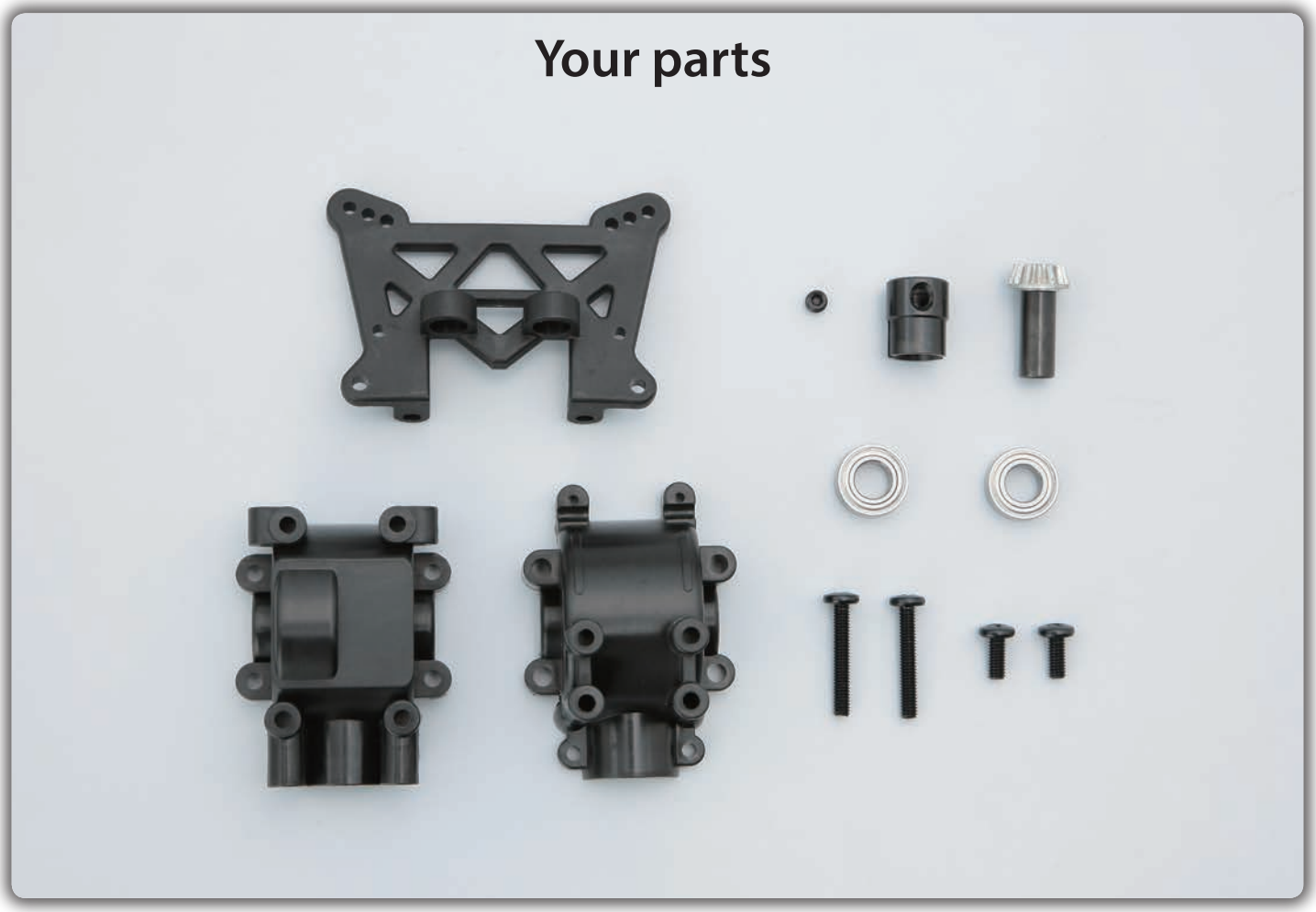
Assembling the front bulkhead

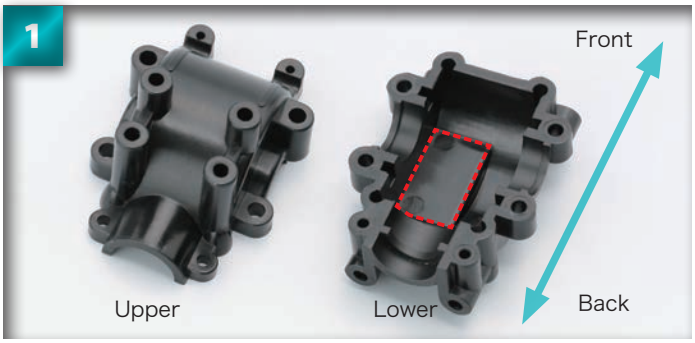
Your parts



Front shock stay
Lower bulkhead
Upper bulkhead
5 x 4mm set screw
Cup joint
Driveshaft (with 13T bevel pre-fitted)
1680 ball bearings x 2
4 x 25mm binding-head screws x 2
4 x 10mm binding-head screws x 2

Tools and materials

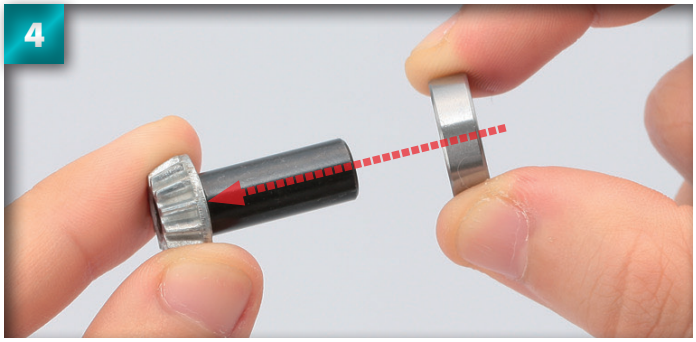
Phillips screwdriver
2.5mm Allen key (Stage 7)
Thread-locking adhesive (or rubber-based adhesive)
Front differential (Stage 24)
Grease (Stage 11)
Paper



Make a note of the shape and orientation of the upper and lower bulkheads. The inside of the lower bulkhead has a flat surface, marked in the photo.

Place the differential you assembled in Stage 24 carefully into the lower bulkhead, with the ring gear on the right side of the bulkhead.

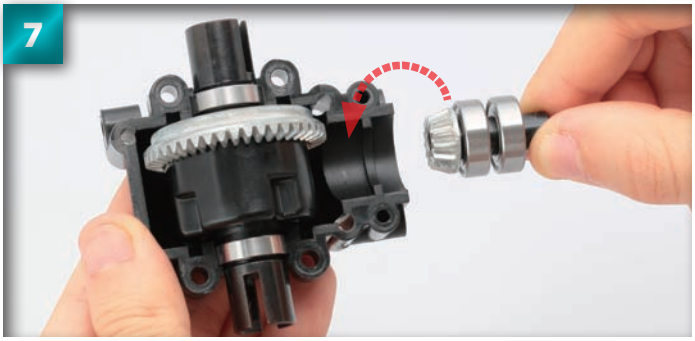
Your assembly should look like this, with the differential case sitting snugly into the lower bulkhead, and the right and left ball bearings resting in the cylindrical recesses on either side (circled).



Slide one of the 1680 ball bearings over the driveshaft so that it rests against the back of the pre-fitted 13T bevel gear.

Make sure the ball bearing is sitting flush with the bevel.

Now slide the second 1680 ball bearing over the driveshaft until it rests in the middle, leaving a space between it and the first.



Place the assembled driveshaft into the recess at the back of the lower bulkhead (arrowed).

The driveshaft should sit so that the ridge in the recess separates the two ball bearings, and the teeth of the 13T bevel engage those of the 43T ring gear.

Apply some grease to the ring and bevel gears.

Gently rotate the driveshaft, so that the gears turn, spreading the grease evenly.

Place the upper bulkhead onto the lower, making sure their orientation is matched.

Make sure that the two parts are sitting flush with one another, and that they are not disturbing either of the ball bearings.

Turn the protruding end of the driveshaft so that the flat (D-cut) section is facing upwards (see red shading).

Slide the cup joint over the end of the driveshaft, as arrowed, with the hole on the cup joint facing upwards.

Carefully place the 5 x 4mm set screw onto the tip of your 2.5mm Allen key.

Apply a little thread-locking adhesive to the threaded portion of the set screw. Rubber-based adhesive can also be used.

17

First make sure that the flat D-cut surface of the driveshaft inside the joint is still facing up, then insert the set screw into the hole in the cup joint.

18

Tighten with the Allen key. When the set screw won't tighten any more, loosen it by one half-turn.

19

Slot a single piece of paper in between the cup joint and the bulkhead. If the paper gets stuck, tease the cup joint back a fraction. This is to establish the correct gap between the two parts.

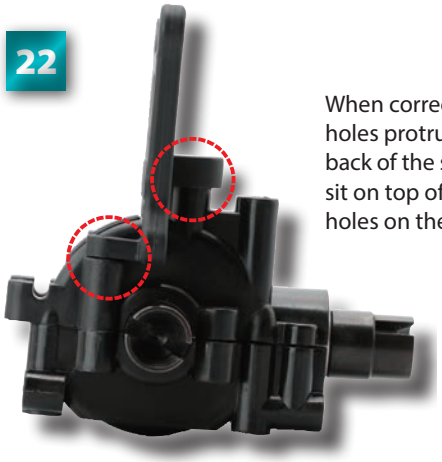
20

Now tighten the set screw with the Allen key. The paper should be able to come out without tearing.

21

Position the front shock stay onto the top of the upper bulkhead, checking against the photo that you have placed it the right way round.

22



When correctly positioned, the holes protruding to the front and back of the shock stay (circled) will sit on top of the corresponding holes on the bulkhead.

Insert a 4 x 25mm binding-head screw into one of the holes on the front of the shock stay.

23

Tighten with a screwdriver, but not too firmly, as this is only a temporary assembly.

24

Insert the other 4 x 25mm binding-head screw into the other hole.

Tighten, again not too firmly.

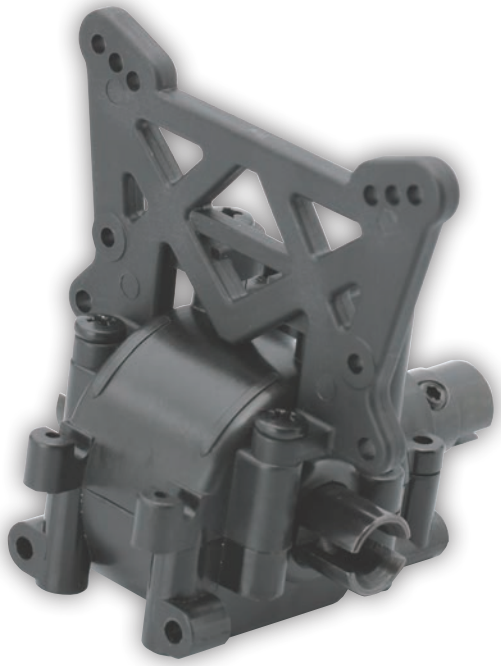
Rotate the assembly and place a 4 x 10mm binding-head screw into one of the holes on the back of the shock stay.

Tighten with a screwdriver, but as with the previous few steps, do not tighten too firmly.

Place the second 4 x 10mm binding-head screw into the remaining hole.

Tighten this screw completely, using a screwdriver. Then return to each of the other screws and tighten fully to secure the shock stay. This is to ensure each screw remains straight while the others are fitted.

Assembled parts

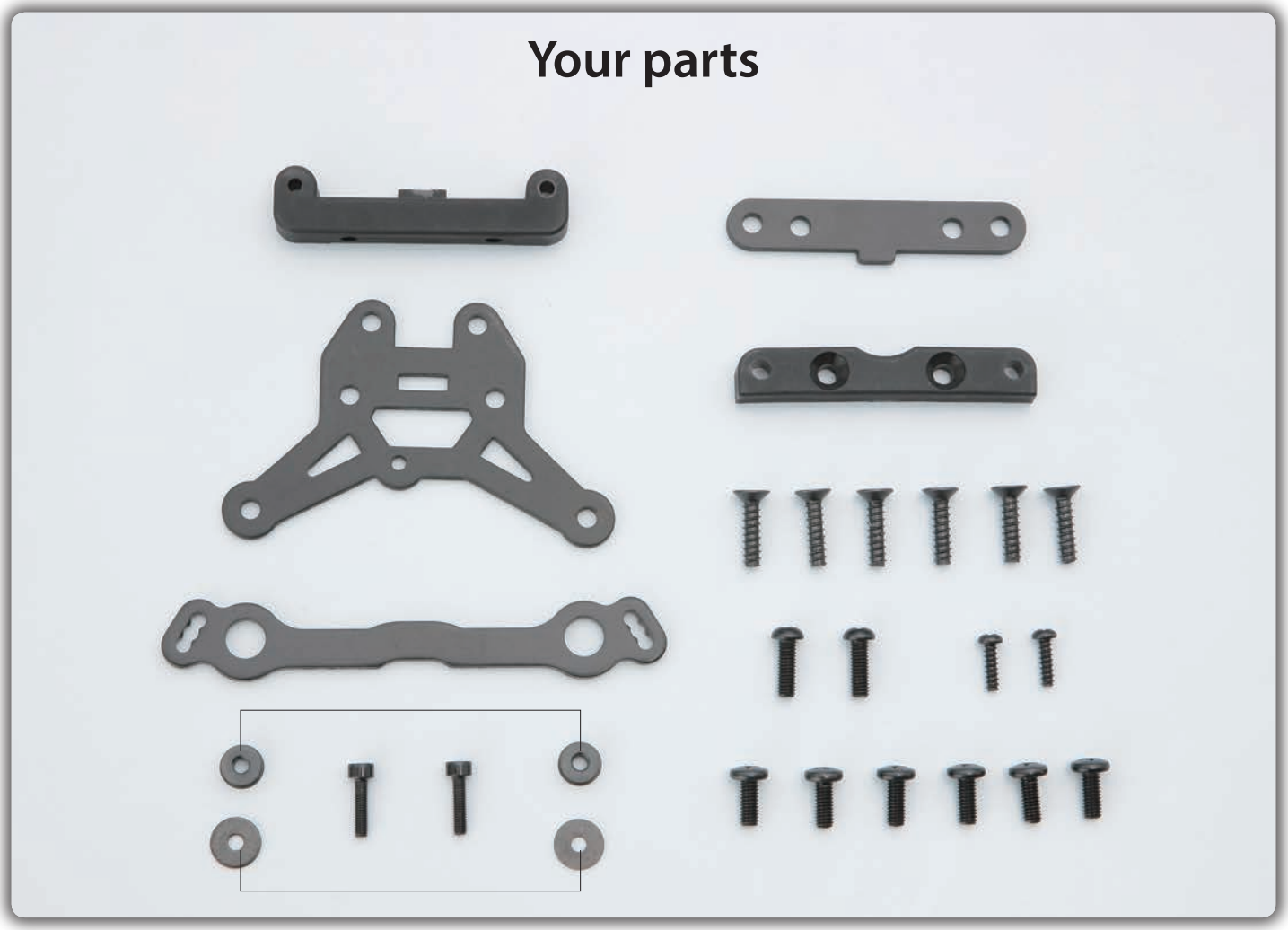


This stage is comlete, and your assembly should look like this. Store it, and any spare parts, away safely for next time.

Stage 26

Building up the front suspension

Your parts



Front upper suspension holder
Front lower suspension plate
Front bulkhead plate
Front lower suspension holder

Steering plate
Steering collars x 2
3 x 10mm washers x 2
3 x 12mm cap screws x 2

4 x 16mm countersunk screws x 6
4 x 12mm round-head screws x 2
3 x 10mm round-head screws x 2
4 x 10mm binding-head screws x 6

Tools and materials

Phillips screwdriver
2.5mm Allen key (Stage 7)

Main chassis assembly (Stage 22)
Front bulkhead assembly (Stage 25)
Servo saver (Stage 3)

Familiarise yourself with the screws

Five different types of screw are used in this stage, so be sure to make a note of the characteristics of each. Measure each against the parts list above to double-check you know which is which.

Check the servo saver

For this stage you will need the servo saver you assembled in Stage 3. Before beginning, check that the left and right are properly aligned.

Place a 4 x 12mm round-head screw into the hole on the back right side of the front bulkhead (see arrow).

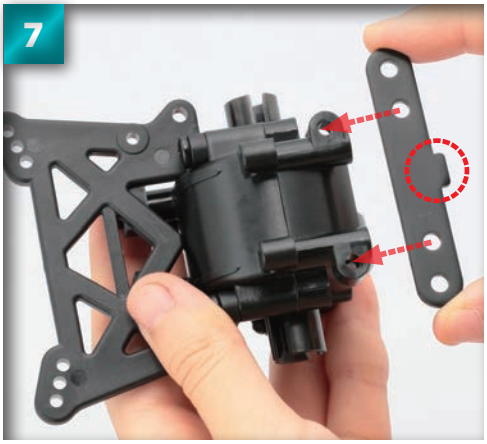
Tighten firmly with a screwdriver.

Repeat Steps 1 and 2 with the corresponding hole on the left of the bulkhead.

Now set one of the 3 x 10mm round-head screws into the hole on the bulkhead directly to the right of the cup joint.

Tighten firmly with a screwdriver.

Repeat Steps 4 and 5 with the corresponding hole to the left of the cup joint.



Line up the front lower suspension plate with the holes on the front side of the bulkhead (see arrows). Make sure the circled projection on the plate is positioned as it is in the photo.

Insert a 4 x 10mm binding-head screw through one of the holes on the plate and into the hole on the bulkhead.

9

Use a screwdriver to tighten the screw, then repeat for the other hole.

10

Turn the bulkhead around, and locate the holes beneath the cup joint. Line up the front lower suspension holder, so that countersunk holes are facing you. Note the position of the circled countour on the holder – this will accommodate the curve of the cup joint.

11

Insert a 4 x 16mm countersunk screw through one of the holes in the holder and into the bulkhead. Make sure the holder is positioned the right way round, with the contoured section fitting to the curve of the cup joint.

12

Tighten wth a screwdriver.

13

Repeat Steps 11 and 12 for the other hole on the holder.

14

Line up the front bulkhead plate with the front suspension holder, following the red arrows. Make sure the hole in the middle portion of the bulkhead plate (circled) is slightly to the left of centre.

15

Your assembly should look like this, with the screw holes aligned and the rectangular projection fitting into the corresponding hole.

16

Place a 4 x 10mm binding-head screw into one of the holes of the bulkhead plate.

17

Tighten with a screwdriver.

Repeat Steps 16 and 17 with the other hole.

18

19

Lay the front bulkhead assembly flat on your work surface. Line up the holes on the front bulkhead plate with those on the bulkhead assembly (see arrows).

Insert a 4 x 10mm binding-head screw into one of the holes on the plate.

20

21

Tighten with a screwdriver.

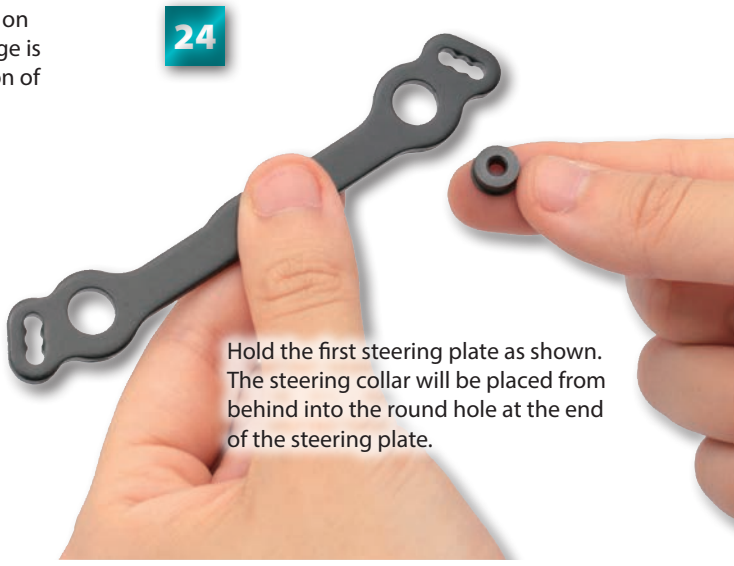
Repeat Steps 20 and 21 for the other hole.

22

23

Inspect the steering collars on a flat surface. The wider ridge is situated at the lower portion of the collar.

24



Hold the first steering plate as shown. The steering collar will be placed from behind into the round hole at the end of the steering plate.

25

Fit the collar into the hole from the back, the thinner top of the collar first. The collar is not secured, so hold it in place with your finger.

26

Still holding the collar from behind, place a 3 x 10mm washer over the front of the collar, as shown.

27

Hold the collar and the washer between your finger and thumb to prevent their slipping. Place the assembly, washer side first, onto the arm of the right servo saver, lining up the screw hole with the centre of the washer (see arrow).

28

Insert a 3 x 12mm cap screw through the centre of the washer and into the hole.

29

Tighten with the 2.5mm Allen key. Once fully tightened, loosen by one half-turn.

30

As you did in Step 24, line up the other steering collar with the hole at the other end of the steering plate.

31

Hold in place with your finger.

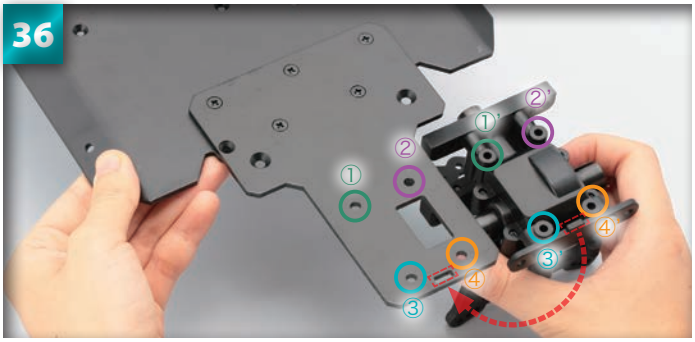
32

Place the other 3 x 10mm washer over the front side of the collar.

Holding the collar and washer in place, position the assembly onto the hole on the arm of the left servo saver. Make sure the servo saver is the right way up – the joint in the servo saver is on the bottom half of the body, below the arm.

Tighten with the 2.5mm Allen key. Once fully tightened, loosen by one half-turn.

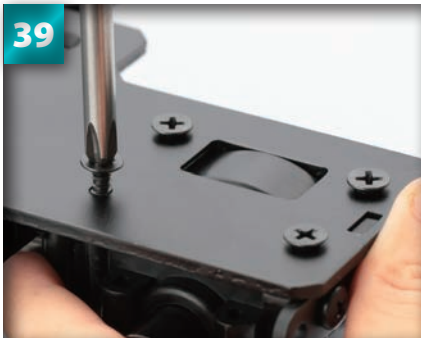
Your assembly should look like this. Store this away safely until it is needed.



Position the chassis with the underside facing you. With the front bulkhead assembly also underside-up, align the holes, using the numbers and arrows in the photograph as a guide.

Insert a 4 x 16mm countersunk screw into one of the holes.

Fasten with a screwdriver, but do not tighten too hard.



Repeat with the other three holes, again not tightening too hard. The heads of the screws should remain above the surface.

This session is complete. Double-check that you have used the correct screws for each step, and store your model away safely until next time.

Assembled parts

Stage 27

Installing the front lower suspension arms

Your parts

Front left lower suspension arm
Front right lower suspension arm
3 x 42mm screw shafts x 2
Front left hub carrier
4 x 74mm suspension shafts x 2
Front right hub carrier
E3 E-rings x 4

Tools and materials

Phillips screwdriver
Cutters
Knife
Pliers
Tissue paper
Main chassis (Stage 26)

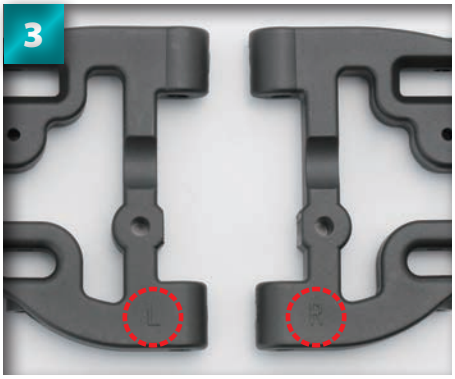
1

Use cutters to separate the front lower suspension arms from the remains of the plastic moulding.

2

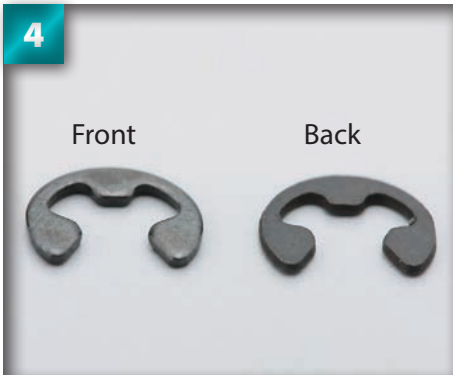
Use a knife to carefully remove any burrs.

3



Lay the suspension arms together on your work surface – you will see that they are marked L and R for left and right.

4



Now inspect the E3 E-rings, and make a note of which side is which – the front has rounded edges and the back is flat.

5

Use pliers to carefully clip one of the E-rings around the groove at the tip of the 4 x 74mm suspension shaft.

6

Repeat with the second suspension shaft. Your parts should look like this – at this stage only one E-ring on each should be fitted.

7

Holding the left hub carrier as shown, line up the left suspension arm – the holes on the narrow end of the suspension arm should sandwich those on the body of the hub carrier (see arrows). The side of arm marked 'L' should be facing upwards, closest to you.

8

With the side of the hub carrier marked 'L' facing you, insert the 3 x 42mm screw shaft through the holes lined up in Step 7, as shown.

9

Left lower suspension arm and hub carrier

Your assembly should look like this. Make a note of the orientation of the parts.

10

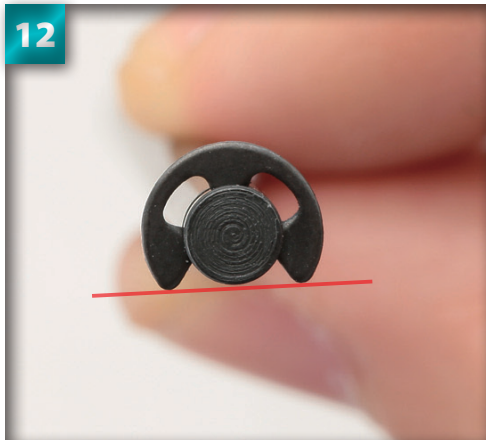
Right lower suspension arm and hub carrier

Tighten the screw shaft with a screwdriver until the head of the screw touches the suspension arm – do not overtighten. Repeat Steps 1 to 10 with the right lower suspension arm and right hub carrier. Again, be sure to check the orientation of the parts against the photo.

11

Lay the chassis and bulkhead assembly you built in Stage 26 on your work surface, with the back end of the front bulkhead facing you. Lay some tissue paper over the chassis plates.

12



Position the 4 x 74mm suspension shaft from Step 6 so that the open section of the E-ring is facing down, and the rounded top side of the E-ring facing outwards, as shown.

13

Insert the end of the suspension shaft into the hole on the bulkhead, following the red arrow. At this stage, just rest the tip of the shaft inside the hole – it should not protrude from the other side of the hole.

14

Place the left suspension holder assembly so that it fits between the two joints on the bulkhead, following the arrows.

15

Once placed, push the suspension shaft right through the holes in the arms of the suspension holder so that it protrudes on the far side of the assembly.

16

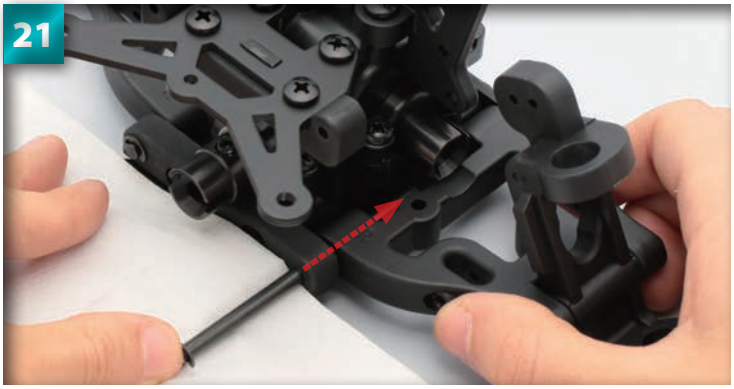
When placed correctly, the tip of the suspension shaft should be visible on the far side, as shown.

Line up another E-ring. It will fit onto the protruding tip of the shaft, with the open edge facing down and the rounded top side facing outwards.

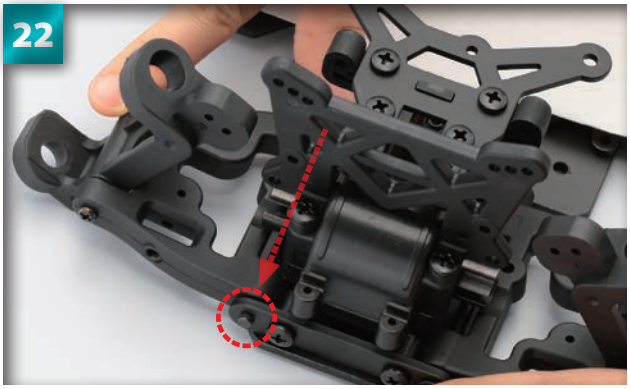
Carefully clip into place with pliers.

Repeat Step 13 for the right side of the bulkhead, again making sure not to push the suspension shaft too far at first.

Repeat Step 14 with the right suspension holder.



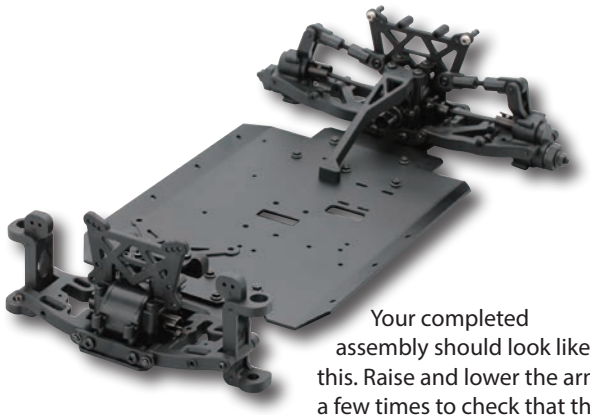
Push the suspension shaft through the holes on the bulkhead and suspension holder.



As with the left side, the tip of the suspension shaft should be visible.

Clip an E-ring over the tip of the shaft as you did in Step 18 to complete the assembly of the front lower suspension arms.

Assembled parts



Your completed assembly should look like this. Raise and lower the arms a few times to check that they can move freely.

Stage 28

Assembling the front upper suspension arms

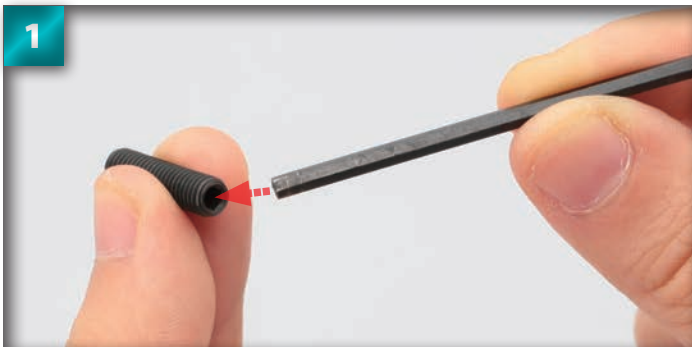
Your parts

6.8mm ball ends x 2
Front upper arms x 2
5 x 20mm full-thread shafts x 2
6.8mm flange balls x 2
3 x 15mm countersunk screws x 2
3 x 42mm screw shafts x 2

Tools and materials

Phillips screwdriver
Pliers
Callipers (or ruler)
2.5mm Allen key (Stage 7)
Tissue paper
Main chassis (Stage 27)

1



Place the hollow end of one of the 5 X 20mm full-thread shafts onto the tip of the 2.5mm Allen key.

2

Make sure the shaft is fitted onto the longer arm of the Allen key.

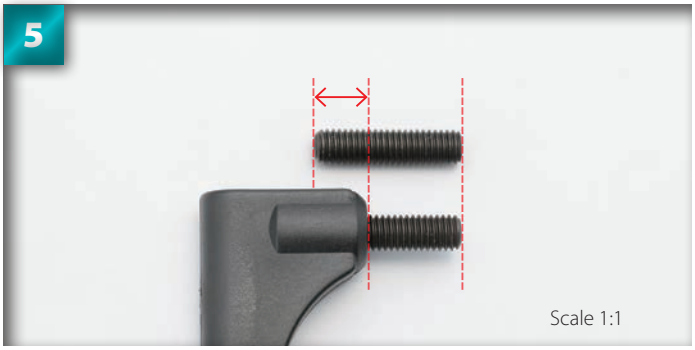
3

Place the tip of the shaft into the corresponding hole on one of the front upper arms, making sure to enter the hole perfectly straight to avoid damaging the threads.

4

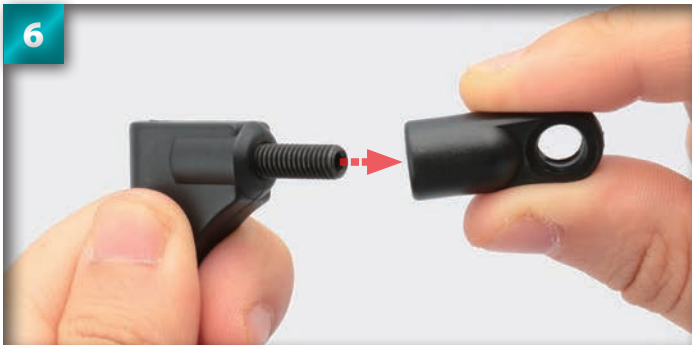
Hold the upper arm firmly, and turn the Allen key to tighten in the shaft.

5



Keep turning the Allen key until a little less than half of the shaft's length is inside the upper arm. This photo is full-scale, so you can measure your assembly against it to help get the correct length.

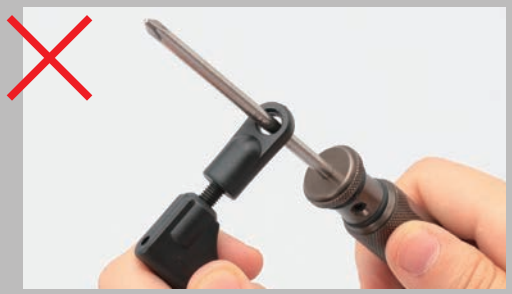
6

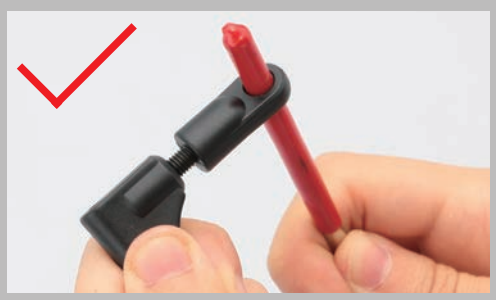


Next, line up the visible end of the shaft with the hole at the base of the first ball end, making sure to hold the parts level to each other.

Tips!

If the parts become difficult to turn, you may want to use a pen or pencil to give you some extra leverage. Insert through the hole in the ball end and turn slowly. Do not use an object with a smaller diameter than the hole, or one made of metal such as a screwdriver's shaft, as this could result in the interior of the hole becoming mis-shapen, which will affect the moving part when driven.





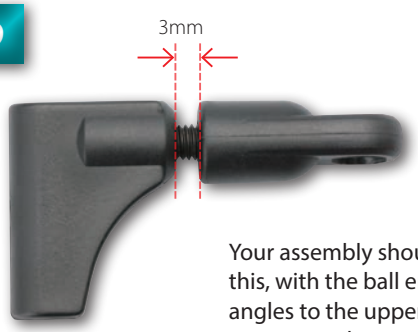
7

Turn the ball end so that it takes in the full-thread shaft. Keep going until about the same length of the thread that entered the upper arm (a little under half) is inside.

8

This should leave the portion of the shaft visible between the two parts measuring 3mm. Use a set of callipers (or a ruler) to check this.

9



Scale 1:1

Your assembly should look like this, with the ball end at right angles to the upper arm, and a 3mm gap between the two parts.

10

Place the first 6.8mm flange ball into the hole on the ball end of the upper arm. Make sure it enters from the direction shown in the photo.

11

Wrap the parts in tissue paper to protect them, then press into place with pliers.

12

Check that the flange ball can move freely within the ball arm. The first upper suspension arm is now complete.

13

Repeat Steps 1 to 12 to build the second upper suspension arm. The two assemblies should look like this – make sure the 3mm gap between the sections of the arms are matching.

14

With the chassis and bulkhead assembly laying flat your work surface, line up the left upper suspension arm with the left lower suspension arm you fitted to the front bulkhead in Stage 27 (see arrow).

15

Position the upper suspension arm as shown, so that the holes in the front and back of the part line up with those on the shock stay and bulkhead.

16

Hold the upper arm in place, and line up a 3 x 42mm screw shaft with the hole on the outside of the shock stay (arrowed).

Gently push the screw shaft through from the outside of the shock stay. If necessary, adjust the upper arm until the screw shaft moves freely through each hole.

17

Once the shaft has entered every hole, tighten with a screwdriver. Stop as soon as the head of the screw rests against the shock stay.

18

19

Line up the upper suspension arm's ball end and flange ball with the left front hub carrier you fitted in Stage 27. Make sure the hole in the flange ball is positioned against the circled hole on the hub carrier.

20

Holding the parts together, insert a 3 x 15mm countersunk screw into the hole in the ball-shaped side of the flange ball (arrowed).

Screw into place, but be careful not to overtighten, as this can affect the movement of the part.

21

Check that the suspension arm is able to move back and forth slightly.

22

Repeat Steps 14 and 15 with the right upper suspension arm. Make sure to follow the orientation shown in the photo.

Hold the upper arm in place, and line up a 3 x 42mm screw shaft with the hole on the outside of the shock stay (arrowed).

Gently push the screw shaft through from the outside of the shock stay. If necessary, adjust the upper arm until the screw shaft moves freely through each hole.

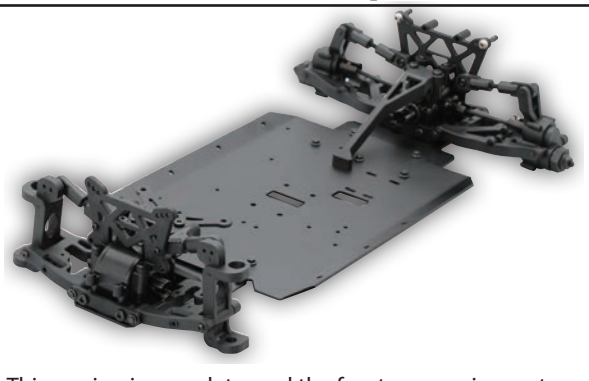
Tighten with a screwdriver, stopping as soon as the head of the screw rests against the shock stay.

Line up the upper suspension arm's ball end and flange ball with the right front hub carrier. Make sure the hole in the flange ball is positioned against the circled hole on the hub carrier.

Hold the parts together and insert a 3 x 15mm countersunk screw into the hole in the ball-shaped side of the flange ball (arrowed).

Screw into place, but again be careful not to overtighten.

Assembled parts



This session is complete, and the front suspension system is beginning to take shape. Store your assembly safely until next time.