Service Manual

802.7 Plus
802.7 Super
803 Plus
803 Super
804 Plus
804 Super

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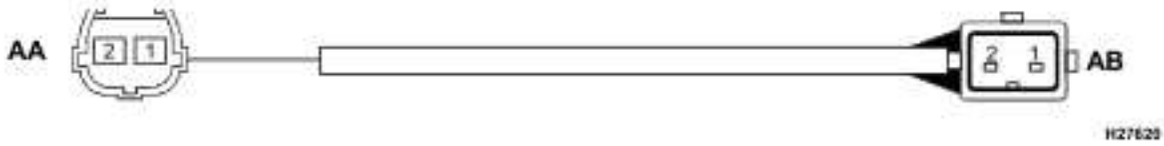
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Harness Specifications - cont'd

Fuel Sender Adaptor Harness



AA	FUEL SENDER			A,B
TERM	WIRE	SIZE	DEST	TYPE
1	408	1,0	AB1	C,D
2	600	1,0	AB2	C,D

AB	MAIN HARNESS			E,F
TERM	WIRE	SIZE	DEST	TYPE
1	408	1,0	AA1	G
2	600	1,0	AA2	G

Item Reference Table

Item Ref.	Description
A	Econoseal Socket Housing, Two Way
B	Econoseal Socket Retainer, Two Way
C	Econoseal Socket Terminal, 0.75 - 2.0 mm
D	Econoseal Cable Seal
E	Junior Timer Pin Housing, Two Way
F	Heatshrink Sleeving, Adhesive Lined
G	Junior Timer Pin Terminal

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Fuel Injection Pump Assembly

Removing and Fitting

Removing

1 Remove fuel pipe assembly from injectors and fuel pump, see page L/5 - 6.

2 Remove the two mounting bolts **A** and nuts **B**.

3 Carefully lift the fuel injection pump until access to the link snap pin **C** is gained.

4 Disconnect the link **D** and remove the fuel injection pump.

5 Remove the shim(s) **E**. Record the number and thickness of the shim(s) for re-assembly.

Fitting

1 Put the shim(s) **E** in position.

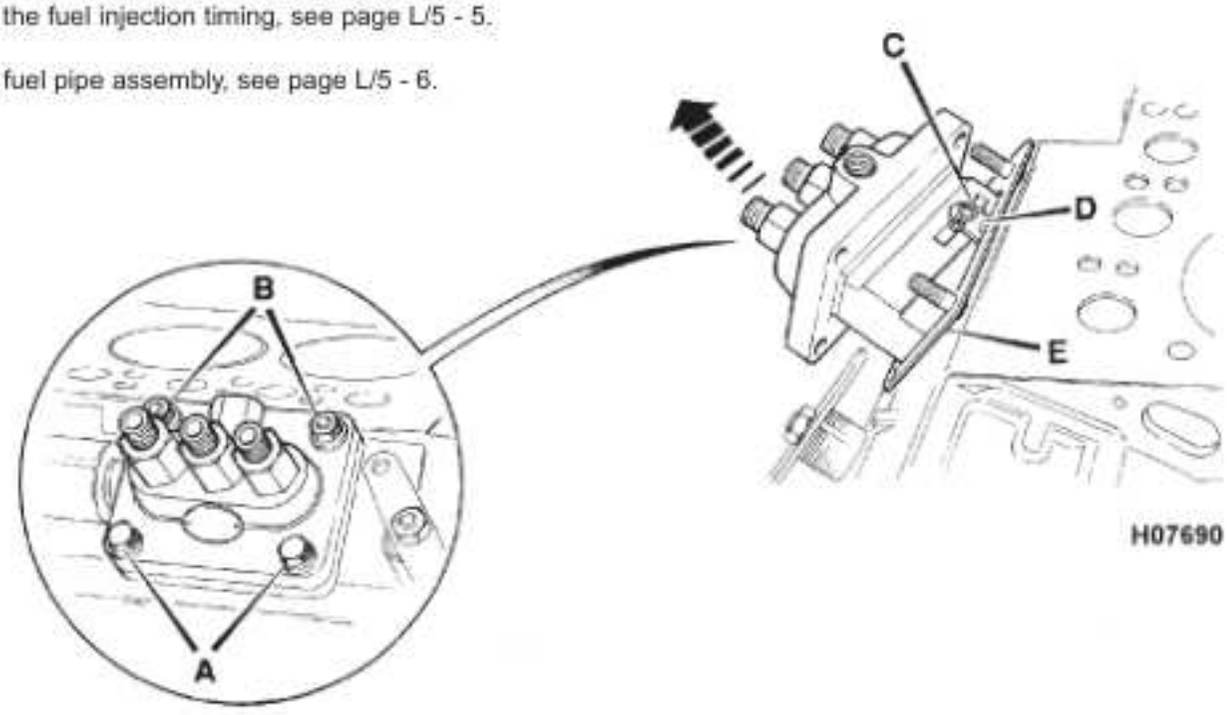
2 Position the fuel pump and connect the link **D**. Fit the snap pin **C**.

3 Install the fuel pump and fit the mounting bolts **A** and nuts **B**.

4 Tighten the mounting nuts and bolts.

5 Adjust the fuel injection timing, see page L/5 - 5.

6 Fit the fuel pipe assembly, see page L/5 - 6.



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Piston and Connecting Rods (cont'd)

Inspecting

1 Examine the outer surface of the piston **D** for cracks, scores and burns. If excessive, renew the piston.

- Check the larger diameter of the piston skirt (1 0 mm (0.4 in) from the bottom) and check the inside diameter (thrust direction) of the cylinder bore. Calculate the clearance between the cylinder and the piston. If this clearance is more than the permitted value, or the piston diameter is less than the permitted value (see Technical Data) renew the piston.

Note: *If the cylinder bore is oversized, make sure that an oversized piston is used.*

3 Measure the inside diameter of the gudgeon pin hole and the outside diameter of the gudgeon pin. Calculate the difference. If the clearance is excessive (see Technical Data), renew as necessary.

4 Measure the outside diameter of the gudgeon pin. If less than permitted value (see Technical Data) renew it.

5 Clean out the carbon from the piston ring grooves.

6 Examine the piston rings and renew as necessary.

7 Insert the rings into the cylinder bore at right angles to the bore and measure the clearance. If the clearance is excessive (see Technical Data), renew as necessary.

8 Measure the clearance between the piston ring groove and the ring. If the clearance is excessive (see Technical Data), renew the ring.

9 Check the connecting rod **E** for distortion between the large and small ends. If the distortion is excessive (see Technical Data), renew the connecting rod.

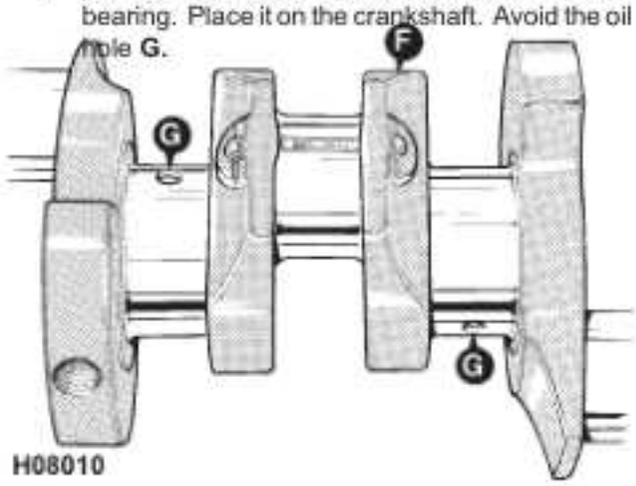
10 Measure the inside diameter of the connecting rod small-end bush and calculate the clearance between the small-end bush and the gudgeon pin. If the clearance is excessive (see Technical Data), renew as necessary.

11 Assemble the connecting rod to the crankshaft and measure the play in the shaft direction. If the play is excessive (see Technical Data), renew the connecting rod.

12 Check the oil clearance, using plastigauge, as follows:

- Remove oil or foreign matter from the bearing and crankshaft **F.**

- Cut the plastigauge to the same width as the bearing. Place it on the crankshaft. Avoid the oil hole **G.**



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- Assemble the connecting rod and connecting rod cap and torque tighten to 49-54Nm (5.0-5.5 kgf m, 36-40 lbf ft).

Note: *Never rotate the connecting rod.*

- Remove the connecting rod cap. Measure the oil clearance with the scale printed on the gauge bag.

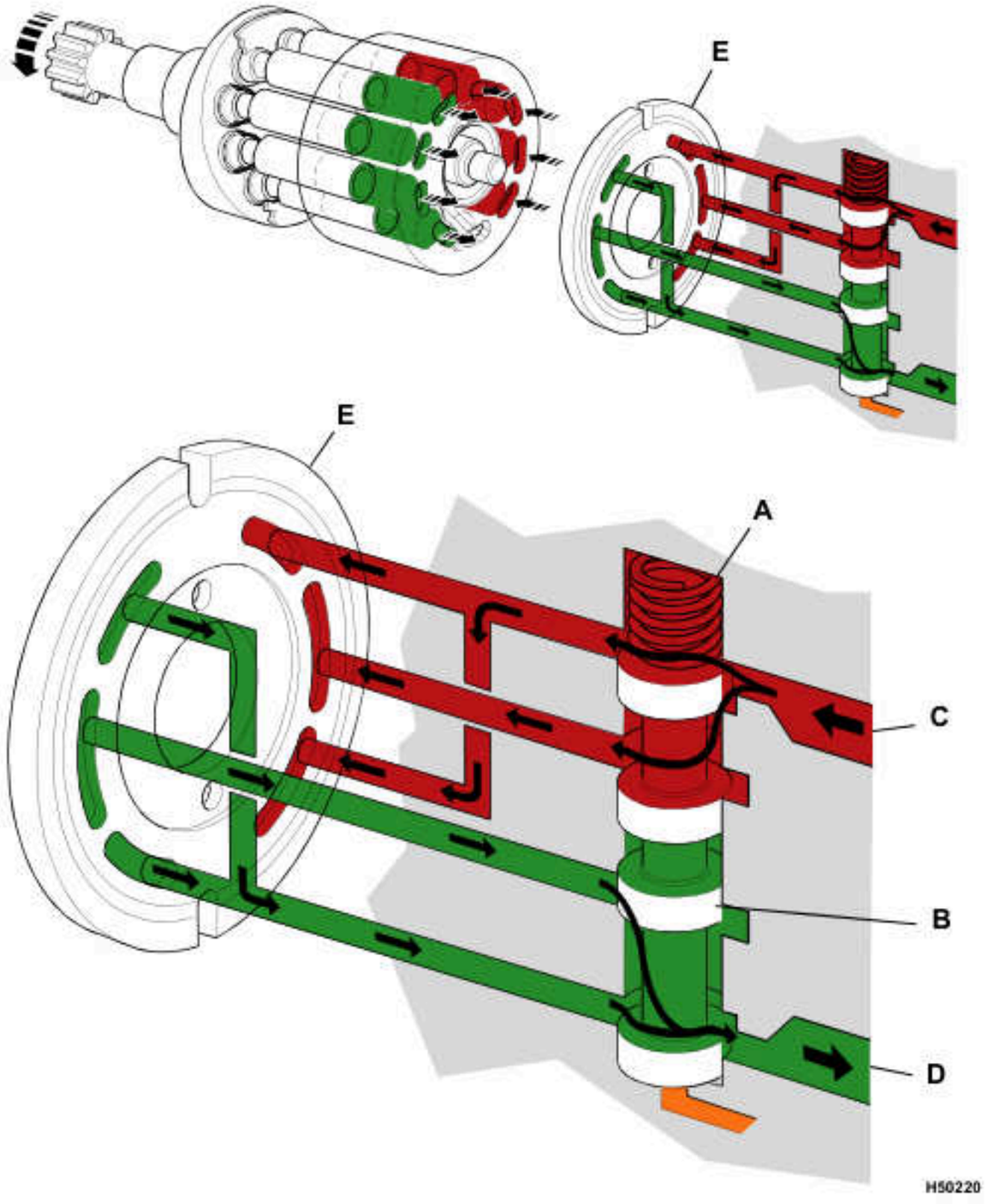
Note: *Measure the widest area.*

If oil clearance exceeds the permitted value (see Technical Data), renew the bearing. Or, grind the crankshaft and use underside bearings as follows (see Microfiche for part numbers):

Bearing Size	Crankshaft Pin O.D.
Standard	51.964 - 51.975 mm (2.0458 - 2.0463 in)
0.25 mm (0.0098 in)	51.714 - 51.725 mm (2.0360 - 2.0364 in)
0.50 mm (0.0196 in)	51.464 - 51.475 mm (2.0261- 2.0266 in)

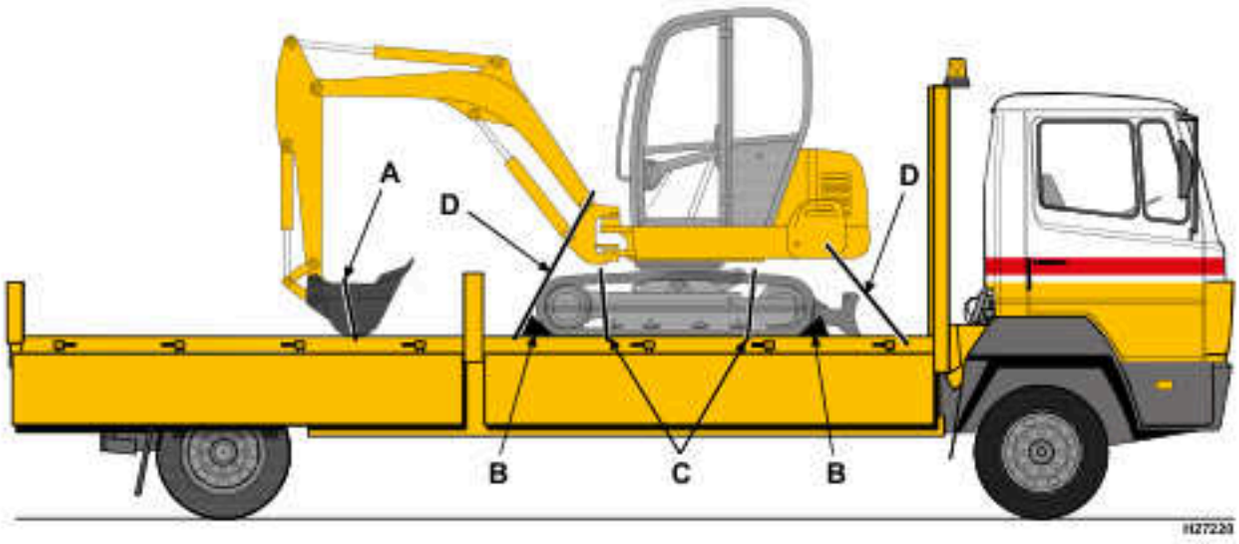
Note: *When grinding the outside diameter of the crankshaft, make sure that the oil clearance is correct before reassembly.*

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B90 SECURING THE MACHINE B90



B91 SECURING THE MACHINE B91

WARNING

The machine must be securely tied down to the trailer to prevent lateral movement, fore-and-aft movement, and slewing of the superstructure. Failure to do so could cause injury to yourself or others.

1 Engage slew lock. Ensure by operating the slew control that the slew lock is engaged.

2 Close the bucket. Position the dipper vertically and lower the boom until the bucket rests on a wooden block on the trailer bed.

3 Position a wire rope **A** of suitable breaking strain over the bucket and secure to the trailer shackles.

4 Place skids **B** under each track at front and rear to prevent movement of the machine in the fore-and-aft direction.

5 Position a wire rope **C** of suitable breaking strain around each track at front and rear and secure to the trailer shackles to prevent lateral movement of the machine.

6 Attach wire ropes **D** of suitable breaking strain to the lifting points on the superstructure and secure to the trailer shackles to prevent the superstructure from swinging.

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*Hydraulic Circuit Schematic - 802.7 Super / 803 Super / 804Plus & Super

Component Key

P Pump
P1 Pump Section 1 (variable displacement)
P2 Pump Section 2 (variable displacement)
P3 Pump Section 3 (fixed displacement)
T Tank
E Engine
1 Five Spool Valve Block
1A Main Relief Valve
1B Dozer Spool
1C Auxiliary Relief Valves
1D Load Hold Check Valves
1E Swing Spool
1F Slew Spool
1G Dipper Boost Spool
1H Auxiliary Spool
1J Anti-cavitation valve
2 High Pressure Carry-over Tube
2A Non-Return Valve
3 Six Spool Valve Block
3A Bucket/Boom/RH Track - MRV
3B L.H. Track/Dipper/Boom Boost - MRV
3C R.H. Track Spool
3D Boom Spool
3E Bucket Spool
3F L.H. Track Spool
3G Dipper Spool
3H Boom Boost
4 Pressure Maintenance Valve
4A Pressure Reducing Valve
4B Shuttle Valves
4C Servo Isolation Solenoid
4D Two Speed Tracking Solenoid
4E Non-return Valve
4F Pressure Test Points
5 Accumulator
6 R.H. Joystick Controller
6A Boom Control
6B Bucket Control
7 L.H. Joystick Controller
7A Swing / Slew Control
7B Dipper Control
8 Dual Solenoid Valve
9 Dozer Ram
10 Swing Ram
11 Slew Motor
11A Cross-line Relief Valves
11B Slew anti-cavatation Valves
12 Dipper Ram
13 Dipper Boost Dump Valve
14 Auxiliary Couplings (Double Acting)
14A Auxiliary Coupling (Single Acting)
15 Rotary Coupling
16 L.H. Track Motor
16A Counterbalance Valve
16B Two Speed Tracking Valve
17 R.H. Track Motor
17A Counterbalance Valve
17B Two Speed Tracking Valve
18 Boom Ram
19 Bucket Ram
19A Restrictor
20 Oil Cooler
21 Return Filter with By-pass Valve
22 Suction strainer
23 Check Valve

*Hydraulic Circuit - 802.7 Super / 803 Super / 804Plus & Super

Note: *Circuit and description are for ISO machines.*

The mini-excavator hydraulic circuit is fed from a hydraulic oil tank **T**, located to the right of the operator's cab.

The system is powered by a three section pump **P**, connected directly to the engine crankshaft.
Sections **P1** and **P2** are constant horsepower variable displacement pumps, section **P3** is a fixed displacement gear pump
When the engine is running, the pump draws fluid from the tank and routes it through the two main control valve blocks **1** and **2**.

Pump section **P1** supplies the control valve sections for:

- Dozer ram, **1B**
- Swing ram, **1E**
- Slew motor, **1F**
- Dipper Boost, **1G**
- Auxiliary, **1H**

Pump section **P2** supplies the control valve sections for:

- Right hand track motor, **17**
- Boom ram, **18**
- Bucket ram, **19**

Pump section **P3** supplies the control valve sections for:

- Left hand track motor, **3F**
- Dipper ram, **3G**
- Boom boost, **3H**

Supply from all three pumps is also directed to the Pressure Maintenance Valve **4**, fitted with a single adjustable pressure reducing valve **4A**, Servo Isolation Solenoid Valve **4C** and Two Speed Tracking Solenoid **4D**. Supply from the pumps is via a servo signal hose directed into shuttle valves **4B**.

Main relief valves (M.R.V.) **1A, 3A** and **3B** are fitted in the main control valve blocks to vent hydraulic pressure, venting excess flow to tank **T**.

Auxiliary relief valves (A.R.V.) **1C** are fitted to protect the dipper, boom and the head side only on the dozer ram from damage that might be generated through over-pressure conditions during operation.
When the A.R.V.'s are open, over pressure fluid is routed to the control valve exhaust chamber and back to tank **T**.

The service lines to the dozer ram, the track motors and the pilot line from the high speed selector to the track motors are routed through a rotary coupling **15**. This device allows the machine upper structure to turn without damaging hoses connected to services mounted on the undercarriage.

The remaining service lines connect directly to their relevant devices. Return fluid from services or from the neutral pressure circuit is routed back to tank through an exhaust line and return filter **21**.

Neutral Pressure Circuit

With the engine running, but no service selected, the pump flows are routed from pump sections **P1**, **P2** and **P3** to respective valves.

The valve spools are spring loaded to the neutral position, allowing fluid to pass through the valve's neutral circuit and returned to tank through the return line.

Excess pressure in the selected circuit opens the M.R.V. associated with the valve section suppied and vents excess pressure back to tank **T**.

Dipper Boost

Dipper speed is increased by an automatic dipper boost system. Dipper boost is achived by adding a fifth spool **1G** between the slew and auxiliary spools in the rear valve block **1**, the spool is arranged in series to the slew spool to maintain 'preferred' slew operation. The boost supply from pump **P1** via this fifth spool is piped through a line mounted relief valve **13** and joins the main dipper spool **3G** flow to the ram **L**.
Relief valve **13** limits the boost pressure to 160 bar (2320 lbf/in2) and is pilot operated from pressure developing in the main dipper feed pump **P3**. This dump valve ensures that when dipper tearout is utilised the boost supply is off-loaded back to tank by relief valve **13A** enabling full system pressure to be generated at the main excavator pumps **P2** and **P3** without overloading the engine.

Main Relief Valves

The main relief valves **1A, 3A** and **3B** are incorporated into the respective control valve blocks

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