

'90 TUNE-UP MANUAL FOR OW 01

FZR750R LIMITED EDITION



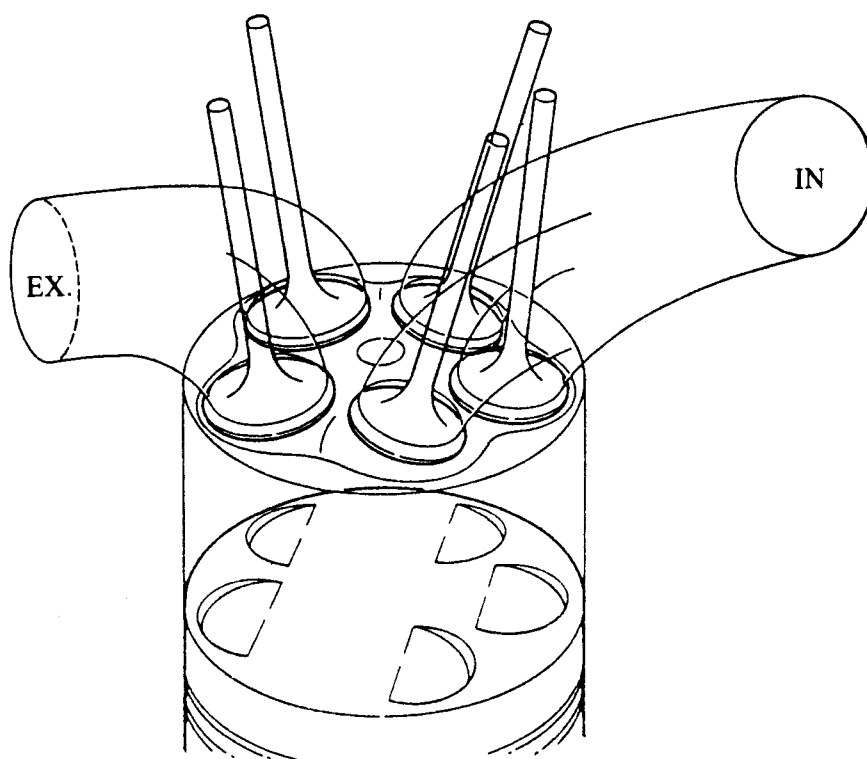
YEC

Please note:

- These parts are intended exclusively for racing purposes. You are strictly requested not to use them for a public road ride.
Please abide by the laws of your own country.

No warranty allowed:

- These parts are prepared for the specific purpose of racing. Thus, please understand that they are not covered under warranty.



Specifications are subject to change without
notice for improvement.

Engine specifications (Endurance races, Sprint races kit)

Item	
Engine type	4-cycle, water-cooled, DOHC 5-valve
Bore	72.35 mm (STD = 72 mm)
Stroke	46 mm
Displacement	756.5 cc (STD = 749 cc)
Compression ratio	12.8
Carburetor type	BDST38
Exhaust system	4-1 EXUP
Clutch type	Wet, multi-disk type
Transmission	Constant mesh type, 6-speed

For other service data, refer to the standard model service manual.

- The new kit installed in the engine should be replaced with a new one:

For Sprint race — Every 3,000 km

For Endurance race — Every 5,000 km

☆ This kit is for '89, '90 FZR750R (3FV1)

FZR750R kit item

Endurance races kit	Spring races kit
Gasket set	←
Piston set	←
Camshaft set	←
Piston ring set	←
Air funnel set	←
Carburetor setting parts set	←
Silencer set	←
Ignitor unit	←
Wire harness set (for endurance)	Wire harness set (for sprint)
Drive sprocket set	←
A.C.G. set	Plug set
Clutch spring	←

Optional parts

Super cross-ratio transmission
Oversize cylinder ass'y
Rear sprocket set (for rear wheel standard)
Crankshaft, driven gear set
Exhaust pipe kit
Long type air funnel (For BDST38 carburetor)
Air induction box kit (For BDST38 carburetor)
TDM38 carburetor and air induction box kit
High throttle kit (For BDST38 carburetor)
Clutch push lever kit

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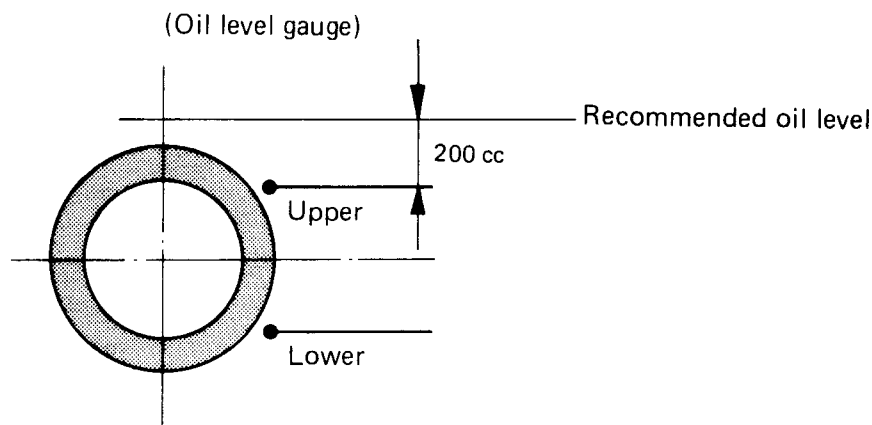
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1. Tuning methods for basic engines (Endurance races, Sprint races kit)

1) Engine oil level setting

Always maintain the engine oil level higher than the lower level line in a racing circuit. Otherwise, engine trouble may result.

To set the oil level, first warm up the engine (the cooling water temperature should be higher than 70°C) and then stop the engine. Five minutes later, add the engine oil up to the upper level, and again add 200 cc of oil. No power loss will result from this oil level.



CAUTION:

Be sure to use the standard type inlet for the oil strainer.

2) Adjustment of intake and exhaust valve clearances

The on-the-market FZR750R has the valve clearance set to meet the intended performance and the related noise regulations.

When you ride a motorcycle on the circuit racecourse where high engine rpm is often needed, adjust the valve clearances as follows:

In cold condition	For public road	For circuit racecourse
Intake valve (IN.)	0.11 ~ 0.20 mm	0.20 ~ 0.25 mm
Exhaust valve (EX.)	0.21 ~ 0.30 mm	0.30 ~ 0.35 mm

3) Adjustment of engine idling

Engine brake is very effective for a 4-stroke engine. Set the idling rpm a little higher than usual to get better stability in a circuit racecourse run.

1,200 rpm (Standard) \Rightarrow 1,500 ~ 1,700 rpm (Racing)

- * In relation to ignition timing advance characteristics, idling rpm deviates widely. Therefore, after a full warm up, make sure of the idling rpm again. Be careful that too high idling rpm will cause riding difficulty. (Carburetor is set to standard specification.)

4) Selection of secondary reduction sprocket

Select a secondary reduction ratio according to the conditions of the driving course and weather.

Use a drive chain of size 50. (The standard size is 532.)

(Endurance races, Sprint races kit)

No.	Part No.	Part name	Q'ty	Remarks
	1FN-17461-70	Sprocket, drive	1	15T
	1FN-17461-80	Sprocket, drive	1	16T
	1FN-17461-90	Sprocket, drive	1	17T
☆	90215-21022	Washer, lock	1	φ44 x φ25 with 5 spares

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

Driven sprockets for the Endurance kit and the sprint kit are available in 42T to 49T as options. (See P. 27)

5) Change of muffler

The '89, '90 FZR750R employs EXUP which is an exhaust system designed for increased engine torque at low and middle speeds and improved throttle response at high speeds.

The EXUP system for standard models can be used for racing without making any modification, but it is necessary to replace the silencer with the one contained in the kit.

(It is necessary for the local made muffler to change the carb. setting.)

6) Selection of spark plug (Endurance races, Sprint races kit)

Spark plug selection may depend on the individual engine and/or carburetor settings. As a guideline, however, the following spark plugs may be used.

Please pay careful attention to the clearance with the piston when a spark plug other these items is used.

NGK	ND
Resistor less	Resistor less
R217 #9	X27ES-ZU
R217 #10	X31ES-ZU
R217 #11	X34ES-ZU
R217 #12	

7) Engine break-in

Break-in the engine in the following steps: (Metal replacement and whole parts replacement)

• Idling	30 min.
• 6,000 rpm and less	15 min.
• 8,000 rpm and less	15 min.
• 9,000 rpm and less	15 min.
• 10,000 rpm and less	15 min.

CAUTION:

After break-in operation, check the tightness of engine bolts and the condition of the wire locking the drain bolt. Also, check for oil leakage and abnormal noise.

8) Others

○ Recommendable fuel

Use race gasoline or high octane gasoline.

○ Recommendable engine oil

Single grade #30-#40 or 20W-40 or equivalent
(10W-40 or 10W-50 NG)

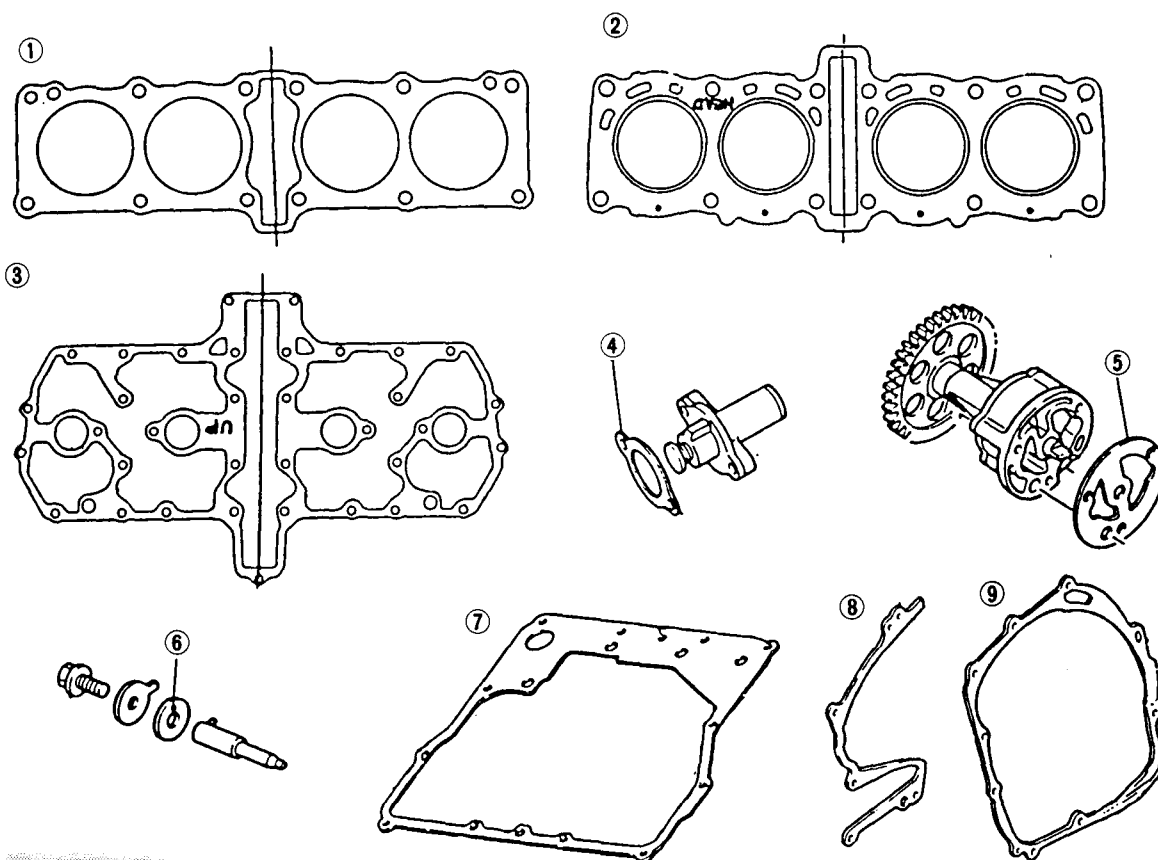
When overhauling the engine, replace both engine oil and oil filter.

2. Tuning methods by installation of kit parts (Endurance races, Sprint races kit)

CAUTION:

It is advisable to use kit parts, which are performance parts, in the form of sets. The use of these kit parts in combination with other maker's parts will have an adverse effect on kit parts.

1) Installations of cylinder gasket and cylinder head gasket



CAUTION:

- Use a new gasket for each installation.

*Install these gaskets in accordance with the procedures for the standard ones.

(See the service manual)

No.	Part No.	Part name	Q'ty	Remarks
☆ 1	3FV-11351-00	Gasket, cyl. (Metal)	1	With 2 spares
☆ 2	3FV-11181-00	Gasket, cyl. head 1	1	"
☆ 3	3FV-11182-00	Gasket, cyl. head 2	1	"
☆ 4	3OX-12213-00	Gasket, tensioner	1	"
☆ 5	2GH-13329-00	Gasket, pump cover	1	"
☆ 6	90430-06210	Gasket	1	"
☆ 7	3GM-13414-00	Gasket, strainer	1	"
☆ 8	1AE-15451-00	Gasket, crank case 1	1	"
☆ 9	2GH-15461-00	Gasket, crank case 2	1	"

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

2) Installation of high-compression piston (Endurance races, Sprint races kit)

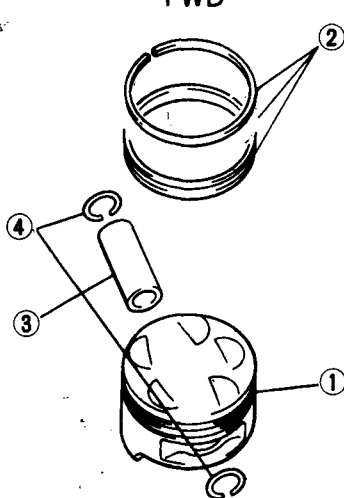
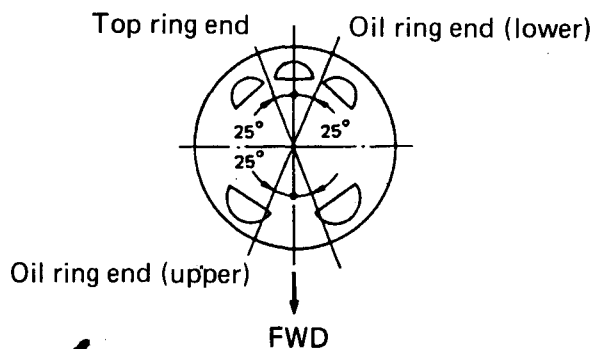
The '90 kit piston is a forged part and therefore, it is superior in strength. The piston and piston rings-should be replaced every 3,000 km of operation.

Compression ratio	12.8 ± 0.2 : 1	(A, B kit)
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Make measurements using engine oil by the volume-method or by the weight-method. The results thus obtained may somewhat vary from measurement to measurement, so they should be treated as a guideline.

Installation of piston ring

Top ring – Having nothing to do with the ring position



For installation of each ring, see the service manual.

For engine reassembly make sure that the piston pins are inserted into their original cylinders.

CAUTION:

Before installation, apply Yamaha molybdenum grease to the connecting rod small end and to the piston pin.

CAUTION:

Avoid cutting the cylinder to increase the compression ratio, or the clearance between the piston crown and cylinder head will be reduced and thus, the engine could be damaged.

	No.	Part No.	Part name	Q'ty	Remarks
	1	3FV-11631-71	Piston	4	
	2	3FV-11610-70	Piston, ring ass'y	4	
☆	3	2GH-11633-02	Pin, piston	4	
☆	4	93450-19052	Circlip (φ19)	8	

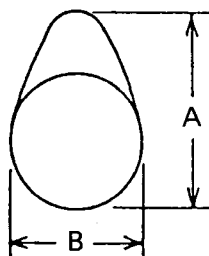
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3) Assembling the cam-shaft

Both cam-shaft lift and working angle have been changed for better engine performance.

Cam size

(IN, EX)



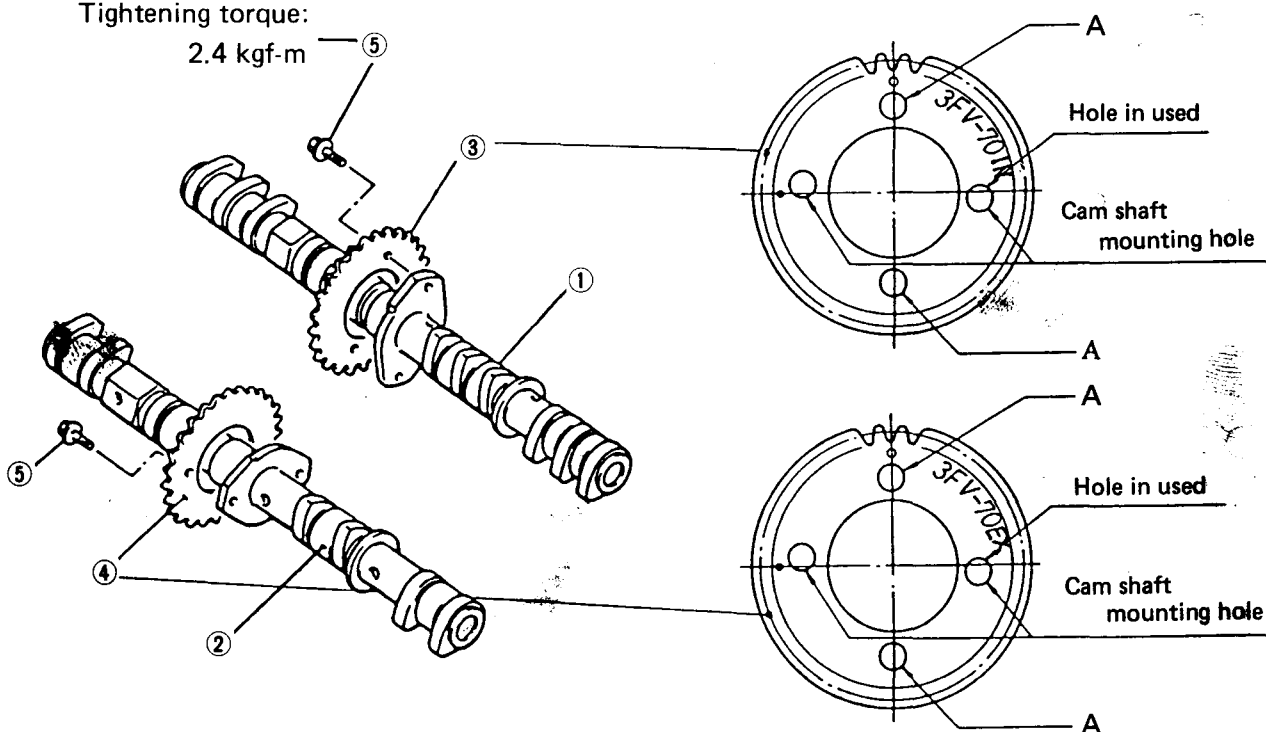
	STD ('89, '90)		'90 kit	
	IN	EX	IN	EX
A	32.65 mm	33.05 mm	32.75 mm	33.15 mm
B	25.00 mm	25.00 mm	25.00 mm	25.00 mm
Working angle	284°	284°	292°	292°
Actual lift	7.40 mm	7.80 mm	7.50 mm	7.90 mm
Event angle	105°	105°	103°	103°
Sprocket	3GM-00	3GM-00	3FV-70	3FV-70

Y/F 750

32.62 33
25.00 25.00
284° 284°

Tightening torque:

2.4 kgf-m



NOTE:

Install the sprocket cam kit so that the surface (on which the model No. is engraved) faces outside. Be sure that the kit is installed on the cam-shaft mounting side. If it is mounted on the A side, valve timing will be incorrect, thus causing trouble. The assembly procedure is the same as that of the standard type cam shaft. (Refer to the Service Manual)

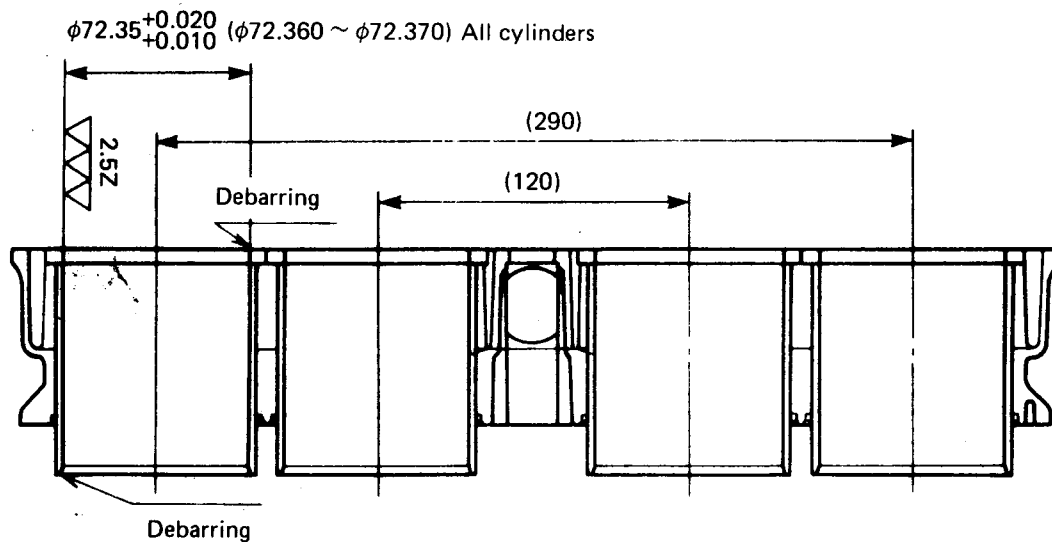
No.	Part No.	Part name	Q'ty	Remarks
1	3FV-12171-70	Shaft cam 1	1	
2	3FV-12181-70	Shaft cam 2	1	
3	3FV-12176-70	Sprocket cam 1	1	
4	3FV-12177-70	Sprocket cam 2	1	
☆ 5	90105-07342	Bolt	4	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

4) Machining of the cylinder for increased cylinder bore (Endurance and Sprint kits)

The kit piston for the '89, '90 FZR750R has a larger bore than the STD piston to meet the regulations. Therefore, it is necessary for you will have to purchase the cylinder which is an option kit part (3FV-11310-70) or bore your STD cylinder. (The endurance and sprint kits do not contain any cylinder whose bore is increased.)

<Diagram of cylinder bore machining>



- Dimensions of finished kit piston

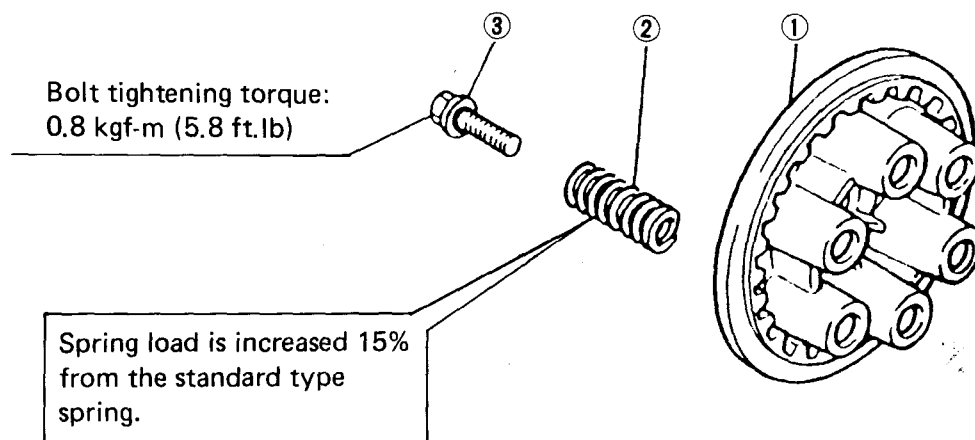
$\phi 72.35^{+0.080}_{-0.095}$ ($\phi 72.255 \sim \phi 72.270$)

- Piston clearance

90 ~ 115 μm

5) Dimensions of the assembled clutch spring (Endurance, Sprint kits)

Since the engine using a race kit is higher in power, and therefore, the clutch tends to slip and acceleration is unsatisfactory. Therefore, it is generally required to replace the clutch spring with a reinforced spring.



*This special spring can be installed in the same manner as the standard type.
(Refer to the Service Manual)

No.	Part No.	Part name	Q'ty	Remarks
☆ 1	58L-16351-00	Plate, pressure	(1)	Identified by green paint
☆ 2	90501-230E4	Spring <i>SFU-230E4-70</i>	6	
☆ 3	90159-06123	Screw, with washer	(6)	

() Use the original equipment.

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

6) Installation of high-speed ignition unit (Endurance races, Sprint races kit)

Considering the increased engine power and speed, the ignition timing and EXUP characteristics are changed, and an ignitor unit has been newly employed.

* Replace the ignitor unit in the same manner as for the standard one.
(See the Service Manual)

• Kit engine speed

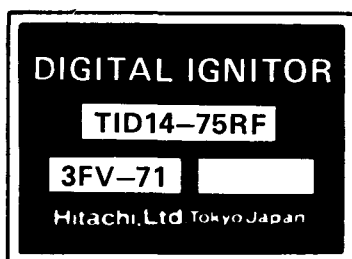
Kit specification	Recommendable engine speed	Ignition out setting engine speed
Sprint races	13,500 rpm	13,800 rpm
Endurance races	13,000 rpm	13,800 rpm
Standard model (3FV1)		13,800 rpm

* The sprint and endurance models use the same type ignitor.

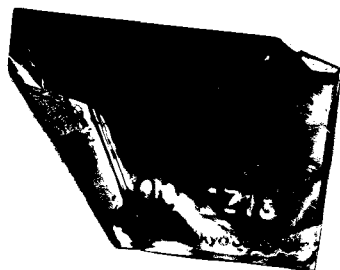
CAUTION:

- Be careful to distinguish between the high-speed and the standard ignition.
- Ensure a clearance of 50 mm min. between the pick-up coil wire and the high-tension code.

Stamped plate for racing ignitor



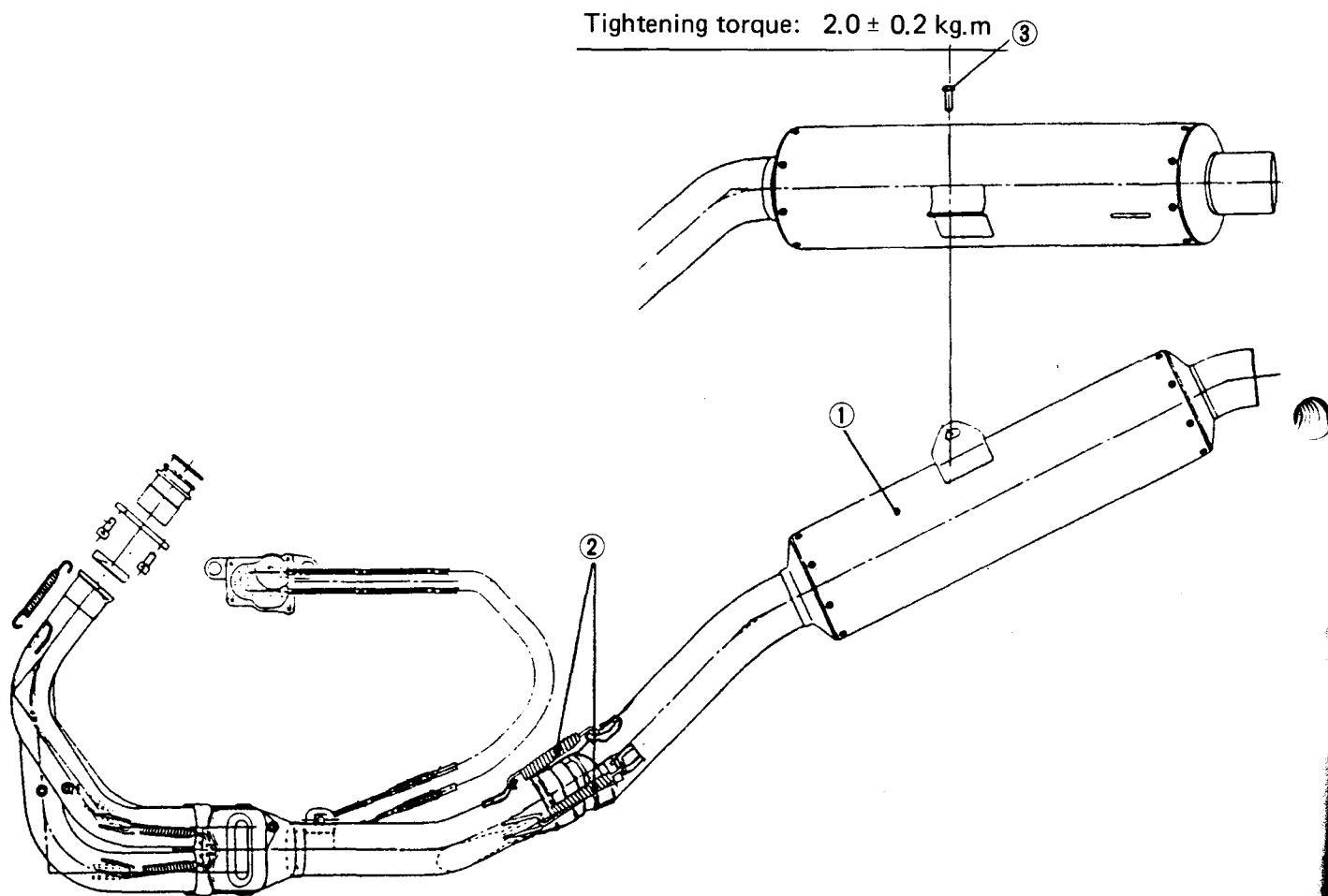
No.	Part No.	Part name	Q'ty	Remarks
	3FV-82305-71	Ignitor unit	1	Endurance races, Sprint races kit



7) Installing the muffler set (Endurance, Sprint races kit)

Use the standard type exhaust pipe and insert the kit muffler thoroughly into the standard diffuser, then install the springs ②.

The muffler can be installed in the same way as the standard type.



No.	Part No.	Part name	Q'ty	Remarks
1	3FV-14710-71	Muffler ass'y	1	
☆ 2	90507-20030	Spring	2	2 more springs
☆ 3	92013-08020	Bolt	(1)	For muffler installation

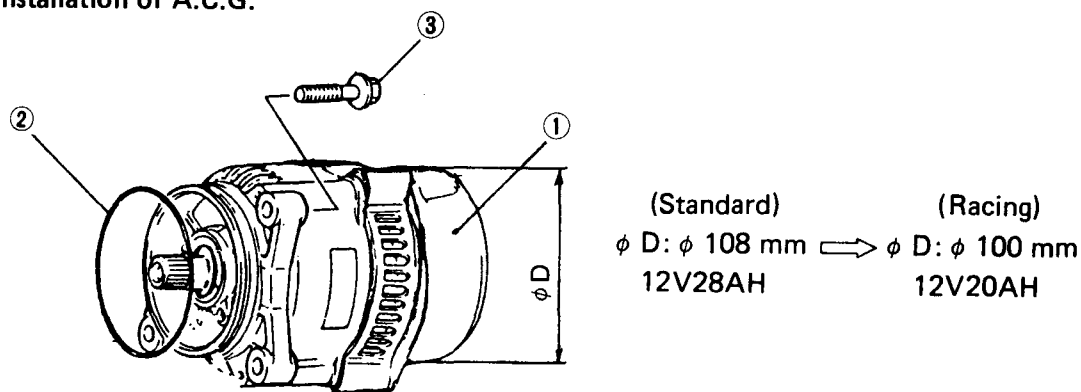
Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

() use the original equipment.

8) Installation of lightweight parts (Endurance kit)

For endurance races, a lightweight A.C.G. is made available.
(This A.C.G. is separately sold as an independent part.)

Installation of A.C.G.



No.	Part No.	Part name	Q'ty	Remarks
1	1AE-81600-70	A.C.G.	1	
☆ 2	36Y-81642-50	O-ring	1	With 1 spare ($\phi 79.6 \times 3.5$)
☆ 3	95026-08030	Bolt, FL	3	For A.C.G. fitting (M8 x 30)

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

CAUTION:

- Apply grease to the O-ring for the installation of A.C.G. to the engine.

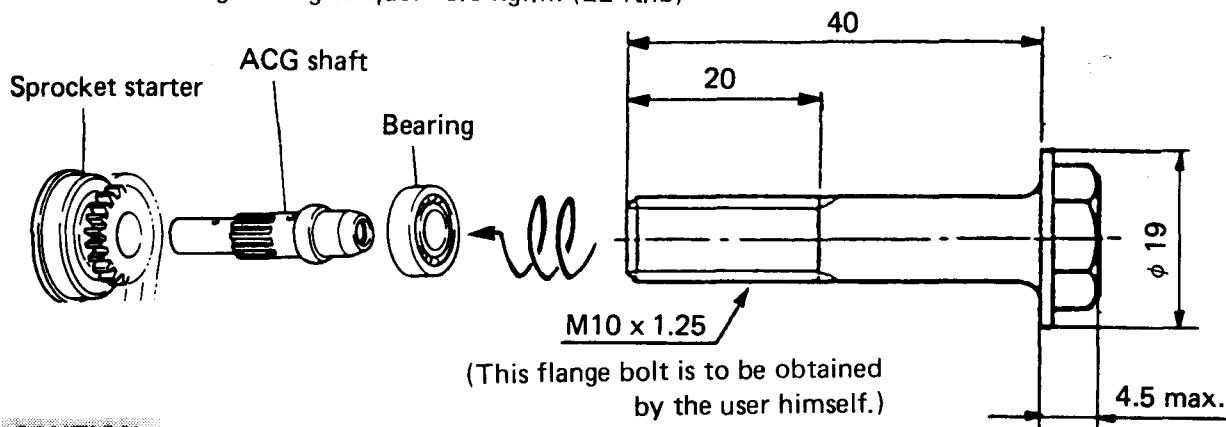
Removing A.C.G. and starter motor (Sprint races kit)

A.C.G. and starter motor can be removed for a short time race like a sprint, etc.

① Removing A.C.G.

When A.C.G. is removed, the oil passage becomes open to the air with the result lower oil pressure which will lead to engine seizure. To prevent such a pressure drop, screw an M10 x 1.25 bolt into the A.C.G. shaft.

Tightening torque: 3.0 kgf.m (22 ft.lb)

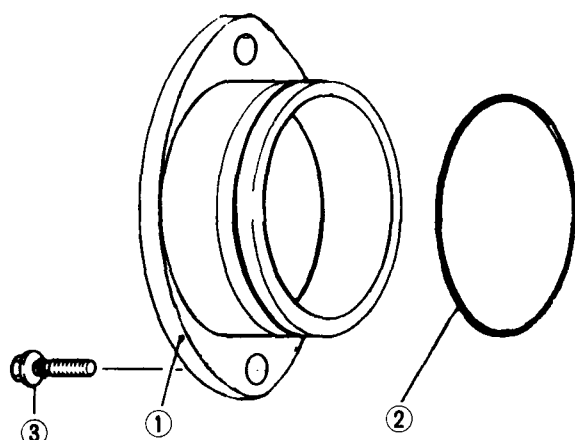


CAUTION:

Apply Loc-tite to this bolt for installation to the A.C.G. shaft.

② Installation of ACG cover

Install the cover upon removal of ACG.



CAUTION:

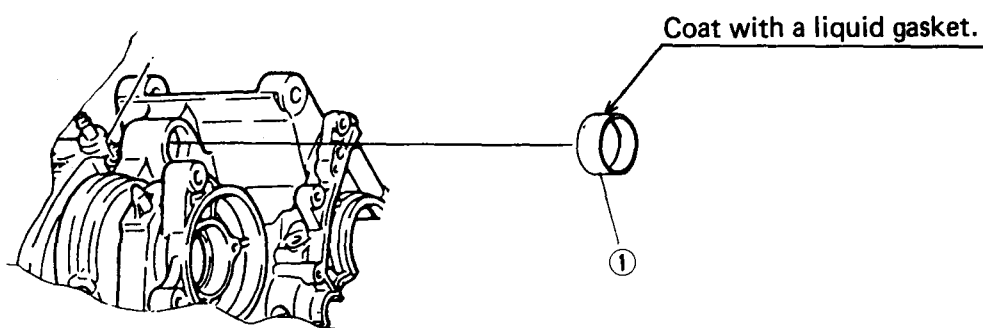
- Apply grease to O-ring for installation.

	No.	Part No.	Part name		Remarks
	1	1AE-15178-70	Plug	1	ACG blind cover
☆	2	36Y-81642-50	O-ring	1	With 1 spare (ϕ 79.6 x 3.5)
☆	3	95026-08016	Bolt, FL	2	For blind cover (M8 x 16)

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

③ Removal of starter motor (Sprint races kit)

Remove the starter motor and force-fit the plug.

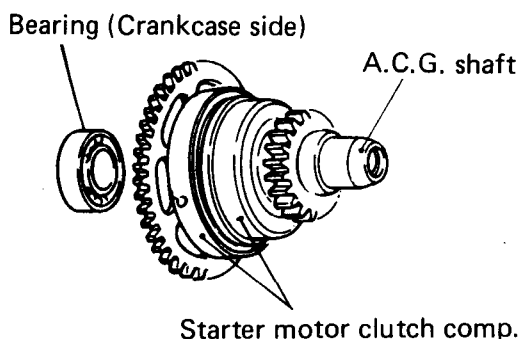


	No.	Part No.	Part name		Remarks
☆	1	90338-30096	Plug	1	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

④ Removing A.C.G., starter motor and starter clutch comp.

When removing the complete starter motor clutch, remove the bearing which is force-fitted to the upper crankcase.



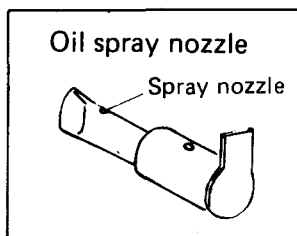
CAUTION:

- If the engine is operated with the bearing force-fitted, the bearing could slip off due to the engine vibration and thermal expansion of the bearing and thus, the engine could be damaged.
- Removal of the oil spray nozzle will allow the oil passage to open, and thus the oil pressure could be reduced. Never attempt to remove the oil spray nozzle.

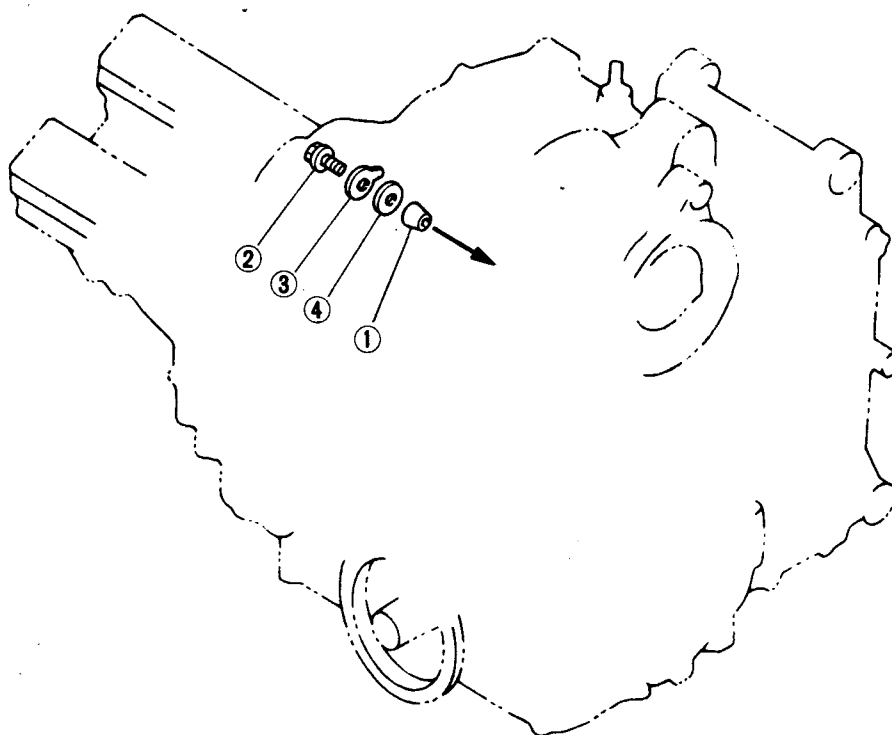
The complete starter clutch is oil lubricated. If it is removed from the crankcase, the oil passage becomes open to the air resulting in an oil pressure drop.

To prevent this drop, the starter clutch complete is lubricated with oil, and therefore, when it is removed, the oil passage is opened, thus causing the oil pressure to reduce. Therefore, install the plug the A.C.G. oil passage (see P.13) to prevent the oil pressure from dropping, and close the oil blowing hose in the oil spray nozzle.

Close the oil spray nozzle. By closing the nozzle, the normal oil pressure can easily be maintained.



9) A.C.G. oil passage plug installation (Sprint races)



	No.	Part No.	Part name	Q'ty	Remarks
☆	1	90336-06031	Plug, taper	1	
☆	2	95821-06016	Bolt, FL	(1)	
☆	3	90201-061M7	Washer, plate	(1)	
☆	4	90430-06210	Gasket	(1)	

() Use the original equipment.

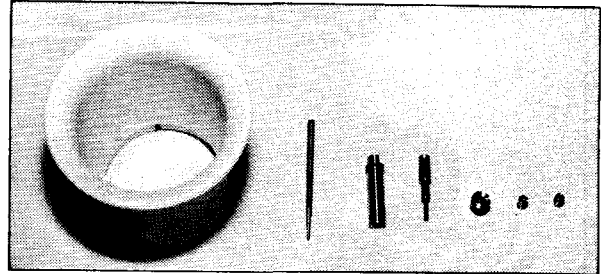
Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

For plug ①, see page 12 about the removal of A.C.G., stater motor and starter motor clutch component.

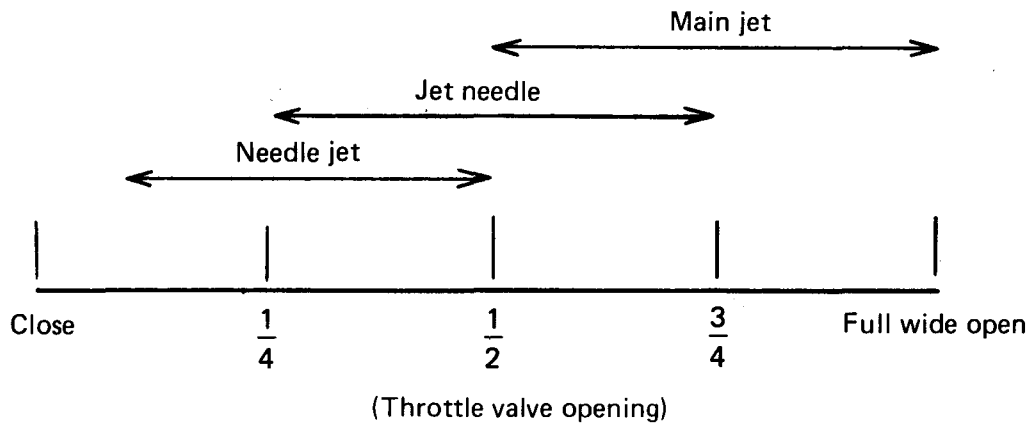
10) Installation of carburetor setting parts (Endurance races, Sprint races kit)

① Basic carb. settings for race

Carburetor model		BDST38 (MIKUMI)
Main jet	(M.J.)	(#135) (#137.5) (#140) (#142.5) #145 (#147.5) (#150) (#152.5) (#155)
Main air jet	(M.A.J.)	#50 (STD)
Pilot jet	(P.J.)	#42.5 (STD)
Pilot air jet	(P.A.J.)	#125
Jet needle	(J.N.)	5CHR2 (3rd notch)
Needle jet	(N.J.)	Y-2 (Y-4)(Y-6)
Diaphragm spring		200 ~ 275g
Carburetor joint		



② Effective range of settings of carburetor components



③ Notes for settings

- For the racing purpose, the pilot jet (slow) system is mostly concerned with idling, starting and low speeds and therefore need not be changed.
- A 4-stroke engine accurately set with the BS (SU) carburetor is little affected by changes in weather, etc.

Standard Model SCEW 11

Glaucoise 1+4 127.5

 2+3 122.5

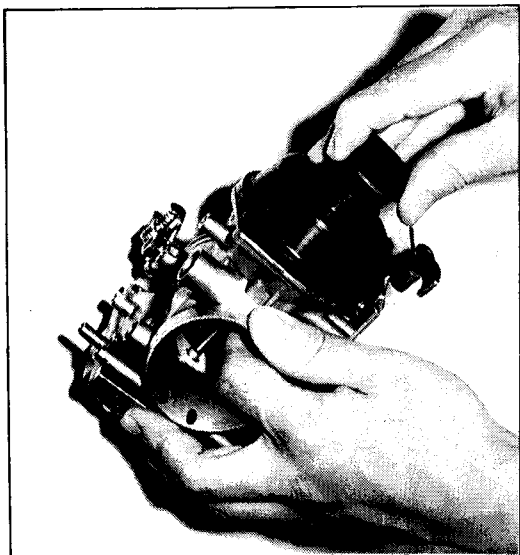
Modeloise 40

————— Note on jet needle replacement —————

The carburetor used by the '89, '90 FZR750R allows the replacement of the jet needle without removing the diaphragm cover.

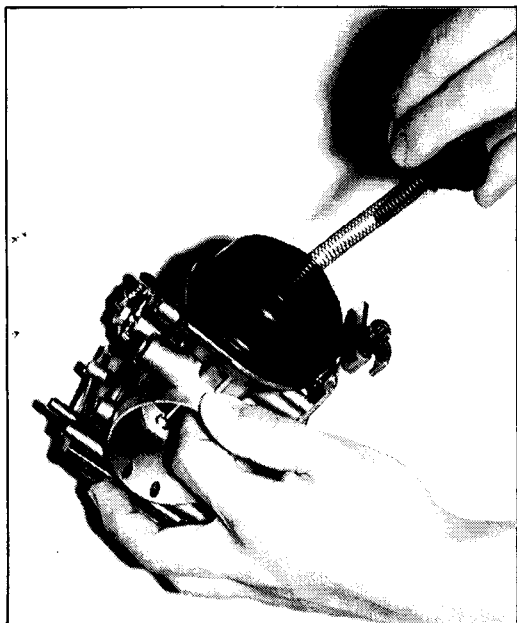
① Removal of jet needle

Lift up the free piston with your finger, and remove the diaphragm cover cap, then remove the diaphragm spring and jet needle. Removal of the cap without tilting up the free piston may damage the diaphragm spring in some cases.



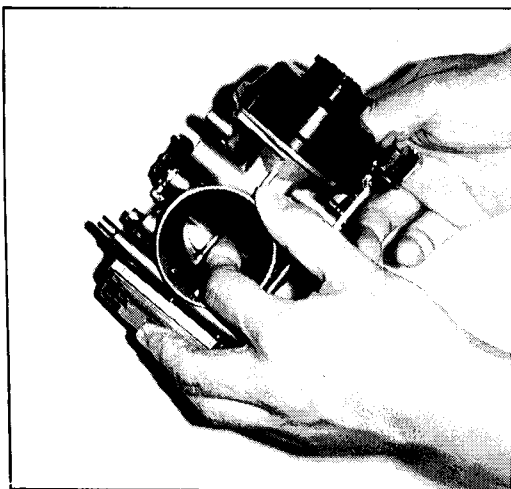
② Installation of jet needle

Insert the jet needle into the free piston. Next, lift up the free piston with your finger and install the diaphragm spring by pushing it with the cap.



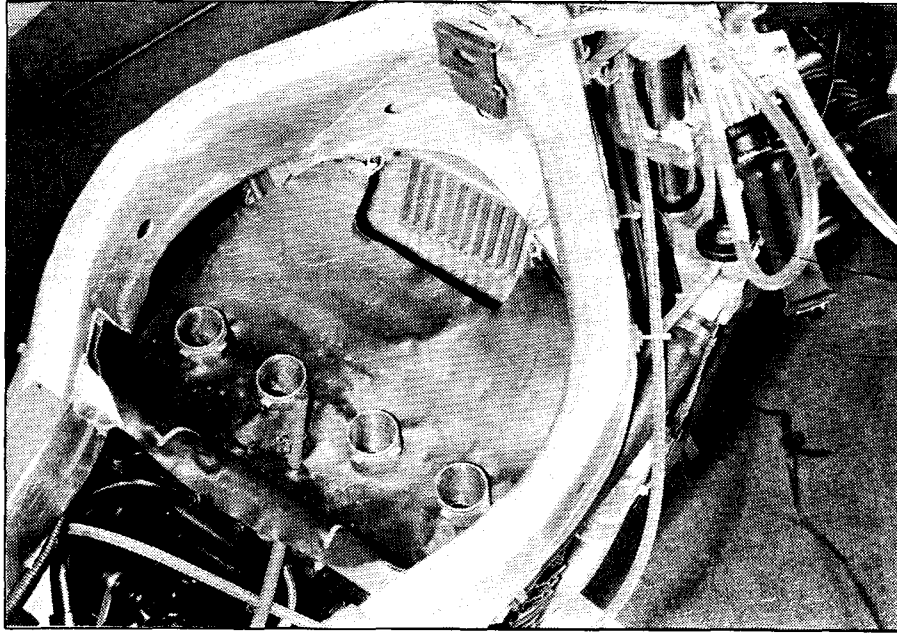
③ Checking the operation of the piston valve

By lightly lift up the piston valve with your finger, check if its weight is correct.
(The piston valves must be installed in the four cylinders so that they can operate in the same manner.)



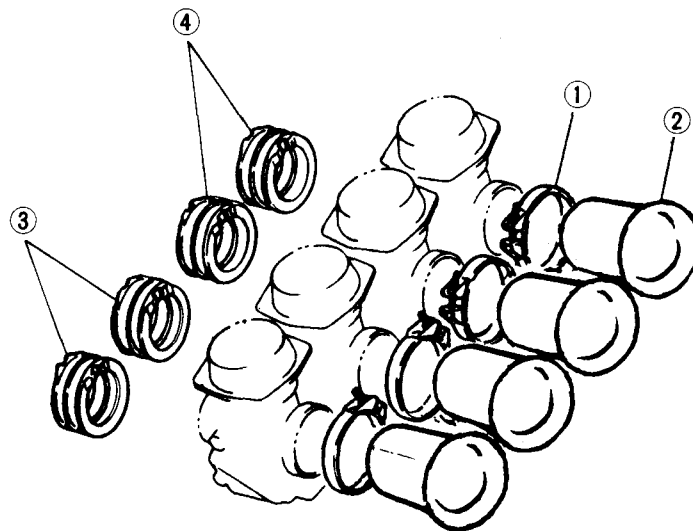
CAUTION:

- It is advisable to cover the funnel with a net or the like to keep dirt and pebbles out of the carburetor.
- Install a rubber board down in front of the carburetor as a baffle to shut off air from the radiator and head so that the engine may not suck in warm air and lose power.
(See the photo.)



(Top view)

Installation of air funnel (Endurance races, Sprint races kit)



	No.	Part No.	Part name	Q'ty	Remarks
☆	1	90460-65169	Clamp, hose	4	For joint 1
	2	3FV-14453-70	Joint 1	4	Air funnel
☆	3	3GM-13597-00	Joint carburetor 3	2	
☆	4	3GM-13598-00	Joint carburetor 4	2	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

10) Installation of wireharness kit set

No.	Part No.	Part name	Q'ty	Remarks
1	3FV-W8259-71	Wireharness kit	1	Kit for sprint races
	3FV-W8259-81	Wireharness kit	1	Kit for endurance races
	3FV-82590-71	Wireharness ass'y	1	
	2H7-82570-00	Emergency switch	1	Fuel cut switch
	4U8-81950-02	Relay ass'y	1	Fuel cut relay
1	3FV-82590-81	Wireharness ass'y	1	
2	25G-81950-01	Relay ass'y	1	Lamp relay
3	3AU-81940-00	Starter relay	1	
4	1HX-84735-00	Socket cord ass'y	2	
5	2H7-82570-00	Emergency switch	1	Fuel cut switch
6	4U8-81950-02	Relay ass'y	1	Fuel cut relay

- ① Wire harness ^{25G} / ~~4U8-81950-00~~
- ② Lamp relay (4U8-81950-00)
- ③ Starter switch (3AY-81970-00)
- ④ Socket cord ass'y (1HX-84735-00)
- ⑤ Fuse
- ⑥ Relay ass'y (for 25G fuel pump)
- ⑦ Ignitor unit
- ⑧ Starter motor lead
- ⑨ Negative lead wire
- ⑩ EXUP motor lead
- ⑪ Starter motor
- ⑫ Generator
- ⑬ Water temperature gauge lead
- ⑭ Tachometer lead
- ⑮ Pick-up lead
- ⑯ Band
- ⑰ Clamp
- ⑱ Clamp
- ⑲ Clamp
- ⑳ Clamp
- ㉑ Ignition coil
- ㉒ Ground
- ㉓ Ignition coil (R)
- ㉔ Ignition coil (L)
- ㉕ Emergency stop switch (2H7-82576-00)
- ㉖ Bracket (3FV-21335-70)
- ㉗ Bolt (91001-06016) . . . Use the bolt originally used on the vehicle.
- ㉘ Fuel cut relay assembly (4U8-81950-02)

- ☐ A Wire harness position x White tape
- ☐ B To stop switch
- ☐ C To handle switch (R)
- ☐ D To head light
- ☐ E To fuel pump

On the sprint and endurance models, the wire harness can be routed in the same manner.
(The wiring diagram for the endurance model is shown here)

*To the purchaser of the kit (B kit) for endurance races.

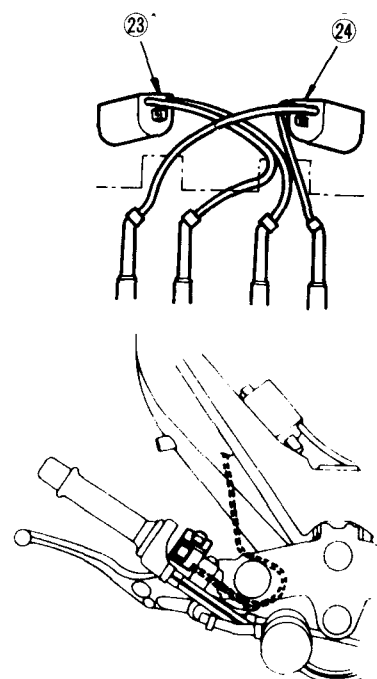
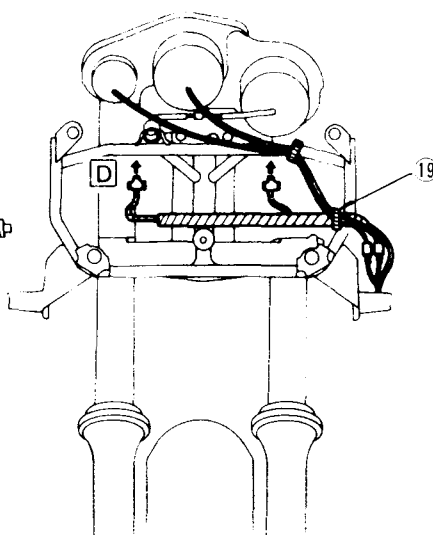
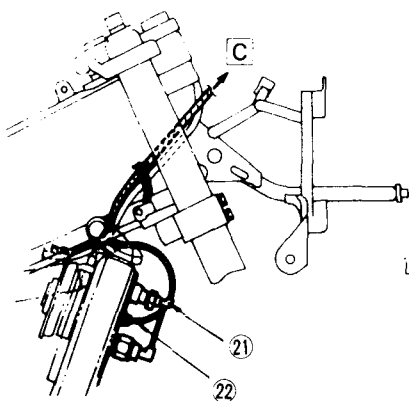
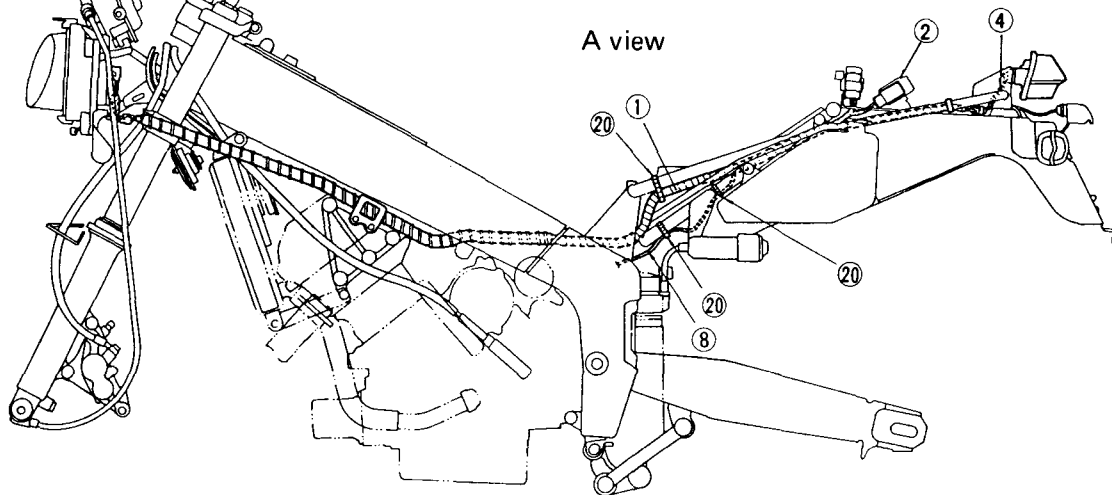
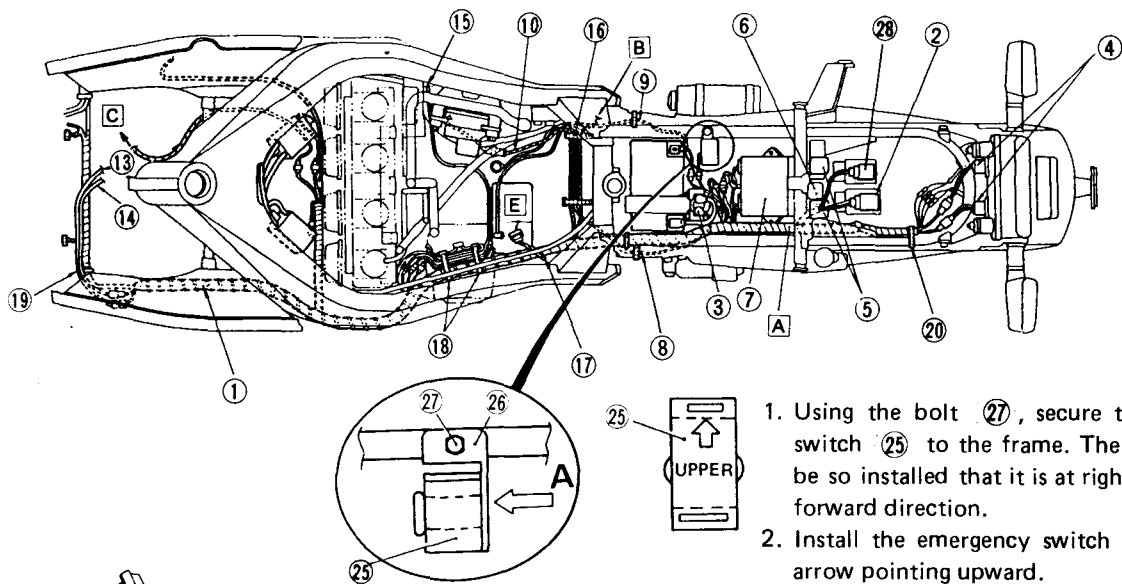
1) Lights switch

- Off — OFF
- PO — Tail light Only one lamp
- ON — Head light (Hi-beam) } Lamp
- Meter illumination }
- Tail light }

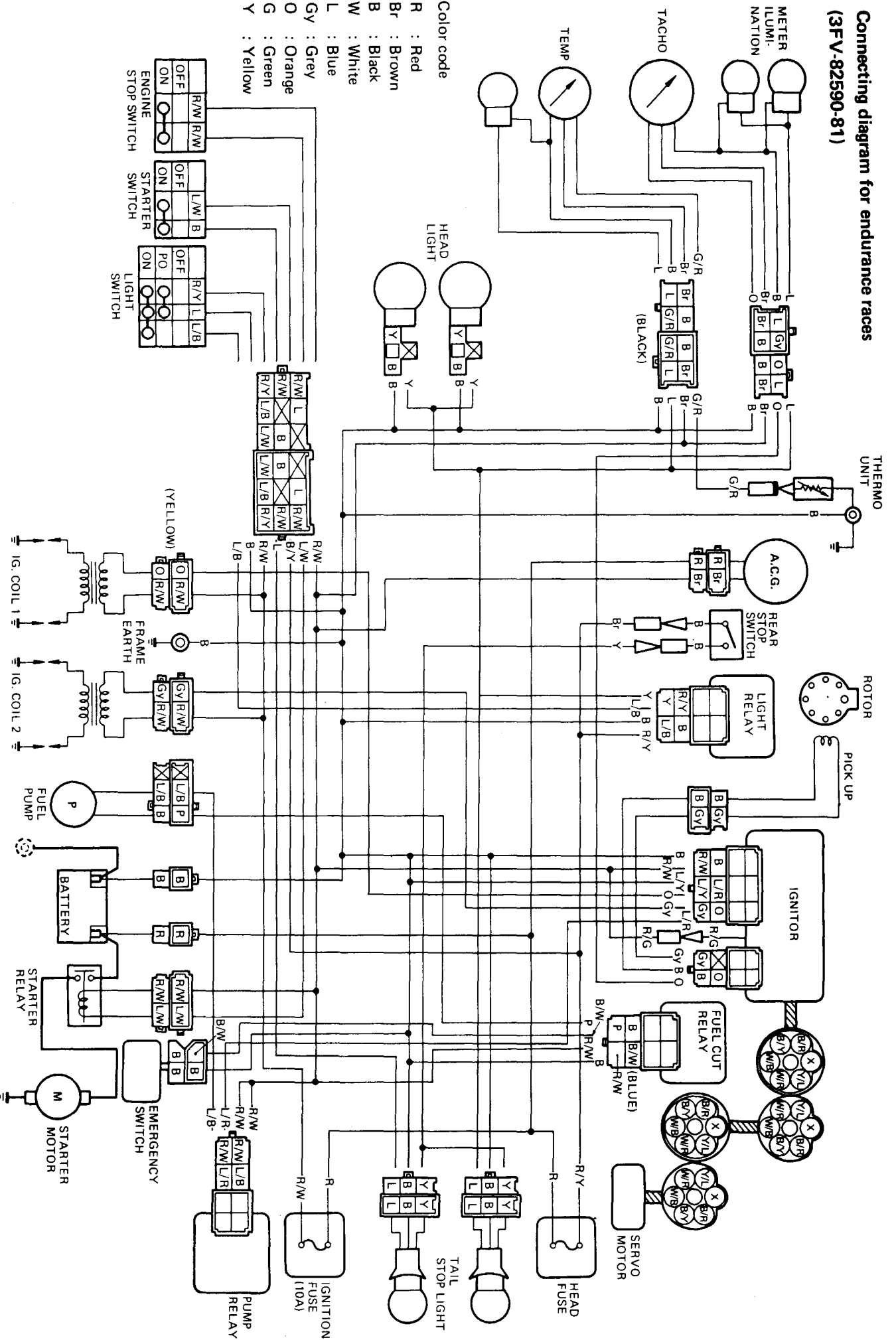
2) Battery coupler

Disconnect the battery coupler from the coupler on the wire harness side.
(The circuit is so designed that the brake lamp is directly connected to the battery.)

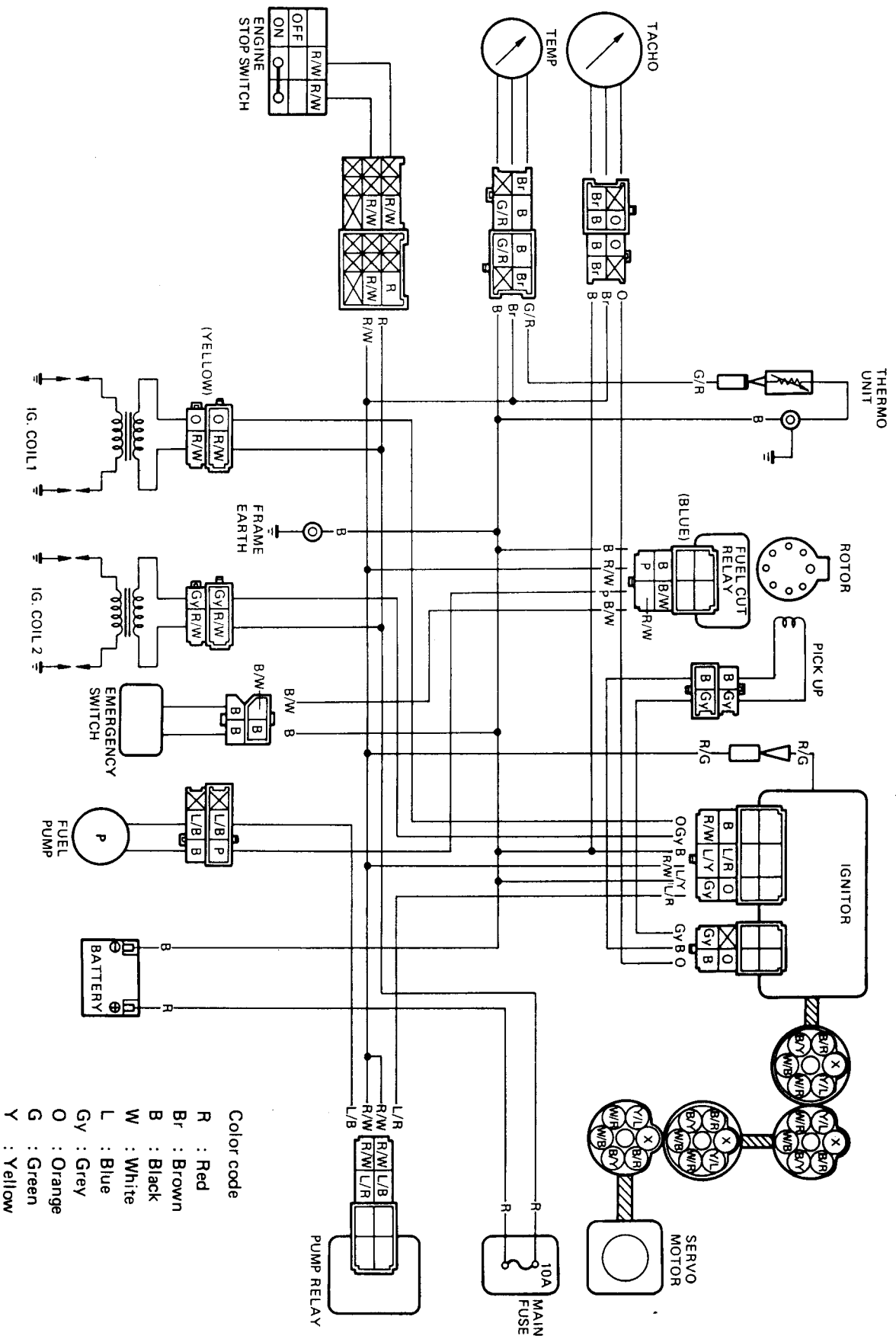
Wire harness routing diagram



Connecting diagram for endurance races (3FV-82590-81)



Connecting diagram for sprint races (3FV-82590-71)



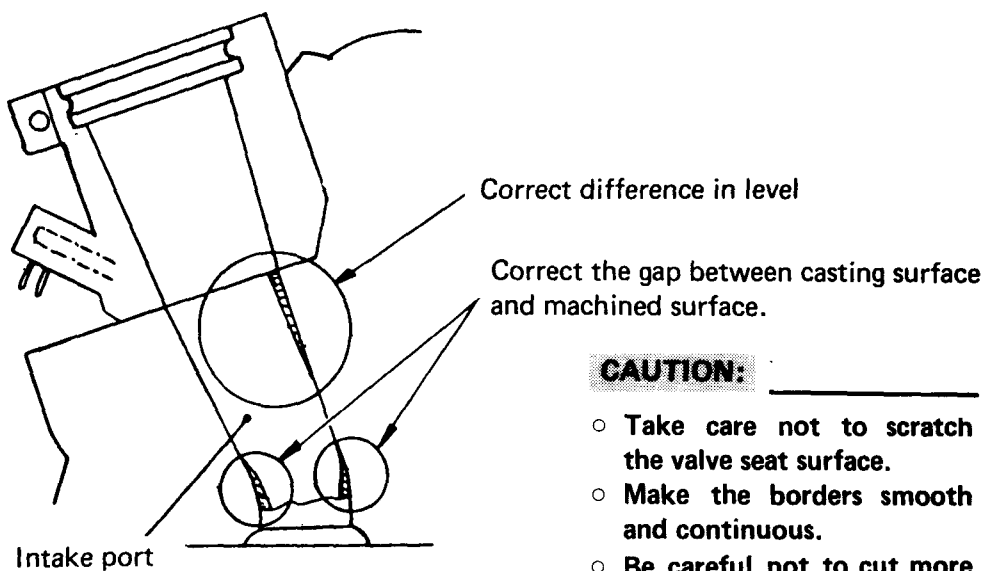
3. Other modification of engine interior

1) Modification of stepped intake and exhaust ports

To reduce intake and exhaust resistance, it is advisable to modify the stepped portion of ports and hone their inner surfaces so that both mixture and exhaust gases can flow through smoothly.

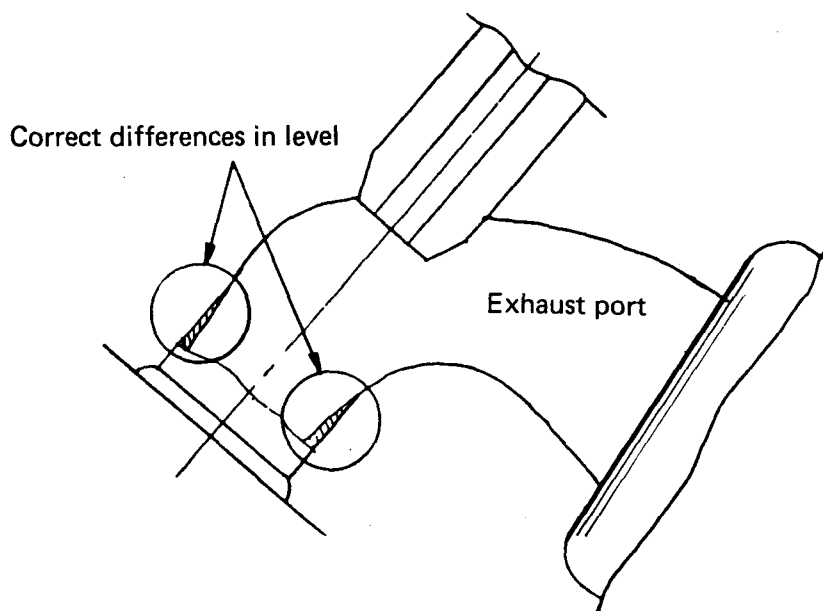
Ⓐ Modification of intake port step and inner walland grinding.

Modify the step shown below and provide a fine finish on the inner wall.



Ⓑ Modification of exhaust port steps and inner wall.

Modify the exhaust port steps as shown below and provide a fine finish on the inner wall.



CAUTION:

- Take care not to scratch the valve seat surface.
- Make the borders smooth and continuous.

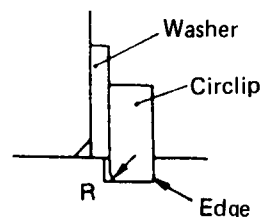
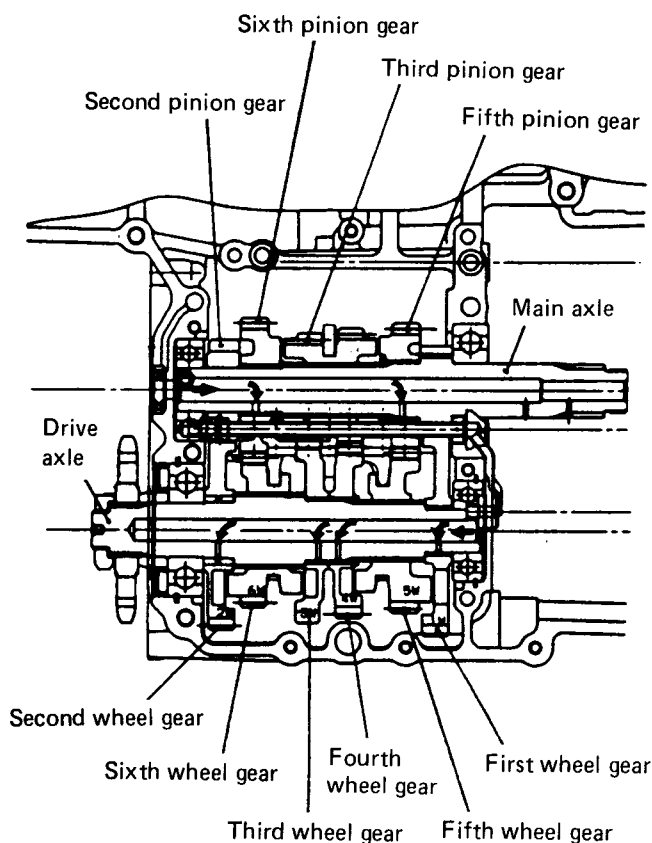
4. Installation of optional parts

NOTE:

It is advisable to use the kit parts, which are functional parts, as a set, as much as possible.

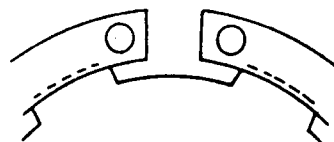
Use of kit parts and other maker's parts may impair the function of kit parts.

1) Installing the super cross-ratio transmission assembly



The circlip should be so installed that the round edge is on the gear side and the square edge is on the other side.

The ends of the circlip must be positioned in a groove of the spline.



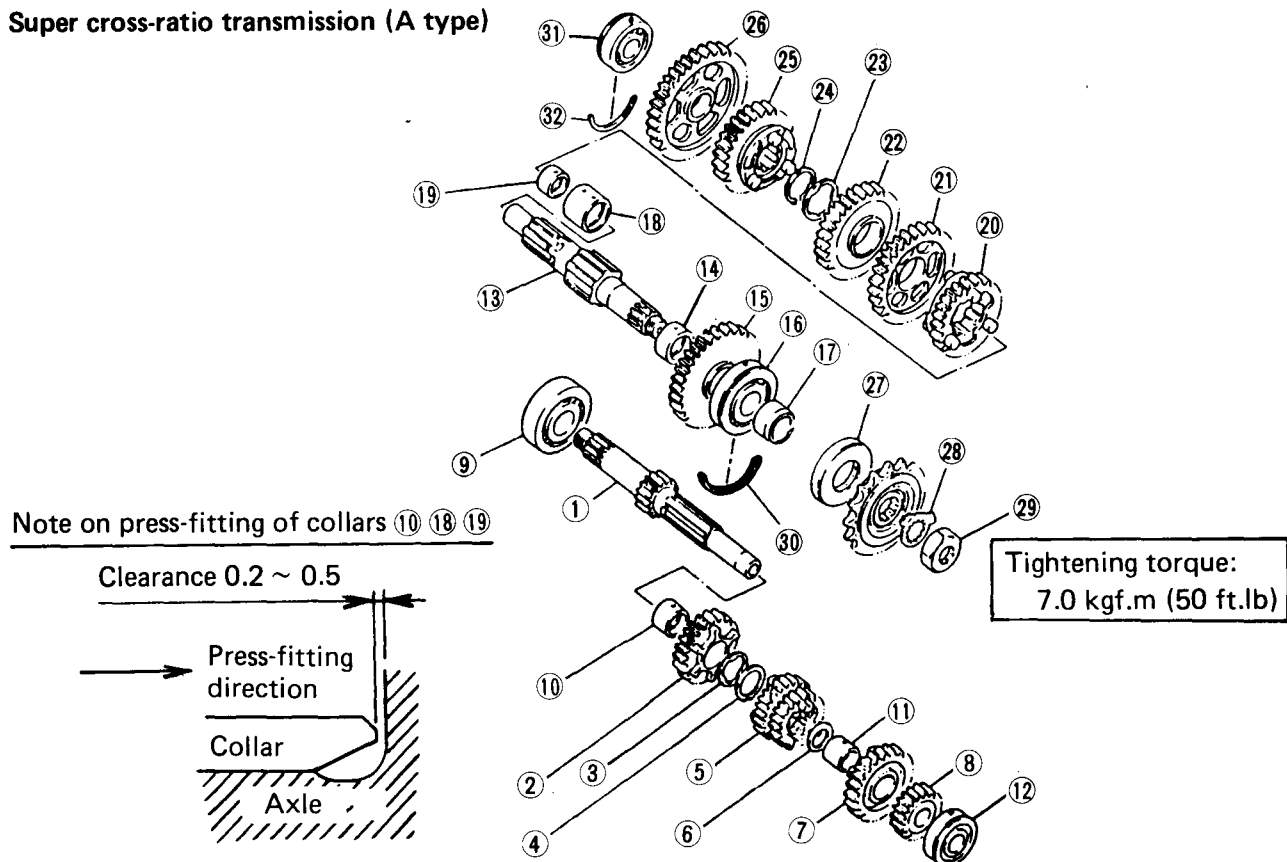
NOTE:

- Before installing the transmission assembly, be sure to make sure that the any oil passage in the main axle and drive axle is clogged.

Comparison of transmission gear ratios

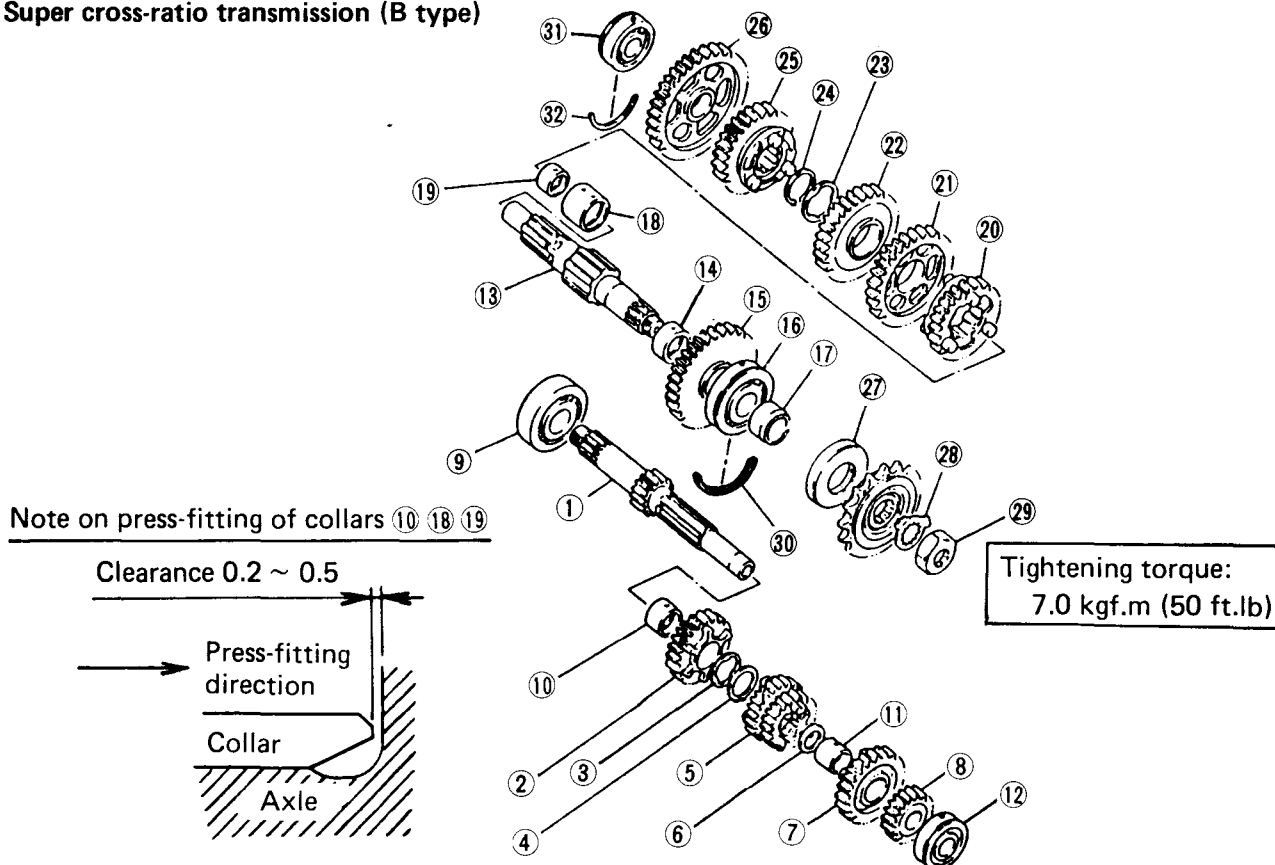
	Standard ratio	Super cross-ratio (A type)	Super cross-ratio (B type)
Speed 1	32/13 = 2.462	30/13 = 2.308	39/16 = 2.438
Speed 2	33/17 = 1.941	34/18 = 1.889	37/18 = 2.056
Speed 3	31/19 = 1.632	32/20 = 1.600	35/20 = 1.750
Speed 4	33/23 = 1.435	33/23 = 1.435	33/23 = 1.435
Speed 5	26/20 = 1.300	26/20 = 1.300	26/20 = 1.300
Speed 6	25/21 = 1.190	25/21 = 1.190	25/21 = 1.191

Super cross-ratio transmission (A type)



No.	Part No.	Part name	Q'ty	Remarks
1	3FV-17410-70	Main axle ass'y	1	
2	3FV-17411-70	Axle, main	1	
3	2NK-17151-01	G5P	1	
4	90209-22191	Washer	1	G5P left side (φ30.3 x φ22.2)
5	93440-25019	Circlip	1	G3, 4P right side (φ25)
6	3FV-17131-70	G3P	1	
7	90201-200K3	Washer	1	G6P right side (φ27 x φ20.8)
8	2NK-17161-01	G6P	1	
9	3FV-17121-70	G2P	1	
10	93306-30541	Bearing	1	Main axle, right side (φ65 x φ25)
11	90387-253M6	Collar	1	For G5P (φ28 x φ25 x 18.9)
12	90387-203M7	Collar	1	For G6P (φ23.5 x φ20.5 x 18)
13	93306-20455	Bearing	1	Main axle, left side (φ47 x φ20)
14	3FV-17420-70	Drive axle ass'y	1	
15	3FV-17421-00	Axle, drive	1	
16	90387-263M8	Collar	1	For G2W (φ32 x φ26 x 14.3)
17	3FV-17221-70	G2W	1	
18	93305-30501	Bearing	1	Drive axle, left side (φ62 x φ2.5)
19	90387-255V9	Collar	1	Drive sprocket, side (φ35 x φ25 x 14.2)
20	90387-284M0	Collar	1	For G3, 4W (φ23 x φ20 x 12.6)
21	90387-204M1	Collar	1	For G1W (φ23 x φ20 x 12.6)
22	3FV-17261-70	G6W	1	
23	3FV-17231-70	G3W	1	
24	2NK-17241-01	G4W	1	
25	90209-25196	Washer	1	G4W right side (φ34 x φ25.2)
26	93440-28062	Circlip	1	G5W left side φ28
27	3FV-17251-70	G5W	1	
28	3FV-17211-70	G1W	1	
29	93102-35423	Seal, oil	1	With 1 spare (φ35 x 6)
30	90215-21022	Washer, lock	1	φ44 x φ25
31	90179-18020	M18 nut	1	
32	278-17424-01	Clip	1	Drive axle, left side (φ58.6 semi-circle)
33	93306-20455	Bearing	1	Drive axle, right side (φ47 x φ20)
34	93440-45144	Circlip	1	Drive axle, right side (φ45 semi-circle)

Super cross-ratio transmission (B type)



No.	Part No.	Part name	Q'ty	Remarks
	3FV-17410-80	Main axle ass'y	1	
1	3FV-17411-80	Axle, main	1	
2	3FV-17151-00	G5P	1	
3	90209-22191	Washer	1	G5P left side (φ30.3 x φ22.2)
4	93440-25019	Circlip	1	G3, 4P right side (φ25)
5	3FV-17131-80	G3P	1	
6	90201-200K3	Washer	1	G6P right side (φ27 x φ20.8)
7	3FV-17161-00	G6P	1	
8	3FV-17121-80	G2P	1	
9	93306-30541	Bearing	1	Main axle, right side (φ65 x φ25)
10	90387-253M6	Collar	1	For G5P (φ28 x φ25 x 18.9)
11	90387-203M7	Collar	1	For G6P (φ23.5 x φ20.5 x 18)
12	93306-20455	Bearing	1	Main axle, left side (φ47 x φ20)
	3FV-17420-80	Drive axle ass'y	1	
13	3FV-17421-00	Axle, drive	1	
14	90387-263M8	Collar	1	For G2W (φ32 x φ26 x 14.3)
15	3FV-17221-80	G2W	1	
16	93305-30501	Bearing	1	Drive axle, left side (φ62 x φ2.5)
17	90387-255V9	Collar	1	Drive sprocket, side (φ35 x φ25 x 14.2)
18	90387-284M0	Collar	1	For G3, 4W (φ23 x φ20 x 12.6)
19	90387-204M1	Collar	1	For G1W (φ23 x φ20 x 12.6)
20	3FV-17261-00	G6W	1	
21	3FV-17231-80	G3W	1	
22	3FV-17241-00	G4W	1	
23	90209-25196	Washer	1	G4W right side (φ34 x φ25.2)
24	93440-28062	Circlip	1	G5W left side φ28
25	3FV-17251-00	G5W	1	
26	3FV-17211-80	G1W	1	
27	93102-35423	Seal, oil	1	With 1 spare (φ35 x 6)
28	90215-21022	Washer, lock	1	φ44 x φ25
29	90179-18020	M18 nut	1	
30	278-17424-01	Clip	1	Drive axle, left side (φ58.6 semi-circle)
31	93306-20455	Bearing	1	Drive axle, right side (φ47 x φ20)
32	93440-45144	Circlip	1	Drive axle, right side (φ45 semi-circle)

Note on the assembling of the cross-ratio transmission (A type, B type)

Care to be taken when press-fitting the collar (⑩ , ⑪ , ⑭ , ⑮ , ⑲)

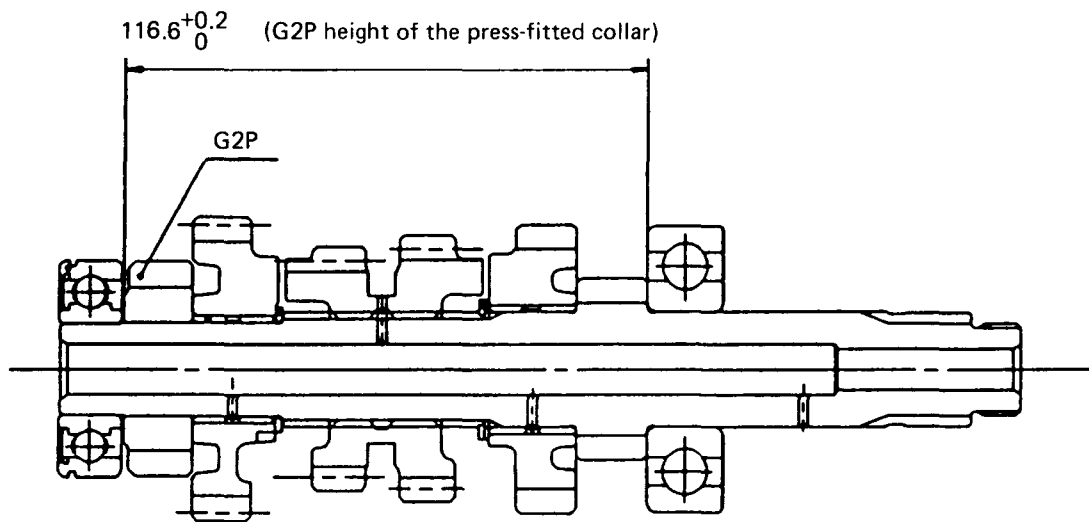
1. Press-fit each collar so that the edge chamfered at 35° is on the inner side.
2. Be sure the oil hole (φ3) in each collar is aligned with each collar in the shaft.
3. Take care not to press-fit the collar excessively, or it may deform.

(After press-fitting the collar, make sure the gear can rotate smoothly.)

After setting the drive axle in the lower case, shift the clips ③① , ③② outward by tapping the bearings on both ends with a soft-head hammer.

Apply molybdenum oil desulfured to the inner surface and sides of the transmission side gears, contact surfaces of the axle with other parts, and grooves in the forks.

*For the assembly procedure of other parts, refer to the Service Manual.



G2P dimensions of the press-fitted collar

NOTE:

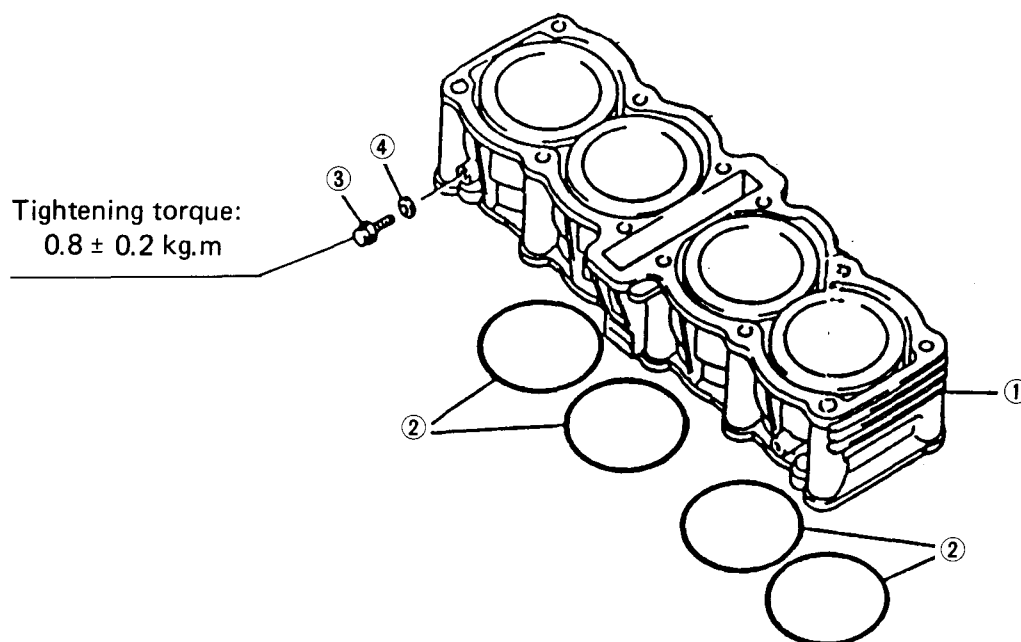
- The G2P cannot be reused. Whenever disassembled, it must be replaced with a new one.
- If either of the pinion gear and the wheel gear needs to be replaced, both gears must always be replaced in pairs.
(Example) When replacing the G2P, the G2W must be replaced.
- For additional safety, the cross-ratio transmission should be replaced.

2) Over-size cylinder ass'y

This cylinder is possible to be used in combination with kit pistons.

Cylinder inside dia.

$$\phi 72.35^{+0.020}_{+0.010} (\phi 72.360 \sim \phi 72.370)$$



No.	Part No.	Part name	Q'ty	Remarks
1	3FV-11310-70	Cylinder	1	
☆ 2	93210-76211	O-ring	4	
☆ 3	95021-06012	Bolt, FL	2	
☆ 4	90430-06014	Gasket	2	

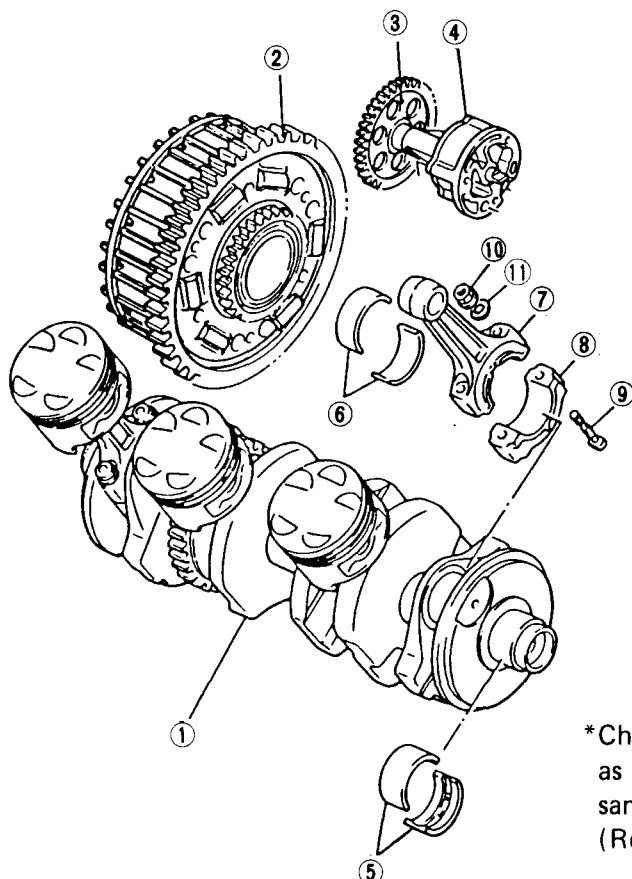
Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

3) Rear sprocket set (For rear wheel standard)

No.	Part No.	Part name	Q'ty	Remarks
1	1AE-25442-90	Sprocket driven	1	42T Aluminium
2	1AE-25443-90	Sprocket driven	1	43T Aluminium
3	1AE-25444-90	Sprocket driven	1	44T Aluminium
4	1AE-25445-90	Sprocket driven	1	45T Aluminium
5	1AE-25446-90	Sprocket driven	1	46T Aluminium
6	1AE-25447-90	Sprocket driven	1	47T Aluminium
7	1AE-25448-90	Sprocket driven	1	48T Aluminium
8	1AE-25449-90	Sprocket driven	1	49T Aluminium

4)Crankshaft and driven gear kit set

Compared with the standard type crankshaft, the primary ratio is increased (from 1.659 to 1.896) and the crankshaft weight is reduced about 500 grams.



*Checking of sizes of the bearings ⑤ and ⑥, as well as their installation, can be done in the same manner as the standard type bearing. (Refer to the Service Manual)

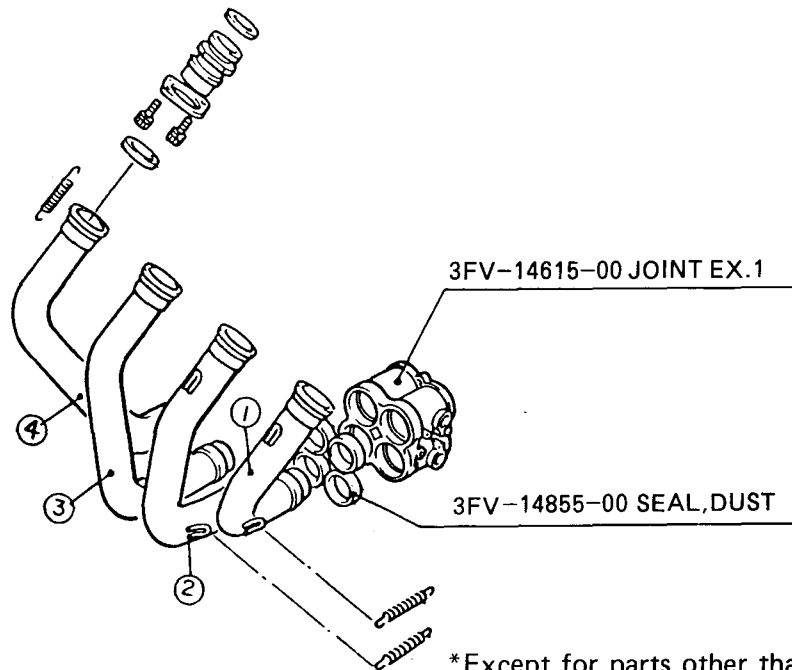
No.	Part No.	Part name	Q'ty	Remarks
1	3FV-11411-70	Crank shaft	1	
☆ 2	1TV-16150-01	Driven gear ass'y	1	
☆ 3	1AE-13330-00	Pump shaft ass'y	1	
☆ 4	3FV-13300-00	Oil pump ass'y	(1)	
☆ 5	2GH-11416-00	Bearing, crank shaft	10	Identification: Blue paint
☆ 5	2GH-11416-10	"	10	" Black paint
☆ 5	2GH-11416-20	"	10	" Brown paint
☆ 5	2GH-11416-30	"	10	" Green paint
☆ 5	2GH-11416-40	"	10	" Yellow paint
☆ 6	3GM-11656-00	Bearing, conrod	8	" Blue paint
☆ 6	3GM-11656-10	"	8	" Black paint
☆ 6	3GM-11656-20	"	8	" Brown paint
☆ 6	3GM-11656-30	"	8	" Green paint
☆ 7	3FV-11651-01	Rod, connecting 1	(4)	
☆ 8	3FV-11652-01	Cap, connecting rod	(4)	
☆ 9	3FV-11654-00	Bolt, conrod	(8)	
☆ 10	90179-09379	Nut	(8)	
☆ 11	90201-090J9	Washer, plain	(8)	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

() use the original equipment.

5) Exhaust pipe kit ($\phi 42.7$, $\phi 38.1$)

Compared with the standard type, the $\phi 42.7$ pipe is designed with more importance on high speed operation, and the $\phi 38.1$ pipe with more weight on mid-and low-speed operation.



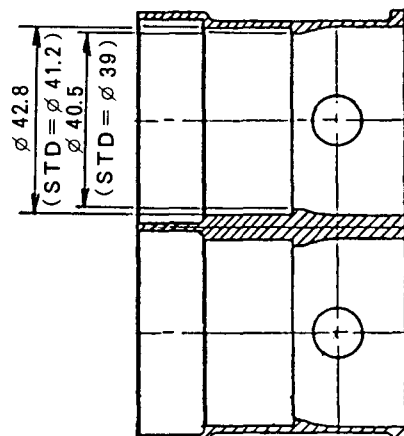
No.	Part No.	Part name	Q'ty	Remarks
	3FV-Y4610-70	Exhaust pipe kit		$\phi 42.7$
1	3FV-14611-70	Pipe, exhaust 1	1	
2	3FV-14621-70	Pipe, exhaust 2	1	
3	3FV-14631-70	Pipe, exhaust 3	1	
4	3FV-14641-70	Pipe, exhaust 4	1	
	3FV-Y4610-80	Exhaust pipe kit		$\phi 38.1$
1	3FV-14611-80	Pipe, exhaust 1	1	
2	3FV-14621-80	Pipe, exhaust 2	1	
3	3FV-14631-80	Pipe, exhaust 3	1	
4	3FV-14641-80	Pipe, exhaust 4	1	

The area into which the exhaust pipe is inserted.

NOTE:

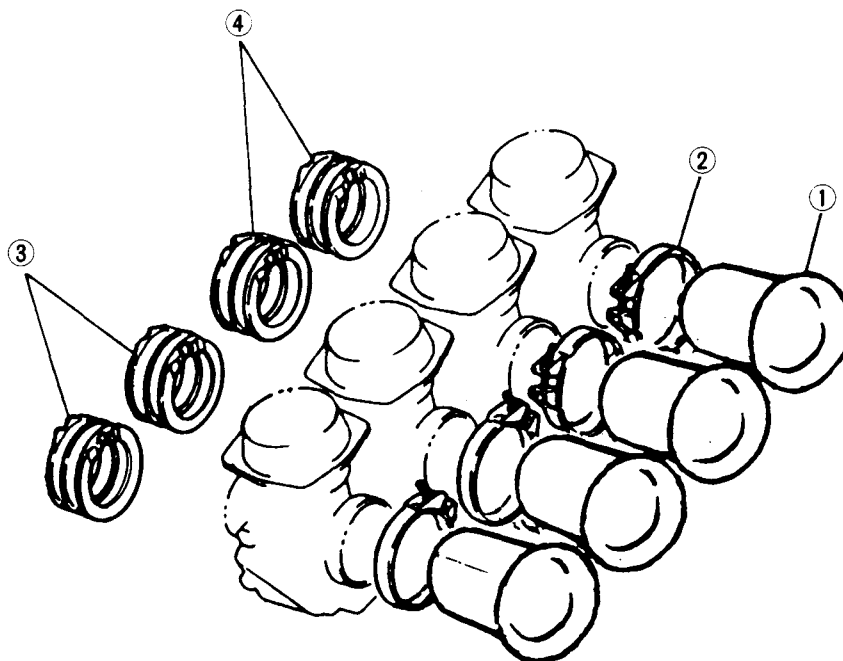
The exhaust pipe kit (3FV-Y4810-80) can be used, together with the standard type parts without extra machining. The exhaust pipe kit (3FV-Y4610-70) has a larger diameter, so the area into which the exhaust pipe (3FV-14615-00 (Joint EX. 1)) is inserted requires additional machining. Machine the area according to the diagram to the right.

No additional machining is necessary for pipes other than the $\phi 40.5$ and $\phi 42.8$ (at four places).



6) Long-type air funnel (for the BDST38 carburetor)

The long-type air funnel (60 mm long) has been made 30 mm longer than the standard type (30 mm long), with importance on low and medium speed operation.

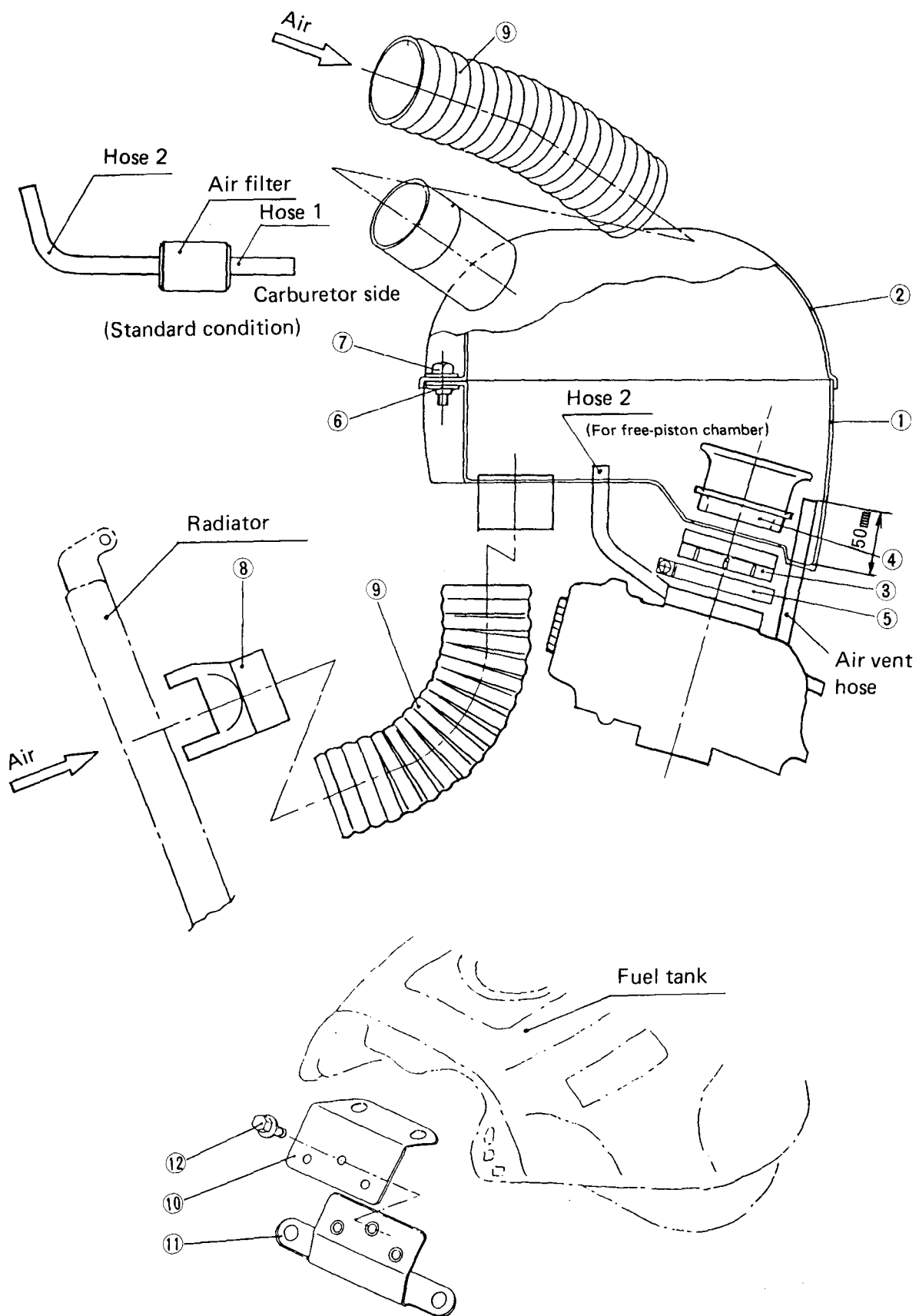


	No.	Part No.	Part name	Q'ty	Remarks
	1	3FV-14453-75	Joint 1	4	Air funnel
☆	2	90460-65169	Clamp, hose	(4)	
☆	3	3GM-13597-00	Joint, carburetor 3	(2)	
☆	4	3GM-13598-00	Joint, carburetor 4	(2)	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

Parts in parenthesis are the same as the standard kit set parts.

7) Air induction box kit (for the BDST38 carburetor)



Basic carburetor settings for racing (when the BDST38 carburetor air induction box is used)

• Carburetor type	BDST38 (OW01 STD)	
• Main jet (M.J.)	#150 (1, 4 cyl.), #160 (2, 3 cyl.)	#120
• Main air jet (M.A.J.)	Same as the standard kit settings	#125
• Pilot jet (P.J.)		#130
• Pilot air jet (P.A.J.)		#135
• Jet needle (J.N.)		#140
• Needle jet (N.J.)		#145
• Diaphragm spring		#155

NOTE:

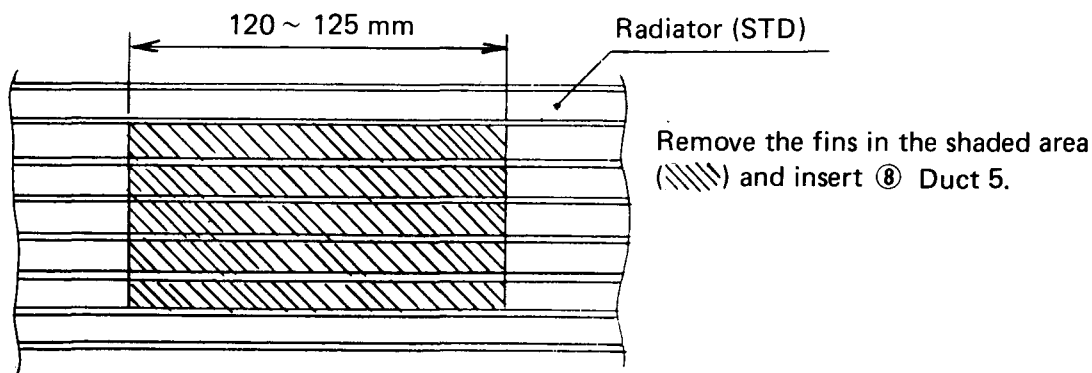
- * The above settings are the basic settings for the case when the induction box for the BDST38 carburetor is installed on the engine using the '90 FZR750 (OW01) kit parts.
- * Insert the BDST38 carburetor air vent hose 50 mm into the induction hose.
- * Connect hose 2 to the carburetor and insert it into the induction hose.
(Do not use the air filter and hose 1)

No.	Part No.	Part name	Q'ty	Remarks
1	3FV-14411-71	Case, air filter 1	1	
2	3FV-14421-70	Case, air filter 2	1	
3	3FV-90209-80	Flange	4	
4	3FV-14453-80	Joint 1	4	
☆ 5	90460-65169	Clamp	4	
☆ 6	90183-05044	Nut, spring	5	With 5 spares
☆ 7	97601-05216	Screw, pan head	5	With 5 spares
8	3FV-2838J-70	Duct 5	1	
9	3FV-2838N-71	Duct 1	1	Length 2 m
10	3FV-2419A-70	B.R.K.T., fuel tank 2	1	
11	3FV-24191-70	B.R.K.T., fuel tank 1	1	
☆ 12	97526-06616	Bolt	3	

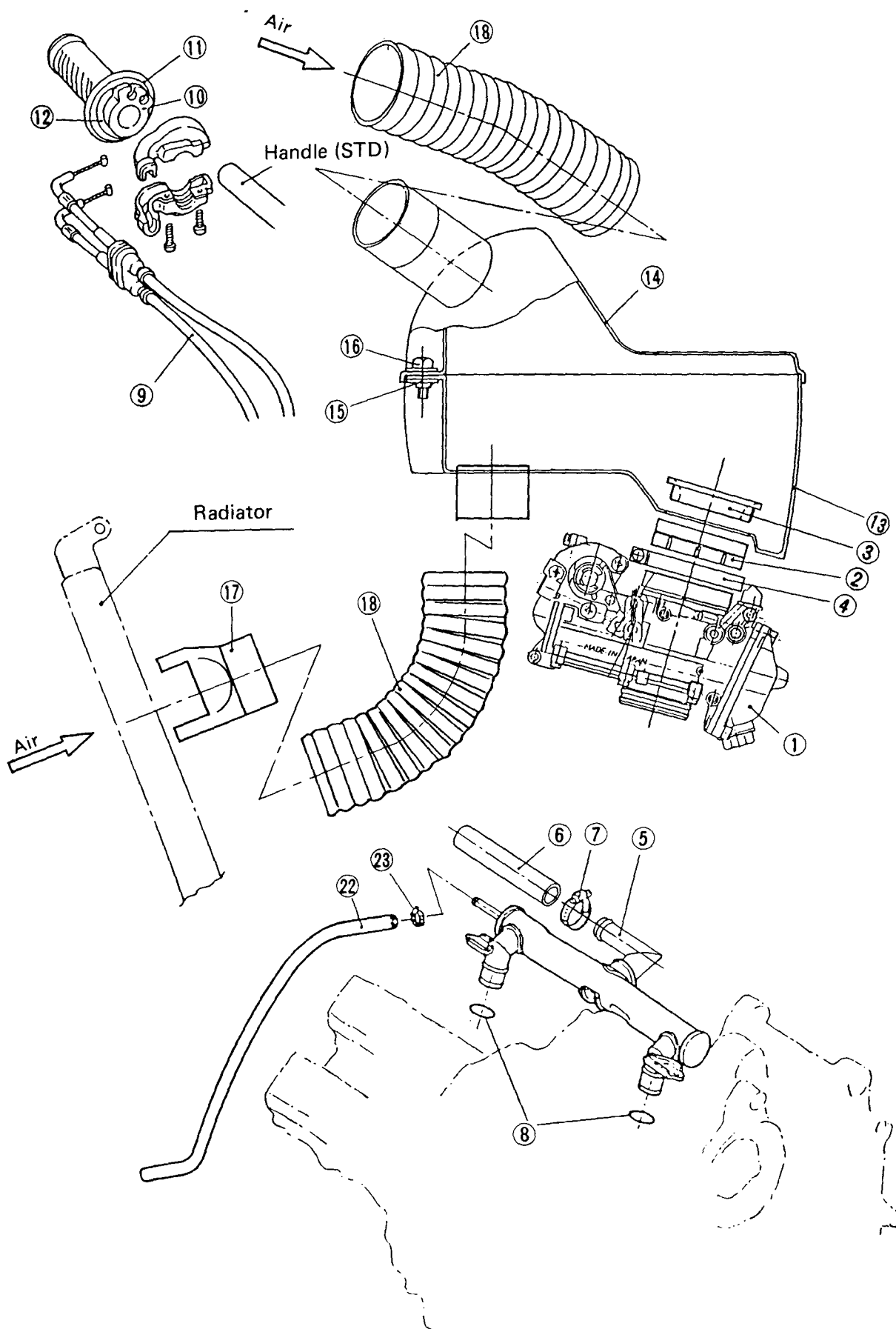
Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

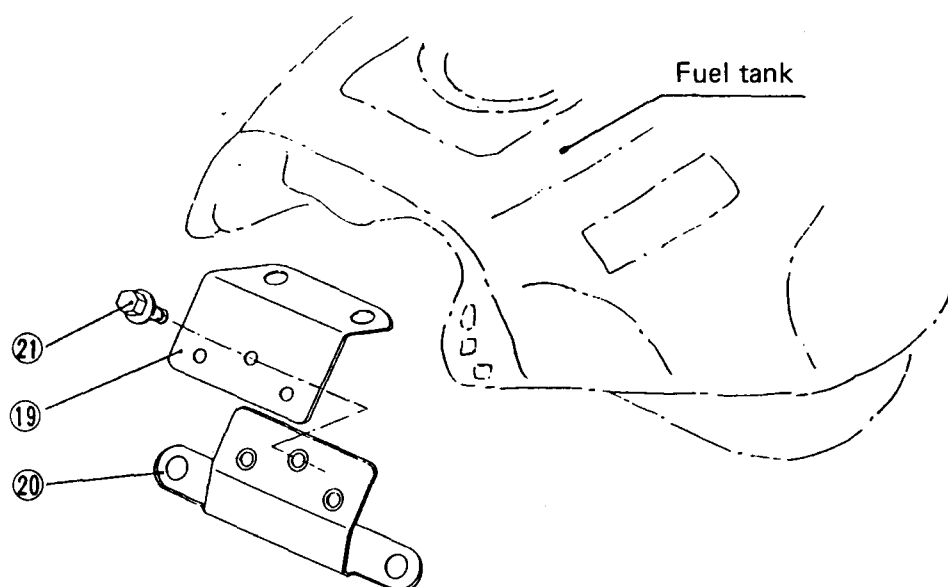
NOTE:

- ⑨ Duct 1: Cut it to the proper length when using.
- ⑧ Duct 5: Insert it into any position of the radiator after removing the fins.



8) TDM38 carburetor and air induction box kit



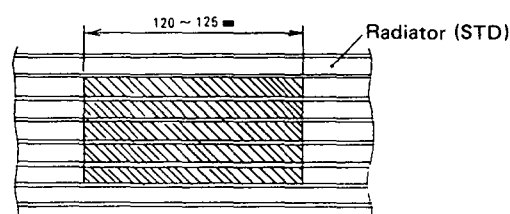


No.	Part No.	Part name	Q'ty	Remarks
1	3FV-14900-71	Carburetor ass'y	1	
2	3FV-90209-A0	Flange	4	
3	3FV-14453-A0	Joint 1	4	
☆ 4	90460-60165	Clamp	4	
5	3FV-12482-70	Pipe 2	1	
6	3FV-12577-70	Hose 2	1	
☆ 7	90450-38040	Clamp	1	
☆ 8	93210-18417	O-ring	2	
9	3FV-26302-70	Throttle wire ass'y	1	With 1 spare
10	3FV-26243-70	Tube, guide	1	With 1 spare
☆ 11	47X-26242-00	Grip 2	1	With 1 spare
☆ 12	47X-26249-00	Ring, leaf	1	With 1 spare
13	3FV-14411-81	Case, air filter 1	1	
14	3FV-14421-80	Case, air filter 2	1	
☆ 15	90183-05044	Nut, spring	5	With 5 spares
☆ 16	97601-05216	Screw, pan head	5	With 5 spares
17	3FV-2838J-70	Duct 5	1	
18	3FV-2838N-71	Duct 1	1	(Length 2 m)
19	3FV-2419A-70	B.R.K.T. fuel tank 2	1	
20	3FV-24191-70	B.R.K.T. fuel tank 1	1	
☆ 21	97526-06616	Bolt	3	
☆ 22	3FV-12589-00	Hose, 6	(1)	
☆ 23	90467-11090	Clip	(2)	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

NOTE:

- ⑱ Cut Duct 1 to the proper length before using.
- Parts in parenthesis are those which are originally installed on the vehicle.
- ⑰ Duct 5: Insert it into any position of the radiator after removing the fins.



CARBURETOR SETTING

Basic carburetor settings for racing (set at the time of shipping)

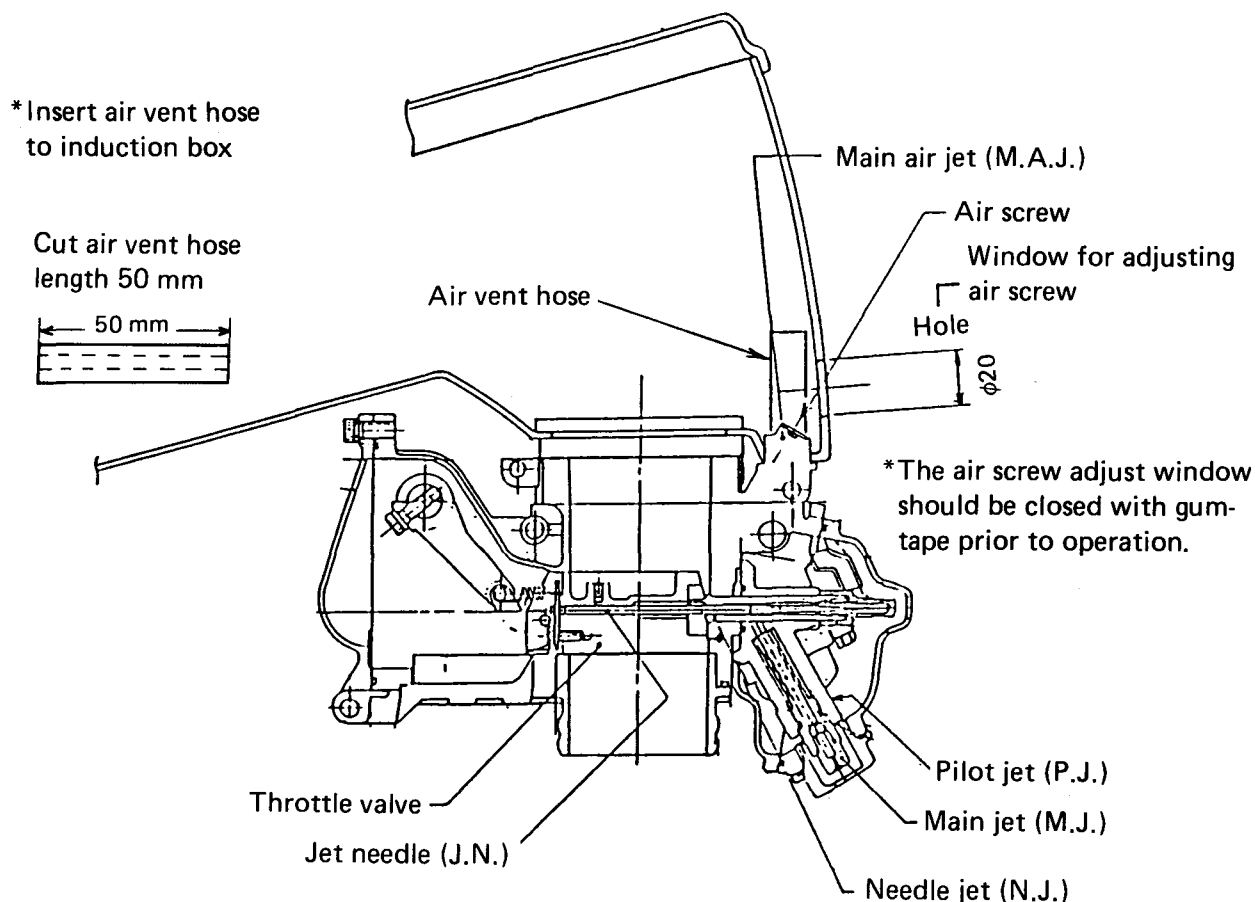
• Carburetor model		TDM38 (MIKUNI)	
• Main jet	(M.J.)	#450 (1, 4 cyl.), #540 (2, 3 cyl.)	#420
• Main air jet	(M.A.J.)	#30	#430
• Pilot jet	(P.J.)	#50	#440
• Pilot air jet	(P.A.J.)	Air screw (Adjusted properly when shipped out)	#450
• Jet needle	(J.N.)	DJ (3rd notch)	#460
• Needle jet	(N.J.)	P-8 (P-4), (Q-2)	#470
			#480
			#490
			#500
			#520
			#540
			#560
			#580
			#600
			#620

NOTE:

- The above settings are the basic settings when the '90 FZR750R (OW01) ENGINE kit parts are used.
- It is advisable to change the position of the main jet, jet needle and needle jet according to the racing conditions.
- The basic setting are the same, whether or not the air induction box is used.
- Most of the carburetor components used in the pilot (slow) circuit affect idling, starting and low speed performance and therefore, no change or modification is necessary.
- It will be unnecessary to change the air screw position (which was set at the factory). If necessary, refer to page 37.

CAUTION:

Be careful not to drop the carburetor or give it a strong shock. Should it be given a strong shock, for any deformation of parts. Also, make sure the good operation of the carburetor.



TIPS ON CARBURETOR SETTINGS

Selecting the main jet

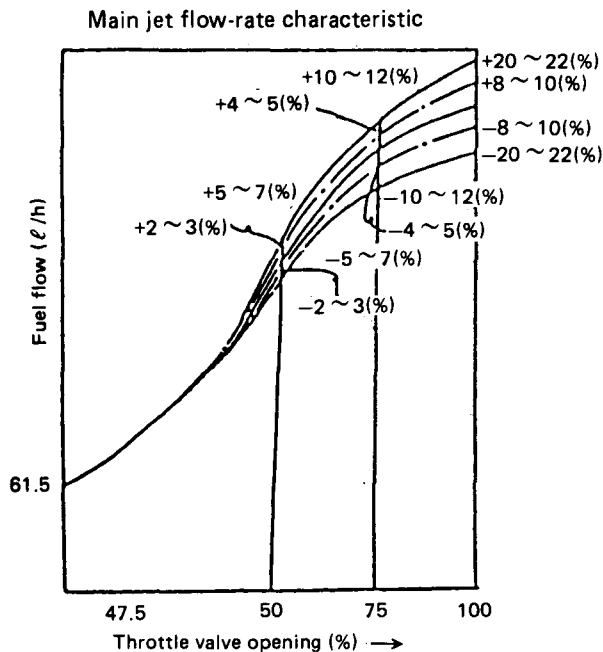
On flat level roads

1. Select the largest (mixture is the richest) of the main jets which are designed for maximum rpm's, that is, maximum speed. The transmission gear position should be selected according to the size of the test course.
2. Measure the increase in speed obtained by quick acceleration from steady speeds of 40 to 50 km/h.
3. Make a decision considering the color of exhaust gases and discoloration of the spark plug. (Do not determine the heat range of the spark plug first. It is more important to determine the heat range according to engine power.)

After a series of tests, check the course, as noted earlier, while paying attention to the following points.

4. Throttle response should be quick and smooth when gears are shifted depending on variations in road conditions, or when climbing up and down.
5. Low speed and full-throttle operation should be smooth, and sustained high speed operation should be possible without knocking or seizure.

Through these tests, the proper main jet can be selected.



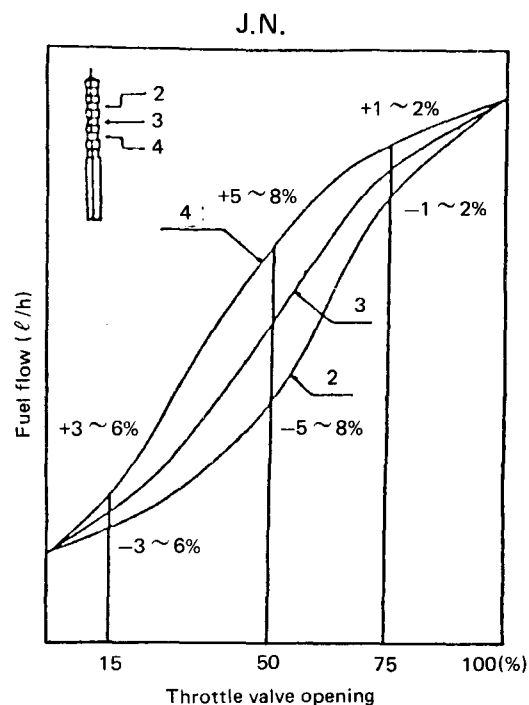
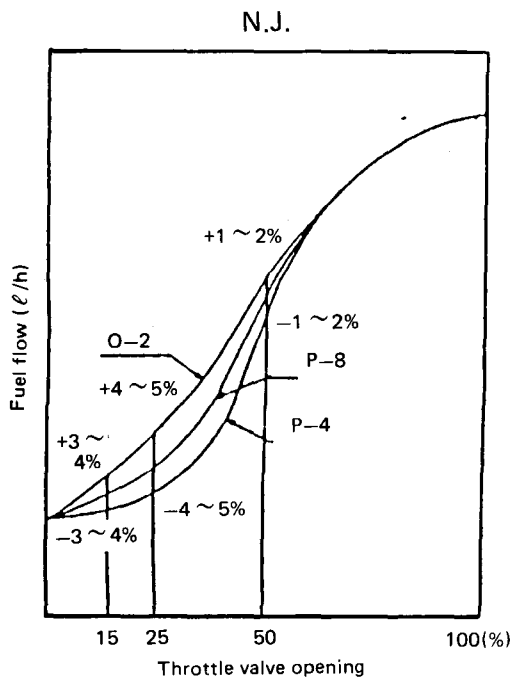
CAUTION:

This is data on a comparison of fuel flow rates when the main jet size was changed by $\pm 10\%$.

- shows characteristics of BDS carburetor
- - - shows characteristics of TDM carburetor

Selection of jet needle and needle jet

The carburetor using a piston-type throttle valve is called a variable venturi type. Both jet needle and needle jet are function parts which are necessary to produce the proper air-fuel mixture through a medium throttle opening or 1/4 to 3/4 opening. Whether or not this part is appropriate will greatly affects the function of a partial load carburetor. The needle jet and needle jet give full play in the range of 1/4 to 3/4 throttle opening. The jet needle is tapered in 1 to 3 steps at its end. As the throttle opening increases, the clearance between the jet needle and needle jet also increases. Thus, the required mixing ratio can be obtained accordingly. The end of the needle end has five grooves, and the mixing ratio is set by the E-ring fitted to one of the grooves. As shown below, the fuel flow-rate can be varied by moving the E-ring position up and down. The jet size of the needle jet is indicated by a combination of alphabetical letter and number. When the jet needle groove position makes the mixture too rich or too lean, it is advisable to change the needle jet size for proper adjustments.

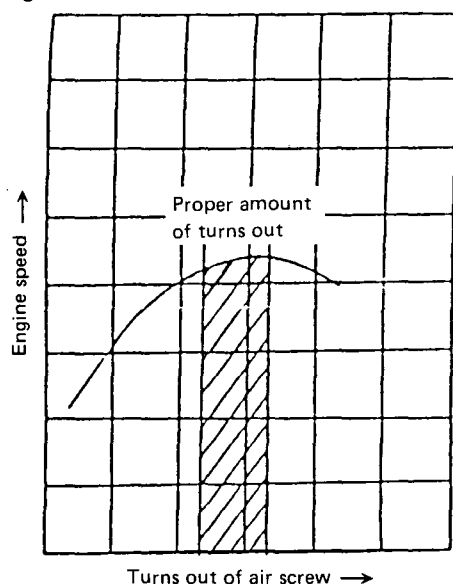


Determining the turns-out of the air screw

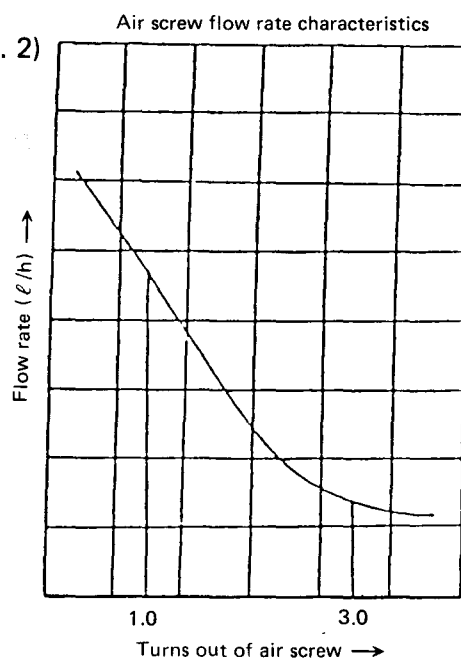
How much the air screw should be backed out should be determined in the following manner. Warm up the engine first, and set the engine speed to 10 to 20% higher than the desired idling speed. From this position, turn the air screw in and out 1/4 to 1/2 turn each time so that the engine runs faster. Next, adjust the throttle stop screw so that the engine idles at the desired speed. Again, turn the air screw in and out 1/4 to 1/2 turn each time so that the engine runs faster. (Fig. 1) Pay attention to the following points:

1. When the air screw has a large amount of turn-out to run the engine faster (for instance, the engine speed does not show any difference in the range from 1-1/2 to 2.0 turns out), it should be backed out in a minimum amount considering acceleration. (In this case, the air screw should be backed out 1-1/2 turns.)
2. When the air screw is in a lightly seated position, the air screw is full-closed. The maximum amount of turns-out is 3.0 turns. If it is turned more than 3.0 turns, the spring will become ineffective and it may come off the position during operation. As you see from the performance curve diagram (Fig. 2), no effect can be expected when the air screw is backed out more than 3.0 turns.

(Fig. 1)

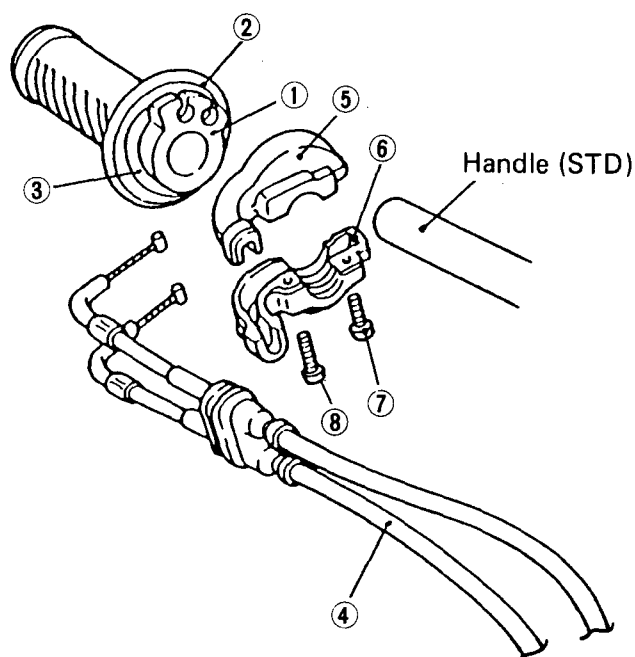


(Fig. 2)



9) High throttle kit (For the BDST38 Kit carburetor)

The throttle valve angle can be set at 60° against 72° of the standard type.

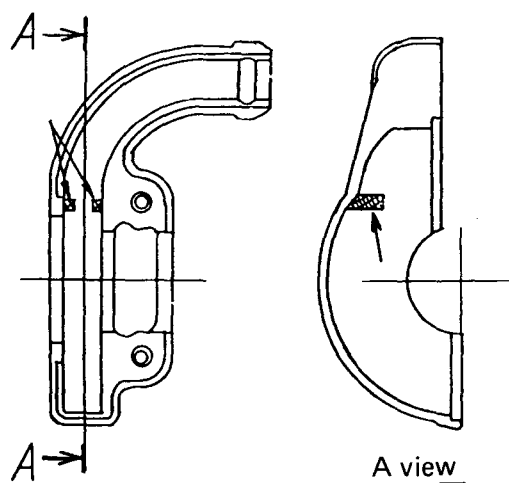


No.	Part No.	Part name	Q'ty	Remarks
1	3FV-26243-80	Tube, guide	1	
☆ 2	47X-26242-00	Grip 2	1	
☆ 3	47X-26249-00	Ring, leaf	1	
4	3FV-26302-80	Wire, throttle ass'y	1	
☆ 5	3FV-26281-00	Cap, grip upper	(1)	Correction is necessary
☆ 6	3FV-26282-00	Cap, grip under	(1)	
☆ 7	98506-05020	Screw, pan head	(1)	
☆ 8	98506-05025	Screw, pan head	(1)	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

The part in parenthesis is the part which is originally installed on the vehicle and which can be used again.

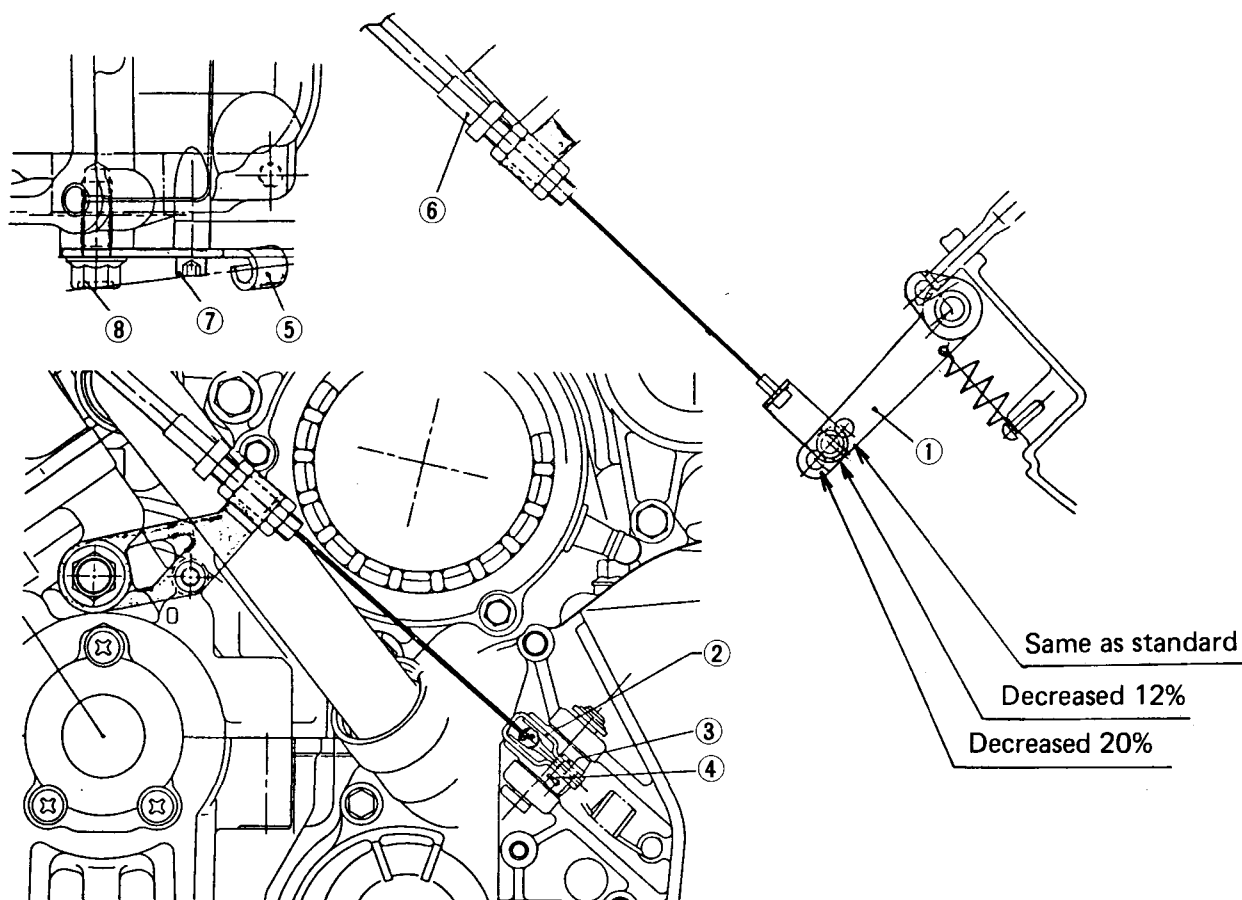
As shown below, part ⑤ should be modified in the following manner:



*Cut the shaded area ~~xxxxxx~~ using a router.
After cutting, assemble the kit and check if it smoothly operates.

10) Clutch push lever kit

Against the standard type, the leverage has been changed and the lever load has been decreased by 12 to 20%.



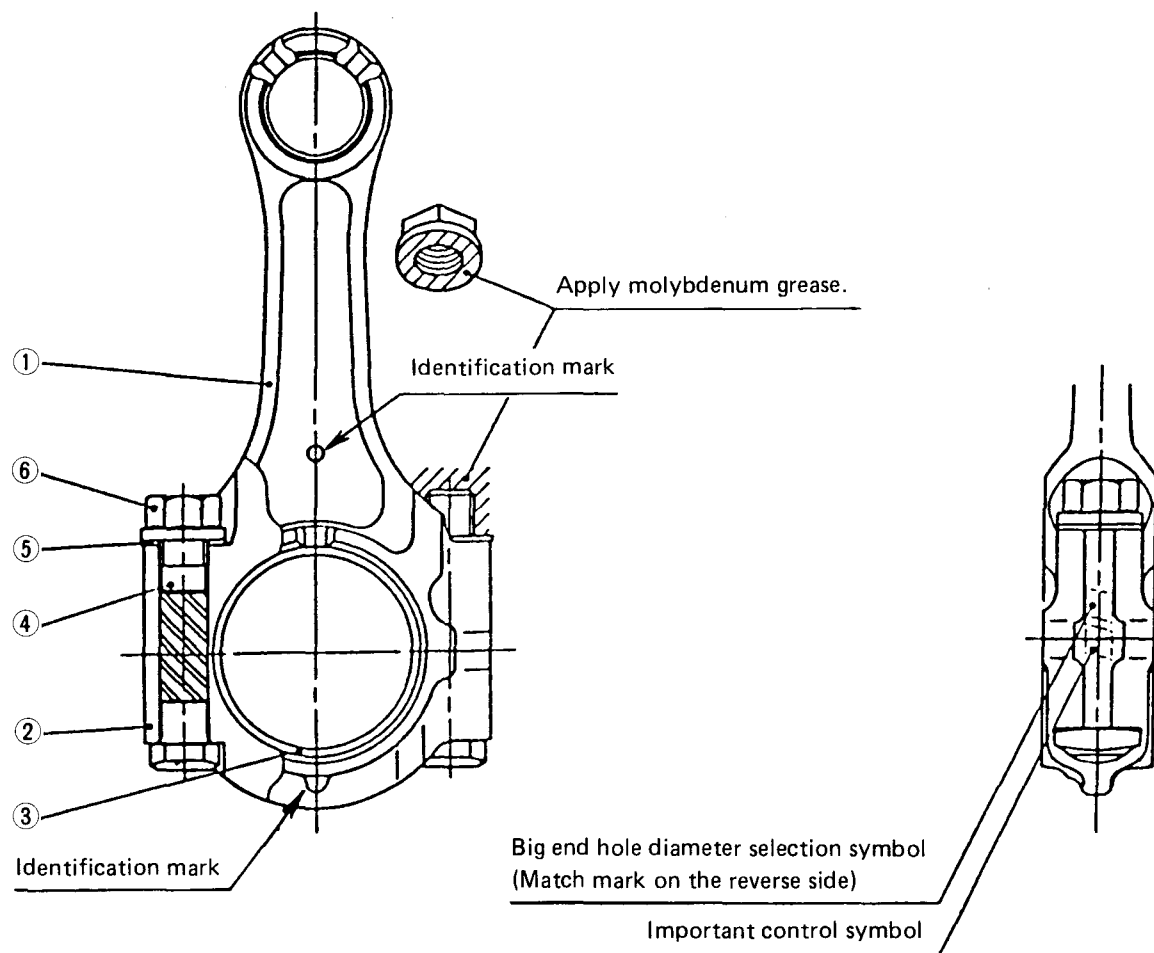
No.	Part No.	Part name	Q'ty	Remarks
1	3FV-16342-70	Lever, push	1	
☆ 2	214-16389-00	Joint	1	
☆ 3	91701-06010	Pin	1	
☆ 4	90468-12006	Clip	1	
5	3FV-15441-70	Holder, clutch wire	1	
6	3FV-26335-70	Wire, clutch	1	
☆ 7	91311-06020	Bolt	1	
☆ 8	95821-10020	Bolt, FL	1	

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

5. Engine service data

1) Connecting rod tightening procedure (Endurance, Sprint)

The '89, '90 FZR750R is so designed that the standard type connecting rod of any kit can be used. When tightening the connecting bolt, strictly follow the specified procedure by taking into consideration the durability, reliability and reliability of the engine.



No.	Part No.	Part name	Q'ty	Remarks
☆ 1	3FV-11651- ⁽⁰¹⁾ ₀₀	Rod, connecting	(4)	Option
☆ 2	3FV-11652-00	Cap, connecting rod	(4)	
☆ 3	3GM-11656-10 ~ 30	Brg, conrod	(8)	
☆ 4	3FV-11654-00	Bolt, conrod	(8)	
☆ 5	90201-090J9	Washer, plain	(8)	
☆ 6	90179-09379	Nut	(8)	

() Use the original equipment.

Parts marked with ☆ are stamped YAMAHA parts and available through the general parts sales channel.

- The '89, '90 FZR750R (OW-01) employs a titanium connecting rod to meet the increased engine speed, and in addition, the connecting rod bolt tightening is controlled by bolt elongation control which is more reliable.

Specified elongation: $170\mu \pm 25\mu$

Procedure

1. Temporarily install the crankshaft, big-end bearing, connecting rod, and bolts in the normal order. (These parts should be installed with the identification mark on the left side, and the bearing should be fully oiled.)
2. The bolts should be fitted with washers. (Always use a new bolt.)
3. Apply molybdenum grease to bolt threads, washers, and contact surfaces of the nuts.
4. Lightly tighten the nut, and using a rag, wipe off the grease on both ends of the bolt.
5. Using a micrometer, measure the bolt length before tightening the bolt.
(A standard type micrometer is acceptable, but a pin-point type is recommendable, which allows easy operation. For the correct measurement, it is advisable to make several measurements and calculate the average of measurements.)
6. Using a torque wrench, temporarily tighten the bolt on both sides to $0.7 \sim 1$ kgm.
7. The bolt should be tightened so that the elongation of the bolt is $170\mu \pm 25\mu$.
(First, tighten the bolt to 4.2 kgm, and measure its length. If the elongation is more than specification, retighten.)
8. If the bolt shows elongation more than specification.
 - When the elongation is more than 220μ or more, replace the bolt and start reassembly.
 - If the elongation is $195\mu \sim 220\mu$, the bolt may be used.

NOTE: _____
If the bolt is found elongated 195μ or more, replace the bolt and reassemble.

2) List of engine tightening torque (Endurance, Sprint kits)

No.	Sec.	Tightening point	Part No.	Part name	Dia x Pitch	Tightening torque (kgf·m)	Qty	Nei:lock	Lock washer	Remarks
T-001	Std.		9502Δ-06ΔΔΔ	Bolt, flange (small)	M6 x 1.0	1.0 ± 0.2				
T-002			9582Δ-06ΔΔΔ 9102Δ-06ΔΔΔ	Bolt, flange	M6 x 1.0	1.0 ± 0.2				
T-003			9131Δ-06ΔΔΔ	Bolt, hexagon socket	M6 x 1.0	1.0 ± 0.2				
T-004			92501-06ΔΔΔ	Screw, panhead	M6 x 1.0	0.7 ± 0.2				
T-006			9502Δ-08ΔΔΔ	Bolt, flange (small)	M8 x 1.25	2.0 ± 0.2				
T-007			9582Δ-08ΔΔΔ	Bolt, flange	M8 x 1.25	2.0 ± 0.2				
T-010	111	Sand hole plug	90340-18101	Plug, straight screw	M18 x 1.5	5.5 ± 0.5	4	SI-U-L (TB1330B)		
T-020		Spark plug installation	94700-00275	Plug, spark	M12 x 1.5	1.75 ± 0.25	4			
T-030		Head tightening	90179-10584	Nut	M10 x 1.25	4.1 ± 0.2	8			Lubricate with oil to screw and stopper
T-040		Head tightening	90176-10064	Nut	M10 x 1.25	4.1 ± 0.2	4			Lubricate with oil to screw and stopper
T-050		Cap x Cam case	90105-06153	Bolt	M6 x 1.0	1.0 ± 0.2	16			
T-060		Cap x Head	90105-06541	Bolt	M6 x 1.0	1.0 ± 0.2	24			
T-070		Head cover tightening	90109-06746	Bolt	M6 x 1.0	1.0 ± 0.2	8			
T-071		Oil hole filling plug	90336-064F0	Plug taper			3	SI-U-L (TB1330D)		Cam case, plug taper section
T-072		Oil hole filling plug	90336-05021	Plug taper			2	SI-U-L (TB1330B)		Cam case, plug taper section
T-090	114	Conrod Conrod cap	3FV-115S4-00 90179-09379	Bolt, conrod Nut	M9 x 1.0	Height control 170 ± 5μ	8			Lubricate Molybdenum gear grease
T-100	121	Plug x Tensioner case (1WG-12210-02)	90109-112F1	Bolt	M11 x 1.0	2.0 ± 0.5	1			
T-110		Sprocket x Cam shaft	90105-07342	Bolt	M7 x 1.0	2.4 ± 0.2	4			
T-120		Damper chain x Lower case	90109-065A8	Bolt	M6 x 1.0	1.0 ± 0.2	2	SI-U-L (TB1330B)		
T-130	124	Protector installation	97606-05310	Screw, panhead w/washer	M5 x 0.8	0.5 ± 0.2	4			
T-131		Pipe 4 installation	90110-06142	Bolt, hexagon socket	M6 x 1.0	1.0 ± 0.2	1			
T-140	131	Oil cooler installation	3FV-13340-00	Byps valve ass'y	M20 x 1.5	6.3 ± 0.3	1			Lubricate with oil to screw and flange
T-150		Oil pan installation	90340-14127	Straight screw	M14 x 1.5	4.3 ± 0.4	1			
T-160		Delivery pipe 2 installation	90401-10096	Bolt, union	M10 x 1.25	2.1 ± 0.2	2			
T-161		Delivery pipe 2 installation	90401-10044	Bolt, union	M10 x 1.25	2.1 ± 0.2	1			
T-170		Baffle plate 1, 2, 3 installation	95026-06012	Bolt, flange (small)	M6 x 1.0	1.0 ± 0.2	10	SI-U-L (TB1330D)		
T-171		Baffle lower plate installation	95026-06010	Bolt, flange (small)	M6 x 1.0	1.0 ± 0.2	4	SI-U-L (TB1330D)		
T-172		Element oil filter	JE8-13441-00	Element oil filter	M20 x 1.5	1.7 ± 0.2	1			Lubricate with oil to O-ring
		Oil pan x Stay muffler	95801-08016	Bolt, flange	M8 x 1.25	2.0 ± 0.2	1			

No.	Sec.	Tightening point	Part No.	Part name	Dia x Pitch	Tightening torque (kgf·m)	Qty	Neji-lock	Lock washer	Remarks
T-180	141	Cap case 2 installation	97601-05216	Screw panhead	M5 x 0.8	0.5 ± 0.2	1			
T-190	146	Nut ring x Head cylinder	91311-08016	Bolt, hexagon socket	M8 x 1.25	2.0 ± 0.2	8			
T-200		Exhaust pipe x Muffler	96816-08025	Bolt, flange	M8 x 1.25	2.0 ± 0.2	1			
T-210		Exhaust gas outlet	90101-06576	Bolt, hexagon	M6 x 1.0	1.0 ± 0.2	4			
T-215		Protector installation	90119-06131	Bolt, hexagon w/washer	M6 x 1.0	1.0 ± 0.2	2			
T-220		Wire bracket installation	90119-06131	Bolt, hexagon w/washer	M6 x 1.0	1.0 ± 0.2	2			
T-225		Exhaust pipe x Stay muffler	95801-08016	Bolt, flange	M8 x 1.25	2.0 ± 0.2	1			
T-230	151	Crankcase 1	90116-105ΔΔ	Bolt, stud	M10 x 1.25	Stretch control 0.5 ~ 1.5 kgf·m 3.2 ± 0.2	12			Lubricate with oil to screw and stopper
T-240		Crankcase 1 x Crankcase 2	90105-09373	Bolt, flange	M9 x 1.25	3.2 ± 0.2	9			Lubricate with oil to screw and stopper
T-245		Crankcase 1 x Crankcase 2	90105-09580	Bolt, flange	M9 x 1.25	3.2 ± 0.2	1			Lubricate with oil to screw and stopper
T-250			95811-06ΔΔΔ	Bolt, flange	M6 x 1.0	1.2 ± 0.2	7			Lubricate with oil to screw and stopper
T-260			95811-08ΔΔΔ	Bolt, flange	M8 x 1.25	2.4 ± 0.2	17			Lubricate with oil to screw and stopper
T-265			90105-09555	Bolt, flange	M9 x 1.25	3.2 ± 0.2	1			Lubricate with oil to screw and stopper
T-270		Cover 1 installation (15416)	90152-06014	Screw, cross reset oval	M6 x 1.0	0.7 ± 0.2	6			Seal bolt
T-280		Plate, bearing cover installation	90151-06014	Screw, cross reset counter	M6 x 1.0	1.0 ± 0.2	3	^{S1-U-L} (TB133D)		
T-290		Cover 2 installation (15427)	95821-06010	Bolt, flange	M6 x 1.0	1.0 ± 0.2	1	^{S1-U-L} (TB133D)		
T-300	156	Guide, upper installation	95816-06014	Bolt, flange	M6 x 1.0	1.0 ± 0.2	2	^{S1-U-L} (TB133D)		
T-310		Wheel starter installation	90110-08177	Bolt, hexagon socket	M8 x 1.0	2.5 ± 0.2	3	^{S1-U-L} (TB133D)		
T-320	161	Boss clutch installation	90170-20257	Nut, hexagon	M20 x 1.0	7 ± 1.0	1		○	Lock washer
T-330		Clutch, spring installation	90159-06123	Screw, with washer	M6 x 1.0	0.8 ± 0.2	6			
T-340	171	Drive sprocket	90179-18020	Nut	M18 x 1.0	7 ± 1.0	1		○	
T-350	181	Stopper shift bar installation	95822-06016	Bolt, flange	M6 x 1.0	1.0 ± 0.2	2	^{S1-U-L} (TB133D)		
T-360		Stopper lever installation	90109-065A9	Bolt	M6 x 1.0	1.0 ± 0.2	1	^{S1-U-L} (TB133D)		
T-370		Rod shift installation	3FV-18187-00-0	Nut	M5 x 0.8 (L)	0.6 ± 0.2	1			Left screw
T-380		Rod shift installation	95311-05700	Nut	M5 x 0.8	0.6 ± 0.2	1			
T-390		Stopper screw	4GO-18127-00	Stopper screw	M8 x 1.25	2.2 ± 0.2	1	^{S1-U-L} (TB133D)	○	
T-400		Joint rod installation	92013-05014	Bolt, button head	M5 x 0.8	1.0 ± 0.2	2	S2-L		
T-405		Pedal front installation	90151-06013	Screw, cross reset counter	M6 x 1.0	1.8 ± 0.2	1	S2-L		
	211	Stay engine installation	90179-10590	Nut	M10 x 1.25	4.9 ~ 6.0	1			

No.	Sec.	Tightening point	Part No.	Part name	Dia x Pitch	Tightening torque (kgf-m)	Qty	Neji-lock	Lock washer	Remarks
T-410	810	AC generator installation	95816-08030	Bolt, flange	M8 x 1.25	2.5 ± 0.2	3			
T-420		Ignitor unit installation	90110-06158	Bolt, hexagon socket	M6 x 1.0	1.0 ± 0.2	1			
T-430		Neutral switch installation	92502-06016	Screw, panhead	M6 x 1.0	0.4 ± 0.2	2	ST-U-L (TBT333D)		
T-440		Ignition coil installation	95822-06040 96702-06500	Bolt, flange Nut, flange	M6 x 1.0	1.0 ± 0.2	4			
T-450		Installation on radiator	3FV-83591-00	Thermo unit	M16 x 1.5	1.8 ± 0.2	1			
T-460		Installation on radiator	2EL-82560-00	Thermo switch ass'y	M16 x 1.5	2.25 ± 0.25	1			
T-465		Installation on radiator	97606-05108	Screw, panhead w/washer	M5 x 0.8	0.5 ± 0.2	1			
T-480		Servo motor installation	97001-06025	Bolt, hexagon	M6 x 1.0	1.0 ± 0.2	1			

3) List of lubricants and sealing compound (Endurance, Sprint kits)

No.	Sec.	Lubricate spot	Seal	Parts requiring lubrication seals			
				Case 2 (Change shaft)	Case 2 (Rod push)	Drive sprocket	Cover, crankcase 1
L-010		Overall oil seal lip portions					
L-020		Overall outer circumferential portions of O-ring	Grease	Cover element	Byps valve	Relief valve	Water pipe
				Sell motor	A.C.G.	Neutral switch	Pipe delivery 2. 3. 4. 5.
				Rod push 2	Water pump	Cover 1 (L, R)	Conduction ass'y
				Nozzle ass'y	Pipe 1 (Both end)	Pipe oil 1 (Both end)	
L-030		Overall bearings	Oil	Gear primary driven inner diam. Lay shaft (L, R)	Main shaft (L, R) Gear idler 2 inner diam.	Drive shaft (L, R) Camshift (R)	
L-040	114	Enlarged end portion of crankshaft	Oil	Crankshaft	Inner circumference of bearing conrod (Metal)	Enlarged end portion con-rod	
L-050		Circumferential of piston	Oil	Piston	Sleeve, cylinder	Ring, piston	
L-060		Circumferential of pin, piston	Oil	Pin, piston	Piston	Small end portion of con-rod	
L-070		Portion of conrod bolt	Molybdenum gear grease	Washer	Bolt	Nut, screw and stopper	
L-080		Portion of crankshaft journal	Oil	Crankshaft	Inner circumference of bearing conrod (Metal)	Crankcase 1 stopper	
L-090	121	Shaft cam Portion of profile	Molybdenum disulfide oil	Shaft cam	Cam case	Cam cap	
L-100		Valve IN, EX portion of stem	Molybdenum disulfide oil	Valve IN, EX	Guide IN, EX valve	Stem seal	Pad
L-110		Valve IN, EX stem end	Oil	Lifter valve	Cam case		
L-120	124	W/P shaft impeller portion	Oil	Shaft impeller	Crankcase 2		
L-130	131	Oil pump ass'y (inside)	Oil	Shaft	Rotor IN, OUT		
L-140		Straigner ass'y	Oil	Housing straigner (inside)	Screen portion		
L-145		Byps valve ass'y	Oil				
L-150	156	Gear, idler 1 (interior)	Oil	Gear idler 1	Shaft 1		
L-160		Starter clutch outer ass'y (inside)	Oil	Clutch starter (outer)	Pin (Roller)	Gear, Id 2 outer diam.	
L-170		Sprocket, starter 2 (inner diam.)	Oil	Sprocket starter 2	Shaft 2		
L-180	161	Gear, primary driven end surface	Oil	Gear	Plate, thrust (L, R)		
L-190		Ball (for clutch)	Oil	Ball	Rod, push		
L-195		Push lever ass'y	Grease	Pin	Bearing	Rod push 2	
L-200	171	Transmission sliding gear Inner surface End surface	Molybdenum disulfide oil	Gear 4P, 5P	Gear 1W, 2W, 3W	Axle main drive	

No.	Sec.	Lubricate spot	Seal	Parts requiring lubrication seals			
				Gear 3P	Gear 4W, 5W	Axle main drive	
L-210		Transmission floating gear groove of folk inner surface	Molybdenum disulfide oil				
L-220	181	Left side bearing portion of camshaft	Oil	Cam shaft	Case 2		
L-230		Outer circumference of bar shift gear	Oil	Bar shift folk	Folk shift 1, 2, 3	Case 2	
L-240		Shaft shift ass'y	Oil	Shaft shift ass'y	Case 2		
L-250		Boss shift inner diam.	Grease	Change pedal	Foot rest (B/D)		
S-010	111	Head cover sealing surface	Three-bond TB1541	Head cover cleaning	Head cover gasket		
S-021		Head cover sealing surface	Three-bond 1215B	Head cover gasket	Cam case		
040	151	Crankcase 1 and 2 sealing surface	Three-bond No. 1215	Case sealing surface			