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UGEARS 70131

UGEARS STEM Gearbox Model Kit - Instruction Manual

Model: 70131

1. INTRODUCTION

This instruction manual provides detailed guidance for the assembly, operation, and maintenance of your UGEARS STEM Gearbox Model Kit. Designed to demonstrate the principles of a car transmission mechanism, this wooden model offers an engaging and educational experience. Please read all instructions carefully before beginning assembly.



Figure 1: The fully assembled UGEARS STEM Gearbox Model Kit.

2. SAFETY INFORMATION

WARNING: CHOKING HAZARD - Small parts. Not suitable for children under 8 years old. Adult supervision is required during assembly and operation, especially for younger users, to prevent ingestion of small components.

Ensure all parts are handled carefully. Do not force pieces together, as this may cause damage. Keep the model away from open flames, excessive moisture, and direct sunlight to preserve the integrity of the wooden components.

3. PACKAGE CONTENTS

Before starting assembly, verify that all components are present in your kit. The UGEARS STEM Gearbox Model Kit includes:

- Wooden boards with precisely pre-cut parts
- Pocket Model Study Guide
- Detailed Color Instruction Manual
- Augmented Reality (AR) app access information



Figure 2: All components included in the UGEARS STEM Gearbox Model Kit.

4. SETUP AND ASSEMBLY INSTRUCTIONS

Assembly of the UGEARS STEM Gearbox Model Kit does not require glue or special tools. All parts are designed to fit together precisely. Follow the step-by-step instructions provided in the included Detailed Color Instruction Manual.

Key Assembly Tips:

1. Carefully remove parts from the wooden boards. Use a gentle pushing motion. If a part is stubborn, use the provided 'helper' tool or a small, blunt object to assist.
2. Smooth any rough edges with fine sandpaper if necessary, but avoid removing too much material.
3. Pay close attention to the orientation of each piece as shown in the manual.
4. Ensure all gears and moving parts are free to rotate without excessive friction. Lubricate with paraffin wax (not included) if movement is stiff.

For an enhanced assembly experience and to visualize the mechanisms, download the UGEARS Augmented Reality (AR) app. Point your device at the model to see interactive animations.

Your browser does not support the video tag.

Video 1: An overview of the UGEARS STEM Lab series, demonstrating assembly and functionality of various models, including the gearbox.

5. OPERATING THE MODEL

The UGEARS STEM Gearbox model is a functional miniature of a car transmission system. It features one reverse gear and three forward gears.

Operating Instructions:

- **Shifting Gears:** Use the gear lever on the top of the model to select between Reverse (R), Neutral (N), First (I), Second (II), and Third (III) gears. Move the lever smoothly to engage the desired gear.
- **Activating Movement:** Rotate the large knob on the side of the model. This action simulates the engine's crankshaft, transferring torque through the gearbox. Observe how the layshaft and gears rotate at increasing speeds depending on the selected gear.
- **Observing Mechanism:** The open design allows you to clearly see how the internal gears mesh and transfer power, illustrating the mechanical principles of a real gearbox.

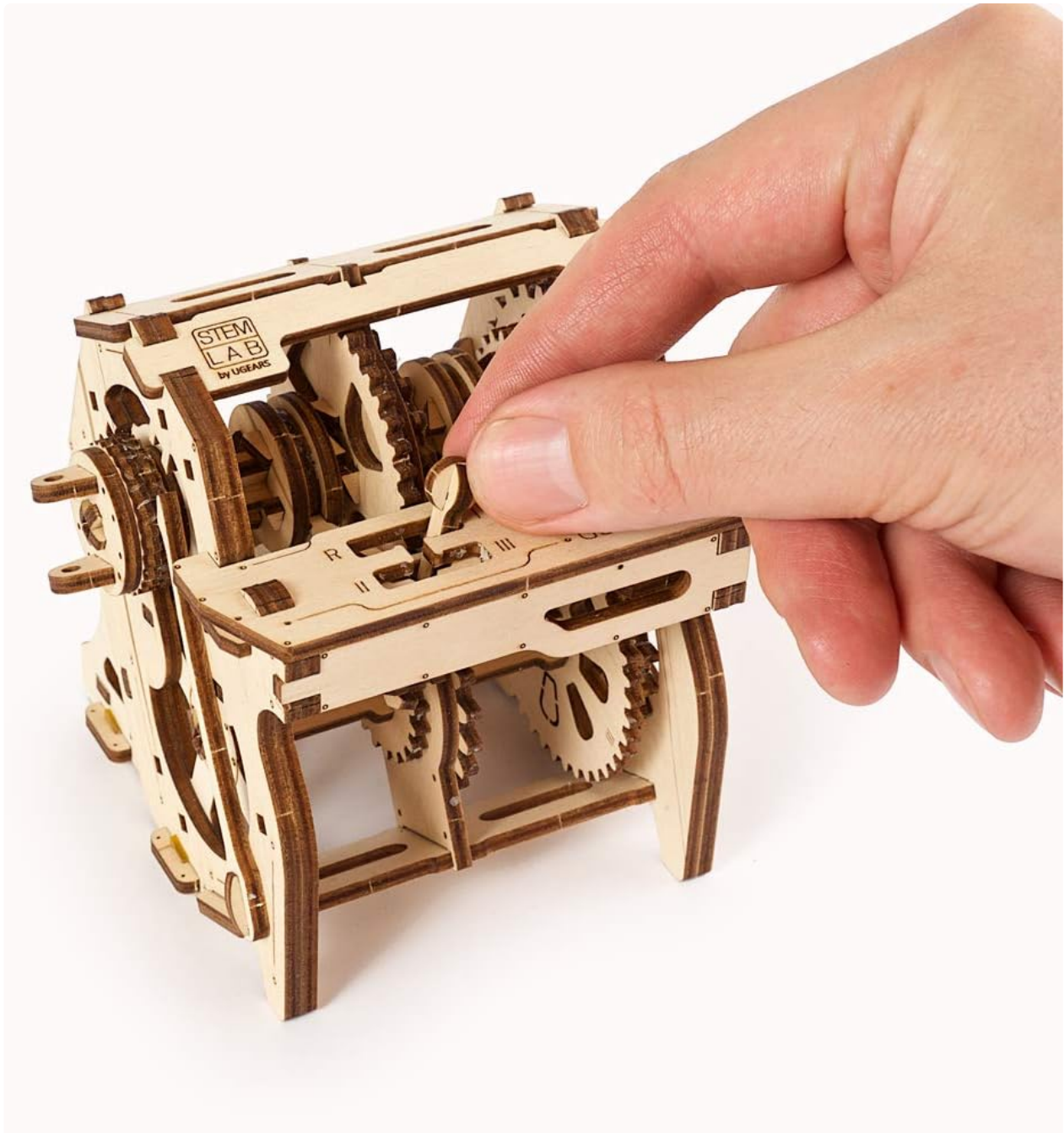


Figure 3: Shifting gears on the UGEARS STEM Gearbox model.

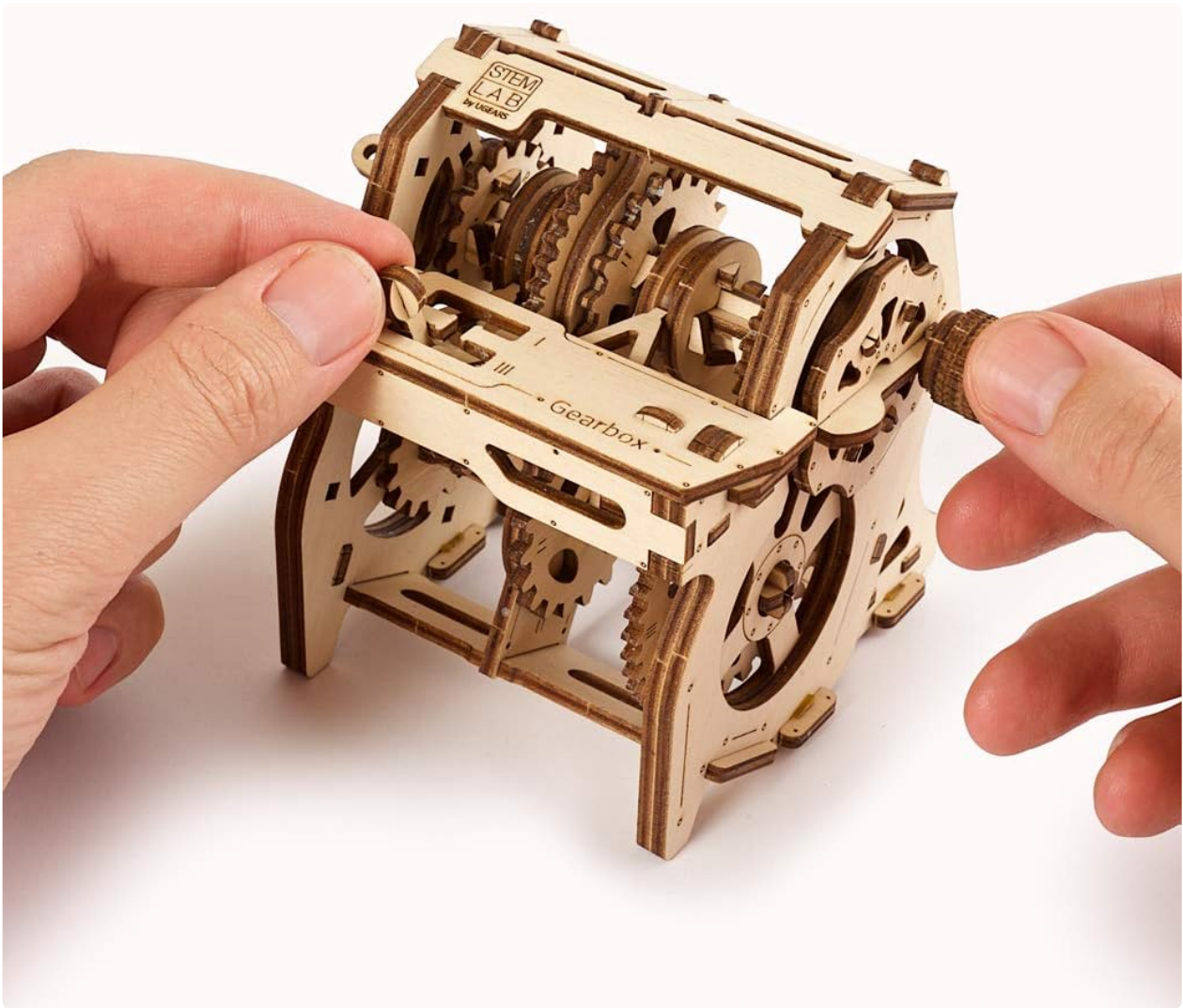


Figure 4: Activating the gearbox mechanism by rotating the side knob.

6. MAINTENANCE

To ensure the longevity and smooth operation of your UGEARS STEM Gearbox model, follow these maintenance guidelines:

- **Cleaning:** Dust the model regularly with a soft, dry cloth or a soft brush. Avoid using water or cleaning solutions, as they can damage the wood.
- **Lubrication:** If any moving parts become stiff, apply a small amount of paraffin wax to the contact points. Do not use oil or grease.
- **Storage:** Store the model in a dry environment at room temperature. Avoid extreme humidity or temperature fluctuations, which can cause the wood to warp or crack.
- **Handling:** Handle the model gently to prevent accidental breakage of delicate parts.

7. TROUBLESHOOTING

If you encounter issues with your UGEARS STEM Gearbox model, consider the following common solutions:

Problem	Possible Cause	Solution
Gears are stiff or do not rotate smoothly.	Friction between parts; parts not fully engaged.	Apply paraffin wax to gear teeth and axle points. Ensure all parts are pressed firmly into place as per instructions.
Gear lever does not move freely between positions.	Misaligned parts or excessive friction.	Check the assembly of the gear shifting mechanism. Apply paraffin wax to the sliding surfaces.
Parts break during assembly.	Excessive force applied; part removed incorrectly.	Always remove parts gently. If a part breaks, contact UGEARS support for replacement options.

8. SPECIFICATIONS

Feature	Detail
Brand Name	UGEARS
Model Number	70131
Material Type	Wood
Number of Pieces	120
Item Weight	408 Grams
Item Dimensions (L x W x H)	7.87 x 2.36 x 0.04 inches (assembled)
Recommended Age Range	8 years and up (Kid, Adult)
Educational Objective	Build, design, learn mechanical principles
Skill Level	Beginner
Power Source	Manual

9. WARRANTY

For detailed information regarding product warranty, please refer to the official UGEARS website or the warranty documentation included with your purchase. Warranty terms and conditions may vary by region and retailer.

10. SUPPORT

Should you require further assistance with assembly, operation, or have any questions about your UGEARS STEM Gearbox Model Kit, please utilize the following resources:

- **Official UGEARS Website:** Visit ugearsmodels.com for FAQs, assembly videos, and contact information.
- **Augmented Reality (AR) App:** The UGEARS AR app provides interactive 3D instructions and demonstrations.

- **Included Documentation:** Refer to the Pocket Model Study Guide and Detailed Color Instruction Manual for comprehensive information.