

# REPAIR MANUAL

**NEW HOLLAND**

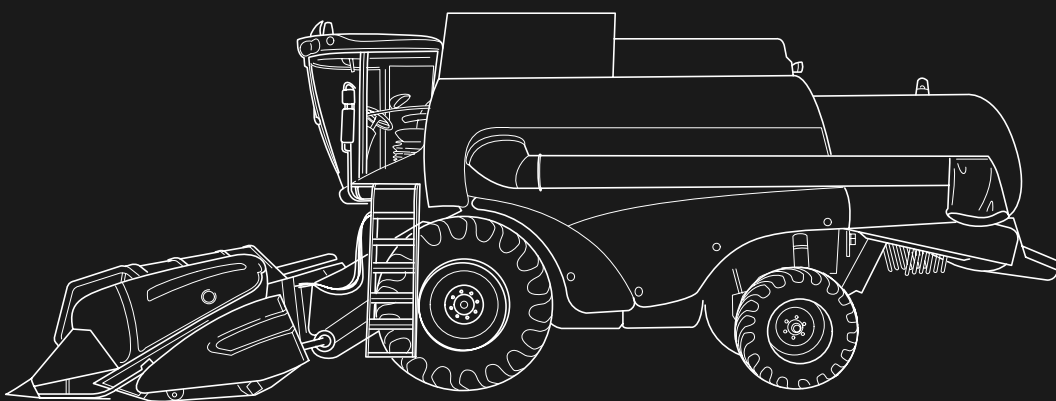
**CS520**

**CS540**

**CS640**

**CS660**

**CL560**

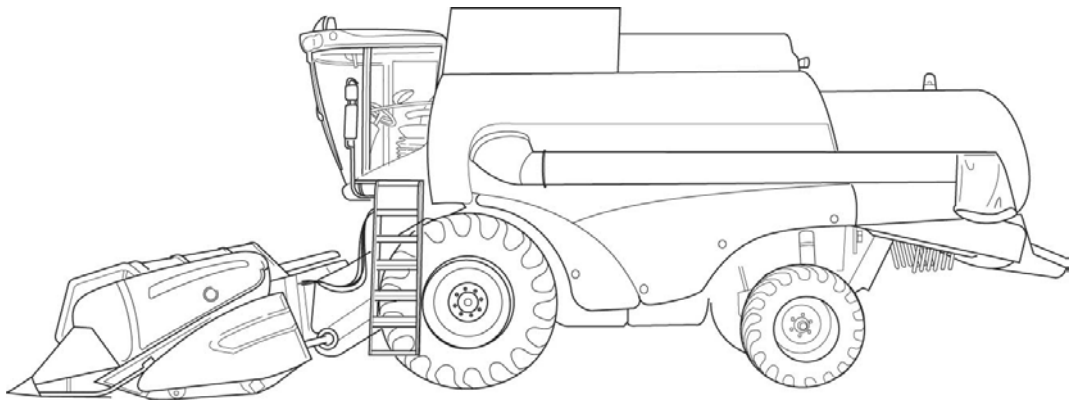


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## **REPAIR MANUAL**



**CL560**  
**CS520**  
**CS540**  
**CS640**  
**CS660**

# Contents

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# **INTRODUCTION**

## Foreword ( - A.10.A.40)

CS540, CS640, CS520, CS660, CL560

### Technical Information

This manual has been produced by a new technical information system. This new system is designed to deliver technical information electronically through CDROM and in paper manuals. A coding system called ICE 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 customers 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 customers concern, you will find all the information classified using the new ICE 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 this new ICE coding into technical information , you will be able to search and retrieve just the right piece of technical information you need to resolve that customers 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 that the piece of technical information is written for.

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 customers 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 letter A, B, C 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	SECTION										
	A - Distribution Systems										
	B - Power Production										
	C - Power Train										
	D - Travelling										
	E - Body and Structure										
	F - Frame Positioning										
	G - Tool Positioning										
	H - Working Arm										
	J - Tools and Couplers										
	K - Crop Processing										
L - Field Processing											
Tractors	X	X	X	X	X	X		X	X		
Vehicles with working arms: backhoes, excavators, skid steers, .....	X	X	X	X	X	X	X	X	X		
Combines, forage harvesters, balers, .....	X	X	X	X	X	X	X	X	X	X	
Seeding, planting, floating, spraying equipment, .....	X	X	X	X	X	X	X		X		X
Mounted equipment and tools, .....					X	X	X		X		

This manual contains these Sections. The contents of each Section are explained over the following pages.

**Contents**

INTRODUCTION	
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**Section Contents**

**SECTION A, DISTRIBUTION SYSTEMS**

This Section covers the main systems that interact with most of the functions of the product. It includes the central parts of the hydraulic, electrical, electronic, pneumatic, lighting and grease lubrication 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.

**SECTION B, POWER PRODUCTION**

This Section covers all the functions related to the production of power to move the machine and to drive various devices.

**SECTION C, POWER TRAIN**

This Section covers all the functions related to the transmission of power from the engine to the axles and to internal or external devices and additional Process Drive functions.

**SECTION D, TRAVELLING**

This Section covers all the functions related to moving the machine, including tracks, wheels, steering and braking. It covers all the axles both driven axles and non-driven axles, including any axle suspension.

**SECTION E, BODY AND STRUCTURE**

This Section covers all the main functions and systems related to the structure and body of the machine. Including the frame, the shields, the operator's cab and the platform.

**SECTION G, TOOL POSITIONING**

This Section covers all the functions related to the final and/or automatic positioning of the tool once the tool is positioned using the Working Arm or the machine frame.

**SECTION K, CROP PROCESSING**

This Section covers all the functions related to crop processing.

## Chapters

Each Chapter is identified by a letter and number combination e.g. Engine B.10.A The first letter is identical to the Section letter i.e. Chapter B.10 is inside Section B, Power Production.

### 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

POWER PRODUCTION  
ENGINE \_ 10.A

TECHNICAL DATA

ENGINE - General specification (B.10.A - D.40.A.10)

CS540

FUNCTIONAL DATA

ENGINE - Dynamic description (B.10.A - C.30.A.10)

CS540

SERVICE

ENGINE - Remove (B.10.A - F.10.A.10)

CS540

DIAGNOSTIC

ENGINE - Troubleshooting (B.10.A - G.40.A.10)

CS540

### 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.

### Index

POWER PRODUCTION - B  
ENGINE

ENGINE - Dynamic description (B.10.A - C.30.A.10)

CS540

ENGINE - General specification (B.10.A - D.40.A.10)

CS540

ENGINE - Remove (B.10.A - F.10.A.10)

CS540

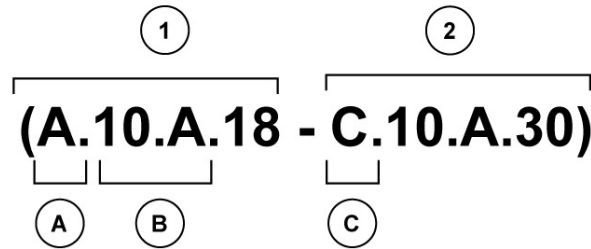
ENGINE - Troubleshooting (B.10.A - G.40.A.10)

CS540

## Information Units and Information Search

Each chapter is composed of information units. Each information unit has the ICE code shown in parentheses which indicates the function and the type of information written in that information unit. 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	Stack valve - Sectional View (A.10.A.18 - C.10.A.30)				
Information Unit ICE code	A	10.A	18	C	10.A.30
ICE code classification	Distribution systems	Primary hydraulic power	Stack valve	Functional data	Sectional view



CRIL03J033E01 1

Navigate to the correct information unit you are searching for by identifying the function and information type from the ICE code.

- **(1)** Function and **(2)** Information type.
- **(A)** corresponds to the sections of the repair manual.  
**(B)** corresponds to the chapters of the repair manual.  
**(C)** corresponds to the type of information listed in the chapter contents, Technical data, Functional Data, Diagnostic or Service.  
**(A)** and **(B)** are also shown in the page numbering on the page footer.  
THE REST OF THE CODING IS NOT LISTED IN ALPHANUMERIC ORDER IN THIS MANUAL.
- You will find a table of contents at the beginning and end of each section and chapter.  
You will find an alphabetical index at the end of each chapter.
- By referring to **(A)**, **(B)** and **(C)** of the coding, you can follow the contents or index (page numbers) and quickly find the information you are looking for.

### Page Header and Footer

The page header will contain the following references:

- Section and Chapter description

The page footer will contain the following references:

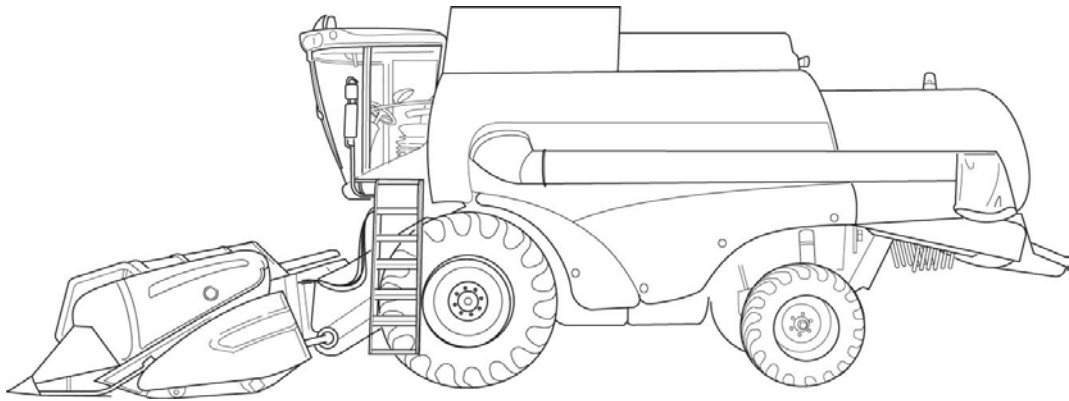
- Publication number for that Manual, Section or Chapter.
- Version reference for that publication.
- Publication date
- Section, chapter and page reference e.g. A.10.A / 9



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## **REPAIR MANUAL**

### **DISTRIBUTION SYSTEMS**



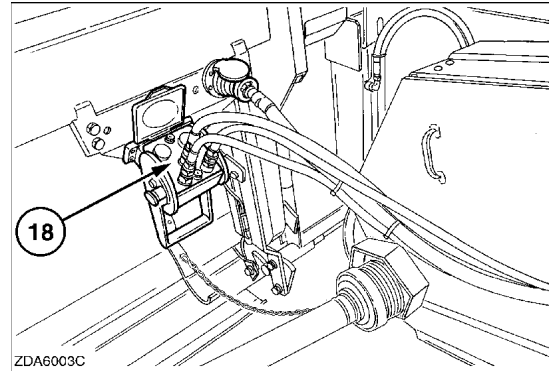
**CL560**  
**CS520**  
**CS540**  
**CS640**  
**CS660**

## PRIMARY HYDRAULIC POWER SYSTEM - Component localisation (A.10.A - C.40.B.20)

CS540, CS640, CS520, CS660, CL560

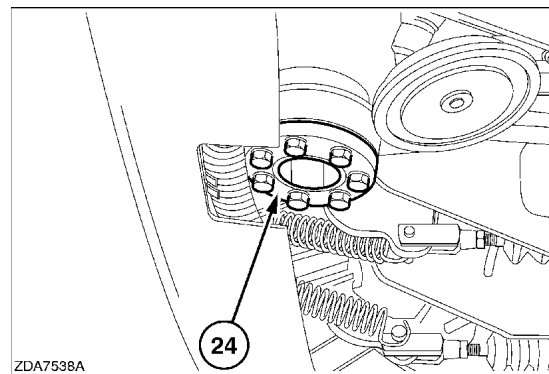
**NOTE:** To find the location of those components, refer to **PRIMARY HYDRAULIC POWER SYSTEM - Overview (A.10.A - C.40.B.10)**

Header quick-release coupler **(18)** (or screw couplers)



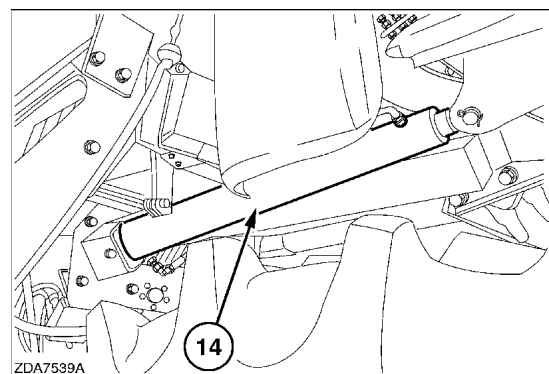
ZDA6003C 1

Steering valve **(24)**



ZDA7538A 2

Unload tube cylinder **(14)**

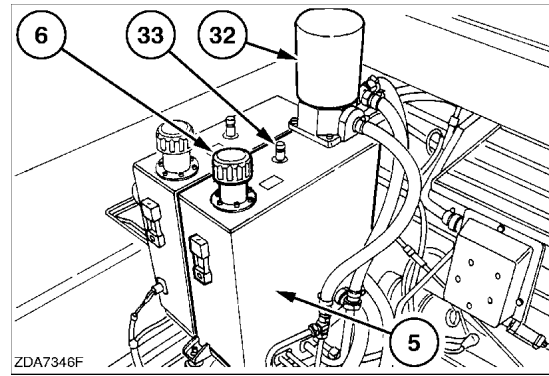


ZDA7539A 3

## DISTRIBUTION SYSTEMS - PRIMARY HYDRAULIC POWER SYSTEM

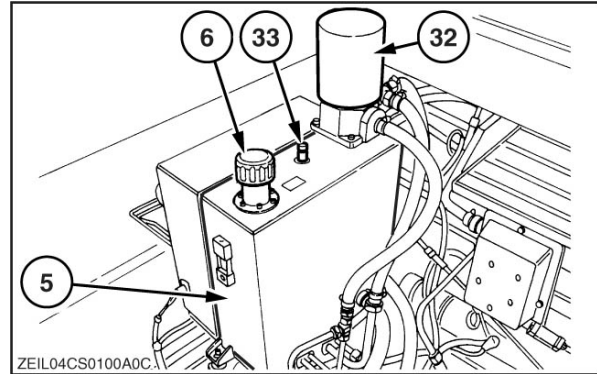
From series 1320 to 1360:

- Oil reservoir (5)
- Filler cap with filter (6)
- Breather with filter and non-return valve (33)
- Low pressure filter (32)

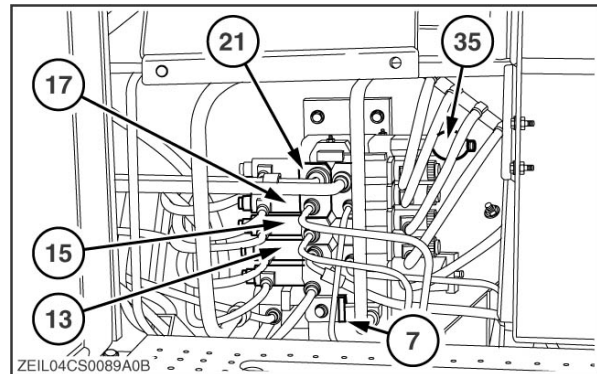


From series 1364 onwards:

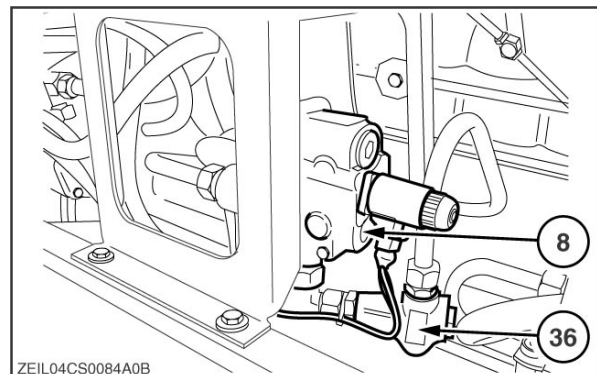
- Oil reservoir (5)
- Filler cap with filter (6)
- Breather with filter and non-return valve (33)
- Low pressure filter (32)



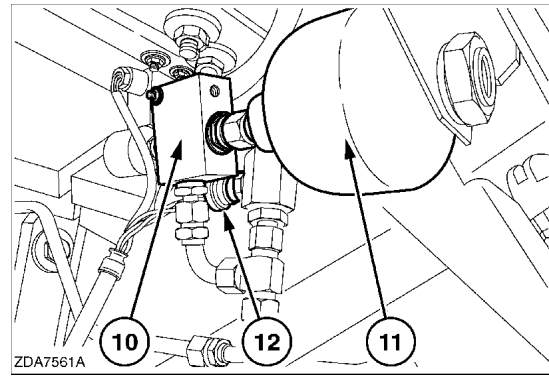
- Load sensing valve (7)
- Unloading tube control valve (13)
- Reel vertical adjustment valve (15)
- Reel horizontal adjustment valve (17)
- Header and straw elevator reversing motor (21)
- Accumulator (35)



- Header height control valve (8)
- High pressure relief valve (36)

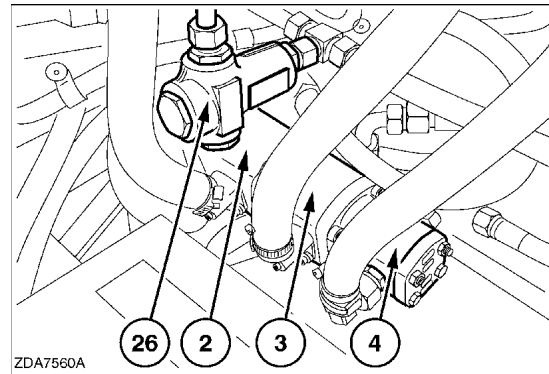


- Accumulator control valve (10)
- Header suspension accumulator (11)
- Pressure sensor (12)



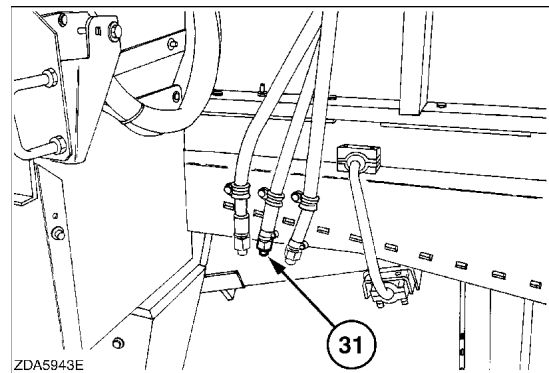
ZDA7561A 8

- Main hydraulic pump (2)
- Pump (3) (Steering circuit)
- Pump (4) (Lateral flotation)
- High pressure relief valve (26)



ZDA7560A 9

- Drain hose (31)



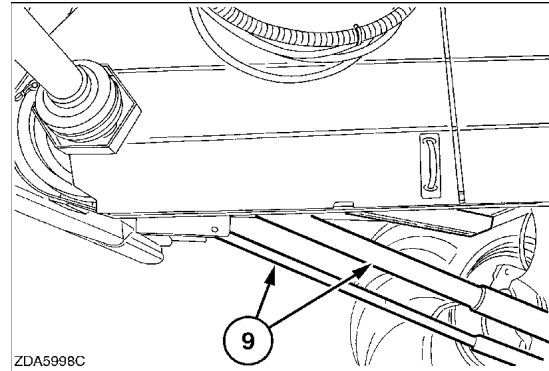
ZDA5943E 10

## PRIMARY HYDRAULIC POWER SYSTEM - Component localisation (A.10.A - C.40.B.20)

CS540, CS640, CS520, CS660

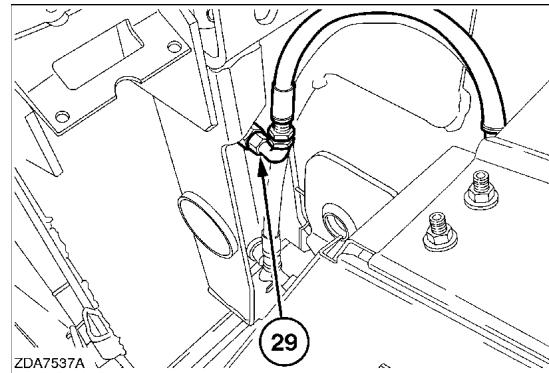
**NOTE:** To find the location of those components, refer to **PRIMARY HYDRAULIC POWER SYSTEM - Overview (A.10.A - C.40.B.10)**

Header lift cylinders (**9**)



ZDA5998C 1

Lateral float cylinder (**29**) (If lateral float installed)

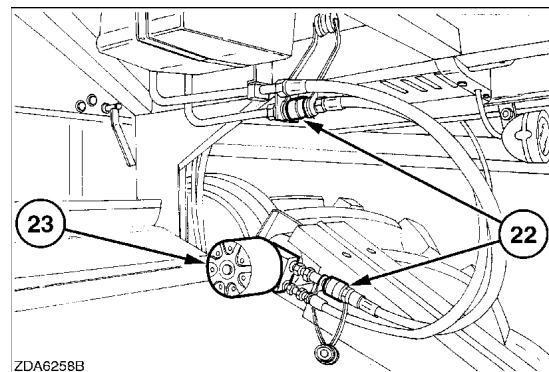


ZDA7537A 2

(If hydraulic reverser)

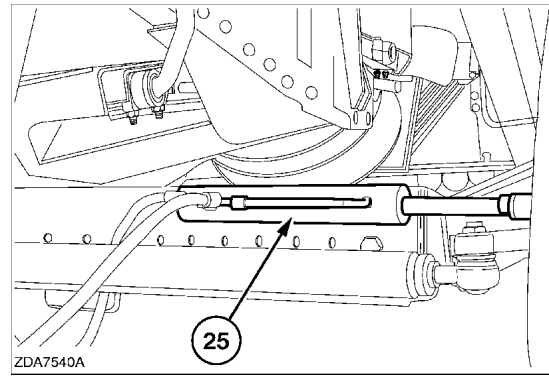
Screw couplers with non return valve (**22**)

Header and straw elevator reversing motor (**23**)



ZDA6258B 3

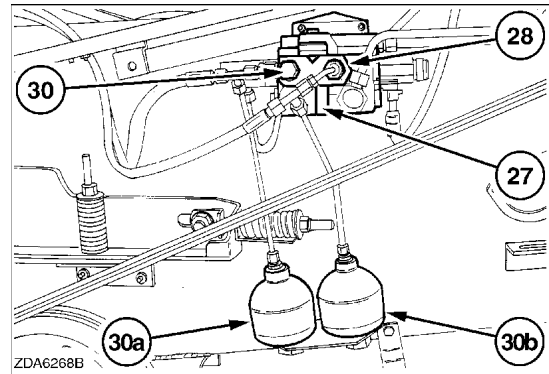
Steering cylinder(s) (25)



ZDA7540A

ZDA7540A 4

- Load sensing valve (27)
- Lateral flotation control valve (28)
- Lateral float minimum pressure valve (60 bar) (30)
- Lateral float accumulator (120 bar) (30a)
- Lateral float accumulator (85 bar) (30b)



ZDA6268B

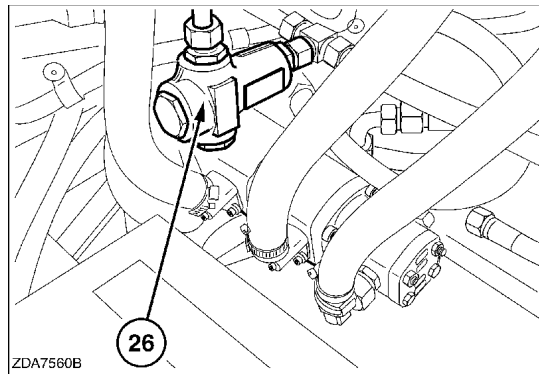
ZDA6268B 5

## Relief valve - Static description (A.10.A.16 - C.30.A.20)

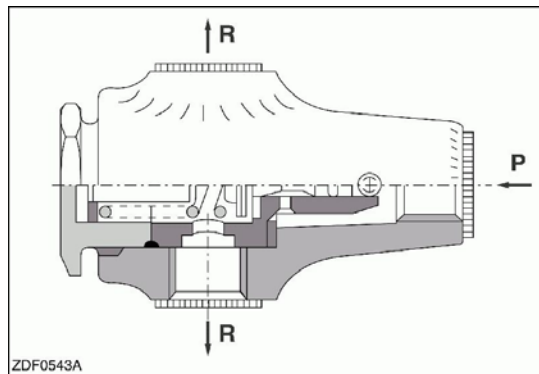
CS540, CS640, CS520, CS660, CL560

The high pressure relief valve is situated above the hydraulic triple pump.

- The high pressure relief valve (**26**), set at **180 bar (2611 psi)**, protects the header height and main control hydraulics.
- A relief valve incorporated in the main control valves has no function in our hydraulic system. Therefore, this relief valve is set at **175 bar (2538 psi)** to avoid interference.



ZDA7560B 1



ZDF0543A 2



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## Stack valve - Dynamic description (A.10.A.18 - C.30.A.10)

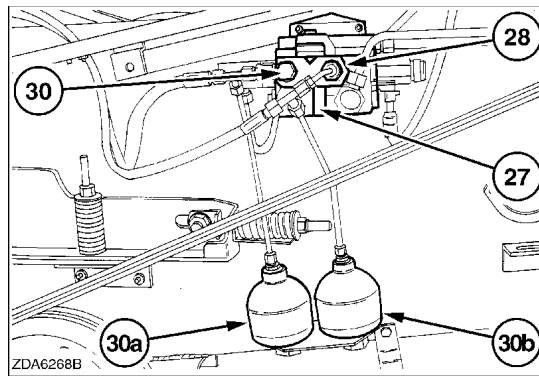
CS540, CS640, CS520, CS660, CL560

If all valves are in the "0" position, then:

The valves (13), (15), (17), (21) and (28), (Refer to **Stack valve - Static description (A.10.A.18 - C.30.A.20)**) are closed, which means that the oil can not flow through these valves.

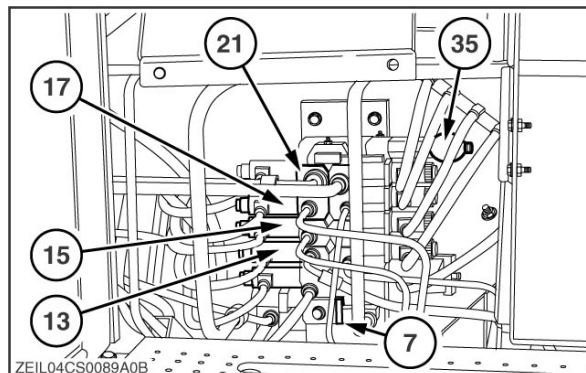
The pressure raises at (7b), (27b), until the load sensing spool is pushed open against spring pressure (delta P=3 bar) and the return pressure in the pilot line (7a), (27a). Now pump oil flows into the return line at standby pressure. When activating one or more of the control spools, the hydraulic cylinder pressure (pump pressure measured after the spool restriction) is present in the pilot line (7a), (27a) and closes the load sensing spool. The pressure oil is available for the activated control spool(s).

When the pump pressure reaches the cylinder pressure (+3 bar), the load sensing spool is pushed partially open. The necessary amount of oil will flow to the control spool at the needed pressure. Excess oil is dumped into the return line.



ZDA6268B\_55 1

When the cylinder reaches end of stroke, the system pressure starts to raise. When the pilot pressure reaches **207 bar** for the main stack valve (**175 bar** for the lateral float stack valve) the pressure relief valve is pushed open and system pressure is limited to **210 bar** (207 + 3 bar). The load sensing lockout valves, (13a), (15a), (17a), (21a), (28a) between the different control spools make sure that pilot pressure cannot escape into the return over not used control spools. When using more than one control spool the highest pilot pressure will operate the load sensing spool.



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