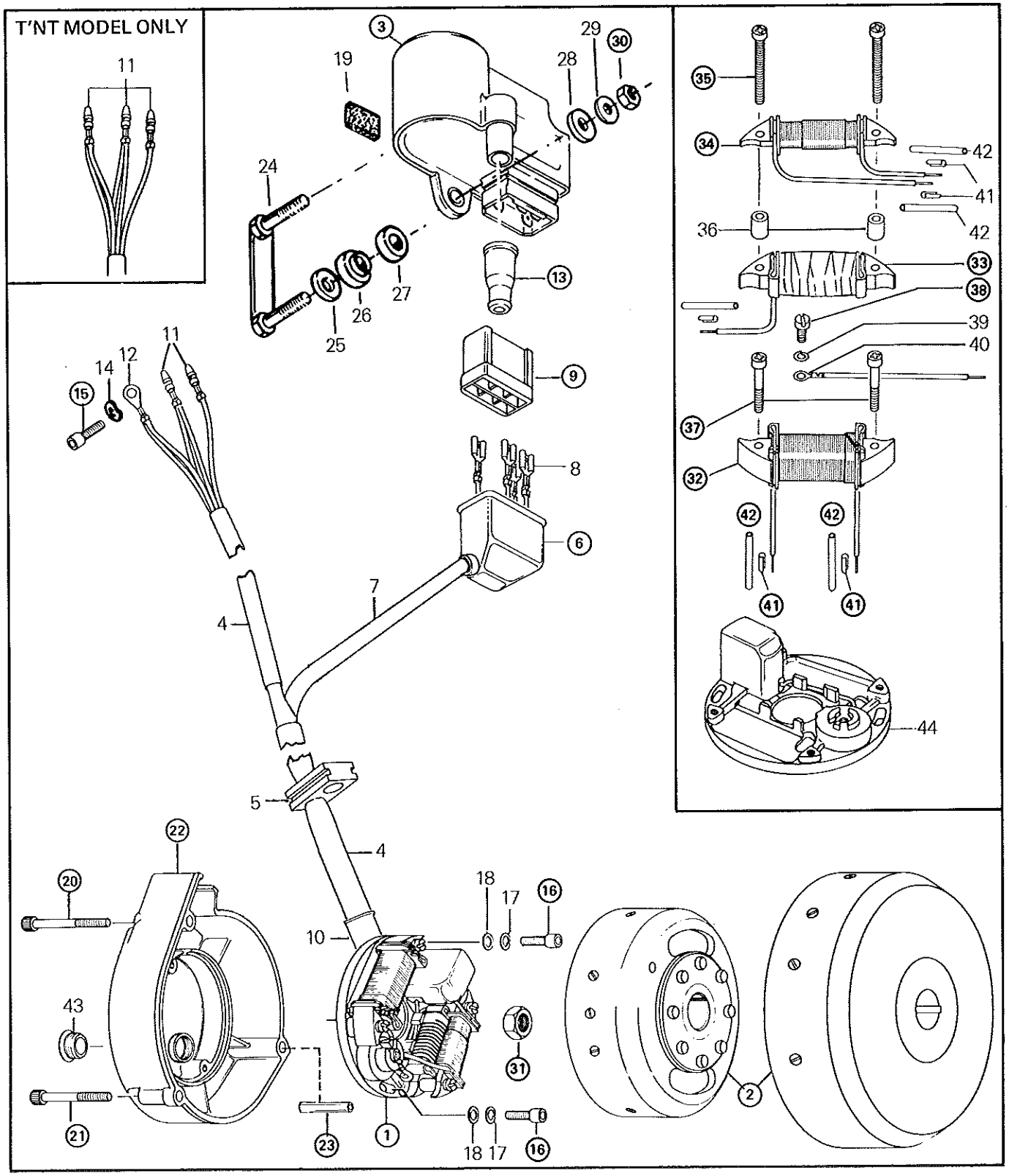
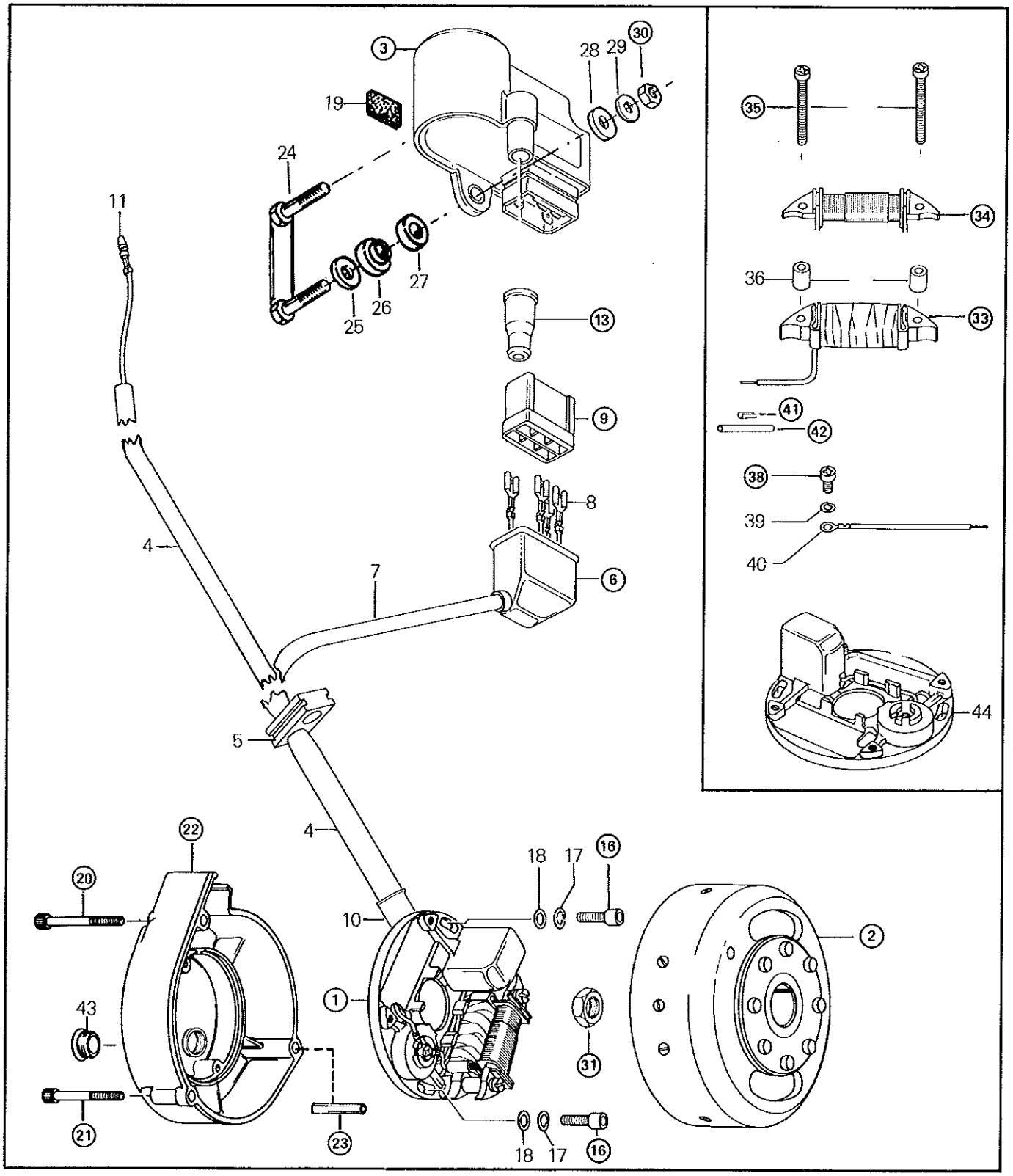
BOSCH SYSTEM
(T'NT – QUALIFIER)



BOSCH SYSTEM
(MX-3)



1. *Stator plate ass'y*
2. *Flywheel*
3. *Electronic box*
4. *Protection hose (400 mm)*
5. *Cable grommet*
6. *Protection boot*
7. *Protection hose (185 mm)*
8. *Straight tab receptacle*
9. *Connector*
10. *Holder*
11. *Contact pin*
12. *Ring tongue*
13. *Protection cap*
14. *Lockwasher*
15. *Allen screw M6 x 16*
16. *Allen screw M5 x 16*
17. *Lockwasher 5 mm*
18. *Flat washer 5.3 mm*
19. *Rubber pad*
20. *Allen screw M6 x 50*
21. *Allen screw M6 x 45*
22. *Magneto cover*
23. *Locating dowel (3)*
24. *Retainer plate*
25. *Flat washer 6 mm*
26. *Rubber bushing*
27. *Rubber washer*
28. *Rubber washer*
29. *Flat washer 6 mm*
30. *Elastic stop nut 6 mm*
31. *Crankshaft nut M16 x 1.5*
32. *Lighting coil*
33. *Charging coil*
34. *Brake light coil*
35. *Screw M4 x 28*
36. *Distance sleeve 10.5 mm*
37. *Screw M4 x 22*
38. *Screw M4 x 6*
39. *Lockwasher 4 mm*
40. *Cable shoe M4*
41. *Splice connector*
42. *Protector tube*
43. *Adjustment plug*
44. *Trigger plate*

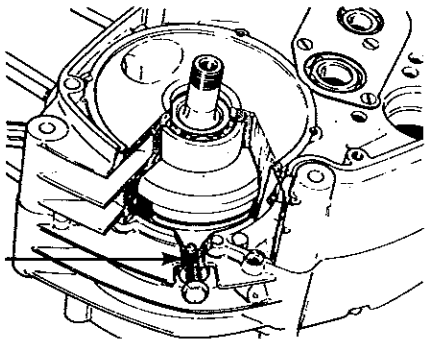
DISASSEMBLY & ASSEMBLY

◆ **WARNING: To prevent powerful electric shocks make sure to stop the engine prior to performing any adjustment or repair onto or near the CD ignition system (i.e. ignition timing, ignition tester, replacement of spark plug, coil or ignition armature, HT lead wire, kill switch).**

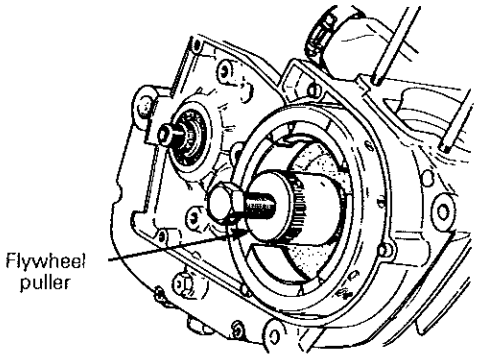
If any adjustment has to be performed with the engine running, do not touch any components related to the C.D. ignition system (i.e. ignition coil, H.T. lead wire, wiring harness, etc...).

①To facilitate timing procedure, perform primary adjustment by matching magneto cover and stator plate marks.

②To remove the flywheel, lock crankshaft at the top dead center position using a crankshaft locking bolt.



Remove the flywheel retaining nut and install special puller on the flywheel. Tighten puller bolt and at the same time, tap gently on the bolt head using a soft hammer to release the flywheel from its taper.



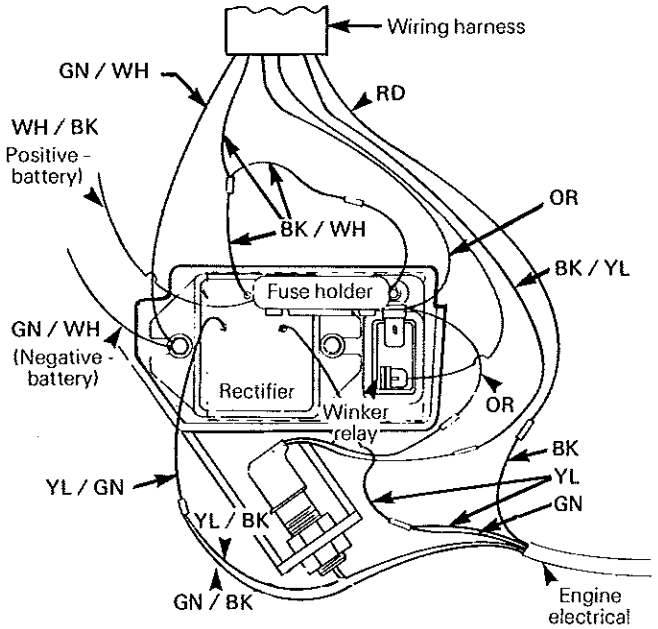
Prior to assembly apply a light coat of Loctite 242 (medium strength) on the crankshaft taper.

③At assembly, connect the wires (as illustrated).

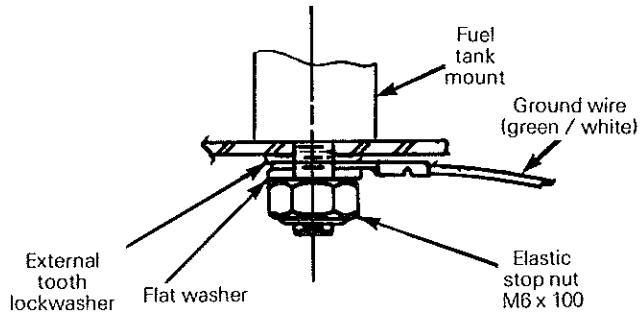
COLOR CODE

GN — GREEN	YL — YELLOW
WH — WHITE	BR — BROWN
RD — RED	BK — BLACK
OR — ORANGE	

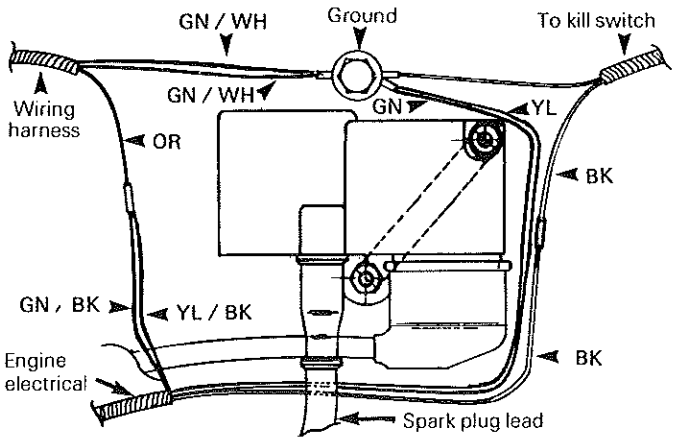
T'NT MODEL



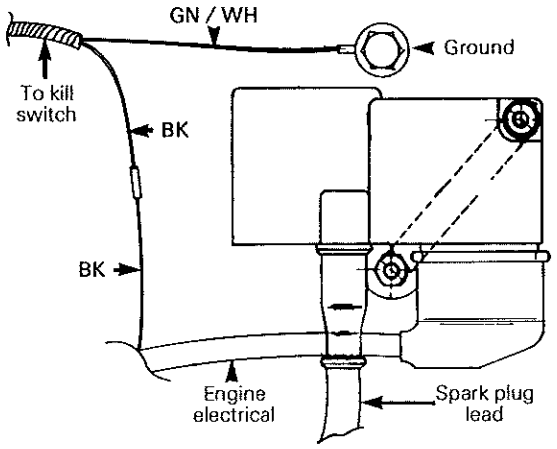
NOTE: On the T'NT model the wiring harness ground wire (green / white) is attached on the right hand fuel tank mount.



QUALIFIER MODEL

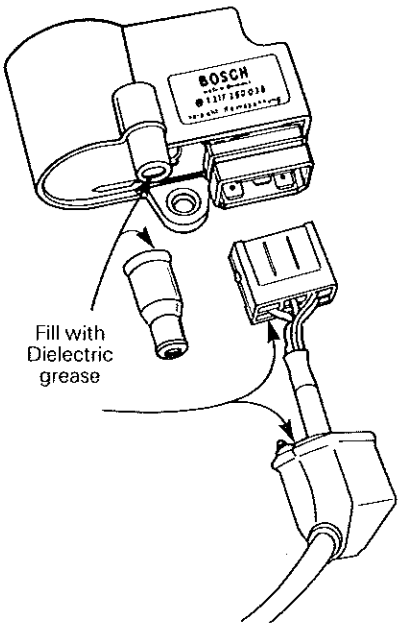


MX-3 250 MODEL ONLY



⑥⑨⑬ Prior to assembly check all connections for dirt or corrosion.

Fully pack the electronic control, the connector block, the rubber boot, the high tension connection and the protector boot with dielectric grease Dow Corning DC4, or equivalent.



CAUTION: To prevent moisture, make sure no air is trapped within the connections. Do not use silicone sealant as contacts may corrode.

⑮ At assembly, torque to 0.8-1.1 kg-m (6-8 ft-lbs).

⑯ At assembly, apply Loctite no. 242 (medium strength) on the retainer screw threads and torque to 0.5-0.6 kg-m (3-4 ft-lbs).

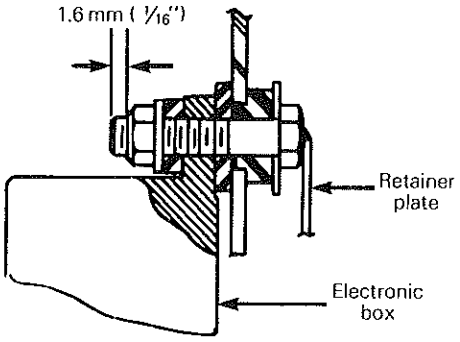
⑳㉑ At assembly torque to 0.8 kg-m (6 ft-lbs).

NOTE: The longest retaining screw (50 mm long) must be fitted in the top magneto cover hole.

㉒ At assembly, apply a light coat of silicone sealant on the mating surface.

㉓ At assembly, make sure the three (3) locating dowels are in position.

㉚ At assembly, tighten the elastic stop nut in order to obtain 1.6 mm (1/16 ") long of threads protruding past the nylock.



CAUTION: Do not overtighten the nuts or the rubber spacers will loose their flexibility.

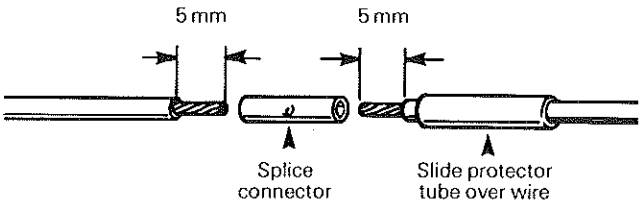
㉛ At assembly, apply Loctite no. 242 (medium strength) on the threads of the magneto retaining nut and torque to 7.5-8 kg-m (55-60 ft-lbs).

㉜㉝㉞ At assembly, hold the coils towards the center, of the stator plate while tightening to prevent the coil shoes from contacting the magneto.

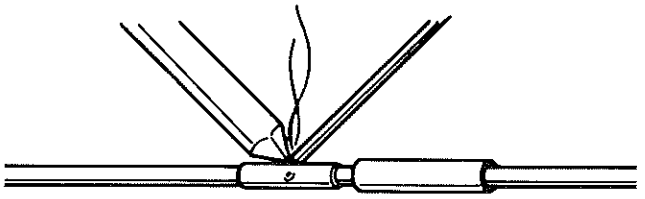
CAUTION: Make sure to route the coil wires away from the center of the stator plate to prevent the wires from rubbing on the magneto flywheel nut.

㉟㊲㊳ At assembly, torque to 0.3 kg-m (2 ft-lbs).
㊶㊷ Use a splice and protector tube, as illustrated, to connect the wires.

Strip 5 mm of insulation from each end.

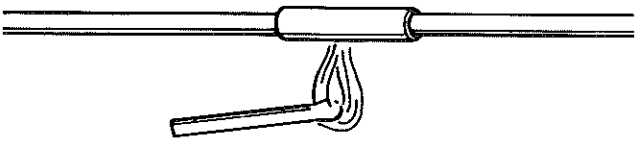


Crimp and solder wires into splice connector with resin core type solder.



CAUTION: Do not use acid core solder, as connections will corrode.

Slide protector tube over splice connector then heat with a match to shrink the protector tube.



CLEANING AND SERVICING

Clean the stator plate and flywheel using only a clean cloth.

Inspect all electrical connections for dirt or corrosion.

Clean as necessary.

Fully pack the electronic control, the connector block, the rubber boot, the high tension connection and the protector boot with dielectric grease Dow Corning DC-4, or equivalent.

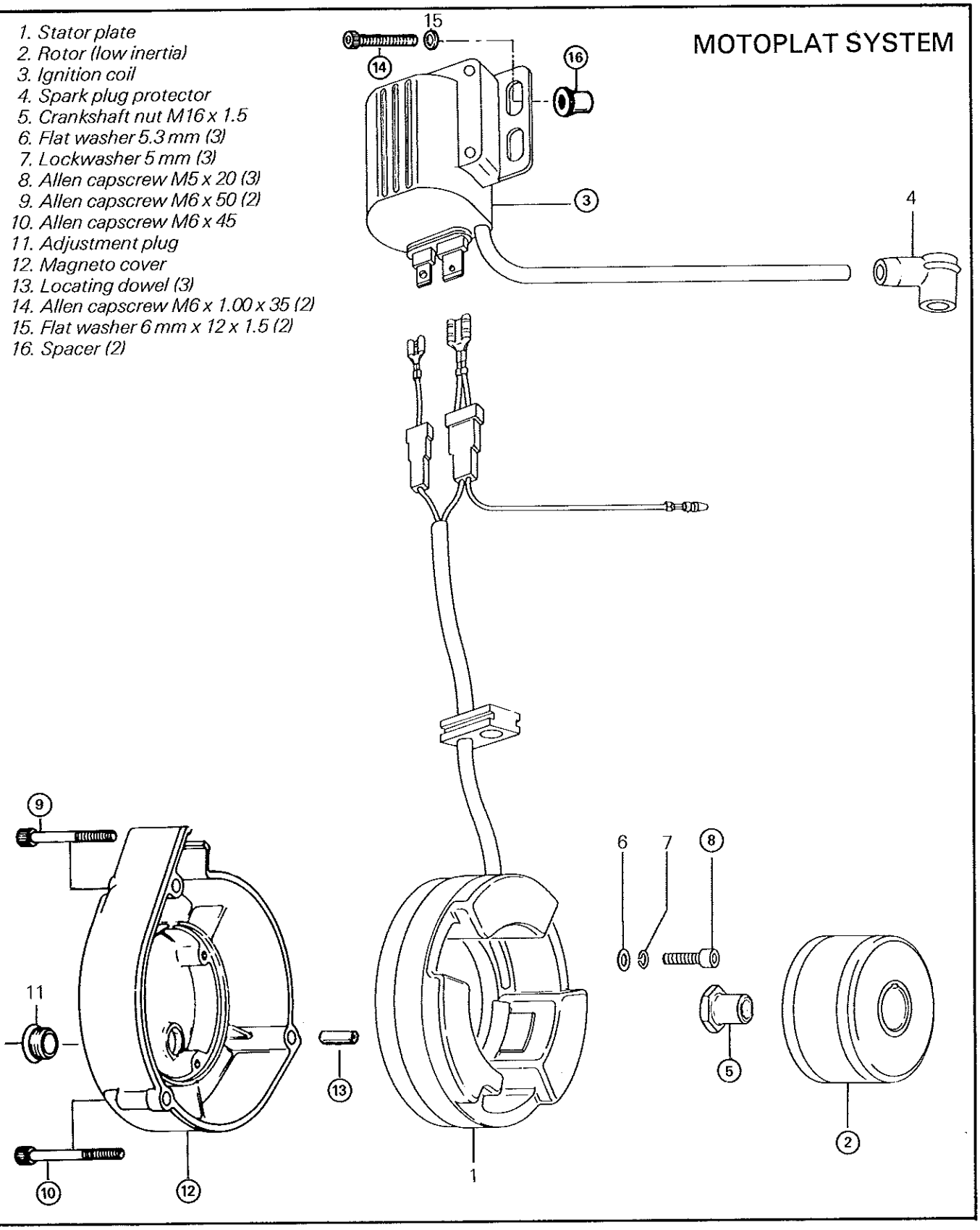
CAUTION: To prevent moisture, make sure no air is trapped within the connections. Do not use silicone sealant as contacts may corrode.

Frequently inspect the ignition cover and crankcase unpainted surfaces for corrosion. If corroded, clean then spray with LPS 3 or equivalent.

CAUTION: Do not attempt to stop the engine by removing the high tension wire from the spark plug. Severe damage will occur to electronic box.

MOTOPLAT SYSTEM

1. Stator plate
2. Rotor (low inertia)
3. Ignition coil
4. Spark plug protector
5. Crankshaft nut M16 x 1.5
6. Flat washer 5.3 mm (3)
7. Lockwasher 5 mm (3)
8. Allen capscrew M5 x 20 (3)
9. Allen capscrew M6 x 50 (2)
10. Allen capscrew M6 x 45
11. Adjustment plug
12. Magneto cover
13. Locating dowel (3)
14. Allen capscrew M6 x 1.00 x 35 (2)
15. Flat washer 6 mm x 12 x 1.5 (2)
16. Spacer (2)



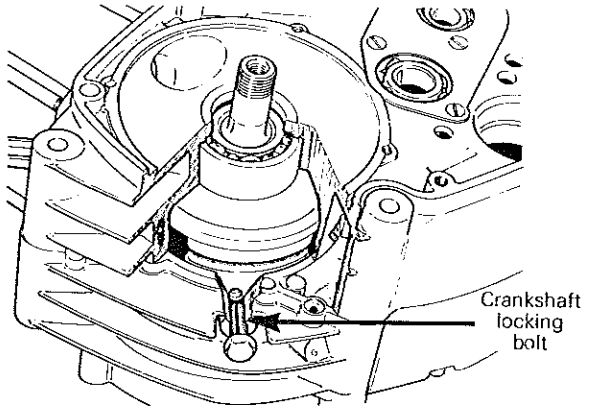
◆ WARNING: To prevent powerful electric shocks make sure to stop the engine prior to performing any adjustment or repairs onto or near the CD ignition system (i.e. ignition timing, ignition tester, replacement of spark plug, coil or ignition armature, H-T lead wire, kill switch).

If any adjustment has to be performed with the engine running, do not touch any components related to the C.D. ignition system (i.e. ignition coil, H.T. lead wire, wiring harness, etc...)

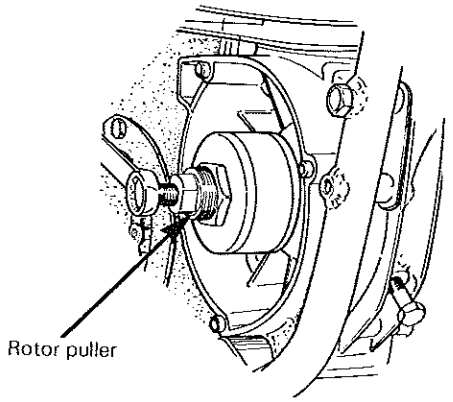
DISASSEMBLY & ASSEMBLY

②Lock crankshaft, remove the rotor retaining nut and install special puller on rotor.

◯ NOTE: To lock crankshaft, remove the crankcase plug and sealing washer. Bring the piston to top dead center position and insert a crankshaft locking bolt through the plug hole into the crankshaft flywheel hole.

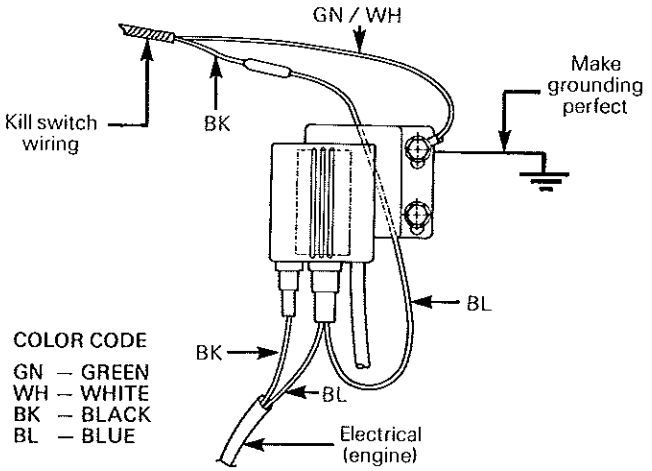


Tighten puller bolt and at the same time, tap gently on the bolt head using a soft hammer to release the rotor from its taper.



③At assembly, connect the wires (as illustrated).

◯ NOTE: To ensure perfect grounding, make sure the frame surface is free of paint at the ignition coil mounting area.



⑤At assembly, apply a light coat of Loctite no. 242 (medium strength) and torque to 8 kg-m (60 ft-lbs).

⑧ At assembly, torque to 0.5 kg-m (4 ft-lbs).

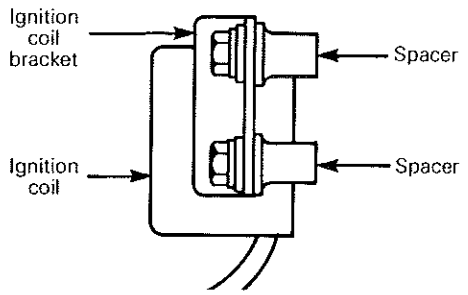
⑨⑩ At assembly, torque to 0.8 kg-m (6 ft-lbs).

⑫ At assembly, apply a light coat of silicone sealant on the mating surface.

⑬ At assembly, make sure the three (3) locating dowels are in position.

⑭ At assembly, torque to .8-1 kg-m (6-7 ft-lbs).

⑯ At assembly, the large diameter end of the spacer must be mounted against the ignition coil bracket.

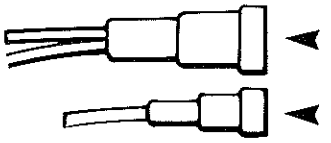


CLEANING & SERVICING

Clean stator plate and rotor using only a clean cloth.

Inspect all electrical connections for dirt or corrosion. Clean as necessary.

Fully pack the electronic control connector terminal with dielectric compound (Dow Corning DC 4 or equivalent).



CAUTION: To prevent moisture, make sure no air is trapped within the connections. Do not use silicone sealant or contacts may corrode.

Frequently inspect the ignition cover and crankcase unpainted surfaces for corrosion. If corroded, clean then spray with LPS 3, or equivalent.

CAUTION: Do not attempt to stop the engine by removing the high tension wire from the spark plug. Severe damage will occur to electronic box.

TESTING PROCEDURE

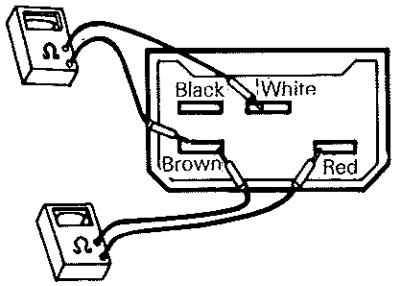
CONTINUITY TEST

The charging and triggering coils can be tested with an ohmmeter.

Bosch Type

Disconnect the multiple connector at the electronic box unit and run a resistance test between the pins of the connector block.

Trigger coil (white)
MAX. 80 ohms
MIN. 50 ohms



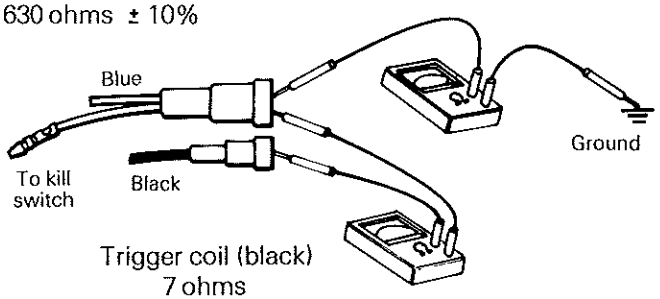
Brown: Ground

Chaging coil (red)
(Cloth insulated)
MAX. 550 ohms
MIN. 450 ohms

Motoplat system

Disconnect the connectors at the ignition coil and run a resistance test between the pins of the connectors.

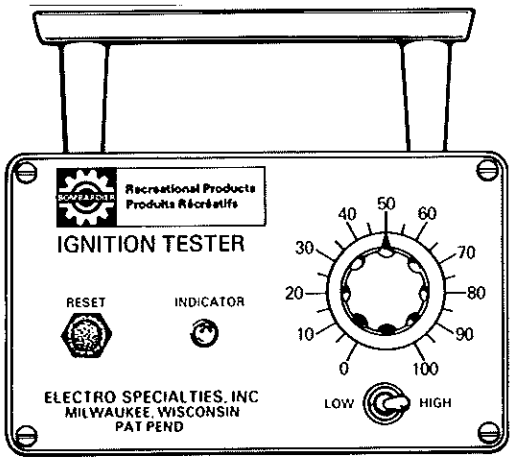
Charging coil (blue)
630 ohms ± 10%



Trigger coil (black)
7 ohms

NOTE: While testing the coils with the ohmmeter it may occur that the readings become altered. To make sure the proper reading is obtained, inverse the test lead of the ohmmeter and perform the test again.

BOMBARDIER IGNITION TESTER (P / N 419 0033 00)



General

The Bombardier ignition tester is an electrical energy measuring device capable of measuring the peak energy output of a coil.

The tester is of solid state construction and performs as a comparator. The correct value of energy output is indicated in each test and is then compared with the value taken from the engine being tested.

The energy output is verified by means of a 0-100 scale on the tester. The greater the energy output, the greater the value indication on the scale. The indication is in the form of an incandescent lamp that lights when the scale knob is set at the position corresponding to the energy output.

The tester has two input ranges selected by a toggle switch. The LOW range is sensitive to AC or DC voltages from 0.5 to 27 volts. The HIGH range is sensitive to AC or DC voltages from approximately 75 to 500 volts.

Test condition

All tests are performed on the vehicle at cranking speed. It would seem logical that removal of spark plug would allow the engine to turn over faster, therefore raising the output level of the ignition system. It was found that vigorous cranking against compression causes the flywheel to snap over, raising the output higher than by cranking without compression. If output results are marginal, output can be measured with and without compression. **Test values listed are taken against compression.**

CAUTION: Never crank engine with spark plug wire detached from spark plug unless emergency stop switch is at off position otherwise electronic box damage may occur.

Always crank vigorously as in actual starting.

Read all instructions **thoroughly** and as you become familiar with this test instrument it will be possible to test a complete ignition system in a matter of minutes.

Always proceed in the following order:

1. Connect tester **P** and **N** clip leads as illustrated.
2. Follow test procedure sequence.
3. After every test that lights the indicator lamp, **reset** the indicator circuit by depressing the reset button.

ANALYSIS OF TEST RESULTS

Indicator lamp lights at specific setting

Output is as specified. Test results should repeat 3 times. If readings do not repeat, output is erratic and cause should be investigated (loose connections or components, etc.).

Indicator lamp lights at a lower setting

This indicates that the output is less than that designed to operated the engine in a satisfactory manner. The engine may run at a lower setting but the subject to hard starting and misfiring. Be certain that correct engine cranking conditions were met before condemning the ignition.

Indicator lamp does not light

One component is defective. Proceed as instructed to find defective component.

Intermittent ignition problems

In dealing with intermittent problems there is no easy diagnosis. For example, problems that occur only at normal engine operating temperature have to be tested under similar conditions.

In most cases of temperature and / or vibration failure, only parts replacement can solve the problem as most of these failures return to normal when engine is not running.

Double trouble

There is always the possibility of more than one defective parts. If after a component has been replaced, the problem still persists, carefully repeat the complete test procedure to find the other defective part.

ANALYSER TEST AND MAINTENANCE

A test simulator is provided with each tester as a means to test the lamp, detector circuit, and batteries.

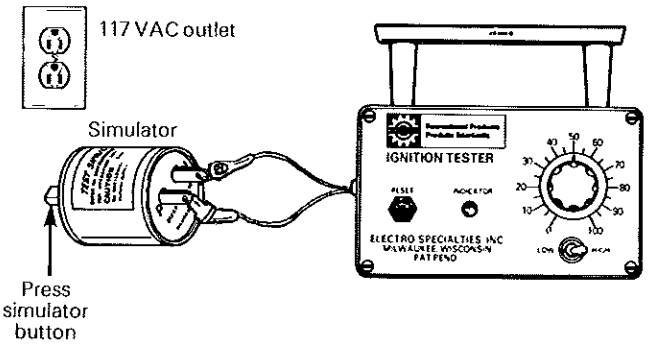
High scale test

a) Place switch in HIGH position. Plug the simulator into an electric outlet (117 VAC) for ten seconds.

CAUTION: After charging, do not touch plug terminals while pressing test button. A mild shock will result.

b) Remove the simulator from the outlet, and connect the "P" and "N" leads from the tester to the simulator as indicated on the bottom of the simulator.

c) Set the tester dial to 50, or below. Depress the button of the simulator. The indicator lamp on the tester should light.



NOTE: For each test performed by the simulator, it must be recharged.

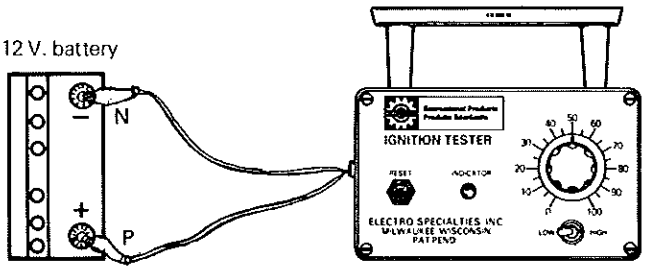
Low scale test

a) Place switch in LOW position.

b) Set tester dial to 50, or below.

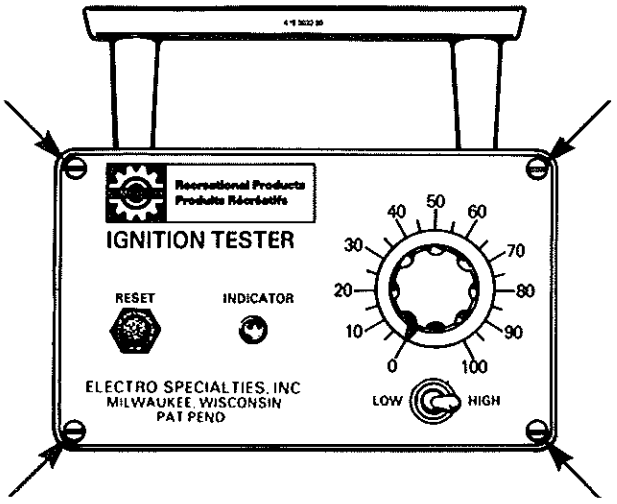
c) Connect N lead to negative terminal of 12 volt battery. Connect P lead to positive terminal of a fully charged 12 volt battery. Indicator lamp should light.

If lamp does not light, check tester batteries. If they are installed correctly and are good, check the clip leads for faulty connections. If no fault can be found, refer to the warranty statement for instructions for sending the tester back to Electro-Specialties, Inc.

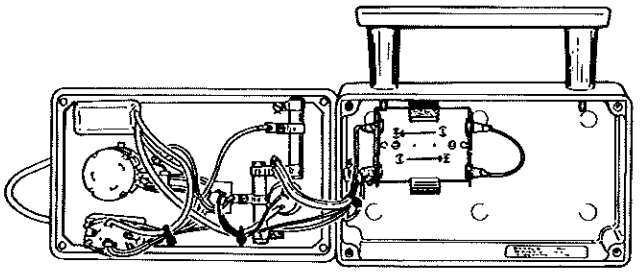


Battery replacement

1. Remove the four (4) screws securing cover to case.



2. Carefully lift cover.
3. Replace batteries with size "C" Alkaline batteries. Be sure to observe polarity markings on battery holder or lamp will not light.



4. Install cover on case carefully being certain that no wires are pinched between cover and case. Secure cover.

NOTE: Weak batteries will not impair tester operation or calibration. The light will glow dim.

Indicator knob alignment

Check indicator knob alignment by turning knob fully clockwise. The white mark on the knob must align with the no. 100 on the scale. If the mark does not line up with the no. 100, loosen the knob set screw, line the mark on the knob with the no. 100, and tighten the set screw. Recheck alignment.

NOTE: If after adjustment, the knob is turned fully counter-clockwise and it does not exactly align with the 0, it is no consequence.

The ignition tester may give false readings if the rivets on the back cover come in contact with metal.

INDEX	PAGE
BOSCH C.D. IGNITION	
Test no. 1 Ignition coil output to spark plug	4
Test no. 2 Charging coil output	4
Test no. 3 Trigger coil output	5
Test no. 4 Lighting coil output	5
MOTOPLAT C.D. IGNITION	
Test no. 5 Ignition coil output to spark plug	6
Test no. 6 Charging coil output	6
Test no. 7 Trigger coil output	7

BOSCH C.D. IGNITION

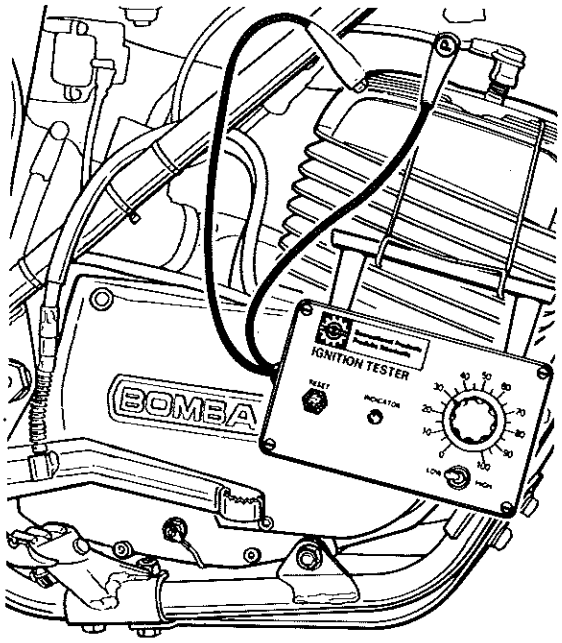
TEST NO. 1: IGNITION COIL OUTPUT TO SPARK PLUG

NOTE: To obtain accurate readings it is necessary to install a new, correctly gapped, spark plug. However, if test is performed on engine before spark plug is changed, a low or no reading could indicate a fouled or faulty spark plug. Replace by a new one and recheck.

1. Attach tester **P** lead over spark plug wire, directly behind spark plug cap. Connect **N** lead to a good engine ground.
2. Set tester switch at LOW position and dial 0 to 30. The test consist of obtaining a positive reading even if the dial is at no. 1 position.
3. Select transmission neutral position, place emergency stop switch in **RUN** position and turn ignition key to **IGNITION**. Kick start pedal down vigorously.

A. Indicator lamp lights: Coil output to spark plug is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. Indicator lamp does not light: Coil output is low or spark plug is faulty. Refer to previous "NOTE" or proceed to test no. 2 and no. 3.

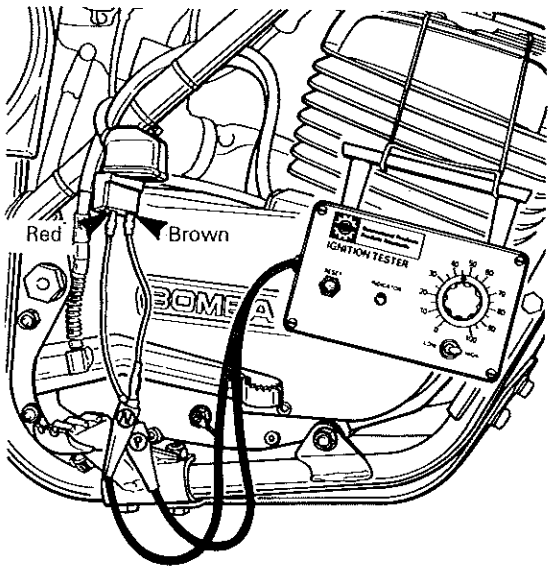


TEST NO. 2: CHARGING COIL OUTPUT

1. Disconnect wire connector at C.D.I. electronic box.
2. Connect tester **P** lead to the red wire coming from the charging coil using the harness adapator, as illustrated. Connect tester **N** lead, to the ground wire **(brown)**.
3. Set tester switch at HIGH position and dial at **45**.
4. Set transmision in neutral, then kick start pedal down vigorously.

A. Indicator lamp lights: Charging coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. Indicator lamp does not light: The problem is a faulty charging coil.



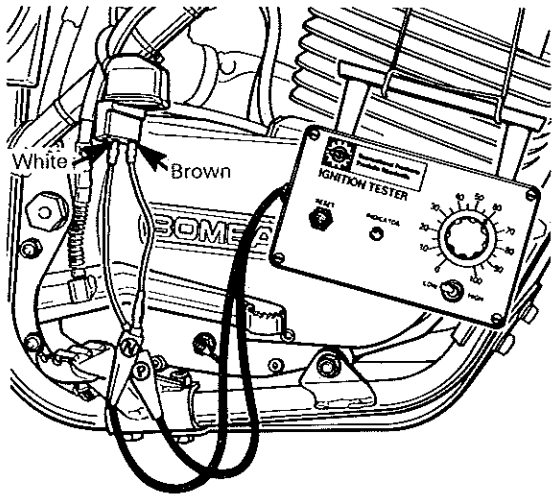
TEST NO. 3: TRIGGER COIL OUTPUT

1. Disconnect wire connector at C.D.I. electronic box.
2. Connect tester **P** lead to white* wire leading from trigger coil using the harness adaptor as illustrated. Connect tester **N** lead to the ground wire (**brown**).
3. Set tester switch at LOW position and dial at 65.
4. Set transmission in neutral, place emergency stop switch in **RUN** position and turn ignition key to **IGNITION** position. Kick start pedal down vigorously.

A. **Indicator lamp lights:** Trigger coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. **Indicator lamp does not light:** The problem is a faulty coil.

* On some units the wire could be violet.



TEST NO. 4: LIGHTING COIL OUTPUT

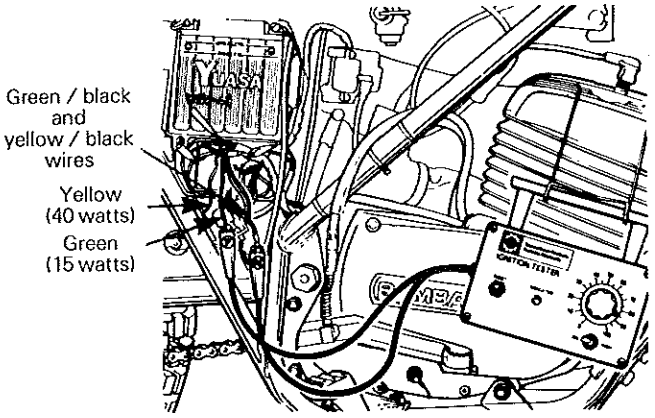
NOTE: There are two (2) lighting coils - 15 watts and 40 watts - connected in parallel. To test each coil individually, it is necessary to separate the **green** and **yellow** wires coming from the lighting coils and leading to the regulator / rectifier.

1. Disconnect the **green / black** and **yellow / black** wire connector from the regulator-rectifier. Disconnect and separate the **green** and **yellow** wires from the regulator-rectifier.
2. Connect tester **P** lead to the **green** wire (15 watt coil). Connect tester **N** lead to green / black and yellow / black wire connector (see illustration).
3. Set tester switch at **LOW** position and dial at 85.
4. Set transmission in neutral, then kick start pedal down.

A. **Indicator lamp lights:** Lighting coil is operating.

B. **Indicator lamp does not light:** Lighting coil is defective.

5. Connect tester **P** lead to the **yellow** wire (40 watt coil) then repeat step 3 and 4.



MOTOPLAT CD IGNITION

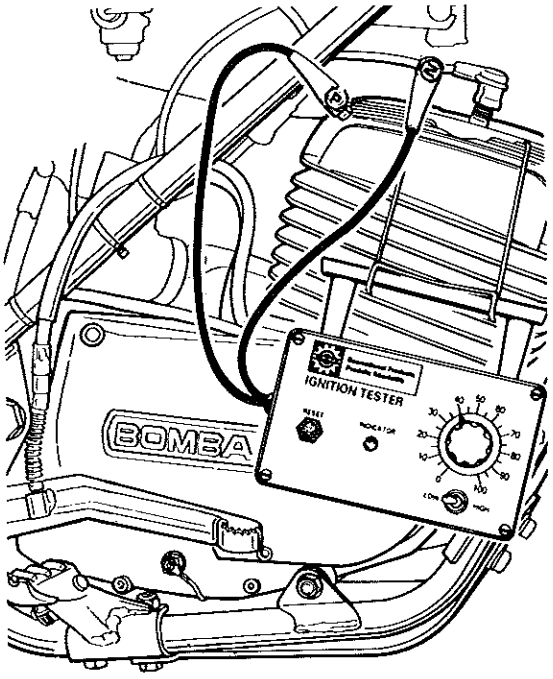
TEST NO 5: IGNITION COIL OUTPUT TO SPARK PLUG

NOTE: To obtain accurate readings it is necessary to install a new, correctly gapped spark plug. However, if test is performed on engine before spark plug is changed, a low or no reading could indicate a fouled or faulty spark plug. Replace by a new one and recheck.

1. Attach tester **N** lead over spark plug wire, directly behind spark plug cap. Connect **P** lead to a good engine ground.
2. Set tester switch at **LOW** and dial at 0 to 40. The test consist of obtaining a positive reading even if the dial is at no. 1 position.
3. Select transmission neutral position and release emergency stop switch. Kick start pedal down vigorously.

A. **Indicator lamp lights:** Coil output to spark plug is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. **Indicator lamp does not light:** Coil output is low or spark plug is faulty. Refer to previous "NOTE" or proceed to test no. 6 and no. 7.

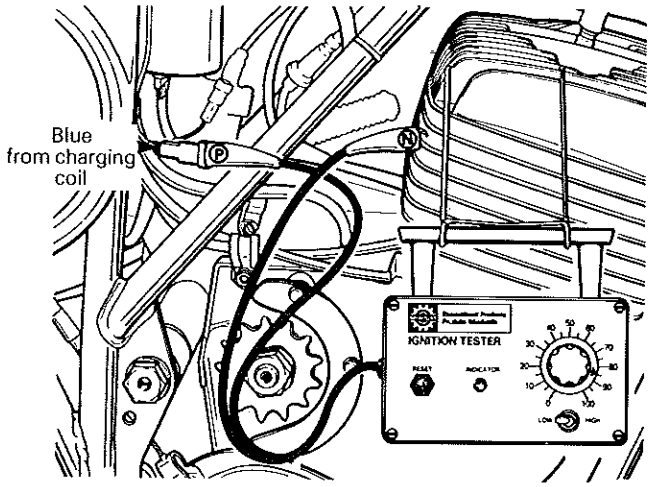


TEST NO. 6: CHARGING COIL OUTPUT

1. Disconnect the two (2) wire connectors from the ignition coil.
2. Connect tester **P** lead to **blue** wire leading from charging coil, using the harness adaptor. Connect **N** lead to a good engine ground.
3. Set tester switch at **LOW** position and dial at **85**.
4. Set transmission in neutral, release emergency stop switch then kick start pedal down vigorously.

A. **Indicator lamp lights:** Coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. **Indicator lamp does not light:** The problem is a faulty coil.

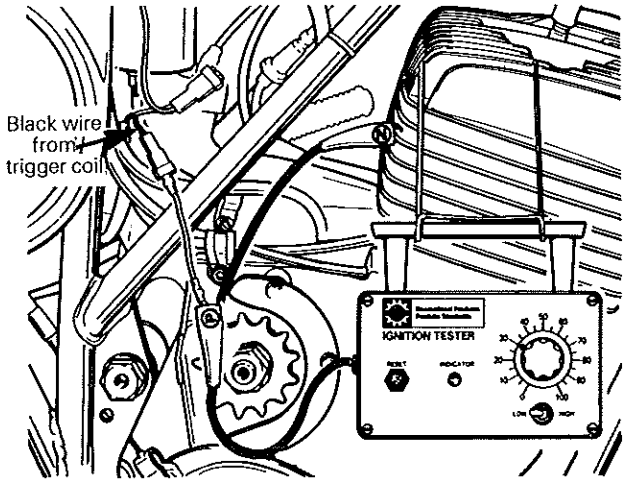


TEST NO 7: TRIGGER COIL OUTPUT

1. Disconnect two (2) wire connectors from the ignition coil.
2. Connect tester **P** lead to **black** wire leading from trigger coil, using the harness adaptor. Connect **N** lead to a good engine ground.
3. Set tester switch at **LOW** position and dial at 85.
4. Set transmission in neutral, release emergency stop switch into upper position then kick start pedal down vigorously.

A. Indicator lamp lights: Coil output is up to specifications. Repeat test at least three (3) times to verify reading and check for consistency.

B. Indicator lamp does not light: The problem is a faulty coil.



BULB SPECIFICATIONS

	T'NT 175-250 7851-7861	Qualifier 125-175-250 7845-7855-7865
Battery rating	5 A / H	
Fuse	14 amps	
Headlamp	25 / 25 W (sealed beam)	35 / 35 W (bulb)
Taillight bulb	8 / 27 W	3 / 3 W
Speedometer illumination bulb	1.7 W	1.7 W
Neutral indicator bulb	2.8 W	
Hi-beam indicator bulb	1.7 W	
Turn-signal indicator bulb	2.8 W	
Turn signal bulb	23 W	
Turn signal (winker relay)	3.75 W signal stat no. 142	

COLOR CODE

BK	— BLACK	GN	— GREEN
WH	— WHITE	GY	— GREY
RD	— RED	VI	— VIOLET
BL	— BLUE	OR	— ORANGE
YL	— YELLOW	BR	— BROWN

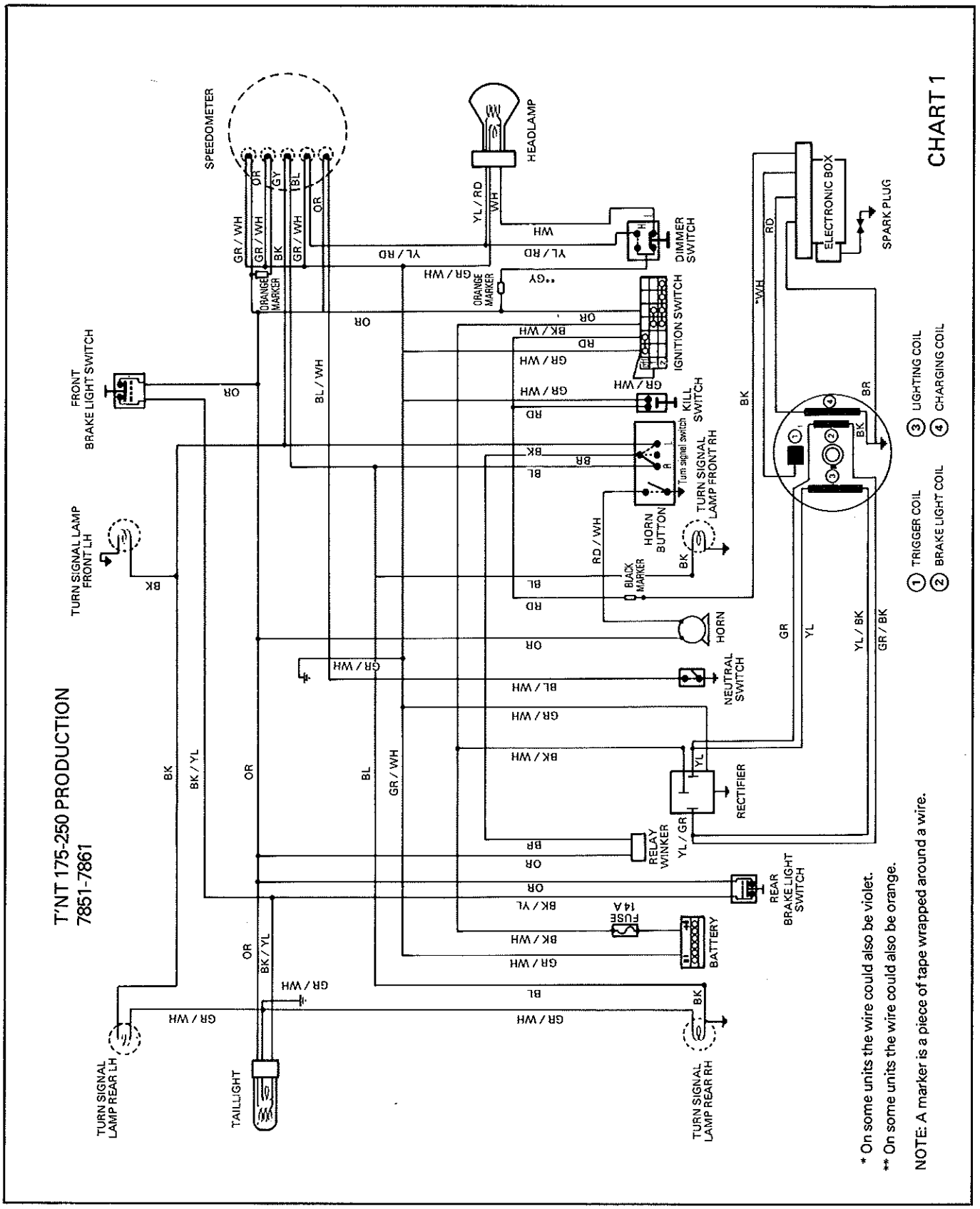
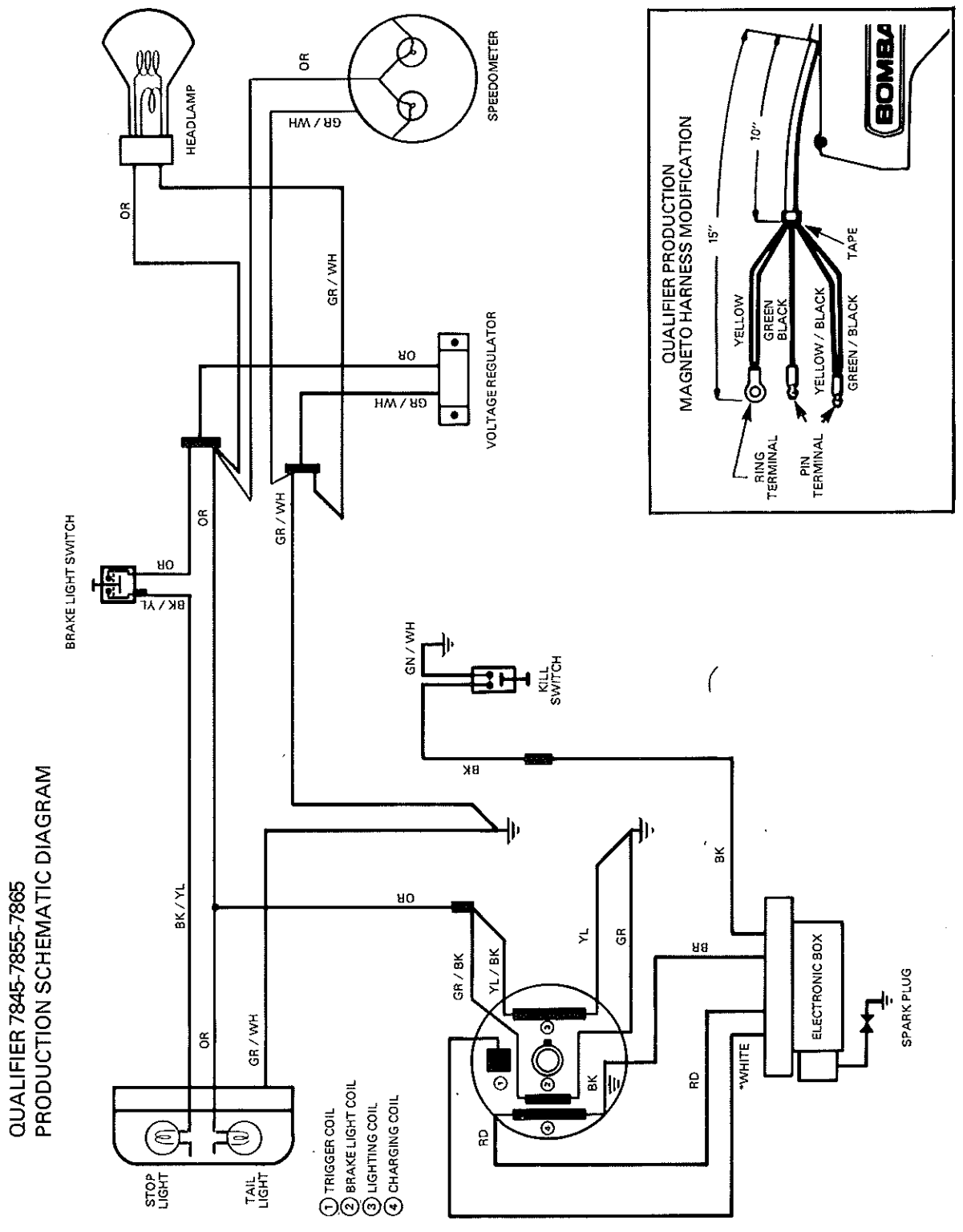

T'NT 175-250 PRODUCTION
7851-7861
CHART 1
SPEEDOMETER
HEADLAMP
DIMMER SWITCH
IGNITION SWITCH
KILL SWITCH
TURN SIGNAL LAMP FRONT RH
HORN BUTTON
HORN
NEUTRAL SWITCH
RECTIFIER
RELAY WINKER
REAR BRAKE LIGHT SWITCH
FUSE 14 A
BATTERY
ELECTRONIC BOX
SPARK PLUG
FRONT BRAKE LIGHT SWITCH
TURN SIGNAL LAMP FRONT LH
TURN SIGNAL LAMP REAR LH
TAILLIGHT
TURN SIGNAL LAMP REAR RH
ORANGE MARKER
BLACK MARKER
① TRIGGER COIL
② BRAKE LIGHT COIL
③ LIGHTING COIL
④ CHARGING COIL
* On some units the wire could also be violet.
** On some units the wire could also be orange.
NOTE: A marker is a piece of tape wrapped around a wire.

CHART 2

QUALIFIER 7845-7855-7865
PRODUCTION SCHEMATIC DIAGRAM



* On some units the wire could also be violet.