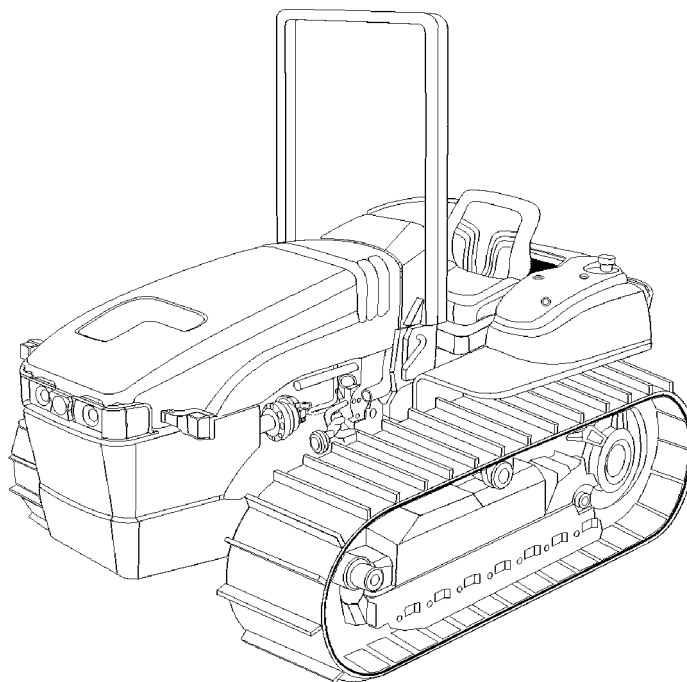




NEW HOLLAND



TK65 - TK75 - TK76 - TK85 - TK95 TRACTORS SERVICE MANUAL

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S E R V I C E

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GENERAL INSTRUCTIONS

IMPORTANT NOTICE

All maintenance and repair work described in this manual must be performed exclusively by NEW HOLLAND service technicians, in strict accordance with the instructions given and using any specific tools necessary. Anyone performing the operations described herein without strictly following the instructions is personally responsible for any eventual injury or damage to property.

BATTERY

Before carrying out any kind of service operations, disconnect and isolate the battery negative lead, unless otherwise requested for specific operations (e.g.: operations that require the engine running). Once the specific operation has been completed, disconnect the lead in order to complete the operation.

SHIMMING

For each adjustment operation, select adjusting shims and measure individually using a micrometer, then add up the recorder values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value indicated for each on shim.

ROTATING SHAFT SEALS

For correct rotating shaft seal installation, proceed as follows:

- before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes;
- thoroughly clean the shaft and check that the working surface on the shaft is not damaged;
- position the sealing lip facing the fluid; with hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will deviate the fluid towards the inner side of the seal;
- coat the sealing lip with a thin layer of lubricant (use oil rather than grease) and fill the gap between the sealing lip and the dust lip on double lip seals with grease;
- insert the seal in its seat and press down using a flat punch; do not tap the seal with a hammer or mallet;
- whilst inserting the seal, check that it is perpendicular to the seat; once settled, make sure that it makes contact with the thrust element, if required;
- to prevent damaging the seal lip on the shaft, position a protective guard during installation operations.

O-RING "SEALS"

Lubricate the O-RING seals before inserting them in the seats, this will prevent them from overturning and twisting, which would jeopardise sealing efficiency.

SEALING COMPOUNDS

Apply one of the following sealing compounds on the mating surfaces marked with an X: RTV SILMATE, RHO-DORSIL CAF 1 or LOCTITE 510 or SILASTIC AP black.

Before applying the sealing compound, prepare the surfaces as follows:

- remove any incrustations using a wire brush;
- thoroughly de-grease the surfaces using one of the following cleaning agents: trichlorethylene, petrol or a water and soda solution.

BEARINGS

When installing bearings it is advised to:

- heat the bearings to 80 to 90 °C (176 to 194 °F) before fitting on the shafts;
- allow the bearings to cool before installing them from the outside.

SPRING PINS

When fitting split socket elastic pins, ensure that the pin notch is positioned in the direction of the force required to stress the pin.

Spiral spring pins do not require special positioning.

FRONT SEALS

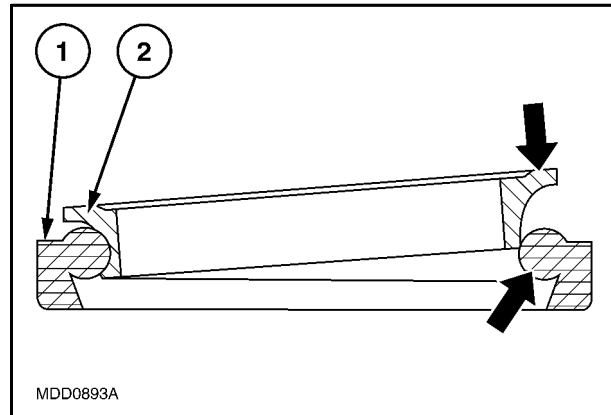
Carefully check the metal rings, making sure that the sealing surfaces show no signs of scoring, dents or wear caused by ring pair misalignment or surface flatness errors.

Even if only one of the rings is faulty, change the entire seal.

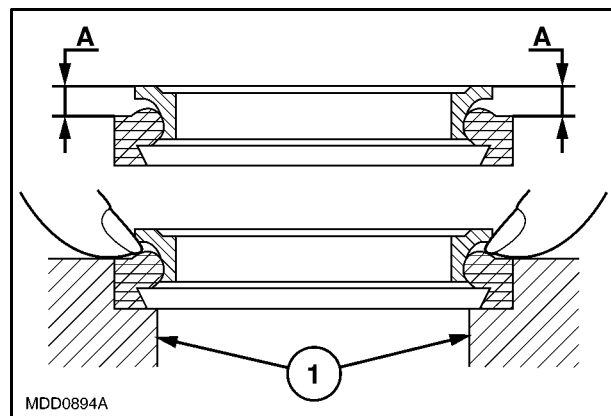
Never pair a used ring with a new one or use different pairs of rings.

To fit the seals, proceed as follows.

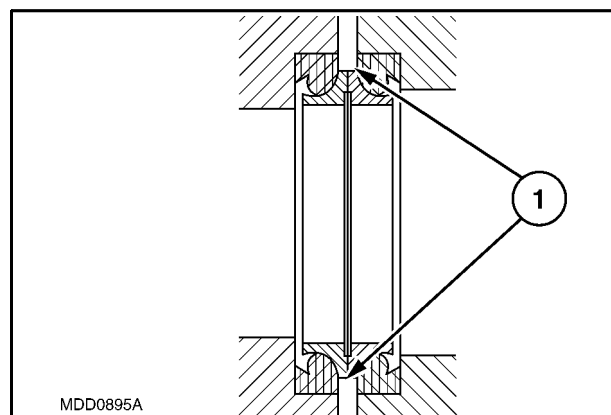
1. Eliminate any sharp edges or burr and carefully clean the seats for the rubber rings.
2. Thoroughly clean the rings on the seals.
3. Insert each metal ring (2) on the respective rubber ring (1), as shown in the drawing, acting on the points indicated by the arrows.
4. Make sure that the metal ring is fitted correctly, checking that measurement (A) is constant on all of the circumference.
5. Assemble each pair of rings in their respective seats (1), manually positioning the rubber ring (as shown in figure
6. Before terminating assembly operations, clean the sealing surfaces (1) with a clean (not frayed) cloth and pour a thin covering of fluid oil over the surfaces.



1



2



3

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Hello dear friend!

Thank you very much for reading.

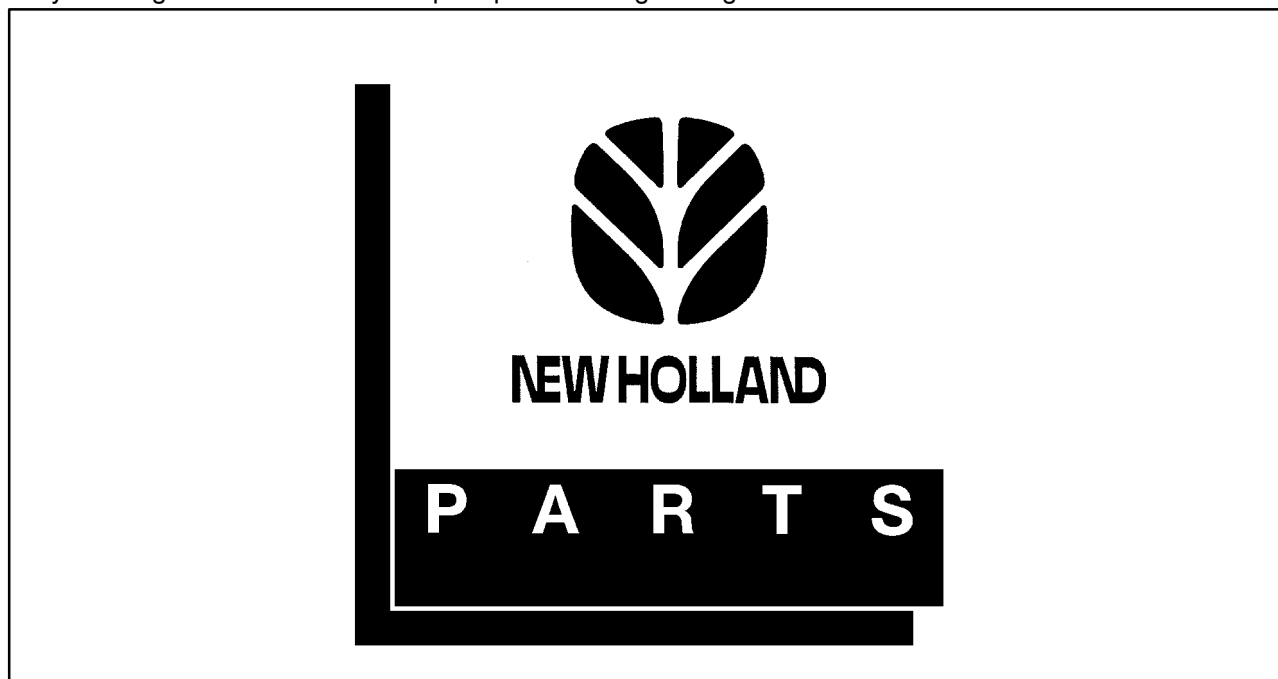
Enter the link into your browser.

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SPARE PARTS

Only use original NEW HOLLAND spare parts bearing the logo shown below.



4

Only original spare parts guarantee the same quality, duration and safety as they are the same parts that are assembled during production.

Only **original NEW HOLLAND parts** can offer this guarantee.

When ordering spare parts, always provide the following information:

- vehicle model (commercial name) and frame number;
- engine type and number;
- part number of the ordered part, which can be found in the "Microfiches" or the "Spare Parts Catalogue", used for order processing.

TOOLS

The tools that NEW HOLLAND propose and illustrate in this manual are:

- specifically researched and designed for use with NEW HOLLAND vehicles;
- essential for reliable repair operations;
- accurately built and rigorously tested so as to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- operating in optimal technical conditions;
- obtaining the best results;
- saving time and effort;
- working in safe conditions.

CAUTION

Wear limit values indicated for certain parts are recommended, but not binding. The terms "front", "rear", "right-hand" and "left-hand" (when referred to different parts) are intended as seen from the driving position with the vehicle in the normal direction of movement.

MOVING THE TRACTOR WITH THE BATTERY REMOVED

External power supply cables should only be connected to the respective positive and negative cable terminals, using efficient clamps that guarantee adequate and secure contact.

Disconnect all services (lights, windshield wipers, etc.) before starting the vehicle.

If the vehicle electrical system requires checking, carry out operations with the power supply connected; once checking is completed, disconnect all services and switch off the power supply before disconnecting the cables.

SAFETY REGULATIONS

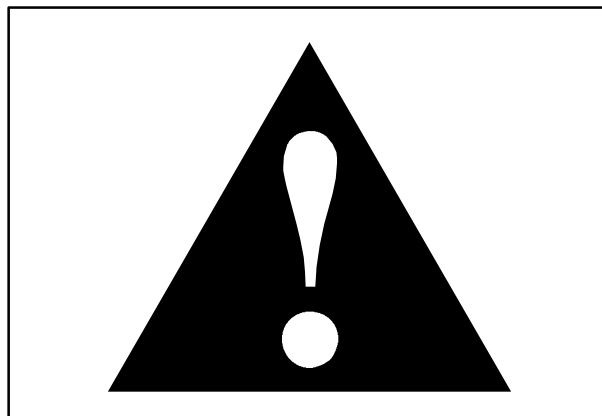
WARNING AND DANGER SYMBOL

This warning symbol points out important messages concerning your safety.

Carefully read the following safety regulations and observe advised precautions in order to avoid potential hazards and safeguard your health and safety. In this manual the symbol is accompanied by the following key-words:

CAUTION - Warnings concerning unsuitable repair operations that may jeopardise the safety of Service personnel.

DANGER Specific warnings concerning potential hazards for operator safety or for other persons directly or indirectly involved.



5

ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of non-observance of simple and fundamental safety regulations. For this reason, IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED by foreseeing possible causes and consequently acting with the necessary caution and care.

Accidents may occur with all types of vehicles, regardless of how well it was designed and built.

A careful and judicious service technician is the best guarantee against accidents.

Precise observance of the most basic safety rule is normally sufficient to avoid many serious accidents.

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

SAFETY REGULATIONS

GENERAL GUIDELINES

- Carefully follow specified repair and maintenance procedures.
- Do not wear rings, wristwatches, jewellery, unbuttoned or loose articles of clothing such as: ties, torn clothing, scarves, open jackets or shirts with open zips that may remain entangled in moving parts. It is advised to wear approved safety clothing, e.g.: non-slip footwear, gloves, safety goggles, helmets, etc.
- Do not carry out repair operations with someone sitting in the driver's seat, unless the person is a trained technician who is assisting with the operation in question.
- Do not operate the vehicle or use any of the implements from different positions, other than the driver's seat.
- Do not carry out operations on the vehicle with the engine running, unless specifically indicated.
- Stop the engine and check that the hydraulic circuits are pressure-free before removing caps, covers, valves, etc.
- All repair and maintenance operations must be carried out using extreme care and attention.
- Service steps and platforms used in the workshop or elsewhere should be built according to standard accident prevention regulations.
- Disconnect the batteries and label all controls to indicate that the vehicle is being serviced. Any parts that are to be raised must be locked in position.
- Do not check or fill fuel tanks, accumulator batteries, nor use starting liquid when smoking or near naked flames, as these fluids are inflammable.
- Brakes are inoperative when manually released for repair or maintenance purposes. Use blocks or similar devices to control the machine in these conditions.
- The fuel nozzle should always be in contact with the filling aperture. Maintain this position until filling operations are completed in order to avoid possible sparks caused by the accumulation of static electricity.

- Only use specified towing points for towing the tractor. Connect parts carefully. Make sure that all pins and/or locks are secured in position before applying traction. Never remain near the towing bars, cables or chains that are operating under load.
- Transport vehicles that cannot be driven using a trailer or a low-loading platform trolley, if available.
- When loading or unloading the vehicle from the trailer (or other means of transport), select a flat area capable of sustaining the trailer or truck wheels. Firmly secure the tractor to the truck or trailer and lock the wheels in the position used by the carrier.
- Electric heaters, battery-chargers and similar equipment must only be powered by auxiliary power supplies with efficient ground insulation to avoid electrical shock hazards.
- Always use suitable hoisting or lifting devices when raising or moving heavy parts.
- Take extra care if bystanders are present.
- Never pour gasoline or diesel oil into open, wide or low containers.
- Never use gasoline, diesel oil or other inflammable liquids as cleaning agents. Use non-inflammable, non toxic commercially available solvents.
- Wear safety goggles with side guards when cleaning parts with compressed air.
- Limit the air pressure to a maximum of 2.1 bar (30.46 psi), according to local regulations.
- Do not run the engine in confined spaces without suitable ventilation.
- Do not smoke, use naked flames, or cause sparks in the area when fuel filling or handling highly inflammable liquids.
- Never use naked flames for lighting when working on the machine or checking for leaks.
- All movements must be carried out carefully when working under, on or near the vehicle. Wear protective equipment: helmets, goggles and special footwear.
- When carrying out checks with the engine running, request the assistance of an operator in the driver's seat. The operator must maintain visual contact with the service technician at all times.
- If operating outside the workshop, position the vehicle on a flat surface and lock in position. If working on a slope, lock the vehicle in position. Move to a flat area as soon as is safely possible.
- Damaged or bent chains or cables are unreliable. Do not use them for lifting or towing. Always use suitable protective gloves when handling chains or cables.
- Chains should always be safely secured. Make sure that the hitch-up point is capable of sustaining the load in question. Keep the area near the hitch-up point, chains or cables free of all bystanders.
- Maintenance and repair operations must be carried out in a CLEAN and DRY area. Eliminate any water or oil spillage immediately.
- Do not create piles of oil or grease-soaked rags as they represent a serious fire hazard. Always store rags in a closed metal container. Before starting the vehicle or implements, make sure that the driver's seat is locked in position. Also check that there are no persons within the tractor or implement range of action.
- Empty pockets of all objects that may fall unobserved into the vehicle parts.
- In the presence of protruding metal parts, use protective goggles or goggles with side guards, helmets, special footwear and gloves.
- When welding, use protective safety devices: tinted safety goggles, helmets, special overalls, gloves and footwear. All persons present in the area where welding is taking place must wear tinted goggles. NEVER LOOK DIRECTLY AT THE WELDING ARC WITHOUT SUITABLE EYE PROTECTION.
- Metal cables tend to fray with repeated use. Always use suitable protective devices (gloves, goggles, etc.) when handling cables.
- Handle all parts carefully. Do not put your hands or fingers between moving parts. Wear suitable safety clothing - safety goggles, gloves and shoes.

START UP

- Never run the engine in confined spaces that are not equipped with adequate ventilation for exhaust gas extraction.
- Never place the head, body, limbs, feet, hands or fingers near fans or rotating belts.

ENGINE

- Always loosen the radiator cap slowly before removing it to allow any remaining pressure in the system to be discharged. Filling up with coolant should only be carried out with the engine stopped or idling (if hot).
- Never fill up with fuel when the engine is running, especially if hot, in order to prevent the outbreak of fire as a result of fuel spillage.
- Never check or adjust fan belt tension when the engine is running.
Never adjust the fuel injection pump when the vehicle is moving.
- Never lubricate the vehicle when the engine is running.

ELECTRICAL SYSTEMS

- If it is necessary to use auxiliary batteries, remember that both ends of the cables must be connected as follows: (+) with (+) and (-) with (-). Avoid short-circuiting the terminals. **GAS RELEASED FROM BATTERIES IS HIGHLY INFLAMMABLE.** During charging, leave the battery compartment uncovered to improve ventilation. Never check the battery charge using "jumpers" (metal objects placed on the terminals). Avoid sparks or flames near the battery zone. Do not smoke to prevent explosion hazards.
- Before servicing operations, check for fuel or current leaks. Eliminate any eventual leaks before proceeding with work.
- Never charge batteries in confined spaces. Make sure that there is adequate ventilation in order to prevent accidental explosion hazards as a result of the accumulation of gases released during charging operations.
- Always disconnect the batteries before performing any kind of servicing on the electrical system.

HYDRAULIC SYSTEMS

- A liquid leaking from a tiny hole may be almost invisible but, at the same time, be powerful

enough to penetrate the skin; Therefore, **NEVER USE HANDS TO CHECK FOR LEAKS.** Use a piece of cardboard or wood for this purpose. If any liquid penetrates skin tissue, call for medical aid immediately. Failure to treat this condition with correct medical procedure may result in serious infection or dermatosis.

- In order to check the pressure in the system use suitable instruments.

WHEELS AND TYRES

- Make sure that the tyres are correctly inflated at the pressure specified by the manufacturer. Periodically check the rims and tyres for damage.
- Stand away from (at the side of) the tyre when checking inflation pressure.
- Only check pressure when the tractor is unloaded and the tyres are cold, to avoid incorrect readings as a result of over-pressure. Do not use parts of recovered wheels as incorrect welding brazing or heating may weaken and eventually cause damage to the wheel.
- Never cut or weld a rim mounted with an inflated tyre.
- To remove the wheels, lock both the front and rear vehicle wheels. After having raised the vehicle, position supports underneath, according to regulations in force.
- Deflate the tyre before removing any objects that may be jammed in the tyre tread.
- Never inflate tyres using inflammable gases; as this may result in explosions and injury to bystanders.

REMOVAL AND RE-FITTING

- Lift and handle all heavy parts using suitable hoisting equipment. Make sure that parts are sustained by appropriate hooks and slings. Use the hoisting eyebolts for lifting operations. Extra care should be taken if persons are present near the load to be lifted.
- Handle all parts carefully. Do not put your hands or fingers between parts. Wear suitable safety clothing - safety goggles, gloves and shoes.
- Avoid twisting chains or metal cables. Always wear safety gloves when handling cables or chains.

CONSUMABLES

COMPONENT TO BE FILLED OR TOPPED UP	QUANTITY dm ³ (gallons)	RECOMMENDED NEW HOLLAND PRODUCTS	NEW HOLLAND SPECIFICATIONS	INTERNATIONAL SPECIFICATIONS
Cooling system: - models TK65, TK75 - models TK76, TK85, TK95	10.5 (2.31) 13.0 (2.86)	Water & liquid AMBRA AGRIFLU 50% + 50%	NH 900 A	-
Fuel tank: - models TK65, TK75 - models TK76, TK85, TK95	80 (17.6) 129 (28.38)	Decanted and fil- tered diesel fuel	-	-
Engine sump: without filter: - models TK65, TK75 - models TK76, TK85, TK95 with filter: - models TK65, TK75 - models TK76, TK85, TK95	6.7 (1.47) 10.5 (2.31) 7.3 (1.61) 11.2 (2.46)	AMBRA SUPER GOLD 15W - 40 oil or 10W - 30	NH 330G (SAE 15W-40) NH 24G (SAE 10W-30)	API CF-4/SG CCMC D4 MIL-L-2104E
Steering clutches	1.4 (0.31)	AMBRA SUPER oil 10W	NH 301 C	API CE CCMC D4 MIL-L-2104C SAE 10W
Transmission: (gears, bevel drive, brakes and hydraulic lift) - models TK65, TK75 - models TK76, TK85, TK95 Track tension wheel, carriage rollers, track support rollers	33.3 (7.32) 39.0 (7.92) -	AMBRA MULTI F oil	NH 420 A	API GL4 ISO 46/68 SAE 20W-30
Final drives (each)	2.0 (0.44)	AMBRA HYPOLIDE 90 oil	NH 520 A	API GL5 MIL-L-2105D SAE 80W-90
Grease fittings	-	AMBRA GR9 grease	NH 710 A	NLGI 2

SECTION 10 - ENGINE

Chapter 1 - Engine

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GENERAL SPECIFICATIONS	3 cylinders	4 cylinders
Engine, technical type:		
- model TK 65 - type 8035.05.421 (BOSCH pump)	See data on page 6-7	-
- model TK 75 - type 8035.25.421 (BOSCH pump)	See data on page 8-9	-
- model TK 76 - type 8045.06.421/521 (BOSCH pump) .	-	See data on page 10-11
- model TK 85 - type 8045.05.421/521 (BOSCH pump) .	-	See data on page 12-13
- model TK 95 - type 8045.25L.421 (BOSCH pump)	-	See data on page 14-15
Cycle	diesel, 4-stroke	
Injection	direct	
Number of on-line cylinders	3	4
Cylinder liners	dry force-fitted in cylinder block	
Piston diameter		
- models TK 65, TK 75	104 mm (4.0945 in.)	-
- model TK 76	-	100 mm (3.937 in.)
- models TK 85, TK 95	-	104 mm (4.0945 in.)
Piston stroke	115 mm (4.37 in.)	
Total displacement:		
- model TK 65	2931 cm ³ (0.6447 gal.)	-
- model TK 75	2931 cm ³ (0.6447 gal.)	-
- model TK 76	-	3613 cm ³ (0.7947 gal.)
- model TK 85	-	3908 cm ³ (0.8596 gal.)
- model TK 95	-	3908 cm ³ (0.8596 gal.)
Compression ratio for models TK 65, TK 76 and TK 85	17 to 1 normally aspirated	
Compression ratio for models TK 75 and TK 95	16.5 to 1 turbocharged	
Maximum power:		
- model TK 65	44.5 kW (60 Hp)	-
- model TK 75	54 kW (72 Hp)	-
- model TK 76	-	53 kW (71 Hp)
- model TK 85	-	58.8 kW (80 Hp)
- model TK 95	-	66.5 kW (90 Hp)
Maximum power speed - models TK 65, TK 75	2300 rpm	
Maximum power speed - TK 76, TK 85, TK 95	2500 rpm	
Maximum torque speed - model TK 65	1400 rpm	-
Maximum torque speed - model TK 75	1400 rpm	-
Maximum torque speed - model TK 76	-	1500 rpm
Maximum torque speed - model TK 85	-	1500 rpm
Maximum torque speed - model TK 95	-	1500 rpm
Number of main bearings	4	5
Sump pan	structural, cast iron	

(continued)

(continued)

GENERAL SPECIFICATIONS	3 cylinders	4 cylinders
Lubrication system	forced, with gear pump	
Pump drive	camshaft	
Engine speed/oil pump speed ratio	2:1	
Oil cleaning	mesh filter on oil intake and filtering cartridge on delivery line	
Normal oil pressure with motor warmed-up and running at maximum speed:		
For models TK 65, TK 76, TK 85	2.9 to 3.9 bar (42.1 to 56.6 psi)	
For models TK 75, TK 95 (starting pressure)	6 bar (87 psi)	
Pressure relief valve	incorporated in oil pump housing	
Valve initial opening pressure	3.5 bar (50.8 psi)	
For further lubrication technical data	See page 23	
Cooling system	coolant circulation	
Radiator on models TK 65, TK 75	3 lines of vertical pipes with copper fins	
Radiator on models TK 76, TK 85, TK 95	4 lines of vertical copper pipes	
Fan, attached to coolant pump pulley	intake, 4-blade in sheet-metal	
Coolant pump	centrifugal vane-type	
Engine speed/coolant pump speed ratio	1:1.403	
Temperature control	thermostat	
Coolant thermometer	coloured scale divided into 3 sections	
Temperature ranges corresponding to each section:		
- initial white section	30 to 65 °C (86 to 149 °F)	
- middle green section (normal working conditions)	65 to 105 °C (149 to 221 °F)	
- final red section	105 to 115 °C (221 to 239 °F)	
For further cooling system technical data	See page 23	
Rev counter	incorporated in control panel	
Operating system	from gear on camshaft	
Hour counter calibrated for engine speed of	1800 rpm	

(continued)

(continued)

GENERAL SPECIFICATIONS	3 cylinders	4 cylinders
Timing system Inlet: - start: before TDC. - end: after BDC. Exhaust: - start: before BDC. - end: after TDC. valve-rocker arm clearance for timing check valve-rocker arm clearance (with engine cold): - intake - exhaust For further timing system technical data	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 helical gears 12° 31° 50° 16° 0.45 mm (0.248 in.) 0.30 ± 0.05 mm (0.1654 ± 0.0276 in.) 0.30 ± 0.05 mm (0.1654 ± 0.0276 in.) See page 20	
Fuel system Air cleaning Fuel pump Fuel filtering Minimum fuel flow rate with pump shaft rotating at 1600 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 double diaphragm through wire filter in fuel supply pump, and replaceable cartridge on delivery line to injection pump 100 litres/hour (22 gal./hour) engine timing rotating distributor type centrifugal counterweights hydraulic refer to the data for the relevant engine type in the table on page 2	

FUEL SYSTEM DATA

Turbocharger (models TK 75, TK 95):	
- GARRETT type	TA 3118-0.82 A/R-57
Injection pump	rotating distributor with speed governor and advance variator incorporated
BOSCH pump:	
- model TK 65	VE 3/11 F 1150 L 766 - 99441586
- model TK 75	VE 3/11 F 1150 L 764 - 99441587
- model TK 76	VE 4/11 F 1250 L 794 - 99472104
- model TK 76	VE 4/11 F 1250 L 810 - 500324959
- model TK 85	VE 4/11 F 1250 L 773 - 99472102
- model TK 85	VE 4/11 F 1250 L 787 - 500324962
- model TK 95	VE 4/11 F 1250 L 850 - 500358111
Direction of rotation	counter-clockwise
Injection order	1-2-3 (TK 65, TK 75) 1-3-4-2 (TK 76, TK 85, TK 95)

	TK 65	TK 75	TK 85	TK 95	TK 76
Injectors:					
BOSCH type		500307714			500317389
- Nozzle holder type		4791124 (KBEL83S35)			
- Nozzle type		99469341 (DLLA132S1320)			500317390 (DLLA132S1335)
Number of nozzle holes		5			5
Nozzle hole diameter mm (in.)		0.23 (0.0091)			0.21 (0.0083)
Calibration pressure bar (psi)		260 to 272 (3771 to 3945)			260 to 272 (3771 to 3945)
Delivery lines for BOSCH pump					
- type	99441952	-		99449006	-
- Line dimension mm (in.)	6x1.75x540 (0.2362x0.0689x21.260)	6x1.75x530 (0.2362x0.0689x20.866)	6x1.75x530 (0.2362x0.0689x20.866)		-

**MODEL TK 65 - CALIBRATION DATA FOR BOSCH INJECTION PUMP
TYPE VE 3/11 F 1150 L 766 - 99441586**

ASSEMBLY DATA

Pump timing on engine: delivery start $9^{\circ} \pm 0.5^{\circ}$ before TDC of cylinder 1 compression stroke.
Plunger pre-lift for timing on engine: 1 mm (0.0394 in.) from BDC (with tools **291754** - **291755**).
Cylinder No.1 delivery line union on pump: marked with letter A.

ASSEMBLY DIMENSIONS

SYMBOL	VHA	MS	ya	yb
mm (in.)	30.1 (1.185)	-	36.5 to 38.5 (1.437 to 1.5157)	40.4 to 45.6 (1.5905 to 1.7953)

CALIBRATION TEST CONDITIONS

Test bench conforming to ISO 4008/1 .../2
Injectors conforming to ISO 7440-A61 - (1.688.901.020 with calibrated pad $\varnothing$ 0.6 mm - 0.0236 in.).
Injector pressure setting 172 to 175 bar (2495 to 2538 psi).
Fuel supply pressure:
..... 0.35 + 0.05 bar (5.1 + 0.7 psi).
Pipes (conforming to ISO 4093.2):
..... 6 x 2 x 840 mm (0.2362 x 0.0787 x 33.071 in.).
Graduate drain time : 30".
Test liquid: ISO 4113 at a temperature of $45^{\circ} \pm 1^{\circ}\text{C}$ ($113^{\circ} \pm 33.8^{\circ}\text{F}$) at outlet.

1. START OF DELIVERY

Plunger pre-lift from TDC: mm -	Pump rotation (viewed from drive side): counter-clockwise	Injection order:1-2-3
------------------------------------	--	-----------------------

2. ADVANCE REGULATOR STROKE

rpm: 1220	Advance stroke: 0.7 to 1.1 mm (0.0276 to 0.0433 in.)
-----------	--

3. FUEL SUPPLY PUMP PRESSURE

rpm: 1220	Internal pressure: 7.9 to 8.5 bar (114.5 to 123.3 psi)
-----------	--

4. FULL LOAD DELIVERY

rpm: 700	Delivery per 1000 shots: 66.7 to 67.7 cm ³ (0.0147 to 0.0149 gal.)	Spread: $\leq$ 3.5 cm ³ (0.0008 gal.)
----------	---	--

5. SPREAD GOVERNOR AT IDLE SPEED

rpm: 325	Delivery per 1000 shots: 16.3 to 17.3 cm ³ (0.0036 to 0.0038 gal.)	Spread: $\leq$ 5.5 cm ³ (0.0012 gal.)
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6. SPREAD GOVERNOR AT MAXIMUM SPEED

rpm: 1200	Delivery per 1000 shots: 48.5 to 49.5 cm ³ (0.0107 to 0.0109 gal.)	Spread: cm ³ -
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7. DELIVERY AT STARTING SPEED

rpm: 100	Delivery per 1000 shots: 60 to 100 cm ³ (0.0132 to 0.022 gal.)
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8. TRANSFER PRESSURE PROGRESSION

rpm	1220	400	
Internal pressure	bar (psi)	7.9 to 8.5 (114.6 to 123.3)	3.4 to 4.4 (49.3 to 63.8)

9. INJECTION ADVANCE PROGRESSION

rpm		1220	1260
Advance stroke	mm (in.)	0.7 to 1.1 (0.276 to 0.0433)	1.3 to 1.9 (0.0512 to 0.0748)

10. BACKFLOW

rpm	400	1150
Backflow cm ³ (gal.)/10 sec	16 to 28 (0.0035 to 0.0062)	20 to 36 (0.0044 to 0.0079)

(continued)

Note: the values shown above in brackets must be used for checking purposes only.

(continued)

11. DELIVERY PROGRESSION

rpm	Delivery per 1000 shots: cm ³ (gal.)
1270	0 to 3 (0 to 0.0007)
1200	48.5 to 49.5 (0.0107 to 0.0109)
700	66.7 to 67.7 (0.0147 to 0.0149)
1150	64.4 to 68.4 (0.0142 to 0.0150)

12. DELIVERY CHECK AT IDLE SPEED

rpm	325	275
Delivery per 1000 shots: cm ³ (gal.)	16.3 to 17.3 (0.0036 to 0.0038)	46 to 47 (0.0101 to 0.0103)

13. ZERO CAPACITY (STOP)

rpm	Voltage (volts)	Delivery per 1000 shots: cm ³ (gal.)
325	0	0 to 3 (0 to 0.0070)

14. AUTOMATIC START SUPPLEMENT

rpm	Delivery per 1000 shots: cm ³ (gal.)
100	60 to 100 (0.0132 to 0.022)
270	59 to 69 (0.0130 to 0.0152)

Note: the values shown above in brackets must be used for checking purposes only.

BENCH TEST PERFORMANCE DATA

Test conditions					
Fixed advance before TDC cylinder No.1 in compression stroke: (see previous page)			Relative humidity 70% _o ± 5.		
Engine without fan, air filter and exhaust silencer.			Ambient temperature 20 ± 3 °C (68 ± 37.4 °F).		
Atmospheric pressure 740 ± 5 mm (29.1339 ± 0.1968 in.) mercury.			Specific gravity of diesel fuel 840 g/l at a temperature of 15 °C (59 °F).		
Throttle lever position	Braking load applied	Engine speed rpm	Power output with engine run-in for a total of:		Fuel consumption kg (lbs.)/h
			Production speed kW (Hp)	50 hours (total) kW (Hp)	
Maximum	For maximum power output	2300	≥ 42 (57.1)	43 to 45.6 (58.5 to 62)	9.9 to 10.5 (21.83 to 23.15)
Maximum	For maximum torque	1400	≥ 29.4 (40)	30 to 31.8 (40.8 to 43.2)	6.4 to 6.8 (14.11 to 23.15)
Maximum	None (no-load)	2450 to 2500	-	-	-
Minimum	None (no-load)	625 to 675	-	-	-

MODELS TK 75 - CALIBRATION DATA FOR BOSCH INJECTION PUMP TYPE VE 3/11 F 1150 L 764 - 99441587

ASSEMBLY DATA

Pump timing on engine: delivery start $6^{\circ} \pm 0.5^{\circ}$ before TDC of cylinder 1 compression stroke.
Plunger pre-lift for timing on engine: 1 mm (0.0394 in.) from BDC (with tools **291754** - **291755**).
Cylinder No.1 delivery line union on pump: marked with letter A.

ASSEMBLY DIMENSIONS

SYMBOL	K	MS	ya	yb
mm (in.)	-	-	38.6 to 40.6 (1.5197 to 1.5984)	40.4 to 45.6 (1.5905 to 1.7953)

CALIBRATION TEST CONDITIONS

Test bench conforming to ISO 4008/1 .../2
Injectors conforming to ISO 7440-A61 - (1.688.901.027 with calibrated pad $\varnothing$ 0.5 mm - 0.0197 in.).

Injector pressure setting 250 to 253 bar (3626 to 3669 psi).

Fuel supply pressure:

..... 0.35 + 0.05 bar (5.1 + 0.7 psi).

Delivery pipes (conforming to ISO 4093.2):

..... 6 x 2 x 450 mm (0.2362 x 0.0787 x 17.716 in.).

Graduate drain time : 30".

Test liquid: ISO 4113 at a temperature of $45^{\circ} \pm 1^{\circ}\text{C}$ ($113^{\circ} \pm 33.8^{\circ}\text{F}$) at outlet.

1. START OF DELIVERY

Plunger pre-lift from TDC: mm -	Pump rotation (viewed from drive side): counter-clockwise	Injection order: 1-2-3
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2. ADVANCE REGULATOR STROKE

rpm: 850	LDA pressure: kPa 100	Advance stroke: 0.2 to 1.2 mm (0.0079 to 0.0472 in.)
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3. FUEL SUPPLY PUMP PRESSURE

rpm: 1220	LDA pressure: kPa 100	Internal pressure: 8.3 to 9.5 bar (129.1 to 137.8 psi)
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4. FULL-LOAD DELIVERY WITH BOOSTER PRESSURE

rpm: 700	LDA pressure: kPa 100	Delivery per 1000 shots: 88.4 to 93.4 cm ³ (0.0194 to 0.0205 gal.)	Spread: $\leq$ - cm ³
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5. FULL-LOAD DELIVERY WITHOUT BOOSTER PRESSURE

rpm: 600	LDA pressure: kPa 0	Delivery per 1000 shots: 70.5 to 75.5 cm ³ (0.0155 to 0.0166 gal.)	Spread: - cm ³
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6. SPREAD GOVERNOR AT IDLE SPEED

rpm: 325	LDA pressure: kPa 0	Delivery per 1000 shots: 6.3 to 17.3 cm ³ (0.0014 to 0.0038 gal.)	Spread: $\leq$ - cm ³
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7. SPREAD GOVERNOR AT MAXIMUM SPEED

rpm: 1210	LDA pressure: kPa 100	Delivery per 1000 shots: 37 to 53 cm ³ (0.0081 to 0.0117 gal.)	Spread: - cm ³
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8. DELIVERY AT STARTING SPEED

rpm: 100	Delivery per 1000 shots: 85 to 125 cm ³ (0.0187 to 0.0275 gal.)
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9. INJECTION ADVANCE PROGRESSION

LDA pressure:	kPa	100
rpm	850	950
Advance stroke	mm (in.)	0.2 to 1.2 (0.0079 to 0.0473) 1.3 to 1.9 (0.0512 to 0.0748)

10. TRANSFER PRESSURE PROGRESSION

LDA pressure:	kPa	100		
rpm		500	1220	1180
Internal pressure supply:	bar (psi)	3.8 to 5.0 (55.1 to 72.5)	8.3 to 9.5 (120.4 to 137.8)	7.9 to 9.1 (114.6 to 132)

11. BACKFLOW

rpm		600	1150
LDA pressure:	kPa	0	100
Backflow for 10 sec.	l (gal.)/h	17 to 31 (3.7395 to 6.819)	21 to 39 (4.6193 to 8.5788)

(continued)

Note: the values shown above in brackets must be used for checking purposes only.



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(continued)

12. DELIVERY PROGRESSION

rpm	LDA pressure kPa	Delivery per 1000 shots: cm ³ (gal.)
1270	100	0 to 3 (0 to 0.0007)
1210	100	37 to 53 (0.0081 to 0.0117)
700	100	88.4 to 93.4 (0.0194 to 0.0205)
600	40	80 to 87 (0.0176 to 0.0191)
600	0	70.5 to 75.5 (0.0155 to 0.0166)
1150	100	76 to 82 (0.0167 to 0.0180)

13. ZERO CAPACITY (STOP)

rpm: 325	Voltage (volts): 0	Delivery per 1000 shots: cm ³ : 0 to 3
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14. DELIVERY CHECK AT IDLE SPEED

rpm	325	410
Delivery per 1000 shots: cm ³ (gal.)	6.3 to 17.3 (0.0014 to 0.0038)	0 to 3 (0 to 0.0007)

Note: the values shown above in brackets must be used for checking purposes only.

15. AUTOMATIC START SUPPLEMENT

rpm	Delivery per 1000 shots: cm ³ (gal.)
100	85 to 125 (0.0187 to 0.0275)
250	74.6 to 86.6 (0.0164 to 0.0190)
160	100 to 130 (0.220 to 0.0286)

BENCH TEST PERFORMANCE DATA

Test conditions					
Fixed advance before TDC cylinder No.1 in compression stroke: (see previous page)			Relative humidity 70% _o ± 5.		
Engine without fan, air filter and exhaust silencer.			Ambient temperature 20 ± 3 °C (68 ± 37.4 °F).		
Atmospheric pressure 990 ± 10 mbar (1.8855 psi).			Specific gravity of diesel fuel 840 g/l at a temperature of 15 °C (59 °F).		
Throttle lever position	Braking load applied	Engine speed rpm	Power output with engine run-in for a total of:		Fuel consumption kg (lbs.)/h
			Production speed kW (Hp)	50 hours (total) kW (Hp)	
Maximum	For maximum power output	2300	≥ 50.4 (68.5)	51.4 to 54.5 (1) (69.9 to 74.1)	11.6 to 12.3 (25.57 to 27.12)
Maximum	For maximum torque	1400	≥ 39.3 (53.4)	40.1 to 42.6 (2) (54.5 to 57.9)	9.1 to 9.6 (20.06 to 21.16)
Maximum	None (no-load)	2475 to 2525	-	-	-
Minimum	None (no-load)	625 to 675	-	-	-

Note: Air delivery pressure (1) 0.875 to 1.025 bar (12.6908 to 14.8664 psi) - (2) 0.55 to 0.65 bar (7.9771 to 9.4275 psi).

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