Combine Fendt 8300-8350 Series

Workshop Manual

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Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

Contents

0. Introduction - Specifications

Contents

0. Introduction - Specifications

0.1 Use of the manual

General
The purpose of the manual is to help dealers and workshops start-up, service and repair AGCO's equipment in the most appropriate and effective manner. If the specified procedures are followed and the recommended special tools are used where necessary, tasks and work can be completed within the time indicated in the manual "Repair Time Schedule".

Pagination
Example: " ... as described in section 2.1.3 on page 73."
This manual is divided into chapters and sections. In the example the figures show:

First figure = Chapter

Second figure = Section

Third figure = Consecutive number in the section in question

73 = Page number in manual

The publication number and version appear at the bottom of the page.

Use
To make it easier to look things up, there is a table of contents at the beginning of every chapter listing the various sections in the chapter.

Modifications
Modified pages have the same section numbering as their predecessors: Only the page number and version number change.

The old pages must be destroyed.

Service tools
In the case of jobs that require service tools, the number of the tool is specified at the point in the text where it is needed.

Repairs and replacement of parts
When replacing parts, it is very important to only ever use genuine AGCO spares.

Please pay particular attention to the following points with regard to repairs and fitting spare parts and other equipment.

Fitting non-genuine spare parts may impair the safety of the machine.

In some countries it is against the law to fit parts that do not conform to the manufacturer's specifications. Torque wrenches must always be adjusted in accordance with the instructions given in the workshop manual. Fit locking devices where specified. If the locking device is ruined by removal, fit a new one.

If non-genuine AGCO parts are fitted, the machine will no longer be covered by the right of complaint, as the manufacturer provides a warranty on all AGCO components. AGCO dealers are under the obligation to supply genuine parts only.

Repair Time Schedule
The manual "Repair Time Schedule" contains a table of normal time requirements for the most common repairs on a combine. The manual is divided into sections corresponding to the layout of the spare parts catalogue.

0. Introduction - Specifications

0.2 General specifications

Cutting table Quick-attach type, can be attached and removed directly on the ground Power take-off with transmission shaft	Unit		8300	8350
Cutting height FreeFlow	cm		-25 to +143	-25 to +143
Cutting height PowerFlow	cm		-40 to +148	-40 to +148
Knife speed	strokes/min.		560	1120
Hydraulically balanced by pressure accumulators			yes	yes
Electro-hydraulic cutting height presetting			yes	yes

Reel	Unit		8300	8350
Electro-hydraulic reel drive	rpm		0-50	0-50
Peripheral speed	km/h		0-9.1	0-9.1
Electro-hydraulic reel control up/down and fore/aft			yes	yes

Threshing cylinder	Unit		8300	8350
Speed, normal	rpm		400-1120	400-1120
Speed, reduced	rpm		307-945	307-945
Width	cm		168	168
Number of rasp bars	units		8	8
Diameter	cm		60	60
Weight	kg		318	318
Electro-hydraulic speed adjustment			yes	yes
Peripheral speed	m/sec.		12.3-36.1	12.3-36.1
Peripheral speed, reduced	m/sec.		9.6-29.7	9.6-29.7

Concave	Unit		8300	8350
Concave area	cm^2		10600	10600
Number of rub bars	units		13	13
Concave wires, self-cleaning, spring steel	mm		Ø 3.5	Ø 3.5
Concave wrap	degrees		117	117
Concave adjustable from operator seat			yes	yes

Rear beater	Unit		8300	8350
Diameter	cm		37.5	37.5

Rotary separator	Unit		8300	8350
Speed, normal	rpm		950	950
Speed, reduced	rpm		475	475
Width	cm		168	168
Diameter	cm		50	50
Separation area	cm^2		10400	10400

Straw walkers	Unit		8300	8350
Number	units		8	8
Area	cm^2		7400	7400
Area with rotary separator	cm^2		6680	6680
Length	cm		400	400
Number of steps	units		5	5
Shutters in straw hood for cleaning straw walkers			yes	yes

Main grain pan	Unit		8300	8350
Two-sectioned lengthwise			yes	yes
Stepped sections removable for cleaning			yes	yes
Crop channelling			yes	yes

Shaker shoe	Unit		8300	8350
Two-sectioned lengthwise			yes	yes
Adjustable sieves			yes	yes
Sieve area	cm^2		5300	5300
Opposite movement of sieves			yes	yes
Crop channelling			yes	yes
Work light			yes	yes

0. Introduction - Specifications

Fanning mill	Unit		8300	8350
Two-sectioned centrifugal blower			yes	yes
Electrical speed adjustment from operator seat or at shaker shoe (left-hand side)			yes	yes
Speed	rpm		460-1150	460-1150
Reduced speed	rpm	-	-	310-790

Grain tank	Unit		8300	8350
Capacity	litres		9500	10500[1]
Inside light			yes	yes
Adjustable full warning			yes	yes
Outside steps and inside ladder for easy access			yes	yes
Sampling tray			yes	yes
[1]Auto Level 9500 litres				

Unloading auger	Unit		8300	8350
Enclosed system, electro-hydraulically pivotable			yes	yes
Unloading also in partially turned-in position, and without threshing unit being engaged			yes	yes
Unloading (depending on conditions)	sec.		110	121
Unloading height (G)	cm		417	417
Unloading auger diameter	cm		33	33

Engine	Unit		8300	8350	8350
Type, SISU			645 DSBAEL	645 DSBAEL	Citius 84 CTA-4V
Speed	rpm		2000-2200	2000-2200	2080
Volume	litres		8.4	8.4	8.4
Number of cylinders			6	6	6
Gross power* (with Power Boost**)	HP		325	350	348 (378)/ 382 (413)
Gross power* (with Power Boost**)	kW		200	257	256 (278)/ 281 (304)
Engine oil, capacity	litres		27	27	27

Engine	Unit		8300	8350	8350
Rotary screen	units		1	1	1
Exhaust-aspirated air cleaner on air intake			yes	yes	yes
Fuel tank, capacity	litres		750	750	750
Coolant	litres		60	60	60
* Gross power according to ISO 14396					
** Power Boost ensures additional capacity during tank unloading. Through a signal from the unloading system the engine output is increased by 30 HP / 22 kW during unloading.					

Gear oil	Unit		8300	8350
Gearbox contains	litres		9.5	9.5
Coupler housing for oil motor	litres		1.5	1.5
Final drives contain	litres		6.0	6.0

Transmission			Unit		8300	8350
Hydrostatic transmission					yes	yes
4-speed, electrical gearshift					yes	yes
Speed	1st gear	Forward	km/h		0-6	0-6
		Reverse	km/h		0-4	0-3
	2nd gear	Forward	km/h		0-13	0-12
		Reverse	km/h		0-9	0-6
	3rd gear	Forward	km/h		0-21	0-20
		Reverse	km/h		0-15	0-10
	4th gear	Forward	km/h		0-25	0-25
		Reverse	km/h		0-18	0-12

Brakes		8300	8350
Hydraulically activated independent brakes		yes	yes
Mechanically activated parking brake		yes	yes

Operator cab		8300	8350
Integrated operator environment with rubber-suspended platform and cab		yes	yes

0. Introduction - Specifications

Operator cab		8300	8350
Electrical control of all functions		yes	yes
FIELDSTAR		yes	yes
"Sealed Beams" light system with 8 fixed lamps for cutting table, area in front of and to the right of the machine plus unloading auger		yes	yes
De-luxe seat		yes	yes

Hydraulic system	Unit		8300	8350
Decentralised, electrically controlled valve functions			yes	yes
Pump	units		3	3
Hydraulic orbitrol steering			yes	yes
Hydraulic system contains	litres		90	90
Hydraulic tank contains	litres		34	34

Tyre pressure				
Traction wheels				
Model	Tyre size	Make	Rim	Pressure, bar
8300	620/75 R34	GOODYEAR	DW20Ax34	3.6
	650/75 R32	CONTINENTAL	DW21Ax32	4.1
	800/65 R32	GOODYEAR	DW27Ax32	2.0
	900/55 R32	GOODYEAR	DW27Ax32	1.9
	1050/50 R32	MICHELIN	DW36Ax32	1.9
8350	650/75 R32	CONTINENTAL	DW21Ax32	4.1
	800/65 R32	GOODYEAR	DW27Ax32	2.0
	900/55 R32	GOODYEAR	DW27Ax32	1.9
	1050/50 R32	MICHELIN	DW36Ax32	1.9
8300 AL	620/75 R34	GOODYEAR	DW20Ax34	4.0
	800/65 R32	GOODYEAR	DW27Ax32	3.0
	900/55 R32	GOODYEAR	DW27Ax32	1.9
8350 AL	800/65 R32	GOODYEAR	DW27Ax32	3.0
	900/55 R32	GOODYEAR	DW27Ax32	1.9

Tyre pressure				
Rear wheels				
Model	Tyre size	Make	Rim	Pressure, bar
8300	600/55-26.5	TRELLEBORG	20.0x26.5	1.5
	15.5/80-24	GOODYEAR	15.5/80-24	2.0
	500/60-26.5	TRELLEBORG	16.0x26.5	2.0
8350	600/55-26.5	TRELLEBORG	20.0x26.5	1.5
	15.5/80-24	GOODYEAR	15.5/80-24	2.0
	500/60-26.5	TRELLEBORG	16.0x26.5	2.0

Tyre pressure				
Rear wheels, four-wheel drive				
Model	Tyre size	Make	Rim	Pressure, bar
8300	600/55-26.5	TRELLEBORG	20.0x26.5	1.5
	15.5/80-24	GOODYEAR	15.5/80-24	2.0
	500/60-26.5	TRELLEBORG	16.0x26.5	2.0
8350	600/55-26.5	TRELLEBORG	20.0x26.5	1.5
	15.5/80-24	GOODYEAR	15.5/80-24	2.0
	500/60-26.5	TRELLEBORG	16.0x26.5	2.0

Tyre pressure				
Wheels, table trailer				
Model	Tyre size	Make	Rim	Pressure, bar
8300	10.0/75-15.3		9.00x15.3	4.7
	11.5/80-15.3		9.00x15.3	3.5
8350	10.0/75-15.3		9.00x15.3	4.7
	11.5/80-15.3		9.00x15.3	3.5

0. Introduction - Specifications

0.3 Dimensions and weight

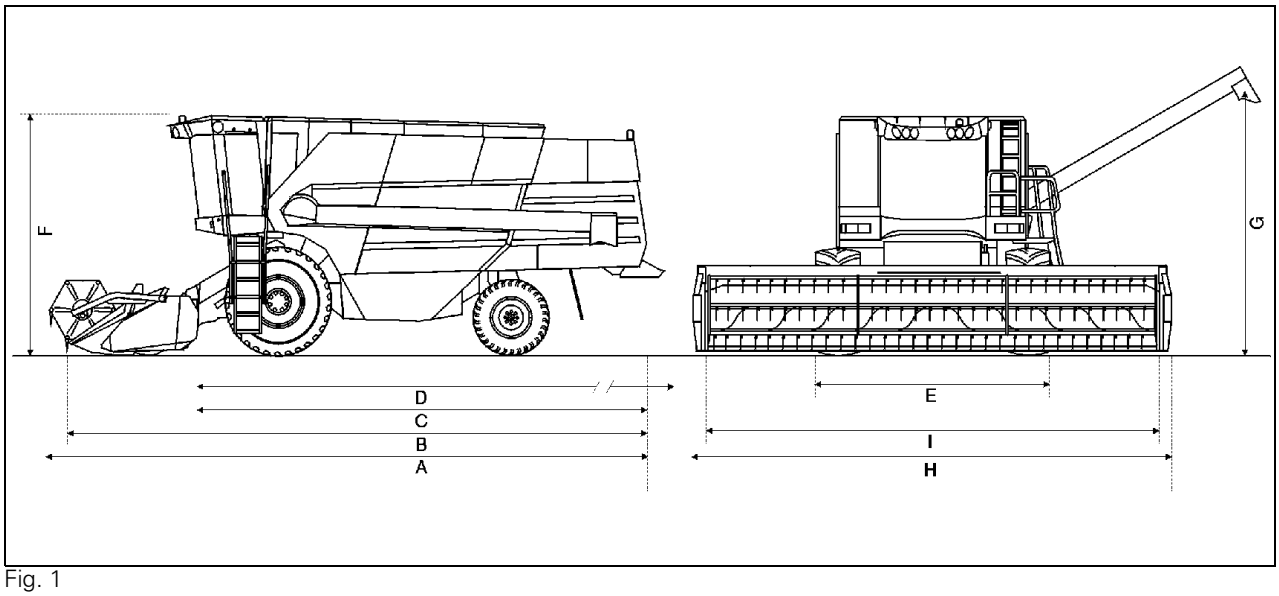


Fig. 1

Dimensions	Unit		8300	8350
Length				
With PowerFlow table, without torpedo dividers, (A)	mm		10203	10203
With FreeFlow table, without torpedo dividers, (B)	mm		9752	9752
Machine without table and spreader hood, (C)	mm		8266	8266
Machine with table on trailer, dependent on table width, (D)	mm		max. 18000	max. 18000
Machine with spreader hood in working position	mm		+ 479	+ 479
Width, (H) (I)				
Table outside (cut) PF and FF, 18'	mm		6016 (5551)	6016 (5551)
Table outside (cut) PF and FF, 20'	mm		6626 (6161)	6626 (6161)
Table outside (cut) PF and FF, 22'	mm		7236 (6771)	7236 (6771)
Table outside (cut) PF and FF, 25'	mm		8150 (7684)	8150 (7684)
Height				
Total height, (F)	mm		4000	4000
In transport without table, and ladder turned in front of traction wheel				
Width with tyres, (E)				
Traction wheels 620/75 R34 AL	mm		3480	3480
Traction wheels 650/75 R32	mm		3500	3500
Traction wheels 800/65 R32	mm		3800	3800
Traction wheels 800/65 R32 AL	mm		3882	3882

Dimensions	**Unit**		**8300**	**8350**
Traction wheels 900/55 R32	mm		4020	4020
Traction wheels 900/55 R32 AL	mm		4020	4020
Traction wheels 1050/50 R32	mm		4350	4350
Width with Tyres				
Rear wheels 15.5/80-24	mm		3740	3740
Rear wheels 15.5/80-24. 4-WD	mm		3565	3565
Rear wheels 500/60-26.5	mm		3500	3500
Rear wheels 500/60-26.5, 4-WD	mm		3460	3460
Rear wheels 600/55-26.5	mm		3740	3740
Rear wheels 600/55-26.5, 4-WD	mm		3705	3705
Turning diameter, with tyres				
650/75R32 - 15.5/80-24	m		16.35	16.35
Weight (without Auto Level, straw chopper, chaff spreader and four-wheel drive)				
Base machine	kg		13880	13880
With 22’ FreeFlow table	kg		15500	
With 22' PowerFlow table	kg		16150	
With 22' PowerFlow table (WWHU)	kg	-	-	16430
With 25' PowerFlow table (WWHU)	kg	-	-	16540

0.4 Safety precautions

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

The safety warning symbol highlights important safety messages on machines, safety signs, operator's manuals and elsewhere. When you see this symbol, be aware of the risk of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY so important for you?

- ACCIDENTS DISABLE and KILL
- ACCIDENTS COST MONEY
- ACCIDENTS can be AVOIDED

0.4.1 Safety in the workshop

This section on safety in your workshop manual is designed to point out some of the basic safety situations that can occur in the course of normal combine repairs, and to suggest possible ways of dealing with such situations.

Further measures may be needed, depending on the nature of the repair and the working conditions on site or in the workshop. AGCO has no direct control over repair methods, operation, inspection, lubrication or general maintenance. It is therefore YOUR responsibility to use good safety procedures in these areas.

0.4.2 Safety - a word to the mechanic

You are responsible for reading and understanding this chapter on safety before carrying out repairs on AGCO equipment.

Remember that YOU are the key to safety. Good safety routines protect not just you, but also the people around you. Study the principles in this chapter and make them part of your safety work. Follow all other general and supplier specific safety precautions, and, above all REMEMBER - YOU ARE RESPONSIBLE FOR SAFETY. YOU CAN PREVENT SERIOUS PERSONAL INJURIES OR DEATH.

0.4.3 Safety - danger, warning and caution

Whenever you see these words and symbols used in the manual and on safety decals, you MUST follow the instructions.

This symbol together with the word DANGER indicates an immediate dangerous situation that, unless avoided, will result in DEATH OR SERIOUS PERSONAL INJURY.

This symbol and the word WARNING indicate a potentially dangerous situation. If the instructions or procedures are not followed correctly, it may result in PERSONAL INJURY OR DEATH.

This symbol together with the word CAUTION indicates a potentially dangerous situation that, unless avoided, may result in MINOR OR MODERATE PERSONAL INJURY OR DAMAGE to equipment.

IMPORTANT: *The word IMPORTANT indicates special instructions that, if not followed exactly, may result in damage to or destruction of the machine and its equipment, the work process or the environment.*

Note: *The word NOTE indicates points of special interest for more effective, easy repair or operation.*

0.4.4 Safety decals

You must NOT remove or cover up danger, warning or instruction decals.

Replace any "DANGER", "WARNING", "CAUTION" or other instruction decal which is illegible, damaged or lacking.

0.4.5 General

Nearly all maintenance work involves having to drive the combine. The operator's manual supplied with all combines or implements contains detailed safety precautions with regard to driving, operation and maintenance. These precautions apply both to mechanic and driver/user and should be read, understood and practised by all personnel.

Before starting maintenance, repair, inspection, dismantling or assembly, whether in a workshop or "in the field", think about the factors that might affect safety, not just for the mechanic doing the work, but also for any onlookers.

- You must NOT allow children or onlookers to stand around or on the machine while you are adjusting, inspecting, repairing or driving it.

0.4.6 Personal safety

Clothing

- The wrong clothes or dressing carelessly can cause accidents. Ensure that you are wearing suitable clothing. You must NOT wear loose-fitting clothing or allow long hair to hang loose in the vicinity of the equipment.

  Some jobs require special safety equipment to be worn.

Eye protection

- Even the most minor eye injury could result in the loss of your sight. Injuries can be avoided by wearing safety glasses when chiselling, grinding, polishing, welding, painting, etc.
- Wear safety glasses of a type suitable for the work in question.

Respiratory protection

- Fumes, dust and spray paint are unpleasant and injurious to health. You can protect yourself against them by wearing respiratory protection.

Hearing protection

- Loud noise can damage your hearing, with the extent of the damage increasing with increases in volume. If you think there is too much noise, wear hearing protection.

Hand protection

- The prior application of barrier creams is advised to prevent irritation and blackening of the skin. Wash your hands in soap and water after finishing work. Solvents such as white spirit, paraffin, etc., can damage the skin.
- Wear gloves whenever possible in order to protect your hands. You must NOT wear rings or wrist watches when working on the machinery, as these items can be caught in moving parts and cause serious injury.

Foot protection

- Strong or protective footwear with reinforced toe caps (safety shoes) can protect your feet from falling objects. Oil-resistant soles will also help stop you slipping.

Safety clothing

- It may be necessary to wear flame-retardant or acid-resistant clothing for certain types of work.

0.4.7 Considerations with regard to equipment

Machine guards

- Before using a machine, you must check that the machine's guards are in place and functional. These guards not only prevent parts of the body or clothing from coming into contact with moving parts of the machine, but also stop objects that might fly off the machine and cause injury. Make sure that any missing guards are replaced.

Lifting equipment

- Always make sure that lifting equipment such as chains, slings, lifting bars, hooks and eyes are inspected thoroughly before use. If you are in any doubt, choose more powerful equipment than necessary.
- You must never stand under a suspended load or raised implement.
- Avoid injury as a result of components being handled incorrectly. Make completely sure that you can lift the object. If you are in any doubt, seek help.

Lifting with a jack

- Choose a jack that is strong enough to take the load.
- Stabilise the combine and chock up the wheels.
- Position support stands under the combine. Lower the jack and allow the combine to rest on the stands.
- You must NOT go under a combine that is being supported by a chain hoist or jack.

Compressed air

- The pressure from a compressed air hose will often be up to 7 bar. This is completely safe if used correctly. Any misuse can cause injury.
- You must never use compressed air to blow dust, filings, dirt, etc., away from the area being worked on unless the right type of nozzle is fitted and safety glasses are being worn.
- Compressed air is not a cleaning agent and only moves dust, etc., from one place to another. Look around you before using a compressed-air hose, as onlookers may get grit in their eyes, in their ears and on their skin.
- Use approved air guns, safety glasses and suitable screening to protect other people in the area being worked on.
- You must never point an air nozzle at another person.

Hand tools

- Many cuts, abrasions and injuries are caused by defective tools. You must never use the wrong tool for the job, as this generally results in either injury or poorly executed work.
- You must never use:
- A hammer with a loose head or cracked handle.
- Adjustable spanners etc. with jaws rounded through wear or otherwise in worn condition.
- Spanners or files as a hammer, or bits, split pins and bolts as a punch.
- Grind convex heads of chisels. The sharp edges can tear your skin if the tool slips. And when you strike the tool, chips can break off and fly into your eye.
- Make sure that you have a handle on every file to prevent the blade from going through your palm or wrist if the file were to slip or catch.
- For removing or changing hardened pegs, use a copper or brass punch rather than a hammer.
- For dismantling, inspection and joining of large components, the recommended special tools must always be used.
- These will help reduce the time and effort required to carry out the work and minimise repair costs.
- Always keep tools clean and in good condition.

Electricity

- Electricity has become so common in everyday use that its potential dangers are frequently overlooked. Misusing electrical equipment can have lethal consequences.
- Before using electrical equipment, especially portable devices, you must check that the cable is neither worn nor frayed and that plugs and sockets etc. are intact. Make sure that you know where the nearest switch is located. Always use an electric cable with earthed 3-pin plug.

0.4.8 General considerations

Solvents

- Only use cleaning fluids and solvents that are known to be safe. Some types of fluid can damage components such as seals, etc., and cause skin irritation. The labels on solvents should be read in order to make sure not only that they are suitable for cleaning the

components and individual parts, but also that they will NOT endanger the personal safety of the user.

Housekeeping

- Many injuries are the result of people falling or slipping on items or materials carelessly left lying about. You can prevent such accidents. If you discover something dangerous, do not ignore it - do something about it.
- A clean, safe workplace improves the surroundings and everyday working environment for everyone.
- Keep your work clean and tidy. Wipe up spillages of any kind whatsoever in order to reduce the risk of falling. Pick up tools and parts from the floor to reduce risk of tripping and serious injury.

Fire

- Fire respects neither persons nor property. It is not always realised just how destructive a fire can be. Everyone should be vigilant at all times.

  Extinguish matches, cigars, cigarettes, etc., before throwing them away.
  Work cleanly and dispose of waste material in the right waste containers.
  Find out where the fire extinguishers are located and learn how to use them.
  You must NOT permit or use naked flames near the fuel tank, fuel lines, battery, hydraulic hoses or hydraulic components.
- When using a gas burner, you must always have a fully loaded fire extinguisher to hand.
- In the event of fire:

  Do NOT panic - warn people nearby and sound the alarm.

First aid

- During the sort of work carried out by mechanics, dirt, grease, fine dust, etc., will all settle on skin and clothes. If you ignore scratches, grazes or burns, infections can develop in just a short time. What initially seems a trifle can become painful and injurious. It takes just a few minutes to put a dressing on a new cut, but it will take much longer to heal if you fail to do so. Make sure you know where the first aid box is located and ensure it is always complete.

0.4.9 Operational considerations

- Stop the engine if at all possible before undertaking maintenance work.
- Put up a warning sign on self-propelled equipment that it would be dangerous to start because a service or inspection is due. Disconnect the battery leads and remove the key if you leave such a unit unattended.
- Do NOT try to start the engine while standing beside the machine or trying to bypass the safety start switch. Make it a rule to check that the safety start switches for neutral are working correctly.
- Do not run the engine for an extended period in a closed building or an area with insufficient ventilation, as exhaust fumes are extremely toxic.
- Always turn the radiator cap to first stop so that the pressure in the system can disperse when the coolant is hot.
- You must never work under a combine which is resting on a soft surface. Always take the unit to an area with a firm, flat surface on which to work - concrete is preferable.
- If it proves necessary to raise the equipment for easier access for servicing or repairs, make sure that safe, stable pedestals have been placed under the axle housing, enclosures etc. before work starts.
- Use footboards or work platforms when servicing inaccessible areas.
- Cleanness in the machine's hydraulic system is important for optimum performance. When servicing or repairing the system, plug the hose ends and component connections so as to prevent dirt from getting in.
- Clean the outside of all components before carrying out any sort of repair. Dirt and abrasive dust can reduce the efficiency and useful life of a component, resulting in costly replacements. Use of high-pressure cleaner or steam cleaner is recommended.
- Before releasing hoses or pipes connecting tools to remote control valves etc., turn off the engine and release all pressure in the pipes by activating the levers several times. This will eliminate the risk of personal injury owing to oil pressure.
- Before pressure testing, you must ensure that all hoses and connection clamps, not just on the equipment, but also on the testing equipment, are in good condition and pressure-sealed. Pressure readings must be taken with the specified gauges. The correct method must be closely followed to prevent damaging the system or equipment and to eliminate any risk of personal injury.
- Hydraulic fluid escaping under pressure can have enough force to penetrate a person's skin. You can find a leak under pressure by using a small piece of cardboard. You must never use your hands. If you get "injected" with hydraulic fluid, seek medical attention immediately.
- You must NOT park or attempt to inspect the equipment on a slope. If this cannot be avoided, you must take extra care and chock up the wheels.
- Follow the recommended safety precautions set out in the workshop manual when dismantling the air-conditioning system, as escaping coolant can cause frostbite.
- Before removing wheels and tyres from a machine, you must check whether extra ballast has been added (liquid or weights). Obtain help and use suitable equipment to support the weight of the wheel unit. Position the wheels so that they cannot fall over and maim anyone.
- When filling the tyres with air, take care not to put too much in - check the pressure constantly. Excessive pressure can cause tyres to explode, resulting in personal injury.

- Follow these safety precautions together with the others contained in this manual and you will protect yourself. If you ignore them, you can easily be maimed for the rest of your life.

0.4.10 Maintenance techniques

Maintenance safety
Relevant maintenance methods and correct repair methods are important for both reliable operation of all agricultural machinery and for the personal safety of those carrying out the work.

This workshop manual gives general guidelines for carrying out repair and maintenance work using well-tried effective techniques. Following them will help ensure that a thorough repair is completed with success.

There are numerous variations in methods, techniques, tools and spare parts in connection with the maintenance of combines, quite apart from the skills of the individual technician in carrying out the work. This manual can in no way foresee all such variations and give advice on or warn against every single one of them. Anyone departing from the instructions in this manual needs to be aware that they are putting their own personal safety and the correct functioning of the combine at risk in their choice of repair methods, tools and/or spare parts.

Maintenance techniques
Clean the outside of all components before carrying out any sort of repair. Dirt and abrasive dust can reduce the effective useful life of a component, resulting in costly replacements.

Time spend on preparing and cleaning working surfaces can really pay for itself, as it makes the work easier and safer and will result in the serviced components being more reliable and effective in use.

Use cleaning fluids that are known to be safe Some types of fluid can damage seals and cause skin irritation. Check the labels on solvents to make sure that they are suitable for cleaning components and also that they do NOT represent a risk to the personal safety of the user.

Replace O-rings, seals or packing rings when they have been disturbed. Never mix new and old seals or O-rings regardless of their condition. Always coat new seals and O-rings with hydraulic oil before fitting.

When you replace components, you must use the right tool for the job.

Hoses and pipes
You must always replace hoses and pipes with damaged ends.

When mounting a new hose you must loosely connect both ends and make sure the hose takes up the desired position before tightening the connections. Clips should be done up tightly enough to hold the hose without squeezing it and to prevent rubbing or contact with other parts.

Before removing hoses or pipes, make sure that you identify them in such a way that they can be reassembled correctly.

Make sure that the hoses fitted have no kinks or twists after fixing.

Bearings
Bearings that are considered suitable for further use should be cleaned in a suitable solvent and put in clean lubricating oil until they are used.

Do NOT rotate bearings using compressed air. The centrifugal force can cause a ball or roller to fly outwards with enough force to cause injury.

Fitting a bearing can be classified in two ways: Press fit on rotating parts such as shafts and gears, for example, and push fit into static places such as a gearbox reduction. Where possible, you should always fit the bearing on the rotating component first.

Always use pullers or a press to remove and/or fit bearings, bushes and cylinder sleeves, etc. Use hammer, punch or chisel only when absolutely necessary and remember to use safety glasses.

Shim rings
When removing shim rings, tie them together and identify them with regard to their location. Keep them clean and flat until they are refitted.

Cables and wires
When dismantling or interrupting a group of cables or wires, each of them must be labelled to ensure they can be connected correctly again.

Always cut ducts and conduits back properly to prevent rubbing, cable damage and possible fire damage.

0.5 Practical advice

Safety
When working on any machine, the first thing you must be aware of is your own safety and that of others. In order to work without risk, it is important to understand what the work actually involves, to use implements and any equipment needed correctly, and, finally, to use your head at all times.

Troubleshooting
The following method can be used to help locate faults in the machine based on the information in the workshop manual.

The method involves going through a number of logical steps in order to identify, localise and repair the fault:

- Establish the nature of the problem.
- List possible causes.
- Rule out causes.
- Carry out the checks in the right order in order to find the right cause.
- Compare the approximate useful life remaining with the cost of spare parts and labour.
- Carry out the repair that was found to be necessary.
- Check that the components and functions affected are working correctly.

Handling heavy objects
Unless otherwise indicated, adjustable lifting tackle must always be used for disassembly. All lifting straps or chains must be parallel with each other and hang as vertically as possible in relation to the object being lifted. If the straps or chains are designed for a much higher lifting capacity than the weight of the current load, it is permitted to use straps and chains in a triangular arrangement (2, 3 or 4 straps or chains from the same ring under the tackle hook).

Please note that when a tilted component is removed, the lifting eye will have a much smaller capacity if the angle between the load-bearing elements and the object is less than 90° (right and wrong lifting method). The lifting eye must never be bent. The same applies to the yokes, which must only be subjected to tensile stress. A length of pipe and a disc can be used to reduce the load on the lifting eye.

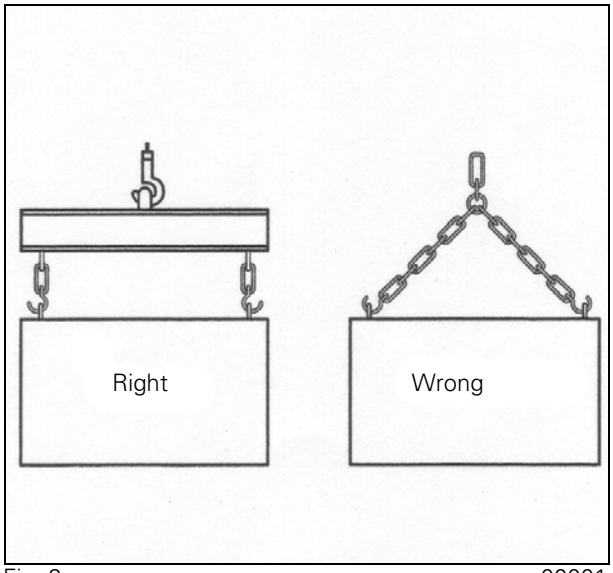


Fig. 2 00001

Forged lifting eye fittings
(A) Load - (B) Shackle - (C) Shackle holding plate (3 mm thick) - (D) Connector (may be welded to the plate).

In some cases special lifting accessories are available to ensure that balance is maintained and handling can take place without risk.

Note: *In the event of problems when removing a component, check that all the bolts and nuts have been removed and that no other parts are causing an obstruction.*

Cleaning and penetration by foreign bodies
To ensure that the machine has the longest possible useful life, it is important to protect its vital moving parts from dust and foreign bodies. The necessary precautions must therefore be taken. Guards, seals and filters are there to keep the air, fuel and lubricant systems clean. Such protective devices must not be removed.

Whenever a hydraulic, fuel, lubricant or air line is disconnected, the disconnection point and surrounding area must be cleaned. As soon as the line has been disconnected, a plug, cover or piece of tape must be applied to the pipe or opening to prevent penetration by foreign bodies.

Similarly, covers and inspection hatches must be cleaned and the opening covered during removal.

Clean and inspect all parts. Check all channels and holes for blockages. Cover components to stop them getting dirty. The parts must be completely clean before remounting. New parts must remain in their packaging until they are fitted.

Mounting
When assembling a machine, complete the steps one by one. Never put a partially assembled component to one side in order to start assembling another component. Carry out all the recommended adjustments. Check the finished work to make sure that nothing has been forgotten.

Check the various adjustments again before starting the machine.

Note: *Before fitting new parts, remove the rust protection from all their machined surfaces (the coating generally peels off).*

Lubrication
Fill the housing of repaired or replaced components as instructed with clean, fresh lubricant of the type and grade recommended in the section of the instruction manual on regular maintenance.

Spacers
When removing spacers, keep them all together and mark the mounting point. Spacers must be clean and not deformed when they are refitted.

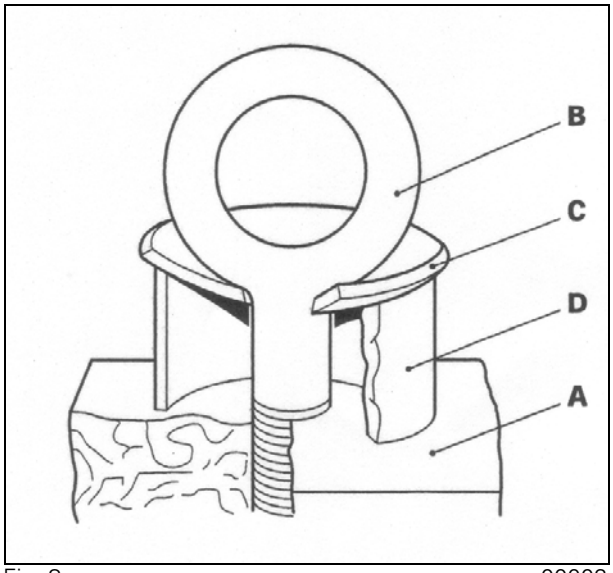


Fig. 3 00002

Seals
The holes in flat seals must match up with the lubrication channels in the relevant parts. If the seals have to be made, choose a suitable type and thickness of material and make cuts in the right places. If seals are cut incorrectly, it can lead to serious malfunctions.

Seal rings/lip seals ("SPY")
Coat the lips of "SPY" seal rings with oil before fitting. Do not put grease on the seal rings unless they are grease seals.

The main elements of a "SPY" seal ring are the cap (1), the sealing part (2) and the spring collar (3).

In (Fig. 4) you can see a single "SPY" seal ring. In the cross section you can see the "flange" (4) and "pin" (5), which sit on the outside and inside respectively in a seal ring with a lip. With a few exceptions, the pin on an oil ring with a lip faces the lubricant side. Certain seal rings have an extra lip without spring.

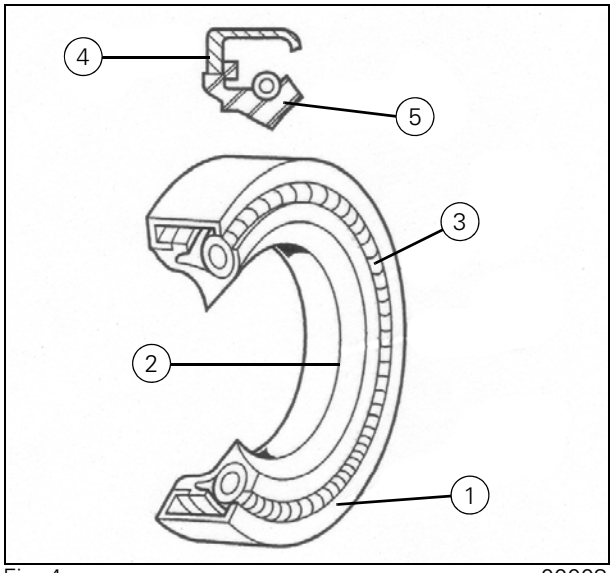


Fig. 4 00003

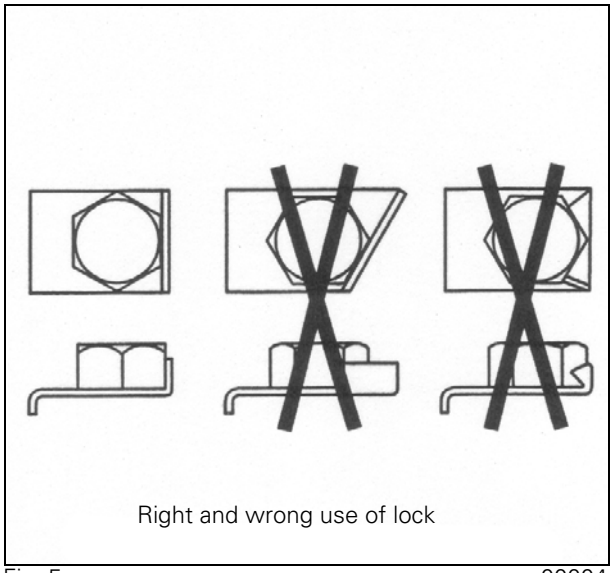
Securing and locking nuts and bolts
To prevent nuts and screws working loose, use retaining washers, lock plates and split pins. In addition to these mechanical devices, use locking paste, e.g. Loctite.

In order to work effectively the locking plate has to be bent down over the edge of the object. Bend the other end up against one of the surfaces of the nut or bolt head.

New locking plates must always be fitted in housings with moving parts. When fitting lock washers on aluminium housings, insert a spring washer between the lock washer and the housing.

Note: *Retaining washers (Grower, star washer, spring washer etc.) must never be inserted under nuts or screw heads which are to be tightened to a specified torque.*

Note: *When using locking paste such as Loctite, the parts must always be cleaned of grease before applying the paste.*

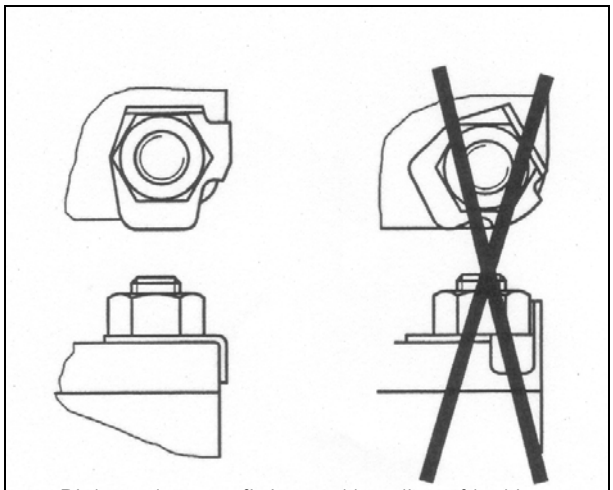

Right and wrong use of lock
Fig. 5 00004

Lubricating rings and tight fit
Do not fit the rings with just a hammer. Use a suitable fitting tool together with a hammer or, even better, a press, if possible.

When using a press, make sure that the pressure is exerted in the same direction as the drilled hole. If there is an oiling hole in the lubricating ring, it must line up with the hole in the adjoining part.

Where one part fits tightly inside another, lubricate both surfaces. Tapered parts must be fitted dry. Check the tapered surfaces for impurities and burrs before fitting. They must be completely dry.

Fitting bolts in non-through holes
Bolts of the right length must be used. If the screw is too long, it will hit against the base before the screw head is in contact with the part to be held: this will cause the threads to be damaged.


Right and wrong fitting and bending of locking plate tabs
Fig. 6 00005

If the bolt is too short, it may not have enough thread engaged to hold the part in place and so will not work effectively.

0.6 Start-up instructions

0.6.1 General

To ensure the machine is regularly maintained during the warranty period, the Head Office or local AGCO dealer and supplier must arrange for service inspection after 50 hours' operation and after the first harvest.

This inspection has been introduced and is designed to ensure that the machine gives optimum performance during the whole warranty period, with the result that it will operate reliably for many years to come.

0.6.2 Pre-delivery checks

Prior to delivery to the dealer and delivery from the dealer to the customer or transfer to the user, head office must ensure that the following is done:

BEFORE INSPECTION

- Check the combine/cutting table/table trailer and equipment for transport damage.
- Check that the combine has been delivered in accordance with the order/delivery specification.
- Verify and register the serial numbers on the combine, engine, cutting table and yieldmeter source (if fitted).
- Fit any parts that were removed before transport.
- Fit any optional equipment ordered (if it was not fitted at the factory).

FLUID LEVEL CHECK

Check the various fluid levels and top up if necessary:

1. Cooling system, antifreeze 50%
2. Fuel tank.
3. Engine oil.
4. Gearbox.
5. Final drives.
6. Hydraulic oil tank(s)
7. Brake fluid tank.
8. Wobble box (knife drive).
9. Right-angle gear for returns thresher.
10. Battery acid level and cable shoe.

LUBRICATION

Lubricate the following points:

11. All grease nipples.

SETTINGS

Fit the cutting table in accordance with the operato's manual. Check and adjust if necessary:

12. Main crop elevator/chains.
13. Check tightening of all air-intake hoses/pipe connections on the engine.
14. Make sure that hoses, pipes and lines are not close to the exhaust system, belt pulleys, belts, etc.
15. Check the tightening of hoses and connections in the cooling system.
16. Slip clutches for main crop elevator/returns system, after dismantling and cleaning.
17. Check that the clutch for the cutting table/table auger does not slip, after dismantling and cleaning.
18. Concave setting.
19. Rotary separator concave setting.
20. Rear beater curtains.
21. Check hydraulic connections for leaks. Repair if necessary.
22. All belts and chains.
23. Seals for stone trap/main grain pan and shaker shoe.
24. Function and setting of straw chopper clutch.
25. Tightening of bolts in wheels and undercarriage in accordance with operator's manual.
26. Tyre pressure in accordance with operator's manual.

BEFORE STARTING THE ENGINE

Turn on the ignition and check:

27. That the pilot lamps for oil pressure and ignition come on.
28. Lights - main lights, direction flashers, warning lights and horn.
29. Operation ofFIELDSTAR.
30. Select and check: "Combine type" / "Equipment setup" / "Equipment type" and "Gear ratio".

STARTING THE ENGINE

Start the engine and check:

31. That the pilot lamps for oil pressure and ignition go out.
32. Cooling water temperature sensor (if fitted).
33. Operation of throttle lever.
34. That the fuel stop function stops the engine.

WHILE THE ENGINE IS RUNNING

do the following:

The combine must be kept under constant observation and checked for faults/leaks during this testing.

35. Check the threshing unit and cutting table at low speed. Then let the threshing unit run for 30 minutes at max. speed and check all the functions. The reels should run at half speed.
36. Check table reversing at low engine speed.
37. Check operation of hydrostatic transmission, speed control/gearshift and brakes.
38. Check all electrical/hydraulic functions/control systems.
39. Check mechanical/electrical clutches.
40. Check max./min. speed for reel/threshing cylinder and fanning mill.
41. Check engine and straw walker speed.

42. Check that pre-set cutting height is in accordance with FIELDSTAR. Zero and then set to 10 cm cutting height.
43. Calibrate cutting height control and set to 10 cm cutting height.
44. Check field pressure control and set to 5 bar below the actual pressure for 10 cm cutting height.
45. Calibrate Auto Level combine and table (if fitted).
46. Calibrate operation of Auto Level combine and table (if fitted).
47. Check pre-set cutting height/cutting height control and field pressure control.
48. Check operation of optional equipment, electrical sieves/vertical knife/chaff spreader/straw chopper/ electrical straw deflectors/chopper vibration sensor and returns volume sensor (if fitted).
49. Calibrate Constant Flow. Set sensitivity to 12, response to 5 and cylinder load to 4.5.

FINAL CHECK
When the engine has been stopped, do the following:

50. Check that there are no oil, fuel or coolant leaks.
51. Check the machine for any loose nuts, bolts, etc.
52. Remove all preservatives and shipping labels.
53. Clean the combine.
54. Check that all the safety guards are fitted.
55. Check that the contents of the toolbox and the technical manuals are in accordance with the specifications (particularly if a yieldmeter is fitted).

0.6.3 Instruction of combine operator

The customer or combine operator must be instructed in the basic principles of the combine and its operation.

This instruction must include the following:

- Basic principles of the combine
- Functions and instruments.
- Safety precautions
- Driving the combine
- Use of FIELDSTAR.
- Initial harvest settings
- Harvesting technology and optional equipment
- Routine maintenance
- Off-season storage
- Right to free service
- Legislation with regard to yieldmeter source

This instruction must be given in the presence of everyone who will be involved in the operation and maintenance of the machine.

All points must be explained in detail and run through with the customer where relevant for the combine model in question - special attention must be drawn to all points relating to safety during operation and maintenance.

1. Stress the importance of all the safety guards being in place when the machine is in operation, and demonstrate how to open and close the guards on both sides of the machine.
2. Explain the use of the cutting table's safety stop, and how important it is for the engine to be stopped when work is being done on the machine.
3. Show where the main switch is located and how to operate it, and point out how important it is to use it to turn off the machine's electrical system.
4. Explain about the yieldmeter and point out the legal requirements regarding registrations. Also point out the importance of keeping the cover on the source and the detector clean.
5. Explain how to use the operator's manual and other technical manuals supplied with the machine, and show where they and the toolbox are kept.
6. Point out the importance of the serial numbers for the combine, cutting table and engine, and show where the numbers are located.
7. Explain how to adjust the steering wheel and operator seat.
8. Demonstrate the following instruments in the operator cab:

- Switches in the cab roof panel.
- Demonstrate how to clean the cab air filter and how to use the blower/heating/air-conditioning/recirculation.
- Windscreen wiper
- Work light and unloading auger light.

9. Explain the use of the rotating yellow beacon and hazard light.
10. Demonstrate the grain tank light/adjustment of the bottom cover over the unloading auger/grain tank cover, electrical/manual opening, and level sensor.
11. Explain that the multi-function lever must be in neutral position when the engine is being started and stopped.
12. Explain operation of the throttle lever and point out that the engine must run at max. speed during harvesting.
13. Demonstrate how to start and stop the engine when it is both hot and cold.
14. Explain the pilot lamp for engine oil pressure, pilot lamp for charging, transport lights, direction flashers, hazard light and horn.
15. Demonstrate manoeuvring the combine, start and stop, and use of the gears and multi-function lever. Explain that the machine must be at a standstill before changing gear.
16. Demonstrate the cooling water temperature/oil pressure gauge and pilot lamp.
17. Demonstrate the parking brake and pilot lamp.
18. Demonstrate the use of brakes, latched and unlatched. Explain how to adjust and check the fluid levels.
19. Demonstrate the sampling lever and tray for returns.

20. Instruct in use of FIELDSTAR system.
21. Demonstrate how to use the systems by running through the menus. Explain how to operate/calibrate and adjust, for example: Constant Flow, Auto Level table, Auto Level machine, etc.
22. Explain the forward speed indicator and shaft speeds.
23. Explain how to use the monitoring system:

- How the system sends an alarm in the event of a malfunction, and how it will stop the engine if the alarm is ignored in the case of serious faults such as engine overheating, low engine oil pressure, and lack of oil in the hydraulic system.
- Show how to prevent an engine stop if required for road safety reasons.
- How to zero the trip counters that enable the operator to check the number of hours worked and hectares harvested in the course of a day. The accumulated number of hours and hectares cannot be zeroed and acts as a log for the owner.

24. Demonstrate and explain the switches on the multifunction lever and control panel.
25. Explain engagement and disengagement of the threshing unit, table drive and unloading auger. Use of table auger reversing.
26. Demonstrate how to change the concave setting electrically/mechanically.
27. Show how to set the clearance between the rotary separator and concave.
28. Explain operation and alteration of cylinder speed.
29. Demonstrate how to vary fanning mill speed. Explain the necessity of regular cleaning inside the fanning mill guard.
30. Demonstrate sieve adjustment, including the top sieve extension, electrical/manual.
31. Demonstrate and explain adjusting the straw deflectors in the straw chopper, electrical/manual.
32. Demonstrate mounting and dismounting the cutting table and explain table alignment.
33. Demonstrate hydraulic operation of the cutting table up and down. Explain how to use and adjust the automatic table functions. Point out that if the cutting table is lowered all the way down, the oil pressure in the accumulators will be reduced and the cutting table will lose its floatation.
34. Demonstrate hydraulic operation of the reel up and down, forward and back/reel speed and automatic reel control.
35. Demonstrate hydraulic operation of the unloading auger.
36. Demonstrate sampling from the grain tank.
37. Show how to swivel the cab ladder forwards for transport on public roads.
38. Demonstrate the location and use of all the fuses.
39. Demonstrate the settings and control lever for positioning the reel spring tines correctly and how to adjust the reel for special crops.
40. Demonstrate and explain how to change the speed of the table auger and how to adjust the slip clutch for the table auger.
41. Demonstrate how to replace and adjust the knives.
42. Explain how important it is for the PowerFlow belts to run straight and the PowerFlow table to be kept clean.
43. Show distance from table auger and fingers to table bottom and cut-off strips.
44. Demonstrate how to check the fluid levels in the engine, hydraulic tank, radiator, fuel tank, gearbox and final drives.
45. Explain how to service the engine's air cleaner and the importance of keeping the engine compartment clean.
46. Demonstrate and explain how to clean the water cooler/oil cooler and condenser.
47. Explain how to fill and bleed the fuel system. Point out the importance of clean fuel.
48. Demonstrate operation of the ladder to the engine compartment.
49. Point out how important it is to stop the engine before carrying out any cleaning, adjustments or repairs on the machine.
50. Demonstrate how to empty the stone trap.
51. Demonstrate how to use the concave filler plates.
52. Show the cleaning iron for use when cleaning the main grain pan and shaker shoe.
53. Demonstrate sieve adjustment, including the top sieve extension.
54. Explain how to replace the sieves and remove the main grain pan.
55. Demonstrate how to clean the tank filling elevator, returns elevator and bottom shutters, how to remove the augers and how to clean the good grain and returns augers.
56. Demonstrate how to adjust the straw deflectors in the straw chopper.
57. Demonstrate how to clean the straw walkers.
58. Demonstrate how to use the cylinder wrench.
59. Explain how important it is to check belt/chain tension daily, and demonstrate how to tension belts and chains.
60. Explain oil changing and inspection with reference to the operator's manual.
61. Show the location of all drain plugs, filler plugs, fluid level plugs and dipsticks.
62. Advise on recommended coolants, lubricant qualities for the engine and hydraulic tank(s), and grease.
63. Provide instruction in how to replace the hydrostatic pump and tank filter elements.
64. Show where the oil can and grease gun are kept.
65. Show the lubrication decals and explain the importance of the colour-coded lubrication intervals.
66. Explain tensioning and lubrication of chains, including cleaning and lubrication of elevator chains, after every harvest season.

67. Explain that the tension of all nuts and bolts should be checked every day, including wheel bolts, particularly as time goes by and the components settle.
68. Explain the importance of correct tyre pressure.
69. Explain the operation and calibration of optional equipment mounted on the machine, e.g.: Straw chopper, chaff spreader, Constant Flow, Auto Level table, Auto Level machine, etc.
70. Discuss with the customer which crops are to be harvested and check that the necessary equipment is present. Demonstrate and explain how to adjust the combine for the particular crop.
71. Explain cleaning and off-season storage.

To conclude instruction the dealer should:

72. Enter all combine serial numbers in the combine identification section of the Combine Service Record Book.
73. Familiarise the owner with the service and warranty terms, and the service inspections required during the warranty period.
74. Complete the Installation and Delivery Coupon, and ask for the owner's signature.

0.7 Conversion tables

0.7.1 Conventional Units of Measurement

Units of measurement (international system)

Force in N (Newtons)	Conversion:	1 N	= 0.1019 kg	
		1 kg	= 9.81 N	
Power in kW (kilowatts)	Conversion:	1 kW	= 1.36 HP	Other units: HP (horsepower)
		1 kW	= 1.34 HP	
		1 CV	= 0.736 kW	
		1 HP	= 0.986 HP	
		1 HP	= 0.746 kW	
		1 HP	= 1.014 HP	
Torque in Nm (Newton metre)	Conversion:	1 Nm	= 0.1019 kgm	
		1 kgm	= 9.81 Nm	
		1 kgm	= 10 Nm*	
Specific consumption in g/kWh (grams per kilowatt-hour)	Conversion:	1 g/kWh	= 0.736 g/HPh	Other units: g/CVh (grams per horsepower-hour)
		1 g/HPh	= 1.36 g/kWh	
Pressure in kPa (kilopascal)	Conversion:	1 kg/cm²	= 1 Atm	Other units: kg/cm² (kilograms/square centi-metre) Atm (technical atmosphere) psi (pounds per square inch)
		1 kg/cm²	= 98.1 kPa	
		1 kg/cm²	= 0.981 bar	
		1 kg/cm²	= 1 bar*	
		1 kg/cm²	= 14.22 psi	
		1 bar	= 100 kPa	
		1 bar	= 1.02 kg/cm²	
		1 bar	= 14.51 psi	
		1 psi	= 6.9 kPa	
		1 psi	= 0.069 bar	
		1 psi	= 0.0703 kg/cm²	
		1 kPa	= 0.145 psi	
		1 kPa	= 0.0102 kg/cm²	
		1 kPa	= 0.01 bar	

* For the sake of simplicity, the Nm and bar units are converted according to ratios 10:1 and 1:1.

Conversion values for Imperial measurement system

0.1 mm	= 3.937 mils
1 mm	= 0.991 inch
1 m	= 3.281 ft
1 km	= 0.621 miles
1 cm^3	= 0.061 cu.in
1 l	= 1.759 pts (0.88 imp. qts)
1 bar	= 14.5038 psi
1 g	= 0.035 oz. (0.564 dr)
1 kg	= 2.205 lbs
1 t	= 1.102 short ton (0.9842 long ton)
0°	= 32° F

(In the case of temperature differences 1 °C = 1.8 °F)

0.8 Locking and sealing agents

The products are called Loctite in this manual for original fitting.

The trade names or AGCO's equivalent part numbers as set out in the following table are used for repairs:

Original fitting name	*Trade name*
270	Strong thread locking
242	Normal thread locking
AS 310 silicone	Colourless silicone
5910 black silicone seal for rear axle tube	Blacktite
510 sealing agent for flat surfaces	Formajoint/Masterjoint
518 sealing agent for flat surfaces	Unijoint/Masterjoint

The products can be ordered from the following address:

Henkel Loctite France S.A.

10, avenue Eugène Gazeau

BP 40090

F-60304 Senlis Cedex

Procedure for using Loctite products

1. Remove all old product residues and rust.
- By mechanical means: Brush, abrasive cloth
- By chemical means: "DECAPLOC 88"
- Allow the product to work, scrape and wipe.

2. Degrease the parts with a dry solvent.
- Preferably "LOCTITE 706 Super Dry Solvent".

3. Allow the solvent to evaporate.

4. Coat the parts with the recommended LOCTITE product:
- In non-through holes put the product on the last few grooves in the bottom of the hole.
- In the case of cylindrical knock-ins, coat both contact faces with the product using a clean brush.
- With bearing surfaces put a stripe on one of the two surfaces and round the holes, then press the surfaces together as quickly as possible.

Note: *Limit the amount of product used to avoid jamming adjoining parts.*

Note: *The fit must not be changed after 5 minutes of hardening so as not to "break" the product film.*

Note: *If the ambient temperature is less than +10°C, LOCTITE T 747 activator should be used on at least one of the workpieces after the second stage in order to make the LOCTITE product harden faster (except for SILI-COMET). Excess product outside the joint will not harden (the products are anaerobic, i.e. they harden when there is no oxygen present).*

Grease

If components that are in contact with the hydraulic oil are lubricated with grease, oil-miscible grease must be used to prevent the hydraulic filters from becoming blocked.

Use: "Amber Technical" grease, which is available from WITCO, 76320 Saint-Pierre des Elfes, France.