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Connector Location			
Connector Number	Schematic Location	Machine Location	
CONN1	F-34	C-13, L-13	
CONN2	J-55, K-35	G-13, L-13	
CONN3	J-15, K-35	C-13, L-13	
CONN4	K-35	C-13, L-13	
CONN5	D-35	D-13, L-13	
CONN12	K-35	B-12, M-12	
CONN13	H-12, K-35	B-12, M-12	
CONN14	F-30	B-12, M-12	
CONN17	K-7	C-6, M-6	
CONN18	F-7	C-6, M-6	
CONN21	F-7	C-6, M-6	
CONN22	F-7	B-6, M-6	
CONN28	B-35	C-14, L-14	
CONN29	B-35	C-14, L-14	
CONN30	C-14	D-15, L-15	
CONN31	F-14, G-3	E-6, M-6	
CONN32	F-14, G-3	E-6, L-6	
CONN33	C-13	D-15, L-15	
CONN34	C-32	F-17, M-17	
CONN35	A-31	D-15, L-15	
CONN36	C-31	D-17, M-17	
CONN37	F-6, D-10	B-12, M-12	
CONN38	A-6, B-6	B-16, L-16	
CONN39		C-14, L-14	

Harness And Wire Electrical Schematic Symbols

Symbols

Pressure Symbol

Temperature Symbol

Level Symbol

Flow Symbol

Circuit Breaker Symbol

Symbols and Definitions

Fuse: A component in an electrical circuit that will open the circuit if too much current flows through it.

Switch (Normally Open): A switch that will close at a specified point (temp, press, etc.). The circle indicates that the component has sense terminals and a wire can be disconnected from it.

Switch (Normally Closed): A switch that will open at a specified point (temp, press, etc.). No circle indicates that the wire cannot be disconnected from the component.

Ground (Wire): This indicates that the component is connected to a grounded wire. The grounded wire is fastened to the machine.

Ground (Case): This indicates that the ground is not directly wired to connect. It is grounded by being fastened to the machine.

Reed Switch: A switch whose contacts are controlled by a magnet. A magnet closes the contacts or a normally open reed switch; it opens the contacts of a normally closed reed switch.

Sensor: A component that is used with the temperature or pressure gauge. The sensor measures the temperature or pressure. Its resistance change is given an indication to the gauge via temperature or pressure.

Relay (Magnetic): A relay is an electrical component that is actuated by electricity. It has a coil that makes an electromagnet when current flows through it. The electromagnet can open or close the switch part of the relay.

Solenoid: A solenoid is an electrical component that is actuated by electricity. It is a coil that makes an electromagnet when current flows through it. The electromagnet can open or close the switch part of the relay.

MAGNETIC LATCH SOLENOID: A magnetic latch solenoid is an electrical component that actuates electrically and holds actuated by a permanent magnet. It has two coils (each with polarity) that make electromagnets when current flows through them. It also has an internal switch that places the latch coil circuit open at the time the coil becomes energized.

Harness and Wire Symbols

Dash connector: Typical representation of a dash connector. Connects harness wires and the microcable connects at pins.

See-Saw Connector: Typical representation of a See-Saw connector. The plug or receptacle connects both pins and isolates.

Wife, Cable, or Sensor Accessory
Includes Terminals and Connectors
Connector Accessory Codes

Harness Wires and Cables
Includes Terminals and Connectors
For "Consumers" and Terminal Indicators which are not included in the CC - 12's

C-C-A AG-CG
130-500 130-700

No. Part Number
for Conductor
to Ground

325 AG-15-13P-14R

AG-CA 1L-700B
3L-512

C12
Pin Number for
Consumer Accessory

9X-1123
Pin Number for
Accessory

CC-12
Conductor
Number

Single-Wire
Connector

Socket

Resistor(s)

Ground
Symbol

Cross Identification
Symbol

200-132 BK-14

Wire Gauge

Terminal Identification Code
The number indicates wire
size in American Wire
Gauge (AWG).

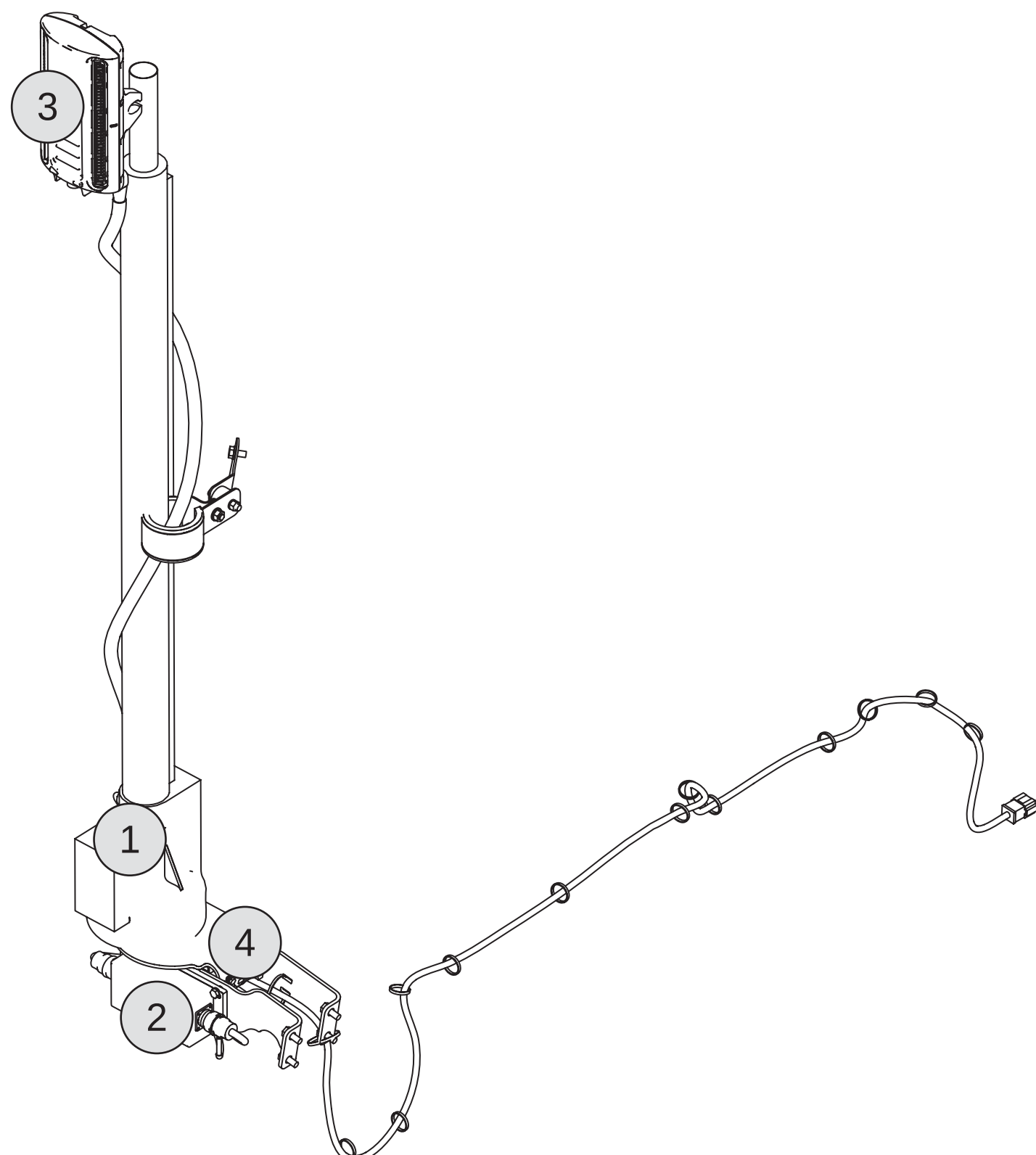
Deutsch connector: Typical representation of a Deutsch connector. The plug contains all

Off Machine Switch Specification				
Part No.	Function	Actuate	Deactuate	Contact Position
131-9203	Ride Control Pressure Switch	3500 kPa MAX (257.0 psi MAX)	1500 ± 150 kPa (207.1 ± 21.5 psi)	Normally Open
230-6923	A/C Refrigerant Switch	275 kPa MAX ¹ (40 psi)	170 ± 55 kPa (24.6 ± 8 psi)	Normally Open ¹
119-9631	Thermostat Switch	-0.6 ± 1.4°C (31.6 ± 2.5°F)	4.2 ± 1.4°C (39.6 ± 2.5°F)	Normally Closed

Resistor, Sender and Solenoid Specifications			
Part No.	Component Description	Resistance (Ohms) ¹	
AW-9972	Sender: Cool Temperature	54°C (127°F): 950 to 715	
SC-0020	Solenoid: RTD Load Valve	110°C (230°F): 72 to 82	
251-3231	Sender: Fuel Line (R&M)	21.8 ± 1.0	Empty: 240 to 350
249-7100	Solenoid: Left Side Shift, Right Side Shift	10.3 ± 0.6	
244-3106	Sender: Cockpit Temperature	54°C (127°F): 560 to 715	
298-8987	Resistor: Exhaust	110°C (230°F): 72 to 82	
	Resistor: Coolant	120 ± 6	
216-1566	Sender: Fuel Line (M&C)	Empty: 240 to 350	Full: 70 to 130
214-0302	Solenoid: A/C Compressor Clutch	3.2	

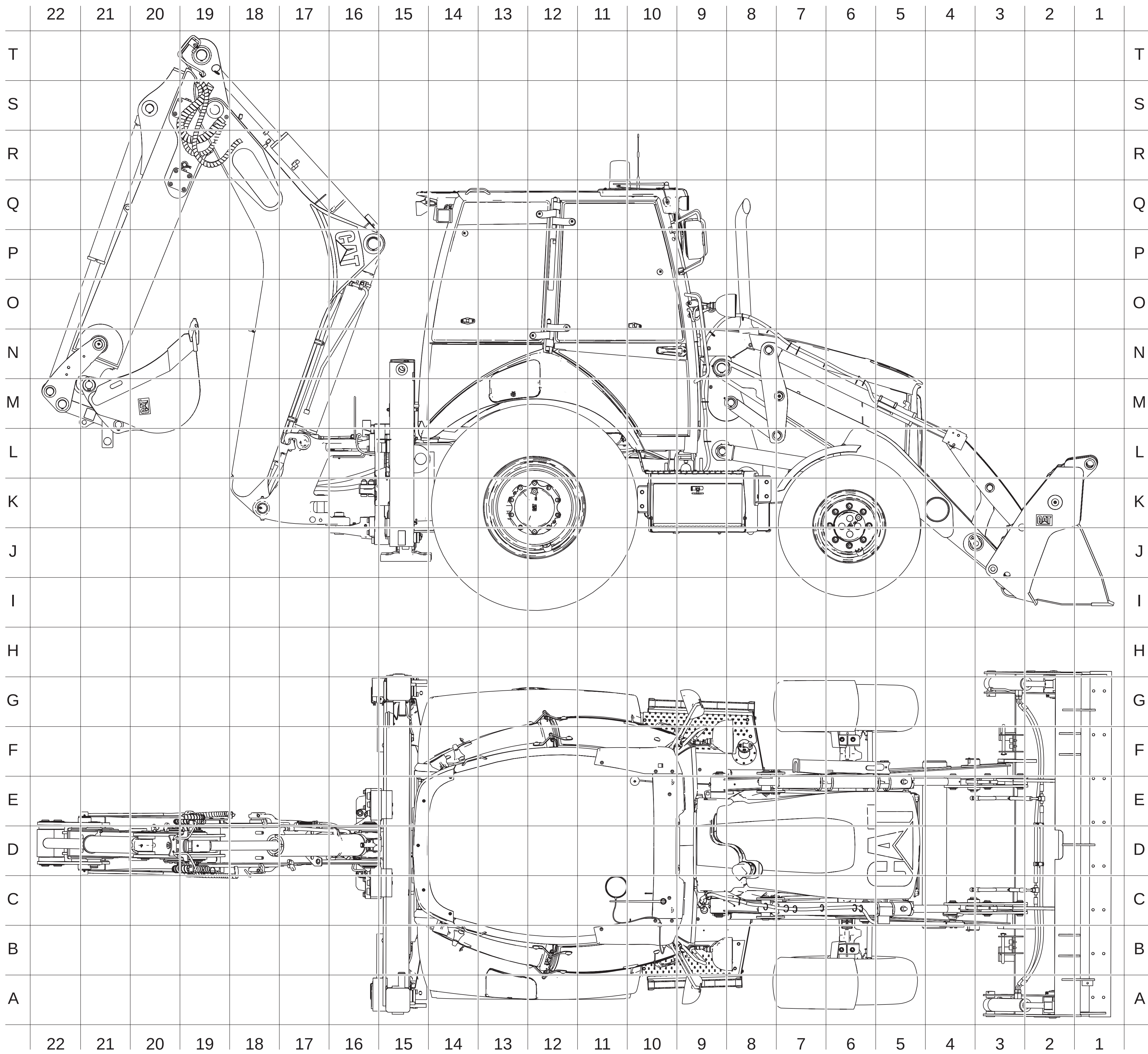
Component Identifiers (CID) ¹	
Module Identifier (MID) ²	
Machine Control Module (MID No. 053)	
CID	Component
1482	10 Volt Sensor/DC Power Supply
1586	Buckley Cylinder Position Sensor
1587	Clack Cylinder Position Sensor
1590	Extensometer Stick Cylinder Position Sensor
1599	Stick Cylinder Position Sensor
2106	Hot Swing Angle Sensor
MIDS Main Module (MID No. 053)	
CID	Component
820	Keyboard
871	Indicator System
2400	Laser Receiver
2403	Main Position
2405	Machine Control Module
2452	Laser Send Module Power Relay

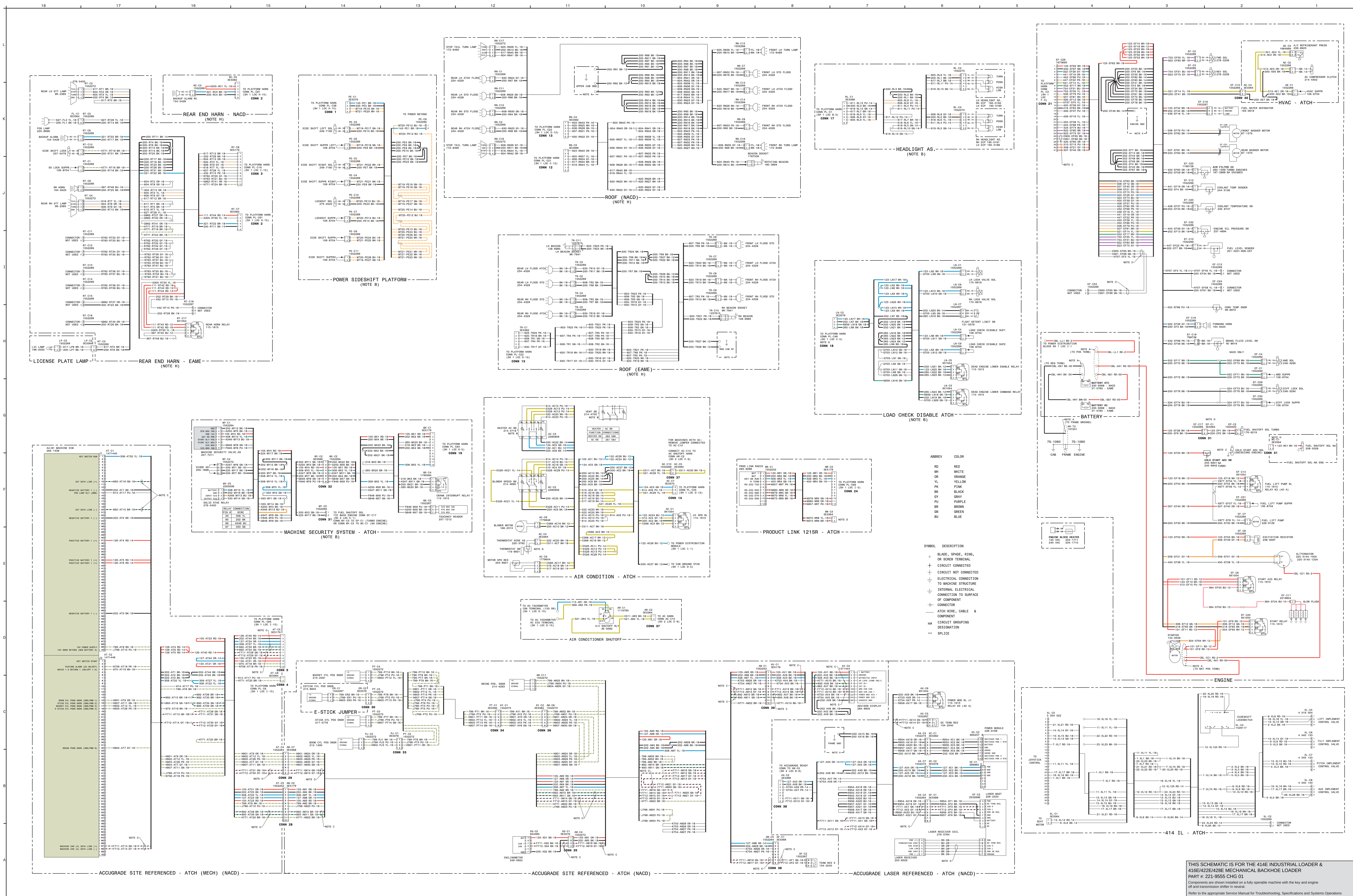
Related Electrical Service Manuals	
Title	Form Number
Electric Starting Motor: 143-0539	SEN93828
Machine ECM:	REN96488
Engine Troubleshooting:	REN92417
AccuGrade Laser System:	KEN96051



Accugrade (ATCH) Component Locations

Failure Mode Identifiers (FMI)	
FMI No.	Failure Description
01	Data valid but above normal operational range.
02	Data valid but below normal operational range.
03	Data erratic, intermittent, or incorrect.
04	Voltage above normal or shorted high.
05	Voltage below normal or shorted low.
06	Current below normal or open circuit.
07	Current above normal or grounded circuit.
08	Mechanical system not responding properly.
09	Abnormal frequency, pulse width, or period.
10	Abnormal update.
11	Abnormal rate of change.
12	Failure mode not identifiable.
13	Bad device or component.
14	Out of calibration.
15	Reserved.





THIS SCHEMATIC IS FOR THE 414E INDUSTRIAL LOADER & 416E/422E/428E MECHANICAL BACKHOE LOADER
PART #: 221-9555 CHG 01
Components are shown installed on a fully operable machine with the key and engine off and transmission in neutral.
Refer to the appropriate Service Manual for Troubleshooting, Specifications and Systems Operations

WIRE GROUP	DESCRIPTION
RED	BLADE, SPARE, REND, OR SCREEN TERMINAL
WHITE	CIRCUIT CONNECTED TO MACHINE STRUCTURE
ORANGE	ELECTRICAL CONNECTION TO MACHINE STRUCTURE
YELLOW	INTERNAL ELECTRICAL CONNECTION TO SURFACE OF COMPONENT
BLACK	ATCH WIRE, CABLE & COMPONENT
GRAY	CIRCUIT GROUPING DESIGNATION
PURPLE	SLIDE
BROWN	SLIDE
BLUE	SLIDE