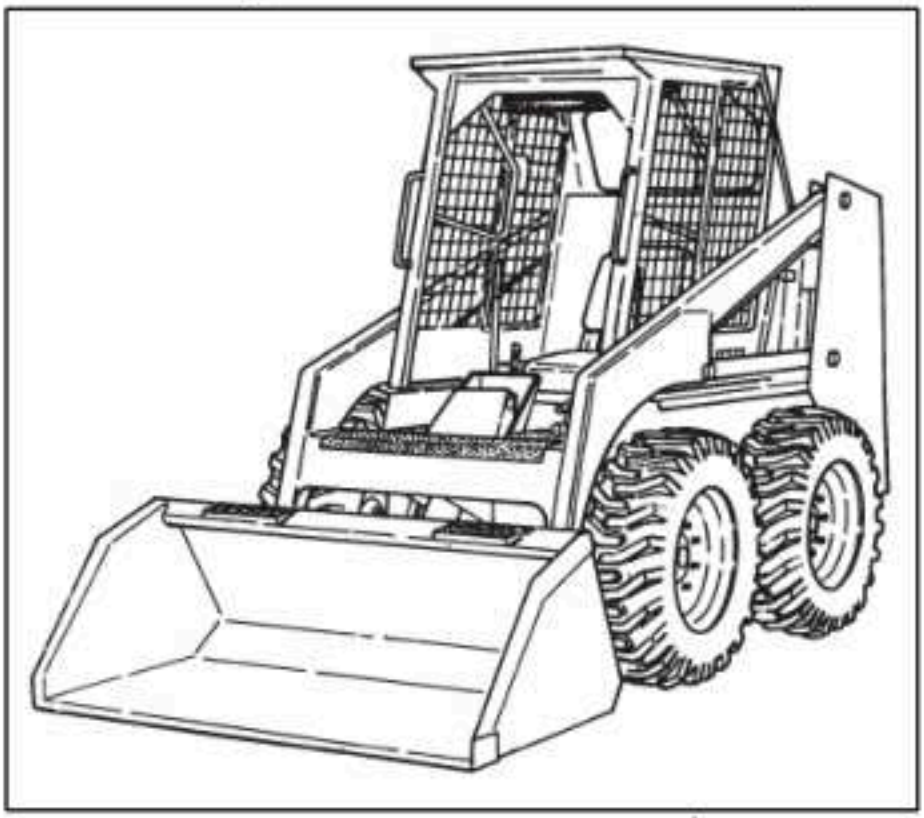
5 4 0

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# Service Manual

## 540 (S/N 501012001 & Above)
## 543 (S/N 502412001 & Above)
## 543B (S/N 511111001 & Above)



MELROE
INGERSOLL-RAND

6566532 (11–94)

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Revised Oct. 94





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### 6–3.2 Installing The Battery

1. Put the battery bracket in the loader and locate it in the correct position.
2. Install the battery into the battery bracket (Fig. 6–4 or Fig. 6–5).
3. Install the battery holddown clamp and tighten the nuts to 30–50 in.–lbs. (3.4–5.5 Nm) torque.
4. Connect the positive cable first and tighten the clamp.
5. Connect the negative cable and tighten the clamp.
6. Close the rear door.

## 6–4 WIRE HARNESS FOR THE OPERATOR CAB

### 6–4.1 Removing The Wire Harness For The Operator Cab

1. Open the rear door. Disconnect the negative cable from the battery.
2. Disconnect the wiring harness connector behind the seat (Fig. 6–6).
3. Disconnect the connector at the fuel sender wires (Fig. 6–7, Item 1).
4. Remove the harness clip (Fig. 6–7, Item 2).
5. Remove the rear light from the mounting. Disconnect the wires from the rear light (Fig. 6–8).
6. Remove all the harness clips on the operator cab (Fig. 6–9).
7. Remove the dash panel nuts and bolts (Fig. 6–10).

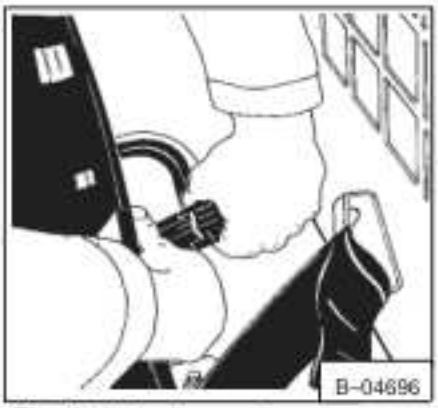



**Fig. 6–6** Wire Harness Connector

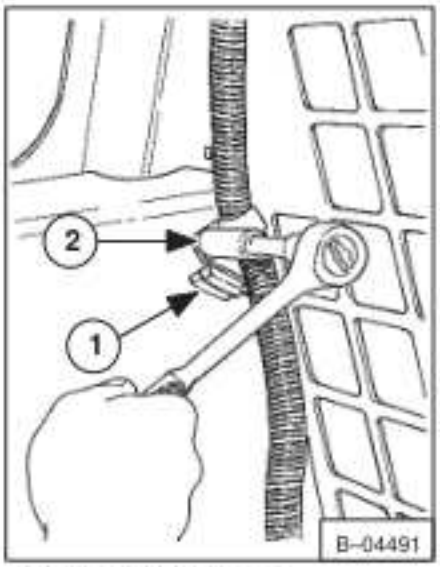



**Fig. 6–7** Wire Harness Clip




**Fig. 6–8** Rear Light

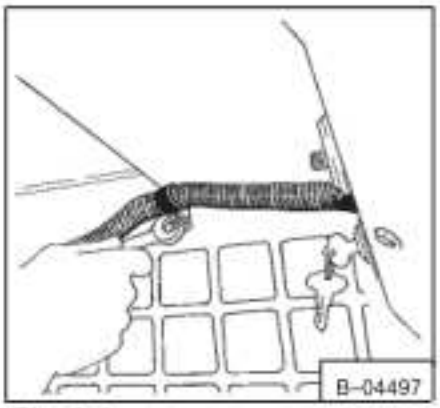



**Fig. 6–9** Harness Clip

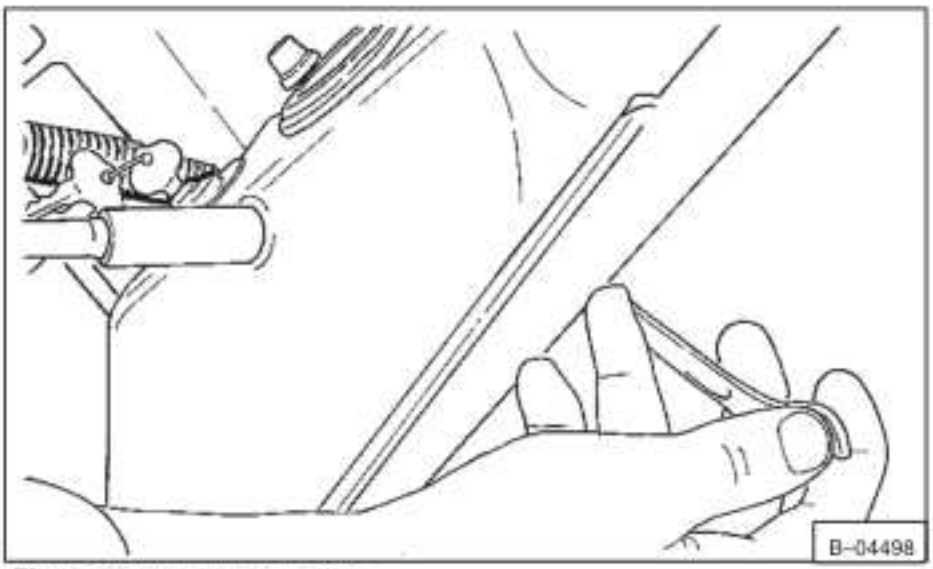



**Fig. 6–10** Dash Panel Bolts & Nuts



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| KEY TO CORRECT THE CAUSE | |
|---|---|
| 1. Battery capacity low. | 25. Incorrect valve tappet adjustment. |
| 2. Bad electrical connection. | 26. Sticking valves. |
| 3. Faulty starter motor. | 27. Spark plug gap not correct. |
| 4. Incorrect grade of oil. | 28. Worn cylinder bores. |
| 5. Low cranking speed. | 29. Worn valves and seats. |
| 6. Fuel tank empty. | 30. Broken, worn or sticking piston rings. |
| 7. Ignition system has damage. | 31. Worn valve stems or guides. |
| 8. Plugged fuel line. | 32. Worn or damaged bearings. |
| 9. Faulty fuel lift pump. | 33. Not enough oil in the oil pan. |
| 10. Plugged fuel filter. | 34. Gauge is not correct. |
| 11. Restriction in the air cleaner. | 35. Oil pump is worn. |
| 12. Wrong starting procedure. | 36. Pressure relief valve is open. |
| 13. Choke not completely closed. | 37. Pressure relief is sticking closed. |
| 14. Choke not completely opened. | 38. Broken relief valve spring. |
| 15. Carburetor is dirty or has a defect. | 39. Faulty suction pipe. |
| 16. Incorrect valve timing. | 40. Plugged oil filter. |
| 17. Poor compression. | 41. Piston seizure. |
| 18. Plugged fuel tank vent. | 42. Damaged fan. |
| 19. Dirt or water in the fuel. | 43. Faulty engine mounting. |
| 20. Sticking or restricted throttle. | 44. Plugged breather pipe. |
| 21. Exhaust pipe restriction. | 45. Valve stem seals damaged. |
| 22. Cylinder head gasket leaking. | 46. Plugged oil pump pipe strainer. |
| 23. Overheating. | 47. Broken valve spring. |
| 24. Governor adjustment not correct. | |



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8. Measure the clearance with a feeler gauge (Fig. 7B–119).

9. The specifications are as listed below:

Top Ring – 0.0079–0.0138 inch (0,20–0,35 mm).

Second Ring – 0.0118–0.0177 inch (0,30–0,45 mm).

Oil Ring – 0.0098–0.0157 inch (0,25–0,40 mm).

The allowable wear limit for all the rings is 0.0492 inch (1,25 mm).

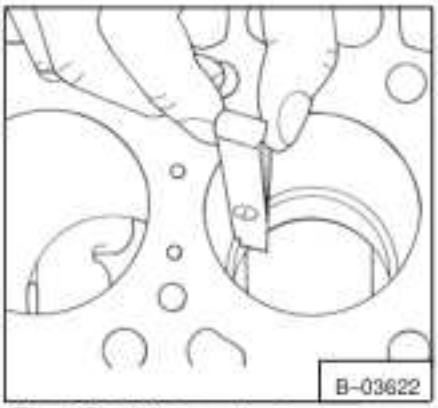



**Fig. 7B–119** Piston Ring Gap

10. Install the connecting rod on the tool (Fig. 7B–120) and check for correct alignment.

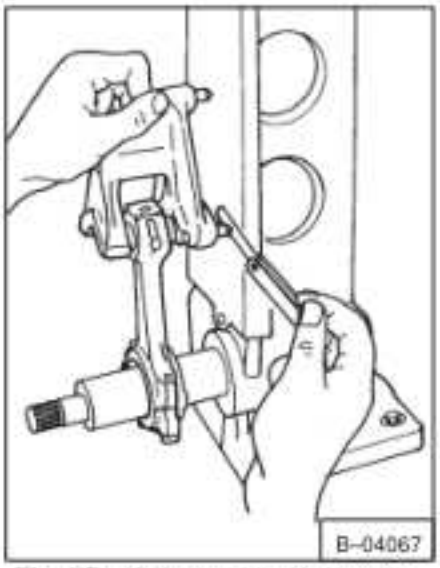



**Fig. 7B–120** Connecting Rod Alignment

**NOTE: Check the I.D. of the connecting rod bushing because it is used for this check, make sure it is not worn.**

11. The specifications are 0.0008 inch (0,02 mm). The allowable wear limit is 0.0020 inch (0,05 mm).

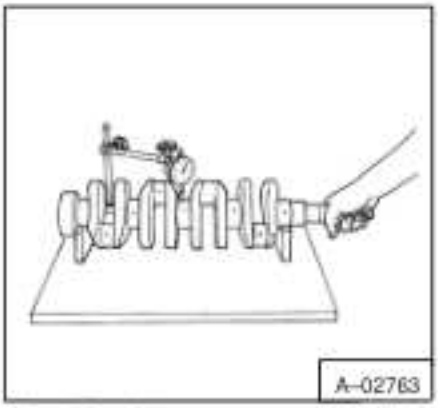



**Fig. 7B–121** Crankshaft Alignment

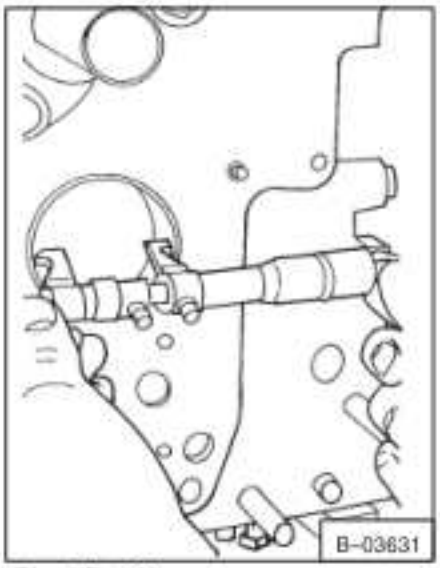



**Fig. 7B–122** Main Bearing Clearance

### 7B–5.6 Servicing The Crankshaft

1. Put the crankshaft in V–blocks (Fig. 7B–121).

2. Put a dial gauge on the center journal. Turn the crankshaft at a slow rate.

3. The specifications are 0.0008 inch (0,02 mm). The allowable wear limit is 0.0031 inch (0,08 mm).

4. Measure the No. 1 main bearing (Fig. 7B–122). The specifications are 1.7317–1.7339 inch (43,984–44,040 mm).

5. Measure the No. 1 main bearing journal (Fig. 7B–123). The specifications are 1.7296–1.7303 inch (43, 943–43,950 mm). The clearance between the bearing and the journal must be 0.0013–0.0042 inch (0,034–0,106 mm) and the allowable wear limit is 0.0079 (0,2 mm). Replace as needed.

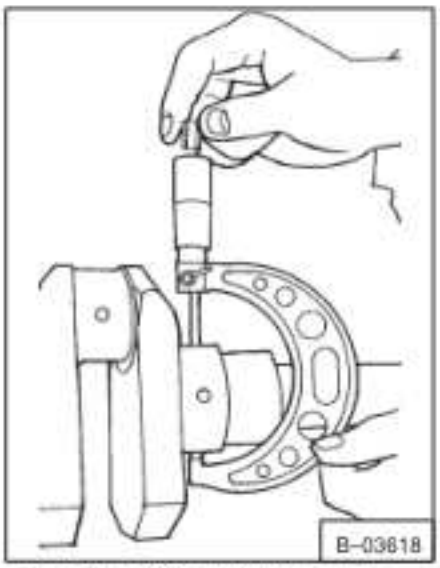



**Fig. 7B–123** Crankshaft Main Bearing



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## OIL FLOW EXPLANATION

The fluid flows by gravity from the reservoir **[1]** to the port block **[3]** which is on the inside of the left fender. Return fluid from the cold oil by–pass valve **[4]** and the oil cooler **[23]** joins with the reservoir fluid to supply fluid to the hydraulic pump **[16]** "case drain" fluid from the hydrostatic pump **[17]** hole in housing **[17]** and also supplies fluid to the hydraulic pump **[16]**.

The hydraulic pump **[16]** is a "gear type" pump and is driven by a shaft through the hydrostatic pumps **[17]**. The fluid goes from the hydraulic pump **[16]** to the hydraulic control valve **[11]**.

The hydraulic control valve **[11]** has an adjustable relief valve **[13]**. When all the spools of the control valve are in the neutral position, the fluid goes through the control valve **[11]** and to the oil cooler **[23]**. If one of the spools is activated, the fluid goes out the respective port and to wither the base end, or the rod end of the cylinder(s) **[9]** **[10]**. As the fluid goes into one end of the cylinder(s) the fluid from the other side of the cylinder flows back into the control valve **[11]**. When the cylinder(s) reaches the end of the stroke, the fluid reaches the setting of the relief valve **[13]**, it will open and let the fluid by–pass the hydraulic circuit (internally) and go back to the oil cooler **[23]**.

If you let the spool go back to the neutral position, then there is fluid available for the other sections of the control valve **[11]**. Two sections of the control valve**[11]** can be used at the same time if the main relief valve **[13]** is not open.

The fluid flows from the oil cooler **[23]** through the 10 micron filter **[21]** to the hydrostatic pumps **[17]**. This fluid is called "charge supply fluid". In the hydrostatic pumps **[17]** the fluid is against two high pressure relief/replenishing valves **[18]**, two replenishing valves **[19]** and the charge relief valve **[7]**. When the fluid gets to the hydrostatic pumps **[17]** it activates the high pressure relief/replenishing valves **[18]**. The replenishing valves open and let fluid into the hydrostatic pumps **[17]** for replenishing, lubrication and cooling.

The hydrostatic pumps **[17]** and two hydrostatic motors **[2]**. One pump and one motor work together as a pair to drive on one side of the loader. The other pump and motor work as a pair to drive the opposite side of the loader.

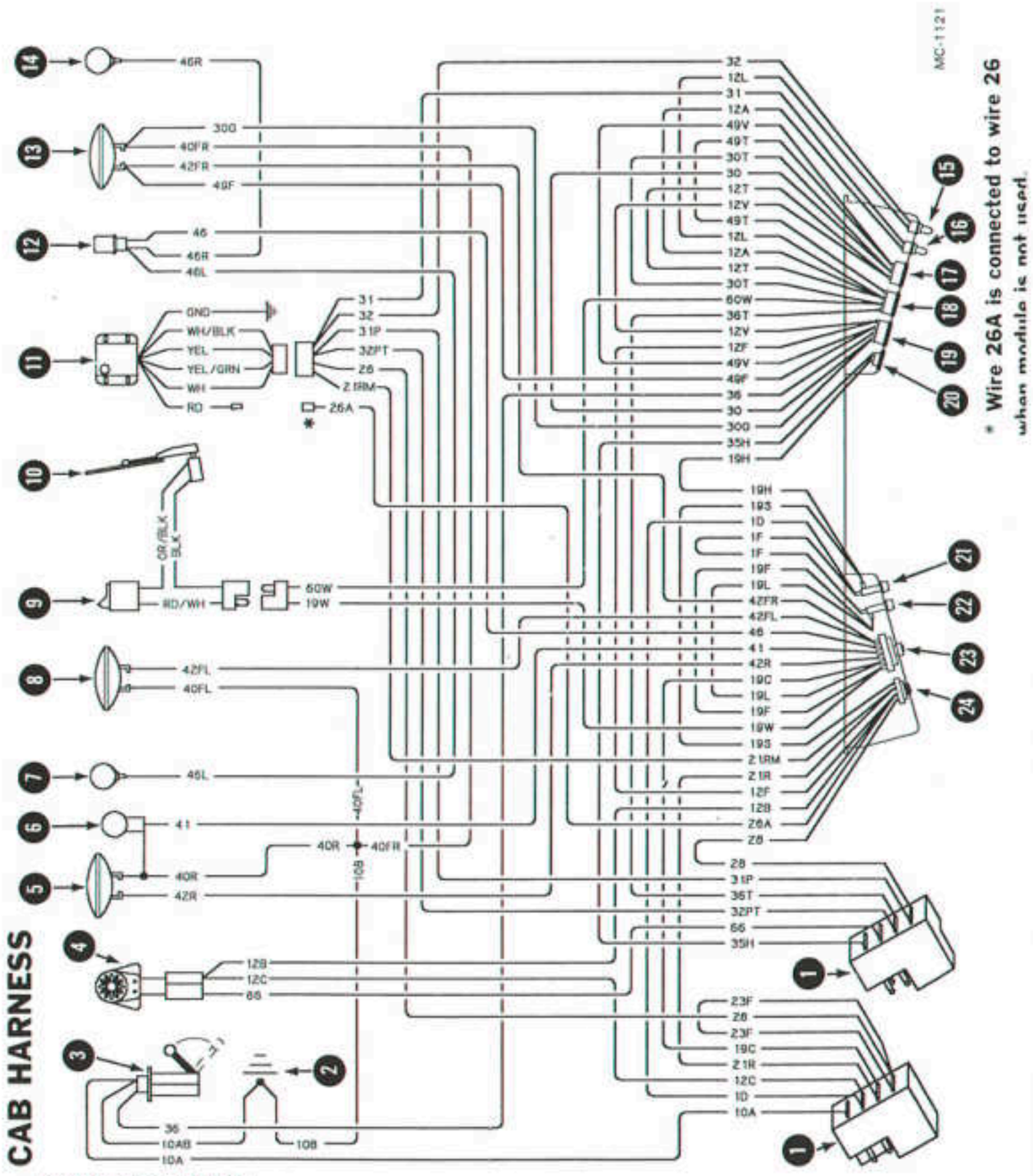
When the replenishing valve **[19]** open and fluid goes into the hydrostatic pumps **[17]**, the flow of fluid becomes the "drive loop fluid". When the steering levers are in neutral, the hydrostatic pumps **[17]** and the hydrostatic motors **[2]** are not working, but do have charge pressure. When the steering levers are moved, the swashplates in the pumps **[17]** are angled and the fluid is forced out of the pressure side of the hydrostatic pumps **[17]** and to the hydrostatic motors **[2]**. This flow of fluid is called "drive pressure". Drive pressure is much higher than charge pressure causing the replenishing valves **[18]** or **[19]** to close, allowing the flow of the fluid to go to the motors **[2]**. There are four replenishing valves **[18]** and **[19]**, two for each hydrostatic pump **[17]**. One is for forward travel and one for reverse travel. When the loader is driven with the bucket down, into a pile of material, there is resistance causing high pressure fluid in the drive loop. There is a relief valve built into the high pressure replenishing/relief valves **[18]** (for forward travel). This relief valve releases the high pressure fluid in the drive loop. When the relief valve opens, the extra fluid goes from the drive loop to the charge loop to be used again.

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# CAB WIRING DIAGRAM (P/N 6720032)

## 543 (S/N 22127 & Above) & 543B

### (Printed October 1994)




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# HYDRAULIC / HYDROSTATIC FLOW CHART

For Model

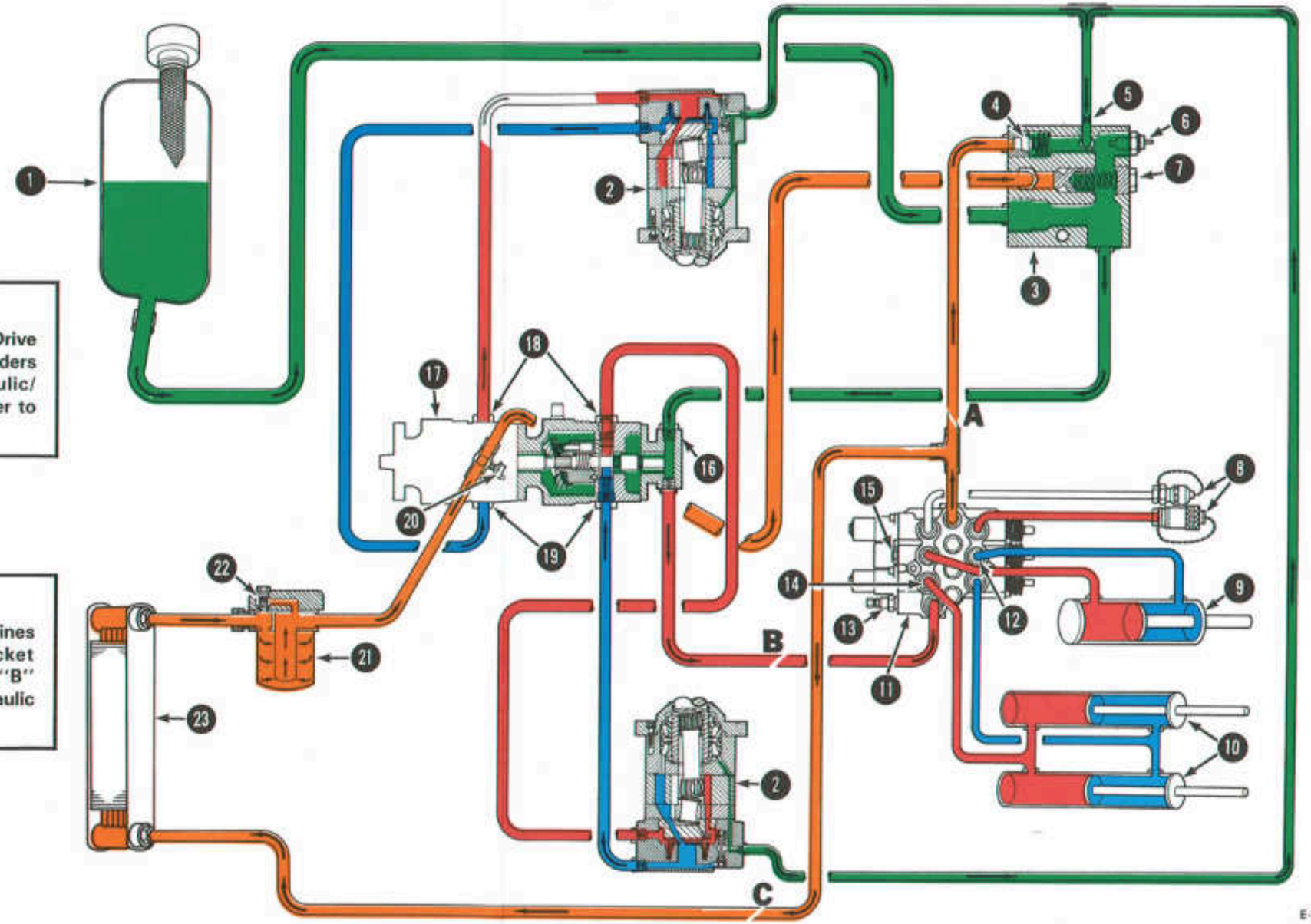
## 540, 543 (Starting With S/N 13001), 543B

Chart #6570283 (Printed October 1994)

RED - - - - - - - - - High Pressure
BLUE - - - - - - - - Low Pressure
GREEN - - - - - - Case Drain & Reservoir
ORANGE - - - - - Charge Pressure

**NOTE**
Chart shows oil flow in Forward Drive Position and with Hydraulic Cylinders Partially Extended. For Hydraulic/ Hydrostatic System Operation, refer to Sheet 2 of this publication.

**NOTE**
Refer to Chart #6570282 for machines equipped with optional Bucket Positioning Valve. Reference "A", "B" and "C" indicate location of hydraulic circuitry connection.




E-1750



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