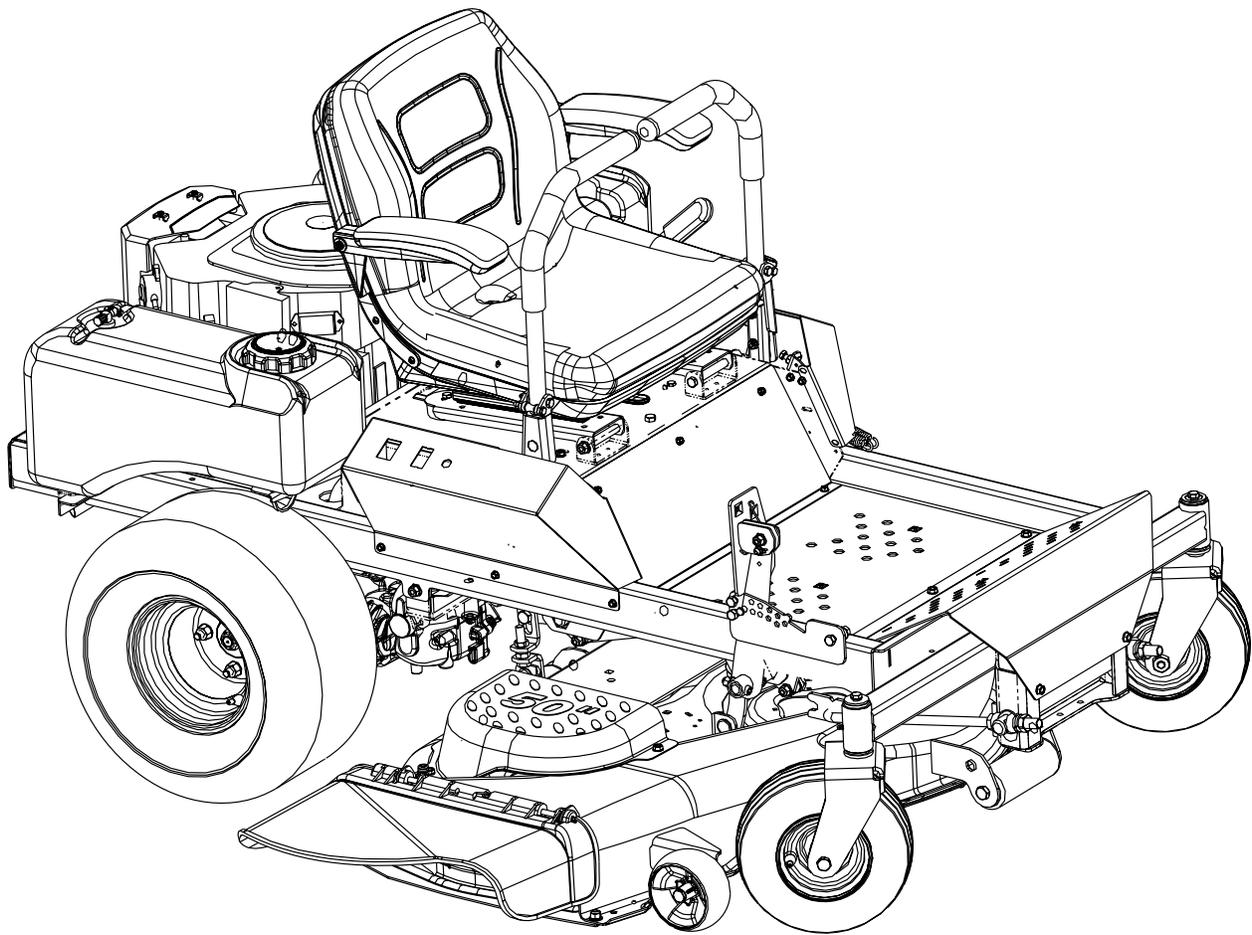




MODEL YEAR 2007
Z – FORCE ELECTRICAL SYSTEMS



PRIMARY WIRE COLOR DESIGNATION:

RED or Combination as Red w/ Black Stripe.

POSITIVE (+) power supply.

Circuit runs from battery, thru a fuse, to the ignition switch for distribution to components as Starter Solenoid (orange wire) and Charging System.

GREEN:

NEGATIVE (-) main Ground Circuit.

Circuit runs from engine block to components requiring constant ground.

ORANGE or Combination as Orange w/ Black or White Stripe.

POSITIVE (+) power supply to activate the engine starter solenoid.

Circuit begins at the ignition switch and is tied directly into safety switches before ending at the starter solenoid.

Example, when the brake is engaged, the brake switch makes the orange wire circuit and allows the current to flow to the next component. When the brake is off the circuit is broken within the switch and the current cannot flow to the next component, therefore the engine starter will not engage.

YELLOW or Combination as Yellow w/ Black or White Stripe.

NEGATIVE (-) circuit ground to engine magneto.

Circuit begins at the ignition switch and is tied directly into the seat and safety switches before ending at the engine. This circuit provides a means to ground the engine magneto which in turn does not allow the engine to provide spark to the spark plugs.

BLUE or Other Colors:

These are secondary circuits providing current to components and accessories.

Example, BLUE Wire provides positive (+) current to activate the PTO clutch.

PRIMARY COMPONENTS:

BATTERY:

12 Volt, CA @ 32 deg.F = 320, CCA @ 0 deg.F = 260.

NEGATIVE CABLE to the engine block mounting bolt.

POSITIVE CABLE to the engine starter solenoid.

POSITIVE WIRE, main circuit to fuse and ignition switch.

FUSE:

Blade Type, Automotive, 20 amp for main circuit from battery to ignition switch.

On 2007 Model Units the fuse & labeled holders are mounted on the fuel tank bracket bolted to the back of the seat box. It is just behind the hydro oil reservoir.

SEAT SWITCH:

The operator presents (seat) switch is integrated in the seat cushion. When the operator is in the seat, a negative (ground) circuit is broken.

PRIMARY COMPONENTS: Cont.

IGNITION SWITCH: Cont. Pole Contact per Key Position.

OFF –

“G” Green, Ground + “M”, Yellow Wire, Magneto + “R” Accessory. Closed Circuits.
 Engine Magneto is grounded and will not produce spark to spark plugs.
 “B” Red Positive is isolated. Not feeding other circuits.

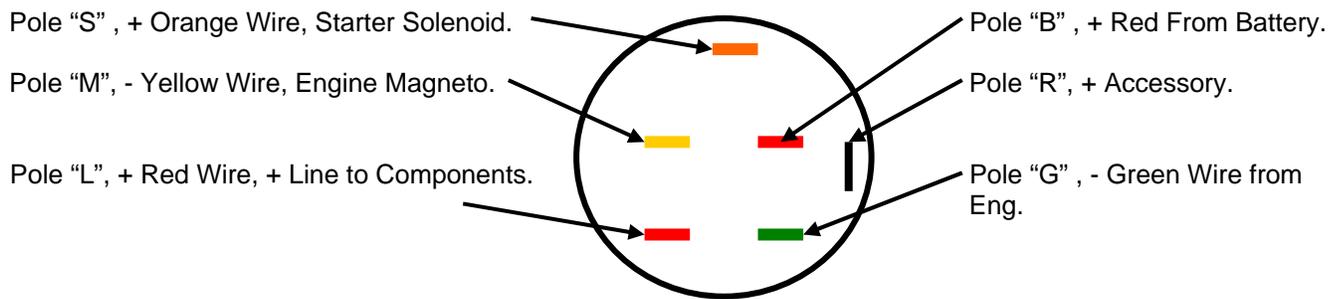
ON –

“B” Red Positive from Battery + “L” Red Wire to feed circuits + “R” Positive to Acc.
 Positive Current is sent to components as switches and engine harness.
 Magneto is no longer grounded at key switch but is still depending on safety switches to allow the engine to produce spark to spark plugs.
 “S” Orange Wire has no current.

START –

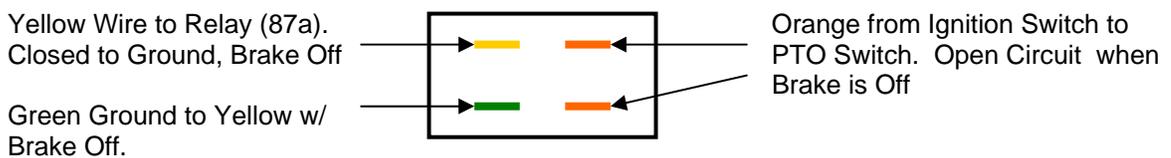
“B” Red Positive from Battery + “S” Orange Wire to Engine Starter Solenoid + “L” Red to feed circuits.
 Positive current is routed thru the orange wire to activate the engine starter solenoid. The complete circuit is dependent on the safety switch system in order to activate the starter.
 Positive Current is sent to components as switches and engine harness.
 Magneto is no longer grounded at key switch but is still dependent on safety switches to allow the engine to produce spark to spark plugs.

IGNITION SWITCH: 6 pole, key activated. View From POLE Side



BRAKE SWITCH:

This is a manually operated safety switch. When the brake is in the engaged position, switch button in, the orange wire (starter circuit) is closed allowing current to pass thru from the ignition switch. The circuit between the green ground and yellow (magneto) is open. With the brake disengaged, the open and closed circuits are reversed.



CURCUIT ROUTING Z - FORCE ENGINES:

RED (+)

Battery
Fuse
To Ign. Switch (B)
Ign. Switch From (L)
PTO Switch (1)
Hr. Meter
Engine Harness Plug

ORANGE (Starter)

Ignition Switch (S)
PTO Switch (3&9)
Brake Switch
Engine Harness (Starter Solenoid)
Lead w/ Spade for Solenoid (KAW. Eng.)

Harness To Engine

Kohler

Mating Plug Connection From Harness to Engine
Harness - Engine
Orange / Black to Red & Blue (2 wires)
Starter Solenoid
Red to Red
Yellow to White & White (2 wires)
Magneto
Green to Yellow (2 wires)

GREEN (-)

Engine Block
Brake Switch
Ignition Switch (G)
PTO Switch (2)
PTO Clutch
Hr. Meter
Harness
+
Lead w/ Eye to
Starter Solenoid
(KAW Eng.)

YELLOW (Magneto)

Ignition Switch (M)
LOOPED CIUCUIT
Engine Harness Plug (Magneto)
Seat Switch
PTO Switch
Brake Switch

BLUE (PTO CLUTCH)

LOOPED CIRCUIT
PTO Switch (4) PTO Switch (4)
LH Rev. Cut Out Sw. RH Rev. Cut Out Sw.
PTO Clutch PTO Clutch

Harness To Engine

Kawasaki

Extension Plugged Into Kohler Harness
Harness - Engine
Orange / Black to Starter Solenoid
Red to Red (2 wires)
Yellow to White & Black (2 wires)
Magneto
Green to Solenoid
Mounting Bracket

DIAGNOSTICS:

PREVENTION:

The cause of most electrical issues are moisture resulting in corrosion, loose wires or contacts (mainly ground wires & cables) or damaged wires.

It is highly recommended that a part of regular service is to inspect the electrical system including all related components. This is especially true in areas of high humidity, exposure to lawn chemicals, units stored outdoors or units that are pressure washed frequently.

Begin at the ignition switch, service all switches, relays and timers along the wire harness.

Unplug each component and clean with electrical contact cleaner.

Inspect the plug connectors to be sure all wires are secure within the housing.

Coat connections and mating surfaces with Di-Electric Grease and reassemble.

As you go through the electrical system check wiring for damaged insulation and crushed or crimped wires.

Repair or replace as required.

SYMPTOM / DIAGNOSIS:

BEFORE DIAGNOSING ELECTRICAL SYSTEMS, ALWAYS, CHECK GROUND CONNECTIONS AND BATTERY CONDITION.

Engine Starter Will Not Turn Over. (Brake On, PTO Switch Off, Operator in Seat)

- 1) Pull Switch to Engage PTO.
Click Yes = Current in System. - Go to #3
Click NO = No Current in System. - Go to #2
- 2) Check Fuse.
Bad = Replace (May Blow Again if Short In System)
Good = OK Current From Battery to Ignition Switch. Go to #3
- 3) Check Current, Orange Wire @ Starter Solenoid. Key in Start Position.
Current Reading 10 – 12 volts = Possible faulty solenoid or starter.
Current Reading Less Than 10 – 12 volts = Low Battery or Current Drop thru Components.
No Current Reading. = Dead Battery or Faulty Orange Wire Circuit.
Trace Orange Wire Circuit from Ignition Switch thru System.

Engine Starter Will Turn Over, Engine Will Not Start.. (Brake On, PTO Switch Off, Operator in Seat)

- 1) Fuel in System and Tank Fuel Valves Open.
- 2) Turn Key from Off to On Position. - Listen for Click at Engine Carb.
No Click = Faulty Afterfire Solenoid or No Current to Solenoid.
Yes Click = Afterfire Solenoid Functional
- 3) Check Engine Spark.
Yes Spark to Spark Plugs = Non Starting not Due to Electrical Problem.
No Spark to Spark Plugs = Possible Yellow Wire Grounding Magneto.
- 4) Disconnect Yellow Wire From Engine Circuit at Engine Harness Plug.
No Spark to Spark Plugs = No Spark not Due to (Yellow Wire) Grounding Magneto.
Yes Spark to Spark Plugs = Harness (Yellow Wire) Grounding Magneto.
Trace Yellow Wire Circuits from Ignition Switch to Relay and Yellow / White Wire Brake, PTO Switches to Relay.

Engine Shuts Down When Brake is Released or PTO Switch is Engaged.

(Brake On, PTO Switch Off, Operator in Seat)

The primary cause of this symptom is the Seat Switch Grounding Out the Yellow Magneto Wire.

The Yellow Wire circuit in the seat switch is closed w/o an operator in the seat. If the switch is faulty, it will remain closed with an operator in the seat. Therefore when the brake is released the circuit to the magneto is completed grounding the engine magneto.

NOTES

