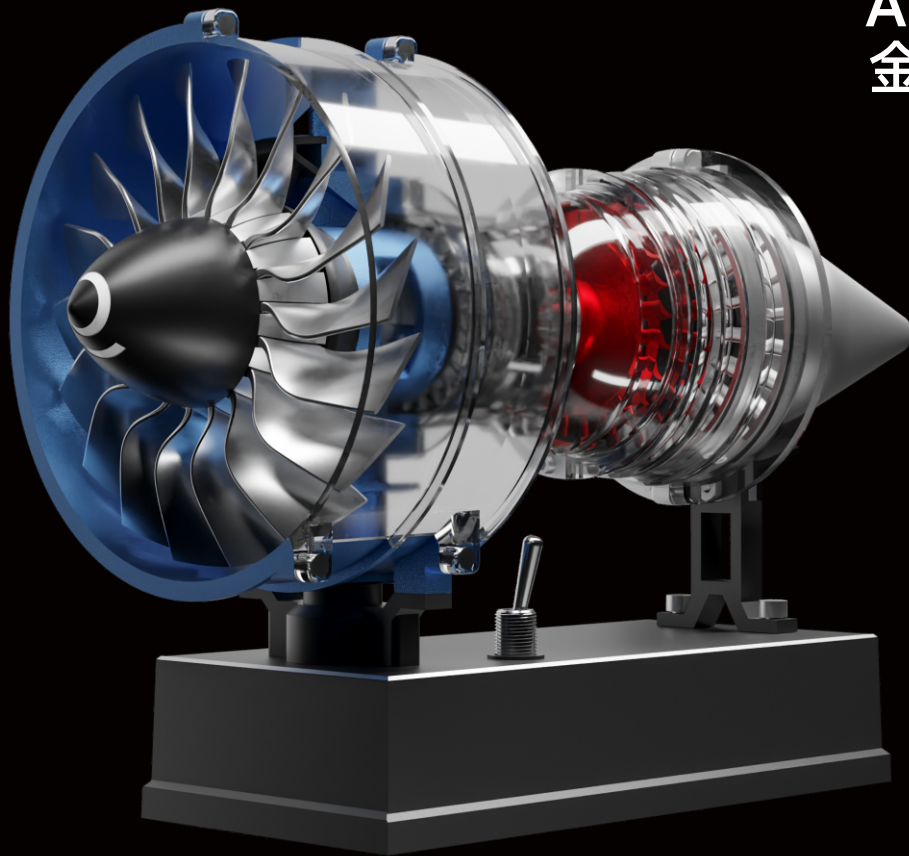




Metal Machine Assembly Model 金属机器 组装模型



Degree of Difficulty: ★★☆☆☆

Model: DM122

难度系数: ★★☆☆☆

型号: DM122

Mini Turbofan Engine 迷你涡扇发动机

Real Models Real Worlds

真模型 真世界

产品基本信息

一. 产品参数

产品名称: 迷你涡扇发动机

产品型号: DM122

主要材质: 阳极氧化铝+不锈钢+锌合金

充电电压: 直流5V

电池容量: 450mAh

组装难度: II级

产品标准: GB/T9254-2008

GB/T17626.2-2006

质检等级: A

二. 产品介绍

- ◆ 土星工匠师系列产品为金属机构组装模型。主要材料选用铝合金表面阳极氧化, 产品结构采用真实的工业结构;
- ◆ 使用各种工具组装零件, 安装工序及方法接近实际工业要求;
- ◆ 该系列产品主要用来提高用户的动手能力、专注力, 培养严谨讲秩序的习惯;
- ◆ 认识各种工业机器, 学习各种工业结构, 提高用户的探究及创新力。

三. 组装要求

- ◆ 组装前要仔细阅读《标准件组装基础知识》, 学会基本的标准件组装方法和工具使用;
- ◆ 要求组装时桌面整洁, 防止丢失零件或错装。组装严谨有序, 看图仔细, 避免组装错误;
- ◆ 注意说明书中的提示语, 注意零件的安装方向, 防止理解错误。注意检测环节的要求;
- ◆ 摩擦部位尽量使用润滑油, 防止运转时卡死。紧固螺钉必须安装到底, 防止零件松动;
- ◆ 组装完成后要调试装配间隙及松紧度, 有疑问可查询本公司相关网站或微信公众号;
- ◆ 鼓励在成人看护及确保安全的情况下, 使用锉刀、砂纸等简单去材料工具, 优化零件;
- ◆ 鼓励用户在没有安全隐患的情况下, 将模型进行零部件修改或总体改

装，及早具备改装能力；

- ◆ 说明书后面附零件表，用户可根据列表拆散模型并重新装入盒中；
- ◆ 如果零件有丢失，可向我公司咨询或采购（土星官方网店）；
- ◆ 模型结构可能持续优化，如有说明书内容与实物不符，请参考公司最新组装资讯；
- ◆ 本产品长期不使用可能会造成电池失效、润滑油干枯、产品间隙沉积灰尘等造成产品无法运行的，请更换电池或拆解零件进行清洗。

注意事项

一. 安全须知

- ◆ 请仔细阅读本手册中的内容，以确保您能够正确且安全的使用本产品；
- ◆ 该系列产品为工业级别金属机构模型，因此组装和使用该模型需要一定的安全意识，提高安全意识也是该模型的作用之一；
- ◆ 本模型适合14岁及以上用户使用，相关安全事项请仔细阅读本说明书提示；
- ◆ 严禁让儿童或宠物吞咬本产品或其备件，以免造其伤害；
- ◆ 合理使用组装工具，严格按说明书组装零件，避免强装硬拆，防止划伤。严禁工具或零件尖角部位离眼睛太近，以免挫伤身体；
- ◆ 本模型主要由金属零件组成，具有一定的硬度和重量，请妥善放置，避免产品及配件受到强烈冲击和震动，以免砸伤身体或损坏本产品；

- ◆ 机械运动时，请不要将手指或身体其它部位放入零件运动范围内，避免压伤；
- ◆ 电线接头须按说明书指示标记连接，避免错接引起电路短路或失灵；
- ◆ 电池充放电及放置方法请按要求进行，电池停用3个月以上建议更换电池；
- ◆ 请勿以任何形式强行阻碍零件运转，如需关闭请直接关闭电源即可；
- ◆ 如对模型进行改装，请留意相关零件参数，避免使用大功率电器动力零部件或装置，导致意外；
- ◆ 请按说明书正确使用本产品的零部件，切勿做其它用途。

二. 电池和充电注意事项

- ◆ 本产品配备专用充电线。用户自备电源适配器，其输出DC电压需5V，其输出DC电流不小于1000mA。禁止使用高于6V的适配器给产品充电；
- ◆ 充电前请确保触点干燥，无脏污。产品不使用或维修拆机时请不要充电；
- ◆ 不可将电池投入火中，也不能将其暴露在诸如日照、火烤或类似过热的环境中，以免电池漏液、过热、爆裂或起火；
- ◆ 如果电池更换不当会有爆炸危险，只能用同样类型或等效型电池来更换；
- ◆ 本产品配备的锂电池，严禁拆卸、挤压、加热或燃烧电池，严禁使用尖锐物、螺钉刀等触碰、撬电池，以上操作可能会引起电池起火

或燃烧；

- ◆ 如果电池在使用、充电或保存过程中有温度过高、变色、起鼓、漏液等异常现象，请停止使用并更换新电池，以免造成安全问题；
- ◆ 充电时，由于电池温度会升高，请不要将电池和易燃物放在一起（如：床头、衣物、书本等），以免引发火灾；
- ◆ 请勿在高温、潮湿等环境中充电，温度以0至35摄氏度为宜，湿度应在65%以下，产品设计使用最高环境温度为45摄氏度；
- ◆ 为减少儿童触电危险，请在家长或其他监护人的指导下操作。

三. 产品声明

- ◆ 使用本产品前，请您仔细阅读并遵守本手册中的各种说明及警示。对于不正确使用或不遵守本产品相关说明使用所造成的后果，本公司概不负责；
- ◆ 本产品适合于14岁及以上用户使用。因使用本产品用户年龄偏小或将产品给对本产品相关安全要求不熟悉者使用，造成的安全问题本公司概不负责；
- ◆ 本产品是工业机构模型，仅作为学习和体验使用。不得将产品作为其它用途使用，否则本公司不承担任何责任；
- ◆ 本公司在不断提高、完善产品的设计和使用功能，如说明书所载内容与实际产品的内容略有不同，恕无法另行通知，敬请见谅。因此任何以本说明书的数据、图片或文字描述为依据的索赔要求将不予受理；

- ◆ 本着不断完善，持续发展的原则，本公司保留在不预先通知的情况下，对本手册中描述的任何产品细节进行修改和改进的权利；
- ◆ 产品说明书中的图片用于指导用户操作，仅供参考，具体请以实物为准；
- ◆ 在使用法律允许的最大限度内，在任何情况下，本公司与其供应商均不对任何特殊、偶然、附带、或间接损失承担责任，无论该损失由何种原因引起；
- ◆ 本手册中含有重要信息，请保留备用。

- ◆ Users are encouraged to perform part modification or overall modification of model without potential safety hazard so as to develop modification capability as soon as possible;
- ◆ The user may disassemble this model and put it in the package again according to the parts list attached hereto;
- ◆ If any part is lost, please inquire of or purchase it from us (Teching official online store);
- ◆ The model structure is subject to continual improvement. If the real object differs from the instruction manual, please refer to our latest assembly information.
- ◆ Once the product fails to function due to battery failure, lubricating oil shortage or dust accumulation in product gaps because it is left unused for long, it's advisable to change the battery or disassemble and clean its parts.

Precautions

I. Safety Instruction

- ◆ Please read this manual carefully so that you are in a position to use this product correctly and safely;
- ◆ This series of products are industrial-level metal models, so its assembly and use requires certain safety awareness; improvement of safety awareness is also a function of the model;
- ◆ This model is suitable for users aged 14 and over. Please read this manual carefully for relevant safety information;
- ◆ Strictly prohibit children or pets swallowing or biting this product or its spare parts, since this may cause injury/damage;
- ◆ Use assembly tools rationally, assemble the parts in strict conformity with the instruction manual, and avoid forcible handling to avoid scratches; keep sharp points of tools or parts away from the eyes to avoid contusions;

- ◆ This model is made up of metallic parts mainly, and has a certain level of hardness and a certain weight; please place it properly to avoid bodily injuries; Protect the products and accessories against intense shock and vibration so as to avoid personal injury and product damage;
- ◆ During mechanical movement, do not put a finger or any other part of the body within the movement range to avoid contusions;
- ◆ Wire connectors must be connected according to the marks specified in the instruction manual to avoid short-circuit or failure arising from wrong connection;
- ◆ Charge, discharge and place the battery as required; it is advised to replace the battery when it has not been used for 3 months or more;
- ◆ Do not prevent any part from running forcibly in any form; to do this, turn off the power directly;
- ◆ To refit this model, please pay attention to the relevant part parameters, and avoid using any high-power electric part or device that may result in an accident.
- ◆ Please use parts of this product properly as per instruction manual. Don't use them for other purposes.

II. Battery and charging precautions

- ◆ This product is delivered with dedicated charging cable. Users shall use their own power adapters; output DC voltage: 5V; output DC current $\geq 1000\text{mA}$;
- ◆ Please make sure the contact is dry and free of dirt before charging. Please don't charge the battery if the product is not in use or is in repair;
- ◆ Don't put the battery in fire or have it exposed to sunlight, fire or similar excessively hot environment, since this may lead to leakage, excessively high temperature, bursting or ignition of battery;
- ◆ If improper change of battery may cause explosion, the battery must be replaced with one of identical or equivalent type;

General information about product

I. Product Data

Product name: Mini Turbofan Engine

Product model: DM 122

Main materials: Anodic aluminum oxide + stainless steel + zinc alloy

Charging voltage: DC 5V

Battery capacity: 450mAh

Assembly difficulty: Level II

Product standards: GB/T9254-2008

GB/T17626.2-2006

II. Product description

- ◆ Teaching Craftsman series of products are metal structure assembly models. Its primary material is aluminum alloy with anodized surface, and the product structure is a real industrial structure;
- ◆ Assemble parts using various tools with the installation procedures and methods substantially compliant with practical industrial requirements;
- ◆ This series of products are principally designed to improve users' hands-on ability and concentration, and to develop habits of "preciseness and stress on discipline";
- ◆ Learn about various industrial machines, and study various industrial structures to improve user's capability of research and innovation.

III. Assembly Requirements

- ◆ Be sure to read the Basics of Standard Parts Assembly carefully to master basic standard parts assembly procedure and the usage of tools before assembly;
- ◆ The table shall be kept tidy and clean during assembly to prevent parts being lost or incorrectly assembled. Assemble parts in a rigorous and orderly fashion, view the diagrams carefully, and avoid incorrect assembly;
- ◆ Pay attention to the prompt text in instruction manual, carefully view the part installation orientation, and avoid incorrect comprehension. Pay attention to the requirements on testing;
- ◆ Lubricating oil shall be applied to friction areas to the greatest extent to prevent jamming during operation. Fastening screws must be thoroughly mounted to prevent looseness of parts;
- ◆ If you have any doubt when adjusting any assembly clearance or tightness after the completion of assembly, please refer to our website or WeChat public account;
- ◆ Users are encouraged to optimize the parts using material removing tools like files and sand paper with adult care where the personal safety is guaranteed;

- ◆ Never disassemble, squeeze, heat and set fire to the lithium battery delivered with this product, and never touch and pry the battery using any sharp object or screwdriver, etc., since this may cause the battery to ignite or burn;
- ◆ In the case of excessively high temperature, discoloration, bulging, leakage and other anomalies during the use, charging or keeping of battery, please take it out of service and change it with a new one to avoid safety problem;
- ◆ Since the battery temperature rises when it's being charged, please don't have the battery to come into contact with inflammables (e.g. bedside, clothing and books, etc.) since this may result in a fire;
- ◆ Please don't charge the battery in a moist space with high temperature; the temperature is recommended to be 0~35° C, and the humidity shall not exceed 65%; the design max. ambient temperature for using the product is 45° C;
- ◆ To alleviate the risk of electric shock, children are not allowed to use the product without the help of their parents or other custodians.

III. Product Declaration

- ◆ Please carefully read and observe various instructions and warnings in this manual before using this product. Our company shall not be held responsible for any consequence of failure to properly use this product or observe related operating instructions;
- ◆ This product is suitable for users aged 14 and over. Our company shall not be held responsible for any safety problem arising from the use of this product by too young users or users who are not familiar with relevant safety requirements;
- ◆ As a model in industrial structure, this product is designed exclusively for learning and experience. Do not use this product for other purposes; otherwise, we will assume no responsibility for any consequence thereof;

- ◆ We have been improving the design and operation features of our product, so separate notice will not be given for slight difference between instruction manual and actual product. Hence, any claim for compensation filed based on the data, pictures or text of this instruction manual will be rejected;
- ◆ For constant improvement and sustainable development, our company reserves the right to modify and improve any product detail given in this manual without prior notice;
- ◆ The pictures in instruction manual guide users for operation, and are thus for indication only; the real product shall prevail;
- ◆ Our company and its suppliers shall not be held responsible for any special, incidental, collateral or indirect loss in any case to the greatest extent the law permits, regardless of its cause;
- ◆ Please keep this manual properly since it contains important information.

CATALOG

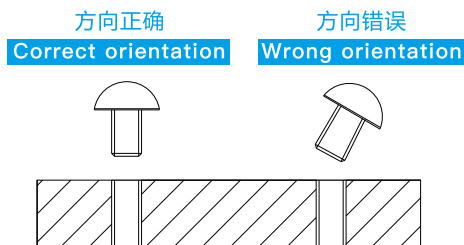
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• 1.底座总成 Base Assembly	001
• 2.风扇总成 Fan Assembly	005
• 3.前支撑机匣总成 Front Support Casing Assembly	007
• 4.组装风扇总成与前支撑总成 Assemble the Fan Assembly and the Front Support Assembly	010
• 5.高压机匣燃烧室总成 High - Pressure Casing Combustor Assembly	012
• 6.涡轮机匣总成 Turbine Casing Assembly	019
• 7.组装高压机匣与涡轮机匣总成 Assemble the High-Pressure Casing and Turbine Casing Assembly	024
• 8.组装前支撑机匣总成与高压机匣总成 Assemble the Front Support Casing Assembly and the High-Pressure Casing Assembly	025
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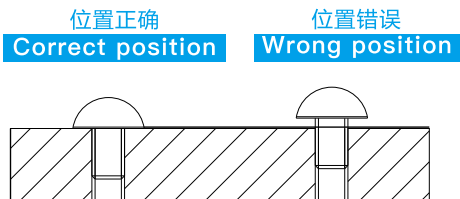
标准件组装基础知识 Basic knowledge of standard parts assembly

1、螺丝安装 Screw installation

(1) 螺丝安装方向 Screw installation direction

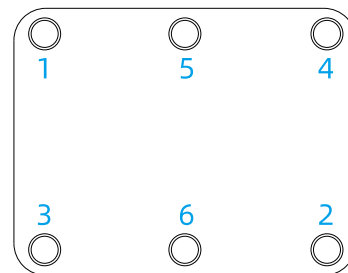


(2) 螺丝拧紧深度 Screw tightening depth

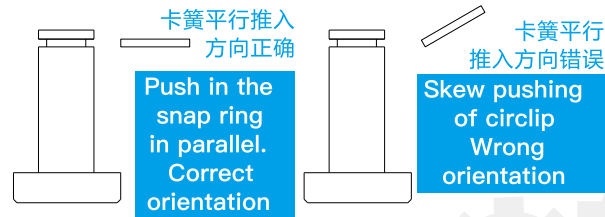


(3) 螺丝安装顺序 Screw installation sequence

按照编号顺序, 对角安装螺丝
Mount the screws diagonally
in order of number



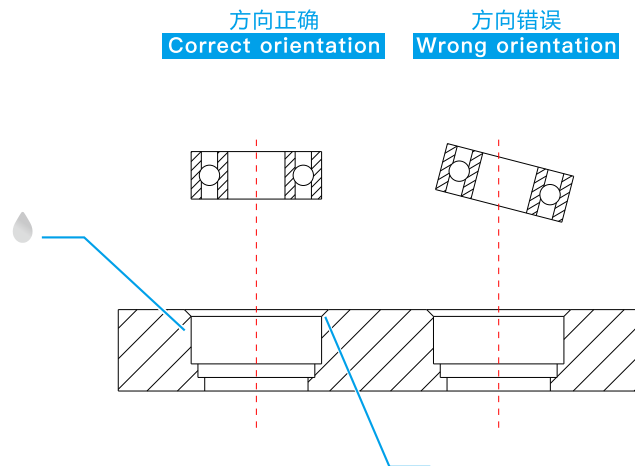
2、卡簧安装方法 Circlip installation method



3、轴承安装 Bearing installation

(1) 轴承装入轴承座孔

Insert the bearing into the bearing housing

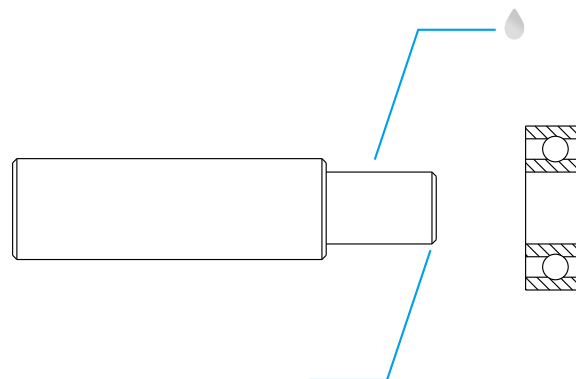


检查轴承座孔倒角及毛刺；
在轴承座孔侧面加少量润
滑油；将轴承对直装入到
底，施压部位为轴承外圈。

Check the orifice of bearing block for chamfer and burr; apply a little lubricating oil onto side face of shaft installation point; align the bearing and mount it to the final position; pressure is applied to the outer race of bearing.

(2) 轴承装入轴

Bearing into the shaft



Check the shaft end for chamfer and burr; apply a little lubricating oil onto side face of shaft installation point; align the bearing and mount it to the final position; pressure is applied to the inner race of bearing.

检查轴端倒角及毛刺；
在轴安装部位侧面加
量润滑油；将轴承对
直装入到底，施压部
位为轴承内圈。

重要提示：组装前，先找到瓶装润滑油，务必在所有润滑油标识处涂上足够的润滑油，否则机器容易卡死。

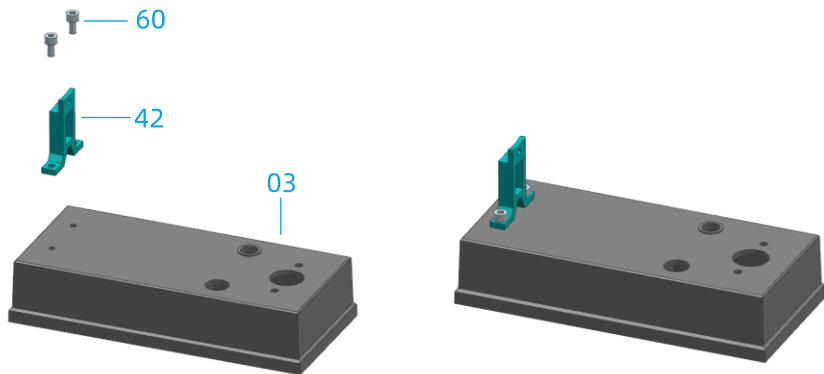
Important note: before assembly, find the bottled grease first, and be sure to apply enough grease on all grease marks, otherwise the machine is easy to get stuck.



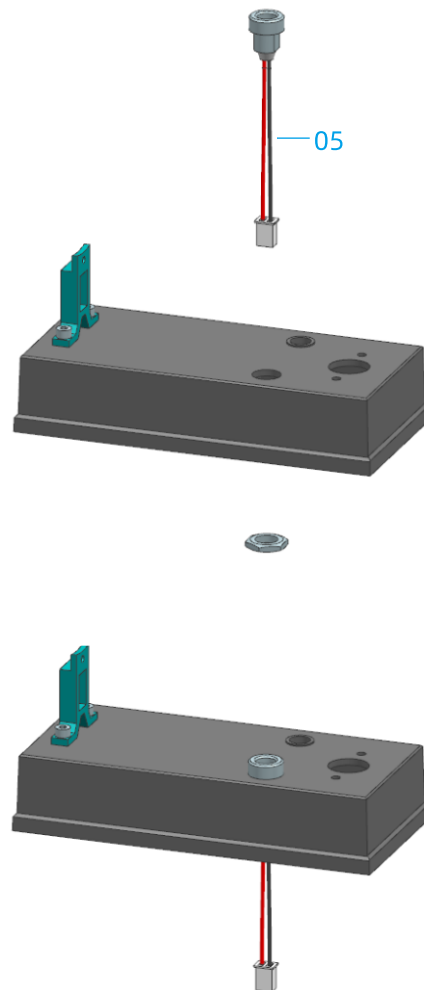
加润滑油的位置标识
Location identification
of grease

1. 底座总成 Base Assembly

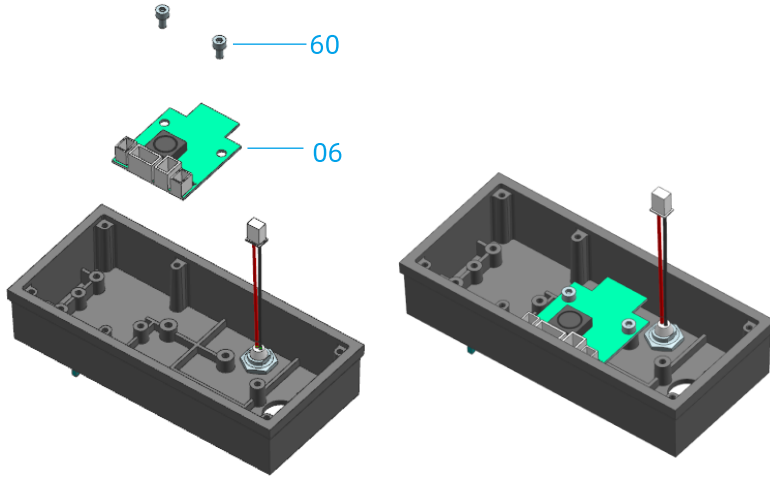
1.1 组装支架 Assemble the Bracket



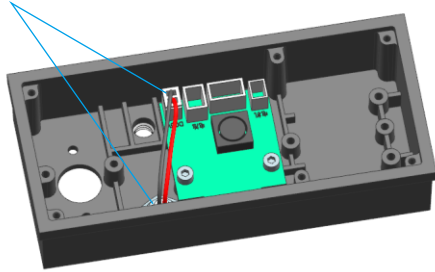
1.2 组装充电口 Assemble the Charging Port



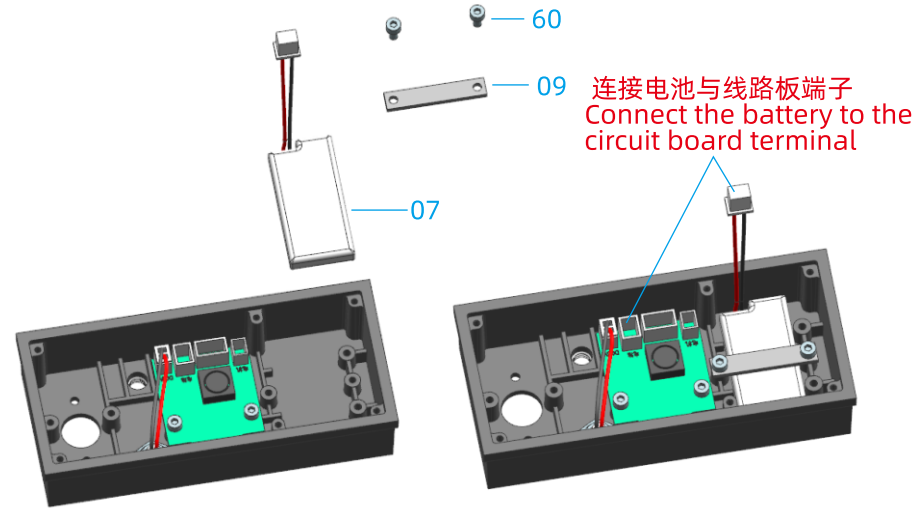
1.3 组装线路板 Assemble the Circuit Board



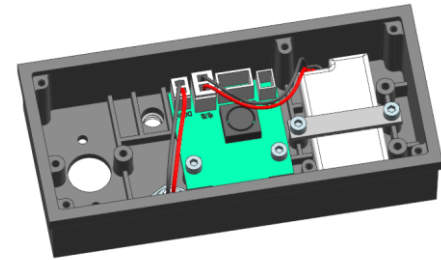
连接充电口与线路板端子
Connect the charging port to the circuit board terminal



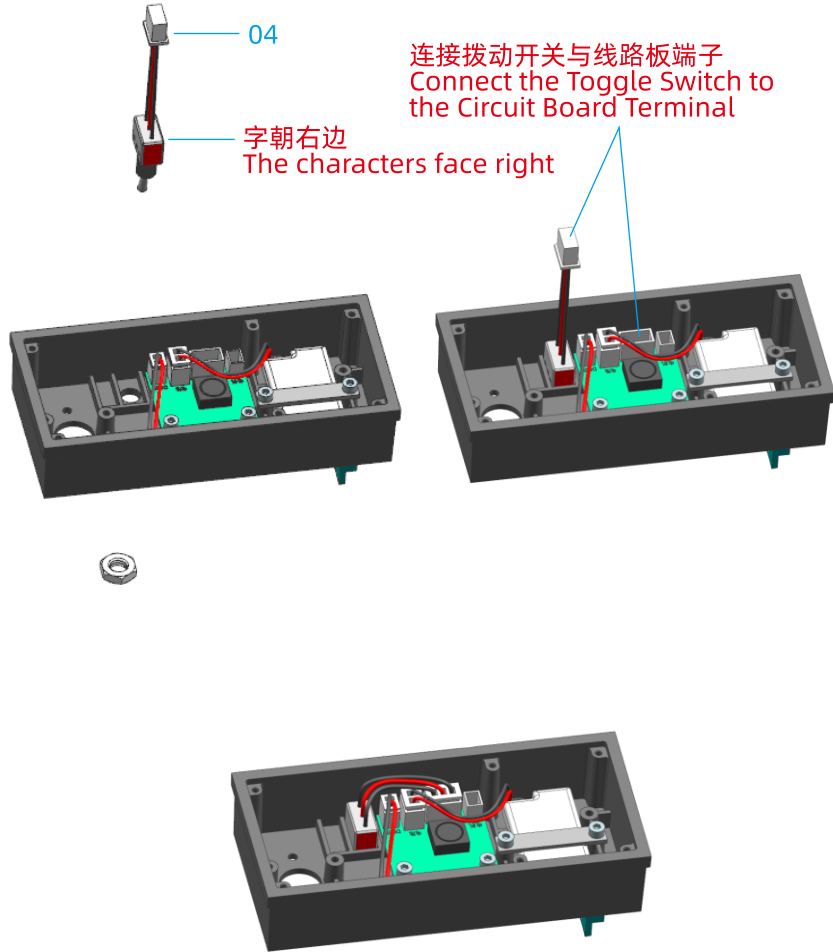
1.4 组装电池 Assemble the Battery



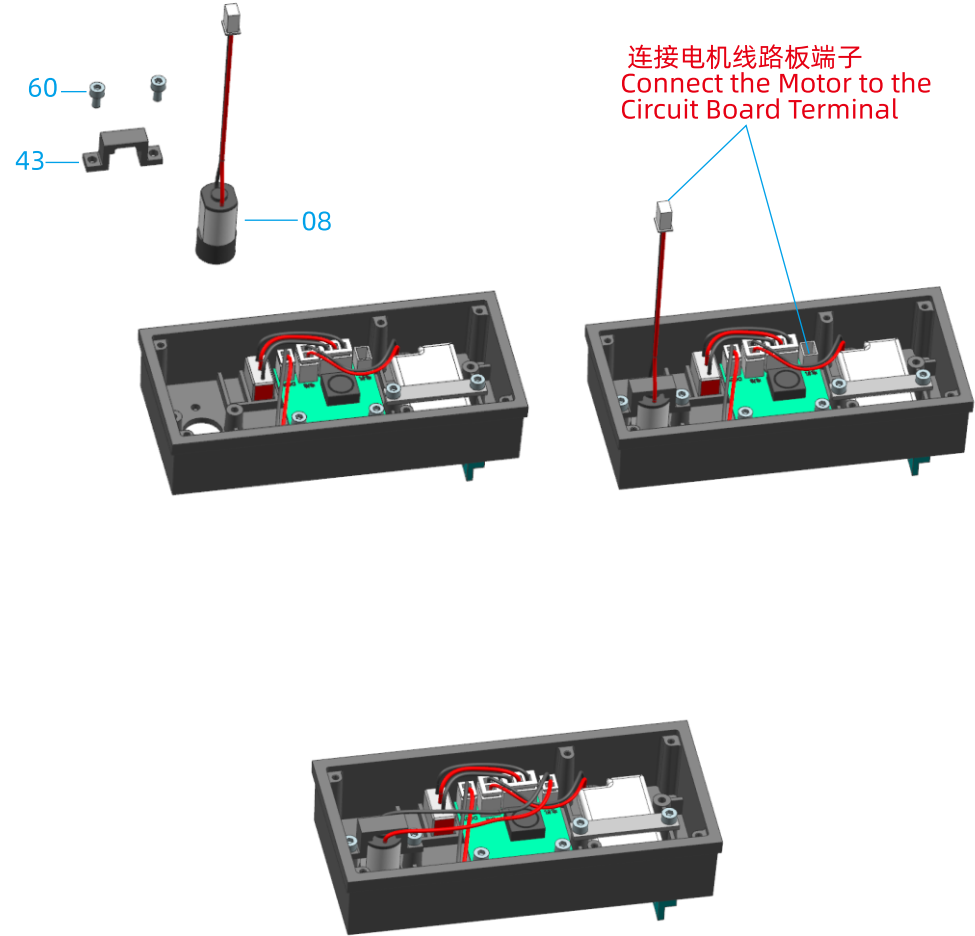
连接电池与线路板端子
Connect the battery to the circuit board terminal



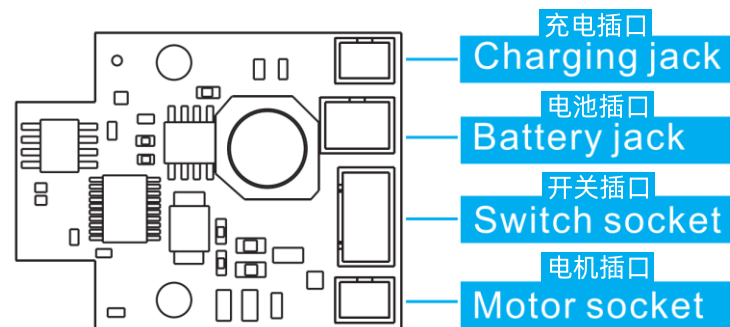
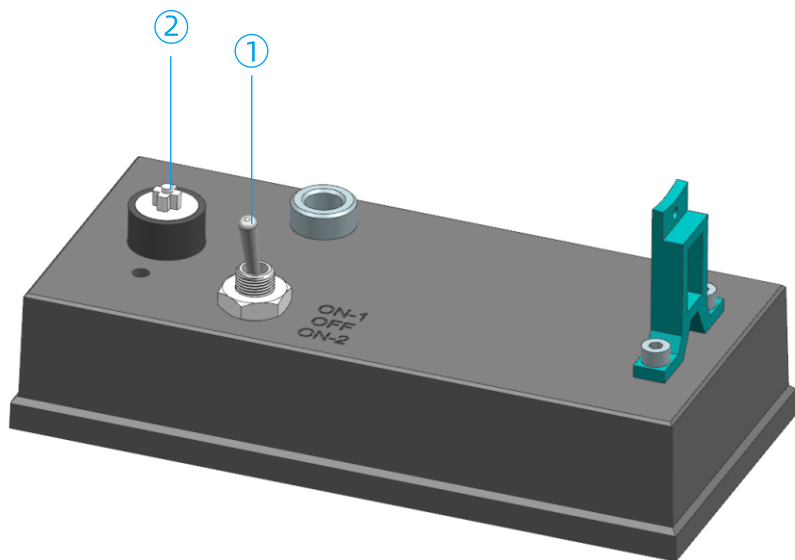
1.5 组装拨动开关 Assemble the Toggle Switch



1.6 组装电机 Assemble the Motor



测试 Testing

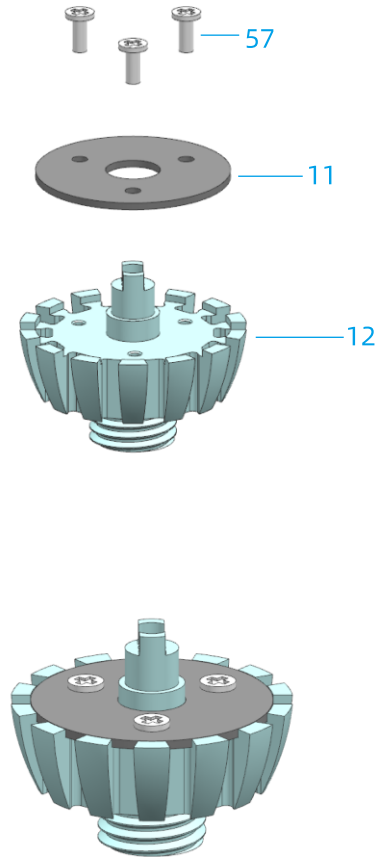


电路板标识图
Circuit board
identification diagram

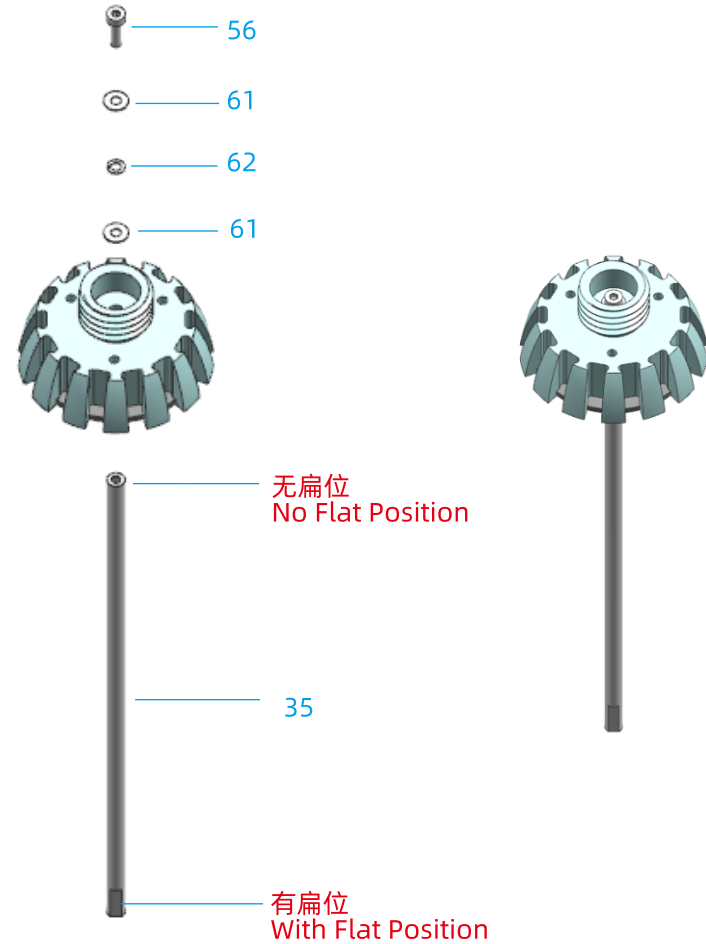
- 1、往前推开关（ON-1，电池供电），往后推开关（ON-2,电源供电）
- 2、观察电机是否正常转动
- 1、Push the switch forward (ON - 1, battery powered) and push the switch backward (ON - 2, power supply powered).
- 2、Observe whether the motor rotates normally.

2. 风扇总成 Fan assembly

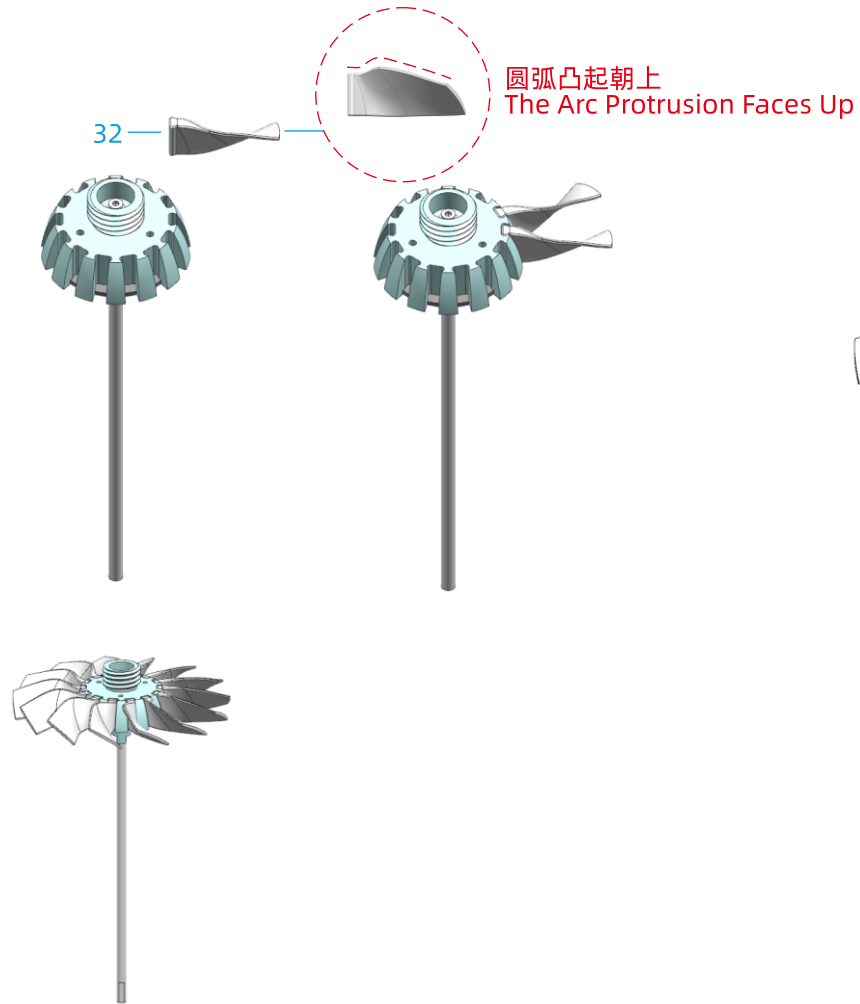
2.1 组装风扇封板 Assemble the Fan Cover Plate



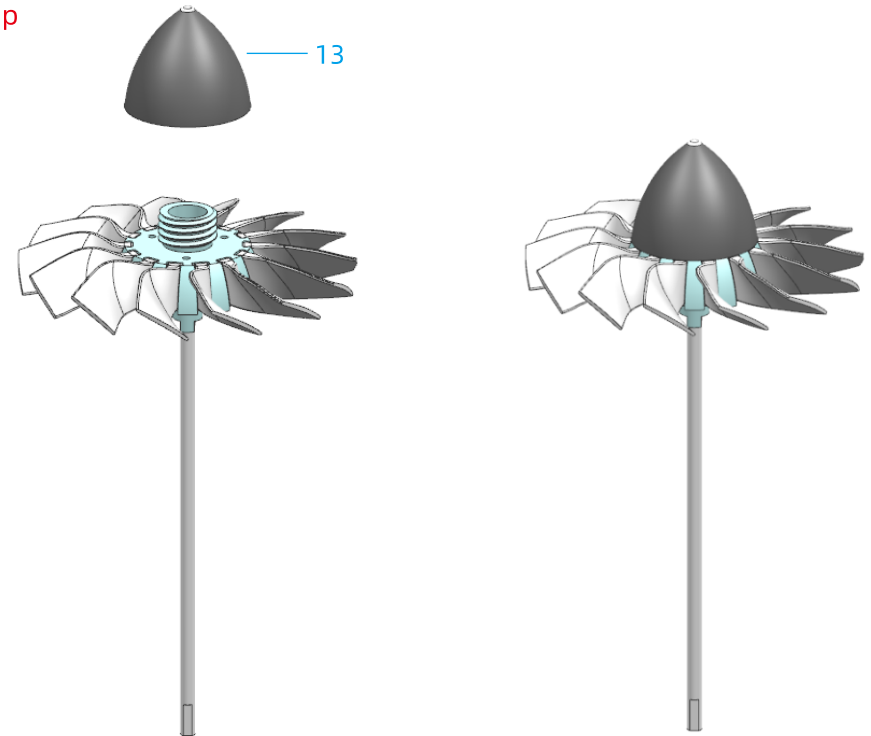
2.2 组装中心轴 Assemble the Central Shaft



2.3 组装风扇叶 Assemble the Fan Blades

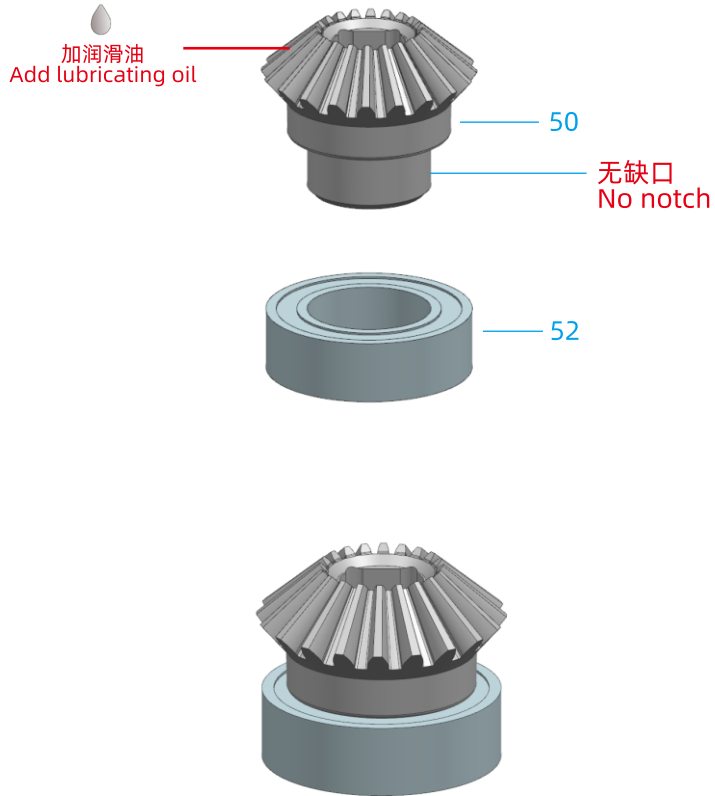


2.4 组装进气锥 Assemble the Air Intake Cone

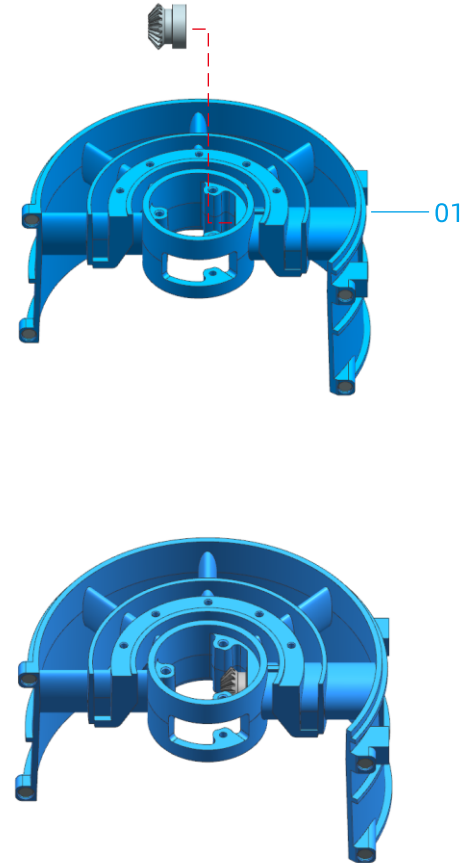


3.前支撑机匣总成 Front Support Casing Assembly

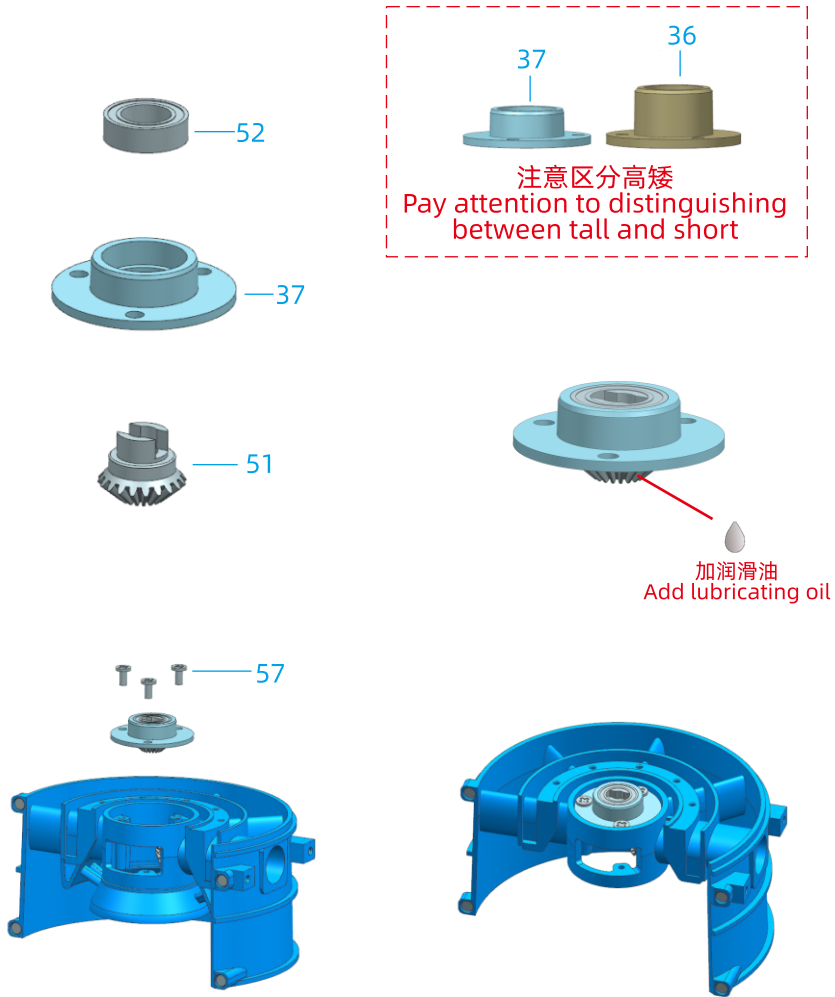
3.1 组装锥齿轮轴承 Assemble the Bevel Gear Bearing



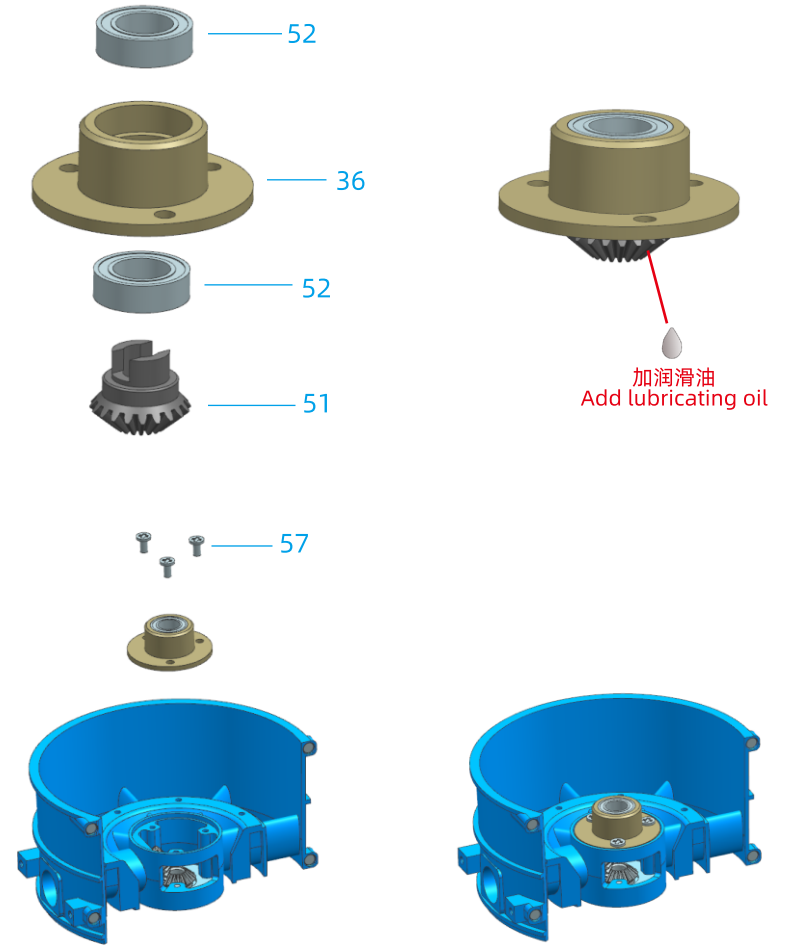
3.2 组装传动锥齿轮组 Assemble the Drive Bevel Gear Set



3.3 组装锥齿盖组 Assemble the bevel gear cover assembly

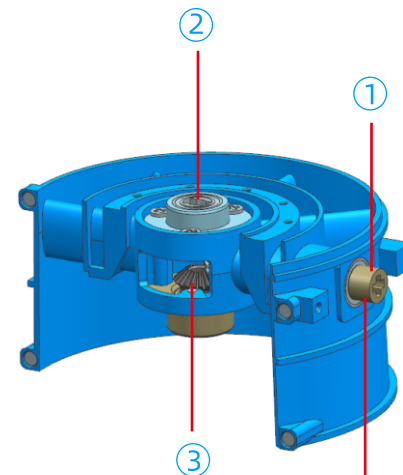
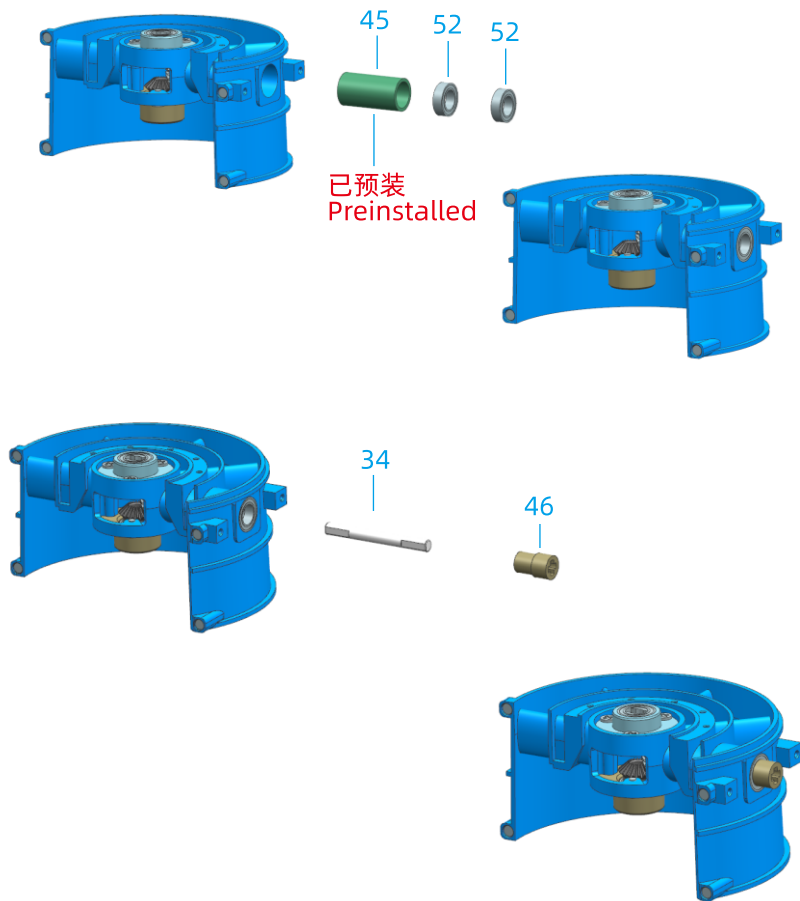


3.4 组装轴承座组 Assemble the bearing housing assembly



3.5 组装传动轴与电机转接头 Assemble the drive shaft and motor adapter

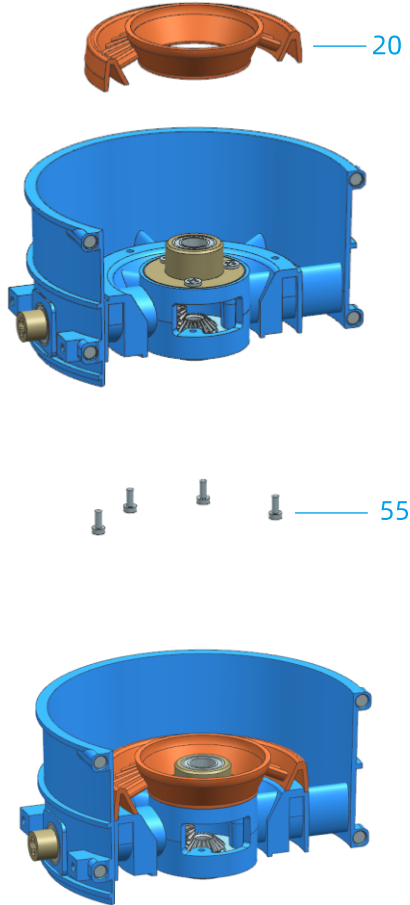
3.5.1 测试 Testing



测试完之后建议把52/24/46取下来，方便后续组装
It is recommended to take down 52/24/46 after the test to facilitate subsequent assembly

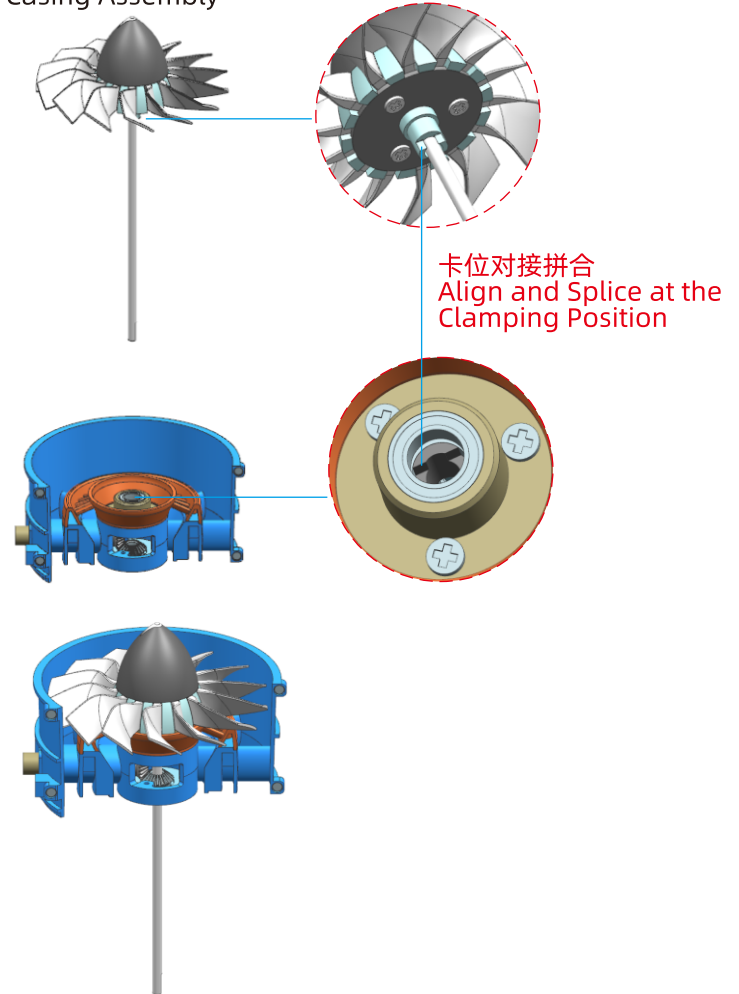
- 1、转动电机连接头
 - 2、观察锥齿盖组是否顺畅转动
 - 3、观察轴承座组是否顺畅转动
- 1 □ Rotate the motor connector
- 2、Observe whether the bevel gear cover assembly rotates smoothly
- 3、Observe whether the bearing housing assembly rotates smoothly

3.6 组装低压静子 Assemble the Low-Pressure Stator

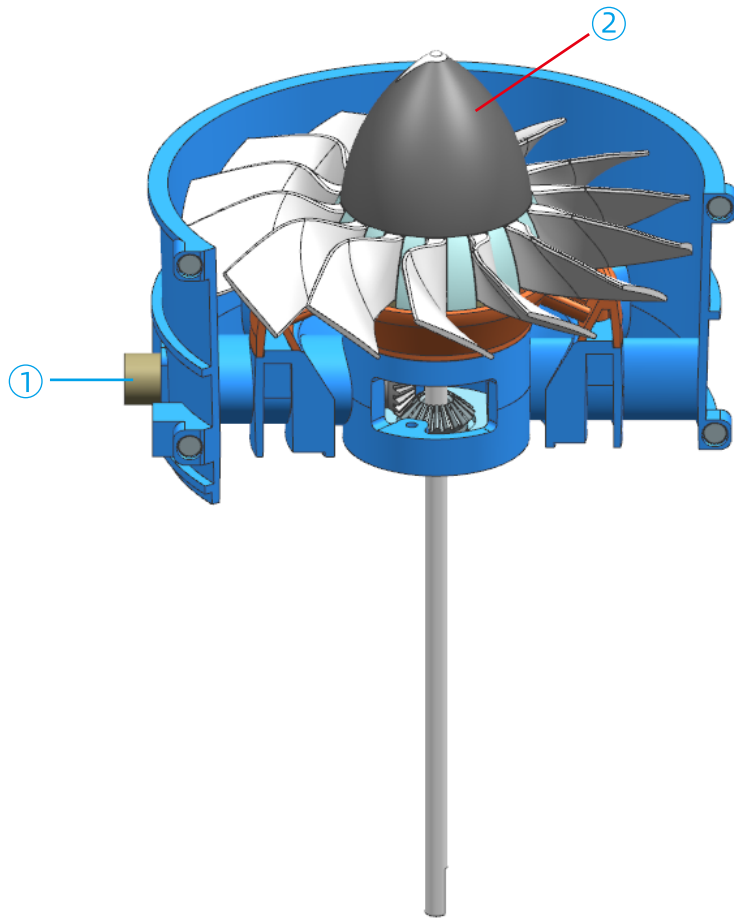


4. 组装风扇总成与前支撑总成 Assemble the Fan Assembly and the Front Support Assembly

4.1 组装风扇总成与前支撑机匣总成 Assemble the Fan Assembly and the Front Support Casing Assembly



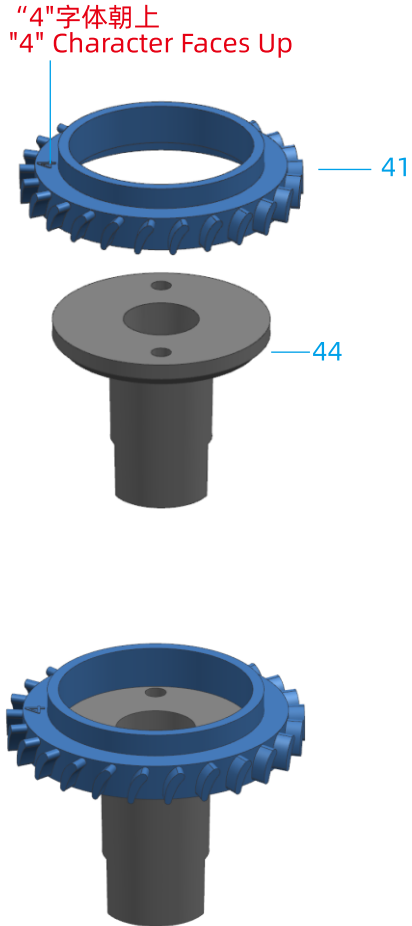
测试 Testing



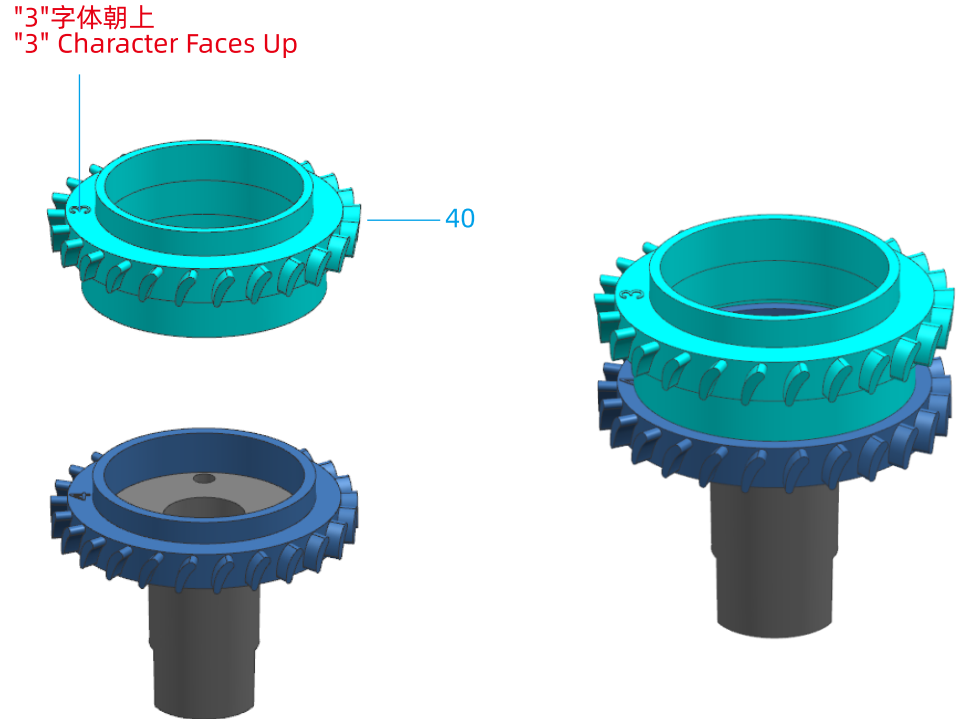
- 1、旋转电机转接头
- 2、观察风扇总成能否顺畅转动
- 1、Rotate the motor adapter
- 2、Observe whether the fan assembly can rotate smoothly

5. 高压机匣燃烧室总成 High-Pressure Casing Compressor Assembly

5.1 组装四级高压转子 Assemble the Fourth Stage High-Pressure Compressor Rotor

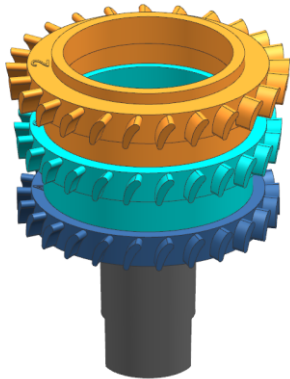
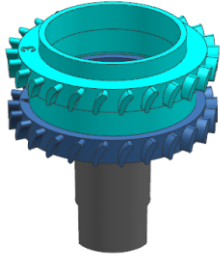


5.2 组装三级高压转子 Assemble the Third Stage High-Pressure Compressor Rotor

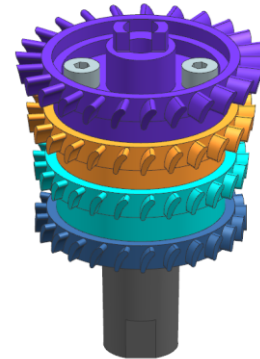
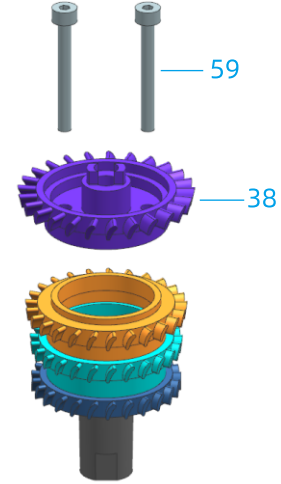


5.3 组装二级高压转子 Assemble the Second Stage High-Pressure Compressor Rotor

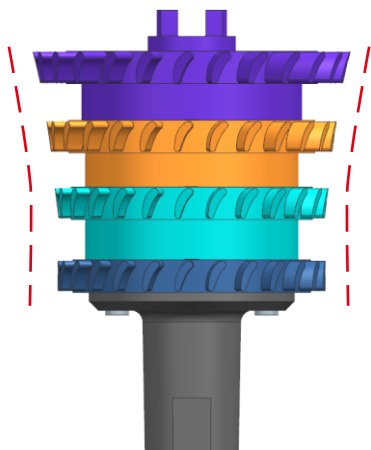
"2"字体朝上
"2" Character Faces Up



5.4 组装一级高压转子 Assemble the First Stage High-Pressure Rotor

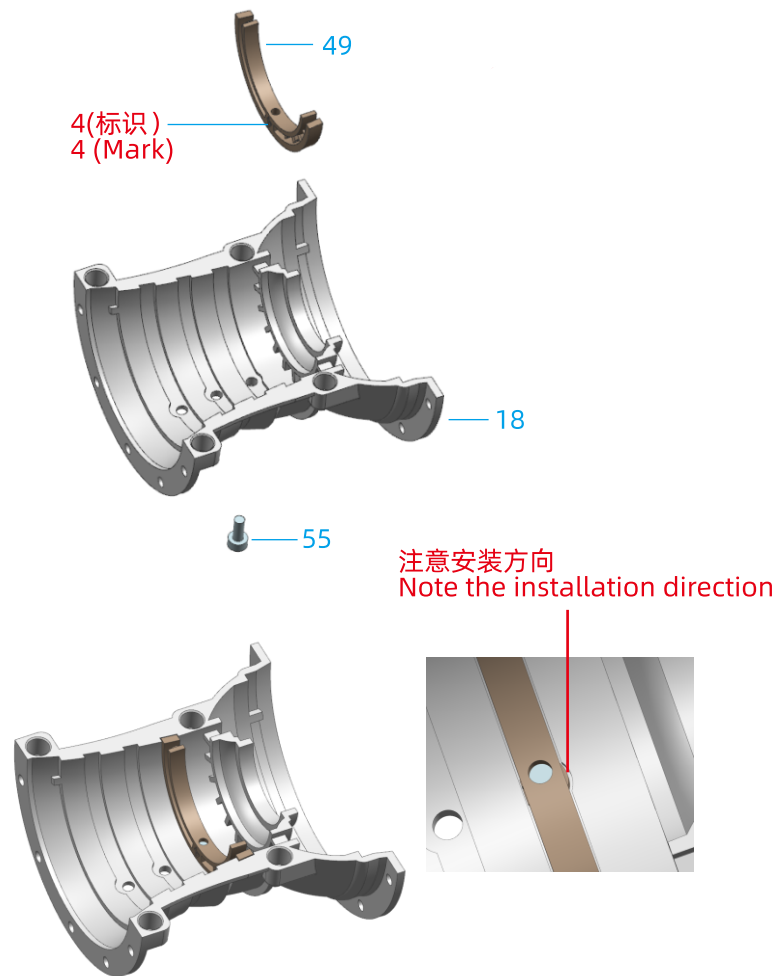


5.5 检查 Inspection

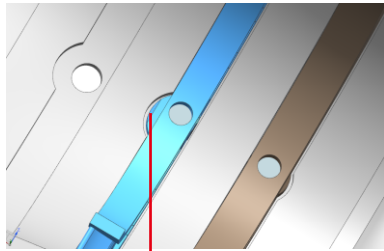
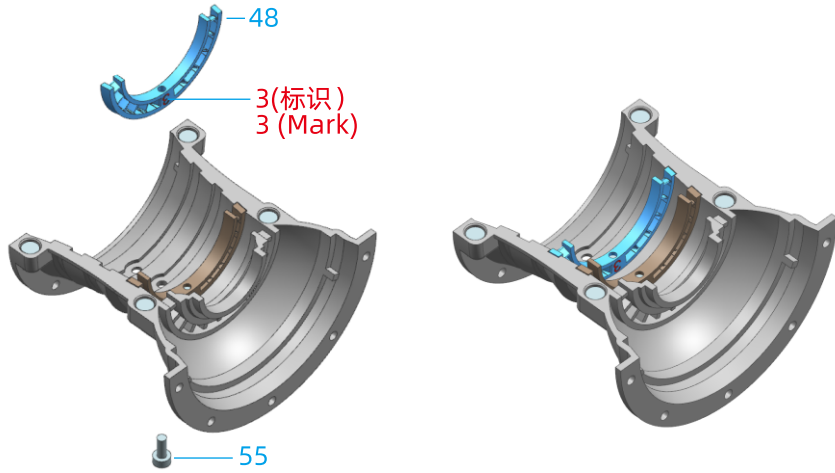


检查各高压转子是否按如图所示直径从上往下逐渐变小
Check whether the diameters of each high - pressure rotor gradually decrease from top to bottom as shown in the figure

5.6 组装四级高压静子 Assemble the Four Stage High-Pressure Compressor Stator

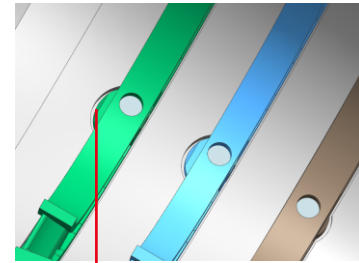
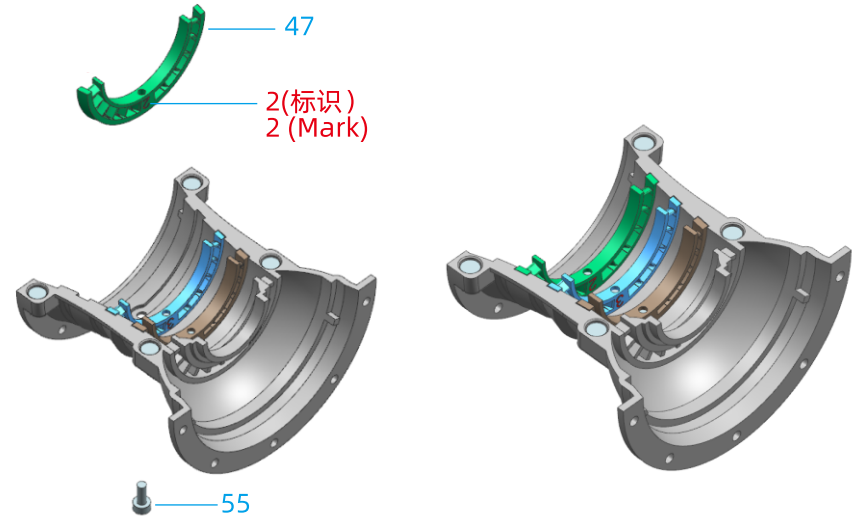


5.7 组装三级高压静子 Assemble the Thrid Stage High-Pressure Compressor Stator



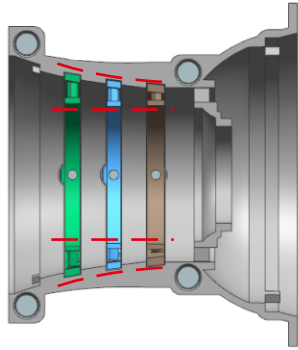
注意安装方向
Note the installation direction

5.8 组装二级高压静子 Assemble the Second Stage High-Pressure Compressor Stator



注意安装方向
Note the installation direction

5.9 检查 Inspection



1、检查各静子是否如图所示呈梯形状排列

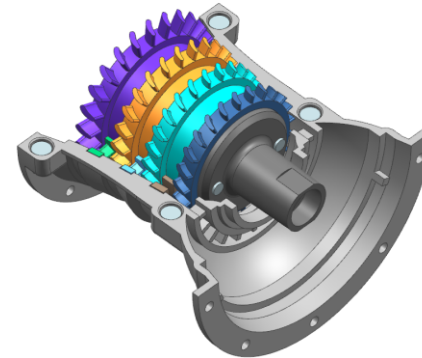
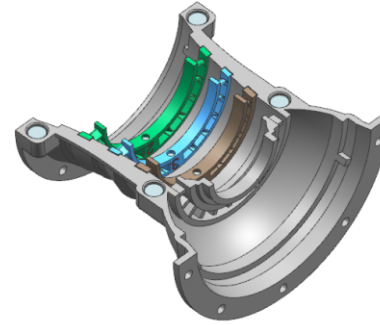
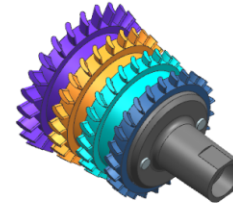
1、Check whether each stator is arranged in a trapezoidal shape as shown in the figure



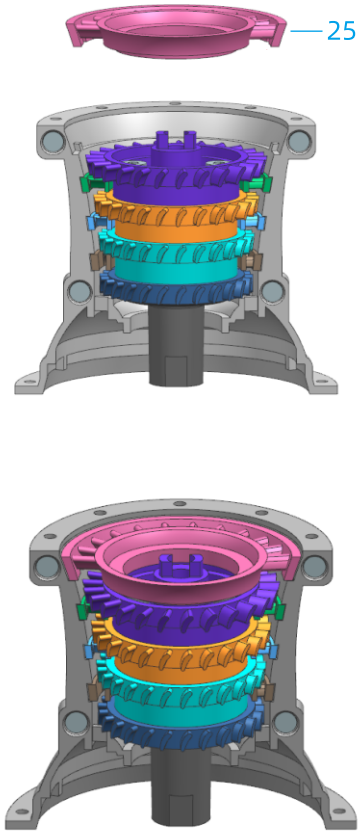
2、检查背后3个螺丝是否安装

2、Check whether the 3 screws on the back are installed

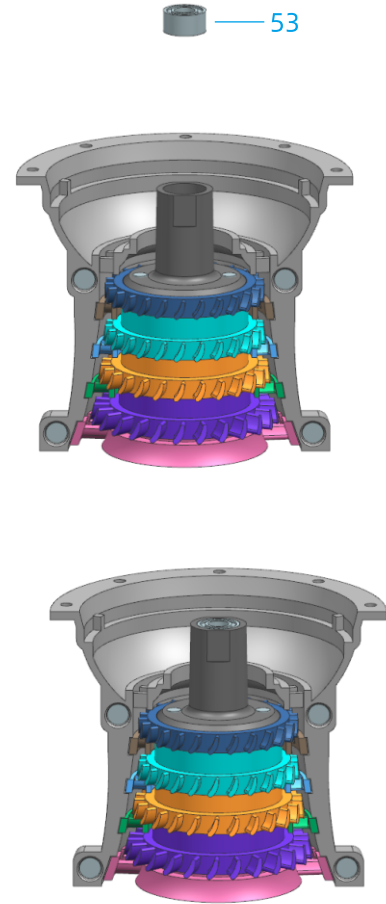
5.10 组装高压转子组 Assemble the High-Pressure Compressor Rotor Set



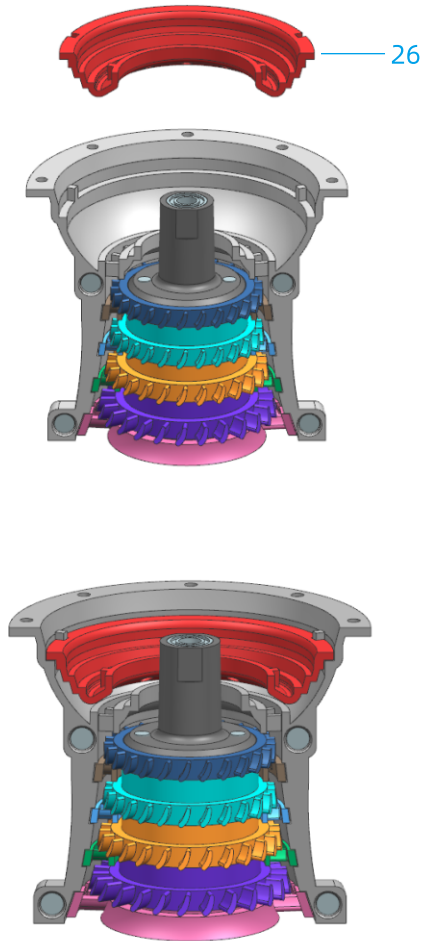
5.11 组装一级高压静子 Assemble the First Stage High-Pressure Compressor Stator



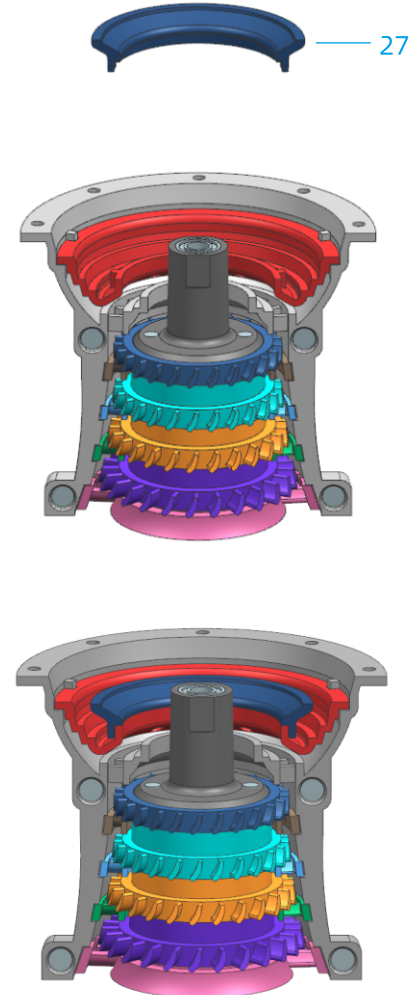
5.12 组装高压气机后盘轴承 Assemble the Bearing of the Rear Disk of the High-Pressure Compressor



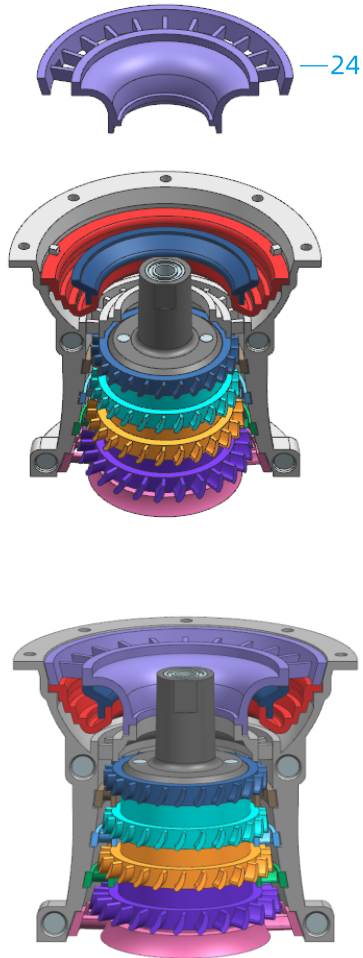
5.13 组装燃烧室外壳 Assemble the Combustor Chamber Outer Shell



5.14 组装燃烧室内壳 Assemble the Combustor Chamber Inner Shell

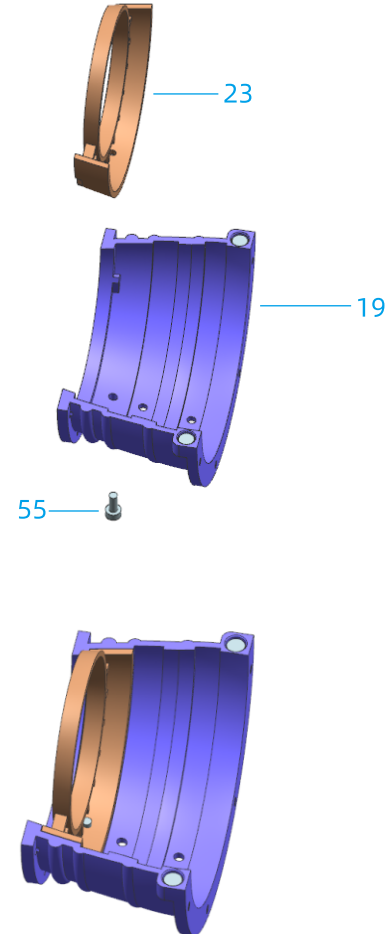


5.15 组装一级高压涡轮静子 Assemble the First Stage High-Pressure Turbine Stator

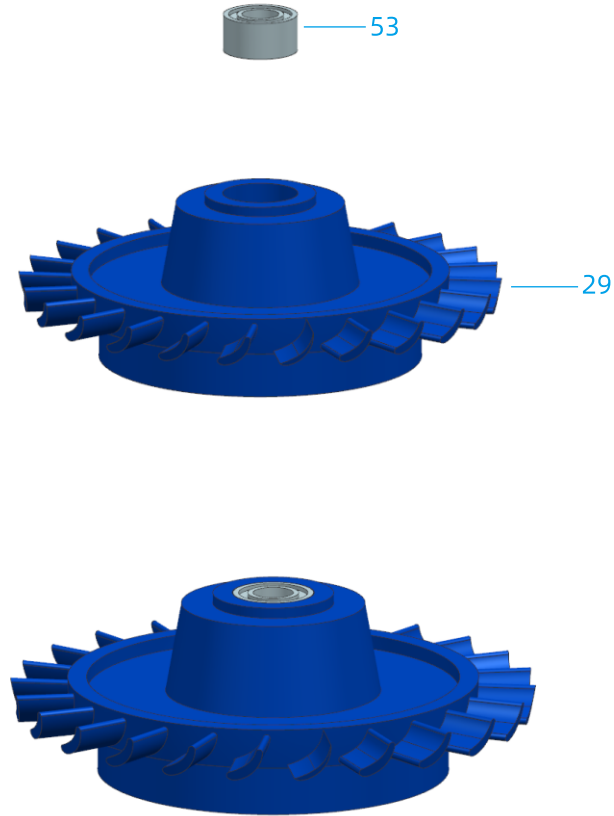


6. 涡轮机匣总成 Turbine Casing Assembly

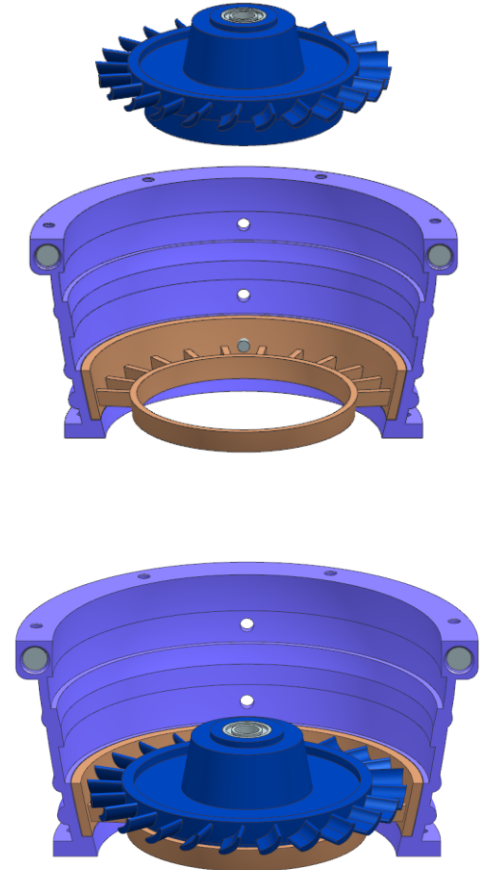
6.1 组装二级高压涡轮静子 Assemble the Second Stage High-Pressure Turbine Stator



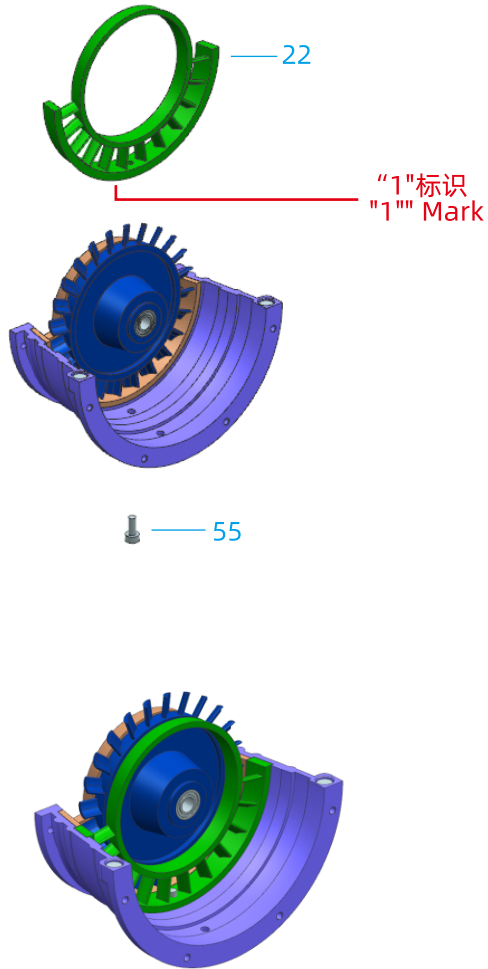
6.2 组装二级高压涡轮轴承 Assemble the secondary high-pressure turbine bearing



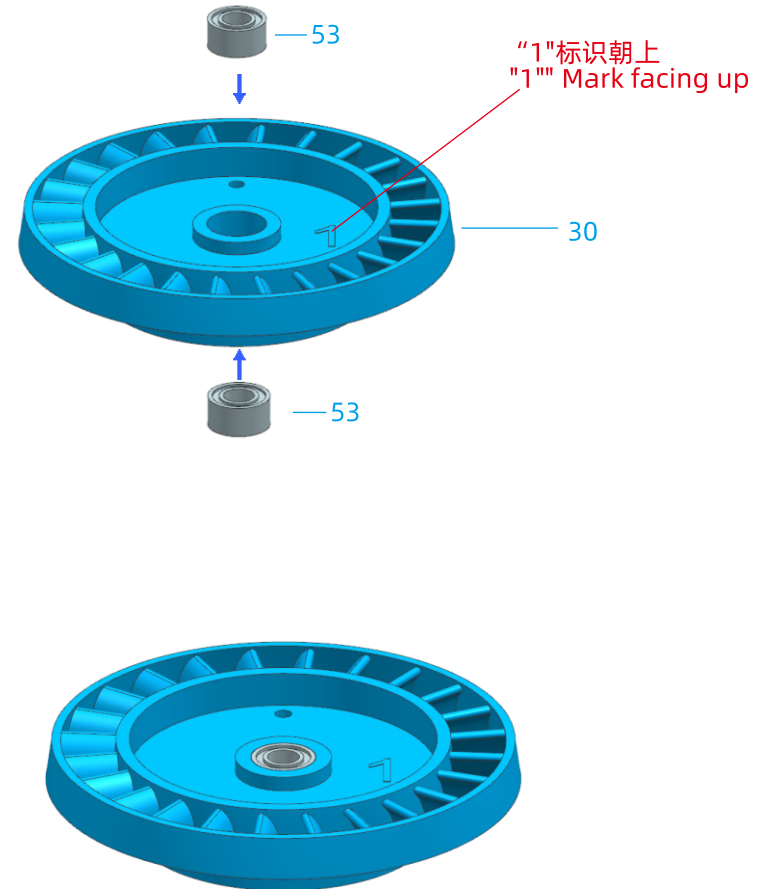
6.3 组装二级高压涡轮 Assemble the secondary high-pressure turbine



6.4 组装一级低压涡轮静子 Assemble the first-stage low-pressure turbine stator

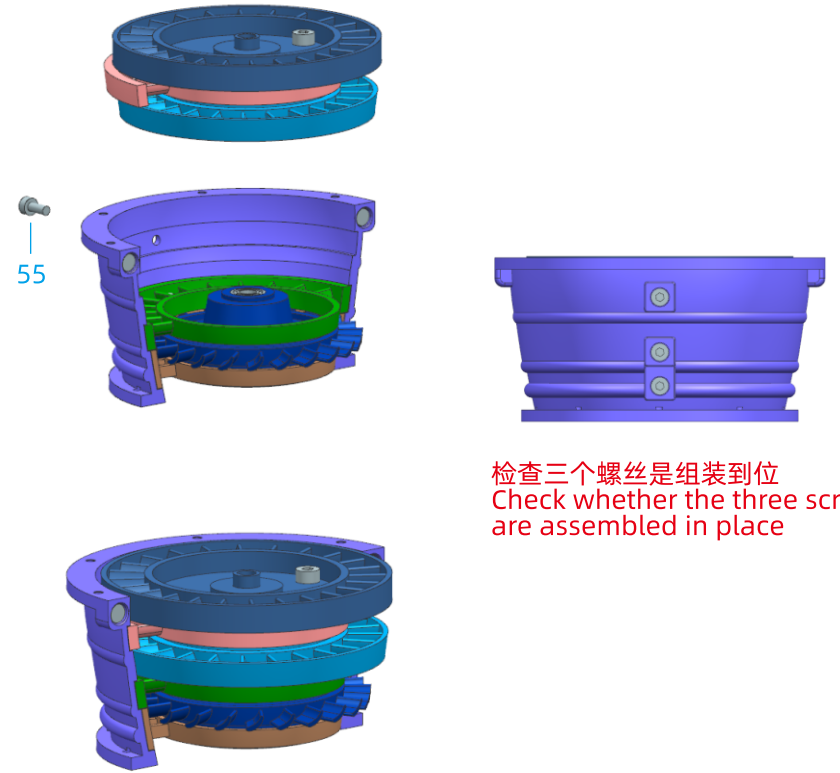
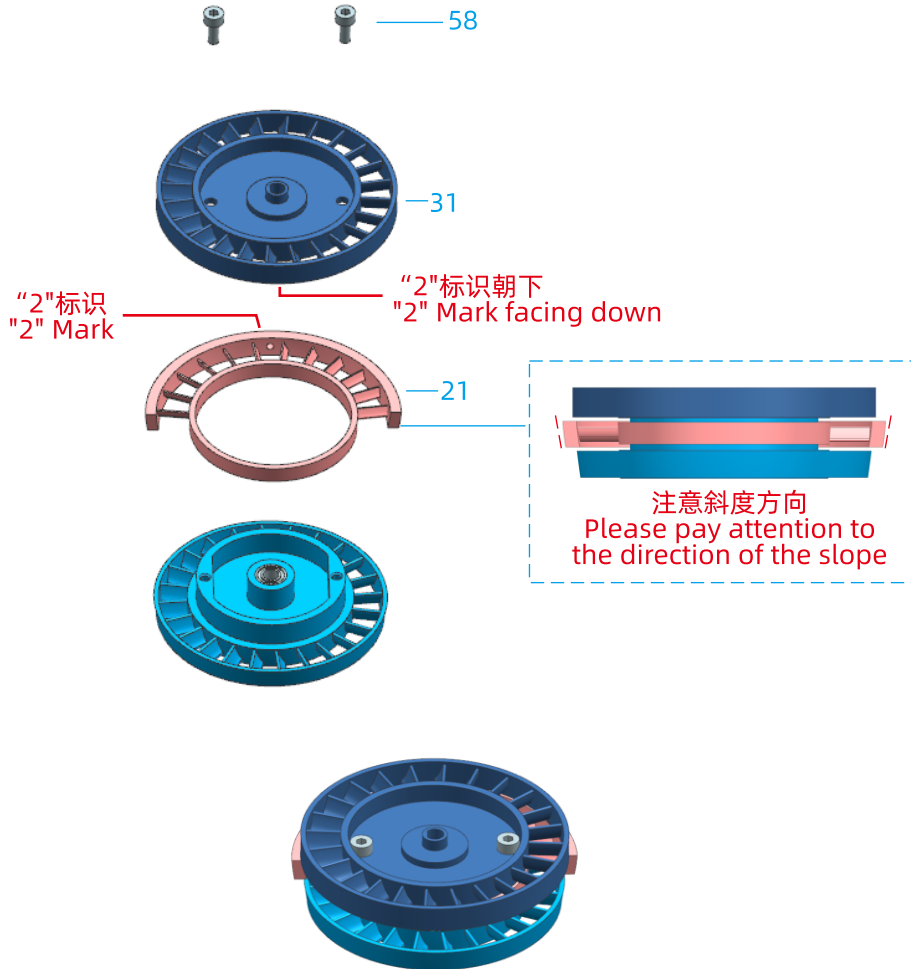


6.5 组装一级低压涡轮转子轴承 Assemble the first-stage low-pressure turbine rotor bearing

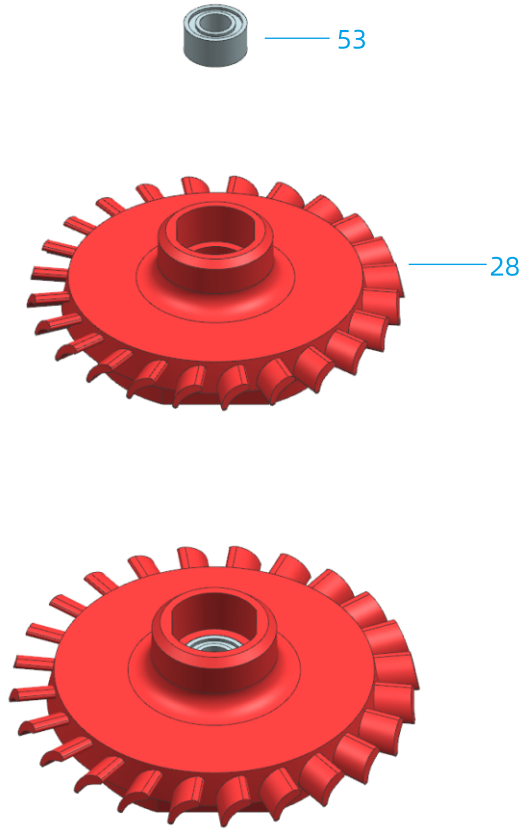


6.6 组装二级低压涡轮静子和二级低压涡轮转子 Assemble the secondary low-pressure turbine stator and the secondary low-pressure turbine rotor

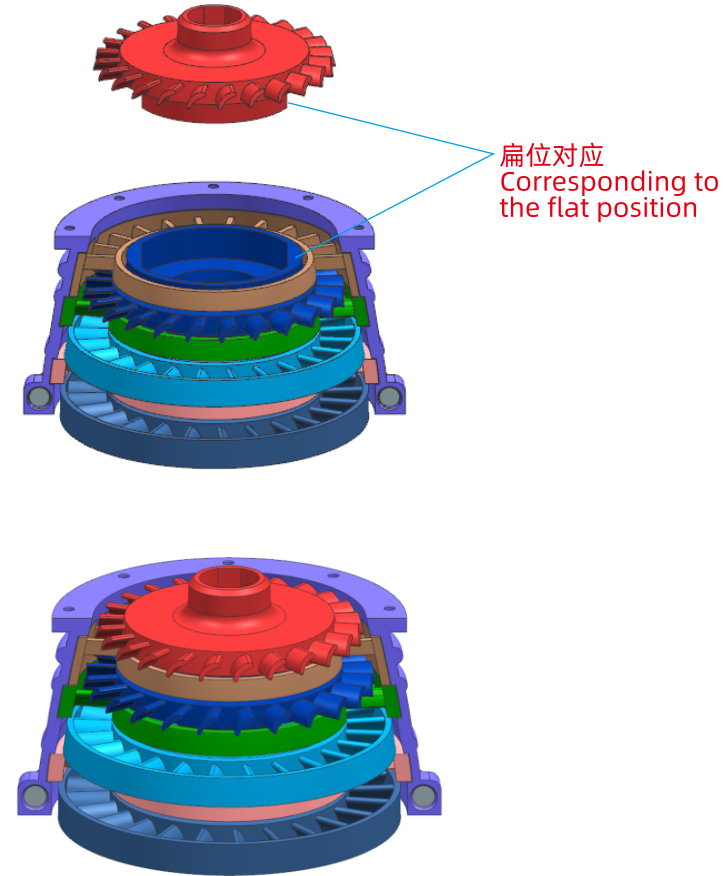
6.7 组装低压涡轮组 Assemble the low-pressure turbine group



6.8 组装一级高压涡轮轴承 Assemble the first-stage high-pressure turbine bearing

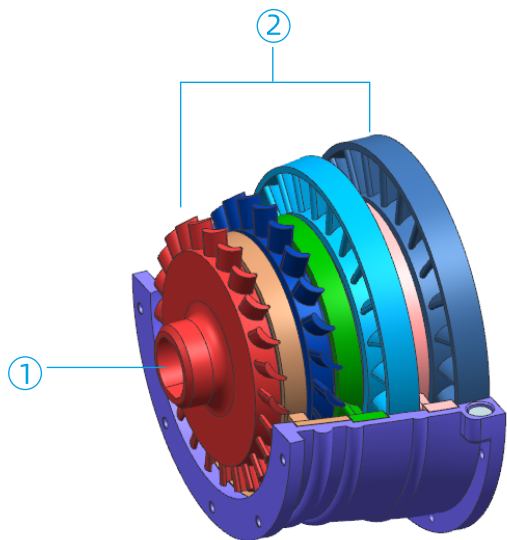


6.9 组装一级高压涡轮 Assemble the first-stage high-pressure turbine

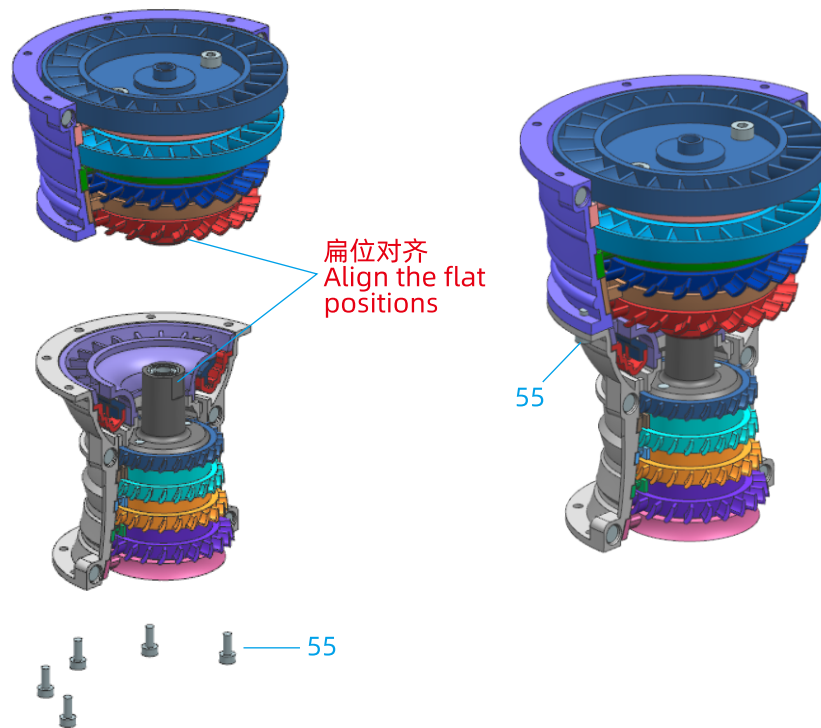


7. 组装高压机匣与涡轮机匣总成 Assemble the High-Pressure Casing and Turbine Casing Assembly

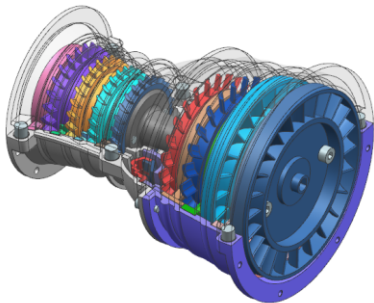
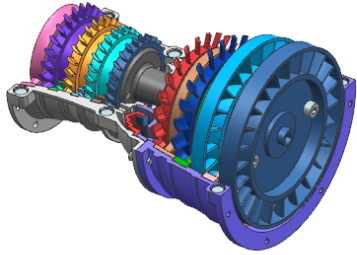
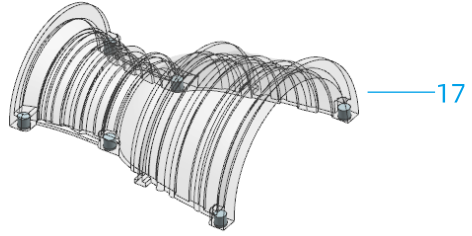
7.1 组装高压机匣与涡轮机匣 Assemble the high-pressure casing and turbine casing



- 1、拨动转子
- 2、检查各组件旋转是否顺畅
- 1、 Turn the rotor
- 2、 Check whether each component rotates smoothly



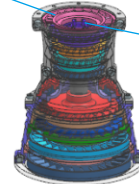
7.2 组装机匣罩 Assemble the casing cover



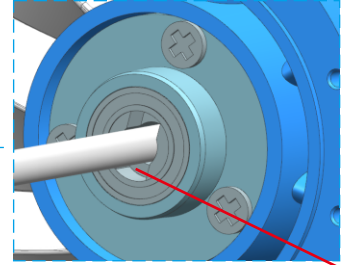
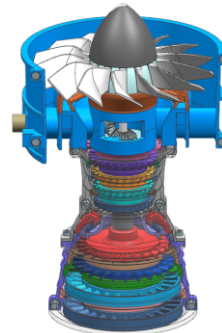
8. 组装机匣总成与高压机匣总成 Assemble the Front Support Casing Assembly and the High-Pressure Casing Assembly

8.1 组装机匣总成与高压机匣总成 Assemble the Front Support Casing Assembly and the High-Pressure Casing Assembly

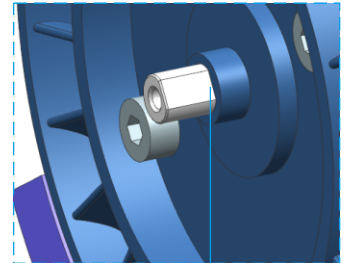
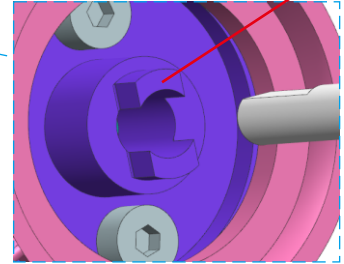
注意组装到位
Pay attention to
proper assembly



55

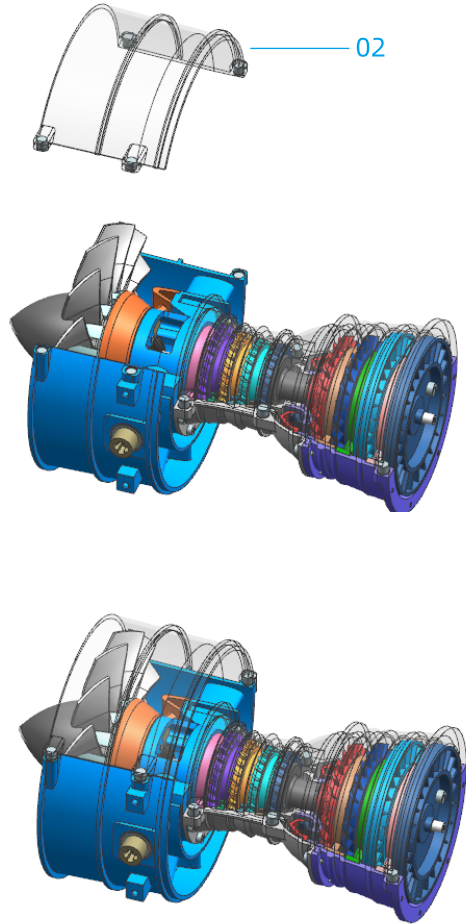


扁位对齐
Align the
flat positions



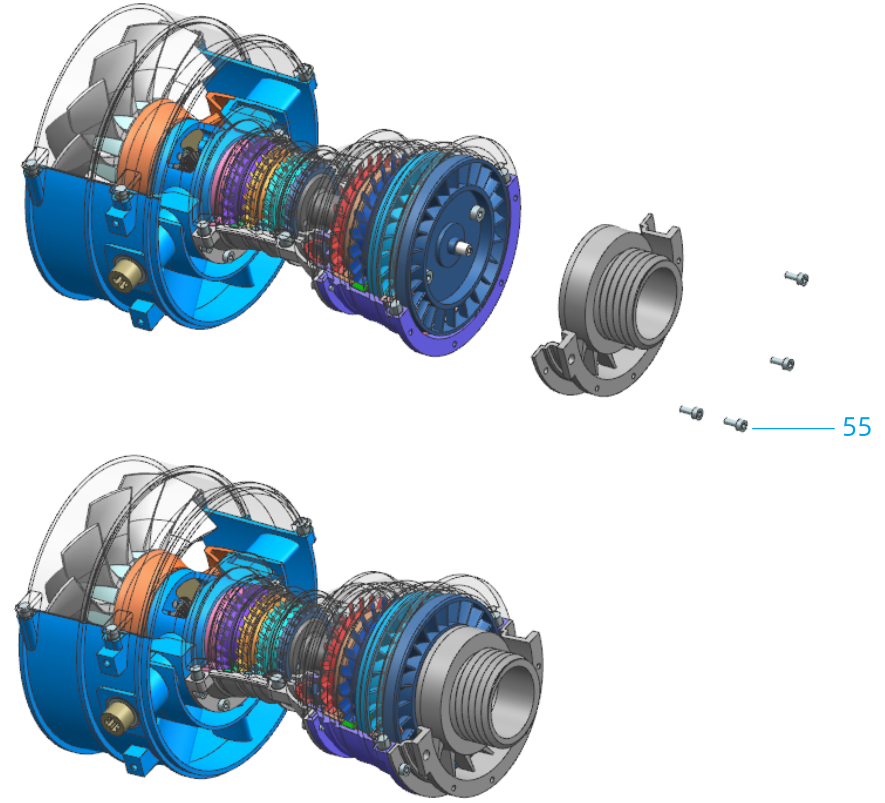
扁位对齐 Align the flat positions

8.2 组装前支撑机匣罩 Assemble the front support casing cover

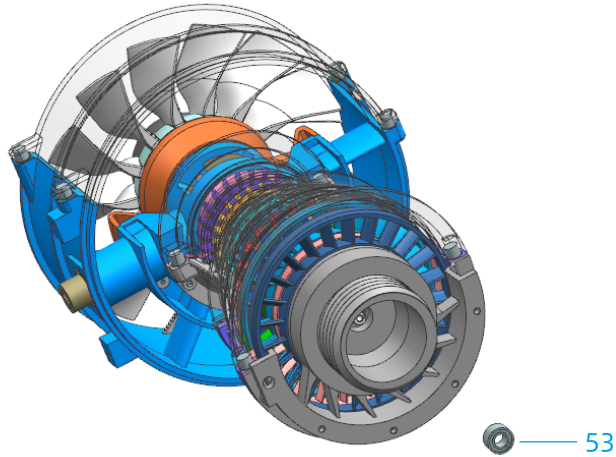


9. 组装后支撑总成 Assemble the Rear Support Assembly

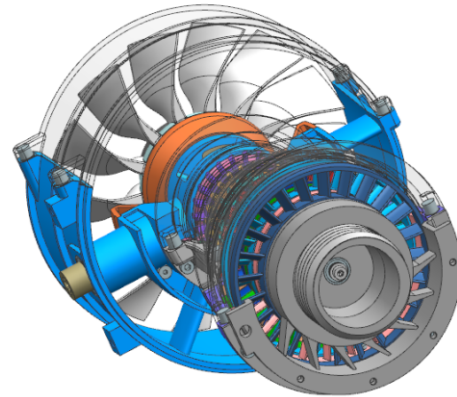
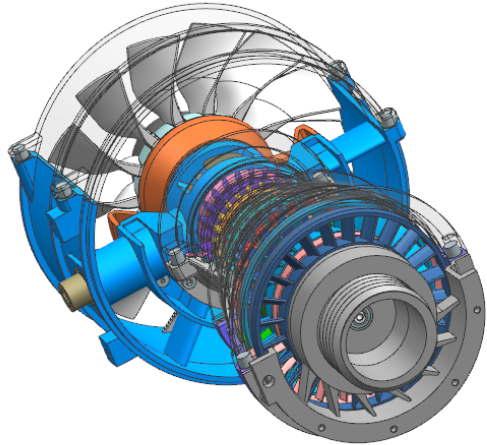
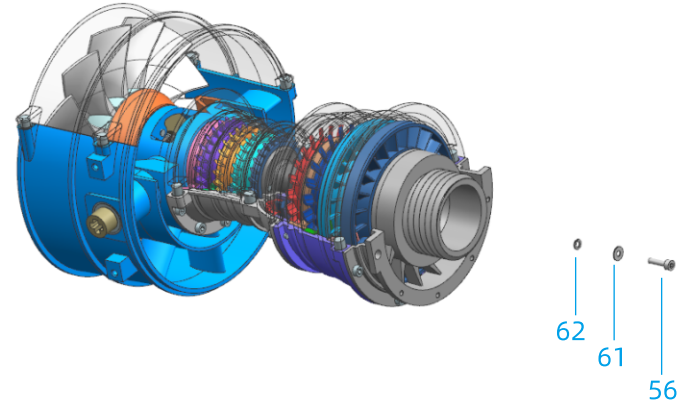
9.1 组装轴承 Assemble the bearing



9.2 组装后支撑机匣 Assemble the rear support casing

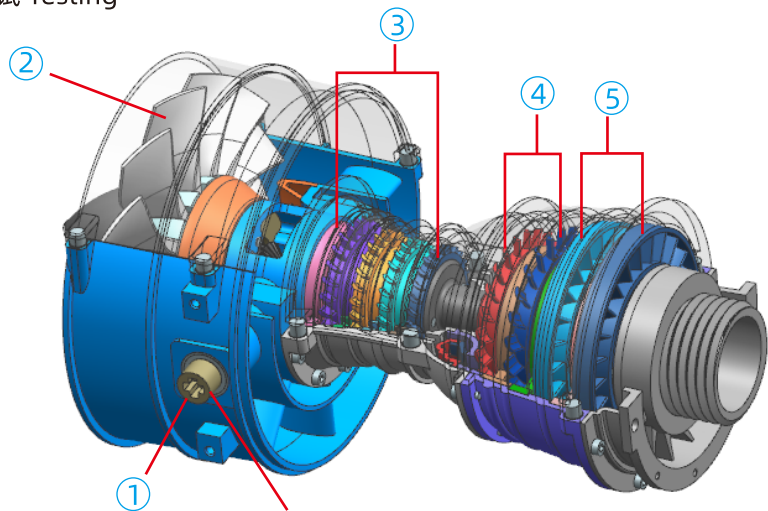


9.3 组装中心轴右侧垫片螺丝 Assemble the gasket screw on the right side of the central shaft



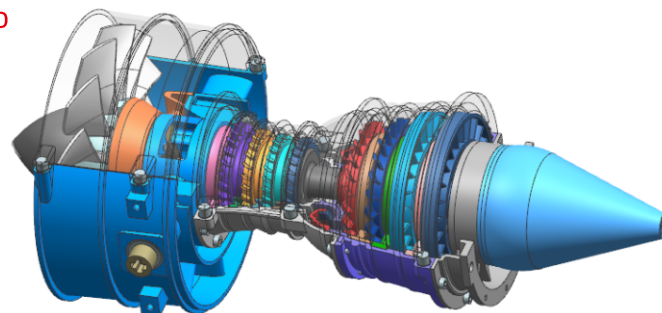
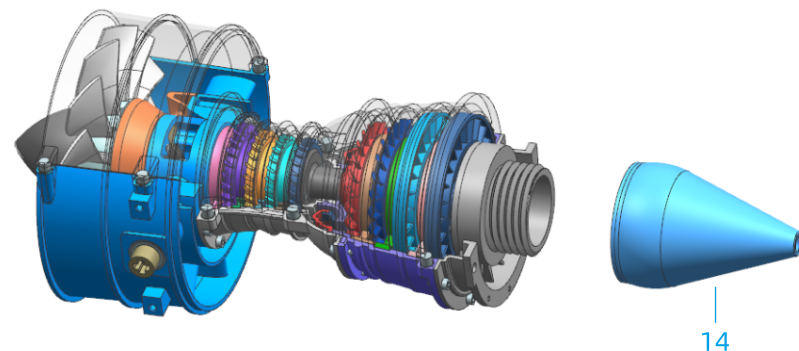
测试 Testing

9.4 组装尾锥 Assemble the tail cone

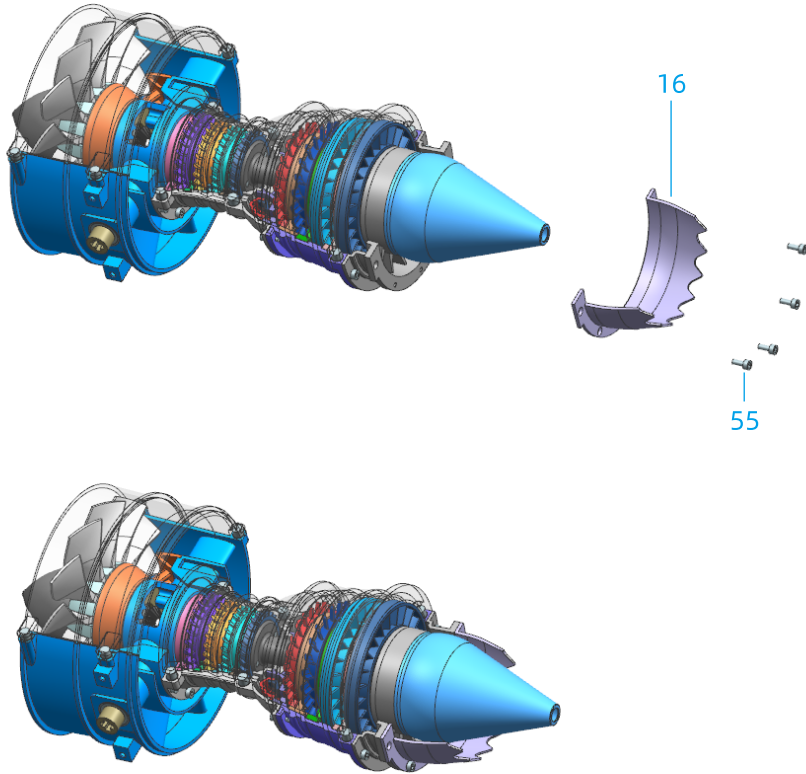


注意：若3.5.1测试后步骤已拆下，按3.5步骤组装回组件
 Note: If the components have been removed in the steps after Test 3.5.1, reassemble them according to Step 3.5

- 1、转动电机接头
- 2、观察风扇总成是否正常转动
- 3、观察高压转子组是否正常转动
- 4、观察高压涡轮组是否正常转动
- 5、观察低压涡轮组是否正常转动
- 1、 Rotate the motor connector
- 2、 Observe whether the fan assembly rotates normally
- 3、 Observe whether the high-pressure rotor group rotates normally
- 4、 Observe whether the high-pressure turbine group rotates normally
- 5、 Observe whether the low-pressure turbine group rotates normally

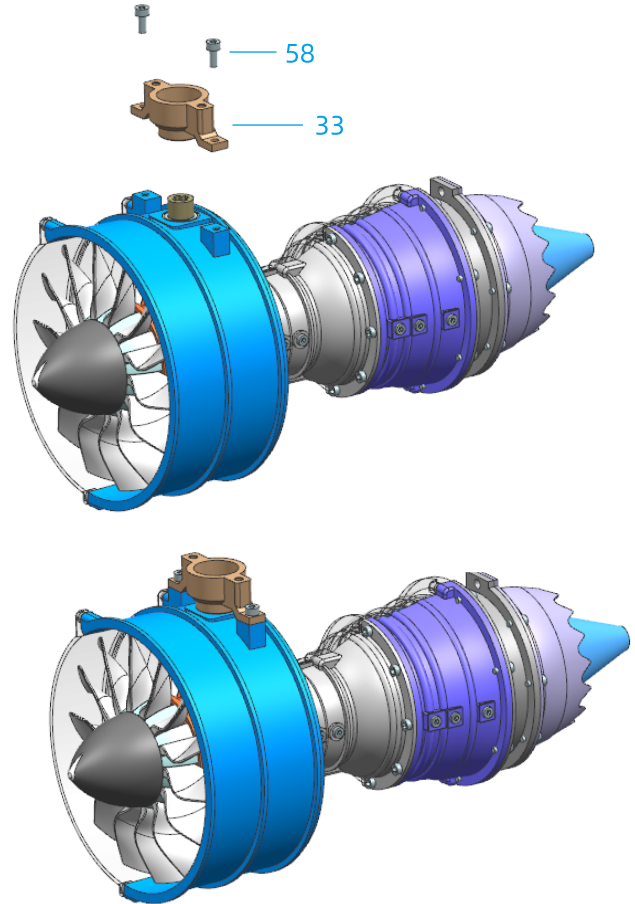


9.5 组装尾喷管 Assemble the tail nozzle

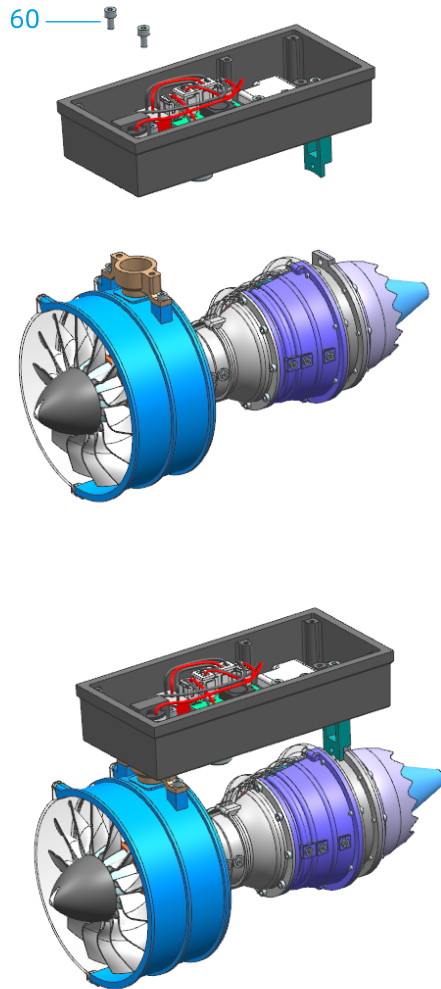


10. 总装 Final Assembly

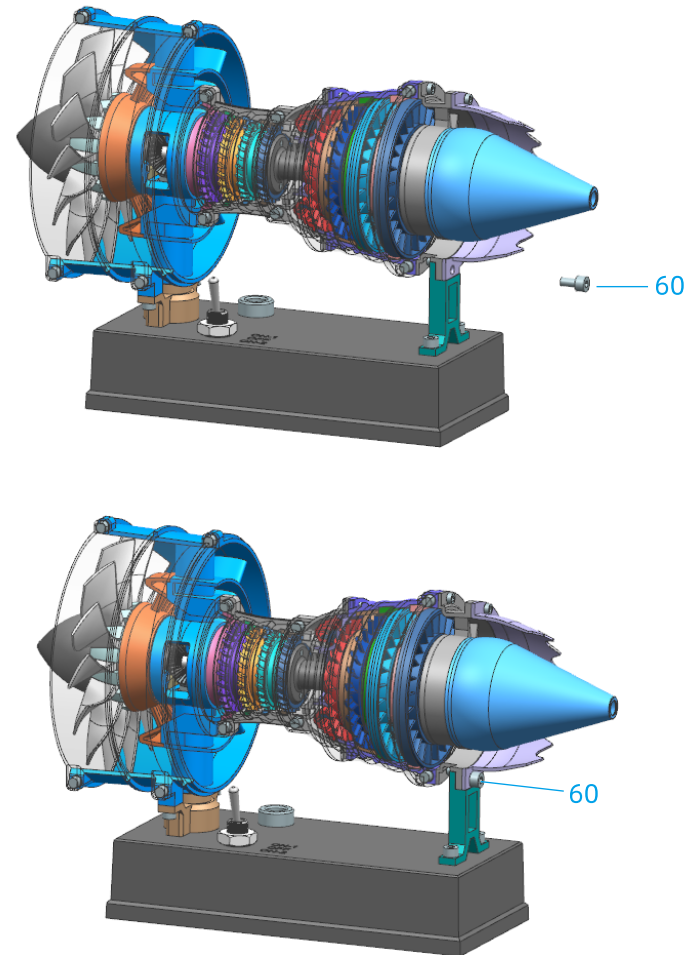
10.1 组装电机支座 Assemble the motor support

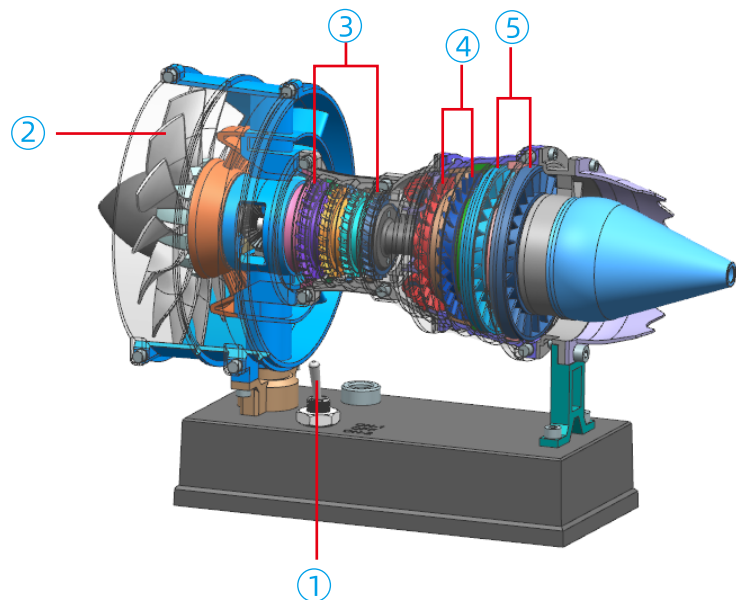


10.2 组装总成与底座 Assemble the assembly and the base

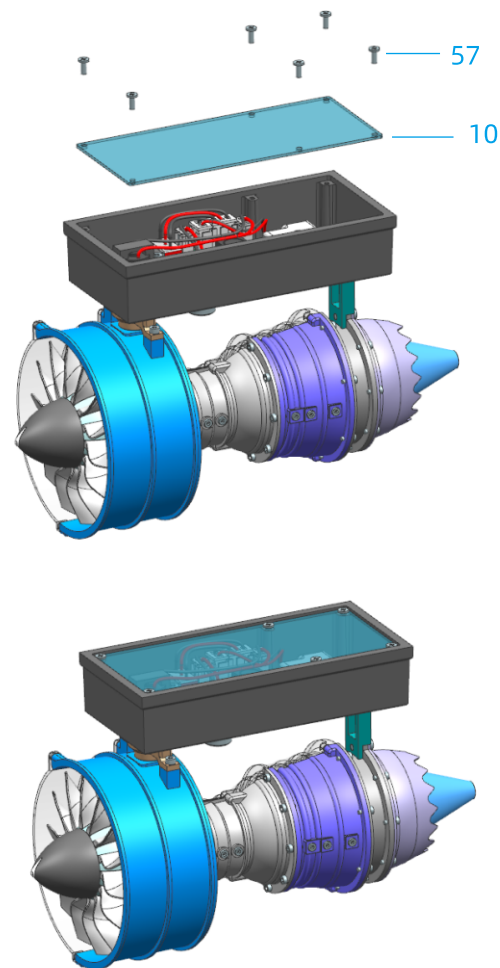


10.3 组装支架螺丝 Assemble the bracket screws

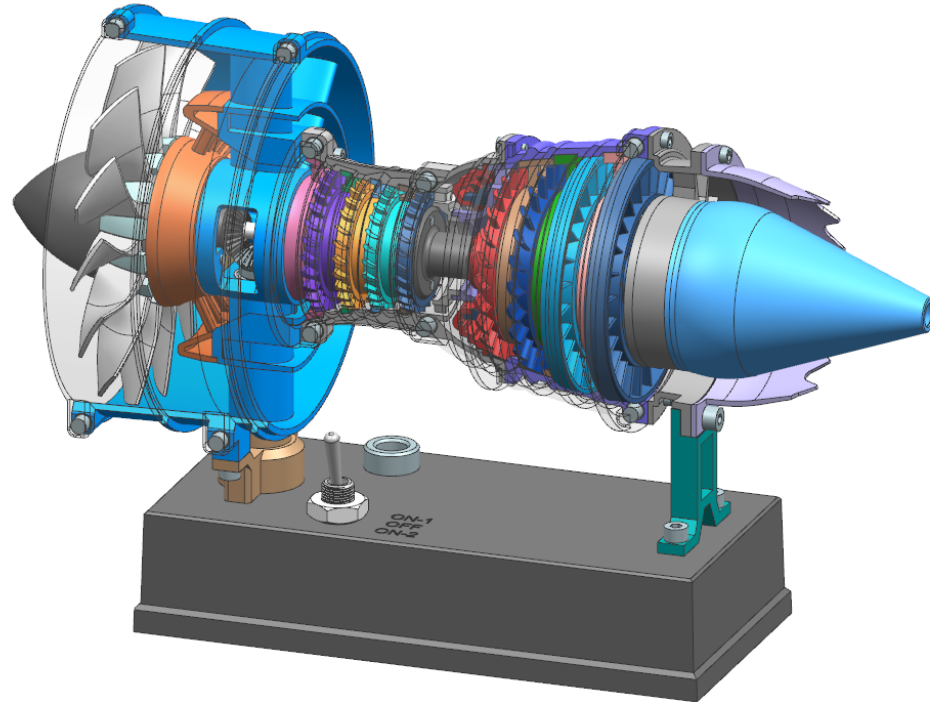




- 1、拨动开关
- 2、观察风扇总成是否正常转动
- 3、观察高压转子组是否正常转动
- 4、观察高压涡轮组是否正常转动
- 5、观察低压涡轮组是否正常转动
- 1、 Toggle the switch
- 2、 Observe whether the fan assembly rotates normally
- 3、 Observe whether the high - pressure rotor group rotates normally
- 4、 Observe whether the high - pressure turbine group rotates normally
- 5、 Observe whether the low - pressure turbine group rotates normally



组装完成 Assembly completed











序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
01		前支撑机匣 Front Support Casing	1
02		前支撑机匣罩 Front Support Casing Cover	1
03		底座 Base	1
04		拨动开关 Toggle Switch	1
05		充电口 Charging Port	1
06		线路板 Circuit Board	1
07		电池 Battery	1
08		电机 Motor	1

序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
09		电池压板 Battery Pressure Plate	1
10		底座底板 Base Bottom Plate	1
11		风扇封板 Fan Sealing Plate	1
12		风扇鼓 Fan Drum	1
13		进气锥 Air Intake Cone	1
14		尾锥 Tail Cone	1
15		后支撑机匣 Rear Support Casing	1
16		尾喷管 Tail Nozzle	1

序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
17		机匣罩 Casing Cover	1
18		高压机匣 High-Pressure Compressor Casing	1
19		涡轮机匣 Turbine Casing	1
20		低压静子 Low-Pressure Stator	1
21		二级低压涡轮静子 Second Stage Low-Pressure Turbine Stator	1
22		一级低压涡轮静子 First Stage Low-Pressure Turbine Stator	1
23		二级高压涡轮静子 Second Stage High-Pressure Turbine Stator	1
24		一级高压涡轮静子 First Stage High-Pressure Turbine Stator	1

序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
25		一级高压静子 First Stage High-Pressure Stator	1
26		燃烧室外壳 Combustor Chamber Outer Shell	1
27		燃烧室内壳 Combustor Chamber Inner Shell	1
28		一级高压涡轮 First Stage High-Pressure Turbine	1
29		二级高压涡轮 Second Stage High-Pressure Turbine Rotor	1
30		一级低压涡轮转子 First Stage Low-Pressure Turbine Rotor	1
31		二级低压涡轮转子 Second Stage Low-Pressure Turbine Rotor	1
32		风扇叶 Fan Blade	14

序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
33		电机支座 Motor Support	1
34		传动轴 Transmission Shaft	1
35		中心轴 Central Shaft	1
36		轴承座 Bearing Seat	1
37		锥齿盖 Bevel Gear Cover	1
38		一级高压转子 First Stage High-Pressure Compressor Rotor	1
39		二级高压转子 Second Stage High-Pressure Compressor Rotor	1
40		三级高压转子 Third Stage High-Pressure Compressor Rotor	1

序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
41		四级高压转子 Fourth Stage High-Pressure Compressor Rotor	1
42		支架 Bracket	1
43		电机压板 Motor Pressure Plate	1
44		高压气机后盘 Rear Disk of High-Pressure Compressor	1
45		传动轴套 Transmission Shaft Sleeve	1
46		电机转接头 Motor Adapter	1
47		二级高压静子 Second Stage High-Pressure Compressor Stator	1
48		三级高压静子 Third Stage High-Pressure Compressor Stator	1

序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
49		四级高压静子 Fourth stage High-Pressure Compressor Stator	1
50		锥齿轮1 Bevel Gear 1	1
51		锥齿轮2 Bevel Gear 2	2
52		轴承 6*10-3 Bearing	6
53		轴承 3*6-2.5 Bearing	6
55		内六角螺丝 M1.6*4 Hexagon Socket Screw M1.6*4	40
56		M1.6内六角螺丝 M1.6*6 Hexagon Socket Screw M1.6*6	3
57		平头螺丝CM2*4 Flat-head Screw CM2*4	20

序号 Serial number	零部件图片 Parts Photo	零部件名称 Component Name	数量 Number
58		内六角螺丝M2*5 Hexagon Socket Screw M2*5	5
59		内六角螺丝 M2*18 Hexagon Socket Screw M2*18	2
60		内六角螺钉 M2.5*5 Hexagon Socket Screw M2.5*5	15
61		M1.6垫片 M1.6 Washer	6
62		M1.6弹簧垫片 M1.6 Spring Washer	3
63		润滑油 Grease	1

保修说明

一> 保修须知

购买本产品，请仔细阅读以下保修条款，以确保产品得到有效保修

1. 本产品为组装体验式产品，拆包装后无质量问题不支持7天无理由退换货。不拆包装的情况下从购买之日起7天可以退换货；
2. 购买本产品时，由销售商协助在保修卡上完整、真实的填写您的相关信息，并索要有效发票或购买凭证，且妥善保管；
3. 用户需要保修时，必须出具购机发票或有效三包凭证。如果用户丢失有效发票或三包凭证且不能提供复印件的，根据机器的生产日期后延60日为保修的起始日期，提供一年的保修服务；
4. 保修对象为用户购机后及使用前有质量问题的零件。对于用户不合理使用而损坏的零件，本公司提供收费服务；
5. 本公司保留对售后服务条款的最终解释权及修改权限。

二> 售后服务及保修内容

1. 自产品签收日起，电机、电池、电路板三个月保修，其它零件提供一年保修；
2. 购新机时如发现零件缺失，凭保修卡的购买日期30天内厂家予以免费补发缺失的零件，超过30天则需要用户到土星官方网站购买

3. 用户组装完成后产品出现无法运转或不良的情况，可向厂家咨询原因，也可寄回厂家免费检测或调试；
4. 用户碰到任何产品问题，本公司或授权机构免费提供技术咨询或指导；
5. 所有在保修范围内被更换下来的零件，零件和附件归本公司所有。用户必须提供有质量问题的零件，向本公司换取新零件。

三> 非保修内容

1. 超过三包有效期的；
2. 未按产品使用说明书要求使用、维护、保管不当造成损坏的；
3. 非本公司或授权销售网点销售的产品；
4. 无有效发票或三包凭证的，或擅自涂改售后服务卡的（能够证明在三包有限期的产品除外）
5. 售后服务卡上的产品型号或编号与商品不相符的；
6. 因不可抗力（如：水灾、火灾、地震、雷击等）造成伤害的；
7. 产品使用中的自然磨损，如：产品间隙变大、润滑油干涩、电池长期老化等造成的问题；
8. 对于非产品本身品质原因造成的故障（如：进水、受潮、摔坏、外力挤压、变形、使用不当等）
9. 经销商对保修内容作出的约定，凡超出本保修协议的，不在保修范围内。

Warranty description

I. Warranty Instruction

Please carefully read the following warranty terms when purchasing this product so as to assure effective warranty for the product:

1. Since this product is for assembly experience, "7-day no-hassle return/change policy" is not available if no quality defect is found after unpacking. "7-day no-hassle return policy" is available if the package is not removed;
2. When this product is purchased, your dealer will assist you to write down your complete real information on the warranty card, when you should ask the dealer for effective invoice or purchase voucher; then, the invoice and voucher shall be properly kept;
3. Users who apply for warranty have to show their purchase invoices or effective "three guarantees" certificate. For users who lost their effective voices or "three guarantees" certificate and fail to provide their copies, the warranty period is one year from the 60th day after the manufacturing of machine;
4. The warranty object is the parts that are found with defects after purchase and before use. We provide paid services for parts damaged by improper use by users;
5. We reserve the right to interpret and modify the terms & conditions of after-sales service.

II. Items of After-sales Service and Warranty

1. The warranty period for motor, battery and circuit board is three months from the day on which they are received and accepted; the warranty period for other parts is one year from the day on which they are received and accepted;
2. The user who finds some part missed when purchasing a new machine could request the manufacturer to supply the missed part within 30 days after the purchase date on warranty card; the user has to purchase that

- part at Teching's official website after the said 30 days;
3. If the assembled product fails to run or run properly, the user could either consult the manufacturer for possible causes, or send the product back to the manufacturer for free testing or debugging;
4. We and our authorized agencies provide free technical advice or instruction for users who encounter any product problem;
5. All parts and accessories replaced within the scope of the warranty belong to our company. Users have to provide defective parts so that we can exchange them with new ones.

III. Items outside Scope of Warranty

1. Beyond the "three guarantees" period;
2. Damage is caused by failure to use, maintain and keep the product as per instruction manual;
3. Products that are not sold by us or our authorized sales outlets;
4. Those who hold no valid invoice or "three guarantees" certificate, or those who modify the after-sales service card without permission (except the case where the product is confirmed to be within the "three guarantees" period);
5. The product model or serial number on after-sales service card fail to match the commodity;
6. Damage caused by force majeure (e.g. flood, fire, earthquake, lightning strike, etc.);
7. Natural wear during the use of product, e.g. the problems arising from product gaps expansion, lubricating oil shortage, and battery aging, etc.;
8. For the faults (e.g. moisture invasion, dampness, breakage, external force extrusion, deformation and improper use, etc.) caused by other factors than product quality;
9. Dealers shall make agreement on warranty coverage; the situations outside this warranty agreement are not covered by the warranty.

售后服务

- 1.可以扫描土星小助手二维码，进行技术咨询；
- 2.可以进入土星文化公众号，获得相关技术咨询；
- 3.可以直接拨打本公司400电话，咨询本公司技术人员；
- 4.可以用邮件的形式向本公司进行技术咨询；
- 5.可以向附近的授权机构提出技术咨询；
- 6.可以以各种方式对本公司产品提出意见、建议和新产品期望。



售后服务卡

用户名：_____ 联系电话：_____

产品名称：_____ 产品编号：_____

产品流水号：_____

问题描述：_____

服务内容：

零件补缺 零件更换 检测服务 需退换货

销售单位：_____

销售地点：_____

经办人：_____ 售后完成时间：_____

公 司：广州市土星文化发展有限公司

地 址：广州市黄埔区宏明路宝盛大厦

售后邮箱：sales@techingedu.com.cn

热线电话：4001-020-019



土星公众号



土星小助手



Sales service card

Account name: _____ Tel: _____

Product name: _____ Product No.: _____

Serial number of product: _____

Problem description: _____

Service content:

- Part replenishment Testing service
 Part replacement Return and change of goods needed

Sales unit: _____

Place of sale: _____

Operator: _____ After-sales completion time: _____

Company:
Guangzhou Teching Cultural Development Co., Ltd.
Address:
Baosheng Building, Hongming Road,
Huangpu District, Guangzhou City, China
After-sales email: sales@techingedu.com.cn
Hotline: 0086-13924277386 4001-020-019



Sales Service

1. Scan the Teching Assistant QR code for technical consultation;
2. Relevant technical information is available at Teching's official account;
3. You can call our hotline directly and consult our technician;
4. Technical consultation can be sent to us by mail;
5. Technical advice can be obtained from nearby authorized agencies;
6. You are encouraged to bring forward your comments and suggestions on our products and your expectations for new products in various manners.

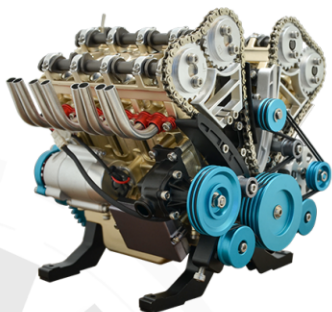
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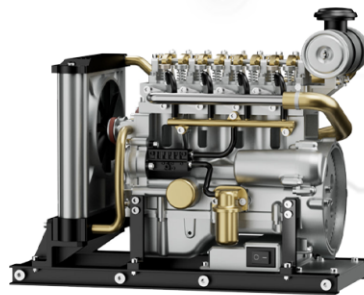
Super Products 超人气产品



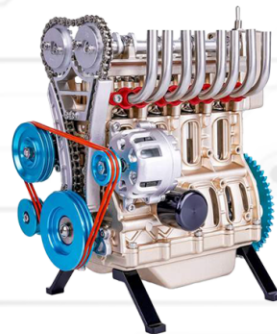
Turbofan engine (DM119)
航空涡扇发动机 (DM119)



V8 Engine (DM118)
V8发动机 (DM118)



Mini diesel engine (DM115)
迷你柴油发动机 (DM115)



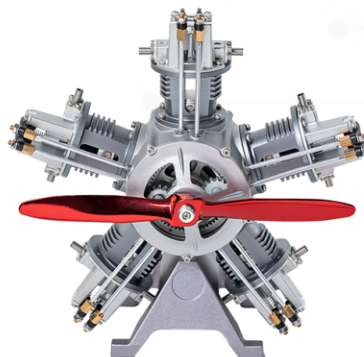
4-Cylinder engine (DM113)
直列四缸发动机 (DM113)



Small bypass turbofan engine (DM135)
小涵道比涡扇发动机 (DM135)



Turbocharged 4-Cylinder Engine (DM111)
涡轮增压四缸发动机 (DM111)



5-Cylinder radial engine (DM116)
星型五缸发动机 (DM116)



Oil pumping unit (DM601)
抽油机 (DM601)

传承 · 探索 · 创新
Heritage · Discovery · Discovery



公 司 广州市土星文化发展有限公司
Company Guangzhou Teching Culture Development Co., Ltd

地 址 广州市黄埔区宏明路宝盛大厦
Address Baosheng building, Hongming Road, Huangpu District, Guangzhou City, China.

热线电话 0086-13924277386
Service Tel

售后邮箱 master@techingedu.com
After-sales email

网 址 http://www.techingedu.com
w e b s i t e

WhatsApp 0086-13924277386



土星官网
OFFICIAL WEBSITE