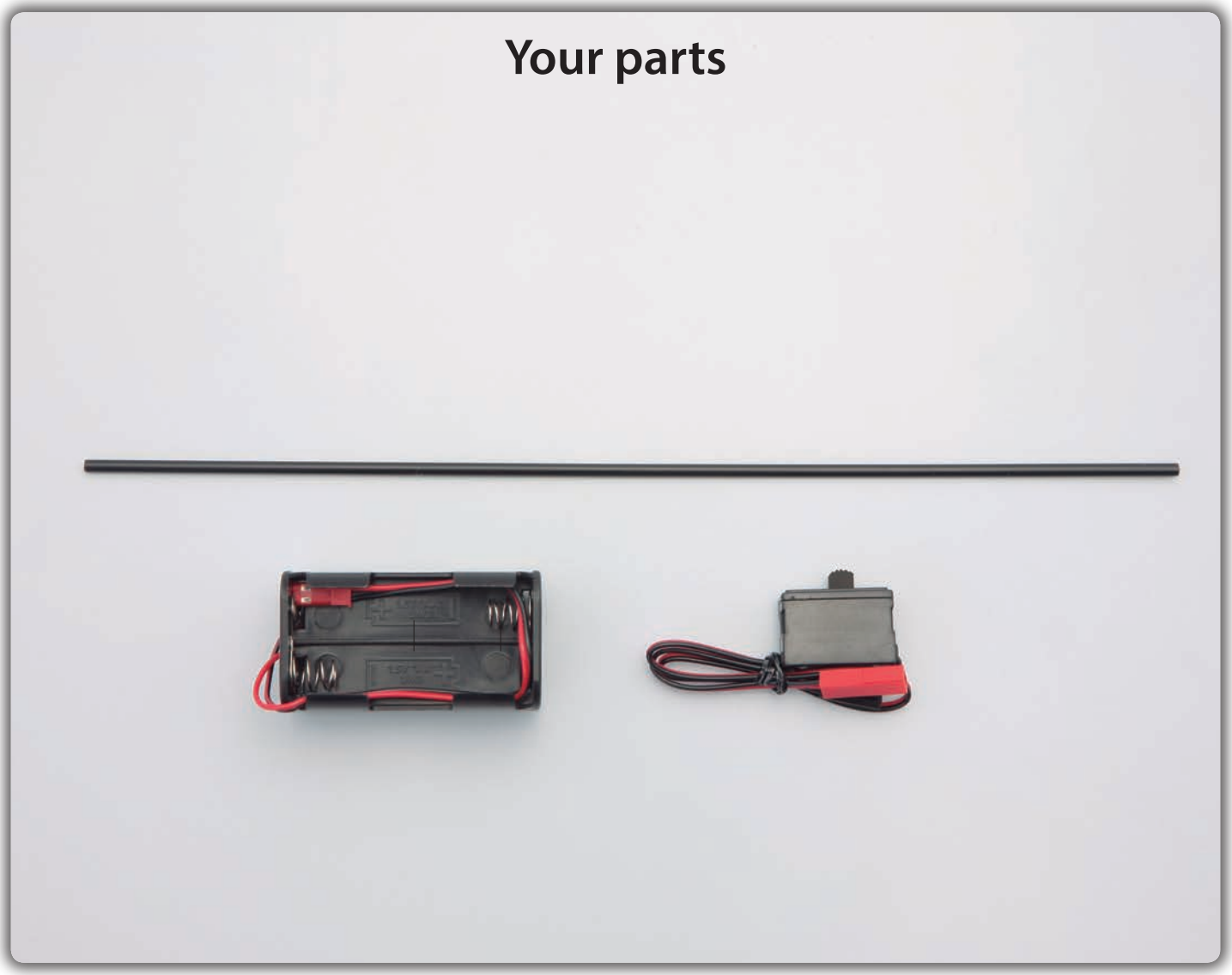
Stage 45

The battery box and power switch – an overview

Your parts



Aerial tube
Battery box
Power switch

The power switch and battery box

1

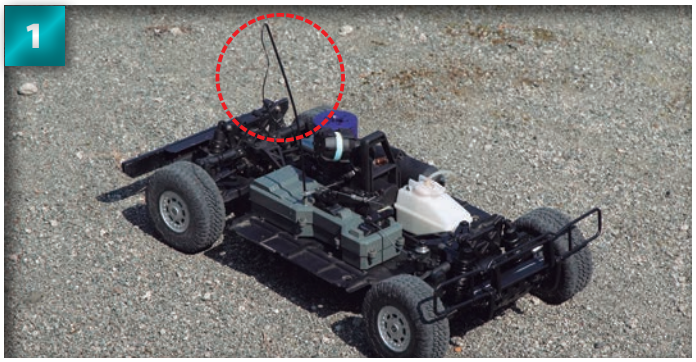
The battery box and power switch is located inside the radio box, which will be fitted to the base of the chassis in coming stages. The box is pictured open here, but during operation is sealed shut using body pins. This is to prevent dust and dirt getting inside the components, which can affect the operation of the parts.

2

The power supply in your Hummer H1 uses alkaline AA batteries. It is useful to acquire a battery power checker like the one in the photo above, to check the power level before fitting replacement batteries.

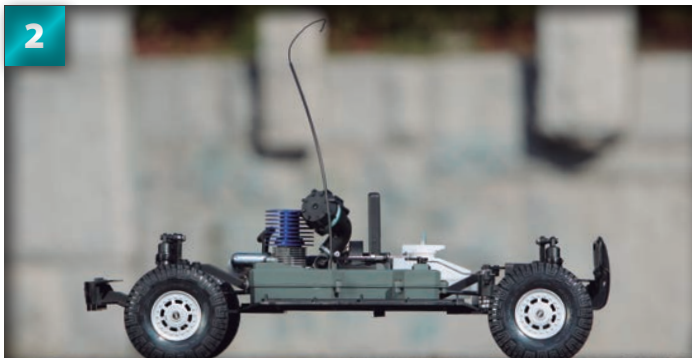
The aerial

1



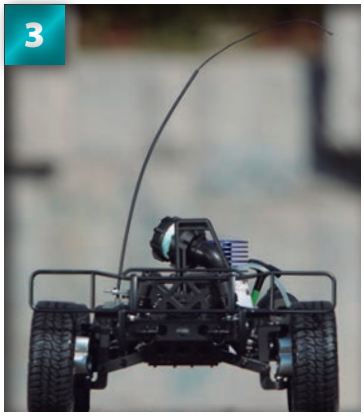
This is the aerial, pictured in its position in the centre of the chassis with the body frame and panels removed. The length of the wire will be cut depending on the radio frequency used by the remote control, but should not be so long that it is folded up, as this will disturb the signal.

2



Whatever length the aerial is cut to, it will be taller than the roof of the body panels. This is not an issue, as the soft resin tubing of the aerial will bend sufficiently to fit inside the body.

3



From the front, you can get an idea of how the aerial will reach up to the roof and curve over. This means that, unlike most RC cars, it isn't necessary to cut a hole in the roof for the aerial.

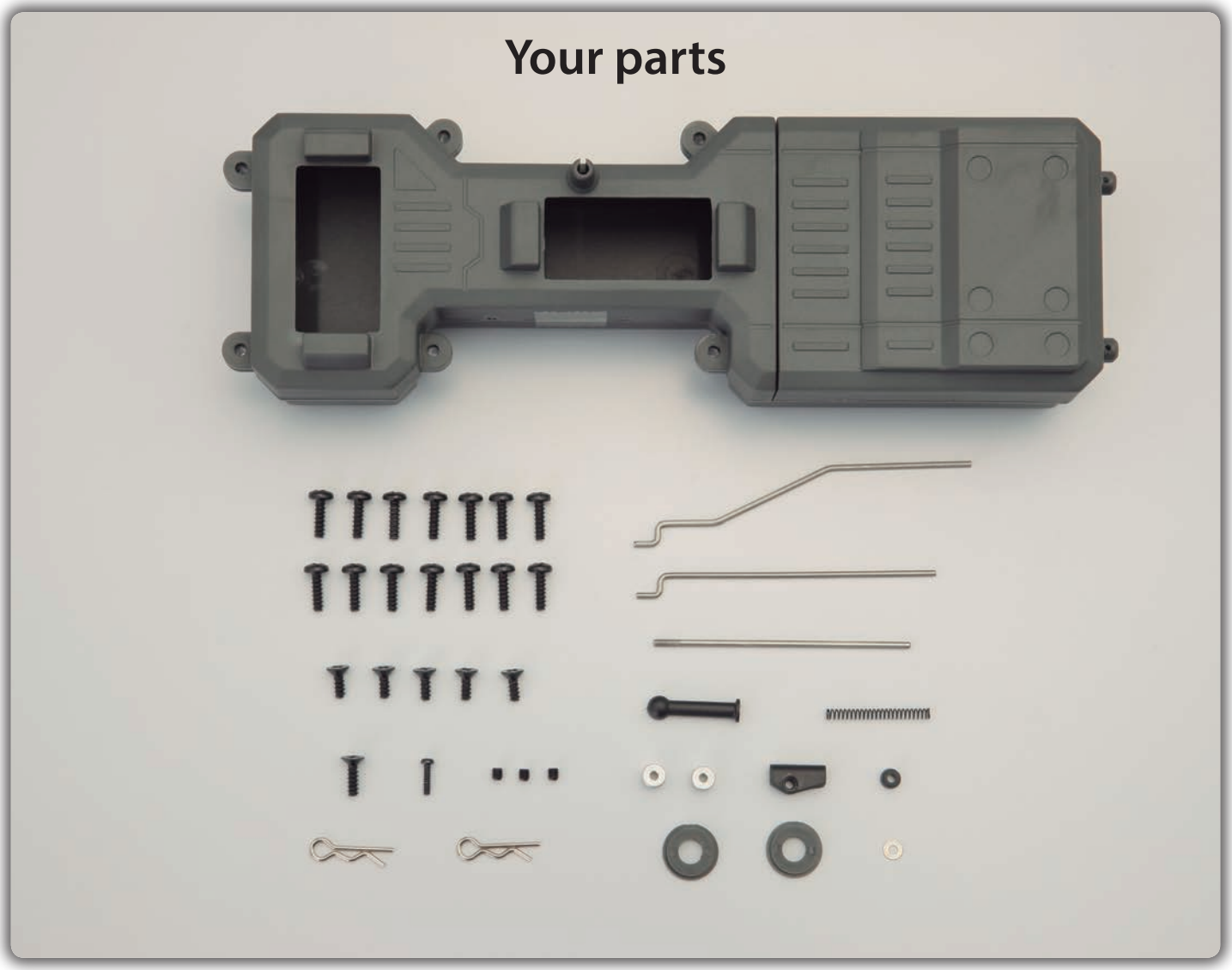
4

Fitting the body frame and panels is straightforward. Simply lower over the chassis and aerial carefully, then clip into place with pins, ready for action.

Stage 46

Mounting the radio box

Your parts

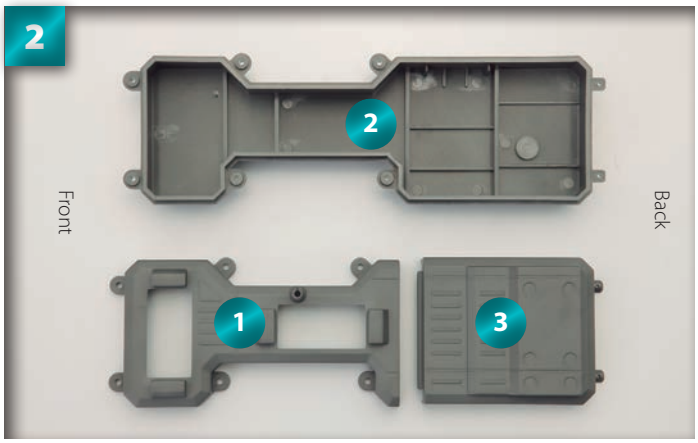


Radio box upper and lower (temporarily assembled)
Radio box lid (temporarily assembled)
3 × 10mm binding-head self-tapping screws × 14
3 × 8mm self-tapping screws × 5
3 × 10mm self-tapping screw
2 × 8mm self-tapping screw
3 × 3mm set screws x 3
Body pins × 2
Steering rod
Brake rod
Throttle linkage rod
Throttle ball end
Throttle spring
2mm stoppers × 2
Linkage base
Brake collar
Radio box collars × 2
2mm washer

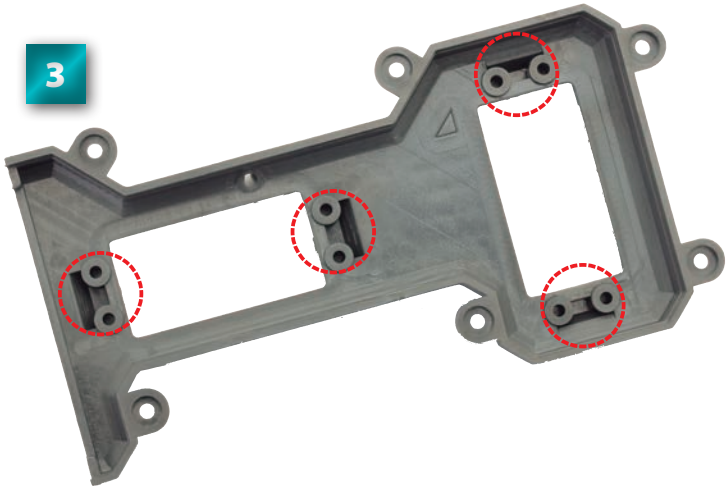
Tools and materials

Phillips screwdriver
Main chassis assembly (Stage 44)
Pen
Plastic bag

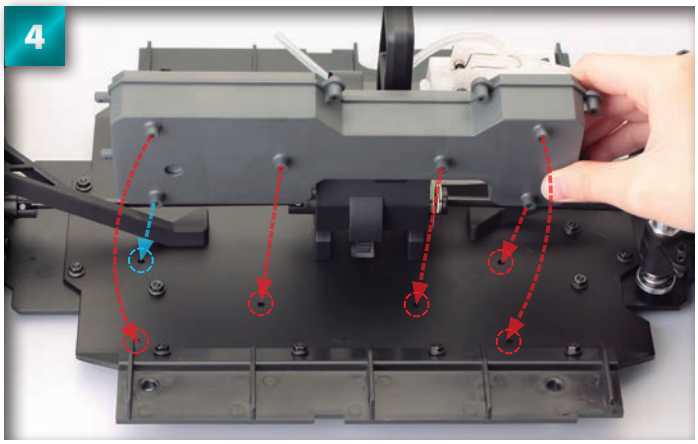
Remove the cellophane tape holding together the parts that make up the radio box.



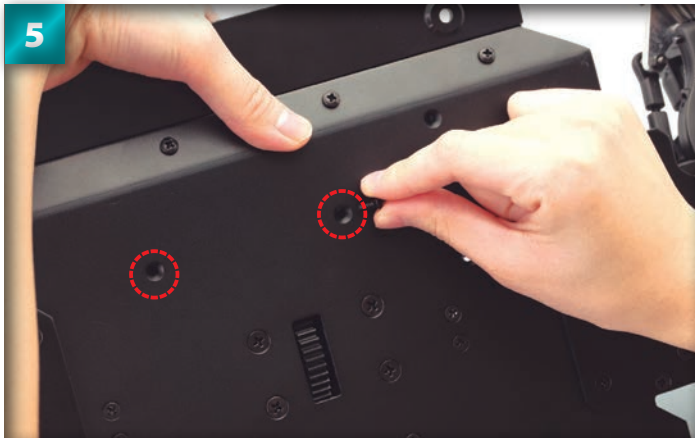
Lay out the parts and make a note of which is which. To the bottom left (1) is the box upper, at the top is the box lower (2) and to the bottom right (3) is the lid. Also make a note of their orientation, as this is the position in which they will be fitted onto the chassis.



Inspect the underside of the radio box upper. There are four sets of screw holes lining the rectangular openings. These will be used in the coming steps.



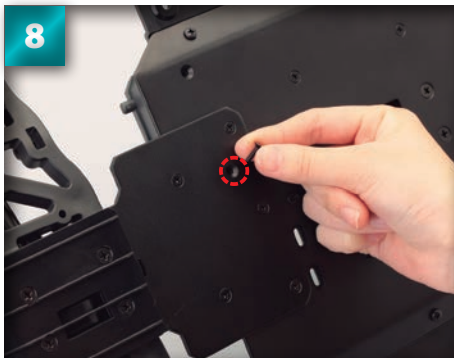
Line up the radio box lower with the six holes circled on the surface of the chassis. The hole circled in blue marks the hole through which you will fit the 3 × 10mm self-tapping screw.



When the projections on the underside of the radio box are lined up with the six holes circled in Step 4, begin inserting the 3 × 8mm self-tapping screws, starting with the two central holes circled above. Place the screw into the hole nearest the front first.

Tighten the screw with a screwdriver.

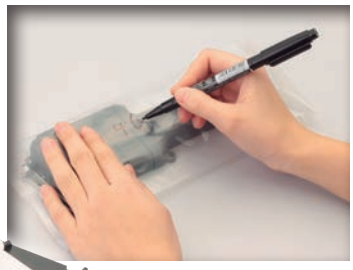
Next, fit and tighten the second 3 × 8mm self-tapping screw into the adjacent hole.

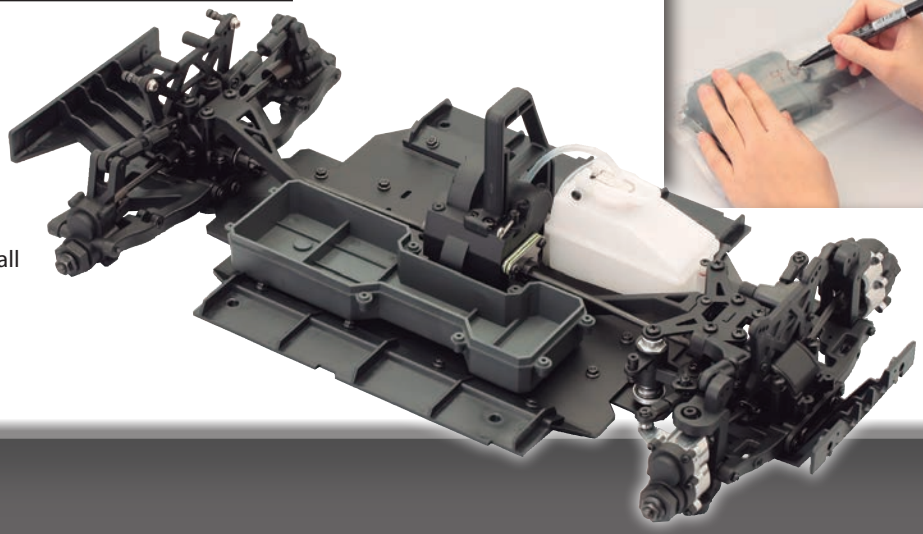


Place the 3 × 10mm self-tapping screw into the hole that sits on the joint between the chassis's main and rear plates. This was the hole marked in blue in Step 4.

Fit the remaining 3 × 8mm self-tapping screws into the last three holes that were marked in Step 4. Tighten each fully with a screwdriver.

Assembled parts

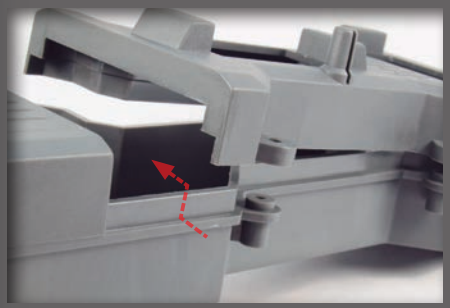




This stage is complete. Be sure to keep all the unused parts in a plastic bag safely, marked for reference.

Sealing the radio box

The radio box fitted inside your RC Hummer H1 is different to that of most radio-controlled cars. Due the heavier, off-road nature of its use, your Hummer's radio box requires a considerable amount of protection. As such , the radio box is designed and fitted in such a way that it is able to operate under even the most ambitious driver. Firstly, the radio box itself is made of thick impact-resistant plastic, moulded to provide excellent protection from dust and water. To achieve this, a high step has been moulded along the edges of the upper and lower box sections (see photo below left). Then, the box is fitted several millimetres above the chassis base, rather than on it, so that the box receives fewer of the vibrations or jolts experienced by the rest of the chassis, as these can affect the smooth running of the radio control components within the box.



The joint between the edges of the radio box's upper and lower sections features a high step to prevent dust particles or water entering.

It is possible to run your Hummer H1 through puddles, as the crucial radio box is so well sealed and protected.

The chassis and components stripped of the body casing after driving through water. It is advised that the model be cleaned thoroughly after use.

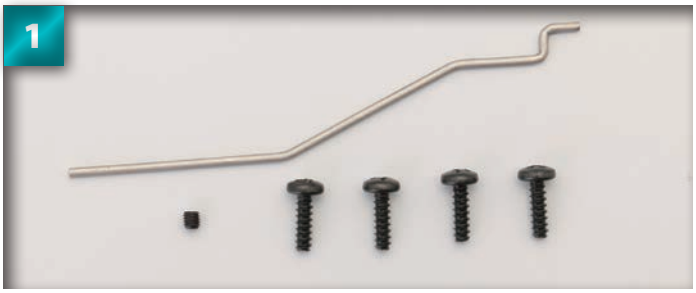
Installing the steering servo

Your parts

Steering servo (KS-302DS)
Servo horn
2.6 × 10mm servo horn screw

Tools and materials

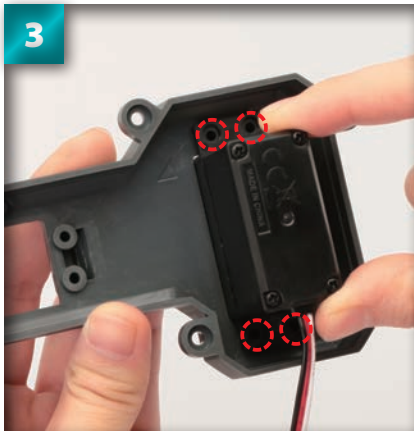
Phillips screwdriver
Needle-nose pliers
1.5mm Allen key (Stage 11)
Main chassis assembly (Stage 46)
Radio box (Stage 46)
Steering rod (Stage 46)
3 × 10mm self-tapping screws × 4 (Stage 46)
3 × 3mm set screw (Stage 46)
Paper towel or tissue
Thread-locking agent (or rubber-based adhesive)



Prepare the above parts saved from Stage 46. Lay out the steering rod, four 3 × 10mm binding-head self-tapping screws, and a 3 × 3mm set screw.

Hold the radio box upper so that its underside is facing up, then place the steering servo into the rectangular space so that the screw holes on both parts line up.

The steering servo will fit in place neatly, so that the screw holes align (circled).



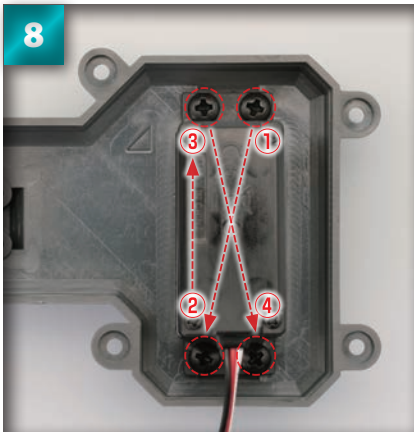
Place one of the 3 × 10mm binding-head self-tapping screws into the first hole (see arrow).

Turn the screw into place with a screwdriver, but only gently at this stage.

Rotate the assembly and insert the next 3 × 10mm screw into the hole on the other side, diagonally opposite the one fitted in Step 5.

Tighten with a screwdriver, again only lightly.

Add the remaining two 3 × 10mm screws saved from Stage 46 into the free holes and tighten all four in the order shown in the photo.



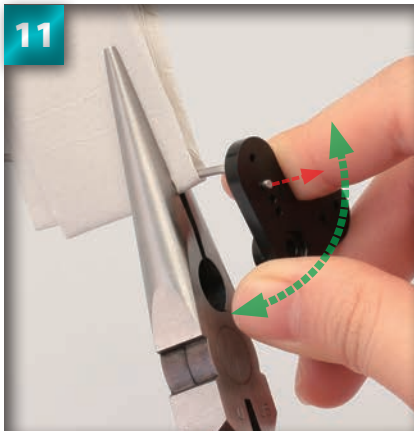
9

Wrap the steering rod (Stage 46) in a strip of paper towel or tissue to protect it.

10

Hold the steering rod firmly in the needle-nose pliers, then insert its tip into the circled hole on the servo horn, as shown. Make sure you have the correct end of the rod.

Twist the servo horn from side to side to help the hole accommodate the steering rod.



11

Keep twisting until the rod is protruding through to the other side of the servo horn.

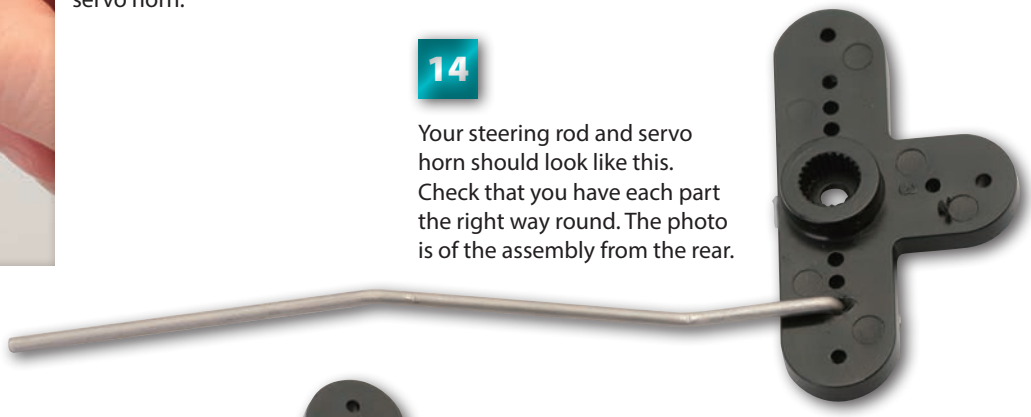
12

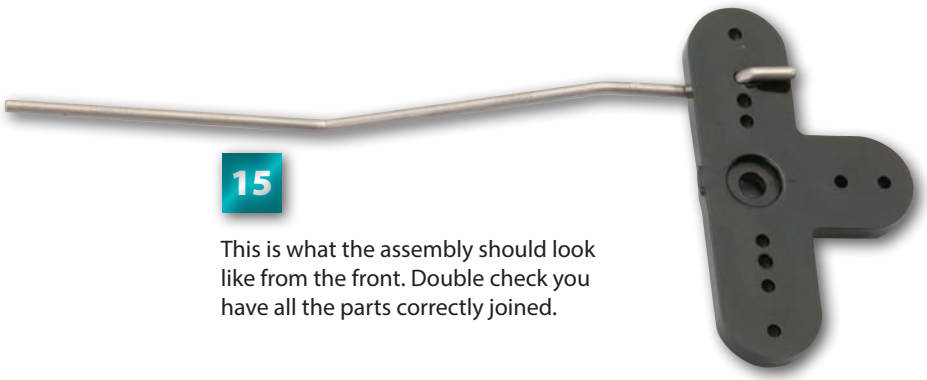
13

Carefully feed the rod through so that the short section of the rod that is between two right-angles is the only part within the servo horn.

14

Your steering rod and servo horn should look like this. Check that you have each part the right way round. The photo is of the assembly from the rear.





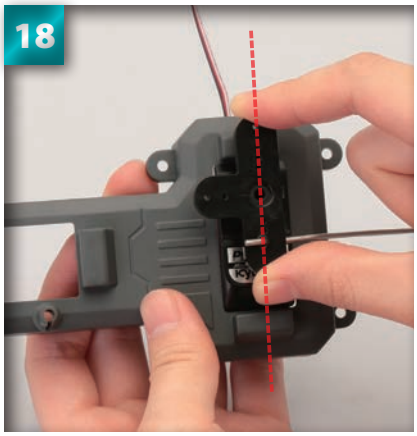
15

This is what the assembly should look like from the front. Double check you have all the parts correctly joined.

Hold the servo horn steady, and move the steering rod back and forth a number of times. This is to very slightly widen the hole and create a smoother action.

Hold the steering box with the steering servo facing upwards, as shown. Place the steering rod and servo horn assembly onto the circular output shaft on the servo, so that the round ridge on the back side of the servo horn accommodates the shaft.

Press the steering horn onto the servo so that it sits snugly and level to the edge of the box (see dotted red line).



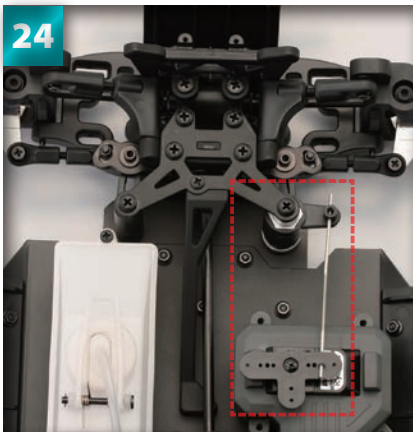
Press into place.

Place the 2.6 × 10mm servo horn screw into the hole in the centre of the servo horn.

Tighten with a screwdriver, but as this is only a temporary assembly do not tighten fully.

Hold the radio box to the front right of the chassis assembly. Insert the free end of the steering rod into the front right servo saver (see arrow).

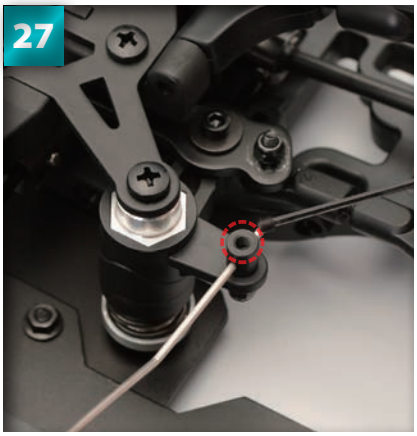
Carefully lower the radio box (upper) onto the lower section fitted in the previous stage. The parts should fit together snugly.



Inspect the photo carefully. The steering rod should be almost straight, with the steering servo at right angles to the edge of the radio box. This set-up is known as the 'neutral' position.

Place the next 3 × 3mm set screw (Stage 46) onto the tip of the 1.5mm Allen key.

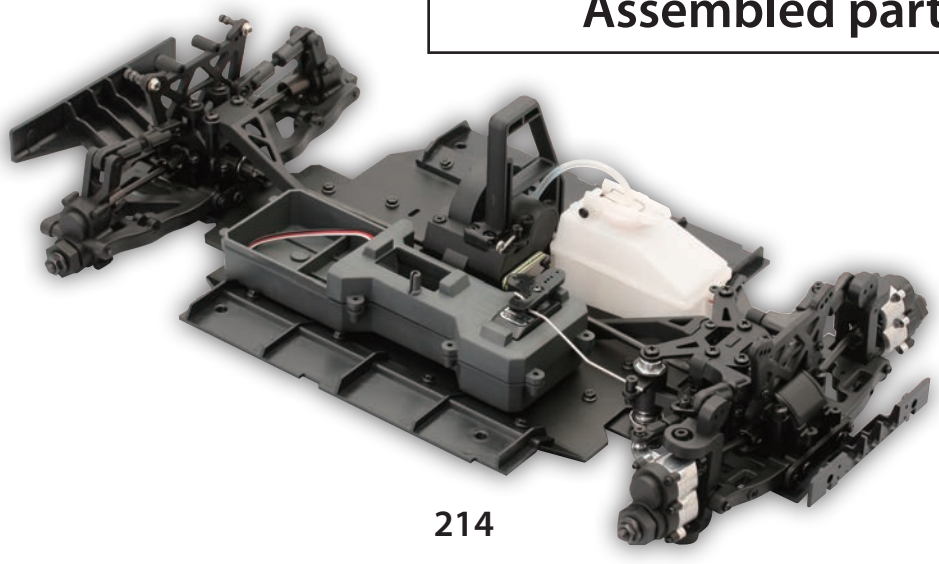
Apply a little thread-locking agent, or rubber-based adhesive.



Place the set screw into the hole in the arm of the servo saver into which the steering rod is fitted.

Turn the Allen key to tighten the set screw, but only lightly at this stage.

Assembled parts



Fitting the throttle servo

Your parts

Throttle servo (KS-302DS)
Servo horn
Servo horn screw

Tools and materials

Phillips screwdriver
Needle-nose pliers (two pairs)
Cutters
Scissors
1.5mm Allen key (Stage 11)
Cross wrench (Stage 8)
Main chassis assembly (Stage 47)
Paper towel or tissue
Thread-locking agent or rubber-based adhesive
Silicon tubing (Stage 43)
Battery box (Stage 45)
Power switch (Stage 45)

Tools and materials from Stage 46

Radio box lid
2 × 8mm self-tapping screw
3 × 3mm set screws × 2
Body pins × 2
Brake rod
Throttle linkage rod
Throttle ball end
Throttle spring
2mm stoppers × 2
Linkage base
Brake collar
Radio box collars × 2
2mm washer
3 × 10mm binding-head self-tapping screws × 10

Hold the throttle linkage rod (Stage 46) with the needle-nose pliers, covering it with a piece of folded paper towel or tissue for protection. Screw the throttle ball end (also Stage 46) onto the threaded tip.

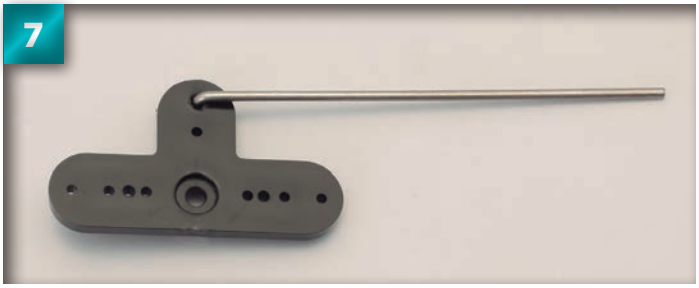
Turn the ball end until the remaining visible portion of the threaded section measures 2mm.

Next, wrap the brake rod (Stage 46) in a piece of folded paper towel.

Holding the brake rod with the needle-nose pliers, line up the tip of the rod with the circled hole on the servo horn. Make sure you have the servo horn the right way round, with the recessed circle in the central portion facing upwards, as shown.

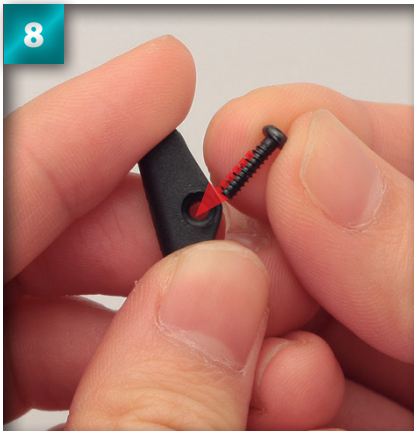
Carefully turn the servo horn from right to left until the tip of the rod makes its way through to the other side.

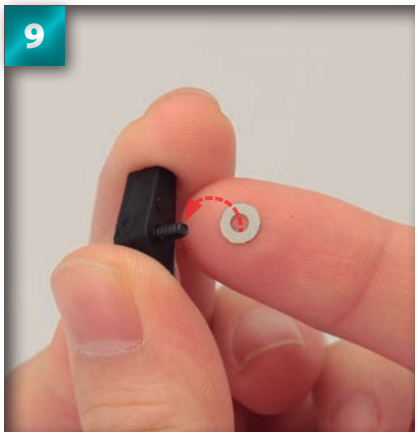
Push the front of the servo horn down (upper arrow) while lifting the back up (lower arrow) Keep going until the portion of the rod that appears vertical in the photo is in the hole of the servo horn.



Your servo horn and brake rod assembly should look like this.

Insert a 2 × 8mm self-tapping screw (Stage 46) into the stepped/recessed hole in the centre of the linkage base (also Stage 46).

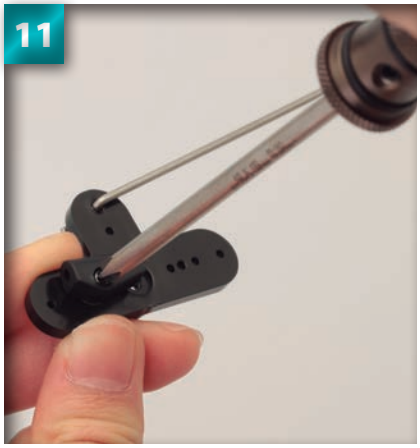




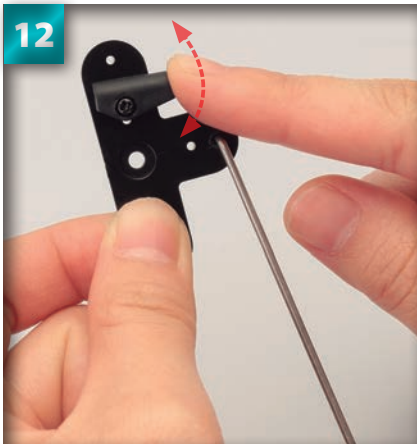
Place a 2mm washer over the protruding tip of the screw at the other side of the linkage base.

Making sure the washer and screw do not fall out, place the tip of the screw into the circled hole on the side of the servo horn.

Tighten with a screwdriver, but only up to the point where the linkage base can still be rotated slightly.



Make sure that the screw is loose enough that you can move the linkage base back and forth a little, but tight enough to stop the part rattling.

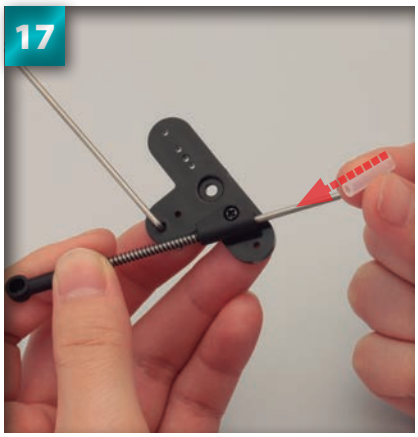


Prepare the throttle linkage rod assembly from Step 1, and slide the throttle spring (Stage 46) over the free end of the rod.

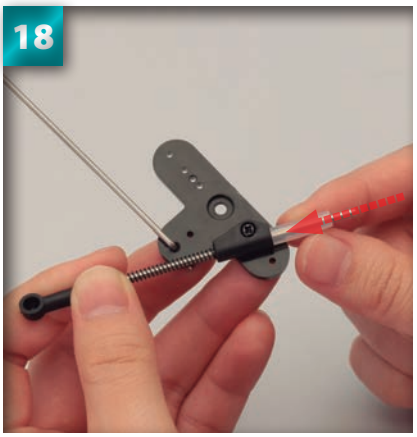
Making sure the spring does not fall off, insert the free tip of the rod into the hole in the side of the linkage base.

Push the throttle linkage rod through the linkage base until the spring fitted in Step 13 rests against the side of the linkage base.

Use scissors to cut the silicon tubing kept from Stage 43 in half.

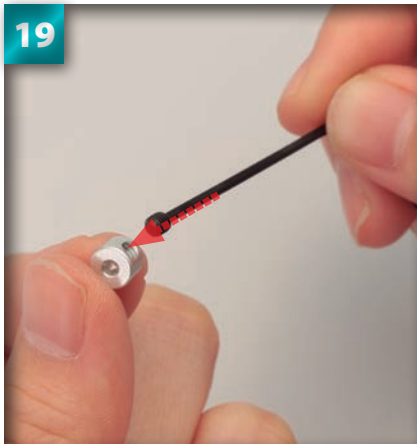


Slide one of the lengths of silicon tubing over the free end of the throttle linkage rod.



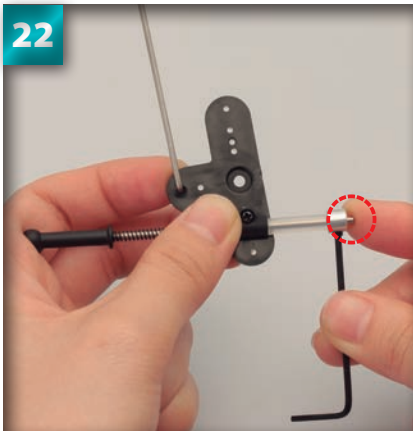
Slide the tube along until it rest against the side of the linkage base.

Place the first 3 × 3mm set screw (Stage 46) onto the tip of the 1.5mm Allen key. Apply a little thread-locking agent (or rubber-based adhesive), then begin to tighten into the hole in the side of the 2mm stopper (also Stage 46).



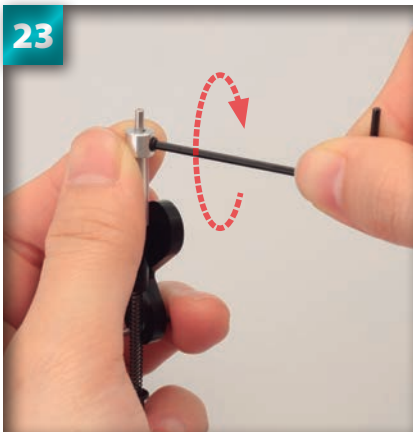
Turn the set screw into the hole, but stop before it enters the central hole. Leave the Allen key in place.

Slide the 2mm stopper over the free end of the throttle linkage rod.

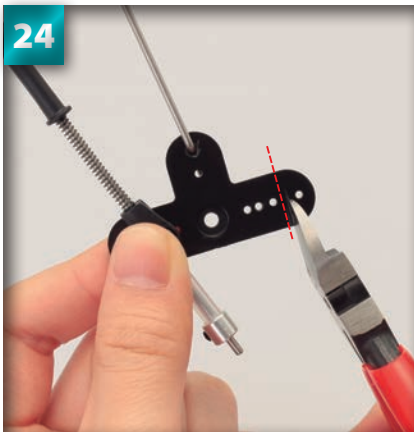


Push the 2mm stopper along the rod until it rests against the silicon tubing fitted in Step 17.

Secure the stopper in place by tightening the set screw with the Allen key.



Use the cutters to remove the curved tip at the right side of the servo horn. Follow the dotted line shown in this photo, and use the photo of Step 38 as a reference. Do not try to cut the tip off all at once, but instead go little by little.



Very carefully remove the temporarily-fixed radio box top from the chassis assembly (Stage 47). To do this, you will need to unscrew the set screw holding the steering rod in place.

Hold the radio box top with its underside facing upwards, with the throttle servo in your other hand, with the circular output shaft at the top of the box. Place the servo through the hole in the radio box top so that the screw holes line up to each other (see arrows).

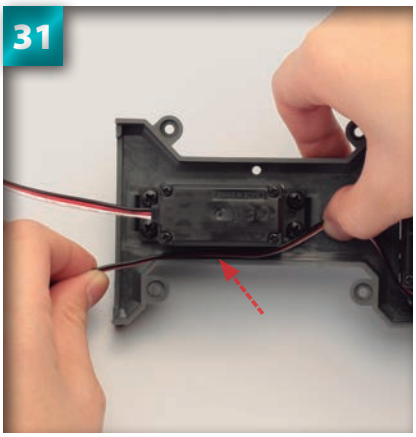
Adjust the servo so that it fits neatly into the hole, with all the screw holes lined up directly.

Place the first 3 × 10mm binding-head self-tapping screw into one of the holes in the servo.

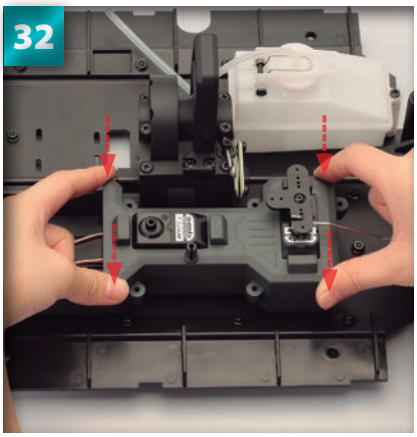
Lightly tighten the screw with a screwdriver.

Fit the remaining three 3 × 10mm binding-head self-tapping screws into the holes in the servo. Make sure that the servo is set perfectly straight into the hole in the radio box top, then tighten each screw fully to secure the part.

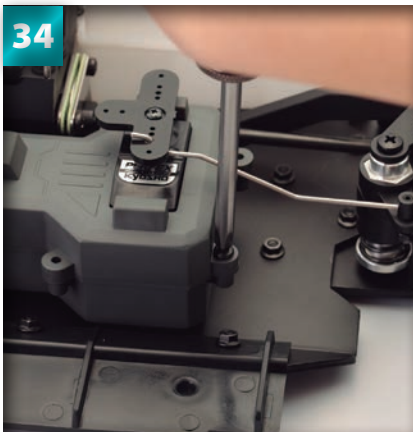
Pass the cable coming out of the steering servo along the gap between the throttle servo and out to the back of the radio box top.



Lower the radio box top onto the box bottom fitted to the main chassis in Stage 46. The holes along the edge of the box top should line up with those on the box bottom.



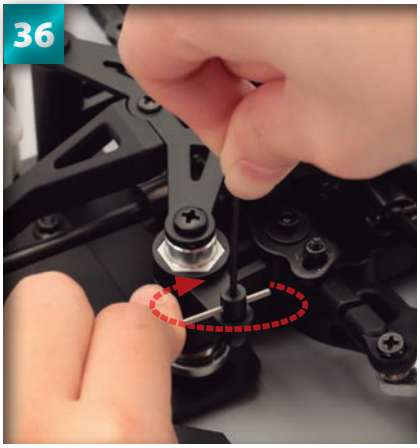
Place a 3 × 10mm binding-head self-tapping screw into the first of the holes along the edge of the radio box.



Tighten the screw gently with a screwdriver.

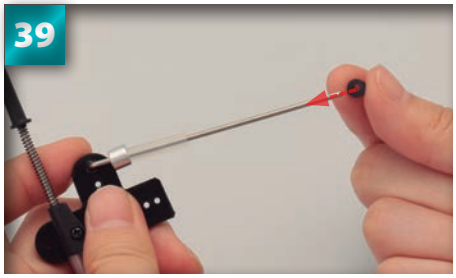
Tighten each of the remaining five screws into the remaining holes lining the radio box. Once all six screws are in, tighten each to fully fasten the box.

Carefully re-insert the steering rod into the front servo saver, then tighten the set screw again to secure the parts. The steering rod should be left in the 'neutral' position (see Step 24, Stage 47).

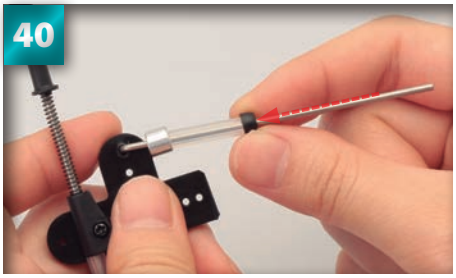


Holding the parts in place, turn the chassis assembly and tighten the 3mm nylon nut on the underside of the servo saver using the arm of the cross wrench marked '5.5'.

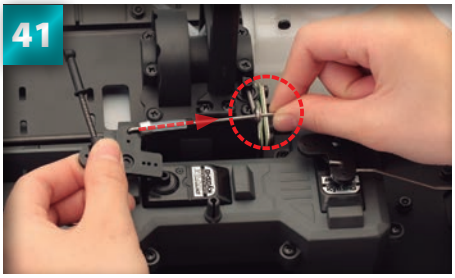
Prepare the second 2mm stopper and 3mm set screw in the same way as you did in Steps 19 and 20. Place the assembly over the free end of the brake rod.



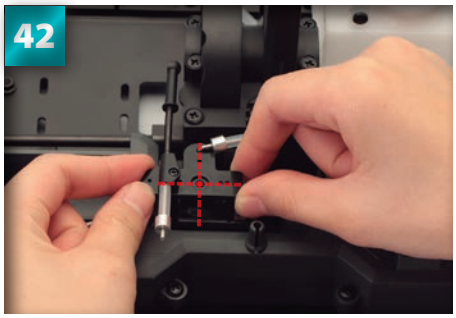
Slide the 2mm stopper down to the base of the brake rod. Then, slide over the remaining length of silicon tubing, followed by the brake collar (Stage 46). The brake collar should be put on with the flat side facing the silicon tube.



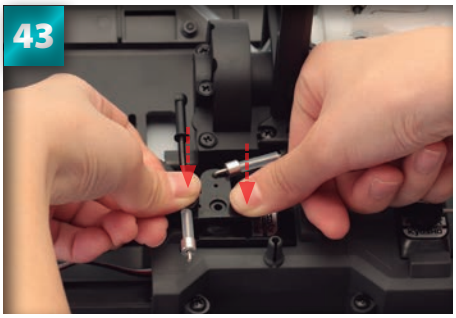
Push all parts along so they rest against each other, as shown. Do not tighten the set screw in the 2mm stopper at this stage.



Insert the free end of the brake rod into the brake lever (circled).

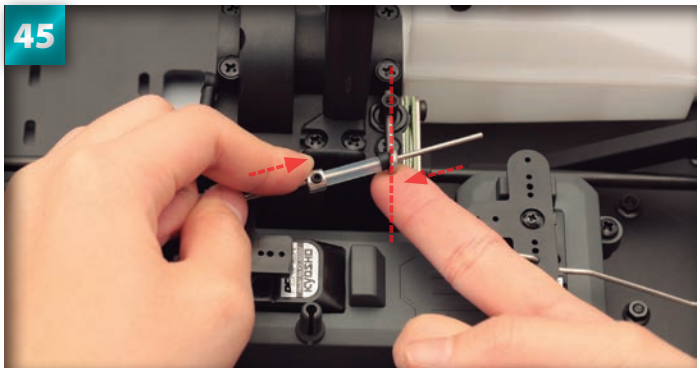


With the brake rod still attached through the brake lever, place the throttle servo horn onto the throttle servo. The servo horn should sit perfectly at right angles to the edge of the radio box.

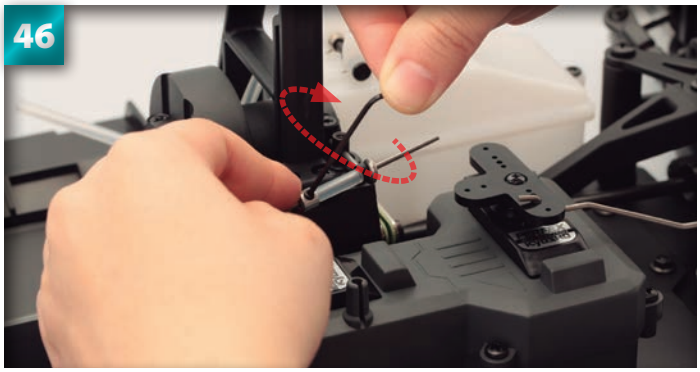


Push the servo horn down so that it slots into place, with the output shaft on the top of the servo beneath. At this stage, the brake rod will be set at an angle.

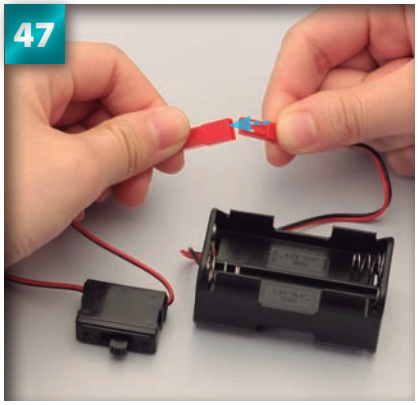
Place the servo horn screw into the central hole of the servo horn, then tighten with a screwdriver. This is a temporary assembly, so only tighten lightly at this stage.



Hold the brake lever level (see dotted lines), then push the stopper, silicon tube and brake collar up against the hoop of the brake lever.



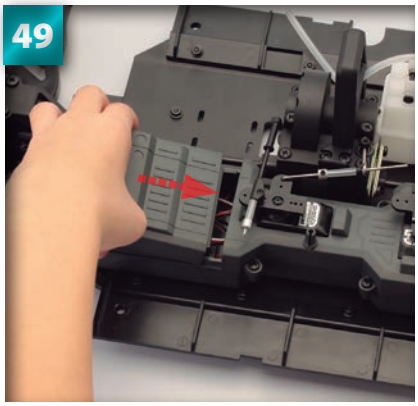
Once in position, tighten the 3mm set screw with the 1.5mm Allen key to secure the parts.



Prepare the power switch and battery box supplied with Stage 45, and join the connectors of both. There is only one way the connectors will fit correctly.

Place the power switch and battery box inside the space at the rear of the radio box, as shown. It is not necessary at this stage to connect the servo cables.

Make sure all the cables are safely inside the radio box, then close the box by adding the lid (see arrow).



Fit both radio box collars (Stage 46) over the cylindrical projections at the rear of the radio box. The wider side of the collars should sit against the body of the box.

Hold the first of the two body pins supplied with Stage 46 in the needle-nose pliers, as shown.

Hold the circular end of the body pin in the second pair of pliers, then very carefully rotate both in opposite directions to cause the body pin to bend – see photo for Step 53 for the correct angle.

The photo shows the correct angle of the bend in the body pin. Repeat Steps 51 and 52 for the other body pin. This is to make it easier to attach and remove the pins in later use.

Push the first body pin through the hole in the projection at the rear of the radio box. The bend in the pin should be positioned away from the box.

Repeat with the second body pin, so that the radio box is fastened shut. Your assembly should look like this.

Assembled parts