



## # 385001 ALU ADJ. BALL DIFFERENTIAL INSTRUCTION MANUAL

Differentials allow the wheels at opposite ends of the same axle to rotate at different speeds. Why is this important? When a car turns around a corner or in a circle, the outer wheel has a larger diameter circle to follow than the inner wheel. The outer wheel must travel further than the inner one in the course of the circle, so it needs to rotate faster to keep up. If the differential is too tight, the result is that the wheels "fight" each other for the proper rotation speed, resulting in loss of traction.

- For optimal performance, the rear differential should be as free as possible, with minimal slippage.
- When the front differential is looser than the rear differential, steering response increases.
- When the front differential is tighter than the rear differential, steering response decreases, but there is more stability in the turns.
- A tighter rear diff will make the car understeer slightly into a corner, but makes the car more difficult to control out of a corner (powerslides).
- Make sure that neither diff slips under power, as this will cause power loss and excessive wear.
- On very high traction surfaces, the diffs can be adjusted tighter for better response.

### Building the differentials:

When you build a differential, DO NOT tighten it fully; build the diff and tighten very gently. If you overtighten the diff initially, the diff balls will mar the surface of the diff plates and the diff balls and plates will become damaged.

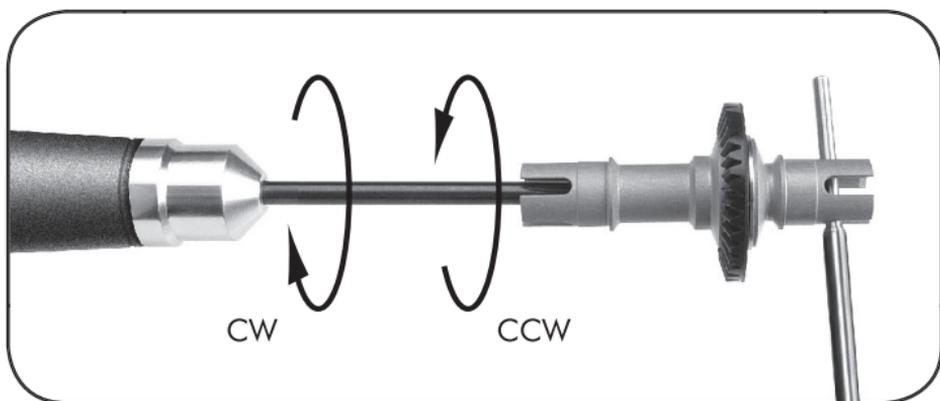
Tighten the diff until you feel some resistance. To check the diff, put wrenches in the left and right outdrive slots, then try to rotate the pulley. It should take some force to get the pulley to slip between the two outdrives. Then remove both wrenches and rotate one of the diff halves while holding the pulley stationary. The action should feel smooth. If it doesn't, loosen the diff screw 1/16 to 1/8 of a turn. Final adjustment will be made with the diff in the car and on the track.

### Breaking in the differentials:

Differentials must be properly broken in to operate properly. When breaking in the diff, the balls create a groove in the diff rings; this is normal and essential for proper operation. If you tighten the diff fully the first time you build it, the balls will not create a proper groove, and will become damaged. After the car is completely assembled, run the car for few minutes, then tighten each diff a little bit. Repeat this several times to break in the diff and set the correct tightness.

### Adjusting the differential:

Insert a pin in the end of the shorter outdrive and use a Phillips screwdriver to tighten/loosen the diff screw inside the longer outdrive.



- To tighten the diff, turn the screwdriver CW (clockwise).
- To loosen the diff, turn the screwdriver CCW (counter-clockwise).

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