

FC23
Front Cut Mower
Workshop Service Manual

MASSEY FERGUSON®
FC23
Front Cut Mower
4283355M1
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Massey Ferguson®

**FC23
Front Cut Mower**

**WORKSHOP SERVICE MANUAL
4283355M1**

01 - Introduction

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INTRODUCTION

INTRODUCTION

This service manual has been prepared with the latest service information available at the time of publication. Read the service manual carefully before doing any service on the compact tractor. This manual is one of the most important tools available to the service technician.

Right-hand and left-hand, as used in this manual, is determined by facing the direction the machine will travel when in use.

The photos, illustrations, and data used in this manual were current at the time of printing, but due to possible production changes, your machine can vary slightly. The Manufacturer reserves the right to redesign and change the machine as necessary without notification.



WARNING: Some pictures in this manual show the machine with shields or guards removed to allow for a better view of the subject of the picture. All shields and guards must be in position before operating the machine.

TO THE DEALERS

This manual was developed to provide the best possible information, technical support and service to the customer. Review the Table of Contents and basic layout to become familiar with locations of pertinent information such as maintenance table, specifications and etc.

REPLACEMENT PARTS

To receive efficient service, always remember to give the dealer the following information:

- Correct part description or part number.
- Model number of your machine.
- Serial number of your machine.

UNITS OF MEASUREMENT

Measurements are given in metric units followed by the equivalent in US units. Hardware sizes are given in millimeters for metric hardware and inches for US hardware.

TABLE OF CONTENTS

A Table of Contents is in the front of this manual. The Table of Contents shows the divisions. The individual divisions also have a Table of Contents.

PAGE NUMBERS

All page numbers are made of two numbers separated by a dash, such as 01-25. The number before the dash is the division number. The number following the dash is the page number in that division. Page numbers will be at the lower right or left of each page.

Introduction

SAFETY PRECAUTIONS

The safety of the operator is one of the main concerns in designing and developing a new machine. Designers build in as many safety features as possible. However, every year many accidents occur which could have been avoided by a few seconds of thought and a more careful approach to handling equipment.

It is YOUR responsibility to read and understand the safety section in this manual before operating your machine. You must follow these safety instructions that take you step by step through your working day.

Remember that YOU are the key to safety. Good safety practices not only protect you, but also the people around you. Study the features in this manual and make them a working part of your safety program. Keep in mind that this safety section is written only for this type of machine. Practice all other usual and customary safe working precautions, and above all - REMEMBER - SAFETY IS YOUR RESPONSIBILITY. YOU CAN PREVENT SERIOUS INJURY OR DEATH.

In order to provide a better view, certain photographs or illustrations in this manual may show an assembly with a safety shield removed. However, the equipment should never be operated in this condition. Keep all shields in place. If shield removal becomes necessary for repairs, replace shield prior to further operation.

SAFETY ALERT SYMBOL

This safety alert symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

FIG. 1: The safety alert symbol identifies important safety messages on machines, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

ACCIDENTS DISABLE and KILL

ACCIDENTS are COSTLY

ACCIDENTS can be AVOIDED

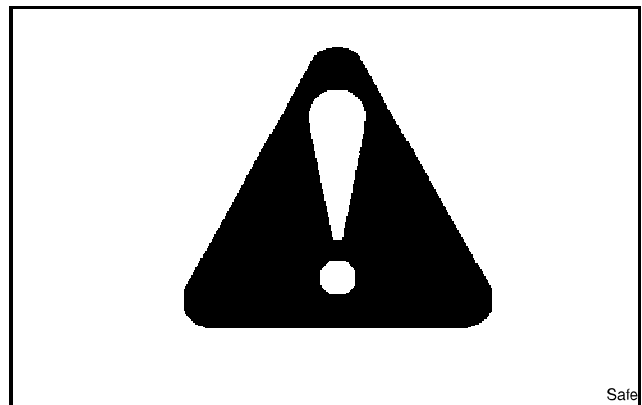


FIG. 1

SIGNAL WORDS

The words DANGER, WARNING or CAUTION are used with the safety alert symbol. Learn to recognize these safety alerts, and follow the recommended precautions and safe practices.



DANGER: indicates an imminently hazardous situation that, if not avoided, will result in **DEATH OR VERY SERIOUS INJURY**.



WARNING: indicates an imminently hazardous situation that, if not avoided, could result in **DEATH OR SERIOUS INJURY**.



CAUTION: indicates an imminently hazardous situation that, if not avoided, could result in **MINOR INJURY**.

The following words and instructions are not related to personal safety but are used throughout this book to give you additional tips as you operate or service this equipment.

IMPORTANT: indicates a special instruction or procedure that, if not strictly followed, may cause damage to, or destruction of the machine, the process, or the surroundings.

NOTE: indicates additional information about a subject or procedure for more efficient or convenient operation or repair.

Safety Signs



WARNING: DO NOT remove or obscure Danger, Warning, Caution or Instruction signs. Replace any Danger, Warning, Caution or Instruction signs that are not readable or are missing. Replacement signs are available from you Dealer in the event of loss or damage. The actual location of these Safety signs is illustrated in this Operator's Instruction Book.

If a used machine has been purchased, refer to the illustrations at the end of this section to ensure that all the safety signs are in the correct position and are readable.

Introduction

GENERAL SAFETY RULES



WARNING: An operator should not use alcohol or drugs which can affect their alertness or coordination. An operator on prescription or 'over the counter' drugs needs medical advice on whether or not he or she can properly operate equipment.

Always keep this Operator Instruction Book with the machine. This book must be made available to the operator of the machine at all times.

FIG. 2: Read this book carefully and learn how to use the machine correctly. Become familiar with the operation of the mower, the controls, safety and instructional signs.

Do not let anyone operate this machine without thorough instruction and training.

DO NOT operate this machine unless you are trained.

This Operator Instruction Book is compiled to cover correct working practices that are associated with the basic mower operation.

The Operator Instruction Book does not cover operation and safety instructions relevant to all known attachments that may be used at the time of machine delivery or at some future date.

It is essential that operators only use approved implements and attachments, and understand the relevant instruction manuals.

NEVER let children or untrained people operate or service the equipment.

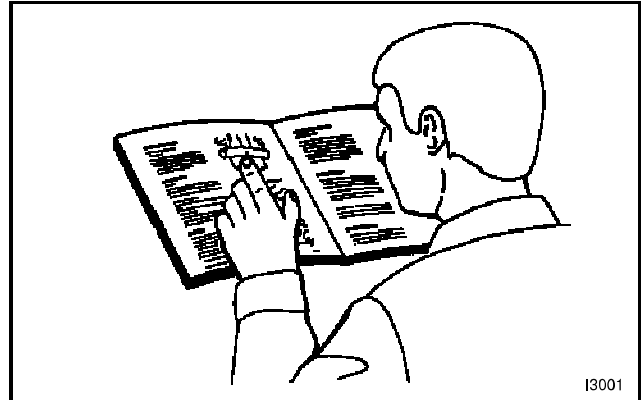


FIG. 2

Roll-Over Protective Structure (ROPS)

ROPS are effective in reducing injuries during overturns. Overturning a mower without ROPS or with the ROPS folded down can result in serious injury or death. Operate with ROPS folded down only when conditions make this necessary. Return ROPS to upright, locked position as soon as conditions permit.

FIG. 3: DO NOT weld, drill or alter the ROPS.

If the mower has been rolled over or the ROPS frame has been damaged in any manner, the ROPS must be replaced. Do not attempt to repair a damaged ROPS. If damage does occur, consult your Dealer and replace all damaged parts.

Before using the machine ensure that the ROPS frame is not damaged and that it is securely fastened to the machine.

DO NOT attach chains, ropes or cables to the ROPS for pulling purposes - damage to the ROPS and/or overturn of the machine may result.

Observe all recommendations and instructions regarding the installation of covers or roofs which are to be used as SUNSHIELDS ONLY and do not afford the operator protection from falling objects.

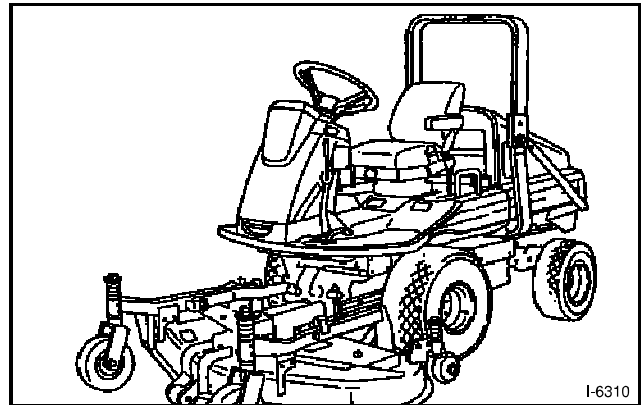


FIG. 3

I-6310

Seat Belt Usage

Always wear the seat belt, correctly adjusted, during mower operation unless operating with the ROPS folded down. Do not wear the seat belt when ROPS is folded down.

Check the seat belt for damage. A damaged seat belt must be replaced.

Fastening Seat Belt

FIG. 4: The seat belt for this machine is located beside the seat. Sit in the seat, adjust the seat belt length, and fit the latch into the buckle.

Releasing Seat Belt

The seat belt can be released by pushing down on the buckle. Properly store the seat belt beside the seat.

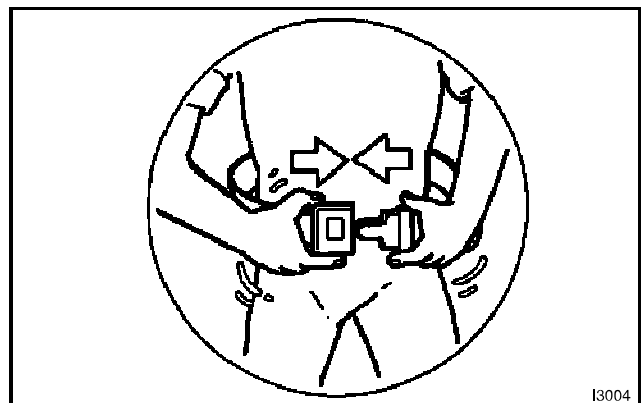


FIG. 4

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Introduction

Protect Yourself

FIG. 5: Always wear protective clothing and appropriate safety equipment

Wear all the protective clothing and personal protective devices issued to you or called for by job conditions.

You may need:

- A hard hat.
- Safety glasses, goggles, or face shield.
- Hearing protection.
- Respirator or filter mask.
- Inclement weather clothing.
- Reflective clothing.
- Heavy gloves (neoprene for chemicals, leather for rough work).
- Protective footwear.
- Other specialized protective gear.

DO NOT wear loose clothing, jewelry, or long hair as this may catch on moving parts of the machine causing injury.

Additional Equipment

FIG. 6: A fire extinguisher and first aid box must be carried with the machine or be kept readily available at all times. Consult your Dealer.

Note where fire extinguishers and first-aid or emergency equipment are kept and get to know where to get help in a hurry. Make sure you know how to use this equipment.

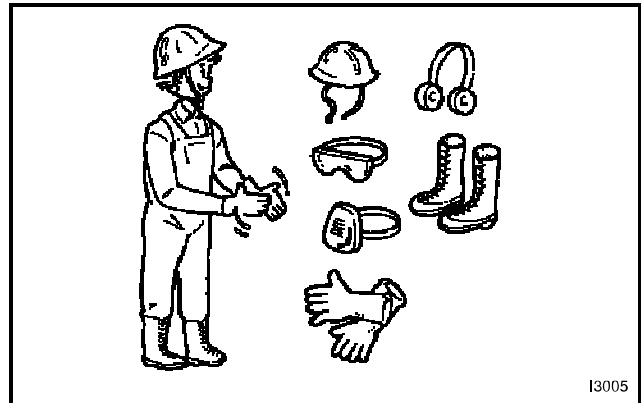


FIG. 5

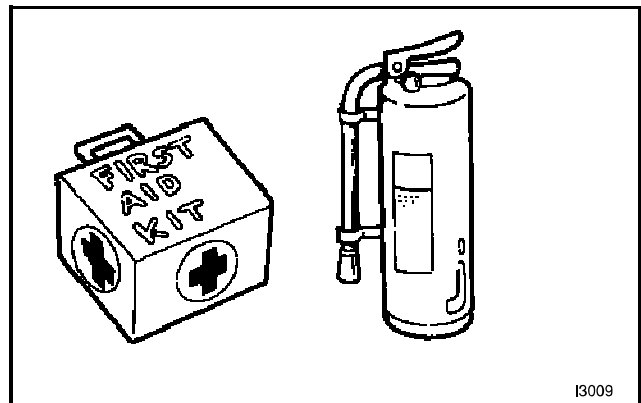


FIG. 6

General Operational Safety Rules

FIG. 7: DO NOT carry passengers.

DO NOT permit others, especially children, to ride on the mower or on any implement or attachment connected to, or installed on mower.



FIG. 7

FIG. 8: When dismounting and/or leaving the operator's seat FOR ANY REASON, always:

1. Disengage PTO.
2. Shut off engine.
3. Lower the mower deck to the ground.
4. Apply the parking brake.
5. Place the control levers in the outward neutral locked position.
6. Remove the key and take the key with you.

Do not attempt to service machine, clear obstructions or unplug blockages with the engine running. Always shut off engine and allow all motion to cease.

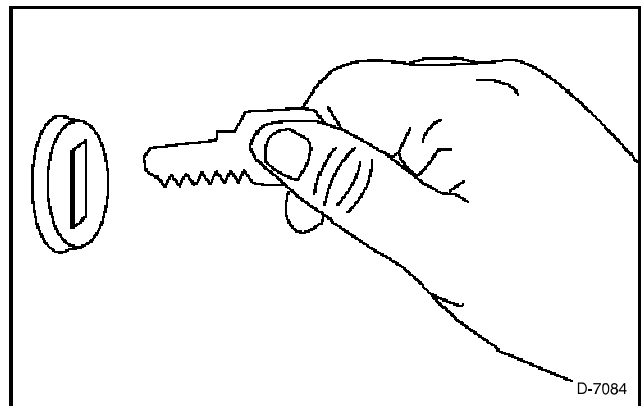


FIG. 8

Introduction

FIG. 9: Keep clear of all rotating components. Be especially observant of areas of discharge, intake or other mechanical motion.

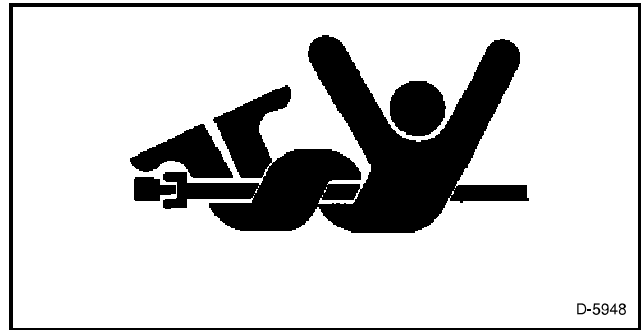


FIG. 9

FIG. 10: Keep clear of rotating blades.

DO NOT put hands or feet under, or into mower with engine running.

Be aware that rotating one blade can cause other blades to rotate.

Keep all shields and guards in place.

Never raise the mower deck with the blades operating.

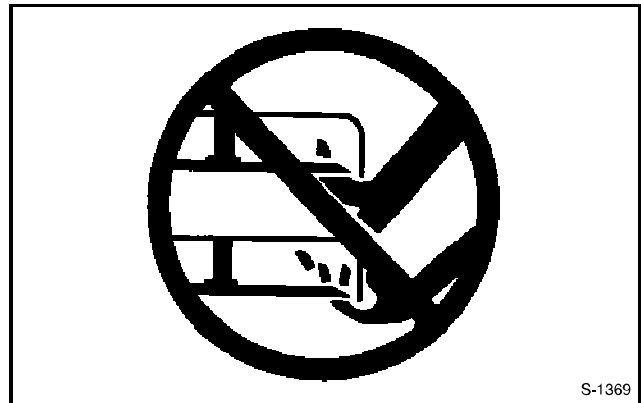


FIG. 10

FIG. 11: Keep clear of mower discharge. This mower has the capability of throwing objects far distances.

Never operate the mower without either the discharge chute or the entire grass collection system in place.

Keep discharge chute lowered and secured, or operate only with an approved grass catcher in place.

DO NOT direct mower discharge toward bystanders, pets and buildings. Keep children and other persons clear of the work area.

Beware of bystanders, particularly children. Always look around to make sure that everyone is away from the area before starting the engine or moving the machine. This is particularly important with higher noise levels as you may not hear people shouting.



FIG. 11

GENERAL INFORMATION

FIG. 12: Model name and identification number

The name plate, which gives the model name, type, production serial number, and production year of the machine, is located on the left-hand side of the chassis.

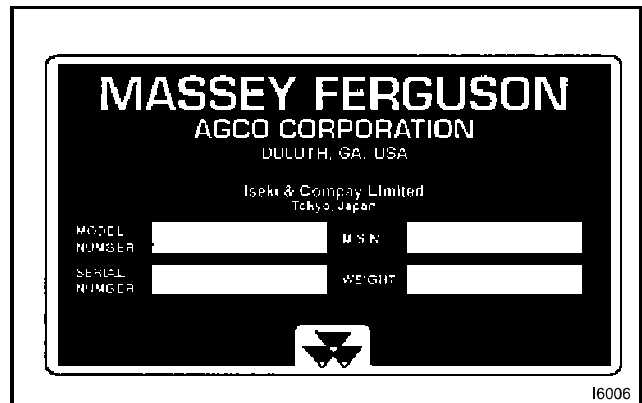


FIG. 12

FIG. 13: Location of the name plate.

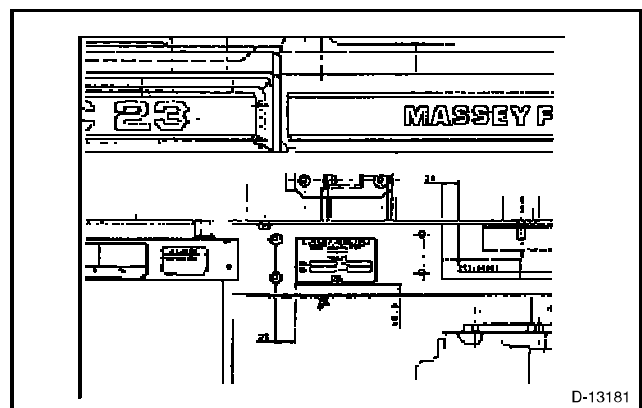


FIG. 13

FIG. 14: The chassis number is punched on the plate provided on the left-hand side of the chassis.

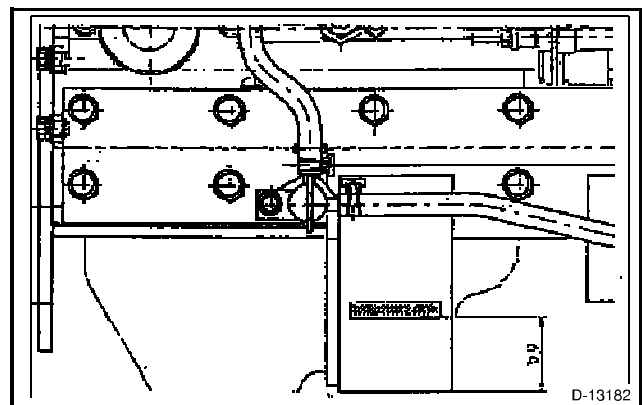


FIG. 14

Introduction

FIG. 15: The engine model name is cast into the right-hand side wall of the cylinder block.

The serial number is punched into the left-hand side wall of the cylinder block

- (1) Model name
- (2) Displacement
- (3) Serial number

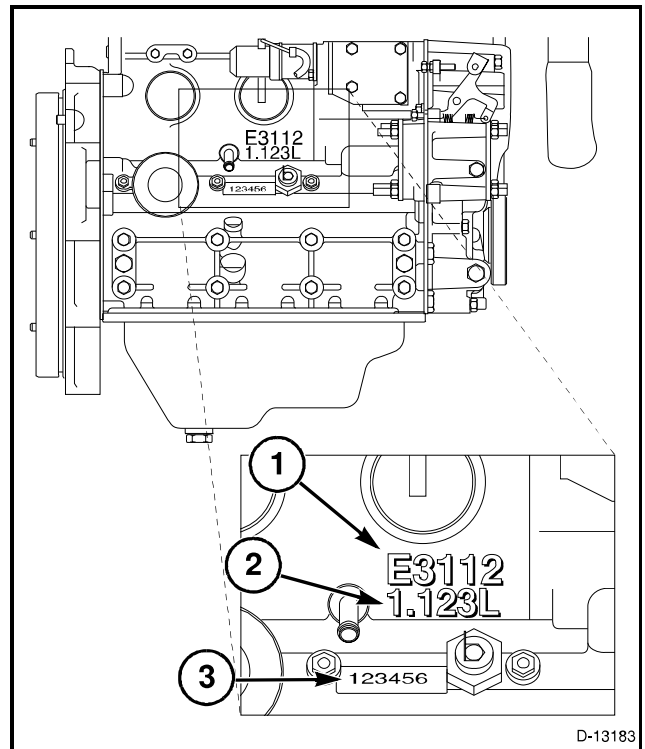


FIG. 15

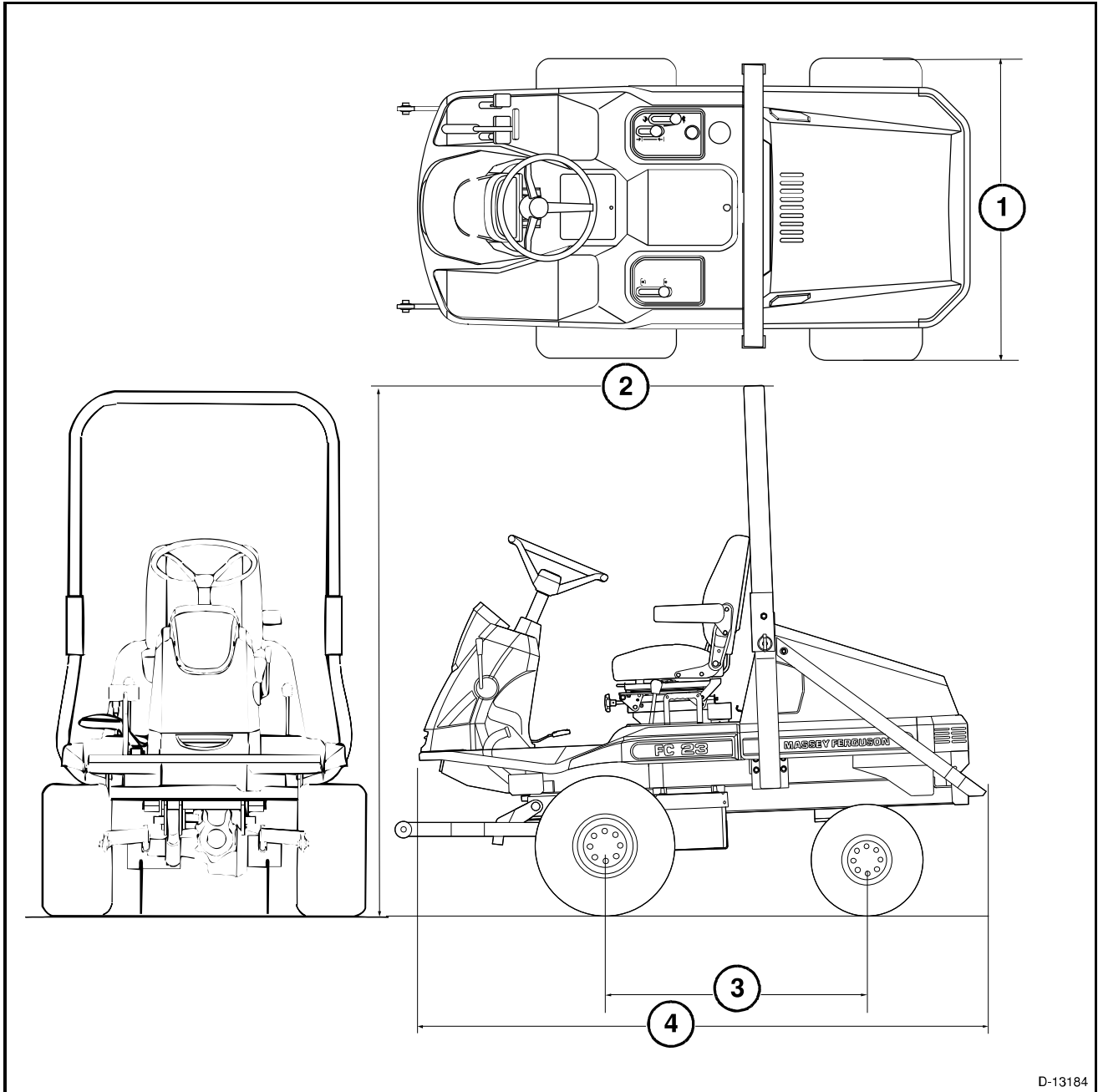
Specifications

These specifications are subject to change without notice.

| Part | | FC 23 FH Dimensions |
|------------------------------------|---------------------|----------------------------------|
| Dimensions | Overall Length | 2065 mm (81.3 in) |
| | Overall Width | 1185 mm (46.7 in) |
| | Overall Height | 1930 mm (76.0 in) |
| Weights (Ballast weights included) | | 570 kg (1257 lbs) |
| Engine | Model | E3112-G |
| | Number of Cylinders | 3 |
| | Output | 22.0 kW (2800 rpm) |
| | Piston Displacement | 1124 cc (69 cu in) |
| | Combustion Chamber | Swirl Chamber |
| Fuel Tank Capacity | | 27 liters (7.13 gal) |
| Transmission | Main Shift | HST (Hydro-Stat Transmission) |
| Traveling Speed | Forward | 0 to 13.5 km/h (8.4 mph) |
| | Reverse | 0 to 6.5 km/h (4.0 mph) |
| Wheel Base | | 950 mm (37.4 in) |
| Tread | Front | 835 mm (36.8 in) |
| | Rear | 890 mm (35.0 in) |
| Minimum Ground Clearance | | 120 mm (4.7 in) |
| Wheel Drive Method | | 2-WD/ 4WD Selection |
| Steering System | Steering Method | Power Assisted Steering |
| | Steering Wheels | Rear Wheels |
| Tires | Front | 20x10.0-8 4PR |
| | Rear | 20x6.5-8 4PR |
| PTO | Front | 2470 rpm |
| | Rear | Directly Connected to the Engine |
| Brake System | | Dry, Inner Shoes Expansion Type |
| Safety Devices | Mower | Lift Control |
| | PTO Lever | Shift Control |
| | Engine | Starting Control |
| | HST Pedals | Operation Control |
| Cruise Lock Releasing | | |

Introduction

Exterior Views and Dimensions



D-13184

FIG. 16

FIG. 16: Exterior Views and Dimensions

- (1) Overall Width: 1185 mm (46.7 in)
- (2) Overall Height: 1930 mm (76.0 in)
- (3) Wheelbase: 950 mm (37.4 in)
- (4) Overall Length: 2065 mm (81.3 in)

Periodical Inspection Table

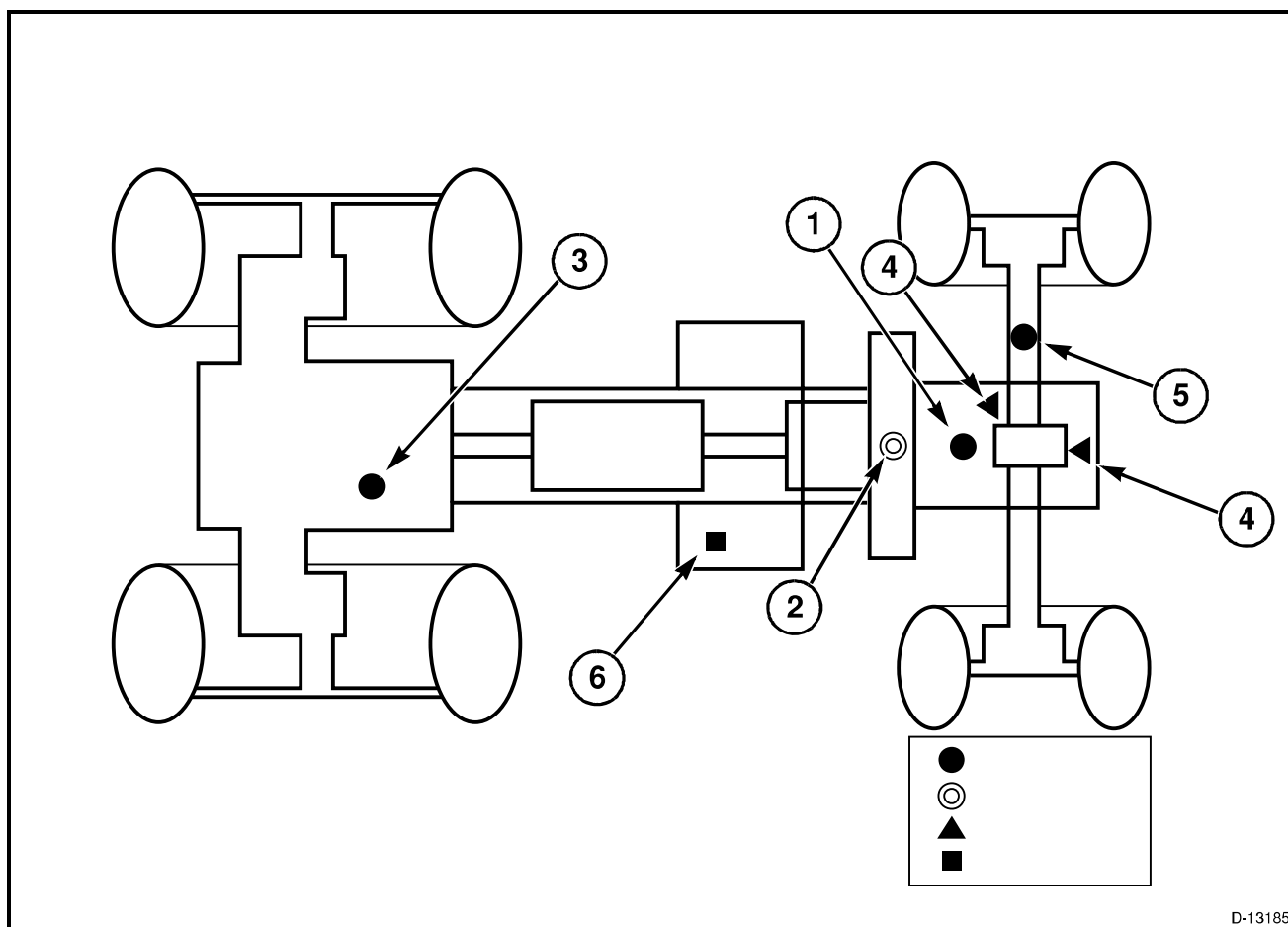
| Check Points | Intervals After That | Judgement Criteria |
|--|---|--|
| Engine Oil | Replace after initial 50 hours and then every 100. | maintain the specified level 2.9 liters (0.77 gal) |
| Air Cleaner | Clean every 50 hours. | |
| Engine Coolant | Replace every year | Fill up to radiator throat. (4.5 liters) |
| Fuel | | Keep Fuel Tank Full |
| Fuel Strainer | Clean after every 100 hours. Replace element after 300 Hours. | |
| Fan Belt | | 10 mm (0.4 in) deflection |
| Electrolyte Level | Inspect after every 50 hours | Level must be kept up. |
| Engine Oil Filter | Replace after initial 50 hours. Replace after every 300 hours. | |
| Transmission Oil | Replace after initial 50 hours and then every 200 hours. | Maintain the specified level 6.5 liters (1.72 gal) |
| Hydraulic Oil Filter | Replace after initial 50 hours and then every 200 hours. | |
| Suction Filter | Clean every initial 50 hours and then every 200 hours. | |
| Brake Pedal Play | | 20 to 30 mm (0.8 to 1.2 in) |
| Steering Wheel | Check every 300 hours. | Make sure there are no abnormal ties. |
| Ball Joints of Steering System Linkage | Check after every 300 hours. | Loose ball joints must be tightened. |
| Tire Pressure | | Front 1.6 bar (23 psi) Rear 2.0 bar 23 psi |
| Toe-In | Adjust after every 300 hours. | 0 to 10 mm (0 to 0.4 in) |
| Wheel Tightening Nuts | | make sure all nuts are tightened to the correct torque. M10 nuts 54 to 69 Nm (40.0 to 50.0 lbf ft) |

Introduction

| Check Points | Intervals After That | Judgement Criteria |
|----------------------|--|--------------------------------|
| Rear Axle Oil | Replace after initial 50 hours. Replace after every 300 hours | |
| Grease-Up | Inject grease after every 50 hours. | |
| Radiator Screen | | Makes sure there are no clogs. |
| Radiator | | Makes sure there are no clogs. |
| Electrical Apparatus | | Makes sure there are no clogs. |
| Safety Switches | | All must work correctly. |
| Air Intake Opening | | Makes sure there are no clogs |
| Bolts and Nuts | | Makes sure there are no clogs |
| Rubber Pipes | Check after every 100 hours. | |

IMPORTANT: Above mentioned service manuals must be used as a reference criteria. If working conditions are harder, earlier service is recommended.

Filling Diagram



D-13185

FIG. 17

FIG. 17: Filling diagram

| Ref. No. | Filling Points | Lubricants | Quantity |
|----------|---|--|----------------------|
| 1 | Engine | Engine oil Diesel engine oil 10W-30 Better than class CC | 2.9 liters (0.8 gal) |
| 2 | Radiator | Coolant (Soft water + antifreeze) | 4.5 liters (1.2 gal) |
| | | Radiator | 2.6 liters (0.7 gal) |
| | | Engine cylinder block | 1.9 liters (0.5 gal) |
| 3 | Transmission Case | HST oil | 7.3 liters (1.9 gal) |
| 4 | Center Pivot (2 Points) | Lithium based-grease | As required |
| 5 | Rear Axle | Gear oil (SAE 80) | 2.5 liters (0.7 gal) |
| 6 | Fuel Tank | Diesel fuel | 27 liters (7.1 gal) |
| | Other lubrication points marked with yellow paint. | Gear oil or grease | As required |

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02 - Disassembly of Major Components

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DISASSEMBLY OF MAJOR COMPONENTS

GENERAL PRECAUTIONS FOR SEPERATION AND INSTALLATION

Before Operation

- Always be safety conscious in selecting clothes to wear and suitable tools to use.
- Before disassembly, be sure that you familiarize yourself with the assembled condition for subsequent reference in reassembly.
- Keep parts and tools in proper order during operations.
- When servicing electrically live parts, be sure to disconnect the negative battery terminal.
- To prevent oil or water leaks, use the liquid gasket as required.
- When reassembling disassembled parts, discard used gaskets, O rings, or oil seals and install new ones.
- When lifting up only the front or rear part of the tractor, be sure to wedge the grounded wheels.
- When the tractor is jacked up, be sure to support the entire tractor with something like a stand. Lifting it up with a jack only is a dangerously unstable procedure.
- When replacing parts, use authorized, genuine Massey Ferguson parts only. Massey Ferguson assumes no responsibility for accidents, operating problems or damage caused by the use of imitation parts. Also, the use of unauthorized parts will result in relatively poor machine performance

Precautions to be followed when installing common parts

Roller or Ball Bearings

- When a bearing is fitted in by the outer race, use an installer, which is specially designed to push only the outer race and vice versa.
- The installer must be designed to install the bearing on the shaft in a parallel position.
- When installing a bearing, which appears the same on both sides, install it so that the face which has the identification number faces in a direction for easy visual identification. All the bearings which are to be installed in the transmission case will be put into the correct location, so that their identification number faces outward.
- If a shaft or a hole where a bearing is to be installed has a stopper, the bearing must be pushed in completely until it is seated against the stopper.
- Installed bearings must turn smoothly.

Oil Seals

- Oil seal installer should be designed so as not to deform the oil seals.
- During installation, make sure not to damage the lips, and assure that it is pushed in parallel to the shaft or hole.
- When oil seals are installed, there will not be any turnover of the lips nor dislocation of the springs.
- When a multi lip seal is installed, the grooves between lips must be filled with grease, not adhesive.
- Use lithium based grease.
- Make sure there is no oil or water leaks through the installed soil seals.

Disassembly of Major Components

O-Rings

- O rings must be coated with grease before installing.
- Installed O rings should have no slack or twist.
- Installed O rings must maintain proper air tightness.

Snap-Rings

- Snap ring installers must be designed so it will not permanently deform the snap rings.
- Installed snap rings must be seated securely in the groove.
- Make sure not to overload the snap ring to the extent that it is permanently deformed.

FIG. 1: When installing a snap ring, install it as shown in the figure with its round edge side turned toward the part to be retained. This round edge is formed when the snap ring is pressed out.

- (1) Snap ring
- (2) Round edge side
- (3) Thrust force

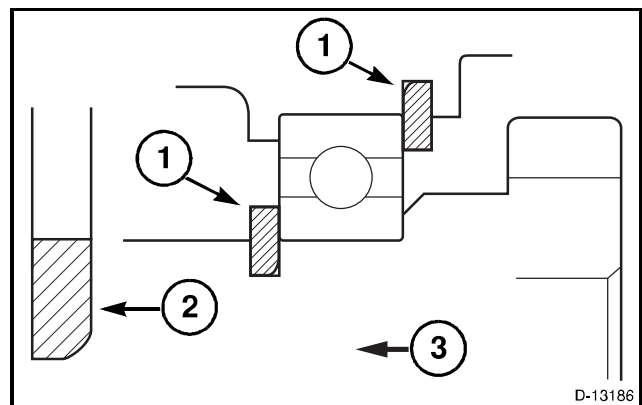


FIG. 1

Spring (Roll) Pins

FIG. 2: Spring pins

- Spring pins must be driven in properly and tightly.
- Spring pins must be installed so that their seams will face the direction from which the load is applied.
- The roll pins installed in the transmission or other parts where much force is applied must be retained with wire.

- (1) Force

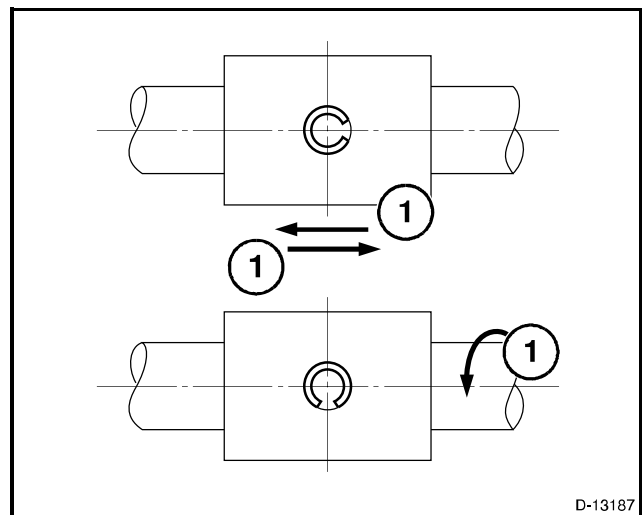


FIG. 2

Cotter Pins

FIG. 3: When installed, cotter pins must be bent securely at the ends as shown in the figure.

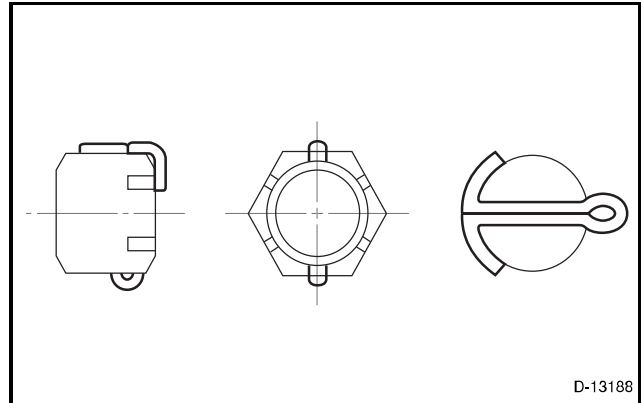


FIG. 3

Nuts and Bolts

- Special bolts are installed at several locations, make sure not to interchange other bolts.
- Bolts and nuts must be tightened to their specified torque with a torque wrench.
- When locking the bolts or nuts with wire or a lock washer, make sure to wind the wire paying sufficient attention to its winding direction and bend the lock washer for secure locking.
- When locking bolts and nuts with an adhesive, apply the adhesive on the thread and tighten securely.
- Apply an adhesive (THREE BOND TB1104) to parts through which there is any possibility of oil leaks, such as stud bolts and tapped through parts.
- Each lock nut must be tightened securely.
- When tightening bolts and nuts, refer to the tightening torque table.

After installation, each grease fitting must be filled with grease.

- When installing grease fittings, make sure to turn the fitting tips in a direction that will provide easy access for a grease gun.

Disassembly of Major Components

Other Precautions

- Make sure not to damage any finished surfaces or parts.
- Always refrain from forcing installation.
- Each lever knob must be installed and coated with an adhesive (SUPER THREE CEMENT TB1702).
- Each contact surface must be coated with an adhesive (THREE BOND TB 1215) and tightened evenly with bolts. Adhesive coated surfaces must be installed within 30 minutes after application of the adhesive. The contact surfaces must be flawless and free from foreign matter, and especially from grease before application of the adhesive.
- Contact surfaces of the sleeve metal (support) and front transmission case.
- Contact surfaces of the hydraulic control lever guide and cylinder case
- The surface or the thread where an adhesive is to be applied must be completely free of chips and oil.

Removal of the Mower Deck

FIG. 4: Disconnect the universal joint (1) (drive shaft) from the front mower.

Extract the lift arm pins (2).

Extract the fulcrum pins (3).

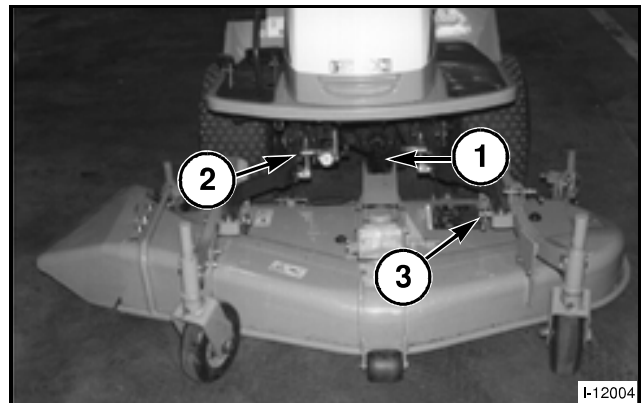


FIG. 4

FIG. 5: Rear view of mower.

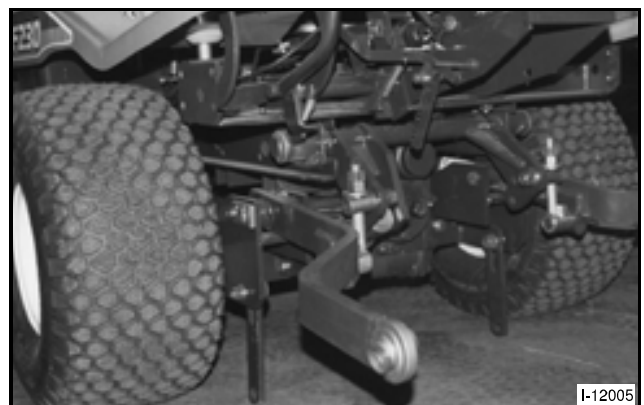


FIG. 5

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03 - Engine Accessories

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