An Oshkosh Corporation Company

Service & Maintenance Manual

Models

1930ES
2032ES
2632ES
2646ES
3246ES

PVC 2004

31217119

March 24, 2020 - Rev A

ANSI

CE

AS/NZS

An Oshkosh Corporation Company

Order the manual at mid-west-tech.com >

SECTION NO.	TITLE	PAGE NO.
SECTION 1 - SPECIFICATIONS		
1.1	Machine Specifications	1-1
	Platform Capacities	1-2
	Fluid Capacities	1-3
	Tires	1-3
	Batteries	1-4
	Motors	1-4
	Battery Charger/AC Inverter	1-4
	Lift Speed (No Load in Platform)	1-6
	Travel Speed	1-7
	Model Dimensions	1-7
1.2	Torque Requirements	1-8
1.3	Lubrication	1-8
	Hydraulic Oil	1-8
	Pressure Settings	1-9
1.4	Limit Switches	1-10
	Tilt Alarm	1-10
	High Drive Speed Cutout	1-10
1.5	Cylinder Specifications	1-11
1.6	Major Component Weights	1-11
1.7	Critical Stability Weights	1-11
1.8	Thread Locking Compound	1-12
1.9	Torque Charts	1-13
	SAE Fastener Torque Chart	1-13
	SAE Fastener Torque Chart (Continued)	1-14
	SAE Fastener Torque Chart (Continued)	1-15
	SAE Fastener Torque Chart (Continued)	1-16
	SAE Fastener Torque Chart (Continued)	1-17
	SAE Fastener Torque Chart (Continued)	1-18
	Metric Fastener Torque Chart	1-19
	Metric Fastener Torque Chart (Continued)	1-20
	Metric Fastener Torque Chart (Continued)	1-21
	Metric Fastener Torque Chart (Continued)	1-22
SECTION 2 - GENERAL		
2.1	Machine Preparation, Inspection, and Maintenance	2-1
	General	2-1
	Preparation, Inspection, and Maintenance	2-1
	Pre-Start Inspection	2-1
	Pre-Delivery Inspection and Frequent Inspection	2-1
	Annual Machine Inspection	2-1
	Preventative Maintenance	2-1
2.2	Service and Guidelines	2-2
	General	2-2
	Safety and Workmanship	2-2
	Cleanliness	2-2
	Components Removal and Installation	2-2
	Component Disassembly and Reassembly	2-3
	Pressure-Fit Parts	2-3
	Bearings	2-3
	Gaskets	2-3
	Bolt Usage and Torque Application	2-3
	Hydraulic Lines and Electrical Wiring	2-3
	Hydraulic System	2-3
	Lubrication	2-3
	Battery	2-3
	Lubrication and Servicing	2-3

MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >

SECTION NO.	TITLE	PAGE NO.
2.3	Lubrication and Information	2-4
	Hydraulic System	2-4
	Hydraulic Oil	2-4
	Changing Hydraulic Oil	2-4
	Lubrication Specifications	2-4
2.4	Cylinder Drift Test	2-5
	Platform Drift	2-5
	Cylinder Drift	2-5
2.5	Pins and Composite Bearing Repair Guidelines	2-5
2.6	Preventive Maintenance and Inspection Schedule	2-6
	Footnotes:	2-7
SECTION 3 - CHASSIS & SCISSOR ARMS		
3.1	Traction System	3-1
	Theory of Operation	3-1
3.2	Pump/Motor - Theory of Operation	3-2
	Pump Motor Electrical Evaluation	3-2
3.3	Drive Motor Electrical Evaluation	3-4
	Common Traction System Difficulties	3-4
	Power Module Electrical Evaluation	3-5
3.4	Torque Hub	3-6
	Roll Test	3-6
	Leak Test	3-6
	Oil Check/Fill Procedure	3-6
	Brakes - Manual Disengage Procedure	3-7
	Drive Motor Removal	3-8
	Main Gearbox Disassembly	3-9
	Input Carrier Disassembly	3-10
	Hub Disassembly	3-11
	Spindle Disassembly	3-12
	Spindle Sub-Assembly	3-13
	Hub Sub-Assembly	3-14
	Input Carrier Sub-Assembly	3-15
	Main Gearbox Assembly	3-16
	Motor and Brake Assembly	3-18
	Tightening and Torquing Bolts	3-19
	Assembly Tools	3-19
3.5	Drive Motor Cable Routing	3-20
	1930ES Only	3-20
	2032ES/2632ES/2646ES/3246ES Only	3-21
3.6	Electric Drive Motor Service	3-22
	Servicing Guidelines	3-23
	Drive Motor Troubleshooting	3-23
	Drive Motor Disassembly	3-23
	Drive Motor Inspection and Service	3-24
	Drive Motor Reassembly	3-24
3.7	Power Module - ZAPI	3-26
	ZAPI Power Module Electrical Evaluation	3-27
3.8	MDI (Multifunction Digital Indicator) and Brake Release	3-28
	Installation:	3-28
	Removal:	3-29
3.9	Battery Removal	3-30
	Battery Maintenance and Safety Practices	3-31
3.10	Battery Charger	3-31
	Battery Charger Maintenance	3-32
3.11	Battery Charger/Inverter (Option)	3-37
	Battery Charger/Inverter Troubleshooting	3-37
3.12	Limit Switch Locations	3-39

MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >

SECTION NO.	TITLE	PAGE NO.
	Pothole Switch Replacement	3-40
	Rotary Angle Sensor Replacement	3-41
3.13	Ground Control Station	3-41
	Box Disassembly	3-41
	Tilt Sensor Replacement	3-42
3.14	Scissor Arms and Platform Positioning and Support	3-43
3.15	Platform Removal	3-44
3.16	Scissor Arms Removal	3-44
3.17	Platform Control Station	3-50
	Printed Circuit Board Replacement	3-50
	Joystick Controller	3-51
SECTION 4 - HYDRAULICS		
4.1	Cylinders - Theory of Operation	4-1
4.2	Valves - Theory of Operation	4-1
	Solenoid Control Valves (Bang-Bang)	4-1
	Relief Valves	4-1
	Crossover Relief Valves	4-1
	Proportional Valve	4-1
	Manual Descent Valve	4-1
4.3	Cylinder Checking Procedure	4-2
	Cylinders Without Counterbalance Valves and Steer Cylinder	4-2
4.4	Lift Pressure Setting Procedure	4-2
4.5	Hydraulic Oil Fill	4-3
	Oil Check Procedure	4-3
	Slide Block Lubrication	4-4
4.6	Lift Cylinder Removal	4-5
4.7	Cylinder Repair	4-7
	Disassembly	4-7
	Steer Cylinder Piston Removal	4-8
	Cleaning and Inspection	4-8
	Assembly	4-9
	Pump Removal	4-12
	Motor Removal	4-14
SECTION 5 - JLG CONTROL SYSTEM		
5.1	Diagnostic Port	5-1
5.2	Hand Held Analyzer	5-1
	To Connect the Hand Held Analyzer:	5-1
	Using the Analyzer	5-2
	Changing the Access Level of the Hand Held Analyzer	5-3
	Adjusting Parameters Using the Hand Held Analyzer	5-4
	Machine Setup	5-4
5.3	Tilt Sensor Calibration	5-5
	Failure Troubleshooting for The Field	5-5
5.4	Tilt Sensor Electrical Evaluation	5-6
5.5	Elevation Angle Sensor Electrical Evaluation	5-6
	Tilt vs. Allowed Height Evaluation	5-7
5.6	Elevation Sensor Calibration	5-8
5.7	Updating Software	5-8
5.8	Troubleshooting	5-9
5.9	Machine Model Adjustment	5-26
5.10	Machine Configuration Programming Information	5-27
SECTION 6 - DIAGNOSTIC TROUBLE CODES		
6.1	Introduction	6-1
6.2	DTC Index	6-1

MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >

1.5 CYLINDER SPECIFICATIONS

Description	1930ES	2032ES	2632ES	2646ES	3246ES
Lift Cylinder Bore	2.8 in (7.1 cm)	3.1 in (7.9 cm)	3.1 in (7.9 cm)	3.9 in (9.9 cm)	3.9 in (9.9 cm)
Lift Cylinder Stroke	43.2 in (108 cm)	48 in (122 cm)	48 in (122 cm)	44.9 in (114 cm)	56.8 in (144 cm)
Lift Cylinder Rod Diameter	1.8 in (4.5 cm)	2.1 in (5.5 cm)	2.1 in (5.5 cm)	2.4 in (6 cm)	2.4 in (6 cm)
Steer Cylinder (Stroke)	6.3 in (16 cm)	6.3 in (16 cm)	6.3 in (16 cm)	6.1 in (15.6 cm)	6.1 in (15.6 cm)

1.6 MAJOR COMPONENT WEIGHTS

Component	1930ES	2032ES	2632ES	2646ES	3246ES
Platform	100 lb (45 kg)	133 lb (61 kg)		176 lb (80 kg)	
Manual Platform Extension	45 lb (20 kg)				
Arm Assembly - (Includes Lift Cylinder)	620 lb (281 kg)	939 lb (426 kg)	1,213 lb (550 kg)	1,645 lb (746 kg)	
Chassis w/Wheel/Tire and Drive Assembly	1,067 lb (484 kg)	1,764 lb (800 kg)		1,554 lb (705 kg)	

1.7 CRITICAL STABILITY WEIGHTS

⚠ WARNING

DO NOT REPLACE ITEMS CRITICAL TO STABILITY, SUCH AS BATTERIES OR SOLID TIRES, WITH ITEMS OF DIFFERENTWEIGHT OR SPECIFICATION. DO NOT MODIFY UNIT IN ANY WAY TO AFFECT STABILITY.

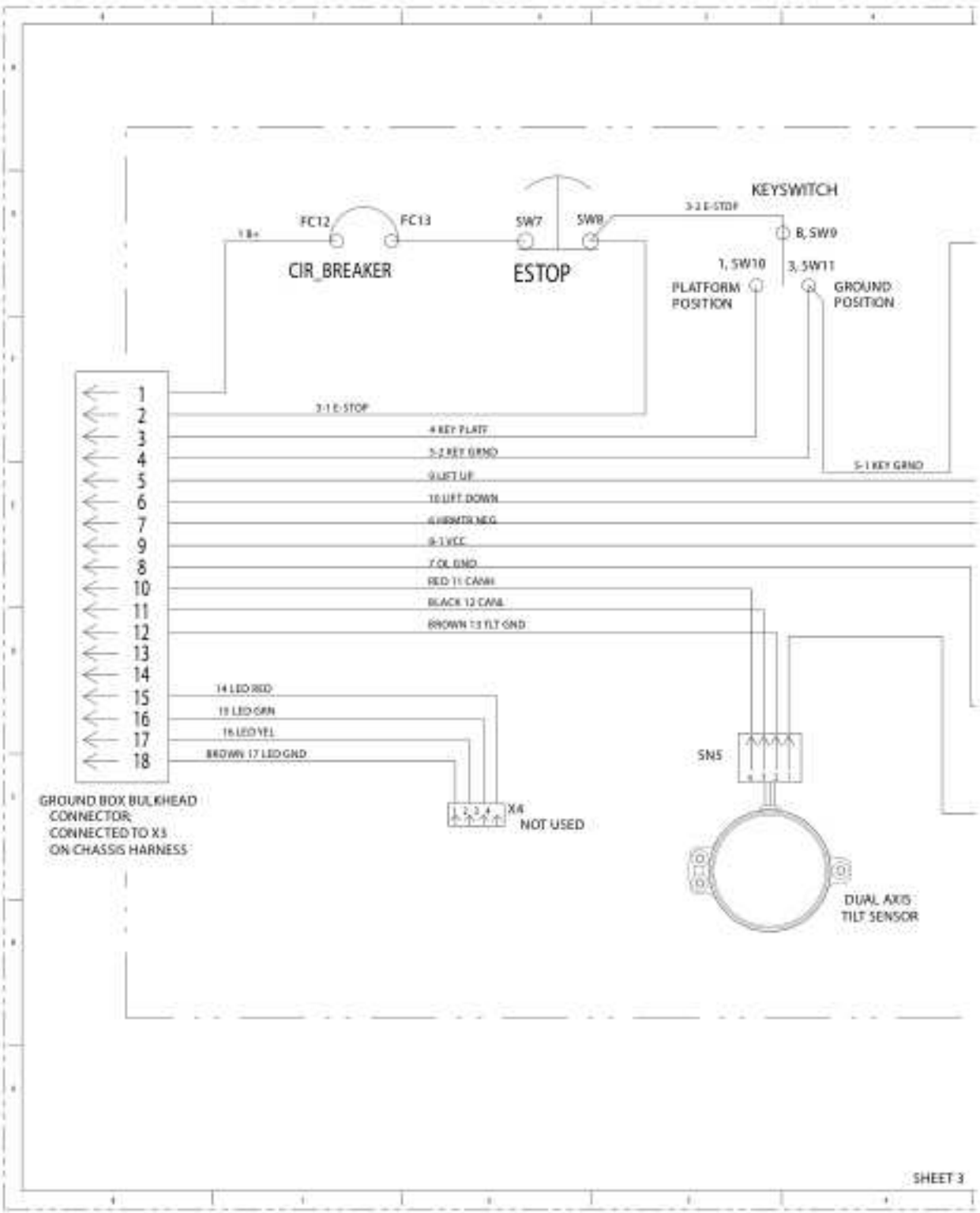
Component	1930 ES	2032ES	2632ES	2646ES	3246ES
Counterweight(s) (CE, AUS)	586 lb (266 kg)	726 lb (329.5 kg)		1606.7 lb (728.8 kg)	1973.8 lb (895.3 kg)
Counterweight (ANSI, CSA, JPN)					
Wheel and Tire Assembly (each)	22 lb (9.8 kg)	39.7 lb (18 kg)			
Wheel/Tire and Drive Assembly (each)	117 lb (53 kg)	162 lb (73.4 kg)			
Lift Cylinder	176 lb (80 kg)	205 lb (93 kg)		263 lb (119 kg)	283 lb (128 kg)
Batteries: (each) 220 Amp 220 Amp (used with Inverter/Charger) 245 Amp	67 lb (30.4 kg) 66 lb (30 kg) N/A	67 lb (30.4 kg) 66 lb (30 kg) 70 lb (32 kg)			

MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >

Table 5-2. Flash Code Listing

Flash Code	Help Message	Cause	Possible Resolve
9 9	LSS INTERNAL ERROR – PIN EXCITATION	The Excitation Voltage for the Load Sensors < 4.25V. 9-9 Flash Code LSS Module Message – Status Message (0x81) is reporting "INTERNAL ERROR – PIN EXCITATION < 4.25V" AND [Machine Setup's LOAD is set to 1=CUTOUT PLT OR 2=CUTOUT ALL]. Retained until power is re-cycled. Vehicle assumed to be Overloaded.	The sensors may be excessively loading the Excitation Supply due to wiring damage, or the Load Sensing System Module may have hardware difficulty.
9 9	LSS INTERNAL ERROR – DRDY MISSING FROM A/D	The DRDY Interrupt from the Load Sensing System Module's A/D Converter is missing. 9-9 Flash Code LSS Module Message – Status Message (0x81) is reporting "INTERNAL ERROR – DRDY INTERRUPT FROM A/D" AND [Machine Setup's LOAD is set to 1=CUTOUT PLT OR 2=CUTOUT ALL]. Retained until power is re-cycled. Vehicle assumed to be Overloaded.	This may indicate Load Sensing System Module hardware difficulty.
9 9	POWER MODULE FAILURE: PERSONALITY RANGE ERROR	The Power Module detected an out-of-range or corrupt personality setting. 9-9 Flash Code The Power Module is reporting a "Configuration Range" Fault Code (11d) OR a "Configuration CRC" Fault Code (12d) OR a "Motor Setup" Fault Code (13d). Retained until power is re-cycled.	Reset control system Personalities to default settings to clear difficulty.
9 9	POWER MODULE FAILURE: INTERNAL ERROR	The Power Module detected an internal error via self-test. 9-9 Flash Code The Power Module is reporting a "Two Direction" Fault Code (4d) OR a "Sequence" Fault Code (5d) OR a "CANbus Input" Fault Code (6d) OR a "12V Supply Detection" Fault Code (18d) OR a "System Monitor Activated" Fault Code (24d). Retained until power is re-cycled.	Re-cycle power to clear difficulty.
9 9	POWER MODULE FAILURE: CHECK POWER CIRCUITS OR MOSFET SHORT CIRCUIT	The Power Module detected an error in the Power Wiring for the Drive or Pump. Alternately, the Power Module has failed a self-test. 9-9 Flash Code The Power Module is reporting an "Armature MOSFET Short Circuit" Fault Code (17d) OR an "Armature MOSFET's Off" Fault Code (19d) OR an "Armature MOSFET's On" Fault Code (20d) OR an "Armature Pullup MOSFET Short Circuit" Fault Code (21d). Retained until power is re-cycled.	Check wiring and motors or replace the Power Module. Re-cycle power to clear difficulty.
9 9	POWER MODULE FAILURE: SYSTEM MONITOR	The ground board detected armature, field, or pump current while function was not commanded.	Refer to Drive Motor Electrical Evaluation in Section 3.2. Refer to Pump Motor Electrical Evaluation in Section 4.3. Refer to Power Module Electrical Evaluation in Section 3.6.
9 9	EEPROM FAILURE – CHECK ALL SETTINGS	The control system detected an EEPROM failure. Personalities and Machine Setup settings may be reset to default values. 9-9 Flash Code The control system's EEPROM checksum indicates corruption. Retained until EEPROM settings are corrected and power is re-cycled.	Check / correct all settings and re-cycle power to clear difficulty.

MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >



MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >

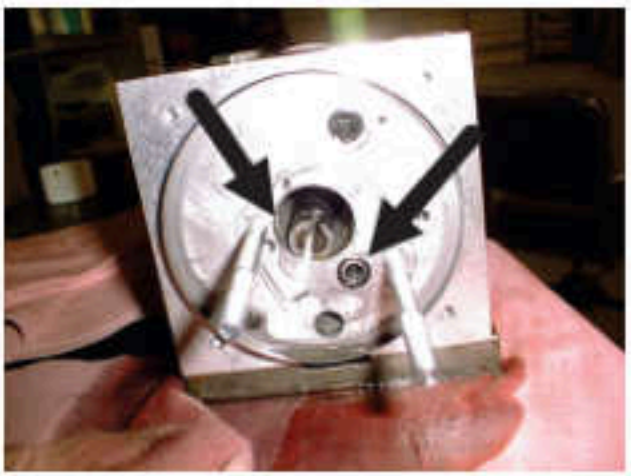


11. Remove allen nut on the return/filter line and rotate large retainer ring to remove return/filter line.
12. Replace the return/filter line oring if necessary.
13. With the return line and the pickup tube removed, the pump can be removed.
14. Loosen and remove the two hexhead nuts from the pump and block. Remove pump from valve body.





NOTE: *Be sure to remove and discard the plastic plug at the oil inlet on the new pump before installing.*



15. Check oring on valve body and replace if necessary before installing the new pump. Lubricate orings before assembling.

NOTE: *There are two orings used to seal the pump to the valve body, one for the pump inlet (shown above) and one on the pump boss around the drive coupler.*

MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >

3.8 MDI (MULTIFUNCTION DIGITAL INDICATOR) AND BRAKE RELEASE



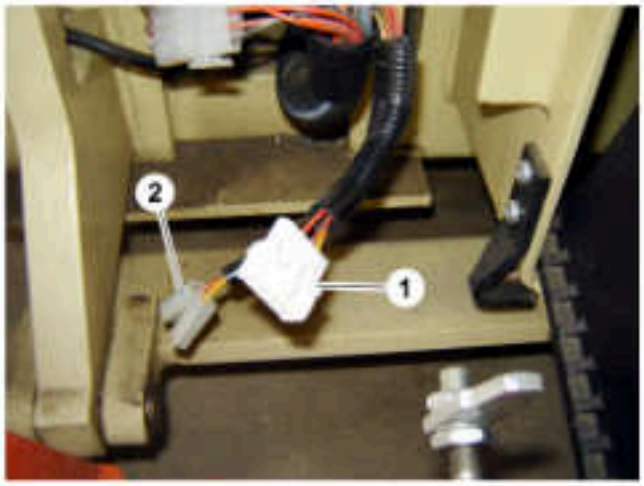
MDI and Brake Release Bracket

Installation:

NOTICE

ENSURE EMS BUTTONS ON THE CONTROL STATIONS ARE PUSHED IN TO THE OFF POSITION BEFORE CONNECTING AND MOUNTING THE MDI AND BRAKE RELEASE BRACKET.

1. Open the Battery Cover on the right side of the machine (ground control station side). Lifting up on the battery tray and pulling out will allow for maximum extension.
2. Locate the Diagnostic Port (1) and Brake Release Plugs (2).

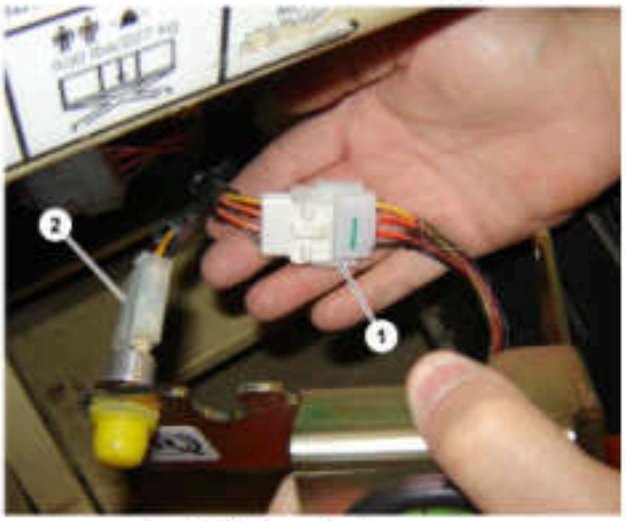


1. Diagnostic Port
2. Brake Release Plugs

3. Apply di-electric grease to the two Brake Release Plugs. Connect the Brake Release Plugs to the Brake Release Button on the backside of the mounting bracket.

NOTE: *The brake release plugs have no polarity, therefore, can be connected to either post on the button.*

4. Connect the MDI harness to the Diagnostic Port.



1. MDI Connected
2. Brake Release Connected

MidWestTech | JLG 1930ES, 2032ES, 2632ES, 2646ES, 3246ES Scissor Lift Service Manu... Order the manual at mid-west-tech.com >