Tuning After Break In

High Speed Needle

The idle speed is set after the engine is up to operating speed. To properly set the idle speed turn on your radio and set the throttle trim to neutral. Turn the idle adjustment screw counter clockwise to increase the idle speed. The idle should be set high enough to keep the engine running, but low enough to prevent the clutch from engaging.

Tune with the throttle so the engine is 1/4 turned on and the engine runs at 1/2 throttle for 3 tanks.

The vehicle should not move when idling. If it does, adjust the trim settings on the transmitter.

Drive the vehicle in a 20 foot oval, do not apply more than 1/2 throttle. Coast for short amounts of time to allow the engine to cool, then accelerate again.

Continue this process for a total of three tanks of gas. If the motor shuts off repeat the steps.

Stop Tuning

1. Use a Rag

Use to cover the exhaust tip. This will stop the motor and prevent any fuel from reaching the exhaust tip. Pull the starter cord several times until the engine reaches the carburetor and no bubbles are seen.

2. Push the Fuel Line

To remove fuel from the carburetor, use a pin to push the fuel lines to the carb. Be careful the fuel line can be hot! If your engine shows any of the following signs, please stop your engine and retune to a richer setting. Read this section carefully. Failure to follow these tuning steps could result in damage to your engine and void your engine warranty!

Tuning Tips

While a lean motor will have higher performance, it will lead to premature engine wear and failure. Use the following information to tune your engine to your driving conditions. Remember, a slightly rich setting is a safer setting.

More Fuel = RICH

Rich Fuel Mixture

A slightly rich fuel mixture delivers a cooler running temperature and more lubrication, but with slightly less power and longer engine life. Symptoms of an engine that are too lean are spattering rough idles, no smoke from the exhaust and hard to restart.

Less Fuel = LEAN

Lean Fuel Mixture

Provides stronger combustion and power, but if you lean out too much, the result is more engine heat and a shorter engine life.

Testing your engine:

- Check for overheating.
- Check your oil level.
- Check for excessive smoke.
- Check for reduced performance.
- Check for reduced mileage.

Use a rag to cover the exhaust tip. This will stop the fuel flow to the carb and prevent any fuel from reaching the exhaust tip. Pull the starter cord several times until the engine reaches the carburetor.

Carb Reducer

2 carburetor reducers are included with your engine (8mm yellow; 8.5mm orange). These are used for restricting airflow. The smaller the reducer the lower the power. The larger the reducer the lower the power. Use these to tune your engine for your local track conditions.

Stop Tuning

If your engine shows any of the above signs, please stop your engine and retune to a richer setting. Further leaning will damage the engine.

1. There is no white smoke when at full throttle.
2. The engine overheats or bugs.
3. Reduced top speeds or loss of power.
4. Temperatures above 275° F (135° C).

Important

The idle needle and cylinder sleeves are designed to achieve proper running tolerances when they are properly broken in. Newer engines need a break-in period of about 6-8 tanks 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.

Engine Break In

1. Fill the fuel tank and prime the carburetor

Use a 20-30% Nitro fuel. Use 20-30% Nitro Engine fuel with a minimum of 10% Oil.

Fill the fuel tank completely. Use only 20-30% nitro content fuel with a minimum of 10% oil. Use a high quality manufacturer model car fuel only. Be sure 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 is off. Manually turn the throttle servo until the carburetor is 1/4 of the way open.

Attach the glow plug igniter to the engine. Start the engine by pulling the starter cord (30cm MAX). Adjust the throttle servo so the engine runs fast enough to idle without engaging the clutch or turning the wheels.

Run the engine for three tanks of gas. If the motor shuts off repeat the steps.

3. Drive at 1/2 throttle for 3 tanks

The vehicle should not move when idling. If it does, adjust the trim settings on the transmitter.

Drive the in a 20 foot oval, do not apply more than 1/2 throttle. Coast for short amounts of time to allow the engine to cool, then accelerate again.

Continue this process for a total of three tanks of gas.

Tuning Tips

While a lean motor will have higher performance, it will lead to premature engine wear and failure. Use the following information to tune your engine to your driving conditions. Remember, a slightly rich setting is a safer setting.

More Fuel = RICH

Rich Fuel Mixture

A slightly rich fuel mixture delivers a cooler running temperature and more lubrication, but with slightly less power and longer engine life.

Symptoms of an engine that are too lean are spattering rough idles, no smoke from the exhaust and hard to restart.

Lean Fuel Mixture

Provides stronger combustion and power, but if you lean out too much, the result is more engine heat and a shorter engine life.

Testing your engine:

- Check for overheating.
- Check your oil level.
- Check for excessive smoke.
- Check for reduced performance.
- Check for reduced mileage.

Use a rag to cover the exhaust tip. This will stop the fuel flow to the carb and prevent any fuel from reaching the exhaust tip. Pull the starter cord several times until the engine reaches the carburetor.

Carb Reducer

2 carburetor reducers are included with your engine (8mm yellow; 8.5mm orange). These are used for restricting airflow. The smaller the reducer the lower the power. The larger the reducer the lower the power. Use these to tune your engine for your local track conditions.

Stop Tuning

If your engine shows any of the above signs, please stop your engine and retune to a richer setting. Further leaning will damage the engine.

1. There is no white smoke when at full throttle.
2. The engine overheats or bugs.
3. Reduced top speeds or loss of power.
4. Temperatures above 275° F (135° C).

Warranty

Your Axial engine is warranted to be free from defects in materials and workmanship for a period of two (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 if you 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, continuous neglect, 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 repair 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 949-600-8642. Our customer service hours are Monday through Friday 8:00am to 5:00pm, Pacific Standard Time.

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

The engine must be returned complete with crankcase, crankshaft, piston, sleeve, connecting rod, cylinder head, carburetor, and pull starter. You should not return the clutch, flywheel, flywheel collet, nut, air cleaner, manifold, or muffler.

Please contact Axial customer service if you have any issues with your engine.
### 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>Engine could be warm out</td>
<td>Relieve fuel tank</td>
<td></td>
</tr>
<tr>
<td>Contaminated fuel</td>
<td>Replace fuel</td>
<td></td>
</tr>
<tr>
<td>Glow plug igniter is not charged</td>
<td>Change glow igniter</td>
<td></td>
</tr>
<tr>
<td>Glow plug is bad</td>
<td>Replace glow plugs</td>
<td></td>
</tr>
<tr>
<td>No fuel flow</td>
<td>Check fuel lines for cracks, leaks, and holes. Replace fuel line if necessary.</td>
<td></td>
</tr>
<tr>
<td>Engine flooded</td>
<td>Remove glow plug and discharge fuel</td>
<td></td>
</tr>
<tr>
<td>Engine has overheated</td>
<td>Allow engine to cool, richen the fuel mixture and then restart</td>
<td></td>
</tr>
<tr>
<td>Throttle valve isn’t adjusted properly</td>
<td>Set idle and adjust needle valves to the manufacturer's recommended settings</td>
<td></td>
</tr>
<tr>
<td>Air cleaner is blocked</td>
<td>Clean or replace if necessary</td>
<td></td>
</tr>
</tbody>
</table>

### Maintenance and Cleaning

**Important**

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

**Air Filter**

The air filter is the biggest enemy to your engine. Proper and regular maintenance is one of the most important factors that will affect your engine's performance and life. We recommend cleaning this filter after every run. Always follow the instructions from the manufacturer recommendations for 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 body 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 of this step to ensure no dirt gets inside the carburetor. Pull the element from the housing and rinse the filter. Squeeze any excess fluid from the element. Apply high-quality air filter oil to the element.

**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 to the carburetor and secure with a step Nut. 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 catalysts to facilitate the combustion process. If the catalyst is not burned out properly over time it can gum up and damage the crank bearings. Using your fuel bottle, drain off the remaining fuel in the tank. Use a fully charged igniter and to 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 add several drops of after-run oil. Then crank the engine over to spread it throughout the engine. To prepare the engine for use, use 70% isopropyl alcohol or distilled water 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.

### Spare Parts

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Description</th>
<th>Number</th>
<th>Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AX0005</td>
<td>28 / 32 Engine Connecting Rod</td>
<td>AX0222</td>
<td>28 / 32 Engine Undiwal</td>
<td>AX036</td>
<td>28 / 32 Engine Fuel Inlet</td>
</tr>
<tr>
<td>AX0006</td>
<td>28 Engine Piston/Pin Retainer Set</td>
<td>AX0232</td>
<td>28 / 32 Engine Idle Adjustment Screw</td>
<td>AX037</td>
<td>28 / 32 Engine Carb. Dust Boot</td>
</tr>
<tr>
<td>AX0007</td>
<td>28 / 32 Engine Retainer for Piston/Pin (Pc)</td>
<td>AX024</td>
<td>28 / 32 Engine Slide Valve</td>
<td>AX038</td>
<td>28 / 32 Engine O-Ring 2 X 1.5mm (2 Pcs)</td>
</tr>
<tr>
<td>AX0010</td>
<td>28 Crankcase</td>
<td>AX025</td>
<td>28 / 32 Engine O-Ring Set</td>
<td>AX039</td>
<td>28 / 32 Engine Low-Speed Needle Valve</td>
</tr>
<tr>
<td>AX0012</td>
<td>28 / 32 Engine Pull Start Assembly</td>
<td>AX026</td>
<td>28 / 32 Engine Fuel Line Fitting/Washer Set</td>
<td>AX040</td>
<td>28 / 32 Engine O-Ring 11.5 X 1.25mm (2 Pcs)</td>
</tr>
<tr>
<td>AX0013</td>
<td>28 Engine Gasket Set (0.15mm/0.3mm)</td>
<td>AX027</td>
<td>28 / 32 Engine High-Speed Needle Valve</td>
<td>AX045</td>
<td>28 / 32 Engine Silicone Exhaust Seal</td>
</tr>
<tr>
<td>AX0014</td>
<td>28 / 32 Engine Lock Pin for Carburetor</td>
<td>AX028</td>
<td>28 / 32 Engine High-Speed Needle with O-Ring</td>
<td>AX046</td>
<td>32 Engine piston pin-retainer set</td>
</tr>
<tr>
<td>AX0015</td>
<td>28 Engine pull start shifter holder</td>
<td>AX029</td>
<td>28 / 32 Engine Mid Range Needle</td>
<td>AX050</td>
<td>32 Engine Button Head</td>
</tr>
<tr>
<td>AX0016</td>
<td>28 Engine Starting Shaft</td>
<td>AX030</td>
<td>28 / 32 Engine High-Speed Needle Valve Set</td>
<td>AX051</td>
<td>32 Engine crankcase</td>
</tr>
<tr>
<td>AX0017</td>
<td>Engine cover plate set</td>
<td>AX031</td>
<td>28 Engine button head</td>
<td>AX054</td>
<td>32 Engine Gasket Set</td>
</tr>
<tr>
<td>AX0018</td>
<td>28 / 32 Engine Screw</td>
<td>AX032</td>
<td>28 / 32 Engine Pull Start Screw Set (8 Pcs)</td>
<td>AX056</td>
<td>32 Engine Pull Start Shaft Holder</td>
</tr>
<tr>
<td>AX0019</td>
<td>28 / 32 Engine Dust Protection Set</td>
<td>AX033</td>
<td>28 / 32 Engine Rear Bearing 14 X 25 X 6</td>
<td>AX058</td>
<td>32 Engine Cover Plate Set</td>
</tr>
<tr>
<td>AX0020</td>
<td>28 / 32 Engine Slide Carburetor Complete</td>
<td>AX034</td>
<td>28 / 32 Engine Front Bearing 7 X 19 X 5</td>
<td>AX072</td>
<td>28 / 32 Engine High-Speed Needle Adjusale Cap</td>
</tr>
</tbody>
</table>

### Glow Plug

#### Proper Glow Plug Selection:

Proper glow plug selection depends on several factors. Fuel type, nitro methanol content, weather, altitude can drastically affect performance. Finding the best combination of fuel and plug temperature for your driving condition is the 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:

1. Remove the glowplug when using more than 1/2 throttle or if the engine does not start with a new assembly.
2. Do not run the engine lean. Lean conditions will overheat the plug, causing the element to be damaged or burnt.
3. Use the best Fuel/Plug combination for your driving conditions.
4. The plug temperature is dependent on the surface is tough.

#### 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 falling, there are several signs that can indicate the plug should be replaced:

1. Fuel mixture is inconsistent or the engine stalls at lower settings.
2. Engine temperature is different at the surface is tough.

#### Glow Plug Testing:

![Glow Plug Testing Diagram](image-url)

- [ ] Return to factory settings when eating
- [ ] If slighted is disturbed or bent, engine becomes difficult to start.

### Oil & Fuel Temp

- **Cold**
  - Cold: 40°C - 49°C
- **Medium**
  - Medium: 50°C - 59°C
- **Hot**
  - Hot: 60°C - 69°C

### Glow Plug

- **Medium**
  - Cold: 40°C - 49°C
  - Medium: 50°C - 59°C
  - Hot: 60°C - 69°C

#### Glow Plug Temperatures

- **Cold**
  - Cold: 40°C - 49°C
- **Medium**
  - Medium: 50°C - 59°C
- **Hot**
  - Hot: 60°C - 69°C

### Oil Temperatures

- **Cold**
  - Cold: 40°C - 49°C
- **Medium**
  - Medium: 50°C - 59°C
- **Hot**
  - Hot: 60°C - 69°C

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

---

* Material: High-quality aluminum or steel, depending on engine type.*

* Dimensions: Vary depending on engine type and model.*

* Color: There may be variations in color depending on the engine model.*

* Compatibility: Ensure the part is compatible with your specific engine model.*