



Neptune Submarine KIT & SC



No.5220-K

No.5220-F



Please read all instructions thoroughly before assembling the kit.

The contents are subject to change without prior notice due to product improvements and specification changes.

INSTRUCTION MANUAL

WARRANTY

Thunder Tiger Corporation guarantees this model kit to be free from defects in both material and workmanship. The total monetary value under warranty will in no case exceed the cost of the original kit purchased. This warranty does not cover any components damaged by use or modification. Part or parts missing from this kit must be reported within 60 days of purchase. No part or parts will be sent under warranty without proof of purchase. To receive part or parts under warranty, the service center must receive a proof of purchase and/or the defective part or parts. Should you find a defective or missing part, contact the authorized Thunder Tiger Service/Distributor nearest you. Under no circumstances can a dealer or distributor accept return of a kit if assembly has started.

INTRODUCTION

Congratulations on your purchase of the Thunder Tiger NEPTUNE SB-1 submarine. The NEPTUNE SB-1 submarine is the 1st underwater R/C model by Thunder Tiger. Equipped with high technology operating equipment in the inner hull tube, covered by the brilliantly yellow color outer hull, the NEPTUNE SB-1 will let you enjoy the otherwise hidden, underwater world.

Adopting a static diving system, operating the Neptune is just like the real thing. The system is driven by a ballast tank that with a pump & motor unit. Start the pump to induct the water into the ballast tank. Control the amount of water in the ballast tank, the submarine can dive from the surface and stay underwater in static. Using the propulsion power unit and full elevator and rudder control, you can drive the submarine graceful sailing underwater. Install a digital camera (optional) and you can watch the amazing underwater scenes.

Equipped with a auto-detect protecting system, if the system detects low battery power, low transmission signal, leakage, then the roll pump will auto start to flood the water out of the ballast tank to make the submarine float back to the surface.

NEPTUNE SB-1 submarine, will bring you to experience the mystery world under water!

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ITEMS & TOOLS REQUIREMENT

RADIO SET



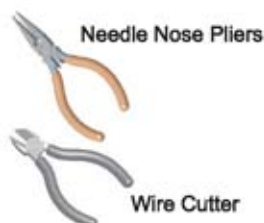
Notice:

It need at least 4Ch or above radio set to operate this model. For the super combo version(5220-F), the radio set already be included.

TOOLS NEEDED FOR ASSEMBLY



Phillips type screwdrivers & hex wrenches
(Ref: TTR screw Drive Set)



Needle Nose Pliers

Wire Cutter



Lexan Cutter/
Scissors

Thread Locking Glue

TOOLS INCLUDED IN KIT



Hex Wrench
1.5mm, 2mm, 2.5mm,
3mm, 5mm



4-way Cross Wrench



5-way Nut Wrench



Wrench 17/19mm

IMPORTANT NOTES & WARNING

RADIO



1. When turning radio on, first turn on the transmitter and extend the transmitter antenna.
 2. Then turn on the receiver (The switch is located on the bottom of the front flange unit).
- When turning off, first turn the receiver off, then the transmitter.

BATTERY CHARGING



One 12V sealed Lead-Acid battery is included in the kit to supply all the requiring battery power for all the electric equipment and power drive system. During charging process, a all night slow charger also be enclosed in the box. Please follow the operating description to execute the battery charging process. DO NOT leave the charger unattended, DO NOT operate the charging process in flammable environment.

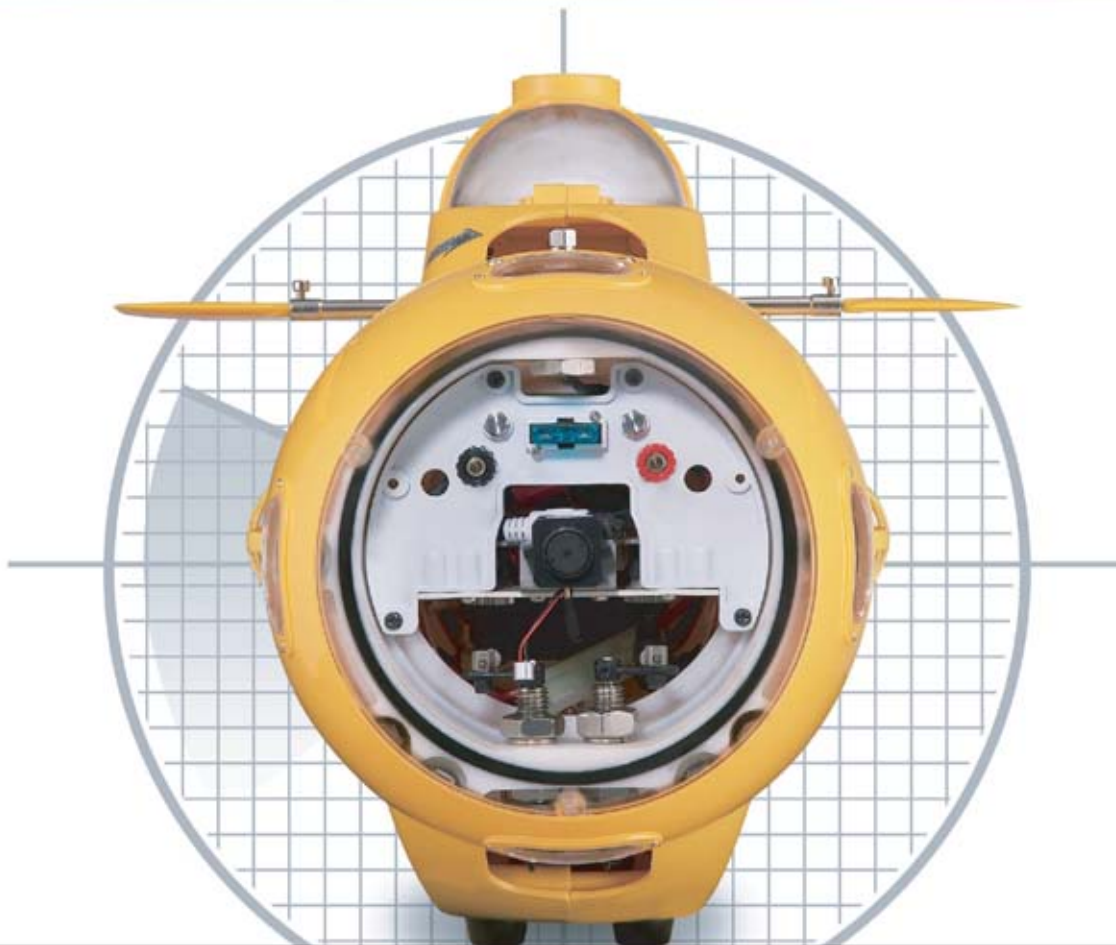
WARNING



1. This radio control submarine is not a toy. If not properly assembled and operated, it is capable of causing property damage. Thunder Tiger and it's distributor have no control over damage resulting from shipping, improper construction, or improper usage.
2. You must choose the suitable and safety area to play the submarine. To avoid the dangerous of falling into the water.



ASSEMBLY SECTION



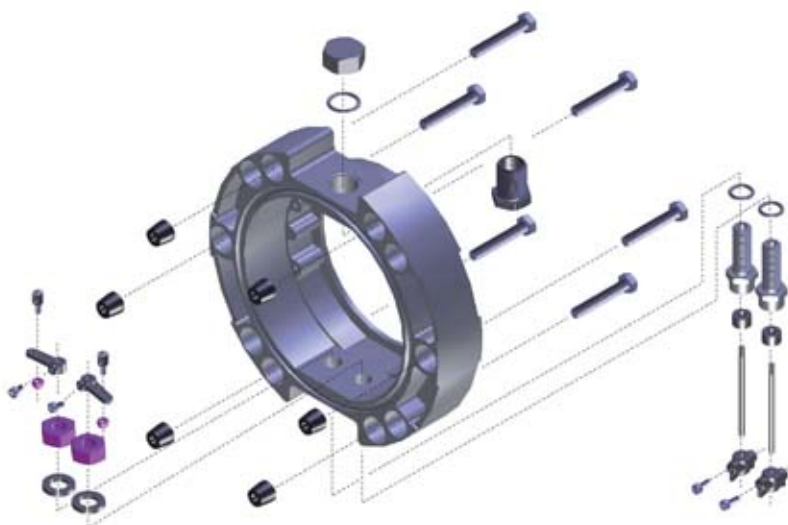
Most parts in the kit version are organized and packed in difference bags & Box. The packages are according to the assembly step and all the bag/box No are shown on the outside of the package. Basically, the electronic are package in Box1~Box4 and other parts are packaged in the Bag-A~ Bag-I. For all the screws, nuts, O-ring ...standard parts are also packed in one bag. In each assembly step, the need standard parts and BAG are shown on the bottom of each assembly icons. Do not open all the bags at once. Just open and prepare the right parts from the bag and correct standard parts before each assembly step. Then follow the drawing/information are shown in each step to execute the assembly process.

1

FRONT FLANGE UNIT ASSEMBLY



1.1 FRONT FLANGE



1.1.1 UPPER SEALED BOLT



Ø15mm
O Ring



1.1.2 LOWER SEALED BOLTS



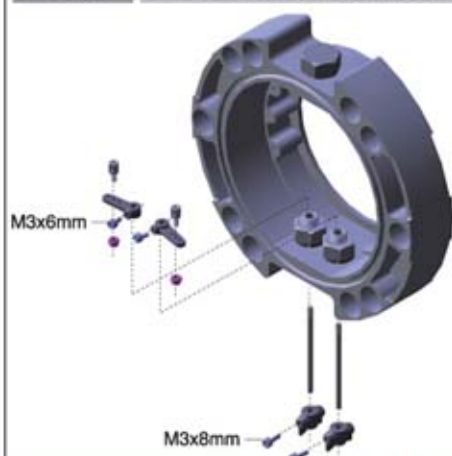
Ø9.5mm
O Ring

M10
Nut

Ø10mm
Spring Washer



1.1.3 SWITCH LINKAGE ARM

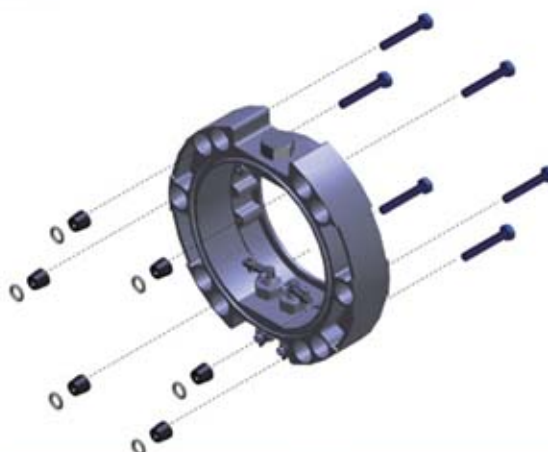


 x 2
  x 2
  x 2

M3x6mm Socket Head Machine Screw
 M3x8mm Socket Head Machine Screw
 M3 Lock Nut



1.1.4 MOUNTING BOLT & CONE RUBBER

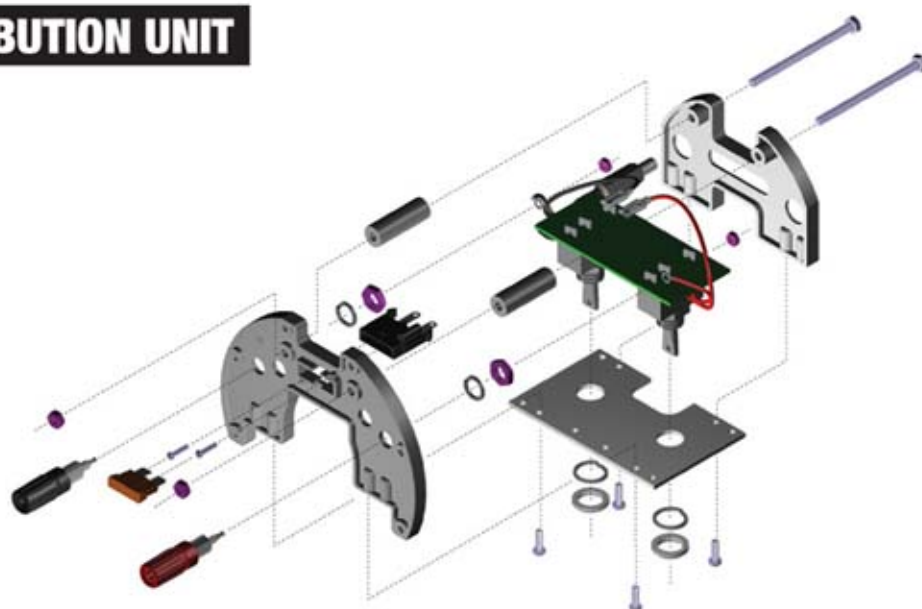


 x 6
  x 6

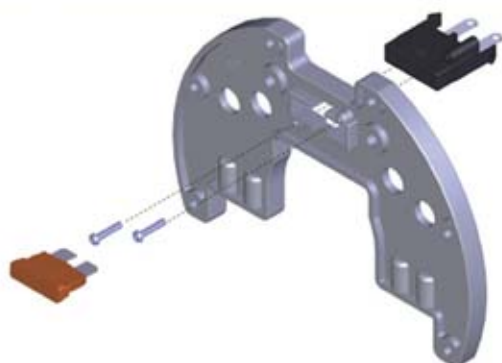
M6x38mm Hex Head Screw
 Ø6mm O Ring



1.2 POWER DISTRIBUTION UNIT



1.2.1 FUSE

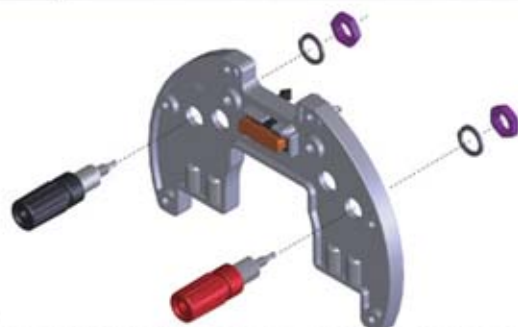


 x 2

M2x10mm BT Phillip Tap Screw



1.2.2 CHARGING BINDING POST



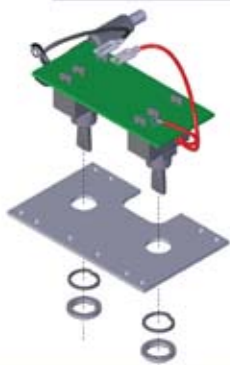
Note:
The spring washer & nuts already installed on the Binding Post. Remove that before assembly.

 x 2
  x 4

Ø4mm Spring Washer
 M4 Nut



1.2.3 POWER DISTRIBUTION BOARD



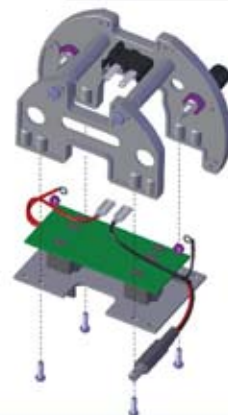
1
BOX
B
BAG

1.2.4 MOUNTING FRAME



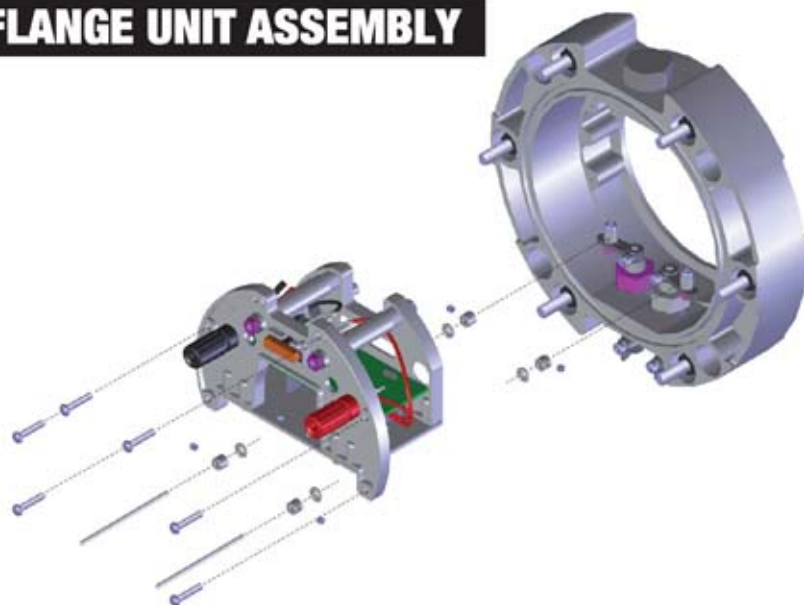
M4x60mm
Hex Head Screw x 2
M4
Nut x 2
Ø4mm
Spring Washer x 2
B
BAG

1.2.5 UNIT ASSEMBLY

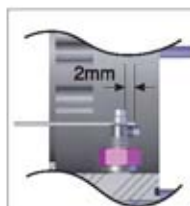
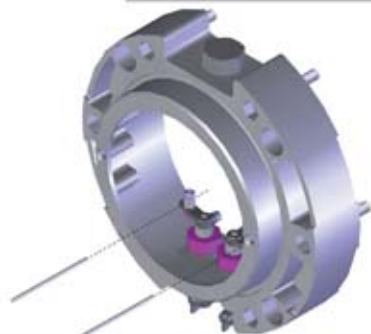


M3x10mm
BT Phillip Tap Screw x 4
B
BAG

1.3 COMPLETE FRONT FLANGE UNIT ASSEMBLY

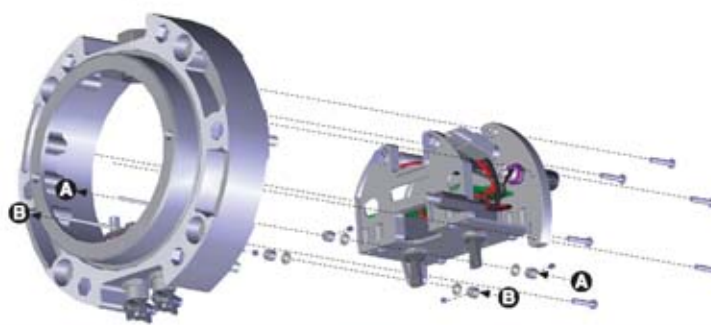


1.3.1 INSTALLATION OF SWITCH LINKAG



M3x4mm
Socket Head Machine Screw x 2
B
BAG

1.3.2 INSTALLATION OF POWER DISTRIBUTION UNIT



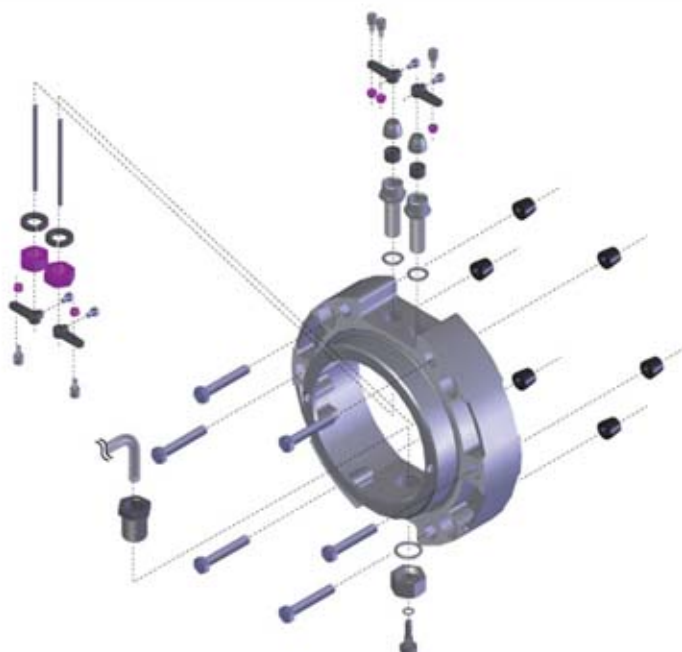
M3x16mm
BT Phillip Tap Screw x 6
M3x3mm
Set Screw x 4
Ø3mm
O Ring x 4
B
BAG

2

REAR FLANGE UNIT ASSEMBLY



2.1 REAR FLANGE



2.1.1 WATER INLET BOLT



x1
 Ø4mm O Ring
 x1
 Ø15mm O Ring



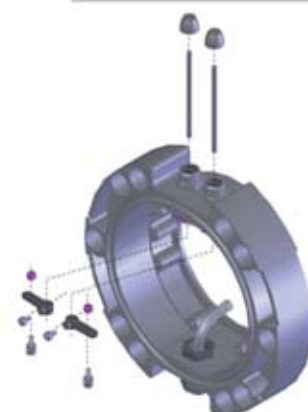
2.1.2 UPPER SEALED BOLTS



x1
 Ø9.5mm O Ring
 x2
 M10 Nut
 x2
 Ø10mm Spring Washer



2.1.3 CONTROL LINKAGE ARM



x2
 M3 Lock Nut
 x2
 M3x6mm Socket Head Machine Screw



2.1.4 CONTROL ARM

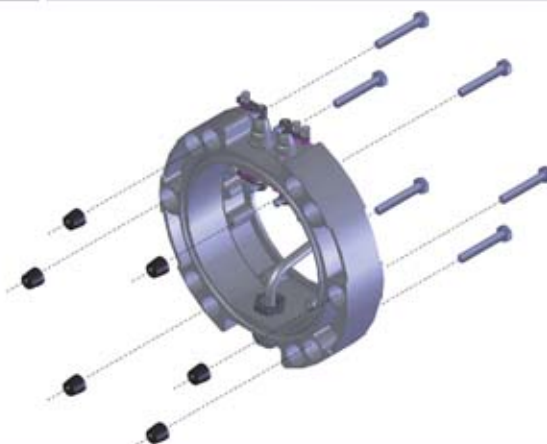


 x 2
M3x6mm
Socket Head Machine Screw

 x 3
M3
Lock Nut



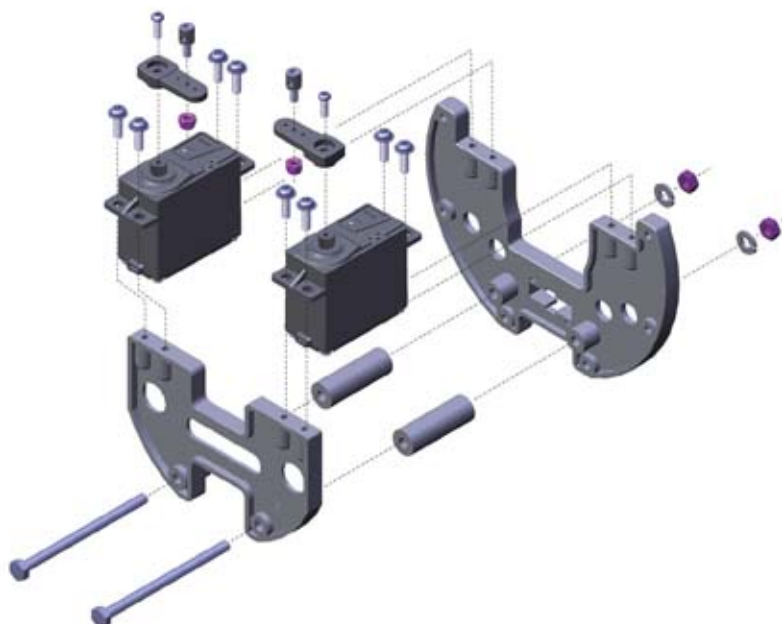
2.1.5 MOUNTING BOLT & CONE RUBBER



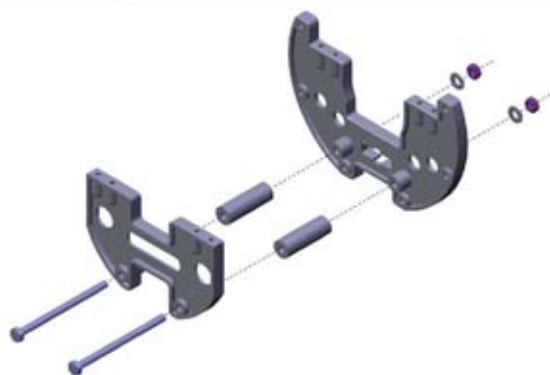
 x 6
M6x38mm
Hex Head Sscrew




2.2 SERVO UNIT



2.2.1 MOUNTING FRAME



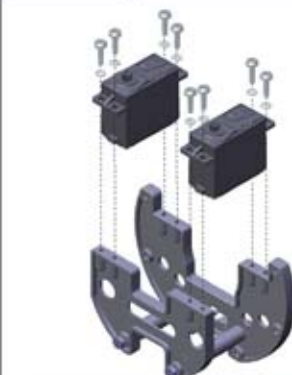
 x 2
M4x60mm
Hex Head Sscrew

 x 2
M4
Nut

 x 2
Ø4mm
Spring Washer



2.2.2 SERVOS



 x 8
M3x10mm
BT Phillip Tap Screw

 x 4
Ø3mm
Washer



2.2.3 SERVO ARM

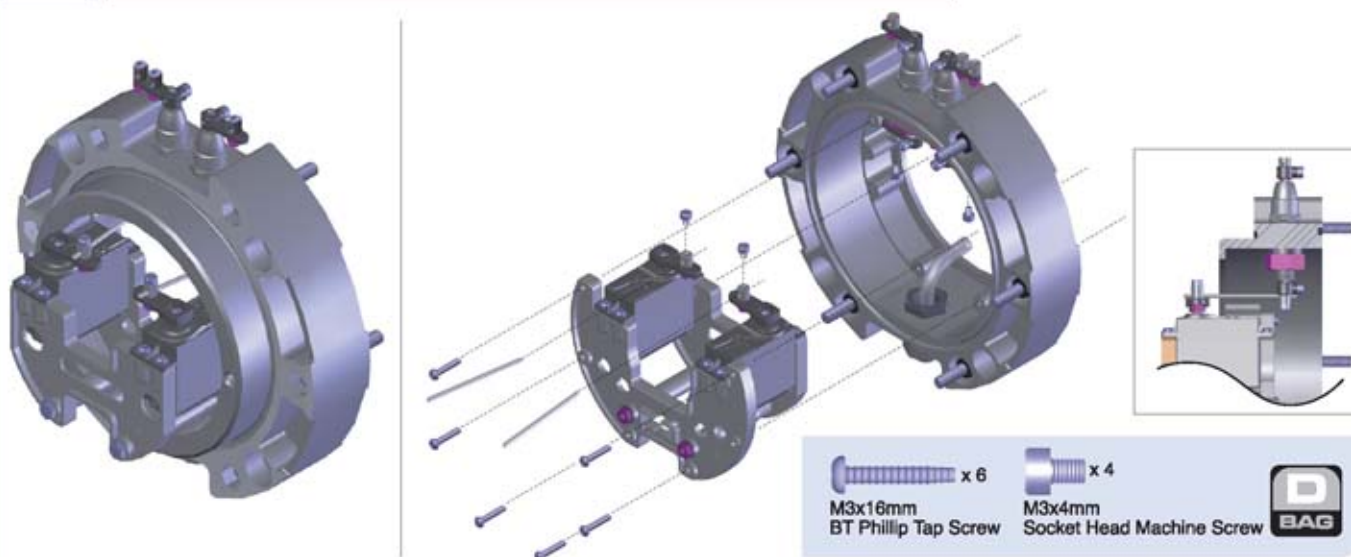


 x 2
M2.6x8mm
BT Phillip Tap Screw

 x 2
M3
Lock Nut

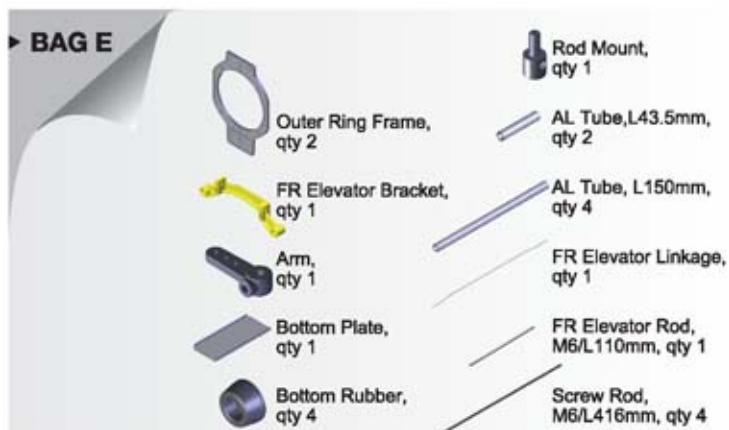
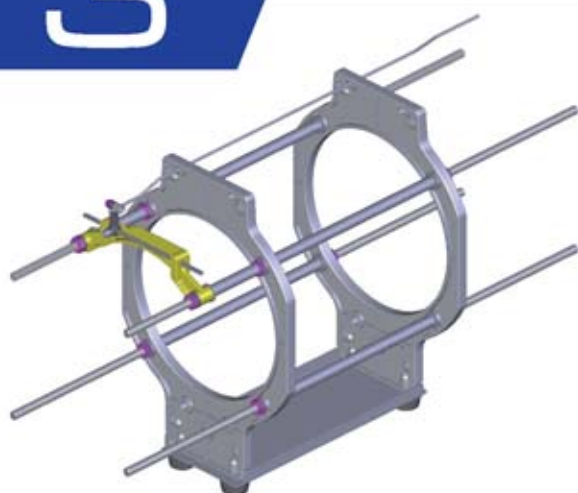


2.3 COMPLETE REAR FLANGE UNIT ASSEMBLY

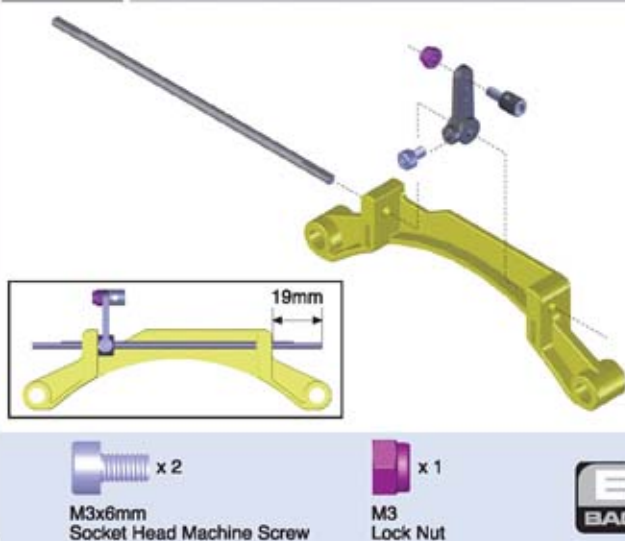


3

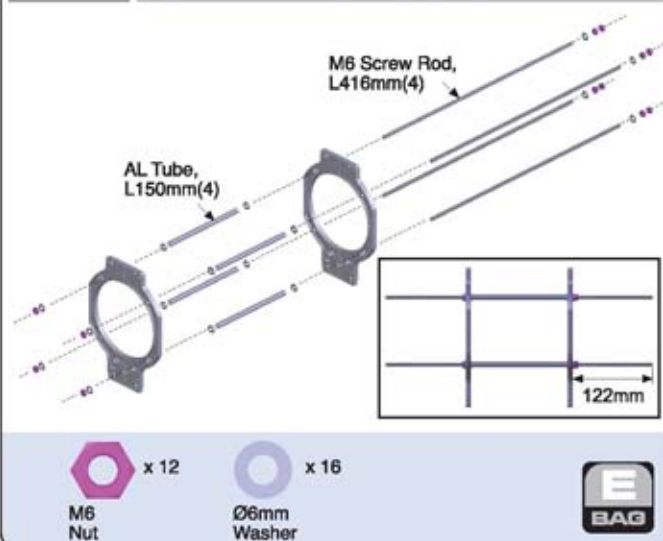
OUTER FRAME ASSEMBLY



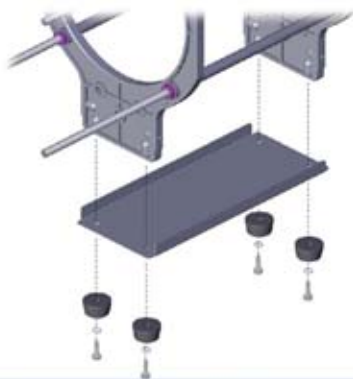
3.1 FRONT ELEVATOR BRACKET



3.2 OUTER RING FRAME

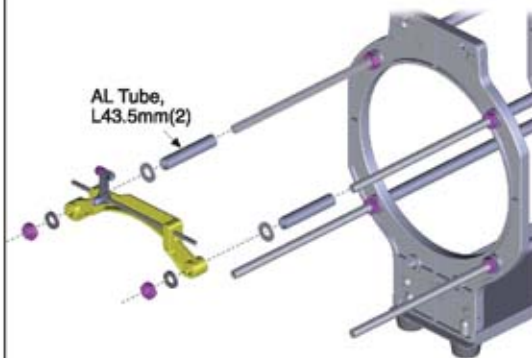


3.3 BOTTOM PLATE



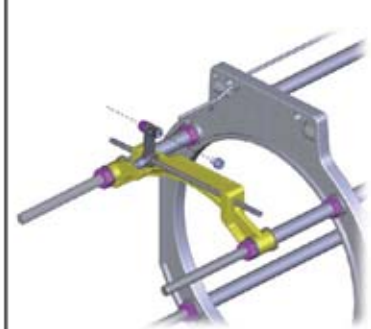
- M3x12mm BT Phillip Tap Screw x 4
- Ø3mm Washer x 4

3.4 BRACKET INSTALLATION



- Ø6mm Spring Washer x 2
- M6 Nut x 2
- Ø6mm Washer x 2

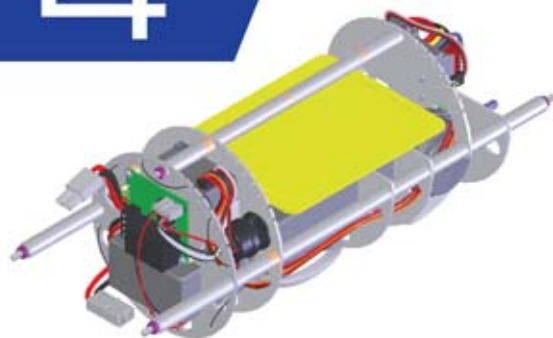
3.5 LINKAGE ROD



- M3x4mm Socket Head Machine Screw x 1

4

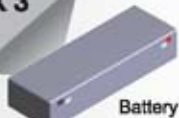
INNER STRUCTURE ASSEMBLY



BAG F

- Case, qty 1
- Ballast, qty 1
- Water Tube, qty 1
- 1st Inner Frame, qty 1
- 2nd Inner Frame, qty 1
- 3rd Inner Frame, qty 1
- 4th Inner Frame, qty 1
- 5th Inner Frame, qty 1
- 6th Inner Frame, qty 1
- Screw Bolt, M4/L335, qty 2
- Screw Bolt, M4/L240, qty 1
- Screw Bolt, M4/L210, qty 1
- Spacer Collar, qty 4
- Spacer Washer, qty 3
- Plastic Tube, L30mm, qty 17
- Plastic Tube, L60mm, qty 8
- Pump Cap, qty 1
- Pump Roller, qty 3
- Water Tube, L220, qty 1
- Pump Mount, qty 1
- Pump Motor Mount, qty 1
- Connector, qty 1
- 3-Way Connector, qty 1

BOX 3



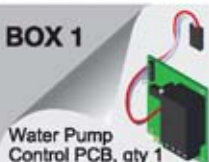
Battery

BOX 4



Pump Motor

BOX 1



Water Pump Control PCB, qty 1



Speed Controller, qty 1



Speed Controller Wire, qty 1



Leakage Detecting Wire, qty 1



Servo Connecting set, qty 1



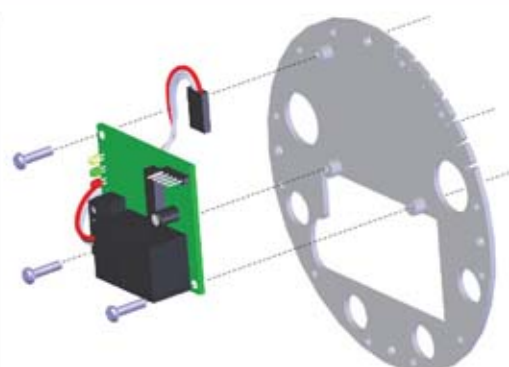
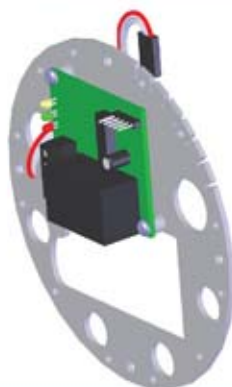
Pressure Sensor, qty 1



Double-Sided Foam, qty 2

Double-Sided Foam (for pressure sensor), qty 1

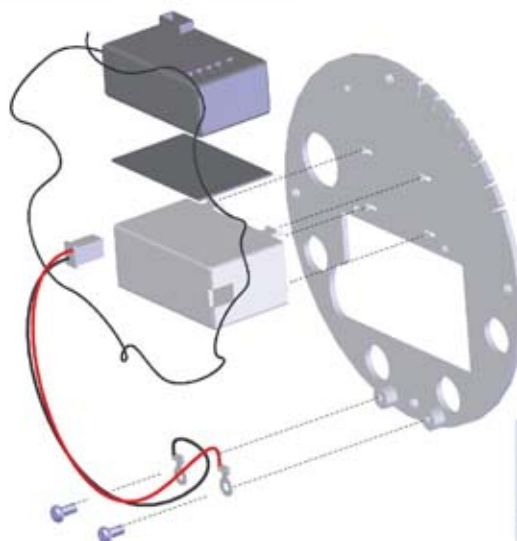
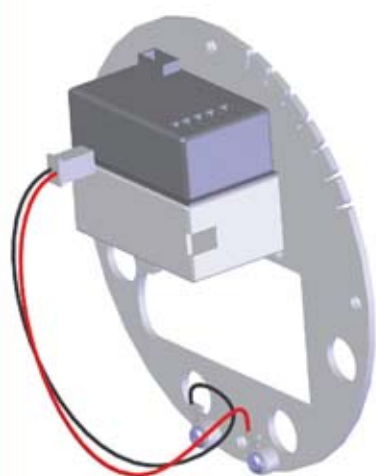
4.1 1st INNER FRAME W/WATER PUMP CONTROL PCB



- M3x8mm BT Phillip Machine Screw x 3



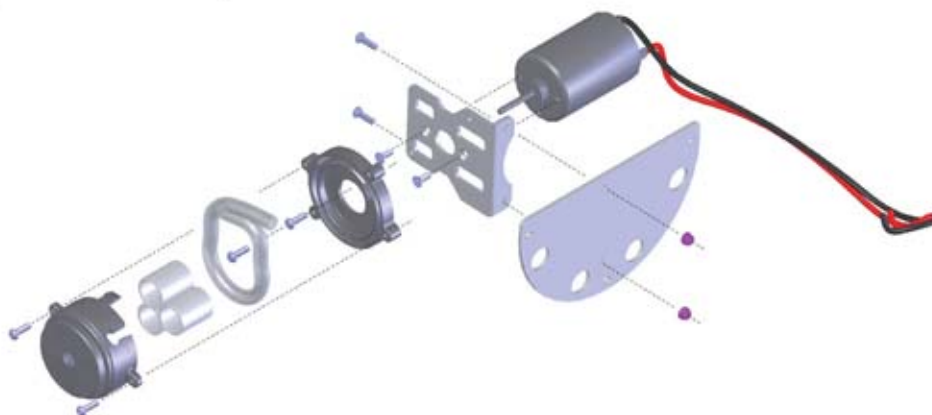
4.2 2ND INNER FRAME W/RECEIVER



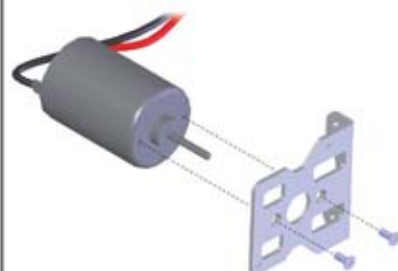
x 2
M3x8mm
BT Phillip Machine Screw

1 **F**
BOX **BAG**

4.3 4TH FRAME W/PUMP UNIT



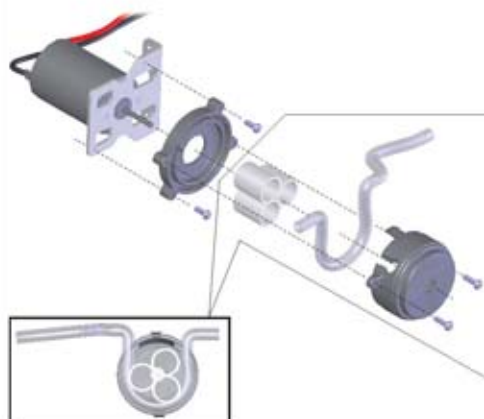
4.3.1 MOTOR MOUNTING



x 2
M3x8
CT Phillip Machine Screw

4 **F**
BOX **BAG**

4.3.2 ROLLER PUMP

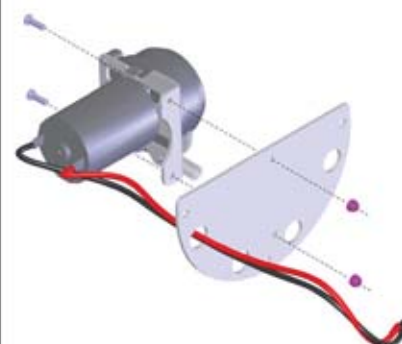


x 2
M3x10
BT Phillip Machine Screw

x 2
M3x10mm
BT Phillip Tap Screw

F
BAG

4.3.3 FRAME W/PUMP UNIT

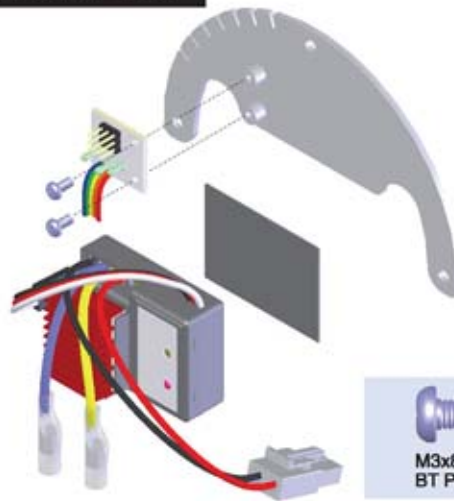
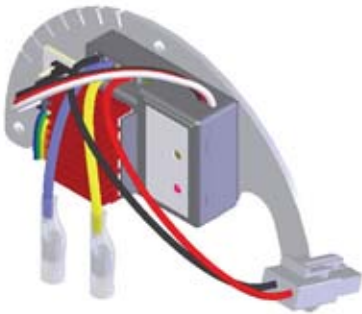


x 2
M3x10
BT Phillip Machine Screw

x 2
M3
Lock Nut

F
BAG

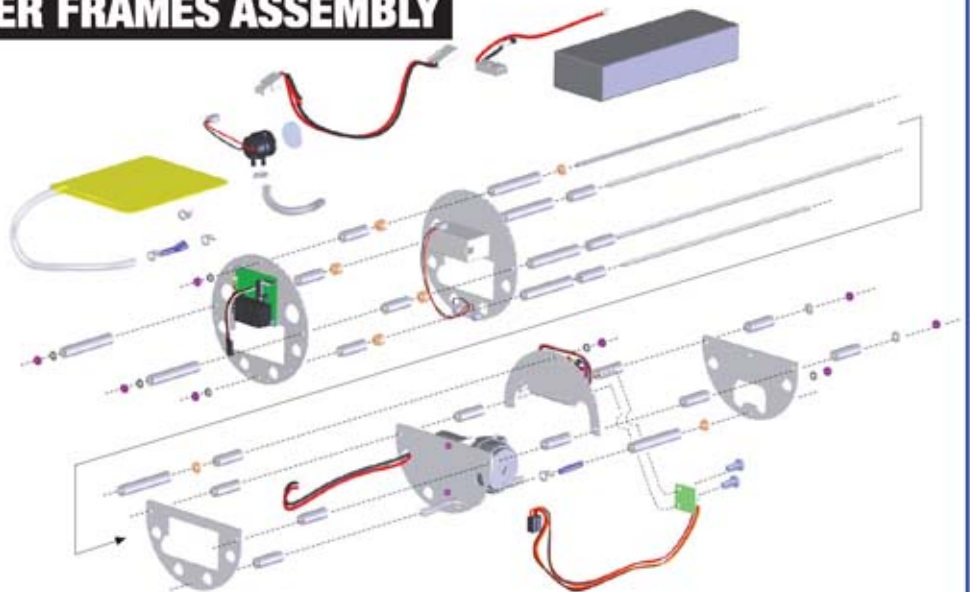
4.4 5TH FRAME W/SPEED CONTROLLER



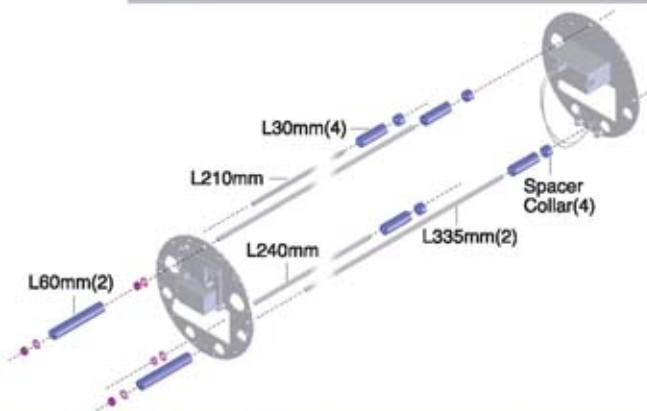
x 2
M3x8
BT Phillip Machine Screw

1
BOX

4.5 COMPLETE INNER FRAMES ASSEMBLY



4.5.1 1ST & 2ND INNER FRAMES ASSEMBLY

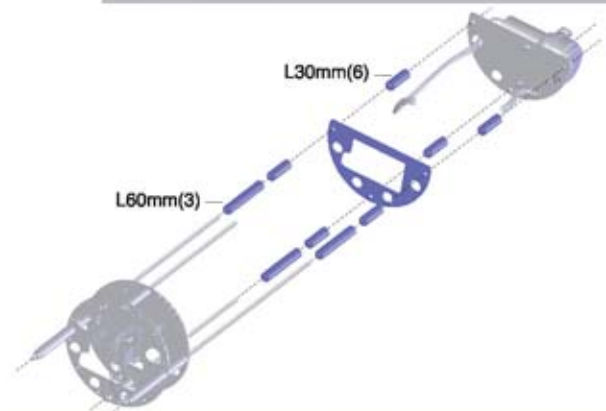


x 4
M4
Nut

x 4
Ø4mm
Washer

F
BAG

4.5.2 3RD & 4TH INNER FRAMES ASSEMBLY

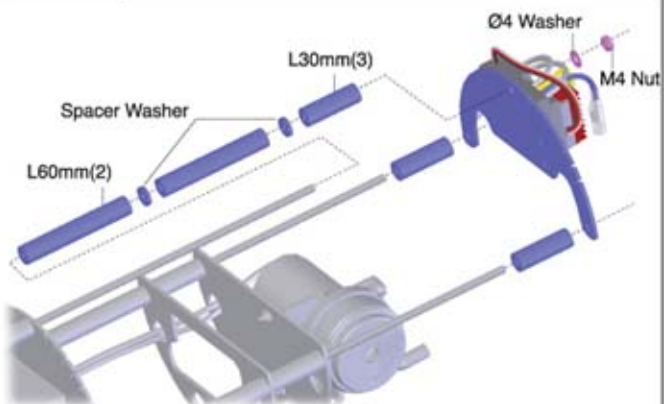


L30mm(6)

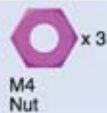
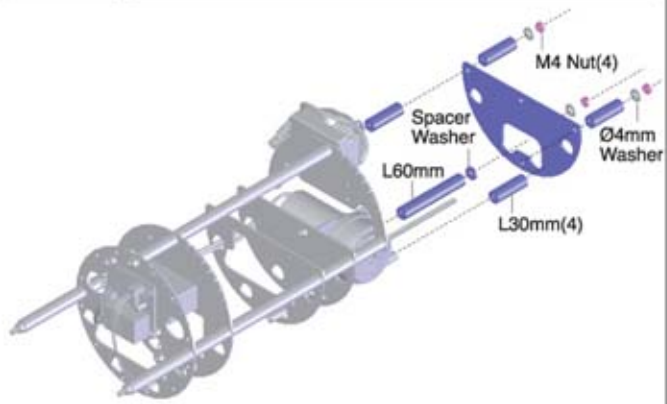
L60mm(3)

F
BAG

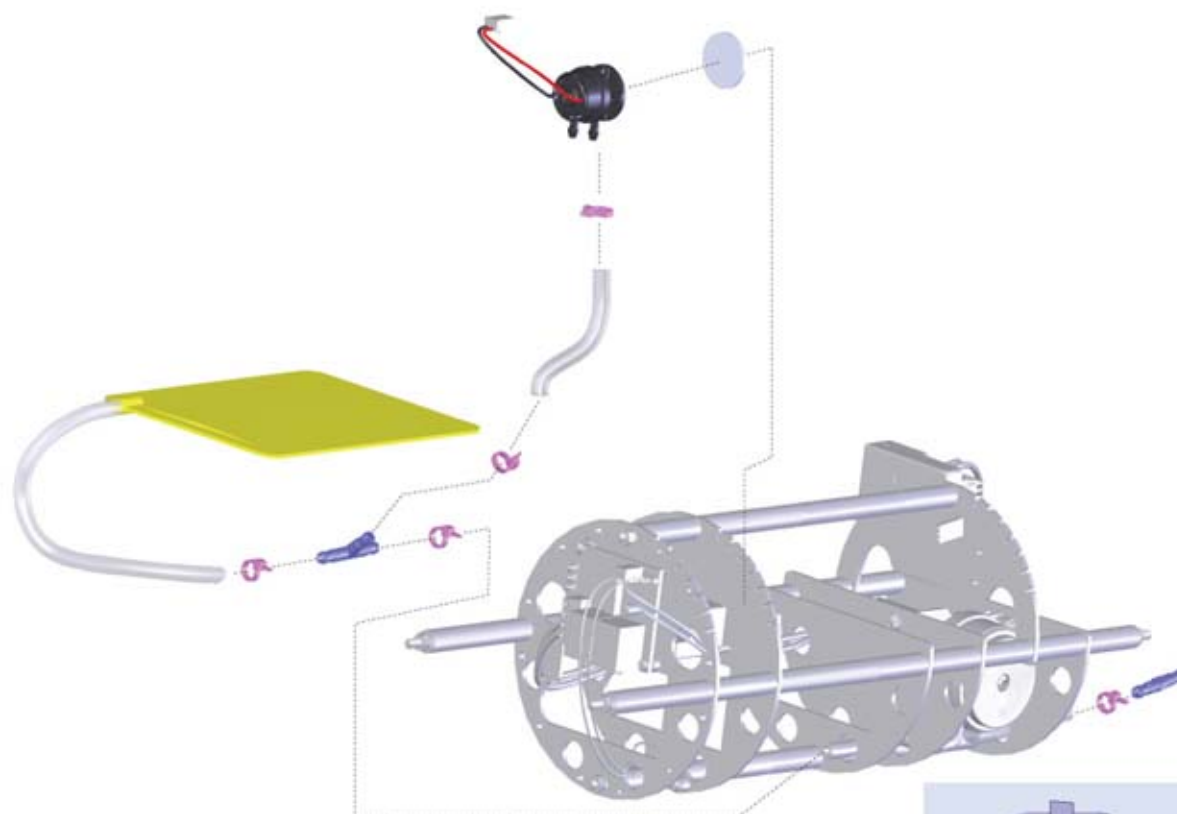
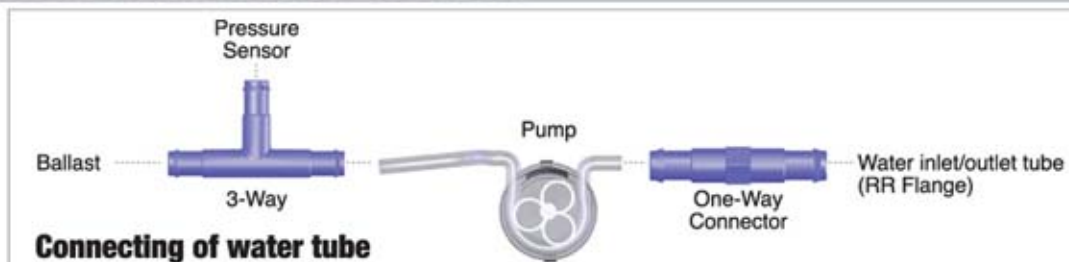
4.5.3 5TH INNER FRAME ASSEMBLY



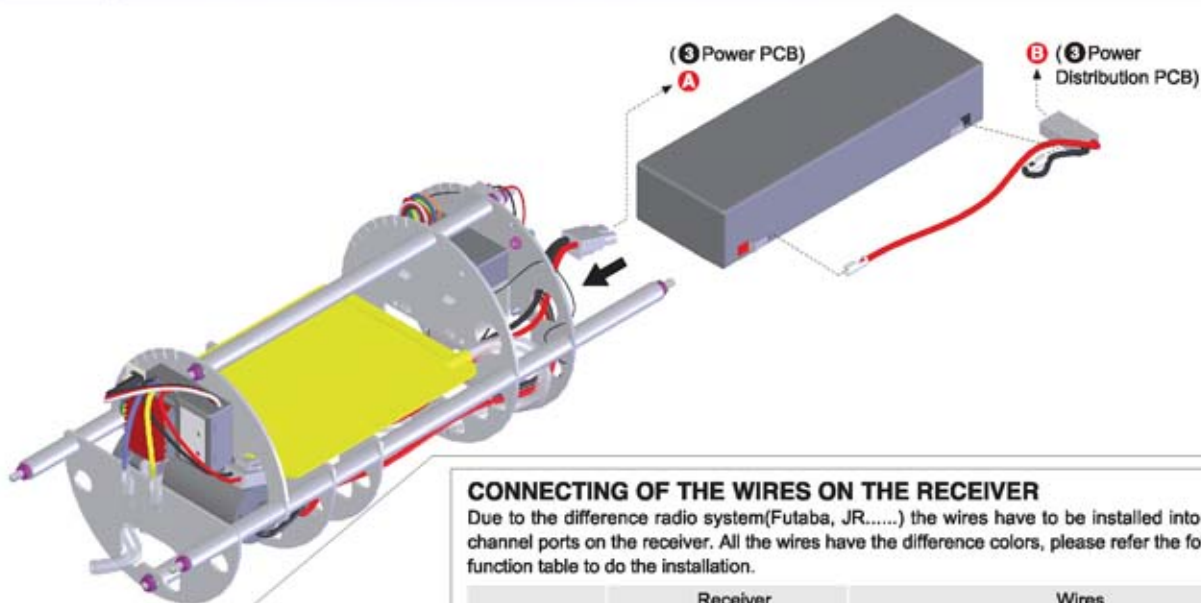
4.5.4 6TH INNER FRAME ASSEMBLY



4.5.5 BALLAST TANK & PRESSURE SENSOR



4.5.6 SERVO/WIRE & BATTERY INSTALLATION

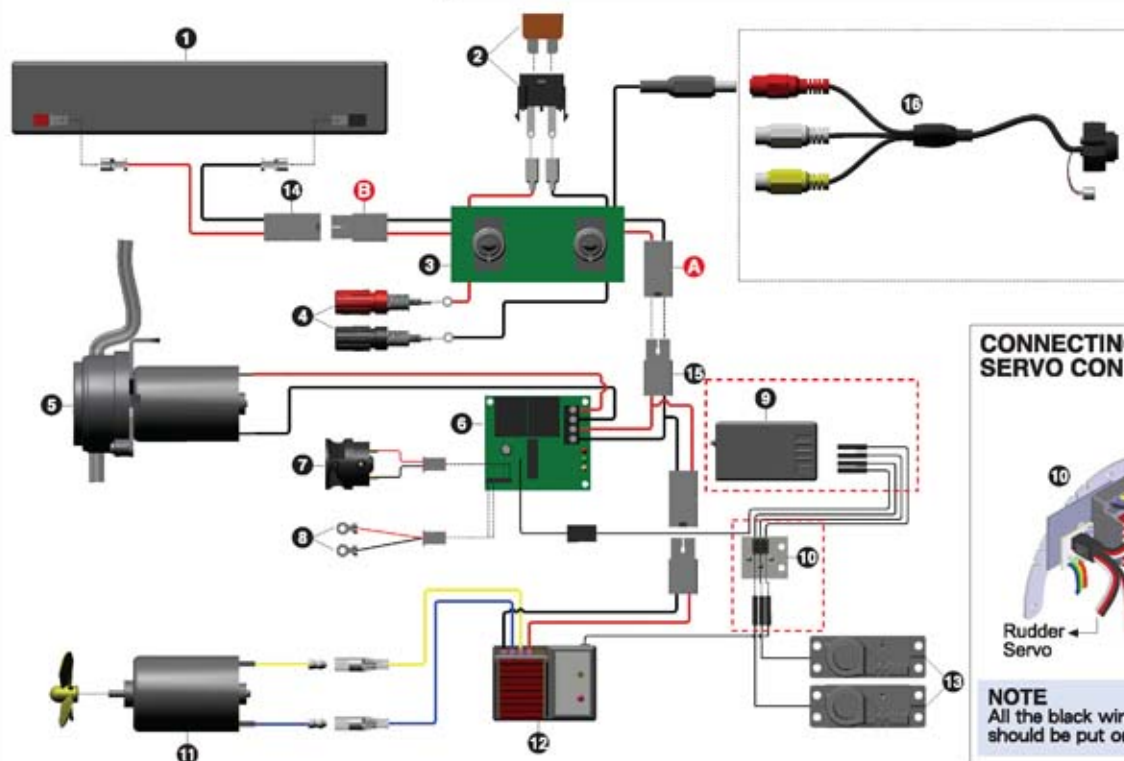


CONNECTING OF THE WIRES ON THE RECEIVER

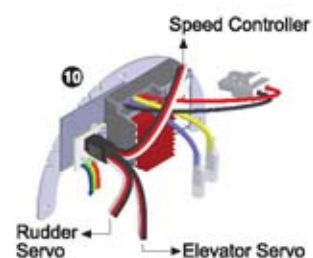
Due to the difference radio system (Futaba, JR.....) the wires have to be installed into the correct channel ports on the receiver. All the wires have the difference colors, please refer the following wire function table to do the installation.

Receiver	Color	Wires		
		Drive System	Function	Wire From
Skymaster/JR				
CH 4	CH 4	Water Pump	Diving/Floating	Power Distribution PCB
CH 1	CH 2	Speed Controller (Propeller)	Forward/Backward	Servo Connecting Set
CH 2	CH 1	Rudder Servo	Turn Left/Right	
CH 3	CH 3	Elevator Servo	Pitch Up/Down	

CONNECTING OF ELECTRONIC UNIT & Battery



CONNECTING OF THE SERVO CONNECTING SET



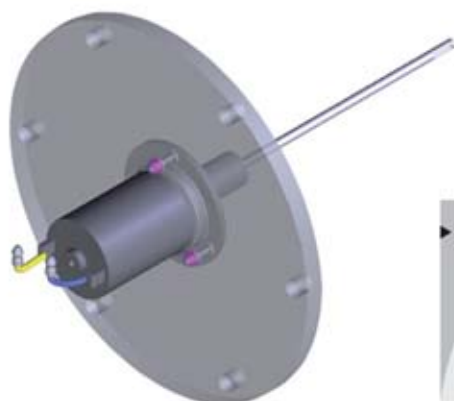
NOTE
All the black wire in each connectors should be put on the top.

- 1 Battery 2 Fuse 7 Pressure Sensor 12 Speed Controller
- 3 Power Distribution PCB 8 Leakage Detecting Wire 13 Servo (rudder & elevator)
- 4 Charging Binding Post 9 Receiver 14 Battery Connecting Wire
- 5 Water Pump 10 Servo Connecting Set 15 Speed Controller Wire
- 6 Water Pump Control PCB 11 Propulsion Motor 16 Camera Set (optional)



5

PROPULSION SYSTEM W/REAR COVER ASSEMBLY



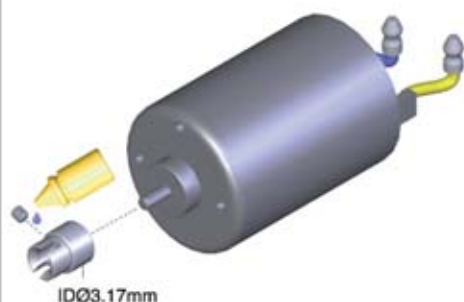
BOX 4

Propulsion Motor,
qty 1

BAG G



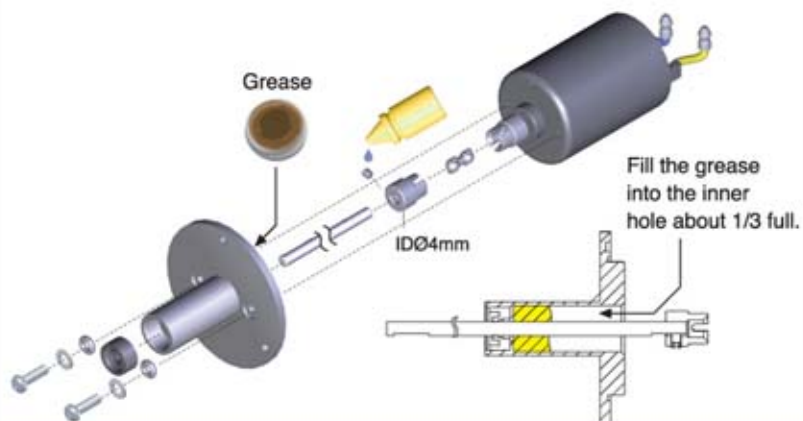
5.1 MOTOR W/DRIVE CUP



x 1
M3x3mm
Set Screw

4 BOX G BAG

5.2 MOTOR MOUNTING W/DRIVE SHAFT



x 1
M3x3mm
Set Screw

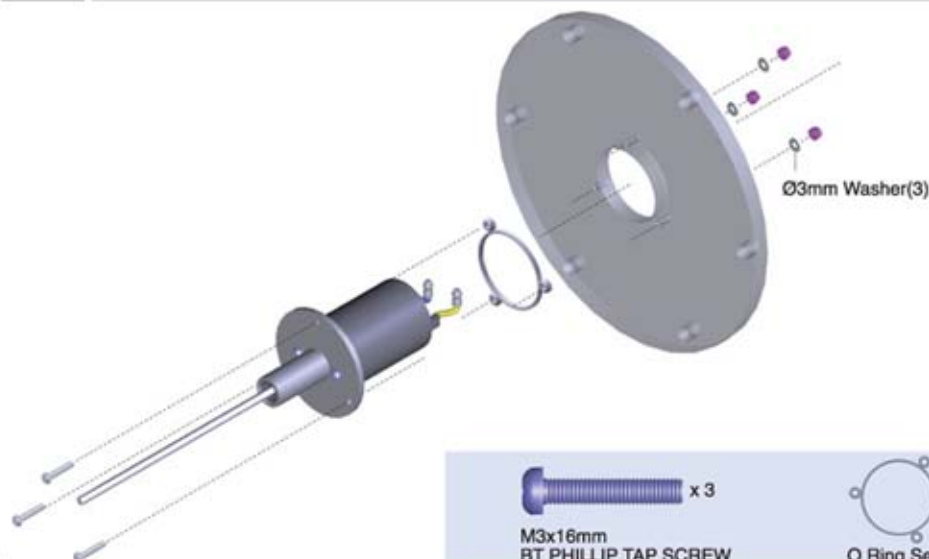
x 2
Ø3mm
O Ring

x 2
M3x12mm
BT PHILLIP TAP SCREW

x 2
Ø3mm
Washer

G BAG

5.3 MOTOR UNIT W/ REAR COVER PLATE



x 3
M3x16mm
BT PHILLIP TAP SCREW

x 1
O Ring Set.

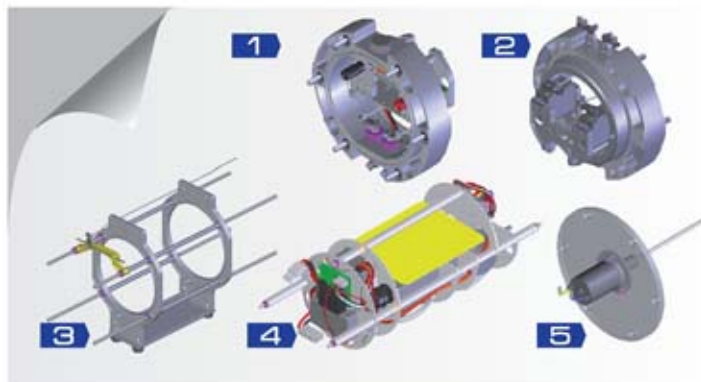
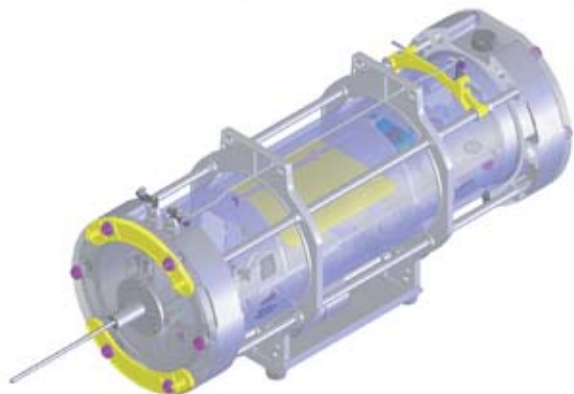
x 3
Ø3mm
Washer

x 3
M3
Lock Nut

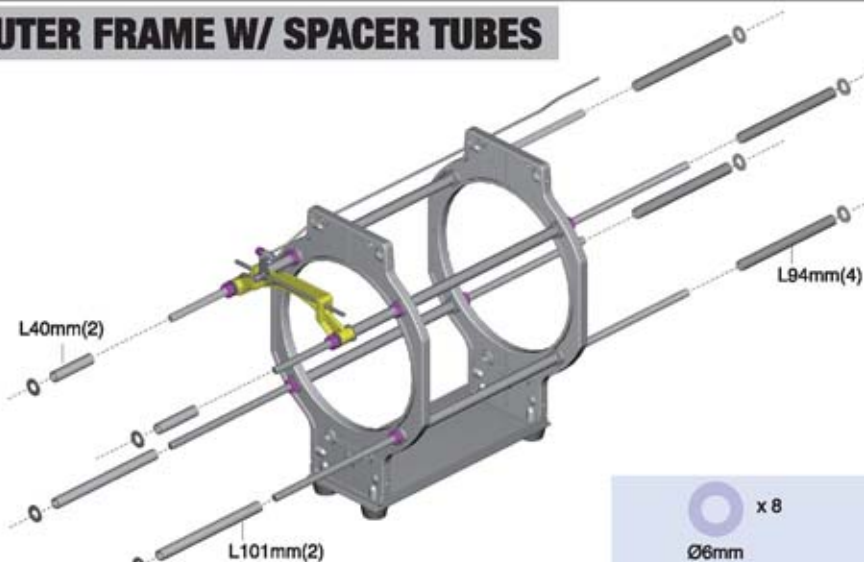
G BAG

6

COMPLETE HULL STRUCTURE ASSEMBLY



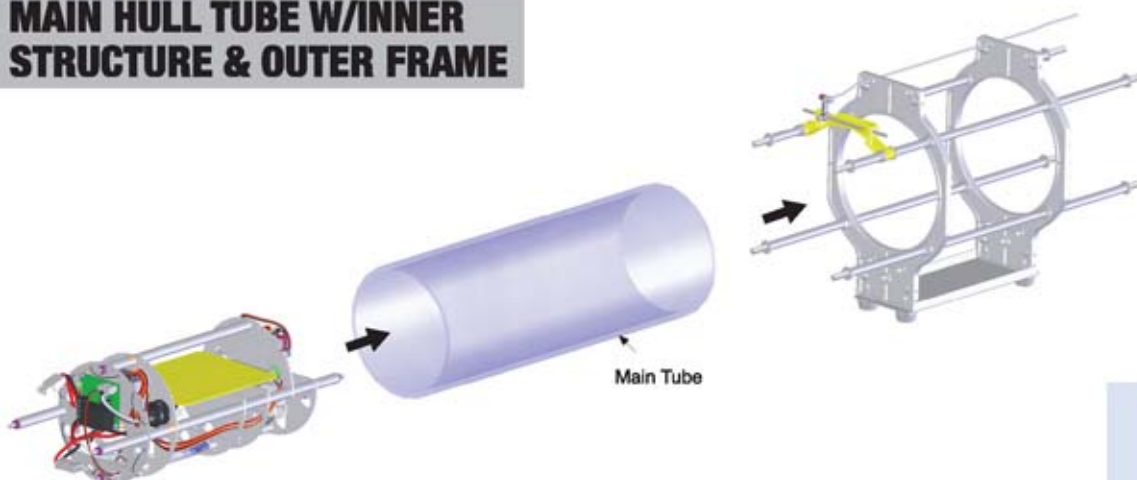
6.1 OUTER FRAME W/ SPACER TUBES



x 8
Ø6mm
Washer



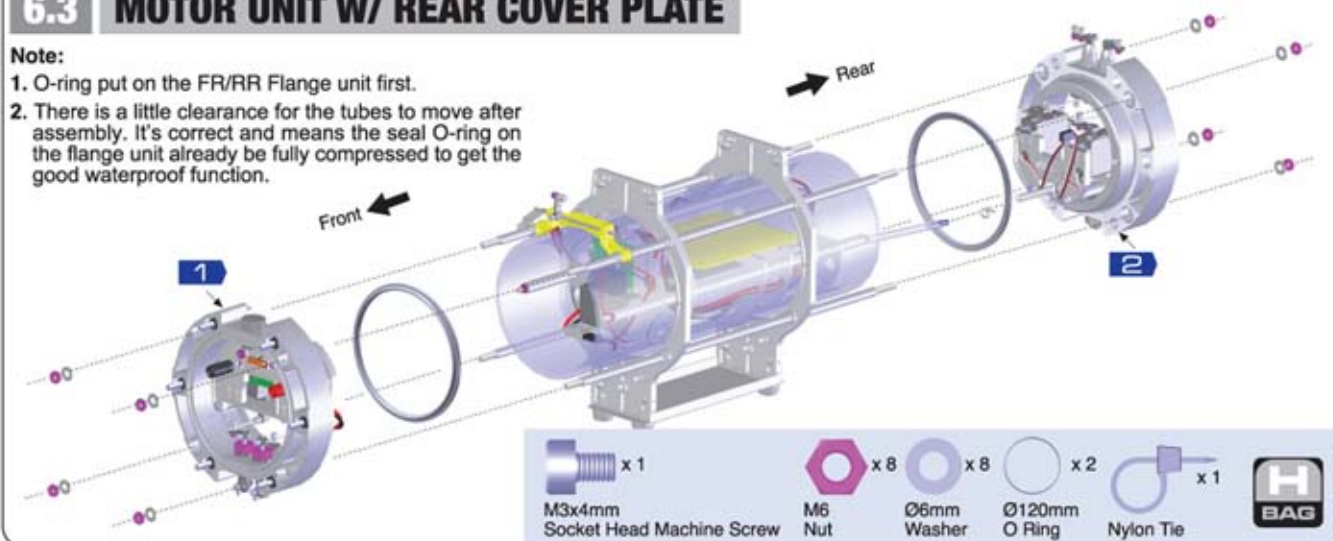
6.2 MAIN HULL TUBE W/ INNER STRUCTURE & OUTER FRAME



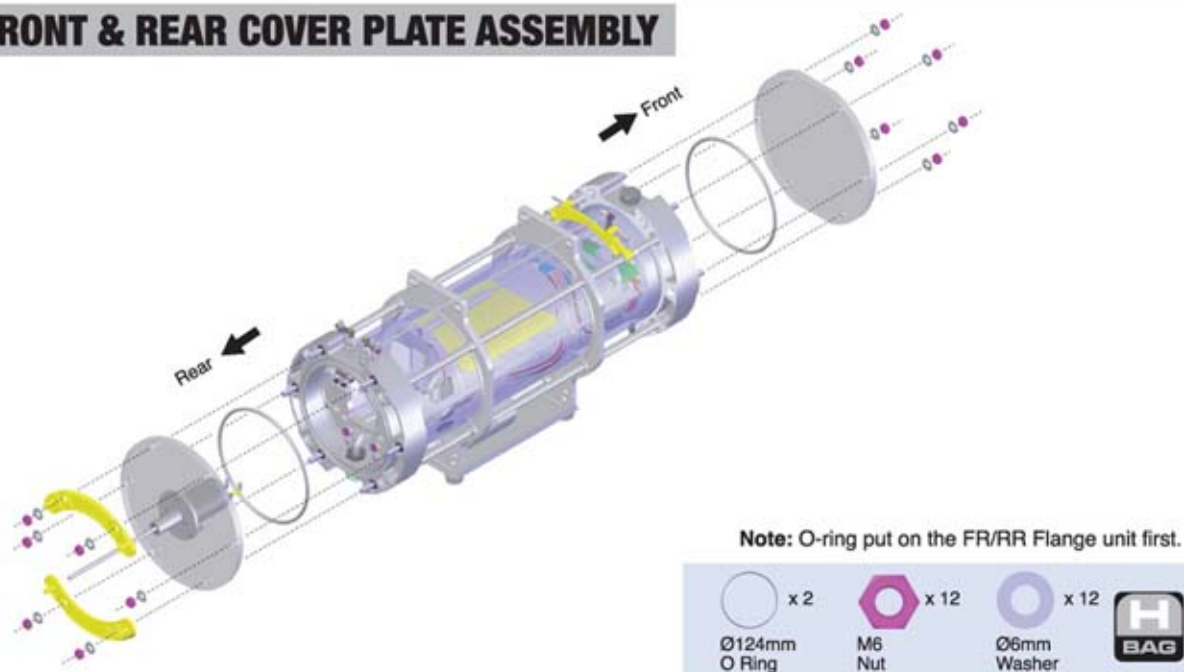
6.3 MOTOR UNIT W/ REAR COVER PLATE

Note:

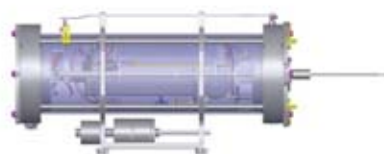
1. O-ring put on the FR/RR Flange unit first.
2. There is a little clearance for the tubes to move after assembly. It's correct and means the seal O-ring on the flange unit already be fully compressed to get the good waterproof function.



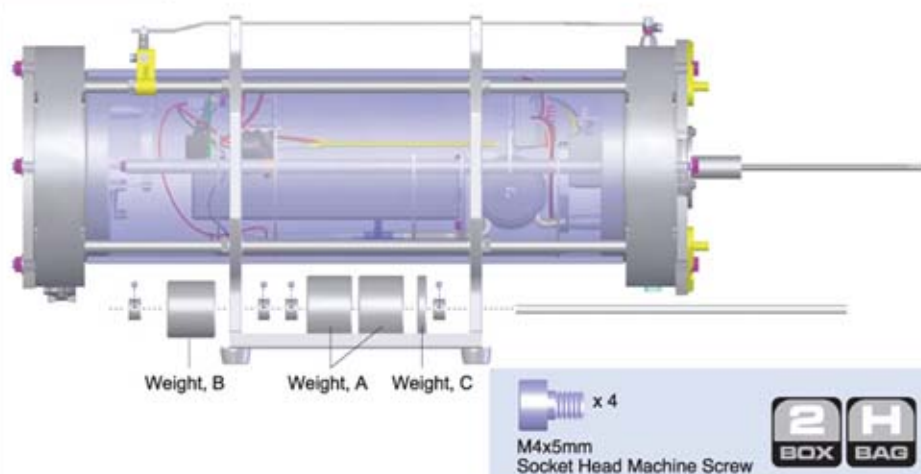
6.4 FRONT & REAR COVER PLATE ASSEMBLY



6.5 WEIGHT INSTALLATION

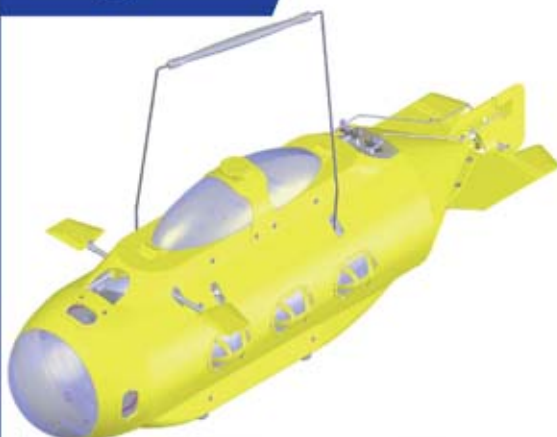


Note: The weight position have to be adjusted on the correct position.



7

EXTERNAL BODY ASSEMBLY



BAG I



BAG J



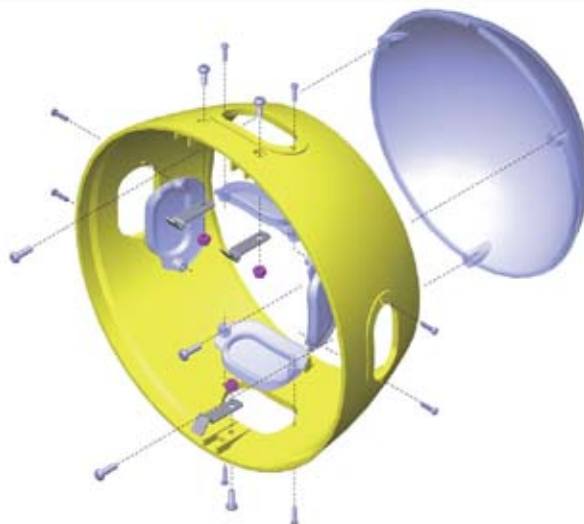
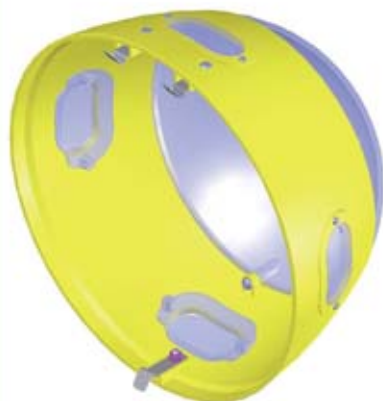
BAG K



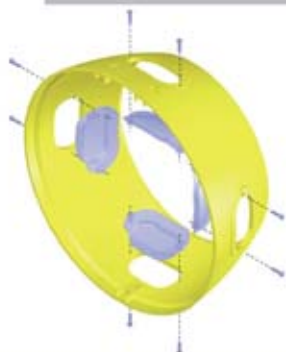
BAG L



7.1 FRONT CABIN ASSEMBLY



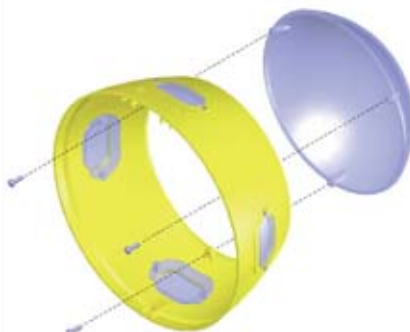
7.1.1 CABIN WINDOW INSTALLATION



M2x8mm
BT Phillip Tap Screw



7.1.2 FRONT CANOPY



M3x10mm
BT Phillip Tap Screw



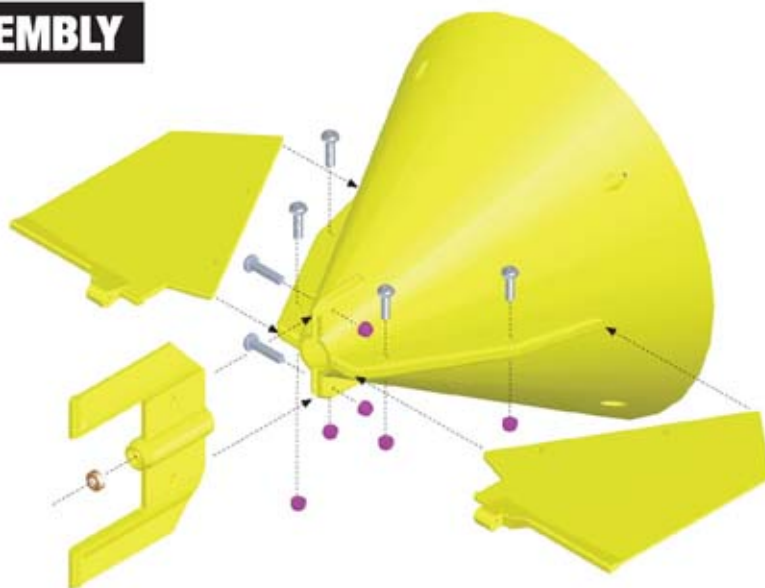
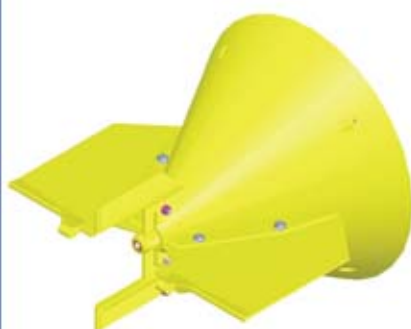
7.1.3 SPRING CLIPS



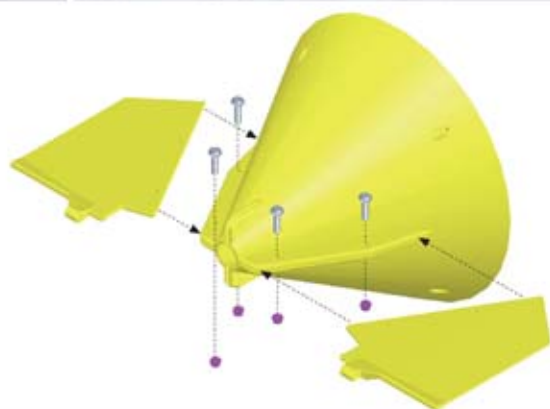
M3 Lock Nut
M3x8 BT Phillip Machine Screw




7.2 REAR CONE UNIT ASSEMBLY



7.2.1 HORIZONTAL TAIL FIN

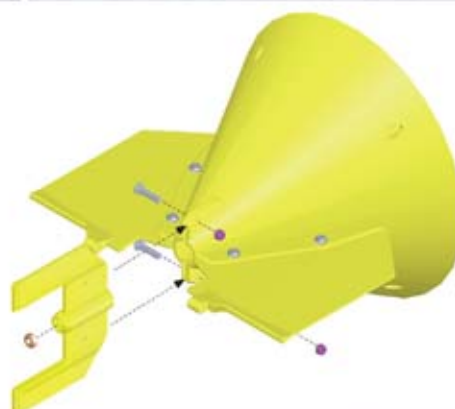



 x 4
M3x12mm
BT P.MACHINE SCREW


 x 4
M3
Lock Nut



7.2.2 DRIVE SHAFT HOLDER

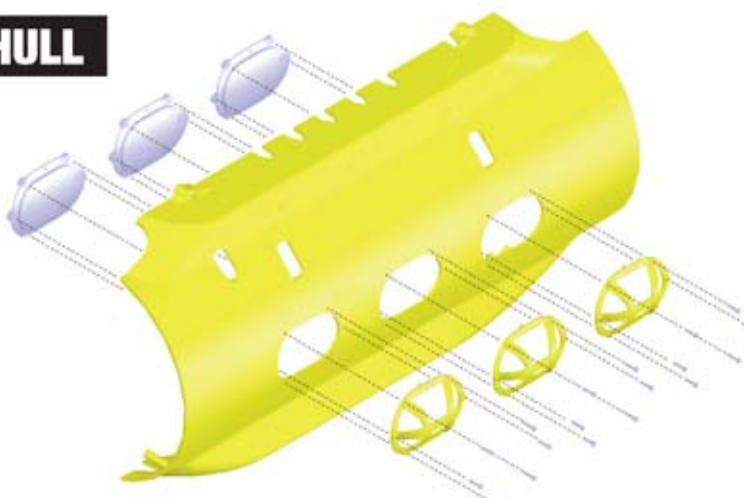


 x 2
M3x12mm
BT P.MACHINE SCREW

 x 2
M3
Lock Nut



7.3 LEFT & RIGHT SIDE HULL

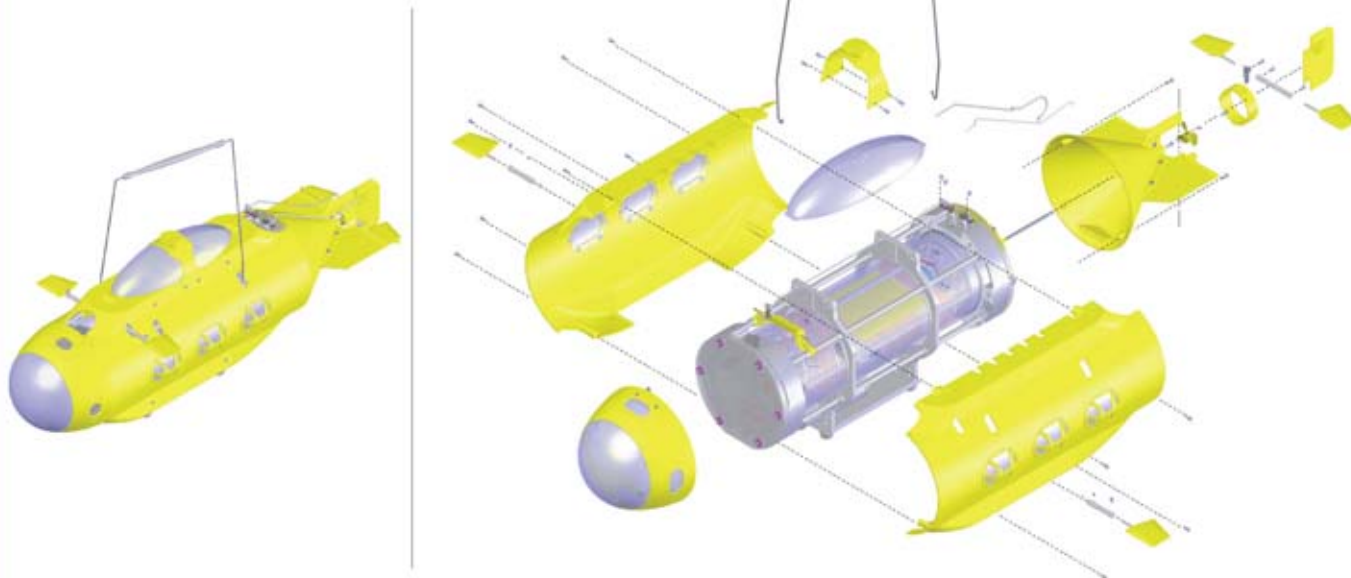


Note: Left side is shown in the drawing.
Right side has the same assembly process.

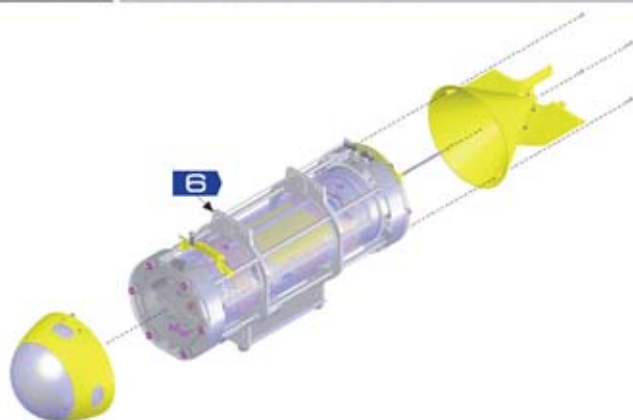
 x 36
M2x10mm
BT Phillip Tap Screw



7.4 COMPLETE MODEL ASSEMBLY



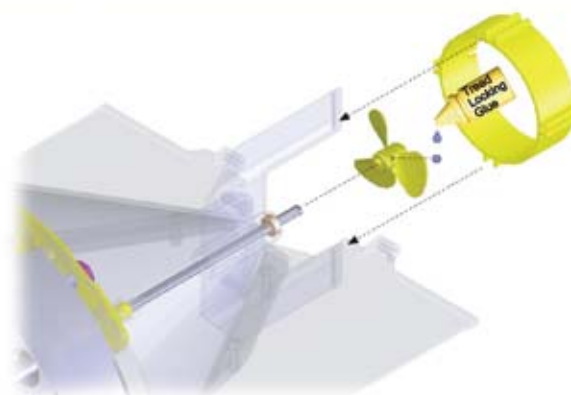
7.4.1 FRONT CABIN & REAR CONE



 x 4
M3x10mm
BT Phillip Tap Screw



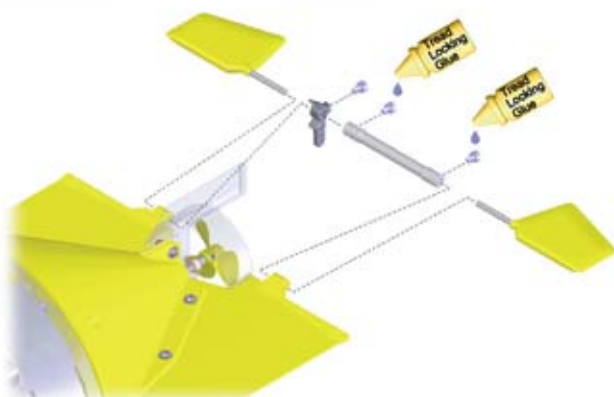
7.4.2 PROPELLER



 x 1
M3x3mm
Set Screw



7.4.3 TAIL ELEVATOR

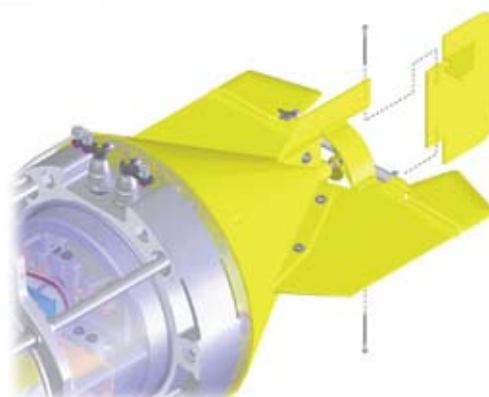


 x 2
M3x4mm
Socket Head Machine Screw

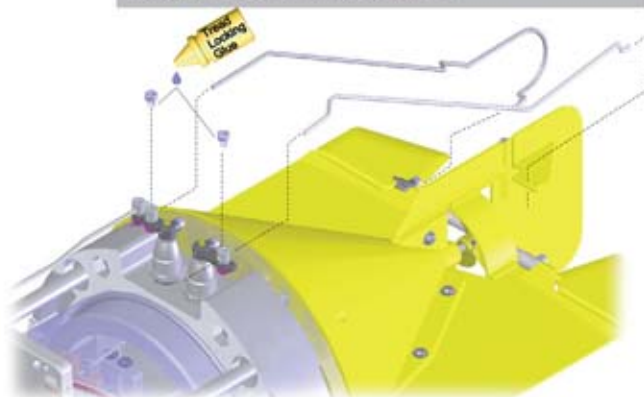
 x 1
M3x6mm
Socket Head Machine Screw



7.4.4 RUDDER



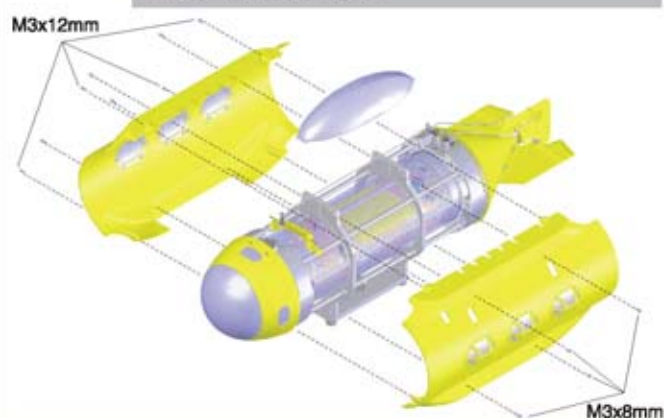
7.4.5 ELEVATOR & RUDDER CONTROL LINKAGE



x 2
M3x4mm
Socket Head Machine Screw



7.4.6 SIDE HULL W/TOP CANOPY INSTALLATION



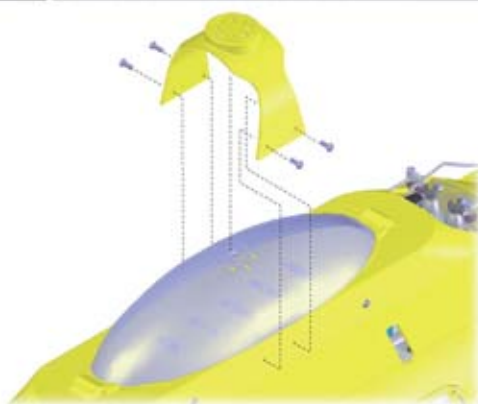
x 8
M3x8mm
BT Phillip Tap Screw



x 4
M3x12mm
BT Phillip Tap Screw



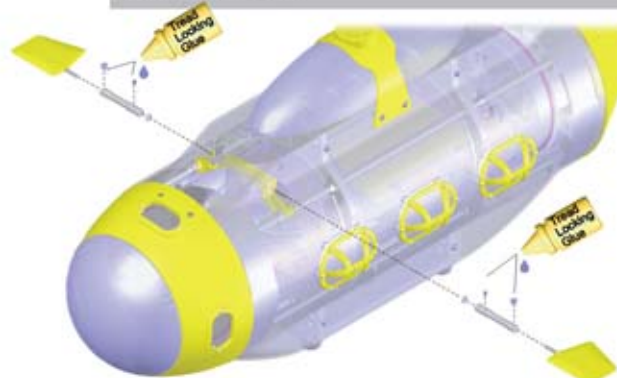
7.4.7 TOP CABIN HOLDER



x 4
M3x8mm
BT Phillip Tap Screw



7.4.8 INSTALLATION OF THE FRONT ELEVATOR



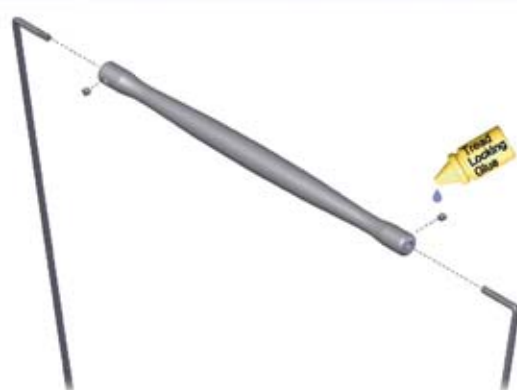
x 2
M3x4mm
Set Screw



x 2
M3x4mm
Socket Head Machine Screw



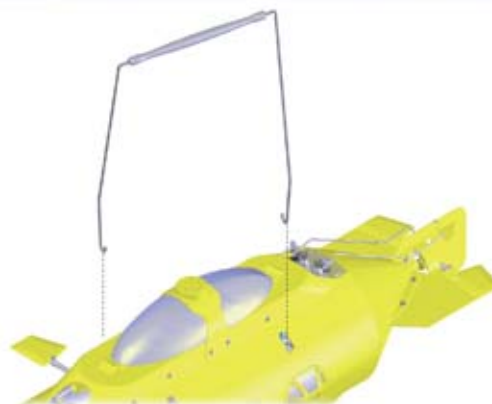
7.4.9 HANDLE BAR ASSEMBLY



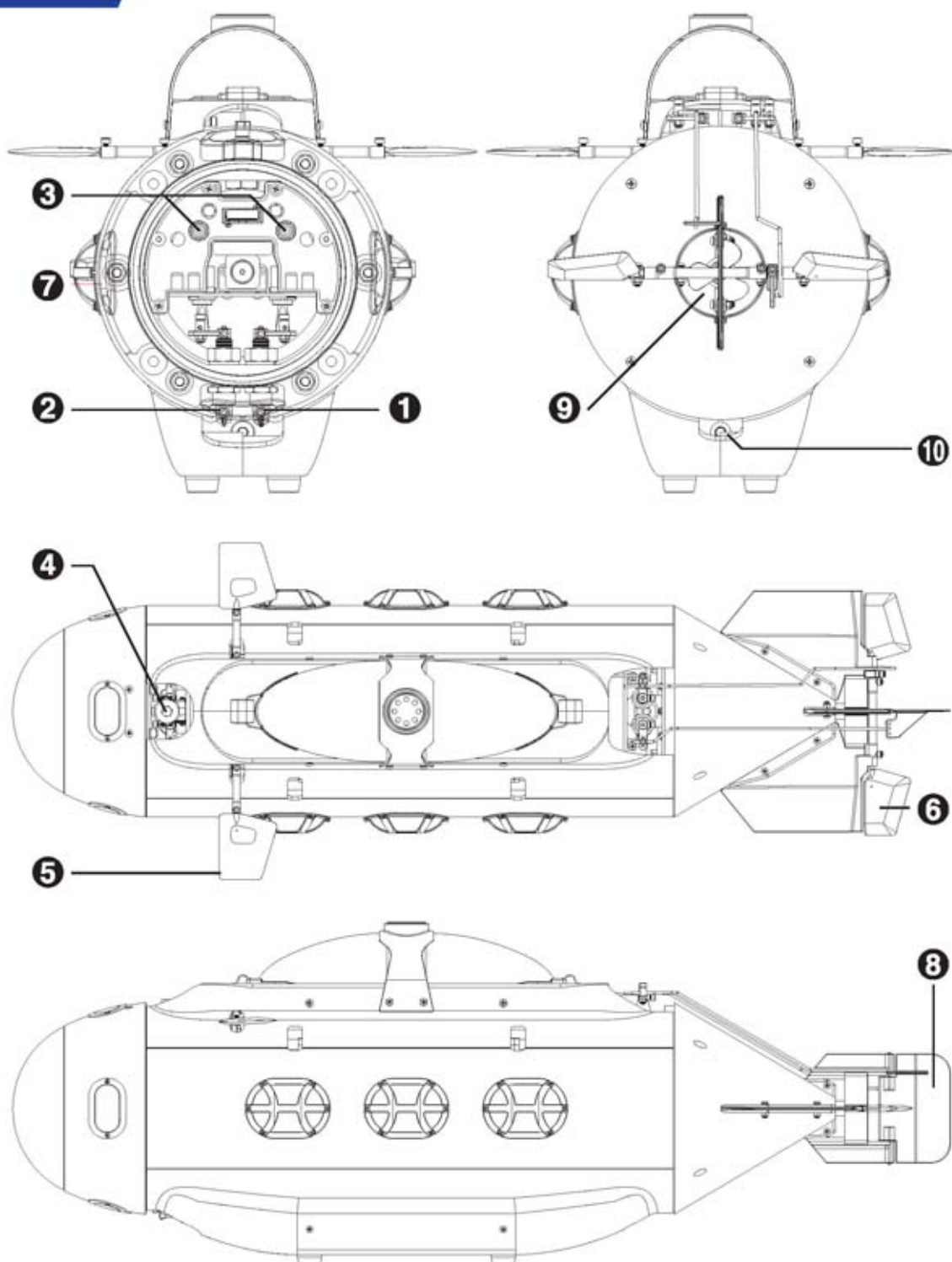
x 2
M3x4mm
Set Screw



7.4.10 HANG ON THE HANDLE BAR

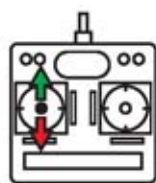


CONFIGURATION



- | | |
|---|--------------------------------------|
| 1 Switch-Power On | 6 Rear Elevator |
| 2 Switch-CCD Power On (Function when CCD is installed) | 7 LED light (inside the hull) |
| 3 Charging Plug | 8 Rudder |
| 4 Video Cable Connector | 9 Propeller |
| 5 Front Elevator | 10 Water Inlet/Outlet hole |

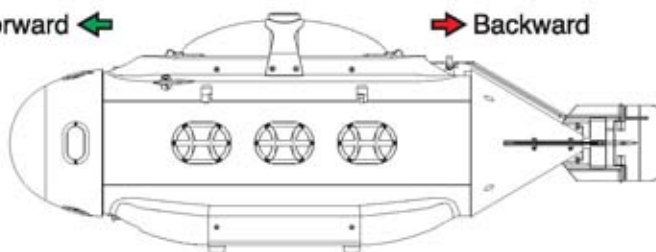
RADIO CONTROL vs SUBMARINE MOVEMENT



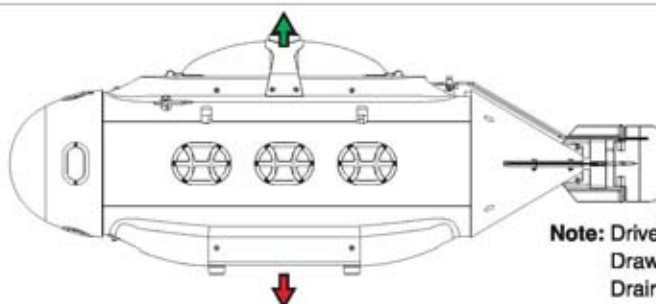
Throttle

Forward 

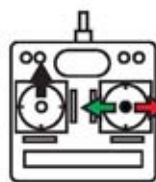
 Backward



Floating / Diving



Note: Drive of water pump.
Draw water for diving.
Drain water for floating.

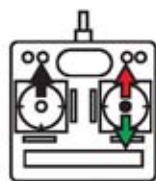
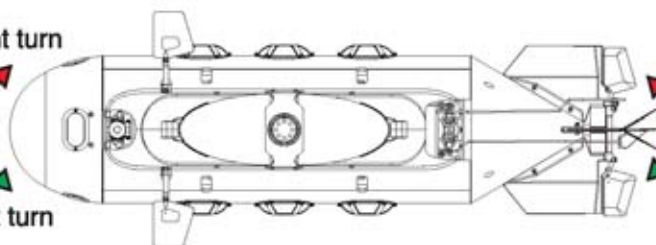


Steering
(Forward)

Right turn




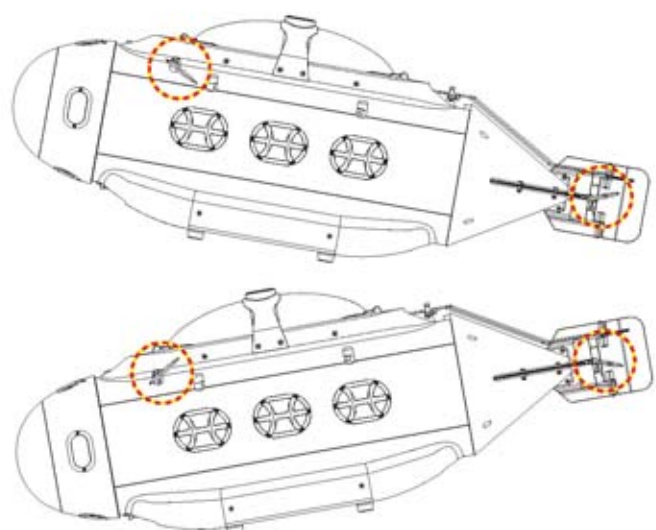
Left turn



Elevator
(Forward)

 Nose up

Nose down




NOTE:













- 1) The radio show in the drawing is similar to MODE 2 of RC airplanes: throttle is at the left stick and elevator is at the right one. However, the double recovery stick radio easily allows to shift to Mode 1. Open the inner hull and exchange the servo connectors at the receiver.
- 2) Due to it's more difficult for the RF signal through the water(especially for the high density water like sea..). So the controllable distance is much shorter than the radio system operating in the surface. Base on our experience, maximum controllable depth for 40Mhz RF radio system is about 5M.



INTRODUCTION FOR THE MAIN DEVICE

■ LED INDICATION LIGHT

On the main control PCB unit, there are 3 LED lights are designed to show the current status of the Submarine. You can watch the light from the right side 1st hull window. Please refer the following chart to get the light information.

Light Sign	SB-1 Status	Light Sign	SB-1 Status
 (Y)  (G)  (R)	Yellow Light On-- <ul style="list-style-type: none">• Water Pump On• Ballast Bag Filled• Diving	 (Y)  (G)  (R)	Red Light On (Continuous) <ul style="list-style-type: none">• Normal Operating
 (Y)  (G)  (R)	Green Light On— <ul style="list-style-type: none">• Water Pump On• Ballast Bag emptied• Surface	 (Y)  (G)  (R)	Red Light Flash <ul style="list-style-type: none">• Low Battery• Tx signal lost• Water inside Hull

■ AUTO-DETECT PROTECTING SYSTEM

Combined with a auto-detect protecting system on the main PCB control board, if the system detects low battery power, low transmission signal, leakage(water inside hull), then the roll pump will auto start to flood the water out of the ballast tank to make the submarine float back to the surface. In the same time, the Red LED light will turn to flash.

■ PUMP W/BALLAST FOR THE STATIC DIVING SYSTEM

Base on the Archimedes principle—principle that states a body immersed in a fluid is buoyed up by a force equal to the weight of the displaced fluid. The principle applies to both floating and submerged bodies.

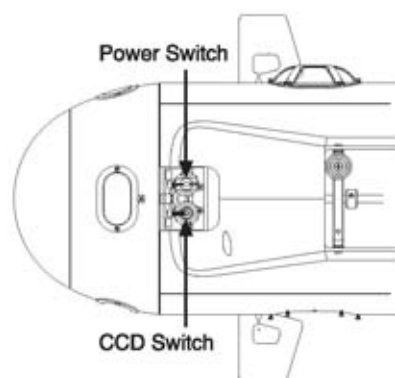
So base on this principle, equipped with a roll pump with ballast tank device in the inner hull, through the pump operating system to draw or drain the water into or out of the ballast tank to change the weight of the submarine. With suitable design of the volume and weight, then it is easy to operate the SB-1 submarine diving or floating and even static stay under the water. So we call this the static diving system just like the real submarine.

The buoyancy of an object depends, therefore, only upon two factors: the object's volume, and the density of the surrounding fluid. So when you choose the difference water(with difference density) to play, you have to re-adjust the weight unit to make the submarine can be diving and floating smoothly and quickly. Normally, it need take about 20~30seconds from floating to diving.

OPERATING

■ POWER SWITCH

There are 2 main power switch located on the bottom of the front flange. From the bottom view, the right switch is to control the main battery power for all the electric devices. The left switch is prepared for the CCD system that when a CCD device installed.



■ PREPARATION

Please follow the following procedures to do the preparation.

- 1) Check that no water is inside the hull. If some water is inside, the submarine shouldn't be used until you discover the cause of the problem and solve it.
- 2) Close the front cap and tighten the nuts (sequence: each after the opposite). After locking, the front O-Ring should appear uniformly flattened against the cap.
- 3) Place the front nose in position
- 4) Switch on the transmitter and check TX battery status.
- 5) Switch on the submarine. Keep the submarine onto the table and check the following functions:
 - Check throttle: move left stick up/down and verify that full forward and reverse speed is reached. In centre position (idle) the propeller should not move. Correct TX trim if necessary
 - Check pump: move left stick right and left and verify that the pump starts running and inflates or empties the bag. You may hear the noise of the motor and also feel the pump action by placing a finger at the water intake. NOTE: Pump action is on-off and it's normal that it is not proportional. However, be sure that the centre idle position of the stick is equally far from left and right working position. Trim if necessary
 - Check dive planes (right stick up/down). Verify that stick neutral position corresponds to horizontal dive planes. Trim if necessary
 - Check rudder (right stick left right). Verify that stick neutral position corresponds to straight rudder. Trim if necessary
 - Switch off RX and TX and carry the model at the waterside.

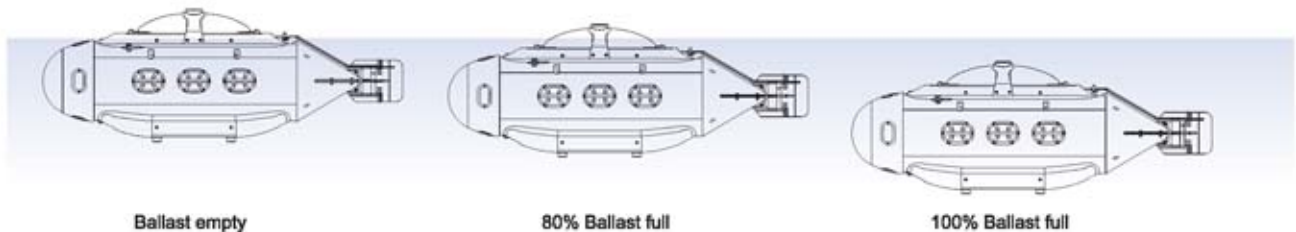
■ PRE-LAUNCH CHECK

- Switch on the transmitter. Check again TX battery status.
- Switch on the receiver (main switch). Check no interference from any other RC transmitter
- If the submarine doesn't switch on, check the fuse and replace if necessary (NOTE: if the fuse is burnt again, then should be a short circuit inside. Don't use the model. Open it and search for any electrical problem)
- Check that the front nose is perfectly installed. If it isn't, any hit during the launch will cause it to fall down into the water. It will sink, being heavier than the water. Therefore, pay much attention.
- If the camera is not used, check that the cap of the cable connector is tightened. If the camera is used, see "Camera operation" paragraph.
- Start the pump and empty the bag (left stick to left), until the bag is totally emptied. This will be shown by the changed noise and the absence of air coming out from the water intake.

OPERATING

■ BUOYANCY CHECK & WEIGHT ADJUSTING

- Before using the submarine for the first time, check its correct buoyancy.
- Fill a bath tub with cold water and put the submarine into it
- With the ballast bag completely empty, the submarine should float keeping the turret and a thin part of the outer hull above the waterline. You can change the weight parts to get the suitable position.
- Check if the submarine has a good trim, staying horizontal and without listing. If necessary adjust the ballast in the submarine keel. And, adjust the position of the weight parts to make the submarine level without pitch up or down.
- Please remember that different water conditions (for example, bath tub, swimming pool or lake) have an influence on the submarine trim due to different water density. Perform a buoyancy check any time you want to use the submarine in new places.



■ LAUNCH

- Find a good launch position, with the possibility to stand stable with no risk of falling into the water. The water surface should be easily reachable and must not be too low.
- Insert the handle into the holes of the external hull. Be sure that the hooks are connected to the metal rod of the inner hull and not only to the outer plastics .
- Lift the sub and gently place it into the water.
- Wait until the front nose and the rear cone are totally full of water. These are free-flood compartments and it's normal they become totally full of water, no large air bubble should remain inside them.
- At this point, disconnect the handle.

NOTE: Pay attention not to let the handle fall into the water, because it will sink!

- Start piloting your Neptune SB-1.

■ RECOVERY

- Start the pump in order to have the ballast bag completely empty
- Pilot the sub along the side of the swimming pool or lake, in a reachable position.
- Connect the hooks handle to the lifting points inside the slots of the hull. Be sure to clamp the inner metal rod and not only the plastic hull.
- Lift the submarine out of the water. During this phase, it will be significantly heavier, because of the water trapped between inner and outer hulls. Then, this water will be discarded and the operation will be simpler. Place the sub on a horizontal surface
- Switch the submarine and the transmitter off.
- Have a quick inspection of the hull and check no part has been damaged or lost.

OPERATING

■ USAGE

- All the controls are described above.
- Rudder and throttle functions are similar to any other R/C boat.
- This submarine is capable to perform both static and dynamic dive.
- For a full static dive, keep the motor idle and start the pump flooding the bag. You will see the waterline at the turret become higher and higher until the entire submarine will be submerged and will go down vertically to the bottom. The opposite command will cause the pump to empty the ballast bag and the submarine will raise to the surface.
- Dynamic dive is possible thanks to the speed of the boat and the action of the dive planes. As there's so much buoyancy to win, for better result we recommend to reduce the buoyancy and partially fill the ballast bag with water. The ideal situation is reached when only the top ring of the turret is out of the water: at this point, start the motor full forward and set the dive planes to the "down" position: the submarine will dive and you will have dynamic control of the depth by operating the dive planes.
- Pay attention to any collision. If the submarine is running in a swimming pool or any other place with hard vertical walls, avoid any hit with these hard structures. The rudder might be damaged or even the front nose might be broken.
- Also, be aware to avoid algae bloom, leaves or any other seaweed that may be ingested by the propeller. If leaves or other are wound around the propeller shaft, its efficiency will be greatly reduced and the stress on the motor will be much higher. This situation should be avoided in order not to have critical damages on the propulsion system.
- If the submarine raises to the surface on its own, it's possible that some safety function has switched on. Take the submarine out of water and check the alarm code from the RED flashing LED
- If the submarine raises to surface because of low battery, you will discover much lower motor power and no capability of diving. At this point, recover immediately the sub before the battery is completely empty (Please remember that the receiver is BEC-equipped and the power source is the same also for the electronics!).

■ CAMERA SYSTEM INSTALLATION AND OPERATION (OPTIONAL)

- It's recommend to prepare the following optional parts to install the camera with cable system.

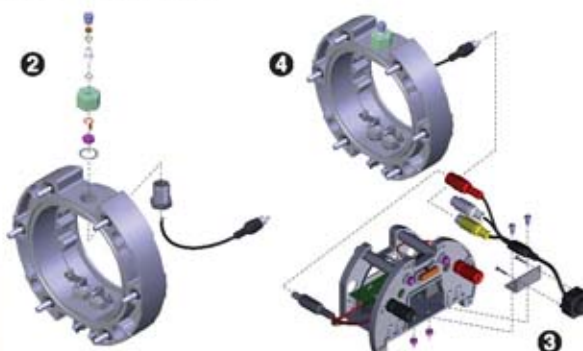
- | | |
|--|-----------------------------------|
| 1) PJ6181 CAMERA CABLE PLUG SET | 2) AT0320 VIDEO CABLE, 15M |
| 3) AQ1285 CCD CAMERA SET | 4) AQ1701 VIDEO RECEIVER |

- Please refer the following procedure to install the CCD camera in the Submarine.

- 1) Dismantle the power distribution unit from the front flange unit. (Please refer the "1 FRONT FLANGE UNIT ASSEMBLY" section.)
- 2) Install the Cable plug(PJ 6181)on the front Flange Upper Sealed Bolt.

NOTE: After the installation of the cable plug, then the M16 nut will be replaced by the Cable plug set. Please keep the M16 Nut.

- 3) Install the CCD carmea(AQ1825) & installation hardware(PJ6181) on the "Power Distribution Unit"
- 4) Connecting the yellow connector on the CCD camera with the Cable Plug.
- 5) Refer the assembly procedure to assembly the dismantal parts and finish the complete submarine assembly.



OPERATING

- Connecting of the camera system installed in submarine and Video Receiver(AQ1701) with the Video Cable(AT0320)
 - 1) Unscrew the cap on the camera cable connector.
 - 2) Screw in the video cable RCA connector into the Cable Plug on the submarine.
 - 3) Connect the free end of the cable video plug to the "AV INPUT" port on the top of the Polyphemus Video Receiver (AQ1701). (or to other similar device).
 - 4) Switch on the submarine Carnea Switch. (Refer P22 CONFIGURATION)
 - 5) Check the focus of the camera and, if necessary, adjust it.
 - 6) After the use of the camera, switch off the camera switch and screw the cap on the camera cable plug.



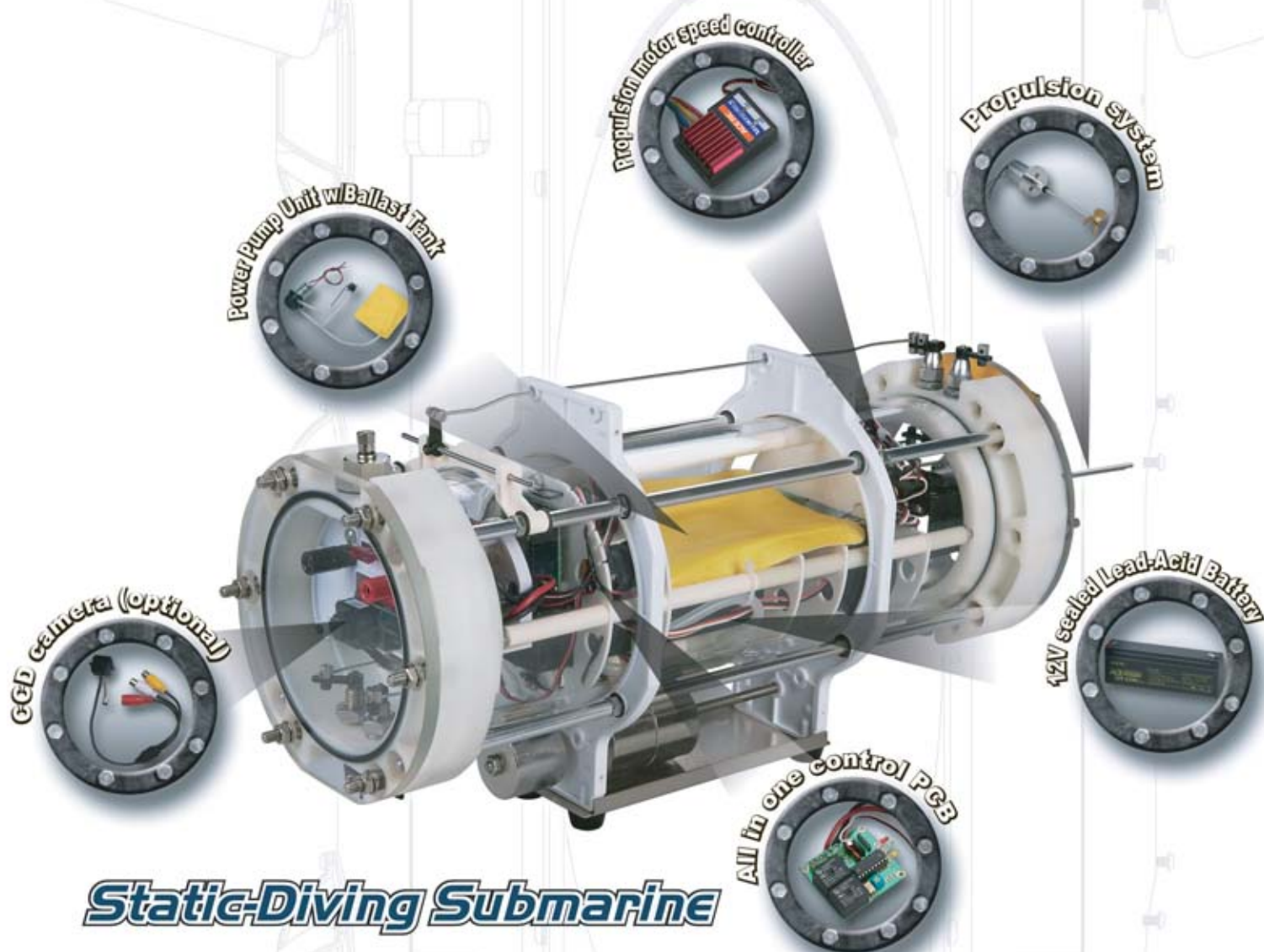
NOTE: Please remember that the signal coming from the camera is analog: if you wish to make digital movies, you have to use an analog/digital video converter.

MAINTENANCE AND PERIODICAL CHECK UP

- Remove the outer hull panels and clean every part
- Before storing the submarine for a long time of non activity, open and keep open the front cap and remove the battery
- Check the pressure sensor (try to over fill the ballast bag)
- Check the fail safe system (switch off the RC transmitter and see if the rescue system activates)
- Check the low battery safety system
- Check the integrity of inner hull
- Check there is no leakage from the inner linkages and tubing
- Check the dive planes and rudder operating angles. If necessary adjust control rods and TX trims
- Check the O-Ring status and correct tightening
- Check operation of the switches and of all the other water proof exits. Devices must be tightened but must retain a smooth movement

SERVICE

Thunder Tiger strives to bring you the highest level of quality and service we can provide. We race and test our products around the world to bring you state-of-the-art items. Thunder Tiger guarantees that you should enjoy many hours of trouble free use from our R/C products. Thunder Tiger products have been sold worldwide through the authorized distributors that are supported directly and rapidly from Thunder Tiger. You may find that Thunder Tiger is always pursuing to explore new items creatively with highest quality. To update the latest product information and to get the best technical support, please feel free to contact your local hobby shops or Thunder Tiger authorized distributor.



Static-Diving Submarine

FEATURES

- 1) RADIO CONTROL MODEL
- 2) HIGH IMPACT ABS PLASTIC HULL
- 3) 12V MOTOR PROPULSION POWER UNIT
- 4) DUAL STATIC & DYNAMIC DIVING SYSTEM
- 5) BALLAST TANK W/ROLL PUMP & MOTOR DRIVE SYSTEM
- 6) FULLY ELEVATOR/RUDDER CONTROL DEVICE
- 7) AUTO-DETECT ELECTRONIC PROTECTING SYSTEM
- 8) VIDEO TRANSPORT CABLE CONNECTOR EQUIPPED
- 9) 12V SEALED LEAD-ACID BATTERY INCLUDED

BASIC SPECIFICATION

DISPLACEMENT	7.7KG SURFACE, 7.95 KG SUBMERGED
OVERALL LENGTH	774MM
BEAM	290MM
DRAFT	200MM
HEIGHT	285MM
PROPULSION MOTOR	12V MOTOR
PROPELLER	3 BLADES OD 40MM, PITCH 41MM
SPEED	1.45KNOTS(2.7KM/H) SURFACE, 1.08KNOTS(2.0KM/H) SUBMERGED
OPERATING DIVING DEPTH	5M
MAX. DIVING DEPTH	10M (MECHANICAL LIMIT)



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