**Spec 1S Series Nitro Engines**

**Engine Features**

- Carburetor
- Reducer
- High Speed Needle
- Fuel Filter
- Mid Range Needle
- Idle Adjustment Screw
- Throttle Linkage
- Low Speed Needle
- Crankcase
- Crankshaft

**Factory Carburetor Settings**

- High Speed Needle
- Mid Range Needle
- Low Speed Needle
- Idi Adjustment Screw
- Pull Start
- Heat Slink
- Exhaust Outlet

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**Engine Break In**

**Important**

The stroker and cylinder sleeves are designed to achieve proper running tolerances when they are properly broken in. New engines need a break-in period of about 34 hours before they can be run at full throttle. Be sure to follow all the steps in the break in process or the engine will suffer damage.

1. **Fill the fuel tank and prime the carburetor**
   - Use 20%-30% nitro fuel. Use only 20%-30% nitro content fuel. Use a high quality, branded model car fuel only. To prime the engine, use a piece of cloth to cover the exhaust tip. Pull the starter cord several times until the fuel reaches the carburetor and no bubbles are seen.

2. **Adjust the carburetor and start the engine**
   - Make sure the receiver is switch off. Manually turn the throttle screw until the carburetor is 1/4 of the way open.
   - Attach the glow plug ignition to the engine. Start the engine by pulling the starter cord (30-40 times MAX).
   - Adjust the throttle screw so the engine runs fast enough to idle without engaging the clutch or turning the wheels.
   - Run the engine for two tank of gas. If the motor shuts off repeat steps.

3. **Drive at 1/2 throttle**
   - The vehicle should not move when idling. If it does, adjust the idle speed settings on the transmitter.
   - Drive the vehicle in 1/2 to 3/4 of the area. Do not do more than 1/3 throttle. Coast for short periods of time to allow the engine to cool and accelerate.
   - Continuously this process for a total of two tanks of fuel.

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**Tuning After Break In**

**High Speed Needle**

Turn the high speed needle 1/8 turn increments to lean out the fuel mixture for increased top speed and throttle performance. Drive the car to notice the changes in speed and throttle responses.

Continue turning the carburetor in this way turning in 1/8 turn increments only (minimum of 1/16 turn from IDLE)

**Idle Adjustment Screw**

The idle speed is set after the engine is up to operating speed. To properly set the idle speed turn up and down the idle speed screw until the engine starts at the correct RPM. Turn the idle adjustment screw counter clockwise to reduce the idle speed or clockwise to increase the idle speed. The idle should be set high enough to keep the engine running but low enough to prevent the drivetrain from engaging.

**Idle Adjustment Screw**

We recommend that you do not touch the low speed needle. Gp adjustment is needed, the low speed needle is set after the high speed needle is adjusted. If the low speed needle is too lean you will experience the following:
- 1. Horse power
- 2. Overheating
- 3. If you experience any of the above, return to factory settings and start the tuning process over.

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**Warranty**

Your Axial engine is warranted to be free from defects in materials and workmanship for a period of 2 years from date of purchase. If there are any defects with the materials, workmanship, or assembly of your engine, Axial will gladly repair or replace it at our discretion. Engines that have been worn out, abused, or improperly operated will not be covered under this warranty.

**Not covered by Warranty:**

This warranty does not cover problems from normal wear, abuse, neglect, or any damage arising as a result of improper use, use of improper fuel, overheating, condensation, or crash damage.

Axial shall not be liable for any loss or damages, whether direct, indirect, special, incidental, or consequential, arising from the use, misuse, or abuse of this product and any accessory or chemical to operate this product.

**Servicing:**

Any repairs made to engines resulting from neglect or misuse will be charged parts and labor before the work is started. Please contact customer service at Axial for any warranty claims at 949-658-8642. Our customer service hours are Monday through Friday 9:00am to 5:00pm, Pacific Standard Time.

If an engine needs to be sent in, customer service will issue a RA. All engine returns require a RA.

The engine must be returned complete with crankcase, crankshaft, piston, sleeve, connecting rod, cylinder head, carburetor, and pull starter. You should not return the ducts, filter, filter sock, oil, air cleaner, manifold, or muffler.

Please contact Axial customer service if you have any issues with your engine.

Axial

21201 Bake Parkway Suite 114
Lake Forest, CA 92650
**Troubleshooting**

<table>
<thead>
<tr>
<th>Description</th>
<th>Possible Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine does not start</td>
<td>Fuel mixture needle settings are out of range</td>
<td>Set the needles to the factory setting</td>
</tr>
<tr>
<td></td>
<td>Engine could be worn out</td>
<td>Replace piston and sleeve</td>
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<tr>
<td></td>
<td>Out of fuel</td>
<td>Refill fuel tank</td>
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<tr>
<td></td>
<td>Contaminated fuel</td>
<td>Replace fuel</td>
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<tr>
<td></td>
<td>Glow plug igniter is not charged</td>
<td>Charge glow igniter</td>
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<tr>
<td></td>
<td>Glow plug is bad</td>
<td>Replace glow plug</td>
</tr>
<tr>
<td></td>
<td>No fuel flow</td>
<td>Check fuel lines for cracks, leaks, and holes. Replace fuel line if necessary.</td>
</tr>
<tr>
<td></td>
<td>Engine flooded</td>
<td>Remove glow plug and discharge fuel</td>
</tr>
<tr>
<td></td>
<td>Engine has overheated</td>
<td>Allow engine to cool, enrich the fuel mixture and then restart</td>
</tr>
<tr>
<td></td>
<td>Throttle valve isn’t adjusted properly</td>
<td>Set idle and adjust needle valve to the manufacturer’s recommended settings</td>
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<tr>
<td>Air cleaner is blocked</td>
<td></td>
<td>Clean or replace if necessary</td>
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<tr>
<td>Engine starts, then stalls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idle speed is too low</td>
<td>Adjust the idle speed</td>
<td></td>
</tr>
<tr>
<td>Air bubbles in the fuel line</td>
<td>Check for leaks or cracks in the fuel line</td>
<td></td>
</tr>
<tr>
<td>Glow plug is bad</td>
<td>Replace glow plug</td>
<td></td>
</tr>
<tr>
<td>Engine is overheated</td>
<td>Allow engine to cool and then restart</td>
<td></td>
</tr>
<tr>
<td>Airflow through system is bad</td>
<td>Check connections between tank, engine and exhaust</td>
<td></td>
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<tr>
<td>Trottle servo is improperly set up</td>
<td>Set servo to neutral and reset according to radio and model manufacturer’s specifications.</td>
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<tr>
<td>Trottle servo glich</td>
<td>Replace the radio batteries</td>
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</tbody>
</table>

**Maintenance and Cleaning**

Important

Read this section carefully. Failure to perform proper care and maintenance of your engine could result in damage to your engine and void your engine warranty.

Air Filter

Cut is the biggest enemy to your engine. Proper air filter maintenance is one of the most important factors that will affect your engine performance and life. We recommend cleaning the filter after every 100 hours. Follow the instructions from the manufacturer’s recommendations on the proper cleaning and maintenance of your filter. Always check your air filter after each run to make sure it is properly seated to the carburetor and the carburetor. Never run your engine without the air filter.

Cleaning the Air Filter:

Remove the air filter element from the air filter body. It is important to take care during this step to make sure not to get dirt inside the carburetor. Wash the air filter element in soapy water or mild liquid dish soap and rinse with fresh water. Squirt any excess fluid from the element. Apply high-quality oil to the element if necessary.

Reinstalling the Air Filter:

After properly cleaning the air filter make sure it is reinstalled correctly. Make sure there are no gaps between the air filter and the body. Make sure the air filter body is seated on the carburetor and secure with a tie strap. Never run your engine without the air filter!

Engine Storage

Properly maintaining and storing your engine is critical to the life of your engine. Nitro fuel contains caustic fuel stabilizer. If the engine is not burned out properly, it can gum up and damage the crank bearings. Using your fuel bleeder, drain off the remaining fuel in the tank. Use a fuel-charged engine and then restart the engine to burn any remaining fuel out of the lines. Repeat this step until the engine will not start. After draining off the fuel, remove the glow plug and several drops of after-run oil, then crank the engine over to spread it throughout the engine. To prevent the engine from seizing, 70% benzene alcohol or Detarctol Mixed and cycle it through the engine. **DO NOT TRY TO START THE ENGINE WITH ALCOHOL!** The few minutes you spend to properly care for your engine will add valuable time to its operating life and maintain optimum performance.

**Glow Plug**

Proper Glow Plug Selection:

Proper glow plug selection depends on several factors. Fuel type, nitro methane content, weather and altitude can drastically affect performance. Finding the best combination of fuel and plug temperature for your engine condition is key to getting the maximum performance out of your engine.

Extending the Life of Your Glow Plug:

To maximize and extend the life of your glow plug follow these simple tips:

- Remove the glow plug when using more than 1/3 throttle or if the engine does not start with a slow advance.
- Do not run the engine lean. Lean conditions will overheat the plug causing the element to be damaged or burnt.
- Use the best Fuel/Glow plug combination for your dining conditions.
- Use a fuel bleeder for proper fuel mixing.

When to Replace the Glow Plug:

Fuel and temperature will have an effect on the performance, reliability, and life span of the glow plug. Therefore, it should be considered expendable engine components. Aside from burnout or plug failure, there are several signs that indicate the plug should be replaced:

- Plug temperature is low when idling
- Plug temperature is damaged or burnt
- Engine becomes difficult to start

Glow Plug Testing

**Spares Parts**

**NOTE:** Some features and parts may differ depending on which model engine you have.

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>A0001</td>
<td>28 Engine w/Green Cooling Head</td>
<td>AX213</td>
<td>A0029</td>
<td>28 / 32 Mid Range Needle</td>
<td>AX365</td>
<td>32 Cylinder/Piston Set</td>
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<td>A0002</td>
<td>28 Engine w/Gray Head</td>
<td>AX216</td>
<td>A0030</td>
<td>28 / 32 High Speed Needle Valve</td>
<td>AX464</td>
<td>32 Cylinder/Piston/Connecting Rod Set</td>
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<td>A0003</td>
<td>28 Cylinder/piston Set</td>
<td>AX317</td>
<td>A0031</td>
<td>28 Button Head</td>
<td>AX165</td>
<td>28/32 Silicone Exhaust Seal</td>
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<tr>
<td>A0004</td>
<td>28 Cylinder/Piston/Connecting Rod Set</td>
<td>AX318</td>
<td>A0032</td>
<td>28/32 Screw M6x3x1.1mm (Mpc)</td>
<td>AX465</td>
<td>32 Piston Pin/retainer Set</td>
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<td>A0005</td>
<td>28 / 32 Connecting Rod</td>
<td>AX319</td>
<td>A0033</td>
<td>28/32 Dust Protection Set</td>
<td>AX468</td>
<td>32 Heatshrink Head (Green)</td>
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<tr>
<td>A0006</td>
<td>28 Piston Pin/retainer Set</td>
<td>AX320</td>
<td>A0034</td>
<td>28/32 Front Bearing 7x1.36</td>
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<td>Heatshrink Head (Gray)</td>
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<td>A0007</td>
<td>28 / 32 Retainer For Piston Pin (3pcs)</td>
<td>AX321</td>
<td>A0035</td>
<td>28/32 Brass Collet</td>
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<td>32 Button Head</td>
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<td>28 / 32 Heatshrink Head (Green)</td>
<td>AX322</td>
<td>A0036</td>
<td>28/32 Fuel Inkt</td>
<td>AX511</td>
<td>32 Carnicase</td>
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<td>28 / 32 Heatshrink Head (Gray)</td>
<td>AX323</td>
<td>A0037</td>
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<td>AX562</td>
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<td>A0010</td>
<td>28 / 32 Screws</td>
<td>AX324</td>
<td>A0038</td>
<td>28/32 O-ring 2x6.7mm (Spec)</td>
<td>AX564</td>
<td>32 Gauze Set 0.15mm/0.3mm</td>
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<td>A0011</td>
<td>28 / 32 CrackShaft</td>
<td>AX325</td>
<td>A0039</td>
<td>28/32 Low Speed Needle Valve</td>
<td>AX565</td>
<td>32 Piston Shaft Holder (Assembled)</td>
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<td>A0012</td>
<td>28 / 32 FuelLine Fitting/Marker Set</td>
<td>AX326</td>
<td>A0040</td>
<td>28/32 O-ring 11x1.27mm (Spec)</td>
<td>AX568</td>
<td>32 Cover Plate Set</td>
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<td>A0013</td>
<td>28 / 32 Gasket Set (51.5mm/0.3mm)</td>
<td>AX327</td>
<td>A0041</td>
<td>32 Engine w/Green Cooling Head</td>
<td>AX372</td>
<td>28 / 32 Adjuster Cap</td>
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<td>A0014</td>
<td>28 / 32 Lock Pin For Carburetor</td>
<td>AX328</td>
<td>A0042</td>
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<td>AX372</td>
<td>28 / 32 Adjuster Cap</td>
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