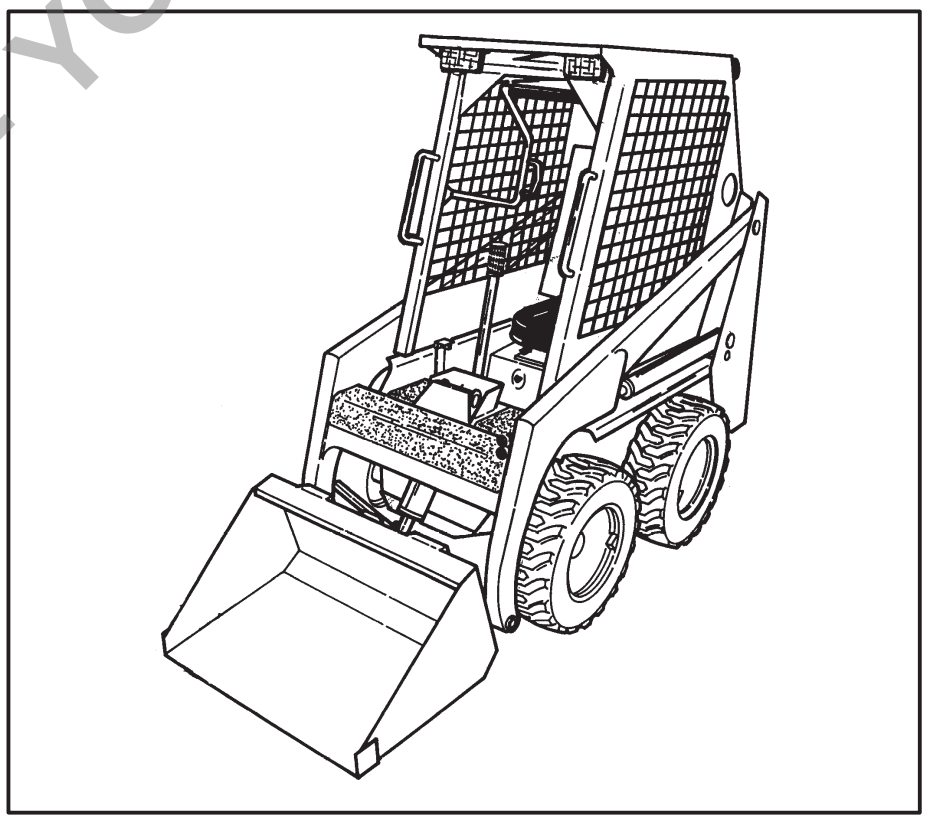
4 4
4 4
0 3

4
4
3
B

Service Manual



MELROE
INGERSOLL-RAND

bobcat®

6566694 (11–95) Printed in U.S.A.

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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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MAINTENANCE SAFETY

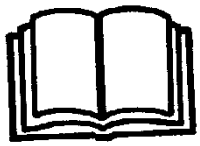
WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0903

Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

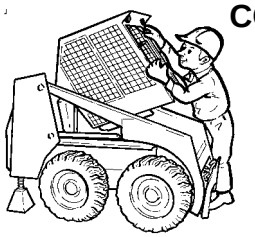
CORRECT



B-10731a

Never service the Bobcat Skid-Steer Loader without instructions.

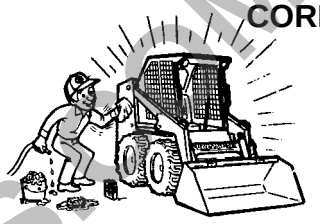
CORRECT



B-12365

Use the correct procedure to lift or lower operator cab.

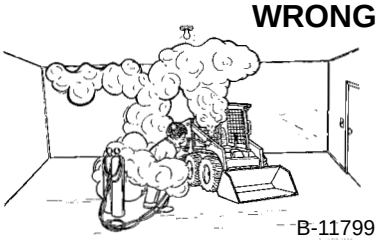
CORRECT



B-7469

Cleaning and maintenance are required daily.

WRONG



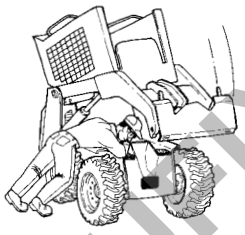
B-11799

Have good ventilation when welding or grinding painted parts.

Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.

Avoid exhaust fume leaks which can kill without warning. Exhaust system must be tightly sealed.

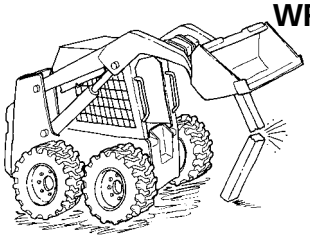
WRONG



B-15231

Disconnecting or loosening any hydraulic tubeline, hose, fitting, component or a part failure can cause lift arms to drop. Do not go under lift arms when raised unless supported by an approved lift arm support device. Replace it if damaged.

WRONG

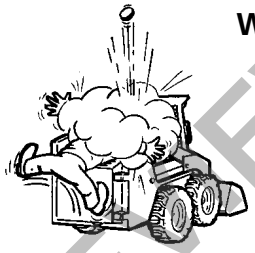


B-15280

Never work on loader with lift arms up unless lift arms are held by an approved lift arm support device. Replace if damaged.

Never modify equipment or add attachments not approved by Bobcat Company.

WRONG



B-6590

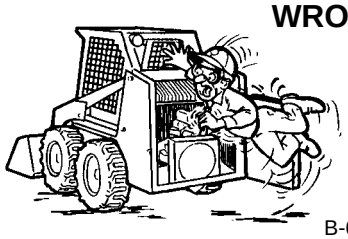
Stop, cool and clean engine of flammable materials before checking fluids.

Never service or adjust loader with the engine running unless instructed to do so in the manual.

Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate the skin or eyes.

Never fill fuel tank with engine running, while smoking or when near open flame.

WRONG



B-6580

Keep body, jewelry and clothing away from moving parts, electrical contact, hot parts and exhaust.

Wear eye protection to guard from battery acid, compressed springs, fluids under pressure and flying debris when engines are running or tools are used. Use eye protection approved for type of welding.

Keep rear door closed except for service. Close and latch door before operating the loader.

WRONG



B-6589

Lead-acid batteries produce flammable and explosive gases.

Keep arcs, sparks, flames and lighted tobacco away from batteries.

Batteries contain acid which burns eyes or skin on contact. Wear protective clothing. If acid contacts body, flush well with water. For eye contact flush well and get immediate medical attention.

Maintenance procedures which are given in the Operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures which are **not** in the Operation & Maintenance Manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL. Always use genuine Bobcat replacement parts.** The Service Safety Training Course is available from your Bobcat dealer.

MSW01-0805

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SERVICE SCHEDULE

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The service schedule is a guide for correct maintenance of the Bobcat loader.

⚠ WARNING

Instructions are necessary before operating or servicing machine. Read Operation & Maintenance Manual, Handbook and signs (decals) on machine. Follow warnings and instructions in the manual when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Failure to follow instructions can cause injury or death.

W–2003–1289

SERVICE SCHEDULE				HOURS						
440	443 443B	ITEM	SERVICE REQUIRED	8–10	25	50	100	250	500	1000
■	■	Engine Air Cleaner	Empty the dust cup.	■						
■	■	Engine Oil	Check level & add oil as needed.	■						
■		Engine Cooling System	Check & clean as needed (Including oil cooler).	■						
	■	Engine Cooling System	Check coolant level in recovery tank.	■						
■	■	Tires	Check air pressure & check for damage.	■						
■	■	Indicators & Gauges	Check for correct operation of all indicators, switches and lights.	■						
■	■	Seat Belt & Seat Bar	Check the condition of seat belt. Check the seat bar, when raised it must lock both pedals.	■						
■	■	Safety Signs (Decals)	Check for damaged signs (decals). Replace any signs (decals) that are not in correct location.	■						
■	■	All Loader Pivot Pins	Add grease to the fittings until extra grease shows.	■						
■	■	Hydraulic/Hydrostatic Fluid	Check fluid level in the reservoir & add fluid as needed.	■						
■		Engine Oil	Replace the engine oil.		■					
■	■	Engine Air Cleaner	● Replace the filter element.			■				
■		Engine Air Shrouding	Remove & clean shrouding & cooling fins.			■				
	■	Engine Oil & Filter	Replace engine oil & filter.				■			
■	■	Battery	Check cables & water level.			■				
■	■	Control Pedals & Steering Linkage	Check operation. Make repairs & adjustments as needed.			■				
■	■	Bob–Tach	Check locking lever & wedges for condition & operation.			■				
■	■	Wheel Nuts	Check for loose wheel nuts (See Page 1–17).			■				
■	■	Parking Brake	Check operation. Make adjustment as needed.			■				
	■	Alternator Belt	Check tension, make adjustment as needed.			■				
	■	Engine Fuel Filter	Remove water from the filter.			■				
■		Engine Ignition System	Check & clean spark plugs.				■			
■	■	Hydraulic/Hydrostatic Filter Element	Replace the filter element.				■			
■	■	Spark Arrestor Muffler	Clean the spark chamber.				■			
■	■	Steering Levers	Lubricate the grease fittings.					■		
■	■	Engine Fuel Filter	Remove & replace the filter element.					■		
■		Engine Ignition System	Check points & timing. Replace spark plugs.						■	
■		Engine Compression	Check the compression.						■	
■		Engine Valves	Check & set clearance at valves.						■	
■		Cylinder Head	† Service						■	
■		Starter Drive	Service						■	
■	■	Chaincase	Replace the fluid.							■
■	■	Hydraulic/Hydrostatic Reservoir	Replace the fluid & filter element.							■

● **More often in dusty conditions.**

† **250 hours when leaded gasoline is used.**

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HYDRAULIC / HYDROSTATIC FLOW CHART

For Model

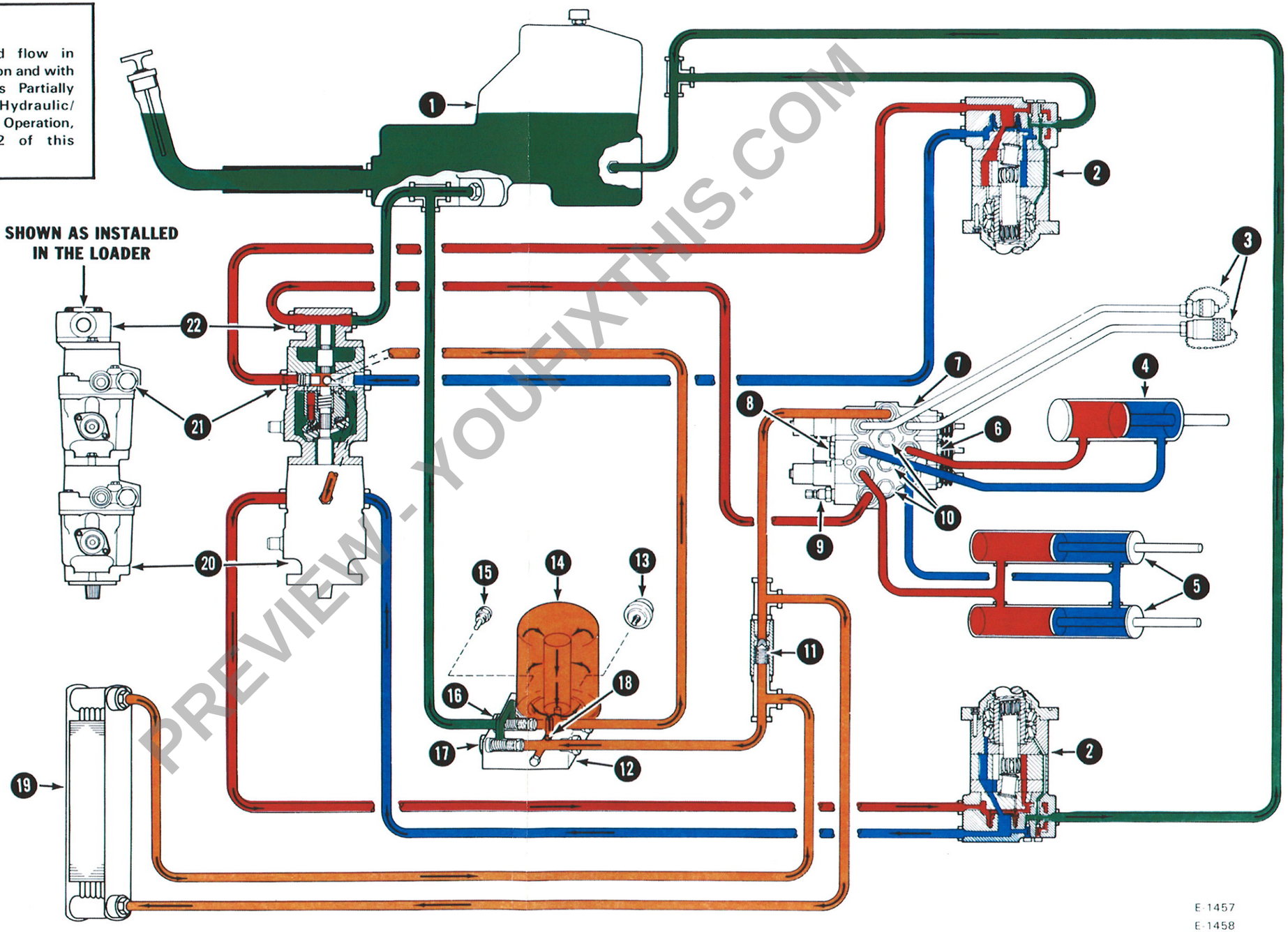
440 (S/N 11001 Thru 11711)
443 (S/N 11001 Thru 13914)

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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HYDROSTATIC SYSTEM

TROUBLESHOOTING

The following troubleshooting chart is provided for assistance in locating and correcting problems which are most common. Many of the recommended procedures must be done by authorized Bobcat Service Personnel only.

⚠ WARNING

Check for correct function after adjustments, repairs or service. Failure to make correct repairs or adjustments can cause injury or death.

W–2004–1285

PROBLEM	CAUSE
The hydraulic system will not operate.	1, 2, 3 4
Slow hydraulic system action.	1, 3, 5, 7, 8
Hydraulic action is not smooth.	1, 5, 7, 8, 9
Lift arms go up slowly at full engine RPM.	1, 3, 5, 7, 8, 10, 12
The lift arms or Bob–Tach will move with the pedal in neutral position.	6, 11
The lift arms come down slowly with the pedal in the neutral position.	6, 11, 12, 13

KEY TO CORRECT THE CAUSE

1. The fluid level is not correct.
2. The pedal linkage is disconnected.
3. The hydraulic pump is not working correctly.
4. The relief valve is not working correctly.
5. The pedal linkage is not adjusted correctly.
6. The pedal lock linkage is not adjusted correctly.
7. Relief valve is not at the correct pressure.
8. Suction leak on the inlet side of the hydraulic pump.
9. Fluid is cold.
10. Using the loader for more than its rated capacity.
11. Spool in the valve section is not centering or the centering spring is broken.
12. Internal leak at the lift cylinder(s).
13. External leak at the lift cylinder(s).

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HYDRAULIC CONTROL VALVE (Cont'd)

Disassembly of the Control Valve

IMPORTANT

When making repairs on hydrostatic and hydraulic systems, clean the work area before disassembly and keep all parts clean. Always use caps and plugs on hoses, tubelines and ports to keep dirt out. Dirt can quickly damage the system.

I–2003–0284

To disassemble the hydraulic control valve, use the following procedure:

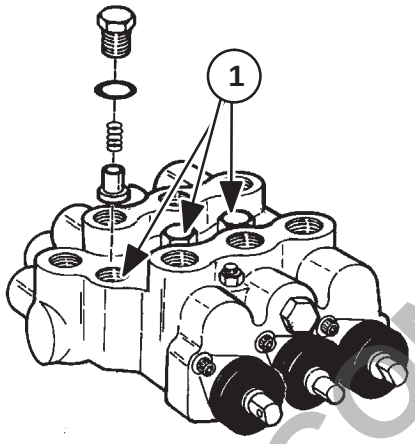
Mark each section and spool of the control valve so that each spool can be returned to its original bore during assembly.

Put the control valve on a work bench and install bolts through the valve and bench for easier disassembly.

Remove the loader check valves (Item 1) **[A]** from the three center ports (Items C1, C2 & C3) **[B]** in the top section of the control valve.

Remove the anti–cavitation valve **[C]** from the center port (Item E2) **[B]**. Remove the O–rings and back–up washers from the anti–cavitation valve.

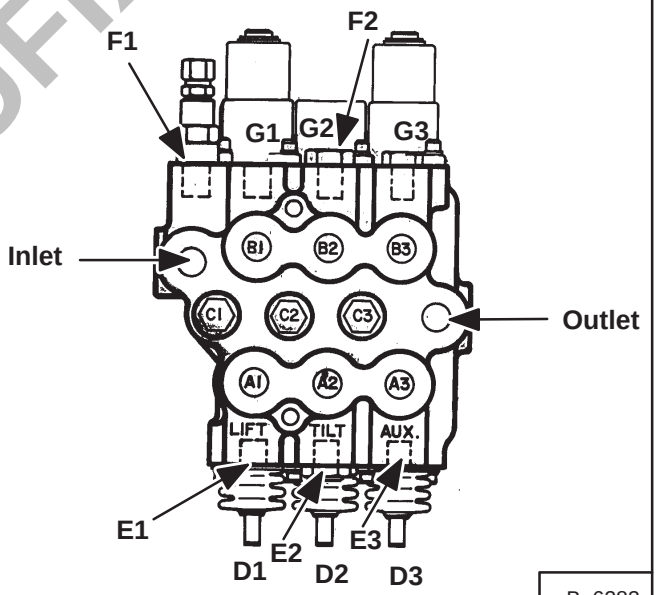
A



B–5833

B

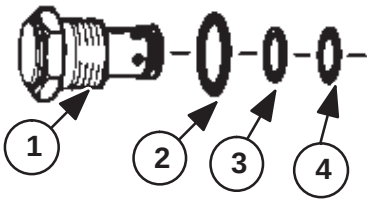
A1 – Lift Cylinder, Rod End
A2 – Tilt Cylinder, Base End
A3 – Auxiliary Coupler
B1 – Lift Cylinder, Base End
B2 – Tilt Cylinder, Rod End
B3 – Auxiliary Coupler
C1 – Lift Load Check
C2 – Tilt Load Check
C3 – Auxiliary Load Check
D1 – Lift Spool
D2 – Tilt Spool
D3 – Auxiliary Spool
E2 – Anti–Cav. Valve
F1 – Relief Valve
F2 – Plug
G1 – Lift Detent
G2 – Tilt Centering Spring
G3 – Auxiliary Detent



B–6283

C

1. **Anti–Cavitation**
2. **O–Ring**
3. **Back–Up Washer**
4. **O–ring**



E–1446

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⚠ WARNING

AVOID INJURY OR DEATH

Stop, cool and clean engine of flammable material. Never service or adjust loader with engine running unless instructed to do so in manual.

W–2061–0887

Open the rear door to service the engine. Pull the latch pin (rotate clockwise) on the left side of the rear door **[A]**.

Open the rear door to the right.

⚠ WARNING

Keep the rear door closed when operating the machine. Failure to do so could seriously injure a bystander.

W–2020–1285

Air Cleaner Service

440 – Bobcat Loader

It is important to service the air cleaner cup at regular intervals for good engine performance and long service life. Remove the dust cup **[B]** every day and clean it.

Replace the air filter element every 50 hours of loader operation or more if the loader is operated in dusty conditions.

To replace the air cleaner element, use the following procedure:

NOTE: Contamination can enter the system whenever the element is removed. DO NOT use air pressure to clean the air filter housing or the filter element.

Loosen the clamp and remove the dust cup **[B]**.

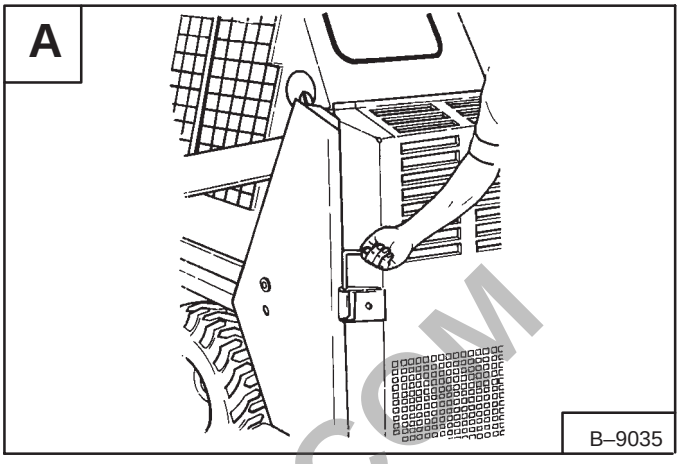
Remove the wing nut and remove the filter element from the air cleaner **[C]**.

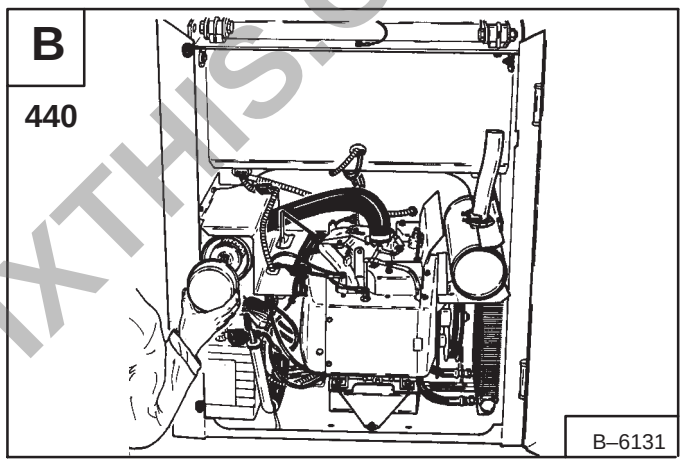
Clean the inside of the air cleaner housing so that the filter element has a smooth surface to contact at the seal. Check the filter housing for holes from corrosion, especially if the Bobcat loader is used in fertilizer application.

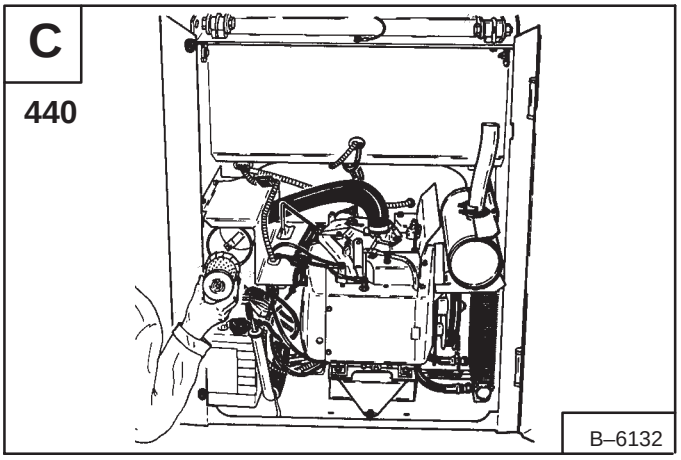
Install a new filter element **[C]** and tighten the wing nut.

Install the dust cup **[B]** and tighten the clamp.

Check to make sure that all the hoses and clamps are tight.







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ENGINE HARNESS
443 (S/N 12183—16280)

WIRE LEGEND

NO.'s	COLOR	GAUGE
0	Black	Cable
1	Red	Cable
1A	Red	10
1B	Red	12
1C	Red	12
1D	Red	12
12B	Orange	16
12C	Orange	16
12HN	Orange	16
14R	Lt. Green/White	16
20	Black	16
21R	White	16
21S	White/Lt. Green	12
28	Lt. Blue/Black	16
28B	Lt. Blue/Orange	10
28S	Lt. Blue/Yellow	16
31P	Yellow/Green	16
32P	Yellow	16
32PT	Yellow	16
35H	Yellow/Brown	16
36T	Purple/White	16
64	Orange/Blue	16
66	Orange/Green	16

PARTS LEGEND

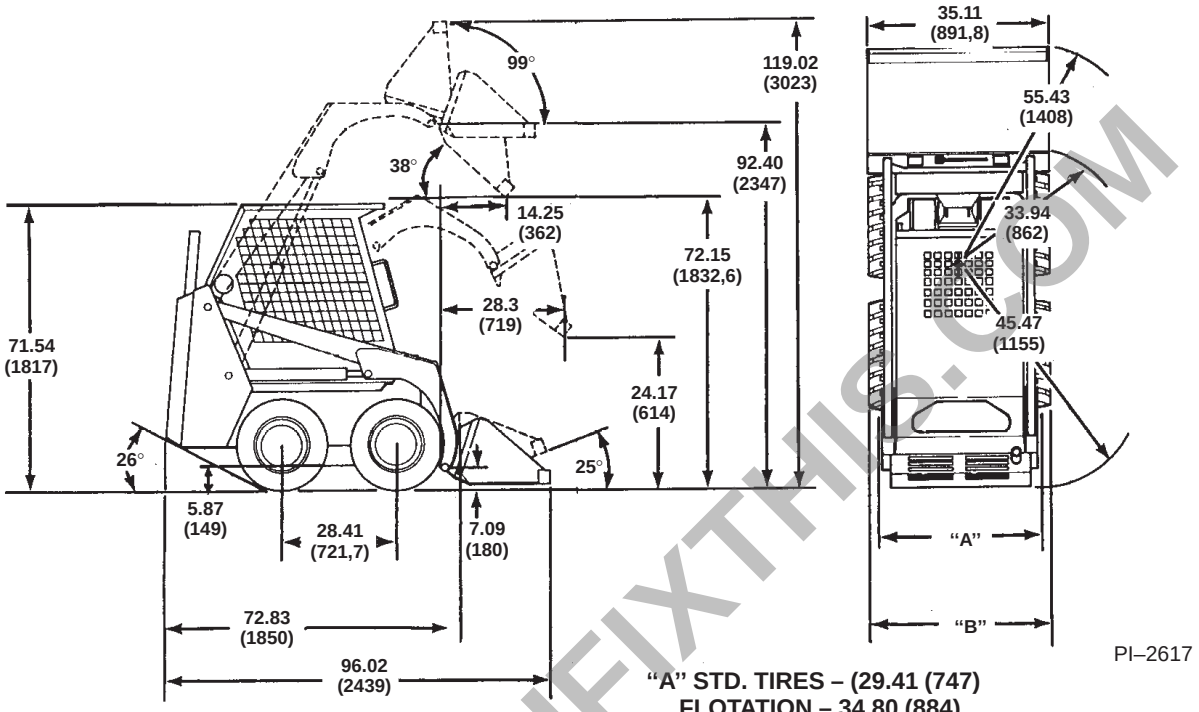
1. Operator Cab Harness Connector
2. Fuel Solenoid Valve (Opt.-Rental Kit)
3. Accessory Harness Connector (Opt.)
4. Charge Pressure Switch
5. Fluid Temperature Switch
6. Horn Button (Opt.)
7. Back-Up Alarm Switch (Opt.)
8. Alternator
9. Starter
10. Diode
11. Glow Plugs
12. Coolant Temp. Switch (Opt.-Rental Kit)
13. Coolant Temp. Sender
14. Engine Oil Pressure Switch
15. Pre-Heat Relay
16. Starter Relay
17. Engine Harness Connector
18. Chassis Harness Connector
19. Battery
20. Hourmeter (Opt.-Rental Kit)

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440 LOADER SPECIFICATIONS

LOADER DIMENSIONS

- Dimensions are given for loader equipped with standard tires and dirt bucket. Dimensions may vary with other types. All dimensions are shown in inches. Respective metric dimensions are given in millimeters enclosed by parentheses.
- Where applicable, specifications conform to SAE or ISO standards and are subject to change without notice.



PI–2617

"A" STD. TIRES – (29.41 (747)
FLOTATION – 34.80 (884)
"B" STD. TIRES – 35.43 (900)
FLOTATION – 43.31 (1100)

OPERATIONS & PERFORMANCE

	440
Weights	
Operating Weight	2260 lbs. (1025 kg)
Rated Operating Capacity	600 lbs. (272 kg)
Bucket Capacity	4.91 cu.–ft. (0.139 m^3)
Travel Speed	Infinitely variable 0–5.2 MPH (8,4 km/hr.)
Controls	
Vehicle	Direction & speed controlled by two hand levers.
Loader Function	Lift, tilt function controlled by separate foot pedals. Auxiliary functions controlled by the right steering lever.
Engine	Hand lever throttle; key–type starter switch
Main Drive	Hydrostatic
Parking Brake	Mechanical disc, foot operated pedal,
ENGINE	
Make	Kohler
Model	KT17QS
Fuel	Gasoline
Horsepower	16.2 HP (12,1 kW) @3000 RPM
Maximum Governed RPM	3000 RPM
Torque	29.5 ft.–lbs. (40 Nm) @ 2350 RPM
Number of Cylinders	Two
Bore/Stroke	3.125 (79,4)/2.75 (69,8)
Displacement	42.19 cu. in. (691,4 cm^3)
Cooling System	Air
Lubrication	Pressure System W/Filter
Crankcase Ventilation	External
Lubrication	Pressure System
Ignition	12 volt, battery ignition W/breaker points & coil.
Air Cleaner	Dry replaceable paper element.
High Idle RPM	3200 RPM
Low Idle RPM	1200 RPM

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ENGINE SPECIFICATIONS – 443 (KUBOTA) (Cont'd)

Engine Torque

Bolt material grades are shown by numbers punched on the bolt heads.

Before tightening, check the numbers shown below.

PUNCHED NUMBER	BOLT MATERIAL GRADE	
None	Standard	S41, S20C
7	Special Bolts	S43C, S48C (Refined)
9	Special Bolts	SCM3, SCR3 (Refined)

BOLT TORQUES			
MATERIAL GRADE	**STANDARD BOLT**	**SPECIAL BOLT**	**SPECIAL BOLT**
NOMINAL DIAMETER	SS41, S20C	S43C, S48C (Refined)	SCR3, SCM3 (Refined)
M6	5.8 to 6.9 ft.–lbs. (7.8 to 9.3 Nm)	7.2 to 8.3 ft.–lbs. (9.8 to 11.3 Nm)	9.0 to 10.5 ft.–lbs. (12.3 to 14.2 Nm)
M8	13.0 to 15.2 ft.–lbs. (17.7 to 20.6 Nm)	174. to 20.3 ft.–lbs. (23.5 to 27.5 Nm)	21.7 to 25.3 ft.–lbs. (29.4 to 34.3 Nm)
M10	28.9 to 33.3 ft.–lbs. (39.2 to 45.1 Nm)	35.4 to 41.2 ft.–lbs. (48.0 to 55.9 Nm)	44.8 to 52.1 ft.–lbs. (60.8 to 70.6 Nm)
M12	46.3 to 53.5 ft.–lbs. (62.8 to 72.6 Nm)	57.1 to 66.5 ft.–lbs. (77.5 to 90.2 Nm)	75.9 to 86.8 ft.–lbs. (103.0 to 117.7 Nm)
M14	79.6 to 92.6 ft.–lbs. (107.9 to 125.5 Nm)	91.1 to 108.5 ft.–lbs. (123.6 to 147.1 Nm)	123.0 to 144.7 ft.–lbs. (166.7 to 196.1 Nm)
M16	123.0 to 141.0 ft.–lbs (166.7 to 191.2 Nm)	144.7 to 166.4 ft.–lbs. (196.1 to 225.5 Nm)	191.7 to 224.2 ft.–lbs. (259.9 to 304.0 Nm)
M18	180.8 to 209.8 ft.–lbs. (245.2 to 284.4 Nm)	202.5 to 235.1 ft.–lbs. (274.6 to 318.7 Nm)	253.2 to 296.5 ft.–lbs. (343.2 to 402.0 Nm)
M20	145.9 to 289.3 ft.–lbs. (333.4 to 392.2 Nm)	271.2 to 318.2 ft.–lbs. (367.7 to 431.5 Nm)	361.6 to 419.5 ft.–lbs. (490.3 to 568.7 Nm)

*Cylinder Head Bolts and Nuts . . . . . 28.7–32.5 ft.–lbs. (38,9–44,1 Nm)
*Main Bearing Bolts . . . . . 15–17 ft.–lbs. (20.24 Nm)
*Main Bearing Case Bolts . . . . . 22–25 ft.–lbs. (29–34 Nm)
*Flywheel Bolts . . . . . 40–43 ft.–lbs. (54–59 Nm)
*Connecting Rod Bolts . . . . . 20–22 ft.–lbs. (27–30 Nm)
*Rocker Arm Bracket Studs . . . . . 12–15 ft.–lbs. (17–21 Nm)
*Idler Gear Shaft Bolts . . . . . 7–8 ft.–lbs. (9–11 Nm)
Glow Plugs . . . . . 15–18 ft.–lbs. (2–25 Nm)
Drain Plugs . . . . . 30–36 ft.–lbs. (39–49 Nm)
Nozzle Holders . . . . . 22–36 ft.–lbs. (29–49 Nm)
Oil Switch . . . . . 11–15 ft.–lbs. (15–20 Nm)
Fuel Injection Tubeline Fittings . . . . . 11–19 ft.–lbs. (15–26 Nm)
Crankshaft Nut . . . . . 101–116 ft.–lbs. (137–157 Nm)
Injection Pump Vent Screw . . . . . 10–13 ft.–lbs. (14–18 Nm)

*Lightly Oiled Threads

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HYDRAULIC CONTROL VALVE (Cont'd)

Relief Valve (Cont'd)

Checking relief valve pressure without auxiliary hydraulics, use the following procedure:

Raise the operator cab. (See Page 5–1 for the correct procedure.)

Put the auxiliary spool (on the control valve) (Item 1) **[A]** into the "detent" position.

Connect the IN hose from the tester to the front port on the auxiliary section (Item 2) **[A]**.

Connect the OUT hose from the tester to the rear port on the auxiliary section (Item 3) **[A]**.

IMPORTANT

The hydraulic tester must be in the fully open position before you start the engine.

I–2024–0284

NOTE: Make sure the fluid is at operating temperature.

Start the engine and run at idle RPM.

Watch the flow on the hydraulic tester. Increase the engine RPM to maximum.

Turn the restrictor control on the tester to increase the pressure. Read the pressure gauge. The pressure must be 1435 – 1495 PSI (9894 – 10308 kPa).

Checking Relief Valve pressure using the quick couplers:

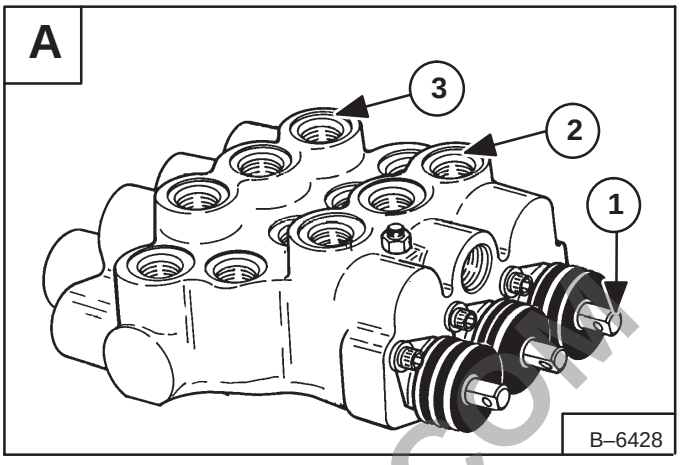
Connect the tester to the quick couplers **[B]**.

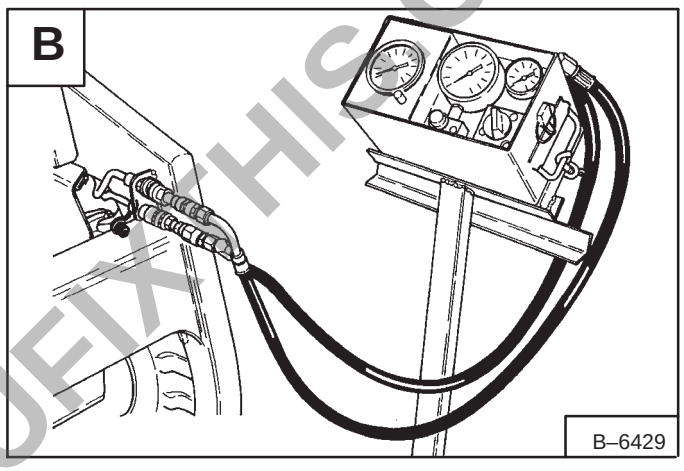
Start the engine and run at idle RPM.

Activate the auxiliary hydraulic control (Right steering lever) to put pressure into the hydraulic tester (inlet port). Watch the flow on the hydraulic tester. Increase the engine RPM to maximum.

Turn the restrictor control on the tester to increase the pressure.

Read the pressure on the gauge. The pressure must be 1435 – 1495 PSI (9894 – 10308 kPa).





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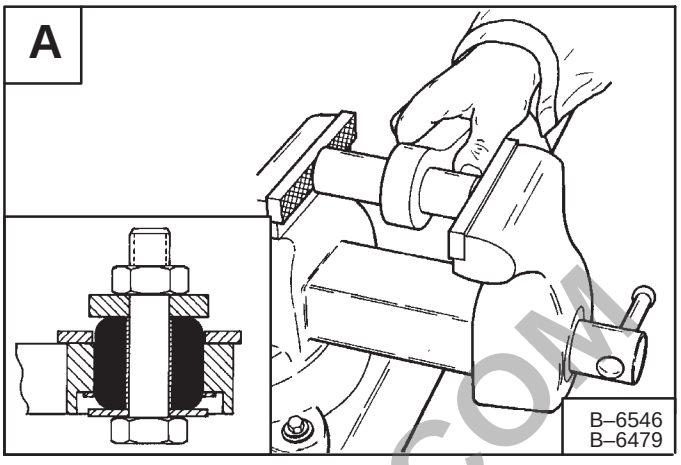
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STEERING LINKAGE (Cont'd)

Installing the Pintle Arms

Install the bushing in the pintle arm **[A]**.

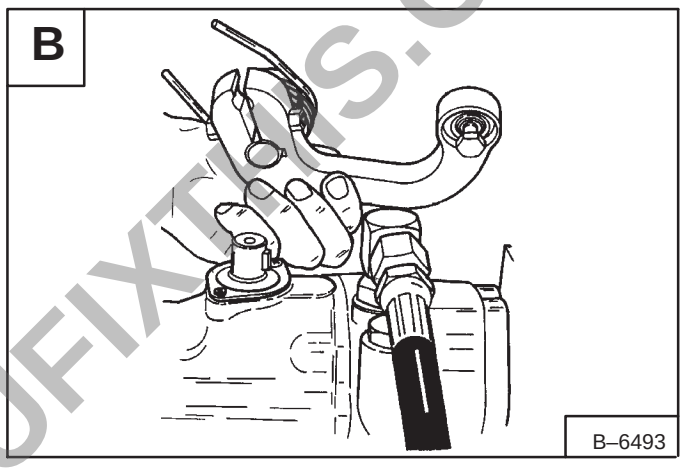
Install the centering spring and sleeve into the pintle arm.



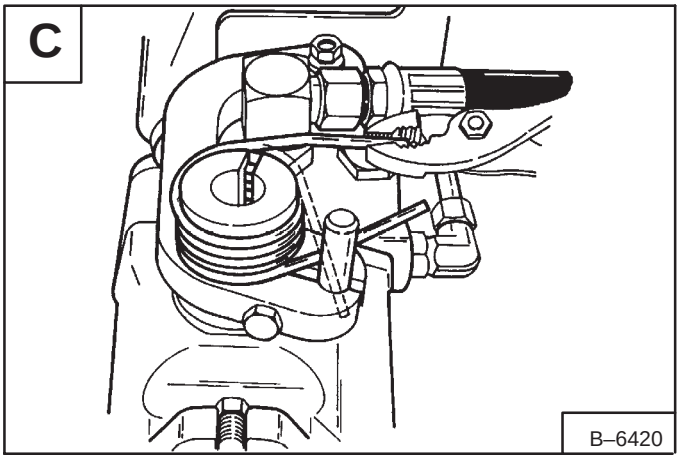
Install the assembly on the pump shaft **[B]**.

Install the dowel pin.

Tighten the pintle arm bolt and nut.

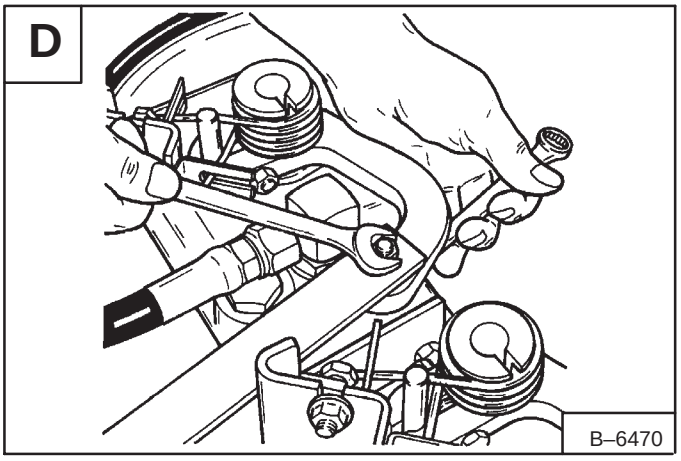


Connect the spring ends **[C]**.



Connect the steering linkage to the pintle arm **[D]**.

Adjust the steering linkage. (See Page 3–8.)



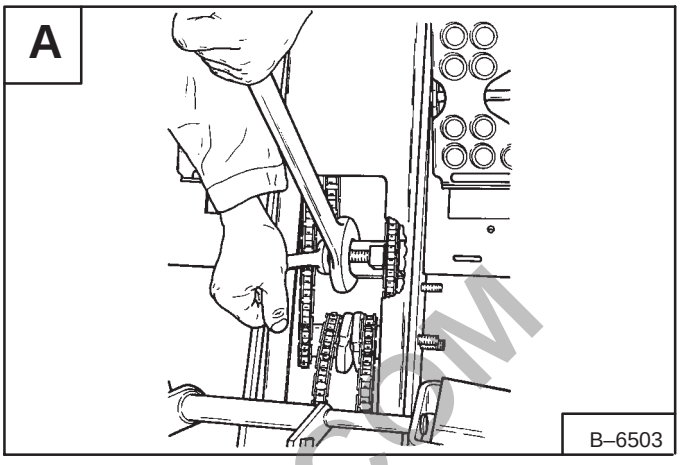
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DRIVE CHAINS (Cont'd)

Installing the Drive Chain(s) (Cont'd)

Connect the chain using the chain link press tool **[A]**.



Install the hydrostatic motor into the sprocket and the chaincase.

Install the brake discs.

Install the mounting nuts on the motor flange and tighten to 95 ft.–lbs. (129 Nm) torque.

Install the high pressure hoses and the case drain hose. Tighten the fittings.

Add the correct fluid to the chaincase. (See Page 8–1 for the correct fluid.)

Install the chaincase cover and parking brake assembly. (See Page 4–5.)

Install the front panel on the steering levers.

Install the tires and wheels.

Lower the operator cab. (See Page 5–1 for the correct procedure.)

Remove the jackstands from under the loader frame.

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ALTERNATOR SYSTEM (440)

Replacing the Stator

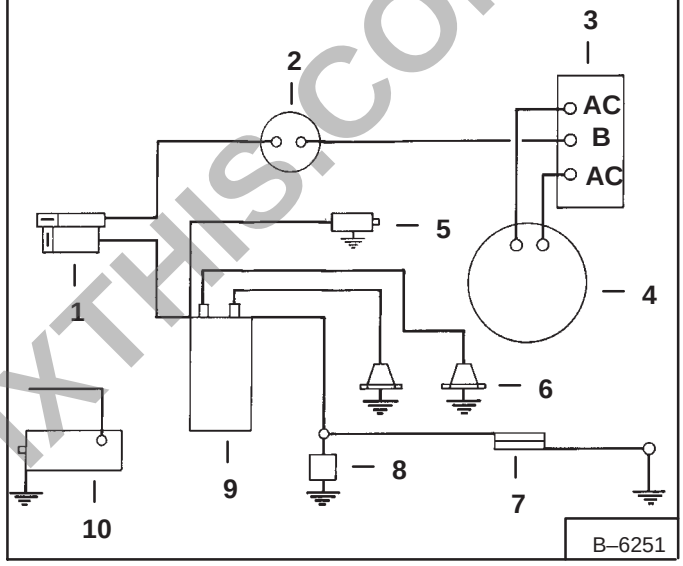
Remove the engine air shrouding from the flywheel. (See Section 7A for the correct procedure.)

Remove the flywheel. (See Section 7A for the correct procedure.)

A

440

1. **Plug**
2. **Ammeter (Used For Test Only)**
3. **Rectifier/Regulator**
4. **Flywheel Alternator**
5. **Shutdown Control (Fuel Solenoid)**
6. **Spark Plugs**
7. **Points**
8. **Condenser**
9. **Coil**
10. **Starter**



Remove the bolts that hold the stator to the crankcase **[B]**.

Install a new stator, rotate the stator on the crankcase until the clip that holds the leads together is between the eight and ten o'clock position.

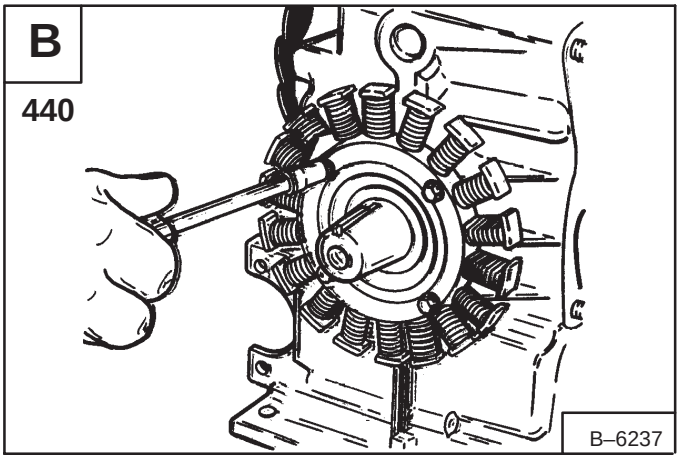
Install the bolts and tighten.

Install the flywheel. (See Section 7A for the correct procedure.)

Install the air shrouding. (See Section 7A for the correct procedure.)

B

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CARBURETOR & GOVERNOR (Cont'd)

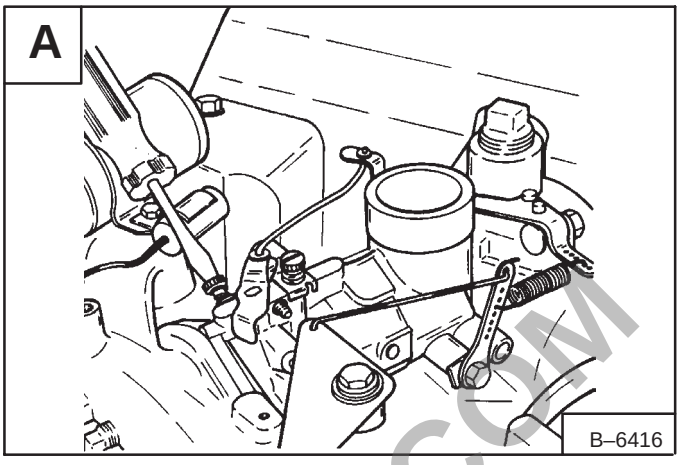
Carburetor Adjustment on the Engine (Cont'd)

Idle Speed Setting [A]

Run the engine at full governed RPM with no load for 5–10 minutes.

Put the engine speed control in the idle position.

Turn the speed screw in or out so the engine will idle at 1200 RPM.

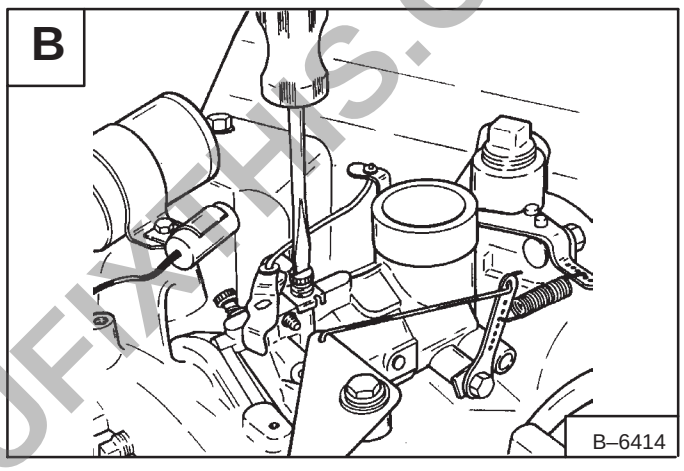


Shutdown Control Solenoid

The engine shutdown control solenoid is mounted on the carburetor which prevents the engine from *running on* after the ignition switch is turned OFF.

Make sure the solenoid has a good electrical connection and good contact with the holddown bracket (ground).

Remove the main fuel adjustment screw **[B]**.



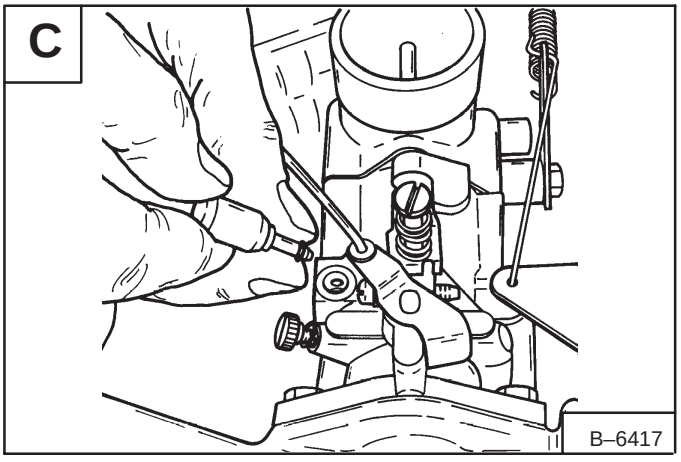
Remove the solenoid and plunger from the carburetor **[C]**.

Check the plunger for being stuck. Replace if damaged.

Check for a defect in the solenoid with an ohmmeter. Solenoid resistance is about 20 ohms.

Install the plunger and solenoid **[C]**.

Install the main fuel screw, make adjustment to the main fuel screw. (See Page 7A–21.)



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CYLINDER HEAD (Cont'd)

Servicing the Cylinder Head (Cont'd)

Push down on the spring 1.22'' (31 mm). The compression load must be 16.5 lbs. (7,49 kg). Replace the valve spring if it does not meet these specifications.

Measure the inside diameter of the rock arm bushing and the shaft diameter **[A]**.

The inside of the rocker arm bushing is 0.4330–04346'' (10,997–11,038 mm). The rocker arm shaft diameter is 0.4320–0.4324" (10,973–10,984 mm). If the measurements are not within the specifications, replace the parts as needed.

Assembly of the Cylinder Head

Install the valves.

Put oil on the valve seal and install the valve seal on the valve.

Install the valve spring and the retainer.

Install the thermostat.

Install a new gasket and the thermostat housing.

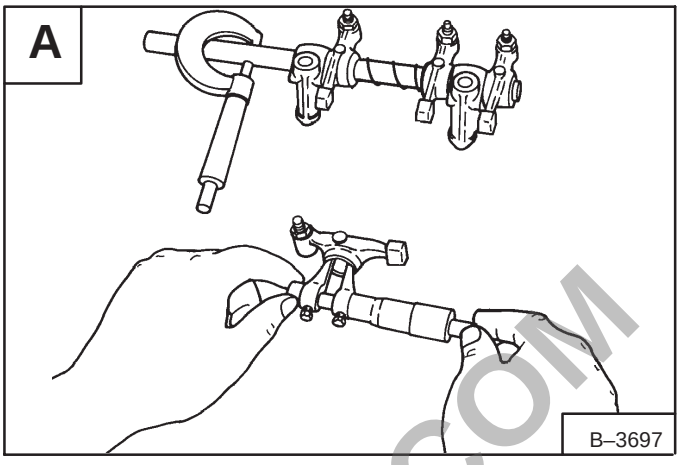
Installing the Cylinder Head

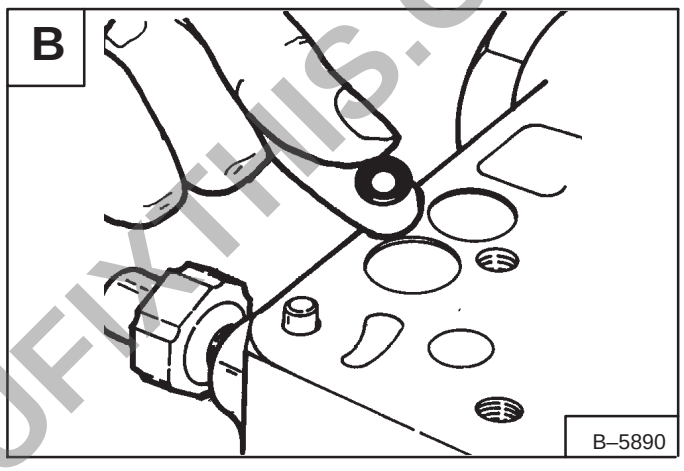
Install a new O–ring on the engine block **[B]**.

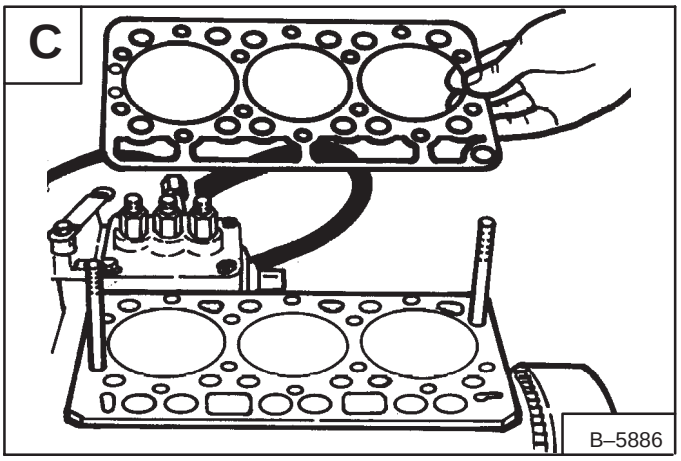
Install a new head gasket and shim if there was a shim present during disassembly **[C]**. The shim (when used) goes between the cylinder head and gasket.

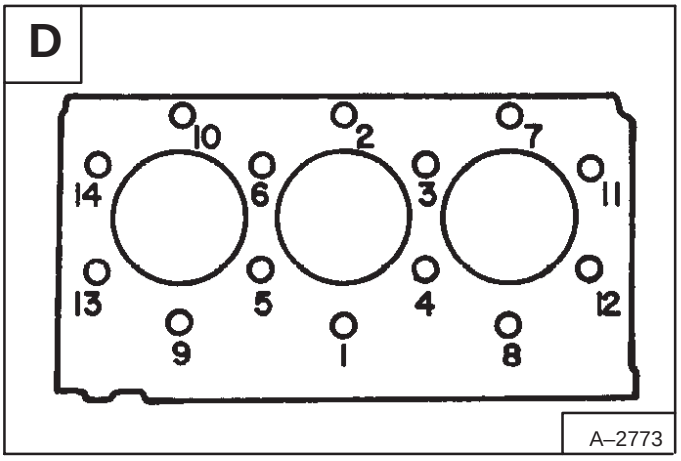
Install the cylinder head on the engine block.

Put oil on the cylinder head bolts and nuts and tighten to 29–33 ft.–lbs. (40–45 Nm) torque. Use the same tighten sequence as shown in **[D]**.









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