

# TN55D, TN55S, TN65D, TN65S, TN70D, TN70S, TN75D, TN75S REPAIR MANUAL COMPLETE CONTENTS

SECTION 00 - GENERAL .....	2
SECTION 10 - ENGINE .....	2
SECTION 18 - CLUTCH .....	4
SECTION 21 - TRANSMISSIONS .....	5
SECTION 23 - FWD TRANSFER BOX AND AUTO FWD .....	9
SECTION 25 - FRONT AXLE (FWD) .....	11
SECTION 27 - REAR MECHANICAL DRIVE .....	15
SECTION 31 - MECHANICAL POWER TAKE-OFF .....	16
SECTION 33 - BRAKING SYSTEM .....	17
SECTION 35 - HYDRAULIC SYSTEM .....	18
SECTION 41 - STEERING .....	27
SECTION 44 - AXLES AND WHEELS .....	29
SECTION 50 - CAB AIR CONDITIONING SYSTEM .....	30
SECTION 55 - ELECTRICAL SYSTEM .....	32
SECTION 90 - CAB .....	48

The following pages are the collation of the contents pages from each section and chapter of the TND and TNS Series Repair manual. Complete Repair part # 87059380.

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 TND and TNS Series Tractors.

## SECTION 00 - GENERAL

BOOK 1 - 87059381

### Chapter 1 - General

#### CONTENTS

Section	Description	Page
	General Instructions .....	2
	Safety Regulations .....	4
	Consumables .....	7

## SECTION 10 - ENGINE

BOOK 1 - 87059381

### Chapter 1 - Engine

#### CONTENTS

Section	Description	Page
	Specifications .....	3
	Lubrication .....	4
	Cooling System .....	4
	Speedometer/Tachometer .....	4
	Timing System .....	5
	Fuel System .....	5
	Fuel Supply Pump Data .....	15
	Crankcase/Cylinder Block Data .....	15
	Crankcase and Bearings Data .....	16
	Connecting Rod Data .....	17
	Piston Data .....	18
	Valve Timing Gear Data .....	19
	Tappet Data .....	19
	Rocker Arm - Valve Data .....	20
	Cylinder Head Data .....	21
	Lubrication System Data .....	22
	Cooling System Data .....	22
	Torque Settings .....	23
	Special Tools .....	24
	Sectional Views .....	26

---

# SECTION 10 - ENGINE

BOOK 1 - 87059381

## Chapter 1 - Engine (Continued)

### CONTENTS

Section	Description	Page
	Troubleshooting .....	30
	Overhaul .....	34
10 001 10	Engine .....	34
	Removal .....	34
	Installation .....	35
10 001 30	Compression Test .....	36
10 001 54	Disassembly .....	37
	Assembly .....	47
	Checks, Dimensions and Repairs .....	56
	Cylinder Block and Cylinder Liners .....	56
	Crankshaft, Main Bearings and Flywheel .....	58
	Connecting Rods .....	62
	Pistons .....	63
	Camshaft, Tappets and Valves .....	66
	Valve Seats In Cylinder Head .....	70
	Lubrication System .....	71
	Cooling System .....	72
10 101 53	Valve Guides .....	74
10 101 60	Injector Sleeves .....	77
10 102 70	Crankshaft Front Oil Seal .....	79
	Removal .....	79
	Installation .....	80
10 106 12	Valve/Rocker Arm Clearance Adjustment .....	81
10 216 10	Fuel Tank .....	83
	Removal .....	83
	Installation .....	84
10 218 30	Fuel Injectors .....	85
	Removal .....	85
	Installation .....	86
10 246 14	Bosch Injection Pump .....	87
	Removal .....	87
	Installation .....	89
	Timing .....	90
	Fuel Circuit Air Bleeding .....	92

---

# SECTION 18 - CLUTCH

BOOK 1 - 87059381

## Chapter 1 - Clutch

### CONTENTS

Section	Description	Page
	Specifications .....	2
	Luk 11"/11" Clutch .....	2
	Luk 11" Clutch .....	3
	Tightening Torques .....	3
	Special Tools .....	3
	Description and Operation .....	4
	Sectional Views .....	4
	Troubleshooting .....	6
	Overhaul .....	7
18 110 10	Clutch .....	7
	Removal .....	7
	Installation .....	15
18 110 30	Dual Disk Clutch 11"/11" .....	17
	Disassembly .....	17
	Assembly .....	20
18 110 30	11" Single Clutch (fitted with the power-shuttle gearbox) .....	21
	Disassembly .....	21
	Assembly .....	21
	Checks, Measurements and Repairs .....	22
	Dual Clutch .....	22
	Coplanarity Adjustment of 11"/11" Dual Clutch Release .....	23
	Coplanarity Adjustment of 11" Single Plate Clutch Release Levers .....	24
18 100 40	Main Clutch Control Linkage .....	25
	PTO Clutch Control .....	26

---

# SECTION 21 - TRANSMISSIONS

BOOK 2 - 87059382

## Chapter 1 - Mechanical Transmission (8 x 8) and (16 x 16) Synchro-Command

### CONTENTS

Section	Description	Page
	Specifications .....	2
	Shuttle Unit .....	2
	Gearbox and Range Gear .....	2
	Tightening Torques .....	2
	Special Tools .....	4
	Sectional Views .....	8
	Description and Operation .....	13
	Troubleshooting .....	13
	Overhaul .....	15
	Rear Transmission - Gearbox Casing .....	15
21 118 10	Removal .....	15
21 118 12	Installation .....	20
21 118 85	Disassembly .....	22
	Assembly .....	28
	Adjustment .....	30
21 130 10	Gearbox Control Lever .....	32
	Removal .....	32
	Installation .....	32
21 130 11	Range Gear Control Lever .....	33
	Removal .....	33
	Installation .....	33

---

## SECTION 21 - TRANSMISSIONS

BOOK 2 - 87059382

### Chapter 2 - Power Shuttle Transmission (8 x 8 and 16 x 16 versions)

#### CONTENTS

Section	Description	Page
	Specifications .....	2
	Shuttle .....	2
	Gearbox .....	2
	Power Shuttle .....	2
	Tightening Torques .....	3
	Special Tools .....	4
	Sectional Views .....	7
	Clutches Control Pressure Test .....	10
	Description and Operation .....	12
	Troubleshooting .....	12
	Overhaul .....	13
21 118 85	Transmission - Gearbox .....	13
	Disassembly .....	13
	Assembly .....	14
21 134 46	Power Shuttle Control Valve .....	15
	Disassembly .....	15
	Assembly .....	17
21 134 70	A + B Clutch Valve Solenoids .....	18
	Removal .....	18
	Installation .....	18
21 154 60	Dump Valve Solenoid .....	19
	Removal .....	19
	Installation .....	19
21 154 34	Clutch Casing .....	20
	Disassembly .....	20
	Assembly .....	23

---

# SECTION 21 - TRANSMISSIONS

BOOK 2 - 87059382

## Chapter 3 - Power Shuttle Transmission Calibration, Faults and Diagnostics

### CONTENTS

Section	Description	Page
	Fault Codes Indication .....	3
	Description of Systems (ECM and Calibration and Diagnostic Unit - CDU) .....	4
	Automatic Self-Diagnosis (ECM) .....	5
	ECM First Start Up (Self Configuration) .....	6
	Transmission Disabled Indicator Light .....	7
	Diagnosis During Operation .....	9
	Calibration and Diagnostics Unit (CDU) .....	10
	Power Shuttle Fault Code Priority .....	11
	Calibration and Diagnostic Unit Use .....	14
	HH Menu Access .....	15
	H1 - Clutches A and B Calibration .....	18
	H2 - Clutches A and B Calibration Values Display .....	23
	H3 - System Configuration .....	24
	H4 - Power Shuttle Hardware and Software Revision Levels .....	26
	H5 - Control Switch Diagnosis .....	27
	H6 - Clutch A Fill Time Modification and Display .....	32
	H7 - Clutch B Fill Time .....	34
	H8 - Erasure of Data Stored in the Non-Volatile Memory (NVM) .....	36
	H9 - Voltmeter Functions .....	37
	HA - Clutch Pedal Potentiometer and Status Switch .....	41
	Clutch Pedal Potentiometer Replacement and Clutch Pedal Switch Adjustment .....	43
	HC - Transmission Oil Temperature Sender .....	44
	HD - HI/LO Synchronizer Operation .....	45
	HE - Gear Change Adjustments .....	47
	HF - Stored Error Codes .....	48
	Troubleshooting Fault Codes .....	50
	Description of Systems (ECM and Electronic Service Tool - EST) .....	51
	Automatic Self-Diagnosis (ECM) .....	52
	ECM First Start Up (Self Configuration) .....	53
	Transmission Disabled Indicator Light .....	54
	Diagnosis During Operation .....	56
	Power Shuttle Fault Code Priority .....	58

---

# SECTION 21 - TRANSMISSIONS

BOOK 2 - 87059382

## Chapter 3 - Power Shuttle Transmission Calibration, Faults and Diagnostics (Continued)

### CONTENTS

Section	Description	Page
	Electronic Service Tool (EST) .....	61
	Downloading the Latest Software into TN Series Tractor Power Shuttle Control Module with the Electronic Service Tool .....	62
	Connecting the Electronic Service Tool (EST) to the Tractor .....	66
	H1 - Clutches A and B Calibration .....	70
	H2 - Clutches A and B Calibration Values Display .....	75
	H3 - System Configuration .....	76
	H4 - Power Shuttle Hardware and Software Revision Levels .....	78
	H5 - Control Switch Diagnosis .....	79
	H6 - Clutch A Fill Time Modification and Display .....	84
	H7 - Clutch B Fill Time .....	86
	H8 - Erasure of Data Stored in the Non-Volatile Memory (NVM) .....	88
	H9 - Voltmeter Functions .....	89
	HA - Clutch Pedal Potentiometer and Status Switch .....	93
	Clutch Pedal Potentiometer Replacement and Clutch Pedal Switch Adjustment .....	95
	HC - Transmission Oil Temperature Sender .....	96
	HD - HI/LO Synchronizer Operation .....	97
	HE - Gear Change Adjustments .....	99
	HF - Stored Error Codes .....	100
	Troubleshooting Fault Codes .....	102
	Fault Codes .....	104
	Power Shuttle (8 x 8 and 16 x 16) Electronic Control Unit Input/Output Wiring Diagram .....	307

---

# SECTION 23 - FWD TRANSFER BOX AND AUTO FWD

BOOK 3 - 87059383

## Chapter 1 - FWD Transfer Box

### CONTENTS

Section	Description	Page
	Specifications .....	2
	FWD Electrohydraulic Engagement .....	2
	Transmission Shaft .....	2
	Tightening Torques .....	3
	Special Tools .....	4
	Sectional Views .....	6
	Description and Operation .....	9
	FWD Drive Gear With Electrohydraulic Coupling .....	9
	Troubleshooting .....	10
	Overhaul .....	11
23 101 26	Transmission Shafts and Guard (TN55S, TN65S and TN75S) .....	11
	Removal .....	11
	Installation .....	12
23 101 26	Transmission Shafts and Guard (TN55D, TN65D and TN75D) .....	13
	Removal .....	13
	Installation .....	13
23 101 40	Drive Gear Housing .....	14
	Removal .....	14
	Installation .....	15
23 141 42	Disassembly (Mechanical Only) .....	16
	Assembly (Mechanical Only) .....	17
	Disassembly (Electrohydraulic Only) .....	18
	Assembly (Electrohydraulic Only) .....	19

---

## SECTION 23 - FWD TRANSFER BOX AND AUTO FWD

BOOK 3 - 87059383

### Chapter 2 - Auto FWD, Calibration and Diagnostics

#### CONTENTS

Section	Description	Page
	Description and Operation .....	2
	Automatic FWD Fault Codes Indication .....	2
	Faults Code Decoding .....	2
	Calibrations .....	3
	HH Menu Access .....	3
	H3 - System Configuration .....	4
	H4 - Software Revision Level .....	6
	H5 - Control Switches Diagnosis .....	6
	H8 - Deleting Data From the Non-Volatile Memory .....	7
	H9 - Voltmeter Functions .....	8
	HD - FWD Engagement Position .....	9
	HF - Errors Stored in the Non-Volatile Storage of the ECU .....	9
	First Start-Up .....	11
	Troubleshooting .....	12
	ECU Location .....	13
	Fault Codes .....	14
	PTO and FWD Electronic Control Unit Wiring Diagram .....	89

---

## SECTION 25 - FRONT AXLE (FWD)

BOOK 3 - 87059383

### Chapter 1 - Front Axle (Super Steer Axle)

#### CONTENTS

Section	Description	Page
	Specifications .....	3
	Tightening Torques .....	5
	Special Tools .....	8
	Sectional Views .....	11
	Description and Operation .....	14
	Troubleshooting .....	16
	Overhaul .....	17
25 100 30	Front Axle Assembly .....	17
	Removal .....	17
	Installation .....	20
25 102 15	Bevel Drive and Front Axle Differential Housing .....	21
	Removal .....	21
	Installation .....	23
25 102 20	Disassembly .....	25
	Assembly .....	26
	Adjustments .....	27
25 102 24	Front Axle Differential .....	33
25 104 34	Front Differential Lock Clutch Assembly .....	34
	Disassembly .....	34
	Assembly .....	36
25 108 30	Front Epicyclic Final Drive with Brake .....	37
	Removal .....	37
	Installation .....	38
	Wheel Hub Seal .....	39
	Removal .....	39
	Installation .....	40
25 108 30	Front Epicyclic Final Drive .....	41
	Removal .....	41
	Installation .....	42

---

## SECTION 25 - FRONT AXLE (FWD)

BOOK 3 - 87059383

### Chapter 1 - Front Axle (Super Steer Axle) (Continued)

#### CONTENTS

Section	Description	Page
	Planetary Gears (TN55S) .....	43
	Disassembly .....	43
	Inspection .....	44
	Assembly .....	44
	Planetary Gears (TN65S, TN70S, TN75S) .....	44
	Disassembly .....	44
	Inspection .....	44
	Assembly .....	44
	Wheel Hub Seal .....	46
	Removal .....	46
	Installation .....	46
25 108 38	Wheel Hub and Steering Knuckle .....	47
	Removal .....	47
	Installation .....	47
25 108 46	Steering Knuckle Pins and Bearings .....	49
	Removal .....	49
	Installation .....	49
44 511 80	Front Drive Wheels Toe-In Check .....	50

---

## SECTION 25 - FRONT AXLE (FWD)

BOOK 3 - 87059383

### Chapter 2 - Front Axle (FWD)

#### CONTENT

Section	Description	Page
	Specifications .....	3
	Tightening Torques .....	5
	Special Tools .....	7
	Sectional Views .....	9
	Description and Operation .....	10
	Troubleshooting .....	12
	Front Axle Hydraulic Differential Lock .....	12
	Overhaul .....	13
25 100 30	Front Axle Assembly .....	13
	Removal .....	13
	Installation .....	16
	Disassembly .....	17
	Assembly .....	25
25 104 34	Front Differential Lock Clutch Unit .....	26
	Disassembly .....	26
	Assembly .....	27
25 108 46	Steering Knuckle Pins and Bearings .....	28
	Removal .....	28
	Installation .....	28
	Adjustments .....	29
	Stub Axle .....	29
	Bevel Drive .....	31
	Bevel Drive Shaft Bearing Preload .....	31
	Drive Pinion Position Adjustment Shim Thickness .....	32
	Differential Bearings and Backlash Between Pinion and Ring Gear .....	35
25 102 34	Front Axle Differential .....	38
	Limited Slip Self-Locking Differential Lock .....	39
25 102 27	Front Axle Differential with Limited Slip Unit .....	39
	Disassembly .....	39
	Assembly .....	40
44 511 80	Front Drive Wheels Toe-In Check .....	41

---

## SECTION 25 - FRONT AXLE (FWD)

BOOK 3 - 87059383

### Chapter 2 - Front Axle (FWD) (Continued)

#### CONTENT

Section	Description	Page
25 108 30	Front Epicyclic Final Drive .....	42
	Removal .....	42
	Installation .....	43
	Planetary Gears (TN55D) .....	44
	Disassembly .....	44
	Inspection .....	45
	Assembly .....	45
	Planetary Gears (TN65D, TN70D, TN75D) .....	45
	Disassembly .....	45
	Inspection .....	45
	Assembly .....	45
	25 108 30	Front Epicyclic Final Drive with Brake .....
Removal .....		47
Installation .....		48
Planetary Gears TN55D (with brake) .....		49
Disassembly .....		49
Inspection .....		50
Assembly .....		50
Planetary Gears TN65D, TN70D, TN75D (with brakes) .....		50
Disassembly .....		50
Inspection .....		50
Assembly .....		50

---

# SECTION 27 - REAR MECHANICAL DRIVE

BOOK 3 - 87059383

## Chapter 1 - Rear Mechanical Transmission

### CONTENTS

Section	Description	Page
	Specifications .....	2
	Bevel Gear Pair and Differential .....	2
	Lateral Final Drives .....	3
	Tightening Torques .....	4
	Special Tools .....	6
	Sectional Views .....	10
	Description and Operation .....	13
	Troubleshooting .....	13
	Bevel Gear Pair and Differential .....	13
	Lateral Final Drives .....	13
	Hydraulically Controlled Differential Lock .....	14
	Overhaul .....	15
27 106 16	Rear Transmission Gearbox .....	15
	Removal .....	15
	Installation .....	18
27 110 10	Adjusting the Position of Differential Lock Engagement Sleeve .....	21
	Bevel Drive .....	22
	Adjustment .....	22
27 120 10	RH or LH Lateral Final Drive Box Assembly .....	27
	Removal .....	27
	Installation .....	29
27 120 34	Drive Wheel Shaft .....	30
	Removal .....	30
	Installation .....	31
27 120 32	Epicyclic Final Drive .....	32
	Removal .....	32
	Installation .....	32

---

## SECTION 31 - MECHANICAL POWER TAKE-OFF

BOOK 3 - 87059383

### Chapter 1 - Mechanical Power Take-off

#### CONTENTS

Section	Description	Page
	Specifications .....	2
	Special Tools .....	3
	Tightening Torques .....	4
	Sectional Views .....	5
	Description and Operation .....	6
	PTO .....	6
	Mechanically Engaged PTO Control .....	6
	Servo Assist PTO Control .....	7
	Overhaul .....	8
31 112 20	Mechanical PTO .....	8
	Removal .....	8
	Installation .....	10
	PTO Brake .....	11
	Adjustments .....	12
	PTO Speed Sensor .....	12

## SECTION 31 - MECHANICAL POWER TAKE-OFF

BOOK 3 - 87059383

### Chapter 2 - PTO Servo-Assist Valve

#### CONTENTS

Section	Description	Page
	Description and Operation .....	2
	Adjustments .....	5
	PTO Clutch Servo Control .....	5
	Hydraulic PTO Servo Assist Cable .....	6
	PTO Engaged Switch .....	7

---

# SECTION 33 - BRAKING SYSTEM

BOOK 3 - 87059383

## Chapter 1 - Braking System

### CONTENTS

Section	Description	Page
	Specifications .....	2
	Tightening Torques .....	2
	Sectional Views .....	4
	Special Tools .....	6
	Description and Operation .....	7
	Troubleshooting .....	8
	Overhaul .....	10
33 202 60	Right or Left Hand Brake .....	10
	Removal .....	10
	Installation .....	10
33 202 46	Brake Hydraulic Pump .....	12
	Removal .....	12
	Installation .....	15
	Service Brakes Control Pedals Stroke (tractors with cabs) .....	16
	Adjustment .....	16
33 202 04	Brake Hydraulic System .....	17
	Air Bleeding .....	17
33 110 40	Parking Brake Disks .....	20
	Removal .....	20
	Installation .....	21
33 110 08	Hand Brake Control .....	21
	Stroke Adjustment .....	21

---

# SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

## Chapter 1 - High Pressure System Description and Operation

### CONTENTS

Operation	Description	Page
	Precautionary Statements .....	3
	Description and Operation .....	4
35 104	High-Pressure System Hydraulic Pump .....	5
35 110	Mechanically Controlled Hydraulic Lift .....	7
	Principles of Draft Control .....	8
	Principles of Position Control .....	8
	Principles of Float .....	9
	Principles of Draft and Position Control Combined .....	9
	Lift-O-Matic .....	9
	Hydraulic Power Lift (HPL) Control Valve Oil Flow .....	10
	Lift Phase .....	10
	Neutral Phase .....	11
	Lower Phase .....	12
	Remote Control Valves .....	13
	Simple Self-Centering .....	13
	Simple Self-Centering with Float .....	13
	Detent with Auto-Release and Float .....	13
	Rear Remote Valve Arrangement .....	14
	Rear Remote Valve Stacking .....	15
	Rear Remote Valve Control Levers .....	15
	Quick-Fit Couplers .....	16
	Zero Pressure Return Port .....	16
	Mid-Mount Control Valves .....	17
	Mid-Mount Coupler Relocation Kit .....	17
	Joystick Control for Mid-Mount Valves .....	17
	Switching Between Single and Double-Acting Cylinders .....	17
	Double-Acting Valve with Automatic Detent Release and Float .....	18
	Float Phase .....	18
	Lift Phase .....	19
	Lower Phase .....	20

---

## SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

### Chapter 1 - High Pressure System Description and Operation (Continued)

#### CONTENTS

Operation	Description	Page
	Double-Acting Valve less Automatic Detent Release and Float .....	21
	Lift Phase .....	21
	Lower Phase .....	21
	Single-Acting Valve less Automatic Detent Release and Float .....	22
	Lift Phase .....	22
	Lower Phase .....	22
	Hydraulic System Diagram .....	23

---

# SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

## Chapter 2 - High Pressure System Overhaul and Adjustment

### CONTENTS

Operation	Description	Page
	Specifications .....	2
	Tightening Torques .....	7
	Special Tools .....	9
	Sectional Views .....	11
	Troubleshooting .....	18
	Overhaul .....	20
35 110 40	Mechanically Controlled Lift Internal Controls .....	20
	Disassembly .....	20
	Assembly .....	23
	Mechanically Controlled Lift Adjustments .....	24
	Position Control .....	24
	Upper Stroke Limit .....	26
	Draft Control .....	27
	Position Control Rod .....	30
	Draft Control Rod .....	30
	Lift-O-Matic Device .....	31
	Lift Arm Descent Speed .....	32
	Lift-O-Matic Device Upper Stroke Limit .....	33
35 110 42	Arm Shaft and Lift Cylinder .....	34
	Disassembly .....	34
	Assembly .....	36
35 114 14	Mechanically Controlled Lift Control Valve .....	38
	Disassembly .....	38
	Assembly .....	41
35 114 30	Lift Pressure Relief Valve .....	42
35 114 32	Calibration .....	42
35 104 30	Hydraulic Pump .....	44
	Disassembly .....	44
	Inspection .....	44
	Assembly .....	44
35 204 46	Auxiliary Control Valves .....	45
	Disassembly - Assembly .....	45
	Testing .....	46

---

## SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

### Chapter 3 - Low-Pressure System Description and Operation

#### CONTENTS

Operation	Description	Page
35 260	Description and Operation .....	2
	Low-Pressure, Steering and Lubrication System .....	2
	Low-Pressure Oil Flow .....	5
	Transmission Lubrication System .....	6
	Steering System Oil Flow .....	7
	Electro-Hydraulic Rear Differential Lock .....	8
	Electro-Hydraulic Front Differential Lock .....	10
	Electro-Hydraulic Four-Wheel Drive (FWD) .....	12
	PTO Servo-Assist Valve .....	14

## SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

### Chapter 4 - Low-Pressure System Test Fitting Locations

#### CONTENTS

Operation	Description	Page
	System Test Fitting Locations .....	2

---

# SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

## Chapter 5 - Electronically Controlled Hydraulic Lift

### CONTENTS

Section	Description	Page
	Specifications .....	4
	Tightening Torques .....	6
	Special Tools .....	6
	Sectional Views .....	9
	Description and Operation .....	12
	Electronic Lift Controls Locations .....	12
	Control Valve and Sensors Locations .....	13
	Electronically Controlled Lift General Description .....	14
	Electronically Controlled Hydraulic Lift General Operation .....	15
	Neutral Phase .....	15
	Lifting Phase .....	17
	Lowering Phase .....	19
	Overhaul .....	21
35 110 30	Electronically Controlled Lift .....	21
	Removal .....	21
	Installation .....	24
35 110 53	Draft Sensor Support .....	26
	Removal .....	26
	Installation .....	26
35 130 30	Electronic Control Center .....	27
	Removal .....	27
	Installation .....	27
35 130 36	Lift Arm Potentiometer .....	28
	Removal .....	28
	Installation .....	29
35 130 56	Draft Sensor .....	30
	Removal .....	30
	Installation .....	31
35 134 42	Hydraulic Lift Unit .....	33
	Disassembly .....	33
	Assembly .....	35

---

# SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

## Chapter 5 - Electronically Controlled Hydraulic Lift (Continued)

### CONTENTS

Section	Description	Page
	Cylinder Safety Valve Calibration .....	37
35 138 20	Lift Control Valve .....	38
	Removal .....	38
	Installation .....	38
35 138 24	Disassembly - Assembly .....	39
	Lift Calibration .....	42
	Calibration and Diagnostic Unit .....	43
	Connecting the Calibration and Diagnostic Unit to the Tractor .....	43
	Electronically Controlled Lift Fault Code Indications .....	45
	Calibrating the Electronic Lift with the CDU .....	46
	HH Menu Access .....	46
	H1 - Rear Lift Raising and Lowering Solenoid Valves Calibration .....	48
	H2 - Rear Lift Current Calibration Values Display (EDC) .....	50
	H3 - ECU Configuration and Modification Display .....	51
	H4 - Software Revision Level .....	52
	H5 - Control Switches Diagnosis .....	53
	H6 - Draft Sensors Values Display (LVDT) .....	54
	H8 - Cancellation of Data Stored in the Non-Volatile Storage .....	54
	H9 - Voltmeter Functions .....	55
	HA - Rear Hydraulic Lift Arms Position .....	56
	HF - Faults Stored in the Non-Volatile Storage of the ECU .....	57
	First Start-Up .....	59
	Fault Diagnosis .....	60
	Troubleshooting .....	60
	ECU Location .....	60
	Fault Codes .....	61

---

# SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

## Chapter 6 - Trailer Brake Control Valves

### CONTENTS

Operation	Description	Page
	Description and Operation .....	2
	Functional Testing and Troubleshooting .....	9
	Overhaul .....	12
33 220 40	Trailer Brake Valve .....	12
	Removal .....	12
	Installation .....	12

---

# SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

## Chapter 7 - Electronic Lift and Front Power Take-Off

### CONTENTS

Operation	Description	Page
	Specifications .....	3
	Tightening Torques .....	5
	Sectional Views .....	8
	Description and Operation .....	13
	Front Lift .....	14
	Front Power Take-Off .....	15
	Front Lift Troubleshooting .....	18
	Overhaul .....	20
31 140 30	Front PTO Transmission Shaft .....	20
	Removal .....	20
	Installation .....	27
31 140 34	Disassembly .....	28
	Assembly .....	28
31 140 43	Front Power Take-Off Electromagnetic Coupler .....	30
	Removal .....	30
	Installation .....	32
31 140 46	Disassembly .....	33
	Assembly .....	36
31 162 52	Front Lift Support .....	37
	Removal .....	37
	Installation .....	39
	Front Power Take-Off Fault Codes and Signals .....	40
	Calibrating the Front PTO .....	41
	HH Menu Access .....	41
	H3 - System Configuration .....	42
	H4 - Software Revision Level .....	44
	H5 - Control Switches Diagnosis .....	44
	H8 - Deleting Data From the Non-Volatile Memory .....	45
	H9 - Voltmeter Functions .....	46
	HD - FWD Engagement Position .....	47
	HF - Errors Stored in the Non-Volatile Storage of the ECU .....	47

---

## SECTION 35 - HYDRAULIC SYSTEM

BOOK 4 - 87059384

### Chapter 7 - Electronic Lift and Front Power Take-Off (Continued)

#### CONTENTS

Operation	Description	Page
	First Start-Up .....	49
	Fault Diagnosis .....	50
	ECU Location .....	50
	Fault Codes .....	51
	Calibrating the Front Electronic Lift .....	65
	Connecting the Calibration and Diagnostic Unit (CDU) to the Tractor .....	67
	Electronically Controlled Front Lift Fault Code Indications .....	68
	HH Menu Access .....	69
	H1 - Rear Lift Raising and Lowering Solenoid Valves Calibration .....	71
	H2 - Rear Lift Current Calibration Values Display (EDC) .....	73
	H3 - ECU Configuration and Modification Display .....	74
	H4 - Software Revision Level .....	75
	H5 - Control Switches Diagnosis .....	76
	H6 - Draft Sensors Values Display (LVDT) .....	77
	H8 - Cancellation of the Data Stored in the Non-Volatile Storage .....	77
	H9 - Voltmeter Display .....	78
	HA - Rear Lift Arms Position Display .....	79
	HB - Front Lift Arms Position Display .....	80
	HF - Errors Stored in the Non-Volatile Storage of the ECU .....	81
	First Start-Up .....	82
	Fault Diagnosis .....	83
	ECU Location .....	83
	Fault Codes .....	84
	Front PTO and FWD Electronic Control Unit Diagram .....	131
	Front/Rear Electronic Lift ECU Diagram .....	133

---

# SECTION 41 - STEERING

BOOK 5 - 87059385

## Chapter 1 - Steering

### CONTENTS

Operation	Description	Page
	Specifications .....	2
	Tightening Torques .....	2
	Special Tools .....	2
	Description and Operation .....	3
	Sectional Views .....	3
	Troubleshooting .....	6
	Overhaul .....	8
41 204 10	Hydrostatic Steering Wheel .....	8
	Removal .....	8
	Installation .....	8
41 204 30	Hydrostatic Steering Control Valve .....	9
	Removal .....	9
	Installation .....	11
41 204 34	Disassembly .....	12
	Assembly .....	18
41 204 38	Bench Testing .....	27

---

# SECTION 41 - STEERING

BOOK 5 - 87059385

## Chapter 2 - Open Center Flow Gear Pump

### CONTENTS

<b>Operation</b>	<b>Description</b>	<b>Page</b>
	Specifications .....	2
	Hydraulic Pump - Mechanical Shuttle Transmission .....	2
	Hydraulic Pump - A 31 XRP 2 .....	3
	Tightening Torques .....	3
	Sectional Views .....	4
	Description and Operation .....	5
	Overhaul .....	6
41 206 20	Hydrostatic Steering Oil Pump (A 31 XRP 2 pump model) .....	6
	Disassembly .....	6
	Assembly .....	6

---

# SECTION 44 - AXLES AND WHEELS

BOOK 5 - 87059385

## Chapter 1 - Axles and Wheels

### CONTENTS

Section	Description	Page
	Specifications .....	2
	Sectional Views .....	4
	Tightening Torques .....	5
	Special Tools .....	7
	Troubleshooting .....	8
	Overhaul .....	9
44 101 22	Front Axle Hub .....	9
	Disassembly .....	9
	Assembly .....	11
44 101 30	Front Axle .....	12
	Removal .....	12
	Installation .....	14
44 101 46	Stub Axle .....	15
	Disassembly .....	15
	Assembly .....	17
	Adjustments .....	19
44 511 80	Checking the Alignment of the Leading Wheels .....	19

## SECTION 50 - CAB AIR CONDITIONING SYSTEM

BOOK 5 - 87059385

### Chapter 1 - Cab Air Conditioning System

#### CONTENTS

Operation	Description	Page
	Safety Precautions .....	3
	Special Tools .....	5
	Specifications .....	5
	Description and Operation .....	6
	Main Components .....	7
	Sanden SD 5H11 Model Compressor .....	8
	Condenser .....	9
	Filter/Dryer .....	9
	Thermostatic Expansion Valve .....	10
	Evaporator .....	11
	Cab Heating and Ventilation Controls .....	12
	Ventilation .....	12
	Electric Fan .....	12
	Air Filter .....	12
	Heating .....	13
	Temperature Control Knob .....	13
	Ignition Switch .....	13
	Cab Air Conditioning Controls .....	14
	Air Conditioning and Temperature Control Button .....	14
	Heating Control Knob .....	14
	3-Speed Electric Fan Control Knob .....	14
50 200 03	Function and Cooling Testing .....	15
	Pressure Variations at Different Altitudes .....	16
	Cab Vents Temperature Table .....	16
	Maintenance .....	17
	Troubleshooting .....	19
	Refrigerant Recovery - Recycling and Evacuation - Charging Stations .....	23
	Dehydration, Recharging and Refrigeration Check .....	25
	System Charging Operations .....	30