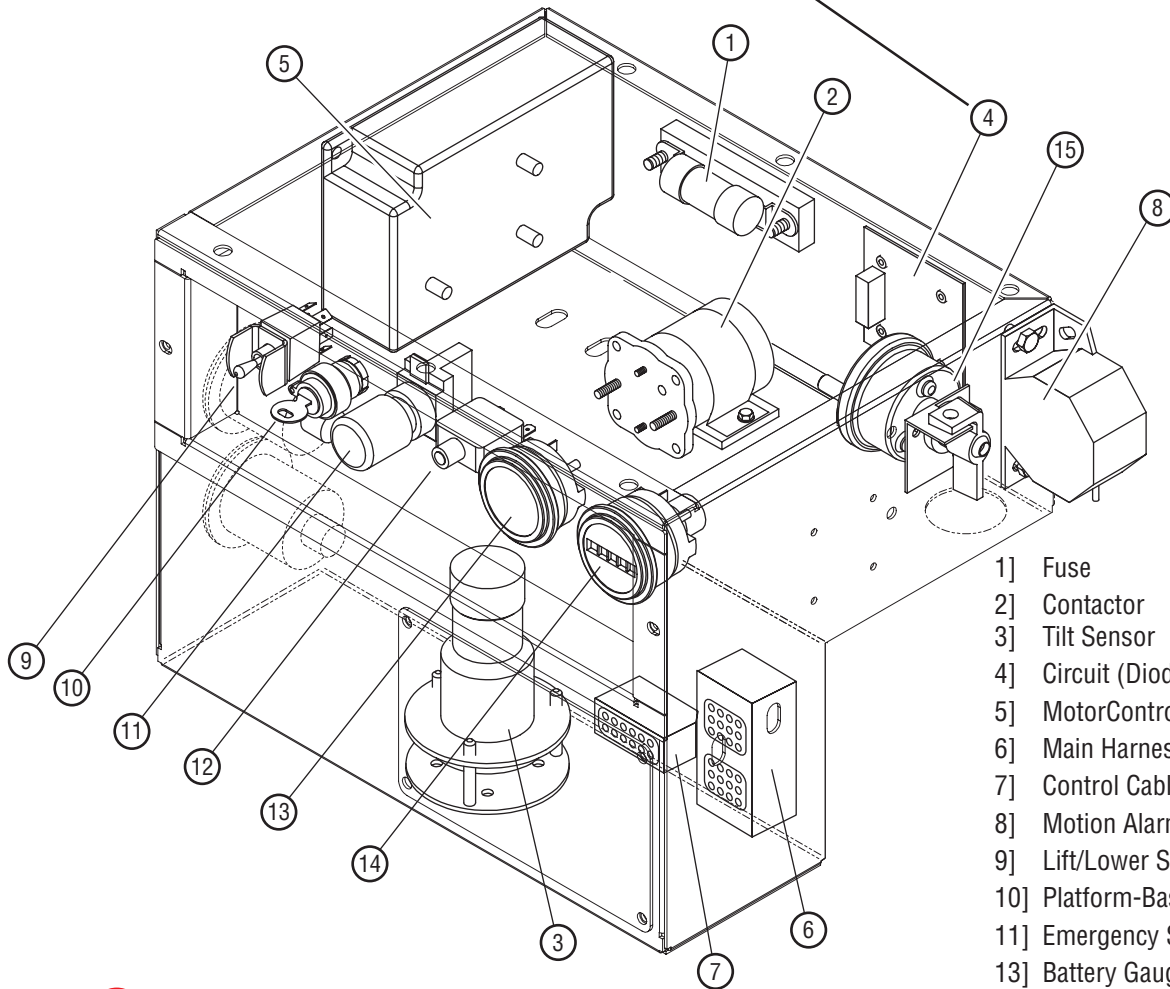


J1 Plug Pin Identification

PIN #	WIRE #	SIGNAL	FUNCTION
1	10	INPUT	Drive Reverse
2	11	INPUT	Drive Forward
3	19	OUTPUT	Brake, Decel Valve signal
4	8	INPUT	Steer Left
5	18	OUTPUT	Steer signal to Sevcon
6	5	INPUT	Down signal
7	20	OUTPUT	Signal to Motion Alarm(s) (optional)
8	17	OUTPUT	Sevcon & Hour Meter (motor function requested)
9	15	INPUT	Battery Negative
10	7	INPUT	Steer Right
11	4	INPUT	Lift Up
12	2	INPUT	Limit Switch (24V = platform down)
13	3	OUTPUT	Enable, from lower Lift switch
14	21	OUTPUT	To Sevcon (for speed cutback)

MEC
ILLUSTRATION No.
ART_2181



- 1] Fuse
- 2] Contactor
- 3] Tilt Sensor
- 4] Circuit (Diode) Board
- 5] MotorControl Unit
- 6] Main Harness Connection
- 7] Control Cable Connection
- 8] Motion Alarm (option)
- 9] Lift/Lower Switch
- 10] Platform-Base Selector
- 11] Emergency Stop Switch
- 13] Battery Gauge
- 14] Hour Meter
- 15] Battery Cutoff Switch

MEC
ILLUSTRATION No.
ART_2233



SEVCON MOTOR SPEED CONTROLLER


The Sevcon Motor Speed Controller (MC-1) is a microprocessor designed with the express purpose of operating the D/C electric motor at varying speeds. The controller uses Pulse-Width Modulation (PWM) technology on the Ground side of the motor to control motor speed. Out of concern for operator safety and to prevent short-circuiting, the Controller monitors certain circuits for potential abnormalities. When the controller senses a problem it errs to the side of safety and stops all motor operation. The green LED will flash a code indicating the reason for the shutdown.

Refer to the *LED Diagnostics Definitions* and *Sevcon Motor Speed Controller - Connections* on the following pages.

The diagram shows the Sevcon Motor Speed Controller (MC-1) with its terminal block and a plug. The terminal block has three terminals labeled B+, B-, and M2. The plug has 12 pins numbered 1 through 12. A green LED is located on the top of the controller. The plug is connected to the terminal block.

Cable Connection Identification	
B+	Battery Positive Cable from 250 AMP Fuse
B-	Negative Battery Cable and GROUND wire (15) connection
M2	Motor Ground (Pulse-Width Modulated [PWM] variable speed control)

MC-1 Plug Pin Identification		
PIN #	WIRE #	FUNCTION
1	22	B+ power input (power up)
2	17	Lift, Drive or Steer functions input (functions requiring motor)
3	18	Steer Requested (adds additional motor speed for steer)
4	3	Enable Switch signal input
5	21	Speed cut-back (24 Volts = full speed, 0 Volts = creep speed)
6	16	Motor Start Relay signal (GROUND signal to activate Motor Start Relay)
7	41	Lift Valve B- (provides GROUND signal to Lift Valve)
8	none	none
9	14	Accelerator reference signal (3.6 Volts to Potentiometer)
10	none	none
11	none	none
12	none	none


 ILLUSTRATION No.
 ART_2182

LED Diagnostics Definitions (Flash Codes)

LED READING	DIAGNOSIS
LED Steady On	Controller is operational and detects no irregularities on monitored circuits.
LED Off	<p>No power-up</p> <ul style="list-style-type: none"> • No power to pin # 1. • No ground to B- post. • LED failure or internal controller fault.
2 Flashes	<p>Procedure fault.</p> <ul style="list-style-type: none"> • Enable depressed at power up. • Enable depressed for more then 15 seconds without function request. • No signal on wire 17 pin # 2 when function requested. • No B- to diode board. • Failed diode/s. • Damaged wire harness. • Internal controller fault.
3 Flashes	<p>Motor circuit low.</p> <p>Set with unit at rest and is the result of the voltage at M-2 dropping to approximately 4 volts or lower. Possible causes:</p> <ul style="list-style-type: none"> • Short to ground in the motor circuit between the motor contactor and the M-2 terminal.
4 Flashes	<p>Motor circuit high.</p> <p>Set with the unit at rest and is the result of the voltage at M-2 terminal rising above 21 volts. Possible causes:</p> <ul style="list-style-type: none"> • Motor contactor points are welded shut
5 Flashes	<p>Motor contactor circuit open.</p> <p>Set when a function is requested but no current can flow through the motor circuit to the M-2 terminal. Possible causes:</p> <ul style="list-style-type: none"> • Blown 200 amp fuse • Malfunctioning motor contactor • Worn motor brushes • Incomplete circuit to the Sevcon pin #6 <p>If the motor and contactor circuits are diagnosed as working properly:</p> <ul style="list-style-type: none"> • Sevcon internal fault

continued...

LED Diagnostics Definitions (continued)

LED READING	DIAGNOSIS
<p>6 Flashes</p>	<p>Accelerator fault. Set with unit at rest, a 6 flash will result in an 80% cutback of motor speed. The Accelerator is the proportional control circuitry for the Sevcon. It works in conjunction with the potentiometer located in the upper control box, which is connected to the joystick handle through a gear arrangement.</p> <p>Measure voltage at terminals 14 and 15 on the platform terminal strip or at the potentiometer plug connection.</p> <ul style="list-style-type: none"> • With the joystick handle in neutral, 3.6 volts should be measured on the accelerator circuit (wire #14). • Voltage proportionally decreases with the travel of the joystick, with 0 volts at full stroke. • With the joystick centered, voltages lower than 3.1 or higher than 3.9 will trigger a (6 flash) code.
<p>7 Flashes</p>	<p>Battery voltage fault.</p> <ul style="list-style-type: none"> • This includes battery voltage below 12 volts or above 45 volts as measured on pin #1. • This code will disable all functions.
<p>8 Flashes</p>	<p>Thermal cutback.</p> <ul style="list-style-type: none"> • Sevcon internal temperatures above 176 degrees F. • Will limit motor speed in comparison with over temperature. • Resets when cooled.
<p>9 Flashes</p>	<p>Battery voltage at or below 18 volts</p> <ul style="list-style-type: none"> • As measured on pin #1. • This code will interrupt or prevent lift function but will allow drive and steer functions. <p>When lift is interrupted due to a 9 flash, the electric motor will still run.</p>



Sevcon Motor Speed Controller - Connections

The following two pages describe the connections to the Sevcon Motor Speed Controller with a brief description of their function and the voltage measurements under normal conditions.

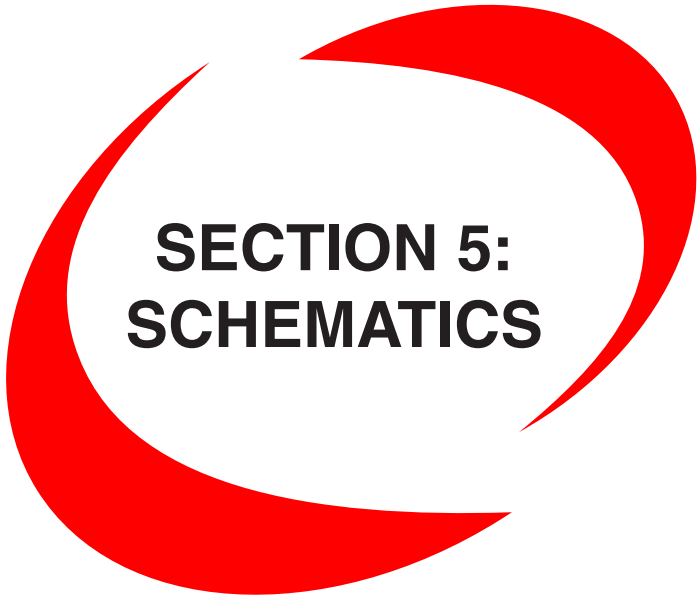
Important: Batteries must be fully charged before troubleshooting!
A fully charged battery set on a 24 V DC system will have a nominal voltage of 25.6 V DC

FUNCTION	VOLTAGE READING
PIN 1 – WIRE 22 (WIRE 9 ON EARLY UNITS)	
Battery Positive Input	Switched 5% less than battery voltage <ul style="list-style-type: none"> • Controller power-up and reference point for battery state-of-charge. • Green LED indicates controller power-up. • Power travels through the upper emergency-stop switch with upper controls selected. • 7-Flash code and 9-flash code indicate low voltage at this terminal.
Pin 2 Wire 17	
Lift, Drive or Steer functions requested	Motorized function is requested 15%-18% less than battery voltage <ul style="list-style-type: none"> • Controller begins the motor run sequence with this signal but still requires a signal on pin 4 and a change on pin 9 before the motor will operate.
Pin 3 Wire 18	
Steer Function Requested	When steering is operated 15%-18% less than battery voltage <ul style="list-style-type: none"> • Adds motor speed to compensate for addition of steer requirement during drive operation. • Provides a minimum motor speed for steer requirement when only steer is operated.
Pin 4 Wire 3	
Enable signal input	When joystick trigger pulled 5% less than battery voltage. <ul style="list-style-type: none"> • Motor will not start without this input • A signal here longer then 15 seconds without a signal on pin-2 or pin-3 will result in a 2-flash code failure.
Pin 5 Wire 21	
Speed cut-back signal from limit switch or Lift circuit	Full speed: 24 V DC Creep speed: 0 V DC. <ul style="list-style-type: none"> • Speed cut-back is the elevated drive speed.



Sevcon Motor Speed Controller - Connections (continued)

FUNCTION	VOLTAGE READING
PIN 6 – WIRE 16	
Motor Start Relay ground signal	<p>Idle: 24 V DC</p> <p>When function requested: 0 V DC.</p> <ul style="list-style-type: none"> • This is how the Controller maintains control over the motor circuit. • Sevcon controls the Motor Start Relay function ground signal. • Will not operate the motor start relay when 2, 3, 4 & 7 flash codes occur.
PIN 7 – WIRE 41	
Ground signal to Lift solenoid valve	<p>0 volts</p> <p>No ground presence until lift is requested.</p> <ul style="list-style-type: none"> • By providing the ground signal, lift function can be prevented anytime battery voltage falls below 18 volts. This will result in a 9 flash code.
PIN 9 – WIRE 14	
Accelerator reference signal to the potentiometer (upper control box)	<p>From 3.5 V DC with joystick in the neutral to 0 V DC at full stroke.</p> <ul style="list-style-type: none"> • Controller uses this circuit to monitor joystick input after pins 2 & 4 energize. • Controls motor speed in reference to the voltage on this circuit. • Voltages above 4.0 V DC or below 3.0 V DC will result in a 6 flash code.
POST B+	
Battery positive cable from 200 amp fuse	<p>Full battery voltage.</p> <ul style="list-style-type: none"> • No real diagnostic value.
POST B–	
Battery positive cable from 200 amp fuse	<p>Battery ground cable connection</p> <p>Ground path for motor operation</p> <ul style="list-style-type: none"> • All system ground wires (wire #s 15 & 15A) terminate here. • Best place to connect ground lead from multi-meter while troubleshooting.
POST M-2	
PWM controlled motor ground	<p>Idle: 12 V DC – 13 V DC</p> <p>During operation, between 5 V DC & 24 V DC.</p> <ul style="list-style-type: none"> • 12 – 13 volts is reference voltage used by the controller to monitor motor circuit irregularities at idle. • 0 volts at idle = 3 flash code • Above 20 volts at idle = 4 flash code • No voltage change after Motor Start Relay signal = 5 flash code.

A large, stylized red graphic consisting of two curved, overlapping shapes that form a partial circle, framing the central text.

SECTION 5: SCHEMATICS

Hydraulic Schematics 5-2

- 2033ES - Serial # 8804000 - 8804099
- 2633ES - Serial # 11100000 - 11100599 5-2
- 2033ES - Serial # 8804100 - CURRENT
- 2633ES - Serial # 11101000 - CURRENT 5-4

Electric Schematics 5-9

- 2033ES, S/N 8804000 - 8804099
- 2633ES, S/N 11100000 - 11100599 5-10
- 2033ES, S/N 8805000 - Current
- 2633ES, S/N 11101000 - Current 5-12



HYDRAULIC SCHEMATICS

2033ES - Serial # 8804000 - 8804099

2633ES - Serial # 11100000 - 11100599

ITEM	DESCRIPTION	Location
CBV1	Counterbalance Valve	Main Manifold (MA-1)
CV1	Check Valve	Main Manifold (MA-1)
CYL1	Steering Cylinder	Machine Base, Front
CYL2	Lift Cylinder, 2047, 2647	Scissor Assembly
FD1	Flow Divider	Main Manifold (MA-1)
HP1	Hand Pump, Brakes	Brake Release Manifold (MA-2)
MA-1	Main Manifold Assembly	Battery Compartment
MA-2	Brake Release Manifold	Battery Compartment
MA-3	Manifold Assembly	Lift Cylinder
MV1	Manifold Valve	Main Manifold (MA-1)
NV1	Needle Valve	Main Manifold (MA-1)
ORF1	Orifice Plug, Wheel Motors	Main Manifold (MA-1)
ORF3	Orifice, Down Valve	Lift Cylinder Manifold (MA-3)
P1	Pump	Pump Compartment
PCF1	Steering Relief Flow Control	Main Manifold (MA-1)
RV1	Relief Valve, Lift Relief	Main Manifold (MA-1)
RV2	Relief Valve, Main Relief	Main Manifold (MA-1)
RV3	Relief Valve, Steering	Main Manifold (MA-1)
SV1	Spool Valve, Steering	Main Manifold (MA-1)
SV2	Spool Valve, Lift	Main Manifold (MA-1)
SV3	Spool Valve, Drive	Main Manifold (MA-1)
SV4	Spool Valve, Decel	Main Manifold (MA-1)
SV5	Spool Valve, Torque	Main Manifold (MA-1)
SV6	Spool Valve, Torque	Main Manifold (MA-1)
SV7	Spool Valve, Brakes	Main Manifold (MA-1)
SV8	Poppet Valve, Down	Main Manifold (MA-1)
SV9	Spool Valve, Down	Lift Cylinder Manifold (MA-3)
TP1	Test Port	Main Manifold (MA-1)
WB1	Wheel Brake	Drive Wheel
WB2	Wheel Brake	Drive Wheel
WM1	Wheel Motor, Right Side	Machine Base
WM2	Wheel Motor, Left Side	Machine Base

HYDRAULIC SCHEMATIC

Model / Serial #

1532ES | 9001000 - 9001099

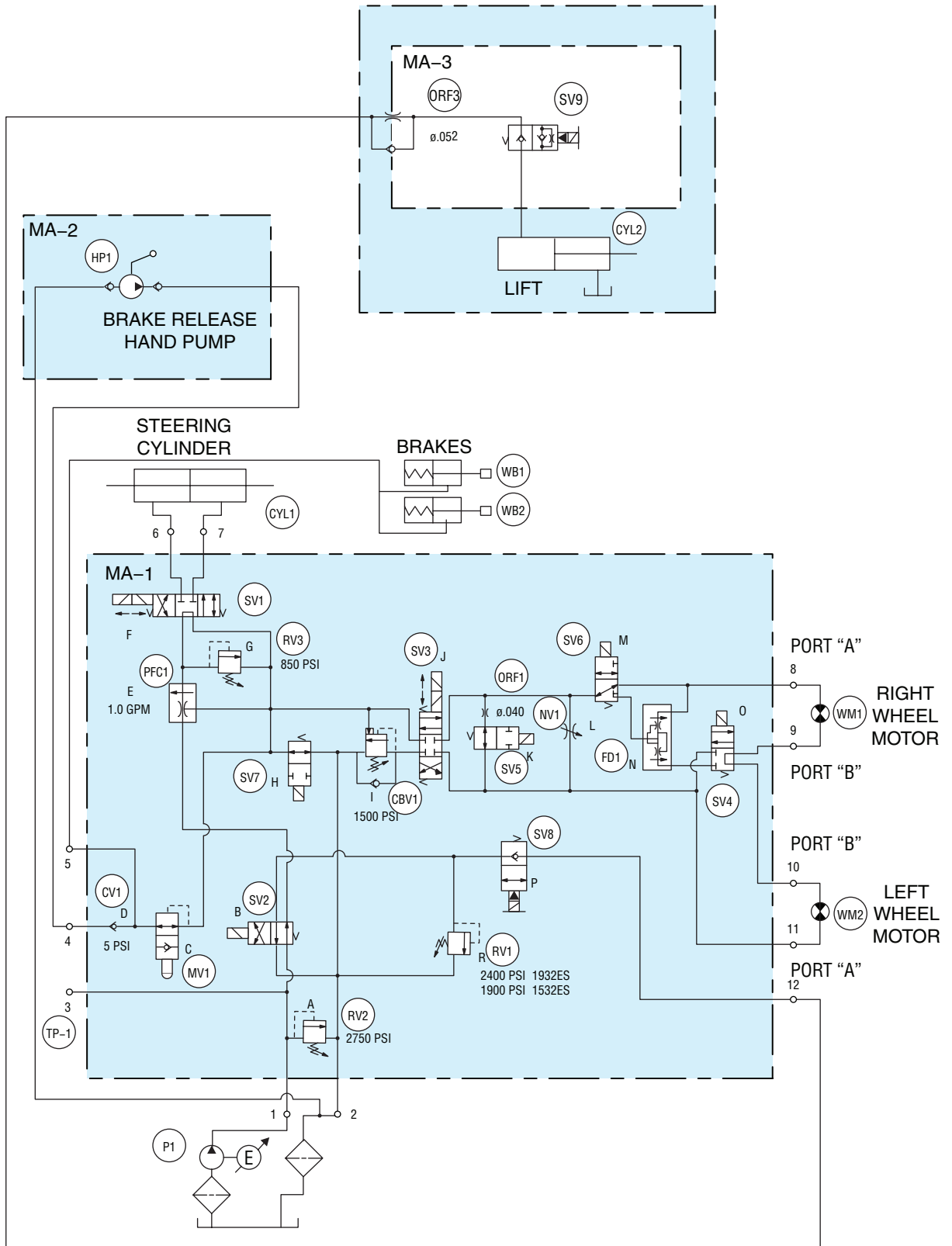
1932ES | 9104000 - 9104999

2033ES | 8804000 - 8804099

2633ES | 11100000 - 11100599

Reference Art #: 915

Publication Art #: ART_2194



2033ES - Serial # 8804100 - CURRENT**2633ES - Serial # 11101000 - CURRENT**

ITEM	DESCRIPTION	Location
CBV1	Counterbalance Valve	Main manifold (MA-1)
CYL1	Steering Cylinder	Machine Base, Front
CYL2	Lift Cylinder	Scissor Assembly
FD1	Flow Divider	Main manifold (MA-1)
FRR1	Steering Relief Flow Control	Main manifold (MA-1)
HP1	Hand Pump, Brakes	Brake Release Manifold (MA-2)
MA-1	Main Manifold Assembly	Machine Base, Battery Compartment
MA-2	Manifold Assembly	Lift Cylinder
MV1	Manifold Valve	Main manifold (MA-1)
NV1	Needle Valve	Main manifold (MA-1)
ORF1	Orifice Plug, Wheel Motors	Main manifold (MA-1)
ORF2	Orifice Disc, Brake Release	Main manifold (MA-1)
ORF3	Orifice, Down Valve	Lift Cylinder Manifold (MA-3)
P1	Pump	Pump Compartment
RV1	Relief Valve, Lift Relief	Main manifold (MA-1)
RV2	Relief Valve, Main Relief	Main manifold (MA-1)
SV1	Spool Valve, Steering	Main manifold (MA-1)
SV2	Spool Valve, Lift	Main manifold (MA-1)
SV3	Spool Valve, Drive	Main manifold (MA-1)
SV4	Spool Valve, Brake/Decel	Main manifold (MA-1)
SV5	Spool Valve, Torque	Main manifold (MA-1)
SV6	Spool Valve, Torque	Main manifold (MA-1)
SV9	Spool Valve, Down	Lift Cylinder Manifold (MA-2)
WB1	Wheel Brake	Drive Wheel
WB2	Wheel Brake	Drive Wheel
WM1	Wheel Motor, Right Side	Machine Base
WM2	Wheel Motor, Left Side	Machine Base



HYDRAULIC SCHEMATIC

Model: / Serial #

1532ES | 9001100 -

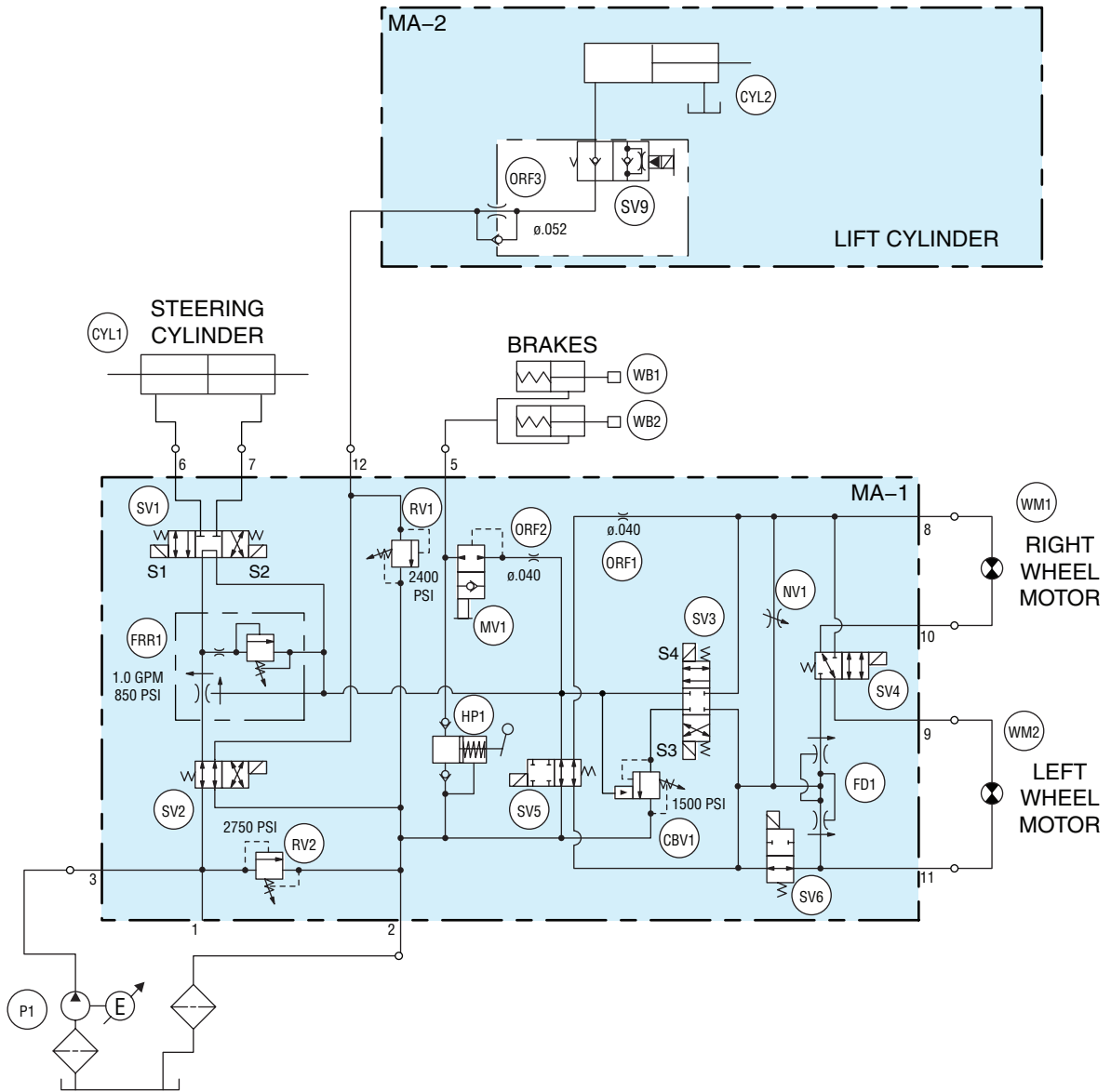
1932ES | 9105000 -

2033ES | 8804100 -

2633ES | 1101000 -

Reference Art #: 965

Publication Art #: ART_2195



Hydraulic Manifold - early style

Model: / Serial #

1532ES | 1932ES

2033ES | 2633ES

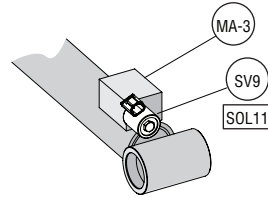
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Publication Art #: ART_2196

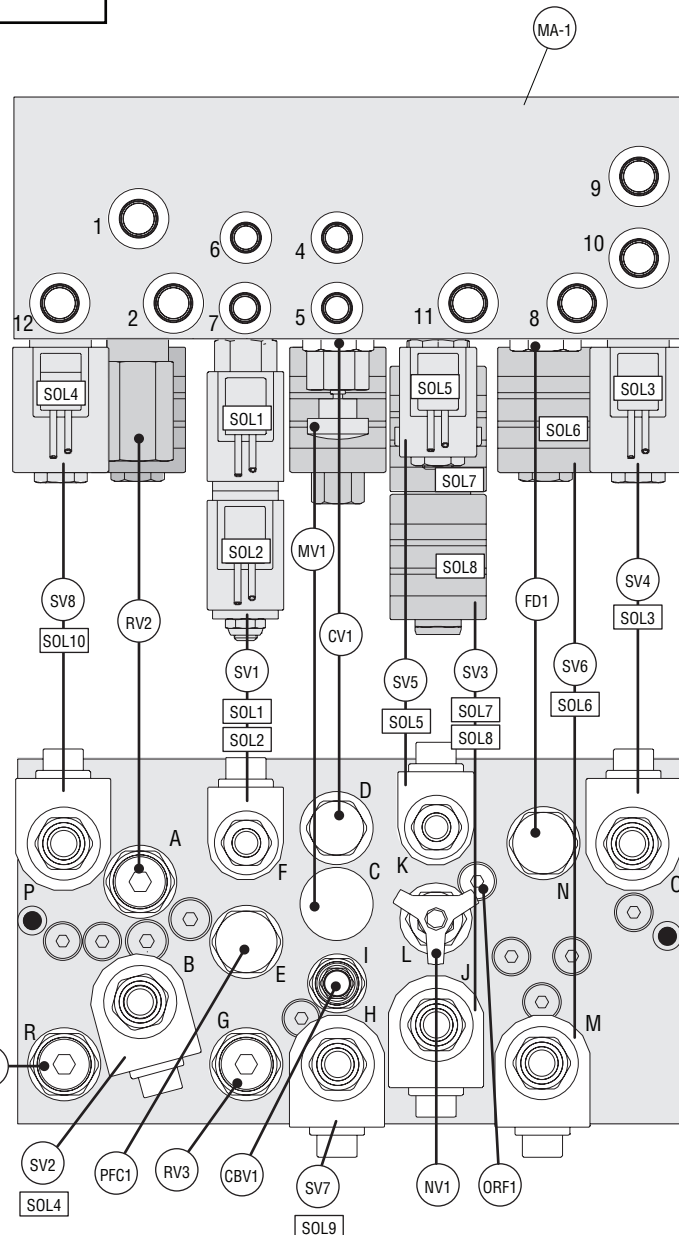
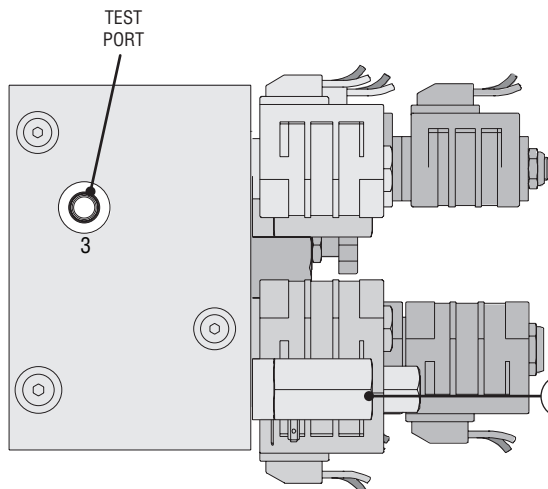
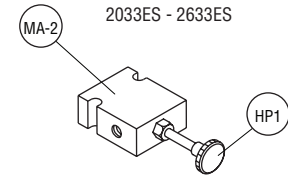
NOTE: Early style manifold. Refer to Hydraulic Schematic for serial # break

COMPONENTS	FUNCTION	PORTS	
CBV1	Relief Valve	Counter Balance	1
CV1	Check Valve	Flow Control, Brakes	2
SOL1	Coil (SV1)	Steer Right	3
SOL2	Coil (SV1)	Steer Left	4
SOL3	Coil (SV5)	Drive/Decel	5
SOL4	Coil (SV2)	Lift	6
SOL5	Coil (SV4)	Torque	7
SOL6	Coil (SV6)	Torque	8
SOL7	Coil (SV3)	Drive Forward	9
SOL8	Coil (SV3)	Drive Reverse	10
SOL9	Coil (SV7)	Brakes	11
SOL10	Coil (SV8)	Down	12
FD1	Flow Divider		
MV1	Manual Valve	Brake Release	
NV1	Needle Valve	Freewheel	
ORF1	Orifice Plug		
PFC1	Flow Control	Steer Relief	
RV1	Relief Valve	Lift Relief	
RV2	Relief Valve	Main Relief	
RV3	Relief Valve	Steering Relief	
SV1	Spool Valve	Steering Control	
SV2	Spool Valve	Lift Control	
SV3	Spool Valve	Direction Control	
SV4	Spool Valve	Torque	
SV5	Spool Valve	Drive Dump/Decel	
SV6	Spool Valve	Torque	
SV7	Spool Valve	Brakes	
SV8	Poppet Valve	Down	
MA2	HP1	Hand Pump	Brake Release
MA3	SOL11	Coil (SV9)	Down, Lift Cylinder
	SV9	Spool Valve	Emergency Lowering

LIFT CYLINDER
1532ES - 1932ES
2033ES - 2633ES



BRAKE RELEASE HAND PUMP
1532ES - 1932ES
2033ES - 2633ES



mec Hydraulic Manifold - current style

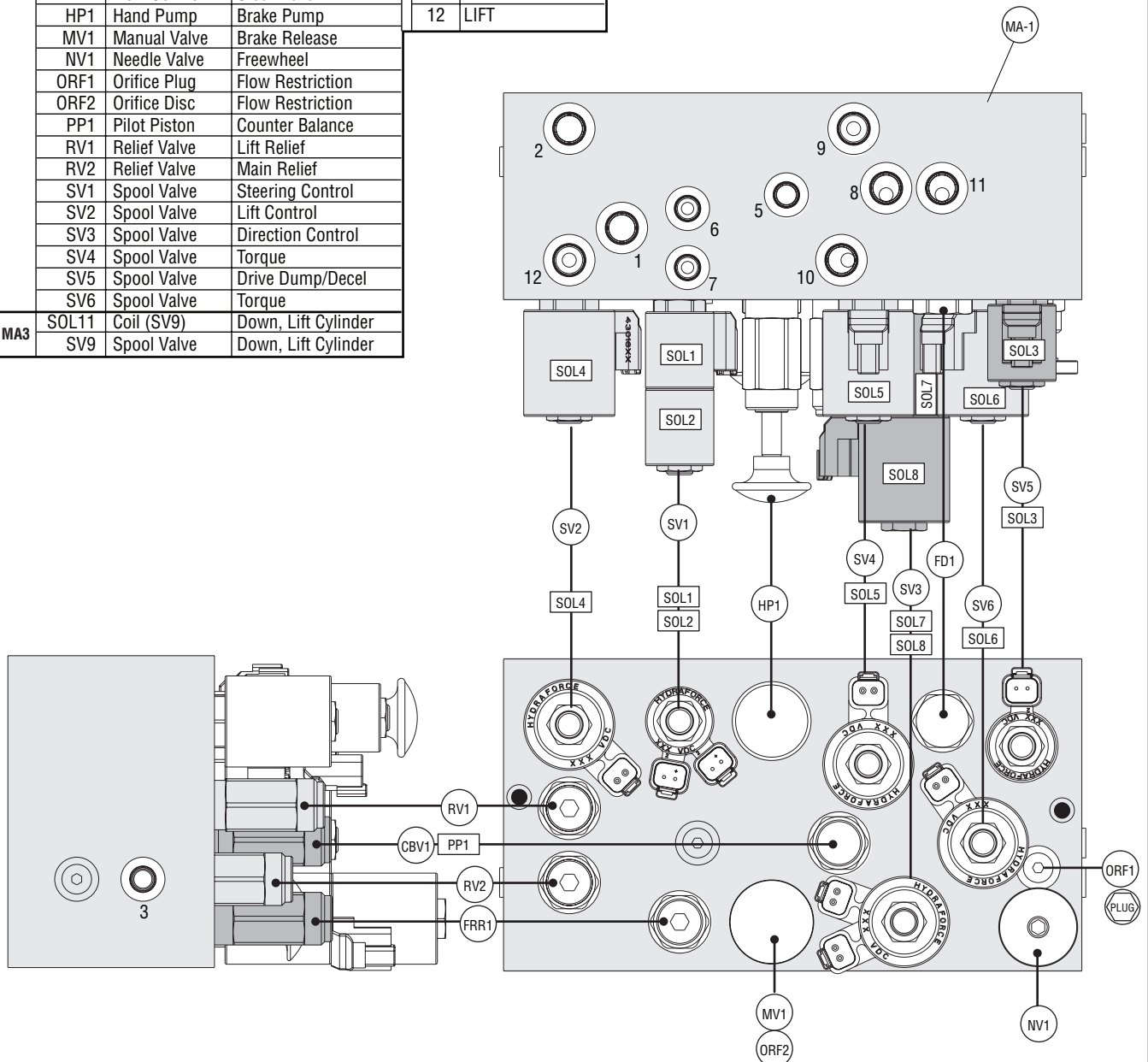
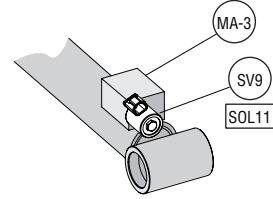
Model: / Serial #
 1532ES | 1932ES
 2033ES | 2633ES

Reference Art #: none | Publication Art #: ART_2197

NOTE: Current style manifold. Refer to Hydraulic Schematic for serial # break

COMPONENTS		FUNCTION	PORTS	
CBV1	Relief Valve	Counter Balance	1	PUMP
SOL1	Coil (SV1)	Steer Right	2	TANK
SOL2	Coil (SV1)	Steer Left	3	TEST PORT
SOL3	Coil (SV5)	Brake/Decel	4	N/A
SOL4	Coil (SV2)	Lift	5	BRAKE
SOL5	Coil (SV4)	Torque	6	STEER
SOL6	Coil (SV6)	Torque	7	STEER
SOL7	Coil (SV3)	Drive Forward	8	RIGHT B
SOL8	Coil (SV3)	Drive Reverse	9	LEFT A
FD1	Flow Divider		10	RIGHT A
FRR1	Flow Control	Steer Relief	11	LEFT B
HP1	Hand Pump	Brake Pump	12	LIFT
MV1	Manual Valve	Brake Release		
NV1	Needle Valve	Freewheel		
ORF1	Orifice Plug	Flow Restriction		
ORF2	Orifice Disc	Flow Restriction		
PP1	Pilot Piston	Counter Balance		
RV1	Relief Valve	Lift Relief		
RV2	Relief Valve	Main Relief		
SV1	Spool Valve	Steering Control		
SV2	Spool Valve	Lift Control		
SV3	Spool Valve	Direction Control		
SV4	Spool Valve	Torque		
SV5	Spool Valve	Drive Dump/Decel		
SV6	Spool Valve	Torque		
MA1	SOL11	Coil (SV9)		
MA3	SV9	Spool Valve		

LIFT CYLINDER



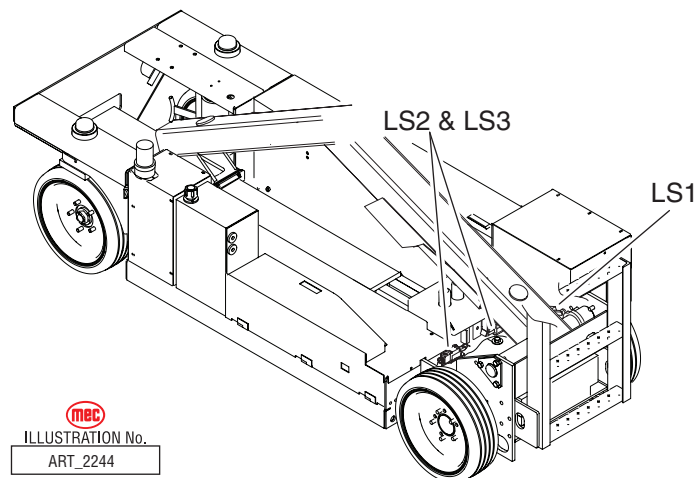
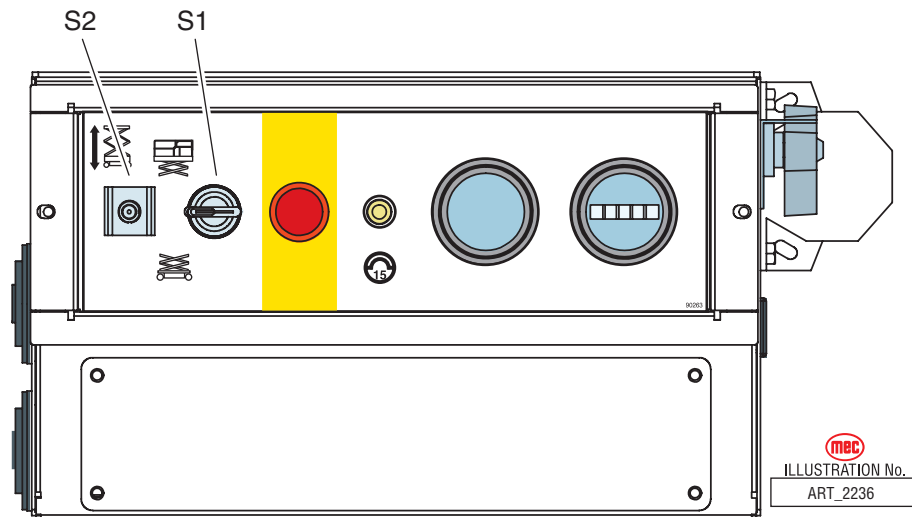
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ELECTRIC SCHEMATICS

NOTES: (Unless otherwise specified)

1. Switch **S1 BASE/PLATFORM** makes contact from the CENTER to the LEFT position when placed in **BASE**.
2. Switch **S2 UP/DOWN** makes contact from the CENTER to the LEFT position when the switch is held in the CONTACT position and automatically returns to the CENTER position when released.
3. Switch **LS1** breaks the N/C set of contacts and makes the N/O set of contacts when the platform reaches approximately 7 feet.
4. Switch **LS2 and LS3** makes the N/C set of contacts when the Pothole Bars are down and locked in place.



2033ES, S/N 8804000 - 8804099

2633ES, S/N 11100000 - 11100599

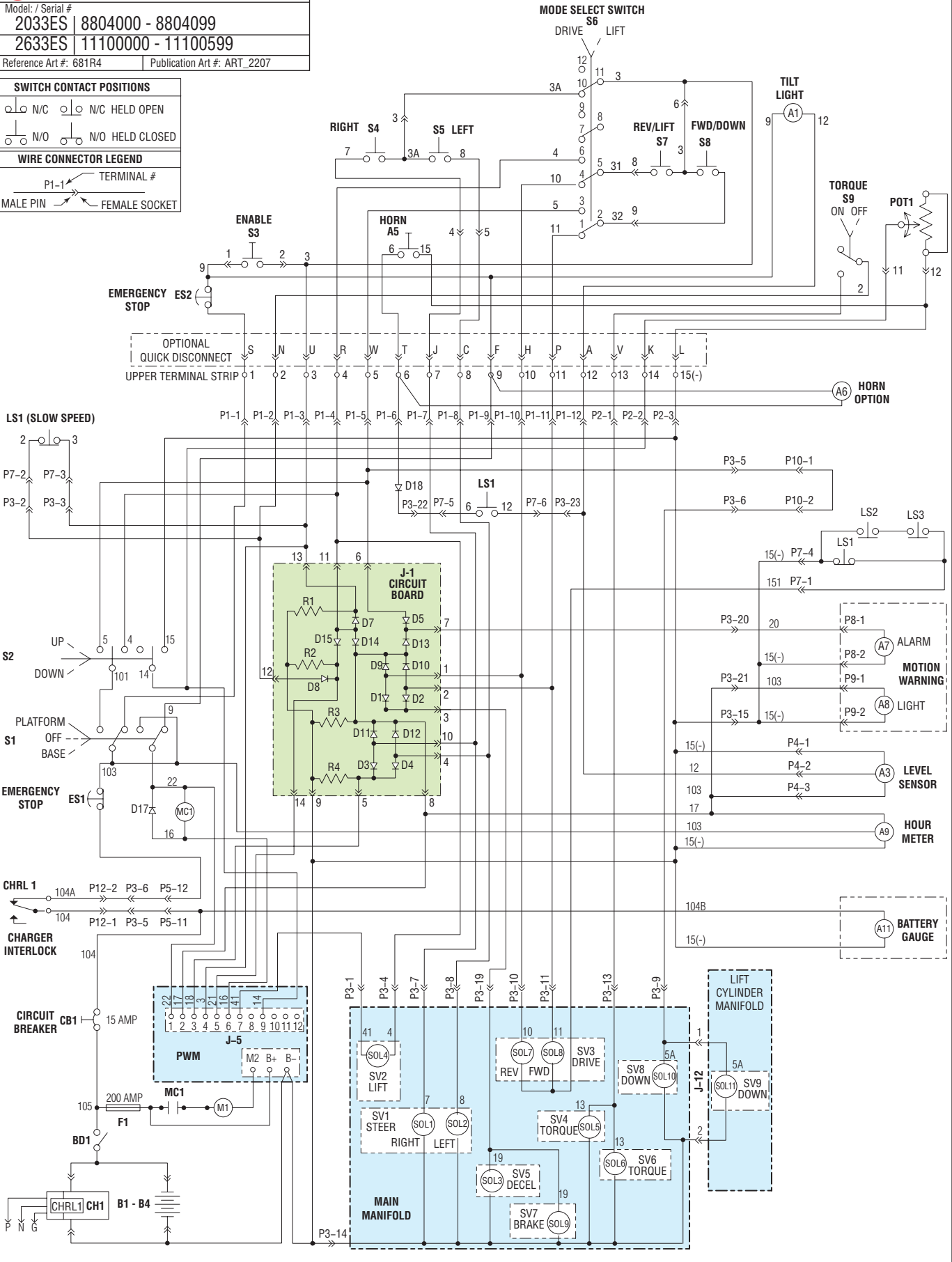
ITEM	DESCRIPTION	FUNCTION	LOCATION
A1	Tilt Light, 28V	Warn when Machine is Tilted	Upper Control Box
A3	Level Sensor	Activates Tilt Light	In Lower Control Box
A5	Push-Button Switch	Activates Horn	On Upper Control Box
A6	Horn, 12V - 48V (option)	Activated by Operator	Under Platform
A7	Overload/Motion Alarm (option)	Warn of Movement	Outside Lower Control Box
A8	Motion Light (option)	Warn of Movement	Front Left Corner of Machine
A9	Hour Meter	Record Machine Usage Time	Lower Control Panel
A11	Battery Indicator	Show Battery Status	Lower Control Panel
B1-4	6-V Deep Cycle Battery	Power for Motor And Control Circuit	Inside Battery Compartment
BD1	Battery Disconnect Switch	Disconnect All Electrical Power	Lower Control Box
CB1	Circuit Breaker, 15AMP Manual	Control Circuit Protection	Lower Control Panel
CH1	Battery Charger	Recharges 24-VDC Battery Pack	Inside Pump Compartment
CHRL1	Charger Relay	Disconnect Electric when Charger ON	Inside Charger
D1 - D15	Circuit Board Diodes	Directs Signal to Proper Location	Inside Lower Control Box
D17	Diode w/Ring Terminals	Suppression Diode	Across Contactor Coil
D18	Diode	Optional "Out of Level" Alarm	Main Harness
ES1	Switch, Emergency Stop	Shutdown All Moving Functions	Lower Control Panel
ES2	Switch, Emergency Stop	Shutdown All Platform Functions	Upper Control Box
F1	Fuse, 200AMP	Main Line Fuse	Inside Lower Control Box
LS1	Limit Switch, Double Pole	Enable Drive and High Speed	Right Rear Corner of Machine
LS2	Limit Switch, Single Pole	Drive Enable if Pothole Deployed	On pothole Linkage
M1	Motor, 24V, 2HP	Turn the Hydraulic Pump	Inside Pump Compartment
MC1	24-V Contactor	Connects Battery (+) to Motor	Inside Lower Control Box
PWM	Controller, DC 250AMP	Changes the Motor Speed	Inside Lower Control Box
POT1	Potentiometer, 20K Ohms	Senses Operator Input	Upper Control Box
R1 - R4	Circuit Board Resistors		Inside Lower Control Box
S1	Key Switch, N/O Contact Block	Select Lower or Upper Controls	Lower Control Panel
S2	Switch, Toggle	Lift/Lower at Lower Controls	Lower Control Panel
S3	Switch, Push Button	Enable Other Functions at Platform	Upper Control Box Handle
S4	Switch, Micro	Right Turn Switch	Upper Control Box Handle
S5	Switch, Micro	Left Turn Switch	Upper Control Box Handle
S6	Switch, Toggle	Select LIFT or DRIVE	Upper Control Box
S7	Switch, Micro	Reverse or Lift Switch	Upper Control Box
S8	Switch, Micro	Forward or Down Switch	Upper Control Box
S9	Switch, Toggle	TORQUE Switch	Upper Control Box
SOL1	Coil, Turn Right Solenoid	Activate Turn Right Valve (SV1)	Main Manifold
SOL2	Coil, Turn Left Solenoid	Activate Turn Left Valve (SV1)	Main Manifold
SOL3	Coil, Decel Solenoid	Activate Decel Valve (SV5)	Main Manifold
SOL4	Coil, Lift Solenoid	Activate Lift Valve (SV2)	Main Manifold
SOL5-6	Coil, Torque Solenoid	Activate Torque Valves (SV4) (SV6)	Main Manifold
SOL7	Coil, Reverse Solenoid	Activate Reverse Valve (SV3)	Main Manifold
SOL8	Coil, Forward Solenoid	Activate Forward Valve (SV3)	Main Manifold
SOL9	Coil, Brake Solenoid	Activate Brake Valve (SV7)	Main Manifold
SOL10	Coil, Down Solenoid	Activate Down Valve (SV8)	Main Manifold
SOL11	Coil, Down Solenoid	Activate Down Valve (SV9)	Lift Cylinder Manifold



MEC ELECTRIC SCHEMATIC

Model / Serial #
 2033ES | 8804000 - 8804099
 2633ES | 11100000 - 11100599
 Reference Art #: 681R4 | Publication Art #: ART_2207

SWITCH CONTACT POSITIONS	
	N/C N/C HELD OPEN
	N/O N/O HELD CLOSED
WIRE CONNECTOR LEGEND	
	TERMINAL #
	MALE PIN
	FEMALE SOCKET



2033ES, S/N 8805000 - Current
2633ES, S/N 11101000 - Current

ITEM	DESCRIPTION	FUNCTION	LOCATION
A1	Tilt Light, 28V	Warn when Machine is Tilted	Upper Control Box
A3	Level Sensor	Activates Tilt Light	Inside Lower Control Box
A5	Push-Button Switch	Activates Horn	Upper Control Box
A6	Horn, 12V - 48V (option)	Activated by Operator	Under Platform
A7	Overload/Motion Alarm (option)	Warn of Movement	Outside Lower Control Box
A8	Motion Light (option)	Warn of Movement	Front Left Corner of Machine
A9	Hour Meter	Record Machine Usage Time	Lower Control Panel
A11	Battery Indicator	Show Battery Status	Lower Control Panel
B1-4	6-V Deep Cycle Battery	Power for Motor And Control Circuit	Inside Battery Compartment
BD1	Battery Disconnect Switch	Disconnect All Electrical Power	Lower Control Box
CB1	Circuit Breaker, 15AMP Manual	Control Circuit Protection	Lower Control Panel
CH1	Battery Charger	Recharges 24-VDC Battery Pack	Inside Pump Compartment
CHRL1	Charger Relay	Disconnect Electric when Charger ON	Inside Charger
MC1	24-V Contactor	Connects Battery (+) to Motor	Inside Lower Control Box
D1 - D15	Circuit Board Diodes	Directs Signal to Proper Location	Inside Lower Control Box
R1 - R4	Circuit Board Resistors		Inside Lower Control Box
D17	Diode w/Ring Terminals	Suppression Diode	Across Contactor Coil
ES1	Switch, Emergency Stop	Shutdown All Moving Functions	Lower Control Panel
ES2	Switch, Emergency Stop	Shutdown All Platform Functions	Upper Control Box
F1	Fuse, 200AMP	Main Line Fuse	Inside Lower Control Box
LS1	Limit Switch, Double Pole	Enable Drive and High Speed	Right Rear Corner of Machine
LS2	Limit Switch, Single Pole	Drive Enable if Pothole Deployed	On pothole Linkage
LS3	Limit Switch, Single Pole	Drive Enable if Pothole Deployed	On pothole Linkage
M1	Motor, 24V, 2HP	Turn the Hydraulic Pump	Pump Compartment
PWM	Controller, DC 250AMP	Changes the Motor Speed	Inside Lower Control Box
POT1	Potentiometer, 20K Ohms	Senses Operator Input	Upper Control Box
S1	Key Switch, N/O Contact Block	Select Lower or Upper Controls	Lower Control Panel
S2	Switch, Toggle	Lift/Lower at Lower Controls	Lower Control Panel
S3	Switch, Push Button	Enable Other Functions at Platform	Upper Control Box Handle
S4	Switch, Micro	Right Turn Switch	Upper Control Box Handle
S5	Switch, Micro	Left Turn Switch	Upper Control Box Handle
S6	Switch, Toggle	Select LIFT or DRIVE	Upper Control Box
S7	Switch, Micro	Reverse or Lift Switch	Upper Control Box
S8	Switch, Micro	Forward or Down Switch	Upper Control Box
S9	Switch, Toggle	TORQUE Switch	Upper Control Box
SOL1	Coil, Turn Right Solenoid	Activate Turn Right Valve (SV1)	Main Manifold
SOL2	Coil, Turn Left Solenoid	Activate Turn Left Valve (SV1)	Main Manifold
SOL3	Coil, Decel/Brake Solenoid	Activate Decel/Brake Valve (SV5)	Main Manifold
SOL4	Coil, Lift Solenoid	Activate Lift Valve (SV2)	Main Manifold
SOL5-6	Coil, Torque Solenoid	Activate Torque Valves (SV5)(SV6)	Main Manifold
SOL7	Coil, Reverse Solenoid	Activate Reverse Valve (SV3)	Main Manifold
SOL8	Coil, Forward Solenoid	Activate Forward Valve (SV3)	Main Manifold
SOL11	Coil, Down Solenoid	Activate Down Valve (SV9)	Lift Cylinder



MEC ELECTRIC SCHEMATIC

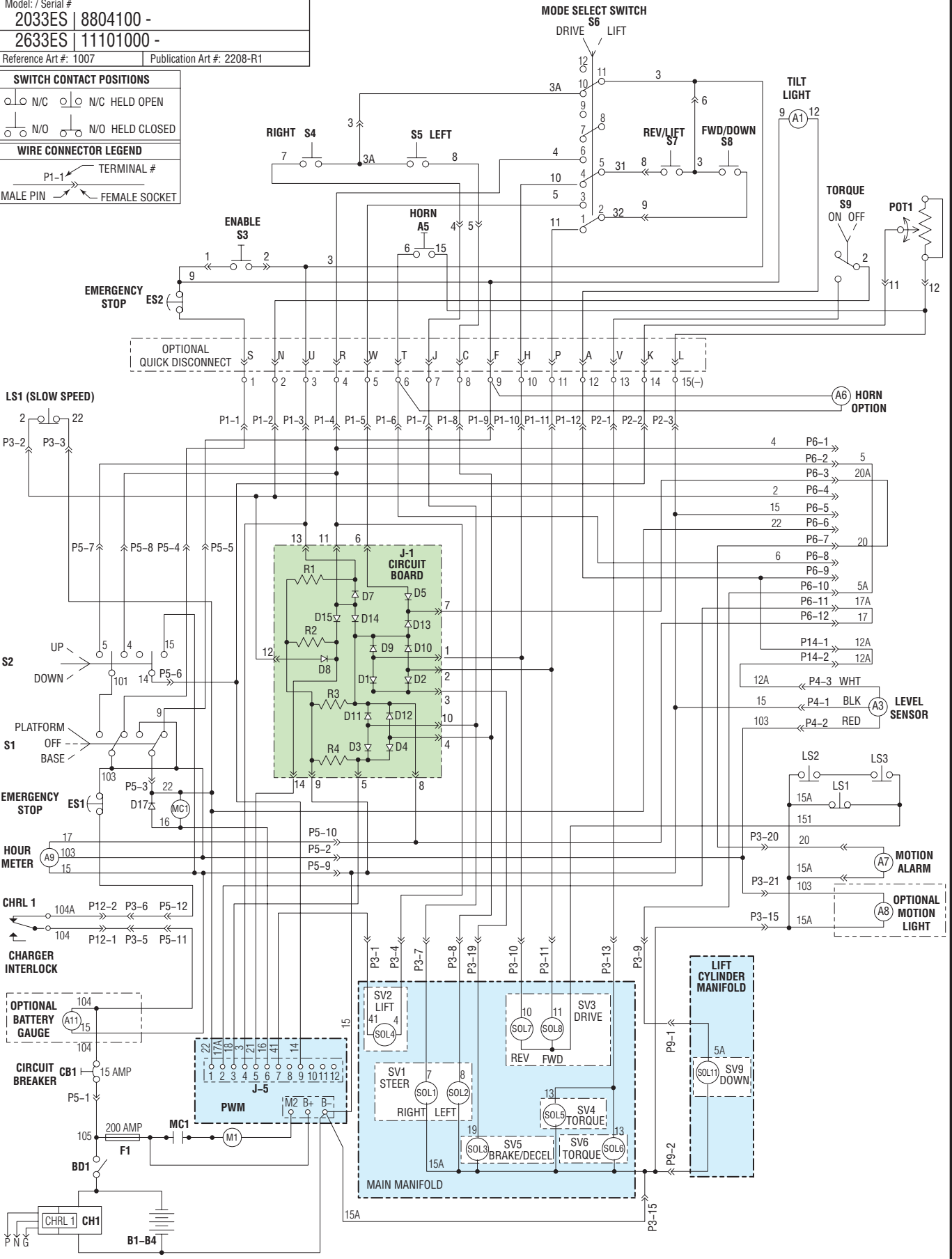
Model: / Serial #
 2033ES | 8804100 -
 2633ES | 11101000 -
 Reference Art #: 1007 | Publication Art #: 2208-R1

SWITCH CONTACT POSITIONS

N/C N/O N/O HELD OPEN
 N/O N/O HELD CLOSED

WIRE CONNECTOR LEGEND

TERMINAL #
 P1-1
 MALE PIN FEMALE SOCKET

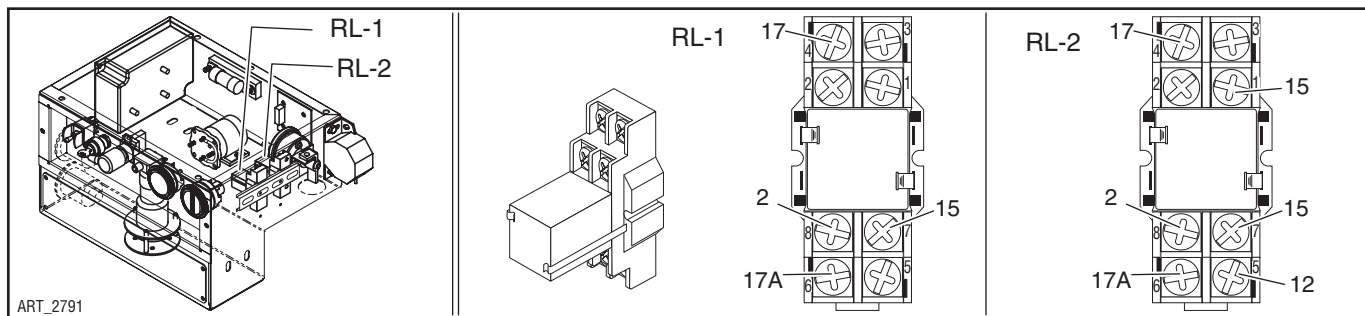


With Tilt Disable, Canada

2033ES, S/N 8804100 - Current

2633ES, S/N 11100600 - Current

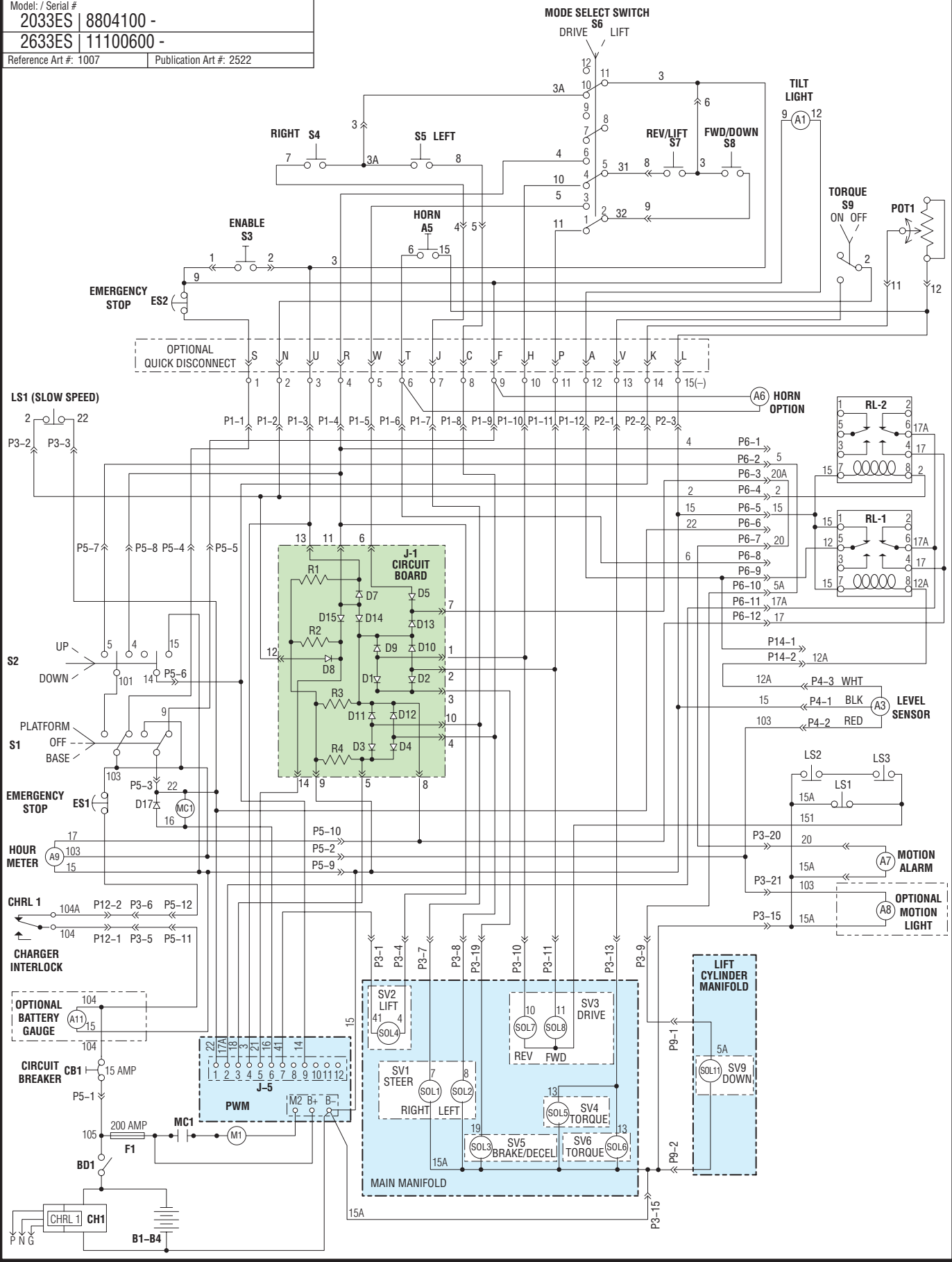
ITEM	DESCRIPTION	FUNCTION	LOCATION
A1	Tilt Light, 28V	Warn when Machine is Tilted	Upper Control Box
A3	Level Sensor	Activates Tilt Light	Inside Lower Control Box
A5	Push-Button Switch	Activates Horn	Upper Control Box
A6	Horn, 12V - 48V (option)	Activated by Operator	Under Platform
A7	Overload/Motion Alarm (option)	Warn of Movement	Outside Lower Control Box
A8	Motion Light (option)	Warn of Movement	Front Left Corner of Machine
A9	Hour Meter	Record Machine Usage Time	Lower Control Panel
A11	Battery Indicator	Show Battery Status	Lower Control Panel
B1-4	6-V Deep Cycle Battery	Power for Motor And Control Circuit	Inside Battery Compartment
BD1	Battery Disconnect Switch	Disconnect All Electrical Power	Lower Control Box
CB1	Circuit Breaker, 15AMP Manual	Control Circuit Protection	Lower Control Panel
CH1	Battery Charger	Recharges 24-VDC Battery Pack	Inside Pump Compartment
CHRL1	Charger Relay	Disconnect Electric when Charger ON	Inside Charger
MC1	24-V Contactor	Connects Battery (+) to Motor	Inside Lower Control Box
D1 - D15	Circuit Board Diodes	Directs Signal to Proper Location	Inside Lower Control Box
R1 - R4	Circuit Board Resistors		Inside Lower Control Box
D17	Diode w/Ring Terminals	Suppression Diode	Across Contactor Coil
ES1	Switch, Emergency Stop	Shutdown All Moving Functions	Lower Control Panel
ES2	Switch, Emergency Stop	Shutdown All Platform Functions	Upper Control Box
F1	Fuse, 200AMP	Main Line Fuse	Inside Lower Control Box
LS1	Limit Switch, Double Pole	Enable Drive and High Speed	Right Rear Corner of Machine
LS2	Limit Switch, Single Pole	Drive Enable if Pothole Deployed	On pothole Linkage
LS3	Limit Switch, Single Pole	Drive Enable if Pothole Deployed	On pothole Linkage
M1	Motor, 24V, 2HP	Turn the Hydraulic Pump	Pump Compartment
PWM	Controller, DC 250AMP	Changes the Motor Speed	Inside Lower Control Box
POT1	Potentiometer, 20K Ohms	Senses Operator Input	Upper Control Box
RL-1 - RL-2	Relay, SPDT 2-Pole	Cutout Function when Tilted	Inside Lower Control Box
S1	Key Switch, N/O Contact Block	Select Lower or Upper Controls	Lower Control Panel
S2	Switch, Toggle	Lift/Lower at Lower Controls	Lower Control Panel
S3	Switch, Push Button	Enable Other Functions at Platform	Upper Control Box Handle
S4	Switch, Micro	Right Turn Switch	Upper Control Box Handle
S5	Switch, Micro	Left Turn Switch	Upper Control Box Handle
S6	Switch, Toggle	Select LIFT or DRIVE	Upper Control Box
S7	Switch, Micro	Reverse or Lift Switch	Upper Control Box
S8	Switch, Micro	Forward or Down Switch	Upper Control Box
S9	Switch, Toggle	TORQUE Switch	Upper Control Box
SOL1	Coil, Turn Right Solenoid	Activate Turn Right Valve (SV1)	Main Manifold
SOL2	Coil, Turn Left Solenoid	Activate Turn Left Valve (SV1)	Main Manifold
SOL3	Coil, Decel/Brake Solenoid	Activate Decel/Brake Valve (SV5)	Main Manifold
SOL4	Coil, Lift Solenoid	Activate Lift Valve (SV2)	Main Manifold
SOL5-6	Coil, Torque Solenoid	Activate Torque Valves (SV5)(SV6)	Main Manifold
SOL7	Coil, Reverse Solenoid	Activate Reverse Valve (SV3)	Main Manifold
SOL8	Coil, Forward Solenoid	Activate Forward Valve (SV3)	Main Manifold
SOL11	Coil, Down Solenoid	Activate Down Valve (SV9)	Lift Cylinder



ART_2791

mecc ELECTRIC SCHEMATIC: CANADA

Model / Serial #
 2033ES | 8804100 -
 2633ES | 11100600 -
 Reference Art #: 1007 | Publication Art #: 2522



Component Locations

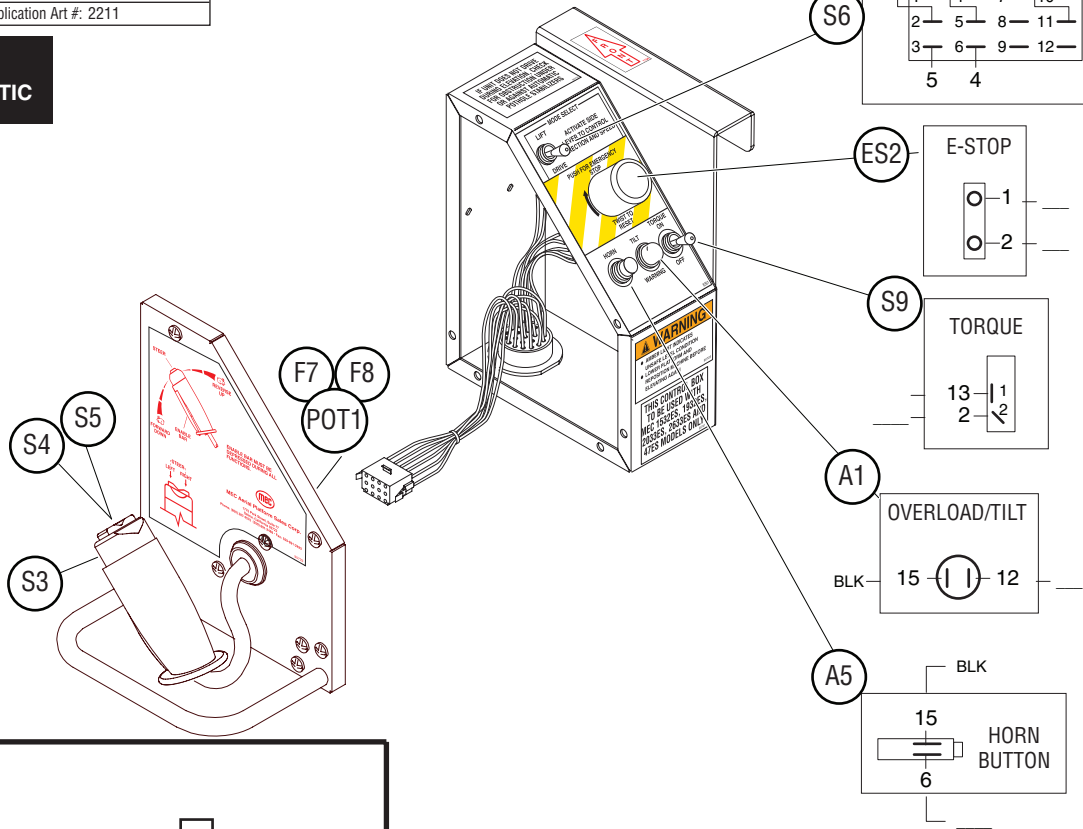
Model: / Serial #

ES Models: all

Reference Art #: none

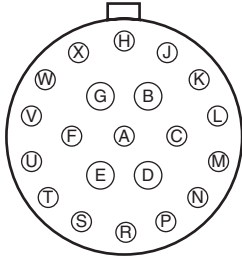
Publication Art #: 2211

**REFER TO
ELECTRIC SCHEMATIC**

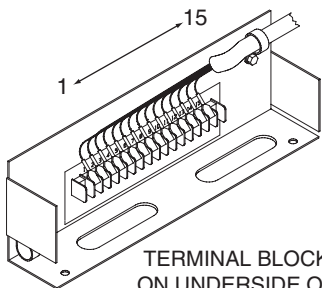


**REMOVABLE
CONTROL
HARNESS**

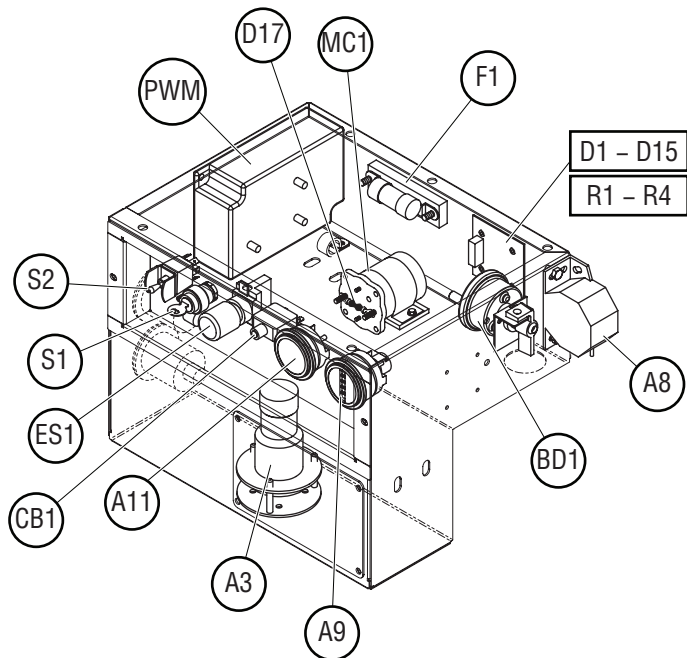
PIN #	WIRE #
S	1
F	9
W	5
R	4
V	13
A	12
H	10
P	11
U	3
T	6
J	7
N	2
C	8
K	14
M	16 (GND)
L	15



END VIEW OF
REMOVABLE
CONTROL HARNESS
(OPTIONAL
QUICK
DISCONNECT)



TERMINAL BLOCK
ON UNDERSIDE OF
PLATFORM DECK

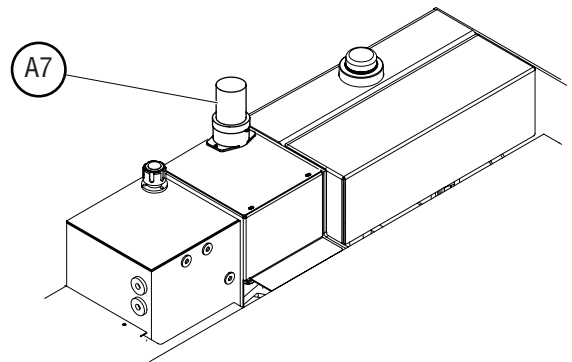
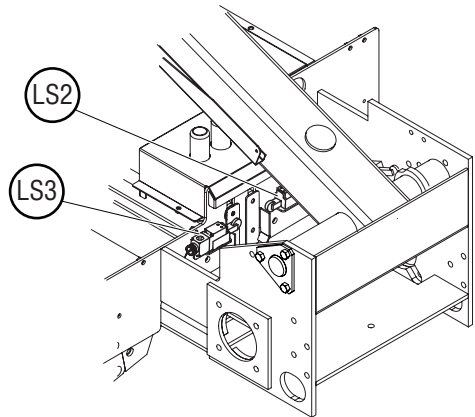
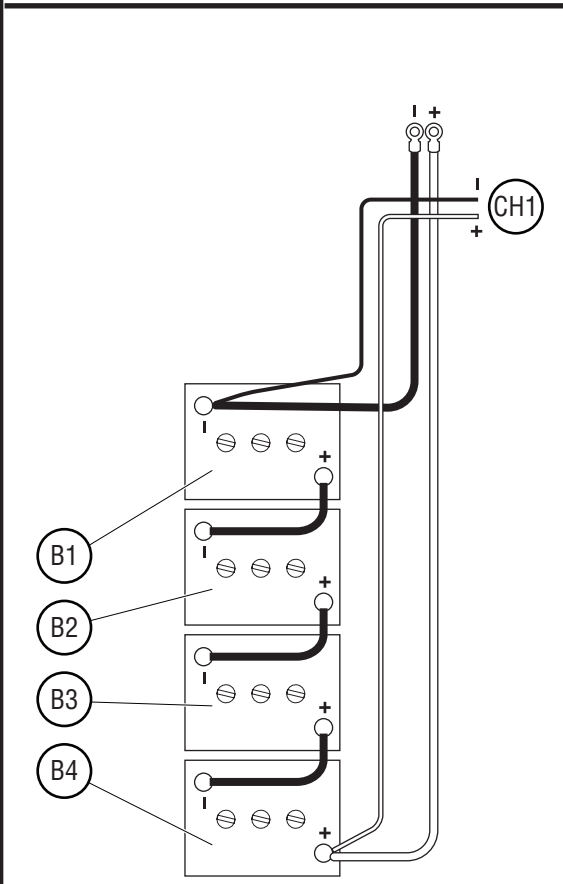
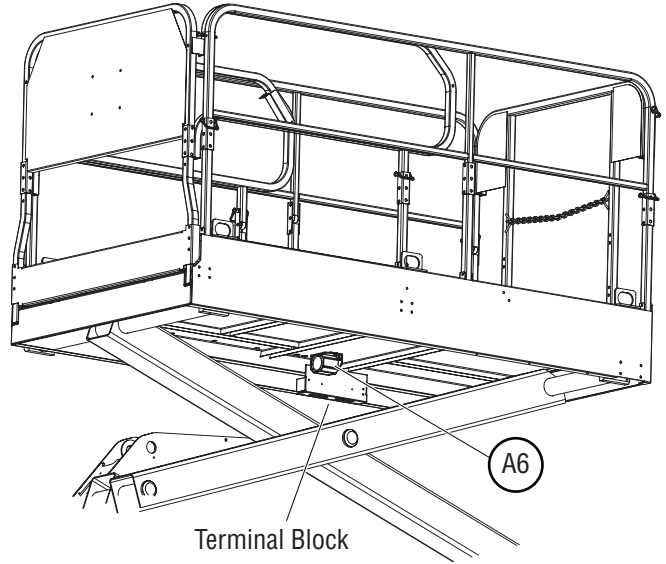


mec Component Locations

Model: / Serial #
2033ES - 2633ES: all

Reference Art #: none Publication Art #: 2215

**REFER TO
ELECTRIC SCHEMATIC**

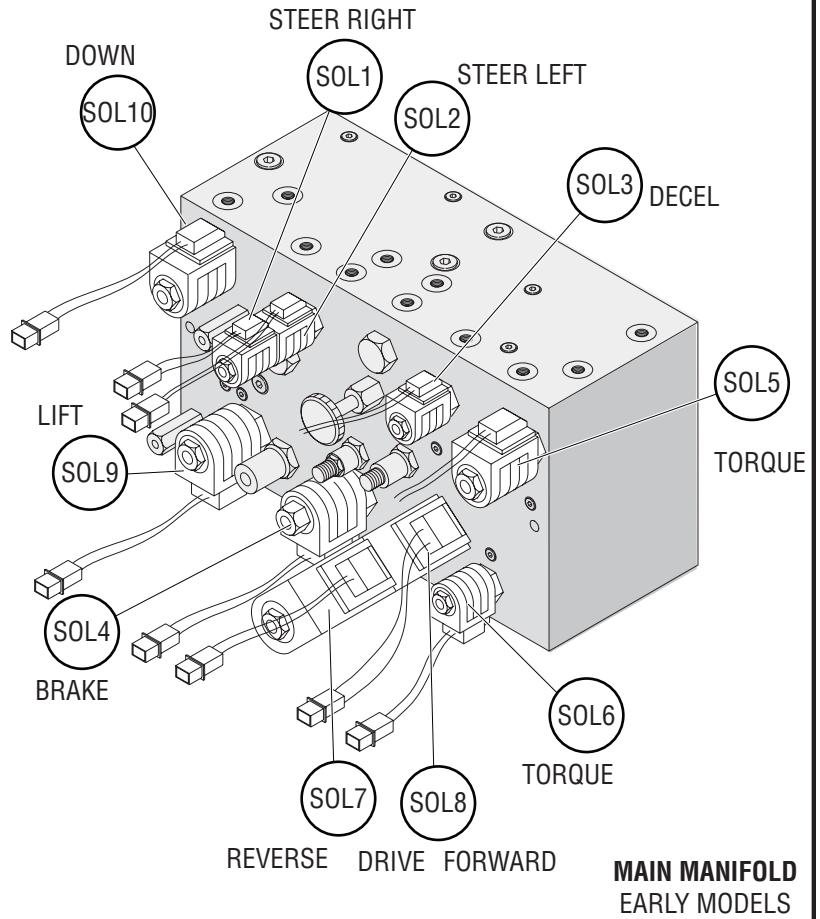


MEC Component Locations

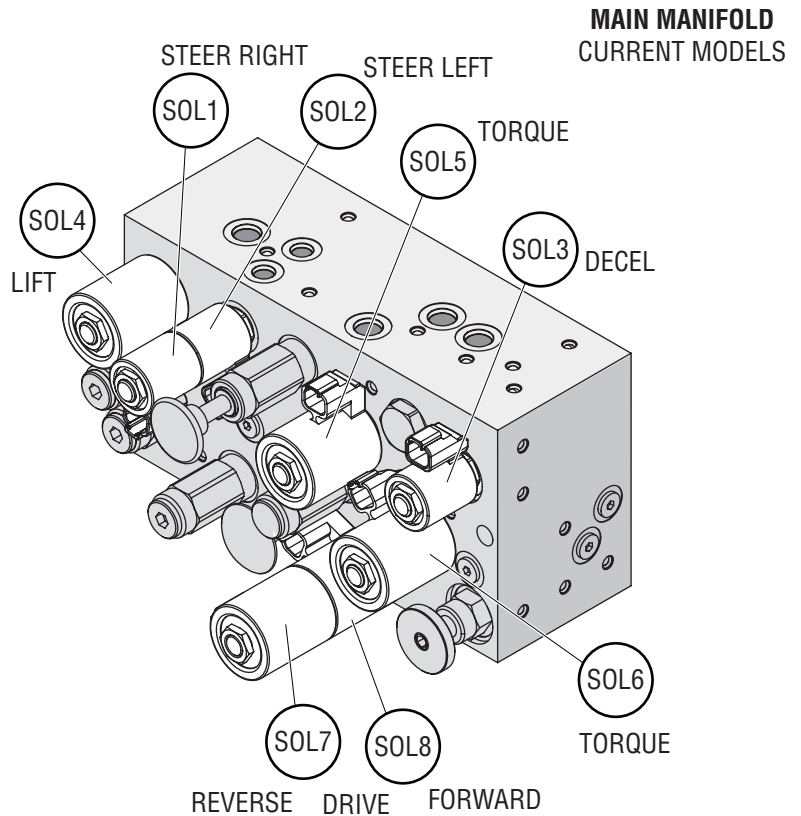
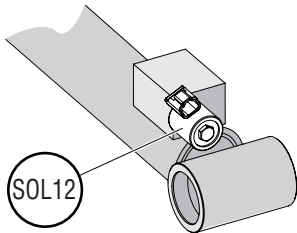
Model: / Serial #
ES Models: all

Reference Art #: none Publication Art #: ART_2213

**REFER TO
ELECTRIC SCHEMATIC**



LIFT CYLINDER



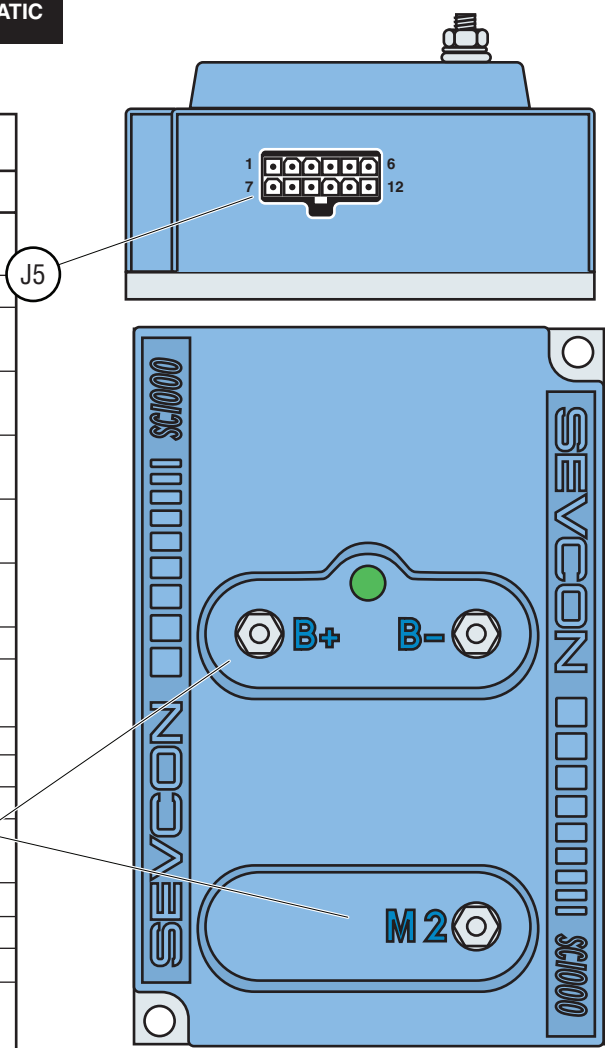
MEC Plug Pin Identification	
Model: / Serial #	
ES Models : all	
Reference Art #: none	Publication Art #: 2217

**REFER TO
ELECTRIC SCHEMATIC**

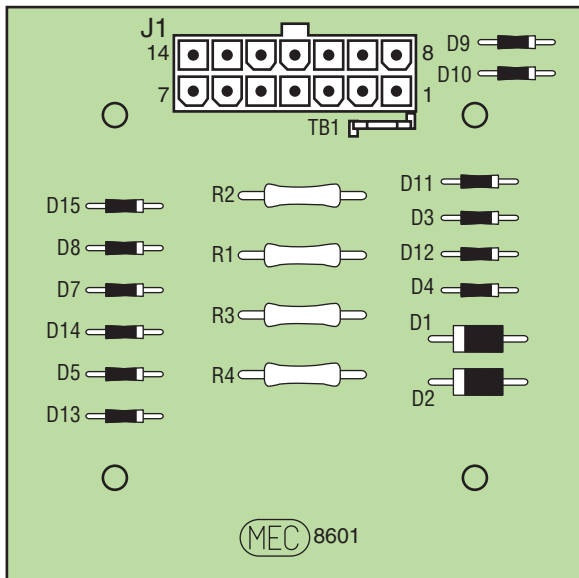
PWM

J5 Pin Identification		
PIN #	WIRE #	FUNCTION
1	22	B+ power input (power up)
2	17	Lift, Drive or Steer functions requested (functions requiring motor)
3	18	Steer Requested (adds additional motor speed for steer)
4	3	Enable signal input
5	21	Speed cut-back (24 Volts = full speed, 0 Volts = creep speed)
6	16	Motor Start Relay signal (GROUND signal to activate Motor Start Relay)
7	41	Lift Valve B- (provides GROUND signal to Lift Valve)
8	none	none
9	14	Accelerator reference signal (3.6 Volts to Potentiometer)
10	none	none
11	none	none
12	none	none

Terminal Identification	
POST	FUNCTION
B+	Battery Positive Cable from 200 AMP Fuse
B-	Negative Battery Cable and GROUND wire (15) connection
M2	Motor Ground (Pulse-Width Modulated [PWM] variable speed control)



Circuit Board



J1 Plug Pin Identification

PIN #	WIRE #	SIGNAL	FUNCTION
1	10	INPUT	Drive Reverse
2	11	INPUT	Drive Forward
3	19	OUTPUT	Brake, Decel Valve signal
4	8	INPUT	Steer Left
5	18	OUTPUT	Steer signal to Sevcon
6	5	INPUT	Down signal
7	20	OUTPUT	Signal to Motion Alarm(s) (optional)
8	17	OUTPUT	Sevcon & Hour Meter (motor function requested)
9	15	INPUT	Battery Negative
10	7	INPUT	Steer Right
11	4	INPUT	Lift Up
12	2	INPUT	Limit Switch (24V = platform down)
13	3	OUTPUT	Enable, from lower Lift switch
14	21	OUTPUT	To Sevcon (for speed cutback)

