
TM120, TM130, TM140, TM155, TM175, TM190 REPAIR MANUAL COMPLETE CONTENTS

SECTION 00 - GENERAL	2
SECTION 10 - ENGINE	3
SECTION 18 - CLUTCH	11
SECTION 21 - TRANSMISSION SYSTEMS	12
SECTION 23 - DRIVE LINES	21
SECTION 25 - FRONT AXLE	23
SECTION 27 - MECHANICAL REAR WHEEL DRIVE	26
SECTION 31 - POWER TAKE-OFF	29
SECTION 33 - BRAKES	33
SECTION 35 - HYDRAULIC SYSTEM	36
SECTION 41 - STEERING	55
SECTION 44 - FRONT AXLE AND WHEELS	57
SECTION 50 - AUXILIARY UNITS	58
SECTION 55 - ELECTRICAL SYSTEM	60
SECTION 90 - CAB	109

The following pages are the collation of the contents pages from each section and chapter of the TM Series Repair manual. Complete Repair part # 87611238.

The sections used through out all New Holland product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the TM Series Tractors.

SECTION 00 - GENERAL

BOOK 1 - 87611239

Chapter 1 - General

CONTENTS

Section	Description	Page
	General Instructions	3
	Important Notice	3
	Shimming	3
	Rotating Shaft Seals	3
	O Rings	3
	Sealers	3
	Bearings	3
	Spring Pins	3
	Precautionary Notice	4
	Equipment Notice	4
	Spare Parts Notice	4
	General Notices	4
	Health and Safety	5
	Health and Safety Precautions	5
	Precautionary Statements	14
	Safety	15
	The Tractor	15
	Driving the Tractor	15
	Operating the Tractor	15
	Operating the PTO	16
	Servicing the Tractor	16
	Diesel Fuel	17
	ROPS	17
	Ecology and the Environment	18
	Precautions	18
	Minimum Hardware Tightening Torques	19
	Federal Emissions Warranty	21
	California Emission Control Warranty Statement	22
	Lubricants and Fluids	24
	Sulphur in Fuel	24
	Biodegradable Transmission, Drive Axle, Hub, and Hydraulic System Oil	24

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 1 - Separating and Removing The Engine

CONTENTS

Section	Description	Page
	Tightening Torques	2
	Special Tools	3
	Separating and Removing the Engine	4
	Front Axle and Support	4
	Separating Front Axle and Support from Engine	4
	Installation	12
	Engine and Front Support	14
	Separating Engine and Front Support from Transmission	14
	Installation	20
	Engine	21
	Removal	21
	Installation	24

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 2 - 7.5L CNH Engine

CONTENTS

Section	Description	Page
	Specifications	6
	Cylinder Block	6
	Cylinder Head	6
	Exhaust Valves	7
	Intake Valves	7
	Valve Springs	7
	Camshaft Lobe Lift	7
	Installed Valve Recession	7
	Valve Inserts	7
	Valve Seats	8
	Valve Timing	8
	Camshaft Idler Gear	8
	Camshaft Gear	8
	Rocker Arm Shaft	8
	Rocker Arm	8
	Tappets	8
	Camshaft	8
	Connecting Rods	9
	Piston Pin	9
	Pistons	9
	Piston Rings	9
	Crankshaft	10
	Crankshaft Drive Gear	10
	Main Bearing	10
	Crankpin Bearings	10
	Crankshaft Re-grinding	11
	Flywheel	11
	Oil Pump	11
	Oil Pressure	11
	Oil Filter Support	12
	Engine Oils and Change Periods	12

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 2 - 7.5L CNH Engine (Continued)

CONTENTS

Section	Description	Page
	Engine Oil Capacities	12
	Grease and Sealants	12
	Thermostat	12
	Radiator Cap	12
	Water Pump	12
	Fan Belt	12
	Cooling System Capacities	12
	Cooling Fluid	12
	Tightening Torques	13
	Description	13
	Special Tools	15
	Troubleshooting	16
	Description of Operation	20
	General	20
	Cylinder Block Assembly	20
	Cylinder Head Assembly	21
	Camshaft Assembly	21
	Crankshaft Assembly	21
	Connecting Rods	22
	Pistons	22
	Manifolds	22
	Timing Gears	22
	Lubrication System	23
	Crankcase Breather	26
	Overhaul - Cylinder Head	27
	Introduction	27
	Operations or Repairs That Can Be Performed With the Engine Still in the Vehicle	27
	Timing Check	28
	Cylinder Head, Valves, and Related Parts	31
	Cylinder Head Removal	31
	Cylinder Head Disassembly	34

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 2 - 7.5L CNH Engine (Continued)

CONTENTS

Section	Description	Page
	Cylinder Head Inspection and Repair	35
	Cylinder Head Assembly	39
	Engine Front Cover and Timing Gears	42
	Timing Gears Check and Removal	42
	Installation	44
	Oil Pan	47
	Removal	47
	Inspection and Repair	47
	Installation	47
	Flywheel	48
	Removal	48
	Inspection and Repair	48
	Installation	48
	Rear Cover Plate	49
	Removal	49
	Installation	49
	Oil Pump	50
	Removal	50
	Disassembly	51
	Inspection and Repair	51
	Installation	51
	Oil Pressure Relief Valve	52
	Removal	52
	Installation	52
	Camshaft	53
	Removal	53
	Inspection and Repair	53
	Camshaft Bearings	54
	Removal	54
	Installation	54
	Camshaft and Tappet Installation	54

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 2 - 7.5L CNH Engine (Continued)

CONTENTS

Section	Description	Page
	Pistons	55
	Removal	55
	Inspection and Repair	56
	Connecting Rod Bush Replacement	58
	Cylinder Block Overhaul	59
	Cylinder Bore	60
	Sleeving - Boring and Honing	61
	Piston and Piston Ring Replacement and Installation	62
	Crankshaft	65
	Removal	65
	Inspection and Repair	65
	Assembly	66
	Front Crankshaft OSL Seat Installation	69
	Engine Compression Test	71
	Test Procedure	71
	Test Readings	71
	Test Conclusion	71
	Cooling System - (CNH 7.5 Liter Engine)	72
	Description of Operation	72
	Troubleshooting	74
	Tightening Torques	75
	Specifications	75
	Thermostat	75
	Water Pump	75
	Drive Belt	75
	Cooling Capacities	75
	Coolant Flow	75
	Cooling Fluid	75
	Overhaul - Cooling System	76
	Radiator	76
	Removal	76

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 2 - 7.5L CNH Engine (Continued)

CONTENTS

Section	Description	Page
	Inspection and Repair	77
	Installation	77
	Thermostat	78
	Removal	78
	Inspection and Repair	78
	Installation	78
	Temperature Warning Sender	79
	Installation	79
	Vistronic Fan Assembly	79
	Clutch Testing	79
	Removal	79
	Installation	79
	Fan Blade Removal	80
	Assembly	80
	Fan Belt Tensioner	80
	Removal	80
	Inspection and Repair	80
	Assembly	80
	Idler Pulley (with air conditioning only)	81
	Water Pump	81
	Removal	81
	Disassembly	82
	Inspection and Repair	83
	Assembly	83
	Installation	84

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 3 - Fuel System

CONTENTS

Section	Description	Page
	Specifications	3
	Tightening Torques	3
	Special Tools	4
	Description of Operations	5
	Single Filter Fuel System	5
	Duel Filter Fuel System	6
	Fuel Shut Off (Injection Pump)	7
	Fuel Injection Pumps	7
	Fuel Sedimenter/Primary Filter	8
	Electric Lift Pump	8
	Secondary Fuel Filter	9
	Power Boost	9
	Constant Engine Speed Control	10
	175 and 190 Tractors	10
	High RPM Switch Priority	10
	Fuel System Overhaul	11
	Bosch VE Type Fuel Injection Pump (Mechanically Governed)	11
	Removal	11
	Inspection	12
	Fuel Injection Pump Timing and Installation	12
	Bosch VP Fuel Injection Pump (Electronically Controlled)	15
	System Diagram	15
	Removal	16
	Inspection	17
	Injection Pump Timing Check	17
	Injection System Bleeding	21
	Fuel Injectors	21
	Removal	21
	Testing	22
	Disassembly	23
	Inspection and Repair	24
	Assembly	26
	Installation	26

SECTION 10 - ENGINE

BOOK 1 - 87611239

Chapter 3 - Fuel System (Continued)

CONTENTS

Section	Description	Page
	Electric Lift Pump	26
	Removal	26
	Testing	27
	Turbocharger	27
	Removal	27
	Disassembly	28
	Cleaning	28
	Inspection	29
	Assembly	29
	Installation	29
	Air Intake Components	31
	Description of Operation	31
	Air Cleaner	31
	Removal	31
	Disassembly (Mechanically Governed Engines)	31
	Disassembly (Electronically Governed Engines)	31
	Inspection and Repair	32
	Assembly	34
	Main Fuel Tank	34
	Removal and Installation	34
	Auxiliary Fuel Tank	36
	Removal and Installation	36
	Crankcase Ventilation	36
	Foot Throttle Cable (Mechanically Governed Engines)	36
	Replacement	36
	Adjustment	37
	Hand Throttle Cable	37
	Replacement	37
	Adjustment	37

SECTION 18 - CLUTCH

BOOK 1 - 87611239

Chapter 1 - Clutch

CONTENTS

Section	Description	Page
	Specifications	2
	13" LUK Clutch	2
	14" Valeo Clutch	2
	Tightening Torques	3
	Sectional Views	4
	13" LUK Clutch - Longitudinal Sectional View	4
	Hydraulic Clutch Control Assembly	4
	Special Tools	5
	Description and Operation	5
	General	5
	Operation	5
	Troubleshooting	6
	Overhaul	7
	Clutch	7
	Disassembly and Assembly	7
	Clutch Hydraulic Control	9
	Removal-Installation	9
	Clutch Pedal Adjustment	10
	Disassembly-Assembly	11
	Clutch Control Hydraulic Circuit Bleeding	13

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 1 - Semi-Powershift Transmission

CONTENT

Section	Description	Page
	Specifications	3
	Semi-Powershift Transmission and Range Gears	3
	Creeper Gears	5
	Tightening Torques	6
	Special Tools	7
	Sectional Views	11
	Semi-Powershift	11
	Range Control Valve	12
	Description and Operation	14
	Introduction	14
	Clutches	14
	Direction, Speed and Range Changes	15
	Gear Selection Sequence	16
	Selecting a Gear - No Clutch Pedal	16
	Selecting a Gear With Clutch Pedal	16
	Range Shifting	16
	Shuttling	16
	Failed Synchronizer Engagement	16
	Semi-Powershift Transmission Oil Flow Illustrations	17
	Semi-Powershift Transmission Oil Flow with 1st Gear Forward Engaged	17
	Semi-Powershift Transmission Oil Flow with 6th Gear Forward Engaged	18
	Power Flow 1st Gear Medium Range-Forward	19
	Power Flow 2nd Gear Medium Range-Forward	20
	Power Flow 2nd Gear Medium Range-Reverse	21
	Limp Home Feature	22
	Description	22
	Instructions	22
	Testing and Calibration	23
	Transmission Clutches, A, B, C, D and E	23
	Pressure Test	23

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 1 - Semi-Powershift Transmission (Continued)

CONTENT

Section	Description	Page
	Low, Medium, High and Reverse Synchronizer	25
	Pressure Test	25
	Clutch and Synchronizer Calibration	27
	Calibration Procedure	27
	Tractor Preparation	27
Overhaul		30
	Semi-Powershift Transmission Housing	30
	Removal	30
	Installation	33
	Transmission Overhaul	34
	Disassembly	34
	Assembly	45
	Adjustments - Internal Components	50
	Semi-Powershift Range Control Valve Assembly	54
	Removal	54
	Installation	55
	Disassembly	56
	Assembly	59
	Semi-Powershift Range Control Solenoid Valve	60
	Replacement	60
	Semi-Powershift Transmission Control Valve	62
	Removal	62
	Installation	63
	Semi-Powershift Transmission Solenoid Valve	64
	Replacement	64

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 2 - Full Powershift Transmission - 30 and 40 kph Transmission

CONTENT

Section	Description	Page
	Specifications	3
	Creeper Gears	5
	Tightening Torques	6
	Special Tools	11
	Description and Operation	14
	Full Powershift Transmission Components	14
	Operation	16
	Full Powershift Transmission Power Flows	18
	1st Gear Selected	20
	10th Gear Selected	20
	16th Gear Selected	21
	Reverse 5th Gear Selected	21
	Input Sensors	22
	Output Devices	24
	Control Device	24
	Driving the Tractor	25
	Auto Shift Function	27
	Auto Shifting in Road Range	27
	Auto Shifting in Field Range	28
	Changing the Gear Span	28
	Go To Mode	29
	Speed Matching	30
	Programming Reverse Gear Ratios	31
	Testing and Calibration	33
	Clutch Calibration	33
	Description	33
	Calibration Procedure	33
	Automatic Calibration Sequence Mode	35
	Calibration Fault Codes	36

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 2 - Full Powershift Transmission - 30 and 40 kph Transmission (Continued)

CONTENT

Section	Description	Page
	Pressure Testing	37
	Transmission Clutches, A, B, C, D, E, F1, F2, F3 and R	37
Troubleshooting		40
	Fault Codes and Fault Finding	40
	Full Powershift Fault Code Display Logic	41
	Limp Home Feature	44
	Description	44
	Instructions	44
Overhaul		45
	Full Powershift Transmission Housing	45
	Removal	45
	Installation	49
	Disassembly	51
	Transmission Components Disassembly	62
	Oil Manifold Bush	62
	Transmission Upper Speed Shaft End Play Adjustment	63
Clutch Overhaul		64
	Clutch 'A'	64
	Clutch 'B'	66
	Clutch 'C'	67
	Clutch 'D'	69
	Clutch 'E'	70
	Clutch 'F3'	71
	Clutch 'F1'	72
	Clutch 'F2'	73
	Reverse Clutch	75
Transmission Reassembly		76
	A, B, C, D and E Clutch Testing	83
	Output Shaft (Fast/Slow) End Play Adjustment	84
	Medium Range Shaft End Play Adjustment	85

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 3 - Full Powershift Transmission, 175 - 190 Models

CONTENT

Section	Description	Page
	Specifications	3
	Full Powershift Transmission	3
	Creeper Gears	5
	Tightening Torques	6
	Special Tools	8
	Description and Operation	11
	Introduction	11
	Operation	14
	Top Cover - 175 and 190 Models	16
	Clutches	17
	Creeper Gears	18
	Power Flows	19
	Input Sensors	24
	Output Devices	26
	Control Device	26
	Full Powershift Transmission Controls	27
	Powershift Control	27
	Shuttle Lever	28
	Clutch Pedal	28
	Driving the Tractor	29
	Auto Shift Function	31
	Changing Gear Shift Threshold	34
	Standby Mode	34
	To Exit the Program	34
	Go To Mode	35
	Speed Matching	36
	Programming Reverse Gear Ratios	36
	Creeper Gears (where fitted)	39
	Creeper Gear Selection	39
	Testing and Calibration	40
	Clutch Calibration	40

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 3 - Full Powershift Transmission, 175 - 190 Models (Continued)

CONTENT

Section	Description	Page
	Description	40
	Calibration Procedure	40
	Automatic Calibration Sequence Mode	43
	Calibration Fault Codes	44
	Pressure Testing	45
	Transmission Clutches, A, B, C, D, E, F1, F2, F3, F4 and R	45
Troubleshooting		48
	Fault Codes and Fault Finding	48
	Full Powershift Fault Code Display Logic	49
	Limp Home Feature	52
	Description	52
	Operation	52
Overhaul		53
	Full Powershift Transmission Housing	53
	Removal	53
	Installation	58
	Disassembly	60
	Transmission Component Disassembly	73
	Oil Manifold Bush	73
	Transmission Upper Speed Shaft End Play Adjustment	74
	Clutch Overhaul	75
	Clutch 'A', 'B', 'C', 'D', 'E'	75
	Clutch 'A'	76
	Clutch 'B'	77
	Clutch 'C'	78
	Clutch 'D'	80
	Clutch 'E'	81
	Clutch 'F3'	82
	Clutch 'F1'	83
	Clutch 'F2'	84
	Reverse Clutch	86

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 3 - Full Powershift Transmission, 175 - 190 Models (Continued)

CONTENT

Section	Description	Page
	Transmission Rear Housing	87
	Disassembly	87
	Pump Drive Gear Installation	88
	Assembly	89
	Clutch Testing	96
	Output Shaft (Fast/Slow) End Play Adjustment	97
	Medium Range Shaft End Play Adjustment	98

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 4 - Dual Command Transmission (Hi-Lo)

CONTENT

Section	Description	Page
	Specifications	2
	Hi-Lo Transmission and Range Gears	2
	Creeper Gears	4
	Shuttle Gears	4
	Tightening Torques	5
	Special Tools	7
	Sectional Views	11
	Dual Command Transmission - Hi-Lo	11
	Range and Speed Control Assembly	12
	Hi-Lo Control Valve	12
	Description and Operation	13
	General	13

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 4 - Dual Command Transmission (Hi-Lo) (Continued)

CONTENT

Section	Description	Page
	Hi-Lo Transmission Oil Flow	14
	Oil Flow with Direct Drive Engaged	14
	Oil Flow with Under Drive Engaged	15
	Testing and Calibration	16
	Clutch and Synchronizer Calibration	16
	Calibration Procedure	16
	Transmission Clutches A and B	19
	Pressure Test	19
	Shuttle Synchronizer Operating Piston	21
	Pressure Test	21
	Troubleshooting	22
	Fault Codes and Fault Finding	22
	Dual Command Fault Code Display	23
	Fault Codes	26
	Clutch Spring Pressure Calibration Fault Codes	27
	Limp Home Feature	28
	Overhaul	29
	Dual Command Hi-Lo Transmission Housing	29
	Removal	29
	Installation	31
	Disassembly	32
	Assembly	42
	Adjustments - Internal Components	46
	Shuttle Gear Bearing Adjustment	46
	Range Input and Output Shaft Taper Bearing Adjustment	48
	Hi-Lo Control Valve	51
	Removal-Installation	51
	Speed and Range Control Assembly	54
	Removal	54
	Installation	55
	Disassembly	56
	Assembly	58

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 2 - 87611240

Chapter 5 - Synchronized Mechanical Shuttle Transmission

CONTENT

Section	Description	Page
	Specifications	2
	Synchronized Mechanical Shuttle Transmission	2
	Creeper Gears	3
	Shuttle Gears	3
	Tightening Torques	4
	Special Tools	6
	Sectional Views	10
	Synchronized Mechanical Shuttle Transmission	10
	Description and Operation	14
	Troubleshooting	14
	Overhaul	15
	Synchronized Mechanical Shuttle Transmission Housing	15
	Removal	15
	Installation	17
	Disassembly of Speed and Range Gears	18
	Assembly of Speed and Range Gears	28
	Adjustments	31
	Disassembly of 5th Speed Gears	35
	Assembly of 5th Speed Gears	39
	Speed and Range Control Rail Assembly	40
	Removal	40
	Installation	41
	Creeper Gears	42
	Removal	42
	Installation	43
	Creeper External Control Lever	43
	Travel Adjustment	43

SECTION 23 - DRIVE LINES

BOOK 3 - 87611241

Chapter 1 - Transfer Box Tractors with Dual Command and Synchronized Mechanical Shuttle Transmissions

CONTENTS

Section	Description	Page
	Specifications	2
	FWD Electro-Hydraulic Clutch	2
	Drive Shaft	2
	Tightening Torques	3
	Special Tools	3
	Troubleshooting	5
	Description and Operation	5
	FWD Electro-Hydraulic Clutch (Sectional View)	6
	Oil Flow	7
	FWD Electro-Hydraulic Clutch (FWD Engaged)	7
	FWD Electro-Hydraulic Clutch (FWD Disengaged)	8
	Overhaul	9
	Drive Shaft and Bearing	9
	Removal (Models Less Front Suspension)	9
	Installation	9
	Drive Shaft Rear Universal Joint	10
	Removal (Models with Front Suspension)	10
	Transfer Box Shaft Oil Seal	11
	Replacement (With the Transfer Box Removed from the Tractor)	11
	Electro-Hydraulic Clutch Transfer Box	12
	Removal	12
	Installation	16

SECTION 23 - DRIVE LINES

BOOK 3 - 87611241

Chapter 2 - FWD Transfer Box and Drive Line Tractors with Semi-Powershift and Full Powershift Transmissions

CONTENTS

Section	Description	Page
	Specifications	2
	FWD Electro-Hydraulic Clutch	2
	Tightening Torques	2
	Special Tools	2
	Troubleshooting	3
	Description and Operation	4
	FWD Electro-Hydraulic Clutch	5
	Oil Flow	6
	FWD Electro-Hydraulic Clutch (FWD Engaged)	6
	FWD Electro-Hydraulic Clutch (FWD Disengaged)	7
	Overhaul	8
	Drive Shaft Rear Universal Joint	8
	Removal (Models with Front Suspension)	8
	Electro-Hydraulic Transfer Clutch	9
	Removal	9
	Disassembly	12
	Assembly	13
	Installation	14

SECTION 25 - FRONT AXLE

BOOK 3 - 87611241

Chapter 1 - Mechanical Front Axle

CONTENT

Section	Description	Page
	Specifications	3
	Tightening Torques	5
	Special Tools	6
	Locally Fabricated Tools	6
	Sectional Views	9
	Front Axle	9
	Planetary Reduction Hub	10
	Description and Operation	10
	Front Differential Lock Assembly	11
	Dog Clutch	11
	MultiPlate Wet Clutch	12
	Troubleshooting	13
	Overhaul	14
	Standard Front Axle	14
	Removal	14
	Installation	16
	Suspended Front Axle	17
	Removal	17
	Installation	21
	Supersteer Front Axle	22
	Removal	22
	Installation	24
	Supersteer Swivel Bearing Adjustment	24
	Hub Cassette Seals - All Axle Options	26
	Replacement	26
	Front Axle Housing Disassembly - All Options	30
	Differential Support Housing and Differential Lock Removal	34
	Dog Clutch Differential Lock Disassembly/Assembly	36
	Multi-Plate Differential Lock Clutch - Disassembly/Assembly	38

SECTION 25 - FRONT AXLE

BOOK 3 - 87611241

Chapter 1 - Mechanical Front Axle (Continued)

CONTENT

Section	Description	Page
	Axle Component Reassembly - All Options	40
	Gasket Sealer Application Diagram for Assembly of Bevel Drive Unit and Epicyclic Final Drive Unit	40
	Adjustments	41
	Crown Wheel Differential	41
	Disassembly/Reassembly - All Options	41
	Differential Components - Dog Clutch	41
	Backlash Adjustment - Side Gears and Planet Pinion	41
	Pinion Shaft	42
	Removal - All Options	42
	Determining Pinion Shaft Pre-load Shim Thickness	45
	Determining Pinion Shaft Position Shim Thickness	46
	Pinion Installation	49
	Pinion Bearing Preload Rolling Torque Adjustment	50
	Differential and Pinion Shaft Adjustments - All Models	53
	Adjusting the Backlash Between the Pinion and Crown Wheel Teeth	53
	Adjusting Differential Bearing Preload - All Options	54
	Swivel Pin and Potentiometer	55
	Steering Swivel Pin and Bearing Replacement	55
	Swivel Pin Bearing Adjustment	56
	Steering Angle Potentiometer Replacement	58
	Toe-In Adjustment	59

SECTION 25 - FRONT AXLE

BOOK 3 - 87611241

Chapter 2 - Terraglide (Front Axle Suspension)

CONTENT

Section	Description	Page
	Specifications	2
	System Relief Valve	2
	Tightening Torques	2
	Description and Operation	3
	Terraglide System	3
	General Introduction	3
	Terraglide Superior Leveling System	5
	Hydraulic Control System	6
	Oil Flow Illustrations	8
	System Switched OFF	8
	System Switched ON	9
	Suspension Height Adjustment	15
	(Height Adjustment After Loss of Oil from the System or Additional Weight Added to Front of Tractor	15
	Lowering Suspension	16
	(Height Adjustment After Removing Weight from Front of Tractor	16
	Suspended Front Axle Calibration (H1)	17
	Troubleshooting	19
	Fault Finding	19
	Fault Code Listing	20
	Overhaul	21
	Suspended Front Axle	21
	Removal	21
	Installation	25
	Suspension Components	26
	Suspension Arm and Pivot Assemblies	26
	Potentiometer	27
	Cylinder	28
	Suspension Cylinder	29
	Removal	29
	Installation	30
	Disassembly	30
	Inspection	31
	Assembly	31
	Suspension Valve Block	33
	Removal - Installation	33
	Component Replacement	34

SECTION 27 - MECHANICAL REAR WHEEL DRIVE

BOOK 3 - 87611241

Chapter 1 - Mechanical Rear Wheel Drive (Models 120 - 155)

CONTENT

Section	Description	Page
	Specifications	2
	Pinion, Crown Wheel and Differential	2
	Final Drives	3
	Tightening Torques	4
	Special Tools	6
	Sectional Views	9
	Mechanical Rear Axle	9
	Rear Axle With Dog Clutch Differential Lock	10
	Rear Axle With Multi-plate Clutch Differential Lock	11
	Description and Operation	11
	Introduction	11
	Differential Lock Oil Flow	12
	Dog Type Clutch	12
	Multi-Plate Clutch	13
	Troubleshooting	14
	Pinion, Crown Wheel and Differential	14
	Final Drives	14
	Hydraulic Differential Lock	15
	Overhaul	16
	Rear Axle Housing	16
	Removal	16
	Installation	18
	Rear Axle Housing Inner Components	21
	Removal	21
	Installation	29
	Backlash and Preload Setting	30
	General Description and Location	30
	Determining Pinion Shaft Position Shim Thickness	31
	Determining Pinion Shaft Preload Shim Thickness	33
	Adjustment of Crown Wheel Bearing Pre-load and Crown Wheel to Pinion Backlash	34
	Hydraulic Pump Idler Gear Bearing Adjustment	37

SECTION 27 - MECHANICAL REAR WHEEL DRIVE

BOOK 3 - 87611241

Chapter 1 - Mechanical Rear Wheel Drive (Models 120 - 155) (Continued)

CONTENT

Section	Description	Page
	Hydraulic Lock Differential Assembly	40
	Disassembly	40
	Assembly	42
	Adjustment	42
	Differential Lock Control Unit (Dog Type Clutch)	44
	Disassembly	44
	Assembly	45
	Multi-Plate Clutch Hydraulic Differential Lock Control Unit	46
	Disassembly	46
	Assembly	46
	Final Drive Case (Left or Right Hand)	47
	Removal	47
	Installation	50
	Planetary Carrier and Drive Shaft	51
	Removal	51
	Installation	54

SECTION 27 - MECHANICAL REAR WHEEL DRIVE

BOOK 3 - 87611241

Chapter 2 - Mechanical Rear Wheel Drive (Models 175 - 190)

CONTENT

Section	Description	Page
	Specifications	2
	Pinion, Crown Wheel and Differential	2
	Final Drives	3
	Tightening Torques	3
	Special Tools	5
	Sectional Views	8
	Mechanical Rear Axle	8
	Rear Axle with Multi-plate Clutch Differential Lock	9
	Description and Operation	10
	Introduction	10
	Differential Lock Oil Flow	11
	Troubleshooting	12
	Pinion, Crown Wheel and Differential	12
	Final Drives	12
	Hydraulic Differential Lock	13
	Overhaul	14
	Rear Axle Housing	14
	Removal	14
	Installation	21
	Rear Axle Housing Inner Components	23
	Removal	23
	Installation	28
	Backlash and Preload Setting	29
	General Description and Location	29
	Determining Pinion Shaft Position Shim Thickness	30
	Determining Pinion Shaft Pre-load Shim Thickness	32
	Adjustment of Crown Wheel Bearing Pre-load and Crown Wheel to Pinion Backlash	33
	Multi-plate Clutch Hydraulic Differential Lock Control Unit	37
	Clutch Discs Replacement	37
	Fault Codes and Diagnostics	37

SECTION 27 - MECHANICAL REAR WHEEL DRIVE

BOOK 3 - 87611241

Chapter 2 - Mechanical Rear Wheel Drive (Models 175 - 190) (Continued)

CONTENT

Section	Description	Page
	Differential Overhaul	38
	Adjustment	39
	50 kph Clutch	41
	Description and Operation	41
	Removal and Installation	42
	Final Drive Case (Left or Right Hand)	45
	Removal	45
	Installation	48
	Planetary Carrier and Drive Shaft	49
	Removal	49
	Installation	52

SECTION 31 - POWER TAKE-OFF

BOOK 3 - 87611241

Chapter 1 - Power Take-Off, 120-155 Models

CONTENT

Section	Description	Page
	Specifications	2
	Power Take-Off	2
	Tightening Torques	3
	Special Tools	4
	Sectional Views	5
	Three Speed Ground Drive PTO	5
	540/1000 rpm PTO	6
	Engine Controlled PTO Drive Shaft and Control Unit	7

SECTION 31 - POWER TAKE-OFF

BOOK 3 - 87611241

Chapter 1 - Power Take-Off, 120-155 Models (Continued)

CONTENT

Section	Description	Page
	Description and Operation	7
	Introduction	7
	PTO Control Panel	8
	Fender Mounted PTO Controls	10
	PTO Control Clutch Oil Flow (Illustration)	12
	PTO Disengaged	12
	PTO Engaged	13
	PTO Clutch Brake	14
	Troubleshooting and Fault Finding	15
	Introduction	15
	Mechanical and Hydraulic Issues	15
	Electronic Management Unit / Touch Panel PTO Generated Fault Codes	16
	Overhaul	17
	Power Take Off (PTO)	17
	Removal	17
	Installation	19
	Disassembly 540/750/1000 rpm PTO	20
	Assembly	26
	Ground Drive PTO Interlock Switch Adjustment	29

SECTION 31 - POWER TAKE-OFF

BOOK 3 - 87611241

Chapter 2 - Power Take-Off, 175-190 Models

CONTENT

Section	Description	Page
	Specifications	2
	Power Take-off	2
	Special Tools	3
	Tightening Torques	3
	Sectional Views	4
	Fully Independent 540/1000 rpm PTO	4
	Engine Controlled Upper PTO Drive Shaft	5
	Description and Operation	5
	Introduction	5
	PTO Control Panel	6
	Fender Mounted PTO Controls	7
	PTO Central Controller	9
	Soft Start and Power Management Systems	10
	PTO Control Clutch Oil Flow (Illustrations)	11
	PTO Disengaged	11
	PTO Engaged (Initial Engagement)	13
	PTO Soft Start	13
	PTO Engaged (Final Engagement)	16
	PTO Clutch Brake	16
	Troubleshooting and Fault Finding	17
	Introduction	17
	Mechanical and Hydraulic Issues	17
	Electronic Management Unit/Touch Panel PTO Generated Fault Codes	18
	Overhaul	19
	Power Take Off (PTO)	19
	Removal	19
	Installation	20
	Disassembly 540/1000 rpm PTO	21
	Assembly	27
	PTO Clutch Calibration	28
	175 and 190 Models Only	28

SECTION 31 - POWER TAKE-OFF

BOOK 3 - 87611241

Chapter 3 - Hydraulic Front Lift and Power Take-Off

CONTENT

Section	Description	Page
	Specifications	2
	Tightening Torques	2
	Description and Operation	3
	Front Hydraulic Lift	3
	Front PTO	5
	PTO Clutch Control Oil Flow (Illustration)	6
	PTO Engaged	6
	PTO Disengaged	8
	Troubleshooting	10
	Overhaul	11
	Hydraulic Front Lift	11
	Removal	11
	Installation	13
	Front PTO	16
	Removal	16
	Installation	18
	Disassembly	18
	Inspection	21
	Assembly	22
	Hydraulic and Electrical Connections	24

SECTION 33 - BRAKES

BOOK 4 - 87611242

Chapter 1 - Tractor Brakes

CONTENT

Section	Description	Page
	Specifications	3
	Special Tools	4
	Tightening Torques	6
	Sectional Views	7
	Parking and Service Brake	7
	Front Service Brake	8
	Rear Service Brake Master Cylinders	9
	Description and Operation	10
	Control Circuit	10
	Models 120-155	10
	Models 175 and 190	10
	Front Servo / Booster Valve	10
	Front Service Brakes	10
	Rear Service Brakes	10
	Parking Brake	10
	Brake System Components	11
	Models 120-155	11
	Models 175-190	12
	Power Brake Operation - Models 175-190	13
	Master Cylinder Oil Flow Illustrations	13
	Bleeding / System Top Up	16
	Troubleshooting	17
	Overhaul	18
	Rear Service Brakes, Right or Left	18
	Models 120-155	18
	Removal	18
	Installation	21
	Models 175-190	22
	Removal	22

SECTION 33 - BRAKES

BOOK 4 - 87611242

Chapter 1 - Tractor Brakes (Continued)

CONTENT

Section	Description	Page
	Front Service Brakes, Right or Left	27
	All Models	27
	Removal	27
	Inspection	30
	Seal Replacement	30
	Installation	32
	Hydraulic Brake Master Cylinder (All Models)	33
	Removal	33
	Installation	34
	Service Brake Pedal Height Adjustment	34
	Brake Pedal Switches Adjustment	35
	Front Brake Booster Valve And Master Cylinder	36
	(Models 120-155)	36
	Removal	36
	Installation	37
	Disassembly	38
	Inspection	38
	Assembly	38
	Hydraulic Brake System Air Bleeding	39
	Procedure	39
	Front Brakes (if equipped)	40
	Bleeding Sequence	41
	Parking Brake	43
	Removal	43
	Disassembly	44
	Assembly	45
	Installation	45
	Handbrake Control	48
	Travel Adjustment	48

SECTION 33 - BRAKES

BOOK 4 - 87611242

Chapter 2 - Air Trailer Brakes

CONTENT

Section	Description	Page
	Specifications	3
	Tightening Torques	4
	Description and Operation	5
	Trailer Brake Identification (Origin)	5
	Universal	5
	"German"	5
	"Italian"	5
	Universal Type Air Brake Operation and Schematics	6
	Operation	7
	German Type Air Brakes Operation and Schematics	8
	"German" Air Brake Operation	9
	Dual Line Braking System	9
	Single Line Braking System	9
	Brakes Disengaged	9
	Brakes Engaged	9
	Italian Type Air Brakes Operation and Schematics	10
	Operation	11
	Exploded View of Component Location	12
	Air Brake System Components Description and References to Location	13
	Troubleshooting	15
	Electrical System Schematic	16
	Overhaul	17
	Component Removal and Installation	17
	Drain the Air Reservoirs	17
	Compressor	17
	Unload Valve	18
	Reservoir Tanks	18
	Dual Line Solenoid	18
	Dual Line Control Valve	18
	Pilot Head Valve	19

SECTION 33 - BRAKES

BOOK 4 - 87611242

Chapter 2 - Air Trailer Brakes (Continued)

CONTENT

Section	Description	Page
	Pressure Switch/Sender	19
	Single Line Control Valve	19
	Coupler	20
	Air Line	20
	Components Exploded Views	21
	Couplers	21
	Compressor	22
	Unload Valve	24
	Single Line Control Valve	26
	Dual Line Control Valve	28
	Solenoid Valve	30
	Pressure Testing	31
	Tractor Preparation	31
	Pre-Test Procedure	31
	Handbrake Test Procedure	32
	Handbrake Control Cable Adjustment	33
	Leak Test	33
	Brake Pedal Test Procedure	34
	Pressure Regulator ON/OFF Test Procedure	35

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 1 - Hydraulic Circuits

CONTENT

Section	Description	Page
	Description and Operation	3
	Circuit Identification and Component Make Up	3
	High Pressure Circuit	3

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 1 - Hydraulic Circuits (Continued)

CONTENT

Section	Description	Page
	Steering Circuit	3
	Low Pressure Circuit	3
	Lubrication Circuit	3
	High Pressure Hydraulic System Type and Pump Identification	4
	Closed Center Load Sensing Hydraulic System - (Variable Displacement Piston Type Pump)	4
	Open Center Hydraulic System (Fixed Displacement Gear Type Pump)	6
	Transmission Identification	6
	Full Powershift	6
	Semi Powershift	6
	Dual Command	7
	Synchronized Mechanical Shuttle	7
	Variable Displacement CCLS High Pressure Hydraulic Circuit	8
	120-155 Models with Electronic Draft Control	8
	175-190 Models with Electronic Draft Control	9
	Components	10
	Hydraulic Pump (Variable Displacement)	10
	Load Sensing Valve	10
	Steering Pump	11
	Steering Flow Control Valve (120-155 Models)	11
	Steering Priority Valve (175-190 Models)	11
	Trailer Brake Valve	12
	Hydraulic Lift Electronic Draft Control Valve	12
	Closed Center Load Sensing Remote Control Valves	12
	Hydraulic Lift Cylinders	13
	Suspended Front Axle Control Valve (1)	13
	Mid-Mount Remote Valves	14
	High Pressure Hydraulic System - Electrical Switches (120-155 Models)	14
	High Pressure Hydraulic System - Electrical Switches (175 and 190 Models)	15
	Steering Motor	15
	Steering Cylinders	15
	Load Sensing Shuttle Valve	15

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 1 - Hydraulic Circuits (Continued)

CONTENT

Section	Description	Page
	Hydraulic Flow Operation and Illustrations	16
	Variable Displacement CCLS Circuit (120-155 Models)	16
	Variable Displacement CCLS Circuit (175-190 Models)	18
	Fixed Displacement Open Center High Pressure Hydraulic Circuit	21
	120-155 Models with Mechanical Hydraulic Lift	21
	Components	22
	Hydraulic Pump (Fixed Displacement)	22
	High Pressure Circuit Relief Valve	22
	Trailer Brake Valve	22
	Open Center Remote Valve	22
	Lift Cylinder Control Valve	23
	Low Pressure Regulating Valve	23
	Hydraulic Flow Operation and Illustrations	24
	Fixed Displacement Open Center High Circuit	24
	Low Pressure Hydraulic Circuits - (Operation, Components and Hydraulic Flows)	26
	Full Powershift Transmission (175-190 Models)	26
	Full Powershift Transmission (120-155 Models)	33
	Semi Powershift Transmission	39
	Dual Command Transmission	43
	Synchronized Mechanical Shuttle Transmission	47
	Troubleshooting	51
	General Fault Finding	51
	Initial Fault Finding Checks	51
	Transmission Low Pressure Warning Light 'ON'-Full Powershift Transmission	52
	Charge Pressure Light Flashing	53
	Intake Filter Restriction Warning Light 'ON'	53
	Power Steering Working or Working Incorrectly	54
	Trailer Brakes Working	54
	Hydraulic Lift Not Working Correctly	55
	Remote Control Valves Working - Mechanically-Operated Type	56
	Remote Control Valves Working - Electro-hydraulic (EHR) Type	57

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 2 - Variable Flow Hydraulic Pump Assembly 120 to 155 Models

CONTENT

Section	Description	Page
	Special Tools	3
	Specifications	4
	Hydraulic Outputs	4
	Charge Pump	4
	Load Sensing Variable Displacement Piston Pump	4
	Steering/Low Pressure Circuit Pump	4
	Tightening Torques	5
	Description and Operation	6
	Variable Displacement Pump Assembly	6
	Principal of Operation	7
	Piston Pump - Swashplate Controlled	7
	Principal of Operation	8
	Pressure Valves and Switches	9
	Intake Filter and Restriction Switch	9
	Low Charge Pressure Switch	9
	Charge Pressure Filter Dump Valve	10
	Charge Pressure Valve	10
	Steering Flow Control Valve (All Models except Supersteer)	10
	Steering Flow Control Valve (Models with Supersteer)	10
	Flow and Pressure Compensating Valves (Variable Displacement Pump Load Sensing Valve)	11
	Hydraulic Oil Flow and Illustrations	12
	Charge Pump Oil Flows	12
	Low Pressure Standby	14
	High Pressure Circuit High Demand	16
	High Pressure Circuit Low Demand	17
	Controlling Maximum System Pressure	18
	Troubleshooting	19
	Fault Finding	19
	Initial Fault Finding Checks	19

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 2 - Variable Flow Hydraulic Pump Assembly 120 to 155 Models (Continued)

CONTENT

Section	Description	Page
	Transmission Low Pressure Warning Light 'ON' - Full Powershift Transmission	21
	Transmission Low Pressure Warning Light 'ON' - Semi-Powershift and Dual Command Transmissions	22
	Charge Pressure Light Flashing	23
	Intake Filter Restriction Warning Light On	23
	Power Steering Not Working or Working Incorrectly	24
	Trailer Brakes Not Working	24
	Hydraulic Lift Not Working Correctly	25
	Remote Control Valves Not Working	26
	Pump Pressure and Flow Testing	27
	Low Pressure Standby	27
	High Pressure Standby	28
	Load Sensing Circuit Test	29
	Charge Pressure Test	29
	Piston Pump Flow Test	30
	Steering Pump/Low Pressure Pump Test	31
	Steering Circuit Pressure Test	31
	Hydraulic Pump Leak Test	32
	Overhaul	33
	Pressure Valves and Switches	33
	Charge Pressure Valve	34
	Charge Pressure Filter Dump Valve	34
	Steering Flow Control Valve (All Models except Supersteer)	35
	Steering Flow Control Valve (All Models with Supersteer)	35
	Pressure and Flow Compensator Valve	36
	Variable Displacement Pump Assembly	38
	Removal	38
	Installation	40
	Steering Pump	41
	Charge Pump	43
	Piston Pump and Swash Plate	45
	Pump Drive Gear and Bearing	49

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 3 - Variable Flow Hydraulic Pump Assembly 175 and 190 Models

CONTENT

Section	Description	Page
	Special Tools	3
	Specifications	4
	Hydraulic Output	4
	Charge Pump	4
	Load Sensing Variable Displacement Piston Pump	4
	Steering/Low Pressure Circuit Pump	4
	Tightening Torques	5
	Description and Operation	6
	Variable Displacement Pump Assembly	7
	Principal of Operation	8
	Variable Displacement Piston Pump - Swashplate Controlled	9
	Principal of Operation	9
	Pressure Valves and Switches	10
	Intake Filter and Restriction Switch	10
	Low Charge Pressure Switch	11
	Charge Pressure Filter Dump Valve	11
	Charge Pressure Valve	11
	Steering Flow Control Valve	12
	Flow and Pressure Compensating Valves	13
	Hydraulic Circuit Oil Flows and Illustrations	14
	Charge Pump Oil Flow	14
	Generating Low Pressure Standby	16
	Regulating Low Pressure Standby	18
	High Pressure Circuit High Demand	20
	High Pressure Circuit Low Demand	22
	Limiting Maximum System Pressure	24
	Operation of Low Pressure Regulating Valve	26
	Troubleshooting	28
	Fault Finding	28
	Initial Fault Finding Checks	28

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 3 - Variable Flow Hydraulic Pump Assembly 175 and 190 Models (Continue)

CONTENT

Section	Description	Page
	Transmission Low Pressure Warning Light 'On'-Full Powershift Transmission	29
	Charge Pressure Light Flashing	30
	Intake Filter Restriction Warning Light On	30
	Power Steering Not Working or Working Incorrectly	31
	Trailer Brakes Not Working	31
	Hydraulic Lift Not Working Correctly	32
	Remote Control Valves Not Working - Mechanically Operated Type	33
	Remote Control Valves Not Working - Electro-hydraulic (EHR) Type	34
	Pump Pressure and Flow Testing	35
	Low Pressure Standby	35
	High Pressure Standby	36
	Load Sensing Circuit Test	37
	Charge Pressure Test	37
	Piston Pump Flow Test	38
	Steering Pump/Low Pressure Pump Test	39
	Steering Circuit Pressure Test	39
	Hydraulic Pump Leak Test	40
	Overhaul	41
	Pressure Control Valves and Switches	41
	Priority Valve (Steering Flow Control Valve)	43
	Pressure and Flow Compensator Valve	44
	Variable Displacement Pump Assembly	46
	Removal	46
	Input Shaft Seal Replacement	47
	Steering Pump Overhaul	48
	Charge Pump Overhaul	50
	Piston Pump and Swashplate Overhaul	52
	Disassembly	52
	Assembly	54

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 4 - Electronic Draft Control

CONTENTS

Section	Description	Page
	Specifications	4
	Maximum Lift Capacities - All Models	4
	Valve Settings	4
	Hydraulic Lift Cover (120 to 155 Models Only)	4
	Special Tools	4
	Tightening Torques	5
	Description and Operation	6
	Electronic Draft Control	6
	Introduction	6
	Components	9
	Hydraulic Lift Assembly and Control Valve	9
	Hydraulic Pump	9
	Electronic Draft Control (EDC) Processor	10
	Load Sensing Pins	11
	In Cab Operator Controls	12
	Rear Fender Lift Lower Switches	15
	Electronic Draft Control Valve (Components)	16
	Operation of Draft Control	18
	Draft Control - Low Sensitivity Setting	19
	Draft Control - High Sensitivity Setting	20
	Hydraulic Oil Flows and Illustrations - Electronic Draft Control Valve	21
	Neutral	21
	Raising	23
	Lowering	25
	Troubleshooting	27
	Fault Finding	27
	Electronic Draft Control Fault Codes	30
	Calibration Procedures (Error Code 24)	31
	Calibration of Lift Arm Potentiometers and Lift Control Pod	31
	Calibration of the EDC Valve	33
	Valve Calibration Review (H3 Diagnostic Routine)	35

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 4 - Electronic Draft Control (Continued)

CONTENTS

Section	Description	Page
	Overhaul	36
	Electronic Draft Control Valve	36
	Removal	36
	Installation	37
	Disassembly	38
	Assembly	42
	Hydraulic Lift Cover-120 to 155 Models Only	43
	Removal	43
	Disassembly	46
	Assembly and Installation	48
	Load Sensing Pin Replacement	50
	Removal	50
	Installation	50

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 5 - Mechanical Rear Hydraulic Lift

CONTENT

Section	Description	Page
	Specifications	3
	Rear Hydraulic Lift	3
	Implement Linkage	4
	Tightening Torques	5
	Special Tools	7
	Description and Operation	8
	Component Make-up with Sectional Views	8
	Lift Positioning Control and Oil Flow Illustrations	11
	Introduction	11

SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87611242

Chapter 5 - Mechanical Rear Hydraulic Lift (Continued)

CONTENT

Section	Description	Page
	Troubleshooting	15
	Hydraulic Lift	15
	Overhaul	17
	Rear Lift External Controls	17
	Disassembly - Assembly	17
	Rear Hydraulic Lift	18
	Removal - Installation	18
	Rear Lift Internal Controls and Components	22
	Disassembly - Assembly	22
	Lifting Cylinder and Cross Shaft	24
	Disassembly - Assembly	24
	Lift Control Valve	27
	Removal - Installation	27
	Disassembly - Assembly	28
	Adjustments	33
	Internal Adjustments	33
	Position Control Rod Adjustment	33
	Draft Control Rod Adjustment	35
	Max Lift Height Adjustment	37
	Draft Control Rod Mounting Position Adjustment	38
	Linkage Adjustments	38
	Position Control Adjustment	38
	Draft Control Adjustment	39
	Lift-O-Matic Adjustment	40
	Lift-O-Matic Height Limit Adjustment	40
	Operations to Be Carried Out to Adjust the Lift-O-Matic Height Limit	41
	Max Height Adjustment (with the Control Valve Removed and Lift on the Tractor)	42
	Drop Rate Adjustment	43
	Oil Filter - Replacement	43
	Lift Pressure Regulating Valve - Replacement	44
	Setting	44

SECTION 35 - HYDRAULIC SYSTEM

BOOK 5 - 87611243

Chapter 6 - Closed Center Remote Control Valves

CONTENTS

Section	Description	Page
	Special Tools	3
	Specifications	3
	Tightening Torques	3
	Fault Finding and Pressure Testing	4
	Remote Valve Flow Test	4
	Remote Control Valves Not Working - Mechanical Remote Valves	4
	Remote Control Valves Not Working - Electro-hydraulic Remote Valves	5
	Electro-hydraulic Remote Valve Fault Codes	6
	Description and Operation - Mechanical Remote Valves	7
	Controls and Features	7
	Internal Component Make-up	10
	Flow Control Adjuster	10
	Flow Control Spool	10
	Load Hold Check Valve	10
	Lock Valve	10
	Control Valve Spool	10
	Spool Centering and Detent Mechanism	10
	Hydraulic Oil Flows and Illustrations	12
	Oil Flow In Neutral	12
	Oil Flow In Raising (Cylinder Extend)	14
	Oil Flow In Lowering (Cylinder Retract)	16
	Oil Flow In Float	18
	Operation of Detent Pressure Regulating Valve	20
	Oil Flow of Two or More Control Valves Simultaneously	23
	Description and Operation - Electro-hydraulic Remote Valves	25
	Controls and Features	25
	Control Levers	25
	Isolator Switch	26
	Manual and Programmable Lever Operation	27
	Manual Operation	27
	Programmable Operation	28

SECTION 35 - HYDRAULIC SYSTEM

BOOK 5 - 87611243

Chapter 6 - Closed Center Remote Control Valves (Continued)

CONTENTS

Section	Description	Page
	Flow Control Adjustment	29
	Quick Couplers	30
	Operation of Controls During Implement Hook-up	30
	Relieving System Pressure	30
	Connecting Single-acting Cylinders	31
	Connecting Double-acting Cylinders	31
	Operating Continuous Flow Hydraulic Equipment	32
	Operating Several Remote Valves Simultaneously or Remote Valves and Hydraulic Lift Simultaneously	33
	Bleeding Remote Cylinders	33
	Re-calibrating Electronic Remote Valve Levers	34
	Component Make-up	35
	Solenoid Control Unit (Figure NO TAG)	37
	Flow Control Spool (2)	37
	Load Hold Check Valve (3)	37
	Lock Valve (5)	37
	Control Valve Spool (4)	37
	Spool Centering Spring (6)	37
	Hydraulic Oil Flows and Illustrations	40
	Oil Flow In Neutral	40
	Oil Flow In Raising (Cylinder Extend)	42
	Oil Flow In Lowering (Cylinder Retract)	44
	Oil Flow In Float	46
	Operation of Two or More Control Valves Simultaneously	49
	Overhaul	51
	Mechanically Controlled Remote Valves	51
	Removal and Installation	51
	Remote Valves 1 and 2	51
	Remote Valves 3 and 4	52
	Complete Valve Stack	53
	Disassembly and Assembly with Exploded Views of Components	55
	Assembly	60

SECTION 35 - HYDRAULIC SYSTEM

BOOK 5 - 87611243

Chapter 6 - Closed Center Remote Control Valves (Continued)

CONTENTS

Section	Description	Page
	Electro-hydraulic Remote Valves	61
	Removal	62
	Installation	65
	Disassembly and Assembly with Exploded Views of Components	66
	Assembly	70
	Removal and Installation-Complete Valve Stack	70
	EHR Valve Number Programming	72
	Internal Valve Component Replacement (with Available Repair Kits)	74
	Lift Check Valve Replacement	74
	Lift Port Lock Valve Replacement	75
	Flow Control Valve Replacement	77
	Flow Control Regulator Replacement	78
	Remote Valve Coupler Seal Replacement	80

SECTION 35 - HYDRAULIC SYSTEM

BOOK 5 - 87611243

Chapter 7 - Open Center Remote Control Valves

CONTENT

Section	Description	Page
	Specifications	2
	Tightening Torques	2
	Special Tools	2
	Sectional Views	3
	Description and Operation	6
	Controls and Features	6
	Hydraulic Oil Flows and Operating Phases	7
	Controlling a Double Acting Cylinder	7
	Valve Controlling a Single Acting Cylinder	7
	Valve Controlling a Double Acting Cylinder with Auto-release and Float	8
	Overhaul	11
	Remote Control Valve	11
	Removal - Installation	11
	Disassembly-Assembly	13
	Testing and Adjusting	14
	Flow Control Adjuster	16
	Disassembly - Assembly	16
	Flow-rate Adjustment (on the Tractor)	17

SECTION 35 - HYDRAULIC SYSTEM

BOOK 5 - 87611243

Chapter 8 - External Lift Rams

CONTENT

Section	Description	Page
	External Assist Rams - 120 to 155 Models	2
	Specifications	2
	Description and Operation	3
	Assist Ram Overhaul	3
	Removal - Installation	3
	Disassembly - Reassembly	3
	External Assist Rams - 175 and 190 Models	4
	Specifications	4
	Description and Operation	5
	Assist Ram Overhaul	5
	Removal - Installation	5
	Disassembly - Assembly	6

SECTION 35 - HYDRAULIC SYSTEM

BOOK 5 - 87611243

Chapter 9 - Hydraulic Pressure Testing

CONTENT

Section	Description	Page
	Introduction	3
	Special Tools	4
	Specifications	5
	Closed Center Systems 175 and 190 Models	5
	Main Hydraulic Pump	5
	Steering/Lubrication Pump	5
	Closed Center Systems 120 to 155 Models	5
	Main Hydraulic Pump	5
	Steering/Low Pressure Pump	5

This as a preview PDF file from best-manuals.com



Download full PDF manual at best-manuals.com