It is of vital importance, before attempting to operate your engine, to read the general "SAFETY INSTRUCTIONS AND WARNINGS" in the following section and to strictly adhere to the advice contained therein.

* Also, please study the entire contents of this instruction manual, so as to familiarize yourself with the controls and other features of the engine.

**SAFETY INSTRUCTIONS AND WARNINGS ABOUT YOUR O.S. ENGINE**

Remember that your engine is not a "toy", but a highly efficient internal-combustion machine whose power is capable of harming you, or others, if it is misused or abused. As owner, you, alone, are responsible for the safe operation of your engine, so act with discretion and care at all times. If at some future date, your O.S. engine is acquired by another person, we would respectfully request that these instructions are also passed on to its new owner.

* The advice which follows is grouped under two headings according to the degree of damage or danger which might arise through misuse or neglect.

**WARNINGS**

These cover events which might involve serious (in extreme circumstances, even fatal) injury.

**NOTES**

These cover the many other possibilities, generally less obvious sources of danger, but which, under certain circumstances, may also cause damage or injury.

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**ENGINE CONSTRUCTION**

With this engine, the piston will feel tight at the top of its stroke (TDC) when the engine is cold. This is normal. The cylinder bore has a slight taper. The piston and cylinder are designed to achieve a perfect running clearance when they reach operating temperature.

**ABOUT THE WARRANTY**

Since this is a special SPEED version, individual special parts are available only for limited period (one year after finishing the production). Also, the engine is free of warranty due to damage and/ or wear occurred during running.

**While Operating**

* Please do not run on a public street, this could cause serious accidents, personal injuries and/ or property damage.
* Please do not run near pedestrians or small children.
* Please do not run in small or confined areas.
* Please do not run where loud noises can disturb others, such as hospitals and residential areas.

**NOTE**

As delivered, the engine has the carburetor lightly fit into its intake. Secure it changing its angle according to the car chassis.

---

**NOTES ON OPERATION**

**ABOUT THE ENGINE**

The O.S. SPEED B2102 is a high performance factory tuned engine produced by O.S. SPEED TEAM technicians. The novel low profile head contributes to stabilizing a chassis with low central gravity. The new carburetor 22C (B) and the crankshaft improve fuel consumption. Bypass of the crankcase is modified for better performance.

**TOOLS, ACCESSORIES, etc.**

The following items are necessary for operating the engine.

* Items necessary for starting

**FUEL**

Generally, it is suggested that the user selects a fuel that is commercially available for model two-stroke engines. When the brand of fuel is changed, or the nitro content increased, it is advisable to repeat the running-in procedure referred to in the RUNNING-IN paragraphs. Please note that high-nitro fuels, although power may be increased for competition purposes, glowplug elements do not last as long and engine life will be shortened.

**FUEL FILTER**

To installed in the fuel line between fuel tank and carburetor to prevent foreign matter from entering the carburetor.

**GLOWPLUG IGNITER**

Commercially available handy glowplug heater in which the glowplug battery and battery leads are integrated.

**STARTER BOX**

For starting the engine.

**FUEL PUMP**

For filling the fuel tank, a simple, polyethylene "squeezo" bottle, with a suitable spout, is required.

**O.S. SPEED SILICONE FUEL LINE**

(Option extra)

The connection between the fuel tank and the engine.

**2.5mm ID**

**TOOLS**

O.S. SPEED DRIVER TOOLS

O.S. SPEED FLYWHEEL KEY

O.S. SPEED CLUTCH WRENCH & ADJUSTER

O.S. SPEED FLYWHEEL PULLER

O.S. SPEED PLUG WRENCH

**BASIC ENGINE PARTS**

---

**WARNINGS**

Model engine fuel is poisonous. Do not allow it to come into contact with the eyes or mouth. Always store it in a clearly marked container and out of the reach of children.

Model engine fuel is also highly flammable. Keep it away from open flame, excessive heat, sources of sparks, or anything else which might ignite it. Do not smoke or allow anyone else to smoke, near to it.

Model engines generate considerable heat. Do not touch any part of your engine until it has cooled. Contact with the muffler (silencer), cylinder head or exhaust header pipe, in particular, may result in a serious burn.

Never operate your engine in an enclosed space. Model engines, like automobile engines, exhaust deadly carbon-monoxide. Run your engine only in an open area.

**NOTES**

* This engine is intended for model cars. Do not attempt to use it for any other purpose.
* Mount the engine in your model securely, following the manufacturers’ recommendations, using appropriate screws and locknuts.

---

**TOOLS WHEN APPLYING AN ELECTRIC STARTER**

Do not over-prime. This could cause a hydraulic lock and damage the engine on application of the electric starter.

If over-primed, remove glowplug, close needle-valve and apply starter to pump out surplus fuel. Cover the head with a rag to prevent any pumped out fuel from getting into your eyes.

---

**Standard accessories**

- Glow Plug P3 Turbo head 1piece (Hot Type)
- Carburetor Reducer (RED) 6.5mm 1piece each (w/ "O" Ring)
- Exhaust Seal Ring 1piece
- Dust Cap P3, P16, P18 1piece each

---

**INSTRUCTION MANUAL**

**FACTORY TUNED ENGINE**

O.S. SPEED B2102 W/22C(B)
NOTE: While the Mixture Control Valve and the Metering Valve are set at the standard position when the engine leaves the factory, readjustment may be necessary occasionally to allow for changes in fuel formula and climatic conditions. Readjust the controls only when satisfactory results cannot be obtained with the standard positions following the instructions mentioned in the "CARBURETOR ADJUSTMENT" section.

### INSTALLATION OF THE CARBURETOR
As delivered, the engine has its carburetor lightly installed in the intake boss. Secure it as follows.

1. Loosen the retainer screw, rotate the carburetor to its correct position and make sure that it is pressed well down into the intake boss, compressing the rubber gasket, before retightening screw.

2. Rotate the retainer screw gently until it stops, then tighten a further 120-180°.

3. Do not overtighten the screw as this will damage the thermo insulator.

**NOTE**
Be careful not to damage the O rings when removing the carburetor retainer from the engine.
First, remove the retainer Retaining screw, then pull out each part. Do not push the part in or damage the O rings.

### ENGINE INSTALLATION
Make sure that the vehicle's engine mounting surfaces are level and in the same plane. Poor installation may cause distortion of the crankcase, bearings, etc., resulting in erratic running and loss of performance. The recommended screws for securing the engine are 3mm or 4-40 steel Allen hexagon socket type. If existing holes in the engine mount do not align perfectly with engine mounting lugs, enlarge them slightly with a needle-file so that screws are in alignment with the mounting holes.

Attention:
It is vitally important to set the throttle at the correct position before starting the engine. If the engine is allowed to run with the throttle too far open under "no load" conditions (i.e., with the driving wheels not in contact with the ground) it will rapidly overheat and may be seriously damaged.

6. When the engine is warmed up, disconnect the glowplug battery and try running the car on the track. If the engine stops soon after running at around mid speed, the mixture is too rich. Close the needle-valve 15-30°, if the engine still stalls, close the metering needle 15-50°, Run the car on the track until one tank of fuel has been consumed, then close the needle-valve very little (within 10°).

7. Repeat this procedure (close needle-valve very little after one tank of fuel has been consumed) until approx. 2 liters of fuel have been consumed, extending gradually the full throttle running time at the straight. Carefully observe the exhaust smoke. Be sure to run the engine with visible smoke at all times. If the smoke is not visible, the needle-valve is closed too far.

Now the RUNNING-IN (Breaking-in) is completed.

### NOTE
The engine bottom may interfere with chassis of some models. In this case, file off the chassis so that the engine may not interfere with the chassis when it is installed.

**Note:**
Be sure to use a collet supplied when using a optional 28XZ Hyper Flywheel Set.

### PRESSURIZED FUEL SYSTEM
- It is recommended that a muffler pressurized fuel feed system be used so that the fuel may be stably fed to the carburetor.
- The following procedure is suitable when a fuel containing 30% nitro-methane is used.

1. Set the carburetor controls at the standard positions (positions when the engine leaves the factory.)
2. Switch the transmitter and make sure that each linkage moves correctly.
3. Make sure rotating direction of the starter box is correct (counter-clockwise seen from the front edge of the crankshaft), and turn the engine with the starter box to draw fuel into the engine.
4. Connect glowplug battery to heat the plug and start the engine with the starter box.

   When the engine does not start or stops right after being started, try the followings.
   - Close the needle-valve approx. 90° from the standard position.
   - Set the throttle opening a little wider (approx. 1mm) than the standard setting by adjusting the Throttle Stop Screw.

5. When the engine starts, warm it up by repeatedly increasing the rpm to medium speed and back again to a fast idle with the mixture set very rich, a glowplug connected, and the driving wheels clear of the ground. The rich mixture will provide adequate lubrication and cooling, indicated by a profuse exhaust smoke.

### INSTALLATION OF THE STANDARD ACCESSORIES
Installing the glow plug, Insert P3 plug supplied into heat sink-head carefully, making sure that it is not cross-threaded before tightening firmly. (All the O.S. T-Type plugs including the P3 are not supplied with a washer.)
Install the exhaust seal ring supplied.
How to stop the engine
To stop the engine, close the throttle to idle speed and shut it off completely with the trim lever on the transom. Then, cut off the fuel supply by pinching the fuel delivery tube to the carburetor.

Warning:
Do not touch rotating parts, engine and silencer when stopping the engine as they become very hot, and contact with them may result in a serious burn.

CARBURETOR ADJUSTMENT
Carburetor adjustment should be carried out only after the running-in has been completed.

1. NEEDLE VALVE ADJUSTMENT
Run the vehicle (with throttle fully open) over the longesr time available straight course a few times to observe the model’s speed. Return the vehicle to the starting point and close the Needle-valve 15° and repeat the run, taking note of the improvement in performance.
Continue with further runs, gradually reduce the Needle-valve setting aiming to achieve the highest straight-line speed (optimum position).
Remember, however, if the Needle-valve is closed too far, the engine will overheat, accompanied by visibly diminished exhaust smoke and the model will lose speed.
At this point, throttle down immediately, stop the vehicle and reopen the Needle-valve 30–45°.

2. METERING NEEDLE ADJUSTMENT
After setting the Needle-valve at optimum position, run the vehicle a few times at the straight line.
With the engine running, close the throttle and allow it idle for about five seconds, then reopen the throttle fully.
If, at idle point, the engine punts out an excessive amount of smoke and the vehicle does not accelerate smoothly and rapidly or even stops, it is probable that the idle mixture is too rich. In this case, turn the Metering needle clockwise 15–30°.
If, on the other hand, the engine tends to speed up momentarily and then cut out abruptly when the throttle is opened, the idle mixture is too lean. In this case, turn the Metering needle counter-clockwise 15–30°.

3. THROTTLE STOP SCREW ADJUSTMENT
If the engine runs too fast with the throttle closed, the throttle stop screw should be turned counter-clockwise to allow the throttle opening to be reduced.

OPTIMUM MIXTURE CONTROL POSITION
With the optimum mixture control position, light smoke is visible during high speed running and the engine rpm increases smoothly during acceleration. Carry out adjustment 1–3, patiently until the engine responds quickly and positively to the throttle control.
Remember that, if the engine is operated with the fuel/air mixture slightly too lean, it will overheat and run unevenly. As with all engines, it is advisable to set both the needle-valve and metering needle slightly on the rich side of the best rpm setting, as a safety measure. Finally, beyond the normal break-in period, a slight readjustment toward a leaner needle setting may be required to maintain maximum performance.

Note:
Please regard the standard positions in the instruction manual as just a guide. Positions will vary due to the fuel and silencer used. In general, if a fuel containing less nontemthane is available, the needle-valve will need to be closed further. Remember, closing the needle-valve too far can cause rusting and damage to the engine.

CARE AND MAINTENANCE
1. The minute particites of foreign matter, that are present in any fuel tank by accumulating and partially obstructing fuel flow, cause engine performance to become erratic and unreliable. O.S. Super-Filters (large and small) are available, as optional extras, to deal with this problem.
   One of these filters installed to the pickup tube inside your refueling container, will prevent the entry of foreign material into the fuel tank. It is also recommended that a good in-line filter be installed between the tank and carburetor.

DIAGRAM:

- T-2090SC TUNED SILENCER COMPLETE SET (72106192)
- T-2090SC Tuned Silencer Assembly (72106190)
- Exhaust Seal Ring (2pcs.) (22826140)
- Joint Spring (3pcs.) (72106042)
- M2000SC Exhaust Header Pipe Assembly (72106440) (75mm)
- Header Pipe Spring (2pcs.) (72101272)
- Exhaust Seal Ring (2pcs.) (22826140)

- 28XZ HYPER FLYWHEEL SET
  - (For MUGEN) (71812000)
  - (For KYOSHO) (71813000)
- SUPER AIR CLEANER 203 (72413000)
- 203 Filter Element (4pcs.) (72413020)
- SUPER AIR CLEANER 204 (72415000)
- 204 Filter Element (4pcs.) (72415200)

PRESSURE CHAMBER SET
(7155000)

- O.S. SPEED CARBURETOR REPAIR KIT 21 (71490000)
- O.S. SPEED CARBURETOR Repair Parts 21 (71490100)

- O.S. SPEED CLUTCH BEARING (1050ZZ 4pcs.) (71550001)
- O.S. SPEED CLUTCH BEARING (1050ZZ 10pcs.) (71550002)
- O.S. SPEED CILCONE TUBE
  (72506100) 2.5mm x 1000mm
- O.S. SPEED EXHAUST SEAL RING 21 (10pcs.) (22826145)

- O.S. SPEED DUST CAP SET FOR 12x30 CLASS 3mm(2pcs.) / 16mm(2pcs.) / 18mm(1pc.) (22849254)
- DUST CAP SET 3mm (5pcs.) (73300305)
- DUST CAP SET 16mm (5pcs.) (73300162)
- DUST CAP SET 18mm (3pcs.) (73300182)

- O.S. SPEED CLUTCH WRENCH & ADJUSTER (71415300)
- O.S. SPEED FLYWHEEL KEY (71415200)
- O.S. SPEED FLYWHEEL PULLER (71415100)
- O.S. SPEED PLUG WRENCH (71520100)
- O.S. SPEED PHILLIPS SCREW DRIVER NO.1 (71417100)
- O.S. SPEED PHILLIPS SCREW DRIVER NO.2 (71417200)

- O.S. SPEED SPRING REMOVER (71415500)
- O.S. SPEED BODY REAMER (71415400)

- O.S. SPEED DRIVER TOOLS

   Code No. | Description
   ------------------------
   71410105 | O.S. SPEED HEX WRENCH DRIVER 1.5
   71410200 | O.S. SPEED HEX WRENCH DRIVER 2.0
   71410250 | O.S. SPEED HEX WRENCH DRIVER 2.5
   71410300 | O.S. SPEED HEX WRENCH DRIVER 3.0
   71411200 | O.S. SPEED HEX BALL WRENCH DRIVER 2.0
   71411250 | O.S. SPEED HEX BALL WRENCH DRIVER 2.5
   71412500 | O.S. SPEED FLAT HEAD SCREWDRIVER 3.0
   71413550 | O.S. SPEED NUT DRIVER 3.5
   71413600 | O.S. SPEED NUT DRIVER 6.0
   71413700 | O.S. SPEED NUT DRIVER 7.0
**ENGINE EXPLODED VIEW**
- Type of screw: C, Cap Screw

**ENGINE PARTS LIST**

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<tr>
<th>No.</th>
<th>Code No.</th>
<th>Description</th>
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<td>Outer Head</td>
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<td>2</td>
<td>2A304100</td>
<td>Inner Head</td>
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<td>2A204160</td>
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<td>4</td>
<td>2A203010</td>
<td>Built-up Parts Set</td>
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<td>4-1</td>
<td>2A203000</td>
<td>Cylinder &amp; Piston Assembly</td>
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<td>4-2</td>
<td>22016000</td>
<td>Piston Pin</td>
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<tr>
<td>4-3</td>
<td>21817010</td>
<td>Piston Pin Retainer 4mm (6pcs.)</td>
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<td>22425003</td>
<td>Connecting Rod (w/piston pin retainers 3pcs.)</td>
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<td>5</td>
<td>2A381000</td>
<td>Carburetor Complete (Type 2200(B) R6.0)</td>
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<td>Carburetor Retainer Assembly</td>
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<td>24881824</td>
<td>&quot;O&quot; Ring (2pcs.)</td>
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<td>7</td>
<td>23731020</td>
<td>Ball Bearing (Front)</td>
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<td>2A301000</td>
<td>Crankcase</td>
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<td>23730050</td>
<td>Ceramic Bearing (Rear)</td>
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<td>71461300</td>
<td>Glow Plug P3</td>
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<td>18</td>
<td>22826140</td>
<td>Exhaust Seal Ring</td>
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<td>19</td>
<td>71533865</td>
<td>Carburetor Reducer 6.5mm(RED) w/ &quot;O&quot; Ring (2pcs.)</td>
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<tr>
<td>20</td>
<td>22615000</td>
<td>&quot;O&quot; Ring (1pc.)</td>
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<tr>
<td>21</td>
<td>22884250</td>
<td>Dust Cap Set (3mm, 16mm, 18mm)</td>
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* marked parts are available only for limited period (one year after finishing the production).

**CAP SCREW SETS** (10pcs./set)

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<th>Size</th>
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<tr>
<td>2A670030</td>
<td>M6 x 47</td>
<td>Cover Plate Retaining Screw (4pcs.)</td>
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<tr>
<td>2A671655</td>
<td>M2 x 18</td>
<td>Carburetor Retainer Retaining Screw (1pc.)</td>
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<td>2A671880</td>
<td>M3 x 18</td>
<td>Cylinder Head Retaining Screw (4pcs.)</td>
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**CARBURETOR EXPLODED VIEW**
- Type of screw: C, Cap Screw 5, Set Screw

**CARBURETOR PARTS LIST**

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<td>26381501</td>
<td>Retaining Screw</td>
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<td>Dust Cover</td>
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<td>3</td>
<td>2A381500</td>
<td>Metering Needle Assembly</td>
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<td>27881820</td>
<td>&quot;O&quot; Ring (2pcs.)</td>
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<td>4</td>
<td>2A381200</td>
<td>Slide Valve</td>
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<td>71533261</td>
<td>Carburetor Reducer 6mm (Red)</td>
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<td>Fuel Inlet (No.15)</td>
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<td>Throttle Stop Screw</td>
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<td>27881820</td>
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<td>23781600</td>
<td>Mixture Control Valve Assembly</td>
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<td>&quot;O&quot; Ring (L1) (2pcs.)</td>
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<td>22781800</td>
<td>&quot;O&quot; Ring (S1) (2pcs.)</td>
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<td>10</td>
<td>2A381100</td>
<td>Carburetor Body (w/Thermo Insulator)</td>
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<td>10-1</td>
<td>2AN81101</td>
<td>Thermo Insulator</td>
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<tr>
<td>11</td>
<td>29015019</td>
<td>Carburetor Rubber Gasket</td>
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</tbody>
</table>

**THREE VIEW DRAWING**

- Dimensions (mm)

**SPECIFICATIONS**
- Displacement: 3.46 cc / 0.211 cu.in.
- Bore: 16.4 mm / 0.646 in.
- Stroke: 16.4 mm / 0.646 in.
- Output: 2.65 hp / 2.91 hp / 34,000 r.p.m., 4,000-42,000 r.p.m.
- Practical R.P.M: 347 g / 12.25 oz., (Engine)