

# INSTRUCTIONS FOR O.S. MAX-CZ-2 ENGINE

**IMPORTANT:** Before attempting to operate your engine, please read through these instructions so as to familiarize yourself with the controls and other features of the engine. Also, pay careful attention to the recommendations contained in the "Safety Instructions and Warnings" leaflet enclosed.

The O.S. MAX CZ-2 is a small high-performance engine for radio-controlled 'buggy' type vehicles. It has been developed from the MAX CZ-1, which was designed expressly for newcomers to the hobby and for those with no previous experience of model engines.

Features of the engine include the following:

- Integral starting device enabling anyone to start the engine easily.
- Unique type of carburettor which is very simple to adjust.
- Schnuerle scavenging system for greater efficiency and increased resistance to overheating.
- Three ball-bearings, two for crankshaft and one for starting shaft, are employed for improved starting and running qualities, greater durability and shorter running-in period.
- O.S. No.8 glowplug. A plug wrench and starting cord are also supplied with the engine.

## NAMES OF ENGINE PARTS

In the following instructions, engine parts are identified as shown:

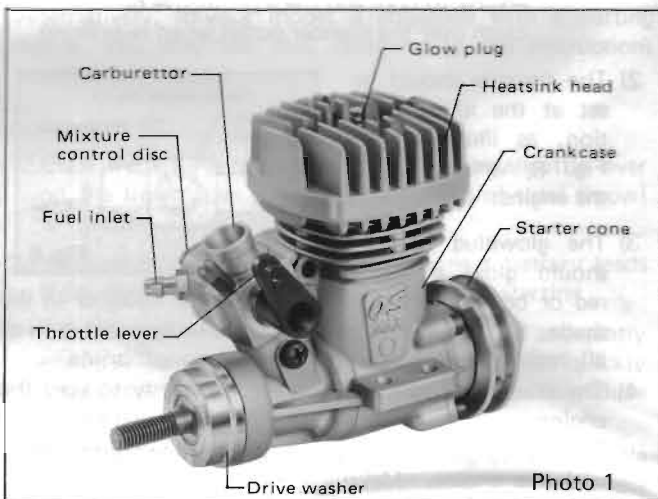


Photo 1

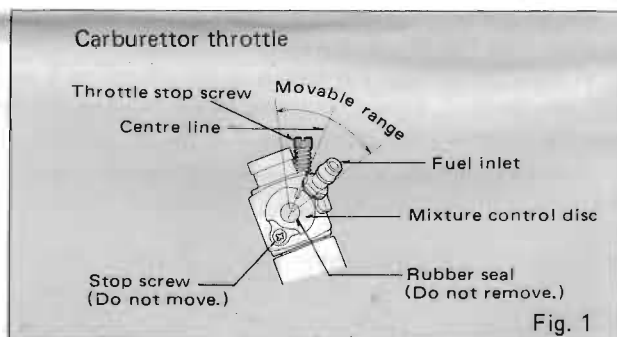


Fig. 1

## TOOLS, ACCESSORIES, ETC.

The following are necessary for operating the engine.



## SPECIFICATIONS

Displacement	2.11 c.c.	(0.129 cu.in.)
Bore	14.0 mm	(0.551 in.)
Stroke	13.7 mm	(0.539 in.)
Practical R.P.M.	3,000 – 24,000	
Weight	205 g	(7.2 oz.)

### 1. Fuel

Good quality standard methanol-based model glowplug engine fuel containing approximately 10% nitromethane and 18–22% castor-oil (or synthetic lubricant of good quality having similar viscosity to that of castor-oil).

**Note:** Fuel flow is controlled by a needle-valve within the carburettor. The needle-valve is factory set and the engine will run without adjustment provided that a fuel of the above specification is used. If the percentage of nitromethane and/or lubricant varies, or the quality of the fuel is poor, the engine may not run properly.

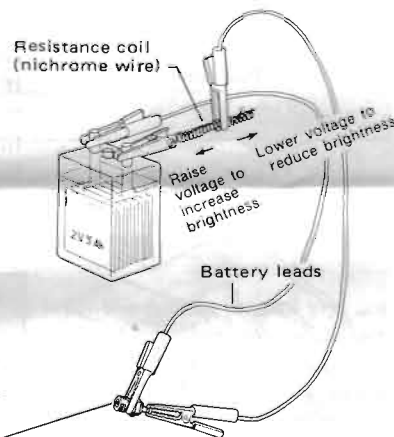
### 2. Glowplug

An O.S. Type No. 8 glowplug (recommended) is fitted to the engine.

1.5 volt heavy-duty dry battery



or 2 volt rechargeable lead acid cell (at least 5Ah)



If a 2-volt cell is employed, use a resistance wire, as shown, to reduce applied voltage, otherwise element will overheat and burn out

Adjust applied voltage by changing the position of clip on resistance coil until glowplug element is glowing bright red or orange colour.

### 3. Glowplug battery

The power source for heating the glowplug may be either a large heavy-duty 1.5-volt dry cell, or preferably, a 2-volt rechargeable lead-acid cell (accumulator).

#### 4. Battery leads

These are used to conduct current from the battery to the glowplug. Basically, two leads with clips, as illustrated above, are required, but, for greater convenience, twin leads with special glowplug connectors, as shown on the right, are commercially available.



Photo 2

#### 5. Socket wrench

Used for tightening glowplug. A simple socket wrench is supplied with the engine. For prolonged and heavy-duty use, the optional O.S. long socket wrench (with plug grip), or O.S. two-way socket wrench, are recommended.

### INSTALLATION OF THE ENGINE

Refer to the instructions supplied with the model kit.

Be sure to use a muffler pressurized fuel feed system on this engine. (See Fig. 2)

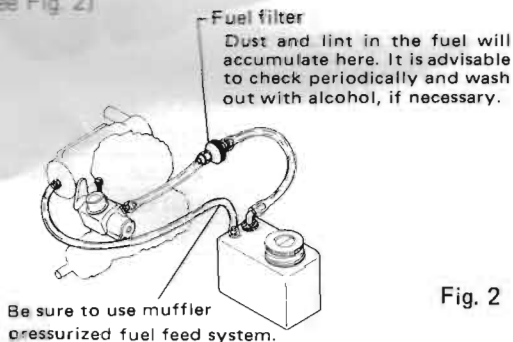


Fig. 2

Note: Locate the fuel tank as shown in the Fig. 3.

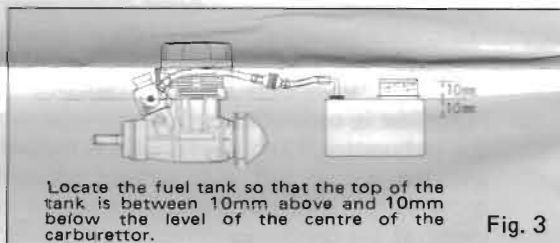


Fig. 3

### PRE-OPERATIONAL CHECKS

1. Rinse out the fuel tank with methanol or fuel before installing it.
2. Make sure that the fuel tube (silicone tubing) is properly connected between the fuel tank and the fuel inlet of the carburettor.

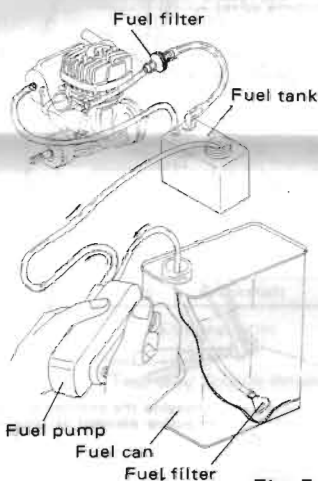


Fig. 5

#### Note:

It is advisable to use commercially available fuel filters when the tank is filled. (See Fig. 5.)

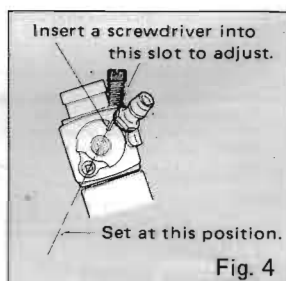


Fig. 4

3. Make sure that the mixture control disc is aligned in the centre of its movable range as illustrated in Fig. 4. If

not, correct by inserting a screwdriver in the slot and carefully rotating the disc.

### STARTING

For quick and reliable starting, key requirements are as follows:

- 1) Correct priming.
- 2) Correct opening of carburettor throttle.
- 3) Adequate "glow" at glowplug.
- 4) Rapid rotation of crankshaft.

- 1) When it is to be started for the first time, the engine must be "primed" with fuel. The priming procedure is as follows:

- Place your finger over the silencer exhaust outlet.
- Turn the starter cone slowly clockwise. This will pressurize the fuel tank and cause fuel to flow from the tank, through the delivery tube, to the carburettor.
- When fuel is seen to reach the carburettor, prime the engine by turning the starter cone two more revolutions (still with the silencer outlet covered) to draw fuel into the engine.

Note: With all engines, the exact priming quantity needed for quick starting will vary slightly according to air temperature, engine temperature, quantity of fuel remaining in the engine, etc. Therefore, rotate the starter cone through two priming turns, as mentioned, when starting the engine for the first time and during wintry weather when air temperature is low (below 5°C or 40°F). When restarting the engine while it is still warm, one priming revolution should be sufficient.

Warning: Take care not to touch the silencer or engine when they are very hot after a run. Allow the engine to cool and use a protective pad of cotton cloth over the silencer outlet when re-priming.

- 2) The throttle should be set at the idling position, as illustrated in Fig. 6, when starting the engine.

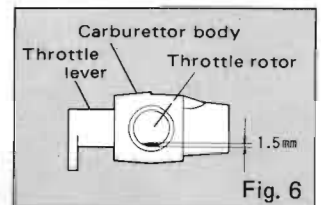


Fig. 6

- 3) The glowplug element should glow a bright red or orange colour, when seen under cover or in the shade. If the element glows dull red or does not glow at all, replace or recharge, the battery, as appropriate.
- 4) The crankshaft must be rotated vigorously to start the engine.

The CZ-2 is started easily with the starting cord supplied with the engine. Make a knot at one end of the cord and seal the knot with instant fixing glue. Tie the other end to the bamboo dowel supplied and fix with instant glue. (See Fig. 7)

Wind the cord around the groove in the starter cone, and pull the bamboo dowel vigorously while holding the car securely with the other hand. (See Fig. 8)

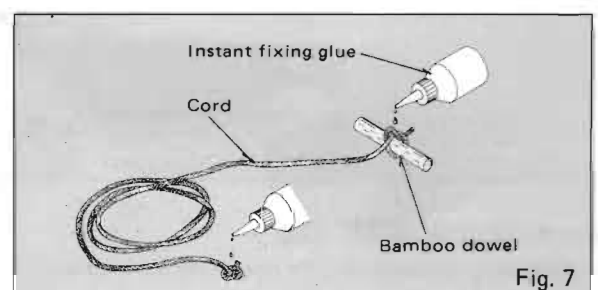
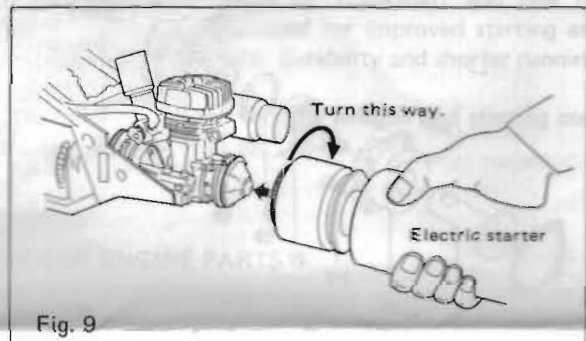
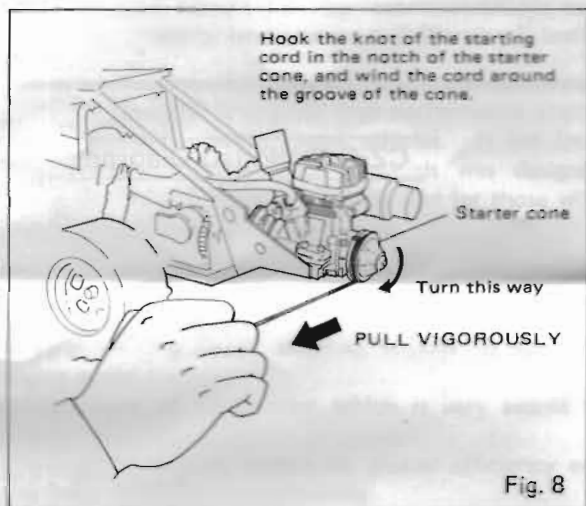


Fig. 7

If an electric starter is used, bring the starter into contact with the starter cone as illustrated in Fig. 9. Make sure that the direction of rotation is correct. (If necessary, reverse leads on battery to provide clockwise rotation.)



Alternatively, if your model is equipped with a starting device, you may use this, referring to the instructions supplied with the kit.

### RUNNING

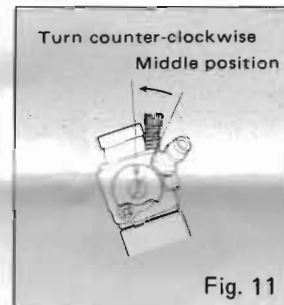
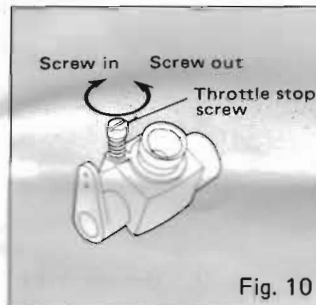
1. Once the engine has started, advance the throttle lever on the transmitter slightly (approx. 1/6 of total throw) to increase engine revolutions.
2. Remove glowplug battery or disconnect battery leads from glowplug about 5 to 10 seconds after starting.
3. Lift the rear wheels of the car off the ground and gently advance the throttle lever to full speed, then quickly return the lever to less than half-throttle to reduce engine revolutions.

**WARNING!** If the engine is kept running at full throttle under "no load" conditions (i.e. with the driving wheels free instead of under running conditions) the engine may be damaged, especially when it is new.

4. Close the throttle to the idling speed. If the engine stops when the driving wheels are lowered to the ground, screw-in the throttle stop screw one half-turn. If, on the other hand, the idling speed is set too high with the throttle lever in the fully closed position, the buggy may move forward. In this case, gradually screw-out the throttle-stop until the buggy remains stationary with the engine idling. (See Fig. 10)
5. The first few runs with the buggy will be used for "running-in" or "breaking-in". Advance the throttle slowly to engage the clutch and the car will move off. Continue to advance the throttle. With the mixture control disc set in the middle position, the acceleration

is likely to quite slow and a good deal of light grey smoke may be emitted from the silencer. This is correct for initial running-in.

If, however, with the throttle fully open, speed falls off while the exhaust smoke becomes thinner, or the engine stops, this would indicate that the mixture is too lean. In this case, turn the mixture control disc counter-clockwise as indicated in Fig. 11.

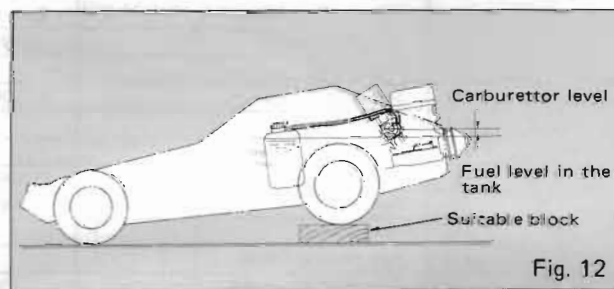


If necessary, recheck the effect of the mixture control disc adjustment to ensure that the engine accelerates slowly, issuing light grey smoke from the silencer, until one full tank of fuel has been consumed.

6. Continue running the vehicle under these conditions until approximately 5 full tanks of fuel have been used. Then, turn the mixture control disc clockwise very slightly and make another test run. Acceleration should be slightly improved. Now turn the mixture control disc clockwise again, very slightly, and repeat the experiment.

If the mixture control disc is turned (clockwise) beyond the optimum position, the buggy will slow down, accompanied by visibly diminished exhaust smoke and the engine may stop.

Turning the mixture control disc clockwise reduces the fuel supply to the engine, while turning it counter-clockwise increases the fuel supply. When the disc is properly adjusted, the car will reach its maximum performance and respond quickly and positively to the throttle control.



7. Adjustment to the mixture control disc may cause the idling speed to change slightly. Therefore, if necessary, re-adjust the throttle stop screw as described in paragraph 4.

- Notes:**
1. It is best not to refill the fuel tank until you are ready to make another run. If the car is left unattended with a full tank, fuel may flow into the engine, causing it to "flood" and making it difficult to re-start. To prevent this, raise the rear of the buggy, as shown in figure 12, so that the carburettor is above the fuel level in the tank.
  2. Do not run your buggy without fitting an air-cleaner to the carburettor air intake. Dust and dirt that may otherwise be drawn into the engine will rapidly shorten its life.

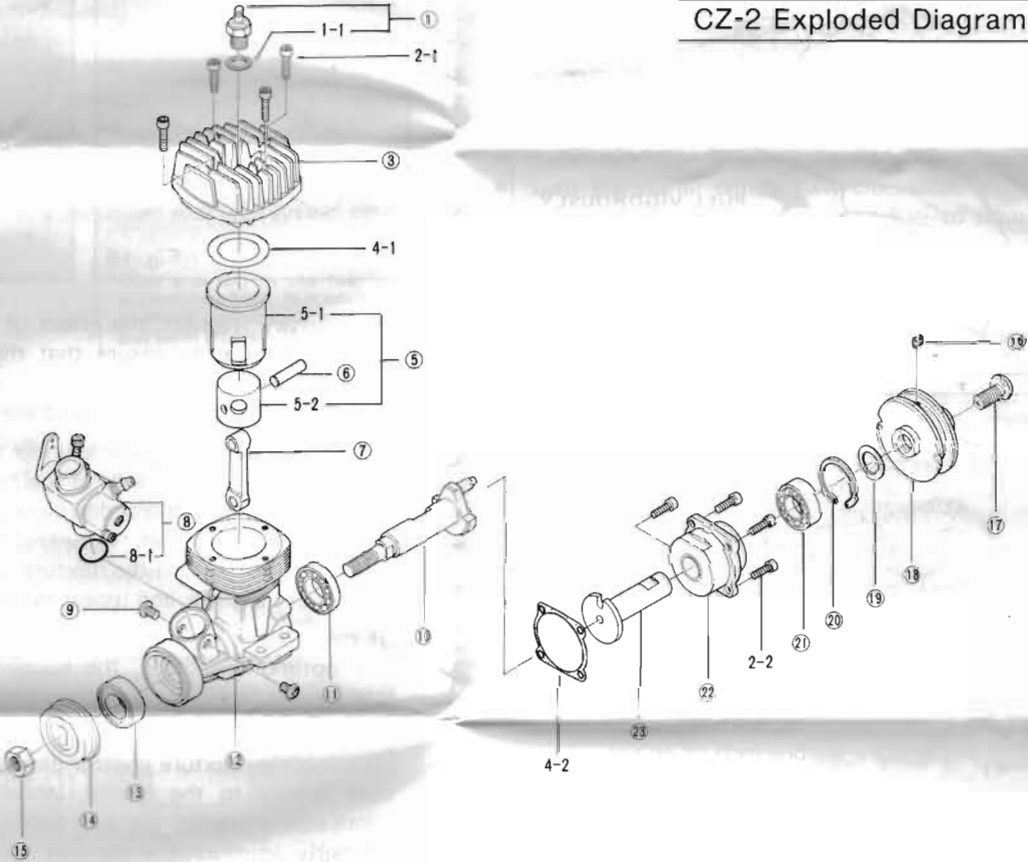
## AFTER RUNNING

- Drain any remaining fuel from the tank at the conclusion of the running session.
- After emptying the tank, energize the glowplug and try to start the engine, so that any fuel remaining in the engine will be consumed. If necessary, repeat this procedure until the engine fails to fire.

Leaving raw fuel inside the engine may result in difficult starting later.

- Clean the exterior of the engine with methanol or kerosene. Do not use gasoline or a solvent which may damage the silicone fuel tubing or the plastic car body.

## CZ-2 Exploded Diagram



## PARTS LIST

No.	Description	Code No.	No.	Description	Code No.
①	Glow Plug No. 8	71608001	⑪	Crankshaft Bearing (rear)	21230000
1-1	Plug Gasket		⑫	Crankcase	21201000
②	Screw Set	21213000	⑬	Crankshaft Bearing (front)	22631019
2-1	Head Screw		⑭	Drive Washer	21208000
2-2	Rear Housing Screw		⑮	Propeller nut	20810007
③	Heatsink Head	21204310	⑯	Starter Cone Set-screw	24842241
④	Gasket Set	21214000	⑰	Starter Cone Fixing Screw	21221700
4-1	Head Gasket		⑱	Starter Cone	21221300
4-2	Rear Housing Gasket		⑲	Rear Thrust Washer	21221500
⑤	Cylinder & Piston Ass'y	21203010	⑳	Bearing Retainer	212351123
5-1	Cylinder Liner		㉑	Starting Shaft Bearing	21232000
5-2	Piston		㉒	Rear Housing	21221100
⑥	Piston Pin	21206000	㉓	Starting Shaft	21221200
⑦	Connecting Rod	21205000		Starting Cord Set	21221900
⑧	Carburettor	21281000		Socket Wrench Type S	71521100
8-1	Carburettor Rubber Gasket	22616000		Two-way Socket Wrench	*71501007
⑨	Carburettor Retaining Screws	23081706		Long Socket Wrench (with plug grip)	*71521000
⑩	Crankshaft	21202000		Air Cleaner	*72403000

\* Optional extra

The specifications are subject to alteration for improvement without notice.

Two-way Socket Wrench



Long Socket Wrench (w/plug grip)



Air Cleaner



**D.S. ENGINES MFG. CO., LTD.**

6-15 3-chome Imagawa Higashiumiyoshi-ku  
Osaka 546, Japan. TEL. Osaka (06) 702-0225

© Copyright 1987 by O.S. Engines Mfg. Co., Ltd.  
All rights reserved Printed in Japan