An Oshkosh Corporation Company

Service & Maintenance Manual

Models

1930ES
2032ES
2632ES
2646ES
3246ES

PVC 1910

31215074

January 8, 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 A	**- INTRODUCTION - MAINTENANCE SAFETY PRECAUTIONS**	
	General	1-1
	Hydraulic System Safety	1-1
	Maintenance	1-1
SECTION 1	**- SPECIFICATIONS**	
1.1	Machine Specifications	1-1
	Capacities	1-2
	Fluid Capacities	1-2
	Tires	1-3
	Batteries	1-3
	Motors	1-3
	Battery Charger/AC Inverter	1-3
	Lift Speed (No Load in Platform)	1-5
	Travel Speed	1-6
	Model Dimensions	1-6
1.2	Torque Requirements	1-7
1.3	Lubrication	1-7
	Hydraulic Oil	1-7
	Pressure Settings	1-8
1.4	Limit Switches	1-9
	Tilt Alarm	1-9
	High Drive Speed Cutout	1-9
1.5	Cylinder Specifications	1-10
1.6	Major Component Weights	1-10
1.7	Critical Stability Weights	1-10
1.8	Thread Locking Compound	1-11
1.9	Torque Charts	1-12
	SAE Fastener Torque Chart	1-12
	SAE Fastener Torque Chart (Continued)	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
	Metric Fastener Torque Chart	1-18
	Metric Fastener Torque Chart (Continued)	1-19
	Metric Fastener Torque Chart (Continued)	1-20
	Metric Fastener Torque Chart (Continued)	1-21
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

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

SECTION NO.	TITLE	PAGE NO.
2.2	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
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

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

SECTION NO.	TITLE	PAGE NO.
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
	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

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

Capacities

NOTE: *All platform extension capacities are 250 lb (120 kg)*

Model	ANSI/CSA		CE INDOOR		CE OUTDOOR		AUSTRALIAN INDOOR		AUSTRALIAN OUTDOOR	
	Max Capacity	Max Persons	Max Capacity	Max Persons	Max Capacity	Max Persons	Max Capacity	Max Persons	Max Capacity	Max Persons
1930ES	500 lb (227 kg)	2	230 kg	2	120 kg	1	230 kg	2	120 kg	1
2032ES	800 lb (363 kg)	2	360 kg	2	160 kg	1	360 kg	2	160 kg	1
2632ES single cap	500 lb (227 kg)	2	230 kg	2	N/A	N/A	230 kg	2	N/A	N/A
2632ES dual cap to 20 ft	800 lb (363 kg)	2	360 kg	2	N/A	N/A	360 kg	2	N/A	N/A
2632ES dual cap to 26 ft	500 lb (227 kg)	2	230 kg	2	N/A	N/A	230 kg	2	N/A	N/A
2646ES	1000 lb (454 kg)	2	450 kg	2	230 kg	2	450 kg	2	230 kg	2
3246ES to 26 ft	1000 lb (454 kg) Zone A	2	450 kg	2	320 kg	1	450 kg	2	320 kg	1
3246ES to 32 ft	700 lb (317 kg) Zone B	2	320 kg	2	320 kg	1	320 kg	2	320 kg	1

Fluid Capacities

Description	1930ES	2032ES	2632ES	2646ES	3246ES
Hydraulic Tank	2 Gal (7.6 L)	2 Gal (7.6 L)		3 Gal (11.3 L)	
Hydraulic System (Including Tank)	2.2 Gal (8.3 L)	2.8 Gal (10.6 L)		5.3 Gal (19.9 L)	

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 >

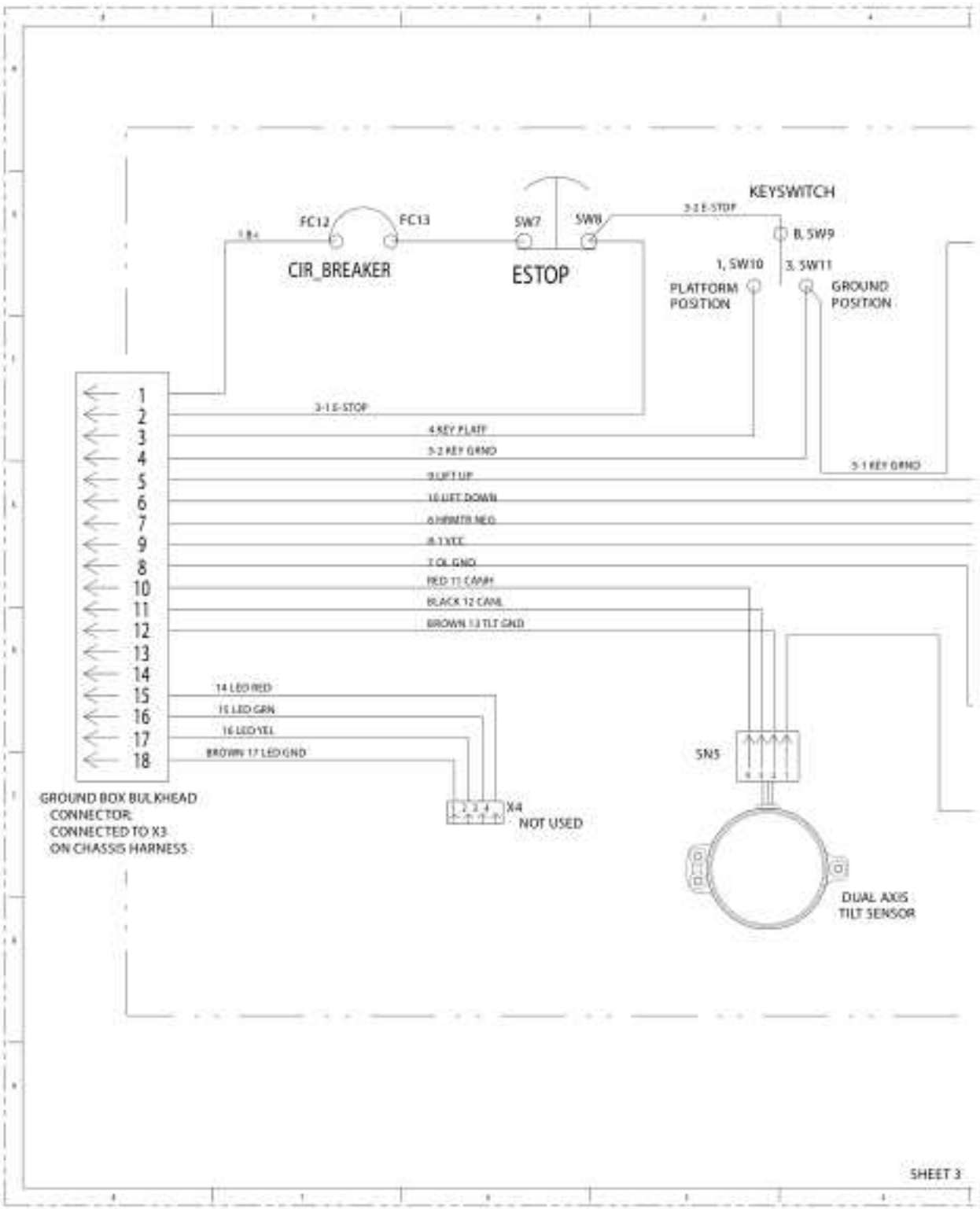


Figure 7-22. Electrical Schematic - Sheet 5 of 10

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

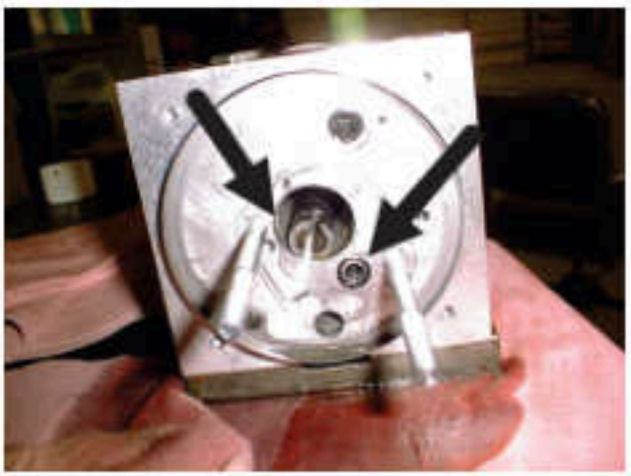


11. Remove allen nut on the return/filter line and rotate large retainer ring to remove return/filter line.
12. Replace the return/filter line oring if necessary.
13. With the return line and the pickup tube removed, the pump can be removed.
14. Loosen and remove the two hexhead nuts from the pump and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

Table 1-3. Battery Charger Specifications

DESCRIPTION	Green Power 1001218595
OUTPUT	
Nominal DC Output Voltage	24V
Maximum DC Output Voltage	34V
Maximum DC Output Current	30A
INPUT	
AC Input Voltage	100-240V
AC Input Frequency	45-65 HZ
Maximum AC Input Current	8.5A
OPERATION	
Charging Indicator	Yellow LED
100% Charge Indicator	Green LED

Table 1-4. Battery Charger/AC Inverter Specifications

DESCRIPTION	Xantrex 1001093839
AC INVERTER	
Output Power (Continuous)	1000 W
Output Power (Surge)	3000 W
AC Output Current	36 A
AC Output Voltage	115 to 125 VAC
Output Frequency	60 Hz
DC Input Voltage	21.2 to 29 VDC
Remote ON/OFF	Yes
Modified Sine Wave	-
CHARGER	
Nominal DC Output Voltage	28 VDC
Maximum DC Output Voltage	33 VDC
Maximum DC Output Current	23 to 27 ADC
Required Interlock Current	1 A
Input Voltage (AC)	100 to 130 VAC
Nominal Input Voltage (AC)	120 VAC
Input Frequency	54 to 66 Hz
OPERATION	
Charging Indicator	Yellow LED
100% Charge Indicator	Green LED
Fault Indicator	Red LED
PROTECTION	
Output Reverse DC Polarity	125 A Replaceable Fuse
Output AC Short Circuit	Internally Controlled
AC Overload	20 A Internal Slow Blow Charger Fuse

Table 1-4. Battery Charger/AC Inverter Specifications

DESCRIPTION	Xantrex 1001093839
DC Overload	Voltage Limited - Internally Controlled
MECHANICAL	
Operating Temperature	–40°F to + 185°F (–40°C to + 85°C)
Housing	Shock and Water Resistant Aluminum

Table 1-5. Battery AC Inverter Specifications

DESCRIPTION	Power Bright 1001136757
AC INVERTER	
Output Power (Continuous)	900 W
Output Power (Surge)	1800 W
AC Output Current	7.5 A
AC Output Voltage	117 ± 10% VAC
Output Frequency	60 Hz
DC Input Voltage	20 to 30 VDC
Modified Sine Wave	Yes
PROTECTION	
Output Reverse DC Polarity	3 X 25 A Replaceable Fuse
MECHANICAL	
Operating Temperature	–4°F to + 113°F (–20°C to + 45°C)

Lift Speed (No Load in Platform)

NOTE: *No load in platform on measured lift speeds.*

Table 1-6. Lift Speed

Model	Lift Up (Seconds)	Lift Down (Seconds)
1930ES	18 - 26	22 - 35
2032ES	25 - 36	30 - 46
2632ES	28 - 38	32 - 40
2646ES	38 - 50	40 - 55
3246ES	50 - 62	58 - 68

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