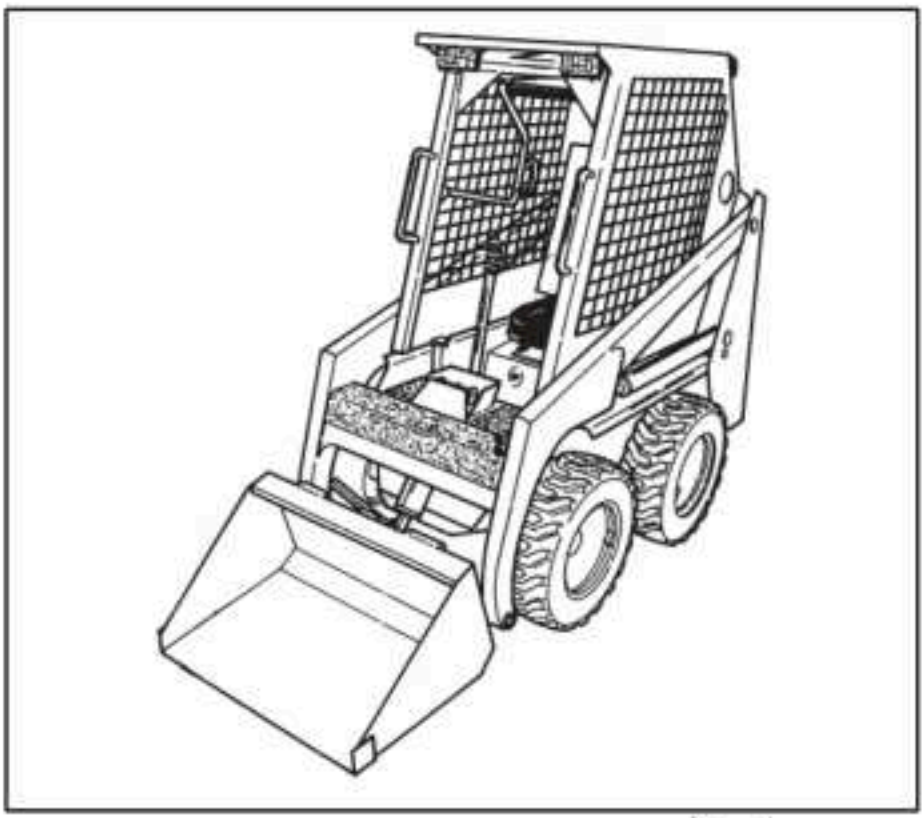
4 4 0

4 4 3

4 4 3 B

Service Manual



MELROE
INGERSOLL-RAND
6566694 (11-95)
Printed in U.S.A.

bobcat

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CALIFORNIA
PROPOSITION 65 WARNING

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.

REFERENCE INFORMATION

Write the correct information for Your Bobcat loader in the spaces below. Always use these numbers when referring to your Bobcat loader.

Loader Serial Number ..... _____
Engine Serial Number ..... _____
_____
_____
_____

NOTES: _____
_____
_____
_____
_____
_____

YOUR LOADER DEALER: _____
ADDRESS: _____
PHONE: _____

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OPERATOR CAB (Cont'd)

Removing the Operator Cab

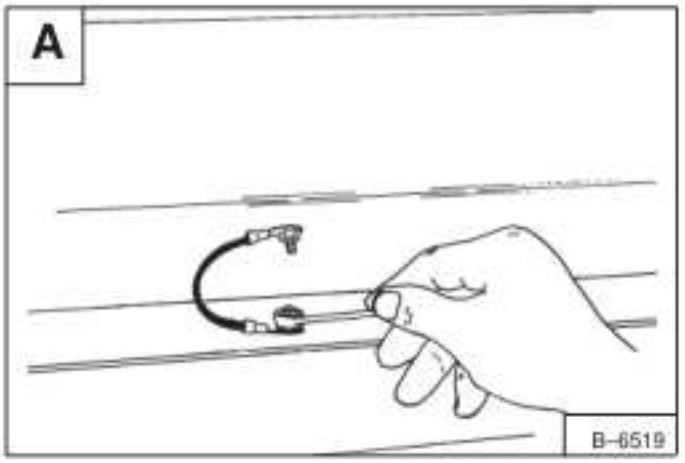
Stop the engine.

Remove the retainer pins at the front corners of the operator cab.

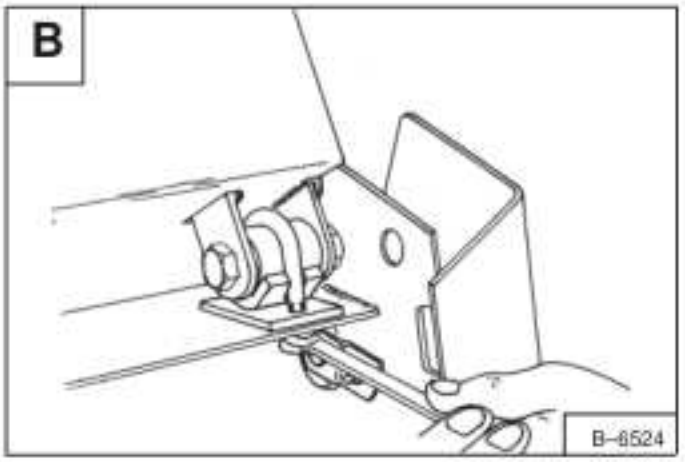
Remove the retainer plates at the front corners of the operator cab.

Disconnect the wire harness behind the seat.

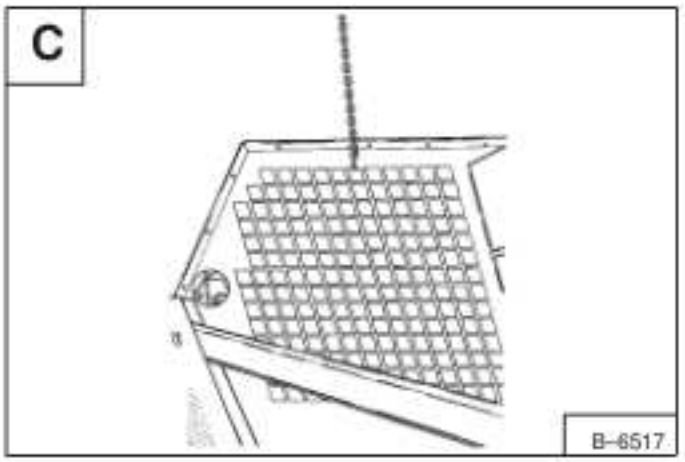
Remove the ground wire at the rear of the operator cab **[A]**.



Remove the operator cab u–bolts **[B]**.



Install a chain hoist and remove the operator cab from the loader **[C]**.



Installing the Operator Cab

Raise the operator cab with a chain hoist, over the loader.

Lower the chain hoist until the pivot bushings are over the u–bolt mounting holes.

Install the u–bolts and tighten **[B]**.

Connect the ground wire **[A]**.

Install the retainer plates and retainer pins at the front corners of the operator cab.

Connect the wire harness behind the seat.

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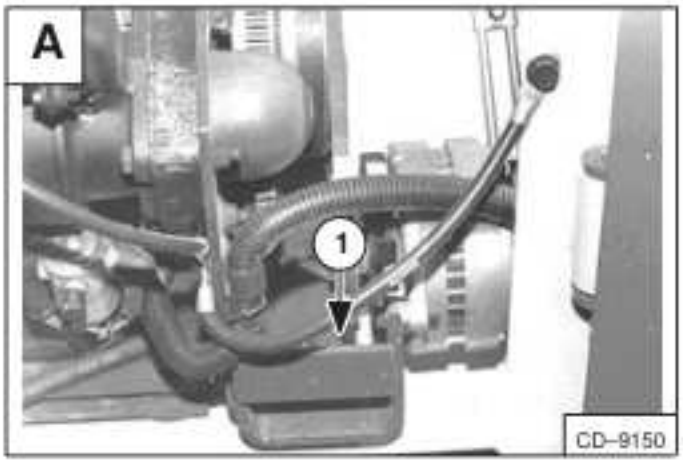
ALTERNATOR (Motorola)

Belt Tension

To adjust the belt tension, use the following procedure:

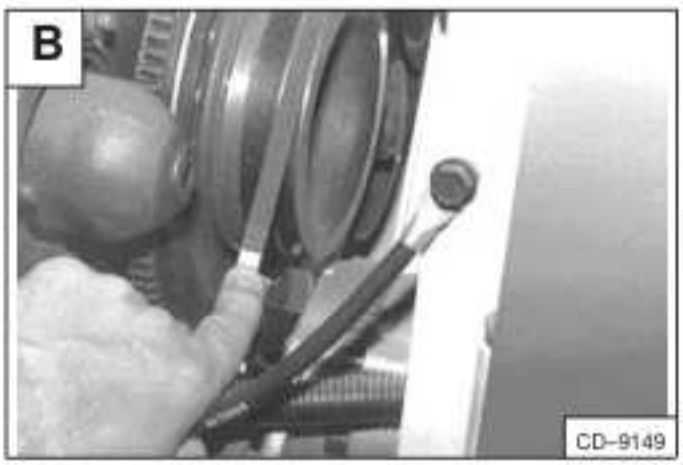
Stop the engine. Open the rear door.

Loosen the alternator adjusting bolts (Item 1) **[A]**.



Move the alternator to give the belt about 3/8" (9,5 mm) deflection with about 20 lbs. (89 N) force between the pulleys **[B]**.

Tighten the adjusting bolt. Close the rear door.



Troubleshooting the Alternator

PROBLEM	CAUSE	CORRECTION
Battery undercharged –Voltmeter indicates discharge.	1. Defective cables, corroded battery terminals, etc. 2. Loose or broken belt. 3. Worn or broken brushes. 4. Defective alternator system. 5. Defective wire harness.	1. Check, clean or replace as needed. 2. Check belt. 3. Replace brush assembly. 4. Refer to *Checking the Alternator.* 5. Check wiring harness.
Battery overcharges –Excessive use of water –voltmeter indicates more than 14.5 bolts (engine @ idle RPM)	1. Defective wire harness. 2. Defective alternator system. 3. Bad ground. 4. Broken sense lead.	1. & 2. Refer to *Checking the Alternator.* 3. Check ground connection. 4. Check, clean or repair as needed.
Battery charges at idle, but discharges under load conditions.	1. Slipping belts. 2. Alternator defective.	1. Check belt and adjust tension or replace as needed. 2. Disassemble, check diodes.

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RECONDITIONING THE ENGINE (Cont'd)

Cylinder Barrels

Check all the gasket surfaces to make sure they are free of deep scratches. Check the cylinder bore for wear, tapered or out–of–round as listed in the specifications:

Cylinder Bore:

New Diameter: 3.125" (79.375 mm)
Max. Wear Dia.: 3.128" (79,45 mm)
Max. Out–of–round: 0.002" (0.05 mm)
Max. Taper: 0.0015" (0.03 mm)

The cylinder bore can be bored oversize (0.010, 0.020 & 0.030"). Make sure to fit the correct oversize piston to the bore. After boring or honing the bore, clean the cylinder wall with warm water and soap, after drying, apply lubrication (SAE 10) to prevent rust.

Valves

Carefully inspect valve parts. Check valves and valve seat area (or inserts) for deep pitting, cracks or distortion. Check the clearance of the valve guides, see **[A]** for the correct specification.

Valve Guide

To remove, press the guide down into the valve chamber until the guide is completely removed. Be careful not to damage the cylinder barrel when removing the old guide. Press the new guide into the cylinder to the correct depth. After installation, ream the guide to the correct inside diameter. (See Specifications on Page 8A–1.)

Valve Seat Inserts

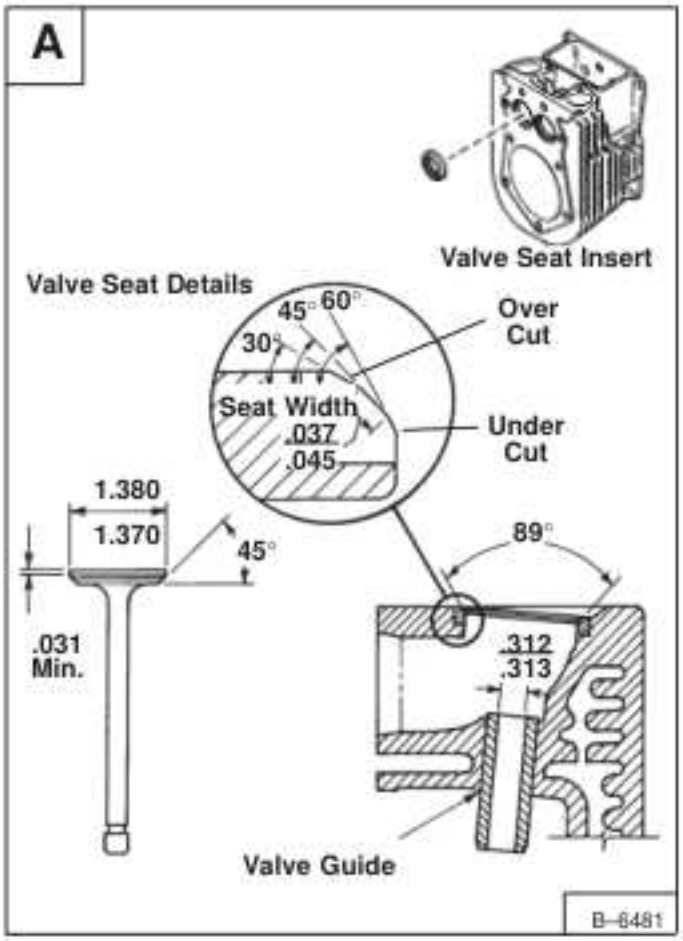
If the valve seats are pitted, cracked or distorted the insert must be replaced. Before removing the insert, measure the width of the insert so you can order the correct size.

Remove the inserts with a valve seat removal tool. Make sure the new inserts are correctly seated in the bore so the insert is pressed in straight. Grind the seat to the correct angle. (See Page 7A–29.) Valves which have been re–surfaced or new valves must be lapped in for a correct fit **[B]**.

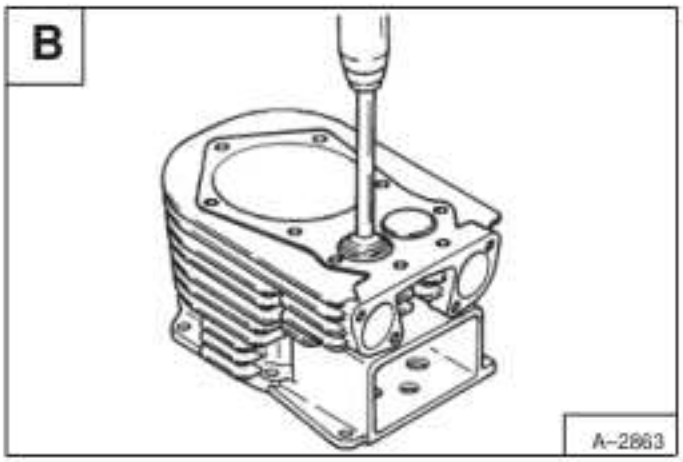
Valve Springs

There are two different valve springs used; a short spring (free length 1.542" [39,17 mm]) and a long spring (free length 1.688" [42,88 mm]). The short spring is used with the valve rotators.

A



B



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FLUID FLOW EXPLANATION

The fluid flows from the reservoir ❶ to the hydraulic pump ㉒ . "Case drain" fluid from the hydrostatic pumps ⑳ flows through the bearings of the hydrostatic pumps and also supplies fluid to the hydraulic pump ㉒ .

The hydraulic pump ㉒ is a "gear type" pump and is driven by a shaft through the hydrostatic pumps ⑳ . The fluid goes from the hydraulic pump ㉒ to the hydraulic control valve ❼ . The hydraulic control valve ❼ has a simple main relief valve ❾ . When all three spools are in the neutral position, the fluid goes to the oil cooler ⑲ . If one of the spools is activated, the fluid goes out the respective port and to either the base end, or the rod end of the hydraulic cylinder(s) ❹ ❺ . As the fluid goes into one end of the cylinder(s) the fluid comes back from the opposite end of the cylinder(s) and back to the control valve ❼ . When the cylinder(s) reaches the end of the stroke, the fluid flow stops and causes hydraulic pressure to increase. When the pressure reaches the setting of the main relief valve ❾ , it opens and lets the fluid by-pass the hydraulic circuit (internally) and goes out to the "tee" fitting. When this happens, there is no fluid to the down stream sections of the control valve ❼ . If the spool goes back to the neutral position, then there is fluid available for the other sections. Two sections of the control valve ❼ can be used at the same time if the main relief valve ❾ is not open.

The fluid which goes to the "tee" fitting will go to the oil cooler ⑲ or through to the oil cooler by-pass valve ⓫ if the oil flow restriction is excessive. The fluid which goes through the oil cooler ⑲ goes to the port block ⓬ .

The fluid goes through an orifice ⓲ and through the 10 micron filter ⓮ and to the hydrostatic pumps ⑳ for charge supply fluid. The by-pass valve ⓱ will open during any of the following conditions: (a) during cold weather operation (when the fluid is cold), (b) if there is excessive flow from the hydraulic cylinder(s) ❹ ❺ and (c) will allow fluid flow when it cannot go through the filter element ⓮ (plugged).

The normal flow of the fluid called "charge pressure fluid" goes to the front and rear hydrostatic pumps ⑳ from the 10 micron filter ⓮ past the temperature switch ⓯ and the pressure switch ⓭ . The charge relief valve ⓰ regulates charge pressure. Excessive fluid will go back to the fluid reservoir ❶ .

When the fluid gets to the hydrostatic pumps ⑳ , it activates the replenishing valves ㉑ . As the pressure increases the replenishing valves ㉑ will open and let fluid into the hydrostatic pumps ⑳ and the hydrostatic motors ❷ for replenishing of fluid.

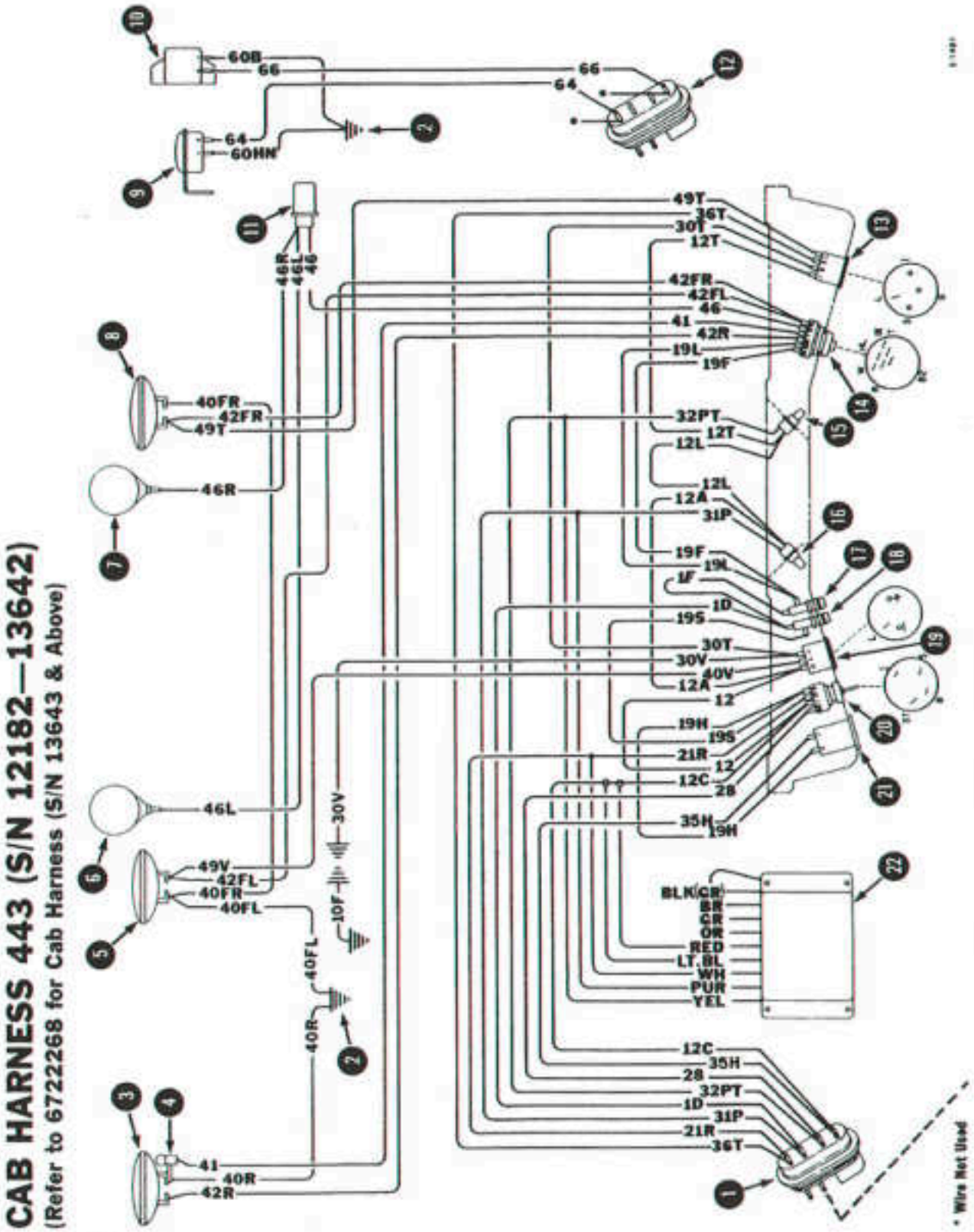
When the replenishing valves ㉑ open and charge fluid goes into the hydrostatic pumps ⑳ , the flow becomes "drive loop fluid". When the steering levers are in the neutral position, the pumps ⑳ and motors ❷ are not working but do have charge pressure. When the steering levers are moved, the swashplates in the pumps ⑳ are angled and the fluid is

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WIRING DIAGRAM (P/N 6720350)

443 (With Motorola Alternator)

(Printed February 1996)



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HYDRAULIC / HYDROSTATIC FLOW CHART

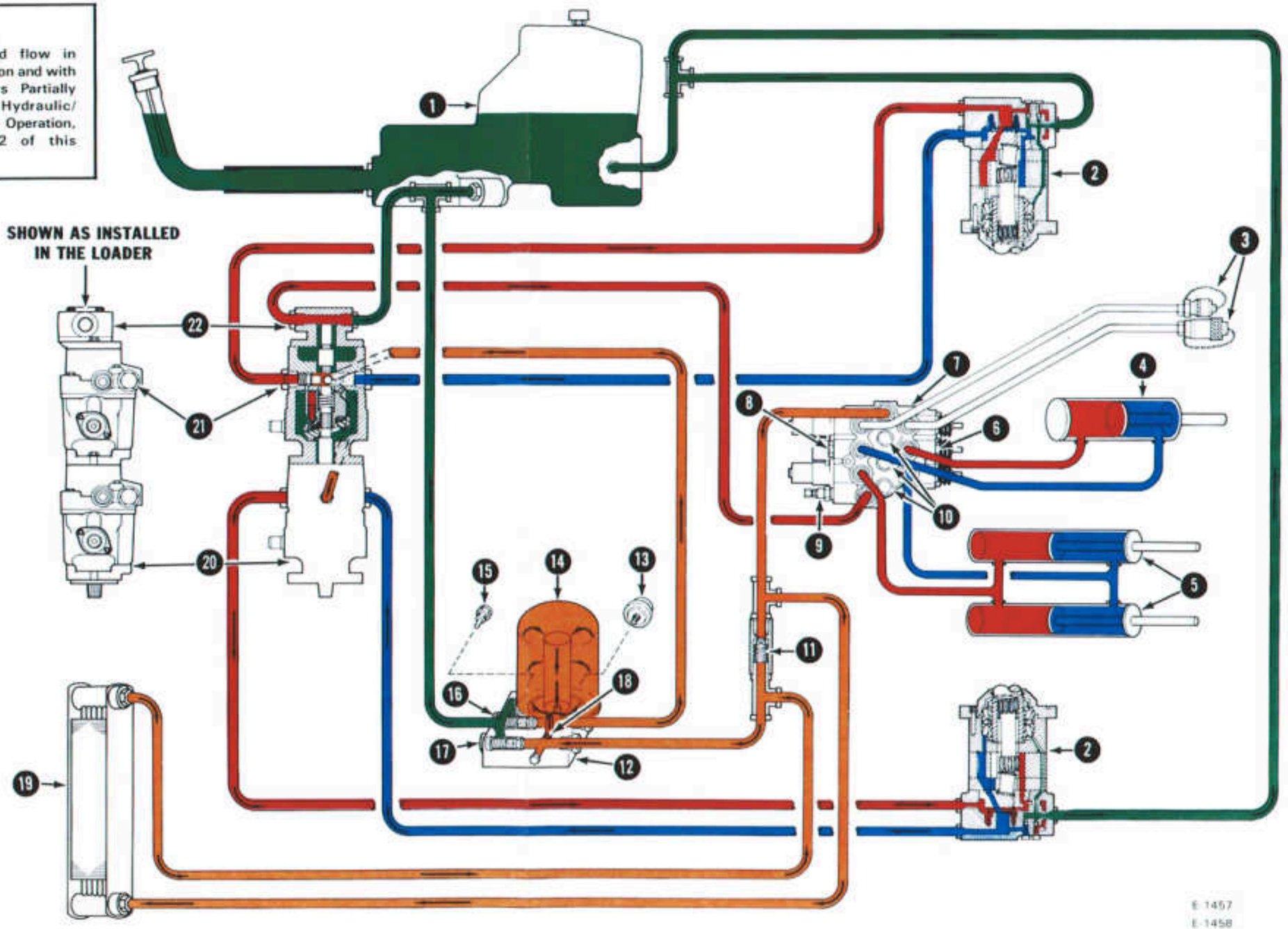
For Model

440 (S/N 11001 Thru 11711)
443 (S/N 11001 Thru 13914)

Chart #6566616 (Printed January 1990)

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

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



E-1457
E-1458

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