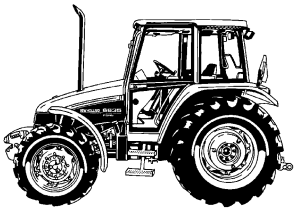
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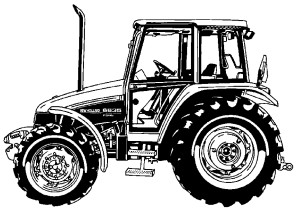


# 35 SERIES TRACTOR REPAIR

## 4835, 5635, 6635, 7635

**Vol. 1**

**86566075**

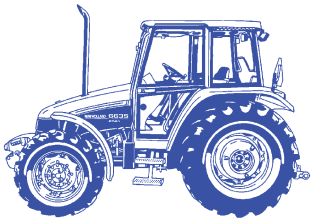
35 SERIES TRACTOR REPAIR

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# NEW HOLLAND

# REPAIR MANUAL

## 4835 5635
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## Section 1 – General Information

NEW HOLLAND

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# 35 SERIES REPAIR MANUAL CONTENTS




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# GENERAL INSTRUCTIONS

### IMPORTANT NOTICE

All maintenance and repair operations described in this manual should be carried out exclusively by authorized 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 the 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 rollover and twisting during mounting, which will jeopardize 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 agents: trichlorethylene, diesel fuel or a water and soda solution.

### BEARINGS

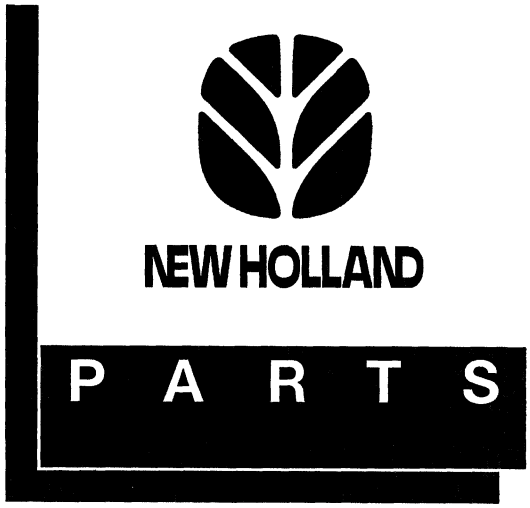
It is advisable to heat the bearings to 80° to 90°C (176° to 194° F) before mounting them on their shafts and cool them down before inserting them into their seats with external tapping.

### SPRING PINS

When mounting split socket spring pins, ensure that the pin notch is oriented in the direction of the effort to stress the pin.
Spiral spring pins should not be oriented during installation.

## NOTES FOR SPARE PARTS

Use exclusively **genuine NEW HOLLAND spare parts**, the only ones bearing this logo.




Only genuine parts guarantee the same quality, life, and 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 ID number;
- engine type and ID 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 this 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 prudent rule and safety precaution. 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 machine 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 precaution against accidents.

Careful observance of only this 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 caught in 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.

◊ To transfer a failed tractor, use a trailer or a low loading platform trolley if available.

◊ To load and unload the machine from the transport vehicle, 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.

◊ For electrical heaters, battery-chargers and similar equipment, use exclusive auxiliary power supplies with an efficient ground to avoid electrical shock.

◊ Always use lifting equipment of appropriate capacity to lift or move heavy components.

◊ Pay special attention to bystanders.

◊ Never pour gasoline or diesel fuel into open, wide and low containers.

◊ Never use gasoline, diesel fuel or other flammable liquids as cleaning agents. Use non-flammable non-toxic proprietary solvents.

◊ Wear protection goggles with side guards when cleaning parts using compressed air.

◊ Do not exceed a pressure of 2.1 bar (30.5 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 sit in the operator's seat and keep the service technician under visual supervision 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 in your pockets any object which might fall unobserved into the tractor's inner compartments.

◊ Whenever there is the possibility of ejected metal parts or similar, use protective 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 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, or 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 fluid 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 gasses relieved 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. Without 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.

◊ 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.

◊ Deflate the tire before removing any object caught in the tire tread.

◊ Never inflate tires using flammable gasses 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.

# CONSUMABLES

| PART TO BE FILLED | Quantity $dm^3$ litres (US gal) | New Holland Recommended Product | New Holland Specification | International Specification |
|---|---|---|---|---|
| Cooling system:<br>- without cab:<br>65, 75, 85 and<br>95 HP models .....<br>- with cab:<br>65, 75, 85 and<br>95 HP models ..... | <br><br>14 (3.70 US gal)<br><br>16 (4.23 US gal) | 50% Antifreeze Plus 50% Clean, Soft Water | M97B18-D | WSN-M97B18-D |
| Windscreen washer tank ... | 2 (0.53 US gal) | Water and Washer Fluid | - | - |
| Fuel tank, all models. ..... | 110 (29.0 US gal) | Decanted and Filtered Diesel Fuel | - | 40 min. Cetne Rating (No. 2) |
| Crankcase sump:<br>- without filter:<br>65, 75, 85 and<br>95 HP models .....<br>- with filter:<br>65, 75, 85 and<br>95 HP models ..... | <br><br>9.5 (2.51 US gal)<br><br>10.5 (2.77 US gal) | Premium Multi-Grade Engine Oil | SH/CG-4 API15W-40) | API CF-4/SG<br>CCMC D4<br>MIL-L-2104E |
| Brake control circuit ..... | 0.4 (0.42 US qt) | Brake Oil | M97B18-D | - |
| Front axle:<br>axle case:<br>- 65 and 75 HP models .....<br>- 85 and 95 HP models .....<br><br>lateral final drives (each):<br>- 65 and 75 HP models .....<br>- 85 and 95 HP models .....<br>Rear transmission (bevel gear pair - lateral final drives and brakes), gearbox, hydraulic lift, PTO and hydrostatic steering:<br>- 65 and 75 HP models .<br>- 85 and 95 HP models .....<br>With synchronised reverser, all models ..... | <br><br>4.5 (1.19 US gal)<br>7.0 (1.85 US gal)<br><br><br>0.8 (0.84 US qt)<br>1.25 (1.32 US qt)<br><br><br><br><br>49 (12.94 US gal)<br>55 (14.53 US gal)<br><br>55 (14.53 US gal) | Multigrade Transmission, Rear Axle, and Hydraulic Oil | 134-D<br>85700812 | API GL4<br>ISO 32/46<br>SAE 10W-30 |
| Front wheel hubs ..... | - | Multipurpose Grease Extreme Pressure (EP) | 865033661 | NLGI 2<br>ESE-M1C75-B<br>ESN-M1C137-B |
| Compression cups ..... | - | | | |

# ENGINE SPECIFICATIONS

| GENERAL SPECIFICATIONS | 4-cylinder |
|---|---|
| **Engine type:** | |
| - mod. 65 hp norm. aspirated - type 8045.06R.213/214/215 (BOSCH pump) | Pages 2-7 - 2-8 |
| - mod. 75 hp norm. aspirated - type 8045.05R.214/215 (BOSCH pump) | Pages 2-9 - 2-10 |
| - mod. 85 hp turbocharged - type 8045.25.203/204/205 (BOSCH pump) | Pages 2-11 - 2-12 |
| - mod. 95 hp turbocharged - type 8045.25k.213/215 (BOSCH pump) | Pages 2-13 - 2-14 |
| Cycle | Diesel, 4-stroke |
| Fuel injection | Direct |
| No. of in-line cylinders | 4 |
| Cylinder liners | dry force-fitted in cylinder block |
| Piston diameter | |
| - mod. 65 hp | 100 mm (3.937 in.) |
| - mod. 75 hp | 104 mm (4.094 in.) |
| - mod. 85 hp | 104 mm (4.094 in.) |
| - mod. 95 hp | 104 mm (4.094 in.) |
| Piston stroke | 115 mm (4.528 in.) |
| Total displacement: | |
| - mod. 65 hp | 3613 $cm^3$ |
| - mod. 75 hp | 3908 $cm^3$ |
| - mod. 85 hp | 3908 $cm^3$ |
| - mod. 95 hp | 3908 $cm^3$ |
| Compression ratio | 17 to 1 normally aspirated<br>16.5 to 1 turbocharged |
| Maximum power: | |
| - mod. 65 hp | 48 kW (65 hp) |
| - mod. 75 hp | 56 kW (75 hp) |
| - mod. 85 hp | 63 kW (85 hp) |
| - mod. 95 hp | 70 kW (95 hp) |
| Max. power speed | 2500 rpm |
| Max. torque speed: 65 hp model | 1400 rpm |
| Max. torque speed: 75 hp model | 1400 rpm |
| Max. torque speed: 85 hp model | 1500 rpm |
| Max. torque speed: 95 hp model | 1500 rpm |
| Number of main bearings | 5 |
| Sump pan | Structural, cast iron |

*(continued)*

| GENERAL SPECIFICATIONS | 4-cylinder |
|---|---|
| **Lubrication** | forced, with gear pump |
| Pump drive | camshaft |
| Engine speed/oil pump speed ratio | 2:1 |
| Oil cleaning | mesh screen on oil pick-up and filter cartridge in delivery line |
| Normal oil pressure, warm engine running at max. speed: | 2.9 to 3.9 bar (42 to 57 psi) |
| Pressure relief valve | built into pump housing |
| Valve opening pressure | 3.5 bar (51 psi) |
| For further lubrication data | See page 2-22 |
| **Cooling system** | water circulation |
| Radiator on 65 hp and 75 hp models | 3-row vertical pipes with copper fins |
| Radiator on 85 hp and 95 hp models | 4-row vertical copper pipes |
| Fan, attached to coolant pump pulley | 6-blade steel exhauster fan |
| 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 | 65° to 105° C (149° to 221° F) |
| - final red section | 105° to 115° C (221° to 239° F) |
| For further cooling system data | See page 2-22 |
| **Rev counter** | incorporated in control panel |
| Drive | from gear on camshaft |
| Hour counter calibrated for engine speed of | 1800 rpm |

*(continued)*

| GENERAL SPECIFICATIONS | 4-cylinder |
|---|---|
| **Timing** | overhead valves operated camshaft located in engine block through tappets, pushrods and rockers; camshaft is driven by the crankshaft through helical gears. |
| Inlet: | |
| - start: before TDC | 12° |
| - end: after BDC | 31° |
| Exhaust: | |
| - start: before BDC | 50° |
| - end: after TDC | 16° |
| Valve clearance for timing check | 0.45 mm (0.0177 in.) |
| Valve clearance for normal running (engine cold): | |
| - inlet | 0.30 to 0.05 mm (0.0118 to 0.0020 in.) |
| - exhaust | 0.30 to 0.05 mm (0.0118 to 0.0020 in.) |
| For further timing data | See page 2-19 |
| **Fuel system** | |
| Air cleaning | dual cartridge dry air filter, with clogged filter indicator with centrifugal pre-filter and automatic dust ejector |
| Fuel supply pump | double diaphragm |
| Fuel filtering | through wire filter in fuel supply pump, and replaceable cartridge on delivery line to injection pump. |
| Minimum fuel flow rate with pump shaft rotating at 1600 rpm | 100 litres/hour (26.4 US gal/hr) |
| Operated by eccentric cam | on camshaft |
| BOSCH injection pump | distributor type |
| All-speed governor, incorporated in pump: | |
| BOSCH | centrifugal counterweights |
| Automatic advance regulator, incorporated in pump: | |
| BOSCH | hydraulic |
| For further fuel system data: | |
| For fixed advance (pump setting for start of delivery before TDC) - Pressure setting - Injection order, and other information regarding the BOSCH pump | refer to the data for the relevant engine type in the table on page 2-3 |

## FUEL SYSTEM DATA

| | |
|---|---|
| Turbocharger (models 85 hp, 95 hp): | |
| - GARRETT type | TA 3118-0.82 A/R-57 |
| Injection pump | distributor type with incorporated speed governor and automatic advance regulator |
| BOSCH pump: | |
| - 65 hp model | VE 4/11 F 1250 L 164-2 - 4804869 |
| - 75 hp model | VE 4/11 F 1250 L 613-1 - 99441847 |
| - 85 hp model | VE 4/11 F 1250 L 613 - 99436544 |
| - 95 hp model | VE 4/11 F 1250 L 678 - 99449527 |
| Direction of rotation | counter-clockwise |
| Injection order | 1-3-4-2 |

| | 65 hp | 75 hp | 85 hp | 95 hp |
|---|---|---|---|---|
| Injectors: | | | | |
| BOSCH | 4792442 | 4800029 | 4824170 | 99469340 |
| - Nozzle holder type | 4791124 | 4791124 | 4791124 | 4791124 |
| - Nozzle type | 4792443 | 4800030 | 4824171 | 99469341 |
| OMAP | | | | |
| - Nozzle holder type | 4796644 | - | - | - |
| - Nozzle type | 4792447 | - | - | - |
| STANADYNE | 4802391 | 4802394 | 99431239 | - |
| - Nozzle holder type | 4802392 | 4802392 | 4802392 | - |
| - Nozzle type | 4802393 | 4802395 | 99431240 | - |
| Number of nozzles | 4 | 3 | 3 | 5 |
| Diameter of nozzle orifices ..... mm (in.) | 0.31 (0.12 in.) | 0.35 (0.14 in.) | 0.35 (0.14 in.) | 0.23 (0.09 in.) |
| Pressure setting ..... bar | 230-242 (3335 - 3510 psi) | 230-242 (3335 - 3510 psi) | 260-272 (3770 - 3940 psi) | 260-272 (3770 - 3940 psi) |
| Fuel delivery lines - BOSCH pump | | | | |
| - type | 4797516 | 4797516 | 99436547 | 99449006 |
| - Dimensions ..... mm | 6x1.5x530 | 6x1.5x530 | 6x1.75x530 | 6x1.75x530 |

## 65 hp MODEL - CALIBRATION DATA FOR BOSCH INJECTION PUMP TYPE VE 4/11 F 1250 L 164-2

### ASSEMBLY DATA

Pump timing on engine: delivery start 4° ± 1° 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 n. 1 delivery line union on pump: marked with letter A.

### ASSEMBLY DIMENSIONS

| SYMBOL | SVS (max) | KF | MS | ya | yb |
|---|---|---|---|---|---|
| mm | 4.30 | 5.00-5.40 | 1.40-1.80 | 37.9-39.9 | 44.2-49.6 |

### CALIBRATION TEST CONDITIONS

Test bench conforming to ISO 4008/1.../2
Injectors conforming to ISO 7440-A61 - (1688901020 with pad diameter(∅) 0.6 mm [0.0236 in.])
Injector pressure setting: 172 to 175 bar (2490 to 2540 psi).
Supply pressure: 0.35 ± 0.05 bar (5.1 ± 0.7 psi).
Delivery pipes (conforming to ISO 4093.2):
6 x 2 x 840 mm
Graduate drain time: 30 sec.
Test liquid: ISO 4113 at a temperature of 45° ± 1°C (113° ± 33.8°F).

### 1. START OF DELIVERY

| | | |
|---|---|---|
| Plunger pre-lift from TDC:<br>mm 0.2 ± 0.02 (0.04)<br>in. 0.0080 ± 0.0008 (0.0016) | Pump rotation (viewed from drive side):<br>counter-clockwise | Injection order: 1-3-4-2 |

### 2. ADVANCE REGULATOR STROKE

| | |
|---|---|
| Rpm: 800 | Advance stroke: 3.0 ± 3.4 mm |

### 3. FUEL SUPPLY PUMP PRESSURE

| | |
|---|---|
| Rpm: 800 | Internal pressure: 4.1 ± 4.7 bar |

### 4. FULL-LOAD DELIVERY

| | | |
|---|---|---|
| Rpm: 750 | Delivery per 1000 shots 62 ± 63 $cm^3$ | Spread: ≤ 4.0 (4.0) $cm^3$ |

### 5. SPREAD GOVERNOR AT IDLE SPEED

| | | |
|---|---|---|
| Rpm: 350 | Delivery per 1000 shots: 21 ± 25 $cm^3$ | Spread: ≤ 3.5 (3.5) $cm^3$ |

### 6. SPREAD GOVERNOR AT MAX. SPEED

| | | |
|---|---|---|
| Rpm: 1350 | Delivery per 1000 shots: 43 ± 7 $cm^3$ | Spread: - $cm^3$ |

### 7. DELIVERY AT STARTING

| | |
|---|---|
| Rpm: 100 | Delivery per 1000 shots: 80 to 140 $cm^3$ |

### 8. TRANSFER PRESSURE PROGRESSION

| Rpm | | 600 | 800 | 1250 |
|---|---|---|---|---|
| Internal supply pressure | bar | 3.2 to 3.8 | 4.1 to 4.7 | 6.1 to 6.7 |

### 9. INJECTION ADVANCE PROGRESSION

| Rpm | | 600 | 800 | 1000 |
|---|---|---|---|---|
| Advance stroke | mm | 1.2 to 2.0 (0.9 to 2.3) | 3.0 to 3.4 (2.5 to 3.9) | 5.4 to 6.2 (5.1 to 6.5) |

### 10. BACKFLOW

| Rpm | | 500 | 1250 |
|---|---|---|---|
| Backflow | $cm^3$ /10 sec | 41.7 to 83.4 (26.7 to 98.4) | 55.6 to139 (40.6 to 153) |

*(continued)*

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

## 11. DELIVERY PROGRESSION

| Rpm | Delivery per 1000 shots: $cm^3$ |
|---|---|
| 1450 | 1.5 (0 to 3) |
| 1400 | 8 to 18 (5 to 21) |
| 1350 | 43 to 47 (39 to 51) |
| 1250 | 52 to 55 (50 to 57) |
| 750 | 62 to 63 (59.5 to 65.5) |
| 500 | 57 to 61 (55.5 to 62.5) |

## 12. DELIVERY CHECK AT IDLE SPEED

| Rpm | | 350 | 450 |
|---|---|---|---|
| Delivery per 1000 shots: | $cm^3$ | 21 to 25 (19 to 27) | 0 to 2.0 |

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

## 13. MECHANICAL ZERO CAPACITY (STOP)

| rpm | Voltage (volt) | Delivery per 100 shots: $cm^3$ |
|---|---|---|
| 1250 | 12 | 0 to 3 |

## 14. ELECTRICAL ZERO CAPACITY (STOP)

| rpm | Voltage (volt) | Delivery per 100 shots: $cm^3$ |
|---|---|---|
| 350 | 12 | 0 to 3 |

## 15. AUTOMATIC START CAPACITY SUPPLEMENT

| rpm | Delivery per 100 shots: $cm^3$ |
|---|---|
| 100 | 90 to 140 |
| 250 | 30 to 50 |
| 150 | 100 to 150 |

## BENCH TEST PERFORMANCE DATA

**Test conditions**

Fixed advance before TDC cylinder No. 1 in compression stroke: (see previous page)

Engine without fan, air filter and exhaust silencer.

Atmospheric pressure: 740 ± 5mm (29.13 ± 0.20 in.) Hg (at altitude of Turin).

Relative humidity 70% ± 5.

Ambient temperature 20 ± 3° C (68 ± 5°F).

Specific gravity of diesel fuel 830 ± 10 g/litre.

| Throttle lever position | Braking load applied | Engine speed rpm | Power output with engine run-in for a total of: 2 hours kW (hp) | Power output with engine run-in for a total of: 50 hours kW (hp) | Fuel consumption kg/h |
|---|---|---|---|---|---|
| Maximum | For maximum power output | 2500 | ≥ 46.3 (63) | 47.8 to 49.6 (65 to 67.5) | 11 to 11.4 |
| Maximum | For maximum torque | 1500 | ≥ 31.8 (43) | 32.8 to 34.9 (44.6 to 47.6) | 7.1 to 7.6 |
| Maximum | None (no-load) | 2750 to 2790 | - | - | - |
| Minimum | None (no-load) | 625 to 675 | - | - | - |