NEW HOLLAND

445/M2
445T/M2
668T/M2
Engines

SERVICE MANUAL

6-80940 NA

Issued 04-2006

NEW HOLLAND

www.newhollandconstruction.com

MidWestTech | New Holland 445/M2, 445T/M2, 668T/M2 Engine Service Manual | Publicati... Order the manual at mid-west-tech.com >

SECTION 3

DUTY – INDUSTRIAL EQUIPMENT

	Pagina
GENERAL INFORMATION	3
❑ Version equipped with mechanical feed pump	3
❑ Clearance data	4
PART ONE – MECHANICAL COMPONENTS	7
OVERHAUL OF ENGINE PROVIDED WITH MECHANICAL ROTARY PUMP	9
❑ Preface	9
❑ Engine setting operations for the assembly on turning stand	9
❑ Disassembly of application components	11
❑ Installation of application components	19
❑ Completion of the engine	33
❑ Rotary feed pump disassembly and assembly procedure	35
❑ Feed system bleed procedure	38
❑ Power take–off disassembly and assembly procedure	38
❑ Check and controls	38
OVERHAUL OF ENGINE PROVIDED WITH MECHANICAL IN LINE PUMP	39
❑ Preface	39
❑ Engine setting operations for the assembly on turning stand	39
❑ Disassembly of application components	41
❑ Installation of application components	49
❑ Completion of the engine	63
❑ Feed pump unit disassembly and assembly procedure	65
❑ Feed system bleed procedure	69
❑ Power take–off disassembly and assembly procedure	69
❑ Check and controls	69
TIGHTENING TORQUE	71

MidWestTech | New Holland 445/M2, 445T/M2, 668T/M2 Engine Service Manual | Pub... Order the manual at mid-west-tech.com >

	Pagina
PART TWO – ELECTRICAL EQUIPMENT	73
ELECTRICAL COMPONENT LAYAOUT (4 CYL. ENGINES WITH ROTARY PUMP)	75
❑ Cooling liquid temperatur sensor	76
❑ Starter	76
❑ KSB water temperatur sensor	76
❑ Electromagnets assembled to feed pump	77
❑ Oil pressure switch	77
❑ Fuel filter	77
❑ Pre-post heating resistor	78
❑ Alternator	78
ELECTRICAL COMPONENT LAYAOUT (6 CYL. ENGINES WITH PUMP UNIT)	79
❑ Cooling liquid temperatur sensor	80
❑ Starter	80
❑ KSB water temperatur sensor	80
❑ Engine stop assembled to feed pump	81
❑ Oil pressure switch	81
❑ Fuel filters	81
❑ Pre-post heating resistor	82
❑ Alternator	82

	Pagina
PART THREE – TROUBLESHOOTING	83
PART FOUR – MAINTENANCE PLANNING	91
MAINTENANCE PLANNING	93
❑ Recovery	93
❑ Planning of controls and periodical intervention	93
❑ Checks not included in maintenance planning – daily check	94
MAINTENANCE PROCEDURES – CHECKS AND CONTROLS	94
❑ Engine oil level check	94
❑ Check of fuel system	95
❑ Cooling system check	95
❑ Lubricating system check	95
❑ Check of water presence within fuel filter or pre-filter	95
❑ Check of drive belt tensioning	96
❑ Check of belt's tear and wear status	96
❑ Check and setting of tapped clearance	96
❑ Oil motor and filter replacement	97
❑ Fuel filter replacement	98
❑ Alternator belt replacement	98

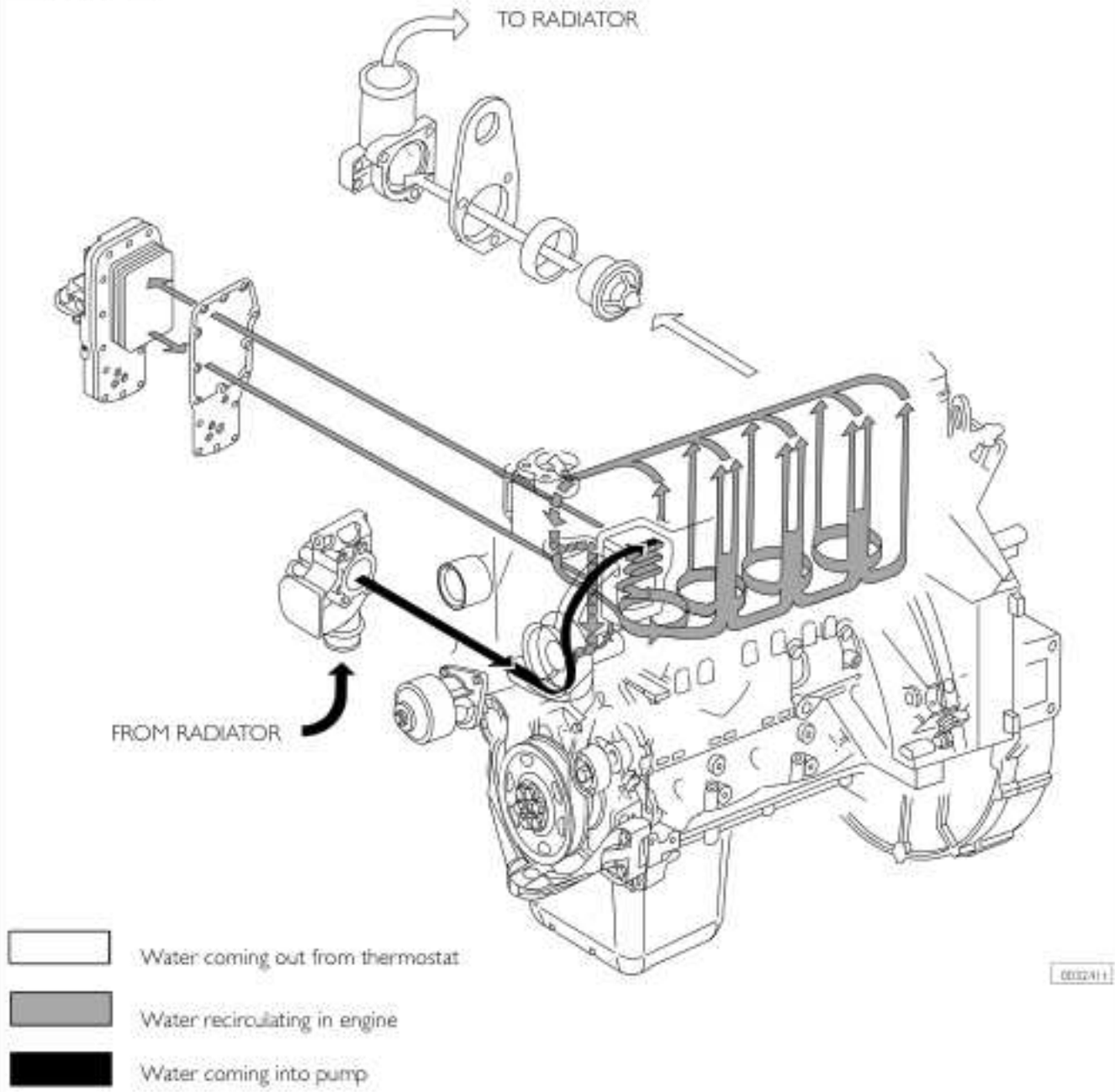
MidWestTech | New Holland 445/M2, 445T/M2, 668T/M2 Engine Service Manual | Pub... Order the manual at mid-west-tech.com >

COOLING SYSTEM

The engine cooling system, closed circuit forced circulation type, generally incorporates the following components:

- Expansion tank; placement, shape and dimensions are subject to change according to the engine's equipment.
- Radiator, which has the duty to dissipate the heat subtracted to the engine by the cooling liquid. Also this component will have specific peculiarities based on the equipment developed, both for what concerns the placement and the dimensions.
- Visc pusher fan, having the duty to increase the heat dissipating power of the radiator. This component as well will be specifically equipped based on the engine's development.
- Heat exchanger to cool the lubrication oil even this component is part of the engine's specific equipment.
- Centrifugal water pump, placed in the front part of the engine block.
- Thermostat regulating the circulation of the cooling liquid.
- The circuit may eventually be extended to the compressor, if this is included in the equipment.

Figure 4



COOLING SYSTEM LAYOUT (4 cyl. engines)

MidWestTech | New Holland 445/M2, 445T/M2, 668T/M2 Engine Service Manual | Pub... Order the manual at mid-west-tech.com >

ANOMALY	POSSIBLE CAUSE	REMEDY	NOTE
Engine running with abnormal knocking	Knocking of crankshaft causing excessive play on one or more main or rod bearings or excessive play on shoulders.	Rectify the pins of the crankshaft and install smaller bearings. Replace the thrust half-rings.	
	Crankshaft unbalanced.	Check alignment of crankshaft.	
	Loosening of screws securing flywheel.	Replace the loosened screws and tighten all the screws to the specified torque.	
	Misalignment of rods.	Replace the rods.	
	Noise from piston journals due to excessive play of piston hubs and in the rod bushing. Loose bushings in the rod seatings.	Replace the piston journal and/or the piston and rod bushing. Replace with new bushings.	
	Noisy timing.	Adjust the play between camshaft cams and tappets and check that there are no broken springs, that there is no excessive play between the valve stems and the valve guides, tappets and seatings.	
The engine smokes abnormally. Black or dark grey smoke.	Excessive maximum pump output.	Disconnect the pump and adjust delivery in accordance with the data given in the calibration table.	See your dealer.
	K.K.S.B. device out of calibration or malfunctioning.	Check operation by a tester and adjust correctly as described in the manual.	
	There is an excessive delay on the injection pump.	Correct the set-up.	

MidWestTech | New Holland 445/M2, 445T/M2, 668T/M2 Engine Service Manual | Pub...
Order the manual at mid-west-tech.com >

SECTION 4

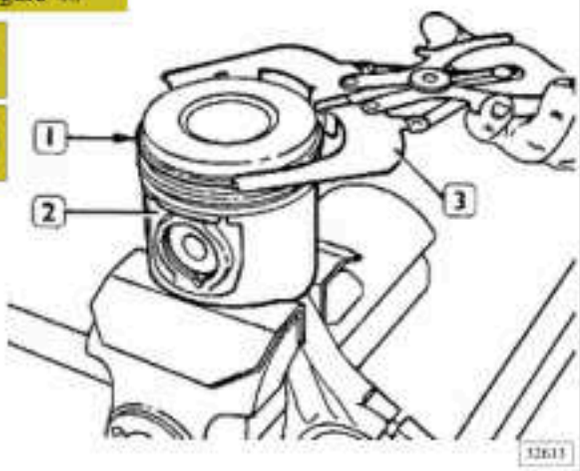
Overhaul and technical specifications

	Pagina
GENERAL SPECIFICATIONS	3
CLEARANCE DATA	4
ENGINE OVERHAUL	11
ENGINE REMOVAL AT THE BENCH	11
REPAIR OPERATIONS	12
CYLINDER UNIT	12
❑ Checks and measurements	12
❑ Checking head supporting surface on cylinder unit	13
TIMING SYSTEM	13
❑ Camshaft	13
❑ Checking cam lift and pin alignment	14
BUSHES	14
❑ Bush replacement	16
❑ Tappets	16
❑ Fitting tappets – camshaft	16
OUTPUT SHAFT	17
❑ Measuring journals and crankpins	17
❑ Replacing oil pump control gear	21
❑ Fitting main bearings	21
❑ Finding journal clearance	21
❑ Checking output shaft shoulder clearance	22
CONNECTING ROD – PISTON ASSEMBLY	22
❑ Pistons	23
❑ Measuring piston diameter	23
❑ Piston pins	24
❑ Conditions for proper pin-piston coupling	24
❑ Split rings	24
❑ Connecting rods	25
❑ Bushes	25
❑ Checking connecting rods	26
❑ Checking torsion	26

MidWestTech | New Holland 445/M2, 445T/M2, 668T/M2 Engine Service Manual | Pub... Order the manual at mid-west-tech.com >

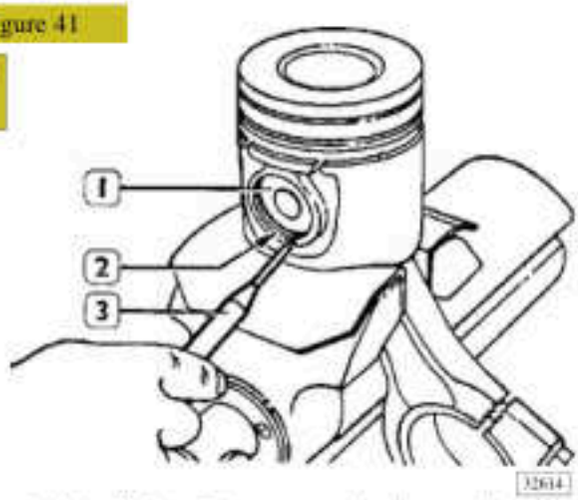
Pistons
Measuring piston diameter

Figure 40



Remove split rings (1) from piston (2) using pliers 99360183 (3).

Figure 41



Piston pin (1) split rings (2) are removed using a scriber (3).

Figure 42

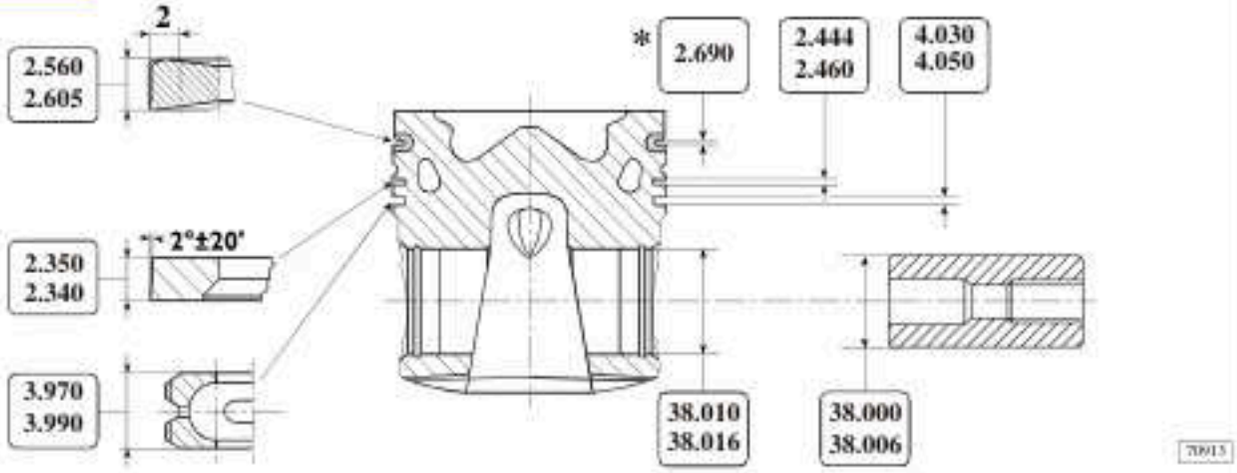
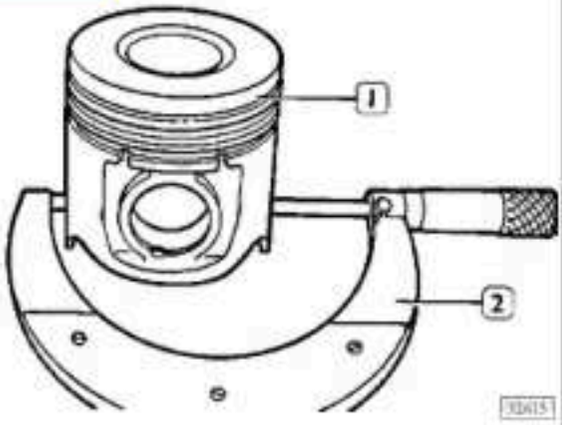


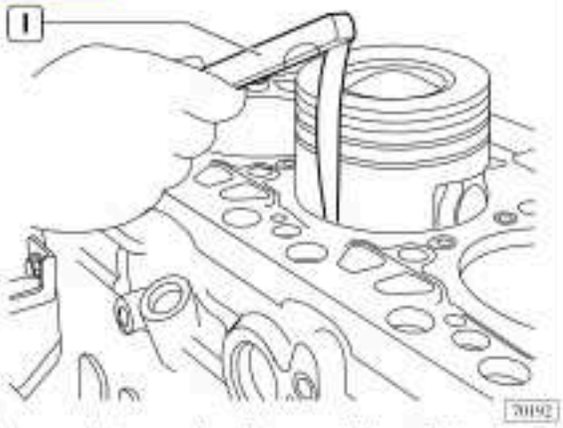
Figure 43



Using a micrometer (2), measure the diameter of the piston (1) to determine the assembly clearance.

The diameter shall be measured at 12 mm from the piston skirt.

Figure 44



The clearance between the piston and the cylinder barrel can be checked also with a feeler gauge (1) as shown in the figure.

MAIN DATA CONCERNING KS. PISTON, PINS AND SPLIT RINGS

* Value measured on 58 mm diameter for 4 cylinder

MidWestTech | New Holland 445/M2, 445T/M2, 668T/M2 Engine Service Manual | Pub... Order the manual at mid-west-tech.com >