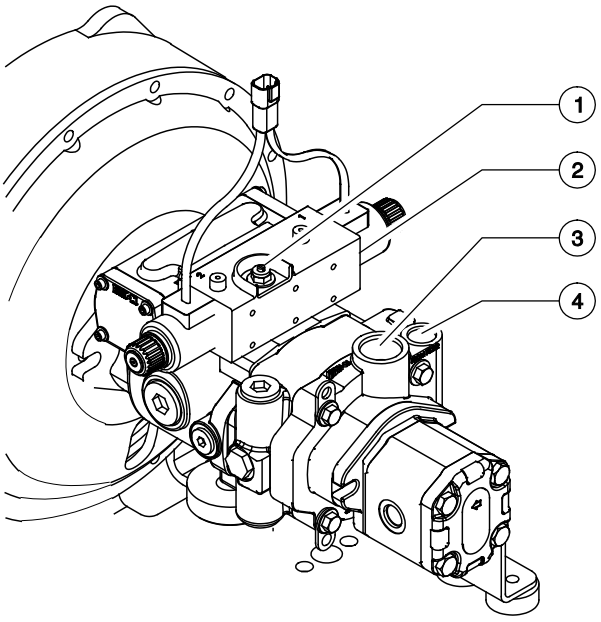
7 Turn the adjustment screw in a clockwise direction until the reading on the pressure gauge drops to its lowest point. Note the position of the screw.

8 Turn the adjustment screw in a counter clockwise direction until the reading on the pressure gauge reaches it highest point. Continue to turn the adjustment screw in a counter clockwise direction until the reading on the pressure gauge drops to its lowest point. Note the position of the screw.

9 Turn the adjustment screw in a clockwise direction to a position halfway between the positions noted in steps 7 and 8.

10 While holding the adjustment screw in position, tighten the adjustment screw locknut. Torque to 9-11 ft-lbs / 12-15 Nm.

11 Turn the engine off. Remove the blocks and lower the machine to the ground.



1 pump neutral adjustment screw
2 EDC
3 large filter port
4 smaller filter port

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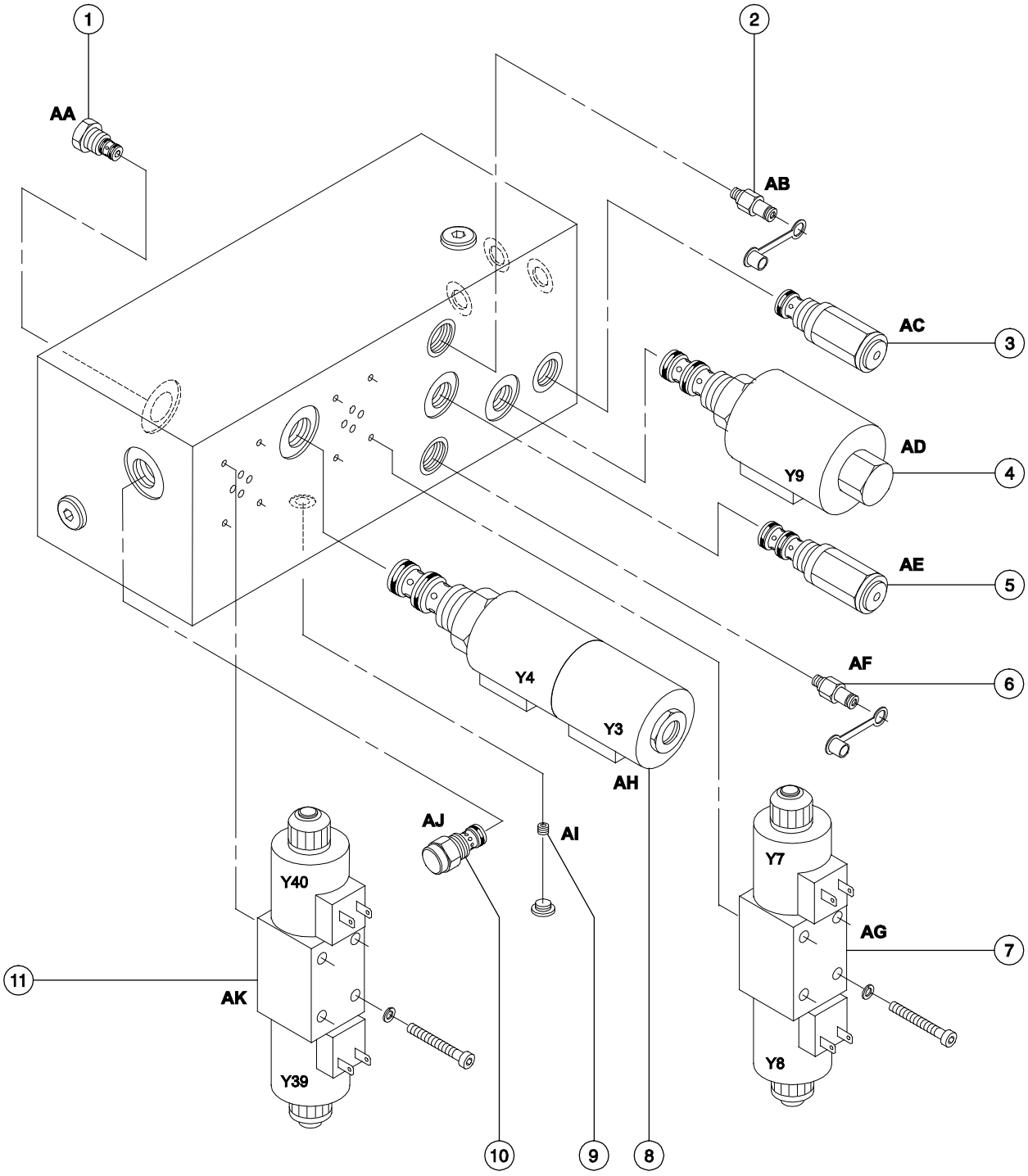
7-1
Function Manifold Components - Models with Outriggers

The function manifold is located in the chassis tray on the ground controls side of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.3 bar	AA	Platform down circuit	40 - 45 ft-lbs 54 - 61 Nm
2	Diagnostic port	AB	Pressure Circuit	
3	Relief valve, 3500 psi / 241.3 bar	AC	System relief	25 ft-lbs / 34 Nm
4	Proportional solenoid valve	AD	All functions	46 - 54 ft-lbs 62 - 73 Nm
5	Relief valve, 2000 psi / 138 bar	AE	Steer and outrigger circuit	50 ft-lbs / 68 Nm
6	Diagnostic port	AF	Pressure Circuit	
7	Solenoid valve, 3 position 4 way	AG	Platform up/down	30 - 35 in-lbs 3 - 4 Nm
8	Solenoid valve, 3 position 4 way	AH	Steer left/right	45 ft-lbs / 61 Nm
9	Orifice Plug, 0.150 inch / 3.8 mm	AI	Platform down circuit	
10	Flow regulator valve, 0.1 gpm / 0.38 L/min	AJ	Bleeds off proportional valve to tank	33 - 37 ft-lbs 45 - 50 Nm
11	Solenoid valve, 3 position 4 way	AK	Outriggers extend / retract	30 - 35 in-lbs 3 - 4 Nm

Manifolds



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

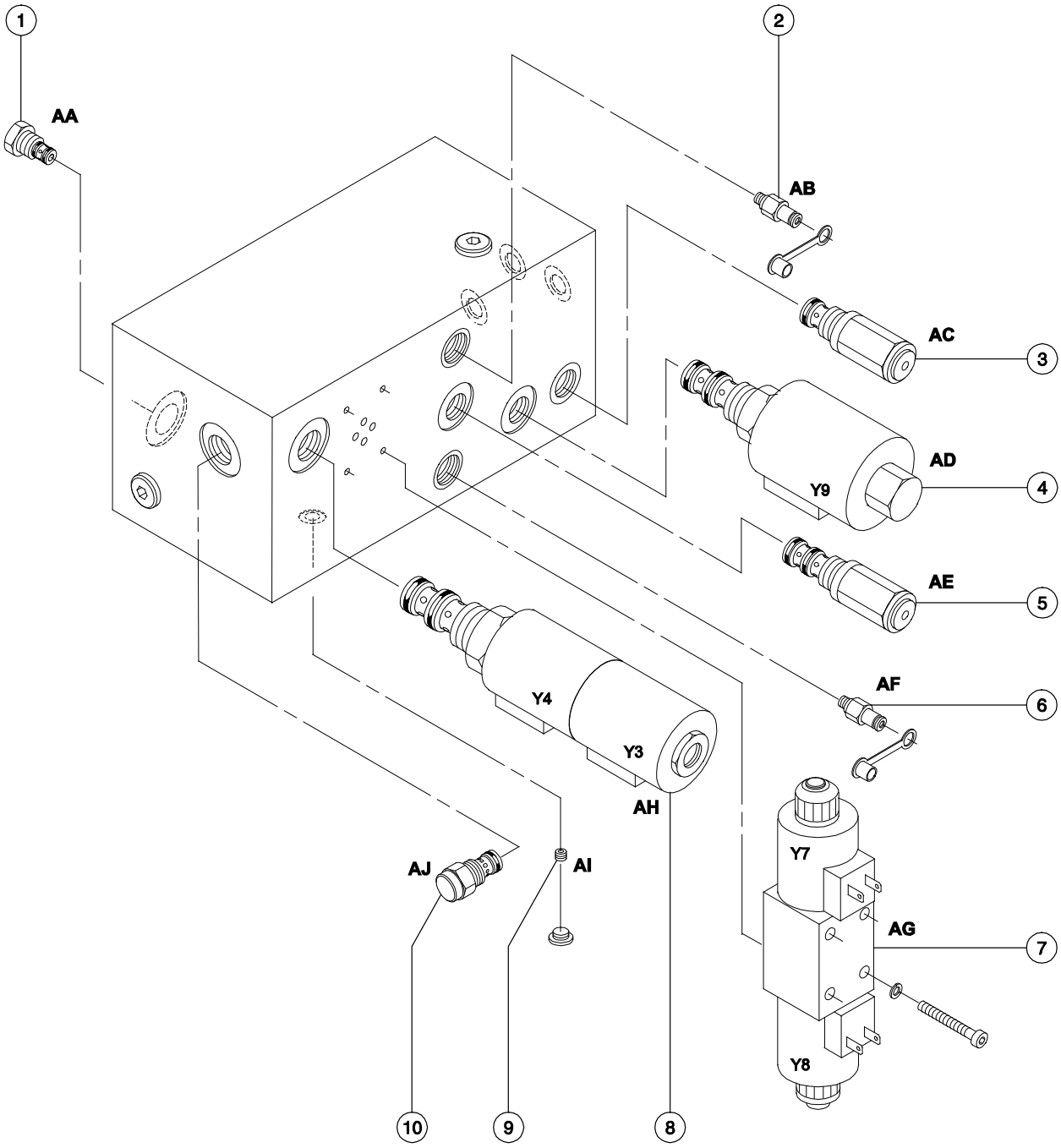
Note: 'alpha-numeric' callouts refer to corresponding notes on the electrical schematic.

7-2
Function Manifold Components - Models without Outriggers

The function manifold is located in the chassis tray on the ground controls side of the machine.

Index No.	Description	Schematic Item	Function	Torque
1	Check valve, 5 psi / 0.3 bar	AA	Platform down circuit	40 - 45 ft-lbs 54 - 61 Nm
2	Diagnostic port	AB	Pressure Circuit	
3	Relief valve, 3500 psi / 241.3 bar	AC	System relief	25 ft-lbs / 34 Nm
4	Proportional solenoid valve	AD	All functions	46 - 54 ft-lbs 62 - 73 Nm
5	Relief valve, 2000 psi / 138 bar	AE	Steer circuit	50 ft-lbs / 68 Nm
6	Diagnostic port	AF	Pressure Circuit	
7	Solenoid valve, 3 position 4 way	AG	Platform up/down	30 - 35 in-lbs 3 - 4 Nm
8	Solenoid valve, 3 position 4 way	AH	Steer left/right	45 ft-lbs / 61 Nm
9	Orifice Plug, 0.150 inch / 3.8 mm	AI	Platform down circuit	
10	Flow regulator valve, 0.1 gpm / 0.38 L/min	AJ	Bleeds off proportional valve to tank	33 - 37 ft-lbs 45 - 50 Nm

Manifolds



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

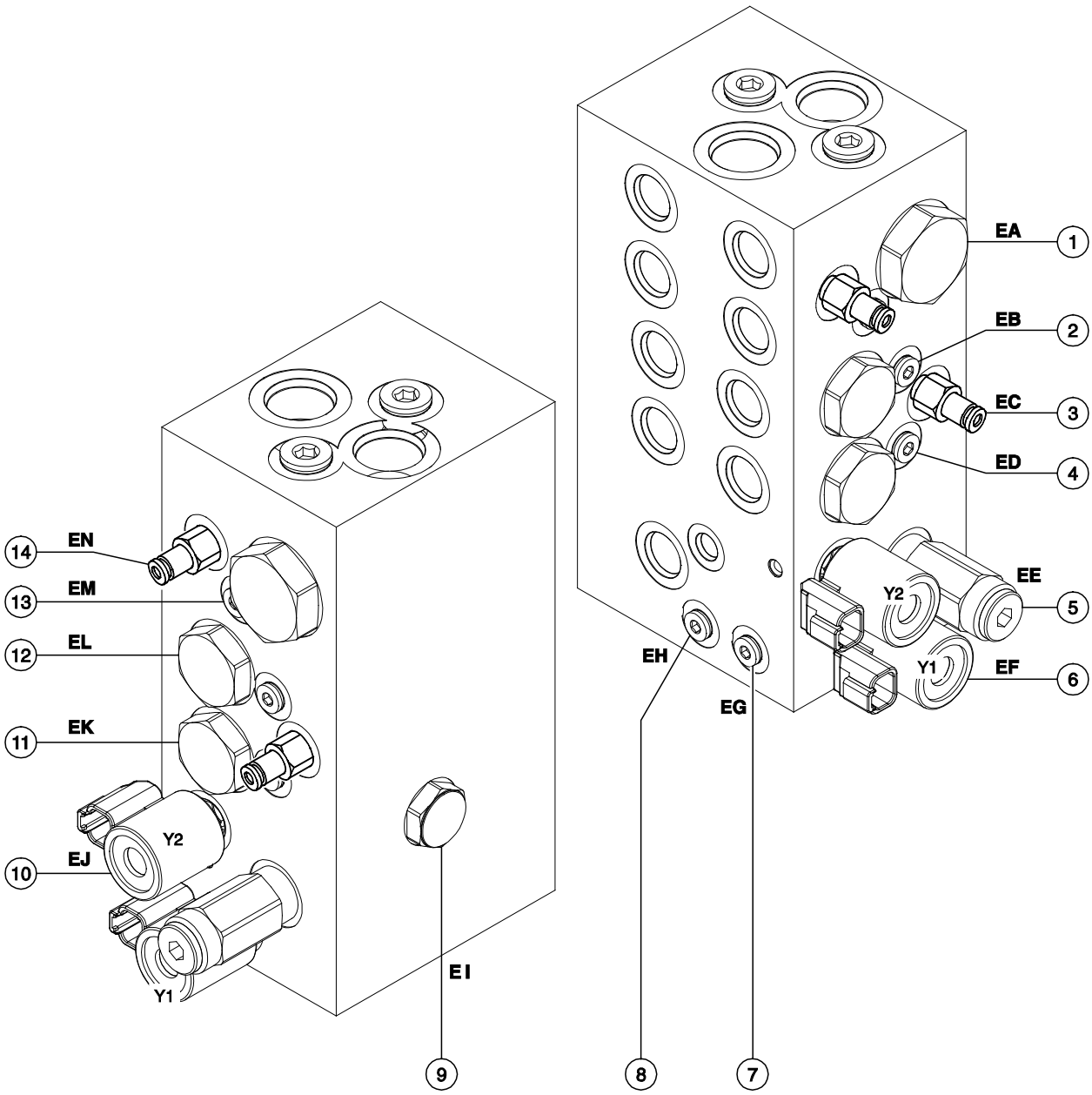
Note: 'alpha-numeric' callouts refer to corresponding notes on the electrical schematic.

7-3
Traction Manifold Components

The traction manifold is located under the function manifold

Index No.	Description	Schematic Item	Function	Torque
1	Flow divider/combiner valve	EA	Controls flow to front and rear drive motors	95 - 100 ft-lbs 129 - 135 Nm
2	Orifice Plug, 0.043 inch / 1.1 mm	EB	Balances flow from flow divider/combiner (item EL) to front drive motors	
3	Diagnostic port	EC	Testing "P2" pressure port	
4	Orifice Plug, 0.046 inch / 1.2 mm	ED	Balances flow from flow divider/combiner (item EK) to rear drive motors	25 ft-lbs / 34 Nm
5	Relief valve, 280 psi / 19.3 bar	EE	Charge pressure circuit	25 - 30 ft-lbs 34 - 41 Nm
6	Solenoid Valve, 2 position 3 way	EF	2-speed motor shift circuit	20 ft-lbs / 27 Nm
7	Orifice Plug, 0.035 inch / 0.9 mm	EG	Brake circuit	
8	Orifice Plug, 0.045 inch / 1.1 mm	EH	2-speed motor shift circuit	
9	Shuttle valve. 2 position, 3 way	EI	Charge pressure circuit that gets hot oil out of low pressure side of drive pump and allow slow pressure flow path for brake release and 2-speed motor shift	50 ft-lbs / 68 Nm
10	Solenoid Valve, 2 position 3 way	EJ	Brake release	20 ft-lbs / 27 Nm
11	Flow divider/combiner valve	EK	Controls flow to non-steer end drive motors in forward and reverse	70 - 75 ft-lbs 95 - 102 Nm
12	Flow divider/combiner valve	EL	Controls flow to steer end drive motors in forward and reverse	70 - 75 ft-lbs 95 - 102 Nm
13	Orifice Plug, 0.090 inch / 2.3 mm	EM	Balances flow from flow divider/combiner (item EA) to front and rear drive motors	25 ft-lbs / 34 Nm
14	Diagnostic port	EN	Testing "P1" pressure port	

Manifolds



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

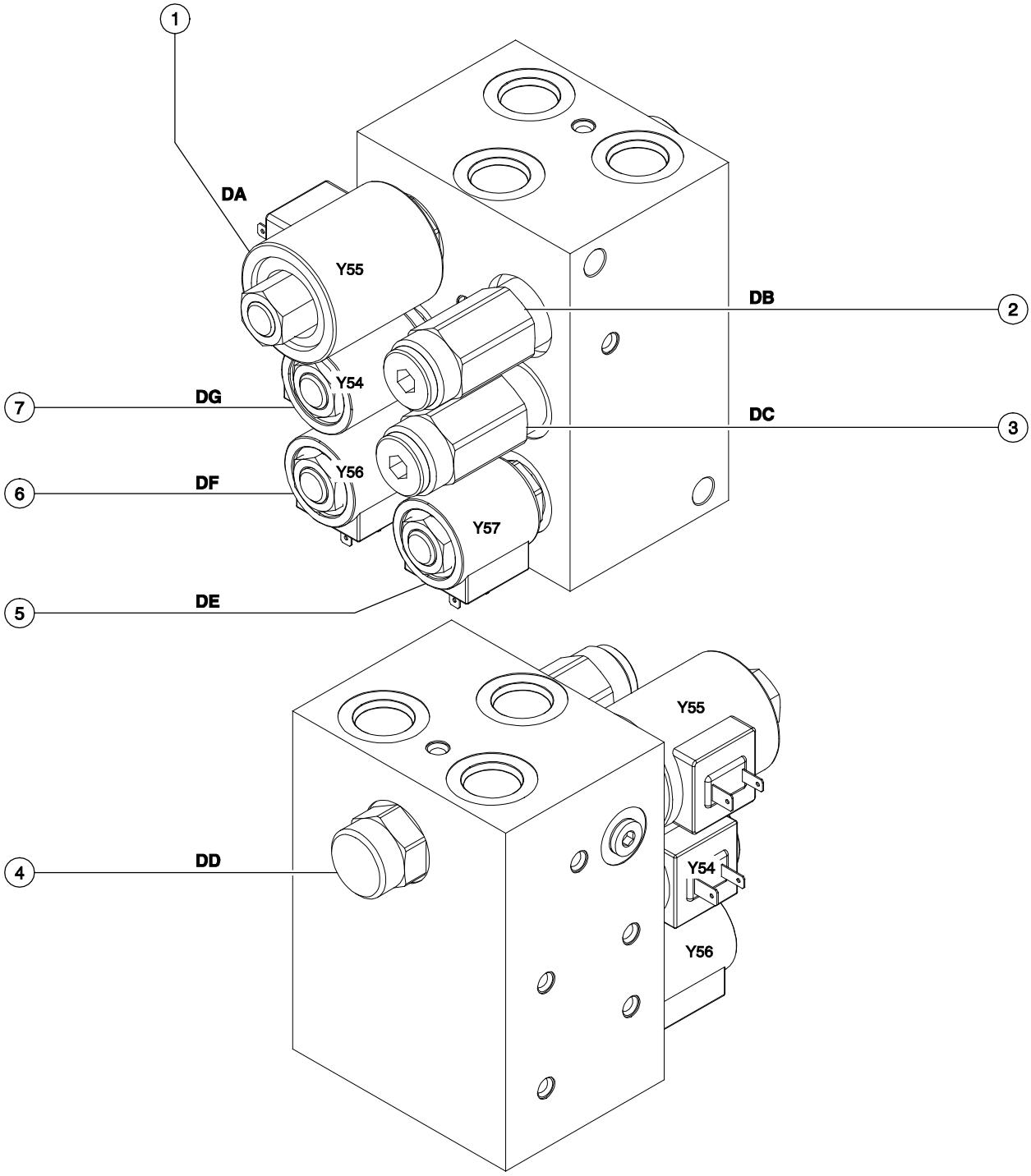
Note: 'alpha-numeric' callouts refer to corresponding notes on the electrical schematic.

7-4
Oscillate Manifold Components, GS-90 (option)

The oscillate manifold is located under the function manifold.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid valve, 2 position 2 way	DA	Oscillate circuit	45 ft-lbs / 61 Nm
2	Relief valve, 3500 psi / 241.3 bar	DB	System relief	25 - 30 ft-lbs 34 - 41 Nm
3	Relief valve, 900 psi / 62 bar	DC	Float circuit relief	25 - 30 ft-lbs 34 - 41 Nm
4	Priority flow regulator, 1 gpm / 3.8 L/min	DD	Oscillate circuit	45 - 50 ft-lbs 61 - 68 Nm
5	Solenoid Valve, 2 position 3 way	DE	Oscillate right	40 ft-lbs / 54 Nm
6	Solenoid Valve, 2 position 3 way	DF	Oscillate left	40 ft-lbs / 54 Nm
7	Solenoid valve, 2 position 2 way	DG	Oscillate float	40 ft-lbs / 54 Nm

Manifolds



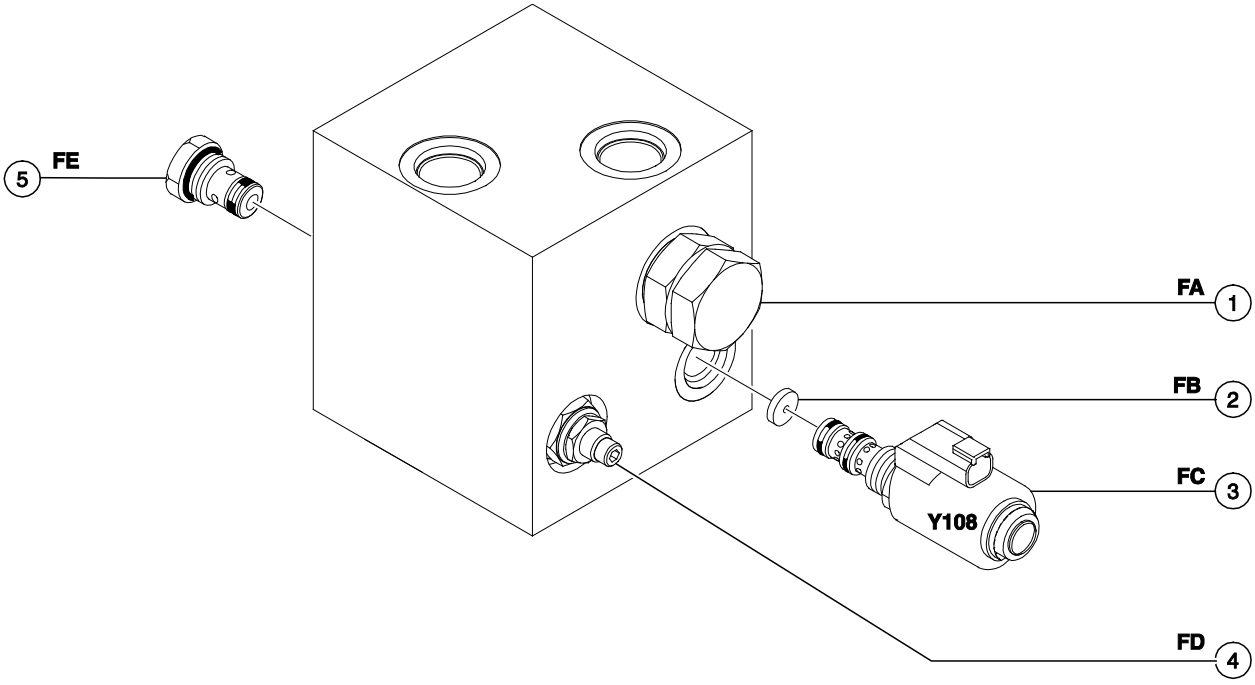
Note: 'alpha' callouts refer to corresponding notes on the hydraulic schematic.

Note: 'alpha-numeric' callouts refer to corresponding notes on the electrical schematic.

7-5
Diverter Manifold Components (welder option)

The welder manifold is located under the drive manifold.

Index No.	Description	Schematic Item	Function	Torque
1	Directional valve	FA	Diverter valve	80-90 ft-lbs / 108-122 Nm
2	Orifice, 0.030 inch / .76 mm	FB	Delays shift to drive	35-40 ft-lbs / 47-54 Nm
3	Solenoid Valve, 2 position 3 way	FC	Pilot valve to diverter	35-40 ft-lbs / 47-54 Nm
4	Relief valve, 270 psi / 18.6 bar	FD	Charge pressure circuit	35-40 ft-lbs / 47-54 Nm
5	Check valve, 3 psi / .21 bar	FE	Prevents oil to generator	35-40 ft-lbs / 47-54 Nm



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

Note: 'alpha-numeric' callouts refer to corresponding notes on the electrical schematic.

Manifolds

7-6 Valve Adjustments - Function Manifold

How to Adjust the System Relief Valve

Note: Perform this procedure with a minimum hydraulic oil temperature of 32°F / 0°C and a maximum hydraulic oil temperature of 120°F / 48°C.

Note: Be sure that the hydraulic oil level is between the full and add marks on the oil level indicator.

Note: Refer to Function Manifold Component list to locate the system relief valve.

1 **Models with outriggers:** Deploy the outriggers and level the machine.

Models without outriggers: Chock both sides of the wheels at the steer end of the machine.

2 Locate the system relief valve on the function manifold.

3 Connect a 0 to 5000 psi / 0 to 350 bar pressure gauge to the test port on the function manifold.

4 Remove the platform controls from the platform.

Note: Perform this test from the ground with the platform controls. Do not stand in the platform.

5 Determine the test weight for your machine. Refer to the specifications below.

Rated work load at full height, maximum	
GS-3384 and GS-3390	2500 lbs 1135 kg
GS-4390 (most models - refer to capacity indicator decal)	1500 lbs 680 kg
GS-4390 (some models - refer to capacity indicator decal)	1800 lbs 816 kg
GS-5390	1500 lbs 680 kg

6 Using a suitable lifting device, place the test weight, determined in step 5, at the center of the platform floor. Secure the weight to the platform.

7 Turn the key switch to platform controls and pull out the red Emergency Stop button to the on position at both ground and platform controls. Start the engine.

8 Press and hold the lift function enable button.

9 Activate the platform up function and fully raise the platform while observing the pressure reading on the pressure gauge.

⊙ Result: The hydraulic pressure should not exceed 3500 psi / 241 bar.

⊙ Result: The platform should lift and fully raise. Proceed to step 13.

⊠ Result: The platform does not fully raise OR raises too easily. Proceed to step 10.

NOTICE Component damage hazard. Do not continue to operate the machine if the hydraulic pump is cavitating.

10 Turn the machine off. Hold the system relief valve with a wrench and remove the cap.

11 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

12 Repeat this procedure beginning with step 7.

13 Fully lower the platform.

14 Using a suitable lifting device, add an additional weight to the platform not to exceed 20% of the maximum rated work load at full height. Secure the weight to the platform. Refer to the specifications below.

Additional test weight	
GS-3384 and GS-3390	500 lbs 227 kg
GS-4390 (most models - refer to capacity indicator decal)	375 lbs 170 kg
GS-4390 (some models - refer to capacity indicator decal)	450 lbs 204 kg
GS-5390	375 lbs 170 kg

15 Activate the platform up function and attempt to raise the platform.

⊙ Result: The platform does not raise. Proceed to step 21.

☒ Result: The platform lifts. Proceed to step 16.

16 Lower the platform to the stowed position.

17 Turn the machine off. Hold the system relief valve with a wrench and remove the cap.

18 Adjust the internal hex socket. Turn it counterclockwise to decrease the pressure. Install the relief valve cap.

19 Start the engine.

20 Repeat this procedure beginning with step 15.

21 Turn the machine off and remove the weight from the platform.

How to Adjust the Steer Relief Valve

Note: Refer to Function Manifold Component list to locate the steer relief valve.

1 Connect a 0 to 3000 psi / 0 to 250 bar pressure gauge to the test port (item AB) on the function manifold.

2 Start the engine from the platform controls.

3 Press and hold the function enable switch and hold the steer thumb rocker switch in the right direction. Allow the wheels to completely turn to the right, then continue holding the switch while observing the pressure reading on the pressure gauge. Note the pressure. Refer to Specifications, *Hydraulic Component Specifications.*

4 Turn the engine off. Use a wrench to hold the relief valve and remove the cap (item AE).

5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

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

6 Repeat steps 2 through 3 to confirm the relief valve pressure.

Manifolds

7-7
Valve Adjustments - Traction Manifold

How to Adjust the Charge Pressure Relief Valve

Note: Refer to Drive Manifold Component list to locate the charge pressure relief valve.

1 Connect a 0 to 600 psi / 0 to 50 bar pressure gauge to test port #2 on the drive manifold.

2 Start the engine from the platform controls.

3 Drive the machine slowly in the direction indicated by the blue arrow on the platform controls and observe the pressure reading on the pressure gauge. Refer to Specifications, Hydraulic Components Specifications.

NOTICE Component damage hazard. Driving the machine in reverse will place excessive pressure on the pressure gauge and will damage the gauge. Do not drive the machine in a reverse direction.

4 Turn the engine off. Use a wrench to hold the charge pressure relief valve and remove the cap (item EE).

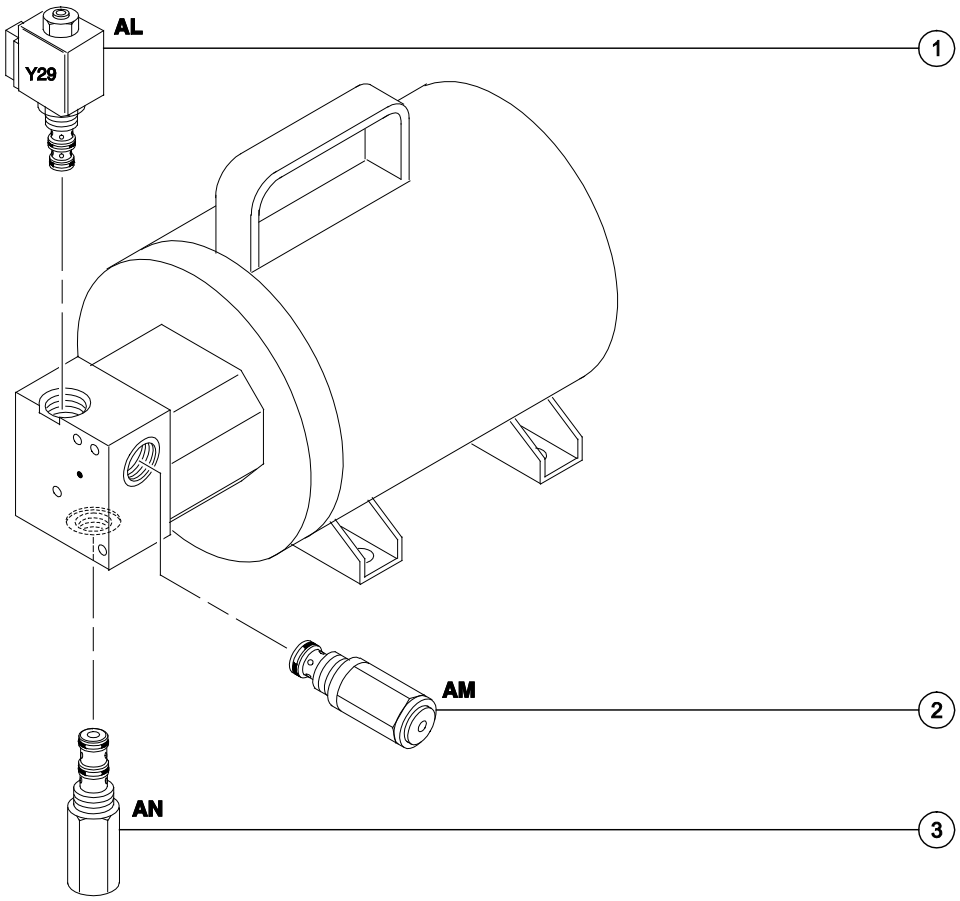
5 Adjust the internal hex socket. Turn it clockwise to increase the pressure or counterclockwise to decrease the pressure. Install the relief valve cap.

6 Repeat steps 2 through 3 to confirm the relief valve pressure.

7-8
Generator Manifold Components

The generator manifold is located below the ground controls.

Index No.	Description	Schematic Item	Function	Torque
1	Solenoid operated 2 position, 3 way directional valve	AL	Generator on/off	25 ft-lbs / 34 Nm
2	Flow regulator valve, 4.3 gpm / 16.3 L/min	AM	Generator speed	20 ft-lbs / 27 Nm
3	Relief valve, 3000 psi / 206.8 bar	AN	Generator circuit	20 ft-lbs / 27 Nm



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

Manifolds

7-9
Valve Adjustments - Generator Manifold

How to Adjust the Generator Voltage

⚠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.

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

Note: Be sure that the hydraulic oil level is between the full and add marks on the oil level indicator.

1 Disconnect all electrical tools from the machine.

2 Start the engine from the platform controls.

3 Press the generator select switch.

⊙ Result: The generator should activate and the engine should go to high rpm.

4 Connect an electrical tool, which does not draw more than 15A, to the electrical outlet at the platform controls and run the tool at full speed.

5 Connect the positive and negative leads from a multimeter of sufficient capacity to the electrical outlet at the generator.

⊙ Result: The reading on the multimeter should be 112 to 118V AC.

⊙ Result: If the reading on the multimeter is not 112 to 118V AC, proceed to step 6.

6 Turn the key switch to the off position.

7 Use a wrench to hold the generator flow regulator valve (item AM) and remove the cap.

8 Adjust the internal hex socket. Turn it clockwise to increase the AC voltage or counterclockwise to decrease the AC voltage. Install the flow regulator valve cap.

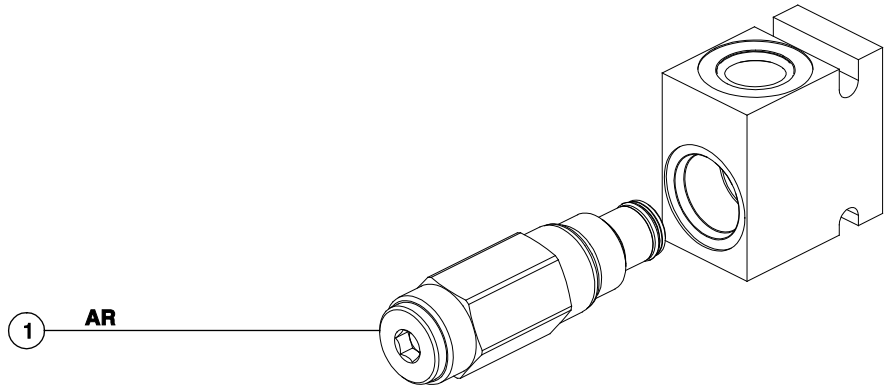
NOTICE Component damage hazard. Failure to adjust the generator as instructed may result in damage to the generator or other electrical equipment. Do not adjust the generator to other than specified.

9 Repeat steps 2 through 5 to confirm the generator AC voltage.

7-10
Generator Relief Valve Manifold Components

The generator relief valve manifold is located in the hydraulic manifold compartment.

Index No.	Description	Schematic Item	Function	Torque
1	Relief valve, 3500 psi / 241 bar	AR	Generator pressure circuit	25 ft-lbs / 34 Nm



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

Manifolds

7-11 Valve Coils

How to Test a Coil

A properly functioning coil provides an electromotive force which operates the solenoid valve. Critical to normal operation is continuity within the coil that provides this force field.

Since coil resistance is sensitive to temperature, resistance values outside specification can produce erratic operation. When coil resistance decreases below specification, amperage increases. As resistance rises above specification, voltage increases.

While valves may operate when coil resistance is outside specification, maintaining coils within specification will help ensure proper valve function over a wide range of operating temperatures.

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

Note: If the machine has been in operation, allow the coil to cool at least 3 hours before performing this test.

1 Tag and disconnect the wiring from the coil to be tested.

2 Test the coil resistance using a multimeter set to resistance (Ω). Refer to the Valve Coil Resistance Specification table.

⊙ Result: If the resistance is not within the adjusted specification, plus or minus 10%, replace the coil.

Valve Coil Resistance Specification

Note: The following coil resistance specifications are at an ambient temperature of 68°F / 20°C. As valve coil resistance is sensitive to changes in air temperature, the coil resistance will typically increase or decrease by 4% for each 18°F / 10°C that your air temperature increases or decreases from 68°F / 20°C.

Description	Specification
Proportional solenoid valve, 12V DC (schematic item AD)	4.1Ω
Solenoid valve, 3 position 4 way, 10V DC (schematic items AG and AK)	3.6Ω
Solenoid valve, 3 position 4 way, 10V DC with diode (schematic item AH)	7.2Ω
Solenoid valve, 2 position 2 way, 10V DC (schematic items CA, CB, CC and CD)	5.5Ω
Solenoid Valve, 2 position 3 way, 10V DC (schematic item AL)	6Ω
Solenoid valve, 2 position 2 way, 12V DC with diode (schematic item DA)	7.5Ω
Solenoid Valve, 2 position 3 way, 12V DC with diode (schematic items DE and DF)	10Ω
Solenoid valve, 2 position 2 way, 12V DC with diode (schematic item DG)	10Ω
Solenoid Valve, 2 position 3 way, 10V DC with diode (schematic items EF and EJ)	7Ω
Solenoid Valve, 2 position 3 way, 10V DC (schematic item FC)	6Ω

How to Test a Coil Diode

Properly functioning coil diodes protect the electrical circuit by suppressing voltage spikes. Voltage spikes naturally occur within a function circuit following the interruption of electrical current to a coil. Faulty diodes can fail to protect the electrical system, resulting in a tripped circuit breaker or component damage.

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

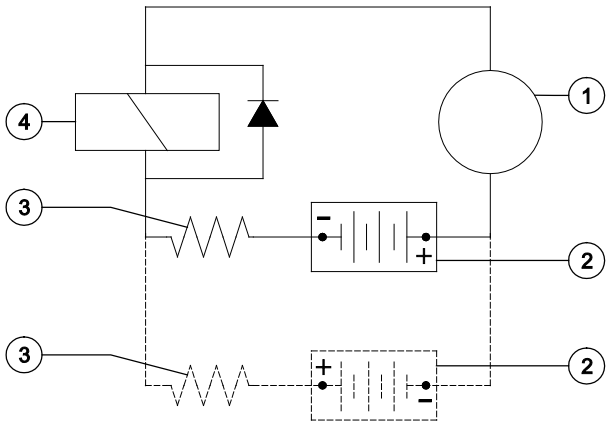
1 Test the coil for resistance. Refer to Repair Procedure, *How to Test a Coil*.

2 Connect a 10W resistor to the negative terminal of a known good 9V DC battery. Connect the other end of the resistor to a terminal on the coil.

Resistor 10Ω

Genie part number 27287

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



1 multimeter
2 9v DC battery
3 10Ω resistor
4 coil

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

3 Set a multimeter to read DC current.

Note: The multimeter, when set to read DC current, should be capable of reading up to 800 mA.

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

5 Momentarily connect the positive lead from the multimeter to the positive terminal on the 9V DC battery. Note and record the current reading.

6 At the battery or coil terminals, reverse the connections. Note and record the current reading.

⊙ Result: Both current readings are greater than 0 mA and are different by a minimum of 20%. The coil is good.

⊠ Result: If one or both of the current readings are 0 mA, or if the two current readings do not differ by a minimum of 20%, the coil and/or its internal diode are faulty and the coil should be replaced.

Fuel and Hydraulic Tanks

8-1
Fuel Tank

How to Remove the Fuel Tank

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

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

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

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

2 Start the engine and raise the platform approximately 18 feet / 5.5 m from the ground.

3 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

Note: Be sure that the safety arm is locked in the vertical position.

4 Lower the platform onto the safety arm. Turn the machine off.

⚠ WARNING Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

5 Attach a lifting strap from an overhead crane to the entry ladder on the hydraulic tank side of the machine.

6 Remove the entry ladder mounting fasteners. Remove the entry ladder from the machine.

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

7 Remove the retaining fasteners from the access plate located behind the hydraulic and fuel tank tray.

8 Locate and close the 2 fuel tank shutoff valves located at the fuel tank (if equipped).

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

10 Remove the fuel filler cap from the tank.

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

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

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

12 Remove the fuel tank hold down strap retaining fasteners. Remove the straps from the fuel tank.

13 Support and secure the fuel tank to an appropriate lifting device.

14 Remove the fuel tank from the machine.

NOTICE Component damage hazard. The fuel tank is plastic and may become damaged if allowed to fall.

Note: Clean the fuel tank and inspect for cracks or other damage before installing.

8-2 Hydraulic Tank

The primary functions of the hydraulic tank are to cool, clean and deaerate the hydraulic fluid during operation. It utilizes internal suction strainers for the pump supply lines and has an external return line filter with a filter condition indicator.

How to Remove the Hydraulic Tank

NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

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

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

2 Start the engine and raise the platform approximately 18 feet / 5.5 m from the ground.

3 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

Note: Be sure that the safety arm is locked in the vertical position.

Fuel and Hydraulic Tanks

4 Lower the platform onto the safety arm. Turn the machine off.

⚠WARNING Crushing hazard. Keep hands clear of the safety arm when lowering the platform.

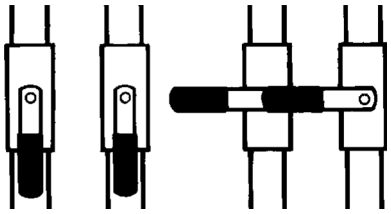
5 Attach a lifting strap from an overhead crane to the entry ladder on the hydraulic tank side of the machine.

6 Remove the entry ladder mounting fasteners. Remove the entry ladder from the machine.

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

7 Remove the retaining fasteners from the access plate located behind the hydraulic and fuel tank tray.

8 Close the two hydraulic tank shut-off valves at the hydraulic tank. (if equipped)



open closed

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

9 Remove the drain plug from the hydraulic tank and completely drain the tank into a suitable container. Refer to Specifications, *Machine Specifications*.

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

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

11 Tag, disconnect and plug the tank return hose at the tank.

12 Disconnect and plug the T-fitting located at the tank with the 2 hoses connected to it.

13 Remove the hydraulic tank strap retaining fasteners and remove the hydraulic tank strap from the machine.

14 Support and secure the hydraulic tank to a suitable lifting device.

15 Remove the hydraulic tank from the machine.

⚠WARNING Crushing hazard. The hydraulic tank could become unbalanced and fall if it is not properly supported and secured to the lifting device when it is removed from the machine.

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

Note: Always use pipe thread sealant when installing the drain plug and strainers.

9-1
Yoke and Drive Motor

How to Remove the Yoke and Drive Motor

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

Note: When installing a steer yoke, Loctite® 243™ threadlocker must be applied to the retaining fasteners securing the king pins.
Torque to 44 ft-lbs / 60 Nm.

1 Chock both sides of the wheels at the non-steer end of the machine.

2 Center a lifting jack under the drive chassis at the steer end of the machine.

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

4 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

⚠WARNING Crushing hazard. The chassis will fall if not properly supported.

5 Remove the wheel lug bolts. Remove the tire and wheel assembly.

6 Remove the hose clamps retaining fasteners from the drive motor guard. Remove the hose clamps.

7 Remove the retaining fasteners from the drive motor guard. Remove the drive motor guard from the yoke.

8 Tag, disconnect and plug the hoses from the drive motor. Cap the fittings on the drive motor.

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

9 Support and secure the yoke and drive motor assembly to a lifting jack.

10 Remove the cotter pin from the tie rod clevis pin.

Note: Always use a new cotter pin when installing a clevis pin.

11 Remove the retaining fastener from the steer cylinder rod end pivot pin. Remove the pivot pin.

12 Remove the retaining fastener from the lower yoke pivot pin.

13 Place a rod through the pin and twist to remove the pin.

14 Repeat steps 11 and 12 for the upper yoke pivot pin.

15 Remove the yoke and drive motor assembly from the machine.

⚠CAUTION Crushing hazard. The yoke and drive motor assembly may become unbalanced and fall if not properly supported and secured to the lifting jack when it is removed from the machine.

Steer Axle Components

How to Remove a Drive Motor

NOTICE Component damage hazard. Repairs to the motor should only be performed by an authorized dealer.

NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

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

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

2 Chock both sides of the wheels at the non-steer end of the machine.

3 Center a lifting jack under the drive chassis at the steer end of the machine.

4 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

⚠WARNING Crushing hazard. The chassis will fall if not properly supported.

5 Remove the wheel lug bolts. Remove the tire and wheel assembly.

6 Remove the hose clamps retaining fasteners from the drive motor guard. Remove the hose clamps.

7 Remove the retaining fasteners from the drive motor guard. Remove the drive motor guard from the yoke.

8 Tag, disconnect and plug the hoses from the drive motor. Cap the fittings on the drive motor.

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

9 Remove the drive motor mounting fasteners. Remove the drive motor.

Note: There is an O-ring on the drive motor and drive hub assembly. It is installed between the drive motor and drive hub. Be sure that the O-ring is in place when installing the drive motor onto the machine.

Mounting bolt torque specifications	
Drive motor to drive hub, dry	75 ft-lbs 102 Nm
Drive motor to drive hub, lubricated	56 ft-lbs 76 Nm

9-2 Steer Cylinder

How to Remove the Steer Cylinder

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

1 Tag, disconnect and plug the hydraulic hoses from the steer cylinder. Cap the fittings on the cylinder.

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

2 Remove the pin retaining fasteners from the barrel-end pivot pin. Place a rod through the pin and twist to remove the pin.

Note: While removing the pin retaining fasteners, take note of the quantity and location of the spacers when removing the pivot pin.

3 Remove the pin retaining fasteners from the rod-end pivot pin. Place a rod through the pin and twist to remove the pin.

Note: While removing the pin retaining fasteners, take note of the quantity and location of the spacers when removing the pivot pin.

4 Remove the steer cylinder from the machine.

9-3 Oscillating Axle Option - GS-90 Models

How the Oscillating Axle Functions

When driving the GS-90 with the platform in the stowed position, the oscillating axle function ensures that all four wheels maintain solid contact with the ground, delivering the maximum traction available.

When driving the GS-90 with the platform raised above the down limit switch height, the oscillating axle function is limited in that the oscillating cylinders only respond to input from the oscillating axle limit switches, located on the rear axle.

Oscillate Stowed Relay CR84

Terminal 30 of the Oscillate Stowed relay, CR84, receives power from the Platform Down limit switch, LS6. When the platform is raised above LS6, power to terminal 30 will be cut.

Terminal 86 of CR84 is connected to pin J2-C5 at the ECM. Pin J2-C5 is powered anytime the Brake Release valve coil Y2 is energized, thus energizing CR84 terminal 87 and, ultimately, all four oscillating valve coils, allowing oil to pass between the oscillating cylinders. J2-C5 continues to power terminal 86 for 0.5 seconds after Y2 is de-energized.

Steer Axle Components

Oscillate Raised Relay CR85

Terminal 30 of the Oscillate Raised relay, CR85, receives power from the Power relay, CR42. When power is cut to terminal 86 of CR42 via key switch or either Emergency Stop button, power to terminal 30 of CR85 will be lost.

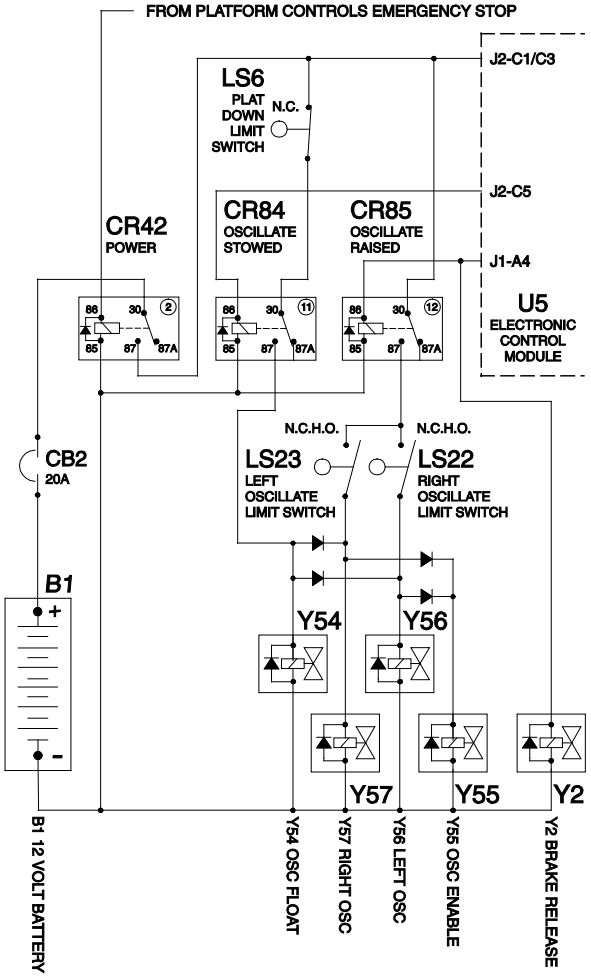
Terminal 86 of CR85 receives power from pin J1-A4 while drivin is engaged and the ECM is powered.

J1-A4 is disabled when an outrigger is lowered to the ground.

Oscillate Limit Switches LS22, LS23

The right and left oscillating limit switches, LS22 and LS23 respectively, are normally closed limit switches, held in the open position when the machine is on a level surface.

When the left rear or right rear wheel 'drops', the limit switch will relax and close its circuit, sending power to the appropriate oscillating valve coil.



10-1
Drive Motor and Brake

How to Remove a Drive Motor and Brake

NOTICE Component damage hazard. Repairs to the motor should only be performed by an authorized dealer.

NOTICE Component damage hazard. The work area and surfaces where this procedure will be performed must be clean and free of debris that could get into the hydraulic system and cause severe component damage. Dealer service is recommended.

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

1 Block the steer wheels.

2 Tag, disconnect and plug the hydraulic hoses from the drive motor and brake. Cap the fittings on the drive motor and brake.

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

3 Remove the drive motor mounting fasteners.

4 Slide the drive motor shaft out of the brake and remove the drive motor from the machine.

5 Remove the brake from the drive hub.

Note: There are two O-rings on the drive motor and brake assembly. One is installed between the brake and drive hub and another between the brake and drive motor. Be sure that both O-rings are in place when installing the brake and drive motor onto the machine.

Mounting bolt torque specifications	
Drive motor to drive hub, dry	75 ft-lbs 102 Nm
Drive motor to drive hub, lubricated	56 ft-lbs 76 Nm

Non-steer Axle Components

10-2
Drive Hub

How to Remove a Drive Hub

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

1 Remove the drive motor. Refer to Repair Procedure, *How to Remove a Drive Motor*.

2 Block the steer wheels and center a lifting jack of ample capacity under the drive chassis at the steer end of the machine.

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

4 Raise the machine approximately 2 inches / 5 cm. Place blocks under the chassis for support.

⚠WARNING Crushing hazard. The chassis will fall if not properly supported.

5 Remove the wheel lug bolts. Remove the tire and wheel assembly.

6 Place a second lifting jack under the drive hub for support and secure the drive hub to the lifting jack.

7 Remove the drive hub mounting bolts that attach the drive hub to the axle. Remove the drive hub.

⚠WARNING Crushing hazard. The drive hub may become unbalanced and fall if it is not properly supported and secured to the lifting jack.

Mounting bolt torque specifications

Drive hub to axle, lubricated (thread locker on bolt threads)	180 ft-lbs 244 Nm

10-3
Oscillating Axle

Refer to Repair Procedure, *Oscillating Axle Option - GS-90 Models*

Outrigger Components

11-1 Outrigger Cylinder

How to Remove an Outrigger Cylinder (if equipped)

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

Note: Perform this procedure with the platform in the stowed position and the outriggers fully retracted.

1 Remove the outrigger footpad.

2 Remove the mounting fasteners from the outrigger cover. Remove the cover.

3 Tag and disconnect the wiring from the outrigger cylinder solenoid valve.

4 Tag, disconnect and plug the hydraulic hoses from the outrigger cylinder. Cap the fittings on the cylinder.

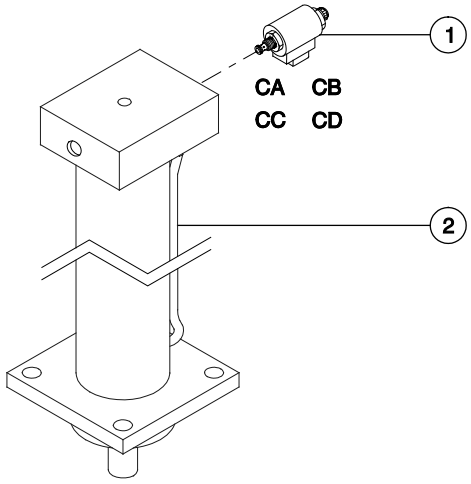
⚠ WARNING Bodily injury hazard. Spraying hydraulic oil can penetrate and burn skin. Loosen hydraulic connections very slowly to allow the oil pressure to dissipate gradually. Do not allow oil to squirt or spray.

5 Attach a lifting strap from an overhead crane to the barrel end of the outrigger cylinder for support. Do not apply any lifting pressure.

6 Remove the outrigger cylinder mounting fasteners. Remove the outrigger cylinder from the machine.

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

Note: If the outrigger cylinder is being replaced, remove the shoulder pin from the barrel end of the outrigger cylinder and install it onto the new cylinder.



1 valve coil
2 outrigger cylinder

12-1
Platform Overload System (if equipped)

How to Calibrate the Platform Overload System (if equipped)

Machines with platform overload systems, proper calibration is essential to safe machine operation. An improperly calibrated platform overload system could result in the system failing to sense an overloaded platform. The stability of the machine is compromised and it could tip over.

Note: Verify the hydraulic oil level is at the FULL mark on the hydraulic tank.

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

All models:

1 **Models with outriggers**: Deploy the outriggers and level the machine.

2 Apply a thin layer of dry film lubricant to the area of the chassis where the scissor arm wear pads make contact.

3 Disconnect the platform controls from the machine at the platform.

4 Open the large ground control panel door and locate the Electronic Control Module (ECM) wire harness to platform controls wire harness connection below the ground controls.

Note: This connection is just below the ground controls.

5 Tag and disconnect the platform controls wire harness from the ECM wire harness.

6 Securely connect the platform controls to the ECM wire harness.

7 Using a suitable lifting device, place a test weight, corresponding to the maximum load as indicated on the capacity indicator decal, in the center of the platform floor. Secure the weight to the platform. Refer to the chart below.

GS-3384 and GS-3390	2500 lbs 1134 kg
GS-4390 (most models - refer to capacity indicator decal)	1286 lbs 583 kg
GS-4390 (some models - refer to capacity indicator decal)	1421 lbs 645 kg
GS-5390	1410 lbs 640 kg

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

9 Raise the platform to approximately 19 ft / 6 m.

10 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

Note: Be sure that the safety arm is locked in the vertical position.

11 Loosen the retaining ring and remove the switch adjustment cover from the pressure switch(es).

Note: The pressure switch is located on the lift cylinder.

12 Using a small slotted screwdriver, turn the adjustment screw of the platform overload pressure switch(es) one-quarter turn into the hydraulic line.

13 Push in the ground controls red Emergency Stop button to the off position.

Platform Overload Components

GS-3384, GS-3390 and GS-4390 models:

14 Pull out the red Emergency Stop button to the on position at the ground controls. Wait 3 seconds and start the engine.

⊙ Result: The alarm doesn't sound and the engine will start and run. Proceed to step 15.

⊠ Result: The engine will not start and an alarm is sounding. Repeat this procedure beginning with step 12.

Note: The red Emergency Stop button must be cycled after each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

Note: Wait a minimum of 3 seconds between each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

15 Raise the platform until the position indicator corresponds to the maximum load position of the capacity indicator decal.

⚠ DANGER Tip-over hazard. Raising the platform with maximum load above the maximum load position, as shown on the capacity indicator decal on the side of the platform, could result in the machine tipping over, resulting in death or serious injury. Do not raise the platform above the maximum load position of the capacity indicator decal.

Note: To perform this step, the system relief valve will need to be adjusted.

Note: To help complete this part of the procedure, apply a piece of tape to the underside of the platform at a point which corresponds to the maximum load position of the capacity indicator decal before raising the platform.

⊙ Result: The engine continues to run. Proceed to step 16.

⊠ Result: The engine has stopped and an alarm is sounding. Proceed to step 17.

Set the pressure switch

16 Turn the nut (or adjustment screw) of the platform overload pressure switch out of the hydraulic line until the overload alarm sounds and the engine stops running.

Note: Turning the nut (or adjustment screw) out of the hydraulic line will activate the alarm; turning the nut (or adjustment screw) into the hydraulic line will deactivate the alarm.

17 Slowly turn the nut (or adjustment screw) of the platform overload pressure switch one-quarter turn into the hydraulic line.

18 Push in the ground controls red Emergency Stop button to the off position.

19 Pull out the red Emergency Stop button to the on position at the ground controls. Wait 3 seconds and start the engine.

⊙ Result: The alarm doesn't sound and the engine will start and run. Proceed to step 20.

⊠ Result: The engine will not start and an alarm is sounding. Repeat this procedure beginning with step 17.

Note: The red Emergency Stop button must be cycled after each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

Note: Wait a minimum of 3 seconds between each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

20 Return the safety arm to the stowed position. Lower the platform to the stowed position.

Note: After returning the safety arm to the stowed position, use the auxiliary down function to lower the platform.

Platform Overload Components

Set the maximum height limit switch

21 Using a suitable lifting device, place a test weight in the center of the platform floor. Secure the weight to the platform. Refer to the chart below.

GS-3384 and GS-3390	1135 lbs 515 kg
GS-4390 (most models - refer to capacity indicator decal)	680 lbs 308 kg
GS-4390 (some models - refer to capacity indicator decal)	816 lbs 370 kg

22 Raise the platform to approximately 19 ft / 6 m.

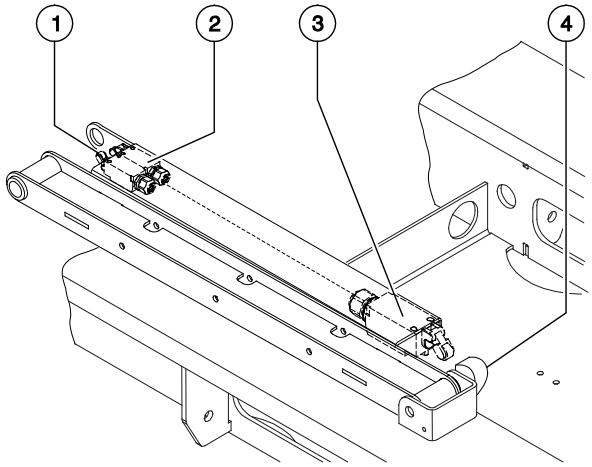
23 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

24 Remove the maximum height limit switch cam fasteners. Remove the cam from the machine so that the limit switch will not be activated.

25 Raise the platform until it is approximately 25.5 inches / 65 cm less than full height.

26 Raise the platform in 2 inch / 5 cm increments until the overload alarm sounds and the engine stops running. Proceed to step 27.

☒ Result: The alarm does not sound and the engine continues to run when the platform reaches full height. Repeat this procedure beginning with step 7.



Limit switch legend

1 load sense delay limit switch
2 down limit switch
3 maximum height limit switch
4 maximum height limit switch cam

27 Install and adjust the maximum height limit switch cam until the limit switch activates just before the point reached in step 26. Securely tighten the cam fasteners. Do not over tighten.

28 Use the auxiliary down function to lower the platform approximately 6 inches / 15 cm.

Platform Overload Components

29 Start the engine and fully raise the platform.

⊙ Result: The engine continues to run. Proceed to step 30.

⊠ Result: An alarm sounds and the engine stops running. Repeat this procedure beginning with step 24.

30 Lower the platform to approximately 6 m.

31 Return the safety arm to the stowed position. Proceed to step 59.

GS-5390 models:

32 Pull out the red Emergency Stop button to the on position at the ground controls. Wait 3 seconds and start the engine.

⊙ Result: The alarm doesn't sound and the engine will start and run. Proceed to step 33.

⊠ Result: The engine will not start and an alarm is sounding. Repeat this procedure beginning with step 12.

Note: The red Emergency Stop button must be cycled after each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

Note: Wait a minimum of 3 seconds between each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

33 Raise the platform until the position indicator corresponds to the maximum load position of the capacity indicator decal.

⚠ DANGER Tip-over hazard. Raising the platform with maximum load above the maximum load position, as shown on the capacity indicator decal on the side of the platform, could result in the machine tipping over, resulting in death or serious injury. Do not raise the platform above the maximum load position of the capacity indicator decal.

Note: To perform this step, the system relief valve will need to be adjusted.

Note: To help complete this part of the procedure, apply a piece of tape to the underside of the platform at a point which corresponds to the maximum load position of the capacity indicator decal before raising the platform.

⊙ Result: The engine continues to run. Proceed to step 34.

⊠ Result: The engine has stopped and an alarm is sounding. Proceed to step 35.

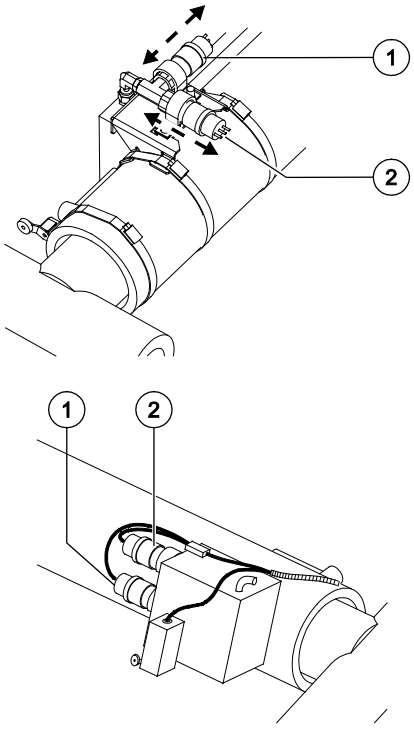
Platform Overload Components

Set the maximum height pressure switch

34 Working on platform overload pressure switch 1 (parallel to the cylinder on early models) with a small slotted screwdriver, turn the adjustment screw out of the hydraulic line just until the overload alarm sounds and the engine stops running. Refer to the illustrations below.

Note: Turning the screw out of the hydraulic line will activate the alarm; turning the screw into the hydraulic line will deactivate the alarm.

Note: The white/black wire should be connected to this pressure switch.



1 switch 1
2 switch 2

35 Slowly turn the adjustment screw of the platform overload pressure switch into the hydraulic line in 90° increments just until the overload alarm doesn't sound and the engine will start and run.

Note: To allow for the platform overload system delay, wait 3 seconds between each quarter turn of the adjustment screw.

Note: The red Emergency Stop button must be cycled after each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

36 Activate the dual pressure switch limit switch, located on the cylinder, by fully rotating the roller arm of the limit switch. Secure the roller arm in the activated position.

37 Start the engine.

Set the platform stowed pressure switch

38 Working on platform overload pressure switch 2 (perpendicular to the cylinder on early models), remove the retaining ring securing the switch adjustment cover to the pressure switch. Refer to the illustrations at step 34.

39 Slide the switch adjustment cover away from the tee fitting, exposing the slotted switch adjustment screw inside.

40 Using a small slotted screwdriver, turn the adjustment screw just until the overload alarm sounds and the engine stops running.

Note: Turning the screw out of the hydraulic line will activate the alarm; turning the screw into the hydraulic line will deactivate the alarm.

Platform Overload Components

41 Slowly turn the adjustment screw of the platform overload pressure switch into the hydraulic line in 90° increments just until the overload alarm doesn't sound and the engine will start and run.

Note: To allow for the platform overload system delay, wait 3 seconds between each quarter turn of the adjustment screw.

Note: The red Emergency Stop button must be cycled after each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

42 Turn the screw of the platform overload pressure switch into the hydraulic line an additional one-quarter turn.

43 Deactivate the dual pressure switch limit switch, which was activated in step 36.

44 Raise the platform slightly and return the safety arm to the stowed position.

45 Lower the platform to the stowed position.

Set the maximum height limit switch

46 Using a suitable lifting device, place a test weight in the center of the platform floor. Secure the weight to the platform. Refer to the chart below.

GS-5390	680 lbs 308 kg

47 Raise the platform to approximately 19 ft / 6 m.

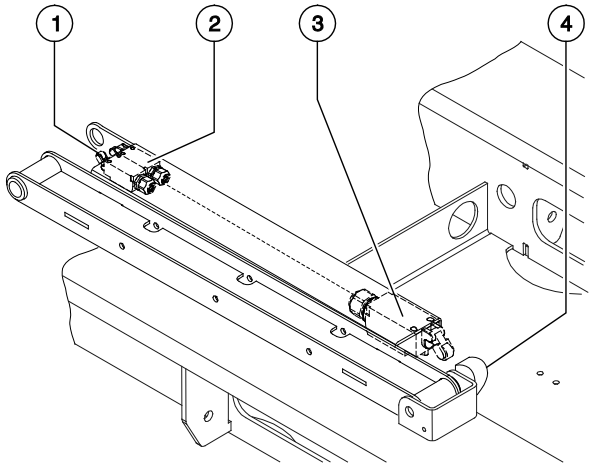
48 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

49 Remove the maximum height limit switch cam fasteners. Remove the cam from the machine so that the limit switch will not be activated.

50 Raise the platform until it is approximately 25.5 inches / 65 cm less than full height.

51 Raise the platform in 2 inch / 5 cm increments until the overload alarm sounds and the engine stops running. Proceed to step 52.

☒ Result: The alarm does not sound and the engine continues to run when the platform reaches full height. Repeat this procedure beginning with step 7.



Limit switch legend

1 load sense delay limit switch
2 down limit switch
3 maximum height limit switch
4 maximum height limit switch cam

Platform Overload Components

52 Install and adjust the maximum height limit switch cam until the limit switch activates just before the point reached in step 51. Securely tighten the cam fasteners. Do not over tighten.

53 Use the auxiliary down function to lower the platform approximately 6 inches / 15 cm.

54 Start the engine and fully raise the platform.

⊙ Result: The engine continues to run. Proceed to step 55.

⊠ Result: An alarm sounds and the engine stops running. Repeat this procedure beginning with step 49.

55 Lower the platform to approximately 6 m.

56 Return the safety arm to the stowed position.

Confirm the platform stowed pressure switch setting

57 Lower the platform to the stowed position.

58 Raise the platform to approximately 13 ft / 4 m in 1.6 ft / 0.5 m increments.

⊙ Result: The engine should continue to run. Proceed to step 59.

⊠ Result: The engine stops running. Using a small screwdriver, turn the screw of the platform overload pressure switch, perpendicular to the cylinder, into the hydraulic line in 90° increments until the alarm does not sound and the engine will start and run. Repeat this procedure beginning with step 47.

Note: To allow for the platform overload system delay, wait 3 seconds between each quarter turn of the adjustment screw.

Note: The red Emergency Stop button must be cycled after each quarter turn of the nut (or adjustment screw) to allow the platform overload system to reset.

All models:

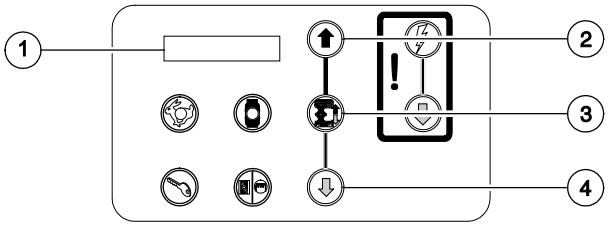
Disable the descent delay function

59 Push in the ground controls red Emergency Stop button to the off position.

60 Turn the key switch to ground controls.

61 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: tune speeds is showing in the diagnostic display window.



1 diagnostic display
2 blue platform up button
3 lift function enable button
4 yellow platform down button

62 Use the yellow platform down arrow to scroll to select options.

⊙ Result: select options is showing in the diagnostic display window. The ECM is now in programming mode.

63 Press the lift function enable button.

⊙ Result: descent delay on is showing in the diagnostic display window.

64 Press the lift function enable button to deactivate the descent delay option.

⊙ Result: descent delay off is showing in the diagnostic display window.

Platform Overload Components

65 Push in the ground controls red Emergency Stop button to the off position.

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

Note: For more information on programming, refer to Repair Procedure, *Software Configuration*.

Calibrate the load sense delay limit switch

67 Turn the key switch to platform controls. Start the engine.

68 Lower the platform until the load sense delay limit switch activates and the platform stops lowering. Release the joystick.

⊙ Result: The alarm does not sound and the engine continues to run. Proceed to step 76.

⊠ Result: The alarm sounds and the engine stops running. The load sense delay limit switch needs to be calibrated. Proceed to step 69.

69 Raise the platform to approximately 19 ft / 6 m.

70 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

71 Loosen the fasteners securing the load sense delay limit switch cam just enough to allow movement of the cam.

72 Working from the outside of the machine, rotate the load sense delay limit switch cam in a clockwise direction until the cam lobe is approximately 0.02 inches / 1 mm lower. Tighten the fasteners. Do not over tighten.

73 Return the safety arm to the stowed position.

74 Raise the platform approximately 3.3 ft / 1 m.

75 Repeat this procedure beginning with step 68.

Enable the descent delay function

76 Push in the ground controls red Emergency Stop button to the off position.

77 Turn the key switch to ground controls.

78 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: tune speeds is showing in the diagnostic display window.

79 Use the yellow platform down arrow to scroll to select options.

⊙ Result: select options is showing in the diagnostic display window. The ECM is now in programming mode.

80 Press the lift function enable button.

⊙ Result: descent delay off is showing in the diagnostic display window.

81 Press the lift function enable button to activate the descent delay option.

⊙ Result: descent delay on is showing in the diagnostic display window.

82 Push in the ground controls red Emergency Stop button to the off position.

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

Platform Overload Components

Calibrate the down limit switch

84 Turn the key switch to platform controls. Start the engine.

85 Raise the platform approximately 3.3 ft / 1 m.

86 Lower the platform until the down limit switch activates and the platform stops lowering. Quickly release the controls and then immediately attempt to lower the platform to the stowed position.

⊙ Result: The platform stops for 4 to 6 seconds. Release the joystick and proceed to step 94.

☒ Result: The platform stops and then will immediately begin to lower again. The down limit switch needs to be calibrated. Proceed to step 87.

87 Raise the platform to approximately 19 ft / 6 m.

88 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

89 Loosen the fasteners securing the down limit switch cam just enough to allow movement of the cam. Refer to the illustration at step 51.

90 Working from the outside of the machine, rotate the down limit switch cam in a clockwise direction until the cam lobe is approximately 0.02 inches / 1 mm lower. Tighten the fasteners. Do not over tighten.

Note: When adjusting the down limit switch cam, do not move cam which activates the load sense delay limit switch.

91 Raise the platform approximately 3.3 ft / 1 m.

92 Return the safety arm to the stowed position.

93 Repeat this procedure beginning with step 86.

94 Lower the platform to the stowed position. Remove the weight from the platform.

⊙ Result: The platform lowers to the stowed position. Proceed to step 99.

☒ Result: The platform stops lowering. The down limit switch needs to be calibrated. Proceed to step 95.

95 Raise the platform to approximately 19 ft / 6 m.

96 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

97 Loosen the fasteners securing the down limit switch cam just enough to allow movement of the cam.

98 Working from the outside of the machine, rotate the down limit switch cam in a counter clockwise direction until the cam lobe is approximately 1 mm higher. Tighten the fasteners. Do not over tighten.

Note: When adjusting the down limit switch cam, do not move cam which activates the load sense delay limit switch.

99 Raise the platform to approximately 19 ft / 6 m.

100 Release the safety arm latch, lift the safety arm and rotate to a vertical position. Lock the safety arm in position.

101 Install the cover onto the platform overload pressure switch or switch box and securely tighten the cover retaining fasteners. Do not over tighten.

102 Apply Sentry Seal to one of the cover retaining fasteners where it contacts the platform overload pressure switch box.

103 Return the safety arm to the stowed position.

104 Lower the platform to the stowed position.

105 Calibrate the system relief valve. Refer to Repair Procedure, *How to Adjust the System Relief Valve*.

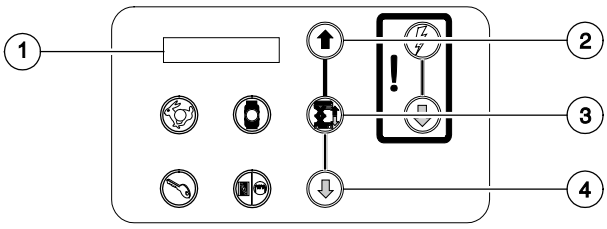
Platform Overload Components

12-2 Platform Overload Recovery Message (software version B3 and later)

If the ground controls LCD screen displays Ovrld Recovery, the emergency lowering system has been used while the platform was overloaded.

Note: This message shall be cleared by a person trained and qualified on the troubleshooting and repair of this machine.

Note: Use the following illustration to identify the description of each control button used in this procedure.



1 LCD screen
2 up button
3 function enable button
4 down button

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

2 Press and hold both the blue platform up and yellow platform down buttons. Pull out the red Emergency Stop button to the on position at the ground controls.

⊙ Result: Tune speeds is showing in the LCD screen.

3 Use the down button to scroll to select options.

4 Press the lift function enable button.

⊙ Result: Descent delay is showing in the LCD screen.

5 Use the down button to scroll to overload.

6 Press and hold the function enable button for 5 seconds.

⊙ Result: A screen will appear asking for the overload recovery passcode.

7 Press the buttons in the following sequence: **(down) (down) (up) (enable)**

⊙ Result: The LCD screen displays cleared and returns to the overload screen.

8 Use the down button to scroll to return to main menu.

9 Press the lift function enable button.

⊙ Result: Select options is showing in the LCD screen.

10 Push in the ground controls red Emergency Stop button to the off position.

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Fault Codes

Observe and Obey:

☑ Troubleshooting and repair procedures shall be completed by a person trained and qualified on the repair of this machine

☑ Immediately tag and remove from service a damaged or malfunctioning machine.

☑ Repair any machine damage or malfunction before operating the machine.

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

- Machine parked on a firm, level surface
- Key switch in the off position with the key removed
- The red Emergency Stop button in the off position at both the ground and platform controls
- Wheels chocked
- All external AC power supply disconnected from the machine
- Platform in the stowed position

Before Troubleshooting:

☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.

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

☑ Read each appropriate fault code thoroughly. Attempting short cuts may produce hazardous conditions.

☑ Be aware of the following hazards and follow generally accepted safe workshop practices.

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

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

⚠WARNING Bodily injury hazard. 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.

⊙ 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.

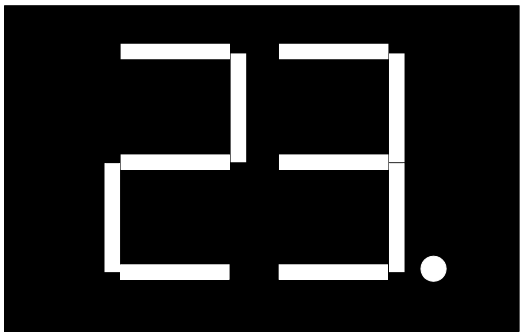
Note: Two persons will be required to safely perform some troubleshooting procedures.

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.

LED Diagnostic Readout



The diagnostic readout displays numerical codes that provide information about the machine operating status and about malfunctions. The dot to the right of the numbers remain on when a fault code is displayed.

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 Codes

ID	System Ready	LED	Condition	Result	Solution
1	INTERNAL ECU FAULT	Red	Internal ECM error.	System shutdown.	Replace ECM.
2	PLATFORM ECU FAULT	Red	Platform/ECM communication error.	System shutdown.	Troubleshoot control cable OR troubleshoot platform controls.
20	CHASSIS START SW FAULT	Red	Engine start button fault at ground controls.	Engine will not start.	Replace ECM.
21	CHASSIS CHOKE SW FAULT	Red	Starting aid button fault at ground controls.	Starting aid disabled.	Replace ECM.
22	CHASSIS UP SW FAULT	Red	Up switch fault at ground controls.	Platform up function inhibited.	Replace ECM.
23	CHASSIS LIFT SW FAULT	Red	Platform up/down enable button fault at ground controls.	Platform up/down functions inhibited.	Replace ECM.
24	DOWN SW FAULT	Red	Down switch fault at ground controls.	Platform down function inhibited.	Replace ECM.
25	LEFT TURN SW FAULT	Red	Left turn switch fault.	Malfunctioning steer left microswitch.	Troubleshoot steer left microswitch.
26	RIGHT TURN SW FAULT	Red	Right turn switch fault.	Malfunctioning steer right microswitch.	Troubleshoot steer right microswitch.
27	DRIVE ENABLE SW FLT	Red	Function enable switch on joystick is activated when machine is turned on.	Machine functions disabled.	Release function enable switch on joystick before power up OR replace joystick.
28	OFF NEUTRAL DRIVE JOYSTICK	Red	Drive joystick off neutral when machine is turned on.	Machine functions disabled.	Release joystick before power up OR replace joystick.
29	PLATFORM LIFT SW FAULT	Red	Lift enable button fault at the platform controls.	Platform up/down functions inhibited.	Troubleshoot button OR replace printed circuit board at platform controls.
30	OFF NEUTRAL LIFT JOYSTICK	Red	Up/down switch off neutral.	Platform up/down functions inhibited.	Replace up/down switch at platform controls.
31	PLATFORM CHOKE SW FAULT	Red	Starting aid fault at the platform controls.	Starting aid disabled.	Troubleshoot button OR replace printed circuit board at platform controls.

Fault Codes

ID	System Ready	LED	Condition	Result	Solution
32	PLATFORM START SW FAULT	Red	Engine start button fault at platform controls.	Engine will not start.	Troubleshoot button OR replace printed circuit board at platform controls.
33	LEFT FRONT OUTRIG SW FLT	Red	Left front outrigger enable button fault at platform controls.	Outriggers disabled.	Troubleshoot button OR replace printed circuit board at platform controls.
34	RIGHT FRONT OUTRIG SW FLT	Red	Right front outrigger enable button fault at platform controls.	Outriggers disabled.	Troubleshoot button OR replace printed circuit board at platform controls.
35	LEFT REAR OUTRIG SW FLT	Red	Left rear outrigger enable button fault at platform controls.	Outriggers disabled.	Troubleshoot button OR replace printed circuit board at platform controls.
36	RIGHT REAR OUTRIG SW FLT	Red	Right rear outrigger enable button fault at platform controls.	Outriggers disabled.	Troubleshoot button OR replace printed circuit board at platform controls.
37	AUTO LEVEL SWITCH FAULT	Red	Outrigger auto level enable button fault at platform controls.	Outriggers disabled.	Troubleshoot button OR replace printed circuit board at platform controls.
3812	OSCILLATE LIMIT SWITCHES	Red	Value to high. Voltage above 3000 mV.	Elevated drive and platform up disabled.	Troubleshoot oscillate limit switches.
3815	OSCILLATE LIMIT SWITCHES	Red	Value to low. Voltage below 1000 mV.	Elevated drive and platform up disabled.	Troubleshoot oscillate limit switches.
3819	OSCILLATE LIMIT SWITCHES	Red	Voltage out of range.	Elevated drive and platform up disabled.	Troubleshoot oscillate limit switches.
3821	OSCILLATE LIMIT SWITCHES	Red	Voltage inconsistent.	Elevated drive and platform up disabled.	Troubleshoot oscillate limit switches.
4021	OSCILLATE OUTPUT	Red	Both oscillate valve outputs are on at the same time while elevated. Flashing or Motion Beacon option is set to **on** and it is not installed on the machine.	Elevated drive and platform up disabled.	Troubleshoot oscillate limit switches or replace ECU. Set the option to **off** if not installed on the machine.
4022	OSCILLATE OUTPUT	Red	Oscillate valve output is active for more than 4 seconds.	Elevated drive and platform up disabled.	Troubleshoot oscillate limit switches or replace ECU.
49	DRIVE COIL 1 FAULT	Red	Drive coil 1 (Y1) fault.	High speed drive function will not operate.	Troubleshoot coil OR wiring.

Fault Codes

ID	System Ready	LED	Condition	Result	Solution
50	DRIVE COIL 2 FAULT	Red	Drive coil 2 (Y1A) fault.	High speed drive function will not operate.	Troubleshoot coil OR wiring.
51	DRIVE COIL 3 FAULT	Red	Drive coil 3 (Y1B) fault.	High speed drive function will not operate.	Troubleshoot coil OR wiring.
52	FUNC PROP COIL FAULT	Red	Proportional coil (Y9) fault.	Lift and outrigger functions are disabled.	Troubleshoot coil OR wiring.
54	UP COIL FAULT	Red	Up coil (Y8) fault.	Platform up function inhibited.	Troubleshoot coil OR wiring.
55	DOWN COIL FAULT	Red	Down coil (Y7) fault.	Platform down function inhibited.	Troubleshoot coil OR wiring.
56	RIGHT TURN COIL FAULT	Red	Right turn coil (Y3) fault.	Steer right function inhibited.	Troubleshoot coil OR wiring.
57	LEFT TURN COIL FAULT	Red	Left turn coil (Y4) fault.	Steer left function inhibited.	Troubleshoot coil OR wiring.
58	BRAKE COIL FAULT	Red	Brake release coil (Y2) fault.	Brakes will not release.	Troubleshoot coil OR wiring.
60	FORWARD 1 COIL FAULT	Red	Forward 1 coil (Y6) fault.	Drives slow or not at all when elevated.	Troubleshoot coil OR wiring.
61	REVERSE 1 COIL FAULT	Red	Reverse 1 coil (Y5) fault.	Drives slow or not at all when elevated.	Troubleshoot coil OR wiring.
62	FORWARD 2 COIL FAULT	Red	Forward 2 coil (Y6A) fault.	Drives slow or not at all when elevated.	Troubleshoot coil OR wiring.
63	REVERSE 2 COIL FAULT	Red	Reverse 2 coil (Y5A) fault.	Drives slow or not at all when elevated.	Troubleshoot coil OR wiring.
64	OSCILLATE LEFT COIL	Red	Value to low or Value to high.	Elevated drive and platform up disabled.	Troubleshoot oscillate left valve coil (Y93) or wiring.
65	OSCILLATE RIGHT COIL	Red	Value to low or Value to high.	Elevated drive and platform up disabled.	Troubleshoot oscillate right valve coil (Y94) or wiring.
66	LOW OIL PRESSURE	Red	Low oil pressure.	Engine stops.	Check the engine oil level OR check wiring from the oil pressure switch to ECM OR replace the oil pressure switch.

Fault Codes

ID	System Ready	LED	Condition	Result	Solution
67	HIGH COOLANT TEMPERATURE	Red	High coolant temperature.	High engine temperature OR defective engine coolant or oil temperature switch.	Gasoline/LPG models: Check the engine radiator coolant level OR check the wiring from the water temperature switch to ECM OR replace the water temperature switch. Diesel models: Check the engine oil level OR check the wiring from the oil temperature switch to ECM OR replace the oil temperature switch.
68	LOW ECU VOLTAGE	Red	Low ECM voltage.	System shutdown.	Charge battery.
69	LOW ENGINE RPM	Red	Low RPM.	Engine idle RPM too low.	Contact Genie Product Support.
70	HIGH ENGINE RPM	Red	High RPM.	Engine RPM too high.	Contact Genie Product Support.
80	LEFT FRONT OTRG COIL FLT	Red	Left front outrigger coil (Y35) fault.	Left front outrigger function inhibited.	Troubleshoot coil OR wiring.
81	LEFT REAR OTRG COIL FLT	Red	Left rear outrigger coil (Y33) fault.	Left front outrigger function inhibited.	Troubleshoot coil OR wiring.
82	RIGHT FRONT OTRG COIL FLT	Red	Right front outrigger coil (Y36) fault.	Right front outrigger function inhibited.	Troubleshoot coil OR wiring.
83	RIGHT REAR OTRG COIL FLT	Red	Right rear outrigger coil (Y34) fault.	Right rear outrigger function inhibited.	Troubleshoot coil OR wiring.
84	OUTRIGGER EXT COIL FLT	Red	Outrigger extend coil (Y40) fault.	Outrigger extend function disabled.	Troubleshoot coil OR wiring.
85	OUTRIGGER RET COIL FLT	Red	Outrigger retract coil (Y39) fault.	Outrigger retract function disabled.	Troubleshoot coil OR wiring.
86	OUTRIGGER SLOW COIL FLT	Red	Outrigger slowdown coil (Y44) fault.	Outrigger slow extend function disabled.	Troubleshoot coil OR wiring.
90	2 SPEED COIL FAULT	Red	2 speed coil (Y1) fault	High torque drive function disabled.	Troubleshoot coil OR wiring.
92	DRIVE FWD PROP COIL FAULT	Red	Drive pump forward proportional coil (Y51) fault	Drive forward function disabled.	Troubleshoot coil OR wiring.
93	DRIVE REV PROP COIL FAULT	Red	Drive pump reverse proportional coil (Y51) fault	Drive reverse function disabled.	Troubleshoot coil OR wiring.
94	MACHINE TYPE FAULT	Red	Wrong machine type selected	Machine functions disabled.	Correct selection.
102	DOWN LS CROSS-CHECK FLT	Red	Down limit switch fault	All functions inhibited except platform down.	Troubleshoot down limit switches and wiring.

Fault Code Display - Deutz Models

How to Retrieve Active Engine Fault Codes - Deutz D 2.9 L4 Models

The ECM constantly monitors the engine by the use of sensors on the engine. The ECM also uses signals from the sensors to initiate sequential fuel injection and make constant and instantaneous changes to ignition timing, fuel delivery and throttle position to maintain the engine's running condition at its highest efficiency while at the same time keeping exhaust emissions to a minimum. When a sensor fails or returns signals that are outside of set parameters, the ECM will store a fault code in memory that relates to the appropriate sensor. One or more fault LED's will illuminate on the display located at the ground control box. The active fault code will also be displayed on the LCD screen.

If an engine fault occurs that does not result in an engine shutdown, the engine rpm will go into limp home mode resulting in the loss of high rpm.

When operating from the platform, if the red Emergency Stop button is pushed in, the active fault code(s) will be erased from the display.

Start the engine from the ground control box and operate various boom functions to verify that an active engine fault occurs and is shown on the display.

Note: All faults are stored in the Previous Fault history menu. These faults will not be erased when corrective action has been completed.

With an active fault and the engine running: (preferred method)

1 At the ground controls, activate the auxiliary pump toggle switch to shut the engine off.

Note: Do not push in the red Emergency Stop button or turn the key switch to the off position.

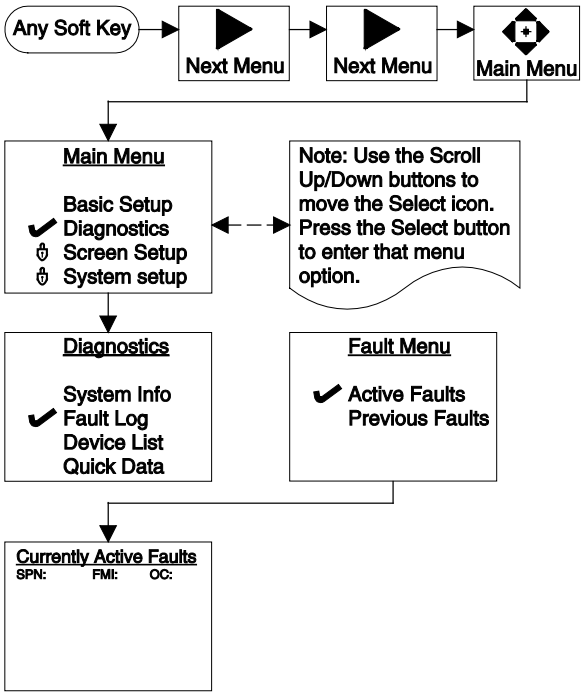
2 Press any soft key below the display.

3 Use the scroll up / down keys to check for multiple engine fault codes.

With the engine not running:

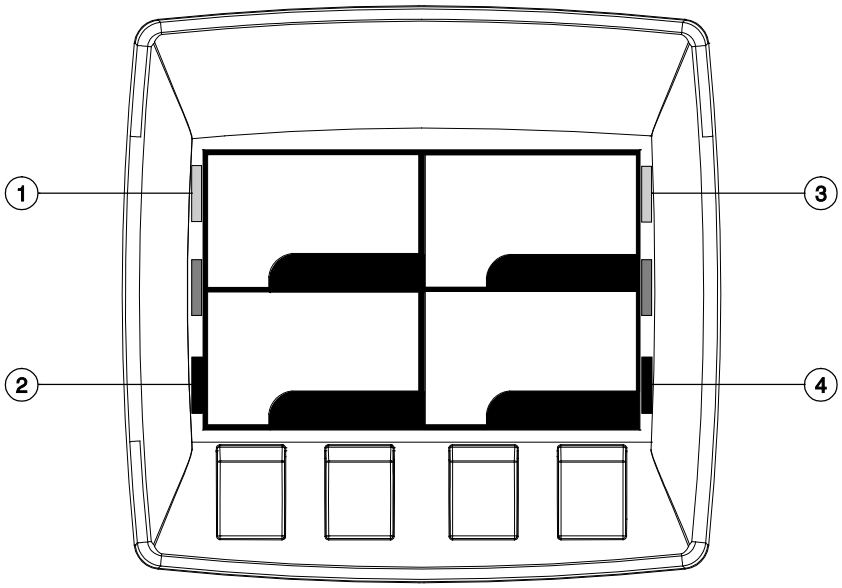
1 At the ground controls, turn the key switch to ground controls and pull out the red Emergency Stop button.

2 Navigate to the Active Fault Menu and use the scroll up / down keys to check for multiple engine fault codes.



Fault Code Display - Deutz Models

Flashing and Solid LED's - Deutz D 2.9 L4 Models



1 Left green LED:
Flashing, engine fault detected. Contact service.
Solid, fault acknowledged. Contact service.

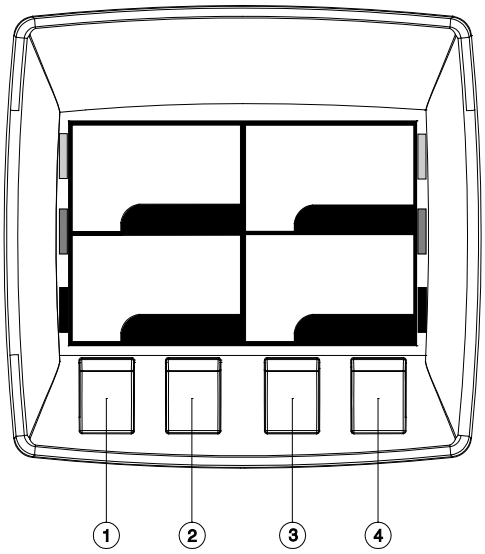
2 Left red LED:
Flashing, engine fault detected. Contact service.
Flashing with right flashing amber LED, engine soot level over 140%. Engine shut down. Contact service.

3 Right green LED:
Flashing, engine fault detected. Contact service.
Solid, fault acknowledged. Contact service.

4 Right red LED:
Flashing, engine fault detected. Contact service.
Flashing with right flashing amber LED, engine soot level over 140%. Engine shut down. Contact service.

Fault Code Display - Deutz Models

Soft Key Functions and Icons - Deutz D 2.9 L4 Models



1 Next menu • Exit / Back one screen • Decrease brightness (-)

2 Brightness / Contrast • Scroll up • Increase • Increase brightness (+)

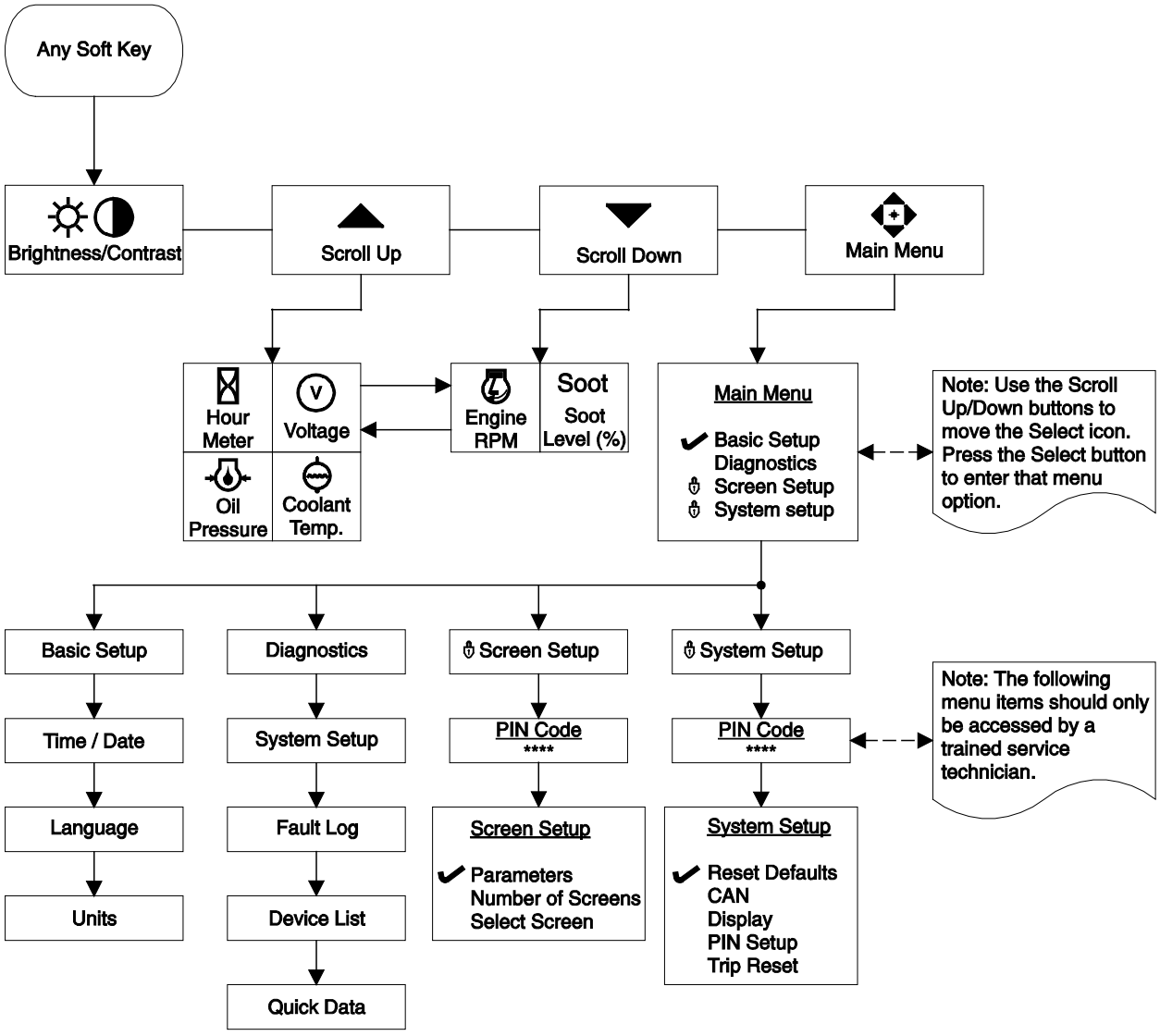
3 Scroll down • Decrease • Decrease contrast (-)

4 Select / Next • Main menu • Increase contrast (+)

Next Menu	Brightness/ Contrast		
Exit / Back One Screen	Scroll Up	Scroll Down	Select
Main Menu	Hour Meter	Oil Pressure	Coolant Temp.
Engine RPM	Soot Soot Level Percent (%)	V Voltage	Pin # Protected

Fault Code Display - Deutz Models

Main Menu Structure - Deutz D 2.9 L4 Models



Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
51	3	1019	EGR-Valve, short circuit to battery
51	3	1024	Position sensor error of actuator EGR-Valve; signal range check high
51	3	1226	EGR-Valve; short circuit to battery (A02)
51	3	1227	EGR-Valve; short circuit to battery (A67)
51	4	1020	EGR-Valve; short circuit to ground
51	4	1025	Position sensor error actuator EGR-Valve; signal range check low
51	4	1228	EGR-Valve; short circuit to ground (A02)
51	4	1229	EGR-Valve; short circuit to ground (A67)
1	4	1232	Actuator error EGR-Valve; Voltage below threshold
51	5	1015	Actuator error EGR-Valve; signal range check low
51	5	1017	Actuator EGR-Valve; open load
51	5	1023	Actuator error EGR-Valve; signal range check low
51	5	1223	Actuator EGR-Valve; open load
51	6	1014	Actuator error EGR-Valve; signal range check high
51	6	1022	Actuator error EGR-Valve; signal range check high
51	6	1224	Actuator EGR-Valve; over current
51	6	1230	Actuator error EGR-Valve; Overload by short-circuit
51	7	1016	Actuator position for EGR-Valve not plausible
51	11	1231	Actuator error EGR-Valve; Power stage over temp due to high current
51	12	1018	Actuator EGR-Valve; powerstage over temperature
51	12	1021	Mechanical actuator defect EGR-Valve
51	12	1225	Actuator EGR-Valve; over temperature
94	1	474	Low fuel pressure; warning threshold exceeded
94	1	475	Low fuel pressure; shut off threshold exceeded
94	3	472	Sensor error low fuel pressure; signal range check high
94	4	473	Sensor error low fuel pressure; signal range check low
97	3	464	Sensor error water in fuel; signal range check high
97	4	465	Sensor error water in fuel; signal range check low
97	12	1157	Water in fuel level prefilter; maximum value exceeded
100	0	734	High oil pressure; warning threshold exceeded
100	0	735	High oil pressure; shut off threshold exceeded
100	1	736	Low oil pressure; warning threshold exceeded
100	1	737	Low oil pressure; shut off threshold exceeded
100	3	732	Sensor error oil pressure; signal range check high
100	4	733	Sensor error oil pressure sensor; signal range check low
102	2	88	Charged air pressure above warning threshold
102	2	89	Charged air pressure above shut off threshold
102	4	777	Sensor error charged air press.; signal range check low

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
105	0	996	High charged air cooler temperature; warning threshold exceeded
105	0	997	High charged air cooler temperature; shut off threshold exceeded
105	3	994	Sensor error charged air temperature; signal range check high
105	4	995	Sensor error charged air temperature; signal range check low
108	3	412	Sensor error ambient air press.; signal range check high
108	4	413	Sensor error ambient air press.; signal range check low
110	0	98	High coolant temperature; warning threshold exceeded
110	0	99	High coolant temperature; shut off threshold exceeded
110	3	96	Sensor error coolant temp.; signal range check high
110	4	97	Sensor error coolant temp.; signal range check low
111	1	101	Coolant level too low
132	11	1	Air flow sensor load correction factor exceeding the maximum drift limit; plausibility error
132	11	2	Air flow sensor load correction factor exceeding drift limit; plausibility error
132	11	3	Air flow sensor low idle correction factor exceeding the maximum drift limit
132	11	4	Air flow sensor load correction factor exceeding the maximum drift limit
157	3	877	Sensor error rail pressure; signal range check high
157	4	878	Sensor error rail pressure; signal range check low
168	0	1180	Physical range check high for battery voltage
168	1	1181	Physical range check low for battery voltage
168	2	47	High battery voltage; warning threshold exceeded
168	2	48	Low battery voltage; warning threshold exceeded
168	3	45	Sensor error battery voltage; signal range check high
168	4	46	Sensor error battery voltage; signal range check low
171	3	417	Sensor error environment temperature; signal range check high
171	4	418	Sensor error environment temperature; signal range check low
172	0	1182	Physical range check high for intake air temperature
172	1	1183	Physical range check low for intake air temperature
172	2	9	Sensor ambient air temperature; plausibility error
172	2	983	Intake air sensor; plausibility error
172	3	981	Sensor error intake air; signal range check high
172	4	982	Sensor error intake air sensor; signal range check low
174	0	481	High low fuel temperature; warning threshold exceeded
174	0	482	High Low fuel temperature; shut off threshold exceeded
175	0	740	Physical range check high for oil temperature
175	0	745	High oil temperature; warning threshold exceeded
175	0	746	High oil temperature; shut off threshold exceeded
175	1	741	Physical range check low for oil temperature

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
175	2	738	Sensor oil temperature; plausibility error
175	2	739	Sensor oil temperature; plausibility error oil temperature too high
175	3	743	Sensor error oil temperature; signal range check high
175	4	744	Sensor error oil temperature; signal range check low
190	0	389	Engine speed above warning threshold (FOC-Level 1)
190	2	421	Offset angle between crank- and camshaft sensor is too large
190	8	419	Sensor camshaft speed; disturbed signal
190	8	422	Sensor crankshaft speed; disturbed signal
190	11	390	Engine speed above warning threshold (FOC-Level 2)
190	12	420	Sensor camshaft speed; no signal
190	12	423	Sensor crankshaft speed; no signal
190	14	391	Engine speed above warning threshold (Overrun Mode)
190	14	1222	Camshaft- and Crankshaft speed sensor signal not available on CAN
411	0	791	Physical range check high for differential pressure Venturiunit (EGR)
411	1	792	Physical range check low for differential pressure Venturiunit (EGR)
411	3	795	Sensor error differential pressure Venturiunit (EGR); signal range check high
411	4	381	Physical range check low for EGR differential pressure
411	4	796	Sensor error differential pressure Venturiunit (EGR); signal range check low
412	3	1007	Sensor error EGR cooler downstream temperature; signal range check high
412	4	1008	Sensor error EGR cooler downstream temperature; signal range check low
520	9	306	Timeout Error of CAN-Receive-Frame TSC1TR; Setpoint
597	2	49	Break lever mainswitch and break lever redundancy switch status not plausible
624	3	971	SVS lamp; short circuit to batt.
624	4	972	SVS lamp; short circuit to grd.
624	5	969	SVS lamp; open load
624	12	970	SVS lamp; powerstage over temperature
630	12	376	Access error EEPROM memory (delete)
630	12	377	Access error EEPROM memory (read)
630	12	378	Access error EEPROM memory (write)
639	14	84	CAN-Bus 0 "BusOff-Status"
651	3	580	Injector 1 (in firing order); short circuit
651	4	586	High side to low side short circuit in the injector 1 (in firing order)
651	5	568	Injector 1 (in firing order); interruption of electric connection
652	3	581	Injector 2 (in firing order); short circuit
652	4	587	High side to low side short circuit in the injector 2 (in firing order)
652	5	569	Injector 2 (in firing order); interruption of electric connection
653	3	582	Injector 3 (in firing order); short circuit
653	4	588	High side to low side short circuit in the injector 3 (in firing order)
653	5	570	Injector 3 (in firing order); interruption of electric connection

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
654	3	583	Injector 4 (in firing order); short circuit
654	4	589	High side to low side short circuit in the injector 4 (in firing order)
654	5	571	Injector 4 (in firing order); interruption of electric connection
676	11	543	Cold start aid relay error.
676	11	544	Cold start aid relay open load
677	3	956	Starter relay high side; short circuit to battery
677	3	960	Starter relay low side; short circuit to battery
677	4	957	Starter relay high side; short circuit to ground
677	4	961	Starter relay low side; short circuit to ground
677	5	958	Starter relay; no load error
677	12	959	Starter relay; powerstage over temperature
703	3	426	Engine running lamp; short circuit to battery
703	4	427	Engine running lamp; short circuit to ground
703	5	424	Engine running lamp; open load
703	12	425	Engine running lamp; powerstage over temperature
729	5	545	Cold start aid relay open load
729	12	547	Cold start aid relay; over temperature error
898	9	305	Timeout Error of CAN-Receive-Frame TSC1TE; Setpoint
1079	13	946	Sensor supply voltage monitor 1 error (ECU)
1080	13	947	Sensor supply voltage monitor 2 error (ECU)
1109	2	121	Engine shut off demand ignored
1136	0	1398	Physikal range check high for ECU temperature
1136	1	1399	Physikal range check low for ECU temperature
1136	3	1400	Sensor error ECU temperature; signal range check high
1136	4	1401	Sensor error ECU temperature; signal range check low
1176	3	849	Sensor error pressure sensor upstream turbine; signal range check high
1176	4	850	Sensor error pressure sensor downstream turbine; signal range check high
1180	0	1193	Physical range check high for exhaust gas temperature upstream turbine
1180	0	1460	Turbocharger Wastegate CAN feedback; warning threshold exceeded
1180	0	1462	Exhaust gas temperature upstream turbine; warning threshold exceeded
1180	1	1194	Physical range check low for exhaust gas temperature upstream turbine
1180	1	1461	Turbocharger Wastegate CAN feedback; shut off threshold exceeded
1180	1	1463	Exhaust gas temperature upstream turbine; shut off threshold exceeded
1180	3	1067	Sensor error exhaust gas temperature upstream turbine; signal range check high
1180	11	1066	Sensor exhaust gas temperature upstream turbine; plausibility error
1188	2	1414	Wastegate; status message from ECU missing

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
1188	7	1415	Wastegate actuator; blocked
1188	11	1411	Wastegate actuator; internal error
1188	11	1412	Wastegate actuator; EOL calibration not performed correctly
1188	11	1416	Wastegate actuator; over temperature (> 145øC)
1188	11	1417	Wastegate actuator; over temperature (> 135øC)
1188	11	1418	Wastegate actuator; operating voltage error
1188	13	1413	Wastegate actuator calibration deviation too large, recalibration required
1231	14	85	CAN-Bus 1 "BusOff-Status"
1235	14	86	CAN-Bus 2 "BusOff-Status"
1237	2	747	Override switch; plausibility error
1322	12	610	Too many recognized misfires in more than one cylinder
1323	12	604	Too many recognized misfires in cylinder 1 (in firing order)
1324	12	605	Too many recognized misfires in cylinder 2 (in firing order)
1325	12	606	Too many recognized misfires in cylinder 3 (in firing order)
1326	12	607	Too many recognized misfires in cylinder 4 (in firing order)
2659	0	1524	Physical range check high for EGR exhaust gas mass flow
2659	1	1525	Physical range check low for EGR exhaust gas mass flow
2659	2	1523	Exhaust gas recirculation AGS sensor; plausibility error
2659	2	1527	AGS sensor temperature exhaust gas mass flow; plausibility error
2659	12	1526	Exhaust gas recirculation; AGS sensor has "burn off" not performed
2797	4	1337	Injector diagnostics; timeout error of short circuit to ground measurement cyl. Bank 0
2798	4	1338	Injector diagnostics; timeout error of short circuit to ground measurement cyl. Bank 1
2798	4	1339	Injector diagnostics; short circuit to ground monitoring Test in Cyl. Bank 0
2798	4	1340	Injector diagnostics; short circuit to ground monitoring Test in Cyl. Bank 1
3224	2	127	DLC Error of CAN-Receive-Frame AT1IG1 NOX Sensor (SCR-system upstream cat; DPF-system downstream cat); length of frame incorrect
3224	9	128	Timeout Error of CAN-Receive-Frame AT1IG1; NOX sensor upstream
3248	4	1047	Sensor error particle filter downstream temperature; signal range check low
3699	2	1616	DPF differential pressure sensor and a further sensor or actuator CRT system defective
3699	2	1617	Temperature sensor us. and ds. DOC simultaneously defect
3699	14	1615	Maximum stand-still-duration reached; oil exchange required
4765	0	1039	Physical range check high for exhaust gas temperature upstream (DOC)
4765	1	1042	Physical range check low for exhaust gas temperature upstream (DOC)

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
4766	0	1029	Physical range check high for exhaust gas temperature downstream (DOC)
4766	1	1032	Physical range check low for exhaust gas temperature downstream (DOC)
4768	2	1036	Sensor exhaust gas temperature upstream (DOC); plausibility error
4768	3	1044	Sensor error exhaust gas temperature upstream (DOC); signal range check high
4768	4	1045	Sensor error exhaust gas temperature upstream (DOC) signal range check low
4769	2	1026	Sensor exhaust gas temperature downstream (DOC); plausibility error
4769	3	1034	Sensor error exhaust gas temperature downstream (DOC); signal range check high
4769	4	1035	Sensor error exhaust gas temperature downstream (DOC); signal range check low
523006	3	34	Controller mode switch; short circuit to battery
523006	4	35	Controller mode switch; short circuit to ground
523008	1	648	Manipulation control was triggered
523008	2	649	Timeout error in Manipulation control
523009	9	825	Pressure Relief Valve (PRV) reached maximun allowed opening count
523009	10	833	Pressure relief valve (PRV) reached maximun allowed open time
523212	9	171	Timeout Error of CAN-Receive-Frame ComEngPrt; Engine Protection
523216	9	198	Timeout Error of CAN-Receive-Frame PrHtEnCmd; pre-heat command, engine command
523240	9	179	Timeout CAN-message FunModCtl; Function Mode Control
523350	4	565	Injector cylinder-bank 1; short circuit
523352	4	566	Injector cylinder-bank 2; short circuit
523354	12	567	Injector powerstage output defect
523470	2	826	Pressure Relief Valve (PRV) forced to open; performed by pressure increase
523470	2	827	Pressure Relief Valve (PRV) forced to open; performed by pressure shock
523470	7	876	Maximum rail pressure in limp home mode exceeded (PRV)
523470	11	831	The PRV can not be opened at this operating point with a pressure shock
523470	11	832	Rail pressure out of tolerance range
523470	12	828	Open Pressure Relief Valve (PRV); shut off condition
523470	12	829	Open Pressure Relief Valve (PRV); warning condition
523470	14	830	Pressure Relief Valve (PRV) is open
523550	12	980	T50 start switch active for too long
523601	13	948	Sensor supply voltage monitor 3 error (ECU)
523603	9	126	Timeout Error of CAN-Receive-Frame AMB; Ambient Temperature Sensor

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
523605	9	300	Timeout Error of CAN-Receive-Frame TSC1AE; Traction Control
523606	9	301	Timeout Error of CAN-Receive-Frame TSC1AR; Retarder
523612	12	387	Internal software error ECU; injection cut off
523612	12	612	Internal ECU monitoring detection reported error
523612	12	613	Internal ECU monitoring detection reported error
523612	12	614	Internal ECU monitoring detection reported error
523612	12	615	Internal ECU monitoring detection reported error
523612	12	616	Internal ECU monitoring detection reported error
523612	12	617	Internal ECU monitoring detection reported error
523612	12	618	Internal ECU monitoring detection reported error
523612	12	619	Internal ECU monitoring detection reported error
523612	12	620	Internal ECU monitoring detection reported error
523612	12	621	Internal ECU monitoring detection reported error
523612	12	623	Internal ECU monitoring detection reported error
523612	12	624	Internal ECU monitoring detection reported error
523612	12	625	Internal ECU monitoring detection reported error
523612	12	627	Internal ECU monitoring detection reported error
523612	12	628	Internal ECU monitoring detection reported error
523612	12	637	Internal ECU monitoring detection reported error
523612	12	1170	Internal software error ECU
523612	14	973	Softwarereset CPU SWReset_0
523612	14	974	Softwarereset CPU SWReset_1
523612	14	975	Softwarereset CPU SWReset_2
523613	0	856	Maximum positive deviation of rail pressure exceeded (RailMeUn0)
523613	0	857	Maximum positive deviation of rail pressure in metering unit exceeded (RailMeUn1)
523613	0	858	Railsystem leakage detected (RailMeUn10)
523613	0	859	Maximum negative deviation of rail pressure in metering unit exceeded (RailMeUn2)
523613	0	860	Negative deviation of rail pressure second stage (RailMeUn22)
523613	0	862	Maximum rail pressure exceeded (RailMeUn4)
523613	1	861	Minimum rail pressure exceeded (RailMeUn3)
523613	2	864	Setpoint of metering unit in overrun mode not plausible
523615	3	594	Metering unit (Fuel-System); short circuit to battery highside
523615	3	596	Metering unit (Fuel-System); short circuit to battery low side
523615	4	595	Metering unit (Fuel-System); short circuit to ground high side
523615	4	597	Metering Unit (Fuel-System); short circuit to ground low side
523615	5	592	Metering unit (Fuel-System); open load
523615	12	593	Metering unit (Fuel-System); powerstage over temperature
523619	2	488	Physical range check high for exhaust gas temperature upstrem (SCR-CAT)
523698	11	122	Shut off request from supervisory monitoring function

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
523717	12	125	Timeout Error of CAN-Transmit-Frame AmbCon; Weather environments
523718	3	1488	SCR mainrelay; short circuit to battery (only CV56B)
523718	4	1489	SCR mainrelay; short circuit to ground (only CV56B)
523718	5	1486	SCR mainrelay; open load (only CV56B)
523718	12	1487	SCR mainrelay; powerstage over temperature (only CV56B)
523766	9	281	Timeout Error of CAN-Receive-Frame Active TSC1AE
523767	9	282	Timeout Error of CAN-Receive-Frame Passive TSC1AE
523768	9	283	Timeout Error of CAN-Receive-Frame Active TSC1AR
523769	9	284	Timeout Error of CAN-Receive-Frame Passive TSC1AR
523770	9	285	Timeout Error of CAN-Receive-Frame Passive TSC1DE
523776	9	291	Timeout Error of CAN-Receive-Frame TSC1TE - active
523777	9	292	Passive Timeout Error of CAN-Receive-Frame TSC1TE; Setpoint
523778	9	293	Active Timeout Errorof CAN-Receive-Frame TSC1TR
523779	9	294	Passive Timeout Error of CAN-Receive-Frame TSC1TR

SPN	FMI	SPN	Description
523788	12	299	Timeout Error of CAN-Transmit-Frame TrbCH; Status Wastegate
523793	9	202	Timeout Error of CAN-Receive-Frame UAA10; AGS sensor service message
523794	9	203	Timeout Error of CAN-Receive-Frame UAA11; AGS sensor data
523895	13	559	Check of missing injector adjustment value programming (IMA) injector 1 (in firing order)
523896	13	560	check of missing injector adjustment value programming (IMA) injector 2 (in firing order)
523897	13	561	check of missing injector adjustment value programming (IMA) injector 3 (in firing order)
523898	13	562	check of missing injector adjustment value programming (IMA) injector 4 (in firing order)
523910	6	1261	Air Pump; over current
523913	3	74	Sensor error glow plug control diagnostic line voltage; signal range check high
523913	4	75	Sensor error glow plug control diagnostic line voltage; signal range check low
523914	3	78	Glow plug control; short circuit to battery
523914	4	79	Glow plug control; short circuit to ground
523914	5	76	Glow plug control; open load
523914	5	1216	Glow plug control release line; short circuit error
523914	11	1217	Glow plug control; internal error
523914	12	77	Glow plug control; powerstage over temperature
523919	2	1378	Sensor air pump airpressure; plausibility error
523920	2	1379	Sensor exhaust gas back pressure burner; plausibility error

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
523922	7	1262	Burner Shut Off Valve; blocked closed
523922	7	1264	Burner Shut Off Valve; blocked closed
523929	0	109	Fuel Balance Control integrator injector 1 (in firing order); maximum value exceeded
523929	1	115	Fuel Balance Control integrator injector 1 (in firing order); minimum value exceeded
523930	0	110	Fuel Balance Control integrator injector 2 (in firing order); maximum value exceeded
523930	1	116	Fuel Balance Control integrator injector 2 (in firing order); minimum value exceeded
523931	0	111	Fuel Balance Control integrator injector 3 (in firing order); maximum value exceeded
523931	1	117	Fuel Balance Control integrator injector 3 (in firing order); minimum value exceeded
523932	0	112	Fuel Balance Control integrator injector 4 (in firing order); maximum value exceeded
523932	1	118	Fuel Balance Control integrator injector 4 (in firing order); minimum value exceeded
523935	12	168	Timeout Error of CAN-Transmit-Frame EEC3VOL1; Engine send messages
523936	12	169	Timeout Error of CAN-Transmit-Frame EEC3VOL2; Engine send messages
523946	0	1158	Zero fuel calibration injector 1 (in firing order); maximum value exceeded
523946	1	1164	Zero fuel calibration injector 1 (in firing order); minimum value exceeded
523947	0	1159	Zerofuel calibration injector 2 (in firing order); maximum value exceeded
523947	1	1165	Zerofuel calibration injector 2 (in firing order); minimum value exceeded
523948	0	1160	Zerofuel calibration injector 3 (in firing order); maximum value exceeded
523948	1	1166	Zerofuel calibration injector 3 (in firing order); minimum value exceeded
523949	0	1161	Zerofuel calibration injector 4 (in firing order); maximum value exceeded
523949	1	1167	Zerofuel calibration injector 4 (in firing order); minimum value exceeded
523960	0	1011	Physical range check high for EGR cooler downstream temp.
523960	0	1458	High exhaust gas temperature EGR cooler downstream; warning threshold exceeded
523960	1	1012	Physical range check low for EGR cooler downstream temp.
523960	1	1459	High exhaust gas temperature EGR cooler downstream; shut off threshold exceeded
523980	14	1187	Bad quality of reduction agent detected
523981	11	918	Urea-tank without heating function (heating phase)
523982	0	360	Powerstage diagnosis disabled; high battery voltage
523982	1	361	Powerstage diagnosis disabled; low battery voltage

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
523988	3	1245	Charging lamp; short circuit to battery
523988	4	1246	Charging lamp; short circuit to ground
523988	5	1243	Charging lamp; open load
523988	12	1244	Charging lamp; over temp.
523998	4	1327	Injector cylinder bank 2 slave; short circuit
523999	12	1328	Injector powerstage output Slave defect
524014	1	1254	Air pressure glow plug flush line; below limit
524016	2	1259	Amount of air is not plausible to pump speed
524016	2	1260	Calculated amount of air is not plausible to HFM reading
524016	11	1258	HFM sensor; electrical fault
524021	11	1263	Burner fuel line pipe leak behind Shut Off Valve
524024	11	1302	Deviation of the exhaust gas temp. setpoint to actual value downstream (DOC) too high
524028	2	1431	CAN message PROEGRActr; plausibility error
524029	2	1432	Timeout Error of CAN-Receive-Frame ComEGRActr - exhaust gas recirculation positioner
524030	7	1440	EGR actuator; internal error
524031	13	1441	EGR actuator; calibration error
524032	2	1442	EGR actuator; status message EGRCust is missing
524033	7	1443	EGR actuator; due to overload in Save Mode
524034	3	1438	Disc separator; short circuit to battery
524034	4	1439	Disc separator; short circuit to ground
524034	5	1436	Disc Separator; open load
524034	12	1437	Disc Separator; powerstage over temperature
524035	12	1341	Injector diagnostics; time out error in the SPI communication
524057	2	1505	Electric fuel pump; fuel pressure build up error
524097	9	1663	Timeout error of CAN-Transmit-Frame DPFBrnAirPmpCtl
524098	9	1664	Timeout error of CAN-Transmit-Frame ComDPFBrnPT
524099	9	1665	Timeout error of CAN-Transmit-Frame ComDPFC1
524100	9	1666	Timeout error of CAN-Transmit-Frame ComDPFHisDat
524101	9	1667	Timeout error of CAN-Transmit-Frame ComDPFTstMon

Deutz D 2.9 L4 Engine Fault Codes

SPN = Suspect Parameter Number
FMI = Failure Mode Identifier
KWP = Keyword Protocol

SPN	FMI	KWP	Description
524102	9	1674	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmpCtl
524103	9	1675	Timeout error of CAN-Receive-Frame ComRxDPFBrnAirPmp
524104	9	1676	Timeout error of CAN-Receive-Frame ComRxDPFCtl
524105	9	1668	Timeout error of CAN-Transmit-Frame ComEGRMsFlw
524106	9	1677	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw1
524107	9	1678	Timeout error of CAN-Receive-Frame ComRxEGRMsFlw2
524108	9	1669	Timeout error of CAN-Transmit-Frame ComEGRTVActr
524109	9	1679	Timeout error of CAN-Receive-Frame ComRxEGRTVActr
524110	9	1670	Timeout error of CAN-Transmit-Frame ComETVActr
524111	9	1680	Timeout error of CAN-Receive-Frame ComRxETVActr
524112	9	1671	Timeout ComITVActr
524113	9	1681	Timeout error of CAN-Receive-Frame ComRxITVActr
524114	9	1659	Timeout error of CAN-Transmit-Frame A1DOC
524115	9	1660	Timeout error of CAN-Transmit-Frame AT1S
524116	9	1661	Timeout error of CAN-Transmit-Frame SCR2
524117	9	1662	Timeout error of CAN-Transmit-Frame SCR3
524118	9	1672	Timeout error of CAN-Receive-Frame ComRxCM1
524119	9	1673	Timeout error of CAN-Receive-Frame ComRxCustSCR3
524120	9	1682	Timeout error of CAN-Receive-Frame ComRxSCRHtDiag
524121	9	1683	Timeout error of CAN-Receive-Frame ComRxTrbChActr
524122	9	1684	Timeout error of CAN-Receive-Frame ComRxUQSens
524123	9	1685	Timeout error of CAN-Receive-Frame ComSCRHtCtl
524124	9	1686	Timeout error of CAN-Receive-Frame ComTxAT1IMG
524125	9	1687	Timeout error of CAN-Receive-Frame ComTxTrbChActr

Ford MSG-425 Engine Fault Codes

How to Retrieve Ford Engine Fault Codes

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

1 Open the ground controls side cover.

2 Pull out the red Emergency Stop button to the on position at both the ground and platform controls. Turn the key switch to ground controls.

3 Quickly activate and release the start toggle switch/button. Do not start the engine.

4 Move and hold the run/test toggle switch to the test position.

⊙ Result: The check engine light should turn on. The check engine light should begin to blink.

5 Continue to hold the run/test toggle switch in the test position. Count the blinks and note the results. Refer to the Fault Codes section, *Ford MSG-425 Engine Fault Codes*.

Note: Before the fault codes are displayed, the check engine light will blink a code 1-6-5-4 three times. After the fault codes, the check engine light will blink a code 1-6-5-4 three times again indicating the end of the stored codes.

Note: If any fault codes are present, the ECM will blink a three digit code three times for each code stored in memory. It will blink the first digit of a three digit code, pause, blink the second digit, pause, and then blink the third digit. For example: the check engine light blinks 5 consecutive times, blinks 3 times and then 1 time. That would indicate code 531.

Note: Once a fault code has been retrieved and the repair has been completed, the ECM memory must be reset to clear the fault code from the ECM. Refer to Fault Codes Procedure, *How to Clear Engine Fault Codes from the ECM*.

How to Clear Engine Fault Codes from the ECM

Note: Perform this procedure with the engine off and the key switch in the off position.

1 Locate the battery under the ground control panel.

2 Disconnect the negative battery cable from the battery for a minimum of 20 minutes.

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

3 Connect the negative battery cable to the battery.

4 Start the engine and allow it to idle for approximately ten minutes.

⊙ Result: The check engine light should not turn on.

⊠ Result: If the check engine light is on, the ECM is detecting a fault code. Refer to Fault Codes Procedure, *How to Retrieve Engine Fault Codes*.

Ford MSG-425 Engine Fault Codes

Code	Description
16	Never crank synced at start
91	FP low voltage
92	FP high voltage
107	MAP Low Voltage
108	MAP High Pressure
111	IAT higher than expected 1
112	IAT low voltage
113	IAT high voltage
116	ECT higher than expected 1
117	ECT/CHT Low Voltage
118	ECT/CHT High Voltage
121	TPS1 lower than TPS2
122	TPS1 low voltage
123	TPS1 high voltage
127	IAT higher than expected 2
129	BP low pressure
134	EGO open/lazy pre-cat 1
140	EGO open/lazy post-cat 1
154	EGO open/lazy pre-cat 2/post-cat 1
160	EGO open/lazy post-cat 2
171	AL high gasoline bank1
172	AL low gasoline bank1
174	AL high gasoline bank2
175	AL low gasoline bank2
182	FT Gasoline Low Voltage
183	FT Gasoline High Voltage
187	FT Gaseaous fuel low voltage
188	FT Gaseaous fuel high voltage
217	ECT higher than expected 2
219	Max govern speed override
221	TPS1 higher than TPS2
222	TPS2 low voltage
223	TPS2 high voltage
236	TIP Active

Code	Description
237	TIP Low Voltage
238	TIP High Voltage
261	Injector Loop Open or Low-side short to Ground
262	Injector Coil Shorted
264	Injector Loop Open or Low-side short to Ground
265	Injector Coil Shorted
267	Injector Loop Open or Low-side short to Ground
268	Injector Coil Shorted
270	Injector Loop Open or Low-side short to Ground
271	Injector Coil Shorted
273	Injector Loop Open or Low-side short to Ground
274	Injector Coil Shorted
276	Injector Loop Open or Low-side short to Ground
277	Injector Coil Shorted
279	Injector Loop Open or Low-side short to Ground
280	Injector Coil Shorted
282	Injector Loop Open or Low- side short to Ground
283	Injector Coil Shorted
285	Injector Loop Open or Low-side short to Ground
286	Injector Coil Shorted
288	Injector Loop Open or Low-side short to Ground
289	Injector Coil Shorted

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

Ford MSG-425 EFI Diagnostic Manual	
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Ford MSG-425 Engine Fault Codes

Code	Description
301	Emissions/catalyst damaging misfire
302	Emissions/catalyst damaging misfire
303	Emissions/catalyst damaging misfire
304	Emissions/catalyst damaging misfire
305	Emissions/catalyst damaging misfire
306	Emissions/catalyst damaging misfire
307	Emissions/catalyst damaging misfire
308	Emissions/catalyst damaging misfire
326	Knock 1 Excessive Signal
327	Knock 1 sensor Open
331	Knock 2 Excessive Signal
332	Knock 2 sensor Open
336	Crank sync noise
337	Crank loss
341	Cam sync noise
342	Cam loss
420	Gasoline cat monitor
430	Gasoline cat monitor
524	Oil pressure low
562	Battery Voltage Low
563	Battery Voltage High
601	Flash checksum invalid
604	RAM failure
606	COP failure
615	Start relay coil open
616	Start relay control ground short
617	Start relay coil short to power
627	Fpump relay coil open
628	FPump motor loop open or high-side shorted to ground
628	Fpump relay control ground short
629	FPump motor high-side shorted to power
629	Fpump relay coil short to power

Code	Description
642	5VE1 low voltage
643	5VE1 high voltage
650	MIL open
652	5VE2 low voltage
653	5VE2 high voltage
685	Relay Coil Open
686	Relay Control ground short
687	Relay coil short to power
1111	Fuel rev limit
1112	Spark rev limit
1121	FPP1/2 simultaneous voltages out of range
1122	FPP1/2 do not match each other or the IVS
1151	CL high LPG
1152	CL low LPG
1153	CL high NG
1154	CL low NG
1155	CL high gasoline bank1
1156	CL low gasoline bank1
1157	CL high gasoline bank2
1158	CL low gasoline bank2
1161	AL high LPG
1162	AL low LPG
1163	AL high NG
1164	AL low NG
1165	LPG cat monitor
1166	NG cat monitor
1171	Megajector delivery pressure higher than expected
1172	Megajector delivery pressure lower than expected

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

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Ford MSG-425 Engine Fault Codes

Code	Description
1173	Megajector comm lost
1174	Megajector voltage supply high
1175	Megajector voltage supply low
1176	Megajector internal actuator fault detection
1177	Megajector internal circuitry fault detection
1178	Megajector internal comm fault detection
1311	Misfire detected
1312	Misfire detected
1313	Misfire detected
1314	Misfire detected
1315	Misfire detected
1316	Misfire detected
1317	Misfire detected
1318	Misfire detected
1511	AUX analog PU1 high
1512	AUX analog PU1 low
1513	AUX analog PU2 high
1514	AUX analog PU2 low
1515	AUX analog PD1 high
1516	AUX analog PD1 low
1517	AUX analog PU3 high
1518	AUX analog PU3 low
1521	CHT higher than expected 1
1522	CHT higher than expected 2
1531	IVS/Brake/Trans-Park interlock failure
1541	AUX analog PUD1 high
1542	AUX analog PUD1 low
1543	AUX analog PUD2 high
1544	AUX analog PUD2 low
1545	AUX analog PUD3 high

Code	Description
1551	AUX DIG1 high
1552	AUX DIG1 low
1553	AUX DIG2 high
1554	AUX DIG2 low
1555	AUX DIG3 high
1556	AUX DIG3 low
1561	AUX analog PD2 high
1562	AUX analog PD2 low
1563	AUX analog PD3 high
1564	AUX analog PD3 low
1611	5VE 1/2 simultaneous out of range
1612	RTI 1 loss
1613	RTI 2 loss
1614	RTI 3 loss
1615	A/D loss
1616	Invalid interrupt
1621	Rx Inactive
1622	Rx Noise
1623	Invalid Packet Format
1624	Shutdown Request
1625	Shutdown Request
1626	CAN Tx failure
1627	CAN Rx failure
1628	CAN addresss conflict failure

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

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Ford MSG-425 Engine Fault Codes

Code	Description
1629	J1939 TSC1 message receipt lost
1630	J1939 ETC message receipt lost
1631	PWM1-Gauge1 open / ground short
1632	PWM1-Gauge1 short to power
1633	PWM2-Gauge2 open /ground short
1634	PWM2-Gauge2 short to power
1635	PWM3-Gauge3 open / ground short
1636	PWM3-Gauge3 short to power
1641	Buzzer control ground short
1642	Buzzer open
1643	Buzzer control short to power
1644	MIL control ground short
1645	MIL control short to power
2111	Unable to reach lower TPS
2112	Unable to reach higher TPS
2115	FPP1 higher than IVS limit
2116	FPP2 higher than IVS limit
2120	FPP1 invalid voltage and FPP2 disagrees with IVS
2121	FPP1 lower than FPP2
2122	FPP1 high voltage
2123	FPP1 low voltage
2125	FPP2 invalid voltage and FPP1 disagrees with IVS
2126	FPP1 higher than FPP2
2127	FPP2 low voltage
2128	FPP2 high voltage
2130	IVS stuck at-idle, FPP1/2 match
2131	IVS stuck off-idle, FPP1/2 match
2135	TPS1/2 simultaneous voltages out of range
2139	FPP1 lower than IVS limit
2140	FPP2 lower than IVS limit
2229	BP high pressure
2300	Primary Loop Open or Low-side Short to Ground
2301	Primary Coil Shorted
2303	Primary Loop Open or Low-side Short to Ground
2304	Primary Coil Shorted
2306	Primary Loop Open or Low-side Short to Ground
2307	Primary Coil Shorted

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

Ford MSG-425 EFI Diagnostic Manual	
Genie part number	162067

Ford MSG-425 Engine Fault Codes

Code	Description
2309	Primary Loop Open or Low-side Short to Ground
2310	Primary Coil Shorted
2312	Primary Loop Open or Low-side Short to Ground
2313	Primary Coil Shorted
2315	Primary Loop Open or Low-side Short to Ground
2316	Primary Coil Shorted
2318	Primary Loop Open or Low-side Short to Ground
2319	Primary Coil Shorted
2321	Primary Loop Open or Low-side Short to Ground
2322	Primary Coil Shorted
2618	Tach output ground short
2619	Tach output short to power

For further engine fault code troubleshooting and diagnostic information, refer to the Ford MSG-425 EFI Diagnostic Manual (EDI part number 1080030).

Ford MSG-425 EFI Diagnostic Manual	
Genie part number	162067

Schematics

Observe and Obey:

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

Before Troubleshooting:

- ☑ Read, understand and obey the safety rules and operating instructions in the appropriate operator's manual on your machine.
- ☑ Be sure that all necessary tools and test equipment are available and ready for use.

About This Section

There are two groups of schematics in this section.

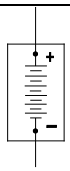
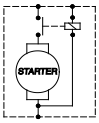
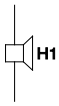
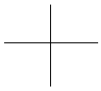
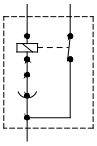
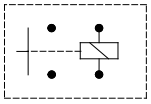
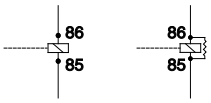
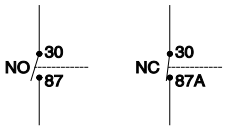
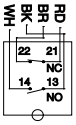
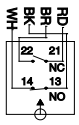
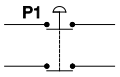
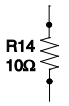
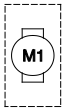
Electrical Schematics

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

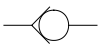
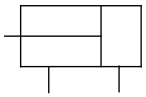
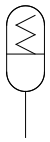
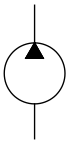
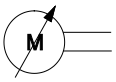
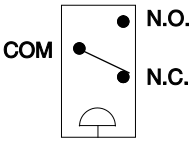
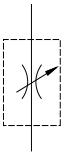
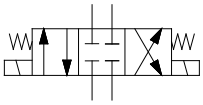
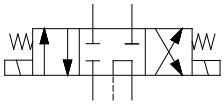
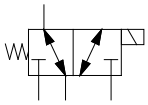
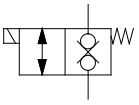
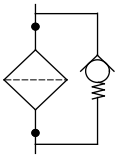
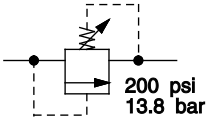
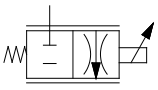
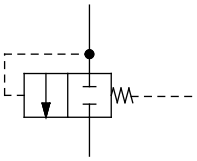
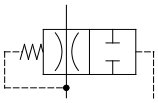
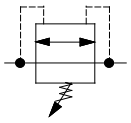
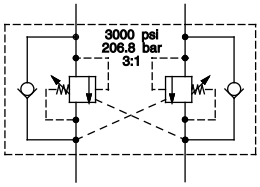
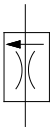
Hydraulic Schematics

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

Electrical Symbols Legend

 Battery	 Motor	 Horn or alarm	 Flashing beacon	 Gauge
 Diode	 Coil with suppression	 LED	 Fuse with amperage	 Circuit breaker with amperage
 Connection - no terminal	 Circuits crossing no connection	 Quick disconnect terminal	 Level sensor without outriggers	 Power relay
 Coil solenoid or relay	 Contact solenoid or relay	 Button normally open	 Limit Switch not held	 Limit Switch held
 Red emergency stop button normally closed	 Resistor with ohm value	 Starting aid or glow plug	 Electric motor	

Hydraulic Symbols Legend

 Orifice with size	 Check valve	 Cylinder, double acting	 Accumulator
 Pump, fixed displacement	 Pump, prime mover (engine or motor)	 Pressure switch	 Needle valve
 Solenoid operated 3 position 4 way directional valve	 Solenoid operated 3 position 5 way directional valve	 Solenoid operated 2 position, 3 way directional valve	 Solenoid operated 2 position 2 way directional valve
 Filter with bypass relief valve	 Relief valve with pressure setting	 Solenoid operated proportional valve	 Differential sensing valve
 Pilot operated flow regulator valve	 Dual piloted relief valve	 Counterbalance valve with pressure and pilot ratio	 Priority flow regulator

Electrical Component and Wire Color Legends

Item	Description
B1	**Battery**
BN	**Button**
BN2	Engine start (PCON)
BN3	Starting aid (PCON)
BN4	High idle (PCON)
BN5	Horn (PCON)
BN6	High torque (PCON)
BN7	Generator (option) (PCON)
BN9	Lift enable (PCON)
BN14	Fuel select (PCON)
BN20	Auto level (PCON)
BN21	Right rear outrigger (PCON)
BN22	Left rear outrigger (PCON)
BN23	Auxiliary down enable (GCON)
BN24	Right front outrigger (PCON)
BN25	Function enable (PCON)
BN26	Left front outrigger (PCON)
BN29	High idle (GCON)
BN32	Fuel select (GCON)
BN33	Platform up/down enable (GCON)
BN34	Platform up (GCON)
BN35	Platform down (GCON)
BN91	Auxiliary down (GCON)
C1	**Capacitor, 4700 uF**
CB	**Circuit breaker**
CB2	System power, 20A
CB6	Controls, 7A
CB7	Throttle, 25A (Deutz models)
Item	**Description**
FB1	**Flashing beacon (option)**
G	**Gauge**
G6	Hour meter
GND	**Ground**
H	**Horn or alarm**
H1	Alarm (PCON)
H2	Automotive-style horn
H5	Alarm (GCON)

JC9	**Joystick Controller**
KS1	**Key switch**
M	**Motor**
M2	Auxiliary pump
M3	Engine starter
M4	Fuel pump
N.C.	**Normally Closed**
N.O.	**Normally Open**
P	**Power Switch**
P1	Emergency stop button (ground)
P2	Emergency stop button (platform)
Item	**Description**
PS2	**Platform Overload Pressure Switch**
Q	**Solenoid**
Q3	High idle
Q8	Fuel shut off
QD	**Quick Disconnect**
QD3	Control cable to ground
QD4	Control cable to platform
S	**Sensor**
S7	Level sensor (models without outriggers)
S8	Level sensor (models with outriggers)
SW	**Switch**
SW2	Engine oil pressure
SW3	Engine oil temperature
SW6	Steer left/right
U	**Electronic Component**
U1	Electronic control module (GCON)
U2	Electronic control module (PCON)

Electrical Component and Wire Color Legends

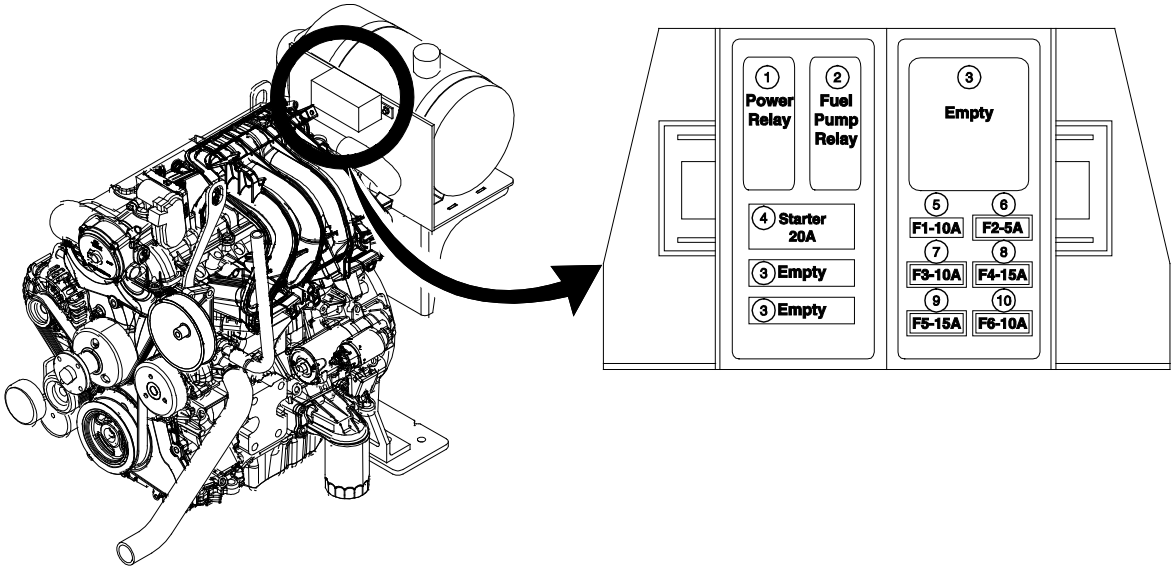
Item	Description
Y	**Valve Coil**
Y2	Brake release
Y3	Steer right
Y4	Steer left
Y7	Platform down
Y8	Platform up
Y9	Proportional control
Y27	Two speed
Y29	Generator on (option)
Y33	Left rear outrigger
Y34	Right rear outrigger
Y35	Left front outrigger
Y36	Right front outrigger
Y39	Outrigger retract
Y40	Outrigger extend
Y51	Electronic displacement control
Y93	Left oscillate
Y94	Right oscillate
Y95	Oscillate float
Y100	Oscillate enable

Wire Color Legend	
Item	**Description**
BL	Blue
BK	Black
BR	Brown
GY	Grey
OR	Orange
PP	Purple
RD	Red
WH	White
YL	Yellow

Wire Color Legend - Ford Engine	
Item	**Description**
BL	Blue
BK	Black
BR	Brown
DB	Dark Blue
DG	Dark Green
GN	Green
GY	Grey
LB	Light Blue
LG	Light Green
N	Natural
O	Orange
PK	Pink
P	Purple
R	Red
T	Tan
W	White
Y	Yellow

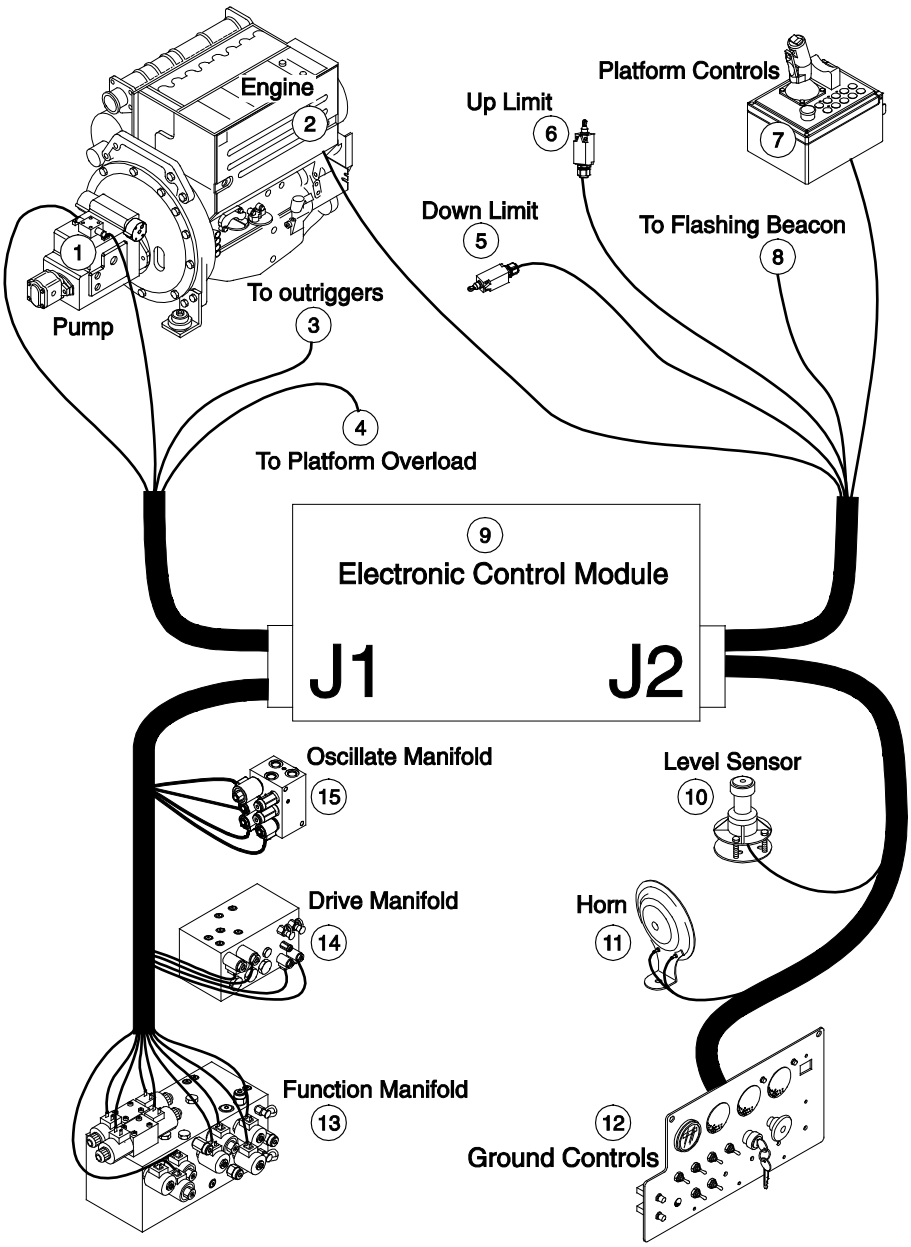
Ford Engine Relay Layout

Ford MSG-425 EFI



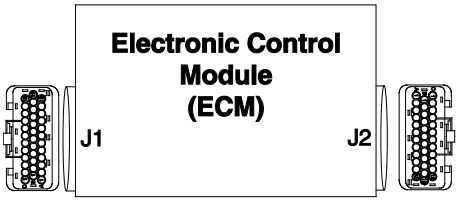
1 Power Relay
2 Fuel Pump Relay
3 Empty
4 Starter - 20A
5 Fuse 1 - 10A, Battery voltage to EPR
6 Fuse 2 - 5A, Ignition voltage to GCP and relays
7 Fuse 3 - 10A, Battery voltage to GCP
8 Fuse 4 - 15A, Fuel pump
9 Fuse 5 - 15A, Battery voltage out of Power Relay
10 Fuse 6 - 10A, Alternator

Electronic Control Module Layout



1 pump
2 engine
3 to outriggers
4 to platform overload
5 down limit switch
6 up limit switch
7 platform controls
8 to flashing beacon
9 electronic control module
10 level sensor
11 horn
12 ground controls
13 function manifold
14 drive manifold
15 oscillate manifold

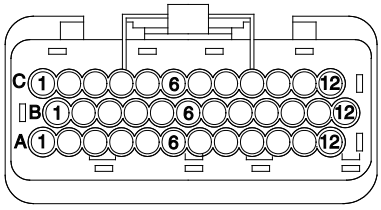
Electronic Control Module Pin-Out Legend



J1 Connector

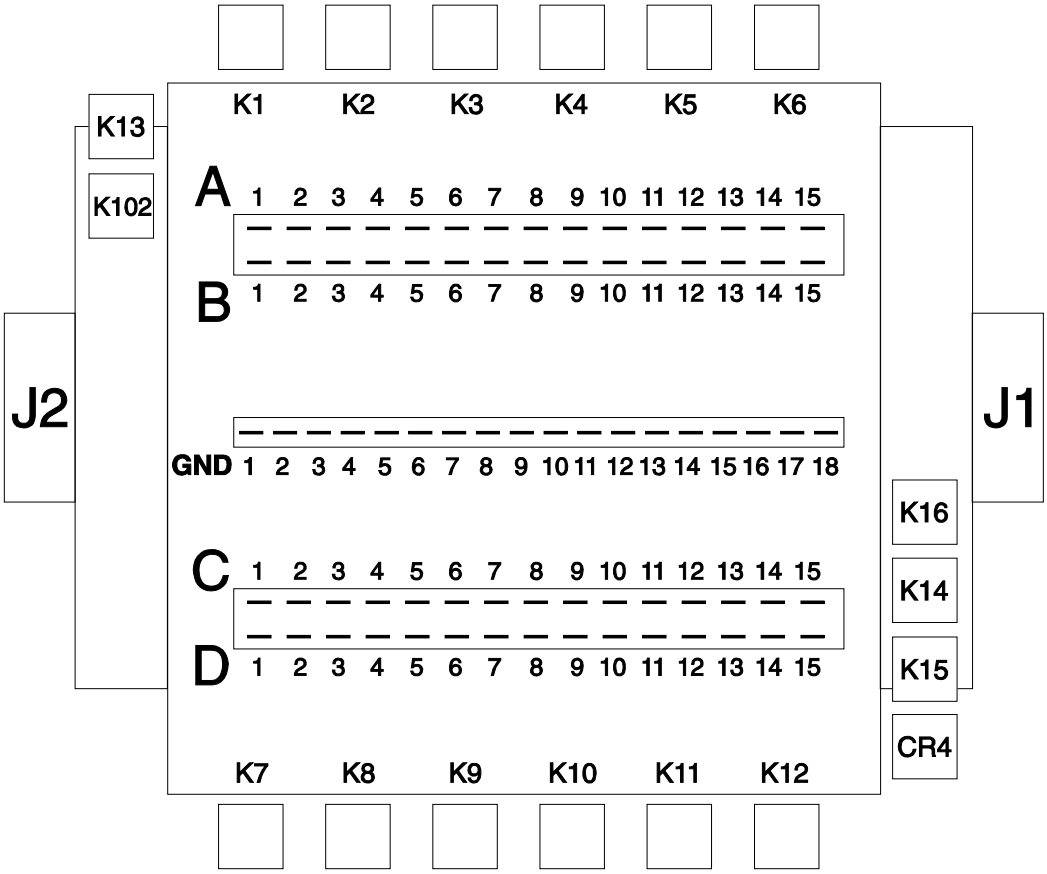
Pin	Description
A1	Right turn coil Y3 (output)
A2	Left turn coil Y4 (output)
A3	Up coil Y8 (output)
A4	Brake coil Y2 (output)
A5	Plug
A6	Plug
A7	Plug
A8	Plug
A9	Down coil Y7 (output)
A10	2 speed coil Y1 (output)
A11	Plug
A12	Plug
B1	Generator coil Y29 (output)
B2	Reverse coil/EDC Y51 (output)
B3	Forward coil/EDC Y51 (output)
B4	Proportional coil (+) Y9 (output)
B5	Right front outrigger coil Y36 (output)
B6	Outrigger extend coil Y40 (output)
B7	Outrigger retract coil Y39 (output)
B8	Plug
B9	Left front outrigger coil Y35 (output)
B10	Left rear outrigger coil Y33 (output)
B11	Right rear outrigger coil Y34 (output)
B12	LPG select (output)
C1	Plug
C2	Platform overload (input)
C3	Right front outrigger limit switch LS13 (input)
C4	Right rear outrigger limit switch LS15 (input)
C5	Left front outrigger limit switch LS12 (input)
C6	Left rear outrigger limit switch LS14 (input)
C7	Alternator (input)
C8	Engine oil pressure SW2 (input)
C9	Engine water temp SW1 OR oil temp SW3 (input)
C10	Plug
C11	Plug
C12	Plug

Electronic Control Module Pin-Out Legend



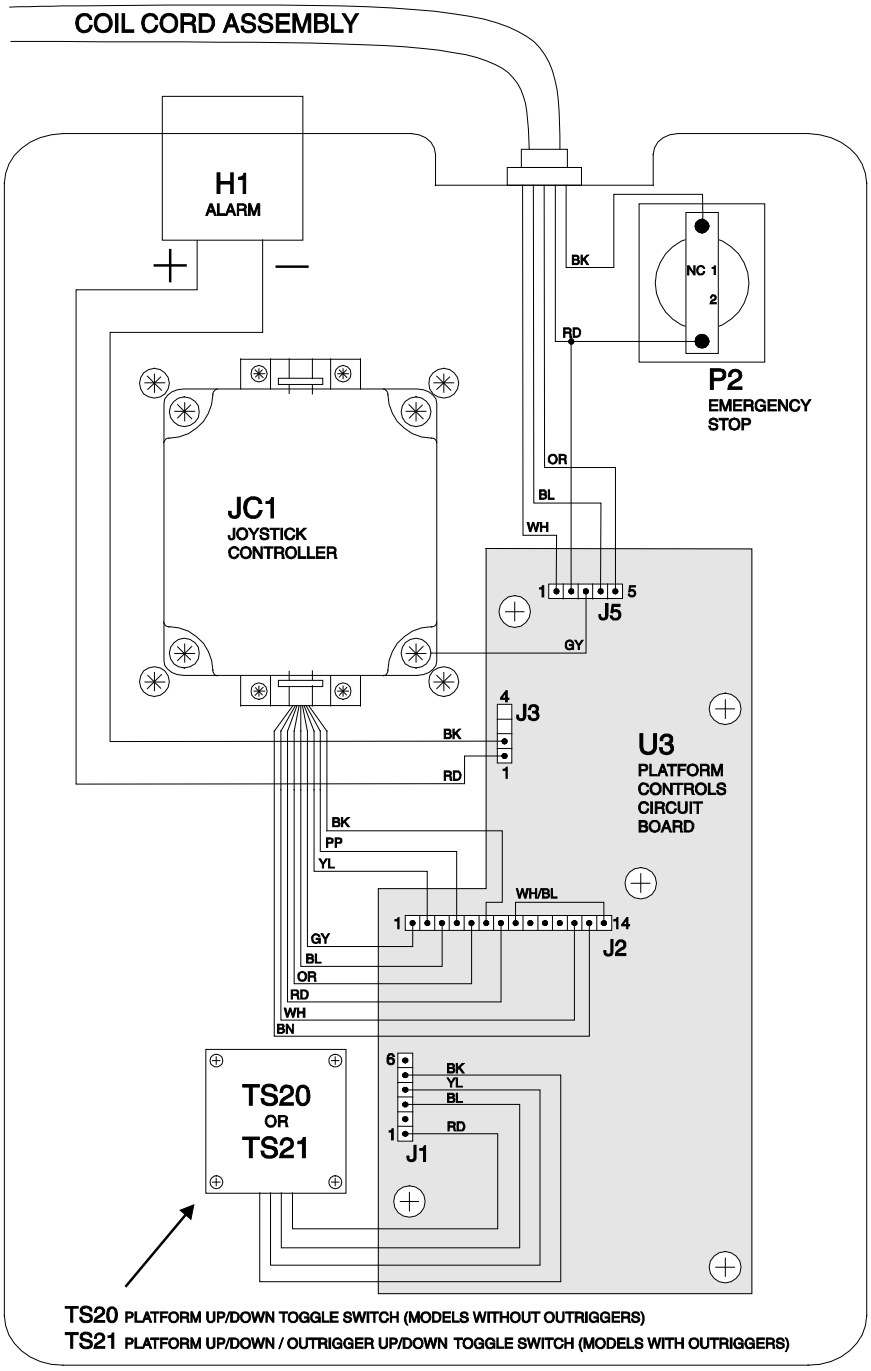
J2 Connector	
Pin	**Description**
A1	Up limit switch LS5 (input)
A2	Down limit switch LS6 (input)
A3	Aux down power (input)
A4	Aux down relay CR23 terminal 86 (output)
A5	Key switch terminal 3 (input)
A6	Level sensor S7 (white) (input)
A7	Plug
A8	Plug
A9	Plug
A10	Platform controls (ground) (input)
A11	Platform controls (data +) (input)
A12	Platform controls (data -) (input)
B1	Level sensor S8 (blue) (input)
B2	Level sensor S8 (black) (input)
B3	Level sensor S8 (yellow) (input)
B4	Plug
B5	Plug
B6	Plug
B7	Engine start relay CR1 terminal 86 (output)
B8	Ignition relay CR8 terminal 86 (output)
B9	Engine high idle (output)
B10	Level sensor S7 or S8 (red) (output)
B11	Horn relay CR5 terminal 86 (output)
B12	Alarm (output)
C1	System power (input)
C2	System power (input)
C3	System power (input)
C4	Engine starting aid (output)
C5	Oscillate stowed relay CR84 terminal 86 (output)
C6	Oscillate raised relay CR85 terminal 86 (output)
C7	Ground (output)
C8	Plug
C9	Plug
C10	Auxiliary down relay CR23 terminal 87 (output)
C11	Flashing beacons FS1 (output)
C12	ECM power (input)

Ground Controls Wiring Panel Layout

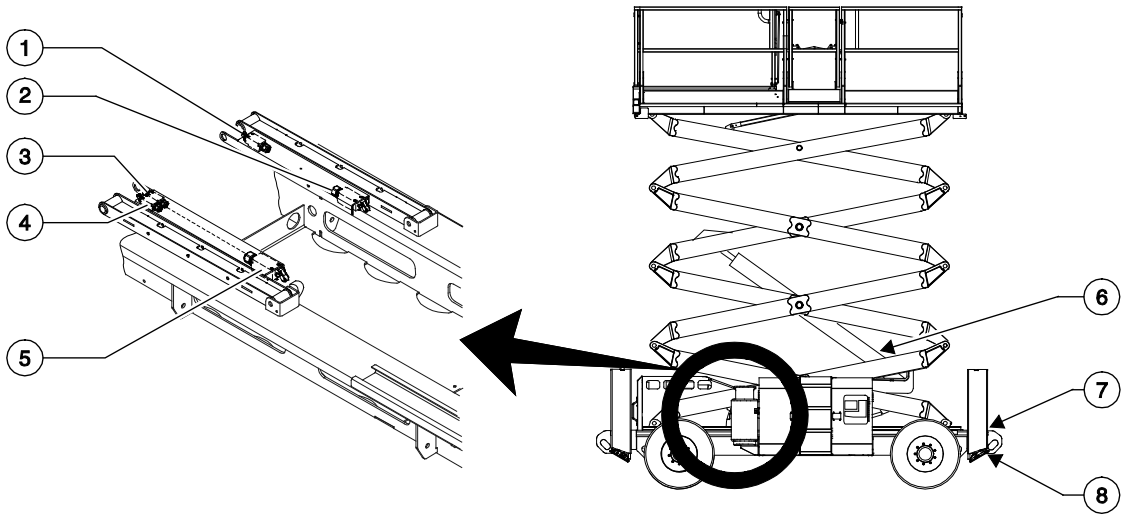


K1 1st E-Stop
K2 2nd E-Stop
K3 Starter
K4 Ignition
K5 Horn
K6 Auxiliary down
K7 Load sense (AS/CE models)
K8 Oil cooler (option)
K9 1st up enable (GS-5390 models)
K10 2nd up enable (GS-5390 models)
K11 Oscillate stowed (option)
K12 Oscillate elevated (option)
K13 2nd load sense (AS/CE models)
K14 3rd load sense (AS/CE models)
K15 Descent overload
K16 Coil cutout
K102 Telematics
CR4 High rpm (Deutz models)

Wiring Diagram - Platform Control Box



Limit Switch Legend



1 up limit switch LS5 (GS-5390 models) (hydraulic tank side)

2 up limit switch LS5A (GS-5390 models) (hydraulic tank side)

3 down limit switch LS6 (ground controls side)

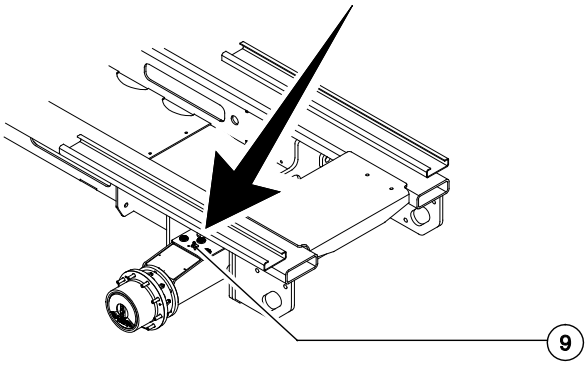
4 load sense delay LS25 (CE models) (ground controls side)

5 maximum height LS24 (CE models) (ground controls side)

6 dual pressure switch LS26 (GS-5390 CE models)

7 outrigger deployed (all models)

- left front LS12
- right front LS13
- left rear LS14
- right rear LS15



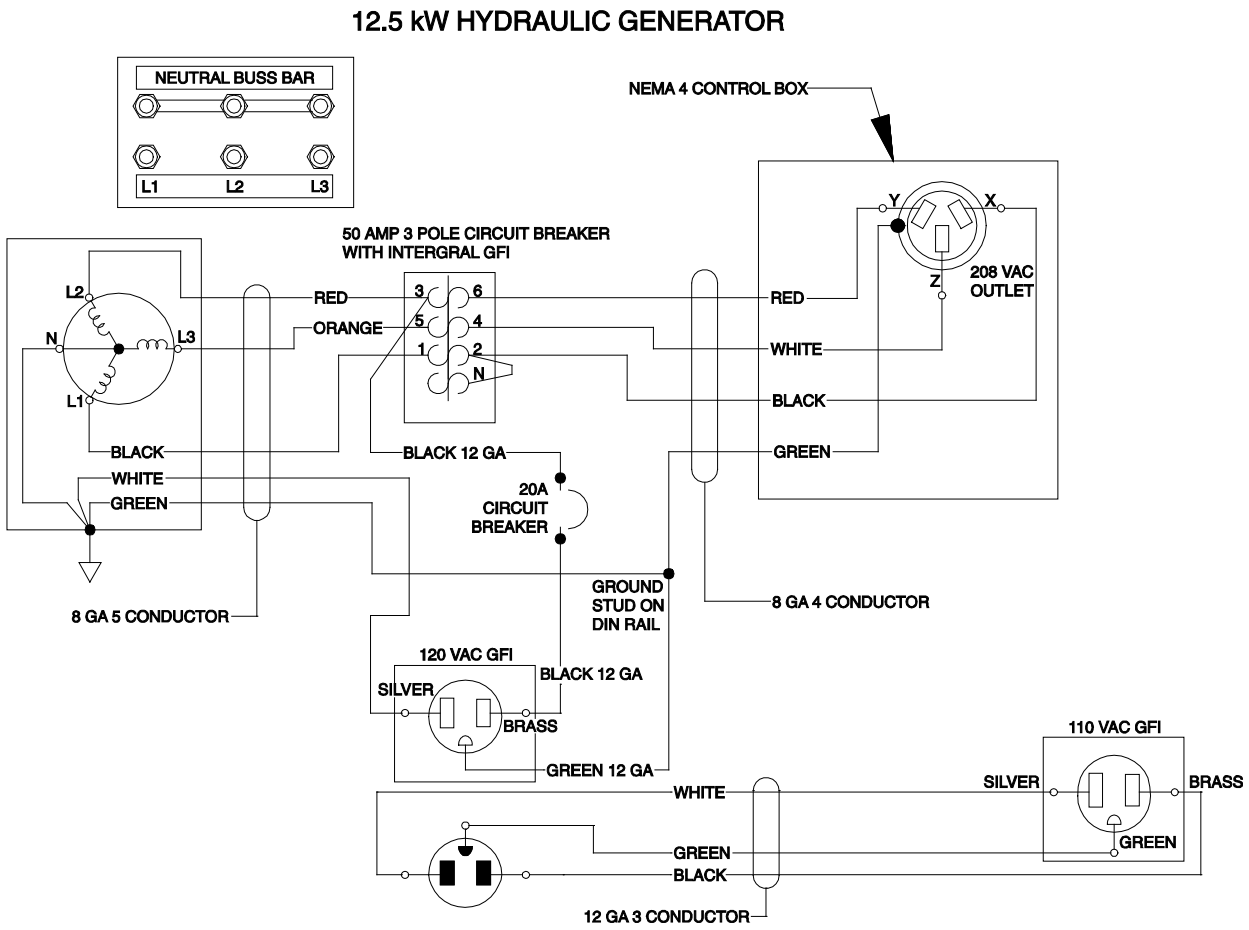
8 outrigger deployed (GS-5390 CE models) (lower)

- left front LS12A
- right front LS13A
- left rear LS14A
- right rear LS15A

9 oscillate axle (GS-90 models) (located inside axle)

- left axle LS23
- right axle LS22

Wiring Diagram - 12 kW Hydraulic Generator (option)



Wiring Diagram - 12 kW Hydraulic Generator (option)

Theory of Operation

1 Turning on the Generator sends a signal to the ECU which deactivates the function as long as the generator function is turned on. In addition, the Generator “on” signal from the ECU deactivates all other functions, until that function is enabled, which deactivates the generator function until the enabled function is deactivated. Furthermore, the generator “on” signal from the ECU switches the engine to high RPM.

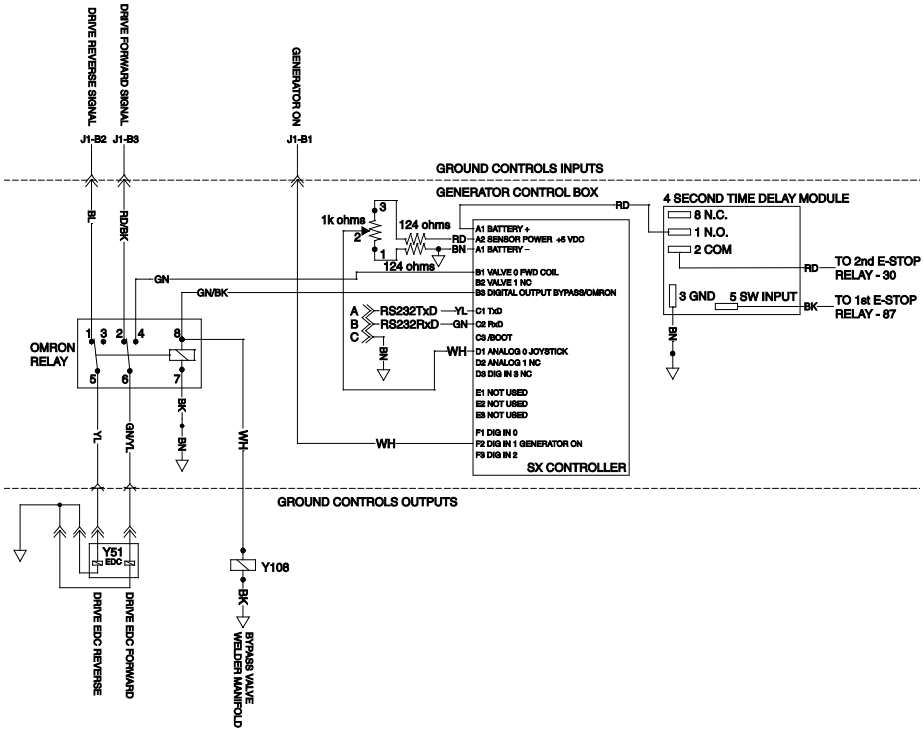
2 The SX controller is turned ON supplying power to the bypass valve and the change over relay. The EDC valve is switched over to the output of the SX controller.

1 When the AC generator is turned OFF, the SX module will ramp the output to the EDC to threshold preventing cavitation, to the hydraulic motor powering the generator. When the threshold is reached, the bypass valve is turned OFF.

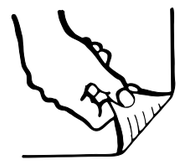
2 The time relay module keeps the SX controller ON, four additional seconds after the ESTOP is pressed, allowing for a controller ramp down of the generator.

Adjustment:

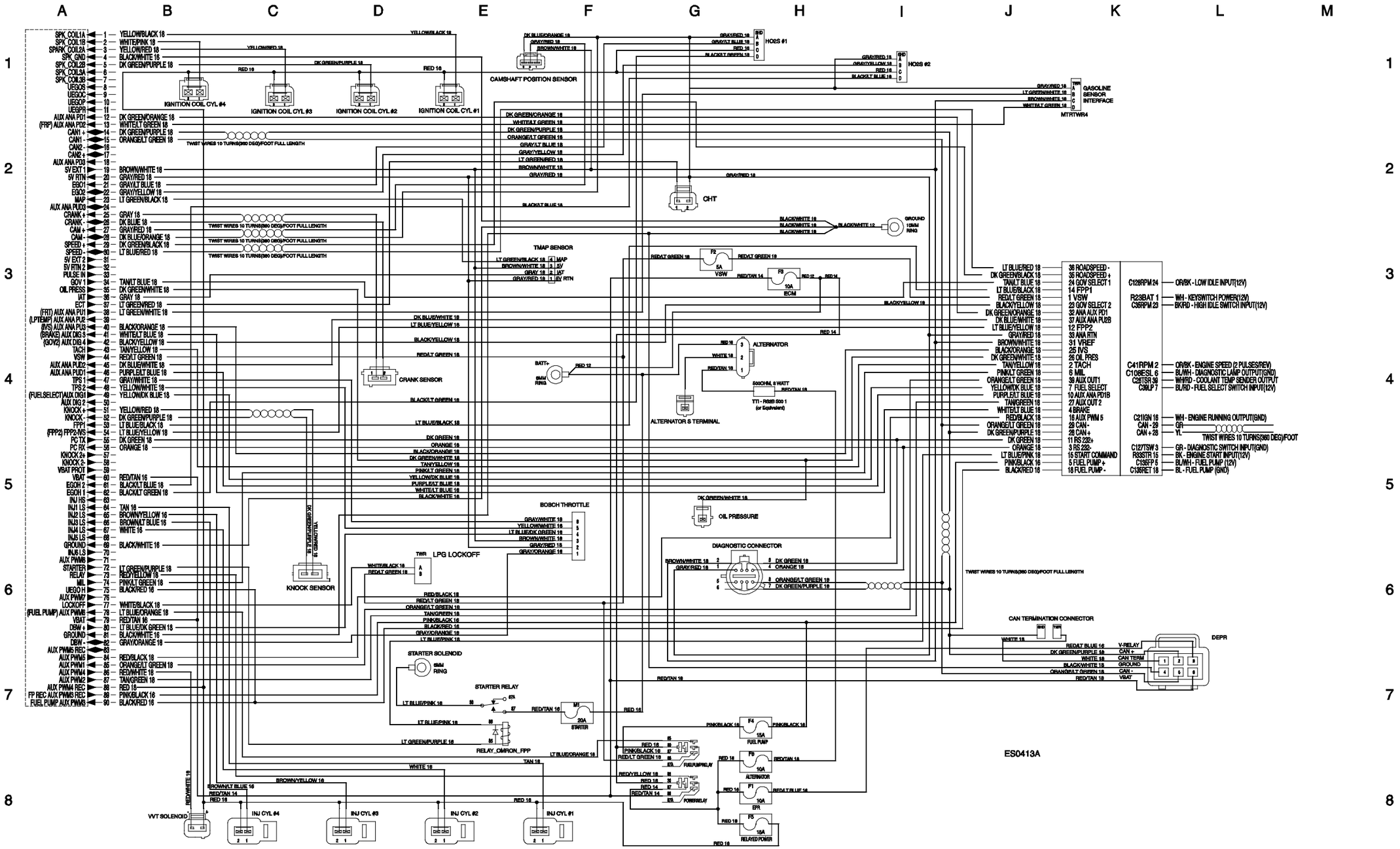
1 Connect a digital multi meter (DMM) with a frequency counter to the 110V AC outlet. Adjust the potentiometer until a frequency of 66.5 HZ is obtained with no load on the generator.



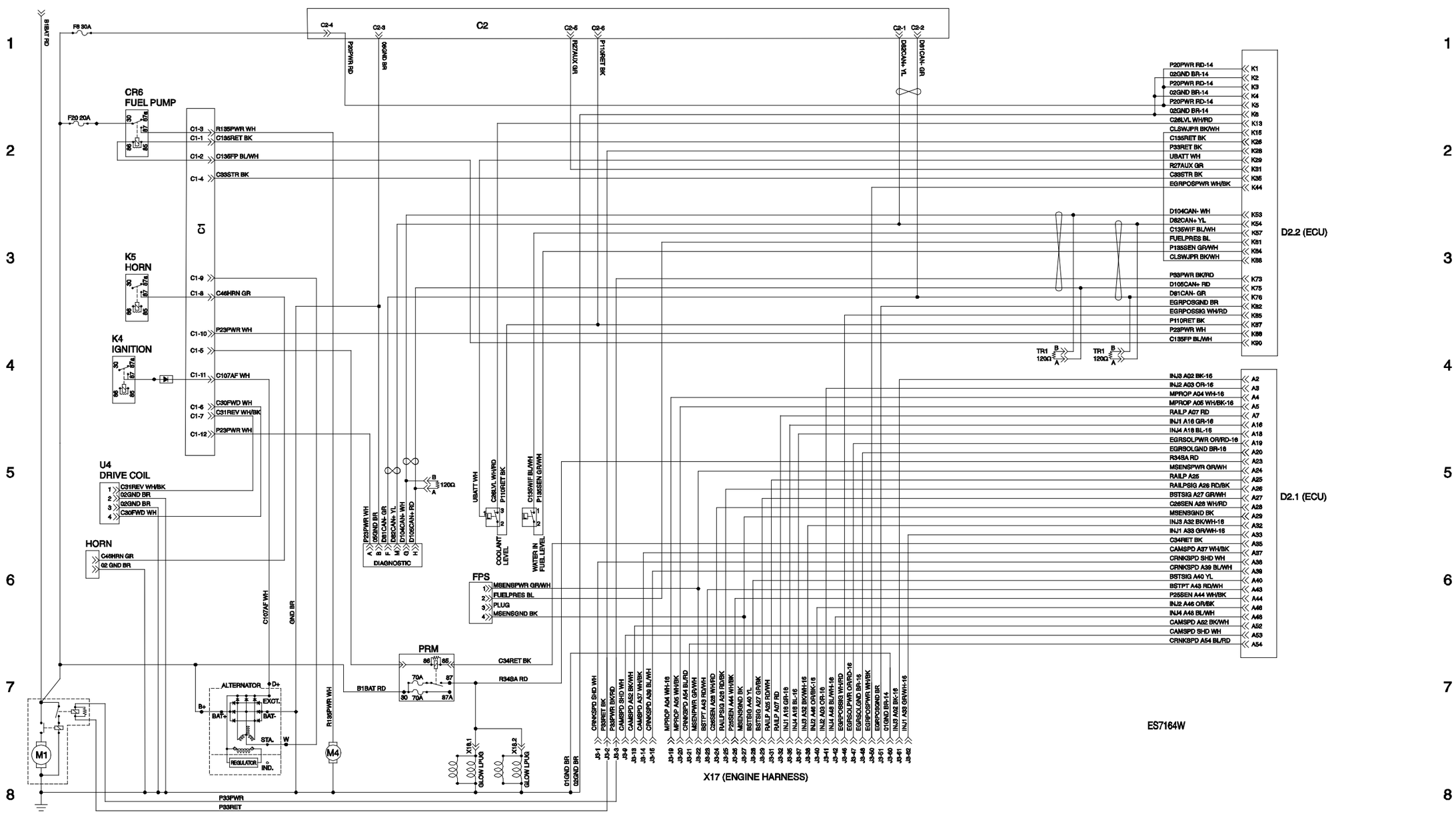
Ford MSG-425 Engine Wire Harness



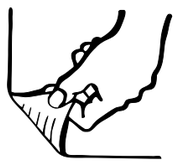
Ford MSG-425 EFI Engine Wire Harness



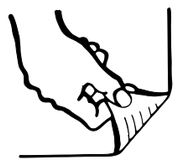
Deutz D 2.9 L4 Engine Wire Harness



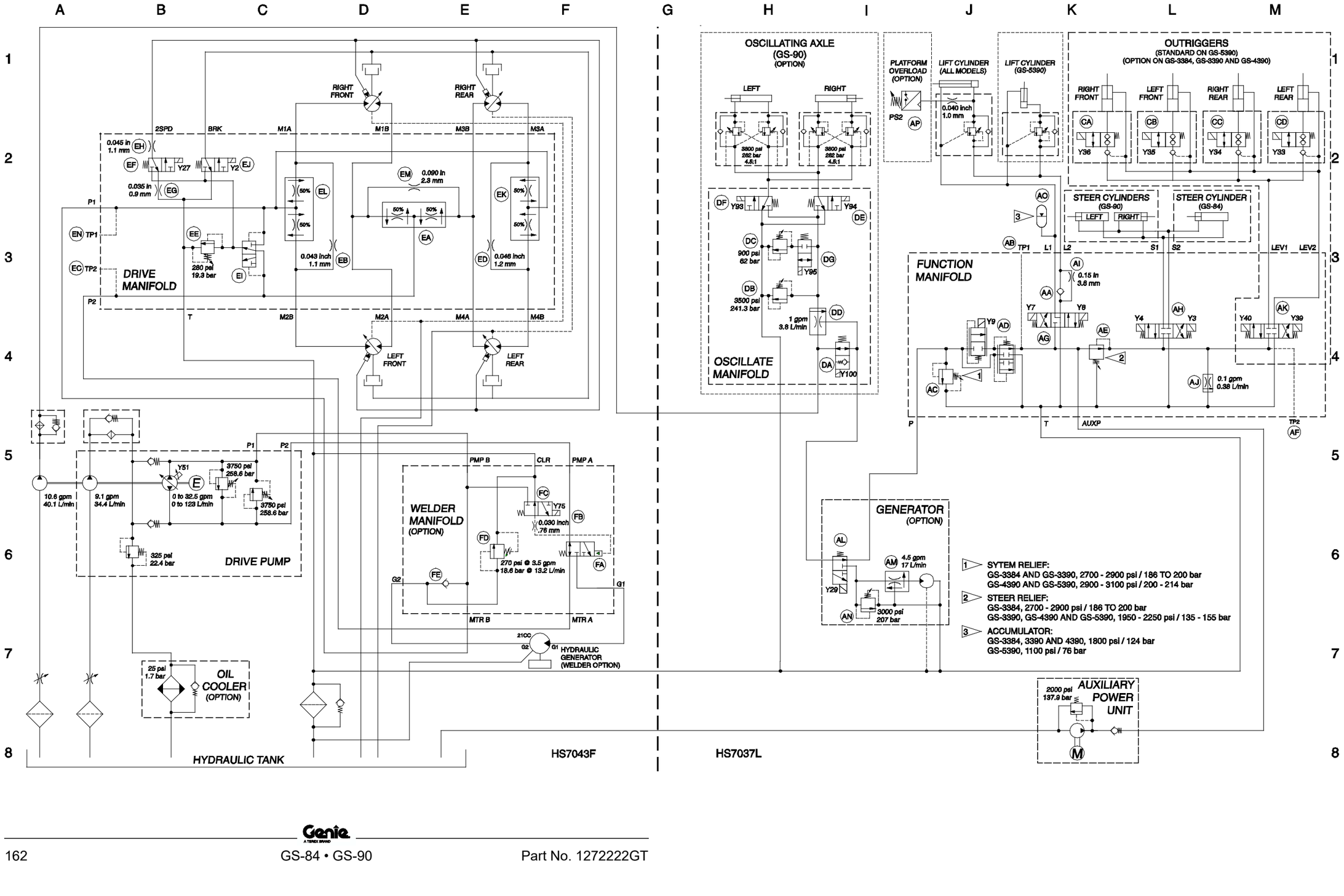
Deutz D 2.9 L4 Engine Wire Harness



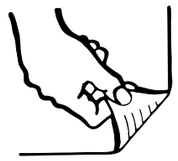
Hydraulic Schematic, To Serial Numbers GS8415-42316 and GS9015-50184



Hydraulic Schematic, To Serial Numbers GS8415-42316 and GS9015-50184



Hydraulic Schematic, From Serial Numbers GS8415-42317 and GS9015-50185



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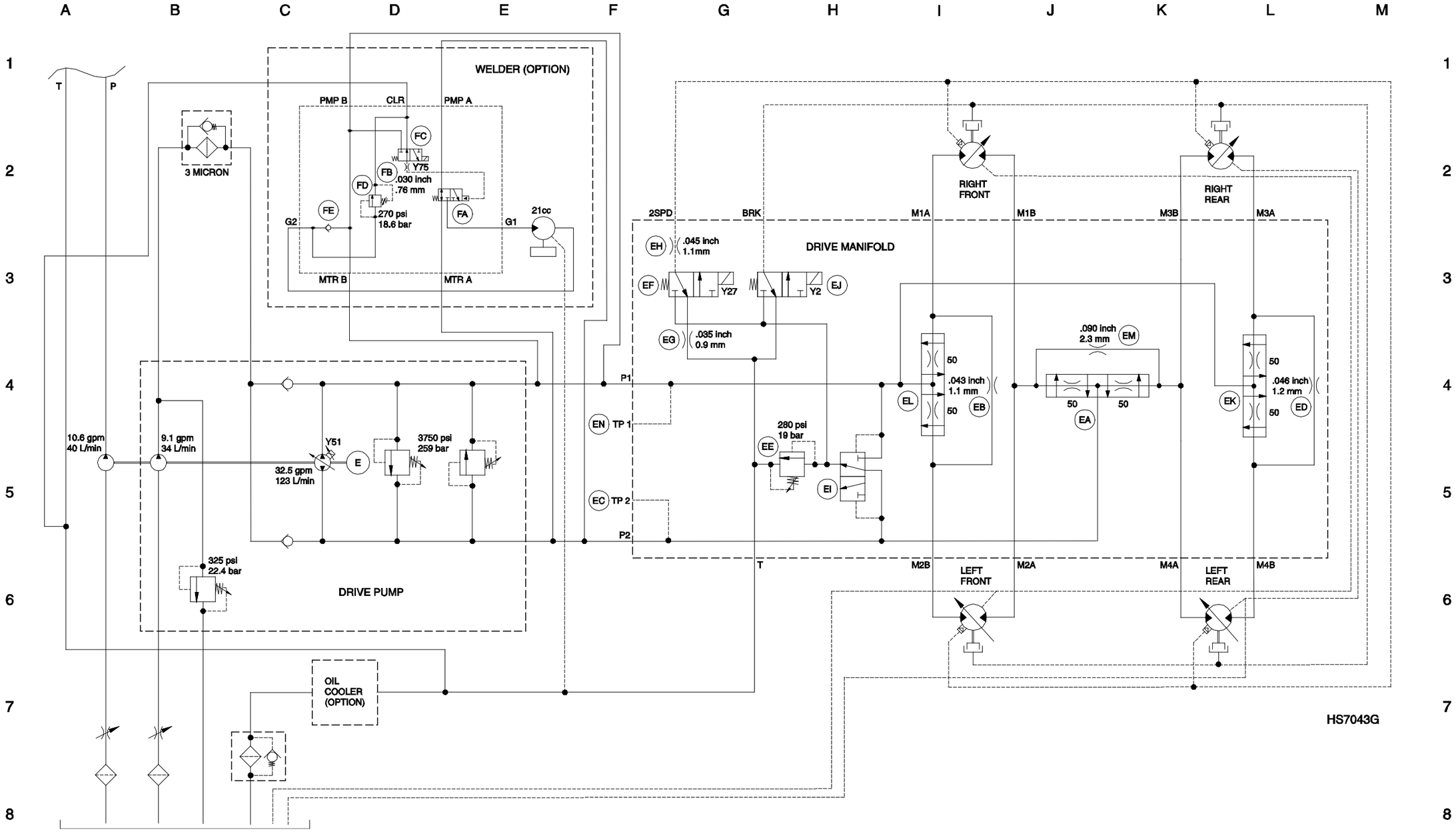

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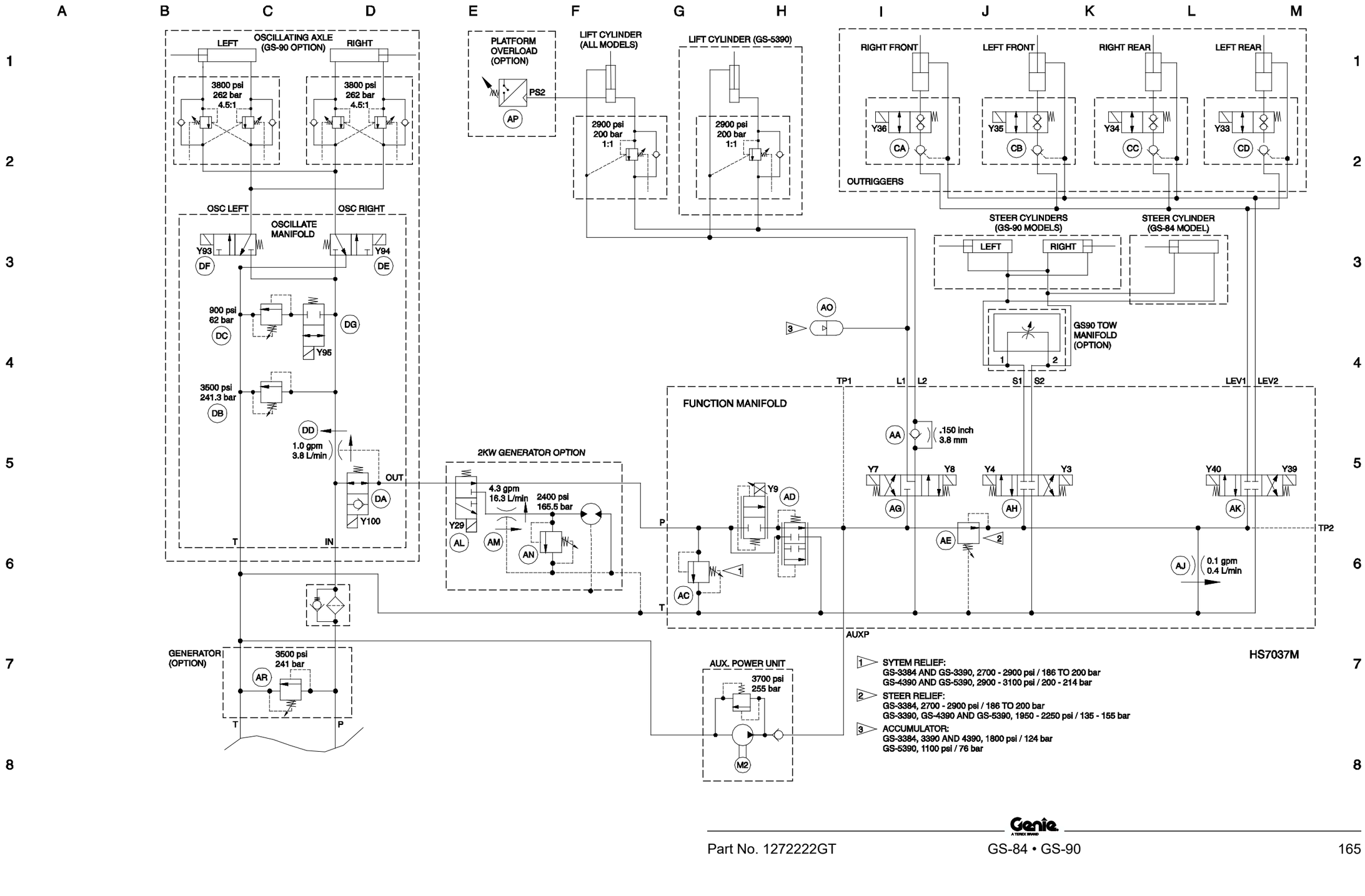
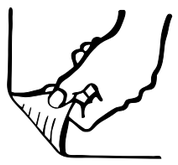
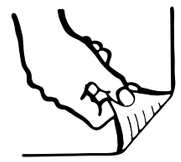


Hydraulic Schematic, From Serial Numbers GS8415-42317 and GS9015-50185



Electrical Schematic, Ford Engine Models (ANSI/CSA)

(from GS84D-101) • (to GS84F-45671, GS90D-2776, GS90F-54948)



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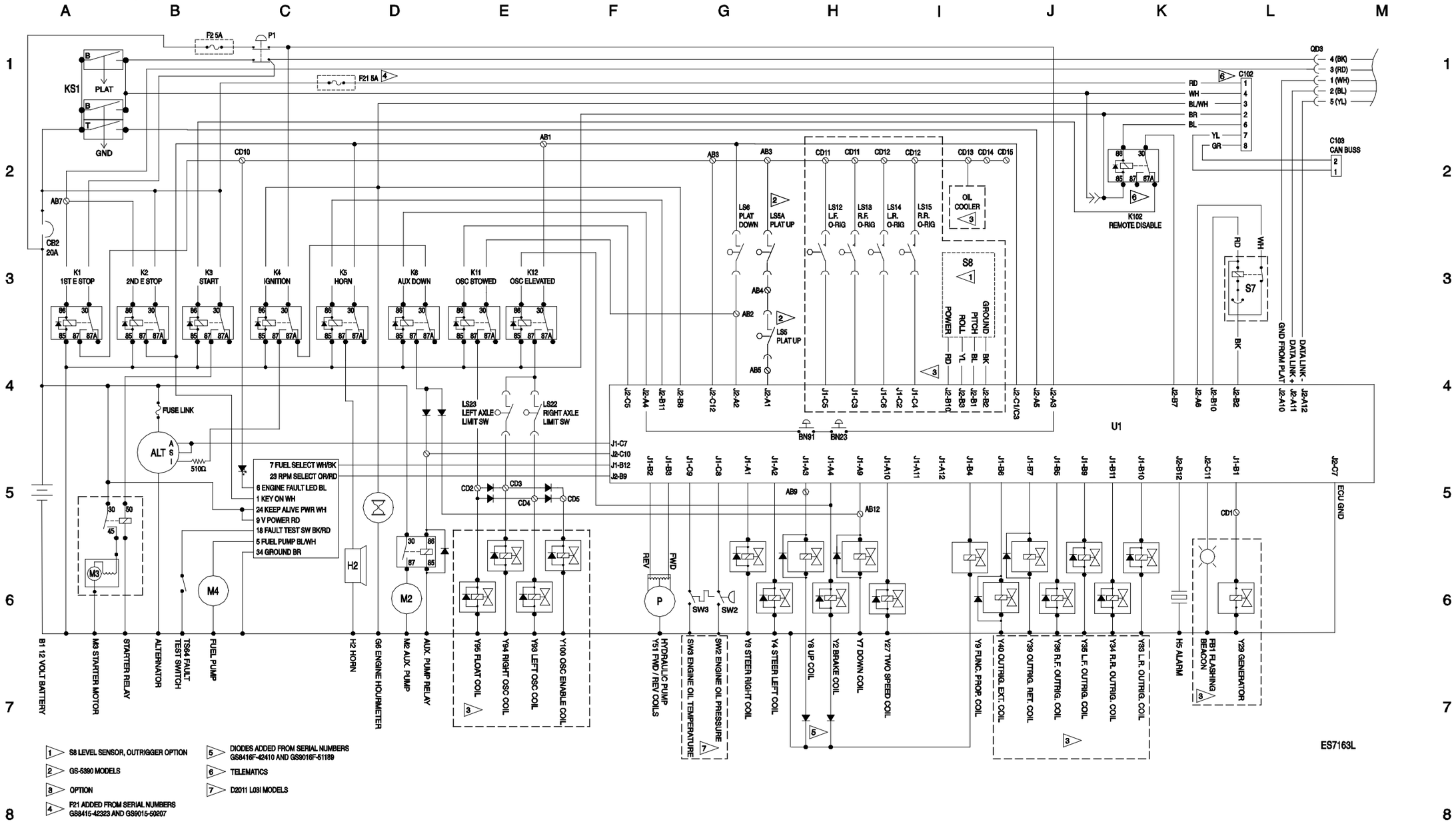
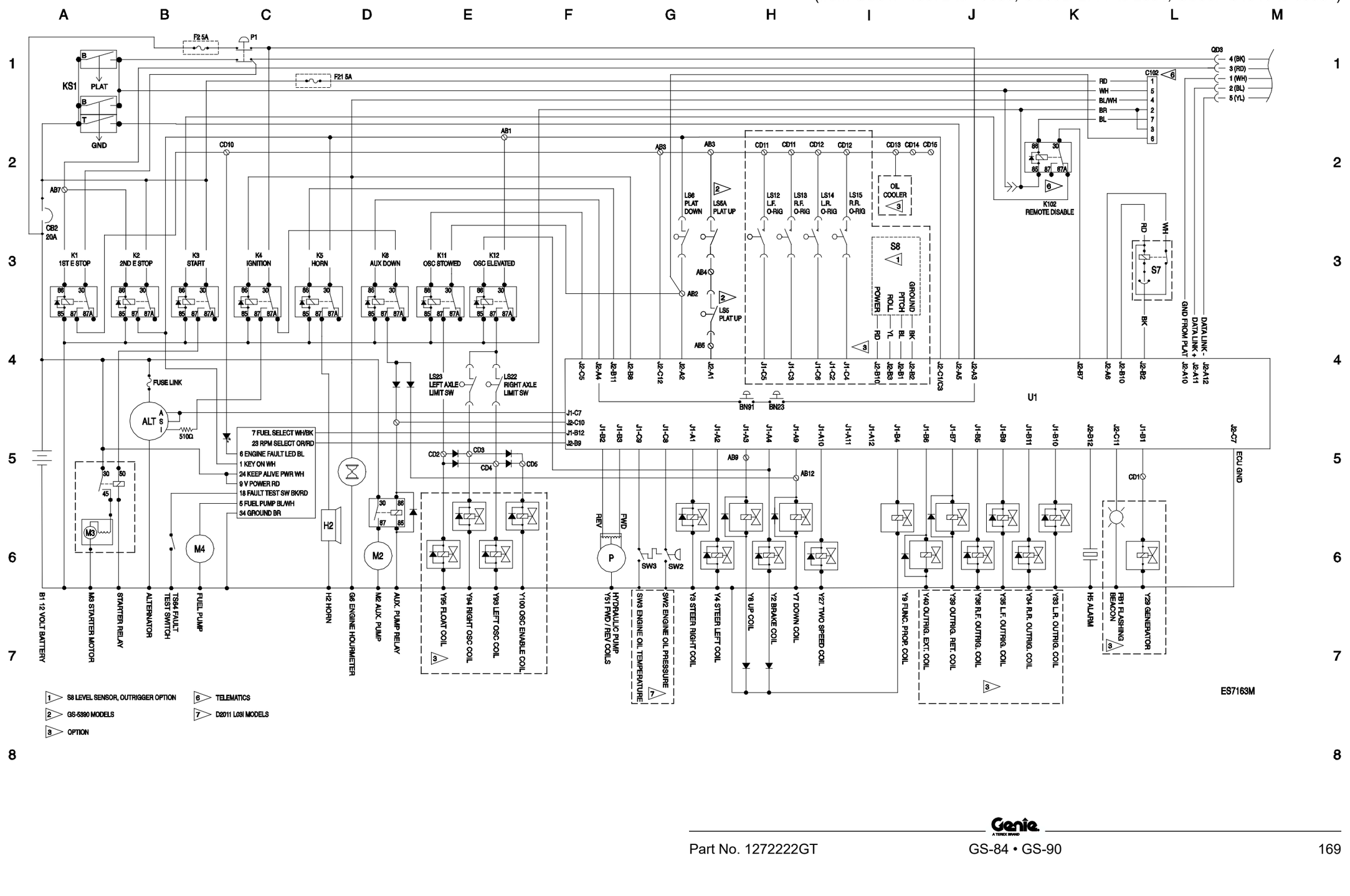


Electrical Schematic, Ford Engine Models (ANSI/CSA)

(from GS84F-45672 to 45680, GS90D-2777 to 2861, GS90F-54949 to 55081)



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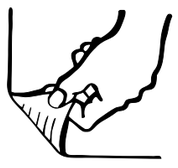

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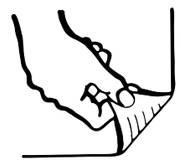
(from GS84F-45681, GS90D-2862, GS90F-55082)



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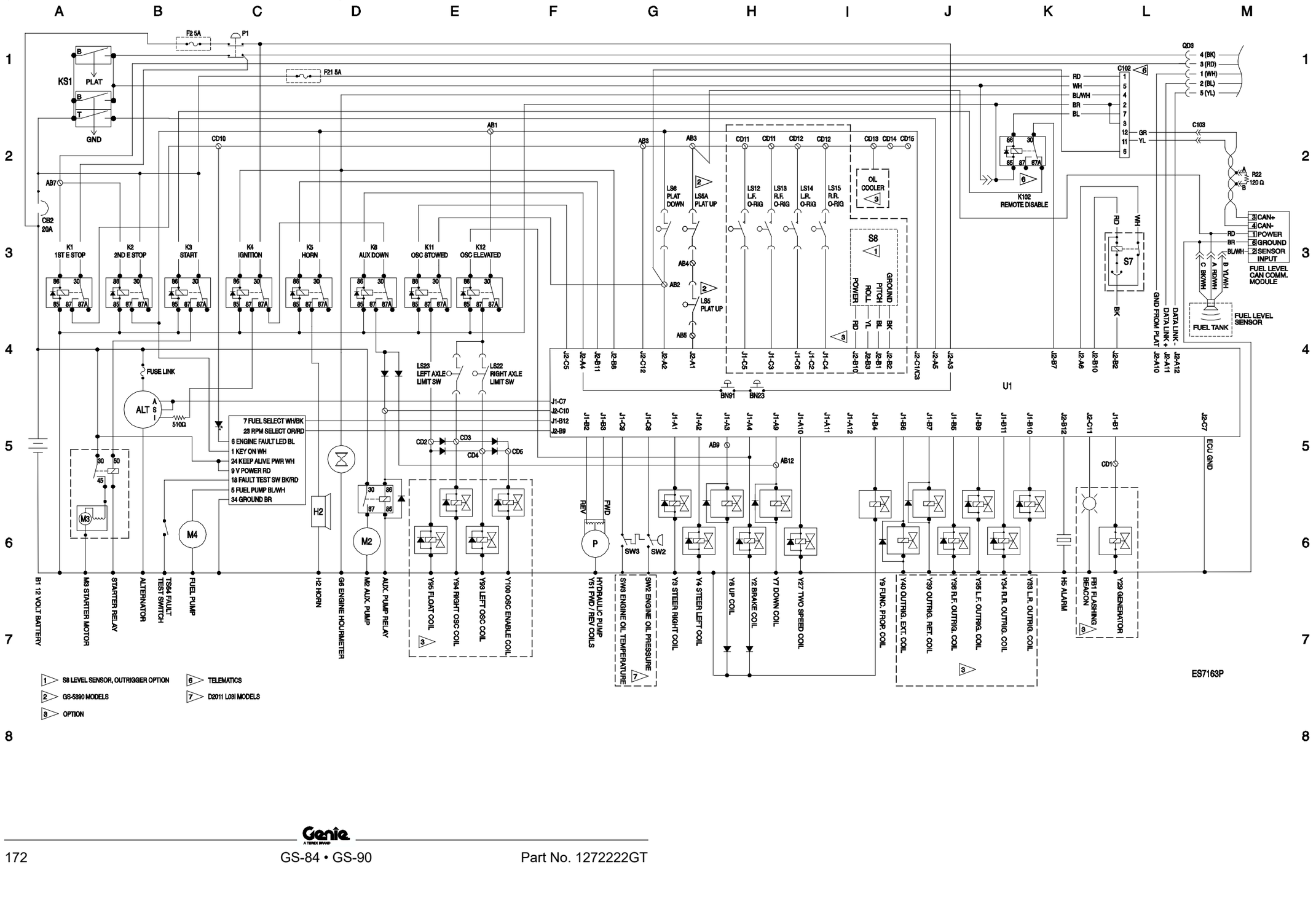
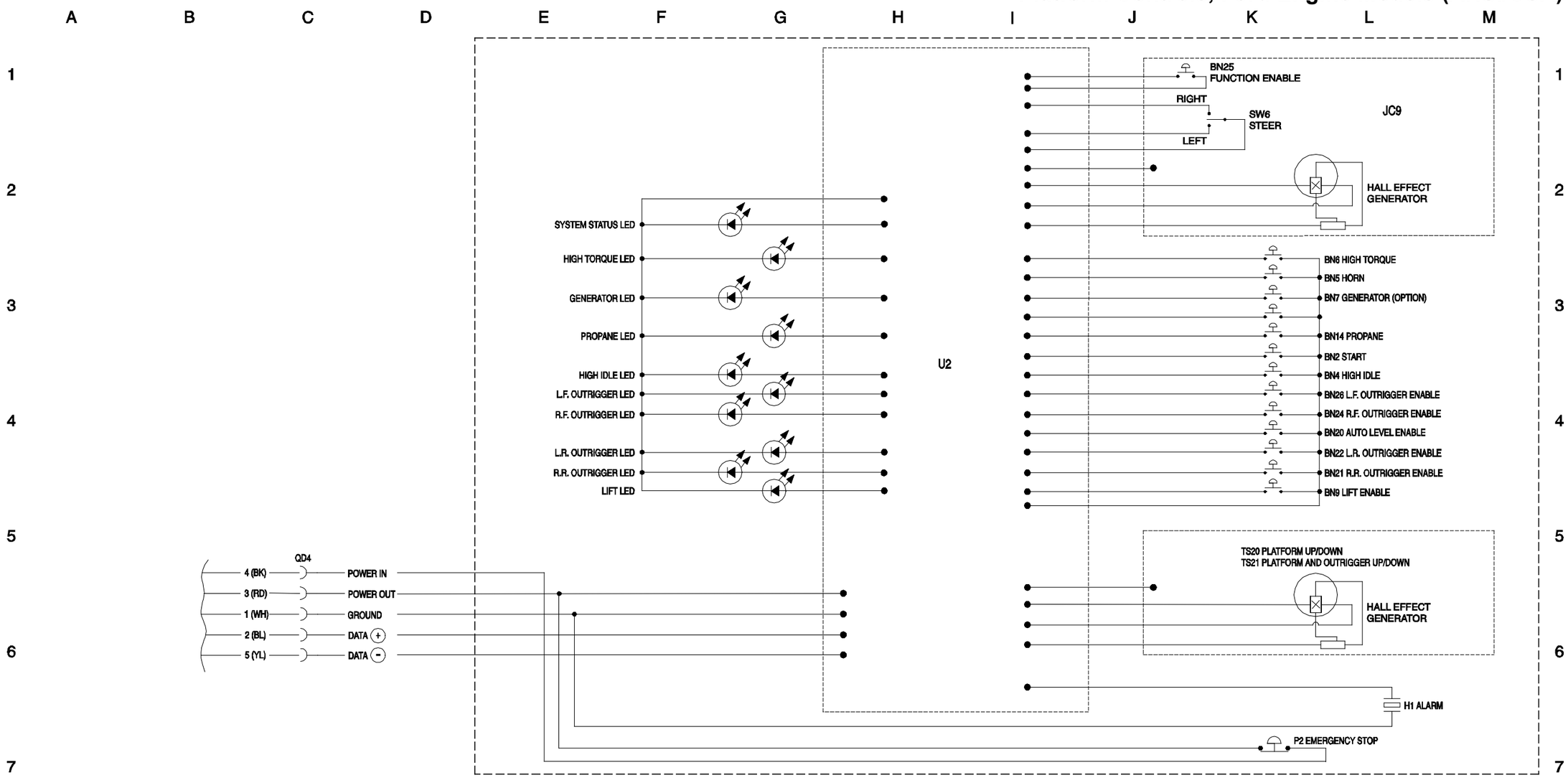


Platform Controls, Ford Engine Models (ANSI/CSA)



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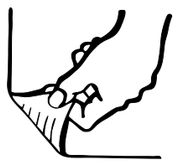

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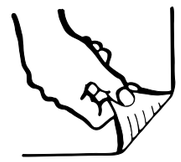

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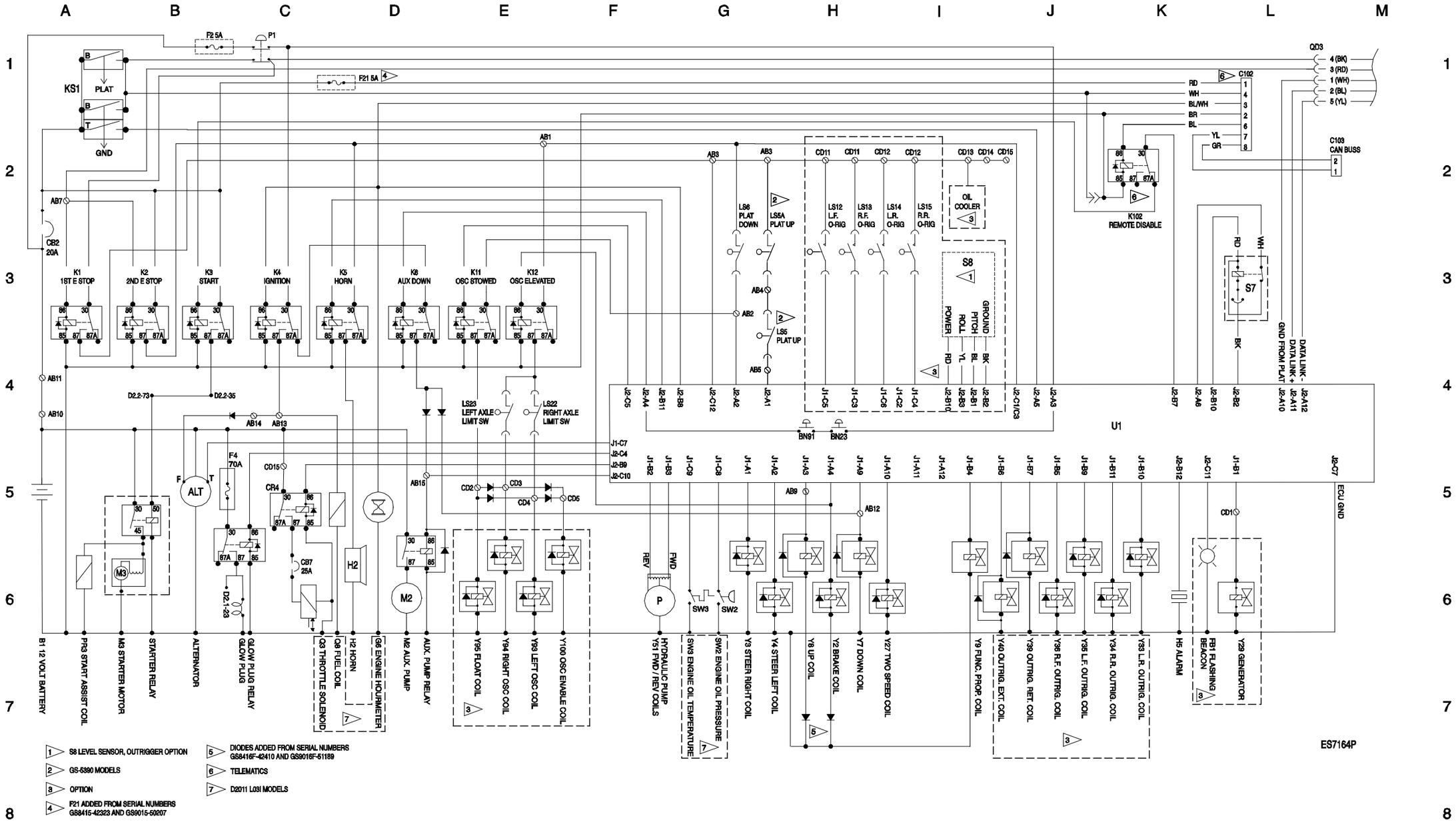
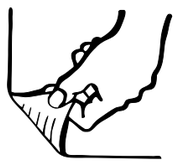


Electrical Schematic, Deutz Engine Models (ANSI/CSA)

(from GS84F-45672 to 45680, GS90D-2777 to 2861, GS90F-54949 to 55081)

Electrical Schematic, Deutz Engine Models (ANSI/CSA)

(from GS84F-45672 to 45680, GS90D-2777 to 2862, GS90F-54949 to 55081)



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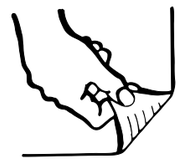
(from GS84F-45681, GS90D-2862, GS90F-55082)



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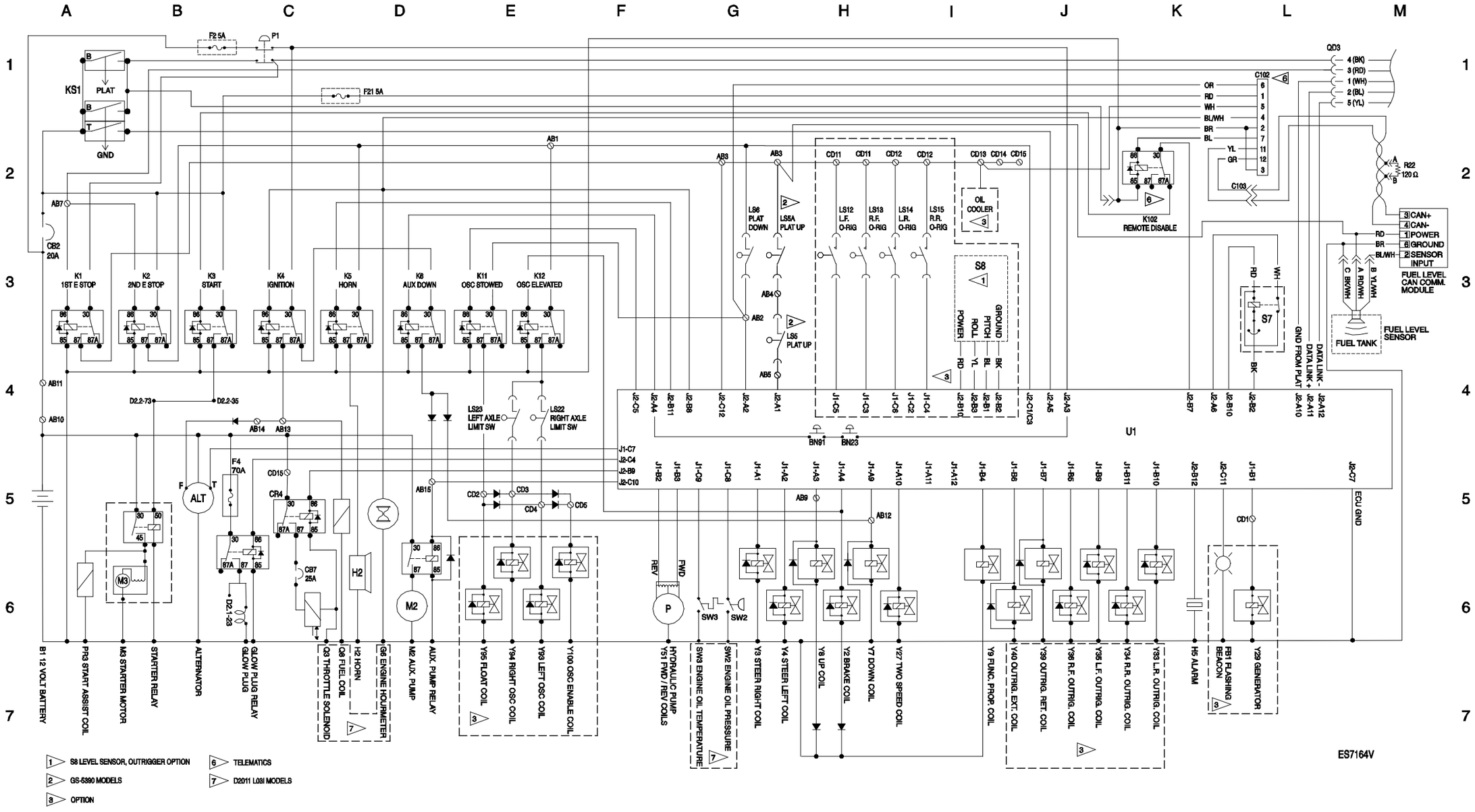
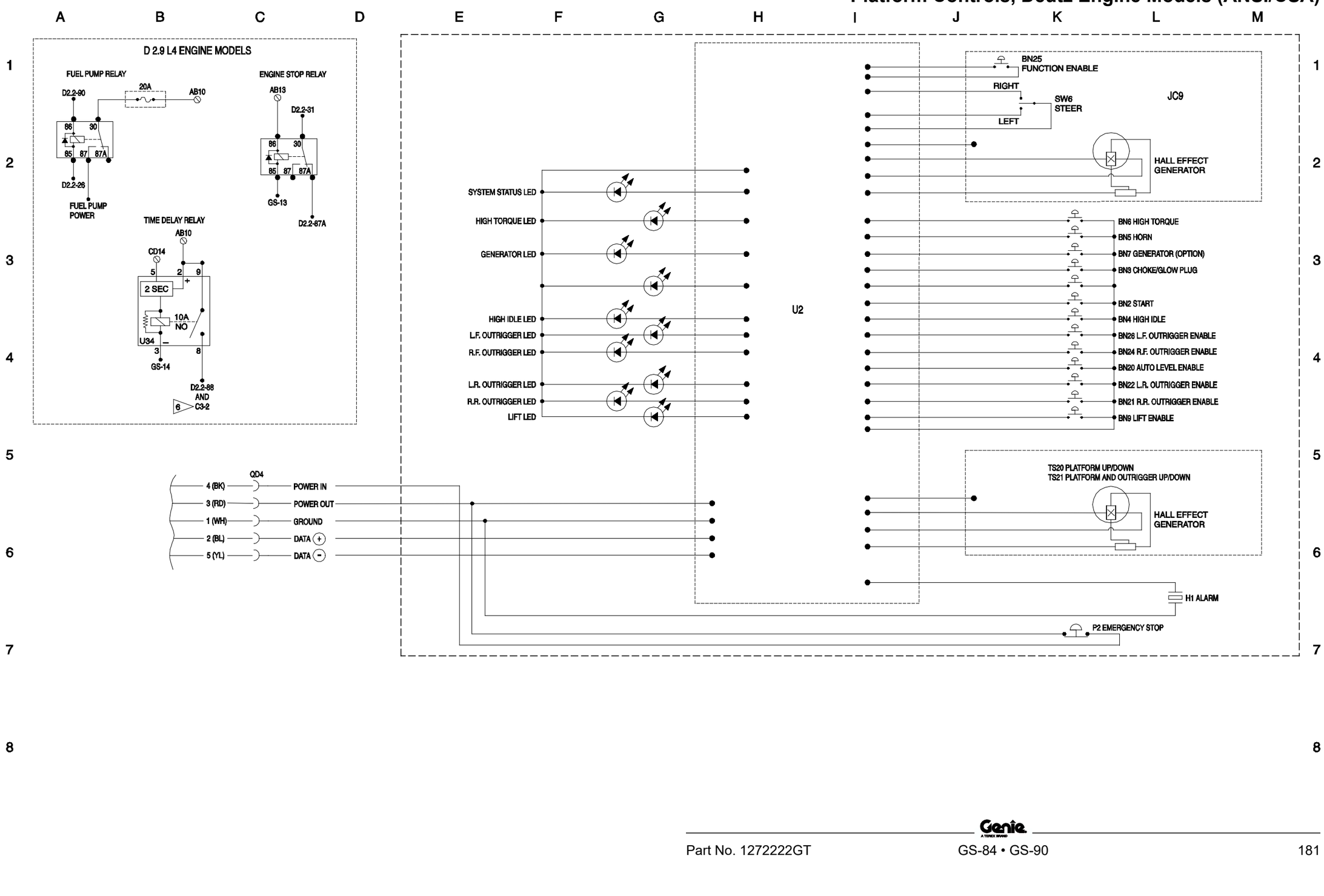


Platform Controls, Deutz Engine Models (ANSI/CSA)



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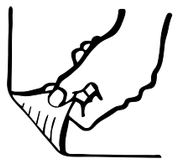

Electrical Schematic, Ford Engine Models (AS/CE)

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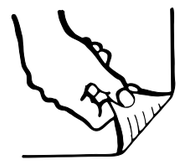

Electrical Schematic, Ford Engine Models (AS/CE)

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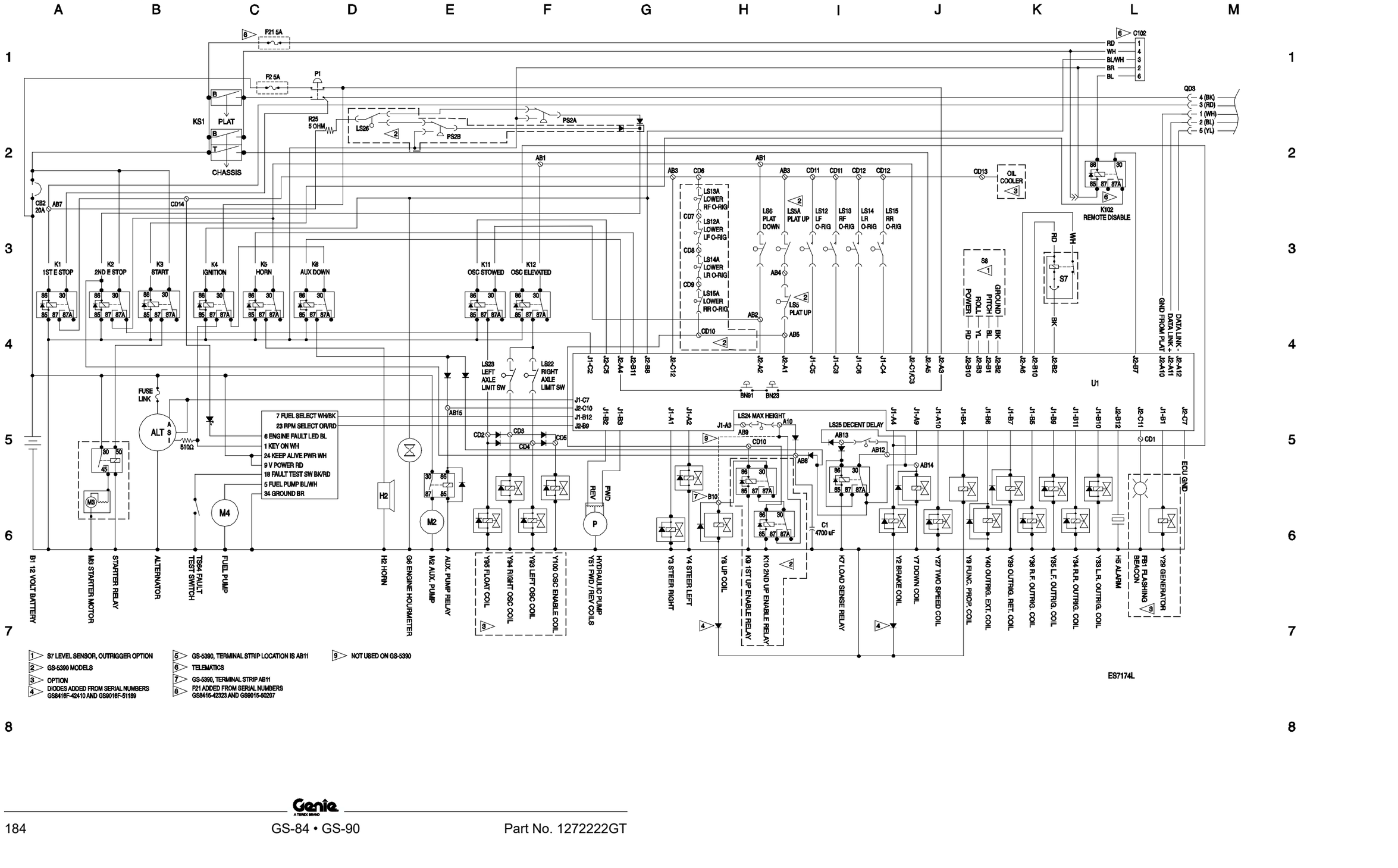
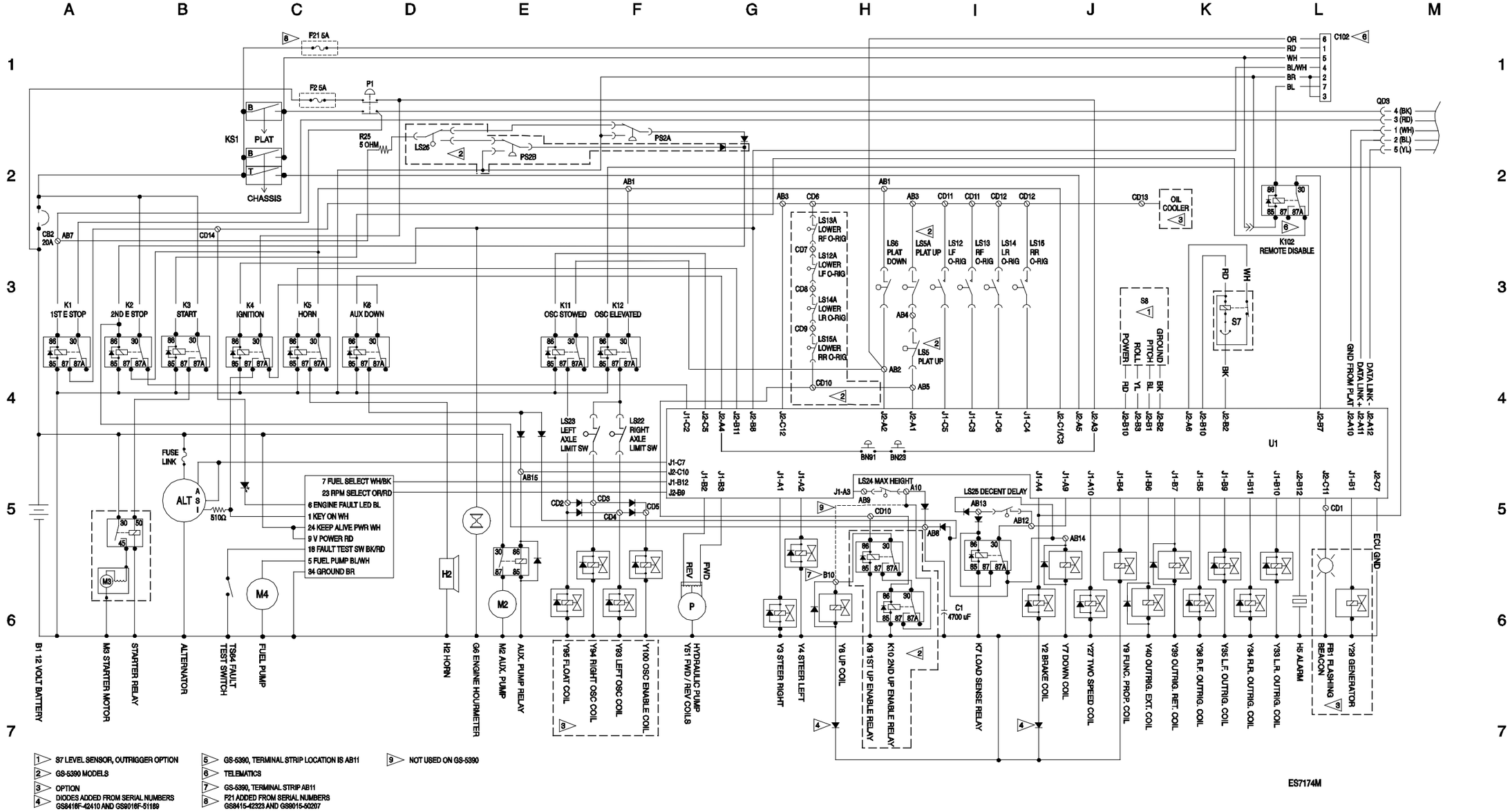


Electrical Schematic, Ford Engine Models (AS/CE)

(from GS84F-54672 to 45680, GS90D-2777 to 2861, GS90F-54949 to 55081)



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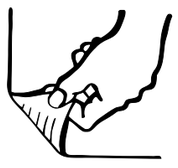

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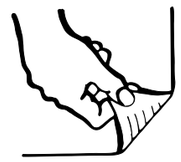
(from GS84F-45681, GS90D-2862, GS90F-55082)



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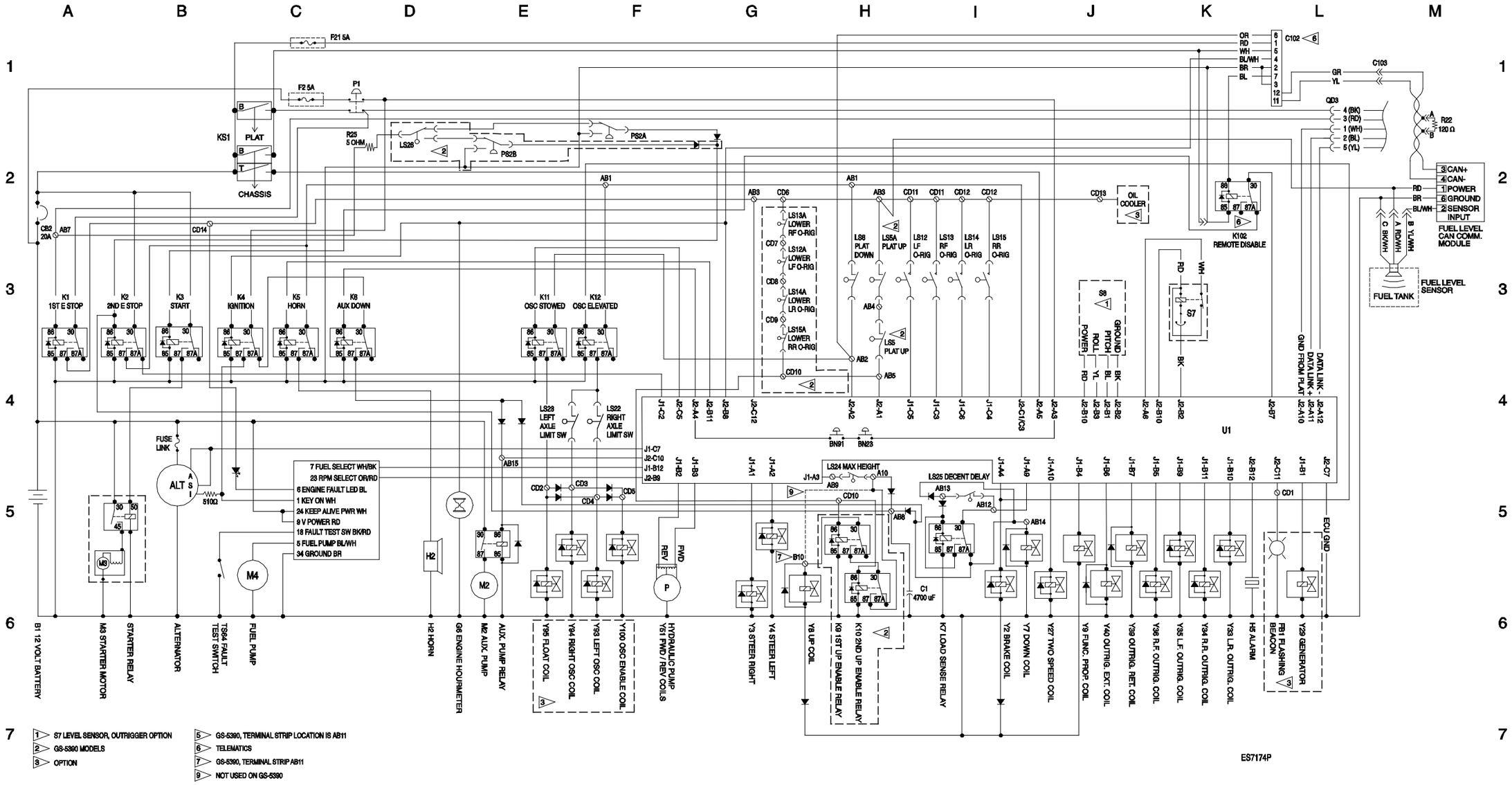
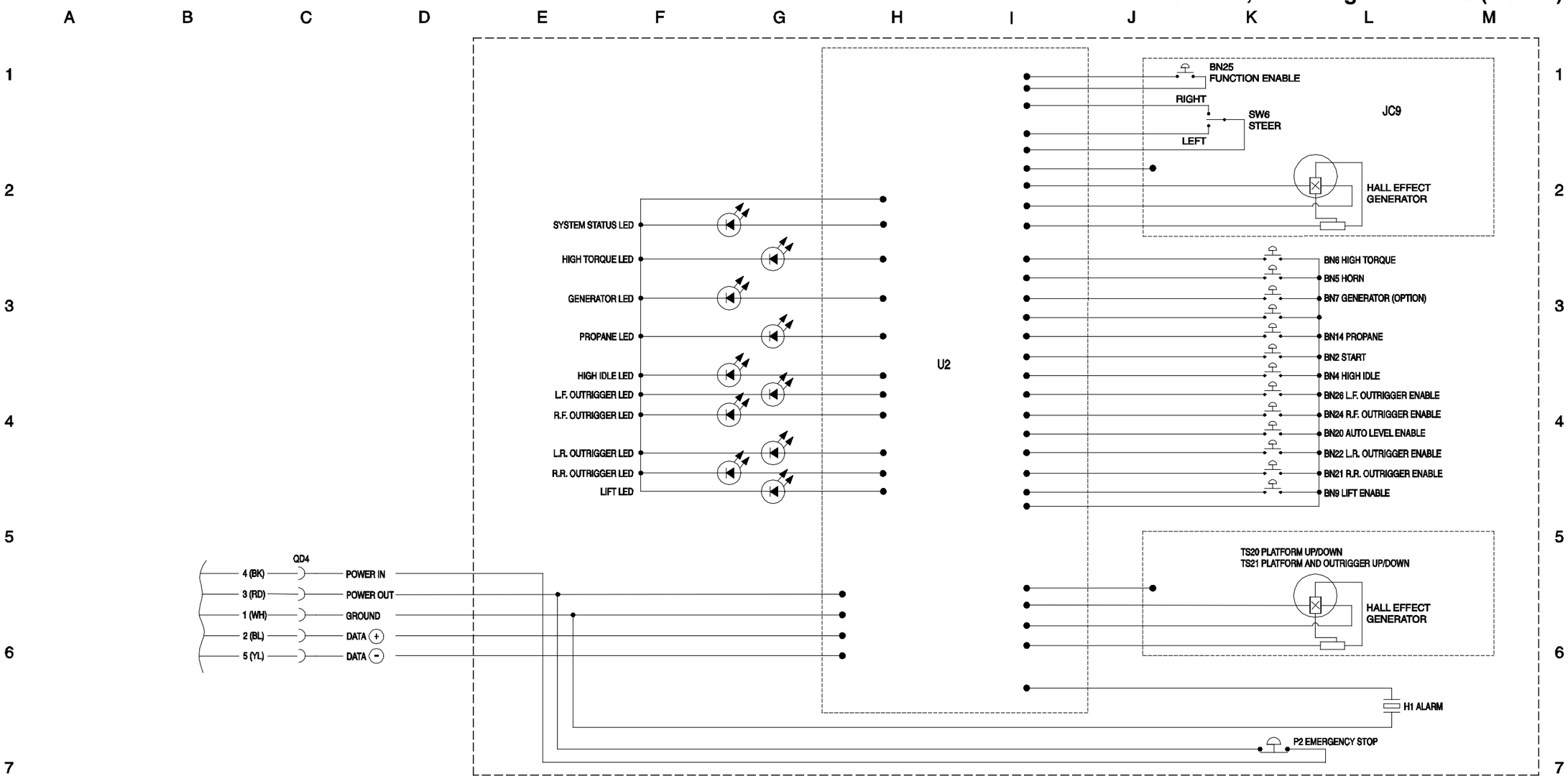
(from GS84F-45681, GS90D-2862, GS90F-55082)



Platform Controls, Ford Engine Models (AS/CE)



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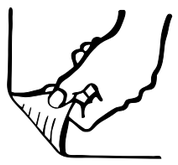

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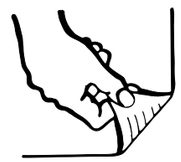

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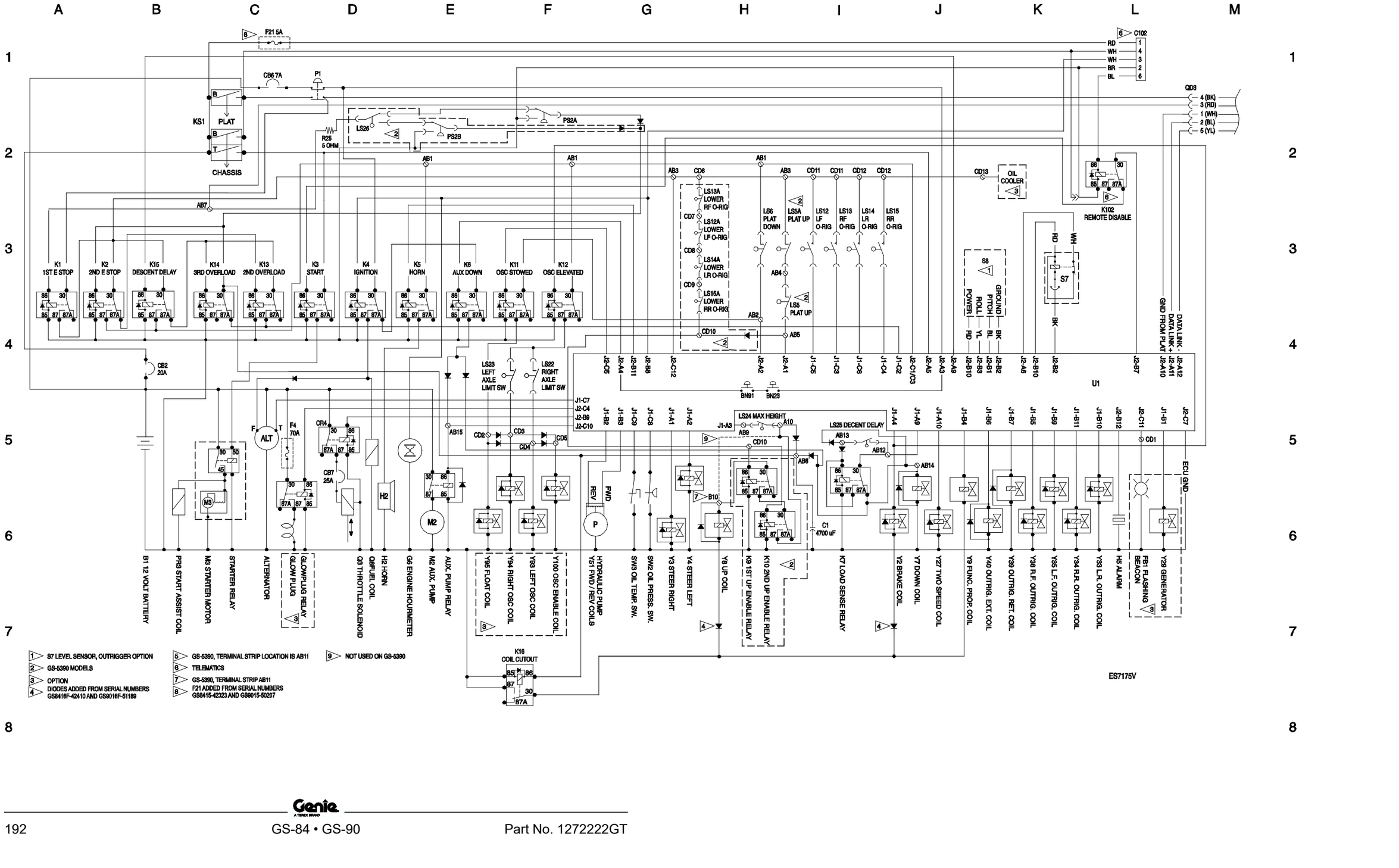

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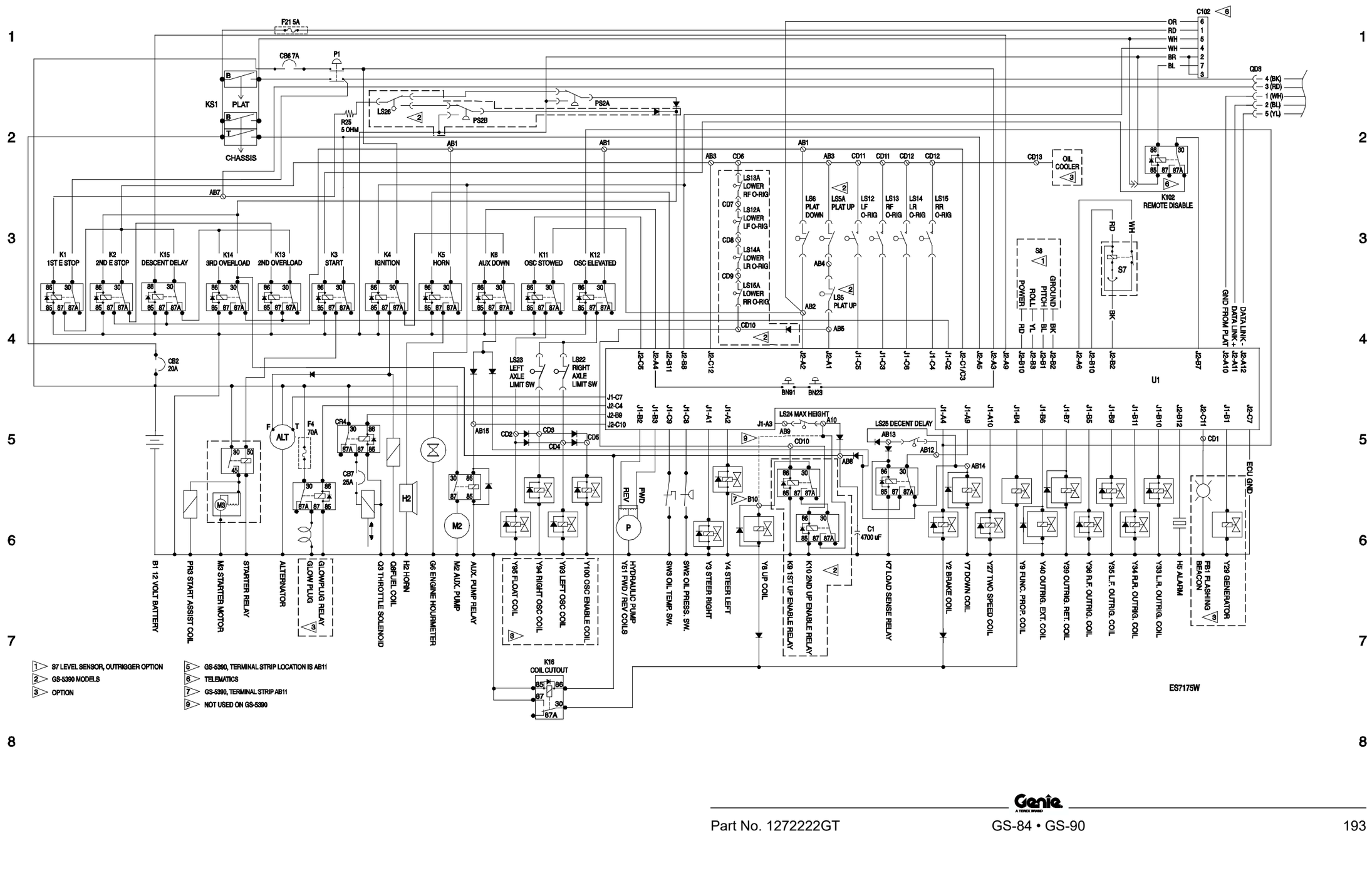
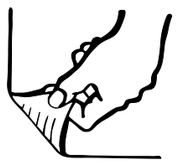
(from GS84F-45672 to 45680, GS90D-2777 to 2861, GS90F-54949 to 55081)



Electrical Schematic, Deutz Engine Models (AS/CE)

(from GS84F-45672 to 45680, GS90D-2777 to 2862, GS90F-54949 to 55081)



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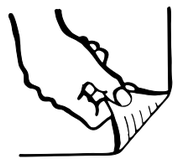
(from GS84F-45681, GS90D-2862, GS90F-55082)



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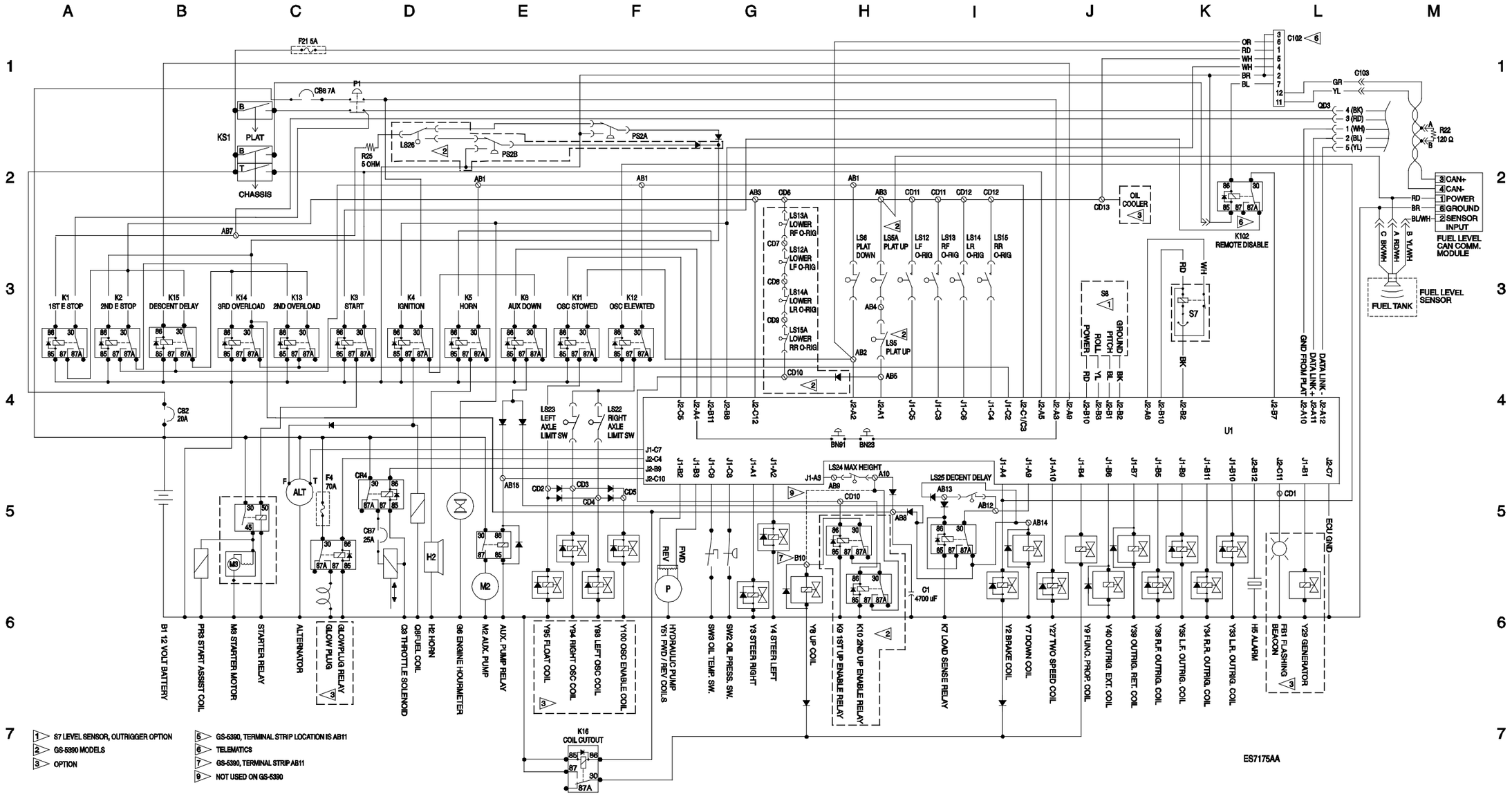
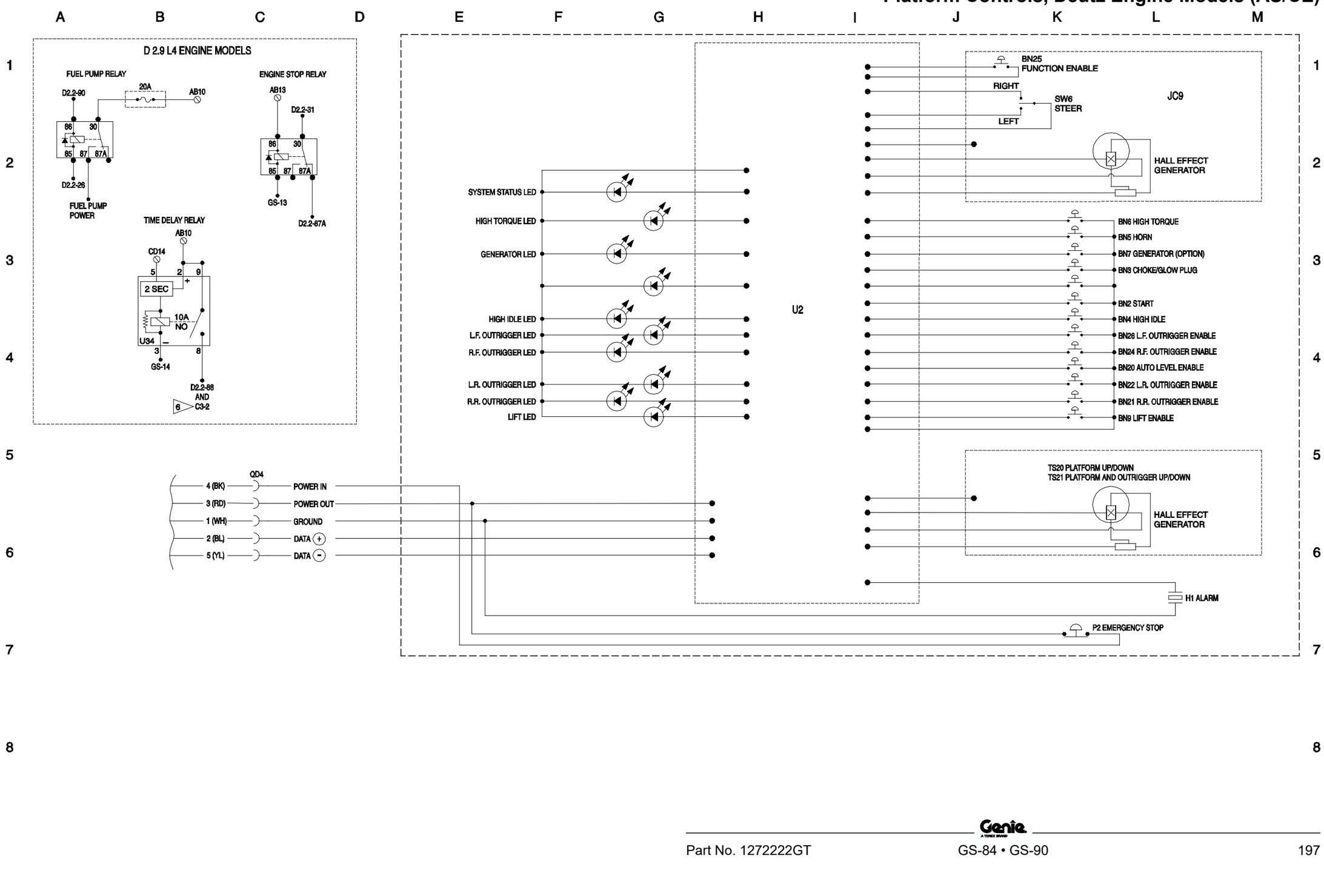


Platform Controls, Deutz Engine Models (AS/CE)



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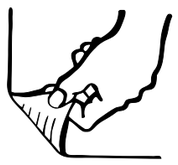

California Proposition 65

WARNING

Operating, servicing and maintaining this equipment can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. These chemicals can be emitted from or contained in other various parts and systems, fluids and some component wear by-products. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your equipment and vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your equipment or vehicle and after operation. For more information go to www.P65Warnings.ca.gov/passenger-vehicle.

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

www.genielift.com

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