

MACHINE GENERAL SPECIFICATIONS

Engine

Make and model	CASE 4T 390
Total SAE power rating at 2800 rpm	79.8 kW (108 hp)
4 stroke, 4 cylinder diesel engine	turbocharged
Displacement	3920 cm ³
Bore	102 mm
Stroke	120 mm
Cooling	water-cooled
Battery start	Two 12-volt batteries, 24 V, 100 Ah

Working specifications

Speed	2000 rpm
Power rating : SAE	68.5 kW (93 hp)
DIN 70020 - DIN 6271	65 kW (88 hp)
EEC 80/1269 - ISO 9249	65 kW (88 hp)
Performance maintained up to 3000 m altitude at a temperature of 25°C.	
Capacities : Oil sump	10 L
Fuel tank	150 L
Electric fuel tank filler pump	optional
Average hourly consumption	12 L/h
Engine and pump assembly mounted on rubber blocks.	
Heavy-duty dust filtration.	

Hydraulic system

Variable flow circuit with all functions independent and simultaneous.

Working pressure	350 bar
Total capacity of hydraulic reservoir	115 L
Total capacity of system	184 L

2-body pump :

1 variable displacement body for the attachment and travel circuits	flow 210 L/min
1 fixed flow body for the upperstructure frame swing	flow 44 L/min

Direct drive by flexible coupling.

Installed hydraulic power	55.5 kW (75.4 hp)
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Fixed displacement pumps for servo-duties.

Attachment and travel control valves, parallel, closed centre, acting on the "Load Sensing" pump regulation.

Flow rates per function independent of pressures.

Oil cooler with air cooling from engine.

High pressure, multi-spiral hoses

minimum safety factor	2 to 4 times working pressure
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Self-lubricating hydraulic swivel.

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

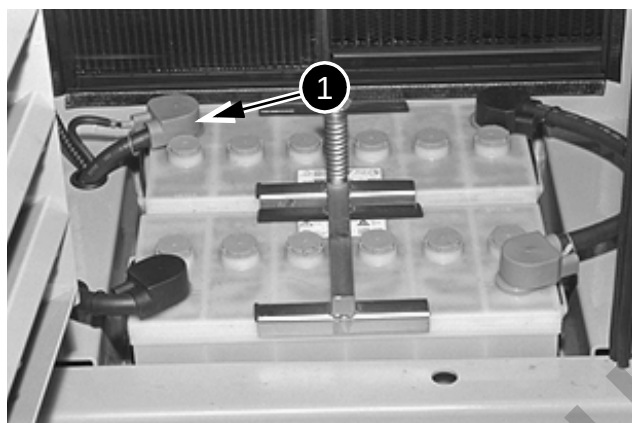
- Park the machine on hard, flat ground.
- Lower the attachment to the ground.
- Stop the engine and let it cool down.
- Turn the battery master switch to the "OFF" position and remove the key.



ATTENTION : When the machine is operating, the components of the engine and the hydraulic pump attain a high temperature. To avoid being burnt by hot metal or scalded by high temperature water or oil, let the machine cool down before beginning any service operation.

Removal and Installation

STEP 1



PG02234

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

STEP 2

Remove the access panels located under the engine.

STEP 3

Remove the exhaust silencer outlet tube.

NOTE : When installing, make sure that the exhaust outlet is pointing towards the rear.

STEP 4

Remove the upper hood using a suitable lifting device.

STEP 5

Remove the side panel on the walkway side.

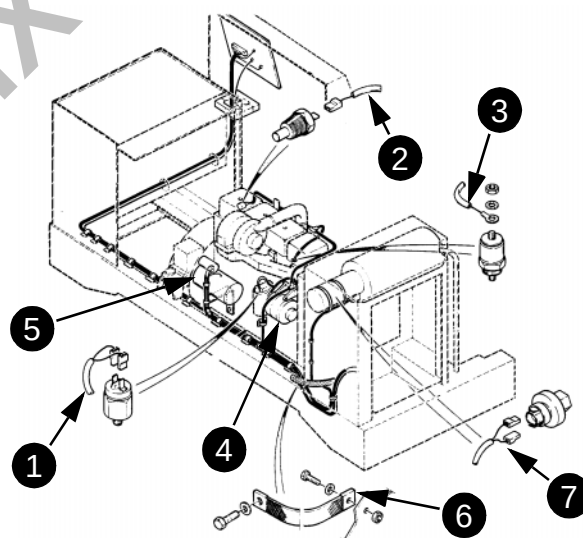
STEP 6

Remove the exhaust silencer and its bracket.

STEP 7

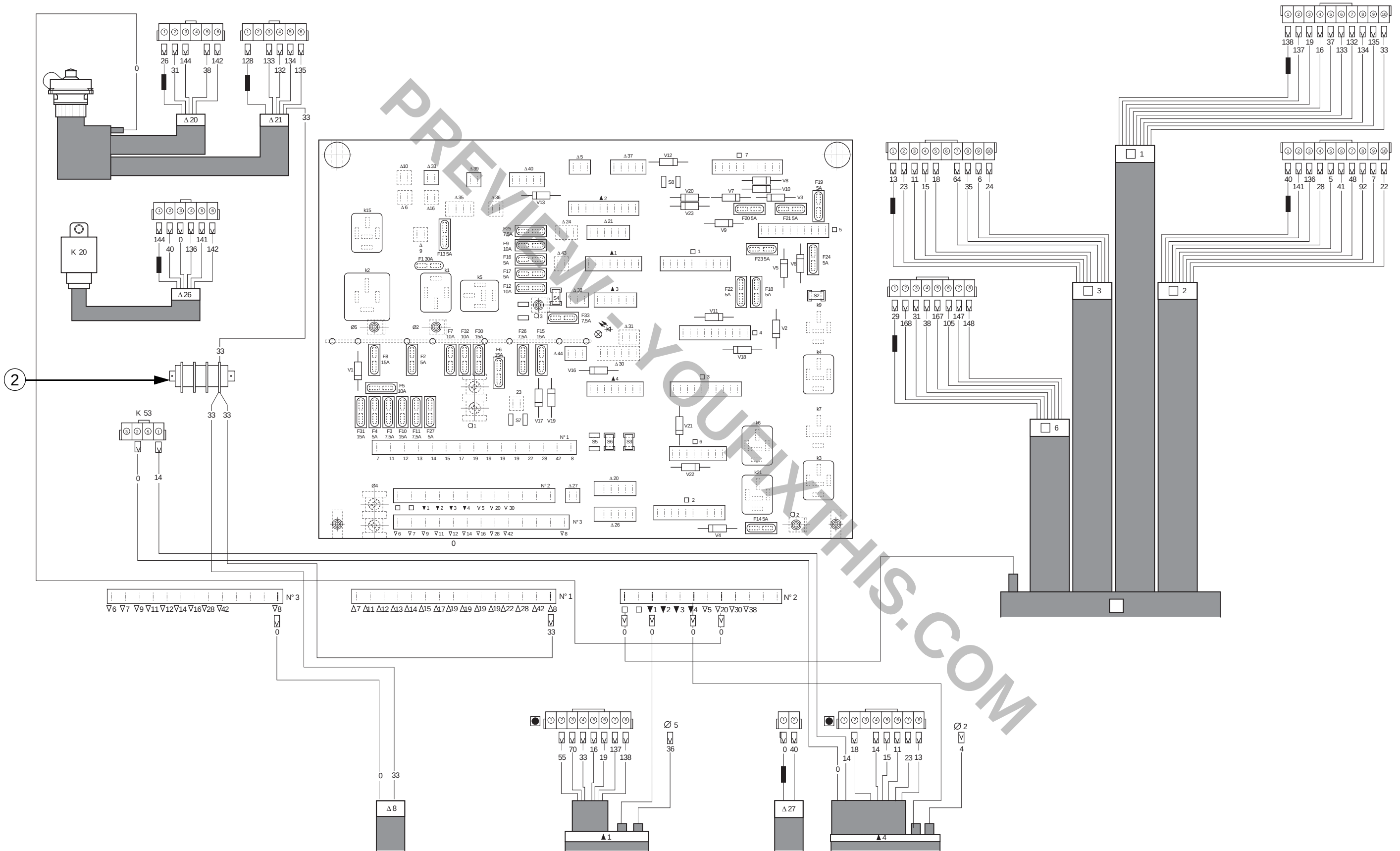
Remove the hose connecting the turbocharger to the air filter.

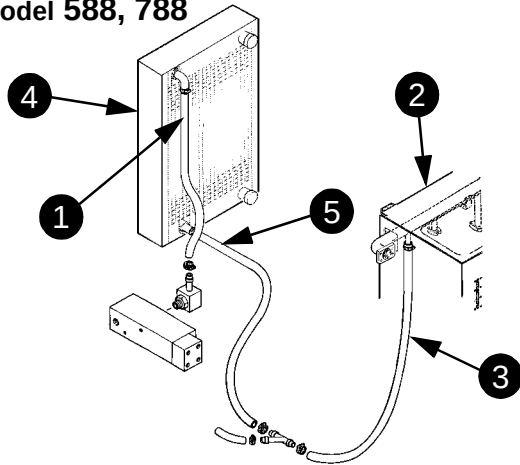
STEP 8



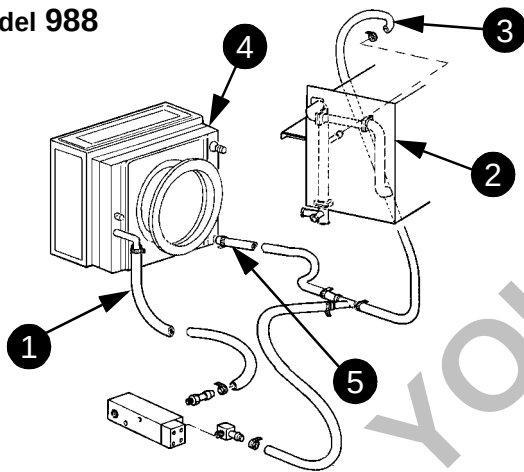
PDG0416

- 1 ENGINE OIL PRESSURE PRESSOSTAT.
- 2 ENGINE COOLANT SOLUTION TEMPERATURE SENDER.
- 3 ENGINE SHUT-DOWN SOLENOID VALVE
- 4 ALTERNATOR (SEE SECTION 4003) FOR WIRING IDENTIFICATION.
- 5 STARTER MOTOR (SEE SECTION 4004) FOR WIRING IDENTIFICATION.
- 6 EARTHING STRAP.
- 7 AIR FILTER RESTRICTION PRESSURE SWITCH.



STEP 6**Model 588, 788**

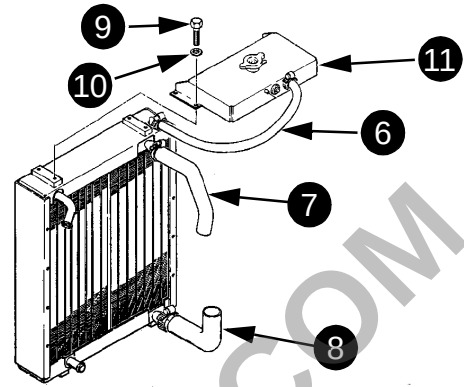
PDG0420

Model 988

PDG0421

Remove and plug the upper hydraulic fluid hose (1). To avoid losing fluid, disconnect the oil cooler (4) return hose (3) from the hydraulic reservoir (2) and drain the oil into a clean receptacle. Reconnect the return hose (3) to the reservoir (2) then remove and plug the oil cooler (4) hose (5).

NOTE: Refer to "Tools required" on page 3 for plugging the hoses (1) and (5).

STEP 7

C199H504

Remove the degassing hose (6) from the radiator and plug it.

Remove and plug the water pump/radiator return hose (7).

Remove and plug the water pump/radiator feed hose (8).

Remove the mounting screws (9) and washers (10) from the coolant reservoir (11).

STEP 8

CD99H006

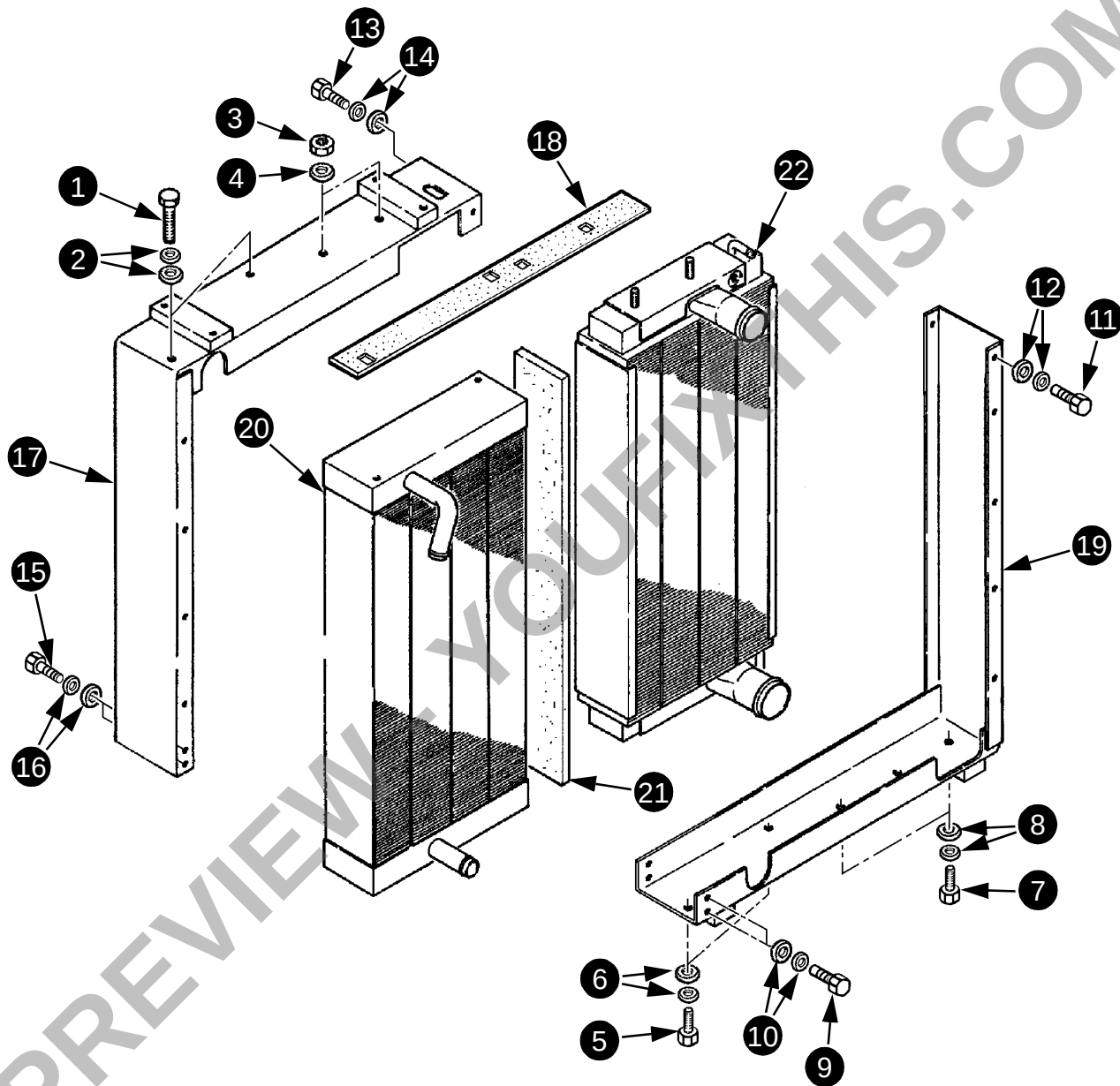
Remove the fan guard fastening hardware and remove the guard.

REPLACING THE RADIATOR OR THE OIL COOLER

Model 588, 788 (bolted radiator and oil cooler frame)

Disassembly and assembly

NOTE: The parts are numbered in order of disassembly. Assembly is carried out in the reverse order from that of disassembly.



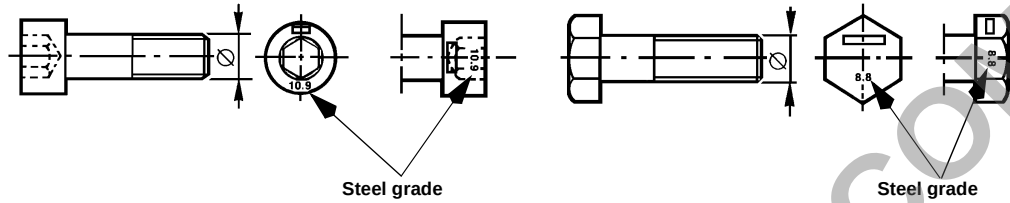
- 1 SCREW
- 2 WASHERS
- 3 NUT
- 4 WASHERS
- 5 SCREW
- 6 WASHERS
- 7 SCREW
- 8 WASHERS
- 9 SCREW
- 10 WASHERS
- 11 SCREW

- 12 WASHERS
- 13 SCREW
- 14 WASHERS
- 15 SCREW
- 16 WASHERS
- 17 UPPER AND LEFT-HAND SIDE BRACKET
- 18 FOAM SEAL
- 19 LOWER AND RIGHT-HAND SIDE BRACKET
- 20 HYDRAULIC FLUID COOLER
- 21 FOAM SEAL
- 22 COOLANT SOLUTION RADIATOR

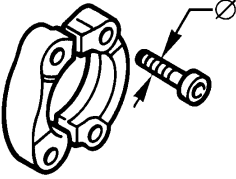
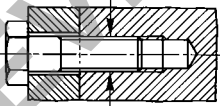
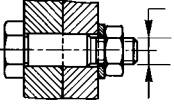
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STANDARD SCREW A TORQUE SPECIFICATIONS

Correct screw identification



PDG0320

	Diameter x thread size Grade 8.8	Key		Torque			
				Nm		lb.ft	
Two-part hydraulic connector (to SAE J518 specifications) 	M5 x 0.8	4	8	5.5	5.5	4.1	4.1
	M6 x 1	5	10	9	9	6.7	6.7
	M8 x 1.5	6	13	22.5	22.5	16.6	16.6
	M10 x 1.5	8	17	45	45	33.2	33.2
	M12 x 1.75	10	19	70	80	51.6	59
	M14 x 2	12	22	100	120	73.8	88.6
	M16 x 2	14	24	170	200	125.5	147.6
	M18 x 2.5	14	27	250	300	184.5	221.4
	M20 x 2.5	17	30	350	400	258.3	295.2
	M22 x 2.5	17	32	500	600	369	442.8
	M24 x 3	-	36	600	700	442.8	516.6
	M27 x 3	-	41	900	1000	664.2	738
	M30 x 3.5	-	46	1200	1400	885.6	1033.2
Components assembled by screws and bolts SCREW   BOLT	Grade 10.9						
	M5 x 0.8	4	8	75	75	5.6	5.6
	M6 x 1	5	10	12.5	12.5	9.3	9.3
	M8 x 1.5	6	13	35	35	25.8	25.8
	M10 x 1.5	8	17	60	70	44.3	51.6
	M12 x 1.75	10	19	100	120	73.8	88.6
	M14 x 2	12	22	170	200	125.5	147.6
	M16 x 2	14	24	250	300	184.5	221.4
	M18 x 2.5	14	27	350	400	258.3	295.2
	M20 x 2.5	17	30	500	600	369	442.8
	M22 x 2.5	17	32	700	800	516.6	442.8
	M24 x 3	-	36	900	1000	664.2	738
	M27 x 3	-	41	1200	1400	885.6	1033.6
	M30 x 3.5	-	46	1700	1900	1254.6	1402.2

	Zinc bichromate
	Phosphate

588 crawler and wheeled hydraulic excavators

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** Refer to the Engine Service Manual

SAFETY



WARNING: This symbol means **WARNING ! BE VIGILANT ! YOUR SAFETY IS AT RISK**. The message that follows the symbol contains important safety information. Read it carefully. Be sure you understand the possible risks of injury or even death.

To avoid all risks, always follow the safety notes contained in this section and throughout this manual.

Put the warning tag shown below on the key for the keyswitch when servicing or repairing the machine. One warning tag is supplied with each machine. Additional tags, Part Number 321-4614, are available from your service parts supplier.



PDG0328



WARNING: Read the Operator's Manual carefully and make sure you understand how to operate the controls correctly.



WARNING: Never operate the machine and attachment controls unless you are seated in the operator's seat. If you are not in the operator's seat, you run the risk of serious injury.



WARNING: The machine is built to carry the operator only. Do not allow passengers to ride on the machine.



WARNING : Prior to starting up the engine read the safety messages contained in the operator's manual carefully. Read all safety stickers on the machine. Have people move back from the machine. Learn how to use the controls before starting up the machine. It is your responsibility to follow the manufacturer's instructions on how to operate and maintain the machine. It is your responsibility to follow applicable rules and regulations. Service and Operator's Manuals are available from your J.I. Case Dealer.



WARNING: If you wear loose clothing or if you omit to use safety equipment for your work, you risk injury. Always wear clothes that do not risk getting caught in the machine. Other safety equipment may be necessary, in particular : helmets, safety shoes, ear plugs, safety glasses, protection mask, thick gloves and reflecting clothes.



WARNING: When working close to the fan with the engine running, avoid wearing loose clothing and operate with extreme caution.



WARNING: When checking the hydraulic circuits, follow procedures to the letter. **DO NOT CHANGE** procedures.

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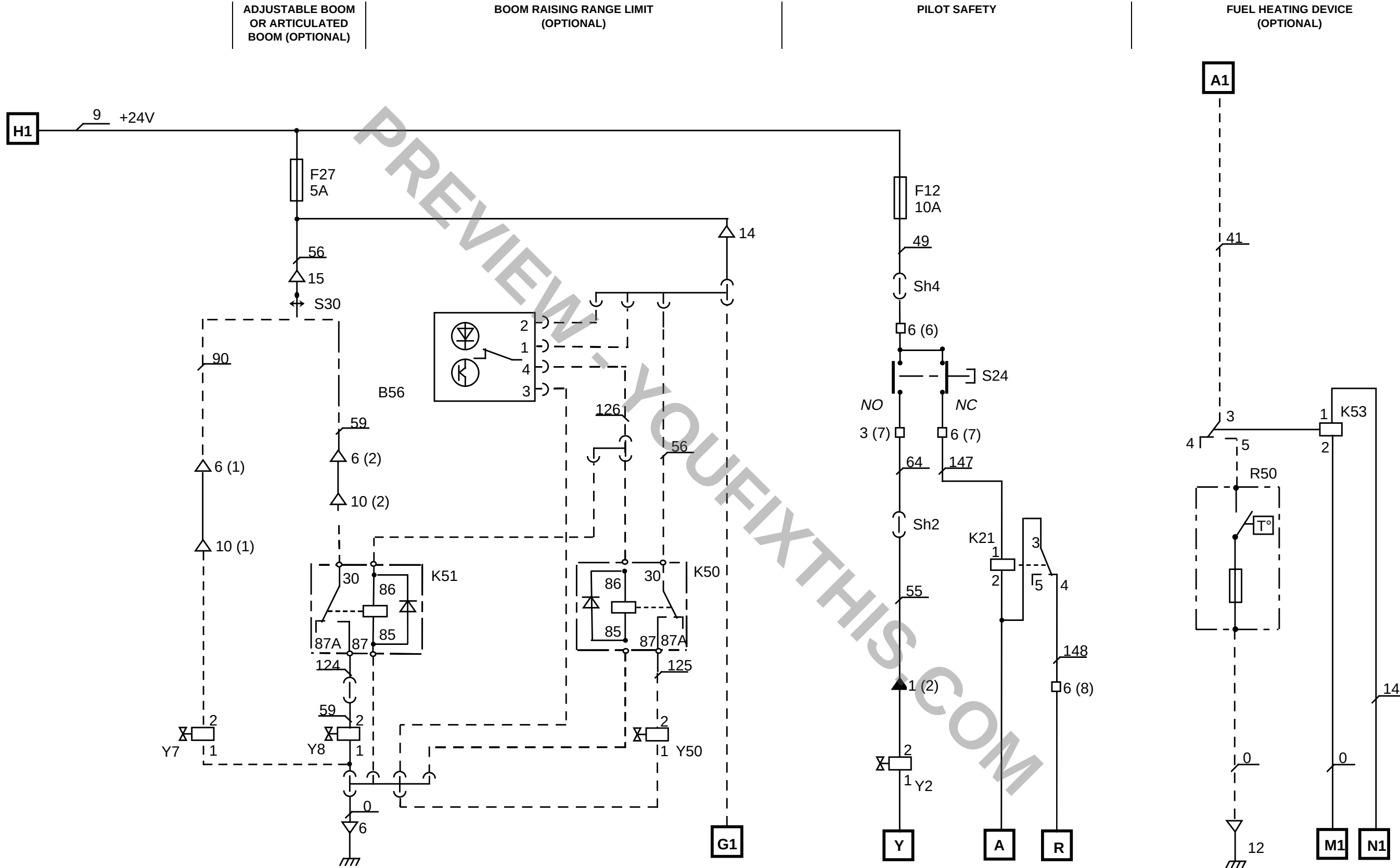
2002

2002

ENGINE REMOVAL AND INSTALLATION

588 Excavators

Download full manual at youfixthis.com



CAB FLOOR WIRING (OPTIONAL)

ELECTRICAL CABINET

1 4 terminal strip

▲ 3, △ 6, △ 9, △ 14, ▽ 14, △ 15, △ 16, △ 19, △ 24, △ 38, △ 43 et □ 6

INSTRUMENT PANEL

- B55 Steering brake pressure switch
- H30 Cold start assistance switch lighting
- H31 Rotary switch lighting
- H32 Overload indicator switch lighting
- H52 Pilot system cancellation switch lighting
- H53 Front working light switch lighting
- H55 Foglight switch lighting
- H58 Quick-attach switch lighting
- S20 Cold start assistance switch
- S21 Overload indicator switch
- S25 Rotary light switch (specific to certain countries)
- S30 Adjustable or articulated boom switch
- S52 Pilot system cancellation switch
- S53 Front working lights switch
- S55 Foglight switch
- S56 Quick-attach switch
- V50 Quick-attach diode
- V51 Quick-attach diode
- V52 Quick-attach diode
- H15 Audible warning

ENGINE MODULE AND UPPERSTRUCTURE WIRING (OPTIONAL)

ELECTRICAL CABINET

1 4 terminal strip

▲ 1, ▲ 4, △ 10, △ 11, △ 12, △ 19, △ 22, △ 23 (1) (2), △ 33, △ 42 et Ø 5

UPPERSTRUCTURE

- B23 Overload indicator
- B56 Boom raising range limitation detector
- E24 Dipper lighting
- E25 Rear foglight
- E29 Licence plate lighting
- K50 Adjustable boom raising range limitation relay
- K51 Adjustable boom lowering range limitation relay
- K53 Fuel heating device relay (fitted standard)
- R50 Fuel heating device
- Y3 Fuel filler pump
- Y7 Adjustable or articulated boom extending solenoid valve
- Y8 Adjustable or articulated boom retracting solenoid valve
- Y14 Pilot system cancellation solenoid valve
- Y50 Adjustable boom raising range limitation solenoid valve
- Y51 Quick-attach solenoid valve
- Y52 Quick-attach solenoid valve
- Y53 Fuel filler pump
- X5 Steering column connector

ENGINE

- E12 Engine compartment light
- R10 Cold start assistance resistor
- R11 Cold start assistance glow plug
- S28 Engine compartment working light switch

Section

4001

ELECTRICAL SCHEMATICS
Wheeled excavators

CAB FLOOR WIRING (OPTIONAL)

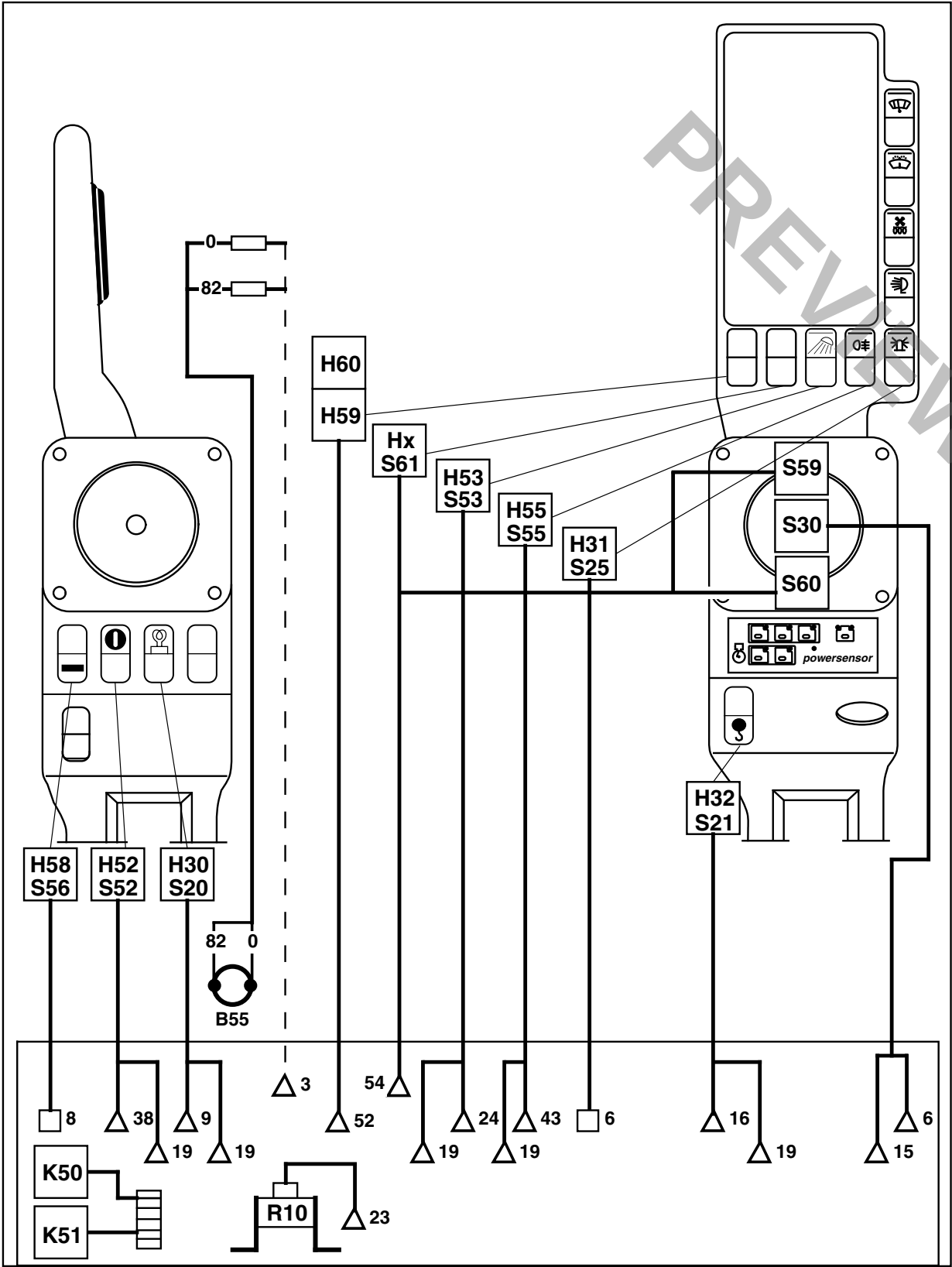
ELECTRICAL CABINET

1 Connecting strip

△ ▽ □ See page 3

INSTRUMENT PANEL

- B55 Steering brake pressure switch
- H30 Cold start assistance switch lighting
- H32 Overload indicator switch lighting
- H52 Pilot system cancellation switch lighting
- H53 Front working light switch lighting
- H58 Quick coupler switch lighting
- H59 Forward travel indicator lamp (green)
- H60 Reverse travel indicator lamp (red)
- K50 Adjustable boom raising limitation relay
- K51 Adjustable boom retracting limitation relay
- R10 Cold start assistance heating element
- S20 Cold start assistance
- S21 Overload indicator switch
- S30 Adjustable or articulated boom control switch
- S52 Pilot system cancellation switch
- S53 Cab front working light switch
- S56 Quick coupler switch
- S59 Forward travel switch
- S61 Direction of travel reverser switch

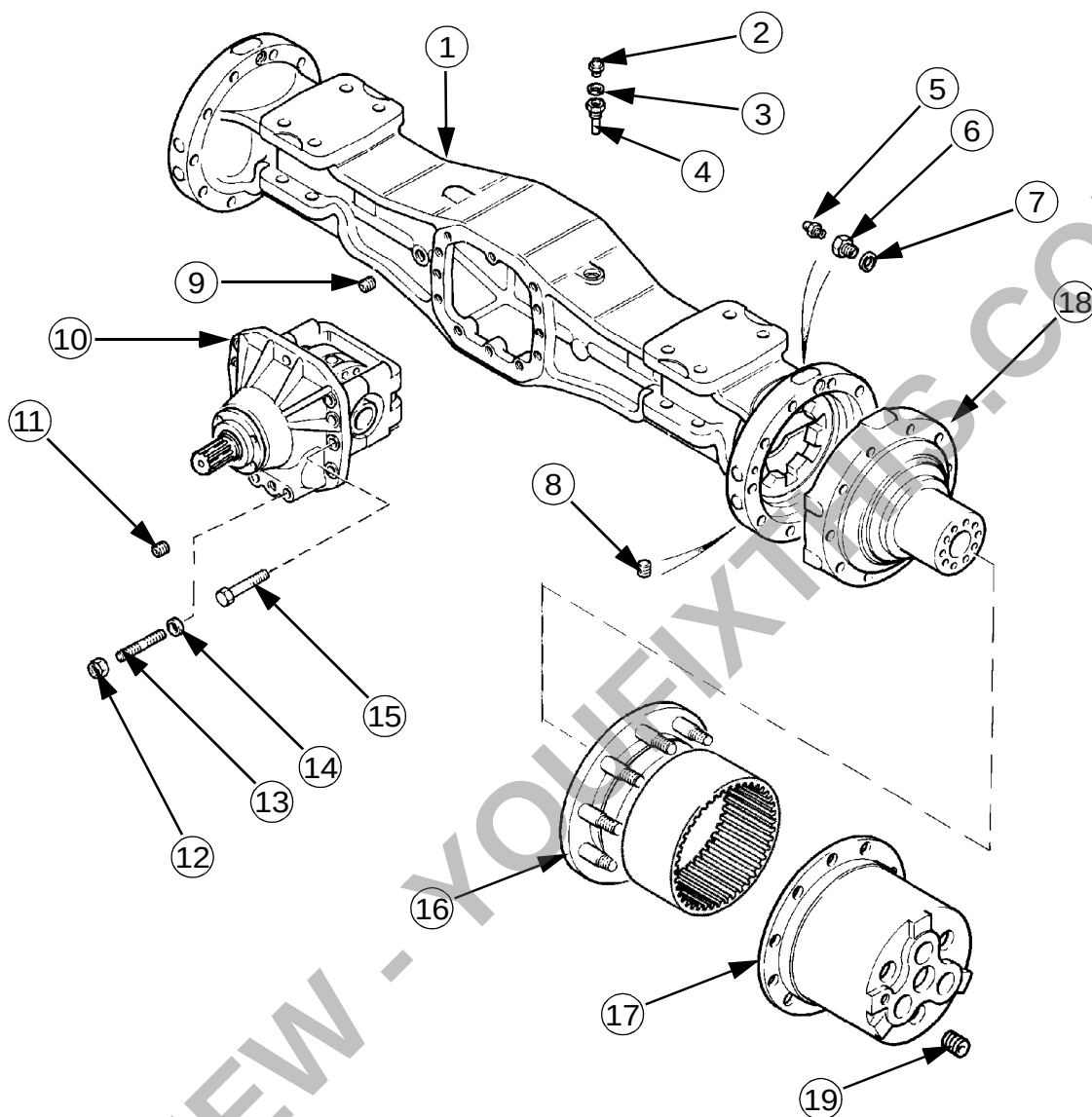


PREVIEW - YOUFIXTHIS.COM

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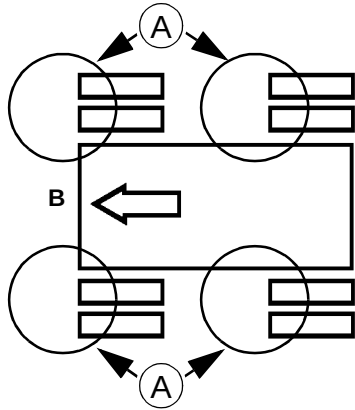
Disassembly and assembly



- | | | | |
|----|-------------------|----|---------------------------------|
| 1 | AXLE HOUSING | 11 | DRAIN PLUG |
| 2 | BREATHER | 12 | PINION HOUSING RETAINING NUT |
| 3 | SEAL | 13 | PINION HOUSING STUD |
| 4 | BREATHER SUPPORT | 14 | WASHER |
| 5 | BLEED SCREW | 15 | PINION HOUSING RETAINING SCREWS |
| 6 | BLEED SCREW UNION | 16 | WHEEL HUB |
| 7 | SEAL | 17 | PLANETARY GEAR |
| 8 | DRAIN PLUG | 18 | HUB SHAFT AND SERVICE BRAKE |
| 9 | FILLER PLUG | 19 | REDUCTION GEAR DRAIN PLUG |
| 10 | PINION HOUSING | | |

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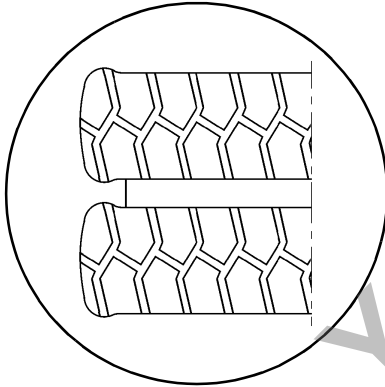
Direction of installation of tyres on rims



B = Front of machine

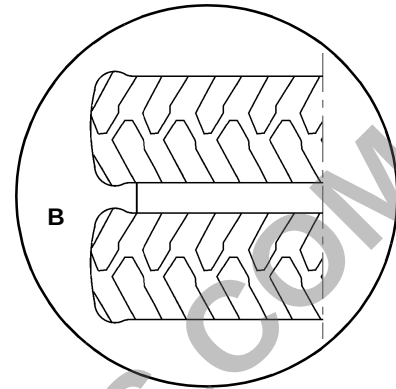
CS99K549

1. Detail (A) Nokia tyre (no particular direction)



CI99K511

2. Detail (A) Mitas/Barum tyre

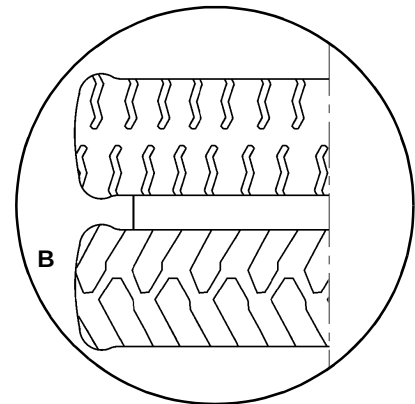


CI99K512

An arrow on the tyre indicates the direction of rotation when the excavator is moving forward.

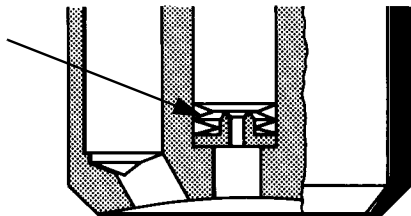
3. Detail (A) Special Rail-Road Barum inside tyre (no particular direction)

Outside Mitas tyre (an arrow on the tyre indicates the direction of rotation when the excavator is moving forward).



CI99M507

NOTE: Tyres with Barum markings have been replaced by tyres with Mitas markings. These tyres are identical and interchangeable.

NOTE:

PDH0164

When assembling, install the spring washers in the barrel central bore, as shown.

STEP 12

D02230

Remove the retaining plate retaining screws.

NOTE: When assembling, install the screws using Loctite 262.

STEP 13

D02226

Carefully remove the retaining plate complete with pistons and guide shaft.

STEP 14

D02224

Remove the pistons and the central shaft from the retaining plate.

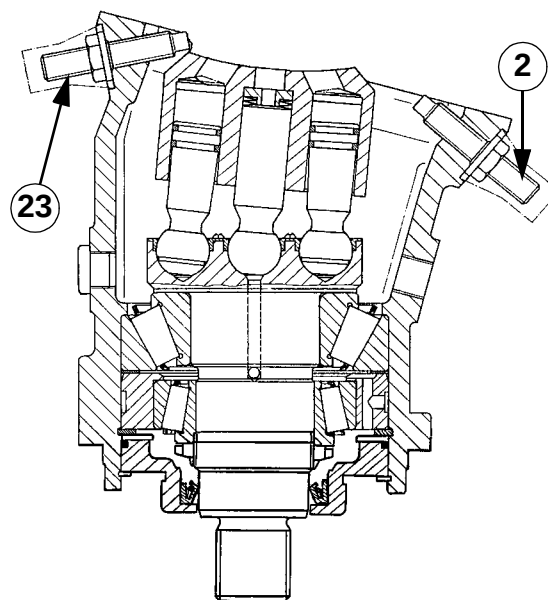
NOTE: When assembling, proceed in the reverse order from that of disassembly.

There are two travel motors on the **788** and **988** excavators.

- A standard motor
- A motor for excavators operating in Germany

The only differing feature between these two versions is in the adjustment of the minimum displacement screw (23).

The minimum displacement adjusting screw (23) and the maximum displacement adjusting screw (2) must not be disassembled.



PDH0325

Section

7080

**STEERING, STABILIZER, DOZER BLADE
AND FRONT AXLE LOCKING CYLINDERS**

ALL CHECKS AND ADJUSTMENTS ARE CARRIED OUT AT VARIOUS ENGINE SPEEDS AND AT A TEMPERATURE OF 50°C.

Checking the pilot pressure with the control arm lowered

Connect the multimeter to the manifold at **M4**.
Run the engine at full speed.
The pressure should be greater than **34** (bar).
If it is not, check the **P35** or the electrical circuit.

AFTER EACH CHECK, IF THE PARAMETERS ARE INCORRECT, ADJUST AT THE COMPONENT CONCERNED OR CHANGE THE COMPONENT.

Setting the LS valve pressure

Static test using the same 0/40 bar pressure gauge:

WARNING! Start the engine running, before connecting the pressure gauge at **M1**.

Raise the left-hand control arm as a safety measure.
Run the engine at full speed.

Connect the pressure gauge at **M3**. The pressure should be between **8** and **12** (bar). If not, check the **P10**.

Connect the pressure gauge at **M1**. The difference between **M1** and **M3** should be **21** to **25** (bar).

Dynamic test using multimeter:

Assemble the spacer on the boom raising control lever push-rod.

Connect the two outlets from the multimeter at **M1** and **M3**.

Operate the boom raising control.

The pressure differential should be between **21** and **23** (bar).

Checking the maximum flow from the variable displacement pump

Run the engine at full speed.

Connect the multimeter for flow measurement.

Retract the dipper and close the bucket simultaneously.

The flow should be greater than **205** (l/min) and the pressure at **M1** lower than **125** (bar).

Checking the balance valve flows

Attachment control valves

Supply the large chambers of the boom, bucket and dipper cylinders, one after another.

The flows should be between:

- **140** and **160** (l/min) on the boom.
- **90** and **110** (l/min) on the bucket.
- **115** and **135** (l/min) on the dipper.

Travel control valve

Connect the multimeter at **M6** to check the travel control valve spool pilot pressure in forward and reverse travel.

Raise the excavator using the stabilizers and the blade.

Select job-site speed, travel forward and reverse.

The pressure readings should be **24** (bar) minimum. If they are not, adjust the pressure regulator or add shims under the travel reverser spool spring(s).

Forward travel The flow reading should be between **163** and **173** (l/min).

If it is not, adjust the balance valve.

Reverse travel The flow reading should be between **160** and **173** (l/min). The universal joint speeds in work-site speed range should be between **649** and **659** rpm or (**547** and **556** rpm for German excavators in forward travel and between **627** and **659** rpm or (**523** and **556** rpm for German excavators) in reverse travel.

The universal joint speeds in road speed range should be between **2166** and **2196** rpm or (**1825** and **1855** rpm for German excavators) in forward travel and between **2091** and **2196** rpm or (**1745** and **1855** rpm for German excavators) in reverse travel.

Stabilizer and blade control valve.

When descending a slope, the flow should be for:

- **2 stabilizer pads**: between **150** and **180** (l/min)
- **1 dozer blade**: between **60** and **80** (l/min)

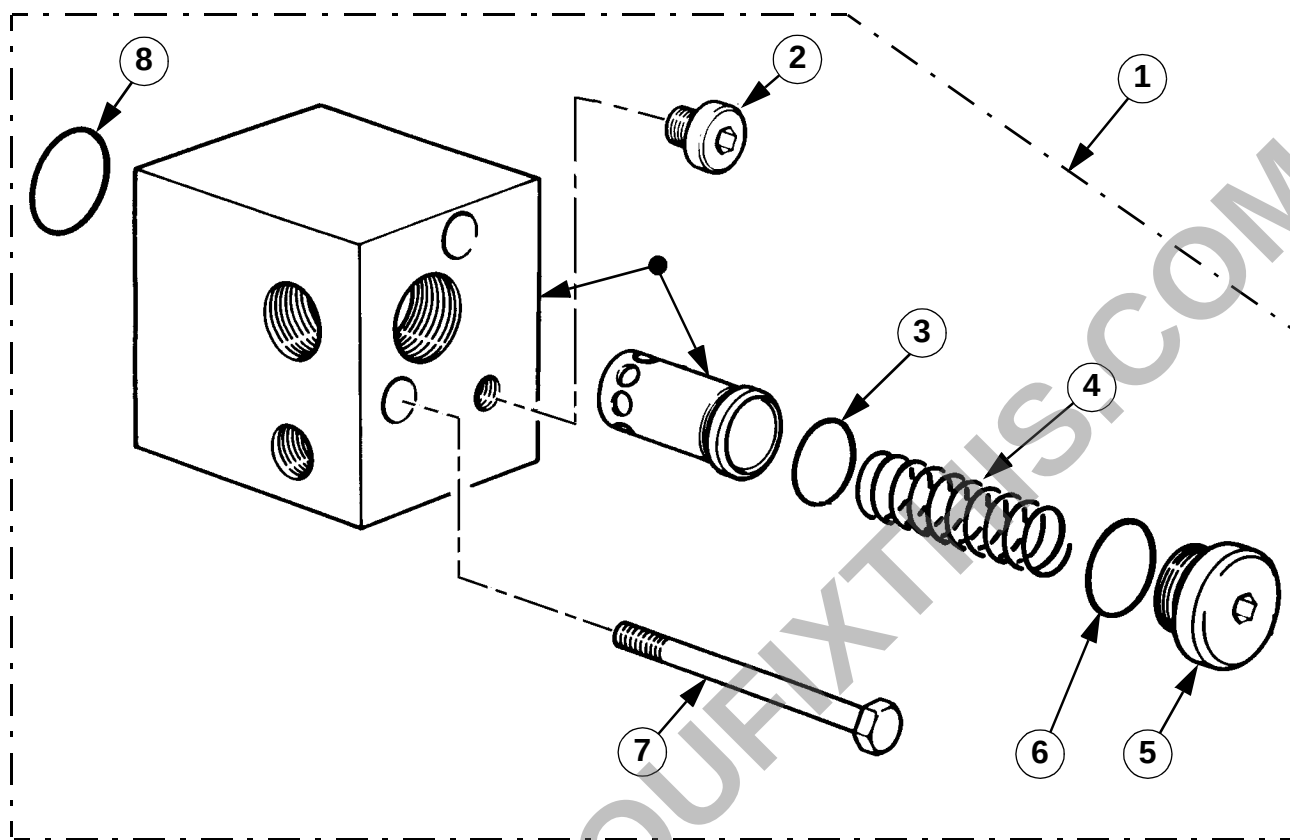
If not, adjust the balance valve, or check the jet at the large chamber inlet for the blade.

When raising, the flow should be for:

- **2 stabilizer pads**: between **40** and **50** (l/min)
- **1 blade**: between **15** and **30** (l/min)

If it is not, check the flow limiter(s) at the front or rear of the chassis when equipped with stabilizer pads.

Disassembly and assembly of P10 pressure limiter

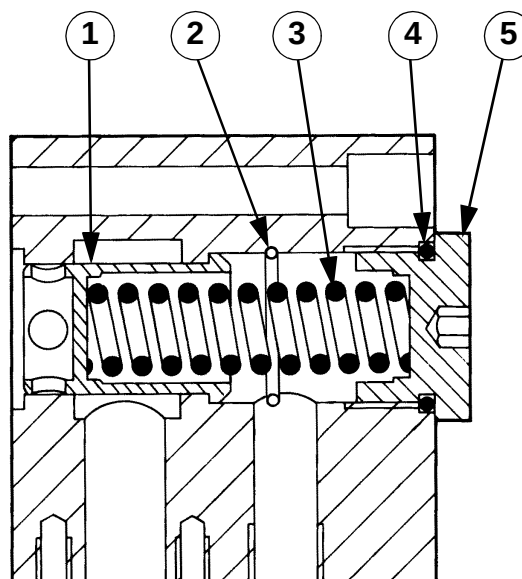


PDH0080

- 1 P10 PRESSURE LIMITER BLOCK SPOOL
- 2 PLUG
- 3 RETAINING RING
- 4 PRE-SET SPRING
- 5 PLUG
- 6 O-RING
- 7 SCREW
- 8 O-RING

Cross-sectional drawing

- 1 SPOOL
- 2 RETAINING RING
- 3 PRE-SET SPRING
- 4 O-RING
- 5 PLUG

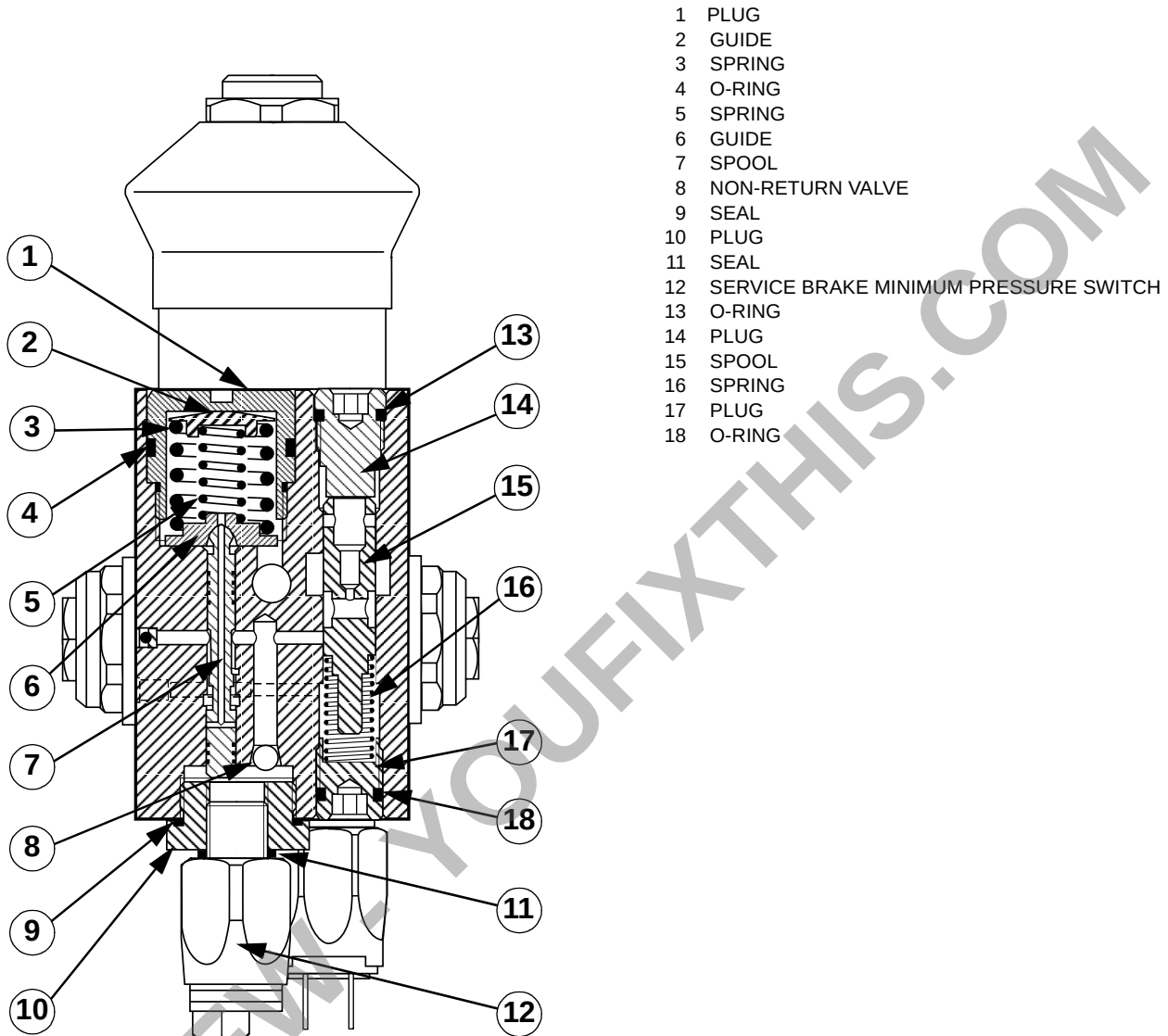


PDG0028

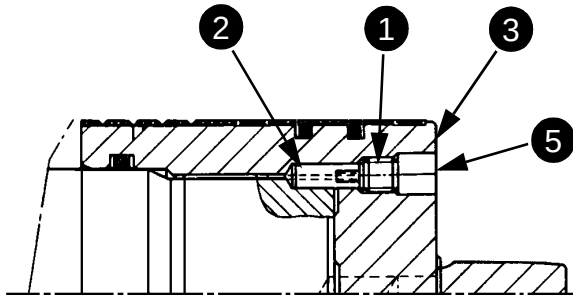
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Engagement/disengagement/Flow divider

SECTION C-C



CS96M010

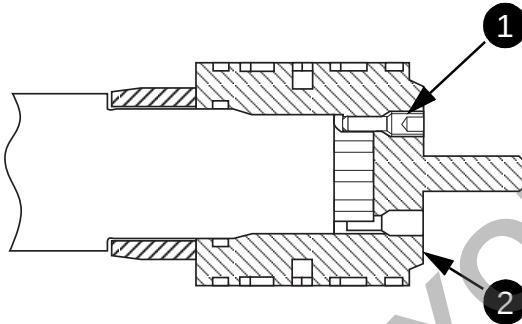
STEP 3

PDF0241C

Remove the piston (3) once again to eliminate any trace of iron filings or chips inside the orifice (5). Install piston (3) again and tighten it to torque using special tool CAS 1618. Introduce the locking pin (2) into its housing. Install the retainer screw (1) and tighten to torque. (See the specifications).

NOTE : Do not lubricate the retainer screw (1).

2) Piston with rotation lock using locking pin not involving a drilling out operation

Removal

PDH0311A

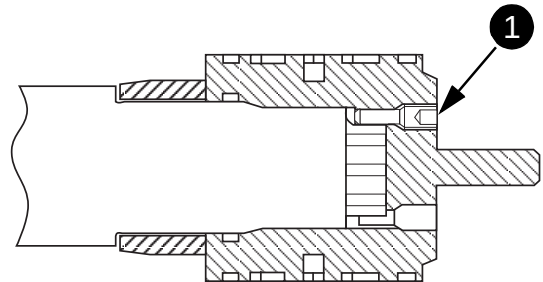
Remove the locking pin (1) using an 8 mm hexagonal Allen key.

Remove piston (2) using special tool CAS 1618.

NOTE : Make a visual inspection of the seal grooves, threads, the piston and the threads of the cylinder rod.

Installation**STEP 1**

Lubricate the piston threads and the cylinder rod thread. Install the piston on the cylinder rod using special tool CAS 1618. Tighten the piston to torque (see the specifications).

STEP 2

PDH0311B

Introduce the locking pin (1) into its housing and tighten to torque of (see specifications). If the locking pin will not go in, tighten to a higher torque. Never untighten.

NOTE : Do not lubricate the locking pin (1).

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