VISIBLE-RESULTS

MASSEY FERGUSON®

MF 4200 Series Tractor Workshop Service Manual

4200 SERIES TRACTOR

SERVICE MANUAL

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1449494M1

NOTES

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Introduction and Safety in the Workshop

INTRODUCTION

The purpose of this manual is to assist Dealers and Distributors in the efficient repair and maintenance of Massey Ferguson farm machinery. Carrying out the procedures as detailed, together with the use of special tools where appropriate, will enable the operations to be completed within the time stated in the Repair Time Schedule.

To assist with locating information, each section of the manual is preceded by a contents page listing the operations. Each instruction within an operation has a sequence number, and to complete the operation in the minimum time it is essential that these instructions are performed in numerical sequence commencing at 1, unless otherwise stated.
When applicable, these sequence numbers identify the components in the appropriate illustration. Where an operation requires the use of a special tool, the tool number is quoted under the operation heading and is repeated in, or following, the instruction involving its use.

Indexing

For convenience the manual is divided into sections and parts, each page bearing a section and part number. The sections are subdivided into numbered operations. Example: 1-7A would be Operation 1 in Section 7, Part A. This simplifies cross referencing and enables the subject to be found easily.

Definition of Terms

The operation descriptions generally used throughout the schedules may be defined as follows:

Removal and Refitment – Remove and refit an original part or assembly, or a new part or assembly which does not involve additional operations or time.

Install – Install a part or component not previously fitted e.g., accessories.

Overhaul – Remove a part or assembly, dismantle, inspect and recondition, re-assemble, and re-install making all necessary adjustments.

Dis-assembly and Re-assembly – The terms 'Dis-assembly' and 'Re-assembly' indicate the orderly taking apart of an assembly into individual parts and rebuilding it into the original assembly.

Adjust – Make the necessary adjustments to restore specified setting or performance.

Check – Ascertain if a setting or condition is within the limits of acceptability, either as defined in the manufacturer's specifications or, where a dimension is not specified, in the judgement of the mechanic. The checking of fixings, e.g. nuts and bolts, includes tightening to the specified torque figures listed in this Manual.

Servicing – All technical work undertaken to maintain the machine in working order.

Special Tools

Where the use of a special tool is specified in an operation the tool number will be shown under the operation heading and also following the instruction requiring its use.

The use of the special tools mentioned in the text contributes to a safe, efficient and profitable repair. Some operations are impracticable without their use, for example, the refitment of the differential unit. Distributors and Dealers are therefore urged to check their tools against the list provided. Where necessary, tools may be ordered from: V L Churchill & Co Ltd, London Road, Daventry, Northants, England, NN11 4NF. Telephone 01327 704461.

For further details, refer to the special tool catalogue for this range of tractors, Publication No. 1856 550 M3, reference No. A1038.

Repairs and Replacements

When service parts are required it is essential that only genuine Massey Ferguson replacements are used.

Attention is particularly drawn to the following points concerning repairs and the fitting of replacement parts and accessories:

Safety features embodied in the tractor may be impaired if other than genuine parts are fitted.

In certain territories, legislation prohibits the fitting of parts not to the tractor manufacturer's specification. Torque wrench setting figures given in the Workshop Manual must be strictly adhered to. Locking devices where specified must be fitted. If the efficiency of a locking device is impaired during removal it must be renewed.

The tractor warranty may be invalidated by the fitting of other than genuine Massey Ferguson parts. All Massey Ferguson replacements have the full backing of the manufacturer's warranty. Massey Ferguson Distributors and Dealers are obliged to supply only genuine service parts.

Repair of the Tractor

Follow these important points:

CLEAN THE TRACTOR AND DIAGNOSE THE FAULT BEFORE DIS-ASSEMBLY.

If possible, make a complete diagnosis to determine the extent of the repair required. Take precautions, as necessary, to prevent dirt or other foreign material entering the hydraulic, fuel or air systems.

DO NOT MIX PARTS.

Make particular note of special parts which should not be interchanged.

DURING DIS-ASSEMBLY, CLEAN PARTS THOROUGHLY AND INSPECT THEM FOR WEAR, DAMAGE, ETC.

LABEL PARTS. PROTECT PRECISION OR MACHINED SURFACES.

Amendments

Under normal conditions revised pages are issued carrying the same number as the existing pages requiring amendment. The new pages are inserted in place of the existing ones. The old pages should then be destroyed.

The issue number is printed on the bottom of each page, e.g. Issue 1, 2 or 3 etc.

In some cases additional pages or completely new sections may be issued. These pages are to be inserted immediately following the page carrying the next lowest page number, or section number as appropriate.

Where new pages are required to be positioned between existing pages, the new page numbers will contain a suffix letter - example: New page number 7A-16a. This page is inserted after existing page number 7A-16 and before page number 7A-17. Correspondingly a further new page numbered 7A-16b would be positioned after 7A-16a but before 7A-17.

To ensure that a record of amendments to this manual is readily available, the list of amendments will be re-issued with each set of revised pages, quoting the amendment number, date of issue and appropriate instructions.

NOTE: *Service Bulletins and Amendment Sheets are issued to the Massey Ferguson Distributors and Dealers only and are not for general circulation.*

Amendment Status

Date	Issue	Page	Remarks
May 1997	M1	Issue 1 released	

SAFETY ALERT SYMBOL AND TERMS

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

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 ★

SAFETY in the WORKSHOP

This safety section of your Workshop Service manual is intended to point out some of the basic safety situations which may be encountered during the normal repair operations of the tractor, and to suggest possible ways of dealing with these situations.

Additional precautions may be necessary, depending on the type of repair and the conditions at the work site or in the workshop. Massey Ferguson has no direct control over the repair procedures, operation, inspection, lubrication or general maintenance. Therefore it is YOUR responsibility to use good safety practices in these areas.

SAFETY – A WORD to the MECHANIC

It is your responsibility to read and understand this safety section before carrying out repairs on Massey Ferguson equipment.

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 section and the rest of the manual and make them a working part of your safety programme. Practice all other usual and customary safe working precautions, and above all – REMEMBER – SAFETY IS YOUR RESPONSIBILITY. YOU CAN PREVENT SERIOUS INJURY OR DEATH.

SAFETY – DANGER, WARNING and CAUTION

Whenever you see these signal words and symbol  used in this manual and on decals, you MUST take note of their instructions.

DANGER: The symbol and the word DANGER indicates an imminently hazardous situation which, if not avoided, will result in DEATH OR VERY SERIOUS INJURY.

WARNING: The symbol and the word WARNING indicates a potentially hazardous situation. If the instructions or procedures are not correctly followed it could result in PERSONAL INJURY, OR LOSS OF LIFE.

CAUTION: *The symbol and the word CAUTION is used to indicate a potentially hazardous situation that, if not avoided, may result in MINOR OR MODERATE INJURY.*

IMPORTANT: *The word IMPORTANT is used to identify special instructions which, if not observed, could result in damage to, or destruction of the machine, process or its surroundings.*

NOTE: *The word NOTE is used to indicate points of particular interest for more efficient and convenient repair or operation.*

SAFETY DECALS

WARNING: DO NOT remove or obscure Danger, Warning or Instruction Decals.

Replace any Danger, Warning, Caution or Instruction Decals that are not readable, damaged or are missing.

GENERAL

Practically all service work involves the need to drive a tractor. The Operator Instruction Book, supplied with each tractor or implement, contains detailed safety precautions relating to driving, operating and servicing. These precautions are as applicable to the service mechanic as they are to the operator, and should be read, understood and practised by all personnel.

Prior to undertaking any maintenance, repair, overhaul, dismantling or re-assembly 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.

- DO NOT allow children or bystanders around or on the machine while it is being adjusted, serviced, repaired or operated.

PERSONAL CONSIDERATIONS

Clothing

- The wrong clothes or carelessness in dress can cause accidents. Check to see that you are suitably clothed. DO NOT wear loose clothing or long hair around equipment.

  Some jobs require special protective equipment

Eye Protection

- The smallest eye injury may cause loss of vision. Injury can be avoided by wearing the proper eye protection when engaged in chiselling, grinding, discing, sanding, welding, painting etc.
- Wear safety goggles or safety glasses appropriate to the job in hand.

Breathing Protection

- Fumes, dust and paint spray are unpleasant and harmful. These can be avoided by wearing respiratory protection.

Hearing Protection

- Loud noise may damage your hearing and the greater the exposure the worse the damage. If you think the noise is excessive, wear ear protection.

Hand Protection

- It is advisable to use a protective barrier cream before work to prevent irritation and skin contamination. After work clean your hands in soap and water. Solvents such as white spirit, paraffin, etc., may harm the skin.
- Wear gloves when ever possible to protect your hands. DO NOT wear rings or wrist watches when working on machinery, as they could catch on moving parts and cause serious injury.

Foot Protection

- Substantial or protective footwear with reinforced toe-caps (safety shoes) will 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.

EQUIPMENT CONSIDERATIONS

Machine Guards

- Before using any machine, check to ensure that the machine guards are in position and serviceable. These guards not only prevent parts of the body or clothing coming in contact with the moving parts of the machine, but also ward off objects that might fly off the machine and cause injury. Ensure that missing guards are replaced.

Lifting Appliances

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

Jacking

- Select a jack strong enough to carry the load.
- Stabilise the tractor and chock the wheels.
- Put support stands under the tractor. Lower the jack and let the tractor rest on the stands.
- DO NOT go under a tractor supported by a chain hoist or jack.

Compressed Air

- The pressure from a compressed air line is often as high as 7 bar (100 lbf/in^2). It is perfectly safe if used correctly. Any misuse may cause injury.
- Never use compressed air to blow dust, filings, dirt etc., away from your work area unless the correct type of nozzle is fitted and eye protection is used.
- Compressed air is not a cleaning agent, it will only move dust, etc., from one place to another. Look around before using an air hose as bystanders may get grit into their eyes, ears or skin.
- Used approved air guns, wear safety goggles, and use proper shielding to protect others in the work area.
- Never point an air nozzle at a persons body.

Hand Tools

- Many cuts, abrasions and injuries are caused by defective tools. Never use the wrong tool for the job, as this generally leads either to some injury, or to a poor job.
- Never use:
  - A hammer with a loose head or split handle.
  - Spanners or wrenches with splayed or worn jaws.
  - Spanners or files as hammers; or drills, clevis pins or bolts as punches.
- Grind off mushroom heads from chisels. The sharp edges can tear your skin if the tool slips. And, when the tool is struck, chips could break off and fly into your eyes.
- Keep a handle on every file to prevent the tang from piercing your palm or wrist if the file should slip or catch.
- For removing or replacing hardened pins use a copper or brass drift rather than a hammer.
- For dismantling, overhauling and assembly of major components, always use Special Service Tools recommended.

  These will reduce the work effort, labour time and 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 make sure that the cable is not worn or frayed and that the plugs, sockets, etc., are intact; make sure you know where the nearest isolating switch is located. Always use an earthed (grounded) 3 pin electrical cord.

GENERAL CONSIDERATIONS

Solvents

- Use only cleaning fluids and solvents that are known to be safe. Certain types of fluids can cause damage to components such as seals, etc., and can cause skin irritation. Solvent labels should be checked that they 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.
- Keep work organised and clean. Wipe up spills of any kind to minimise the possibility of a fall. Keep tools and parts off the floor to further reduce the possibility of tripping and causing serious injury.

Fire

- Fire has no respect for persons or property. The destruction that fire can cause is not always fully realised. Everyone must be constantly on guard.
  - Extinguish matches, cigars, cigarettes, etc., 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 open flame near the fuel tank, fuel lines, battery, hydraulic hoses or component parts
- When using a gas torch, always keep a fully charged fire extinguisher within reach.
- In the event of fire:
  - DO NOT panic - warn those near and raise the alarm.

First Aid

- In the type of work that mechanics are engaged in, dirt, grease, fine dust, etc. all settle upon the skin and clothing. If a cut, abrasion or burn is disregarded it may be found that an infection has formed within a short time. 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 and that it is kept fully stocked at all times.

OPERATIONAL CONSIDERATIONS

- Stop the engine, if at all possible, before performing any service.
- Place a warning sign on self propelled equipment which, due for service or overhaul, would be dangerous to start. Disconnect the battery leads if leaving such a unit unattended and remove the key.
- DO NOT attempt to start the engine while standing beside the tractor or attempt to by-pass the safety start switch. Make a practise of checking that neutral start switches are functioning correctly.
- 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 level working surface - concrete is preferred.
- If it is found necessary to raise the equipment for ease of servicing or repair, make sure that safe and stable supports are installed, beneath axle housings, casings, etc., before commencing work.
- Certain repair or overhaul procedures may necessitate 'Separating the tractor', either at the engine gearbox or gearbox/rear axle locations. These operations are simplified by the use of the Tractor Splitting Kit/Stands (Use the Massey Ferguson MF.3012 Tractor Splitting Track, also available, MF.3013 Cab 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 that are not within easy reach.
- 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 high pressure washer or steam cleaner is recommended.
- 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, make sure all hoses and connectors not only of the equipment, but also those of the test equipment, are in good condition and tightly sealed. Pressure readings must be taken with the gauges specified. The correct procedure should be rigidly observed to prevent damage to the system or equipment, and to eliminate the possibility of personal injury.
- Hydraulic fluid escaping under pressure can have enough force to penetrate the human skin. To locate a leak under pressure, use a small piece of cardboard, never use your hands. If you are injected with hydraulic fluid seek medical help immediately.
- When equipment or implements are required to be attached to the hydraulic linkage, either for testing purposes or for transportation, the 'Position Control' should be used.
- Always lower equipment to the ground when leaving the tractor.
- If high lift attachments are installed on a tractor beware of overhead power, electric or telephone cables when travelling. Drop the attachment near to ground level to increase stability and minimise risks.
- DO NOT park or attempt to service the equipment on an incline. If unavoidable, take extra care and chock all wheels.
- Observe recommended precautions as indicated in this Service Manual when dismantling the air conditioning system as escaping refrigerant can cause frostbite.
- Prior to removing wheels and tyres from a tractor, 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. Store the wheel so that they cannot fall over and cause injury.
- When inflating tyres beware of over inflation - constantly check the pressure. Over inflation can cause tyres to burst and result in personal injury.

Heed these safety precautions, and the ones found in this manual, and you will protect yourself accordingly. Disregard them and you may become injured for life.

SERVICING TECHNIQUES

Service Safety

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all farm machinery as well as the personal safety of the individual doing the work.

Introduction and Safety in the Workshop

This Service Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure that a thorough repair is successfully completed.

There are numerous variations in procedures, techniques, tools, and parts for servicing tractors, 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. Anyone who departs from the instructions provided in this Manual must realise that one compromises their personal safety and the tractor's integrity by the choice of repair methods, tools and/or parts.

Service Techniques

Clean the exterior of all components before carrying 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. Check the label on Solvents to ensure 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 their ends 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 or contact with other parts.

Before removing hoses or tubes make sure they are identified so that they can be correctly re-assembled.

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

Bearings

Bearings which are considered suitable for further service should be cleaned in a suitable solvent and immersed in clean lubricating oil until required.

DO NOT spin bearings with compressed air. The centrifugal force could cause a ball or roller to fly outward with enough force to cause an injury.

Installation of a bearing can be classified in two ways: press fit on rotating parts such as shafts, and gears, and push fit into static locations such as reduction gear housings. Where possible, always install the bearing onto the rotating component first.

Always use pullers or a press to remove and/or install bearings, bushings and cylinder sleeves, etc. Use hammers, punches and chisels only when absolutely necessary and be sure to wear safety goggles.

Shims

When shims are removed, tie them together and identify them as to location. Keep shims clean and flat until they are re-installed.

Gaskets

Be sure the holes in the gasket correspond with the lubricant passages in the mating parts. If gaskets are to be made, select material of the proper type and thickness. Be sure to cut holes in the right places. Blank gaskets can cause serious damage - always renew gaskets prior to re-installation.

Lip Type Seals

Lubricate the lips of the lip-type seals before installation. Use petroleum jelly. DO NOT use grease. Ensure that the oil seal is fitted the right way round, the lip of the seal is placed next to the lubricant that is sealed. Some seals have a second auxiliary lip, which is used to prevent the ingress of dirt to the seal lip.

If, during installation, the seal lip must pass over a shaft that has splines, a keyway, rough surface or a sharp edge, the lip can be easily damaged. Always use a seal protector, when one is provided.

Use of Bolts in Blind Holes

Use bolts of the correct length. A bolt which is too long may 'bottom' before the head is tight against the part it is to hold. The threads can be damaged when a 'long' bolt is removed. If a bolt is too short, there may not be enough threads engaged to hold the part securely.

Locking Devices

Lockwashers, flat metal locks or split pins are used to lock nuts and bolts.

Flat metal locks must be installed properly to be effective. Bend one end of the lock around the edge of the part. Bend the other end against one flat surface of the nut or bolt head. Always install new locks.

Always fit new split pins/cotter pins and bend the ends round so that they will not catch in clothing and help to prevent cuts.

Cables and Wires

When removing or disconnecting a group of cables or wires, tag each one to assure proper re-assembly.

Always clip back wires and cable looms properly to prevent chafing, cable damage and possible damage by fire.

Tractor Specification

Section 1 – Part B

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TRACTOR SPECIFICATION

Engine

Make	Perkins diesel to Massey Ferguson specification.
Type	Four stroke, water cooled, direct injection.
Models applicable:	
4215 Tractors (52 DIN) Low Emission	903.27 engine.
4220 Tractors (60 DIN) Low Emission	903.27T engine - Turbocharged.
4225 Tractors (65 DIN)	4.41 engine.
4235 Tractors (75 DIN)	4.41 engine.
4240 Tractors (80 DIN)	4.41 engine.
4243 Tractors (85 DIN)	1004 engine - Turbocharged.
4245 Tractors (85 DIN)	1004 engine - Turbocharged.
4253 Tractors (95 DIN)	1004 engine - Turbocharged.
4255 Tractors (95 DIN)	1004 engine - Turbocharged.
4260 Tractors (100 DIN)	1006 engine.
4263 Tractors (100 DIN) Low Emission	1006 engine.
4270 Tractors (110 DIN)	1006 engine.
4270 Tractors (110 DIN) Low Emission	1006 engine - Turbocharged.
Cylinders	3, 4 or 6.
Engine power and torque	Consult the sales promotional leaflet for your model of tractor issued by your local Massey Ferguson Dealer at time of sale.
Idle speed	750 ± 25 rev/min.
Maximum rated speed - all models	2200 rev/min.
Maximum no load speed - all models	2310 rev/min.
Valve tip clearance:	
All tractors - Inlet (hot or cold)	0,20 mm (0.008 in).
All tractors - Exhaust (hot or cold)	0,45 mm (0.018 in).

Cooling System

Type	Thermostat controlled with centrifugal pump to assist circulation multi-blade fan driven by a single or double belt from the crankshaft pulley.
Radiator pressure cap rating	0,75 bar (10 lbf/in^2).
Fan belt (s) deflection	10 mm (3/8 in) or 35 N (8 lbf).
Air conditioner compressor belt deflection	15 mm (1/2 in).

Fuel System

Fuel lift pump	Mechanical, driven from camshaft, hand primed.
Fuel Filter	CAV canister type filter.
Water sedimentor	CAV with transparent sediment bowl.
Injection Pump	CAV distributor type with mechanical governor.
Injectors	CAV nozzles and holders.
Starting aid	CAV thermostart.

Air System

Type	Two stage dry element with warning light. Removable main and secondary element.

Clutch

Type:	
4215, 4220, 4225, 4235	305 mm (12 in) - coil spring type.
4243 to 4270	330 mm (13 in) - belleville spring type.
Routine clutch adjustment	No routine adjustment required.
Clutch pedal height	Adjust to suit operator comfort.

Transmission

18 x 6 Speedshift gearbox	The 18 Speedshift gearbox has 18 forward and six reverse speeds. This is achieved by using a three forward and one reverse speed gearbox with synchromesh on all gears. This is compounded by a three speed range gearbox to give nine forward and three reverse speeds. At the front of the gearbox there is an electro/hydraulically operated Fast/Slow Speedshift unit which doubles the number of speeds to 18 forward and six reverse.
Number of gears forward	18.
Number of gears reverse	6.
12 x 12 Shuttle gearbox	Twelve speeds forward and reverse. This is achieved by using a four-speed gearbox, compounded by a three-speed range gearbox to give twelve speeds. A forward/reverse unit is situated in front of the gearbox, all gears are synchromesh. A creeper attachment is available with this transmission with a reduction ratio of 4.7 : 1.
Number of gears forward	12.
Number of gears reverse	12.
12 speed shuttle creeper gearbox	The creeper reduction unit is a self contained set of gears mounted in the front section of the gearbox above the forward and reverse shuttle gears.
Application	Tractors fitted with 12 speed shuttle gearbox.
Speed reduction ratio	4.7 : 1.
Number of creeper speeds	4.
12 x 4 Synchromesh gearbox	The 12 x 4 synchromesh gearbox has 12 forward and 4 reverse speeds. This is achieved by using a three forward and one reverse gearbox with synchromesh on all gears. This is compounded by a two speed range gearbox to give six speeds which is further doubled by a manual selector lever situated to the right of the drivers console. Reverse is available on all gears.
Number of gears forward	12.
Number of gears reverse	4.
8 x 8 Shuttle gearbox	Eight speeds are available forward and reverse. This is achieved by using a four speed gearbox compounded by a two speed range gearbox to give eight speeds. A shuttle lever to the left of the steering wheel provides easy forward to reverse gear changing.
Number of gears forward	8.
Number of gears reverse	8.
Range gearbox	The range gearbox is directly bolted to the rear of the main gearbox forming an integral unit. It is fitted with either a two or three speed unit. It also provides the drive to the front four-wheel drive axle.

Rear Axle

Rear axle maximum static load:	
4215 to 4220	4536 kgf (10000 lbf) - Narrow.
4225 to 4255 and 4263	4536 kgf (10000 lbf) - Normal-duty.
4260 and 4270	5443 kgf (12000 lbf) - Heavy-duty.
Rear track - Pressed steel wheels:	
4215 to 4225	1425-1830 mm (56-72 in) - Narrow.
4225 to 4255 and 4263	1425-2130 mm (56-84 in) - Normal-duty.
4260 and 4270	1525-2235 mm (60-88 in) - Heavy-duty.
Rear track - Cast centre wheels:	
4225 to 4255 and 4263	1395-2210 mm (55-87 in).
4260 and 4270	1425-2130 mm (56-84 in).

Rear track - PAVT wheels - single ramp:	
4225 to 4255 and 4263	1425-1930 mm (56-76 in) - normal-duty rear axle.
4260 and 4270	1525-2130 mm (60-84 in) - heavy-duty rear axle.
Rear track - PAVT wheels - dual ramp:	
4225 to 4255 and 4263	2030-2130 mm (80-84 in) - normal-duty rear axle.
4260 and 4270	1830-2440 mm (72-96 in) - heavy-duty rear axle.

Brakes

Type	Multi-disc oil immersed.
Model	T.S. brake (Tangential Slave).
Parking brake	Cable operated on both brakes independent of the foot brake.
Brake fluid	Mineral based (Green) - Massey Ferguson part No. 3405 389 M1.

Power Take-Off

Single-speed PTO:	
540 rev/min PTO speed	1789 engine rev/min.
Economy PTO:	
Standard 540 PTO	1979 engine rev/min.
Economy 540 (540E) PTO	1421 engine rev/min.
Two-speed PTO:	
540 rev/min PTO speed	1902 engine rev/min.
1000 rev/min PTO speed	2000 engine rev/min.
540 rev/min PTO shaft:	
No. of splines	6.
Outside diameter	34,93 mm (1.375 in).
1000 rev/min PTO shaft:	
No. of splines	21.
Outside diameter	34,93 mm (1.375 in).

Steering

Type	Hydrostatic power steering.
Pump	Transmission mounted gear pump drawing oil from the transmission case.
Turns lock to lock	4
Steering wheel	Tilt adjustable.

Front Axle – Two-Wheel Drive

Type	Three section with telescopic outer arms.
Model application:	
4215 to 4225	Normal-duty.
4225 to 4255	Heavy-duty.
4243 to 4270	Extra heavy-duty.
4235 to 4270	Wide row crop.
Front track settings:	
Normal-duty	1245-1855 mm (49-73 in).
Heavy-duty and extra heavy-duty	1315-1820 mm (52-72 in).
Static load:	
Normal-duty axles	2600 kgf (5732 lbf).
Heavy-duty axles	3460 kgf (7628 lbf).
Extra heavy-duty axles	4360 kgf (9612 lbf).
Front wheel tow-in	0-5 mm (0-3/16 in) at wheel rim.
Turning circles - less brakes:	
4215 and 4220	6,8 metre (268 in).
4225 to 4255	8,0 metre (315 in).
4260 and 4270	9,5 metre (374 in).

Front Axle – Four-Wheel Drive

Type	Centre drive, hydraulically engaged with Hydralock differential.		
Tractor model - see axle identification plate:	Axle model - all centre drive	Width across hub flanges	Maximum static load
4215, 4220, 4225, 4235	AG 66 Narrow	1366 mm (53.82 in)	3000 kgf (6614 lbf)
4225, 4235	AG 66 Wide	1562 mm (61.54 in)	3000 kgf (6614 lbf)
4225, 4235,4243, 4245, 4253, 4255, 4263	AG 75	1669 mm (65.76 in)	4500 kgf (9921 lbf)
4225, 4235,4243, 4245, 4253, 4255, 4263	AG 85	1669 mm (65.76 in)	4500 kgf (9921 lbf)
4255, 4260, 4270	AG 105	1800 mm (70.92 in)	5000 kgf (11023 lbf)
Toe-in	0-4 mm (0-5/32 in).		
Maximum turning angle	55°.		
Turning circles - less brakes:			
4215 and 4220	7,8 metre (307 in).		
4225 to 4255	8,0 metre (315 in).		
4260 and 4270	9,2 metre (362 in).		
Front track settings:			
AG 66 narrow front axle	1423-1624 mm (56 in-64 in).		
AG 66 wide front axle	1412-1820 mm (56 in-72 in).		
AG 75 or AG 85 front axle.	1407-1908 mm (55 in-75 in).		
AG 105 front axle on 24 inch wheels	1557-2058 mm (61 in-81 in).		
AG 105 front axle on 28 inch wheels	1451-2058 mm (57 in-81 in).		

Wheel and Rim Nut and Bolt Torques

Front axle - two-wheel drive bolts	95 Nm (70 lbf ft).
Front axle - Four-wheel drive:	
Wheel nuts	270 Nm (200 lbf ft).
Rim to disc nuts	190 Nm (140 lbf ft).
Rear Wheels - Pressed steel:	
Wheel nuts	325 Nm (240 lbf ft).
Rim to disc nuts	240 Nm (177 lbf ft).
Rear wheels - Cast centre:	
Wheel nuts	325 Nm (240 lbf ft).
Rim clamp nuts (PAVT)	260 Nm (192 lbf ft).

Electrical System

Voltage	12 volt negative earth.	
Battery:		
Double battery installation	Type 372.	
Single battery installation	Type 665.	
	Type 372.	Type 665.
SAE rating	590A.	810A.
IEC rating	390A.	545A.
DIN rating	350A.	490A.
Ampere hour	120.	70.
Reserve capacity	110 min.	220 min.
Starter motor:		
Type	Solenoid engaged pinion, safety start device operated by the gear shift lever and on the PTO.	
Size	2,2 Kw.	
Alternator:		
Type	A127-70.	
Size	70 amp, machine sensed.	
Regulating voltage	14.2 volt.	

Tractor Specification

Light bulb sizes and part No.:	
Head light	45/40 W - Continental (white) - 916 866 M1.
Work light	55 W - Halogen H3 - 1628494 M1.
Side light	5 W - Single contact - 963 333 M1.
Stop and rear light	5/21 W - Double contact index - 908 543 M1.
Direction indicator light	21 W - Single contact - 621 235 M1.
Number plate light	5 W - Festoon - 621 234 M1.
Interior light	5 W - Festoon - 621 234 M1.
Instrument panel lights	1,2 W - Capless - 3405 185 M1.
Rotating beacon	55 W - Halogen H1 - 3405 180 M1.
Fuses – Continental blade type:	
Size and colour	2 amp (clear), 5 amp (tan), 7,5 amp (brown), 10 amp (red), 15 amp (blue), 20 amp (yellow), 25 amp (natural white), 30 amp (green).

Lift Hydraulics

Hydraulic pump:	
Model	Mk. 3.
Type	Four cylinder, scotch yoke, driven from the PTO drive line.
Output at 2200 engine rev/min at normal working pressure:	
540 rev/min PTO (single speed)	17 litre/min (3.7 gal/min)(4.5 US gal/min).
540/540E rev/min PTO	22 litre/min (4.8 gal/min)(5.8 US gal/min).
540/1000 rev/min PTO	28 litre/min (6.2 gal/min)(7.4 US gal/min).
Pressure relief valve setting	227 bar (3292 lbf/in^2).

Auxiliary Hydraulics

Pump Type	Dual element gear type, transmission mounted.
Make	Sunstrand.
Drive	Chain drive from PTO clutch housing.
Maximum pump flow at 2200 engine rev/min at normal working pressure:	
Output	38 litre/min (8.4 gal/min)(10.0 US gal/min).
Maximum pressure	210 bar (3046 lbf/in^2).
Oil strainer:	
Type	100 micron washable.
Location	Right-hand side of rear axle housing.
Oil Filter:	
Type	Centrifugal washable.
Location	Manifold block, right-hand side of rear axle housing.
Auxiliary hydraulic control valves:	
Type	Open centre.
Number of sections	1, 2, 3 or 4.
Type of sections available	Spring return to neutral. Detented with pressure kick-out. Detent with kickout plus float. Motor.
Combined Flow at quick release coupling at 2200 engine rev/min:	
Combined flow 540 PTO (single speed)	55 litre/min (12.1 gal/min)(14.5 US gal/min).
Combined flow 540/540E PTO	60 litre/min (13.2 gal/min)(15.8 US gal/min).
Combined flow 540/1000 PTO	66 litre/min (14.5 gal/min)(17.4 US gal/min).
Pressure at quick release coupling with combined flow at 2200 engine rev/min	210 bar (3046 lbf/in^2) maximum.
Trailer brake valve:	
Make	Bosch.
Ratio	4:1.
Piston diameter	12 mm.
Maximum pressure to brakes	135 bar (1960 lbf/in^2).
Maximum oil flow to trailer brake	15 litre/min (3.3 gal/min)(4 US gal/min).

Drawbars

Standard:

Maximum static load:	
Normal-duty:	
Inner position	775 kgf (1709 lbf).
Centre position	775 kgf (1709 lbf).
Fully extended position	775 kgf (1709 lbf).
Heavy-duty:	
Inner position	1180 kgf (2601 lbf).
Centre position	1180 kgf (2601 lbf).
Fully extended position	1180 kgf (2601 lbf).
Distance to PTO shaft:	
Inner position	250 mm (10 in).
Centre position	350 mm (14 in).
Fully extended position	400 mm (16 in).
Drawbar face to centre of PTO shaft	200 mm (7.88 in).
Drawbar side swing from centre	221 mm (8.70 in).
Pintle-pin:	
Maximum static load	3000 kgf (6614 lbf).
Drawbar maximum static load	1180 kgf (2601 lbf).

Pick-up Hitch

Normal-duty:	
Hook:	
Maximum static load	2243 kgf (4945 lbf).
Drawbar - distance to PTO shaft:	
Inner position	350 mm (14 in).
Fully extended position	400 mm (16 in).
Drawbar - maximum static load:	
Inner position	775 kgf (1709 lbf).
Fully extended position	775 kgf (1709 lbf).
Heavy-duty:	
Hook - maximum static load:	
Inner position	3058 kgf (6742 lbf).
Centre position	1180 kgf (2601 lbf).
Fully extended position	1180 kgf (2601 lbf).
Drawbar - distance to PTO shaft:	
Inner position	250 mm (10 in).
Centre position	350 mm (14 in).
Fully extended position	400 mm (16 in).
Drawbar - maximum static load:	
Inner position	1180 kgf (2601 lbf).
Centre position	1180 kgf (2601 lbf).
Fully extended position	1180 kgf (2601 lbf).

Lift Linkage

Linkage types:

4215, 4220, 4225, 4235, 4245	Interchangeable ball ends - Category 1 and 2.
4225, 4235, 4243, 4245, 4253	Normal-duty telescopic - Maximum capacity 3000 kgf (6614 lbf)
4245, 4255, 4260, 4270	Heavy-duty telescopic
4225, 4235, 4245, 4255, 4260, 4270	Fixed ball ends - category 2.
4225, 4235, 4245, 4255, 4260, 4270	Hook ends - category 2.
4225, 4235, 4245, 4255, 4260, 4263, 4270	Telescopic ends - category 2.

Tractor Specification

Lift capacity at link ends with links horizontal:	
4215, 4220, tractors	2200 kgf (4850 lbf).
4225, 4235, tractors	2600 kgf (5732 lbf).
4225, 4235, 4245 tractors	3000 kgf (6614 lbf) with 1 x 28 mm assistor cylinder.
4225, 4235, 4245, 4255 tractors	4000 kgf (8818 lbf) with 2 x 28 mm assistor cylinders.
4260, 4270 tractors	5000 kgf (11023 lbf) with 2 x 40 mm assistor cylinders.

Air Conditioning System

Refrigerant type	R134a.
Compressor type	SD7H15-7952
Refrigerant oil type	PAG (SP-20)
Quantity of oil	206 cc (7.0 fl oz) - total system capacity.
Drive belt deflection	12-15 mm (1/2-5/8 in).
Refrigerant capacity	1.4 kg (3 lb).

Capacities

Fuel tank:	
Lo-Profile Cab - 4215, 4220, 4225	84 litres (18.5 gal)(22 US gal).
Lo-Profile Cab - 4235, 4243, 4245, 4253, 4255	
Single tank	98 litres (22 gal)(26 US gal).
Twin tanks	113 litres (25 gal)(30 US gal).
Standard Cab - Sloping hood - 4235, 4243, 4245, 4253, 4255	
Single tank	127 litres (28 gal)(34 US gal).
Twin tanks	142 litres (31 gal)(37 US gal).
Standard Cab - 4235, 4243, 4245, 4253, 4255	
Single tank	127 litres (28 gal)(34 US gal).
Twin tanks	186 litres (41 gal)(49 US gal).
Standard Cab - 4260, 4263, 4270	202 litres (44 gal)(53 US gal).
Engine oil:	
Three cylinder engines	5,7 litres (1.3 gal)(1.5 US gal).
Four cylinder engines	6,5 litres (1.4 gal)(1.7 US gal).
Six cylinder engines	13,5 litres (3.0 gal)(3.6 US gal).
Cooling system:	
Three cylinder engines	10,2 litres (2.3 gal)(2.7 US gal).
Four cylinder engines	17,5 litres (3.9 gal)(4.6 US gal).
Six cylinder engines	28,0 litres (6.2 gal)(7.4 US gal).
Transmission/hydraulics:	
Two- and four-wheel drive	50,0 litres (11.0 gal)(13.2 US gal).
Rear axle epicyclic hubs - heavy-duty only - each side	2,9 litres (5 pts)(5 US pts).
Front four-wheel drive axle:	
Oil capacity - epicyclic - each side:	
AG 66	0,8 litre (1.5 pt) (1.5 US pt).
AG 75 and AG 85	1,0 litre (1.8 pt) (1.8 US pt).
AG 105	1,2 litre (2 pt) (2 US pt).
Oil capacity - complete axle:	
AG 66, AG 75 , AG 85	5,6 litre (1.2 gal) (1.5 US gal).
AG 105	7,6 litre (1.7 gal) (2 US gal).
Dual screen and rear window washer bottle:	
Capacity	2,5 litre (4 pt) (4 US pt).

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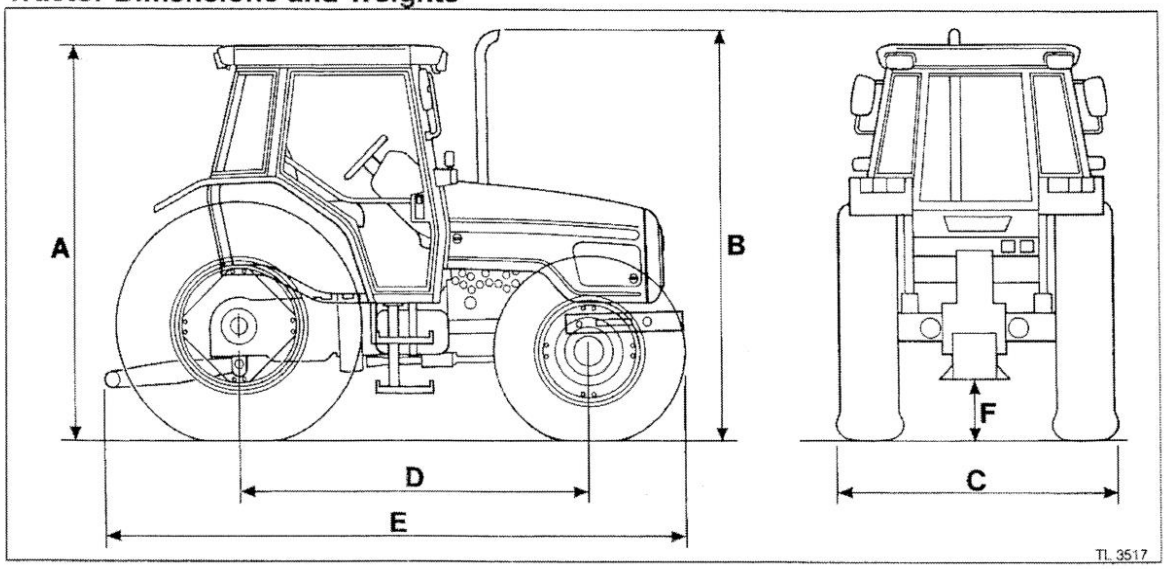
Tractor Specification

Tractor Dimensions and Weights



Dimensions - mm (in)

Tractor model	4215	4220	4225	4235
Tyre size (rear)	14.9 - 28	14.9 - 28	16.9 - 30	16.9 - 34
Track setting	1525 (60)	1525 (60)	1525 (60)	1525 (60)
A. Overall height:				
Lo-Profile cab, flat roof	2360 (93)	2360 (93)	2365 (93)	-
Lo-Profile cab, standard roof	2450 (97)	2450 (97)	2455 (98)	-
Lo-Profile cab, flat roof	-	-	-	2445 (96)
Lo-Profile cab, standard roof	-	-	-	2535 (100)
Standard cab (flat floor), Sloping hood, standard roof	-	-	2565 (101)	2615 (103)
Standard cab (flat floor), standard roof	-	-	-	2615 (103)
Standard cab (flat floor),standard roof	-	-	-	-
B. Height over exhaust	30-150 mm (1-6 in) above cab height			
C. Overall width	1900 (75)	1900 (75)	1955 (77)	1955 (77)
D. Wheel base:				
Two-wheel drive - normal-duty axle	2130 (84)	2130 (84)	2190 (86)	2190 (86)
Two-wheel drive - heavy- and extra heavy-duty axle	-	-	2350 (93)	2350 (93)
Four-wheel drive - AG 66 axle	2230 (88)	2230 (88)	2280 (90)	2280 (90)
Four-wheel drive - AG 75, AG 85 or AG 105 axle	-	-	2350 (93)	2350 (93)
E. Overall length:				
Two-wheel drive - without weights	3740 (147)	3740 (147)	3850 (152)	4010 (158)
Two-wheel drive - with weights	4075 (160)	4075 (160)	4185 (165)	4345 (171)
Four-wheel drive - without weights	3860 (152)	3860 (152)	3940 (155)	4050 (160)
Four-wheel drive - with weights	4192 (165)	4192 (165)	4277 (168)	4345 (171)
F. Minimum ground clearance (average)			340 (13)	340 (13)

continued

Tractor Dimensions and Weights *continued*

Dimensions - mm (in)

Tractor model	4243/4245	4253/4255	4260/4263	4270
Tyre size (rear)	16.9 - 34	16.9 - 34	16.9 - 38	18.4 - 38
Track setting	1625 (64)	1625 (64)	1625 (64)	1625 (64)
A. Overall height:				
Lo-Profile cab, flat roof	-	-	-	-
Lo-Profile cab, standard roof.	-	-	-	-
Lo-Profile cab, flat roof	2445 (96)	2445 (96)	-	-
Lo-Profile cab, standard roof	2535 (100)	2535 (100)	-	-
Standard cab (flat floor), Sloping hood, standard roof	2615 (103)	2640 (104)[1]	-	-
Standard cab (flat floor), standard roof	2615 (103)	2640 (104)[1]	-	-
Standard cab (flat floor), standard roof	-	-	2680 (106)	2740 (108)
B. Height over exhaust	30-150 mm (1-6 in) above cab height			
C. Overall width	2055 (81)	2055 (81)	2055 (81)	2095 (82)
D. Wheel base:				
Two-wheel drive - heavy-duty axle	-	-	-	-
Two-wheel drive - heavy- and extra heavy-duty axle	2350 (93)	2350 (93)	2610 (103)	2610 (103)
Four-wheel drive - AG 66 axle	2350 (93)	-	-	-
Four-wheel drive - AG 75, AG 85 or AG 105 axle	2280 (90)	2350 (93)	2610 (103)	2610 (103)
E. Overall length:				
Two-wheel drive - without weights	4010 (158)	4010 (158)	4322 (170)	4322 (170)
Two-wheel drive - with weights	4345 (171)	4345 (171)	4655 (183)	4655 (183)
Four-wheel drive - without weights	4050 (160)	4100 (161)	4412 (174)	4450 (175)
Four-wheel drive - with weights	4345 (171)	4345 (171)	4655 (183)	4655 (183)
F. Minimum ground clearance (average)	340 (13)	390 (15)	390 (15)	405 (16)

NOTE: *The word 'Sloping hood' refers to the High Visibility type hood with small radiator grille.*

The weights and dimensions can vary, depending on the specification of tyres, optional equipment, size of fuel tank etc. The dimensions and weights quoted are based on a tractor with the most common build and tyre size, therefore a slight variation may be found between these figures and your tractor.

[1] on 16.9 - 38 tyres.

Weights - kg (lb)

Tractor model - Four-wheel drive	4215	4220	4225	4235
Front axle	-	-	1396 (3078)	1506 (3320)
Rear axle	-	-	2000 (4409)	2200 (4850)
Total	-	-	3396 (7497)	3706 (8170)
Tractor model - Four-wheel drive	**4243/4245**	**4253/4255**	**4260/4263**	**4270**
Front axle	1533 (3380)	1533 (3380)	1700 (3748)	1700 (3748)
Rear axle	2226 (4907)	2226 (4907)	2421 (5337)	2421 (5337)
Total	3759 (8287)	3759 (8287)	4121 (9085)	4121 (9085)

Tractor model - Two-wheel drive	4215	4220	4225	4235
Front axle	-	-	1146 (2526)	1256 (2769)
Rear axle	-	-	2000 (4409)	2200 (4850)
Total	-	-	3146 (6936)	3456 (7619)
Tractor model - Two-wheel drive	**4245**	**4255**	**4260**	**4270**
Front axle	1283 (2829)	1283 (2828)	1450 (3197)	1450 (3197)
Rear axle	2226 (4907)	2226 (4907)	2421 (5337)	2421 (5337)
Total	3509 (7736)	3509 (7736)	3871 (8534)	3871 (8534)

TRACTOR MOUNTING POINTS

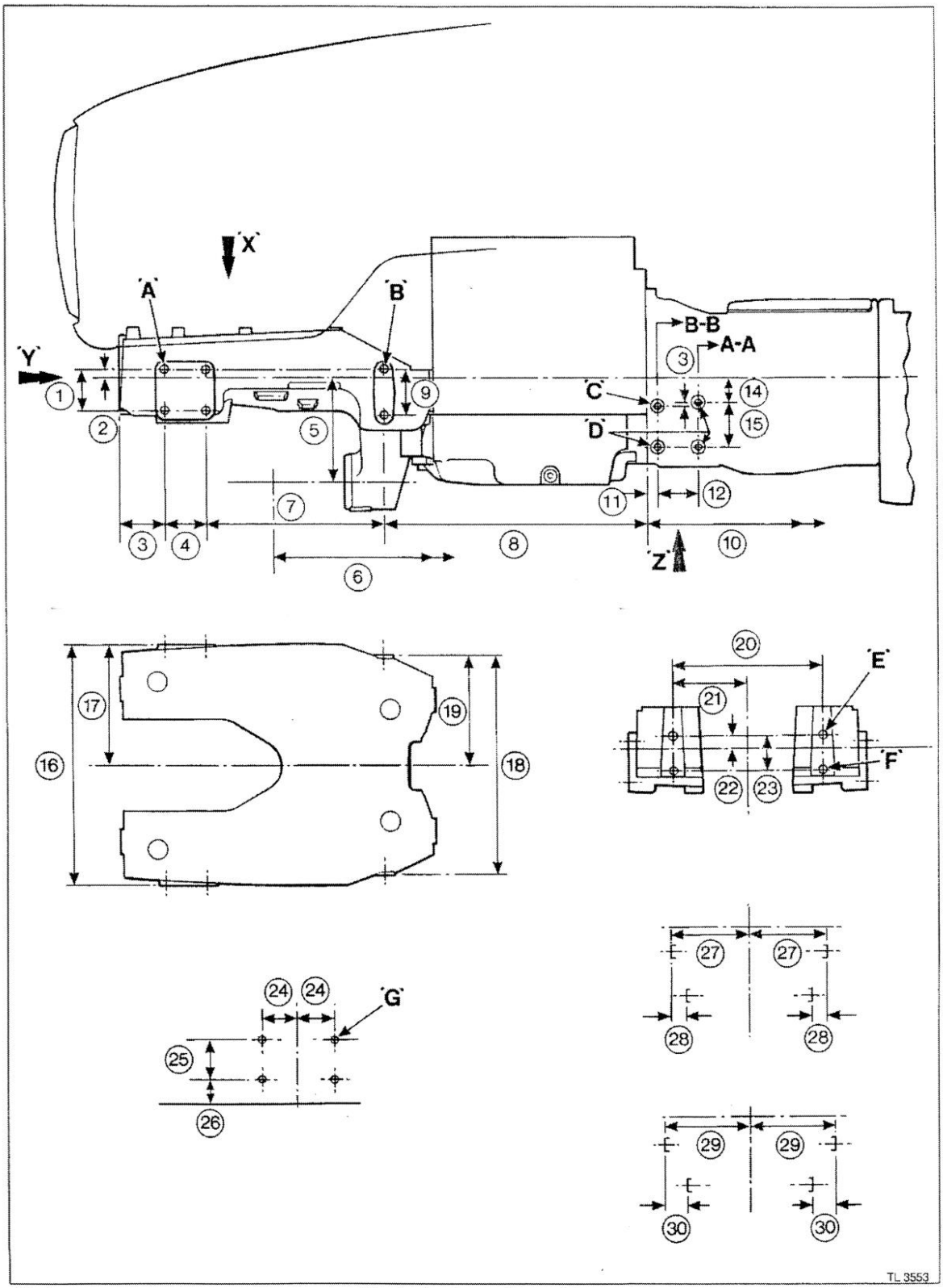


Fig.1 Tractor front mounting points

MOUNTING POINTS

Refer to Fig.1 and Fig.2.

Tractor Front (Fig.1):

1. 101,6 mm (4 in).
2. 20 mm (0.788 in).
3. 60,4 mm (2.364 in) high visibility hood.
   115,4 mm (4.547 in) standard hood.
4. 101.6 mm (4 in).
5. 260 mm (10.244 in).

Wheelbase two-wheel drive:

6. 2133 mm (84.040 in) 3 cylinder engine tractor.
   2187 mm (86.168 in)4 cylinder engine tractor *(see Note 1)*.
   2350 mm (92.590 in) 4 cylinder engine tractor.
   2609 mm (102.795 in) 6 cylinder engine tractor.

Note 1: Tractors fitted with light weight front axle.

Wheelbase four-wheel drive:

2227 mm (87.744 in) 3 cylinder engine tractor.
2281 mm (89.871 in) 4 cylinder engine tractor *(see Note 2)*.
2350 mm (92.590 in) 4 cylinder engine tractor *(see Note 3)*.
2609 mm (102.795 in) 6 cylinder engine tractor.

Note 2: Tractors fitted with AG 66 type axle

Note 3: Tractors fitted with AG 75, 85 or 105 type axles.

7. 448 mm (17.651 in).
8. 612 mm (24.113 in) 3 cylinder engine tractor.
   664,75 mm (26.191 in) 4 cylinder engine tractor.
   908,22 mm (35.784 in) 6 cylinder engine tractor.
9. 114 mm (4.492 in).
10. 1406 mm (55.396 in) - to centre of rear axle.
11. 25.4 mm (1 in).
12. 101.6 mm (4 in).
13. 9,65 mm (0.380 in).
14. 60,45 mm (2.382 in).
15. 111,25 mm (4.383 in).

View arrow 'X':

16. 600 mm (23.640 in).
17. 300 mm (11.820 in).
18. 550 mm (21.670 in).
19. 275 mm (10.835 in).

View arrow 'Y':

20. 381 mm (15.011 in).
21. 190 mm (7.486 in).
22. 31,87 mm (1.256 in).
23. 86 mm (3.388 in).

View arrow 'Z':

24. 91,95 mm (3.623 in).
25. 101,6 mm (4 in).
26. 60,2 mm (2.372 in).

Section 'AA':

27. 197,61-196,09 mm (7.786-7.765 in).
28. 39,62-36,58 mm (1.561-1.441 in).

Section 'BB':

29. 216,28-215,52 mm (8.521-8.491 in).
30. 57,53-56,77 mm (2.267-2.238 in).

Hole sizes:

A. 4 holes M20 - 2,5 x 38 mm deep.
B. 2 holes M20 - 2,5 x 38 mm deep.
C. 1 hole 5/8 in - 11 UNC x 23,8 mm deep.
D. 3 holes 5/8 in - 11 UNC x 31,8 mm deep.
E. 2 holes 22,33/22,00 (0.867 in) diameter through.
F. 2 holes M20 - 2,5 through.
G. 4 holes 5/8 in - 11 UNC x 31,7 mm deep.

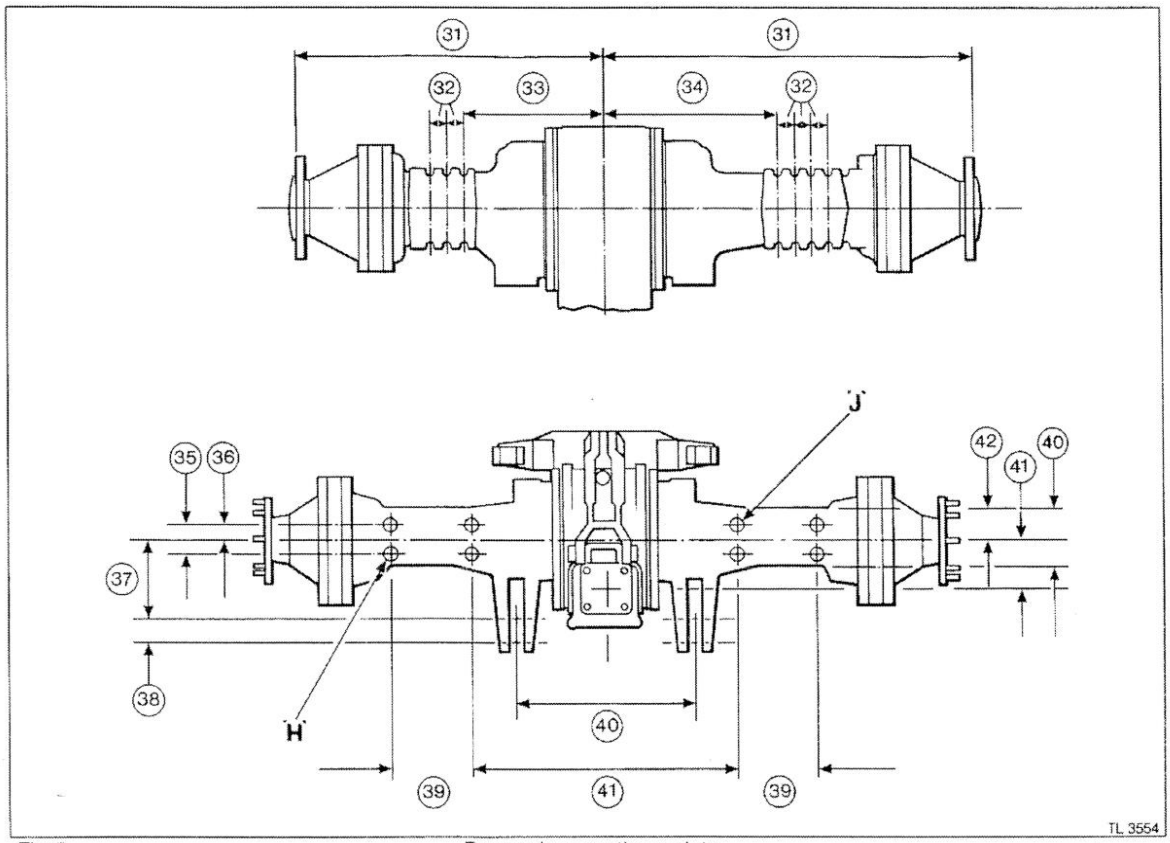


Fig.2 Rear axle mounting points

Rear axle (Fig.2):

31. 734 mm (28.20 in) narrow axle.
    885,5 mm (34.889 in) normal-duty axle.
    936,5 mm (36.898 in) heavy-duty axle
32. 41 mm (1.615 in).
33. 345,5 mm (13.613 in) narrow axle.
34. 428 mm (16.863 in) Normal- and heavy-duty axle.
35. 80 mm (3.152 in).
36. 40,8 mm (1.607 in).
37. 212,5 mm (8.373 in).
38. 67 mm (2.640 in) heavy-duty axle only.
39. 220 mm (8.668 in).
40. 161,5 mm (6.363 in).
41. 127 mm (5 in).
42. 90,2 mm (3.554 in).

Hole sizes:

H. 4 holes 5/8" - 11 UNC x 28 mm deep.

J. 4 holes 5/8" - 11 UNC x 30 mm deep.

TRACTOR IDENTIFICATION

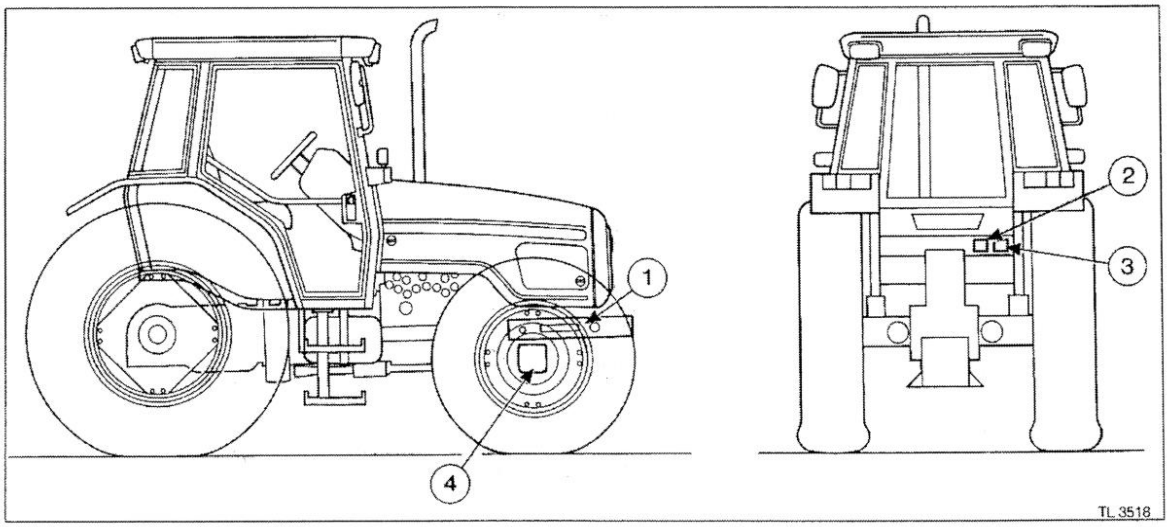


Fig.3

SERIAL NUMBERS – TRACTOR

The serial number of the tractor forms a very important part in the identification of the tractor, when it was made and the components included in its build. The serial number MUST always be quoted when communicating with Massey Ferguson or the Dealer.

The location of serial numbers and serial number plates are shown in Fig.3. The serial number is stamped on the right-hand side of the front support casting (1 Fig.3) and detailed in Fig.4. This information is repeated on a serial number plate located on the rear of the tractor (2 Fig.3), and detailed in Fig.5.

The cab compliance and serial number plate is located at the rear of the cab (3 Fig.3). The front four-wheel drive axle serial number plate is fixed to the rear right-hand side of the axle (4 Fig.3), and detailed in Fig.7 on page 1B-18.

The tractors are numbered systematically and the number gives information on machine build, engine, transmission, when it was built and year of manufacture.

The serial number information is as follows:

Example:

1	3	5	7	9		
A	A	A	A	1	1	A	A	X	A	F	3	2	1	2	1
2		4	6		8	10									

1. Family

A = 4200 series tractor emissions complient engine, standard sheet metal.

B = 4200 series tractor non emissions complient engine, standard sheet metal.

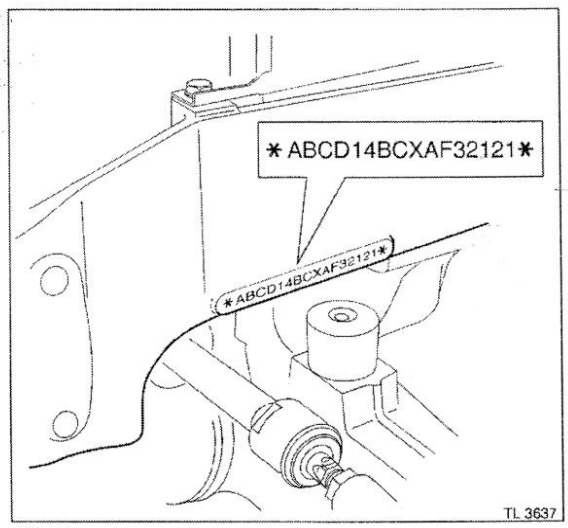


Fig.4

C = 4200 series tractor emissions complient engine, low sheet metal.

D = 4200 series tractor non emissions complient engine, low sheet metal.

2. Engine Make, Type & Power

AA = Perkins three cylinder diesel engine 52 DIN.

AB = Perkins three cylinder diesel engine 60 DIN.

BA = Perkins four cylinder diesel engine 65 DIN.

BB = Perkins four cylinder diesel engine 75 DIN.

BC = Perkins four cylinder diesel engine 85 DIN.

BD = Perkins four cylinder diesel engine 105 DIN.

BE = Perkins four cylinder diesel engine 95 DIN.

BF = Perkins four cylinder diesel engine 80 DIN.

CA = Perkins six cylinder diesel engine 100 DIN.

CB = Perkins six cylinder diesel engine 110 DIN.

3. Transmission Type

A = 8 x 2 Manual gearbox.

B = 8 x 8 Shuttle gearbox.

C = 12 x 4 Manual gearbox.

D = 12 x 12 Shuttle gearbox.

E = 18 x 6 Speedshift gearbox.

4. Notional Road Speed

1 = 30 km/hr.

2 = 40 km/hr.

5. Driving Axles

1 = Two-wheel drive - short wheelbase.

2 = Two-wheel drive - long wheelbase.

3 = Four-wheel drive - short wheelbase.

4 = Four-wheel drive - long wheelbase.

5 = Four-wheel drive - portal axle.

6. Cab or Safety Frame Structure

A = High cab, fixed windscreen (type 5001).

B = Low cab, fixed windscreen (type 5003).

C = High cab, forestry (type 5002).

D = Low cab, opening windscreen (type 5004).

E = High cab, opening windscreen (type 5005).

F = Not allocated.

G = Not allocated.

H = Safety frame 2 post (type 1800), standard wide axle.

J = Safety frame 2 post (type 1801), standard wide axle.

K = Safety frame 2 post (type 1900), narrow rear axle.

L = Safety frame 2 post (type 1901), narrow rear axle.

M = Safety frame 4 post (type 1500), standard wide axle.

N = Safety frame 4 post extra high (type 1500XH) standard rear axle.

P = Safety frame 4 post (type 1700) narrow rear axle.

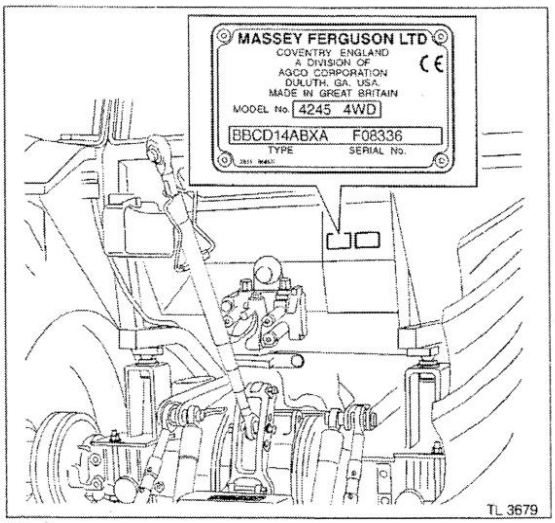


Fig.5

7. Cab & Safety Frame Mounting Normal- and Heavy-duty Axle

A = High rear mount (type R21), wide rear axle.

B = High rear mount (type R19), wide rear axle.

C = Low rear mount (type R17), wide rear axle.

D = High rear mount (type R20), narrow rear axle.

E = Low rear mount (type R18), narrow rear axle.

F = Low rear mount (type R15), wide rear axle.

G = Low rear mount (type R16), narrow rear axle.

Footstep tractors:

E = 2 & 4 post safety frame wide rear axle.

F = 2 & 4 post safety frame narrow rear axle.

8. Not Used (X)

9. Application

A = Massey Ferguson
B = Massey Ferguson "ES" Spain
E = Iseki
F = Massey Ferguson "3" range North America

10. Serial Number

F = Year of manufacture, see year code letter, F 1997
32 = Week of manufacture, 32nd week (week 1 = 1st week in January.
121 = 121st tractor built in that week.

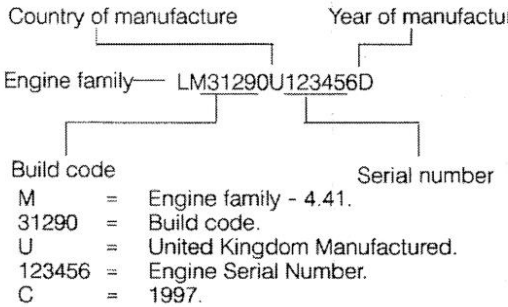
Year Code Letter

F = 1997 - January to December
G = 1998 - January to December
H = 1999 - January to December
J = 2000 - January to December
K = 2001 - January to December

SERIAL NUMBERS – ENGINE

The engine numbering system (Fig.6) consists of up to thirteen letters and numbers giving details of build code, country of origin, serial number and year of manufacture.

Example:



M = Engine family - 4.41.
31290 = Build code.
U = United Kingdom Manufactured.
123456 = Engine Serial Number.
C = 1997.

Engine family codes:

CP = 903.27 engine
LM = 4.41 - engine.
AH = 1004T - engine.
YA = 1006 - engine.
YG = 1006 - Low emission engine.
YH = 1006T - Low emission engine.

Country of manufacture:

B = Brazil.
F = France.
L = Italy.
P = Poland.
T = Turkey.
U = United Kingdom.

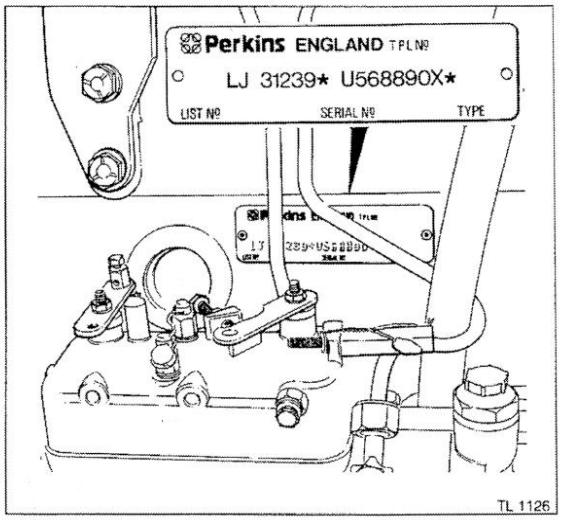


Fig.6

Year of manufacture:

B = 1996.
C = 1997.
D = 1998.
E = 1999.
F = 2000.

SERIAL NUMBERS – FRONT AXLE

The serial number plate (Fig.7) is important, it identifies the model and size of the front axle fitted to the tractor because different axles can be fitted to many tractors. The plate is divided into five sections, each section giving information as follows:

1. Axle

Axle type:

AG 66 CD - Type 66 centre drive - narrow (Short Wheel Base) 4215, 4220, 4225, 4235, 4245 tractors.

AG 66 CD - Type 66 centre drive - wide (Short Wheel Base) 4225, 4235 tractors.

AG 66 CD - Type 66 centre drive - portal (Short Wheel Base) 4225, 4235, 4245 tractors.

AG 75 CD - Type 75 centre drive (Long Wheel Base) 4225, 4235, 4243 tractors.

AG 85 CD - Type 85 centre drive (Long Wheel Base) 4245, 4253, 4255, 4260, 4263 tractors.

AG 85 CD - Type 85 centre drive - portal (Long Wheel Base) 4255, 4260 tractors.

AG 105 CD - Type 105 centre drive (Long Wheel Base) 4245, 4255, 4260, 4270 tractors.

2. Differential

Differential type:

NS = No-spin (autolock).
ST = Standard (no differential lock).
HY = Hydrolock (hydraulic).

3. Total Ratio

This is the total ratio value of the axle from the input to the wheel.

4. Serial Number

Progressive serial number:

The last two letters of the number refer to the date of build.

The first letter denotes the month:

A	= January.	G	= July.
B	= February.	H	= August.
C	= March.	I	= September.
D	= April.	L	= October.
E	= May.	M	= November.
F	= June	N	= December.

The second letter denotes the year:

F = 1996.
G = 1997.
H = 1998.
J = 1999.
K = 2000.

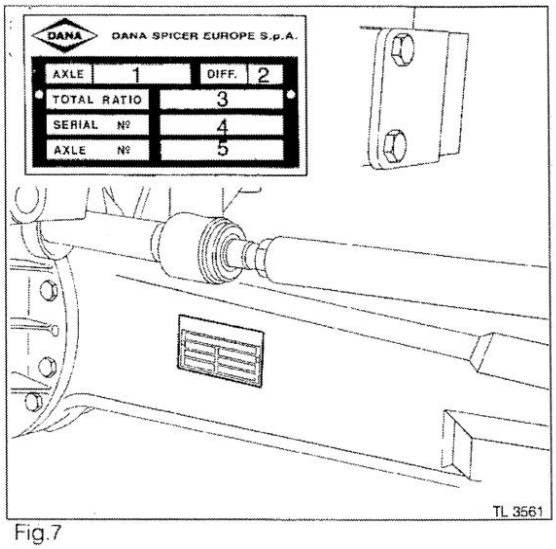
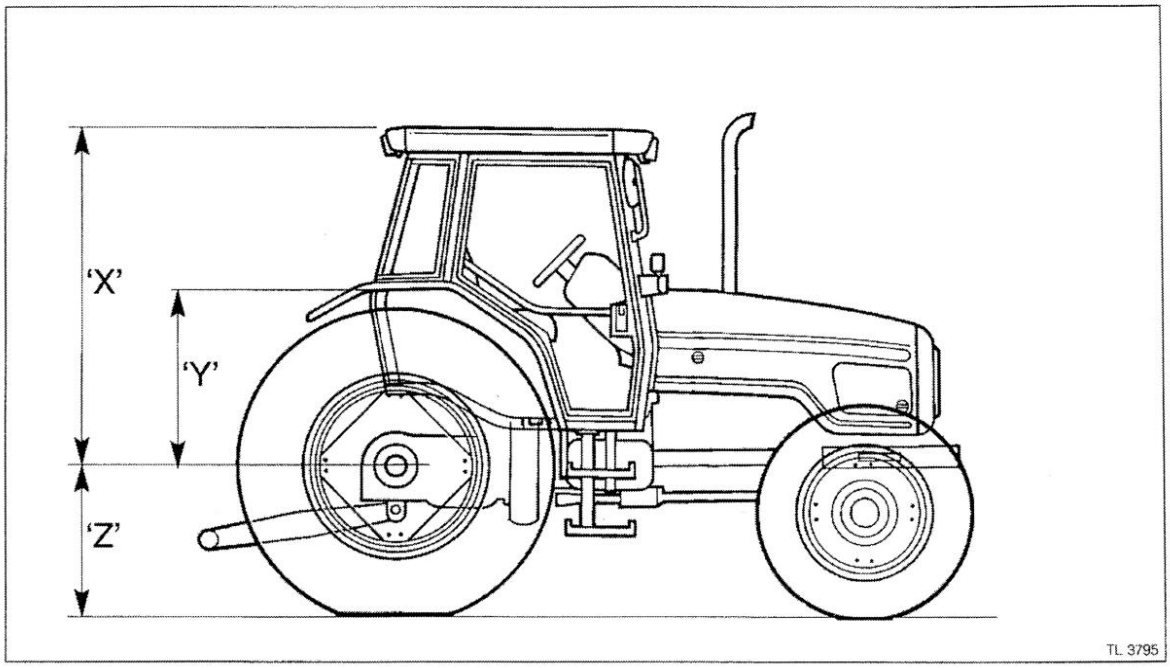


Fig.7

5. Axle Number

Part numbers of axles:

3808 857 M91 - AG 66 - CD - Narrow - Hydralock.
3808 858 M91 - AG 66 - CD - Wide - Hydralock.
3808 334 M91 - AG 75 - CD - Hydralock.
3808 336 M91 - AG 85 - CD - Hydralock.
3808 338 M91 - AG105 - CD - Hydralock.



TRACTOR IDENTIFICATION and HEIGHT

The 4200 series tractors come in various types starting with the 'Standard Tractor'. This has a standard cab with a flat floor and standard roof with the heating and ventilating system installed, the hood is a normal type and size. The cab is set at two heights depending on the model and size of the rear wheels. The basic structure of all the cabs are the same size from the six cylinder down to the three cylinder.

The next type is similar to the first with a sloping hood used for loader and front mounted implement work.

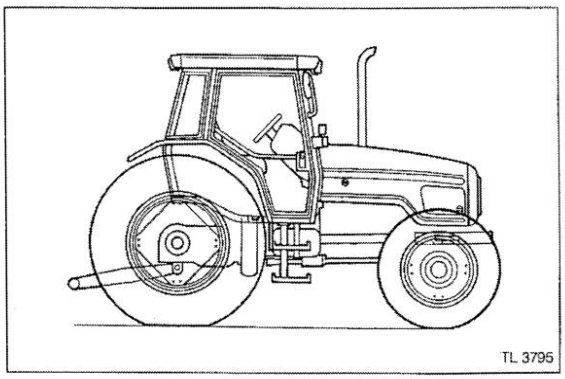
The third type is called 'Lo-Profile', the cab is set lower on the chassis and in the cab there is a tunnel around the transmission. This build only comes with a sloping hood. As an option, it can be fitted with a flat roof which further reduces the overall height of the tractor.

The last and fourth type is for tractors with three cylinder engines, it is only available with the Lo-Profile cab and sloping hood, the cab is set lower for the small wheels. It is also available with a four cylinder engine (4225). These models are available with a standard or flat roof cab for working in low buildings.

The following illustrations show the visual differences between the types of build and the changes in height depending on model and tyre size. The height of cab controls the size of fuel tank fitted.

4260, 4263 and 4270 Standard Tractors

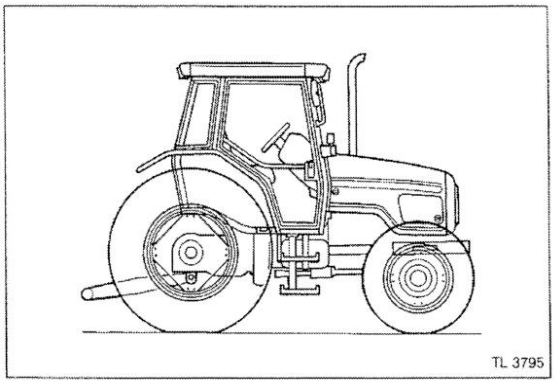
6 cylinder engines.
Standard roof.
Standard cab with flat floor.
Standard hood.
Cab height 'X' = 1900 mm.
Mud guard height 'Y' = 990 mm.
'Z' = rolling radius of tyre.
Fuel tank capacity = 202 litres (two tanks).



Tractor Specification

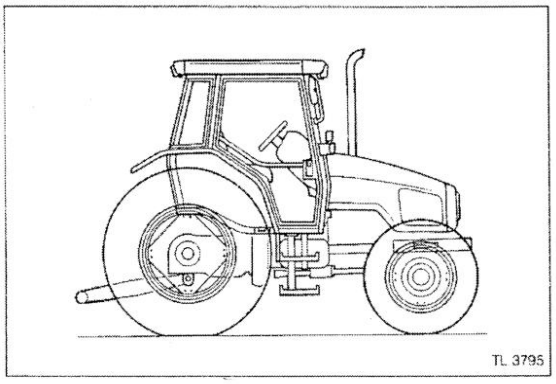
4225, 4235, 4243, 4245, 4253 and 4255 Standard Tractors

4 cylinder engines.
Standard roof.
Standard cab with flat floor.
Standard hood.
Cab height 'X' = 1860 mm.
Mud guard height 'Y' = 950 mm
'Z' = rolling radius of tyre.
Fuel tank capacity = 127 litres (single tank).



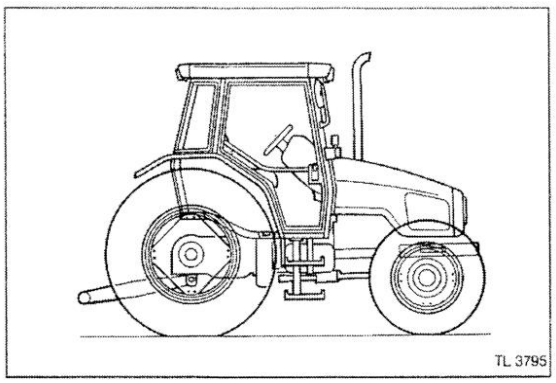
4225, 4235, 4243, 4245, 4253 and 4255 Standard Tractors

4 cylinder engines.
Standard roof.
Standard cab with flat floor.
Sloping hood.
Cab height 'X' = 1860 mm.
Mud guard height 'Y' = 950 mm.
'Z' = rolling radius of tyre.
Fuel tank capacity = 127 litres (single tank).



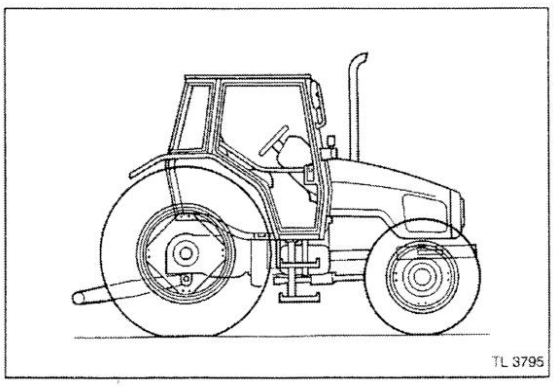
4235, 4243, 4245, 4253 and 4255 Lo-Profile Tractors

4 cylinder engines.
Standard roof.
Lo-Profile cab with tunnel floor.
Sloping hood.
Cab height 'X' = 1780 mm.
Mud guard height 'Y' = 870 mm.
'Z' = rolling radius of tyre.
Fuel tank capacity = 98 litres (single tank).



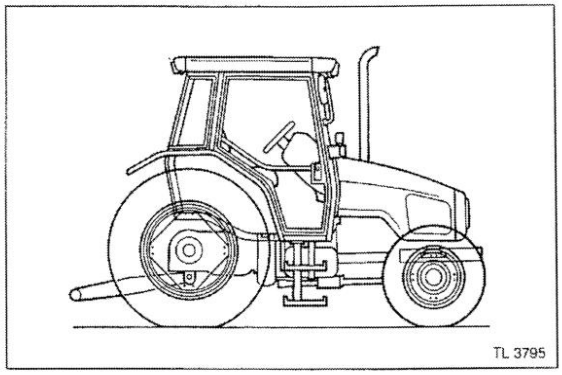
4235, 4245, and 4255 Lo-Profile Tractors

4 cylinder engines.
Flat roof.
Lo-Profile cab with tunnel floor.
Sloping hood.
Cab height 'X' = 1780 mm.
Mud guard height 'Y' = 870 mm.
'Z' = rolling radius of tyre.
Fuel tank capacity = 98 litres (single tank).



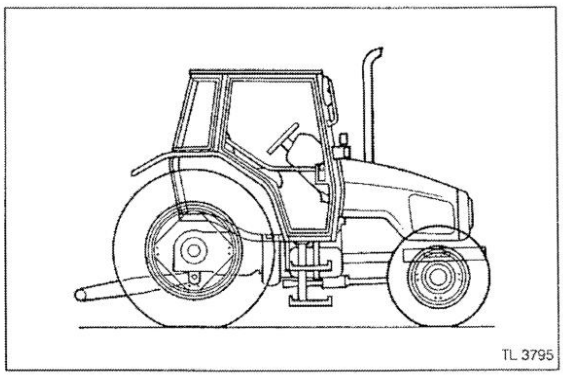
4215, 4220 and 4225 Lo-Profile Tractors

4215, 4220 - 3 cylinder engines.
4225 - 4 cylinder engine.
Standard roof.
Lo-Profile cab with tunnel floor.
Sloping hood.
Cab height 'X' = 1745 mm.
Mud guard height 'Y' = 835 mm.
'Z' = rolling radius of tyre.
Fuel tank capacity = 84 litres.



4215, 4220 and 4225 Lo-Profile Tractors

4215, 4220 - 3 cylinder engines.
4225 - 4 cylinder engine.
Flat roof.
Lo-Profile cab with tunnel floor.
Sloping hood.
Cab height 'X' = 1665 mm.
Mud guard height 'Y' = 835 mm.
'Z' = rolling radius of tyre.
Fuel tank capacity = 84 litres.



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Miscellaneous Data

Section 1 – Part C

Table of Contents

BOLT TORQUE SPECIFICATIONS (GENERAL GUIDE FOR INCH FASTENERS)

Use the "Standard Torque" charts as a general guide when tightening fasteners that DO NOT HAVE SPECIFIC TIGHTENING RECOMMENDATIONS.

Inch Fasteners Standard torque in Newton Metres (Foot Pounds)					
* Inch bolt size	SAE grade 5 **mild steel below grade 5	SAE grade 8 ISO grade 8.8 BS grade S		ISO grade 10.9 BS grade V	
		*** Non-rigid joint	**** Rigid joint	*** Non-rigid joint	**** Rigid joint
1/4 inch	6-8 (4-6)	9-12 (7-9)	11-15 (8-11)	13-18 (10-13)	16-22 (12-16)
5/16 inch	12-16 (9-12)	18-24 (13-18)	22-30 (16-22)	25-34 (18-25)	31-43 (23-32)
3/8 inch	22-30 (16-22)	31-42 (23-31)	39-53 (29-39)	44-60 (32-44)	55-75 (41-55)
7/16 inch	35-47 (26-35)	51-69 (38-51)	64-86 (47-63)	72-96 (53-71)	90-120 (66-89)
1/2 inch	54-72 (40-53)	80-104 (59-77)	100-130 (74-96)	110-140 (81-103)	140-180 (103-133)
5/8 inch	110-140 (81-103)	160-210 (118-155)	200-260 (148-192)	220-300 (162-221)	280-370 (207-273)
3/4 inch	190-250 (140-184)	280-370 (207-273)	350-460 (258-339)	390-530 (287-391)	490-660 (361-487)
7/8 inch	310-410 (228-302)	450-610 (332-450)	560-760 (413-561)	640-850 (472-672)	800-1060 (590-782)
1 inch	460-620 (339-457)	670-900 (494-664)	840-1120 (620-826)	960-1280 (708-944)	1200-1600 (885-1180)

Key to table above:

* *NOTE: The size is the diameter of the shank - not the head width.*

** *NOTE: Mild steel torque values to be used for SAE Grade 5 bolts when weld nuts, or other low strength nuts are used.*

*** *NOTE: Use these values when any of the following conditions exist:*

1. Possible damage to the joined members of the assembly may occur.
2. Thick and/or highly compressible gaskets are used between members.
3. Non-flat unmachined seating surfaces for bolt head (or nut) occurs.
4. Non-flat or non-parallel joint faces are encountered.

**** *NOTE: Use these values when ALL of the following conditions exist:*

1. Damage will not occur to the joined members of the assembly.
2. It is desirable to use this higher clamping force to ensure tightness.
3. Fastener thread is not lubricated prior to assembly.

BOLT TORQUE SPECIFICATIONS (GENERAL GUIDE FOR METRIC FASTENERS)

Use the "Standard Torque" charts as a general guide when tightening fasteners that DO NOT HAVE SPECIFIC TIGHTENING RECOMMENDATIONS.

Metric Fasteners Standard torque in Newton Metres (Foot Pounds)					
* Metric bolt size	SAE grade 5 ** mild steel below grade 5	SAE grade 8 ISO grade 8.8 BS grade S		ISO grade 10.9 BS grade V	
		*** Non-rigid joint	**** Rigid joint	*** Non-rigid joint	**** Rigid joint
M6	4-5 (3-4)	8-11 (6-8)	10-14 (7-10)	12-16 (9-12)	14-20 (10-15)
M8	10-13 (7-10)	20-28 (15-21)	25-35 (18-26)	29-37 (21-27)	36-46 (27-34)
M10	19-25 (14-18)	40-56 (30-41)	50-70 (37-52)	57-77 (42-57)	72-96 (53-71)
M12	33-43 (24-32)	72-96 (53-71)	90-120 (66-89)	100-130 (74-96)	120-160 (89-118)
M16	84-110 (62-81)	160-210 (118-155)	200-260 (148-192)	240-320 (177-236)	300-400 (221-295)
M20	160-210 (118-155)	340-450 (251-332)	420-560 (310-413)	480-640 (354-472)	600-800 (443-590)

Key to table above:

* *NOTE: The size is the diameter of the shank - not the head width.*

** *NOTE: Mild steel torque values to be used for SAE Grade 5 bolts when weld nuts, or other low strength nuts are used.*

*** *NOTE: Use these values when any of the following conditions exist:*

1. Possible damage to the joined members of the assembly may occur.
2. Thick and/or highly compressible gaskets are used between members.
3. Non-flat unmachined seating surfaces for bolt head (or nut) occurs.
4. Non-flat or non-parallel joint faces are encountered.

**** *NOTE: Use these values when ALL of the following conditions exist:*

1. Damage will not occur to the joined members of the assembly.
2. It is desirable to use this higher clamping force to ensure tightness.
3. Fastener thread is not lubricated prior to assembly.

Miscellaneous Data

CHEMICALS and SEALANTS

The following chemicals and sealants quoted in this Workshop Service Manual are available from Massey Ferguson Parts Departments.

Description	Quantity	Part No.
Hylomar Jointing and sealing compound.	100 g tube 280 g aerosol	1447 390 M1 3638 340 M91
Lock 'n' Seal Loctite 222 - prevents small components from vibrating loose and provides an effective pipe thread seal against liquids or gases.	10 ml	3930 904 M1
Studlock Loctite 270 - a heavy duty version of Lock 'n' Seal for larger components which need less frequent stripping down. Highly resistant to industrial fluids and gases.	10 ml	3405 352 M5
Crownwheel Retainer Loctite 638 - for high strength retaining of close fitting parts. Designed to retain slip fitted or to strengthen press fitted parts, shafts bushes, pulleys etc.	6 ml	3930 274 M92
574 Multi-Gasket Loctite 573 - forms a strong, flexible gasket which provides a gas-tight, water-tight, oil-tight seal up to 200° C (392° F). Does not shrink,crack, tear or perish.	50 ml	3900 613 M2
Cleaner and Degreaser Loctite 7061 - a all-purpose solvent for removing grease and dirt.	400 ml aerosol	3930 907 M1
Super Glue Instant bonding for metals, plastics,rubber and ceramics.	5g	3930 905 M1
Clear Silicone A clear, tough, flexible and waterproof seal for metal, rubber, glass and plastics.	80g 310 ml	3405 357 M5 3405 423 M2
Penetrating oil A highly effective multi-purpose lubricant, moisture dispersant and dismantling spray.	330 ml aerosol	3930 850 M2
Gasket Remover Disolves gaskets for easy removal.	300 ml	3930 908 M1
Citrus Handcleaner Works with or without water.	3 litre	3930 906 M1
Anti-freeze Ethylene-glycol based, designed for protection down to minus 33° C (minus 27° F). Suitable for all types of engines, including those with aluminium cylinder heads.	1 litre 5 litre 25 litre 205 litre	1894 799 M2 1891 780 M2 1891 781 M2 1891 782 M2
Brake Fluid (Green) Specially developed for braking systems requiring a mineral fluid.	0,5 litre	3405 389 M1
Anti-Squawk Additive Specially developed to be added to the transmission oil to prevent noise from wet brake installations.	1 litre	1889 891 M2

CONVERSION TABLES

Area	Multiply by
mm^2 to in^2	0.0015
in^2 to mm^2	645.16
m^2 to ft^2	10.764
ft^2 to m^2	0.0929
ha to acre	2.4711
acre to ha	0.4047

Capacity	Multiply by
ml to fluid oz	0.0351
fluid oz to ml	28.413
litre to gal	0.2200
gal to litre	4.5640
litre to US gal	0.2640
US gal to litre	3.7850
gal to US gal	1.2010
US gal to gal	0.8330

Length	Multiply by
mm to in	0.0394
in to mm	25.400
m to ft	3.2808
ft to m	0.3048
km to mile	0.6214
mile to km	1.6093

Power	Multiply by
ps to hp	0.9863
hp to ps	1.0139
kW to hp	1.3410
hp kW	0.7457

Pressure	Multiply by
bar to lbf/in^2	14.504
lbf/in^2 to bar	0.0690

Speed	Multiply by
km/hr to mile/hr	0.6214
mile/hr to km/hr	1.6093

Torque	Multiply by
Nm to lbf ft	0.738
lbf ft to Nm	1.356

Volume	Multiply by
mm^3 to in^3	0.6102
in^3 to mm^3	163.87
m^3 to ft^3	35.315
ft^3 to m^3	0.0283

Weight	Multiply by
gram to oz	0.3530
oz to gram	28.350
kg to lb	2.2046
lb to kg	0.4536
kg to ton	0.0010
ton to kg	1016.1
tonne to ton	0.9842
ton to tonne	1.0160

Temperature	
°C to °F	1.8 x °C + 32
°F to °C	(°F - 32) ÷1.8

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Servicing the Tractor

Section 1 – Part D

Table of Contents

Servicing the Tractor

GENERAL

This section has been compiled to enable the reader to ascertain quickly what action is necessary to prepare a new tractor for sale, install it on the farm and carry out the 50 and 250 hour services, which should be rendered during the warranty period.

The timing of these two services has been calculated to provide maximum tractor efficiency throughout the warranty period thus safeguarding the subsequent life of the tractor.

Also detailed is the 'Running-in' procedure which will ensure that the engine will give a satisfactory performance through-out its life.

NOTE: *This is an optimum list of checks, instructions, etc., and may not apply to the tractor you are working on.*

PRE-DELIVERY INSPECTION

Check **1–1D**

Procedure

Before checking

1. Verify and record for future use the serial numbers of the tractor, engine, and four-wheel drive front axle.
2. Assemble all parts that have been removed for transport.

Checking levels

Check and adjust if necessary the following levels with their specific liquids:

3. Cooling system, water or anti-freeze.
4. Fuel tank.
5. Engine oil.
6. Transmission and rear axle.
7. Rear axle epicyclic hubs (heavy-duty only).
8. Four-wheel drive front axle.
9. Four-wheel drive front axle epicyclic hubs.
10. Battery.
11. Hydraulic brake reservoir.
12. Screen washer reservoir - cab only.

Lubrication

Lubricate the following points:

13. Lubricate all grease points as detailed in the Operator Instruction Book.
14. Lightly oil clutch linkage, hand and foot throttle linkage, all hinges, catches and door locks.

Adjustments

Check and adjust if necessary:

15. Battery condition, charge if necessary.
16. Tension of fan and air conditioner compressor belt(s).
17. Clutch pedal cable - height.
18. Brake pedal linkage - free pedal clearance.
19. Torque of all wheel and rim nuts and bolts.
20. Tyre pressures.

Checks before Road Test

Turn the starter switch to 'Auxiliary' position (ON) - check:

21. All warning lights - ON, warning buzzer sounds.
22. Lights - head, side, indicator, work, interior and panel.
23. Hazard warning lights and horn.
24. Cab heater and fresh air blower.
25. Remove all traces of oil, fuel and coolant from the tractor to permit a leak check after road test.

Start the Engine

Start the engine and carry out the following functional tests:

26. Safety start switches - transmission and PTO.
27. Air cleaner restriction indicator, momentarily blanking off the air intake.
28. Fuel cut-off.

Road Test

Restart the engine, warm up the tractor, drive forward - carry out the following checks:

29. Balance and operation of brakes.
30. Operation in all gears.
31. Differential lock function.
32. Four-wheel drive function.
33. Operation of cab heater and fresh air blower.
34. Operation of all air conditioning.
35. Operation of all gauges and instruments.
36. Parking brake effectiveness.

After Road Test

Hydraulic lift performance with 400 kg (900 lb) weight fitted to lower links - check operation:

37. Draft control.
38. Position control.
39. Transport - correctly positioned.
40. Pick-up hitch release, setting correctly positioned.
41. Response control effectiveness.
42. Selector valve - function.
43. Auxiliary control valve - function.
44. Trailer brake valve - function.

Electronic Systems

Check the operation of the following:

45. Electronic linkage control, if fitted.

Final Checks

With engine stopped, carry out the following:

46. Ensure that there are no oil, fuel or coolant leaks.
47. Clean off all preservatives and shipping labels.
48. Clean the tractor.
49. Ensure tool box contents and literature pack are to specification:
    a. Operator Instruction Book.
    b. Maintenance Chart.
    c. Tractor Service Record Book.
    d. Safety Book (North America only)

TRACTOR INSTALLATION

Instruction **2–1D**

Procedure

These instructions are to be given to the Owner and/or Operator of the tractor, all items must be fully explained and where applicable, performed. Emphasis must be given to all safety precautions in the operation and servicing of the tractor and its implements.

Installation Check List:

Use the Operator Instruction Book, Maintenance Chart and Tractor Service Record Book supplied with the tractor to explaining the following:

1. Location and significance of tractor, engine, cab and four-wheel drive front axle serial numbers.
2. Safety points and safety decals fitted to the tractor and highlighted in the Operator Instruction Book.
3. Use of all instruments and controls.
4. Running-in procedures.
5. Operation of the hand and foot throttles, use of the gear/travel speed chart.
6. Use and adjustment of the clutch pedal height.
7. Differential lock - engagement and disengagement.
8. Four-wheel drive - engagement and disengagement and four-wheel braking, when fitted.
9. Brake operation - latched and unlatched, method of adjustment.
10. Attachment of auxiliary hydraulic equipment.
11. Wheel width adjustment, front and rear. Correct settings for steering stops, front wheel alignment and tyre pressures.
12. Drawbar and pick-up hitch - operation and positions.
13. Servicing the tractor - routine maintenance procedures and service intervals as detailed in the Operator Instruction Book. Position of drain plugs, filler plugs and dipsticks, including hydraulic brake fluid reservoir.
14. Use of recommended Massey Ferguson lubricants and alternatives. Advice on engine fuel and oil filter replacement.
15. Instruct in the cleaning methods to be adopted for the hydraulic centrifuge filter and suction screens on the hydraulic system.
16. Cooling system - coolant level, frost precautions, adjustment of fan belt and cleaning the radiator, and oil cooler.
17. Maintenance of the engine and cab air filters.
18. Servicing of the air conditioning system. Adjustment of compressor belt, cleaning the condenser and operation during winter periods.
19. Connection and operation of trailers fitted with hydraulic brakes.
20. Use and power ratings of electrical output sockets for auxiliary equipment.
21. Operation and care of the radio cassette player. Care of cassettes in the tractor environment.

Demonstrate the following:

You will demonstrate the following points:

22. Engine starting and stopping procedures, when hot and cold.
23. Removal of air from the fuel system, the importance of using clean fuel.
24. Driving the tractor, starting and stopping, the use and sequence of gears, operation of clutches, especially those fitted with front end loaders and shuttle gearboxes.
25. Operation of the PTO, how to select the appropriate speed and how to change the PTO shaft.

26. Use of the hydraulic lift system, how to make adjustments and attach implements. Use of stabilisers and pick-up hitch, if fitted.
27. Operation of cab heater, fresh air blower or air conditioning system.

Carry out the following:

To complete the Installation, your are required to:

28. Give separate instructions on the use of any implements or attachments supplied.
29. Enter all the tractor serial numbers in the Registration Data section of this Tractor Service Record Book.
30. Explain to the owner his Warrant entitlement and the services due during the warranty period.
31. Complete the Installation and Registration Certificate and request the owner's signature.

RUNNING-IN

Instruction **3–1D**

Procedure

1. Experience has shown that the first 50 hours of tractor operation have a significant effect on the performance and life of the engine. From new, the tractor should be engaged in work which will load the engine as near as possible to full working conditions, emphasis should be given on varying the load to assist in the running-in.

Full load should not be applied until the engine has reached a temperature of at least 60°C (140°F).

2. Use low gear when pulling heavy loads.
3. During the running in period, check frequently the tightness of all wheel nuts and bolts.
4. To ensure proper clutch life, care must be taken to bed-in the friction plates properly.

NOTE: *During the first 15 hours of the tractor's life, frequently, but carefully engage and disengage the clutch. After the first 50 hours operation it may be necessary to adjust the clutch pedal height to suit the driver.*

INITIAL 50 HOUR SERVICE

Servicing **4–1D**

Procedure

The following operations are to be carried out after 50 hours running to remove factory fill lubricants by the Dealer service engineer.

Engine

1. Change the engine oil.
2. Change the engine oil filter.
3. Check the tappets, and adjust if necessary

Fuel System and Air Cleaner

4. Change the primary fuel filter element.
5. Check the air cleaner, clean the filter if necessary.

Cooling System

6. Check the coolant level and replenish if necessary.
7. Check the alternator/fan belt tension and adjust if necessary.
8. Check the air conditioning compressor belt tension and adjust if necessary.

Front Axle and Steering

9. Check the front axle oil level (four-wheel drive only), top up if necessary.
10. Check the front axle epicyclic oil level (four-wheel drive only), top up if necessary.

Transmission and Hydraulics

11. Check the transmission oil level and top-up if necessary.
12. Check the oil in the rear epicyclic hubs and top-up if necessary (heavy-duty axles only).
13. Check the torque of all wheel and rim nuts and bolts.
14. Check the tyre pressures and adjust if necessary.

Clutch and Brakes

15. Check the clutch pedal height and adjust if driver requests.
16. Check the foot brakes and adjust if necessary.
17. Check the parking brake and adjust if necessary.
18. Check the brake fluid level and top up if necessary.

Cab

19. Check the screen washer bottle fluid level and replenish if necessary.
20. Check the cab air filter, and clean if necessary.

General

21. Lubricate all grease points.
22. Lightly oil the clutch linkage, throttle linkage both hand and foot, hinges, catches, and door locks.
23. Road test the tractor, checking all instruments, lights and services for correct functioning, in the event of any fault being found this must be corrected.
24. After the road test, check for leaks in the oil, coolant and fuel systems.
25. Enquire if any operational difficulties are being experienced by the Owner, correct or demonstrate as necessary.
26. Complete the 1st Service record card in the Tractor Service Record Book.

250 HOUR SERVICE

Servicing **5–1D**

Procedure

The following operations are to be carried out after 250 hours running or before the end of the warranty period which ever is first by the Dealer service engineer.

Engine

1. Change the engine oil.
2. Change the engine oil filter.

Fuel System and Air Cleaner

3. Check the air cleaner, clean the filter if necessary.

Cooling System

4. Check the coolant level and replenish if necessary.
5. Check the alternator/fan belt tension and adjust if necessary.
6. Check the air conditioning compressor belt tension and adjust if necessary.

Electrical System

7. Check the battery electrolyte level and replenish if necessary.
8. Check the operation of the safety start switches.

Front Axle and Steering

9. Check the front axle oil level (four-wheel drive only), top up if necessary.
10. Check the front axle epicyclic oil level (four-wheel drive only), top up if necessary.

Transmission and Hydraulics

11. Check the transmission oil level top-up if necessary.
12. Check the oil in the rear epicyclic hubs and top-up if necessary (heavy-duty axles only).
13. Check the torque of all wheel and rim nuts and bolts.
14. Check the tyre pressures and adjust if necessary.

Clutch and Brakes

15. Check the clutch pedal height and adjust if driver requests.
16. Check the foot brakes and adjust if necessary.
17. Check the parking brake and adjust if necessary.
18. Check the brake fluid level and top up if necessary.

Cab

19. Check the screen washer bottle fluid level and replenish if necessary.
20. Clean the cab air filter.

General

21. Lubricate all grease points.
22. Lightly oil the clutch linkage, throttle linkage both hand and foot, hinges, catches, and door locks.
23. Road test the tractor, checking all instruments, lights and services for correct functioning, in the event of any fault being found this must be corrected.
24. After the road test, check for leaks in the oil, coolant and fuel systems.
25. Enquire if any operational difficulties are being experienced by the Owner, correct or demonstrate as necessary.
26. Complete the 2nd Service record card in the Tractor Service Record Book.

TRACTOR STORAGE

Instruction **6–1D**

Procedure

General

When preparing a tractor for storage, comply with the following recommendations to ensure that the tractor is in good condition when required for use. Thoroughly clean the tractor, giving particular attention to the greasing points and oil filler plugs. Park the tractor in a dry, level and covered area away from the weather and livestock with easy exit in case of fire.

When the tractor has to be stored in the open air, park it on level ground in the shelter of a building or wall and completely cover it with a good tarpaulin.

Tyres

1. Jack up the tractor and position wooden blocks under the axles to relieve the tyres of all weight.
2. Inflate the tyres a little above the normal pressure and chalk that pressure on the tyre wall. Protect the tyres from direct sunlight.
3. When ballasted tyres are not filled with calcium chloride, deflate the tyres, empty out the water and re-inflate with air.
4. When wheel weights are fitted, remove, clean and paint any bare metal and refit.

Hydraulic Lift System

5. Check and replenish the transmission oil level in the centre housing to the high mark on the dipstick.
6. Using the tractor hydraulics, with the Response Control in FAST, raise and lower the linkage several times.
7. Engage the PTO for a short period to obtain the maximum circulation of transmission oil around the centre housing.
8. Raise the linkage to the Transport Position and support the two lift arms in this position with wooden chocks.
9. Leave the two quadrant levers in the Transport Position i.e., the Draft Control (outer) lever past the UP and the Position Control (inner) lever in Transport Position. DO NOT MOVE the quadrant control levers from these positions.

Steering

10. Clean and coat the exposed steering cylinder rod with grease.

Engine

11. Drain the engine sump oil, when hot if possible.
12. Change the filter element.
13. Refill the engine sump with an approved grade of oil.
14. Seal the crankcase breather, exhaust and air cleaner pipes with adhesive tape after running the engine.
15. Clean the dry air cleaner unit.

Cooling System

16. Drain the header tank, radiator and cylinder block, when hot if possible and leave the taps in the open position.
17. Rest the header tank cap on the filler neck.

Fuel System

18. Clean the fuel filter bowl(s), renew the elements and drain any sediment out of the fuel tank.
19. Top up the fuel tank completely to prevent condensation forming on the unfilled portion of the tank, thus resulting in water contaminating the fuel.
20. Remove the injectors and spray approximately 2 ml (0.65 fl oz) of engine oil into each cylinder bore. Using new joint washers, refit the injectors and slowly rotate the crankshaft one complete revolution. DO NOT bleed the fuel system of air.
21. Lubricate the foot and hand throttle control linkage.

Clutch

22. Fully depress the clutch pedal and hold down with a wooden chock. The clutch friction plates will then not bond themselves to the flywheel or pressure plates.

Battery

23. Remove the battery from the tractor.
24. Check the electrolyte level and top up as necessary.
25. Clean the battery top and coat the terminals with petroleum jelly.
26. Fully charge the battery from an external source.
27. Repeat the external charge every month during the storage period and top up the electrolyte as necessary.
28. Store the battery in a cool, dry, dust free location but not directly on a concrete or metal surface. There must be no possibility of freezing.

Alternator and Starter Motor

29. Remove any dust or dirt from the alternator.
30. Smear the starter motor and solenoid terminals with petroleum jelly.

Sheet Metal

31. All rusty, scratched or bare patches of castings and/or sheet metal must be cleaned with abrasive papers and repainted. Matching colours are available for all Massey Ferguson tractors.
32. The bright metal components and surfaces must be cleaned and/or degreased and the protectives sprayed or brushed on.

TRACTOR WATERPROOFING

Instruction **7–1D**

Procedure

General

Before working in water, such as in paddy fields or flooded areas, certain waterproofing modifications must be made to the tractor.

In addition, two extra maintenance services are required.

Starter Motor and Solenoid Assembly

1. Remove the starter motor and solenoid assembly.
2. Thoroughly clean the exterior of the starter motor and solenoid assembly.
3. Blank off the drive end bracket.
4. Seal all the openings in the starter motor and solenoid assembly with suitable waterproof putty.
5. Apply a thick coating of grease to the starter motor and solenoid terminals and ensure that the drive end bracket is blanked off.
6. Coat the exterior of the starter motor and solenoid assembly with a water repellent spray.
7. Refit the starter motor and solenoid assembly to the engine.
8. Reconnect the wiring harness.

Battery

9. Clean the battery top and smear the battery terminals with petroleum jelly.

Engine Breather Pipe

NOTE: *The engine breather pipe is of a critical length and after modification it can be longer but NEVER shorter. When refitted it must point generally in a downward direction without 'U' bends or restrictions to trap liquid or dirt.*

10. Route the plastic breather pipe to the front of the engine and secure it to one of the timing case bolts with a suitable clip.

Engine Dipstick

11. Remove the engine dipstick and store in the tool box.
12. Fit a tapered rubber plug to the engine dipstick tube.

Clutch Housing Drain Hole

13. Discard the split pin in the drain hole in the clutch housing.
14. Enlarge the drain hole, tap and fit a screwed plug.

PTO Shaft Cap

15. Remove the PTO cap.
16. Grease both threads
17. Refit the PTO cap and screw it fully home.

Extra Maintenance

Every 10 Hours or Daily

Charge all grease points with an approved grease until it exudes from the seals or shafts.

Every 50 Hours or Weekly

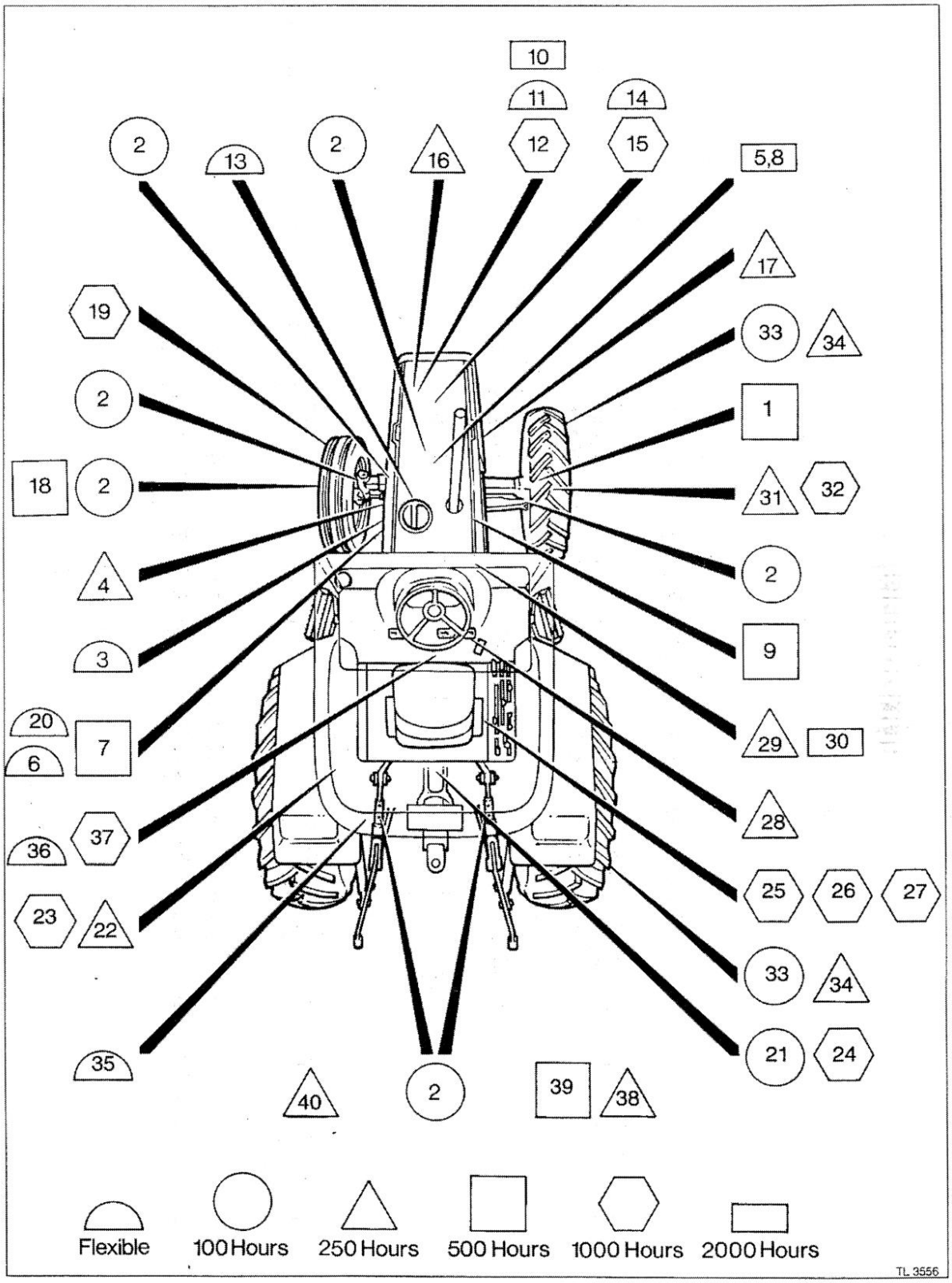
18. Remove the clutch housing drain plug, permit any water to drain away and refit the drain plug.
19. Ensure that the engine breather pipe is unobstructed.

Maintenance Chart		EVERY				
		Flex **	100 hours	250 hours	500 hours	1000 hours
GREASE POINTS	Grease four-wheel drive front axle universal joints.				1	
	Grease all other grease nipples, *(see pagesNO TAG andNO TAG).*		2			
ENGINE	Check the engine oil level and top up if necessary.	3				
	Change the engine oil and filter.			4		
	Check the valve tip clearance and adjust if necessary.	(5) every 2000 hours - Dealer				
FUEL SYSTEM	Drain the sediment from the fuel filter bowl(s).	6				
	Change the fuel filter elements.				7	
	Fit reconditioned fuel injectors.	(8) every 2000 hours - Dealer				
	Clean the fuel lift pump sediment chamber and strainer.				9	
AIR CLEANER	Change the inner SECONDARY element.	(10) every 2000 hours				
	Check and clean the dry air cleaner MAIN element.	11				
	Change the dry air cleaner MAIN element.					12
COOLING SYSTEM	Check the radiator coolant level and top up if necessary.	13				
	Clean the radiator, condenser and oil cooler fins.	14				
	Drain, flush and refill the cooling system.					15
ELECTRICAL SYSTEM	Clean the battery(ies), smear the terminals with petroleum jelly and check the electrolyte level.			16		
	Check the tension of the alternator/fan and air compressor belt.			17		
STEERING	Check the front wheel hub adjustment (two-wheel drive).				18	
	Check the front wheel alignment (two-wheel drive).					19
CLUTCH	Change the clutch operating cable.	Every 3000 hours - Dealer				
	Adjust the clutch pedal cable.	20				
TRANSMISSION AND HYDRAULICS	Check the transmission/hydraulic oil level and top up if necessary.		21			
	Check the rear epicyclic hub oil level and top up (heavy-duty only).			22		
	Change the rear epicyclic oil (heavy-duty only).					23
	Change the transmission/hydraulic oil.					24
	Clean the auxiliary pump strainer.					25
	Clean the centrifugal filter.					26
	Clean the linkage pump oil strainer.					27
BRAKES	Check the brakes and adjust if necessary.			28		
	Check the hydraulic brake fluid level and top up.			29		
	Change the brake fluid and check the condition of the brake pipes.	(30) every 2000 hours - Dealer				
FOUR-WHEEL DRIVE FRONT AXLE	Check the front axle and epicyclic oil levels and top up.			31		
	Change the front axle and epicyclic oil.					32
WHEELS AND TYRES	Check all tyre pressures.		33			
	Check wheel nut tightness.			34		
CAB	Check the windscreen/rear window washer bottle and top up.	35				
	Remove and clean the cab air filter.	36				
	Change the cab air filter.					37
	Check operation of air-conditioning system.			38		
	Check air-conditioning compressor belt tension.				39	
GENERAL	Oil can lubrication.			40		

Table 1

Symbols and numbers cross refer to the tractor maintenance and lubrication chart, *(see page1D-9)* for location purposes.

IMPORTANT: ** *Flexible maintenance times vary according to individual conditions of operation. You must establish times for servicing flexible items. An average interval time for checking these items is at each fuel fill.*



Tractor lubrication chart, *(see 1D-8)*.

MASSEY FERGUSON RECOMMENDED LUBRICANTS

ENGINE

Specification:

Use Massey Ferguson Super Tractor Universal Oil 10W-30.

or

Massey Ferguson Super Premium Universal Oil 15W-30.

or

Super Tractor Universal Oil (STUO) covered by Massey Ferguson specification M1139 to one of the viscosities listed in Table 2 below.

or

One of the alternative lubricants listed on page 1D-12 or its equivalent.

Capacity:

Three cylinder engine ..... 5,7 litres (1.3 gal)(1.5 US gal).
Four cylinder engine ..... 6,5 litres (1.4 gal)(1.7 US gal).
Six cylinder engine ..... 13,5 litres (3.0 gal)(3.6 US gal).

Requirements:

Oil must meet one of the following minimum specifications:

Naturally aspirated engines ..... API CC/CCMCD1
Turbocharged engines ..... API CD/CCMCD2

Viscosity:

Ambient temperature range			Oil viscosity - SAE number
	Degree F	Degree C	
Cold	Below 41	Below 5	10W. 10W/20 10W/30
Temperate	25 to 81	-4 to +27	10W/30. 20W. 15W/30. 20W/30. 10W/40. 15W/40. 20W/50.
Hot	Above 64	Above 18	15W/40. 20W/30. 20W/40. 20W/50. 30.

Table 2

TRANSMISSION and HYDRAULICS

Specification:

Use Massey Ferguson Super Tractor Universal Oil 10W-30

or

Massey Ferguson Super Premium Universal Oil 15W-30.

or

Super Tractor Universal Oil (STUO) M1139 or Universal Tractor Transmission Oil (UTTO) M1135 to one of the viscosities listed in Table 3 below.

or

One of the alternative lubricants listed on page 1D-12 or its equivalent.

Capacity:

All transmissions ..... 50,0 litres (11.0 gal)(13.2 US gal)

Viscosity:

Ambient temperature range			Oil viscosity - SAE number
	Degree F	Degree C	
Cold	Below 41	Below 5	10W/20 10W/30.
Temperate	25 to 81	-4 to +27	10W/30. 15W/30. 20W/30. 10W/40. 15W/40. 20W/50.
Hot	Above 64	Above 18	15W/40. 20W/30. 20W/40. 20W/50.

Table 3

FOUR-WHEEL DRIVE FRONT AXLE

Specification:

Use Massey Ferguson Super Tractor Universal Oil 10W-30.
or
Massey Ferguson Super Premium Universal Oil 15W-30.
or
Massey Ferguson Universal Gear Oil EP 80W-90.
or
One of the alternative lubricants listed on page 1D-12 or its equivalent.

Capacity:

Axle (each side) - AG 66/75/85 (4215, 4220, 4225, 4235, 4243, 4245, 4255)	5,6 litres (1.2 gal)(1.5 US gal).
Axle (each side) - AG 105 (4253, 4255, 4260, 4263, 4270)	7,6 litres (1.7 gal)(2 US gal).
Epicyclic hub (each side) - AG 66 (4215, 4220, 4225, 4235)	0,8 litres (1.5 pts)(1.5 US pts).
Epicyclic hub (each side) - AG 75/85 (4235, 4243, 4245, 4255)	1,0 litres (1.8 pts)(1.8 US pts).
Epicyclic hub (each side) - AG 105 (4253, 4255, 4260, 4263, 4270)	1,2 litres (2.0 pts)(2.0 US pts).

BRAKE FLUID

Use Massey Ferguson LHM Mineral Brake Fluid part number 3405 389 M1 (1 litre bottle).
or
Mineral type oil as specified in the alternative lubricants listed on page1D-12.
DO NOT use vegetable type fluid. The correct fluid is colour coded GREEN.

GENERAL

Grease Points

Use Massey Ferguson Multi-Purpose Grease NLG1 EP2 or any multi-purpose lithium-based grease. Always clean the grease gun and fittings before and after use.

Grease points are located as follows:

Two-wheel drive tractors

Front wheel hubs	2 points.
Front axle swivel pins	2 points.
Steering ram pivot pin	1 point.

Four-wheel drive tractors

Universal joints	2 points.
Front axle swivel pins	4 points

All tractors

Front axle pivot bearing	2 points.
Adjustable lift rods	4 points.
Assistor rams top bearing	2 points.

With an oil can lubricate throttle and control linkage every 250 hours.

IMPORTANT: *Severe working conditions.*
Where tractors are operating arduous work cycles, or when working in areas where there are dusty conditions, paddy fields, deep water etc, coupled with a lack of maintenance care and low specification fuel and oil, the intervals of service should be halved, particularly for oil and filter changes.

CAUTION: *Tractor lubricants and greases:*
No significant hazard when properly used and in the application for which they were designed. Frequent and/or prolonged skin contact may give rise to skin irritations. Emergency treatment of acute effects:

- Ingestion: DO NOT induce vomiting. Administer 250 ml (1/2 pint) milk or 50 ml olive oil. Seek medical advice.
- Skin Contact: Remove by wiping, wash with soap and water.
- Inhalation: Saturated vapour non-toxic at room temperature. - Remove from exposure.
- Eye contact: Wash with copious amounts of warm water.

ALTERNATIVE LUBRICANTS

For engine oil viscosities and temperature - see tables on page 1D-8.

Unit	Temp.	BP	CALTEX	CASTROL	ESSO
Engine naturally aspirated	See page 1D-8	Vanellus M Terrac Extra	Delo 100 Delo 200 Delo 350 Delo 500 Super Tractor Oil Delo 350 Delo 500 Multigrade	Castrol Agri MP Castrol Agri MP Fortec Castrol CRF	Unifarm Super Tractor Oil Essolube DX-34+ Essolube MHX
Engine turbocharged	See page 1D-8	Vanellus C3 Terrac Extra BP Multigrade 15W-40	Delo 350 Delo 350 Multigrade Delo 500 Delo 500 Multigrade Super Tractor Oil Delo SMP Delo SMP Multigrade	Castrol Agri MP Castrol Agri MP Fortec Castrol Agri Trimax Castrol Agri Powermax Castrol RX Castrol RX Super Plus	Unifarm Super Tractor Oil Essolube MHX SAE 15W40 Essolube Cargo 15W40 Esso Super Diesel Oil TD
Transmission, hydraulics and 4WD front axle	Cold	Tractran 9 Terrac Extra 10W30	RPM Tractor Hydraulic Fluid	Castrol Agri MP Castrol Agri MP Fortec Castrol Agri Power Trans Castrol Agri Multi Trans	Torque Fluid 56 Unifarm AL 3100
	Temperate	Terrac Extra 10W30 Terrac Extra 10W40 Terrac 15 Tractran 8	Super Tractor Oil TDH Fluid HT RPM Tractor Hydraulic Fluid	Castrol Agri MP Castrol Agri MP Fortec Castrol Agri Power Trans Castrol Agri Multi Trans Castrol Agri AS Super	Torque Fluid 56 Torque Fluid 62 Unifarm AL 3100 Super Tractor Oil
	Hot	Terrac Extra 10W40 Terrac 15 Tractran 8	Super Tractor Oil TDH Fluid HT	Castrol Agri MP Castrol Agri MR Fortec Castrol Agri Power Trans Castrol Agri Multi Trans Castrol Agri AS Super	Unifarm Torque Fluid 62 AL 3100 Super Tractor Oil
Brake fluid	All temps.	Hydraulic LHM	Rando HDZ 15	Castrol CHSMO Castrol LHM	LHM Fluid
	Over -20°C	Autran MBX Autran GM-MP Vanellus C3 10W	Rando HD 32 ATF HDA Delo 350 10W	Castrol TQ D Castrol RX Super 10 Castrol Agri ATF	Torque Fluid 10 ATF D ATF TAS A Essolube XD-3 SAE 10W
Grease	All temps.	Energrease LS-EP2	Molytex EP2	Castrol LM Castrol LMX	Esso Beacon 2 Esso Beacon EP2

Unit	Temp.	MOBIL	SHELL	TEXACO	TOTAL
Engine naturally aspirated	See page 1D-8	Mobil Super Universal Mobil Universal Delvac 1300 Delvac Super 1300	Rotelia X Rimular X Rimular XT Harvella S Harvella TX Super Universal Farm Oil	Universal Tractor Oil Ursatex Super Universal Tractor Oil Super Universal Tractor Oil-Premium	Rubia S Rubia XT Multagri TM Multagri Super
Engine turbocharged	See page 1D-8	Mobiland Super Universal Delvac 1300 Delvac Super 1300 Delvac XHP	Harvella S Harvilla TX Super Universal Farm Oil Rimula X Rimula XT Rotella TX	Ursa Super LA Ursa Super TD Texfarm Super Universal Tractor Oil Super Universal Tractor Oil-Premium	Multagri Super Multagri TM Rubia XT
Transmission, hydraulics and 4WD front axle	Cold	Mobiland Super Universal Mobilfluid 423	Donax TD Harvella TX	TDH Oil Texfarm 10W30	Multagri Super 10W30 Transmission MP
	Temperate	Mobiland Super Universal	Donax TT Harvella Harvella TX Super Universal Farm Oil Farmecon Universal Oil	Texfarm Super Universal Tractor Oil Super Universal Tractor Oil-Premium	Multagri Super Multagri TM Transmission MP
	Hot	Mobiland Super Universal	Harvella 10W40 Harvella TX Donax TT	Super Universal Tractor Oil	Multagri Super Multagri TM Transmission MP
Brake fluid	All temps.	Mobil DET 11	Shell LHM S	Rando HD 10	LHM Plus
	Over -20°C	Mobil ATF 200 Mobil ATF 220 Delvac 1310	Donax TA Donax TX Rimula X 10W Tellus T15	Texamatic 9226 Textran C3 Ursa Super LA 10W	Fluid ATX Azolla ZS 32 Robias 10W
Grease	All temps.	Mobilux EP2 Mobilgrease HP222	Farm Grease Universal Retinax LX	Multifak All Purpose EP2	Multis or Multis EP2

Table 4

NOTE: *All engine oils recommended for turbocharged engines are suitable for use in naturally–aspirated engines after running in.*

SPLITTING THE TRACTOR

TABLE OF CONTENTS

Splitting the Cab Tractor

Section 2 – Part A

Table of Contents

Splitting the Tractor

SPECIFICATION

Bolt Torques

Bolts and nuts front support casting to engine	280 Nm (205 lbf ft).
Bolts and nuts engine to gearbox	115 Nm (85 lbf ft).
Bolts gearbox to range gearbox	102 Nm (75 lbf ft).
Bolts and nuts range gearbox to centre housing	102 Nm (75 lbf ft).
Bolts and nuts cab rubber mounts	85 Nm (65 lbf ft).
Bolts front cab support bracket to gearbox	203 Nm (150 lbf ft).
Bolts rear cab support bracket to axle casing	200 Nm (148 lbf ft).
Bolts front torsion bar to flywheel housing	375 Nm (275 lbf ft).
Torsion bar tension	120-140 Nm (90-103 lbf ft).

Special Tools

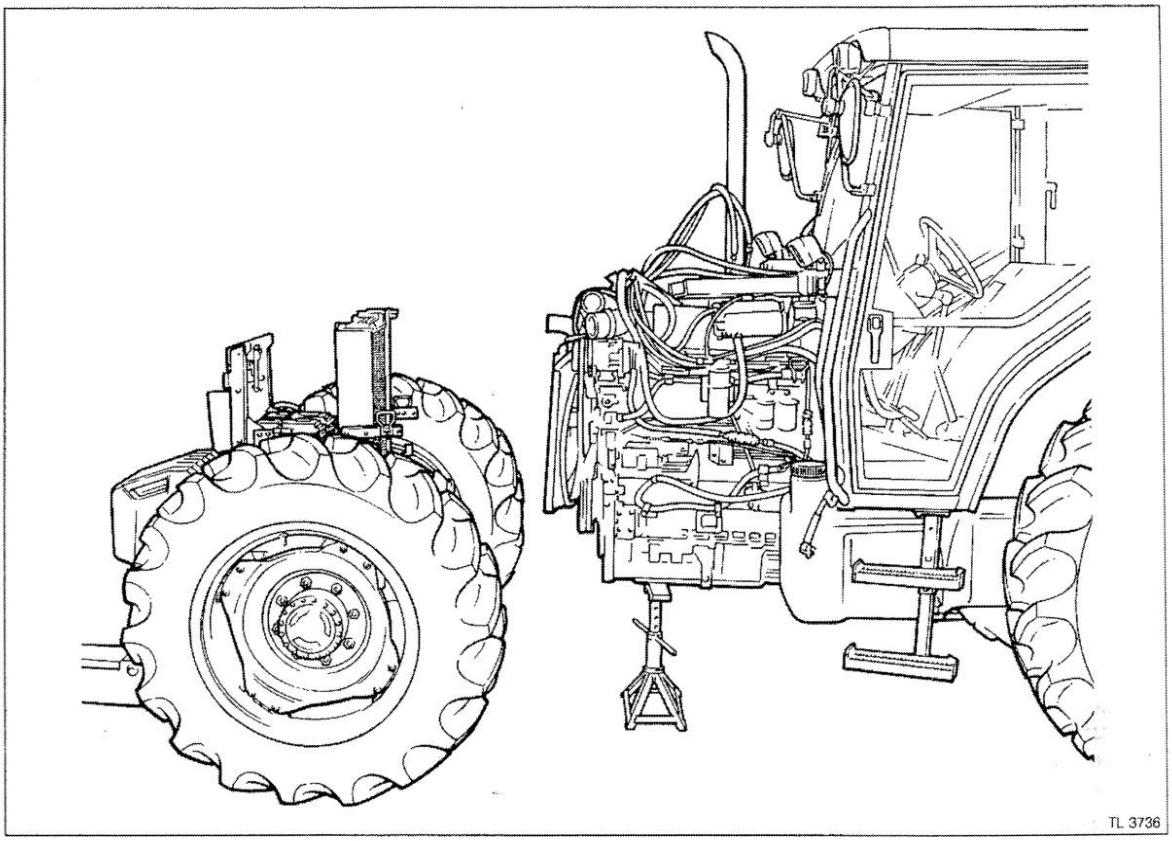
MF.367B	Transmission torque wrench.
MF.3012	Tractor splitting track.
MF.3013	Cab stands.
3376 935 M1	Blanking plug and cap.

General Description

These instructions on splitting the tractor are given as a guide, you may find that your tractor does not contain some of the features shown or described. This is due to the large number of build variations; for example, height of cab, three, four or six cylinder engines, with or without air conditioning and the various types of gearbox.

The main differences are that standard cabs with flat floors give greater access around the transmission compared with Low Profile cabs. Tractors with Hi-visibility hoods have side mounted batteries behind the right-hand footstep. Tractors with six cylinder engines can have torsion bars across the top of the transmission case to increase the lift capacity.

When splitting the tractor, work safely, use a tractor splitting track and cab stands, DO NOT work under parts of the tractor which are only supported on a hydraulic jack.



SPLITTING BETWEEN the FRONT AXLE and ENGINE

Special Tools:
MF.3012 Tractor Splitting Track

Removal and Refitment **1–2A**

Removal

1. If the tractor is four-wheel drive, first disconnect the drive shaft at the front axle end. To turn the drive shaft to gain access to the coupling split pin it may be necessary to move the tractor under power. The shaft cannot be turned without the engine running. *(see operation 1-5E).*
2. Apply the tractor parking brake and fit blocks to hold the rear wheels.
3. Fit hard wood wedges between the front axle support casting and axle beam on both sides to prevent the front assembly tilting during removal and refitment.
4. Remove the exhaust pipe.
5. Remove the hood side panels, centre section and front grille, *(see operation 1-12B).*
6. Remove the header tank cap and drain the cooling system via the drain tap on the front of the radiator bottom tank.
7. Disconnect the batteries.
8. If the tractor is fitted with front mounted batteries, disconnect the power cable at the starter motor.
9. Disconnect the wires to the headlights, horn, and air cleaner switch.
10. Disconnect the pipes to the steering cylinder in front of the radiator, marking with a felt tip pen which is left and right.
11. Disconnect the hose between the air cleaner and engine.

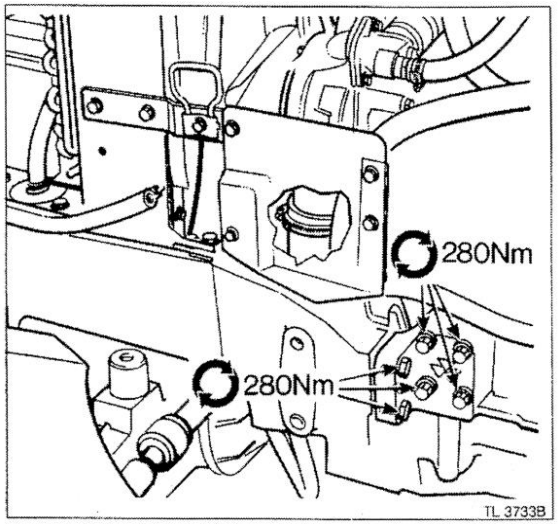
Oil Cooler/Air Conditioner Condenser

12. If the tractor is fitted with either an oil cooler or air conditioner condenser or both, they can be moved to one side without disconnecting the pipes.
13. Disconnect the oil cooler from the radiator frame.
14. Remove the top runner retaining the condenser to the radiator.
15. Disconnect the panel above the radiator through which all the pipes and hoses pass.
16. Lift the oil cooler, condenser and all the pipes up and over so that they rest on top of the engine.

Splitting the Tractor

General

17. Remove the fan cowl and hang it over the fan.
18. Disconnect the radiator and header tank hoses.
19. Disconnect the differential lock pipe connection to the four-wheel drive front axle.
20. Support the tractor under the engine sump using the fixed stand part of MF.3012 Tractor Splitting Track, or a suitable jack, place wood between the jack and sump to prevent slippage.
21. To the front of the tractor fit a full set of weights to counter balance the weight of the front axle.
22. Place a suitable trolley jack under the weights.
23. Remove the bolts and nuts securing the front axle support casting to the engine, there are bolts and nuts inside and outside the support casting.
24. Carefully wheel the front assembly away from the engine on its wheels and the front trolley jack.



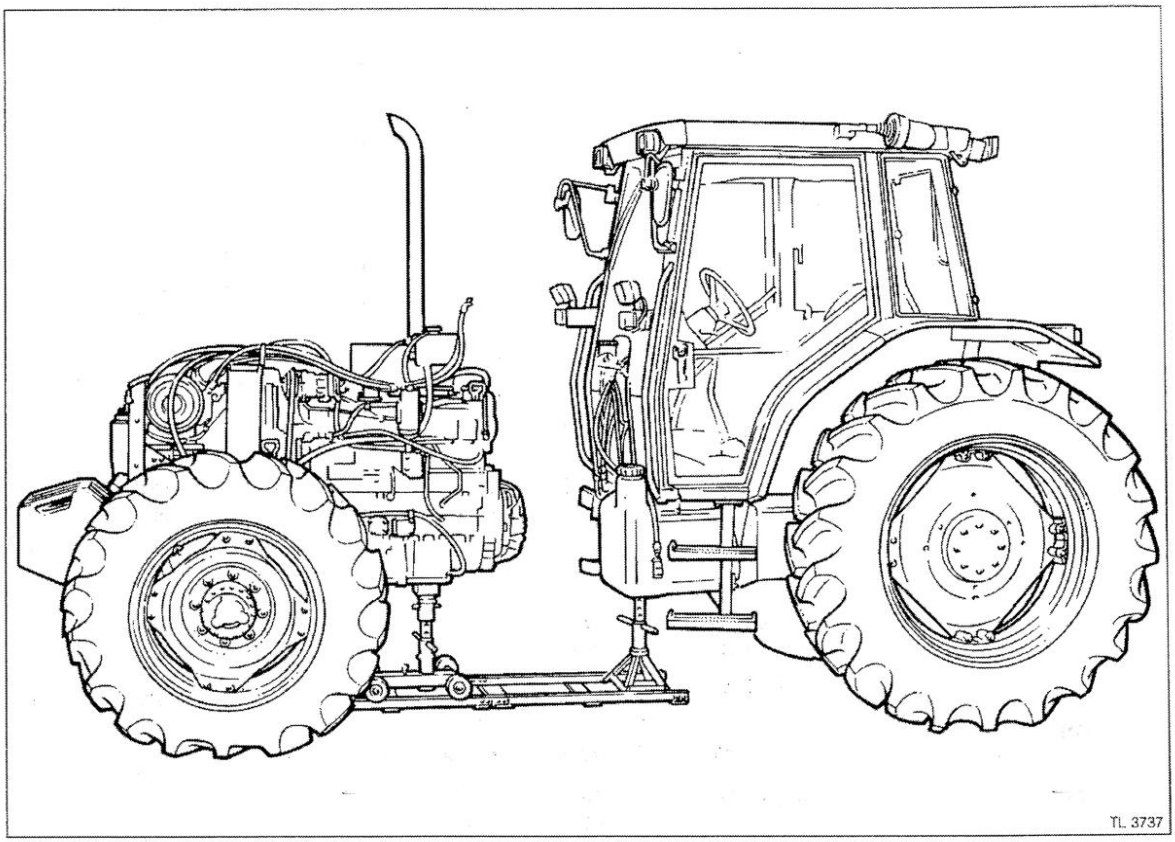
Refitment

25. Reverse procedures 1 to 24 except:

a. Tighten the front axle support casting to engine bolts and nuts to a torque of 280 Nm (205 lbf ft).

b. Fill the cooling system with a 50% anti-freeze/water solution.

c. Check all oil levels and for leaks.



SPLITTING BETWEEN the ENGINE and GEARBOX

Special Tools:
MF.3012 Tractor Splitting Track
3376 935 M1 Blanking Plug and Cap

Removal and Refitment **2–2A**

Removal

1. If the tractor is four-wheel drive, first disconnect the drive shaft at the front axle end. To turn the drive shaft to gain access to the coupling split pin it may be necessary to move the tractor under power. The shaft cannot be turned without the engine running. Remove the drive shaft assembly *(see operation 1-5E)*.
2. Apply the tractor parking brake and fit blocks to hold the rear wheels.
3. Fit hard wood wedges between the front axle support casting and axle beam on both sides to prevent the front assembly tilting during removal and refitment.
4. Remove the exhaust pipe.
5. Remove the hood side panels, centre section and front grille, *(see operation 1-12B)*.
6. Disconnect the batteries.

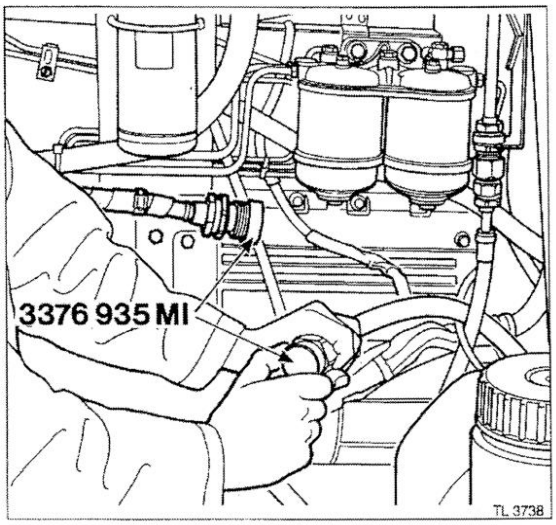
Left-hand Side

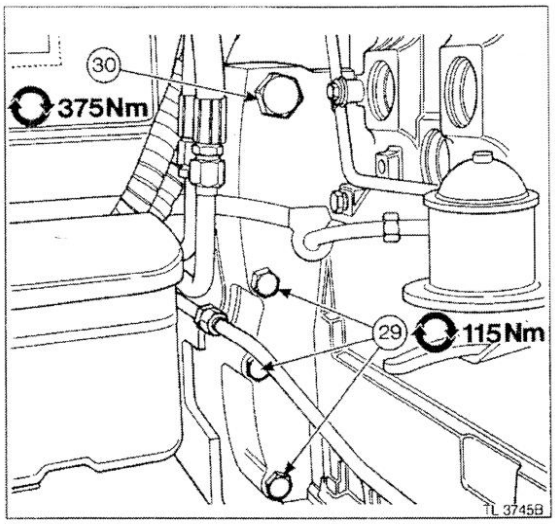
7. Disconnect the main power cable and wires to the solenoid, remove the starter motor.
8. Disconnect the throttle cable.
9. Disconnect the stop control cable, if fitted.
10. Disconnect the two electrical multi-pin plugs in front of the cab bulkhead.
11. Disconnect the hydraulic pipes from the steering unit to the front axle, mark with a felt tip pen for refitment.
12. Disconnect the hydraulic pipe from steering unit to oil cooler, if fitted.
13. Disconnect the fuel leak-off pipe to tank at the fuel filter.
14. Disconnect the air conditioner couplings and fit blanking plug and cap, Massey Ferguson part number 3376 935 M1 to prevent the loss of refrigerant, if fitted.
15. Tractors with shuttle gearbox, remove the shift lever bracket fitted to the rear of the cylinder block.

Right-hand Side

16. Remove the tool box.
17. Disconnect the four-wheel drive differential lock pipe.
18. Disconnect the hydraulic pipe from the oil cooler, if fitted.

19. Disconnect the fuel pipe at the lift pump.
20. Clamp the two cab heater hoses at the base of the cab. Remove and drain off the coolant. Mark one of the pipes with tape to aid correct refitment.
21. Assemble the MF.3012 Tractor Splitting Kit, The stationary part is assembled under the gearbox, it must be placed on the end of the track to prevent the track from moving when parting the tractor. The trolley is placed under the engine sump. Wood should be place between the rear jacks and the tractor to prevent slipping. The two vertical side plates must be fitted each side of the engine sump to prevent side slippage.
22. On tractors with six cylinder engines fitted with torsion bars, the tension is released by removing the two large bolts on each side of the cylinder block at the rear of the engine. These bolts can be removed and refitted without having to re-tension the rods.
23. Remove the bolts and nuts holding the engine to the gearbox case. There is a 13 mm screw securing the top centre of the gearbox.
24. Check that all bolts have been removed, some fit front to back, others back to front.
25. Withdraw the engine and front axle forward.





Refitment

26. Ensure that the clutch release bearing is held back and wired in place, *(see operation 3-4A)*.
27. Align the engine with the gearbox. Two guide studs will assist its alignment. These should be approximately 100 mm (4 in) long x M12 with the non-threaded end tapered and slotted for a screwdriver.

    They should be placed in opposite holes from which the studs can easily be removed when the tractor is assembled.
28. Turn the flywheel through the starter motor aperture and, at the same time, push the engine and front axle towards the transmission.

    Turning the flywheel will align the clutch plate splines with the gearbox and PTO input shaft. Continue pushing and turning until the engine flanges meet.

IMPORTANT: *DO NOT force, fit and tighten any bolts until the two flanges meet, or serious damage may occur to the transmission and clutch.*

29. Fit some bolts, remove the guide studs if used, fit the remainder of the bolts and tighten them to a torque of 115 Nm (85 lbf ft).
30. On tractors with torsion bars tighten the bolts to a torque of 375 Nm (275 lbf ft).
31. Reverse procedures 1 to 21.
32. Test drive the tractor.
33. Check all oil and coolant levels and check for leaks.

Thank you very much for your reading.

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