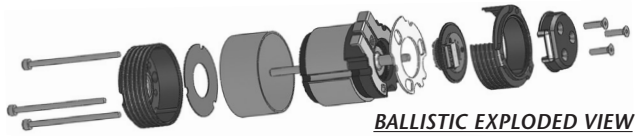
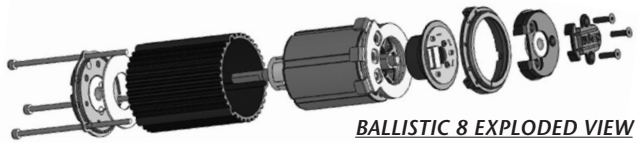
Novak End Bell *(w/factory-installed bearing)* **& Bearing Replacement**

END BELL & BEARING REPLACEMENT INSTRUCTIONS:

1. Remove motor from vehicle & brush off any dirt *(do not use motor cleaner)*.
2. **Remove the front end bell/cap** *(end section of motor on the same side as the pinion shaft)* using a hex wrench to remove the three long socket head cap screws. The front end bell/cap will then slide off the motor.
   NOTE: The front bearing is secured in the end bell/end cap with a non-removable locking agent. Removal of the bearing can bend or damage the end bell/cap.
3. **Remove the rotor** by grasping the pinion shaft with pliers and carefully pulling the rotor out of the motor.
   Note: The rotor is the magnet in brushless motors and will attract metallic objects (wrenches, washers, etc.)--place rotor on a soft cloth or towel to prevent damage.
   –Most Novak motors have shim washers on the pinion end *(& sometimes on the back end)* of the rotor to adjust free play--***Do Not*** lose these & re-install them on the correct side of rotor. ***Washers may be stuck to the bearing.***
   –Older SS series motors have brass spacers on both sides of rotor between magnet & bearings--***Do not lose them & re-install them on the correct sides.***
   –Check condition of rotor--***Careful to not damage electronics inside motor***.
4. **Clean inside motor** using compressed air. ***(NO solvents or spray cleaners)***.
5. **Note the timing setting of the motor.** Newer Novak motors with adjustable timing have a timing label on the side of the back end cap and a timing notch machined into the back end bell/ring to indicate the timing set point. ***Make note of this to properly set timing during assembly.***
6. **Remove back end cap from motor** using a hex wrench to remove the 3 flat head cap screws. The bearing on older plastic end cap motors is held between the end cap and the sensor assembly *(beneath the power wire tabs--**Note: Don't rotate the sensor assembly**)--end cap may be slightly stuck due to excess flux--gently pry end cap off if needed.* Bearings on newer metal end cap motors are pressed in and secured with a non-removable locking agent--replacement bearings come factory-installed in a new end cap.
7. On older plastic cap motors, **remove rear bearing** with small needle nose pliers. **Install new bearing** into the recess in the plastic sensor assembly.
8. If your motor had a silicone sensor grommet inside the end cap, insert it into the new end cap. **Install new back end cap *(and plastic bearing cover on Ballistic 8 motors)*** and re-install flat head screws. ***Hold the old end cap above the new end cap to determine proper timing position.*** Install new timing label on the side of end cap with proper timing mark aligned with the timing notch in end bell/cap. ***If changing wind type (Wye/Delta) in Ballistic 8 motors, install new timing label directly over old label and then rotate end cap to the other wind position (Y or D).***
9. **Re-install rotor**, with shim washers/brass spacers on correct sides of rotor *(short brass spacer goes on pinion side in SS motors)*. ***Use a rolled-up piece of a business card inserted down into stator to help align and insert rotor.***
10. **Remove insulator from old front end bell** and insert it into new one.
11. **Install new front end bell/cap** by inserting the 3 long socket cap screws into the new end bell/cap, aligning screws with slots in stator, and threading into tapped holes in the back end bell/ring--***Check that rotor spins freely as tightening screws***--If binding occurs, disassemble motor and determine cause. If it turns freely, firmly tighten the screws.
    If screws do not have a patch of locking agent on threads, add a small drop to tips.
12. **Re-check screw tension** after a few runs. Check all 6 main screws.



BALLISTIC EXPLODED VIEW

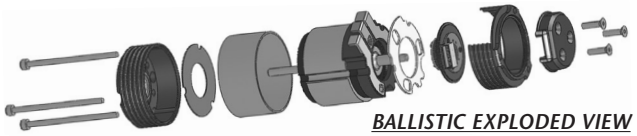


BALLISTIC 8 EXPLODED VIEW

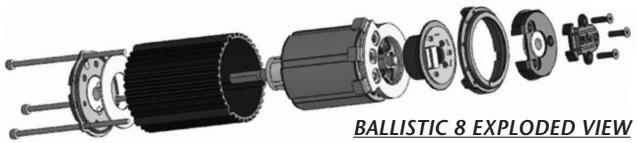
Novak End Bell *(w/factory-installed bearing)* **& Bearing Replacement**

END BELL & BEARING REPLACEMENT INSTRUCTIONS:

1. Remove motor from vehicle & brush off any dirt *(do not use motor cleaner)*.
2. **Remove the front end bell/cap** *(end section of motor on the same side as the pinion shaft)* using a hex wrench to remove the three long socket head cap screws. The front end bell/cap will then slide off the motor.
   NOTE: The front bearing is secured in the end bell/end cap with a non-removable locking agent. Removal of the bearing can bend or damage the end bell/cap.
3. **Remove the rotor** by grasping the pinion shaft with pliers and carefully pulling the rotor out of the motor.
   Note: The rotor is the magnet in brushless motors and will attract metallic objects (wrenches, washers, etc.)--place rotor on a soft cloth or towel to prevent damage.
   –Most Novak motors have shim washers on the pinion end *(& sometimes on the back end)* of the rotor to adjust free play--***Do Not*** lose these & re-install them on the correct side of rotor. ***Washers may be stuck to the bearing.***
   –Older SS series motors have brass spacers on both sides of rotor between magnet & bearings--***Do not lose them & re-install them on the correct sides.***
   –Check condition of rotor--***Careful to not damage electronics inside motor***.
4. **Clean inside motor** using compressed air. ***(NO solvents or spray cleaners)***.
5. **Note the timing setting of the motor.** Newer Novak motors with adjustable timing have a timing label on the side of the back end cap and a timing notch machined into the back end bell/ring to indicate the timing set point. ***Make note of this to properly set timing during assembly.***
6. **Remove back end cap from motor** using a hex wrench to remove the 3 flat head cap screws. The bearing on older plastic end cap motors is held between the end cap and the sensor assembly *(beneath the power wire tabs--**Note: Don't rotate the sensor assembly**)--end cap may be slightly stuck due to excess flux--gently pry end cap off if needed.* Bearings on newer metal end cap motors are pressed in and secured with a non-removable locking agent--replacement bearings come factory-installed in a new end cap.
7. On older plastic cap motors, **remove rear bearing** with small needle nose pliers. **Install new bearing** into the recess in the plastic sensor assembly.
8. If your motor had a silicone sensor grommet inside the end cap, insert it into the new end cap. **Install new back end cap *(and plastic bearing cover on Ballistic 8 motors)*** and re-install flat head screws. ***Hold the old end cap above the new end cap to determine proper timing position.*** Install new timing label on the side of end cap with proper timing mark aligned with the timing notch in end bell/cap. ***If changing wind type (Wye/Delta) in Ballistic 8 motors, install new timing label directly over old label and then rotate end cap to the other wind position (Y or D).***
9. **Re-install rotor**, with shim washers/brass spacers on correct sides of rotor *(short brass spacer goes on pinion side in SS motors)*. ***Use a rolled-up piece of a business card inserted down into stator to help align and insert rotor.***
10. **Remove insulator from old front end bell** and insert it into new one.
11. **Install new front end bell/cap** by inserting the 3 long socket cap screws into the new end bell/cap, aligning screws with slots in stator, and threading into tapped holes in the back end bell/ring--***Check that rotor spins freely as tightening screws***--If binding occurs, disassemble motor and determine cause. If it turns freely, firmly tighten the screws.
    If screws do not have a patch of locking agent on threads, add a small drop to tips.
12. **Re-check screw tension** after a few runs. Check all 6 main screws.



BALLISTIC EXPLODED VIEW

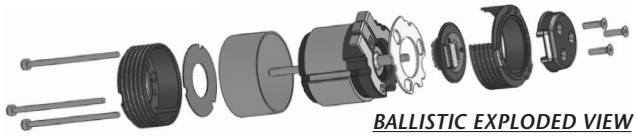


BALLISTIC 8 EXPLODED VIEW

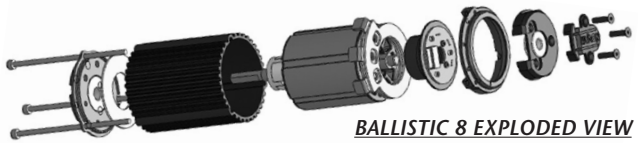
Novak End Bell *(w/factory-installed bearing)* **& Bearing Replacement**

END BELL & BEARING REPLACEMENT INSTRUCTIONS:

1. Remove motor from vehicle & brush off any dirt *(do not use motor cleaner)*.
2. **Remove the front end bell/cap** *(end section of motor on the same side as the pinion shaft)* using a hex wrench to remove the three long socket head cap screws. The front end bell/cap will then slide off the motor.
   NOTE: The front bearing is secured in the end bell/end cap with a non-removable locking agent. Removal of the bearing can bend or damage the end bell/cap.
3. **Remove the rotor** by grasping the pinion shaft with pliers and carefully pulling the rotor out of the motor.
   Note: The rotor is the magnet in brushless motors and will attract metallic objects (wrenches, washers, etc.)--place rotor on a soft cloth or towel to prevent damage.
   –Most Novak motors have shim washers on the pinion end *(& sometimes on the back end)* of the rotor to adjust free play--***Do Not*** lose these & re-install them on the correct side of rotor. ***Washers may be stuck to the bearing.***
   –Older SS series motors have brass spacers on both sides of rotor between magnet & bearings--***Do not lose them & re-install them on the correct sides.***
   –Check condition of rotor--***Careful to not damage electronics inside motor***.
4. **Clean inside motor** using compressed air. ***(NO solvents or spray cleaners)***.
5. **Note the timing setting of the motor.** Newer Novak motors with adjustable timing have a timing label on the side of the back end cap and a timing notch machined into the back end bell/ring to indicate the timing set point. ***Make note of this to properly set timing during assembly.***
6. **Remove back end cap from motor** using a hex wrench to remove the 3 flat head cap screws. The bearing on older plastic end cap motors is held between the end cap and the sensor assembly *(beneath the power wire tabs--**Note: Don't rotate the sensor assembly**)--end cap may be slightly stuck due to excess flux--gently pry end cap off if needed.* Bearings on newer metal end cap motors are pressed in and secured with a non-removable locking agent--replacement bearings come factory-installed in a new end cap.
7. On older plastic cap motors, **remove rear bearing** with small needle nose pliers. **Install new bearing** into the recess in the plastic sensor assembly.
8. If your motor had a silicone sensor grommet inside the end cap, insert it into the new end cap. **Install new back end cap *(and plastic bearing cover on Ballistic 8 motors)*** and re-install flat head screws. ***Hold the old end cap above the new end cap to determine proper timing position.*** Install new timing label on the side of end cap with proper timing mark aligned with the timing notch in end bell/cap. ***If changing wind type (Wye/Delta) in Ballistic 8 motors, install new timing label directly over old label and then rotate end cap to the other wind position (Y or D).***
9. **Re-install rotor**, with shim washers/brass spacers on correct sides of rotor *(short brass spacer goes on pinion side in SS motors)*. ***Use a rolled-up piece of a business card inserted down into stator to help align and insert rotor.***
10. **Remove insulator from old front end bell** and insert it into new one.
11. **Install new front end bell/cap** by inserting the 3 long socket cap screws into the new end bell/cap, aligning screws with slots in stator, and threading into tapped holes in the back end bell/ring--***Check that rotor spins freely as tightening screws***--If binding occurs, disassemble motor and determine cause. If it turns freely, firmly tighten the screws.
    If screws do not have a patch of locking agent on threads, add a small drop to tips.
12. **Re-check screw tension** after a few runs. Check all 6 main screws.



BALLISTIC EXPLODED VIEW



BALLISTIC 8 EXPLODED VIEW

NOVAK

Rotor Replacement Instructions for Novak Brushless Motors

55-5980-1 • 9/2011

ROTOR REPLACEMENT INSTRUCTIONS:

1. Remove motor from vehicle & brush off any dirt *(do not use motor cleaner)*.
2. **Remove the front end bell/cap** *(end section of motor on the same side as the pinion shaft)* using a hex wrench to remove the three long socket head cap screws. The front end bell/cap will then slide off the motor. Be sure to keep track of front insulator disc.
3. **Remove old rotor** by grasping pinion shaft with pliers and pulling it straight out of the motor.
   Note: The rotor is the magnet in brushless motors and will attract metallic objects (wrenches, washers, etc.)--place rotor on a soft cloth or towel to prevent damage.
   –Most Novak motors have shim washers on the pinion end *(& sometimes on the back end)* of the rotor to adjust free play--***Do Not*** lose these & re-install them on the correct side of rotor. ***Washers may be stuck to the bearing.***
   –Older SS series motors have brass spacers on both sides of rotor between magnet & bearings--***Do not lose them & re-install them on the correct sides.***
4. **Clean inside motor** using compressed air. ***(NO solvents or spray cleaners)***.
5. **Install new rotor**:

Rotors with Nickel-Plated Magnets

–Use a rolled-up piece of a business card inserted down into the center of the stator to help align and insert rotor *(or the clear tube some new rotors come packaged in if it fits in the stator)*.

–Make sure the shim washers are on the correct sides of the rotor, just as they were positioned on the original rotor.

–While holding the new rotor's shaft on the pinion end with a pair of needle nose pliers, carefully insert rotor down into motor. Once the rotor is seated in the back bearing, remove the rolled paper/tube from motor.

Take extra care when inserting the new rotor into the motor, as the high strength of the rotor will pull it into the motor with great force, and will easily damage the sensor assembly inside the motor.

Older SS-Series/Velociti Rotors without Nickel Plating

Make sure the shim washers or brass spacers are on the correct sides of the rotor, just as they were removed from the original rotor *(shorter brass spacer goes on the pinion side in the SS-series motors)*.

Take care not to damage the new rotor while it is being inserted into the motor, as it will be magnetically attracted to the sides during assembly.

6. **Replace insulator in front end bell** if it was removed in Step 2.
7. **Replace front end bell/end cap** by inserting the 3 long socket cap screws into the holes of the end bell/cap, aligning screws with slots in stator, and threading into the tapped holes in the back end bell/ring--***Check that rotor spins freely as tightening screws***--If binding occurs, disassemble motor and determine cause. If it turns freely, firmly tighten the screws.
   If screws do not have a patch of locking agent on threads, add a small drop to tips.
8. **Re-check screw tension** after the first couple runs--It is common for the vibration and heating to allow parts to settle. Check all 6 main screws.

Customer Service:

(949) 833-8873 • FAX **(949) 833-1631**

e-mail: ***cs@teamnovak.com***

www.teamnovak.com

NOVAK

Rotor Replacement Instructions for Novak Brushless Motors

55-5980-1 • 9/2011

ROTOR REPLACEMENT INSTRUCTIONS:

1. Remove motor from vehicle & brush off any dirt *(do not use motor cleaner)*.
2. **Remove the front end bell/cap** *(end section of motor on the same side as the pinion shaft)* using a hex wrench to remove the three long socket head cap screws. The front end bell/cap will then slide off the motor. Be sure to keep track of front insulator disc.
3. **Remove old rotor** by grasping pinion shaft with pliers and pulling it straight out of the motor.
   Note: The rotor is the magnet in brushless motors and will attract metallic objects (wrenches, washers, etc.)--place rotor on a soft cloth or towel to prevent damage.
   –Most Novak motors have shim washers on the pinion end *(& sometimes on the back end)* of the rotor to adjust free play--***Do Not*** lose these & re-install them on the correct side of rotor. ***Washers may be stuck to the bearing.***
   –Older SS series motors have brass spacers on both sides of rotor between magnet & bearings--***Do not lose them & re-install them on the correct sides.***
4. **Clean inside motor** using compressed air. ***(NO solvents or spray cleaners)***.
5. **Install new rotor**:

Rotors with Nickel-Plated Magnets

–Use a rolled-up piece of a business card inserted down into the center of the stator to help align and insert rotor *(or the clear tube some new rotors come packaged in if it fits in the stator)*.

–Make sure the shim washers are on the correct sides of the rotor, just as they were positioned on the original rotor.

–While holding the new rotor's shaft on the pinion end with a pair of needle nose pliers, carefully insert rotor down into motor. Once the rotor is seated in the back bearing, remove the rolled paper/tube from motor.

Take extra care when inserting the new rotor into the motor, as the high strength of the rotor will pull it into the motor with great force, and will easily damage the sensor assembly inside the motor.

Older SS-Series/Velociti Rotors without Nickel Plating

Make sure the shim washers or brass spacers are on the correct sides of the rotor, just as they were removed from the original rotor *(shorter brass spacer goes on the pinion side in the SS-series motors)*.

Take care not to damage the new rotor while it is being inserted into the motor, as it will be magnetically attracted to the sides during assembly.

6. **Replace insulator in front end bell** if it was removed in Step 2.
7. **Replace front end bell/end cap** by inserting the 3 long socket cap screws into the holes of the end bell/cap, aligning screws with slots in stator, and threading into the tapped holes in the back end bell/ring--***Check that rotor spins freely as tightening screws***--If binding occurs, disassemble motor and determine cause. If it turns freely, firmly tighten the screws.
   If screws do not have a patch of locking agent on threads, add a small drop to tips.
8. **Re-check screw tension** after the first couple runs--It is common for the vibration and heating to allow parts to settle. Check all 6 main screws.

PRODUCT WARRANTY: Novak Electronics, Inc. guarantees all products to be free from defects in materials or workmanship for a period of 120 days from the original date of purchase (verified by dated, itemized sales receipt). Warranty does not cover incorrect installation, components worn by use, damage resulting from thermal overload or use of excessive timing, physical damage from being dropped, corrosion, abrasion from any foreign materials, or any damage caused by a crash, flooding, or other natural disaster. In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice.

©2011 Novak Electronics, Inc. All Rights Reserved

Customer Service:

(949) 833-8873 • FAX **(949) 833-1631**

e-mail: ***cs@teamnovak.com***

www.teamnovak.com

NOVAK

Rotor Replacement Instructions for Novak Brushless Motors

55-5980-1 • 9/2011

ROTOR REPLACEMENT INSTRUCTIONS:

1. Remove motor from vehicle & brush off any dirt *(do not use motor cleaner)*.
2. **Remove the front end bell/cap** *(end section of motor on the same side as the pinion shaft)* using a hex wrench to remove the three long socket head cap screws. The front end bell/cap will then slide off the motor. Be sure to keep track of front insulator disc.
3. **Remove old rotor** by grasping pinion shaft with pliers and pulling it straight out of the motor.
   Note: The rotor is the magnet in brushless motors and will attract metallic objects (wrenches, washers, etc.)--place rotor on a soft cloth or towel to prevent damage.
   –Most Novak motors have shim washers on the pinion end *(& sometimes on the back end)* of the rotor to adjust free play--***Do Not*** lose these & re-install them on the correct side of rotor. ***Washers may be stuck to the bearing.***
   –Older SS series motors have brass spacers on both sides of rotor between magnet & bearings--***Do not lose them & re-install them on the correct sides.***
4. **Clean inside motor** using compressed air. ***(NO solvents or spray cleaners)***.
5. **Install new rotor**:

Rotors with Nickel-Plated Magnets

–Use a rolled-up piece of a business card inserted down into the center of the stator to help align and insert rotor *(or the clear tube some new rotors come packaged in if it fits in the stator)*.

–Make sure the shim washers are on the correct sides of the rotor, just as they were positioned on the original rotor.

–While holding the new rotor's shaft on the pinion end with a pair of needle nose pliers, carefully insert rotor down into motor. Once the rotor is seated in the back bearing, remove the rolled paper/tube from motor.

Take extra care when inserting the new rotor into the motor, as the high strength of the rotor will pull it into the motor with great force, and will easily damage the sensor assembly inside the motor.

Older SS-Series/Velociti Rotors without Nickel Plating

Make sure the shim washers or brass spacers are on the correct sides of the rotor, just as they were removed from the original rotor *(shorter brass spacer goes on the pinion side in the SS-series motors)*.

Take care not to damage the new rotor while it is being inserted into the motor, as it will be magnetically attracted to the sides during assembly.

6. **Replace insulator in front end bell** if it was removed in Step 2.
7. **Replace front end bell/end cap** by inserting the 3 long socket cap screws into the holes of the end bell/cap, aligning screws with slots in stator, and threading into the tapped holes in the back end bell/ring--***Check that rotor spins freely as tightening screws***--If binding occurs, disassemble motor and determine cause. If it turns freely, firmly tighten the screws.
   If screws do not have a patch of locking agent on threads, add a small drop to tips.
8. **Re-check screw tension** after the first couple runs--It is common for the vibration and heating to allow parts to settle. Check all 6 main screws.

PRODUCT WARRANTY: Novak Electronics, Inc. guarantees all products to be free from defects in materials or workmanship for a period of 120 days from the original date of purchase (verified by dated, itemized sales receipt). Warranty does not cover incorrect installation, components worn by use, damage resulting from thermal overload or use of excessive timing, physical damage from being dropped, corrosion, abrasion from any foreign materials, or any damage caused by a crash, flooding, or other natural disaster. In no case shall our liability exceed the product's original cost. We reserve the right to modify warranty provisions without notice.

©2011 Novak Electronics, Inc. All Rights Reserved

Customer Service:

(949) 833-8873 • FAX **(949) 833-1631**

e-mail: ***cs@teamnovak.com***

www.teamnovak.com