

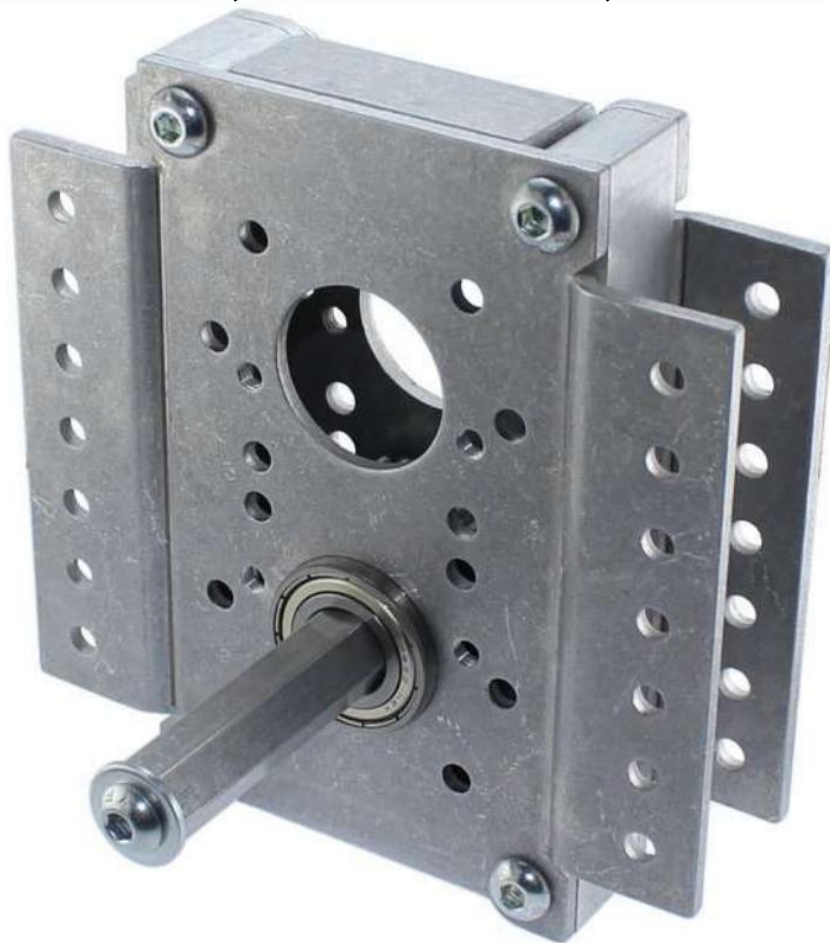


Flyer Gearbox



Assembly Guide

June 2020 Revision

am-4194, am-4226, am-4227



am-4227 Recommended Hand Tool List (not included)





Component	Part #	QTY	Part Photo
3/8-7/16 Open-End Wrench	am-2745	1	
Allen Wrench Set: Fold Up 12 Set Hex	am-3864	1	

Common Bill of Materials

Component	Part #	QTY	Part Photo
Flyer Gearbox Plate	am-4216	2	
Flyer Gearbox Aluminum Spacer	am-2508-750	2	
1/2 in. Hex ID Shielded Flanged Bearing (FR8ZZ-HexHD)	am-2986	1	
1/4-20 x 1.25 in. Button Head Cap Screw	am-1183	4	
1/4-20 Nylock Jam Nut	am-1102	4	
1/4-20 x 0.5 in. Button Head Cap Screw	am-1039	1	
1/4 in. Flat Washer	am-1027	1	





3/8 in. Round ID Shielded Flanged Bearing	am-0573	1	
External Retaining Ring, 1/2" Bowed	am-1540	1	
0.375" Hex Molded Spacer, .063"	am-3947-063	1	
Encoder Mount Pad Spacer V2	am-0208a	1	
10-32 x 0.375 in. Black Oxide BHCS with Nylon Patch	am-1541	4	
Great Red Tacky Grease, 14.2 gram	am-2768	1	
Toughbox Series Short 1/2" Hex Steel Output Shaft	am-0802a	1	

am-4227h CIM Hardware Kit Bill of Materials



Component	Part #	QTY	Part Photo
0.875" Bearing Plate	am-3721	1	
8mm Flat Washer	am-1009	4	
8mm to 1/2 in. Hex Shaft Adapter	am-0588	1	
10-32 x 0.625 in. Button Head Cap Screw with Nylon Patch	am-1549	2	

8 mm Push On Retaining Ring	am-0033	1	
2 x 2 x 10 mm Machine Key	am-1121	1	
0.375" Hex Molded Spacer, .250"	am-3948-250	1	

am-4226h Sport Hardware Kit Bill of Materials

Component	Part #	QTY	Part Photo
57 & CIM Sport Gearbox Face Mount Spacer	am-3787	1	
10-32 x 0.75 in. Hex Drive Button Head Cap Screw	am-1524	2	
0.375" Hex Molded Spacer, .250"	am-3984-250	2	
#10 Fender Washer	am-1523	2	

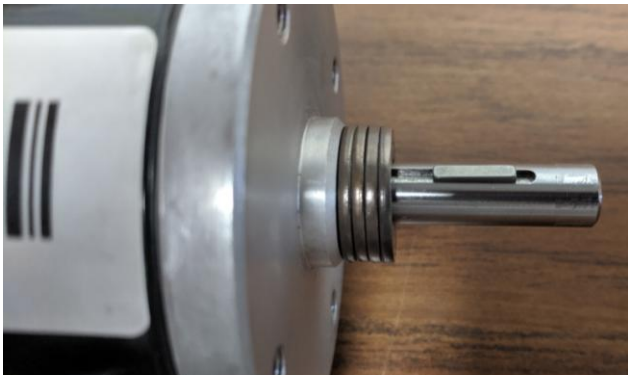
am-4194h Falcon Hardware Kit Bill of Materials

Component	Part #	QTY	Part Photo
Falcon 500 Spline to 1/2 in. Hex Shaft Adapter	am-4187	1	
0.5" Hex Molded Spacer, .500"	am-3948-500	1	

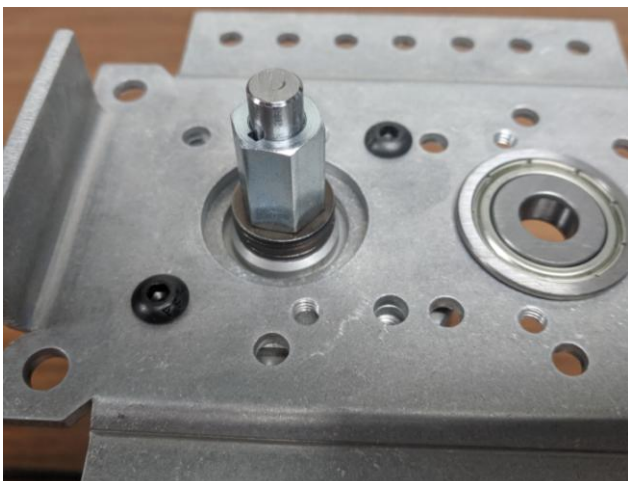
Section “a” covers preparing a CIM style motor to use with your gearbox. If using a 1/2 in. hex shaft as an input such as a Sport gearbox see section “b”. If you are using a Falcon 500 see Section “c”.

Step 1a: Place 4 of the 8mm brown washers (am-1009) on the CIM shaft and then install the key (am-1121) in the keyway.

Note: 4 washers are required for full diameter CIM Motors such as the CIM and the Mini CIM. If using a smaller diameter CIM style input such as the DeCIMate or NEO only 2 washers are required.



Step 3a: Install the 3/8 in. ID bearing (am-0573) in the bearing hole in the plate (am-4216) furthest from the bent tab. The flange of the bearing should be on the same side as the tab. Place this assembly on top of the CIM as shown. Then, install the 5/8 in. long thread patch button head screws (am-1549) into the two tapped holes of the CIM motor.

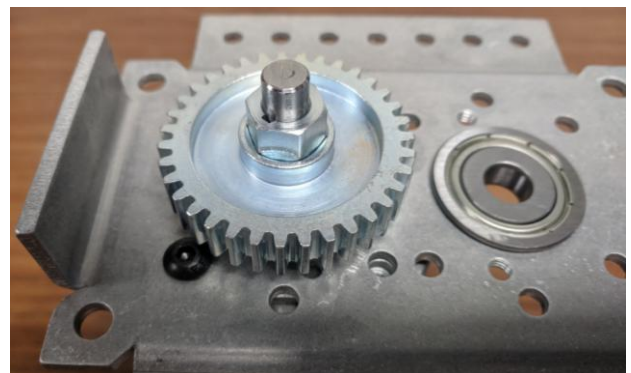


Step 2a: Place the 8mm key to 1/2 in. hex adapter (am-0588) over the shaft and place the spacer plate on the face of the motor with the holes aligned.

Note: This spacer is only needed if all 4 washers were used in step 1a. It is needed to let the CIM clear the bearing in the next step.

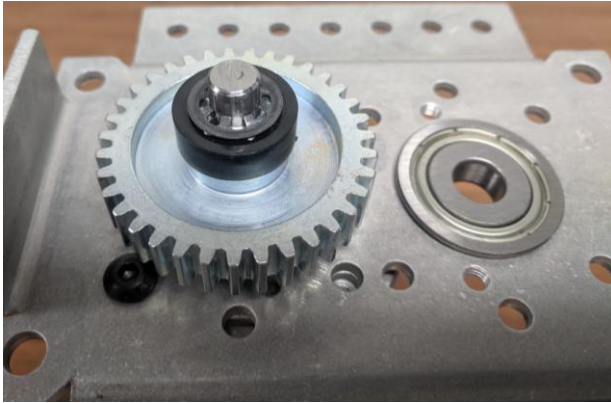


Step 4a: Slip your pinion gear over the hex adapter. If you want the gearbox to spin faster than the motor put the larger of the two gears here. If you want it to spin slower, but with more torque, put the smaller gear here.



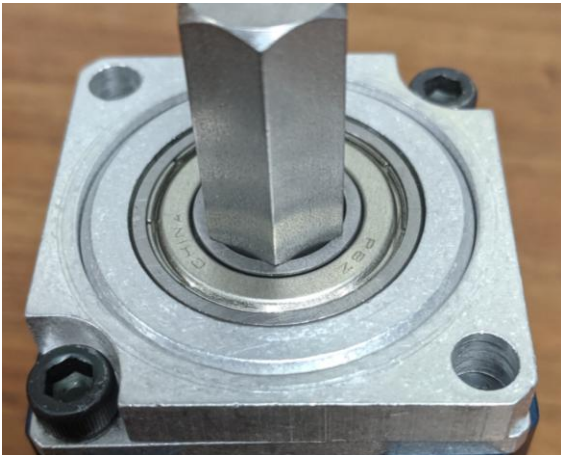
Step 5a: Install the 1/4 in. thick hex spacer (am-3948-250) over the gear. Then press on the 8mm retaining clip (am-0033) to keep all the items on the shaft. The teeth of the clip should point “up” as shown. A socket or box end wrench is a good tool to use for this step.

This is the last CIM specific step, please skip ahead to Step 1d to finish assembly.



Section “b” covers preparing a 57 Sport, or similar, gearbox with a 1/2 in. hex output shaft to be the input to the Flyer. If using a Falcon 500, please skip ahead. If using a CIM style motor, go back to section “a”.

Step 1b: Remove the two shorter screws from the face of the gearbox (we will not be using them later) and place the face mount spacer (am-3787) over the top with the holes aligning to the holes the screws just came out of.

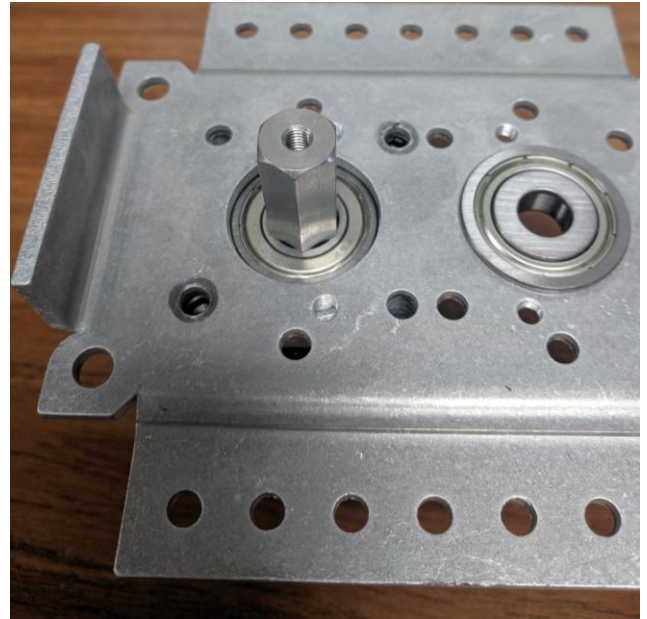


Step 3b: Install the two 3/4 in. long button head cap screws (am-1524) to hold the Sport in place, then place a 1/4 in. thick hex spacer (am-3948-250) on the output shaft. If your input is different from a sport, use your own spacers to get to 1/8 in. above the sheet metal.

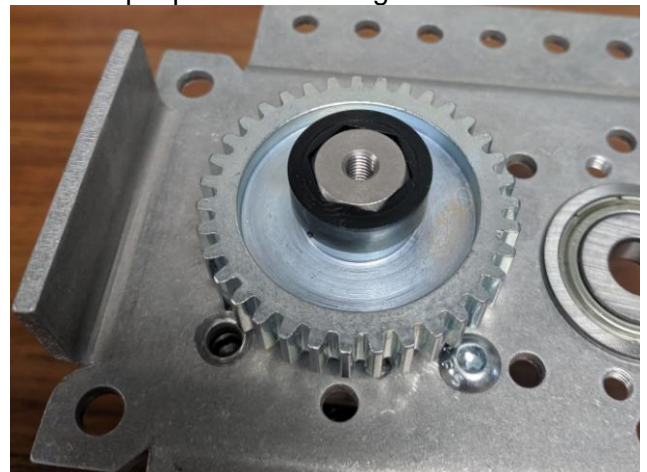
Note: If you are using a two-motor input, or planning on using the Sport side mounting holes to mount the entire assembly, make sure the Sport is oriented the way that you want before screwing it in.



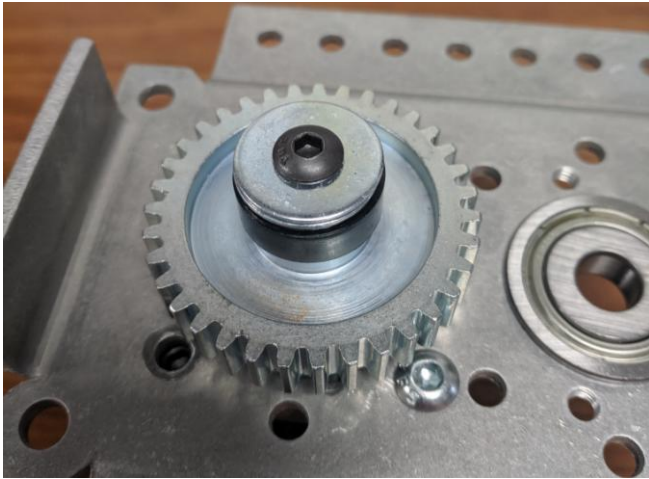
Step 2b: Install the 3/8 in. ID bearing (am-0573) in the bearing hole in the plate (am-4216) furthest from the bent tab. The flange of the bearing should be on the same side as the tab. Place this assembly on top of the Sport gearbox as shown.



Step 4b: Place the pinion gear onto the 1/2 in. hex shaft then place the other 1/4 in. spacer (am-3948-250) over the gear to bring the stack flush with the top of the shaft. Again, if your shaft is different, you may need to supply your own spacers. If you want the Flyer Gearbox to spin faster than the Sport, put the larger of the two gears here. If you want it to spin slower, but with more torque put the smaller gear here.

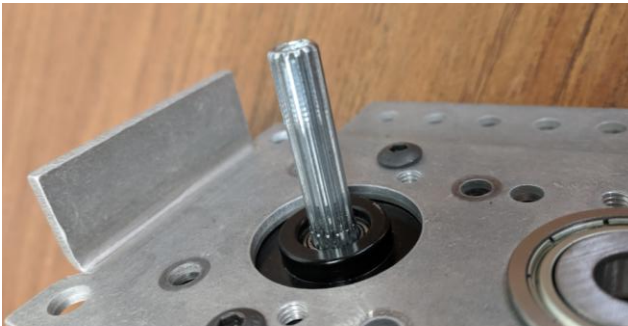


Step 5b: Place two #10 fender washers (am-1523) on the top of the shaft and secure the stack in place with a 3/8 in. long #10-32 thread patch button head cap screw (am-1541). This is the last Sport specific step, please skip ahead to Step 1d to finish assembly.

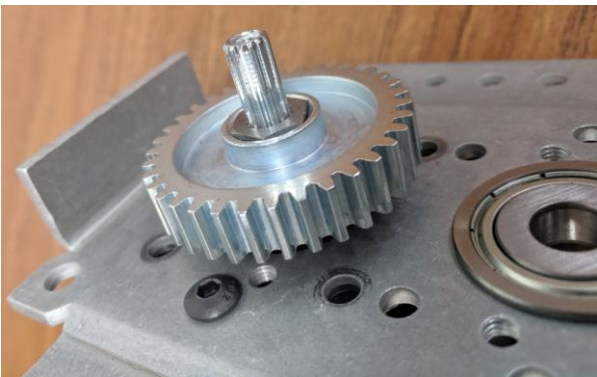


Section "c" covers Installing a Falcon 500 motor.

Step 1c: Install the 3/8 in. ID bearing (am-0573) in the bearing hole in the plate (am-4216) furthest from the bent tab. The flange of the bearing should be on the same side as the tab. Place this assembly on top of the Falcon 500 as shown and secure with two 3/8 in. long thread patch button head cap screws (am-1541) as shown.



Step 3c: Slip your pinion gear over the hex adapter. If you want the gearbox to spin faster than the Falcon 500 motor put the larger of the two gears here. If you want it to spin slower, but with more torque put the smaller gear here.



Step 2c: Place 3 of the 8mm brown washers (am-1009) on the shaft and then install the spline to 1/2 in. hex adapter (am-4187).

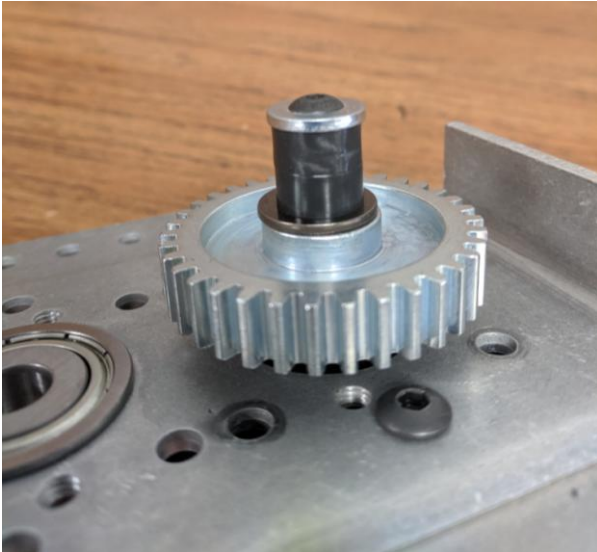


Step 4c: Place one 8mm brown washer and then two 1/4 in. thick Falcon 500 shaft spacers over the shaft to bring it flush to the top. These spacers were included with your Falcon 500.

Note: Make sure the washer is installed first.

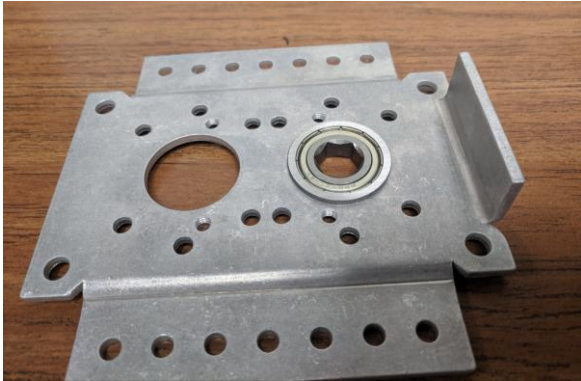


Step 5c: Secure the stack in place with a 1/2 in. long #8-32 thread patch button head cap screw (am-1537) and washer (am-1027). This is the last Falcon 500 specific step, please continue to Step 1d to finish assembly.



Section “d” covers the rest of the assembly after input installation.

Step 1d: Install the 1/2 in. hex bearing (am-2986) in the bearing hole in the other plate (am-4216) closest to the bent tab. The flange of the bearing should be on the same side as the tab.



Step 2d: Take the warped snap ring (am-1540) and install it into the Toughbox output shaft (am-0802a) snap ring groove as shown, it should flex “away” from the magnet end of the shaft.

Note: Any Toughbox output shaft is compatible with the Flyer Gearbox.



Step 3d: Slip the output gear onto the end of the shaft up to the snap ring. Then slip the 1/16 in. thick spacer (am-3947-063) over the 3/8 in. round portion of the shaft.

Note: This spacer has a hex bore, but is being used as a round spacer in this application.



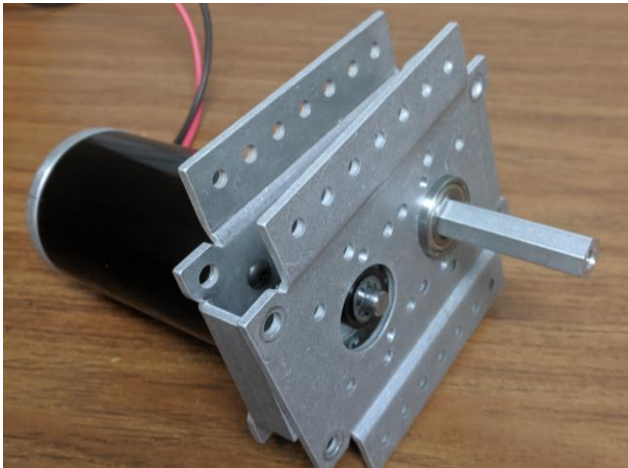
Step 4d: Take the output shaft assembly and insert the 3/8 in. round end of the shaft into 3/8 in. round bearing that is installed on the motor plate assembly from the previous section.

Note: The shaft should point in the same direction as the motor shaft (not pictured).



Step 5d: Install the 1/2 in. hex bearing with gearbox plate from step 1d over the output shaft so that the tabs on both plates point at each other enclosing the gears like shown.

Note: If you wish for the output shaft to point out the same side as the motor simply switch the locations of the hex and round bearings and reverse the shaft.



Step 6d: Place the extrusion spacer (am-2508-750) in the gap on one side of the gearbox. Feed 1/4-20 button head cap screws (am-1183) through the corner holes in one gearbox plate, the holes in the spacer and out the holes in the opposite gearbox plate. Secure in with locknuts (am-1102).

Note: Do not tighten down the nuts all the way yet.



Step 7d: Flip the gearbox over and before installing the second spacer apply a liberal amount of grease (am-2768) to both gears, spin the shaft by hand to mix the grease around and into all the valleys of the gear teeth. Once greasing is complete, repeat step 6d for the other spacer. Now tighten all bolts while ensuring that the output shaft still spins and that the corners of the spacers line up with the gearbox plates.



Step 8d: If you wish to put an encoder on the output shaft install the encoder mount pad (am-208a) using the two 3/8 in. long #10-32 thread patch button head cap screws (am-1541). The screws thread into the gearbox plate for easy installation and removal without disassembly of the gearbox.

