REPAIR MANUAL

SKID STEER/COMPACT TRACK LOADER

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450CT
SERIES 3

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Issued 01Jan08

CASE
CONSTRUCTION

REPAIR MANUAL

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Contents

INTRODUCTION

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INTRODUCTION

Basic instructions

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:

- **(D)** Technical Data (specifications) for all the mechanical, electrical or hydraulic devices, components and, assemblies.
- **(C)** Functional Data (how it works) for all the mechanical, electrical or hydraulic devices, components and assemblies.
- **(G)** Diagnostic Data (fault codes, electrical and hydraulic troubleshooting) for all the mechanical, electrical or hydraulic devices, components and assemblies.

- **(F)** 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.

	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
PRODUCT											
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		

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 **(D)** technical data (specifications), **(C)** functional data (how it works), **(F)** service data (remove, install adjust, etc..) and **(G)** 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

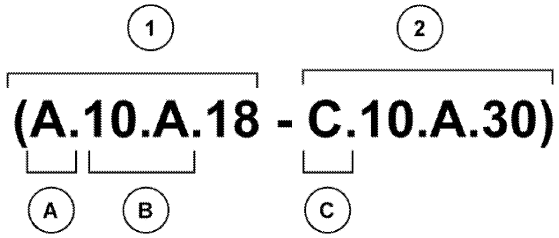
INDEX
The Chapter Index lists in alphabetical order all the types of information (called Information Units) that have been written in that Chapter for that function or system on the machine.

Index

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



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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, **(D)** Technical data, **(C)** Functional Data, **(G)** Diagnostic or **(F)** Service.
  (A) and **(B)** are also shown in the page numbering on the page footer.
  THE REST OF THE CODING IS NOT LISTED IN ALPHA-NUMERIC 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

Hydraulic pump - Flow test

NOTE: *Two persons are required to perform the flowmeter tests for safety to avoid possible injury. One person must be seated in the operators seat when the engine is running. The second person is to control the flowmeter and take the readings.*

1. Park the machine on a level surface. Lower the loader bucket to the floor. Stop the engine.
2. Disconnect the hose from the pump pressure port at Test Point 1 . Install a plug in the hose. Connect the flowmeter inlet hose to the fitting at the pressure port of the pump.
3. Put the flowmeter outlet hose into the hydraulic reservoir. Use wire to fasten the flowmeter outlet hose below the surface of the hydraulic oil.
4. Make sure that the oil level in the hydraulic reservoir is correct.
5. Make sure that the pressure valve of the flowmeter is opened completely.
6. The oil must be at operating temperature. If the oil is not at operating temperature, run the engine at full throttle and close the pressure valve of the flowmeter until the pressure gauge indicates 103 bar (1500 psi). Continue to run the engine at full throttle until the temperature of the oil is 52°C (125°F). Then open the pressure valve completely.
7. Make sure that the pressure valve is opened completely. Adjust the engine speed to 2300 r/min (rpm) and read the flow gauge. Read the flow and record the reading as test number 1 .
8. Slowly close the pressure valve on the flowmeter until the pressure gauge indicates 97 bar (1400 psi). Keep the engine running at 2300 r/min (rpm). Read the flow and record the reading as test number 2 .
9. Slowly close the pressure valve on the flowmeter until the pressure gauge indicates 124 bar (1800 psi). Keep the engine running at 2300 r/min (rpm). Read the flow and record the reading as test number 3.
10. Slowly close the pressure valve on the flowmeter until the pressure gauge indicates 152 bar (2000 psi). Keep the engine running at 2300 r/min (rpm). Read the flow and record the reading as test number 4.
11. Open the pressure valve completely. Decrease the engine speed to low idle and stop the engine.

NOTE: *Understanding the results of the tests are outlined in the steps below.*

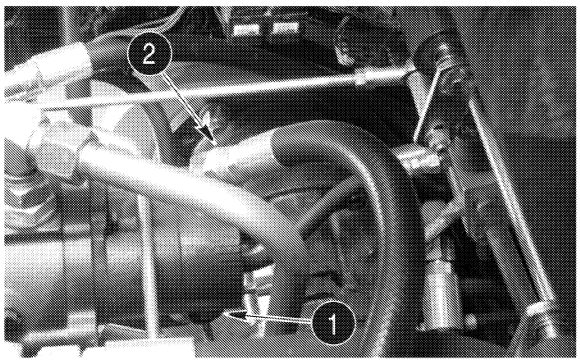
12. If the output at minimum pressure was less than the specification for Gear Pump Flow to Loader (Machine in Neutral) refer to **Hydraulic pump - General specification (A.10.A)**, the problem can be a restriction between the reservoir and the gear pump, or the problem can be a badly worn or damaged gear pump.

13. If the output at minimum pressure was more than the specification refer to **Hydraulic pump - General specification (A.10.A)**, there are no problems between the reservoir and the gear pump. However, the gear pump can be worn or damaged and still have good flow at minimum pressure.

14. Loss of output at 152 bar (2200 psi) indicates that the gear pump is worn or damaged. To determine the efficiency of the gear pump, divide the flow indication from test number 4 by the flow indication from test number 1. This answer multiplied by 100 is the percent efficiency of the gear pump. If the efficiency of the gear pump is less than 75%, repair or replace the gear pump. If the efficiency of the gear pump is more than 75%, the pump is good.

Hydraulic pump - Remove

1. Place a shop towel under the gear pump.
2. Remove the cap from the hydraulic reservoir. Install the **CAS1871** adapter onto the reservoir filler neck.
3. Connect a vacuum pump to the hydraulic reservoir. **CAS10192**
4. **Reservoir - Apply vacuum (A.10.A)** Start the vacuum pump.
5. Tag and disconnect the hose from the fitting at the suction port **(1)** of the gear pump.



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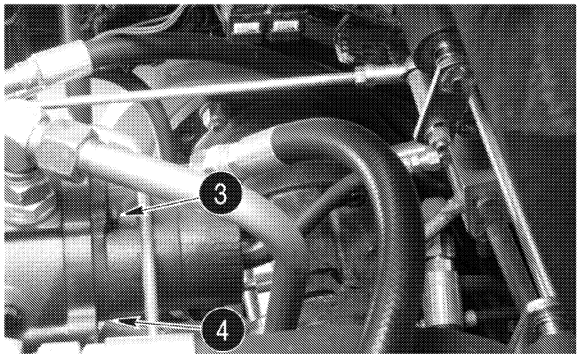
6. Install a plug in the hose and a cap on the fitting.
7. Tag and disconnect the hose from the fitting at the pressure port **(2)** of the gear pump.
8. Install a plug in the hose and a cap on the fitting.
9. Stop the vacuum pump.
10. Loosen and remove the upper pump mounting bolts **(3)** and washers and the lower pump mounting bolts **(4)** and washers.



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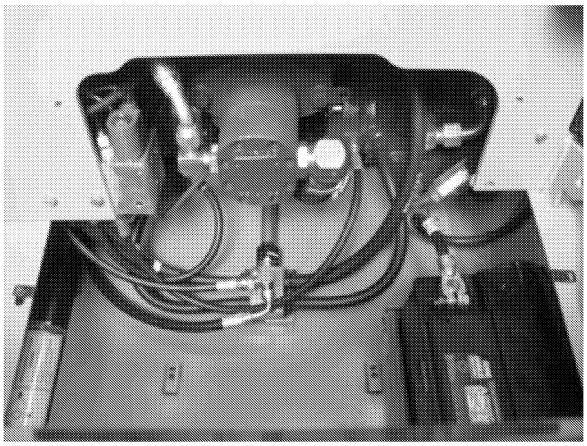
11. Remove the gear pump from the hydrostatic pump mounting location.

Hydraulic pump - Remove (Machines Equipped With Tandem Hydrostatic Pump)

1. Loosen and remove the mounting bolts and washers for the floor plate and the cover. Remove the floor plate and the cover to gain access to the hydraulic pump.



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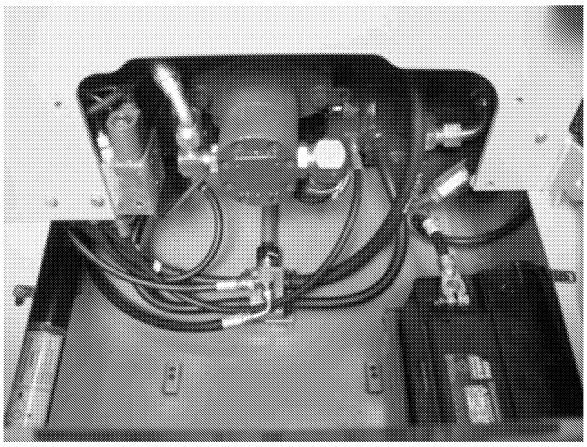
2. Place a shop towel under the gear pump.
3. Remove the cap from the hydraulic reservoir. **CAS1871**
4. Connect a vacuum pump to the hydraulic reservoir. **CAS10192**
5. **Reservoir - Apply vacuum (A.10.A)** Start the vacuum pump.
6. Tag and disconnect the hose from the fitting at the suction port of the gear pump.



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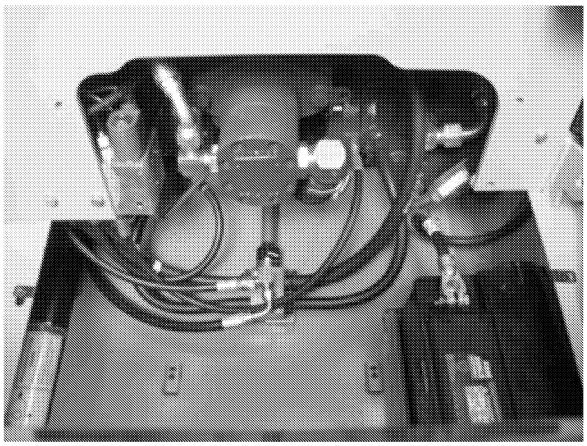
7. Install a plug in the hose and a cap on the fitting.
8. Tag and disconnect the hose from the fitting at the pressure port of the gear pump.
9. Install a plug in the hose and a cap on the fitting.
10. Stop the vacuum pump.

11. Loosen and remove the pump mounting bolts and washers.

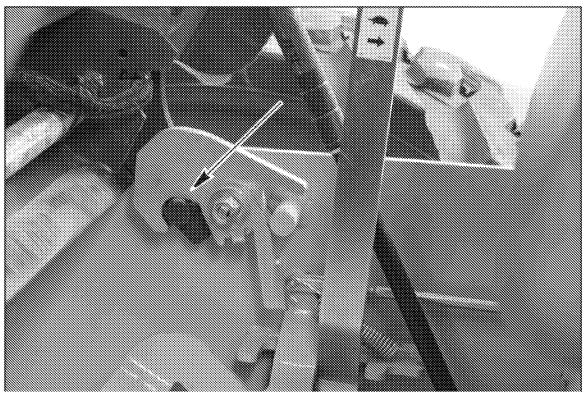


BD04C141x 3

12. Remove the gear pump from the hydrostatic pump mounting location.

Hydraulic pump - Remove (Machines Equipped with Pilot Controls)

1. Remove any attachments from the loader lift arms.
2. Refer to the operators manual for the correct procedure and tilt the ROPS to gain access to the hydrostatic and equipment pump area.
3. Ensure ROPS lock is engaged prior to maintenance.



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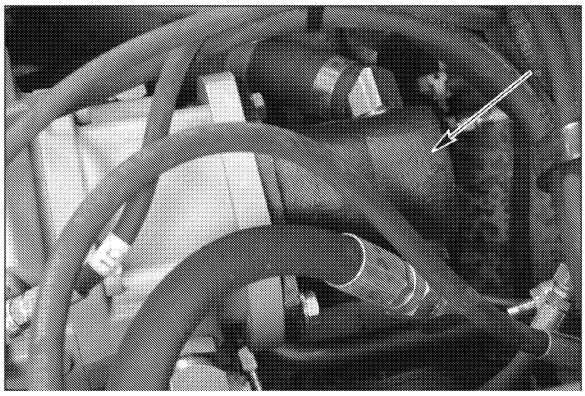
4. Connect a vacuum pump to the hydraulic reservoir.
5. Start the vacuum pump.
6. Disconnect and tag all the hoses from the equipment pump. Install caps and plugs on all fittings and hoses.



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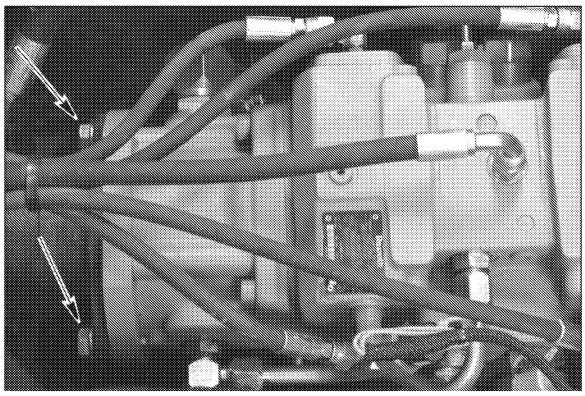
7. Stop the vacuum pump.
8. Loosen and remove the mount bolts from the equipment pump.

NOTE: *Support the equipment pump while removing the mount bolts as not to damage the drive coupling.*



BD06N032_1 3

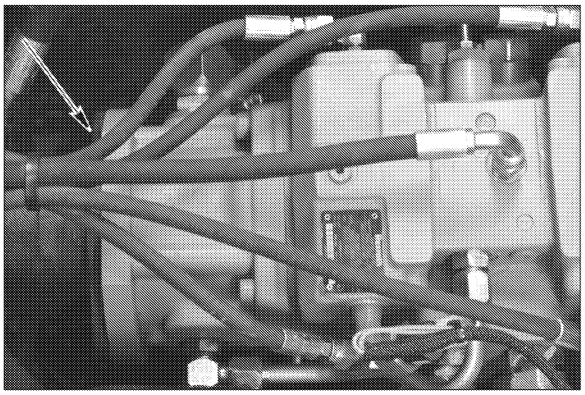
9. Remove the equipment pump from the machine.

Hydraulic pump - Install (Machines Equipped with Pilot Controls)

Prior operation:
Prior operation: Before pump installation, apply Molykote G-4700 to the pump and the coupling splines. Pre-fill the pump with clean hydraulic oil. Inspect O-ring and replace if necessary. Lubricate the O-ring with clean hydraulic oil.

1. Hold the equipment pump against the hydrostatic pump mount location. Rotate the equipment pump shaft until it aligns with the hydrostatic pump coupling.

NOTE: *Apply Loctite No. 243 to all pump mount bolts.*



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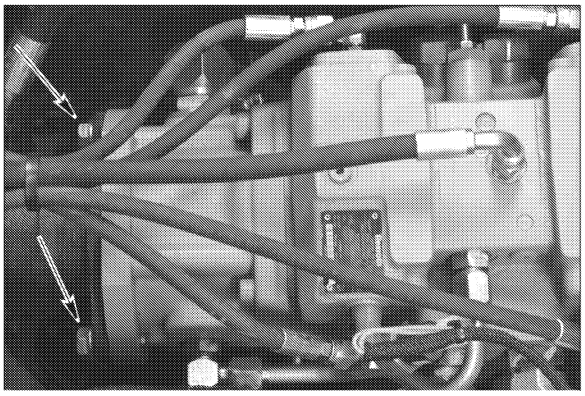
2. Install and tighten the equipment pump mount bolts and washers. Tighten mount bolts to a torque of 110 to 122 Nm (81-90 pound-feet).



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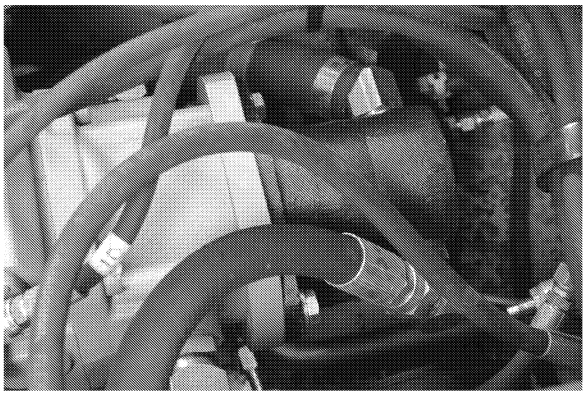
3. Start the vacuum pump.
4. Remove caps and plugs from all fittings and hoses. Install and tighten all hoses on the equipment pump.



BD06N041 3

5. Stop the vacuum pump.
6. Disconnect the vacuum pump from the hydraulic reservoir.
7. Check the oil level in the hydraulic reservoir and add hydraulic oil as needed.
8. Install the reservoir cap on the reservoir filler neck.
9. Clean up any hydraulic fluid from equipment or floor.

10. Start and run the engine at low idle for two to five minutes.
11. Stop the engine.
12. Check for any leaks.
13. Check the oil level in the hydraulic reservoir and add hydraulic oil as needed. Refer to **PRIMARY HYDRAULIC POWER SYSTEM - Capacity (A.10.A)** for the correct type and quantity of hydraulic oil.
14. Install the reservoir cap on the reservoir filler neck.

Hydraulic pump - Disassemble

1. Draw alignment marks on the housing with a white marker. These marks will be referenced during assembly.

GD98J801 1

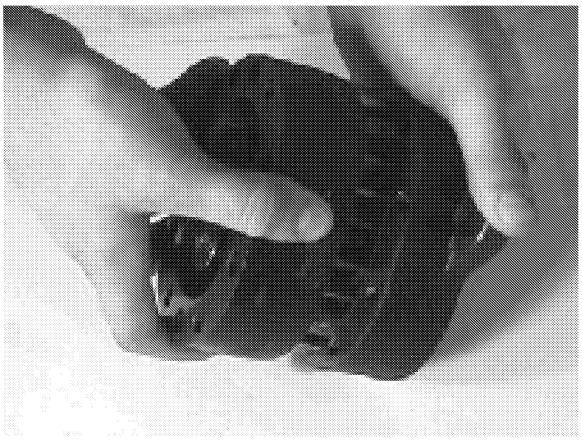
2. Loosen and remove the socket bolts and washers.

GD98J802 2

3. Remove the cover.

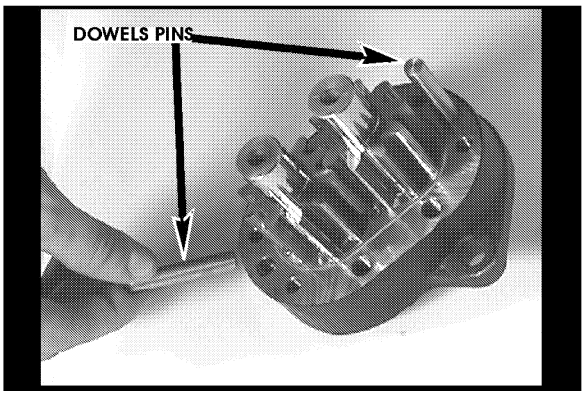
GD98J803 3

4. Remove the gear plate.



GD98J804 4

5. Remove the dowel pins.



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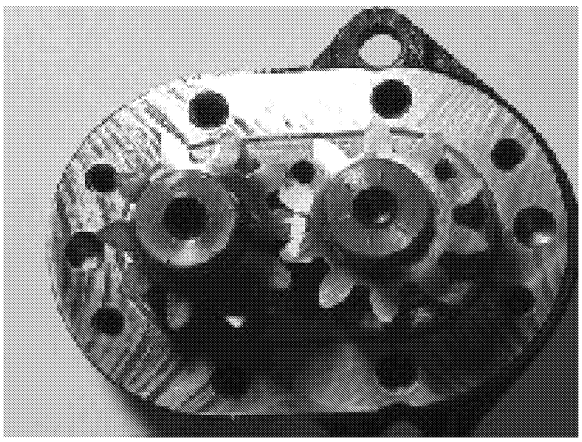
6. Rotate the gear teeth until one gear tooth is centered inside two gear teeth. Draw a mark with a white marker. This mark will be referenced during assembly.



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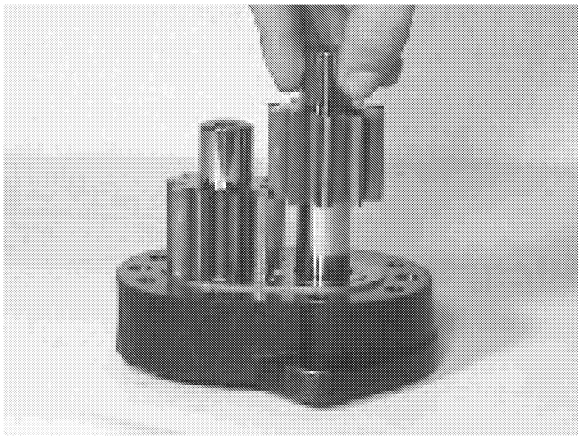
7. Remove the drive shaft.



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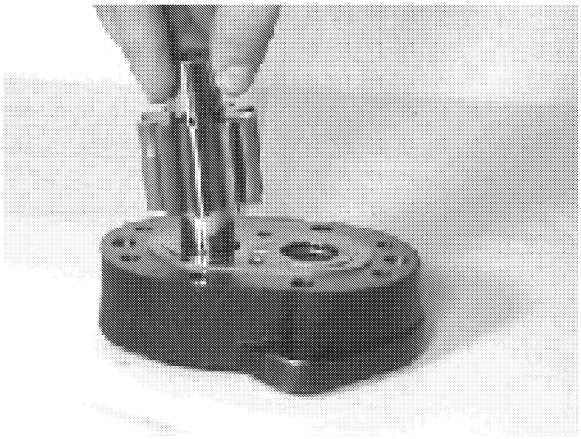
8. Remove the idler shaft.



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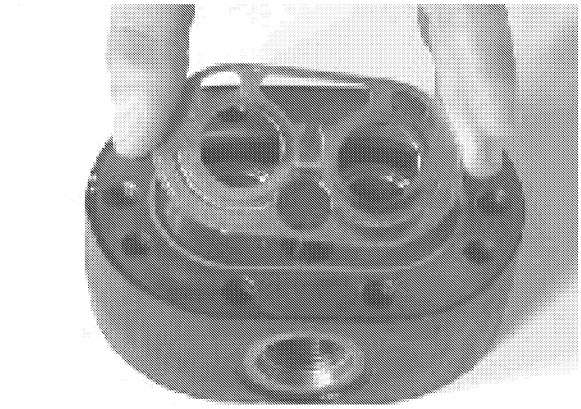
9. Remove the wear plate from the cover.



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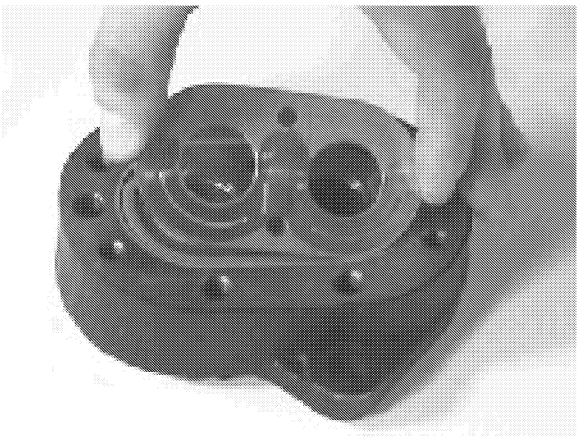
10. Remove the wear plate from the body.



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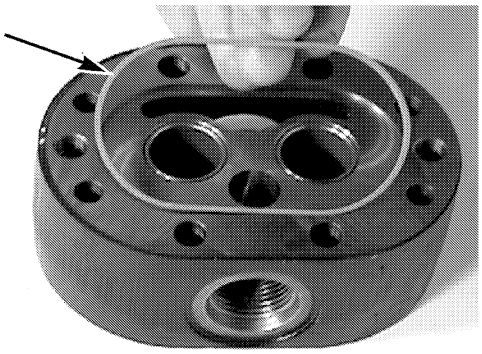
11. Remove and discard the seal ring from the cover.



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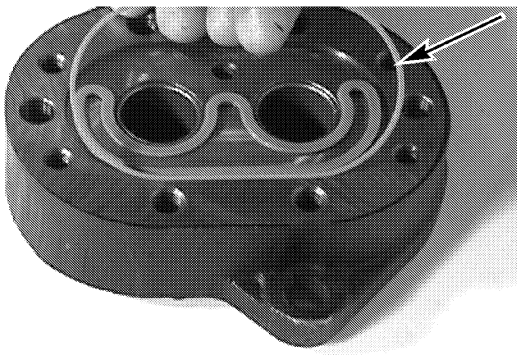
12. Remove and discard the seal ring from the body.



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