

Manitowoc 777

Service/Maintenance Manual





SERVICE/MAINTENANCE MANUAL

This manual has been prepared for and is considered part of -

777

Crane Model Number

7771Ref

Crane Serial Number

This manual is divided into the following sections:

SECTION 1	INTRODUCTION
SECTION 2	HYDRAULIC SYSTEM
SECTION 3	ELECTRIC SYSTEM
SECTION 4	BOOM
SECTION 5	HOISTS
SECTION 6	SWING
SECTION 7	POWER TRAIN
SECTION 8	UNDER CARRIAGE
SECTION 9	LUBRICATION
SECTION 10	TROUBLESHOOTING

NOTICE

The serial number of the crane and applicable attachments (i.e. luffing jib, MAX-ER®) is the only method your Manitowoc dealer or Manitowoc Crane Care has of providing you with correct parts and service information.

The serial number is located on a crane identification plate attached to the operator's cab and each attachment. Refer to the Nameplate and Decal Assembly Drawing in Section 2 of this manual for the exact location of the crane identification plate.

Always furnish serial number of crane and its attachments when ordering parts or discussing service problems with your Manitowoc dealer or Manitowoc Crane Care.



WARNING

To prevent death or serious injury:

- Avoid unsafe operation and maintenance.
Crane and attachments must be operated and maintained by trained and experienced personnel. Manitowoc is not responsible for qualifying these personnel.
- Do not operate or work on crane or attachments without first reading and understanding instructions contained in Operator Information Manual and Service Manual supplied with crane and applicable attachments.
- Store Operator Information Manual and Service Manual in operator's cab.
If Operator Information Manual or Service Manual is missing from cab, contact your Manitowoc dealer for a new one.

Reference Only

THIS PAGE BLANK

See end of this manual for Alphabetical Index

SECTION 1	Introduction
Safe Maintenance Practices	1-1
Maintenance Instructions	1-1
Safe Maintenance Practices	1-1
Identification and Location of Components	1-3
Crane Orientation	1-3
General Operation	1-7
Operating System	1-7
Hydraulic Components	1-7
Charge Pressure	1-11
Main System Pressure	1-11
Accessory System Pressure	1-11
Hydraulic Supply	1-11
EPIC Programmable Controller (PC)	1-16
Brake Release System	1-26
Load Drum Clutch Release System (with free fall)	1-27
Boom System	1-29
Boom Hoist Rotation Indicator	1-29
Counterweight Handling	1-29
Boom Off	1-29
Boom Raise	1-31
Boom Lower	1-33
Swing System	1-36
Swing Lock	1-36
Off	1-37
Swing	1-37
Travel System	1-39
Off	1-39
Left Crawler Forward	1-39
Load Drum Pawl	1-41
Drum Pawl Engage	1-42
Drum Pawl Disengage	1-42
Load Drum (Full Power Mode)	1-43
Liftcrane Operation	1-44
Clamshell Operation: Clamshell Mode	1-47
Load Drum (Free Fall Mode)	1-52
Front Drum in Free Fall	1-54
Crane Setup Systems	1-57
Carbody Jacking System	1-57
Crawler Attachment System	1-61
Optional Systems	1-63
Luffing Jib Hoist System	1-63
Auxiliary Hoist System	1-64
Abbreviations	1-68
SECTION 2	Hydraulic System
Hydraulic Schematics	2-1
Hydraulic System – General	2-1
Checking and Replacing Hydraulic Hoses	2-1
Hydraulic System Maintenance	2-2
Safety	2-2
Storing and Handling Oil	2-2
Storing and Handling Parts	2-2
Inspecting System	2-2
Servicing Pumps	2-3

Cleaning Fill Cap Assembly	2-3
Replacing Filter Elements	2-4
Changing Oil	2-7
Tightening Hydraulic Connections	2-8
Programmable Controller Calibration Procedures	2-12
Controls Calibration	2-12
Pressure Sender Calibration	2-12
Pressure Sender Replacement	2-12
Load Drums, Swing, Track, and Boom Hoist Pump	2-13
Boom Hoist Cylinder	2-13
Disc Brake Operational Test	2-15
Operational Test	2-15
Shop Procedure	2-17
Initial Oil Fill	2-20
Pressure Sender Calibration	2-23
Initial Start-Up	2-24
Controls Calibration	2-26
Pressure Adjustments	2-26
Operating Pressure Checks	2-29
Boom Hoist Leakage Test	2-29
Operating Speed Checks	2-30

SECTION 3. Electric System

Electrical Drawings and Schematics	3-1
Checking and Replacing Electrical Components	3-1
Abbreviations and Symbols	3-2
Test Voltages	3-3
Controller Board Layout	3-3
Pin Identification	3-4
Wire Identification	3-9
Description Identification	3-14
Display Readings	3-19
Operating Conditions	3-19
Operating Limits	3-19
System Faults	3-19
Selecting Display Language	3-21
Crane Diagnostics	3-24
Drum 1, 2, and 8	3-24
BHST (Boom Hoist)	3-24
Swing	3-24
Track	3-24
A1 (Handles)	3-25
D1 and D2 (Digital Outputs and Inputs)	3-25
Crane Software Installation	3-30
CPU and Eprom Compatibility	3-30
EPROM (Chip) Identification	3-30
Eprom Replacement	3-31
Counterweight Limit Switch Adjustment	3-32
Adjustment	3-32
Engine Control Module Ground Modification	3-33
Dielectric Grease	3-34
Connector Pin Identification	3-35
Mini-Change Type Connectors	3-35
Micro-Change Type Connectors	3-39
Quick-Change Type Connectors	3-39

SECTION 4	Boom
Automatic Boom Stop Adjustment	4-1
Maximum Boom Angle	4-1
Operation	4-1
Maintenance	4-1
Bypass Limit Test	4-3
Adjustment	4-3
Physical Boom Stop	4-4
Boom Angle Indicator	4-6
Adjusting Angle Indicator	4-6
Sensor Replacement	4-6
Servicing Boom Hoist Cylinder	4-8
Boom Hoist Cylinders — Welding	4-8
Before Welding on Crane	4-8
If weld arcing at the boom hoist cylinders is detected, carefully inspect the cylinders for damage: pitting in rods, leakage at rod seals, cylinder drift (internal leakage). If damage is found, contact the Service Department at Manitowoc Cranes for repair/replacement instructions.	4-9
Boom and Jib Inspection and Lacing Replacement	4-9
Inspection Intervals	4-9
Inspection Guidelines	4-9
Replacement Criteria	4-9
Dents	4-10
Gradual and Sweeping Bends	4-10
Corrosion and Abrasion	4-10
Kinks	4-12
Cracks and Breaks	4-12
Chord Straightness	4-12
Ordering Lacings	4-14
Assistance	4-14
Boom or Jib Identification	4-14
A. Ordering Lacings from Lacing Drawings	4-15
B. Ordering Lacings without Lacing Drawings	4-16
Repair Procedure	4-17
Extent of Repair	4-17
Preparing for Welding	4-17
Repair Facility	4-17
Outdoor Repairs	4-17
General Equipment Requirements	4-17
Repair Procedures and Processes	4-18
Lacing Replacement	4-18
End Lacing Replacement	4-19
Lacing Removal — Boom Section with a Bent or Bowed Chord Member	4-21
Determining Amount of Stick Electrode Needed	4-21
Inspection Checklist	4-27
Record Keeping	4-27
SECTION 5	Hoists
Hoist Drawings	5-1
Minimum Bail Limit Adjustment	5-1
Weekly Maintenance	5-1
Wire Rope Removal	5-1
Electric Wiring	5-1
Adjustment	5-3
Block-Up Limit Installation and Adjustment	5-4
Operation	5-4
Installation	5-4

Storing Electric Cable 5-6

Disconnecting Block-Up Limit Control 5-9

Removing Jib or Boom Point 5-9

Maintenance 5-9

Adjustment 5-10

Drum Brake Adjustment 5-12

Full-Power Operation (Free Fall Off) 5-12

Free Fall Operation (Optional) 5-12

Brake Inspection 5-12

Brake Adjustment 5-13

Foot Pedal Adjustment 5-14

Drum Pawl Adjustment 5-16

Actuator Removal 5-16

Actuator Installation and Adjustment 5-16

Drum Pressure Roller Adjustment 5-18

General 5-18

Adjustment 5-18

Wire Rope Lubrication 5-19

Wire Rope Inspection and Replacement 5-19

Keeping Records 5-19

Inspecting Wire Rope 5-19

Distributing Wire Rope Wear 5-21

Sheave, Roller, And Drum Inspection 5-22

Load Block and Hook-And-Weight Ball 5-25

SECTION 6. Swing

Manual Release of Swing Brake and Lock 6-1

Manual Release Procedure 6-1

SECTION 7. Power Train

Battery Maintenance 7-1

Safety Information 7-1

Causes of Battery Failure 7-1

Multiple Battery System 7-2

Maintenance 7-2

Charging 7-3

Storage 7-3

Battery Electrical Disconnect Switch 7-3

Engine Air Cleaner Maintenance 7-4

Mounting 7-4

Inspection 7-4

Service 7-4

Engine Clutch Adjustment 7-5

Operation 7-5

Adjustment 7-5

Engine Throttle Adjustment - Cummins C330 7-6

Foot Throttle Linkage Adjustment 7-6

Electronic Fuel Control Adjustment 7-6

Engine Throttle Adjustment - Cummins 6CTA8.3-C260 Engine 7-8

Foot Throttle Linkage Adjustment 7-8

Electronic Speed Control Adjustment 7-8

Setting High Speed 7-8

Setting Gain and Stability 7-8

Test Voltages 7-9

Engine Throttle Adjustment - Caterpillar 3176B and 3176C Engines 7-10

Foot Throttle Linkage Adjustment 7-10

Engine Speed Calibration 7-10
 Engine Throttle Adjustment - Cummins QSL 340, QSC8.3, QSM11, or QSX15 Engine 7-11
 Foot Throttle Linkage Adjustment 7-11
 Engine Speed Calibration 7-11
 Wiring Diagram 7-11
 Engine Diagnostics – Cummins QSL 340 and QSC8.3 Engine 7-12
 Onboard Diagnostics 7-12
 Engine Stop Light 7-12
 Engine Off Diagnostics 7-12

SECTION 8 Under Carriage

Turntable Bearing Bolt Torque 8-1
 Bearing Installation 8-1
 Torque Requirements 8-1
 Bolt Replacement 8-1
 Crawler Adjustment 8-2
 Maintenance 8-2
 Tread Slack Adjustment 8-3
 Hydraulic Hand Pump 8-4
 Assembly 8-4
 Maintenance 8-4
 Air Removal 8-5
 Operation 8-5

SECTION 9 Lubrication

Lubrication 9-1

SECTION 10 Troubleshooting

Introduction 10-1
 Safety Summary 10-1
 General Guidelines 10-1
 Test Equipment 10-2
 Troubleshooting Charts 10-3
 Testing 10-28
 Test 1 – Battery Test (12 and 24 VDC) 10-28
 Test 2 – Electric Fuel Control (EFC) Box Test Points 10-29
 Test 3 – Checking Resistance at Engine Temperature Switch 10-31
 Test 4 – Checking Resistance at Engine Oil Pressure Sender 10-32
 Test 5 – Cleaning and Adjusting the Engine RPM Transducer (Past Production) 10-33
 Test 6 – Testing for Voltage at the Fuse Box 10-34
 Test 7 – Checking Voltage at the Control Handle 10-35
 Test 8 – Adjusting the Control Handle Potentiometer 10-36
 Test 9 – Location of Pump Test Ports 10-37
 Test 10 – Location of Motor Test Ports 10-39
 Test 11 – Manually Stroking the Pump 10-41
 Test 12 – Setting the Pump Pressure 10-42
 Test 13 – Setting Pump Neutral 10-43
 Test 14 – Adjusting Pump Charge Pressure Relief 10-44
 Test 15 – Checking Pump Charge Pressure 10-45
 Test 16 – Checking Charge Pressure at Motor Port X1 10-46
 Test 17 – Testing the Motor PCP and Pump EDC 10-47
 Test 18 – Testing for Pump and Motor Leakage 10-48
 Test 19 – Testing Hydraulic Solenoid Brake Valves 10-49
 Test 20 – Checking Hydraulic Brake Pressure 10-50
 Test 21 – Adjusting the Lower Accessory Relief Valve 10-51
 Test 22 – Adjusting Jacking Counterbalance Valves 10-52

Test 23 – Transducer Test.....10-53
Test 24 – Checking Voltage at the Load Drum Encoder10-54

Reference Only

SECTION 1 INTRODUCTION

TABLE OF CONTENTS

- Safe Maintenance Practices 1-1
 - Maintenance Instructions 1-1
 - Safe Maintenance Practices 1-1
- Identification and Location of Components 1-3
 - Crane Orientation 1-3
- General Operation 1-7
 - Operating System 1-7
 - Hydraulic Components 1-7
 - Hydraulic Pumps 1-8
 - Hydraulic Motors 1-10
 - Charge Pressure 1-11
 - Main System Pressure 1-11
 - Accessory System Pressure 1-11
 - Hydraulic Supply 1-11
 - Hydraulic Tank 1-12
 - Filtration 1-12
 - Suction Manifold 1-15
 - Supercharge Manifold 1-16
 - Oil Return Manifolds and Cooling System 1-16
 - EPIC Programmable Controller (PC) 1-16
 - Standard Crane Mode 1-18
 - Other Crane Modes 1-18
 - Digital Display 1-19
 - Voltage Availability 1-20
 - Brake Release System 1-26
 - Hydraulically Released 1-26
 - Load Drum Clutch Release System (with free fall) 1-27
- Boom System 1-29
 - Boom Hoist Rotation Indicator 1-29
 - Counterweight Handling 1-29
 - Boom Off 1-29
 - Boom Raise 1-31
 - Boom Lower 1-33
- Swing System 1-36
 - Swing Lock 1-36
 - Off 1-37
 - Swing 1-37
- Travel System 1-39
 - Off 1-39
 - Left Crawler Forward 1-39
 - Travel Detent Button 1-40
- Load Drum Pawl 1-41
 - Drum Pawl Engage 1-42
 - Drum Pawl Disengage 1-42
- Load Drum (Full Power Mode) 1-43
 - Liftcrane Operation 1-44
 - Off 1-44
 - Hoist 1-44
 - Lower 1-46
 - Clamshell Operation: Clamshell Mode 1-47
 - Programming 1-47

Off	1-47
Close Bucket	1-47
Hoist Bucket	1-49
Open Bucket	1-50
Lower Bucket	1-51
Load Drum (Free Fall Mode)	1-52
Front Drum in Free Fall	1-54
Crane Setup Systems	1-57
Carbody Jacking System	1-57
Jacking Cylinder Extend	1-57
Jacking Cylinder Neutral	1-57
Jacking Cylinder Retract	1-59
Crawler Attachment System	1-61
Crawler Lock Pin Extend	1-61
Crawler Lock Pin Retract	1-62
Optional Systems	1-63
Luffing Jib Hoist System	1-63
Auxiliary Hoist System	1-64
Auxiliary Hoist Rotation Indicator	1-65
Auxiliary Drum Pawl System	1-65
Auxiliary Hoist Off	1-65
Auxiliary Hoist Raise	1-65
Auxiliary Hoist Lower	1-66
Abbreviations	1-68

Thanks for your reading.

Please click here to download complete manual instantly.

And can also choose other manuals.

Feel free --->write to me with any questions.

Our service email:

manuals007@hotmail.com