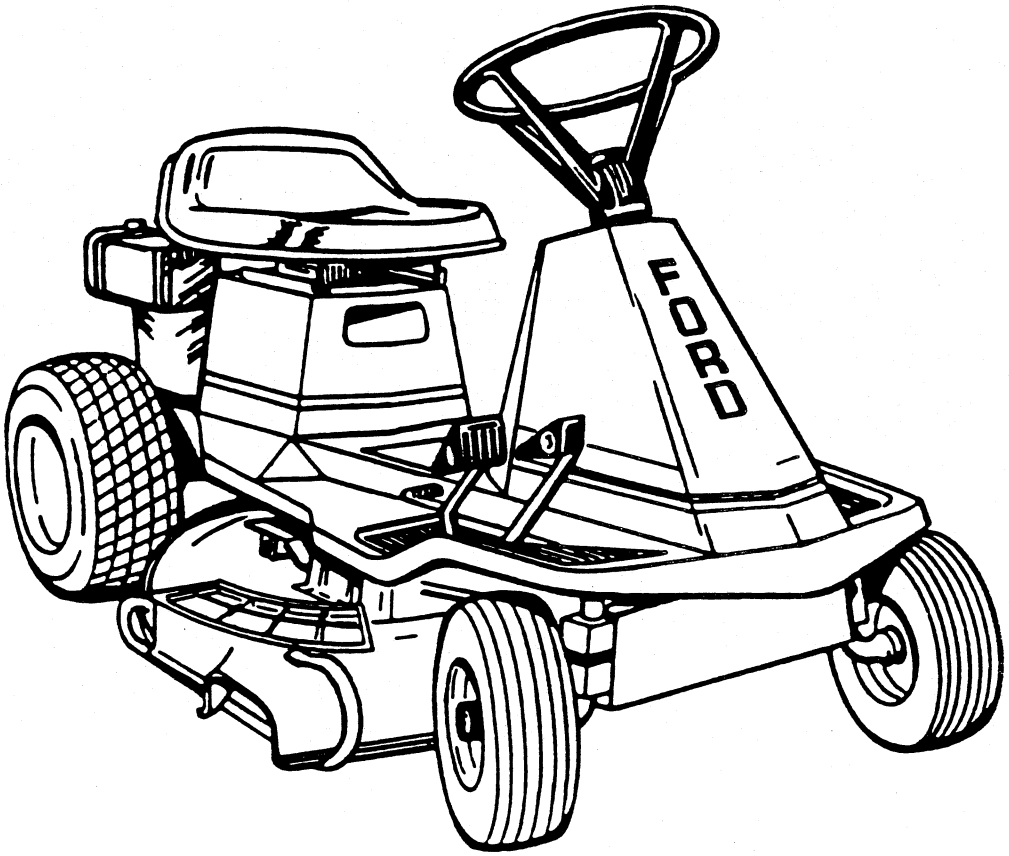
FORD

Service Manual

FORD
NEW HOLLAND

Rider Mower Tractor
Series 830 and 1130

Models Produced After March 1, 1981



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SPECIFICATIONS

Chassis (type)	1 piece stamped steel
Wheel base	45-1/2" (1156 mm.)
Wheel tread	22-1/2" (571.5 mm.)
Turning radius	30" (762 mm.)
Tires (front)	11/4.00 x 5 (10-12 psi)
Tires (rear)	16/6.50 x 8 (10-12 psi)
Steering (type)	gear and sector
Differential (type)	planetary
Gear reducer (type)	pinion driven primary gear 5.6 to 1 reduction
Battery	sealed lead-acid 12V (5 A.H. @ 10 hr.)
Traction drive (type)	infinite speed friction disc
Ground speed (forward)	0-4.5 mph (7.2 kph)
Ground speed (reverse)	0-2.0 mph (2.4 kph)
Engine (manufacturer)	Briggs and Stratton
Models (43048)	190702 - 1195-01 8 hp
(43049)	190707 - 1196-01 8 hp
(43050)	252707 - 0213-01 11 hp
Air cleaner	reuseable foam cleaner element
Oil capacity (8 hp)	2-1/4 pints (1 l.)
Oil capacity (11 hp)	3 pints (1.4 l.)
Fuel capacity	3 qts. (2.8 l.)
Governor setting	3300 to 3500 RPM
Speed control (type)	remote cable controlled
Spark plug (type)	Champion RCJ8 or equivalent
Spark plug (gap)	.030 in. (.076 mm.)
Breaker point (gap)	.020 in. (.050 mm.)

TORQUE VALUES

Steering support mounting bracket screws	100-120 in/lbs
Steering support mounting screws	100-120 in/lbs
Steering support to console panel screws	40-60 in/lbs
Throttle control casing clamp screw	10-15 in/lbs
Steering sector bushing retainer screw	60-80 in/lbs
Belt brake mounting screws	40-60 in/lbs
Synthetic differential bearing mounting screws	50-70 in/lbs
Treadle bearing mounting screws	50-70 in/lbs
Front axle bearing mounting screws	50-70 in/lbs
Front wheel spindle mounting screws	50-70 in/lbs
Stand up bracket to engine mounting screws	40-60 in/lbs
Muffler to engine mounting screws	80-100 in/lbs
Differential pinion mounting bolts/nuts	140-160 in/lbs
Engine pulley to engine crankshaft screw	20-24 ft/lbs
Cutter bar mounting screws	35-40 ft/lbs
Gear reducer mounting screws	65-80 in/lbs
Traction arm bearing retainer screw	40-60 in/lbs

MAINTENANCE CHART

Engine shroud screen	daily/10 hrs.	brush clean
Engine oil	before/after every use	(add as needed)
Engine air cleaner	10 hrs.	wash/reoil
Engine cooling fins	daily/10 hrs.	clean debris
Spark plugs	100 hrs.	service/replace
Breaker points	100 hrs.	service/replace
Ignition timing	100 hrs.	adjust
Battery		no maintenance required
Cutter drive belt	50 hrs.	check wear
Tires	50 hrs.	check air pressure
Brake		no maintenance required
Differential		no maintenance required
Gear reducer		no maintenance required
Drive chain tension	25 hrs.	adjust

LUBRICATION CHART

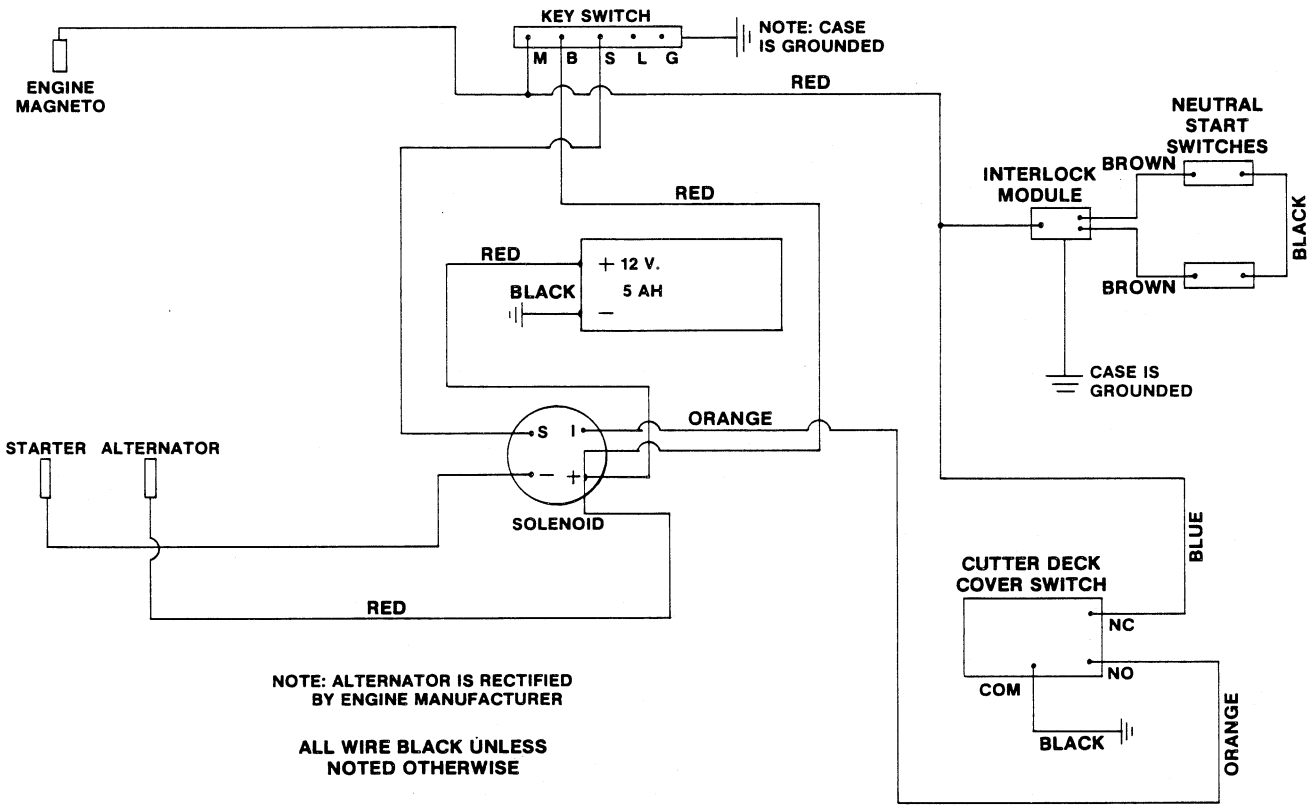
Engine crankcase		
40° - 120° F	change oil every 25 hrs.	use SC, SD SAE 30
0° - 40° F	change oil every 25 hrs.	use SC, SD 10W-30
Below 0° F	change oil every 25 hrs.	use SC, SD 5W-20
Differential	permanently lubed	202 EP #2 Lithium grease
Gear reducer	permanently lubed	202 EP #2 Lithium grease
Front wheel bearings	grease annually	general purpose grease
Pivot shaft bearings	oil every 25 hrs.	SAE 30
Drive chain	oil every 10 hrs.	SAE 30 or chain lube
RH rear axle bearings	oil every 10 hours	SAE 30 or chain lube
Cutter clutch arm guide	grease every 25 hrs	general purpose grease

WARNING

Before standing unit upright for service, lubrication or repair, close fuel shut-off valve at carburetor and check that no more than 3/4 tank of fuel is present. Fuel leakage from the carburetor and/or tank cap will occur unless these precautions are followed.

ELECTRICAL SYSTEM

WIRING DIAGRAM



BATTERY CHARGING SYSTEM

DESCRIPTION

The charging system consists of an alternator/stator, diode, charging coil lead, and battery.

THEORY OF OPERATION

The charging system components function in the following manner. Alternating current (AC) is produced by the alternator while the engine is operating. AC current flows to the diode. The diode converts alternating current (AC) to direct current (DC) in order to charge the battery. A charging coil lead carries DC current to the battery.

TROUBLESHOOTING SEQUENCE

If the battery fails to recharge causing the starter to crank the engine sluggishly or not at all, isolate the problem in the charging system using the following troubleshooting sequence.

1. Test battery-no load (page 7), if battery voltage does not increase, see step 2.
2. Test charging coil lead (page 9), if lead is OK, see step 3.
3. Test alternator/stator (page 8), if alternator is OK, see step 4.
4. Test diode (page 8).

ENGINE CRANKING SYSTEM

DESCRIPTION

The cranking system consists of the battery, key switch, solenoid, cutter deck cover switch, and starter motor.

THEORY OF OPERATION

The cranking system components function in the following manner. Turning the key switch to START allows current to flow from the battery to the base of the solenoid. When the cutter deck cover switch is closed, a ground is provided to complete the circuit from battery to solenoid. A complete circuit through the base of the solenoid closes the solenoid switch and allows battery current to flow to the starter motor. When the cutter deck cover switch is open, an open circuit exists from the battery to solenoid. The solenoid switch will not function and no current is allowed to flow to the starter.

TROUBLESHOOTING SEQUENCE

If the starter motor fails to crank the engine, isolate the problem in the cranking system using this troubleshooting sequence:

1. Test cutter deck cover switch (page 11), if switch is OK, see step 2.
2. Test key switch (page 9), if key switch is OK, see step 3.
3. Test solenoid (page 10), if engine cranks, solenoid is bad; replace solenoid. If engine does not crank, charge and test battery (page 7).

INTERLOCK SYSTEM

DESCRIPTION

The interlock system consists of an interlock module, two neutral start switches (traction drive and cutter clutch) and the cutter deck cover switch.

THEORY OF OPERATION

The interlock system components function in the following manner. The interlock module receives current from the engine magneto. Current flows from the module to the two neutral start switches that are wired in series. The module is sensitive to voltage through the neutral start switches and returning to the module. Resistance, totaling, more than 5 ohms measured through both switches and the switch lead (indicating either poor switch contact or an open switch) will trigger the module and prevent the engine from starting by grounding the magneto. The cutter deck cover switch interfaces with the interlock system and prevents the engine from starting when the switch lever is not actuated by the deck cover or catcher chute. When not actuated, the switch closes and grounds the magneto, preventing the engine from starting.

TROUBLESHOOTING SEQUENCE

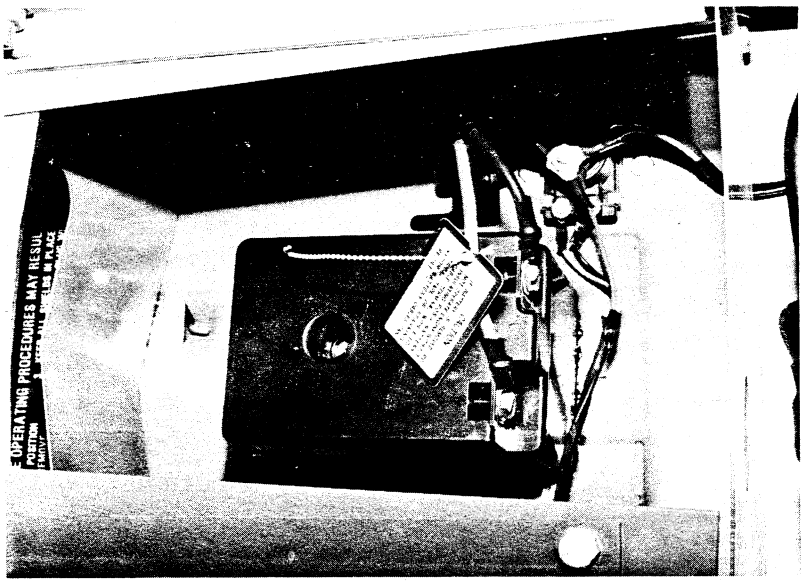
If the engine refuses to start manually or with the electric starter, isolate the problem in the interlock system using the following troubleshooting sequences:

1. Test cutter deck cover switch (page 11), if switch is OK, see step 2.
2. Test engine magneto (page 11), if magneto is OK, see step 3.
3. Test interlock module (page 12), if module is OK, see step 4.
4. Test neutral start switches (page 12).

RMT ELECTRICAL SYSTEM
TESTING and SERVICE

BATTERY

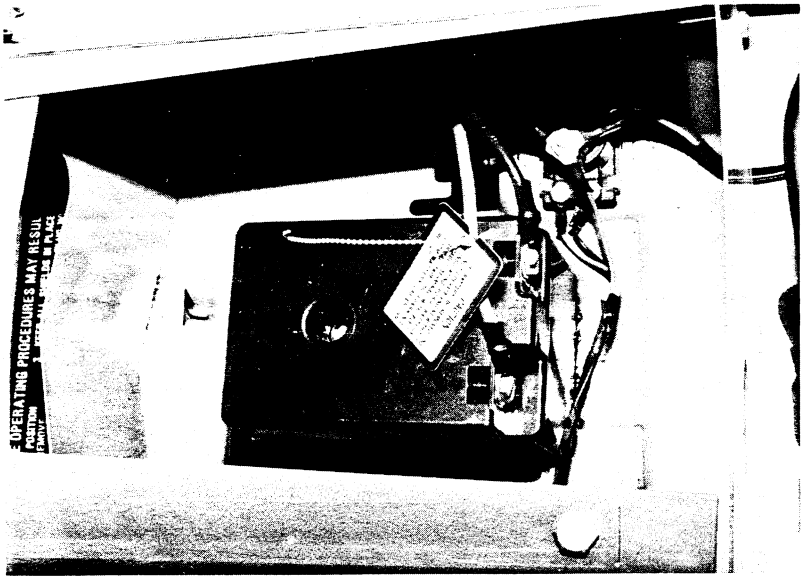
The battery is a sealed lead-acid type having a nominal voltage of 12VDC and a capacity of 5.0 amp/hours at a 10 hour rate. The battery is located beneath the operator seat. No maintenance is required or possible for this battery. Because of its construction, it is not necessary to remove the battery when standing the rider upright. The battery is constantly recharged by current generated in the charging coil and rectified by a diode. Recharging occurs anytime the engine is operating.



BATTERY TEST (No Load)

If the electric starter fails to crank the engine, first check the open circuit (no load) voltage of the battery using a DC voltmeter.

1. Attach (+) positive lead of test instrument to (+) positive battery connection.
2. Attach (-) negative lead of test instrument to (-) battery ground connection.



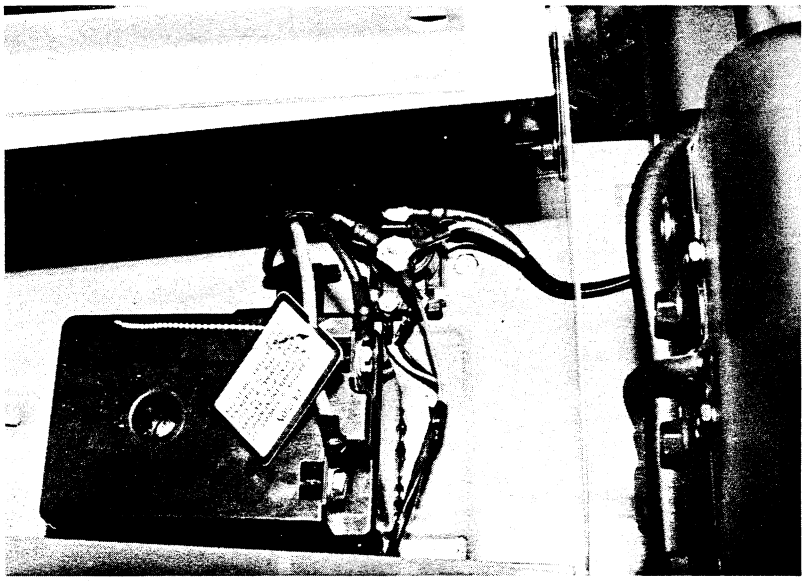
Open circuit voltage must be 11 VDC minimum or above. If 11 volts or below, start engine manually and allow to run at 3/4 throttle for 10-15 minutes. Additional recharging time may be necessary to fully charge battery if open circuit voltage was below 11 VDC. If battery voltage did not increase after recharging, check diode, charge leads, and connections before replacing battery.

BATTERY TEST (Load)

If the battery met the standards of the NO LOAD test, perform a LOAD test to determine if the battery can produce sufficient current to crank the engine. It is possible that a battery could have adequate open circuit voltage but not be capable of energizing the starter motor.

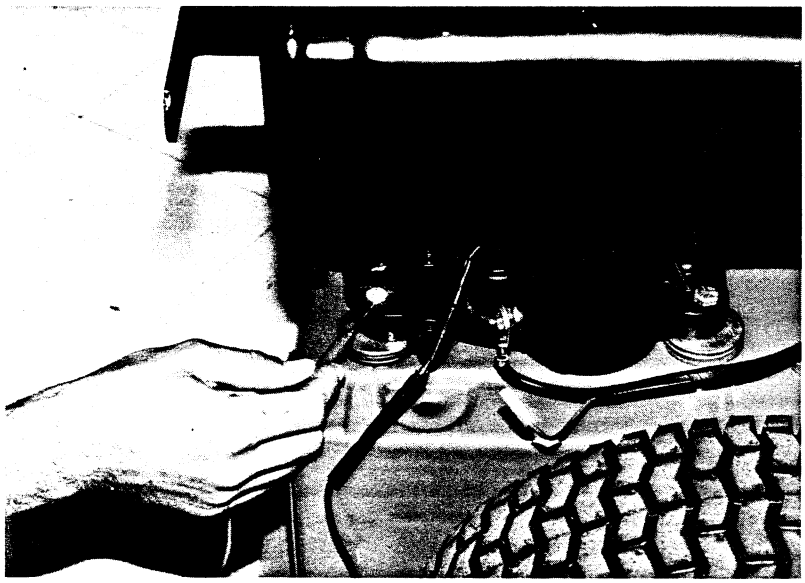
Disconnect the high tension lead at the spark plug. Connect the (+) positive lead from a DC voltmeter to the (+) positive battery lead. Connect the (-) negative lead of the meter to the (-) negative battery lead.

Crank the engine for 15 seconds and note the voltage registered. If voltage falls below 9-1/2 VDC during the test, the battery should be replaced.



ALTERNATOR/DIODE TEST

Disconnect the charging coil lead at the diode. Cut the diode from the alternator lead. Connect one probe of an ohmmeter to the alternator lead. Connect the other probe to a clean ground surface. The alternator is good if the meter indicates resistance between 1 - 2 ohms. If battery voltage (no load) failed to increase after engine operation and the alternator tested good, the diode is defective and must be replaced. Briggs and Stratton part numbers for diode (393814)— and alternator including diode (391529).

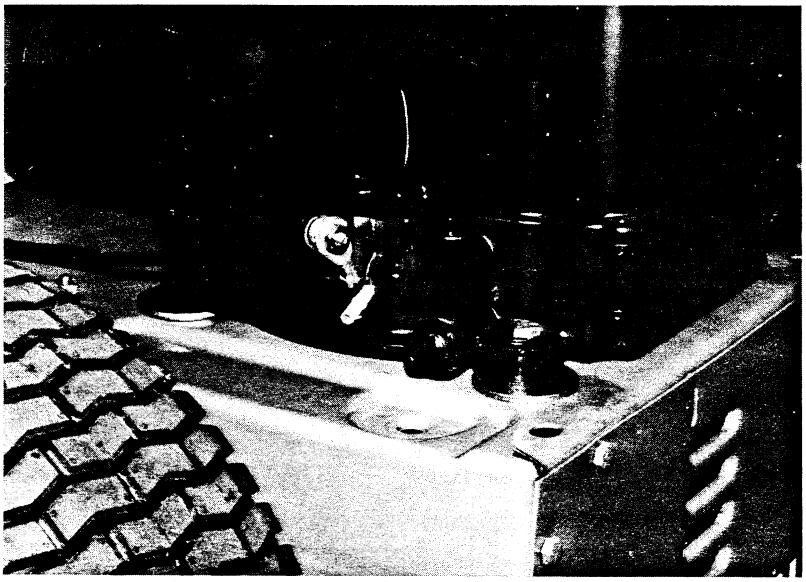


DIODE TEST (Optional)

Disconnect the charging coil lead at the diode. Cut the diode from the alternator lead. Connect the probes of an ohmmeter to the diode terminals. Note the action of the meter (either continuity or open circuit). Reverse the test probes on diode terminals. Note the action of the meter (either continuity or open circuit). The diode is defective if the test results were the same in both cases. Note, an ohmmeter capable of producting 9 VDC is required for this test. Instruments with lower voltage outputs will indicate an open circuit regardless of the position of the probes and will produce inconclusive results.

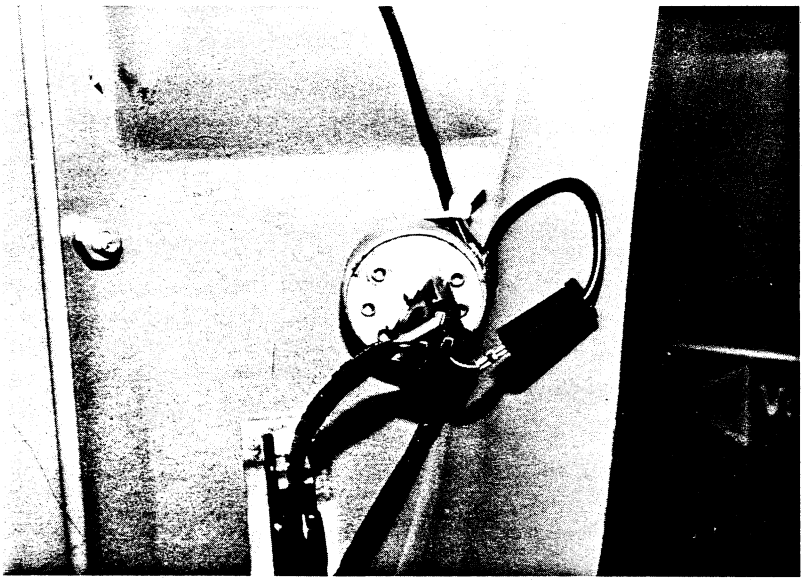
CHARGING COIL LEAD TEST

Connect an ohm meter or continuity light between either end of the charging coil lead. Repair or replace the lead if the test indicates resistance or an open circuit.



KEY SWITCH TEST

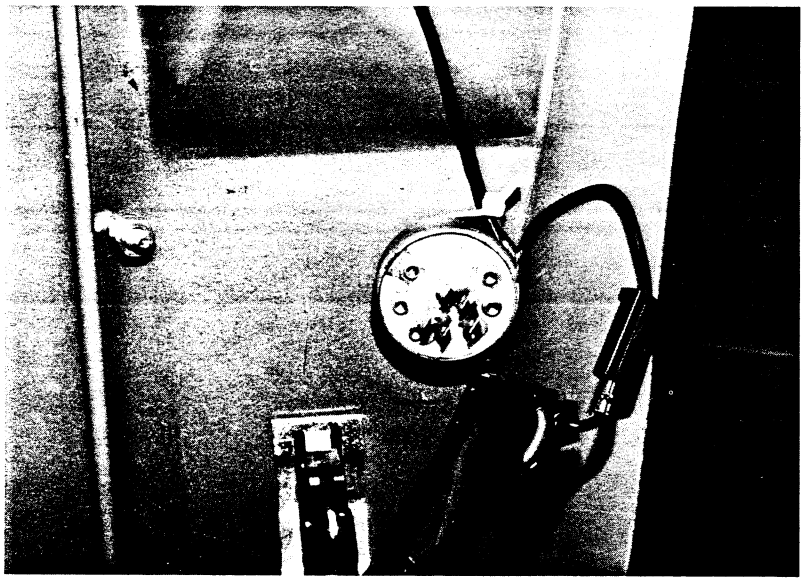
If the engine fails to crank or cranks but refuses to start with a known good battery, the problem could be in the key switch, solenoid, or interlock system. To test the key switch, first check that the terminal connections from the wiring harness to the switch are clean and tight. If the engine still refuses to crank or start, disconnect the terminal connectors and perform a continuity test on the switch. Note that two terminals on the key switch are not used in this application. Reinstall terminal connectors accordingly.



OFF - Continuity between terminals G and M. Open circuit will prevent engine from stopping with key in OFF position. Engine will start and run.

ON - Continuity between terminals B and L. Open circuit will prevent engine from starting. Engine will not start manually.

START - Continuity between terminals B and S. Open circuit will prevent starting with electric starter. Engine can be started manually.

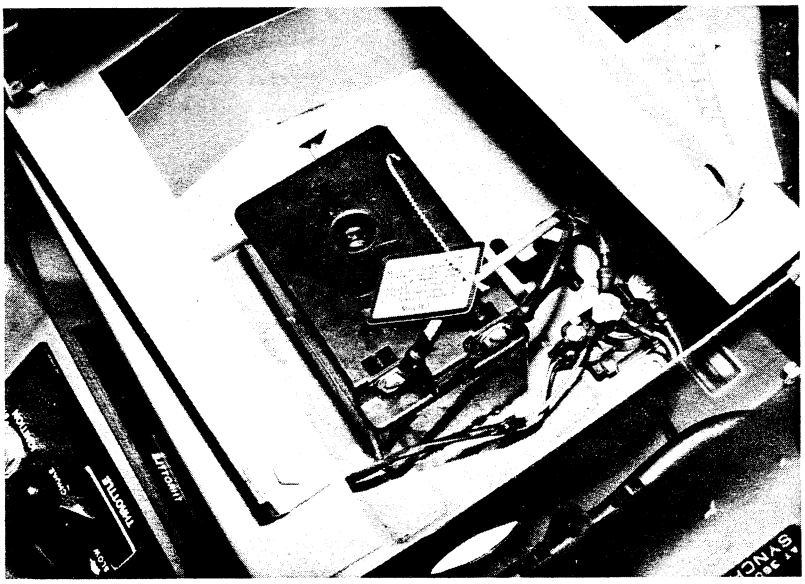


SOLENOID TEST

If the starter motor will not crank the engine with known good battery and key switch, check for a defective solenoid.

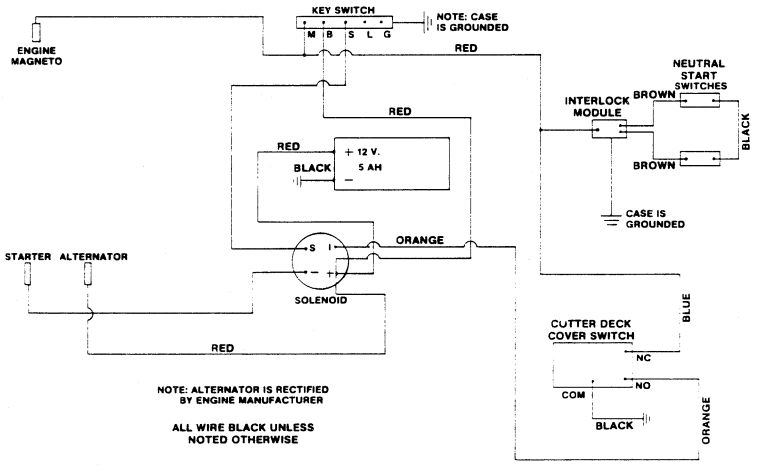
Touch a 10 or 12 gauge jumper wire to the (+) positive and (-) negative terminals on the top of the solenoid.

If the engine had failed to crank using the key switch but cranks with the terminals jumped, the solenoid is defective. Before making this test, the key switch should be checked as previously noted.

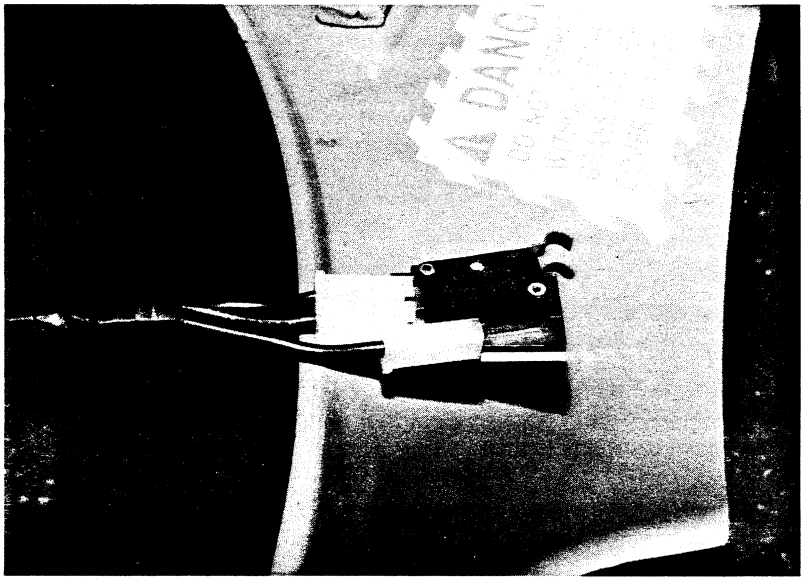


INTERLOCK SYSTEM

The interlock system consists of an interlock module, traction and cutter neutral-start switches, and a cutter deck cover switch. The traction and cutter switches are connected to an interlock module which is supplied with current through the key switch from the engine magneto ground. The interlock module prevents the engine from starting if either or both traction and cutter switches are open, that is, not in the neutral position. The cutter deck cover switch is connected directly to the engine magneto ground independent of the interlock module. The cutter deck cover switch will prevent the engine from starting and cranking or will kill the engine unless the deck cover or grass catcher chute is securely mounted.



CUTTER DECK COVER SWITCH TEST

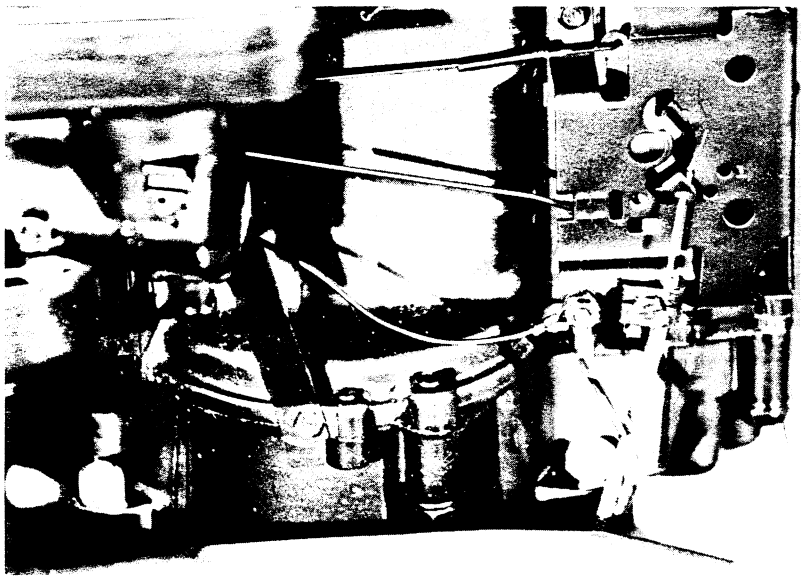


If the engine fails to crank with the electric starter and the neutral start switches are in the neutral position, check that deck cover or catcher chute is properly mounted and actuating the cutter deck cover switch lever. If the switch lever is not being sufficiently depressed by either cover or chute, carefully bend the lever. To test the switch following an adjustment of the lever or to determine proper function, proceed as follows. Remove the catcher chute or cover to gain access to the switch.

Disconnect switch from harness. Connect a continuity light or ohmmeter across the terminals marked COM and NC. Do not depress the switch lever. The meter should indicate continuity. Depress the lever and observe that the circuit opens.

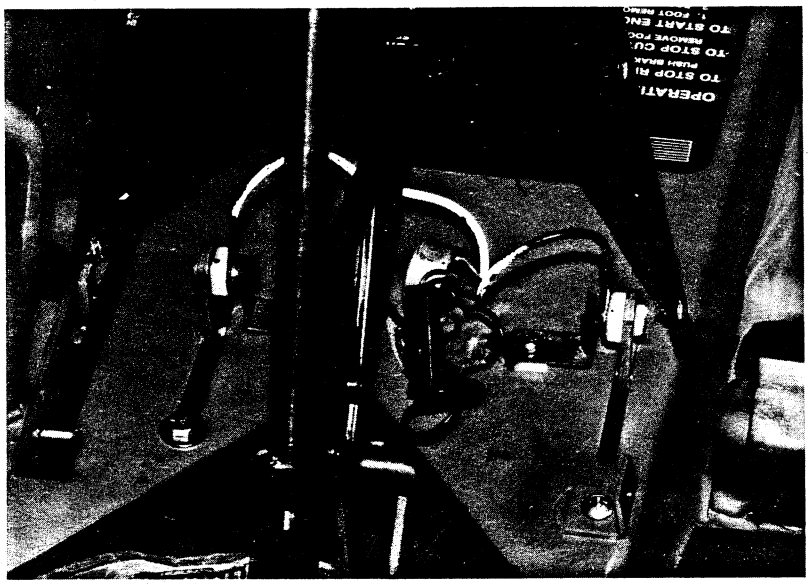
Connect a continuity light or ohmmeter across the terminals marked COM and NO. Do not depress the switch lever. The meter should indicate an open circuit. Depress the lever and observe that the circuit closes. Replace the switch if test results are otherwise.

ENGINE MAGNETO TEST



Before proceeding with further testing of the interlock system, check that the engine magneto is functioning properly. To test the magneto exclusive of the interlock system, disconnect the ground lead on the left side of the engine and crank the engine. If the engine has ignition spark the magneto is good and the no-start problem is in the interlock system. Connect the magneto ground lead before proceeding with any tests.

INTERLOCK MODULE TEST



Remove the steering support to gain access to the module and neutral start switches. Note that a shorter screw is installed in the steering support adjacent to the LH and RH neutral start switch. Do not install one of the longer mounting screws in this location. A longer screw can contact the neutral start switch preventing the engine from starting. To test the interlock module exclusive of the neutral start switches proceed as follows.

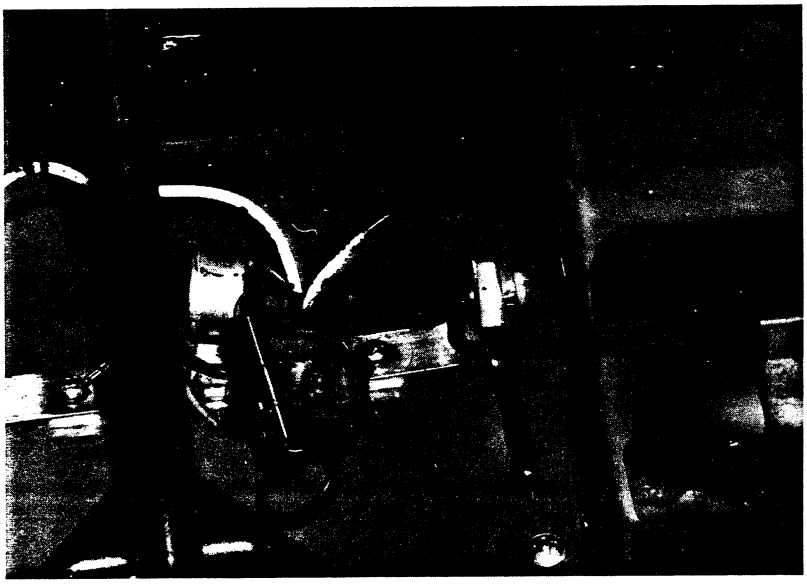
Connect a suitable jumper wire across the two brown leads from the interlock module.

Do not disconnect the red module ground wire during this test.

Connect a spark tester to the high tension lead. Crank the engine and check for ignition spark.

If the engine lacks ignition spark the module is defective. If the engine has spark proceed to check the neutral start switches. Bear in mind that this test is conclusive only if the cutter deck cover switch is functioning properly. Also, always check the cutter deck cover switch and engine magneto before replacing the interlock module. In most cases, hard starting is due to resistance in the neutral start switches caused by contamination or loose connections rather than a defective module.

NEUTRAL START SWITCH TEST



The interlock switches (neutral start) can prevent the engine from starting due to misalignment of the contacts, contamination causing resistance, or damage to the switch insulators. If troubleshooting has isolated the no-start problem to the neutral start switches perform a continuity check across both switches before making any adjustments to the contact plates.

Connect a continuity light or ohm meter to the contact plate and contact screw. The switch is making good contact if the test instrument indicates continuity or less than one ohm through the switch. In order for ignition to occur a total of no more than 5 ohm resistance can be present through both neutral start switches and the interlock harness. Perform the same test on the other switch. If any resistance is noted examine the insulators for cracks caused by overtightening the mounting screws or loose contact plate mounting screws. Clean the contact surfaces with crocus cloth or fine steel wool. Should the engine again fail to start, carefully bend the contact plate toward the contact screw until positive engagement occurs. Check the adjustment with a continuity light or ohm meter. If a continuity light or ohm meter is not available it is possible to troubleshoot and adjust the neutral start switches by inserting a screwdriver or open end wrench through the slot in the console panel and gently bending the contact plate until the switch is functional. Loose hardware, however, must be tightened to prevent repeat no starts.