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GENERAL INFORMATION 5.1

Ignition	12 Volts
Grounding	Negative
Alternator Brand	Nippondenso
Alternator Rating	60 Amp
Alternator Type	Internal Regulator
Battery	One (1)
Battery Rating	730 CCA, 125 Reserve Minutes
Battery Type	SERV 3478
Starter Brand	Nippondenso
Pre - Heater	(4) Glow Plugs
Glow Plug Location	Cylinder Head
Circuit Breaker	(1) 40 Amp, Starter / Ignition Switch
Protection	Fuse Block in Engine Compartment
Fuse Rating:	
Engine Shut Off Solenoid	15 Amp
Alternator	10 Amp
Safety Circuit	10 Amp
Horn	10 Amp
Aux. Hydraulics	10 Amp
Cab Heater	10 Amp
Back up Alarm	10 Amp
Dome Light	10 Amp
Starter	40 Amp Relay*
Glow Plugs	40 Amp Relay*
Cooling Fans	(2) 40 Amp Relay*
*	Linked to 10 Amp Fuse in Panel

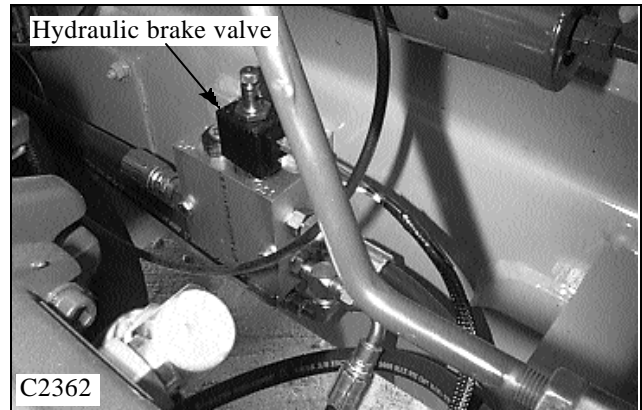
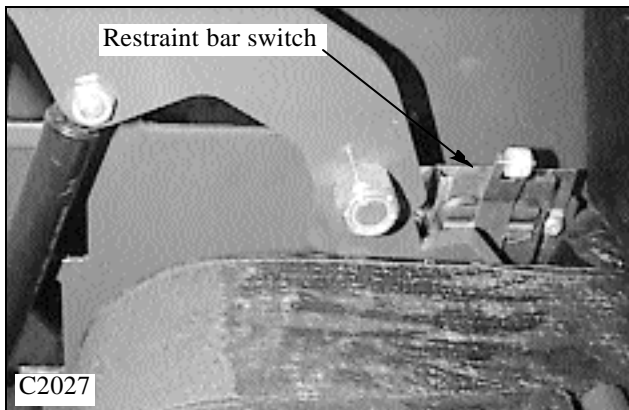
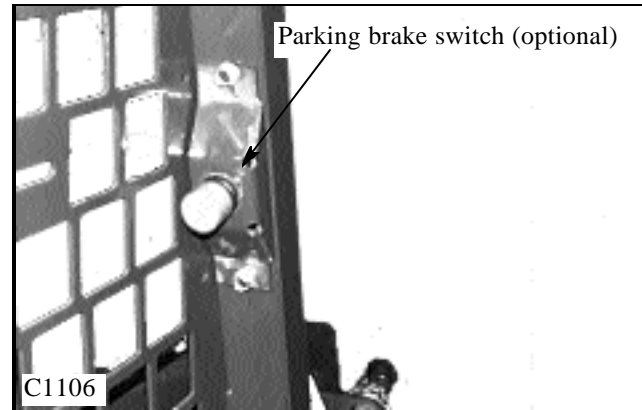
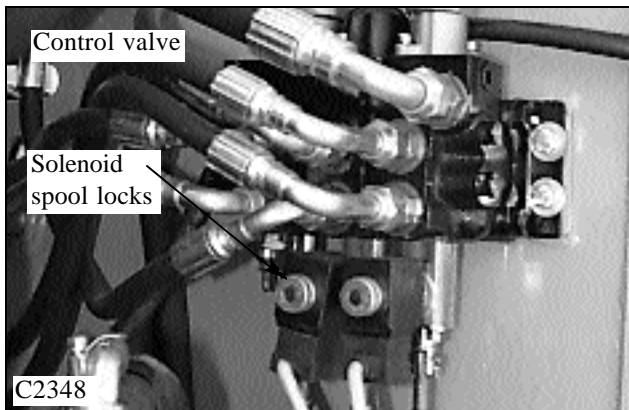
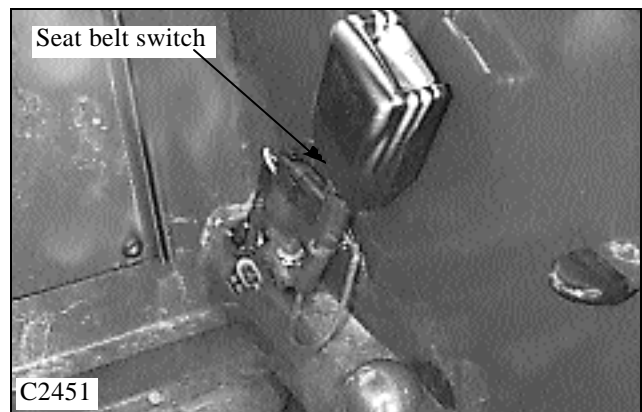
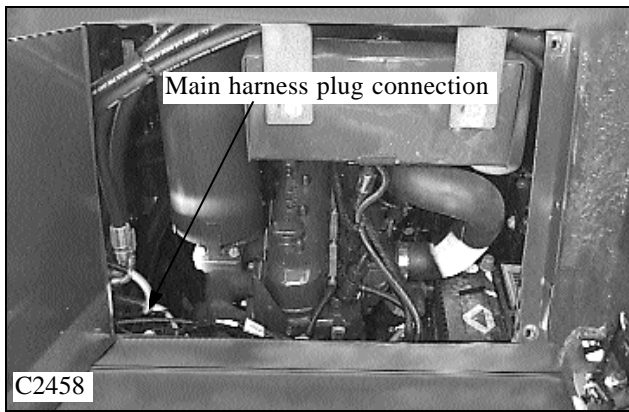
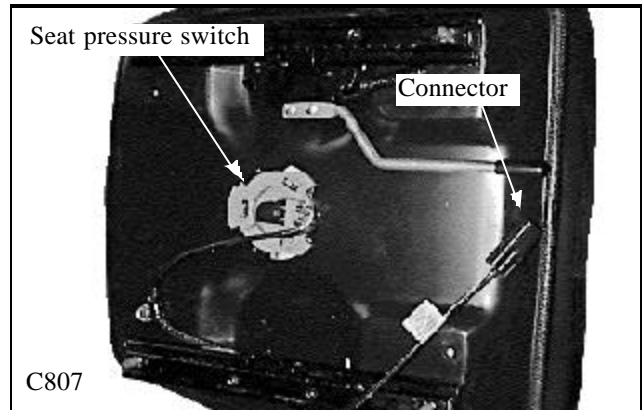


GENERAL INFORMATION 5.1

Introduction

The photographs below and at right show the safety switches and their location. These photographs will assist you when referencing the electrical circuit drawings. The parking brake will not release and the lift and tilt hydraulic functions will not operate when any one of these circuits have failed or malfunctioned.

Be sure to disconnect the seat pressure switch connector before removing the seat from the loader and be careful not to pinch the wires upon installation.



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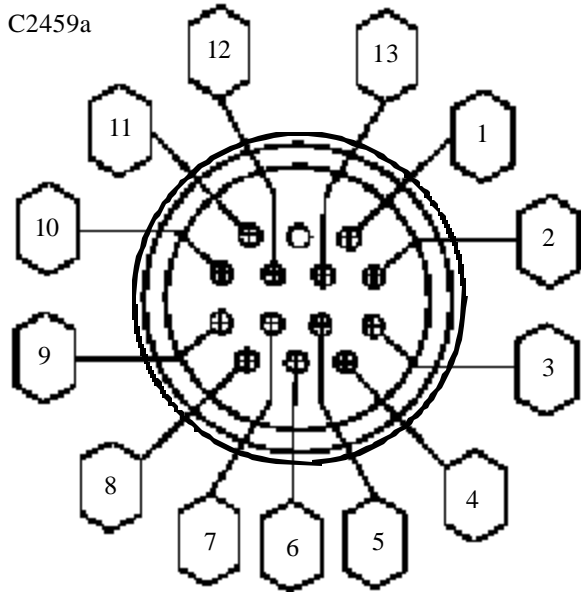
WIRING SCHEMATIC 5.2

Engine Harness Connector

Diagram C2459a Legend. Shown is the wire color and function of each pin terminal in the connector plug.

PIN	WIRE COLOR	FUNCTION
1	Tan	Starter relay
2	Blk / Wht	Fuse block
3	Red / Wht	Glow plug relay
4	White	Circuit breaker
5	Purple	Engine oil pressure
6	Pink	Air filter
7	Pple / Wht	Coolant temperature
8	Wht / Brn	Horn button
9	Brn / Wht	Brake light switch
10	Red / Org	Rear light
11	Org / Blue	Fuel level (+)
12	Blue / Wht	Hydraulic temperature
13	Grey / Wht	Alternator (L)
14	Grey	Seat Belt

C2459a

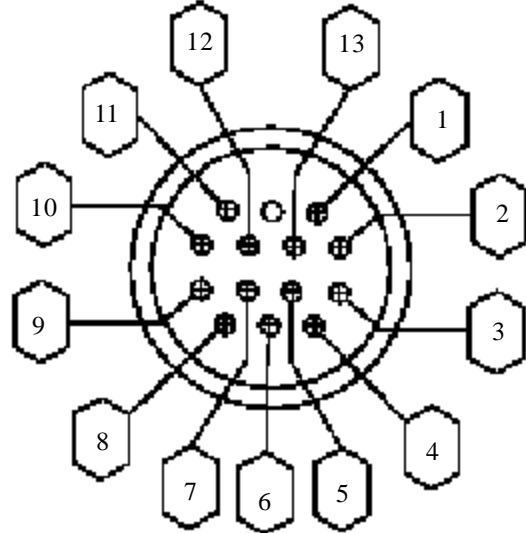


ROPS Harness Connector

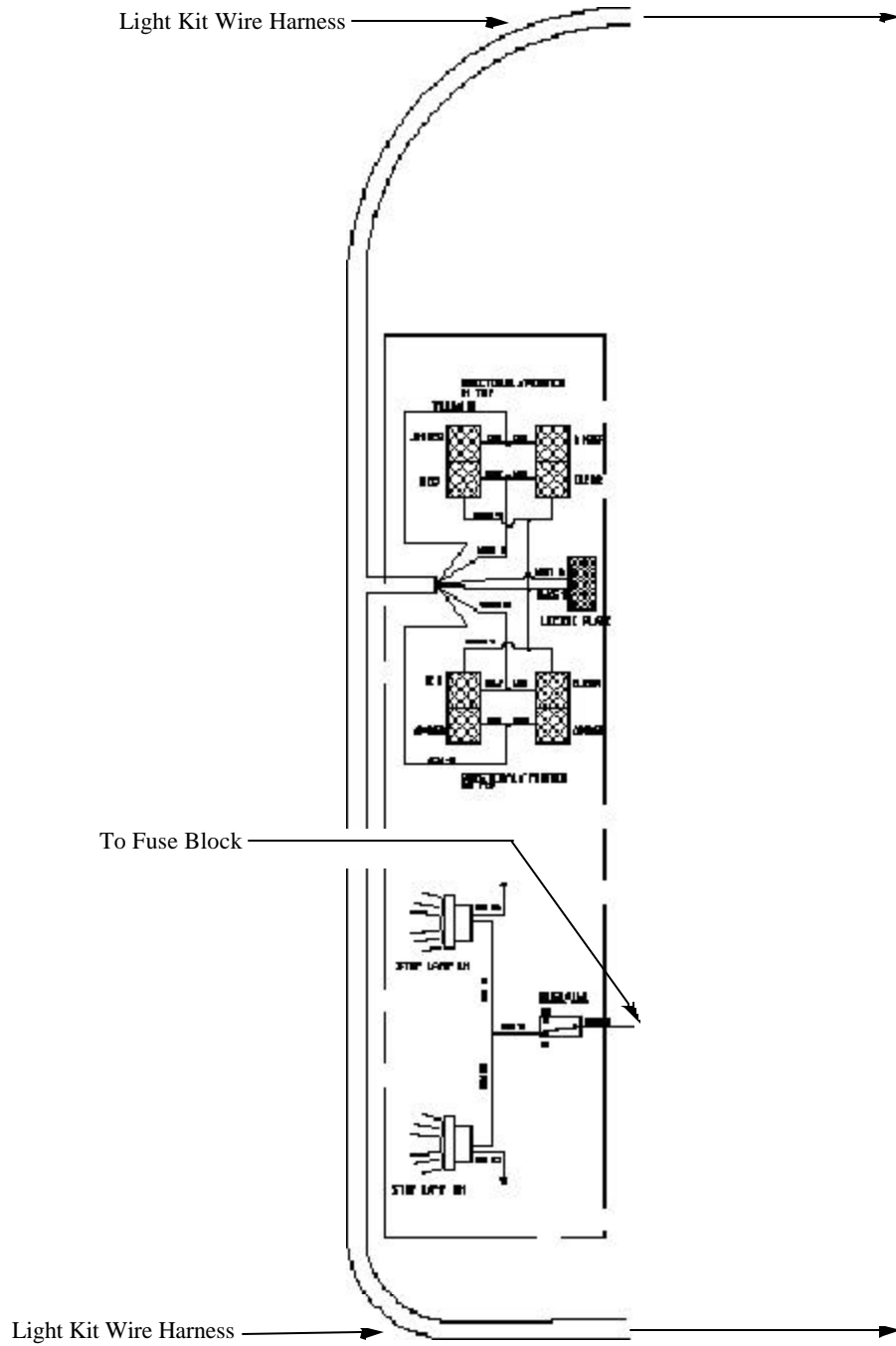
Diagram C2459 Legend. Shown is the wire color and function of each pin terminal in the connector plug.

PIN	WIRE COLOR	FUNCTION
1	Purple	Eng. oil press. indicator
2	Org / Blue	Fuel level (+) gauge
3	Grey	Charge (L) indicator
4	Grey / Wht	Brake light
5	Blue	Hyd. temp. indicator
6	Yl / Red	Spare
7	Wht / Brn	Horn
8	Brown	Aux. indicator
9	White / Pple	Spare
10	Red	Seat belt indicator
11	Tan	Ignition (50)
12	Red / Wht	Ignition (19, 17)
13	Pple / Wht	Coolant temp. indicator

C2459

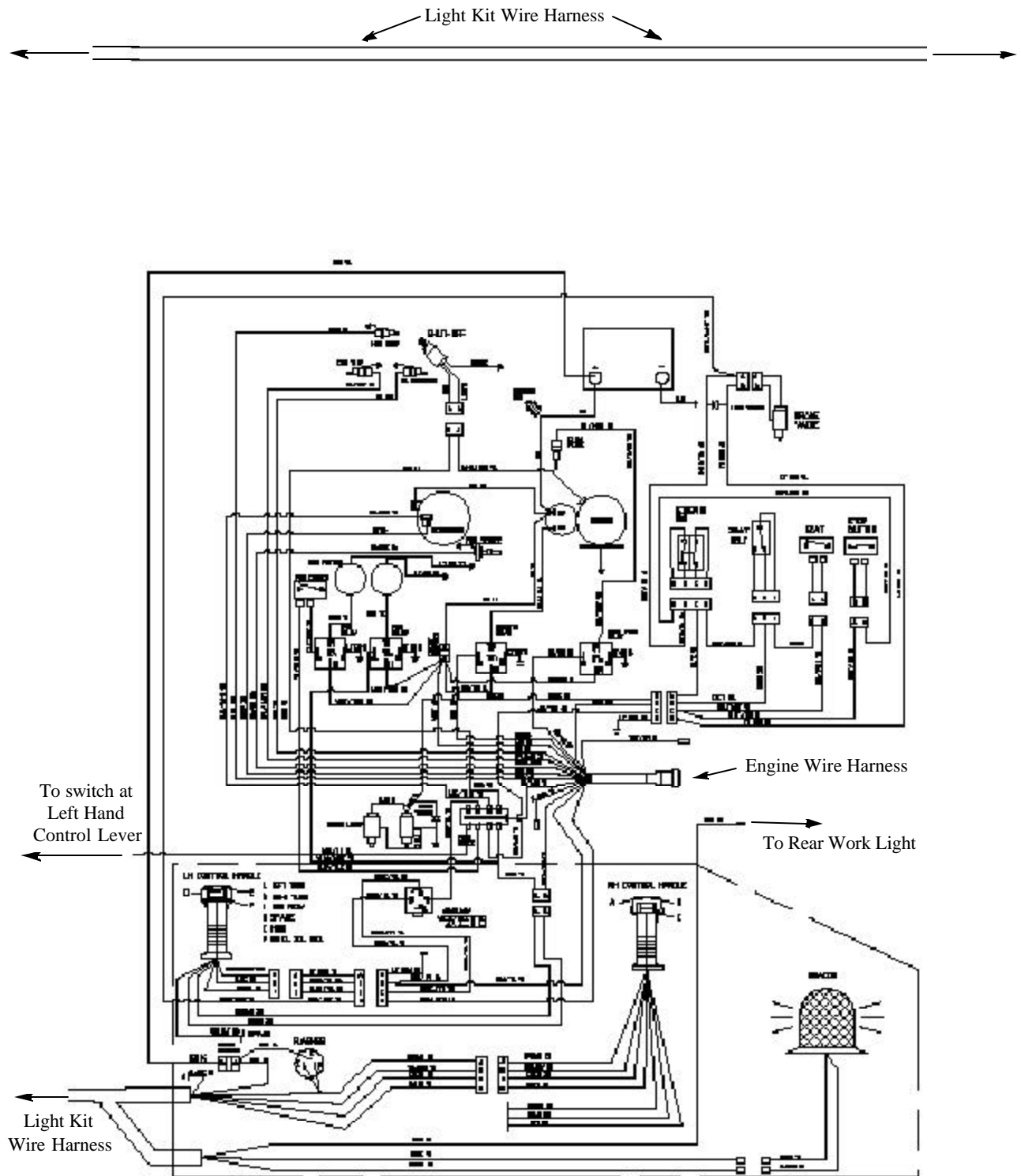


WIRING SCHEMATIC 5.2



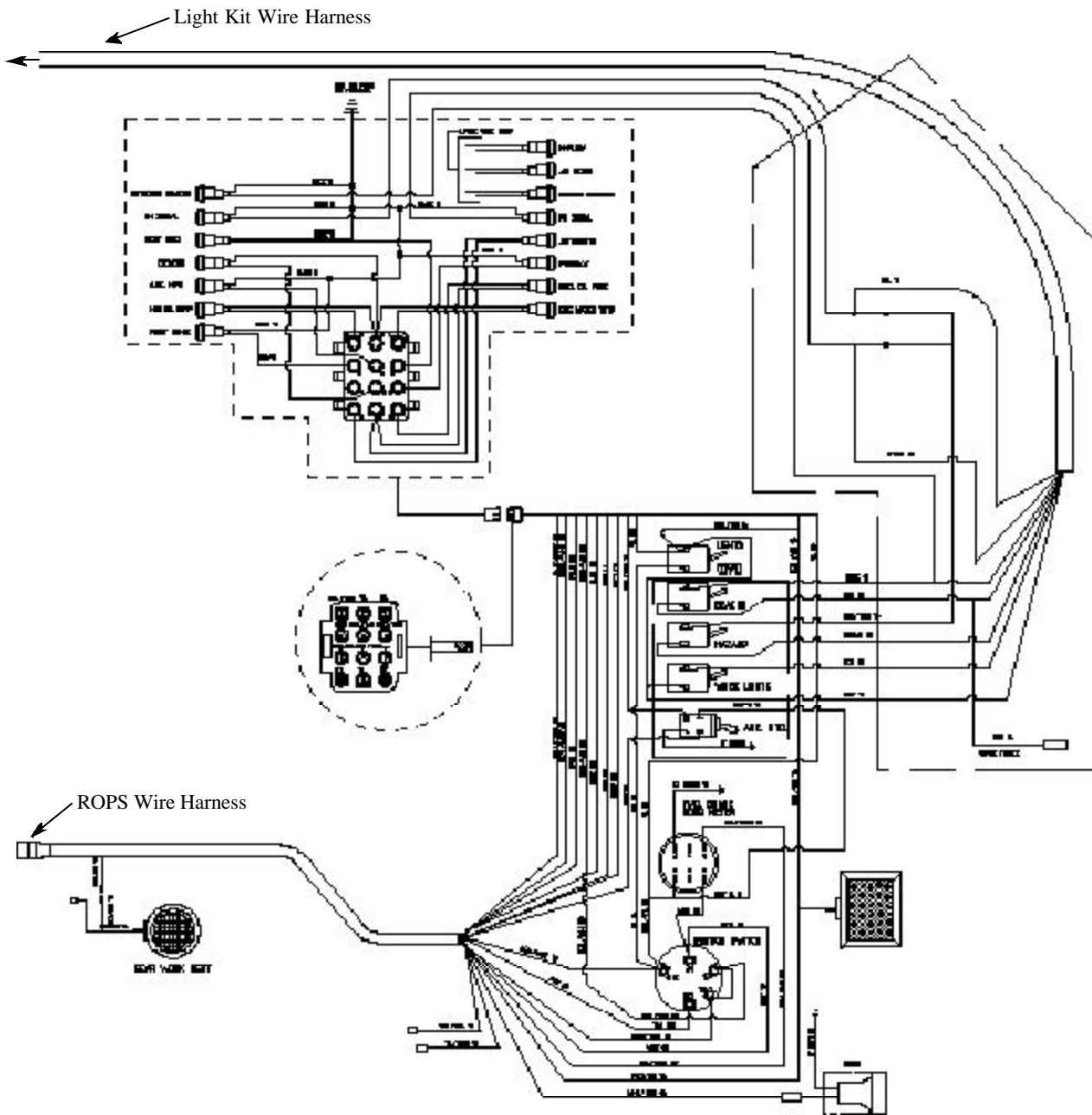
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WIRING SCHEMATIC 5.2

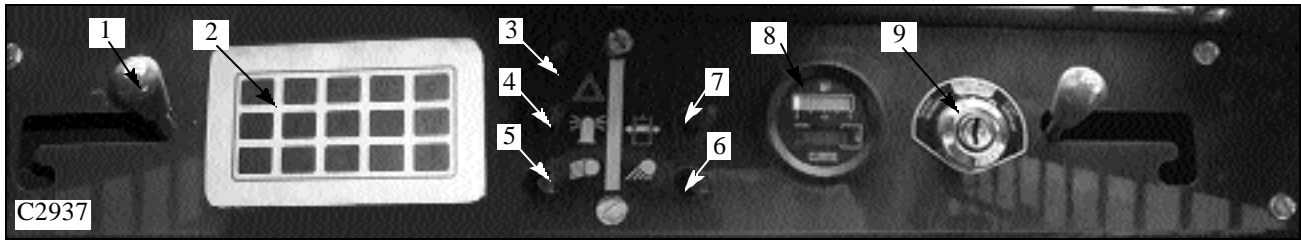


C2961

WIRING SCHEMATIC 5.2

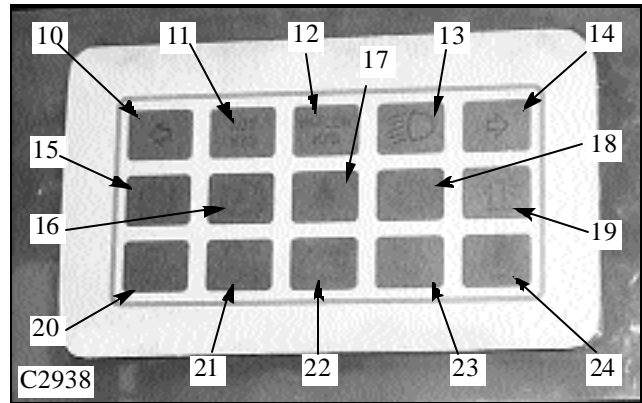


INSTRUMENTATION 5.3



Index C2937, C2938

- 1 Boom Support Knob
- 2 Indicator Panel
- 3 Hazard
- 4 Rotary Beacon
- 5 Dipped Beam Light
- 6 Work Light
- 7 Electric Auxiliary
- 8 Fuel Gauge / Hour Meter
- 9 Ignition Switch
- 10 Left Hand Directional Signal
- 11 Electric Auxiliary
- 12 _____
- 13 Dipped Beam Light
- 14 Right Hand Directional Signal
- 15 Hydraulic Oil Temperature
- 16 Parking Brake
- 17 Seat Belt
- 18 Low Charge Pressure
- 19 Rotating Beacon
- 20 Engine Oil Pressure
- 21 Engine Coolant Temperature
- 22 Alternator
- 23 _____
- 24 Preheat



Switch & Bulb Replacement

To replace a faulty gauge, meter, switch or indicator bulb dash panel:

- 1 Remove the boom support knobs and the 6 bolts retaining the dash panel (fig. C2937). Gently pull the dash panel out and down.
- 2 Remove the wiring from the effected part. Note the wire colors and terminal locations.

- 3 The fuel gauge is retained by a bracket and 2 mounting nuts. Remove the nuts and the gauge can be replaced.
- 4 The ignition and head light switch is retained by a knurled nut on the outside of the dash panel. Remove the nut and the switch can be replaced.
- 5 The hour meter is retained in the dash panel with molded in tabs. Squeeze the tabs together and the hour meter can be replaced.
- 6 Indicator bulbs can be replaced by twisting the socket and pulling the bulb.

INSTRUMENTATION 5.3

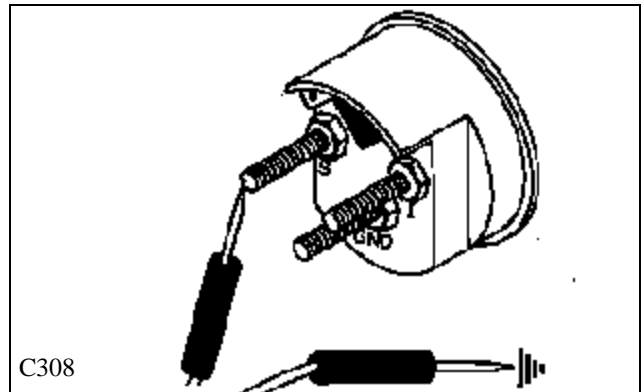
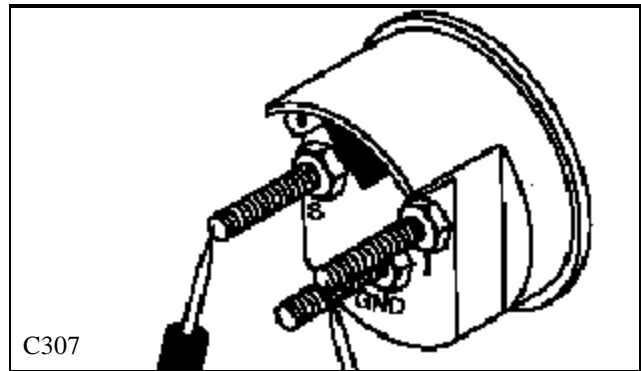
Testing the Fuel Gauge

- 1 Remove the dash panel to access the fuel gauge. (fig. C2462)
- 2 With the ignition switch off, connect an ohmmeter between the “S” terminal and the “I” terminal. (fig. C307)
- 3 An ohmmeter reading of 150 to 250 ohms is normal. A higher or lower reading means the gauge is faulty and needs to be replaced.

NOTE: If the fuel gauge test results were good and the gauge still fails to function do the following test:

- 1 With the ignition switch off, connect an ohmmeter between the “S” terminal and the other end to ground.
- 2 An ohmmeter reading of 50 to 500 ohms is normal. A higher or lower reading means the wire going to the “S” terminal is faulty.

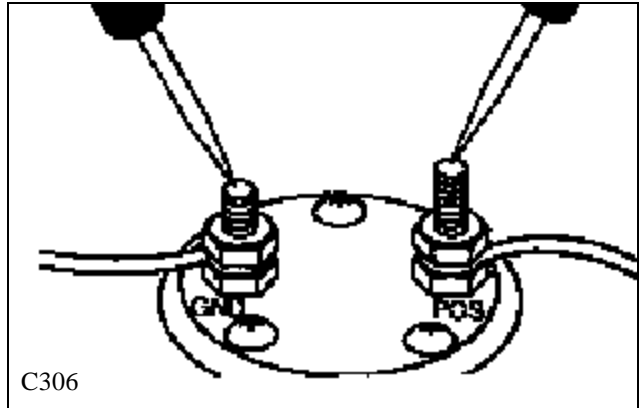
NOTE: If the test is good, check the fuel sending unit in the fuel tank for failure.



INSTRUMENTATION 5.3

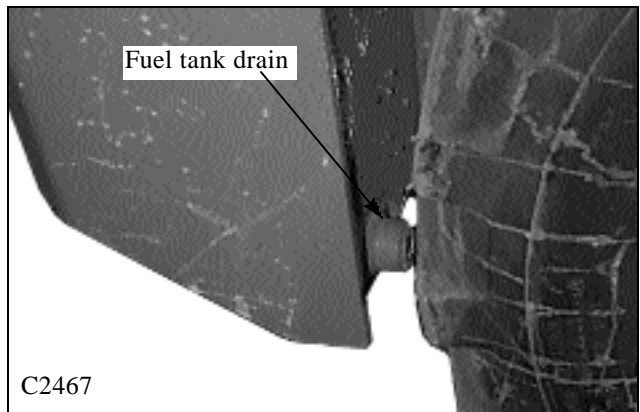
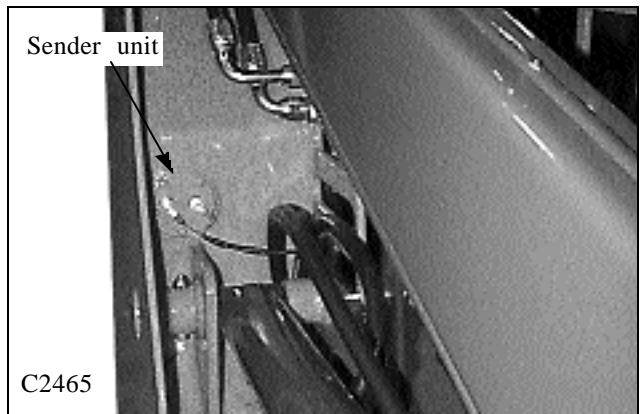
Testing the Fuel Sender

- 1 With the ignition switch off, connect an ohmmeter between the positive and negative terminals of the fuel sending unit. (fig. C306)
- 2 An ohmmeter reading of 50 to 500 is normal. A reading higher or lower means a faulty sender and will need replaced.



Replacement

- 1 Make sure the fuel level is below the point where the sender unit is mounted to the fuel tank, just behind the right lift cylinder (fig. C2465) Drain the fuel tank if necessary (fig. C2467).
- 2 Remove the 2 wires connected to the fuel sending unit. Be sure the ignition switch is off.
- 3 Remove the 5 screws retaining the sending unit to the fuel tank and remove the sender noting the orientation to the mounting holes.
- 5 Install a new sending unit and gasket. Use gasket sealant on both sides of the gasket. Torque the mounting screws no more than 20 inch / lbs.
- 7 Connect the sender wires taking care not to over tighten the nuts and stripping the studs. Green wire is ground.



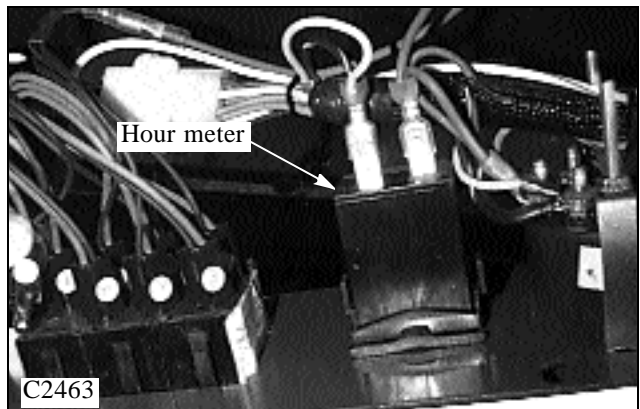
Testing the Hour Meter

The hour meter records the number of engine operating hours.

To check the hour meter, remove the 6 bolts retaining the dash panel.

Using a 12 volt test meter, connect the positive lead to the positive terminal of the hour meter and the ground lead of the tester to a good ground. Turn the ignition switch to the "RUN" position.

A reading of 12 volts means the hour meter is defective. No voltage reading means there could be a problem in the wire running from the "ACC" terminal on the ignition switch to the positive side of the hour meter or a defective ignition switch.



IGNITION SWITCH 5.4

Testing the Ignition Switch

The ignition switch is a 4 position switch. OFF, PRE-HEAT, RUN and START. Turning the key counterclockwise will engage the PREHEAT. To activate the starter, turn the key clockwise. When the key is released it will return to the RUN position.

Before performing any test to the ignition switch, disconnect the negative or ground wire from the battery terminal. Remove the 3 screws retaining the right hand dash panel to the dash pod to access the ignition switch.

TEST 1: "RUN" POSITION.

Connect an ohmmeter across the terminals marked 30 and ACC. (fig. C297) Turn the ignition switch to the run position.

A low resistance reading is normal. High resistance reading means you will have to replace the ignition switch.

TEST 2: "START" POSITION.

(a) Connect an ohmmeter between the terminals marked 30 and 50 on the ignition switch. (fig. C298) Turn the ignition switch to the "START" position and observe the ohm readings.

(b) Connect the ohmmeter leads across terminals marked 30 and 17 on the ignition switch. (fig. C299) Turn the ignition switch to the "START" position and observe the ohmmeter reading.

Low resistance reading is normal.

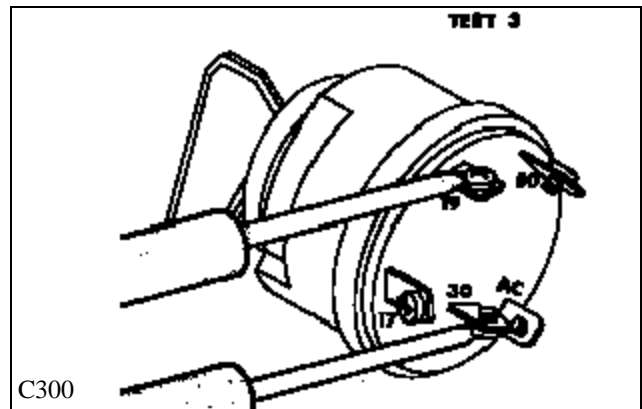
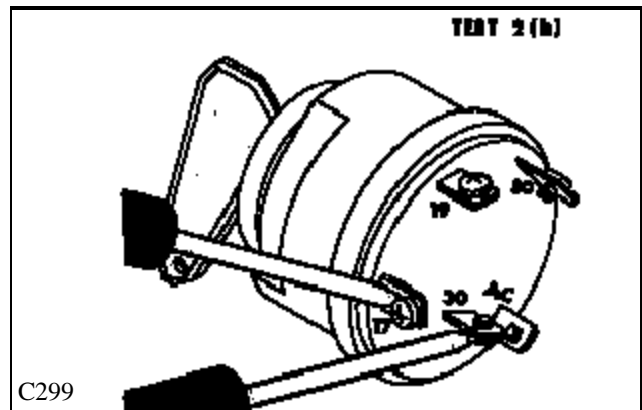
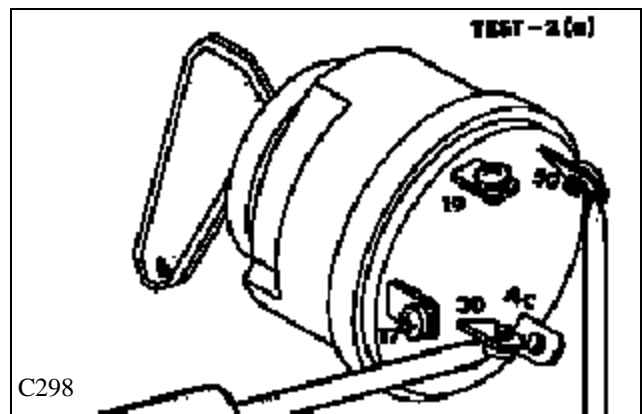
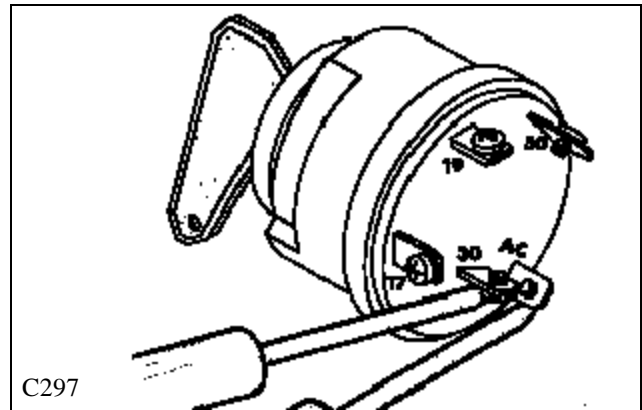
High resistance reading means the ignition switch needs replacement.

TEST 3: "HEAT" POSITION.

Connect the ohmmeter leads between the terminals marked 30 and 19 on the ignition switch. (fig. C300) Turn the ignition switch to the "HEAT" position and observe the ohmmeter readings.

Low resistance reading normal.

High resistance reading, replace the ignition switch.



ENGINE GLOW PLUGS 5.5

Testing the Glow Plugs

Before performing any test on the glow plugs be sure to disconnect the ground wire from the battery.

TEST 1: GLOW PLUGS.

NOTE: Each glow plug is to be checked individually. Remove the connecting bar between each glow plug before testing.

With the ignition switch off, connect one end of the ohmmeter lead to the glow plug terminal and the other lead end to a clean ground.

A reading of 0.9 ~ 1.2 ohms is normal.

An infinite or "0" reading means the glow plug is defective and must be replaced.

TEST 2: IGNITION SWITCH to GLOW PLUGS.

Remove the bolts retaining the dash panel. (fig. C2939, C2462) With the ignition switch off, disconnect the red / white wire from ignition terminal 19. Connect one ohmmeter lead to the terminal marked 19 on the ignition switch and the other lead to the red / white wire.

Low to "0" reading means good continuity.

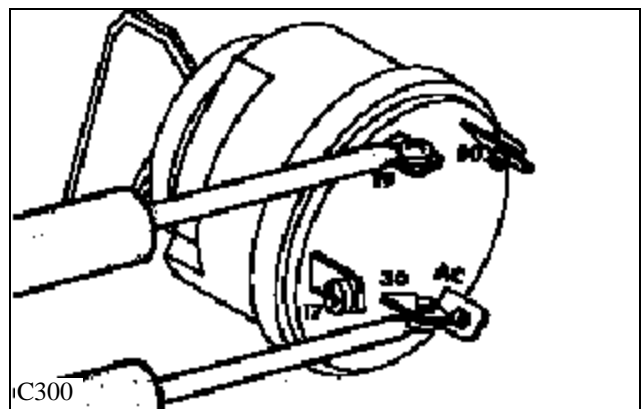
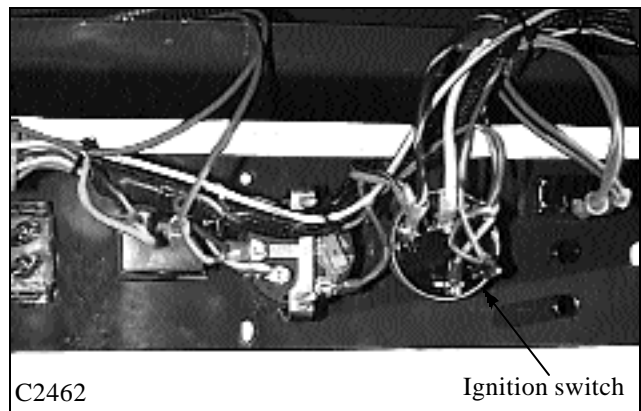
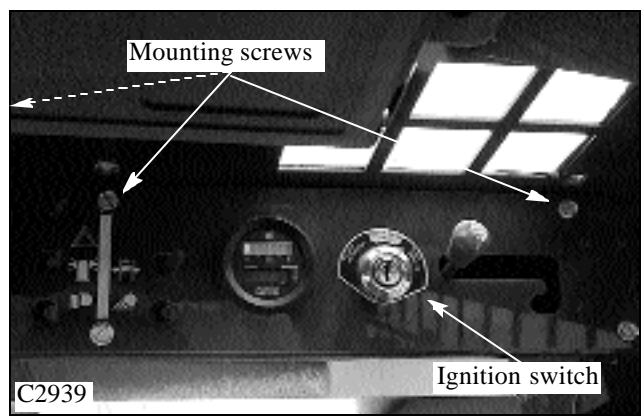
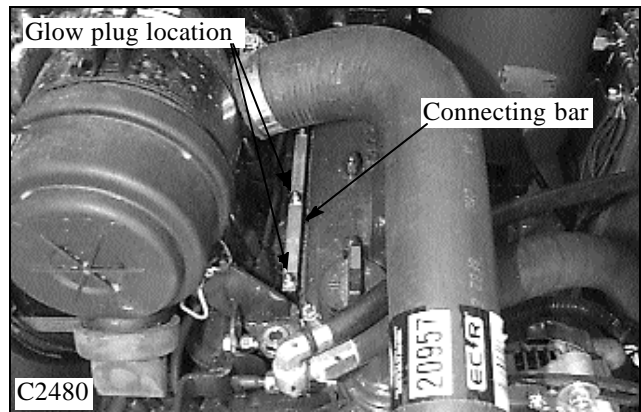
High reading means the red / white wire from the ignition switch to the manifold heater is defective.

TEST 3: IGNITION SWITCH "HEAT" POSITION.

Connect the ohmmeter leads between the terminals marked 30 and 19 on the ignition switch. (fig. C300) Turn the ignition switch to the "HEAT" position and observe the ohmmeter readings.

Low resistance reading normal.

High resistance reading, replace the ignition switch.



Pre-Heat Indicator

Check the ignition switch terminals 17 and 19 with an ohmmeter. If there is good continuity between the two terminals the bulb or wiring is bad on the pre-heat indicator light.

To change the indicator bulb, remove the bolts retaining the dash panel to the ROPS. Select the proper bulb, twist and pull the socket and bulb assembly bulb from the dash panel. Replace the mini bulb and or the socket assembly.

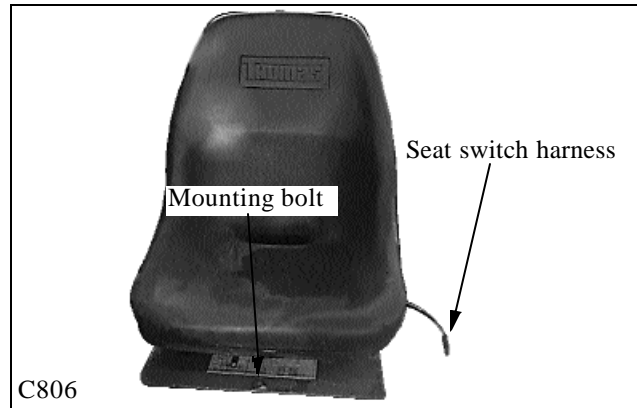
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BATTERY 5.6

Removal and Inspection

The battery is located in the ROPS behind the operators seat. To remove the battery:

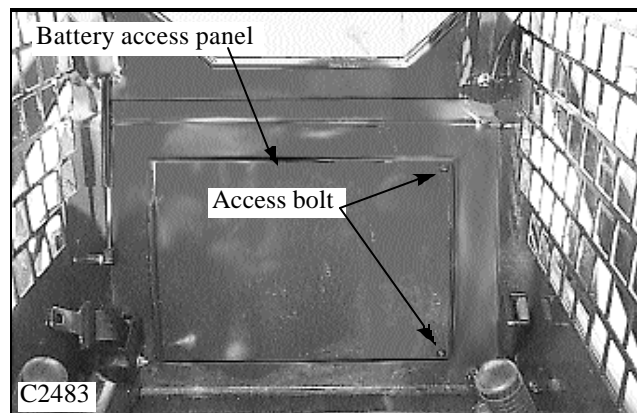
- 1 Remove the seat mount retaining bolt and disconnect the seat belt wiring harness connection. (fig. C806)
- 2 Pull up and toward the front of the loader and remove the seat. Be careful to not catch any electrical wiring while removing.



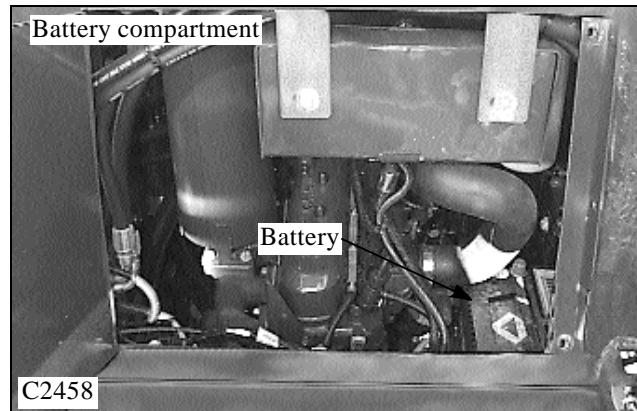
- 3 Remove the access bolt from the battery compartment cover (fig. C2483) to gain access to the battery (fig. C2458).

WARNING

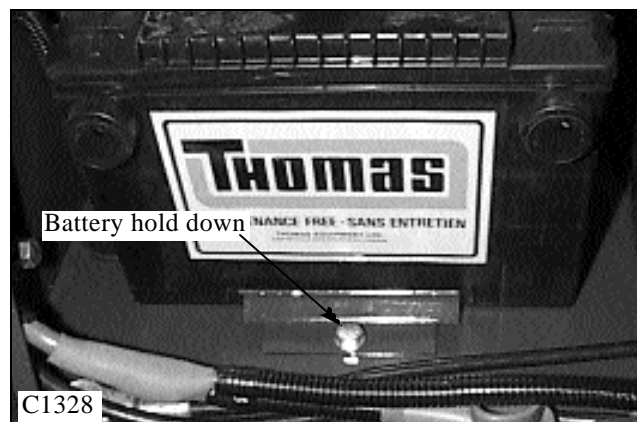
Batteries contain sulfuric acid which can harm the eyes and skin on contact. Always wear goggles and protective clothing while servicing the battery. Flush skin or eyes with water upon contact. Consult a physician.



- 4 Disconnect both battery ground terminals first. Then disconnect the positive cables from the battery.



- 5 Remove the bolt securing the battery hold down bracket. (fig. C1328)
- 6 Carefully remove the battery from the compartment.
- 7 Inspect the battery cables for corrosion and damage. Remove any corrosion using a wire brush and a soda solution. Replace the cables having damaged or deformed ends.
- 8 Clean the outside of the battery case if the battery is to be reused. Flush the terminal areas with a soda solution taking care not to allow the solution into the battery cells. Remove corrosion from the battery terminals with a wire brush..

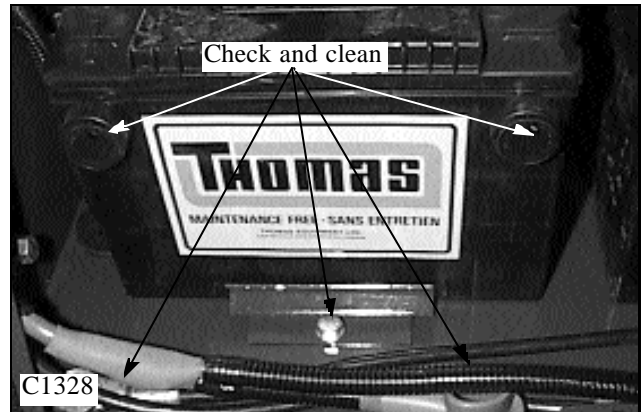


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BATTERY 5.6

Removal and Inspection

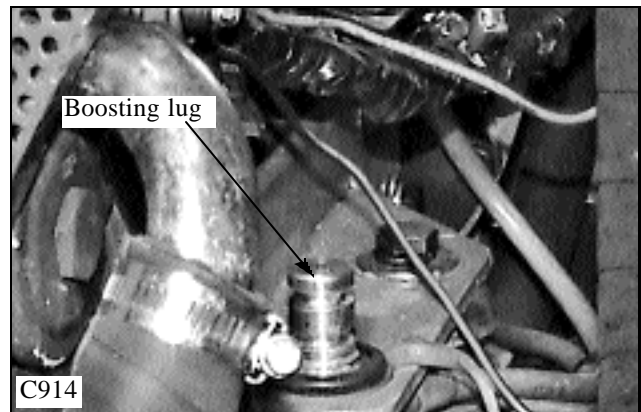
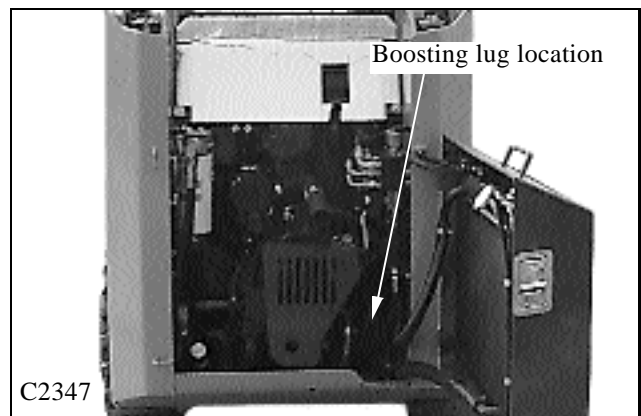
9 Inspect the battery case for cracks that may allow electrolyte to leak into the environment. Inspect the batteries on a regular basis for damage such as cracks or a broken case. Inspect the battery cables for tightness and corrosion. Remove any corrosion and coat the terminals with a dielectric grease. Check the battery hold downs to be sure they are properly retaining the battery in the compartment. (fig. C1328)



Boosting

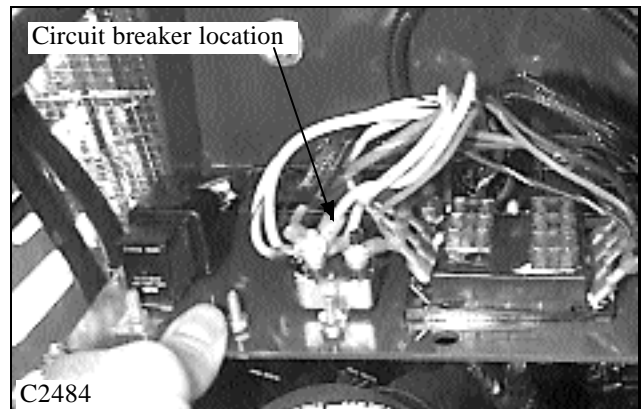
In the event the loader has failed to start and requires boosting, a boosting lug or post is located in the engine compartment. (fig. C2347)

- 1 Open the rear door and raise the engine compartment cover.
- 2 Remove the red rubber protective cover from the boosting lug. (fig. C914)
- 3 The ignition must be in the off position.
- 4 Connect the positive cable from the 12 volt boosting supply to the boosting lug on the loader.
- 5 Connect the negative ground cable to the boosting supply first, and then to a clean ground on the loader engine. Keep the cables away from any moving parts.
- 6 Start the engine.
- 7 Remove the negative ground cable from the engine first and then the boosting supply. Remove the positive cable from the boosting lug.



Circuit Breaker

The circuit breaker is in the fuse panel, located in the engine compartment. (fig. C2484). See section 5.7.



ELECTRICAL PANEL 5.7

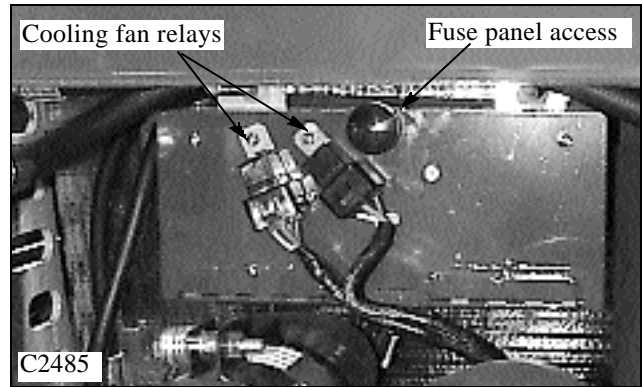
The loader is equipped with a 12 volt, negative ground electrical system. The circuit breaker, fuses and relays are in a panel located in the engine compartment, just underneath of the engine cover. (fig. C2485)

To access the electrical panel:

- 1 Open the rear door and raise the engine cover.
- 2 Remove the bolt holding the electrical panel cover closed. (fig. C2485)
- 3 Open the cover and the circuit breaker, fuses and relays will be exposed. (fig. C2484)

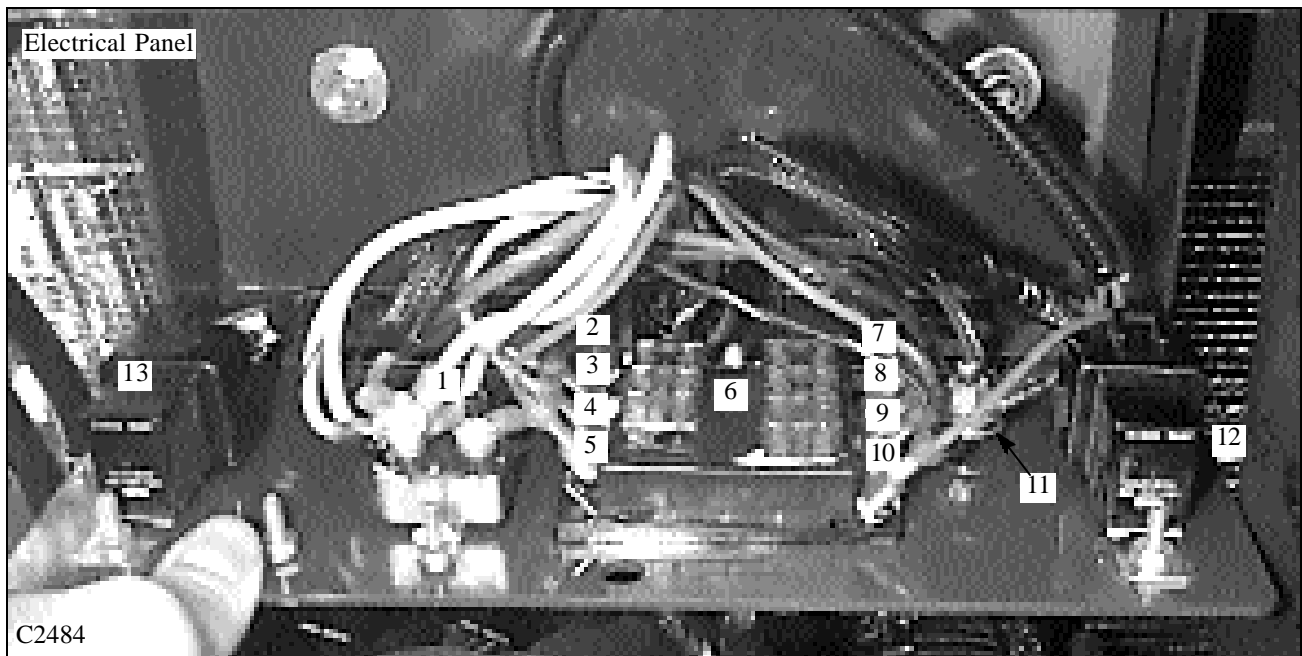
Visually check the fuses for burnt contacts.

- 1 Disconnect the battery grounds before testing or replacing the circuit breaker.
- 2 Remove the 2 nuts retaining the wires to the circuit breaker. Be sure to note the location of the wires and the terminals they are connected to. There is a battery side and an accessories side to the circuit breaker.
- 3 Using an ohmmeter, connect a lead to each of the stud terminals and take a reading. Low resistance is normal. High resistance means the circuit breaker is defective and must be replaced.



The relays are identical and may be checked by swapping one for the other to trace a malfunction. If changing the relays around does not repair the problem, the problem is either in the wiring, or in the actual electrical component.

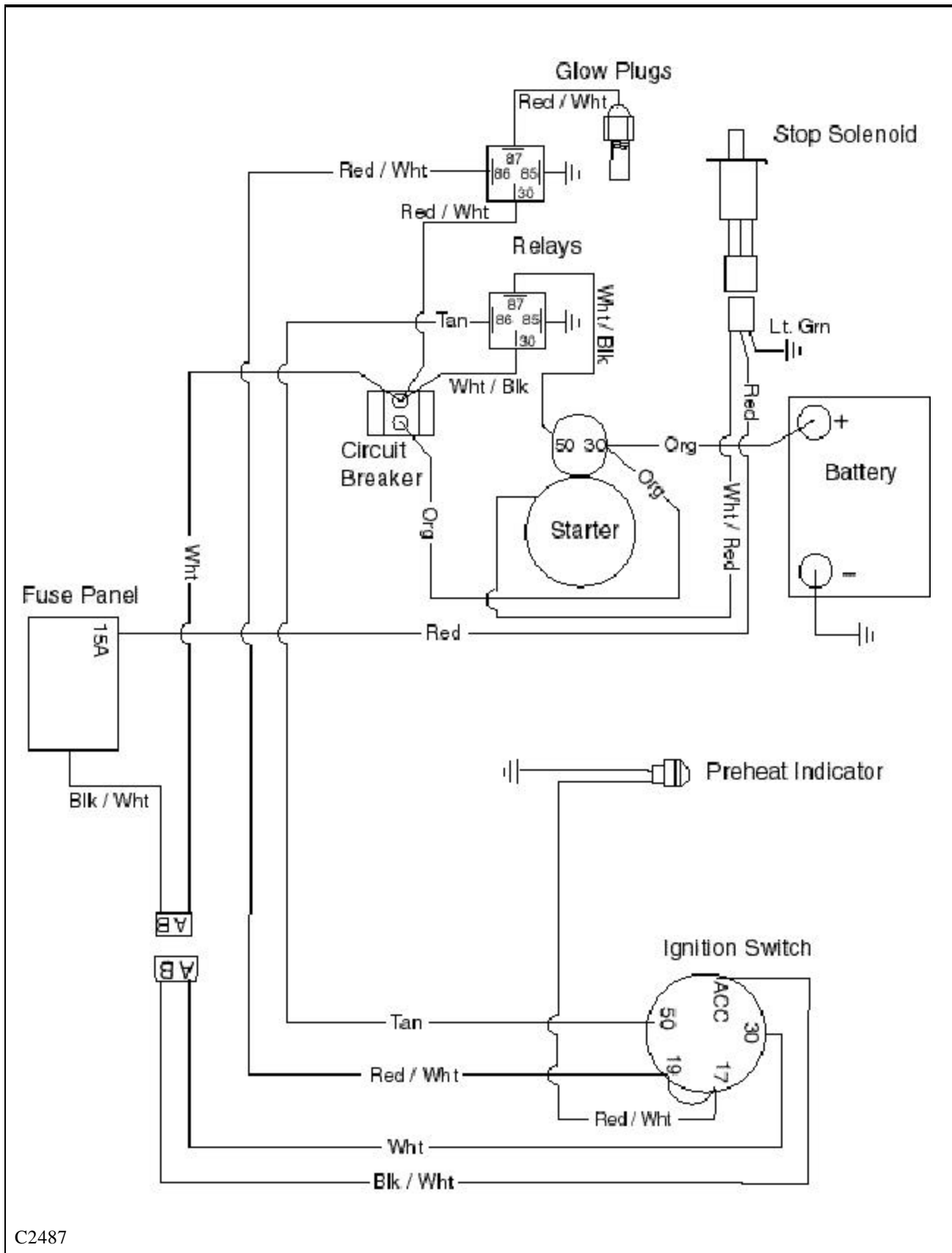
The ground bolt should be checked occasionally for corrosion and cleaned if necessary. Use a dielectric grease to protect the ground point from the elements.



ELECTRICAL PANEL LEGEND.(fig. C2484)

- | | |
|---|-------------------------------------|
| 1 Main Circuit Breaker | 7 Cooling Fan (10 Amp, YL / WH) |
| 2 Engine Stop Solenoid (15 Amp, RED) | 8 Safety Switches (15 Amp, OR / WH) |
| 3 Alternator (10Amp, BLK / WH) | 9 Horn / Option (10 Amp, BRN) |
| 4 Auxiliary Solenoid (10 Amp, RED / YL) | 10 Option / Spare |
| 5 Option / Spare | 11 Grounding Point (LT GRN) |
| 6 Power From Ignition Switch Acc (BLK / WH) | 12 Glow Plug Relay (40 Amp) |
| | 13 Starter Relay (40 Amp) |

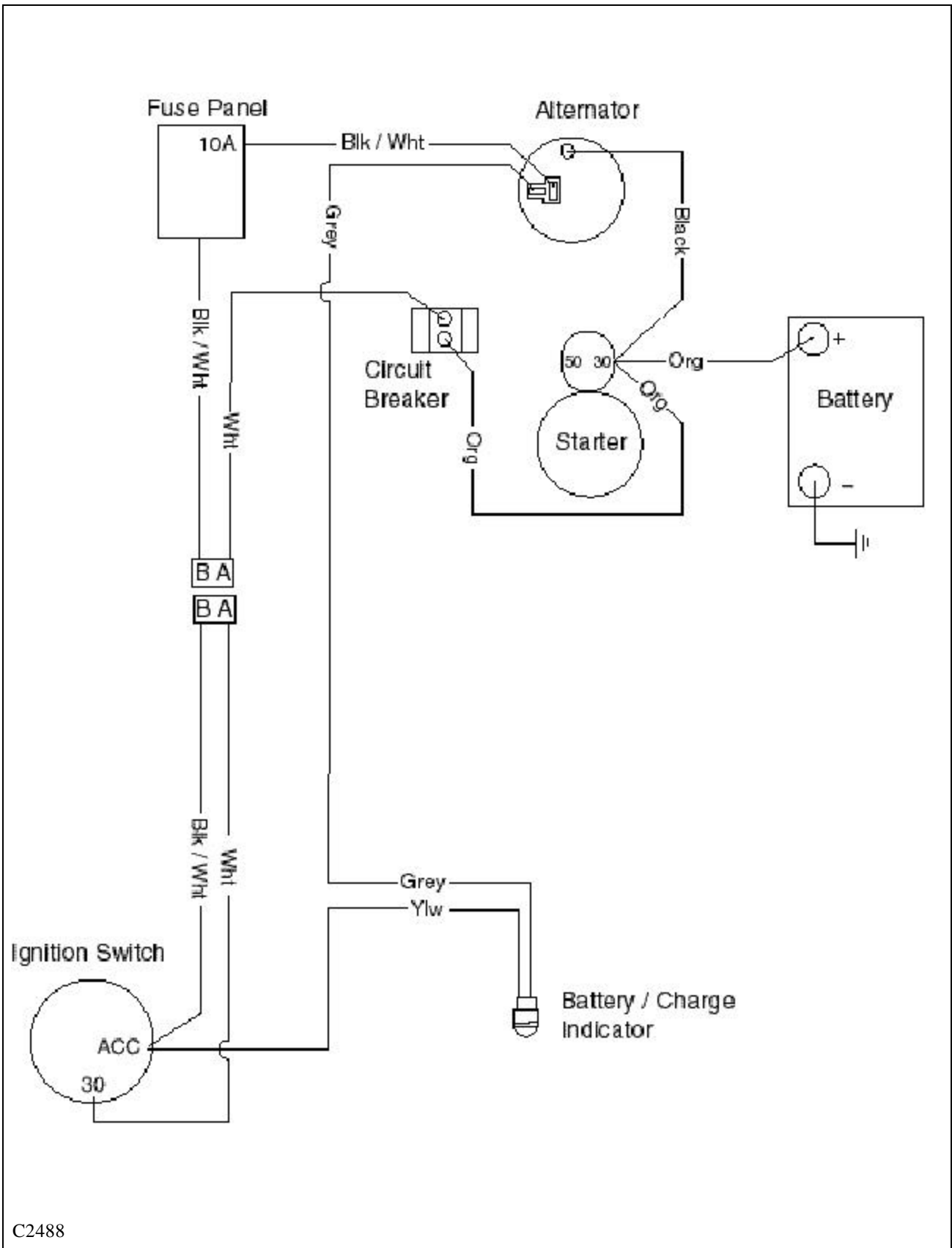
STARTING CIRCUIT 5.8



C2487



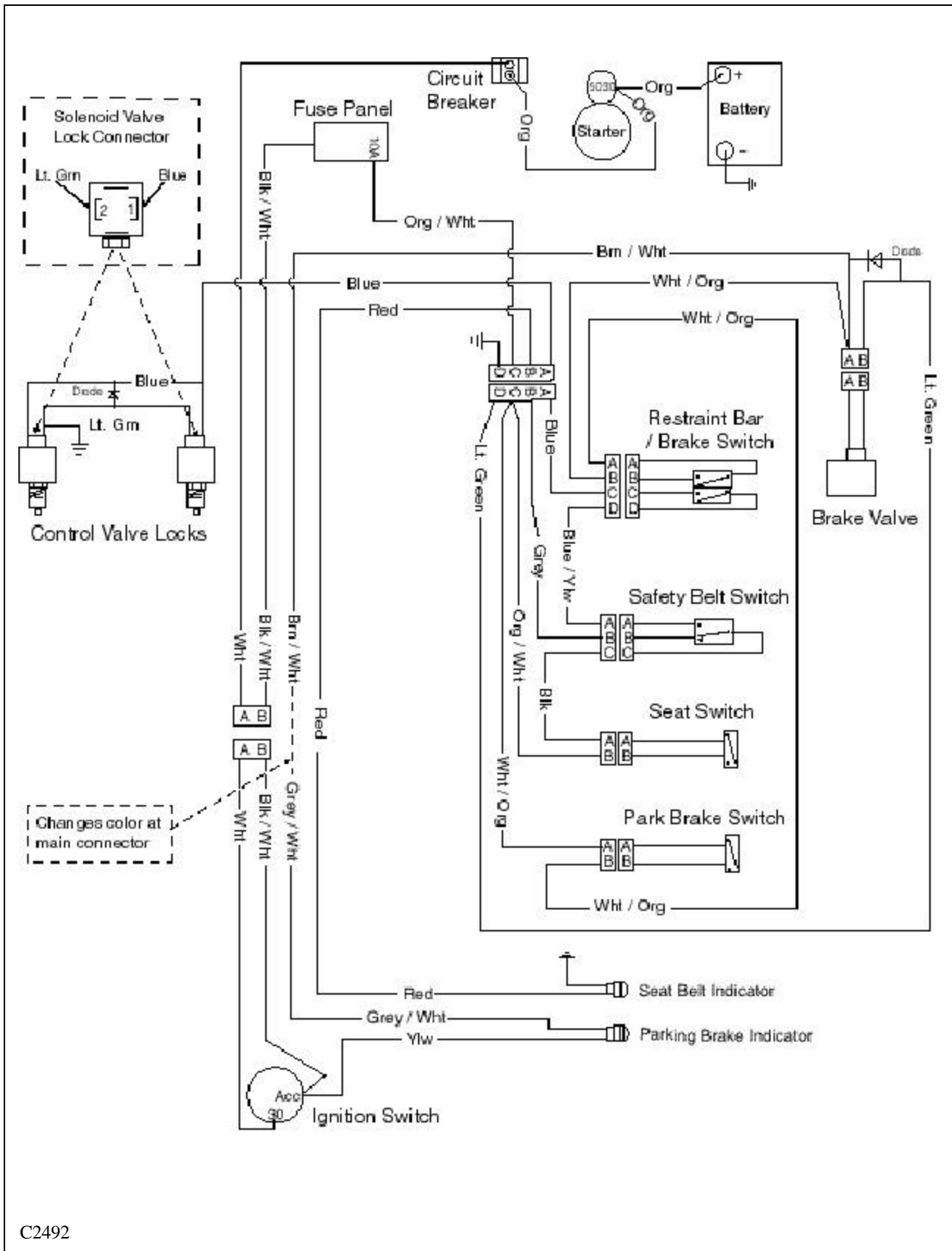
CHARGING CIRCUIT 5.9



C2488

5

SAFETY CIRCUIT 5.10



C2492



SAFETY CIRCUIT 5.10

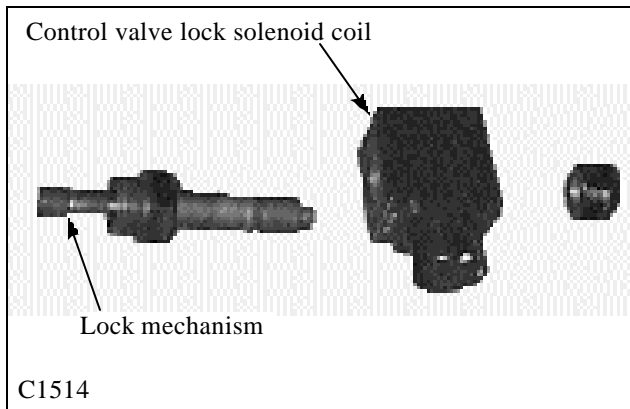
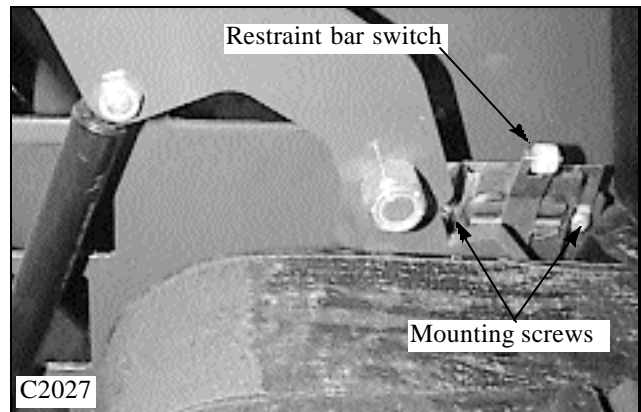
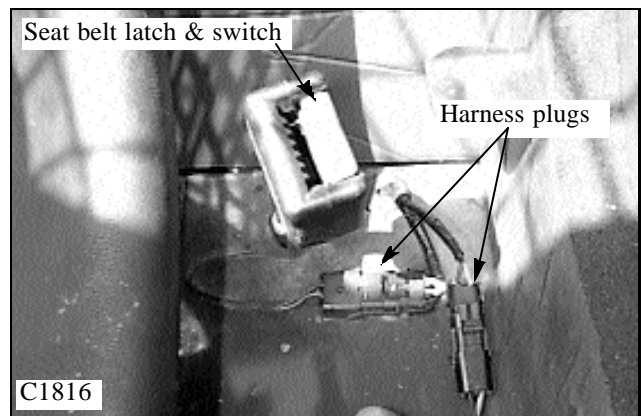
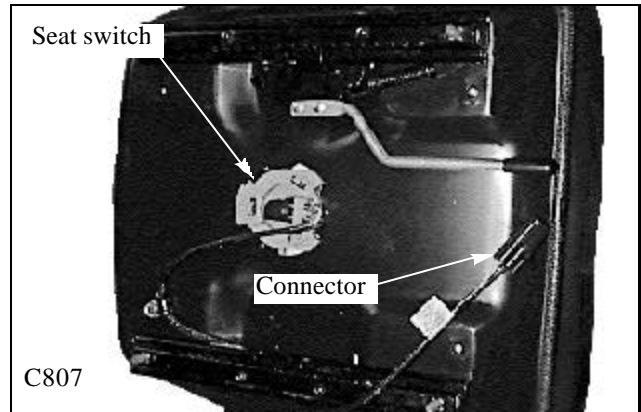
General Information

The loader is equipped with 3 inter - connected safety switches. These 3 switches operate 2 electric solenoid controlled lock devices. One (1) solenoid coil on the hydraulic brake valve (fig. C2364), one (1) pair of solenoid coils on the hydraulic control valve (fig. C1514) Failure of any one (1) of these switches will prevent the operation of the solenoid coils and loader functions. All 3 must be hooked up, functioning and, if applicable, adjusted correctly.

The bottom of the operators seat is equipped with a pressure sensitive switch. The operator must be in the seat to close the switch and release the parking brake and unlock the control valve functions. (fig. C807) No adjustments required. When removing and replacing the seat, be sure to disconnect the wire connector and not to pinch the wires under the seat plate.

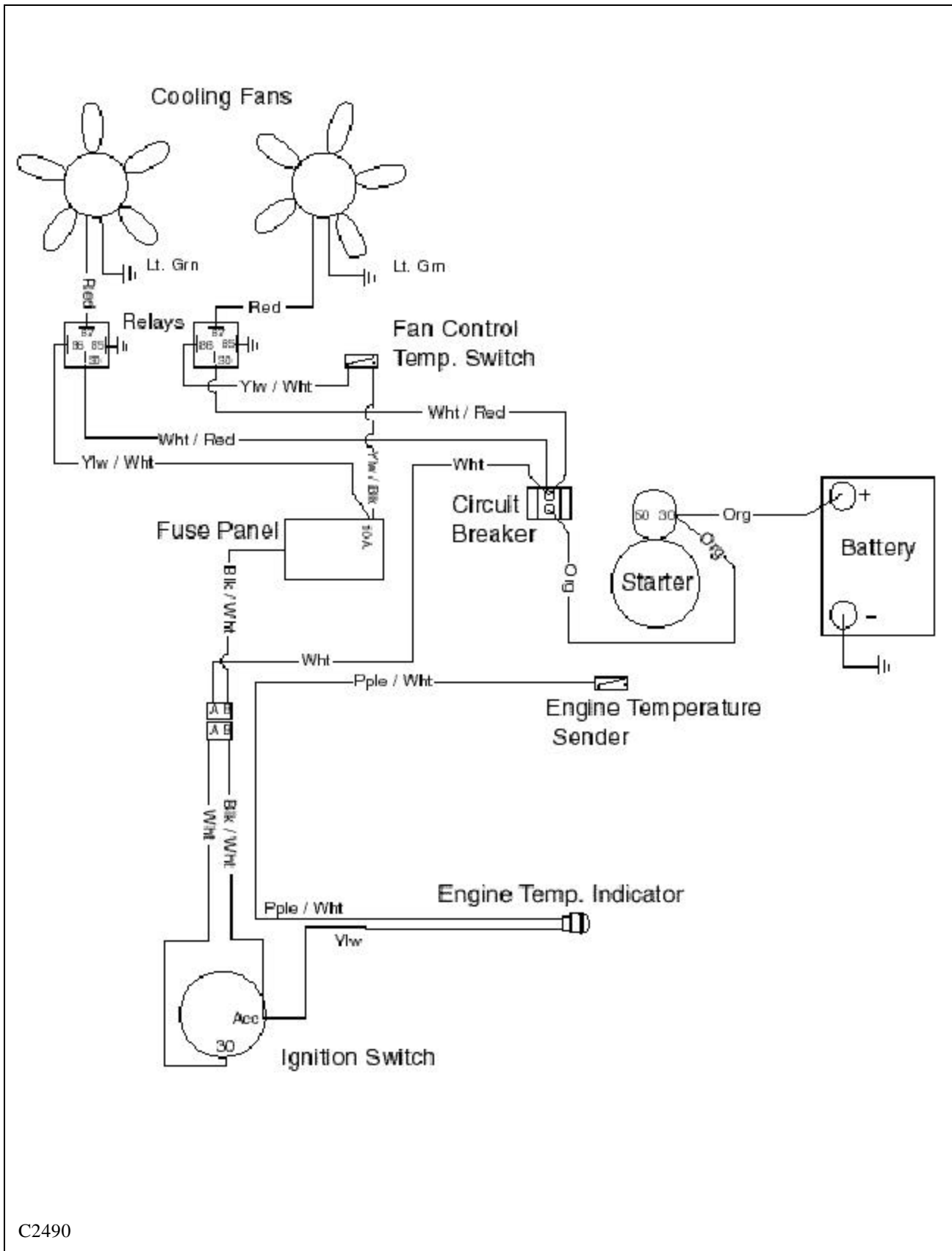
The seat belt assembly is equipped with a safety switch. The operator must have the seat belt fastened around them in order to close the switch and allow the parking brake to release and the control valve to function. (fig. C1816) No adjustments required.

The restraint bar is equipped with a dual function safety switch. (fig. C2027) With the restraint bar in the raised position, the parking brake is activated, the control valve functions are locked and the activation indicator lights are illuminated on the dash panel. Lowering the restraint bar releases the parking brake by energizing the solenoid coil to release the hydraulic brake valve lock (fig. C2362), turns off the indicator lights in the dash panel and releases the locks in the main control valve by energizing the solenoid coils. (fig. C1514). The restraint bar must be in the lowered position for the control functions to operate. The switch must contact the restraint bar when in the lowered position.



5

COOLING FAN CIRCUIT 5.11



C2490



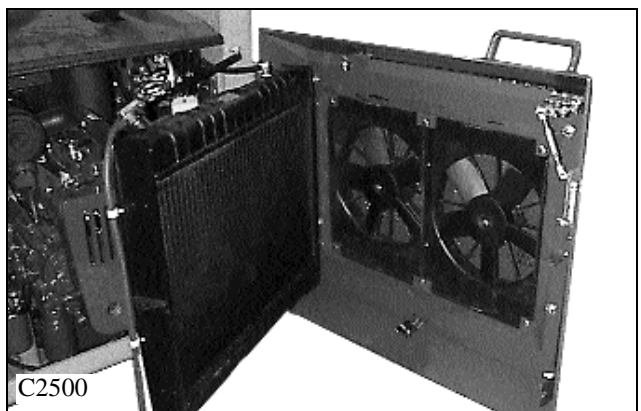
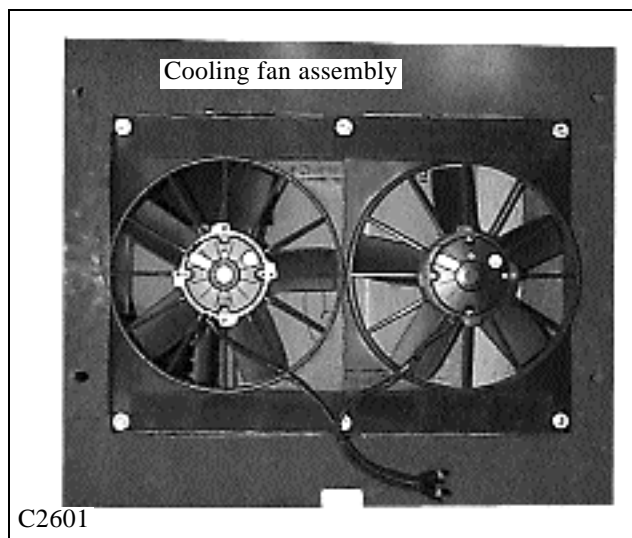
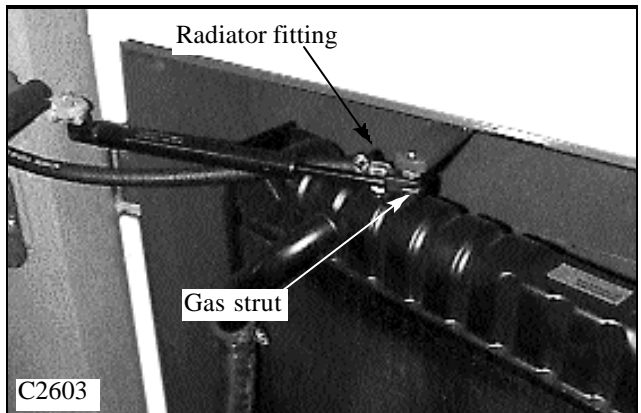
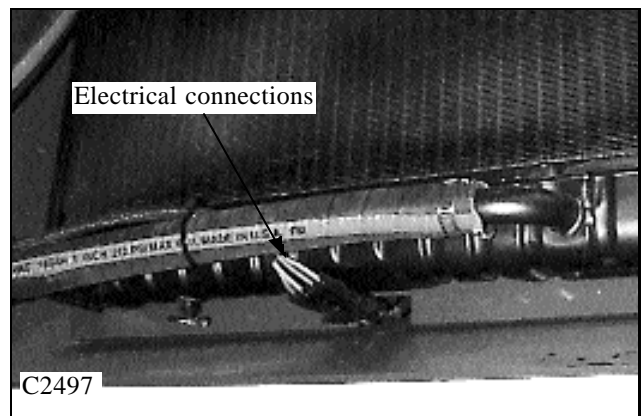
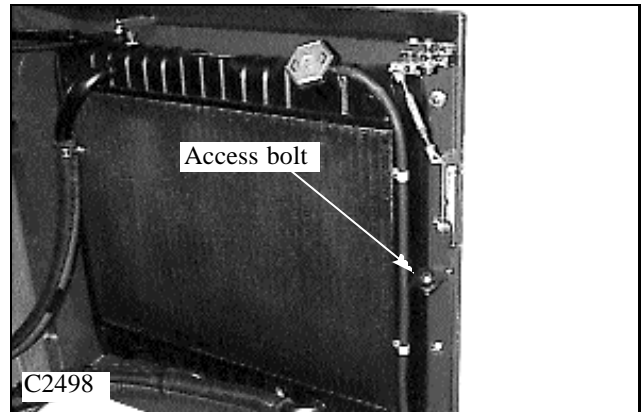
COOLING FAN CIRCUIT 5.11

General Information

The loader is equipped with dual cooling fans. The fans and motors are contained in a single housing and cannot be replaced individually. (fig. C2601).

The cooling fans may be accessed by opening the rear door and removing the bolt retaining the engine radiator to the mounting bracket. (fig. C2498). The radiator may then be swung open.

Check the electrical wiring to make sure it will not interfere with the radiator when swung open. (fig. C2497). Also check the gas strut (optional) to radiator clearance before swinging the radiator open. It may be necessary to disconnect the gas strut if so equipped. (fig. C2603).



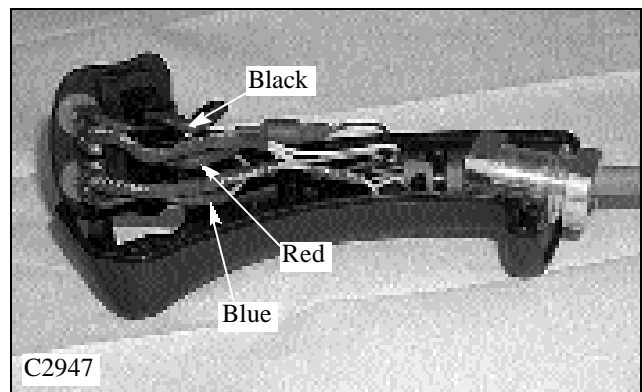
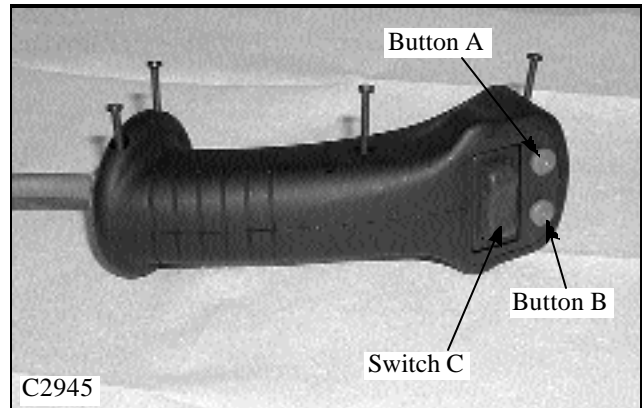
5

AUXILIARY CONTROL HANDLE 5.12

The auxiliary handle control contains 2 push buttons and 1 rocker switch. On the left hand control handle, Button A is a spare button, Button B controls the horn and Switch C controls forward and reverse operation of an attachment. On the right hand control handle, Button A operates the left turn signal and Button B operates the right turn signal. (See fig. 2945)

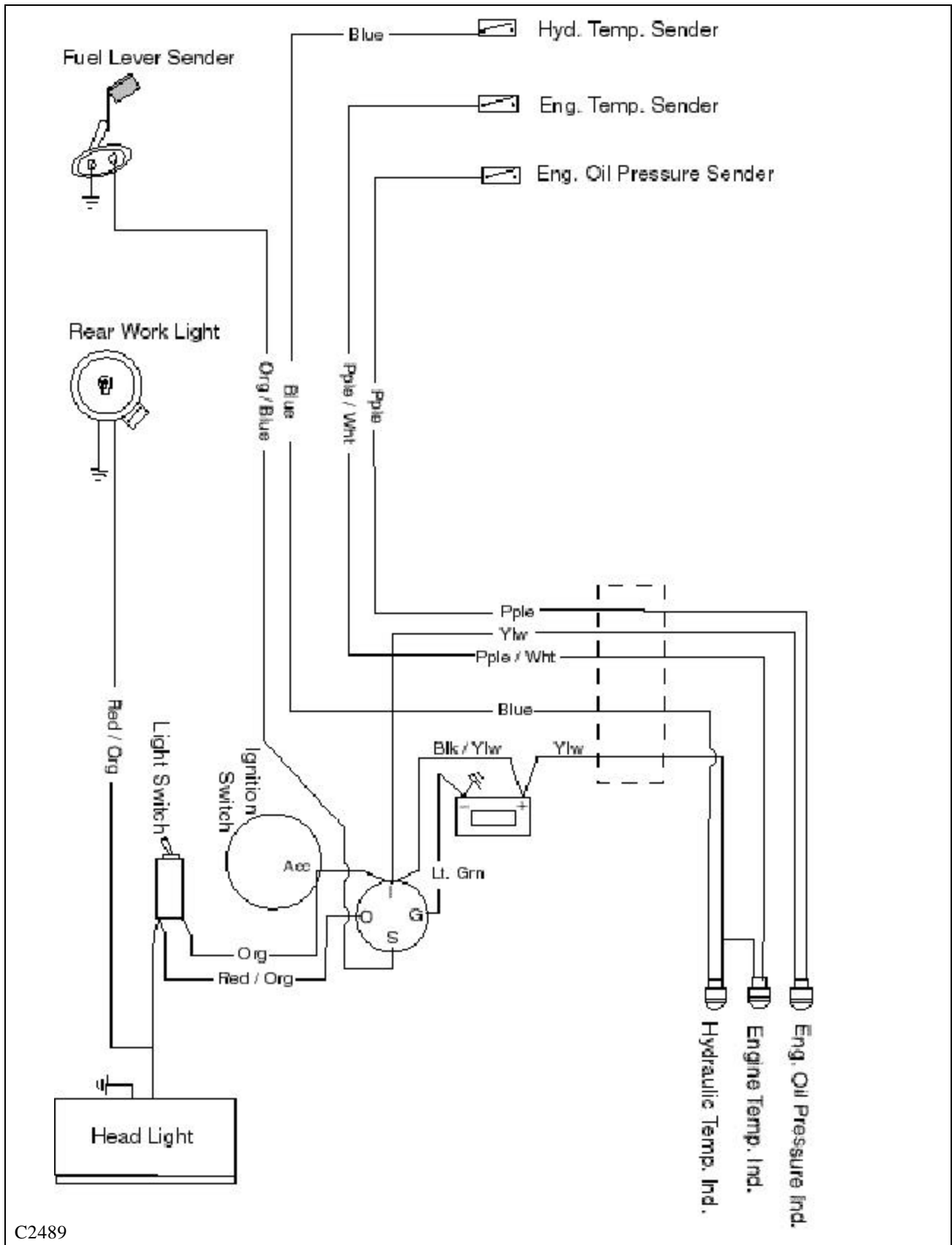
To replace a defective switch :

- 1 Make sure the ignition key switch is in the "OFF" position.
- 2 Remove the four screws from the side of the handle (fig. C2945).
- 3 Pull the handle apart, separating from the middle (fig. C2946).
- 4 Unplug the 3 wires that are connected to the rocker switch (black, red and blue - fig. 2947).
- 5 Remove the switch from the mounting plate by pressing on the outer ends and pushing the switch through the opening.
- 6 Replace with the new switch, reconnect the wires, and replace the outer shell.



5

ACCESSORIES CIRCUIT 5.13



C2489



TROUBLE SHOOTING 5.14

STARTING SYSTEM

Problem	Cause	Corrective Action	Section
Starter will not engage.	Battery discharged.	Check the battery and charge or replace.	5.6
	Loose or disconnected wiring.	Verify continuity of starting circuit. Check and repair.	
	Defective ignition switch.	Check the switch and replace if necessary.	5.4
	Defective starter solenoid.	Check and replace if necessary. Kubota repair manual P / N 40916.	Kubota repair manual
	Defective relay.	Check and replace.	5.7
	Defective starter.	Check and replace if necessary.	Kubota repair manual
Starter motor turns but does not engage.	Defective overrunning clutch or low battery charge.	Replace starter or parts. Check the battery and charging system. Kubota repair manual P / N 40916.	Kubota repair manual
Pinion engages but engine does not turn over.	Defective starter.	Check and replace. Kubota repair manual P / N 40916.	Kubota repair manual
	Low battery charge.	Check and repair.	5.6
	Engine seizure.	Check and replace.	7
	Hydrostatic pump failure.	Check and replace.	2
Starter motor rotates a full speed before pinion engages.	Defective pinion spring.	Check and replace. Kubota repair manual P / N 40916.	Kubota repair manual
Starter remains engaged after the engine has started.	Faulty ignition switch.	Check and replace.	5.4
	Defective solenoid.	Check and replace. Kubota repair manual P / N 40916.	Kubota repair manual



SAFETY LOCKING MECHANISM

Problem	Cause	Corrective Action	Section
Control locks will not release.	Blown fuse.	Check fuse and replace with 15 Amp.	5.7
	Safety switch out of adjustment or defective.	Remove the seat, check and adjust or replace.	5.10
	Defective lock solenoid.	Check and replace.	2 / 5.10
	Defective lock mechanism.	Check and replace.	1.4 / 5.10
	Short in wiring harness.	Check for proper grounding, repair or replace harness.	

TROUBLE SHOOTING 5.14

CHARGING SYSTEM

Problem	Cause	Corrective Action	Section
Battery low in charge.	Faulty wiring or connections.	Check and repair or replace.	
	Drive belt slipping.	Check and adjust.	7
	Defective battery.	Test battery and replace if necessary.	5.6
	Defective alternator or regulator.	Check charging output. Repair or replace if necessary. (see Kubota manual Thomas p / n 40916)	Kubota repair manual
Alternator overcharging and battery overheats.	Defective battery.	Test battery and replace if necessary.	
	Defective regulator	Check charging output. Replace if necessary. (see Kubota repair manual Thomas p / n 40916)	Kubota repair manual
Low or no output voltage from alternator.	Drive belt slipping.	Check and adjust.	7
	Faulty wiring or connections.	Check and repair or replace.	
	Defective alternator or regulator.	Check charging output. Replace if necessary. (see Kubota repair manual Thomas p / n 40916)	Kubota repair manual
Charge indicator light flickers or runs dim.	Faulty wiring or connections.	Check and repair or replace.	
	Dirty alternator slip rings or brushes.	Check and repair or replace. (see Kubota repair manual Thomas p / n 40916)	Kubota repair manual
Charge indicator goes out but becomes brighter as the engine RPM increases.	Faulty wiring or connections.	Check and repair or replace.	
Charge indicator light is on while the engine is operating.	Drive belt slipping.	Check and adjust.	7
	Defective alternator or regulator.	Check charging output. Replace if necessary. (see Kubota repair manual Thomas p / n 40916)	Kubota repair manual

