Ingersoll-Rand®
Utility Equipment

Operating & Maintenance Manual

Wheel Loader

WL440



This manual contains important safety information.
Do not destroy this manual.
This manual must be available to the personnel who operate and maintain this machine.

Ingersoll-Rand.
Utility Equipment
P.O. Box 868 - 501 Sanford Ave
Mocksville, N.C. 27028

Book 22509418 (09/04)

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

TABLE OF CONTENTS
Operating & Maintenance Manual

TITLE PAGE

INTRODUCTION. 5

1 Introduction. 6
1.1 General 6
1.2 Warranty & Maintenance. 7
1.3 Notes on Using the Instruction Book. 8
1.4 Environmental Requirements 8
1.5 Pictograms 9
1.6 Copyright. 12

SAFETY & PREVENTION OF ACCIDENTS 13

2 Safety & Prevention of Accidents 14
2.1 Introductory Remarks 14
2.2 Proper Use 14
2.3 General Safety Notes 15
2.4 Operation 15
2.5 Danger Zone 16
2.6 Transport of Persons. 16
2.7 Stability 16
2.8 Travel Operation 17
2.9 Operation 17
2.10 Guides. 18
2.11 Danger of Falling Objects 18
2.12 Working in the Vicinity of Underground Power Lines 18
2.13 Working in the Vicinity of Overhead Power Lines 19
2.14 Operation in Closed Rooms 19
2.15 Work Stoppages 20
2.16 Change of Work Attachments, Maintenance, Repair 20
2.17 Tiedown, Loading & Transportation 22
2.18 Monitoring & Inspections. 22
2.19 Fire Protection. 23
2.20 Emergency Exit. 23
2.21 Other Dangers. 23

TECHNICAL DATA. 25

3 Technical Data. 26
3.1 Views. 26
3.2 Diesel Engine 29
3.3 Electrical System. 29
3.4 Travel Drive. 30
3.5 Brakes. 30
3.6 Hydraulic System 31
3.7 Axles 32
3.8 Tires 32
3.9 Fuels, Lubricants & Coolants 33
3.9.1 Filling Quantities:. 33

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

TABLE OF CONTENTS
Operating & Maintenance Manual

TITLE PAGE

3.9.2 Fuel, Lubricant & Coolant Specifications . . . 34
3.10 Permissible Loads According to German Regulations (StVZO) . . . 35
3.11 Sound Level Values & Vibration . . . 36
3.12 Dimensions & Weights . . . 36
3.13 Front Loader Installation . . . 37
3.14 Loader Buckets . . . 38
3.15 Fork Lift Attachment . . . 38
3.16 Optional Accessories . . . 40

OPERATION . . . 41

4 Operation . . . 42
4.1 First Commissioning . . . 42
4.2 Operator Controls & Display Elements . . . 43
4.3 Engine . . . 48
4.3.1 Starting the Engine . . . 48
4.3.2 Monitoring during Operation . . . 50
4.3.3 Switching off the Engine . . . 50
4.4 Driver's Seat/Steering Wheel Tilt Adjustment . . . 51
4.5 Heating/Ventilation . . . 53
4.6 Light Switch According to StVZO . . . 54
4.7 Hydroinflation of Tires . . . 55
4.8 Driving, Steering & Braking . . . 56
4.8.1 Driving . . . 56
4.8.2 Steering . . . 59
4.8.3 Braking . . . 60
4.8.4 Road Travel . . . 61
4.8.5 Parking the Machine . . . 63

LOADING OPERATION . . . 65

5. Loading Operation . . . 66
5.1 General . . . 66
5.2 Loader Operation . . . 66
5.3 Changing Work Attachments . . . 69
5.3.1 General . . . 69
5.3.2 Assembly of Work Attachments . . . 70
5.4 Notes on How to Work with the Machine . . . 74
5.4.1 Loading . . . 74
5.4.2 Scraping, Grading . . . 74
5.4.3 Excavation Work . . . 74

RECOVERY & TRANSPORT . . . 75

6 Tiedown & Transport of the Machine . . . 76
6.1 Tiedown of the Machine . . . 76
6.2 Loading the Machine Using a Crane . . . 78
6.3 Transporting the Machine . . . 79

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

TABLE OF CONTENTS
Operating & Maintenance Manual

TITLE PAGE

CARE & MAINTENANCE 81

7 Care & Maintenance 82
7.1 General Notes 82
7.2 Intervals 82
7.3 Regular Oil Analysis 83
7.4 Warranty 83
7.5 Inspection Parts & Aids 84
7.6 Care & Cleaning 85
7.7 Notes for Winter Operation 86
7.8 Checking, Maintenance & Inspection Plans 88
7.8.1 Initial Inspection (Delivery/Handing-Over Inspection) 88
7.8.2 Daily and Weekly Tasks 90
7.8.3 Overview of Lubricating Points 93
7.8.4 Inspection Plan 95
7.9 Inspection & Maintenance Work 98
7.9.1 Engine Oil 98
7.9.2 Engine Oil Filter 100
7.9.3 Engine Oil Cooling 101
7.9.4 Fuel System 102
7.9.5 Air Filter & Air Intake 106
7.9.5.1 Dust Extraction Valve 106
7.9.5.2 Air Intake 106
7.9.5.3 Cartridge Maintenance Interval 107
7.9.5.4 Replacing Cartridges 108
7.9.5.5 Cleaning the Main Cartridge 110
7.9.6 V-Belts 111
7.9.7 Checking the Valve Lash 113
7.9.8 Brakes 114
7.9.9 Hydraulic Oil 116
7.9.10 Hydraulic Oil Cooler 118
7.9.11 Hydraulic Oil Filter 119
7.9.12 Breather 121
7.9.13 Axles 122
7.9.13.1 Front Axle Differential 123
7.9.13.2 Differential of Rear Axle with Transmission 124
7.9.13.3 Wheel Hub 125
7.9.14 Wheels 126
7.9.15 Injection Valves 126
7.9.16 Toothed Belt for Engine 126
7.9.17 Electrical Equipment 127
7.9.18 Cab Ventilation Dust Filter 129
7.9.19 Windshield Washer System 130
7.10 Shutdown 131
7.10.1 Preservation (Temporary Shutdown) 131
7.10.2 During Shutdown 131
7.10.3 After Shutdown 132

TROUBLE-SHOOTING 133

8 Trouble-Shooting 134
8.1 General 134
8.2 Engine 134

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

3.8.2 Fuel, Lubricant & Coolant Specifications

Application	Code designation according to Bi[1)]	Prescribed fuels, lubricants & coolants for Central Europe		Remarks
		Designation	Specification, Standards, Quality	
Engine		Diesel fuel	DIN 51601 ASTM D975 1-D / 2-D	**NOTICE** **Before using RME-fuels (rape oil methyl ester), it is essential to consult your responsible *INGERSOLL-RAND* dealer for further details.**
Engine	EO 1540 A	Engine oil	SAE 15W-40 API CF4 ACEA E3 or E2	See also engine manufacturer's instructions
Hydraulic system	HYD 1040	Hydraulic oil or multi-grade engine oil	HVLP D 68 or SAE 10W-40	**The following viscosity limit values must be kept (according to ASTM 445)** at 100°C min. 10 mm²/s (cSt) at -10°C approx. 1,500 mm²/s (cSt)
	BIO-E-HYD-HEES	Biodegradable hydraulic oil on synthetic ester base	Filling according to customer specifications. Brand label on machine. r mineral hydraulic oils. **NOTICE** **When changing from mineral to Do not mix biodegradable oils of different suppliers.**	The same viscosity specifications apply as for mineral hydraulic oils. **NOTICE** **When changing from mineral to biodegradable hydraulic oils, the tank and hydraulic system must be completely drained, cleaned and flushed.** **For further details before changing oils, please consult your responsible *INGERSOLL-RAND* dealer.**
Axles	GO 90 LS	Transmission oil	SAE 85W-90LS API-GL 5	Alternative recommendations SAE 90LS SAE 80W-90LS
Lubricating points	MPG-A	Multi-purpose, lithium-soap based grease	K2K-30 DIN 51825	
Brake	ATF	Brake oil	ATF Type A Suffix A Dexron-IID	

[1)] In conformity with the regulation lubricants of the Main Association of the German Building Industry e.V.

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

43. Switch for air conditioning and temperature control
44. Fan switch - heater
45. Not assigned *
46. Not assigned *
47. Pre-selection switch for actuation of additional control circuit (Pos. 5)
48. Pre-selection switch for float position - OFF/Impulse/Continuous mode
49. Not assigned *
50. Glow plug and starter switch
51. Hazard warning switch
52. Working floodlight, front
53. Working floodlight, rear
54. Not assigned *
55. Not assigned *
56. Option - 4th control circuit
57. Heater control
58. Monitor - manual transmission indicator range I
59. Monitor - manual transmission indicator range II
60. Monitor - manual transmission indicator range - disabled

NOTICE

If this symbol comes up, the manual transmission is in an intermediate position. *The machine is not ready for operation!* This can be remedied by performing brief steering movements until the manual transmission engages.

61. Speed indicator
62. Option - Flow setting for 4th control circuit, e.g. sweeper rotating speed

* For non-standard equipment

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

7.9.5.3 Cartridge Maintenance Interval

Air Filter-Main Cartridge

- The air filter main cartridge must be replaced as soon as the filter maintenance indicator lamp (44/32) on the instrument panel lights up during operation.
- Brief delay in maintenance does not result in lower filter efficiency.

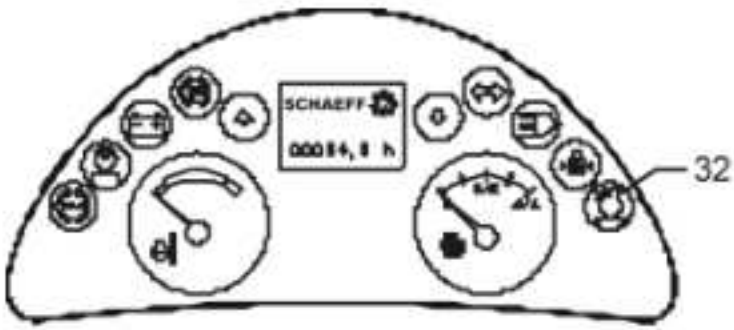


Fig. 44 - Operation

Air Filter-Safety Cartridge

The air filter safety cartridge must be replaced in the following cases:

- After the fifth maintenance of the main cartridge
- After 2 years of operation at the latest
- If the service indicator switches on after the main cartridge has just been serviced
- If the main cartridge is damaged
- If the safety cartridge is damaged

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

1.3 Notes on Using the Instruction Book

References to pictures and items

The references to pictures and items contained in the text, such as *"Figure 12/4"* or *"12/4"* mean Figure 12, Item 4.

Look for these signs on the machine.

⚠ DANGER
(Red Background)
Indicates the presence of a hazard which WILL cause serious injury, death or property damage, if ignored.

⚠ WARNING
(Orange Background)
Indicates the presence of a hazard which CAN cause serious injury, death or property damage, if ignored.

⚠ CAUTION
(Yellow Background)
Indicates the presence of a hazard which WILL or can cause injury or property damage, if ignored.

NOTICE
(Blue Background)
Indicates important set-up, operating or maintenance information.

1.4 Environmental Requirements

Applicable environmental requirements must be observed for all tasks performed on and with the machine.

During installation, repair and maintenance tasks, particular care must be taken that substances that would damage the environment such as

- Lubricating grease and oil
- Hydraulic oil
- Fuel
- Coolants
- Cleaning fluids containing solvents

are not allowed to come in contact with the soil or the water system.

These substances must be stored in suitable containers and must be properly transported, collected and disposed of.

If the substances listed above do reach the soil, the leak or outlet must be stopped immediately and the fluid must be cleaned up with a suitable absorbent material. If necessary, the soil involved must be removed. Absorbent materials and removed soil must be disposed of

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >

7.9.5.5 Cleaning the Main Cartridge

NOTICE

Never wash or brush out the main cartridge.

7.9.6 V-Belts

Checking the Condition of V-Belts

⚠ WARNING

Only check and tension V-belts with the engine off!

Danger of injury!

- Visual check of complete V-belts.

NOTICE

Replace worn or damaged V-belts immediately.

Checking the V-Belt Tension

NOTICE

To check the V-belt tension, a tension gauge is recommended. Check the tension according to the manufacturer's operating instructions.

Checking the V-Belt Tension without a Belt Tension Gauge

- To check the tension, press the V-belt with your thumb in the middle of the greatest free length, and measure the sag.
- Using medium thumb pressure of approx. 45 N, the V-belt sag (A) should equal 10 - 15 mm.

MidWestTech | Bobcat WL440 Wheel Loader Operating & Maintenance Manual | Publicatio... Order the manual at mid-west-tech.com >