

SERVICE MANUAL

TD5.65 / TD5.75 / TD5.85
TD5.95 / TD5.105 / TD5.115
Tractor

Part number 47445474

English
August 2013



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SERVICE MANUAL

TD5.105 , TD5.115 , TD5.65 , TD5.75 , TD5.85 , TD5.95

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Note to the Owner

General instructions

Important notice

All maintenance and repair operations described in this manual should be carried out exclusively by the NEW HOLLAND authorised workshops. All instructions detailed should be carefully observed and special equipment indicated should be used if necessary.

Everyone who carries out service operations described without carefully observing these prescriptions will be directly responsible of deriving damages.

Shimming

At each adjustment, select adjusting shims, measure them individually using a micrometer and then sum up recorded values. Do not rely on measuring the whole shimming set, which may be incorrect, or on rated value indicated for each shim.

Rotating shaft seals

To correctly install rotating shaft seals, observe the following instructions:

- Let the seal soak into the same oil as it will seal for at least half an hour before mounting.
- Thoroughly clean the shaft and ensure that the shaft working surface is not damaged.
- Place the sealing lip towards the fluid. In case of a hydrodynamic lip, consider the shaft rotation direction and orient grooves in order that they deviate the fluid towards the inner side of the seal.
- Coat the sealing lip with a thin layer of lubricant (oil rather than grease) and fill with grease the gap between the sealing lip and the dust lip of double lip seals.
- Insert the seal into its seat and press it down using a flat punch. Do not tap the seal with a hammer or a drift.
- Take care to insert the seal perpendicularly to its seat while you are pressing it. Once the seal is settled, ensure that it contacts the thrust element if required.
- To prevent damaging the sealing lip against the shaft, place a suitable protection during installation.

O-rings

Lubricate the O-rings before inserting them into their seats. This will prevent the O-rings from rolling over and twine during mounting which will jeopardise sealing.

Sealers

Apply one of the following sealers: **RTV SILMATE**, **RHODORSIL CAF 1**, or **LOCTITE PLASTIC GASKET** over the mating surfaces marked with an X.

Before applying the sealer, prepare the surface as follows:

- Remove possible scales using a metal brush.
- Thoroughly degrease the surfaces using one of the following cleaning agent: trichlorethylene, petrol or a water and soda solution.

Bearings

It is advisable to heat the bearings to **80 - 90 °C (176 - 194 °F)** before mounting them on their shafts and cool them down before inserting them into their seats with external tapping.

Roll pins

When fitting straight roll pins, ensure that the pin notch is oriented in the direction of the effort to stress the pin. Coil roll pins can be installed in any position.

Notes for spare parts

Use exclusively genuine NEW HOLLAND spare parts.

Only genuine parts guarantee same quality, life, safety as original components as they are the same as mounted in production.

Only the NEW HOLLAND genuine spare parts can offer this guarantee.

All spare parts orders should be complete with the following data:

- Tractor model (commercial name) and frame number.
- Engine type and number.
- Part number of the ordered part, which can be found on the "Microfiches" or the "Spare parts catalogue", which is the base for order processing.

Notes for equipment

Equipment which NEW HOLLAND proposes and shows in this manual are as follows:

- Studied and designed expressly for use on NEW HOLLAND tractors.
- Necessary to make a reliable repair.
- Accurately built and strictly tested to offer efficient and long-lasting working means.

We also remind the repair personnel that having these equipment means:

- Work in optimal technical conditions.
- Obtain best results.
- Save time and effort.
- Work more safely.

Notices

Wear limits indicated for some details should be intended as advised, but not binding values. The words "front", "rear", "right hand", and "left hand" referred to the different parts should be intended as seen from the operator's seat oriented to the normal sense of movement of the tractor.

How to move the tractor with the battery removed

Cables from the external power supply should be connected exclusively to the respective terminals of the tractor positive and negative cables using pliers in good condition which allow proper and steady contact.

Disconnect all services (lights, wind-shield wipers, etc.) before starting the tractor

If it is necessary to check the tractor electrical system, check it only with the power supply connected. At check end, disconnect all services and switch the power supply Off before disconnecting the cables.

Safety rules

Pay attention to this symbol



This warning symbol points out important messages involving personal safety. Carefully read the safety rules contained herein and follow advised precautions to avoid potential hazards and safeguard your safety and personal integrity. In this manual you will find this symbol together with the following key-words:

WARNING – It gives warning about improper repair operations and deriving potential consequences affecting the service technician's personal safety.

DANGER – It gives specific warning about potential dangers for personal safety of the operator or other persons directly or indirectly involved.

To prevent accidents

Most accidents and personal injuries taking place in workshops are due from non-observance of some simple and essential prudential rule and safety precautions. For this reason, **IN MOST CASES THEY CAN BE AVOIDED**. It suffices to foresee possible causes and act consequently with necessary caution and care.

The possibility that an accident might occur with any type of machines should not be disregarded, no matter how well the machine in question was designed and built.

A wise and careful service technician is the best precautions against accidents.

Careful observance of this only basic precaution would be enough to avoid many severe accidents.

DANGER: Never carry out any cleaning, lubrication or maintenance operations when the engine is running.

Safety rules

Generalities

- Carefully follow specified repair and maintenance procedures.
- Do not wear rings, wristwatches, jewels, unbuttoned or flapping clothing such as ties, torn clothes, scarves, open jackets or shirts with open zips which could get hold into moving parts. We advise to use approved safety clothing such as anti-slipping footwear, gloves, safety goggles, helmets, etc.
- Never carry out any repair on the machine if someone is sitting on the operator's seat, except if they are certified operators to assist in the operation to be carried out.
- Never operate the machine or use attachments from a place other than sitting at the operator's seat.
- Never carry out any operation on the machine when the engine is running, except when specifically indicated.
- Stop the engine and ensure that all pressure is relieved from hydraulic circuits before removing caps, covers, valves, etc.
- All repair and maintenance operations should be carried out with the greatest care and attention.
- Service stairs and platforms used in a workshop or in the field should be built in compliance with the safety rules in force.
- Disconnect the batteries and label all controls to warn that the tractor is being serviced. Block the machine and all equipment which should be raised.
- Never check or fill fuel tanks and accumulator batteries, nor use starting liquid if you are smoking or near open flames as such fluids are flammable.
- Brakes are inoperative when they are manually released for maintenance purposes. In such cases, the machine should be kept constantly under control using blocks or similar devices.
- The fuel filling gun should remain always in contact with the filler neck. Maintain this contact until the fuel stops flowing into the tank to avoid possible sparks due to static electricity buildup.
- Use exclusively specified towing points for towing the tractor. Connect parts carefully. Ensure that foreseen pins and/or locks are steadily fixed before applying traction. Do not stop near towing bars, cables or chains working under load.

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- To transfer a failed tractor, use a trailer or a low loading platform trolley if available.
- To load and unload the machine from the transportation mean, select a flat area providing a firm support to the trailer or truck wheels. Firmly tie the machine to the truck or trailer platform and block wheels as required by the forwarder.
- For electrical heaters, battery-chargers and similar equipment use exclusive auxiliary power supplies with a efficient ground to avoid electrical shock hazard.
- Always use lifting equipment and similar of appropriate capacity to lift or move heavy components.
- Pay special attention to bystanders.
- Never pour gasoline or diesel oil into open, wide and low containers.
- Never use gasoline, diesel oil or other flammable liquids as cleaning agents. Use nonflammable nontoxic proprietary solvents.
- Wear protection goggles with side guards when cleaning parts using compressed air.
- Do not exceed a pressure of **2.1 bar (30.45 psi)**, in accordance with local regulations.
- Do not run the engine in a closed building without proper ventilation.
- Do not smoke, use open flames, cause sparks in the nearby area when filling fuel or handling highly flammable liquids.
- Do not use flames as light sources when working on a machine or checking for leaks.
- Move with caution when working under a tractor, and also on or near a tractor. Wear proper safety accessories: helmets, goggles and special footwear.
- During checks which should be carried out with the engine running, ask an assistant to seat at the operator's seat and keep the service technician under visual control at any moment.
- In case of operations outside the workshop, drive the tractor to a flat area and block it. If working on an incline cannot be avoided, first block the tractor carefully. Move it to a flat area as soon as possible with a certain extent of safety.
- Ruined or plied cables and chains are unreliable. Do not use them for lifting or trailing. Always handle them wearing gloves of proper thickness.
- Chains should always be safely fastened. Ensure that fastening device is strong enough to hold the load foreseen. No persons should stop near the fastening point, trailing chains or cables.
- The working area should be always kept CLEAN and DRY. Immediately clean any spillage of water or oil.
- Do not pile up grease or oil soaked rags, as they constitute a great fire hazard. Always place them into a metal container. Before starting the tractor or its attachments, check, adjust and block the operator's seat. Also ensure that there are no persons within the tractor or attachment operating range.
- Do not keep into your pockets any object which might fall unobserved into the tractor's inner compartments.
- Whenever there is the possibility of being reached by ejected metal parts or similar, use protection eye mask or goggles with side guards, helmets, special footwear and heavy gloves.
- Wear suitable protection such as tinted eye protection, helmets, special clothing, gloves and footwear whenever it is necessary to carry out welding procedures. All persons standing in the vicinity of the welding process should wear tinted eye protection. **NEVER LOOK AT THE WELDING ARC IF YOUR EYES ARE NOT SUITABLY PROTECTED.**
- Metal cables with the use get frayed. Always wear adequate protections (heavy gloves, eye protection, etc.)
- Handle all parts with the greatest caution. Keep your hands and fingers far from gaps, moving gears and similar. Always use approved protective equipment, such as eye protection, heavy gloves and protective footwear.

Start up

- Never run the engine in confined spaces which are not equipped with adequate ventilation for exhaust gas extraction.
- Never bring your head, body, arms, legs, feet, hands, fingers near fans or rotating belts.

Engine

- Always loosen the radiator cap very slowly before removing it to allow pressure in the system to dissipate. Coolant should be topped up only when the engine is stopped or idle if hot.
- Do not fill up fuel tank when the engine is running, mainly if it is hot, to avoid ignition of fires in case of fuel spilling.
- Never check or adjust the fan belt tension when the engine is running. Never adjust the fuel injection pump when the tractor is moving.
- Never lubricate the tractor when the engine is running.

Electrical systems

- If it is necessary to use auxiliary batteries, cables must be connected at both sides as follows: (+) to (+) and (–) to (–). Avoid short circuiting the terminals. GAS RELEASED FROM BATTERIES IS HIGHLY FLAMMABLE. During charging, leave the battery compartment uncovered to improve ventilation. Avoid checking the battery charge by means of “jumpers” made by placing metallic objects across the terminals. Avoid sparks or flames near the battery area. Do no smoke to prevent explosion hazards.
- Prior to any service, check for fuel or current leaks. Remove these leaks before going on with the work.
- Do not charge batteries in confined spaces. Ensure that ventilation is appropriate to prevent accidental explosion hazard due to build up of gases released during charging.
- Always disconnect the batteries before performing any type of service on the electrical system.

Hydraulic systems

- Some fluid slowly coming out from a very small port can be almost invisible and be strong enough to penetrate the skin. For this reason, NEVER USE YOUR HANDS TO CHECK FOR LEAKS, but use a piece of cardboard or a piece of wood to this purpose. If any fluid is injected into the skin, seek medical aid immediately. Lack of immediate medical attention, serious infections or dermatosis may result.
- Always take system pressure readings using the appropriate gauges.

Wheels and tires

- Check that the tires are correctly inflated at the pressure specified by the manufacturer. Periodically check possible damages to the rims and tires.
- Keep off and stay at the tire side when correcting the inflation pressure.
- Check the pressure only when the tractor is unloaded and tires are cold to avoid wrong readings due to over-pressure. Do not reuse parts of recovered wheels as improper welding, brazing or heating may weaken the wheel and make it fail.
- Never cut, nor weld a rim with the inflated tire assembled.
- To remove the wheels, block both front and rear tractor wheels. Raise the tractor and install safe and stable supports under the tractor in accordance with regulations in force.
- Deflate the tire before removing any object caught into the tire tread.
- Never inflate tires using flammable gases as they may originate explosions and cause injuries to bystanders.

Removal and installation

- Lift and handle all heavy components using lifting equipment of adequate capacity. Ensure that parts are supported by appropriate slings and hooks. Use lifting eyes provided to this purpose. Take care of the persons near the loads to be lifted.
- Handle all parts with great care. Do not place your hands or fingers between two parts. Wear approved protective clothing such as safety goggles, gloves and footwear.
- Do not twine chains or metal cables. Always wear protection gloves to handle cables or chains.

Safety rules

Cab air conditioning system

Refrigerant must be handled with extreme care to avoid injury, always wear safety gloves and goggles.

Liquid refrigerant can cause freezing of the skin and serious damage to the eyes, even blindness in some cases.

Keep refrigerant containers away from heat sources, as the increase of internal pressure due to heating could cause the container to explode.

In contact with a naked flame or hot metal surfaces the refrigerant may give off a toxic gas. If inhaled this gas can cause serious harm.

To avoid the possibility of accidents take the simple precautions described below.

The operation of emptying the system must be carried out in a well-ventilated area, well away from any naked flames.

During the charging and emptying operations, take the necessary precautions to protect the face and above all the eyes from accidental contact with refrigerant.

In case of accident, proceed as follows:

- If has entered the eyes, wash immediately with a few drops of mineral oil, then wash them thoroughly with a solution of boric acid and water (one spoonful of acid in 1/4 cup of water) and seek medical assistance immediately.
- Freezing of the skin caused by contact with liquid refrigerant can be treated by gradually warming the injured area with cold water followed by application of a greasy cream. Seek medical assistance.
- The air-conditioning system contains a mixture of refrigerant and oil under high pressure, under no circumstances loosen pipe fittings/couplings or work on pipes without having first evacuated the system.
- For the same reason, never unscrew the compressor oil level plug when the system is charged.
- Do not heat the refrigerant container. Above **50 °C (122 °F)** the pressure increases very rapidly.
- Keep the air-conditioning system away from heat sources to prevent possible explosion due to the increase of pressure in the system.

When transferring refrigerant from one container to another, only use homologated liquid refrigerant containers equipped with safety valves.

Never fill liquid refrigerant containers over 80% of their maximum capacity.

Do not modify the settings of safety valves and the control devices.

Never connect the recovery/recycling and evacuation/charging stations to electrical power outlets with voltages other than those specified, do not leave the stations powered on unless they are to be used immediately.

Consumables

Component to be filled or topped up	Qty.	Recommended products	International specification
Cooling system: Without cab: TD 5.65, and TD5.75 TD5.85 TD 5.95, TD5.105 and TD5.115 With cab: TD 5.65 and TD5.75 TD5.85 TD 5.95, TD5.105 and TD5.115	11 l (2.91 US gal) 12 l (3.17 US gal) 14 l (3.70 US gal) 13 l (3.43 US gal) 14 l (3.70 US gal) 16 l (4.23 US gal)	Water & liquid NEW HOLLAND AMBRA AGRIFLU 50% + 50% NH900A	-
Windscreen washer bottle	2 l (0.53 US gal)	Water & cleaning liquid	-
Fuel tank	110 l (29.06 US gal)	Decanted and filtered diesel fuel	-
Engine sump: TD 5.65 and TD 5.75 TD 5.85 TD 5.95, TD5.105 and TD5.115	7.6 l (2.01 US gal) 8.5 l (2.25 US gal) 10 l (2.64 US gal)	NEW HOLLAND AMBRA MASTERGOLD™ HSP ENGINE OIL SAE 15W-40 NH330H	API CH-4 ACEA E5
Brake control circuit	0.4 l (0.1 US gal)	NEW HOLLAND AMBRA BRAKE LHM NH610A	ISO 7308
Front axle: Axle housing Final drives (each)	7 l (1.8 US gal) 1.25 l (0.3 US gal)	NEW HOLLAND AMBRA MULTI G™ HYDRAULIC TRANSMISSION OIL NH410B	API GL-4 ISO 32/46 SAE 10W - 30
Rear transmission (bevel drive and brakes), gearbox, hydraulic lift and PTO	46 l (12.15 US gal)		
Rear final drives (each)	5.3 l (1.40 US gal)		
Front wheel hubs	-	NEW HOLLAND AMBRA GR-9 MULTI-PURPOSE GREASE NH710A	NLGI 2
Grease fittings	-		

NOTICE: Use only heavy-duty, low silicate coolant such as **NEW HOLLAND AMBRA AGRIFLU**. Automotive antifreeze purchased at local supply store outlets most likely is not low silicate and must not be used in heavy-duty diesel engines. Always have a minimum of 50% ethylene glycol coolant in the cooling system, adjusting the concentration based on ambient temperature, according to coolant label instructions. Use good quality water. Deionized water is ideal for cooling systems and is contained in some prepackaged coolants labeled as pre-mixed with water. If the low silicate ethylene glycol coolant is not pre-charged with supplemental diesel coolant additive/inhibitor, this must be added to the solution to provide protection against corrosion and pitting.



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Engine and crankcase - 001

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Engine - General specification

TD5.

Table 1

General specification	4 Cylinders
<p>Engine, technical type: TD5.95 model - type F4CE9487N*J (BOSCH pump) TD5.105 model - type F4CE9484L*J (BOSCH pump) TD5.115 model - type F4CE9484C*J (BOSCH pump)</p> <p>Cycle Fuel injection Number of cylinders in line Piston diameter: Model TD5.95, TD5.105, TD5.115 Piston stroke Total displacement: Model TD5.95, TD5.105, TD5.115 Compression ratio for models TD5.95, TD5.105, TD5.115 Maximum power: Model TD5.95 - type F4CE9487N*J Model TD5.105 - type F4CE9484L*J Model TD5.115 - type F4CE9484C*J Maximum torque: : TD5.95 - type F4CE9487N*J Maximum torque: TD5.105 - type F4CE9484L*J Maximum torque: TD5.115 - type F4CE9484C*J Maximum torque speed Number of main bearings Sump</p>	<p>Diesel, 4-stroke Direct 4</p> <p>104 mm (4.0945 in) 132 mm (5.1969 in)</p> <p>4485 cm³ (273.69 in³) 17.5:1</p> <p>70 kW (95 Hp) 78 kW (106 Hp) 83 kW (113 Hp) 390 N·m (3452 lb in) 425 N·m (3762 lb in) 450 N·m (3983 lb in) 1300 RPM 5 Structural, cast iron</p>
<p>Lubrication Pump drive Engine speed/oil pump speed ratio Oil cleaning Normal oil pressure with motor warmed-up At slow idling speed At fast idling speed</p>	<p>Forced, with lobe pump Camshaft 1:1 Mesh filter on oil intake and filtering cartridge on delivery line</p> <p>1.2 bar (17.4 psi) 3.8 bar (55.1 psi)</p>
<p>Cooling system Radiator on models TD5.95, TD5.105, TD5.115 Fan, attached to the pulley Coolant pump Engine speed/coolant pump speed ratio Coolant thermometer Temperature ranges corresponding to each section: Initial blue section Middle green section (normal working conditions) Final red section Temperature control Initial opening</p>	<p>Coolant circulation 4 lines of vertical pipes with copper fins Intake, in plastic with 10 blades Centrifugal vane-type 1:1.977 Coloured scale divided into 3 sections</p> <p>40 - 60 °C (104 - 140 °F) 60 - 110 °C (140 - 230 °F) 110 - 120 °C (230 - 248 °F) Via thermostat valve 81 - 85 °C (178 - 185 °F)</p>
<p>Timing system Intake: Start: before T.D.C. End: after B.D.C. Exhaust:</p>	<p>Overhead valves operated by tappets, rods and rocker arms via the camshaft located in the engine block; the camshaft is driven by the crankshaft using straight-tooth gears</p> <p>10°± 30' 10°± 30'</p>

Engine - Engine and crankcase

General specification	4 Cylinders
Start: before B.D.C. End: after B.D.C. Valve-rocker arm clearance (with engine cold) Intake Exhaust For further timing system technical data	64° 26° 0.20 - 0.30 mm (0.0079 - 0.0118 in) 0.45 - 0.55 mm (0.0177 - 0.0217 in) see 8
Fuel system Air cleaning Fuel pump Fuel filtering Minimum fuel flow rate with pump shaft rotating at 1800 RPM Cam operated BOSCH injection pump All-speed governor, incorporated in pump: BOSCH Automatic advance regulator, incorporated in pump: BOSCH For further fuel system technical data: Fixed advance (pump setting for start of delivery before TDC) - Pressure setting - Injection order, and other information regarding the BOSCH pump	Dual cartridge dry air filter, with clogged filter indicator with centrifugal pre-filter and automatic dust ejector With double diaphragm Through wire filter in fuel supply pump, and replaceable cartridge on delivery line to injection pump 127.6 l/hour (34 US gal/hour) Engine timing Rotating distributor type Centrifugal counterweights Hydraulic Refer to the data for the relevant engine type in the table 1

Table 2

Turbo charger: For versions F4CE9487N*J: Type HOLSET HX25W For versions F4CE9484L*J: Type HOLSET HX25W For versions F4CE9484L*J: Type HOLSET HX25W	TB11H/A085BXL TB11K/A11CXL TB11K/A11CXL
Injection pump BOSCH pump: TD5.95 model - type F4CE9487N*J TD5.105 model - type F4CE9484L*J TD5.115 model - type F4CE9484C*J Direction of rotation Injection order	Rotating distributor with speed governor and advance regulator incorporated VE 4/12 F1250 L2023 (S/N 504218827) E 4/12 F E 4/12 F Anticlockwise 1-3-4-2 (For all models)

Table 3

	TD5.95	TD5.105	TD5.115
BOSCH - type injectors:			
F4CE9487N*J	504254390 DSLA 145 P 1441	-	-
F4CE9484L*J	-	504254390 DSLA 145 P 1441	-
F4CE9484C*J	-	-	504254390 DSLA 145 P 1441
Number of nozzle holes	7	7	7
Nozzle hole diameter mm:			
F4CE9487N*J	0 192	-	-
F4CE9484L*J	-	0 192	-

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F4CE9484C*J	-	-	0 192
Calibration pressure bar	260 - 272 bar (3770 - 3944 psi)	260 - 272 bar (3770 - 3944 psi)	260 - 272 bar (3770 - 3944 psi)

Table 4

Crankcase/cylinder block data		
Crankcase		Cast-iron monobloc with cylinder liners, crankshaft, camshaft and tappets
Cylinder bore diameter		104 - 104.024 mm (4.0945 - 4.09543 in)
Oversized cylinder bore diameter		104.5 - 104.524 mm (4.11417 - 4.11512 in)
Main journal half bearing seat diameter	External no. 1-5	87.982 - 88.008 mm (3.46386 - 3.46488 in)
	Internal no. 2-3-4	87.977 - 88.013 mm (3.46366 - 3.46508 in)
Camshaft bushing seat diameter:		
Front		59.222 - 59.248 mm (2.33157 - 2.33260 in)
Intermediate		59.222 - 59.248 mm (2.33157 - 2.33260 in)
Rear		59.222 - 59.248 mm (2.33157 - 2.33260 in)
Diameter of standard tappet bores in crankcase		16 - 16.03 mm (0.62992 - 0.63110 in)

Table 5

Crankshaft and bearings data		
Crankshaft		Balanced with integral counterweights
Standard journal diameter		82.987 - 83.013 mm (3.2672 - 3.2682 in)
Journal undersizes		0.25 - 0.5 mm (0.0098 - 0.0197 in)
Main journal half bearing thickness		2.456 - 2.464 mm (0.0967 - 0.0970 in)
Main half bearing undersizes (internal diameter)		0.25 - 0.5 mm (0.0098 - 0.0197 in)
Clearance between bearings and main journal	External no. 1-5	0.041 - 0.119 mm (0.0016 - 0.0047 in)
	Internal no. 2-3-4	0.041 - 0.103 mm (0.0016 - 0.0041 in)
Standard crankpin diameter		68.987 - 69.013 mm (2.7160 - 2.7170 in)
Crankpin undersizes		0.25 - 0.5 mm (0.0098 - 0.0197 in)
Standard connecting rod half bearing thickness		1.955 - 1.968 mm (0.0770 - 0.0775 in)
Connecting rod half bearing undersizes (internal diameter)		0.25 - 0.5 mm (0.0098 - 0.0197 in)
Bearing to crankpin clearance		0.033 - 0.041 mm (0.0013 - 0.0016 in)
Standard crankshaft thrust washer width		37.28 - 37.38 mm (1.4677 - 1.4717 in)
Width of main bearing for thrust		25.98 - 26.48 mm (1.0228 - 1.0425 in)
Width of corresponding crankshaft journal		37.475 - 37.55 mm (1.4754 - 1.4783 in)
Crankshaft assembly endfloat		0.172 - 0.24 mm (0.0068 - 0.0094 in)

Table 6

Connecting rod data		
Connecting rods		Printed in steel, oblique-cut type
Diameter of small end bushing seat		40.987 - 41.013 mm (1.6137 - 1.6147 in)
Outside diameter of small end bushing		41.279 - 41.553 mm (1.6252 - 1.0425 in)
Interference between small end bushing and seat		0.266 - 0.566 mm (0.0105 - 0.0223 in)
Inside diameter of small end bushing (measured after fitting)		38.019 - 38.033 mm (1.4968 - 1.4974 in)
Diameter of big end bearing seats		72.987 - 73.013 mm (2.8735 - 2.8745 in)
Connecting rod-crankpin end float		0.1 - 0.33 mm (0.0039 - 0.0130 in)

Table 7

Piston data	TD5.95 - TD5.105 - TD5.115
Pistons	Light alloy with three compression rings, including two seal rings and one scraper ring
Standard piston diameter, measured at 61 mm (2.40 in) from skirt base and perpendicularly to the gudgeon pin axis	104 - 104.024 mm (4.0945 - 4.0954 in)
Piston clearance in cylinder liner	0.268 - 0.31 mm (0.0106 - 0.0122 in)
Piston oversizes	0.5000 mm (0.0197 in)
Piston protrusion at T.D.C. from cylinder block face	0.28 - 0.52 mm (0.0110 - 0.0205 in)
Gudgeon pin diameter	37.994 - 38 mm (1.4958 - 1.4961 in)
Diameter of gudgeon pin seat in piston	38.01 - 38.016 mm (1.4965 - 1.4967 in)
Gudgeon pin to seat clearance	0.01 - 0.022 mm (0.0004 - 0.0009 in)
Gudgeon pin to small end bearing clearance	0.019 - 0.039 mm (0.0007 - 0.0015 in)
Piston ring groove depth:	
1st ring	2.705 - 2.735 mm (0.1065 - 0.1077 in)
2nd ring	2.44 - 2.46 mm (0.0961 - 0.0969 in)
3rd ring	4.03 - 4.05 mm (0.1587 - 0.1594 in)
Piston ring thickness:	
1st ring	2.56 - 2.735 mm (0.1008 - 0.1077 in)
2nd ring	2.35 - 2.38 mm (0.0925 - 0.0937 in)
3rd ring	3.97 - 3.99 mm (0.1563 - 0.1571 in)
Piston ring groove clearance (measured vertically):	
1st ring	0.1 - 0.175 mm (0.0039 - 0.0069 in)
2nd ring	0.06 - 0.11 mm (0.0024 - 0.0043 in)
3rd ring	0.04 - 0.073 mm (0.0016 - 0.0029 in)
Assembly clearance between piston ring ends in cylinder sleeves:	
1st ring	0.3 - 0.4 mm (0.0118 - 0.0157 in)
2nd ring	0.6 - 0.8 mm (0.0236 - 0.0315 in)
3rd ring	0.3 - 0.55 mm (0.0118 - 0.0217 in)
Spare piston ring oversizing	0.500 mm (0.0197 in)

Table 8

Valve timing gear data	
Inside diameter of camshaft bearings (fitted and reamed):	
Front	54.083 - 54.147 mm (2.1293 - 2.1318 in)
Intermediate	54.083 - 54.147 mm (2.1293 - 2.1318 in)
Rear	54.083 - 54.147 mm (2.1293 - 2.1318 in)
Diameter of camshaft journals:	
Front	53.995 - 54.045 mm (2.1258 - 2.1278 in)
Intermediate	53.995 - 54.045 mm (2.1258 - 2.1278 in)
Rear	53.995 - 54.045 mm (2.1258 - 2.1278 in)
Clearance between camshaft journals and bushings	0.038 - 0.152 mm (0.0015 - 0.0060 in)
Camshaft end float	0.1 - 0.36 mm (0.0039 - 0.0142 in)
Crankshaft to camshaft teeth clearance	0.076 - 0.28 mm (0.0030 - 0.0110 in)

Table 9

Tappet data	
Tappet bore in crankcase	16 - 16.03 mm (0.6299 - 0.6311 in)
Outside diameter of standard tappet	0.6271 - 0.6283 mm (0.0247 - 0.0247 in)
Tappet running clearance	0.0016 - 0.0039 mm (0.0001 - 0.0002 in)

Table 10

Rocker arm - valve data	
Rocker-arm shaft diameter	18.963 - 18.975 mm (0.7466 - 0.7470 in)
Rocker-arm shaft seat diameter	19 - 19.026 mm (0.7480 - 0.7491 in)
Rocker arm bore to shaft clearance	0.025 - 0.063 mm (0.0010 - 0.0025 in)
Valve clearance for normal running (engine cold):	

Rocker arm - valve data	
Inlet valve	0.3 - 0.05 mm (0.0118 - 0.0020 in)
Exhaust valve	0.55 - 0.05 mm (0.0217 - 0.0020 in)
Cam lift:	
Inlet valve	6.045 mm (0.2380 in)
Exhaust valve	7.239 mm (0.2380 in)

Table 11

Cylinder head data	
Cylinder head	In cast iron with fitted valve seats and seats for injectors and thermostat valve
Maximum face re-grinding depth that can be removed from the cylinder head in the event of reboring	0.130 mm (0.0051 in)
Diameter of valve stem seat in cylinder head	8.019 - 8.039 mm (0.3157 - 0.3165 in)
Valve stem diameter	7.96 - 7.98 mm (0.3134 - 0.3142 in)
Assembly clearance between valve stem and seat	0.039 - 0.079 mm (0.0015 - 0.0031 in)
Valve seat angle in head:	
Inlet valve	60°
Exhaust valve	45°
Valve face angle:	
Inlet valve	60°
Exhaust valve	45°
Diameter on head for fitting valve seat:	
Inlet valve	46.987 - 47.013 mm (1.8499 - 1.8509 in)
Exhaust valve	43.637 - 46.663 mm (1.7180 - 1.8371 in)
Valve seat insert outside diameter:	
Inlet valve	47.063 - 47.089 mm (1.8529 - 1.8539 in)
Exhaust valve	43.713 - 43.739 mm (1.7210 - 1.7220 in)
Valve stand-in relative to cylinder head face:	
Inlet valve	0.336 - 1.072 mm (0.0132 - 0.0422 in)
Exhaust valve	0.104 - 0.84 mm (0.0041 - 0.0331 in)
Interference between valve seat and head:	
Inlet valve	0.05 - 0.102 mm (0.0020 - 0.0040 in)
Exhaust valve	0.05 - 0.102 mm (0.0020 - 0.0040 in)
Valve head diameter:	
Inlet valve	44.87 - 45.13 mm (1.7665 - 1.7768 in)
Exhaust valve	41.87 - 42.13 mm (1.6484 - 1.6587 in)
Inlet and exhaust valve springs:	
Free length	63.5 mm (2.5000 in)
Length under load of 329 N (74 lb)	49.02 mm (1.9299 in)
Length under load of 641 N (144 lb)	38.2 mm (1.5039 in)
Injector protrusion relative to head face:	
injectors: BOSCH DLLA 145 P 1338 - BOSCH DSLA 145 P 1255	Not adjustable

Engine - Torque

TD5.

Tightening torques

Parts to be tightened	Thread	Tightening torque	Angle
Flywheel casing retaining bolts (2) (Fig. Engine - Assemble (NEF Engine) (10.001))	M12 x 1.25 x 100 M16 x 1.50 x 80 M16 x 1.50 x 100 M12 x 1.25 x 78	70 - 90 N·m (52 - 66 lb ft) 180 - 220 N·m (133 - 162 lb ft) 70 - 90 N·m (52 - 66 lb ft)	
Oil sump retaining bolts (3) (Fig. Engine - Assemble (NEF Engine) (10.001))	M10 x 1.50 x 45 M10 x 1.50	45 - 55 N·m (33 - 41 lb ft) 65 - 75 N·m (48 - 55 lb ft)	

Engine - Engine and crankcase

Parts to be tightened	Thread	Tightening torque	Angle
Oil sump threaded plugs (2) (Fig. Engine - Assemble (NEF Engine) (10.001))	M22 x 1.5	45 - 55 N·m (33 - 41 lb ft)	
Rocker arm support retaining bolts (2) (Fig. Engine - Assemble (NEF Engine) (10.001))	M 8x 1.25	20 - 30 N·m (33 - 41 lb ft)	
Tappet cover retaining bolts (1) (Fig. Engine - Assemble (NEF Engine) (10.001))	M 8x 1.25	20 - 30 N·m (33 - 41 lb ft)	
Exhaust manifold retaining bolts (3) (Fig. Engine - Assemble (NEF Engine) (10.001))	M10x 1.50	52 - 58 N·m (38 - 43 lb ft)	
Intake manifold retaining bolts (2) (Fig. Engine - Assemble (NEF Engine) (10.001))	M 8x 1.25	20 - 30 N·m (15 - 22 lb ft)	
Oil cooler retaining bolts (4) (Fig. Engine - Assemble (NEF Engine) (10.001))	M 8x 1.25	20 - 30 N·m (15 - 22 lb ft)	
Coolant pump retaining bolts (2) (Engine - Assemble (NEF Engine) (10.001))	M 8x 1.25	20 - 30 N·m (15 - 22 lb ft)	
Coolant inlet manifold retaining bolts (2)(Engine - Assemble (NEF Engine) (10.001))	M10 x 25	35 - 55 N·m (26 - 41 lb ft)	
Thermostat valve assembly retaining bolts (3) Engine - Assemble (NEF Engine) (10.001)	M8 x 1.25	20 - 30 N·m (26 - 41 lb ft)	
Fan support retaining bolts (3) Engine - Assemble (NEF Engine) (10.001)	M8 x 1.25 x 50 M10 x 1.50 x 25	20 - 30 N·m (26 - 41 lb ft) 40 - 50 N·m (30 - 37 lb ft)	
Injector fastener (1) Engine - Assemble (NEF Engine) (10.001)	–	55 - 65 N·m (41 - 48 lb ft)	
Fuel pump retaining bolts (5) Engine - Assemble (NEF Engine) (10.001)	M8 x 1.25	20 - 30 N·m (15 - 22 lb ft)	
Nuts securing turbine mod. (2) Engine - Assemble (NEF Engine) (10.001)	M8 x 1.25	20 - 30 N·m (15 - 22 lb ft)	
Alternator retaining bolts (3) Engine - Assemble (NEF Engine) (10.001)	M10 x 1.50	40 - 50 N·m (30 - 37 lb ft)	
Starter motor retaining bolts (5) (Fig. Engine - Assemble (NEF Engine) (10.001))	M10 x 1.50	50 - 60 N·m (37 - 44 lb ft)	
Camshaft plate retaining bolts (3) (Fig. Engine - Assemble (NEF Engine) (10.001))	M8 x 1.25	20 - 30 N·m (15 - 22 lb ft)	
Injection pump retaining bolts (3) (Fig. Engine - Assemble (NEF Engine) (10.001))	M8 x 1.25	7 - 17 N·m (5 - 13 lb ft)	
Oil pump gear casing retaining bolts (2) (Fig. Engine - Assemble (NEF Engine) (10.001))	M8 x 1.25	20 - 30 N·m (15 - 22 lb ft)	

Parts to be tightened	Thread	Tightening torque	Angle
Additional counterweight retaining bolts (3) (Fig. Engine - Assemble (NEF Engine) (10.001))	M10 x 1.5	40 - 56 N·m (30 - 41 lb ft)	
Camshaft gear retaining bolts (1) (Fig. Engine - Assemble (NEF Engine) (10.001))	M8 x 1.25	32 - 40 N·m (24 - 30 lb ft)	
Main bearing cap bolts (1) Fig. Engine - Assemble (NEF Engine) (10.001)			
phase 1	M12 x 1.5	44 - 56 N·m (32 - 41 lb ft)	
phase 2	M12 x 1.5	74 - 86 N·m (55 - 63 lb ft)	
phase 3	M12 x 1.5		85 - 95 °C (185 - 203 °F)
Big end cap bolts (1) Fig. Engine - Assemble (NEF Engine) (10.001)			
phase 1	M10 x 1.25	25 - 35 N·m (18 - 26 lb ft)	
phase 2	M10 x 1.25	45 - 55 N·m (33 - 41 lb ft)	
phase 3	M10 x 1.25		55 - 65 °C (131 - 149 °F)
Cylinder head bolts (1) (Fig. Engine - Assemble (NEF Engine) (10.001))	M12 x 1.75 x 70	45 - 55 N·m (33 - 41 lb ft)	90 °C (194 °F)
Note: For the tightening sequence, See Engine - Assemble (NEF Engine) (10.001)	M12 x 1.75 x 140	35 - 45 N·m (26 - 33 lb ft)	180 °C (194 °F)
	M12 x 1.75 x 180	45 - 75 N·m (48 - 55 lb ft)	180 °C (194 °F)
Bolts fastening pulley on crankshaft (1) (Fig. Engine - Assemble (NEF Engine) (10.001))	M12 x 1.25	45 - 55 N·m (48 - 41 lb ft)	85 - 95 °C (185 - 203 °F)
Engine flywheel retaining bolts (1) (Fig. Engine - Assemble (NEF Engine) (10.001))	M12 x 1.25	25 - 35 N·m (18 - 26 lb ft)	55 - 65 °C (131 - 149 °F)

Engine - Special tools (NEF Engine)

TD5.

ATTENTION: The operations described in this section can only be carried out with *ESSENTIAL* tools indicated by an (X).

To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

List of specific tools required for the various operations described in this Section.

- X **380000216** Engine removal and installation tool
- 380000220** Clamp for fitting piston in cylinder liner **60 - 125 mm (2.3622 - 4.9213 in)**
- X **380000221** Pliers for piston ring disassembly and reassembly **65 - 110 mm (2.5591 - 4.3307 in)**
- 380000301** Rotating stand for overhaul operations (capacity **1000 daN (2248 lbf)**, torque **1200 N·m (885 lb ft)**)
- X **380000302** Tool for engine valve disassembly and reassembly
- 380000304** Pair of gauges for angular tightening with **12.7 mm (0.5 in)** and **19.1 mm (0.75 in)** square connection
- 380000362** Crankshaft lifting tool
- X **380000364** Dial gauge base for various measurements (use with **380000228**)

- 380000569** Movable tool for dismantling tractors with bracket **380000500** and adapter plate **380000844**
- X **380000661** Engine mounting brackets for rotating stand **380000301**
- X **380000663** Tool to extract crankshaft rear seal
- X **380000664** Splining tool for fitting rear seal on crankshaft
- X **380000665** Tool to extract crankshaft front seal
- X **380000666** Splining tool for fitting front seal on crankshaft
- X **380000667** Drift for camshaft bushing disassembly and reassembly (use with **380000668**)
- 380000668** Grip for interchangeable drifts
- X **380000669** Gasket extraction tool
- X **380000670** Tool for cartridge filter disassembly
- 380000671** Injector extraction tool
- 380000975** Box with full set of tools to regrind valve seats
- 380000976** Spring load test appliance
- 380001003** Complete square to check for connecting rod distortion
- 380001268** Belt tension gauge

Injection pump bench test

- 380000228** Dial gauge **0 - 5 mm (0 - 0.197 in)**
- X **380000914** Dial-gauge holder tool for rotary injection pump timing (use with **380000228**)
- X **380000732** Tool for engine flywheel rotation (use with **380000988**)
- X **380000988** Plate for engine flywheel rotation tool with flywheel timing pin (use with **380000732**)

Engine - Special tools (F5 Engine)

TD5.

ATTENTION: The operations described in this section can only be carried out with **ESSENTIAL** tools indicated by an (X).

To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.

List of specific tools required for the various operations described in this Section.

- 380000569** Movable tool for dismantling tractors with bracket **380000500** and adapter plate **380000844**.

Engine - General specification (8000 Engine)

TD5.

Table 1

General specification	3 Cylinders
Engine type:	
Model TD5.65 T.C.A. (turbo charged after cooled) - type (BOSCH pump)	8035.25C.313T
Model TD5.75 T.C.A. (turbo charged after cooled) - type (BOSCH pump)	8035.25D.313T
Cycle	Diesel, 4-stroke
Fuel injection	Direct
Number of cylinders in line	3
Cylinder liners	
Piston diameter:	
Model TD5.65	104 mm (4.0945 in)
Model TD5.75	104 mm (4.0945 in)
Piston stroke	115 mm (4.5276 in)
Total displacement:	
Model TD5.65 - TD5.75	2931 cm³ (178.86 in³)
Compression ratio	18 to 1 turbocharged with intercooler

General specification	3 Cylinders
Maximum power ECE R 120 at 2300 RPM Model TD5.65 Model TD5.75 Fast idling speed Maximum torque (Nm) at 1400 RPM : TD5.65 model Maximum torque (Nm) at 1400 RPM : TD5.75 model Number of main bearings Sump	<p style="text-align: center;">48 kW (65 Hp) 53 kW (72 Hp) 2525 RPM 261 N·m (192.5 lb ft) 295 N·m (217.6 lb ft) 4 Structural, cast iron</p>
Lubrication Pump drive Engine speed/oil pump speed ratio Oil cleaning Normal oil pressure, with engine hot (at 75 - 85 °C (167 - 185 °F)) and at fast idling speed: Pressure relief valve Valve opening pressure For further lubrication data	<p style="text-align: center;">Forced, with gear pump Camshaft 2:1 Mesh filter on oil intake and cartridge filter on delivery line For max rpm (2475 - 2575 RPM) : 2.4 - 3.8 bar (34.8 - 55.1 psi) For idling rpm (600 - 700 RPM) : 1.5 - 2.7 bar (21.8 - 39.2 psi) Built into pump housing 3.5 bar (50.75 psi) See 13</p>
Cooling system Radiator on TD5.65, TD5.75 models Fan, attached to coolant pump pulley Coolant pump Engine speed/coolant pump speed ratio Temperature control Coolant temperature gauge Temperature ranges corresponding to each section: Initial white section Middle green section Final red section For further cooling system data	<p style="text-align: center;">Coolant circulation two-row 112 tube and 57 aluminum fins ten-blade fixed plastic fan Centrifugal vane-type 1:1,45 Thermostat Coloured scale divided into three sections 30 - 65 °C (86 - 149 °F) 65 - 105 °C (149 - 221 °F) 105 - 115 °C (221 - 239 °F) See 13</p>
Timing Intake: Start: before T.D.C. End: after B.D.C. Exhaust: Start: before B.D.C. End: after B.D.C. Valve clearance for timing check Valve clearance for normal running (engine cold): Intake Exhaust For further timing data	<p style="text-align: center;">Overhead valves operated by a camshaft located in the engine block through tappets, push rods and rockers. Camshaft is driven by the crankshaft through helical gears.</p> <p style="text-align: center;">12° 31° 50° 16° 0.30 mm (0.0118 in) 0.25 - 0.35 mm (0.0098 - 0.0138 in) 0.25 - 0.35 mm (0.0098 - 0.0138 in) See page 10</p>
Fuel system Air cleaning Fuel pump Fuel filtering Minimum fuel flow rate with pump shaft rotating at 1600 RPM	<p style="text-align: center;">Dual cartridge dry air filter, with clogged filter indicator with centrifugal pre-filter and automatic dust ejector. With double diaphragm Mesh filter in fuel supply pump, and replaceable cartridge on delivery line to injection pump. 100 l/hour (26 US gal/hour)</p>

General specification	3 Cylinders
Operated by eccentric cam BOSCH injection pump All-speed governor, incorporated in pump: BOSCH Automatic advance regulator, incorporated in pump: BOSCH	On camshaft Rotating distributor type Centrifugal counterweights Hydraulic

Table 2

Data

Turbocharger (Model TD95D): GARRETT type	T25
Fuel injection pump BOSCH pump: TD5.65 model TD5.75 model Direction of rotation Injection order	Distributor type with incorporated speed governor and automatic advance regulator VE 3/12 F 1150 L 1136 - 84300596 VE 3/12 F 1150 L 1137 - 84300597 Anticlockwise 1-2-3 (TD5.65 and TD5.75)

Table 3

Fuel injectors: BOSCH Nozzle holder type Nozzle type Number of nozzle holes Diameter of nozzle orifices Pressure setting	6 260 - 268 bar (3770 - 3886 psi)
	FARMALL 65A FARMALL 75A
Fuel delivery lines - BOSCH pump Type Dimensions	- -

Table 4

Fuel supply pump data	
Eccentricity of drive shaft	3 mm (0.1181 in)
Diameter of drive shaft at bushings	31.975 - 32 mm (1.2589 - 1.2598 in)
Internal diameter of installed and reamed bushings	32.05 - 32.075 mm (1.2618 - 1.2628 in)
Interference between bushings and seats	0.063 - 0.14 mm (0.0025 - 0.0055 in)
Assembly clearance between shaft and bushings	0.05 - 0.1 mm (0.0020 - 0.0039 in)
Thickness of internal washer	1.45 - 1.5 mm (0.0571 - 0.0591 in)
Thickness of external washer	2.93 - 3 mm (0.1154 - 0.1181 in)

Table 5

Crankcase/cylinder block data	
Cylinder block	Cast-iron monobloc, incorporating seatings for crankshaft bearings, camshaft and push rod/tappet assemblies
Internal diameter of cylinder liners	104 - 104.024 mm (4.0945 - 4.09543 in) ⁽¹⁾
External diameter of cylinder liners	107.02 - 107.05 mm (4.2134 - 4.2146 in)
Diameter of cylinder bores	106.85 - 106.9 mm (4.2067 - 4.2087 in)
Interference fit between cylinder liners and bores	0.12 - 0.2 mm (0.0047 - 0.0079 in)
Liner internal diameter oversizes	0.4 - 0.8 mm (0.0157 - 0.0315 in)
Liner external diameter oversizes	0.2 mm (0.0079 in)
Maximum permissible liner ovality or taper due to wear ⁽²⁾	0.12 mm (0.0047 in)
Diameter of main shell bearing seats	84.2 - 84.23 mm (3.3150 - 3.3161 in)

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