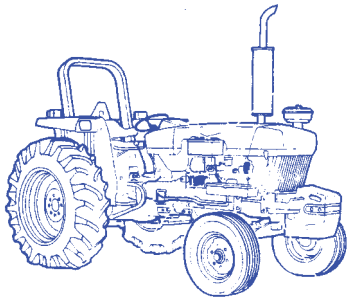


NEW HOLLAND

5610S 6610S 7610S 7010 8010

REPAIR MANUAL

NEW HOLLAND

SERVICE

87032902 4/03

5610S, 6610S, 7610S, 7010, 8010 REPAIR MANUAL COMPLETE CONTENTS

The following pages are the collation of the contents pages from each section and chapter of the 5610S, 6610S, 7610S, 7010, and 8010 Tractor Repair manual. Complete Repair part # 87032901.

The sections used through out all New Holland product Repair manuals may not be used for each product. Each Repair manual will be made up of one or several books. Each book will be labeled as to which sections are in the overall Repair manual and which sections are in each book.

The sections listed above are the sections utilized for the 5610S, 6610S, 7610S, 7010, and 8010 Tractors.

SECTION 00 - GENERAL

BOOK 1 - 87032902

Chapter 1 – General

CONTENTS

SECTION 10 - ENGINE

BOOK 1 - 87032902

Chapter 1 - Diesel Engines

CONTENTS

SECTION 10 - ENGINE

BOOK 1 - 87032902

Chapter 1 - Diesel Engines (Continued)

CONTENTS

SECTION 10 - ENGINE

BOOK 1 - 87032902

Chapter 2 - Engine Cooling System

CONTENTS

SECTION 10 - ENGINE

BOOK 1 - 87032902

Chapter 3 - Air Cleaning System

CONTENTS

SECTION 10 - ENGINE

BOOK 1 - 87032902

Chapter 4 - Fuel System

CONTENTS

SECTION 10 - ENGINE

BOOK 1 - 87032902

Chapter 4 - Fuel System (Continued)

CONTENTS

SECTION 10 - ENGINE

BOOK 1 - 87032902

Chapter 5 - Turbocharger

CONTENTS

SECTION 18 - CLUTCH

BOOK 1 - 87032902

Chapter 1 - Single Clutches

CONTENTS

SECTION 18 - CLUTCH

BOOK 1 - 87032902

Chapter 2 - Servicing Clutch Associated Parts

CONTENTS

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 1 - 87032902

Chapter 1 - 8 x 2 Transmission

CONTENTS

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 1 - 87032902

Chapter 2 - 16 x 4 Dual Command (Dual Power) Transmission

CONTENTS

SECTION 21 - TRANSMISSION SYSTEMS

BOOK 1 - 87032902

Chapter 3 - Reduction Gearbox Assembly

CONTENTS

SECTION 23 - FRONT AXLE TRANSFER BOX

BOOK 1 - 87032902

Chapter 1 - Front Axle Transfer Box

CONTENTS

SECTION 25 - FRONT AXLE–FOUR WHEEL DRIVE

BOOK 1 - 87032902

Chapter 1 - Four Wheel Drive

CONTENTS

SECTION 27 - MECHANICAL REAR WHEEL DRIVE

BOOK 2 - 87032903

Chapter 1 - Rear Axle

CONTENTS

SECTION 27 - MECHANICAL REAR WHEEL DRIVE

BOOK 2 - 87032903

Chapter 1 - Rear Axle (Continued)

CONTENTS

SECTION 31 - POWER TAKE-OFF

BOOK 2 - 87032903

Chapter 1 - Power Take-Off Systems

CONTENTS

SECTION 31 - POWER TAKE-OFF

BOOK 2 - 87032903

Chapter 1 - Power Take-Off Systems (Continued)

CONTENTS

SECTION 33 - BRAKING SYSTEM

BOOK 2 - 87032903

Chapter 1 - Braking System

CONTENTS

SECTION 35 - HYDRAULIC SYSTEM

BOOK 2 - 87032903

Chapter 1 - Hydraulic Circuits

CONTENTS

SECTION 35 - HYDRAULIC SYSTEM

BOOK 2 - 87032903

Chapter 2 - Hydraulic Pumps

CONTENTS

SECTION 35 - HYDRAULIC SYSTEM

BOOK 2 - 87032903

Chapter 3 - Remote Control Circuit

CONTENTS

SECTION 35 - HYDRAULIC SYSTEM

BOOK 2 - 87032903

Chapter 4 - Component Overhaul

CONTENTS

SECTION 35 - HYDRAULIC SYSTEM

BOOK 2 - 87032903

Chapter 5 - Adjustments and Testing

CONTENTS

SECTION 41 - STEERING SYSTEM

BOOK 2 - 87032903

Chapter 1 - Hydrostatic Steering System

CONTENTS

SECTION 41 - STEERING SYSTEM

BOOK 2 - 87032903

Chapter 2 - Component Overhaul

CONTENTS

SECTION 44 - FRONT AXLE–TWO WHEEL DRIVE

BOOK 2 - 87032903

Chapter 1 - Two Wheel Drive

CONTENTS

SECTION 55 - ELECTRICAL SYSTEMS

BOOK 2 - 87032903

Chapter 1 - Description, Operation and Overhaul

CONTENTS

SECTION 55 - ELECTRICAL SYSTEMS

BOOK 2 - 87032903

Chapter 1 - Description, Operation and Overhaul (Continued)

CONTENTS

SECTION 55 - ELECTRICAL SYSTEMS

BOOK 2 - 87032903

Chapter 2 - Alternator and Charging System

CONTENTS

SECTION 55 - ELECTRICAL SYSTEMS

BOOK 2 - 87032903

Chapter 3 - Starting Motor and System

CONTENTS

SECTION 55 - ELECTRICAL SYSTEMS

BOOK 2 - 87032903

Chapter 4 - Battery, Servicing and Testing

CONTENTS

SECTION 55 - ELECTRICAL SYSTEMS

BOOK 2 - 87032903

Chapter 5 - Electrical System Diagrams

CONTENTS

GENERAL INSTRUCTIONS

IMPORTANT NOTICE

All maintenance and repair operations described in this manual should be carried out exclusively by New Holland authorised workshops. All instructions should be carefully observed and special equipment where indicated should be used.
Anyone who carries out service operations described without carefully observing these prescriptions will be directly responsible for any damage caused.

NOTES FOR EQUIPMENT

Equipment which NEW HOLLAND proposes and shows in this manual is:

- 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 life.

NOTICES

The words “front”, “rear”, “right hand”, and “left hand” refer to the different parts as seen from the operator’s seat oriented to the normal direction of movement of the tractor.

HEALTH AND SAFETY

CONTENTS

HEALTH AND SAFETY PRECAUTIONS

Many of the procedures associated with vehicle maintenance and repair involve physical hazards or other risks to health. This section lists, alphabetically, some of these hazardous operations and the materials and equipment associated with them. The precautions necessary to avoid these hazards are identified.

The list is not exhaustive and all operations and procedures and the handling of materials, should be carried out with health and safety in mind.

ACIDS AND ALKALIS - see Battery acids, e.g. caustic soda, sulfuric acid.

Used in batteries and cleaning materials.

Irritant and corrosive to the skin, eyes, nose and throat. Causes burns.

Avoid splashes to the skin, eyes and clothing. Wear suitable protective gloves and goggles. Can destroy ordinary protective clothing. Do not breathe mists.

Ensure access to water and soap is readily available for splashing accidents.

ADHESIVES AND SEALERS - see Fire

Highly Flammable, Flammable, combustible.

Generally should be stored in "No Smoking" areas; cleanliness and tidiness in use should be observed, e.g. disposable paper covering benches; should be dispensed from applicators where possible; containers, including secondary containers, should be labelled.

Solvent based Adhesives/Sealers - See Solvents.

Follow manufacturers instructions.

Water based Adhesives/Sealers

Those based on polymer emulsions and rubber lattices may contain small amounts of volatile toxic and harmful chemicals. Skin and eye contact should be avoided and adequate ventilation provided during use.

Follow manufacturers instructions.

Resin based Adhesives/Sealers - e.g. epoxide and formaldehyde resin based.

Mixing should only be carried out in well ventilated areas as harmful or toxic volatile chemicals may be released.

Skin contact with uncured resins and hardeners can result in irritation; dermatitis and absorption of toxic or harmful chemicals through the skin. Splashes can damage the eyes.

Provide adequate ventilation and avoid skin and eye contact. Follow manufacturers instructions.

Anaerobic, Cyanoacrylate and other Acrylic Adhesives

Many are irritant, sensitizing or harmful to the skin. Some are eye irritants.

Skin and eye contact should be avoided and the manufacturers instructions followed.

Cyanoacrylate adhesives (super-glues) must not contact the skin or eyes. If skin or eye tissue is bonded cover with a clean moist pad and get medical attention. do not attempt to pull tissue apart. Use in well ventilated areas as vapours can cause irritation of the nose and eyes.

For two-pack systems see Resin based adhesives/ sealers.

Isocyanate (Polyurethane) Adhesives/ Sealers - see Resin based Adhesives.

Individuals suffering from asthma or respiratory allergies should not work with or near these materials as sensitivity reactions can occur.

Any spraying should preferably be carried out in exhaust ventilated booths removing vapours and spray droplets from the breathing zone. Individuals working with spray applications should wear supplied air respirators.

ANTIFREEZE - see Fire, Solvents e.g. Isopropanol, Ethylene Glycol, Methanol.

Highly Flammable, Flammable, Combustible.

Used in vehicle coolant systems, brake air pressure systems, screenwash solutions.

Vapours given off from coolant antifreeze (glycol) arise only when heated.

Antifreeze may be absorbed through the skin in toxic or harmful quantities. Antifreeze if swallowed is fatal and medical attention must be found immediately.

ARC WELDING - see Welding.

BATTERY ACIDS - see Acids and Alkalis.

Gases released during charging are explosive. Never use naked flames or allow sparks near charging or recently charged batteries.

BRAKE AND CLUTCH FLUIDS (Polyalkylene Glycols) - see Fire.

Combustible.

Splashes to the skin and eyes are slightly irritating. Avoid skin and eye contact as far as possible. Inhalation of vapour hazards do not arise at ambient temperatures because of the very low vapour pressure.

BRAZING - see Welding.

CHEMICAL MATERIALS - GENERAL - see Legal Aspects.

Chemical materials such as solvents, sealers, adhesives, paints, resin foams, battery acids, antifreeze, brake fluids, oils and grease should always be used with caution and stored and handled with care. They may be toxic, harmful, corrosive, irritant or highly inflammable and give rise to hazardous fumes and dusts.

The effects of excessive exposure to chemicals may be immediate or delayed; briefly experienced or permanent; cumulative; superficial; life threatening; or may reduce life-expectancy.

DO'S

Do remove chemical materials from the skin and clothing as soon as practicable after soiling. Change heavily soiled clothing and have it cleaned.

Do carefully read and observe hazard and precaution warnings given on material containers (labels) and in any accompanying leaflets, poster or other instructions. Material health and safety data sheets can be obtained from Manufacturers.

Do organise work practices and protective clothing to avoid soiling of the skin and eyes; breathing vapours/aerosols/dusts/fumes; inadequate container labelling; fire and explosion hazards.

Do wash before job breaks; before eating, smoking, drinking or using toilet facilities when handling chemical materials.

Do keep work areas clean, uncluttered and free of spills.

Do store according to national and local regulations.

Do keep chemical materials out of reach of children.

DO NOTS

Do Not mix chemical materials except under the manufacturers instructions; some chemicals can form other toxic or harmful chemicals; give off toxic or harmful fumes; be explosive when mixed together.

Do Not spray chemical materials, particularly those based on solvents, in confined spaces e.g. when people are inside a vehicle.

Do Not apply heat or flame to chemical materials except under the manufacturers' instructions. Some are highly inflammable and some may release toxic or harmful fumes.

Do Not leave containers open. Fumes given off can build up to toxic, harmful or explosive concentrations. Some fumes are heavier than air and will accumulate in confined areas, pits etc.

Do Not transfer chemical materials to unlabelled containers.

Do Not clean hands or clothing with chemical materials. Chemicals, particularly solvents and fuels will dry the skin and may cause irritation with dermatitis. Some can be absorbed through the skin in toxic or harmful quantities.

Do Not use emptied containers for other materials, except when they have been cleaned under supervised conditions.

Do Not sniff or smell chemical materials. Brief exposure to high concentrations of fumes can be toxic or harmful.

Clutch Fluids - see Brake and Clutch Fluids.

Clutch Linings and Pads - see Brake and Clutch Linings and Pads.

CORROSION PROTECTION MATERIALS - see Solvents, Fire.

Highly flammable, flammable.

These materials are varied and the manufacturers instructions should be followed. They may contain solvents, resins, petroleum products etc. Skin and eye contact should be avoided. They should only be sprayed in conditions of adequate ventilation and not in confined spaces.

Cutting - see Welding.

De-Waxing - see Solvents and Fuels (Kerosene).

DUSTS

Powder, dusts or clouds may be irritant, harmful or toxic. Avoid breathing dusts from powdery chemical materials or those arising from dry abrasion operations. Wear respiratory protection if ventilation is inadequate.

ELECTRIC SHOCK

Electric shocks can result from the use of faulty electrical equipment or from the misuse of equipment even in good condition.

Ensure that electrical equipment is maintained in good condition and frequently tested.

Ensure that flexes, cables, plugs and sockets are not frayed, kinked, cut, cracked or otherwise damaged.

Ensure that electric equipment is protected by the correct rated fuse.

Never misuse electrical equipment and never use equipment which is in any way faulty. The results could be fatal.

Use reduced voltage equipment (110 volt) for inspection and working lights where possible.

Ensure that the cables of mobile electrical equipment cannot get trapped and damaged, such as in a vehicle hoist.

Use air operated mobile equipment where possible in preference to electrical equipment.

In cases of electrocution:-

- switch off electricity before approaching victim

- if this is not possible, push or drag victim from source of electricity using dry non-conductive material

- commence resuscitation if trained to do so

- SUMMON MEDICAL ASSISTANCE

EXHAUST FUMES

These contain asphyxiating, harmful and toxic chemicals and particles such as carbon oxides, nitrogen oxides, aldehydes, lead and aromatic hydrocarbons. Engines should only be run under conditions of adequate extraction or general ventilation and not in confined spaces.

Gasolene (Petrol) Engine

There may not be adequate warning properties of odour or irritation before immediate and delayed toxic or harmful effects arise.

Diesel Engine

Soot, discomfort and irritation usually give adequate warning of hazardous fume concentrations.

FIBRE INSULATION - see Dusts.

Used in noise and sound insulation.

The fibrous nature of surfaces and cut edges can cause skin irritation. This is usually a physical and not a chemical effect.

Precautions should be taken to avoid excessive skin contact through careful organisation of work practices and the use of gloves.

FIRE - see Welding, Foams, Legal Aspects.

Many of the materials found on or associated with the repair of vehicles are highly flammable. Some give off toxic or harmful fumes if burnt.

Observe strict fire safety when storing and handling flammable materials or solvents, particularly near electrical equipment or welding processes.

Ensure before using electrical or welding equipment but that there is no fire hazard present.

Have a suitable fire extinguisher available when using welding or heating equipment.

FIRST AID

Apart form meeting any legal requirements it is desirable for someone in the workshop to be trained in first aid procedures.

Splashes in the eye should be flushed with clean water for at least ten minutes.

Soiled skin should be washed with soap and water.

Inhalation affected individuals should be removed to fresh air immediately.

If swallowed or if effects persist consult a doctor with information (label) on material used.

Do not induce vomiting (unless indicated by manufacturer).

FOAMS - Polyurethane - see Fire.

Used in sound and noise insulation. Cured foams used in seat and trim cushioning.

Follow manufacturers instructions.

Unreacted components are irritating and may be harmful to the skin and eyes. Wear gloves and goggles.

Individuals with chronic respiratory diseases, asthma, bronchial medical problems or histories of allergic diseases should not work with or near uncured materials.

The components, vapours, spray mists can cause direct irritation, sensitivity reactions and may be toxic or harmful.

Vapours and spray mists must not be breathed. These materials must be applied with adequate ventilation and respiratory protection. Do not remove respirator immediately after spraying, wait until vapour/ mists have cleared.

Burning of the uncured components and the cured foams can generate toxic and harmful fumes.

Smoking, open flames or the use of electrical equipment during foaming operations and until vapours/mists have cleared should not be allowed. Any heat cutting of cured foams or partially cured foams should be conducted with extraction ventilation (see Body Section 44 Legal and Safety Aspects).

FUELS - see Fire, Legal Aspects, Chemicals - General, Solvents.

Used as fuels and cleaning agents.

Gasolene (Petrol).

Highly flammable.

Swallowing can result in mouth and throat irritation and absorption from the stomach can result in drowsiness and unconsciousness. Small amounts can be fatal to children. Aspiration of liquid into the lungs, e.g. through vomiting, is a very serious hazard.

Gasolene dries the skin and can cause irritation and dermatitis on prolonged or repeated contact. Liquid in the eye causes severe smarting.

Motor gasolene may contain appreciable quantities of benzene, which is toxic upon inhalation and the concentrations of gasolene vapours must be kept very low. High concentrations will cause eye, nose and throat irritation, nausea, headache, depression and symptoms of drunkeness. Very high concentrations will result in rapid loss of consciousness.

Ensure there is adequate ventilation when handling and using gasolene. Great care must be taken to avoid the serious consequences of inhalation in the event of vapour build up arising from spillages in confined spaces.

Special precautions apply to cleaning and maintenance operations on gasolene storage tanks.

Gasolene should not be used as a cleaning agent. It must not be siphoned by mouth.

Kerosene (Paraffin)

Used also as heating fuel, solvent and cleaning agent.

Flammable.

Irritation of the mouth and throat may result from swallowing. The main hazard from swallowing arises if liquid aspiration into the lungs occurs. Liquid contact dries the skin and can cause irritation or dermatitis. Splashes in the eye may be slightly irritating.

In normal circumstances the low volatility does not give rise to harmful vapours. Exposure to mists and vapours from kerosene at elevated temperatures should be avoided (mists may arise in de-waxing). Avoid skin and eye contact and ensure there is adequate ventilation.

Gas-Oil (Diesel Fuel) - see Fuels (Kerosene).

Combustible.

Gross or prolonged skin contact with high boiling gas oils may also cause serious skin disorders including skin cancer.

GAS CYLINDERS - see Fire.

Gases such as oxygen, acetylene, carbon dioxide, argon and propane are normally stored in cylinders at pressures of up to 2000 lb/sq. in. (13,790 kn/m^2) and great care should be taken in handling these cylinders to avoid mechanical damage to them or to the valve gear attached. The contents of each cylinder should be clearly identified by appropriate markings.

Cylinders should be stored in well ventilated enclosures, and protected from ice and snow, or direct sunlight. Fuel gases (e.g. acetylene and propane) should not be stored in close proximity to oxygen cylinders.

Care should be exercised to prevent leaks from gas cylinders and lines, and to avoid sources of ignition.

Only trained personnel should undertake work involving gas cylinders.

Gases - see Gas Cylinders.

Gas Shielded Welding - see Welding.

Gas Welding - see Welding.

GENERAL WORKSHOP TOOLS AND EQUIPMENT

It is essential that all tools and equipment are maintained in good condition and the correct safety equipment used where required.

Never use tools or equipment for any purpose other than that for which they were designed.

Never overload equipment such as hoists, jacks, axle and chassis stands or lifting slings. Damage caused by overloading is not always immediately apparent and may result in a fatal failure the next time that the equipment is used.

Do not use damaged or defective tools or equipment, particularly high speed equipment such as grinding wheels. A damaged grinding wheel can disintegrate without warning and cause serious injury.

Wear suitable eye protection when using grinding, chiselling or sand blasting equipment.

Wear a suitable breathing mask when using sand blasting equipment, working with asbestos based materials or using spraying equipment.

Glues - see Adhesives and Sealers.

High Pressure Air, Lubrication and Oil Test Equipment - see Lubricants and Greases.

Always keep high pressure equipment in good condition and regularly maintained, particularly at joints and unions.

Never direct a high pressure nozzle at the skin as the fluid may penetrate to the underlying tissue etc. and cause serious injury.

LEGAL ASPECTS

Many laws and regulations make requirements relating to health and safety in the use of materials and equipment in workshops. Some of these laws which apply in the U.K. are listed. Similar laws exist for other territories:-

- The Factories Act (1961).
- The Asbestos Regulations (1969).
- Highly Flammable Liquids and Liquified Petroleum Gases Regulations (1972).
- Deposit of Poisonous Waste Act (1972).
- Control of Pollution Act (1974).
- Health and Safety at Work Act (1974).
- The Packaging and Labelling of Dangerous Substances Regulations (1978).
- Control of Lead Regulations (1981).

Workshops should be familiar, in detail, with these and associated laws and regulations. Consult local factory inspectorate if in any doubt.

LUBRICANTS AND GREASES

Avoid all prolonged and repeated contact with mineral oils, especially used oils. Used oils contaminated during service (e.g. routine service change sump oils) are more irritating and more likely to cause serious effects including skin cancer in the event of gross and prolonged skin contact.

Wash skin thoroughly after work involving oil. Proprietary hand cleaners may be of value provided they can be removed from the skin with water. Do not use petrol, paraffin or other solvents to remove oil from the skin.

Lubricants and greases may be slightly irritating to the eyes.

Repeated or prolonged skin contact should be avoided by wearing protective clothing if necessary. Particular care should be taken with used oils and greases containing lead. Do not allow work clothing to be contaminated with oil. Dry clean or launder such clothing at regular intervals. Discard oil soaked shoes.

Do not employ used engine oils as lubricants or for any application where appreciable skin contact is likely to occur. Used oils may only be disposed of in accordance with local regulations, e.g. in the U.K., the Control of Pollution Act.

There are publications describing the problems and advising on precautionary measures. For the U.K. these include:

SHW 295:	Effects of mineral oil on the skin
SHW 295A:	Cancer of the skin caused by oil
SHW 397:	Cautionary notice: Effects of mineral oil on the skin

Noise Insulation Materials - see Foams, Fibre Insulation.

PAINTS - see Solvents and Chemical Materials - General.

Highly Flammable, Flammable.

One Pack. Can contain harmful or toxic pigments, driers and other components as well as solvents. Spraying should only be carried out with adequate ventilation.

Two Pack. Can also contain harmful and toxic unreacted resins and resin hardening agents. The manufacturers instructions should be followed and the section of page 05-2 on resin based adhesives, isocyanate containing Adhesives and Foams should be consulted.

Spraying should preferably be carried out in exhausted ventilated booths removing vapour and spray mists from the breathing zone. Individuals working in booths should wear respiratory protection.

Those doing small scale repair work in the open shop should wear supplied air respirators.

Paint Thinners - see Solvents.

Petrol - see Fuels (Gasolene).

Pressurised Equipment - see High Pressure Air, Lubrication and Oil Test Equipment.

Resistance Welding - see Welding.

Sealers - see Adhesives and Sealers.

SOLDER - see Welding.

Solders are mixtures of metals such that the melting point of the mixture is below that of the constituent metals (normally lead and tin). Solder application does not normally give rise to toxic lead fumes, provided a gas/air flame is used. Oxy-acetylene flames should not be used, as they are much hotter and will cause lead fumes to be evolved.

Some fumes may be produced by the application of any flame to surfaces coated with grease etc. and inhalation of these should be avoided.

Removal of excess solder should be undertaken with care, to ensure that fine lead dust is not produced, which can give toxic effects if inhaled. Respiratory protection may be necessary.

Solder spillage and filing should be collected and removed promptly to prevent general air contamination by lead.

High standards of personal hygiene are necessary in order to avoid indigestion of lead or inhalation of solder dust from clothing.

SOLVENTS - see Chemical Materials - General Fuels (Kerosene), Fire.

e.g. Acetone, white spirit, toluene, xylene, trichlorethane.

Used in cleaning materials, de-waxing, paints, plastics, resins, thinners etc.

Highly Inflammable, Flammable.

Skin contact will degrease the skin and may result in irritation and dematitis following repeated or prolonged contact. Some can be absorbed through the skin in toxic or harmful quantities.

Splashes in the eye may cause severe irritation and could lead to loss of vision.

Brief exposure to high concentrations of vapours or mists will cause eye and throat irritation, drowziness, dizziness, headaches and in the worst circumstances, unconsciousness.

Repeated or prolonged exposures to excessive but lower concentrations of vapours or mists, for which there might not be adequate warning indications, can cause more serious toxic or harmful effects.

Aspiration into the lungs (e.g. through vomiting) is the most serious consequence of swallowing.

Avoid splashes to the skin, eyes and clothing. Wear protective gloves, goggles and clothing if necessary.

Ensure good ventilation when in use, avoid breathing fumes, vapours and spray mists and keep containers tightly sealed. Do not use in confined spaces.

When the spraying material contains solvents, e.g. paints, adhesives, coatings, use extraction ventilation or personal respiratory protection in the absence of adequate general ventilation.

Do not apply heat or flame except under specific and detailed manufacturers instructions.

Sound Insulation - see Fibre Insulation, Foams.

Spot Welding - see Welding.

SUSPENDED LOADS.

There is always a danger when loads are lifted or suspended. Never work under an unsupported suspended or raised load, e.g. jacked up vehicle, suspended engine, etc.

Always ensure that lifting equipment such as jacks, hoists, axle stands, slings, etc. are adequate and suitable for the job, in good condition and regularly maintained.

Never improvise lifting tackle.

Underseal - see Corrosion Protection.

WELDING - see Fire, Electric Shock, Gas Cylinders.

Welding processes include Resistance Welding (Spot Welding), Arc Welding and Gas Welding.

Resistance Welding

This process may cause particles of molten metal to be emitted at high velocity and the eyes and skin must be protected.

Arc Welding

This process emits a high level of ultraviolet radiation which may cause eye and skin burns to the welder and to other persons nearby. Gas-shielded welding processes are particularly hazardous in this respect. Personal protection must be worn, and screens used to shield other people.

Metal spatter will also occur and appropriate eye and skin protection is necessary.

The heat of the welding arc will produce fumes and gases from the metals being welded and from any applied coatings or contamination on the surfaces being worked on. These gases and fumes may be toxic and inhalation should always be avoided. The use of extraction ventilation to remove the fumes from the working area may be necessary, particularly in cases where the general ventilation is poor, or where considerable welding work is anticipated. In extreme cases where adequate ventilation cannot be provided, supplied air respirators may be necessary.

Gas Welding

Oxy-acetylene torches may be used for welding and cutting and special care must be taken to prevent leakage of these gases, with consequent risk of fire and explosion.

The process will produce metal spatter and eye and skin protection is necessary.

The flame is bright and eye protection should be used, but the ultra-violet emission is much less than that from arc welding, and lighter filters may be used.

The process itself produces few toxic fumes, but such fumes and gases may be produced from coatings on the work, particularly during cutting away of damaged body parts and inhalation of the fumes should be avoided.

In brazing, toxic fumes may be evolved from the metals in the brazing rod, and a severe hazard may arise if brazing rods containing cadmium are used. In this event particular care must be taken to avoid inhalation of fumes and expert advice may be required.

SPECIAL PRECAUTIONS MUST BE TAKEN BEFORE ANY WELDING OR CUTTING TAKES PLACE ON VESSELS WHICH HAVE CONTAINED COMBUSTIBLE MATERIALS, E.G. BOILING OR STEAMING OUT OF FUEL TANKS.

White Spirit - see Solvents.

FEDERAL EMISSIONS WARRANTY

(North America Only)

(California owner's emissions warranty is covered elsewhere)

New Holland warrants that your new 1996 and later heavy-duty off-road diesel engine was designed, built, and equipped to conform to applicable U.S. Environmental Protection Agency regulations for a period of use of five years or 3,000 hours of operation, whichever occurs first.

The new model year, class of diesel engine, and emission application determination for your engine are identified on the emission control information label affixed to the top of your engine's rocker arm cover. The warranty period begins on the date the new equipment is sold to the first retail purchaser.

Any emission control system parts which are proven defective during normal use will be repaired or replaced during the warranty period. The warranty repairs and service will be performed by any authorized New Holland dealer at the dealer's place of business, with no charge for parts or labor (including diagnosis).

As the engine owner, you are responsible to perform all the required maintenance listed in your owner's manual. New Holland will not deny an emission warranty claim solely because you have no record of maintenance; however, a claim may be denied if your failure to perform maintenance resulted in the failure of a warranted part. Receipts covering regular maintenance should be retained in the event of questions and these receipts should be passed on to each subsequent owner of the engine.

It is recommended replacement parts used for maintenance or repairs be New Holland Service Parts to maintain the quality originally designed into your emission certified engine. The use of non-New Holland parts does not invalidate the warranty on other components unless the use of such parts causes damage to warranted parts.

New Holland wishes to assure the emission control systems warranty is being properly administered. If you believe you have not received the service entitled to under this warranty, you should contact the nearest New Holland Branch Office for assistance.

Service Department
New Holland North America, Inc.
500 Diller Avenue
New Holland, PA 17557
(717) 355-1121

Please note that the Emission Warranty does not cover:

1. Systems and parts that were not first installed on the new equipment or engine as original equipment by New Holland.
2. Part malfunctions caused by abuse, misuse, improper adjustment, modification, alteration, tampering, disconnection, improper or inadequate maintenance, or use of non-recommended fuels and lubricating oils.
3. Accident caused damage, acts of nature, or other events beyond New Holland's control.
4. Replacement of expendable items made in connection with scheduled maintenance.
5. Parts requiring replacement, inspection or adjustment maintenance intervals for reasons other than being defective.
6. Parts which are not New Holland Service Parts.
7. Loss of time, inconvenience, loss of use of equipment/engine or commercial loss.
8. Equipment with altered or disconnected hourmeter where the hours cannot be determined.
9. Equipment normally operated outside the United States.
10. Non-defective parts replaced by other than New Holland dealers.

Coverage

This emission control system warranty applies to the following emission control parts.

Fuel Injection Pump
Fuel Injectors
Turbocharger
Intake Manifold
Exhaust Manifold
Boost Pressure Tubing-connection to Aneroid Device ON F.I.P.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT

(North America Only)
(California Only)

Your Warranty Rights and Obligations

The California Air Resources Board and New Holland are pleased to explain the emission control system warranty on your engine. In California, new 1997 and later heavy-duty off-road engines from 100 to 150 HP must be designed, built, and equipped to meet the State's stringent anti-smog standards. New Holland must warrant the emission control system on your engine for the periods of time listed below, provided there has been no abuse, neglect, or improper maintenance of your engine.

Your emission control system includes parts such as the fuel injection system and the air induction system.

Where a warrantable condition exists, New Holland will repair your heavy-duty off-road engine at no cost to you, including diagnosis, parts, and labor.

Manufacturer's Warranty Coverage:

The 1997 and later heavy-duty off-road engines are warranted from the original date of delivery for five years or 3,000 hours of operation, whichever occurs first. If any emission-related part on your engine is defective, the part will be repaired or replaced by New Holland.

Owner's Warranty Responsibilities:

- As the heavy-duty off-road engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. New Holland recommends that you retain all receipts covering maintenance on your heavy-duty off-road engine, but New Holland cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.
- As the heavy-duty off-road engine owner, you should, however, be aware that New Holland may deny you warranty coverage if your heavy-duty off-road engine or a part has failed due to abuse, neglect, improper maintenance, or unapproved modifications.
- Your engine is designed to operate on commercially available diesel fuel only. Use of any other fuel may result in your engine no longer operating in compliance with California's emissions requirements.
- You are responsible for initiating the warranty process. The ARB suggests that you present your heavy-duty off-road engine to a New Holland dealer as soon as a problem exists. The warranty repairs should be completed by the dealer as expeditiously as possible.

If you have questions regarding your warranty rights and responsibilities, you should contact your Branch Office at the address and phone number listed on the Owner Assistance page of your equipments operator manual.

- Prior to the expiration of the warranty, you must give notice of any failure of an emission control warranted part. Such notice must be given to New Holland or an authorized dealer, and you must deliver the engine to the repair location.
- You, the owner, are responsible for incidental costs incurred by yourself or your employees as a result of a warrantable failure. Examples of such costs are communication expenses, meals and lodging.
- The owner is responsible for any business costs or losses, any "downtime" expenses and any "cargo" damage which result from the failure of a warranted part. New Holland is not responsible for other incidental or consequential damages, including but not limited to fines, theft, vandalism or collisions.

Parts covered:

This emission control system warranty applies to the following emission control parts.

Fuel Injection Pump
Fuel Injectors
Turbocharger
Intake Manifold
Exhaust Manifold
Boost Pressure Tubing-connection to Aneroid Device ON F.I.P.

Any replacement part, equivalent in performance and durability, may be used in the performance of any maintenance or repairs and must be provided without charge to the owner. The use of these parts does not reduce the warranty obligations of New Holland. However, New Holland recommends the use of new, genuine New Holland service parts or New Holland approved rebuilt parts and assemblies. New Holland also recommends that the engine be serviced by a New Holland authorized dealer.

New Holland Responsibilities

Warranty work will be provided at no charge to the owner at any authorized dealer, using new genuine New Holland service parts or New Holland approved rebuilt parts or assemblies..

The owner will not be charged for diagnostic labor which leads to the determination that a warranted part is defective, if the diagnostic work was performed at a warranty station.

New Holland is liable for damages to other engine components caused by the failure under warranty of any warranted part.

Warranty Limitations

New Holland is not responsible for failures resulting from abuse or neglect by owner or operator.

New Holland warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built, and equipped so as to conform with all applicable regulations adopted by the Air Resources Board, and that it is free from defects in materials and workmanship which cause the failure of a warranted part.

Any warranted part which is not scheduled for replacement as required maintenance, or which is scheduled only for regular inspection to the effect of "repair or replace as necessary" is warranted for the warranty period.

Any warranted part which is scheduled for replacement as required maintenance is warranted for the period of time prior to the first scheduled replacement point for that part.

New Holland is liable for damages to other engine components caused by the failure under warranty of any warranted part.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements ("**DANGER**", "**WARNING**", and "**CAUTION**") followed by specific instructions. These precautions are intended for the personal safety of you and those working with you. Please take the time to read them.

⚠ DANGER ⚠

This word "DANGER" indicates an immediate hazardous situation that, if not avoided, will result in death or serious injury. The color associated with Danger is RED.

⚠ WARNING ⚠

This word "WARNING" indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. The color associated with Warning is ORANGE.

⚠ CAUTION ⚠

This word "CAUTION" indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

FAILURE TO FOLLOW THE "DANGER", "WARNING", AND "CAUTION" INSTRUCTIONS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

MACHINE SAFETY

The precautionary statement ("**IMPORTANT**") is followed by specific instructions. This statement is intended for machine safety.

IMPORTANT: *The word "IMPORTANT" is used to inform the reader of something he needs to know to prevent minor machine damage if a certain procedure is not followed.*

INFORMATION

NOTE: *Instructions used to identify and present supplementary information.*

SAFETY

PRECAUTIONARY STATEMENTS

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read the following precautions before operating this equipment. Equipment should be operated only by those who are responsible and instructed to do so.

Carefully review the procedures given in this manual with all operators. It is important that all operators be familiar with and follow safety precautions.

THE TRACTOR

1. Read the Operator's Manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Only allow properly trained and qualified persons to operate the tractor.
3. To prevent falls, use the handrails and step plates when getting on and off the tractor. Keep steps and platform clear of mud and debris.
4. Do not permit anyone but the operator to ride on the tractor unless a passenger seat is fitted. There is no safe place for extra riders otherwise.
5. Replace all missing, illegible or damaged safety decals.
6. Keep safety decals free of dirt or grime.
7. Do not modify or alter or permit anyone else to modify or alter the tractor or any of its components or any tractor function without first consulting your dealer.
8. Tractor wheels are very heavy. Handle with care and ensure, when stored, that they cannot fall.

DRIVING THE TRACTOR

1. Always sit in the drivers seat while starting or driving the tractor.
2. When driving on public roads, have consideration for other road users. Pull in to the side of the road occasionally to allow any following traffic to pass. Do not exceed the legal speed limit set in your area.
3. Use low beam lights when meeting a vehicle at night. Make sure the lights are adjusted to prevent blinding the drive of an oncoming vehicle
4. Reduce speed before turning or applying the brakes. Ensure that both brake pedals are locked together when traveling at road speeds or when on public roads. Brake both wheels simultaneously when making an emergency stop.
5. Use extreme caution and avoid hard application of the tractor brakes when towing heavy loads at road speeds.
6. Any towed vehicle whose total weight exceeds that of the towing tractor must be equipped with brakes for safe operation.
7. Never apply the differential lock when turning. When engaged, the differential lock will prevent the tractor from turning.
8. Always check overhead clearance, specifically when transporting the tractor. Watch where you are going, especially at low overhanging obstacles.
9. Use extreme caution when operating on steep slopes.
10. To avoid overturns, drive the tractor with care and at speeds compatible with safety, especially when operating over rough ground, when crossing ditches or slopes and when turning overturning.
11. If the tractor becomes stuck or the tires are frozen to the ground, reverse the tractor out to prevent corners.
12. Keep the tractor in the same gear when going downhill as would be used when going uphill. Do not coast or freewheel down hills.

OPERATING THE TRACTOR

1. Apply the parking brake, place the PTO control in the 'OFF' position, the lift control lever in the down position, the remote control valve levers in the neutral position and the transmission lever in neutral before starting the tractor.
2. Do not start the engine or operate controls while standing beside the tractor. Always sit in the tractor seat when starting the engine or operating the controls.

3. Do not bypass the neutral start switches. Consult your authorized dealer if your neutral start controls malfunction. Use jump cables only in the recommended manner. Improper use can result in a tractor runaway.
4. Avoid accidental contact with the gear shift levers while the engine is running. Unexpected tractor movement can result from such contact.
5. Do not get off the tractor while it is in motion.
6. Shut off the engine and PTO and apply the parking brake before getting off the tractor.
7. Do not park the tractor on a steep incline.
8. Do not run the tractor engine in an enclosed building without adequate ventilation. Exhaust fumes are toxic and can cause death.
9. Always wear a protective mask when working with toxic spray chemicals. Follow the directions on the chemical container.
10. If the power steering or engine ceases operating, stop the tractor immediately as the tractor will be more difficult to control.
11. Stop the engine and relieve pressure before connecting or disconnecting hydraulic, steering or fuel lines.
12. Tighten all connections before starting the engine or pressurizing lines.
13. Pull only from the swinging drawbar or the lower link drawbar in the lowered position . Use only a drawbar pin that locks in place. Pulling from the tractor rear axle or any point above the axle may cause the tractor to overturn.
14. If the front end of the tractor tends to rise when heavy implements are attached to the three-point hitch, install front end or front wheel weights. Do not operate the tractor with a light front end.
15. Always select Position Control when attaching implements and when transporting equipment. Be sure hydraulic couplers are properly installed and will disconnect safety in case of accidental detachment of the implement.
16. Do not leave equipment in the raised position when the vehicle is stopped or unattended.
17. Ensure any attached equipment or accessories are correctly installed, are approved for use with the tractor, do not overload the tractor and are operated and maintained in accordance with the instructions issued by the equipment or accessory manufacturer.
18. Remember that your tractor, if abused or incorrectly used, can be dangerous and become a hazard both to the operator and to bystanders. Do not overload or operate with attached equipment which is unsafe, not designed for the particular task or is poorly maintained.
19. The tractor is designed to provide the minimum noise level at the operator's ears and meets or exceeds applicable standards in this respect. However, noise (sound pressure level) in the workplace can exceed 86 dB(A) when working between buildings or in confined spaces. Therefore, it is recommended that operators wear suitable ear protectors during vehicle operation.

OPERATING THE PTO

1. When operating PTO driven equipment, shut off the engine and wait until the PTO stops before getting off the tractor and disconnecting the equipment.
2. Do not wear loose clothing when operating the power take-off or especially when near rotating equipment.
3. When operating stationary PTO driven equipment, always apply the tractor parking brake and block the rear wheels front and back.
4. To avoid injury, do not clean, adjust, unclog or service PTO driven equipment when the tractor engine is running.
5. Make sure the PTO guard is in position at all times and always replace the PTO cap when the PTO is not in use.

SERVICING THE TRACTOR

1. The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow the pressure to escape before removing the cap entirely.
2. Do not smoke while refueling the tractor. Keep any type of open flame away. Wait for the engine to cool before refueling.
3. Keep the tractor and equipment, particularly brakes and steering, maintained in a reliable and satisfactory condition to ensure your safety and comply with legal requirements.
4. To prevent fire or explosion, keep open flames away from battery or cold weather starting aids. To prevent sparks which could cause explosion, use jumper cables according to instructions.
5. Stop the engine before performing any service on the tractor.

6. Escaping diesel/hydraulic fluid under pressure can penetrate the skin causing serious injury.
   - **Do not** use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.
   - Stop the engine and relieve pressure before connecting or disconnecting lines.
   - Tighten all connections before starting the engine.
   - If fluid is injected into the skin obtain medical attention immediately.
7. Do not modify or alter or permit anyone else to modify or alter the tractor or any of its components or any tractor function without first consulting an authorized dealer.
8. The fuel oil in the injection system is under high pressure and can penetrate the skin. Unqualified persons should not remove or attempt to adjust a pump, injector, nozzle or any other part of the injection system. Failure to follow these instructions can result in serious injury.
9. Continuous long term contact with used engine oil my cause skin cancer. Avoid prolonged contact with used engine oil. Wash skin promptly with soap and water.

DIESEL FUEL

1. Under no circumstances should gasoline, alcohol or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. In a closed container such as a fuel tank these blends are more explosive than pure gasoline. Do not use these blends.
2. Never remove the fuel cap or refuel with the engine running or hot.
3. Do not smoke while refueling the tractor or when standing near fuel. Keep any type of open flame away. Wait for the engine to cool before refueling.
4. Maintain control of the fuel filter pipe nozzle when filling the tank.
5. Do not fill the fuel tank to capacity. Allow room for expansion.
6. Wipe up spilled fuel immediately.
7. Always tighten the fuel tank cap securely.
8. If the original fuel tank cap is lost, replace it with an approved cap. A non-approved cap may not be safe.
9. Keep equipment clean and properly maintained.
10. Do not drive equipment near open fires.
11. Never use fuel for cleaning purposes.
12. Arrange fuel purchases so that summer grade fuels are not used in the winter.

ROPS

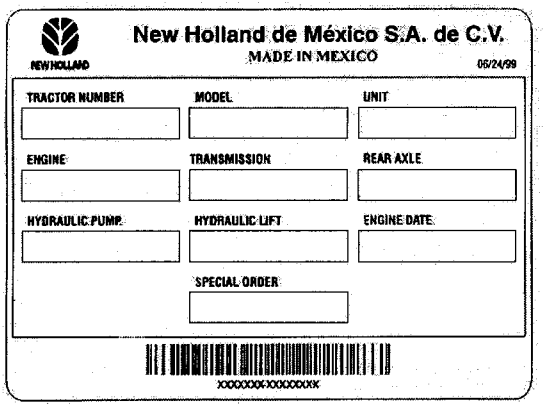
The tractor may be equipped with a safety frame (ROPS) which must be maintained in a serviceable condition. Be careful when driving through doorways or working in confined spaces with low headroom.

1. Do not modify, drill, weld or alter the ROPS in any way.
2. Never attempt to straighten or weld the ROPS or retaining brackets, which have suffered damage. By doing so you may weaken the structure and endanger your safety.
3. Do not secure any parts on the ROPS or attach it with other than the special high tensile bolts and nuts specified.
4. Never attach chains or ropes to the safety frame or roll bar for pulling purposes.
5. Never take unnecessary risks even though your safety frame or roll bar affords you the maximum protection possible.
6. Whenever possible, operate with the ROPS in its fully upright and locked position.

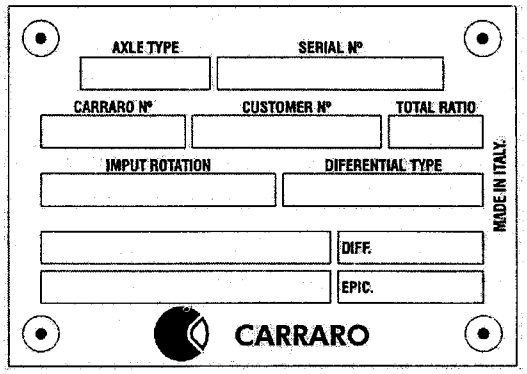
IDENTIFICATION DECALS

A vehicle identification plate is located under the tractor hood. In addition, if your tractor is equipped with optional four wheel drive, a similar plate is affixed to the rear surface of the front axle housing.

For convenience, the numbers shown on the plates should be recorded and given to your authorized New Holland dealer in the event the tractor requires service.



Vehicle Identification Plate



Front Axle Identification Plate

20024998

SAFETY DECALS

(North America Only)

The following safety decals have been placed on your machine in the areas indicated. They are intended for your personal safety and for those working with you. Please take this manual and walk around your machine to note the content and location of these warning signs.

Keep the decals legible. If they are not, obtain replacements from your authorized dealer. The decal replacement part numbers are listed with each decal.