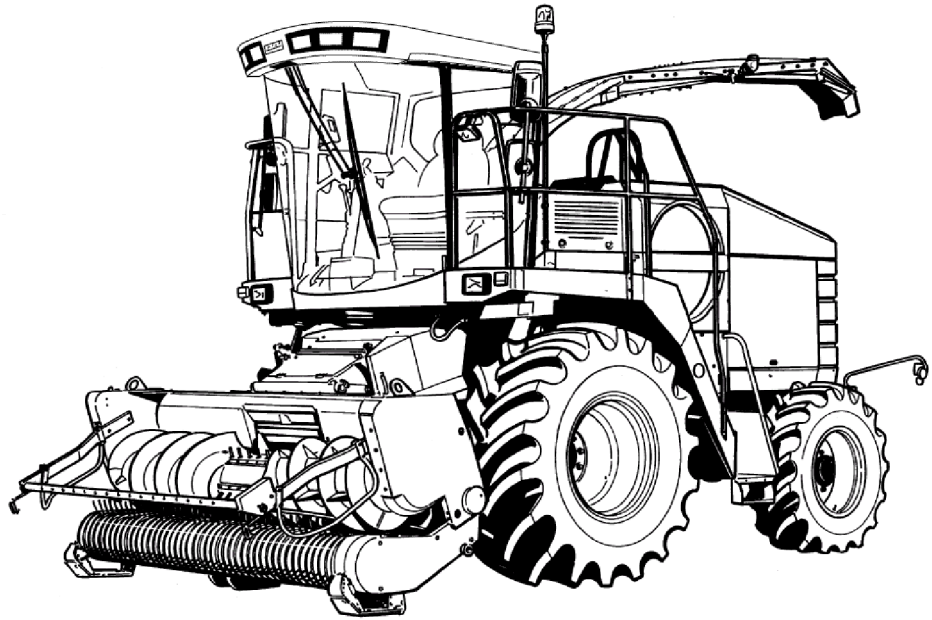


**Forage Harvester
CHX320, CHX420, CHX520
and CHX620**

Repair Manual

6-71020EN

CASE *III*



CHX320-CHX420-CHX520-CHX620 FORAGE HARVESTERS REPAIR MANUAL

SECTIONS

CONTENT

GENERAL INFORMATION	00
ENGINE	10
LIVE P.T.O.	14
TRANSMISSION	21
4WD LINES	23
FRONT MECHANICAL DRIVE	25
HYDROSTATIC TRANSMISSION	29
BRAKES AND CONTROL	33
HYDRAULIC SYSTEM	35
STEERING	41
CAB CLIMATE CONTROL	50
ELECTRICAL SYSTEM	55
ATTACHMENTS/HEADERS	58
PRODUCT FEEDING	60
CHOPPING	64
EJECTION	70
ACCESSORIES	88

S E R V I C E

GENERAL INFORMATION

Section	Description	Page
	Introduction	2
	Important information	2
	General instructions	3
	Shimming	3
	Rotating shaft seals	3
	O-ring seals	3
	Sealing compounds	3
	Bearings	3
	Cotter pins	3
	Protecting the electronic / electrical systems during charging or welding	4
	Spare parts	5
	Tools	5
	Abbreviations	5
	Safety regulations	6
	Accident prevention	6
	Safety rules	6
	General guidelines	6
	Start-up	8
	Engine	8
	Electrical system	8
	Hydraulic systems	8
	Wheels and Tyres	9
	Removal and Re-fitting	9
	Explanation of machine serial number	10
	Conversion chart	11
	Hardware tightening torques	12
	Drive line and components	14
	Lubricants to be used	16

SECTION 10 - ENGINE

Chapter 1 - IVECO Engine F3A - General

	Walk around the engine	2
	The Iveco engine	7
	Engine block and cylinder liners	9
	Crankshaft	9
	Crankshaft sealing rings	10
	Connecting rods	10
	Pistons	10
	Camshaft	11
	Timing system	11

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>

Flywheel	12
Auxiliary drivebelt	13
Lubrication	14
Oil filter	15
Oil sump	16
Cooling	16
Electronically controlled injection system	17
Pump injector	18

SECTION 10 - ENGINE

Chapter 2 - IVECO Engine - F3A

General specifications	3
Fuel system data	7
Main data	8
Torque settings	17
Plan of tightening sequence	22
Tools	25
Mechanical troubleshooting	29
Preliminary conditions	29
Engine - Disassembly - Assembly	33
General notes	43
Crankshaft	44
Pistons, Pistons rings and Connecting rods	48
Cylinder head	50
Oil pump and , timing system intermediate gears	51
Engine flywheel	53
Camshaft	54
Injectors pump	55
Rocker arm shaft	55
Completing the engine	59
Assembly diagram for Fan drive belt - Water pump - Alternator	63
Crankcase, Cylinder liners	64
Crankshaft, Bearings	67
Selecting main and big end bearing shells	70
Preliminary appraisal of data to make the selection	72
Pistons	86
Connecting rods	89
Piston and Connecting rod - Assembly	92
Cylinder head	96
Tappets and Camshaft	99
Valve springs, Rocker arm shaft and Rocker arms	104
Checks, Measurements and Repairs	104
Fitting valves and oil seal	105

Rocker arm shaft	106
Main data of the rocker arm shaft (Dimensions in mm)	106
Rocker arms	107
Lubrication system	107
Cooling circuit	112
Fuel supply	113
Replacing the valve guides	116
Injector case - Replacement	117
Crankshaft front cover seal - Replacement	120
Adjusting clearance of rocker arms to valves and pre-load of pump injector rocker arms	121
Pump injector - Removal - Refitting	123
Bleeding the fuel supply system	126
Water pump - Removal-Refitting	127
Thermostat - Removal - Refitting	128

SECTION 10 - ENGINE

Chapter 3 - IVECO Engine F3B - General

Engine description	3
Engine main components	3
Crankshaft	4
Crankcase gas ring	4
Connecting rods	5
Pistons	5
Cylinder head	6
Camshaft	6
Intake valve control	6
Exhaust valve control	6
Injector-pump control	6
Camshaft drive	7
Camshaft driving	7
Engine flywheel	8
Auxiliary component control	9
Oil sump	9
Oil filter	10
Fuel supply	11
Main components of the ms6.2 edc system	11
MS6.2 electronic control unit	13
Control unit operation	14
Engine coolant temperature sensor	16
Fuel temperature sensor	16
Supercharging air temperature sensor	17
Supercharging pressure sensor	17

Flywheel sensor	17
Distribution sensor	18
Pre - After heating resistance	18

SECTION 10 - ENGINE

Chapter 4 - IVECO Engine F3B

General specification	3
Fuel system data	7
Main data	8
Torque settings	13
Plan of tightening sequence	16
Tools	19
Mechanical troubleshooting	22
Engine - Disassembly - Assembly	30
General notes	39
Crankshaft	41
Pistons and connecting rods	45
Cylinder head	47
Oil pump and intermediate timing gears	48
Engine flywheel	49
Camshaft	50
Injectors pump	52
Rocker arm shaft	52
Completing the engine	56
Crankcase and cylinder liners	61
Crankshaft and Bearings	63
Selecting main and big end bearing shells	66
Preliminary appraisal of data to make the selection	67
Pistons	78
Connecting rods	81
Piston - Connecting rod assembly	84
Cylinder head	86
Valves	87
Tappets and Camshaft	90
Valve springs, Rocker arm shaft and rocker arms	94
Main data for checking the valve springs	95
Fitting valves and oil seal	95
Rocker arm shaft	96
Rocker arms	97
Lubrication system	98
Cooling system	102
Fuel supply	103
Valve guides - Replacement	106
Injector case - Replacement	107

Crankshaft front cover seal – Replacement	110
Clearance of valves to rocker arms and pre-load of pump injector rocker arms	111
Pump injector – Removal, Refitting	113
Bleeding the fuel supply system	117
Water pump – Removal, Refitting	118
Thermostat – Removal, Refitting	118

SECTION 10 - ENGINE

Chapter 5 - CATERPILLAR Engine

General	2
Case IH - Caterpillar	2
Caterpillar engine	2
Service / Parts	3

SECTION 21 - TRANSMISSION

Specifications	2
Tightening torques and Adjustments	2
Special tools	3
Gearbox shafts	4
Shifting diagram	4
Disassembly of traction gearbox	5
General	5
Removal of selector forks and shifter shafts	5
Removal of drive shaft	5
Removal of the countershaft	6
Removal of transmission main shaft	7
Removal of the half-shaft from the differential	8
Removal of the differential	9
Assembly of traction gearbox	10
Assembly of the differential	10
Assembly of the half-shafts of the differential	10
Assembly of transmission main shaft	11
Assembly of the countershaft	12
Assembly of the drive shaft	12
Assembly of selector shafts and forks	13
Calculation of shims to be installed on the shafts	13
Assembly of the cover	14

SECTION 23 - 4WD LINES

Specifications	2
Tightening torques	2
Special tools	3
Self-made tools	3
Gearbox shafts	5
4WD gearbox - Removal	6
4WD gearbox - Components	7
4WD gearbox - Disassembly	9
Intermediate shaft	10
Input shaft	11
Output shaft and clutch	12
Clutch cylinder	13
4WD gearbox - Assembly	14
Clutch cylinder	14
Output shaft and clutch - pre assembly	15
Input shaft - pre assembly	19
Intermediate shaft - installation	21
Input shaft - installation	22
Cover - installation	25
Clutch pre-assembly - installation	25
4WD gearbox - Installation	26

SECTION 25 - FRONT MECHANICAL DRIVE
Chapter 1 - Final drives CHX320

Final drives - Disassembly	2
Output shaft	2
Input shaft	2
Final drives - Assembly	4
Input shaft	4
End play adjustment	4
Output shaft	4
Preload adjustment	4

SECTION 25 - FRONT MECHANICAL DRIVE
Chapter 2 - Final drives CHX420-520-620

Specifications	2
Tightening Torques	2
Gearbox shafts	3
Wheel bolt - Replacement	4
Final drive - R./ I.	5
Final drive D./A.	7
Disassembly	7
Assembly	10

SECTION 29 - HYDROSTATIC SYSTEM

Hydrostatic circuit and components	2
Circuit	2
Hydrostatic Pump and motor Identification plate	4
Hydrostatic Pump	5
Pump operation	5
Circuit	6
Pump characteristics	9
Multifunction valve	10
Servo Valve	14
System in Neutral	14
Servo Solenoid Valve Energized	14
Hydrostatic Motor	16
Fixed Displacement Motors	16
Drive Motor Characteristics	17
Oil Cooler bypass Valve	18
Filling and bleeding the hydrostatic system	19
Starting the hydrostatic system	21

SECTION 33 - BRAKES AND CONTROL

Brake system	2
General	2
Road Mode	3
Parking brake adjustment	4
Replacement of the brake linings	5
Removal	5
Installation	5
Bleeding the brakes	6
Bleeding the left-hand side circuit	6
Bleeding the connection pipe between the two main cylinders	6

Bleeding the right-hand side circuit	7
Disassembly and assembly of brake shoes and discs	8
Disassembly of brake shoes	8
Disassembly of brake discs	8
Assembly of brake discs	8
Assembly of brake shoes	9

SECTION 35 - HYDRAULIC SYSTEM

Chapter 1 - General

Torque tables for hydraulic components	2
Union nuts	2
Ferrules	2
Metric fittings	2
Unions	2
Connections	3
Swivel nut with ball-type nipple	3
Pump group - Disassembly and Assembly	4
Disassembly of the pump group	5
Removal of the triple pump from the hydrostatic pump	6
Splitting of the triple pump	7
Assembly of the pump group	10
Installation of the pump group to the hydrostatic pump	10

SECTION 35 - HYDRAULIC SYSTEM

Chapter 2 - Work hydraulics - Attachment height control

Circuit diagrams	2
Work Hydraulics - Attachment height control	2
Hydraulic oil reservoir	4
Low pressure filter	5
Breather	5
High pressure filter	5
Non-return valve	5
Function	5
Work hydraulics pump	6
Specifications	6
High pressure relief valve	7
Attachment height control valve (EMR)	8
Neutral position	10
Attachment lifting position	10
Attachment lowering position	11
Pressure relief valve h	11

Emergency hand buttons	11
Specifications	11
Attachment compensation valve	12
Specifications	12
Transport mode	14
Compensation mode	14
Stubble height mode	14
Pressure sensor	15
Specifications	15
Hydropneumatic accumulators	16
Filling	17
Attachment lift cylinders	18

SECTION 35 - HYDRAULIC SYSTEM

Chapter 3 - Work hydraulics - Base unit

Circuit diagrams - Base unit	2
Stack valve	7
Repair of control valves	8
Load sensing valve	9
System in neutral	9
Cutterhead reverse drive motor	10
Specifications	10
Spout rotation pressure relief valve	12
Spout rotation motor	12
Specifications	12
Quick-release couplings	13
Specifications	13
Spout lift cylinder	14
Cylinder disassembly and assembly	14
Reinstallation of spout lift cylinder	15

SECTION 35 - HYDRAULIC SYSTEM

Chapter 4 - Steering hydraulics

Circuit diagrams - Steering hydraulics	2
Steering hydraulics pump	7
Specifications	7
Steering valve	8
Special tools	9
Steering valve - D./A.	10
Steering cylinders	18
Disassembly and assembly	18
Toe-in adjustment, steering ball joints, steering wheel stops	19

SECTION 35 - HYDRAULIC SYSTEM

Chapter 5 - Low pressure hydraulics

Circuit diagrams - Low pressure hydraulics	2
Low pressure hydraulic reservoir	4
Oil and Filter change procedure	4
Oil pressure check procedure	5
Filling the system when (re)installing the low pressure pump	5
Filling the system after (re)installing the main drive transfer gearbox	5
Low pressure pump	6
Specifications	6
Low pressure valve	7
Main drive belt tensioning cylinder	10
Spout deflector cylinder	11

SECTION 35 - HYDRAULIC SYSTEM

Chapter 6 - High-flow hydraulics

Circuit diagrams - High-Flow hydraulics	2
---	---

SECTION 50 - CAB CLIMATE CONTROL

Correct use of the airconditioning system	2
Storage maintenance	2
Air conditioning circuit	3
Components	3
Specifications	4
Refrigerant	4
Compressor	4
Compressor clutch	4
Circuit parameters	4
Low pressure switch	4
High pressure switch	4
Filter-drier	5
Compressor clutch replacement	6
Clutch removal	6
Clutch installation	8
Ventilation unit	10

SECTION 55 - ELECTRICAL SYSTEM**Chapter 1 - General**

General information	2
Wires	2
Color code	2
Wire identification	3
Fuses	4
Symbols	4
Relays	10
Connectors	11

SECTION 55 - ELECTRICAL SYSTEM**Chapter 2 - Wiring Diagrams CHX Europe**

Wiring diagrams CHX Europe	2
----------------------------------	---

SECTION 55 - ELECTRICAL SYSTEM**Chapter 3 - Wiring Diagrams CHX NA**

Wiring diagrams CHX NA	Not used
------------------------------	----------

SECTION 55 - ELECTRICAL SYSTEM**Chapter 4 - Can network basics**

Can network basics	2
General layout electronic system	2
Electronic components	2
Conclusion	2
Electronic system layout	4
Input	4
Output	4
Analog signals (from input or to output)	4
Digital Information	4
Interfaces	4
Software	5
Calibrations	5
Additional info:	5
Can spy	6
Decimal and hexadecimal counting	6
Decimal	6

Hexadecimal	6
How to use the CAN Identifiers	8
How to Enter CAN-SPY	9
CAN-SPY in practice	9
Error codes messages	15
Wiring checking procedure	16
Fault finding routine	17

SECTION 55 - ELECTRICAL SYSTEM

Chapter 5 - Calibration

General	2
Special tools	2
Machine calibration with EST tool	3
Configuration Item Selection screen	6
Maximum Handle position calibration	7
Minimum forward pump current calibration	9
Minimum reverse pump current calibration	11
Vehicle Configuration	13

SECTION 55 - ELECTRICAL SYSTEM

Chapter 6 - Software update

Software Revision	2
Software update with EST tool	3

SECTION 55 - ELECTRICAL SYSTEM

Chapter 7 - Troubleshooting

Machine error messages	2
Attachment height control error messages	51
Error reports	52
Caterpillar error messages	57
List of CAN identifiers	59
Detailed analysis per function	89
1. Electric conditions, engine running or not running	91
2. Engine protection	93
3. Harvest mode	96
5. Cutterhead engagement	102
6. Feed rolls forward engagement	105
7. Feed rolls reverse engagement	107
8. Power reverse	109
9. Four-wheel drive	111

10. Spout rotation	113
11. Raise / lower spout	116
12. Spout deflector	118
13. Reverse cutterhead	120
14. Auxiliary front hydraulics	123
15. Auxiliary rear hydraulics	125
16. Air conditioning	127
17. Silage additives application	129
18. Knife sharpening	131
19. Adjust-O-Matic routine	135
20. Crop processor	141
21. Metal detector operation and troubleshooting	143
22. Attachment height control	155
23. Ground speed	164
24. High flow hydraulics	169
25. Rotary screens	171
26. Rotary screen brushes	172
27. Caterpillar engine	173
28. CAN network	177

SECTION 60 - PRODUCT FEEDING

Chapter 1 - Feed rolls

Metal detector roll	2
Removal	2
Disassembly	4
Metal detector components - D./A.	5
Disassembly	5
Assembly	5
Assembly	6
Installation	7
Smooth roll	9
Removal	9
Installation	10
Upper feed rolls - R./l.	11
Before removal	11
Removal of the upper feed rolls as a complete assembly.	12
Removal of the upper feed rolls as separate components.	12
Replacing wear plates on the upper feed rolls frame	15
Installation	15

SECTION 60 - PRODUCT FEEDING

Chapter 2 - Length of Control gearbox

Length of Control gearbox - R./I.	2
Removal	2
Installation	3
Gearbox shafts	5
Specifications	7
Length of Control gearbox - D./A.	8
1. Alternative drive shaft.	12
2. Transfer shaft	15
3. Upper feed rolls drive shaft	16
4. Selector shaft	17
5. Smooth roll drive shaft	19
6. Metal detector roll drive shaft	20
7. Reinstall the alternative drive shaft	22
8. Install seals and covers.	24

SECTION 60 - PRODUCT FEEDING

Chapter 3 - Attachments drive gearbox

Attachments drive gearbox - R./I.	2
Removal	2
Installation	3
Gearbox shafts	4
Specifications	5
Attachments drive gearbox - D./A.	6
Assembly	10
Idler shaft	10
Input shaft	11
Transfer shaft	12
Attachment drive shaft	13
Idler shaft - Re-installation	14

SECTION 60 - PRODUCT FEEDING

Chapter 4 - Upper feed rolls drive gearbox

Special tools	2
Upper feed rolls drive gearbox - R./l.	2
Removal	2
Installation	4
Gearbox shafts	5
Specifications	5
Upper feed rolls drive gearbox - D./A.	6
Assembly	10
Upper feed rolls drive shaft	10
Front upper feed roll drive shaft	11
Rear upper feed roll drive shaft	14
Re-install the upper feed rolls drive shaft	16
Seals and cover	17

SECTION 64 - CHOPPING

Chapter 1 - Cutterhead

Splitting of components	2
Rotor and bearings - R./l.	2
Removal	2
Assembly	4
Shearbar - R./l.	8
Shearbar support - R./l.	8
Removal	8
Installation	9

SECTION 64 - CHOPPING

Chapter 2 - Cutterhead gearbox

Cutterhead gearbox - R./l.	2
Removal	2
Installation	3
Cutterhead gearbox - D./A.	4
Oil cooler - D./A.	7
Gearbox - Disassembly	8
Input shaft	8
Output shaft	8
Gearbox - Assembly	10
Input shaft	10
Output shaft	10
Backlash	10

SECTION 70 - EJECTION

Chapter 1 - Blower gearbox

Inspection between cutterhead and blower	2
Blower - R./l.	2
Blower gearbox - R./l.	2
Blower gearbox - D./A.	3
Disassembly	3
Assembly	4
Input shaft	4
Output shaft	4
Adjusting the shimming	5

GENERAL INFORMATION**CONTENT**

Section	Description	Page
	Introduction	2
	Important information	2
	General instructions	3
	Shimming	3
	Rotating shaft seals	3
	O-ring seals	3
	Sealing compounds	3
	Bearings	3
	Cotter pins	3
	Protecting the electronic / electrical systems during charging or welding	4
	Spare parts	5
	Tools	5
	Abbreviations	5
	Safety regulations	6
	Accident prevention	6
	Safety rules	6
	General guidelines	6
	Start-up	8
	Engine	8
	Electrical system	8
	Hydraulic systems	8
	Wheels and Tyres	9
	Removal and Re-fitting	9
	Explanation of machine serial number	10
	Conversion chart	11
	Hardware tightening torques	12
	Drive line and components	14
	Lubricants to be used	16

INTRODUCTION

This manual is subdivided in sections marked by two-digit numbers, with independent page numbering within each section. For a quick reference, these sections have the same identification number and the same description of the relevant Flat Time Rate Manual.

The dealt matters and the information can be easily detected by index on the previous pages.

At the bottom of each page there is the manual print number and the relevant publication/up-dating date.

The information of this manual are up-dated at the date of the publication. As Case IH continuously improves its product range, some information could be not up-dated due to modifications of technical or commercial type, as well as for suiting the law regulations of the different countries.

In case of disagreement, refer to Case IH Sales and Service networks.

IMPORTANT INFORMATION

All repair and maintenance works listed in this manual must be carried out only by staff belonging to the Case IH Service network, strictly complying with the instructions given and using, whenever required, the special tools.

Anyone who carries out the above operations without complying with the prescriptions shall be responsible for the subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional or local dealers, reject any responsibility for damages due to the anomalous behaviour of parts and/or components not approved by the manufacturer himself, including those used for the servicing or repair of the product manufactured or marketed by the Manufacturer.

In any case, no warranty is given or attributed on the product manufactured or marketed by the Manufacturer in case of damages due to an anomalous behaviour of parts and/or components not approved by the Manufacturer.

No reproduction, though partial of text and illustrations allowed

GENERAL INSTRUCTIONS

Shimming

For each adjustment operation, select adjusting shims and measure individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value indicated on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

- before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes
- thoroughly clean the shaft and check that the working surface on the shaft is not damaged
- position the sealing lip facing the fluid; with hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will deviate the fluid towards the inner side of the seal
- coat the sealing lip with a thin layer of lubricant (use oil rather than grease) and fill the gap between the sealing lip and the dust lip on double lip seals with grease
- insert the seal in its seat and press down using a flat punch, do not tap the seal with a hammer or mallet
- whilst inserting the seal, check that it is perpendicular to the seat; once settled, make sure that it makes contact with the thrust element, if required
- to prevent damaging the seal lip on the shaft, position a protective guard during installation operations

O-ring seals

Lubricate the O-RING seals before inserting them in the seats, this will prevent them from overturning and twisting, which would jeopardise sealing efficiency.

Sealing compounds

Apply one of the following sealing compounds on the mating surfaces marked with an X: RTV SILMATE, RHODORSIL CAF 1 or LOCTITE PLASTIC GASKET.

Before applying the sealing compound, prepare the surfaces as follows:

- remove any incrustations using a metal brush;
- thoroughly de-grease the surfaces using one of the following cleaning agents: trichlorethylene, petrol or a water and soda solution.

Bearings

When installing bearings it is advised to:

- heat the bearings to 80 to 90 °C before fitting on the shafts;
- allow the bearings to cool before installing them from the outside.

Cotter pins

When fitting split cotter pins, ensure that the pin notch is positioned in the direction of the force required to stress the pin.

Spiral cotter pins do not require special positioning.

Protecting the electronic / electrical systems during charging or welding

To avoid damage to the electronic/electrical systems, always observe the following:

1. Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any attachment attached to the machine.
 - Position the welder ground clamp as close to the welding area as possible.
 - If welding in close proximity to a computer module, then the module should be removed.
 - Never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress.

IMPORTANT: *If welding must be performed on the unit or the attachment (if it is attached), the battery ground cable must be disconnected from the battery. The electronic monitoring system and charging system will be damaged if this is not done.*

Remove the battery ground cable.
Reconnect the cable when welding is completed.

4. Always disconnect the negative cable from the battery when charging the battery with a battery charger.

**WARNING**

Batteries contain sulfuric acid. In case of contact with skin, flush the affected area with water for five minutes. Seek medical attention immediately. Avoid contact with the skin, eyes or clothing. Wear eye protection when working near batteries.

SPARE PARTS

Only genuine spare parts guarantee the same quality, duration and safety as original parts, as they are the same parts that are assembled during standard production.

Only Case IH genuine spare parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and serial number
- part number of the ordered part, which can be found in the "Microfiches" or the "Spare Parts Catalogue", used for order processing

TOOLS

The tools that CASE IH suggests and illustrate in this manual have been:

- specifically researched and designed for use with Case IH machines
- essential for reliable repair operations
- accurately built and rigorously tested so as to offer efficient and long-lasting operation

By using these tools, Repair Personnel will benefit from:

- operating in optimal technical conditions
- obtaining the best results
- saving time and effort
- working in safe conditions

NOTE:

Wear limit values indicated for certain parts should be considered to be recommended, but not binding. The terms "front", "rear", "right-hand" and "left-hand" (when referred to different parts) are determined from the rear, facing in the direction of travel of the machine during operation.

ABBREVIATIONS

Below some often used abbreviations used in this manual:

AKS: Automatic Knife Sharpening

ASBA: Automatic Shear Bar Adjustment

CP: Crop Processor

CPU: Central Processing Unit

EST: Electronic Service Tool

LCD: Liquid Crystal Display

MD: Metal Detector

SAFETY REGULATIONS

WARNING AND DANGER SYMBOL



This warning symbol points out important personal safety messages. Carefully read the following safety regulations and observe advised precautions in order to avoid potential hazards and safeguard your health and safety. In this manual the symbol is accompanied by the following key-words:



WARNING - Warnings concerning unsuitable repair operations that may jeopardise the safety of Repair personnel.

DANGER - Specific warnings concerning potential hazards for operator safety or for other persons directly or indirectly involved.



ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of non-observance of simple and fundamental safety regulations. For this reason, **IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED** by foreseeing possible causes and consequently acting with the necessary caution and care.

Accidents may occur with all types of machine, regardless of how well the machine in question was designed and built.

A careful and judicious service technician is the best guarantee against accidents.

Precise observance of the most basic safety rule is normally sufficient to avoid many serious accident


DANGER


Never carry out any cleaning, lubrication or maintenance operations when the engine is running.

SAFETY RULES

General guidelines

- Carefully follow specified repair and maintenance procedures.
- Do not wear rings, wristwatches, jewellery, unbuttoned or loose articles of clothing such as: ties, torn clothing, scarves, open jackets or shirts with open zips that may remain entangled in moving parts. It is advised to wear approved safety clothing, e.g.: non-slip footwear, gloves, safety goggles, helmets, etc.
- Do not carry out repair operations with someone sitting in the driver's seat, unless the person is a trained technician who is assisting with the operation in question.
- Do not operate the machine or use any of the implements from different positions, other than the driver's seat.
- Do not carry out operations on the machine with the engine running, unless specifically indicated.
- Stop the engine and check that the hydraulic circuits are pressure-free before removing caps, covers, valves, etc.
- All repair and maintenance operations must be carried out using extreme care and attention.
- Service steps and platforms used in the workshop or elsewhere should be built according to standard accident prevention regulations.
- Disconnect the batteries and label all controls to indicate that the machine is being serviced. Any parts that are to be raised must be locked in position.
- Do not check or fill fuel tanks, accumulator batteries, nor use starting liquid when smoking or near naked flames, as these fluids are inflammable.
- Brakes are inoperative when manually released for repair or maintenance purposes. Use blocks or similar devices to control the machine in these conditions.

- The fuel nozzle should always be in contact with the filling aperture. Maintain this position until filling operations are completed in order to avoid possible sparks caused by the accumulation of static electricity.
- Only use specified towing points for towing the machine. Connect parts carefully. Make sure that all pins and/or locks are secured in position before applying traction. Never remain near the towing bars, cables or chains that are operating under load.
- Transport machines that cannot be driven using a trailer or a low-loading platform trolley, if available.
- When loading or unloading the machine from the trailer (or other means of transport), select a flat area capable of sustaining the trailer or truck wheels. Firmly secure the machine to the truck or trailer and lock the wheels in the position used by the carrier.
- Electric heaters, battery-chargers and similar equipment must only be powered by auxiliary power supplies with efficient ground insulation to avoid electrical shock hazards.
- Always use suitable hoisting or lifting devices when raising or moving heavy parts.
- Take extra care if bystanders are present.
- Never pour gasoline or diesel oil into open, wide or low containers.
- Never use gasoline, diesel oil or other inflammable liquids as cleaning agents. Use non-inflammable, non toxic commercially available solvents.
- Wear safety goggles with side guards when cleaning parts with compressed air.
- Reduce the air pressure according to the local regulations in force..
- Do not run the engine in confined spaces without suitable ventilation.
- Do not smoke, use naked flames, or cause sparks in the area when fuel filling or handling highly inflammable liquids.
- Never use naked flames for lighting when working on the machine or checking for leaks.
- All movements must be carried out carefully when working under, on or near the machine. Wear protective equipment: helmets, goggles and special footwear.
- When carrying out checks with the engine running, request the assistance of an operator in the driver's seat. The operator must maintain visual contact with the service technician at all times.
- If operating outside the workshop, position the machine on a flat surface and lock in position. If working on a slope, lock the machine in position. Move to a flat area as soon as is safely possible.
- Damaged or bent chains or cables are unreliable. Do not use them for lifting or towing. Always use suitable protective gloves when handling chains or cables.
- Chains should always be safely secured. Make sure that the hitch-up point is capable of sustaining the load in question. Keep the area near the hitch-up point, chains or cables free of all bystanders.
- Maintenance and repair operations must be carried out in a CLEAN and DRY area. Eliminate any water or oil spillage immediately.
- Do not create piles of oil or grease-soaked rags as they represent a serious fire hazard. Always store rags in a closed metal container. Before engaging the machine, make sure that there are no persons within the machine or implement range of action.
- Empty your pockets of all objects that may fall accidentally unobserved into the machine inner compartments.
- In the presence of protruding metal parts, use protective goggles or goggles with side guards, helmets, special footwear and gloves.
- When welding, use protective safety devices: tinted safety goggles, helmets, special overalls, gloves and footwear. All persons present in the area where welding is taking place must wear tinted goggles. NEVER LOOK DIRECTLY AT THE WELDING ARC WITHOUT SUITABLE EYE PROTECTION.



Suggest:

For more complete manuals. Please go to the home page.

<https://www.ebooklibonline.com>

If the above button click is invalid. Please download this document first, and then click the above link to download the complete manual.

Thank you so much for reading

- Metal cables tend to fray with repeated use. Always use suitable protective devices (gloves, goggles, etc.) when handling cables.
- Handle all parts carefully. Do not put your hands or fingers between moving parts. Wear suitable safety clothing – safety goggles, gloves and shoes.

Start-up

- Never run the engine in confined spaces that are not equipped with adequate ventilation for exhaust gas extraction.
- Never place the head, body, limbs, feet, hands or fingers near rotating and moving parts.

Engine

- Always loosen the radiator cap slowly before removing it to allow any remaining pressure in the system to be discharged. Filling up with coolant should only be carried out with the engine stopped or idling (if hot)..
- Never fill up with fuel when the engine is running, especially if hot, in order to prevent the outbreak of fire as a result of fuel spillage.
- Never check or adjust fan belt tension when the engine is running. Never adjust the fuel injection pump when the Forage Harvester is moving.
- Never lubricate the Forage Harvester when the engine is running.

Electrical system

- If it is necessary to use auxiliary batteries, remember that both ends of the cables must be connected as follows: (+) with (+) and (-) with (-). Avoid short-circuiting the terminals. GAS RELEASED FROM BATTERIES IS HIGHLY INFLAMMABLE. During charging, leave the battery compartment uncovered to improve ventilation. Never check the battery charge using "jumpers" (metal objects placed on the terminals). Avoid sparks or flames near the battery zone. Do not smoke to prevent explosion hazards.
- Before servicing operations, check for fuel or current leaks. Eliminate any eventual leaks before proceeding with work.
- Never charge batteries in confined spaces. Make sure that there is adequate ventilation in order to prevent accidental explosion hazards as a result of the accumulation of gases released during charging operations.
- Always disconnect the batteries before performing any kind of servicing on the electrical system.

Hydraulic systems

- A liquid leaking from a tiny hole may be almost invisible but, at the same time, be powerful enough to penetrate the skin. Therefore, NEVER USE HANDS TO CHECK FOR LEAKS but use a piece of cardboard or wood for this purpose. If any liquid penetrates skin tissue, call for medical aid immediately. Failure to treat this condition with correct medical procedure may result in serious infection or dermatosis.
- In order to check the pressure in the system use suitable instruments.

Wheels and Tyres

- Make sure that the tyres are correctly inflated at the pressure specified by the manufacturer. Periodically check the rims and tyres for damage.
- Stand away from (at the side of) the tyre when checking inflation pressure.
- Do not use parts of recovered wheels as incorrect welding brazing or heating may weaken and eventually cause damage to the wheel.
- Never cut or weld a rim mounted with an inflated tyre.
- To remove the wheels, lock all wheels. After having raised the machine, position supports underneath, according to regulations in force.
- Deflate the tyre before removing any objects that may be jammed in the tyre tread.
- Never inflate tyres using inflammable gases, as this may result in explosions and injury to bystanders.

Removal and Re-fitting

- Lift and handle all heavy parts using suitable hoisting equipment. Make sure that parts are sustained by appropriate hooks and slings. Use the hoisting eyebolts for lifting operations. Extra care should be taken if persons are present near the load to be lifted.
- Handle all parts carefully. Do not put your hands or fingers between parts. Wear suitable safety clothing – safety goggles, gloves and shoes.
- Avoid twisting chains or metal cables. Always wear safety gloves when handling cables or chains.

<https://www.ebooklibonline.com>

Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

The full manual is available for immediate download.

<https://www.ebooklibonline.com>