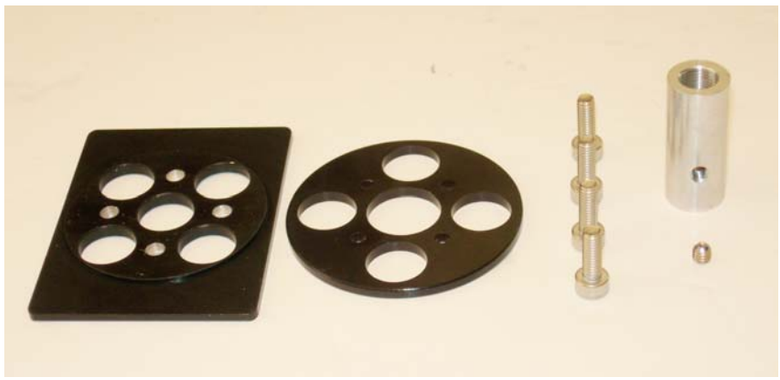
Raptor 30/50 Electric Conversion Kit
Installation Instructions

Parts List

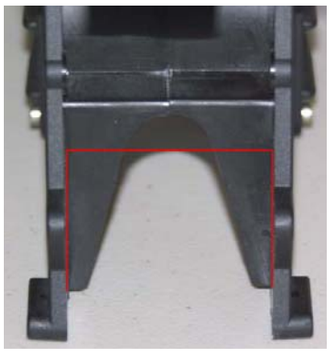
- 1 – Mounting Plate
- 1 – Motor Adapter Ring
- 4 – M3x12 mm Socket Head Motor Mounting Screws
- 1 – 5 mm Pinion Adapter w/ Setscrew



Frame Preparation

Although the conversion can be done with a completely assembled Raptor, it is recommended that if you are starting with a used model, you should disassemble the frames, clean out the residual fuel/"gunk" from all parts, and replace the main bearings and the lower starter shaft bearing. The upper starter shaft bearing can be removed.

In order for some battery packs to fit between the frames, it is necessary to trim off the lower portion of the fan shroud area, as shown in the illustration. This can be cut with a small saw, or with a cutting tool on a Dremel.



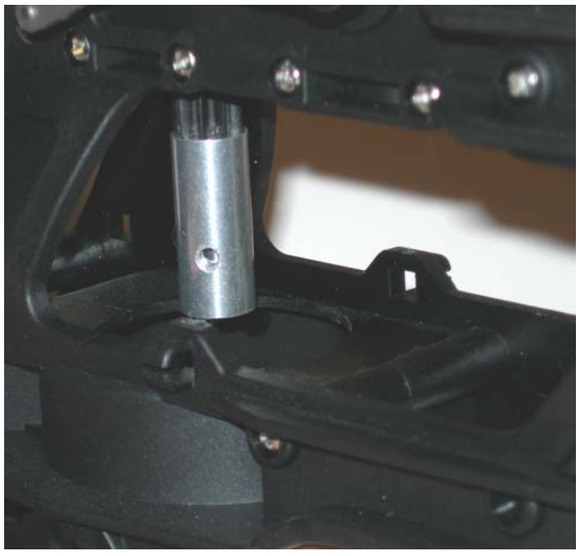
One other consideration, to make it easier to properly set the center-of-gravity (CG), is to move the tail servo to the rear, using one of the many after-market boom mounts for the Raptor. Since the conversion doesn't require a throttle servo, there are then only two servos left that have to be on the servo tray, the elevator servo and the collective pitch servo. A full two ounces of weight can be saved if the bottom portion of the servo tray is cut off, as shown.

Kit Installation

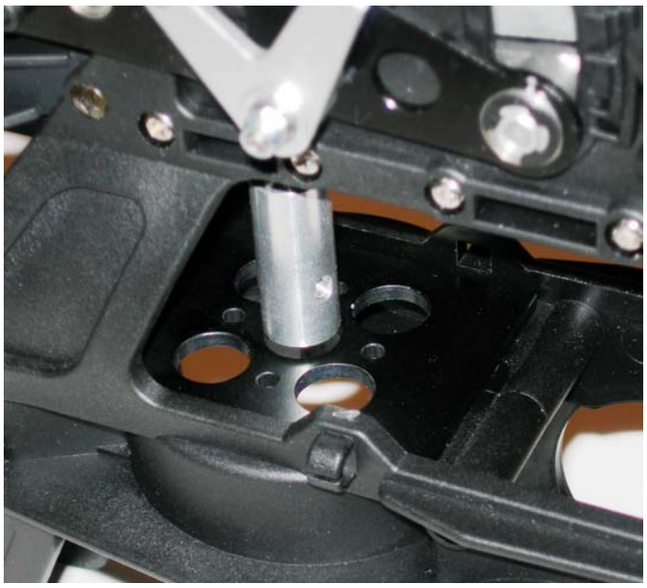
In most cases, such as with the Actro 24-4, the R30's 9T pinion is used in place of the standard R50 10T version. It is screwed into the provided pinion adapter, using a small amount of blue or green Loctite, as shown. Do not install the pinion adapter set screw yet. Again, in most cases, the "matching" R30 86T main gear is used, and this would be a good time to change it.

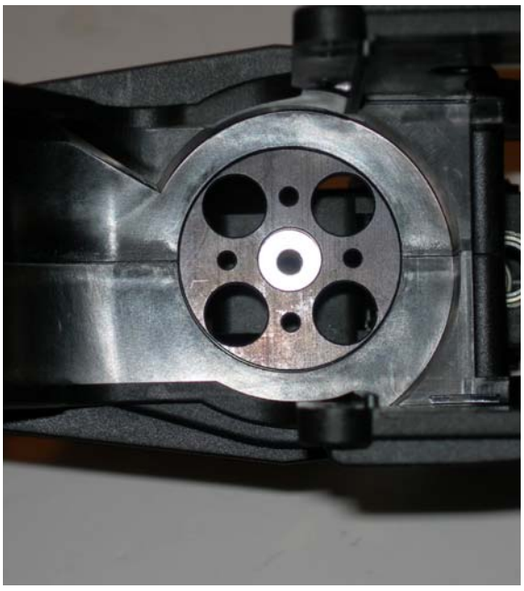
The pinion fits up into the same lower starter shaft bearing as with a glow setup. Instead' of a clutch bell, this pinion adapter is provided to adapt the stock pinion to the motor's 6mm shaft.

Push the completed assembly up into the lower starter shaft bearing, in the upper part of the frames. Make sure the upper part of the pinion goes all the way up into the bearing.



The Motor Mounting Plate is installed next, with the raised circular portion facing down. The circular portion fits into the fan shroud opening in the frames. You might have to loosen frame screws slightly to get the plate to slide into place, as it is a purposely designed “snug fit”. If necessary, re-tighten the frame screws.





Next, for grind a flat on the motor shaft (not necessary with the Actros…), centered about 15 mm down from the top of the shaft. This is very important, as the amount of torque generated by the motor will cause the shaft to slip in the pinion adapter, if the setscrew is not locked to the shaft.

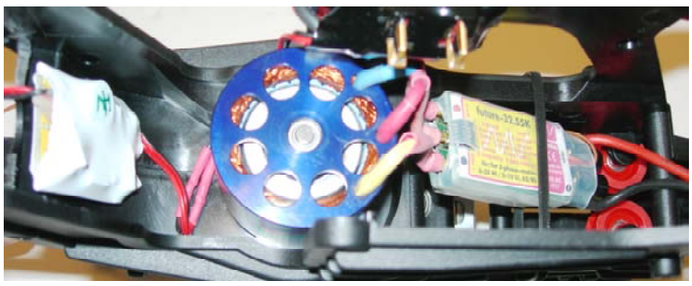
To install the Motor Adapter Ring, it is easier to have the modell upside down and hold two of the motor screws in place so that the ring can be slipped over them, and held before the motor is inserted into place. The motor can now be installed up into the pinion adapter. Line up the setscrew hole with the flat on the motor shaft. Use a small amount of Loctite on the setscrew and install it into the pinion adapter but you don’t have to tighten down all the way yet. Just enough to hold the motor in place,.

Once all four motor screws are part-way installed, again using a sparing amount of blue/green Loctite, loosen the pinion adapter setscrew and then tighten all four motor screws. Finally, the setscrew can be tightened.

This completes the basic installation for the motor/mechanics. Use a cloth to wipe up any excess Loctite.

Electronics Installation

The final step is to install the electronic speed controller, , like the Castle Creations Phoenix HV 85; and the battery packs. The most common way to connect the three motor wires to the speed controller is with 3.5mm gold-plated bullet connectors. The motor can be hard-wired to the controller, but if the motor spins backward, you need to switch any two leads, so having the removable connectors makes this easy to do. The controller can be mounted wherever is convenient, but it should be held in place with a tie-wrap.:

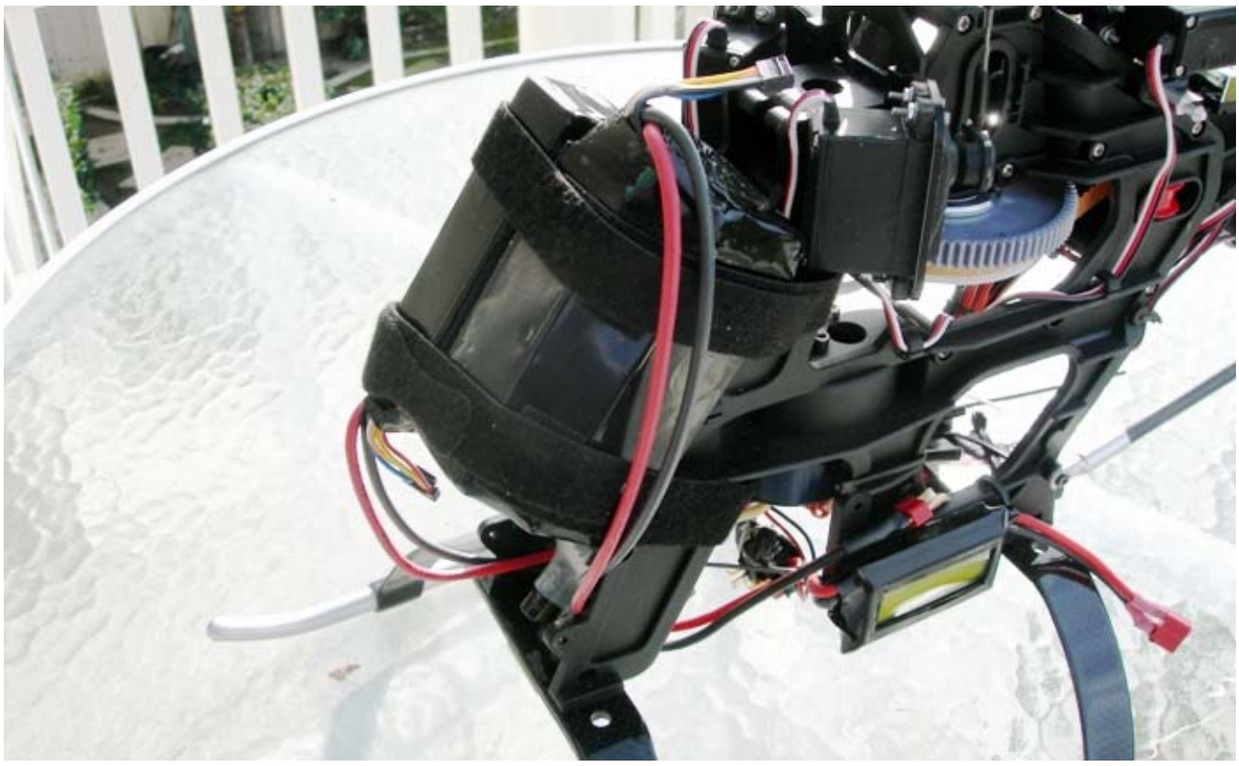


Although not required, a 3-4A external BEC can be used in place of a receiver pack, which is another weight-saving measure. It is normally wired in parallel to the controller power input. Shown mounted on the upper inside part of the fan shroud area, in front of the motor, is a Universal BEC, or UBEC, from KoolFlight Systems...

For best performance, a 10s LiPo configuration, in the 3700-4200 mAh range should be used. There are several options on how to configure the pack(s). Generally, two 5s LiPo packs are used; one up front, under the reduced servo tray, and the other in the rear, in the “tank” area.

The two packs are connected in series, into a 10s configuration, using a series “Y”-connector. Another option is to use a single 10s pack, such as a 10s-3700 FlightPower Evo 20 “NF” pack, but this requires that the frames be raised up from the skids a bit, using spacers, to keep the pack from touching the rotating can of the motor.

If the eCCPM conversion kit is utilized, the CG moves aft, which requires a shifting forward of the packs, to get the CG balanced. In this case, another option would be to use two 5s2p-4200 packs which can actually be strapped to the front of the frames, in place of the servo tray.



Finally, there's an emerging power option which is based on using an 11s setup of eMoli/V28 cells from Milwaukee V28, 7-cell, power tool packs. In order to match the performance of a 10s 3700-4200 LiPo setup, an increase in cell count to 11s is required. This reduces the current requirements and increases the durations so that they come closer to the higher capacity LiPo configuration. Because these cells are heavier than "normal" LiPos, it makes it a challenge to find ways to make these fit properly and to get the CG right. This task is made a lot easier if the eCCPM mod has been performed. In that case, the cells can be split so that some are in the "tank" area, and some are strapped to the front. The two packs can then be wired together in series, as described above.

Final Setup

The Phoenix HV 85 controller, if used should be set in the "Governor Mode-High RPM Range", "Standard Advance Timing" and the default "13 kHz PWM Switching Rate". The 100% head speed for both the 10s LiPo and the 11s eMoli setups will be about 2200 rpm. This is optimum, for 3D performance, but if a lower h/s is desired, the governor mode can be "dialed down" to get the desired hover head speed. It is not recommended that the h/s be set below 1850 rpm, as it will cause the motor and the controller to run hotter.

That's it! Fly safe.