

Legacy • Exploration • Innovation



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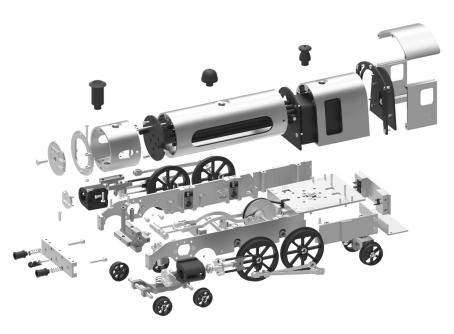




Teching Assistant

Structural features:

- 1. Four-link driving wheel mechanism
- 2. Follow–up suspension system
- 3. Steering valve mechanism of mechanical differential
- 4. Steam mechanism of early trains
- 5. More than 290 parts



Let's create a wonderful life through labor!

General information about product

I. Product Data

Product name: Two-wheeled steam train

Product model: DM21

Main materials: Anodic aluminum oxide + stainless steel

Charging voltage: 5VDC

Battery capacity: 500mAh

Assembly difficulty: ★★★

Product standards: GB/T9254–2008

GB/T17626.2-2006

Quality grade: A

II. Product description

◆ Teching 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;

• 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 \ge 1200mA;

◆ 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;

◆ 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 $0~35^{\circ}$ 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;

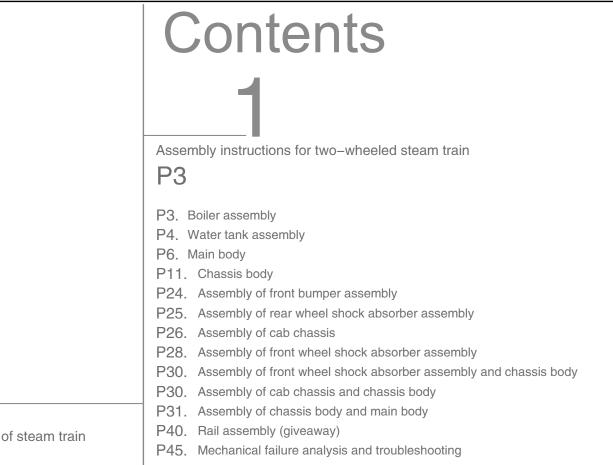
◆ We have been improving the design and operation features of our product, so separate notice will not be given for slight difference between instruction manual and actual product. Hence, any claim for compensation filed based on the data, pictures or text of this instruction manual will be rejected;

◆ 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.

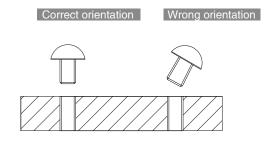


Parts list of steam train

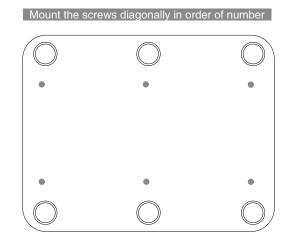
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Basic knowledge on standard parts assembly

- 1. Installation of screws
- (1) Installation of screws

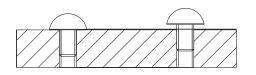


(3) Screw installation order

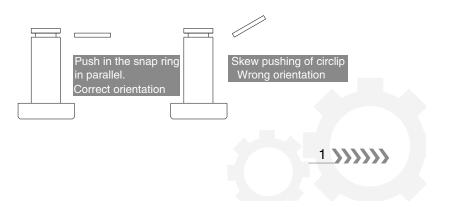


(2) Screw tightening depth





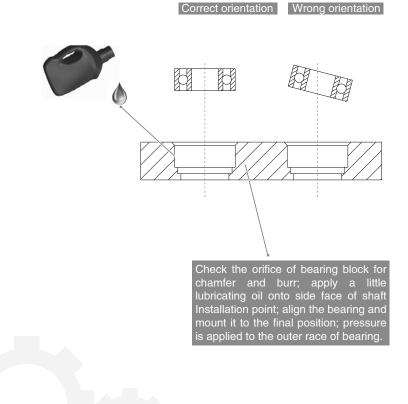
2. Installation of snap ring

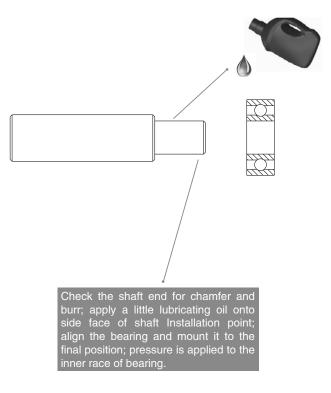




(1) Install the bearing into the bearing seat hole

(2) Install the bearing onto the shaft

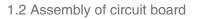


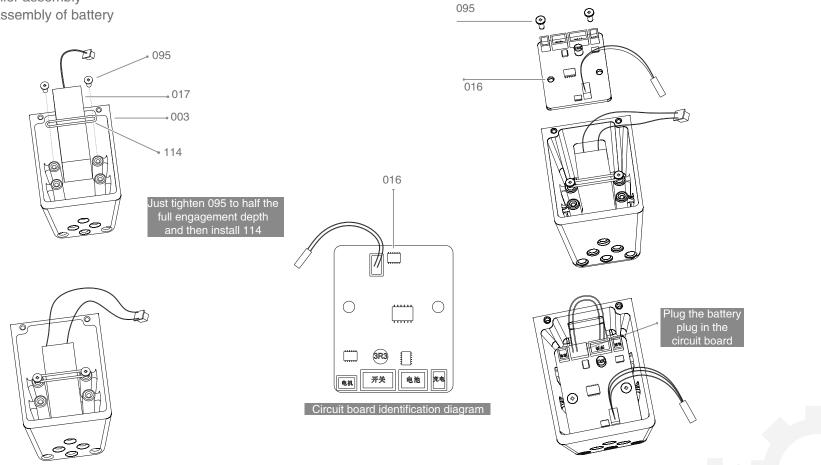


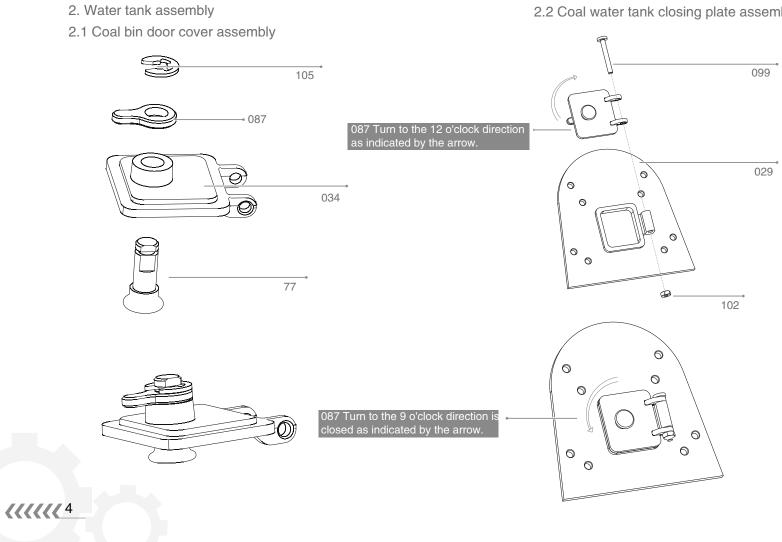
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1. Assembly of two-wheeled steam train

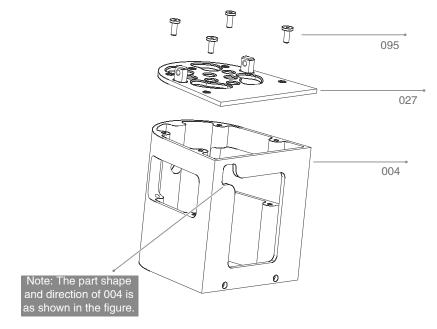
- 1. Boiler assembly
- 1.1 Assembly of battery





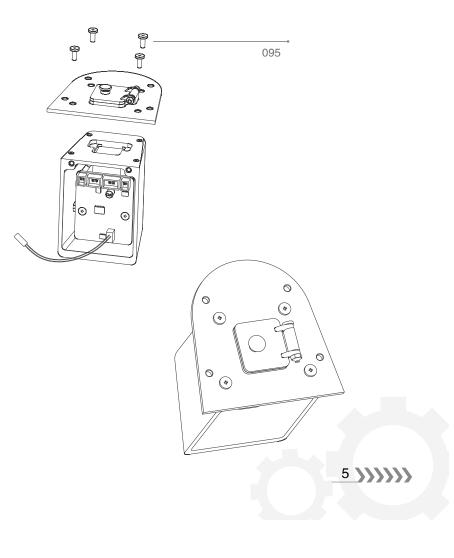


2.2 Coal water tank closing plate assembly

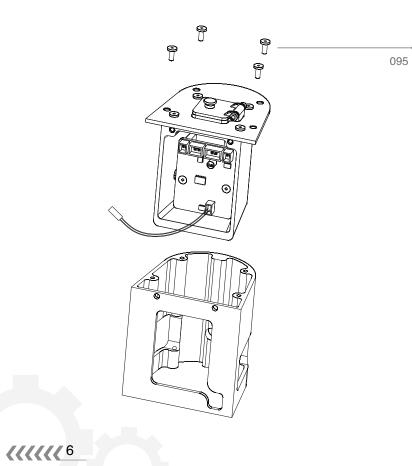


2.3 Assembly of flue rear cover and water tank

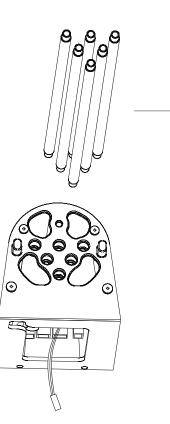
2.4 Assembly of boiler assembly and coal water tank closing plate assembly

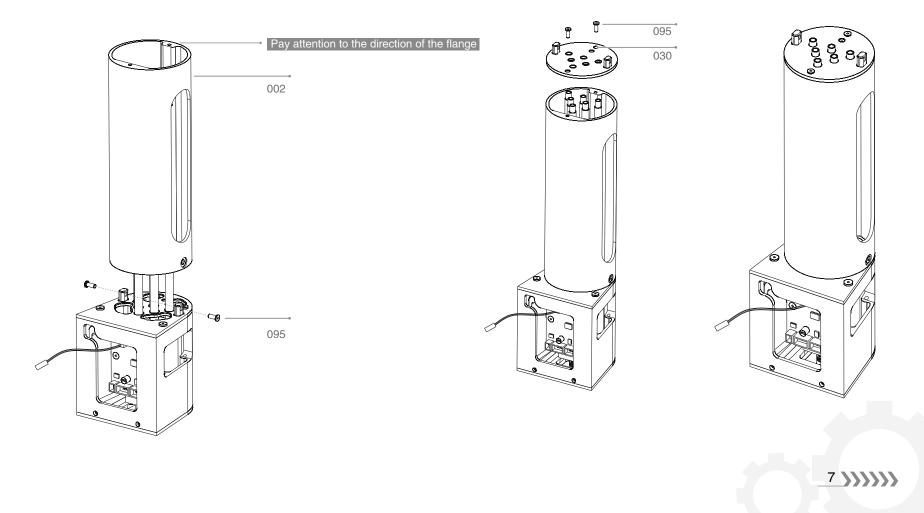






3. Main body3.1 Installation of small flue



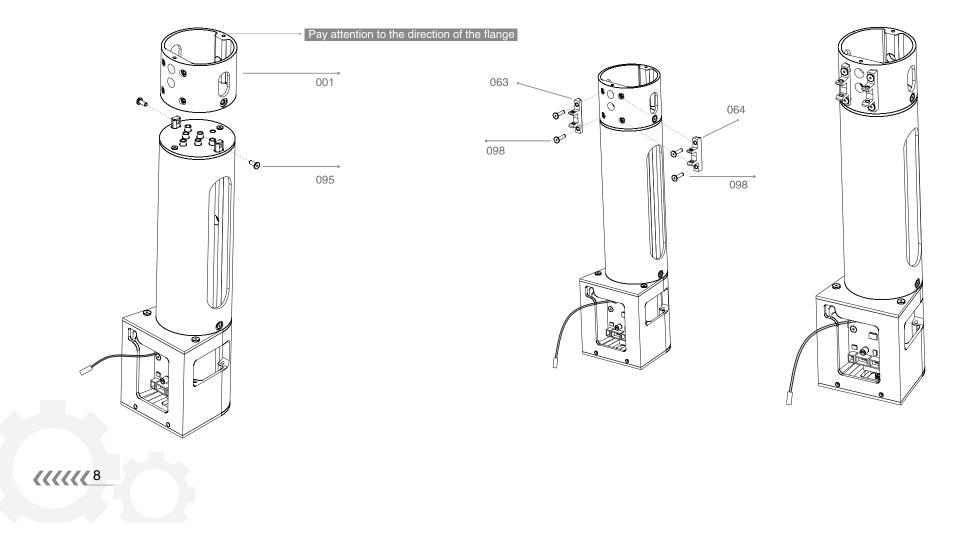


3.2 Assembly of big flue

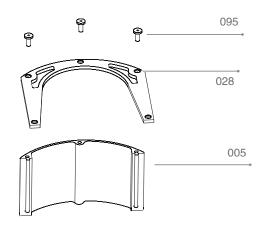
3.3 Assembly of flue middle cover

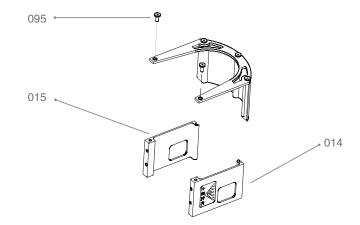
3.4 Assembly of front flue

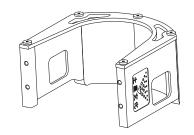
3.5 Installation of left and right flue brackets

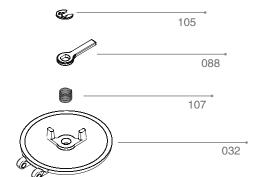


3.6 Assemble the driving cab







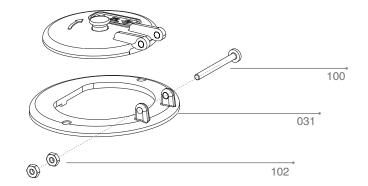


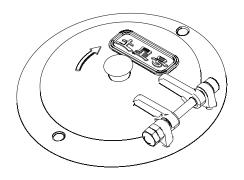
3.7 Assembly of flue front cover assembly



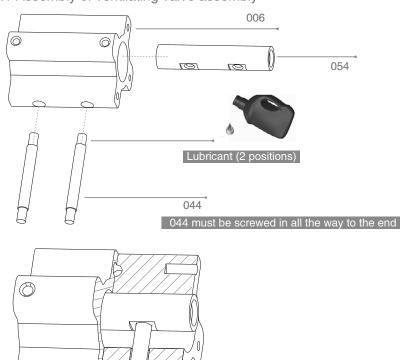


3.8 Assembly of flue front cover plate assembly





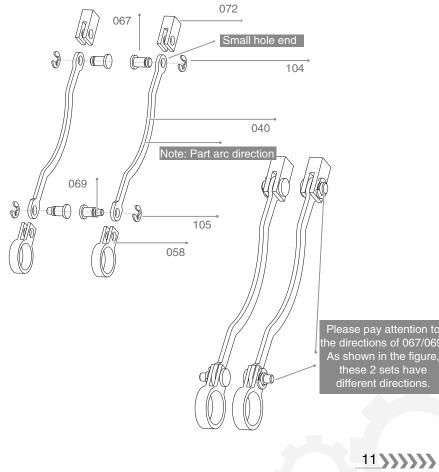
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4. Chassis body

4.1 Assembly of ventilating valve assembly

4.2 Reversing connecting rod assembly

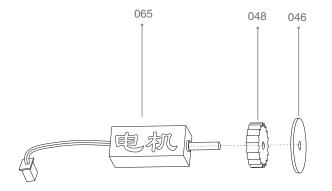


Please pay attention to the directions of 067/069. As shown in the figure, different directions.

4.3 Assembly of ventilating valve assembly and reversing connecting rod assembly

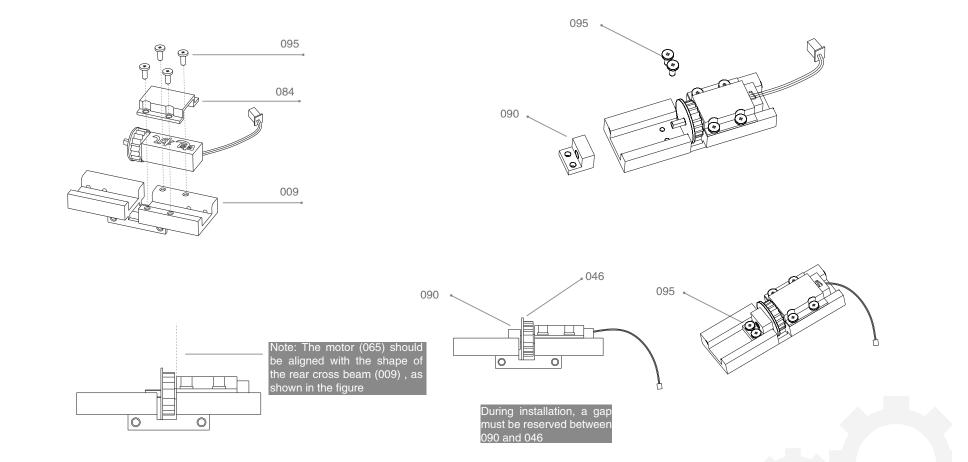
 \bigcirc 10 \bigcirc (006) and (069) Pay attention to the direction, and ensure axial alignment during left and right turning, as shown. Lubricant (4 positions)

4.4 Synchronizing wheel combination





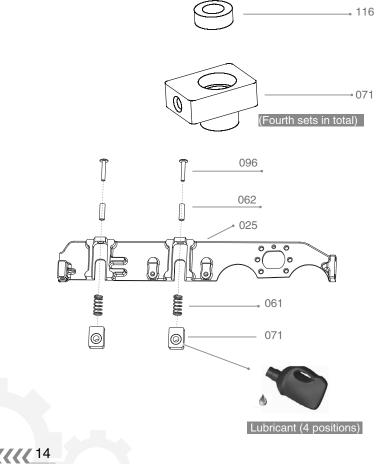
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4.6 Assembly of motor assembly

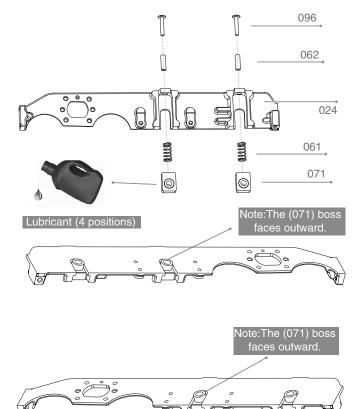
4.5 Assembly of motor assembly

Assembly of motor assembly

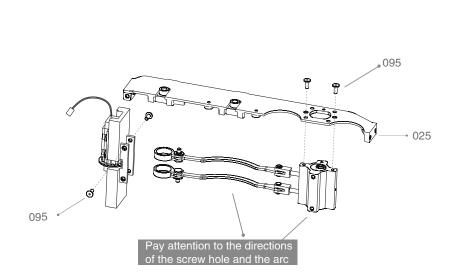


4.7 Assembly of left longitudinal beam assembly

4.8 Assembly of right longitudinal beam assembly

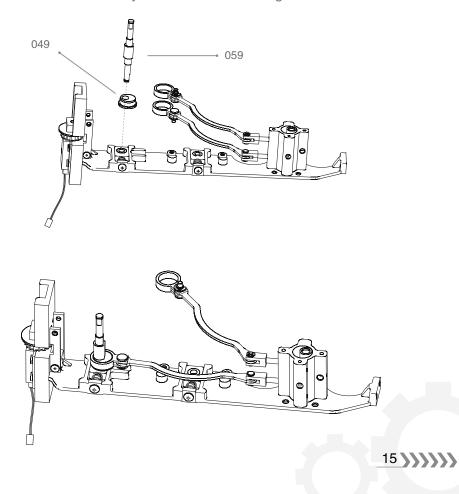


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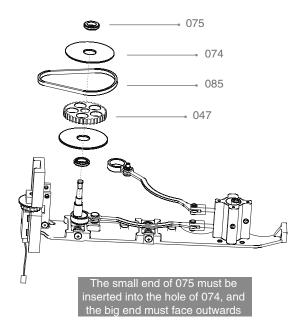


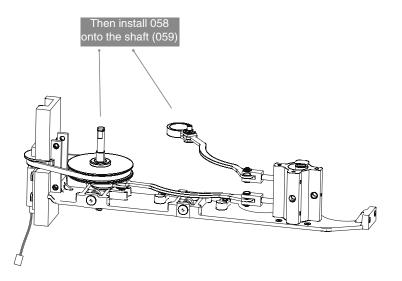
4.9 Assemble the right longitudinal beam and the rear cross beam

4.10 Assembly of main shaft of driving wheel



4.11 Assembly of cam synchronizing wheel

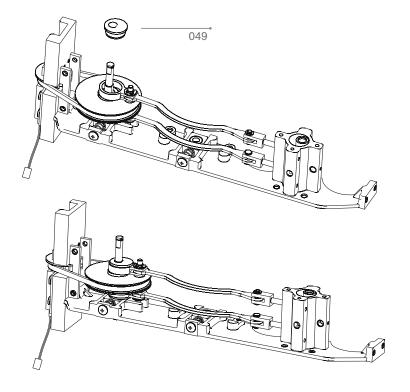


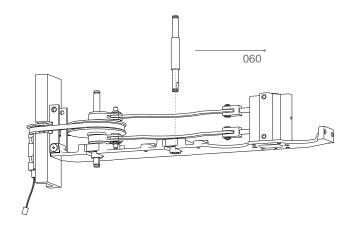


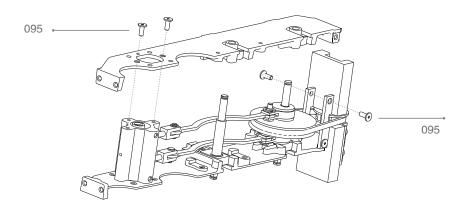
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4.12 Assemble the eccentric wheel

4.13 Assembly of driving connecting rod

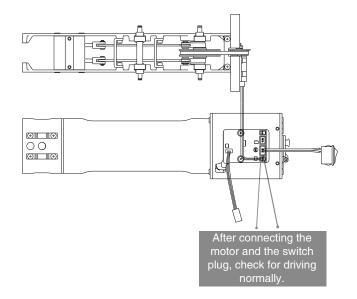


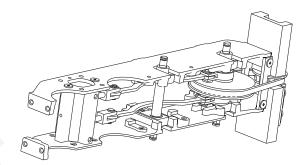




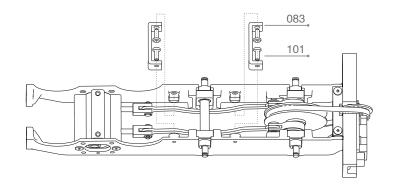
4.14 Assembly of left longitudinal beam assembly

4.15 Testing of ventilating valve



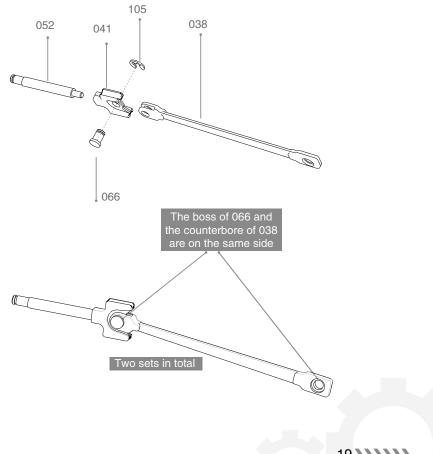


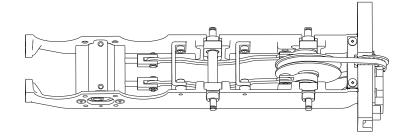
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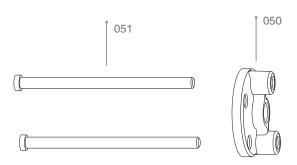
4.16 Assembly of middle support beam

4.17 Assembly of middle driving connecting rod

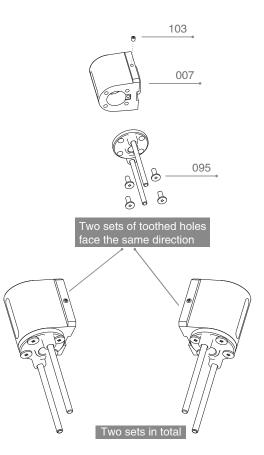


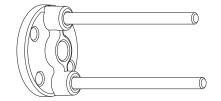




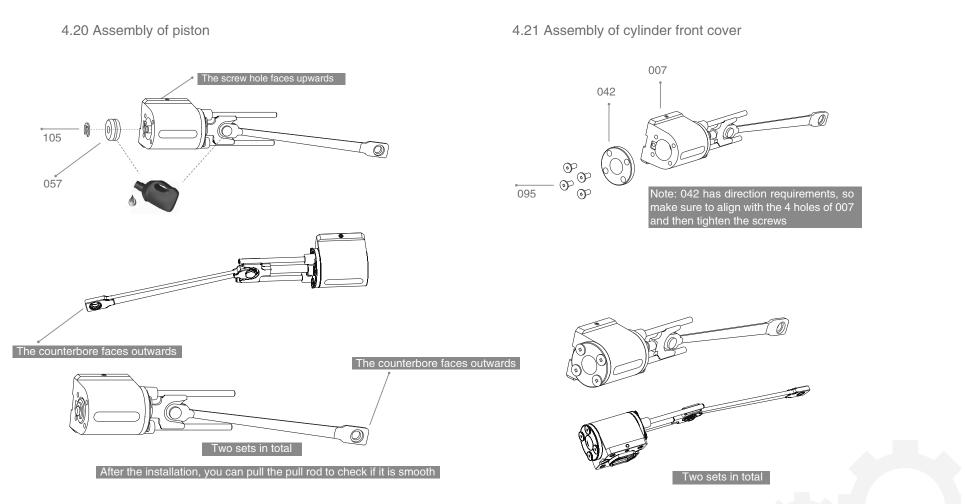


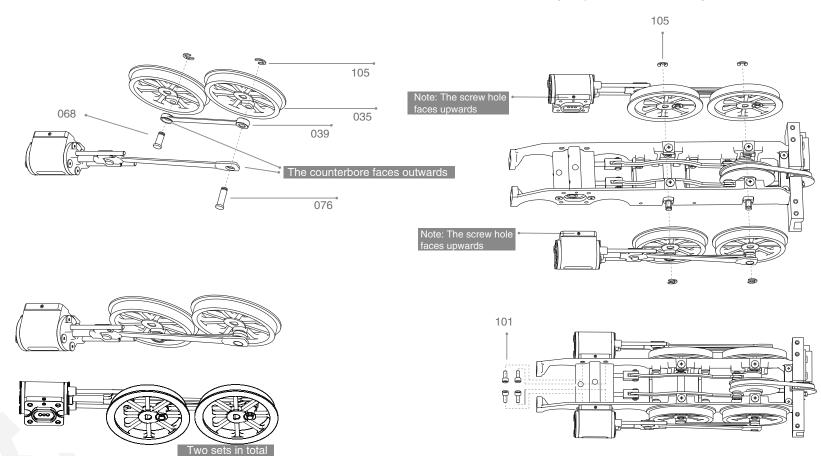
4.19 Assembly of cylinder





Two sets in total

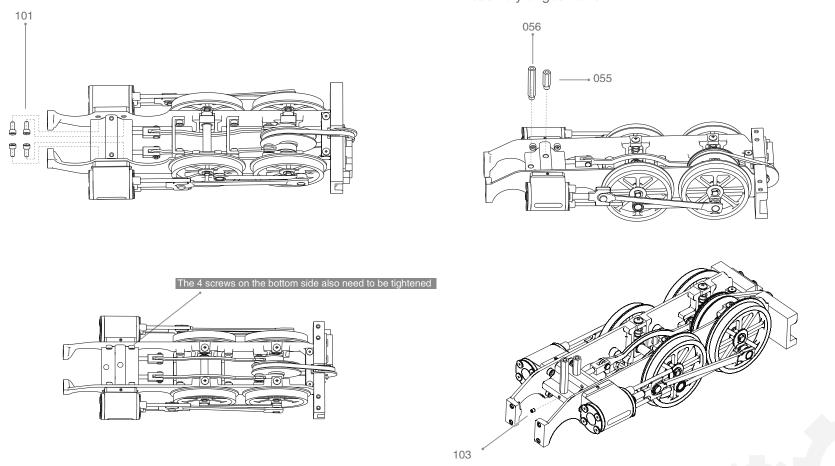




4.22 Assembly of driving wheel

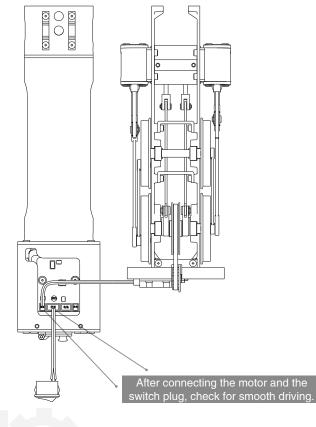
4.23 Assembly of piston rod assembly

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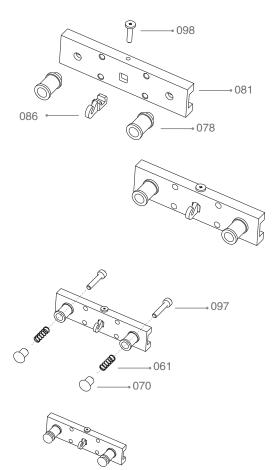


4.2 Assembly of gas valve

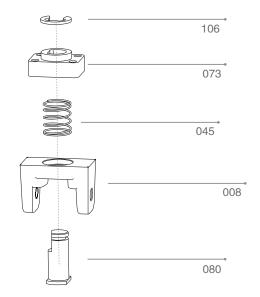




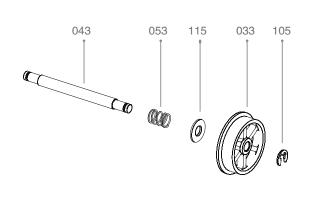
5. Assembly of front bumper assembly

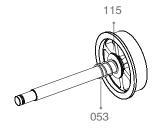


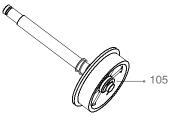
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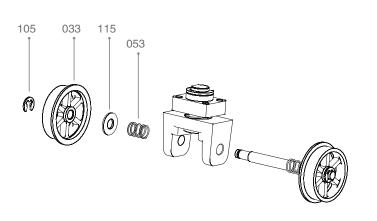




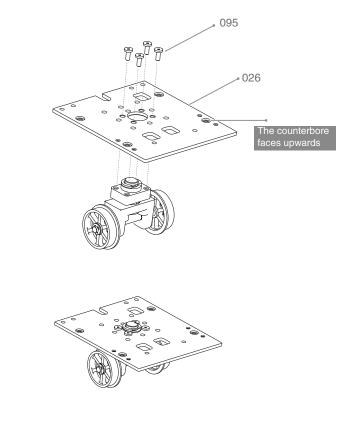


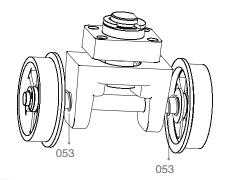
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6. Assembly of rear wheel shock absorber assembly

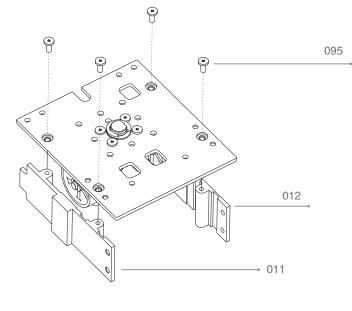


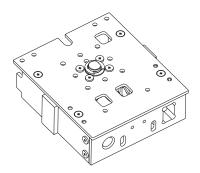
7. Assembly of cab chassis

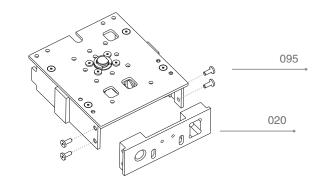


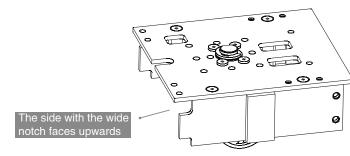


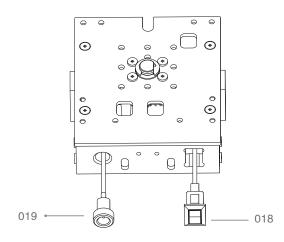
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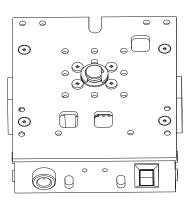




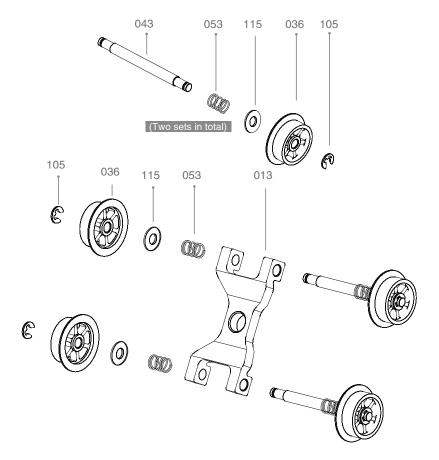




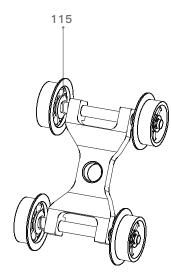


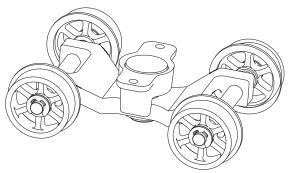


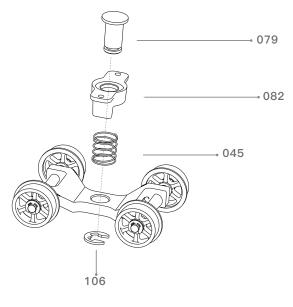
8. Assembly of front wheel shock absorber assembly



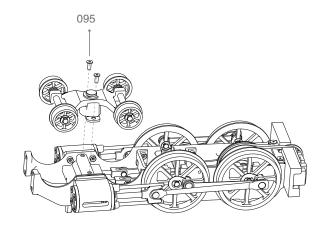
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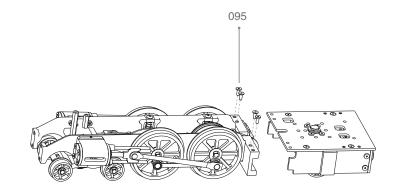


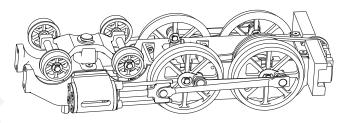


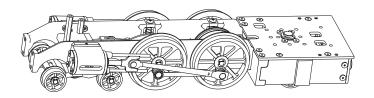


9. Assembly of front wheel shock absorber assembly and chassis body

10. Assembly of cab chassis and chassis body



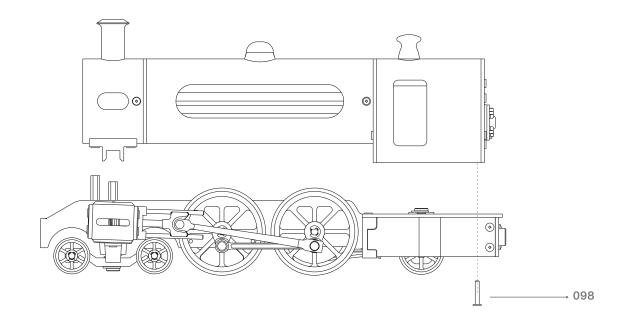


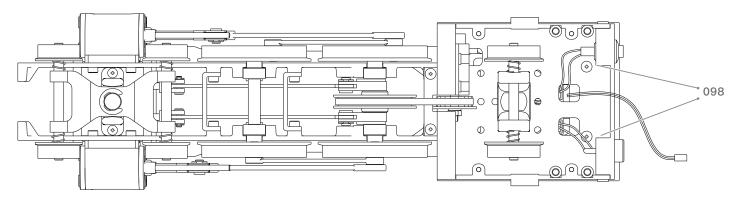


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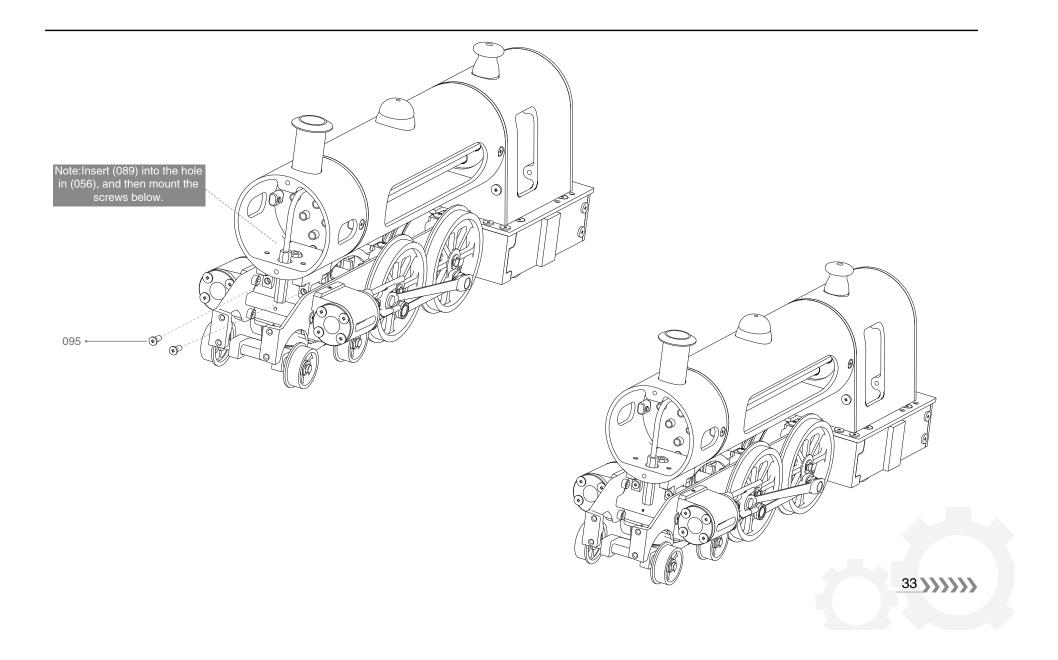
11. Assembly of chassis body and main body 022 021 023 \bigcirc Ô -05 089 Chassis body (\diamond) Main body (9) R 0 S \odot ЪD oД (\diamond) O O outlet \odot 0 000 0 Sensing 0 ۵° able Ø đ 1 , 0)0 **•** Ð 0 0 0 o` 0 0 \cap S ۵ 🖷 🛱 ۲ Switch cable 0 Charging cable \odot \odot Τo 0 TOF te de te Charging Motor Switch Charging Switch

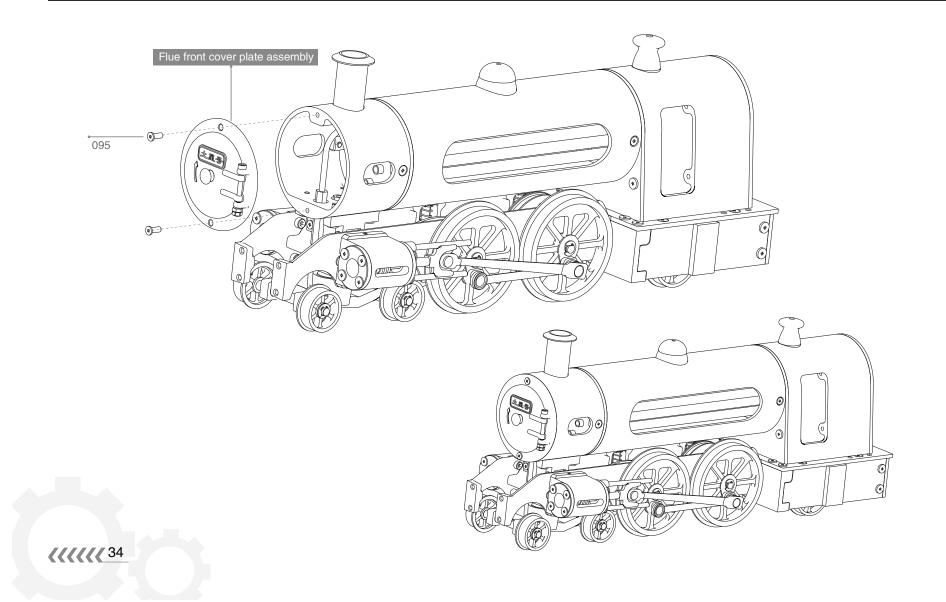
Note: All sockets of the circuit board must be connected correspondingly.

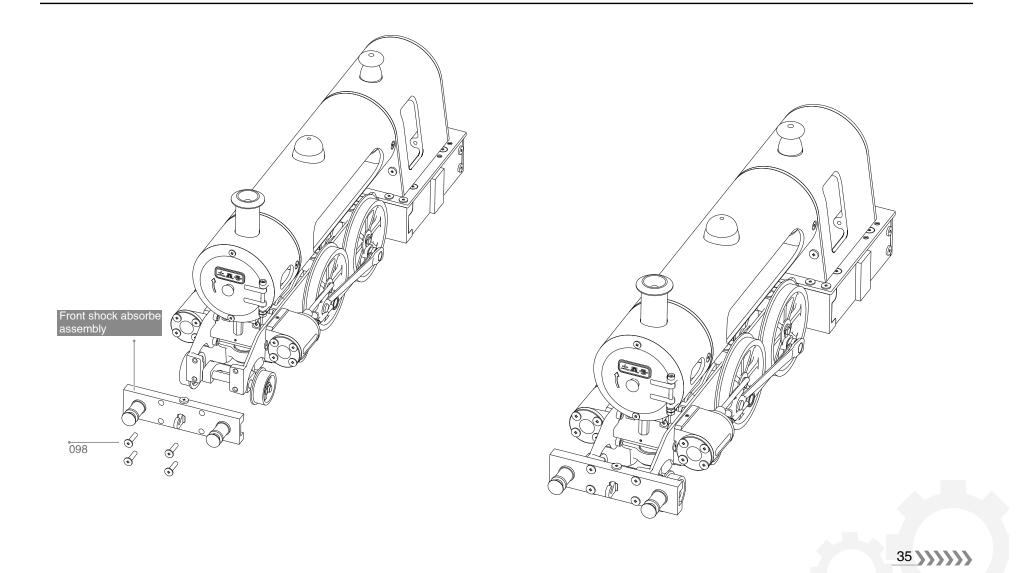


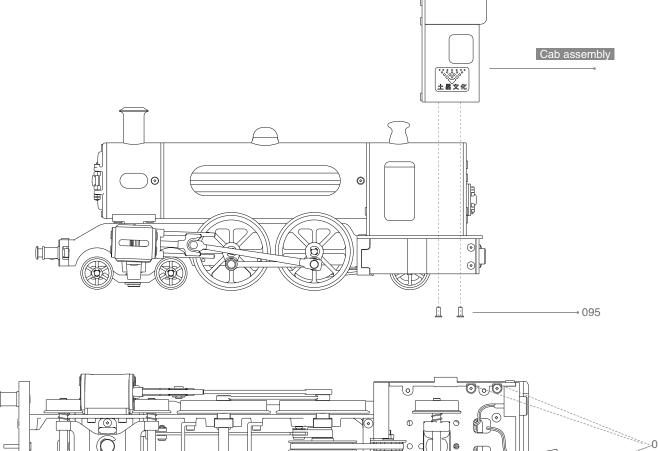


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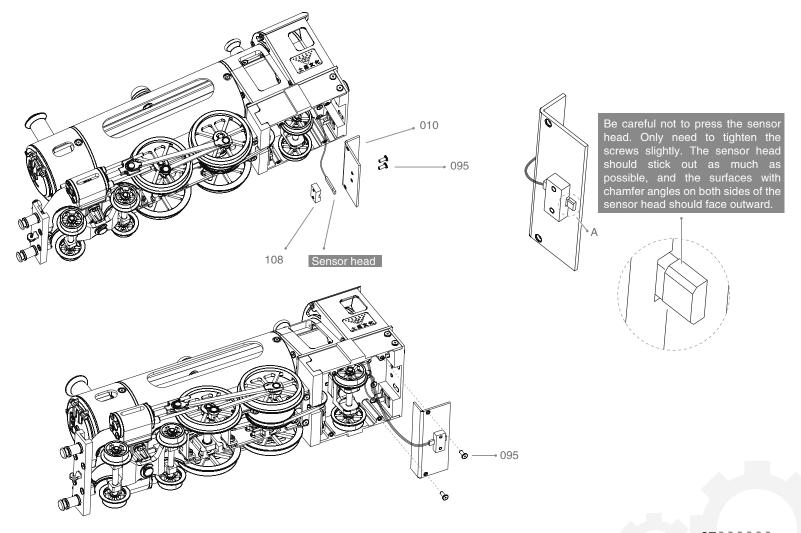


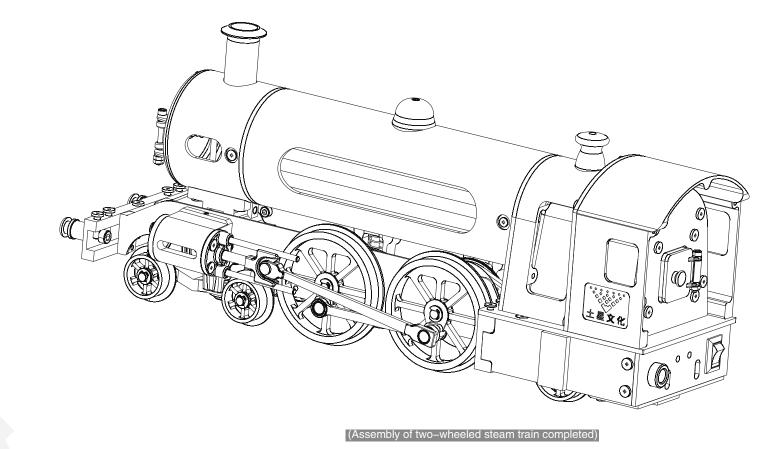




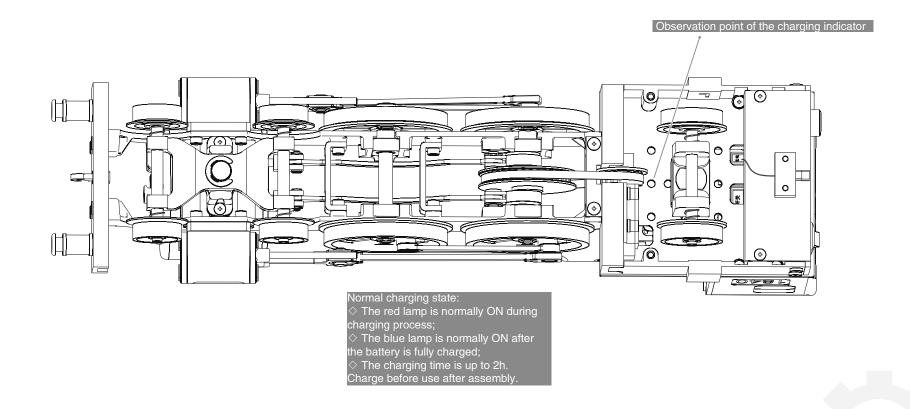


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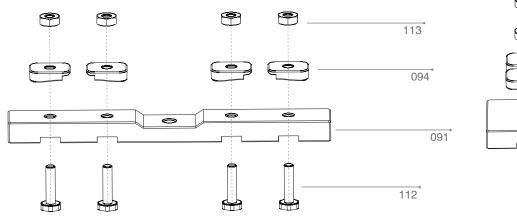


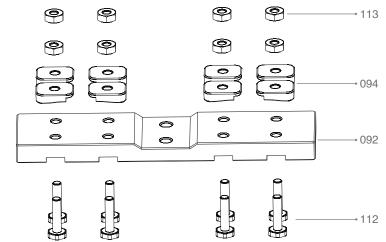


Charging precautions:



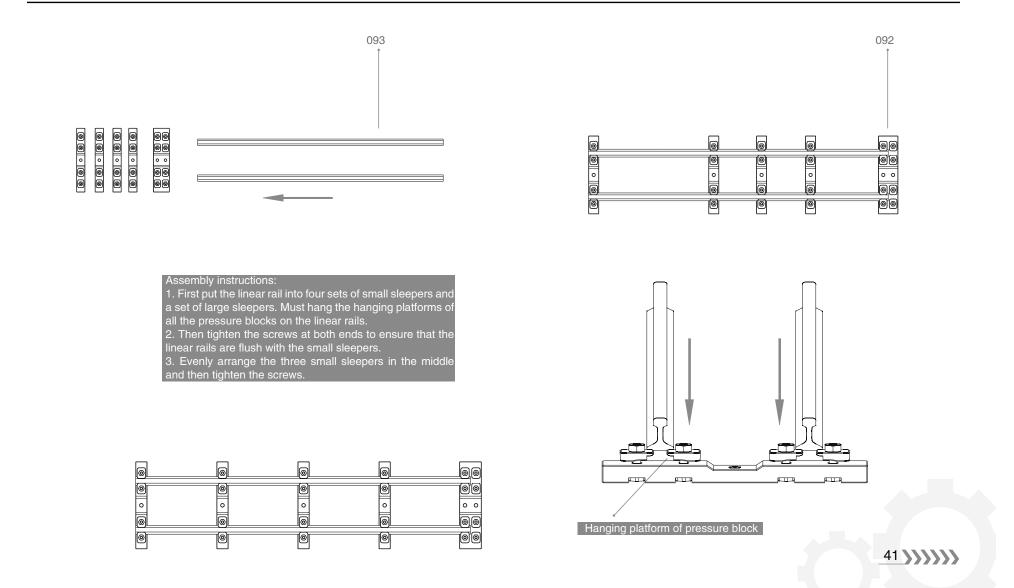
12. Rail assembly (giveaway)

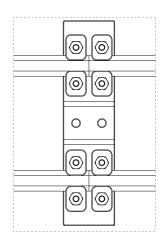






First assemble all the large and small sleepers and just tighten the screws to half the full engagement depth.

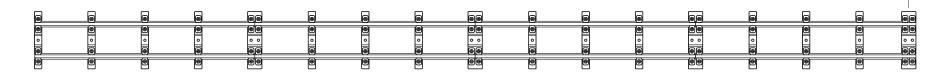




When installing two linear rails to be butted, make sure to pay attention to the connection smoothness of these two linear rails. You can feel it by hand or check it with an object with a straight edge.

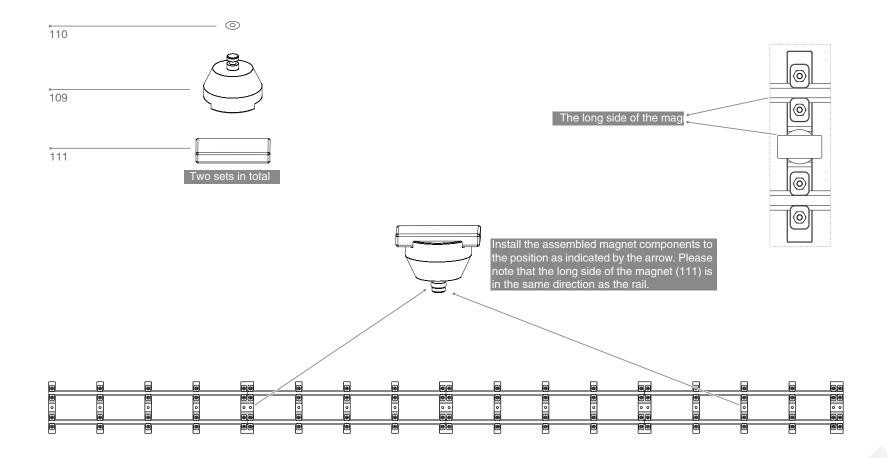
For each set of linear rails, tighten the screws at both ends, and then arrange the middle three sets of small sleepers properly to tighten the screws.

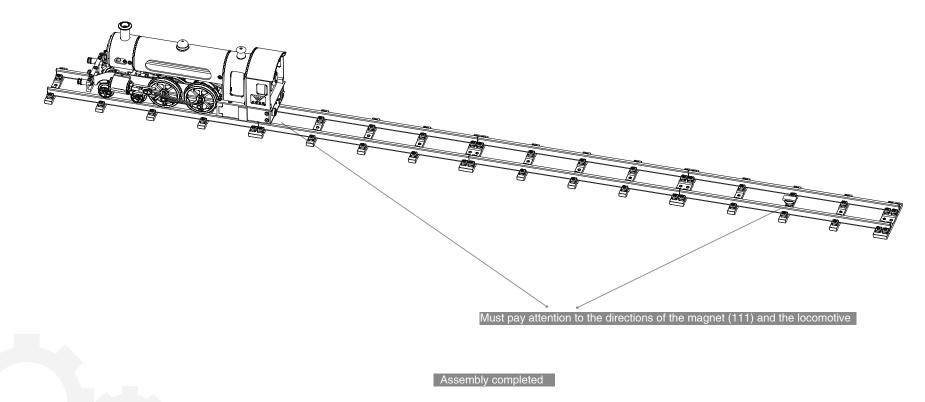
092



Rail components completed

///// 42

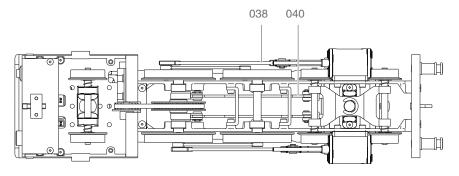




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Troubleshooting

I> If the motion is exceptional when the switch is turned on after assembly, please check against the instruction manual; if no problem is detected, please follow the steps below to perform troubleshooting:



1> Check if the steering connecting rod (040) is installed vertically. Must be adjusted.

2> Check if the active connecting rod (038) is deformed and not straight.

3> Check if the hole and orifice of the ventilating valve (006) have any burrs. If any, scrape off the burrs with a knife and clean them off.

4> Check if the cylinder (007) has any burrs inside. If any, make sure to scrape off the burrs with a knife and clean them off.

5> Check if there are any burrs in the grooves on both sides of the connector for the connecting rod (041). If any, scrape off the burrs with a knife and clean them off.



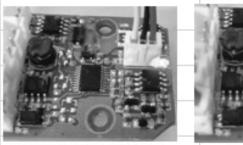
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007

006

II > Electronics troubleshooting table

Common problems description	Solutions
Not charged	 Use a charger with standard USB 5V output; Check if the charging plug is in appropriate contact with charging base; insert the plug thoroughly to the greatest extent; The lamp is in red during charging and turns blue after full charging.
Motor fails to run	 Check if the motor plug is properly inserted and in good contact; Check if the motor functions properly without gear; Perform test after the battery is fully charged
The machine will not run back and forth	 Check if the plug of the sensor head has been plugged in the socket; Check if the Installation position of the sensor head aligns with the magnet on the rail. The typeface of the sensor head should face the magnet. The distance between the sensor head and the magnet should be controlled at about 5mm.





Charging status indication

Fully charged status indication

No.	Product picture	Product name	Qty.	No.	Product picture	Product name	Qty.
001		Front flue	1	009		Rear beam	1
002		Big flue	1	010		Bottom cover plate	1
003		Boiler	1	011		Left bottom plate	1
004		Water tank	1	012		Right bottom plate	1
005		Roof	1	013	01200	Front 4-wheel beam	1
006		Ventilating valve	1	014		Left cab plate	1
007	00	Cylinder	2	015		Right cab plate	1
008		Rear shaft hub bracket	1	016		Circuit board	1
	•						47

No.	Product picture	Product name	Qty.
017		Battery pack	1
018		Power switch	1
019	\Box	Round charging plug	1
020	•	Rear bottom plate	1
021	Ţ	Chimney	1
022		Safety valve	1
023		Adjusting valve	1
024		Left longitudinal beam	1
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No.	Product picture	Product name	Qty.
025		Right longitudinal beam	1
026		Cab bottom plate	1
027		Flue rear cover	1
028		Front roof plate	1
029		Coal water tank closing plate	1
030		Flue middle cover	1
031		Flue front cover plate	1
032		Flue front cover	1

No.	Product picture	Product name	Qty.
033		Rear wheel	2
034		Coal bin door cover	1
035		Driving wheel	4
036		Front wheel	4
037		Small flue	6
038	~	Driving connecting rod	2
039	~	Driven connecting rod	2
040	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Reversing connecting rod	2

No.	Product picture	Product name	Qty.	
041	-9	Connecting rod connector	2	
042		Cylinder front cover	2	
043		Main shaft of front and rear wheels	3	
044	< <u> </u>	Rod of reversing block	2	
045		Damping spring of front and rear wheels	2	
046		Clip of motor synchronizing wheel	1	
047	8	Cam synchronizing wheel	1	
048	No and a second se	Motor synchronizing wheel	1	
			49	

No.	Product picture	Product name	Qty.
049	0	Eccentric gear	2
050		Rear cover of cylinder	2
051	6	Piston rod guide shaft	4
052		Piston rod	2
053		Left and right springs of front and rear wheels	6
054		Reversing block	1
055		Short nozzle	1
056		Long nozzle	1
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No.	Product picture	Product name	Qty.
057	2	Piston	2
058	Ce	Cover of eccentric gear	2
059		Main shaft of driving wheel	1
060		Driven wheel shaft	1
061		Damping spring of main shaft fixing block	6
062		Limit sleeve	4
063		Left flue bracket	1
064		Right flue bracket	1

No.	Product picture	Product name	Qty.
065		Starting motor –M3 thread with D shaft, 100 rpm	1
066		Front connecting shaft of driving rod	2
067		Ventilation adjusting shaft	2
068		Connecting shaft of driven rod	2
069		Rear connecting shaft of reversing connecting rod	2
070		Front end of shock absorber	2
071		Main shaft fixing block	4
072		Lever base	2

No.	Product picture	Product name	Qty.	
073	6.	Rear wheel bracket	1	
074	0	Clip of synchronizing wheel	2	
075	0	Limiting shaft of synchronizing wheel	2	
076		Rear connecting shaft of driving rod	2	
077		Handle	2	
078		Rear end of shock absorber	2	
079		Shaft of front wheel bracket	1	
080		Shaft of rear wheel bracket	1	
			51	

No.	Product picture	Product name	Qty.
081	•	Front beam	1
082		Fixing plate of 4 front wheels	1
083		Middle support beam	2
084		Motor fixing block	1
085	\bigcirc	Timing belt model 156–3M	1
086	LN	Hook	1
087		Latch of coal bin	1
088	0	Front latch of flue	1
///// 52			

No.	Product picture	Product name	Qty.
089		Steam tube	1
090	00	Limit block of synchronizing gear of motor	1
091	· · · · · ·	Small sleeper	13
092		Big sleeper	4
093		Straight rail	8
094		Pressing block	84
095		Flat head D4.5X M2.5X6	87
096		Mushroom head screw M2.5X14	4

No.	Product picture	Product name	Qty.
097	\$	CM2.5X16	2
098	(tp)	Flat head M2.5X10	11
099		Inner hexagon M2X16	1
100	0	Inner hexagon M2X22	1
101		Inner hexagon M2.5X6	12
102	\bigcirc	M2 nut	3
103	0	M2X3 cup point set nut	3
104	57	M2 snap ring	2

No.	Product picture	Product name	Qty.	
105	50	M3 snap ring	25	
106	57	M6 snap ring	2	
107		Locking spring of the front cover of smoke pipe	1	
108	•	Pressure block of sensor head	1	
109	Ŷ	Install the seat	2	
110		O-ring inner diameter: 1.5X; wire diameter: 1.0) 10	
111		Magnet 19X9.4X3.0	2	
112		Outer hexagon M2.5X10	84	
			53	

No.	Product picture	Product name	Qty.
113	0	M2.5 nut	84
114	\bigcirc	Battery 0 Inside diameter of O-ring14X2mm	1
115	\bigcirc	Inner hole of cushion block: 4.5*0.5	8
116	0	φ 7X φ 4X2.5 bearing	4
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Warranty instruction

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.

