Contents

INTRODUCTION

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INTRODUCTION

Basic instructions - How to use and navigate through this Manual

Technical information

This manual has been produced by a new technical information system. This new system is designed to deliver technical information electronically through Web delivery (eTim), DVD and in paper manuals. A coding system called SAP has been developed to link the technical information to other Product Support functions, e.g., Warranty.

Technical information is written to support the maintenance and service of the functions or systems on a customer's machine. When a customer has a concern on his machine it is usually because a function or system on his machine is not working at all, is not working efficiently, or is not responding correctly to his commands. When you refer to the technical information in this manual to resolve that customer's concern, you will find all the information classified using the SAP coding, according to the functions or systems on that machine. Once you have located the technical information for that function or system then you will find all the mechanical, electrical or hydraulic devices, components, assemblies and sub assemblies for that function or system. You will also find all the types of information that have been written for that function or system, the technical data (specifications), the functional data (how it works), the diagnostic data (fault codes and troubleshooting) and the service data (remove, install adjust, etc.).

By integrating SAP coding into technical information, you will be able to search and retrieve just the right piece of technical information you need to resolve that customer's concern on his machine. This is made possible by attaching 3 categories to each piece of technical information during the authoring process.

The first category is the Location, the second category is the Information Type and the third category is the Product:

- LOCATION - is the component or function on the machine, that the piece of technical information is going to describe e.g. Fuel tank.
- INFORMATION TYPE - is the piece of technical information that has been written for a particular component or function on the machine e.g. Capacity would be a type of Technical Data that would describe the amount of fuel held by the Fuel tank.
- PRODUCT - is the model for which the piece of technical information is written.

Every piece of technical information will have those 3 categories attached to it. You will be able to use any combination of those categories to find the right piece of technical information you need to resolve that customer's concern on his machine.

That information could be:

- the description of how to remove the cylinder head
- a table of specifications for a hydraulic pump
- a fault code
- a troubleshooting table
- a special tool

How to use this manual

This manual is divided into Sections. Each Section is then divided into Chapters. Contents pages are included at the beginning of the manual, then inside every Section and inside every Chapter. An alphabetical Index is included at the end of a Chapter. Page number references are included for every piece of technical information listed in the Chapter Contents or Chapter Index.

Each Chapter is divided into four Information types:

- Technical Data (specifications) for all the mechanical, electrical or hydraulic devices, components and, assemblies.
- Functional Data (how it works) for all the mechanical, electrical or hydraulic devices, components and assemblies.
- Diagnostic Data (fault codes, electrical and hydraulic troubleshooting) for all the mechanical, electrical or hydraulic devices, components and assemblies.
- Service Data (remove disassembly, assemble, install) for all the mechanical, electrical or hydraulic devices, components and assemblies.

Sections

Sections are grouped according to the main functions or a systems on the machine. Each Section is identified by a number 00, 35, 55, etc. The amount of Sections included in the manual will depend on the type and function of the machine that the manual is written for. Each Section has a Contents page listed in alphabetic/numeric order. This table illustrates which Sections could be included in a manual for a particular product.

	PRODUCT				
	Tractors				
		Vehicles with working arms: backhoes, excavators, skid steers, ….			
			Combines, forage harvesters, balers, ….		
				Seeding, planting, floating, spraying equipment, ….	
SECTION					Mounted equipment and tools, ….
00 - Maintenance					
05 - Machine completion and equipment					
10 - Engine					
14 - Main gearbox and drive					
18 - Clutch					
21 - Transmission					
23 - Four wheel drive system					
25 - Front axle system					
27 - Rear axle system					
29 - Hydrostatic drive					
31 - Implement power take-off					
33 - Brakes and controls					
35 - Hydraulic systems					
36 - Pneumatic system					
37 - Hitches, drawbars and implement couplings					
39 - Frames and ballasting					
41 - Steering					
44 - Wheels					
46 - Steering clutches					
48 - Tracks and track suspension					
50 - Cab climate control					
55 - Electrical systems					
56 - Grape harvester shaking					
58 - Attachments/headers					
60 - Product feeding					

61 - Metering system						
62 - Pressing - Bale formation						
63 - Chemical applicators						
64 - Chopping						
66 - Threshing						
68 - Tying/Wrapping/Twisting						
69 - Bale wagons						
70 - Ejection						
71 - Lubrication system						
72 - Separation						
73 - Residue handling						
74 - Cleaning						
75 - Soil preparation/Finishing						
76 - Secondary cleaning / Destemmer						
77 - Seeding						
78 - Spraying						
79 - Planting						
80 - Crop storage / Unloading						
82 - Front loader and bucket						
83 - Telescopic single arm						
84 - Booms, dippers and buckets						
86 - Dozer blade and arm						
88 - Accessories						
89 - Tools						
90 - Platform, cab, bodywork and decals						

Section contents

Section	Number	Description
Maintenance	00	
Machine completion and equipment	05	
Engine	10	
Main gearbox and drive	14	
Clutch	18	
Transmission	21	
Four wheel drive system	23	
Front axle system	25	
Rear axle system	27	
Hydrostatic drive	29	
Implement power take-off	31	
Brakes and controls	33	
Hydraulic systems	35	This Section covers the central parts of the hydraulic system. The components that are dedicated to a specific function are listed in the Chapter where all the technical information for that function is included.
Pneumatic system	36	This Section covers the pneumatic system. The components that are dedicated to a specific function are listed in the Chapter where all the technical information for that function is included.
Hitches, drawbars and implement couplings	37	
Frames and ballasting	39	
Steering	41	
Wheels	44	
Steering clutches	46	
Tracks and track suspension	48	
Cab climate control	50	
Electrical systems	55	The Section covers the central parts of the electrical, electronic, and lighting systems. The components that are dedicated to a specific function are listed in the Chapter where all the technical information for that function is included.
Grape harvester shaking	56	
Attachments/headers	58	
Product feeding	60	
Metering system	61	
Pressing - Bale formation	62	
Chemical applicators	63	
Chopping	64	
Threshing	66	
Tying/Wrapping/Twisting	68	
Bale wagons	69	
Ejection	70	
Lubrication system	71	
Separation	72	
Residue handling	73	
Cleaning	74	
Soil preparation/Finishing	75	
Secondary cleaning / Destemmer	76	
Seeding	77	
Spraying	78	
Planting	79	
Crop storage / Unloading	80	
Front loader and bucket	82	

Section	Number	Description
Telescopic single arm	83	
Booms, dippers and buckets	84	
Dozer blade and arm	86	
Accessories	88	
Tools	89	
Platform, cab, bodywork and decals	90	This Section covers all the main functions and systems related to the body of the machine, including the operators cab and the platform.

Chapters

Each Chapter is identified by a number e.g. Hydraulic Systems - Main check valve- 35.359. The first number is identical to the Section number i.e. Chapter 35.359 is inside Section 35, Hydraulic Systems. The second number is representative of the Chapter contained within the Section.
CONTENTS
The Chapter Contents lists all the technical data (specifications), functional data (how it works), service data (remove, install adjust, etc..) and diagnostic data (fault codes and troubleshooting) that have been written in that Chapter for that function or system on the machine.

Contents

HYDRAULIC SYSTEMS - 35
Main control valve - 359

FUNCTIONAL DATA

Main control valve - Sectional view (35.359 - C.10.A.30)

TECHNICAL DATA

Main control valve - General specifications (35.359 - D.40.A.10)

SERVICE

Main control valve - Remove (35.359 - F.10.A.10)

INDEX
The Chapter Index lists in alphabetical order all the types of information (called Information Units) that have been written in that Chapter for that function or system on the machine.

Information units and information search

Each chapter is composed of information units. Each information unit has a page reference within that Chapter. The information units provide a quick and easy way to find just the right piece of technical information you are looking for.

Example information unit	Main control valve - Sectional View (35.359)		
Information Unit SAP code	35		Hydraulic systems
SAP code classification		359	Main control valve

Page header and footer

The page header will contain the following references:

- Section and Chapter description

The page footer will contain the following references:

- Publication number for that Manual, Section or Chapter.
- Version reference for that publication.
- Publication date
- Section, chapter and page reference e.g.35.359 / 9

Advice

All repair and maintenance works listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given; and using, whenever appropriate, the special tools.

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

The manufacturer and all the organizations of it's distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages due to the anomalous behavior 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 behavior of parts and/or components not approved by the manufacturer.

The information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information may not be updated due to modifications of a technical or commercial type, as well as to suit the laws and regulations of different countries.

In case of questions, refer to your Sales and Service Networks.

Foreword

Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances required by advanced technology, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

NOTE: *The following are recommendations that may be of assistance:*

- Become acquainted with and ensure that you understand the relative legislation applicable to your country.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, antifreeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use, and dispose of these substances.
- Agricultural consultants will, in many cases, be able to help you as well.

Helpful hints

- Avoid filling tanks using cans or inappropriate pressurized fuel delivery systems that may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when draining off used engine coolant mixtures, engine, gearbox and hydraulic oils, brake fluids, etc. Do not mix drained brake fluids or fuels with lubricants. Store them safely until they can be disposed of in a proper way to comply with local legislation and available resources.
- Modern coolant mixtures, i.e. antifreeze and other additives, should be replaced every two years. They should not be allowed to get into the soil, but should be collected and disposed of properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your NEW HOLLAND AGRICULTURE dealer or air conditioning specialist has a special extractor for this purpose and will have to recharge the system properly.
- Repair any leaks or defects in the engine cooling or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding as penetrating weld splatter may burn a hole or weaken them, allowing the loss of oils, coolant, etc.

Safety rules

In case you start servicing the header attached to the forage harvester, first read the safety information in the Operator's Manual of your forage harvester.

⚠ WARNING

Avoid injury!
Shut off the engine, remove the key, and make sure all motion is stopped before servicing the machine.
Failure to comply could result in death or serious injury.

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Basic 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

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 combine or on any header attached to the combine.
   - 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 from the combine
   - never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress
4. Always disconnect the negative cable from the battery when charging the battery in the combine with a battery charger.

NOTICE: *If welding must be performed on the unit, either the combine or the header (if it is attached), the battery ground cable must be disconnected from the combine 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.

⚠ WARNING ⚠

Battery acid causes severe burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote - EXTERNAL: flush with water. INTERNAL: drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetables oil. Call physician immediately. EYES: flush with water for 15 minutes and get prompt medical attention.

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SPARE PARTS

Only use "CNH Original Parts" or " NEW HOLLAND AGRICULTURE 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 "CNH Original Parts" or " NEW HOLLAND AGRICULTURE 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 "Service Parts Catalogue", used for order processing

TOOLS

The tools that NEW HOLLAND AGRICULTURE suggests and illustrate in this manual have been:

- specifically researched and designed for use with NEW HOLLAND AGRICULTURE 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

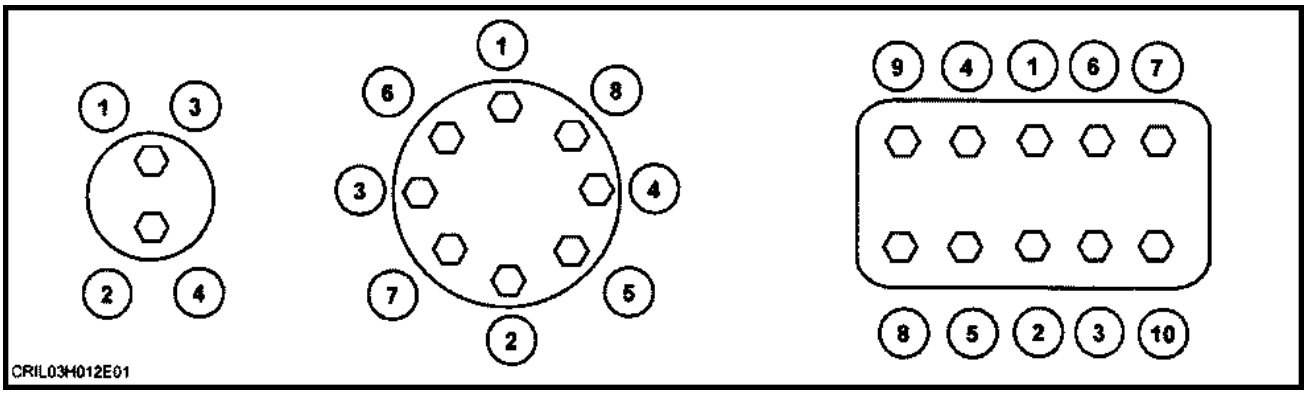
NOTE: *Wear limit values indicated for certain parts should be considered to be recommended, but not binding. The terms "front", "rear", "right-hand" and "left-hand" (when referred to different parts) are determined from the rear, facing in the direction of travel of the machine during operation.*

Torque

Minimum hardware tightening torques (in N m or lb in /lb ft) for normal assembly applications unless otherwise stated

NOTICE: *Shown below is the suggested initial torque tightening sequences for general applications, tighten in sequence from item 1 through to the last item of the hardware.*

The minimum hardware tightening torque on drawings, in specifications etc. have priority.
The applicable CNH Standard is ENS7001.



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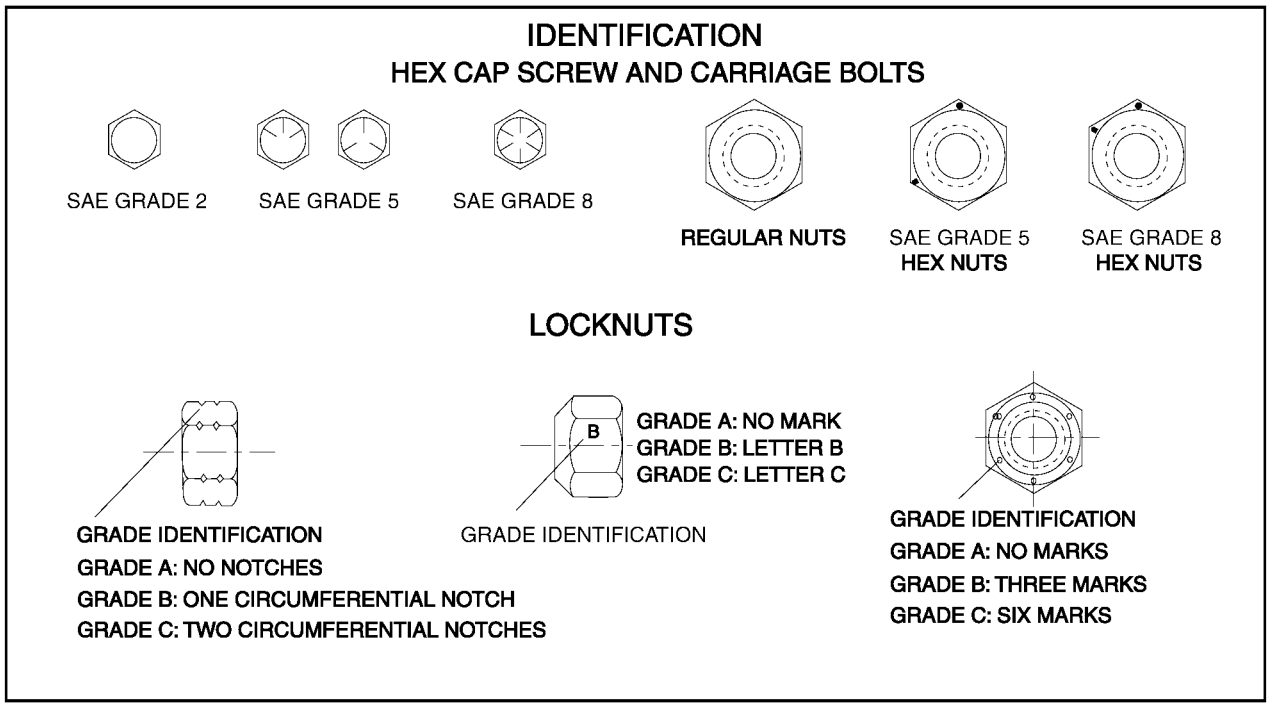
Metric hardware

	Class 8.8 in N m (lb in or lb ft)			Class 10.9 in N m (lb in or lb ft)		
Nominal Size	Plated nut	Lock nut	Hardened nut	Plated nut	Lock nut	Hardened nut
M3	1.3 N·m (11.5 lb in)	0.7 N·m (6.2 lb in)	1.2 N·m (10.6 lb in)	1.8 N·m (15.9 lb in)	0.9 N·m (8.0 lb in)	1.6 N·m (14.2 lb in)
M4	2.9 N·m (25.7 lb in)	1.6 N·m (14.2 lb in)	2.6 N·m (23.0 lb in)	4.2 N·m (37.2 lb in)	2.3 N·m (20.4 lb in)	3.7 N·m (32.7 lb in)
M5	5.9 N·m (52.2 lb in)	3.2 N·m (28.3 lb in)	5.3 N·m (46.9 lb in)	8.5 N·m (75.2 lb in)	4.6 N·m (40.7 lb in)	7.6 N·m (67.3 lb in)
M6	10.1 N·m (89.4 lb in)	5.5 N·m (48.7 lb in)	9.1 N·m (80.5 lb in)	14.5 N·m (10.7 lb ft)	7.9 N·m (69.9 lb in)	13 N·m (9.6 lb ft)
M8	24.5 N·m (18.1 lb ft)	13.5 N·m (10.0 lb ft)	22 N·m (16.2 lb ft)	35.1 N·m (25.9 lb ft)	19.3 N·m (14.2 lb ft)	31.5 N·m (23.2 lb ft)
M10	48.7 N·m (35.9 lb ft)	26.8 N·m (19.8 lb ft)	43.8 N·m (32.3 lb ft)	69.5 N·m (51.3 lb ft)	38.2 N·m (28.2 lb ft)	62.5 N·m (46.1 lb ft)
M12	85 N·m (62.7 lb ft)	46.7 N·m (34.4 lb ft)	76.5 N·m (56.4 lb ft)	121 N·m (89.2 lb ft)	66.5 N·m (49.0 lb ft)	108.9 N·m (80.3 lb ft)
M14	135 N·m (99.6 lb ft)	74.2 N·m (54.7 lb ft)	121.5 N·m (89.6 lb ft)	193 N·m (142.3 lb ft)	106.1 N·m (78.3 lb ft)	173.7 N·m (128.1 lb ft)
M16	210 N·m (154.9 lb ft)	115.5 N·m (85.2 lb ft)	189 N·m (139.4 lb ft)	301 N·m (222 lb ft)	165.5 N·m (122.1 lb ft)	270.9 N·m (199.8 lb ft)
M18	299 N·m (220.5 lb ft)	164.4 N·m (121.3 lb ft)	269.1 N·m (198.5 lb ft)	414 N·m (305.4 lb ft)	227.7 N·m (167.9 lb ft)	372.6 N·m (274.8 lb ft)
M20	425 N·m (313.5 lb ft)	233.72 N·m (172.4 lb ft)	382.5 N·m (282.1 lb ft)	587 N·m (432.9 lb ft)	322.8 N·m (238.1 lb ft)	528.3 N·m (389.7 lb ft)
M22	579 N·m (427 lb ft)	318.4 N·m (234.8 lb ft)	521.1 N·m (384.3 lb ft)	801 N·m (590.8 lb ft)	440.5 N·m (324.9 lb ft)	720.9 N·m (531.7 lb ft)
M24	735 N·m (542.1 lb ft)	404.2 N·m (298.1 lb ft)	661.5 N·m (487.9 lb ft)	1016 N·m (749.4 lb ft)	558.8 N·m (412.1 lb ft)	914.4 N·m (674.4 lb ft)
M27	1073 N·m (791.4 lb ft)	590.1 N·m (435.2 lb ft)	967.5 N·m (713.6 lb ft)	1486 N·m (1096 lb ft)	817.3 N·m (602.8 lb ft)	1337 N·m (986.1 lb ft)
M30	1461 N·m (1077.6 lb ft)	803.5 N·m (592.6 lb ft)	1315 N·m (969.9 lb ft)	2020 N·m (1489.9 lb ft)	1111 N·m (819.4 lb ft)	1818 N·m (1340.9 lb ft)



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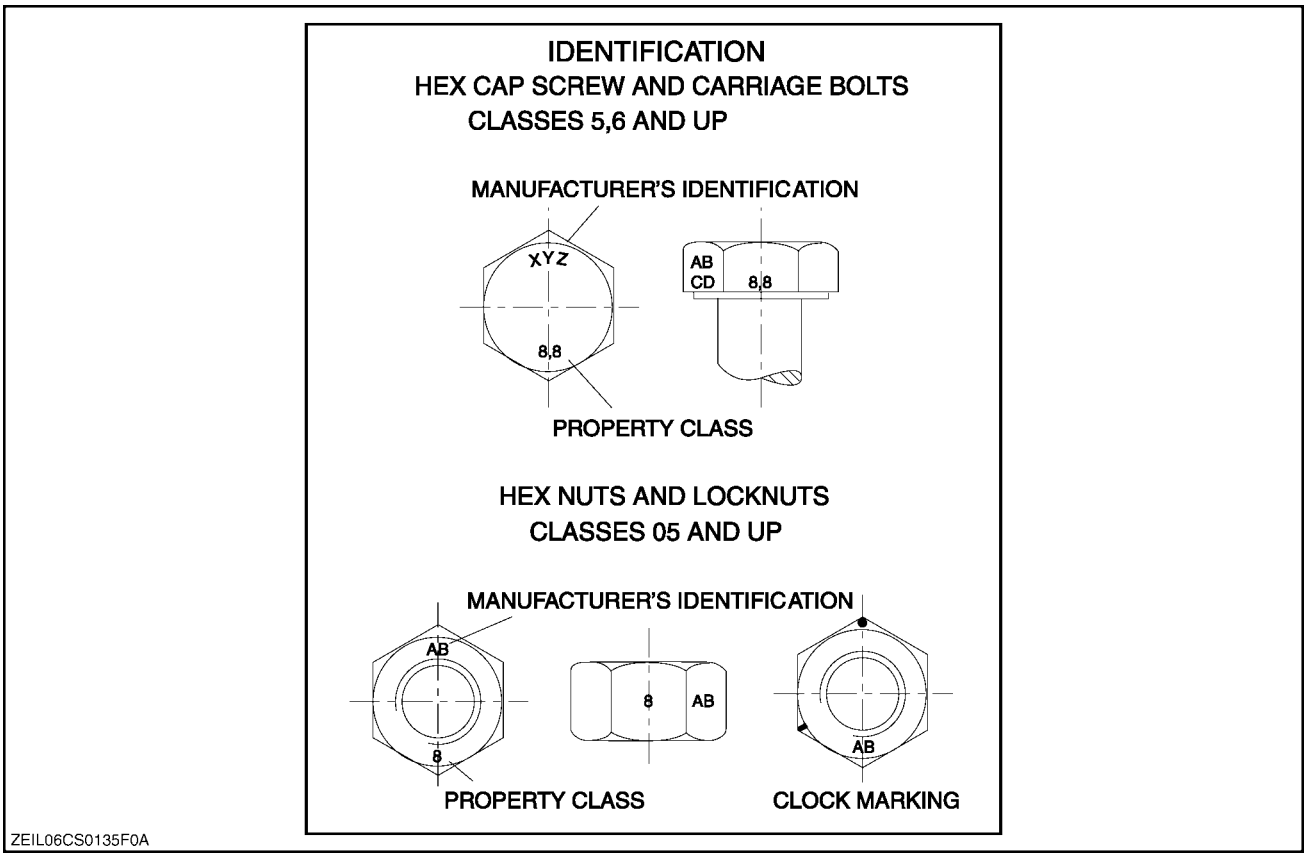

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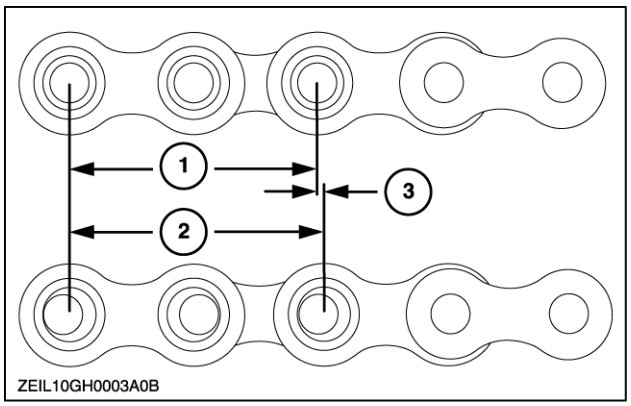
Basic instructions - Chain Wear Tables - Roller Chains

Chain Wear

The individual joints in a roller chain articulate as they enter and leave the sprockets. This articulation results in wear on the pins and bushings. A material is worn away from these surfaces the chain will gradually elongate.



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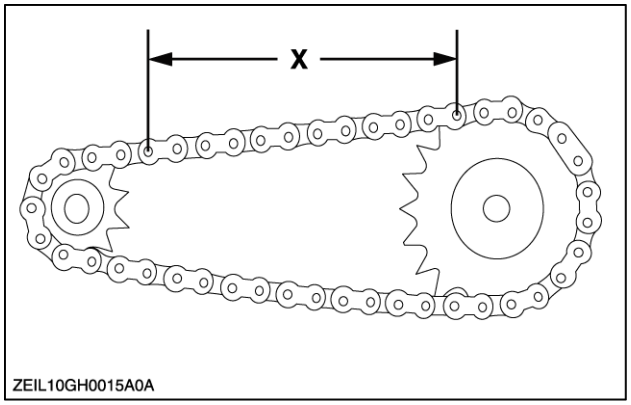
Chains do not "stretch" - material is removed from pin and bushing.

(1): 2x pitch
(2): 2x pitch + wear
(3): elongation due to pin and bushing wear.

Elongation is normal and may be minimized by proper lubrication and drive maintenance. The rate of wear is dependent upon: the relationship between the load and the amount of bearing area between pin and bushing, the material and surface condition of the bearing surfaces, the adequacy of lubrication and the frequency and degree of articulation between pins and bushings.
The latter is determined by the quantity of sprockets in the drive, their speeds, the number of teeth and the length of the chain in pitches.



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Measurement of Chain For Wear Elongation

Relatively accurate wear measurements can be made by using the above illustration. Measure as closely as possible from the center of one pin to the center of another. The more pitches (pins) contained within the measurement increase the accuracy. If the measured value exceeds the nominal by more than the allowable percentage the chain should be replaced.
The maximum allowable wear elongation is approximately **3 %** for most industrial applications, based upon sprocket design. The allowable chain wear in percent can be calculated using the relationship: 200/ **(N)**, where **(N)** is the number of teeth in the large sprocket.
This relationship is often useful since the normal maximum allowable chain wear elongation of **3 %** is valid only up to 67 teeth in the large sprocket. In drives having fixed center distances, chains running in parallel or where smoother operation is required, wear should be limited to approximately **1.5 %**.

For example, if 40 pitches (40 pins) of a #40 chain were measured and the result was **523 mm** (**20.6 in**) or greater (using **3 %** as the maximum allowable wear), the chain should be replaced. Anything less than **523 mm** (**20.6 in**) would still be acceptable by most industrial standards.

WEAR LIMITS ON ROLLER CHAIN

Strand Length in Pitches	No. 40 Chain (08A)		No. 50 Chain (10A)		No. 60 Chain (12A)		No. 80 Chain (16A)	
	New	Replace	New	Replace	New	Replace	New	Replace
40P	508 mm (20.0 in)	523 mm (20.6 in)	635 mm (25.0 in)	654 mm (25.7 in)	762 mm (30.0 in)	787 mm (31.0 in)	1016 mm (40.0 in)	1047 mm (41.2 in)
50P	635 mm (25.0 in)	654 mm (25.7 in)	793 mm (31.2 in)	817 mm (32.2 in)	952 mm (37.5 in)	981 mm (38.6 in)	1270 mm (50.0 in)	1308 mm (51.5 in)
60P	762 mm (30.0 in)	784 mm (30.9 in)	952 mm (37.5 in)	981 mm (38.6 in)	1143 mm (45.0 in)	1177 mm (46.3 in)	1524 mm (60.0 in)	1568 mm (61.7 in)
70P	889 mm (35.0 in)	914 mm (36.0 in)	1111 mm (43.7 in)	1144 mm (45.0 in)	1333 mm (52.5 in)	1371 mm (54.0 in)	1778 mm (70.0 in)	1828 mm (72.0 in)
80P	1016 mm (40.0 in)	1047 mm (41.2 in)	1270 mm (50.0 in)	1308 mm (51.5 in)	1524 mm (60.0 in)	1568 mm (61.7 in)	2032 mm (80.0 in)	2095 mm (82.5 in)
90P	1143 mm (45.0 in)	1177 mm (46.3 in)	1428 mm (56.2 in)	1473 mm (58.0 in)	1714 mm (67.5 in)	1765 mm (69.5 in)	2286 mm (90.0 in)	2355 mm (92.7 in)
100P	1270 mm (50.0 in)	1308 mm (51.5 in)	1578 mm (62.1 in)	1635 mm (64.4 in)	1905 mm (75.0 in)	1962 mm (77.2 in)	2540 mm (100.0 in)	2616 mm (103.0 in)

STANDARD ROLLER CHAIN SIZES - NEW CHAINS

Chain No.	150 Chain No.	Pitch	Width	Roller Diameter
40	08A	12.7 mm (0.5 in)	7.9 mm (0.3 in)	7.9 mm (0.3 in)
50	10A	15.8 mm (0.6 in)	9.5 mm (0.4 in)	10.1 mm (0.4 in)
60	12A	19 mm (0.7 in)	12.7 mm (0.5 in)	11.9 mm (0.5 in)
80	16A	25.4 mm (1.0 in)	15.8 mm (0.6 in)	15.8 mm (0.6 in)
100	20A	31.7 mm (1.2 in)	19 mm (0.7 in)	19 mm (0.7 in)
120	24A	38.1 mm (1.5 in)	25.4 mm (1.0 in)	22.2 mm (0.9 in)
140	28A	44.4 mm (1.7 in)	25.4 mm (1.0 in)	25.4 mm (1.0 in)
160	32A	50.8 mm (2.0 in)	31.7 mm (1.2 in)	28.5 mm (1.1 in)
180	*	57.1 mm (2.2 in)	35.7 mm (1.4 in)	35.7 mm (1.4 in)
200	40A	63.4 mm (2.5 in)	38.1 mm (1.5 in)	39.6 mm (1.6 in)

* No. 150 Number does not exist.

Conversion factors

Length

1 mm	=	0.0393 in	1 in	=	25.4 mm
1 km	=	0.621 miles	1 miles	=	1.609 km
1 m	=	3.281 ft	1 ft	=	0.3048 m

Area

1 ha	=	2.471 ac	1 ac	=	0.404 US fl oz
1 m²	=	10.76 ft²	1 ft²	=	0.0923 m²

Volume

1 litre	=	0.26 US gal	1 US gal	=	3.78 litre
1 litre	=	0.0.28 Bu	1 Bu		35.23 litre
1 litre	=	1.057 US quart	1 US quart	=	0.9464 litre
1 cm³ (cc)	=	0.061 in³	1 in³	=	16.38 cm³ (cc)
1 m³	=	35.31 ft³	1 ft³	=	0.028 m³
1 ml	=	0.033 US fl oz	1 US fl oz	=	29.57 ml

Mass

1 kg	=	2.204 lb	1 lb	=	0.4536 kg

Torque

1 N·m	=	0.7376 lb ft	1 lb ft	=	1.3558 N·m

Power

1 kW	=	1.358 Hp	1 Hp	=	0.746 kW

Pressure

1 bar	=	100 kPa			
1 bar	=	14.505 psi	1 psi	=	0.06894 bar

Temperature

1 °C	=	((1.8 x ° C) + 32) °F	1 °F	=	(0.56 x (° F - 32)) °C

Flow

1 l/min	=	0.2642 US gpm	1 US gpm	=	3.7853 l/min

Speed

1 km/h	=	0.62 mph	1 mph	=	1.6 km/h

Product identification

Explanation of attachment serial number

Example : n° **44E117520**.

44E117520: The first two digits identify the model.

- **44**: 440FI Plus
- **47**: 470FI Plus
- **49**: 490FI Plus

44 **E**117520: The third digit indicates the region.

- **E**: Europe
- **A**: North America

44E **117520**: Serial number of this model.

Hydraulic systems - 35

Flip-up header - 660

440 FI Plus
470 FI Plus
490 FI Plus

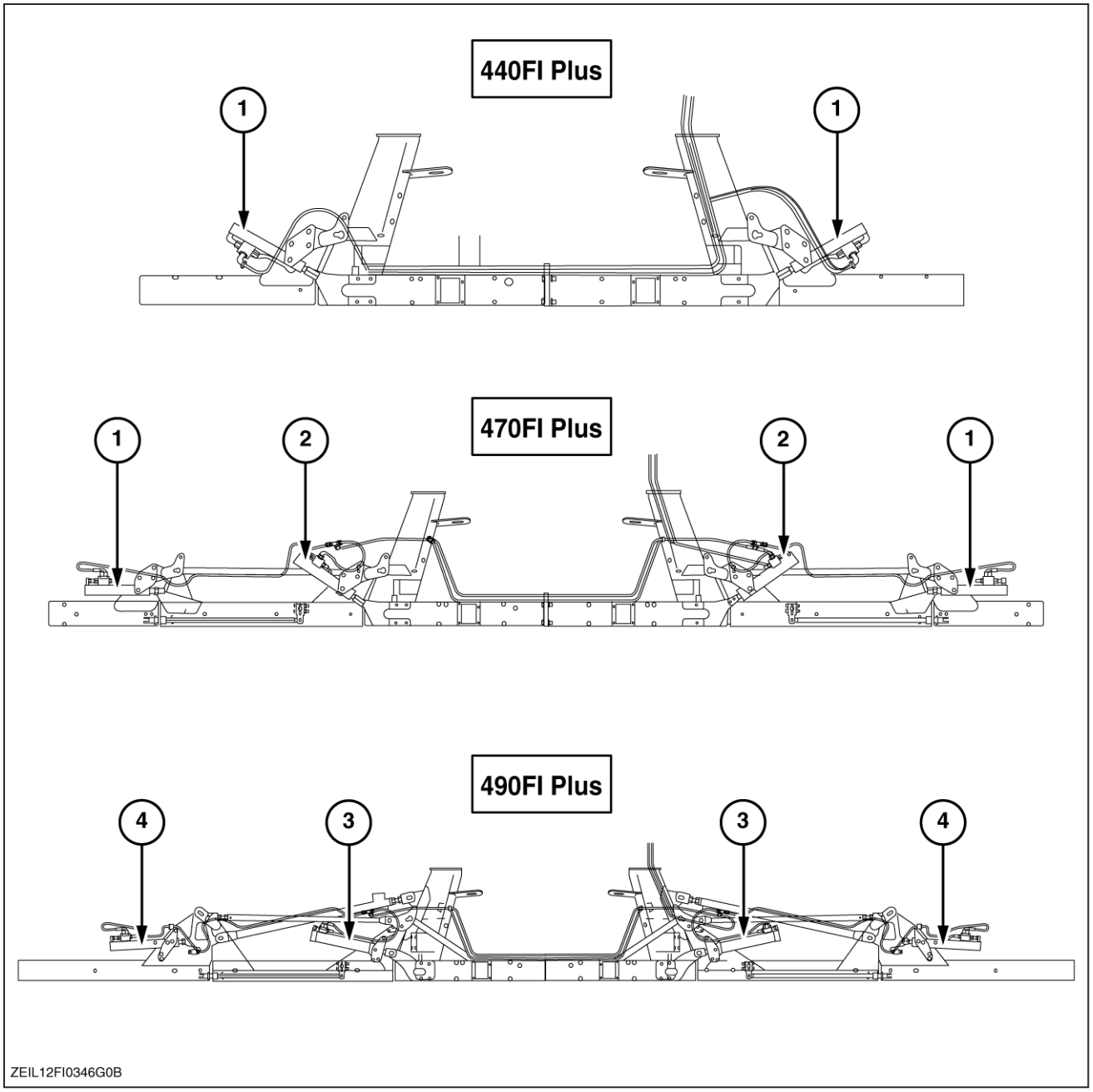
Contents

Hydraulic systems - 35

Flip-up header - 660

Flip-up header cylinder Open/Close cylinder - Overview

1. Hydraulic cylinder - type 1
2. Hydraulic cylinder - type 2
3. Hydraulic cylinder - type 3
4. Hydraulic cylinder - type 4



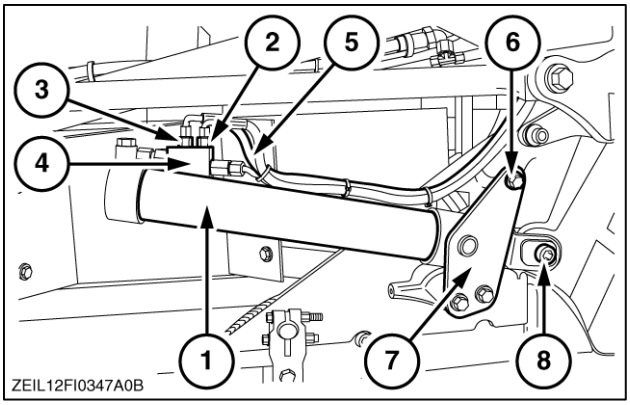
ZEIL12FI0346G0B 1

Flip-up header cylinder Open/Close cylinder - Remove

ATTENTION: *This component has a safety function. Do not attempt to repair it unless you are totally familiar with it. Only use new genuine parts.*

NOTICE: *Before removing the hydraulic cylinder* ***(1)****, unfold the outer sections and relieve hydraulic pressure in the system. Mark the fittings* ***(2)*** *and* ***(3)*** *and their relevant hoses. The fitting* ***(3)*** *includes a* ***1 mm*** *(****0.04 in****) orifice. Always make sure that the orifice is located in the fitting* ***(3)*** *of the check valve* ***(4)****.*

1. Disconnect the hoses **(5)** from the fittings **(2)** and **(3)**.
2. Remove the bolts **(6)** and then the plate **(7)**.
3. Remove the pin **(8)**.
4. Remove the hydraulic cylinder **(1)**.
5. If necessary, overhaul the hydraulic cylinder **(1)**. Refer to **Flip-up header cylinder Open/Close cylinder - Overhaul (35.660)**.



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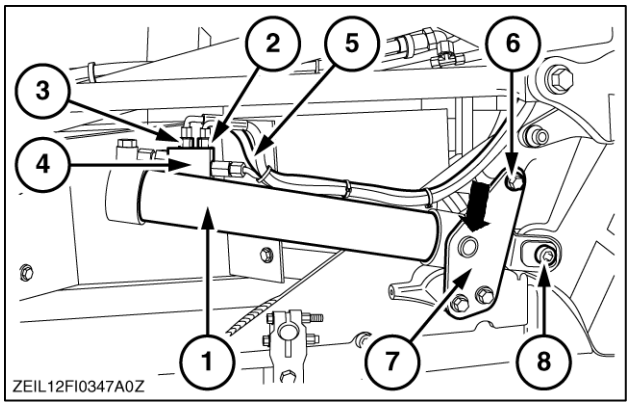
Flip-up header cylinder Open/Close cylinder - Install

1. Install the hydraulic cylinder **(1)** with the pin **(8)**.
2. Apply grease to the pin **(8)** and to the pivot point (see arrow).
3. Install the plate **(7)** with the bolts **(6)**.
4. Connect the hoses **(5)** to the fittings **(2)** and **(3)**.



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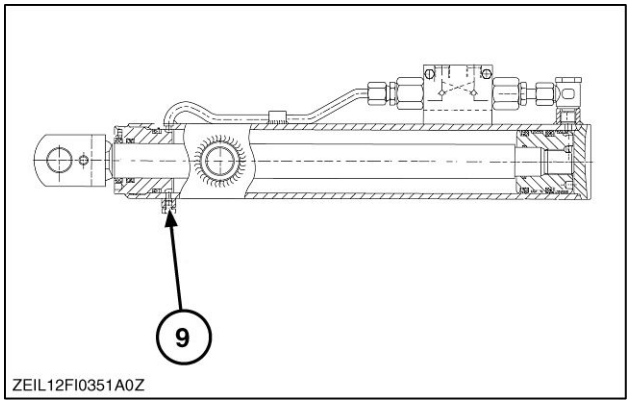
For hydraulic cylinder type 1, 2 and 4

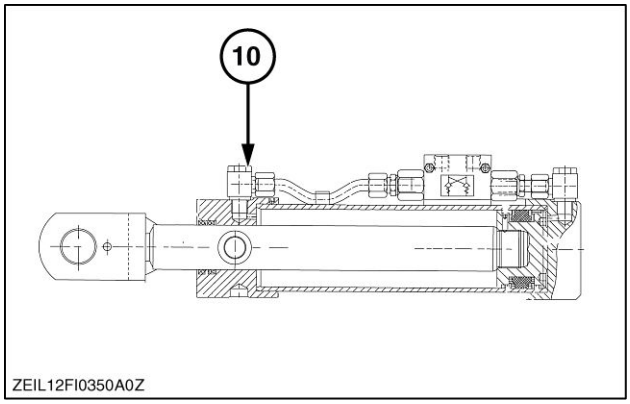
5. Bleed the air from the hydraulic cylinder at the bleed plug **(9)**. Continue to bleed air until there is no air in the oil circuit. Use a suitable container to catch the oil.



ZEIL12FI0351A0Z 2

For hydraulic cylinder type 3

6. Bleed the air from the hydraulic cylinder at the fitting **(10)**. Continue to bleed air until there is no air in the oil circuit. Use a suitable container to catch the oil.



ZEIL12FI0350A0Z 3

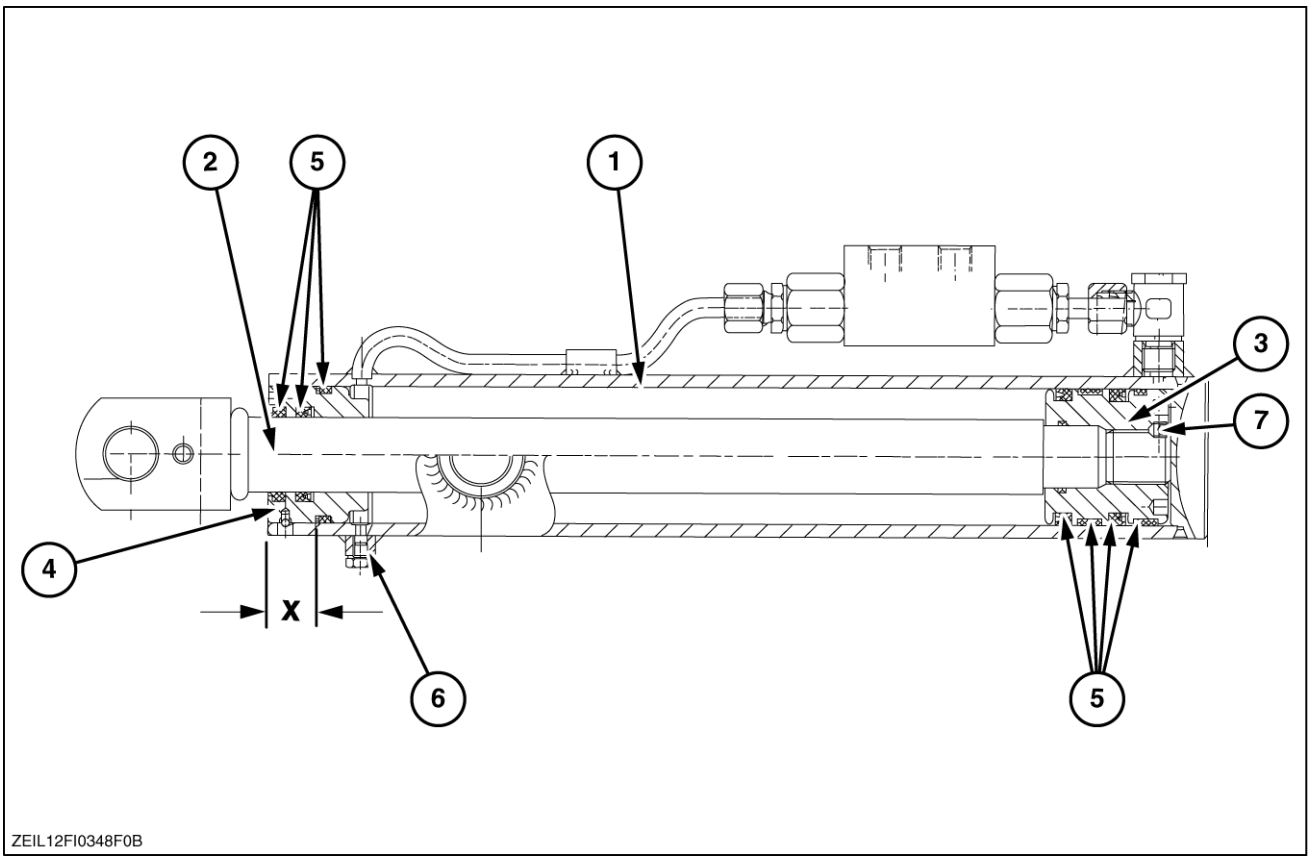
Flip-up header cylinder Open/Close cylinder - Overhaul

ATTENTION: *This component has a safety function. Do not attempt to repair it unless you are totally familiar with it. Only use new genuine parts.*

Hydraulic cylinder - type 1

NOTE: *Do not clamp the cylinder housing **(1)** in a vice to remove the cylinder head **(4)**.*

Remove the cylinder head **(4)**, then pull out the piston rod **(2)** together with the piston **(3)**.



ZEIL12FI0348F0B 1

Check the hydraulic cylinder

- Remove and discard the old gaskets **(5)**. Clean part thoroughly.
- Inspect the inside of the cylinder housing **(1)** for wear or damage.
- Inspect the piston rod **(2)** for wear or damage.
- Inspect the orifice for dirt.
- Always use a new gasket **(5)** for assembling.
- Apply **LOCTITE® 638** onto the thread on the piston rod **(2)**. Coat the area **(X)** of cylinder head **(4)** with **LOCTITE® 8150™**.
- Secure the piston **(3)** with the bolt **(7)**.