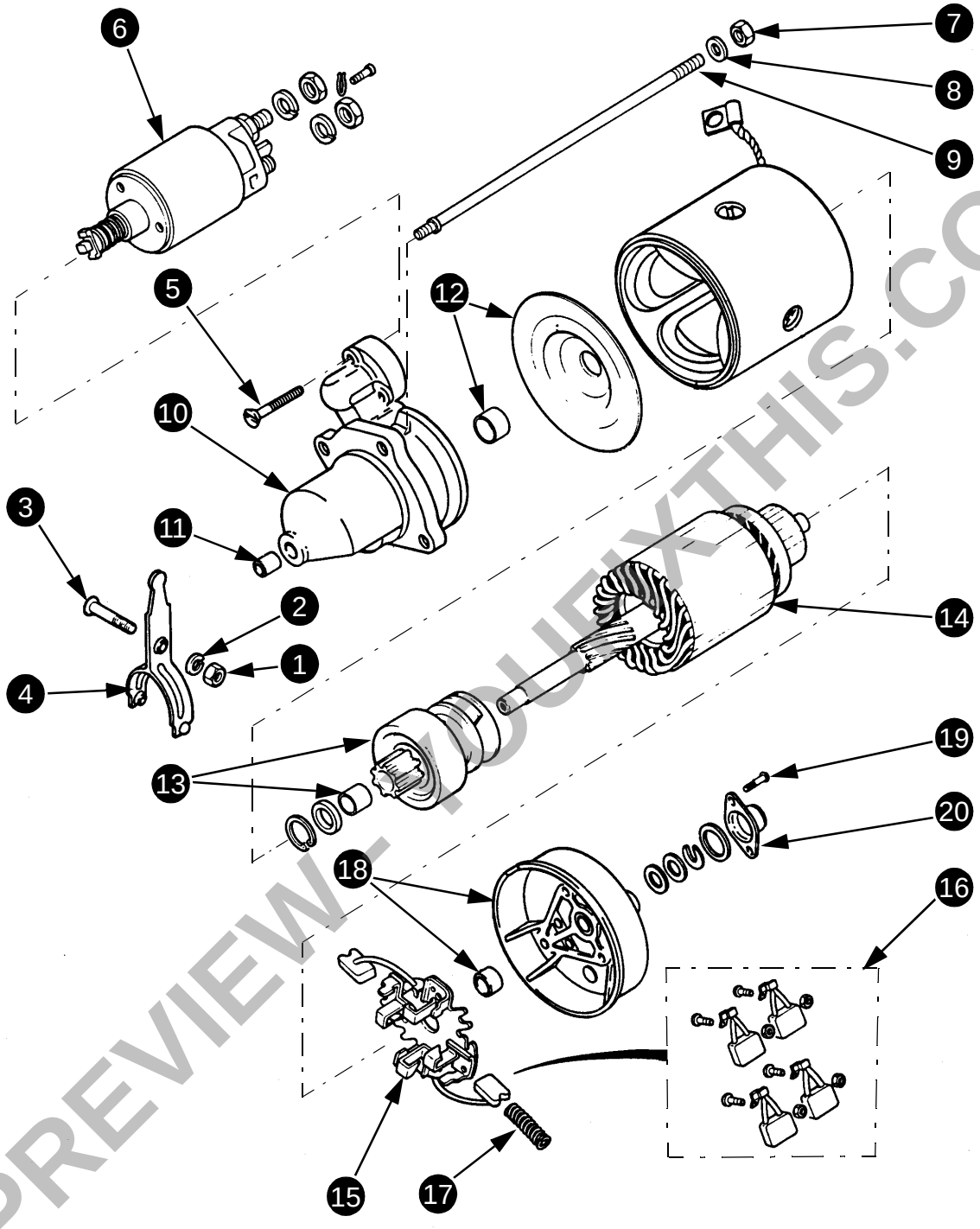
Disassembly and Assembly



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DPH0205

1 NUT
2 WASHER
3 SCREW
4 ENGAGING FORK
5 SCREW
6 SWITCH
7 NUT
8 WASHER
9 TIE-ROD
10 HOUSING
11 BEARING
12 CYLINDER GLAND
13 OVERRUNNING CLUTCH AND DRIVE PINION
14 ARMATURE
15 BRUSH HOLDER
16 BRUSH
17 SPRING
18 COVER
19 SCREW
20 CAP

TABLE OF CONTENTS

SPECIFICATIONS....2
SPECIAL TORQUES....2
TOOLS REQUIRED....2
REMOVAL AND INSTALLATION....3
CHECKING ELECTRICAL CONNECTIONS ON TEMPERATURE SENSORS....9

This symbol is used in this manual to indicate important safety messages. Whenever you see this symbol, carefully read the message that follows, as there is a risk of serious injury.

SPECIFICATIONS

Weights:
- Engine (without hydraulic pump)
  - **WX150 model**.... 350 kg
  - **WX170-200 model**.... 443 kg
- High pressure hydraulic pump
  - **WX150 model**.... 100 kg
  - **WX170-200 model**.... 130 kg
- Upper hood
  - **WX150 model**.... 26 kg
  - **WX170-200 model**.... 43 kg
- Complete cooling circuit
  - **WX150 model**.... 14.5 litres
  - **WX170-200 model**.... 20 litres

Lubricant and coolant solution.... (see section 1002)

SPECIAL TORQUES

Engine/hydraulic pump retaining screws.... 44 Nm
Splined sleeve retaining screws.... 120 Nm
Shock absorber centring stud retaining screws.... 220 Nm
Engine bracket retaining screws.... 217 to 271 Nm

TOOLS REQUIRED

1 1 Torque wrench (10 to 50 Nm)
2 1 Torque wrench (40 to 200 Nm)
3 1 Torque wrench (70 to 360 Nm)
4 1 Sling (400 to 600 kg)
5 2 Slings (150 to 200 kg)
6 1 Receptacle (30 litres)
7 1 Plugging shaft - length 100 mm and diameter 27 mm
8 1 Loctite 638

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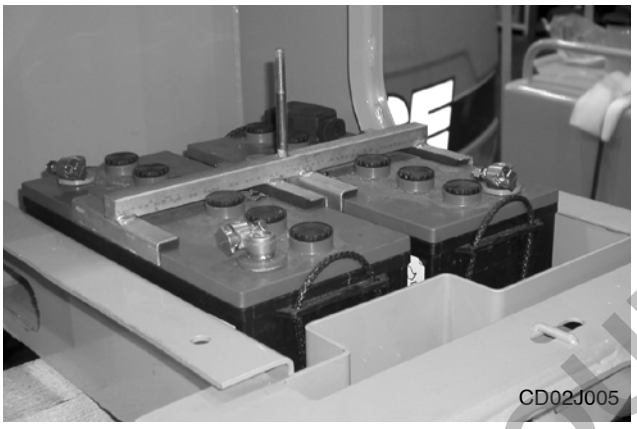
Before carrying out any servicing on the machine, perform the following operations in the order shown:

- Park the machine on flat, hard ground.
- Lower the attachment to the ground.
- Shut down the engine and allow it to cool down.
- Place the battery master switch in the "OFF" position and remove the key.

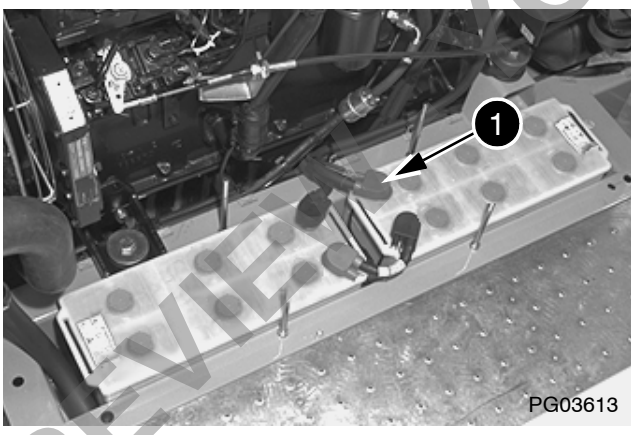
> ⚠ *When the machine is operating, the engine and hydraulic pump reach high temperatures. To avoid being burnt by hot metal or scalded by high temperature oil or water, allow the machine to cool down before starting any servicing operation.*

Removal and installation

STEP 1 WX150 model



WX170-200 model



Disconnect the negative cable (1) first, then disconnect the other cables.

STEP 2

Remove the access panels located under the engine.

STEP 3

Remove the exhaust silencer outlet pipe.

NOTE: *When installing, make sure that the exhaust outlet is oriented rearwards.*

STEP 4

Remove the upper hood using suitable lifting equipment.

STEP 5

Remove the side hood, at the walkway end.

STEP 6

Remove the exhaust silencer and its bracket.

STEP 7

(WX150 model)

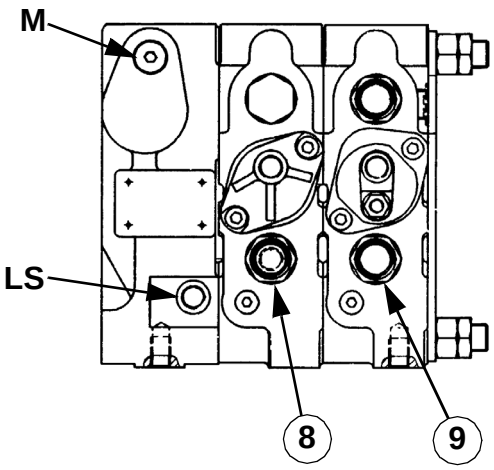
Remove the hose which connects the turbo-charger to the air filter.

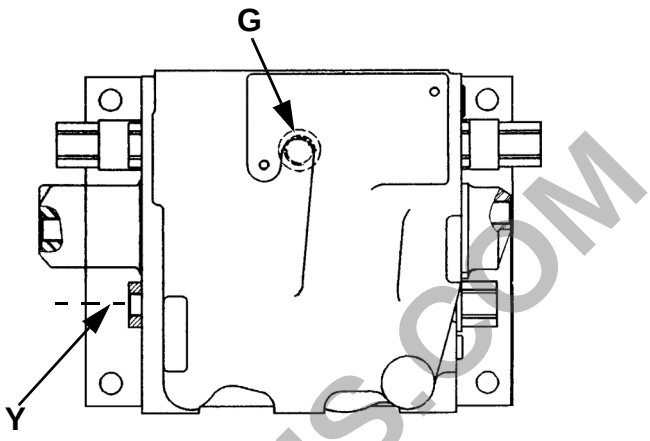
(WX170-200 model)

Remove the hose connecting the air filter to the turbo-charger, disconnect the air filter restriction pressure switch harness (see item (7) Step 11), then remove the air filter.

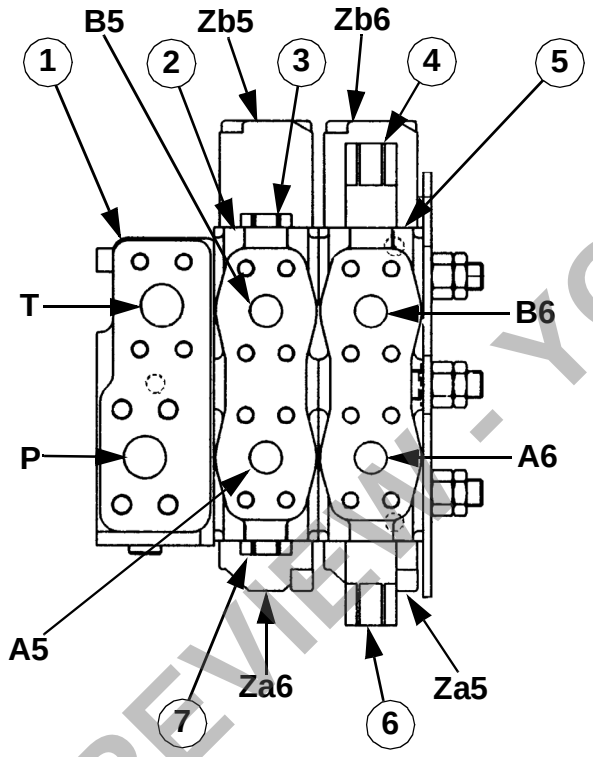
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CONTROL VALVE FOR TRAVEL, STABILIZER AND DOZER BLADE





PDG0344



Identification of ports:

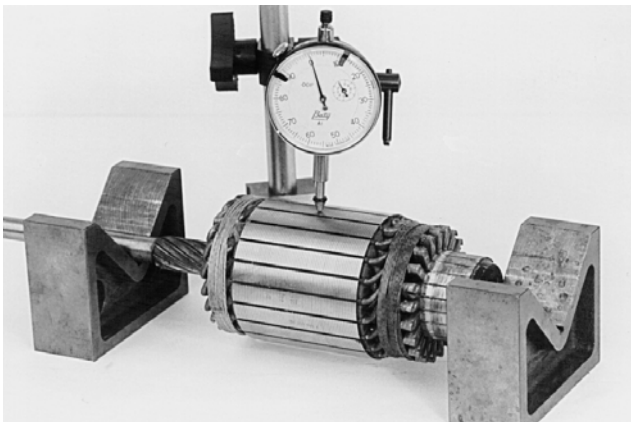
- **A5** Forward travel supply
- **A6** Stabilizer and dozer blade lowering supply
- **B5** Reverse travel supply
- **B6** Stabilizer and dozer blade raising supply
- **G** Not used (plugged)
- **LS** Information from pump Load-Sensing valve
- **M** Not used (plugged)
- **P** Arrival from variable flow pump
- **T** Return to reservoir
- **Y** Travel motor displacement change pilot circuit
- **Za5** Forward travel pilot system
- **Za6** Stabilizer and dozer blade lowering pilot circuit
- **Zb5** Reverse travel pilot system
- **Zb6** Stabilizer and dozer blade raising pilot circuit

Location of components:

1 INLET PLATE
2 TRAVEL CONTROL VALVE SECTION
3 PLUG WITH TRAVEL FORCED-FEED VALVE
4 STABILIZER AND DOZER BLADE RAISING SAFETY VALVE
5 STABILIZER AND DOZER BLADE CONTROL VALVE SECTION
6 STABILIZER AND DOZER BLADE LOWERING SAFETY VALVE
7 PLUG WITH TRAVEL FORCED-FEED VALVE
8 TRAVEL FLOW REGULATOR (BALANCE VALVE)
9 STABILIZER AND DOZER BLADE FLOW REGULATOR ASSEMBLY (BALANCE VALVE)

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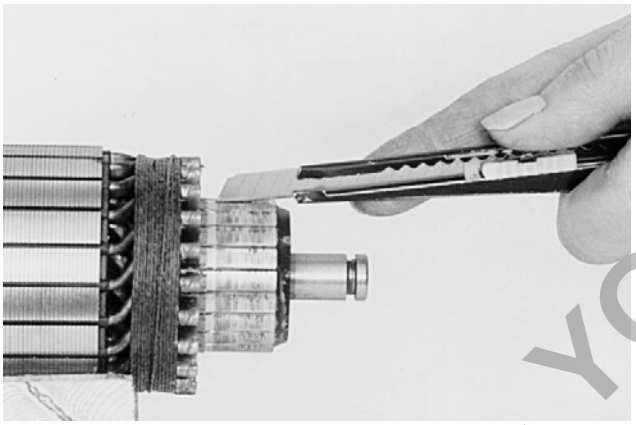
STEP 26



A05521

Place the armature on vee-blocks and check for distortion. If the armature is distorted it must be replaced.

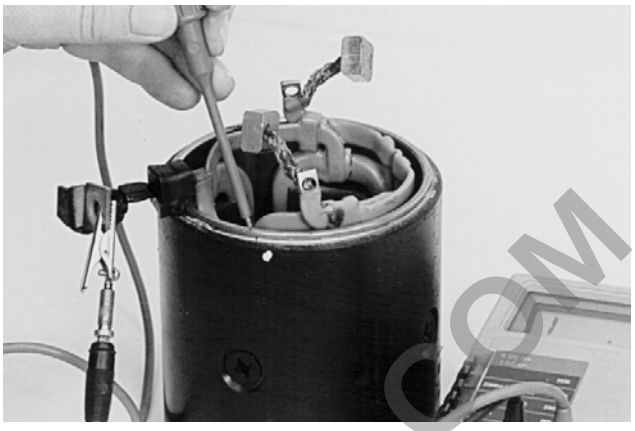
STEP 27



A05533

If the depth of the groove between the commutator segments is less than 0.2 mm, cut the insulation between the commutator segments to a depth of 0.5 mm. Use sandpaper to remove the rough edges from the commutator segments. Do not use emery cloth.

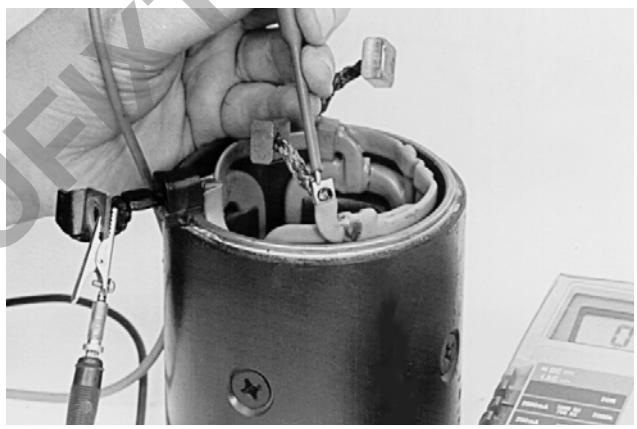
STEP 28



A05537

Place one probe of the multimeter on the field coil terminal and the other probe on an unpainted area on the surface of the frame. If there is continuity the field winding is earthed and must be replaced.

STEP 29



A06506

Place one probe of the multimeter on the field coil terminal and the other probe on the brush connection. If there is no continuity the field winding has an open circuit and must be replaced.

STEP 30

Check the splines and teeth of the overrunning clutch for wear and damage. Make sure the drive clutch moves freely on the armature shaft.

STEP 31

Check the bushings in the drive clutch, drive housing and end cover, replace if worn or damaged.

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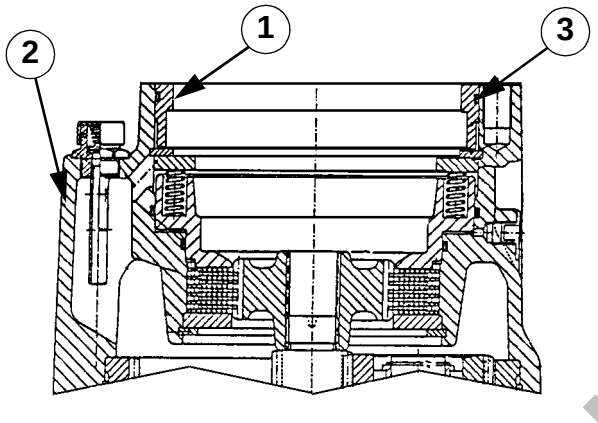
Before using the machine, all the following operations must be carried out in the order shown:

- Turn the battery master switch to the "On" position.
- Start the engine.
- Operate the swing motor.
- Check the hydraulic circuit for leaks.
- Check the oil levels.

Disassembly

NOTE: *The swing brake can be disassembled on the machine.*

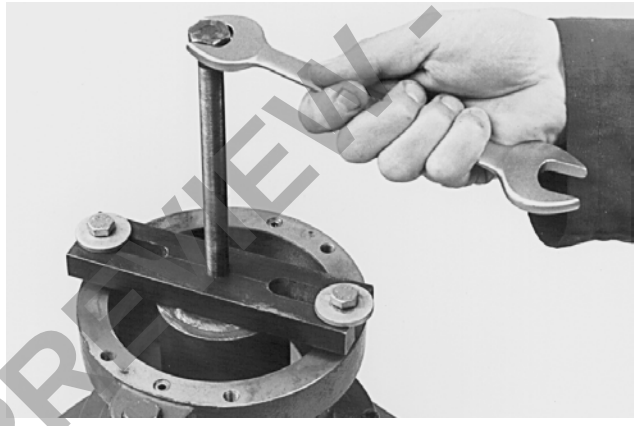
STEP 7



CS95M075

Remove the adapter spacer (1) from the reduction gear (2). Discard the O-ring (3).

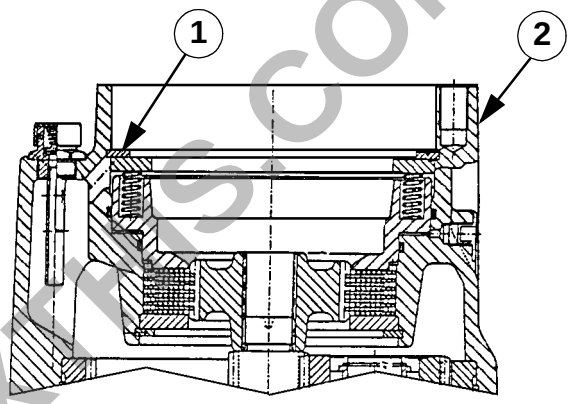
STEP 8



C02314

Install the special tool for compressing the swing brake return springs. See "Tools to be made". Tighten the screw until the snap ring is freed.

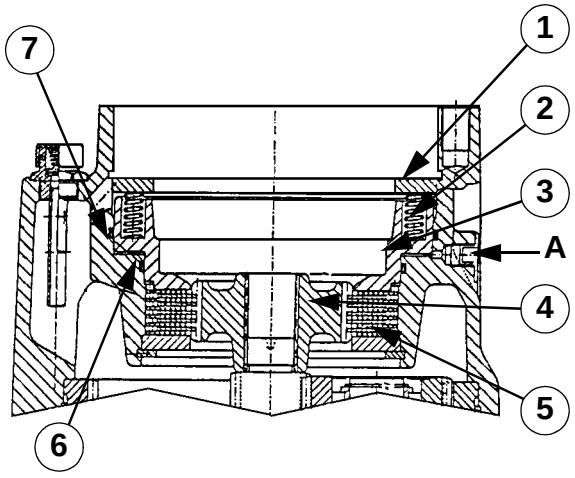
STEP 9



CS95M076

Remove the snap ring (1) from the reduction gear (2) and remove the special tool.

STEP 10

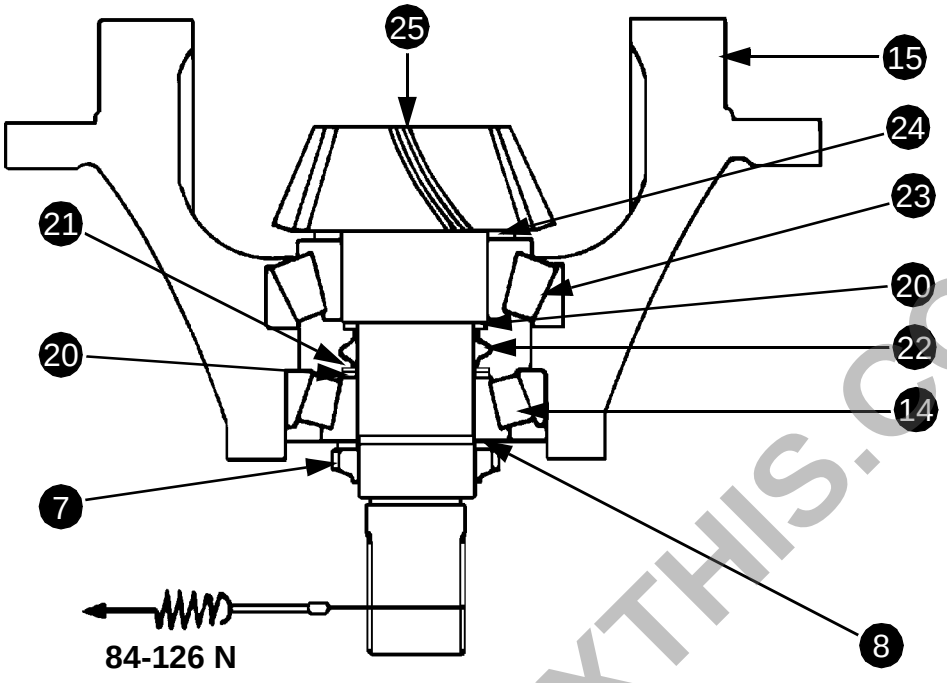


CS95M077

Remove in the following order: the spacer (1), the return springs (2), the brake piston (3), the splined sleeve (4) and the brake discs (5). Scrap the O-rings (6) and (7).

NOTE: *To remove the brake piston (3), carefully use a jet of compressed air, set to minimum pressure, through orifice A.*

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PDH0045

STEP 12

Place the adjusting shim (24), corresponding to the thickness calculated in Step 10 on the pinion shaft (25).

NOTE: *The chamfer on the internal diameter of the adjusting shim must be oriented towards the pinion. Thickness of available shims: 2.5 to 3.4 mm (from 0.10 in 0.10 mm).*

STEP 13

Using a suitable centring piece, install the bearing (23), the washer (20), a new compressible spacer (22) and the two washers (20) and (21) on the pinion shaft (25),

STEP 14

Lubricate the bearing with clean oil and install the pinion shaft assembly (25) in the differential support (15).

STEP 15

Lubricate the bearing (14) with clean oil and install it on the pinion shaft (25).

STEP 16

Install the washer (8) and a new nut (7) on the pinion shaft (25).

Preloading the bearings of the pinion shaft

STEP 17

While preventing the pinion shaft (25) from rotating, tighten the nut (7) to a torque of between 17 and 18 Nm.

STEP 18

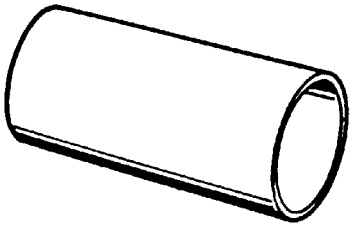
Place a torque wench on the pinion shaft (25) to measure the preload of the bearings.

STEP 19

Tighten the nut (7) until a preload is obtained of between 84 and 126 N. When the preload is correct, hammer over the edge of the nut on the pinion shaft.

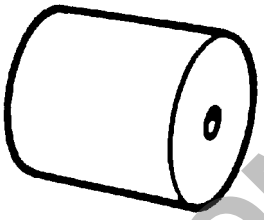
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Kit (CAS-40008)



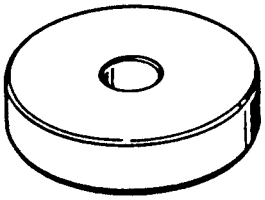
CS96A236

CAS-1596B-1 Calibrating tube.
Used for the first time on page 22.



CS96A237

CAS-1596B-5 Calibrating block.
Used for the first time on page 22.



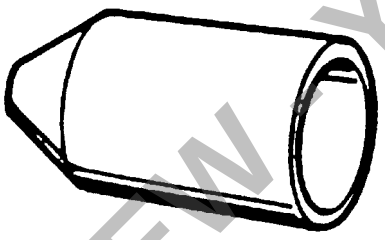
CS96A238

CAS-1596A-6 Aligning disc.
Used for the first time on page 22.



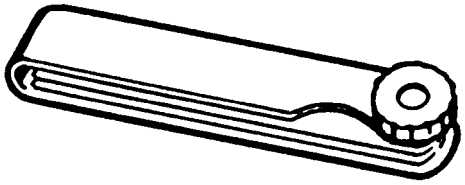
CS96A239

CAS-1596A-7 Pilot (screw).
Used for the first time on page 22.



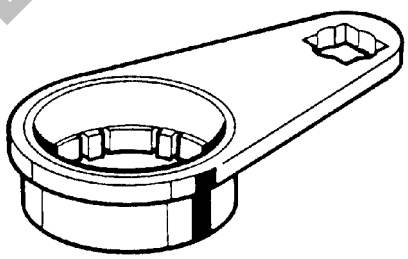
CS96A245

CAS-1596A-4 Handle.
Used for the first time on page 22.



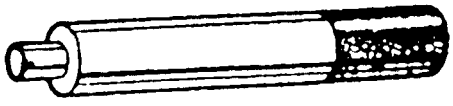
CS96A242

CAS-1668 Feeler gauge.
Used for the first time on page 22.



CS96A241

CAS-2078 Wrench for pinion shaft nut.
Used for the first time on page 21.



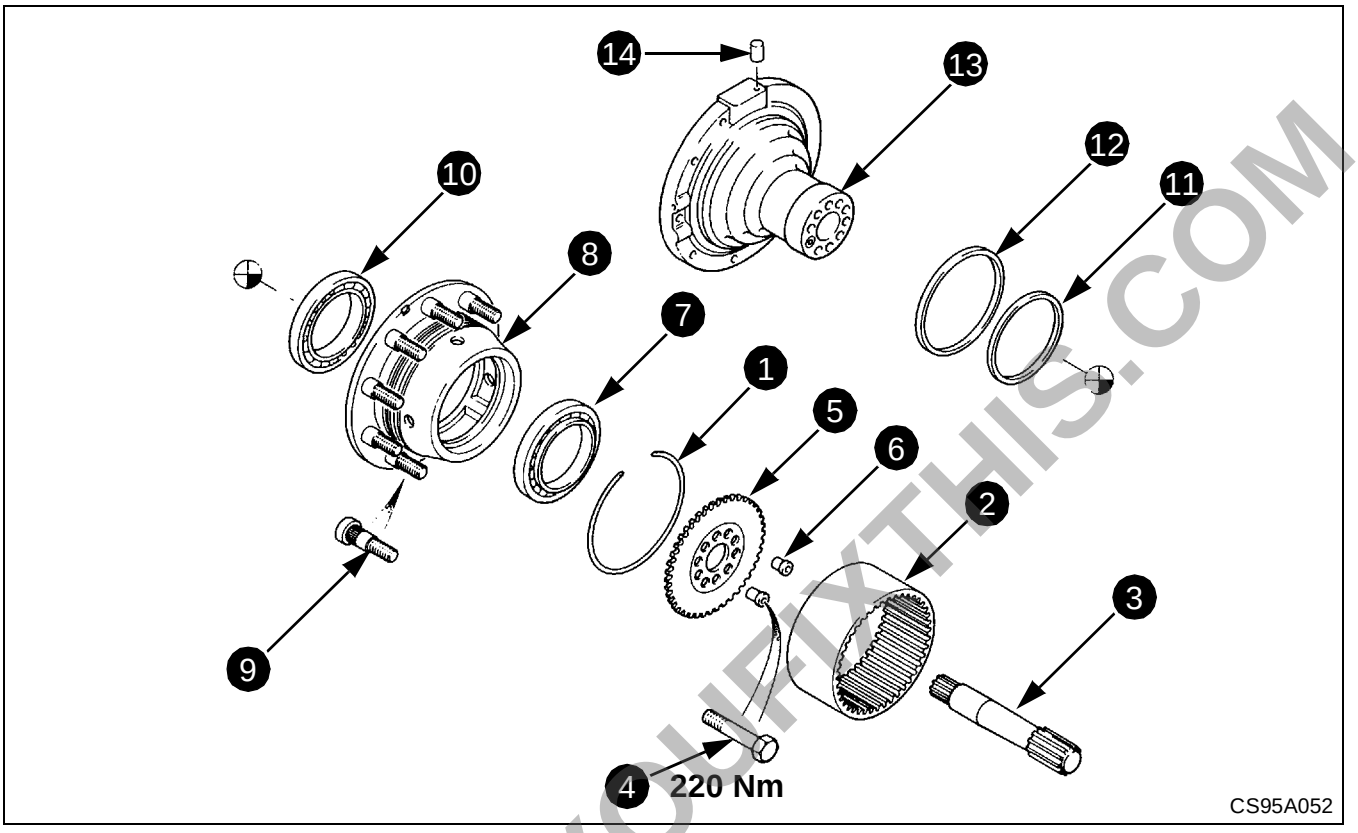
CS96A255

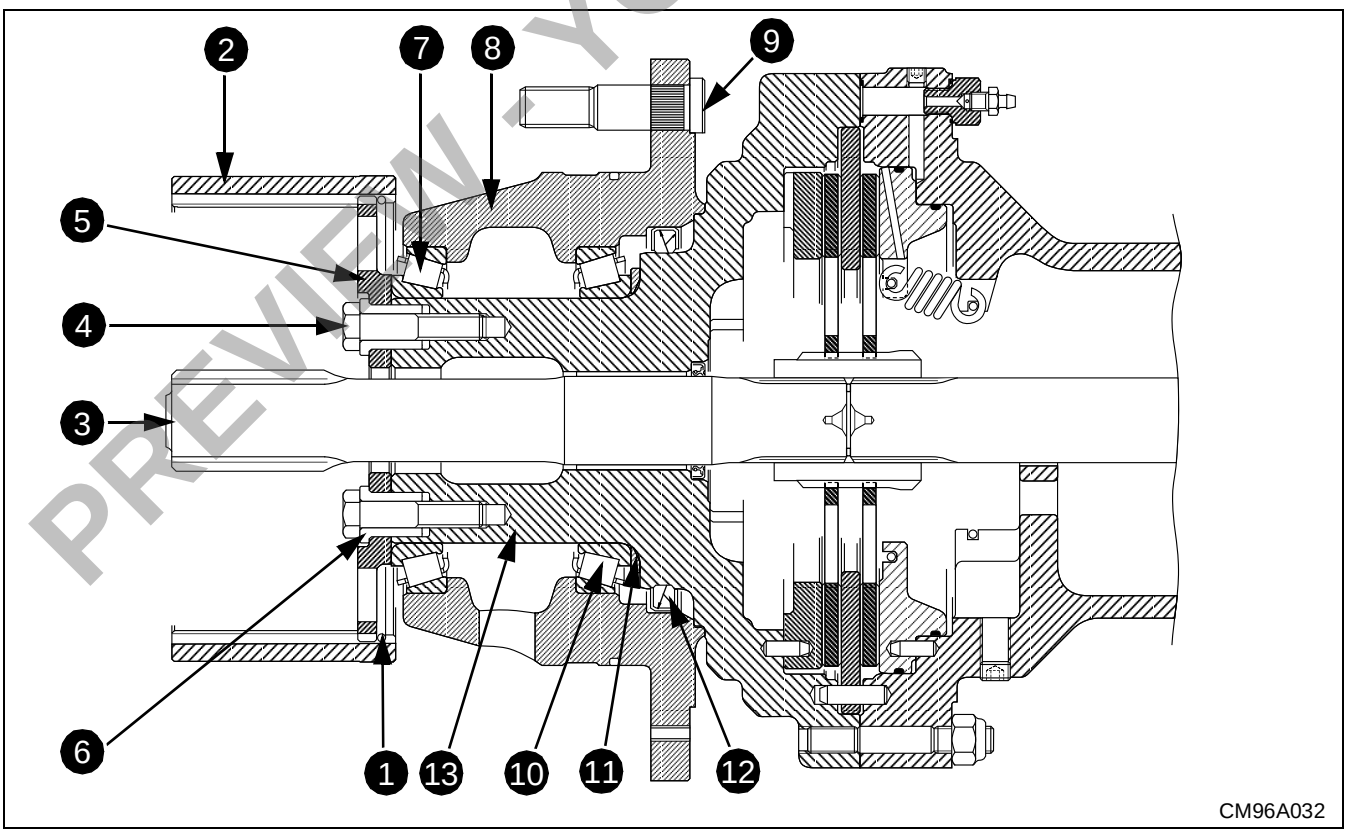
CAS-1716-3 Interchangeable handle.
Used on pages 19, 22 and 25.

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WHEEL HUB

Disassembly and assembly





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Tyre pressures

Maintenance specifications

Check pressures.....Every 100 hours
Checking the torque setting of the wheel nuts.....Every 250 hours
(after 10 hours after re-installing a wheel or during the running-in period)

	Tyre set and type	Recommended inflation pressure	
		Front tyres	Rear tyres
WX150 and WX170 series	4 wheels 18 x 19.5 XF	6 bar	6.5 bar
	8 wheels 11.00-20 PR16	7 bar	7 bar
WX200 series	4 wheels 18 x 22.5 XF	6 bar	6.5 bar
	8 wheels 11.00-20	7 bar	7 bar

Wheel retaining nuts

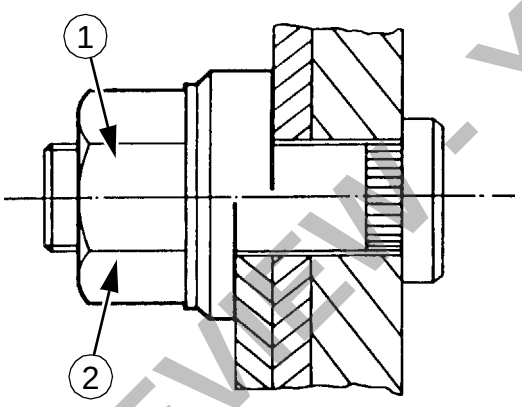
The retaining nuts are different on the 4 wheel configuration and on the 8 wheel configuration.

To prevent nuts becoming loose, follow the following assembly instructions:

Nut Part Number:

(1) 4 wheel configuration: W2434501.

(2) 8 wheel configuration: C1734501.



PDG0141

Replacing twin wheels

WARNING: *Before disassembling twin wheels and in all cases, completely deflate both tyres.*

Deflation and removal

STEP 1

Lift the machine and place blocks under the front or rear axle as required.

STEP 2

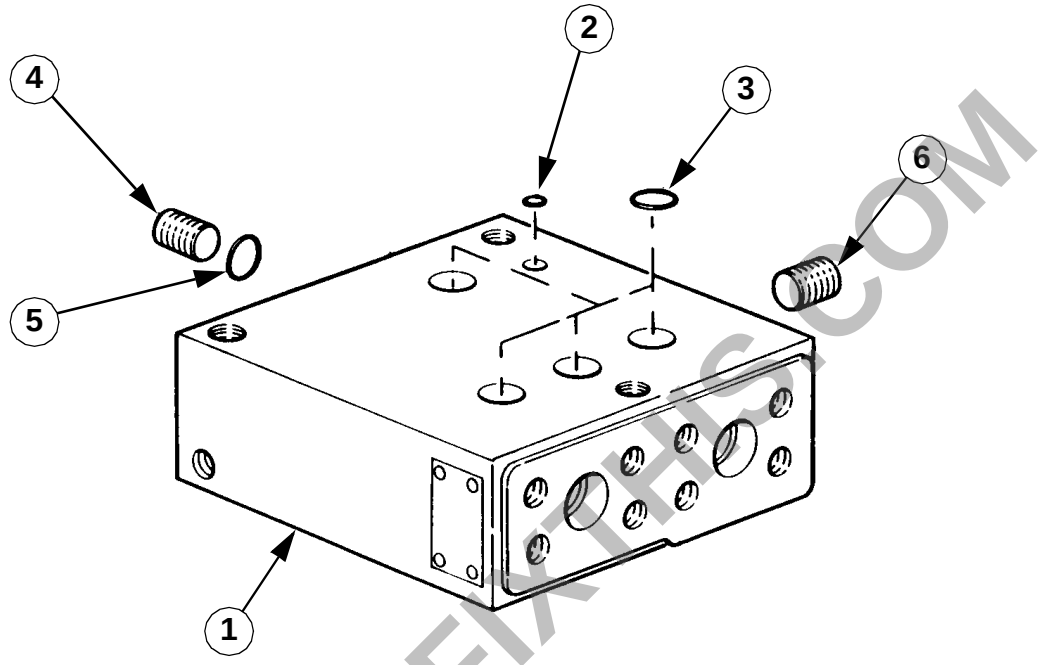
Completely deflate the tyres, even after they have been punctured, by removing the check valve (internal sealing mechanism) from the tyre valve. Unscrew it using check valve extractor Part Number B842606.

IMPORTANT: *If the valve or the valve extension is no longer accessible, take the necessary measures for protection and then deflate the tyre by cutting through the valve or, imperatively, by puncturing the tyre.*

WARNING: *Never face the side of the tyre. Always face the tyre tread. Wait for the complete deflation of the tyre (when hissing stops).*

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Disassembly and assembly of inlet plate



PDH0132

NOTE: *When assembling, replace all seals with new seals.*

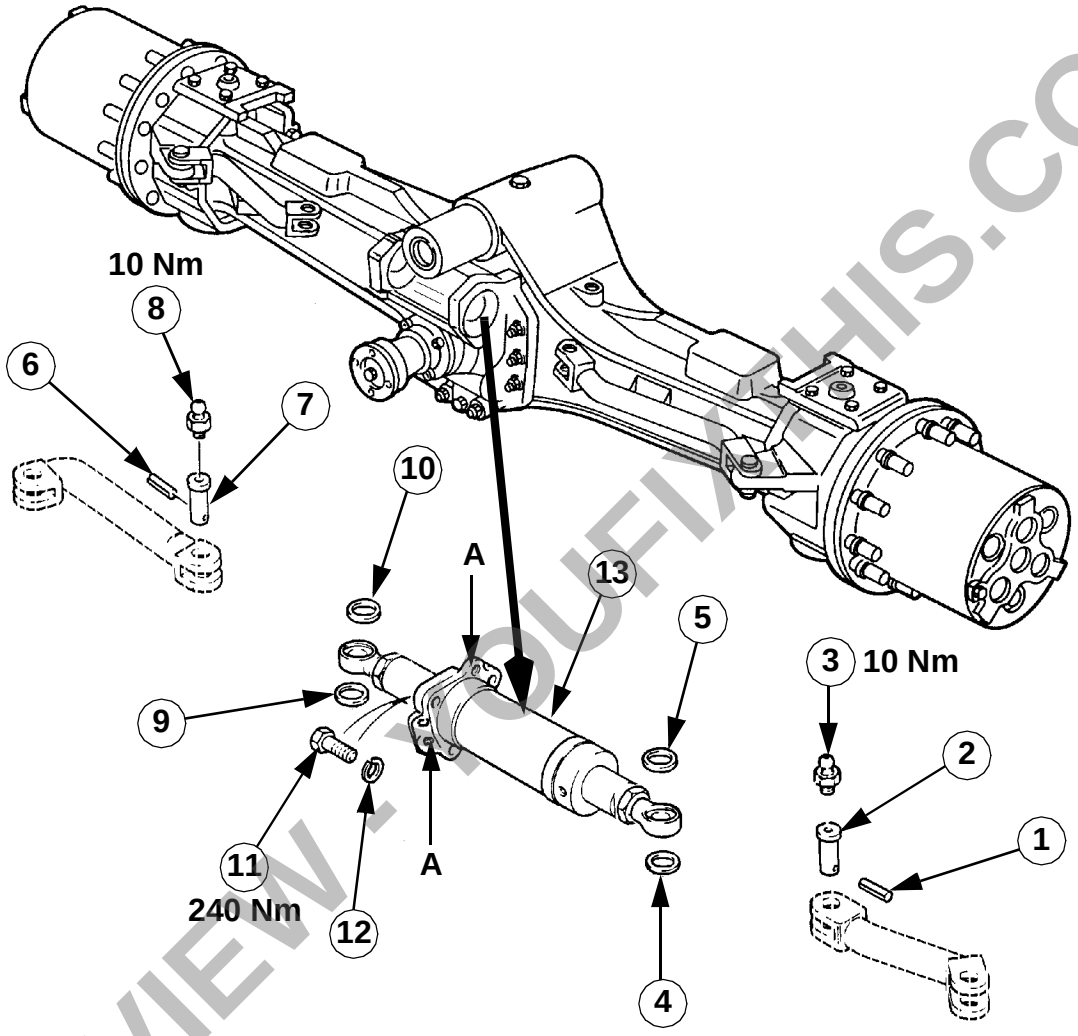
1 INLET PLATE
2 O-RING
3 O-RING
4 PLUG
5 O-RING
6 PLUG

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STEERING CYLINDER

Removal and installation

NOTE: *Components are numbered in order of disassembly. For assembly, follow the same order in reverse.*



PDH0347

NOTE: *Remove the two steering cylinder feed hoses. Remove the steering cylinder using the two extraction holes (A).*

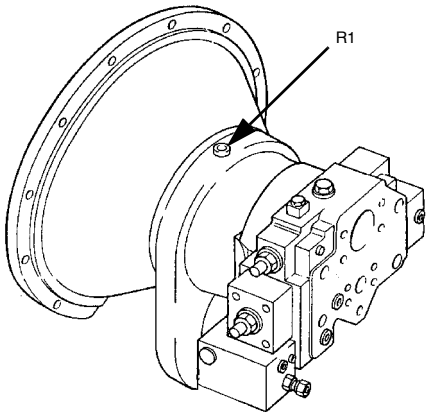
1 PIN
2 ROD
3 GREASE FITTING
4 WASHER
5 WASHER
6 ROLL PIN
7 ROD
8 GREASE FITTING
9 WASHER
10 WASHER
11 RETAINING SCREW
12 WASHER
13 CYLINDER ASSEMBLY

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NOTE: *When installing, assemble the splined sleeve on the pump shaft. The splined sleeve must butt up against the pump shaft shoulder. Tighten the retaining screws to a torque of 100 Nm.*

NOTE: *When installing the hydraulic pump, carry out the same operations in the reverse order. Replace all seals with new seals.*

IMPORTANT: *Open the hydraulic reservoir shut-off valve. Check the level of hydraulic fluid in the hydraulic reservoir and top up if necessary.*



CS02J522

Before starting the machine, remove the hose at R1 on the pump. Fill the pump housing with clean oil via port R1. Install and tighten the hose.

Before running the machine, carry out the following steps:

- Turn the battery master switch to the "ON" position.
- Start the engine.
- Operate the swing, travel and attachment for five minutes, with the engine at idle speed.
- Check the hydraulic circuit for leaks.
- Check the level of hydraulic fluid in the hydraulic reservoir and add fluid if necessary.
- Adjust the regulator block. Refer to section 8001.

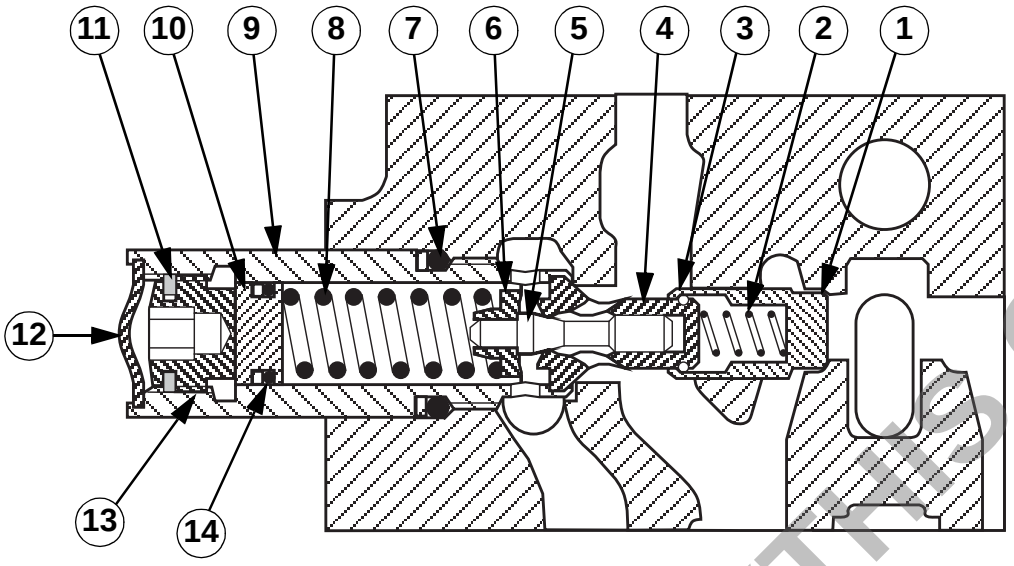
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Cross-sectional view of the swing pump....4
Exploded view of the swing pump....5
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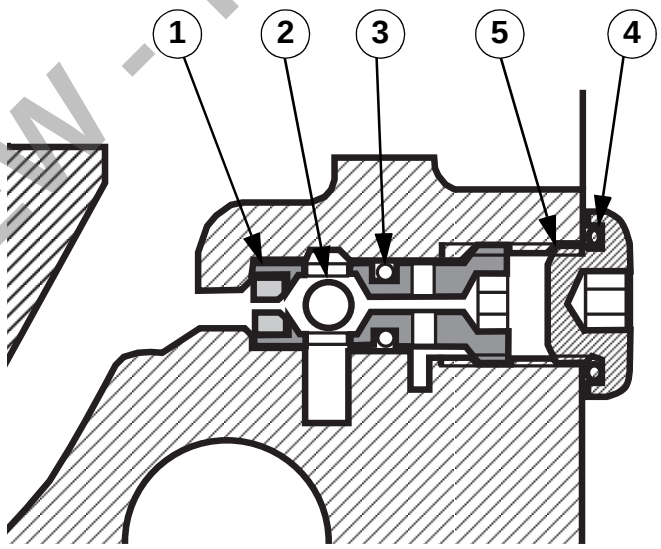
Cross-sectional drawing of secondary relief valve



PDG0252

1 FORCED-FEED POPPET
2 RETURN SPRING
3 RETAINING RING
4 SEAT
5 POPPET
6 SPRING GUIDE
7 O-RING AND BACK-UP RING
8 PRESSURE SETTING SPRING
9 VALVE BODY
10 PUSH ROD
11 LOCKING RING
12 PLUG WASHER
13 ADJUSTING SCREW
14 O-RING AND BACK-UP RING

Cross-sectional drawing of pressure selector

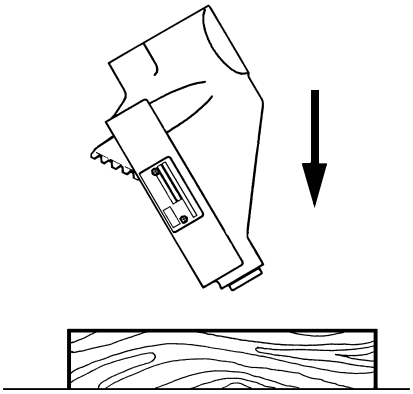


PDG0253

1 SEAT INSERT
2 BALL
3 SEAL
4 SEAL
5 PLUG

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STEP 11



PDG00463

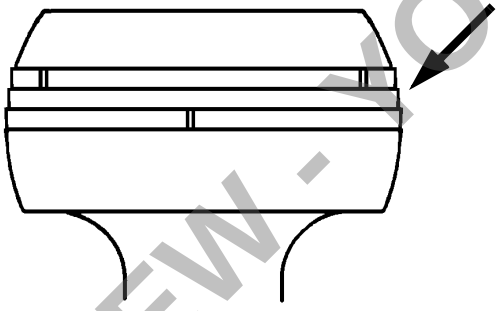
Note the position of the distribution plate in the housing. Remove the distribution plate by tapping the housing on a wood block.

Inspection

STEP 12

After removing them from the hydraulic travel motor, all parts must be carefully cleaned with a degreasing product.

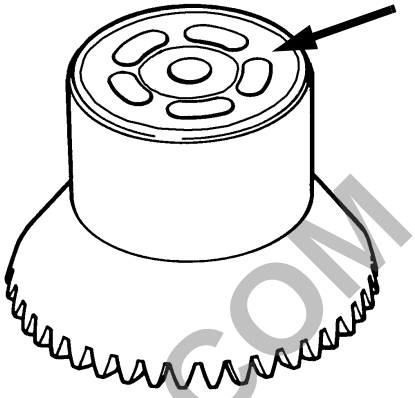
STEP 13



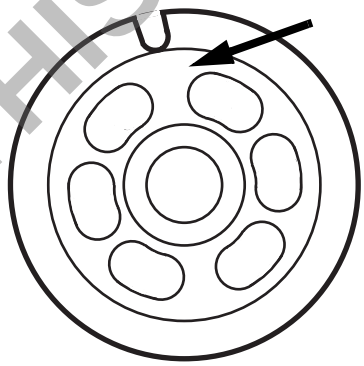
PDG0492

Check the condition and the wear of the piston rings. If they show any scratches or other damage, replace the pistons.

STEP 14



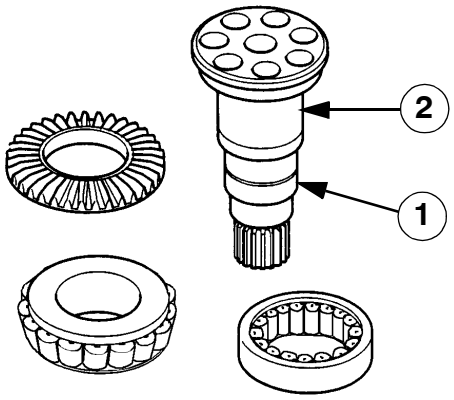
PDG0464A



PDG00465A

Check the friction surface of the barrel and the distribution plate. If they are scratched or damaged, change them.

STEP 15



PDG0495

Check the taper and cylindrical bearings and the crown wheel. Check that the part (1) of the shaft (2) in contact with the seal (marked by the lip), is not damaged. If it is damaged, the shaft must be replaced.

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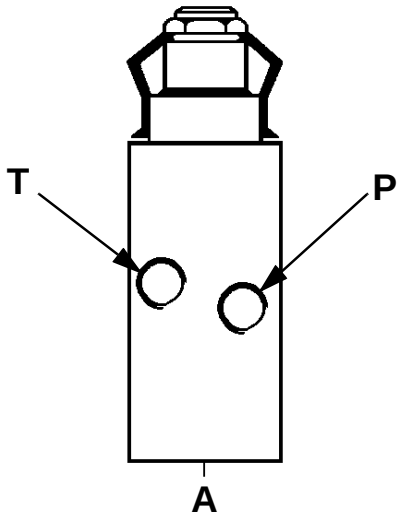
TRAVEL CONTROL BLOCK 3
Disassembly and assembly 3
Cross-sectional view of the travel control 4

SPECIFICATIONS

Type ..... Bloc RP5 8-27MPM2
Weight ..... 1.350 kg
Minimum pressure ..... 8 bar
Maximum pressure ..... 27 bar
Spool stroke ..... 15 mm

HOSE CONNECTIONS

A HAND CONTROL BLOCK SUPPLY
P SERVO-CIRCUIT PRESSURE INLET, COMING FROM MANIFOLD
T RETURN TO RESERVOIR VIA MANIFOLD



CS95N002

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Section

8080

ATTACHMENT CYLINDERS

Wheeled excavators

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Removal and installation

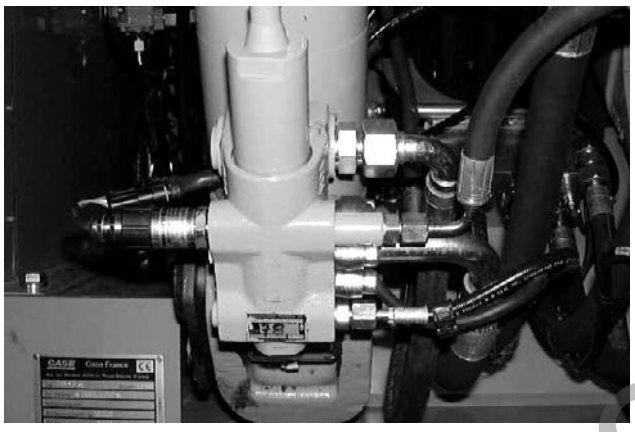
Before performing any service work on the machine, the following steps must be carried out in the order shown:

- Park the machine on flat, hard ground.
- Lower the attachment to the ground.
- Shut down the engine.
- Place the battery master switch in the "OFF" position and remove the key.
- Loosen the hydraulic reservoir pressure release plug two turns. Retighten the plug.
- Operate simultaneously the emergency pump and the control levers to release pressure in the hydraulic system.
- Loosen the hydraulic reservoir pressure release plug two turns to release the pressure.

STEP 1

Turn the upperstructure a quarter of a turn to get easier access to the valves.

STEP 2



CD99J005

Attach identification labels to all the valve hoses that have to be removed. Plug or cap all the hoses (for the RH valve, disconnect the overload indicator detector harness).

STEP 3

Place a clean receptacle under the valve concerned to recover the oil from the cylinder. Remove the 4 valve retaining screws. Remove the valve.

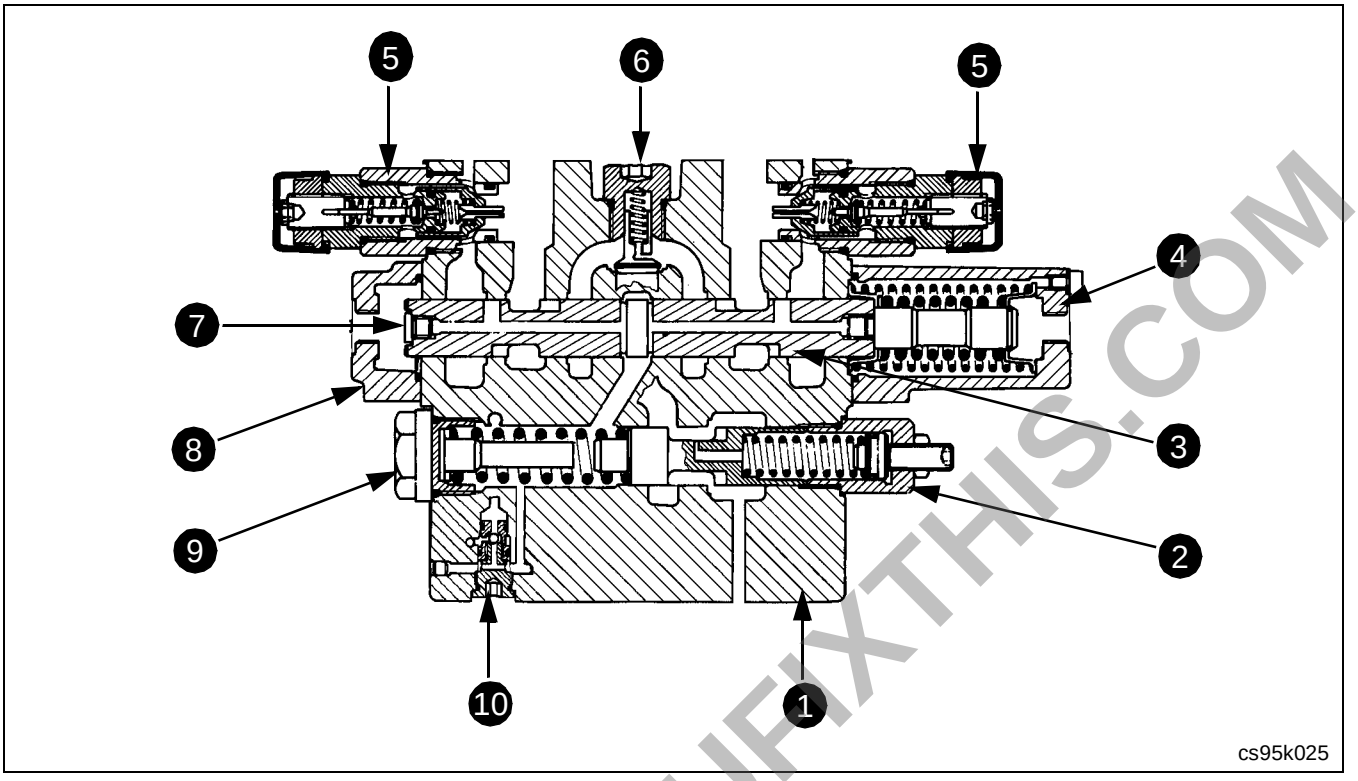
NOTE: *When reassembling, use the same procedure in the reverse order, not forgetting to change the seal between the valve and the cylinder.*

Before using the machine, all the following operations must be carried out in the order shown:

- Close the hydraulic reservoir cap.
- Turn the battery master switch to the "ON" position.
- Start the engine.
- Check the circuit for leaks.
- Check the level of hydraulic fluid in the reservoir and top up if necessary.
- To adjust the valves, refer to section 8001.

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Cross-sectional drawing of a control valve section

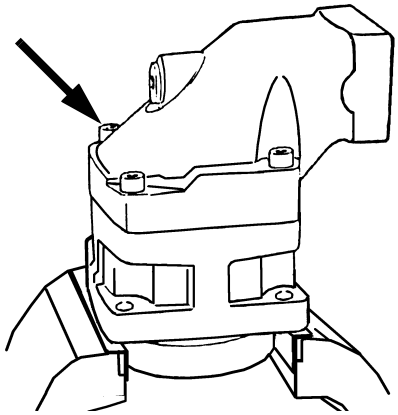


1 Control valve section body
2 Flow regulator assembly (balance)
3 Control spool assembly
4 Large cap
5 Secondary relief valve
6 Non-return check valve assembly
7 Spool plug
8 Small cap
9 Balance valve plug
10 Pressure selector on "Load Sensing" circuit (on control valve sections for bucket dipper only)

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Disassembly

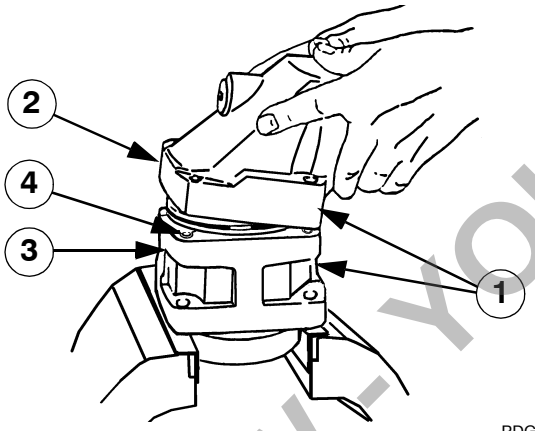
STEP 1



PDG0437

Place the hydraulic travel motor in a soft-jawed vice. Remove the four retaining screws from the upper housing.

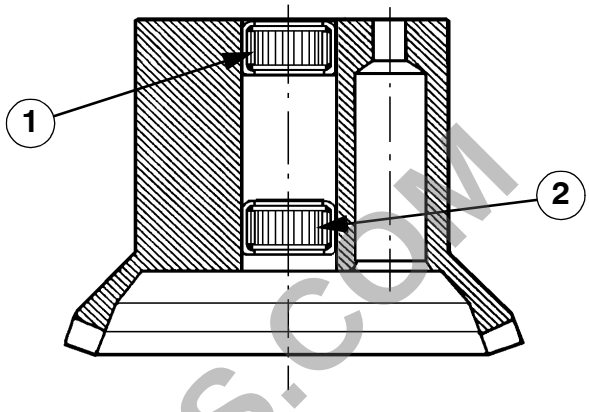
STEP 2



PDG0438

Mark identification marks (1) on the upper housing (2) and the lower housing (3). Carefully remove the housing, lifting it upwards as shown. Remove the barrel. Remove the adjusting shims (4).

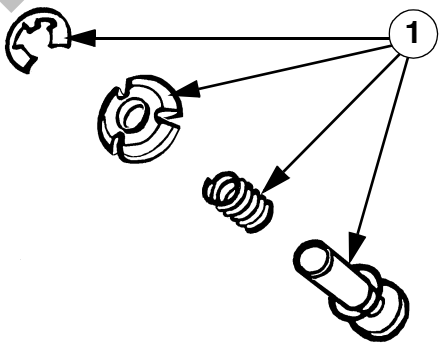
STEP 3



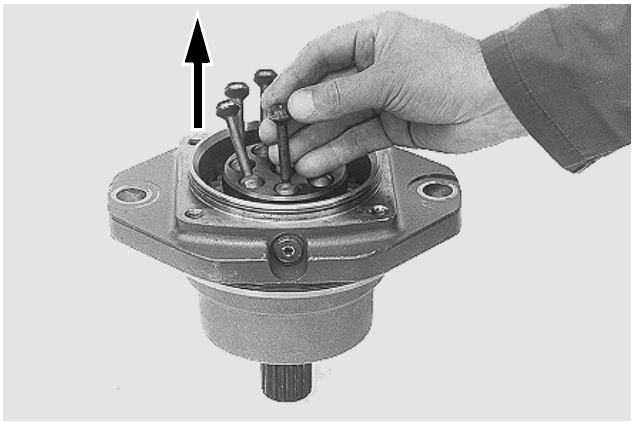
PDG0489

Extract the two needle roller bearings (1) and (2) from the barrel, if necessary.

STEP 4



PDG0497



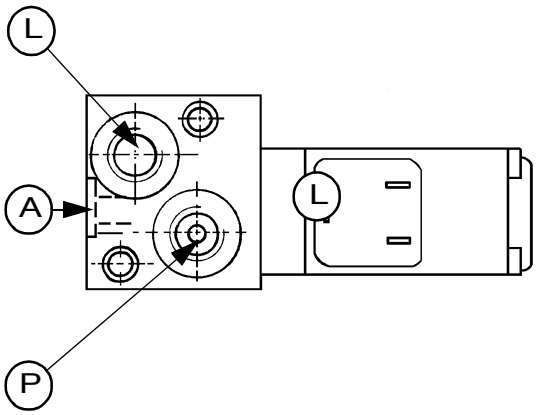
E03519

Remove the barrel support assembly (1). Place the pistons in a position vertical to the axis and remove them, pulling them out of their housings.

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Identification of ports



CS02J558

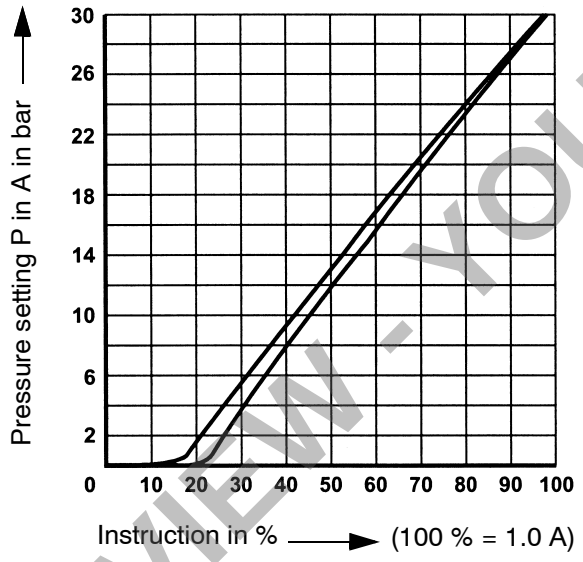
A Torque regulation spool pilot pressure

P Inlet pressure

L Return

Operating principles

Pressure stage 30 bar

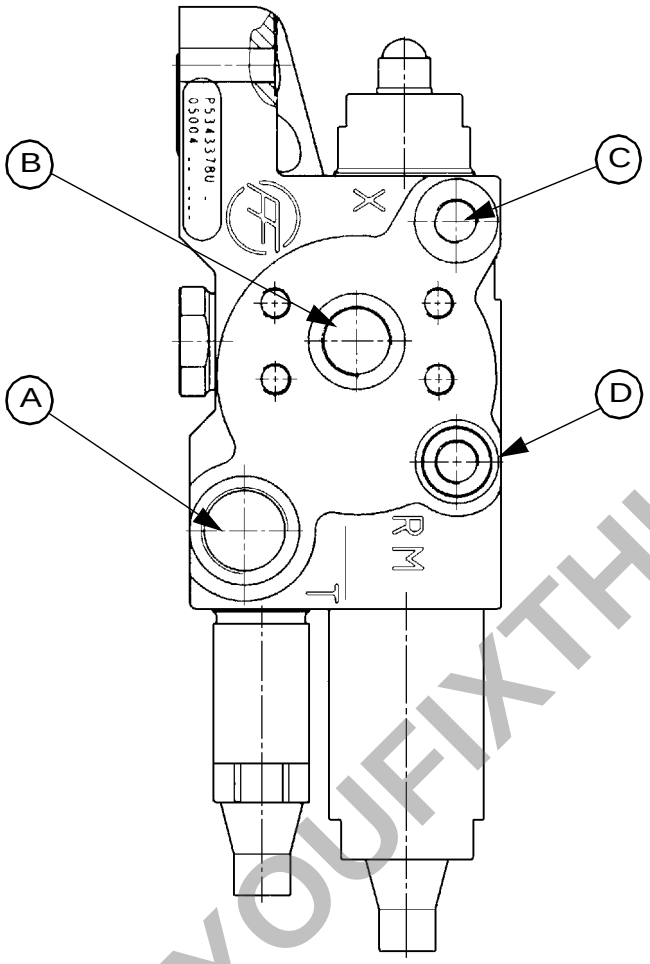


CS02K511

The proportional pressure valve reduces the pressure at port A in proportion to the current at the solenoid. It functions independently from the pressure at port P.

The hydraulic pressure at port A is applied on a spool against the force of the solenoid. When the proportional solenoid is not excited, a return spring placed on the spool makes the connection between A and L.

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CS99H521

Identifications

A Leak return
B Supply to block
C Piloting for boom locking
D Cross-over to right hand block

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