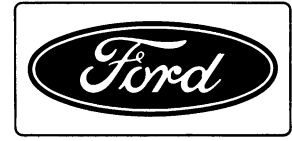


FORD



Service Manual

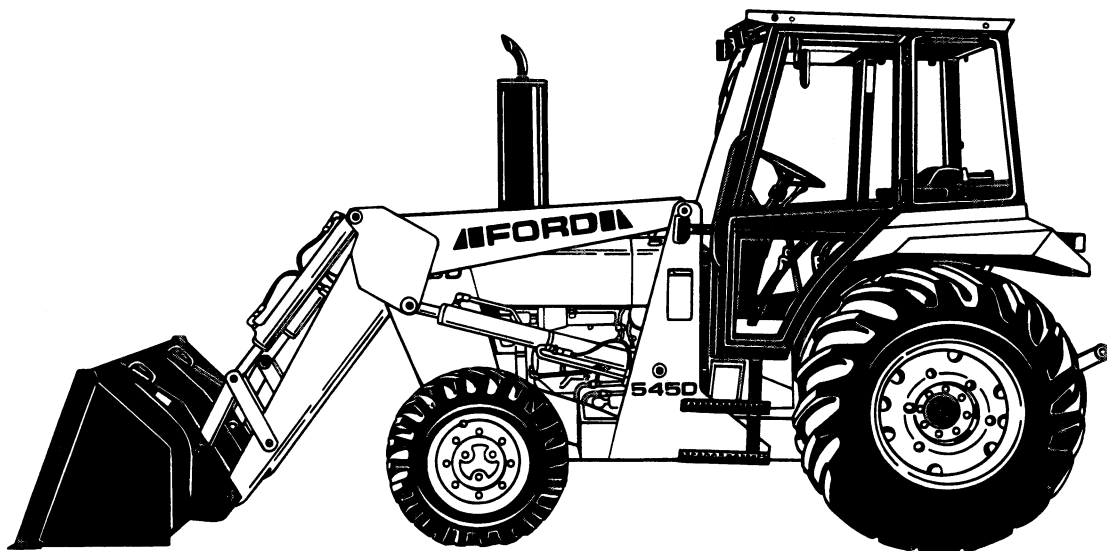
Tractor
250C, 260C

Tractor Loader
345D, 445D, 545D

Section 1 – Engine Systems
Section 2 – Fuel Systems
Section 3 – Electrical System

Vol. 1

40025050A



Reprinted

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INTRODUCTION

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all equipment as well as the personal safety of the individual doing the work. This Service Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help insure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing equipment, as well as in the skill of the individual doing the work. This manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this manual must first establish that he does not compromise his own personal safety nor the safety of others by his choice of methods or tools.

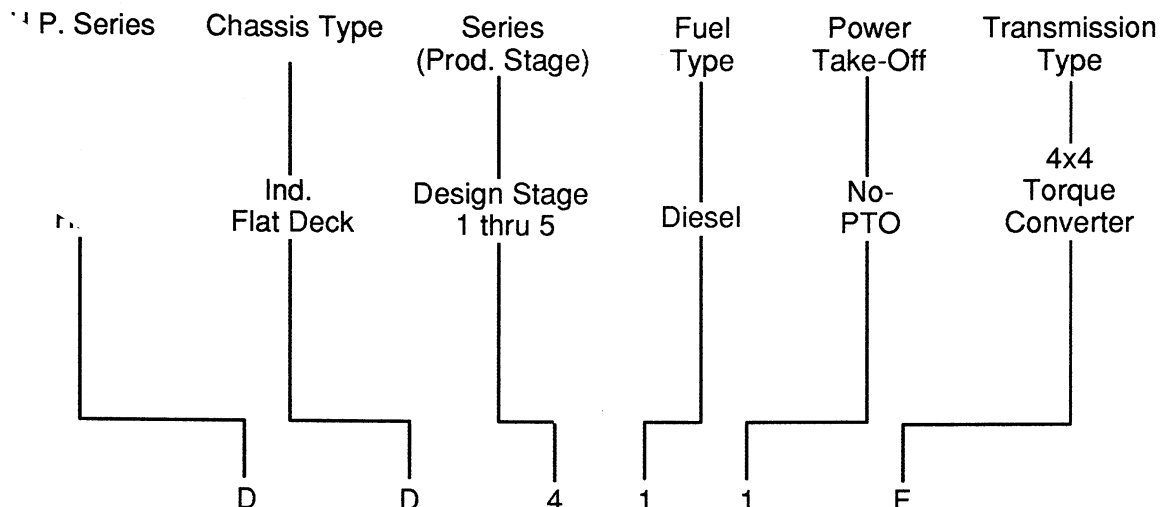
As you read through this manual, you will come across NOTES and WARNINGS. Each one is there for a specific purpose. NOTES are given to prevent you from making an error

that could damage the vehicle. WARNINGS remind you to be especially careful in those areas where carelessness can cause personal injury.

Any reference in this manual to right, left, rear, front, top or bottom is as viewed from the operator's seat looking forward towards the loader.

Ford New Holland policy is one of continuous improvement, and the right to change prices, specifications, equipment or design at any time without notice is reserved. All data in this manual is subject to production variations, so overall dimensions and weights should be considered as approximate only, and the illustrations do not necessarily depict the tractor as it is.

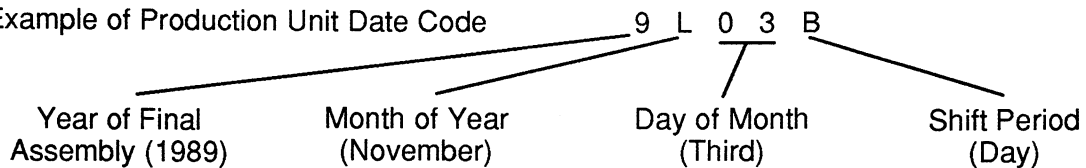
MODEL NUMBER - CODE



KEY TO PRODUCTION DATE CODES

First Number Year	First Letter Month	Second Number DAY OF MONTH	Second Letter PRODUCTION SHIFT
8 - 1988	A - Jan	01-32	A - Midnight
9 - 1989	B - Feb		B - Day
0 - 1990	C - March		C - Afternoon
1 - 1991	D - April		
2 - 1992	E - May		
3 - 1993	F - June		
4 - 1994	G - July		
	H - Aug		
	J - Sept		
	K - Oct		
	L - Nov		
	M - Dec		

Example of Production Unit Date Code



PRECAUTIONARY STATEMENTS

PERSONAL SAFETY

Throughout this manual and on machine decals, you will find precautionary statements (“CAUTION”, “WARNING”, and “DANGER”) 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.



CAUTION: THE WORD “CAUTION” IS USED WHERE A SAFE BEHAVIORAL PRACTICE ACCORDING TO OPERATING AND MAINTENANCE INSTRUCTIONS AND COMMON SAFETY PRACTICES WILL PROTECT THE OPERATOR AND OTHERS FROM ACCIDENT INVOLVEMENT.



WARNING: THE WORD “WARNING” DENOTES A POTENTIAL OR HIDDEN HAZARD WHICH HAS A POTENTIAL FOR SERIOUS INJURY. IT IS USED TO WARN OPERATORS AND OTHERS TO EXERCISE EVERY APPROPRIATE MEANS TO AVOID A SURPRISE INVOLVEMENT WITH MACHINERY.



DANGER: THE WORD “DANGER” DENOTES A FORBIDDEN PRACTICE IN CONNECTION WITH A SERIOUS HAZARD.

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

MACHINE SAFETY

Additional precautionary statements (“ATTENTION” and “IMPORTANT”) are followed by specific instructions. These statements are intended for machine safety.

ATTENTION: The word “ATTENTION” is used to warn the operator of potential machine damage if a certain procedure is not followed.

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.

SAFETY PRECAUTIONS

Practically all service work involves the need to drive the tractor. The operator's manual, supplied with each tractor, contains detailed safety precautions relating to driving, operating and servicing the tractor. These precautions are as applicable to the service technician as they are to the operator, and should be read, understood and practiced by all personnel.

Prior to undertaking any maintenance, repair, overhaul, dismantling or reassembly operations, whether within a workshop facility or out in the field, consideration should be given to factors that may have an effect upon safety - not only upon the mechanic carrying out the work, but also upon bystanders.

PERSONAL CONSIDERATIONS

Clothing

The wrong clothes or carelessness in dress can cause accidents. Check to see that you are suitably clothed.

Some jobs require special protective equipment.

Eye Protection

The smallest eye injury many cause loss of vision. Wear eye protection when engaged in chiseling, grinding, discing, welding, and painting.

Breathing Protection

Fumes, dust and paint spray are unpleasant and harmful. Wear respiratory protection.

Hearing Protection

Loud noise may damage your hearing, and the greater the exposure the worse the damage. Wear ear protection.

Hand Protection

It is advisable to use a protective cream before work to prevent irritation and skin contamination. After work clean your hands with soap and water. Solvents such as mineral spirit and paraffin may harm the skin.

Foot Protection

Wear protective footwear with reinforced toe-caps to protect your feet from falling objects. Additionally oil-resistant soles will help to avoid slipping.

Special Clothing

For certain work it may be necessary to wear flame- or acid- resistant clothing.

Avoid injury through incorrect handling of components. Make sure you are capable of lifting the object. If in doubt get help.

EQUIPMENT CONSIDERATIONS

Machine Shields

Before using any machine, check to be sure that the machine shields are in position and serviceable. These shields not only prevent parts of the body or clothing from coming into contact with the moving parts of the machine, but also ward off objects that might fly off the machine and cause injury.

Lifting Appliances

Always be sure that lifting equipment, such as chains, slings, lifting brackets, hooks and eyes are thoroughly checked before use. If in doubt, select stronger equipment than is necessary.

Never stand under a suspended load or raised implement.

Compressed Air

The pressure from a compressed air line is often as high as 100 lbf/in² (6.9 bar) (7 kgf/cm²). It is safe if used correctly. Any misuse may cause injury.

Never use compressed air to blow dust or dirt away from your work area unless the correct type of nozzle is used.

Compressed air is not a cleaning agent; it will only move dust and dirt from one place to another. Look around before using an air hose as bystanders may get grit in their eyes, ears or skin.

Hand Tools

Many cuts, abrasions and injuries are caused by defective or improvised tools. Never use the wrong tool for the job, as this generally leads to some injury or to a poor job.

Never use:

A hammer with a loose head or split handle.

Spanners or wrenches with worn jaws.

Spanners or files as hammers; or drills, clevis pins, or bolts as punches.

Use a copper or brass drift, rather than a hammer, for removing or replacing hardened pins.

For dismantling, overhaul and reassembly of major and sub-components, always use the Special Service Tools recommended. These will reduce the work effort, labor time and the repair cost.

Always keep tools clean and in good working order.

Electricity

Electricity has become so familiar in day to day usage, that its potentially dangerous properties are often overlooked. Misuse of electrical equipment can endanger life.

Before using any electrical equipment - particularly portable appliances - make a visual check to be sure that the cable is not worn or frayed and that the plugs and sockets are intact. Make sure you know where the nearest disconnect switch is located for your equipment.

GENERAL CONSIDERATIONS

Solvents

Use only cleaning fluids and solvents that are known to be safe. Certain types of fluid can cause damage to components, such as seals, and can cause skin irritation. Check to be sure

that solvents are suitable not only for the cleaning of components and individual parts, but also that they do not affect the personal safety of the user.

Housekeeping

Many injuries result from tripping or slipping over, or on, objects or material left lying around by a careless worker. Prevent these accidents from occurring. If you notice a hazard, don't ignore it - remove it.

A clean, hazard-free place of work improves the surroundings and daily environment for everybody.

Fire

Fire has no respect for persons or property. The destruction that a fire can cause is not always fully realized. Everyone must be constantly on guard.

- Extinguish matches, cigars, and cigarettes before throwing them away.
- Work cleanly, disposing of waste material into proper containers.
- Locate the fire extinguishers and find out how to operate them.
- Do not allow or use an open flame near the tractor fuel tank, battery or component parts.

First Aid

In the type of work that mechanics are engaged in, dirt, grease, and fine dusts all settle upon the skin and clothing. What appears at first to be trivial could become painful and injurious. It only takes a few minutes to have a fresh cut dressed, but it will take longer if you neglect it. Make sure you know where the First Aid box is located.

Cleanliness

Cleanliness of the tractor hydraulic system is essential for optimum performance. When carrying out service and repairs, plug all hose ends and component connections to prevent dirt entry.

Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficiency and working life of a component and lead to costly replacement. Use of a high pressure washer or steam cleaner is recommended.

OPERATIONAL CONSIDERATIONS

Stop the engine, if at all possible, before performing any service.

Place a warning sign on units which, due to service or overhaul, would be dangerous to start. Disconnect the battery leads if leaving such a unit unattended.

Do not attempt to start the engine while standing beside the unit or attempt to bypass the safety start switch.

Avoid prolonged running of the engine in a closed building or in an area with inadequate ventilation as exhaust fumes are highly toxic.

Always turn the radiator cap to the first stop, to allow pressure in the system to dissipate when the coolant is hot.

Never work beneath a tractor which is on soft ground. Always take the unit to an area which has a hard working surface.

If it is necessary to raise the tractor for ease of servicing or repair, be sure that safe and stable supports are installed, beneath axle housings, casings, etc., before beginning.

Certain repair or overhaul procedures may necessitate separating the tractor, either at the engine/front transmission or front transmission/rear transmission locations. These operations are simplified by the use of the tractor splitting kit/stands. Should this

equipment not be available, then every consideration must be given to stability balance and weight of the components, especially if a cab is installed.

Use footsteps or working platforms when servicing those areas of a tractor that are not within easy reach.

Before loosening any hoses or tubes connecting implements to remote control valves, etc., switch off the engine, remove all pressure in the lines by operating levers several times. This will remove the danger of personal injury by oil pressure.

Prior to pressure testing, be sure that all hoses and connectors, not only of the tractor, but also those of the test equipment are in good condition and tightly secured. Pressure readings must be taken with the gauges specified. The correct procedure should be rigidly observed to prevent damage to the system or the equipment, and to eliminate the possibility of personal injury.

When equipment or implements are required to be attached to the hydraulic linkage, either for testing purposes or for transportation, then "position control" should be used.

Always lower the loader and backhoe buckets to the ground or engage the safety locks before leaving the tractor.

If high lift attachments are mounted to a unit, beware of overhead power, electric or telephone cables when traveling. Keep the attachment near to ground level to increase stability.

Do not park or attempt to service a unit on an incline. If unavoidable, take extra care and block all wheels.

Prior to removing wheels and tires from a unit, check to determine whether additional ballast (liquid or weights) has been added. Seek assistance and use suitable equipment to support the weight of the wheel assembly.

When inflating tires, beware of over inflation - constantly check the pressure. Over inflation can cause tires to burst and result in personal injury.

Safety precautions are usually the result of a sad experience, where most likely someone has paid dearly through personal injury.

Observe these precautions and you will protect yourself accordingly. Disregard them and you may duplicate the sad experience of others.

Safety is everybody's responsibility.

SERVICE TECHNIQUES

Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficient working life of a component and lead to costly replacement.

Time spent on the preparation and cleanliness of working surfaces will pay dividends in making the job easier and safer and will result in overhauled components being more reliable and efficient in operation.

Use cleaning fluids which are known to be safe. Certain types of fluid can cause damage to O rings and cause skin irritation. Solvents should be checked that they are suitable for the cleaning of components and also that they do not risk the personal safety of the user.

Replace O rings, seals or gaskets whenever they are disturbed. Never mix new and old seals or O rings, regardless of condition. Always lubricate new seals and O rings with hydraulic oil before installation.

When replacing component parts use the correct tool for the job.

Hoses and Tubes

Always replace hoses and tubes if the cone end or the end connections are damaged.

When installing a new hose, loosely connect each end and make sure the hose takes up the designed position before tightening the connection. Clamps should be tightened sufficiently to hold the hose without crushing and to prevent chafing.

The hoses are the arteries of the unit; be sure they are in good condition when carrying out repairs or maintenance, otherwise the machine's output and productivity will be affected.

After hose replacement to a moving component, check the hose does not foul by moving the component through the complete range of travel.

Be sure any hose which has been installed is not kinked or twisted.

Hose connections which are damaged, dented, crushed or leaking, restrict oil flow and the productivity of the components being served. Connectors which show signs of movement from the original swaged position have failed, and will ultimately separate completely.

A hose with a chafed outer cover will allow water entry. Concealed corrosion of the wire reinforcement will subsequently occur along the hose length with resultant hose failure.

Ballooning of the hose indicates an internal leakage due to structural failure. This condition rapidly deteriorates and total hose failure soon occurs.

Kinked, crushed, stretched or deformed hoses generally suffer internal structural damage which can result in oil restriction, a reduction in the speed of operation and ultimate hose failure.

Free-moving, unsupported hoses must never be allowed to touch each other or related working surfaces. This causes chafing which reduces hose life.

SECTION 1

ENGINE SYSTEMS

3-CYLINDER DIESEL ENGINE

DESCRIPTION AND OPERATION

This Section describes the overhaul and repair of the 3-cylinder direct injection diesel engine.

The engine, Figure 1-1, features a cross flow cylinder head with the inlet and exhaust manifolds on opposite sides of the head. The combustion chamber is formed in the crown of the piston which has three compression and one oil control ring all located above the piston pin with the exception of the Models 260C and 545D, which has two compression and one oil control ring.

The cylinder head assembly incorporates the valves, valve springs and the spring retainers. Valve guides are an integral part of the cylinder head with replaceable valve seats pressed into the valve ports.

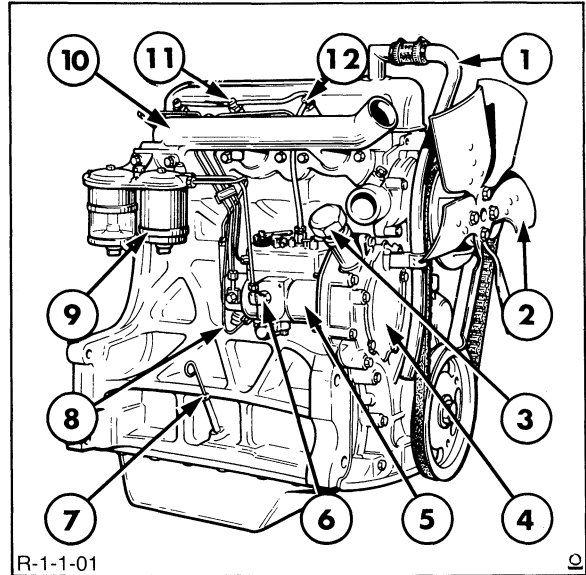


FIGURE 1-1

3-Cylinder Diesel Engine With DPA Distributor Type Fuel Injection Pump

- | | |
|---------------------------|---------------------------|
| 1 Ventilation tube | 7 High pressure fuel pipe |
| 2 Fan | 8 Starter motor |
| 3 Oil filler cap | 9 Fuel filters |
| 4 Timing cover | 10 Inlet manifold |
| 5 Injection pump | 11 Rocker cover |
| 6 Low pressure fuel inlet | 12 Injector |

GENERAL SPECIFICATIONS

The following chart shows the 3-cylinder diesel engine options available.

Model	250C, 345D	445D	260C, 545D
No. of Cylinders	3	3	3
Bore	4.4" (111.8 mm)	4.4" (111.8 mm)	4.4" (111.8 mm)
Stroke	4.4" (106.7 mm)	4.4" (10.67 mm)	4.4" (111.8 mm)
Displacement	201 in ³ (3247 cm ³)	201 in ³ (3247 cm ³)	201 in ³ (3247 cm ³)*

*The 260C and 545D uses the headland piston



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