Competition Use Only

SUZUKI

RGV250

HOP-UP KIT MANUAL

* Before performing any servicing, please read thoroughly RGV250 service manual and RGV250 supplementary service manual

USE THIS MANUAL WITH: RGV250 SERVICE MANUAL
(Part No. 99500-12071-01E)
RGV250 SUPPLEMENTARY SERVICE MANUAL
(Part No. 99501-12020-01E)

09000-69484
*

MANUFACTURE'S EXEMPTION

SUZUKI RGV250 HOP-UP KIT is a special-purpose designed for exclusive use in competition only on racing course as distinguished from public road and highways. RGV250 HOP-UP KIT is not equipped for conformity with traffic law and regulations, and is not accorded with the benefit of product which SUZUKI standardly grants on motorcycle of its manufacture.

NOTE:

* *The motorcycle on which the HOP-UP KIT is installed, is not covered by the SUZUKI WARRANTY.*
* *This HOP-UP KIT manual describes only service specifications and servicing procedures which differ from those of the RGV250 service manual and supplementary service manual.*
* *Specification will be changed without pre-notice.*
* *Please refer to the RGV250 service manual and supplementary service manual for details.*

SUZUKI MOTOR CORPORATION

Sales Department II (for overseas)
Spare Parts & Accessories Division

CONTENT

KIT PARTS INSTALLATION PROCEDURES

1. FUEL

The engine is of two-stroke type, designed to run on oil-premixture fuel (when the oil pump is removed).
Fuel specification: Aviation gasoline. *Racing gasoline can also be used. However, it will require a different carburetion setting.
Oil specification: Motul 700E or Shell Sports SX (both synthetic oil)
Oil mixture ratio: 30 : 1

2. COOLANT

Coolant specification: Soft drinkable water
When filling the cooling system with water, follow the procedures below.

1) Remove the radiator cap and pour water through the filler neck.
2) Bleed air from the water pump.
3) Holding the handlebars, lean the motorcycle two or three times to expel air trapped in the system.
4) Squeeze each radiator hose to drive air away.
5) Loosen the air bleed bolt on the side of radiator to remove air (if the standard radiator is fitted).
6) Repeat the procedures 1) through 5) above until the water level becomes constant.
7) Fit the radiator cap securely.

After the above procedures are completed, start and warm up the engine, then check that there is no water leakage. Stop the engine, allow to cool and check the water level again.

* During the race interval, drain the system completely to avoid corrosion or other harmful problems in the radiator and engine water jacket.
* The water temperature for best engine operation is 55 — 65°C.
  When more than 70°C, considerable power loss will result.

3. WARMING UP

Always warm up the engine before running in the following manner:

1) For 1 — 2 minutes, rev the engine up and down with the range of 5,000 — 6,000 rpm.
2) For another 1 — 2 minutes, rev the engine up and down limiting the highest revolution to 8,000 rpm.
3) When the water temperature reaches approximately 55°C, test drive for approximately 50 m and check the operation of gearshifting, clutch, brake etc. if an appropriate warming up site is available.

(If the water temperature rises to more than 90°C, check the system immediately because there may be problems like leakage, insufficient water etc.)

4. BREAK IN

New machine

Keep the engine as constant as possible during running. To shift up or down, keep to the following rpm limit. Use as high gear as is practically possible.

1) First, run 2 — 3 times in the track limiting the engine speed below 8,000 rpm.
2) Stop and check for parts looseness, leakage etc.
3) Run approximately 15 km limiting the engine speed below 8,000 rpm.
4) Run approximately 15 km limiting the engine speed below 9,000 rpm.
5) Run approximately 15 km limiting the engine speed below 10,000 rpm.

The total of running distance is approximately 45 km.

> CAUTION:
> **During breaking in period, run the engine on slightly rich carburetion.**

When parts replaced

* If the cylinder or crankshaft is replaced, the same break in as new machine is required. (approximately 45 km).
* If the parts such as piston, piston ring, transmission gear are replaced, break in as follows:

  For 10 km below 8,000 rpm
  For 10 km below 9,000 rpm
  For 10 km below 10,000 rpm
  Total distance = 30 km

5. PARTS REPLACEMENT

Scheduled replacement

PARTS OR ITEM	RECOMMENDED CHECK	REPLACE IF FOUND
Piston	Every 500 km	Wear, pitting
Piston ring	Every 500 km	Wear, pitting
Piston pin	Every 1,000 km	Seizure, stepped wear
Piston pin circlip	Every 300 km (each time removed)	Whenever disassembled
Piston pin bearing	Every 500 km	Seizure, wear
Piston pin bearing washer	Every 1,000 km	Wear, scratches
Crankshaft	Every 2,000 km	Runout, seal damage, bearing wear
Transmission oil	Initial 100 km and every 1,000 km	Contamination, emulsification
Drive chain	Every 500 km	Stretch, kink
Fork oil	Initial 100 km and every 3 races	
Brake oil	Every 3 months or after rain	
Pulser clamp (Stage I)	Every 500 km	Damage

Other items to be replaced

ITEM	REPLACE IF FOUND
Spark plug	Electrode wear, insulator damage
Reed valve	Damaged or deformed reed (Affects low rpm performance)
Clutch spring	Fatigue
Drive sprocket	Wear, crack, break
Driven sprocket	Wear, crack, break
Expansion chamber spring	Fatigue, other damage
Exhaust silencer	Noise level over permitted limit

6. TRANSMISSION OIL

Transmission oil capacity: 800 cc when refilling
900 cc when overhauled
Recommended oil: Motul Gearbox or equivalent

7. SPARK PLUG

Specified spark plug: NGK R5184 #10 (Standard)
#9.5 (Optional)
#10.5 (Optional)

Spark gap: 0.5 mm

8. SPARK PLUG CAP

From '89 model, the ignition system is digitally controlled. The digital control system is susceptible to radio interference. Therefore, make sure to use the spark plug cap of standard specification.

9. CYLINDER HEAD (Stage II kit)

The cylinder head combustion chamber of this kit is finished with a special plating so-called an SBC plating to prevent pitting in case of abnormal detonation. The cylinder head combustion chamber of Stage II kit is made smaller than that of Stage I kit for the purpose of increasing compression ratio.

[Maintenance]

Remove carbon deposit from the combustion chamber and inspect for plate peeling, pitting, crack or other abnormal conditions. If the plate peeling is not excessive and without any other damage, sand to smooth the peeled plating edge so that the surface step is not evident, using #600 waterproof sand paper. If the pitting is excessive and there is evidence of gasket leak, then replace the cylinder head.

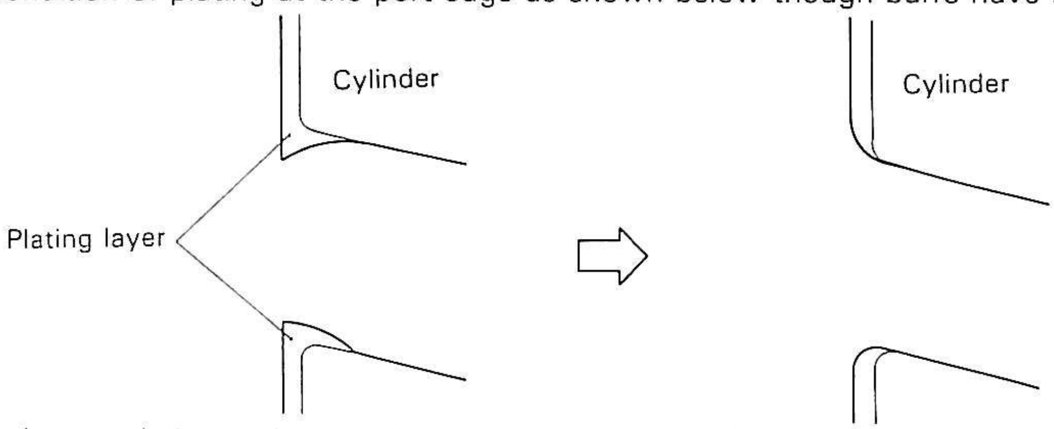
10. CYLINDER (Stage II kit)

On the basis of standard cylinder, the Stage II kit cylinder incorporates modifications of size and timing for the exhaust and transfer ports as well as height dimension relative to piston TDC position to increase compression.

[Maintenance]

If seizure is slight and a little melted piston alloy is left on the cylinder wall, remove it using #400 — 600 waterproof sand paper. However, if the plating is peeling and the cylinder's base alloy surface is visible, the cylinder may not be used and should be replaced.

* Some standard cylinders can have slightly different port timing from the design specification due to the condition of plating at the port edge as shown below though burrs have been removed.



To correct the port timing to the specification, it is recommended to smooth the edge using an abrasive impregnated rubber.

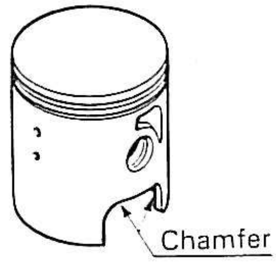
11. PISTON AND PISTON RING

The piston crown for both the Stage I and II kits is finished with SBC plating, the same plating as the cylinder wall, to prevent pitting in case of abnormal detonation.
In the case of Stage II kit, thin piston rings are used for the purpose of reducing weight and friction.

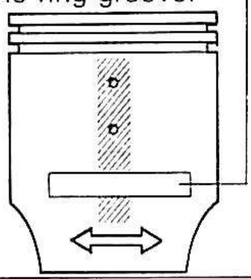
[Maintenance]

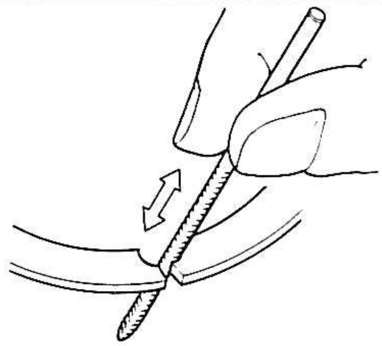
* In the case of standard engine, the expander ring, a wavy steel strap ring, is fitted behind the 2nd ring for the purpose of reducing mechanical noise. When using the machine for competition riding, it is recommended to remove this expander ring in order to reduce friction loss. (Stage I)
* To increase durability, chamfer the piston skirt as shown. (Stage I & II)
* After a break-in operation has been completed, disassemble the piston and cylinder to check the surface contact condition. If a hard spot is found on the piston where it rubs against the cylinder port rib, remove the hard spot slightly using an oil stone or #400 waterproof sand paper. This particular area on the piston will generally become a hard spot and therefore it may be rectified prior to initial assembly.
* Because the Stage II kit piston ring is thin, its ends contact the dowel harder, which likely causes burr and then ring sticking. The result may be broken ring or piston seizure. Therefore, chamfer the ring ends before installation. (Approximately C = 0.3)

After chamfered by a file, smooth the edge using #400 waterproof sand paper.



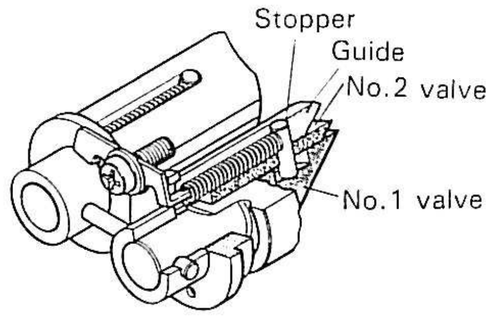
Rectify by removing oil stone or sand paper transversely. Do not scrape above the ring groove.

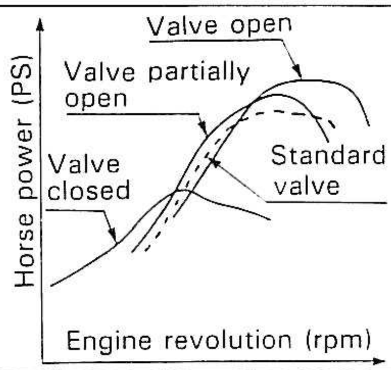




12. EXHAUST VALVE

The Stage II kit exhaust valve has been modified over the standard one so as to make the exhaust passage smoother. The guide and No. 2 valve have been also modified to increase mid range power.
To make the engine capable of producing sufficient power as designed, make sure to use the kit exhaust valve.





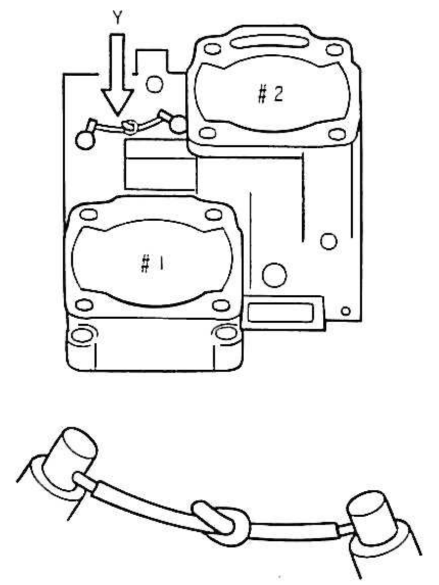
13. CYLINDER GASKET (Stage II)

The standard thickness of cylinder gasket is 1.3 mm when the Stage II kit cylinder is used. Because of dimensional tolerance of each part being assembled, the piston top position at TDC relative to the cylinder upper end can vary.
Therefore, the gasket thickness should be adjusted so that the piston top becomes flush with the cylinder upper end.
In addition to 1.3 mm gasket, the 1.2 and 1.4 mm gaskets are provided as optional.

11241-23D00 .... t = 1.3
11241-23D10 .... t = 1.2
11241-23D20 .... t = 1.4

14. CRANKCASE

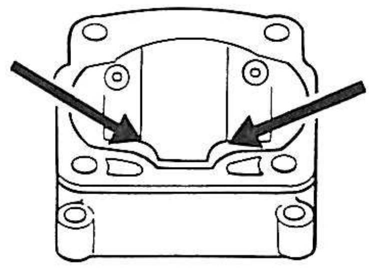
The standard crankcase is used as it is when assembling the kit. However, as the engine lubrication type must be changed from the oil injection to oil pre-mixture fuel, the oil nozzles for crankshaft journal bearing should be blocked.



View Y:

Cut the oil hose to an appropriate length and block the hose either by inserting a plug within the hose or making a tight knot in center.

[Maintenance]
The standard crankcase is die-cast with the use of split dies which unavoidably cause burrs to form on the surfaces such as inlet passage. It is recommended to smooth the surfaces to be free of burrs. Where the applicable regulation can permit, grind and smooth the area guiding intake from the base of reed valve to the transfer port using a routor. This rectification will improve mixture charging efficiency thereby increasing horse power.



15. CLUTCH

There are two types of clutch provided as kit.

(1) Wet, reinforced type (Stage I)

The clutch plate and spring are modified to increase clutch capacity. With this modification, the clutch can be reinforced with comparatively low cost.

(2) Dry clutch (Stage II)

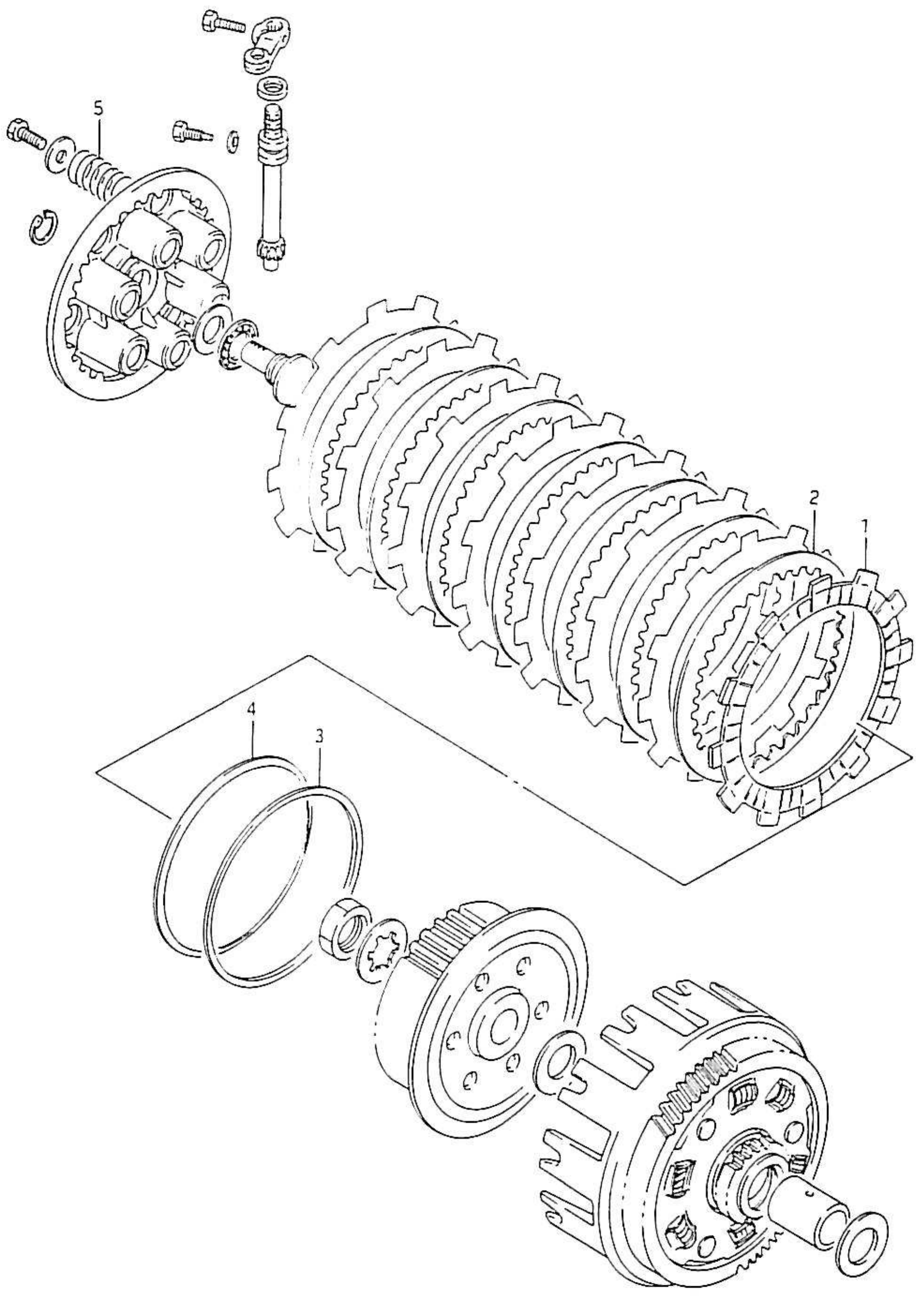
Because of dry type, the clutch will not be affected by transmission oil viscosity, providing drag-free disengagement and low mechanical loss. The parts are designed exclusively for competition use and specially selected magnesium alloy is used for weight reduction.

> CAUTION:
> **Practice of starting using clutch should not be repeated continuously.**
> **Always cool the clutch sufficiently before repeating such a practice.**

(1) Wet, reinforced type (Stage I)

Replace the clutch parts with those listed below. Also, refer to RGV250 Service Manual (99950-12072-01E) for details of replacement procedure.

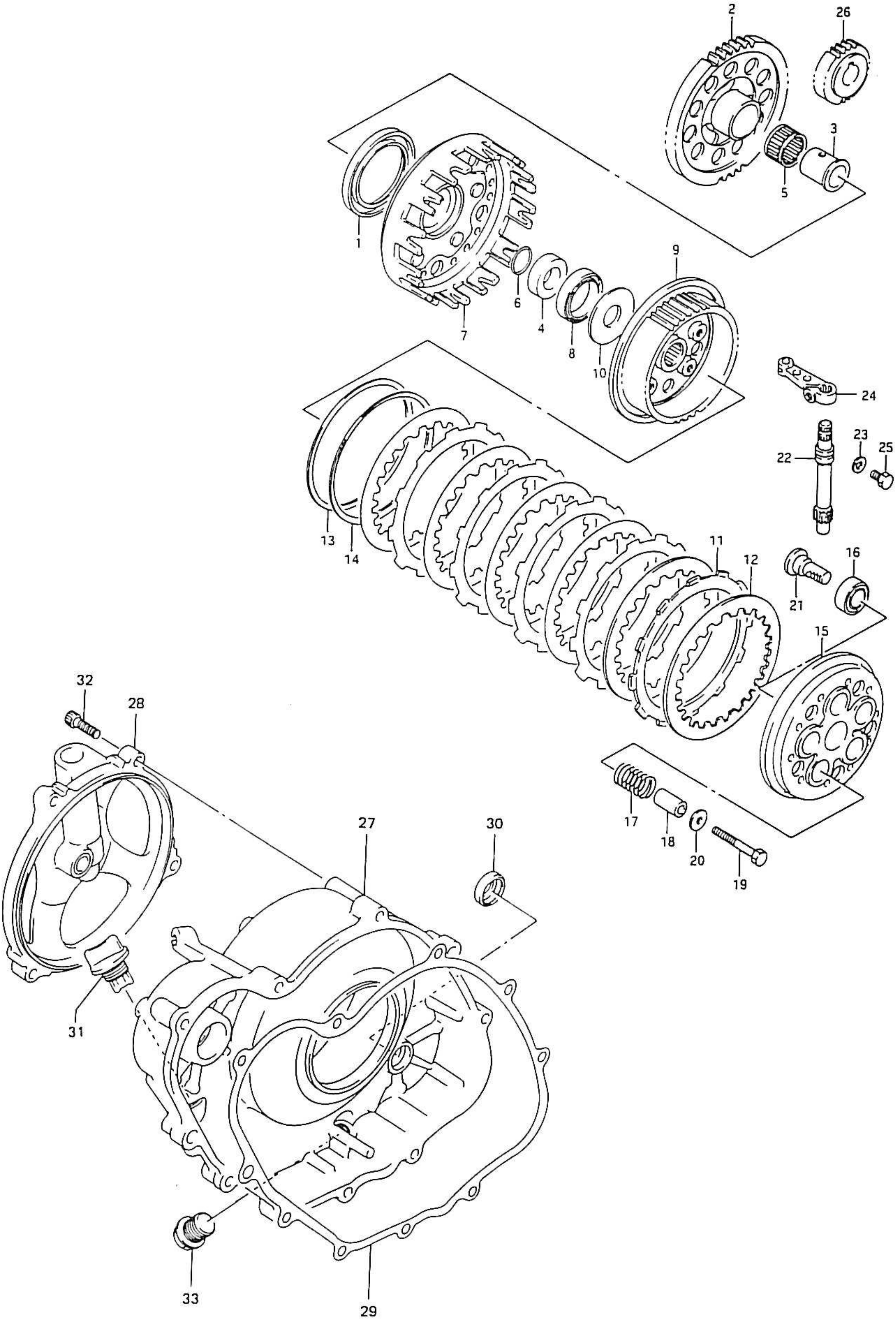
REF. NO.	PART NUMBER	DESCRIPTION	Q'TY/UNIT	REMARKS
1	21441-40A01	PLATE, CLUTCH DRIVE	8	T: 3 mm
2	21451-40A00	PLATE, CLUTCH DRIVEN	7	T: 1.6 mm
3	21471-12C50	SEAT, VAVE WASHER	1	
4	09164-00006	WAVE WASHER	1	
5	09440-19013	SPRING	6	



(2) Dry clutch (Stage II)

REF.NO.	PART NUMBER	DESCRIPTION	Q'TY/UNIT	REMARKS
		CLUTCH SET (DRY)	1	INC., REF. No. 1 — 33
1	09282-58001	OIL SEAL, INNER COVER	1	58x78x7
2	21211-12C50	GEAR, PRIMARY DRIVEN	1	NT: 64/20
3	21251-12C50	SPACER, DRIVEN GEAR	1	
4	21252-12C50	SPACER, DRIVEN GEAR	1	
5	09263-25033	BEARING	2	25x30x19.8
6	09280-20001	O-RING	1	
7	21220-12C50	HOUSING, COMP. CLUTCH	1	
8	09283-35023	OIL SEAL	1	35x45x6
9	21411-12C50	HUB, CLUTCH SLEEVE	1	
10	09160-20051	THRUST WASHER, SLEEVE HUB	1	20x50x2
11	21441-12C50	PLATE, CLUTCH DRIVE	5	T: 3 mm
12	21451-20A01	PLATE, CLUTCH DRIVEN	6	T: 1.6 mm
13	21471-12C60	SEAT, WAVE WASHER	1	
14	21472-12C50	WAVE WASHER, CLUTCH SLEEVE HUB	1	
15	21462-12C51	DISC, CLUTCH PRESSURE	1	
16	21463-15400	BEARING, PRESSURE DISC	1	
17	09440-18017	SPRING, CLUTCH	5	
18	22522-12C50	SPACER, CLUTCH SPRING	5	6.5x13x25.6
19	01107-06405	BOLT	5	6x40
20	21481-17C50	WASHER	5	6.2x18.8x1.6
21	23165-12C50	RACK CLUTCH RELEASE	1	
22	23261-20A00	PINION, CLUTCH RELEASE	1	
23	08322-21068	WASHER, CLUTCH RELEASE PINION	1	
24	23271-14101	ARM, CLUTCH RELEASE	1	
25	09135-06009	BOLT, PINION	1	
26	21111-12C50	GEAR, PRIMARY DRIVE	1	
27	11341-12C50	COVER, CLUTCH INNER	1	
28	11370-12C50	COVER, COMP. CLUTCH OUTER	1	
29	11482-22D00	GASKET, CLUTCH COVER	1	
30	11342-12C50	PLUG, CLUTCH INNER	1	
31	11971-12C50	PLUG, OIL FILLER	1	
32	07120-06252	BOLT, CLUTCH COVER	4	6x25
33	11972-12C50	PLUG, OIL DRAIN	1	
34	24121-12C60	COUNTER SHAFT FOR DRY TYPE	1	NT: 16 (Not shown)
35	17461-12C60	GEAR, WATER PUMP DRIVE	1	32T

NOTE: The water pump related parts are common with those of standard specification.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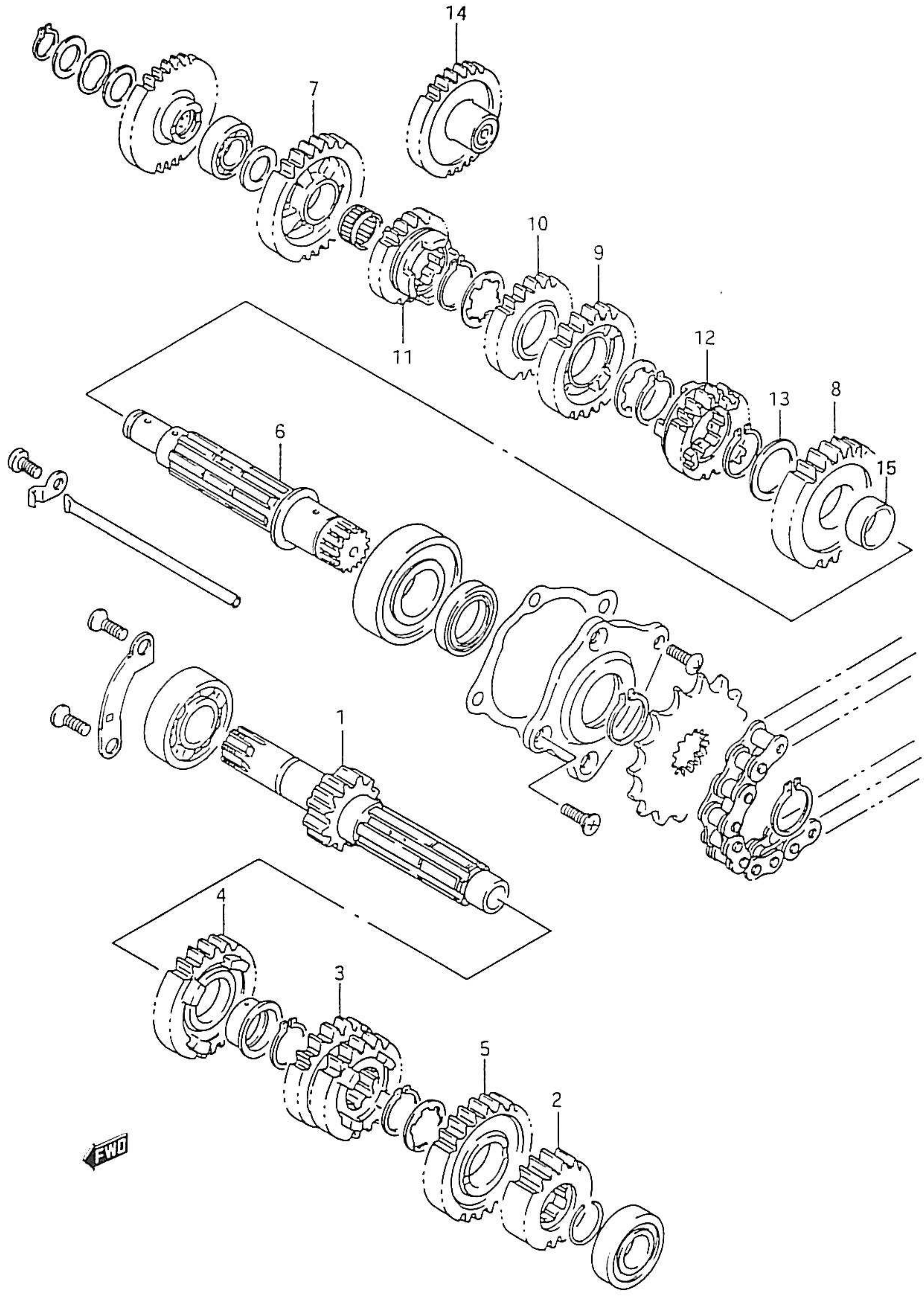
16. CLOSE RATIO TRANSMISSION

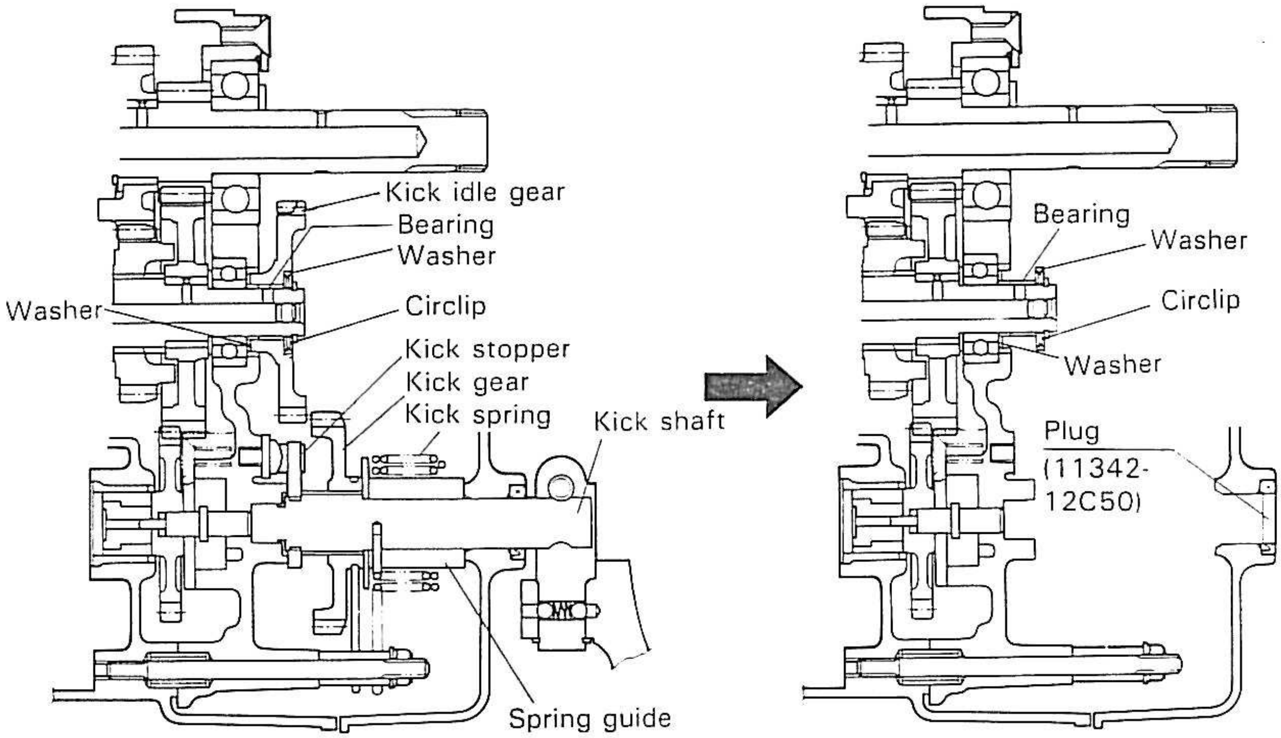
Modify the gear ratios for better suitability for competition using the parts listed below. Refer to RGV250 Service Manual (99950-12072-01E) for details of replacement.



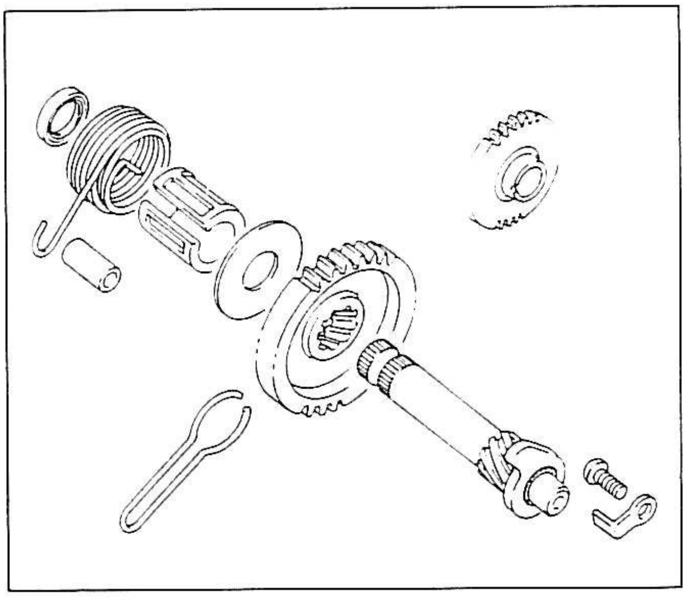
REF. NO.	PART NUMBER	DESCRIPTION	Q'TY/UNIT	REMARKS
1-1	24121-12C50	COUNTERSHAFT	1	For Wet clutch (Stage I)
1-2	24121-12C60	COUNTERSHAFT	1	For Dry clutch (Stage II)
2	24221-12C60	GEAR,2ND DRIVE	1	NT: 17
3	24231-12C60	GEAR, 3RD/4TH DRIVE	1	NT: 18/25
4	24251-12C60	GEAR, 5TH DRIVE	1	NT: 27
5	24261-12C50	GEAR, 6TH DRIVE	1	NT: 25
6	24130-12C51	SHAFT, DRIVE	1	
7	24311-12C52	GEAR, 1ST DRIVEN	1	NT: 30
8	24321-12C60	GEAR, 2ND DRIVEN	1	NT: 25
9	24331-12C60	GEAR, 3RD DRIVEN	1	NT: 22
10	24341-12C60	GEAR, 4TH DRIVEN	1	NT: 26
11	24351-12C60	GEAR, 5TH DRIVEN	1	NT: 25
12	24361-12C50	GEAR, 6TH DRIVEN	1	NT: 21
13	08211-25321	SHIM, 2ND DRIVEN GEAR	1	
14	16320-12C50	GEAR, OIL PUMP DRIVE	1	NT: 28
15	24322-12C60	BUSH, 2ND DRIVEN GEAR	1	

NOTE: Either one of the two different countershafts should be selected for the type of clutch being used.

17. KICK STARTER SYSTEM REMOVAL



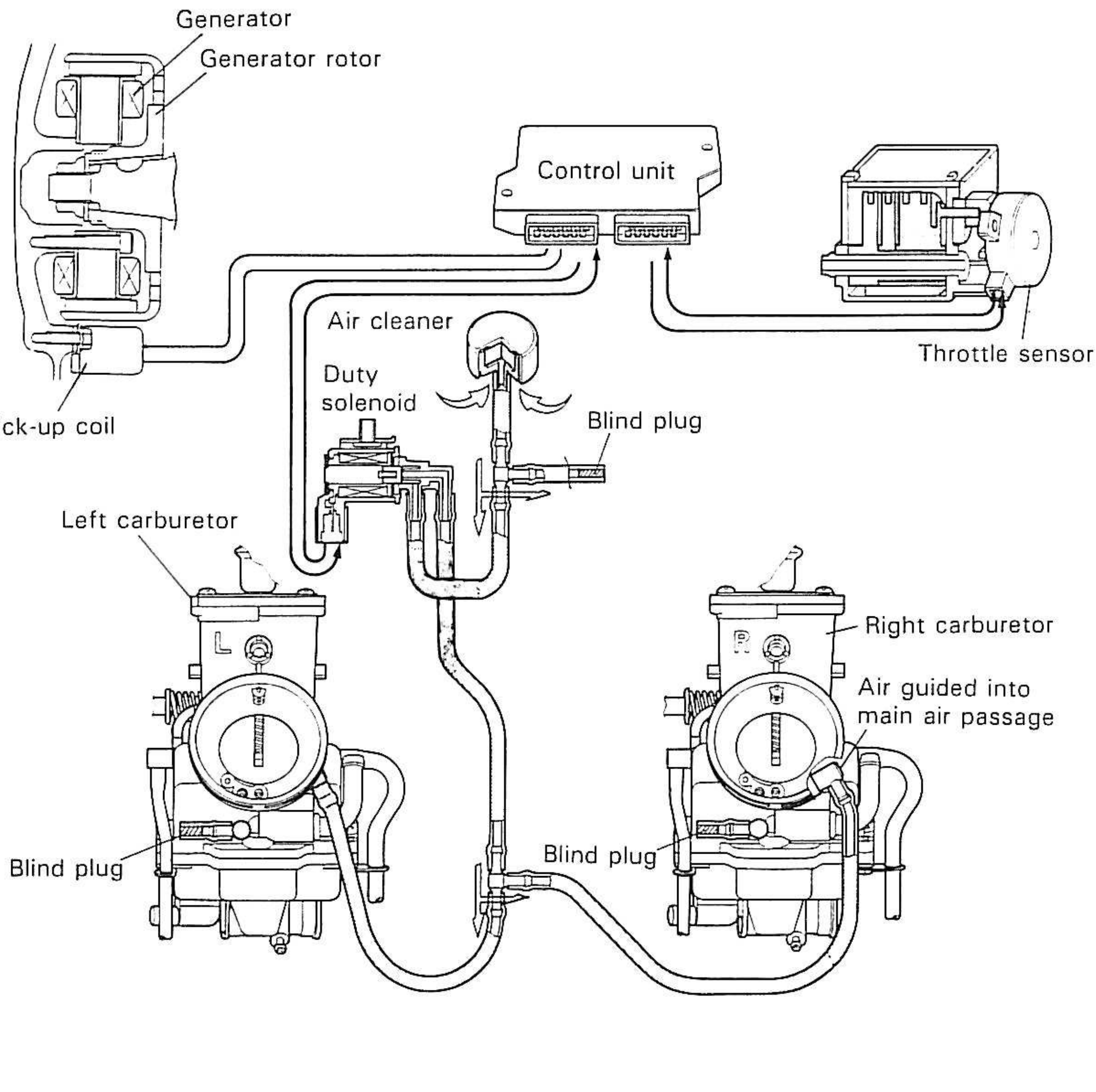
In the case of sprint race, the kick starter system may be removed for reducing weight. The left illustration indicates the parts items that can be removed from the system. However, when removing the kick idle gear, the bearing, washer and circlip should be left on the shaft. Keep the removed parts for reuse so as to take part in a future endurance race which requires kick starter system.



18. CARBURETOR

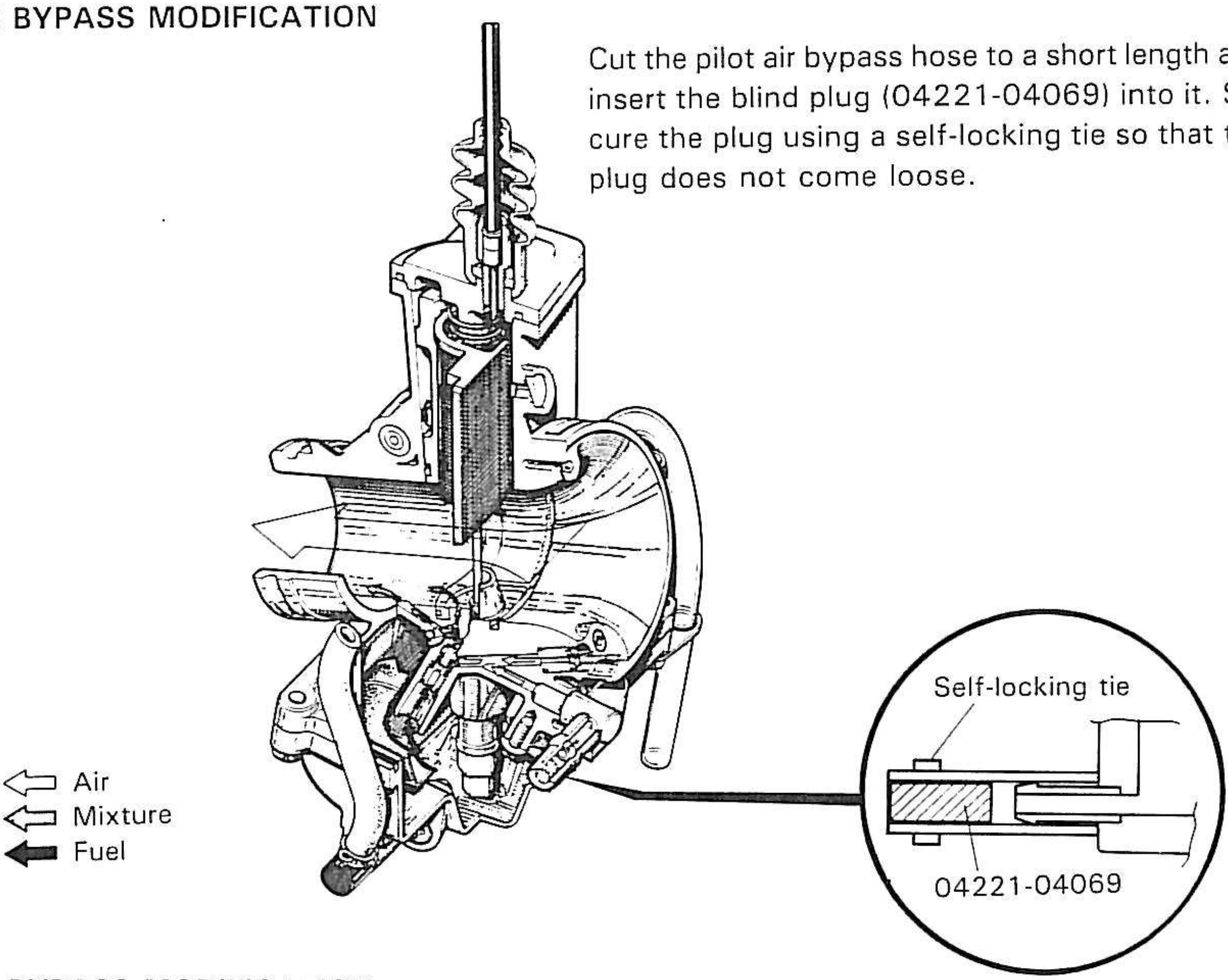
The carburetor uses a flat slide type throttle valve which helps make main bore air flow smoother and provide better fuel atomization, resulting in quicker engine response.

Another feature of this carburetor is in its air control system which supplies electronically controlled auxiliary air to the main air bypass. This control is perfomed by the control unit which receives the throttle valve sensor and engine revolution input signals. And after processing these signal information, the unit outputs an on/off duty signal to allow the optimum amount of main air to pass through the duty solenoid. In the standard provision, the system also controls the pilot air for operation in the low rpm range. However, the pilot air control can be cancelled for easier carburetion adjustment if the machine is to be operated mainly in the mid/high rpm range.



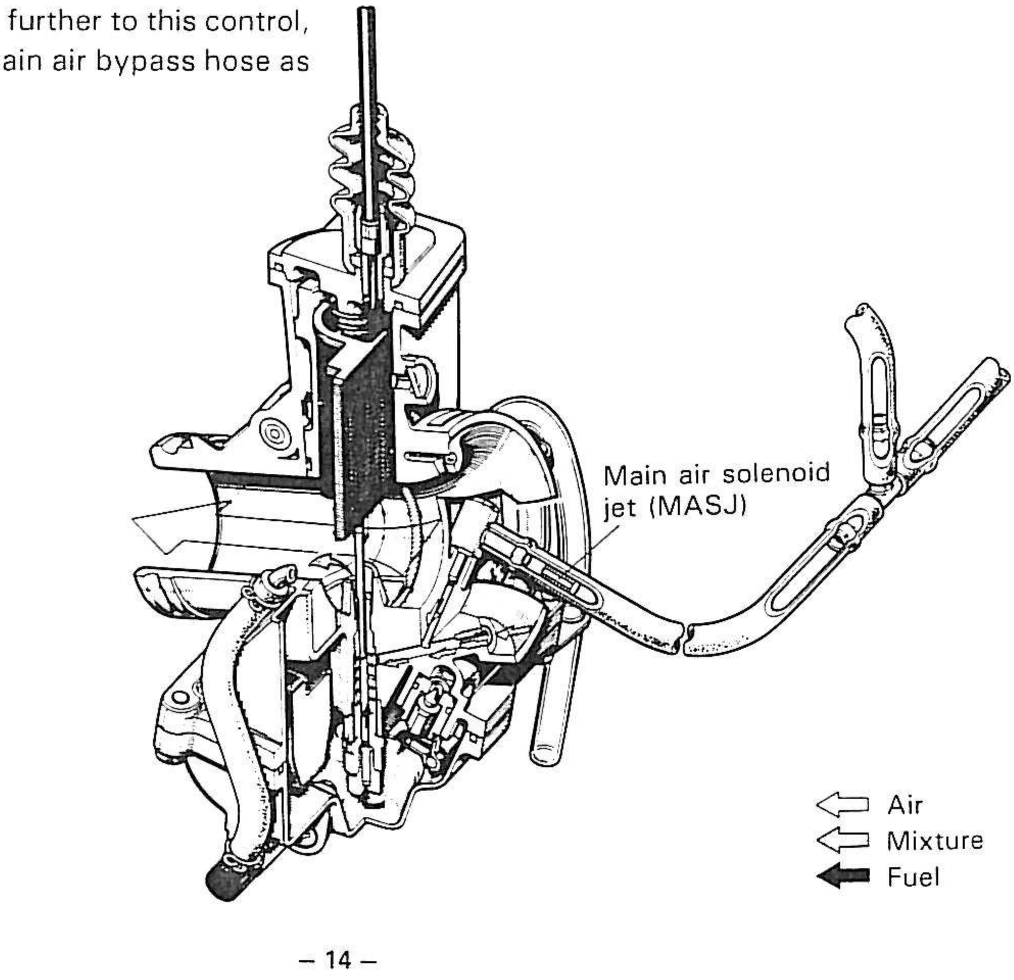
PILOT AIR BYPASS MODIFICATION

Cut the pilot air bypass hose to a short length and insert the blind plug (04221-04069) into it. Secure the plug using a self-locking tie so that the plug does not come loose.



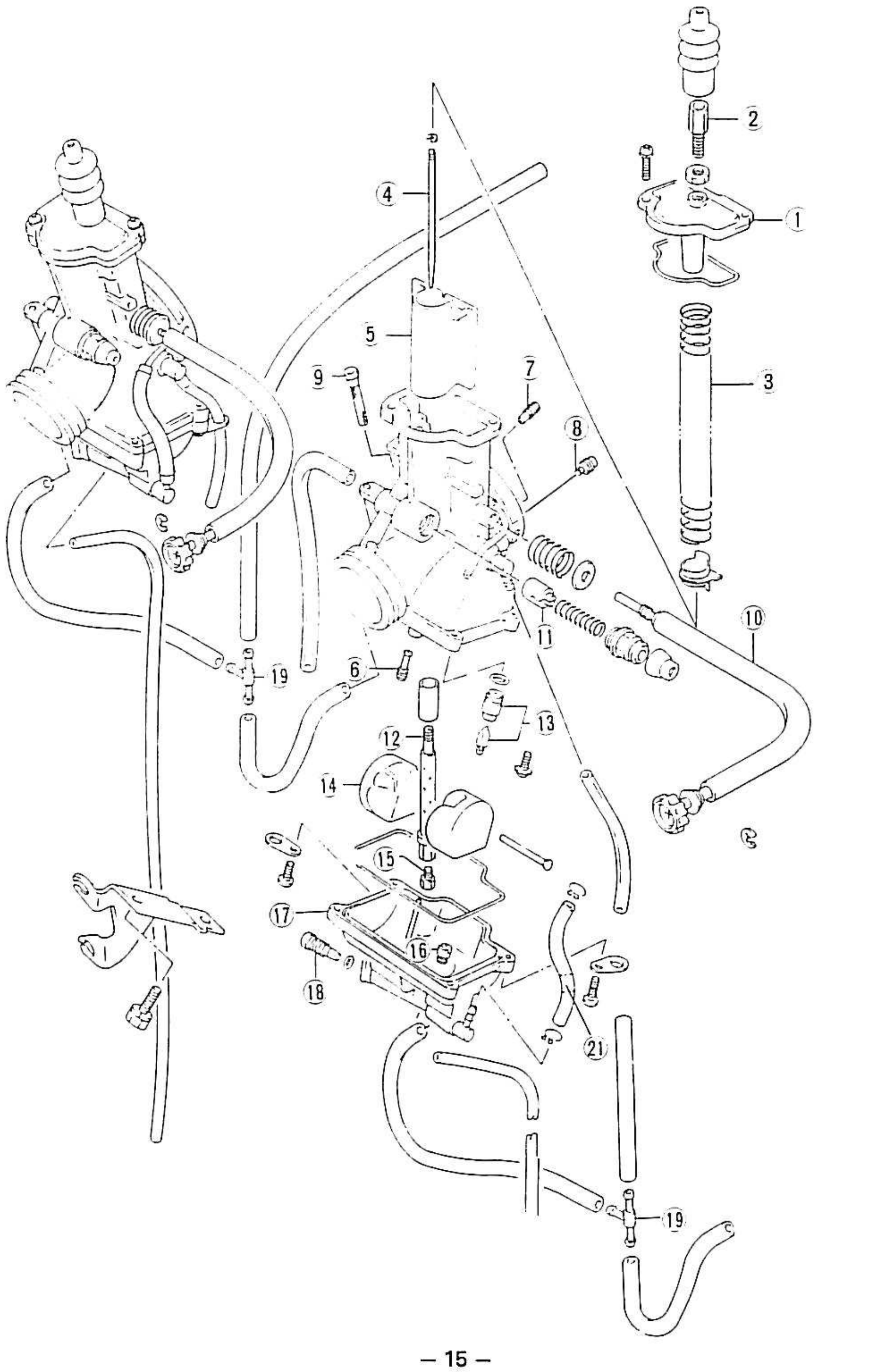
MAIN AIR BYPASS MODIFICATION

The duty solenoid controls air supplied to the main air bypass. However, further to this control, insert the air jet into the main air bypass hose as shown in the illustration.



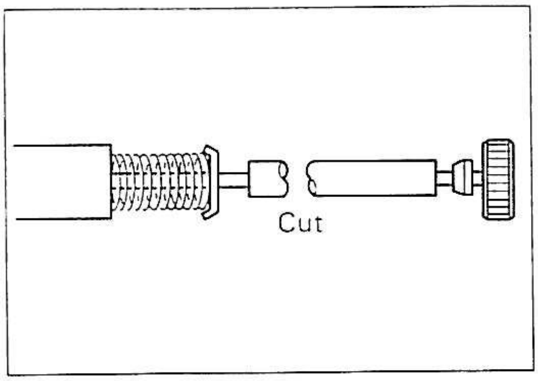
CARBURETOR COMPONENT PARTS LIST

① Top cap	⑧ Pilot air jet	⑮ Main jet
② Cable adjuster	⑨ Filter	⑯ Power jet
③ Spring	⑩ Throttle stop screw	⑰ Chamber
④ Jet needle	⑪ Starter plunger	⑱ Drain screw
⑤ Piston valve	⑫ Needle jet	⑲ Nipple
⑥ Pilot jet	⑬ Needle valve	⑳ Nipple
⑦ Main air jet	⑭ Float	㉑ Powe jet II

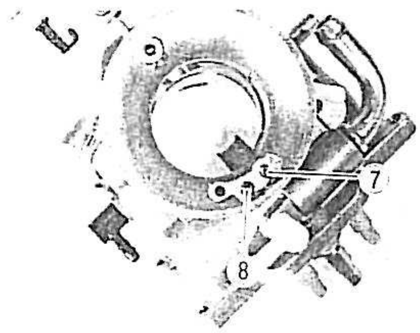


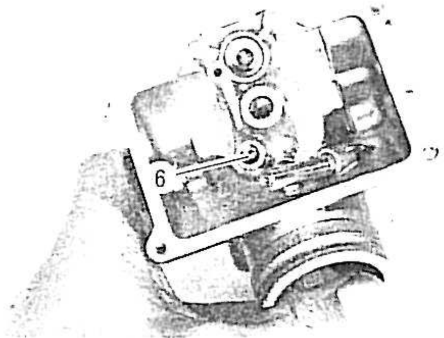
CARBURETOR MODIFICATION

- Loosen the throttle stop screw ⑩ to the point where it will not come loose and the engine cannot continue idling. Then, cut the cable at its base so that the adjuster bracket removal is no longer necessary in the subsequent carburetor tuning.

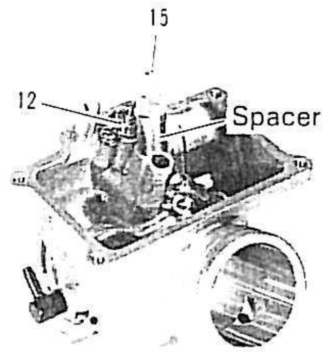


- Cut the spring ③ shorter by four turns of coil to reduce spring load and rider fatigue during competition riding. Care should be taken not to cut it too short, or throttle returnability will be adversely affected.
- Replace the pilot jet ⑥ , main air jet ⑦ and pilot air jet ⑧ with those of the kit.

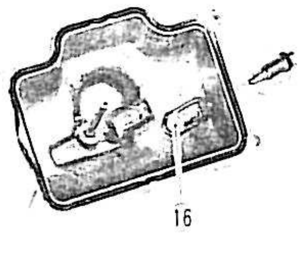




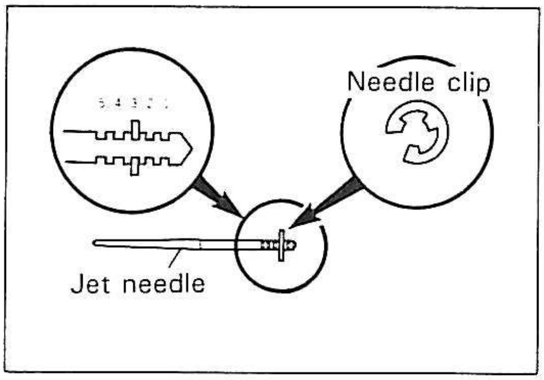
- Replace the main jet ⑮ and needle jet ⑫ with those of the kit.



- Replace the power jet ⑯ with that of the kit.

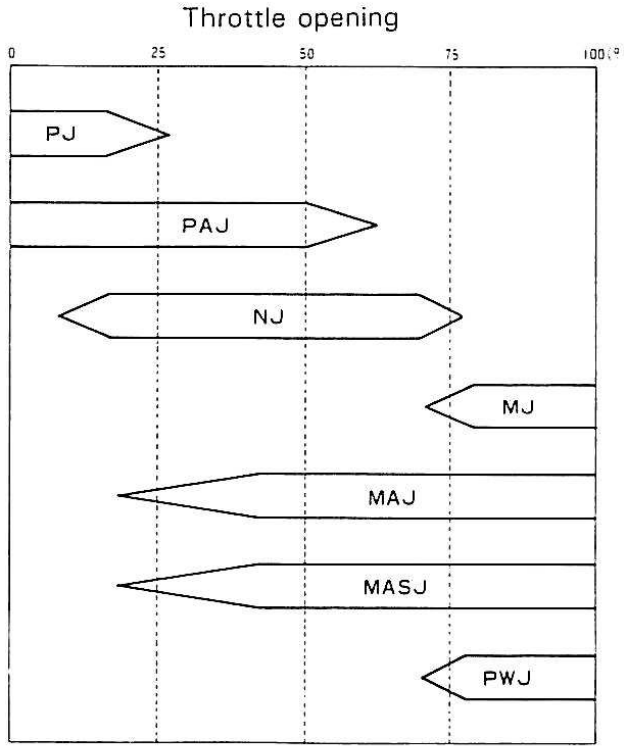


- The power jet II ㉑ which is in the hose connecting between the float chamber and carburetor body should either be replaced with the jet of kit or be left removed.
- Replace the needle jet ④ with that of the kit and fit the clip into the position required.
- Insert into the air control hose the main air solenoid jet, of which the size is appropriate for the condition.



NOTE:
Pilot air jet, main air jet and main air solenoid are of the same type air jet. Therefore, if jets having the same number are interchangeable with each other.

CARBURETION BY DIFFERENT JETS



This diagram indicates were each jet affects the carburetion throughout the throttle opening range.

- PJ (Pilot Jet): With 15% of throttle opening, carburetion is affected in the entire revolution range and with 25% of throttle opening, in the range over 9,000 rpm.
- PAJ (Pilot Air Jet): With less than 50% of throttle opening, carburetion is affected in entire revolution range.
- NJ (Needle Jet): With 15 — 25% of throttle opening, carburetion is affected in entire revolution range; with 35 — 50% of throttle opening, over 9,000 rpm; and with 75% of opening, over 11,000 rpm.
- MJ (Main Jet): With 75% of throttle opening, carburetion is affected in the revolution range over 9,000 rpm, and with 100% of throttle opening, in the range over 7,000 rpm.
- MAJ (Main Air Jet): From 15% of throttle opening, carburetion begins to be gradually affected, and with more than 50% of opening, it is affected in entire revolution range.
- MASJ (Main Air Solenoid Jet): With approximately the same throttle opening range as MAJ, it can affect carburetion. However, due to the duty solenoid control, carburetion influence is limited to within 5,000 — 9,000 rpm and over11,000 rpm.
- PWJ (Power Jet): With 75% of throttle opening, carburetion is affected in the revolution range over 10,000 rpm, and with 100% of throttle opening, in the range over 8,000 rpm.

MJ Increment of #10	#320 Leaner ~ #450 Richer	PJ Increment of #2.5	# 20 Leaner ~ #40 Richer
NJ	O−6 Leaner ~ P−2 Richer	PWJ	#50 Leaner · #60 Richer
JN	 1st 5th Clip position 1st Leaner ~ 5th Richer	PAJ MAJ MASJ PWJ II Increment of #0.1	0.5 Leaner ~ * 0.9 Richer

* Because PAJ, MAJ and MASJ are air metering jets, the larger the number, the more air will flow, resulting in richer mixture.
* Do not change the JN clip position but leave it in the 3rd groove.
* Do not change the MAJ number from 0.5.
- Basically, it is not necessary to change PAJ, MAJ or MASJ for tuning carburetion. Instead, replace PJ, NJ or MJ for different carburetion. Only when time is limited and changing carburetion in the pilot or main system is desired, PAJ or MASJ may be replaced as an alternative tuning. However, such a tuning method is not recommended because at times loss of total carburetor balance may result.

CARBURETOR JETTING EXAMPLE

For Stage I (With racing gasoline)

	#1	#2
MJ	#370	#360
NJ	O−9	O−9
JN	6FL-84-50, 3rd	6FL-84-50, 3rd
PJ	#27.5	#27.5
PAJ	#0.7 (0.8 when raing)	#0.7 (0.8 when raing)
MAJ	#0.5	#0.5
PWJ	#35	#35
PWJ II	# 0.5	# 0.5
MASJ	# 0.5	# 0.5

Circuit with straight: Approx. 500 m.
Temperature: 12°C;
Barometric pressure: 760 mHg

If circuit has the straight longer than this, then increase the MJ number by #20 — #30.

If replacing racing gasoline by aviation gassoline, smaller jets may be used:
For MJ, smaller by #20 — #30;
and for NJ, smaller by 1 — 2 lower rank.

(with aviation gasoline)

	#1	#2
MJ	#350	#340
NJ	O−8	O−8
JN	6FL-84-50, 3rd	6FL-84-50, 3rd
PJ	#27.5	#27.5
PAJ	#0.7 (0.8 when rainy)	#0.7 (0.8 when rainy)
MAJ	#0.5	#0.5
PWJ	#35	#35
PWJ II	# 0.5	# 0.5
MASJ	#0.5	#0.5

For Stage II (With racing gasoline)

	#1	#2
MJ	390	380
NJ	P−1	P−1
JN	6FL-84-50, 3rd	6FL-84-50, 3rd
PJ	#27.5	#27.5
PAJ	#0.7	#0.7
MAJ	#0.5	#0.5
PWJ	#50	#50
PWJ II	None	None
MASJ	# 0.5	# 0.5

Circuit with straight: Approx. 500 m
Temperature: 12°C;
Barometric pressure: 760 mHg

If a circuit has a straight longer than this, then increase the MJ number by #20 − #30.

(With aviation gasoline)

	#1	#2
MJ	370	360
NJ	P−O	P−O
JN	6FL-84-50, 3rd	6FL-84-50, 3rd
PJ	#27.5	#27.5
PAJ	#0.7	#0.7
MAJ	#0.5	#0.5
PWJ	#50	#50
PWJ II	None	None
MASJ	#0.5	#0.5

When operating in a short circuit using a partial throttle opening frequently, a combination of smaller MJ with larger NJ may be suitable. On the contrary, in a large circuit with long straight, use comparatively larger MJ.

CARBURETION WITH DIFFERENT CLIMATIC CONDITION

Condition	Result	Required adjustment
Cold	Lean	To make richer
Hot	Rich	To make leaner
Dry	Lean	To make richer
When hot	Rich	To make leaner
High altitude	Rich	To make leaner

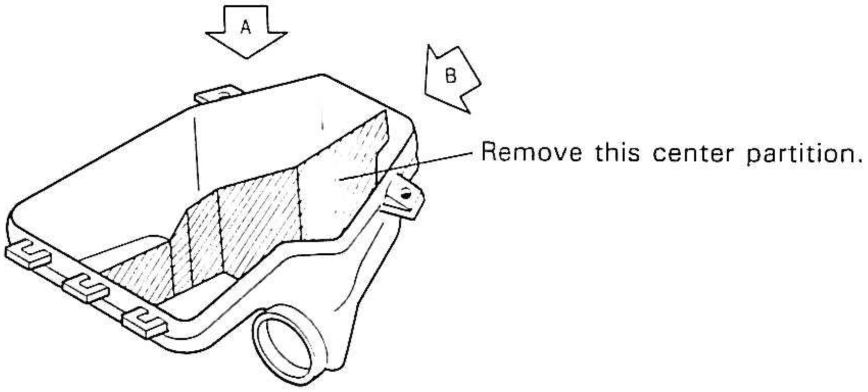
CARBURETOR TUNING BY DIFFERENT FAILURE SYMPTOM

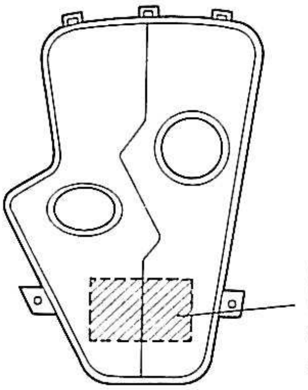
SYMPTOM	ADJUSTMENT	REMARKS
With full open throttle; • Rev peak too low • Doesn't rev up quickly • Poor power output (Rich)	• Decrease MJ size. • Decrease gradually by 1 — 2 sizes while observing piston crown color.	• Check if choke is on. • Check if not overflowing.
With full open throttle; • Hesitates • Pings or knocks • Revs up but power not suffficient.	• Increase MJ size. • Increase gradually by 1 — 2 sizes while observing piston crown color. • Increase PWJ size.	• Check if air not leaking in. • Check if ignition timing not too fast.
Performs dull or intermittent in range 1/4 — 3/4 throttle opening.	Decrease NJ size to make mixture leaner.	(Rich at a partial opening)
Hesitates in range 1/4 — 3/4 throttle opening and torque is poor.	Increase NJ size to make mixture richer.	(Lean at a partial opening)
Responds to gradual but not to quick throttle opening.	Decrease MJ size because of too rich main system.	
Responce too sharpe to control.	Increase PJ size.	
Performs dull when throttle opened from full close.	Decrease PJ size.	

19. AIR CLEANER BOX MODIFICATION

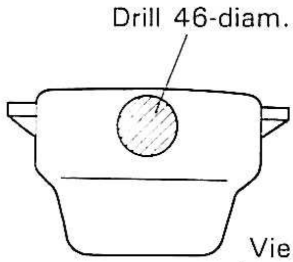
With carburetion modified for competition use, the air cleaner box should also be modified as shown below.

NOTE: The cap, air cleaner, filter and trap (net) are no longer used.

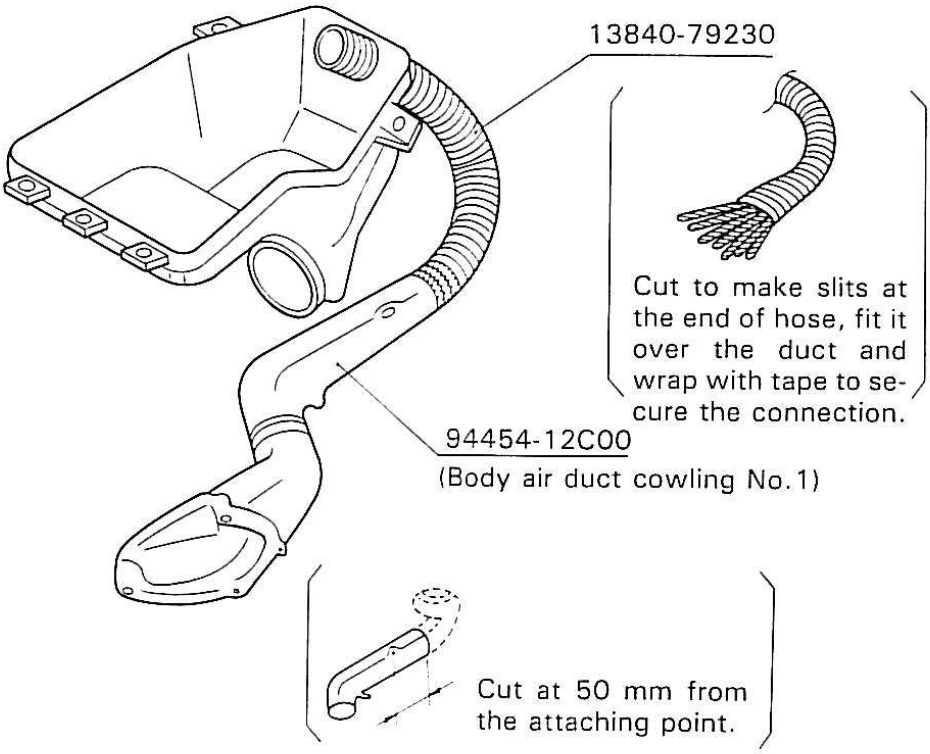




View A

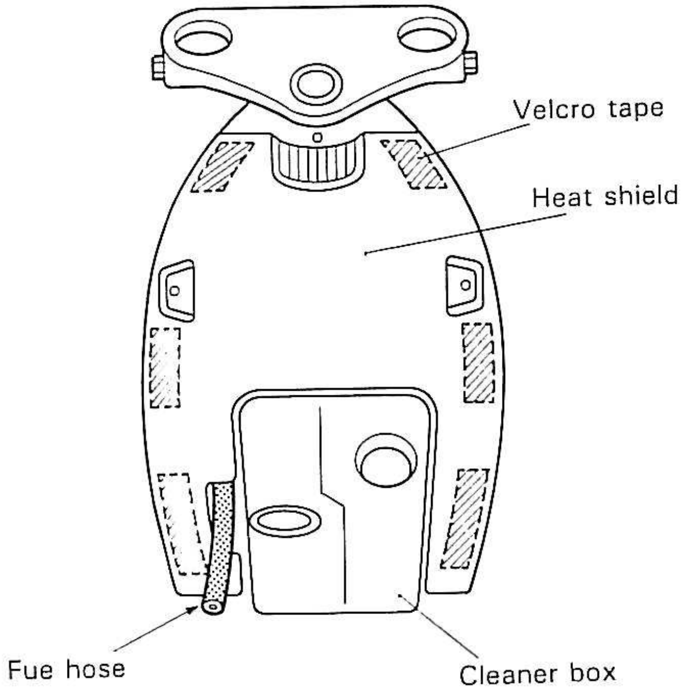


View B



20. INSTALLING HEAT SHIELD

Install the heat shield to prevent hot, expanded air through the radiator from being supplied to the carburetor.



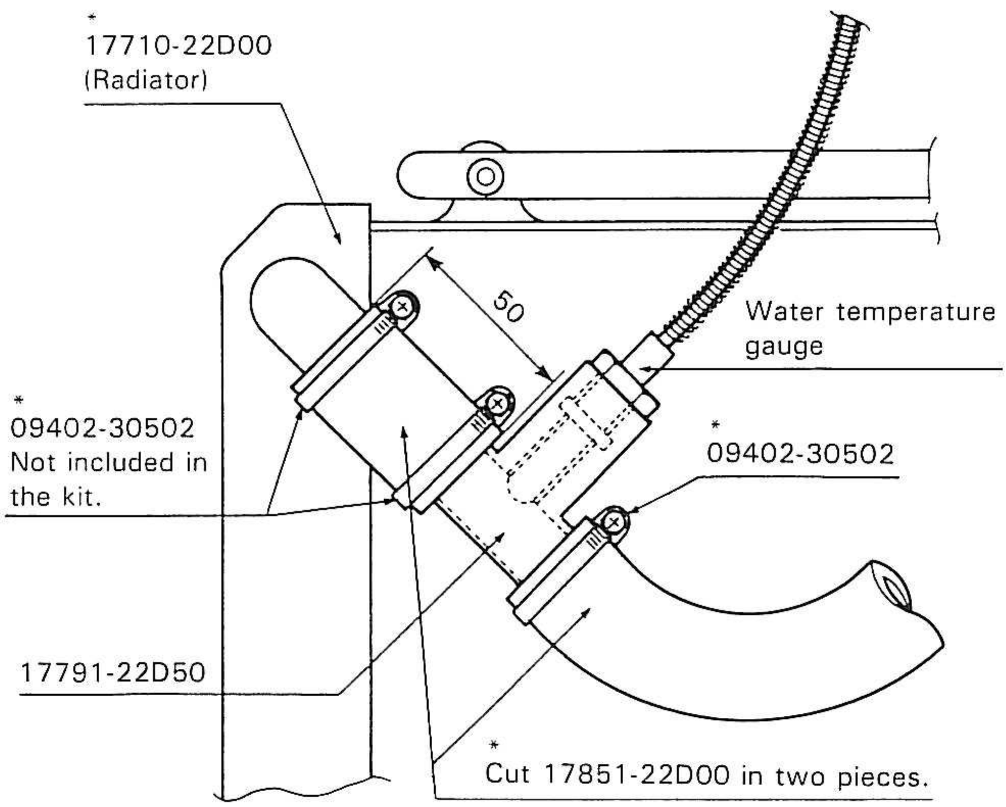
Make sure to use this heat shield, or else carburetion will be largely affected.

1) Position the heat shield and determine the locations for Velcro tape to be stuck on the frame.
2) Stick the Velcro tapes on the tank rail (Thoroughly clean the tank rail to be free from oil.)
3) Install the heat shield using these Velcro tapes.

21. BOURDON TUBE TYPE WATER TEMPERATURE GAUGE INSTALLATION

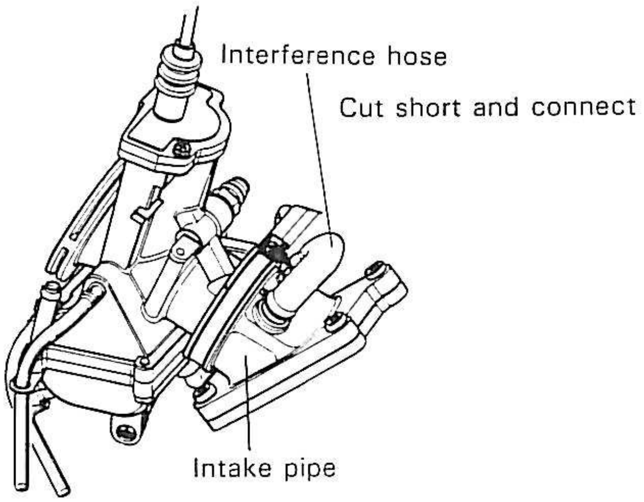
1) When using standard radiator

Cut the radiator inlet hose (17851-22D00) 50 mm from the end and install T-joint (17791-22D50) as shown in the illustration.



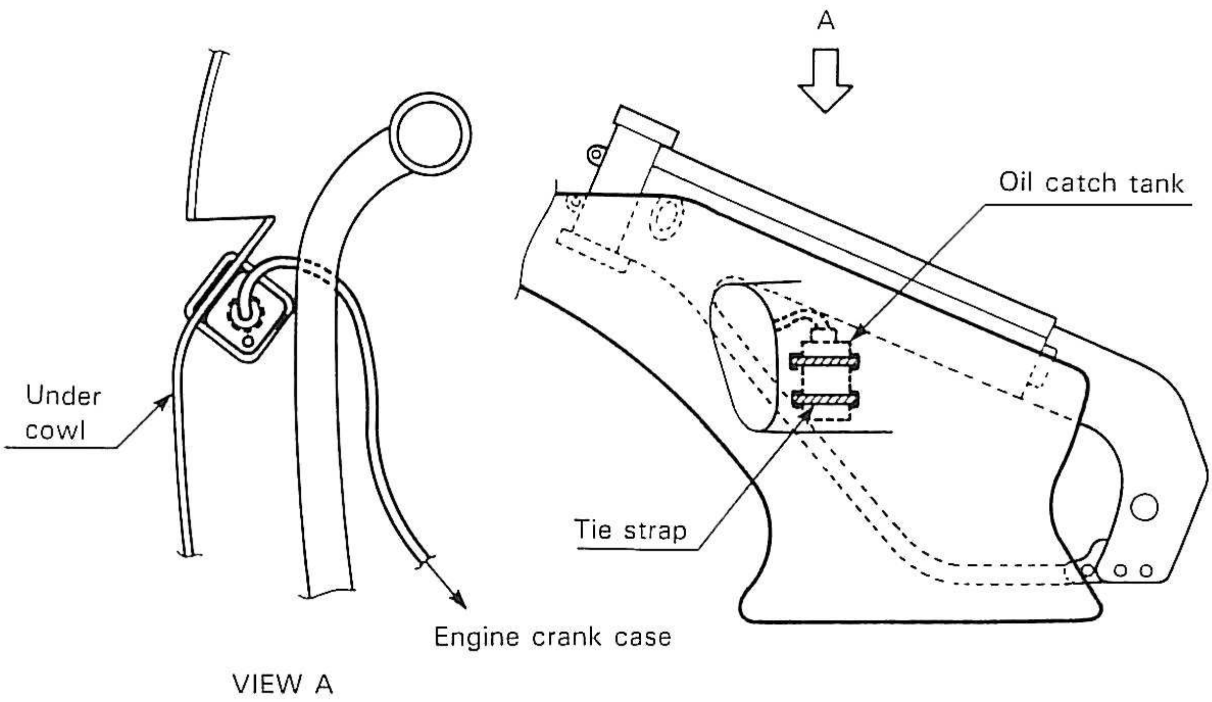
22. SIPC MODIFICATION

SIPC is used on the standard engine for the purpose of improving driveability at a low speed. However, this will be no longer necessary for competition use where mid and high speed range is more important.
To modify, cut the interference hose as short a length as is possible to complete the connection or blind the system.
As an optional, there is an intake pipe, of which the intake passage is smoothly shaped without SIPC connector tube.

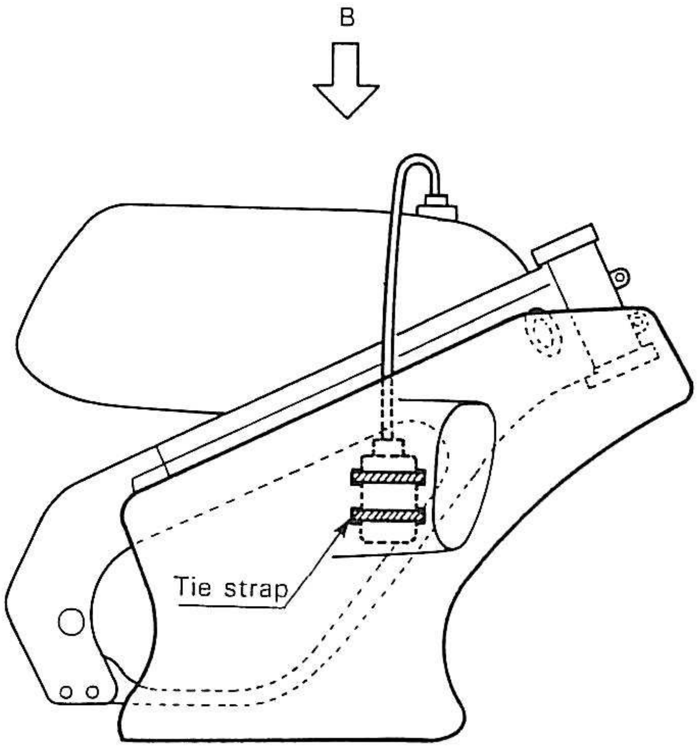


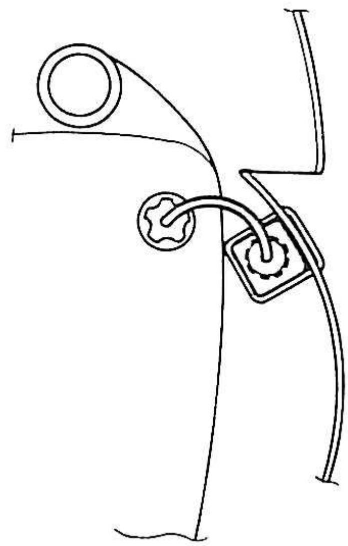
23-1. OIL CATCH TANK

The oil catch tank mounts on inside of the left under cowl at the radiator cooling air outlet. To install, drill four holes in the cowl and secure the tank with tie straps as shown in the illustration. Fit one end of the breather hose to the crankcase breather union, run the hose toward the front of chassis and insert the other end into the oil catch tank through the hole provided in the cap.



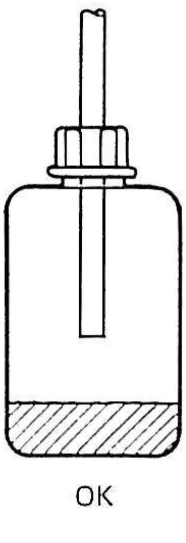
23-2. FUEL CATCH TANK



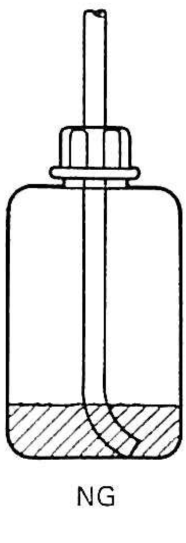


VIEW B

Please mount the fuel catch tank inside of the radiator cooling air outlet at the right under cowl. To install, drill four holes in the cowl and install the tank with tie straps through cowling as shown in the illustration.



OK

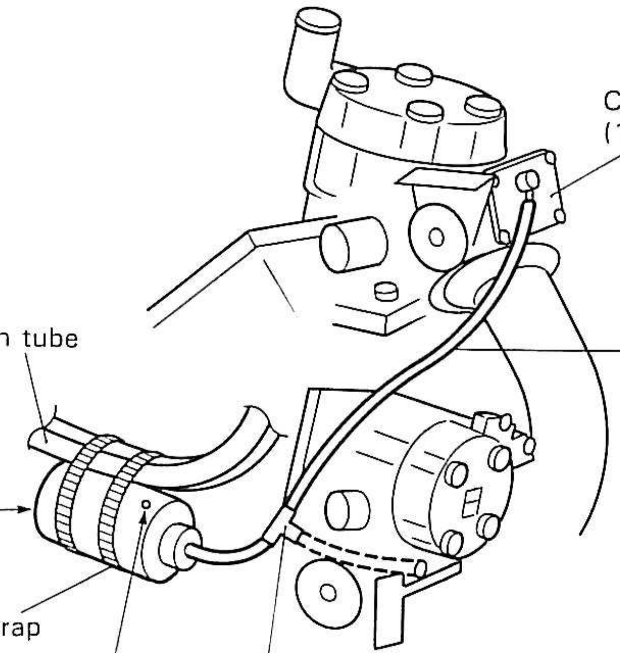


NG

NOTE:
Do not insert the top of hose into the gasoline.
If the top of the hose in gasoline, air in the fuel tank does not go through and the fuel does not flow to carburetor.

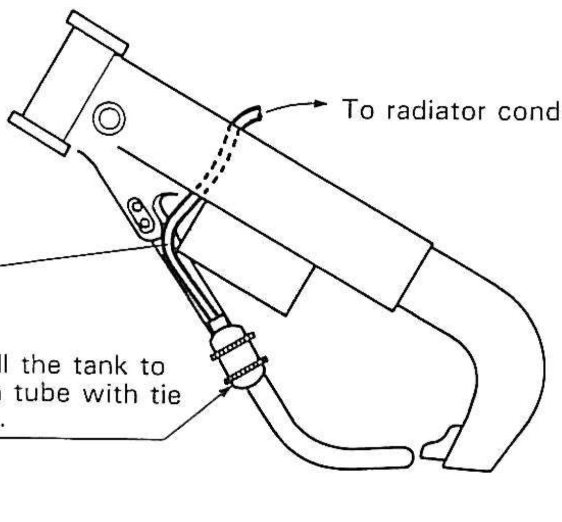
24. CATCH TANK FOR EX VALVE

To help make the exhaust valve operation sure and smooth, the cylinder cover needs to be replaced with that equipped with a breather pipe. Also, the catch tank should be installed.

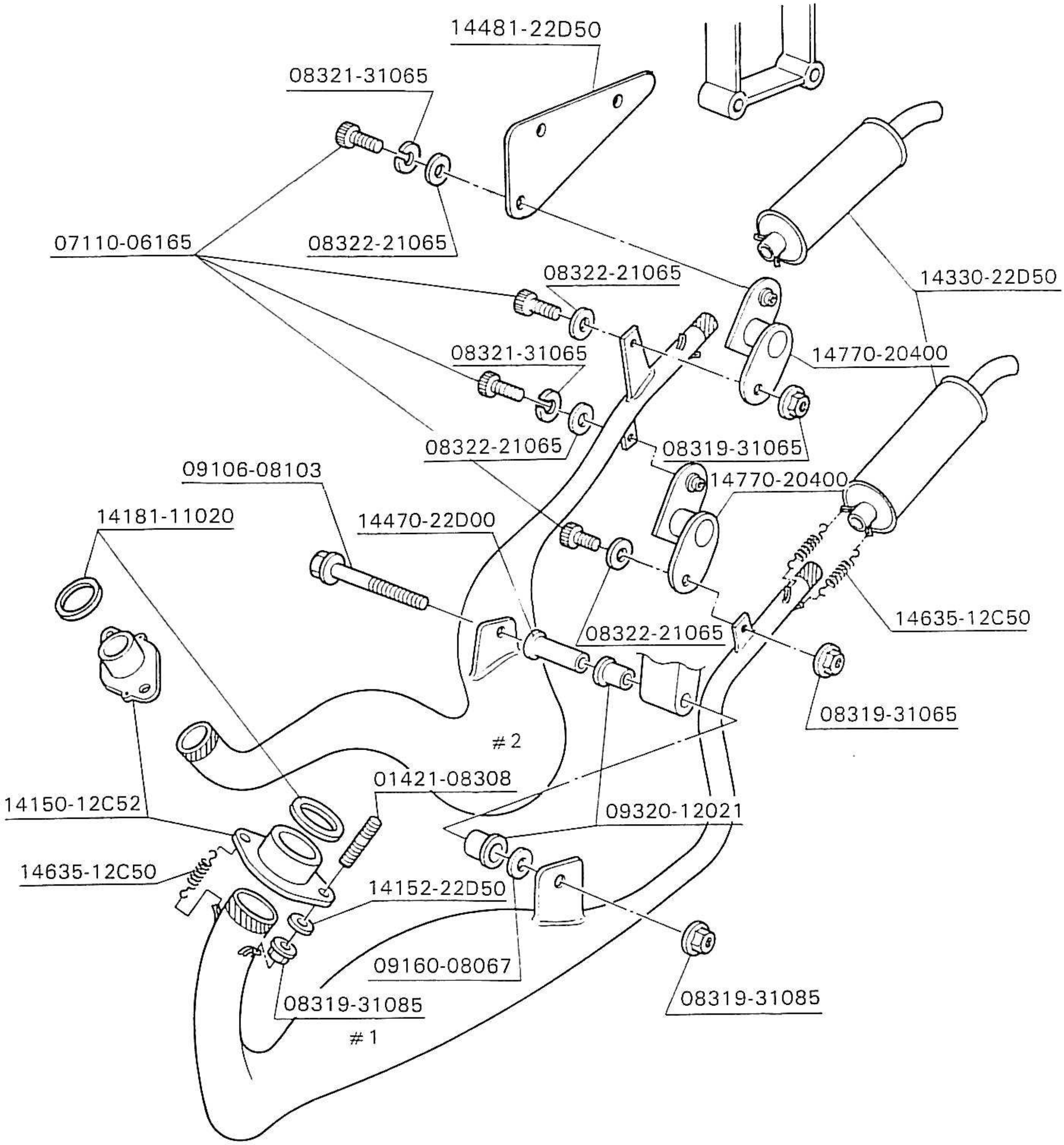


CAUTION:
When installing the hose, care should be taken so that it will not come in contact with the muffler.

25. WATER CATCH TANK

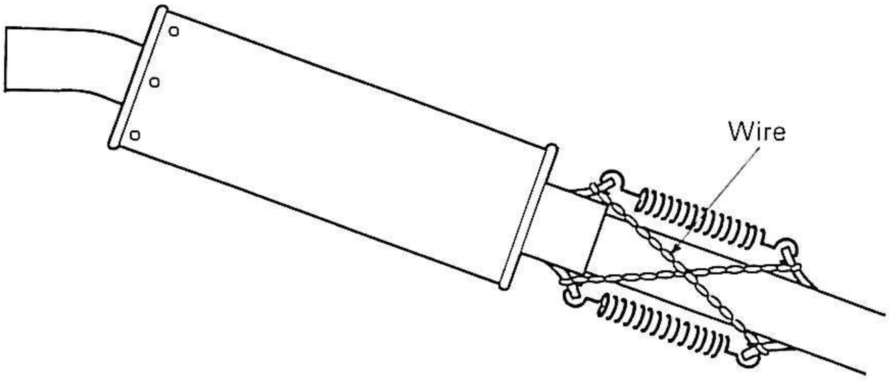


26. MUFFLER INSTALLATION



Apply silicone base liquid gasket to the area show with hatched lines ////// .

27. 2ND MUFFLER (SILENCER) WIRE LOCKING

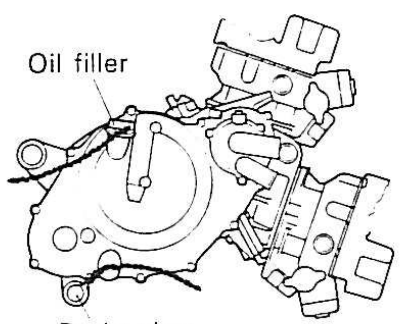


To prevent the silencer from comming off when the spring breaks due to vibration, secure the muffler connection using a wire as illustrated.

> CAUTION:
> **For best matching with the expansion chamber, use the '92 silencer only. If a silencer of other model year is used, it may cause troubles.**

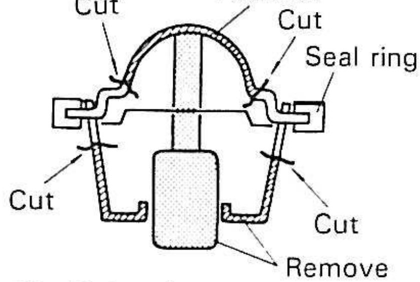
28. OTHER WIRE LOCKING

The race regulation normally requires that the oil filler and drain plugs be locked with wire.
As optional parts, a filler plug and a drain plug with security wire hole are available. Therefore use these plugs.



29. REMOVING THERMOSTAT

To help improve cooling efficiency, remove the thermostat which can be a resistance to maximum water flow. In place of the thermostat, install the thermostat cover seal (17664-12C50). This seal may be substituted by the existing thermostat which has been modified as shown in the illustration.

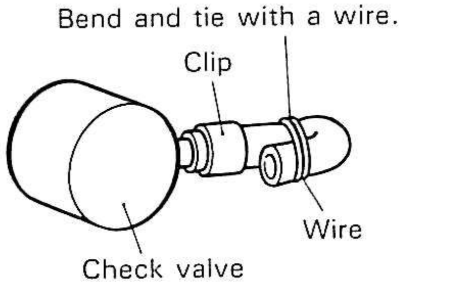


Modifying thermostat

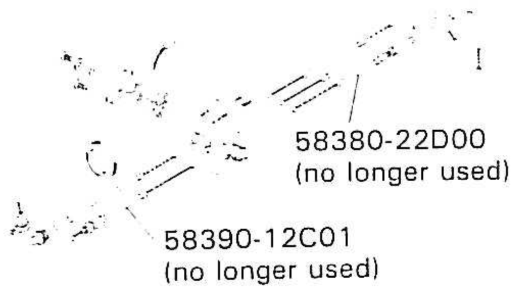
30. OIL PUMP REMOVAL & BLINDING

As fuel/oil mixture is used, the oil pump and oil tank are no longer needed. Modify the system according to the following procedures:

(1) Remove the oil tank.
(2) Drain transmission oil.
(3) Remove the magneto cover.
(4) Remove the oil pump inspection cap.
(5) Remove the oil pump assembly carefully so that the gasket will not be damaged.
(6) With the oil pump removed, the bushing (09301-20005) and oil pump drive gear (16320-12C00) should be left on the engine because they are needed for transmission lubrication.
(7) Cut the oil hose removed from the system to make a short hose, blind one end as shown in the illustation and attach it to each of the oil check valves for the cylinder and crankcase.



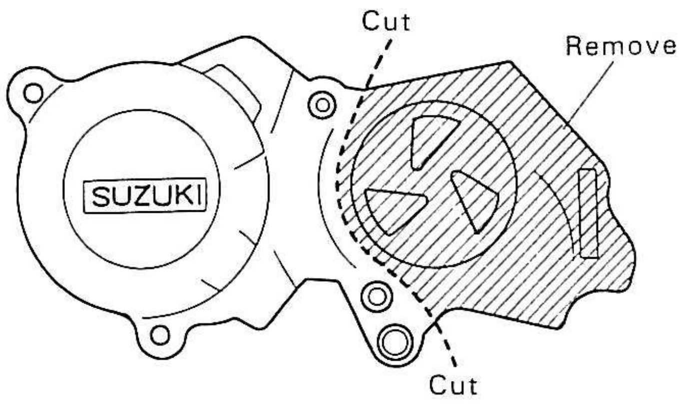
8) Remove the oil pump cable and throttle No.5 actuator cable as they are no longer used in the system.



> **CAUTION:**
> **From the '92 model, the throttle sensor has been adjusted as an assembly with the throttle box. Therefore, the sensor should never be removed from the throttle box.**

31. MAGNETO COVER MODIFICATION (Stage I)

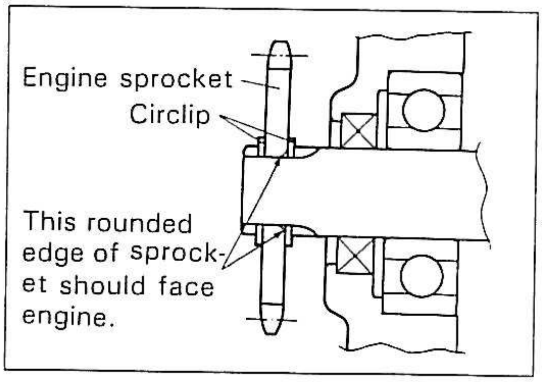
In order to facilitate the engine sprocket replacing work, cut the sprocket cover along the dashed line as illustrated.

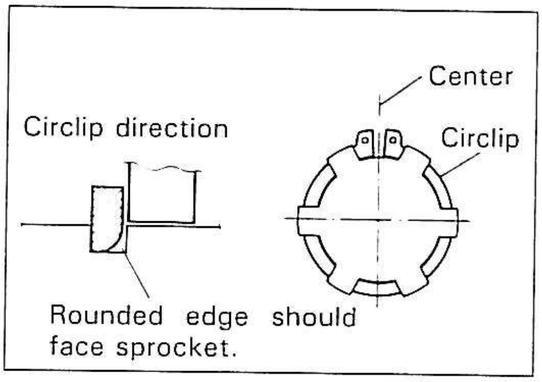


Leave four screw bosses and gearshifting shaft boss unremoved on engine

32. CAUTION WHEN REPLACING ENGINE SPROCKET

Do not confuse between the front and back sides when installing the engine sprocket and circlip.





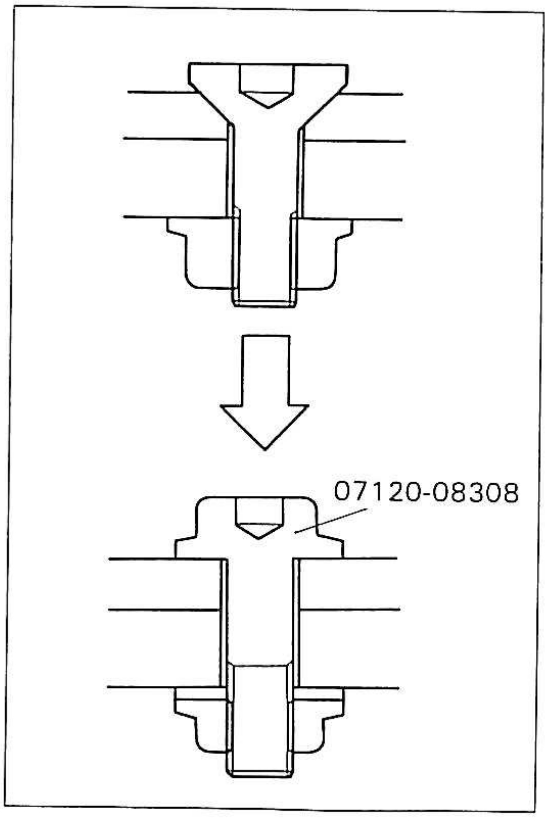
33. CAUTION WHEN REPLACING REAR SPROCKET

The mounting bolt holes of standard rear sprocket have countersink. However, the new kit alloy sprocket mounting holes are drilled straight without countersink. This is for the reason of making interchangeability with the early year model kit. Therefore, when replacing the sprocket, the mounting bolts should also be replaced with those not for countersink.

Select the best suited gear ratio among the following available sizes:

Engine sprocket: 13 – 16 teeth

Rear sprocket: 37 – 47 teeth

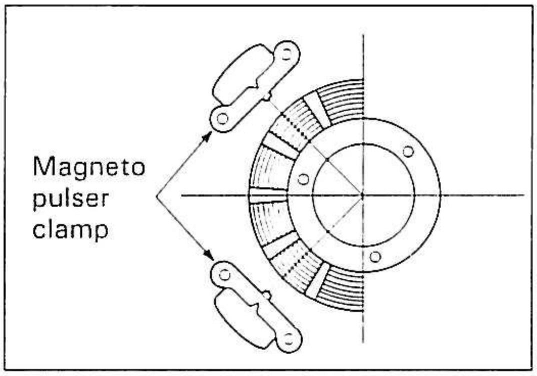


34. STAGE I KIT ELECTRICAL

Based on the standard electrical system, the Stage I kit replaces only a few parts, which results in an enhanced performance.

NOTE:

The ignition system is operated on battery power and therefore under low voltage condition of battery, the designed performance cannot be obtained. Proper care should be taken for battery maintenance and charging system inspection. (At least 12V under no load should be secured.) If the battery voltage is found to be less than 12V, a part of the stator coils may possibly be open even though the stator coil's generating power exists.
Therefore, in this case, check the stator coil continuity.



(1) Replace the magneto pulser coil clamp with that of the Stage I kit. The clamp is designed to surpress the pulser coil vibration which is transmitted from the engine. Therefore, installation of the clamp is important for the engine to output the designed performance. Perform this replacement after the machine has been driven for 500 km.
(2) Remove traffic lighting systems. (turn signal, headlamp, tail lamp, etc.)
(3) Install the Stage I kit wiring harness. (Refer to Fig. 1.)
(4) Replace the control unit with that of the Stage I kit. Make sure to perform this replacement because this unit is an important component for the engine to output the designed performance.
(5) Install the Stage I kit engine kill switch.

NOTE:

The adjustment procedure for exhaust valve cable is the same as that for standard machine.

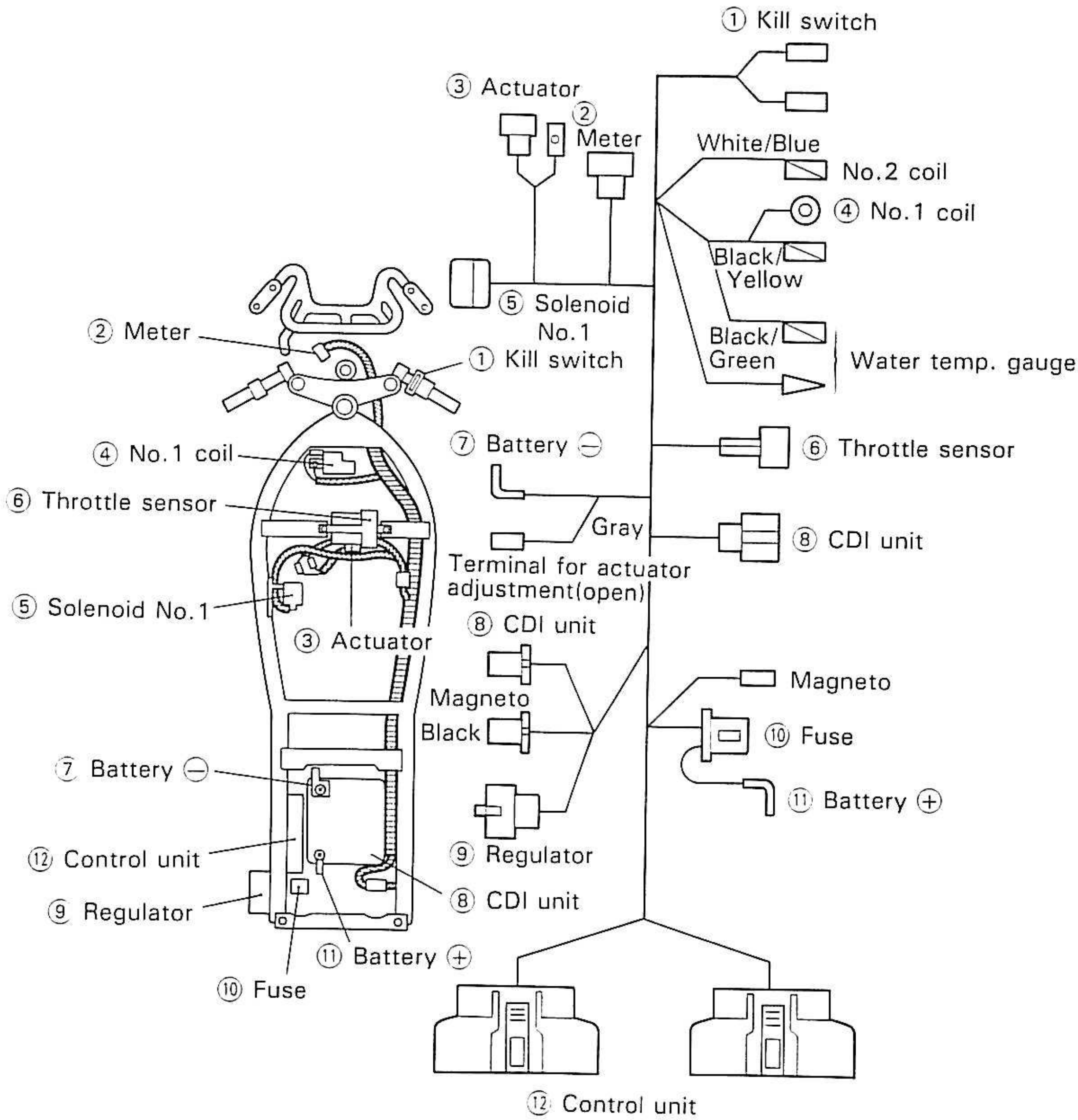
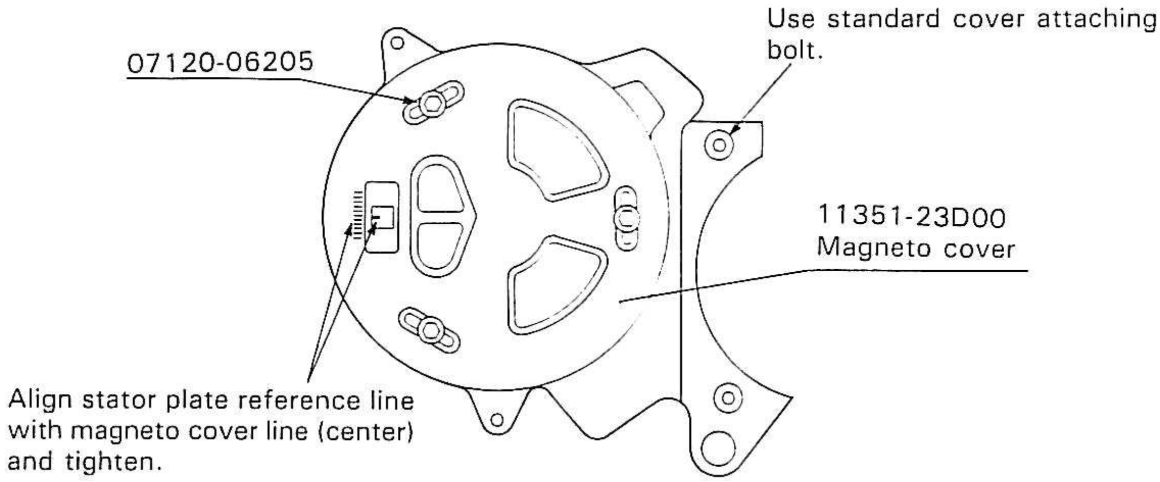


Fig. 1 Stage I kit wiring harness

35. STAGE II KIT ELECTRICAL

MAGNETO

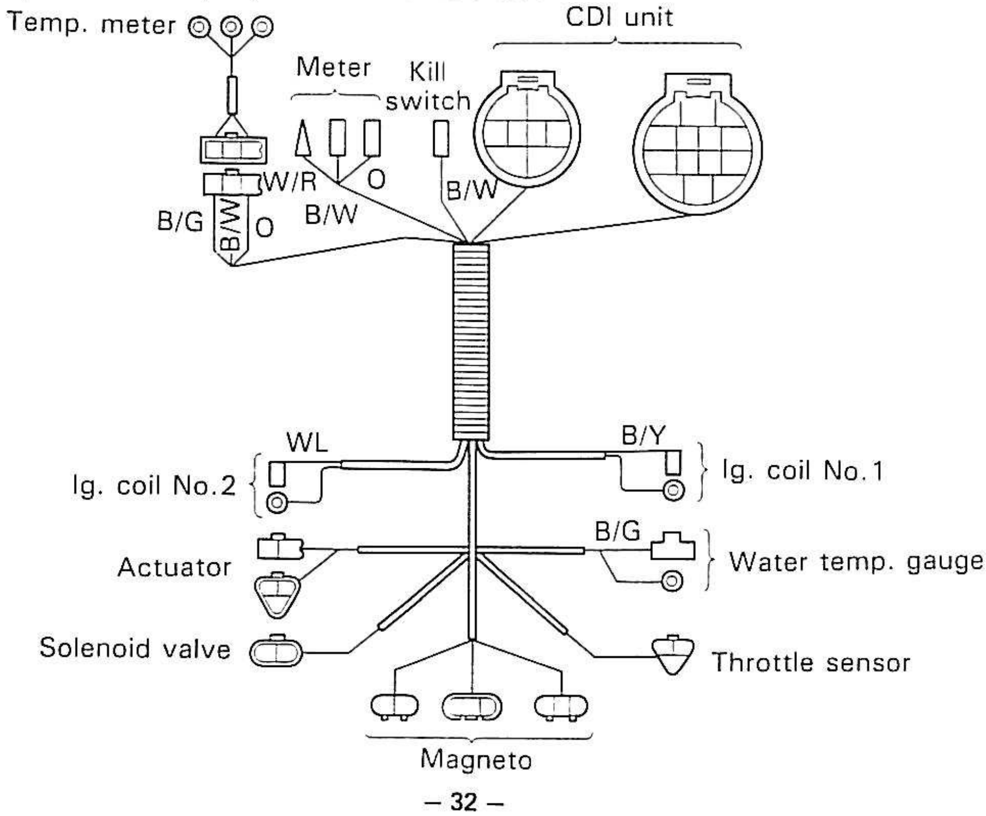
The Stage II kit magneto uses a light weight, 80 mm diam. outer rotor to decrease flywheel inertia, resulting in improved engine response to throttle control. Further, the system operates without battery power, which can contribute to ease of maintenance.



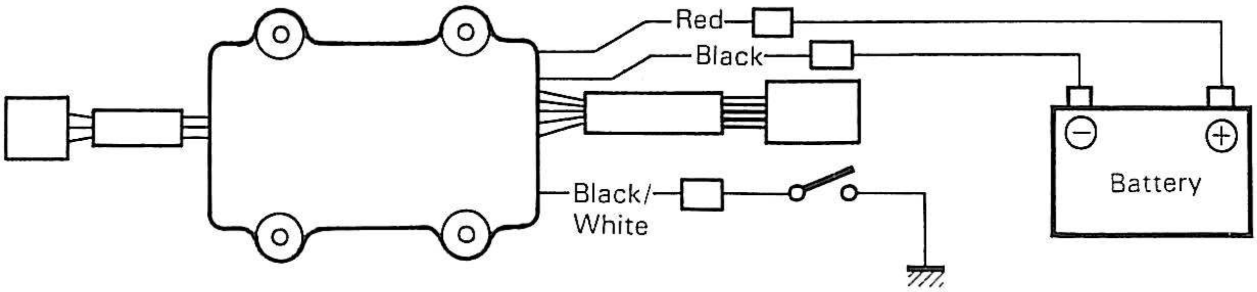
Ignition timing setting can be adjusted as required within ±5° referring to the lines drawn by 1° increment. To change the ignition timing setting, loosen the three bolts (07120-06205), turn the magneto stator plate as required and retighten the bolts. If the stator is moved clockwise by 1°, the ignition advance characteristic as a whole can slide 1° toward advance side.

The Stage II kit equipped engine is designed to give the best performance when the ignition timing is set at ±0°. Under a certain exceptional condition, the timing may be set slightly advanced or retarded from 0° to adjust to a specific course or climatic condition or difference of engine specification. However, unless having accurate data to justify the adjustment, do not attempt to adjust the timing. Otherwise, it may cause troubles.

- The magneto cover is made of magnesium alloy to reduce weight. Anti-corrosion treatment has been applied on the material surface. However, if any whitish powdery substance should be noted, apply rust prevention spray such as CRC5-56.



STAGE II KIT EXHAUST VALVE ACTUATOR ADJUSTMENT



Of three individual lead wires extending from the CDI unit, connect the red lead to the battery positive (+) terminal and the black lead to the negative (−) trminal. (Connection leads are not included in the kit. Prepare them yourself.)
The motor starts in one second after the connection, stops for two seconds and then returns to the Low position. (Black/White lead is for engine kill switch.)

Procedures

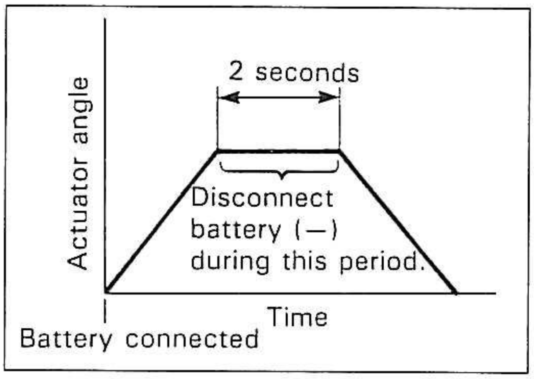
(1) Connect the CDI red lead to the battery (+).
(2) Connect a lead to the CDI black lead and contact the lead end with the battery (−).
(3) Remove the connection with battery (−) when the motor has started and reached the stop position (Adjust position).

⇩

The actuator is held at an intermediate position (Adjust position).

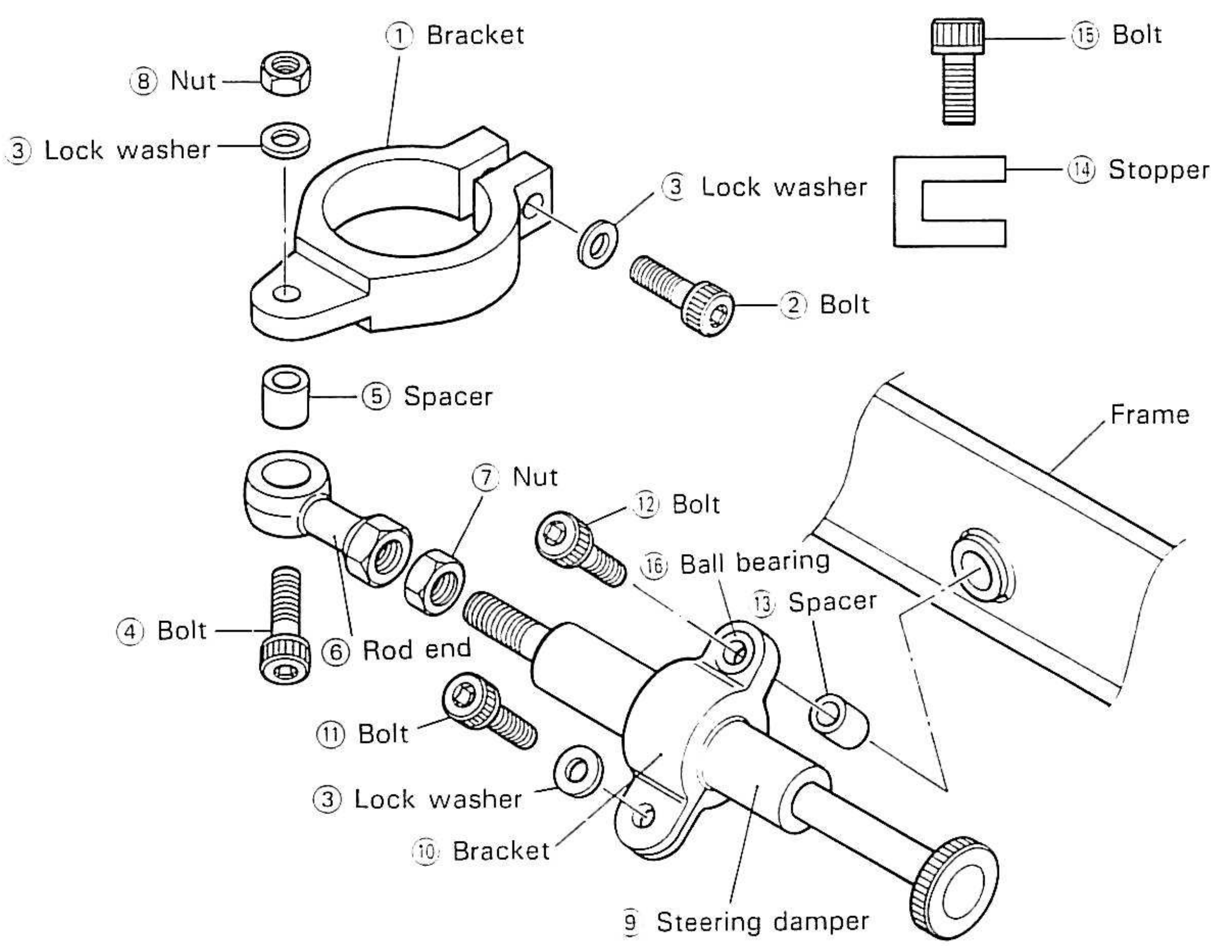
⇩

Perform the cable adjustment. For this adjusting procedure, refer to the standard, unmodified motorcycle adjustment.



36. STEERING DAMPER INSTALLATION

KIT CONTENTS



NO	PART No.	PART NAME	Q'TY
1	51781-22D50	Fork clamp bracket	1
2	07110-06307	Fork clamp bolt	1
3	09164-06009	Lock washer	3
4	07110-06357	Bolt	1
5	09180-06092	Spacer	1
6	51721-15400	Rod end	1
7	08310-11087	Nut	1
8	08310-11067	Nut	1
9	51750-22D51	Steering damper	1
10	51791-33C50	Bracket	1
11	07110-06257	Bolt	1
12	07110-08357	Bolt	1
13	09180-08126	Spacer	1
14	51723-12C50	Steering stopper	2
15	07110-06108	Bolt	2
16	09269-08003	Ball bearing	1

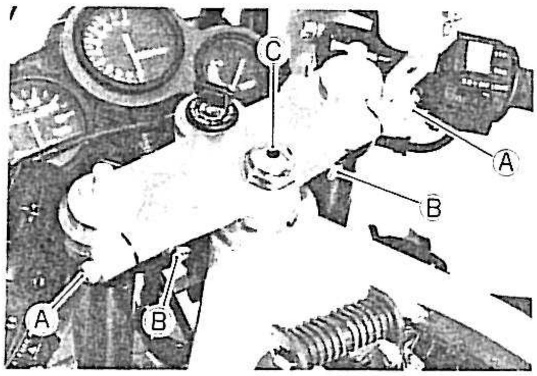
INSTALLATION

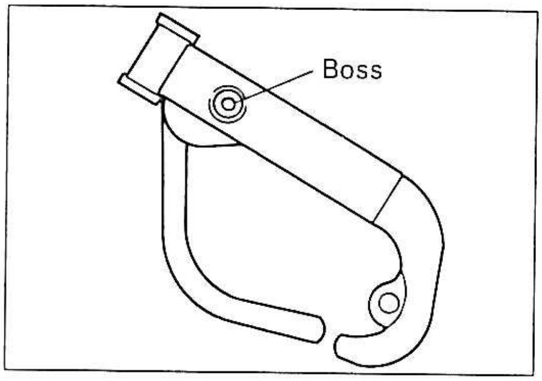
Assembling kit components

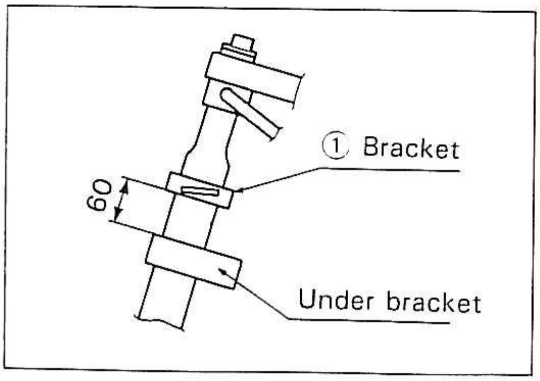
- Attach the rod end ⑥ and nut ⑦ onto the steering damper ⑨.
  Tightening torque: 10 —16 N·m (1.0 — 1.6 kg-m)
- Mount the bracket ⑩ over the steering damper ⑨ , attach the bolt ⑪ together with the lock washer ③ and screw the bolt to bring it to finger tight.
- Attach the bolt ② together with the lock washer ③ onto the bracket ① and bring the bolt to finger tight.
- Connect the rod end ⑥ to the bracket ① using the bolt ④ , lock washer ③ , spacer ⑤ and nut ⑧ as shown in the illustration. Tighten the nut ⑧ to specification.
  Tightening torque: 4 — 7 N·m (0.4 — 0.7 kg-m)

Mounting steering damper

- Loosen the fork inner tube clamp bolt Ⓐ .
- Remove the handlebar clamp bolt Ⓑ.
- Remove the steering upper bracket nut Ⓒ .
- Remove the steering upper bracket.
- Remove the left handlebar holder from the fork inner tube.
- Slide the bracket ① of the steering damper subassembly (as explained above) over the fork inner tube.
- Mount the bracket ⑩ of the damper subassembly onto the tapped boss provided on the frame using bolt ⑫ and spacer ⑬ .
  Tightening torque: 10 — 16 N·m (1.0 — 1.6 kg-m)
- Remount the left handlebar holder on the fork inner tube.
- Remount the steering upper bracket.
- Tighten the steering upper bracket nut Ⓒ to specification.
  Tightening torque: 80 — 100 N·m (8.0 — 10.0 kg-m)
- Tighten the handlebar clamp bolt Ⓑ to specification.
  Tightening torque: 15 — 25 N·m (1.5 — 2.5 kg-m)
- Tighten the fork inner tube bolts Ⓐ to specification.
  Tighening torque: 15 — 25 N·m (1.5 — 2.5 kg-m)





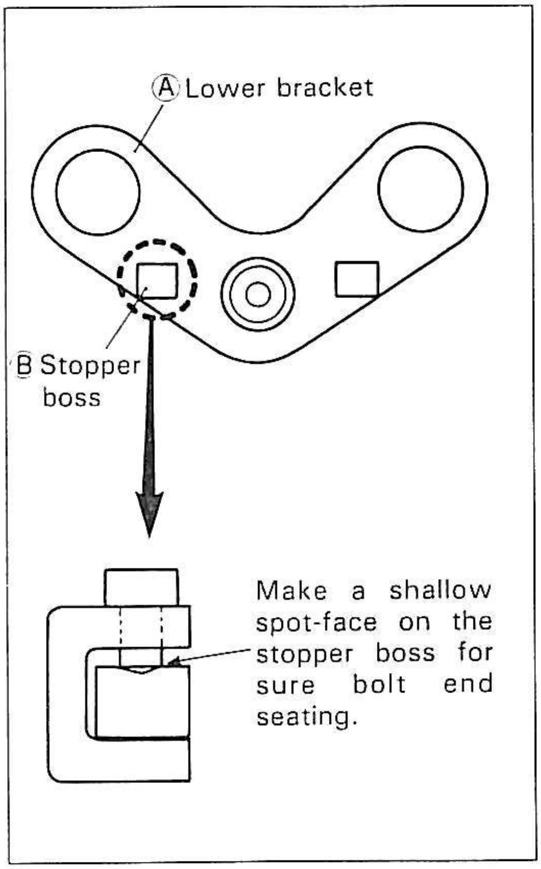


Steering damper setting

- Move the steering damper forward or backward through the bracket ⑩ and locate it so that the damper rod travels forward and backward in an equal distance when the steering is turned to the right and to the left from the center position.
- When the proper location is obtained, tighten the bolts ② and ⑪ to following torque specification.
  Tightening torque: ② Bolt 4 — 7 N·m (0.4 — 0.7 kg-m)
  ⑪ Bolt 4 — 7 N·m (0.4 — 0.7 kg-m)

CAUTION:
It is extremely important that the bolt ⑪ be torqued to the correct specification. After completing the adjustment, make sure that the steering turns smoothly both to the right and left.

- Mount the steering stopper ⑯ on the stopper boss Ⓑ formed on the steering lower bracket Ⓐ and tighten it with the bolt ⑮ .
  Tightening torque: 4 — 7 N·m (0.4 — 0.7 kg-m)



IMPORTANT NOTICE

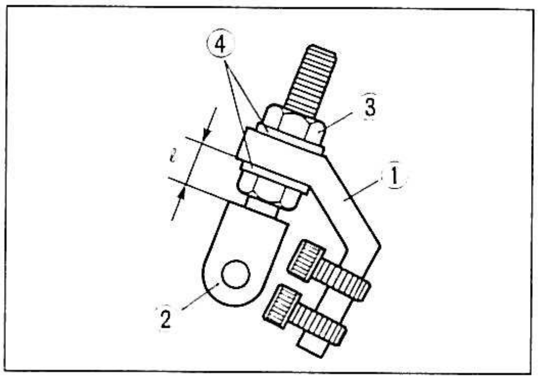
- When using the steering damper, also use the steering stopper as above. Some race regulations prohibit the use of steering damper in such a way as to perform also for steering stopper.
- This steering damper is equipped with damping adjuster. The adjustment can be made in 12 different settings (by turning the dial).
- If an even stronger damping force is desired, replace the damper assembly with 51750-33C50.

37. MACHINE HEIGHT ADJUSTMENT

To adjust the machine height to be best suited for rider and circuit conditions, an optional rear shock height adjuster kit as well as springs for front fork and rear shock are available.

REAR SHOCK HEIGHT ADJUSTER

- Remove the standard bracket and rear shock, and install the kit bracket ① .
- The adjustment is make by changing the adjuster ② position to be heigher or lower after loosening the nut ③ . Tighten the nut ③ upon completion of adjustment.
- The height equal to the standard, unmodified machine is obtained when the dimension ① is set to: ℓ = 23.5mm.



① 41762-23C01 BRACKET, RR SHOCK ABSORBER
② 41763-12C51 CLAMP, SHOCK ABSORBER BRACKET
③ 08310-22148 NUT, HEIGHT ADJUSTER
④ 08322-11148 WASHER, HEIGHT ADJUSTER

FRONT FORK/REAR SHOCK SPRINGS

- Front fork springs (For both Stage I and II)

Part number	Spring constant
51171-22D50	0.475 kg/mm
51171-22D60	0.500 kg/mm
51171-22D70	0.525 kg/mm
51171-22D80	0.550 kg/mm

- Rear shock spring (For Stage I rear shock unit)

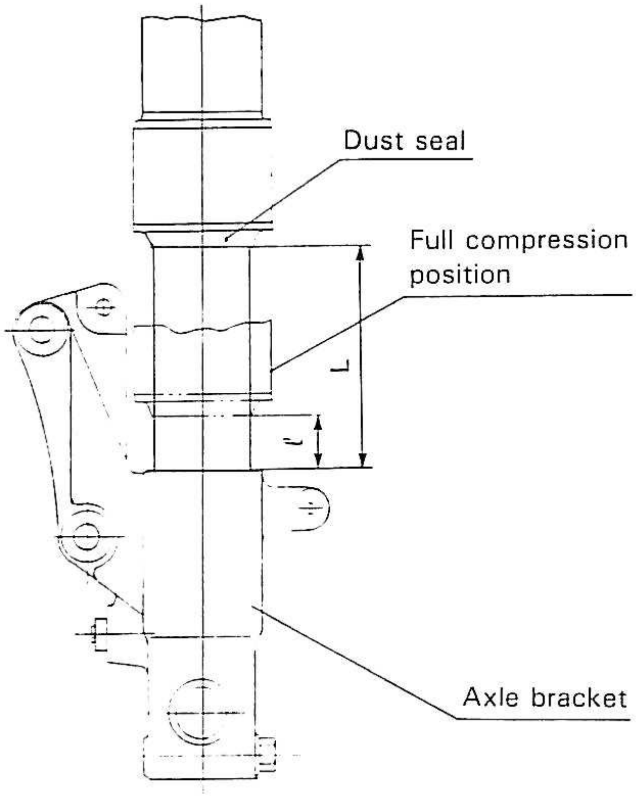
Part number	Spring constant
62211-22D50	6.250 kg/mm
62211-22D60	6.500 kg/mm
62211-22D70	6.750 kg/mm
62211-22D80	7.000 kg/mm

- Rear shock spring (For Stage II rear shock unit)

Part number	Spring constant
62211-23D10	6.250 kg/mm
62211-23D20	6.500 kg/mm
62211-23D30	6.750 kg/mm
62211-23D40	7.000 kg/mm

38. MEASURING SUSPENSION SAG WITH ONE RIDER

- Front

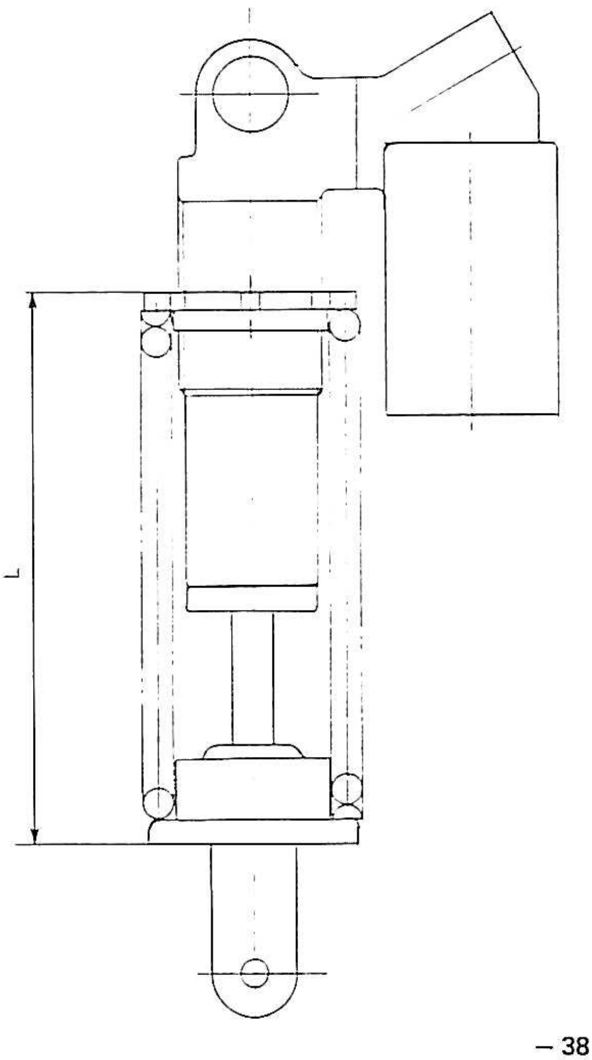


Measure length L when one rider is mounted and obtain the one rider sag (d) as follows:
'92 Stage I kit: d = 135 − L
'91/92 Stage II and '91 Stage I kit: d = 138 − L

Clearance (L) which is measured between the dust seal and axle bracket with fork fully compressed:

'92 Stage I kit: 15 mm
'91/92 Stage II and '91 Stage I kit: 18 mm

- Rear



Measure length L in two conditions, with the rider mounted and not mounted. The sag is the differential of these two measurements. (when the preload has been altered, length L should be measured again.)

39. SUSPENSION SETTING DATA

	ITEM \ VERSION	STAGE I KIT	STAGE II KIT
FRONT	Spring adjuster (Initial)	#4 line from top	#4 line from top
	Damping: Rebound Compression	4 clicks back 4 clicks back	4 clicks back 8 clicks back
	Inner tube top protrusion	7mm	7mm
	Spring constant	0.5 kg/mm	0.5 kg/mm
	Oil level	109 mm	113 mm
	Fork oil	Showa SS8	Showa SS05
	Sag with one rider	42 – 45 mm	42 – 45 mm
	Other spring constant	① 0.475 kg/mm ② 0.500 kg/mm	③ 0.525 kg/mm ④ 0.550 kg/mm
REAR	Spring initial setting	179 mm	173 mm
	Spring constant	6.625 kg/mm	6.500 kg/mm
	Damping: Rebound Compression	2nd position 5 clicks back	10 clicks back 7 clicks back
	Sag with one rider	10 mm	10 mm
	Height adjusting range	–	23.5 mm
	Other spring constant	① 6.250 kg/mm ② 6.500 kg/mm	③ 6.750 kg/mm ④ 7.000 kg/mm

The number of click backs is counted from the full close position where the adjuster is turned all the way clockwise.

40. SUSPENSION SETTING GUIDE

- Feels rough →
  - 1. Unsmooth sliding
    - • Check suspension sliding parts.
    - • Check for front axle off-center or twisted fork.
  - 2. Spring preload too high
    - • Decrease spring preload.
    - • Change with spring of lower spring constant.
    - • Decrease oil.
  - 3. Bottoming
    - • Increase spring preload.
    - • Change with spring of higher spring constant.
    - • Increase oil.
  - 4. Damping too much
    - • Decrease damping force.
  - 5. Tire too hard
    - • Review tire selection. Decrease pressure.

- Feels too soft → Damping not enough
  - • Increase damping force.

- Understeers → Caster too much
  - • Increase fork rebound damping force.
  - • Increase inner tube top end protrusion.
  - • Decrease front fork spring preload.
  - • Increase rear spring preload.
  - • Decrease rear rebound damping force.
  - • Raise chassis rear end.
  - • Increase rear compression damping force.

- Chatters → (Small pitching)
  - 1. Rattles in steering head pipe
    - • Check tightness of bearing end nut.
  - 2. Tire or wheel imbalanced or deformed
    - • Correct balance. Check deformation.
  - 3. Tire not matched
    - • Review tire selection. Try different air pressure.
  - 4. Chassis not matched
    - • Avoid resonance by changing spring preload, or by changing damping force.

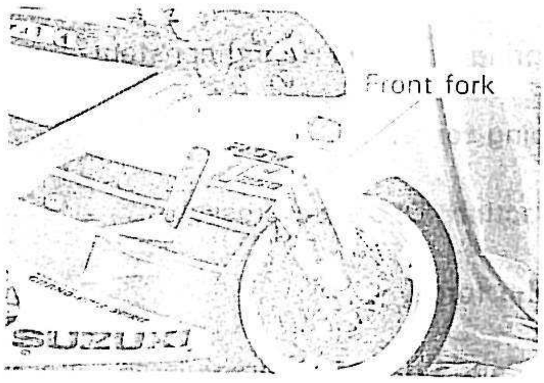
- Kick back → (Steering shaking)
  - 1. If occurs when power on. Insufficient fork rebound travel
    - • Decrease spring preload.
    - • Increase front weight distribution. (Increase fork inner tube top protrusion. Increase rear end height.)
  - 2. If occurs when power off.
    - Insufficient fork compression travel
      - • Decrease front spring preload.
      - • Decrease spring constant.
      - • Decrease front compression damping force.
    - Too much fork compression travel
      - • Increase front spring preload.
      - • Increase spring constant.
      - • Increase front compression damping force.

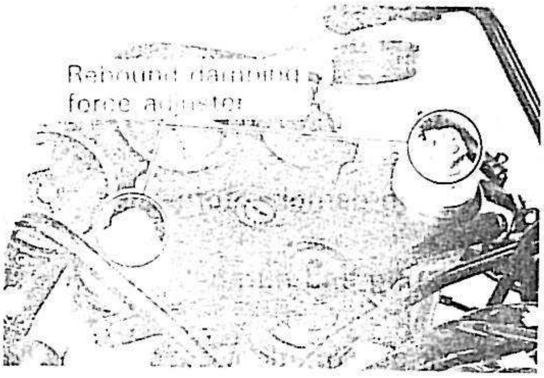
41. STAGE I KIT FRONT FORK

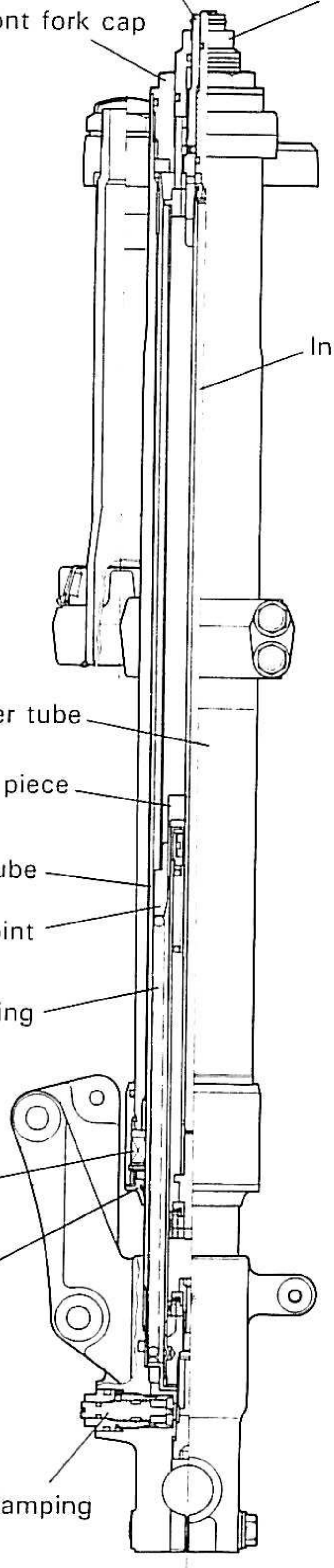
The damping force adjusting mechanism is incorporated at both the top and bottom of the fork.

Top adjuster: Rebound damping force adjustment

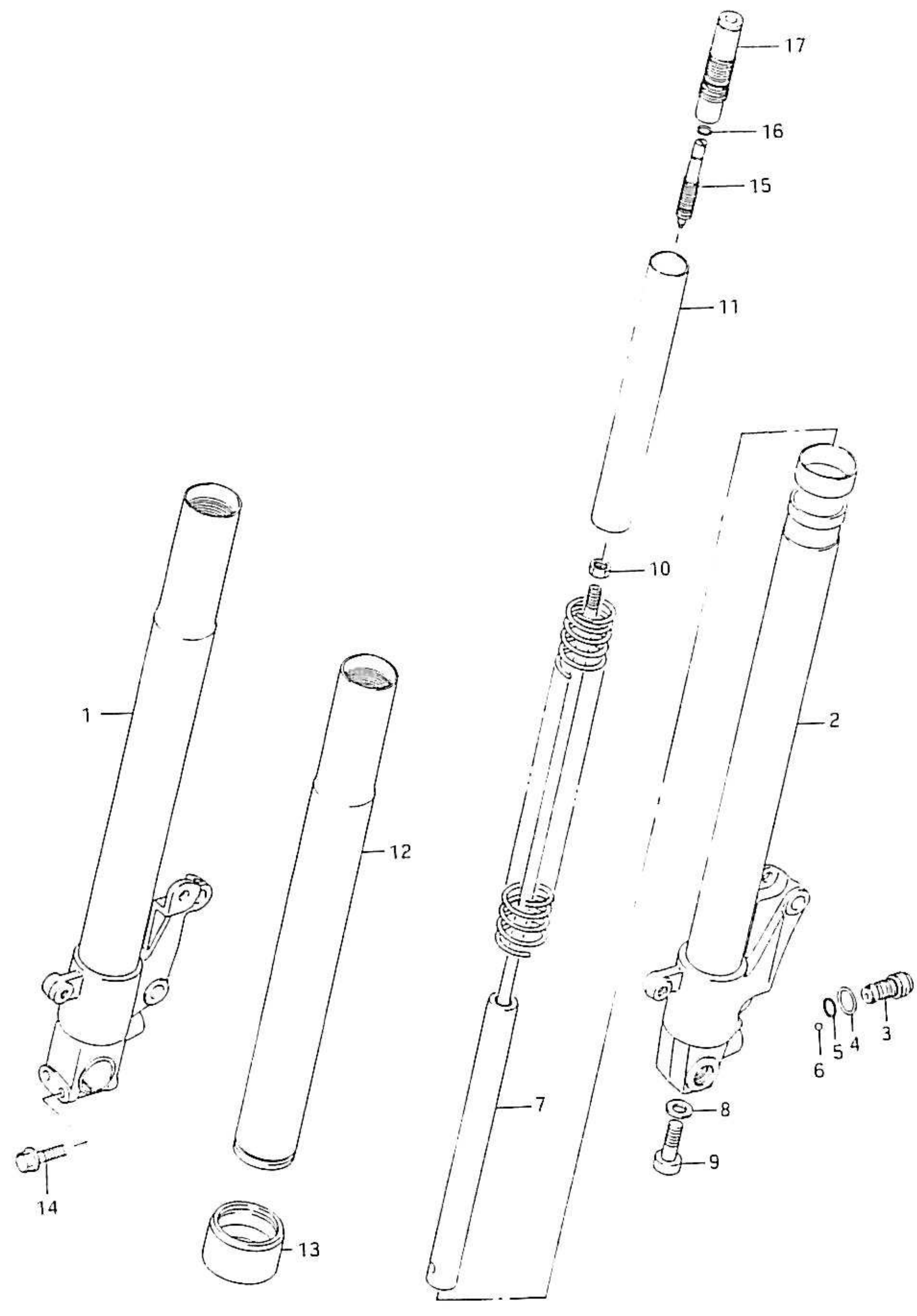
Bottom adjuster: Compression damping force adjustment







FRONT FORK COMPONENT PARTS (Stage I)

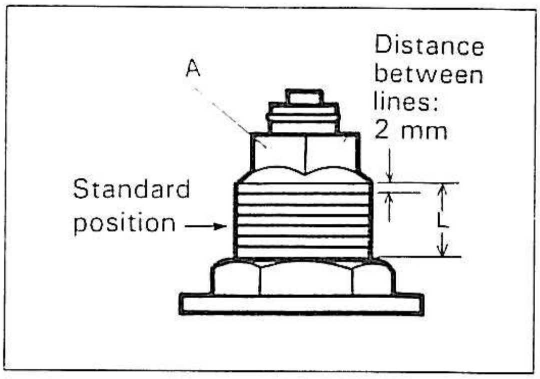


① Inner tube, right	⑩ Nut
② Inner tube, left	⑪ Spring spacer
③ Adjuster piece	⑫ Outer tube
④ O-ring	⑬ Oil seal case
⑤ Expander	⑭ Bolt
⑥ Ball	⑮ Upper adjuster piece
⑦ Front damper	⑯ O-ring
⑧ Washer	⑰ Adjuster case
⑨ Bolt	

FRONT FORK ADJUSTMENT

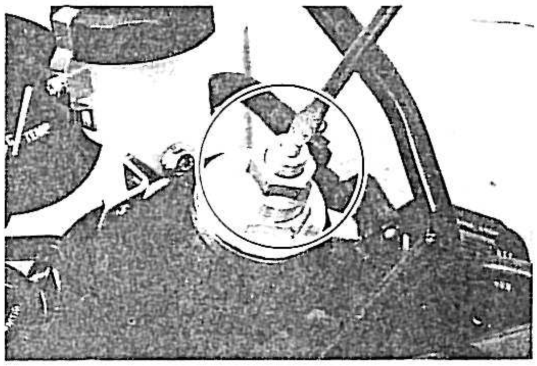
Adjusting spring preload

- Turn the spring adjuster Ⓐ to adjust the spring preload.



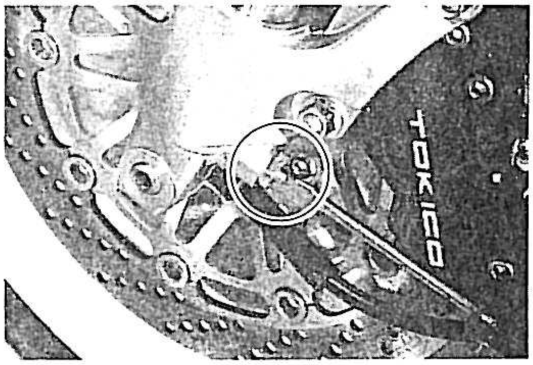
CAUTION:
The right and left adjuster should be set in the same postion.
Never increase the dimension L more than 15 mm.

Adjusting range: 7 settings
Standard setting: 4th line from the top
Turning counterclockwise: decreases the preload Turning clockwise: increases the preload



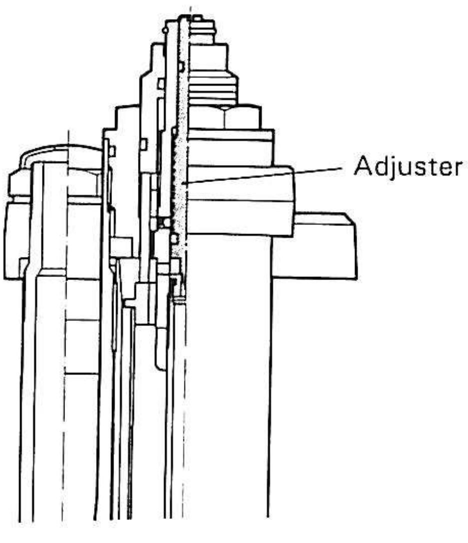
Adjusting damping force

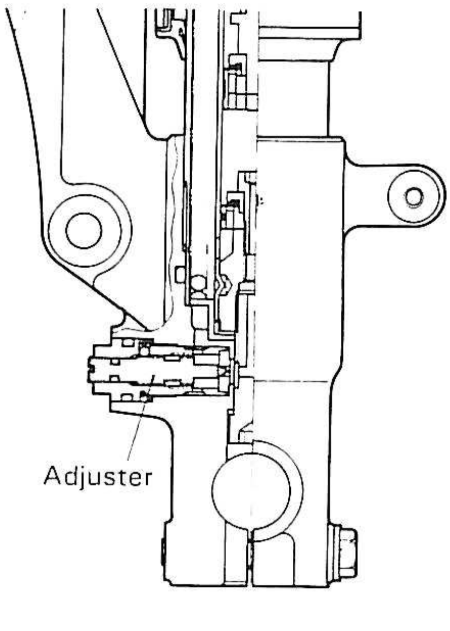
- Both the compression damping and rebound damping can be individually adjusted.
- Location: Rebound damping force adjuster —At top
  Compression damping force adjuster —At bottom



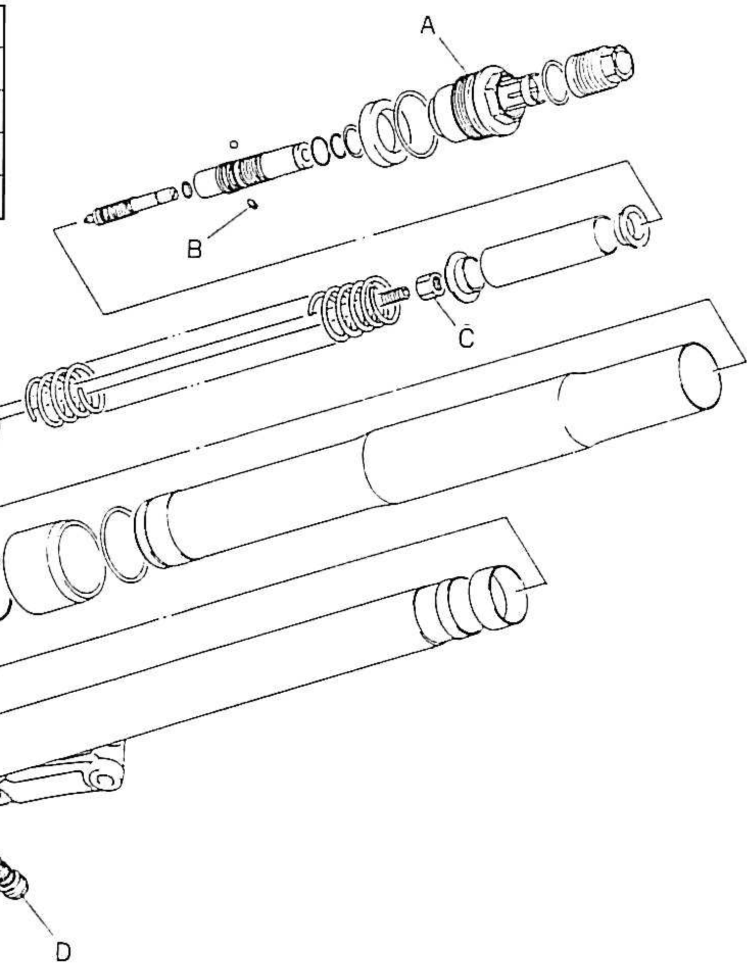
Standard setting
Rebound: Turn the adjuster clockwise all the way in. Slowly back it until you feel a first click stop (this click is counted as #1). Then, turn back the adjuster further until #4 click stop is reached. Compression: Turn the adjuster clockwise all the way in. Slowly back it until you feel a first click stop (This click is counted as #1). Then, turn back the adjuster further until #4 click stop is reached.

CAUTION:
The right and left adjuster should be set in the same position.





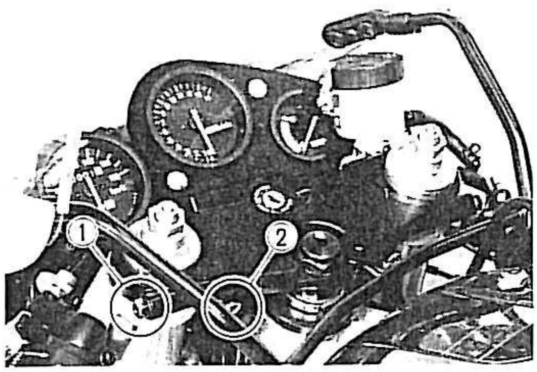
FRONT FORK



Ⓐ	30 — 40 N·m (3.0 — 4.0 kg-m)
Ⓑ	1 — 1.5 N·m (0.1 — 0.15 kg-m)
Ⓒ	18 — 22 N·m (1.8 — 2.2 kg-m)
Ⓓ	15 — 20 N·m (1.5 — 2.0 kg-m)
Ⓔ	30 — 40 N·m (3.0 - 4.0 kg-m)

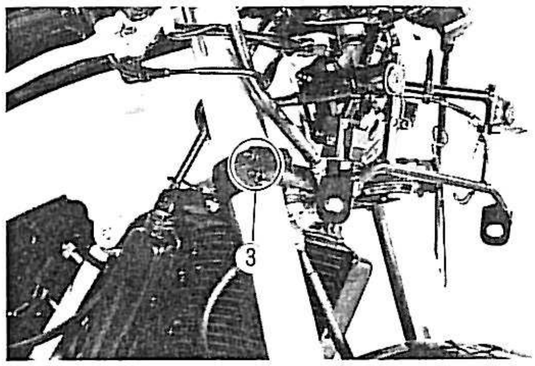
DISASSEMBLY

- Remove the under cowling.
- Remove the front wheel.
- Remove the front fender.
- Loosen the upper bracket clamp bolt ① .
- Loosen the handlebar clamp bolt ② .



NOTE:
To facilitate the disassembly work, loosen the fork cap bolt before loosening other bolts.

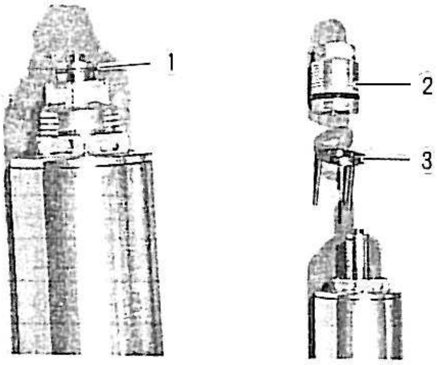
- Pull down the front fork after loosening the clamp bolt ③ .



Tightening torque:
Upper bracket bolt: 20 — 31 N·m (2.0 — 3.1 kg-m)
Lower bracket bolt: 18 — 28 N·m (1.8 — 2.8 kg-m)
Handlebar bolt: 18 — 28 N·m (1.8 — 2.8 kg-m)
Front fork cap: 30 — 40 N·m (3.0 — 4.0 kg-m)

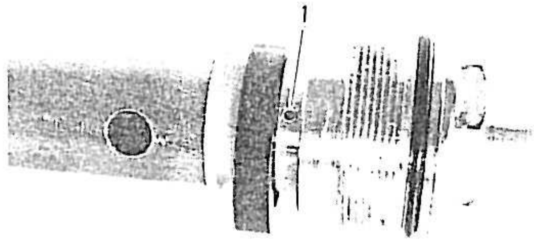
REMOVING SPRING ADJUSTER

- Remove the spring adjuster stopper ring ①.
- Disassemble the spring adjuster ② and pin ③.



REMOVING FORK CAP BOLT

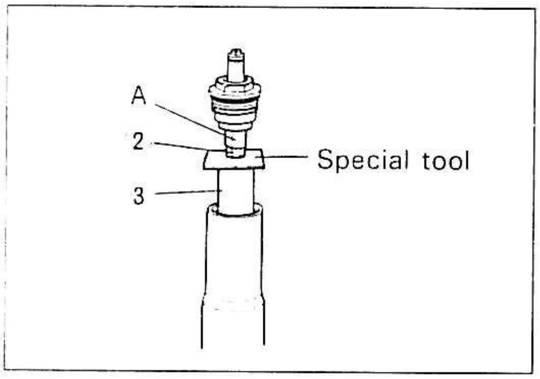
- Remove the cap bolt stopper screw ①.



- Compress the fork spring by pressing down the spacer ③.
- Insert the stopper plate between the lock nut ② and spacer ③.

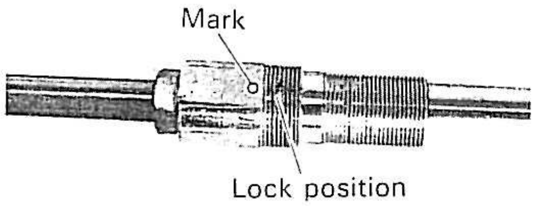
NOTE:
The work should be performed by two operators, while taking care not to get fingers caught between the parts.

Special tool: Stopper plate 09940-94920



- Fit the open end wrench to flats Ⓐ on the adjuster to turn and remove the fork cap bolt.

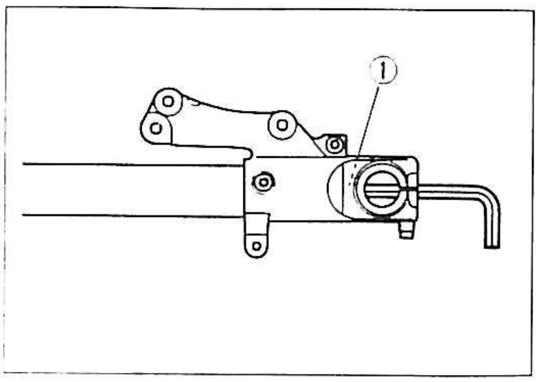
NOTE:
After the cap bolt has been removed, check for any abnormality such as thread damage. If any damage is found, correct it.
Mark a stop position on the adjuster housing for reference used when reassembly.



REMOVING INNER ROD

- Remove the cylinder bolt ①.

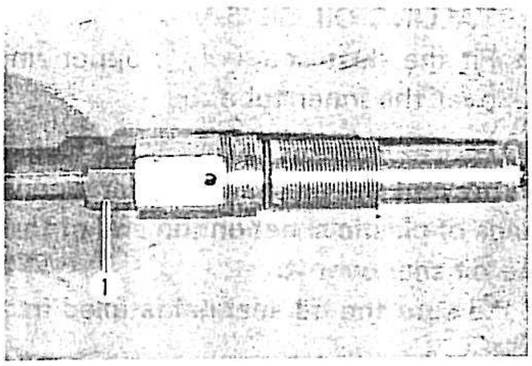
Tightening torque: 3 – 4 N·m (0.3 – 0.4 kg-m)

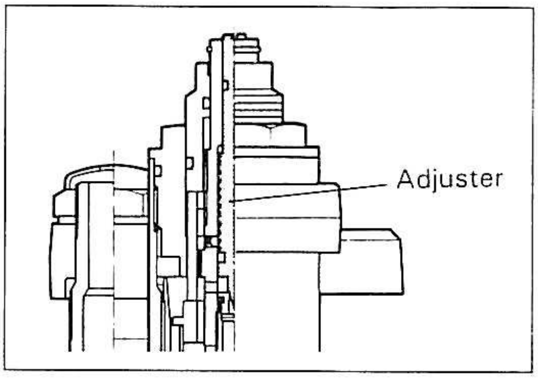


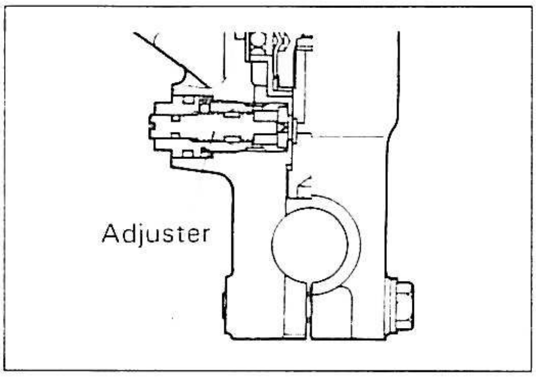
REMOVING DAMPING FORCE ADJUSTER

Rebound damping force adjuster

- Loosen the lock nut ① and remove the adjuster housing.
- Remove the adjuster from the adjuster housing.



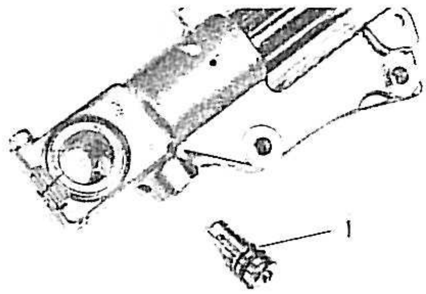




Compression damping force adjuster

- Remove the adjuster housing ① .

NOTE:
This adjuster cannot be disassembled.



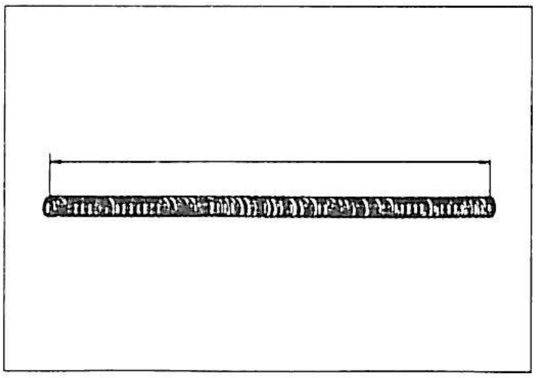
INSPECTION

Fork spring

- Remove the spring from the fork. Measure the spring free length when laid flat.

  Free length service limit: 331.4 mm

- If the spring should be found shorter than the limit, replace with new one.



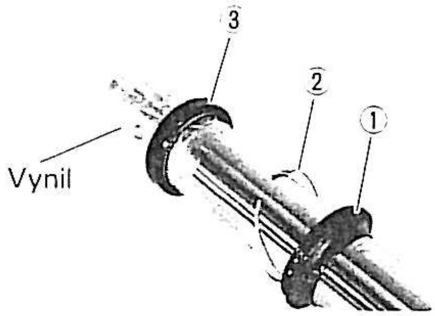
ASSEMBLY

Assemble the front fork parts in the reverse order of disassembly procedure. Also, at the time of assembly, make sure to perform the following:

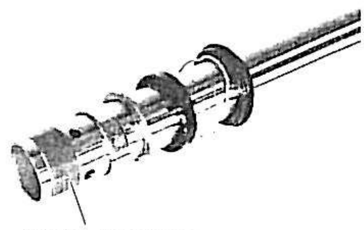
- Apply front fork oil to all sliding parts.
- Apply grease to the oil seal lip.

INSTALLING OIL SEAL

- Fit the dust seal ①, stopper ring ② and oil seal ③ over the inner tube.

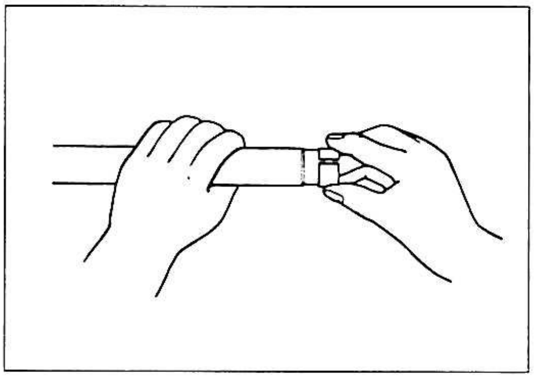


NOTE:
To prevent the oil seal from damage when installing, put a piece of plastic sheet on the end of fork inner tube and slide the oil seal over it.
Make sure the oil seal is installed in the proper direction.



Installing slide bushing and guide bushing

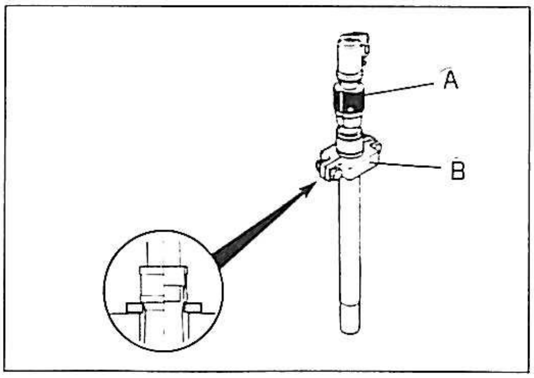
- Clean the bushing groove and fit the bushing of which both the inside and outside are thoroughly cleaned.



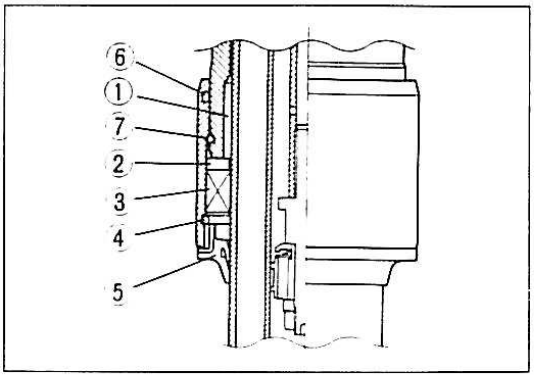
> **CAUTION:**
> **The surface of bushing is Teflon coated. Care should be taken not to cause damage to the surface.**

Installing oil seal

- Install the oil seal and retainer using the special tool.

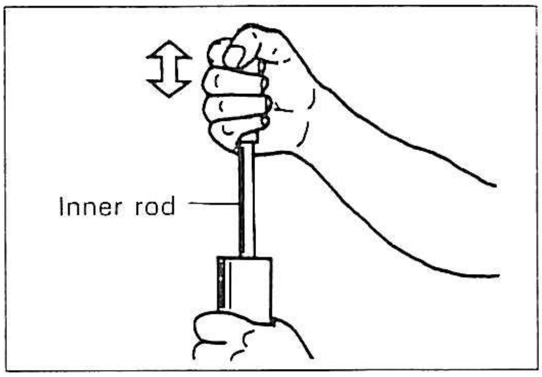


Special tool:
Ⓐ Oil seal installer: 09940-52820
Ⓑ Front fork seal driver support: 09940-52830



① Guide bushing
② Oil seal retainer
③ Oil seal
④ Oil seal housing stopper ring
⑤ Dust seal
⑥ O-ring
⑦ Oil seal stopper ring

FILLING FORK OIL

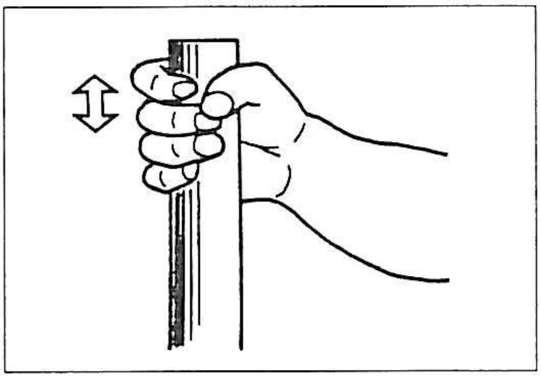


Expelling air from cylinder

- Place the fork in an upright position and push in the inner rod to the fully compressed position.
- Pour fork oil sufficiently.

  Specified fork oil: SS8

- Push the inner rod fully in and then pull out slowly. Repeat this more than ten times to expel air.
- When all air inside the cylinder is bled out, add fork oil and move the outer tube slowly up and down several times to expel air trapped between the outer and inner tubes. Fill oil again.

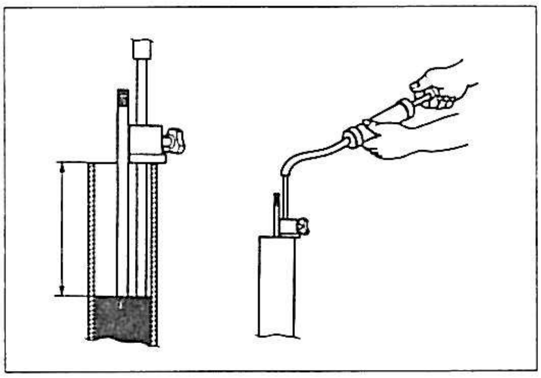


- Leave the fork standstill for a few minutes and adjust the oil level.
- The oil level adjustment should be made using the special tool with the fork fully compressed.

  Special tool:
  Front fork oil level gauge:09943-74111

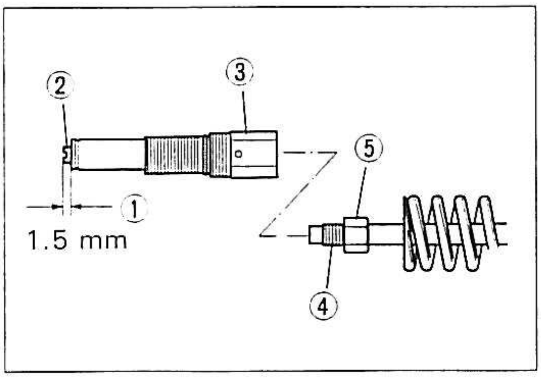
  Fork oil level: 109 mm

  Amount of oil: 458 cc



NOTE:
When checking or adjusting the fork oil level, remove the spring and compress the outer tube and inner rod fully to the bottom.

INSTALLING DAMPING FORCE ADJUSTER

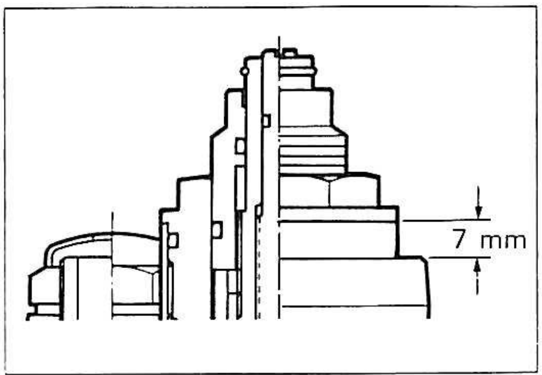


- Lightly turn the lock nut ⑤ all the way in.
- Have the adjust screw ② protruded from the housing ③ by 1.5 mm.
- Turn the housing to reach the lock nut and tighten the lock nut.

  Tightening torque: 18 — 22 N·m (1.8 — 2.2 kg-m)

NOTE:
Secure the housing so as not to turn when tightening the lock nut.

INSTALLING FRONT FORK



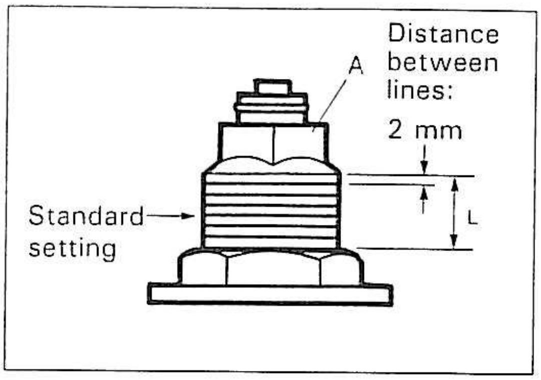
- Install the front fork so that the front fork outer tube top end is higher by 7 mm from the steering upper bracket.

42. STAGE II KIT FRONT FORK

FRONT FORK ADJUSTMENT

Adjusting spring preload

- Turn the spring adjuster Ⓐ to adjust the spring preload.



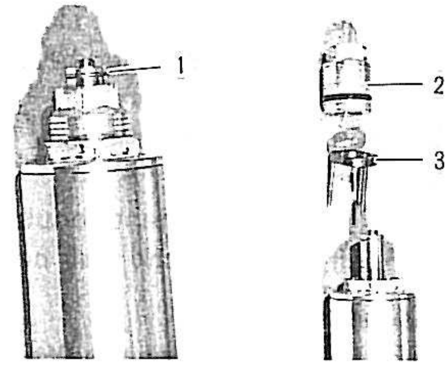
CAUTION:
The right and left adjuster should be set in the same position.
Never increase the dimension L more than 15 mm.

Adjusting range: 7 settings
Standard setting: 4th line from the top
Turning counterclockwise: decreases the preload
Turning clockwise: increases the preload

Replacing spring

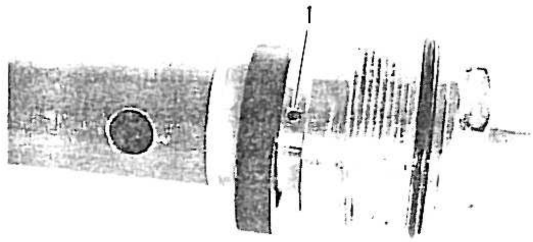
REMOVING SPRING ADJUSTER

- Remove the spring adjuster stopper ring ① .
- Remove the spring adjuster ② and pull out the pin ③ using a magnet.



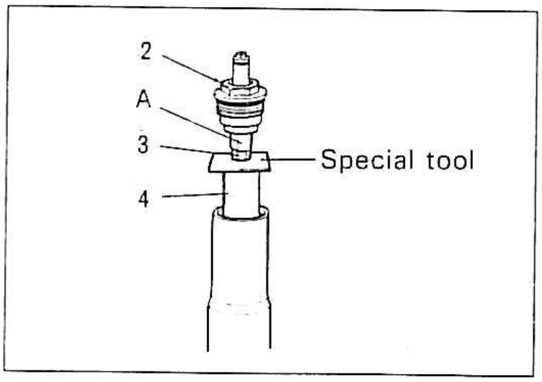
REMOVING FORK CAP BOLT

- Loosen the fork cap bolt ② and remove.



NOTE:
During performing this work, lift the front end using a stand or by holding both sides of the motorcycle to prevent the front end of motorcycle from falling suddenly when the fork cap bolt is removed.

- Gradually lower the front end of motorcycle so as to compress the fork.
- Press the spacer ④ to compress the spring. At this time, hold the cap bolt to prevent it from falling by its weight.
- Insert the stopper plate between the lock nut ③ and spacer ④ .



NOTE:
The work should be performed by two operators, while taking care not to get fingers caught between the parts.

Special tool: Stopper plate 09940-94920

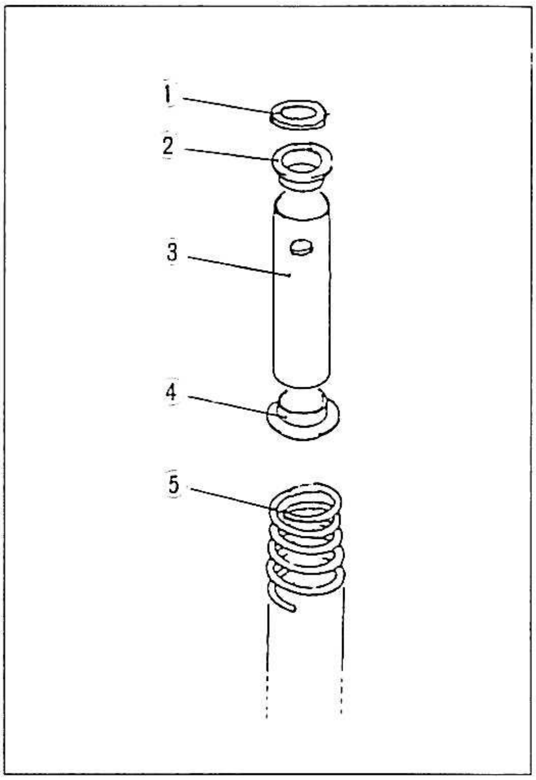
- Fit the open end wrench to flats Ⓐ on the adjuster to turn and remove the fork cap bolt.

NOTE:
Never loosen the lock nut ③ . All adjustments can be performed without loosening the lock nut (including oil seal replacing work)

- Remove the stopper plate.

REMOVING SPRING

• Remove the spring joint plate ①, slider ②, spring spacer ③, spring joint plate ④ and spring.

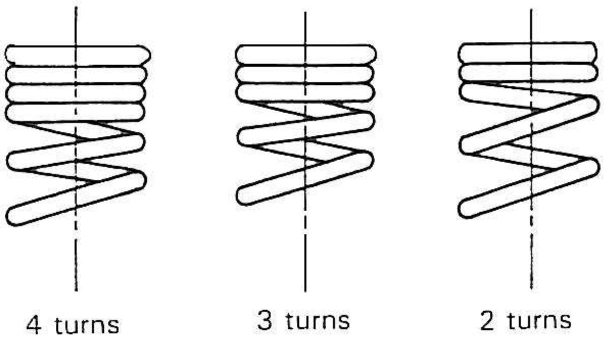


SPRING SELECTION

Part number	Spring constant	Class	Identification
51171-22D50	0.475	Soft	Tight pitch coil end: 2 turns
51171-22D60	0.500	STD	Tight pitch coil end: 3 turns
51171-22D70	0.525	Hard (1)	Tight pitch coil end: 4 turns
51171-22D80	0.550	Hard (2)	Tight pitch coil end: 5 turns

(Springs are common for Stage I and II; Externally buffed)

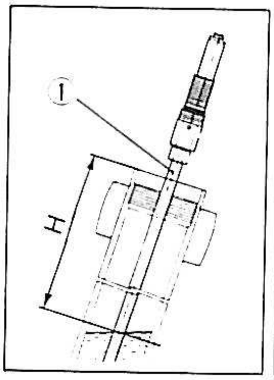
• The front fork assembly supplied from factory has the spring of which the spring constant is 0.500.

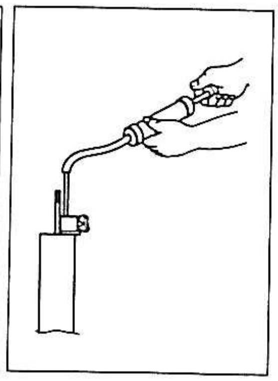


ADJUSTING FORK OIL LEVEL

- Push in the inner rod ① to the fully compressed position.
- Using the special tool, measure the oil level H .

Special tool: Front fork oil level gauge 09943-74111





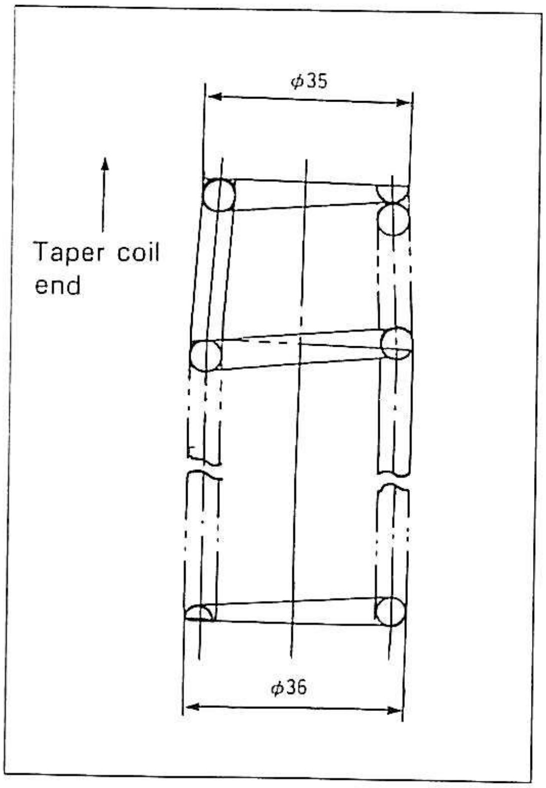
Fork oil level H : 113 mm
Amount of oil: 450cc
Specified fork oil: Showa SS05

NOTE:
When checking or adjusting the fork oil level, remove the spring and compress both the outer tube and inner rod fully to the bottom.

ASSEMBLING

- After the oil level adjustment is completed, assemble the fork parts in the reverse order of disassembly procedures.
- When assembling the front fork parts, attention should be given to the following:

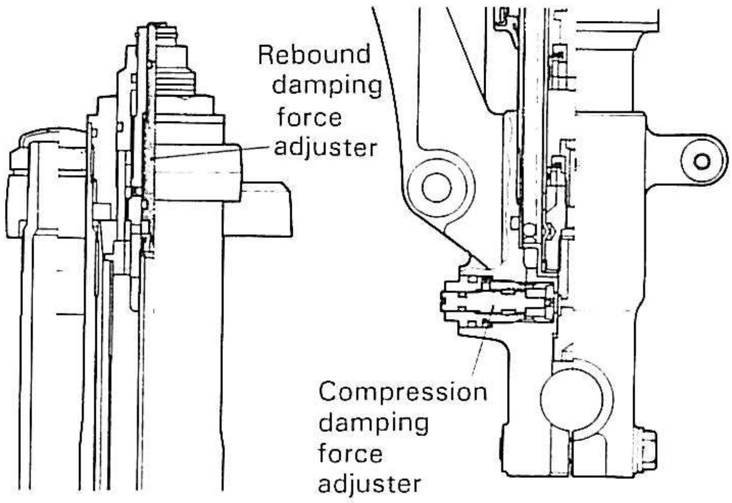
* Wipe clean the spring, spring seat and spacer to be free of dirt and oil.
* Apply a little fork oil to all sliding parts.
* Apply grease to the oil seal lip.
* Install the spring with its tapered end facing up.
Fork cap bolt tightening torque:
3 — 4 N·m (0.3 — 0:4 kg-m)
* Tightening the fork cap bolt should be made with the fork fully extended so that the inside air pressure is 0 kg/cm^2.
* Adjust the spring preload so that the fork sag with one rider seated is equal before and after disassembly.

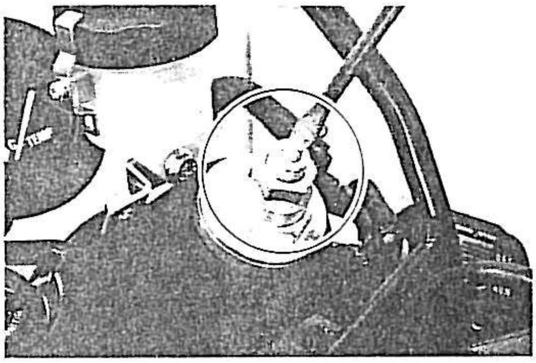


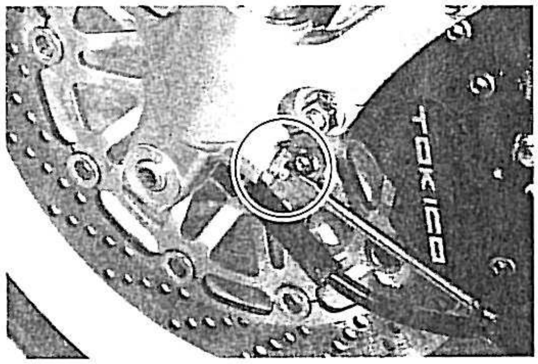
Adjusting fork damping force

- Both the compression damping and rebound damping can be individually adjusted.
- Location: Rebound damping force aduster . . . At top
  Compression damping force adjuster . . . At bottom
- Adjustment: Rebound adjusting range . . . 14 settings
  As adjuster is turned left, damping decreases.
  Compression adjusting range . . . 14 settings
  As adjuster is turned left, damping decreases.

NOTE:
The right and left adjuster should be set in the same position.







* **Standard setting**

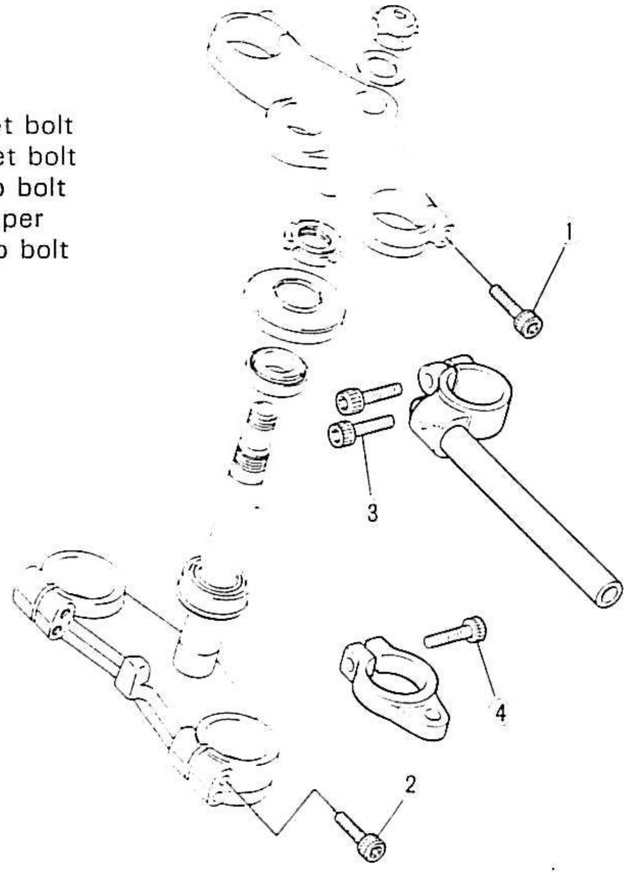
Rebound: Turn the adjuster clockwise all the way in. Slowly back it until you feel a first click stop (this click is counted as #1). Then, turn back the adjuster further until #4 click stop is reached.
Compression: Turn the adjuster clockwise all the way in. Slowly back it until you feel a first click stop (this click is counted as #1). Then, turn back the adjuster further until #8 click stop is reached.

FRONT FORK OIL REPLACEMENT

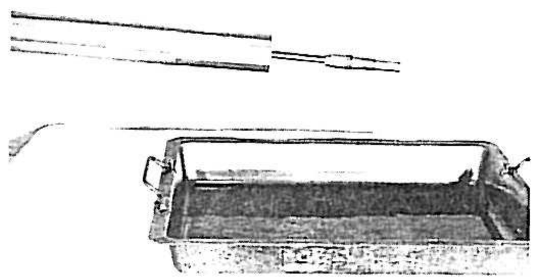
- With the front end lifted, remove the front wheel and front fender.
- Loosen the upper bracket bolt ①, lower bracket bolt ②, handle clamp bolt ③ and steering damper bracket clamp bolt ④, and then pull down the fork to remove it.

NOTE:
Loosening the damper cap bolt prior to the above procedures can facilitate the subsequent work.

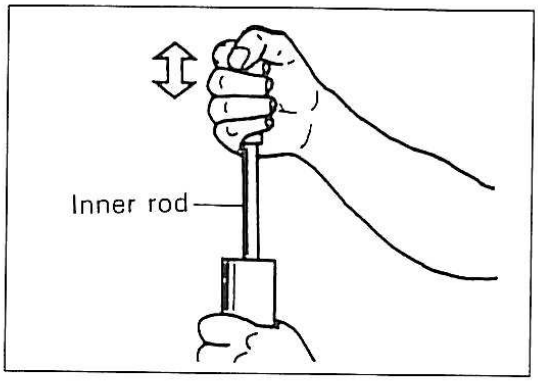
① Upper bracket bolt
② Lower bracket bolt
③ Handle clamp bolt
④ Steering damper bracket clamp bolt



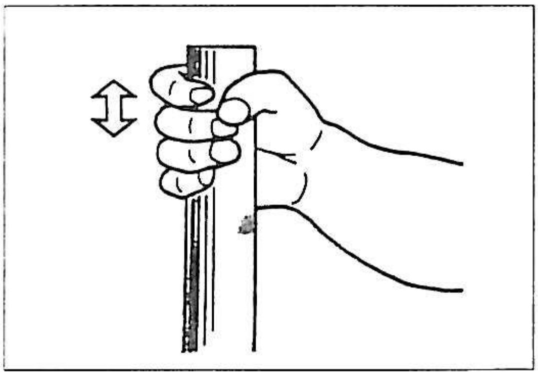
- Remove the spring according to the spring replacement procedures.
- Drain the fork oil.



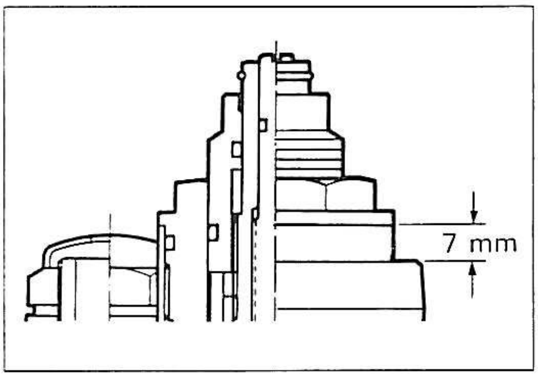
- Place the fork in an upright position and push in the inner rod to the fully compressed position.
- Pour fork oil sufficiently.
  Specified fork oil: Showa SS05
  (P/NO. 99000-99001-SS5)
- Push the inner rod fully in and then pull out slowly. Repeat this more than ten times to expel air.



- When all air inside the cylinder is bled out, add fork oil and move the outer tube slowly up and down several times to expel air trapped between the outer and inner tubes. Fill oil again.
- Adjust the oil level according to the oil level adjusting procedure.
- Install the spring.



- Install the front fork so that the front fork outer tube top end is higher by 7 mm from the steering upper bracket.



Tightening torque:

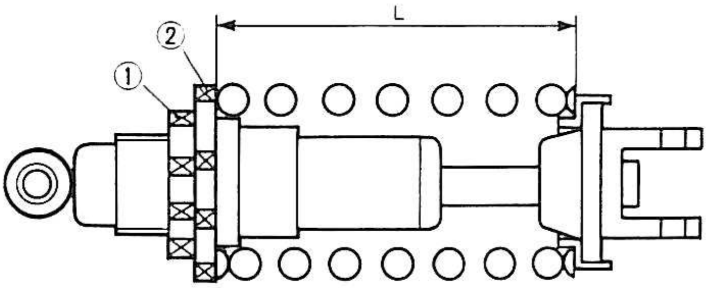
① Upper bracket bolt: 2.0—3.1 N·m (0.20—0.31 kg-m)
② Lower bracket bolt: 1.8—2.8 N·m (0.18—0.28 kg-m)
③ Handle clamp bolt (6mm): 0.8—1.2 N·m (0.08—0.12 kg-m)
④ Steering damper bracket clamp bolt: 0.4—0.7 N·m (0.04—0.07 kg-m)

CAUTION:
If the outer tube top end is to be protruded more than this, secure clearance of at least 10 mm between tire and radiator and also between the fender and lower bridge or cowling.

43. REAR SHOCK ABSORBER

Spring preload adjustment

- To adjust the spring preload, loosen the spring retainer lock nut ① and turn the retainer.



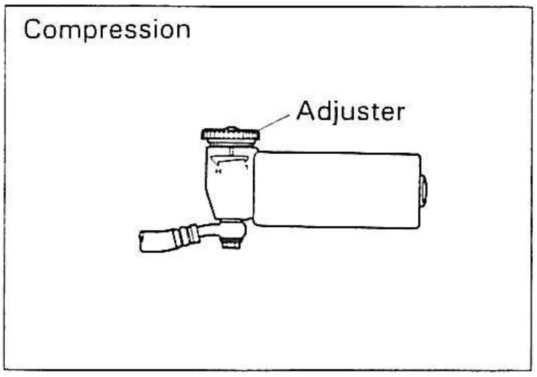
In the case of Stage II kit rear shock absorber, there is no lock nut and therefore the adjustment is made by turning the retainer only.

	Standard length	Adjusting range
Stage I kit rear shock absorber	L = 179 mm	174 — 184 mm
Stage II kit rear shock absorber	L = 173 mm	163 — 190 mm

CAUTION:
Never attempt to adjust beyond the adjusting range.

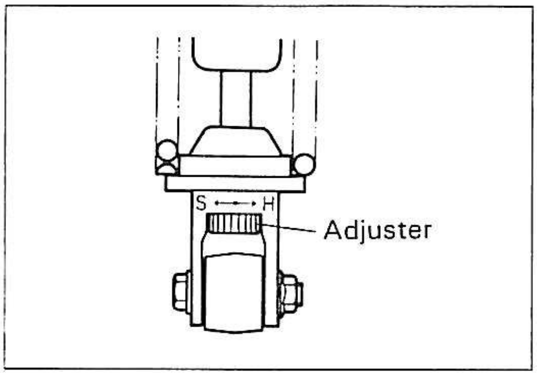
• Compression damping force adjustment
To adjust, turn the adjuster dial located at the oil reservoir.
Turning toward "H": For higher damping force.
Turning toward "L": For lower damping force

Standard position:
Turn the adjuster dial all the way toward "H". Slowly back it until you feel a first click stop (this click is counted as #1). Then, turn back the adjuster dial further until #5 click stop is reached.



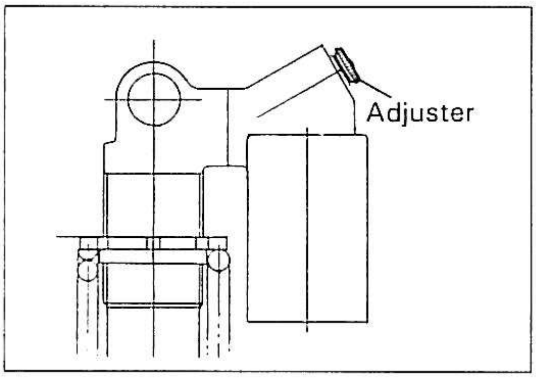
Stage II kit rear shock absorber
• Rebound damping force adjustment
To adjust, turn the adjuster dial located at the bottom:
Turning toward "H": For higher damping force
Turning toward "L": For lower damping force

Standard position
Turn the adjuster dial all the way toward "H". Slowly back it until you feel a first click stop (this click is counted as #1). Then, turn back the adjuster dial further until #10 click stop is reached.
Adjusting range: 20 settings



• Compression damping force adjustment
To adjust, turn the adjuster dial located at the top of the shock absorber:
Turning clockwise: For higher damping force
Turning counterclockwise: For lower damping force

Standard position:
Turn the adjuster dial all the way in. Slowly back it until you feel a first click stop (this click is counted as #1). Then, turn back the adjuster dial further until #7 click stop is reached.
Adjusting range: 20 settings



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