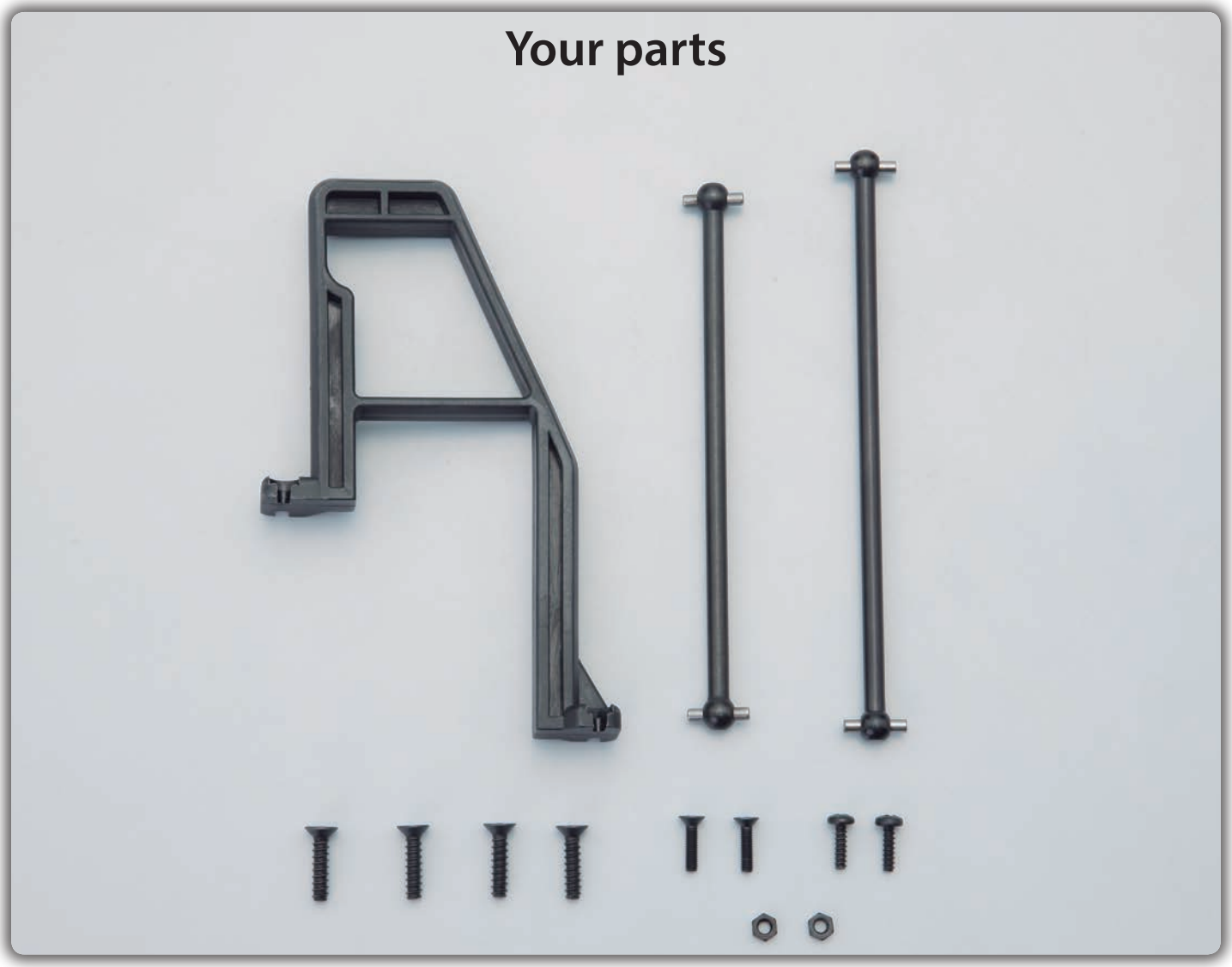
Stage 41

Fitting the driveshafts

Your parts

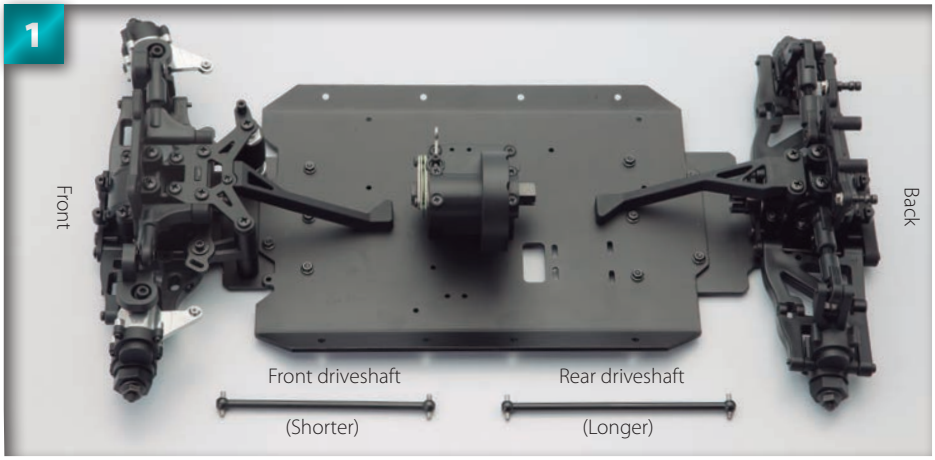


Roll bar
Front driveshaft
Rear driveshaft
4 x 16mm self-tapping countersunk screws x 4
3 x 12mm countersunk screws x 2
3 x 10mm binding-head screws x 2
3mm nuts x 2

Tools and materials

Phillips screwdriver
Main chassis assembly (Stage 40)
Centre gear mount (Stage 40)

1



Lay the main chassis assembly (Stage 40) on your work surface facing to the left. Place the centre gear mount (also Stage 40) in the centre, as shown here. Next, lay out both driveshafts – the longer of the two is the rear driveshaft, and the shorter is the front driveshaft. The difference in length is not large, so make sure not to get these confused.

2

Place one end of the front driveshaft into the differential cup joint facing out of the front bulkhead (circled).

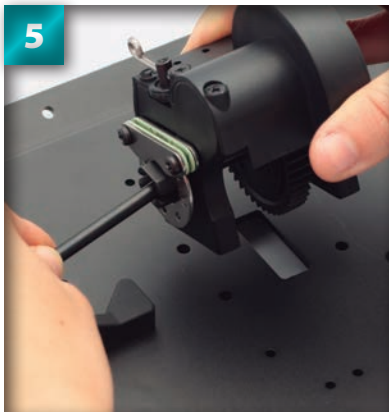
3

Make sure the metal pin set into the end of the driveshaft fits into the two slots in the cup joint.

4

Holding the driveshaft carefully so that the end fitted in Step 2 doesn't fall out of the cup joint, angle the centre gear mount so that its protruding cup joint accommodates the other end of the driveshaft.

5



Again, make sure the tip of the driveshaft is fully inserted into the cup joint.

6

Making sure neither end of the front driveshaft is dislodged, fit the tip of the rear driveshaft into the second cup joint.

7

Holding the parts together carefully, fit the other end of the rear driveshaft into the differential cup joint beneath the rear bulkhead.

8

Make sure the metal pin is fitted into the slots in the cup joint.

9

With both driveshafts in place, lower the centre gear mount down onto the surface of the main chassis, so that the four holes line up with those on the chassis.

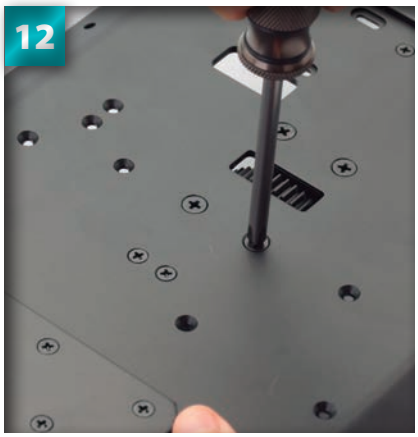
Holding the centre gear mount and driveshafts in place, turn the chassis assembly around so the bottom is facing upwards, then place the first 4 x 16mm self-tapping countersunk screw into one of the circled holes.

10

Still holding the centre gear mount carefully in place, tighten the screw with a Phillips screwdriver. Do not tighten fully at this stage.

11

12



Screw the remaining 4 x 16mm self-tapping countersunk screws into the remaining three holes. When all are in, tighten each fully.

13

Turn the chassis assembly around, then place the roll bar over the centre gear mount, as shown. The shorter arm will sit on the centre gear mount itself, and the longer on the surface of the chassis (see arrows).

Place a 3 x 10mm binding-head screw into the first of the holes on the shorter arm of the roll bar.

14

Tighten with a screwdriver, but do not use too much force at this stage – the roll bar should not be rotated by the turning.

15

Place the second 3 x 10mm binding-head screw into the adjacent hole, then tighten both fully.

Next, inspect the longer arm of the roll bar – it does not matter if it has come away from the chassis surface a little. Place a 3mm nut into the groove in the tip of the arm, as shown by the arrow.

Holding the nut in place with your finger, turn the chassis around and place a 3 x 12mm countersunk screw into the corresponding hole on the underside of the roll bar.

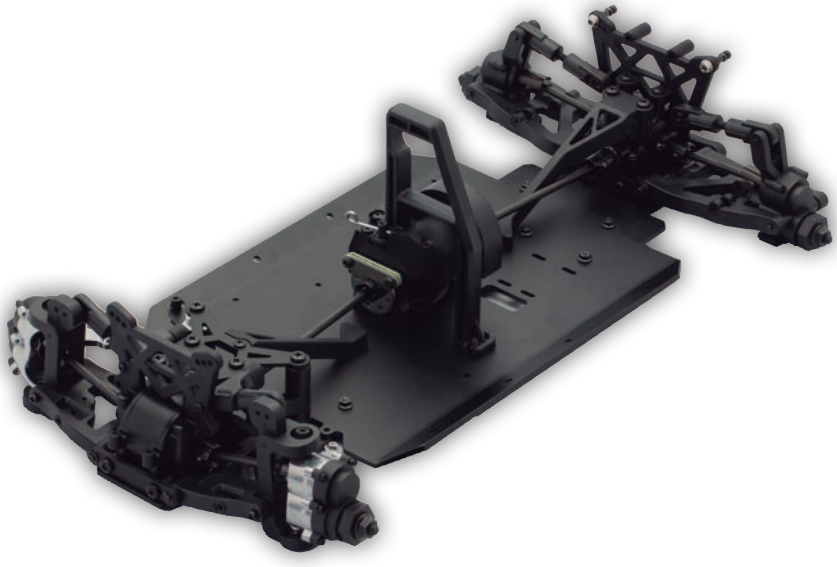
Tighten the screw into the nut with a screwdriver. Be careful not to overscrew, as this can damage the inside of the nut.

Turn the chassis around and place the second 3mm nut into the next groove in the roll bar.

As you did with the first screw, turn around and place the screw into the second hole.

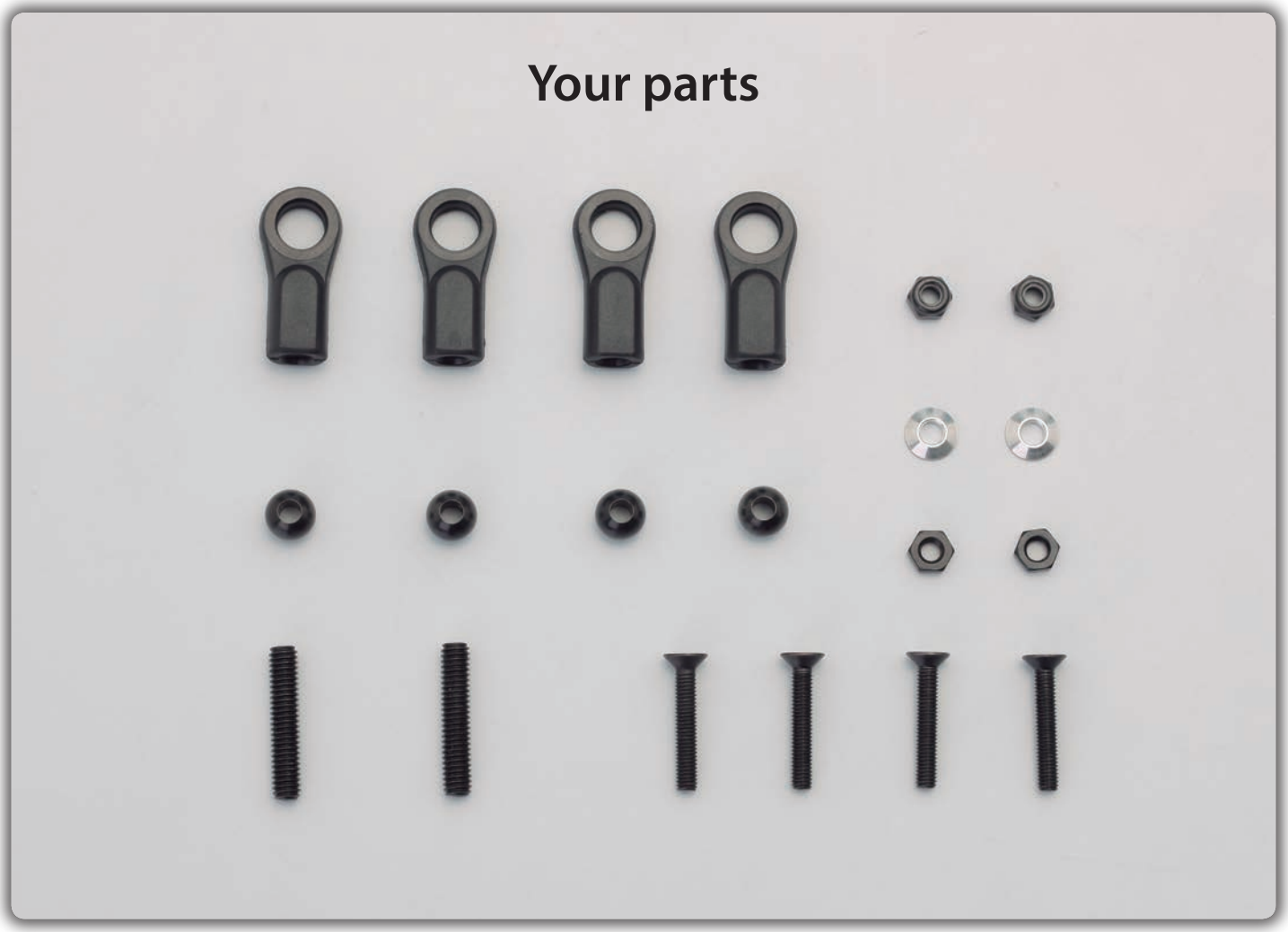
Tighten both screws fully.

Assembled parts



Stage 42

Assembling the front track rods



6.8mm ball ends x 4
3mm nylon nuts x2
Tapered collars x 2
6.8mm pillow balls x 4
3mm nuts x 2
4 x 20mm set screws x 2
3 x 18mm countersunk screws x 4

Tools and materials

Phillips screwdriver
Needle-nose pliers
Callipers (or ruler)
Cross wrench (Stage 8)
Main chassis assembly (Stage 41)
Paper towel or tissue

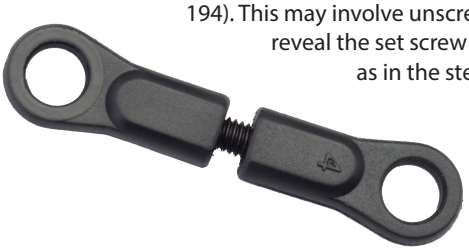
1 Fold a piece of paper towel or tissue around half of the first set screw.

2 Hold the covered end of the set screw with the needle-nose pliers, and screw a 6.8mm ball end over the free end by hand. Turn the ball end until about 8mm of the set screw is inside the part.

3 Holding the ball end fitted in Step 2, line up the next 6.8mm ball end to the free end of the set screw. Make sure the parts are perfectly level with each other.

4 Turn the second ball end so that the set screw enters the part.

5 The ball ends should meet at the centre, giving your first track rod an overall length of 50.8mm. However, when fine-tuning your model at a later stage, you may choose to adjust the 'toe-in' of your steering set-up (see 'Toe-in' box on page 194). This may involve unscrewing the ball ends to reveal the set screw between them, such as in the step photos.



6 Repeat Steps 1 to 5 to assemble the second track rod.

7 Place a 6.8mm pillow ball into the first of the track rod's sockets. The hole in the ball should be perpendicular to the socket.

8 Fold some paper towel or tissue over the part to protect it, then press into place with the needle-nose pliers. Repeat for each socket of both track rods.

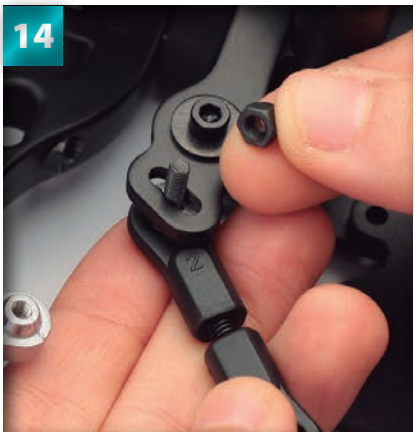
Place a 3 x 18mm countersunk screw through the hole in the pillow ball fitted in Step 8.

Place a tapered collar over the thin tip of the screw. Make sure the convex side of the collar goes over the screw first.

Push the collar down until it rests against the pillow ball.

Holding the countersunk screw in place, position the track rod with the tip of the screw facing upwards beneath the hole in the left side of the steering plate (arrowed).

Push the tip of the screw through the central hole in the steering plate (circled).



Hold the track rod and countersunk screw in place, and line up a 3mm nylon nut to the tip of the screw.

Tighten the nut with your fingers. Turn lightly at first to avoid damaging the thread of the nylon nut.

Position the chassis on its side and hold the nut in place with the end of the cross wrench marked '5.5'. Place the Phillips screwdriver into the head of the countersunk screw.

Angle the front left knuckle arm with the free end of the track rod so that the circled holes line up with each other.

Place a 3 x 18mm countersunk screw through the top of the pillow ball, then through and into the hole in the knuckle arm.

Once the screw is in place, tighten with a screwdriver.

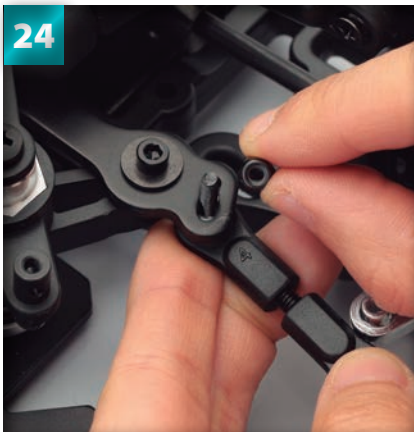
Carefully turn the chassis over and place a 3mm nut onto the tip of the screw.

Tighten as far as you can by hand.

Next, tighten fully using the cross wrench.

Repeat Steps 9 to 11 for the second track rod, then following the same method, fit the screw to the right end of the steering rod.

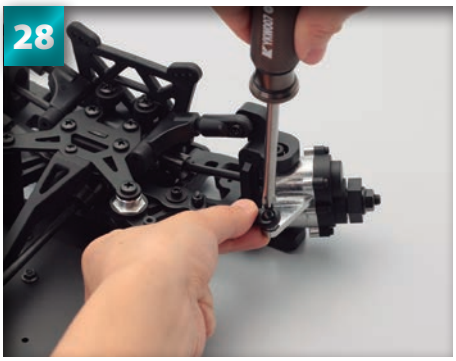
Place the second 3mm nylon nut over the tip of the screw.



As you did in Step 16, hold the nut in place with the cross wrench and tighten the screw with a screwdriver.

Line up the hole in the front right knuckle arm with that of the free end of the track rod fitted in Step 25.

Insert the second 3 x 18mm countersunk screw through the holes in the track rod's pillow ball and the knuckle arm.



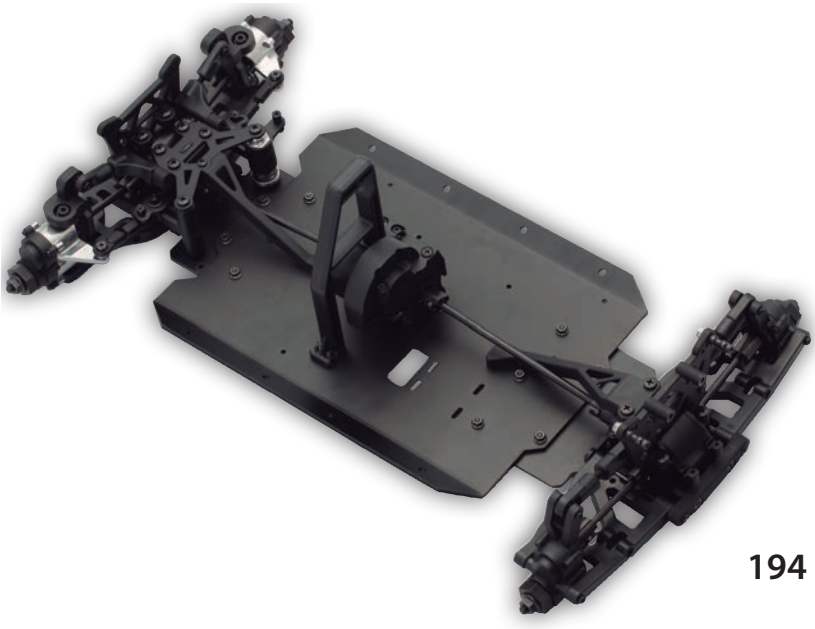
Tighten with a screwdriver.

Turn the chassis over and place the second 3mm nut over the tip of the screw.

Tighten the nut by hand.

Finally, tighten fully with the cross wrench.

Assembled parts



Toe-in

'Toe-in' refers to the angle of the front wheels in relation to the chassis and driveshafts. Wheels are not necessarily always set pointing directly ahead of the vehicle, and the toe-in angle is adjusted to fine-tune the handling of the car.

A positive toe-in refers to a setting in which the wheels point slightly inward, in a 'snow plough' formation. This offers greater stability, especially when driving along a straight.

A negative toe-in, where the wheels are angled slightly outwards, offers better grip when cornering, and so is predominantly used in racing cars.

Toe-in is adjusted by extending or reducing the length of the track rods (for positive and negative toe-in, respectively), and this is done by screwing the ball ends that make up the front track rods (see Step 4) either towards each other to make a shorter overall length, or away from each other to extend the track rods.

Installing the fuel tank

Your parts

Fuel tank
Fuel tank posts x 2
3mm O-rings x 2
3 x 15mm binding-head screws x 2
3 x 10mm countersunk screw
3 x 12mm countersunk screw
Silicone tube

Tools and materials

Phillips screwdriver
Scissors or knife
Cross wrench (Stage 8)
Needle-nose pliers
Paper towel or tissue
Ruler
Pen
Plastic bag

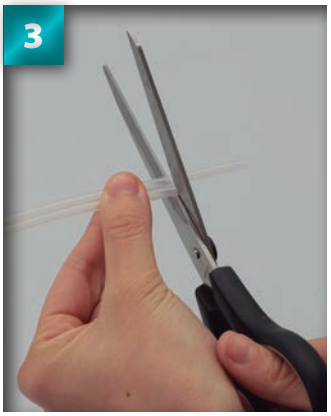
1

Lay the silicone tube out next to a ruler, perfectly straight. Mark the 11cm point using a pen. Do not stretch the tube.

2

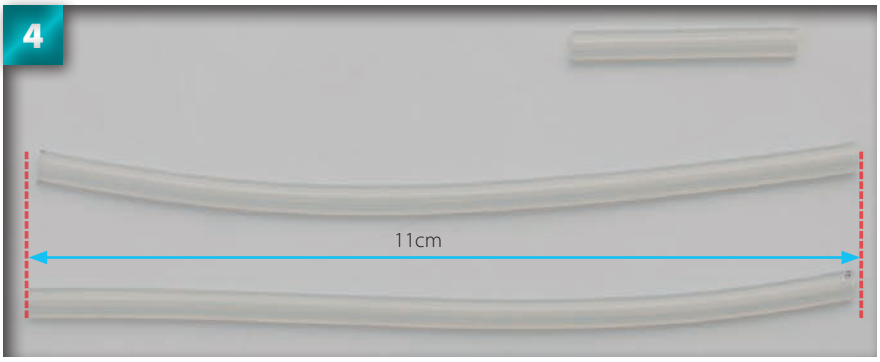
With scissors or a knife, cut the tube at the 11cm mark. If you use a knife, be sure to place the tube on a cuttting mat.

3



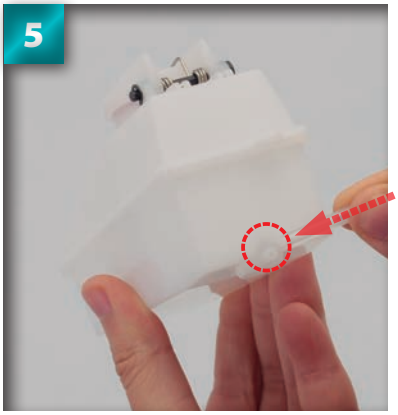
Using scissors, cut the remainder of the silicone tube to the same length.

4



You should be left with two 11cm lengths. Keep the leftover section of tube, as you will be using this at a later stage.

5



Line up the tip of one of the 11cm lengths of tube to the circled hole in the centre of the tank's bottom edge.

6

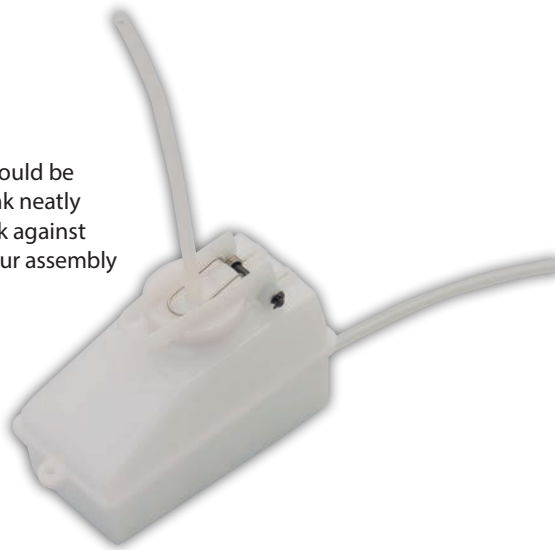
Squeeze the tube just below the tip, then carefully press the tip over the round projection (circled). Be careful not to snag the tube.

7

Next, press the tip of the second 11cm tube over the round projection on the top of the tank.

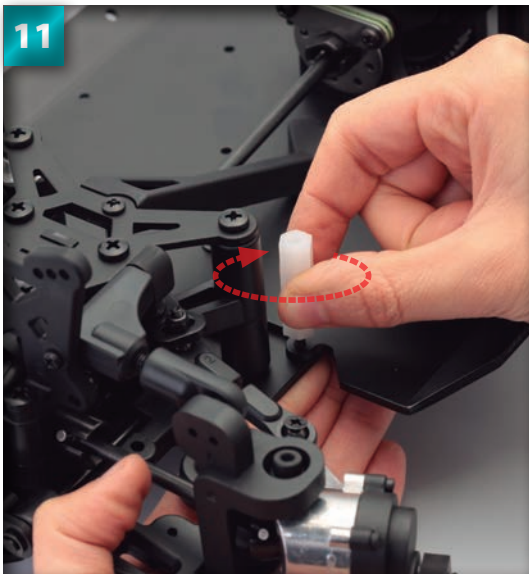
8

The two tubes should be fitted into the tank neatly and snugly. Check against the photo that your assembly looks like this.

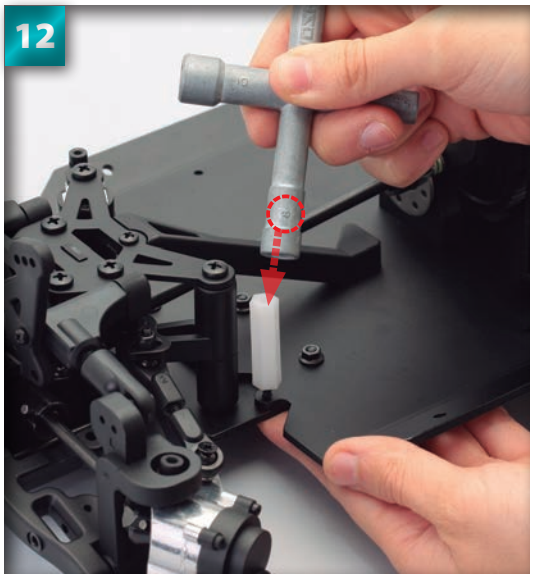


Position the main chassis assembly so that the underside is facing up. Locate the hole shown in the photo at the front end of the chassis, and insert a 3 x 12mm countersunk screw.

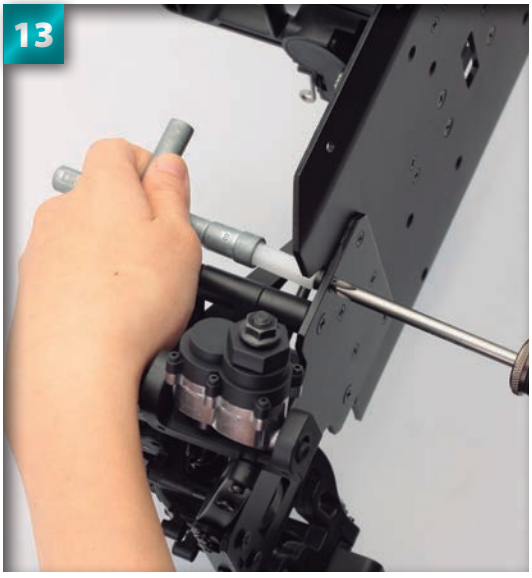
Hold the screw in place, then turn the chassis around and place the first fuel tank post onto the protruding tip of the screw (see arrow).



Holding the screw in place from beneath, turn the fuel tank post clockwise to fasten the part.



Place the end of the cross wrench marked '8' over the top of the fuel tank post.



Position the chassis on its side and tighten the screw with a screwdriver, holding the tank post in place with the wrench.

Place the 3 x 10mm countersunk screw into the arrowed hole on the underside of the main chassis. Check against the photo carefully to make sure you have selected the right hole.

Turn the chassis around again, holding the screw from beneath to prevent it from falling out, then place the second fuel tank post over the tip.

Because of the screw's close proximity to the roll bar, the cross wrench cannot be used for this step. Instead, use the needle-nose pliers – but cover the tank post with some paper towel or tissue first to protect it.

Adjust the two tank posts so that each has one of its six sides directly facing the other, as shown in the photo.

Place the first 3 x 15mm binding-head screw into the hole at the front of the fuel tank.

Place one of the 3mm O-rings over the tip of the screw.

Push the O-ring down so that is rests against the plastic of the tank.

Repeat Steps 18 to 20 for the hole at the back of the tank.

Line up the screws with the tank posts, making sure you have the tank correctly aligned.

Press down on the screws until you feel them slot into the holes in the tank posts.

Lightly tighten the first screw using a screwdriver.

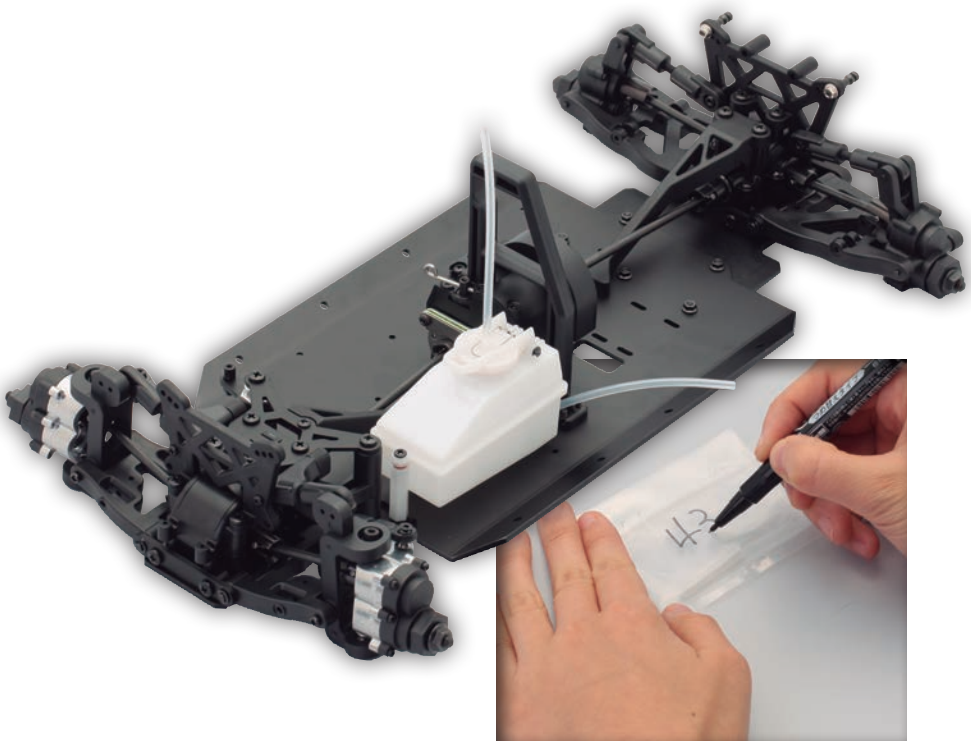
Keep tightening the screw until the O-ring is sandwiched confortably between the tank post and the tank. The O-ring should not be tightened so that it changes shape.

Repeat for the rear of the fuel tank.

Gently move the tank from side to side. It is OK for it to be able to move a little.

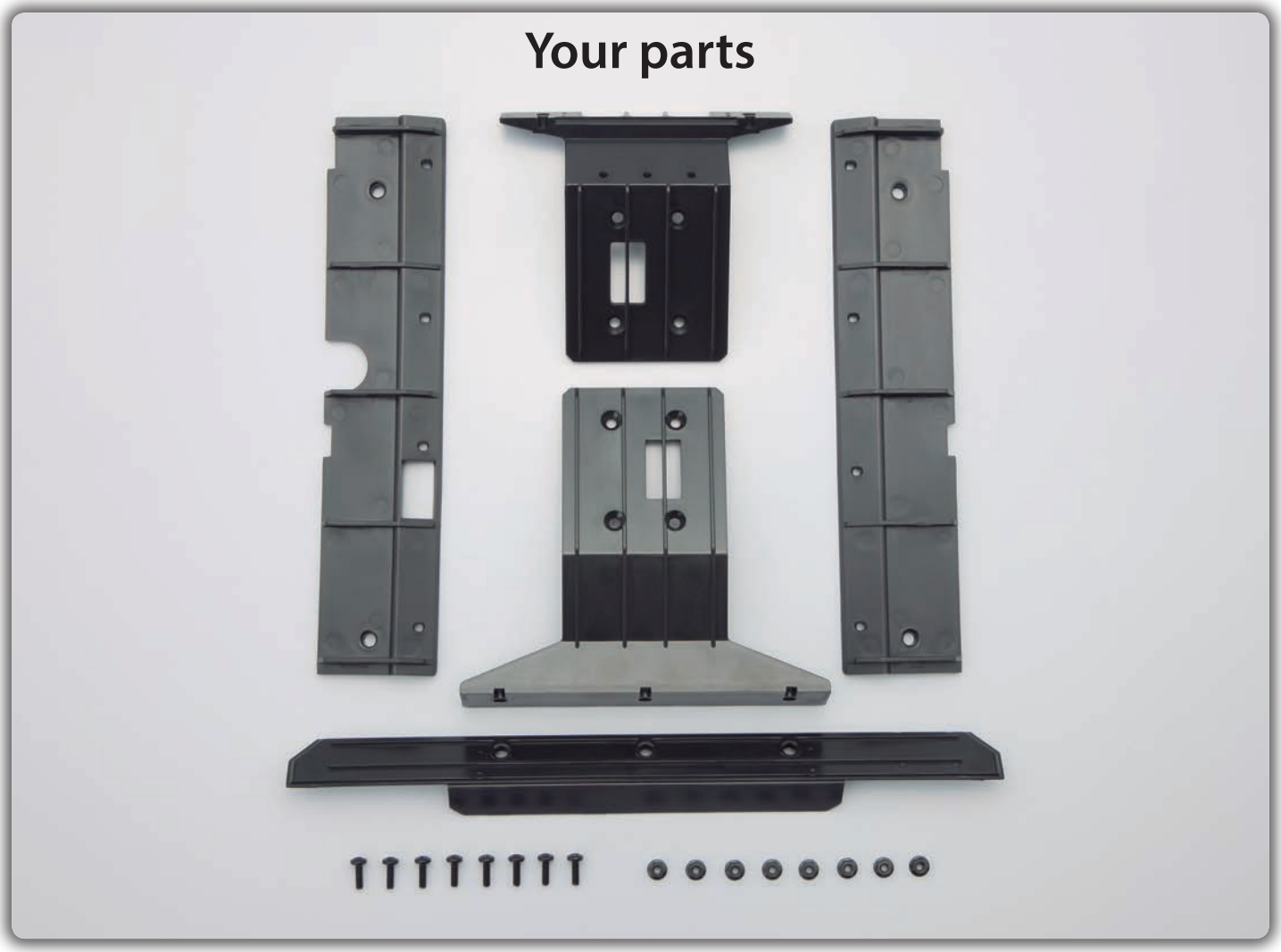
Assembled parts

This stage is complete, and your assembly should look like this. The tank should be able to move slightly: this is so that when the model is running, vibrations carry less directly into the fuel, preventing air bubbles from forming. Also be sure to keep any unused parts in a plastic bag and mark this clearly for ease of reference.



Fitting the chassis bumper mount

Your parts

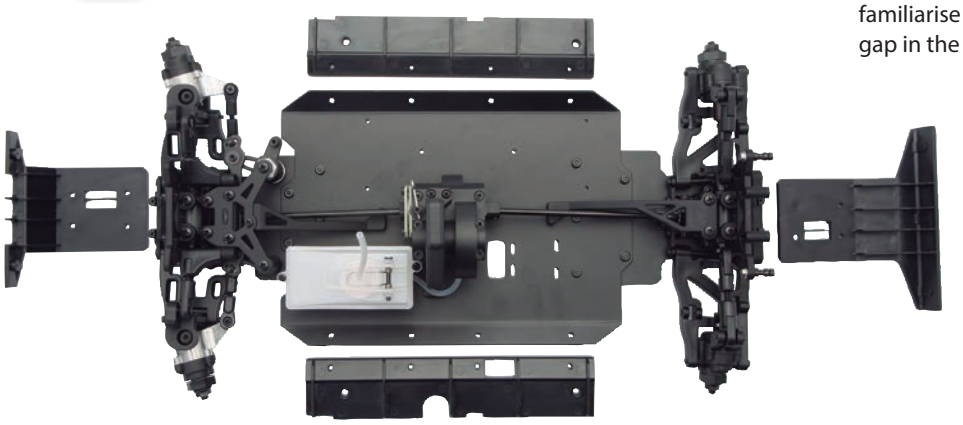


Left body mount base
Front bumper mount
Rear bumper mount
Right body mount base
Rear bumper base
3 x 10mm binding-head screws x 8
3mm flange nuts x 8

Tools and materials

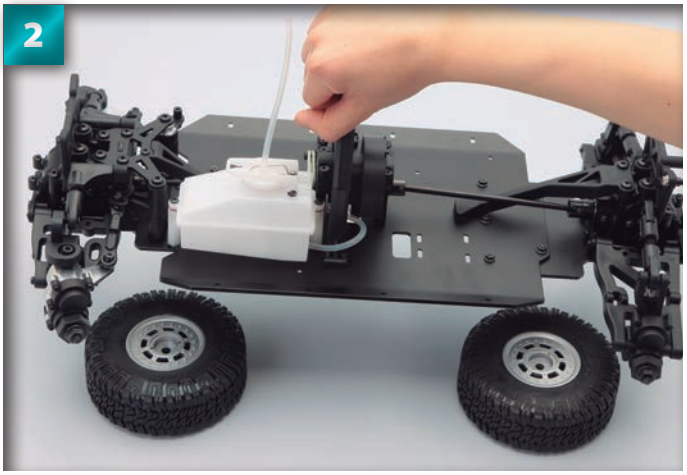
Phillips screwdriver
Main chassis assembly (Stage 43)
Tyre & wheel assemblies x 2 (Stages 1-19)

1



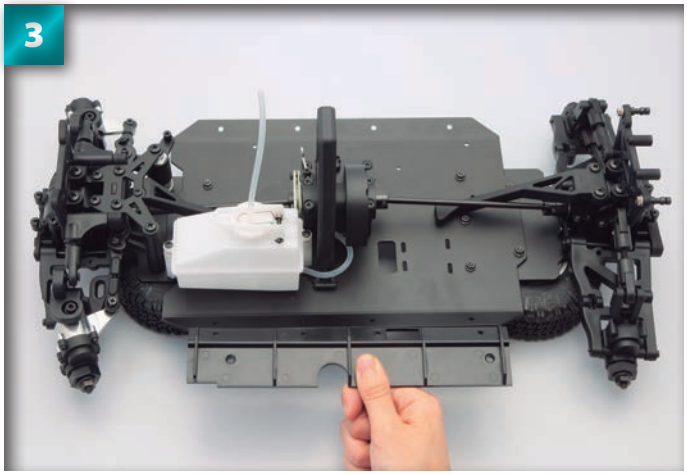
Lay out front and rear bumper mounts and the left and right body mount bases next to your model, as shown, to familiarise yourself with the position of each part. Note the gap in the side of the left body mount base.

2



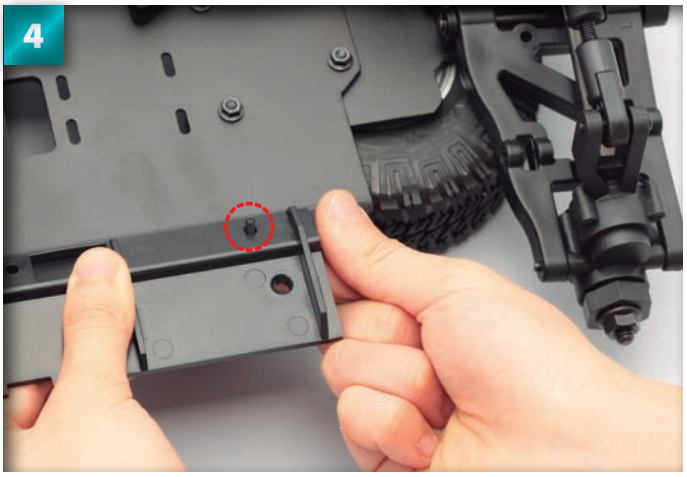
Use the two assembled wheels laid flat on your work surface as a base to raise the main chassis assembly. This will allow you easier access to the side of the chassis.

3



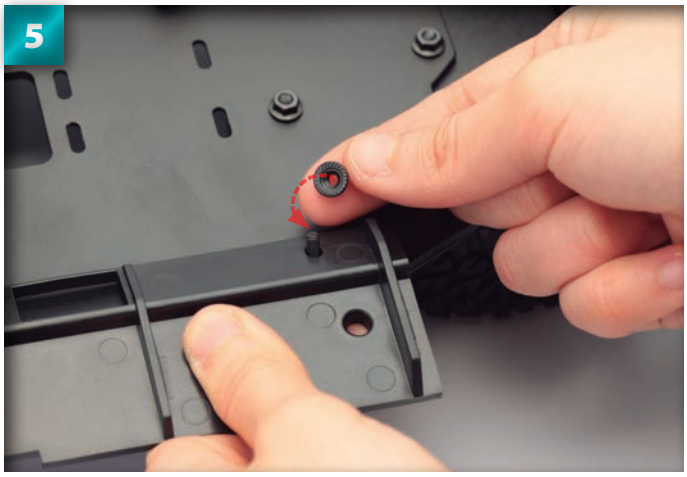
Position the left body mount base next to the left side of the chassis, lining up the row of four screw holes on both parts.

4



Insert a 3 x 10mm binding-head screw through the first pair of holes from the back.

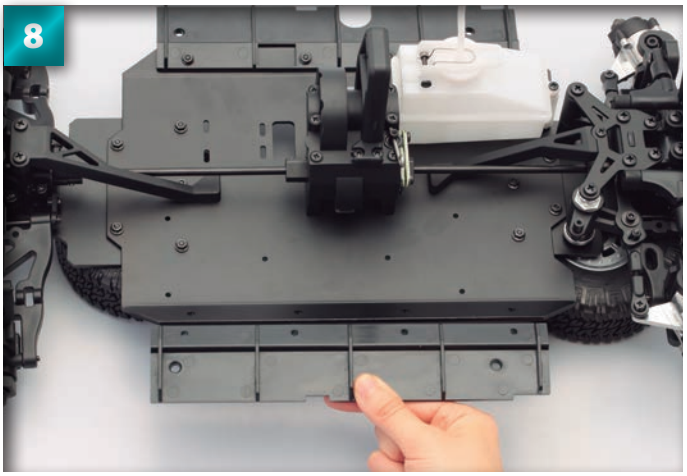
5



Hold the screw in place and put a 3mm flange nut over the tip of the screw.

Turn the nut clockwise to tighten it. At this stage, it is enough to tighten it by hand.

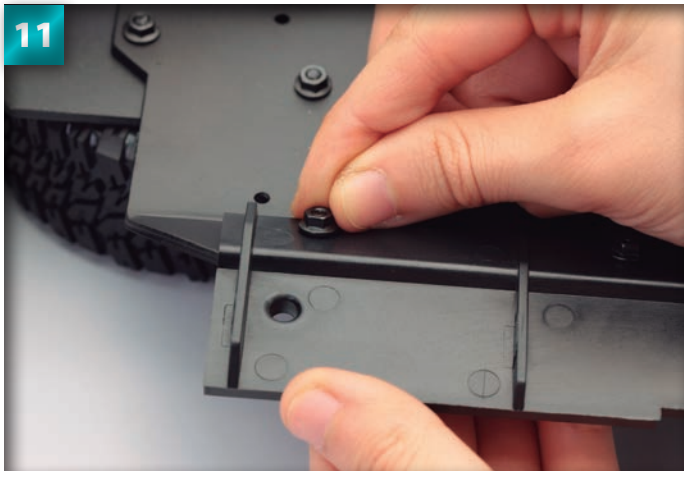
Repeat Steps 4 to 6 for the remaining three pairs of holes to join the left body mount base to the chassis.



Turn the chassis assembly around and position the right body mount to the right side of the chassis, as you did for the left.

Insert a 3 x 10mm binding-head screw through the first pair of holes from the back.

Hold the screw in place and put a 3mm flange nut over the tip of the screw, then tighten by hand.



Repeat Steps 9 to 10 for the remaining three holes to join the parts.

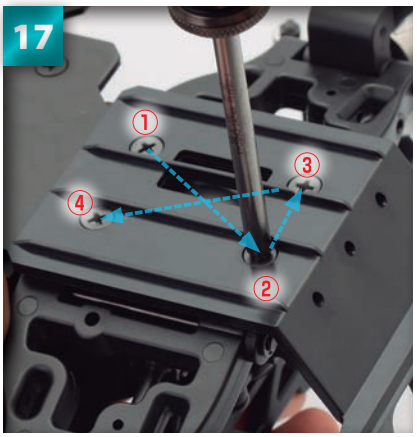
Next, turn the chassis assembly over and begin unscrewing the 4 x 16mm countersunk screws holding the front bulkhead to the chassis.

Remove all four screws so that you can remove the bulkhead. Keep the removed screws safely.

Position the front bumper mount as shown in the photo, making sure that the countersunk holes are facing upwards (see enlarged section).

With the holes lined up, begin re-inserting the 4 x 16mm countersunk screws removed in Step 13. Tighten lightly with a screwdriver.

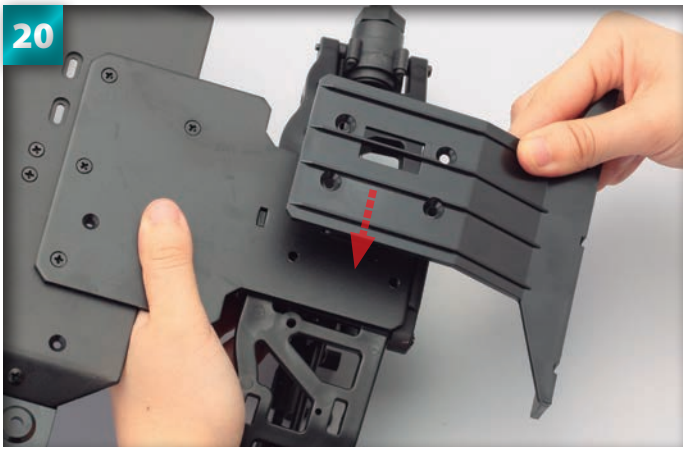
Replace and tighten the remaining three screws. Only tighten these lightly at this stage.



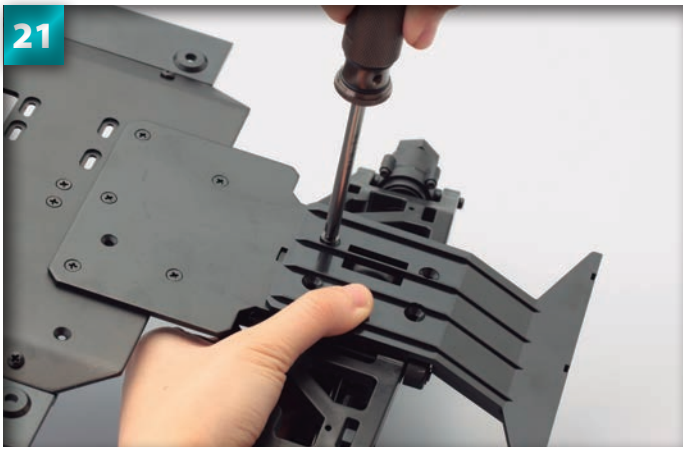
In the order shown in the photo, tighten each screw fully. When the screw stops turning easily, try to perform another half-turn to make sure the part is fastened as tightly as possible.

Next, begin loosening the 4 x 16mm screws at the other end of the chassis.

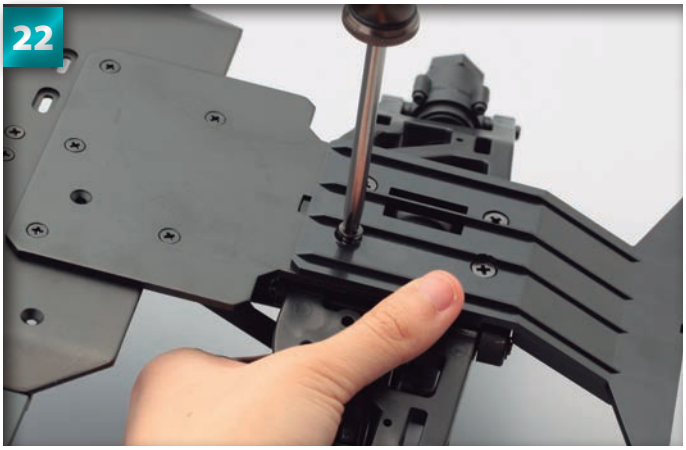
Remove all four screws so that you can remove the rear bulkhead.



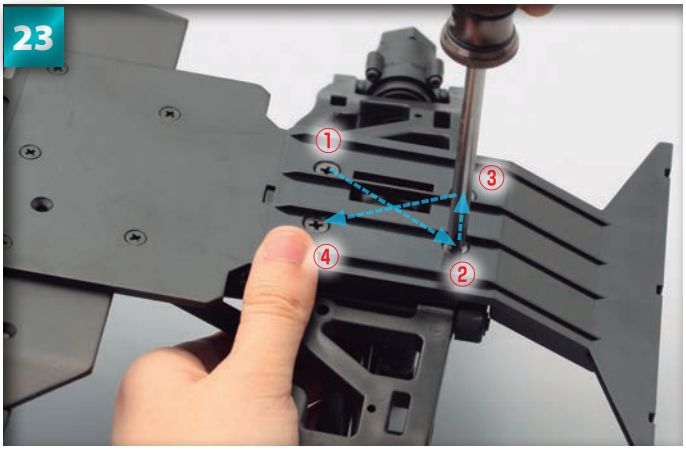
Line up the rear bumper mount, as you did for the front.



Begin re-inserting and tightening the screws removed in Step 19. Only tighten these lightly at first.

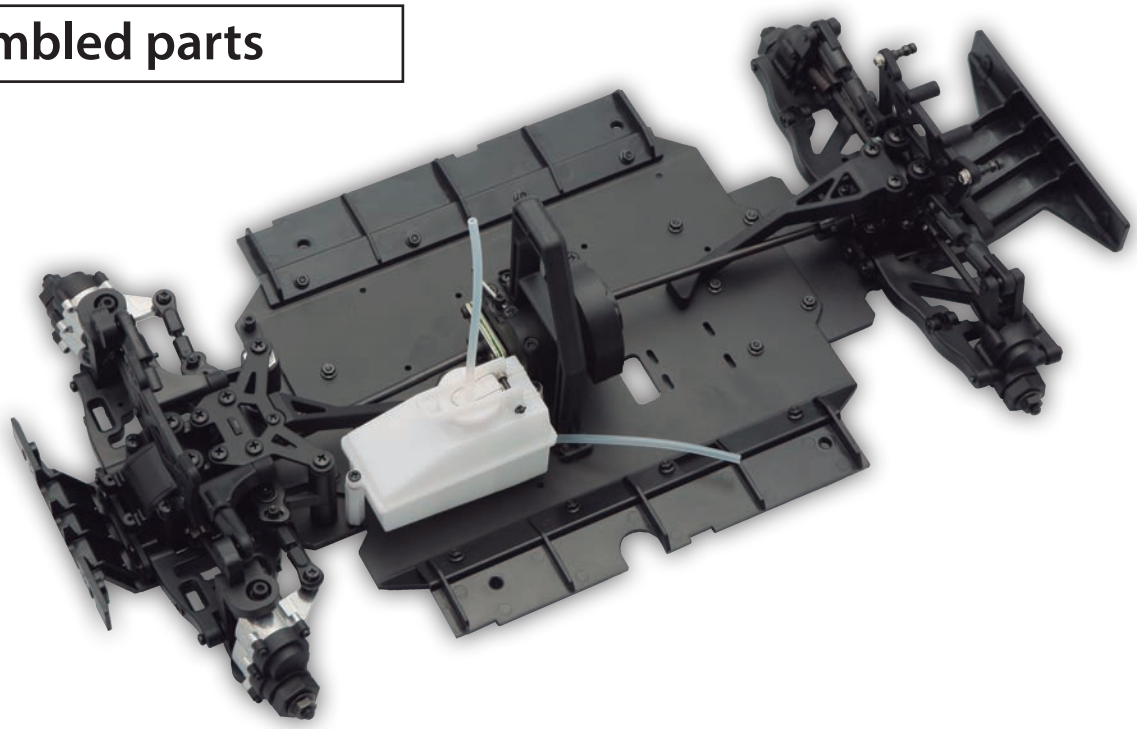


Tighten the remaining three screws lightly.



In the order shown in the photo, tighten each screw fully. When the screw stops turning easily, try to perform another half-turn to make sure the part is fastened as tightly as possible.

Assembled parts



This stage is complete. Remember to store all unused parts safely until next time.