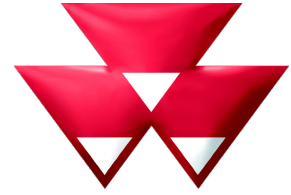


Workshop Service Manual



MASSEY FERGUSON

Rotary Disc Mower Conditioner

1316S



**CALIFORNIA
Proposition 65 Warning**

WARNING: Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, or other reproductive harm.

WARNING: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after handling.

Rotary Disc Mower Conditioner

1	General	1-1
1.1	General information	1-3
1.1.1	Introduction to this service manual	1-3
1.1.2	Units of measurement	1-3
1.1.3	Table of contents	1-3
1.1.4	Page numbers	1-3
1.1.5	Intended use	1-3
1.1.6	Proper disposal of waste	1-3
1.2	Safety	1-5
1.2.1	Safety symbol	1-5
1.2.2	Safety messages	1-5
1.2.3	Information messages	1-5
1.2.4	Safety signs	1-5
1.2.5	A word to the technician	1-6
1.2.6	The service manual	1-7
1.2.7	Operation	1-7
1.2.7.1	Prepare for operation	1-7
1.2.7.2	General information	1-7
1.2.7.3	Personal protective equipment	1-8
1.2.7.4	Seat instructions	1-9
1.2.7.5	Shield and guards	1-9
1.2.7.6	Exhaust warning	1-10
1.2.7.7	Flying debris	1-10
1.2.7.8	Handrails	1-10
1.2.7.9	Agricultural chemicals	1-10
1.2.7.10	Travel on public roads	1-11
1.2.8	Maintenance	1-12
1.2.8.1	General maintenance information	1-12
1.2.8.2	Fire prevention and first aid	1-14
1.2.8.3	High pressure leaks	1-15
1.2.8.4	Accumulator safety	1-15
1.2.8.5	Tire safety	1-16
1.2.8.6	Replacement parts	1-16
1.2.8.7	Weld on the machine precautions	1-16
1.3	Machine identification	1-18
1.3.1	Serial number plate	1-18
1.3.2	Serial number description	1-18
1.4	Service schedule	1-20
1.5	Lubrication details	1-21
1.5.1	Inspection during lubrication	1-21
1.5.2	Sealed bearings	1-21
1.5.3	Lubrication fittings	1-21
1.5.4	Gearboxes	1-25
1.5.4.1	Plug location - swivel gearboxes	1-25
1.5.4.2	Plug location - header drive gearbox	1-25
1.5.4.3	Plug location - cutterbed drive gearbox	1-25
1.5.4.4	Examine the gearbox oil level	1-25
1.5.4.5	Change the gearbox oil	1-26
1.5.5	Conditioner gearboxes	1-26
1.5.5.1	Plug location - conditioner gearbox	1-26
1.5.5.2	Examine the gearbox oil level	1-27

1.5.5.3	Change the gearbox oil	1-27
1.5.6	Cutterbed	1-28
1.5.6.1	Cutterbed oil level	1-28
1.5.6.2	Change the cutterbed oil	1-28
1.5.7	Lubricate the wheel bearings	1-29
1.6	Maintenance	1-32
1.6.1	Bolt torque values	1-32
1.6.2	Remove a lock collar	1-34
1.6.3	Install a lock collar	1-34
1.7	Specifications	1-35
1.7.1	Dimensions and weights	1-35
1.7.2	Header specifications	1-35
1.7.3	Cutterbed specifications	1-35
1.7.3.1	Cutterbed bolt torque	1-35
1.7.4	Drive system specifications	1-35
1.7.5	Tire specifications	1-36
1.7.6	Tractor specifications	1-36
1.7.7	Maximum road speed	1-36
1.7.8	Conditioner specifications	1-36
1.7.9	Lubrication specifications	1-37
1.8	Description of a pull type rotary mower conditioner	1-39
1.8.1	Cutterbed	1-39
1.8.2	Conditioner	1-39
1.8.3	Swathboard	1-39
1.8.4	Forming shields	1-39
1.9	Troubleshooting	1-41
1.9.1	Header troubleshooting	1-41
1.9.2	Cutterbed troubleshooting	1-42
1.9.3	Conditioner troubleshooting	1-43
1.9.4	Crop conditioning and windrow formation	1-44
1.9.5	Cutoff quality	1-45
1.10	Component access	1-47
1.10.1	Component access	1-47
1.10.2	Component location	1-48
2	Drive system	2-1
2.1	Implement driveline	2-3
2.1.1	Remove the implement driveline	2-3
2.1.2	Install the implement driveline	2-4
2.2	Tongue driveline	2-5
2.2.1	Tongue driveline components	2-5
2.2.2	Remove the tongue driveline	2-5
2.2.3	Examine the tongue driveline	2-7
2.2.4	Install the tongue driveline	2-7
2.3	Intermediate driveline	2-9
2.3.1	Remove the intermediate driveline	2-9
2.3.2	Install the intermediate driveline	2-10
2.4	Clutch driveline	2-12
2.4.1	Remove the clutch driveline	2-12
2.4.2	Install the clutch driveline	2-13
2.5	Slip clutch	2-15
2.5.1	Slip clutch components	2-15
2.5.2	Run-in the slip clutch	2-15
2.5.3	Remove the slip clutch	2-15
2.5.4	Disassemble the slip clutch	2-17
2.5.5	Examine the slip clutch	2-19

2.5.6	Assemble the slip clutch	2-19
2.5.7	Install the slip clutch	2-21
2.6	Overrunning clutch	2-23
2.6.1	Remove the overrunning clutch	2-23
2.6.2	Disassemble the overrunning clutch	2-24
2.6.3	Examine the overrunning clutch	2-26
2.6.4	Assemble the overrunning clutch	2-26
2.6.5	Install the overrunning clutch	2-27
2.7	Cutterbed driveline	2-30
2.7.1	Remove the cutterbed driveline	2-30
2.7.2	Install the cutterbed driveline	2-30
2.8	Conditioner drivelines	2-32
2.8.1	Remove the conditioner drivelines	2-32
2.8.2	Examine the conditioner drivelines	2-32
2.8.3	Install the conditioner drivelines	2-33
2.9	Universal joint bearing replacement	2-34
2.9.1	Disassemble a universal joint	2-34
2.9.2	Examine an universal joint	2-36
2.9.3	Assemble an universal joint	2-36
2.10	Quick disconnect	2-39
2.10.1	Disassemble the quick disconnect	2-39
2.10.2	Examine the quick disconnect	2-40
2.10.3	Assemble the quick disconnect	2-40
2.11	Belts	2-42
2.11.1	Belt maintenance	2-42
2.11.2	Adjust the conditioner belt	2-42
2.11.3	Replace the conditioner belt	2-43
2.11.4	Adjust the auger belt	2-45
2.11.5	Replace the auger belt	2-45
2.11.6	Adjust the center cage belt	2-47
2.11.7	Replace the center cage belt	2-47
2.11.8	Adjust the header drive belt	2-48
2.11.9	Replace the header drive belt	2-49
2.12	Conditioner gearbox	2-51
2.12.1	Conditioner gearbox	2-51
2.12.2	Remove the conditioner gearbox	2-51
2.12.3	Install the conditioner gearbox	2-53
2.13	Header drive gearbox	2-55
2.13.1	Header drive gearbox components	2-55
2.13.2	Remove the header drive gearbox	2-56
2.13.3	Disassemble the header drive gearbox	2-59
2.13.4	Assemble the header drive gearbox	2-61
2.13.5	Install the header drive gearbox	2-64
2.14	Cutterbed drive gearbox	2-68
2.14.1	Cutterbed drive gearbox components	2-68
2.14.2	Remove the cutterbed drive gearbox	2-69
2.14.3	Disassemble the cutterbed drive gearbox	2-72
2.14.4	Assemble the cutterbed drive gearbox	2-73
2.14.5	Install the cutterbed drive gearbox	2-76
2.15	Swivel gearbox	2-81
2.15.1	Swivel gearbox components	2-81
2.15.2	Remove the swivel gearbox	2-82
2.15.3	Disassembling the swivel gearbox	2-83
2.15.4	Assemble the swivel gearbox	2-86
2.15.5	Install the swivel gearbox	2-92

3	Hydraulic system	3-1
3.1	General hydraulic information	3-3
3.2	Steering cylinder	3-4
3.2.1	Remove the steering cylinder	3-4
3.2.2	Install the steering cylinder	3-5
3.3	Lift cylinders	3-6
3.3.1	General lift cylinder information	3-6
3.3.2	Remove a lift cylinder	3-6
3.3.3	Install a lift cylinder	3-7
3.4	Header angle cylinder	3-9
3.4.1	Remove the header angle cylinder	3-9
3.4.2	Install the header angle cylinder	3-9
3.5	Conditioner tension cylinder	3-11
3.5.1	Remove a tension cylinder	3-11
3.5.2	Tension cylinder components	3-12
3.5.3	Install a tension cylinder	3-12
3.6	Hydraulic cylinder repair	3-14
3.6.1	Examine the cylinder assembly	3-14
3.6.2	Repair a wire ring type cylinder	3-14
3.6.3	Repair a single acting cylinder	3-15
3.7	Accumulator	3-17
3.7.1	Examine the accumulator charge pressure	3-17
3.7.2	Charge an accumulator	3-18
3.7.3	Discharge an accumulator	3-20
3.7.4	Remove the accumulator	3-21
3.7.5	Install the accumulator	3-22
3.8	Conditioner tension valve	3-25
3.8.1	Remove the tension valve	3-25
3.8.2	Disassemble the tension valve	3-26
3.8.3	Examine the tension valve	3-26
3.8.4	Assemble the tension valve	3-27
3.8.5	Install the tension valve	3-27
3.8.6	Adjust the conditioner roll pressure	3-28
3.8.6.1	Increase the conditioner roll pressure	3-28
3.8.6.2	Decrease the conditioner roll pressure	3-29
4	Electrical system	4-1
4.1	Basic troubleshooting information	4-3
4.1.1	Basic troubleshooting procedures	4-3
4.1.2	Continuity check	4-3
4.1.3	Voltage check	4-4
4.2	Connectors	4-5
4.2.1	Examine a connector	4-5
4.2.2	Terminal numbers	4-5
4.2.3	Dielectric grease	4-6
4.2.4	Pins and sockets	4-6
4.2.5	Replace a Packard connector	4-7
4.2.6	Replace an AMP connector	4-7
4.3	Examine the lighting	4-9
4.3.1	Machine lamp plug wiring diagram - North America	4-10
5	Flotation	5-1
5.1	Header flotation	5-3
5.1.1	Adjust the header flotation	5-3

5.2	Flotation springs	5-4
5.2.1	Remove the flotation springs	5-4
5.2.2	Disassemble the flotation springs	5-5
5.2.3	Assemble the flotation springs	5-5
5.2.4	Install the flotation springs	5-5
6	Cutterbar	6-1
6.1	Discs	6-3
6.1.1	Disc maintenance	6-3
6.1.2	Replace a disc	6-3
6.1.3	Replace a disc spindle assembly	6-4
6.2	Lifters	6-6
6.2.1	Lifters	6-6
6.2.2	Replace the lifters	6-6
6.3	Knives	6-7
6.3.1	Knife wedging under disc	6-7
6.3.2	Knife inspection	6-7
6.3.3	Disc rotation	6-8
6.3.4	Replace a fixed blade knife	6-8
6.3.5	Replace a quick change knife	6-8
6.3.6	Replace a knife quick change spring	6-10
6.3.7	Knife type	6-10
6.3.8	Knife hardware inspection	6-10
7	Conditioner	7-1
7.1	Conditioner adjustments	7-3
7.1.1	Conditioner	7-3
7.1.2	Conditioner spacing	7-3
7.1.2.1	Adjust the conditioner roll spacing	7-3
7.1.3	Adjust the conditioner spacing indicator	7-4
7.1.4	Conditioner roll pressure	7-4
7.1.5	Adjust the conditioner roll pressure - hydraulic adjustment	7-4
7.1.5.1	Increase the conditioner roll pressure	7-4
7.1.5.2	Decrease the conditioner roll pressure	7-5
7.1.6	Conditioner roll timing	7-5
7.1.6.1	Adjust the conditioner roll timing	7-5
7.2	Examine the conditioner rolls	7-7
7.3	Top conditioner roll	7-8
7.3.1	Remove the top conditioner roll	7-8
7.3.2	Install the top conditioner roll	7-11
7.4	Bottom conditioner roll	7-15
7.4.1	Remove the bottom conditioner roll	7-15
7.4.2	Install the bottom conditioner roll	7-19
7.5	Helper roll	7-24
7.5.1	Remove the helper roll	7-24
7.5.2	Install the helper roll	7-25
7.6	Auger stripper	7-28
7.6.1	Adjust the auger stripper plate	7-28
8	Chassis	8-1
8.1	Strut and lift arms	8-3
8.1.1	Remove the strut and lift arm	8-3
8.1.2	Disassemble the strut	8-4
8.1.3	Assemble the strut	8-5
8.1.4	Install the strut and lift arm	8-6
8.2	3-point hitch	8-8

8.2.1	Remove the 3-point hitch	8-8
8.2.2	Install the 3-point hitch	8-9
8.3	Drawbar hitch	8-11
8.3.1	Remove the drawbar hitch	8-11
8.3.2	Install the drawbar hitch	8-12
8.4	Tongue	8-14
8.4.1	Remove the tongue	8-14
8.4.2	Examine the tongue	8-15
8.4.3	Install the tongue	8-16
9	Spindles and wheels	9-1
9.1	Install the wheels	9-3
9.2	Lubricate the wheel bearings	9-4
10	Diagrams	10-1
10.1	How to read wiring schematics	10-3
10.1.1	Diagram numbers	10-3
10.1.2	Location grids	10-3
10.2	Diagram symbols and abbreviations	10-5
10.2.1	Harness and connector identification	10-5
10.2.2	Splices	10-5
10.2.3	Device identification numbers	10-5
10.2.4	Harness abbreviations	10-6
10.2.5	Wire colors	10-6
10.3	Electrical tables	10-7
10.3.1	Circuit table	10-7
10.3.2	Connector table	10-8
10.4	Electrical diagram	10-10
10.4.1	Electrical diagram	10-11
10.5	Connector location	10-13
10.5.1	Connector location	10-15
10.6	Hydraulic schematic	10-17
11	Index	Index-1

1 General

1.1	General information	1-3
1.1.1	Introduction to this service manual	1-3
1.1.2	Units of measurement	1-3
1.1.3	Table of contents	1-3
1.1.4	Page numbers	1-3
1.1.5	Intended use	1-3
1.1.6	Proper disposal of waste	1-3
1.2	Safety	1-5
1.2.1	Safety symbol	1-5
1.2.2	Safety messages	1-5
1.2.3	Information messages	1-5
1.2.4	Safety signs	1-5
1.2.5	A word to the technician	1-6
1.2.6	The service manual	1-7
1.2.7	Operation	1-7
1.2.7.1	Prepare for operation	1-7
1.2.7.2	General information	1-7
1.2.7.3	Personal protective equipment	1-8
1.2.7.4	Seat instructions	1-9
1.2.7.5	Shield and guards	1-9
1.2.7.6	Exhaust warning	1-10
1.2.7.7	Flying debris	1-10
1.2.7.8	Handrails	1-10
1.2.7.9	Agricultural chemicals	1-10
1.2.7.10	Travel on public roads	1-11
1.2.8	Maintenance	1-12
1.2.8.1	General maintenance information	1-12
1.2.8.2	Fire prevention and first aid	1-14
1.2.8.3	High pressure leaks	1-15
1.2.8.4	Accumulator safety	1-15
1.2.8.5	Tire safety	1-16
1.2.8.6	Replacement parts	1-16
1.2.8.7	Weld on the machine precautions	1-16
1.3	Machine identification	1-18
1.3.1	Serial number plate	1-18
1.3.2	Serial number description	1-18
1.4	Service schedule	1-20
1.5	Lubrication details	1-21
1.5.1	Inspection during lubrication	1-21
1.5.2	Sealed bearings	1-21
1.5.3	Lubrication fittings	1-21
1.5.4	Gearboxes	1-25
1.5.4.1	Plug location - swivel gearboxes	1-25
1.5.4.2	Plug location - header drive gearbox	1-25
1.5.4.3	Plug location - cutterbed drive gearbox	1-25
1.5.4.4	Examine the gearbox oil level	1-25
1.5.4.5	Change the gearbox oil	1-26
1.5.5	Conditioner gearboxes	1-26
1.5.5.1	Plug location - conditioner gearbox	1-26
1.5.5.2	Examine the gearbox oil level	1-27

	1.5.5.3	Change the gearbox oil	1-27
1.5.6		Cutterbed	1-28
	1.5.6.1	Cutterbed oil level	1-28
	1.5.6.2	Change the cutterbed oil	1-28
1.5.7		Lubricate the wheel bearings	1-29
1.6	Maintenance		1-32
1.6.1		Bolt torque values	1-32
1.6.2		Remove a lock collar	1-34
1.6.3		Install a lock collar	1-34
1.7	Specifications		1-35
1.7.1		Dimensions and weights	1-35
1.7.2		Header specifications	1-35
1.7.3		Cutterbed specifications	1-35
	1.7.3.1	Cutterbed bolt torque	1-35
1.7.4		Drive system specifications	1-35
1.7.5		Tire specifications	1-36
1.7.6		Tractor specifications	1-36
1.7.7		Maximum road speed	1-36
1.7.8		Conditioner specifications	1-36
1.7.9		Lubrication specifications	1-37
1.8	Description of a pull type rotary mower conditioner		1-39
1.8.1		Cutterbed	1-39
1.8.2		Conditioner	1-39
1.8.3		Swathboard	1-39
1.8.4		Forming shields	1-39
1.9	Troubleshooting		1-41
1.9.1		Header troubleshooting	1-41
1.9.2		Cutterbed troubleshooting	1-42
1.9.3		Conditioner troubleshooting	1-43
1.9.4		Crop conditioning and windrow formation	1-44
1.9.5		Cutoff quality	1-45
1.10	Component access		1-47
1.10.1		Component access	1-47
1.10.2		Component location	1-48