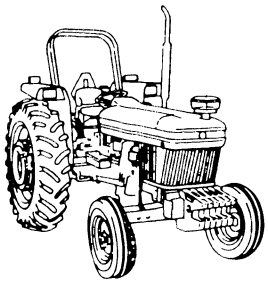


NEW HOLLAND 3010S 4010S 5010S

REPAIR MANUAL

NEW HOLLAND

SERVICE

86566833 3/98

Reprinted

3010S, 4010S, 5010S TRACTORS
REPAIR MANUAL

CONTENTS

SECTION 0
INTRODUCTION

IMPORTANT WARNINGS

◊ *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 who performs the operations described herein without strictly following the instructions is personally responsible for resulting injury or damage to property.*

◊ *The Manufacturer and all organizations belonging to the Manufacturer's distribution network, including but not restricted to national, regional or local distributors, will accept no responsibility for personal injury or damage to property caused by abnormal function of parts and/or components not approved by the Manufacturer, including those used for maintenance and/or repair of the product manufactured or marketed by the Manufacturer.*
In any case, the product manufactured or marketed by the Manufacturer is covered by no guarantee of any kind against personal injury or damage to property caused by abnormal function of parts and/or components not approved by the Manufacturer.

GENERAL INSTRUCTIONS

IMPORTANT NOTICE

All maintenance and repair operations described in this manual should be carried out exclusively by the 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 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 the gap between the sealing lip and the dust lip of double lip seals with grease;
- 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 roll over and twisting during mounting, which will jeopardize sealing.

SEALERS

Apply silicone/gasket eliminator 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

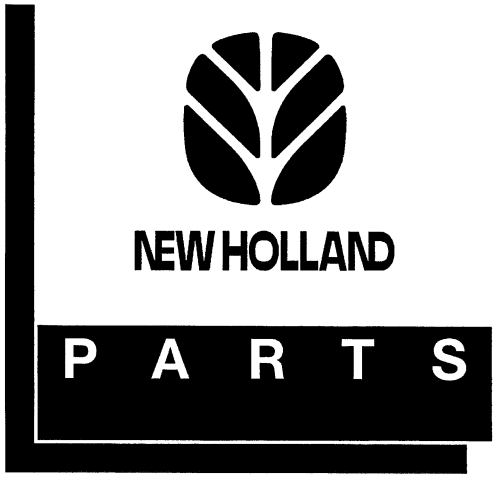
It is advisable to heat the bearings to 80° to 90°C (176° to 194°F) before mounting them on their shafts and cool them down before inserting them into their seats with external tapping.

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 stands 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 or 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 (30.4 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 all times

◊ 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 or welding on the tractor, or on any machine attached to the tractor.

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 tyres 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.

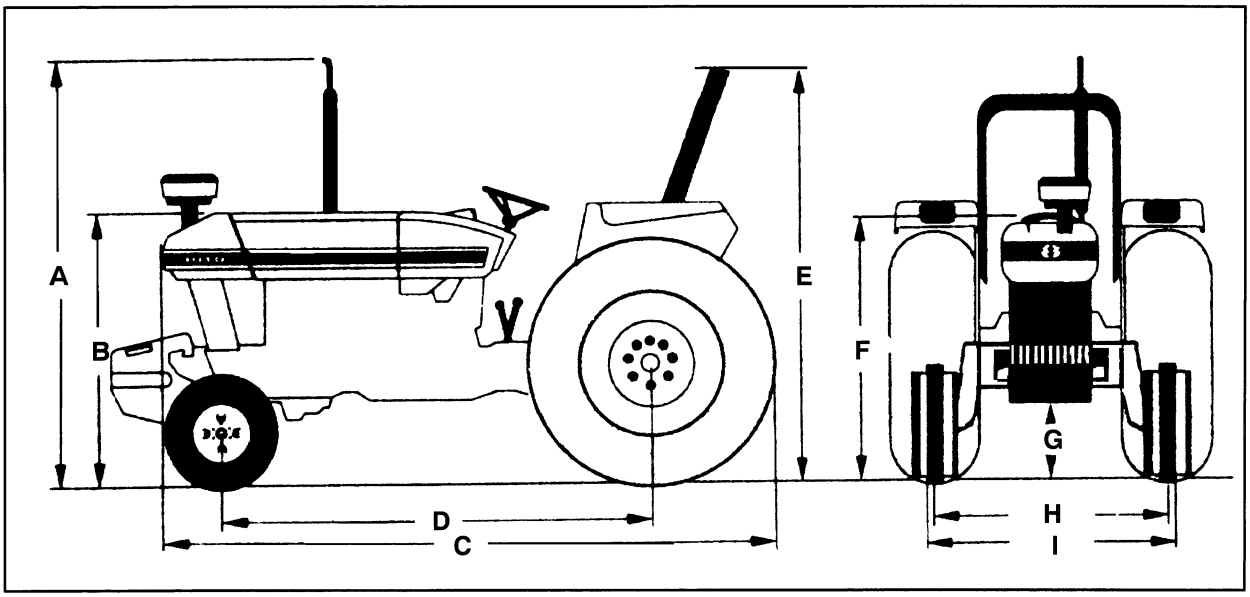
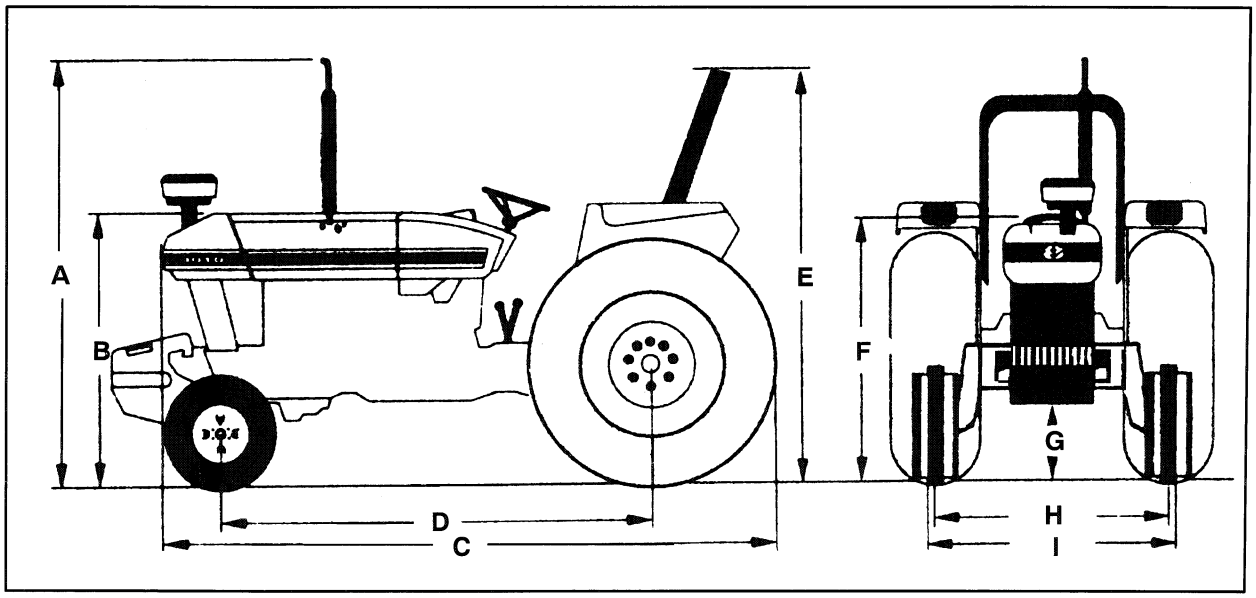


FIGURE 0-1

2WD TRACTOR DIMENSIONS	3010	4010	5010
Standard Front Tires	7.50–16	7.50–16	7.50–16
Standard Rear Tires	14.9–28	16.9–28	16.9–30
A (Height of Exhaust)	2505 mm (98.6 in.)	2510 mm (98.8 in.)	2560 mm (100.8 in.)
B (Height of Hood)	1465 mm (57.7 in.)	1470 mm (57.9 in.)	1520 mm (59.8 in.)
C (Length from Front of Hood to Back of Rear Tire)	3160 mm (124.4 in.)	3160 mm (124.4 in.)	3400 mm (133.9 in.)
D (Length Between Axle Centers)	2010 mm (79.1 in.)	2010 mm (79.1 in.)	2190 mm (86.2 in.)
E (Height of ROPS)	2305 mm (90.7 in.)	2340 mm (92.1 in.)	2340 mm (92.1 in.)
F (Height of Steering Wheel)	1585 mm (62.4 in.)	1605 mm (63.2 in.)	1640 mm (64.6 in.)
G (Clearance)	300 mm (11.8 in.)	300 mm (11.8 in.)	375 mm (14.8 in.)
H (Front Wheel Track Widths)	1372 – 1981 mm (54.0 – 78.0 in.)	1372 – 1981 mm (54.0 – 78.0 in.)	1422 – 2032 mm (56.0 – 80.0 in.)
I (Rear Wheel Track Widths)	1525 – 1930 mm (60.0 – 76.0 in.)	1525 – 1930 mm (60.0 –76.0 in.)	1525 – 2032 mm (60.0 – 80.0 in.)



4WD TRACTOR DIMENSIONS	3010	4010	5010
Standard Front Tires	9.5–24	9.5–24	11.2–24
Standard Rear Tires	14.9–28	16.9–28	16.9–30
A (Height of Exhaust)	2530 mm (99.6 in.)	2530 mm (99.6 in.)	2570 mm (101.2 in.)
B (Height of Hood)	1480 mm (58.3 in.)	1480 mm (58.3 in.)	1490 mm (58.7 in.)
C (Length from Front of Hood to Back of Rear Tire)	3150 mm (124.0 in.)	3240 mm (127.6 in.)	3430 mm (135.0 in.)
D (Length Between Axle Centers)	2040 mm (80.3 in.)	2040 mm (80.3 in.)	2170 mm (85.4 in.)
E (Height of ROPS)	2305 mm (90.7 in.)	2340 mm (92.1 in.)	2340 mm (92.1 in.)
F (Height of Steering Wheel)	1585 mm (62.4 in.)	1605 mm (63.2 in.)	1620 mm (63.8 in.)
G (Clearance)	365 mm (14.4 in.)	365 mm (14.4 in.)	390 mm (15.3 in.)
H (Front Wheel Track Widths)	1448 – 1956 mm (57.0 – 77.0 in.)	1448 – 1956 mm (57.0 – 77.0 in.)	1422 – 2032 mm (56.0 – 80.0 in.)
I (Rear Wheel Track Widths)	1525 – 2032 mm (60.0 – 80.0 in.)	1525 – 2032 mm (60.0 – 80.0 in.)	1525 – 2032 mm (60.0 – 80.0 in.)

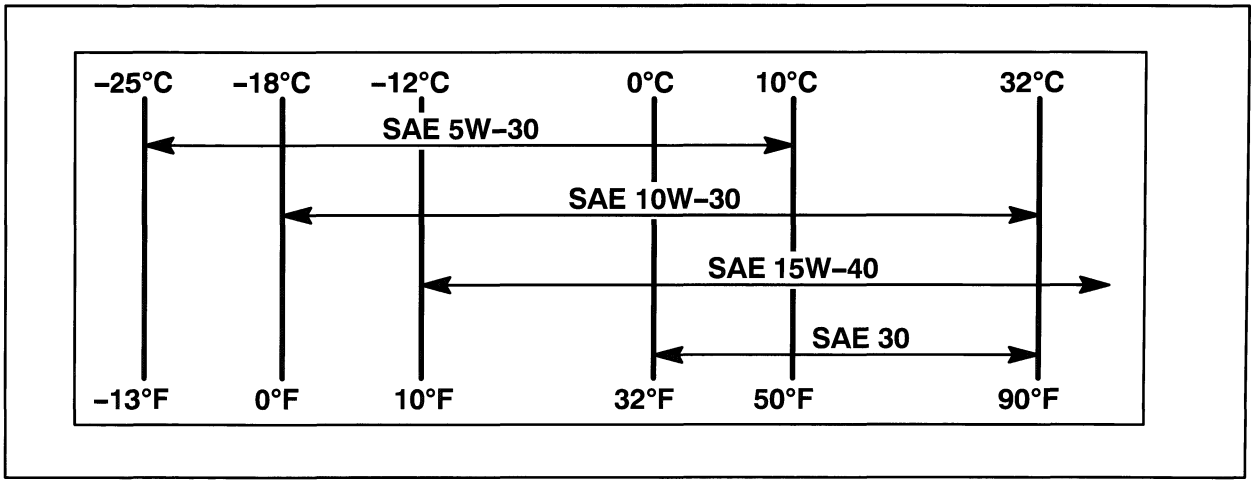
TRACTOR CAPACITIES	3010	4010	5010
Fuel Tank	60 liters (15.8 US gallons)		
Sump Oil (filter included)	9.0 liters (9.5 US quarts)	10.0 liters (10.6 US quarts)	11.7 liters (12.3 US quarts)
Cooling System	11.0 liters (2.9 US gallons)	11.0 liters (2.9 US gallons)	11.6 liters (3.1 US gallons)
Hydrostatic Steering	2.0 liters (2.1 US quarts)		
Front Axle – 4WD	5.5 liters (5.8 US quarts)		
Front Hubs – 4WD	1.2 liters (1.3 US quarts)		
Transmission/Rear Axle – 2WD*	32 liters (33.8 US quarts)		
Transmission/Rear Axle – 4WD*	33 liters (34.9 US quarts)		
Final Drives – 2WD	1.7 liters (1.8 US quarts)	1.7 liters (1.8 US quarts)	3.5 liters (3.7 US quarts)
Final Drives – 4WD	3.5 liters (3.7 US quarts)	3.5 liters (3.7 US quarts)	3.5 liters (3.7 US quarts)

* Remote cylinders can displace up to 7.5 liters (2.0 U.S. gallons) of transmission oil without the tractor requiring more oil, provided it is operating on a level surface. However, it is always a good idea to keep the transmission oil up to the fill line. So when you attach remote devices, replenish the transmission oil with the same amount of oil displaced by the remote cylinder.

RECOMMENDED CONSUMABLES

CONSUMABLE	New Holland Recommended Product	New Holland Specification	International Specification
Fuel	Decanted and filtered diesel fuel		40 min. cetane rating (No.2)
Engine (Sump) Oil	Premium Multigrade Engine Oil	SH / CG-4 API (SAE 15W-40)	API CF-4/SG or CCMC D4 or MIL-L-2104E
Transmission/Hydraulics/ Rear Axle Oil	Multigrade Transmission, Rear Axle and Hydraulic Oil	134-D 85700812	API GL4 or ISO 32/46 or SAE 10W-30
Front Axle Case Oil, Front Wheel Hub Oil, Rear Final Drives	Multigrade Transmission, Rear Axle and Hydraulic Oil	134-D 85700812	API GL4 or ISO 32/46 or SAE 10W-30
Coolant	50% Antifreeze Plus 50% Clean, Soft Water	M97B18-D	WSN-M97B18-D
Grease (including front wheel hub)	Multipurpose Grease Extreme Pressure (EP)	865033661	NLGI 2 or ESE-M1C75-B or ESN-M1C137-B
Hydrostatic Steering Oil	Multigrade Transmission, Rear Axle and Hydraulic Oil	134-D 85700812	API GL4 or ISO 32/46 or SAE 10W-30

Choose the correct oil viscosity from the chart



NOTE: In places with prolonged periods of extreme temperature, local lubricant practices are acceptable. For prolonged periods of extreme low temperatures, SAE 5W is acceptable, and for prolonged periods of extreme high temperatures, SAE 50 is acceptable.

After the first 50 hours of operation, the recommended oil change interval is every 200 hours. But how often you change the engine oil and oil filter depends on:

- The temperature
- The conditions of operation
- The specific characteristics of the fuel you use

If the tractor operates much of the time in temperatures below -12°C (10°F), or under severe conditions, you should change the oil more frequently. If the diesel fuel you are using has between 0.5 and 1.3 percent sulfur, you should also change the oil more frequently. Do not use a fuel with more than 1.3 percent sulfur. If you are using RME fuel, the recommended change interval is every 150 hours.

2WD TRACTOR WEIGHTS	3010	4010	5010
Standard Front Tires	7.50-16	7.50-16	7.50-16
Standard Rear Tires	14.9-28	16.9-28	16.9-30
No Ballast	1992 kg (4382 lbs.)	2037 kg (4481 lbs.)	2252 kg (4954 lbs.)
With Cast Iron Ballasts - 6 front, 6 rear - 548 kg, or 1206 lbs.	2540 kg (5588 lbs.)	2585 kg (5687 lbs.)	2800 kg (6160 lbs.)
Maximum Safe Operating Weight	3500 kg (7720 lbs.)		

4WD TRACTOR WEIGHTS	3010	4010	5010
Standard Front Tires	9.5-24	9.5-24	11.2-24
Standard Rear Tires	14.9-28	16.9-28	16.9-30
No Ballast	2242 kg (4932 lbs.)	2288 kg (5034 lbs.)	2412 kg (5306 lbs.)
With Cast Iron Ballasts - 6 front, 6 rear - 548 kg, or 1206 lbs.	2790 kg (6138 lbs.)	2836 kg (6239 lbs.)	2960 kg (6512 lbs.)
Maximum Safe Operating Weight	3500 kg (7720 lbs.)		

MINIMUM HARDWARE TIGHTENING TORQUES

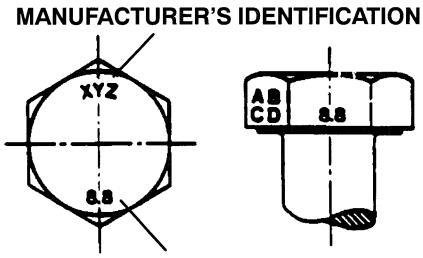
IN FOOT POUNDS (NEWTON-METERS) FOR NORMAL ASSEMBLY APPLICATIONS

METRIC HARDWARE AND LOCKNUTS

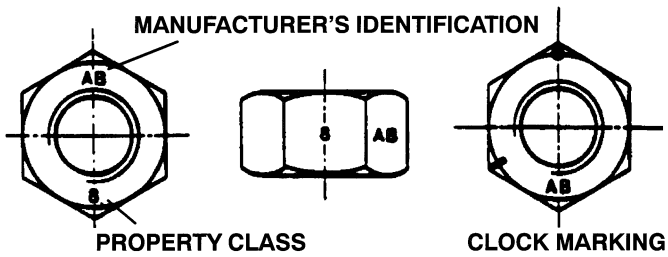
NOMINAL SIZE	CLASS 5.8		CLASS 8.8		CLASS 10.9		LOCKNUT CL.8 W/CL8.8 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	
M4	15* (1.7)	19* (2.2)	23* (2.6)	30* (3.4)	33* (3.7)	42* (4.8)	16* (1.8)
M6	51* (5.8)	67* (7.6)	79* (8.9)	102* (12)	115* (13)	150* (17)	56* (6.3)
M8	124* (14)	159* (18)	195* (22)	248* (28)	274* (31)	354* (40)	133* (15)
M10	21 (28)	27 (36)	32 (43)	41 (56)	45 (61)	58 (79)	22 (30)
M12	36 (49)	46 (63)	55 (75)	72 (97)	79 (107)	102 (138)	39 (53)
M16	89 (121)	117 (158)	137 (186)	177 (240)	196 (266)	254 (344)	97 (131)
M20	175 (237)	226 (307)	277 (375)	358 (485)	383 (519)	495 (671)	195 (265)
M24	303 (411)	392 (531)	478 (648)	619 (839)	662 (897)	855 (1160)	338 (458)

NOTE: Torque values shown with * are inch pounds.

IDENTIFICATION
HEX CAP SCREW AND CARRIAGE BOLTS
CLASSES 5.6 AND UP



HEX NUTS AND LOCKNUTS
CLASSES 05 AND UP



TRACTOR SYSTEM COMPONENTS

POWER TRAIN

- Clutch — Twin, dry, single-plate, 11-inch diameter discs with separate controls. One pedal for the transmission and a hand lever for the P.T.O. Organic material for transmission and P.T.O. clutch plate. The free play on the transmission clutch pedal should be about 25 mm (1.0 in.).
- Transmission — Constant mesh, straight-toothed transmission with epicyclic type splitter produces 8 forward and two reverse speeds. Two levers control the transmission, one range selector and one gearshift selector. In models with a creeper range, the creeper gear is in series with the splitter, making 12 forward and 3 reverse speeds.
- Bevel Drive — Central on differential.
- Differential — Two-pinion with pedal control differential lock.
- Final Drive — Pinion drive, single reduction.

BRAKES

- Service Brakes — Disc, oil-bath, axle shaft mounted brakes. Brake pedals, separate or latched, mechanically operate the brakes. The free play on both pedals should be about 38 mm (1.5 in.).
- Parking Brake — Acting on service brake, a hand lever engages the brakes.

STEERING

- Type — Hydrostatic Power Steering.
- Turning Radius (Without Brakes) — 2WD radius is 3.4 m (11 ft., 2 in.); 4WD radius is 4.1 m (16 ft., 1 in.).

AXLES

- 2WD Front Axle — Inverted U, center pivoting axle. The 3010 and 4010 front axle track can be adjusted to 7 widths by lengthening or shortening the front axle, from 1372 to 1981 mm (54.0 to 78.0 in.). The 5010 front axle track can be adjusted the same way to 7 widths, from 1422 to 2032 mm (56.0 to 80.0 in.).
- 4WD Front Axle — Full-floating, center pivoting, unjointed drive shaft and articulations on tractor centerline. The differential is two-pinion with epicyclic reduction gear in the wheel hubs. Track is adjusted by changing the wheel rim relative to the center disc, changing the rim or disc relative to the axle hub, or by swapping the two wheels. The 3010 and 4010 have 6 widths, from 1448 to 1956 mm (57.0 to 77.0 in.). The 5010 has 7 widths, from 1422 to 2032 mm (56.0 to 80.0 in.).
- Rear Axle — Track adjusted to five or six possible widths, depending on the tractor. Track adjusted by changing the wheel rim relative to the center disc, changing the rim or disc relative to the axle hub, or by swapping the two wheels. The 2WD 3010 and 2WD 4010 have 5 possible widths, from 1525 to 1930 mm (60.0 to 76.0 in.). The 2WD 5010 and all 4WD have 6 widths, from 1525 to 2032 mm (60.0 to 80.0 in.).

POWER TAKE OFF

- Shaft — Six-spline, 34.9 mm (1.375 in.) diameter shaft.
- Clutch — Fully independent. The free play on the P.T.O. clutch link should be 4.5 mm (0.18 in.).
- Designed Operating Speed — 540 RPM.
- Engine Driven Speed — P.T.O. rotates at 540 RPM when engine speed is 1967 RPM. P.T.O. rotates at 686 RPM when engine speed is 2500 RPM.
- Direction — When you look at the P.T.O. from behind the tractor, the splined shaft rotates clockwise.
- Ground Driven Speed — P.T.O. Revolution to Rear Wheel Revolution Ratio:
  >2WD 3010 and 4010 — 14.2 to 1.
  >All 4WD and 2WD 5010 — 15.5 to 1.

HYDRAULIC LIFT

- Modes — Draft control, position control, and combined draft/position control with manual sensitivity control. Draft control sensed through spring behind top link.
- Automatic Control — Automatic arm lift control with Touch Command buttons.
- Pump Drive — Engine timing gears drive the hydraulic gear pump.
- Oil Source — Hydraulic oil taken from rear transmission oil.
- Implements — Category 1 and 2 implements attach with a three-point linkage with normal arms.
- Towing Attachments — Swinging drawbar.
- Lift Weight Limits —

MAXIMUM LIFT CAPACITIES (Starting with lower links horizontal)	**3010 / 4010 / 5010**
At lower link swivel bushings	1745 kg (3847 lbs.)
Center of gravity 610 mm (24.0 in.) from lower link swivel bushing	1340 kg (2954 lbs.)
Maximum lower link end travel with lifting rods fully OUT	785 mm (30.9 in.)
Maximum lower link end travel with lifting rods fully IN	645 mm (25.4 in.)

BALLASTING

- Front End Cast Iron Weights — Six or ten front-end ballast weights and their support are cast iron. The support weighs 80 kg (176.5 lbs.) and each individual weight is 33 kg (73 lbs.). Six weights would have a total possible front end ballast of 278 kg (612 lbs.), and 10 weights would have 410 kg (904 lbs.).
- Rear Wheel Cast Iron Plates — Each rear wheel can take three rings, each ring weighing 45 kg (99 lbs.), for a maximum of 270 kg (594 lbs.) rear cast iron ballast.

ELECTRICAL SYSTEM

- Voltage — 12 Volts.
- Alternator Power — Integral electronic voltage regulator. Maximum output is 55 amps.
- Battery — Maintenance-free 12 V with 107 Ah capacity.
- Starter — Electromagnet operated.
- Lights — Headlights are 60/55 W (H-4) lamps (white or yellow), with adjustable aiming. Parking lights are 5 W (R5W) lights with yellow front and red rear transluscent covers. Work lamp is a halogen bulb with a separate switch.
- Instruments and Accessories — Multifunction instrument panel contains all gauges and warning lights. Flasher pulses parking lights for hazard light operation. Thermostart® cold starting device warms the air in the intake manifold.

Speed Decals

Example:

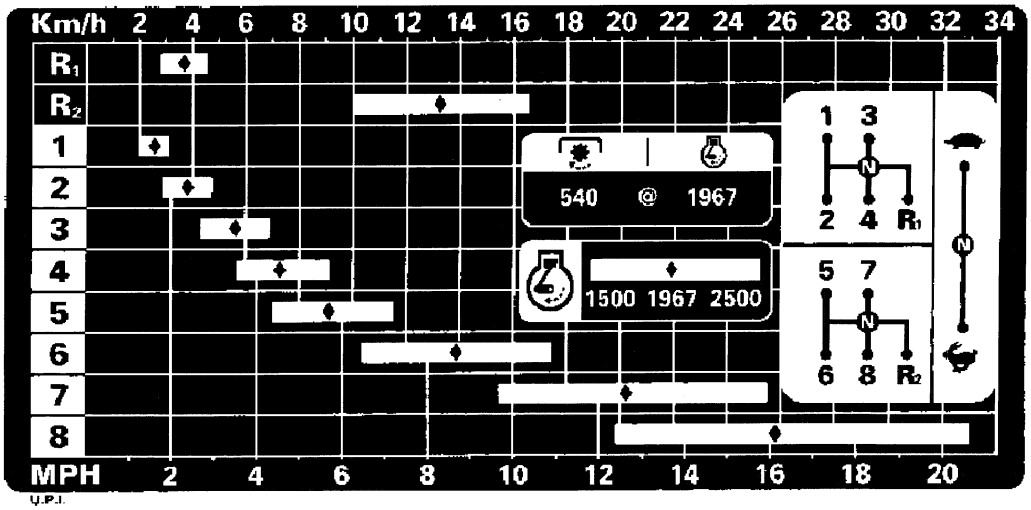


FIGURE 0-2

Each tractor has a speed decal that shows the ground speed for three engine speeds: 1500, 1967, and 2500 RPM.

Each tractor model has a specific decal for the engine, transmission, and final drive configuration. Refer to the charts on the following pages for more precise ground speeds at 2500 RPM and 1967 RPM (when PTO is at 540 RPM).

2WD SPEED CHART

Ground Speed in KPH (MPH) at 2500 RPM

RANGE	GEAR	3010 2WD	4010 2WD	5010 2WD
		14.9-28	16.9-28	16.9-30
I	1	3.1 KPH (1.9 MPH)	3.2 KPH (2.0 MPH)	3.1 KPH (1.9 MPH)
I	2	4.7 KPH (2.9 MPH)	4.9 KPH (3.0 MPH)	4.6 KPH (2.9 MPH)
I	3	6.8 KPH (4.3 MPH)	7.1 KPH (4.4 MPH)	6.7 KPH (4.2 MPH)
I	4	8.8 KPH (5.5 MPH)	9.2 KPH (5.7 MPH)	8.7 KPH (5.4 MPH)
II	5	11.2 KPH (6.9 MPH)	11.7 KPH (7.2 MPH)	11.0 KPH (6.8 MPH)
II	6	16.8 KPH (10.5 MPH)	17.5 KPH (10.9 MPH)	16.6 KPH (10.3 MPH)
II	7	24.6 KPH (15.3 MPH)	25.7 KPH (16.0 MPH)	24.2 KPH (15.1 MPH)
II	8	31.8 KPH (19.8 MPH)	33.2 KPH (20.6 MPH)	31.3 KPH (19.5 MPH)
I	R1	4.5 KPH (2.8 MPH)	4.7 KPH (2.9 MPH)	4.4 KPH (2.7 MPH)
II	R2	16.1 KPH (10.0 MPH)	16.7 KPH (10.4 MPH)	15.8 KPH (9.8 MPH)

4WD SPEED CHART

Ground Speed in KPH (MPH) at 2500 RPM

RANGE	GEAR	3010 4WD	4010 4WD	5010 4WD
		14.9-28	16.9-28	16.9-30
I	1	2.8 KPH (1.8 MPH)	2.9 KPH (1.8 MPH)	3.1 KPH (1.9 MPH)
I	2	4.3 KPH (2.7 MPH)	4.4 KPH (2.8 MPH)	4.6 KPH (2.9 MPH)
I	3	6.2 KPH (3.9 MPH)	6.5 KPH (4.0 MPH)	6.7 KPH (4.2 MPH)
I	4	8.1 KPH (5.0 MPH)	8.4 KPH (5.2 MPH)	8.7 KPH (5.4 MPH)
II	5	10.2 KPH (6.3 MPH)	10.6 KPH (6.6 MPH)	11.0 KPH (6.8 MPH)
II	6	15.3 KPH (9.5 MPH)	16.0 KPH (9.9 MPH)	16.6 KPH (10.3 MPH)
II	7	22.4 KPH (14.0 MPH)	23.4 KPH (14.5 MPH)	24.2 KPH (15.1 MPH)
II	8	29.0 KPH (18.0 MPH)	30.2 KPH (18.8 MPH)	31.3 KPH (19.5 MPH)
I	R1	4.1 KPH (2.5 MPH)	4.2 KPH (2.6 MPH)	4.4 KPH (2.7 MPH)
II	R2	14.6 KPH (9.1 MPH)	15.3 KPH (9.5 MPH)	15.8 KPH (9.8 MPH)

PTO 2WD SPEED CHART

Ground Speed in KPH (MPH) at PTO 540 RPM (Engine 1967 RPM)

RANGE	GEAR	3010 2WD	4010 2WD	5010 2WD
		14.9-28	16.9-28	16.9-30
I	1	2.4 KPH (1.5 MPH)	2.6 KPH (1.6 MPH)	2.4 KPH (1.5 MPH)
I	2	3.7 KPH (2.3 MPH)	3.8 KPH (2.4 MPH)	3.6 KPH (2.3 MPH)
I	3	5.4 KPH (3.3 MPH)	5.6 KPH (3.5 MPH)	5.3 KPH (3.3 MPH)
I	4	7.0 KPH (4.3 MPH)	7.3 KPH (4.5 MPH)	6.8 KPH (4.3 MPH)
II	5	8.8 KPH (5.5 MPH)	9.2 KPH (5.7 MPH)	8.7 KPH (5.4 MPH)
II	6	13.2 KPH (8.2 MPH)	13.8 KPH (8.6 MPH)	13.0 KPH (8.1 MPH)
II	7	19.4 KPH (12.0 MPH)	20.2 KPH (12.6 MPH)	19.1 KPH (11.9 MPH)
II	8	25.0 KPH (15.6 MPH)	26.1 KPH (16.2 MPH)	24.6 KPH (15.3 MPH)
I	R1	3.5 KPH (2.2 MPH)	3.7 KPH (2.3 MPH)	3.5 KPH (2.2 MPH)
II	R2	12.6 KPH (7.9 MPH)	13.2 KPH (8.2 MPH)	12.4 KPH (7.7 MPH)

PTO 4WD SPEED CHART

Ground Speed in KPH (MPH) at PTO 540 RPM (Engine 1967 RPM)

RANGE	GEAR	3010 4WD	4010 4WD	5010 4WD
		14.9-28	16.9-28	16.9-30
I	1	2.2 KPH (1.4 MPH)	2.3 KPH (1.4 MPH)	2.4 KPH (1.5 MPH)
I	2	3.4 KPH (2.1 MPH)	3.5 KPH (2.2 MPH)	3.6 KPH (2.3 MPH)
I	3	4.9 KPH (3.1 MPH)	5.1 KPH (3.2 MPH)	5.3 KPH (3.3 MPH)
I	4	6.3 KPH (3.9 MPH)	6.6 KPH (4.1 MPH)	6.8 KPH (4.3 MPH)
II	5	8.0 KPH (5.0 MPH)	8.4 KPH (5.2 MPH)	8.7 KPH (5.4 MPH)
II	6	12.1 KPH (7.5 MPH)	12.6 KPH (7.8 MPH)	13.0 KPH (8.1 MPH)
II	7	17.7 KPH (11.0 MPH)	18.4 KPH (11.4 MPH)	19.1 KPH (11.9 MPH)
II	8	22.8 KPH (14.2 MPH)	23.8 KPH (14.8 MPH)	24.6 KPH (15.3 MPH)
I	R1	3.2 KPH (2.0 MPH)	3.3 KPH (2.1 MPH)	3.5 KPH (2.2 MPH)
II	R2	11.5 KPH (7.2 MPH)	12.0 KPH (7.5 MPH)	12.4 KPH (7.7 MPH)

SECTION 1
ENGINE

CONTENTS

GENERAL SPECIFICATIONS

ENGINE SPECIFICATIONS	3010	4010	5010
Engine	55 hp; naturally aspirated; 8035.06.307 (w/CAV pump)	60 hp; naturally aspirated; 8035.05.307 (w/CAV pump)	70 hp; naturally aspirated; 8045.06.307 (w/CAV pump)
Cycle	4-stroke diesel		
Fuel Injection	Direct		
Number of Cylinders	3 cylinders	3 cylinders	4 cylinders
Cylinder Liners	Dry, force-fitted on engine block		
Bore (Piston Diameter)	100 mm (3.9370 in.)	104 mm (4.0945 in.)	100 mm (3.9370 in.)
Stroke	115 mm (4.5276 in.)	115 mm (4.5276 in.)	115 mm (4.5276 in.)
Total Displacement	2710 cm^3 (165 $in.^3$)	2931 cm^3 (179 $in.^3$)	3613 cm^3 (220 $in.^3$)
Compression Ratio	17 to 1 ratio		
Maximum Power	40.5 kW (55 hp)	44.5 kW (60 hp)	55.5 kW (70 hp)
Maximum Output Speed	2500 RPM		
Maximum Torque Speed	1500 RPM	1500 RPM	1400 RPM
Idle Speed	650 – 700 RPM		
Main Bearings	4	4	5
Sump	Structural, in cast iron		
Balancer	—	—	Flyweight, engine sump

TIMING SPECIFICATIONS	3010	4010	5010
Valve Gear	Overhead valves; pushrod operated; camshaft driven by the crankshaft through helical gears		
Inlet Start: Before TDC	12°		
Inlet End: After BDC	31°		
Exhaust Start: Before BDC	50°		
Exhaust End: After TDC	16°		
Valve Clearance for Timing Check	0.45 mm (0.0177 in.)		
Valve Clearance Normal Running (Engine Cold) — Inlet	0.30 mm ± 0.05 mm (0.0118 in. ± 0.0020 in.)		
Valve Clearance Normal Running (Engine Cold) — Exhaust	0.30 mm ± 0.05 mm (0.0118 in. ± 0.0020 in.)		

FUEL SYSTEM SPECIFICATIONS	3010	4010	5010
Air Cleaning	Dual cartridge dry air filter; clogged filter indicator; centrifugal pre-cleaner; automatic dust ejector		
Fuel Tank Capacity	60 liters (15.8 US gallons)		
Fuel Supply Pump	Double diaphragm; engine driven; camshaft operated		
Fuel Filtering	Strainer in fuel supply pump; Lucas - dual filter; Bosch - single filter with water separator	Strainer in fuel supply pump; Lucas - dual filter; Bosch - single filter with water separator	Strainer in fuel supply pump; dual filters
Minimum Fuel Flow with Pump Shaft Rotating at 1600 RPM	100 liters/hour (26.4 US gallons/hour)		
Drive Shaft Eccentricity	3.0 mm (0.1181 in.)		
Injection Pump	Rotary distributor type		
Pump All-Speed Governor	Integral; centrifugal counterweights		
Pump Advance Regulator	Integral; hydraulic		
Injection Pump Rotation	Counterclockwise		
Injection Order	1-2-3	1-2-3	1-3-4-2
Injector Nozzles (Orifices)	4	3	4
Nozzle Diameter	0.31 mm (0.0122 in.)	0.35 mm (0.0138 in.)	0.31 mm (0.0122 in.)
Injector Release Pressure	230 – 238 bar (235 – 243 kg/cm^2, 3340 – 3460 PSI)		

INJECTOR SPECIFICATIONS	3010	4010	5010
Pump Model No.	DPS [663] 8522A161A	DPS [662] 8522A151A	DPS [653] 8520A791A
Injection Pump Rotation	Counterclockwise		
Shaft Journal Diameter	31.975 to 32.000 mm (1.2588 to 1.2598 in.)		
Bushing Fitter ID After Reaming	32.050 to 32.075 mm (1.2618 to 1.2628 in.)		
Shaft Clearance in Bushing	0.050 to 0.100 mm (0.0020 to 0.0040 in.)		
Bushing Interference Fit in Housing	0.063 to 0.140 mm (0.0025 to 0.0055 in.)		
Inner Washer Thickness	1.45 to 1.50 mm (0.0570 to 0.0590 in)		
Outer Washer Thickness	2.93 to 3.00 mm (0.1153 to 0.1181 in)		
BOSCH Injector			
Nozzle	4824165	4824171	4824165
Nozzle Holder	4791124	4791124	4791124
LUCAS Injector			
Nozzle	4817266	4817267	4817266
Nozzle Holder	4816070	4816070	4816070
Fuel Delivery Lines	4797511	4797522	4797522
Fuel Delivery Line Dimensions	6 x 2 x 475 mm	6 x 2 x 530 mm	6 x 2 x 530 mm

LUBRICATION SPECIFICATIONS	3010	4010	5010
Lubrication System	Force feed; gear pump		
Engine Capacity (filter included)	9.0 liters (9.5 US quarts)	10.0 liters (10.6 US quarts)	11.7 liters (12.3 US quarts)
Pump Drive	Camshaft		
Engine / Oil Pump Speed Ratio	2 to 1 ratio		
Oil Filtering	Mesh screen on oil pick-up line; full flow filter cartridge on delivery line		
Normal Oil Pressure	2.9 – 3.9 bar (3.0 – 4.0 kg/cm^2, 42.6 – 56.9 PSI)		
Relief Valve	Built into pump housing		
Shaft Clearance in Bushing	0.016 to 0.055 mm (0.0006 to 0.0022 in.)		
Shaft Clearance in Driven Gear	0.033 to 0.066 mm (0.0013 to 0.0026 in.)		
Gear Backlash	0.100 mm (0.0039 in.)		
Gear Clearance in Pump Body	0.060 to 0.170 mm (0.0024 to 0.0067 in.)		
Drive and Driven Gear Thickness	40.961 to 41.000 mm (1.6126 to 1.6142 in.)		
Gear Seat in Pump Height	41.025 to 41.087 mm (1.6152 to 1.6176 in.)		
Drive and Driven Gear End Float	0.025 to 0.126 mm (0.0009 to 0.0049 in.)		
Relief Valve Spring Length — Free	45.0 mm (1.77 in.)		
Relief Valve Spring Length — Loaded 45–49 N (4.6–5.0 kg)	37.5 mm (1.48 in.)		
Relief Valve Spring Length — Loaded 88–94 N (9.0–9.6 kg)	30.5 mm (1.20 in.)		

COOLING SPECIFICATIONS	3010	4010	5010
Cooling System	Water circulation		
Cooling System Capacity	11.0 liters (2.9 US gallons)	11.0 liters (2.9 US gallons)	11.6 liters (3.1 US gallons)
Pump	Centrifugal vane type		
Pump / Engine Speed Ratio	1.403 to 1 ratio		
Pump Interference Fit Between Impeller and Shaft	0.017 to 0.059 mm (0.0007 to 0.0023 in.)		
Pump Interference Fit Between Fan Hub and Shaft	0.024 to 0.058 mm (0.0009 to 0.0023 in.)		
Pump Interference Fit Between Seal Bushing and Impeller	0.012 to 0.058 mm (0.0005 to 0.0023 in.)		
Radiator	3 or 4 deep core vertical tubes		
Pressure Cap Rating	0.9 bar (0.9 kg/cm^2, 13.1 PSI)		
Fan	Suction; attached to water pump pulley; four steel blades		
Temperature Control	Wax thermostat		
Thermostat Starts Opening	79° C ± 2° C (174° F ± 3.6° F)		
Thermostat Fully Open	94° C (201° F)		
Thermostat Valve Travel	7.5 mm (0.295 in.)		
Thermometer Green Range	30° to 105° C (86° to 221° F)		
Thermometer Red Range	105° to 115° C (221° to 239° F)		

TRACTOR METER SPECIFICATIONS	3010	4010	5010
Location	On instrument panel		
Drive	Camshaft gear		
Hour Meter Rated Speed	1800 RPM		
Meter Drive Ratio	1 to 2 ratio		

FUEL SUPPLY PUMP DATA	mm (inches)
Eccentricity of drive shaft	3 mm (0.118 in.)
Diameter of drive shaft at bushings	31.975 to 32.000 mm (1.2588 to 1.2598 in.)
Internal diameter of installed and reamed bushings	32.050 to 32.075 mm (1.2618 to 1.2628 in.)
Interference between bushings and seats	0.063 to 0.140 mm (0.0025 to 0.0055 in.)
Assembly clearance between shaft and bushings	0.050 to 0.100 mm (0.0020 to 0.0040 in.)
Thickness of internal washer	1.45 to 1.50 mm (0.0570 to 0.0590 in.)
Thickness of external washer	2.93 to 3.00 mm (0.1153 to 0.1181 in.)

CRANKCASE/CYLINDER BLOCK DATA	mm (inches)	
	3010/5010	4010
Cylinder block	cast-iron monobloc with replaceable dry, force-fitted cylinder liners, incorporating seatings for crankshaft bearings, camshaft and pushrod/tappet assemblies	
Internal diameter of cylinder liners	100.000 to 100.024 mm (1) (3.9370 to 3.9379 in.) (1)	104.000 to 104.024 mm (1) (4.0945 to 4.0954 in.) (1)
External diameter of cylinder liners	103.020 to 103.050 mm (4.0559 to 4.0571 in.)	107.020 to 107.050 mm (4.2134 to 4.2146 in.)
Diameter of cylinder bores	102.850 to 102.900 mm (4.0492 to 4.0512 in.)	106.850 to 106.900 mm (4.2067 to 4.2086 in.)
Interference fit between cylinder liners and bores	0.120 to 0.200 mm (0.0047 to 0.0079 in.)	
Liner internal diameter oversizes	0.4 and 0.8 mm (0.0157 and 0.0315 in.)	
Liner external diameter oversizes	0.2 mm (0.0079 in.)	
Maximum permissible liner ovality or taper due to wear	0.12 mm (0.0047 in.)(2)	
Diameter of main shell bearing seats	84.200 to 84.230 mm (3.3149 to 3.3161 in.)	
Diameter of camshaft bearing seats:		
- front	54.780 to 54.805 mm (2.1567 to 2.1577 in.)	
- centre	54.280 to 54.305 mm (2.1370 to 2.1380 in.)	
- rear	53.780 to 53.805 mm (2.1173 to 2.1183 in.)	
Diameter of standard tappet bores in crankcase	15.000 to 15.018 mm (0.5906 to 0.5913 in.)	
Tappet oversizes	0.1 - 0.2 - 0.3 mm (0.0039 - 0.0079 - 0.0188 in.)	

(1) Measured after press-fitting and reaming.
(2) Measure in the area swept by piston rings, both parallel and perpendicular to the crankshaft axis.

CRANKSHAFT AND BEARINGS DATA	mm (inches)	
	3010/5010	4010
Crankshaft	balanced with integral counterweights	
Standard journal diameter	79.791 to 79.810 mm (1) (3.1414 to 3.1421 in.) (1)	
Journal undersizes	0.254 - 0.508 - 0.762 - 1.016 mm (0.0100 - 0.0200 - 0.0300 - 0.0400 in.)	
Standard main bearing shell thickness	2.168 to 2.178 mm (0.0854 to 0.0857 in.)	
Main bearing shell undersizes (internal diameter)	0.254 - 0.508 - 0.762 - 1.016 mm (0.0100 - 0.0200 - 0.0300 - 0.0400 in.)	
Bearing shell to journal clearance	0.034 to 0.103 mm (0.0013 to 0.0040 in.)	
Maximum permitted wear clearance	0.180 mm (0.0071 in.)	
Standard crankpin diameter	63.725 to 63.744 mm (1) (2.5088 to 2.5096 in.) (1)	
Crankpin undersizes	0.254 - 0.508 - 0.762 - 1.016 mm (0.0100 - 0.0200 - 0.0300 - 0.0400 in.)	
Standard big-end bearing shell thickness	1.805 to 1.815 mm (0.710 to 0.0715 in.)	
Big-end bearing shell undersizes (internal diameter)	0.254 - 0.508 - 0.762 - 1.016 mm (0.0100 - 0.0200 - 0.0300 - 0.0400 in.)	
Big-end bearing shell to crankpin clearance	0.033 to 0.087 mm (0.0013 to 0.0034 in.)	
Maximum permitted wear clearance	0.180 mm (0.0071 in.)	
Standard crankshaft thrust washer thickness	3.378 to 3.429 mm (0.1330 to 0.1350 in.)	
Thrust washer oversizes (thickness)	0.127 - 0.254 - 0.381 - 0.508 mm (0.0050 - 0.0100 - 0.0150 - 0.200 in.)	
Width of main bearing including thrust washers	31.766 to 31.918 mm (1.2506 to 1.2638 in.)	
Width of corresponding crankshaft journal	32.000 to 32.100 mm (1.2598 to 1.2638 in.)	
Crankshaft assembly endfloat	0.082 to 0.334 mm (0.0032 to 0.0131 in.)	
Max. permitted wear endfloat	0.40 mm (0.0160 in.)	
Maximum ovality or taper of journals and crankpin after regrinding	0.01 mm (0.0004 in.)	
Maximum ovality or taper of worn journals and crankpin	0.05 mm (0.0020 in.)	

(1) Crankshafts with 0.1 mm (0.0039 in.) undersize journals and crankpins and consequently undersize bearing shells may be fitted in factory production.

(continued)

CRANKSHAFT AND BEARINGS DATA	mm (inches)	
	3010/5010	4010
Maximum tolerance for alignment of crankshaft journals with crankshaft supported on the two outer journals	0.10 mm (0.0039 in.)	
Maximum tolerance for alignment, in both directions, of crankpins (3-cylinder engines) or each pair of crankpins (4-cylinder engines) relative to crankshaft journals	0.25 mm (0.0098 in.)	
Maximum tolerance for run-out between the outer surfaces of the crankshaft journals and the crankshaft centreline	± 0.10 mm (± 0.0039 in.)	
Maximum permitted tolerance on run-out of flywheel mounting flange surface relative to the crankshaft centreline, measured with 1/100 mm scale dial gauge resting on front flange surface (A, Fig. 1-99) at a diameter of 108 mm (total gauge reading).	0.025 mm (0.0098 in.)	
Maximum permitted tolerance on co-axial alignment of flywheel centering seat (B, Fig. 1-99) relative to the crankshaft journals (total gauge reading)	0.040 mm (0.0016 in.)	

CONNECTING ROD DATA	mm (inches)	
	3010/5010	4010
Connecting rods	cast-iron with oil way	
Diameter of small end bushing seat	41.846 to 41.884 mm (1.6475 to 1.6490 in.)	
Outside diameter of small end bushing	41.979 to 42.017 mm (1.6527 to 1.6542 in.)	
Interference between small end bushing and seat	0.095 to 0.171 mm (0.0037 to 0.0067 in.)	
Inside diameter of small end bushing (measured after fitting)	38.004 to 38.014 mm (1.4962 to 1.4966 in.)	
Diameter of big end shell bearing seats	67.407 to 67.422 mm (2.6538 to 2.6544 in.)	
Max. tolerance for parallelism between the small end and big end axes measured at 25 mm (0.984 in.)	± 0.07 mm (± 0.0028 in)	
Max. weight difference between con rods in same engine	25 grams (0.88 oz.)	

PISTON DATA	mm (inches)	
	3010/5010	4010
Pistons	Light alloy with two compression rings and one oil control ring	
Standard piston diameter, measured at 57 mm from base from skirt and perpendicularly to the gudgeon pin axis	99.827 to 99.841 mm (3.9302 to 3.9307 in.)	103.812 to 103.826 mm (4.0871 to 4.0876 in.)
Piston clearance in cylinder liner	0.159 to 0.197 mm (0.0063 to 0.0077 in.)	0.174 to 0.212 mm (0.0068 to 0.0083 in.)
Max. permissible clearance due to wear	0.30 mm (0.012 in.)	
Piston oversizes	0.40 and 0.80 mm (0.016 and 0.032 in.)	
Piston protrusion at TDC from cylinder block face	0.355 to 0.761 mm (0.014 to 0.030 in.)	
Gudgeon pin diameter	37.983 to 37.990 mm (1.4954 to 1.4957 in.)	
Diameter of gudgeon pin seat in piston	37.993 to 8.000 mm (1.4958 to 1.4961 in.)	
Gudgeon pin to seat clearance	0.003 to 0.017 mm (0.0001 to 0.0012 in.)	
Gudgeon pin to small end bearing clearance	0.014 to 0.031 mm (0.0006 to 0.0012 in.)	
Max. permissible clearance due to wear	0.060 mm (0.0024 in.)	
Max. weight difference between pistons in same engine	20 grams (0.70 oz.)	
Piston ring groove clearance (measured vertically):		
- Top	0.090 to 0.122 mm (0.0035 to 0.0048 in.)	
- Second	0.060 to 0.092 mm (0.0024 to 0.0036 in.)	
- Bottom	0.040 to 0.075 mm (0.0016 to 0.0029 in.)	
Max. permissible clearance (wear limit):		
- Top	0.50 mm (0.0197 in.)	
- Second and bottom	0.20 mm (0.0079 in.)	
Piston ring end gap (fitted):		
- Top	0.35 to 0.55 mm (0.0138 to 0.0216 in.)	0.40 to 0.65 mm (0.0157 to 0.0256 in.)
- Second	0.30 to 0.45 mm (0.1180 to 0.0177 in.)	0.30 to 0.55 mm (0.1180 to 0.0216 in.)
- Bottom	0.30 to 0.60 mm (0.1180 to 0.0236 in.)	
Max. permissible gap (wear limit)	1.20 mm (0.0472 in.)	

VALVE TIMING GEAR DATA	mm (inches)	
	3010/5010	4010
Timing gear tooth backlash	0.160 mm (0.0093 in.)	
Inside diameter of intermediate gear bushings (fitted and reamed)	37.050 to 37.075 mm (1.4587 to 1.4596 in.)	
Diameter of intermediate gear journal	36.975 to 37.000 mm (1.4557 to 1.4567 in.)	
Journal to bushing clearance	0.050 to 0.100 mm (0.0020 to 0.0039 in.)	
Max. permissible clearance (wear limit)	0.15 mm (0.0059 in.)	
Busing interference fit in seat in intermediate gear	0.063 to 0.140 mm (0.0025 to 0.0055 in.)	
Outside diameter of camshaft bearings:		
- front	54.875 to 54.930 mm (2.1604 to 2.1626 in.)	
- centre	54.375 to 54.430 mm (2.1407 to 2.1429 in.)	
- rear	53.875 to 53.930 mm (2.1210 to 2.1232 in.)	
Interference between bearings and seats in cylinder block	0.070 to 0.150 mm (0.0028 to 0.0059 in.)	
Inside diameter of camshaft bearings (fitted and reamed):		
- front	51.080 to 51.130 mm (2.0110 to 2.0130 in.)	
- centre	50.580 to 50.630 mm (1.9913 to 1.9933 in.)	
- rear	50.080 to 50.130 mm (1.9716 to 1.9736 in.)	
Diameter of camshaft journals:		
- front	50.970 to 51.000 mm (2.0067 to 2.0079 in.)	
- centre	50.470 to 50.500 mm (1.9870 to 1.9882 in.)	
- rear	49.970 to 50.000 mm (1.9673 to 1.9685 in.)	
Clearance between camshaft journals and bearings	0.080 to 0.160 mm (0.0031 to 0.0063 in.)	
Max. permissible clearance (wear limit)	0.20 mm (0.0079 in.)	
Camshaft endfloat between thrust plate and seat on camshaft	0.070 to 0.220 mm (0.0028 to 0.0087 in.)	

TAPPET DATA	mm (inches)	
	3010/5010	4010
Tappet bore in crankcase	15.000 to 15.018 mm (0.5906 to 0.5913 in.)	
Outside diameter of standard tappet	14.950 to 14.970 mm (0.5886 to 0.5894 in.)	
Tappet running clearance	0.030 to 0.068 mm (0.0012 to 0.0027 in.)	
Max. permissible clearance (wear limit)	0.15 mm (0.0059 in.)	
Tappet oversizes	0.1 - 0.2 - 0.3 mm (0.0039 - 0.0079 - 0.0118 in.)	