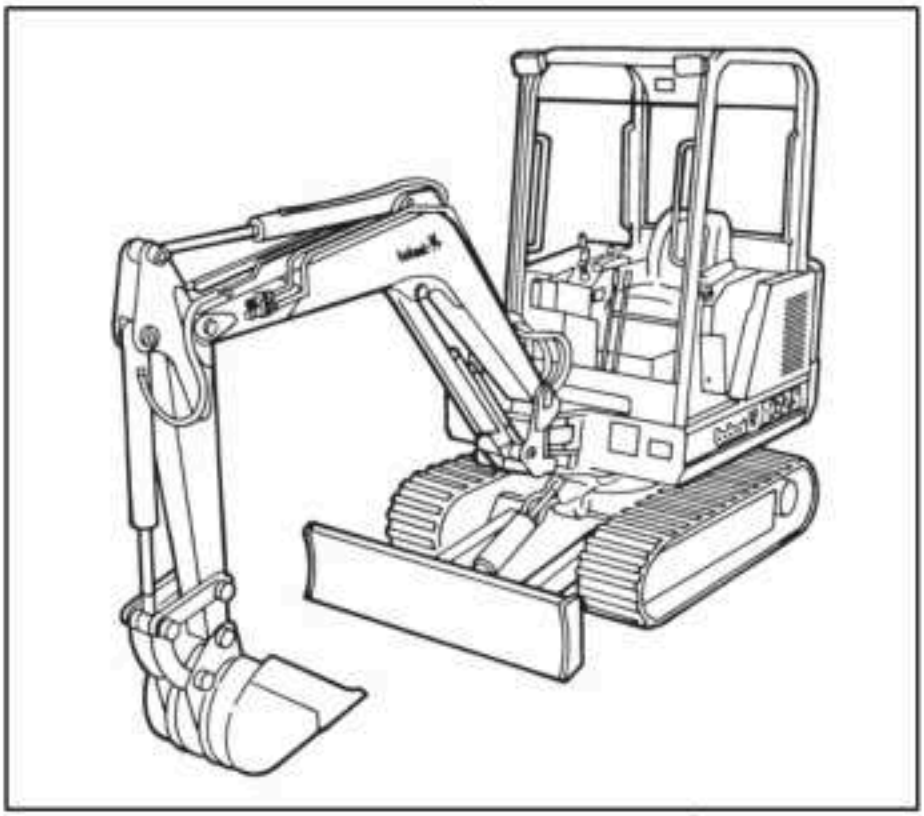
X 325

Excavator

Service Manual

(S/N 511820001 & Above)



MELROE
INGERSOLL-RAND
6722849 (4–94)

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COUNTERWEIGHTS

Removal And Installation

NOTE: The procedure below is for the right hand counter weight. The procedure is identical for the left hand counterweight.

For Right Hand CounterWeight:
Remove the right hand side cover. (See Page 2–85.)
Remove the battery. (See Page 6–3.)

For Left Hand CounterWeight:
Remove the left hand side cover. (See Page 4–5.)

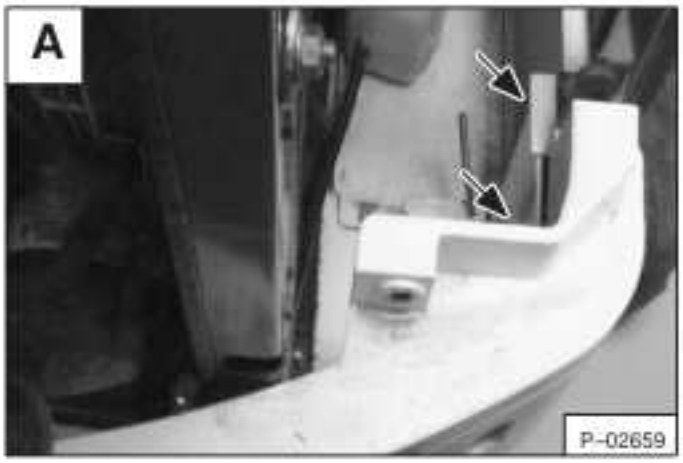
Install a chain and hoist to the counterweight. (Counterweight weighs approximately:
Left Hand = 89 lbs. [40,4 kg].
Right Hand = 91 lbs. [41,1 kg].

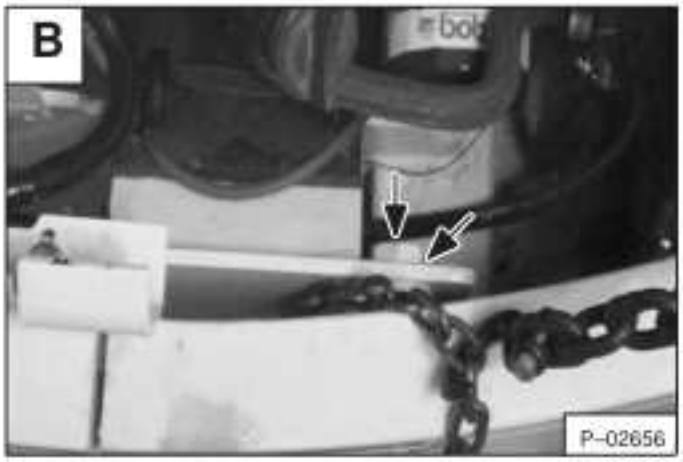
Remove the two outer counterweight bolts (Item 1) **[A]**.

Remove the two inner counterweight bolts (Item 1) **[B]**.

Installation: Tighten the bolts to 235–265 ft. lbs. (320–360 Nm) torque.

Remove the counterweight with the hoist **[C]**.







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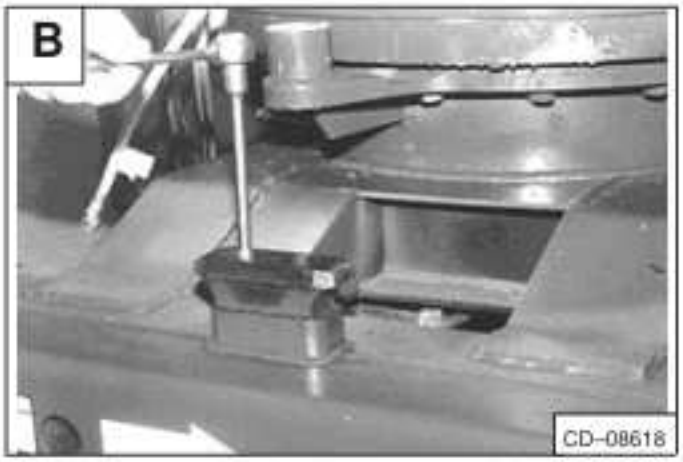
Remove the drive sprocket bolts **[A]**.

Installation: Put liquid adhesive LOCTITE 242 on the bolts and tighten to 80 ft. lbs. (108 Nm) torque.

Remove the drive sprocket from the drive motor and planetary gear assembly.

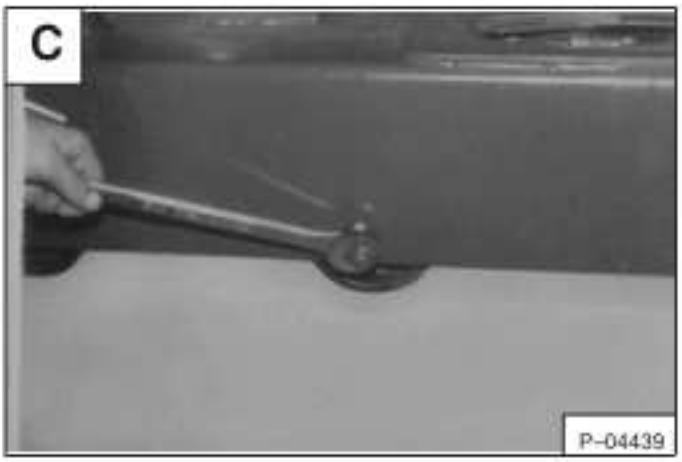


Remove the guide block bolts **[B]**.

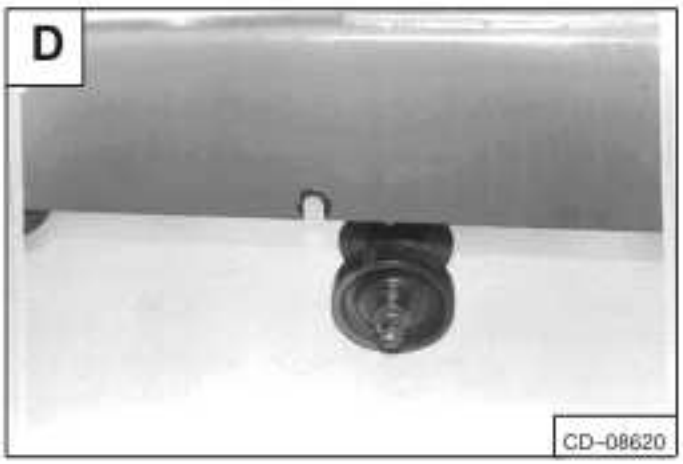


Loosen the nuts on the track roller on both sides of the track frame **[C]**.

Installation: Tighten the nuts to 125–140 ft. lbs. (170–190 Nm) torque.



Remove the track roller **[D]**.



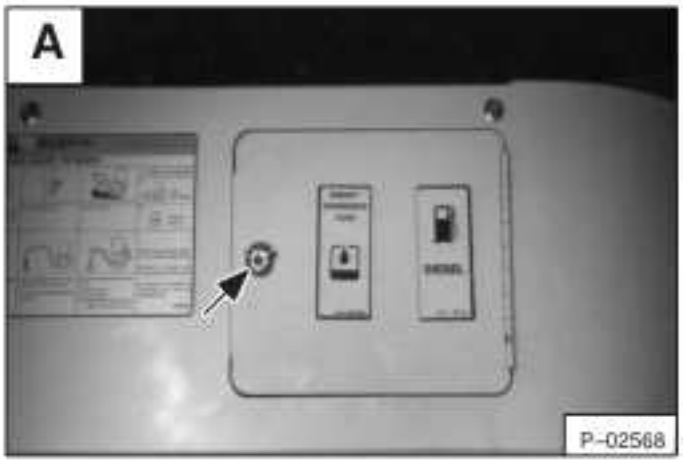
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FUEL LEVEL SENDER

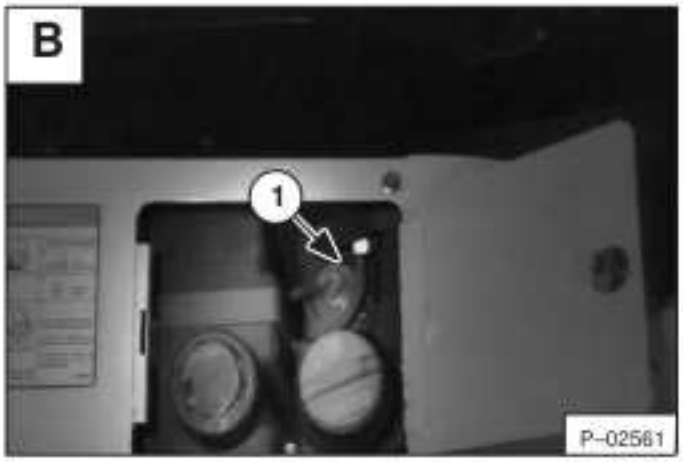
Removal And Installation

Open the locking fuel cover **[A]**.



Disconnect the harness connector form the fuel sender **[B]**.

Remove the fuel sender **[B]**. (The sender threads into the tank, use a wrench to remove the sender).



Checking

Use an ohmmeter to check the resistance of the fuel sender.

The resistance should read as follows:

Full: 15–35 Ohms.
Half: 82–97 Ohms.
Empty: 230–250 Ohms.

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Forward and Reverse Travel is controlled by the left and right steering levers/foot pedals that mechanically activate the respective 6-spool control valve (29) spools.

Right hand travel lever/foot pedal pushed forward - right track forward: Fluid flows from the "A" port of the right hand travel section through the "C" port of the center swivel joint (3) and to the "P2" port of the right hand travel motor (2).

Right hand travel lever/foot pedal pulled back - right track reverse: Fluid flows from the "B" port of the right hand travel section through the "A" port of the center swivel joint (3) and to the "P1" port of the right hand travel motor (2).

Left hand travel lever/foot pedal pushed forward - left track forward: Fluid flows from the "A" port of the left hand travel section through the "D" port of the center swivel joint (3) and to the "P1" port of the left hand travel motor (2).

Left hand travel lever/foot pedal pulled back - left track reverse: Fluid flows from the "B" port of the left hand travel section through the "B" port of the center swivel joint (3) and to the "P2" port of the left hand travel motor (2).

Return fluid from the travel motors (2) returns through the non pressurized "P" port of the travel motor, to the corresponding center swivel joint (3) port and back through the 6-spool control valve (29) internally, to the return port block (13), to the oil cooler (1), through the oil filter (5) and to the supply port block (7).

Travel motor case drain. Fluid returns from the travel motor (2) "T1, T2" ports, to the "G" port of the center swivel joint (3), to the oil cooler (1), through the oil filter (5) and to the supply port block (7).

The Blade Control Lever mechanically controls the 3-spool control valve (14) blade section spool.

Blade control lever pushed forward - lowers the blade: Fluid flows from the "A" port of the blade section to the "F" port of the center swivel joint (3) and to the base end of the blade cylinder.

Blade control lever pull back - raises the blade: Fluid flows from the "B" port of the blade section to the "E" port of the center swivel joint (3) and to the rod end of the blade cylinder.

The Boom Swing Pedal mechanically controls the 3-spool control valve (14) boom swing section spool.

Boom swing pedal pushed to the right - swings the boom right: Fluid flows from the "B" port of the boom swing section to the rod end of the boom swing cylinder.

Boom swing pedal pushed to the left - swings the boom left: Fluid flows from the "A" port of the boom swing section to the base end of the boom swing cylinder.

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HYDRAULIC SYSTEM OPERATION

To Be Used With

HYDRAULIC FLOW CHART

(ISO and STANDARD)

For Model

325 EXCAVATOR

Chart # 6722853 (Printed March 1994)

CHART LEGEND

1. OIL COOLER
2. TRAVEL MOTORS
3. CENTER SWIVEL JOINT
4. BLADE CYLINDER
5. #10 MICRON FILTER (W/25 PSI By-Pass Valve)
6. HYDRAULIC PUMPS . . Triple Section Gear Pump: 3 x 7.14 GPM (27 L/min.) Auxiliary Flow: 14.3 GPM (54 L/min.)
7. SUPPLY PORT BLOCK
8. HYDRAULIC RESERVOIR, Cap (Non-Vented)
9. STRAINER
10. HYDRAULIC RESERVOIR 6.9 Gals. (26 L) (Tank Capacity)
11. BOOM SWING CYLINDER
12. SWING MOTOR
13. RETURN PORT BLOCK
14. 3-SPOOL CONTROL VALVE . 3 Section Boom Swing, Blade and Swing Motor
15. MAIN RELIEF VALVE, ... 2350 PSI (16207 kPa)
16. LOAD CHECK VALVE (Blade Cylinder)
17. RESTRICTOR . . . . . .065" (1.62 mm)
18. LOAD CHECK VALVES (Boom Swing Cylinder)
19. BUILD-UP VALVE . . 200 PSI (1378 kPa)
20. ACCUMULATOR
21. SHUTTLE VALVE
22. PRESSURE REDUCING VALVE . 363 PSI (2500 kPa)
23. ACCUMULATOR RELIEF VALVE 507 PSI (3632 kPa)
24. CONSOLE LOCK-OUT VALVE
25. L.H. JOYSTICK
26. R.H. JOYSTICK (W/Horn Switch)
27. MAIN RELIEF VALVE . . . . . 2350 PSI (16207 kPa)
28. MAIN RELIEF VALVE . . . . . 2350 PSI (16207 kPa)
29. 6-SPOOL CONTROL VALVE 6 Section - R.H. Travel, Boom, Bucket, Auxiliary, Arm and L.H. Travel
30. PORT RELIEF VALVE (Boom Cyl.) 2950 PSI (20345 kPa)
31. PORT RELIEF VALVE (Boom Cyl.) 3400 PSI (23448 kPa)
32. PORT RELIEF VALVE (Bucket Cyl.) 3400 PSI (23448 kPa)
33. PORT RELIEF VALVE (Arm Cyl.) 2950 PSI (20345 kPa)
34. PORT RELIEF VALVE (Arm Cyl.) 2950 PSI (20345 kPa)
35. ONE WAY RESTRICTOR .125" (Arm Cyl.)
36. ONE WAY RESTRICTOR .125" (Boom Cyl.)
37. BUCKET CYLINDER
38. ARM CYLINDER (Cushion)
39. BOOM CYLINDER (Cushion)
40. AUXILIARY QUICK COUPLERS
41. DIRECT TO TANK RETURN LINE
42. HYDRAULIC PUMP TEST PORTS
43. RELIEF VALVE - Swing Motor (2) 1650 PSI (11375 kPa)
44. TRAVEL MOTOR SPOOL

FLUID FLOW EXPLANATION

The fluid flows by gravity from the reservoir 10 through a supply port block 7 to the 3 section hydraulic gear pump 6 . The 3 section gear pumps are coupler driven from the engine. Each gear pump section is protected by a relief valve located in the control valve it supplies.

Fluid from the hydraulic pump (Engine flywheel end) is forced to the 6 spool hydraulic control valve 29 P1 port (Inlet). These control valve sections control R.H. Travel, Boom and Bucket. Fluid under pressure is also diverted to the shuttle valve 21 .

Fluid from the center section hydraulic pump is forced to the P2 port of the 6 spool hydraulic control valve 29 . These control valve sections control L.H. Travel, Arm and Auxiliary. Adjustable relief valves 27 & 28 are located at each end of the 6 spool hydraulic control valve 29 .

With all spools in the neutral position, the open center control valve allows fluid to flow to the port block 13 , to the oil cooler 1 through the oil filter 5 and to the supply port block 7 . When a spool is activated, the fluid flows to the base or rod end of a cylinder 37 , 38 & 39 . The fluid on the other side of the cylinder flows back to the 6-spool hydraulic control valve 29 . When a cylinder reaches the end of the stroke, the pressure increases to 2350 PSI and opens the relief valve 27 or 28 . The fluid then flows through the 6-spool hydraulic control valve 29 internally, to the port block 13 and through the oil cooler 1 . The cooler oil is filtered through the #10 micron filter 5 (with a 25 PSI bypass valve) and returns the fluid to the supply port block 7 .

The 6-spool hydraulic control valve has Port Relief Valves in both ports of the Boom section 30 & 31 , the Rod end of the Bucket section 32 and both ports of the Arm section 33 & 34 . The boom section has a one way restrictor 36 located in the "B" port for limiting the "boom down" speed. The arm section has a one way restrictor 35 located in the "B" port for limiting the "arm in" speed.

The auxiliary spool is hollow, and while in neutral, fluid flows through the center of the spool to the tank port of the valve. When the auxiliary spool is activated two pump flows are combined to supply more fluid to the auxiliary quick couplers 40 on the boom/arm. The female coupler is pressure and the male coupler is return. The auxiliary fluid return flows to the port block 13 , to the oil cooler 1 , through the oil filter 5 and back to the supply port block 7 .

For hydraulic breaker operation, remove the cap from the DIRECT TO TANK fitting 41 and move the return hose from the MALE fitting on the frame to the DIRECT TO TANK fitting 41 . Install the cap on the MALE return line fitting on the frame. The foot pedal will now work one way only and the fluid will flow back to the reservoir 10 with reduced back pressure.

Fluid from the end cap section of the hydraulic pump flows to the inlet port P1 of the 3-spool control valve 14 . Fluid under pressure is also directed to the shuttle valve 21 and the 363 PSI pressure reducing valve 22 which supplies fluid to the joystick controls 25 & 26 .

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