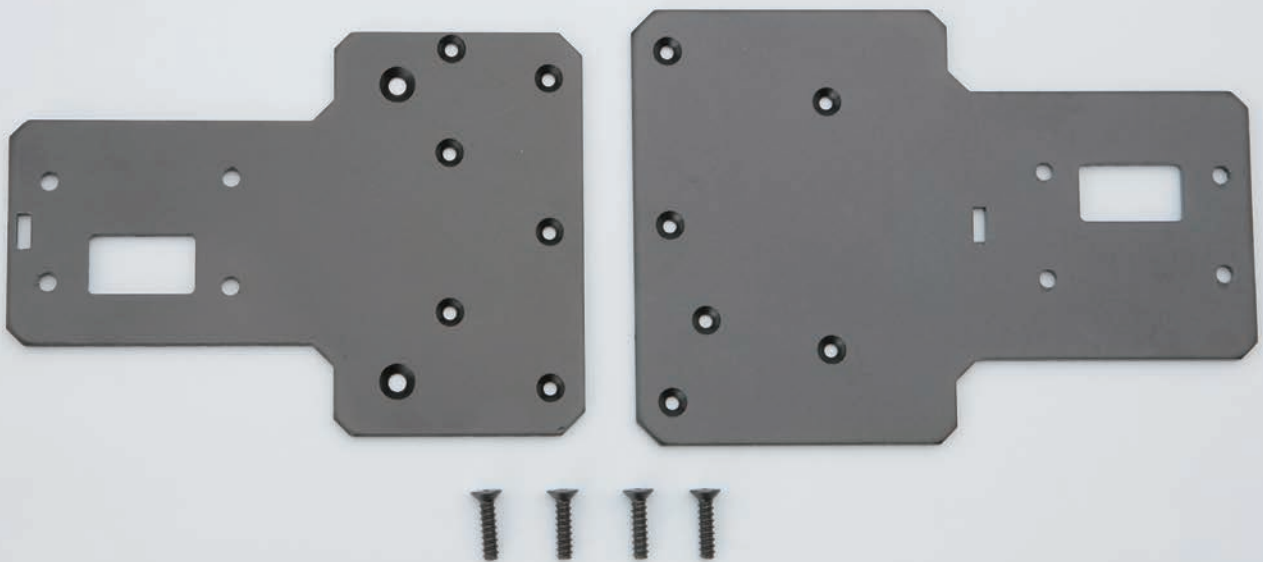


## Stage 21

# Beginning to assemble the chassis

Your parts



Front chassis plate

Rear chassis plate

4 × 16mm countersunk screws × 4

## Tools and materials

Phillips screwdriver

Rear bulkhead assembly (Stage 16)

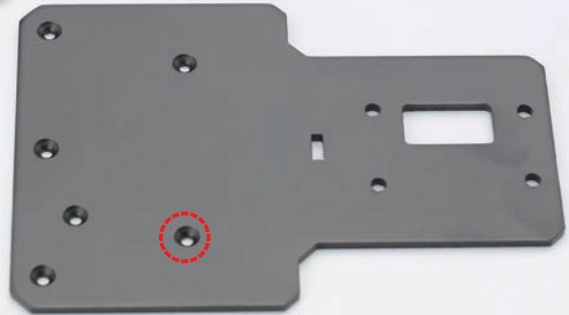
1



Make a note of which chassis plate is which, by laying them next to each other on your work surface. The front plate is the smaller of the two. As you will be assembling the rear chassis in this session, store the front plate away safely for now.

2

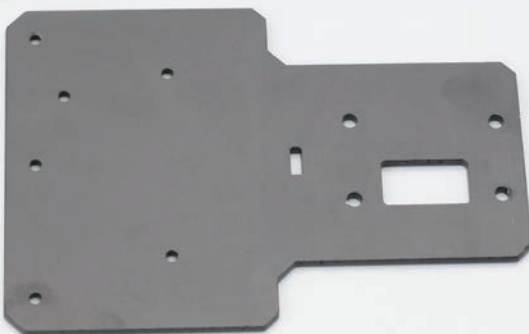
Rear chassis plate – back



Take a closer look at the rear chassis plate – you will see that its front and back surfaces are different. On the back, shown here, some of the holes are countersunk (see red circle). This is to allow the heads of the countersunk screws to sit flush with the surface of the plate once they are screwed in.

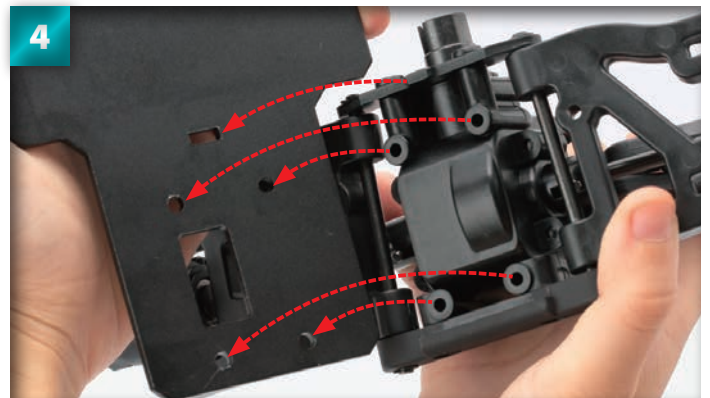
3

Rear chassis plate – front



This is the front of the rear chassis plate. Note that none of the holes on this side are countersunk.

4



Hold the rear chassis plate with the front facing upwards in one hand, and with the other line up the rear bulkhead you assembled in Stage 16. Line up the holes shown by the arrows.

5



Turn the parts over, holding them together carefully to prevent the assembly slipping. Check that the holes are properly aligned.

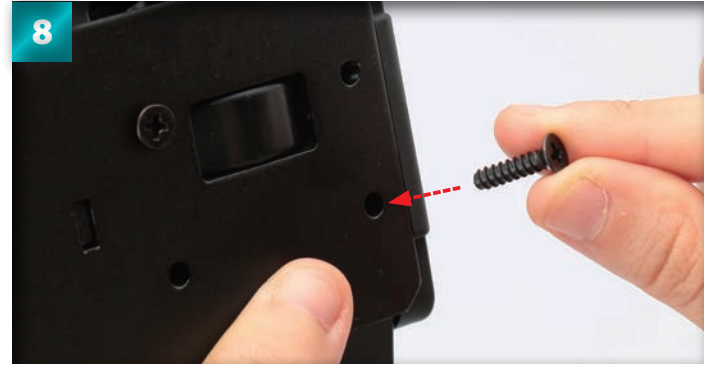
6



Insert one of the 4 x 16mm countersunk screws into one of the four holes you lined up in the previous two steps.



Tighten with a screwdriver, but do not screw in all the way.



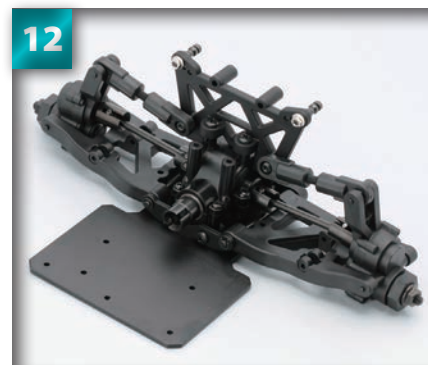
Insert another screw into the hole diagonally opposite.



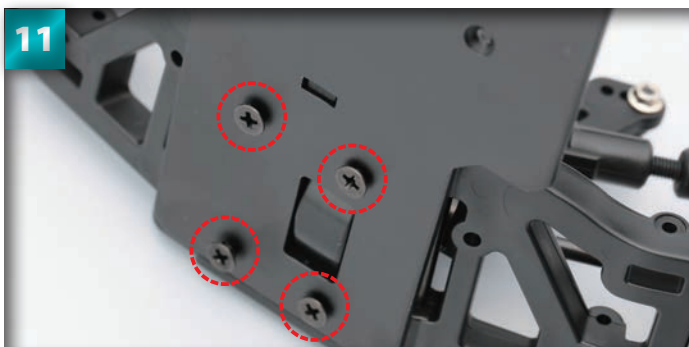
Repeat with the remaining two screws.



Tighten with a screwdriver, again without too much force.



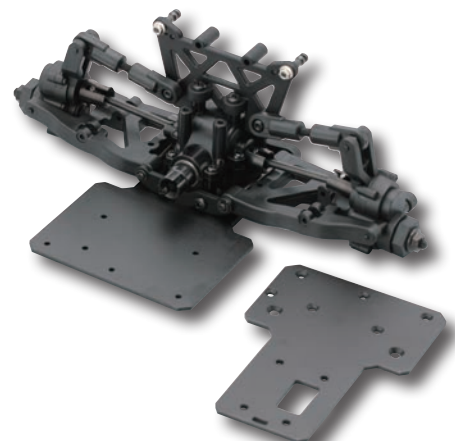
From the front, your assembly should look like this. Note the positioning of the holes on the plate.



Check that the chassis plate is secure and does not rattle or move, but that the screws are not too firmly tightened.

This stage is complete. Store the parts away safely, resting both chassis plates flat during storage to lower the risk of their becoming bent out of shape.

## Assembled parts



## Stage 22

# Assembling the main chassis

### Your parts



Middle chassis plate

3 x 10mm countersunk screws x 11 (1 is a spare)

3mm flange nuts x 11 (1 is a spare)

## Tools and materials

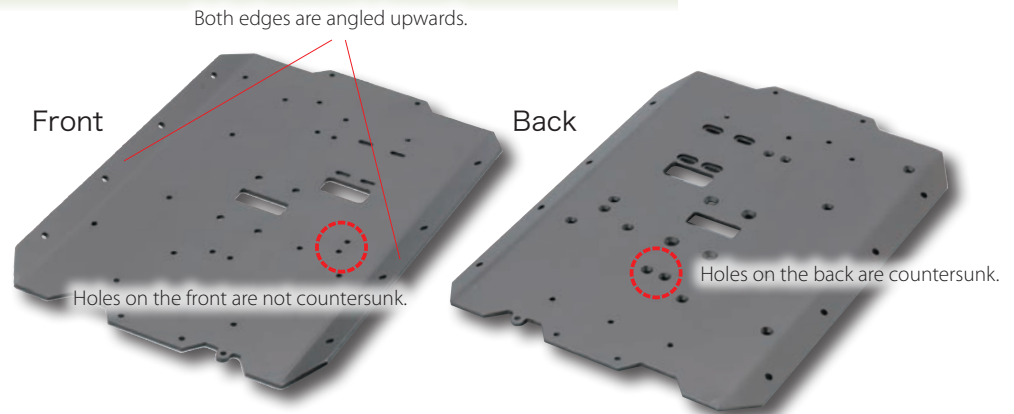
Phillips screwdriver  
Crosswrench (Stage 8)  
Thread-locking adhesive (or  
rubber-based adhesive)  
Masking tape

Front chassis (Stage 21)  
Rear bulkhead (Stage 21)  
Rear torque rod (Stage 8)  
4 x 10mm binding head screws x 2 (Stage 8)  
3 x 10mm countersunk screws x 2 (Stage 8)

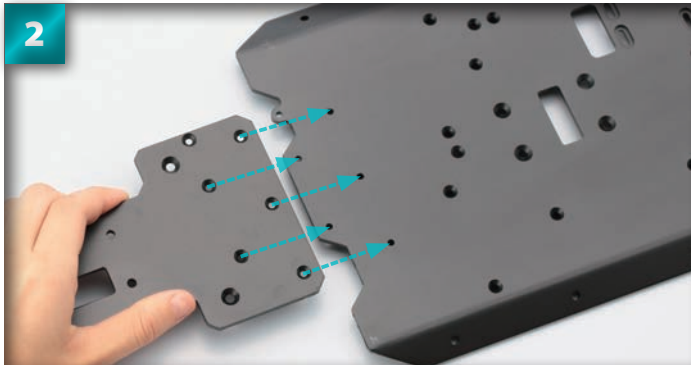
# HUMMER H1: STEP BY STEP

1

Make a note of which side of the middle chassis is which, as they are different to one another. Some of the holes on the back of the plate are countersunk, and the edges of the front are angled upwards.



2



Line up the front chassis supplied with Stage 21 to the main chassis. On both chassis plates, the side with the countersunk holes should face upwards. Line up the holes as arrowed.

3



Insert a 3 x 10mm countersunk screw through the central hole on the front chassis and into the hole on the middle chassis.

4



The screw will go right through both holes so that its countersunk head sits flush with the plate's surface. At this stage, the screw is still moving freely within the hole.

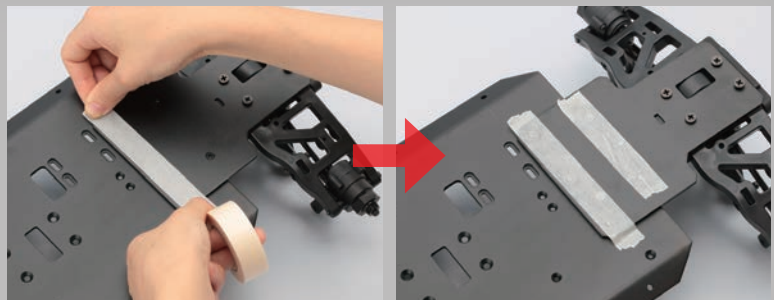
5



Make a note of the shape of the 3mm flange nuts you will use to secure the chassis plate. The back side is set with ridges that bite into the surface of the plate for a stronger hold.

## Using masking tape

As at this stage the screws are not secured, it is useful to hold them in place with masking tape until the flange nuts are added in the next few stages. This way, all five screws can be positioned at the same time without the risk of any falling out.



Place masking tape across the screws once they are inserted.

With the tape holding the screws in place, it is safe to move the assembly.

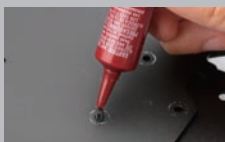
# HUMMER H1: STEP BY STEP



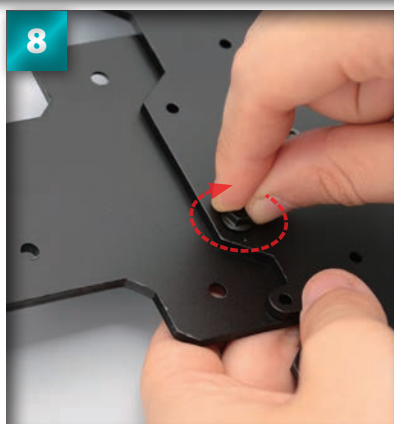
Turn the assembly so that the front of the middle chassis is facing upwards. Holding the screw head from behind to keep it in place (using masking tape will help this, see box on page 97), fit a 3mm flange nut onto the end of the screw and tighten by hand.

## Tip!

Wet the protruding tip of the screw with a little thread-locking adhesive to further secure the hold.



As you did in Stage 6, tighten the flange nut onto the protruding tip of the screw by hand.



Once the first flange nut is tightened by hand, line up the next screw from the back side of the chassis.

Repeat until all five sets of screws and flange nuts are fitted.

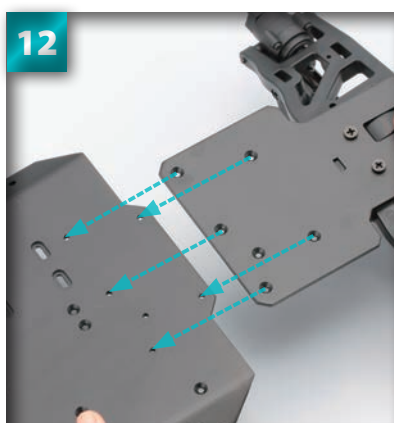


Line up the side of the crosswrench supplied with Stage 8 marked '5.5' with one of the flange nuts, as arrowed.

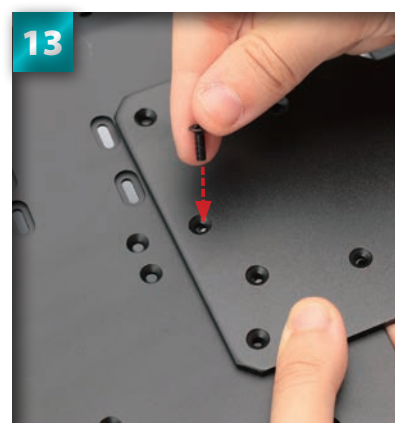


Hold the crosswrench over the flange nut to stop it from moving, and begin to tighten the screws from the other side, this time using a screwdriver. Turn until the hold is firm, and repeat for all five sets of screws and flange nuts.

Next, position the middle chassis so its back is facing upwards, and line up the holes arrowed with those on the rear chassis you attached to the bulkhead in Stage 21.

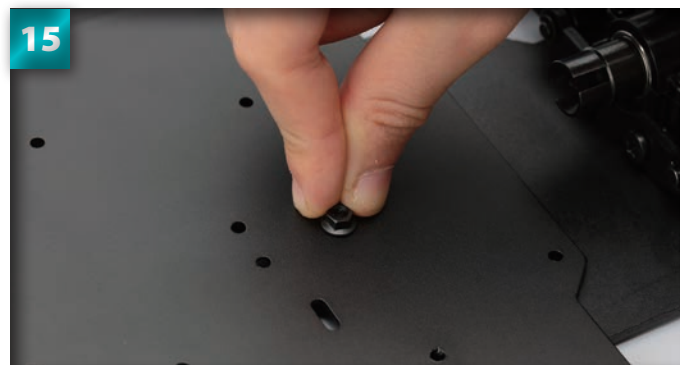


Place another 3 x 10mm countersunk screw into the central hole of the rear chassis. Make sure the side with the countersunk holes is facing you.





The screw will go right through both holes so that its countersunk head sits flush with the surface. At this stage, the screw is not tightened, so hold it in place carefully.

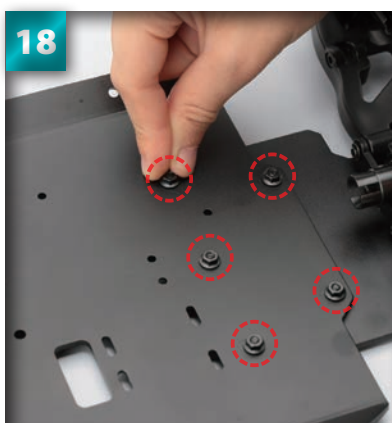


Rotate the chassis and tighten a flange nut by hand onto the tip of the screw, as you did in Stage 6.

Once the first flange nut is tightened by hand, continue to line up the next screw from the back side of the chassis plate.



Fit the next flange nut, again only tightening it by hand.



Repeat until all five sets of screws and flange nuts are in place.

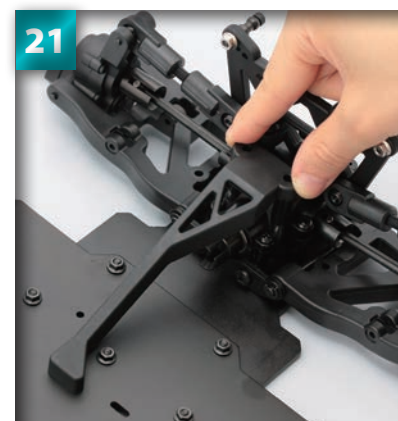


As you did in Stage 11, firmly tighten each set of screws and flange nuts by using the crosswrench and Phillips screwdriver.

Next, prepare the rear torque rod that was supplied with Stage 8, two 4 x 10mm binding-head screws and two 3 x 10mm countersunk screws.



Position the rear torque rod as pictured, so as to connect the rear bulkhead to the chassis.





Insert one of the 4 x 10mm binding-head screws into the hole on the torque rod (see arrow).



Tighten with a screwdriver.



Repeat Steps 22 and 23 with the other binding-head screw.



Turn the assembly upside down, and locate the two holes just ahead of the joint between the rear and middle chassis plates, circled. The countersunk holes should be facing you.

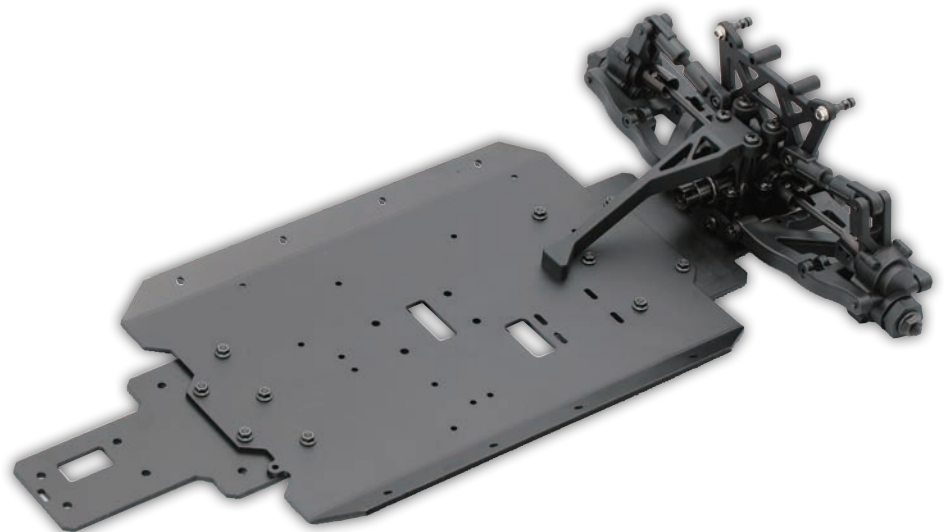


Insert a 3 x 10mm countersunk screw into one of the holes, making sure it is lined up with one of the holes on the end of the torque rod behind.



Tighten with a screwdriver. Repeat with the second screw.

## Assembled parts

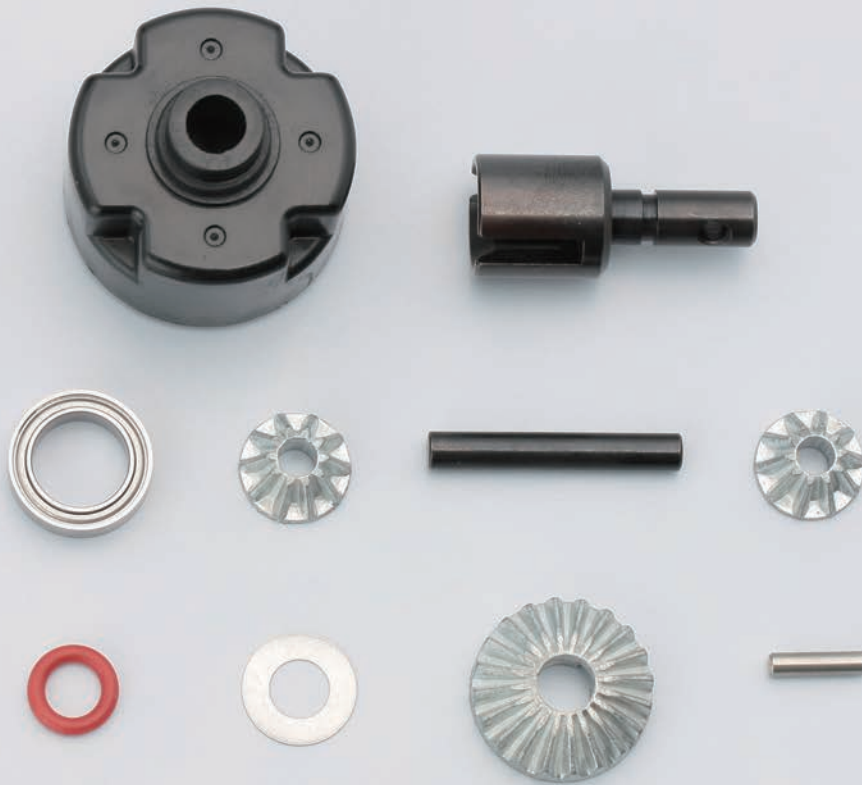


This stage is now complete, and the chassis of your Hummer H1 is beginning to take shape. Store away safely until next time.

Stage 23

## Beginning the front differential

### Your parts



Differential case  
Differential cup joint  
1510 ball bearing  
Bevel gears (10T) x2  
Bevel shaft

6mm O-ring  
6 x 12mm shim  
Differential bevel (20T)  
2.5 x 10.3mm metal pin

### Tools and materials

Tweezers  
Toothpick  
Tissue paper

Grease (Stage 11)

## Fitting the ball bearing to the differential case



Place the 1510 ball bearing onto the cylindrical segment of the differential case, making sure it is on straight.



Using both thumbs, push down on the ball bearing evenly, being careful not to apply too much pressure, as this could damage the ball bearing.

## Assembling the inside of the differential



Apply a little of the grease you kept from Stage 11 to the tip of a toothpick.



Using the toothpick, spread the grease around the groove on the inside of the differential case, as shown. Use just enough so that the groove shines slightly.



Now apply some grease to the thin end of the differential cup joint. Use the photo to gauge a suitable amount.



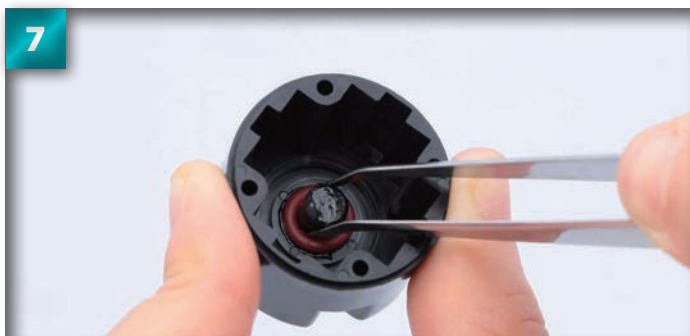
Turn the joint from right to left to spread the grease. If grease builds up between the ball bearing and the case, wipe it with tissue paper.



Insert the greased end of the joint into the case, as shown.



Turn the differential case around, and using tweezers, place the 6mm O-ring over the tip of the joint inside.



Part the tweezers slightly, and gently push the O-ring down into the groove at the base of the joint.



Next, place the 6 x 12mm shim over the shaft so that it rests at the base, covering the O-ring. It does not matter which way round the shim goes.



Using tweezers, carefully line up the 2.5 x 10.3mm metal pin with the hole drilled through the differential joint.



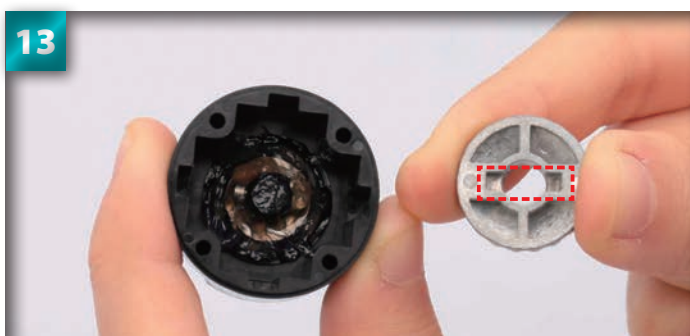
Carefully insert the metal pin through the hole with the tweezers, as shown. Using the recesses cut into the inside of the differential case will allow you more space to position the pin.



Your assembly should look like this, with equal parts of the metal pin visible on each side of the joint.



Liberal apply grease to the inside of the differential case, covering the shim and joint.



Make a note of the rectangular groove in the back of the 20T differential bevel. The metal pin you fitted in Stage 10 will sit inside this once fitted.



Slide the bevel over the tip of the joint so that the groove on the back lines up with the metal pin.

15



Press the bevel into place with your finger.

16



Slide each of the 10T bevels onto the bevel shaft, so that they are facing each other.

17



With the 10T bevels together as shown in the photo, place the bevel shaft into the differential case. The ends of the bevel shaft should fit into the recesses in the side of the case.

18



Once in place, slide the two 10T bevels apart as far as they will go. At this point, they should slot neatly into place with the teeth of the 20T bevel beneath.

19



Liberal apply grease to the inside of the differential case, but do not finish the bag of grease, as you will need it in future stages.

20



Holding the differential case steady, slowly turn the joint from the back to distribute the grease evenly among the moving parts.

## Assembled parts

The first half of your Hummer H1's front differential is complete. Your assembly should look like this.



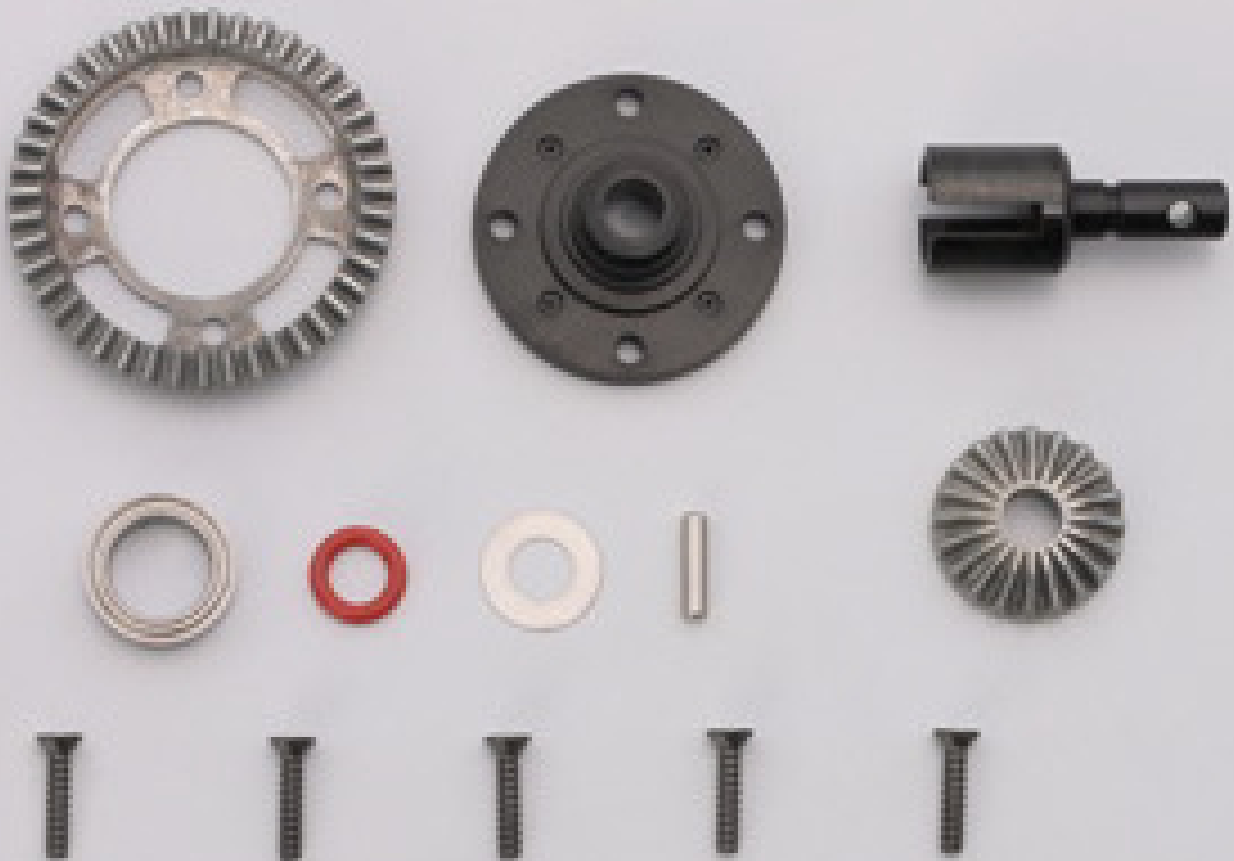
It is very important that you store the parts assembled in this session away from any dirt or dust, as this will stick to the grease and get inside the differential, causing problems for the moving parts within. If possible, keep your assembly and grease in a sealed plastic bag.



Stage 24

## Completing the front differential

### Your parts



Differential ring gear (43T)

Differential cap

Differential cup joint

1510 ball bearing

6mm O-ring

6 × 12mm shim

2.5 × 10.3mm metal pin

Bevel gear (20T)

2.6 × 12mm countersunk screws x 5

### Tool and materials

Tweezers  
Toothpick  
Phillips screwdriver

Differential case (Stage 23)  
Grease (Stage 11)

## Fitting the bearing onto the differential case



Place the 1510 ball bearing over the projection on the differential case.



Press the bearing firmly into position on the projection. Make sure the bearing is aligned with the case.

## Assembling the differential gear



Place a small amount of grease onto the end of a toothpick, and apply some grease to the recess in the centre of the inside of the differential case.



Apply some grease to the differential cup joint.



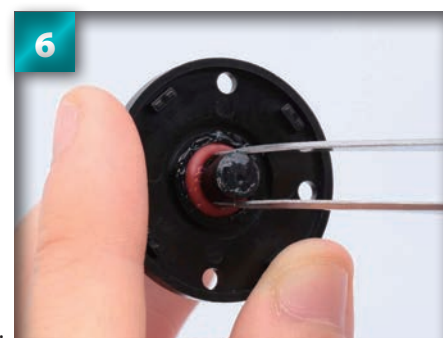
Place the end of the joint into the hole on the inside of the projection that the bearing was placed over.



Place the 6mm O-ring over the end of the joint.



Insert the joint into the hole, slowly rotating it back and forth to spread the grease.



Push the O-ring down onto the joint until it sits in the recess from Step 1.

# HUMMER H1: STEP BY STEP



Place the 6 × 12mm shim over the joint and push it down to rest on the O-ring.



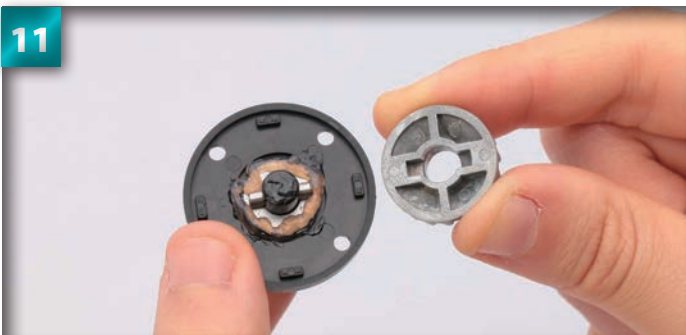
Insert the 2.5 × 10.3mm pin into the hole in the joint, just above the shim.



Adjust the pin so it is positioned evenly in the joint, as shown.



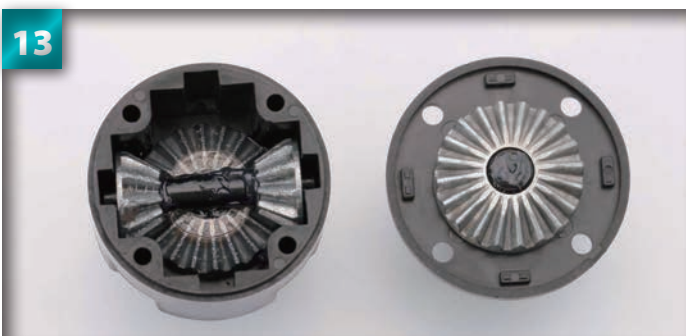
Smear some extra grease around the shim and the joint.



Hold the 20T bevel gear, as shown. Locate the groove on the back of the gear.



Align the groove on the back of the bevel gear with the position of the pin and place the gear into the back of the case, sliding it over the joint.



Push the bevel gear down onto the joint until the pin slots into the groove. Retrieve the differential gear assembly from the previous stage.



Apply a large amount of grease into the back of the differential case.



15 Locate the four screw holes on both the differential case and cap assemblies.



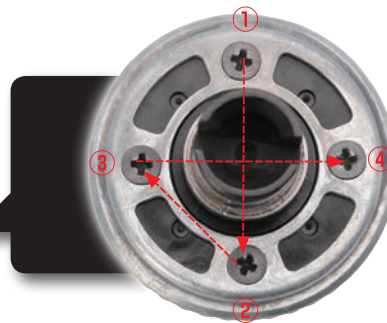
16 Place the two assemblies together, aligning the screw holes of both.



17 Place the 43T gear over the end of the joint.



18 Align the four screw holes of the gear with those of the case.



19 Insert one of the 2.6 × 12mm self-tapping countersunk screws into one of the holes and tighten until halfway in. Then, following the order shown in the diagram on the right, tighten the next three screws halfway into their holes, and when all four are in place, fully tighten them in the same order.



20 Turn the cup joints in opposite directions to spread the grease around the internal gears.

## Assembled parts

