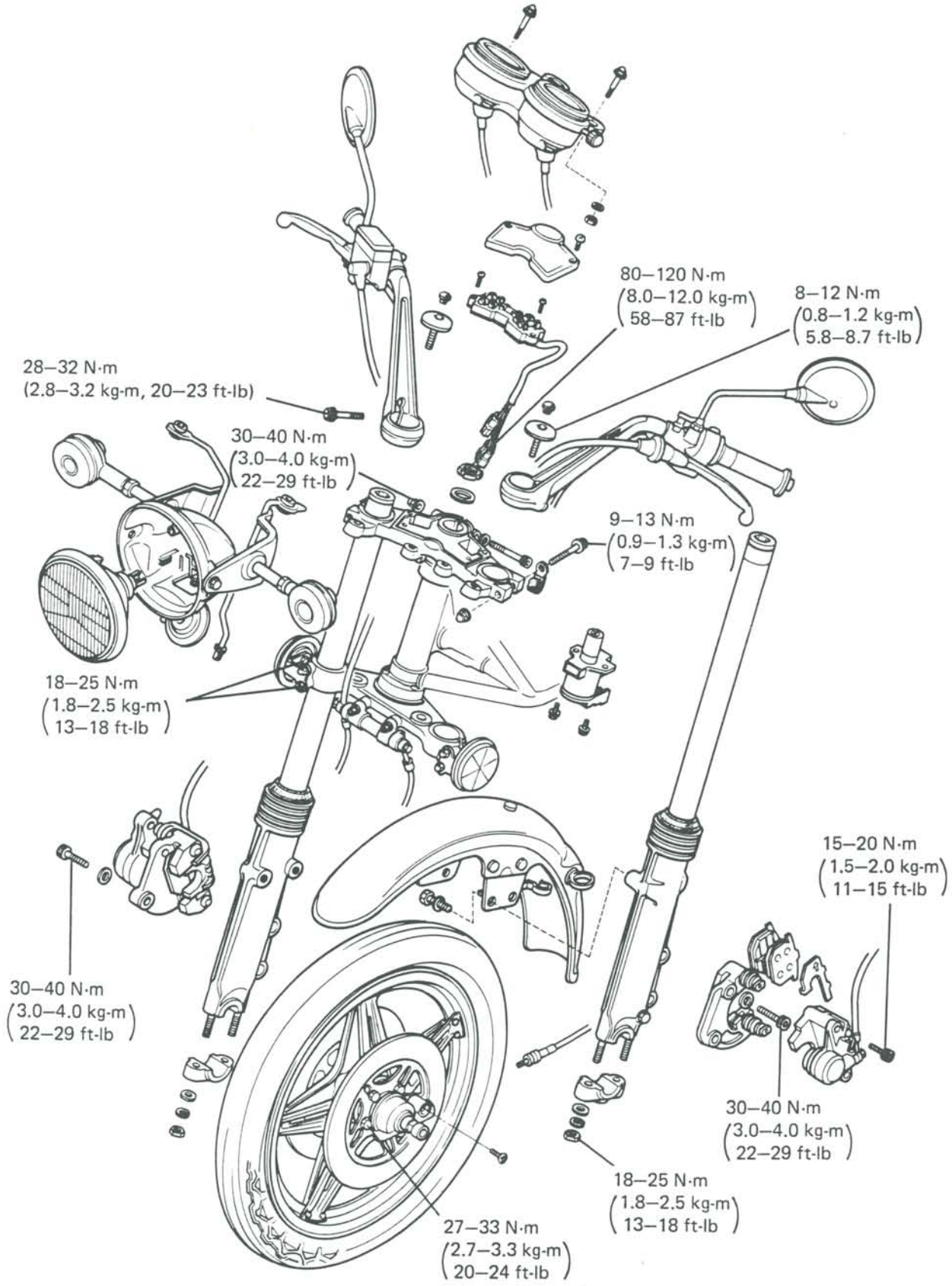
FRONT WHEEL/SUSPENSION

ROUE/SUSPENSION AVANT

VORDERRAD/ AUFHÄNGUNG

RUEDA DELANTERA/ SUSPENSION


80–120 N·m
(8.0–12.0 kg-m)
58–87 ft-lb
8–12 N·m
(0.8–1.2 kg-m)
5.8–8.7 ft-lb
28–32 N·m
(2.8–3.2 kg-m, 20–23 ft-lb)
30–40 N·m
(3.0–4.0 kg-m)
22–29 ft-lb
9–13 N·m
(0.9–1.3 kg-m)
7–9 ft-lb
18–25 N·m
(1.8–2.5 kg-m)
13–18 ft-lb
15–20 N·m
(1.5–2.0 kg-m)
11–15 ft-lb
30–40 N·m
(3.0–4.0 kg-m)
22–29 ft-lb
30–40 N·m
(3.0–4.0 kg-m)
22–29 ft-lb
18–25 N·m
(1.8–2.5 kg-m)
13–18 ft-lb
27–33 N·m
(2.7–3.3 kg-m)
20–24 ft-lb

SERVICE INFORMATION	13–1
TROUBLESHOOTING	13–2
HEADLIGHT	13–3
INSTRUMENTS	13–6
HANDLEBAR SWITCH/HANDLEBARS	13–8
FRONT WHEEL	13–14
FRONT FORK	13–19
STEERING STEM	13–25

SERVICE INFORMATION

WORKING PRACTICE

The front wheel uses a tubeless tire. For tubeless tire repairs, refer to the TUBELESS TIRE MANUAL, code No. 6141550.
Do not remove rivets, nuts and pins from the rim, spoke plate and hub.
Never ride on the rim or try to bend the wheel.
Avoid damaging the aluminum alloy rim.

SPECIAL TOOLS

Special Tools			
Steering Stem Socket	07916–3710100	Bearing Driver Outer (42x47mm)	07746–0010300
Hollow Set Wrench (6mm)	07917–3230000	Bearing Driver Pilot (15mm)	07746–0040300
Bearing Race Remover	07946–3710500	Front Fork Oil Seal Driver Body	07747–0010100
Steering Stem Driver	07946–3710600	Front Fork Oil Seal Attachment (E)	07747–0010600
Bearing Driver Attachment	07946–3710700	Lock Nut Wrench Socket (26 x 30)	07716–0020202
Common Tools		Bearing Driver Handle (A)	07749–0010000
Retainer Wrench C	07710–0010300	Extension Bar	07716–0020500
Retainer Wrench Body	07710–0010400		

TORQUE VALUES

Front brake disc	27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)	Handlebar mounting bolt	28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)
Front axle nut	55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)	Fork bottom bridge	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)
Front caliper bracket	30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)	Fork top bridge	9–13 N·m (0.9–1.3 kg-m, 7–9 ft-lb)
Front caliper	15–20 N·m (1.5–2.0 kg-m, 11–15 ft-lb)	Head top thread	8–12 N·m (0.8–1.2 kg-m, 5.8–8.7 ft-lb)
Front axle holder nut	18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)	Steering stem nut	80–120 N·m (8.0–12.0 kg-m, 58–87 ft-lb)
Front fork bolt	20–30 N·m (2.0–3.0 kg-m, 15–22 ft-lb)		

SPECIFICATIONS

		STANDARD	SERVICE LIMIT
Axle shaft runout		—	0.2 mm (0.008 in)
Front wheel rim runout	Radial	—	2.0 mm (0.08 in)
	Axial	—	2.0 mm (0.08 in)
Fork spring free length		562.0 mm (22.1 in)	552.0 mm (21.7 in)
Tube bend		—	0.2 mm (0.008 in)
Front fork slider I.D.		35.042–35.104 mm (1.3796–1.3820 in)	35.25 mm (1.388 in)
Front fork tube O.D.		34.96–35.90 mm (1.3764–1.4134 in)	34.85 mm (1.372 in)

TROUBLESHOOTING

Hard Steering
1. Steering stem nut too tight
2. Faulty steering stem bearings
3. Damaged steering stem bearings
4. Insufficient tire pressure

Steers to One Side or Does Not Track Straight
1. Unevenly adjusted right and left shock absorbers
2. Bent front forks
3. Bent front axle; wheel installed incorrectly

Front Wheel Wobbling
1. Distorted rim
2. Worn front wheel bearing
3. Faulty tire
4. Axle not tightened properly

Soft Suspension
1. Weak fork spring
2. Insufficient fluid in front forks

Hard Suspension
1. Incorrect fluid weight in front forks

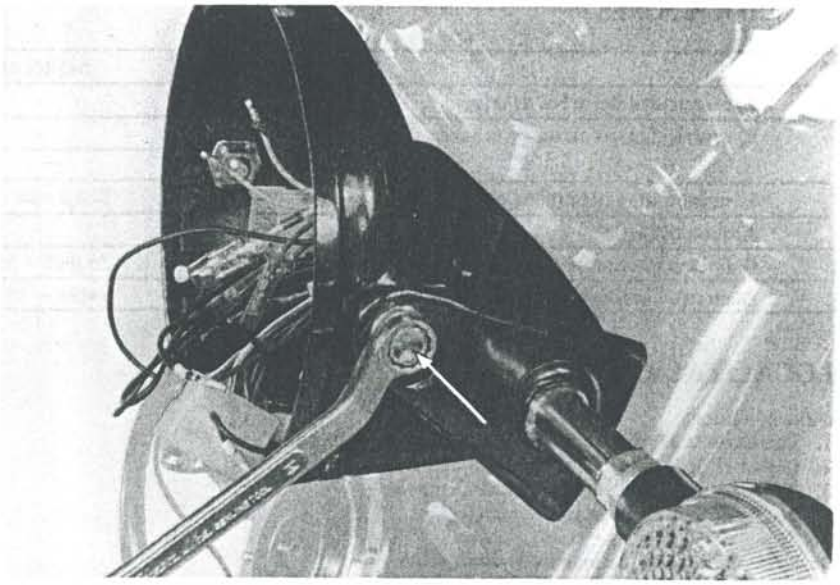
Front Suspension Noise
1. Slider binding
2. Insufficient fluid in forks
3. Loose front fork fasteners

HEADLIGHT

HEADLIGHT CASE REMOVAL

Remove the headlight and disconnect all wires at their couplers and connectors.

To remove the headlight case, unscrew the headlight case mounts.



HEADLIGHT DISASSEMBLY/ ASSEMBLY

Remove the bulb cover, set ring and bulb. Remove the retaining lock pins, screws and horizontal adjusting screw from the rim.

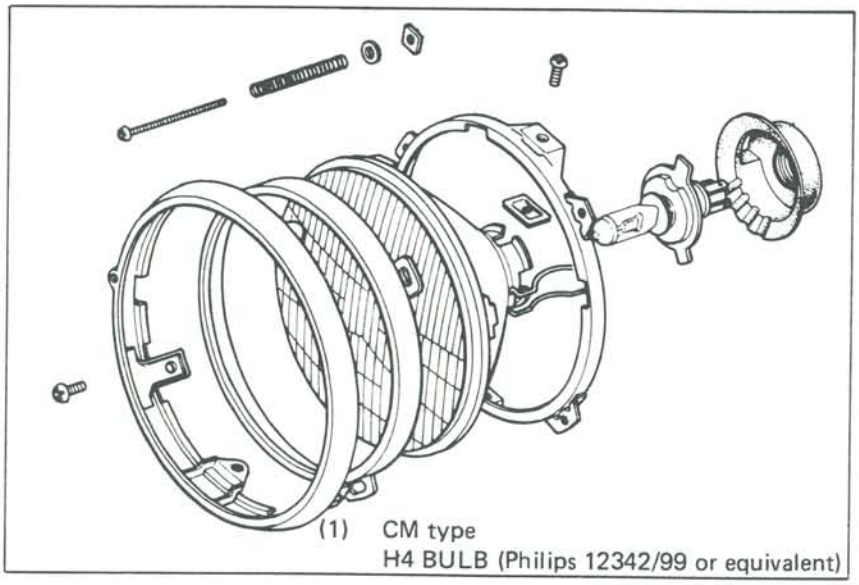
Remove the two headlight unit retaining screws, and headlight unit.

Assembly is essentially the reverse of disassembly.

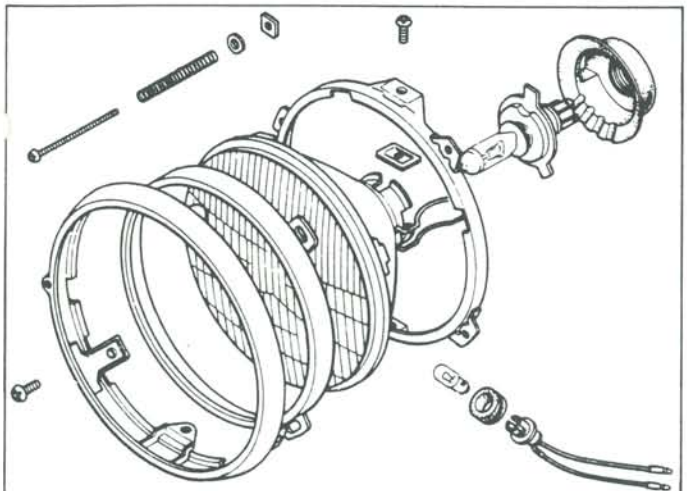
After assembly, adjust headlight beam (Page 3-19).

NOTE

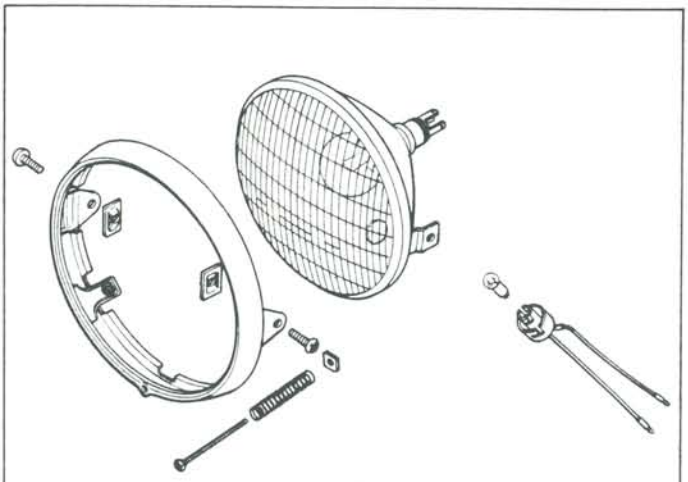
Do not touch the bulb with your fingers.



(1) CM type
H4 BULB (Philips 12342/99 or equivalent)



(2) E, G, F and ED types:
H4 BULB (Philips 12342/99 or equivalent) and position light



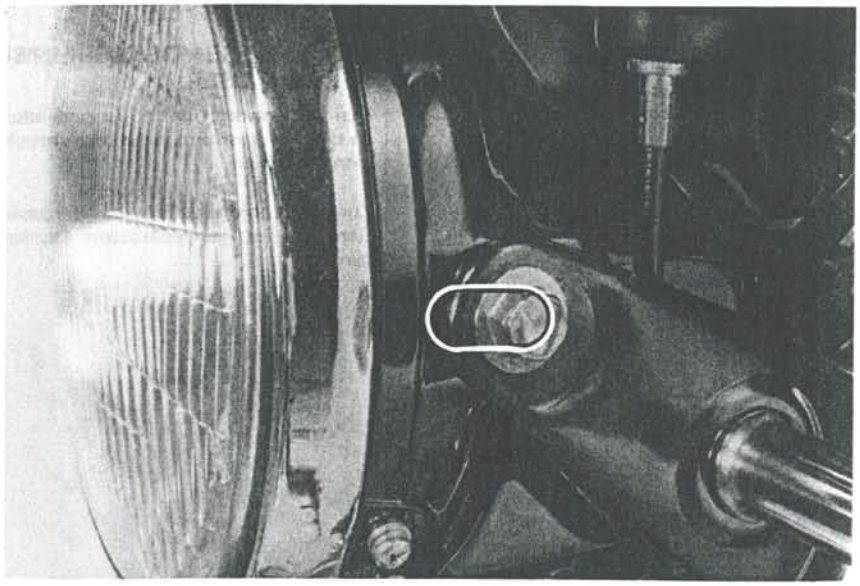
(3) DK, DM, U and SA types:
Sealed beam and position light

HEADLIGHT CASE INSTALLATION

Align the punch marks on the headlight case with the punch marks on the headlight case brackets.

NOTE

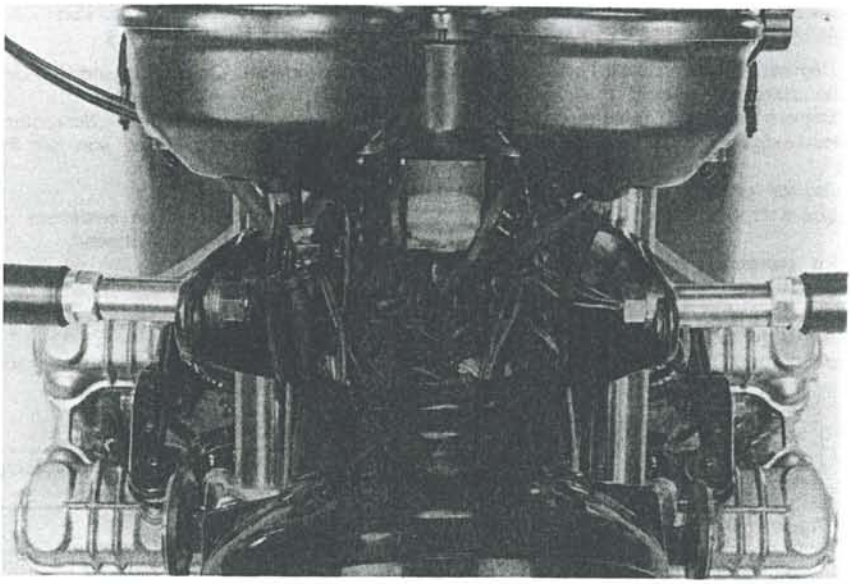
Check each component for operation after assembling.



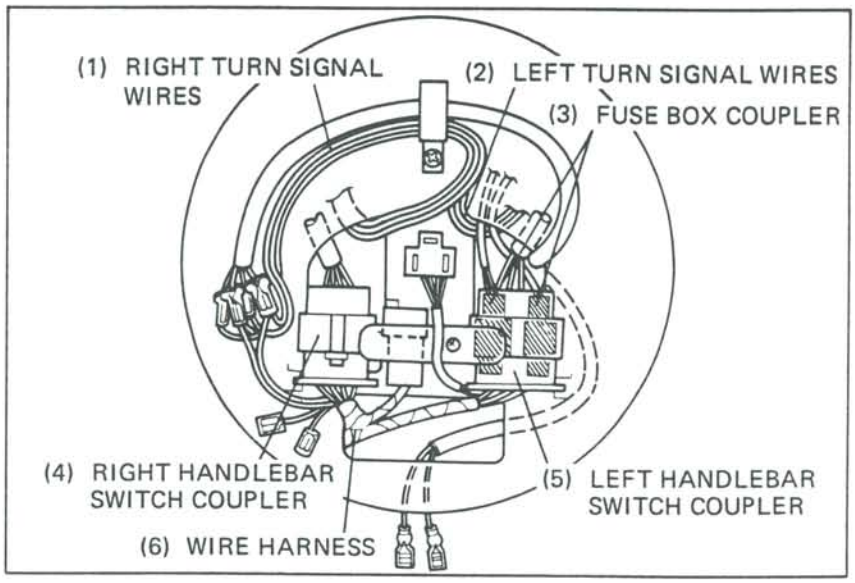
WIRING CONNECTION IN HEADLIGHT CASE

Route the wires into the headlight case through the headlight case hole.

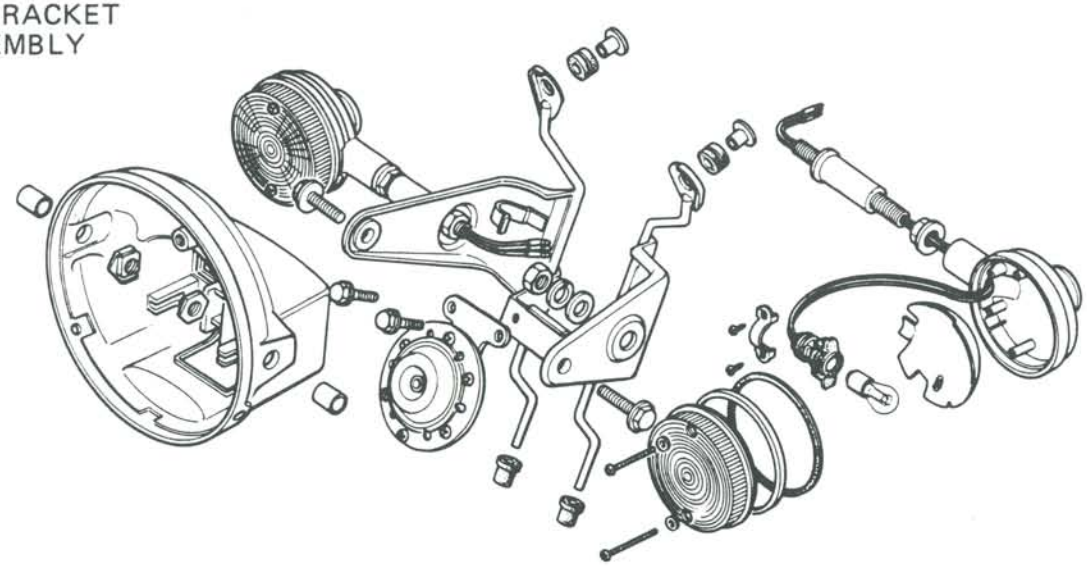
LOWER HOLE: **Main wire harness**
UPPER RIGHT HOLE: **Right turn signal wires**
Right handlebar switch wires
UPPER LEFT HOLE: **Fuse holder wires**
Left handlebar switch wires
Left turn signal wires



Connect the color-coded wires and couplers. Secure each coupler in its correct holder in the headlight case.



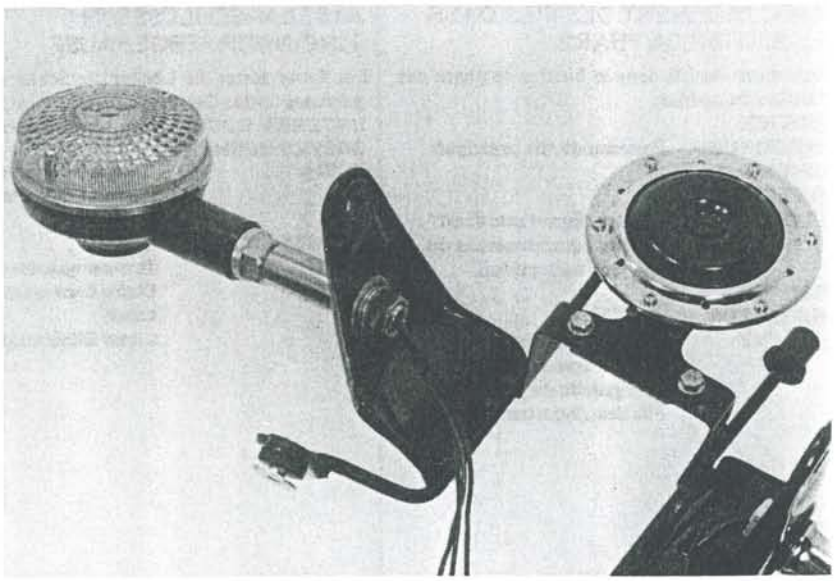
HEADLIGHT CASE BRACKET DISASSEMBLY/ASSEMBLY



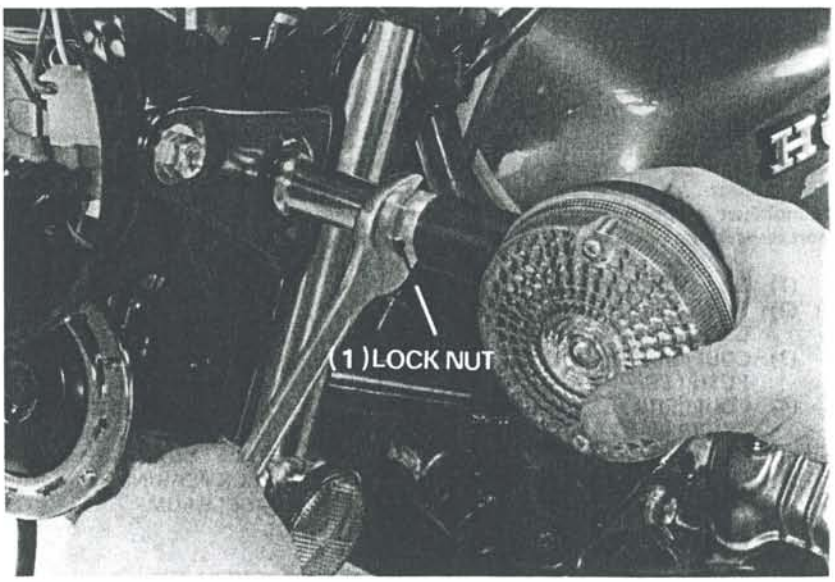
Remove the headlight and disconnect all wires and wire couplers inside the case.
Disconnect the brake hose from the front brake master cylinder.

NOTE

Avoid spilling fluid on painted surfaces. Place a rag over the fuel tank whenever the brake hose is disconnected.



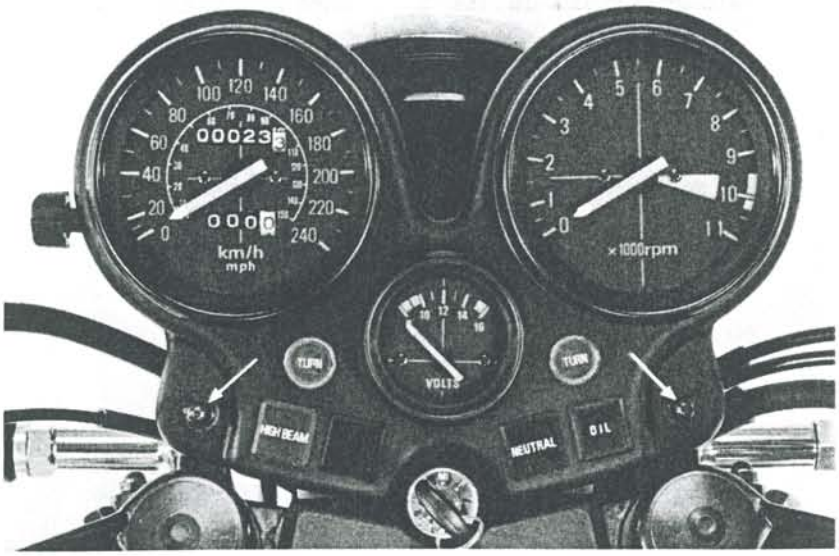
Install the turn signals parallel with the ground. Tighten the lock nuts securely.



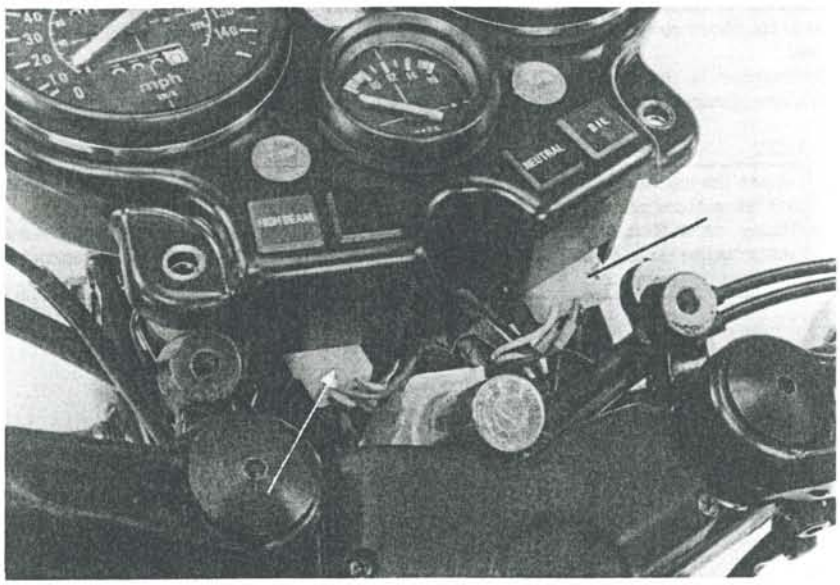
INSTRUMENTS

CLUSTER DISASSEMBLY

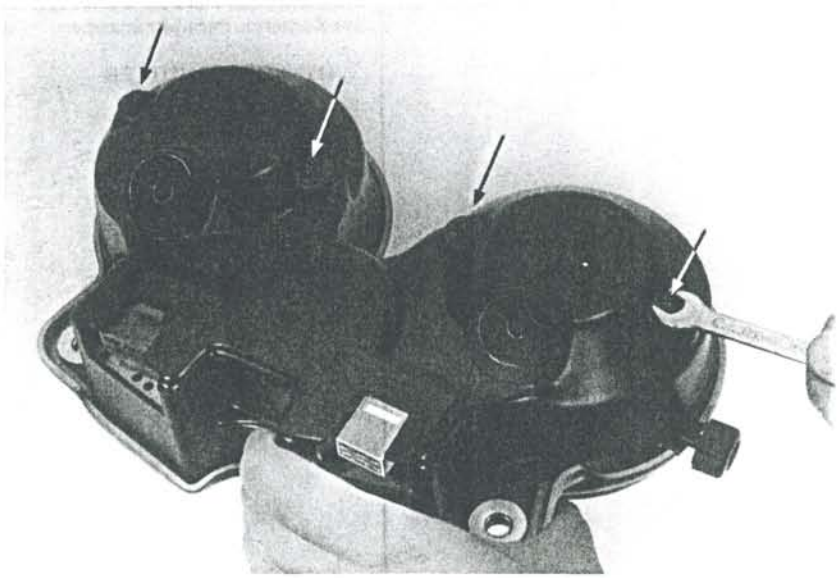
Remove the speedometer and tachometer cables from the instruments.



Remove the two instrument mounting bolts and separate the coupler from the instrument cluster.
Remove the cluster.



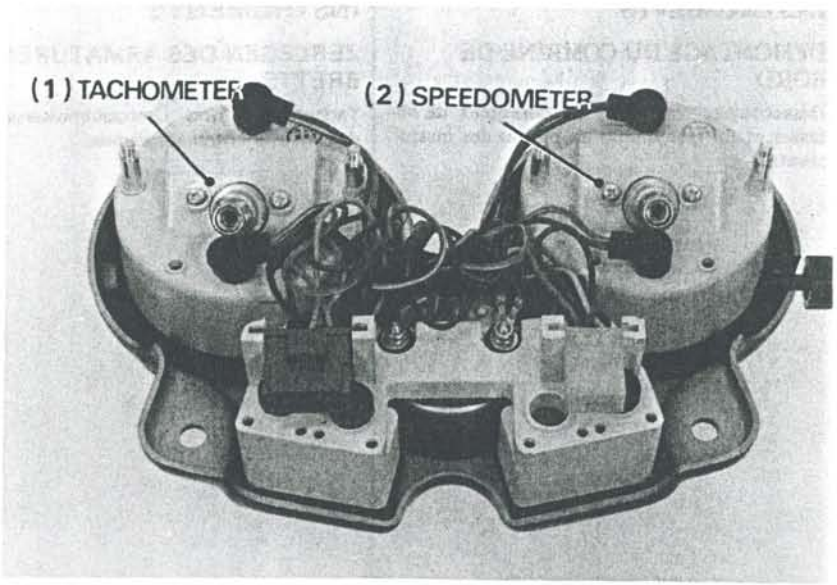
Remove the lower instrument case by removing four bolts.



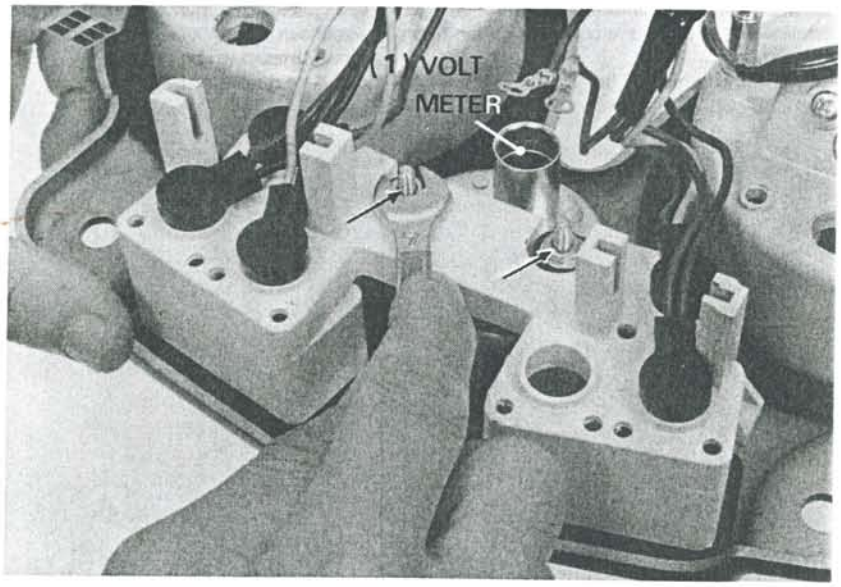
WARNING

Do not leave the instrument upside down for a long time.

Remove the instrument lamps and speedometer and tachometer by pushing them out. Check the meter cable if the needle swings abnormally.



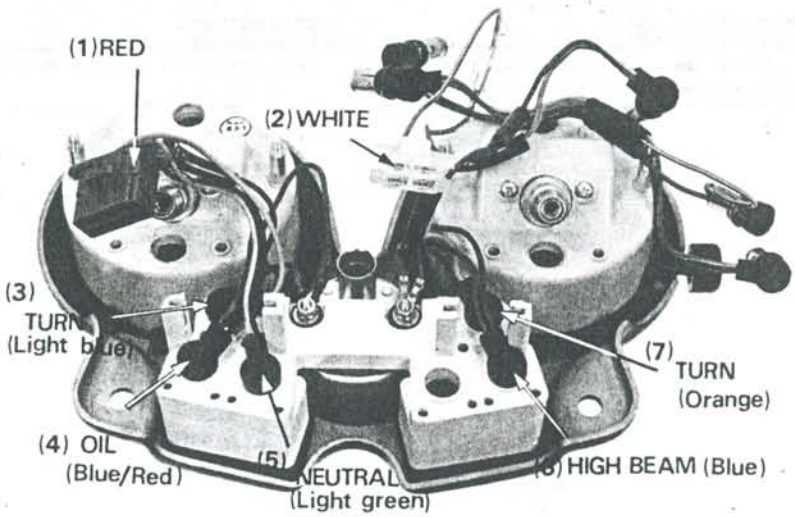
Remove the voltmeter.



CLUSTER ASSEMBLY

Connect the lamp wires color-to-color.

After installing a new bulb, check for continuity. If the bulb does not light, inspect the wiring for open or short circuits.



HANDLEBAR SWITCH/ HANDLEBARS

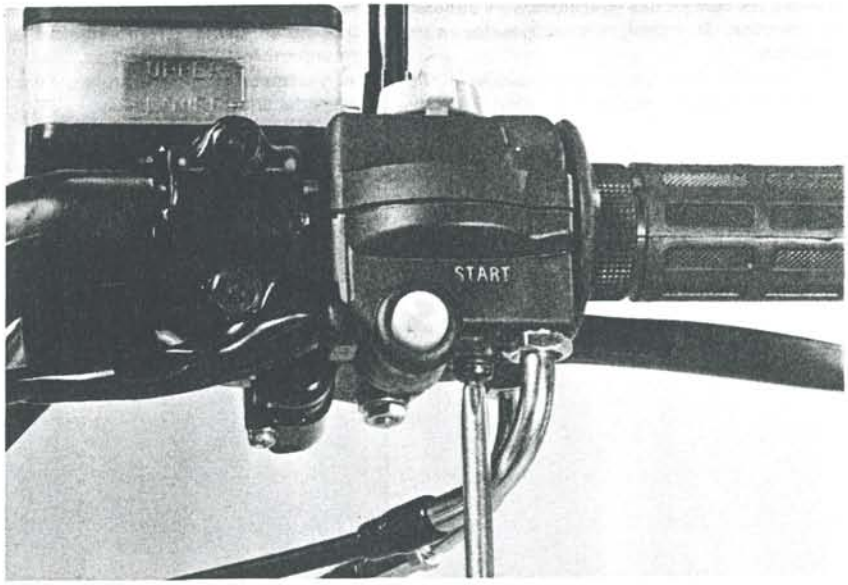
RIGHT HANDLEBAR SWITCH REPLACEMENT

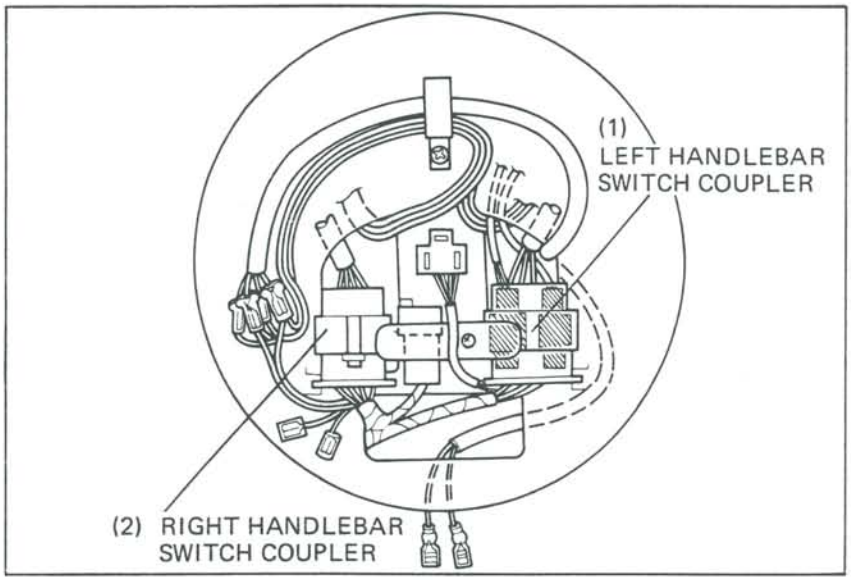
Remove the fuel tank.
Remove the screws holding the upper and lower switch housings.
Remove the throttle cables.
Disconnect the front brakelight switch.
Remove the headlight from the headlight case and disconnect the right handlebar switch wire coupler.
Remove the switch wires from the headlight case.

NOTE

Connect a string to the switch cord and then remove the cord leaving the string. This string is used as a draw cord when routing the wiring of a new switch.

Install a new switch aligning its locating pin in the handlebar.
Turn the handebar all the way to the right and pull the throttle cables to the right.
Then tighten the lock nuts.
TORQUE: 2–3 N·m
(0.2–0.3 kg-m, 1.4–2.1 ft-lb)
Make sure there is clearance between the throttle grip and housing.
Tighten the forward screw first, then tighten the rear screw.
TORQUE: 1–1.5 N·m
(0.1–0.15 kg-m, 0.7–1.1 ft-lb)
Check the switch operation.
Check the throttle operation in all steering positions.
After installing, adjust throttle cable free play. (Page 3–6)





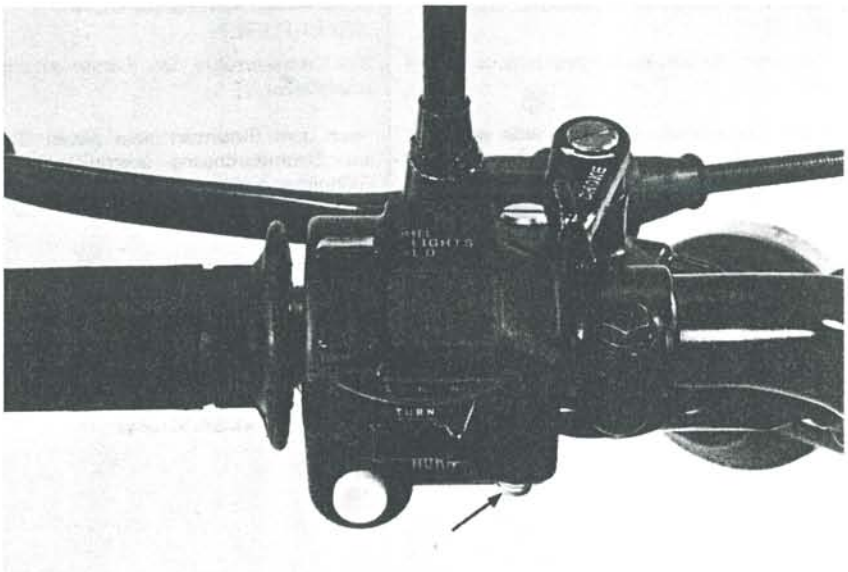
LEFT HANDLEBAR SWITCH REPLACEMENT

Refer to RIGHT HANDLEBAR SWITCH REPLACEMENT.

NOTE

It is not necessary to remove the fuel tank.

Disconnect the left handlebar switch wires.



RIGHT HANDLEBAR REMOVAL

Loosen the three screws attaching the throttle grip/switch housing.
Remove the right handlebar switch wires from the handlebar.

Remove the brake master cylinder.

CAUTION

Secure the brake cylinder in an upright position to prevent the fluid from leaking and damaging the paint and to prevent air from entering the brake system.

NOTE

Do not loosen the brake hose unless necessary.

Remove the handlebar holding bolt.
Remove the handlebar.
Remove the throttle grip and switch assembly.

RIGHT HANDLEBAR INSTALLATION

Attach the handle bar to the holder.

NOTE

Before installing the handlebar holding bolts apply thin coat of oil on the threads.

Coat the throttle grip area of handlebar with grease.
Install the throttle grip switch housing and throttle cables.

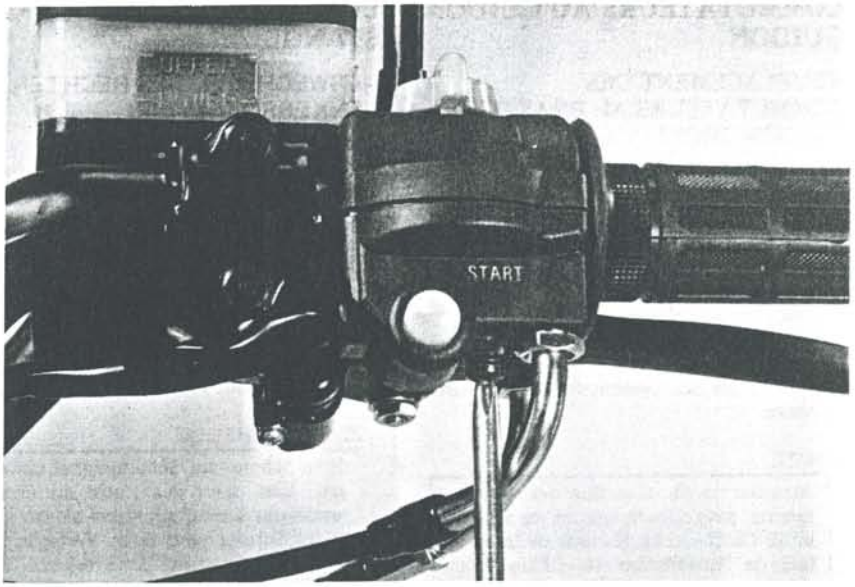
NOTE

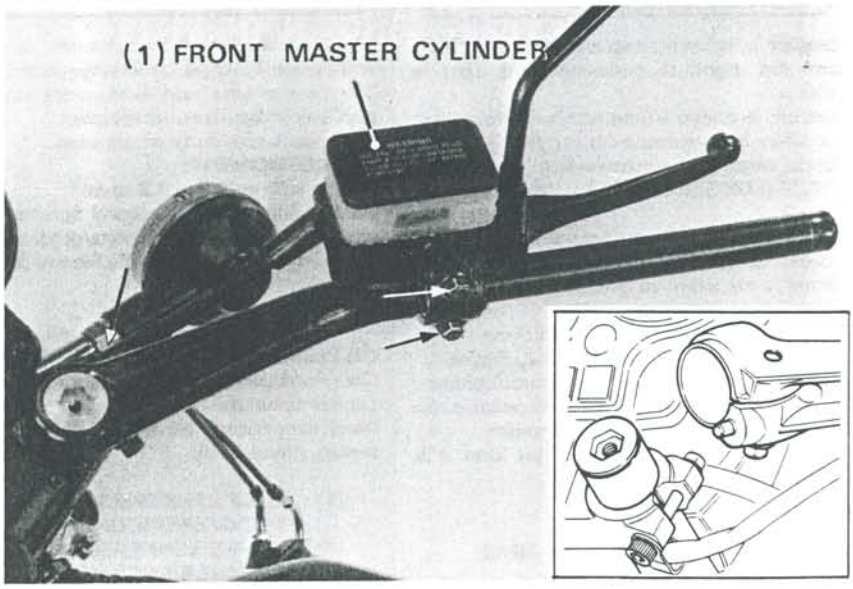
- To prevent kinking or binding, turn the handlebar all the way to the right and pull the throttle cables to the right.
  Then tighten the lock nuts to the 2–3 N·m (0.2–0.3 kg-m, 1.4–2.1 ft-lb).
- Make sure that there is clearance between the throttle grip and housing.

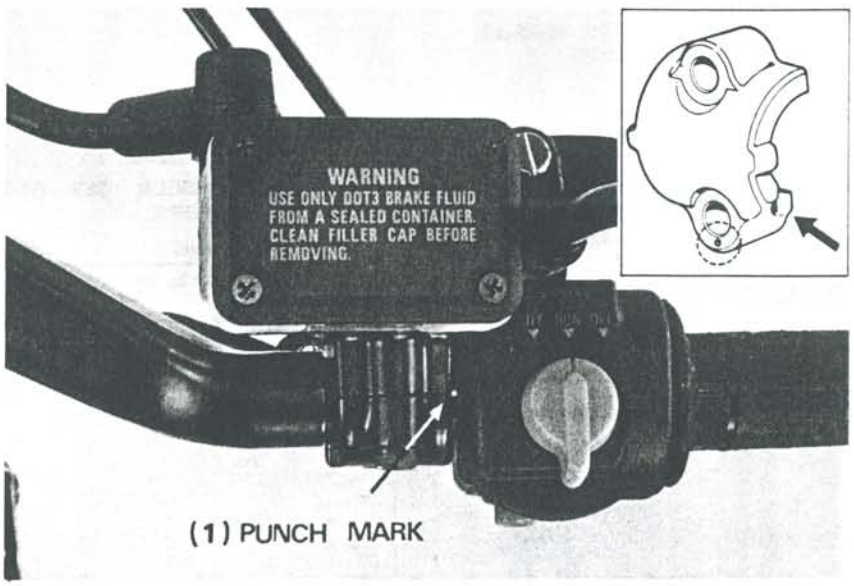
TORQUE for SWITCH HOUSING:
1–1.5 N·m(0.1–0.15 kg-m, 0.7–1.1 ft-lb)

Check throttle operation in all steering positions. (Page 3–4).

Install the master cylinder on the handlebar with the end of the holder aligned with the punch mark and wire relief facing down.
Tighten the upper screw first, then tighten the lower screw.
After assembly, check that the brake lever dose not touch the switch housing when it is pulled in.



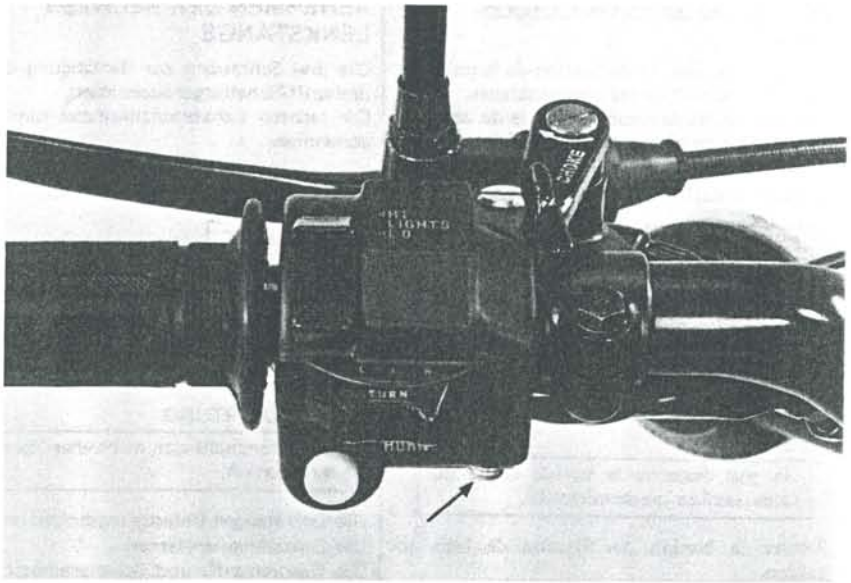




LEFT HANDLEBAR REMOVAL

See RIGHT HANDLEBAR REMOVAL/INSTALLATION.

Remove the left grip.
Remove the left handlebar switch assembly.
Loosen the clutch lever bracket bolt.
Remove the clutch lever assembly.
Remove the handlebar holding bolt and handlebar.



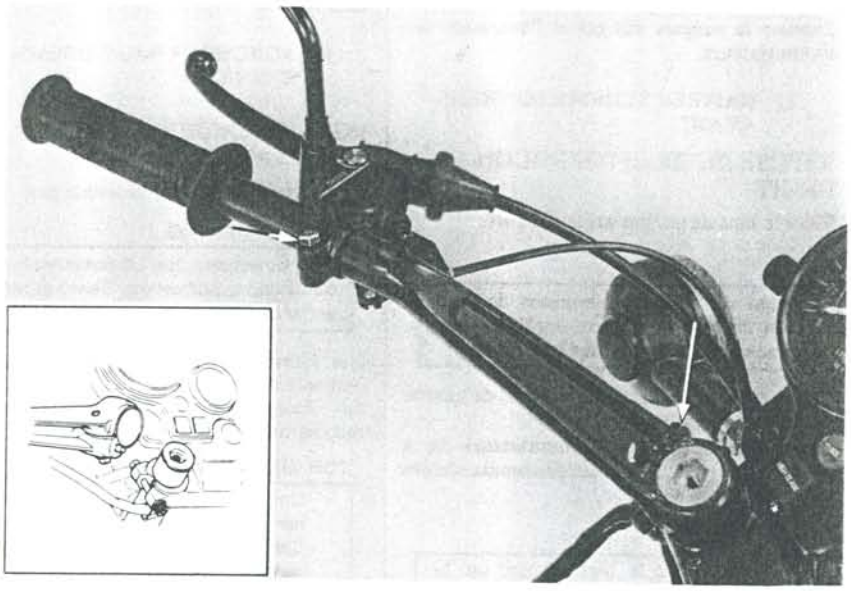
LEFT HANDLEBAR INSTALLATION

Attach the handlebar to the holder.

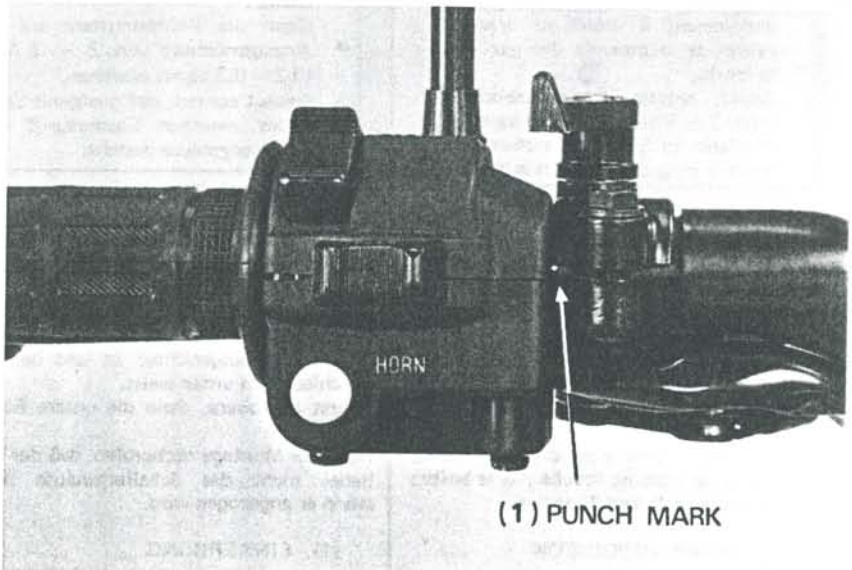
NOTE

Before installing the handlebar holding bolt, apply thin coat of oil on the threads.

Install the left handlebar switch assembly.
Tighten the forward screw first, then tighten the rear screw.
TORQUE: 1–1.5 N·m
(0.1–0.15 kg-m, 0.7–1.1 ft-lb)



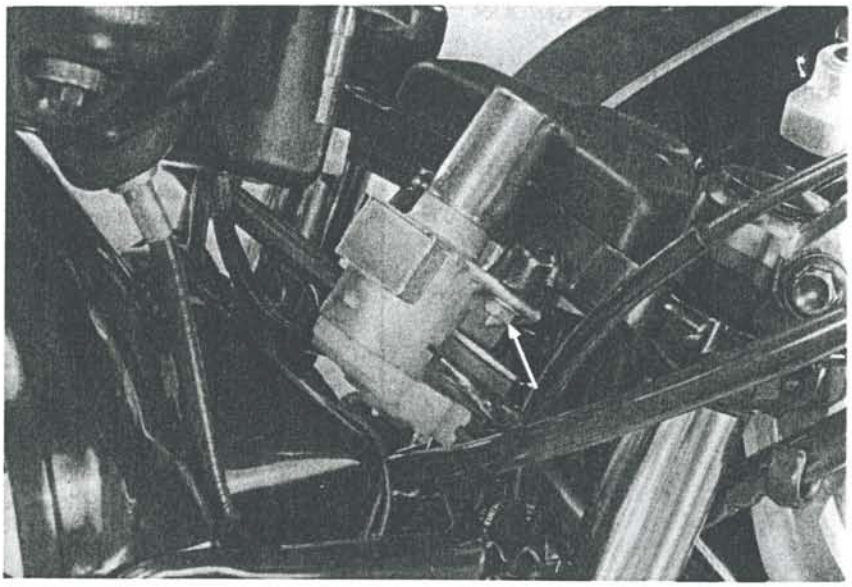
Install the clutch lever assembly.
Install the handle lever bracket with the split aligned with the punch mark on the handlebar.
Install the left grip.



(1) PUNCH MARK

IGNITION SWITCH REPLACEMENT

Remove the two bolts holding the instrument cluster.
Remove the bolt holding the ignition switch and disconnect the wire harness coupler.

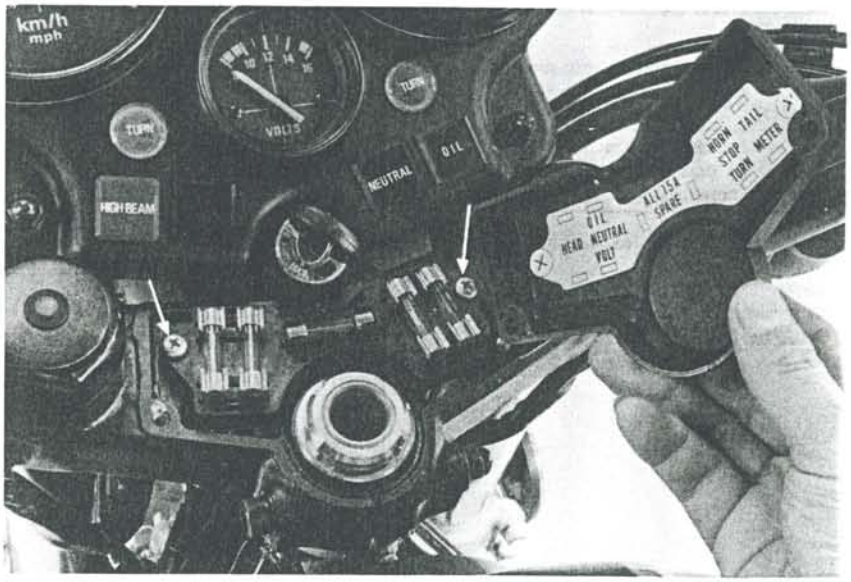


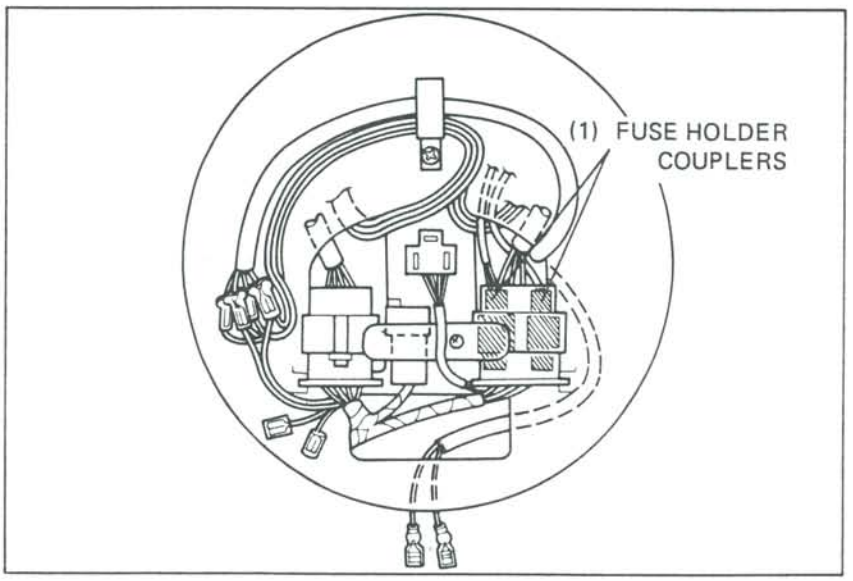
FUSE HOLDER REPLACEMENT

Remove the fuse cover.
Unscrew the screws holding the fuse holder.
Remove the headlight.
Disconnect the wire coupler.
Remove the fuse holder.

NOTE

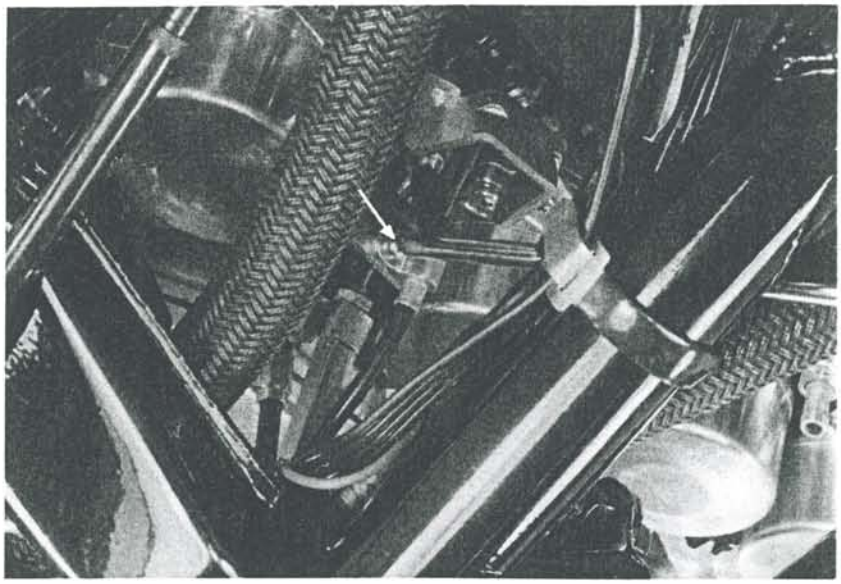
Before disconnecting the holder wires, tie a string to them. This string can be used as a draw cord when installing a new holder.





CHOKE CABLE REPLACEMENT

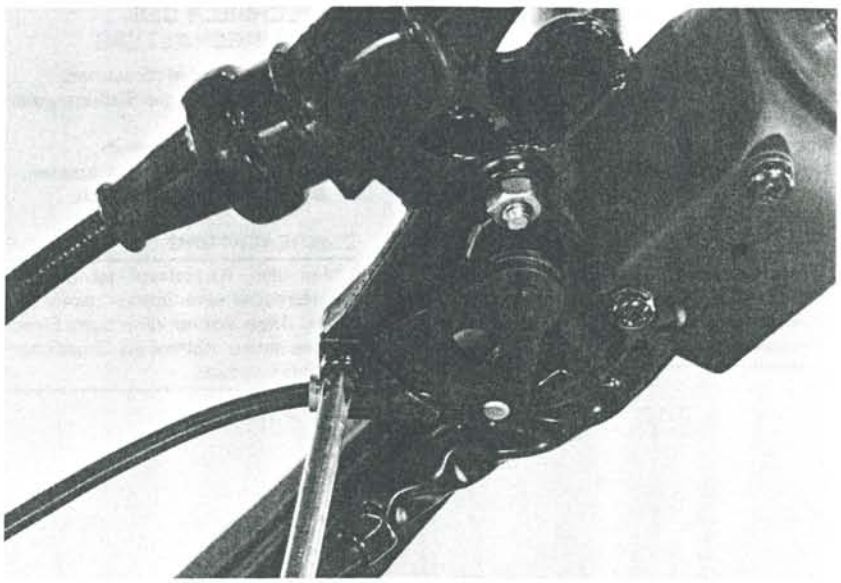
Remove the fuel tank.
Disconnect the choke cable from the lower choke cable bracket.
Remove the cable end from the choke lever.



Remove the choke cable from the choke lever on the handlebar.

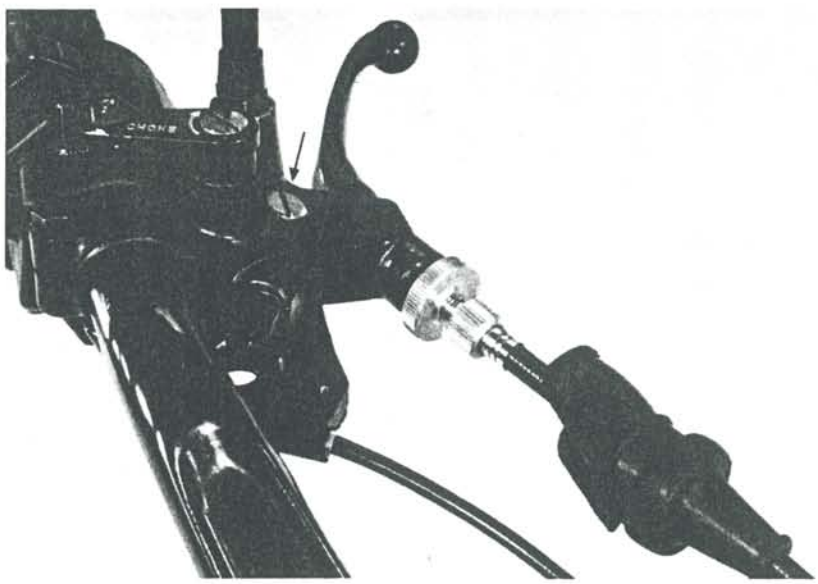
NOTE

Before removing the cable, tie a string to the cable end. This string can be used as a draw cord when installing a new choke cable.



CLUTCH CABLE REPLACEMENT

Remove the fuel tank.
Remove the clutch cable from the lever.

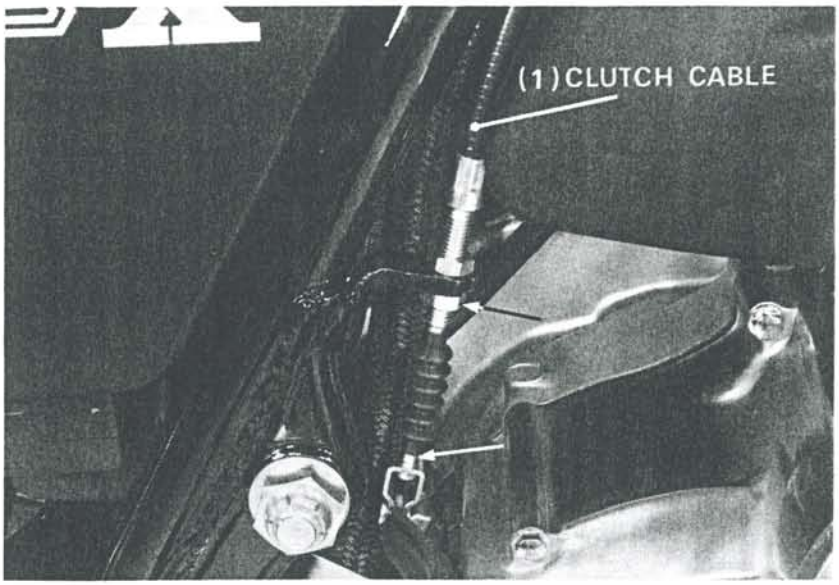


Loosen the lock nut on the engine and remove the clutch cable from the clutch lever.

NOTE

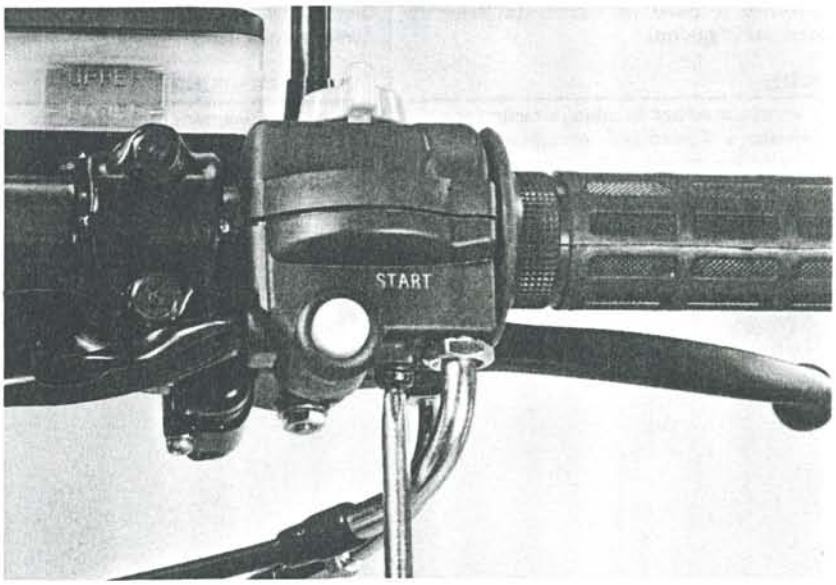
Before removing the clutch cable, connect a string to the end of the cable so that a new cable can be installed easily by using this string as a draw cord.

Adjust the clutch cable after replacement (Page 3-19).



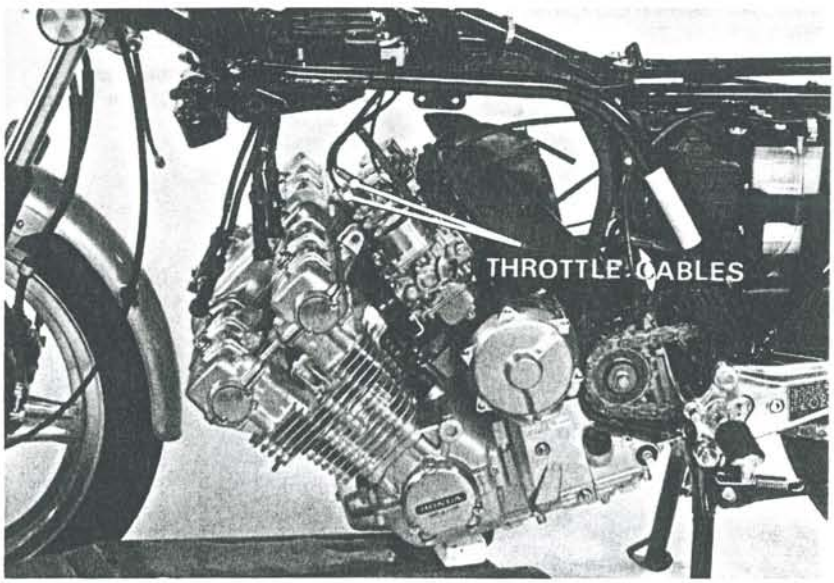
THROTTLE CABLE REPLACEMENT

Remove the fuel tank.
Remove the right handlebar switch/throttle housing.
Remove the throttle cables from the throttle pipes.



Tilt the engine forward (Page 5-1).
Remove the throttle cables from the carburetors.

Adjust throttle cable free play (Page 3-6).



FRONT WHEEL

FRONT WHEEL REMOVAL

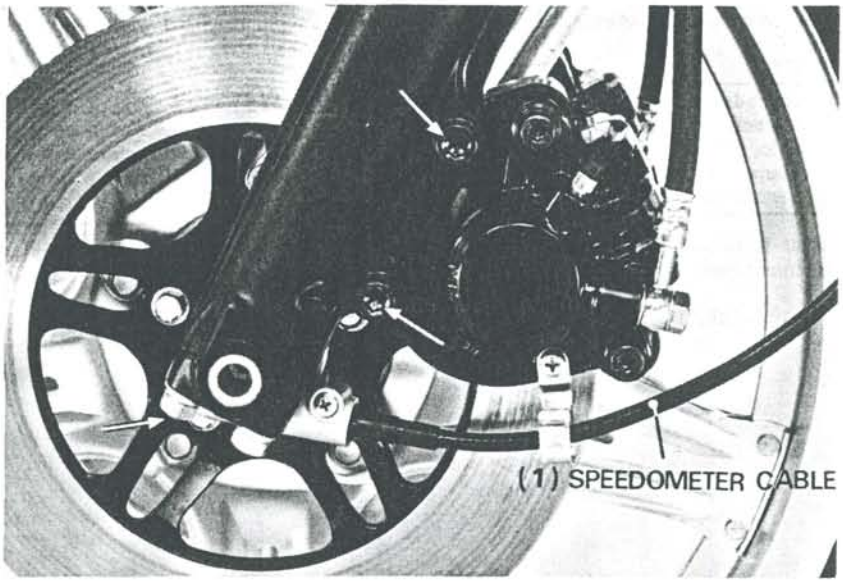
Remove the speedometer cable set screw and the speedometer cable.

Remove the right and left side caliper assemblies by loosening the allen bolts.

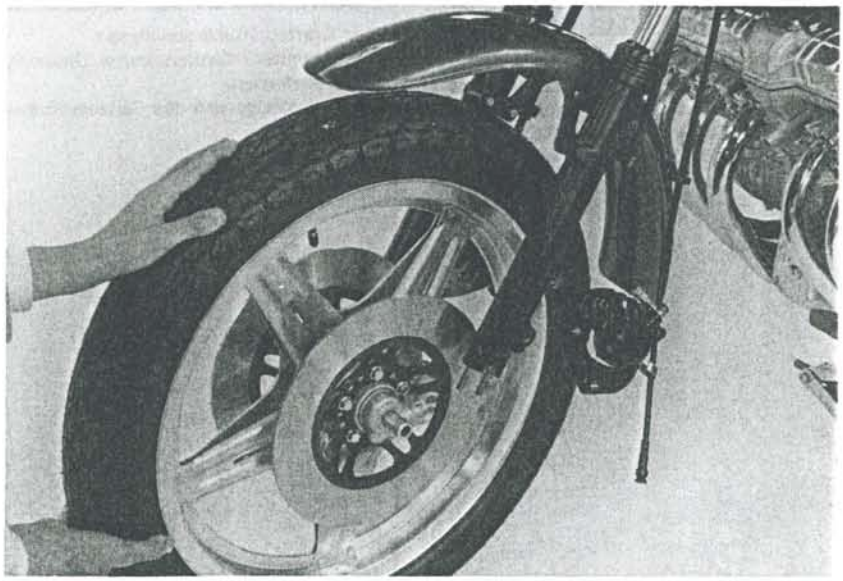
NOTE

Do not operate the front brake lever after removing the front wheel. To do so will cause difficulty in fitting the brake disc between the brake pads.

Remove the right and left axle holders.

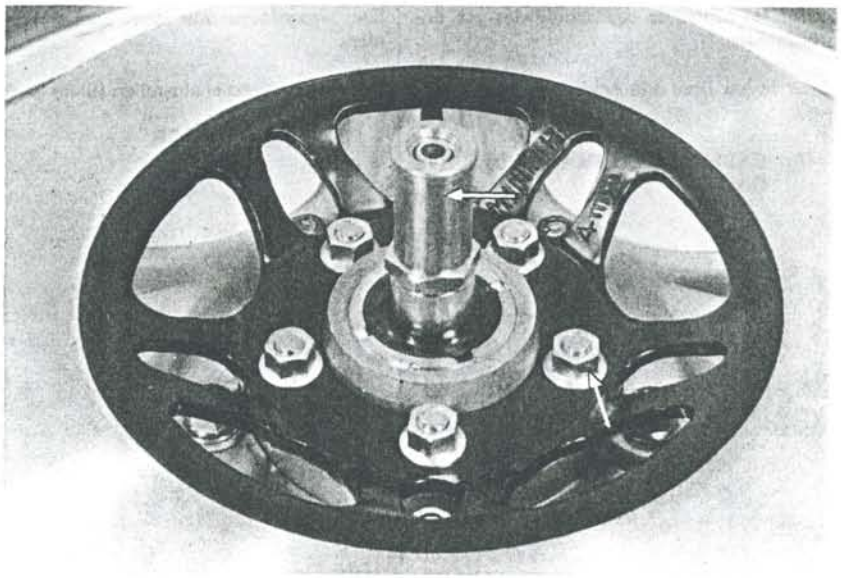


emove either front brake caliper.
Jack up the engine until the forks clear the front axle and remove the front wheel.



FRONT WHEEL DISASSEMBLY

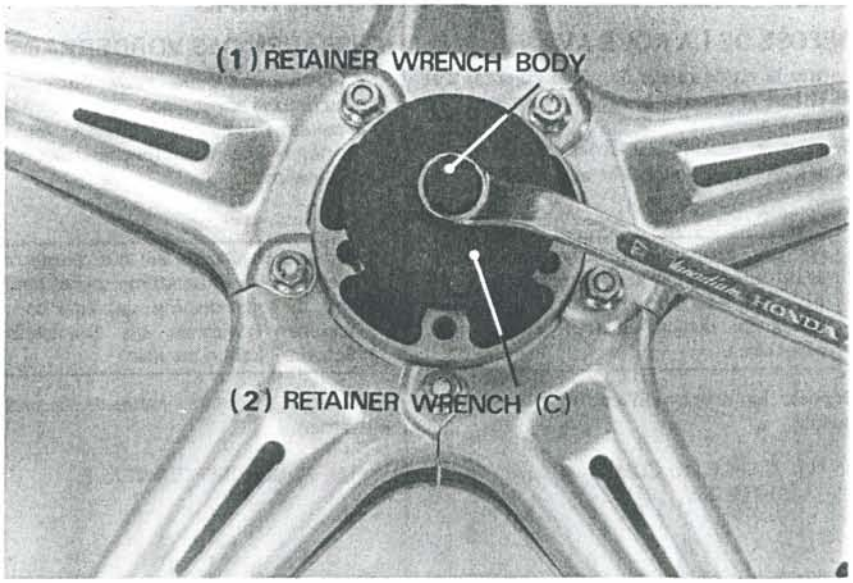
Remove the axle nut, speedometer gear box, axle and collar.
Remove five bolts and discs.



Remove the retainer.
Remove the bearings and the distance collar from the hub.

NOTE

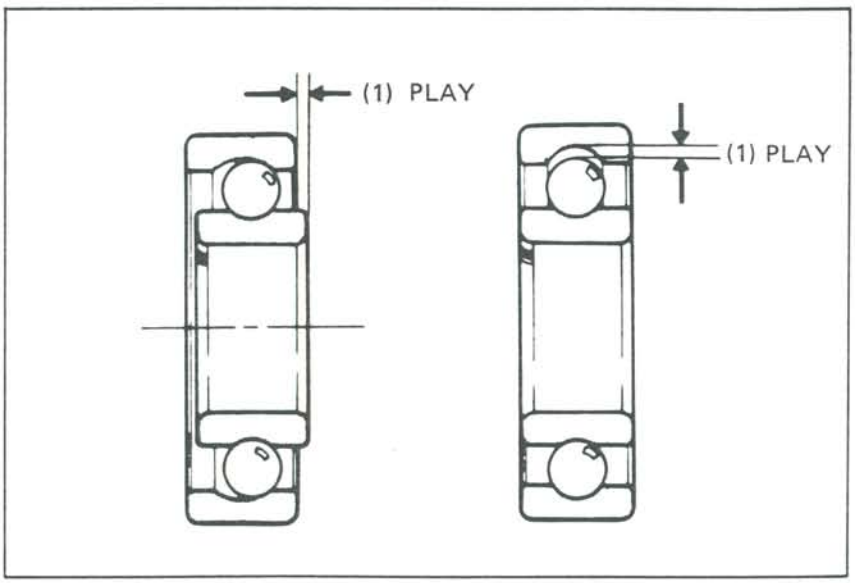
If the bearings are removed, they should be replaced with new ones.



RONT WHEEL INSPECTION

WHEEL BEARING:

Check wheel bearing play by placing the wheel in a truing stand and spinning the wheel by hand. Replace the bearings with new ones if they are noisy or have excesisive play.



WHEEL INSPECTION

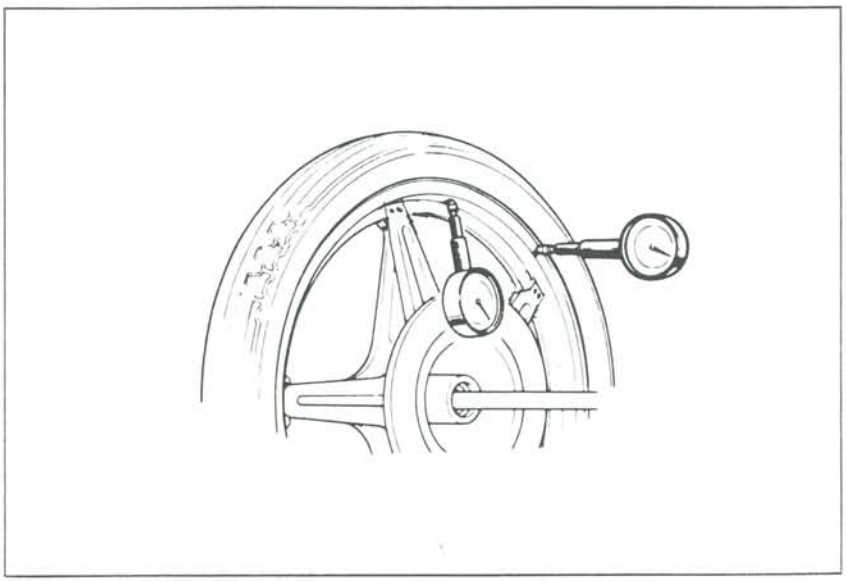
Check the rim runout by placing the wheel in a truing stand. Spin the wheel slowly and read the runout using a dial indicator gauge.

SERVICE LIMITS:

RADIAL RUNOUT: 2.0 mm (0.08 in)
AXIAL RUNOUT: 2.0 mm (0.08 in)

NOTE

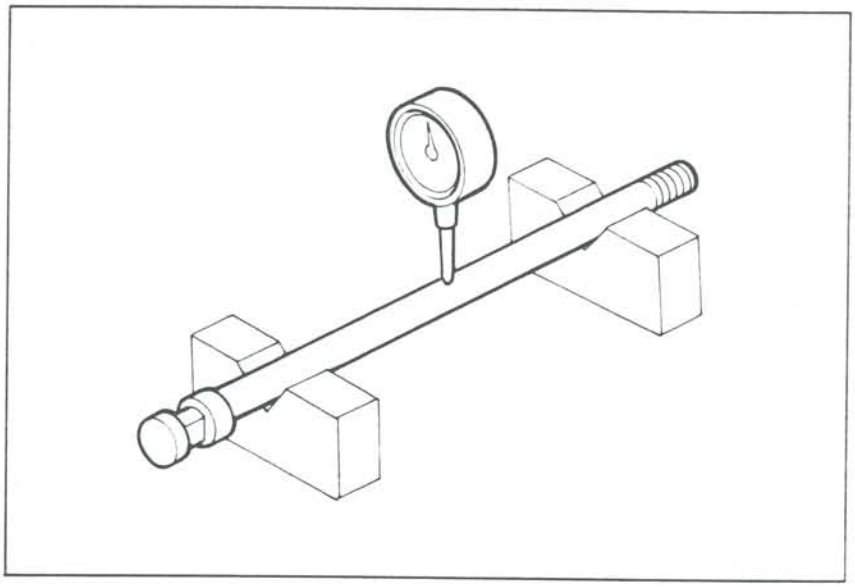
The COMSTAT WHEEL cannot be repaired and must be replaced with a new one if the service limits are exceeded.



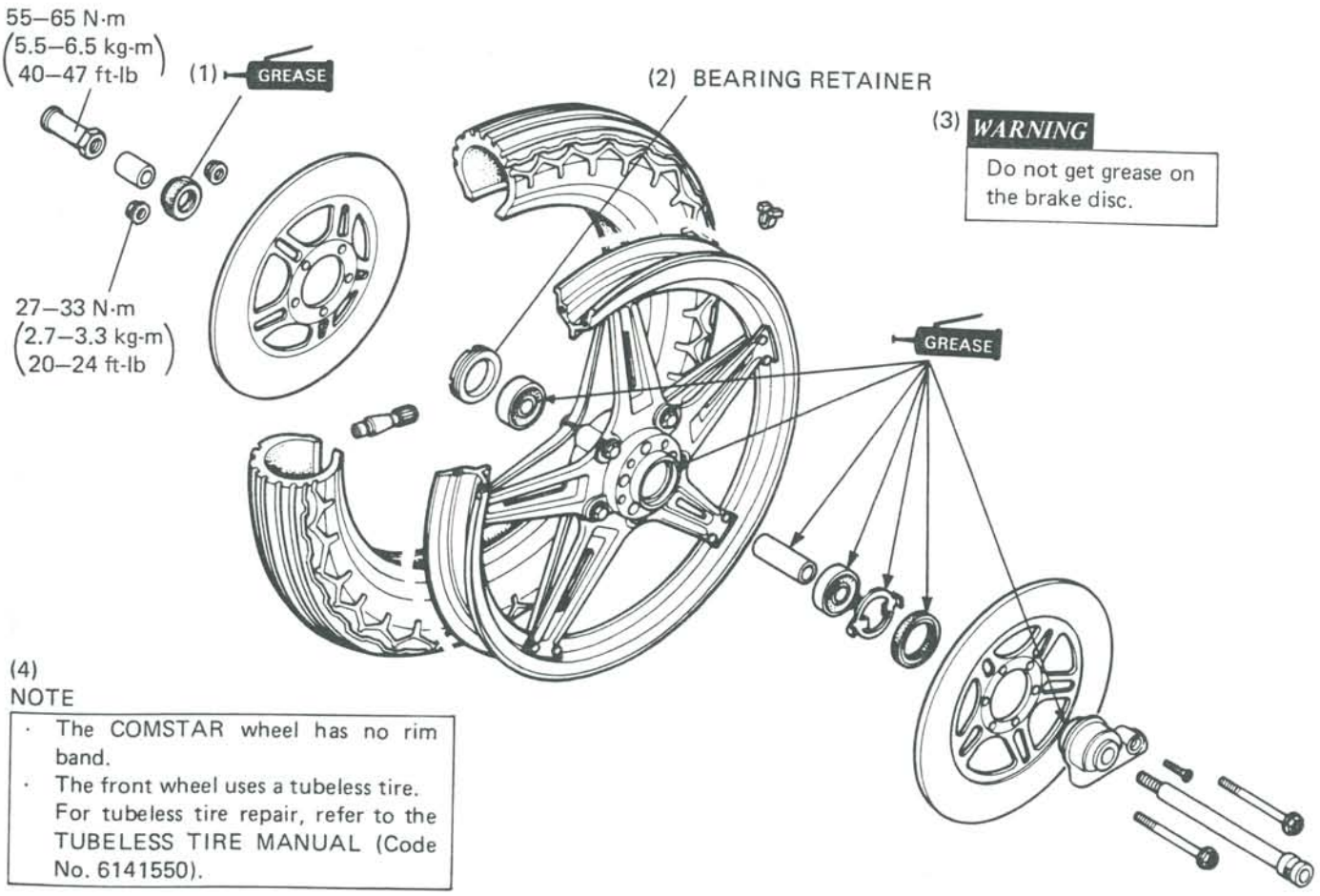
AXLE INSPECTION

Set the axle in V blocks and measure the runout. The actual runout is 1/2 of TIR (Total Indicator Reading).

SERVICE LIMIT: 0.2 mm (0.008 in)



FRONT WHEEL ASSEMBLY



NOTE

- The COMSTAR wheel has no rim band.
- The front wheel uses a tubeless tire. For tubeless tire repair, refer to the TUBELESS TIRE MANUAL (Code No. 6141550).

Pack all bearing cavities with grease.
Drive in the right bearing first.
Press the distance collar into place.

NOTE

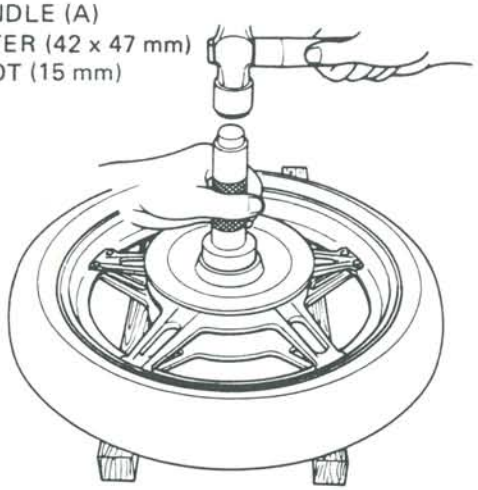
Be certain the distance collar is in position before installing the bearings.

Drive in the left bearing.

NOTE

- Drive the bearing squarely.
- Drive the bearing into position, making sure that it is fully seated and that the sealed side is facing out.

(1)
BEARING DRIVER HANDLE (A)
BEARING DRIVER OUTER (42 x 47 mm)
BEARING DRIVER PILOT (15 mm)

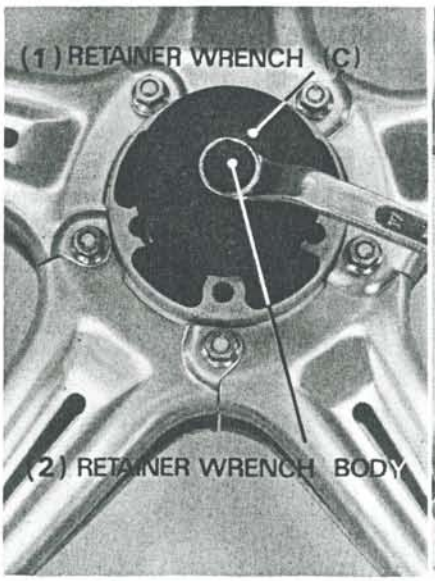


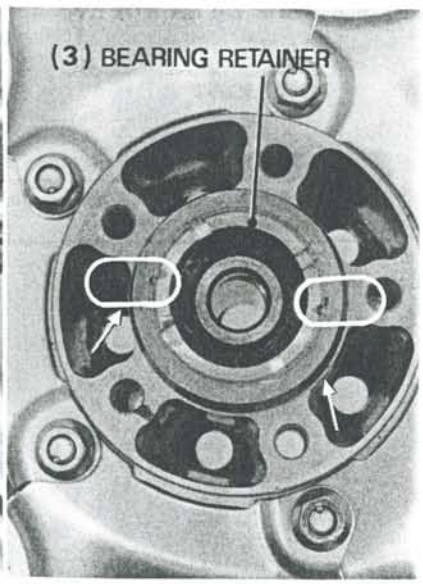
Install the bearing retainer with the tool used to remove it.

NOTE

Inspect the retainer. If the threads are damaged, it should be replaced.

Install the seal and the bearing retainer and peen the edge of the retainer.



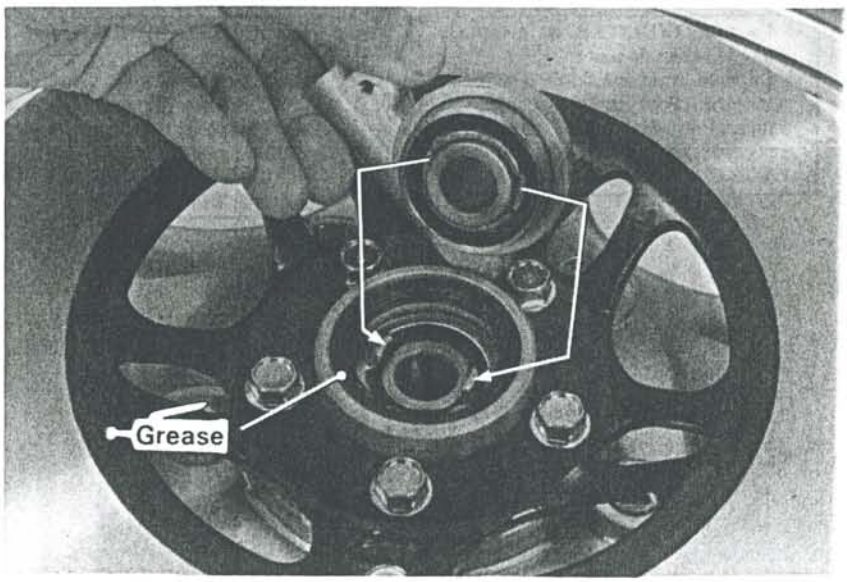


NOTE

The spoke plate bolts and nuts require no retightening since they are secured with lock pins. Do not remove the pins.

Install the speedometer gear retainer.
Lubricate the inside of the oil seal and install it.

Install the speedometer gear in the wheel hub, aligning the tangs with the slots.



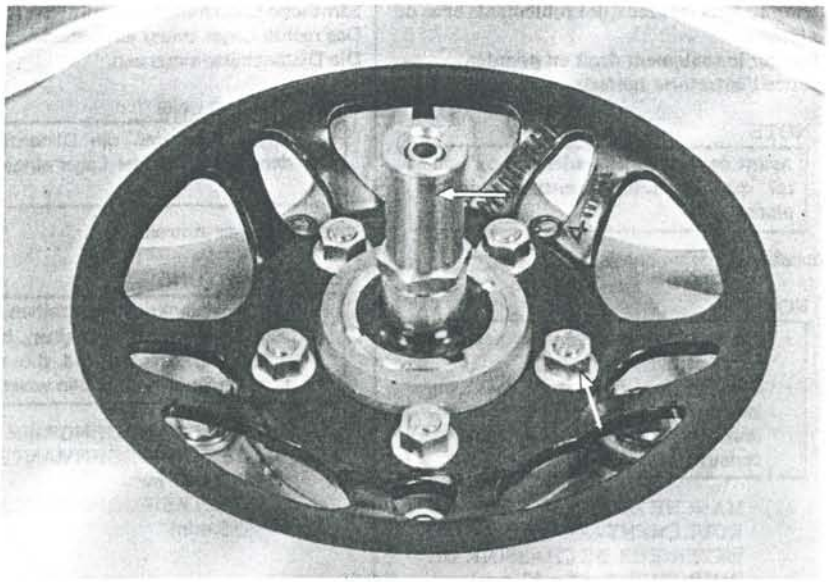
Install the left and right discs.

TORQUE: 27–33 N·m (2.7–3.3 kg-m, 20–24 ft-lb)

Install the left side collar and axle.
Install the axle nut.

TORQUE: 55–65 N·m (5.5–6.5 kg-m, 40–47 ft-lb)

Clean the brake discs with a high quality degreasing agent.



FRONT WHEEL INSTALLATION

Fit the calipers over the discs, taking care not to damage the brake pads. Install the caliper mounting bolts.

TORQUE: 30–40 N·m (3.0–4.0 kg-m, 22–29 ft-lb)

Install the axle holders with the "F" arrow forward. Tighten the forward axle holder nuts lightly.

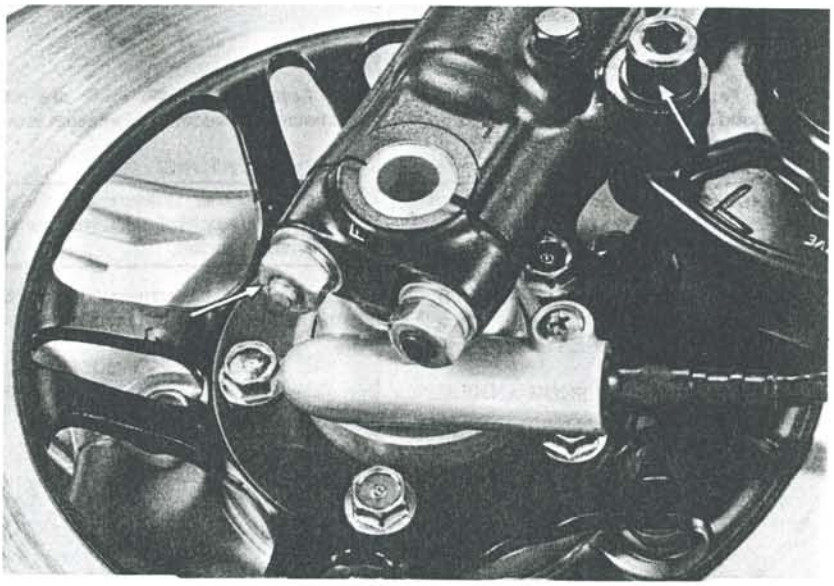
Tighten the right axle holder nuts to the specified torque, starting with the forward nuts.

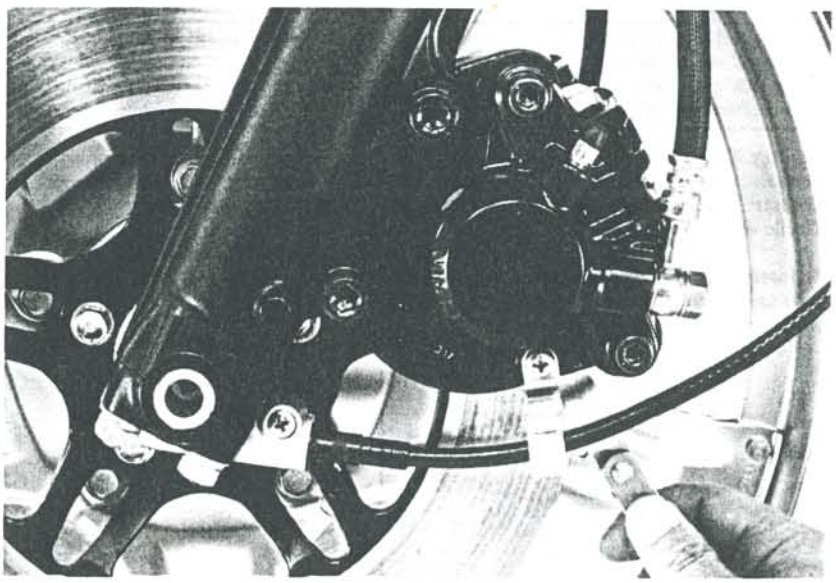
TORQUE: 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

Measure the outside surface of the left brake disc and the rear of the left caliper holder with a 0.7 mm (0.028 in) feeler gauge.
If the gauge cannot be inserted, pull the left fork out until the gauge can be inserted.
Tighten the left holder nuts.
There should be at least 0.7 mm (0.028 in) clearance between the caliper holder and disc.

CAUTION

After installing the wheel, apply the brakes several times and recheck the clearance on both sides. Failure to provide clearance will damage the brake discs and affect braking efficiency.



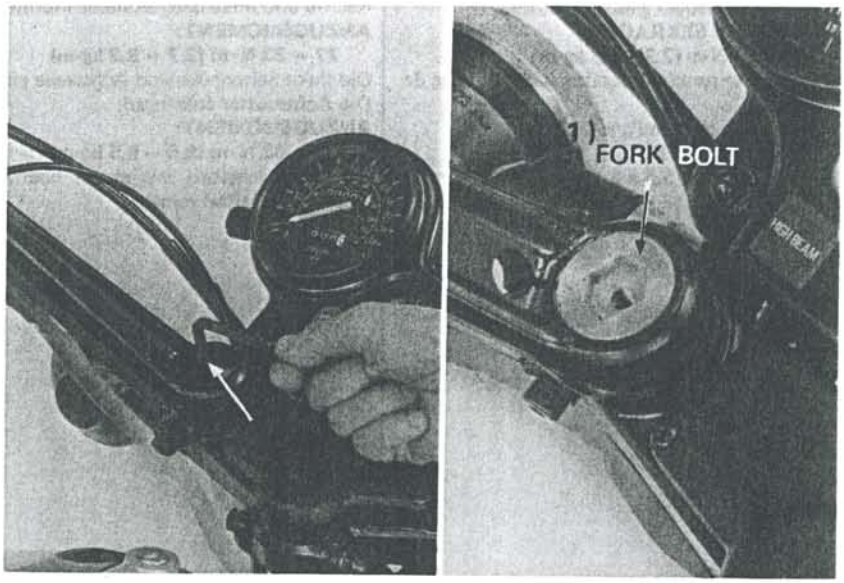


FRONT FORK

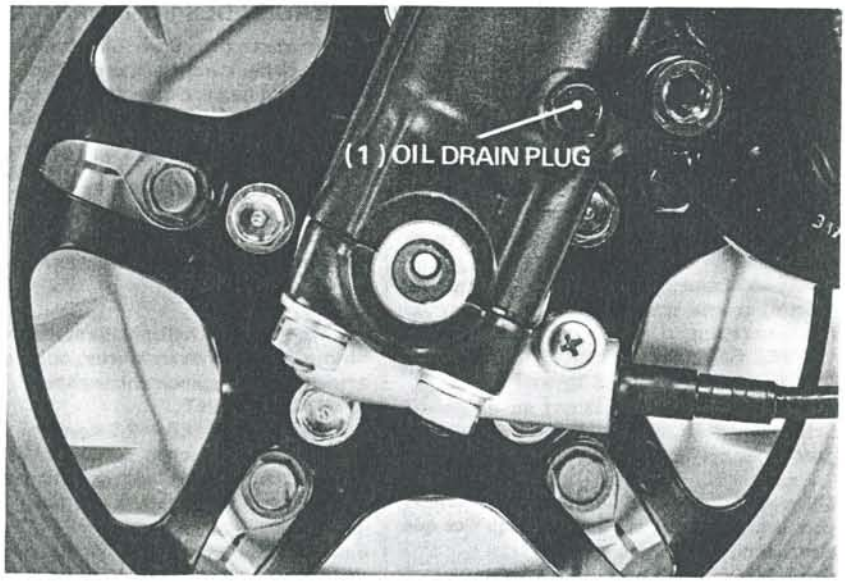
FRONT FORK OIL CHANGE

Remove the handlebar set bolt and filler plug.
Place a pan below the fork, remove the drain plug and allow the fork oil to drain.
Compress the suspension a few times to completely drain the fork.
Refill the fork, page 13-23.

REFILL CAPACITY:
157–162 cm³ (5.3–5.5 ozs)



Repeat this operation for the remaining fork leg.



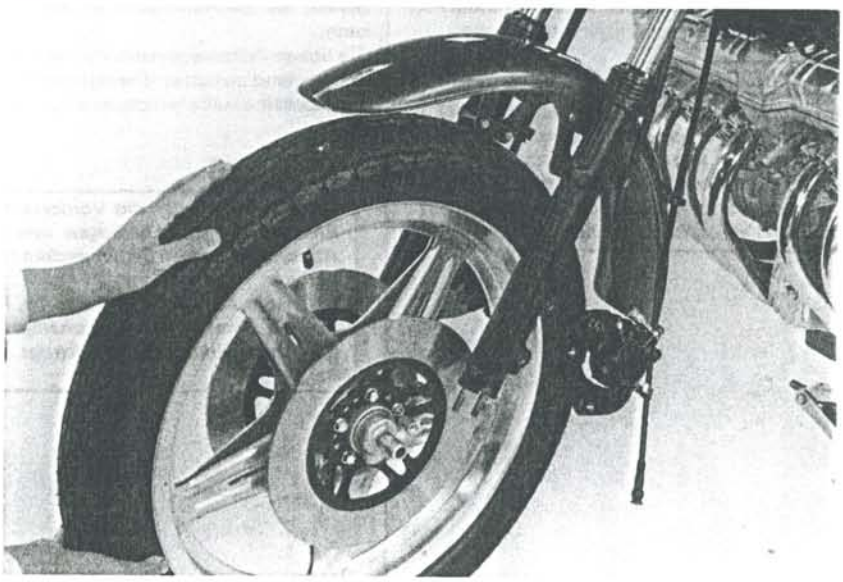
FORK REMOVAL

Remove the front wheel.
Remove the brake calipers.

NOTE

Do not loosen the brake hose unless necessary.

Remove the front fender.

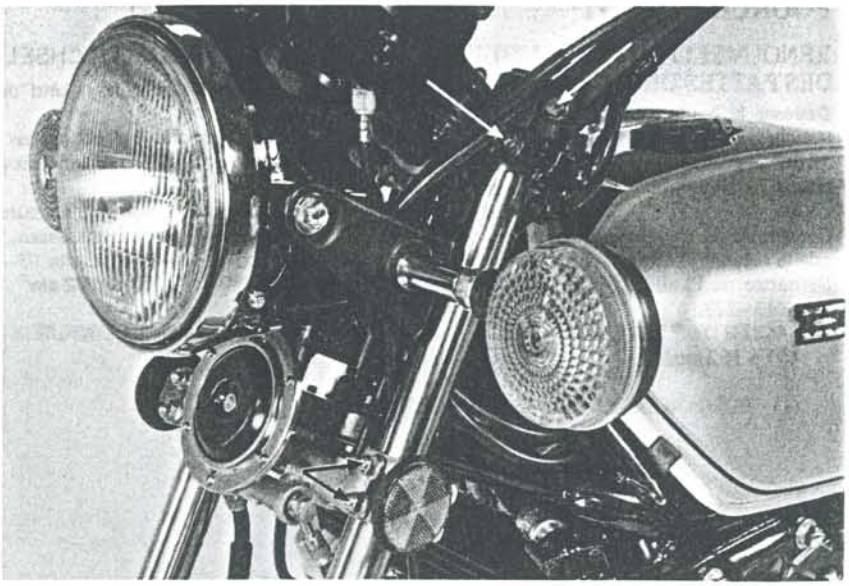


Remove the handlebar set bolt.
Loosen the handlebar mounting bolt.
Loosen the top and bottom fork pinch bolts.
Remove the fork assembly.
Remove the fork tubes from the bottom fork bridge, rotating them by hand.

NOTE

If the fork has been removed due to accident damage, the stem and crown should be checked for alignment and the bearings for damage.

Remove the oil filler plugs and drain the fork legs.

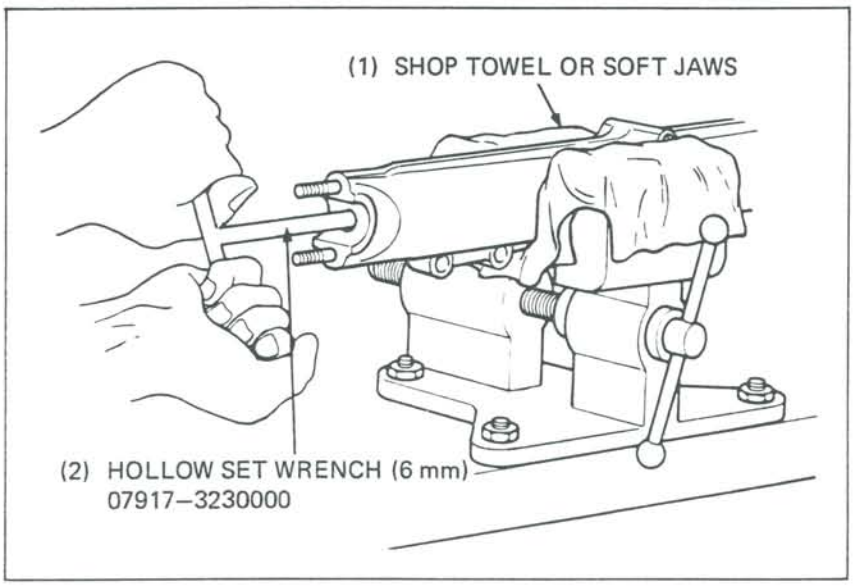


FORK DISASSEMBLY

Remove the socket from the bottom of the fork leg.
Remove the fork tubes and piston.

NOTE

- Hold the fork slider in a vise with soft jaws, being careful not to overtighten it.
- Temporarily install the spring and fork bolt should difficulty be encountered in removing the bolt.

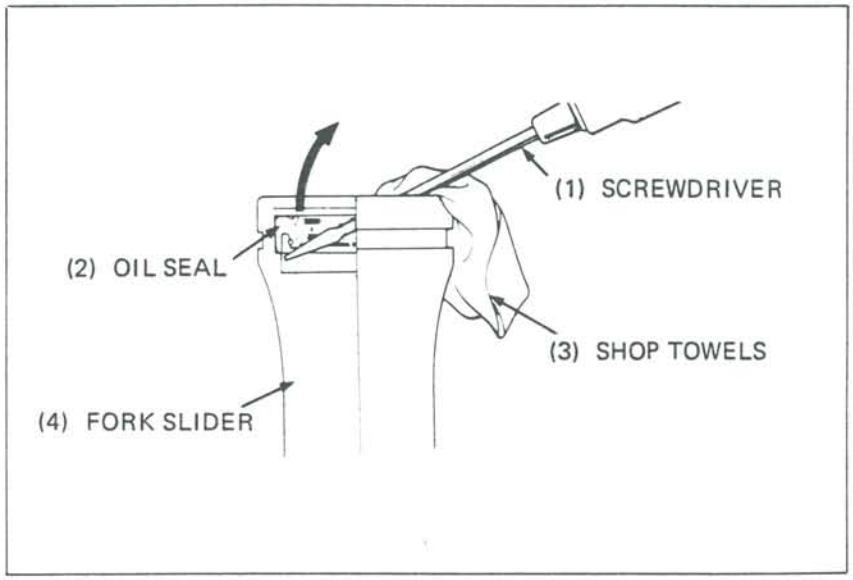


OIL SEAL REMOVAL

Carefully remove the oil seal with a screwdriver.

NOTE

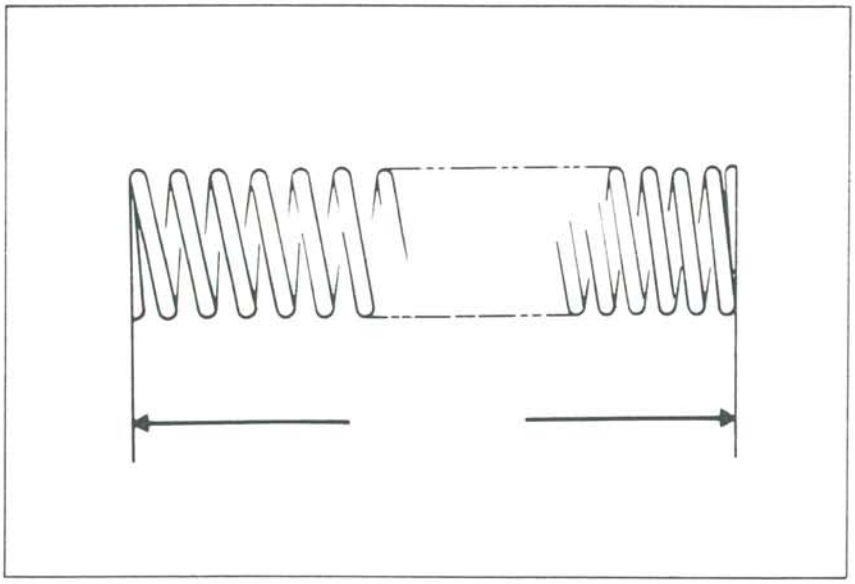
Avoid damaging the inner and outer surfaces of the slider when removing the seal.



SPRING FREE LENGTH INSPECTION

Check the free length of the fork spring. Replace it if it does not meet the specification.

SERCICE LIMIT: 552.0 mm (21.7 in)

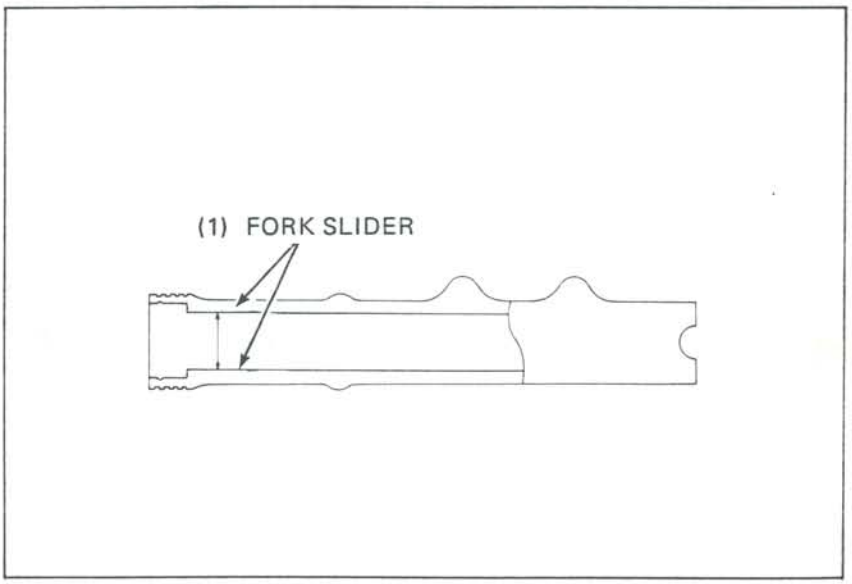


FORK TUBE/FORK SLIDER/ PISTON INSPECTION

Check the fork tubes, fork sliders and pistons for score marks, scratches, or excessive or abnormal wear, replacing those which cannot be reused.
Remove the fork seal. Measure the inside diameter of the guide bushing.

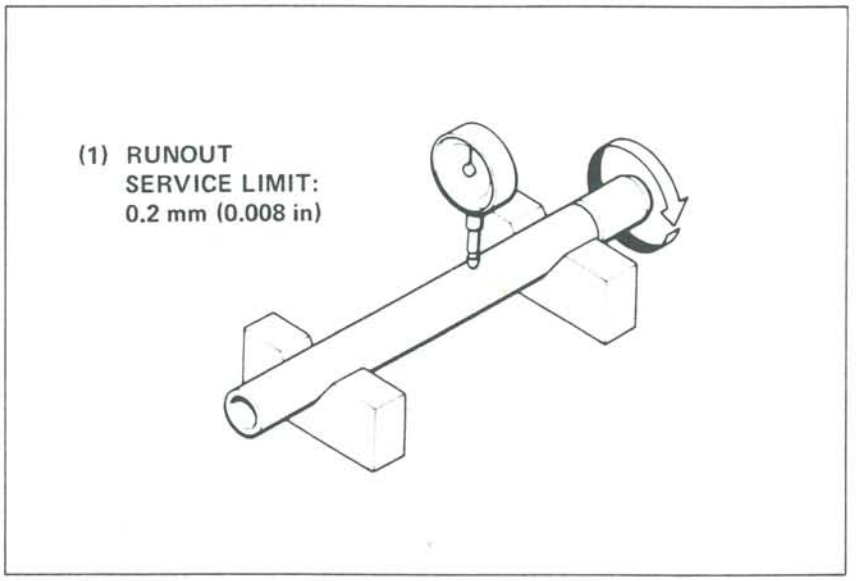
Measure the outside diameter of the fork tube and check the condition of the tube piston and rings.

Front fork slider I.D.
SERVICE LIMIT: 35.25 mm (1.388 in)
Front fork tube O.D.
SERVICE LIMIT: 34.85 mm (1.372 in)

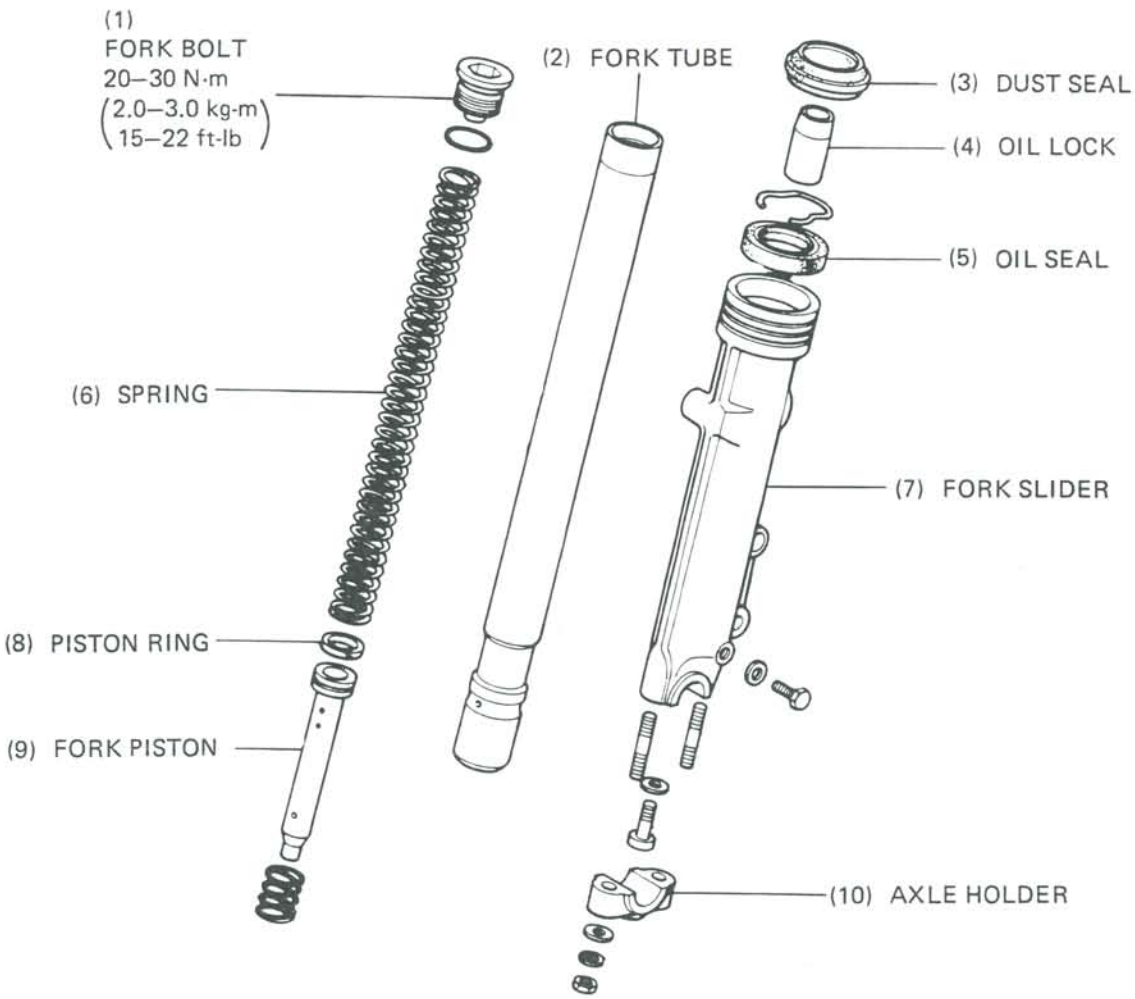


FORK TUBE INSPECTION

Set the fork tube in V blocks and read the runout. Take 1/2 Total Indicator Reading to determine the actual runout.



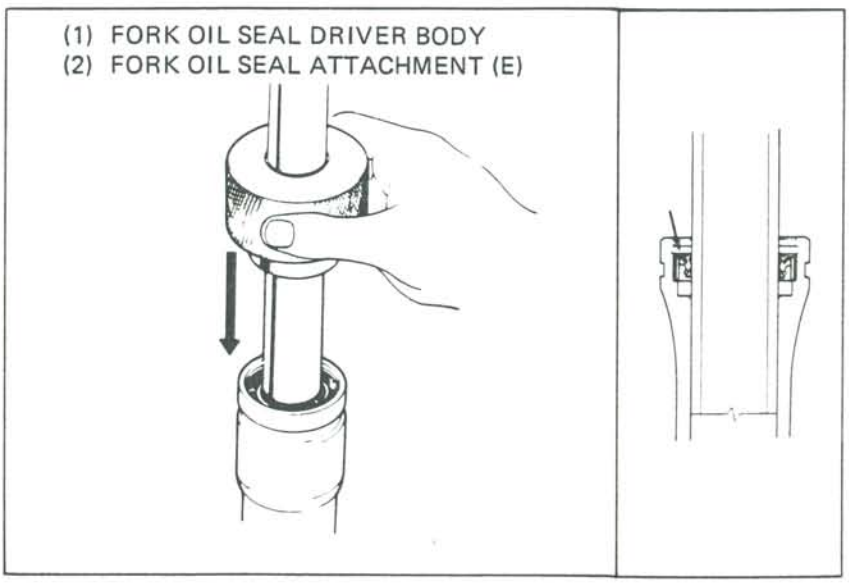
FORK ASSEMBLY



OIL SEAL INSTALLATION

Dip the new fork seal in ATF and install it in the slider using the fork leg as a guide for the seal driver.

Drive the oil seal into position until the snap ring groove appears.
Install the snap ring and dust cover.

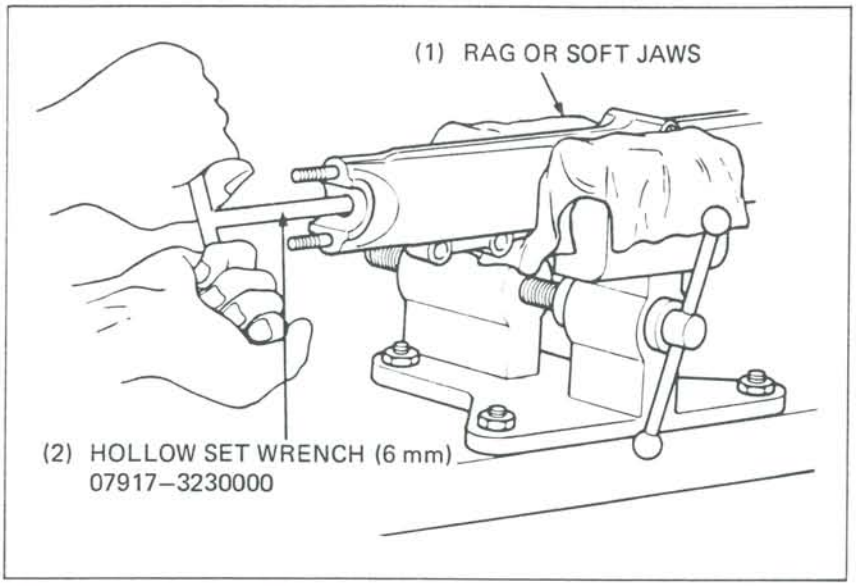


Install the piston and fork tube.
Apply a locking agent to the bolt threads and underside of the bolt and torque to the specified tension.

TORQUE: 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb)

NOTE

Do not overtighten the fork slider in a vise.



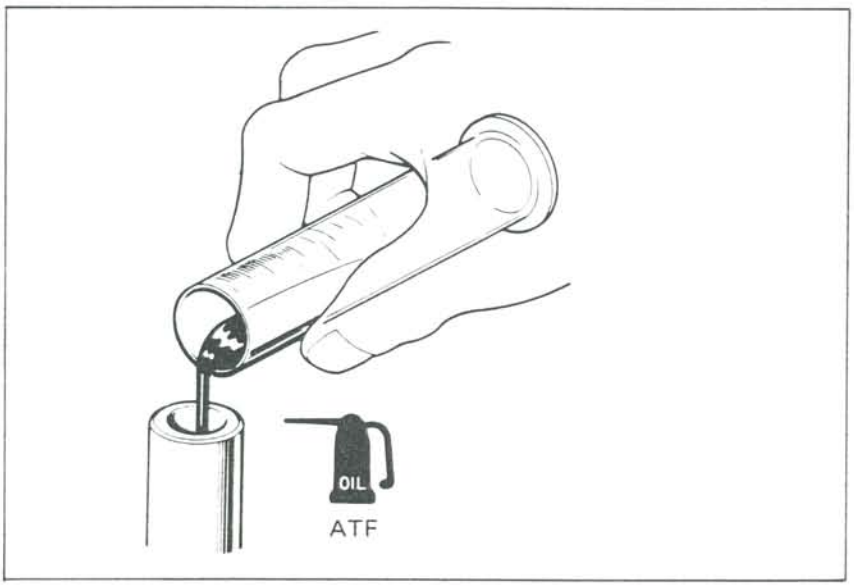
FILLING WITH OIL

Use ATF (Automatic Transmission Fluid) to fill the front fork.

OIL CAPACITY:
177–182 cm³ (6.0–6.2 ozs) at assembly

NOTE

Pour the specified amount of ATF. Do not overfill.

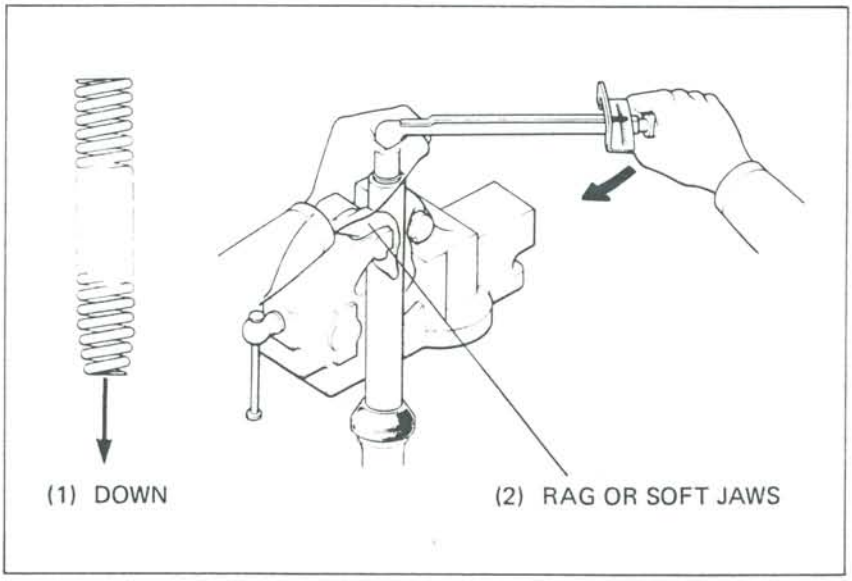


Slide the fork spring and spring seat into position and tighten with the fork bolt.

TORQUE: 20–30 N·m (2.0–3.0 kg-m, 15–22 ft-lb)

NOTE

- Place the fork tube in a vise with soft jaws, avoiding the sliding surface.
  Note the spring direction.
- Before installing the fork bolt, clean the bolts carefully.

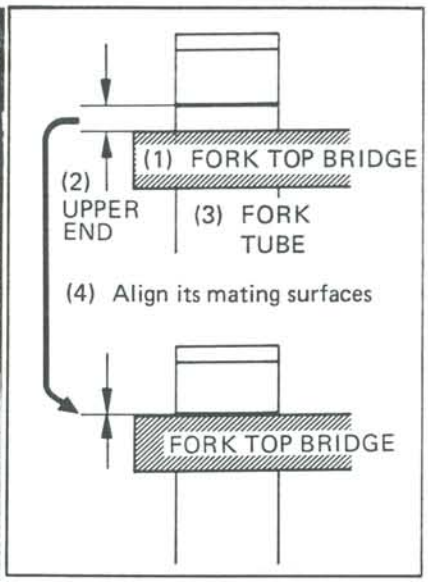


FORK INSTALLATION

Install the fork tubes in the fork top bridge and steering stem, while rotating them by hand.

Position the fork tubes so that the aligning lines are even with the fork top bridge.





'ghten the right and left handlebar mounting bolts.

TORQUE: 28–32 N·m (2.8–3.2 kg-m, 20–23 ft-lb)

NOTE

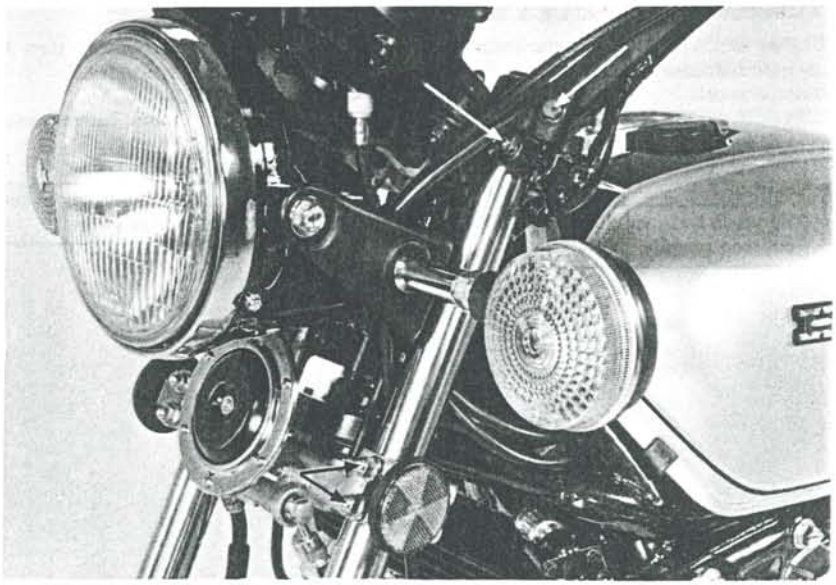
Before installing the mounting bolts, apply thin coat of oil on the threads.

Torque the fork tube pinch bolts at the steering stem.

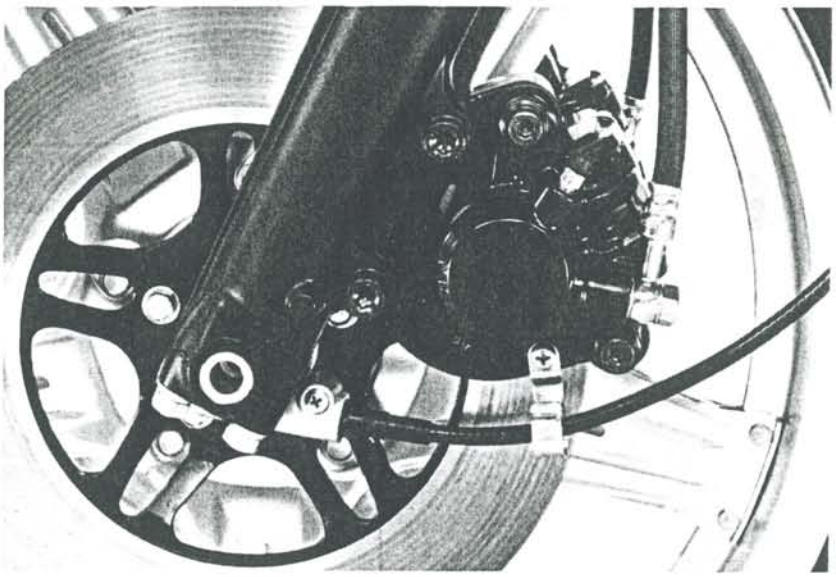
TORQUE: 18–25 N·m (1.8–2.5 kg-m, 13–18 ft-lb)

Torque the fork tube pinch bolts at the top bridge.

TORQUE: 9–13 N·m (0.9–1.3 kg-m, 7–9 ft-lb)



Install the fender.
Install the brake caliper.
Secure the brake hose.
'nstall the front wheel.



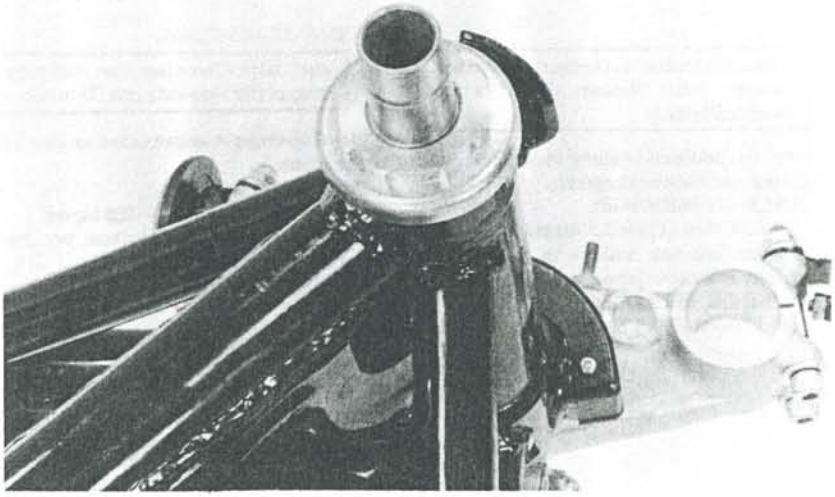
STEERING STEM

STEM REMOVAL

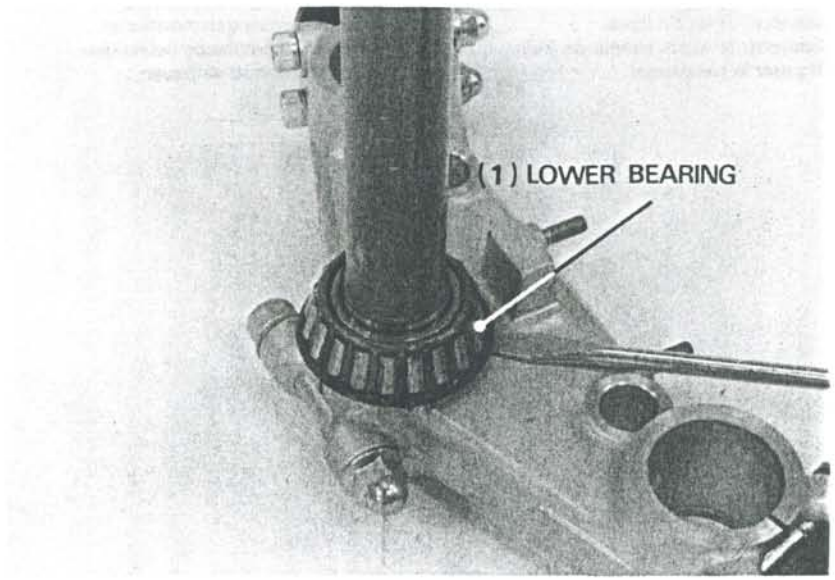
Remove the handlebars.
Remove the instruments (Page 13-6).
Remove the headlight assembly and disconnect the wiring (Page 13-5).
Remove the 2-way joint assembly.
Remove the wheel and forks.
Remove the fuse cover.
Remove the fork top bridge.



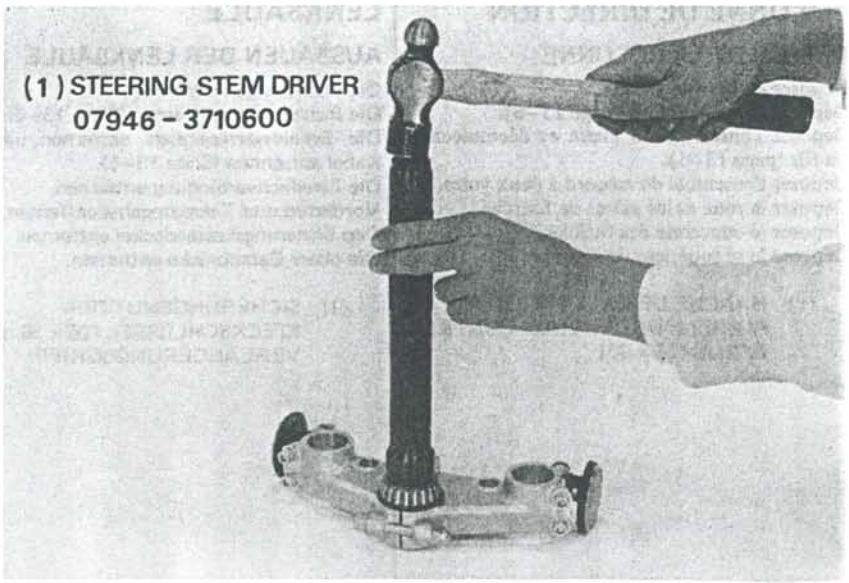
Remove the top thread nut.
Remove the steering stem.



Remove the lower steering stem bearing.



Install a dust seal onto the steering stem and drive the lower bearing inner race over the stem with the special tool.

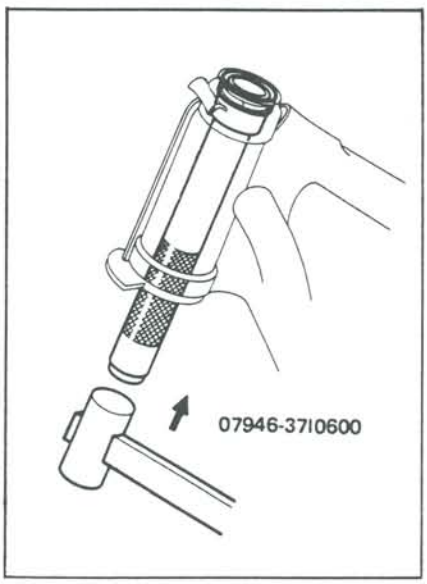


NOTE

Replace the bearing and bearing race as a set.

Remove the upper bearing race with the special tool.



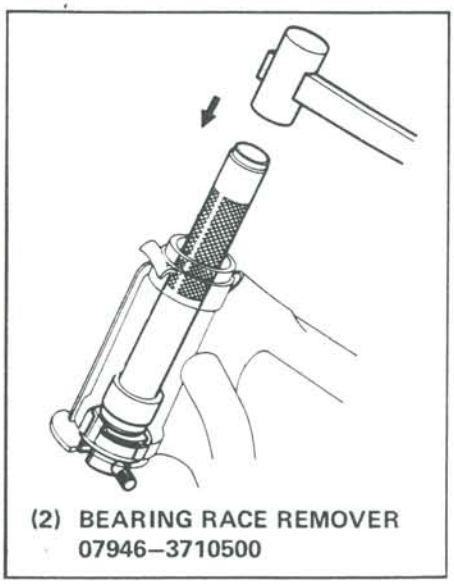


Remove the lower bearing race with the special tool.

NOTE

If the motorcycle has been involved in an accident, examine the area around the steering head for cracks.

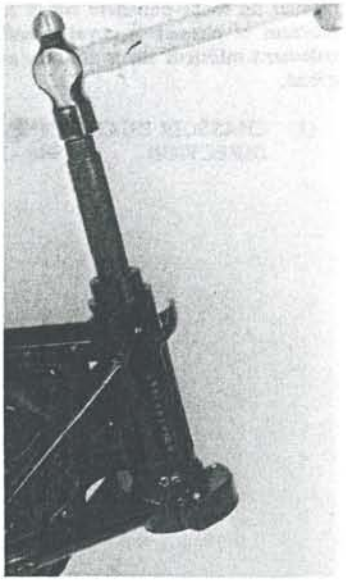




Drive the upper bearing outer race into the head pipe with the special tools.

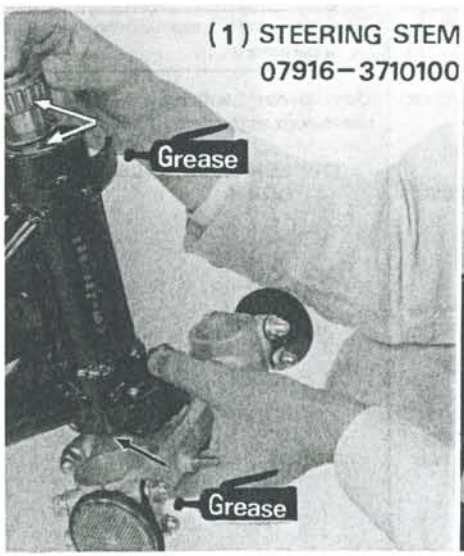
Drive the lower bearing outer race into the head pipe with the special tool.

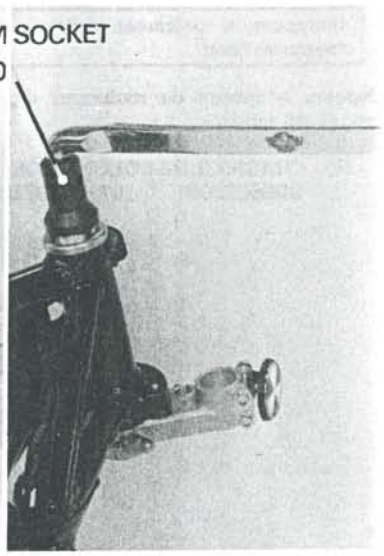




STEERING STEM INSTALLATION

Pack the bearing cavities with bearing grease.
Insert the steering stem into the steering head pipe and install the upper bearing inner race.
Install the steering head top nut and tighten to 30–40 N·m (3.0–4.0 kg-m, 22–28 ft-lb).
Loosen the top nut and retighten to 8–12 N·m (0.8–1.2 kg-m, 6–9 ft-lb).

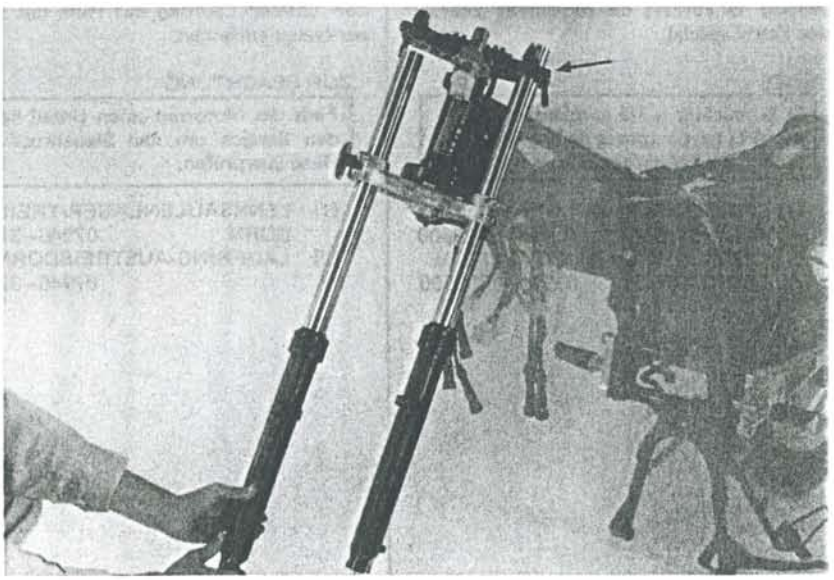




TOP BRIDGE INSTALLATION

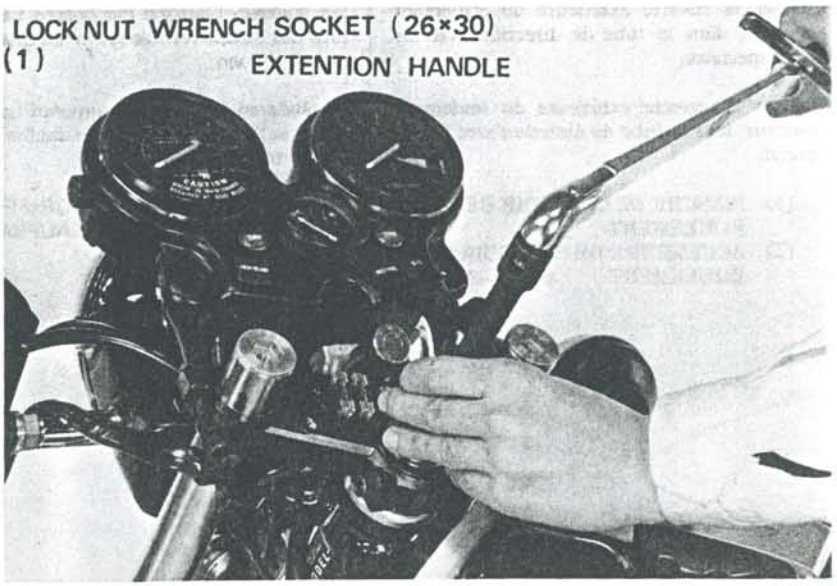
Install the front fork legs.
Position the fork tubes so that the upper ends are even with the steering head adjuster.

Temporarily hold the front fork legs by tightening the steering stem fork pinch bolts.



Torque the steering stem nut.

TORQUE: 80–120 N·m
(8.0–12.0 kg-m, 58–87 ft-lb)



Torque the bottom bridge fork bolts.

TORQUE: 18–25 N·m
(1.8–2.5 kg-m, 13–18 ft-lb)

Install the following:

Handlebars
Instruments
Headlight
Front fender
Front wheel

