453

Bobcat

Service Manual

S/N 515011001 & Above
S/N 515111001 & Above



EQUIPPED WITH
BOBCAT INTERLOCK
CONTROL SYSTEM (BICS™)

6900363 (5–97)

Bobcat
Printed in U.S.A.

© Bobcat Company 1997

MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97 Order the manual at mid-west-tech.com >

ALPHABETICAL INDEX

AIR CLEANER SERVICE 1–1
ALTERNATOR 6–1
ALTERNATOR BELT 1–1
AUXILIARY CONTROL LOCKBOLT 1–1
AXLE, BEARINGS AND SPROCKET 4–1
AXLE HUB 4–1
AXLE SEAL 4–1

BATTERY 6–1
BICS™ (With Press To Operate Button) 8–1
BICS™ (Without Press To Operate Button) 8–1
BICS™ BLOCK VALVE 2–1
BICS™ SYSTEM CONTROLLER 8–1
BOB–TACH 1–1, 5–1

CHAINCASE COVERS 4–1
CHAINCASE FLUID 4–1
CONTROL PEDALS 2–1
CONTROL SHIELD AND
STEERING LEVER PANELS 3–1
CRANKSHAFT AND BEARINGS 7–1
CRANKSHAFT GEAR 7–1
CYLINDER BORE 7–1
CYLINDER HEAD 7–1

DECIMAL & MILLIMETER EQUIVALENTS 9–1
DRIVE BELT 3–1
DRIVE CHAIN 4–1

ELECTRICAL SYSTEM INFORMATION 6–1
ENGINE 7–1
ENGINE COMPRESSTION TEST 7–1
ENGINE COOLING SYSTEM 1–1
ENGINE LUBRICATION SYSTEM 1–1
ENGINE MOUNTING BRACKET 7–1
ENGINE OIL COOLER AND SHROUDING 7–1
ENGINE SPECIFICATIONS 9–1
ENGINE SPEED CONTROL 7–1

FAN 7–1
FINAL DRIVE TRANSMISSION (CHAINCASE) 1–1
FLYWHEEL 7–1
FRONT LIGHTS (OPTIONAL) 6–1
FUEL CAMSHAFT 7–1
FUEL INJECTION PUMP 7–1
FUEL INJECTOR NOZZLES 7–1
FUEL SYSTEM 1–1, 7–1
FUEL TANK 5–1

GLOW PLUGS 7–1

HYDRAULIC CONNECTION SPECIFICATION 9–1
HYDRAULIC CONTROL VALVE 2–1
HYDRAULIC CYLINDERS 2–1
HYDRAULIC FILTER BLOCK 2–1
HYDRAULIC/HYDROSTATIC
FLUID SPECIFICATIONS 9–1
HYDRAULIC/HYDROSTATIC SYSTEM 1–1
HYDRAULIC PUMP 2–1
HYDRAULIC RESERVOIR 2–1
HYDRAULIC SYSTEM INFORMATION 2–1
HYDROSTATIC MOTOR 3–1
HYDROSTATIC PUMP 3–1
HYDROSTATIC SYSTEM INFORMATION 3–1

IDLER GEAR AND CAMSHAFT 7–1
INSTRUMENT PANEL 6–1

LIFT ARM SUPPORT DEVICE 1–1
LIFT ARMS 5–1
LIFT CYLINDER(S) 2–1
LIFTING AND BLOCKING THE LOADER 1–1
LIFTING THE LOADER 1–1
LOADER SPECIFICATIONS 9–1
LUBRICATING THE LOADER 1–1

MAIN RELIEF VALVE 2–1

OIL PUMP 7–1
OPERATOR CAB 1–1, 5–1
OPERATOR CAB GAS CYLINDER 5–1
OPERATOR SEAT 5–1

PARKING BRAKE DISC 4–1
PARKING BRAKE PEDAL 4–1
PEDAL INTERLOCK LINKAGE 2–1
PISTONS AND CONNECTING ROD 7–1
PIVOT PINS 1–1

RADIATOR 7–1
RADIATOR MOUNTING BRACKET 7–1
REAR DOOR 5–1
REAR LIGHTS (OPTIONAL) 6–1
REAR WINDOW 5–1
REMOTE START SWITCH 1–1
ROCKER ARM AND SHAFT 7–1

SEAT BAR 5–1
SEAT BAR RESTRAINT SYSTEM 1–1
SEAT BAR SENSOR 8–1
SEAT SENSOR 8–1
SERVICE SCHEDULE 1–1
SPARK ARRESTOR MUFFLER 1–1
STANDARD TORQUE SPECIFICATIONS
FOR BOLTS 9–1
STARTER 6–1
STEERING LEVERS 3–1
STEERING LINKAGE 3–1

TENSION PULLEY AND SPRING 3–1
THERMOSTAT 7–1
TILT CYLINDER 2–1
TIMING GEARCASE COVER 7–1
TIMING GEARS 7–1
TIRE MAINTENANCE 1–1
TOWING THE LOADER 1–1
TORQUE SPECIFICATION FOR BOLTS 9–1
TRACTION LOCK 8–1
TRANSPORTING THE LOADER 1–1
TROUBLESHOOTING 2–1, 3–1, 6–1, 7–1

U.S. TO METRIC CONVERSION 9–1

VALVE & VALVE SPRINGS 7–1
VALVE CLEARANCE 7–1
VALE GUIDE, VALVE & VALVE SEAT 7–1

WATER PUMP 7–1

Revised Mar. 99

MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97 Order the manual at mid-west-tech.com >

MELROE
INGERSOLL-RAND

bobcat®

453–2
Revision Number
9 October 1998
Date

SERVICE MANUAL REVISION

ROUTE TO ATTENTION

PARTS MANAGER	☐
SERVICE MANAGER	☒
SALES MANAGER	☐

AFFECTING:

Product BOBCAT LOADER

Model 453

Manual No. 6900363 (5–97)

NOTICE **Insert This Sheet With The Above Listed Manual For Future Reference.**

The following pages are a revision to the above Service Manual.

Take out existing pages and put in the new pages as listed below:

TAKE OUT	PUT IN
Maintenance Safety Page	Maintenance Safety Page
ALPHABETICAL INDEX	ALPHABETICAL INDEX
v thru vi	v thru vi
1–1 thru 1–2 1–5 thru 1–10 1–15 thru 1–26	1–1 thru 1–2 1–5 thru 1–10 1–15 thru 1–26
DO NOT REMOVE the Hydraulic Schematics in Section 2 2–1 thru 2–4 2–11 thru 2–12 2–15 thru 2–22 2–35 thru 2–36	2–1 thru 2–4 2–11 thru 2–12 2–15 thru 2–22 2–35 thru 2–36
3–7 thru 3–10	3–7 thru 3–10
4–1 thru 4–2	4–1 thru 4–2
7–1 thru 7–2 7–9 thru 7–10	7–1 thru 7–2 7–9 thru 7–10
8–17 thru 8–18	8–17 thru 8–18
9–1 thru 9–2 9–9 thru 9–16	9–1 thru 9–2 9–9 thru 9–20

MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97 Order the manual at mid-west-tech.com >

MELROE
INGERSOLL-RAND

bobcat®

453–3
Revision Number
24 March 1999
Date

SERVICE MANUAL REVISION

ROUTE TO ATTENTION

PARTS MANAGER	☐
SERVICE MANAGER	☒
SALES MANAGER	☐

AFFECTING:

Product BOBCAT LOADER

Model 453

Manual No. 6900363 (5–97)

NOTICE **Insert This Sheet With The Above Listed Manual For Future Reference.**

The following pages are a revision to the above Service Manual.

Take out existing pages and put in the new pages as listed below:

TAKE OUT	PUT IN
Cover	Cover
Maintenance Safety Page	Maintenance Safety Page
ALPHABETICAL INDEX	ALPHABETICAL INDEX
i thru x	i thru viii
Section 1	Section 1
Section 2 HYDRAULIC SCHEMATICS	Section 2 HYDRAULIC SCHEMATICS
3–3 thru 3–10 3–17 thru 24 3–31 thru 3–32	3–3 thru 3–10 3–17 thru 24 3–31 thru 3–32
Section 4	Section 4
5–7 thru 5–10 5–17 thru 5–18	5–7 thru 5–10 5–17 thru 5–18
Section 7	Section 7
Section 8	Section 8
9–1 thru 9–2 9–17 thru 9–20	9–1 thru 9–2 9–17 thru 9–18

MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97 Order the manual at mid-west-tech.com >

ELECTRICAL SYSTEM INFORMATION

Description

The loader has a 12 volt, negative ground alternator charging system **[A]**.

IMPORTANT

Do Not use silicone base sprays and/or sealants on harness connectors or components.

I-2123-0397

Fuse Location

The electrical system is protected by 6 fuses located in the engine compartment **[B]**.

Remove the clips (Item 1) **[B]** and remove the fuse covers to access the fuses **[C]**.

The decal (Item 2) **[B]** located by the fuse holders specifies the fuse sizes used in the various electrical circuits.

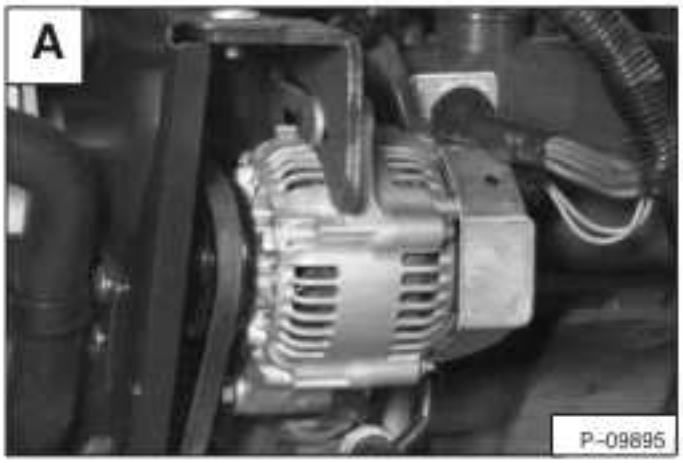
Relay Switches Location

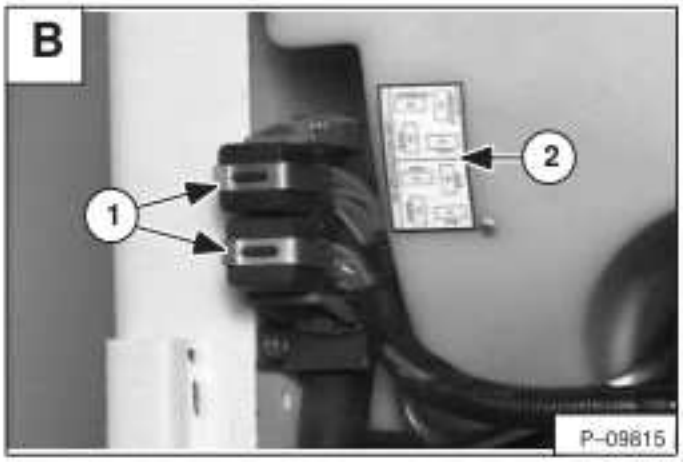
The loader engine harness relay switches (Item 1) **[D]** are located on the lower right side of the engine compartment.

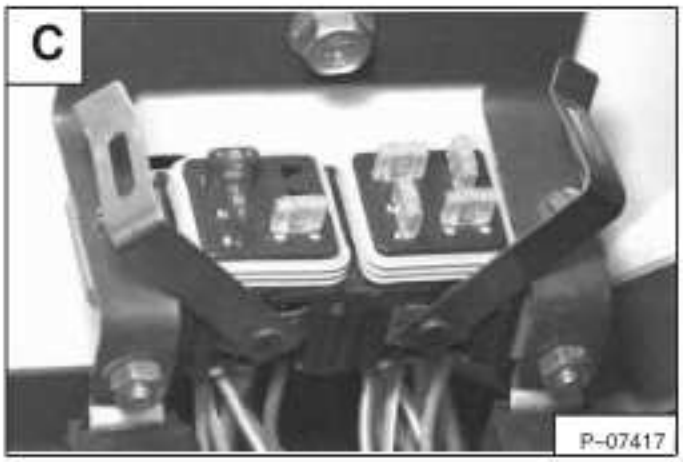
There are five relay switches for the circuitry on the loader.

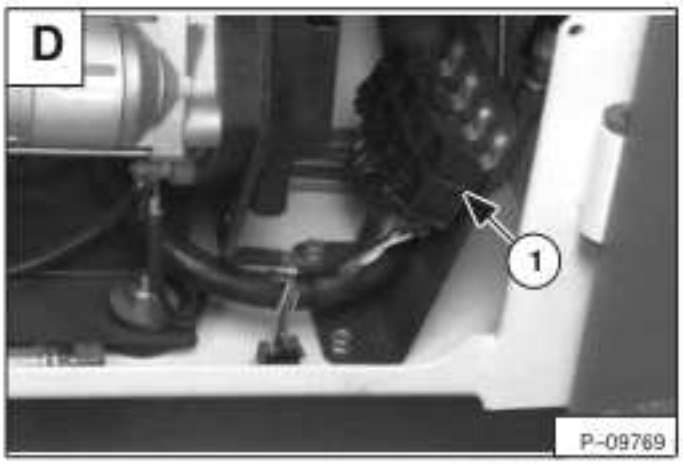
The relay switches are for the starter, switch power, glow plugs, brake, and fuel shut down solenoid.

Replace a relay switch if the switch is malfunctioning. Refer to the engine electrical wiring diagram at the beginning of this section for correct wiring connections.





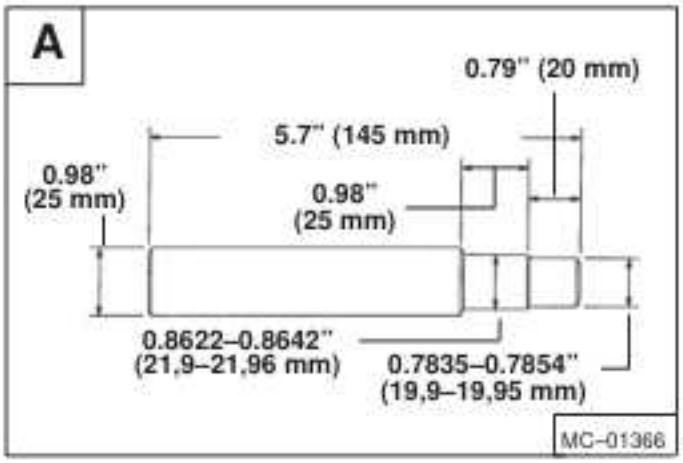




MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97 Order the manual at mid-west-tech.com >

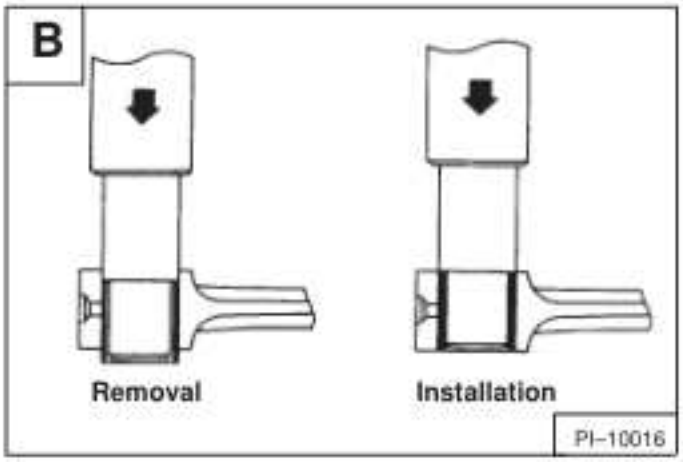
Servicing The Piston And Connecting Rod (Cont'd)

To replace the connecting rod small end bushing, make a driver tool as shown in figure **[A]**.



Use a press and special driver tool to remove the small end bushing **[B]**.

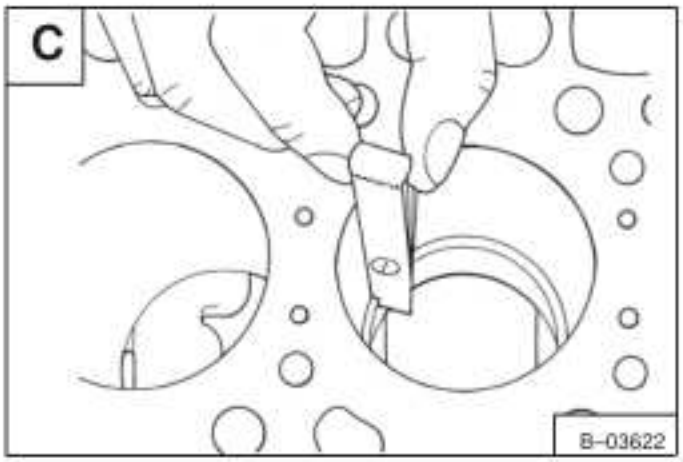
Installation: Clean the small end bushing and bore. Put oil on the bushing and press into the connecting rod until it is flush **[B]**.



Install a new piston ring into the lower part of the cylinder bore. Measure the ring gap with a feeler gauge **[C]**.

If the gap exceeds the allowable limit, replace the ring.

Top Compression Ring & Oil Ring	0.006–0.012 inch (0,15–0,30 mm)
Second Compression Ring	0.012–0.018 inch (0,30–0,45 mm)
Allowable Limit	0.047 inch (1,2 mm)

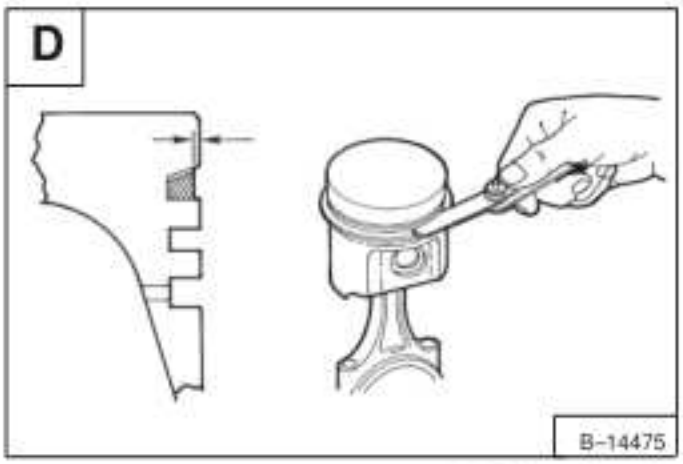


Remove the carbon from the ring grooves. Measure the clearance between the ring and groove with a feeler gauge **[D]**.

If the clearance exceeds the allowable limit, replace the piston.

Second ring	0.0035–0.0043 inch (0,09–0,12 mm)
Oil ring	0.0016–0.0031 inch (0,04–0,08 mm)

Allowable limit second ring	0.0059 inch (0,2 mm)
Allowable limit oil ring	0.0059 inch (0,2 mm)



MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97
Order the manual at mid-west-tech.com >

BICS™ (Without Press To Operate Button) (Cont'd)

Troubleshoot Chart

The following list shows the effects which can happen to the loader, and the probable causes when the BICS Controller lights are off or flashing. Have the service procedure performed ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL.

Indicator Light	Light ON	Light OFF	Effect on Operation of Loader When Light Is OFF	Flashing Indicator Means System Problem (See Your Bobcat Dealer for Service)	
				Number of Flashes	Cause
Seat 	Operator in Seat	No Operator in Seat	Lift and tilt functions will not operate.	2	Seat sensor circuit shorted to battery.
				3	Seat sensor circuit shorted to ground.
Seat Bar 	Seat Bar Down	Seat Bar Up	Lift, tilt and traction functions will not operate.	2	Seat bar sensor circuit shorted to battery.
				3	Seat bar sensor circuit shorted to ground.
Valve 	Control Valve Can Be Used	Control Valve Cannot Be Used	Lift and tilt functions will not operate.	1	Valve output is open.
				2	Valve output circuit shorted to battery.
				3	Valve output circuit shorted to ground.
				3	Valve output circuit is not grounded.
Traction 	Loader can be moved forward & backward.	Loader cannot be moved forward and backward.	Loader cannot be moved forward and backward.	1	Traction lock hold coil circuit is open.
				2	Traction lock hold coil circuit shorted to battery.
				3	Traction lock hold coil circuit shorted to ground.
				4	Traction lock pull coil circuit is open.
				5	Traction lock pull coil circuit is shorted to battery.
				6	Traction lock pull coil circuit is shorted to ground.
Power 	BICS Controller is operating correctly.	BICS Controller is not operating correctly.	Lift, tilt and traction functions will not operate.		

NOTES:

(1) If the seat and/or seat bar sensor circuits are open, the corresponding lights will be OFF. If one of the lights stay OFF, check the circuit for continuity. See Inspection & Maintenance Instructions in Preventive Maintenance section.

(2) If all five lights flash repeatedly, the voltage supply is greater than 16 volts or less than 9 volts.

(3) Flashing patterns will repeat every 3.25 seconds.

(4) If seat indicator light does not go ON, check for debris, dirt or objects under or behind the seat.

NOTE: If the Seat Bar is lowered before the seat sensor is activated, a 10 second delay will occur before the valve and traction lights come on.

MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97 Order the manual at mid-west-tech.com >

⚠ WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, 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–2003–0199

The following publications provide information on the safe use and maintenance of the loader and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the machine is in safe operating condition.
- The Operation & Maintenance Manual delivered with the loader gives operating information as well as routine maintenance and service procedures. It is a part of the loader and must stay with the machine when it is sold. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat loader dealer.
- The loader has machine signs (decals) which instruct on the safe operation and care. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat loader dealer.
- The loader has a plastic Operator's Handbook fastened to the operator cab. Its brief instructions are convenient to the operator. The Handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The EMI Safety Manual (available in Spanish) delivered with the loader gives general safety information.
- The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop–type service and repair work.
- The Skid–Steer Loader Operator Training Course is available through your local dealer. This course is intended to provide rules and practices for correct operation of the Bobcat loader. The course is available in English and Spanish version.
- The Service Safety Training Course is available from your Bobcat dealer. This course provides information for safe and correct service procedures for Bobcat Skid–Steer loaders.
- The Bobcat Skid–Steer Loader Safety Video is available from your Bobcat Dealer.

⚠WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death.

W–2044–1285

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.

I–2019–0284

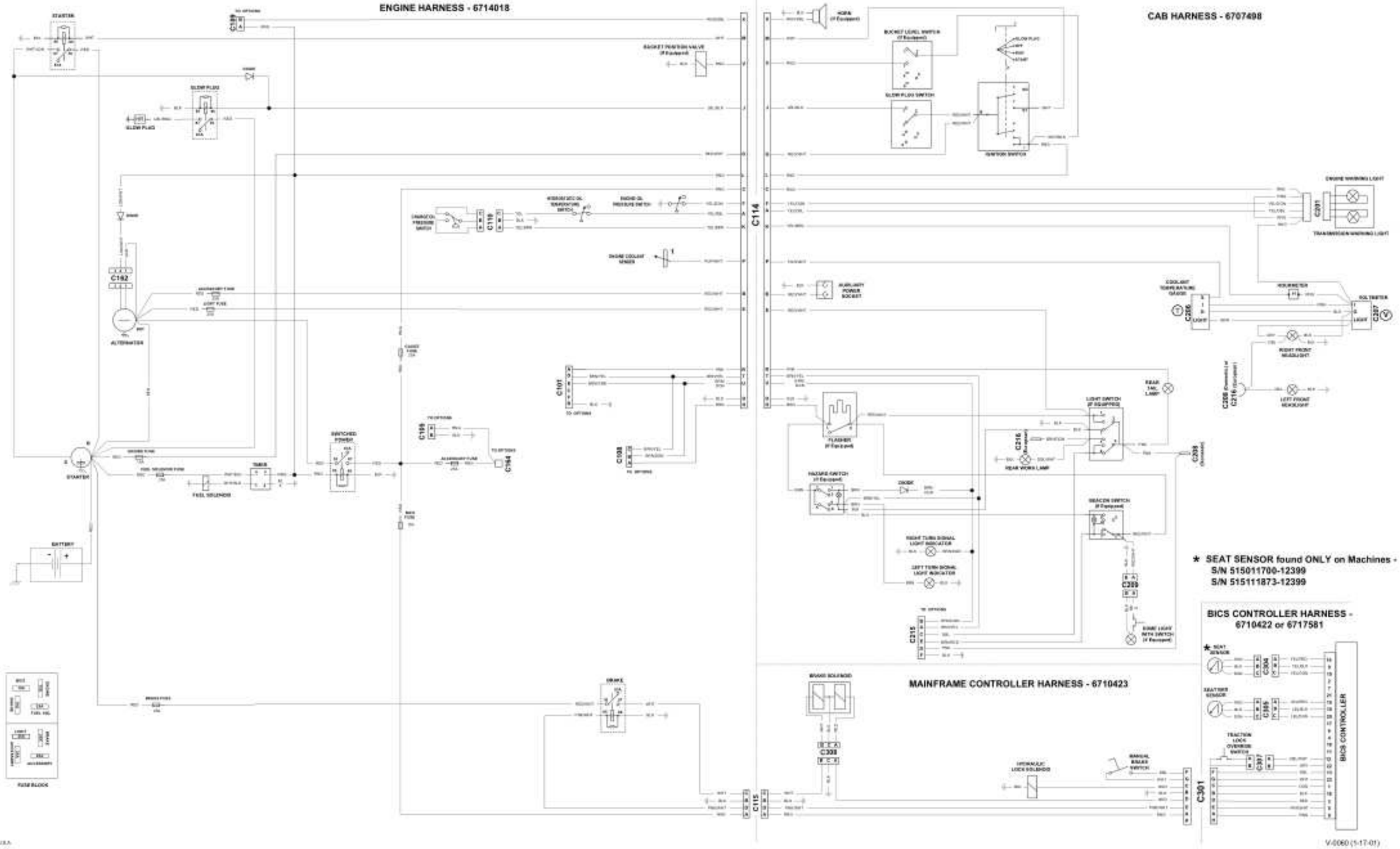
⚠ **Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.**

SIOS–0299

MidWestTech | Bobcat 453 Skid Steer Loader Service Manual | Publication 6900363_5_97 Order the manual at mid-west-tech.com >

453 WIRING SCHEMATIC

S/N 515011001 AND ABOVE
S/N 515111001 AND ABOVE
(PRINTED JANUARY 2001)
V-0060



★ SEAT SENSOR found ONLY on Machines -
S/N 515011700-12399
S/N 515111873-12399

Printed in U.S.A.

V-0060 (1-17-01)

Order the manual at mid-west-tech.com >