YAMAHA Technical Bulletin

15 March 1990

ITEM NO. TB105 **TZR250R (3MA) ENGINE TEMPERATURE PROBLEM**

Most of you will doubltess be aware of the technical difficulties we have experienced with TZR250R model (3MA). This bulletin serves to correct any misinformation that may have been created and itemises a modification procedure to reduce engine temperature. Dealers who have sold and serviced this model will be independently contacted.

1. DISCONNECTION OF CARBURETOR DE ICING SYSTEM.

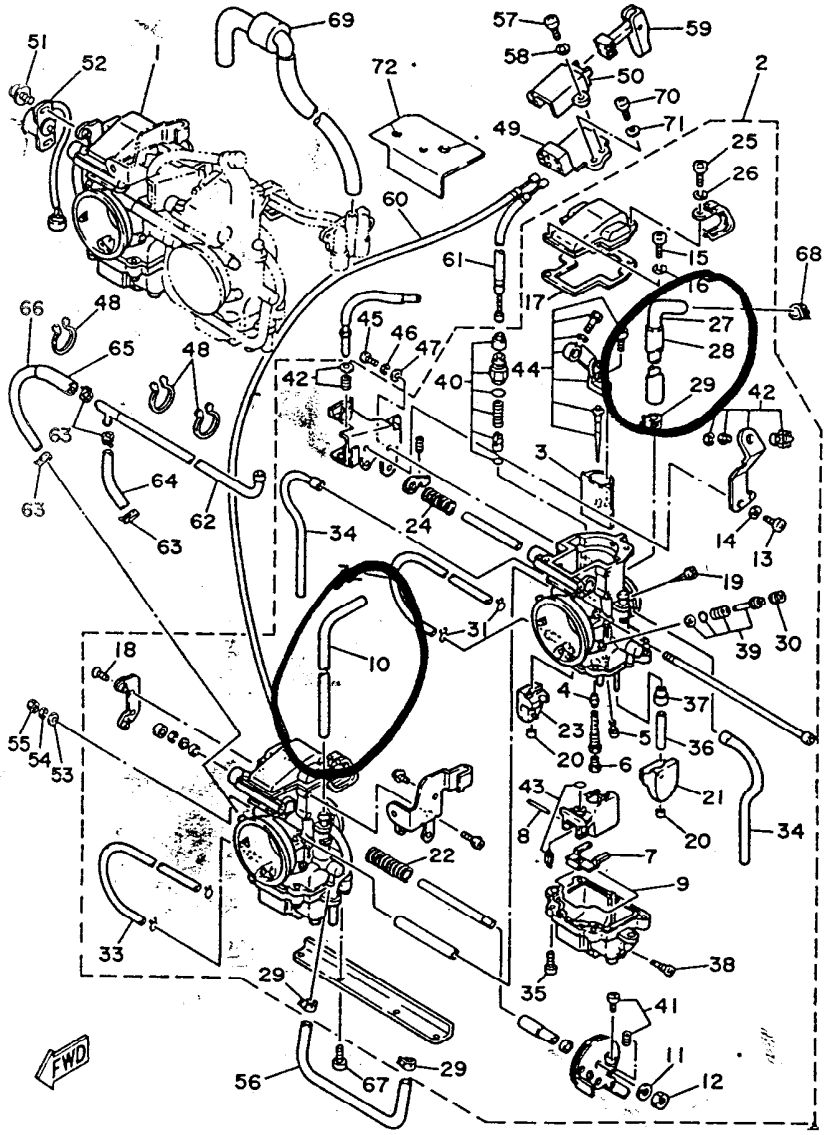


FIG 1

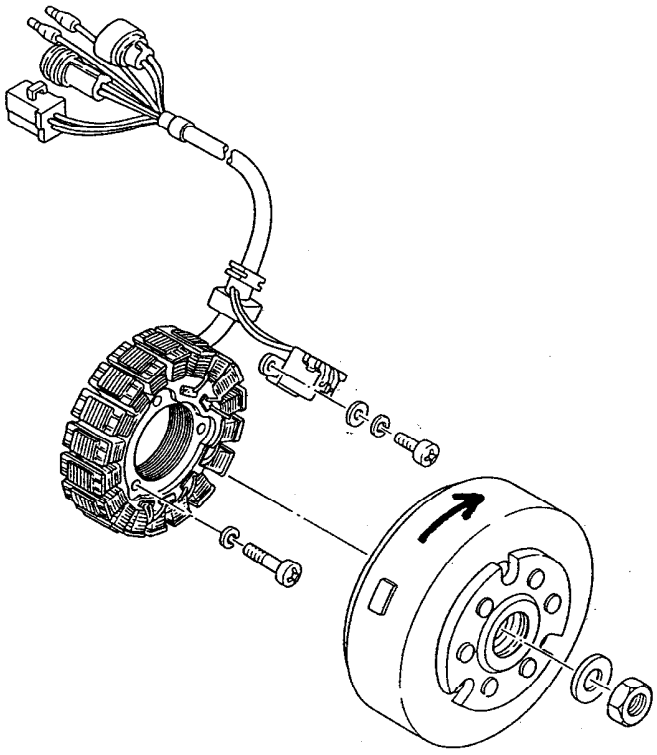
Hose 10 (2RH-12484-00) and Hose 27 (3MA-12483-00) interconnect "coolant" from the cylinder head to cavities in the carburetors.

Disconnect these hoses at the cylinder head and purge all coolant from out of the carburetors. Instal in each hose a 5/16" ball bearing and reconnect to the cylinder head.

The effect of this modification is to lower intake charge temperature, especially on the RH cylinder.

2. RETARDATION OF BASE IGNITION TIMING

A slight delay in firing timing is required to reduce piston crown temperature.

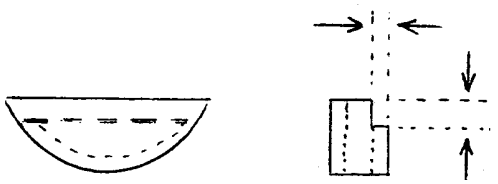


As viewed from the LH side of the motor, the ignition flywheel rotates clockwise.

FIG 2

Remove the flywheel and flywheel key. Carefully cut the flywheel key as depicted in Figure 3.

Remove exactly 1.5mm.



Cut to a depth of 2 - 2.2mm. This ensures that the bottom face of the cutout is slightly below flush with the flywheel taper, when installed.

FIG 3 Flywheel key

Note: Please use the services of an engineering shop to modify the flywheel key, if you feel this is necessary

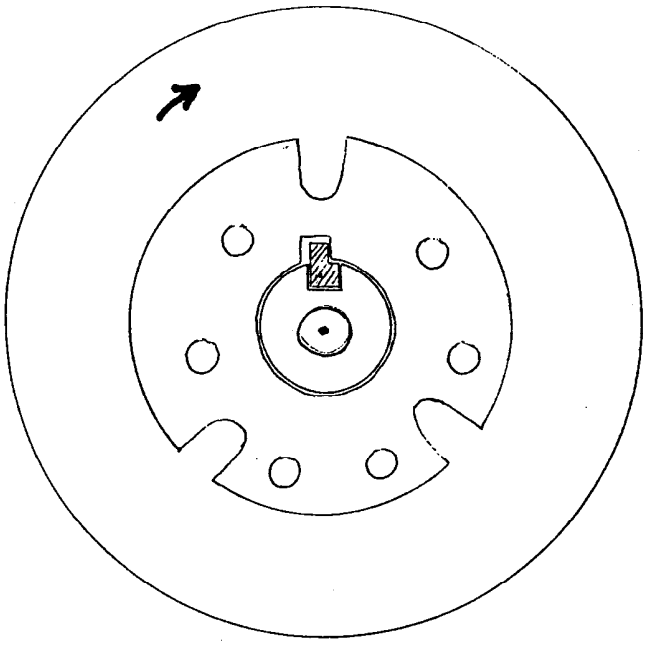


FIG 4

Reassemble the flywheel and key exactly as depicted, retarding the flywheel anticlockwise against the direction of engine rotation. This will ensure that the RH side of the flywheel keyway slot abuts against the cutout face of the key.

Torque the flywheel nut to spec and remove it again. With a torch double check the assembly position is correct. Refit and re-torque the nut.

3. SPARK PLUGS

For high speed road riding and racing use heat range no warmer than NGK B10EV/NGKB10EG/Champion N84G.

Instal 2 spark plug washers on the spark plug for No 2/RH cylinder, this compensates for excessive intrusion into the cylinder. Whilst this method is technically incorrect, 2 washers will suffice for a thick copper washer and heat range change is very minimal.

4. CARBURETOR SETTINGS

Main jet	#200
Power jet	#20
Needle/clip position	6L02-63-2
Pilot jet	#15
Nozzle	Q9 Q8 optional (leaner)
Fuel level	6mm
Float level	18.9 - 20.9mm
Airscrew	$2\frac{1}{4}$ turns.

This model has port opening angles and durations very similar to TZ road race models with a long blowdown period between when the exhaust port opens and the transfers open. Because of this it is more sensitive to carburation, affected by the climatic conditions of the day ie air density
air temperature
humidity.

Size #200 main jet is a safe recommendation but it may be necessary to rejet consistent with "safe" plug readings according to the individual machine and in a racetrack situation according to the climatic conditions of the day.

5. FUEL RECOMMENDATION

Uncorrected compression ratio works out to approximately 14.2:1, similar to YZ models and requiring high octane fuel. Legally, only 96 "Super" petrol pump fuel may be used for production racing. 96 octane is determined by the "RON" (research octane number) method but the true octane rating determined by the "motor method" is closer to a figure of 89. NZACU rules state that no additives may be mixed with fuel but technically there is a case to suggest the addtion of octane boosters would raise the level at which detonation occurs, in a racing situation.

6. 2 CYCLE OIL RECOMMENDATION

For production racing we recommend CASTROL A545 (TTS) or a name brand oil of similar high quality. Steer well clear of the lesser known, unproven oils.

Oil affects fuel volatility and octane rating. Some brands of 2 cycle oil actually contain octane boosters which tends to make a mockery of the ruling concerning fuel additives.

All of the above mentioned modifications are a technical solution to overcome the piston problems experienced and will coincidently give a worthwhile performance boost.

A further modification was carried out on a test unit, we are happy to divulge details but must stress that such modification is not legal for production racing.

EXHAUST PIPES:-

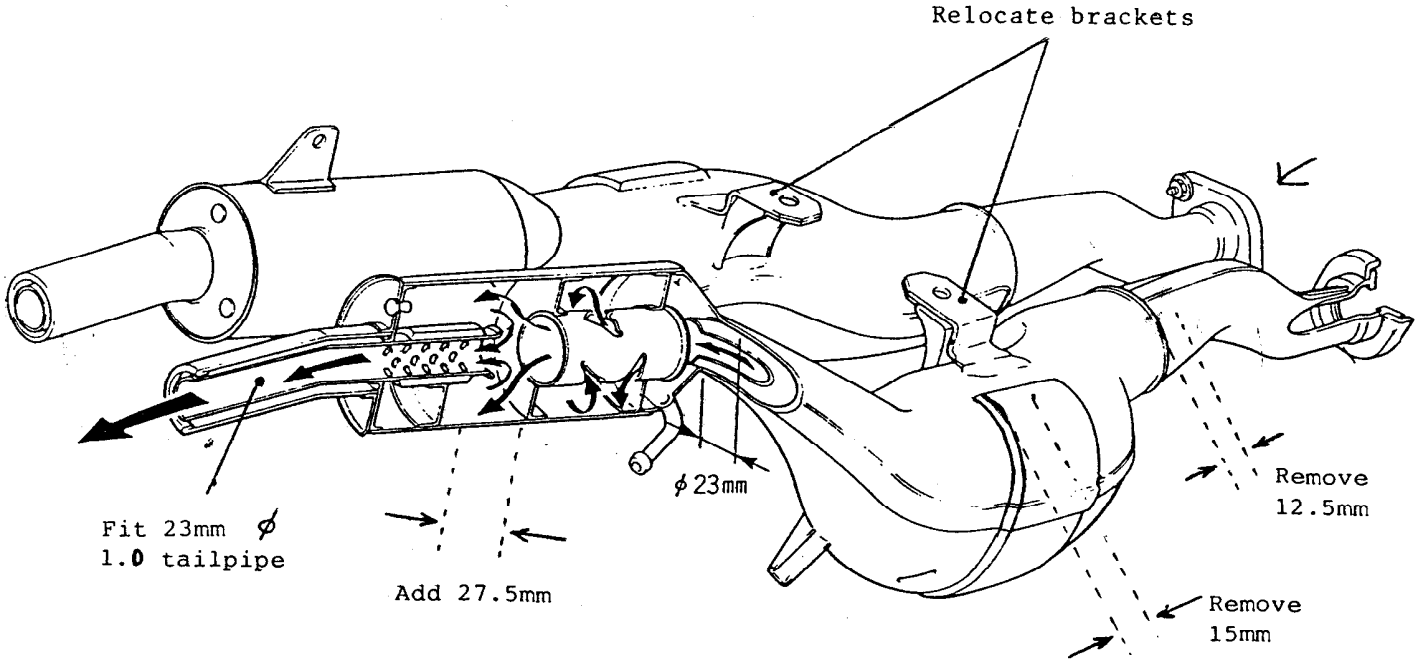
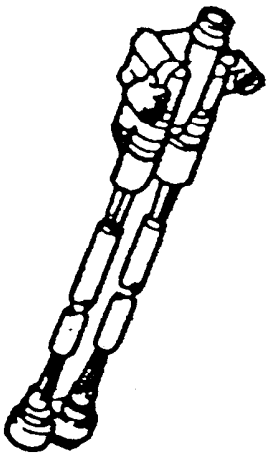


FIG 5

Assessed against exhaust port opening angle, the standard pipes are very long in tuned length expressed as the distance between piston exhaust thrust face and an imaginary point halfway along the reflection cone of the exhaust. We shortened the overall tuned length by removing two sections as depicted. We also replaced the rearmost tailpipes with larger internal diameter pipe to reduce piston crown temperature.

These pipe modifications had a major effect on carburation requiring corrective adjustments to both carburation and the air compensator assembly.



Air compensator Assy
Part No. 3MA-14303-01

FIG 6

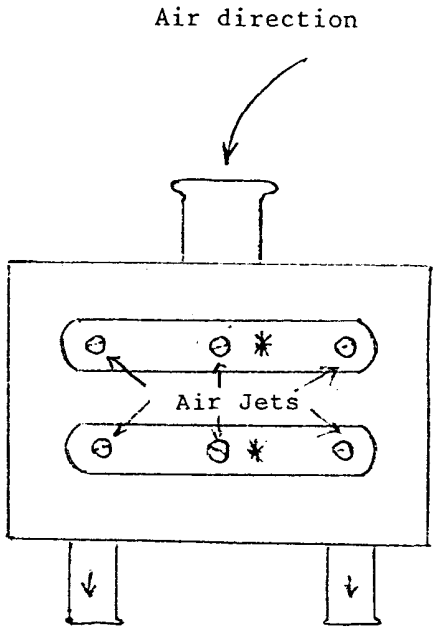


FIG 7

The best settings to suit the modified pipes were as follows;

Central airjets in air compensator (denoted by asterisks * in Fig 7) enlarged to 1.0mm.

Carburation	Main jet	# 190	* Revised
	Power jet	# 20	
	Needle/clip position	6L02-63-2	
	Pilot jet	# 15	
	Nozzle	Q8	* Revised
	Fuel level	6mm	
	Float level	18.9 - 20.9mm	
	Airscrew	2¼ turns	

Once the fueling was sorted the effect on performance was dramatic, giving strong crisp power delivery between 8000 - 12000 RPM with an overrev capability to 12500 RPM. No loss of "driveability" below 8000 RPM was experienced.

SUMMARY

We achieved what we set out to do, to prove that exhaust pipes more complimentary to the road race spec cylinders would boost performance and reduce piston crown temperature.