

Chapter 9

Electrical system

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Degrees of difficulty

Easy, suitable for novice with little experience	jk	Fairly easy, suitable for beginner with some experience	ljs	Fairly difficult, suitable for competent DIY mechanic	gS	Difficult, suitable for experienced DIY mechanic	jS	Very difficult, suitable for expert DIY or professional	^S ^ ^ v
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Specifications

Battery

Capacity.	12 V, 10 Ah
Type	
YZF models.	YTX12-BS
FZS models.	GT12B-4
Charge condition	
Fully charged.	12.8V
Half-charged.	12.3 V
Discharged.	12 V or less
Charging time (see text).	until fully charged (12.8V)
Current leakage.1 mA (max)

Alternator

Nominal output	
YZF models.	12 V, 18.5 A at 5000 rpm
FZS models.	12 V, 18.0 A at 5000 rpm
Stator coil resistance	0.36 to 0.44 ohms @ 20°C

Regulator/rectifier

Regulated voltage output (no load)	14.7 V at 5000 rpm
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Starter circuit cut-off relay

Resistance

YZF models	5 to 15 ohms @ 20°C
FZS models	.8 ohms @ 20°C

Starter relay

Resistance

All YZF models and 1998/99 FZS models	3.96 to 4.84 ohms @ 20°C
2000 FZS models	4.18 to 4.62 ohms @ 20°C

Starter motor

Brush length

Standard	
YZF models	.125 mm
FZS models	.100 mm
Service limit (min) - all models	.4 mm

Commutator diameter

Standard	.28 mm
Service limit (min)	.27 mm
Mica depth	.07 mm

Fuses

YZF models

Main	.30 A
Headlight	.20 A
Signals	.15 A
Ignition	.7.5 A
Cooling fan	.7.5 A

FZS models

Main	.30 A
Headlight	.20 A
Signals	.20 A
Ignition	.20 A
Cooling fan	.10 A
Parking/hazard (2000 model)	.10 A
Back-up	.5 A

Bulbs

Headlight

YZF models	.12V, 60/55 W halogen x 1
FZS models	.12V, 60/55 W halogen x 2

Sidelight (UK models)12 V, 5 W x 1

Brake/taillight

YZF models	
UK models	.12V, 21/5 W x 1
US models	.12V, 27/8 W x 1
FZS models	.12V, 21/5 W x 2

Turn signal lights

YZF models	
UK models	.12 V, 21 W x 4
US models	.12V, 27/8 W x 2 (front), 27 W x 2 (rear)
FZS models	.12 V, 21 W x 4

Instrument lights

YZF models	.12 V, 1.7 W x 4
FZS models	.12 V, 2.0 W x 3

Turn signal indicator light

YZF models	.12 V, 3.4 W
FZS models	
1998 and 1999 models	.12 V, 1.4 W
2000 models	.14V, 1.4 W x 2

Neutral indicator light

YZF models	.12 V,, 3.4 W
FZS models	
1998 and 1999 models	.12 V, 1.4 W
2000 models	.14 V, 1.4 W x 2

Bulbs (continued)

High beam indicator light	
YZF models	12V, 3.4 W
FZS models	
1998 and 1999 models	12V, 1.4 W
2000 models	14V, 1.4 W
Oil level warning light	
YZF models	12V, 3.4 W
FZS models	
1998 and 1999 models	12V, 1.4W
2000 models	14V, 1.4W
Fuel level warning light	
YZF models	12V, 3.4 W
FZS models	
1998 and 1999 models	12V, 1.4 W
2000 models	12V, 2.0 W

Torque settings

Alternator cover bolts	12 Nm
Alternator rotor bolt .	130 Mm
Alternator stator bolts	10 Nm
Oil level sensor bolts .	7 Nm
Pick-up coil screws .	5 Nm
Starter motor bolts .	10 Nm

1 General information

All models have a 12 volt electrical system charged by a three-phase alternator with a separate regulator/rectifier.

The regulator maintains the charging system output within the specified range to prevent overcharging, and the rectifier converts the ac (alternating current) output of the alternator to dc (direct current) to power the lights and other components, and to charge the battery. The alternator rotor is mounted on the left-hand end of the crankshaft.

The starter motor is mounted on the top of the crankcase. The starting system includes the motor, the battery, the relay and the various wires and switches. If the engine kill switch in the "RUN" position and the ignition (main) switch is on, the starter relay allows the starter motor to operate only if the transmission is in neutral (neutral switch "ON") or, if the transmission is in gear, if the clutch lever is pulled into the handlebar and the sidestand is up.

Note: Keep in mind that electrical parts, once purchased, cannot be returned. To avoid unnecessary expense, make very sure the faulty component has been positively identified before buying a replacement part.

2 Electrical system - fault finding

Warning: To prevent the risk of short circuits, the ignition (main) switch must always be "OFF" and the battery negative (-ve) terminal should be disconnected before any of the bike's

other electrical components are disturbed. Don't forget to reconnect the terminal securely once work is finished or if battery power is needed for circuit testing.

1 A typical electrical circuit consists of an electrical component, the switches, relays, etc. related to that component and the wiring and connectors that hook the component to both the battery and the frame.

2 Before tackling any troublesome electrical circuit, first study the wiring diagram (see end of Chapter) thoroughly to get a complete picture of what makes up that individual circuit. Trouble spots, for instance, can often be narrowed down by noting if other components related to that circuit are operating properly or not. If several components or circuits fail at one time, chances are the fault lies in the fuse or earth (ground) connection, as several circuits often are routed through the same connections.

3 Electrical problems often stem from simple causes, such as loose or corroded connections or a blown fuse. Prior to any electrical fault finding, always visually check the condition of the fuse, wires and connections in the problem circuit. Intermittent failures can be especially frustrating, since you can't always duplicate the failure when it's convenient to test. In such situations, a good practice is to clean all connections in the affected circuit, whether or not they appear to be good. All of the connections and wires should also be wiggled to check for looseness which can cause intermittent failure.

4 If testing instruments are going to be utilised, use the wiring diagram to plan where you will make the necessary connections in order to accurately pinpoint the trouble spot.

5 The basic tools needed for electrical fault finding include a battery and bulb test circuit, a continuity tester, a test light, and a jumper wire. A multimeter capable of reading volts,

ohms and amps is also very useful as an alternative to the above, and is necessary for performing more extensive tests and checks.



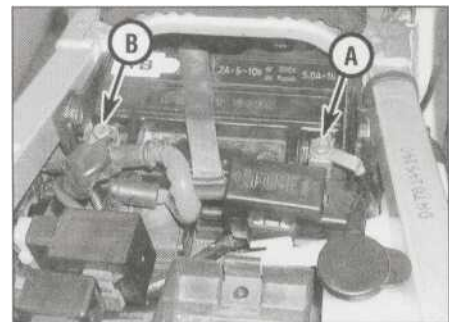
Refer to 'Fault Finding Equipment' in the Reference section for details of how to use electrical test equipment.

Battery - removal, installation, inspection and maintenance

Caution: Be extremely careful when handling or working around the battery. The electrolyte is very caustic and an explosive gas (hydrogen) is given off when the battery is charging.

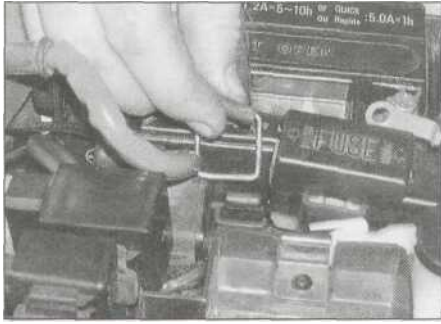
Removal and installation

- 1 Remove the seat (see Chapter 8).
- 2 Unscrew the negative (-ve) terminal bolt first and disconnect the lead from the battery (see illustration). Lift up the red insulating cover to access the positive (+ve) terminal, then unscrew the bolt and disconnect the lead. Release the battery strap or holder,



3.2a Detach the negative lead first (A), then the positive (B)...

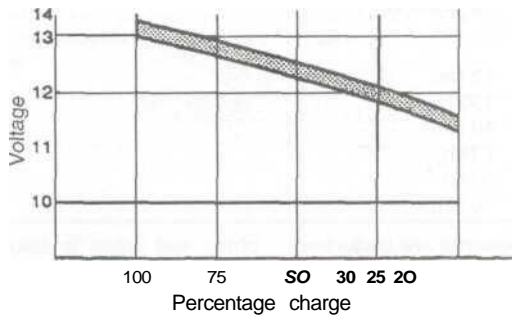
9«4 Electrical system



3.2b ... then unhook the rubber strap ...



3.2c ... and remove the battery



3.10 Measure the terminal voltage to assess the condition of the battery from the chart

The battery must be disconnected from the motorcycle when measuring the voltage

where fitted, and remove the battery from the bike (see illustrations).

3 On installation, clean the battery terminals and lead ends with a wire brush or knife and emery paper. Reconnect the leads, connecting the positive (+ve) terminal first.

HINT

Battery corrosion can be kept to a minimum by applying a layer of petroleum jelly to the terminals after the cables have been connected.

4 Install the seat (see Chapter 8).

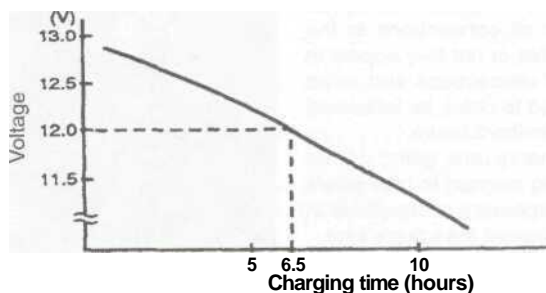
Inspection and maintenance

5 The battery fitted on all models is of the maintenance-free (sealed) type, therefore requiring no specific maintenance. However, the following checks should still be regularly performed.

6 Check the battery terminals and leads for tightness and corrosion. If corrosion is evident, unscrew the terminal screws and disconnect the leads from the battery, disconnecting the negative (-ve) terminal first, and clean the terminals and lead ends with a wire brush or knife and emery paper. Reconnect the leads, connecting the negative (-ve) terminal last, and apply a thin coat of petroleum jelly to the connections to slow further corrosion.

7 The battery case should be kept clean to prevent current leakage, which can discharge the battery over a period of time (especially when it sits unused). Wash the outside of the case with a solution of baking soda and water. Rinse the battery thoroughly, then dry it.

8 Look for cracks in the case and replace the battery if any are found. If acid has been spilled on the frame or battery box, neutralise it with a baking soda and water solution, dry it thoroughly, then touch up any damaged paint.



4.1 Measure the voltage to determine the charging time required

9 If the motorcycle sits unused for long periods of time, disconnect the cables from the battery terminals, negative (-ve) terminal first. Refer to Section 4 and charge the battery once every four to six weeks.

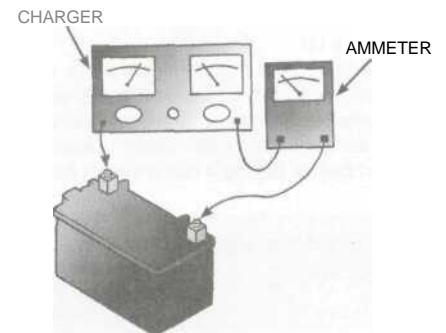
10 The condition of the battery can be assessed by measuring the voltage present at the battery terminals, and comparing the figure against the chart (see illustration). Connect the voltmeter positive (+ve) probe to the battery positive (+ve) terminal, and the negative (-ve) probe to the battery negative (-ve) terminal. When fully charged there should be 12.8 volts (or more) present. If the voltage falls below 12.3 volts the battery must be removed, disconnecting the negative (-ve) terminal first, and recharged as described in Section 4.

4 Battery - charging

Caution: Be extremely careful when handling or working around the battery. The electrolyte is very caustic and an explosive gas (hydrogen) is given off when the battery is charging.

1 Remove the battery (see Section 3). If not already done, refer to Section 3, Step 10, and check the open circuit voltage of the battery. Refer to the chart and read off the charging time required according to the voltage reading taken (see illustration).

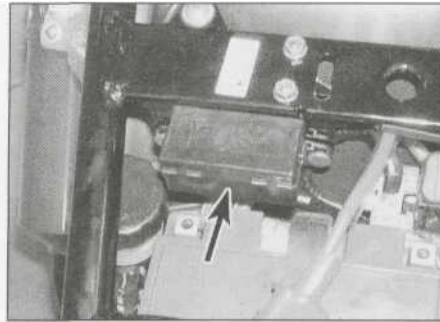
2 Connect the charger to the battery, making sure that the positive (+ve) lead on the charger is connected to the positive (+ve) terminal on the battery, and the negative (-ve) lead is connected to the negative (-ve) terminal. The battery should be charged for the specified time, or until the voltage across the terminals reaches 12.8 V (allow the battery to stabilise for 30 minutes after charging before taking a voltage reading). Exceeding this can cause the battery to overheat, buckling the plates and rendering it useless. Few owners will have access to an expensive current controlled charger, so if a normal domestic charger is



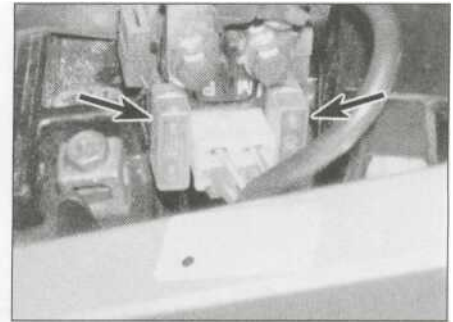
4.2 If the charger doesn't have an ammeter built in, connect one in series DO NOT connect the ammeter between the battery terminals or it will be ruined



5.1 a Fusebox-
YZF models



5.1 b Fusebox (arrowed) -
FZS models



5.1 c The main fuse and a spare are
housed in the starter relay (arrowed)

used check that after a possible initial peak, the charge rate falls to a safe level (**see illustration**). If the battery becomes hot during charging **stop**. Further charging will cause damage. **Note:** *In emergencies the battery can be charged at a higher rate of around 3.0 amps for a period of 1 hour. However, this is not recommended and the low amp charge is by far the safer method of charging the battery.*

3 If the recharged battery discharges rapidly if left disconnected it is likely that an internal short caused -by physical damage or sulphation has occurred. A new battery will be required. A sound item will tend to lose its charge at about 1 % per day.

4 Install the battery (see Section 3).

5 If the motorcycle sits unused for long periods of time, charge the battery once every four to six weeks and leave it disconnected.

may be. Serious damage may be done to the circuit, or a fire may start.

4 If a fuse blows, be sure to check the wiring circuit very carefully for evidence of a short-circuit. Look for bare wires and chafed, melted or burned insulation. If the fuse is replaced before the cause is located, the new fuse will blow immediately.

5 Occasionally a fuse will blow or cause an open-circuit for no obvious reason. Corrosion of the fuse ends and fusebox terminals may occur and cause poor fuse contact. If this happens, remove the corrosion with a wire brush or emery paper, then spray the fuse end and terminals with electrical contact cleaner.

Lighting system - check

5 Fuses - check and replacement

1 The electrical system is protected by fuses of different ratings. All except the main fuse are housed in the fusebox, which is located under the seat (**see illustrations**). The main fuse is integral with the starter relay, which is also located under the seat (**see illustration**).

2 To access the fusebox fuses, remove the seat (see Chapter 8) and unclip the fusebox lid (**see illustration**). To access the main fuse, remove the seat (see Chapter 8) then, on YZF models, displace the starter relay.

3 The fuses can be removed and checked visually. If you can't pull the fuse out with your fingertips, use a suitable pair of pliers. A blown fuse is easily identified by a break in the element (**see illustration**). Each fuse is clearly marked with its rating and must only be replaced by a fuse of the correct rating. Spare fuses are housed in the fusebox, and a spare main fuse is housed in the starter relay. If a spare fuse is used, always replace it so that a spare of each rating is carried on the bike at all times.

Warning: *Never put in a fuse of a higher rating or bridge the terminals with any other substitute, however temporary it*

1 The battery provides power for operation of the headlight, taillight, brake light, turn signals and instrument cluster lights. If none of the lights operate, always check battery voltage before proceeding. Low battery voltage indicates either a faulty battery or a defective charging system. Refer to Section 3 for battery checks and Sections 31 and 32 for charging system tests. Also, check the condition of the fuses (see Section 5). When checking for a blown filament in a bulb, it is advisable to back up a visual check with a continuity test of the filament as it is not always apparent that a bulb has blown. When testing for continuity, remember that on



5.2 Unclip the fusebox lid to access the
fuses

taillight and turn signal bulbs it is often the metal body of the bulb which is the ground or earth.

Headlight

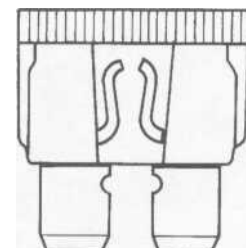
2 If the headlight fails to work, check the bulb first (see Section 7), then the fuse (see Section 5), and the wiring connector, then check for battery voltage at the yellow ("HI" beam) and/or green ("LO" beam) wire terminal on the supply side of the headlight wiring connector. If voltage is present, check the earth (ground) circuit for an open or poor connection.

3 If no voltage is indicated, check the wiring between the headlight, the lighting switches and the ignition switch, then check the switches themselves.

Taillight

4 If the taillight fails to work, check the bulb(s) and the bulb terminals and wiring connector first (see Section 9), then the fuse, then check for battery voltage at the blue/red or blue (according to model) wire terminal on the supply side of the taillight wiring connector, with the ignition switch and lighting switch "ON". If voltage is present, check for continuity between the wiring connector terminals on the taillight side of the wiring connector and the corresponding terminals in the bulbholder. If voltage and continuity are present, check the earth (ground) circuit for an open or poor connection.

5 If no voltage is indicated, check the wiring between the taillight, the lighting switch and the ignition switch, then check the switches themselves.



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5.3 A blown fuse can be identified by a
break in its element

9*6 Electrical system



7.2a Disconnect the wiring connector...



7.2b ... and remove the dust cover

Brake light

6 If the brake light fails to work, check the bulb(s) and the bulb terminals and wiring connector first (see Section 9), then the fuse, then check for battery voltage at the yellow or green/yellow (according to model) wire terminal on the supply side of the taillight wiring connector, with the ignition switch "ON" and the brake lever or pedal applied. If voltage is present, check the earth (ground) circuit for an open or poor connection.

7 If no voltage is indicated, check the brake light switches (see Section 14), then the wiring between the taillight and the switches.

Instrument and warning lights

8 See Section 17 for instrument and warning light bulb replacement.

Turn signal lights

9 If one light fails to work, check the bulb and the bulb terminals first, then the wiring connectors. If none of the turn signals work, check the fuse.

10 If the fuse is good, see Section 11 for turn signal circuit check.

7 Headlight bulb and sidelight bulb - replacement

Note: *The headlight bulb is of the quartz-halogen type. Do not touch the bulb glass as skin acids will shorten the bulb's service life. If the bulb is accidentally touched, it should be wiped carefully when cold with a rag soaked in methylated spirit and dried before fitting.*

Warning: *Allow the bulb time to cool before removing it if the headlight has just been on.*

Headlight

1 On YZF models, for best access to the headlight bulb, remove the instrument trim panel and one of the air duct trim panels (see Chapter 8, Section 3), but note that the bulb is accessible with them in place.

2 Disconnect the relevant wiring connector from the back of the headlight assembly and remove the rubber dust cover, noting how it fits (see illustrations).

3 Release the bulb retaining clip, noting how it fits, then remove the bulb (see illustrations).

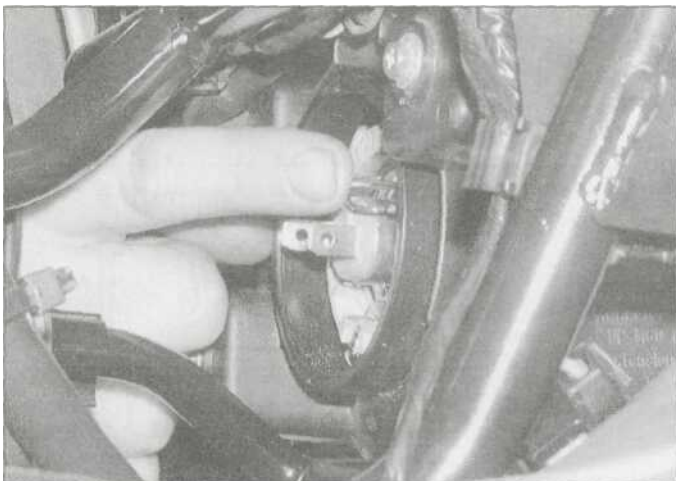
4 Fit the new bulb, bearing in mind the information in the Note above. Make sure the tabs on the bulb fit correctly in the slots in the bulb housing, and secure it in position with the retaining clip.

5 Install the dust cover, making sure it is correctly seated and with the "TOP" mark at the top, and connect the wiring connector (see illustration).

6 Check the operation of the headlight.



Always use a paper towel or dry cloth when handling new bulbs to prevent injury if the bulb should break, and to increase bulb life.



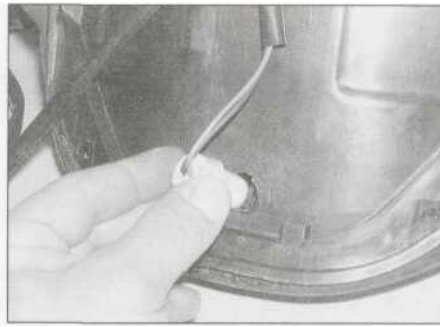
7.3a Release the clip ...



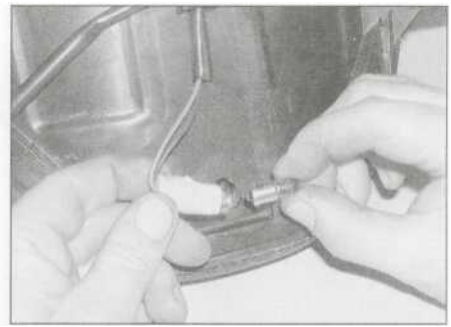
7.3b ... and remove the bulb



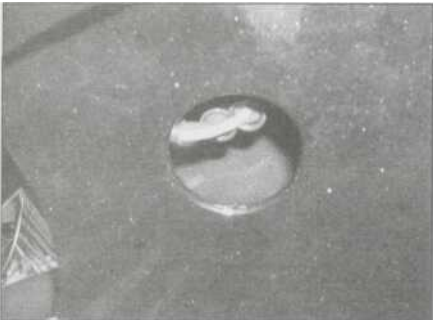
7.5 Fit the dust cover with the "TOP" mark at the top



7.7a Pull the bulbholder out of the base of the headlight



7.7b ... then remove the bulb from the holder



7.8a Access the bulbholder via the hole in the fairing ...



7.8b ... and carefully pull the bulb from the holder



8.2 Release the sidelight wiring from its clip on the fairing

Sidelight

7 On YZF models (except US), remove the headlight (see Section 8). Carefully pull the bulbholder out of its socket in the base of the headlight, then carefully remove the bulb from the holder (**see illustrations**). Install the new bulb in the bulbholder, then install the bulbholder by pressing it in. Install the headlight.

8 On FZS models, the bulbholder is accessed via the hole in the underside of the fairing (**see illustration**). Turn it anti-clockwise to release

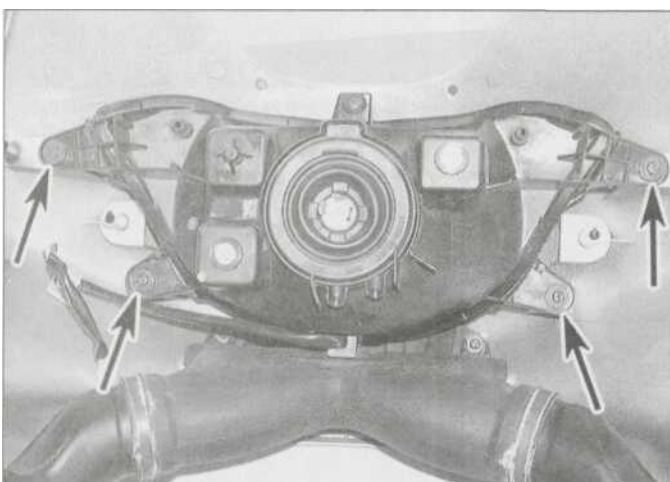
it and draw it out of the headlight - due to the diameter of the hole, it is probably easier to turn the bulbholder using a pair of pointed-nose pliers rather than your fingers. Draw the bulbholder out from between the headlight and fairing by pulling carefully on the wiring - it is easier than trying to feed the bulbholder through the access hole. Carefully pull the bulb out of the holder (**see illustration**). Install the new bulb, then install the bulbholder and turn it clockwise to lock it in place.

9 Check the operation of the sidelight.

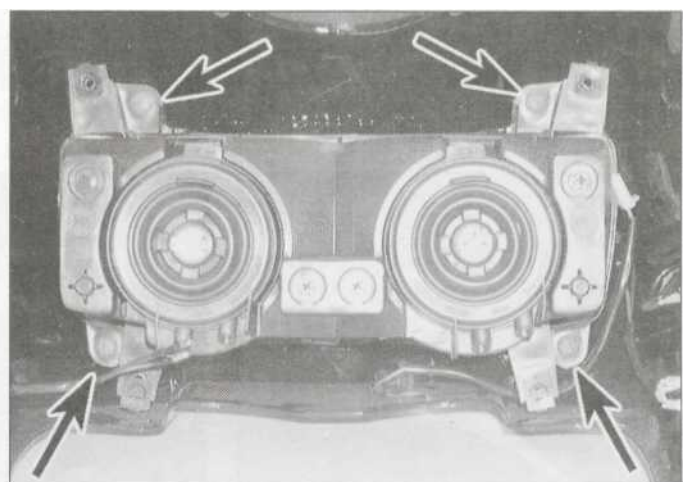
8 Headlight assembly - removal and installation

Removal

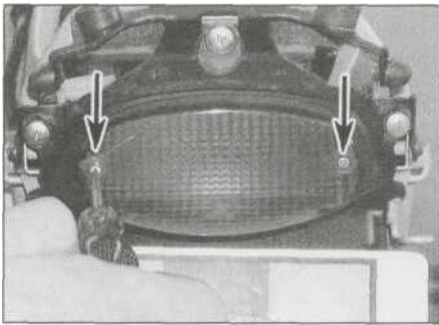
- 1 Remove the fairing (see Chapter 8).
- 2 On YZF models, release the sidelight wiring from its clip on the fairing (**see illustration**).
- 3 Remove the screws securing the headlight to the fairing and lift it out, noting how it fits (**see illustrations**).



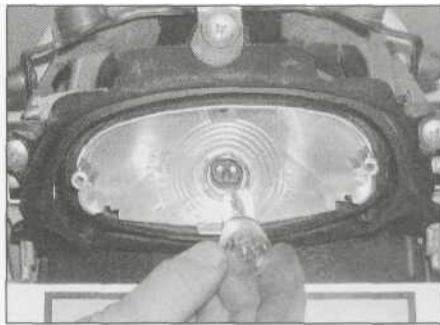
8.3a Headlight mounting screws (arrowed) - YZF models



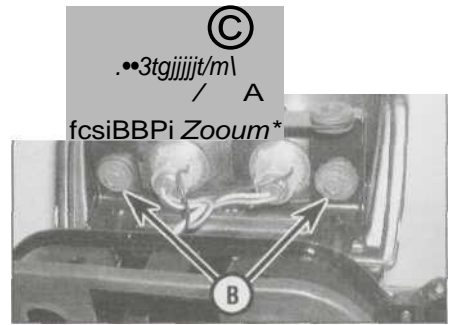
8.3b Headlight mounting screws (arrowed) • FZS models



9.1 a Remove the screws (arrowed) and the lens ...



9.1 b ... then remove the bulb



9.2 Taillight bulbholders (A), and mounting bolts (B)

Installation

4 Installation is the reverse of removal. Make sure all the wiring is correctly connected and secured. Check the operation of the headlight and sidelight. Check the headlight aim (see Chapter 1).

deformed, damaged or deteriorated. Do not overtighten the screw as the lens or threads could be damaged.

5 On FZS models, fit the bulbholder into the taillight and turn it clockwise to secure it, then install the tail cover if removed, the toolbox and the seat (see Chapter 8).

9 Brake/taillight bulb - replacement

1 On YZF models, remove the screws securing the taillight lens and remove the lens. Push the bulb into the holder and twist it anti-clockwise to remove it (see illustrations).

2 On FZS models, remove the seat (see Chapter 8) and the toolbox. For best access, also remove the tail cover (see Chapter 8, Section 3). Turn the bulbholder anti-clockwise and withdraw it from the taillight (see illustration). Push the bulb into the holder and twist it anti-clockwise to remove it.

3 Check the socket terminals for corrosion and clean them if necessary. Line up the pins of the new bulb with the slots in the socket, then push the bulb in and turn it clockwise until it locks into place. **Note:** The pins on the bulb are offset so it can only be installed one way. It is a good idea to use a paper towel or dry cloth when handling the new bulb to prevent injury if the bulb should break and to increase bulb life.

4 On YZF models, fit the lens, making sure it seats correctly onto the rubber seal (see illustration). Use a new seal if the old one is

10 Taillight assembly- removal and installation

Removal

1 On YZF models, remove the side covers (see Chapter 8, Section 3). Disconnect the taillight wiring connector (see illustration). Unscrew the three nuts securing the taillight assembly and carefully remove it, noting the arrangement of the washers, collars and grommets (see illustration).

2 On FZS models, remove the tail cover (see Chapter 8, Section 3). Disconnect the taillight wiring connector (see illustration). Unscrew the two bolts securing the taillight assembly and carefully remove it, noting the arrangement of the collars and rubber grommets (see illustration 9.2). If required, turn the bulbholders anti-clockwise and withdraw them from the taillight.

Installation

3 Installation is the reverse of removal. Check the operation of the taillight and the brake light.

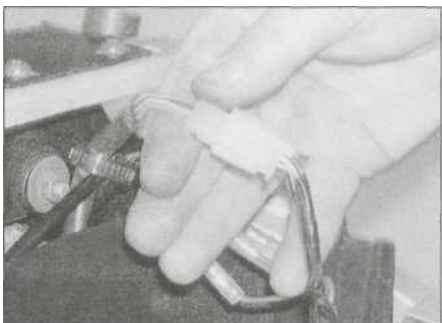


9.4 Make sure the lens sits properly on the rubber seal

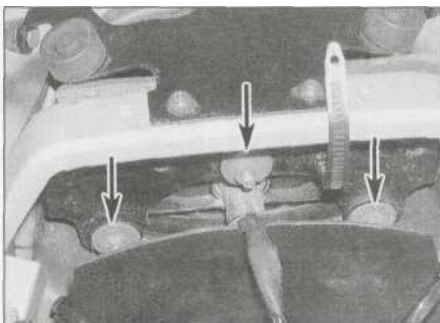
11 Turn signal circuit - check

1 Most turn signal problems are the result of a burned out bulb or corroded socket. This is especially true when the turn signals function properly in one direction, but fail to flash in the other direction. Check the bulbs and the sockets (see Section 12) and the wiring connectors. Also, check the signals fuse (see Section 5) and the switch (see Section 20); on 2000 models FZS models, also check the parking/hazard fuse.

2 The battery provides power for operation of the turn signal lights, so if they do not operate, also check the battery voltage. Low battery voltage indicates either a faulty battery or a defective charging system. Refer to Section 3



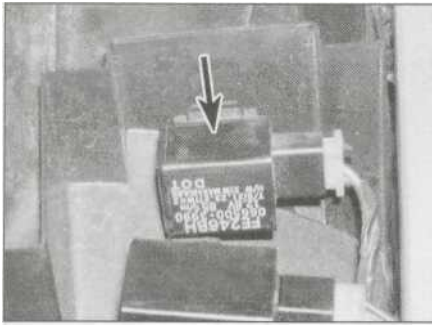
10.1a Disconnect the wiring connector ...



10.1 b ... then unscrew the nuts and remove the taillight



10.2 Disconnect the wiring connector



11.3a Turn signal relay (arrowed)-
YZF models

for battery checks and Sections 31 and 32 for charging system tests.

3 If the bulbs, sockets, connectors, fuse, switch and battery are good, check the turn signal relay, which is mounted under the seat on YZF models, and behind the left-hand side cover on FZS models (**see illustrations**). Remove the seat or side cover for access (see Chapter 8).

4 Check for voltage at the brown wire (brown/red on 2000 FZS model) in the relay wiring connector with the ignition "ON". If no voltage is present, using the appropriate wiring diagram at the end of this Chapter check the wiring between the relay and the ignition (main) switch. If voltage was present, check for voltage at the brown/white wire with the ignition "ON", and with the switch turned to either "LEFT" or "RIGHT". If no voltage is present, replace the relay. If voltage was present, check the wiring between the relay,



11.3b Turn signal relay (arrowed)-
FZS models

turn signal switch and turn signal lights for continuity. Turn the ignition "OFF" when the check is complete.

5 On 2000 FZS models, note that a turn signal fault could be caused by failure of the turn signal hazard relay. The relay is located next to the turn signal relay and can be identified by its wire colours (see wiring diagram at the end of this Chapter).

12 Turn signal bulbs- replacement

1 Remove the screw securing the turn signal lens and remove the lens, noting how it fits (**see illustration**).

2 Push the bulb into the holder and twist it anti-clockwise to remove it (**see illustration**).

Check the socket terminals for corrosion and clean them if necessary. Line up the pins of the new bulb with the slots in the socket, then push the bulb in and turn it clockwise until it locks into place.

3 Fit the lens onto the holder, making sure the tab locates correctly (**see illustration**). Do not overtighten the screw as the lens or threads could be damaged.

13 Turn signal assemblies - removal and installation

Front

Removal

1 On YZF models, remove the fairing side panel (see Chapter 8). Remove the screw securing the turn signal to the inside of the fairing and remove the mounting plate (**see illustration**). Remove the turn signal from the fairing, noting how it fits. Take care not to snag the wiring as you pull it through.

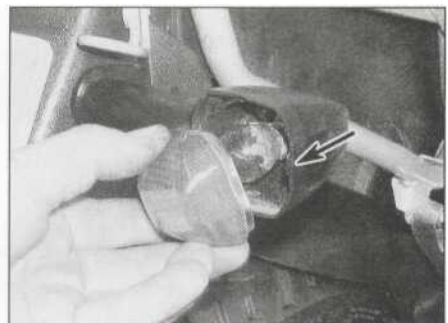
2 On FZS models, if both turn signals are being removed, remove the fairing (see Chapter 8). If only one is being removed, remove the rear view mirror, the trim panel and the fairing bracket for the side being worked on, following the relevant Steps in the procedure for fairing removal (see Chapter 8), then disconnect the turn signal wiring connectors (**see illustration**). Free the wiring from its clamp on the fairing (**see illustration**).



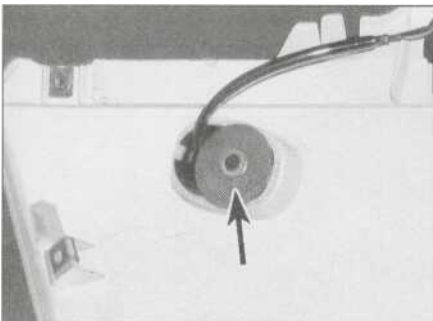
12.1 Remove the screw (arrowed) and
detach the lens ...



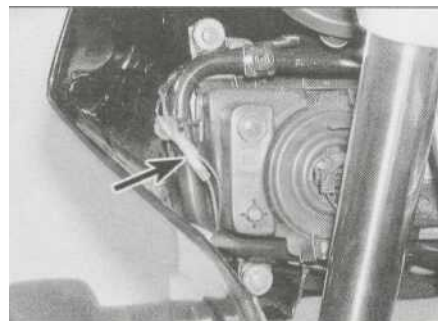
12.2 ... and remove the bulb



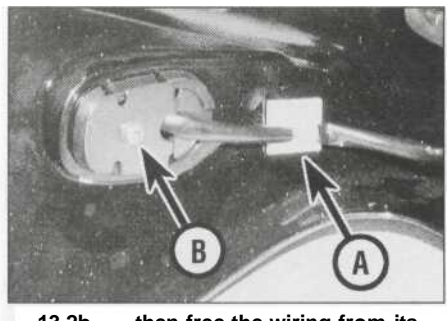
12.3 Make sure the tab (arrowed) locates
correctly when fitting the lens



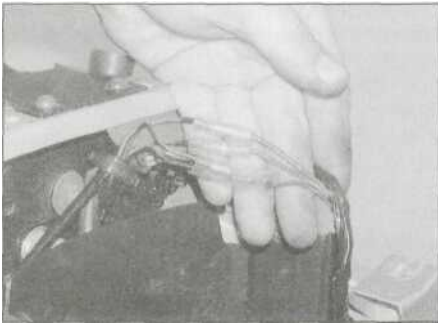
13.1 Remove the mounting plate screw
(arrowed) and withdraw the signal



13.2a Disconnect the turn signal wiring
connectors ..



13.2b ... then free the wiring from its
clamp (A) and remove the mounting plate
screw (B)



13.5a Rear turn signal wiring connectors - YZF models

3 Remove the screw securing the turn signal to the inside of the fairing and remove the mounting plate. Remove the turn signal from the fairing, noting how it fits. Take care not to snag the wiring as you pull it through.

Installation

4 Installation is the reverse of removal. Make sure the wiring is correctly routed and securely connected. Check the operation of the turn signals.

Rear

Removal

5 Remove the seat (see Chapter 8). Trace the wiring back from the turn signal and disconnect it at the connectors (see illustrations). Remove the side covers (YZF models) or tail cover (FZS models) for best access if required (see Chapter 8, Section 3).
6 Unscrew the nut securing the turn signal to



13.5b Rear turn signal wiring connectors - FZS models

the inside of the mudguard and remove the mounting plate (see illustration). Remove the turn signal from the mudguard, taking care not to snag the wiring as you pull it through.

Installation

7 Installation is the reverse of removal. Make sure the wiring is correctly routed and securely connected. Check the operation of the turn signals.

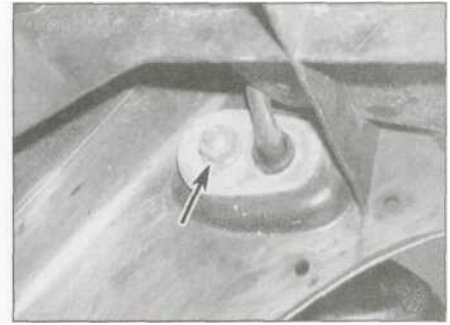
14 Brake light switches - check and replacement

Circuit check

1 Before checking the switches, and if not already done, check the brake light circuit (see Section 6, Step 6).

2 The front brake light switch is mounted on the underside of the brake master cylinder. Disconnect the wiring connectors from the switch (see illustration). Using a continuity tester, connect the probes to the terminals of the switch. With the brake lever at rest, there should be no continuity. With the brake lever applied, there should be continuity. If the switch does not behave as described, replace it with a new one.

3 The rear brake light switch is mounted on the inside of the frame on the right-hand side, above the brake pedal (see illustration). On YZF models remove the seat, on FZS models remove the right-hand side cover (see Chapter 8). Trace the wiring from the switch and



13.6 The turn signal is secured by a nut (arrowed) on the inside of the mudguard

disconnect it at the connector (see illustrations). Using a continuity tester, connect the probes to the terminals on the switch side of the wiring connector. With the brake pedal at rest, there should be no continuity. With the brake pedal applied, there should be continuity. If the switch does not behave as described, replace it with a new one.
4 If the switches are good, check for voltage at the brown wire terminal on the connector with the ignition switch "ON" - there should be battery voltage. If there's no voltage present, check the wiring from the ignition switch (see the Wiring diagrams at the end of this Chapter).

Switch replacement

Front brake light switch

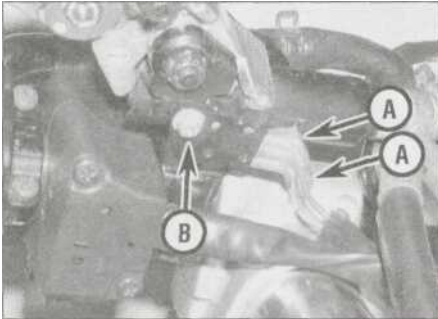
5 The switch is mounted on the underside of the brake master cylinder. Disconnect the wiring connectors from the switch (see illustration 14.2).

6 Remove the single screw and washers securing the switch to the bottom of the master cylinder and remove the switch.

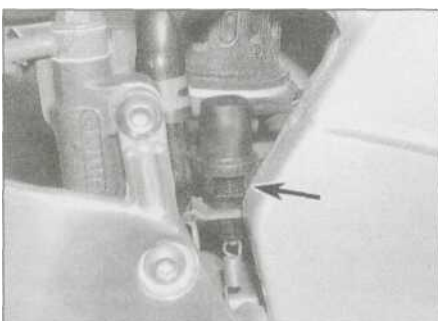
7 Installation is the reverse of removal. The switch isn't adjustable.

Rear brake light switch

8 The switch is mounted on the inside of the frame on the right-hand side, above the brake pedal (see illustration 14.3a). On YZF models remove the seat, on FZS models remove the right-hand side cover (see Chapter 8). Trace the wiring from the switch and disconnect it at the connector (see illustration 14.3b or 14.3c). Free the wiring from any clips or ties.



14.2 Front brake switch wiring connectors (A) and mounting screw (B)



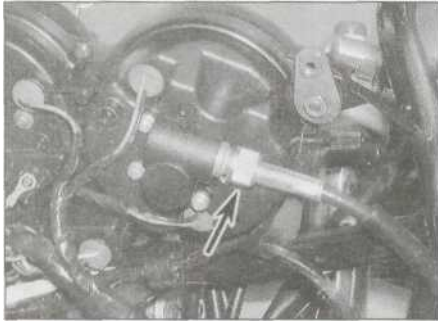
14.3a Rear brake light switch (arrowed) • YZF model



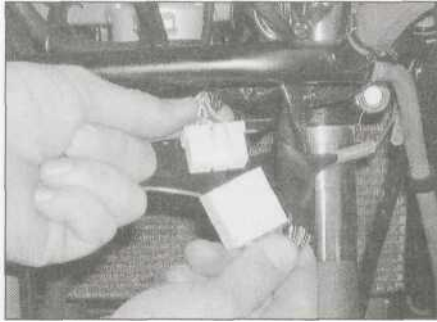
14.3b Rear brake switch wiring connector - YZF models



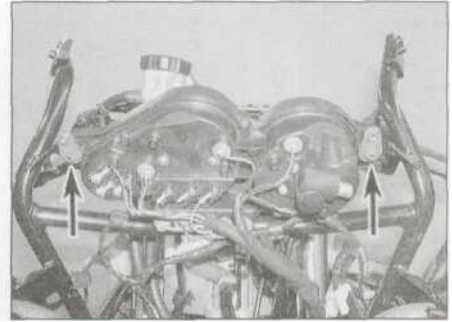
14.3c Rear brake switch wiring connector - FZS models



15.2a Unscrew the knurled ring (arrowed) and detach the cable ...



15.2b ... then disconnect the wiring connector



15.2c Unscrew the nuts (arrowed)

9 Detach the lower end of the switch spring from the brake pedal, then unscrew and remove the switch.

10 Installation is the reverse of removal. Make sure the brake light is activated just before the rear brake pedal takes effect. If adjustment is necessary, hold the switch and turn the adjusting ring on the switch body until the brake light is activated when required.

15 Instrument cluster and speedometer cable - removal and installation

Sc

Instrument cluster

Removal

- 1 Remove the fairing (see Chapter 8).
- 2 On YZF models, unscrew the knurled ring

securing the speedometer cable to the back of the speedometer and detach the cable (see illustration). Trace the wiring from the cluster and disconnect it at the connector (see illustration). Unscrew the nuts securing the cluster to the bracket and lift the cluster off, noting how it fits (see illustrations).

3 On FZS models, pull back the rubber cover on the back of the cluster and disconnect the wiring connector (see illustration). Unscrew the nuts securing the cluster to the bracket and lift the cluster off, noting how it fits (see illustrations).

Installation

4 Installation is the reverse of removal. On YZF models, make sure the brackets for the trim panel are correctly aligned. Make sure that the speedometer cable (YZF models) and wiring connectors are correctly routed and secured.

Speedometer cable (YZF models)

Removal

5 Remove the fairing (see Chapter 8). Unscrew the knurled ring securing the speedometer cable to the back of the speedometer and detach the cable (see illustration 15.2a).

6 Unscrew the knurled ring securing the lower end of the cable to the drive housing on the front wheel and detach the cable (see illustration).

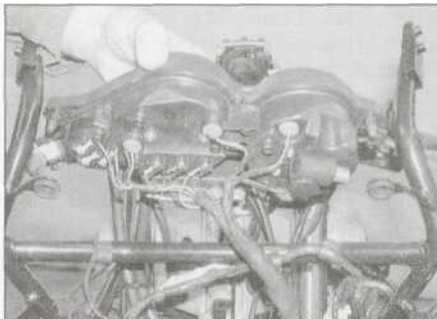
7 Release the cable from its guides in the inner fairing and remove it from the bike, noting its correct routing (see illustration).

Installation

8 Route the cable up through its guides in the inner fairing to the back of the instrument cluster, and fit the lower end through the



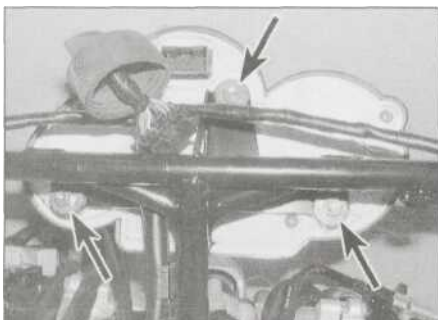
15.2d ... and remove the brackets, noting their alignment...



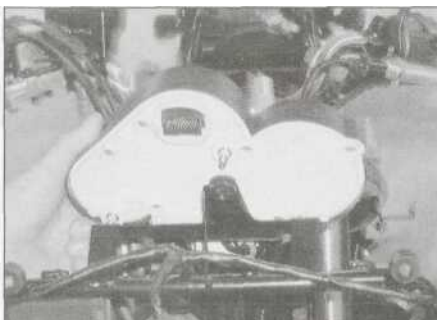
15.2e ... then lift off the cluster



15.3a Pull back the rubber cover and disconnect the wiring connector



15.3b Unscrew the nuts (arrowed)...

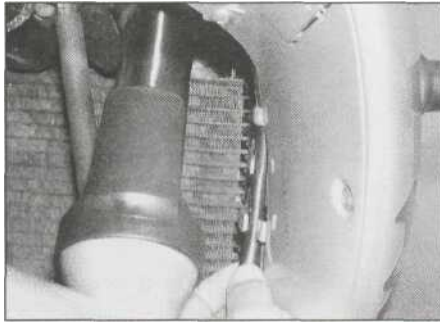


15.3c ... and lift off the cluster



15.6 Unscrew the knurled ring (arrowed) and detach the cable ...

Q



15.7 ... and free it from its guides in the inner fairing

guide attached to the brake caliper (see illustrations 15.7 and 15.10).

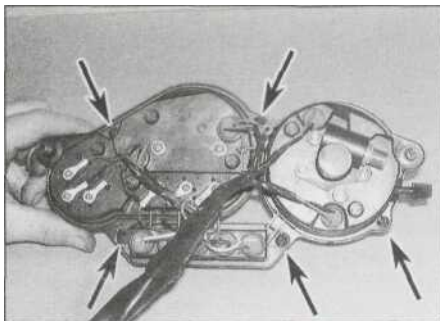
9 Connect the cable upper end to the speedometer and tighten the retaining ring securely (see illustration).

10 Connect the cable lower end to the drive housing and tighten the retaining ring securely (see illustration).

11 Check that the cable doesn't restrict steering movement or interfere with any other components.

16 Instruments - check and replacement

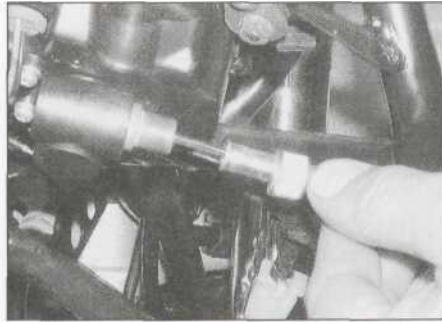
Note: FZS models are equipped with an electronic mileage odometer, trip meter and, on 2000 models, a clock. These are integral



16.5a Remove the screws (arrowed)...



16.5b ... and lift off the front cover



15.9 Fit the cable into the speedometer ...

features of the instrument cluster and can neither be tested nor purchased separately if they fail.

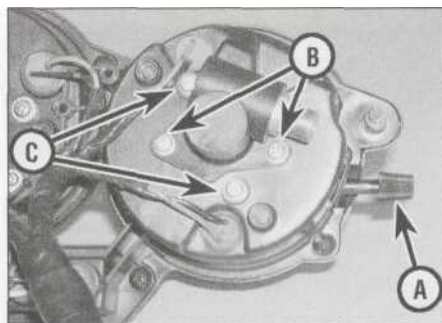
Speedometer

Check

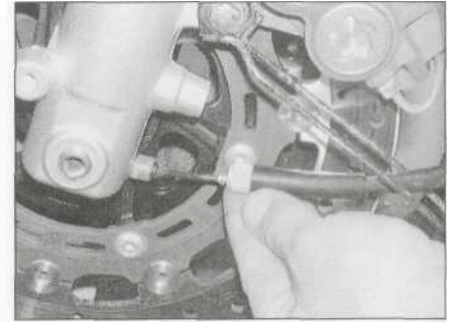
1 Special instruments are required to properly check the operation of this meter. If it is believed to be faulty, take the motorcycle to a Yamaha dealer for assessment. Before doing this, make sure that on YZF models the fault is not due to a faulty cable or drive gear, either at the front wheel or at the instruments (see Step 2), and on FZS models that it is not due to a faulty speed sensor or its wiring (see Step 3).

2 On YZF models, remove the speedometer cable (see Section 15), and check that it is not seized or broken. Replace it with a new one if necessary. Remove the front wheel (see Chapter 7), and check that the drive gear rotates freely. Clean and re-grease it. Replace it with a new one if necessary. Similarly check the driven gear on the back of the instrument cluster.

3 On FZS models, when the ignition is first switched "ON", or while the engine is running, the speed sensor performs its own self-diagnosis in the event of failure or faulty wiring. When a fault occurs, the tachometer will be seen to display zero rpm for 3 seconds, then 4000 rpm for 2.5 seconds, then the actual engine speed for 3 seconds, whereupon it will repeat the cycle until the engine is switched off. If this occurs, check



16.5c Unscrew the trip knob (A), the gearbox housing screws (B) and the instrument screws (C)



15.10 ... and the drive gear housing, and tighten the rings

the wiring between the speed sensor on the front wheel and the speedometer for continuity, referring to the *Wiring Diagrams* if required. If the wiring is good, have the speed sensor checked along with the speedometer by a Yamaha dealer.

Replacement

4 Remove the instrument cluster (see Section 15).

5 On YZF models, remove the casing screws from the back of the cluster and lift off the front cover assembly (see illustrations). Unscrew the odometer trip knob (see illustration). Remove the two screws securing the speedometer gearbox and lift off the box. Remove the two screws securing the speedometer to the casing. Carefully withdraw the speedometer from the front.

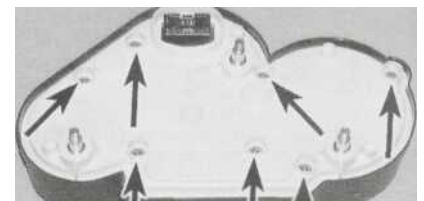
6 On FZS models, remove the casing screws from the back of the cluster and lift off the front cover assembly (see illustration). Remove the instrument cluster from the casing, then remove the two screws securing the fuel gauge and separate it from the speedometer/tachometer assembly. The speedometer and tachometer cannot be separated.

7 Installation is the reverse of removal.

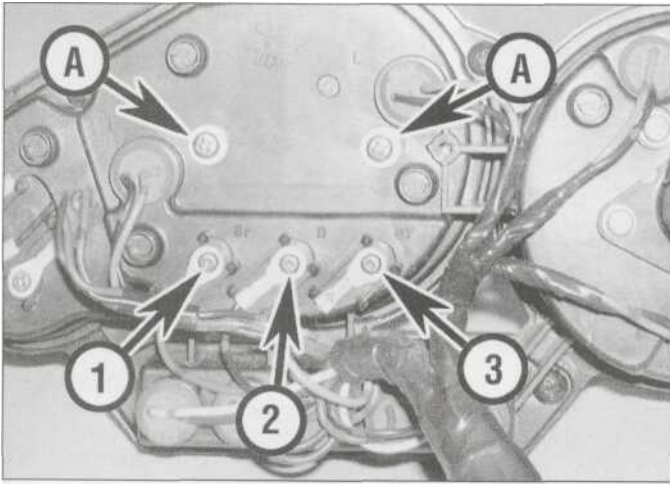
Tachometer

Check

8 Special instruments are required to properly check the operation of this meter. If it is believed to be faulty, take the motorcycle to a Yamaha dealer for assessment.

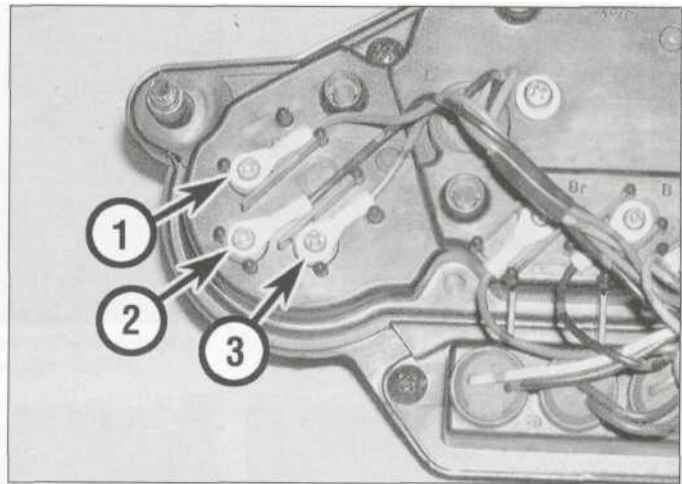


16.6 Remove the screws (arrowed) and lift off the cover



16.10 Remove the screws and detach the wires, then remove the instrument screws (A)

1 Brown wire 2 Black wire 3 Grey wire



16.16 Remove the screws and detach the wires

1 Green/red wire 2 Black wire 3 Brown wire

Replacement

9 Remove the instrument cluster (see Section 15).

10 On YZF models, remove the casing screws from the back of the cluster and lift off the front cover assembly (see illustrations 16.5a and 16.5b). Remove the screws securing the three tachometer wires and detach the wires, noting which fits where (see illustration). Remove the two screws securing the tachometer to the casing. Carefully withdraw the tachometer from the front.

11 On FZS models, remove the casing screws from the back of the cluster and lift off the front cover assembly (see illustration 16.6). Remove the instrument cluster from the casing, then remove the two screws securing the fuel gauge and separate it from the speedometer/tachometer assembly. The speedometer and tachometer cannot be separated.

12 Installation is the reverse of removal. On YZF models, make sure the wiring is correctly connected. As you look at the back of the cluster, the brown wire is for the left-hand terminal, the black for the middle terminal, and the grey for the right-hand terminal (see illustration 16.10).

Coolant temperature gauge (YZF models)

Check

13 See Chapter 3.

Replacement

14 Remove the instrument cluster (see Section 15).

15 Remove the casing screws from the back of the cluster and lift off the front cover assembly (see illustrations 16.5a and 16.5b).

16 Remove the screws securing the three temperature gauge wires and detach the

wires, noting which fits where (see illustration).

17 Carefully withdraw the temperature gauge from the front.

18 Installation is the reverse of removal. Make sure the wiring is correctly connected. As you look at the back of the cluster, the green/red wire is for the left-hand terminal, the black for the middle terminal, and the brown for the right-hand terminal (see illustration 16.16).

Fuel gauge (FZS models)

Check

19 See Chapter 4, Section 15.

Replacement

20 Remove the instrument cluster (see Section 15).

21 Remove the casing screws from the back of the cluster and lift off the front cover assembly (see illustration 16.6).

22 Remove the instrument cluster from the casing, then remove the two screws securing the fuel gauge and separate it from the speedometer/tachometer assembly, noting how it fits.

23 Installation is the reverse of removal.

17 Instrument and warning light bulbs - replacement

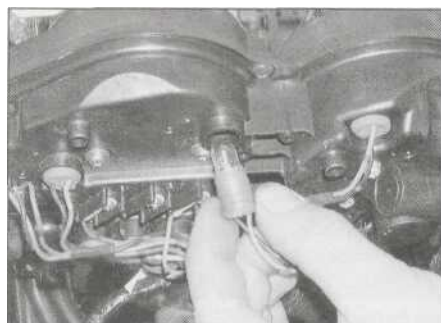
gQ

1 Remove the fairing (see Chapter 8).

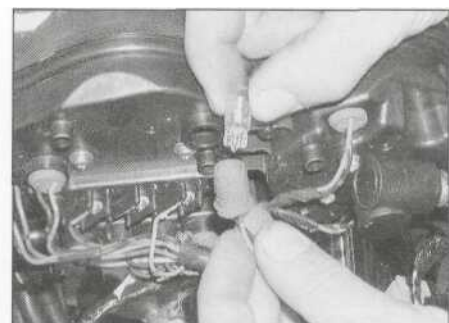
2 On YZF models, the bulbs are accessible with the instrument cluster in place. Carefully pull the bulbholder out of the instrument casing, then pull the bulb out of the bulbholder (see illustrations). If the socket contacts are dirty or corroded, scrape them clean and spray with electrical contact cleaner before a new bulb is installed. Carefully push the new bulb into the holder and push the holder into the casing.

3 On FZS models, remove the instrument cluster (see Section 15). Remove the casing screws from the back of the cluster and lift off the front cover assembly (see illustration 16.6). Remove the instrument cluster from the casing. Remove the bulbholder from the instrument casing, then pull the bulb out of the bulbholder. If the socket contacts are dirty or corroded, scrape them clean and spray with electrical contact cleaner before a new bulb is installed. Carefully push the new bulb into the holder and fit the holder into the casing. Reassemble and install the instrument cluster.

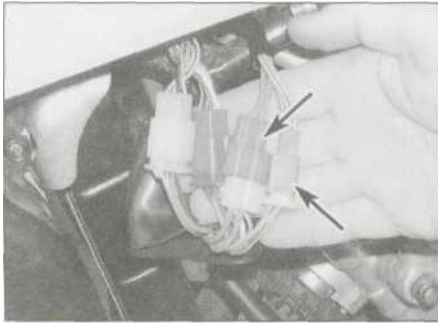
4 Install the fairing (see Chapter 8).



17.2a Pull out the bulbholder ...



17.2b ... and remove the bulb



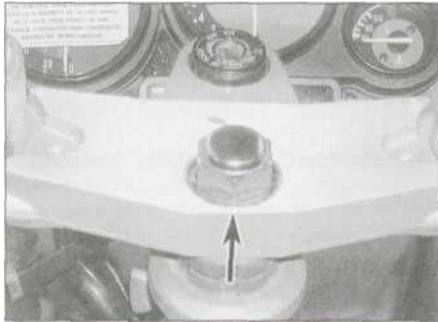
18.1 a Ignition switch wiring connectors (arrowed) - YZF models



18.1b Ignition switch wiring connectors - FZS models



18.5a Slacken the fork clamp bolt (arrowed) on each side ...



18.5b ... then unscrew the steering stem nut and remove the washer ...



18.5c ... and ease the yoke up off the forks



18.6 Ignition switch bolts (arrowed)

18 Ignition (main) switch - check, removal and installation

Warning: To prevent the risk of short circuits, remove the seat and disconnect the battery negative (-ve) lead before making any ignition switch checks.

Check

- 1 Remove the fairing (see Chapter 8). On FZS models remove the fuel tank (see Chapter 4). Trace the ignition (main) switch wiring back from the base of the switch and disconnect it at the connector, which on FZS models is housed in the black plastic box (see illustrations).
- 2 Using an ohmmeter or a continuity tester, check the continuity of the connector terminal



19.3a Left-hand switch wiring connectors - YZF models

pairs (see the *Wiring diagrams* at the end of this Chapter). Continuity should exist between the terminals connected by a solid line on the diagram when the switch is in the indicated position.

- 3 If the switch fails any of the tests, replace it.

Removal

- 4 Remove the fairing. On FZS models remove the fuel tank (see Chapter 4). Trace the ignition (main) switch wiring back from the base of the switch and disconnect it at the connector, which on FZS models is housed in the black plastic box (see illustrations 18.1a and 18.1b). Draw the wiring through to the switch, freeing it from any clips or ties and noting its routing.
- 5 Displace the handlebars from the top yoke (see Chapter 6). Slacken the fork clamp bolts in the top yoke (see illustration). Unscrew the steering stem nut and remove it along with its washer (see illustration). Gently ease the top yoke upwards off the fork tubes and position it clear, using a rag to protect the tank or other components (see illustration).
- 6 Two shear-head bolts mount the ignition switch to the underside of the top yoke (see illustration). The heads of the bolts must be drifted round using a suitable punch or drift, or drilled off, before the switch can be removed. Mount the yoke in a vice equipped with soft jaws and padded out with rags to do this. Remove the bolts and withdraw the switch from the top yoke.

Installation

- 7 Installation is the reverse of removal.

Tighten the new bolts until the heads shear off. Make sure wiring connector is securely connected and correctly routed. Tighten the steering stem nut, the fork clamp bolts and the handlebar bolts to the torque settings specified at the beginning of Chapter 6.

19 Handlebar switches-check

- 1 Generally speaking, the switches are reliable and trouble-free. Most troubles, when they do occur, are caused by dirty or corroded contacts, but wear and breakage of internal parts is a possibility that should not be overlooked. If breakage does occur, the entire switch and related wiring harness will have to be replaced with a new one, as individual parts are not available.
- 2 The switches can be checked for continuity using an ohmmeter or a continuity test light. Always disconnect the battery negative (-ve) cable, which will prevent the possibility of a short circuit, before making the checks.
- 3 On YZF models, remove the left-hand fairing side panel to access the left-hand switch wiring connectors and the air filter housing to access the right-hand switch wiring connectors (see Chapters 8 and 4). On FZS models remove the air filter housing to access all wiring connectors, which are housed inside the black plastic box (see Chapter 4). Trace the wiring harness of the switch in question back to its connectors and disconnect them (see illustrations).

4 Check for continuity between the terminals of the switch harness with the switch in the various positions (i.e. switch "OFF" - no continuity, switch "ON" - continuity) - see the *Wiring diagrams* at the end of this Chapter.

5 If the continuity check indicates a problem exists, refer to Section 20, remove the switch and spray the switch contacts with electrical contact cleaner. If they are accessible, the contacts can be scraped clean with a knife or polished with crocus cloth. If switch components are damaged or broken, it will be obvious when the switch is disassembled.

20 Handlebar switches- removal and installation

Removal

1 If the switch is to be removed from the bike, rather than just displaced from the handlebar, trace the wiring harness of the switch in question back to its connectors and disconnect them. On YZF models, remove the left-hand fairing side panel to access the left-hand switch wiring connectors and the air filter housing to access the right-hand switch wiring connectors (see Chapters 8 and 4) (see **illustrations 19.3a or 19.3b**). On FZS models remove the air filter housing to access all wiring connectors (see Chapter 4), which are housed inside the black plastic box (see **illustration 19.3c**). Work back along the harness, freeing it from all the relevant clips and ties, whilst noting its correct routing.

2 Disconnect the wiring connectors from the brake light switch (if removing the right-hand switch) or the clutch switch (if removing the left-hand switch) (see **illustration 14.2 or 23.2**).

3 Unscrew the handlebar switch screws and free the switch from the handlebar by separating the halves (see **illustrations**). If removing the left-hand switch, remove the choke cable lever, noting how it fits.

Installation

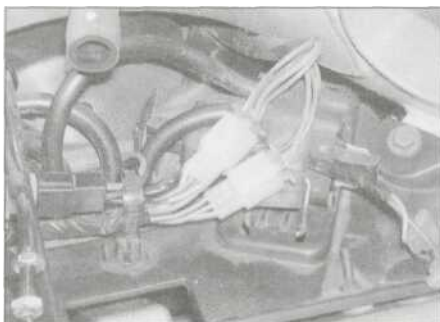
4 Installation is the reverse of removal. Refer to Chapter 4 for installation of the choke cable, if required. Make sure the locating pin in the switch housing locates in the hole in the handlebar. Make sure the wiring connectors are correctly routed and securely connected.

21 Neutral switch - check, removal and installation

Check

1 Before checking the electrical circuit, check the bulb (see Section 17) and fuse (see Section 5).

2 The switch is located in the left-hand side of the transmission casing below the front sprocket. To access the wiring connector on



19.3b Right-hand switch wiring connectors - YZF models



19.3c On FZS models, the wiring connectors are in the black box

YZF models remove the fuel tank, on FZS models remove the left-hand side cover (see Chapter 8, Section 3), then displace the turn signal and starter circuit cut-off relays and draw the wiring connectors out. Trace the wiring from the left-hand side of the engine and disconnect it at the green connector (see **illustrations**). Make sure the transmission is in neutral.

3 With the connector disconnected and the ignition switched "ON", the neutral light should be out. If not, the wire between the connector and instrument cluster must be earthed (grounded) at some point.

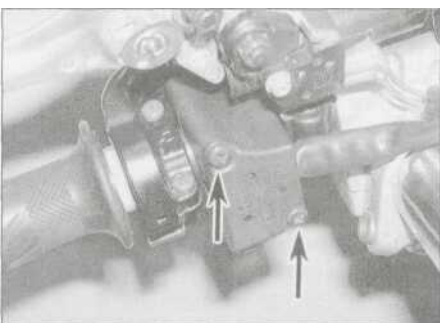
4 Check for continuity between the blue wire terminal on the switch side of the wiring connector and the crankcase. With the transmission in neutral, there should be continuity. With the transmission in gear, there should be no continuity. If the tests prove otherwise, then the switch is faulty.

5 If the continuity tests prove the switch is good, check for voltage at the green terminal on the wiring loom side of the wiring connector using a test light. If there's no voltage present, check the wire between the connector, the instrument cluster and fusebox (see the *Wiring diagrams* at the end of this Chapter). If the voltage is good, check the starter circuit cut-off relay and other components in the starter circuit as described in the relevant sections of this Chapter. If all components are good, check the wiring between the various components (see the *Wiring diagrams* at the end of this Chapter). On FZS models, on completion, remount the relays.

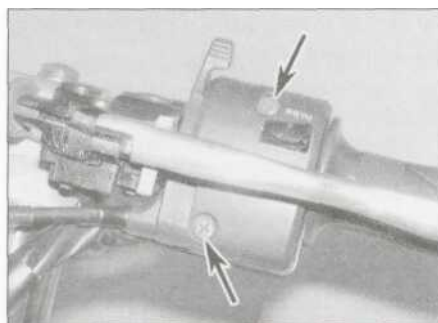
Removal

6 On YZF models remove the left-hand fairing side panel (see Chapter 8, Section 3).

7 Make sure the transmission is in neutral.



20.3a Right-hand switch housing screws (arrowed)



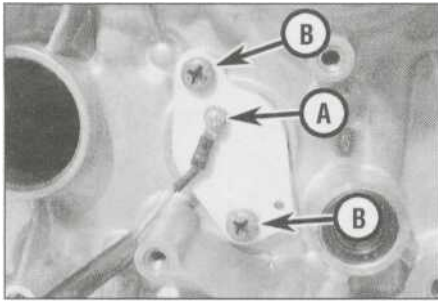
20.3b Left-hand switch housing screws (arrowed)



21.2a Neutral switch wiring connector - YZF models



21.2b Neutral switch wiring connector - FZS models



21.9 Remove the screw (A) and detach the wire, then remove the screws (B) and draw out the neutral switch

The switch is located in the left-hand side of the transmission casing below the front sprocket.

8 Remove the front sprocket cover (see Chapter 6, Section 16, following the relevant Steps).

9 Remove the screw securing the wiring connector and detach the wire (see illustration).

10 Remove the screws securing the switch and detach it from the casing (see illustration 21.9). Discard the O-ring as a new one must be used.

Installation

11 Fit a new O-ring onto the switch (see illustration), then install the switch and tighten its screws securely (see illustration).

12 Attach the wire and secure it with the screw (see illustration 21.9). Check the operation of the neutral light (see above).

13 Install the front sprocket cover (see Chapter 6, Section 16, following the relevant Steps).

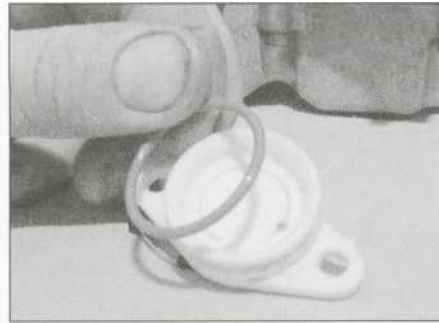
14 On YZF models install the left-hand fairing side panel (see Chapter 8).

22 Sidestand switch - check and replacement

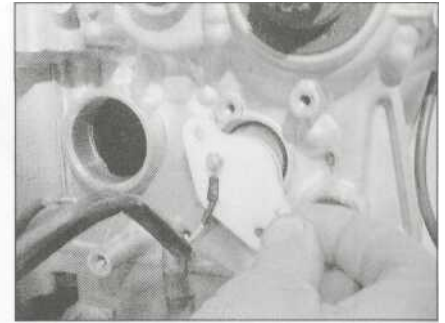


Check

1 The sidestand switch is mounted on the sidestand. The switch is part of the safety circuit which prevents or stops the engine running if the transmission is in gear whilst the sidestand is down, and prevents the engine



21.11 a Fit a new O-ring ...



21.11b ... then install the switch

from starting if the transmission is in gear unless the sidestand is up and the clutch is pulled in. Before checking the electrical circuit, check the fuse (see Section 5).

2 To access the wiring connector on YZF models remove the fuel tank (see Chapter 4), on FZS models remove the left-hand side cover (see Chapter 8, Section 3), then displace the turn signal and starter circuit cut-off relays and draw the wiring connectors out. Trace the wiring from the left-hand side of the engine and disconnect it at the blue connector (see illustrations).

3 Check the operation of the switch using an ohmmeter or continuity test light. Connect the meter probes to the terminals on the switch side of the connector. With the sidestand up there should be continuity (zero resistance) between the terminals, and with the stand down there should be no continuity (infinite resistance).

4 If the switch does not perform as expected, it is defective and must be replaced.

5 If the switch is good, check the starter circuit cut-off relay and other components in the starter circuit as described in the relevant sections of this Chapter. If all components are good, check the wiring between the various components (see the *Wiring diagrams* at the end of this Chapter).

Replacement

6 The sidestand switch is mounted on the sidestand. On YZF models remove the left-hand fairing side panel (see Chapter 8, Section 3) and the fuel tank (see Chapter 4). On FZS models remove the left-hand side cover (see

Chapter 8, Section 3), then displace the turn signal and starter circuit cut-off relays and draw the wiring connectors out. Trace the wiring from the left-hand side of the engine and disconnect it at the blue connector (see illustrations 22.2a and 22.2b). Work back along the switch wiring, freeing it from any relevant retaining clips and ties, noting its correct routing.

7 Remove the screws securing the switch and remove the switch, noting how it fits (see illustration).

8 Fit the new switch, making sure the plunger locates correctly, and tighten the screws securely.

9 Make sure the wiring is correctly routed up to the connector and retained by all the necessary clips and ties.

10 Reconnect the wiring connector and check the operation of the sidestand switch (see above). On FZS models, remount the relays.

11 On YZF models install the fuel tank (see Chapter 4) and the left-hand fairing side panel (see Chapter 8). On FZS models install the left-hand side cover (see Chapter 8).

23 Clutch switch - check and replacement

Check

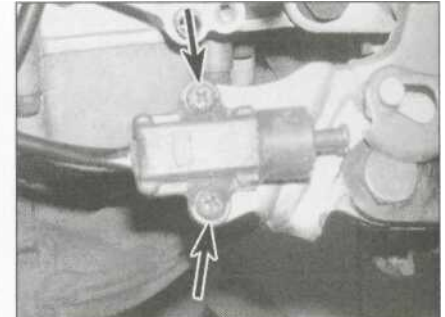
1 The clutch switch is mounted on the underside of the clutch lever bracket. The switch is part of the safety circuit which prevents or stops the engine running if the transmission is in gear whilst the sidestand is



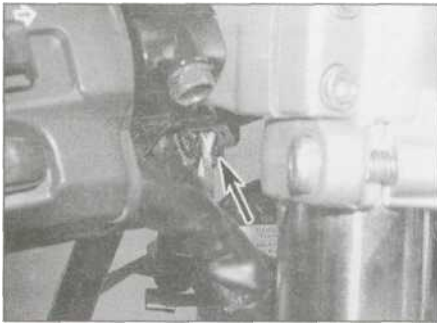
22.2a Sidestand switch wiring connector - YZF models



22.2b Sidestand switch wiring connector • FZS models



22.7 The sidestand switch is secured by two screws (arrowed) - YZF model



23.2 Clutch switch wiring connector (arrowed)

down, and prevents the engine from starting if the transmission is in gear unless the sidestand is up and the clutch lever is pulled in. The switch isn't adjustable.

2 To check the switch, disconnect the wiring connector (see illustration). Connect the probes of an ohmmeter or a continuity test light to the two switch terminals. With the clutch lever pulled in, continuity should be indicated. With the clutch lever out, no continuity (infinite resistance) should be indicated.

3 If the switch is good, check the starter circuit cut-off relay and other components in the starter circuit as described in the relevant sections of this Chapter. If all components are good, check the wiring between the various components (see the *Wiring diagrams* at the end of this Chapter).

Replacement

4 The clutch switch is mounted on the underside of the clutch lever bracket.

5 Disconnect the wiring connector (see illustration 23.2), then remove the screw and detach the switch.

6 Installation is the reverse of removal.

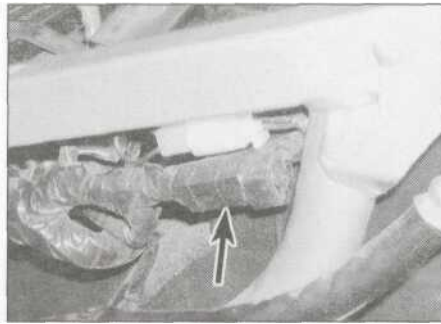
**24 Diode-
check and replacement**

Check

1 The diode is a small block that plugs into the main wiring harness, and is part of the



24.1c ... to access the diode



24.1 a Diode (arrowed) - YZF models

safety circuit which prevents or stops the engine running if the transmission is in gear whilst the sidestand is down, and prevents the engine from starting if the transmission is in gear unless the sidestand is up and the clutch lever is pulled in (see *Wiring Diagrams* at the end of the Chapter). On YZF models remove the left-hand side cover (see Chapter 8, Section 3) - the diode sits under the frame rail (see illustration). On FZS models, remove the fuel tank (see Chapter 4), then unscrew the bolts securing the coil/fuel pump mounting plate and displace it - the diode is underneath it (see illustrations).

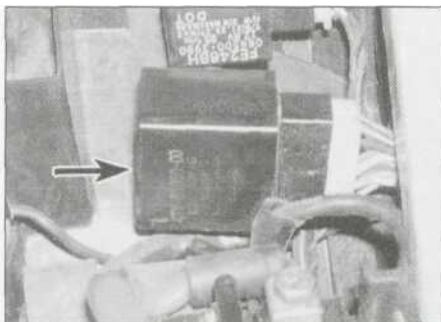
2 Remove the insulating tape, then disconnect the diode from the harness.

3 Using an ohmmeter or continuity tester, connect the positive (+ve) probe to one terminal of the diode and the negative (-ve) probe to the other terminal. Now reverse the probes. The diode should show continuity in one direction and no continuity in the other direction. If it doesn't behave as stated, replace the diode.

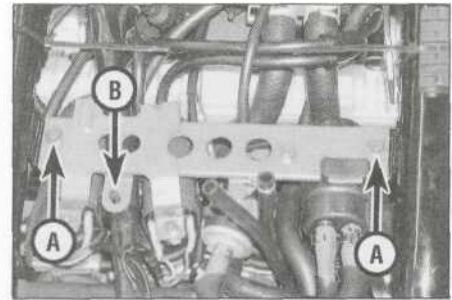
4 If the diode is good, check the starter circuit cut-off relay and other components in the starter circuit as described in the relevant sections of this Chapter. If all components are good, check the wiring between the various components (see the *Wiring diagrams* at the end of this Chapter).

Replacement

5 The diode is a small block that plugs into the main wiring harness. On YZF models remove the left-hand side cover (see Chapter 8, Section 3) - the diode sits under the frame rail (see illustration 24.1a). On FZS models, remove the



25.2a Starter circuit cut-off relay - YZF models



24.1 b On FZS models, unscrew the bolts (A) and release the wiring holder (B), then displace the plate . . .

fuel tank (see Chapter 4), then unscrew the bolts securing the coil/fuel pump mounting plate and displace it - the diode is underneath it (see illustrations 24.1 b and 24.1 c).

6 Remove the insulating tape, then disconnect the diode from the harness and connect the new one.

**25 Starter circuit cut-off relay -
check and replacement**

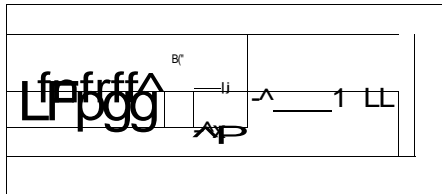
Check

1 The starter circuit cut-off relay is part of the safety circuit which prevents or stops the engine running if the transmission is in gear whilst the sidestand is down, and prevents the engine from starting if the transmission is in gear unless the sidestand is up and the clutch lever is pulled in. The relay is quite complicated internally, containing diodes, resistors and switches, and performs many functions. Due to the extensive (though not complicated) nature of the tests for the relay, the best way to determine whether it is faulty is to substitute it with a new or known-to-be-good one, and see whether the fault is cured.

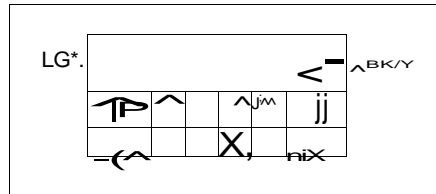
2 If the starter circuit is faulty, first check the fuse (see Section 5). The starter cut-off relay is located under the seat on YZF models, and behind the left-hand side cover on FZS models. Remove the seat or side cover for access (see Chapter 8). Disconnect the relay wiring connector and remove the relay (see illustrations).



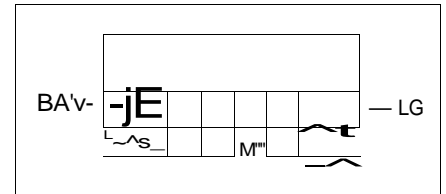
25.2b Starter circuit cut-off relay - FZS models



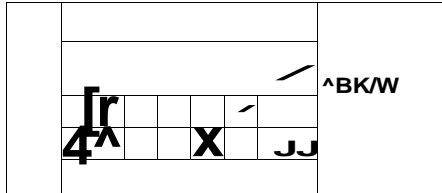
25.3 Starter circuit relay test connections



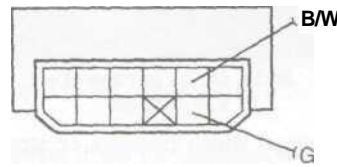
25.4 Starter circuit relay test connections



25.5 Starter circuit relay test connections



25.6 Starter circuit relay test connections



25.7 Starter circuit relay test connections

-<BK/W
-<BK/R

25.8 Starter circuit relay test connections

3 Set a multimeter to the ohms x 1 scale and connect the positive (+ve) probe to the blue wire terminal, and the negative (-ve) probe to the blue/white wire terminal (see illustration). Using a fully-charged 12 volt battery and two insulated jumper wires, connect the battery positive (+ve) lead to the red/black wire terminal, and the negative (-ve) lead to the black/yellow wire terminal. At this point the multimeter should show zero ohms (continuity). If the relay doesn't behave as stated, renew it.

4 Using an ohmmeter or continuity tester, connect the positive (+ve) probe to the black/yellow wire terminal, and the negative (-ve) probe to the light green wire terminal (see illustration). There should be continuity. Now reverse the probes. There should be no continuity. If the relay doesn't behave as stated, renew it.

5 Using an ohmmeter or continuity tester, connect the positive (+ve) probe to the blue/yellow wire terminal, and the negative (-ve) probe to the light green wire terminal (see illustration). There should be continuity. Now reverse the probes. There should be no continuity. If the relay doesn't behave as stated, replace it with a new one.

6 Using an ohmmeter or continuity tester, connect the positive (+ve) probe to the black/white wire terminal, and the negative (-ve) probe to the blue/white wire terminal (see illustration). There should be continuity. Now reverse the probes. There should be no

continuity. If the relay doesn't behave as stated, replace it with a new one.

7 Using an ohmmeter or continuity tester, connect the positive (+ve) probe to the green wire terminal, and the negative (-ve) probe to the blue/white wire terminal (see illustration). There should be continuity. Now reverse the probes. There should be no continuity. If the relay doesn't behave as stated, replace it with a new one.

8 Using an ohmmeter set to the ohms x 100 scale, connect the positive (+ve) probe to the black/red wire terminal, and the negative (-ve) probe to the black/white wire terminal (see illustration). The meter should show between 5 and 15 ohms resistance. If the relay doesn't behave as stated, replace it with a new one.

9 If the relay is good, check the other components in the starter circuit as described in the relevant sections of this Chapter. If all components are good, check the wiring between the various components (see the *Wiring diagrams* at the end of this Chapter).

Replacement

10 The starter cut-off relay is located under the seat on YZF models, and behind the left-hand side cover on FZS models. Remove the seat or side cover for access (see Chapter 8). Disconnect the relay wiring connector and remove the relay (see illustrations 25.2a and 25.2b).

11 Installation is the reverse of removal.

26 Horn - check and replacement

Check

1 If the horn, doesn't work, first check the fuse (see Section 5) and the battery (see Section 3).

2 The horn is mounted under the bottom yoke on YZF models and in the left-hand side of the fairing on FZS models. Remove the fairing (see Chapter 8).

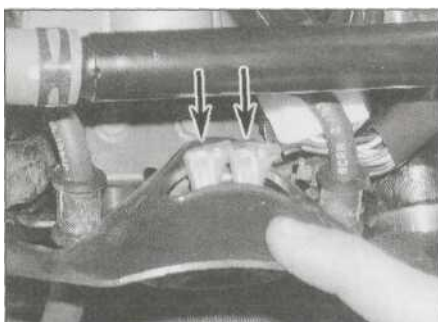
3 Unplug the wiring connectors from the horn (see illustrations). Using two jumper wires, apply battery voltage directly to the terminals on the horn. If the horn sounds, check the switch (see Section 19) and the wiring between the switch and the horn (see the *Wiring diagrams* at the end of this Chapter).

4 If the horn doesn't sound, replace it with a new one.

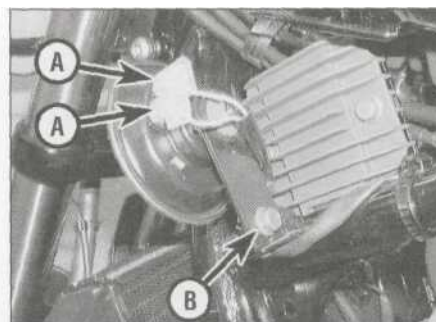
Replacement

5 The horn is mounted under the bottom yoke on YZF models and in the left-hand side of the fairing on FZS models. Remove the fairing (see Chapter 8).

6 Unplug the wiring connectors from the horn (see illustration 26.3a or 26.3b). Unscrew the bolt securing the horn and remove it from the bike (see illustration).



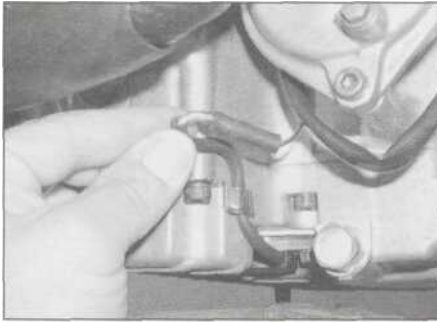
26.3a Horn wiring connectors (arrowed) - YZF models



26.3b Horn wiring connectors (A) and mounting bolt (B) - FZS models



26.6 Horn mounting bolt (arrowed) • YZF models



27.5a Disconnect the sensor wiring connector...

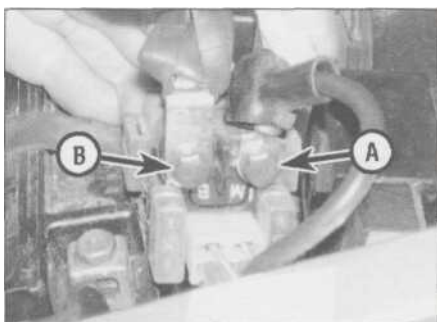
7 Install the horn and securely tighten the bolt. Connect the wiring connectors to the horn. Install the fairing (see Chapter 8).

27 Oil level sensor - check, removal and installation ^

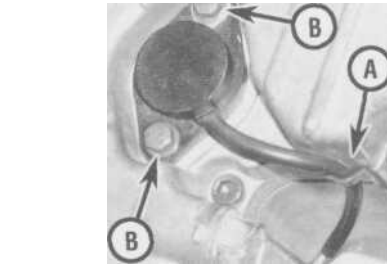
Check

1 With the ignition switch "ON" and the kill switch in the "RUN" position, the oil level warning light should not come on, indicating that the oil level is good. If the light does come on, check the oil level (see *Daily (pre-ride) checks*). If the oil level is good, check the sensor (see Step 3).

2 Start the engine. The oil level warning light should come on, indicating that the oil level has dropped as it is being pumped round the engine. If the light does not come on, stop the engine and check the bulb (see Section 17). If the bulb is good, check for continuity in the wire between the sensor connector and the loom side of the instrument cluster wiring connector (see illustration 15.2b or 15.3a). Also check for continuity between the cluster side of the connector and the bulb holder. If continuity is not found, first disconnect the starter circuit cut-off relay wiring connector, and using an ohmmeter check the resistance between the black/red and black/white wire terminals on the relay. If the resistance is not as specified, or if there is no continuity indicated, replace the relay with a new one. If the relay is good, check the wiring between the various



28.2 Starter motor lead (A) and battery lead (B)



27.5b ... then release the wiring from the clamp (A) and unscrew the bolts (B)...

components and repair it as necessary. If the wiring is good, check the sensor.

3 To check the sensor, remove it from the sump (see Steps 4 and 5 below). Connect one probe of an ohmmeter or continuity tester to the sensor wire and the other probe to its base. With the sensor in its normal installed position (wiring at the bottom), there should be continuity. Turn the sensor upside down. There should be no continuity. If either condition does not occur, replace the sensor.

Removal

4 Drain the engine oil (see Chapter 1).

5 Trace the wiring back from the sensor and disconnect it at the connector (see illustration). Free it from its clamp (see illustration). Unscrew the two bolts securing the sensor to the bottom of the sump and withdraw it from the sump (see illustration). Discard the O-ring as a new one must be used.

Installation

6 Install a new O-ring onto the oil level sensor, then install the sensor into the sump. Tighten its bolts to the torque setting specified at the beginning of the Chapter.

7 Connect the wiring at the connector and check the operation of the sensor (see Steps 1 to 3 above). Secure the wiring in its clamp.

8 Fill the engine with oil (see Chapter 1).

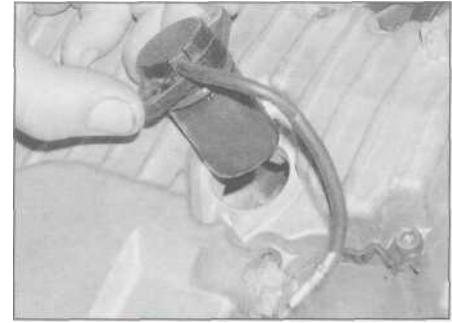
28 Starter relay - check and replacement ^

Check

1 If the starter circuit is faulty, first check the fuse (see Section 5).

2 Remove the seat (see Chapter 8). The starter relay is located behind the battery. Lift the rubber terminal cover and unscrew the bolt securing the starter motor lead (see illustration); position the lead away from the relay terminal. With the ignition switch "ON", the engine kill switch in the "RUN" position, and the transmission in neutral, press the starter switch. The relay should be heard to click.

3 If the relay doesn't click, switch off the



27.5c ... and withdraw the sensor

ignition and remove the relay as described below; test it as follows.

4 Set a multimeter to the ohms x 1 scale and connect it across the relay's starter motor and battery lead terminals (marked "M" and "B" respectively) (see illustration 28.2). Using a fully-charged 12 volt battery and two insulated jumper wires, connect the positive (+ve) terminal of the battery to the red/white wire terminal of the relay, and the negative (-ve) terminal to the blue (YZF) or blue/white (FZS) wire terminal of the relay. At this point the relay should be heard to click and the multimeter read 0 ohms (continuity). If this is the case the relay is proved good. If the relay does not click when battery voltage is applied and indicates no continuity (infinite resistance) across its terminals, it is faulty and must be replaced.

5 If the relay is good, check for battery voltage at the red/white wire terminal on the loom side of the relay wiring connector when the starter button is pressed. If voltage is present, check the other components in the starter circuit as described in the relevant sections of this Chapter. If no voltage was present, or if all components are good, check the wiring between the various components (see the *Wiring diagrams* at the end of this Chapter).

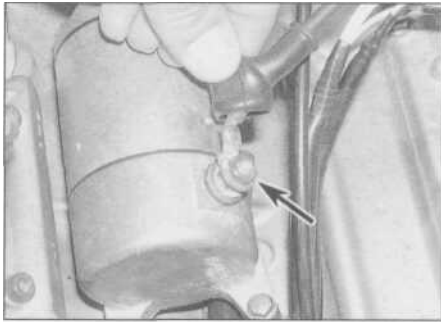
Replacement

6 Remove the seat (see Chapter 8).

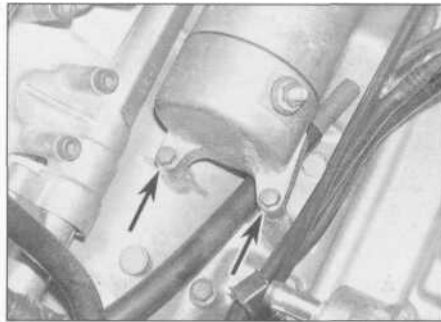
7 Disconnect the relay wiring connector (see illustration). Unscrew the two bolts securing the starter motor and battery leads to the relay and detach the leads (see illustration 28.2). Remove the relay with its rubber sleeve from its mounting lug on the frame.



28.7 Disconnect the relay wiring connector



29.2 Pull back the rubber cover and unscrew the terminal nut (arrowed)



29.3a Unscrew the bolts (arrowed),

***rt~*tm*

29.3b ... and remove the starter motor



8 Installation is the reverse of removal. Make sure the terminal nuts are securely tightened. Connect the negative (-ve) lead last when reconnecting the battery.

29 Starter motor - removal and installation

Removal

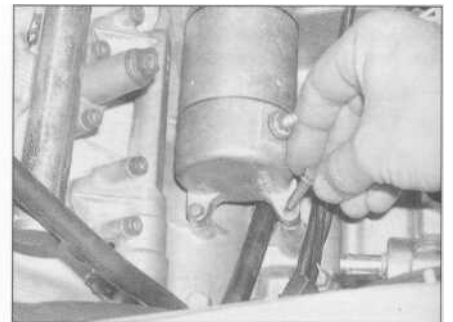
- 1 Remove the seat (see Chapter 8). Disconnect the battery negative (-ve) lead. The starter motor is mounted on the crankcase.
- 2 Peel back the rubber terminal cover and unscrew the nut securing the lead to the starter motor (see illustration). Detach the lead.
- 3 Unscrew the two bolts securing the starter motor (see illustration). Draw the starter motor out of the crankcase and remove it from the machine (see illustration).
- 4 Remove the O-ring on the end of the starter motor and discard it as a new one must be used.

Installation

- 5 Fit a new O-ring onto the end of the starter motor, making sure it is seated in its groove, and smear it with grease (see illustration).
- 6 Manoeuvre the motor into position and slide it into the crankcase (see illustration 29.3b). Ensure that the starter motor teeth mesh correctly with those of the starter idle/reduction gear. Install the mounting bolts and tighten them to the torque setting



29.5 Fit a new O-ring into the groove



29.6 Install the bolts and tighten them to the specified torque

specified at the beginning of the Chapter (see illustration).

- 7 Connect the starter lead to the starter relay and secure it with the nut (see illustration 29.2). Make sure the rubber cover is correctly seated over the terminal.
- 8 Connect the battery negative (-ve) lead and install the seat (see Chapter 8).

30 Starter motor - disassembly, inspection and reassembly

Disassembly

- 1 Remove the starter motor (see Section 29).
- 2 Note the alignment marks between the main housing and the front and rear covers, or make your own if they aren't clear.
- 3 Unscrew the two long bolts, noting how the

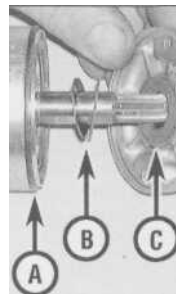
washers locate, and withdraw them from the starter motor (see illustration). Discard their O-rings as new ones must be used.

4 Wrap some insulating tape around the teeth on the end of the starter motor shaft - this will protect the oil seal from damage as the front cover is removed. Remove the front cover from the motor (see illustration). Remove the cover O-ring from the main housing and discard it as a new one must be used. Remove the shims from the front end of the armature shaft or the inside of the front cover, noting their correct fitted locations. Also remove the tabbed thrust washer from the front cover.

5 Remove the rear cover and brushplate assembly from the motor (see illustration). Remove the cover O-ring from the main housing and discard it as a new one must be used (see illustration 30.19). Remove the shims from the rear end of the armature shaft or from inside the rear cover after the



30.3 Unscrew and remove the two bolts (arrowed)...

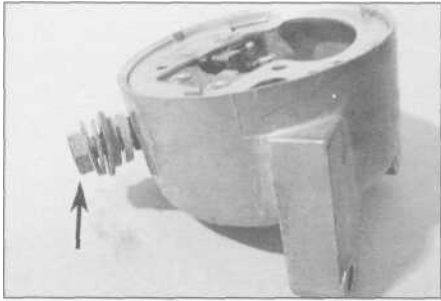


30.4 Remove the front cover, then remove the O-ring (A), shims (B) and tabbed thrust washer (C)

,f



30.5 Remove the rear cover



30.7 Unscrew the nut (arrowed) and remove the various washers and O-ring, noting their order

brushplate assembly has been removed (see illustration 30.20c)

6 Withdraw the armature from the main housing.

7 Noting the correct fitted location of each component, unscrew the terminal nut and remove it along with its washer, the insulating washers and the O-ring (see illustration). Withdraw the terminal bolt and brushplate assembly from the rear cover (see illustration 30.17b).

8 Lift the brush springs and slide the brushes out from their holders (see illustration 30.16).

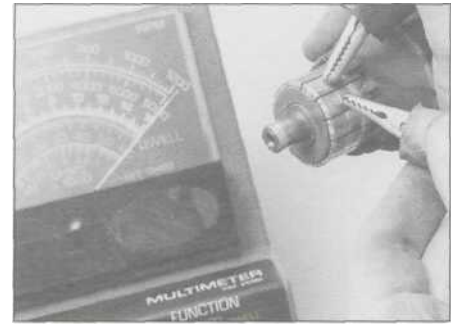
Inspection

9 The parts of the starter motor that are most likely to require attention are the brushes. Measure the length of the brushes and compare the results to the length listed in this Chapter's Specifications (see illustration). If any of the brushes are worn beyond the

service limit, replace the brush assembly with a new one. If the brushes are not worn excessively, nor cracked, chipped, or otherwise damaged, they may be re-used.

10 Inspect the commutator bars on the armature for scoring, scratches and discoloration. The commutator can be cleaned and polished with crocus cloth, but do not use sandpaper or emery paper. After cleaning, wipe away any residue with a cloth soaked in electrical system cleaner or denatured alcohol. Measure the diameter of the commutator and compare it to the specifications. If it has worn below the wear limit, replace the starter motor. Measure the depth of the insulating mica below the surface of the commutator bars. If the mica is less than the depth specified, scrape it away until the specified depth is reached.

11 Using an ohmmeter or a continuity test light, check for continuity between the commutator bars (see illustration). Continuity



30.11 a Continuity should exist between the commutator bars

should exist between each bar and all of the others. Also, check for continuity between the commutator bars and the armature shaft (see illustration). There should be no continuity (infinite resistance) between the commutator and the shaft. If the checks indicate otherwise, the armature is defective.

12 Check for continuity between the terminal bolt and the housing (when assembled). There should be no continuity (infinite resistance).

13 Check the front end of the armature shaft for worn, cracked, chipped and broken teeth. If the shaft is damaged or worn, replace the armature.

14 Inspect the end covers for signs of cracks or wear. Inspect the magnets in the main housing and the housing itself for cracks.

15 Inspect the insulating washers and front cover oil seal for signs of damage and replace them if necessary.

Reassembly

16 Slide the brushes back into position in their holders and place the brush spring ends onto the brushes (see illustration).

17 Ensure that the inner rubber insulator is in place on the terminal bolt, then fit the O-ring over the terminal (see illustration). Insert the bolt through the rear cover and fit the brushplate assembly in the rear cover, making sure its tab is correctly located in the slot in the cover (see illustration). Fit the insulating washers over the terminal, then fit the standard washer and the nut (see illustration 30.7).

18 Slide the shims onto the rear end of the armature shaft, then lubricate the shaft with a drop of oil (see illustration). Insert the



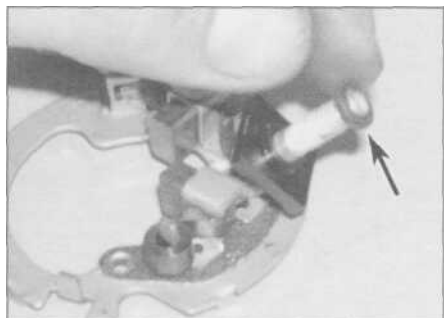
30.9 Measure the brush length



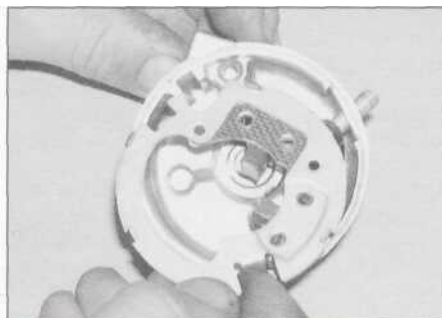
30.11 b There should be no continuity between the commutator bars and the armature shaft



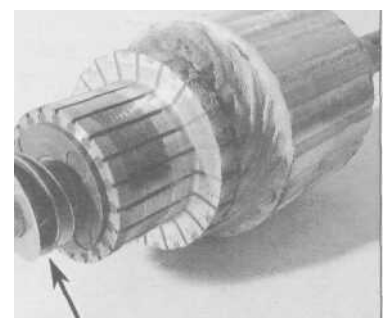
30.16 Fit the brushes into the brushplate and locate the springs



30.17a Fit the inner insulator (arrowed) onto the terminal bolt

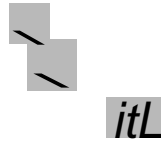


30.17b Fit the brushplate assembly into the rear cover, aligning the tab with the slot

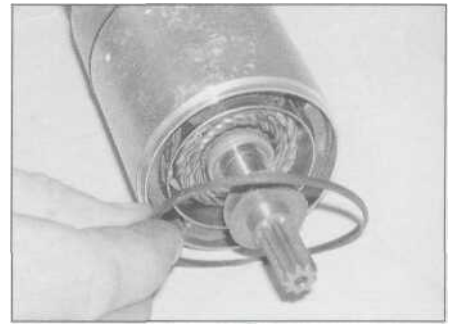


30.18a Fit the shims (arrowed) onto the shaft...

30.18b ... then insert the armature into the rear cover, making sure the brush ends locate correctly



30.19 Fit a new O-ring onto the rear of the housing



30.20a Fit a new O-ring onto the front of the main housing . . .

30.20b ... and locate the tabbed washer in the front cover



30.20c Fit the shims (arrowed) onto the shaft



30.21 Install the long bolts, locating the flat of each washer against the raised edge

armature into the rear cover, locating the brushes on the commutator bars as you do, taking care not to damage them (see illustration). Check that each brush is securely pressed against the commutator by its spring and is free to move easily in its holder.

19 Fit a new O-ring onto the main housing (see illustration). Fit the housing over the armature and onto the rear cover, aligning the marks made on removal (see illustration 30.5). 20 Apply a smear of grease to the lips of the front cover oil seal and fit a new O-ring onto the front of the main housing (see illustration). Fit the tabbed washer onto the cover, making sure the tabs locate correctly (see illustration). Slide the shims onto the front of the armature shaft (see illustration).

Install the cover, aligning the marks made on removal (see illustration 30.4). Remove the protective tape from the shaft end.

21 Slide a new O-ring onto each of the long bolts. Check the marks made on removal are correctly aligned, then install the long bolts and tighten them securely, making sure the flat edge on each washer is against the raised section on the front cover (see illustration).

22 Install the starter motor (see Section 29).

31 Charging system testing - general information and precautions

1 If the performance of the charging system is suspect, the system as a whole should be checked first, followed by testing of the individual components. **Note:** Before beginning the checks, make sure the battery is fully charged and that all system connections are clean and tight.

2 Checking the output of the charging system and the performance of the various components within the charging system requires the use of a multimeter (with voltage, current and resistance checking facilities).

3 When making the checks, follow the procedures carefully to prevent incorrect connections or short circuits, as irreparable damage to electrical system components may result if short circuits occur.

4 If a multimeter is not available, the job of checking the charging system should be left to a Yamaha dealer.

32 Charging system - leakage and output test

1 If the charging system of the machine is thought to be faulty, remove the seat (see Chapter 8) and perform the following checks.

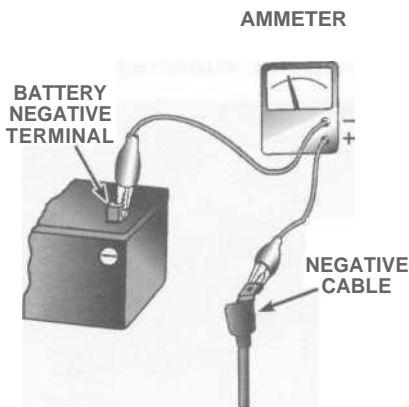
Leakage test

Caution: Always connect an ammeter in series, never in parallel with the battery, otherwise it will be damaged. Do not turn the ignition on or operate the starter motor when the ammeter is connected - a sudden surge in current will blow the meter's fuse.

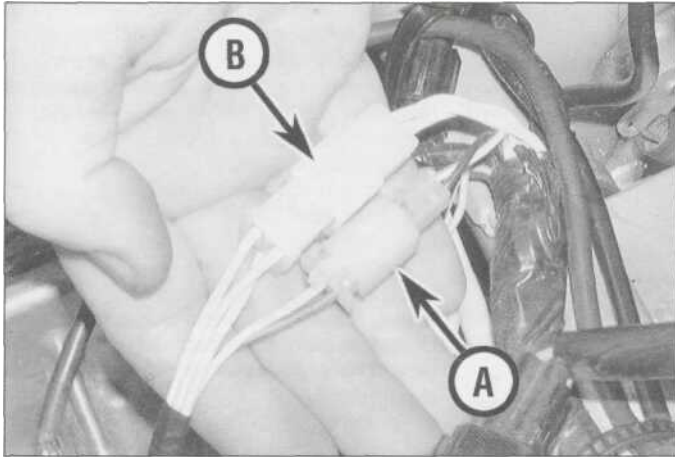
2 Turn the ignition switch off and disconnect the lead from the battery negative (-ve) terminal.

3 Set the multimeter to the amps function and connect its negative (-ve) probe to the battery negative (-ve) terminal, and positive (+ve) probe to the disconnected negative (-ve) lead (see illustration). Always set the meter to a high amps range initially and then bring it down to the mA (milli-amps) range; if there is a high current flow in the circuit it may blow the meter's fuse.

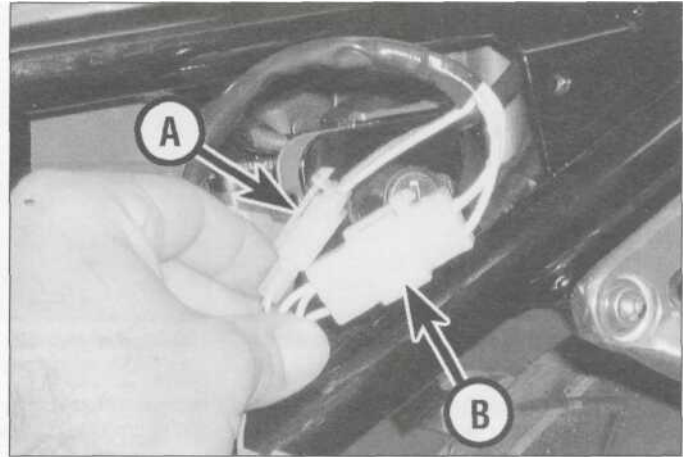
4 No current flow should be indicated. If current leakage is indicated (generally greater than 0.1 mA), there is a short circuit in the wiring. Using the wiring diagrams at the end of this Chapter, systematically disconnect individual electrical components, checking the meter each time until the source is identified.



32.3 Checking the charging system leakage rate



33.2a Alternator wiring connector (B) and pick-up coil wiring connector (A) - YZF models



33.2b Alternator wiring connector (B) and pick-up coil wiring connector (A) - FZS models

5 If no leakage is indicated, disconnect the meter and connect the negative (-ve) lead to the battery, tightening it securely

33 Alternator-
check, removal and installation *v

alternator stator coil assembly is at fault and should be replaced with a new one.

Removal

- 4 To access the wiring connectors on YZF models remove the fuel tank (see Chapter 4), on FZS models remove the left-hand side cover (see Chapter 8, Section 3), then displace the turn signal and starter circuit cut-off relays and draw the wiring connectors out.
- 5 Trace the alternator/pick-up coil wiring back from the alternator cover on the left-hand side of the engine and disconnect it at the two white connectors (see illustration 33.2a or 33.2b). Free the wiring from any clips or guides and feed it through to the alternator cover.
- 6 On YZF models, remove the left-hand fairing side panel (see Chapter 8, Section 3).
- 7 Working in a criss-cross pattern, unscrew the bolts securing the alternator cover and remove the cover, on FZS models noting the coolant hose guard (see illustrations). Note the position of the dowels and remove them if loose.
- 8 To remove the rotor bolt it is necessary to stop the rotor from turning. If a rotor holding strap or tool is not available, and if the engine is still in the frame, place the transmission in gear and have an assistant apply the rear brake, then unscrew the bolt (see illustration).

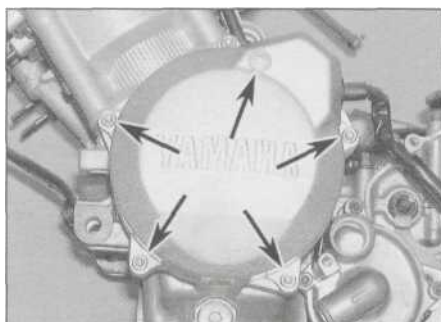
Output test

- 6 Start the engine and warm it up to normal operating temperature. Remove the seat (see Chapter 8).
- 7 To check the regulated voltage output, allow the engine to idle and connect a multimeter set to the 0-20 volts DC scale (voltmeter) across the terminals of the battery (positive (+ve) lead to battery positive (+ve) terminal, negative (-ve) lead to battery negative (-ve) terminal). Slowly increase the engine speed to 5000 rpm and note the reading obtained. The regulated voltage should be as specified at the beginning of the Chapter. If the voltage is outside these limits, check the alternator and the regulator (see Sections 33 and 34).

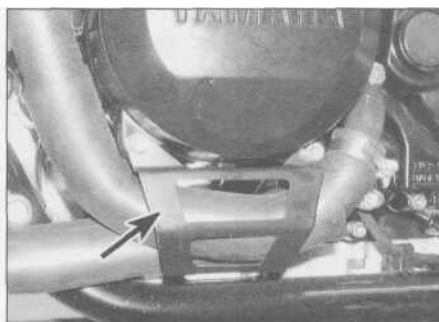
Check

- 1 To access the wiring connectors on YZF models remove the fuel tank (see Chapter 4), on FZS models remove the left-hand side cover (see Chapter 8, Section 3), then displace the turn signal and starter circuit cut-off relays and draw the wiring connectors out.
- 2 Trace the wiring back from the alternator cover on the left-hand side of the engine and disconnect it at the white connector containing the three white wires (see illustrations).
- 3 Using a multimeter set to the ohms x 1 (ohmmeter) scale measure the resistance between each of the white wires on the alternator side of the connector, taking a total of three readings, then check for continuity between each terminal and ground (earth). If the stator coil windings are in good condition the three readings should be within the range shown in the Specifications at the start of this Chapter and there should be no continuity (infinite resistance) between any of the terminals and ground (earth). If not, check the fault is not due to damaged wiring between the connector and coils. If the wiring is good, the

*Clues to a faulty regulator
I are constantly blowing
HIRTI bulbs, with brightness
varying considerably with
engine speed, and battery overheating.*



33.7a Unscrew the alternator cover bolts (arrowed)...



33.7b ... on FZS models, noting the hose guard (arrowed)

33.8 Remove the rotor bolt and its washer

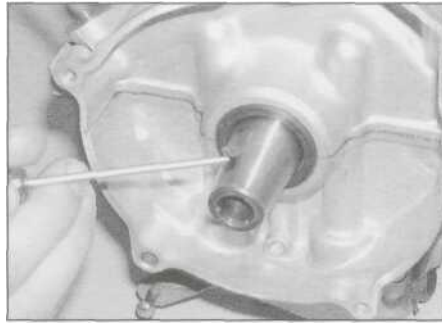


33.9a Remove the rotor using a puller

Caution: If a rotor holding strap is used, make sure it does not contact the raised sections on the outside of the rotor.

9 To remove the rotor from the shaft it is necessary to use a rotor puller. Yamaha provide a special tool (part No. 90890-01362), or alternatively a similar tool can be set up as shown, using the threaded holes in the rotor (see illustration). After the rotor has been removed, remove the Woodruff key from the slot in the crankshaft for safekeeping if loose (see illustration).

10 To remove the stator from the cover, remove the three bolts securing the stator and the two screws securing the pick-up coil, then



33.9b Remove the Woodruff key from its slot for safekeeping

remove the assembly, noting how the rubber wiring grommet fits (see illustration).

Installation

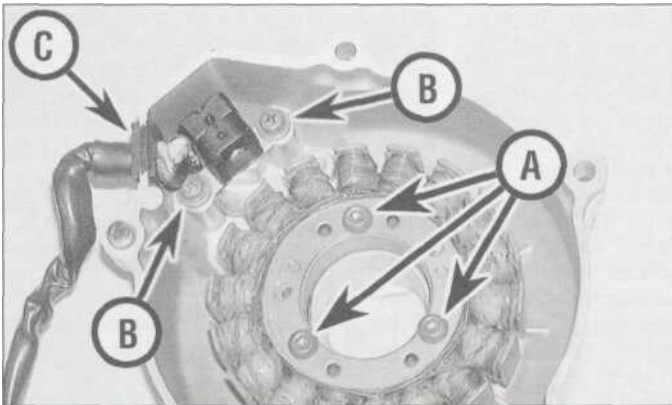
11 Install the stator and the pick-up coil in the cover, aligning the rubber wiring grommet with the groove (see illustration 33.10). Apply a suitable non-permanent thread locking compound to the stator bolt threads, then install the bolts and tighten them to the torque setting specified at the beginning of the Chapter. Also tighten the pick-up coil screws to the specified torque. Apply a suitable sealant to the wiring grommet, then press it into the cut-out in the cover.

12 Clean the tapered end of the crankshaft and the corresponding mating surface on the inside of the rotor with a suitable solvent. Fit the Woodruff key into its slot in the crankshaft (see illustration 33.9b). Make sure that no metal objects have attached themselves to the magnet on the inside of the rotor, then install the rotor onto the shaft, making sure the slot is correctly aligned with the key (see illustration).

13 Install the rotor bolt with its washer (see illustration 33.8), and tighten it to the torque setting specified at the beginning of the Chapter, using the method employed on removal to prevent the rotor from turning (see illustration).

14 Install the alternator cover, making sure it locates onto the dowels (see illustration). Tighten the cover bolts evenly in a criss-cross pattern to the specified torque setting, on FZS models not forgetting the hose guard secured by the bottom bolts (see illustrations 33.7a and 33.7b). Connect the alternator and pick-up coil wiring connectors, making sure they are correctly routed and secured by any clips or ties (see illustration 33.2a or 33.2b)

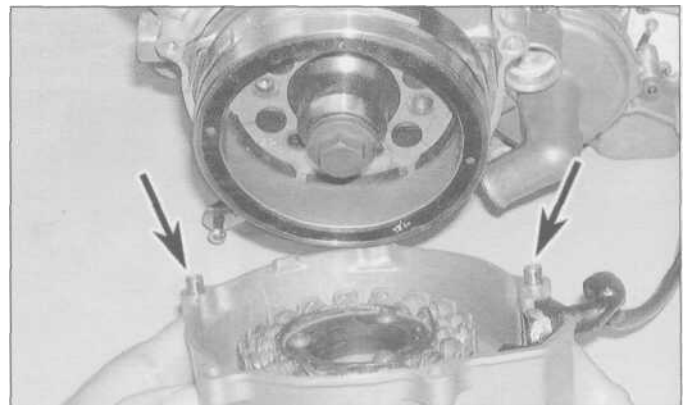
15 On YZF models, install the left-hand fairing side panel and the seat, and on FZS models install the left-hand side cover (see Chapter 8).



33.10 Remove the rotor bolts (A) and the pick-up coil screws (B), and free the wiring grommet (C)



33.12 Slide the rotor onto the shaft, making sure it locates correctly onto the key

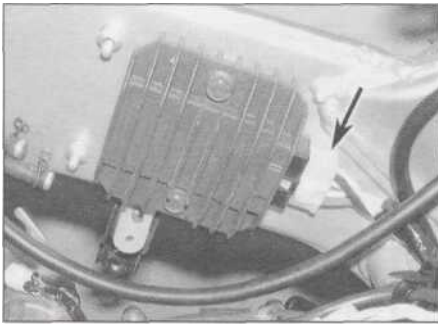


33.14 Make sure the dowels (arrowed) are in place when installing the cover

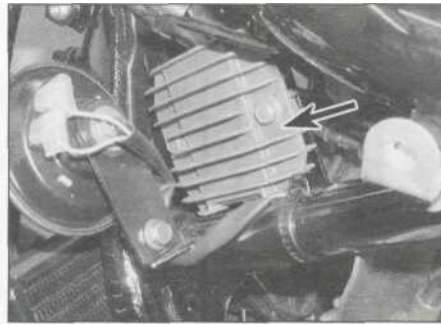


33.13 Tighten the rotor bolt to the specified torque

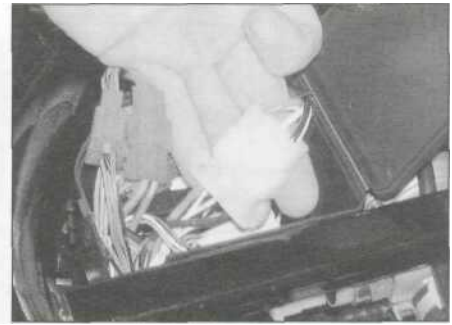




34.3 Regulator/rectifier and its wiring connector (arrowed) - YZF models



34.4a Regulator/rectifier (arrowed) - FZS models



34.3b Regulator/rectifier wiring connector - FZS models

34 Regulator/rectifier - check and replacement

Check

1 Yamaha provide no test specifications for the regulator/rectifier. If it is suspected of being faulty, first check all other components and wiring in the charging circuit, referring to the relevant Sections in this Chapter and to the wiring diagrams at the end.

2 If all other components and the wiring are good, then the regulator/rectifier could be faulty. Remove the unit (see below) and take it to a Yamaha dealer for testing. Alternatively, substitute the suspect unit with a known good one and see if the fault is cured.

Replacement

3 On YZF models, the regulator/rectifier is mounted on the inside of the right-hand frame beam - remove the fuel tank for access (see Chapter 4). Disconnect the wiring connector (see illustration).

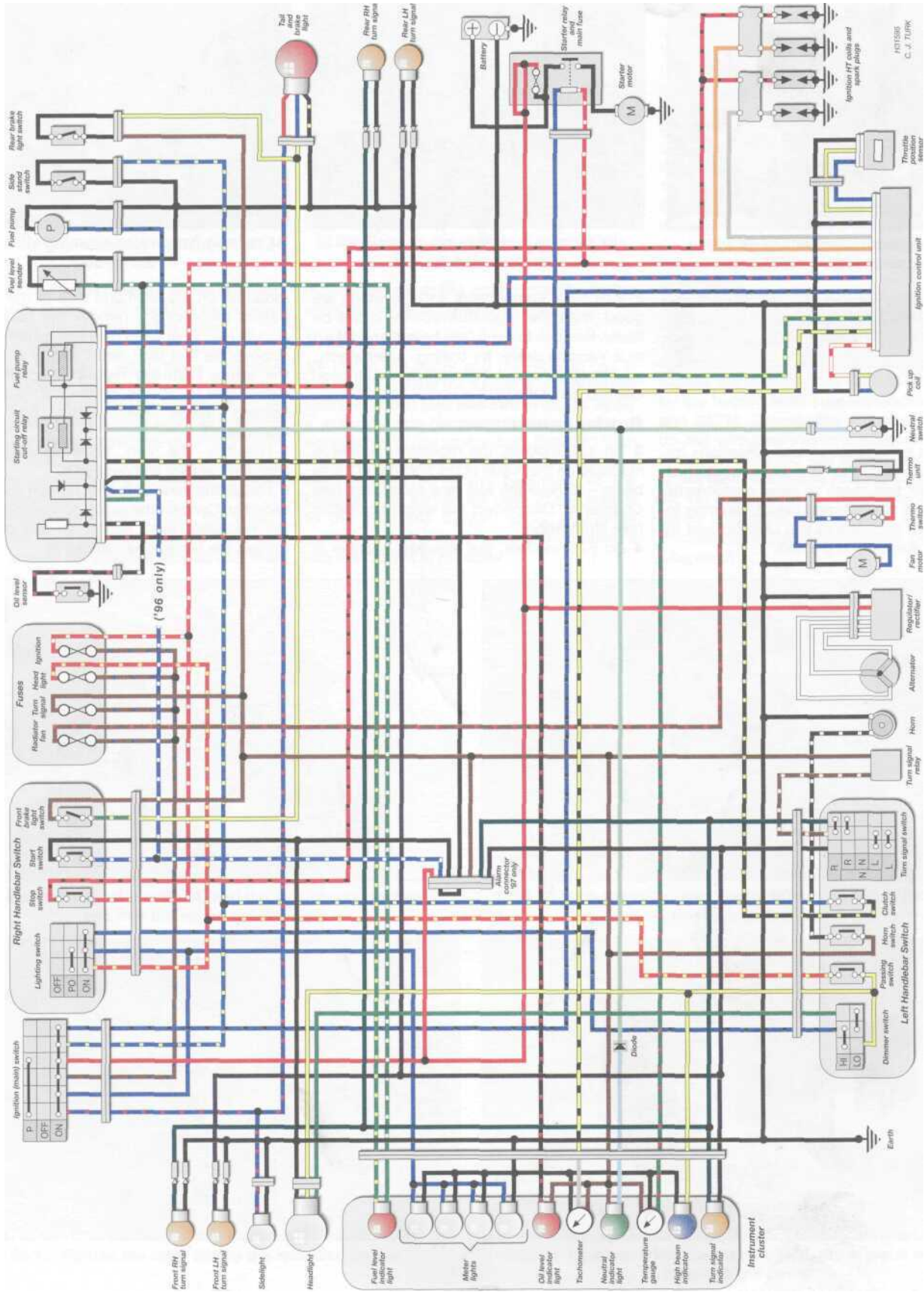
4 On FZS models, the regulator/rectifier is

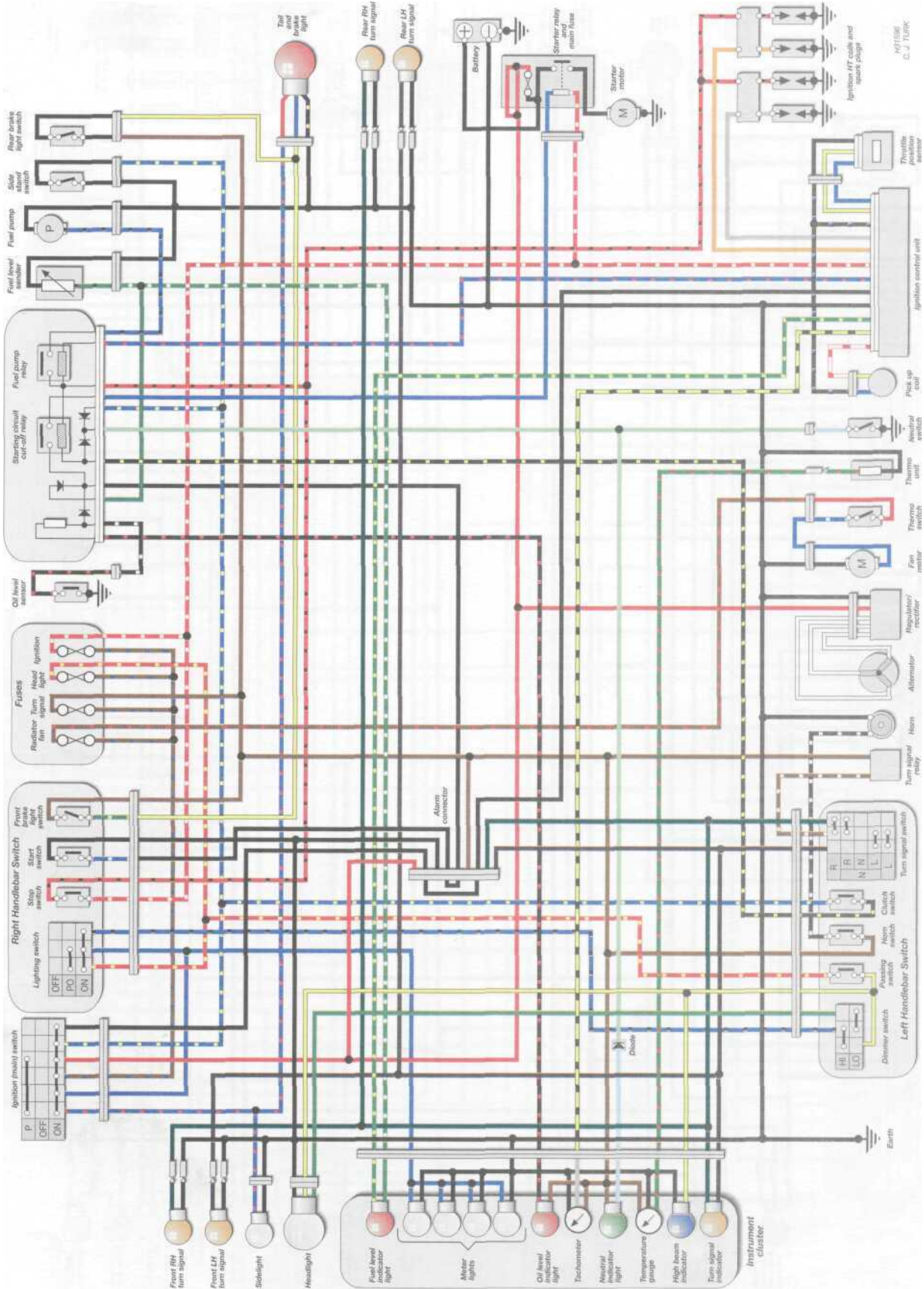
mounted on the left-hand side of the frame behind the fairing - remove the fairing for access (see Chapter 8) (see illustration). Also remove the fuel tank (see Chapter 4). Trace the wiring from the regulator/rectifier and disconnect it at the connector, which is housed inside the plastic box (see illustration).

5 Unscrew the two bolts securing the regulator/rectifier and remove it.

6 Install the new unit and tighten its bolts securely. Connect the wiring connector. Install the fuel tank (see Chapter 4), and on FZS models the fairing (see Chapter 8).

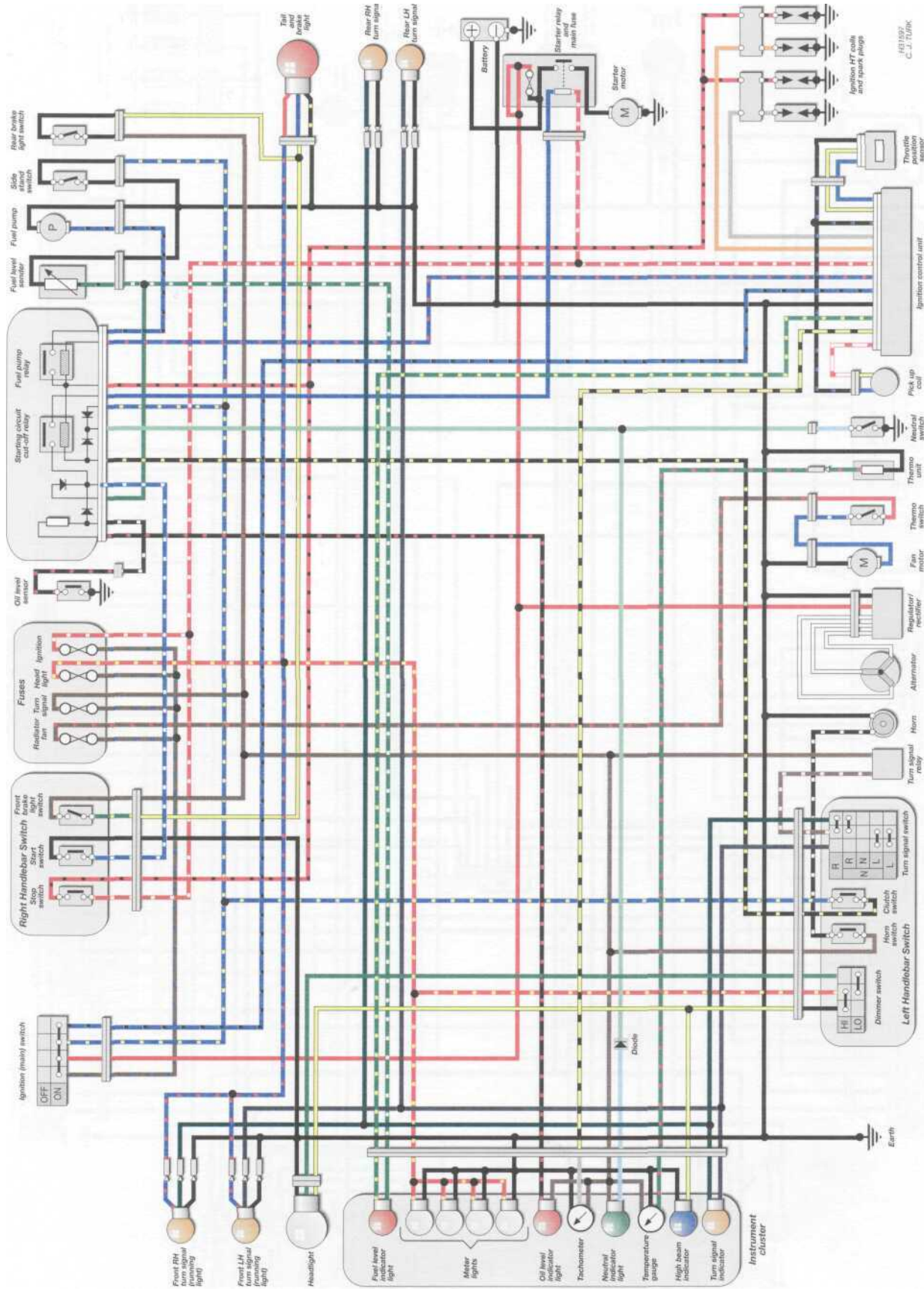
9*26 Wiring diagrams

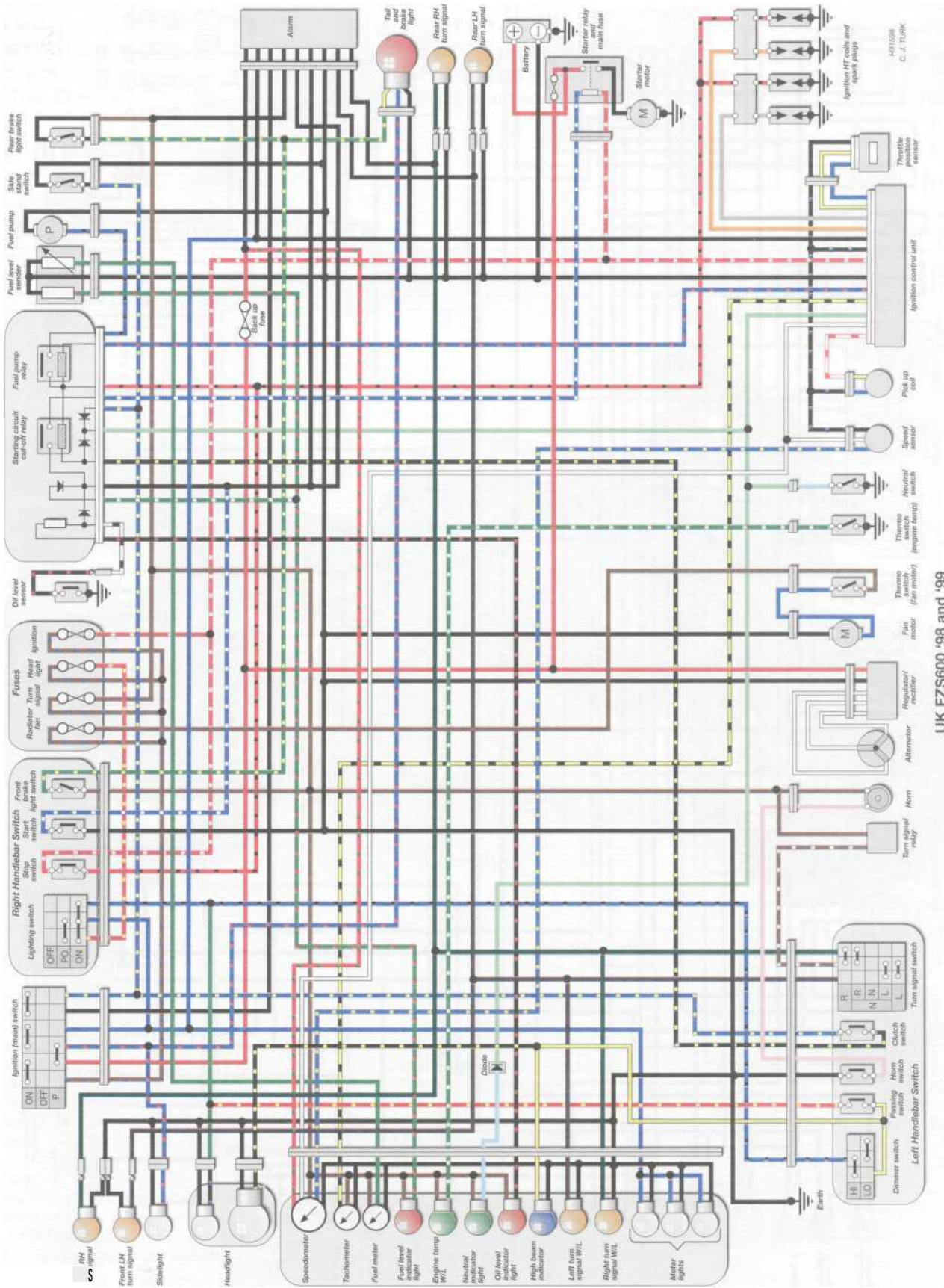




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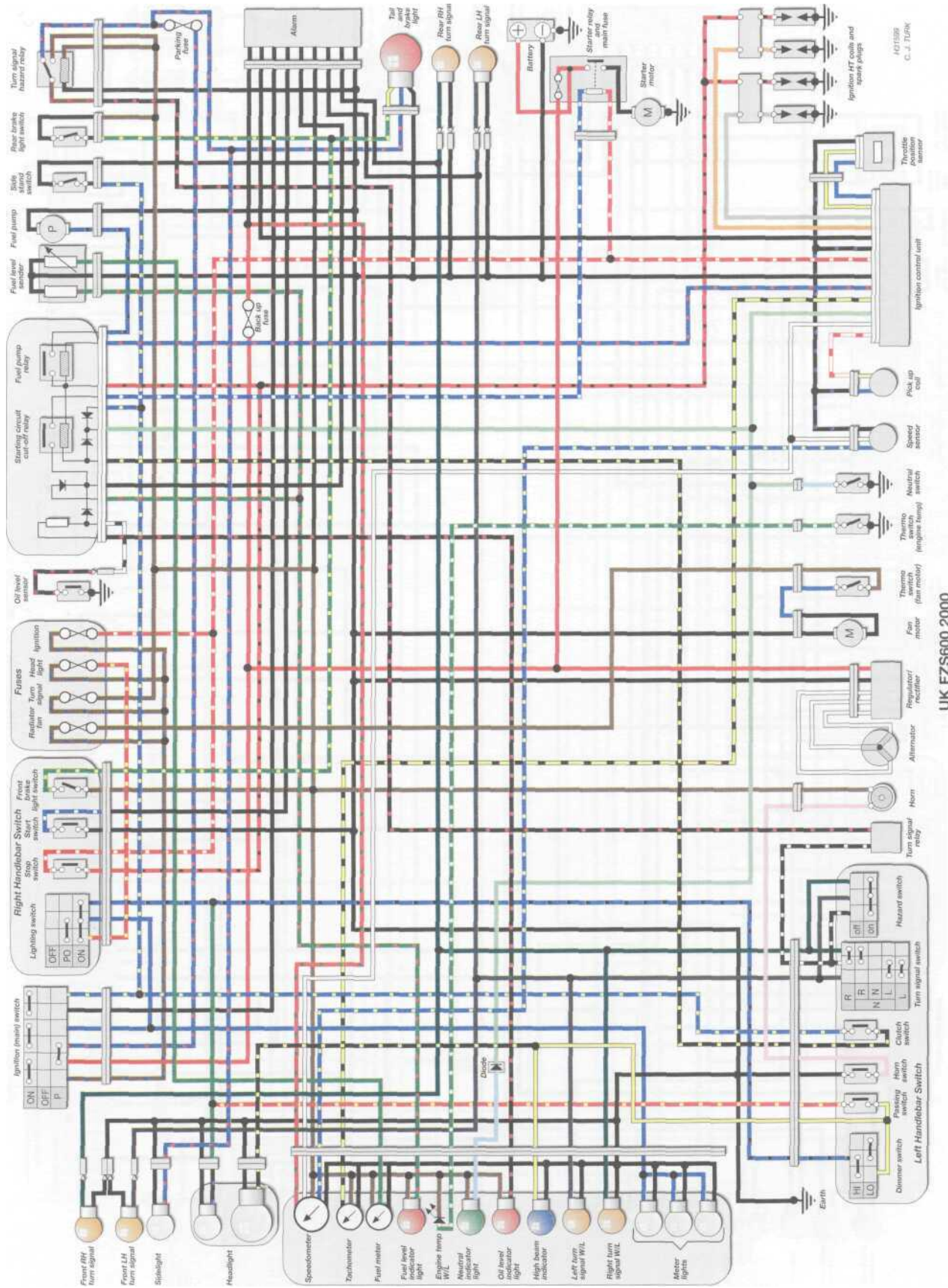
9*28 Wiring diagrams





UK FZS600 '98 and '99

9»30 Wiring diagrams



UK FZS600 2000