



## HPI Tutorial – How to Rebuild the Differential on a Rush Evo

A differential is a mechanical device fitted to a car that allows the inside wheel to turn at a lower speed to the outside wheel during cornering. This results in better handling of the car or truck.

The Rush Evo is fitted with gear differentials; these are the preferred choice for Nitro Powered cars and trucks.

It may be necessary to perform some maintenance of the differential if it no longer feels smooth or does not spin freely.

This tutorial takes you through the steps needed to rebuild the differential fitted to the Rush Evo, and includes instructions on changing the differential internal gears. When rebuilding the diff you will need to replace the diff grease with [Z164 Heavy Duty Grease](#) and the gears with [86014 Gear Diff Bevel Gears](#).

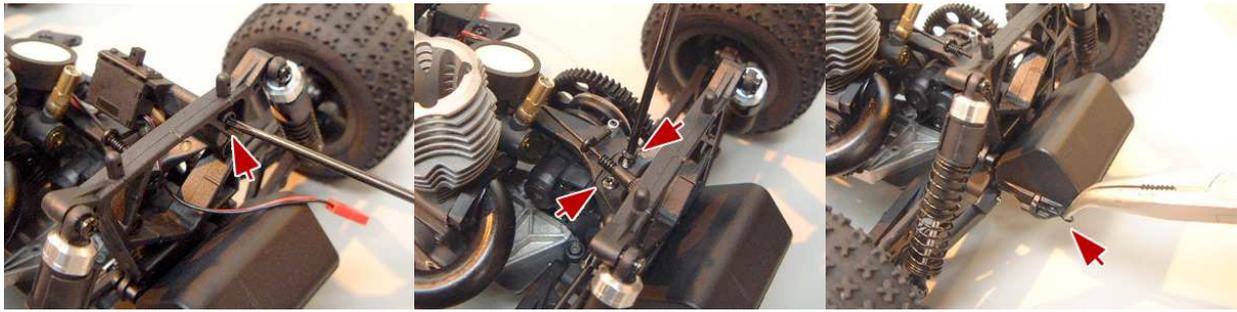
### Before you start

Get a piece of A4 paper and divide it into several rows using a marker pen. This can be used to keep track of which screws have been removed at each step, making it easier to reassemble.



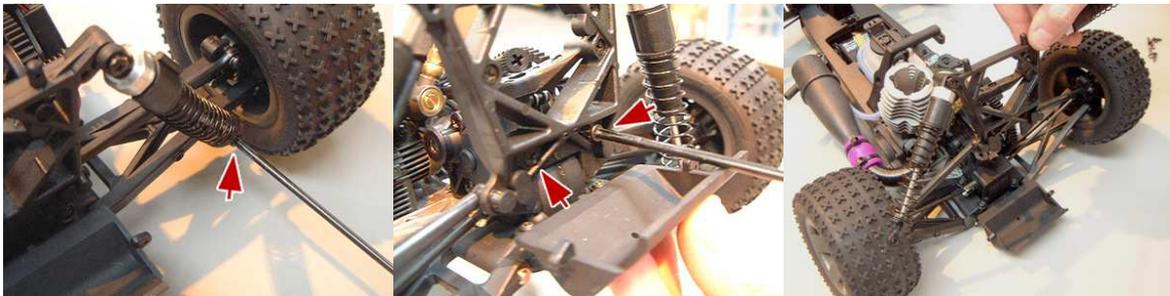
### Step 1

Remove the screw from the switch holder at the back of the rear suspension mount and the two screws from the top of the rear suspension mount. Then remove the battery box secured by two body pins.



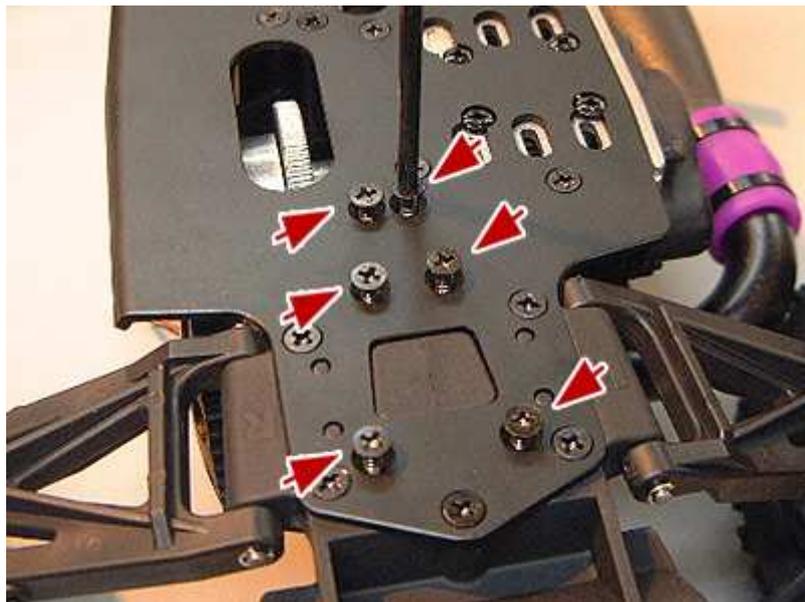
## Step 2

Remove both rear shocks from the suspension arms; remove the remaining two screws that secure the rear suspension mount and then the rear suspension mount can now be detached from the chassis.



## Step 3

Unscrew the six screws shown from the underside of the chassis





## Step 4

Remove the grub screw that is securing the brake arm then move the brake arm away from the gearbox brace. Remove the two screws from the front of the gearbox brace.



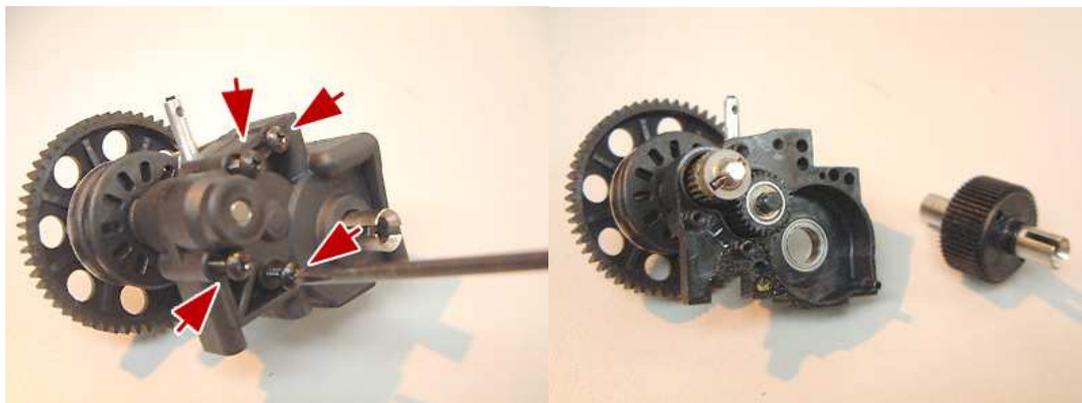
## Step 5

Raise the gearbox brace to free the gearbox and remove the gearbox.



## Step 6

Remove the four screws to expose the internals of the gearbox. Now you can separate the gearbox housings and remove the differential from the gearbox.



## Step 7

There are four screws located on one side of the differential. Remove these four screws, holding the two parts of the differential shell together. You should now be able



to split the two halves of the differential. In the picture below the grease has already been removed from the differential parts for picture clarity.



## Step 8

Use a pair of pliers to remove the shaft containing the planet gears from the differential case. Then carefully use the edge of a screwdriver blade to remove the E clip from inside the differential, as shown in the picture below.



## Step 9

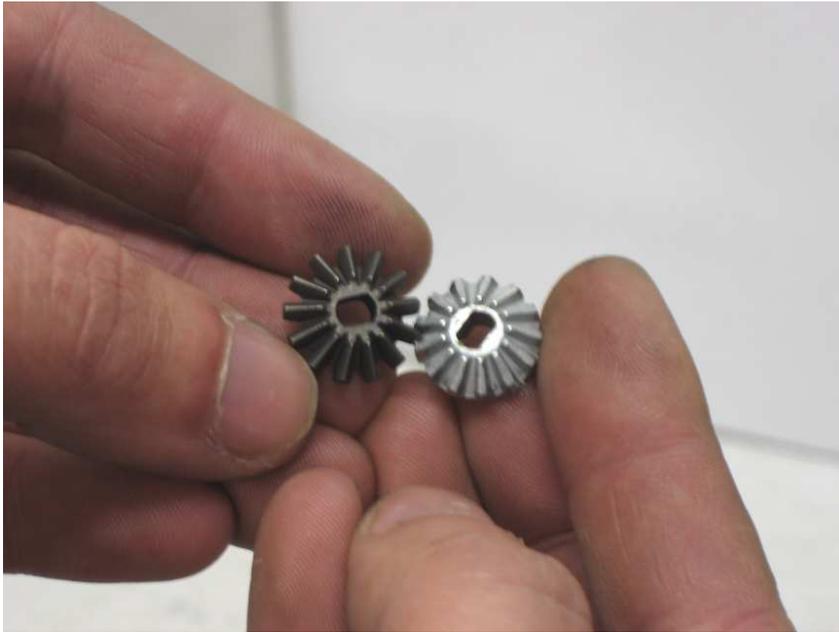
With the E clip removed the differential outdrive should be able to be removed from the differential case. Then use a pair of pliers to remove the Sun gear from the differential case. Repeat this for the other side of the differential case to separate the outdrive from the differential half.





Take a close look at your differential gears. HPI have changed the specification of the gears to improve the durability of the differential. It is likely that your kit already includes the up-rated steel gears, if not we recommend that you replace your differential gears with the steel ones when required for improved durability.

This picture illustrates the difference between the original alloy gear and the replacement steel gears to be fitted. The new steel gear is on the left and the old alloy one is on the right.



Now you are ready to rebuild your differential.

## Step 10

If you are replacing a alloy gear with a steel gear you will need to install one extra shim from the 86014 kit into the case (making a total of two shims). Then use a pair of pliers to fit the new Sun gear into the case. With the new gear installed the E clip can be refitted with a pair of pliers. Ensure that the Sun gear has a liberal coating of grease, as shown.





## Step 11

Apply a small amount of grease to the planet shaft and then install the planet gears. The assembly should look like the one in the picture below. Install planet shaft assembly into slots in differential case and ensure that the planet gears have a good coating of grease.



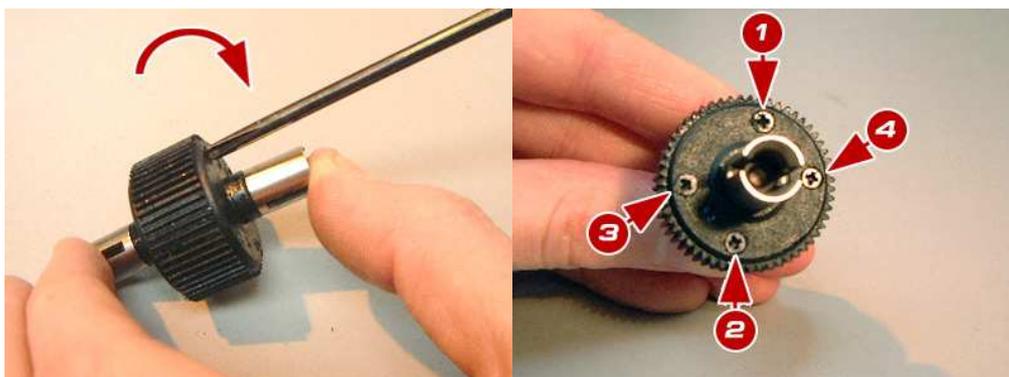
## Step 12

Repeat Step 10 for the other differential half and then bring the two completed differential halves together, making sure that the holes for the securing screws line up.



## Step 13

Refit the four screws that secure the two differential halves together. Do the screws up in the order show so that the differential halves pull down flat.





## Step 14

To reassemble your truck, follow steps 1-6 in reverse order, putting all screws back in the correct places and ensuring they are fully tightened.

