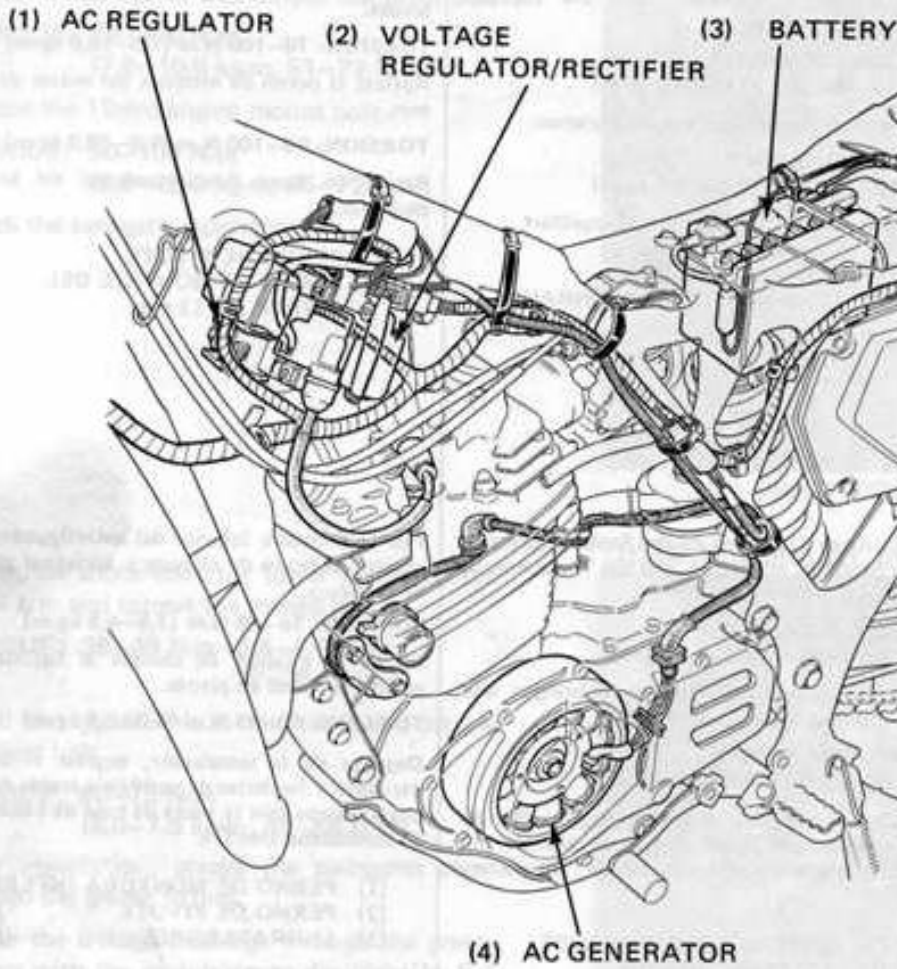




BATTERY/CHARGING SYSTEM



BATTERIE/CIRCUIT DE CHARGE

- (1) REGULATEUR DE COURANT ALTERNATIF
- (2) REGULATEUR/REDRESSEUR DE TENSION
- (3) BATTERIE
- (4) ALTERNATEUR

BATTERIE/LADESYSTEM

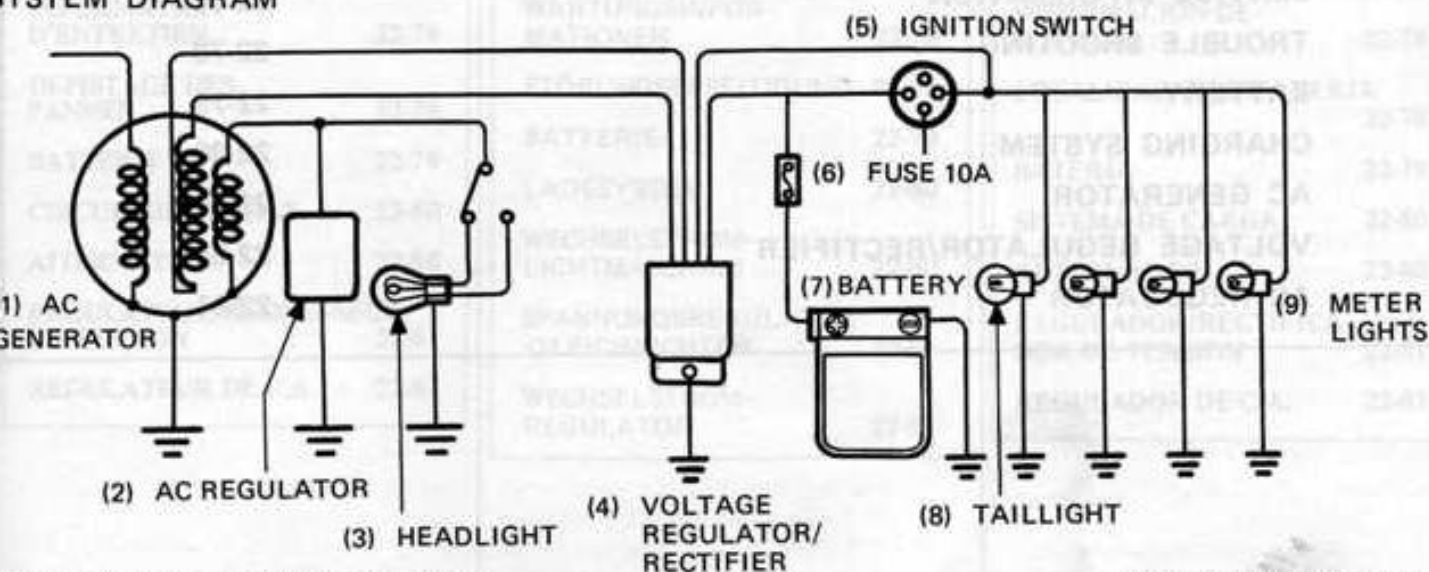
- (1) WECHSELSTROMREGULATOR
- (2) SPANNUNGSREGULATOR/GLEICHRICHTER
- (3) BATTERIE
- (4) WECHSELSTROMLICHTMASCHINE

BATERIA/SISTEMA DE CARGA

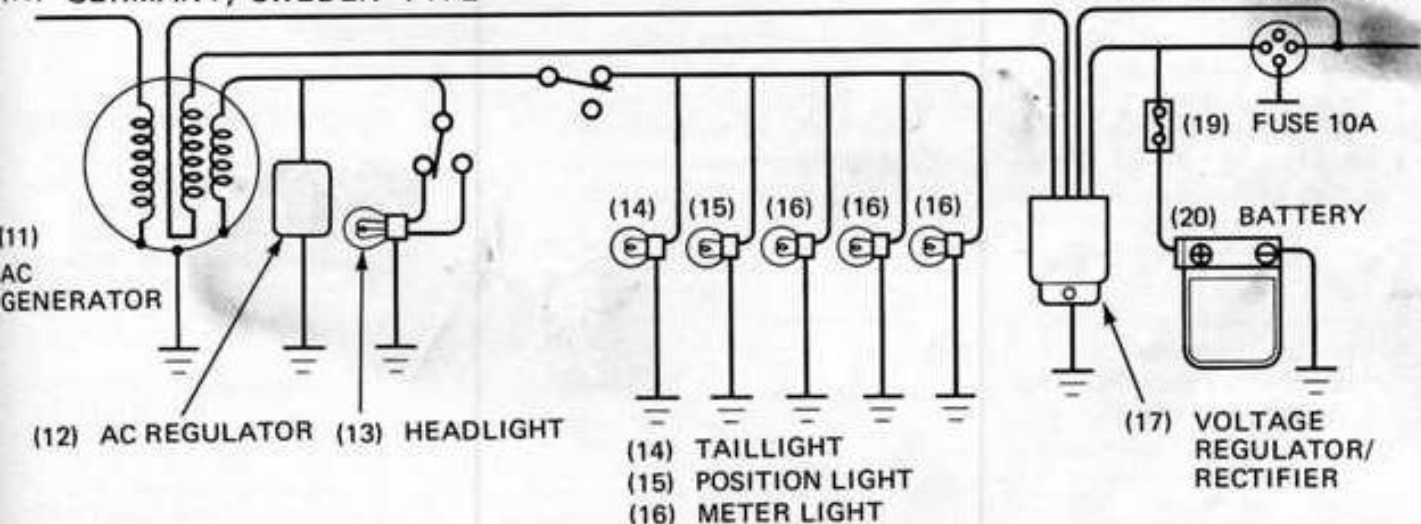
- (1) REGULADOR DE C.A.
- (2) REGULADOR/RECTIFICADOR DE TENSION
- (3) BATERIA
- (4) ALTERNADOR



SYSTEM DIAGRAM



(10) GERMANY, SWEDEN TYPE



SCHEMA DE CABLAGE

- (1) ALTERNATEUR
- (2) REGULATEUR DE C.A.
- (3) PHARE
- (4) REGULATEUR/REDRESSEUR DE TENSION
- (5) CONTACTEUR D'ALLUMAGE
- (6) FUSIBLE 10A
- (7) BATTERIE
- (8) FEU ARRIERE
- (9) ECLAIRAGE DE COMPTEURS
- (10) (TYPE POUR ALLEMAGNE ET POUR SUEDE)
- (11) ALTERNATEUR
- (12) REGULATEUR DE C.A.
- (13) PHARE
- (14) FEU ARRIERE
- (15) FEU DE POSITION
- (16) ECLAIRAGE DE COMPTEURS
- (17) REGULATEUR/REDRESSEUR DE TENSION
- (18) CONTACTEUR D'ALLUMAGE
- (19) FUSIBLE 10A
- (20) BATTERIE

SYSTEMSCHALTPLAN

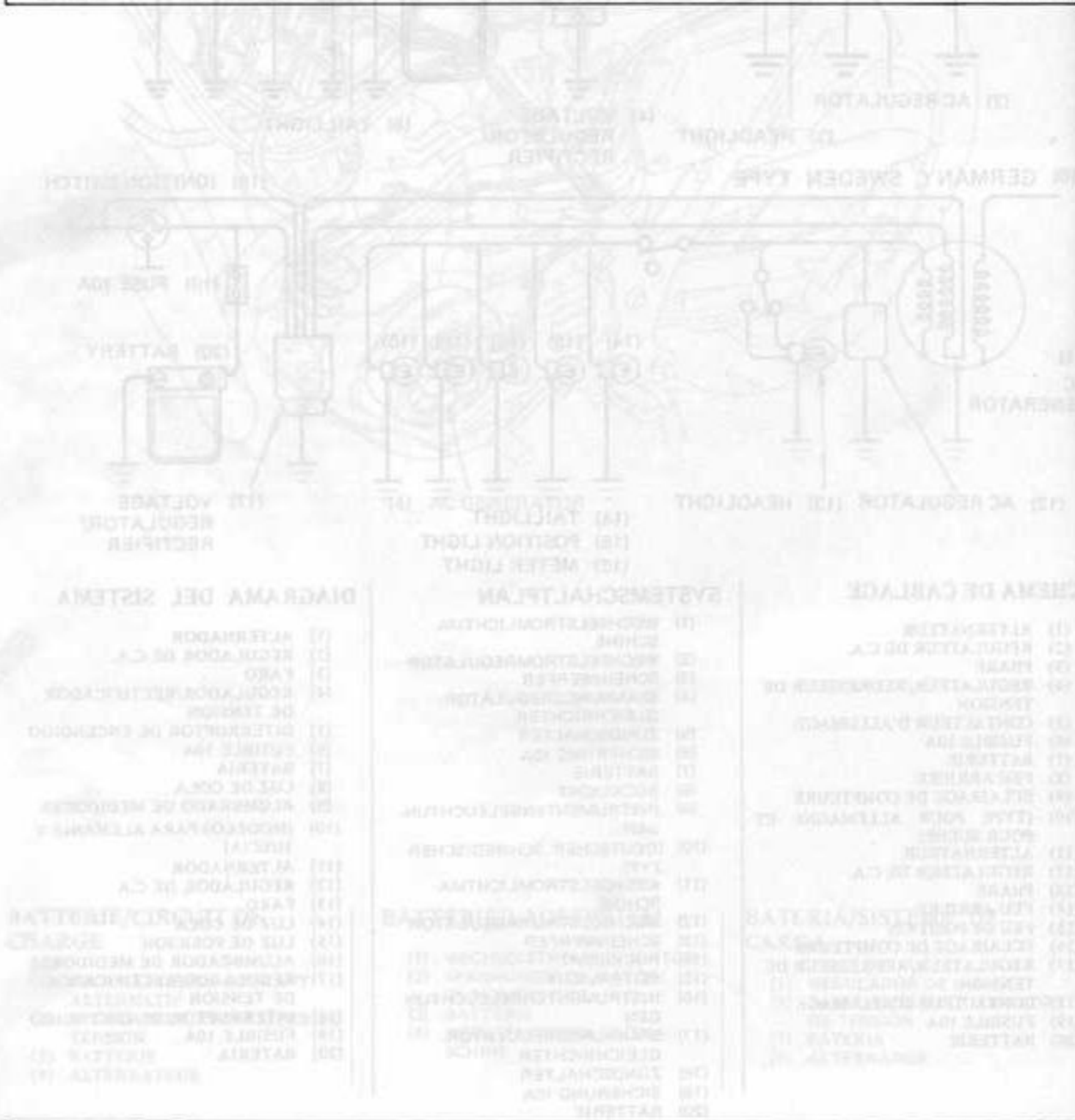
- (1) WECHSELSTROMLICHTMASCHINE
- (2) WECHSELSTROMREGULATOR
- (3) SCHEINWERFER
- (4) SPANNUNGSREGULATOR-GLEICHRICHTER
- (5) ZÜNDSCHALTER
- (6) SICHERUNG 10A
- (7) BATTERIE
- (8) RÜCKLICHT
- (9) INSTRUMENTENBELEUCHTUNGEN
- (10) (DEUTSCHER, SCHWEDISCHER TYP)
- (11) WECHSELSTROMLICHTMASCHINE
- (12) WECHSELSTROMREGULATOR
- (13) SCHEINWERFER
- (14) RÜCKLICHT
- (15) SEITENLICHT
- (16) INSTRUMENTENBELEUCHTUNGEN
- (17) SPANNUNGSREGULATOR-GLEICHRICHTER
- (18) ZÜNDSCHALTER
- (19) SICHERUNG 10A
- (20) BATTERIE

DIAGRAMA DEL SISTEMA

- (1) ALTERNADOR
- (2) REGULADOR DE C.A.
- (3) FARO
- (4) REGULADOR/RECTIFICADOR DE TENSION
- (5) INTERRUPTOR DE ENCENDIDO
- (6) FUSIBLE 10A
- (7) BATERIA
- (8) LUZ DE COLA
- (9) ALUMBRADO DE MEDIDORES
- (10) (MODELOS PARA ALEMANIA Y SUECIA)
- (11) ALTERNADOR
- (12) REGULADOR DE C.A.
- (13) FARO
- (14) LUZ DE COLA
- (15) LUZ DE POSICION
- (16) ALUMBRADOR DE MEDIDORES
- (17) REGULADOR/RECTIFICADOR DE TENSION
- (18) INTERRUPTOR DE ENCENDIDO
- (19) FUSIBLE 10A
- (20) BATERIA



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BATTERY	22-79
CHARGING SYSTEM	22-80
AC GENERATOR	22-80
VOLTAGE REGULATOR/RECTIFIER	22-81
AC REGULATOR	22-81





SERVICE INFORMATION

● **SPECIFICATIONS**

AC generator

Charging start

Charging output

Lighting output

Battery capacity

Fuse

Voltage regulator/rectifier

Battery charging rate

- : 1,200 min⁻¹ (rpm)
- : 16.8V/2.4A minimum at 2,500 min⁻¹ (rpm)
- : 18.4V/5.5A maximum at 8,000 min⁻¹ (rpm) } At disconnect the regulator circuit in voltage regulator rectifier.
- : 13V minimum at 2,500 min⁻¹ (rpm)
- : 23V maximum at 8,000 min⁻¹ (rpm) } At disconnect the AC regulator
- : 12V-3AH
- : 10A
- : Transistorized non-adjustable type
- : 0.3A maximum

TROUBLESHOOTING

No Power – Key Turned On:

1. Dead battery
 - Battery not charged
 - Battery electrolyte evaporated
 - Charging system failure
2. Disconnected battery cable
3. Main fuse burned out
4. Faulty ignition switch

Low Power – Key Turned On:

1. Weak battery
 - Low battery electrolyte level
 - Battery run down
 - Charging system failure
2. Loose battery connection

Low Power – Engine Running:

1. Battery undercharged
 - Low battery electrolyte level
 - One or more dead cells
2. Charging system failure

Intermittent Power:

1. Loose battery connection
2. Loose charging system connection
3. Loose connection or short circuit in ignition system
4. Loose connection or short circuit in lighting system

Charging System Failure:

1. Loose, broken, or shorted wire or connection
2. Faulty voltage regulator/rectifier
3. Faulty AC generator

Headlight burned out

1. Faulty AC regulator

● BATTERY

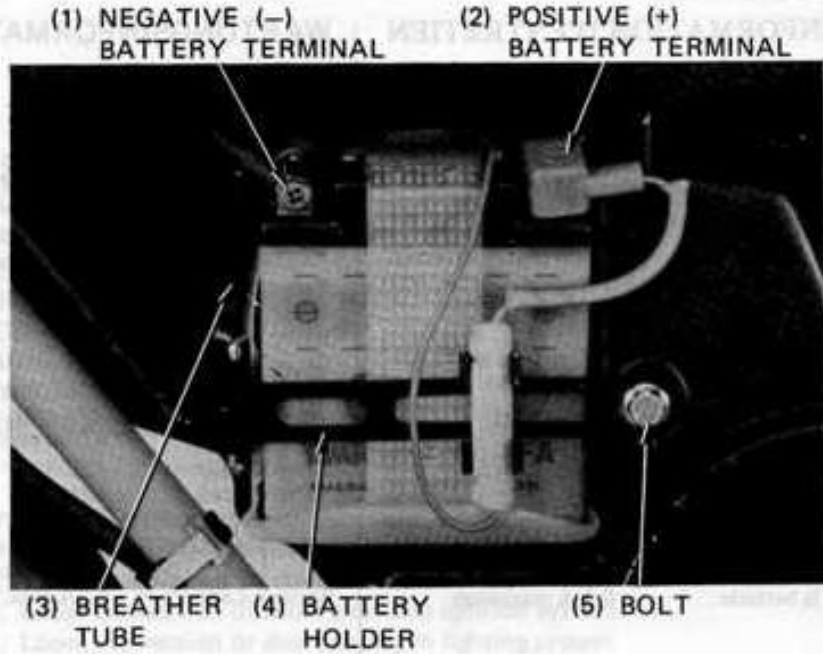
Removal:

Remove the right side cover.
Disconnect the wires from the battery terminals.

NOTE

Remove the negative cable wire first, then remove the positive cable.

Disconnect the breather tube from the battery.
Remove the bolt and open the battery holder.
Remove the battery.



● SPECIFIC GRAVITY TEST

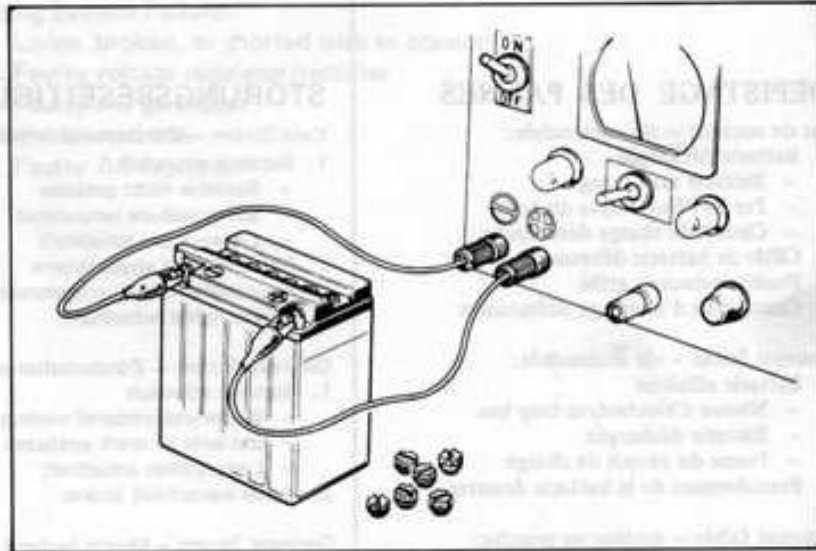
Refer to page 16-3 for battery specific gravity test.

SPECIFIC GRAVITY (20°C/68°F)	
1.26 – 1.28	Full charge
1.22 or below	Undercharge

MAXIMUM CHARGING CURRENT:
0.3 amperes.

NOTE

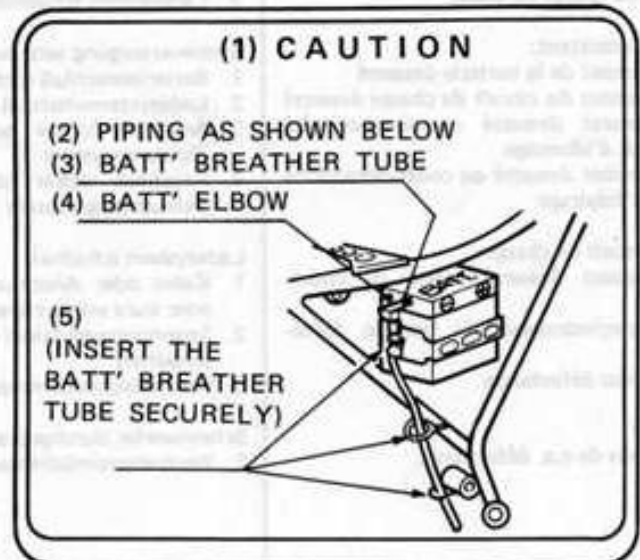
The XL400R and XL500R has a 12V battery. Be sure the charger is set at the 12V range.



Installation is the reverse of removal.
When installing the battery, be sure to connect the breather tube.

CAUTION

Be sure the breather tube is routed as shown on the battery caution label.





(1) VOLTAGE REGULATOR/
RECTIFIER COUPLER

● CHARGING SYSTEM

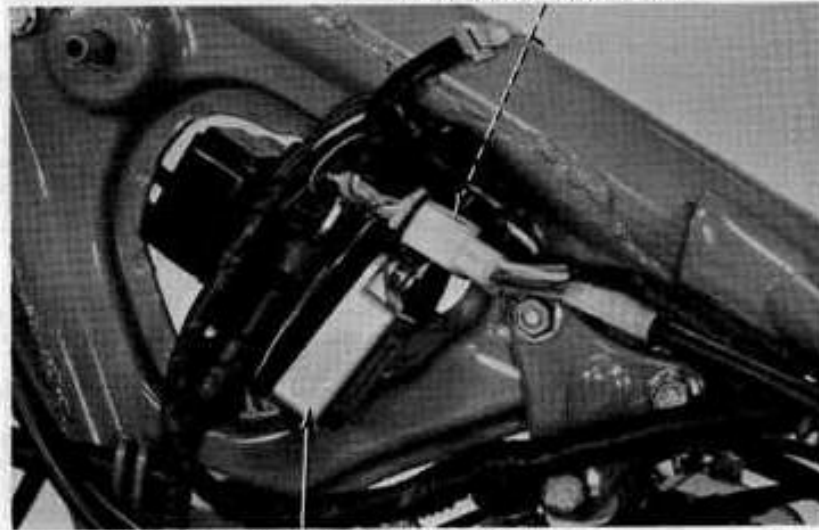
NOTE

Use a fully charged battery to check the charging system output.

Warm up the engine for 10 minutes at 5,000 min⁻¹ (rpm) before taking reading. Disconnect the black wire from the regulator/rectifier coupler.

NOTE

The terminal is a critical part. Be careful not to damage it.



(2) VOLTAGE REGULATOR/
RECTIFIER

Connect a voltmeter and an ammeter to check charging system output.

Start the engine and check the meter readings while increasing engine speed slowly.

NOTE

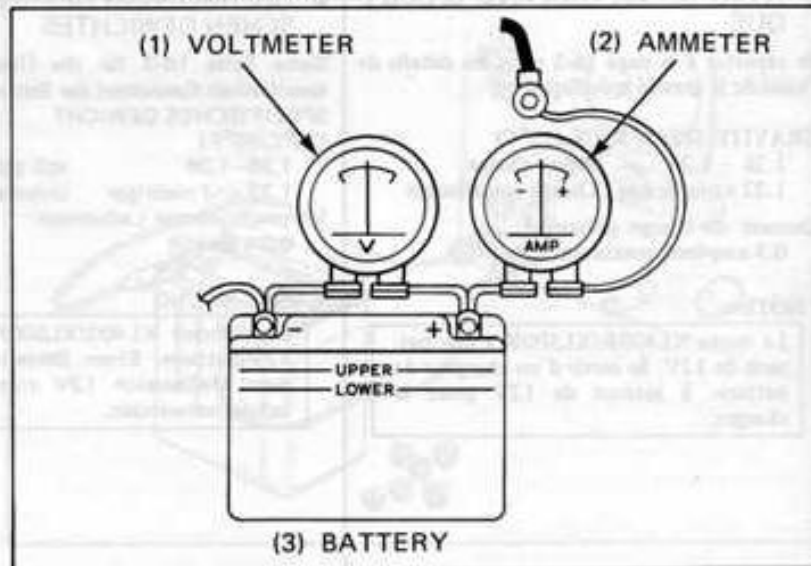
Connect the regulator/rectifier wire as before.

● TECHNICAL DATA

Charging	begins at 1,200 min ⁻¹ (rpm)
2,500 min ⁻¹ (rpm)	16.8V/2.4A min.
8,000 min ⁻¹ (rpm)	18.4V/5.5A max.

If there is no charging current, check each charging circuit connection for looseness.

If the connections are good, check the alternator charging coil for continuity.



● AC GENERATOR

NOTE

It is not necessary to remove the stator to make this test.

CHARGING COIL:

The charging coil is correct if there is continuity between the pink wire and yellow wire.

SPECIFIED RESISTANCE:

0.2-1Ω

LAMP COIL:

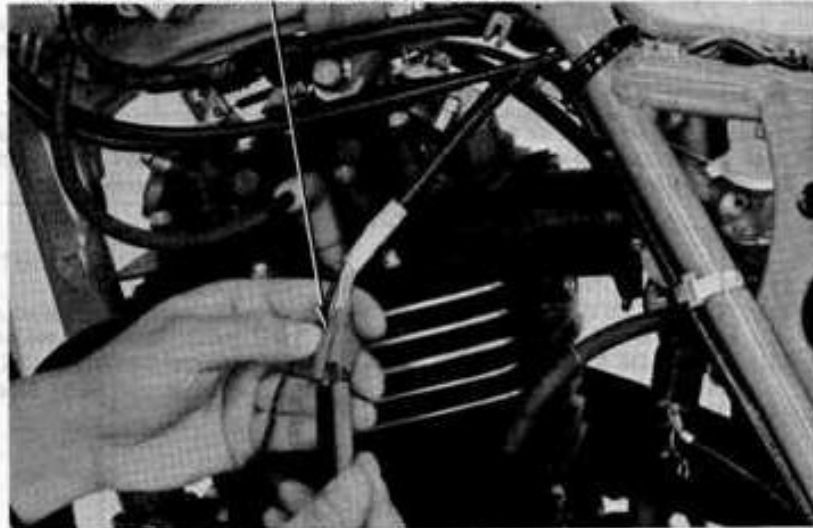
The lamp coil is correct if there is continuity between the white/yellow wire and ground.

SPECIFIED RESISTANCE:

0.2-1Ω

If there is no continuity, it indicates coil open circuit and the stator coil should be replaced with a new one (page 22-33).

(1) AC GENERATOR WIRE COUPLER



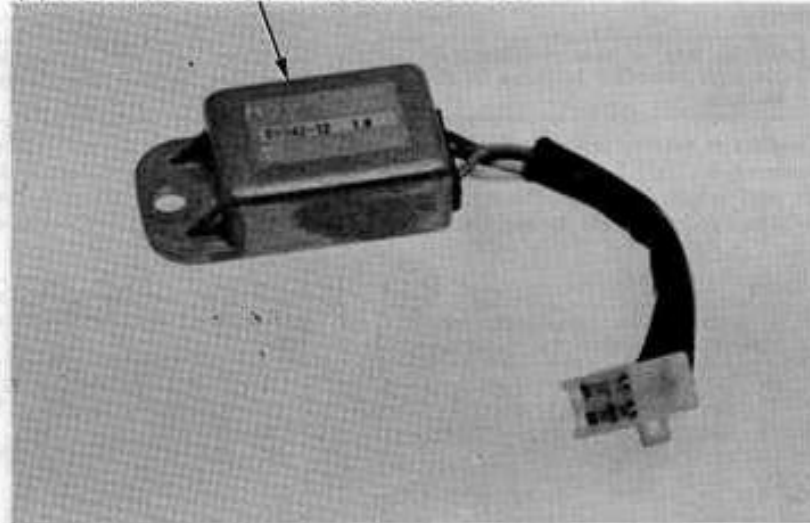
● **VOLTAGE REGULATOR/RECTIFIER**

Check the resistances between the leads with an ohmmeter.

NOTE

- Use SANWA ELECTRICAL TESTER P/N 07308-0020000 or KOWA ELECTRICAL TESTER (TH-5H).
- SANWA and KOWA TESTERS have different measurements as shown.
- Make sure the tester contains new batteries, perform the zero adjustment in the measuring range for accurate readings.

(1) VOLTAGE REGULATOR/RECTIFIER



Tester range: $\left[\begin{array}{l} \text{SANWA } \times \text{ k}\Omega \\ \text{KOWA } \times \text{ 100}\Omega \end{array} \right]$

⊖ Probe	⊕ Probe	Yellow	Pink	Green	Red	Black
Yellow	Yellow		∞	∞	1-20	∞
Pink	Pink	∞		∞	1-20	∞
Green	Green	1-20	1-20		3-100	0.2-20
Red	Red	∞	∞	∞		∞
Black	Black	1-50	1-50	0.2-10	3-100	

● **AC REGULATOR**

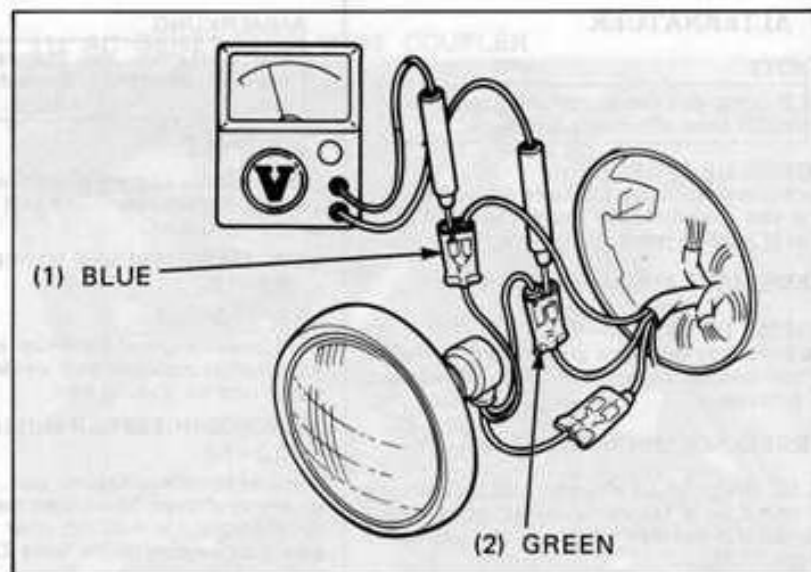
AC regulator test:

Remove the headlight and connect voltmeter as shown.

Select the dimmer switch to "Hi" position.

Start the engine and check the meter readings while increasing engine speed slowly.

SPECIFIC VOLTAGE: 13.5-14.5V
at 5,000 min⁻¹ (rpm)



AC regulator inspection:

Check the resistances between the leads with an ohmmeter.

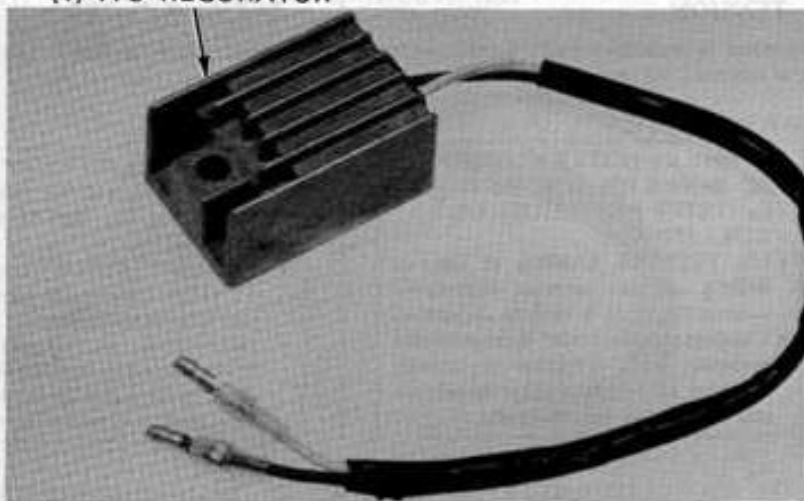
NOTE

- Use SANWA ELECTRIC AL TESTER P/N 07308-0020000 or KOWA ELECTRICAL TESTER (TH-5H).
- SANWA and KOWA TESTERS have different measurements as shown.
- Make sure the tester contains new batteries, perform the zero adjustment in the measuring range for accurate readings.

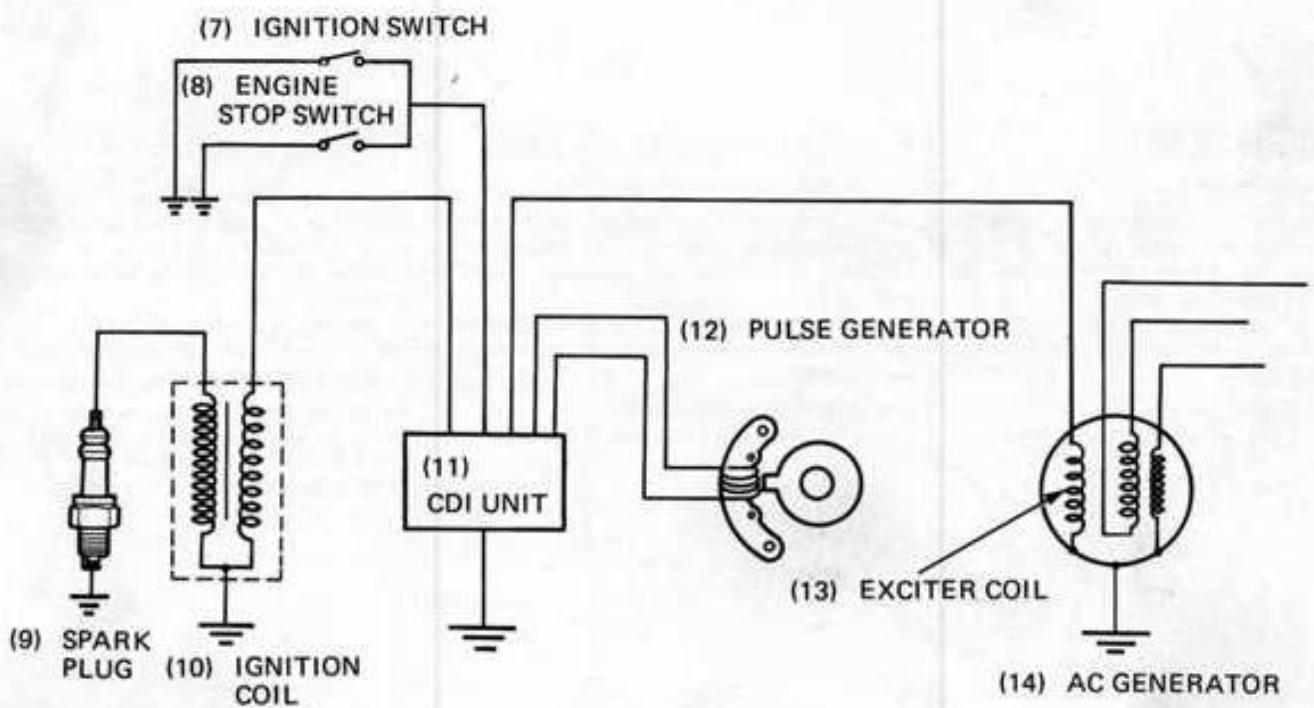
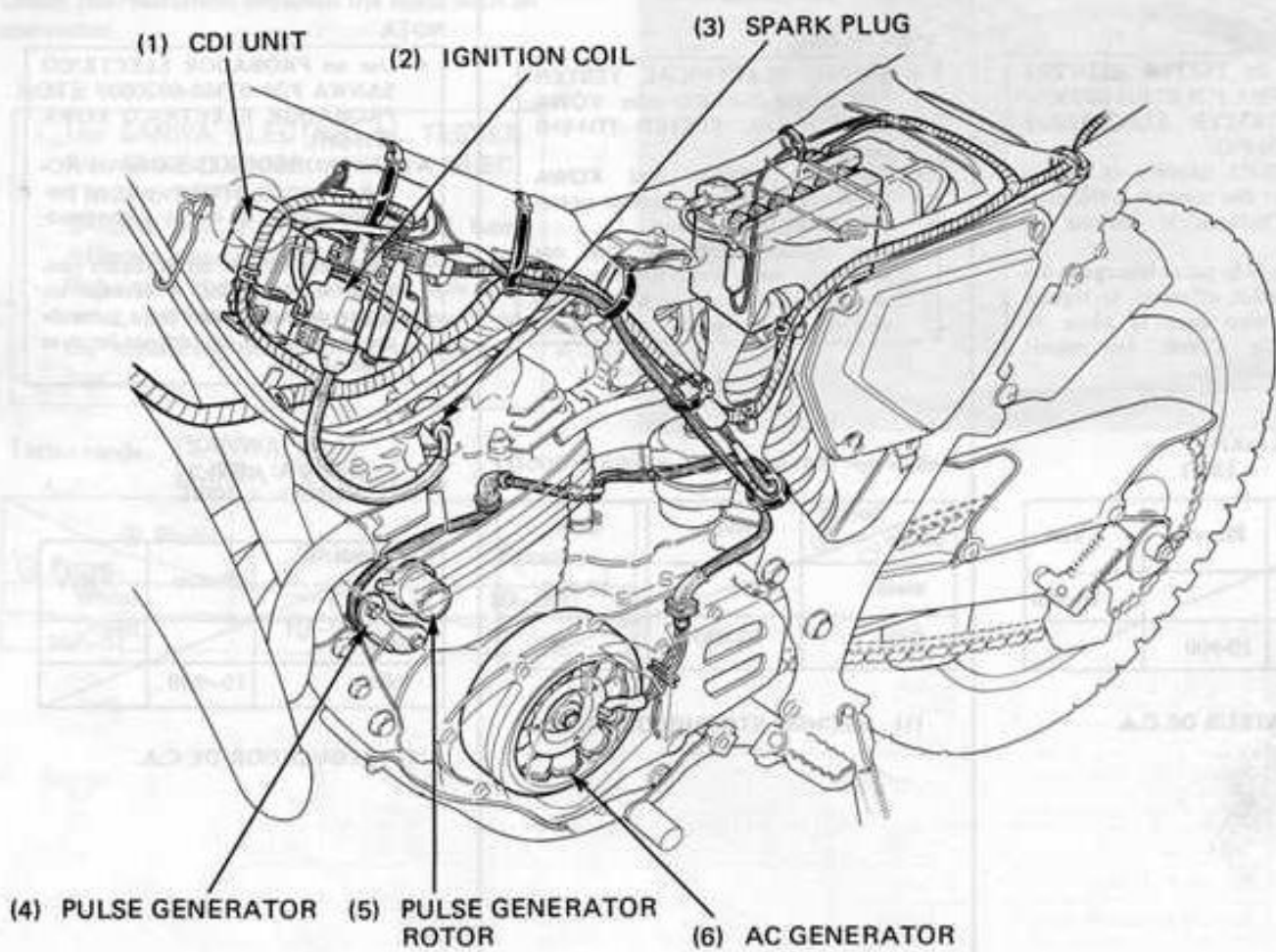
Tester range: $\left[\begin{array}{l} \text{SANWA } \times \text{ k}\Omega \\ \text{KOWA } \times \text{ 100}\Omega \end{array} \right]$

	⊕ Probe		
⊖ Probe		White	Green
White			10-900
Green		10-900	

(1) A C REGULATOR



IGNITION SYSTEM





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- (1) UNITE CDI (ALLUMAGE PAR DECHARGE DE CONDENSATEUR)
- (2) BOBINE D'ALLUMAGE
- (3) BOUGIE D'ALLUMAGE
- (4) GENERATEUR D'IMPULSIONS
- (5) ROTOR DU GENERATEUR D'IMPULSIONS
- (6) ALTERNATEUR
- (7) CONTACTEUR D'ALLUMAGE
- (8) CONTACTEUR D'ARRET DU MOTEUR
- (9) BOUGIE D'ALLUMAGE
- (10) BOBINE D'ALLUMAGE
- (11) UNITE CDI
- (12) GENERATEUR D'IMPULSIONS
- (13) BOBINE D'EXCITATION
- (14) ALTERNATEUR

ZÜNDSYSTEM

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IMPULSLICHTMASCHINE	22-88
ZÜNDPUNKT	22-88

- (1) CDI-EINHEIT
- (2) ZÜNDSPULE
- (3) ZÜNDKERZE
- (4) IMPULSLICHTMASCHINE
- (5) IMPULSLICHTMASCHINENROTORSCHNITT
- (6) WECHSELSTROMLICHTMASCHINE
- (7) ZÜNDSCHALTER
- (8) MOTORABSTELL-SCHALTER
- (9) ZÜNDKERZE
- (10) ZÜNDSPULE
- (11) CDI-EINHEIT
- (12) IMPULSLICHTMASCHINE
- (13) ERREGERSPULE
- (14) WECHSELSTROMLICHTMASCHINE

SISTEMA DE ENCENDIDO

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- (1) UNIDAD CDI (ENCENDIDO POR DESCARGA DE CONDENSADOR)
- (2) BOBINA DE ENCENDIDO
- (3) BUJIA DE ENCENDIDO
- (4) GENERADOR DE IMPULSIONES
- (5) ROTOR DEL GENERADOR DE IMPULSIONES
- (6) ALTERNADOR
- (7) INTERRUPTOR DE ENCENDIDO
- (8) INTERRUPTOR DE PARADA DE MOTOR
- (9) BUJIA DE ENCENDIDO
- (10) BOBINA DE ENCENDIDO
- (11) UNIDAD CDI
- (12) GENERADOR DE IMPULSIONES
- (13) BOBINA DE EXCITACION
- (14) ALTERNADOR



SERVICE INFORMATION

● **GENERAL INSTRUCTIONS**

The XL400R and XL500R uses an electrical ignition timing advance system. If the ignition timing advance is incorrect, check the CDI unit and replace it if necessary.

● **SPECIFICATIONS**

Spark plugs:

	XL400R, XL500R	XL500R U, D type
Standard	DR8ES-L (NGK) or X24ESR-U (ND)	D8EA (NGK) or X24ES-U (ND)
For cold climate (Below 5°C/41°F):	DR7ES (NGK) or X22ESR-U (ND)	D7EA (NGK) or X22ES-U (ND)
For extended high speed riding:	DR8ES (NGK) or X27ESR-U (ND)	D9EA (NGK) or X27ES-U (ND)

Spark plug gap: 0.6–0.7 mm (0.024–0.028 in)

Ignition timing (Initial): 10° BTDC at 1,200 min⁻¹ (rpm)

(Full advance): 35° BTDC at 3,500 min⁻¹ (rpm) (XL500R)

35° BTDC at 3,000 min⁻¹ (rpm) (XL400R)

TROUBLE SHOOTING

No Spark at Plug

1. Engine stop switch "OFF"
2. Poorly connected, broken or shorted wires
 - Between CDI unit and engine stop switch
 - Between CDI unit and ignition coil
 - Between CDI unit and ignition switch
 - Between ignition coil and spark plug
 - Between pulse generator and CDI unit
3. Faulty ignition switch
4. Faulty ignition coil
5. Faulty CDI unit
6. AC generator faulty
7. Faulty pulse generator

Engine Starts But Runs Poorly

1. Ignition primary circuit
 - Faulty ignition coil
 - Loose or bare wire
 - Faulty pulse generator
2. Secondary circuit
 - AC generator faulty
 - CDI unit faulty
 - Faulty pulse generator

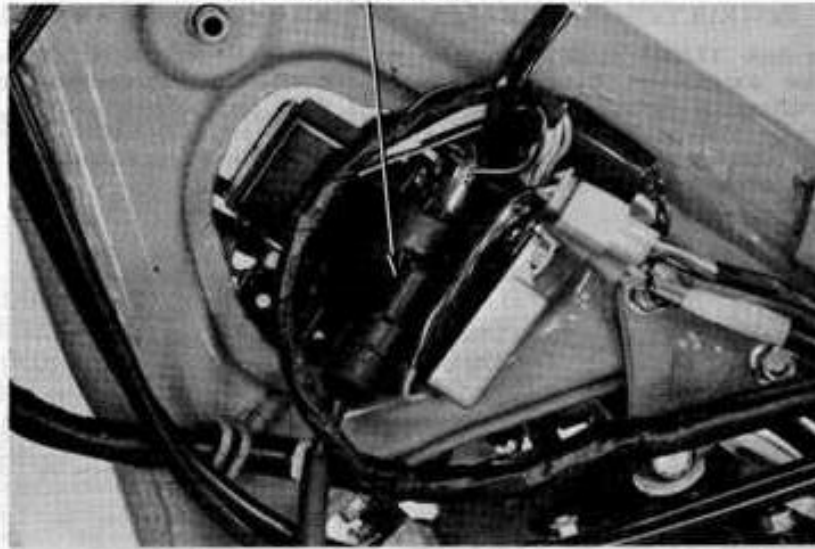


(1) IGNITION COIL

● IGNITION COIL

Removal:

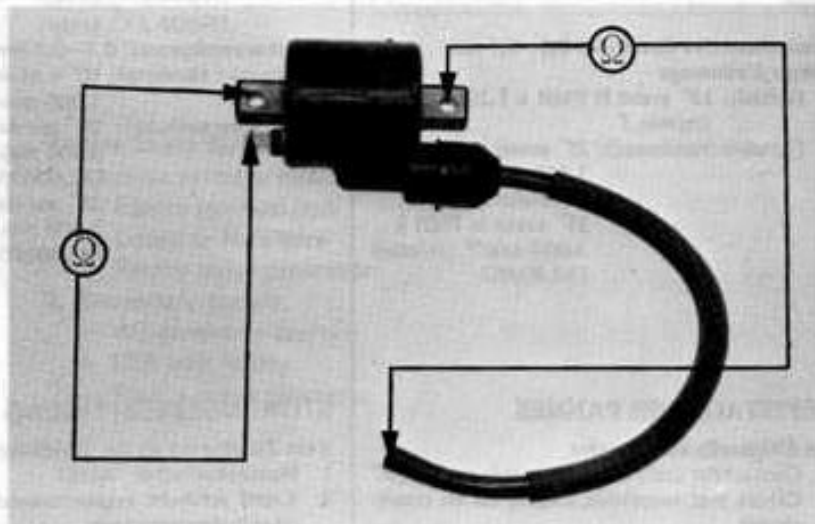
- Remove the fuel tank.
- Disconnect the wire leads.
- Remove the attaching screws and remove the coil.



Inspection:

Measure the resistances of the primary and secondary coils.

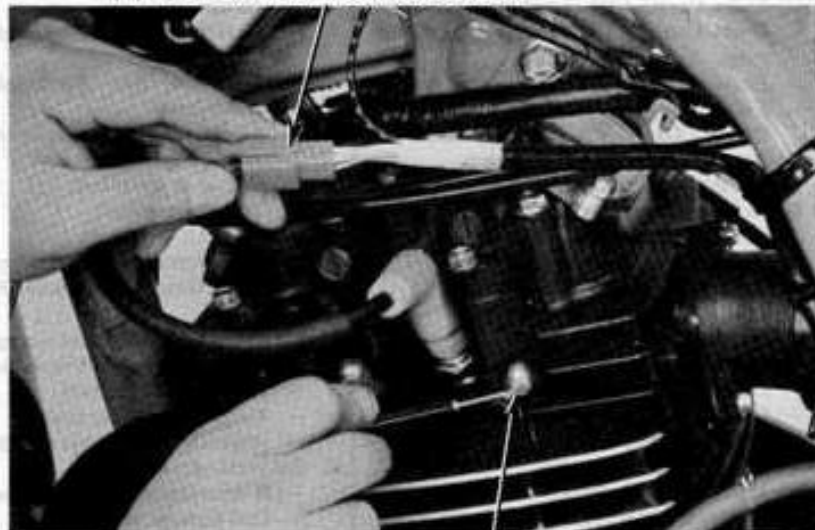
- PRIMARY:** 0.2–0.3Ω
- SECONDARY:** 3.4–4.2kΩ



(1) AC GENERATOR COUPLER

● AC GENERATOR EXCITER COIL

- Disconnect the AC generator wire coupler.
- Measure the resistance between the black/read wire and ground.
- SPECIFIED RESISTANCE:** 50–200Ω



(2) GROUND



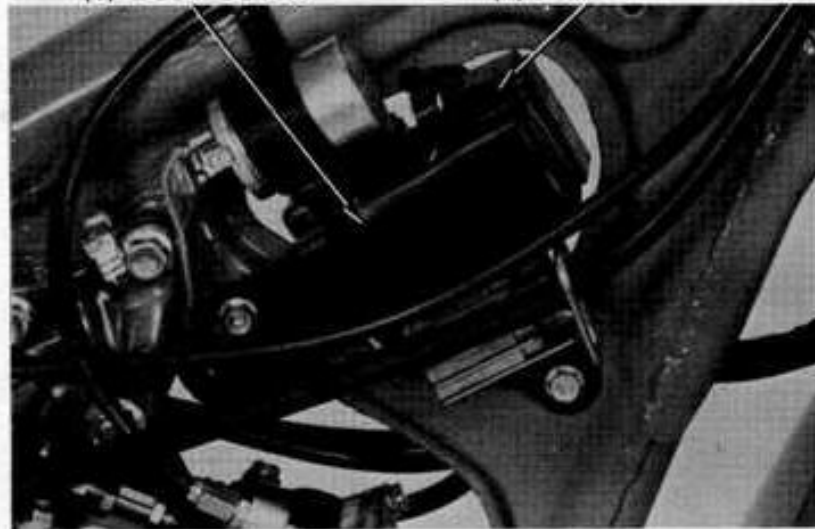
● **CDI UNIT**

Remove the dust cover and disconnect the couplers.

Remove the CDI unit.

(1) DUST COVER

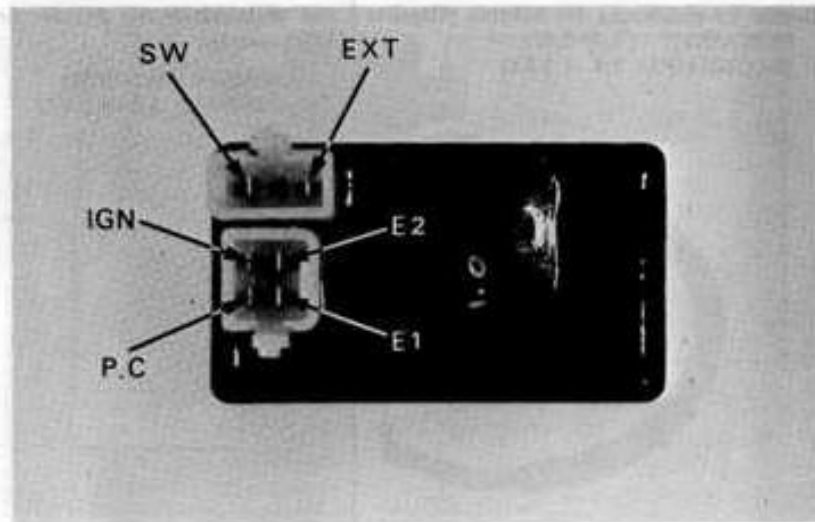
(2) CDI UNIT



Check continuity between the CDI terminals. Replace the CDI unit if the readings do not fall within the limits shown in the table.

NOTE

- The CDI unit is fully transistorized.
- For accurate testing, it is necessary to use a specified electric tester. Use of an improper tester or measurements in improper range may give a false readings.
- Use SANWA ELECTRICAL TESTER (P/N 07308-0020000) or KOWA ELECTRICAL TESTER (TH-5H).



Tester range: $\left[\begin{array}{l} \text{SANWA } \times \text{ k}\Omega \\ \text{KOWA } \times \text{ 100}\Omega \end{array} \right]$

\ominus Probe	\oplus Probe	SW	EXT	P·C	E1·E2	IGN
SW			∞	∞	∞	∞
EXT		0.1-20		* ∞	* ∞	∞
P·C		30-300 [10-100]	10-200 [5-50]		1-100 [1-50]	∞
E1·E2		1-50	0.1-20	1-50		∞
IGN		∞	∞	∞		

(*) : Needle swings and returns to ∞ .
[] : Specification for the XL400R.

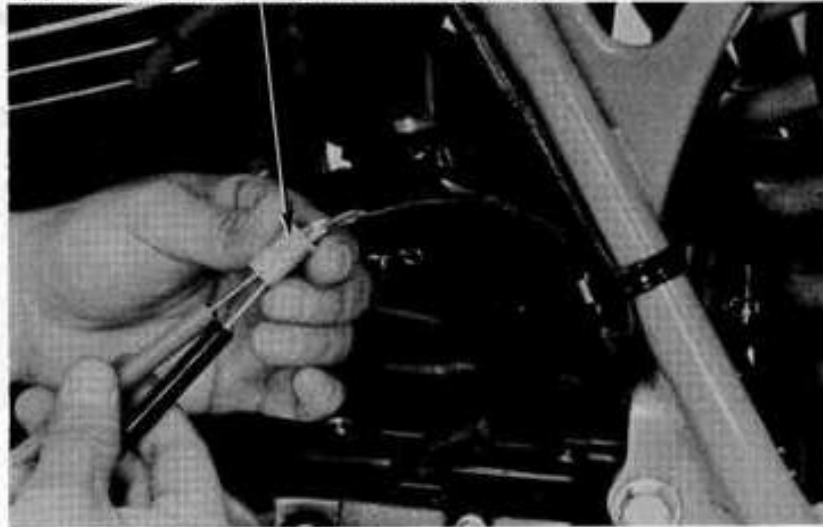
TO GROUND

● PULSE GENERATOR

Disconnect the pulse generator wire coupler and measure the resistance between Blue/Yellow and Green/White terminals.

SPECIFIED RESISTANCE: 510–570Ω

(1) PULSE GENERATOR WIRE COUPLER



● IGNITION TIMING

Remove the timing hole cap.

Connect a timing light and tachometer.

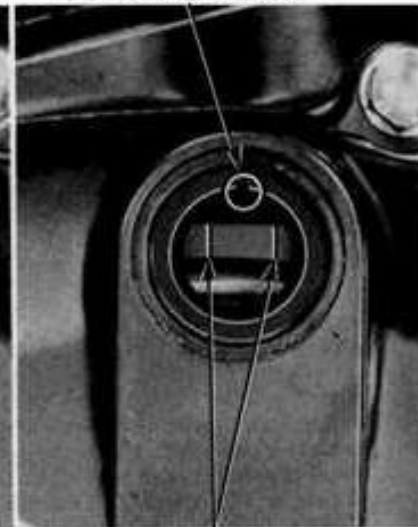
Start the engine and check the ignition timing:

(1) INDEX MARK



(2) F MARK

(1) INDEX MARK



(3) FULL ADVANCE MARKS

IGNITION TIMING SPECIFICATIONS

XL500R	1,200 ± 100 min ⁻¹ (rpm)	1,200 – 2,000 min ⁻¹ (rpm)	3,400 – 4,000 min ⁻¹ (rpm)
XL400R	1,200 ± 100 min ⁻¹ (rpm)	1,200 – 2,000 min ⁻¹ (rpm)	2,900 – 4,000 min ⁻¹ (rpm)
	The index mark should be aligned with F mark.	Timing advance should start.	Timing advance should cease. The index mark should be between the full advance marks.