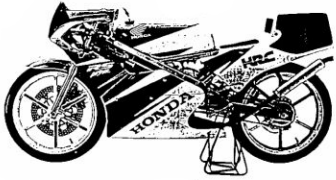
HRC

'94-RS250R

'94-RS125R



'93 & '94 RS250R MAJOR PARTS INTERCHANGEABILITY

No.	Parts name	Interchangeability	Remarks
1.	Crankcase	'94 → '93 NO '94 ← '93 NO	Add the stopper of balancer shaft BRG.
2.	Cylinder comp	'94 → '93 (OK) '94 ← '93 (OK)	The timing & shape of port changed. The height of boss changed.
3.	Crankshaft	'94 → '93 (OK) '94 ← '93 (OK)	Reduction of oil seal friction.
4.	Piston comp	'94 → '93 (OK) '94 ← '93 (OK)	Piston ring is keystone type.
5.	Piston ring	'94 → '93 NO '94 ← '93 NO	Keystone type.
6.	Balancer shaft	'94 → '93 NO '94 ← '93 NO	The dimension changed.
7.	Exhaust valve	'94 → '93 OK '94 ← '93 NO	The dimension changed with port shape.
8.	Carb insulator	'94 → '93 OK '94 ← '93 NO	The dimension changed for improvement.
9.	Clutch center	'94 → '93 (OK) '94 ← '93 NO	The dimension changed, it is possible to use for '93 with washer(90456-425-000).
10.	Clutch outer collar	'94 → '93 OK '94 ← '93 NO	The shape changed.
11.	Reed valve	'94 → '93 OK '94 ← '93 NO	Boysen type
12.	Water pump body	'94 → '93 OK '94 ← '93 NO	More clearance with pump impeller.
13.	Exhaust joint	'94 → '93 OK '94 ← '93 NO	The dimension changed.
14.	Exhaust chamber	'94 → '93 NO '94 ← '93 NO	The dimension changed.
15.	Rear fork	'94 → '93 OK '94 ← '93 NO	The position of brake rod changed.
16.	Front fork	'94 → '93 OK '94 ← '93 (OK)	D/F characteristic & spring rate changed.
17.	Front brake disc	'94 → '93 OK '94 ← '93 OK	The wave washer is deleted. Full froating type.
18.	Front brake pad	'94 → '93 OK '94 ← '93 NO	The thickness & groove No. changed.

'93 & '94 RS250R MAJOR PARTS INTERCHANGEABILITY

No.	Parts name	Interchangeability	Remarks
19.	Change rod	'94 → '93 NO '94 ← '93 NO	The length changed.
20.	Rear cushion	'94 → '93 OK '94 ← '93 NO	D/F characteristic & spring rate changed.
21.	Frame body	'94 → '93 OK '94 ← '93 NO	The hole position of breather changed, the shape of welding part changed.
22.	Eng control unit	'94 → '93 NO '94 ← '93 NO	The characteristic of ignition timing & exhaust valve lift changed.

** Some other parts No. in the parts list is changed for convenience of productive stage, but it is interchangeable.
It is better to use '94 parts.

HANDLING INSTRUCTION FOR RS125R AND RS250R

1. FUEL:Octane value of gasoline.

Use only aviation gasoline 100LL, and ELF HTX975/976 or CASTROL A747 for the mixing oil.

FUEL OIL MIXING CHART

30 : 1	
FUEL	OIL
20 L	667cc
10 L	333cc
5 L	167cc
1 L	33cc

2. TRANSMISSION OIL:Type and a level

Always check the oil level. You can check oil level at level check hole(RS125R), before start the machine. As RS250R has not any level check hole, make sure that you pour the recommended oil as below,

RS250R:0.65 liter(After over hall, and drain)
RS125R:0.65 liter(After over hall),
0.6 liter(After drain)

Some rider use the ATF for the transmission, which may damage the gears and yet very little improvement of power can be expected. Please be sure to use the designated fluid.

RS250R:HONDA ULTRA GP 20W-50, or ELF HTX740.
RS125R:HONDA ULTRA U OIL 10W-30

3. COOLANT AND AIR BLEEDING

In order to avoid freezing and corrosion, the radiator is filled with antifreeze when for shipping the machine. A tap water is fine as coolant in normal use, occasionaly use the radiator coolant is recommended. The inside of radiator would be coated with anti-rust layer from effects of the coolant.

After the engine is re-assembled and the radiator is filled with water, bleed air out of the system by loosening the bleeder check bolts and filling hall.
To facilitate the procedure, a portion of each bolt has been cut, assuring a bleed route within a few turns of the bolt.
These bolts are located at the cylinder head on the 125cc model. While the 250cc has five bolts at the front and rear cylinders, cylinder heads and the water pump.
It should be noted that it is very difficult to bleed the air from the 250's water pump even after the engine has been operated. Bleed the air at these 3 points and the radiator the 250, due to the radiator shapeprevented easy air bleed, tilt the motorcycle to the side for complete bleeding.
Quantity of the coolant is 1.6 liter for 250, and 0.7 liter for 125.

4. WATER TEMPERETURE

The best temperature is 55~65℃.
Water temperature must be above 55℃ before engine is placed undeer load. If temperature falls below 55℃ while riding, cold seizures may occur.
Blanking off part of radiator with adhesive tape can raise temperature in condition of low ambient temperature. Check for the leakage or lack of coolant in radiator if temperature is above 70℃. If water level is too low the temperature gauge will indicate lower than the actual temperature due to lack of the water contact.
The extremely low on water level the gauge may not work.

However for 125, the area of the radiator where the fins are provided for the expansion chamber cooling, and not be covered with gum tape etc.

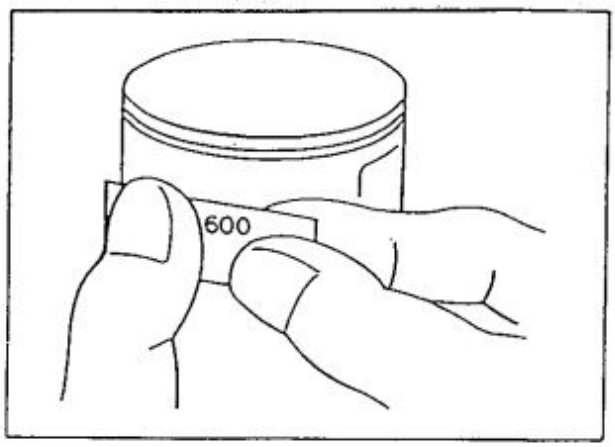
5. BREAKING IN

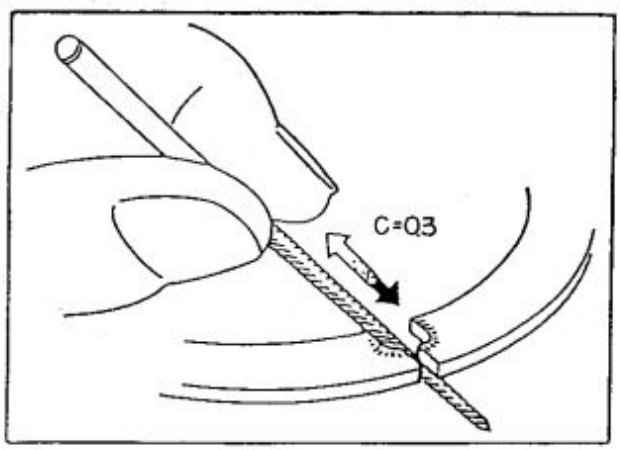
The breaking-in is required for the new engine and when replaced the piston, cylinder, piston ring, crankshaft and etc.
Do the break-in in accordance with the procedure mentioned in the manual.
In general during break-in the engine runs in a low rpm range and the throttle is kept half open. Thus, be sure to replace not only the main jets but jet needles with those smaller in diameter to make mixture rich in low and middle rpm ranges.

The engine should be run at rpm ranges frequently used during the race condition as the final procedure in breaking-in.

Only for 125, after breaking-in and every test disassemble the cylinder and piston for good conformity to each other. Sand off high spots or ridges. With fine emery cloth(#600) by pulling it along periphery as required.

Change both side of piston pin clip to new one every time you maintaine the piston.
Also to prevent piston scuffing by ring ends, dress the end(to about c 0.3) with a round file. (Diamond file is suggested)
Because the piston ring is always moving back and force hitting locating pin due to the shape of ports.





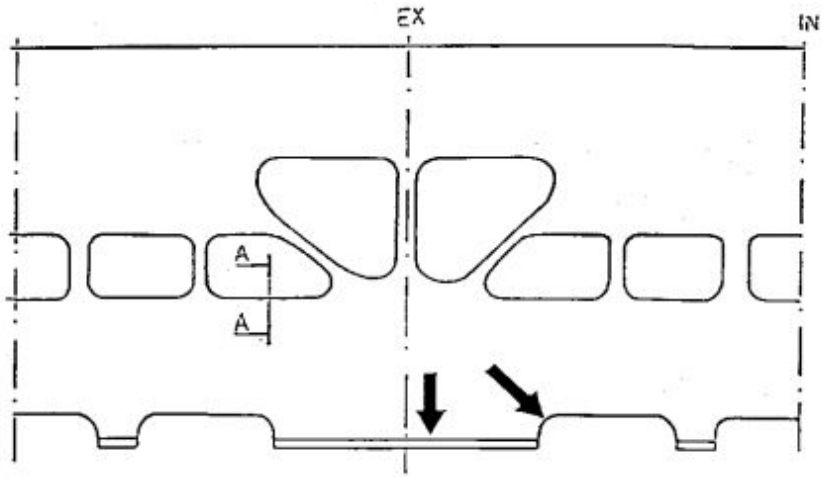
6. MODIFICATION OF CYLINDER HIGH SPOT

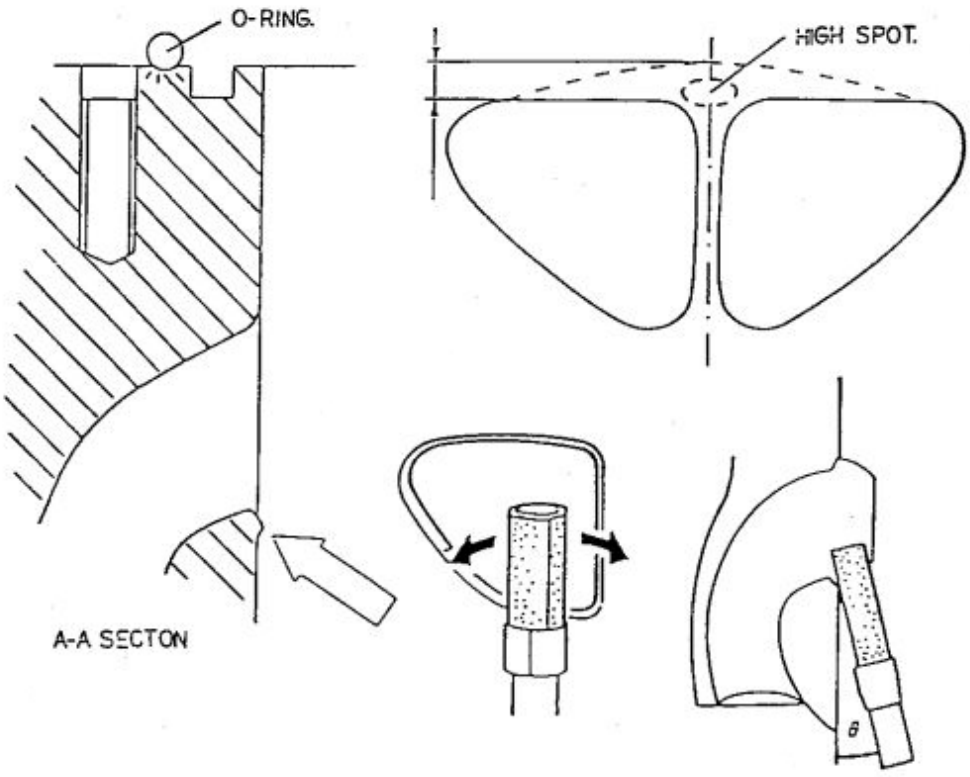
Because of that ceizing trouble may occur by high spot.
Touch up with rubber grinding stone the area if you find the high spot both side of lower EX ports bridge on the cylinder bore, but don't touch the bridge.

Although all the corner of cylinder ports were chamfered, the corner between the port and the cylinder bore will shows the sign of the high spots, the piston will shows the high spots also.

7. CYLINDER O-RING

When installing the cylinder head, the nuts should be temporarily tightened to the point that the gasket is in complete contact with it. Then, the nuts should be tightend in a diagonal order. Otherwise, the O-Ring will be forced out of groove and into the mating surface.
Once this happens, the O-Ring and cylinder mating surface will be damaged.

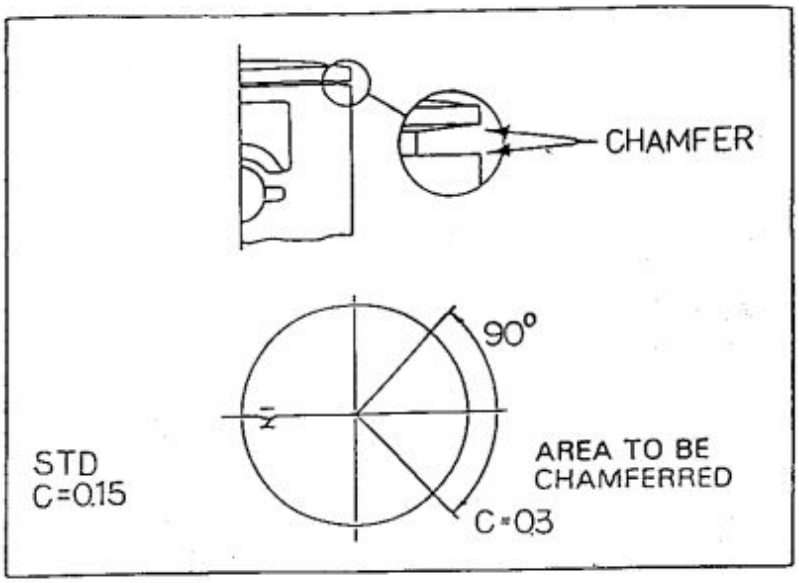


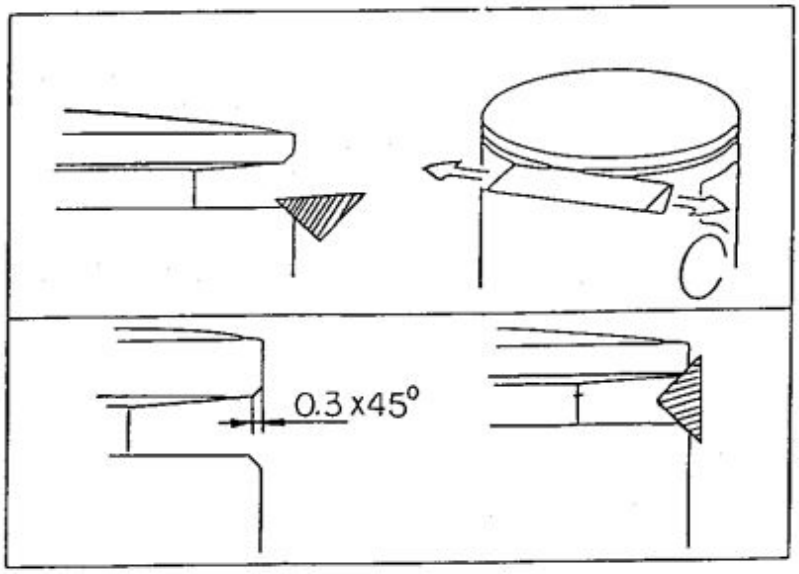


8. PISTON RING STICK

There are 2 types of ring stick.
One of them is carbon stick. It is usually caused by law quality of the oil or too rich of jetting or oil mixing.
Solution of this problem is clean with fine emery cloth or the SCOTCH BRIGHT and change the brand of mixing oil, proper jetting or proper mixing ratio.

Another one is mechanical stick. To prevent and to solve the mechanical stick, chamfer the ring groove with an oil stone wet with gasoline as shown before installing a new piston, after breaking-in and after every test event.
The procedure is using triangle shaped oil stone, chamfer the upper and lower edges of the exhaust side ring groove to about c 0.3.
For 125, correct the ring groove, if mehanical stick has occured. Do not modify the ring groove under normal conditions.

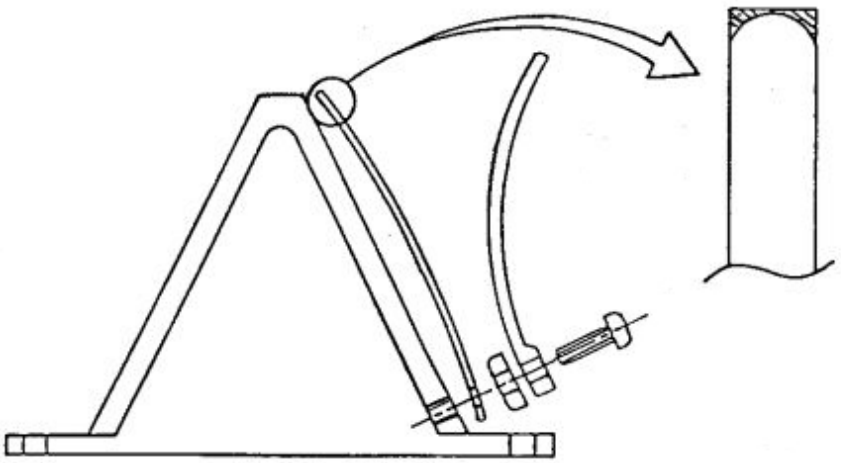


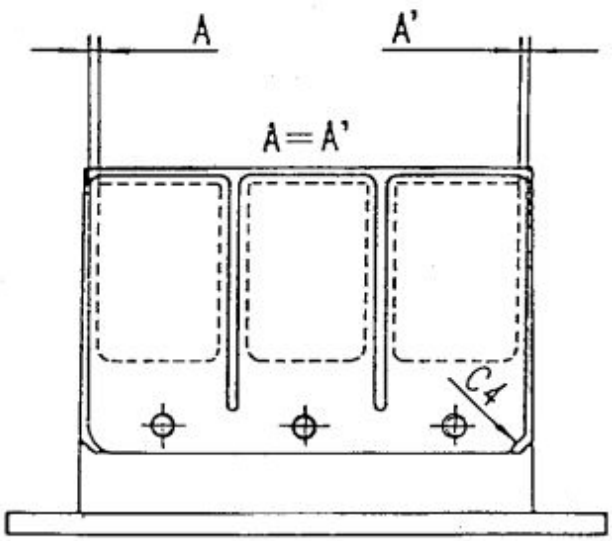


9. REED VALVE(Only for RS125R)

Set together C4 part of the reed valve petal, the reed valve stopper and the reed valve spacer. Because the reed valve shape is arched.

We suggest you to rounded out the top of the reed valve in order to inprove the durability. Keep the dimension A and A' equal when reed valve petal is installed. There is the possibility of durability of deterioration of reed valve body when the reed valve petal was set incorrectly.





10. CARBURETOR SETTING

MAIN JET

To make a machine faster, there two areas where settings are made, the engine-related parts and suspension.

Specifically, the engine-related parts include: carburetor, ignition timing, compression ratio, transmission gear ratio and final gear ratio.

Suspension setting areas include: projection of front fork, rear suspension stroke, spring rate, initial load damping rate, oil level hight, shock gas pressure, tire and wheel selection.

These are only a few examples, there are many other items to adjust.
However, if you don't know what to do, it is easiest to start with the carburetor.

This is because we have to run very close to the best recomended lap time in order to judge if the current suspension condition is acceptable or not.

However the performance of an engine, especially the main jet can be judged even if the lap time is not good as a top rider.

The proper setting of the carburetor has a considerable influence on lap time. Only after you have obtained a satisfactory lap time will you be ready to decide if suspension performance is good enough.

You should remember that without a proper engine setting, you can not perform a proper suspension adjustment.

If you use different specifications and conditions each time you run, you never have a baseline with which to determine what adjustment resulted in better or worse driving perfomance, so there is no way to judge which setting is the best.

Changes in machine specifications can result from maintenance such as replacing heads, adjustments or from fine tuning processes such as eliminating differences between the right/left crankcase, upper/lower crankcase, between crankcase and cylinder and by adjusting the copression ratio.

Machine conditions also differ before and after breaking in. We are not trying to say you can not proceed directly to carburetor adjustments before determining normal specifications.

The more often you race the machine, the more occasions you will have to modify specifications due to trouble or new ideas.

However, it is better not to change the basic specification if carburetor setting is under way. If a basic specification change is unavoidable, you should start by totally resetting the carburetor.

Once you become used to the machine, it is very likely you will make mistakes, such as modifying many parts at the same time.

One example of this kind of mistake is to change ignition timing and main jet at the same time. This does not lead to good performance.

The most important key to determine the proper setting and adjustments needed is to make every test condition is the same, including running pattern.

Among setting adjustment, it is better to begin with main jet setting.
This is because the main jet has the greatest influence on lap time.

In addition, the setting of the main jet is the easiest part to judge.

The setting of the carburetor, especialy the main jet, implies adjusting proper combustion condition of the spark plug or piston.

This can be done only after best setting has been proved and the spark plug or piston condition of that time have been recorded.

If you remember spark plug and piston condition that time, they can be refered to when a different setting is attempted. Even if the best score means the best setting, lap time varies for numerous reasons aat the begining.
Therefore, measurements should be done between two points on a straight line, passing the first point under the same conditions which include using the same gear, the same engine rpm and the same throttle opening.

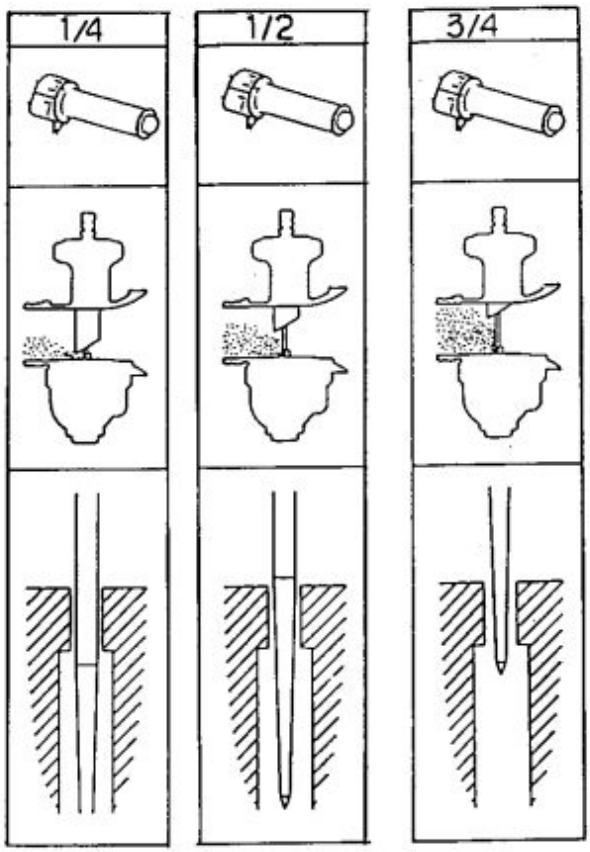
From that point, open the throttle fully and measure which main jet selection provided the highest rpm at the measuring point. The distance between two points doesn't have to be any longer than 400m. The main jet setting which had the highest rpm is the best one.

JET NEEDLE

Setting the jet needle is not as easy as the main jet.. Many people can judge the main jet setting but not the jet needle. There are a wide range of effects depending on clip position, straight diameter and taper angle.

We need to know at least the throttle opening, the gap between the jet needle and main nozzle and relationship between the amount of air passing through the main bore and and the amount of gasoline discharged from the main nozzle.

Fig. 7 shows, you will find how throttlle opening of 1/4, 1/2 and 3/4, how gasoline sent and enlargenment illustration of main nozzle.



If you look closely at the gap between the jet needle and main nozzle which contains jet needle, you can see if the throttle opens widely, which means the projecting part has withdrawn.
That way, more air flows in main bore. If the air flow increases, the air-fuel mixture will be leaner unless the gasoline flow is increased.
The jet needle setting is established to increase or decrease the amount of gasoline flow according to the throttle opening.

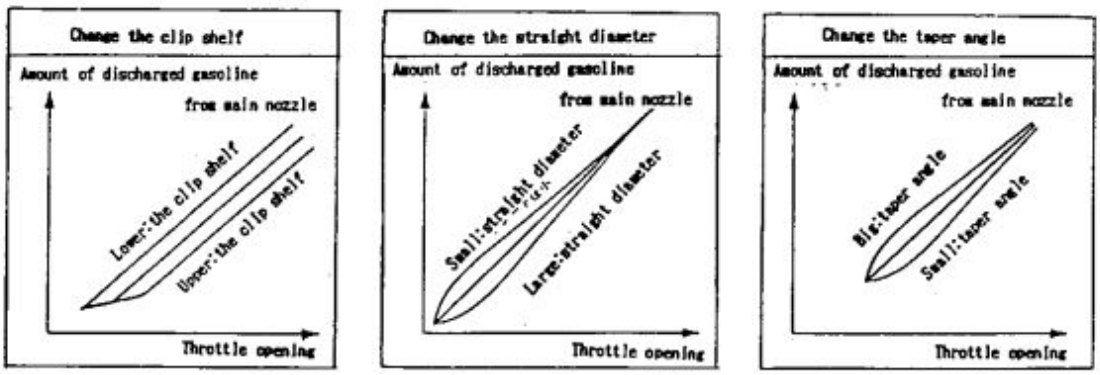
The role of the jet needle is to supply gasoline according to volumetric changes in the air intake caused by throttle valve opening and thus maintain the appropriate air-fuel mixture density from partial opening, which is 1/8 to full opening.

When the throttle valve is almost shut and when it is fully open, the size of the jet needle is roughly decided due to what size of the slow jet or main jet carburetor has.

Individual performance of each carburetor part can not be classified because their performance all overlaps to some degree.

Therefore you can obtain satisfactory performance from a roughly set machine. However, even if you have good setting at full opening and 1/8 opening, that dose not automatically mean it is also good under 1/2 or 1/3(etc.) opening condition.

At the Fig. 8, which shows the relationship between throttle valve opening and amount of the discharged gasoline.



Sometimes the changing linesrepresent the mixture conditions, when the line lowered, less gasoline is discharged for the throttle valve opening, that is, thin air-mixture.

The jet needle must be set so that it has a desirable curve on this graph. To achieve this goal, you have to do is to move it up ward or downward, bend it a little more and change the angle, and sometimes both.

We suggest to keep record of each evaluation every time you change the needle jet setting and record the run for every throttle opening the same as you do for the main jet.

It is easy to begin with changing the clip location.

If you lower the clip, the jet needle is lifted more than the throttle valve opening. That way you can have a wider gap between the jet needle and main nozzle with same throttle opening, and you will have a richer air-fuelmixture. If you move up the clip, you will have a narrower gap between the jet needle and mmain nozzle resulting in a thinner air-fuel mixture.

As you actually go through these operations, you can learn to detect and notice the differences in performance when the mixture is too rich or lean and will be able to determine the best setting quicker.

At the same time, you will be able to understand the fine points of the machine conditions like which mixing ratio is best at around 1/2 opening but not around 1/4 opening.

At this stage, you will not able to adjust the clip locations any more and it is time to consider changing straight diameter or taper angle.

AIR SCREW, and SLOW JET

Most carburetor have two air-fuel mixture formation systems. One is for the main system and the other for the slow system.

It is easier to understand if you imagine that the slow system is another carburetor within the main carburetor. Both entrance and exit of slow system are different from those of main system.

Both entrance and exit are closer to the engine than the main system, and to know the reason, you have to understand the function of the throttle valve.

When the throttle valve is fully open, there is the least pressure at the center of the throttle valve due to the main bore form.

That is the best place to set the nozzle which leads to the inside float chamber fuel.

Since the float chamber fuel is affected by atomospheric pressure, and the low pressure end at nozzle, the more effective fuel discharge will be.

However, as the throttle valve closes, the low pressure ppart moves to the engine side of the throttle valve. If it opens slightly from fully closed position, edge of engine side throttle valve is the least pressure part.

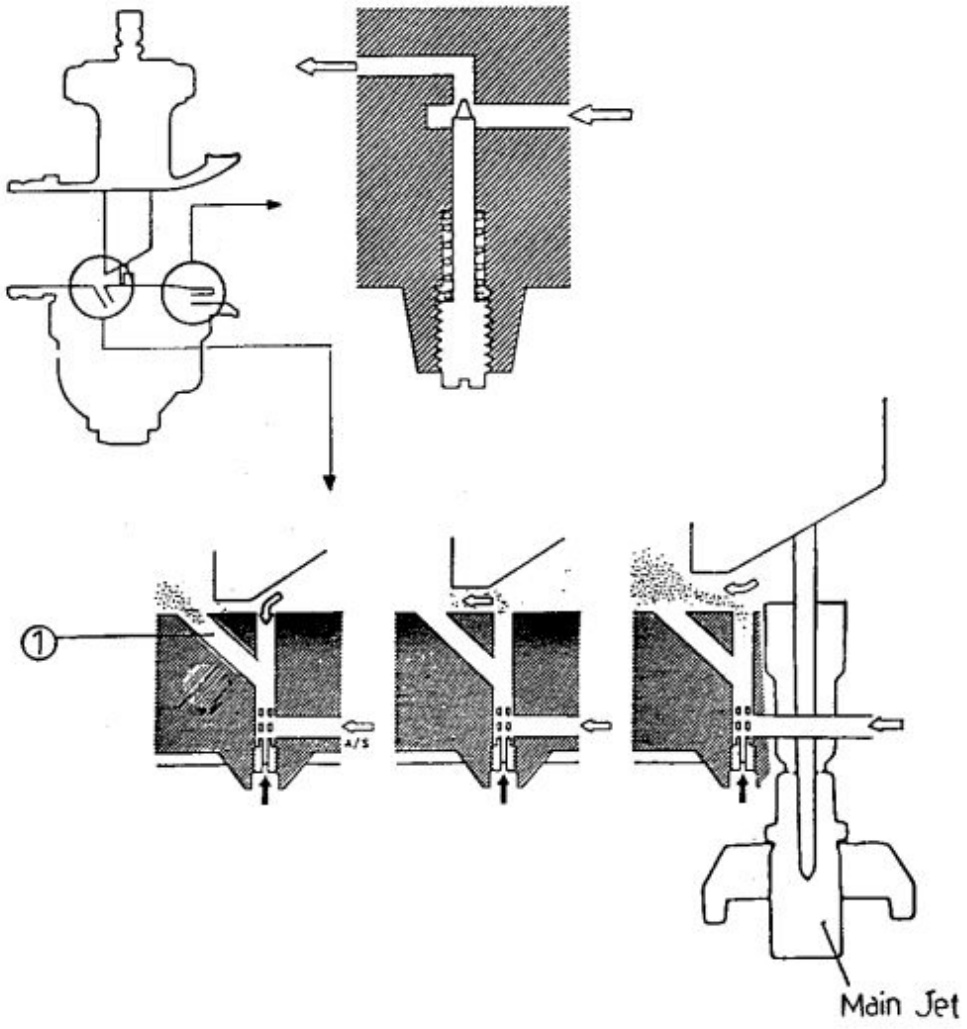
Even if has the least pressure when throttle valve is fully closed, it is almost impossible to discharge fuel from main nozzle and we need an alternative fuel discharge exist

Thus, an independent fuel system other than that provided by the main system was devised in order to provide fuel at situation where the most vaccume has been applied to the throttle valve or when it is only very slightly open.

For the main system nozzle, a slow system has pilot outlet and a bypass hole and there is a slow air passage corresponding to main air the difference is, the slow system has two fuel discharge outlets and there is an air screw in the slow air passage to adjust permitted the airflow.

Two kinds of slow system outlet are closed to the engine than the main system. The pilot outlet① is the closest to the engine with inclined passage from the slow jet hole.

As you can see from illustration shown Fig. 9, the bypass outlet does not function as a fuel discharge outlet when the throttle valve is completely close.



If the throttle valve is slightly open, since the least pressure part is still closer to the engine than the bypass hole, fuel would not discharge from the bypass hole. This would prevent the air-fuel mixture from being too rich due to less air flow from the throttle valve caused by air flowing backwards at the closed or slightly open throttle valve.

As the throttle gradually opens, the least pressur area moves to the main nozzle side by lowering its pressure, and soon fuel discharge from is no need to open a float chamber or remove the carburetor.

It is better to maste how to adjust the air screw first, because there is no need to open a float chamber or remove the caburetor.

All you need is a long flat head screw driver. You don't have to drive the machine, either.

Start the engine and stabilize the throttle at keeping revolution steady at 3,000~4,000rpm and turn the air screw.

Check a rise of engine revolution while snapping of throttle, adjust as the engine revolution rise smoothly.

Next, stop the engine. Turn in the air screw till it stops and record it like 1+3/4 and loosen about 1/4 to 3/4 less rotation from the record, then restart the engine.

Idle the engine and confirm the response from the closed throttle position. In the range 1/4 to 3/4 rotations less than the which had the highest idle revolution, then look for the best response air screw position.

This way you can determine the number of turns to loosen the screw , and it is now time to confirm this by a riding test.

The setting should not go far from this position.

The problem for the air screw adjustment is when turning the screw rotations for less than one or more than two turns. Most carburetor are desinned to have the best slow system performance at around 1 or 1+1/2 loosening turns of the air screw.

If the setting ends too far away from its design, the engine revolutions may not rise smoothly or the engine brake may not work properly.

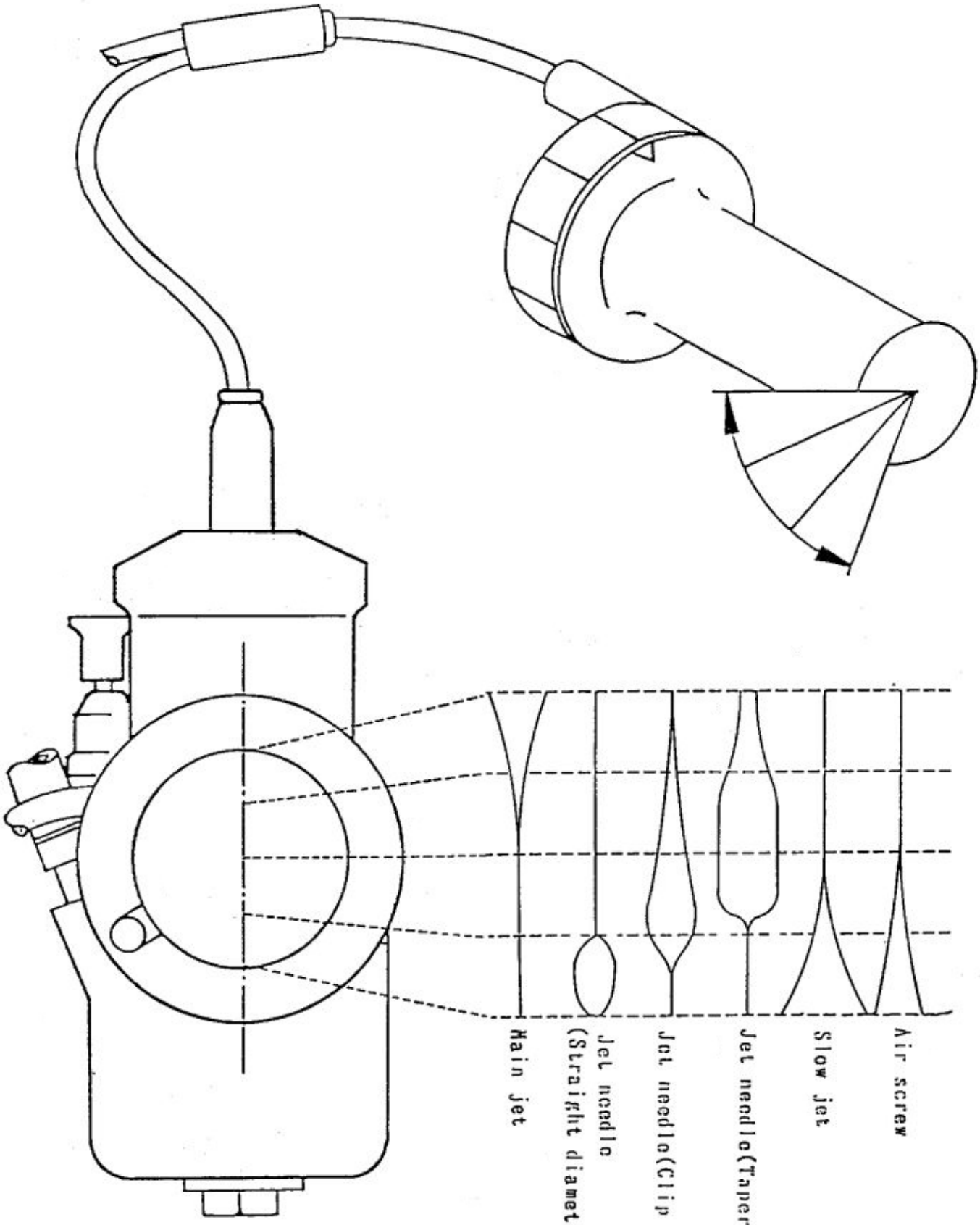
If your best response occurs only after the air screw is loosened less than one or more than two times, you need to change the slow jets.

As you proceed with your adjustment setting and find that the loosened rotations of the air screw is more than the standard(more than two turns), it means a thinner than standard air fuel mixture is needed. Therefore, you should apply a smaller slow jet.
On the contrarl, if the loosened rotations of the air screw are too small(les than one turn), you need to have a bigger slow jet.

Standard atomospheric condition	condition changes	main jet
20℃	+4~5℃	−1 rank
60%	+20%	−1 rank
760mmHg(1013mb)	+25mmHg(33mb)	+1 rank

(Some riders reportedly run the engine without load at speed higher than 13,000rpm for carburation check. Please do not do this, or the crankshaft, piston, piston ring, connecting rod, etc. Maybe damaged.)

CARBURETOR


Main jet
Jet needle (Straight diameter)
Jet needle (Clip shelf)
Jet needle (Taper)
Slow jet
Air screw

11. SPARK PLUG

Check for damage or carbon deposit and do the cleaning with a plug cleaner if necessary.

For 125, be sure to use the sparkplug from HRC (31901-NF4-651), because there is a possibility that NGK's stock plugs includ old type and some of them are not good enough for RS.

250's compact plug(31940-NX5-003) may be used in 125 with the plug cap but the diameter of 125's hightension cord is 1mm smaller than 250's. Maintain it carefully.

12. PLUG CAP

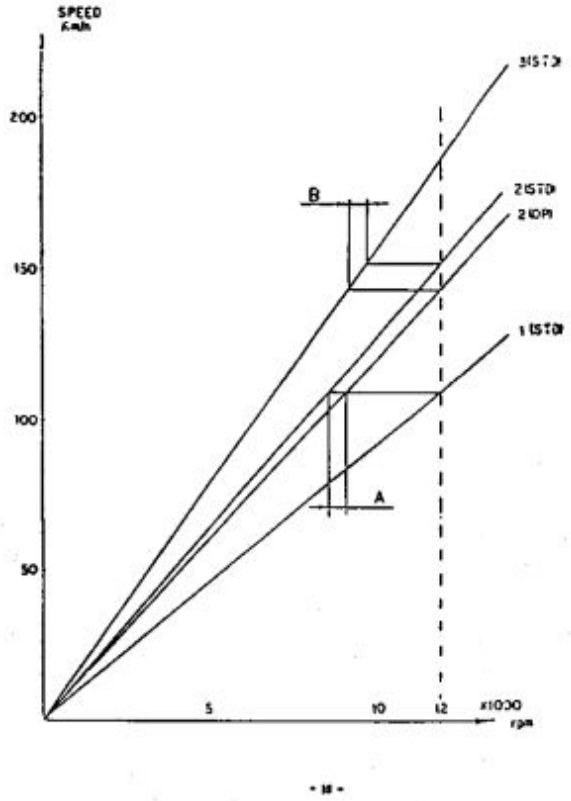
Maintenance must be done regularly. Stain or flaw inside the cap may lead to high tension leadage(flush over), which will in turn cause misfire.
Trouble of this nature is not easily detectable because it takes place only if the high load is supplied to the engine in an early stage of operation.
One of preventive measures is to replace the cap with a new one when the stain becomes difficult to remove.

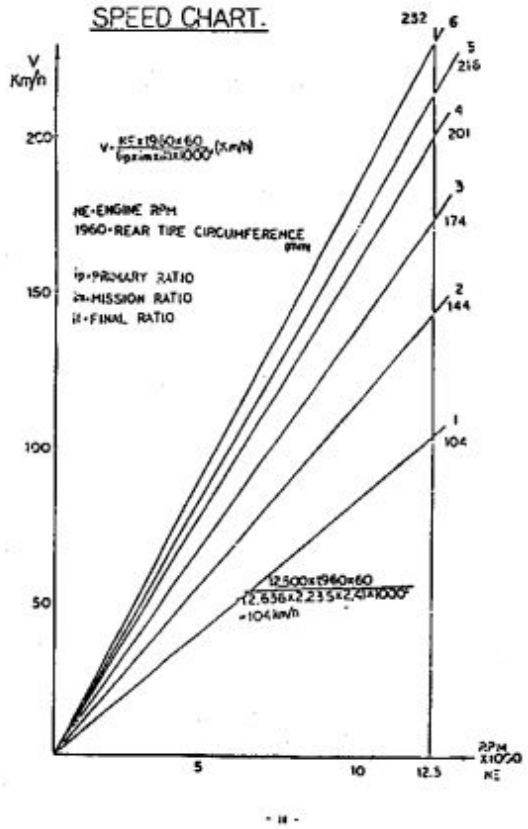
13. GEAR RATIO

Each rider has their own preference to gear ratio setting, therefore it is almost impossible to determaine what setting is the best. HRC recommends the following procedure.

1) Complete several laps of the track with a standard gear ratio.
2) Adopt a final ratio which allows the maximum power out put when the motorcycle reaches top end.
3) Change the ratio of each gear when the engine rpm is too high or too low in corners.
4) Use a speed graph showing motorcycle speed whenever you change the gear ratio. It is much easier to recognize rpm fluctuations due to changes the gear ratio.

For example, this chart shows the rpm differences caused by replacing the standard 2nd gear with the low gear ratio type. Increase in rpm is clearly shown from that achieved with the atandard gear when shifting from 1st. Also clearly shown is that, rpm reduction when shifting to 3rd as compared to the standard rpm reduction.

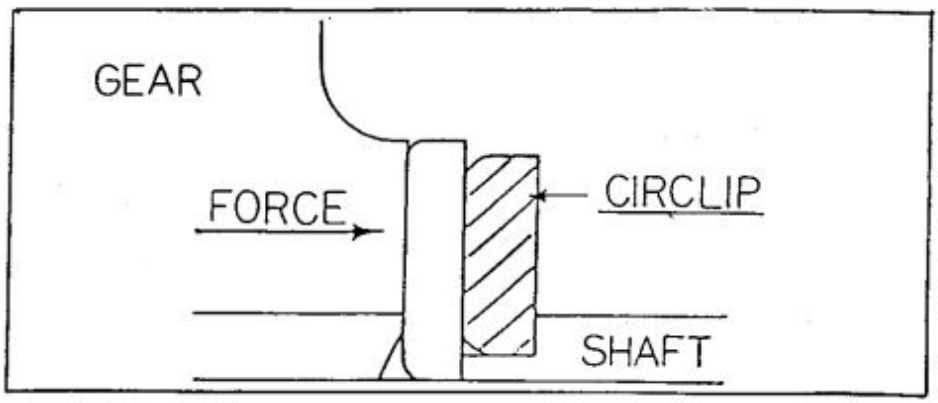


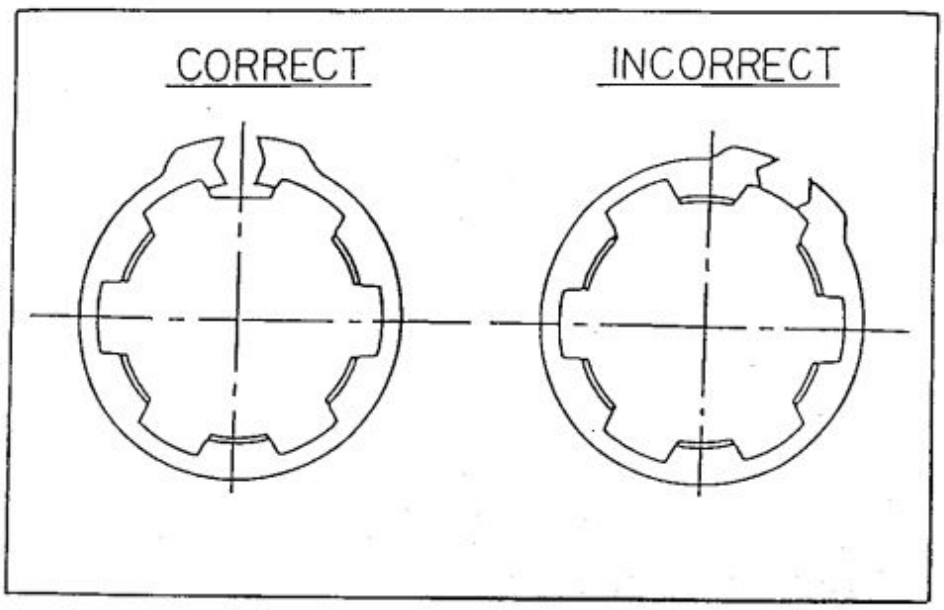


14. TRANSMISSION GEAR CIRCLIP

One point to be remembered here is that circlips should be installed in correct direction. In other words, they should be installed with the rounded side facing towards the gears. This means that the circliips can receive thrust loads on their wider side, resulting less chanceof dislocation.
Another point to be noted is that circlips should also be installed with their gaps aligned with the valley between any two adjacent groove of splines.
Failure to follow this precaution will result in trouble.

The same precaution should be used when installing a circlip on the shift spindlel.





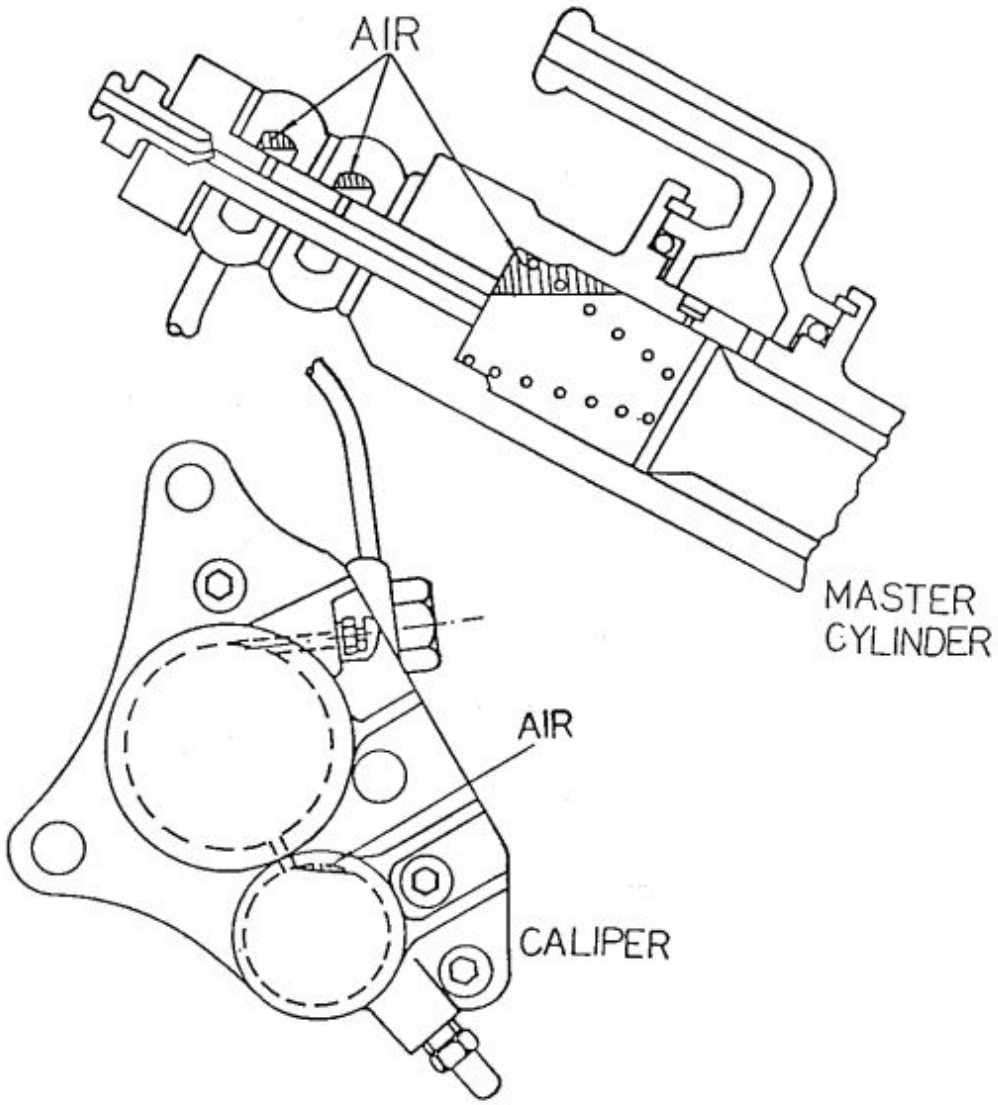
15. FRONT BRAKE

The front blake master cylinder is mounted at angle, so that the air trapped in the corner of oil line. When performing air bleeding the front master cylinder, the master cylinder should be holizontal or vertical in order to bleed out air completly. Tapping with a hard plastic handle etc. it will expedite bleed out the traped air. When the front blake lever becomes spongee, please bleed air and check front brake disks. The limit of run-out is 0.15mm.

Use DOT-4 brake fluid for RS and do not mix with a different brand of oil.

16. REAR BRAKE

The rear master cylinder uses a vinyl tube in place of the ordinary reservoir. The vinyl tube will be deformed or rear brake pedal free play will be increased if the brake pads are worn. Removoe the plug at the top of the tube to let air in. If necessary, pour brake fluid up to the proper level.



17. SPHERICAL BEARING IN REAR SUSPENSION

Inspect the 250's rear suspention and spherical bearing in the cushion rod and 125's swing arm spherical bearing prior to extensive use.
If the movement is not smooth, be sure to perform breaking-in procedures to the extent that the parts may be rotated by hand. Unless this precaution is taken, proper suspension setting can not be done.
For the breaking-in procedure, attach the nut and bolt to the bearing, and rotate with an air wrench. In order to avoid overheating, allow intervals in between rotations and apply oil.

18. TACHOMETER

The hydraulic damper is used for the tachometer to avoid hunting(shaking). Improper placing may cause leakage, resulting in hunting. When the instrument is demounted from the machine for maintenance, it should be stored in upright position or posture as installed.

SPECIAL NOTES FOR RS125R

1. ENGINE MOUNTS

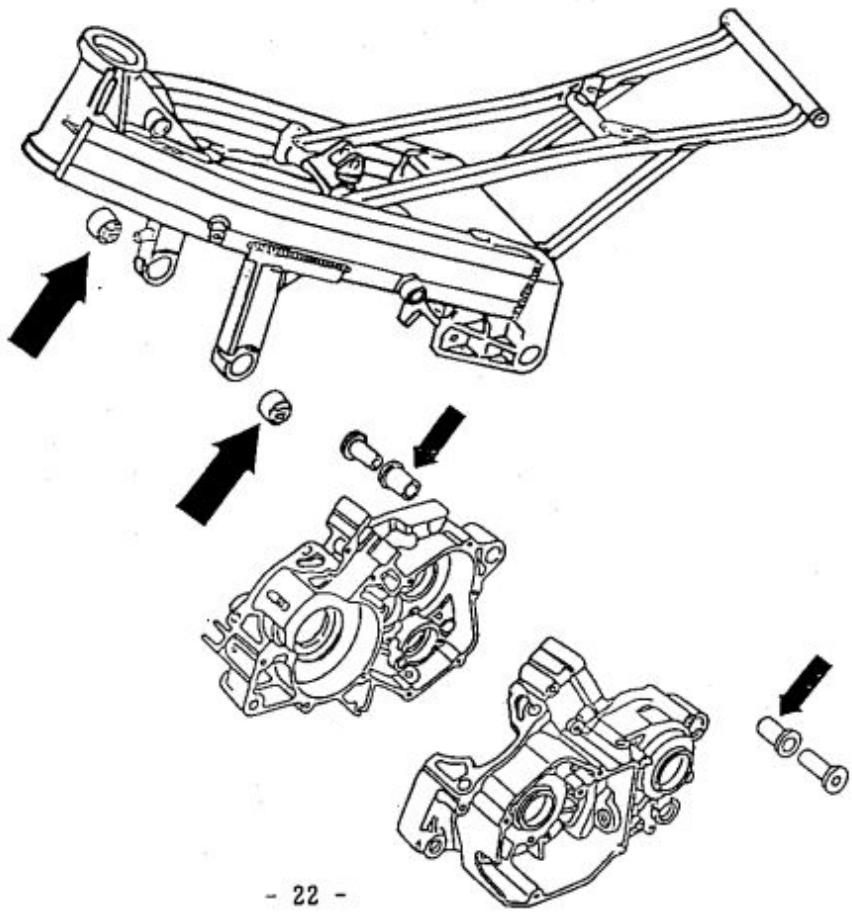
The rubber mounts used in 125 allow some degree of movement of the engine in the frame (Fig. 13).
When installing the engine in the frame, be sure to follow the instructions discribed in the manual.
The toruqe rod is used to limit sidewise movement of the engine by reaction from the drive chain.
Improper adjusted torque rod will cause under strain on the engine. After installing the engine, adjust the torque rod properly.

When you replace the mount rubber insert it properly to the frame because center collar is offset.
The exhaust chamber moves with the engine. Install and adjust the chamber as the instruction given in the manual. Be sure to tighten the fastener to the specified toruqe. Loose fasteners can cause the chamber to crack, as well as abnormal noises and vibrations.

Make sure that there is no undue strain of interference between the engine, exhaust chamber and other stationary parts. Failure to follow this precaution will result in broken frame and cracked exhaust chamber etc.

2. ENGINE MOUNT BUSH

The engine mount bush which located in crankcase is made by nylon, so replace it every 2,000km or vibration has become excessive. In accordance with the maintenance procedure method in the manual.



3. ACG CORD

Route the cords properly with some degree of slack.
Make sure that the cords do not interfere with the front engine hanger.
Removal of ACG cover will allow the wires to come out.

4. CONNECTING OF WATER HOSE TO CYLINDER

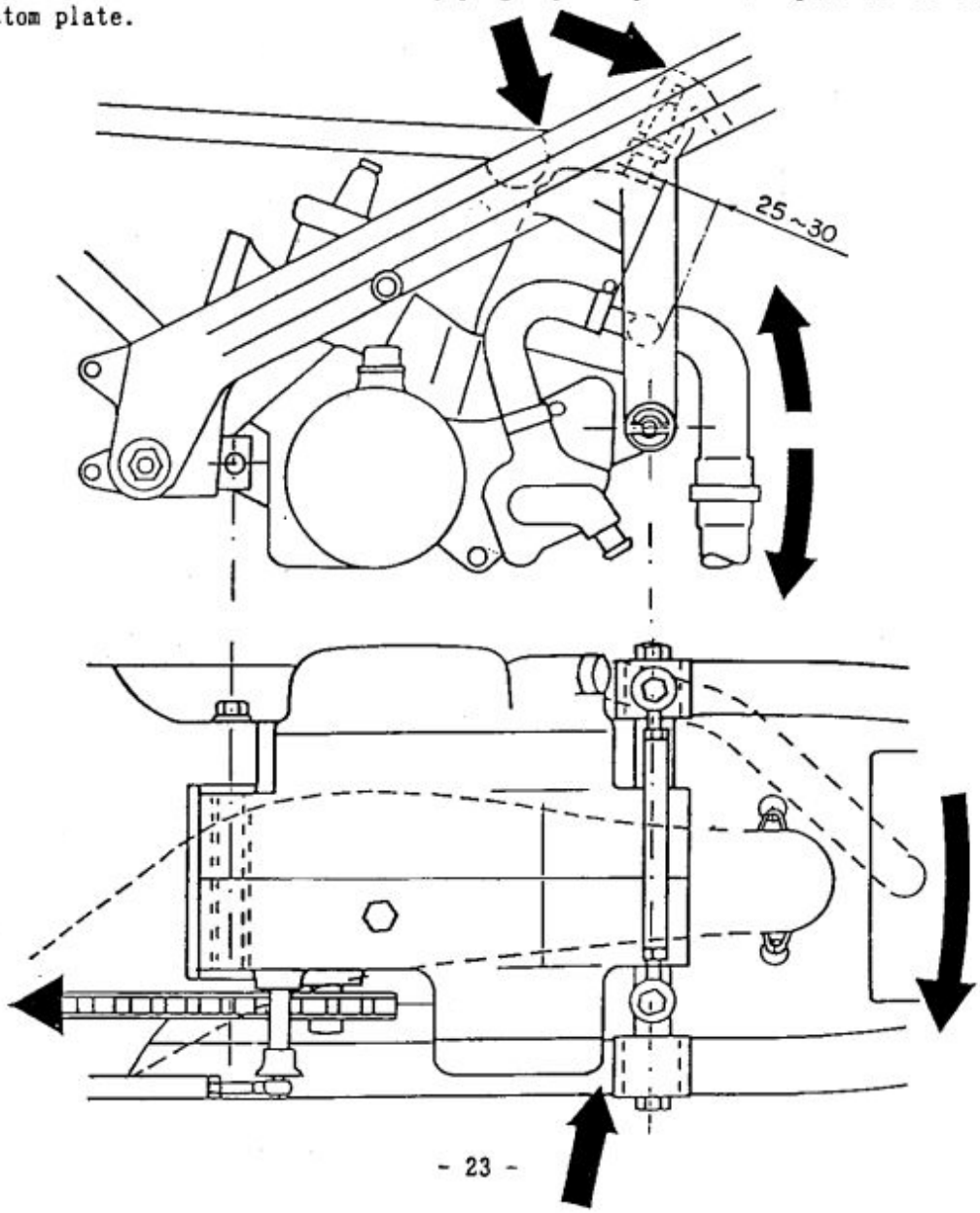
If the hose is slid on to the hose joint too far, engine hanger may touch to the hose, that may lead to have extra vibration or damege to the frame body. Keep it clearance 25mm to 30mm.

5. CYLINDER HEAD

Keep the clearance between the cylinder head mount boss and frame cross pipe. It is better to cut it.

6. FUEL TANK, ACG CORD, PLUG CAP

Keep the clearance between ACG cord, plug cap and protuberant part of the fuel tank bottom plate.



7. EXHAUST CHAMBER

Grinding down the restricted convex at the joint to the tail pipe leads to reduce power loss by 0.5 ~ 1.0 ps.

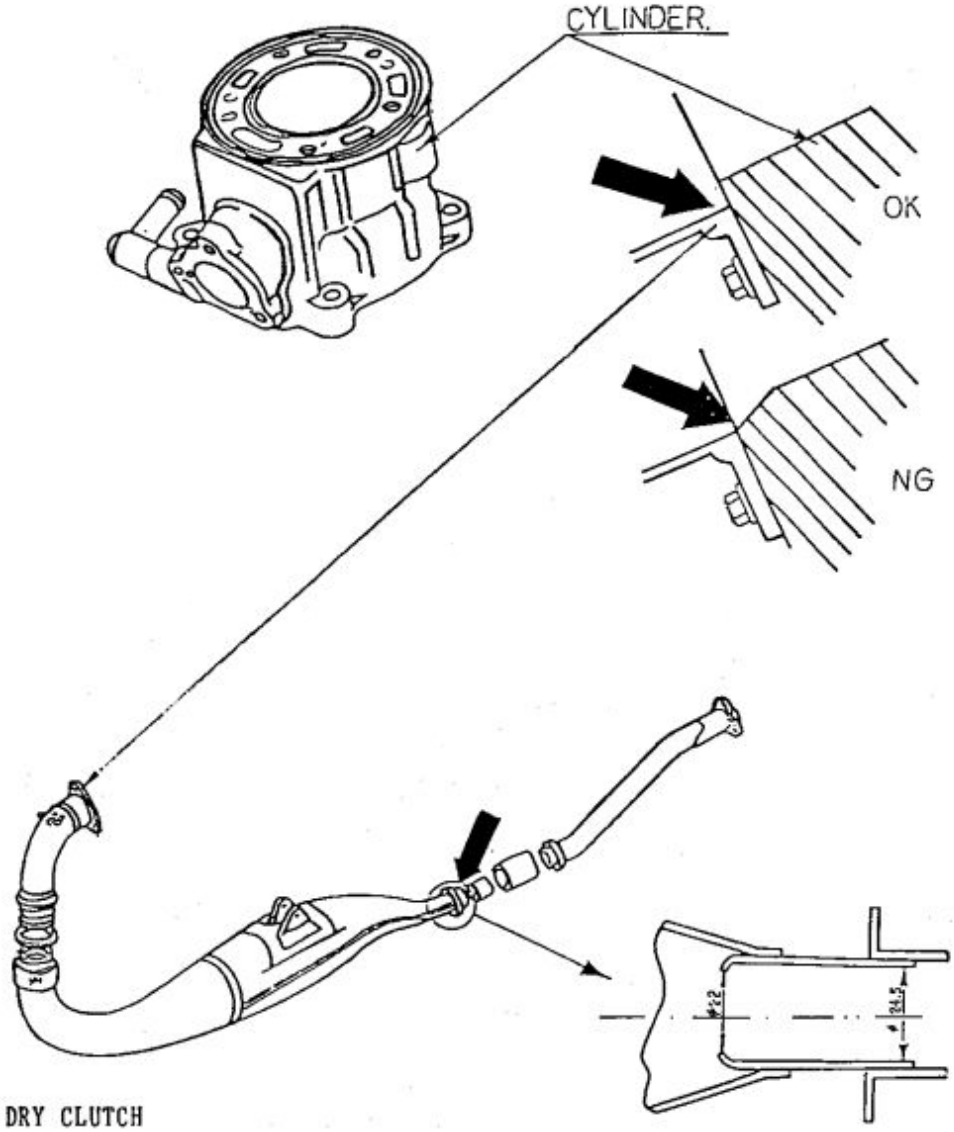
8. CHAMBER JOINT SPACER

The EX chamber joint spacer located between expansion joint and expansion chamber is made out of the stinless mesh. Replace every 1,000km or the thickness has become 6.5mm to prevent damage of exhaust chamber.

9. SILENCER SEAL

Replace the silencer seal every 500km to prevent excess of vibration or exhaust noise level. And secure the joint between the expansion chamber and the silencer joint with a lock wire to prevent come off the EX chamber joint pipe when you hit by other machine or crash. But do not wire lock too tight, make some slack between wire and the silencer seal(5mm ~ 8mm).

To all of the exhaust joints, apply silicon sealer to improve durability.



10. RS125R DRY CLUTCH

Use the clutch with cush drive system. We recommend the FCC(made in Japan) dry clutch.

SPECIAL NOTES FOR RS250R

Put much more emphasis on average time improvement in the racing rather than lap time improvemnt.

1) Reduced the vibration of completed machine so that the rider will not be fatigued so much.
2) Mounted the engine which covers the deterioration of tire performance and increases output when riding at lower and middle speed rpm and prevents the sudden torque increase.
3) Put much more emphasis on nimblness concerning steering stability, and selected geometry which enables riders to steer more easily and become more copetitive during racing.

1. ENGINE INSTALLATION

Correct installation(bolt adjustment and shimming) is very important to keep durability high.
Everytime you install the engine proceed it in accordance with the method mentioned in the manual.
To avoid a crack of frame body cracking, everytime you reinstall the engine, you have to reshimming because the engine may decline than before due to clearance between the engine hanger bolts and mount holes.

2. PISTON

Reformation of piston(apply sand paper to contact surface) should not be done because it will cause piston seizure.
(Lubricant storage place of piston form is gone)

3. CLUTCH

Disk plate contact is not uniform. Break in the machine(one time starting practice for every event).
When disk plate contact is not uniform, clutch judder is caused or half clutch feeling is not stable. Continuous starting practice will cause clutch slipping. Practice starting after at disk plate cooling-off intervals.

4. CARBURETOR SETTING

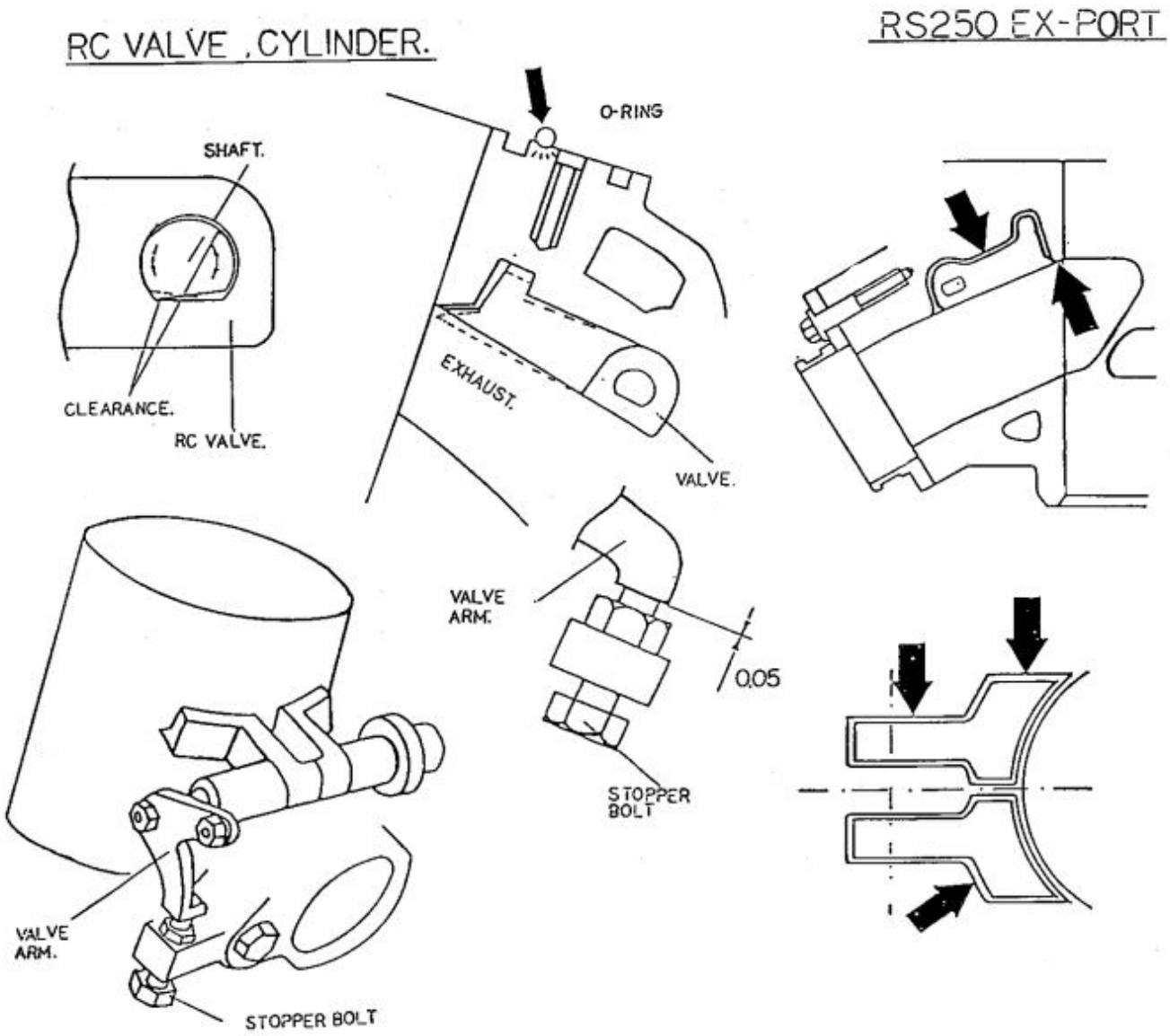
It is better to set the carburetor inthe 'rich' direction for all rev ranges.
Although carburetor setting is largely dependent on rider's throttle operation or riding, set the carburetor in the 'rich' direction from the beginning of throttle opening to 50% opening. This is necessary to check the torque feeling at small and middle rpm. Then set MJ for full opening condition.
(R 1168N-4 to be set)

Note: Good snapping is achieved if carburetor is set in the lean direction from beginning of opening to 50% or so.
However, when actually driving, torque feeling is poor at smaller and middle rpm. When extremely rich at the condition of throttlle fully opened(MJ), better driving can be achieved with throttle little reduced.
Riding with the throttle completely open will affect gear performance at change up and shifting will not be possible without reducing throttle significantly.

5. RC VALVE SYSTEM

When exhaust port timing and form are not suitable when valve is fully opened, output is greatly affected.

1) Make exhaust port timing and form conform to valve fully opened.
2) After driving especially new model, operating angle changes and RC valve is easy to rise out of right position. Careful checking should be done.
   It is also necessary to check after each drive.



6. CHANGE LINK

Set the pedal to the appropriate position without breaking the parallelo-gram.
If Parallelo-gram is broken, up and down stroke load largely varies.

7. STEERING SYSTEM

When starting torque of steering is not appropriate, steering stabillty cannot be achieved
Ensure to control the top thread of steering stem and torque of stem nut.

Too much torque: When turning at lower speed, machine cannot be appropriately steered and tends to fall sideways. Steering delay occurs at the entrance of corner.

Shortage of torque: Head pipe and steering system rattle. Judder occurs when front area separates from the land at the end of corner, etc.

8. REAR ECCENTRIC BODY

Height and axle load change due to chain adjustment and final ratio change.
When rear setting is finished, measure the distance between rear axle center and seat bolt.
Adjust the rear suspension extrusion amount. 2 or 3mm extrusion is allowed, however, adjustment is needed for 5mm or more extrusion.

9. AREA AROUND THE REAR SUSPENSION LINK

Operation is not so good due to bearing friction for new model. Appropriate setting cannot be done in this situation. Set after operating the bearing.

11. FRONT BRAKE

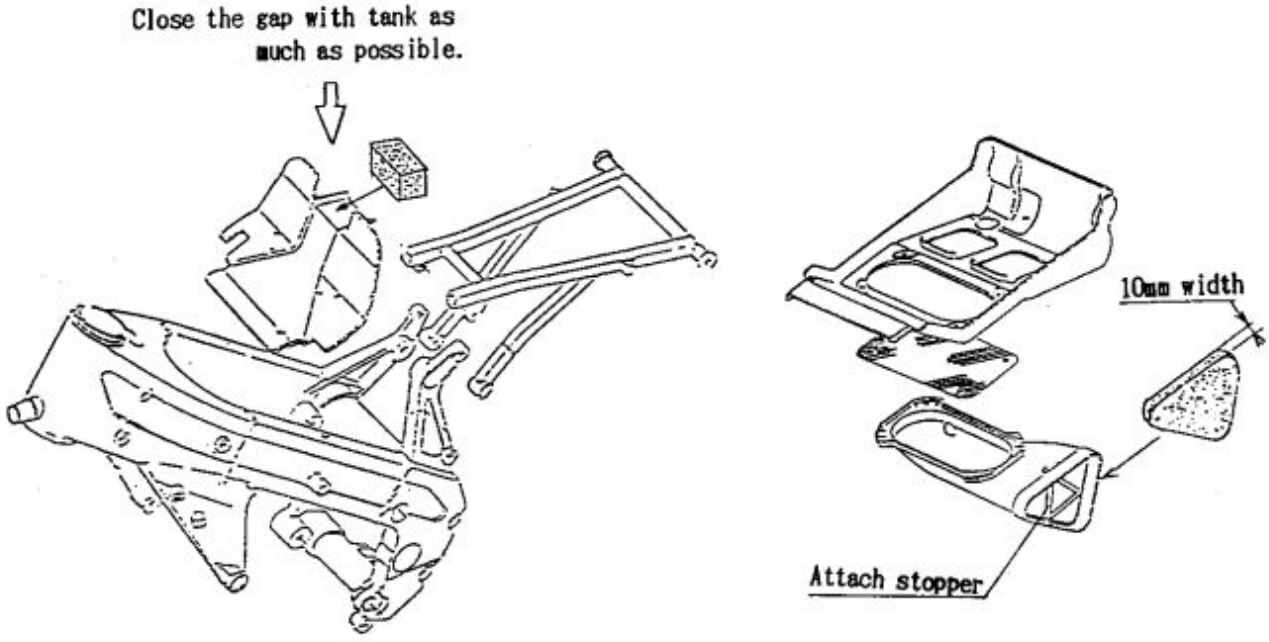
When lever travel changes durring breaking-in, bleed the air. Slight amount of air which cannot be statically bleld may move due to riding vibration, and lever travel may change. When the pad severely worn(initial 5mm → 2～2.5mm) in the circuit due to too much brake application(much heat load) is used, lever travel might change due to heat load. Replace earlier.

**Pad material has high heat insulation. As it becomes worn, caliper and fluid temperature increase more easily.
Brake fluid has characteristics that since it feeds much water, if it is used for a long time, boiling point is lowered, and lever travel is easy to change due to heat load.
Ensure to replace for every two or three races or after driving on a wet road.

Note: Check the pad wear amount when replacing brake fluid and pour an appropriate amount of fluid to cup.
If cup is filled with fluid when pad is worn, feeling of brake always applied is experienced and at worst wheel lock occurs.

12. MACHINE SETTING IN THE RAINY WEATHER

Do not change machine height or suspension position from the setting in the dry weather(Tire should be changed).
When extremely lowering the height, turning performance is deteriorated.
Insert the urethane under the intake duct and seat in order to prevent carburetor from being set inappropriately due to water penetration.



13. BUFFLE SPONGE(17522-NF5-690)

Buffle sponge for fuel tank is available as optional parts to improve the stability by suppressing the moving of the fuel.

14. MACHINE WEIGHT

Reducing machine weight efficiently in order to improve the overall performance.

Basic idea for manufacturing light weight machine is to concentrate the mass.
Having the same weight, machine of mass scattered needs much more strength and has poor steering stability and heavy steering.
It is important to reduce the part far from center of gravity to nearer.
It is also efficient to reduce the revolution parts. But the weight reduction of drive system(transmission, D/chain, RR wheel, etc.) should not be done because the machine strength will be deteriiorated even though transmission efficiency will be increased.

What part's weight should be reduced for '93 RS250R?

1) Weight reduction of steering system and front area
   Front area of 250cc class machine has almost the same weight as 500cc, TT F-1 class.
   Because the size of front tire is the same as that of 500cc, TT F-1.
   As a result, moment of inertia of steering is similar to the moment of inertia of body.
   Therefore, weight reduction of front fork, front brake caliper, disk, front wheel, etc. will effectively improve steering stability.
   Study the weight when changing spacifications.

2) Cowl, seat, front fender, etc.
   More efficient weight reduction is expected when GFRP is replaced with CFRP, etc.

   GFRP: Glass fiber reinforced plastic
   CFRP: Carbon fiber reinforced plastic

3) Others
   In the technical circuit with lower top speed, light feeling of handle bar is obtained only by lowering the grip. Please try it once.

FRAME REPAIR

We do recommend to check the Frame Body carefully after some races and after every crash. If there is any crack, the earlyest repair of crack possibly extends the Frame Body life.

The material and welding rod is shown in the below, and it takes at least 4 days(2 days for 90%) to regain the strength after performing the aluminium welding on Frame Body and Rear Swing Arm.

Aluminium material and welding rod

Part	Material		
	JIS		AA(USA)
Pipe	A7003	T4 T5 T6	7003
Plate	A7N01P	T4 T6	7004 7005
Cast	AC4C	T6	

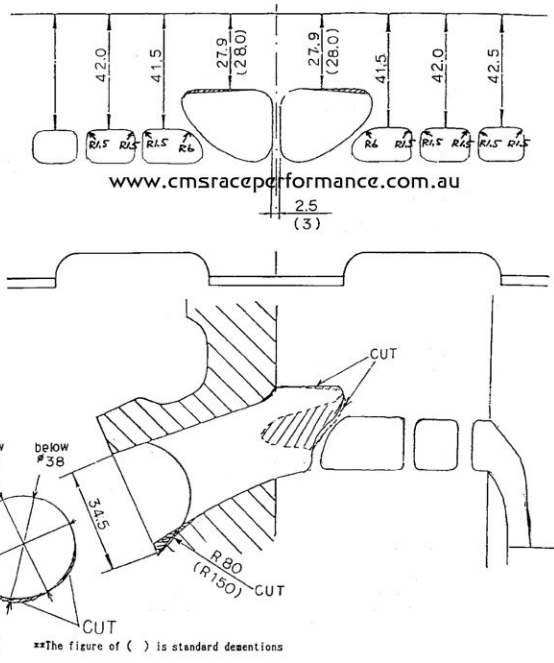
Welding rod					
Japan	USA		UK	Germany Italy	Canada
JIS	AA	AWS	BS	DIN	CSA
A5356	5356	E5356	5356	S-AL. Mg5	5356

ENGINE TUNE UP

As for engine tune-up, a considerable power-up can be achived without major specification change. Especially, 250's performances can be improved up to NSR's.
However, you must have designated fuel, like ELF AV 2T.

【RS125R】

1. Cylinder
   Grind off and finish each port in accordance with the designated dimetions. Slightly grind the corner radius of each port and the smooth out the wall between EX. port and scavenge port. Utmost care should be taken when grinding the wall it is very thin. Center bridge of EX. port should be grinded down, however, minimum thickness of 2.5mm should be secured. After you have modified a cylinder, it is necessary to replate it.



**The figure of ( ) is standard dementions

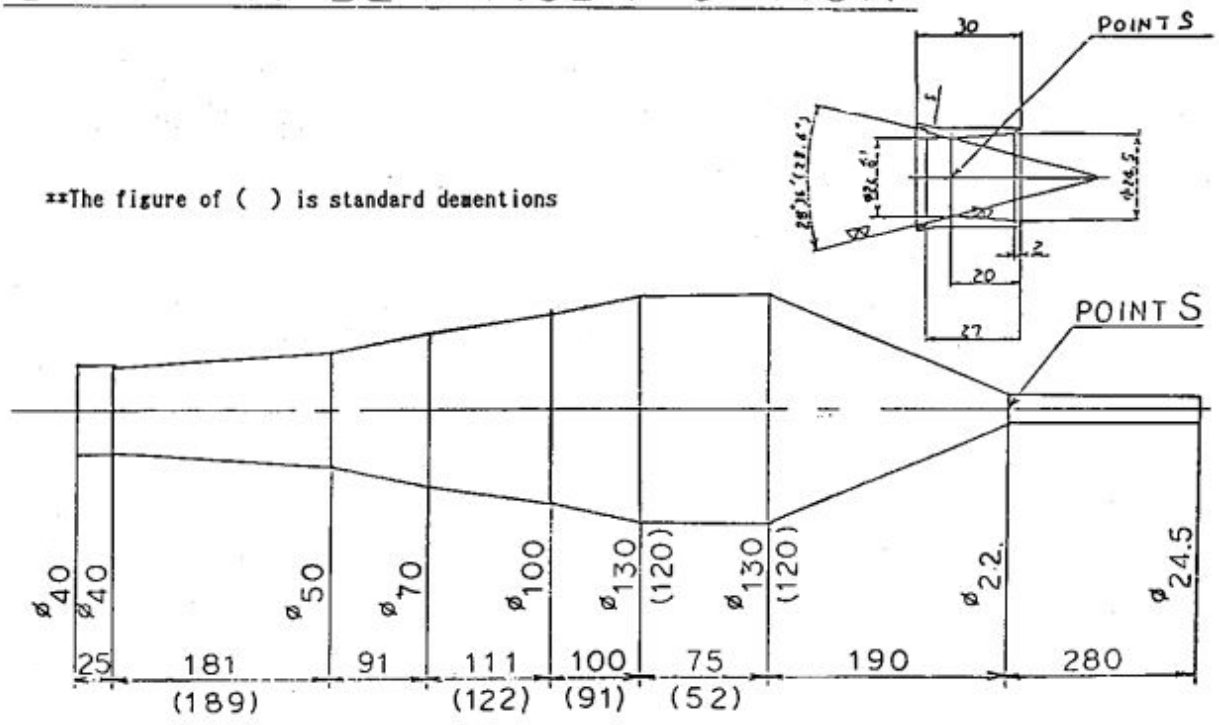
2. Cylinder head
   Replace '93 model cylinder head(12200-NF4-650)

3. Combustion Chamber Volume
   Combustion chamber volume should be set at 10.2 ~ 10.3cc(including spark plug volume).

4. Ignition Timing
   You should not adjust the ignition timing, we recommend for you to buy C.D.I. unit saled by engine tune-up dealer in Japan if you need more.

5. Exhaust System
   Modification of chamber should be done, in accordance with the designated dimentions. See Fig. 21.

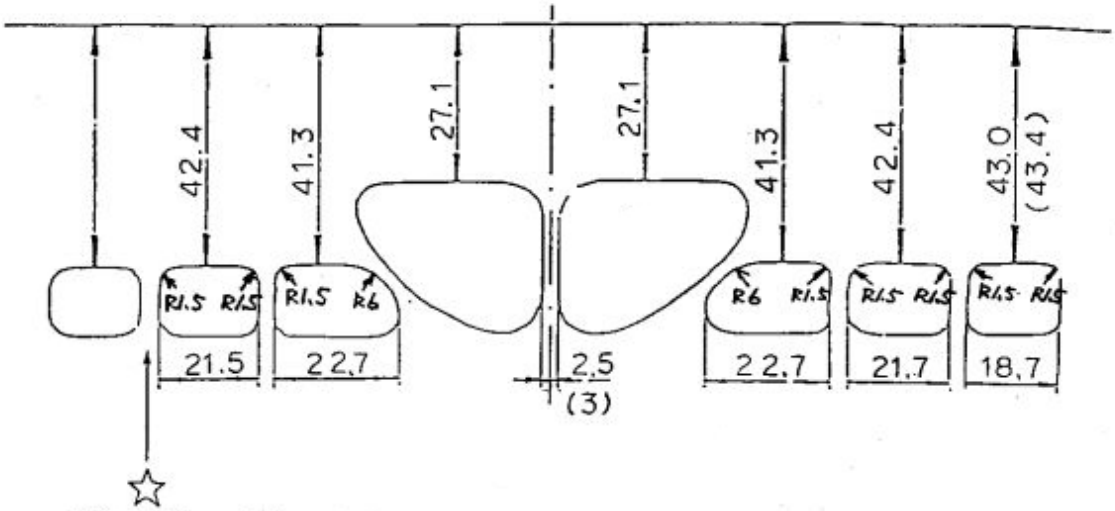
125 cc
EXP CHAMBER MODIFICATION



【RS250R】

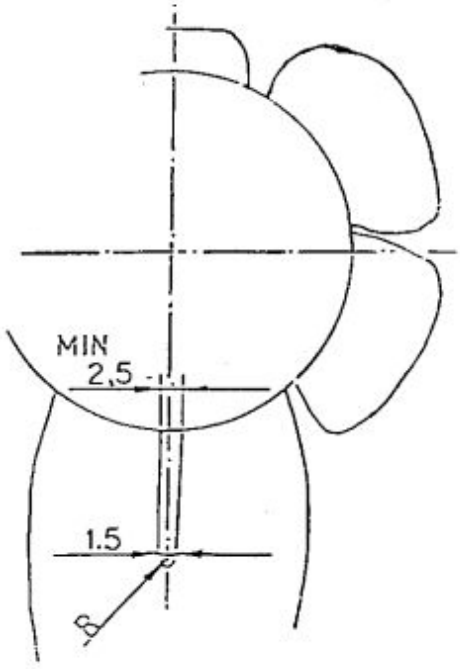
1. Cylinder

Modification of port should be done, in accordance with the designated dimentions.
See Fig. 23
Following portion should be grinded for EX. port center bridge, corner radius and internal wall at the side of the scavenge port.
For Scavenge port, lateralwall and corner radius should be grinded.
Cylinder wall surface in contact with piston ring ends should be grinded very carefully . Corner of intake in contact with the skirt should also be grinded a little.
Fitting of the RC valve is important too, should be fitted as smooth as possible(highly effective of power output).
If plated portion was grinded, re-plating is required.



**Check the position of piston ring end on this part "☆".

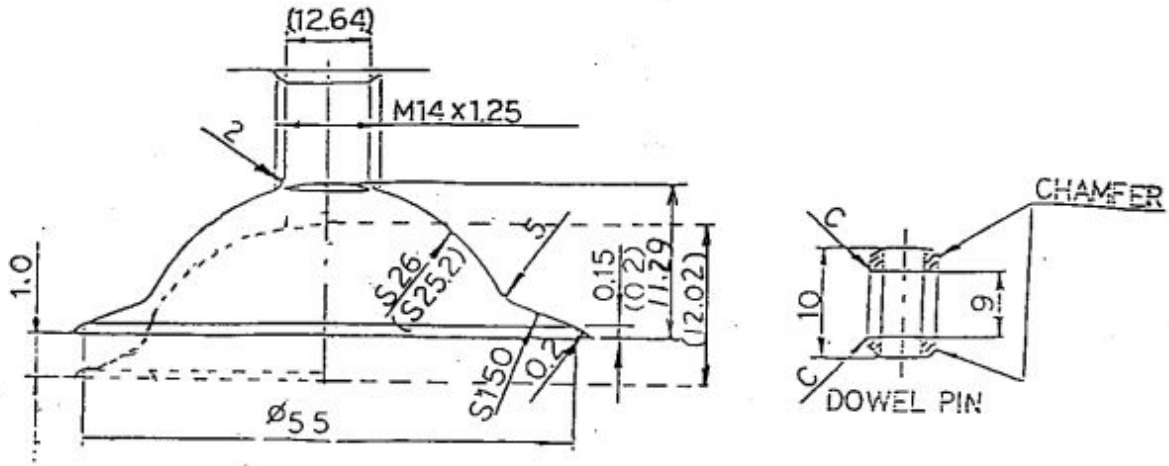
**The figure of ( ) is standard dementions



2. Cylinder head
Combustion chamber volume(10.2cc including spark plug volume) should be achieved by using the method shown in the picture. Less than 10cc volume may result in power loss or seizure or both. Also, insufficient clearance at squish may result in piston interference or detonation.

3. Base Gasket
t:0.4mm(12194-NX5-000)

250cc
CYLINDER HEAD MODIFICATION.



xxThe figure of ( ) is standard dementions.

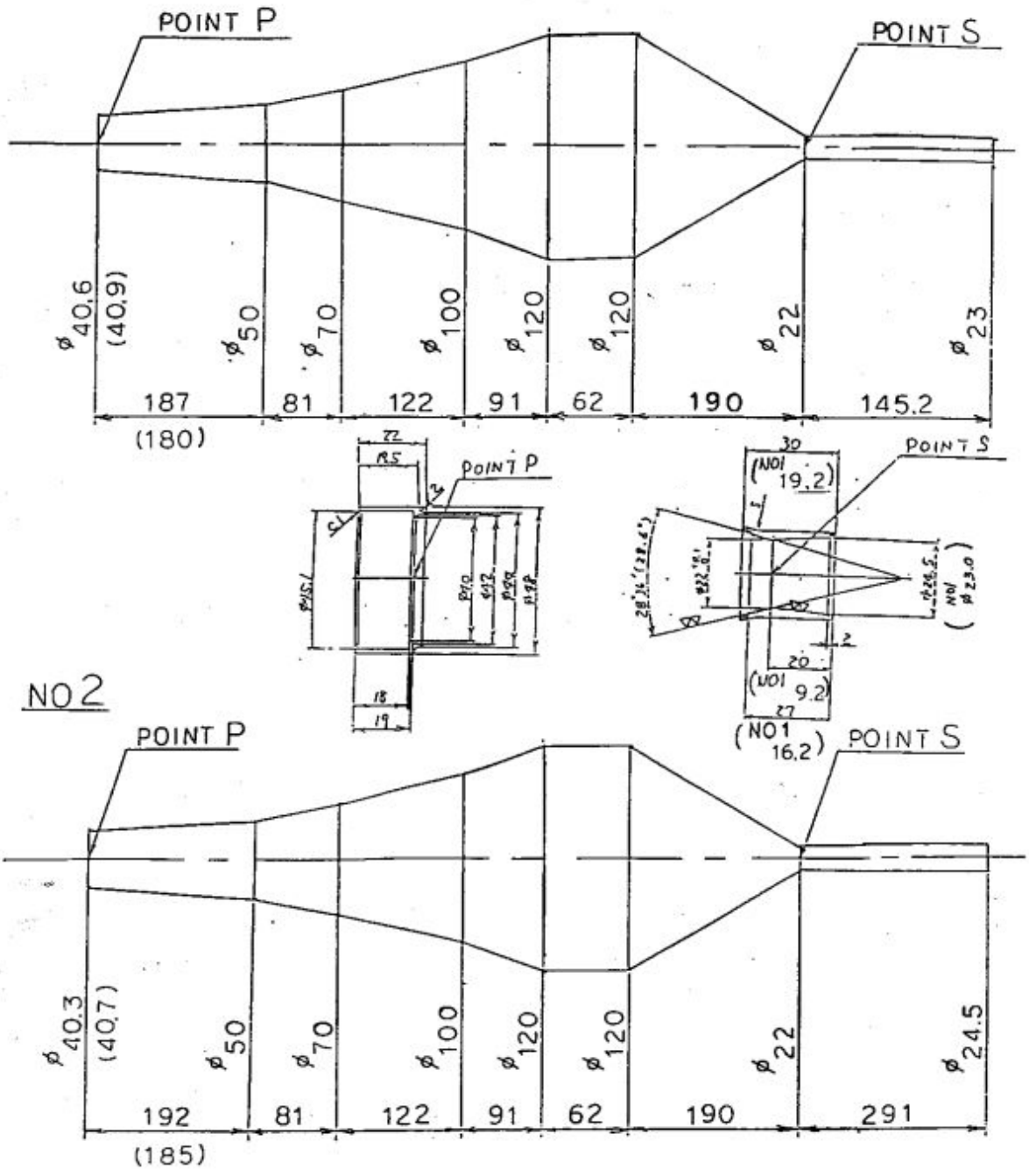
xxAdd any 0.3mm gasket on Spark plug.

4. Exhaust System
Modification of chamber should be done, in accordance with the designated dimentions.

250 cc

EXP CHAMBER MODIFICATION

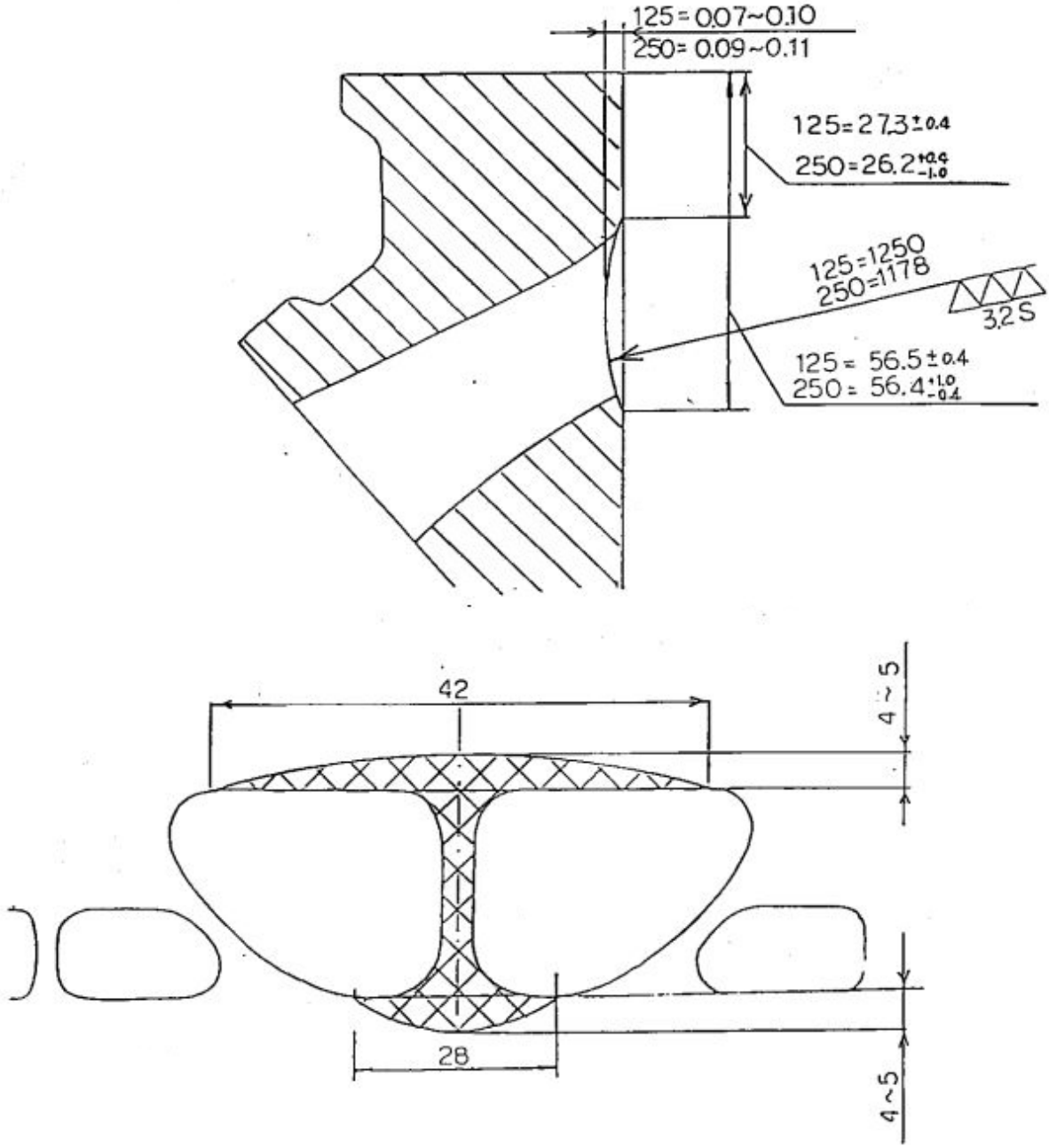
NO 1



NO 2

xxThe figure of ( ) is standard dementions.

Machining after cylinder replating.



These modifications mentioned enable a considerable improvement in power output. However, it should be understood that these modifications will greatly sacrifice the durability of the parts, especially crankshaft and crank case. Therefore, interval in replacement is critical. Service life of 250 crank is 1,000km and crankcase is 2,000km; same of 125 crank is 500km for your guidline.

Notice for maintenance of RS125R

	Item	Measure
1	Con-rod small end BRG Tuning up the engine and too much running at high rpm cause replacement interval shortened.	To avoid any problem, replace it after each 200km running.
2	Piston Tuning up the engine and too much running at high rpm cause replacement interval shortened.	To avoid any problem, replace it after each 300～400km running.
3	Stator(A.C.Generator) Stator coil may loose for long time running.	In case, replace it for new parts.
4	Water temp meter Noise of auto shifter or ignition system may cause malfunction of it.	Be sure to connect the earth harness between ignition coil stay and engine directly.

Notice for maintenance of RS250R

	Item	Measure
1	Piston ring Too much modification of cylinder port and poor chamfer cause ring coming out to cylinder.	To avoid any problem, never modify it rashly without experience.
2	Drive sprocket Too much slack of drive chain cause teeth broken.	Check slack within rear wheel stroke, be sure correct slack without rider.
3	Front fork At the cold condition(teperature is below 10℃), quick full-stroke can cause broken oil seal. Also to tight TY-Rap can cause oil leak or damage the tube.	At the cold condition, push front fork 4 or 5 times in before running. Be sure to maintain it with fork set collar after removing TY-Rap.

'94 RS250R New System

◎ The modification of ignition timing charecteristic by cutting harness of Engine control unit(Black box).

1) In case of cutting Orange wire.

   Ignition Timing for #1 cylinder is retard 1 degree during 12,000～13,000rpm.

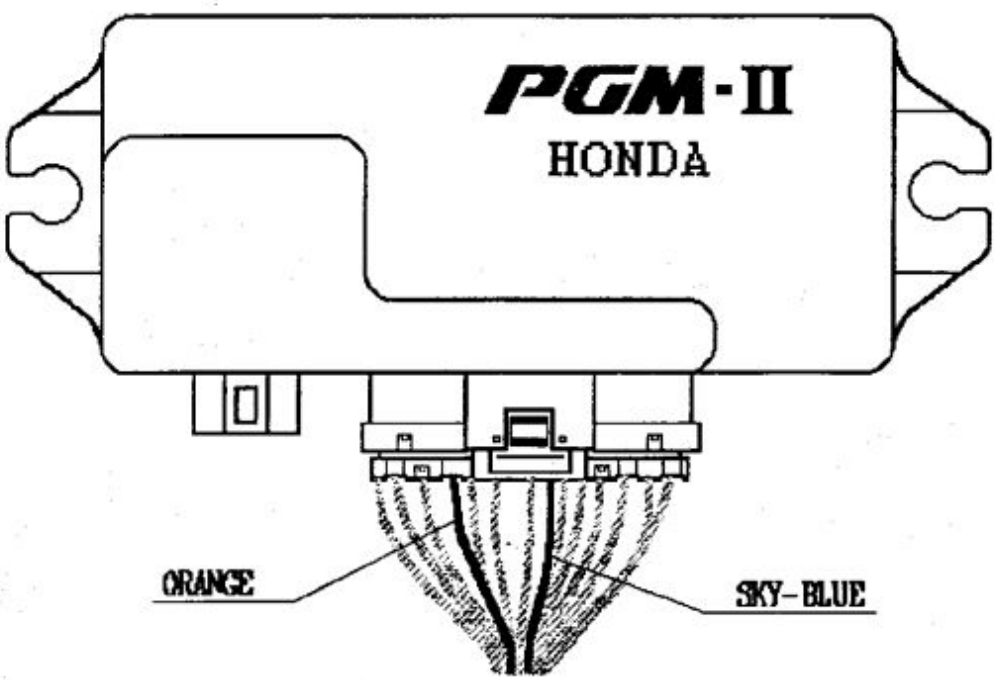
2) In case of cutting Sky-blue wire.

   Ignition Timing for #2 cylinder is retard 1 degree during 12,000rpm～13,000rpm.

3) In case of cutting Orange and Sky-blue Harness.

   Ignition Timing for #1 & #2 cylinder is delayed 0.5 degree during 12,000rpm～13,000rpm.

** It is possible to adjust the ignition timing by this if detonation tend to occur at only one cylinder
And this system control during 12,000rpm～13,000rpm to avoid detonation.



カラーリングは撮影用のものです

HRC
HONDA RACING

'94 RS125R

GP3を制するエキスパートマシン。
'94/RS125R登場。