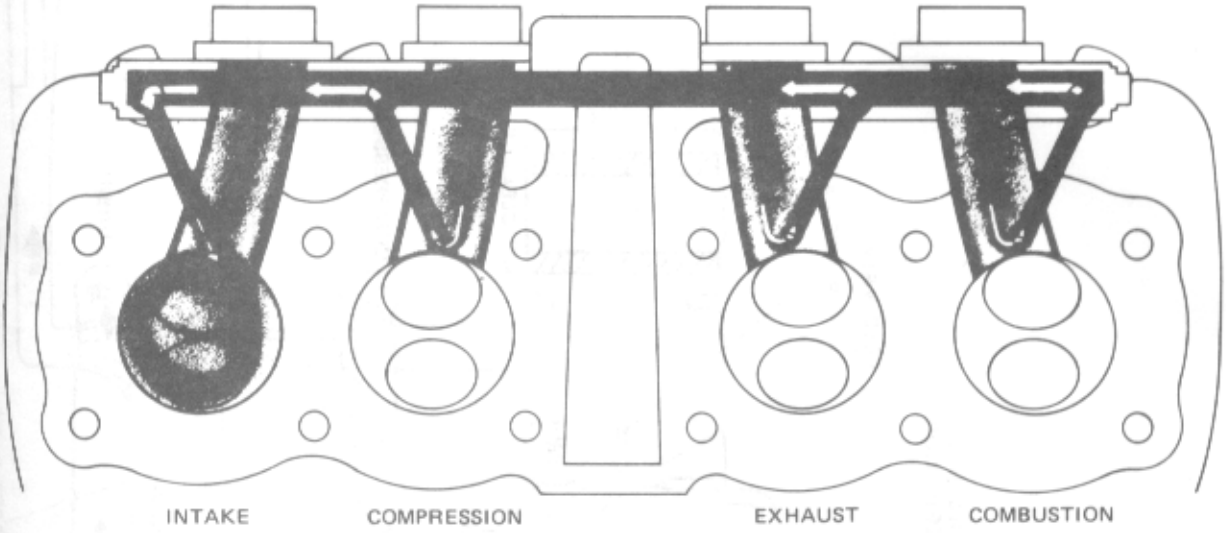
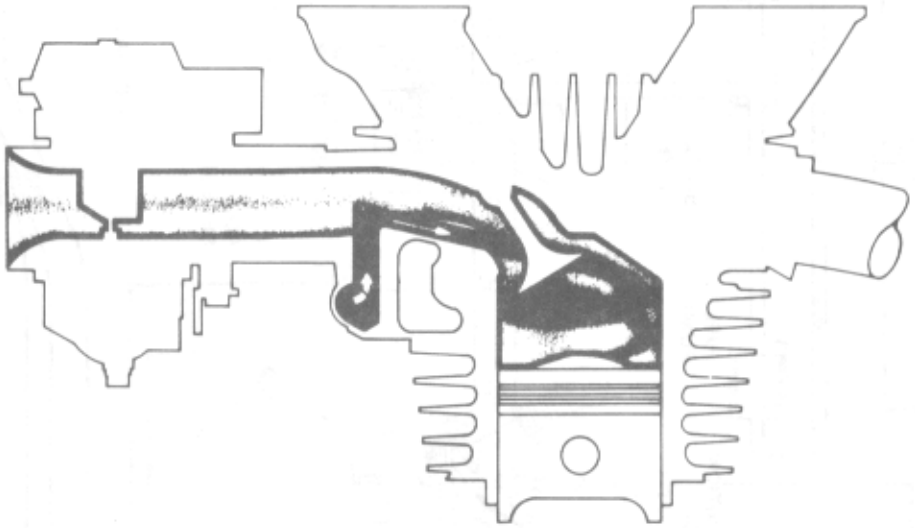
MAJOR FEATURES

YAMAHA INDUCTION CONTROL SYSTEM

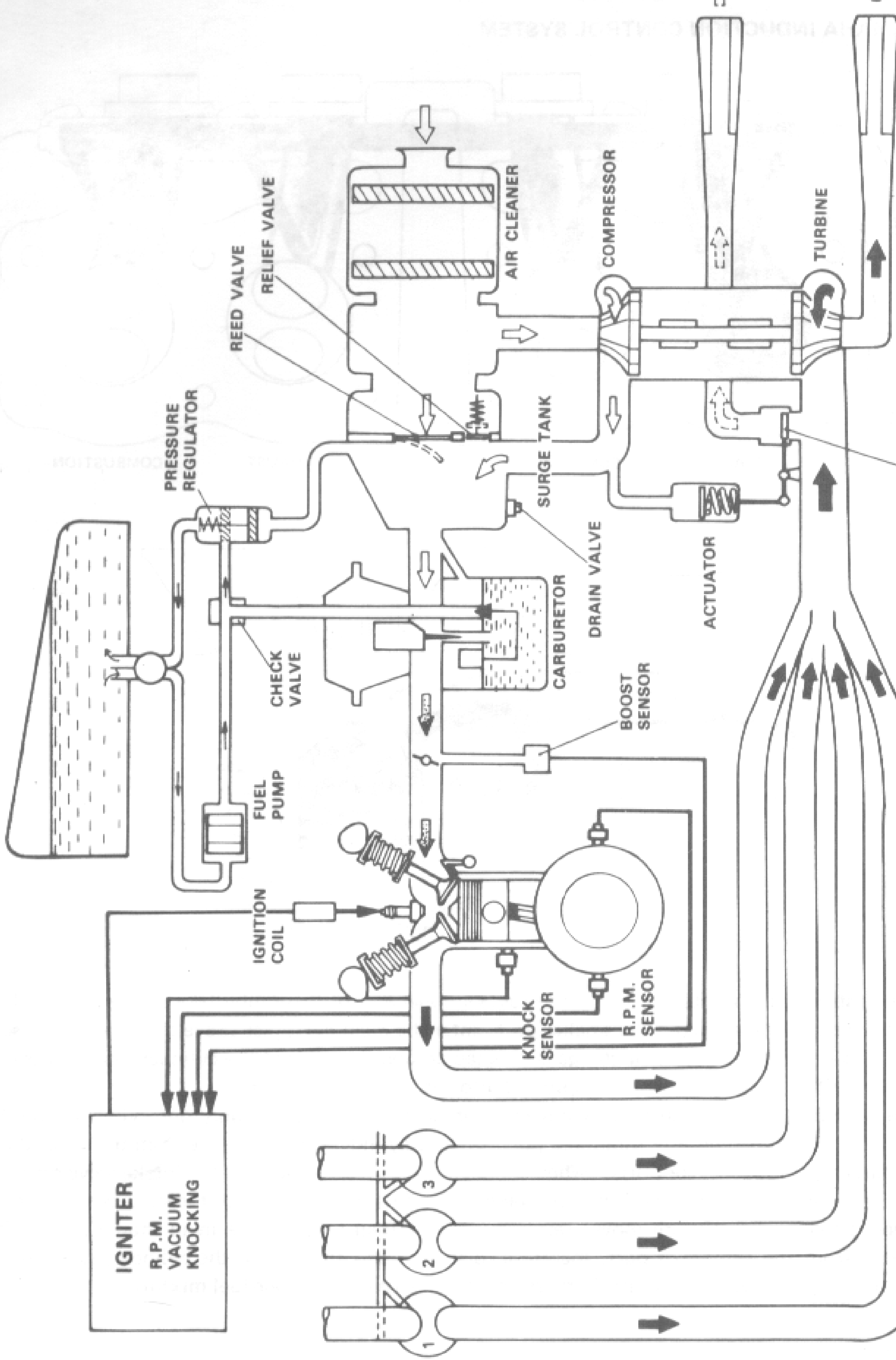




This system has subintake ports. The cross-sectional area of these subintake port is smaller than that of main intake ports. The smaller ports enter the main ports just above the intake valve seat and at such an angle that their charge is directed around the walls of the cylinder; this results in a swirling effect as the mixture is compressed into the combustion chamber.

The subintake ports for all four cylinders are interconnected. Since only one cylinder is on the intake stroke at a time, the subintake port for that cylinder draws mixture from the other three carburetors and subintake ports. When the piston is moving down and the intake valve opens, a vacuum is created in the main and subintake ports. But since the area of the subintake port is so much smaller, the mixture moves faster through it than through the main intake port. The charge from the subintake port, therefore, blasts around the wall of the cylinder, swirling the entire intake charge. This results in more complete burning of the air-fuel mixture.

YAMAHA TURBO SYSTEM

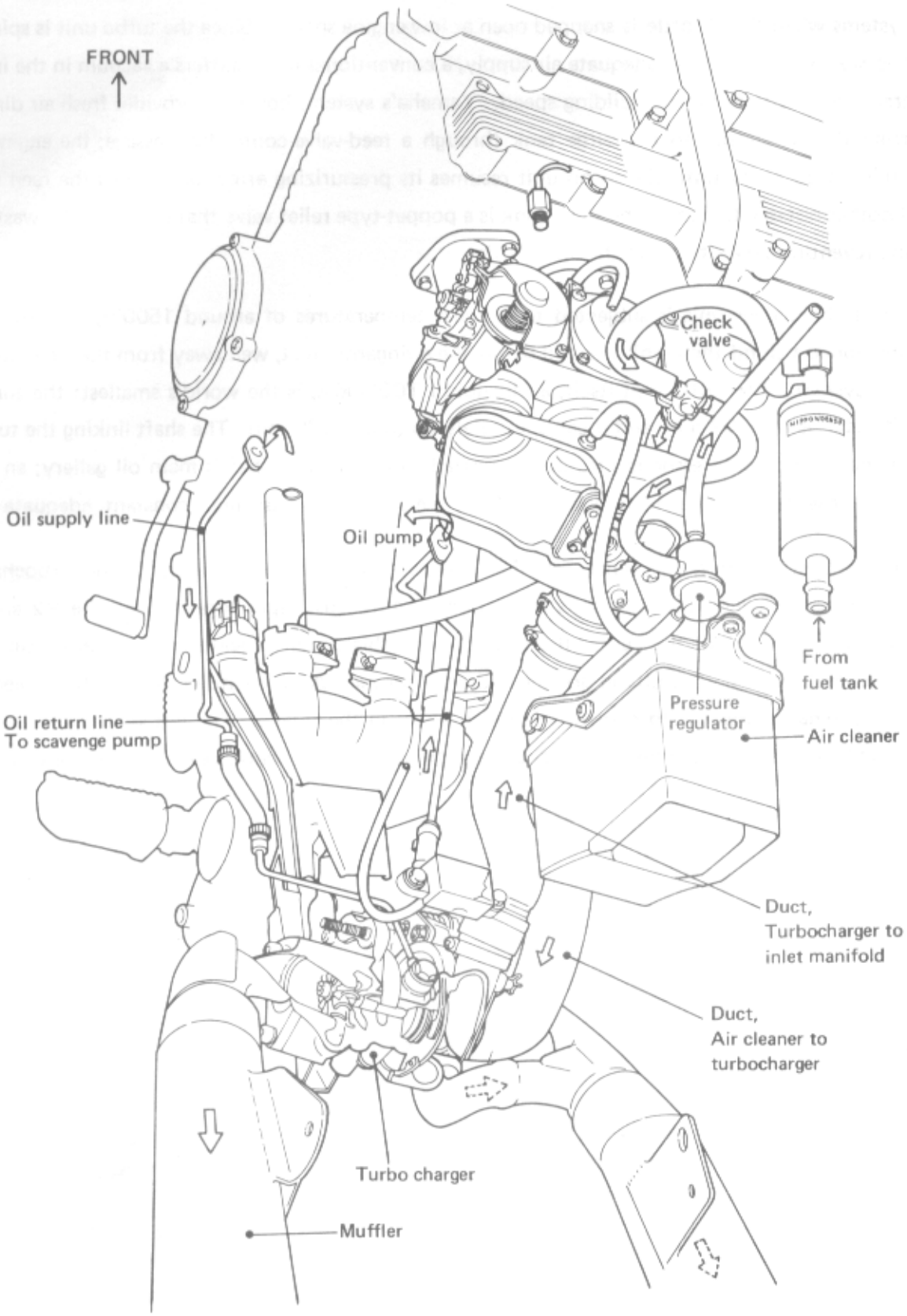


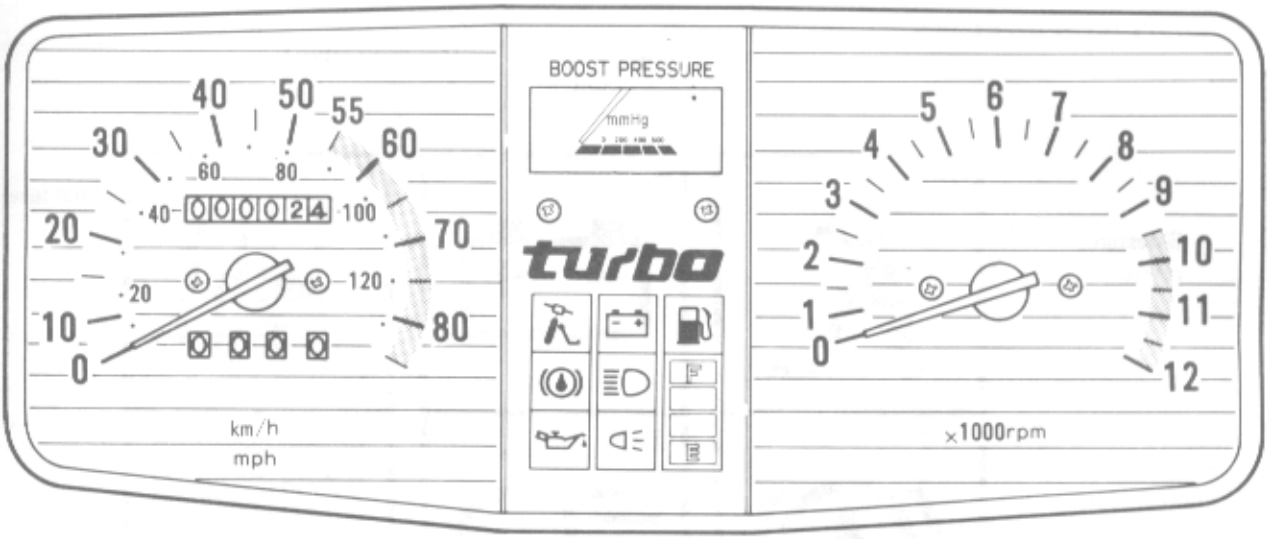
GENERAL DESCRIPTION OF THE TURBOCHARGER

Yamaha has largely eliminated "turbo lag", a phenomenon which afflicts conventional turbo systems when the throttle is snapped open at low engine speeds. Since the turbo unit is spinning too slowly to provide an adequate air supply, a conventional turbo suffers a vacuum in the intake tract and hesitates before building speed. Yamaha's system, however, provides fresh air directly from the air cleaner to the surge tank through a reed-valve-controlled passage; the engine can build speed frelly until the turbo unit resumes its pressurizing effect and closes the reed valve. Another notable feature in the surge tank is a poppet-type relief valve that backs up the wastegate in preventing excess boost in the intake side.

The turbocharger unit is subjected to exhaust temperatures of around 1500°F; it is therefore positioned behind the crankcase and below the swingarm pivot, well away from the rider and the fuel system. The turbo unit itself, a Mitsubishi TC03-06A, is the world's smallest: the turbine diameter is only 39 mm, and it can spin safely up to 210,000 rpm. The shaft linking the turbine to the intake compressor is pressure-lubricated from the crankshaft's main oil gallery; an additional scavenging pump retrieves the oil from the turbo unit, ensuring a constant, adequate flow.

The exhaust system has an inner wall of stainless steel from the header pipes to the turbocharger. A patented exhaust manifold links the #1 and #4 exhaust pipes together and the #2 and #3 pipes together before they enter the turbocharger; this design provides even exhaust pulsing to drive the turbine and results in greater midrange torque. A wastegate in the manifold bleeds off excess exhaust pressure to prevent too much boost in the intake. The left-side muffler receives the exhaust gas from the turbo unit, and the right-side muffler handles excess from the wastegate.

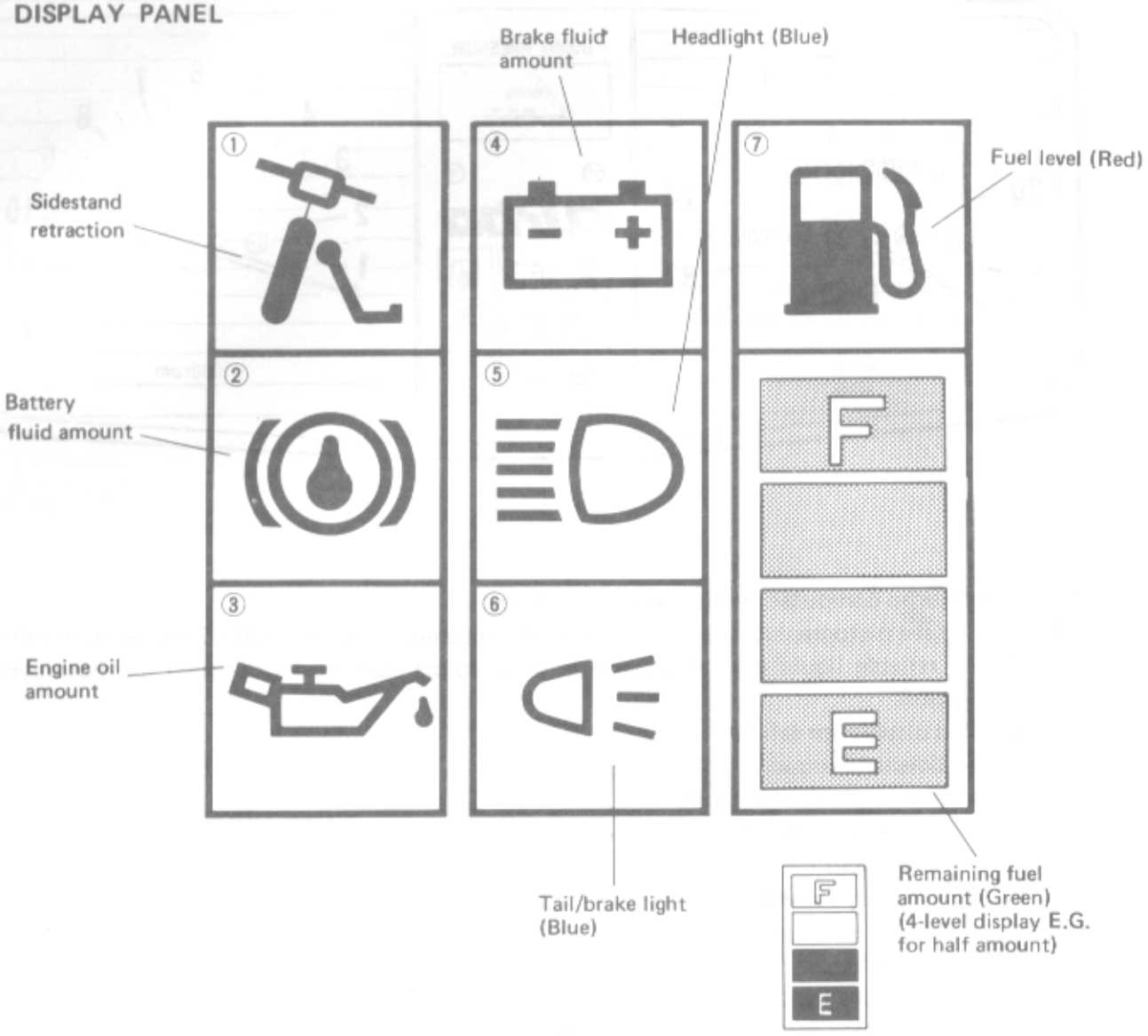

FRONT
Check valve
Oil supply line
Oil pump
From fuel tank
Pressure regulator
Air cleaner
Oil return line
To scavenge pump
Duct, Turbocharger to inlet manifold
Duct, Air cleaner to turbocharger
Turbo charger
Muffler



The XJ650 turbo computer monitor system features:

1. Easy-to-see pictographic displays; a further improvement upon the XJ750 computer monitor.
2. Highly reliable liquid crystal displays in three colors, specifically designed for motorcycle application.
   1) Red display for safety
      - Sidestand retraction
      - Disc brake fluid amount
      - Engine oil amount
      - Fuel amount
   2) Blue display for electrics
      - Battery liquid amount
      - Headlight
      - Tail/brake light
   3) Green display for remaining fuel amount
      - Four-stage display for remaining fuel amount

DISPLAY PANEL



① This indicator is displayed when the sidestand is not retracted.

② This indicator is displayed when the brake fluid level is below specification in the front brake master cylinder.

③ This indicator is displayed when the engine oil level is low.

④ This indicator is displayed when the battery fluid level is low.

⑤ This indicator is displayed when the headlight bulb is burned out.

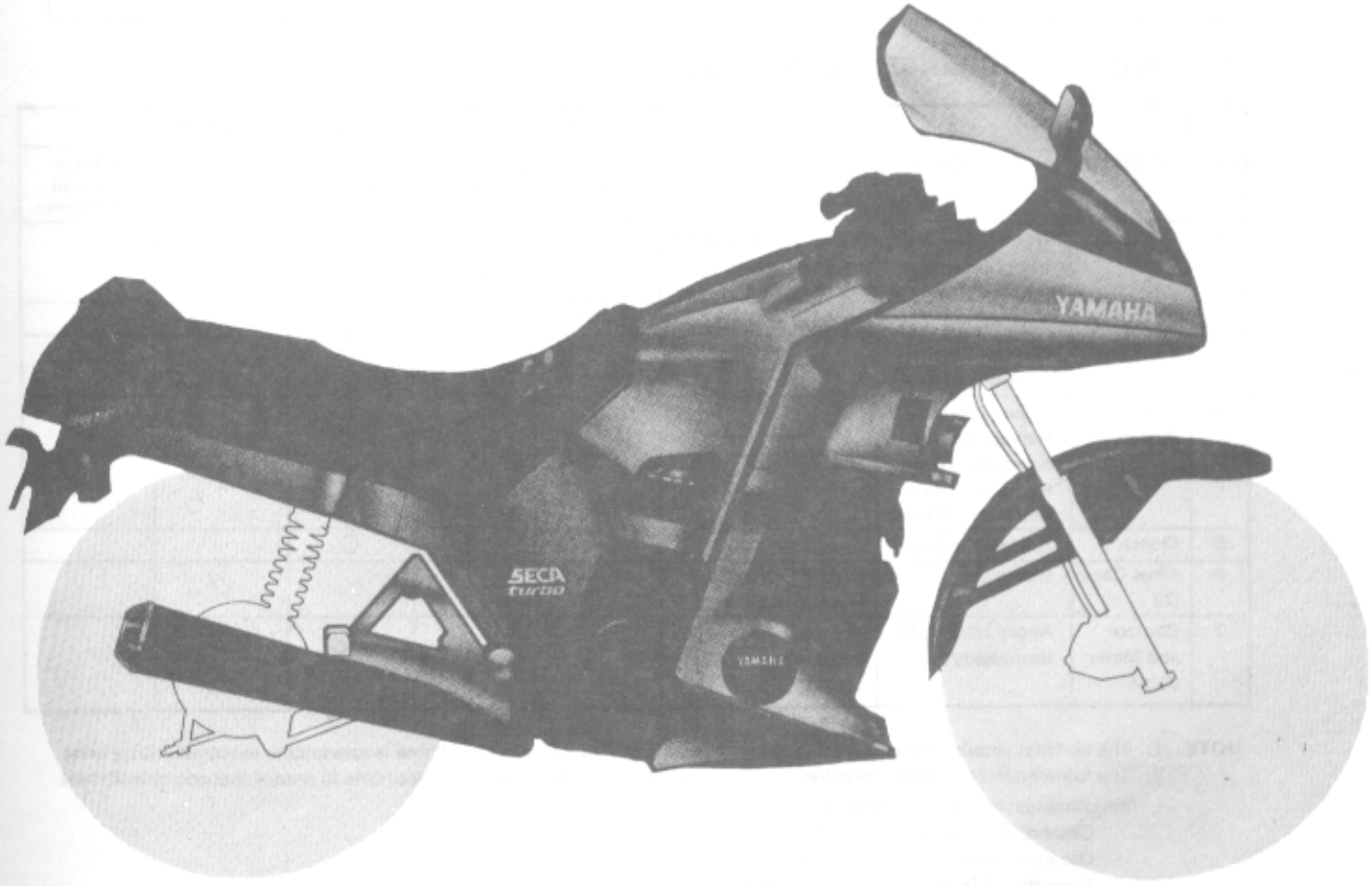
⑥ This indicator is displayed when the taillight and/or brake light bulbs are burned out.

⑦ This indicator is displayed when the fuel level is low.

TURBO 650 FAIRING

The fairings on Yamaha's innovative new models represent more than just handsome cosmetics. Indeed, from their inception to their final rendering, form was designated secondary to function. In designing a fairing; two of the most important aerodynamic factors are wind resistance and front wheel lift force. Through extensive wind-tunnel testing, Yamaha engineers crafted a fairing for the Seca Turbo which significantly reduces these effects. Every component down to the rear-view mirrors was designed with aerodynamic efficiency in mind. The coefficient of drag, a measurement of wind resistance, is among the lowest in the world for a road machine. A reduction of about 10% was achieved in front wheel lift force over a similar machine not equipped with a fairing.

Yamaha maintains its lead in advanced high-performance technology with the introduction of the XJ650LJ, featuring the Yamaha Turbo System. This system uses the power of the exhaust gases, normally wasted, to spin a turbine which supercharges the intake of the air fuel mixture. The system goes far beyond the unrefined, bolt-on turbochargers offered by accessory companies. The Yamaha Turbo System is a fully integrated combination of sophisticated engineering features which virtually eliminates the problems of conventional turbocharging while enhancing its advantages. The result is a lightweight, nimble-handling machine which performs like a superbike with an engine twice as large. Yamaha is poroud to rewrite the books on high-performance motorcycling!



MAINTENANCE AND LUBRICATION CHARTS

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

NO.	ITEM	REMARKS	INITIAL BREAK-IN		THEREAFTER EVERY	
			1,000 km (600 mi) or 1month	5,000 km (3,000 mi) 7 months	4,000 km (2,500 mi) 6 months	8,000 km (5,000 mi) 12 months
1	Valve Clearance	Check and adjust valve clearance when engine is cold.		○		○
2	Spark plug	Check condition. Adjust gap. Clean. Replace after initial 13,000 km (8,000 mi) or 18 months and thereafter every 12,000 km (7,500 mi) or 18 months.		○	○	Replace every 12,000 km (7,500 mi) or 18 months
3	Crankcase Ventilation	Check ventilation hose for cracks or damage. Replace if necessary.		○		○
4	Fuel Line	Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary.		○		○
5	Intake/Exhaust System	Check for leakage. Retighten as necessary. Replace gasket(s) if necessary.		○	○	
6	Idle Speed	Check and adjust engine idle speed. Adjust cable free play if necessary.		○	○	
7	Carburetor Synchronization	Adjust synchronization of carburetors.		○	○	

GENERAL MAINTENANCE/LUBRICATION

NO.	ITEM	REMARKS	TYPE	INITIAL BREAK-IN		THEREAFTER EVERY		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000mi) or 24 months
1	Engine Oil	Warm up engine before draining	Yamalube 4 cycle oil or SAE 20W40 type SE motor oil	○	○	○		
2	Oil Filter	Replace	—	○	○		○	
3	Air Filter	Clean with compressed air.	—		○		○	
4	Brake System	Adjust free play. Replace pads if necessary. (Front) Replace shoes if necessary. (Rear)	—	○ ○	○ ○	○ ○		
5	Clutch	Adjust free play.	—	○	○	○		
6	Final Gear Oil	Replace	SAE 80 API "GL-4" Hypoid gear oil	○			○	
7	Control and Meter Cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W 30 motor oil	○	○	○		

NOTE. 1. The air filter should be cleaned more often than at specified intervals if machine is operated in extremely dusty areas.
2. The lubrication chart must be adhered to strictly. Observe the following service hints to ensure that the oil will meet the demands placed on it by the engine.
   Observe all periodic inspections as outlined.
   Use only the oil grades specified.
   Keep the oil level at the specified level.

NO.	ITEM	REMARKS	TYPE	INITIAL BREAK-IN		THEREAFTER EVERY		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000 mi) or 24 months
8.	Rear Arm Pivot Bearing	Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi)	Medium weight bearing grease.					Repack
9.	Center-and Side-Stand Pivots	Apply lightly	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○		
10.	Front Fork Oil	Drain completely. Refill to specification.	Yamaha fork oil 10 wt or equivalent					○
11.	Steering Ball Bearing and Races	Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi)	Medium weight wheel bearing grease		○	○		Repack
12.	Wheel Bearings	Check bearings for smooth rotation. Replace if necessary.	–		○	○		
13.	Battery	Check specific gravity. Check breather pipe for proper operation.	–		○	○		
14.	Change/ Brake Pedal shaft Pivot	Apply lightly	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○		
15.	A.C. Generator	Replace generator brushes. Replace at initial 13,000 km *(8,000 mi) and thereafter every 16,000 km (10,000 mi)	–					Replace
16.	Brake/ Clutch Lever Pivot Shaft	Apply lightly	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○		

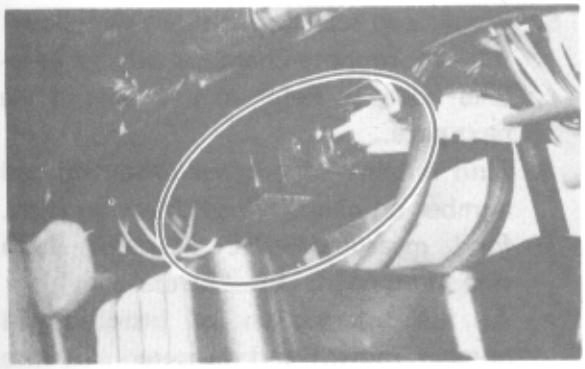
ENGINE

A. Valve clearance adjustment

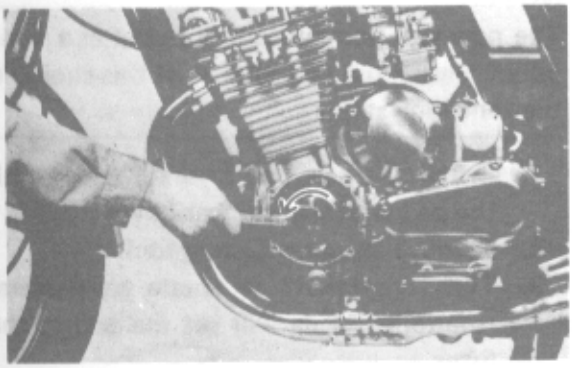
NOTE:

Valve clearance must be measured with the engine and at room temperature.

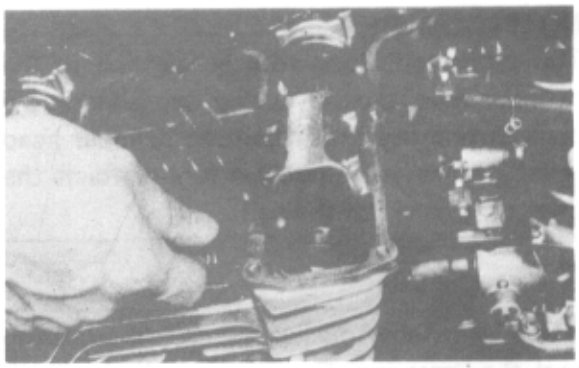
1. Remove the seat, fairing components, and fuel tank. See page 35.
2. Remove the horn, flasher relay, emergency engine stop relay and spark plug lead wires.



3. Remove the cylinder head cover and left crankcase cover (pick-up base cover). Care should be taken to not scratch or damage the gasket sealing surfaces.
4. Turn the crankshaft with the nut on the left end of the crankshaft to turn the cams. The proper position of the cam when measuring the valve clearance is with the cam lobe directly opposite the valve lifter.



5. Insert a feeler gauge between the valve lifter and the camshaft base circle.



Intake valve clearance (cold):
0.11 ~ 0.15 mm (0.004 ~ 0.006 in)
Exhaust valve clearance (cold):
0.16 ~ 0.20 mm (0.006 ~ 0.008 in)

Adjustment

Valve clearance is adjusted by replacing the adjusting pad on the top of the valve lifter. Adjusting pads are available in 25 thicknesses ranging from No. 200 (2.000 mm) to No. 320 (3.20 mm) in steps of 0.05 mm. The thickness of each pad is marked on the pad face that contacts of the valve lifter (not the cam). Adjustment of the valve clearance is accomplished as follows:

1. Determine valve clearance (feeler gauge measurement.)
2. Remove adjusting pad and note number.
3. Select proper pad from appropriate chart (intake or exhaust chart).
4. Install new pad and check installed clearance.

Procedure

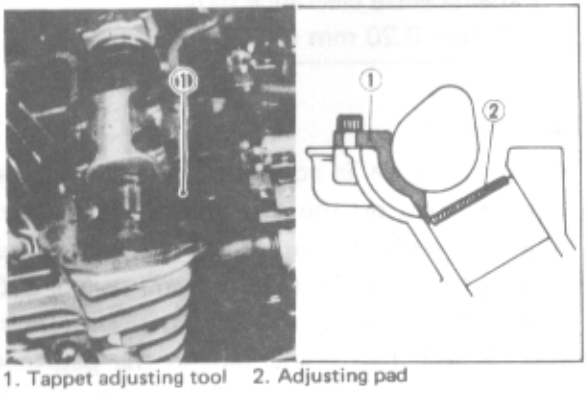
1. Measure valve clearance. If clearance is incorrect, record the measured amount of clearance. This must be measured carefully.
2. There is a slot in the valve lifter. This slot must be positioned opposite the blades of the tappet adjusting tool before the tools is installed.
3. Turn the cam until the lobe fully depresses the valve lifter and opens the valve. Install the tappet adjusting tool as shown to hold the lifter in this depressed position.

NOTE:

The tappet adjusting tool is fastened to the cylinder head securely using one allen screw such as one used to install the cylinder head cover. Make sure that the tool contacts the lifter only, and not the pad.

CAUTION:

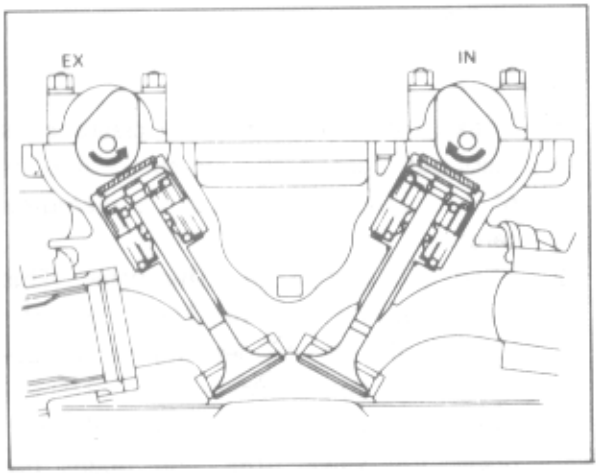
If the cam lobe touches the tappet adjusting tool, the stress may fracture the cylinder head. DO NOT ALLOW THE CAM TO CONTACT THE TAPPET ADJUSTING TOOL.



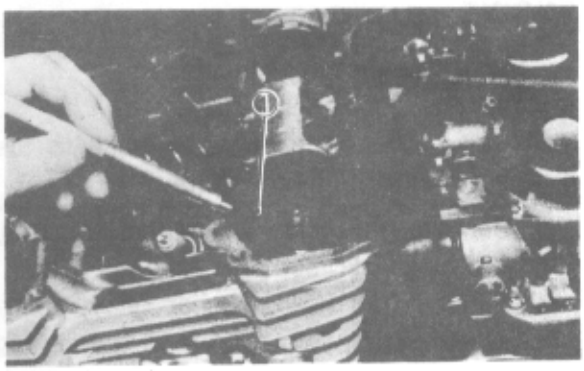
1. Tappet adjusting tool 2. Adjusting pad

4. Carefully rotate the cam so that the pad can be removed. To avoid cam touching the adjusting tool, turn cams as follows: (view from left side of the motorcycle)

   Intake: Carefully rotate CLOCKWISE.
   Exhaust: Carefully rotate COUNTER-CLOCKWISE.



5. Remove the pad from the lifter. There is a slot in the lifter. Use a smaller screwdriver or other blade and a magnetic rod to remove the pad. Note the number on the pad.



1. Adjusting pad

6. Proper pad selection is made as follows: (Use appropriate chart for exhaust or intake valves.) Refer to the table in the next page.
   a. Find number of original (installed) pad number on chart. Read down on chart.
   b. Find measured valve clearance (from step 1) on chart. Read across.
   c. At the intersection of installed pad number (down) and measured clearance (across) is a new pad number.

EXAMPLE:
Intake valve, installed pad:
No. 250 (read down)
Measured clearance:
0.32 mm (read across)
New pad number: No. 270
(intersection of down & across)

NOTE:

The new pad number is to be used as a guide only. Verify the correctness of this choice in the following step(s).

7. Install the new pad in the lifter. Install the pad with the number down.
8. Remove tappet adjusting tool.
9. Turn crankshaft to rotate cam several rotations. This will set the pad in the lifter.
10. Check valve clearance (step 3). If clearance is incorrect, repeat preceding steps until proper clearance is obtained.
11. Inspect head cover gasket. If bent or torn, replace gasket.
12. Reinstall removed parts in reverse order.

PAD SELECTION CHART

Intake

Measured clearance	INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00 - 0.05			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.06 - 0.10		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.11 - 0.15																									
1.16 -0.20	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.21 - 0.25	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.26 - 0.30	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.31 - 0.35	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.36 - 0.40	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0241 - 0.45	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.46 - 0.50	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.51 - 0.55	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.56 - 0.60	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.61 - 0.65	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.66 - 0.70	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.71 - 0.75	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.76 - 0.80	265	270	275	280	285	290	295	300	305	310	315	320													
0.81 - 0.85	270	275	280	285	290	295	300	305	310	315	320														
0.86 - 0.90	275	280	285	290	295	300	305	310	315	320															
0.91 - 0.95	280	285	290	295	300	305	310	315	320																
0.96 - 1.00	285	290	295	300	305	310	315	320																	
1.01 - 1.05	290	295	300	305	310	315	320																		
1.06 - 1.10	295	300	305	310	315	320																			
1.11 - 1.15	300	305	310	315	320																				
1.16 - 1.20	305	310	315	320																					
1.21 - 1.30	310	315	320																						
1.26 - 1.30	315	320																							
1.31 - 1.35	320																								

VALVE CLEARANCE (engine cold) 0.11~0.15 mm
Example: Installed is 250
Measured clearance is 0.32 mm
Replace 250 pad with 270
Pad Number: (example) Pad No. 250 = 2.50 mm
Pad No. 255 = 2.55 mm
Always install pad with number down.

Exhaust

Measured clearance	INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00 - 0.05				200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305
0.06 - 0.10			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.11 - 0.15		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.16 - 0.20																									
0.21 - 0.25	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.26 - 0.30	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.31 - 0.35	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.36 - 0.40	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.41 - 0.45	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.46 - 0.50	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.51 - 0.55	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.56 - 0.60	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.61 - 0.65	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.66 - 0.70	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.71 - 0.75	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.76 - 0.80	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.81 - 0.85	265	270	275	280	285	290	295	300	305	310	315	320													
0.86 - 0.90	270	275	280	285	290	295	300	305	310	315	320														
0.91 - 0.95	275	280	285	290	295	300	305	310	315	320															
0.96 - 1.00	280	285	290	295	300	305	310	315	320																
1.01 - 0.05	285	290	295	300	305	310	315	320																	
1.06 - 1.10	290	295	300	305	310	315	320																		
1.11 - 1.15	295	300	305	310	315	320																			
1.16 - 1.20	300	305	310	315	320																				
1.21 - 1.25	305	310	315	320																					
1.26 - 1.30	310	315	320																						
1.31 - 1.35	315	320																							
1.36 - 1.40	320																								

VALVE CLEARANCE (engine cold) 0.16~0.20 mm
Example: Installed is 250
Measured clearance is 0.32 mm
Replace 250 pad with 265
Pad Number: (example) Pad No. 250 = 250 mm
Pad No. 255 = 255 mm
Always install pad with number down.

B. Spark plug

1. Check the electrode condition and wear, insulator color, and electrode gap.
2. Use a wire gauge for measuring the plug gap.
3. If the electrodes become too worn, replace the spark plug.
4. When installing the plug, always clean the gasket surface. Wipe off any grime that might be present on the surface of the spark plug, and torque the spark plug properly.

Standard spark plug:
BP8ES (NGK) or W24EP-U (ND)
Spark plug gap:
0.7 ~ 0.8 mm (0.028~0.032 in)
Spark plug tightening torque:
2.0 m·kg, (14.5 ft·lb)

C. Cam chain tensioner

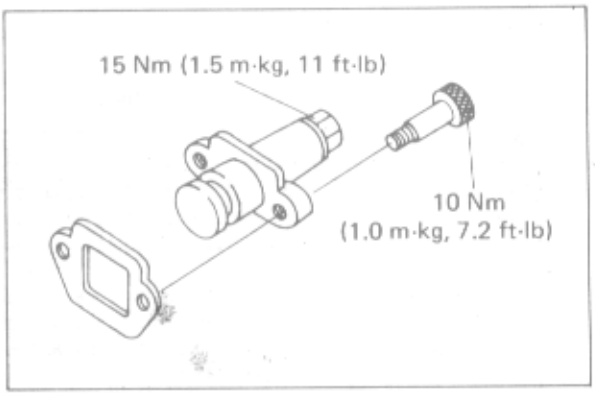
This model has been equipped the automatic cam chain tensioner. No adjustment is necessary.
When installing this tensioner onto the cylinder, proceed as follows:

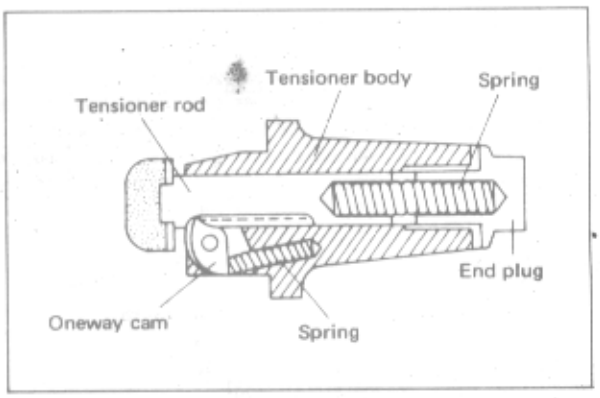
1. Remove the end plug and spring from the tensioner assembly.
2. Unlock the oneway cam by pushing it with your finger and push the tensioner rod into the tensioner body until it stops.
3. Install the tensioner to the cylinder and torque the bolts to the specification.

Tightening torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)

4. Reinstall the spring and end plug with the gasket. Torque the end plug to the specification.

Tightening torque:
15 Nm (1.5 m·kg, 11 ft·lb)





D. Ignition timing

1. Ignition timing is checked with a timing light by observing the position of the stationary pointer and the marks stamped on the timing plate.

The timing plate is marked as follows:	
"⊔"	Firing range for No. 1 (L.H.) cylinder
"T"	Top Dead Center for No. 1 (L.H.) and No. 4 (R.H.) cylinders

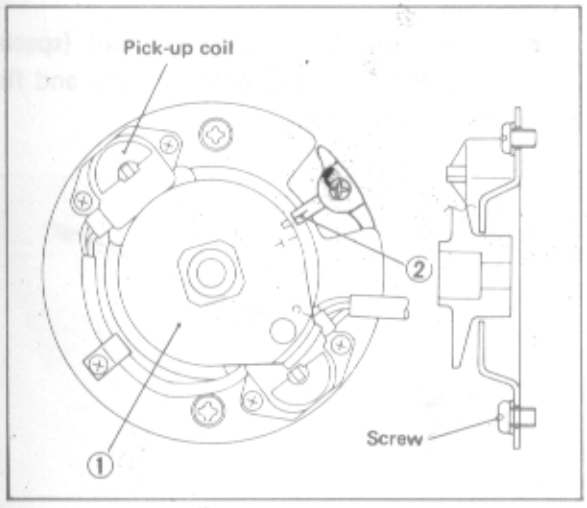
2. Connect the timing light to No. 1 (L.H.) spark plug lead wire.
3. Start the engine and keep the engine speed as specified. Use a tachometer to check the engine speed.

Specified engine speed:	1,050 r/min

4. The stationary pointer should be within the limits of "⊔" on the timing plate. If it exceeds the limits or does not steady, check the timing plate for tightness and/or ignition system for damage. (See "ELECTRICAL")

CAUTION:

Never bend the stationary pointer.



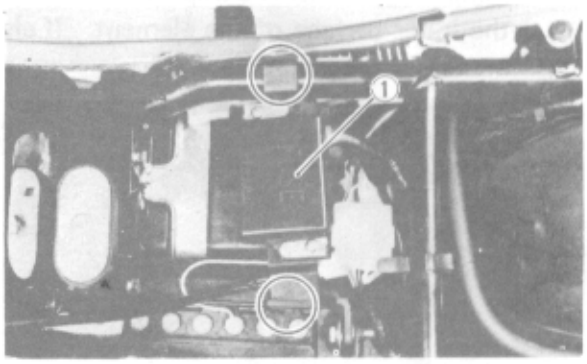
1. Timing plate 2. Stationary pointer

E. Air filter

1. Removal

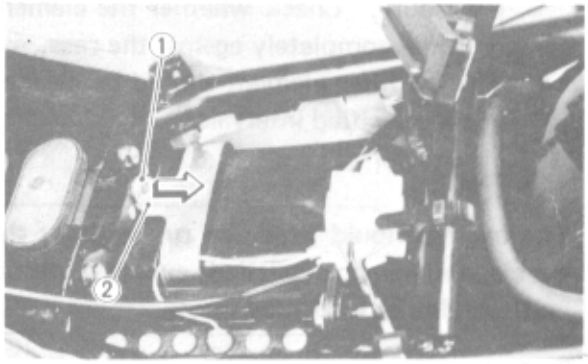
a. Remove the seat.

b. Remove the fuse box.



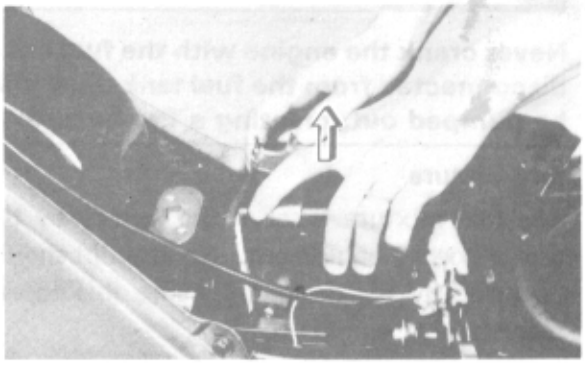
1. Fuse box

c. Remove the air filter case securint screw. Then, pull the air filter case holding plate backward.

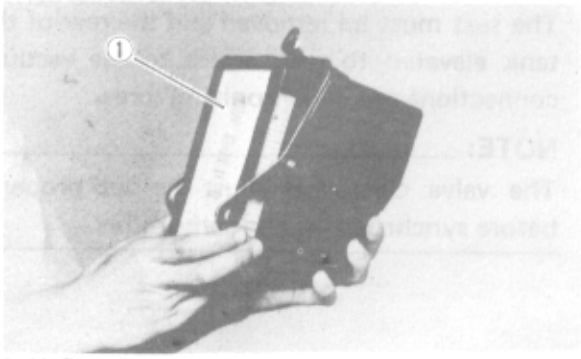


1. Securing screw 2. Holding plate

d. Pull out the air filter case.

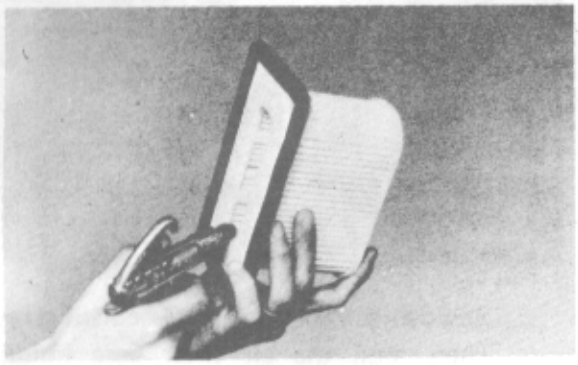


e. Pull out the element.



1. Air filter element

2. Cleaning method
   Tap the element lightly to remove most of the dust and dirt; then blow out the remaining dirt with compressed air from the inner surface of the element. If element is damaged, replace it.



3. Reassemble by reversing the removal procedure. Check whether the element is seated completely against the case.
4. The air filter element should be cleaned at the specified intervals.

CAUTION:

The engine should never be run without the air cleaner element installed; excessive piston and/or cylinder wear may result.

F. Carburetor

WARNING:

Never crank the engine with the fuel lines disconnected from the fuel tank. Fuel will be pumped out, creating a fire hazard.

Idle mixture

The idle mixture is set at the factory by the use of special equipment. No attempt should be made by the dealer to change this adjustment.

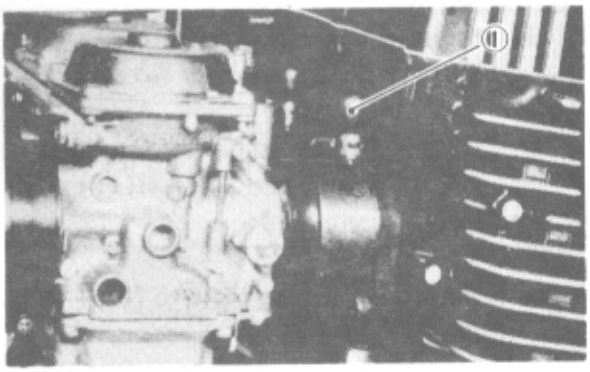
Synchronization

The seat must be removed and the rear of the tank elevated to gain access to the vacuum connections and synchronizing screw.

NOTE:

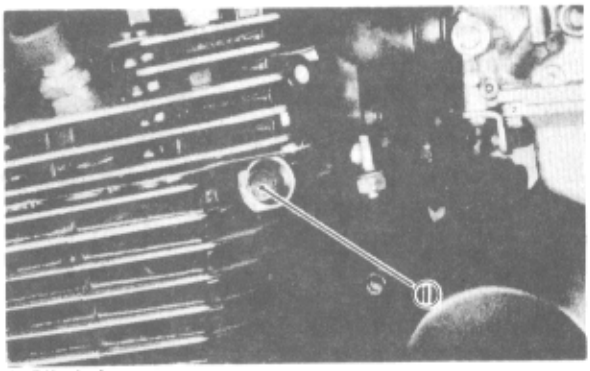
The valve clearances must be set properly before synchronizing the carburetors.

1. Remove the vacuum pipe from the carburetor manifold (No. 3 cylinder) and turn the fuel cock to "PRI."
2. Remove the rubber caps from the No. 1, 2, and 4 carburetor manifolds.



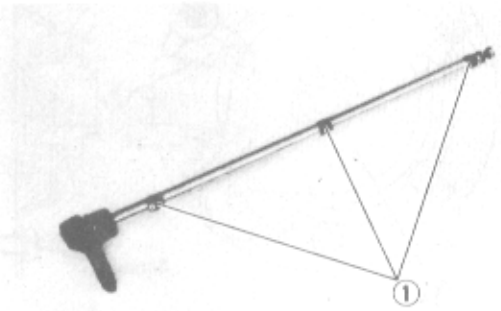
1. Rubber cap

3. Remove either the left or right (but not both) blind plug at the end of the YICS (Yamaha Induction Control System) passage in the cylinder.



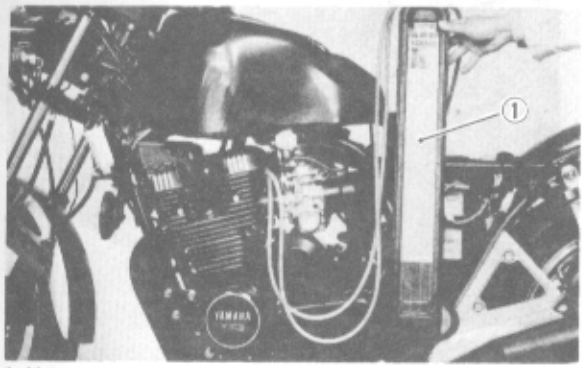
1. Blind plug

4. Insert the YICS shut-off tool (special tool P/No. 90890-04068) fully and flip the locking lever.



1. Shut-off tool rubber (P/No. 90890-04073)

5. Connect each vacuum gauge hose to its proper carburetor.



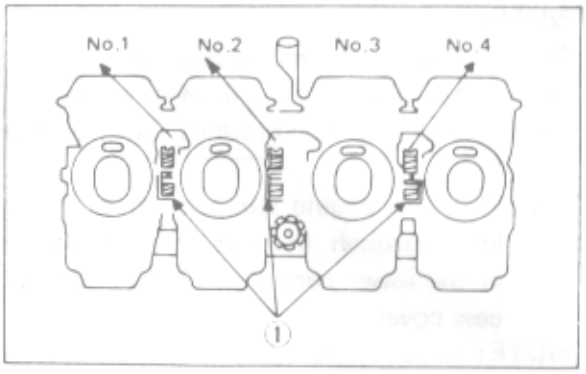
1. Vacuum gauge

6. Start the engine and allow it to warm up for a few minutes. The warm-up is complete when the engine responds normally to the throttle opening.
7. Make sure the engine idle speed is 950 ~ 1,000 r/min. If it is not, adjust the idle speed with the throttle stop screw.

NOTE:

With the YICS shut off tool fitted, the engine speed generally drops a little. Thus, continue with the following steps at an idle speed of 950 ~ 1,000 r/min.

8. Each gauge reading will indicate the same if the carburetors are synchronized. The No. 3 carburetor has no synchronizing screw, and the other carburetors are to be synchronized to it in order, one at a time.
   First, synchronize carburetor No. 1 to carburetor No. 2 by turning the No. 1 synchronizing screw until both gauges read the same.
   Second, in the same way synchronize carburetor No. 4 to carburetor No. 3.
   Third, by adjusting No. 2 screw, watch No. 3 carburetor reading. No. 1 and No. 2 carburetors will both change to match No. 3 carburetor.



1. Synchronizing screws

9. Remove the YICS shut-off tool and reinstall the blind plug.

Tightening torque:
22 Nm (2.2 m·kg, 16 ft·lb)

10. Check the idle speed.
    Adjust if necessary.

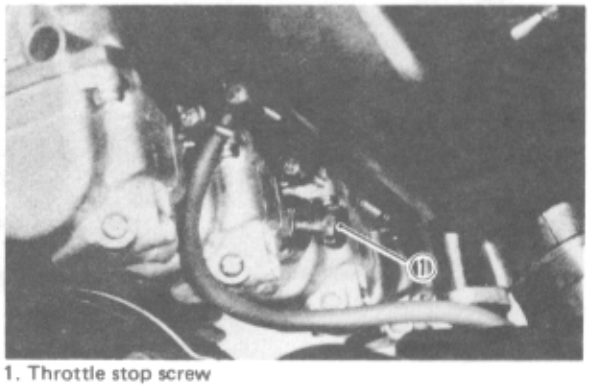
Idle speed adjustment

NOTE:

Carburetors must be synchronized before setting the final idle speed. The idle speed adjustment is made by turning only one throttle stop screw.

1. The engine must be warmed up before setting the idle speed.
2. Set the engine idle speed by turning the throttle stop screw in (to increase engine speed) or out (to decrease engine speed).

Standard idle speed: 1,050 ± 50 r/min



1. Throttle stop screw

G. Engine oil

1. Oil level measurement

a. Place the motorcycle on its centerstand. Warm up the engine for several minutes.

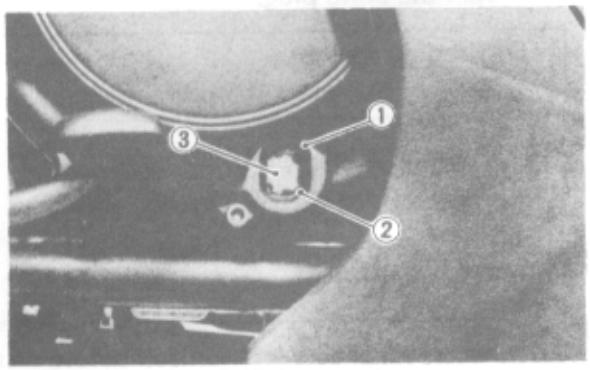
NOTE:

Be sure the motorcycle is positioned straight up when checking the oil level; a slight tilt toward the side can produce false readings.

b. With the engine stopped, check the oil level through the level window locatec at the lower part of the light side crank case cover.

NOTE:

Wait a few minutes until the oil level settles before checking.



1. Maximum mark 2. Minimum mark
3. Level window

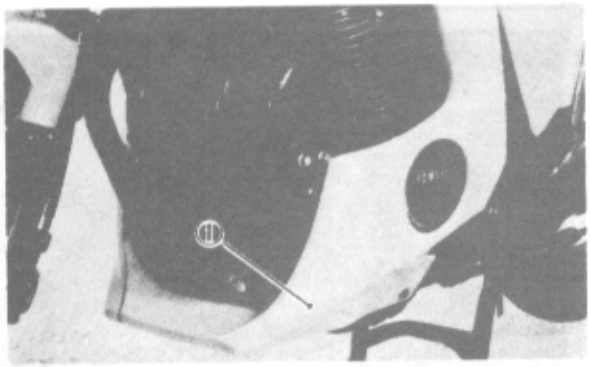
c. The oil level should be at the maximum level. If the level is lower, add sufficient oil to raise it to the maximum level.

2. Engine oil and oil filter replacement

a. Start the engine and run it a few minutes to warm it up.

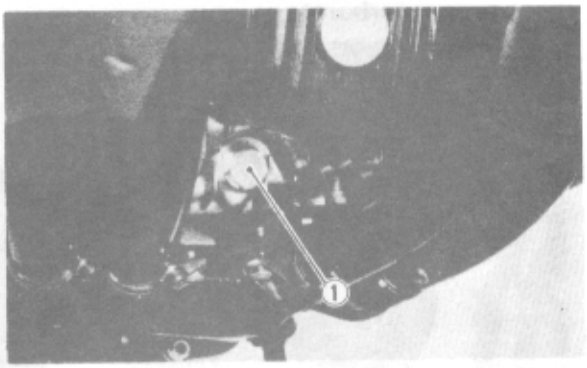
b. Place an oil pan under the engine and remove the oil filler cap.

c. Remove the lower pannel.



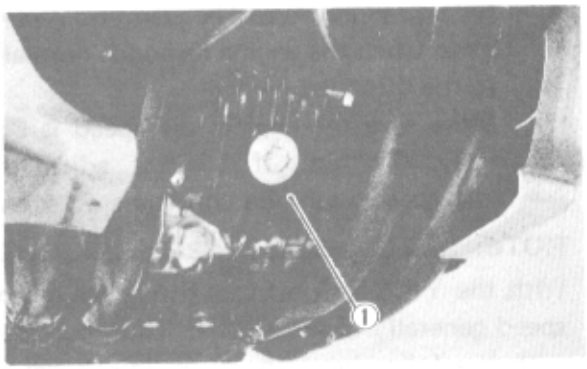
1. Lower pannel

d. Remove the drain plug and drain the oil.



1. Drain plug

e. Remove the oil filter bolt and filter element.



1. Oil filter cover

f. Reinstall the drain plug (make sure it is tight).

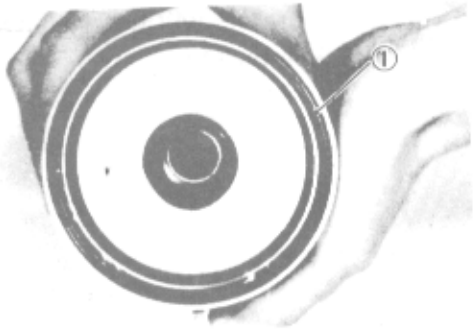
Drain plug torque:
43 Nm (4.2 m·kg, 31.0 ft·lb)

g. Install the new oil filter element, new O-ring and filter cover; tighten the oil filter bolt.

Oil filter bolt torque:
15 Nm (1.5 m·kg, 11.0 ft·lb)

NOTE:

Make sure the O-ring is positioned properly.



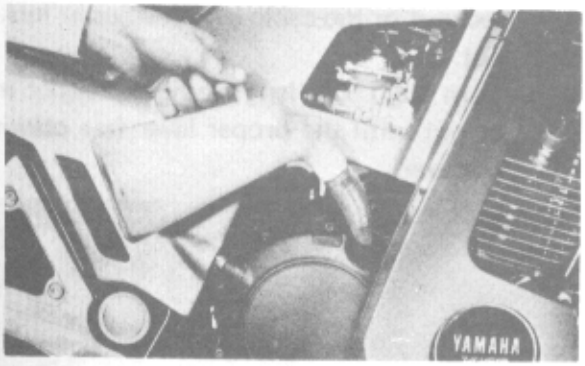
1. Proper O-ring position

h. Add oil through the oil filler hole.

Periodic oi change:
2.5 L (2.2 Imp qt, 2.6 US qt)
With oil filter replacement:
2.9 L (2.6 Imp qt, 3.1 US qt)
Recommended oil:
YAMALUBE 4-cycle oil or SAE 20W40 type SE motor oil

CAUTION:

Take care not to allow foreign material to enter the crankcase.



i. After replacing engine oil, and/or the oil filter, be sure to check for oil leakage. The oil indicator light should go off after oil is filled.

CAUTION:

If the indicator light flickers or remains on, the oil level switch may be damaged. Refer to ELECTRICAL for corrective action.

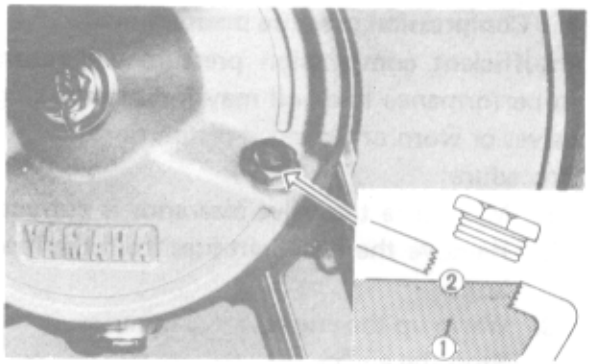
j. Reinstall the lower panel.

H. Final gear oil

1. Oil level measurement
a. Place the motorcycle on a level place and place it on the centerstand. The engine should be cool (at atmospheric temperature).
b. Remove the oil filler cap and check the oil level whether it is to the hole brim. If it is not up to this level, replenish oil.

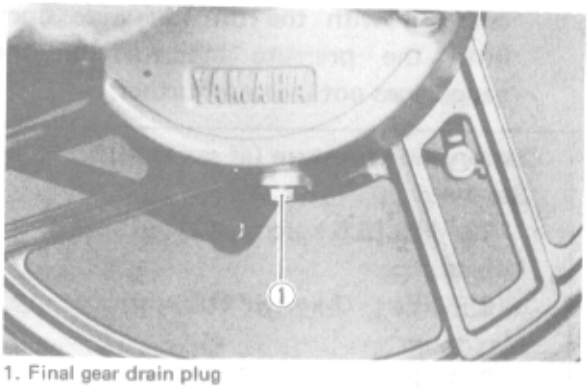
CAUTION:

Take care not to allow foreign material to enter the final gear case.



1. Final gear oil 2. Correct oil level

2. Gear oil replacement
a. Place an oil pan under the final gear case.
b. Remove the final gear oil filler cap and the drain plug, and drain the oil.



1. Final gear drain plug

WARNING:

When draining or filling, take care not to allow foreign material to enter the final gear case. Do not allow the gear oil to contact the tire and wheel.

c. Reinstall and tighten the final drain plug.

Tightening torque:
23 Nm (2.3 m·kg, 17 ft·lb)

d. Fill the gear case to the specified level.

Oil capacity:
Final gear case:
0.2 L (0.18 Imp qt, 0.21 US qt)
Recommended oil:
SAE 80 API "GL-4" Hypoid gear oil.
If desired, an SAE 80W90 hypoid gear oil may be used for all conditions.

e. Reinstall the filler cap securely.

I. Compression pressure measurement

Insufficient compression pressure will result in performance loss and may indicate leaking valves or worn or damaged piston rings.

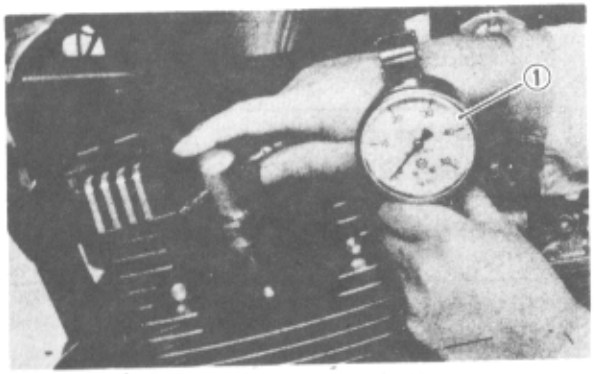
Procedure:

1. Make sure the valve clearance is correct.
2. Remove the headlight fuse from the fuse box.
3. Warm up the engine 2 ~ 3 minutes. Stop the engine.
4. Remove the all spark plugs.
5. Install a compression-check gauge.
6. Turn over the engine with the electric starter (make sure the battery is fully charged) with the battery is fully charged) with the throttle wide open until the pressure indicated on the gauge does not increase further.

Compression pressure (at sea level):
Standard
834 kPa (8.5 kg/cm², 121 psi)
Minimum
686 kPa (7 kg/cm², 100 psi)
Maximum
981 kPa (10 kg/cm², 142 psi)

WARNING:

When cranking the engine, ground the removal spark plug wires to prevent sparking.



1. Compression gauge

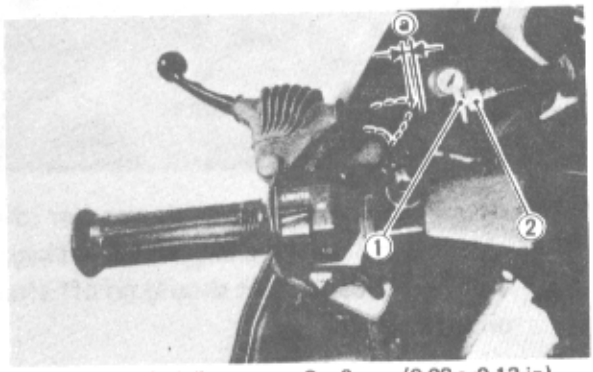
7. If the pressure is too low, squirt a few drops of oil into the cylinder being measured. Measure compression again. If there is a higher reading than before (without oil), the piston rings may be worn or damaged. If the pressure remains the same after measuring with the oil, either or both the rings and valves may be the cause.
8. Check each cylinder. Compression pressure should not vary more than the specified value from one cylinder another.

Difference in gauge reading:
Less than 98.1 kPa (1.0 kg/cm², 14 psi)

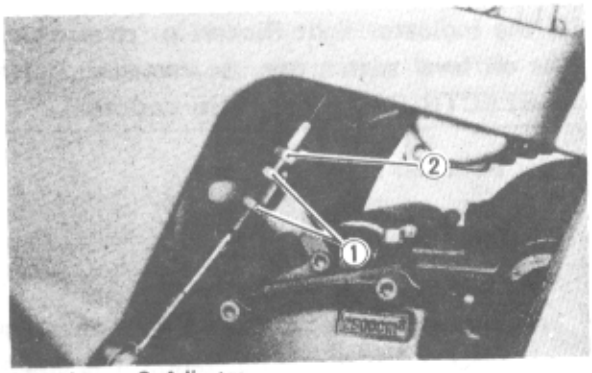
J. Clutch adjustment

Free play adjustment

a. Loosen either the handle lever adjuster locknut or the cable length-adjuster locknut.
b. Turn the cable length-adjuster either in or out until the proper lever free play is achieved.

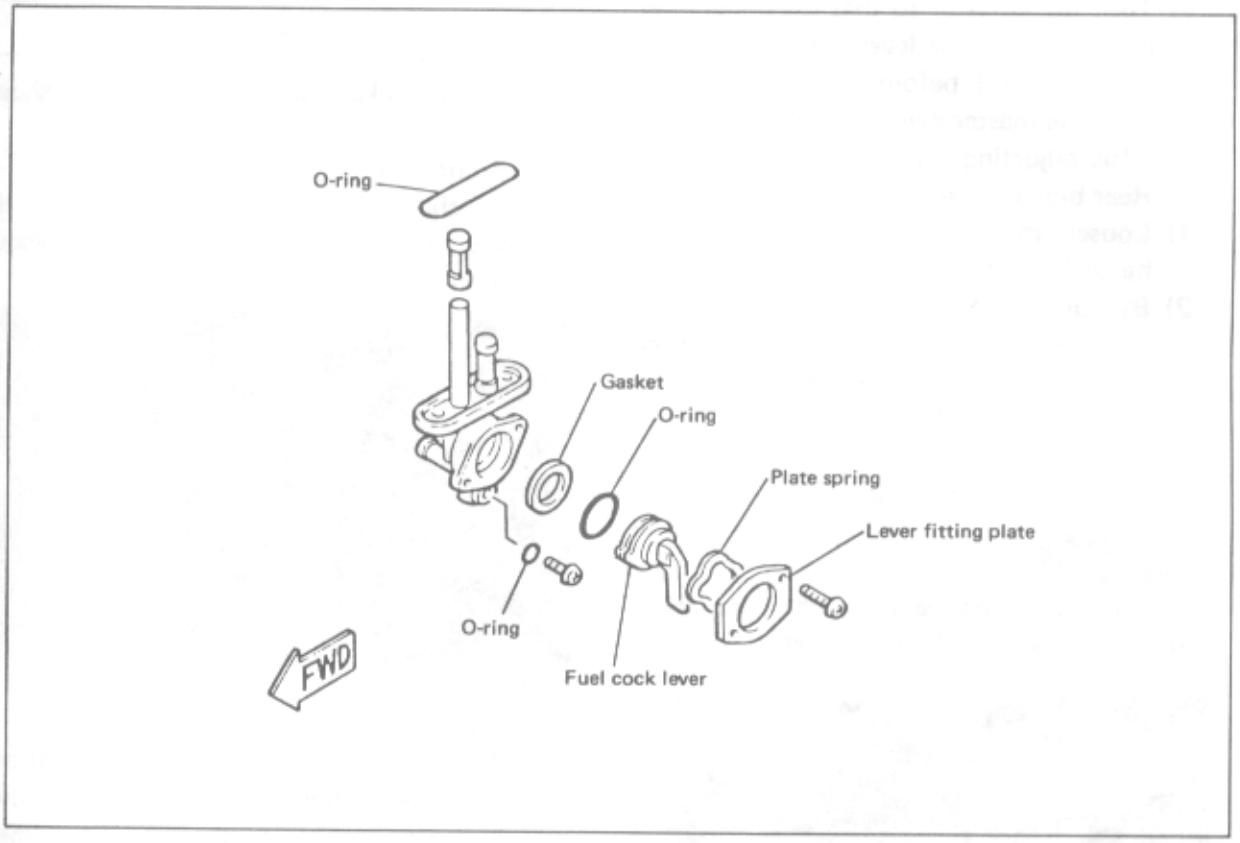


1. Locknut 2. Adjuster a. 2~3 mm (0.08~0.12 in)



1. Locknut 2. Adjuster

A. Fuel petcock



If the fuel petcock is leaking or excessively contaminated, it should be removed from the fuel tank and inspected.

1. Remove the fuel tank, and position it so that fuel will not spill when the petcock is removed.
2. Remove the petcock and inspect the filter screen. Replace the filter if sriously contaminated.
3. Remove the screws on the front and rear of the petcock and remove the plate, gaskets, lever, and diaphragm.
4. Inspect all components and replace any that are damaged. If the diaphragm is in any way damaged, or the petcock body gasket surfaces scratched or corroded, the petcock assembly must be replaced. If there is abrasive damage to any component, the fuel tank must be drained and flushed.
5. Reassemble the petcock and install it on the fuel tank.

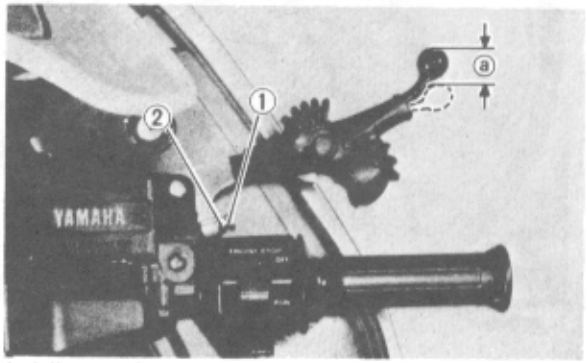
B. Front and rear brake

1. Brake adjustment

a. Front brake lever free play adjustment. The brake can be adjusted by simply adjusting the free play of the brake lever. The piston in the caliper moves forward as the brake pad wears out, automatically adjusting the clearance between the brake pads and brake disc.

CAUTION:

Proper lever free play is essential to avoid excessive brake drag.



1. Adjuster 2. Lock nut a. 5 8 mm (0.2 0.3 in)

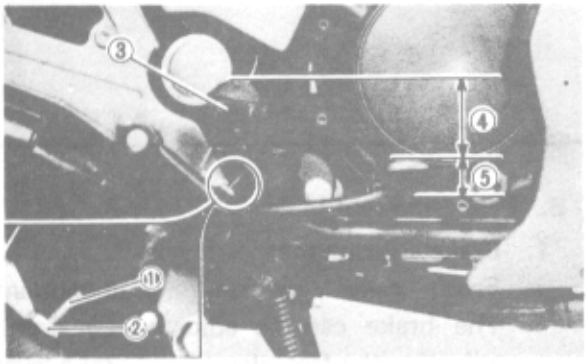
1) Loosen the adjuster locknut on the brake lever.
2) Turn the adjuster so that the brake lever movement at the lever end is 5 ~ 8 mm (0.2 ~ 0.3 in) before the adjuster contacts the master cylinder piston.
3) After adjusting, tighten the locknut.

b. Rear brake pedal height adjustment

1) Loosen the adjuster locknut (for pedal height).
2) By turning the adjuster bolt clockwise or counterclockwise, adjust the brake pedal position so that its top end is approximately 20 mm (0.78 in) below the footrest top end.
3) Secure the adjuster locknut.

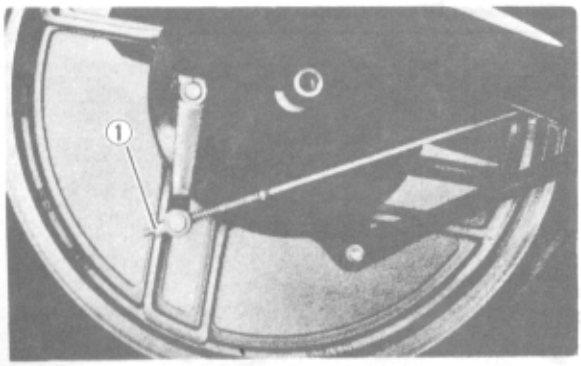
WARNING:

After adjusting the pedal height, the brake pedal free play should be adjusted.



1. Adjuster bolt (for pedal height)
2. Locknut
3. Footrest
4. Pedal height 40 mm (1.6 in)
5. Free play 20 30 mm (0.8 1.2 in)

c. Rear brake pedal free play adjustment
Turn the adjuster on the brake rod clockwise or counterclockwise to provide the brake pedal with a free play of 20 ~ 30 mm (0.8 ~ 1.2 in).



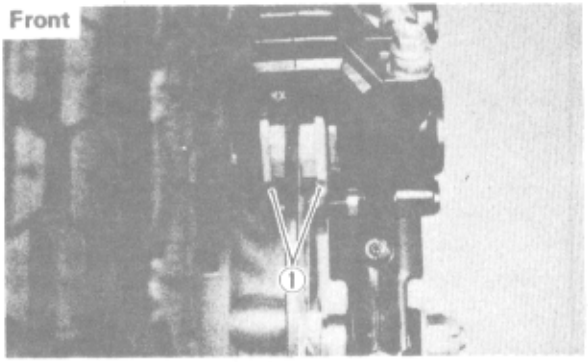
1. Adjuster

WARNING:

Check the operation of the brake light after adjusting the rear brake.

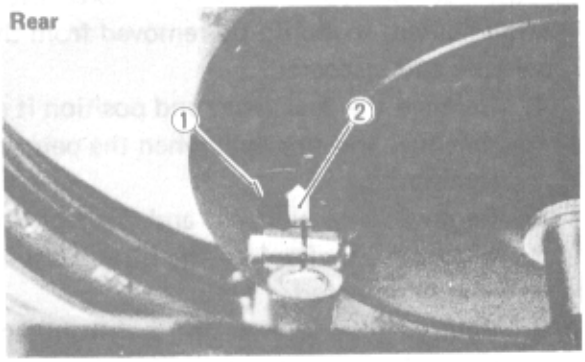
2. Front brake pad and rear brake shoe check

a. Front brake pad
To check, look at the pad in front. If any pad is worn to the wear limit, replace both pads in the caliper.



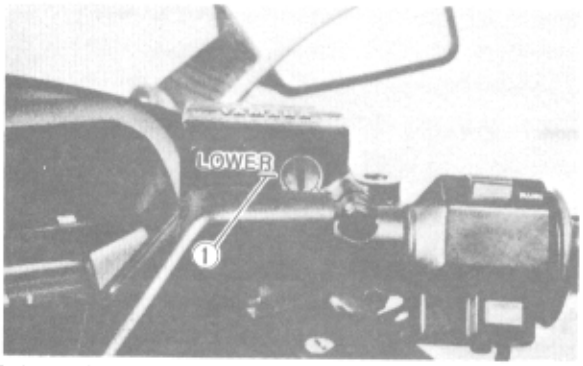
1. Wear indicator

b. Rear brake shoe
To check, see the wear indicator position while depressing the brake pedal. If the indicator reaches to the wear limit line, replace the shoes.



1. Wear limit 2. Wear indicator

3. Brake fluid
Insufficient brake fluid may allow air to enter the brake system, possibly causing the brake to become ineffective. Check the brake fluid level and replenish when necessary, observing these precautions:



1. Lower level

a. Use only the designated quality brake fluid; otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.

Recommended brake fluid: DOT # 3

b. Refill with the same type and brand of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
c. Be careful that water or other contamination does not enter the master cylinder when refilling. Water will significantly lower the boiling point and may result in vapor lock.
d. Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.
e. Check the cause if the brake fluid level goes down.

Brake fluid replacement

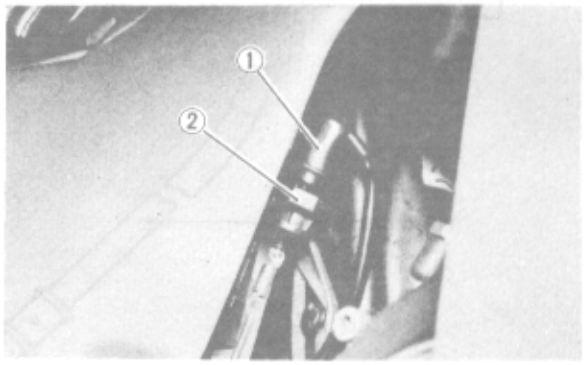
1. Complete fluid replacement should be done only by trained Yamaha service personnel or other qualified mechanic.
2. Complete fluid replacement should be done whenever the caliper cylinder or master cylinder is disassembled, or the fluid becomes seriously contaminated.
3. Replace the following components whenever damaged or leaking, also:

a. Replace all brake seals every two years.
b. Replace all brake hoses every four years.

Brake light switch adjustment

The brake light switch is operated by the movement of the brake pedal.

To adjust, hold the switch body with the hand so it does not rotate and turn the adjusting nut. Proper adjustment is achieved when the brake light comes on slightly before the brake begins to take effect.



1. Switch body 2. Adjusting nut

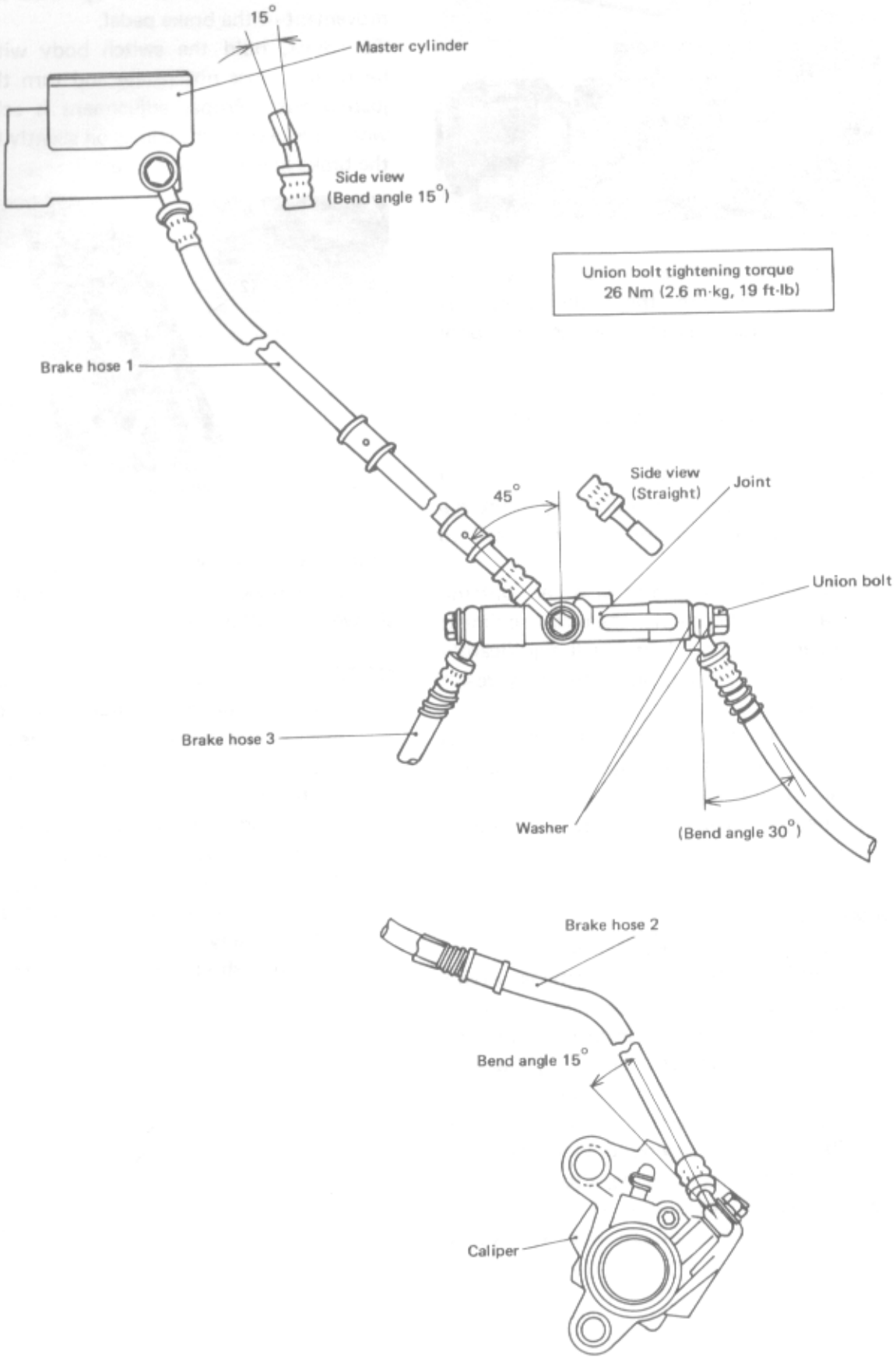
Front brake hose installation

The front brake hoses should be installed as shown in the illustration.

NOTE:

1. When installing the brake hose to the master cylinder, the joint, or the caliper, pay attention to the banjo fitting angle; see the illustration.
2. When installing the banjo fitting to the caliper or the joint, use the stopper.
3. When installing the banjo fitting to the master cylinder, brake hose 1 should not have any excessive twists or bends in it, nor should it be tightly stretched.

FRONT BRAKE HOSE INSTALLATION



C. Tubeless tires and aluminum wheels

This motorcycle is equipped with aluminum wheels designed to be compatible with either tube or tubeless tires. Tubeless tires are installed as standard equipment.

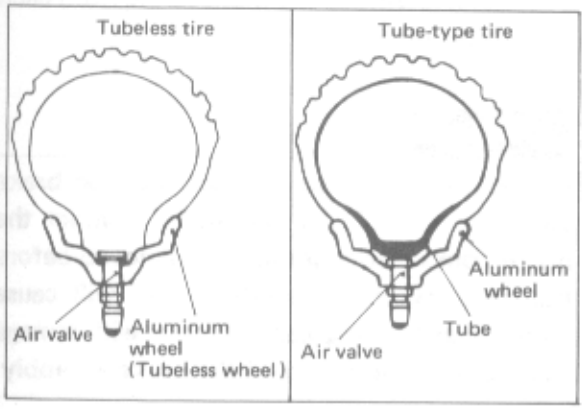
WARNING:

Do not attempt to use tubeless tires on a wheel designed for use only with tube-type tires. Tire failure and personal injury may result from sudden deflation.

Tube-type Wheel — Tube-type tires only

Tubeless-type Wheel — Tube-type or Tubeless tires

When using tube-type tires, be sure to install the proper tube also.



To insure maximum performance, long service, and safe operation, note the following precautions:

1. Check tire pressure before riding; adjust as necessary.
2. Before operation, always check the tire surfaces for wear and/or damage; look for cracks, glass, nails, metal fragments, stones, etc. Correct any such hazard before riding.
3. Always inspect the aluminum wheels before a ride. Place the motorcycle on its centerstand and check for cracks, bends, or warpage of the wheels. Do not attempt even small repairs to the wheel. If a wheel is deformed or cracked, it must be replaced.
4. Tires and wheels should be balanced whenever either one is changed or replaced. Failure to have a wheel assembly balanced can result in poor performance, adverse handling characteristics, and shortened tire life.
5. After installing a tire, ride conservatively to allow the tire to seat itself on the rim properly. Failure to allow proper seating may cause tire failure, resulting in damage to the motorcycle and injury to the rider.
6. After repairing or replacing a tire, check to be sure the valve stem locknut is securely fastened. If not, torque it as specified.

Tightening torque:
0.15 m·kg (1.1 ft·lb)

D. Front fork oil change

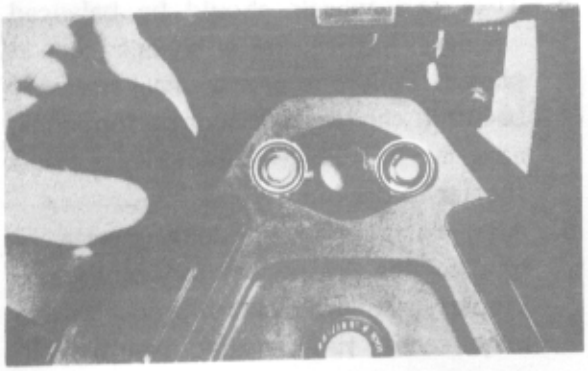
NOTE:

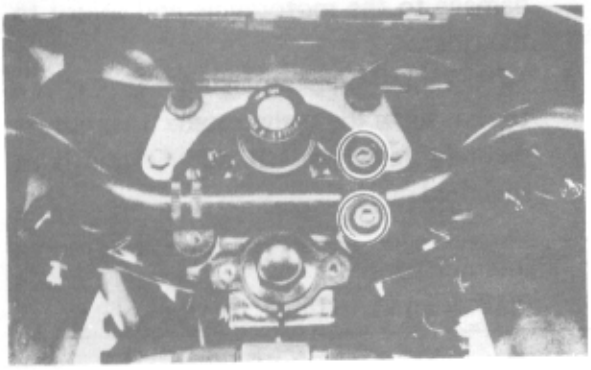
It is recommended that you proceed to the front fork oil change after clearing the front fork area of the fairing. This makes the work easier without the fairing being damaged.

WARNING:

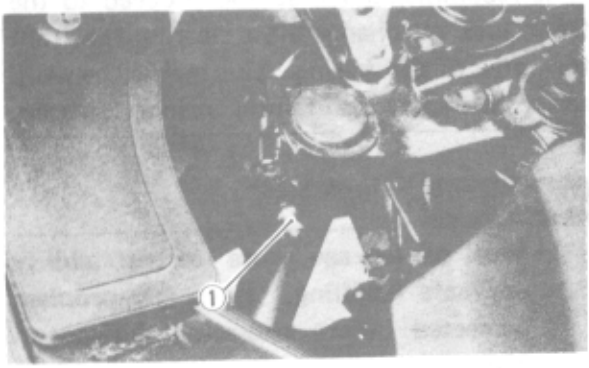
1. **Fork oil leakage cause loss of stability and safe handling. Have any problem corrected before operating the motorcycle.**
2. **Securely support the motorcycle so there is no danger of it falling over.**

1. Raise the motorcycle or remove the front wheel so that there is no weight on the front end of the motorcycle.
2. Remove the handlebar cover and handlebars.



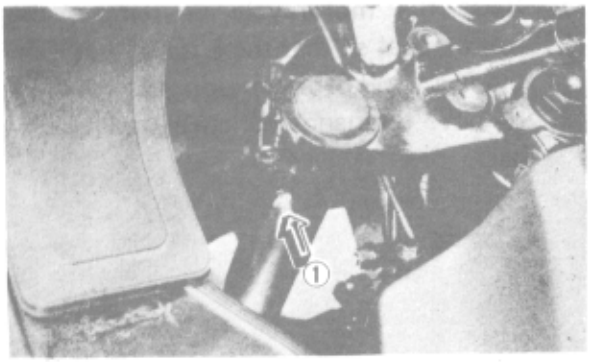


3. Remove the air valve cap from the left fork.



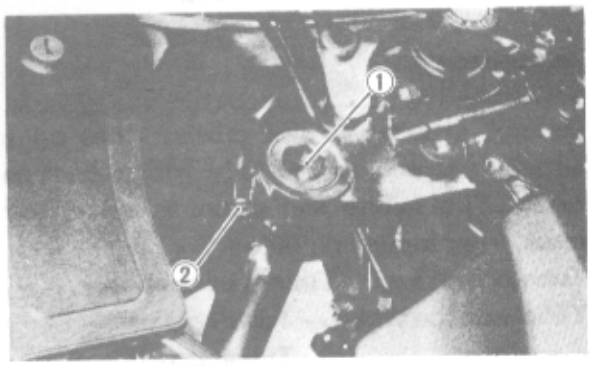
1. Air valve cap

4. Keep the valve open while pressing it for several seconds so that the air can be let out of the inner tube.



1. Push

5. Remove the rubber cap from the top of each fork.
6. Loosen the pinch bolts and remove the cap bolt from each inner tube.

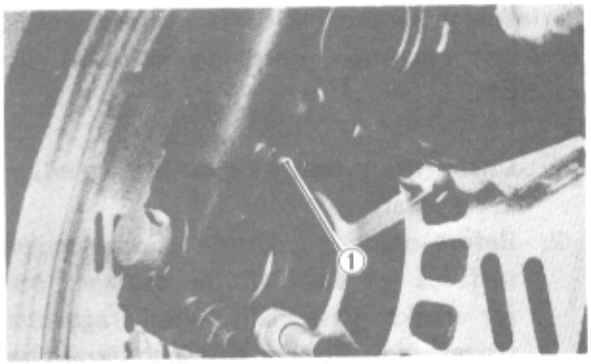


1. Cap bolt 2 Pinch bolt

7. Place an open container under each drain hole. Remove the drain screw from each outer tube.

WARNING:

Do not allow oil to contact the disc brake components. If any oil should contact the brake components, it must be removed before the motorcycle is operated. Oil will cause diminished braking capacity and will damage the rubber components of the brake assembly.



1. Drain screw

8. When most of the oil has drained, slowly raise and lower the outer tubes to pump out the remaining oil.
9. Inspect the drain screw gasket. Replace if damaged. Reinstall the drain screw.
10. Pour the specified amount of oil into the fork inner tube.

Front fork oil (each fork):
238 cm³ (8.4 Imp oz, 8.0 US oz)
Yamaha Fork Oil 10wt or equivalent

11. After filling, slowly pump the outer tubes up and down to distribute the oil.
12. Inspect the O-ring on the cap bolt.
13. Reinstall the cap bolt and the rubber cap. Then, tighten the pinch bolts.

Tightening torque:
Cap bolt:
20 Nm (2.0 m·kg, 14.0 ft·lb)
Pinch bolt:
17 Nm (1.7 m·kg, 12.0 ft·lb)

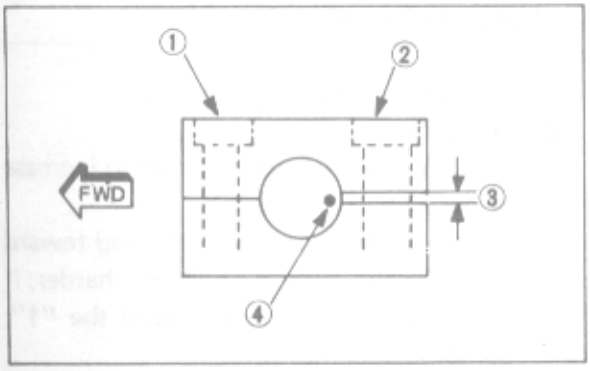
14. Fill the fork with air using a manual air pump or other pressurized air supply. Refer to "Front fork and rear shock absorber adjustment" for proper air pressure adjusting.

Maximum air pressure:
118 kPa (1.2 kg/cm², 17 psi)
Do not exceed this amount.

15. Reinstall the air valve cap to the left fork.
16. Reinstall the handlebars and handlebar cover.

NOTE:
First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.

Handlebar upper holder
tightening torque:
19 Nm (1.9 m·kg, 13.0 ft·lb)



1. 1st 2. 2nd 3. Gap 4. Punch mark

Front fork and rear shock adjustment

CAUTION:
Don't dent the air chamber nor damage the air hose. It will result in an air leakage.

Front fork:

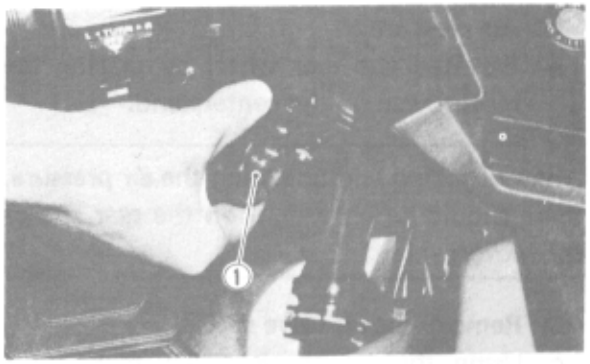
NOTE:
Since the right and left front forks are connected by air hose, there is only one valve where the air pressure is measured and adjusted.

1. Air pressure
a. Elevate the front wheel by placing the motorcycle on the centerstand.

NOTE:
When checking and adjusting the air pressure, there should be no weight on the front end of the motorcycle.

b. Remove the air valve cap.
c. Using the air check gauge, check and adjusted the air pressure. If the air pressure is increased, the suspension becomes stiffer and if decreased, it becomes softer.

To increase:
Use a manual air pump or other pressurized air supply.
To decrease:
Release the air by pushing the valve pin.



1. Air check gauge

NOTE:

An optional air check gauge is available.
P/No. 2X4-2811A-00

Standard air pressure:
39.2 kPa (0.4 kg/cm², 5.7 psi)
Maximum air pressure:
118 kPa (1.2 kg/cm², 17 psi)
Minimum air pressure:
39.2 kPa (0.4 kg/cm², 5.7 psi)

CAUTION:

Never exceed the maximum pressure or oil seal damage may occur.

WARNING:

Never pressurize the front fork above the maximum or below the minimum air pressure. It will cause damage to front fork and/or loss of motorcycle control.

d. Reinstall the air valve cap.

E. Rear shock absorber

NOTE:

Since the right and left shock absorbers are connected by air hose, there is only one valve where the air pressure is measured and adjusted.

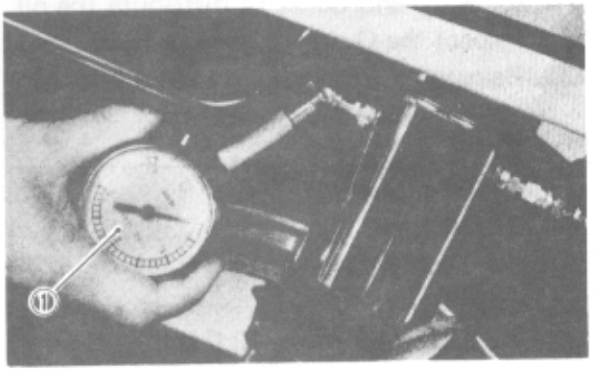
1. Air pressure
a. Elevated the rear wheel by placing the motorcycle on the centerstand.

NOTE:

When checking and adjusting the air pressure, there should be no weight on the rear end of the motorcycle.

b. Remove the air valve cap.
c. Using the air check gauge, check and adjust the air pressure. If the air pressure is increased, the suspension becomes stiffer, and if decreased, it becomes softer.

To increase:
Use a manual air pump or other pressurized air supply.
To decrease.
Release the air by pushing the valve pin.



1. Air check gauge

NOTE:

An optional air check gauge is available.
P/No. 2X4-2811A-00

Standard air pressure:
98.1 kPa (1.0 kg/cm², 14 psi)
Maximum air pressure:
392 kPa (4.0 kg/cm², 57 psi)
Minimum air pressure:
98.1 kPa (1.0 kg/cm², 14 psi)

CAUTION:

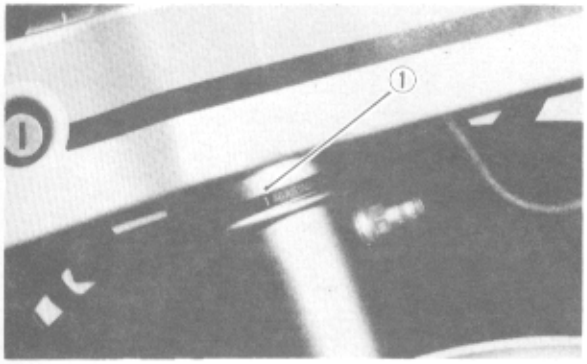
Never exceed the maximum pressure or oil seal damage may occur.

WARNING:

Never pressurize the shock abosrber above the maximum or below the minimum air pressure. It will cause damage to rear shock absorber and/or loss of motorcycle control.

d. Reinstall the air valve cap.
2. Damping
a. Turning the damping adjuster to increase or decrease the damping.
b. If the damping adjuster is turned toward the "4", the damping becomes harder; if the adjuster is turned toward the "1", damping becomes softer.

Standard position – No. 1
No. 1 – Minimum damping
No. 4 – Maximum damping



1. Damping adjuster

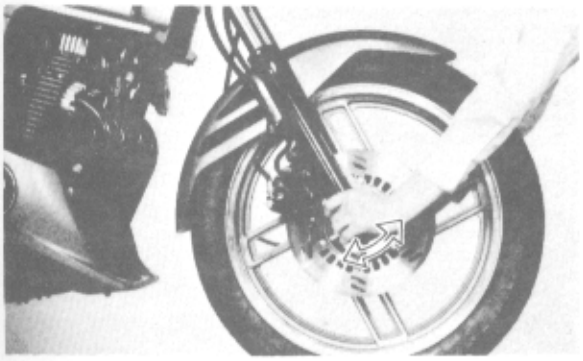
WARNING:

Always the shock absorbers on each side to the same position. Uneven adjustment will cause an improper riding position.

F. Steering head adjustment

The steering assembly should be checked periodically for looseness.

1. Raise the front end of the motorcycle so that there is no weight on the front wheel.
2. Grasp the bottom of the forks and gently rock the fork assembly backward and forward, checking for looseness in the steering assembly bearings.



3. If there is looseness in the steering head, loosen the steering stem and front fork pinch bolts and steering fitting bolt.
4. Use a steering nut wrench to loosen top steering fitting nut. The top nut serves as a locknut.
5. Tighten the lower steering fitting nut until the steering head is tight, but does not bind when forks are turned.
6. Retighten the top steering fitting nut, steering fitting bolt and steering stem and front fork pinch bolts, in that order.
7. Recheck steering adjustment to make sure there is no binding when the forks are moved from lock to lock. If necessary, repeat adjustment procedure.

G. Cable inspection and lubrication

WARNING:

Damage to the outer housing of the various cables may cause corrosion; free movement could be obstructed. An unsafe condition may result, so replace such cables as soon as possible.

1. If the inner cables do not operate smoothly, lubricate or replace them.

Recommended lubricant:
Yamaha Chain and Cable Lube or
SAE 10W30 motor oil

H. Throttle cable and grip lubrication

The throttle twist grip assembly should be greased when the cable is lubricated, since the grip must be removed to get at the end of the throttle cable. Two screws clamp the throttle housing to the handlebar. Once these two are removed, the end of the cable can be held high to pour in several drops of lubricant. With the throttle grip disassembled, coat the metal surface of the grip assembly with a suitable all-purpose grease to cut down friction.

I. Rear arm pivot bearings

The swingarm must pivot freely on its bearings but not have any excess play. Check and adjust pivot bearings if necessary.

J. Brake and change pedals/brake and clutch levers

Lubricate the pivoting parts of each lever and pedal.

Recommended lubricant: Yamaha Chain and Cable Lube or SAE 10W30 motor oil

K. Centerstand and sidestand pivots

Lubricate the centerstand and sidestand at their pivot points.

Recommended lubricants: Yamaha Chain and Cable Lube or SAE 10W30 motor oil

ELECTRICAL

A. Battery

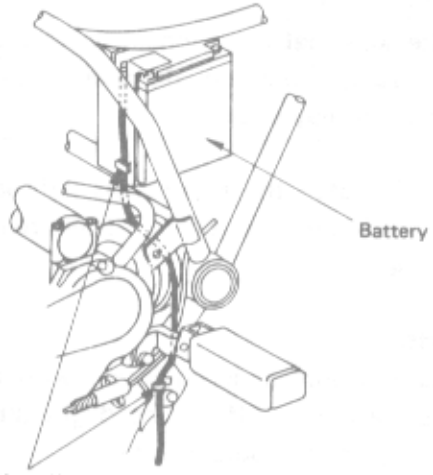
1. The fluid level should be between the upper and lower level marks. Use only distilled water if refilling is necessary.

CAUTION:

Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.

2. Always make sure the connections are correct when installing the battery. Make sure the breather pipe is properly connected, properly routed, and is not damaged or obstructed.

HOW TO LAYOUT BATTERY BREATHER PIPE



CAUTION:

The battery must be charged before using to insure maximum performance. Failure to properly charge the battery before first use or a low electrolyte level will cause premature failure of the battery.

Charging current: 1.2 amps/10 hrs or until the specific gravity reaches 1.280 at 20°C (68°F)

WARNING:

Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contact with skin, eyes, or clothing.

Antidote: EXTERNAL-Flush with water. INTERNAL--Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.

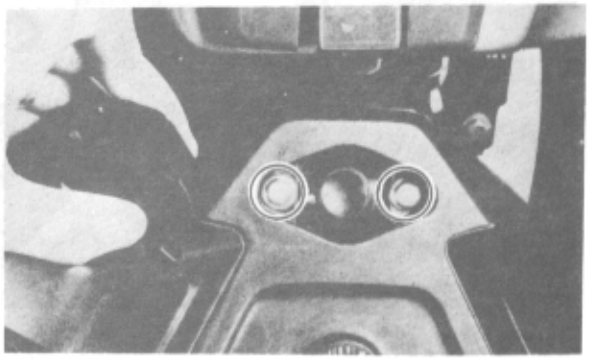
Eyes. Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in closed space. Always shield eyes when working near batteries.

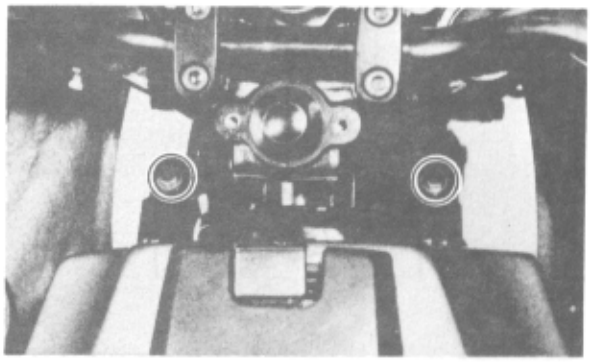
KEEP OUT OF REACH OF CHILDREN.

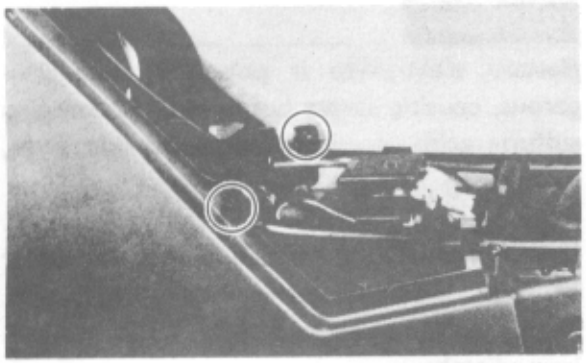
Replenishing the battery bluid

A poorly maintained battery will deteriorate quickly. The battery fluid should be checked at least once a month.

1. Remove the seat.
2. Remove the handlebar cover and side panels (left and right).







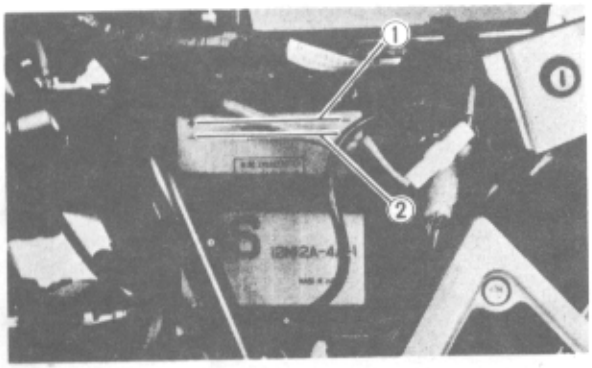
3. The level should be between the upper and lower level marks. Use only distilled water if refilling is necessary.

CAUTION:

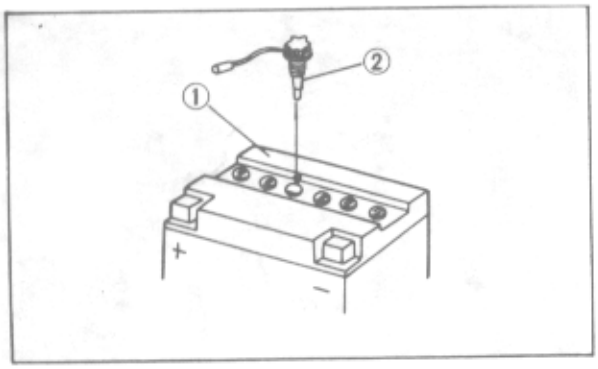
Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.

CAUTION:

Install the battery sensor into 3RD hole from positive terminal.



1. Upper level 2. Lower level



1. Battery 2. Battery sensor

4. When the motorcycle is not to be used for a month or longer, remove the battery and store it in a cool, dark place. Completely recharge the battery before reusing.
5. If the battery is to be stored for a longer period than the above, check the specific gravity of the fluid at least once a month and recharge the battery when it is too low.
6. Always make sure the connections are correct when putting the battery back in the motorcycle.
   Make sure the breather pipe is properly connected and is not damaged or obstructed.

CAUTION:

Make sure that the connection to the battery is correct; otherwise, damage to the microcomputer may occur.

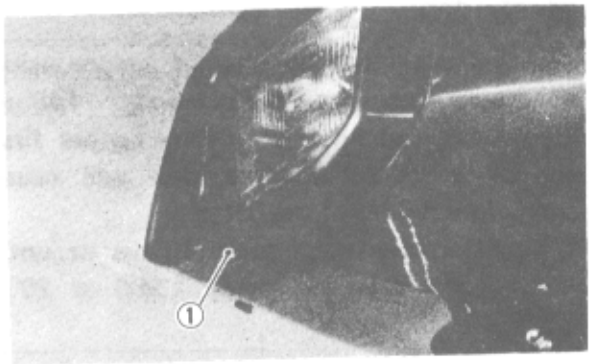
7. Reinstall the side panels (left and right) and handlebar cover. Then, reinstall the seat.

B. Headlight

This motorcycle is equipped with a quartz bulb headlight. If the headlight bulb burns out, replace the bulb as follows:

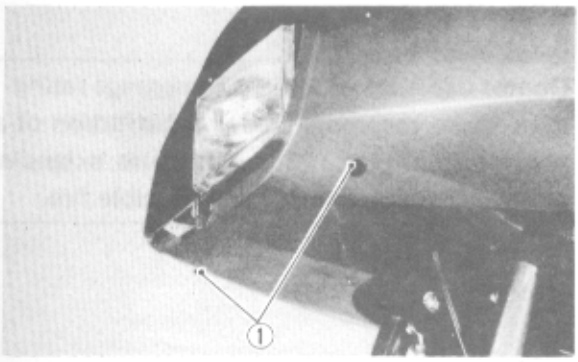
1. Headlight bulb replacement

a. Remove the headlight nacelle.



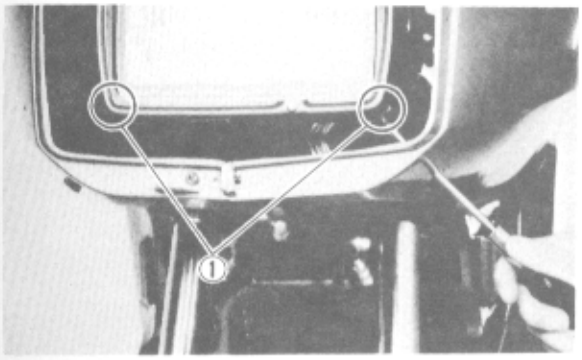
1. Nacelle holding screw

b. Remove the two blind plugs from the upper panels (left and right).



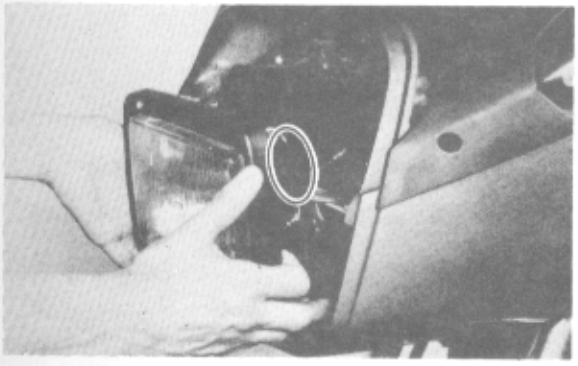
1. Blind plug

c. Remove the 2 screws holding the light unit assembly to the headlight body.

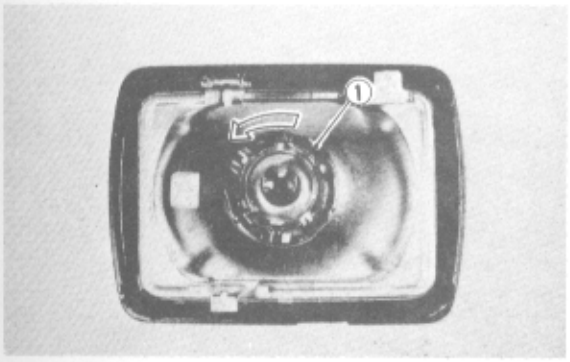


1. Holding screw

d. Disconnect the leads and remove the light unit assembly.



e. Turn the bulb holder counterclockwise and remove the defective bulb.



1. Bulb holder

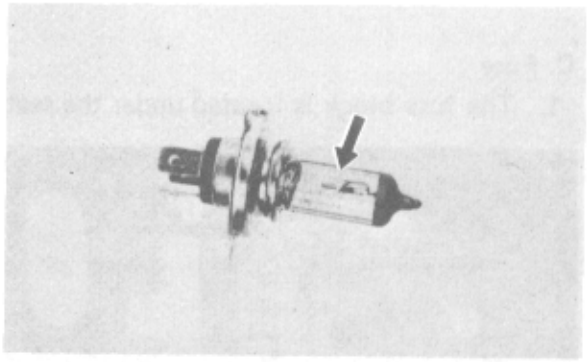
f. Slip a new bulb into position and secure it with the bulb holder.

CAUTION:

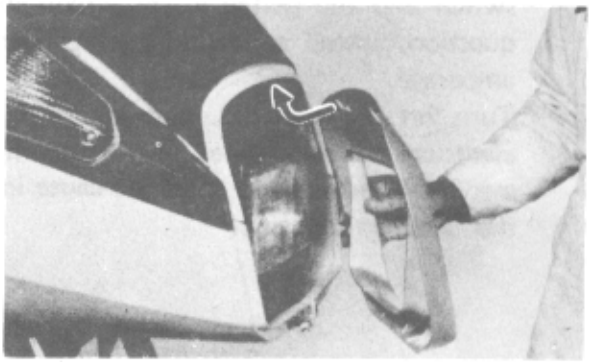
Avoid touching the glass part of the bulb. Also keep it free from oil stains; otherwise, the transparency of the glass, life of the bulb, and luminous flux will be adversely affected. If the glass is oil stained, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

WARNING:

Keep flammable products or your hands away from the bulb while it is on, because it heats up. Do not touch the bulb until it cools down.



g. For reassembly, follow procedure below with care.
   1) Install the two blind plugs.
   2) Make sure the projecting portions of the headlight nacelle are positioned correctly.

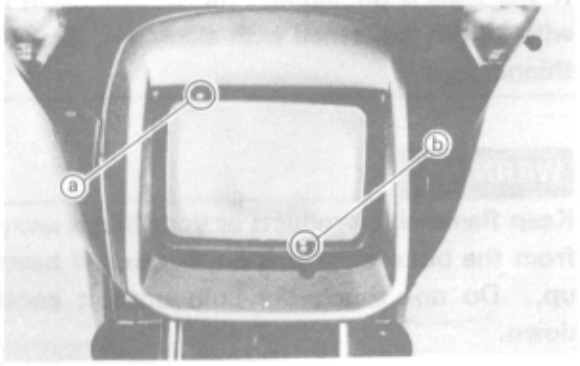


3) Adjust the headlight beam if necessary.

2. Headlight beam adjustment:

a. Horizontal adjustment:
To adjust the beam to the left, turn the adjusting screw clockwise.
To adjust the beam to the right, turn the screw counterclockwise.

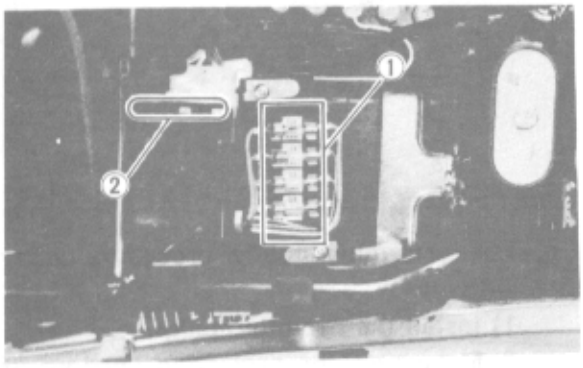
b. Vertical adjustment:
To adjust the beam to the upper, turn the adjusting screw clockwise.



a. Horizontal adjusting screw b. Vertical adjusting screw

C. Fuse

1. The fuse block is located under the seat.



1. Fuse 2. Spare fuse

2. If any fuse is blown, turn off the ignition switch and the switch in the circuit in question, install a new fuse of proper amperage.
Turn on the switches, and see if the electrical device operates. If the fuse immediately blows again, find the cause in the circuit in question.

WARNING:

Do not use fuses of a higher amperage rating than those recommended. Substitution of a fuse of improper rating can cause extensive electrical system damage and possible fire.

NEW SERVICE

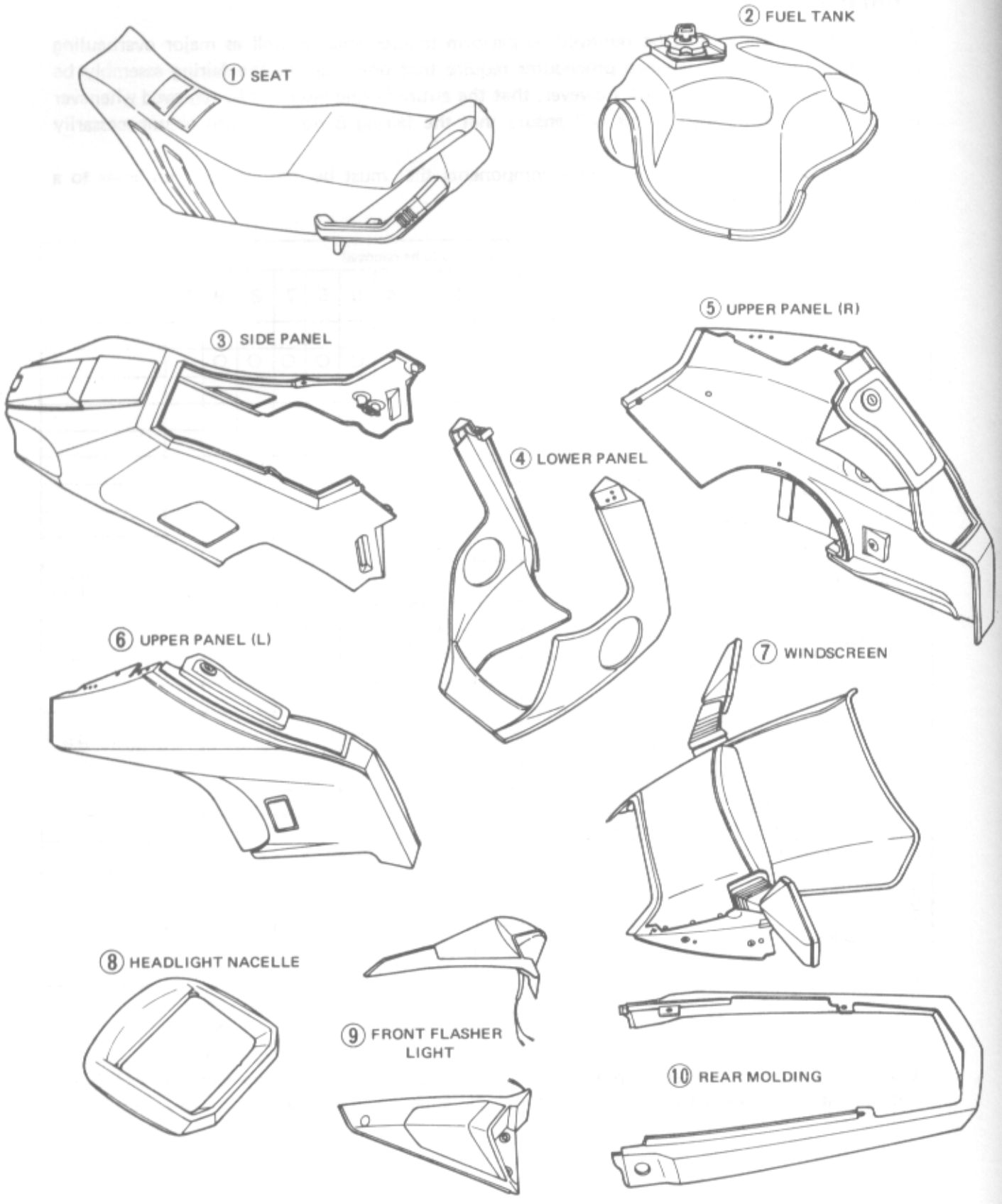
FAIRING REMOVAL

The fairing assembly must be removed to perform maintenance as well as major overhauling procedures. Some maintenance procedures require that only part of the fairing assembly be removed. Yamaha recommends, however, that the entire fairing assembly be removed whenever the motorcycle is serviced. This will ensure that the fairing is not damaged or unnecessarily marred.

The following table lists those fairing components that must be removed to gain acess to a particular area or component:

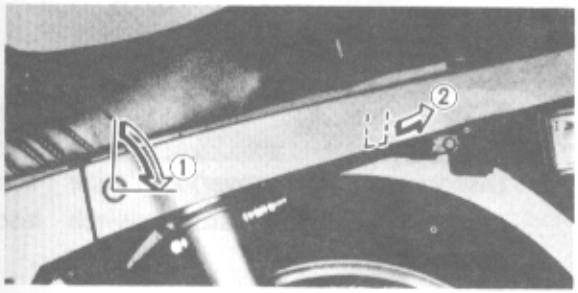
		Sections to be removed										
		1	2	3	4	5	6	7	8	9	10	NOTE
ENGINE	A. Turbo Charger Unit				◌							
	B. Valve Clearance Adjustment	○	○	○		○	○	○	○	○		
	C. Ignition Timing				○							
	D. Air Cleaner	○										
	E. Carburetor	○	○	○	○							
	F. Engine Oil	○										
	G. Final Gear Oil											
	H. Compression Pressure Measurement											
	I. Clutch Adjustment											
CHASSIS	A. Fuel Cock	○	○	*○	*○							*Loosen the securing bolts.
	B. Front and Rear Brake											
	C. Tubeless Tires and Aluminium Wheels											
	D. Front Fork Oil Change											
	E. Rear Shock Absorber										○	
	F. Steering Head Adjustment										○	
	G. Cable Inspection and Lubrication	○		○								*Clutch cable inspection
	H. Throttle Cable and Grip Lubrication	○		○								
	I. Rear Arm Pivot Bearings											
	J. Brake and Change Pedals/Brake and Clutch Levers											
	K. Center and Side Stand Pivots											
ELECTRICAL	A. Battery	○		○								
	B. Spark Plug											
	C. Headlight									○		
	D. Fuse	○										

A fairing component marked with a solid circle must be removed; a fairing component marked with a broken circle need not be removed, but servicing procedures will be much easier if it is.


① SEAT
② FUEL TANK
③ SIDE PANEL
④ LOWER PANEL
⑤ UPPER PANEL (R)
⑥ UPPER PANEL (L)
⑦ WINDSCREEN
⑧ HEADLIGHT NACELLE
⑨ FRONT FLASHER LIGHT
⑩ REAR MOLDING

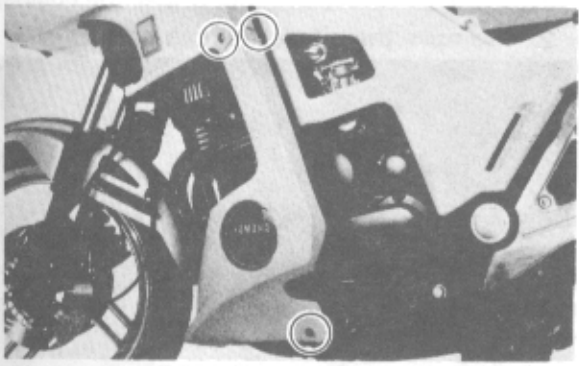
Fairing Removal

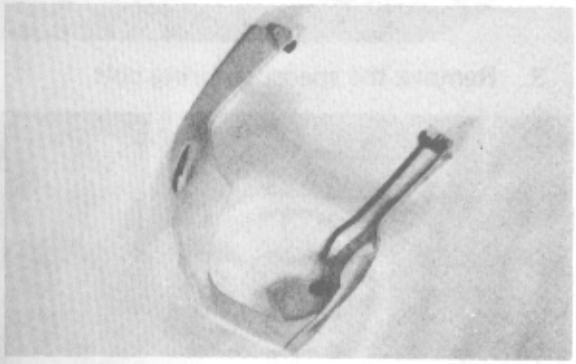
1. Remove the seat.
   To open the seat lock, insert the key in the lock. Then, turn it clockwise and pull the lever backward.



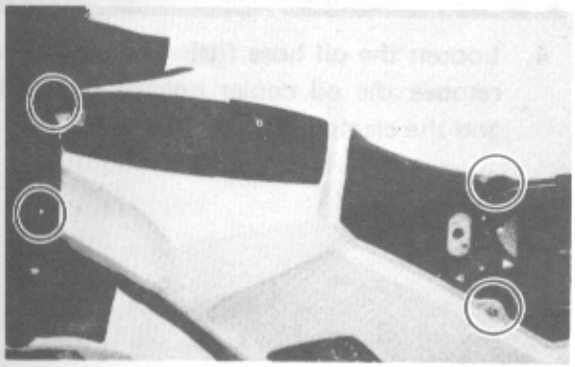
1. Open 2. Pull

2. Remove the lower panel securing bolts (3X2) and remove the lower panel as one piece.

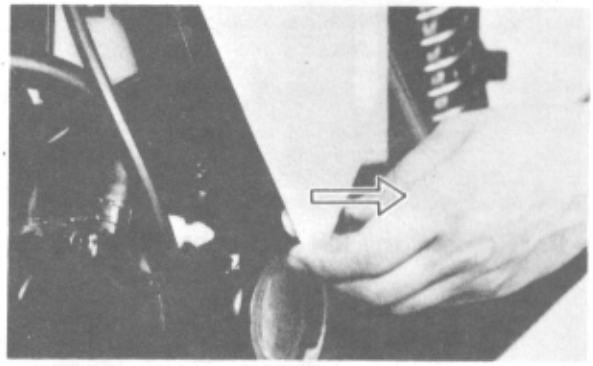




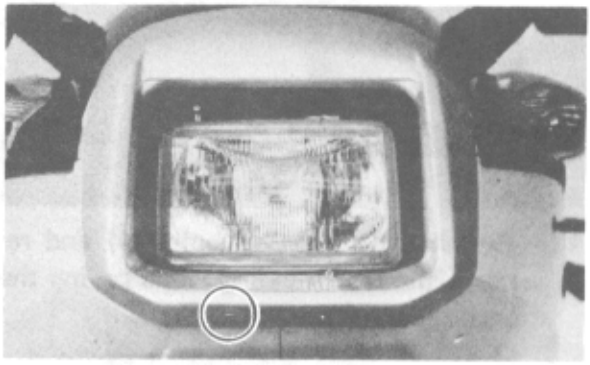
3. Remove the front securing bolts (2) and the side securing bolts (2).



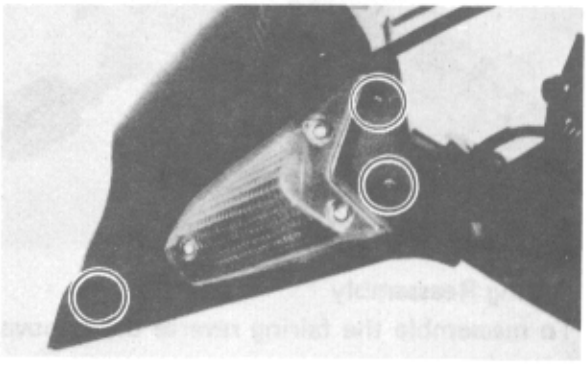
4. Remove the side panels as one piece. Grasp the panels on either side where the panels are joined to the frame. Pull the male connectors out; then pull the rear of the panels up.



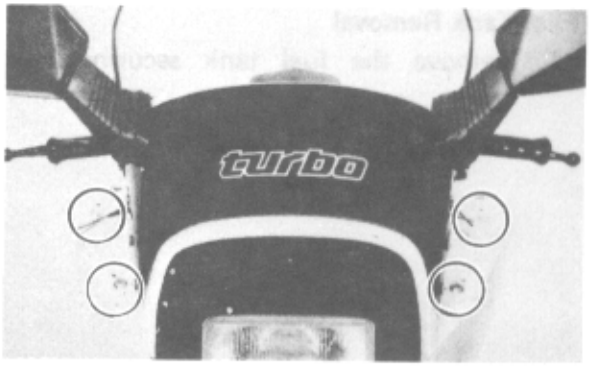
5. Remove the headlight nacelle.



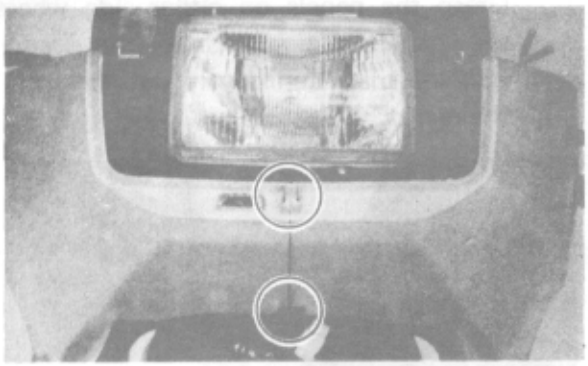
6. Remove the left and right front flashers (3X2); disconnect the lead couplers.



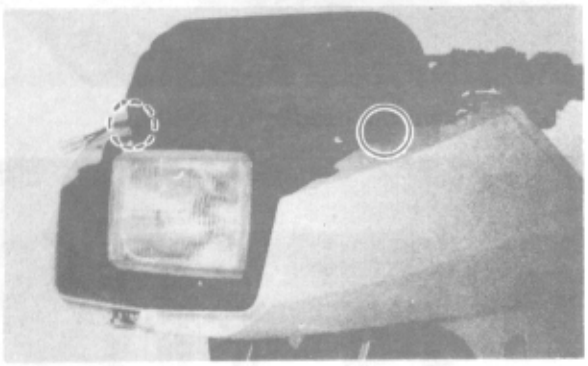
7. Remove the windscreen with the rear view mirrors (2X2).



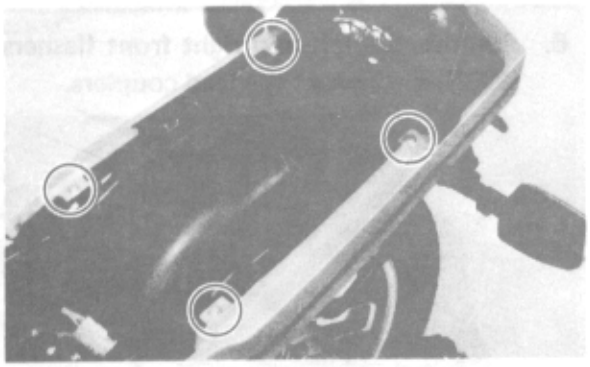
8. Remove the two clips.



9. Remove the left and right upper panels.



10. Remove the securing bolts (4) and remove the rear molding while prying the ends apart.

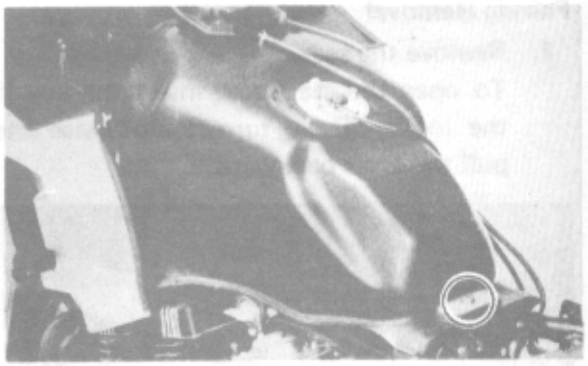


Fairing Reassembly

To reassemble the fairing reverse the removal procedure.

Fuel Tank Removal

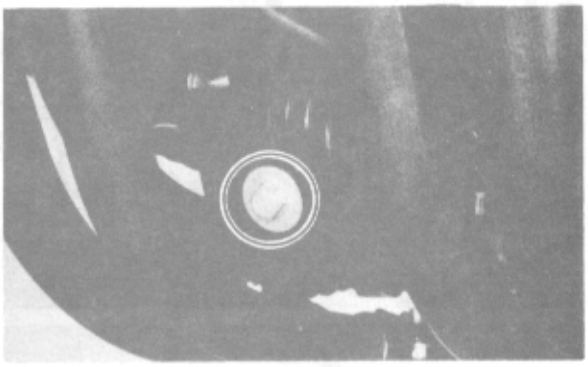
1. Remove the fuel tank securing bolt.



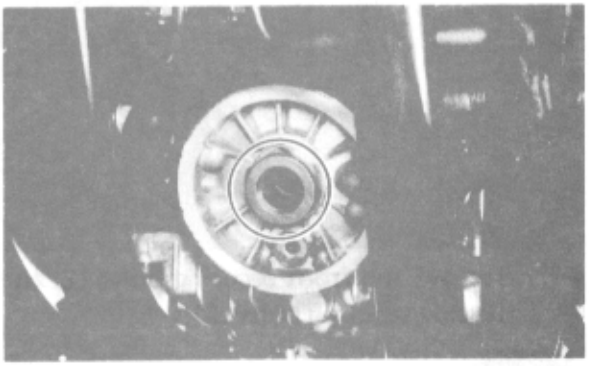
2. Disconnect the overlow pipe and emergency engine stop switch lead connecter.
3. Disconnect the fuel lines.
4. Remove the fuel tank.

Oil Cooler Removal

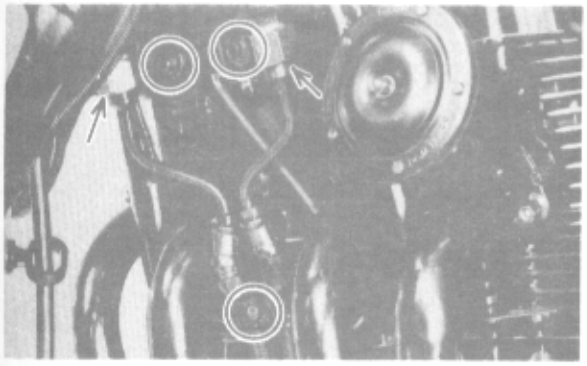
1. Place an open container under the engine.
2. Remove the oil cleaner cap bolt.



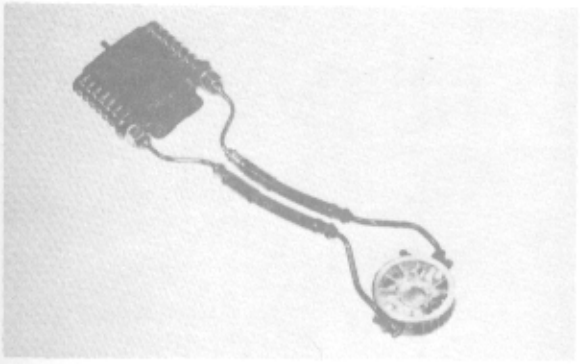
3. Remove the spacer securing bolt.



4. Loosen the oil hose fitting nuts(2); then remove the oil cooler holding bolts (2) and the clamp bolt.

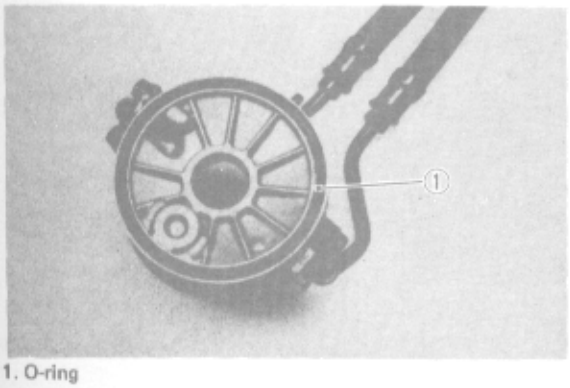


5. Remove the oil cooler assembly, pulling down and then away from the motorcycle.



Oil Cooler Installation

1. Install a new "O-ring" and install the oil cooler spacer to the crankcase. Make sure the "O-ring" is positioned properly.

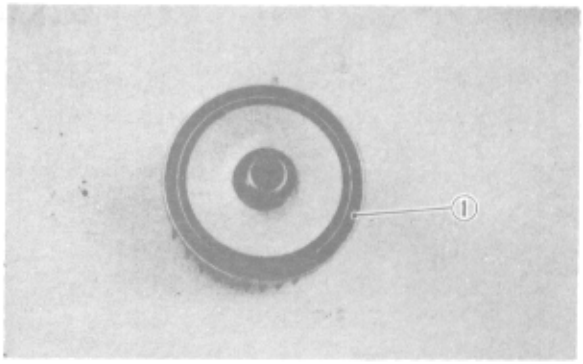


1. O-ring

2. Tighten the spacer securing bolt.

Tightening torque:
50 Nm (5.0 m·kg, 36 ft·lb)

3. Install the oil filter element into the filter cover and install a new "O-ring". Make sure the "O-ring" is positioned properly.



1. O-ring

4. Tighten the oil cleaner cap bolt.

Tightening torque:
15 Nm (1.5 m·kg, 11 ft·lb)

5. Tighten the oil cooler holding bolts (2).

Tightening torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)

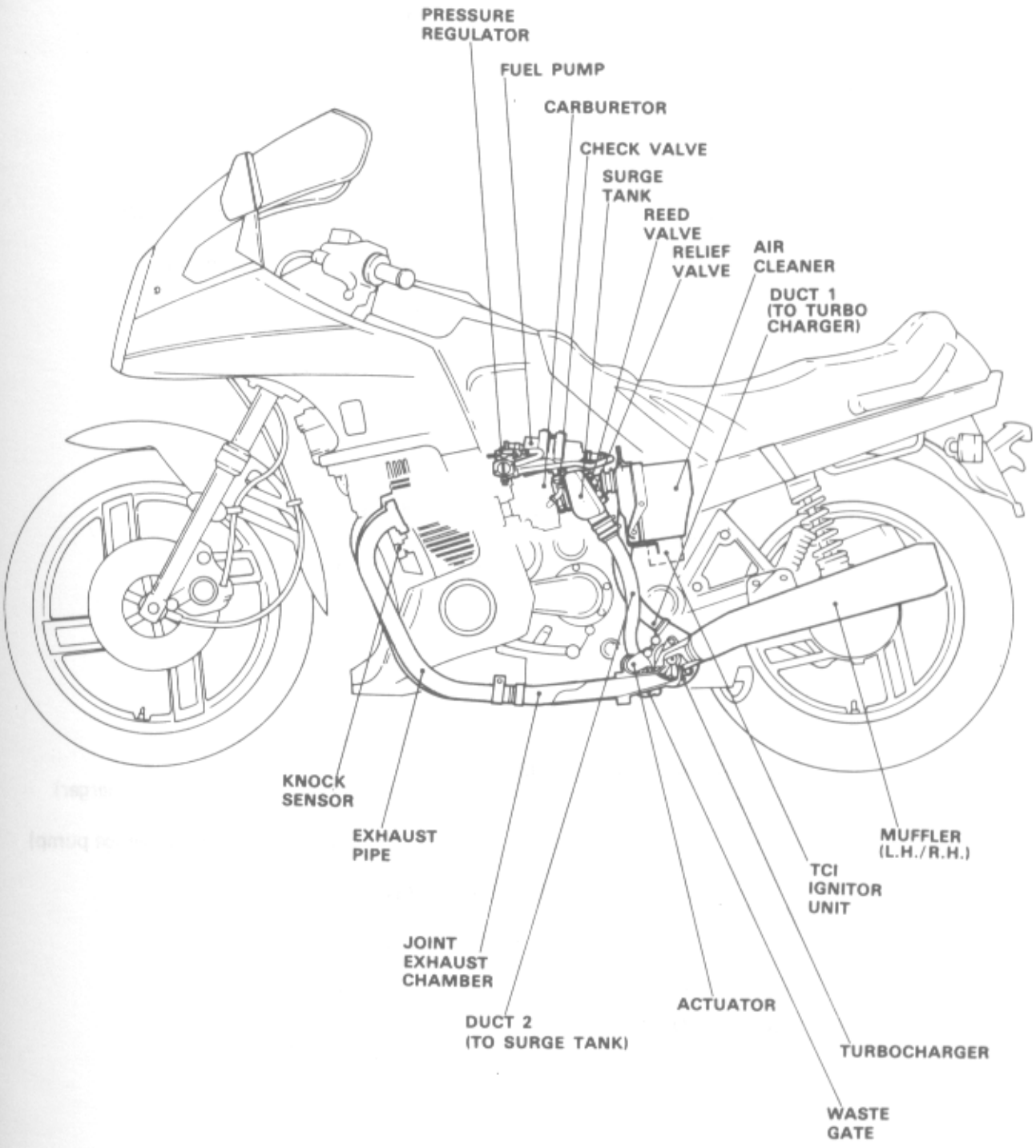
6. Tighten the clamp bolt.

Tightening torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)

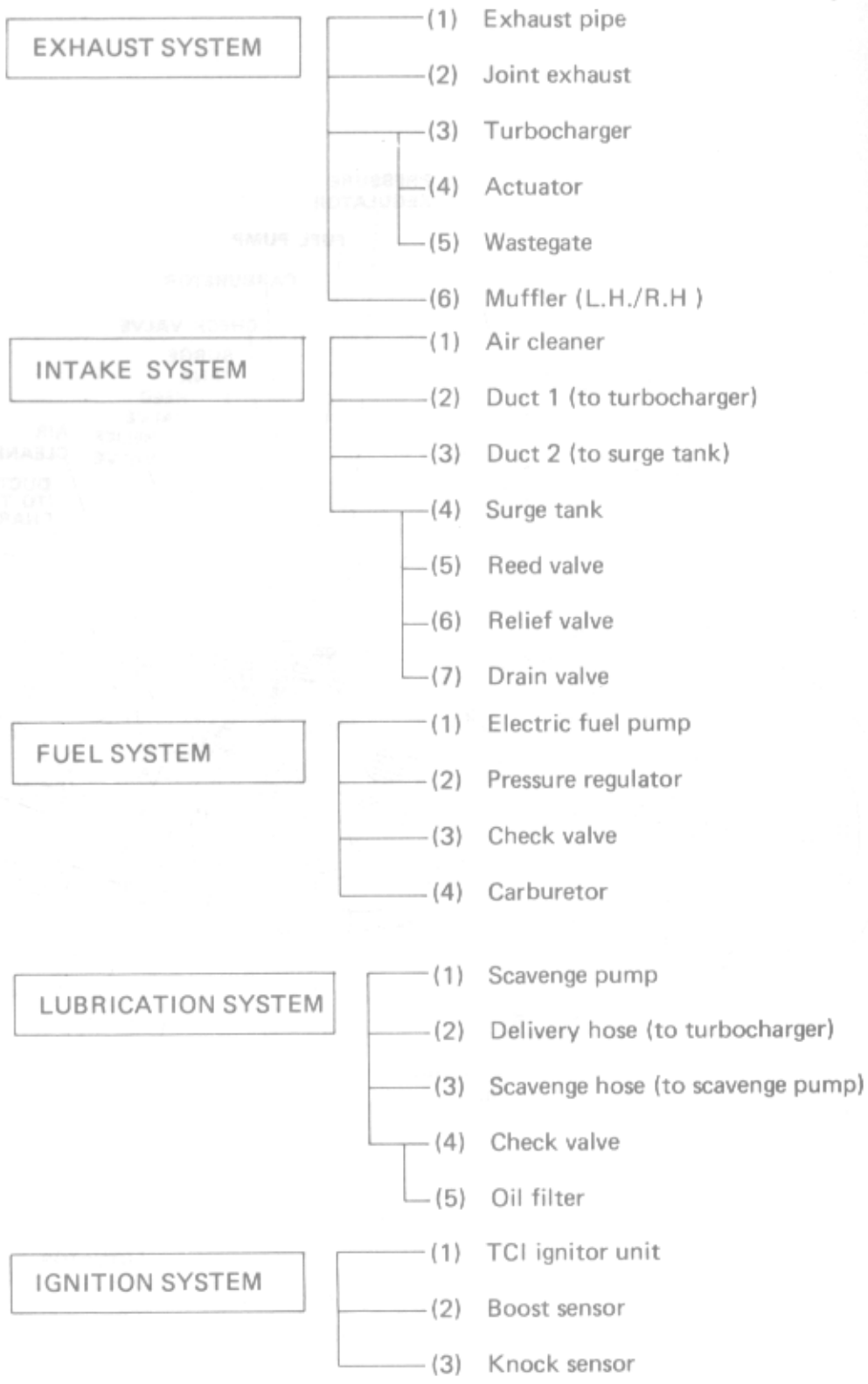
7. Tighten the oil hose fitting nuts (2).

Tightening torque:

LOCATION AND OUTLINE OF TURBO SYSTEM COMPONENTS

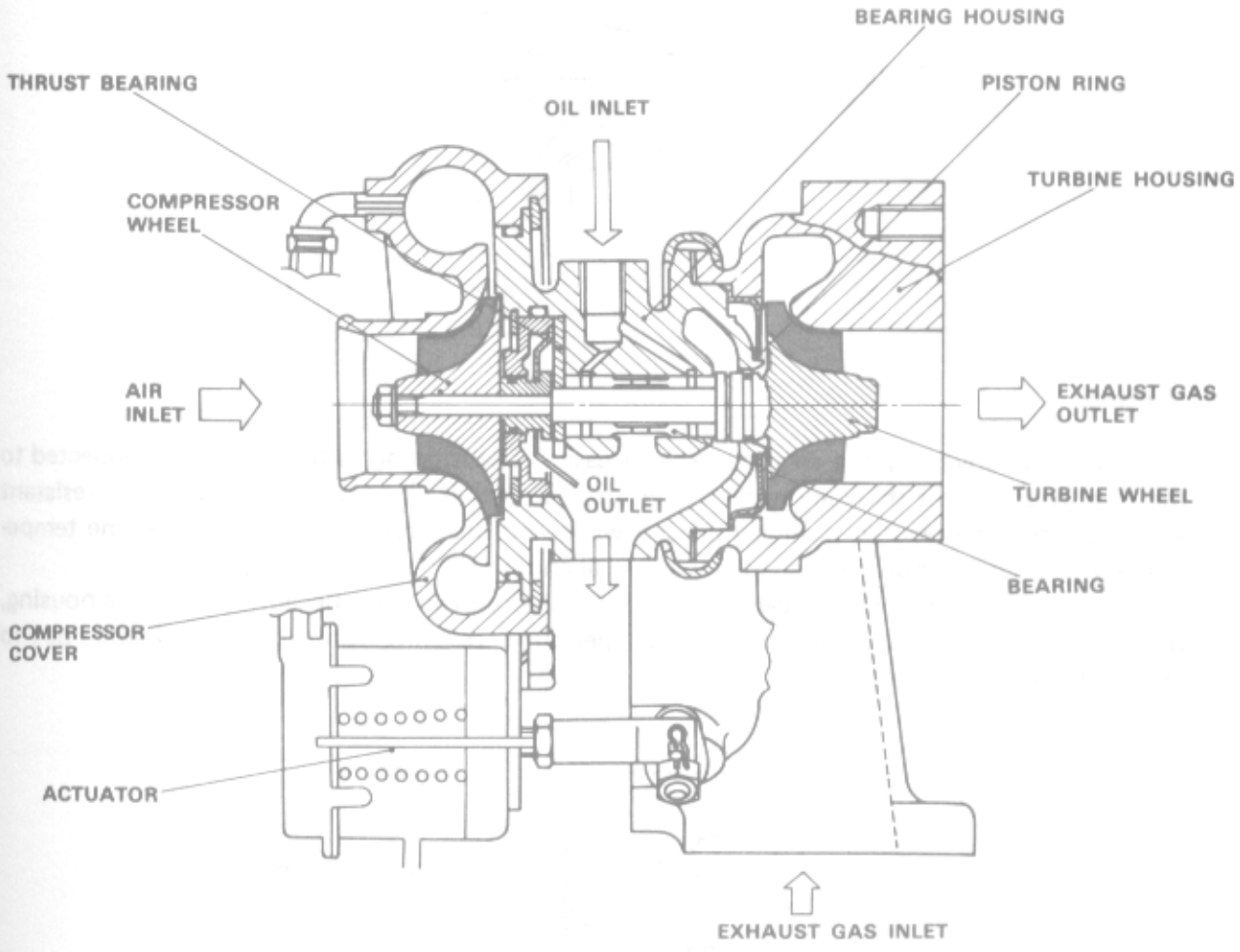


MAJOR COMPONENTS OF THE YAMAHA TURBO SYSTEM



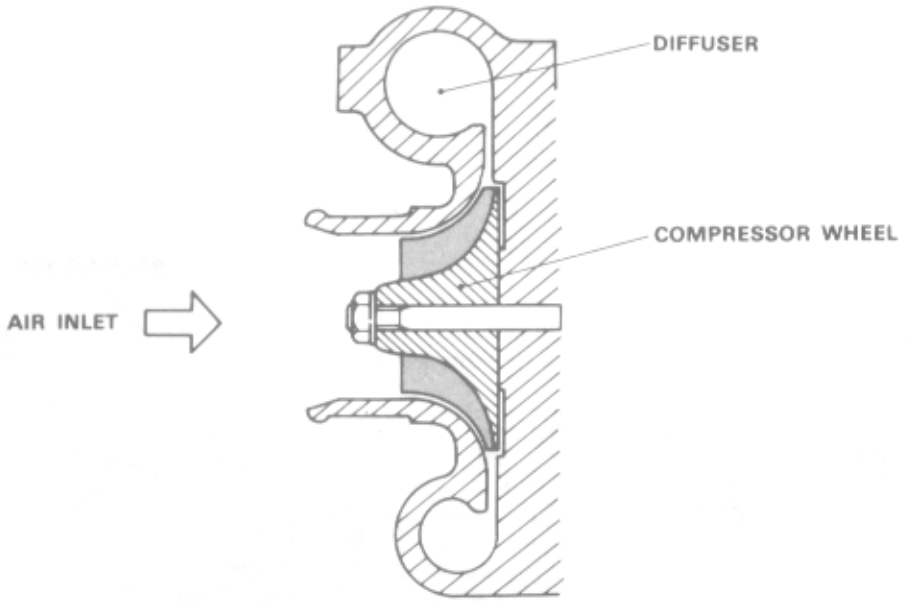
CONSTRUCTION OF THE TURBOCHARGER UNIT

The turbocharger unit is made up of the following components: the compressor, which produces the boost pressure by compressing air; the turbine, which converts the exhaust gas into energy to drive the compressor; the bearings, which support the rotor shaft as it rotates at high speed; and the boost pressure control unit, which is composed of the wastegate and its actuator valve.



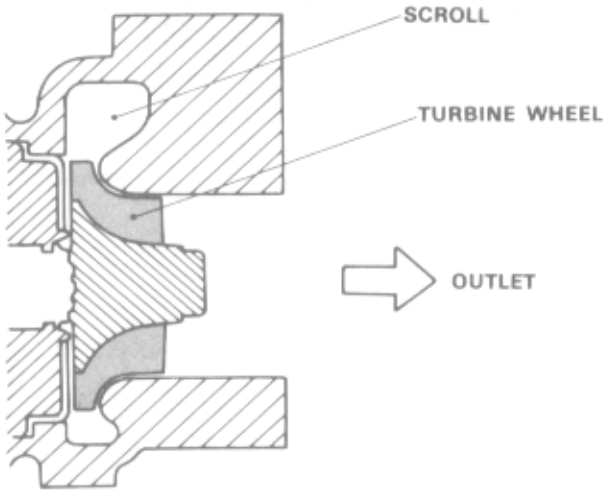
Compressor

The compressor is a rotor located within a housing of decreasing volume. As the compressor rotor turns, in excess of 100,000 rpm, it moves air by centrifugal force. Because of the design, the air being sent to the carburetors slows from its initial velocity, but because of the decreasing volume of the housing, the air pressure increase.



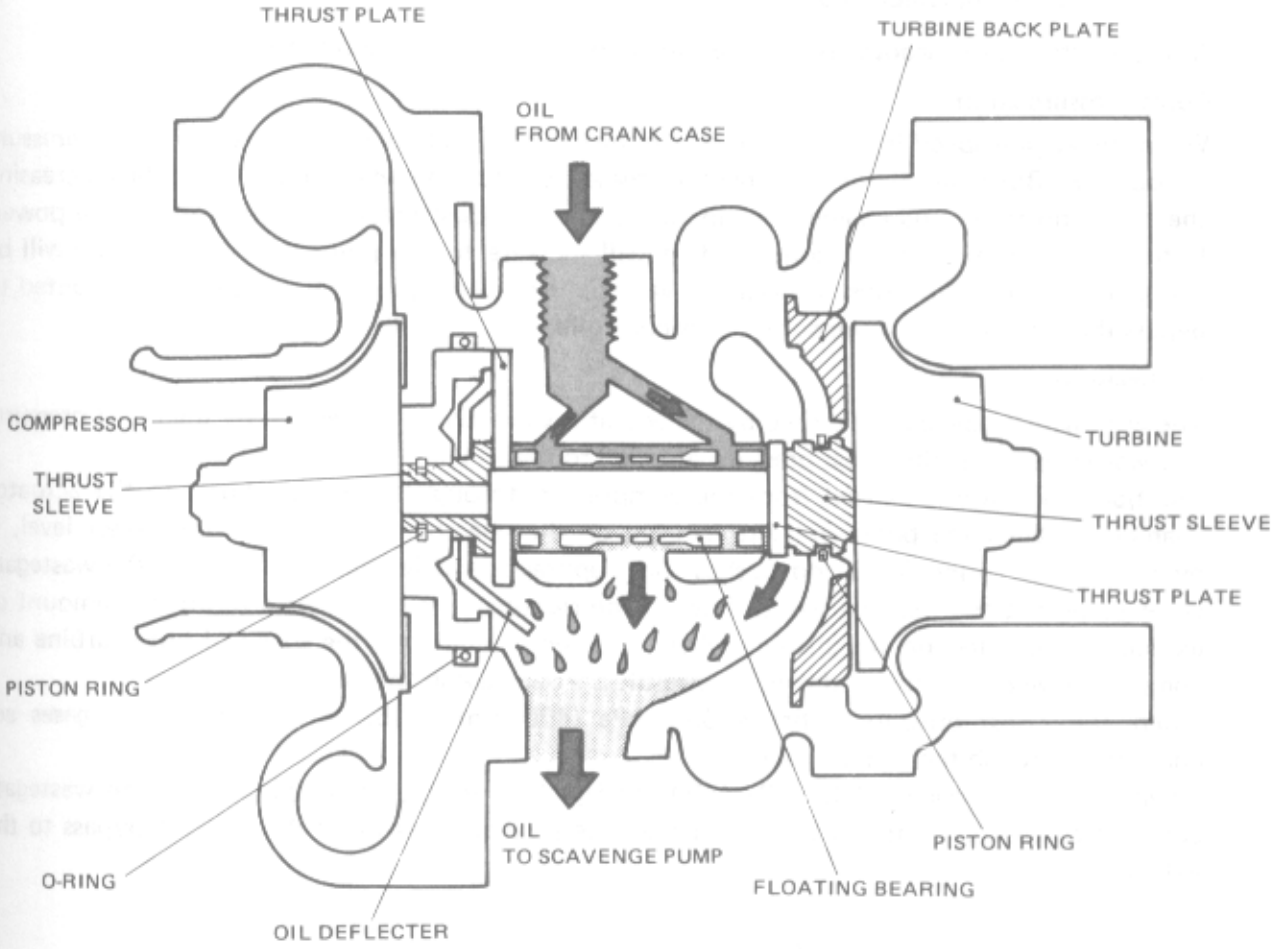
Turbine

The turbine is driven by the engine's exhaust gases. The rotating turbine, which is connected to the compressor, turns the compressor. The turbine rotor is constructed of a ultra heat-resistant alloy, which is a precision casting that can withstand high-speed operation at extreme temperatures. The turbine housing is shaped like a snail and is called a scroll casing.
This design directs the exhaust gases into the turbine rotor blades. Because the turbine housing, like the turbine rotor, is subjected to high temperatures, resisting distortion and oxidation due to extremely high temperatures.



Floating bearing

Floating bearings support the turbine shaft as it turns at speeds of 100,000 to 210,000 rpm. It is the fact that these bearings "float" in a constant flow of lubricating oil that permits the turbine/compressor shaft to spin at such high rpms. These bearings are designed to turn freely between the shaft and the bearing housing. Lubricating oil surrounds the bearings, flowing freely yet absorbing the vibrations created by the turbine/compressor shaft. To ensure that the oil is not stressed any more than necessary, the bearing housing has special seals that separate the exhaust gas driving the turbine from the lubricating oil.



Cooling of the bearing section

During full-throttle, high-speed operation the temperature of the inlet at the turbine is more than 850°C, and even the serface temperature of the turbine housing is as high as 550 to 750℃. If such heat is transferred to the center bearing housing, the bearing temperature will rise accordingly. This reduces the oil's viscosity, making it ineffective in absorbing the vibrations from the floating bearing. To guard against these high temperatures, the rear of the turbine is covered with a backing plate so that an air chamber is formed between the backing plate and the housing, thus serving as a heat insulator.

Gas seal on the turbine side

The shaft on the turbine side is provided with a ring groove into which a small-diameter ring is fitted to seal out the exhaust gas from the turbine. The ring is forced against the center bearing housing by its own tension so that it does not turn with the shaft; the shaft rotates while keeping full contact with the ring.

Oil seal on the compressor side

A ring is fitted in the groove around the thrust collar to provide a good seal.

Boost pressure control

When the engine speed is low, that is, when the exhaust gas flow is not much, the boost pressure is also low. But when the engine speed increases, the turbine wheel spins faster, thus increasing the boost pressure. As engine rpms increase, so does boost pressure, further increasing power. If the boost pressure is not controlled, it will increase to the point where the engine will be damaged. To control boost pressure, a valve is used through which exhaust gas is routed to bypass the turbine. Boost pressure is thus controlled.

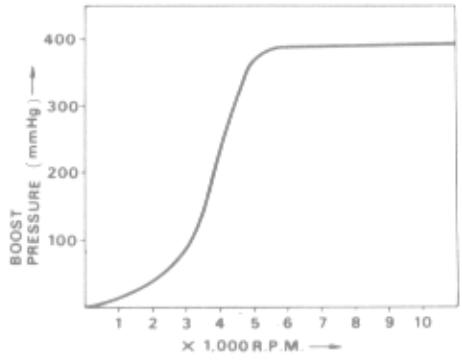
Wastegate valve

The wastegate is opened and closed by the actuator valve which is operated by the boost pressure. The wastegate limits the boost pressure supplied to the engine.

The boost pressure is carried from the compressor, through the rubber hose, to the actuator chamber. When the boost pressure exerted on the chamber goes beyond the preset level, it overcomes the spring force and pushes the diaphragm and linkage. This opens the wastegate valve to permit the exhaust gas to flow to the right-hand muffler. As a result, the amount of exhaust gas exerted on the turbine wheel is reduced, and thus the speed of both turbine and compressor wheels is slowed down. The result is a decrease in the boost.

When the boost pressure is below 53.2 kPa (400 mmHg, 15.7 inHg), all exhaust gases are channeled through the turbine vanes.

When the boost reaches 53.2 kPa (400 mmHg, 15.7 inHg), the diaphragm of the wastegate actuator causes the gate to open, and the excess exhaust gas flows through the bypass to the exhaust pipe.



Wastegate valve:

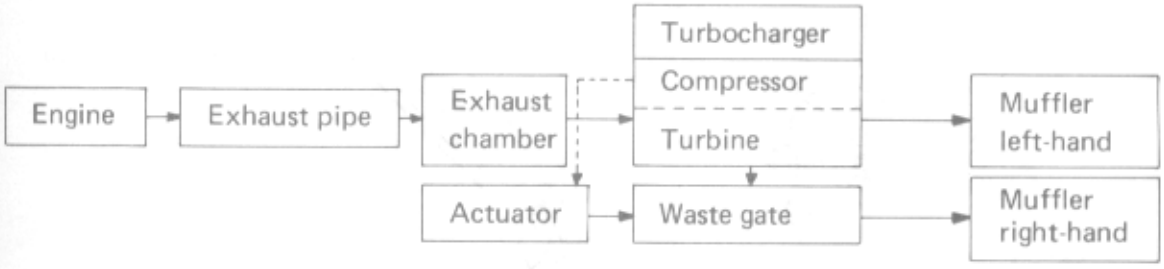
Stroke: 5 mm

Pressure: 83.4± 6.9 kPa
(0.85 ± 0.07 kg/cm^2)
(12.1 ± 1.0 psi)

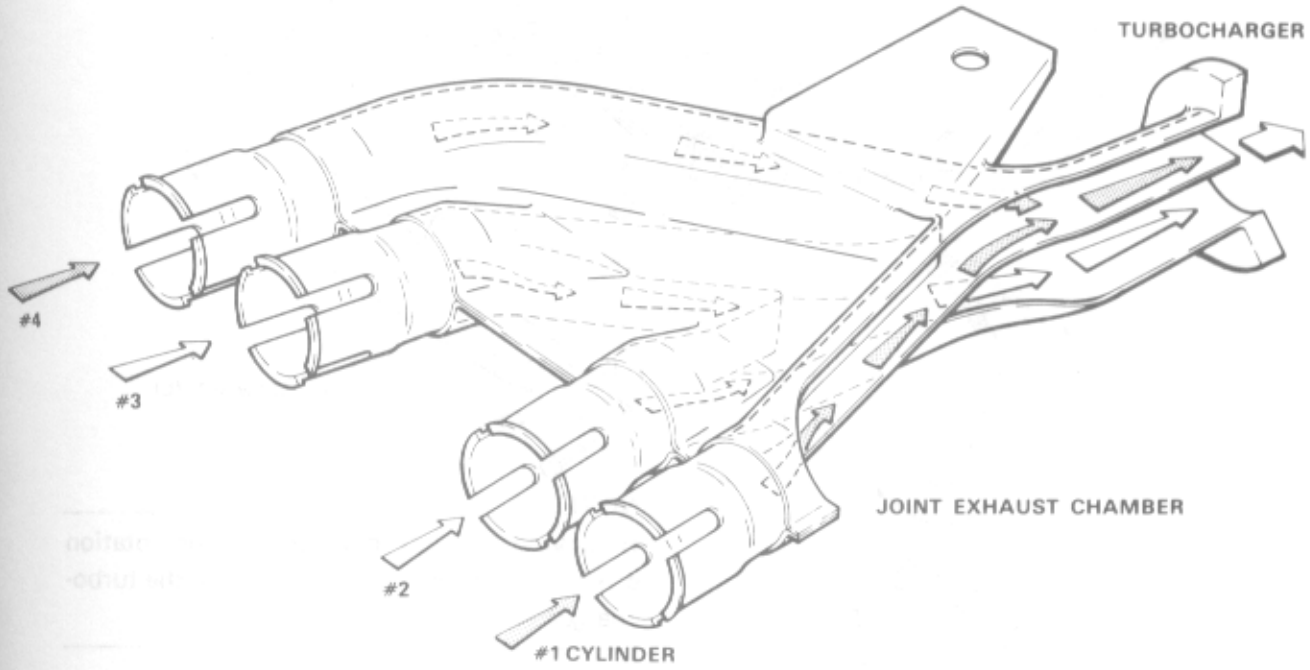
OPERATION OF YAMAHA TURBO SYSTEM

EXHAUST SYSTEM

The exhaust system is composed of exhaust pipes, an exhaust chamber/turbocharger assembly, and mufflers. The turbocharger is operated by the engine's expelled gases and this in turn operates the compressor rotor, which creates the boost pressure for the combustion chambers. The boost pressure is controlled by a wastegate that channels unneeded exhaust out the right-hand muffler. See the block diagram below.



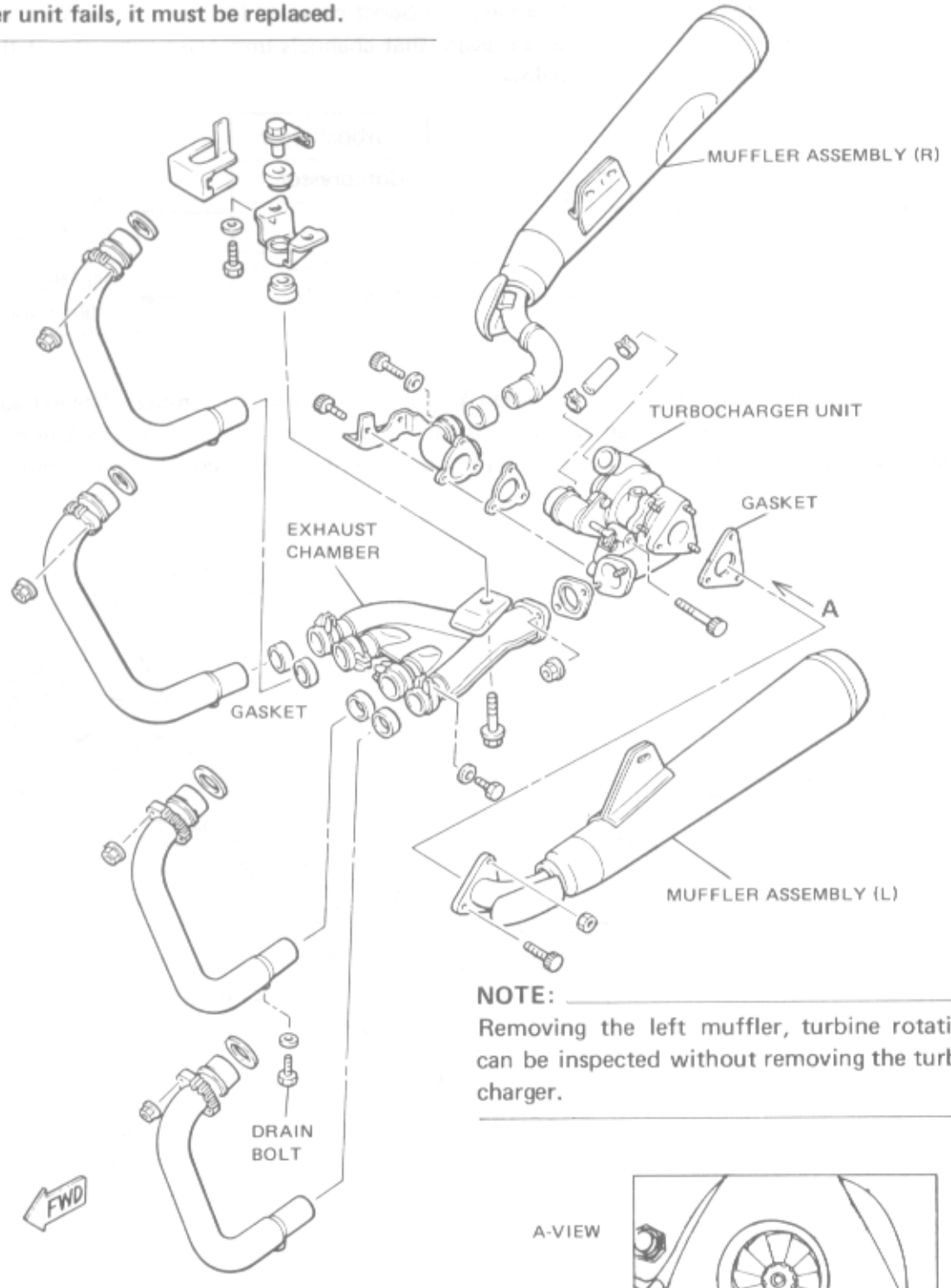
The turbocharging system features a patented Yamaha exhaust joint chamber. The exhaust pipes are grouped together to supply an even exhaust flow -- a 360° interval with less interference from exhaust pulses. As a result, the engine gives a smooth, ever-increasing curve of performance.



EXHAUST SYSTEM REMOVAL

CAUTION:

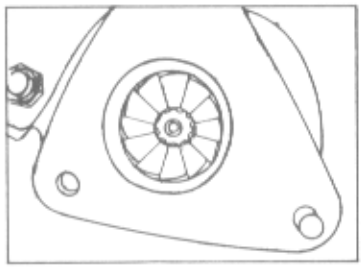
Do not, under any circumstances, disassemble the turbocharger unit itself. If the turbocharger unit fails, it must be replaced.



NOTE:

Removing the left muffler, turbine rotation can be inspected without removing the turbocharger.

A-VIEW



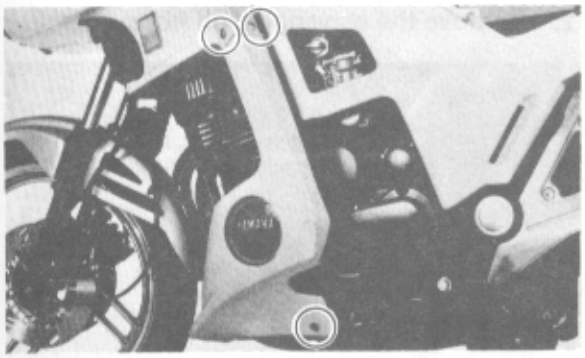
DISASSEMBLY

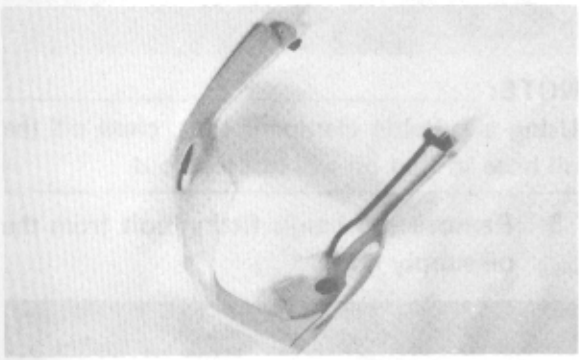
Exhaust Pipe and Exhaust Chamber

1. Remove the lower, fairing panel that shields the turbocharger/exhaust chamber assembly.

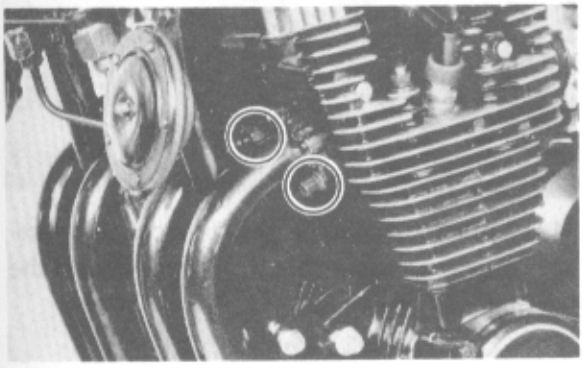
NOTE:

The lower fairing panel need not be removed; however disassembling the exhaust pipes and exhaust chamber will be easier.

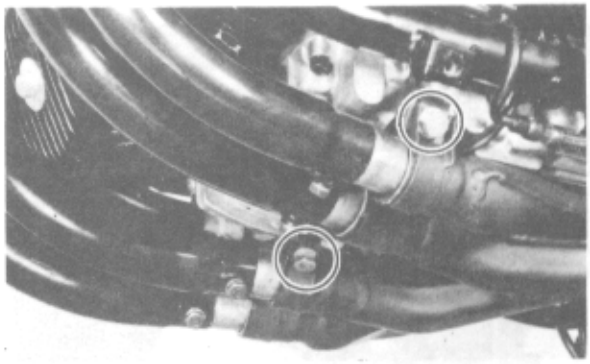




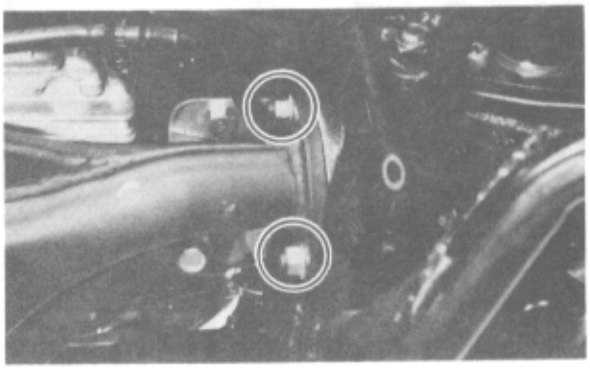
2. Remove the exhaust pipe mounting flange nuts.



3. Loosen the clamps that mount the exhaust chamber to the exhaust pipes.

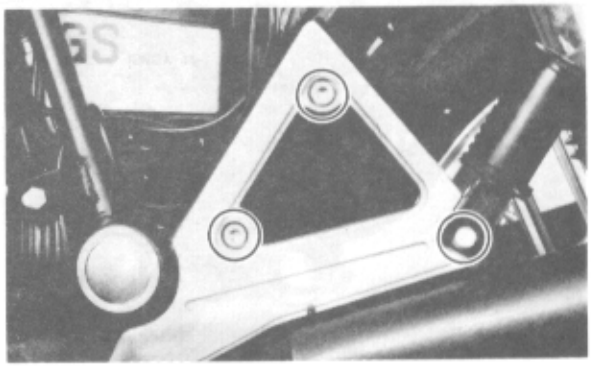


4. Remove the exhaust pipes.
5. Remove the nuts at the exhaust chamber /turbocharger mounting flange, and remove the exhaust chamber.

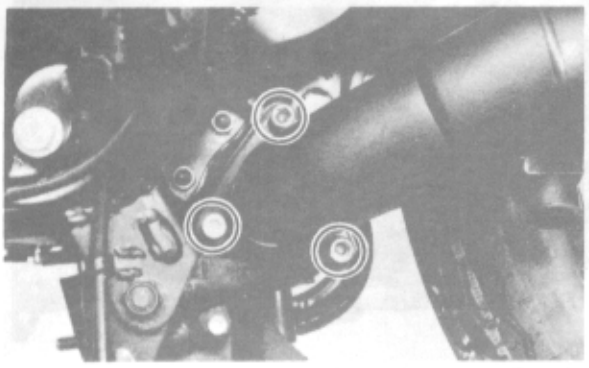


Mufflers

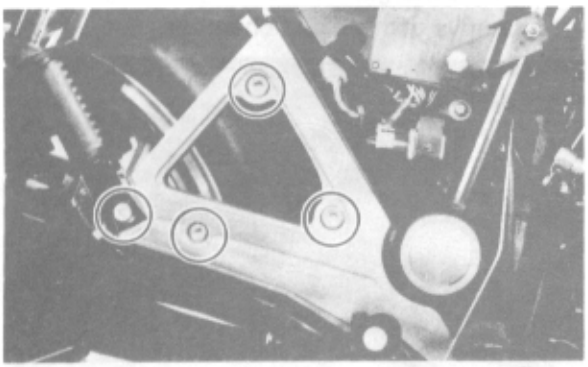
1. Remove the left muffler mounting bracket bolts.



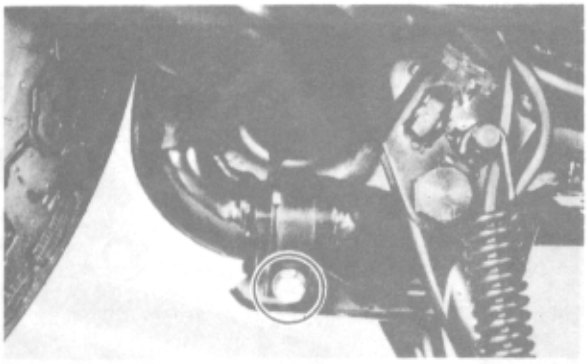
2. While supporting the left muffler, loosen the coupling bolt and nuts at the turbocharger, and remove the left muffler.



3. Remove the right muffler mounting flange bolt.

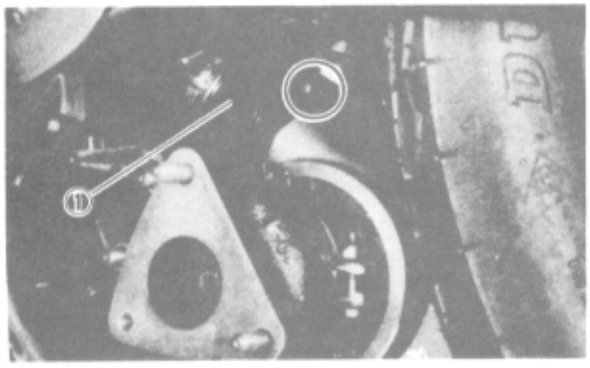


4. While supporting the muffler, remove the mounting flange bolts that connect the muffler to the turbocharger, and remove the muffler.

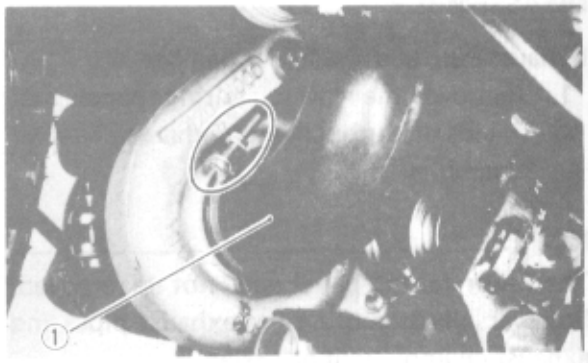


Turbocharger

1. Loosen the clamp screws.

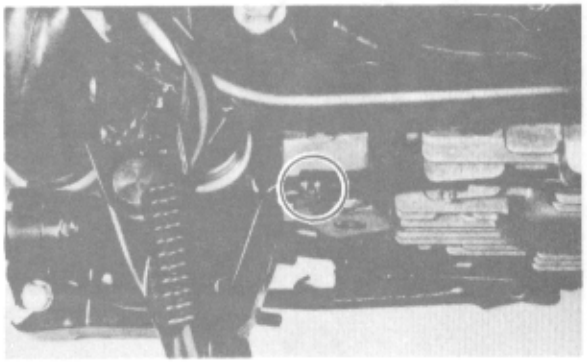


1. Duct to surge tank



1. Duct from air cleaner

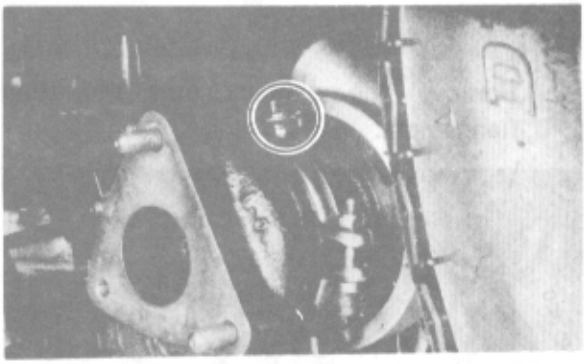
2. Remove the scavenging oil hose.



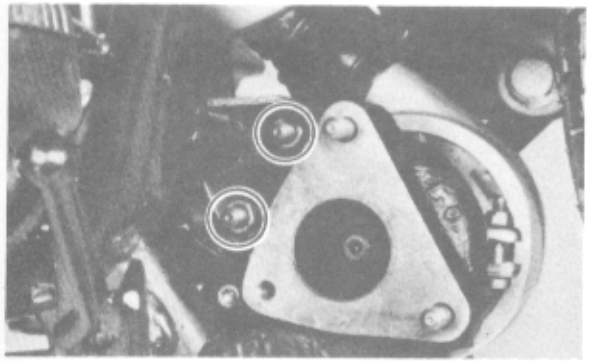
NOTE:

Using a suitable clamp or bolt, close off the oil hose so that oil will not leak out.

3. Remove the banjo fitting bolt from the oil supply hose.



4. While supporting the turbocharger, remove the mounting nuts, and remove the turbocharger.



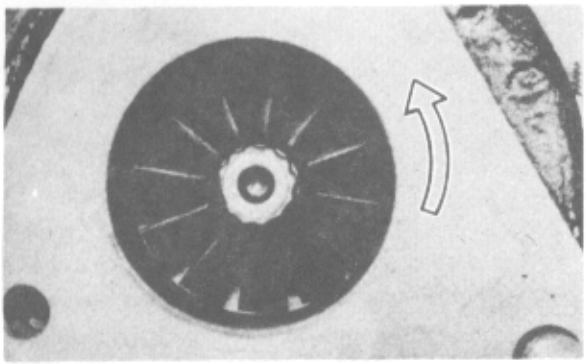
CAUTION:

Don't allow foreign particles to enter the turbocharger, when removing the turbocharger.

INSPECTION

Turbocharger

1. Ensure that the turbine and compressor rotors turn smoothly.



2. Ensure that the actuator valve and wastegate assembly operate correctly.
3. As the turbine is turned it should not bind at any point, there should be no side play, and there should be no axial play in the turbine/compressor shaft.

WARNING:

IF THE TURBOCHARGER UNIT DOES NOT OPERATE PROPERLY, THE ENTIRE UNIT, INCLUDING THE ACTUATOR VALVE/WASTEGATE ASSEMBLY, MUST BE REPLACED.

Exhaust Pipes and Mufflers

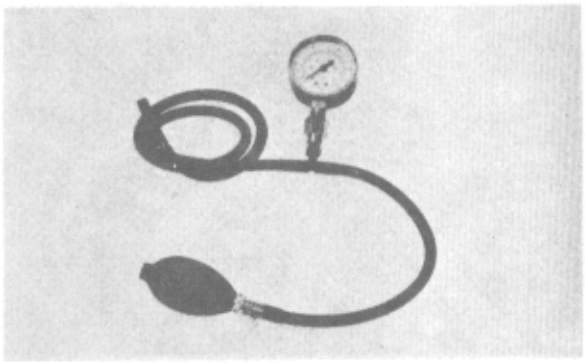
CAUTION:

Check the exhaust pipes, exhaust chamber, and left and right mufflers for any leaks or material that could make its way into the turbocharger unit. Also check the oil scavenge and oil supply lines for any leaks. Replace as necessary.

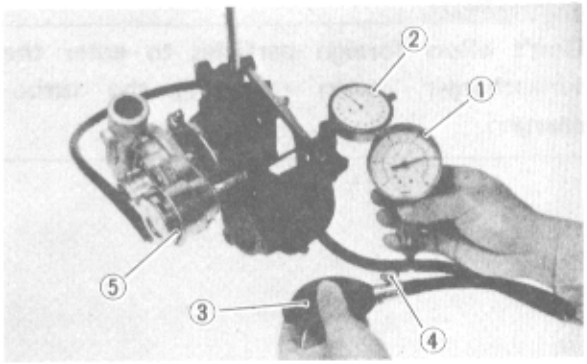
Actuator Valve/Wastegate Assembly

Using the following procedure, check the pressure on the actuator valve.

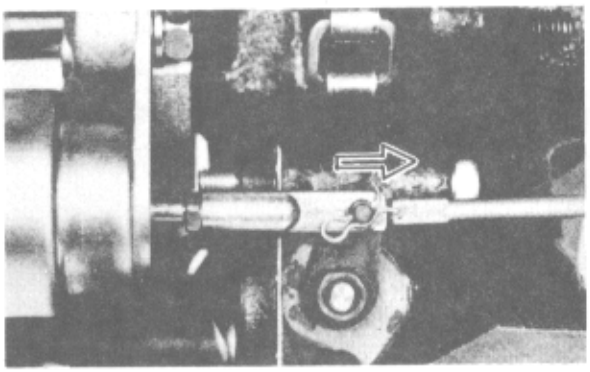
1. Install the turbocharger pressure gauge (P/N YM-33076) and the dial gauge as shown below.



1. Turbocharger pressure gauge



1. Turbocharger pressure gauge
2. Dial gauge
3. Bellows
4. Relief valve
5. Actuator

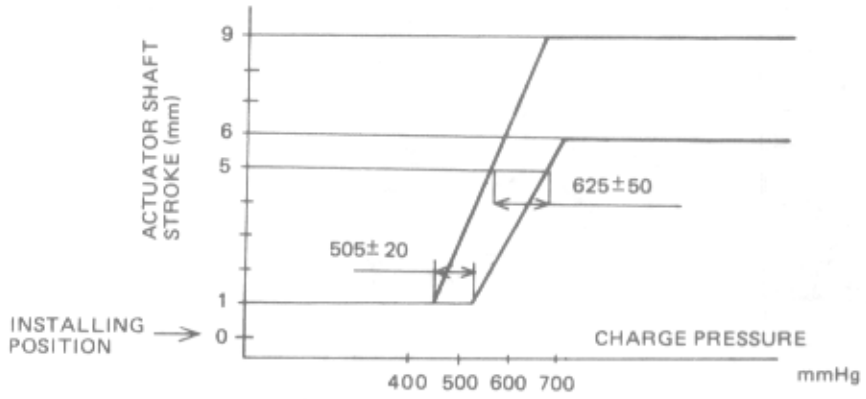


Dial gauge read	Pressure gauge read		
1.0 mm (0.04 in)	67.7 ± 2.9 kPa	0.69 ± 0.03 kg/cm²	9.81 ± 0.43 psi
5.0 mm (0.20 in)	83.4 ± 6.9 kPa	0.85 ± 0.07 kg/cm²	12.1 ± 1.00 psi

CAUTION:

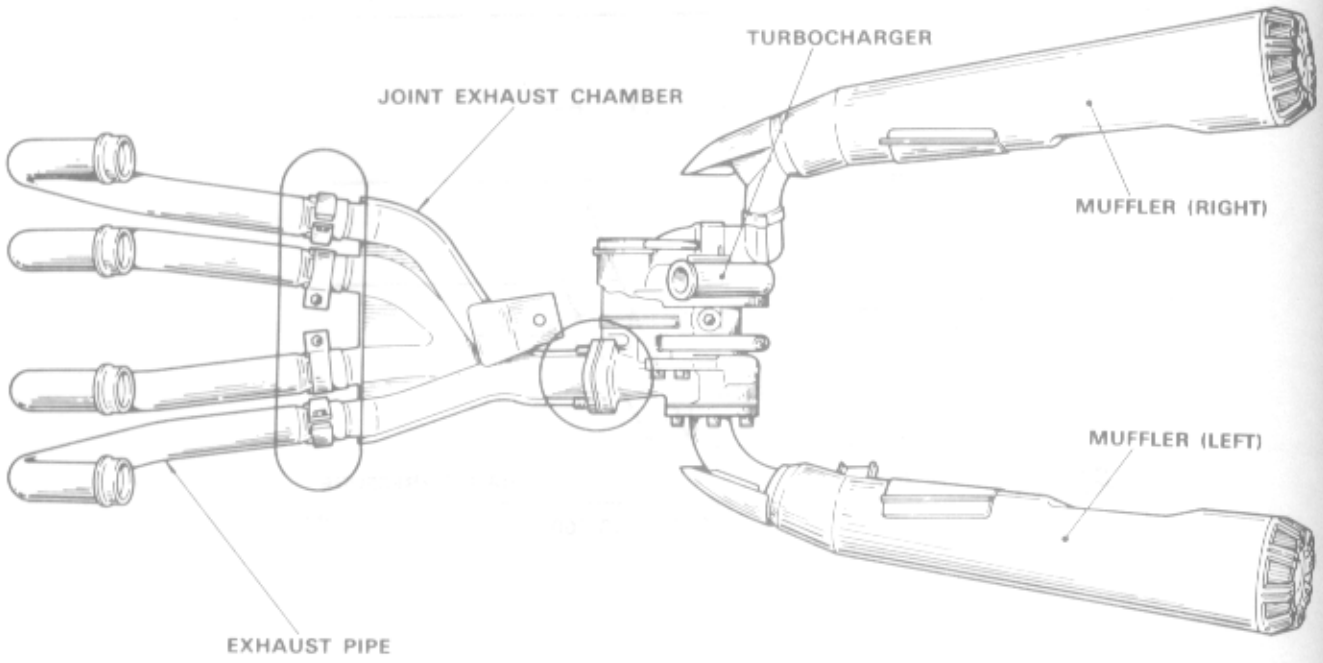
Do not loosen the actuator shaft locknut. The shaft and locknut held fast by an adhesive. An attempt to force them apart will cause damage to the actuator diaphragm.

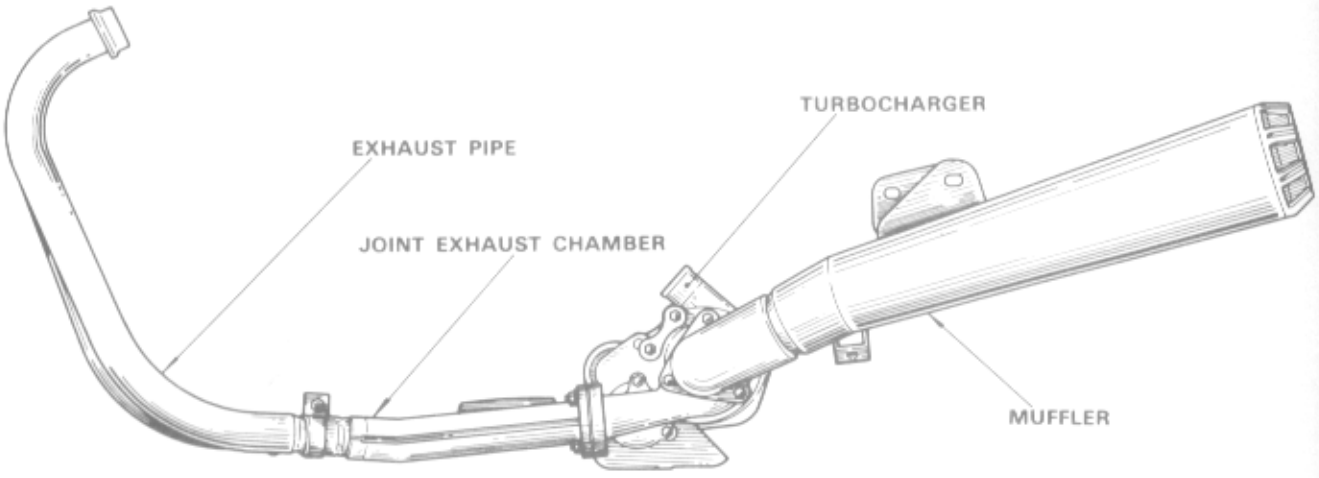
ACTUATOR CURVE



REASSEMBLY

CAUTION: **The exhaust system operates under very high pressure from the turbocharger. Every connection and joint in the system must be tight, and new gaskets must be used. There must be no exhaust leaks or a drop in performance will result.**

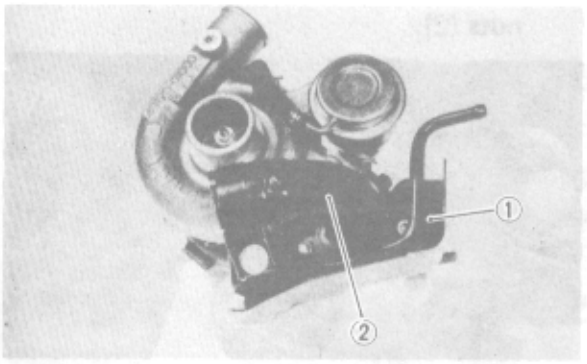




CAUTION:

Observe the following assembly instructions carefully.
The exhaust system must be assembled in the order listed below.

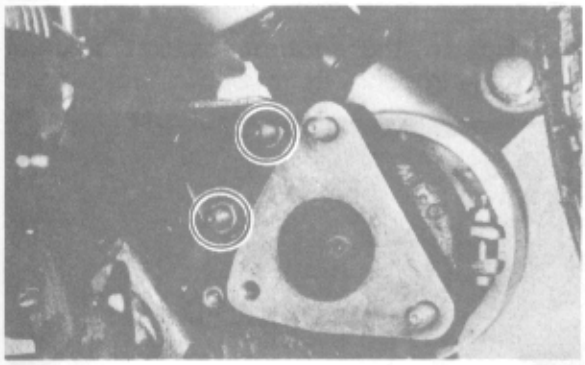
1. Mount the sub-muffler and the protecter to the turbocharger.



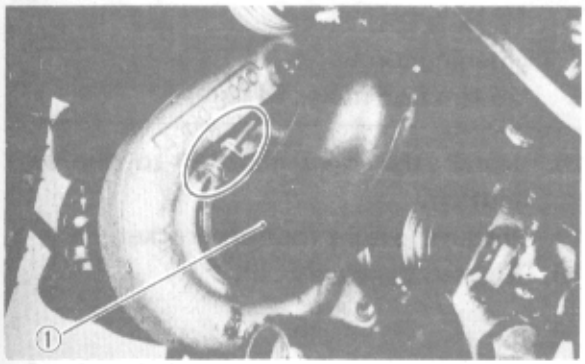
1. Protecter 2. Sub-muffler

Tightening torque:
12 Nm (1.2m·kg, 8.7 ft·lb)

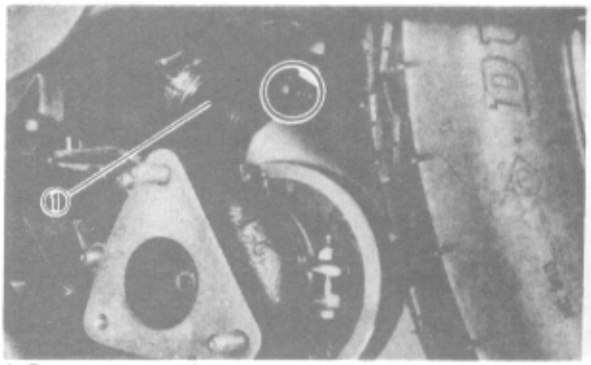
2. Mount the turbocharger to the frame, and finger-tighten the mounting nut.



3. Connect the ducts 1 and 2 to the turbocharger, and tighten the clamp screws.



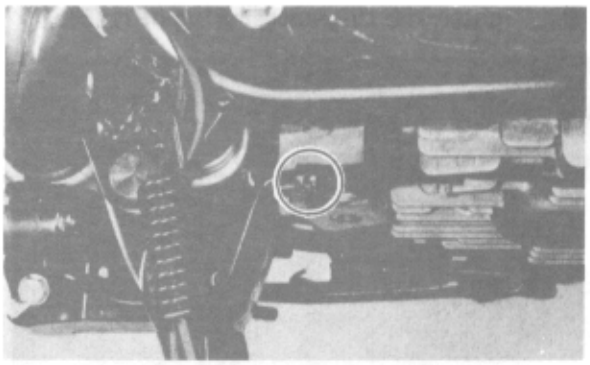
1. Duct from air cleaner

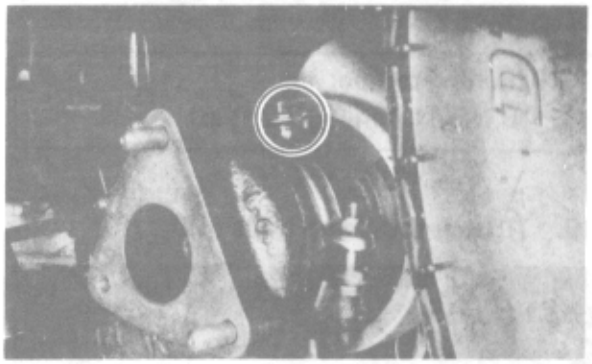


1. Duct to surge tank

Tightening torque:
2 Nm (0.2 m·kg, 1.4 ft·lb)

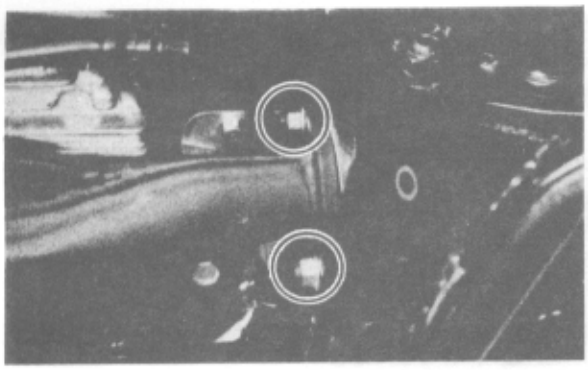
4. Connect the oil lines, and tighten the banjo fitting bolt.





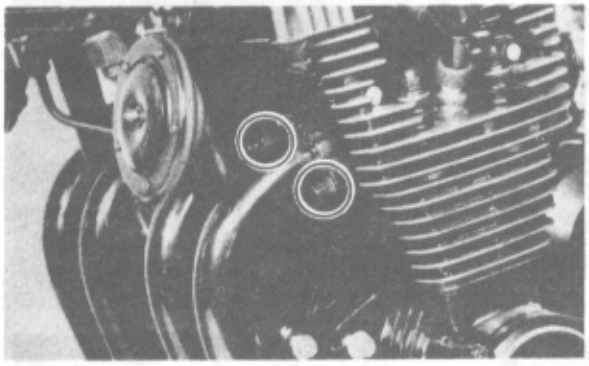
Tightening torque.
21 Nm (2.1 m·kg, 15 ft·lb)

5. Install the exhaust chamber to the turbocharger, and finger-tighten the mounting bolt to the frame.
6. Tighten the flange nuts (2).



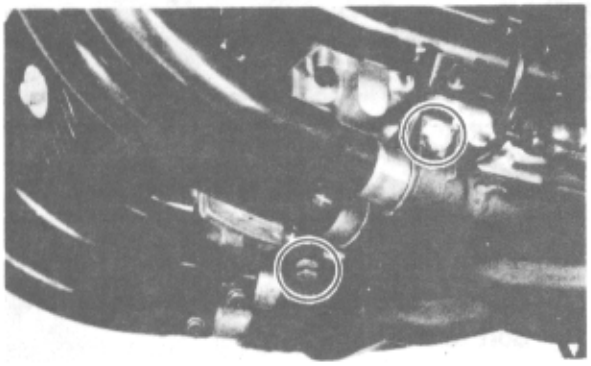
Tightening torque:
20 Nm (2.0 m·kg, 14 ft·lb)

7. Install the exhaust pipes to the exhaust chamber, and install the ringnuts to the cylinder head.
8. Tighten the ringnut securing nuts (8).



Tightening torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)

9. Tighten the clamp bolts (4).



Tightening torque.
20 Nm (2.0 m·kg, 14 ft·lb)

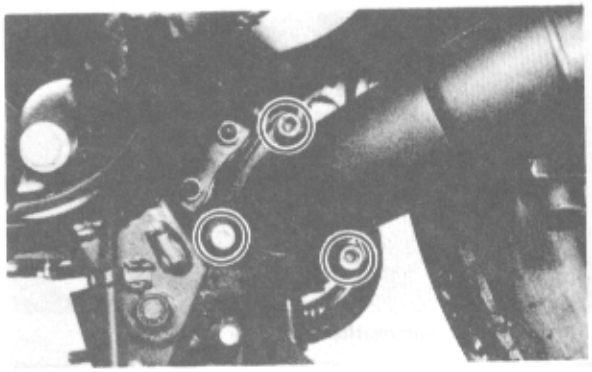
10. Tighten the exhaust chamber mounting bolt.

Tightening torque:
25 Nm (2.5 m·kg, 18 ft·lb)

11. Tighten the turbocharger mounting nuts (2).

Tightening torque:
20 Nm (2.0 m·kg, 14 ft·lb)

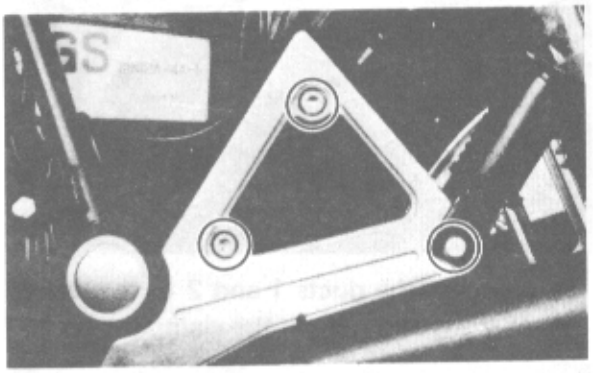
12. Install the left muffler to the turbocharger, and finger-tighten the bolt and nuts (2).



13. Install the left footrest bracket.
14. Tighten the coupling bolt and nuts (2).

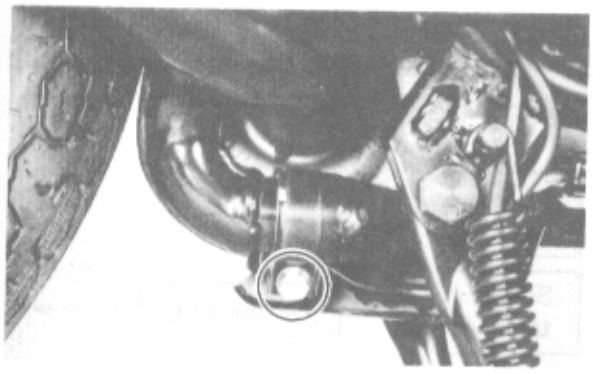
Tightening torque:
20 Nm (2.0 m·kg, 14 ft·lb)

15. Tighten the footrest bracket securing bolts (3).



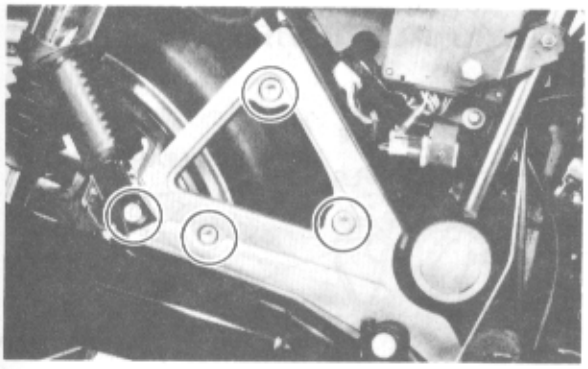
Tightening torque:
25 Nm (2.5 m·kg, 18 ft·lb)

16. Install the right muffler to the sub-muffler.
17. Install the right footrest bracket.
18. Tighten the clamp bolt.



Tightening torque:
20 Nm (2.0 m·kg, 14 ft·lb)

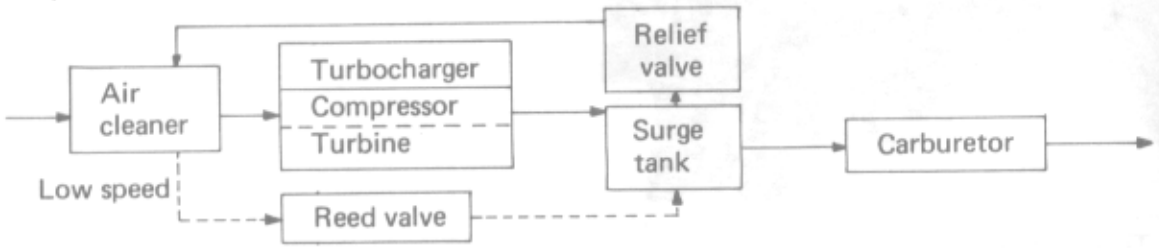
19. Tighten the footrest bracket securing bolts.



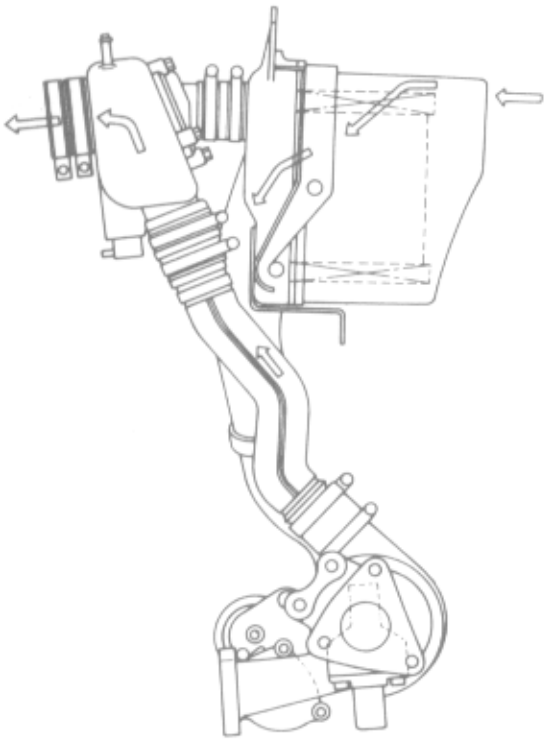
Tightening torque:			
	Nm	m·kg	ft·lb
M8	20	2.0	14
M10	25	2.5	18

INTAKE SYSTEM

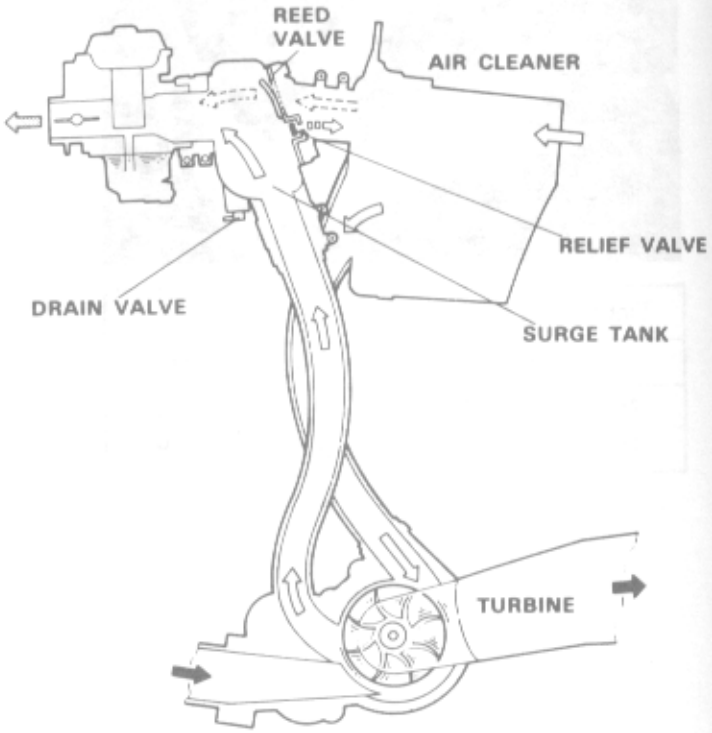
The intake system consists of an air cleaner, a surge tank, a reed valve, and a relief valve. All work together to provide the correct amount of air over the entire range of the engine's performance requirements, from low to high speeds.



SIDE VIEW

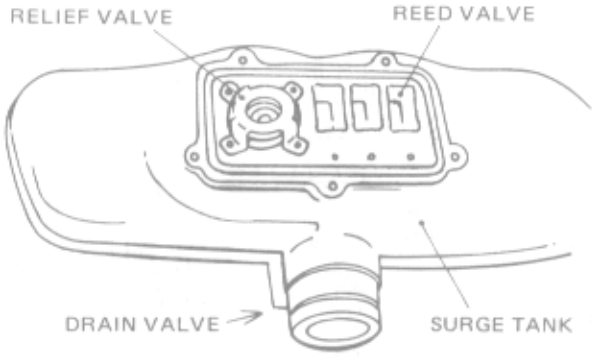


SECTIONAL SIDE VIEW



Surge Tank

The surge tank is an alloy air chamber that can hold large amounts of compressed air under constant pressure. The relief valve and the reed valve are located in the surge tank.



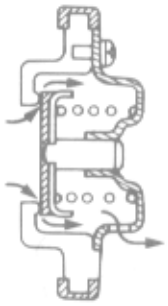
Relief valve

The relief valve releases excessive boost pressure in the surge tank if boost pressure becomes to high. This is a back up system to the waste gate.
If the wastegate actuator valve should fail, the relief valve will open the surge tank, reducing the excess boost pressure and thus protect the engine.

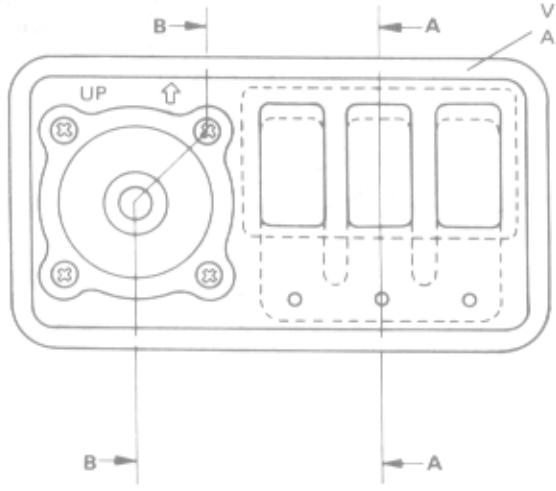
Relief valve setting pressure:
98.1 kPa (1.0 kg/cm², 14.2 psi)

Reed valve

The reed valve opens at low engine RPM when the turbocharger does not provide sufficient boost pressure. In this way, turbo lag is largely eliminated and better throttle response can be obtained.



SECTION B-B
RELIEF VALVE



SECTION A-A
REED VALVE

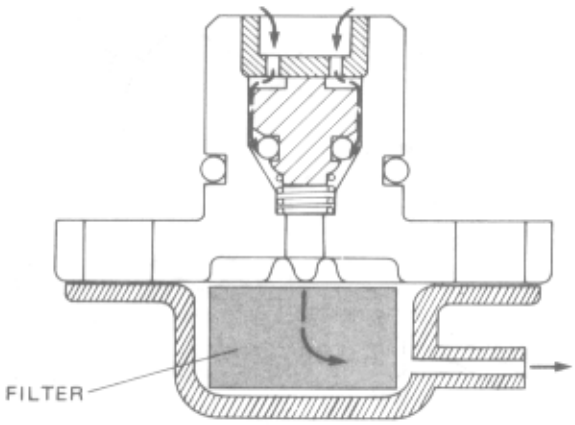
NOTE:

The relief valve assembly must be installed into the surge tank with the arrow pointing upward; see the illustration.

Drain valve;

This valve is provided to drain the surge tank of trapped fuel. It remains open when the engine is at a stop but starts to close as the surge tank is charged.

Drain valve closing pressure: 4.9 kPa (0.05 kg/cm², 0.7 psi)

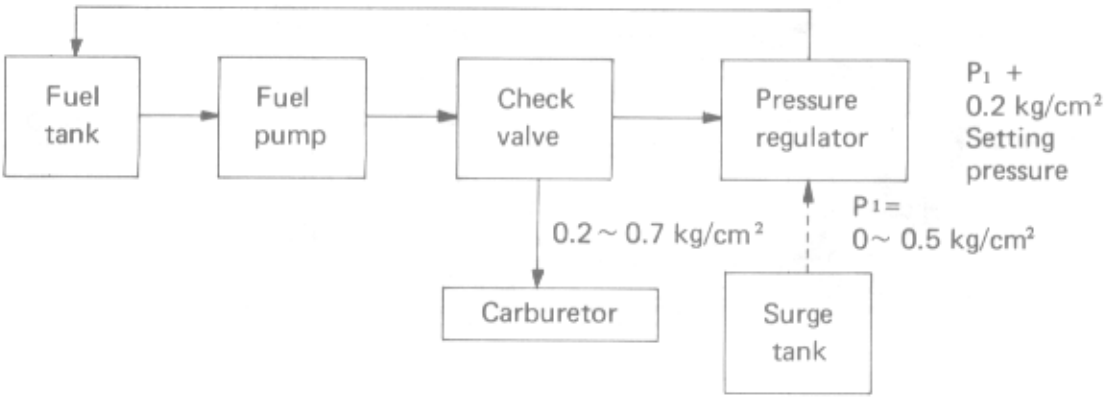


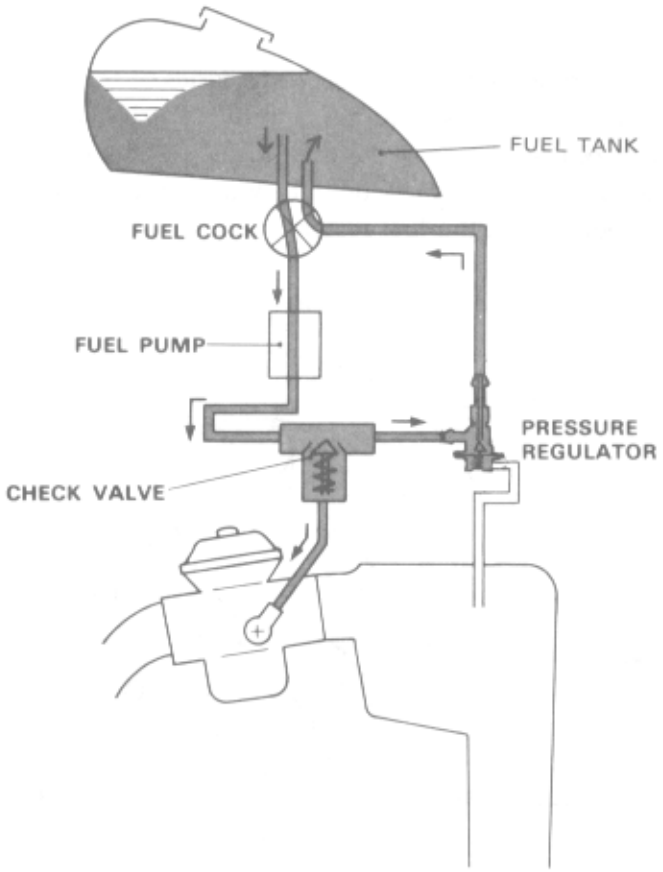
DRAIN VALVE

FUEL SYSTEM

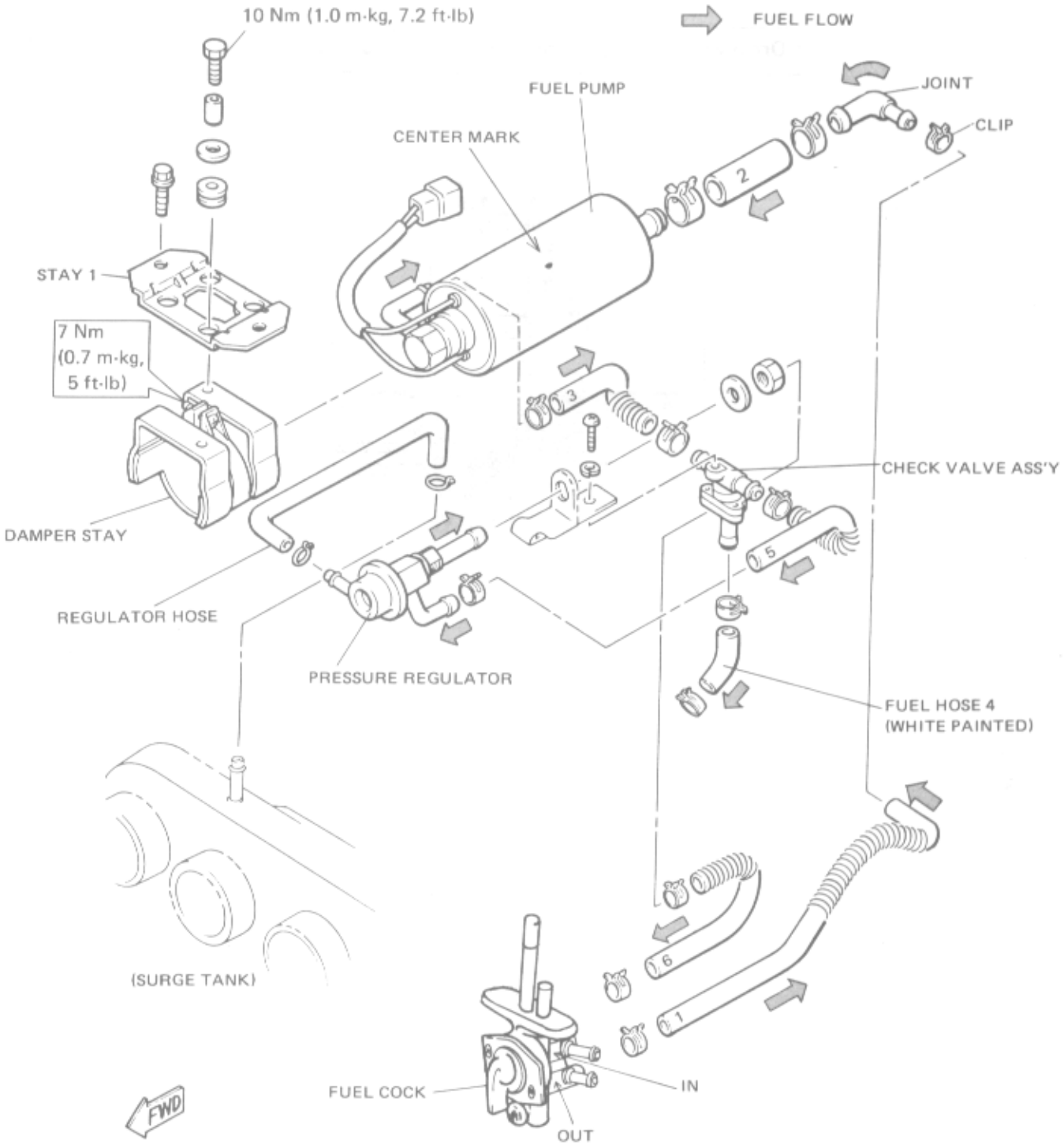
The fuel system is made up of a fuel tank, fuel cock, an electrical fuel pump, a check valve, a pressure regulator, and the carburetors.

Fuel is fed to the carburetor float chambers by the boost pressure picked up from the surge tank. The excess pressure (which determines the rate of flow of the fuel) is channeled through the pressure regulator back into the fuel tank. The pressurized fuel goes through the check valve to the carburetor float chambers. Unlike conventional carburetors, the fuel in the float chamber must be pressurized so that it can be metered into the venturiis. If it were not pressurized, the higher pressure with which the air enters the carburetors as the result of turbocharging would prevent any fuel from leaving the carburetors.





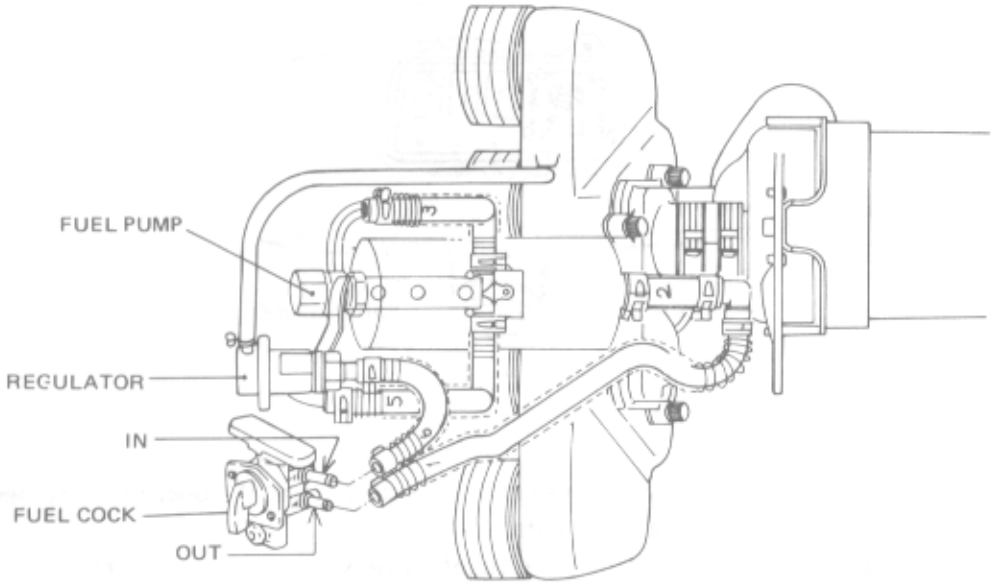
FUEL SYSTEM COMPONENTS



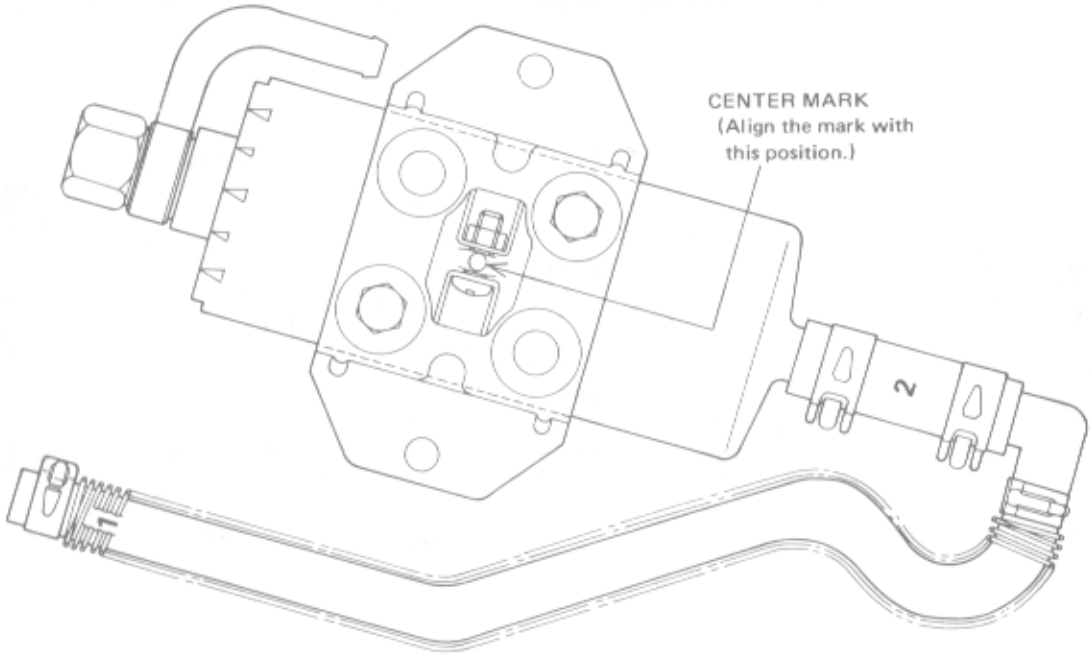
NOTE:

1. Connect fuel hose 1 to the fuel cock "OUT".
2. Connect fuel hose 6 to the fuel cock "IN".
3. The center mark on the fuel pump should be located in the upper center of the damper stay as shown in the illustration.

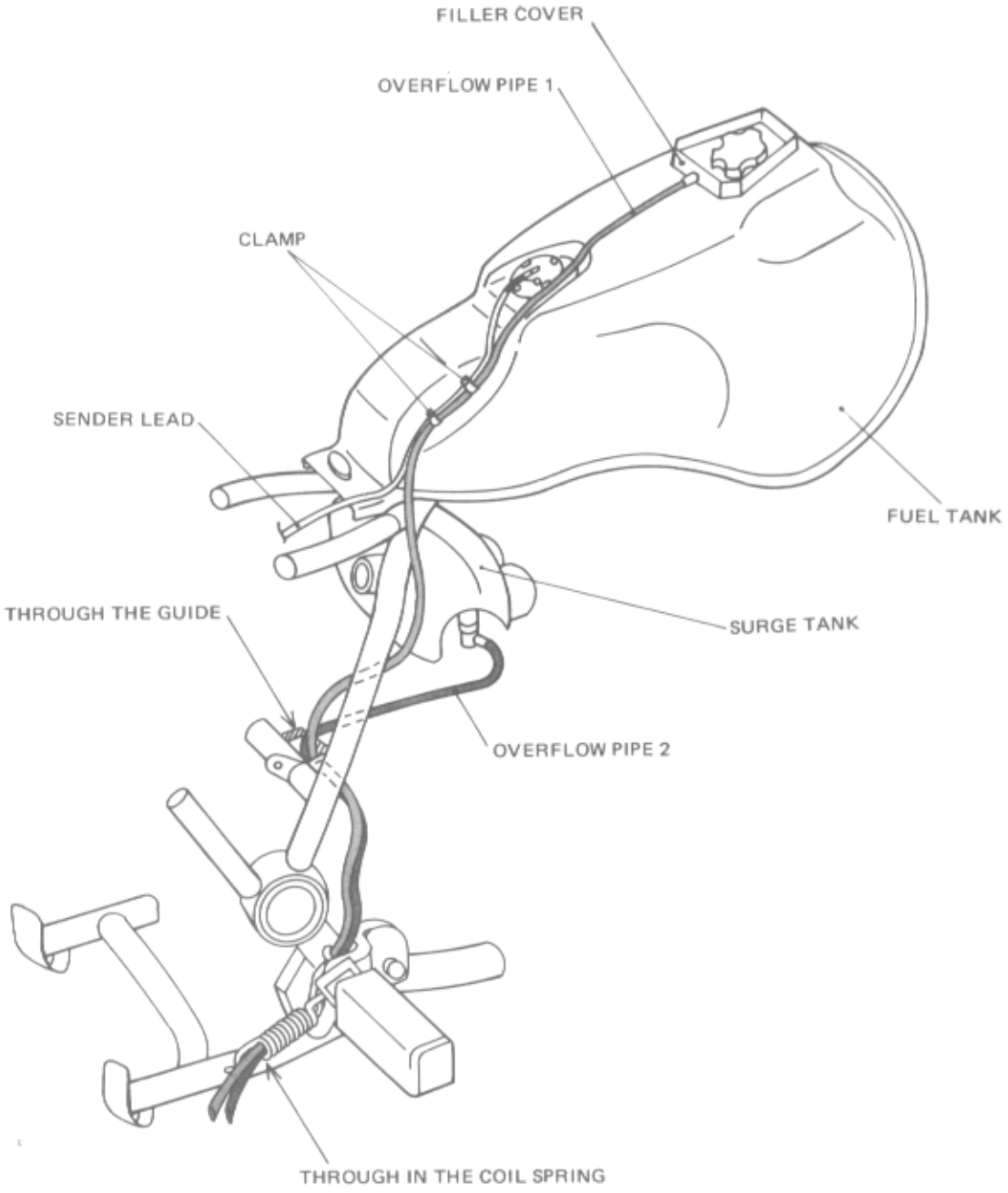
HOW TO LAYOUT FUEL HOSES



FUEL PUMP LOCATION



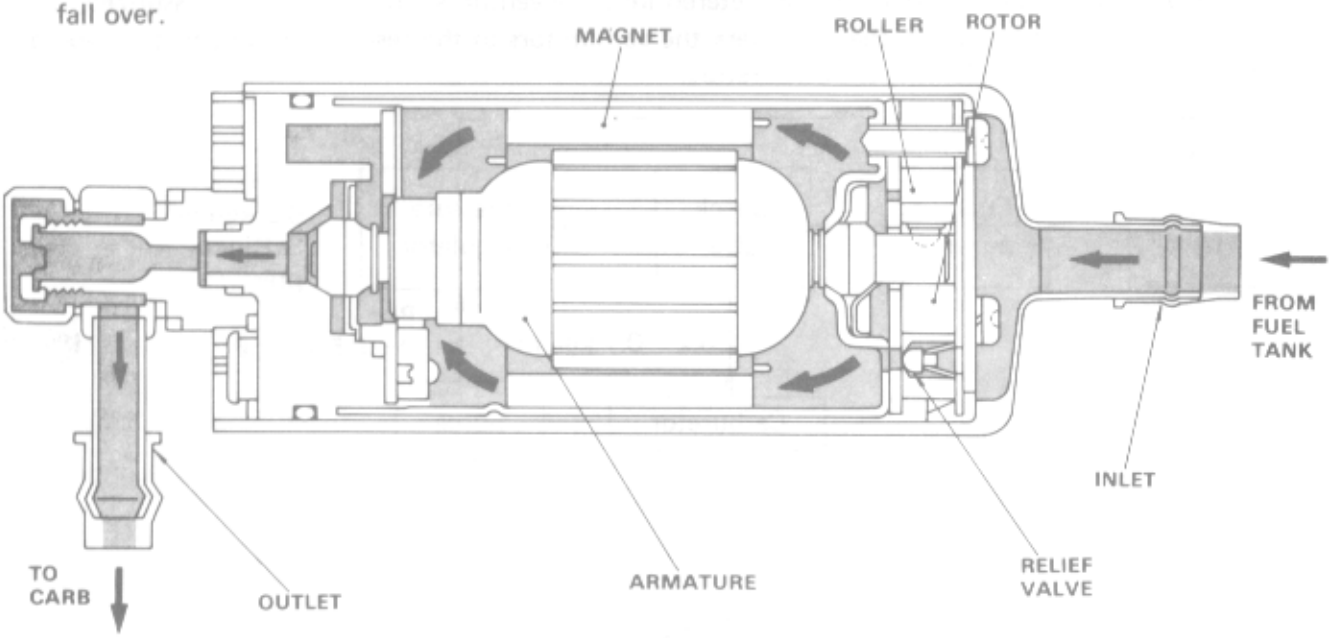
OVERFLOW PIPE ROUTING



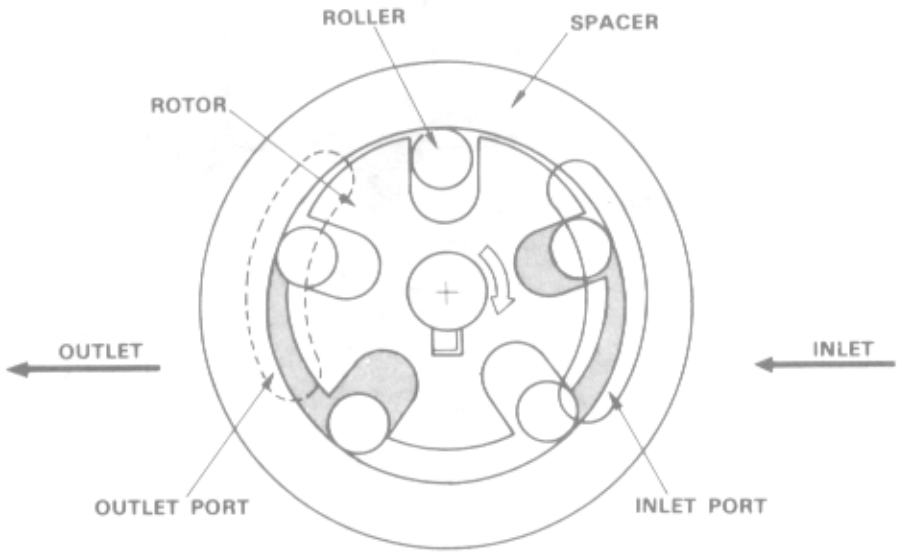
FUEL PUMP

The fuel pump is operated by a DC motor that is directly coupled to the pump. Fuel from the fuel cock is drawn into the pump, flows around the motor to the outlet at the opposite end of the housing, and then is fed through the check valve.

The fuel pump is connected to the electric starter circuit and begins pumping fuel when the starter is made to perate. The pump is protected by the circuits that sense AC generator output should the engine stall and a ballast switch, which shuts the fuel pump off should the motorcycle fall over.

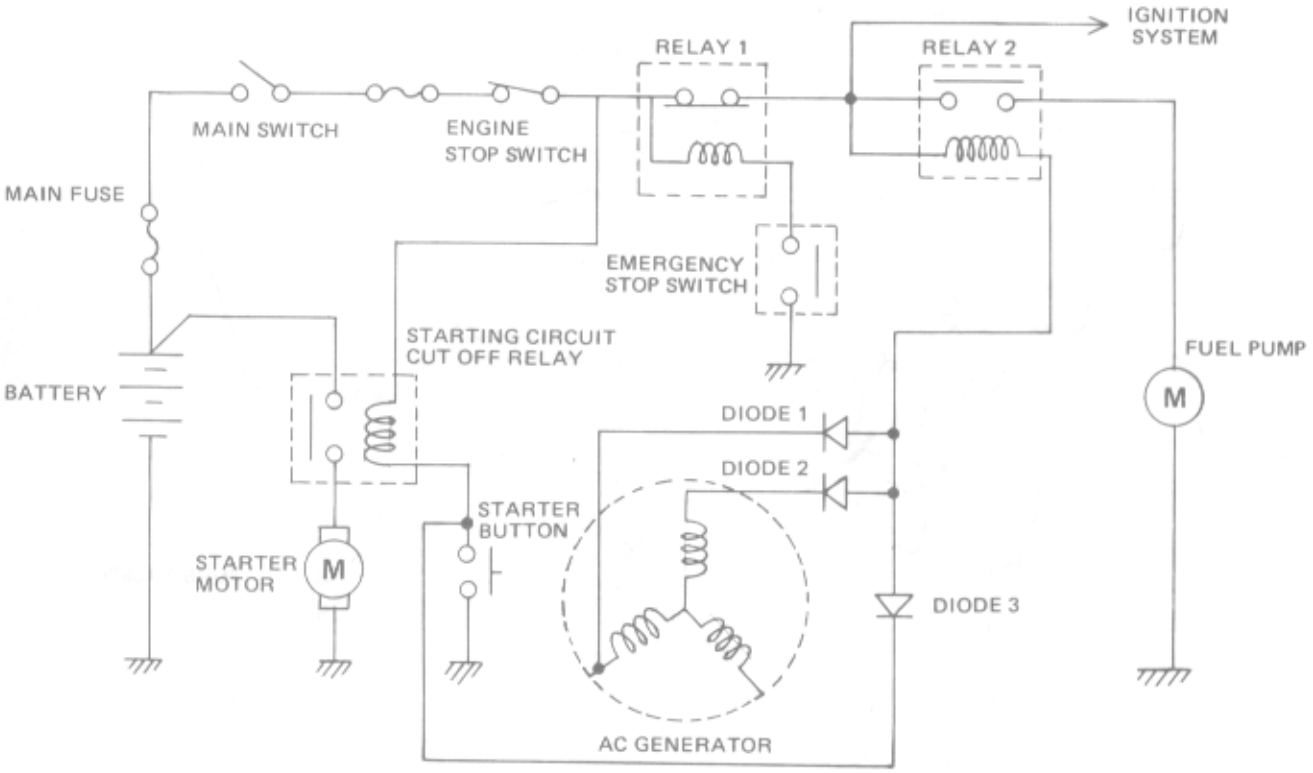


The pump is made up of a housing, a rotor, and a series of rollers. While the rotor is turning, the rollers, which are pushed against the housing by centrifugal force, trap fuel. The fuel thus trapped is squeezed out as the rotor further turns. In the event of restricted fuel flow in the system, a spring-loaded relief valve is used to work at 2.5 kg/cm^2. This valve relieves excess pressure that could build up in the fuel system.



FUEL PUMP CIRCUIT

This fuel pump can run when the starter motor is running or when the engine is running.



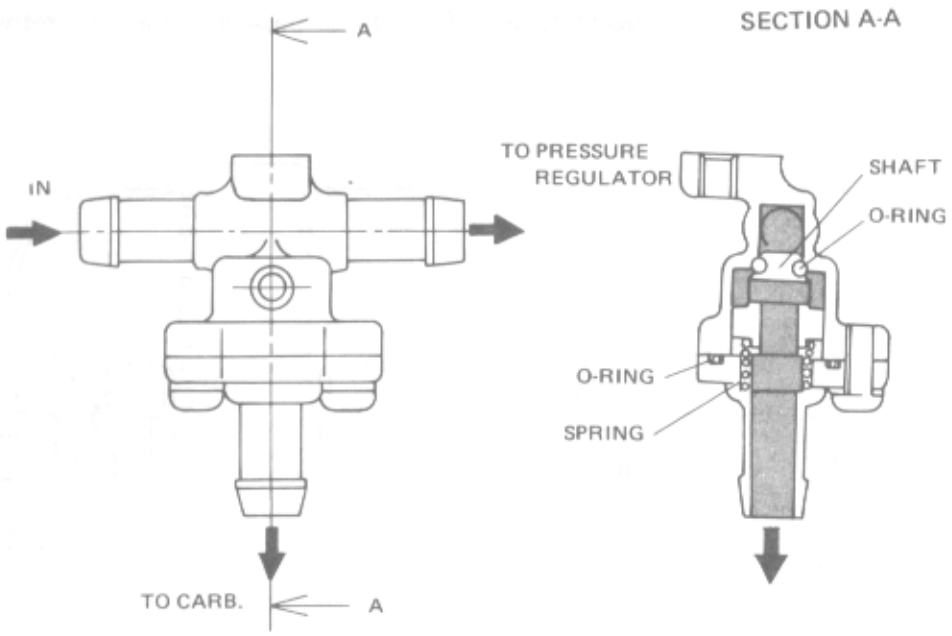
FUEL PUMP OPERATION

1. Main Switch On:
   The ignition system circuit is closed, but the fuel pump will not run.
2. Electric Starter Button On:
   The electric starter begins to operate. Relay 2, in parallel with the electric starter, closes, thereby making the fuel pump operate.
3. Engine On:
   When the engine is turned over, the AC generator creates voltage which keeps relay 2 on and the pump running.
4. Engine Stalls:
   If the engine stalls, the AC generator does not produce voltage. Relay 2 is turned off, stopping the fuel pump. No other switches need be turned off.
5. Motorcycle Falls:
   Should the motorcycle go down, the ballast switch turns on and relay 1 is turned off. This opens the ignition circuit which kills the engine. At the same time, the pump is also cutoff from its power supply and stops running.

Fuel pump specifications:
Consumption amperage: 2A or less
Output pressure: 98.1 kPa (1.0 kg/cm^2, 14.2 psi)

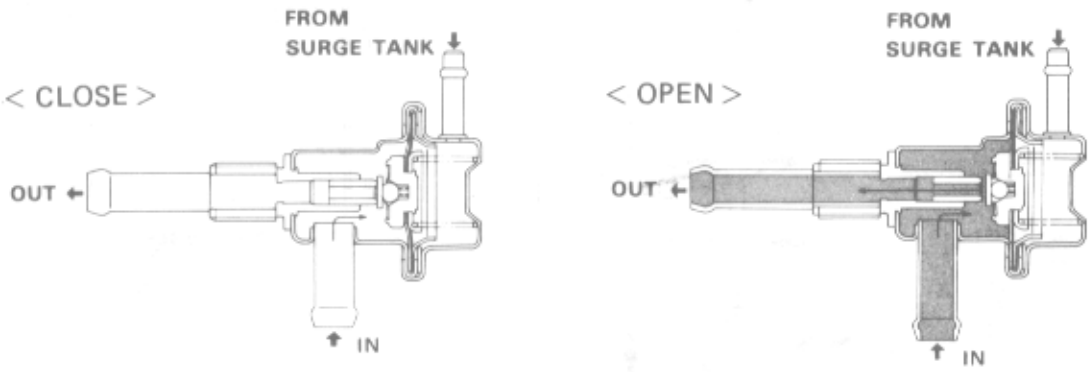
CHECK VALVE

This valve replaces the traditional vacuum fuel cock. It is fitted to the system to prevent fuel flow to the carburetors when the engine is not running. If a pressure of 19.6 kPa (0.2 kg/cm^2, 2.8 psi) is created on the intake side of the valve, fuel flow will be 3.5L/hour to the carburetors.



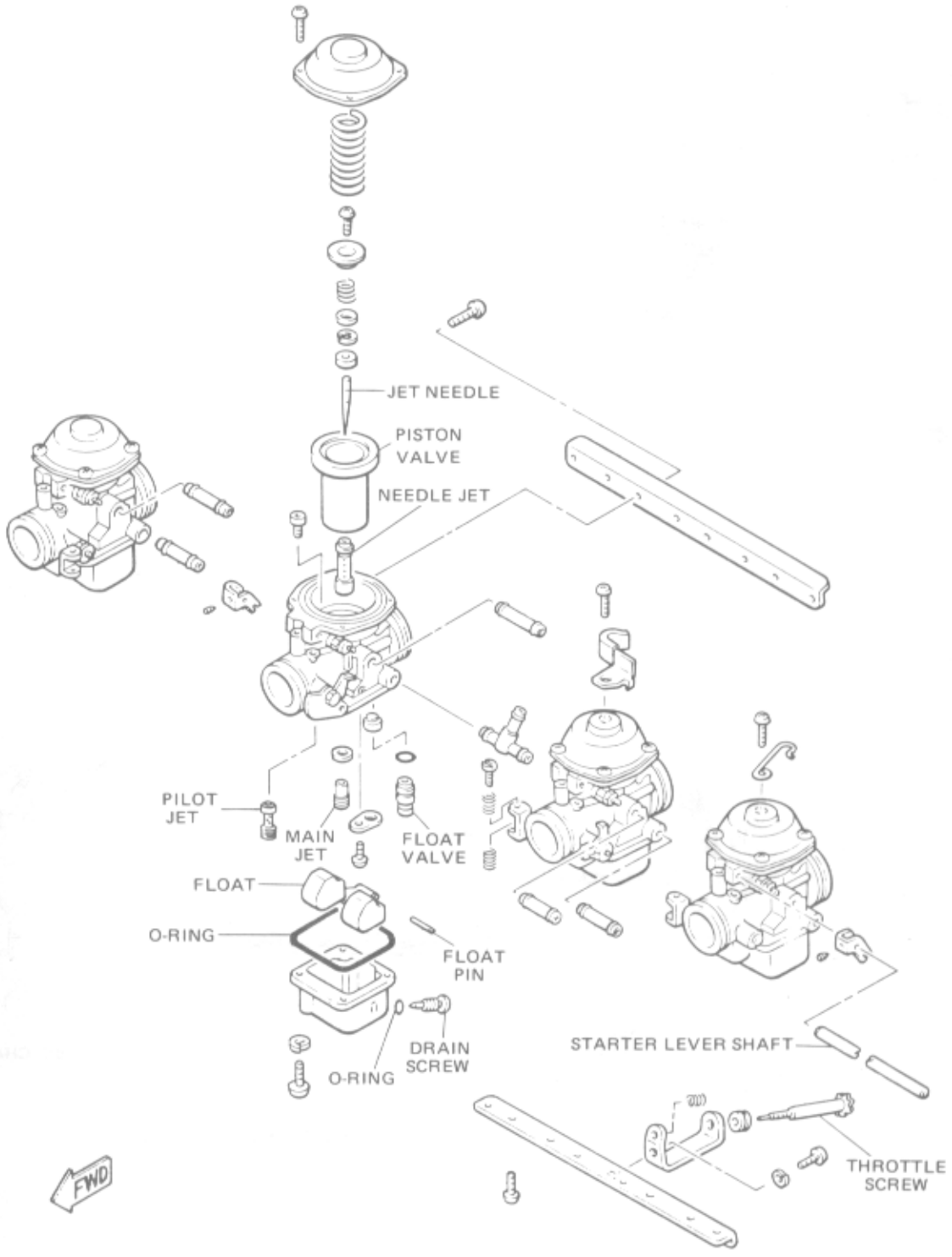
PRESSURE REGULATOR

This regulator is closed when the engine is at a stop and open when the engine is running, thereby controlling the feed pressure (i.e., fuel flow) in the range of the charging pressure plus an additional 0.2 kg/cm^2. Spring-and-diaphragm control of pressure is used to ensure the proper manifold-/fuel pressure difference. The spring end of the regulator is thus open to the engine manifold. As the pressure exceeds 0.2 kg/cm^2, the diaphragm opens the regulator, causing excess fuel to return into the fuel tank.

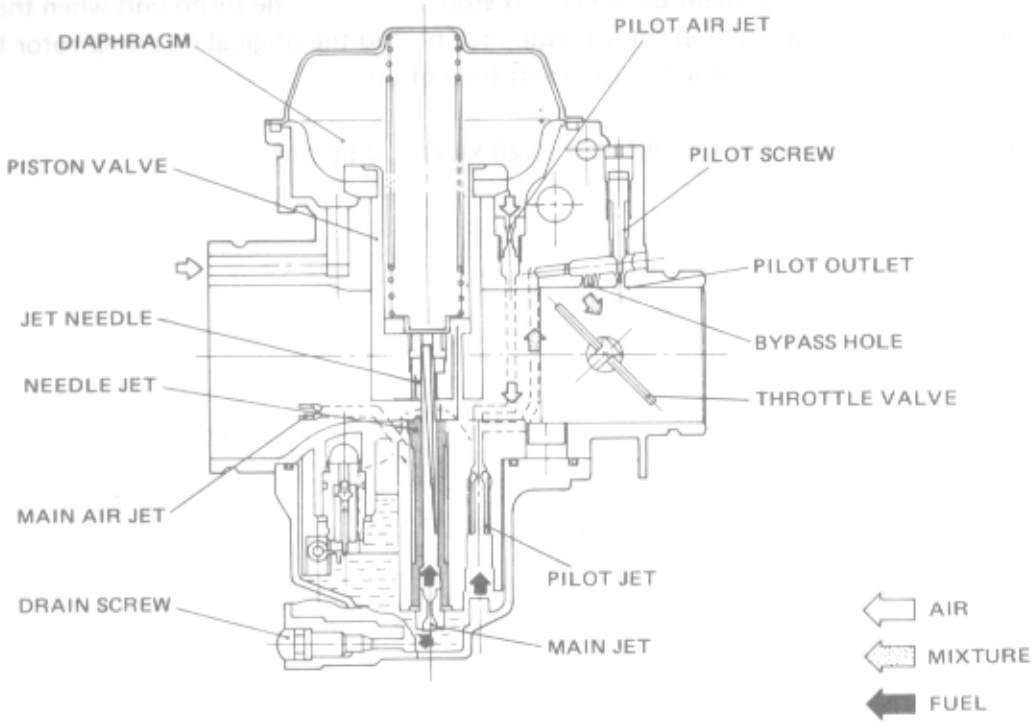


CARBURETOR

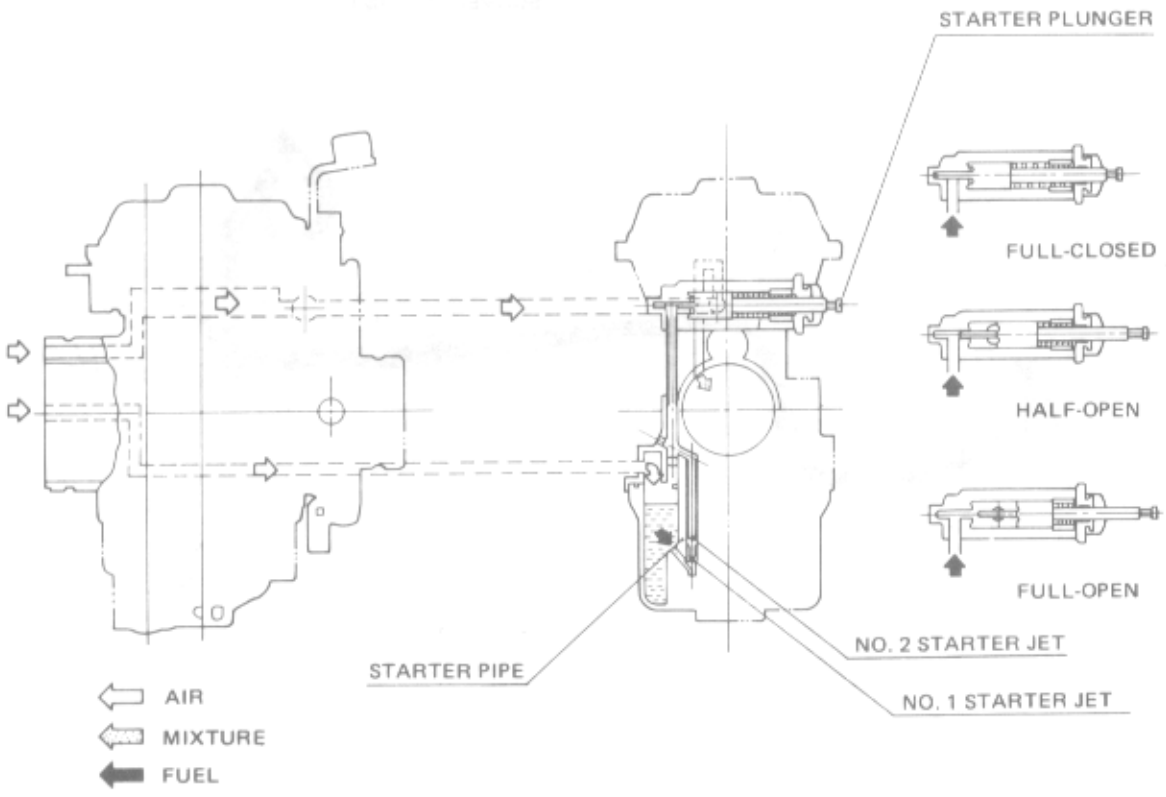
The carburetor is a fully-enclosed type BS30; float chamber ventilation is opened to the surge tank, because the float chamber must always be under boost pressure in order to supply sufficient fuel to the venturi.



CARBURETOR SECTION VIEW

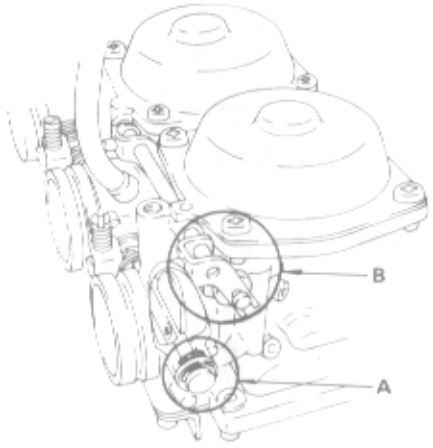


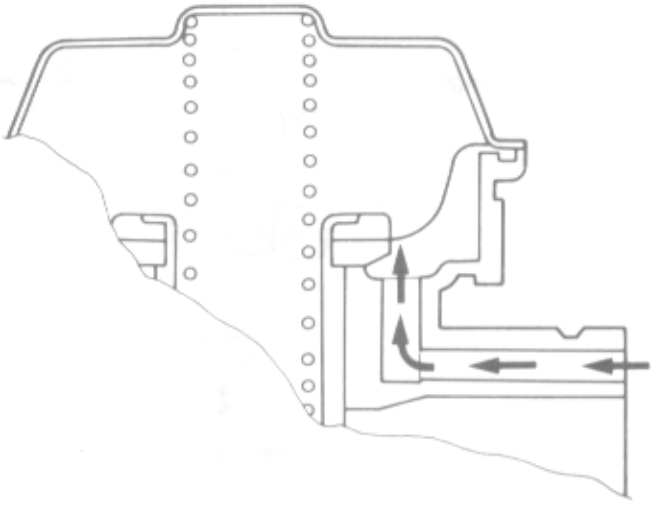
STARTER SYSTEM

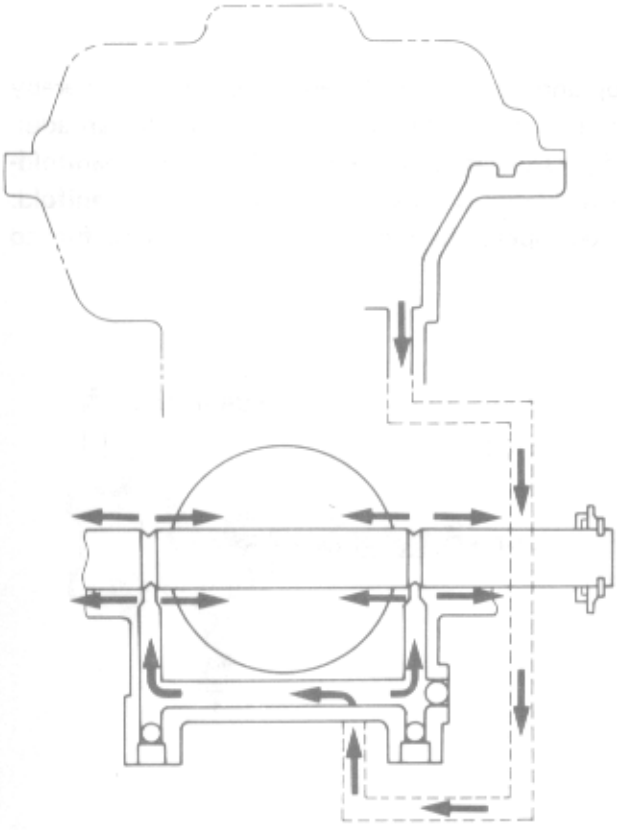


PRESSURE-SEALED CARBURETORS

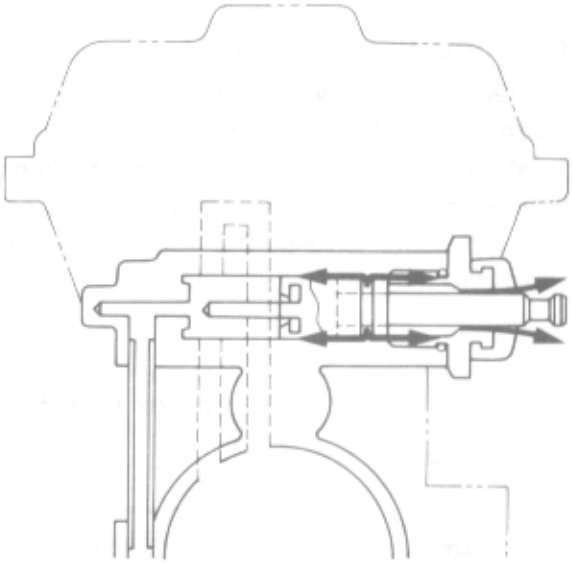
These carburetors have been specifically developed for use with a turbocharger. Because they are subjected to high intake pressures created by the turbocharger, they too must be pressurized to work effectively. To achieve this, the throttle valve shaft and starter plunger have O-rings to prevent pressure leaks, and to ensure that they do not leak, special passages deliver pressurized air to complete the seal. Air will leak from the throttle shaft and starter plunger O-rings, but this is normal. Should, however, fuel begin to leak from these passages, the carburetor must be serviced immediately.





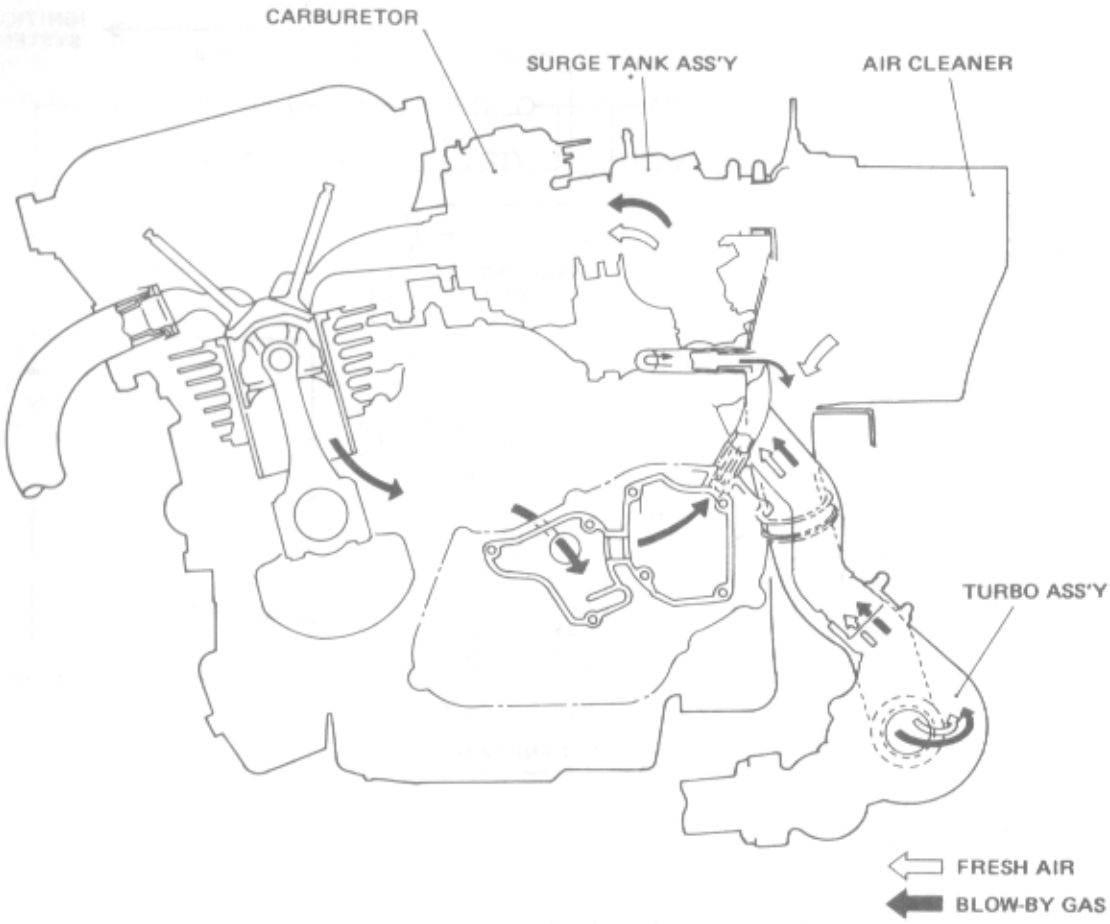


THROTTLE VALVE SHAFT (A)



STARTER PLUNGER (B)

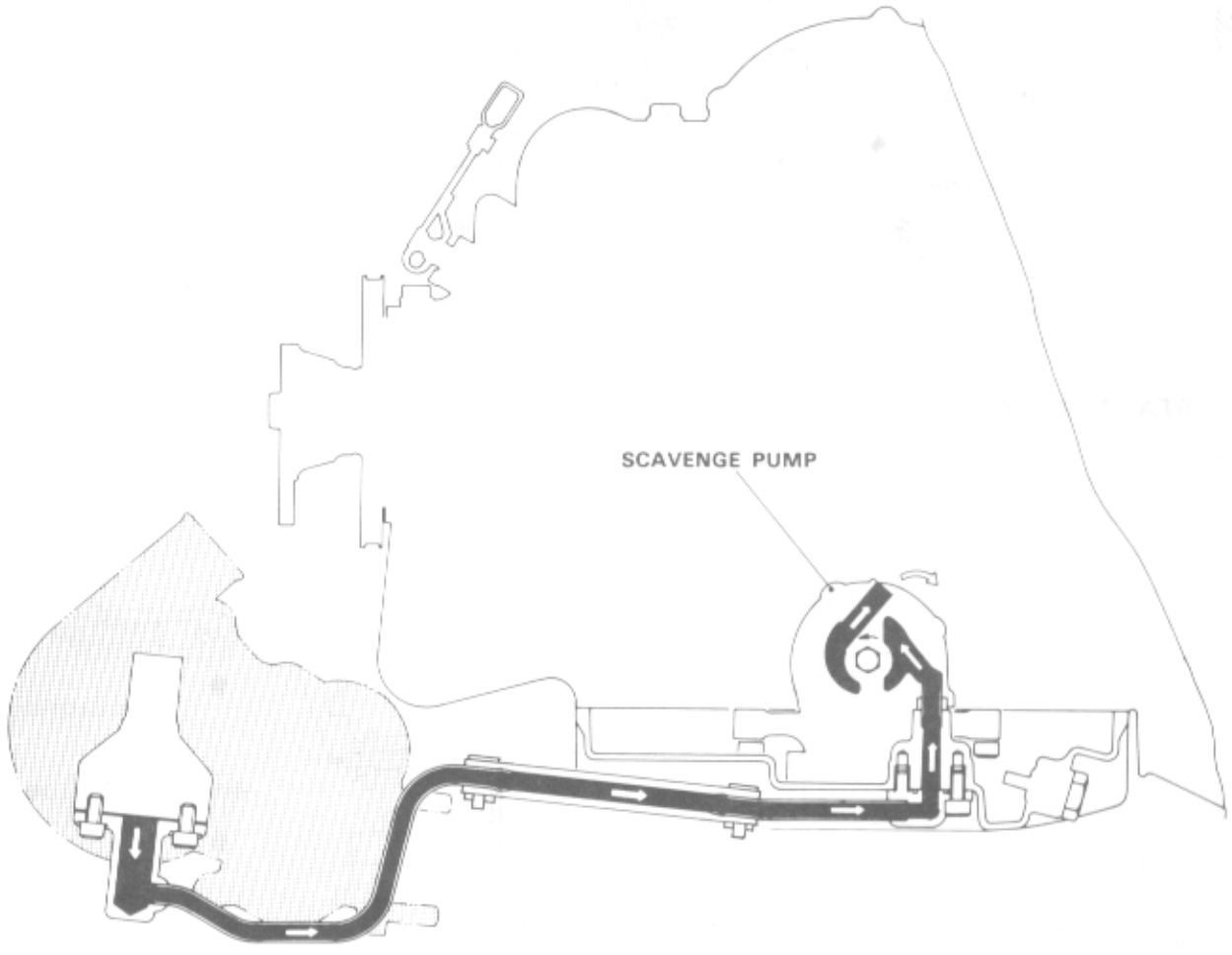
AIR CLEANER AND CRANKCASE VENTILATION SYSTEM



LUBRICATION SYSTEM

The turbo unit is pressure-lubricated from the main engine oil gallery. A check valve is installed on the outlet of the engine main oil gallery to stop oil flow to the turbo unit when the engine is not running. A scavenging pump rotor is equipped behind the original oil pump rotor to retrieve the oil from the turbo unit, ensuring a constant flow of oil.

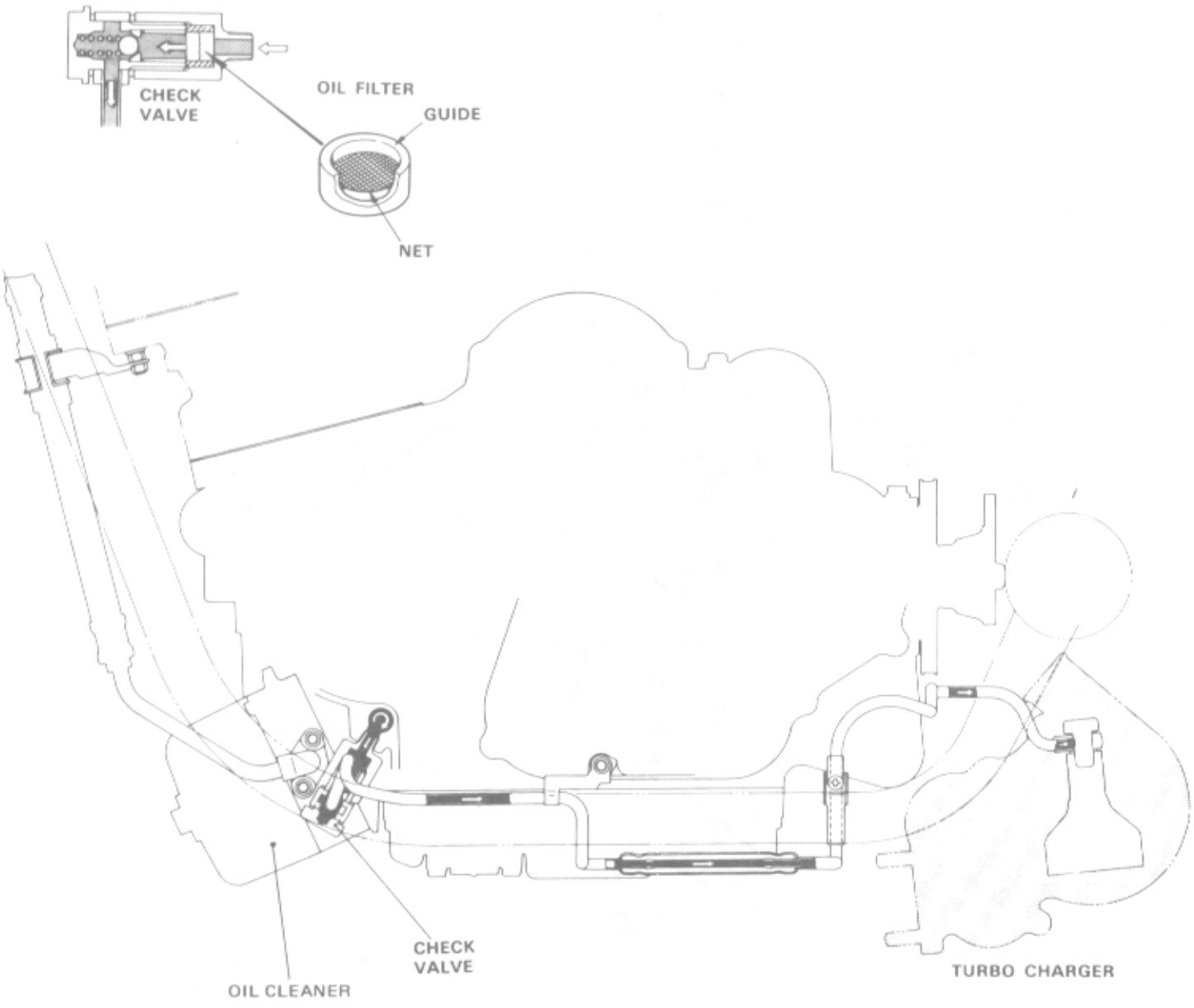
Check valve opening pressure: 24.5 kPa (0.25 kg/cm , 3.56 psi)



RIGHT SIDE VIEW

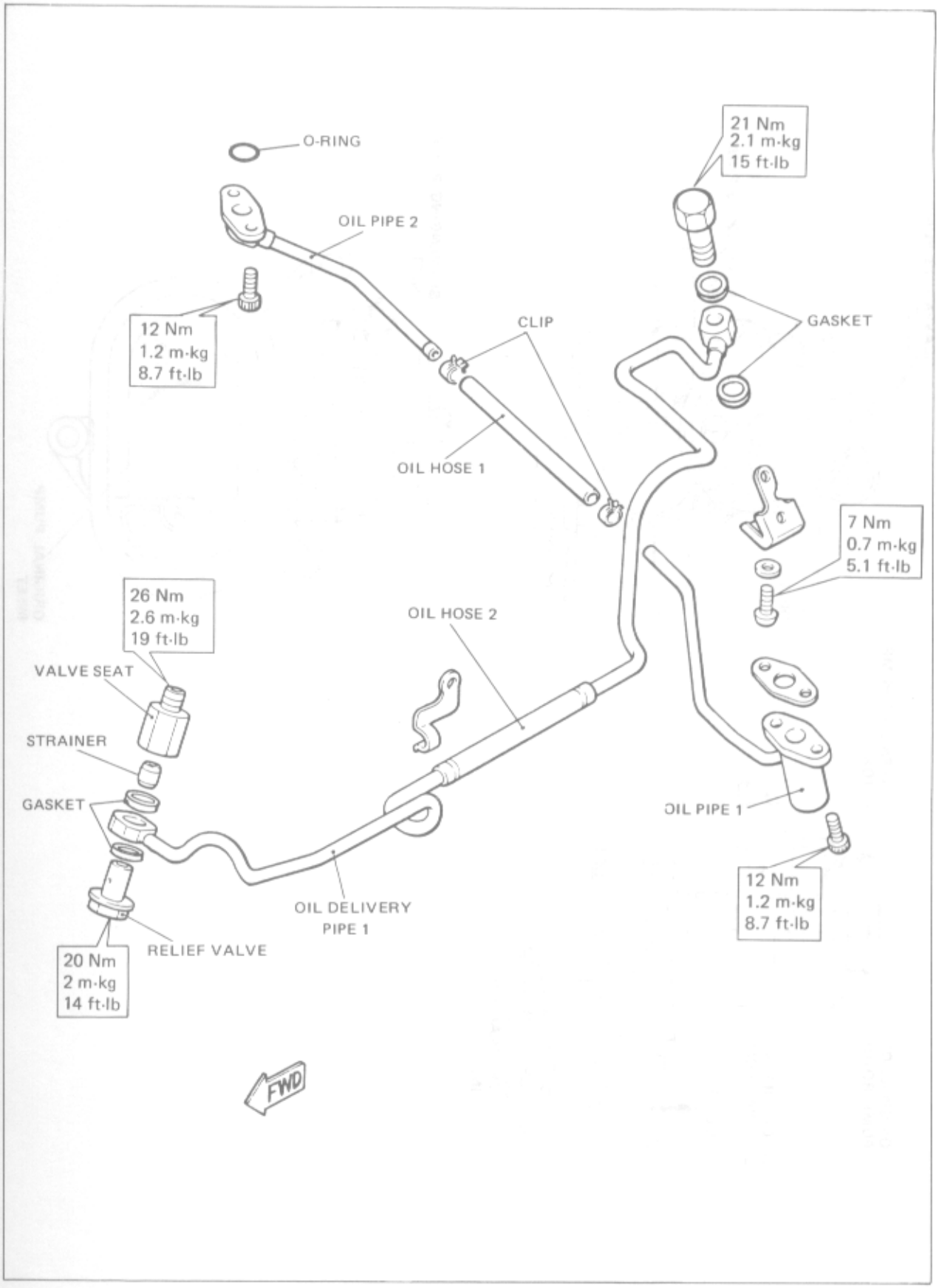
NOTE:

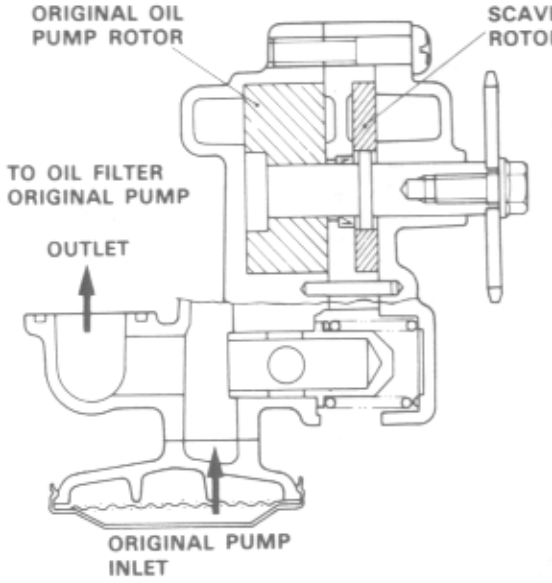
This filter traps material missed by the engine filter. It is made of a coarser mesh than the engine filter and must be cleaned after the first engine oil filter inspection (500 km) and thereafter every

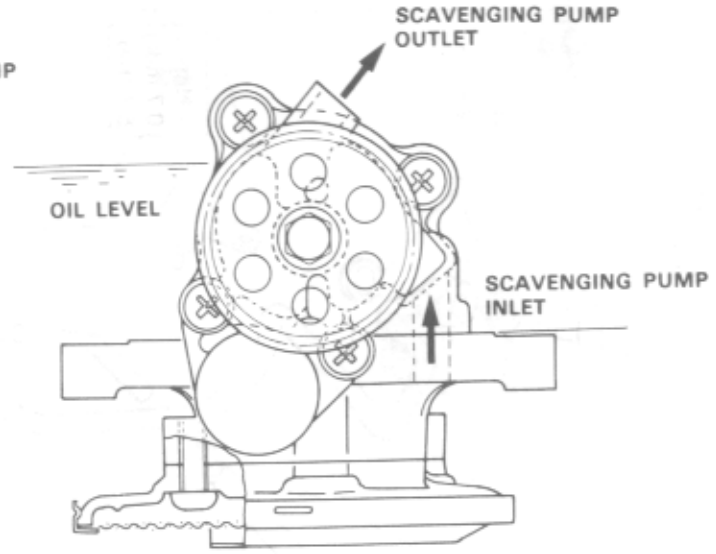


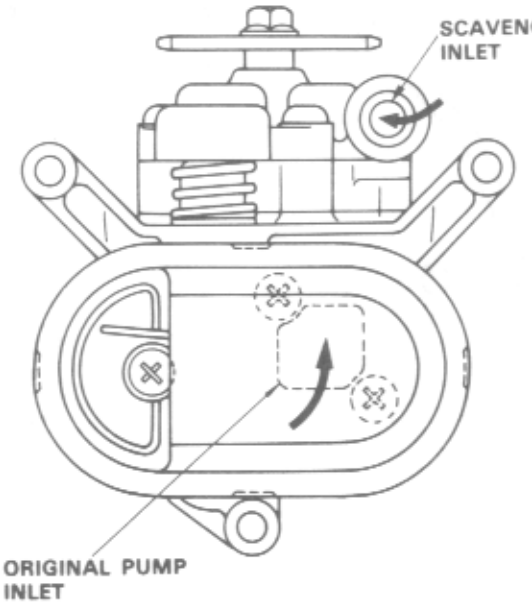
LEFT SIDE VIEW

OIL PIPE FOR TURBO UNIT



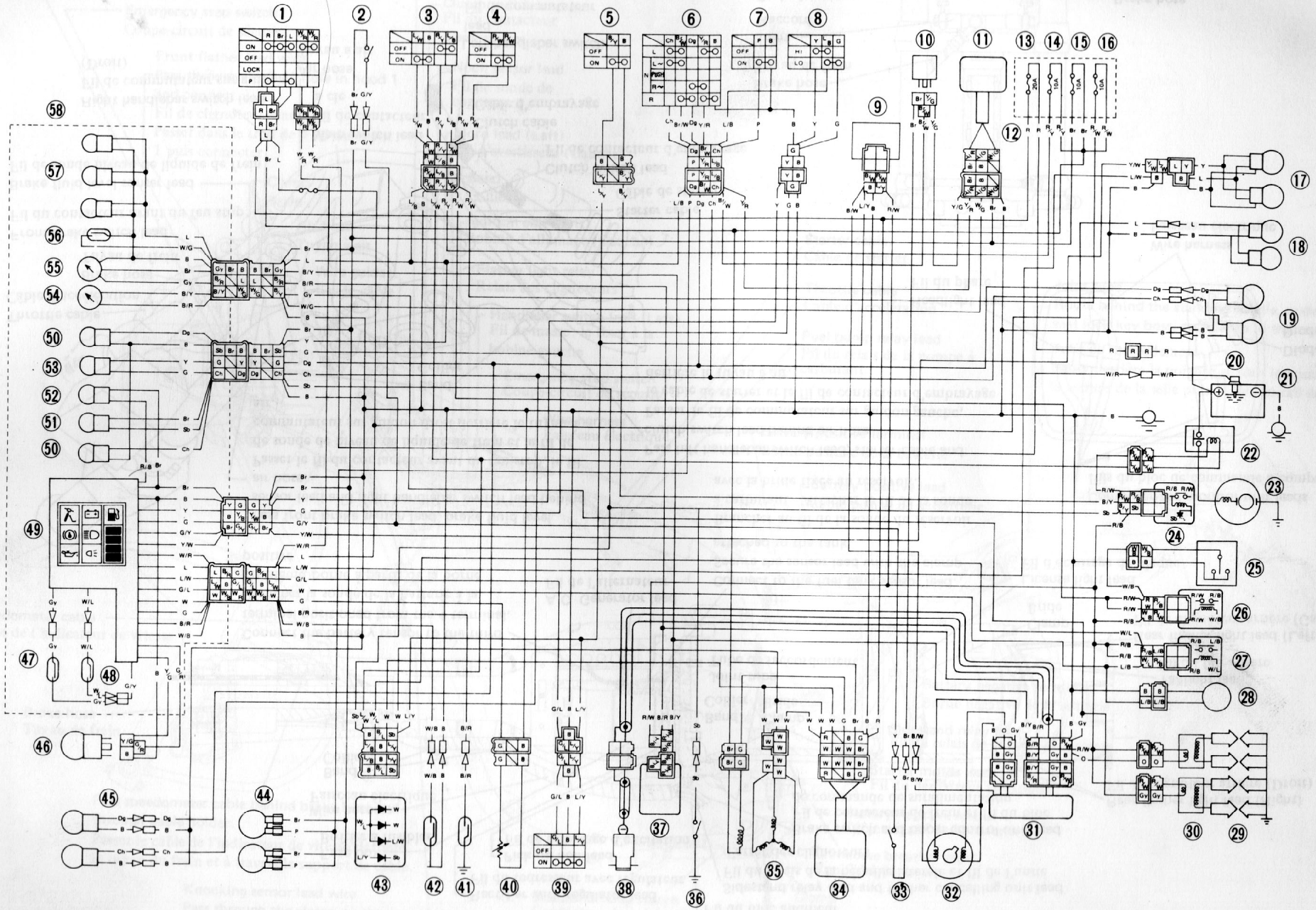

ORIGINAL OIL
PUMP ROTOR
SCAVENGING PUMP
ROTOR
TO OIL FILTER
ORIGINAL PUMP
OUTLET
ORIGINAL PUMP
INLET


SCAVENGING PUMP
OUTLET
OIL LEVEL
SCAVENGING PUMP
INLET


SCAVENGING PUMP
INLET
ORIGINAL PUMP
INLET

XJ650LJ WIRING DIAGRAM

SCHEMA DE CABLAGE DE XJ650LJ



1. Main switch
2. Front brake switch
3. "START" switch
4. "ENGINE STOP" switch
5. Clutch switch
6. "TURN" switch
7. "HORN" switch
8. "LIGHT" (Dimmer) switch
9. Sidestand relay
10. Flasher relay
11. Cancelling unit
12. Fuse box
13. MAIN
14. HEAD
15. SIGNAL
16. IGNITION
17. Tail/brake light
18. License light
19. Rear flasher light
20. Battery sensor
21. Battery
22. Starter relay
23. Starter motor
24. Starter circuit cut-off relay
25. Emergency engine stop switch
26. Engine stop relay
27. Fuel pump relay
28. Fuel pump
29. Spark plug
30. Ignition coil
31. T.C.I. unit
32. Pick up coil
33. Rear brake switch
34. Rectifier/regulator
35. A.C. generator
36. Neutral switch
37. Boost pressure sensor
38. Knock sensor
39. Side stand switch
40. Fuel level sensor
41. Engine oil level sensor
42. Brake fluid level sensor
43. Diode
44. Horn
45. Front flasher light
46. Headlight
47. "CHECK" switch
48. "WARNING" control
49. Computerized monitor
50. "TURN" indicator light
51. "NEUTRAL" indicator light
52. "WARNING" indicator light
53. "HIGH BEAM" indicator light
54. Boost pressure gauge
55. Tachometer
56. Sender
57. Meter light
58. Meter assembly
59. Sealed wire outer, inner

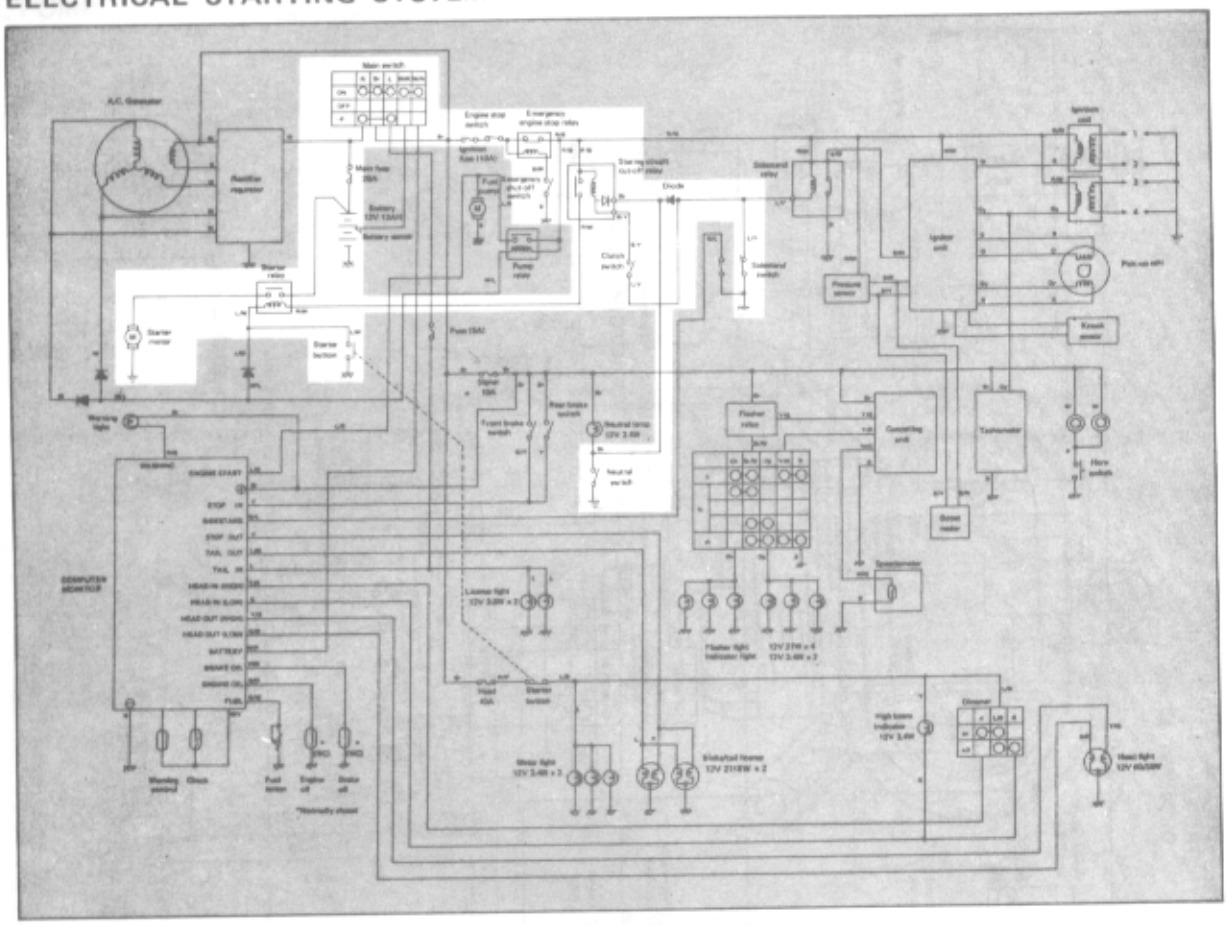
1. Contacteur à clé
2. Contacteur du frein AV
3. Bouton "START"
4. Commutateur "ENGINE STOP"
5. Contacteur d'embrayage
6. Commutateur "TURN"
7. Bouton "HORN"
8. Commutateur "LIGHTS" (Réducteur)
9. Relais de la béquille latérale
10. Relais de clignoteurs
11. Unité d arrêt
12. Boîtier de fusibles
13. PRINCIPAL
14. PHARE
15. SIGNALISATION
16. ALLUMAGE
17. Feu arrière/frein
18. Eclairage de plaque
19. Clignoteur AR
20. Sonde de batterie
21. Batterie
22. Relais de démarreur
23. Démarreur électrique
24. Relais de coupure du circuit de démarrage
25. Contacteur de sécurité
26. Relais de coupure du moteur
27. Relais de pompe
28. Pompe à essence
29. Bougie essence
30. Bobine d'allumage
31. Bloc T.C.I.
32. Bobinage d'excitation
33. Contacteur du frein AR
34. Redresseur/régulateur
35. Alternateur
36. Contacteur de point mort
37. Sonde pression de suralimentation
38. Sonde de cognement
39. Contacteur de la bequille latérale
40. Sonde de carburant
41. Sonde de niveau d'huile du moteur
42. Sonde de niveau de liquide de frein
43. Diode
44. Avertisseur
45. Clignoteur AV
46. Phare
47. Commutateur "CHECK"
48. Commutateur "WARNING CONTROL"
49. Moniteur à micro-ordinateur
50. Témoin de "TURN"
51. Témoin de "NEUTRAL"
52. Témoin de "WARNING"
53. Témoin de "HIGH BEAM"
54. Indicateur de suralimentation
55. Compte-tours
56. Commutateur
57. Lampe de compteur
58. Ensemble tableau de bord
59. Fil sous gaine, Gane, Fil

COLOR CODE

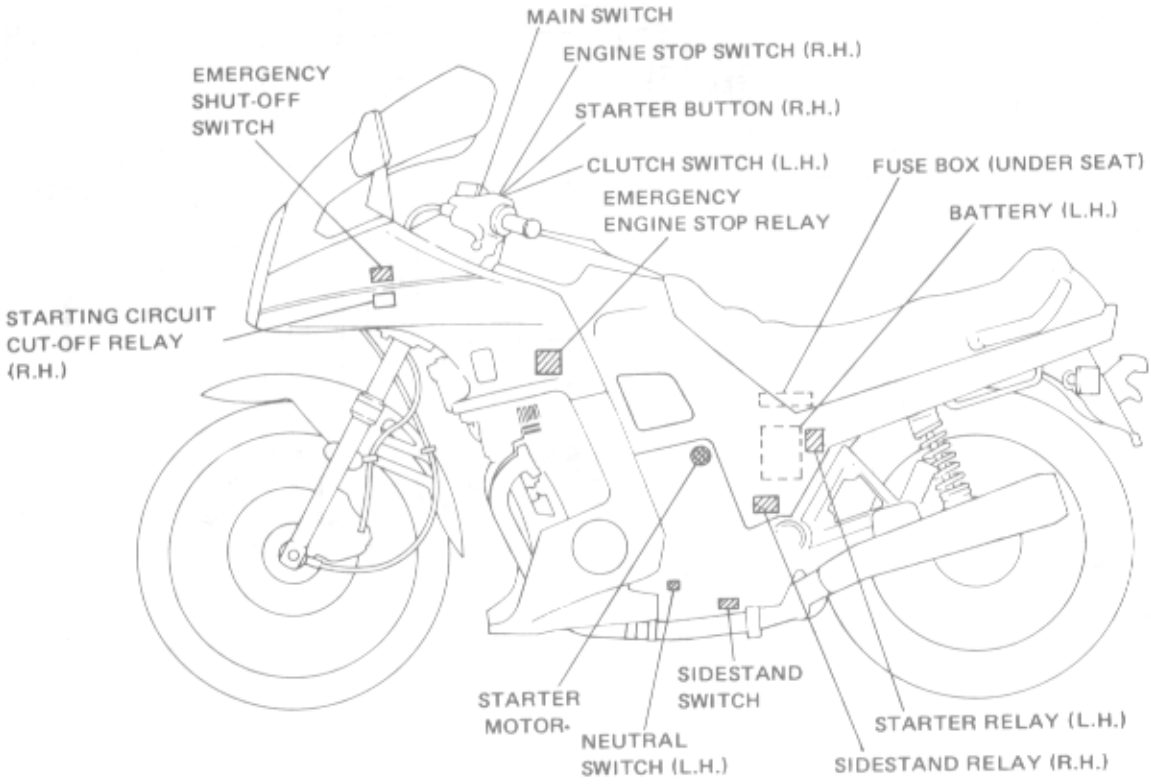
CODE DE COULEUR

Br	Brown Brun	Y	Yellow Jaune	L	Blue Bleu	R/W	Red/White Rouge/Blanc	Y/B	Yellow/Black Jaune/Noir	Y/R	Yellow/Red Jaune/Rouge	E	Ground Masse
R	Red Rouge	Dg	Dark Green Vert Foncé	P	Pink Rose	L/W	Blue/White Blue/Blanc	Br/W	Brown/White Brun/Blanc	R/W	Red/White Rouge/Blanc	B/R	Black/Red Noir/Rouge
W	White Blanc	Ch	Chocolate Chocolat	O	Orange Orange	L/B	Blue/Red Bleu/Rouge	Y/G	Yellow/Green Jaune/Vert	L/R	Blue/Red Bleu/Rouge	Gy	Gray Gris
B	Black Noir	Sb	Sky Blue Bleu Ciel	G	Green Vert	R/Y	Red/Yellow Rouge/Jaune	W/G	White/Green Blanc/Vert	G/Y	Green/Yellow Vert/Jaune	B/Y	Black/Yellow Noir/Jaune

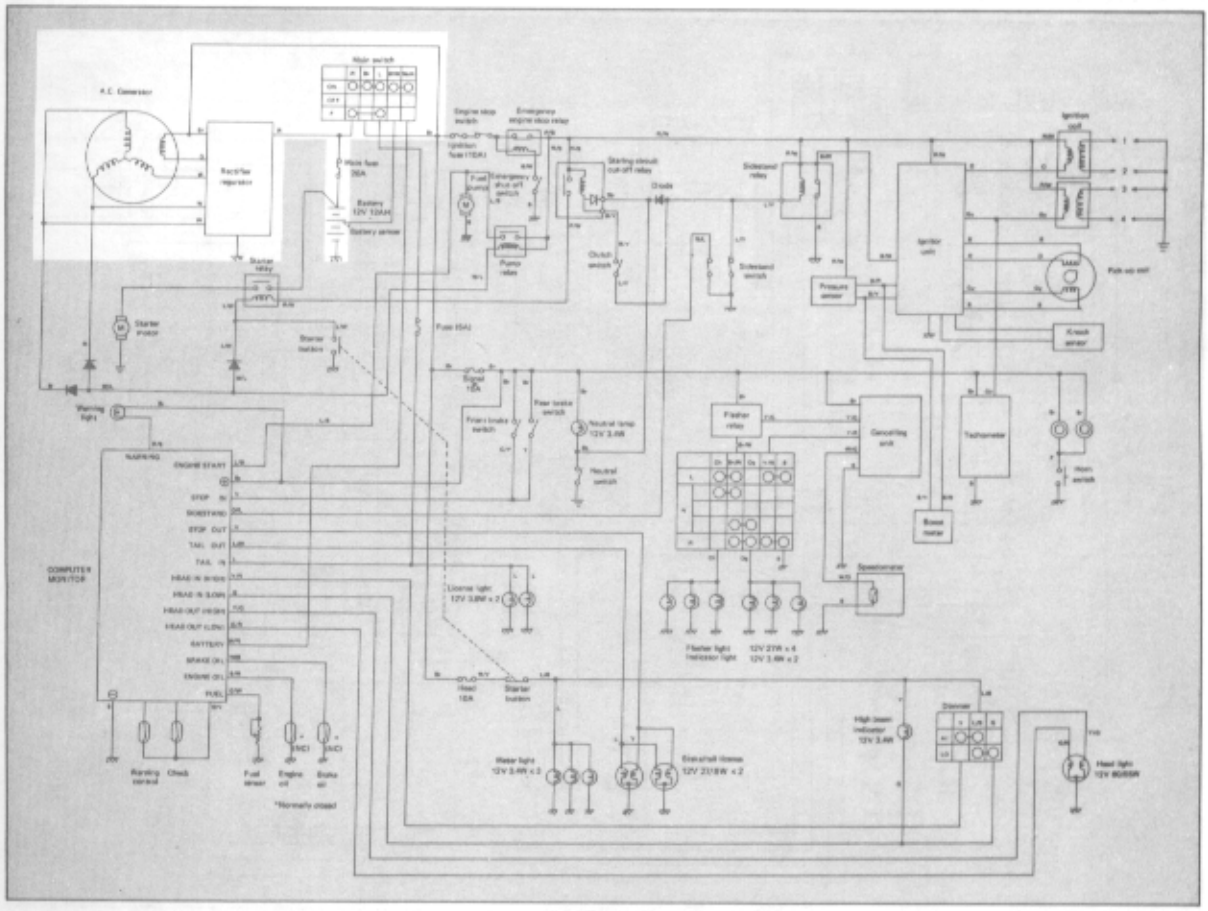
ELECTRICAL STARTING SYSTEM



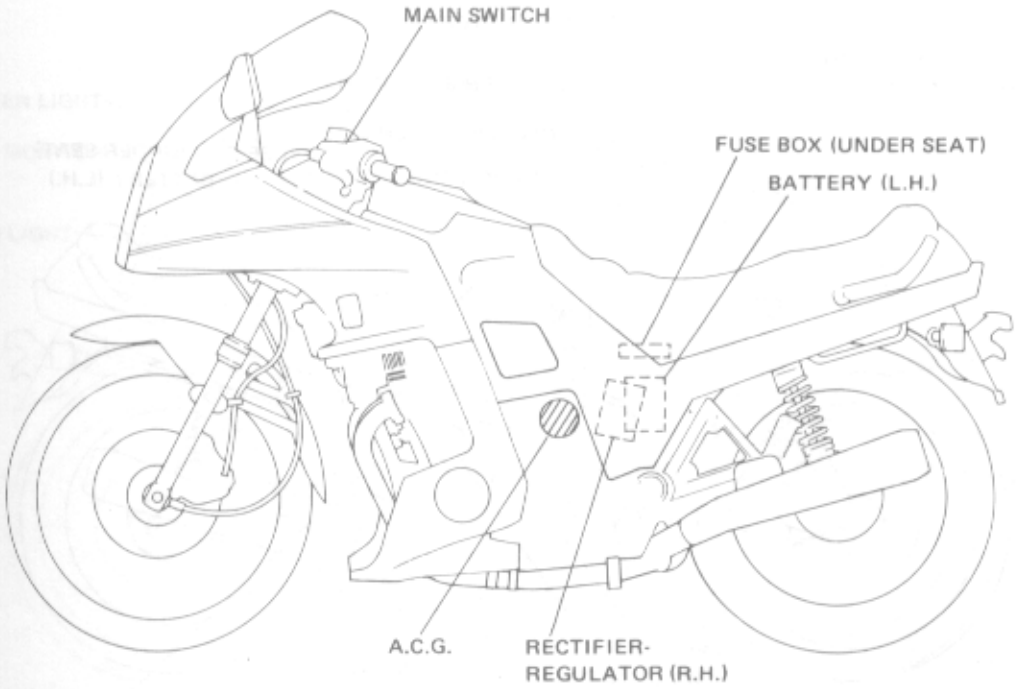
Above circuit diagram shows starter circuit in wiring diagram.



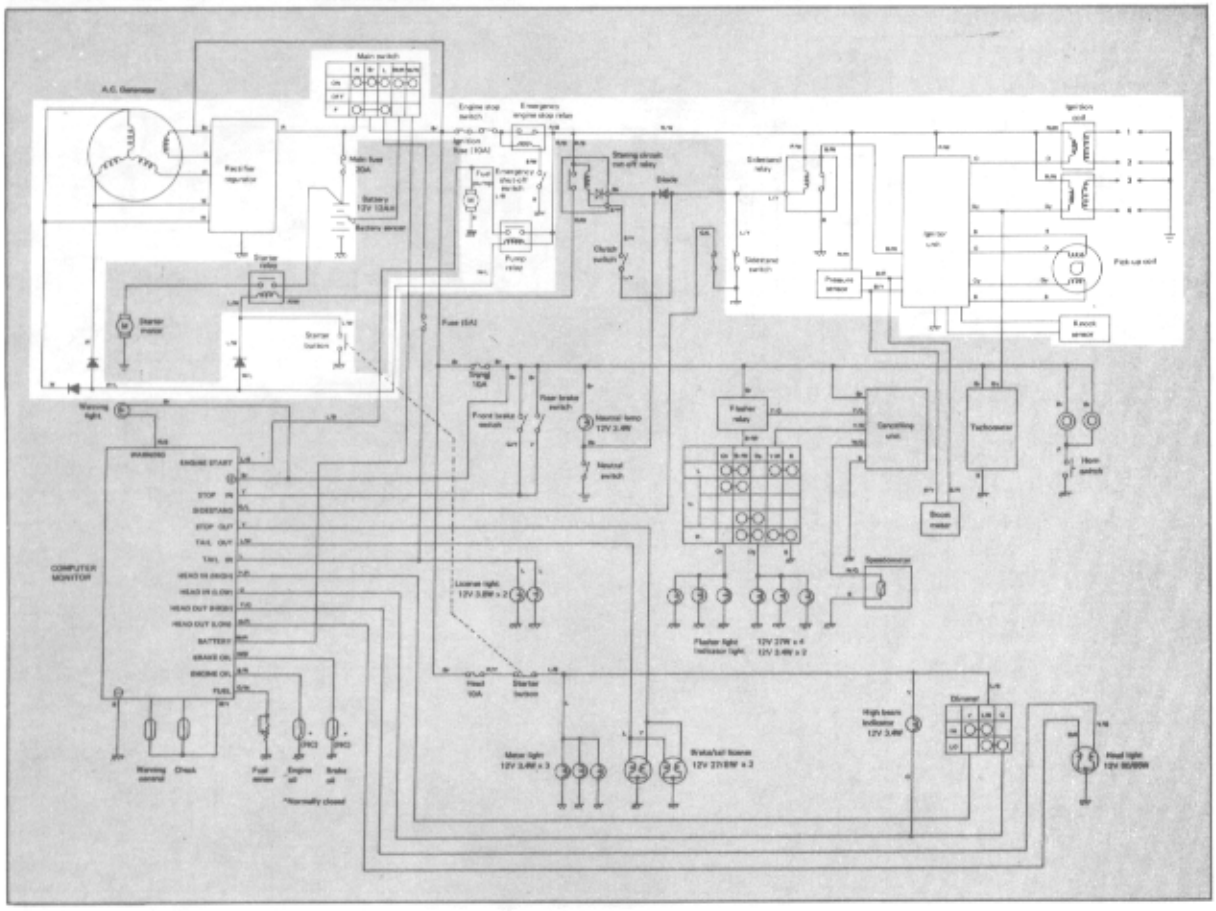
CHARGING SYSTEM



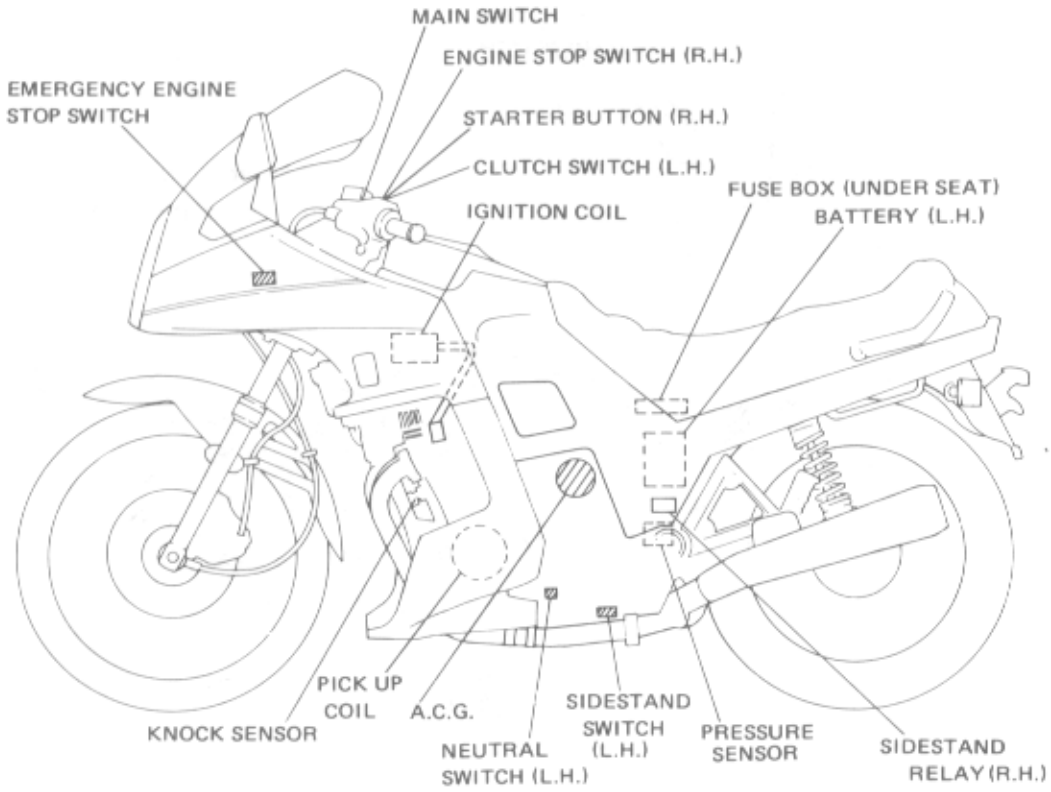
Above circuit diagram shows charging circuit in wiring diagram.



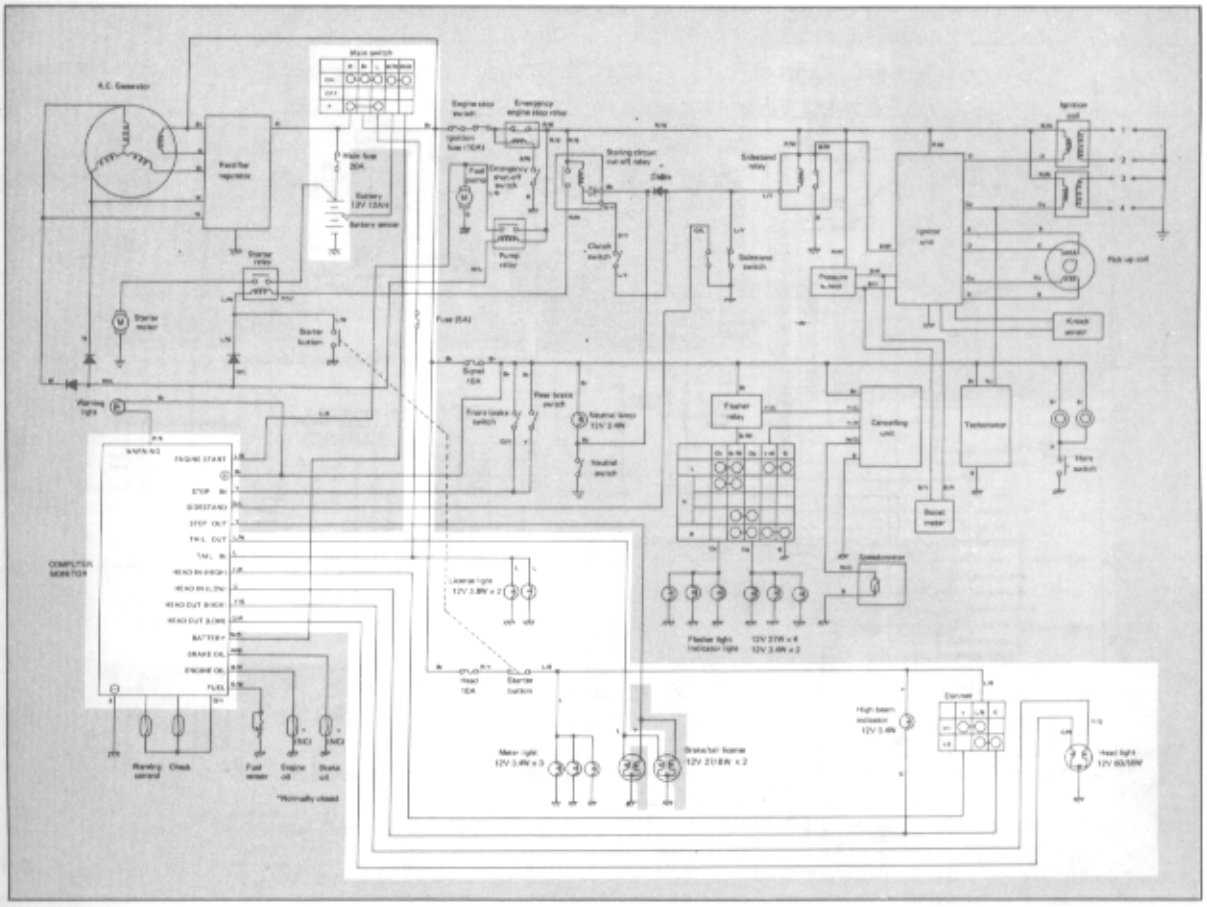
IGNITION SYSTEM



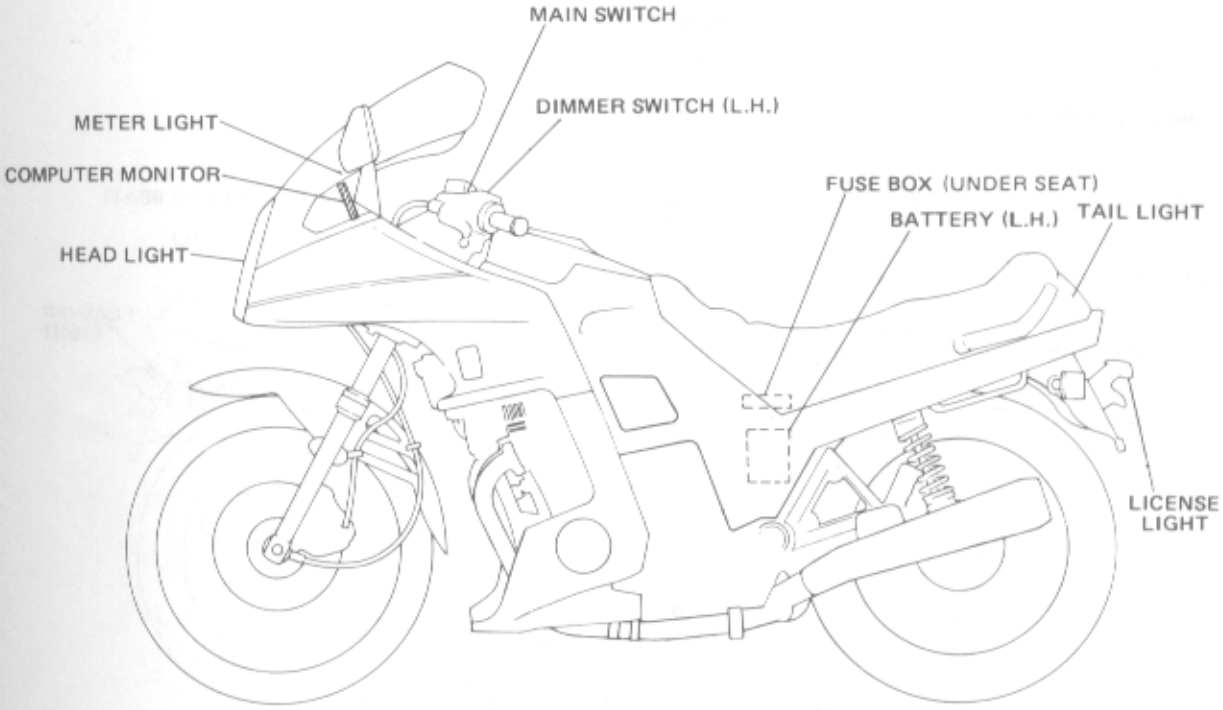
Above circuit diagram shows only ignition circuit in wiring diagram.



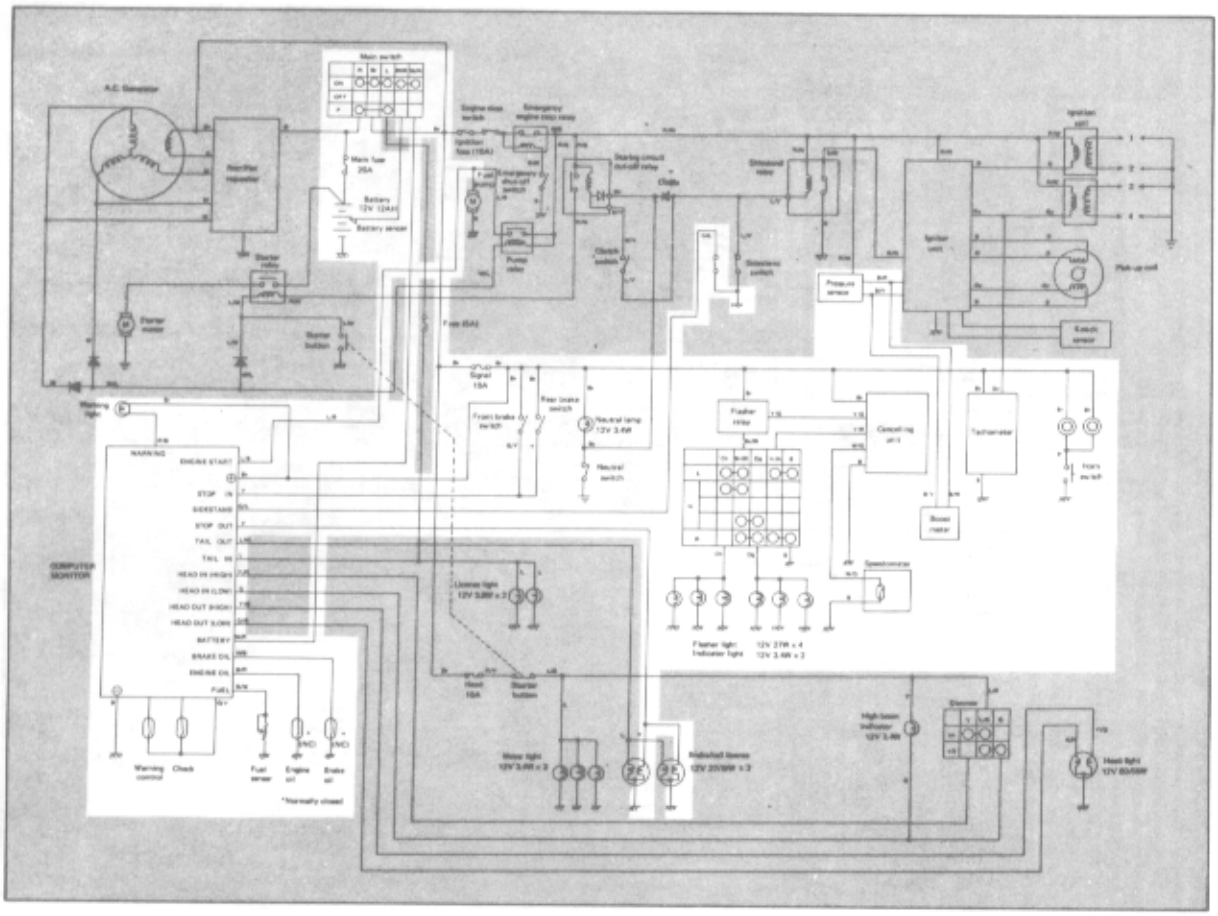
LIGHTING SWITCH



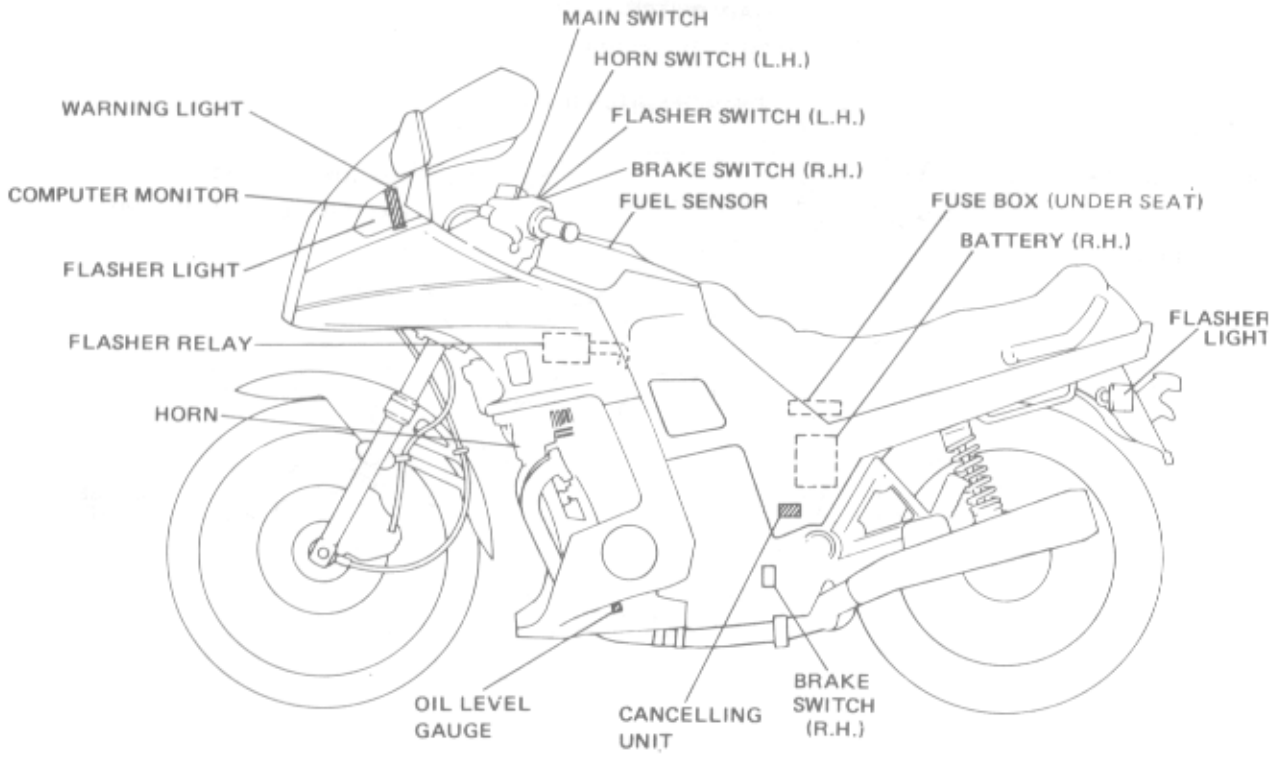
Above circuit diagram shows only lighting circuit in wiring diagram.



SIGNAL SYSTEM



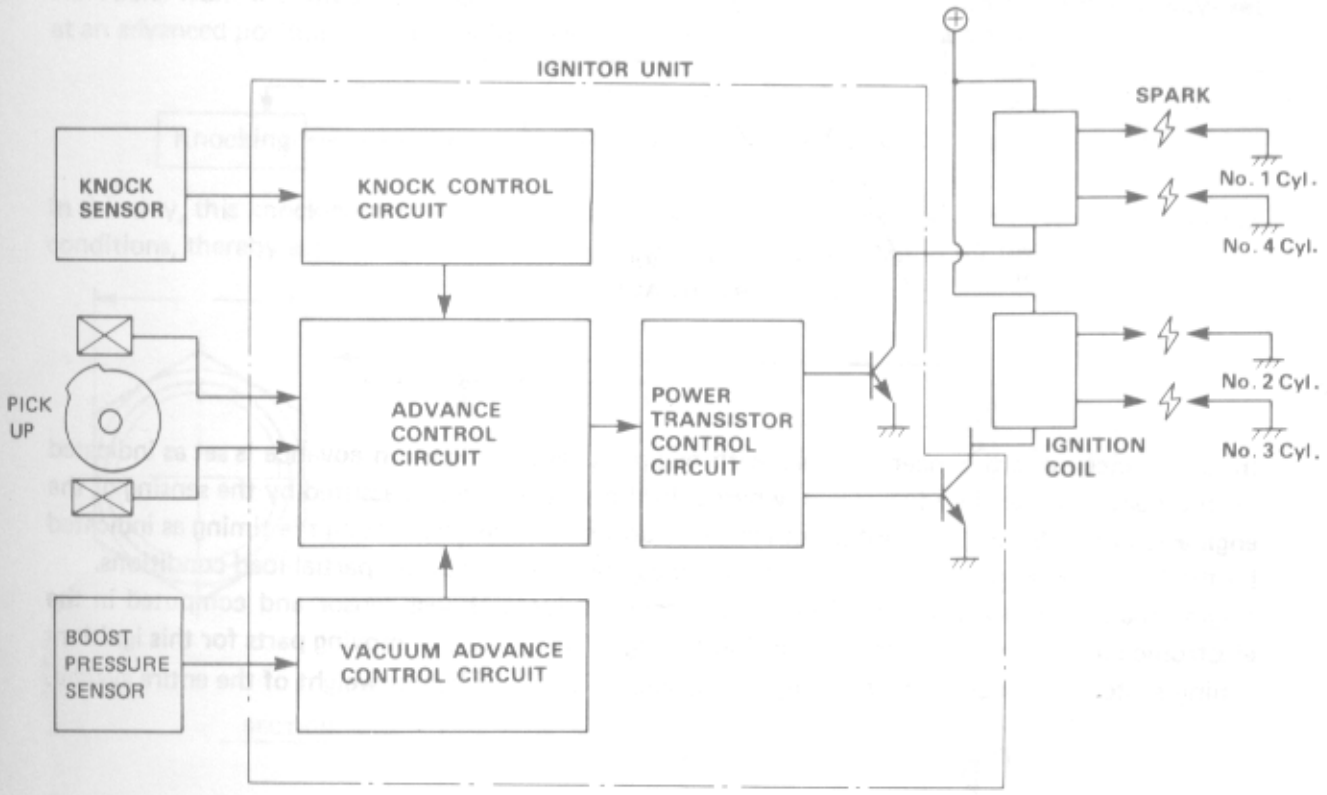
Above circuit diagram shows only signal circuit in wiring diagram.



IGNITION CONTROL SYSTEM

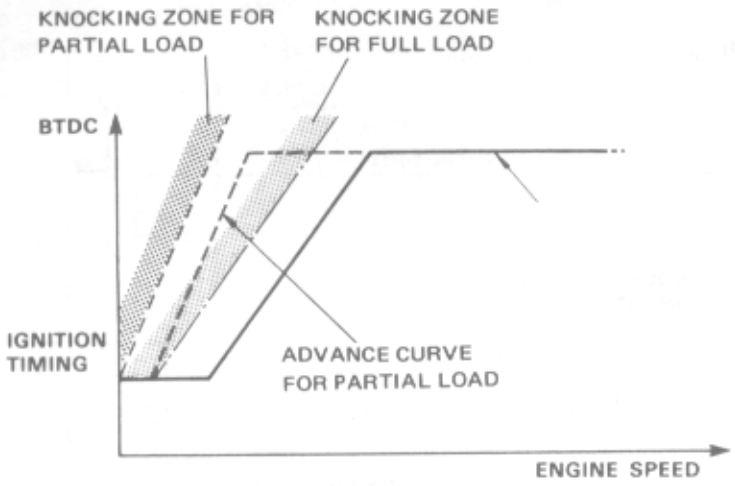
This motorcycle is equipped with the conventional transistor-advance system as well as a semi-conductor-controlled boost sensor and a knock sensor. These combine to produce the optimum ignition timing according to engine conditions (i.e., engine speed, load, knocking, etc.).

Ignition system block diagram



VACUUM ADVANCE CONTROL SYSTEM

Generally speaking, in a 4-stroke motorcycle, the knocking zone varies with engine load.



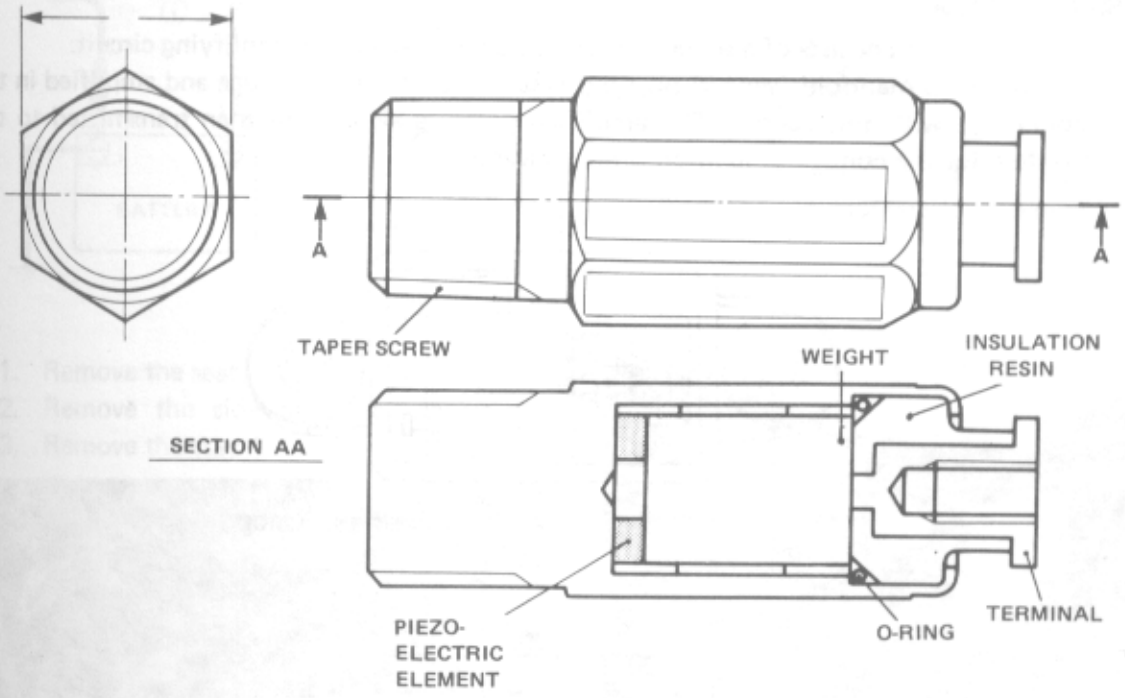
In an advance system concerned only with engine speed, the ignition advance is set as indicated by the heavy broken line (– – – –), whereas in the advance system assisted by the sensing of the engine load conditions, the optimum ignition can be obtained by setting the timing as indicated by the lighter broken line (----------). This is the case especially under partial-load conditions.
Engine load conditions are monitored by a semiconductor boost sensor and computed in the electronic circuit for the control of ignition timing. The absence of moving parts for this ignition-timing system contributes to the longer life, smaller size, and lighter weight of the entire system.

KNOCK SENSOR

The knock sensor senses the high-frequency vibrations developed by the engine and, as soon as this takes place, this knock-sensing system retards the ignition timing gradually so that knocking can be suppressed.

When there is no knocking for a certain period of time, this system functions to advance the ignition timing very gradually, until knocking is about to occur. This sensor feeds back the vibrations from the knocking engine and thereby controls the ignition timing so it is always set at an advanced position, but just before knocking would occur.

In this way, this knock-control system makes it possible to deal with constantly varying operating conditions, thereby supplying the constant and optimum ignition timing and spark.



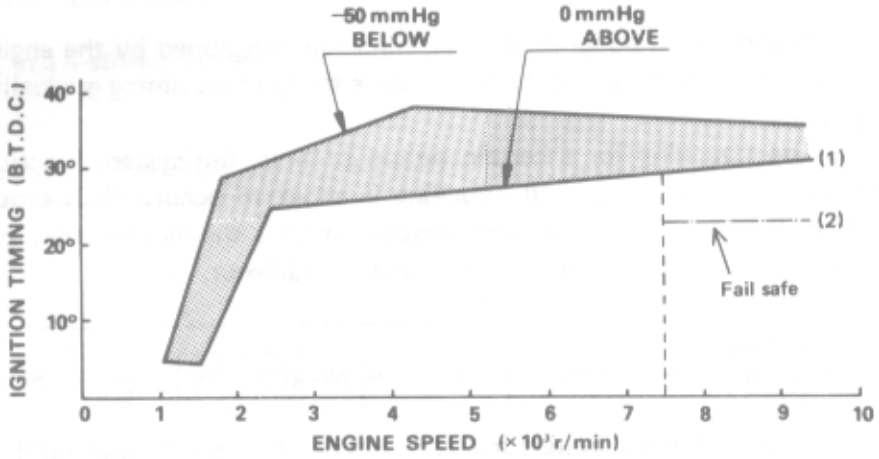
This sensor which is mounted between # 2 and #3 cylinders on the exhaust side, employs a combined piezo-electric element and terminal place. This unit senses high-frequency oscillations caused by engine knocking. The oscillations are a form of pressure, and this pressure generates electrical voltage in the piezo element. The generated voltage is carried to the ignitor unit, and this signal retards the timing, preventing the engine from knocking.

Fail-safe functions

If the knock sensor fails because of a lead failure, short-circuit, couple disconnection, or sensor damage, the ignitor unit automatically retards ignition timing from the advanced setting.

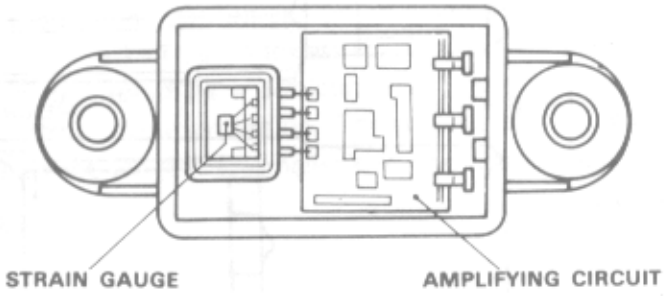
(1) If the pressure sensor is disconnected, the ignition unit automatically retards the ignition timing to the curve (1) shown in the illustration.

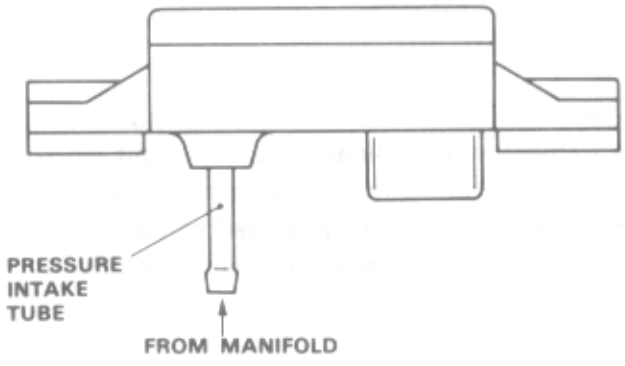
(2) If the knock sensor output is zero, the ignitor unit automatically retards 5 ± 1.5° from the advanced setting, the safest setting over 7,500 rpm.



PRESSURE SENSOR

This boost sensor unit consists of a semiconductor strain gauge and an amplifying circuit. Pressure to the carb manifold (venturi portion) is sensed by the strain gauge and amplified in the circuit connected with this gauge. The amplified pressure signals are than transmitted to the ignition system for the control of ignition timing advance.

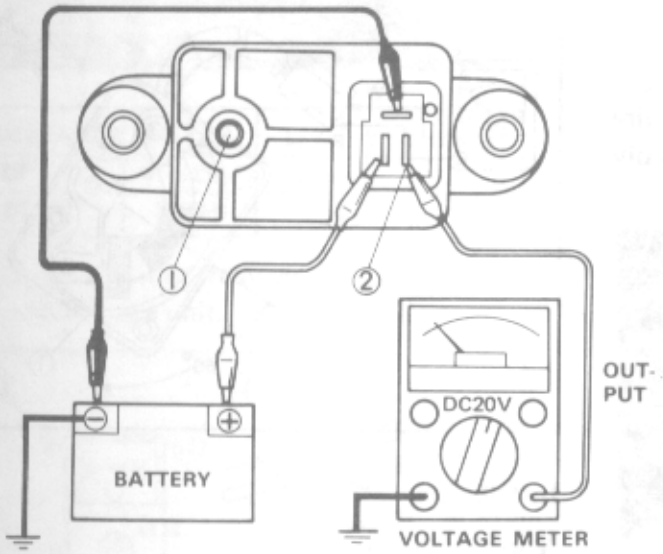


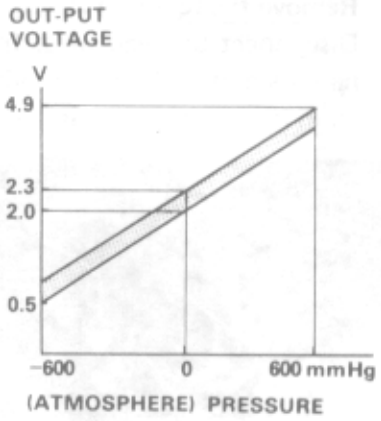


PRESSURE SENSOR INSPECTION (OFF-FRAME)

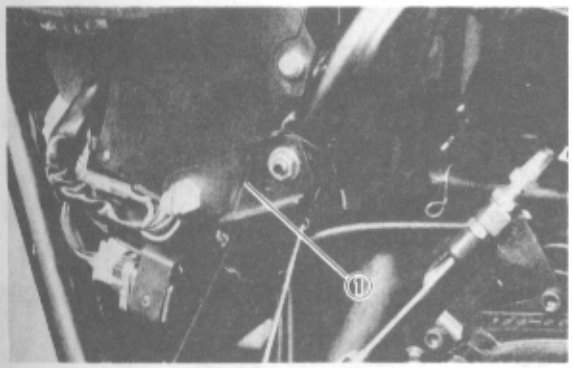
Open the pressure intake tube (1) to the atmosphere, and check the voltage between the output terminal (2) and the ground. See the following picture.

Output voltage: About 2.0 DC. volt





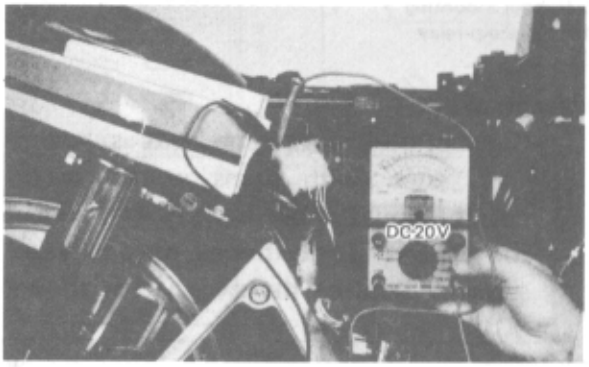
1. Remove the seat.
2. Remove the side panels as one piece.
3. Remove the stay 1.



1. Stay 1.

4. Pull out the TCI unit connecter and connect a Yamaha Pocket Tester.

   ⊕ lead – Black/Red
   ⊖ lead – Black/Yellow



5. Turn the main switch key to ON; or connect the battery ⊕ lead to R/W and ⊖ lead to ground.
6. Read the tester. If the tester reading is not in the vicinity of the specified range, replace the pressure switch.

Specified range: About 2.0 DC. volt

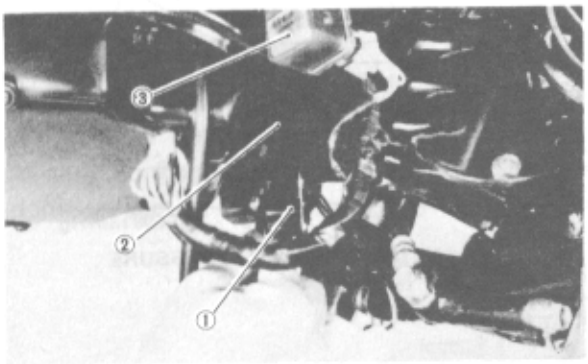
SWITCH AND RELAYS

EMERGENCY SHUT-OFF SWITCH

The emergency shutoff switch is a mechanical switch and mounted behind the headlight. This switch will shut off the ignition system if for any reason the motorcycle reaches a lean angle of 60 degrees or more from vertical.

Removal

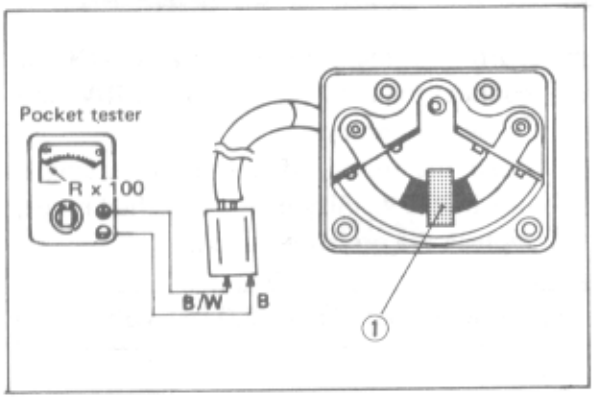
1. Remove the required fairing.
2. Disconnect the lead wires from the wire harness and pull out the switch assembly from its rubber mounting harness.



1. Emergency shut-off switch
2. Rubber mounting
3. Fuel pump relay

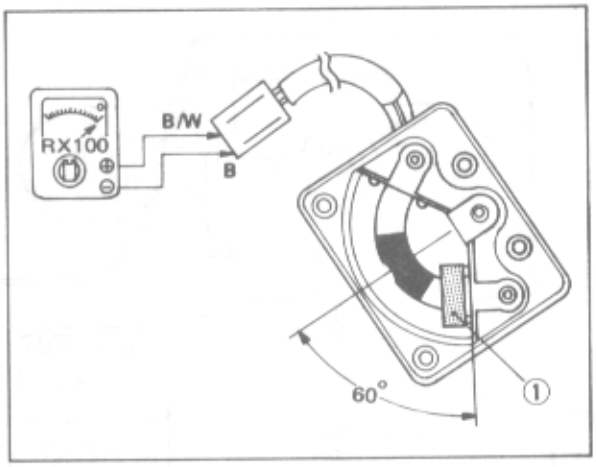
Inspection

1. Connect the pocket tester leads as shown.
2. The tester (with ohms x 100 scale) needle should show infinity (∞) when the switch is positioned vertically as shown. Replace the switch if it shows 0Ω.



1. Weight contact

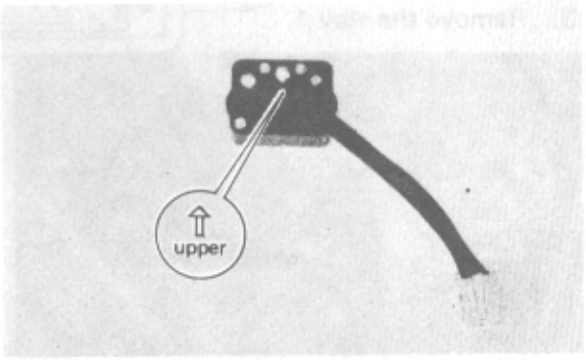
3. The tester (with ohms x 100 scale) needle should swing to 0Ω when the switch is leaned about 60 degrees or more to either left or right from the vertical position.
   Replace the switch if it shows infinite resistance (∞).



Installation

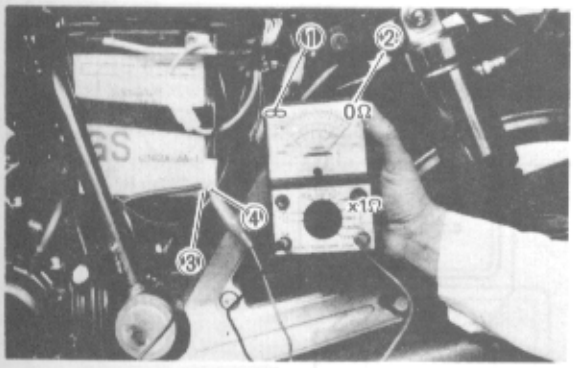
CAUTION:

Install the switch with the arrow pointing up, or the switch will not operate correctly.



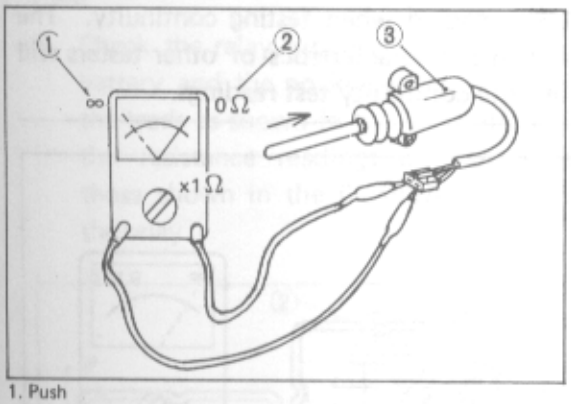
SIDESTAND SWITCH

1. Remove the seat.
2. Remove the side panels as one piece.
3. Disconnect the connector from the wiring harness.
4. Connect the pocket tester leads as shown, and set the tester selector to ohm x 1. When the sidestand is up, the tester should read zero ohms. When the sidestand is down, the tester should read infinity.



SIDESTAND	SWITCH	L/Y	B	G/L
UP	FREE	○	○	○
DOWN	PUSH			

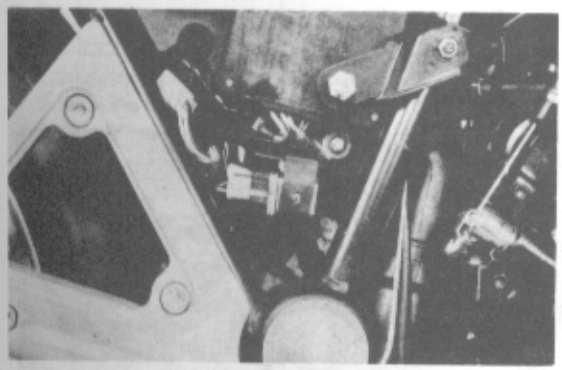
Also you can remove the switch and check it as a unit.



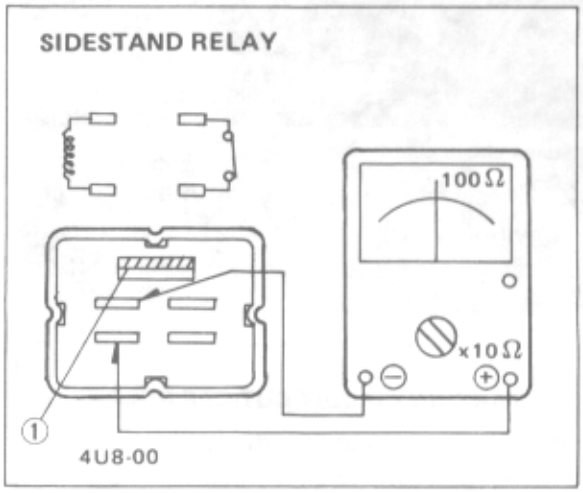
1. Push
2. Free
3. Sidestand switch

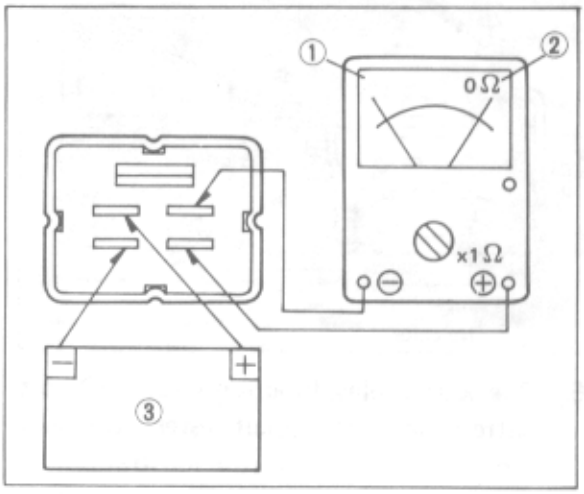
SIDESTAND RELAY

1. Remove the seat and the side panels.
2. Disconnect the connector and remove the sidestand relay.



3. Check the resistance of the relay coil windings with the pocket tester. If the resistance is not within specification, replace the relay.
4. Check the relay contact breaker points with the pocket tester and a 12 volt battery. Connect the leads as shown in the illustration. If the resistance readings do not equal those shown in the illustration, replace the relay.

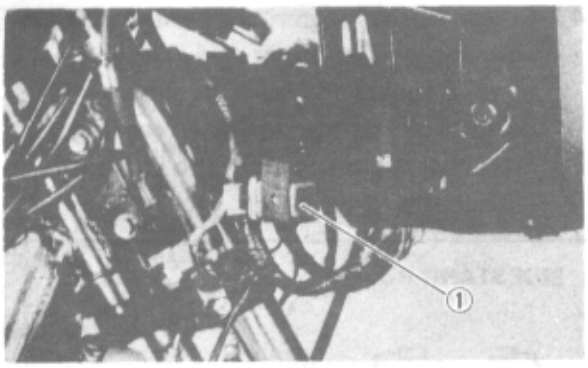




1. When the battery is connected.
2. When the battery is disconnected.
3. 12 volt battery

STARTING CIRCUIT CUT-OFF RELAY

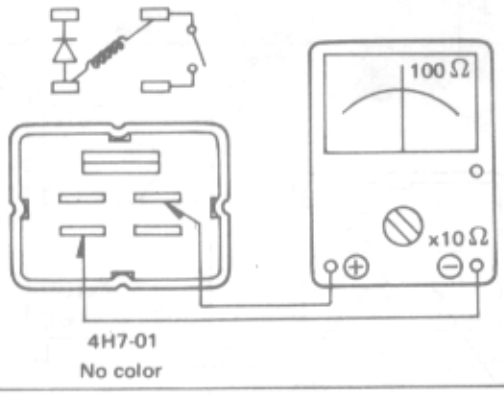
1. Remove the required fairing.
2. Disconnect the connector.
3. Remove the starting circuit cut-off relay.



1. Starter circuit cut-off relay

4. Check the resistance of the relay coil windings with the pocket tester. If the resistance is not within specification, replace the relay.

STARTING CIRCUIT CUT-OFF RELAY

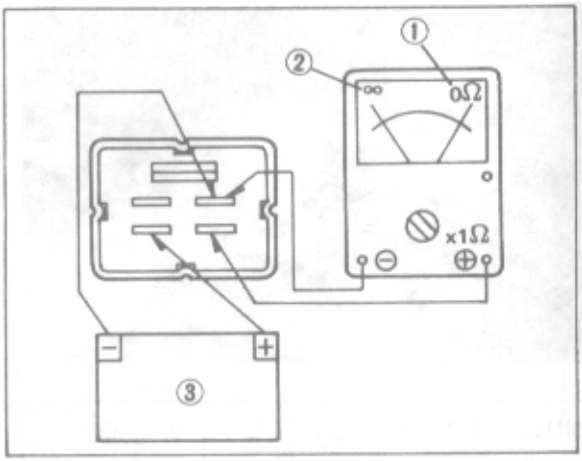


5. Check the relay function with a 12 volt battery and the pocket tester. Connect the leads as shown in the illustration. If the resistance readings do not equal those shown in the illustration, replace the relay.

CAUTION:

Wrong connection of the battery leads may cause damage to the relay diode.

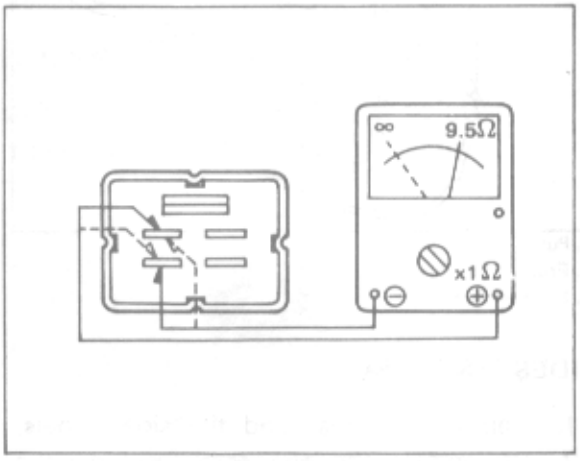
6. Check the diode in the starting-circuit cut-off relay with the pocket tester as shown in the illustration. Replace the relay if the diode is damaged.



1. When the battery is connected.
2. When the battery is disconnected.
3. 12 volt battery

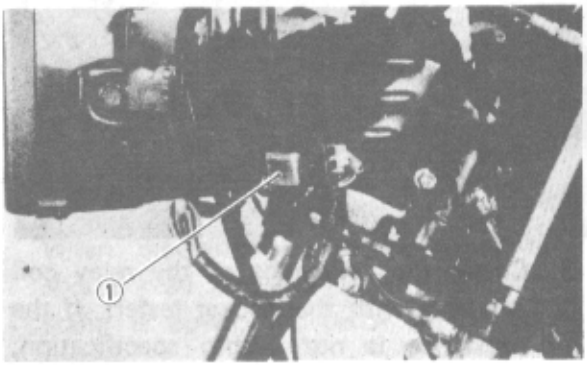
NOTE:

Only the Yamaha Pocket Tester will give a 9.5Ω reading when testing continuity. The particular characteristics of other testers will vary the continuity test readings.



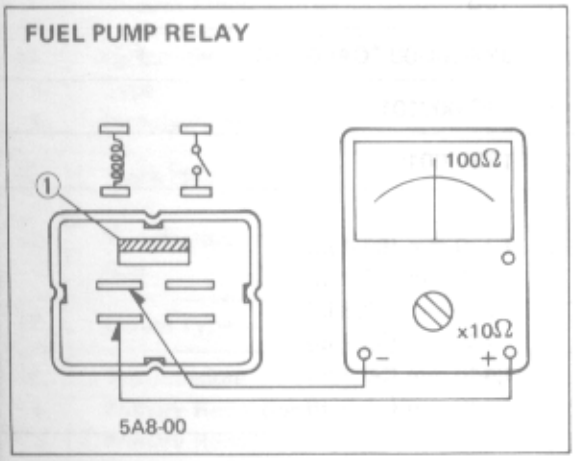
FUEL PUMP RELAY

1. Remove the required fairing.
2. Disconnect the connector.
3. Remove the fuel pump relay.



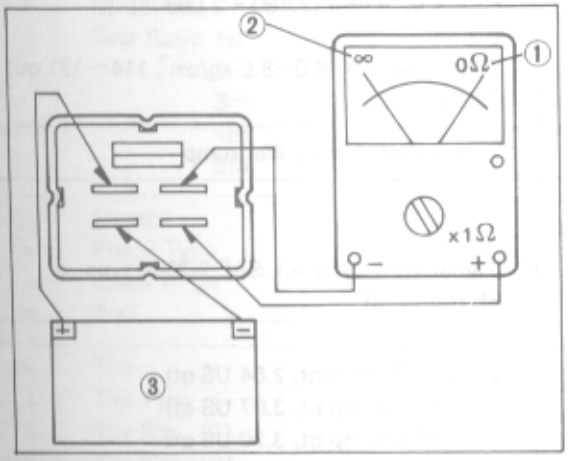
1. Fuel pump relay

4. Check the resistance of the relay coil windings with the pocket tester. If the resistance is not within specification, replace the relay.



1. Red

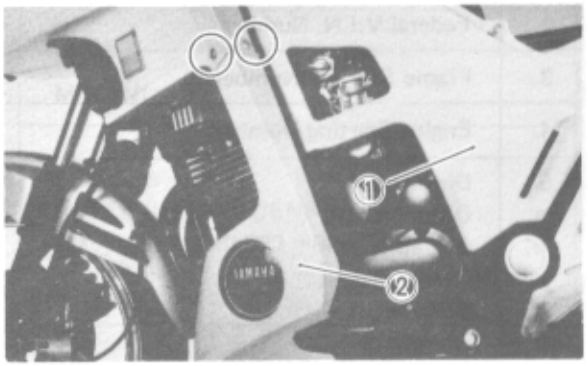
5. Check the relay function with a 12 volt battery and the pocket tester. Connect the leads as shown in the illustration. If the resistance readings do not equal those shown in the illustration, replace the relay.



1. When the battery is connected.
2. When the battery is disconnected.
3. 12 volt battery

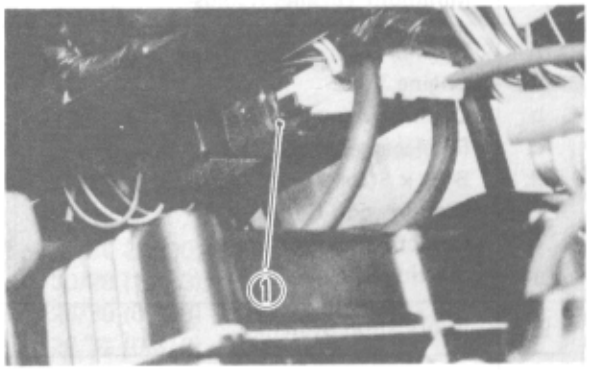
Emergency engine stop relay inspection

1. Remove the seat.
2. Remove the side panels as one piece.
3. Remove the lower panel securing bolts (2X2).



1. Side panel
2. Lower panel

4. Remove the fuel tank.
5. Disconnect the connecter and remove the emergency engine stop relay.



1. Emergency engine stop relay

6. Check the relay as shown in "Sidestand relay inspection."

SPECIFICATIONS

I. GENERAL SPECIFICATIONS

1.	Model Code Number	16G
2.	Federal V.I.N. Number	JYA16G00 *CA000101
3.	Frame Starting Number	16G-000101
4.	Engine Starting Number	16G-000101
5.	Dimensions:	
a.	Overall length	2,170 mm (85.4 in)
b.	Overall Width	730 mm (28.7 in)
c.	Overall Height	1,355 mm (53.3 in)
d.	Seat Height	780 mm (30.7 in)
e.	Wheelbase	1,440 mm (56.7 in)
f.	Minimum Ground Clearance	140 mm (5.5 in)
6.	Weight:	
a.	With Oil and Full Fuel Tank	249 kg (549 lb)
b.	Engine Dry Weight	———
7.	Minimum Turning Radius	2,600 mm (102.4 in)
8.	Engine:	
a.	Engine Type	D.O.H.C., air-cooled, gasoline
b.	Cylinder Arrangement	Forward-incline, parallel 4-cylinder
c.	Displacement	653 cc (39.8 cu.in)
d.	Bore x Stroke	63,0 x 52.4 mm (2.480 x 2.063 in)
e.	Compression Ratio	8.2 : 1
f.	Compression Pressure	785 ~ 834 kPa (8.0~8.5 kg/cm^2, 114 ~ 121 psi)
g.	Starting System	Electric
9.	Lubrication System	Pressure lubricated, Wet sump
10.	Engine Oil Type or Grade	Yamalube 4-cycle oil, SAE 20W40 type SE motor oil
11.	Engine Oil Capacity	
a.	Periodic Oil Change	2.5 L (2.20 Imp qt, 2.64 US qt)
b.	Oil Filter Replacement	2.9 L (2.55 Imp qt, 3.07 US qt)
c.	Total Amount	3.5 L (3.08 Imp qt, 3.70 US qt)
12.	Middle/Final Gear Oil	
a.	Grade or Type	SAE 80 API "GL-4" Hypoid gear oil
b.	Final Gear Case Oil Amount	0.2 L (0.18 Imp qt, 0.21 US qt)
13.	Air Filter	Dry type element

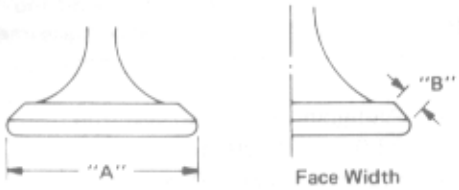
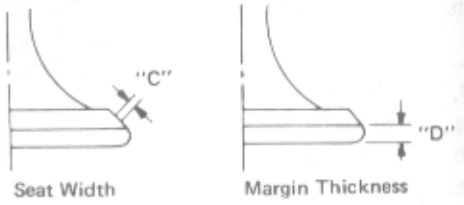
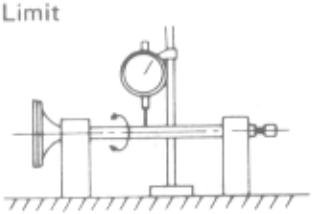
14.	Fuel	
a.	Type	Premium gasoline (Research octan of 95 or more)
b.	Tank Capacity	15.5 L (3.41 Imp gal, 4.10 US gal)
c.	Reserve Amount	2.2 L (0.484 Imp gal, 0.581 US gal)
15.	Carburetor	
a.	Type	BS30
b.	Manufacturer	MIKUNI
16.	Spark Plug	
a.	Type	BP8ES, W24EP-U
b.	Manufacturer	(NGK) (NIPPON DENSO)
c.	Gap	0.7 ~ 0.8 mm (0.023 ~0.032 in)
17.	Clutch Type	Wet, multiple disc
18.	Transmission:	
a.	Primary Reduction System	Gear
b.	Primary Reduction Ratio	97/58 (1.672)
c.	Secondary Reduction System	Shaft drive
d.	Secondary Reduction	
	Transmission output	
	Type/teeth/ratio	Spur gear, 49/36 (1.361)
	Middle gear case	
	Type/Teeth/ratio	Bevel gear, 19/18 (1.055)
	Final gear case	
	Type/Teeth/ratio	Bevel gear, 32/11 (2.909)
e.	Transmission Type	Constant mesh, 5-speed, drum shifter
f.	Operation	Left foot operation
g.	Gear Ratio 1st	35/16 (2.187)
	2nd	30/20 (1.500)
	3rd	30/26 (1.153)
	4th	28/30 (0.933)
	5th	26/32 (0.812)
19.	Chassis:	
a.	Frame Type	Tubular steel double cradle
b.	Caster Angle	27°45′
c.	Trail	115 mm (4.53 in)
20.	Tire	
a.	Tire Type	Tubeless
b.	Tire Size (F)	3.25V19-4PR
c.	Tire Size (R)	120/90 V18
d.	Manufacturer	BRIDGESTONE, DUNLOP
21.	Tire Pressure	(Cold pressure)
a.	Up to 90 kg (198 lb) load* (F)	177 kPa (1.8 kg/cm^2, 26 psi)
	(R)	196 kPa (2.0 kg/cm^2, 28 psi)
b.	90 kg (198 lb) ~166 kg (366 lb) load* (F)	226 kPa (2.3 kg/cm^2, 33 psi)
	(R)	245 kPa (2.5 kg/cm^2, 36 psi)

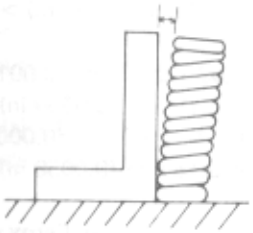
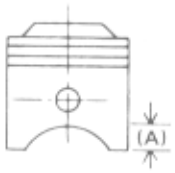
c.	High-speed Riging (F) (R)	196 kPa (2.0 kg/cm^2, 28 psi) 226 kPa (2.3 kg/cm^2, 33 psi)
	*Total weight of accessories, etc. excepting motorcycle.	
22.	Brake	
a.	Front Brake Type	Dual hydraulic disc
b.	Operation	Right hand
c.	Rear Brake Type	Drum brake
d.	Operation	Right foot
23.	Suspension	
a.	Front Suspension	Telescopic fork
b.	Rear Suspension	Swingarm
24.	Shock Absorber	
a.	Front Shock Absorber	Oil damper, air and coil spring
b.	Rear Shock Absorber	Oil damper, air and coil spring
25.	Wheel Travel	
a.	Front Wheel Travel	140 mm (5.6 in)
b.	Rear Wheel Travel	96 mm (3.8 in)
26.	Electrical.	
a.	Ignition System	Battery ignition (Full transistor ignition)
b.	Generator System	A.C. generator
c.	Battery Type or Model	12N12A-4A
d.	Battery Capacity	12V 12Ah (10)
27.	Headlight Type	HALOGEN (Antivibratory bulb)
28.	Bulb Wattage x Pcs	
a.	Headlight	60W/55W 1 pcs.
b.	Turn light	27W x 4 pcs.
c.	Tail/Brake light	8W/27W x 2 pcs.
d.	Meter light	3.4W x 2 pcs.
e.	License light	3.8W x 2 pcs.
29.	Indicator light Wattage x Pcs.	
a.	" Neutral "	3.4W x 1 pcs.
b.	" High Beam "	3.4W x 1 pcs.
c.	" Warning "	3.4W x 1 pcs.
d.	" Turn "	3.4W x 2 pcs.

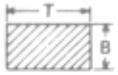
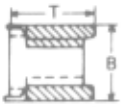
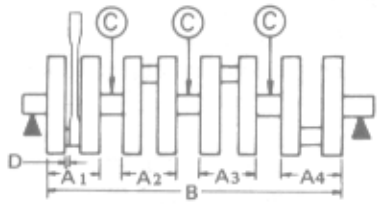
II. MAINTENANCE SPECIFICATIONS

A. Engine

1.	Cylinder Head	
a.	Volume	22.7 cc
b.	Warp Limit	< 0.03 mm (0.0012 in) > *Lines indicate straightedge measurement
2.	Cylinder	
a.	Material	Aluminum alloy with cast iron sleeve
b.	Bore Size	63.0 mm (2.480 in)
c.	Taper Limit	<0.05 mm (0.0020 in)>
d.	Out-of-round Limit	<0.01 mm (0.0004 in)>
3.	Camshaft	
a.	Drive Method	Chain drive Center
b.	Cam Cap Inside Diameter	$25^{+0.021}_{-0}$ mm ($0.98^{+0.008}_{-0}$ in)
c.	Camshaft Outside Diameter	$25^{-0.020}_{-0.033}$ mm ($0.98^{-0.0008}_{-0.0013}$ in)
d.	Shaft-to-cap Clearance	0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)
e.	Cam Dimensions	
	Intake "A"	35.50 mm (1.398 in)
	"B"	28.00 mm (1.102 in)
	"C"	7.50 mm (0.295 in)
	Exhaust "A"	35.50 mm (1.398 in)
	"B"	28.00 mm (1.102 in)
	"C"	7.50 mm (0.295 in)
f.	Valve Timing	
	IN. Open	B.T.D.C. 28°
	Close	A.B.D.C. 48°
	EX. Open	B.B.D.C. 53°
	Close	A.T.D.C. 23°
	Over Lap	α = 51°
g.	Camshaft Runout Limit	0.06 mm (0.0024 in)
h.	Cam Chain Type/Number of Links	BUSH-CHAIN/120
i.	Cam Chain Adjustment Method	Automatic

4.	Valve, Valve Seat, Valve Guide	
a.	Valve Clearance (Cold)	
	IN.	0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)
	EX.	0.16 ~ 0.20 mm (0.0063 ~0.0079 in)
b.	Valve Dimensions	
		
	"A" Head Dia. IN.	33 ± 0.1 mm (1.30 ± 0.0039 in)
	EX.	28 ± 0.1 mm (1.10 ± 0.0039 in)
	"B" Face Width IN.	2.3 mm (0.091 in)
	EX.	2.3 mm (0.091 in)
	"C" Seat Limit Width IN.	1 ± 0.1 mm (0.0394 ± 0.039 in)
	EX.	1 ± 0.1 mm (0.0394 ± 0.039 in)
	"D' Margin Thickness Limit IN.	0.7 mm (0.028 in)
	EX.	0.7 mm (0.028 in)
c.	Stem Outside Diameter	
	IN.	$7^{-0.010}_{-0.025}$ mm (0.2756 $^{-0.0004}_{-0.0010}$ in)
	EX.	$7^{-0.025}_{-0.040}$ mm (0.2756 $^{-0.0010}_{-0.0016}$ in)
d	Guide Inside Diameter	
	IN.	$7^{+0.012}_{0}$ mm (0.2756 $^{+0.0005}_{0}$ in)
	EX.	$7^{+0.012}_{0}$ mm (0.2756 $^{+0.0005}_{0}$ in)
e.	Stem-to-guide Clearance	
	IN.	0.010~ 0.037 mm (0.004 ~ 0.0015 in)
	EX.	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
f.	Stem Runout Limit	<0.03 mm (0.0012 in) >
		
g.	Valve Seat Width Standard	1.0 mm (0.039 in)
	< Limit >	<2.0 mm (0.080 in)>
6.	Valve Spring	
a.	Free Length	
	Inner Spring IN.	35.9 mm (1.413 in)
	EX.	35.9 mm (1.413 in)
	Outer Spring IN.	39.5 mm (1.555 in)
	EX.	39.5 mm (1.555 in)

b.	Spring rate	
	Inner Spring IN.	2.36 kg/mm (132 lb/in)
	EX.	2.36 kg/mm (132 lb/in)
	Outer Spring IN.	4.58 kg/mm (256 lb/in)
	EX.	4.58 kg/mm (256 lb/in)
c.	Compression Length (Valve Closed)	
	Inner Spring IN.	31.0 mm (1.220 in)
	EX.	31.0 mm (1.220 in)
	Outer Spring IN.	34.0 mm (1.339 in)
	EX.	34.0 mm (1.339 in)
d.	Compression Force (Valve Closed)	
	Inner Spring IN.	9.0 kg (20 lb)
	EX.	9.0 kg (20 lb)
	Outer Spring IN.	19.1 kg (42.1 lb)
	EX.	19.1 kg (42.1 lb)
e.	Tilt Limit	
	Inner Spring IN. & EX.	2.5°
	Outer Spring IN. & EX.	2.5°
		
f.	Direction of Winding (Top View)	Intake: Outer / Inner; Exhaust: Outer / Inner
7.	Piston	
a.	Piston Size/ Measuring Point (A) 	63.0 mm (2.48 in)/ 7.5 mm (0.295 in) (From bottom line of piston skirt)
b.	Clearance between Piston & Cylinder <Limit>	0.03 ~ 0.05 mm (0.0012 ~0.0020 in) <0.1 mm (0.0049 in)>
c.	Oversize 1st	—
	2nd	63.50 mm (2.50 in)
	3rd	—
	4th	64.00 mm (2.52 in)
d.	Piston Pin Hole Off-Set	0.5 mm (0.02 in)/In-side

8.	Piston Ring		
a.	Sectional Sketch		
		Top Ring	$B = 1.2^{-0.01}_{-0.03}$ mm ($0.47^{-0.0004}_{-0.0012}$ in) T = 2.6 ± 0.1 mm (0.102± 0.0014 in)
		2nd Ring	$B = 1.5^{-0.01}_{-0.03}$ mm ($0.059^{-0.0004}_{-0.0012}$ in) T = 2.8 ± 0.1 mm (0.110± 0.0004 in)
		Oil Ring	B = 2.5 mm (0.098 in) T = 2.8 ± 0.15 mm (0.110 ± 0.0059 in)
b.	End Gap (Installed)		
	Limit	Top Ring	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in) < 1.0 mm (0.039 in) >
		2nd Ring	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in) < 1.0 mm (0.039 in) >
		Oil Ring	0.3 ~ 0.9 mm (0.012 ~ 0.035 in) < 1.5 mm (0.059 in) >
c.	Side Clearance		
	Limit	Top Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) < 0.15 mm (0.0059 in) >
		2nd Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in) < 0.15 mm (0.0059 in) >
d.	Plating or Coating		
		Top Ring	Chrome plated, Ferox coating
		2nd Ring	—
		Oil Ring	Chrome plated, Ferox coating
9.	Connecting Rod		
a.	Oil Clearance		0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in)
b.	Color Code		1. Blue, 2. Black, 3. Brown, 4. Green
10.	Crankshaft		
			
a.	Crank Width "A"		A_1 = 56.15 mm (2.21 in) A_2 = 59.2 mm (2.33 in) A_3 = 60.45 mm (2.38 in) A_4 = 56.45 mm (2.22 in)
b.	Assembly Width "B"		341.4 ± 0.6 mm (13.44± 0.024 in)
c.	Deflection Limit "C"		< 0.04 mm (0.0016 in) >
d.	Big End Side Clearance "D"		0.16 ~ 0.27 mm (0.006 ~ 0.011 in)
e.	Journal Oil Clearance		0.020 ~ 0.044 mm (0.0008 ~ 0.0017 in)
f.	Color Code – Corresponding Size	Blue	$1.5^{+0.006}_{+0.002}$ mm ($0.0591^{+0.00024}_{+0.00008}$ in)
		Black	$1.5^{+0.002}_{-0.002}$ mm ($0.0591^{+0.00008}_{-0.00008}$ in)
		Brown	$1.5^{-0.002}_{-0.006}$ mm ($0.0591^{-0.00008}_{-0.00024}$ in)
		Green	$1.5^{-0.006}_{-0.010}$ mm ($0.0591^{-0.00024}_{-0.00039}$ in)
		Yellow	$1.5^{-0.010}_{-0.014}$ mm ($0.0591^{-0.00039}_{-0.00055}$ in)

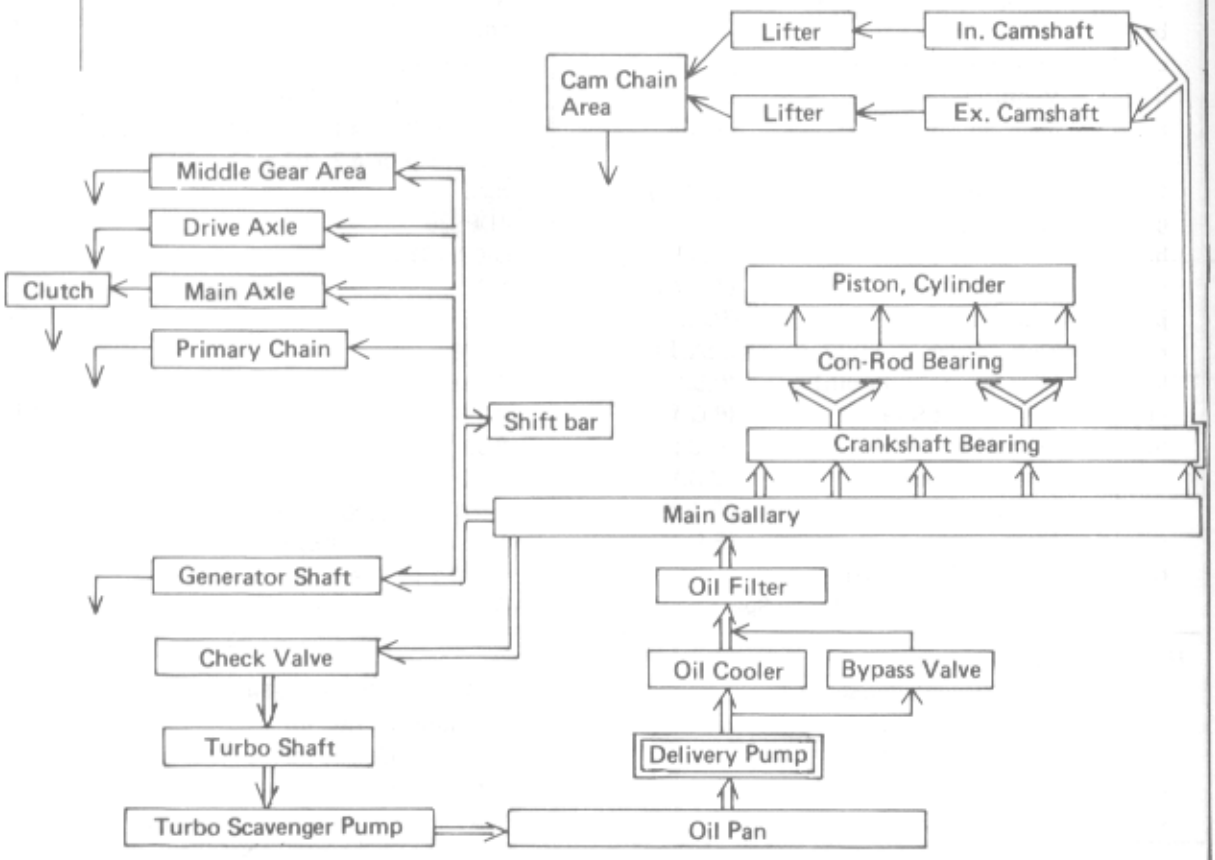
11.	Clutch		
a.	Friction Plate Thickness/Quantity		3.0 ± 0.1 mm (0.12 ± 0.004 in)/8 pcs.
b.	Wear Limit		<2.8 mm (0.11 in)>
c.	Clutch Plate Thickness/Quantity		1.6 mm (0.06 in)/7 pcs.
d.	Warp Limit		<0.05 mm (0.002 in)>
e.	Clutch Spring Free Length		42.8 mm (1.69 in)
f.	Minimum Length		41.8 mm (1.65 in)
g.	Primary Reduction Gear Backlash Tolerance		118
h.	Primary Drive Gear Backlash Number		87 ~ 91
i.	Primary Driven Gear Backlash Number		27 ~ 32
j.	Clutch Release Method		Rack & Pinion pull, Outer pull
12.	Transmission		
a.	Main Axle Run-out Limit		<0.08 mm (0.0031 in)>
13.	Shifter		
a.	Shifter Type		Cam drum
14.	Carburetor		
a.	Type/Manufacturer/Quantity		BS30/MIKUNI/4 pcs.
b.	I.D. Mark		16G 00
c.	Throttle Valve Size		φ 30 mm (φ1.18 in)
d.	Venturi Size		φ 26.4 mm (φ 1.04 in)
e.	Main Jet	(M.J.)	#127.5 (For #1, #4 cyl.), #132.5 (For #2, #3 cyl.)
f.	Main Air Jet	(M.A.J.)	#70
g.	Jet Needle	(J.N.)	4DPS39
h.	Needle Jet	(N.J.)	O-6 (#318)
i.	Throttle Valve	(Th.V.)	14°
j.	Pilot Jet	(P.J.)	#35
k.	Pilot Air Jet	(P.A.J.)	#170
l.	Pilot Screw (turns out)	(P.S.)	Pre-set
m.	Pilot Outlet Size	(P.O.)	φ0.8
n.	Starter Jet	(G.S.)	#30
o.	Valve Seat Size	(V.S.)	φ1.2
p.	Fuel Level	(F.L.)	2 ± 1 mm (0.08 ± 0.04 in)
q.	Float Height	(F.H.)	17.5 ± 0.5 mm (0.7 ± 0.02 in)
r.	Engine Idling Speed		1,050 ± 50 r/min
s.	Vacuum Pressure at Idling Speed		Above 185 mmHg (7.28 inHg)
15.	Turbocharger		
a.	Model/Manufacturer		TC03-06A/MITSUBISHI
b.	Turbine Diameter		φ40 mm (φ 1.58 in)
c.	Compressor Diameter		φ40 mm (φ 1.58 in)
d.	Maximum RPM.		210,000 r/min
e.	Wastegate Valve		Yes

16.	Lubrication System:	
a.	Oil Filter Type	Paper filter
b.	Oil Pump Type	Trochoid pump
c.	Rotor Thickness	
	Delivery pump	$18\ ^{0}_{-0.02}$ mm ($0.709\ ^{0}_{-0.0008}$ in)
	Turbo scavenger pump	$5\ ^{0}_{-0.02}$ mm ($0.197\ ^{0}_{-0.0008}$ in)
d.	Tip Clearance	0.03 ~ 0.09 mm (0.001~ 0.004 in)
e.	Side Clearance	0.03 ~ 0.08 mm (0.01 ~ 0.003 in)
f.	Bypath Valve Setting Pressure	1.0± 0.2 kg/cm (14.2 ± 2.8 lb/in)
g.	Relief Valve Operating Pressure	5.0 ± 0.6 kg/cm (7.2 ± 8.5 lb/in)
h.	Lubrication Diagram	

⇨ Pressure oil feed

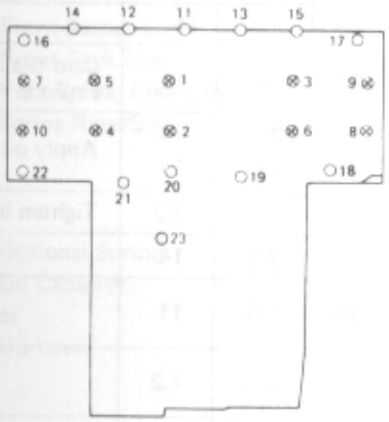
→ Splash oil feed

⇨ Oil suction

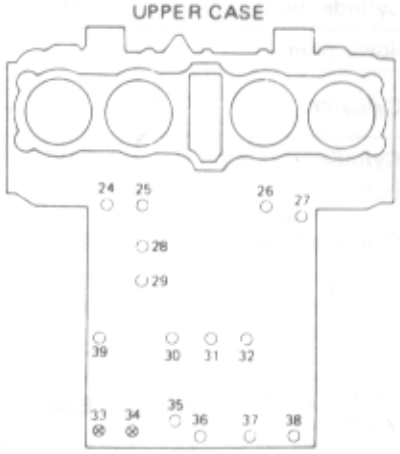


17.	Middle Gear Backlash	0.1 ~ 0.2 mm (0.0039 ~ 0.0079 in)
18.	Final Gear Backlash	0.1 ~ 0.2 mm (0.0039 ~ 0.0079 in)
19.	Crankcase Tightening Sequence	

LOWER CASE



UPPER CASE



Tightening torque:

⊗ ..... 8 mm bolt: 24 Nm (2.4 m·kg, 17.5 ft·lb)

○ ..... 6 mm bolt: 12 Nm (1.2 m·kg, 8.7 ft·lb)

20. Tightening Torque							
Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
ENGINE							
Cylinder head	Nut	M10 P1.25	12	36	3.6	25	Apply oil.
Cylinder head cover	Bolt	M6 P1.0	20	1.0	1.0	7.2	
Spark plug	–		4	20	2.0	14	
Cylinder	Nut	M8 P1.25	2	20	2.0	14	Cam chain case Front & Rear
Cylinder holding bolt	Stud bolt Bolt	M10 P1.25 M10 P1.25	7 5	20 20	2.0 2.0	14 14	Apply oil
Cam shaft cap	Bolt	M6 P1.0	20	10	1.0	7.2	Tighten in 3-stages.
Cam sprocket	Bolt	M7 P1.0	4	20	2.0	14	
Cam chain tensioner end plug		M11 P1.0	1	15	1.5	11	
Cam chain tensioner securing bolt	Bolt	M6 P1.0	2	10	1.0	7.2	
Connecting rod	Nut	M7 P0.75	8	25	2.5	18	
Generator (rotor)	Bolt	M10 P1.25	1	55	5.5	40	
Drain plug	Bolt	M14 P1.5 M8 P1.25	1 1	43 24	4.3 2.4	31 17	Crankcase drain
Oil filter	Bolt	M20 P1.5	1	15	1.5	11	
Pump cover	Screw	M6 P1.0		7	0.7	5.1	
Strainer cover	Bolt	M6 P1.0	13	10	1.0	7.2	
Crankcase	Flange Bolt	M8 P1.25 M6 P1.0	12 27	24 12	2.4 1.2	17 8.7	
Clutch boss	Nut	M20 P1.0	1	72	7.2	52	
Clutch spring screw	Bolt	M6 P1.0	5	10	1.0	7.2	
Change Pedal	Bolt	M6 P1.0	1	10	1.0	7.2	
Neutral Switch	–	M10 P1.25	1	20	2.0	14	
Exhaust Pipe	Nut	M6 P1.0	8	10	1.0	7.2	
Oil cooler	Joint Nut	M22 P1.5	2	45	4.5	32	
SHAFT DRIVE:							
– Middle Gear –							
Drive Shaft	Nut	M34 P1.5	1	110	11	80	Stake.
Mount cover	Screw	M8 P1.25	4	25	2.5	18	Stake.
Driven shaft	Nut	M14 P1.5	1	120	12	85	Use LOCTITE: Stake.
Bearing cap	Flange Bolt	M8 P1.25	4	25	2.5	18	
– Final Gear –							
Drive Shaft	Nut	M14 P1.5	1	110	11	80	
Bearing housing	Flange Bolt	M10 P1.25	2	23	2.3	17	
Bearing housing	Nut	M8 P1.25	6	23	2.3	17	
Oil mount screw	Plug	M14 P1.5	1	23	2.3	17	
Oil drain screw	Plug	M14 P1.5	1	23	2.3	17	
Bearing retainer		M65 P1.5	1	110	11	80	Left hand screw

B. Chassis

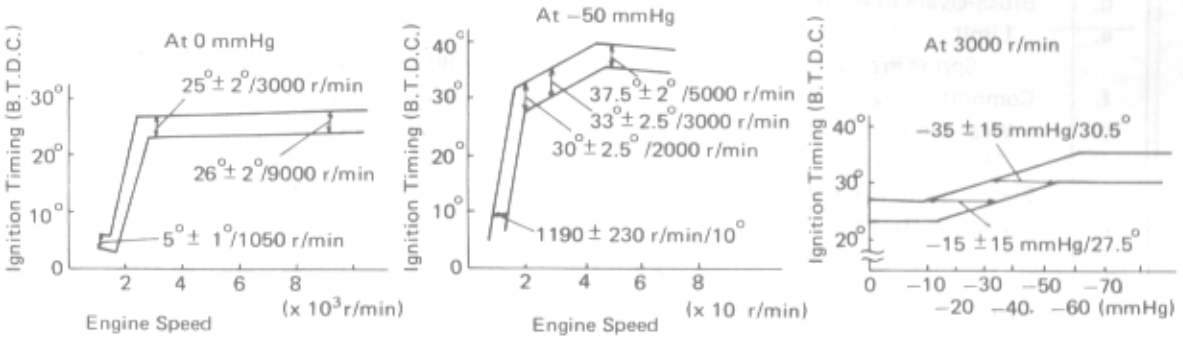
1.	Steering System	
a.	Steering Bearing Type	Ball Bearing
b.	No./Size of Steel Balls	
	Upper	19 pcs/1/4 in
	Lower	19 pcs/1/4 in
c.	Lock-to-lock Angle	38.5°
2.	Front Suspension	
a.	Front Fork Travel	140 mm (5.51 in)
b.	Fork Spring Free Length	449 mm (17.7 in)
c.	Spring Rate/Stroke K_1	4.13 N/mm (0.421 kg/mm, 23.6 lb/in)/ 0 ~100 mm (0~3.94 in)
	K_2	7.36 N/mm (0.75 kg/mm, 42.0 lb/in)/ 100~140 mm (3.94~ 5.51 in)
d.	Optional Spring	No.
e.	Oil Capacity	238± 4 cc (8.04 ± 0.14 US oz)
	or	
	Oil Level	180 mm (7.09 in) (From top of inner tube fully compressed without spring.)
f.	Oil Grade	Yamaha fork oil (10) wt or equivalent SAE 10W30 motor oil
g.	Enclosed Air Pressure	39 kPa (0.4 kg/cm², 5.7 psi)
3.	Rear Suspension	
a.	Shock Absorber Travel	80 mm (3.15 in)
b.	Spring Free Length	251.5 mm (9.90 in)
c.	Spring Rate/Stroke	13.7 N/mm (1.4 kg/mm, 78.4 lb/in)/ 0~80 mm (0 ~ 3.15 in)
d.	Optional Spring	No.
4.	Rear Arm	
a.	Swing Arm Free Play Limit	
	– End	0 mm (0 in)
	– Side	0 mm (0 in)
5.	Wheel	
a.	Front Wheel Type	Cast Wheel
	Rear Wheel Type	Cast Wheel
b.	Front Rim Size/Material	MT1.85 x 19/Steel, Aluminum
	Rear Rim Size/Material	MT2.15 x 18/Steel, Aluminum
c.	Rim Runout Limit – Vertical	<0.5 mm (0.02 in)>
	– Lateral	<1.0 mm (0.04 in)>
6-1.	Disc Brake	
a.	Type Front	Dual disc
b.	Outside Dia. x Thickness	
	Front	267 x 5 mm (10.5 x 0.2 in)

c.	Pad Thickness <Limit> 	6.8 mm (0.27 in) <0.8 mm (0.032 in)>
d.	Master Cylinder Inside Dia. Front	15.87 mm (0.62 in)
e.	Caliper Cylinder Inside Dia. Front	38.18 mm (1.50 in)
f.	Brake Fluid Type	DOT # 3
6-2.	Drum Brake	
a.	Type Rear	Leading trailing
b.	Drum Inside Dia. Rear	200 mm (7.87 in)
c.	Lining Thickness <Limit >	4 mm (0.16 in) <2 mm (0.08 in)>
d.	Shoe Spring Free Length Rear	68 mm (2.68 in)
7.	Brake Lever & Brake Pedal	
a.	Brake Lever Free Play	5.0~8.0 mm (0.2~0.3 in)
b.	Brake Pedal Free Play	20 ~ 30 mm (0.8 ~ 1.2 in)
c.	Brake Pedal Position	40 mm (1.6 in) (Vertical height below footrest top.)
8.	Clutch Lever Free Play	2 ~ 3 mm (0.08~0.12 in)

9. Tightening Torque							
Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m-kg	ft-lb	
CHASSIS:							
Engine Front, upper Mounting Front, under Bolt Rear	Nut Bolt Nut	M10 P1.25 M10 P1.25 M12 P1.25	1 2 1	42 42 70	4.2 4.2 7.0	30 30 50	
Engine Mounting Stay Front	Bolt	M8 P1.25	4	20	2.0	14	
Handle crown & Steering shaft	Bolt Bolt	M14 P1.25 M8 P1.25	1 1	54 20	5.4 2.0	39 14	
Handle crown & Inner tube	Nut cap	M8 P1.25	1	20	2.0	14	
Handle crown & Handle holder	Bolt	M8 P1.25	2	20	2.0	14	
Front fork							
Under bracket & Inner tube	Bolt	M8 P1.25	4	20	2.0	14	
Front wheel shaft	Nut castle	M14 P1.5	1	107	10.7	77	
Front wheel Axle pinch bolt	Nut salf	M8 P1.25	2	20	2.0	14	
Pivot shaft	Bolt	M22 P1.5	1	5.5	0.55	4.0	Taper roller bearing
Rear wheel shaft	Nut castl	M14 P1.5	1	107	10.7	77	
Rear shock absorber (Upper)	Nut cap	M10 P1.25	2	30	3.0	22	
Rear shock absorber (Lower)	L Nut cap R Bolt	M10 P1.25	2	30	3.0	22	
Footrest	Nut	M10 P1.25	2	42	4.2	30	
Tension bar & Brake plate	Bolt	M8 P1.25	1	20	2.0	14	
Tension bar & Rear arm	Bolt	M8 P1.25	1	20	2.0	14	
Camshaft lever & Camshaft	Bolt	M6 P1.0	1	9	0.9	6.5	
Disc sbrake section							
Brake disc & Hub (Front)	Bolt	M8 P1.25	12	20	2.0	14	Lock washer
Master cylinder & Brake hose (Front)	Bolt union	M10 P1.25	1	26	2.6	19	
Brake hose & Joint	Bolt union	M10 P1.25	1	26	2.6	19	
Caliper & Brake hose	Bolt union	M10 P1.25	1	26	2.6	19	
Caliper & Front fork (Front)		M8 P1.25	1	26	2.6	19	
Caliper bleed screw (Front)		M8 P1.25	1	6	0.6	4.3	
Front fender	Bolt	M8 P1.25	4	10	1.0	7.2	
Master cylinder cap	Screw	M5 P0.8	2	1.8	0.18	1.3	
Pivot shaft	Bolt	M22 P1.5	1	100	10.0	72	Lock washer
Final gear & Rear arm	Nut	M10 P1.25	4	42	4.2	30	
Cross Joint	Hexagon bolt with washer	M8 P1.25	4	44	4.4	32	
Muffler bracket & Frame	Bolt	M10 P1.25	3	43	4.3	31	
Rear fender	Bolt	M10 P1.25	2	32	3.2	23	
Muffler bracket & Muffler	Bolt	M10 P1.25	2	25	2.5	18	
Master cylinder & Master cylinder bracket	Bolt	M6 P1.0	2	9	0.9	6.5	

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Valve seat & Crankcase	—	PT 1/8	1	26	2.6	19	Apply Loctite
Relief valve & Valve seat	Union bolt	M16 P1.5	1	20	2.0	14	
Union bolt & Turbocharger	Union bolt	M10 P1.25	1	21	2.1	15	
Oil pipe & Turbocharger	Bolt	M6 P1.0	2	12	1.2	8.7	
Oil pipe & Crankcase	Bolt	M6 P1.0	2	12	1.2	8.7	
Oil pipe clamp crankcase	Screw	M6 P1.0	1	7	0.7	5.1	
Regulator stay 1 & Frame	Hex. bolt	M6 P1.0	2	12	1.2	8.7	
Regulator & Regulator stay	Hex. nut	M12 P1.25	1	18	1.8	13	
Check valve & Regulator stay	Screw	M5 P0.8	1	4	0.4	2.9	
Carburetor & Regulator stay	Screw	M6 P1.0	2	7	0.7	5.1	
Clamp:							
Air filter case & Surge tank	Screw	M4 P0.7	2	2	0.2	1.4	
Turbo duct 2 & Surge tank	Screw	M4 P0.7	2	2	0.2	1.4	
Carburetor & Surge tank	Screw	M4 P0.7	8	2	0.2	1.4	
Drain valve & Surge tank	Screw	M5 P0.8	2	4	0.4	2.9	
Reed valve cover & Surge tank	Bolt	M6 P1.0	5	12	1.2	8.7	
Air filter stay & Frame	Bolt	M6 P1.0	1	7	0.7	5.1	
Air filter case & Stay	Screw	M6 P1.0	1	5	0.5	3.6	
Air filter case & Stay	Screw	Tapping	2	4	0.4	2.9	
Air cleaner stay & Frame	Bolt	M6 P1.0	2	12	1.2	8.7	
Clamp:							
Turbo duct 1 & Turbocharger	Screw	M4 P0.7	1	2	0.2	1.4	
Turbo duct 1 & Air cleaner	Screw	M4 P0.7	1	2	0.2	1.4	
Turbo duct 2 & Turbocharger	Screw	M4 P0.7	2	2	0.2	1.4	
Carb. joint & Carburetor	Screw	M4 P0.7	4	2	0.2	1.4	
Fuel pump & Stay	Screw	M5 P0.8	1	4	0.4	2.9	
Muffler & Foot rest bracket	Flange bolt	M10 P1.25	3	25	2.5	18	
Frame & Foot rest bracket	Bolt	M8 P1.25	1	20	2.0	14	
Frame & Exhaust chamber	Flange bolt	M10 P1.25	1	25	2.5	18	
Turbocharger & Exhaust chamber	Nut	M8 P1.25	2	20	2.0	14	
Turbocharger & Muffler	Bolt	M8 P1.25	1	20	2.0	14	
Turbocharger & Muffler	Nut	M8 P1.25	2	20	2.0	14	
Sub-muffler & Protecter	Bolt	M6 P1.0	3	12	1.2	8.7	
Silencer cap & Muffler	Bolt	M6 P1.0	4	12	1.2	8.7	

C. Electrical

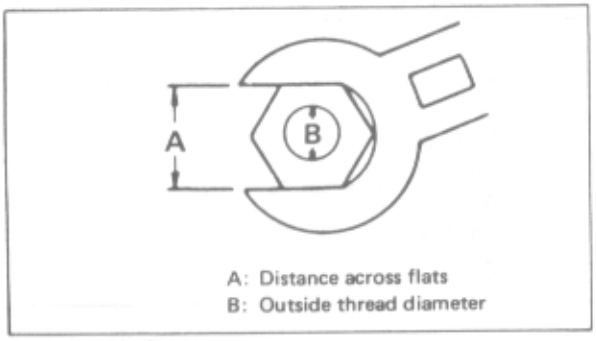
1.	Voltage	12V
2.	Ignition System	
a.	Ignition Timing (B.T.D.C.)	5°/1,050 r/min
	Advanced Timing (B.T.D.C.)	25°/2,500 r/min (Boost pressure 0 mm or more)
		
b.	Advancer Type	Electrical and vacuum controlled
3.	T.C.I.	
a.	Pick up Coil Resistance (Color)	120Ω ± 20% at 20°C (68°F) (O − B, Gy − B)
b.	T.C.I. Unit - Model/Manufacturer	TID14-13/HITACHI
4.		
a.	Ignition Coil - Model/Manufacturer	CM-12-09/HITACHI
b.	Minimum Spark Gap	6 mm (0.24 in) or more at 500 r/min (19 KV/100 r/min at 6V, 16KV/9,500 r/min at 14V)
c.	Primary Winding Resistance	2.5Ω ± 10% at 20°C (68°F)
d.	Secondary Winding Resistance	11KΩ ± 20% at 20°C (68°F)
5.	Charging System	
a.	Type	A.C. Generator
b.	Model/Manufacturer	LD119-08/HITACHI
c.	Output	14V 19A at 5,000 r/min
d.	Field (Inner) Coil Resistance (Color)	4.0Ω ± 10% at 20°C (68°F) (G − Br)
e.	Armature (Outer) Coil Resistance (Color)	0.46Ω ± 10% at 20°C (68°F) (W − W)
f.	Brush-Overall Length	17 mm (0.67 in)
g	− Wear Limit	10 mm (0.39 in)
h.	− Spring Pressure	360 g (12.7 oz)
6.	Voltage Regulator	
a.	Type	I.C. type
b.	Model/Manufacturer	S8534/TOSHIBA
c.	No Load Regulated Voltage	14.5V
7.	Rectifier	
a.	Model/Manufacturer	S8534/TOSHIBA
b.	Capacity	15A
c.	Withstand Voltage	300V

8.	Battery	
a.	Capacity	12V 14AH
b.	Specific Gravity	1.280
9.	Electric Starter System	Constant mesh type
a.	Starter Motor – Model/Manufacturer	ADB4D2/NIPPONDENSO
b.	– Output	0.6 kw
c.	Armature Coil Resistance	0.014Ω ± 6% at 20°C (68°F)
d.	Brush-Overall Length	12 mm (0.47 in)
e.	Limit	<8.5 mm (0.33 in)>
	Spring Pressure	800±150 g (28.22± 5.29 oz)
f.	Commutator Dia.	28 mm (1.1 in)
g.	Wear Limit	<27 mm (1.06 in)>
	Mica Undercut	0.6 ±0.2 mm (0.024± 0.008 in)
h.	Starter Switch Manufacturer	HONDA LOCK
i.	Amperage Rating	150A
10.	Horn	
a.	Type	Eddy type
	Quantity	2 pcs.
b.	Model/Manufacturer	SF-12/Nikko
c.	Maximum Amperage	2.5A
11.	Flasher Relay	
a.	Type	Condenser type
b.	Model/Manufacturer	FU257CD/NIPPONDENSO
c.	Self Cancelling Device	Yes
d.	Flasher Frequency	85 ± 10 cycle/min
e.	Wattage	27W x 2 + 3.4W
12.	Self Cancelling Unit	
a.	Model/Manufacturer	1A0/MATSUSHITA
13.	Oil Level Switch	
a.	Manufacturer	NIPPONDENSO
14.	Fuel Gauge	
a.	Manufacturer	NIPPON SEIKI
b.	Sender Unit Resistance – Full	24Ω ± 10 %
	– Empty	315Ω ± 15 %
15.	Starting Circuit Cut Off Relay	
a.	Model/Manufacturer	4H7-01/OMRON
b.	Coil Winding Resistance	100Ω ± 10% at 20°C (68°F)
c.	Color Code	No. color
16.	Emergency Engine Stop Relay	
a.	Model/Manufacturer	4U8-00/OMRON
b.	Coil Winding Resistance	100Ω ± 10% at 20°C (68°F)
c.	Color Code	Blue
17.	Sidestand Relay	
a.	Model/Manufacturer	4U8-00/OMRON
b.	Coil Winding Resistance	100Ω ± 10% at 20°C (68°F)
c.	Color Code	Blue

18.	Fuel Pump Relay	
a.	Model/Manufacturer	5A8-00/OMRON
b.	Coil Winding Resistance	100Ω ± 10% at 20°C (68°F)
c.	Color Code	Red
19.	Fuel Pump	
a.	Manufacturer	NIPPONDENSO
b.	Consumption Amperage	2A or less
c.	Output Pressure	60 L (13.2 Imp gal, 15.9 US gal)
20.	Circuit Breaker	
a.	Type	Fuse
b.	Amperage for Individual Circuit	
	Main	20A/1 pc.
	Headlight	10A/1 pc.
	Signal	10A/1 pc.
	Ignition	10A/1 pc.
	Tail (In Headlight body)	5A/1 pc.

General Torque Specifications

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a criss-cross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.



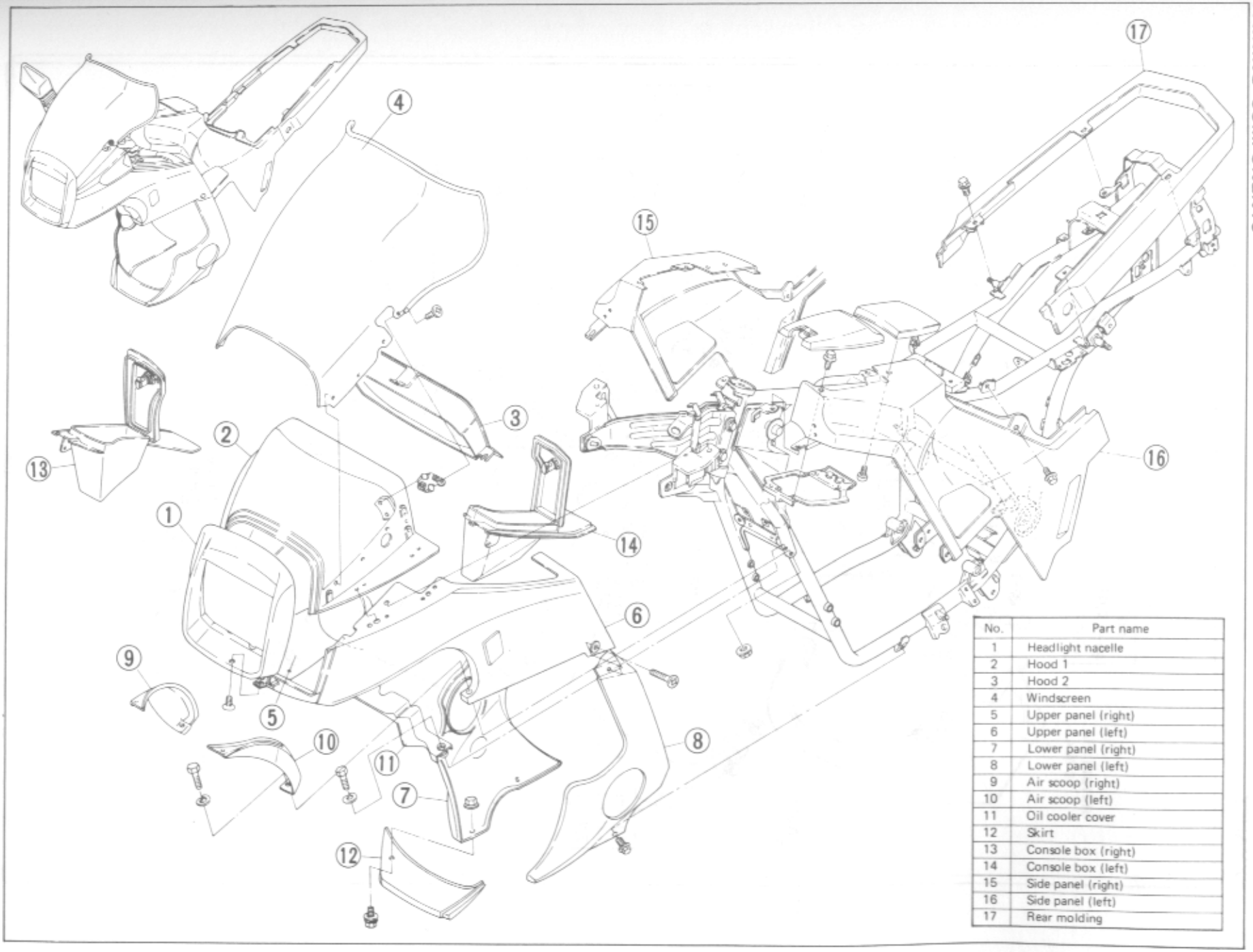
A: Distance across flats
B: Outside thread diameter

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m·kg	ft·lb
10 mm	6 mm	6	0.6	4.5
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	51
22 mm	16 mm	130	13.0	94

CONVERSION TABLES

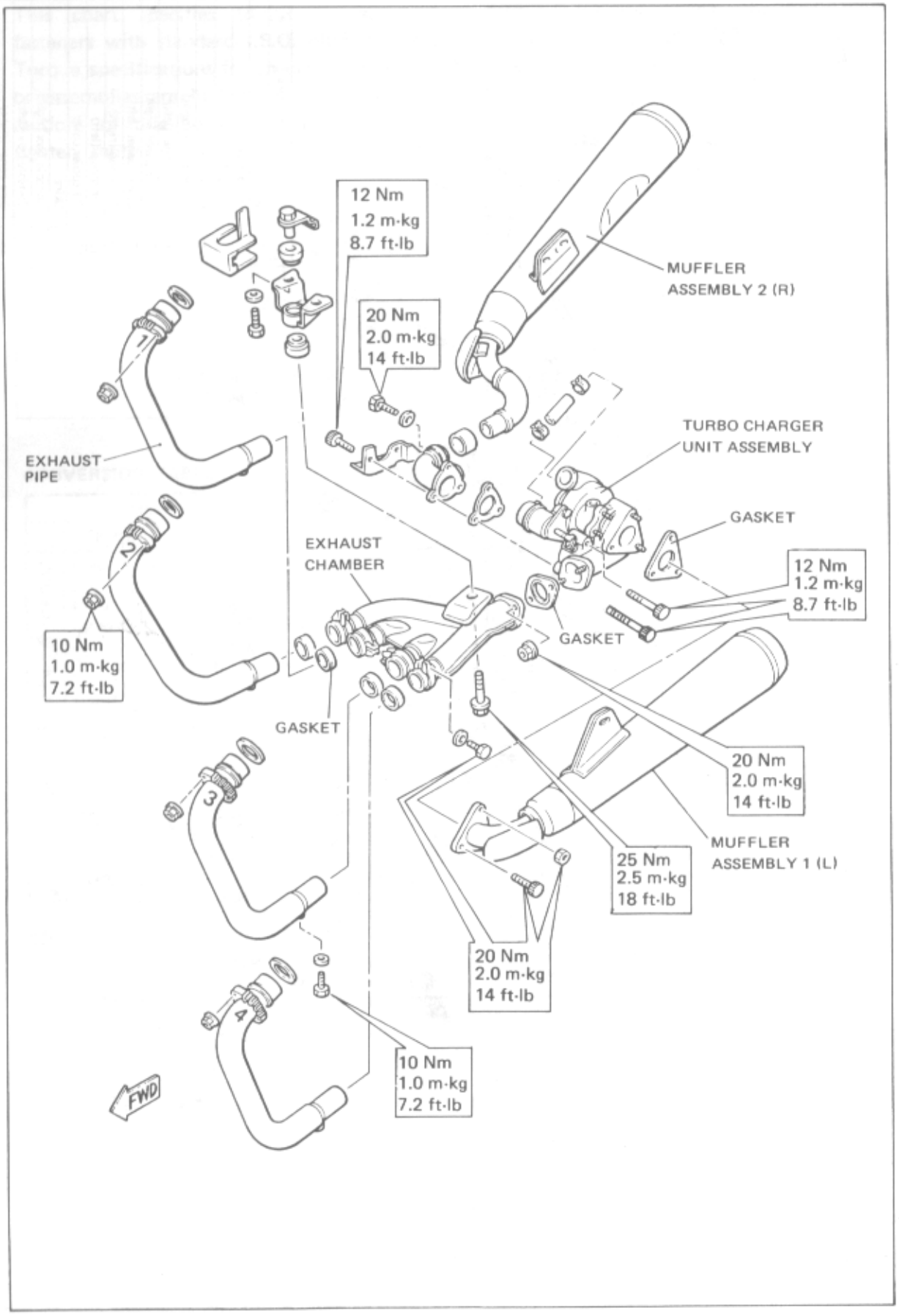
METRIC TO INCH SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	m·kg	7.233	ft·lb
	m·kg	86.80	in·lb
	cm·kg	0.0723	ft·lb
	cm·kg	0.8680	in·lb
WT.	kg	2.205	lb
	g	0.03527	oz
FLOW/DISTANCE	km/lit	2.352	mpg
	km/hr	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
VOL./ CAPACITY	cc (cm^3)	0.03382	oz (US liq)
	cc (cm^3)	0.06102	cu.in
	lit (liter)	2.1134	pt (US liq)
	lit (liter)	1.057	qt (US liq)
	lit (liter)	0.2642	gal (US liq)
MISC.	kg/mm	56.007	lb/in
	kg/cm^2	14.2234	psi (lb/in^2)
	Centigrade (°C)	9/5(°C) + 32	Fahrenheit (°F)

INCH TO METRIC SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	ft·lb	0.13826	m·kg
	in·lb	0.01152	m·kg
	ft·lb	13.831	cm·kg
	in·lb	1.1521	cm·kg
WT.	lb	0.4535	kg
	oz	28.352	g
FLOW/DISTANCE	mpg	0.4252	km/lit
	mph	1.609	km/hr
	mi	1.609	km
	ft	0.3048	m
	yd	0.9141	m
	in	2.54	cm
	in	25.4	mm
VOL./ CAPACITY	oz (US liq)	29.57	cc (cm^3)
	cu.in	16.387	cc (cm^3)
	pt (US liq)	0.4732	lit (liter)
	qt (US liq)	0.9461	lit (liter)
	gal (US liq)	3.785	lit (liter)
MISC.	lb/in	0.017855	kg/mm
	psi (lb/in^2)	0.07031	kg/cm^2
	Fahrenheit (°C)	5/9(°F−32)	Centigrade (°F)

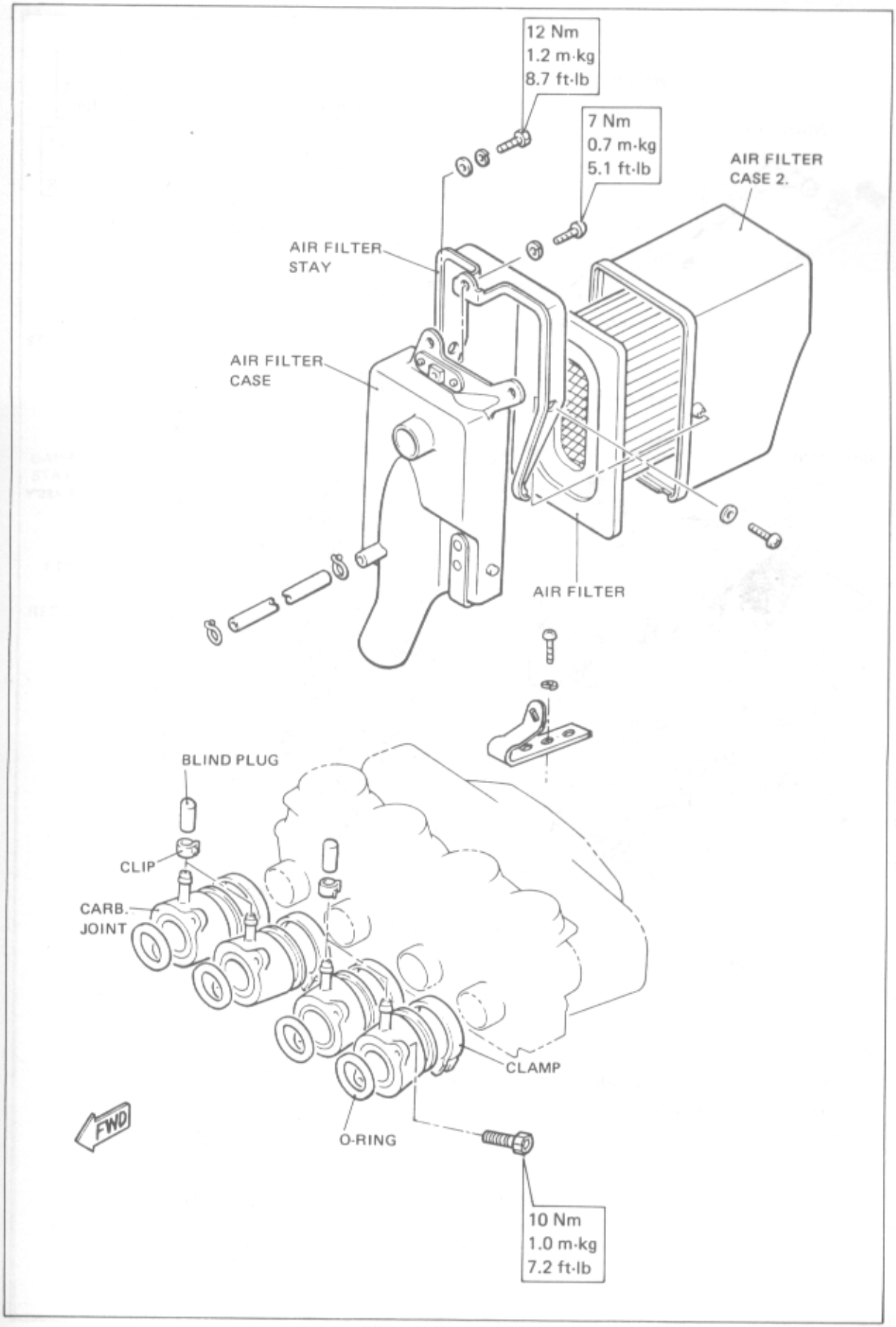


No.	Part name
1	Headlight nacelle
2	Hood 1
3	Hood 2
4	Windscreen
5	Upper panel (right)
6	Upper panel (left)
7	Lower panel (right)
8	Lower panel (left)
9	Air scoop (right)
10	Air scoop (left)
11	Oil cooler cover
12	Skirt
13	Console box (right)
14	Console box (left)
15	Side panel (right)
16	Side panel (left)
17	Rear molding

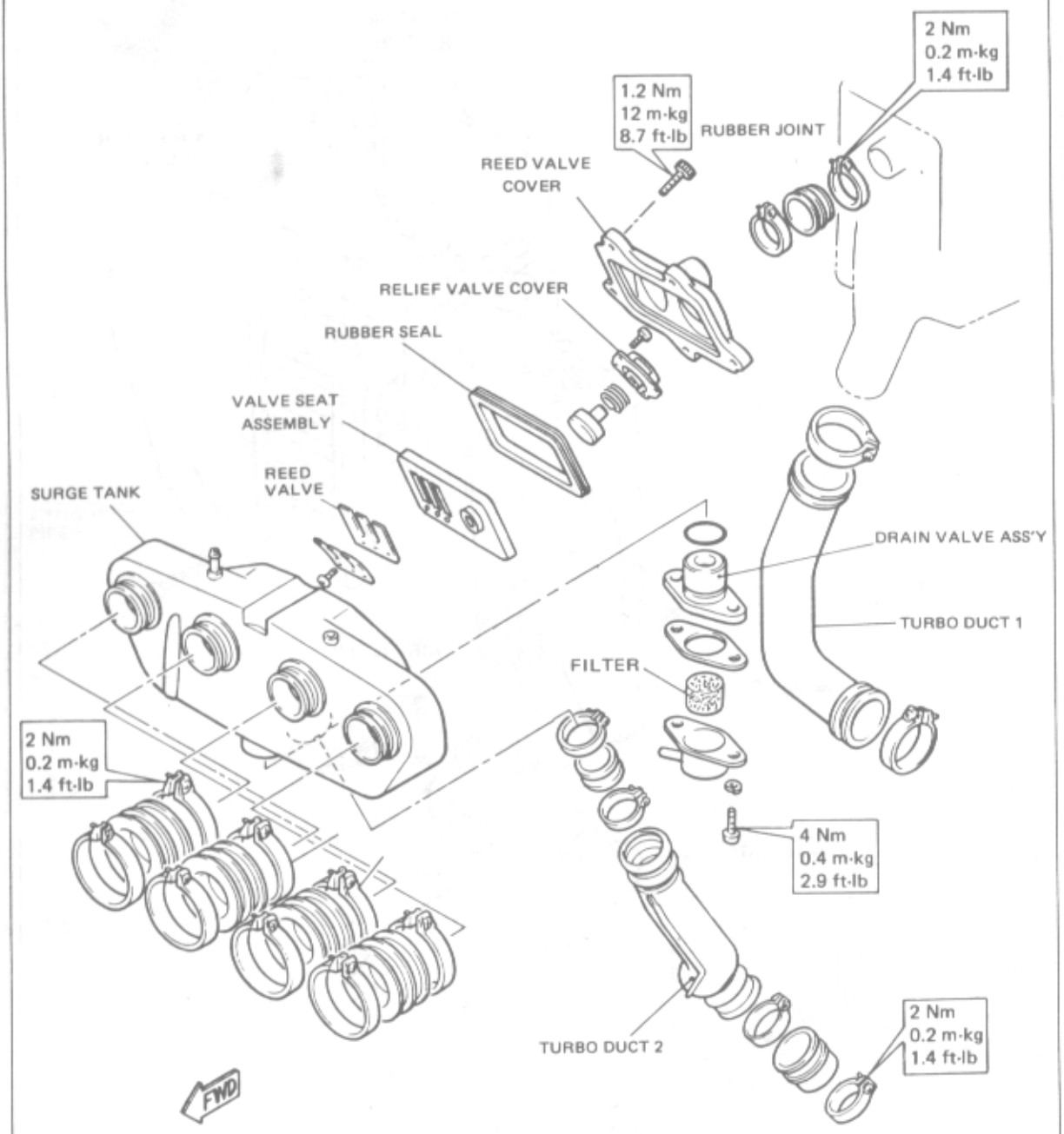
EXHAUST


12 Nm
1.2 m·kg
8.7 ft·lb
MUFFLER
ASSEMBLY 2 (R)
20 Nm
2.0 m·kg
14 ft·lb
TURBO CHARGER
UNIT ASSEMBLY
EXHAUST
PIPE
GASKET
EXHAUST
CHAMBER
12 Nm
1.2 m·kg
8.7 ft·lb
GASKET
10 Nm
1.0 m·kg
7.2 ft·lb
GASKET
20 Nm
2.0 m·kg
14 ft·lb
MUFFLER
ASSEMBLY 1 (L)
25 Nm
2.5 m·kg
18 ft·lb
20 Nm
2.0 m·kg
14 ft·lb
10 Nm
1.0 m·kg
7.2 ft·lb
FWD

INTAKE

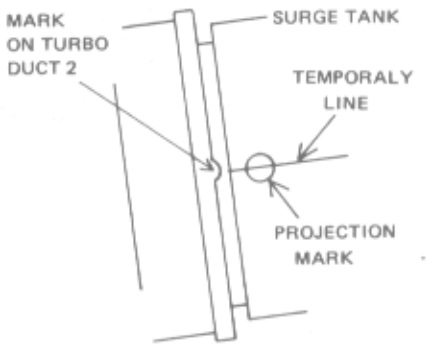

12 Nm
1.2 m·kg
8.7 ft·lb
7 Nm
0.7 m·kg
5.1 ft·lb
AIR FILTER
CASE 2.
AIR FILTER
STAY
AIR FILTER
CASE
AIR FILTER
BLIND PLUG
CLIP
CARB.
JOINT
CLAMP
FWD
O-RING
10 Nm
1.0 m·kg
7.2 ft·lb

SURGE TANK

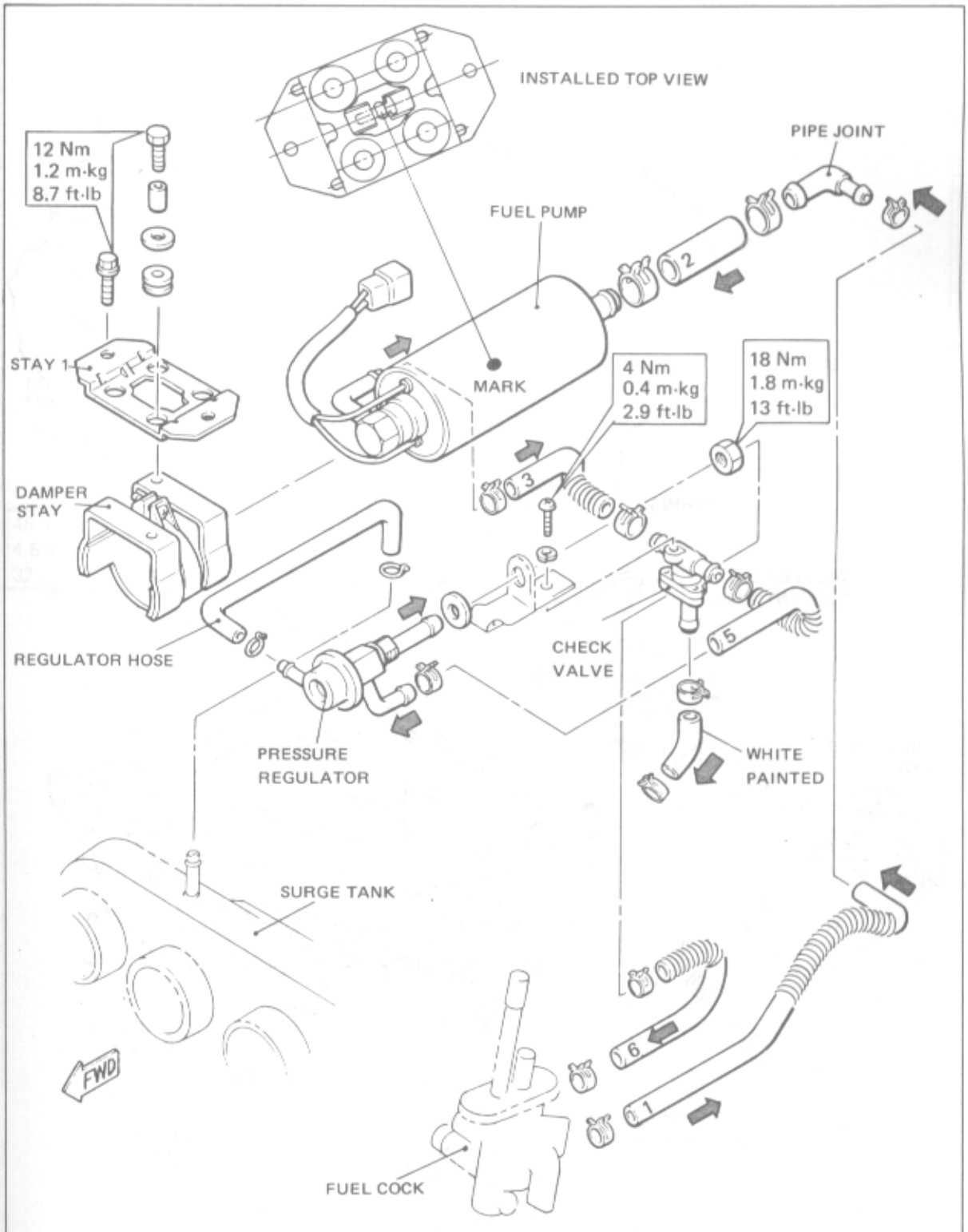


NOTE:

The mark on the turbo duct 2 should be aligned to the surge tank mark.



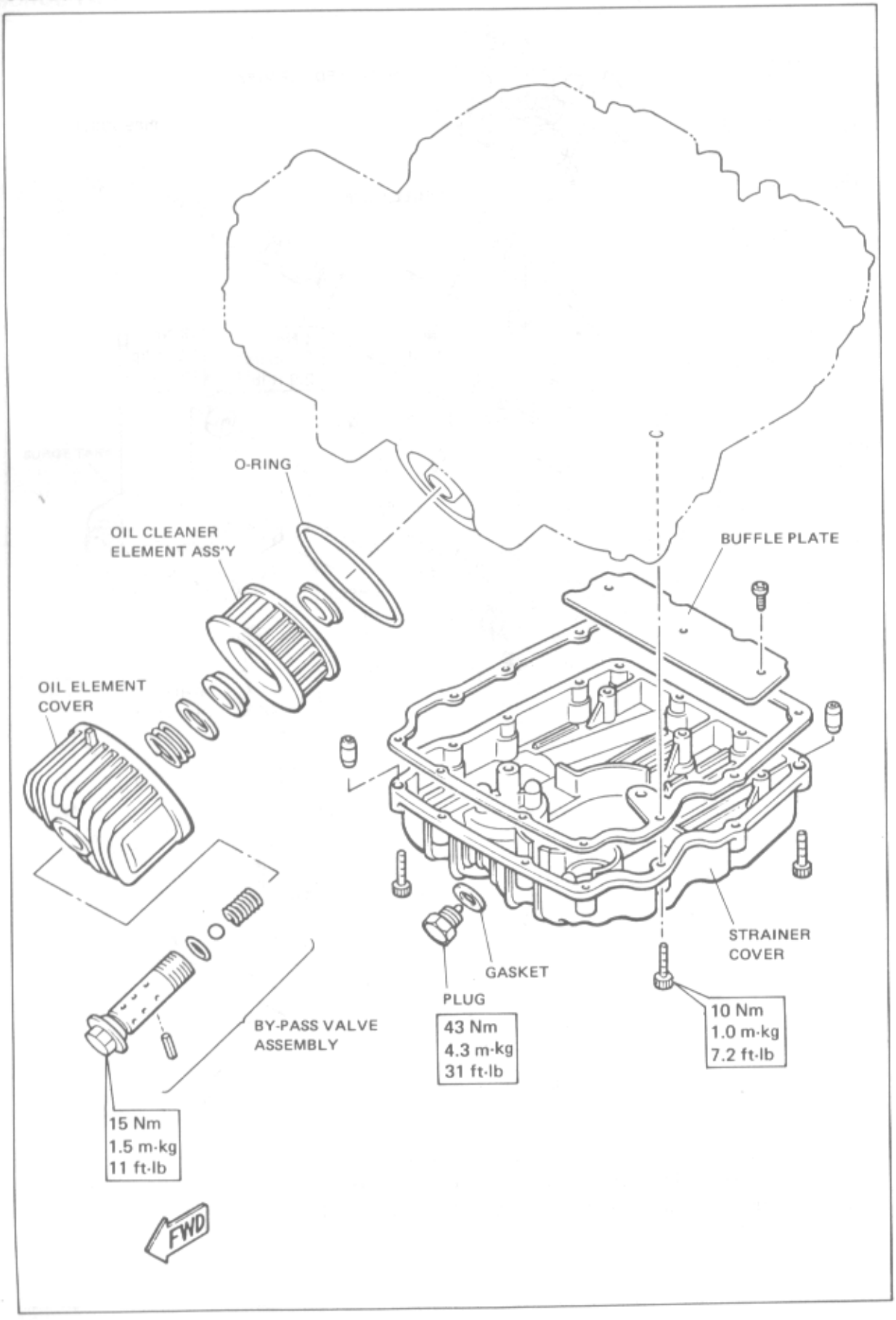
FUEL PUMP



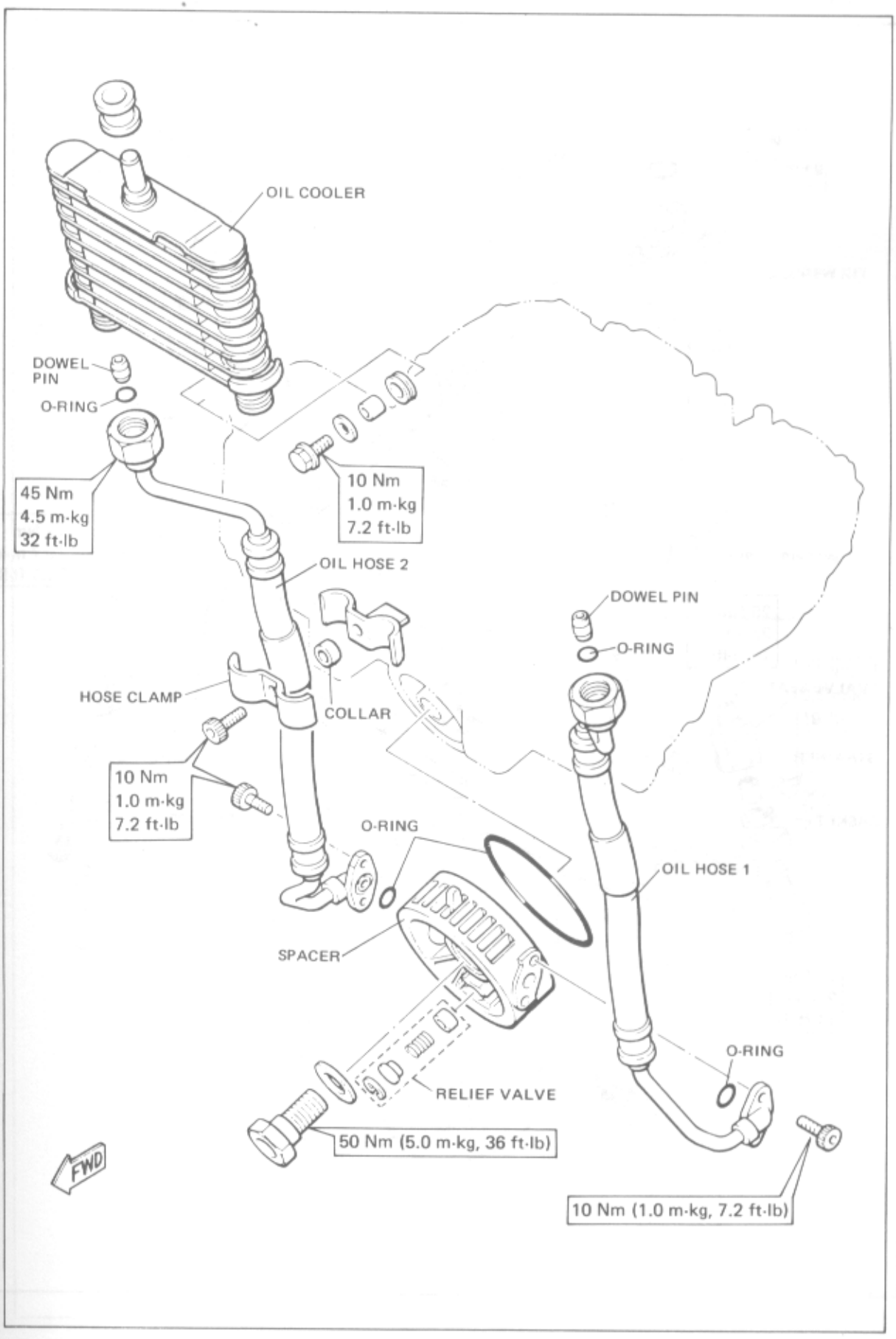
NOTE:

1. The arrow marks (➡) show the fuel flow direction.
2. The fuel hoses and hose clamps should be securely fitted.

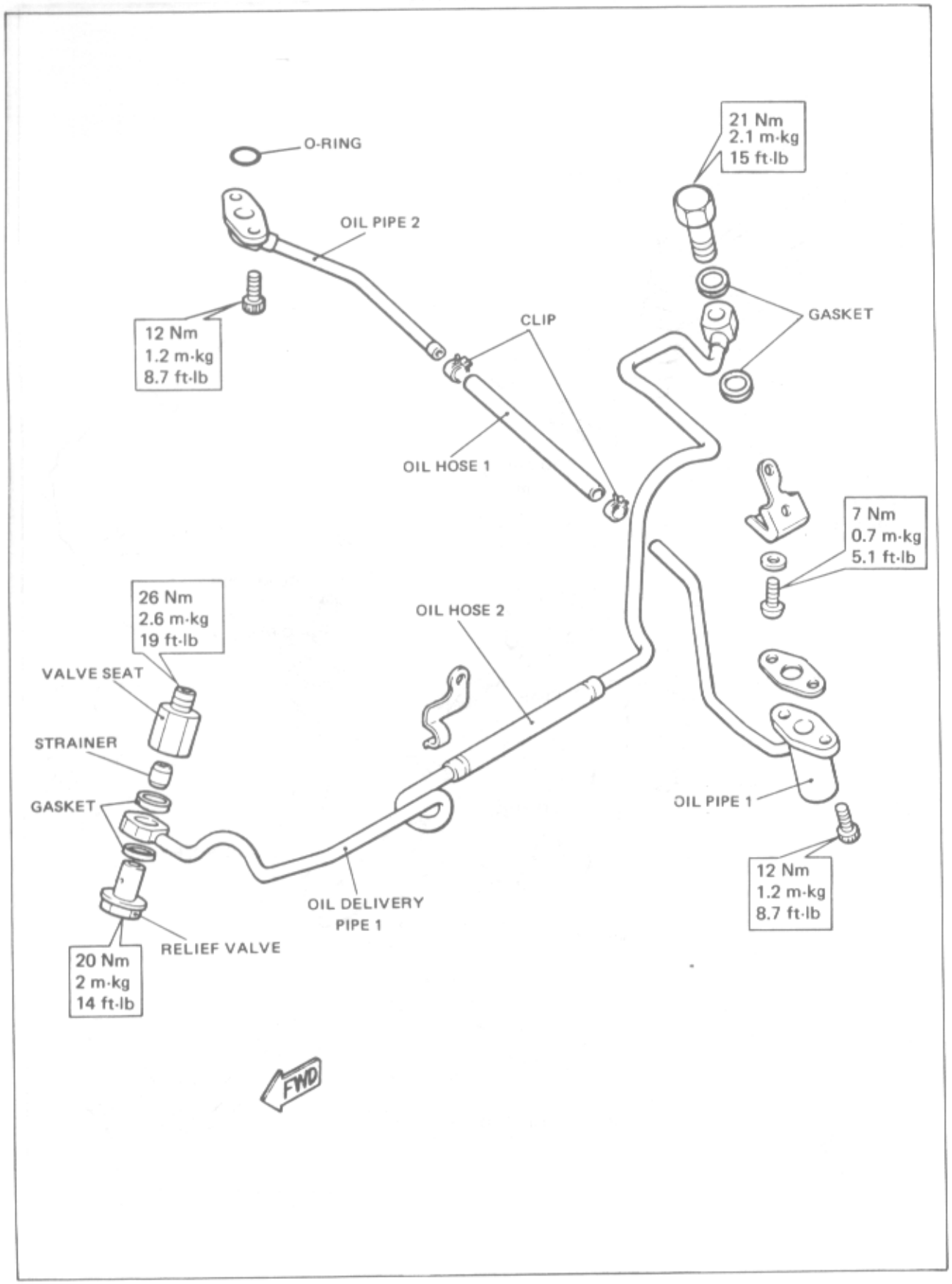
OIL CLEANER


O-RING
OIL CLEANER
ELEMENT ASS'Y
BUFFLE PLATE
OIL ELEMENT
COVER
STRAINER
COVER
GASKET
PLUG
43 Nm
4.3 m·kg
31 ft·lb
10 Nm
1.0 m·kg
7.2 ft·lb
BY-PASS VALVE
ASSEMBLY
15 Nm
1.5 m·kg
11 ft·lb
FWD

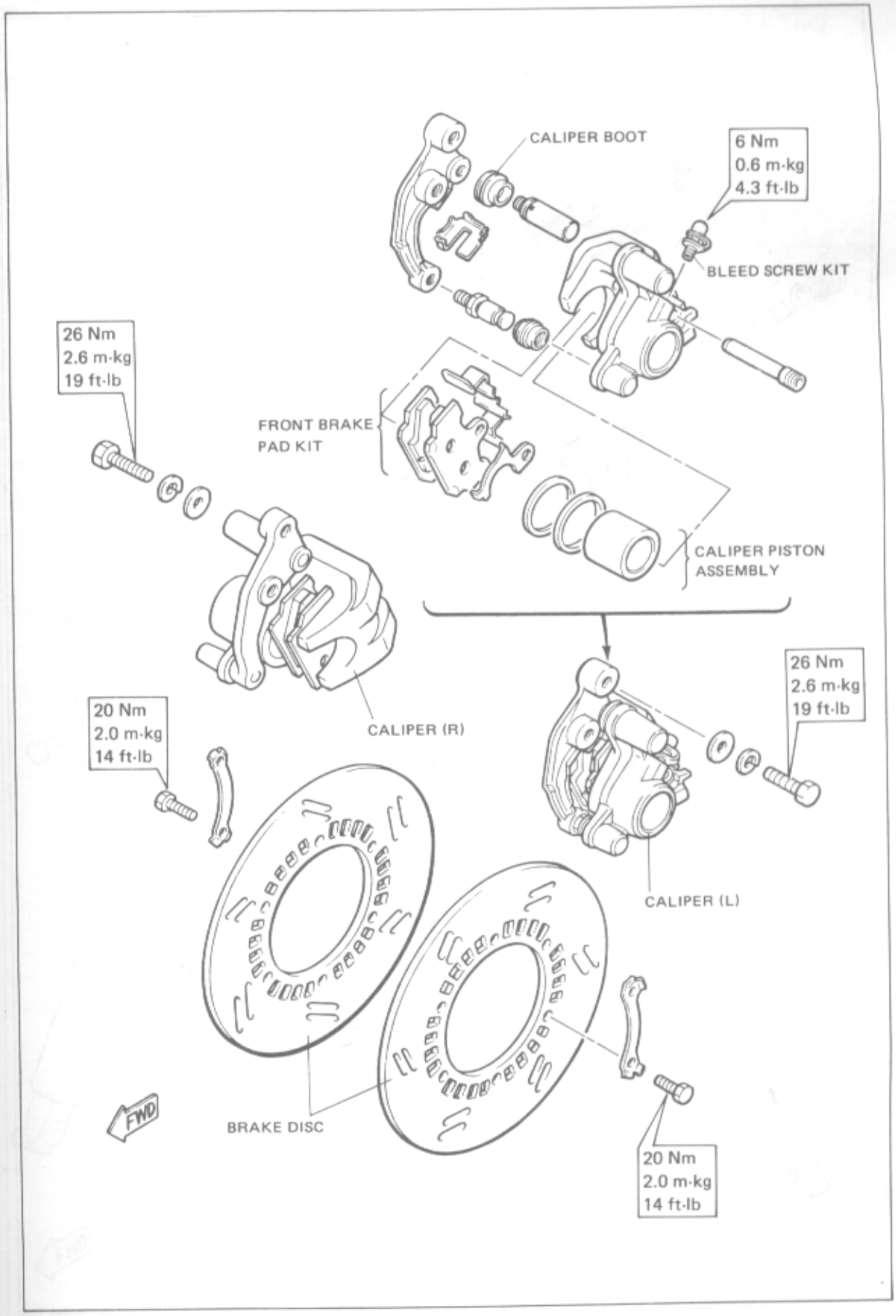
OIL COOLER


OIL COOLER
DOWEL PIN
O-RING
45 Nm
4.5 m·kg
32 ft·lb
10 Nm
1.0 m·kg
7.2 ft·lb
OIL HOSE 2
DOWEL PIN
O-RING
HOSE CLAMP
COLLAR
10 Nm
1.0 m·kg
7.2 ft·lb
O-RING
OIL HOSE 1
SPACER
O-RING
RELIEF VALVE
50 Nm (5.0 m·kg, 36 ft·lb)
FWD
10 Nm (1.0 m·kg, 7.2 ft·lb)

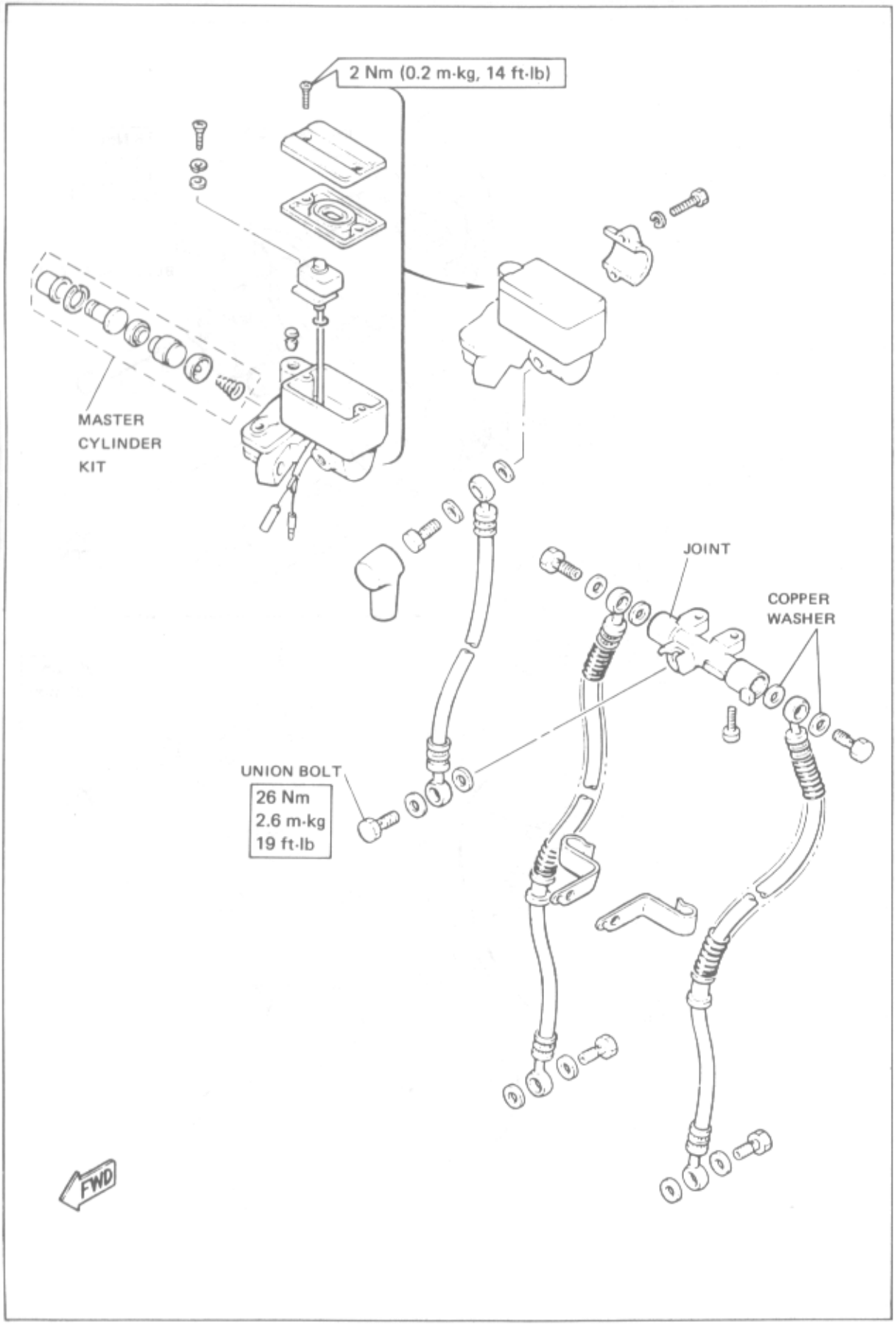
OIL PIPE FOR TURBO UNIT



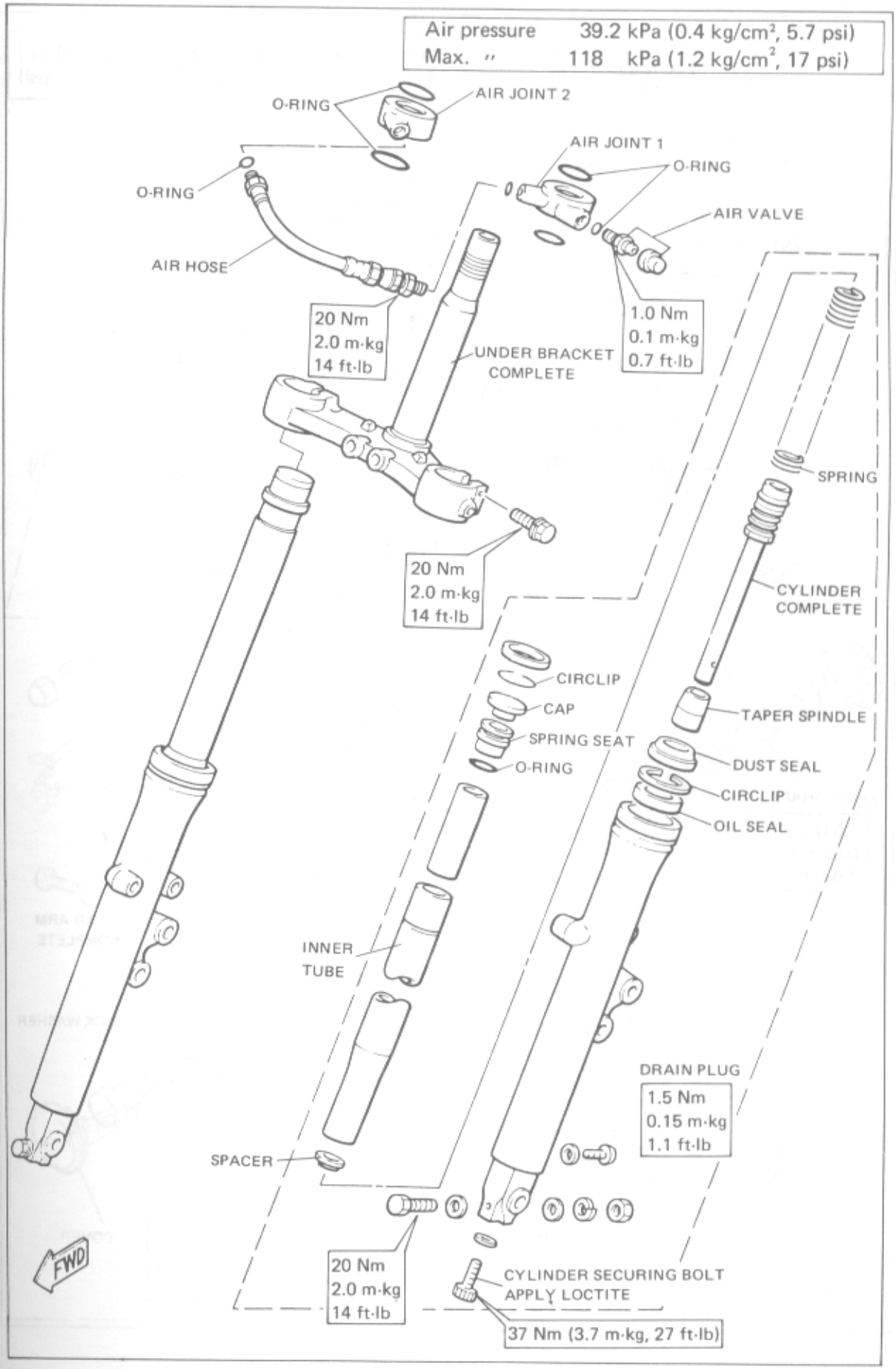
FRONT BRAKE CALIPER



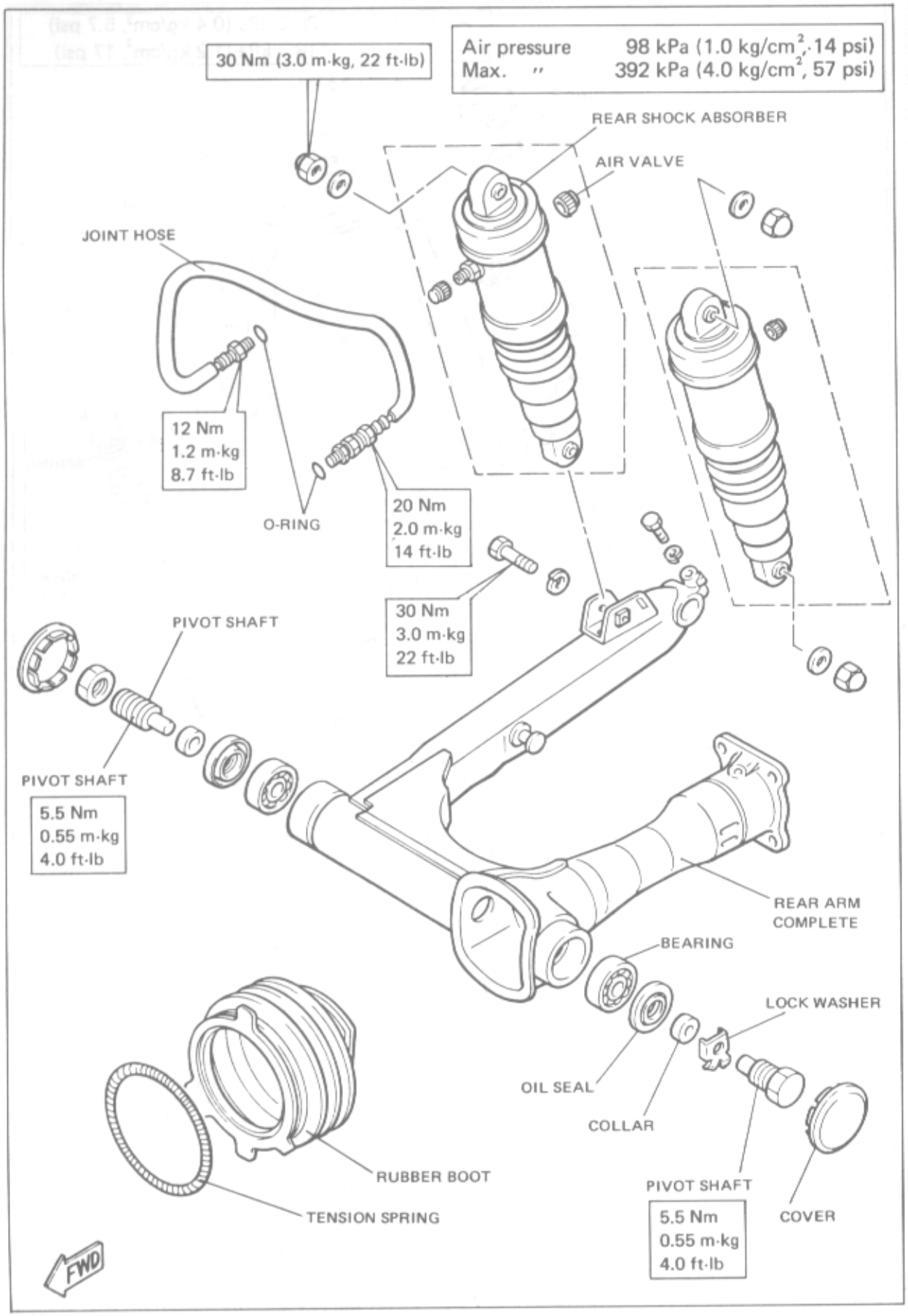
FRONT MASTER CYLINDER



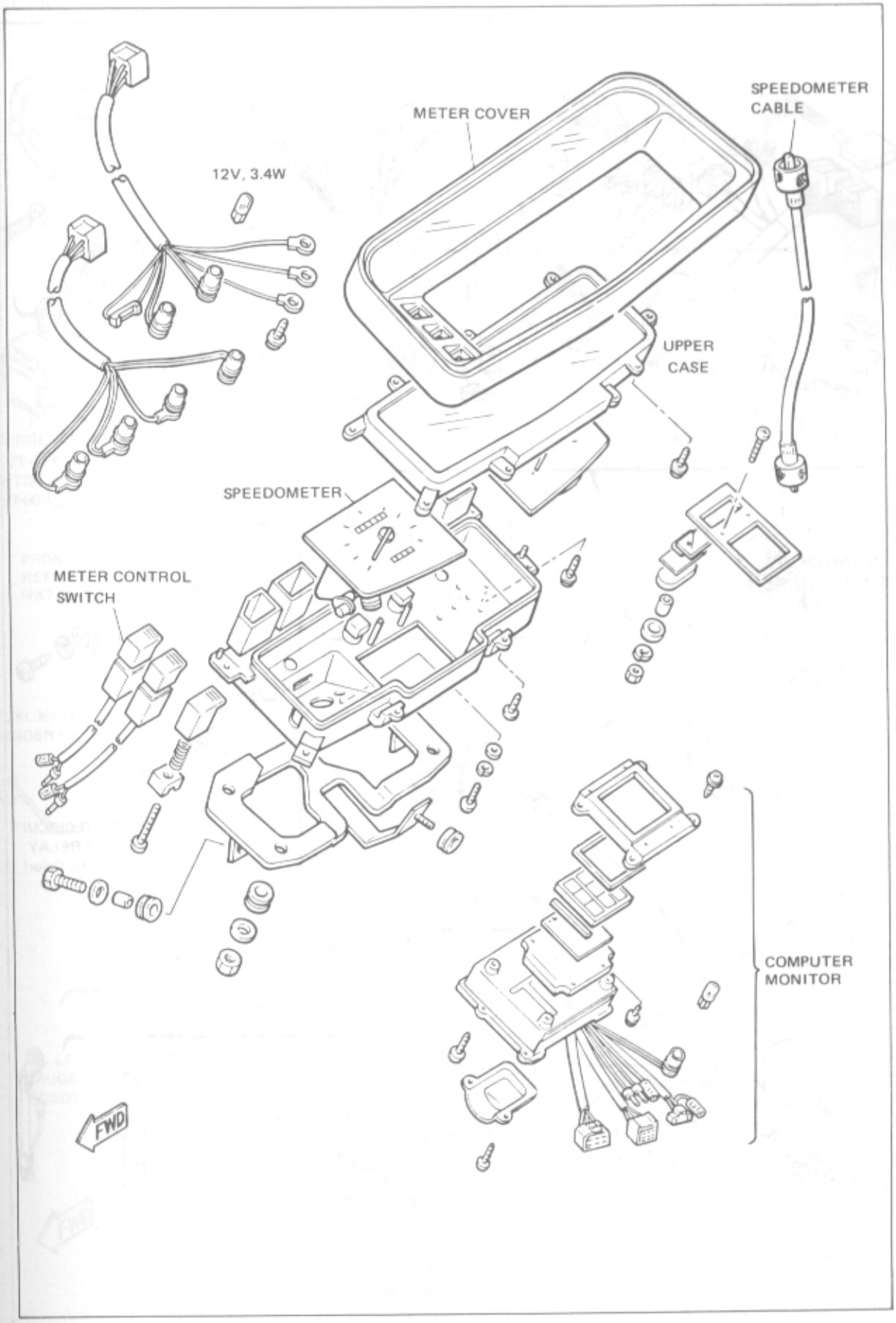
FRONT FORK

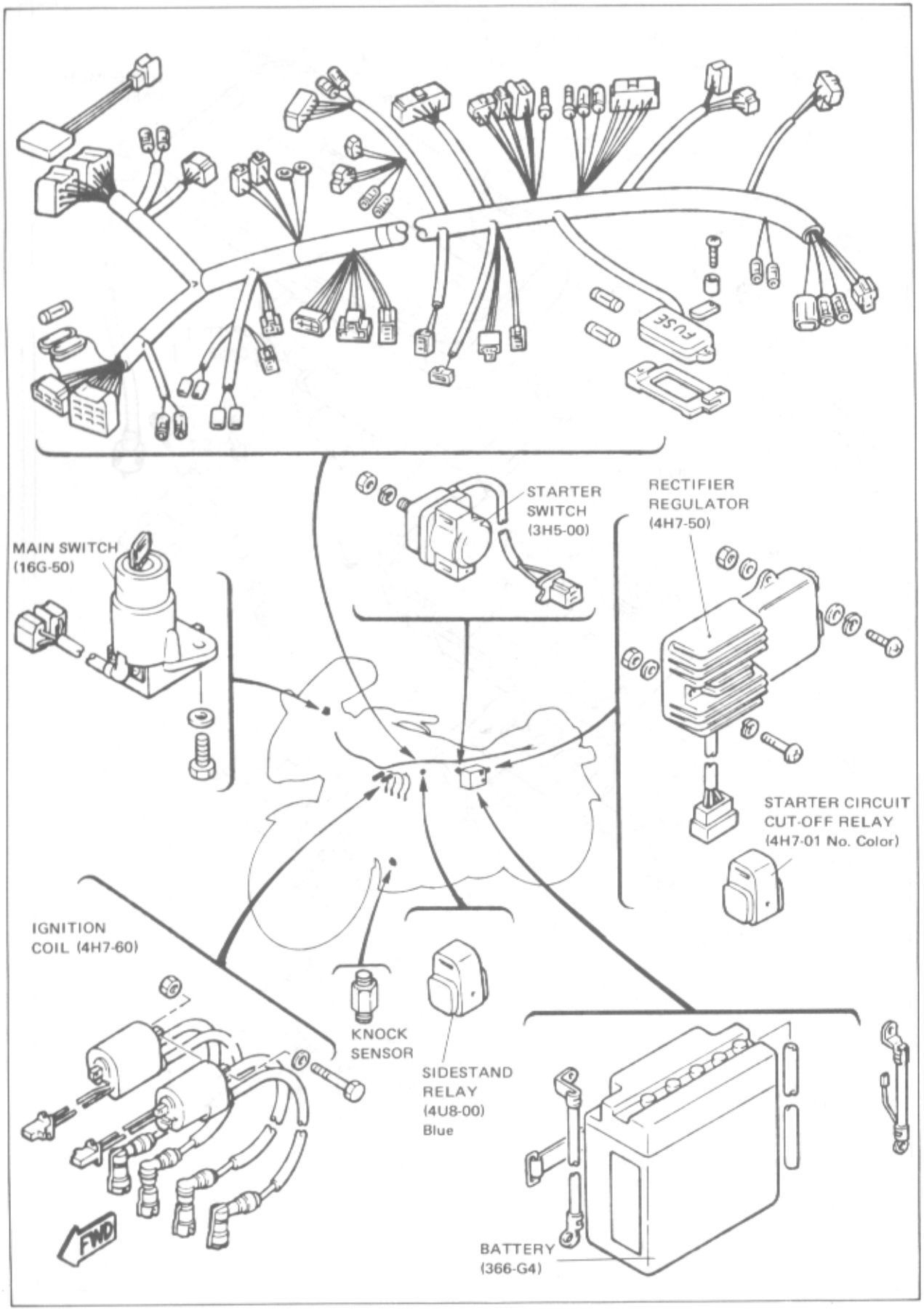

Air pressure 39.2 kPa (0.4 kg/cm², 5.7 psi)
Max. " 118 kPa (1.2 kg/cm², 17 psi)
O-RING
AIR JOINT 2
AIR JOINT 1
O-RING
O-RING
AIR VALVE
AIR HOSE
20 Nm
2.0 m·kg
14 ft·lb
1.0 Nm
0.1 m·kg
0.7 ft·lb
UNDER BRACKET
COMPLETE
SPRING
20 Nm
2.0 m·kg
14 ft·lb
CYLINDER
COMPLETE
CIRCLIP
CAP
TAPER SPINDLE
SPRING SEAT
DUST SEAL
O-RING
CIRCLIP
OIL SEAL
INNER
TUBE
DRAIN PLUG
1.5 Nm
0.15 m·kg
1.1 ft·lb
SPACER
FWD
20 Nm
2.0 m·kg
14 ft·lb
CYLINDER SECURING BOLT
APPLY LOCTITE
37 Nm (3.7 m·kg, 27 ft·lb)

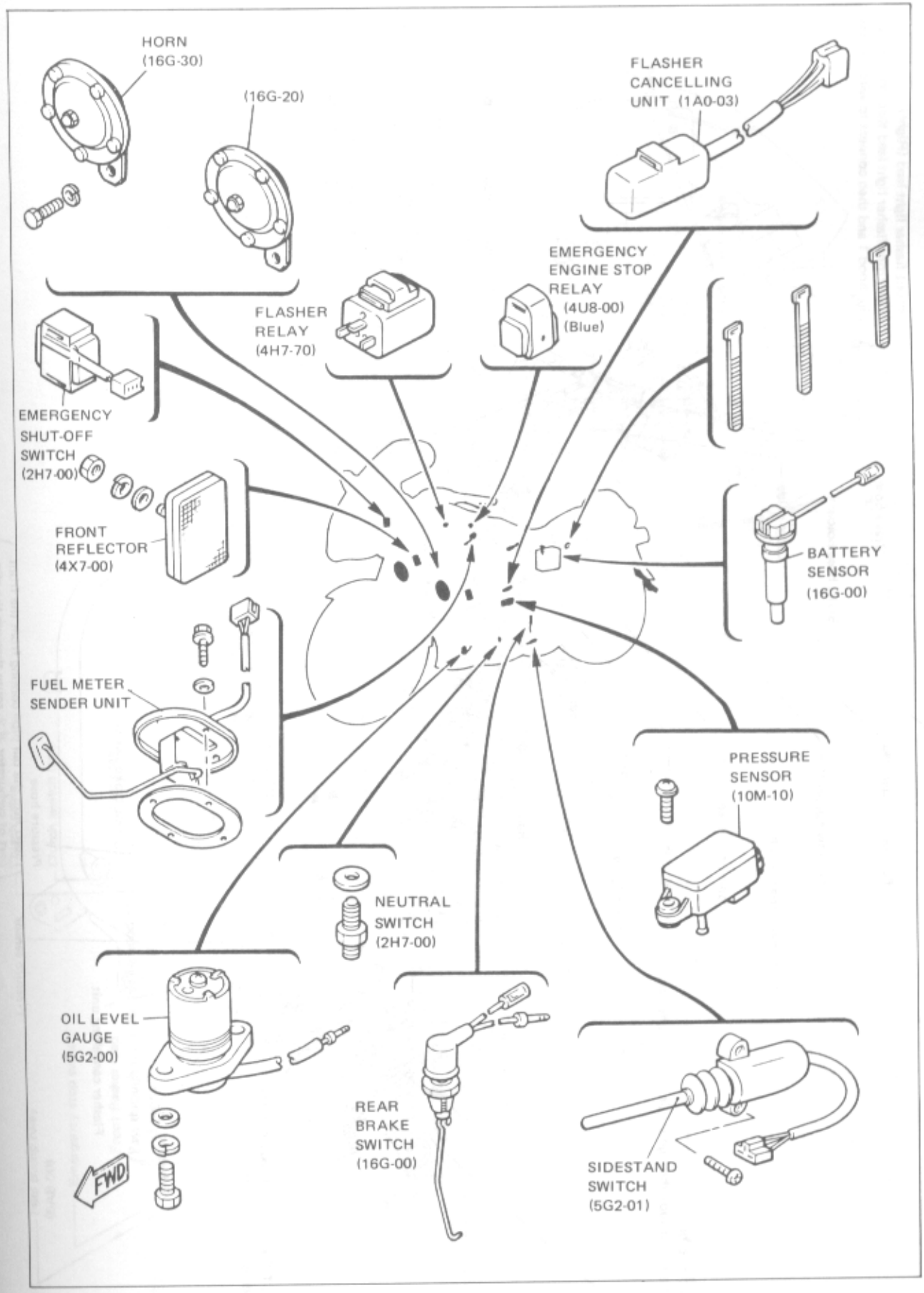
REAR ARM/SUSPENSION

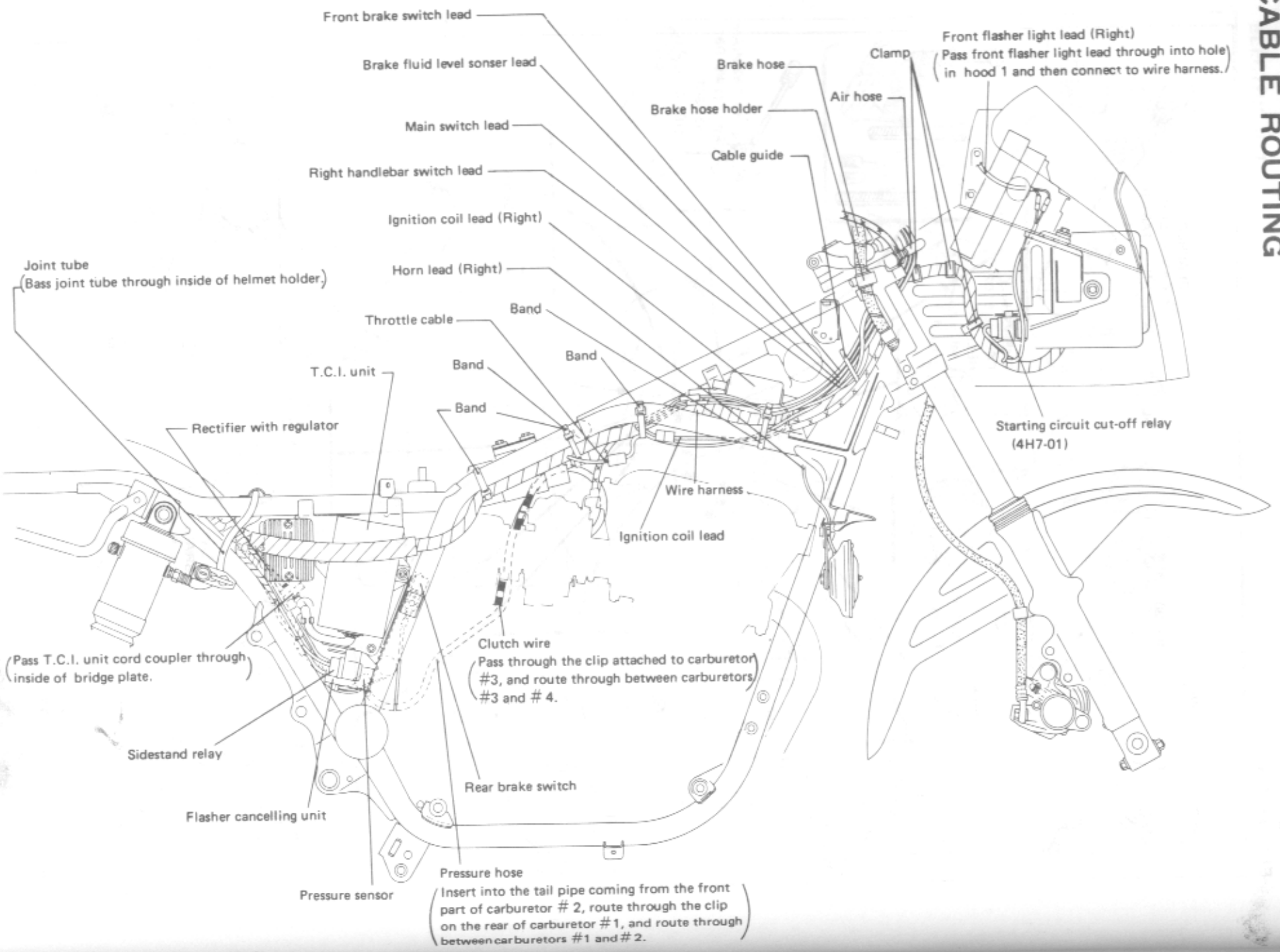


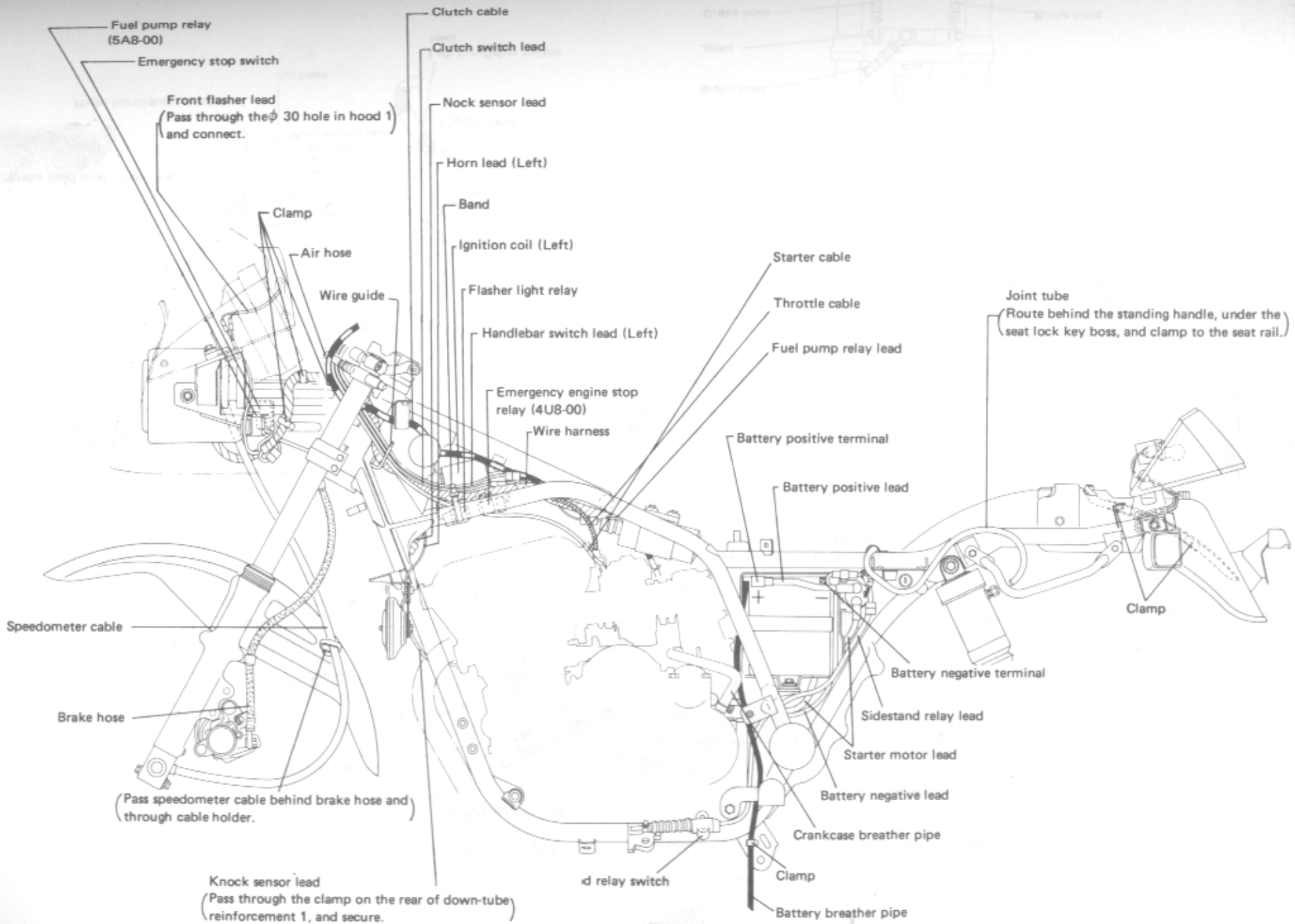
SPEEDOMETER/TACHOMETER

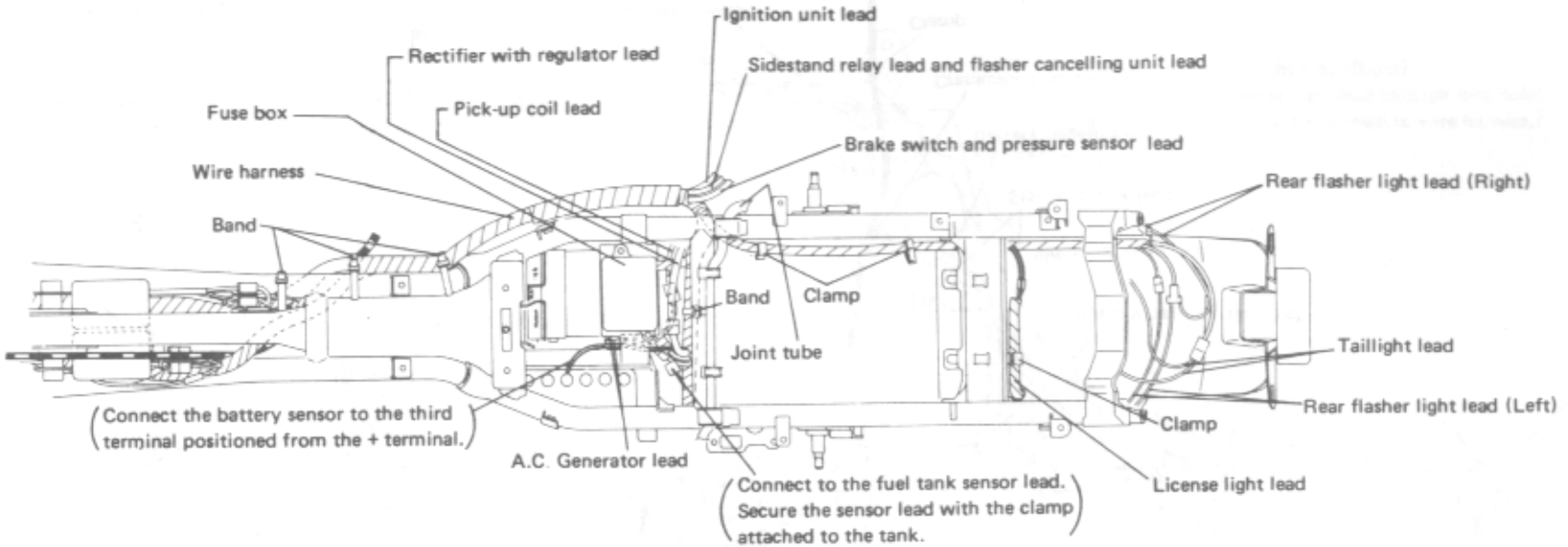


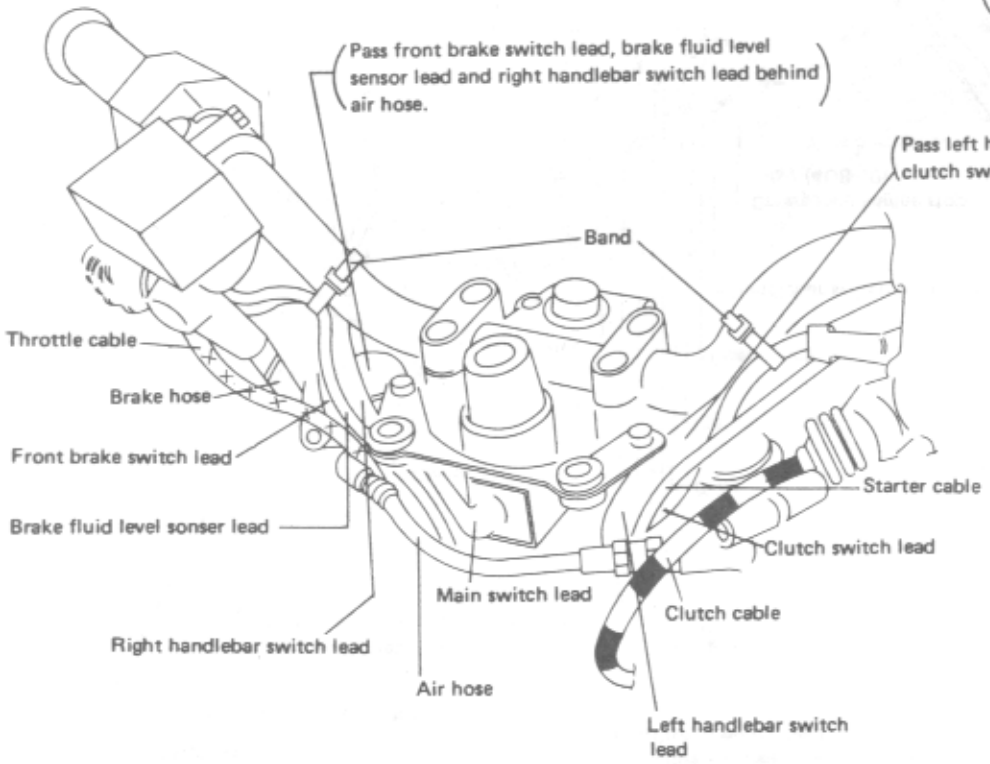

FUSE
STARTER SWITCH (3H5-00)
RECTIFIER REGULATOR (4H7-50)
MAIN SWITCH (16G-50)
STARTER CIRCUIT CUT-OFF RELAY (4H7-01 No. Color)
IGNITION COIL (4H7-60)
KNOCK SENSOR
SIDESTAND RELAY (4U8-00) Blue
FWD
BATTERY (366-G4)

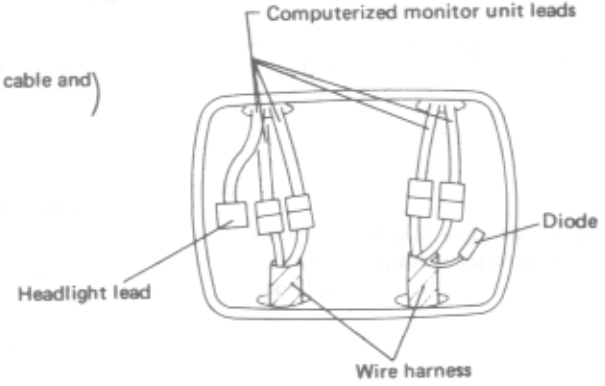

HORN
(16G-30)
(16G-20)
FLASHER
CANCELLING
UNIT (1A0-03)
EMERGENCY
ENGINE STOP
RELAY
(4U8-00)
(Blue)
FLASHER
RELAY
(4H7-70)
EMERGENCY
SHUT-OFF
SWITCH
(2H7-00)
FRONT
REFLECTOR
(4X7-00)
BATTERY
SENSOR
(16G-00)
FUEL METER
SENDER UNIT
PRESSURE
SENSOR
(10M-10)
NEUTRAL
SWITCH
(2H7-00)
OIL LEVEL
GAUGE
(5G2-00)
REAR
BRAKE
SWITCH
(16G-00)
SIDESTAND
SWITCH
(5G2-01)
FWD

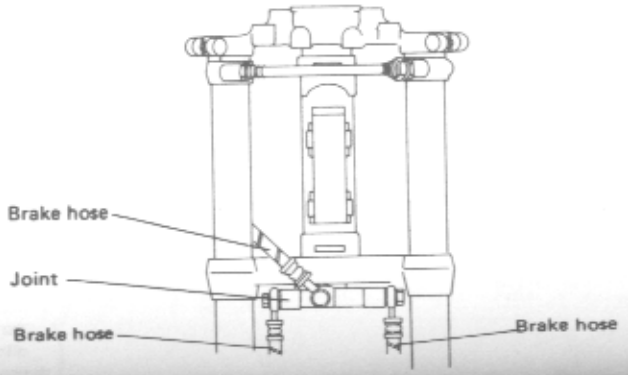

Front brake switch lead
Brake fluid level sonser lead
Main switch lead
Right handlebar switch lead
Ignition coil lead (Right)
Horn lead (Right)
Throttle cable
Band
Band
Band
Band
Band
Joint tube
(Bass joint tube through inside of helmet holder.)
T.C.I. unit
Rectifier with regulator
Brake hose
Brake hose holder
Cable guide
Clamp
Air hose
Front flasher light lead (Right)
(Pass front flasher light lead through into hole in hood 1 and then connect to wire harness.)
Starting circuit cut-off relay
(4H7-01)
Wire harness
Ignition coil lead
Clutch wire
(Pass through the clip attached to carburetor #3, and route through between carburetors #3 and # 4.)
(Pass T.C.I. unit cord coupler through inside of bridge plate.)
Sidestand relay
Flasher cancelling unit
Rear brake switch
Pressure sensor
Pressure hose
(Insert into the tail pipe coming from the front part of carburetor # 2, route through the clip on the rear of carburetor # 1, and route through between carburetors #1 and # 2.)


Fuel pump relay (5A8-00)
Emergency stop switch
Front flasher lead
(Pass through the ϕ 30 hole in hood 1 and connect.)
Clutch cable
Clutch switch lead
Nock sensor lead
Horn lead (Left)
Band
Ignition coil (Left)
Flasher light relay
Handlebar switch lead (Left)
Emergency engine stop relay (4U8-00)
Wire harness
Clamp
Air hose
Wire guide
Starter cable
Throttle cable
Fuel pump relay lead
Joint tube
(Route behind the standing handle, under the seat lock key boss, and clamp to the seat rail.)
Battery positive terminal
Battery positive lead
Clamp
Speedometer cable
Brake hose
(Pass speedometer cable behind brake hose and through cable holder.)
Knock sensor lead
(Pass through the clamp on the rear of down-tube reinforcement 1, and secure.)
Battery negative terminal
Sidestand relay lead
Starter motor lead
Battery negative lead
Crankcase breather pipe
Clamp
Battery breather pipe


Ignition unit lead
Rectifier with regulator lead
Sidestand relay lead and flasher cancelling unit lead
Fuse box
Pick-up coil lead
Brake switch and pressure sensor lead
Wire harness
Rear flasher light lead (Right)
Band
Band
Clamp
Joint tube
Taillight lead
Rear flasher light lead (Left)
Clamp
Connect the battery sensor to the third terminal positioned from the + terminal.
A.C. Generator lead
License light lead
Connect to the fuel tank sensor lead. Secure the sensor lead with the clamp attached to the tank.


Pass front brake switch lead, brake fluid level sensor lead and right handlebar switch lead behind air hose.
Pass left handlebar switch lead, starter cable and clutch switch lead behind air hose.
Band
Throttle cable
Brake hose
Front brake switch lead
Brake fluid level sonser lead
Starter cable
Clutch switch lead
Main switch lead
Clutch cable
Right handlebar switch lead
Air hose
Left handlebar switch lead


Computerized monitor unit leads
Diode
Headlight lead
Wire harness


Brake hose
Joint
Brake hose
Brake hose