

VIBE 90 3D

Designed for Today's
Extreme 3D Flying

ASSEMBLY INSTRUCTIONS



VIBE 90 SPECIFICATIONS

Length:	54 in
Height:	17.5 in
Weight:	10.2-10.5 lb
Engine:	.80-.91 Heli
Bearings:	Full
Gear Ratio:	8:1:4.83
Main Blade:	700-720 mm
(Main rotor blades not included)	



Making the Ultimate Machine

Start with the proven platform of the Worlds and 3D Championship-winning JR® Vigor CS. Then re-think, redesign and restructure 80% of it's critical components, and you get a machine that shrugs off the most merciless, stick-bending punishment today's extreme 3D flying pilots can inflict.

And you top it off with a new name, the Vibe 90 3D.™

That's exactly what (JR did, with critical input from) Curtis Youngblood— with lots of valuable input from Marty Kuhns, Len Sabato and a host of other JR Team members.

Judging by Curtis' string of 3D and FAI wins with his Vibe, their combined efforts have paid off big-time. What's more, flying 10-12 flight per day with very little maintenance, Curtis reports he has yet to find (the Vibe's) its limit.

Great features and enhancements in the new JR Vibe 90 3D:

Just check this list of re-engineered and redesigned components and you'll have a handle on what makes the Vibe 90 3D the machine that'll take your flying to new levels.

Low Parts Count Means Quick Assembly

You will find that your Vibe 90 will assemble very quickly due to its well-thought-out/straight-forward design, low parts count, and preassembled main rotor head, washout unit, tail gear box, tail pitch slider assemblies, and 3-color prepainted FRP canopy. The building time for the Vibe 90 usually takes only 10-12 hours from start to finish.

CCPM Control System

CCPM swashplate control is the key to the Vibe's performance and low parts count. The Vibe 90 can be set up with the normal 120-degree CCPM system that is supported in most of today's modern computer helicopter radio systems, or JR's original 140 CCPM. CCPM 140 places the ball links on the swashplate 140° back from the forward ball, then the rear balls are extended, placing them the same fore-to-aft distance from the center of the main shaft as the front ball. The main advantage is that all three servos going to the swashplate now have the same throw. With conventional 120 CCPM, the throws to the forward servos must be reduced with radio programming by 50%. This causes the longer-throwing servos to lag behind the shorter-throwing servo during quick cyclic inputs.

WARNING

The radio controlled model helicopter contained in this kit is not a toy but a sophisticated piece of equipment. This product is not recommended for use by children. Radio controlled models such as this are capable of causing both property damage and/or bodily harm to both the operator/assembler and/or spectator if not properly assembled and operated. Horizon Hobby, Inc. assumes no liability for damage that could occur from the assembly and/or use/misuse of this product. If you, as the buyer or owner, are not prepared to accept the liability associated with the use of this product, you are advised to return this kit immediately in new and unused condition to the place of purchase.

AMA INFORMATION

We strongly encourage all prospective and current R/C aircraft pilots to join the Academy of Model Aeronautics. The AMA is a non-profit organization that provides services to model aircraft pilots. As an AMA member, you will receive a monthly magazine entitled *Model Aviation*, as well as a liability insurance plan to cover against possible accident or injury. All AMA charter aircraft clubs require individuals to hold a current AMA sporting license prior to operation of their models. For further information, you can contact the AMA at:

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302
(317) 287-1256

Frame Assembly

- New Carbon fiber upper servo mounts
- New Carbon fiber dual radio/gyro trays
- New Carbon tank mounts
- New 90-size motor mount
- New 3D Carbon fin design

Drivetrain

- New large diameter startshaft w/ HD one-way clutch bearing
- New machined aluminum upper pinion bearing block
- New hardened main shaft
- New supported aluminum bevel gear hub
- New HD autorotation assembly
- New 11-tooth pinion
- New 8:0 to 1 gear ratio

Rotor Head

- New no-bind high cyclic swash design
- New one-piece short span CNC 3D center hub
- New dual o-ring 3D dampeners
- New flight tuned composite blade holders, tuned
- New adjustable flybar/blade mixing ratio
- New ball bearing seesaw mixing arms
- New improved flybar control arms

Tail Rotor

- New Heavy Duty Tail Rotor Hub
- New Re-engineered Tail Gear Case
- New CNC Ball bearing Aluminum Tail Pitch Lever
- New Ball bearing Tail Control Lever w/HD Carbon Rod
- New Wide Spaced Dual Boom Braces

Canopy

- New, 3D Dynamic Canopy for drag reduction in all directions
- New Multi Color Pre-Painted Canopy

PREASSEMBLY INFORMATION

When first opening your Vibe 90 3D kit, you will notice that all of the parts are packaged and numbered to coordinate with the assembly step numbers of this instruction manual.

All small hardware (nuts, bolts, washers, etc.) for each step are separated and packaged separately within the main parts bags. When beginning a section, you will need to open only the bag with the corresponding number to the section you are going to start. It is suggested that you place all of the hardware in an open container (e.g., coffee can) during assembly so as not to lose any of the small parts. It may also be helpful to familiarize yourself with the various sizes of screws, bolts, nuts, etc., as illustrated in the appropriate assembly section before you begin assembly. At the end of each assembly, in most cases, there should be no parts remaining.

NOTE: Your kit also includes JR red and green threadlock. Unlike conventional U.S.-made threadlock, JR red is actually the U.S. equivalent of blue. JR green is actually the equivalent of U.S. red.

Great care has been taken in filling the bags with the correct quantity of parts and hardware for each section. However, occasionally mistakes do happen. In the event that you find a parts shortage or are in need of technical assistance, please contact your local JR Heli Division parts dealer or contact the Horizon Service Center directly.

Horizon Service Center
4105 Fieldstone Road
Champaign, IL 61822
(217) 355-9511 (9 a.m. to 5 p.m. CST)

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ITEMS REQUIRED TO COMPLETE THE JR VIBE 90 3D

1. RADIO SYSTEM REQUIREMENTS (NOT INCLUDED):

- 6-channel or greater R/C helicopter system with 120° or 140° CCPM with 5 servos
- 1800mAh or larger receiver battery
- Gyro



JR XP9303



JR PCM10X



JR G500T Gyro



JR G7000T Gyro



JRPS8311 Ultra Torque Digital
Aileron, Elevator, Collective Servo



8700G High Speed Super
Throttle, Tail Rotor Servo



JRPB4440
1800mAh Battery Pack

CCPM-Ready JR Radio Systems

Most current JR heli radio systems (XP662, XP8103 w/digital trims, XP9303, 10X, as well as older 10 series systems) are equipped with 120° CCPM electronics for use with JR CCPM machines. Radios you may be flying now, like the X347, X388S, XP783, and XP8103*, have 120° CCPM capability built in but require activation by the Horizon Service Department. For details, please call (217) 355-9511.

*Please note that many XP8103 systems have the CCPM function already activated. Please check with the Horizon Service Center for details.

Current Radio Systems

JRP1656**PCM 10X, 120° & 140° CCPM
JRP8622**XP8103FM, 120° CCPM
JRP8653**XP8103PCM, 120° CCPM
JRP9252** XP9303 PCM 120/140 CCPM
JRP6822**XP662 FM, 120° CCPM
JR G500T Gyro or equivalent

2. ENGINE REQUIREMENTS (not included):

A .90 – .91 R/C helicopter engine is required.

A special helicopter type muffler is also required.



YS 91 ST4 Heli Engine
or
OS 91 C-Spec Heli Engine



RV01180 (YS)



RV01190 (OS)

3. BUILDING SUPPLIES (not included):

The following items are needed to complete the assembly of the JR Vibe 90 3D:



Fuel Filter



Glow Plugs
(HAN3020)



High-Speed
Grease



Medium
Silicone Fuel
Tubing (3 ft)



Nylon Wire Ties
(to secure radio wires)



Double-Sided Servo
Mounting Tape



Light Oil



Rubbing Alcohol



Pacer Poly Zap 1/2 oz
(PAAPT22)



Pacer Zip Kicker
(PAAPT15) Optional



JB Weld Epoxy Adhesive
(JBW8265S)



Heavy-Duty Servo Wheels
(3 pcs) w/Screws
JRPA216 or equivalent

4. TOOLS NEEDED TO ASSEMBLE THE JR VIBE 90 3D (not included):



Phillips Screwdriver



Nut Drivers: 5 mm, 7 mm



Needle-Nose Pliers



Scissors



Drill and Drill Bits



Small Hammer



Hobby Knife



Metric Ruler



Sandpaper (80-120 Grit)



Allen Wrenches: 1.5, 2.0, 2.5, 3.0 mm



Adjustable Pliers



JR Ball Link Sizing Tool
JRP60219
(Optional)

5. FIELD EQUIPMENT REQUIRED (not included):



12-Volt Electric Starter



12-Volt Starting Battery



1.5-Volt Glow Plug Battery



OR Remote Glow Plug Adaptor

Must have long shaft to reach glow plug.



Helicopter Fuel 15% -30%



Fuel Pump



Glow Plugs
(HAN3020)



Hex Starting Shaft
(JRP960090)



Pitch Gauge
(JRP960326)

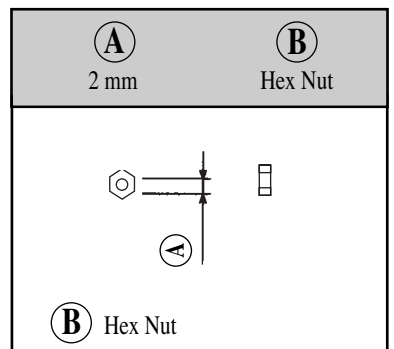
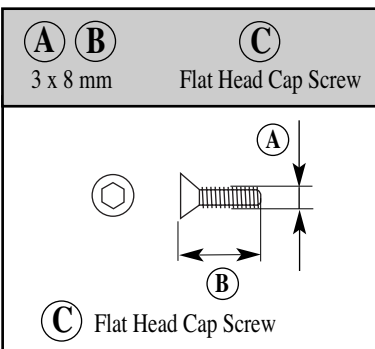
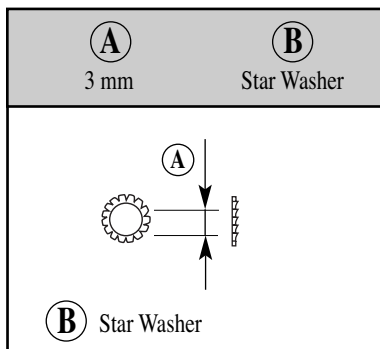
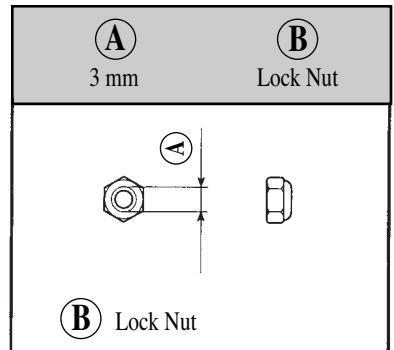
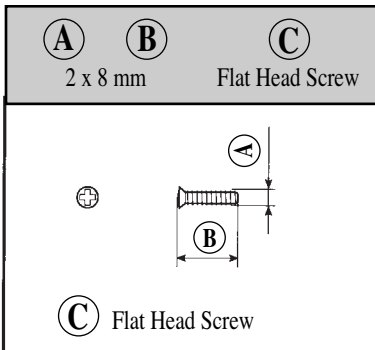
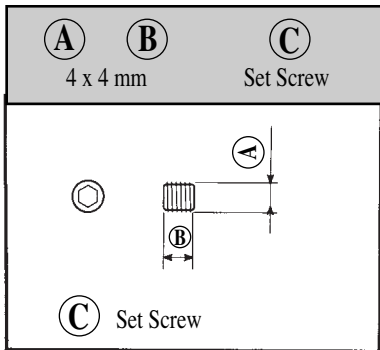
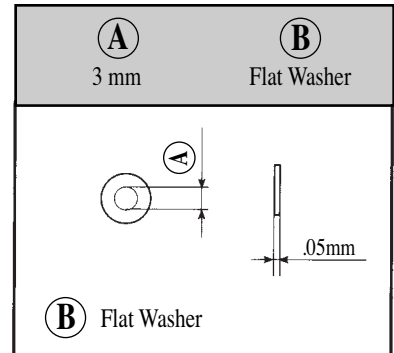
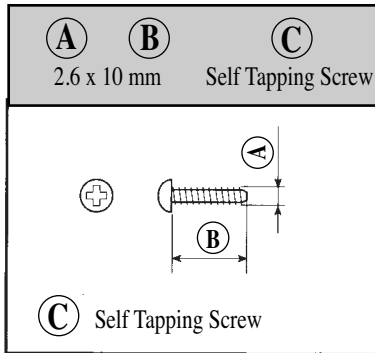
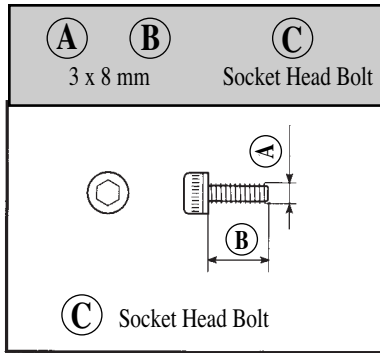


Ball Link Pliers
(RVO1005)

HARDWARE IDENTIFICATION

There are a variety of sizes and shapes of hardware included in this kit. Prior to assembly, please be careful to identify each screw by matching it to the full size screw outlines included in each step.








All of the hardware, screws, nuts, etc., contained in the Vibe 90 3D kit are described in the following A, B, C manner:



1-1

CLUTCH BELL/START SHAFT ASSEMBLY

TEAM TIP: Clean areas with rubbing alcohol to remove any oil residue before applying threadlock.

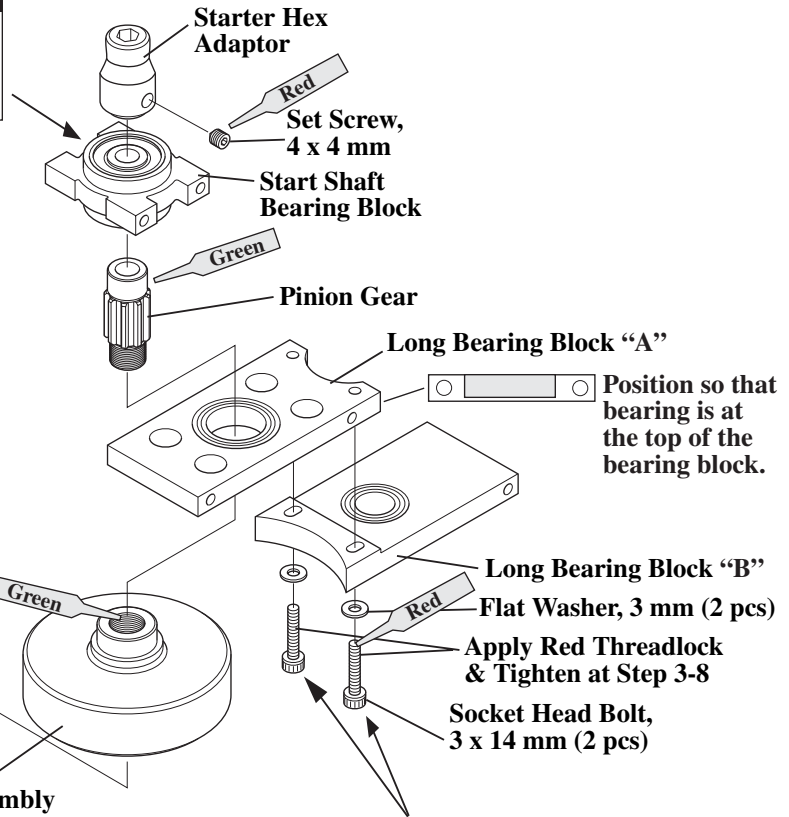
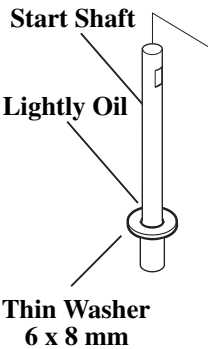
-   ...2 pcs
Socket Head Bolt, 3 x 14 mm
-  1 pc
Set Screw, 4 x 4 mm
-  2 pcs
Flat Washer, 3 mm
- 1 pc
Thin Washer, 6 x 8 mm

 Use Red & Green Threadlock

Assembly Order:

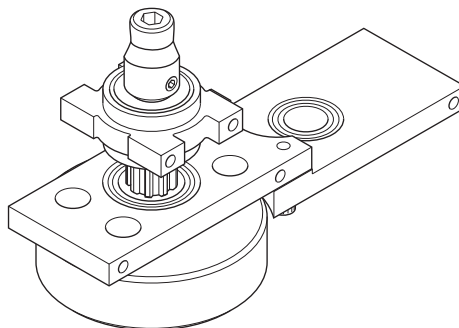
1. Attach pinion to clutch bell
2. Attach clutch bell to bearing block "A"
3. Attach start shaft bearing block to pinion
4. Assemble start shaft assembly
5. Attach bearing block "B"

Note:
Be sure the bearing with the 6 mm ID faces upward.



Note:
Use Green Threadlock






Note:
Do not fully tighten at this time.




Complete Assembly

1-2

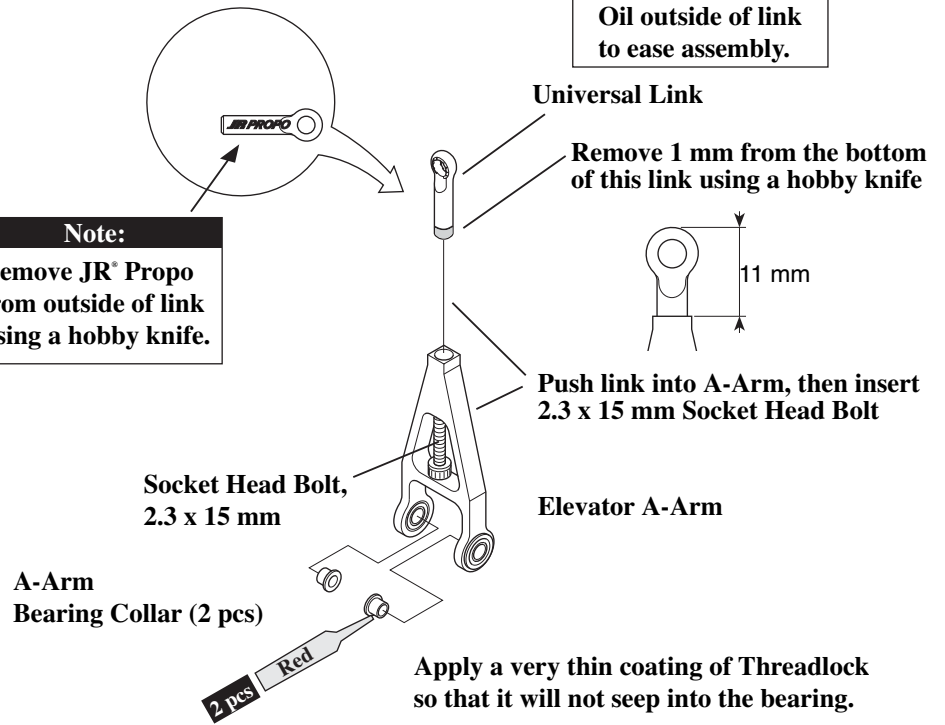
ELEVATOR A-ARM ASSEMBLY

- 2 pcs
Socket Head Bolt, 3 x 8 mm
- 1 pc
Set Screw, 4 x 4 mm
- 1 pc
Socket Head Bolt, 2.3 x 15 mm
- 2 pcs
A-Arm Bearing Collar
- 1 pc
A-Arm Link Base Spindle

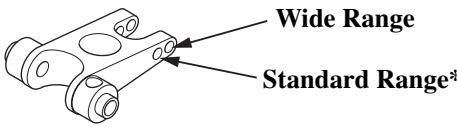
 Use Red Threadlock

Note:
Oil outside of link to ease assembly.

Note:
Remove JR® Propo from outside of link using a hobby knife.



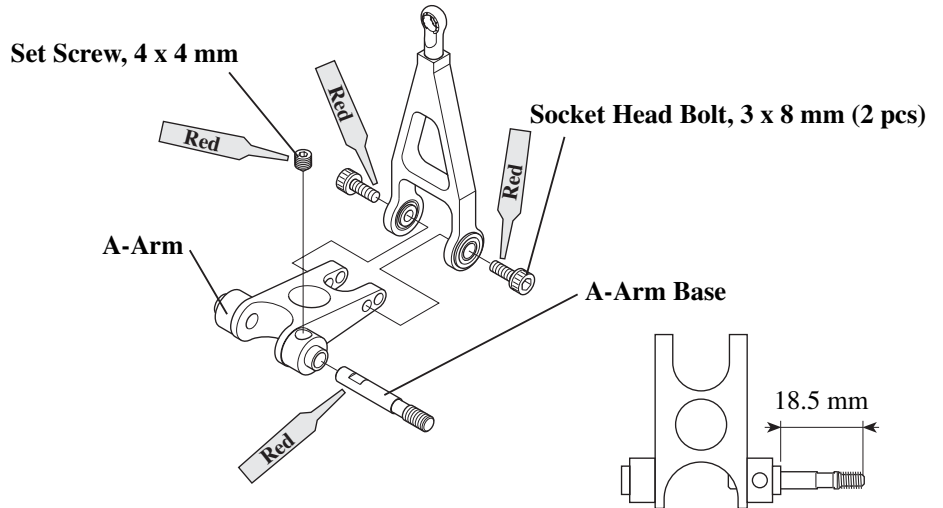
Note:



Wide Range


Standard Range*


*Connect the A-arm to the A-arm base in the standard range position as shown.



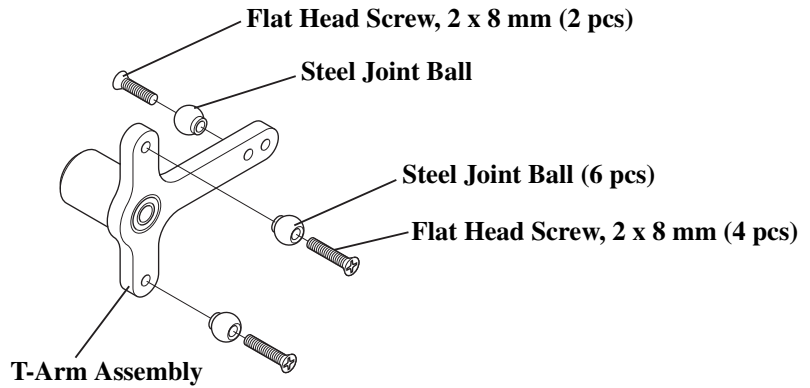
1-3

T-ARM LEVER ASSEMBLY

 8 pc
Flat Head Screw, 2 x 8 mm

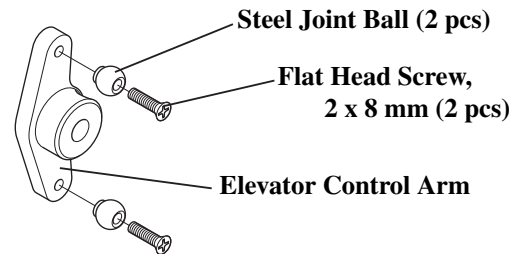
 8 pcs
Steel Joint Ball

 **Use Red Threadlock on all screws**




Note:


Wide Range
Standard Range *
***Connect the control ball to the T-Arms in the standard range position as shown.**

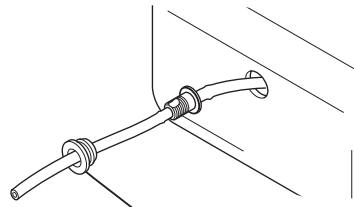


1-4

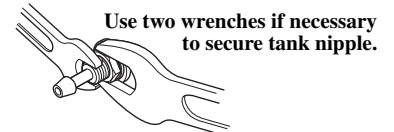
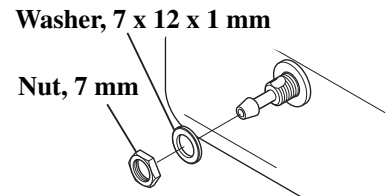
FUEL TANK ASSEMBLY

 1 pc
Nut, 7 mm

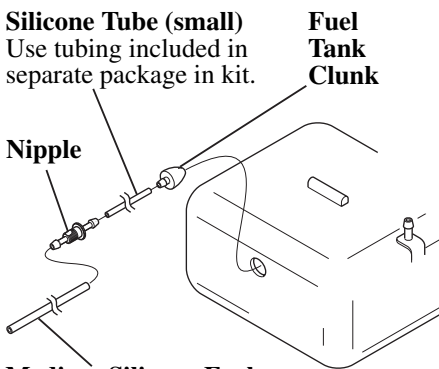
 1 pc
Washer, 7 x 12 x 1 mm



2. Insert the assembly into the fuel tank opening so that the nipple is inside the tank. Next, slide the fuel tank grommet over the medium fuel tubing.

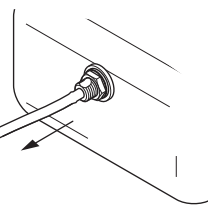


5. Remove the medium silicone fuel tubing from the nipple and secure the nipple to the fuel tank using the 7 x 12 x 1 mm washer and 7 mm nut supplied. Be sure to secure this assembly firmly to avoid leakage.

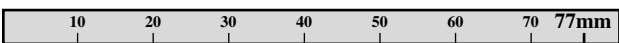
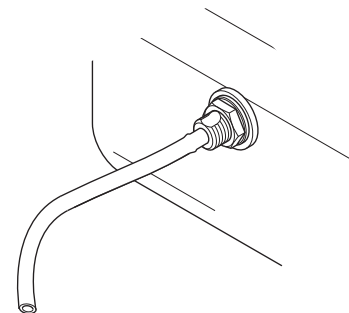


1. Cut the small silicone fuel tubing (included) to a length of 77 mm. Next, connect the fuel tank clunk, nipple, and medium silicone fuel tubing (not included) as shown above.

3. Inset the fuel tank grommet into the fuel tank opening, making sure that it is fully seated.





4. Pull the medium fuel tubing out of the fuel tank until the threads of the fuel tank nipple are exposed.




2-1A

MAIN FRAME ASSEMBLY: BEARING BLOCK/CLUTCH INSTALLATION


4 pcs
Socket Head Bolt, 3 x 8 mm


4 pcs
Socket Head Bolt, 3 x 40 mm

2 pc
Cross Member, 32 mm

4 pcs
Threaded Rod, 3 x 50 mm

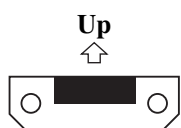
4 pcs
Nylon Lock Nut, 3 mm

8 pcs
Flat Washer, 3 mm

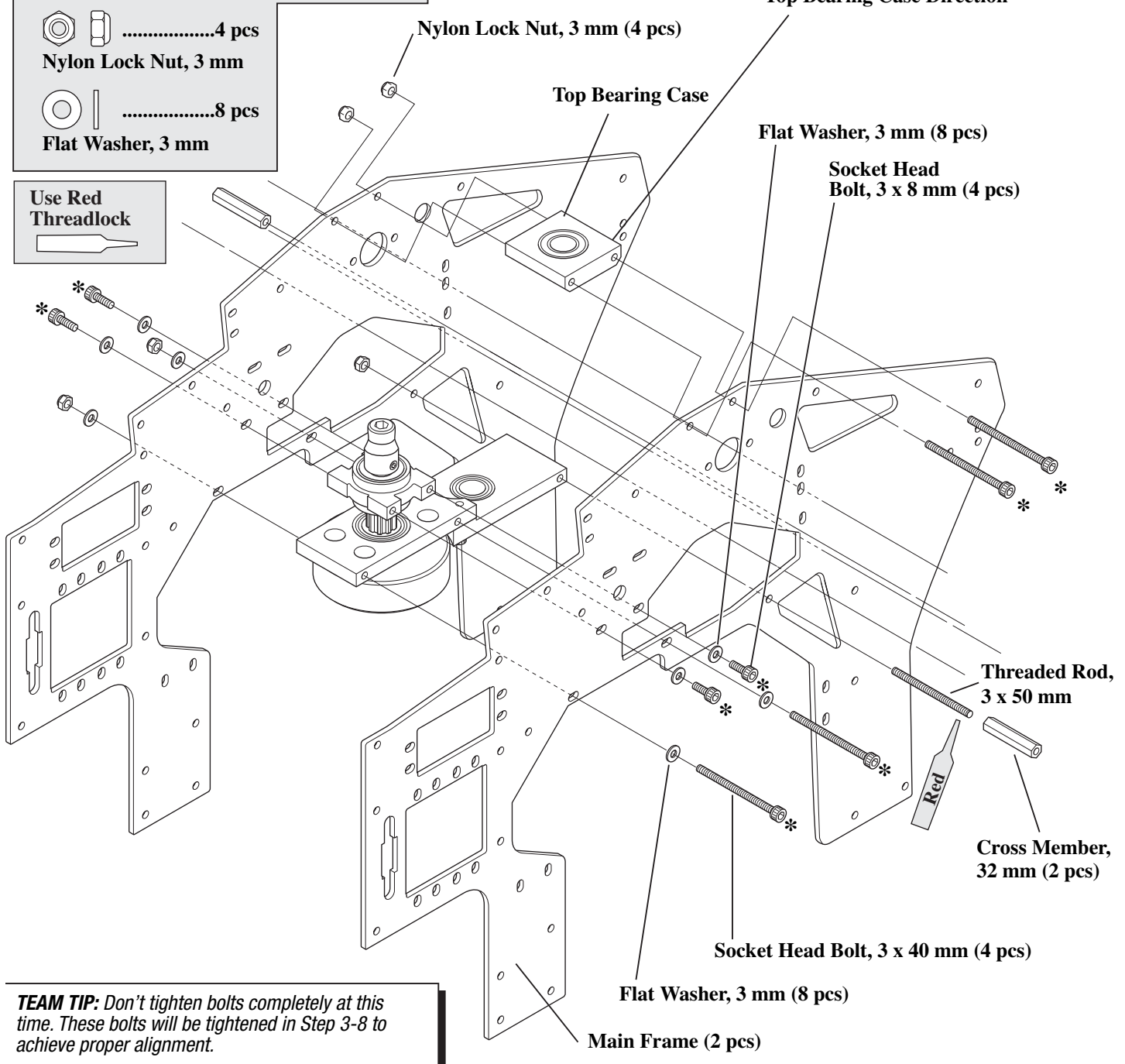
Use Red Threadlock


Note:
 Prior to assembling the main frames, sand all edges of the frame using 120 grit sandpaper. This will prevent wire chaffing during continuous operation.

Note:
 Position so that bearing faces upward.







Top Bearing Case Direction



TEAM TIP: Don't tighten bolts completely at this time. These bolts will be tightened in Step 3-8 to achieve proper alignment.

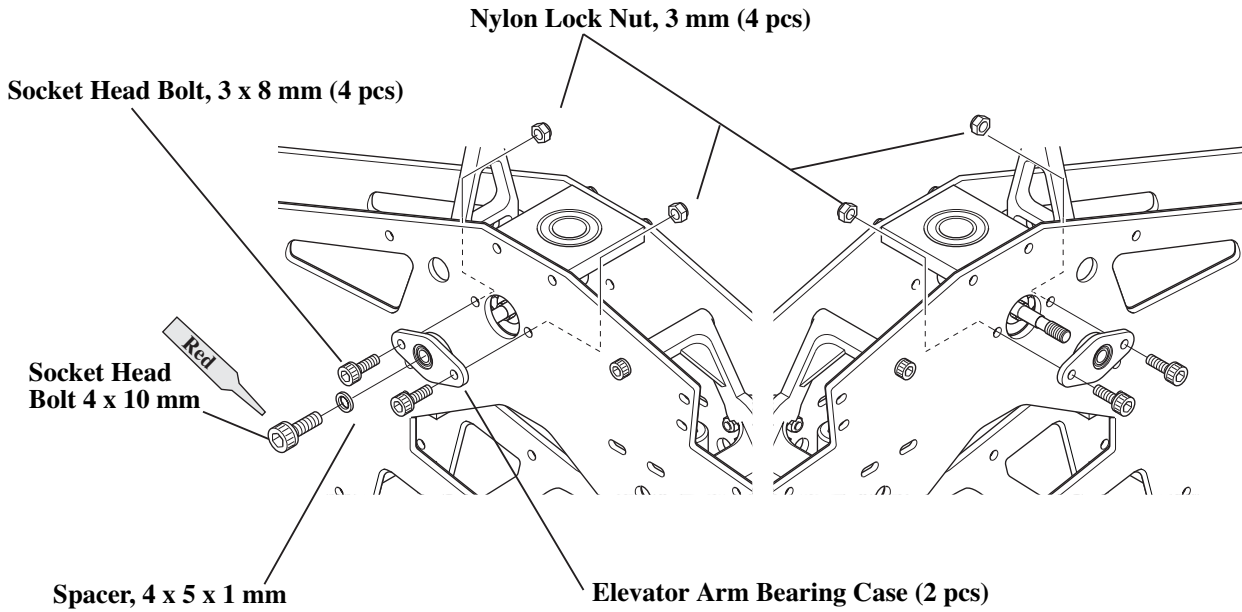
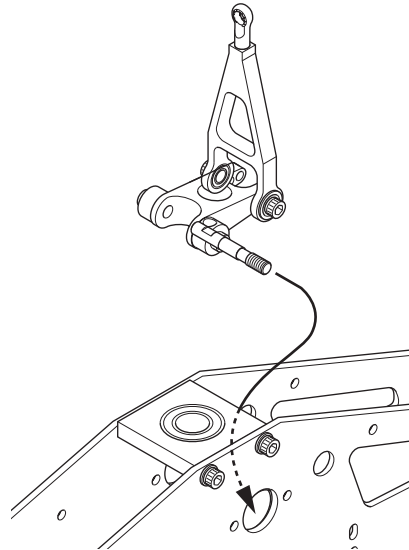
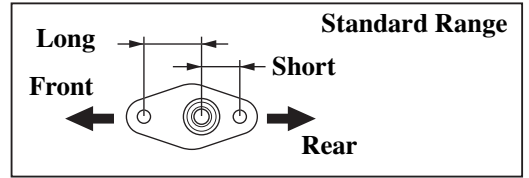
2-1B

ELEVATOR ARM INSTALLATION

- 4 pcs
Socket Head Bolt, 3 x 8 mm
- 1 pc
Socket Head Bolt, 4 x 10 mm
- 4 pcs
Nylon Lock Nut, 3 mm
-  1 pc
Spacer, 4 x 5 x 1 mm

 Use Red Threadlock


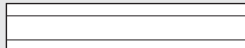
Direction of Installation






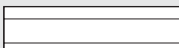
2-2


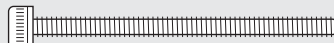
MAIN FRAME ASSEMBLY: CROSS MEMBER INSTALLATION


2 pcs
 Set Screw, 3 x 18 mm


1 pc
 Cross Member, 32 mm


3 pcs
 Nylon Lock Nut, 3 mm

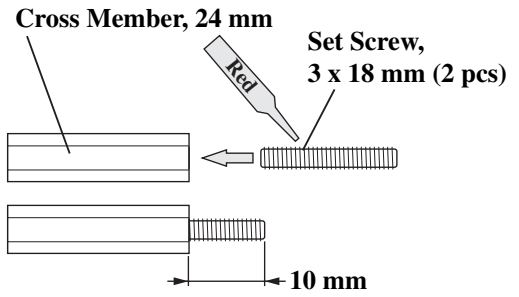

2 pcs
 Cross Member, 24 mm


3 pcs
 Socket Head Bolt, 3 x 40 mm..3 pcs

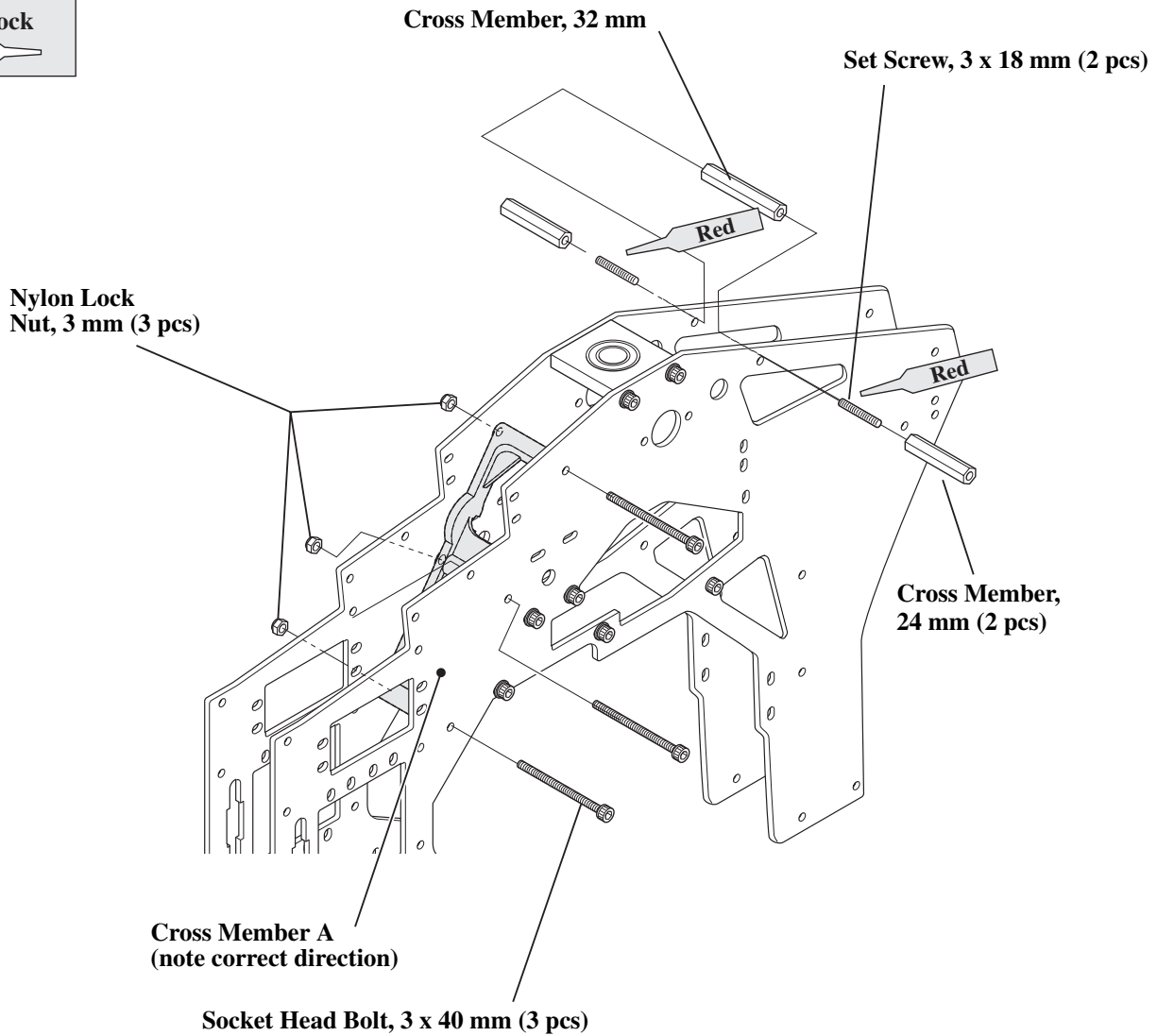
Use Red Threadlock



***TEAM TIP:** Do not apply threadlock to bolts unless you will proceed through Step 3-8 during this building session.





Note:
When installing the cross member A, be careful not to overtighten.





***TEAM TIP:** Don't tighten bolts completely at this time. These bolts will be tightened in Step 3-8.

2-3A



T-LEVER INSTALLATION



Socket Head Bolt, 3 x 28 mm..2 pcs



.....2 pcs

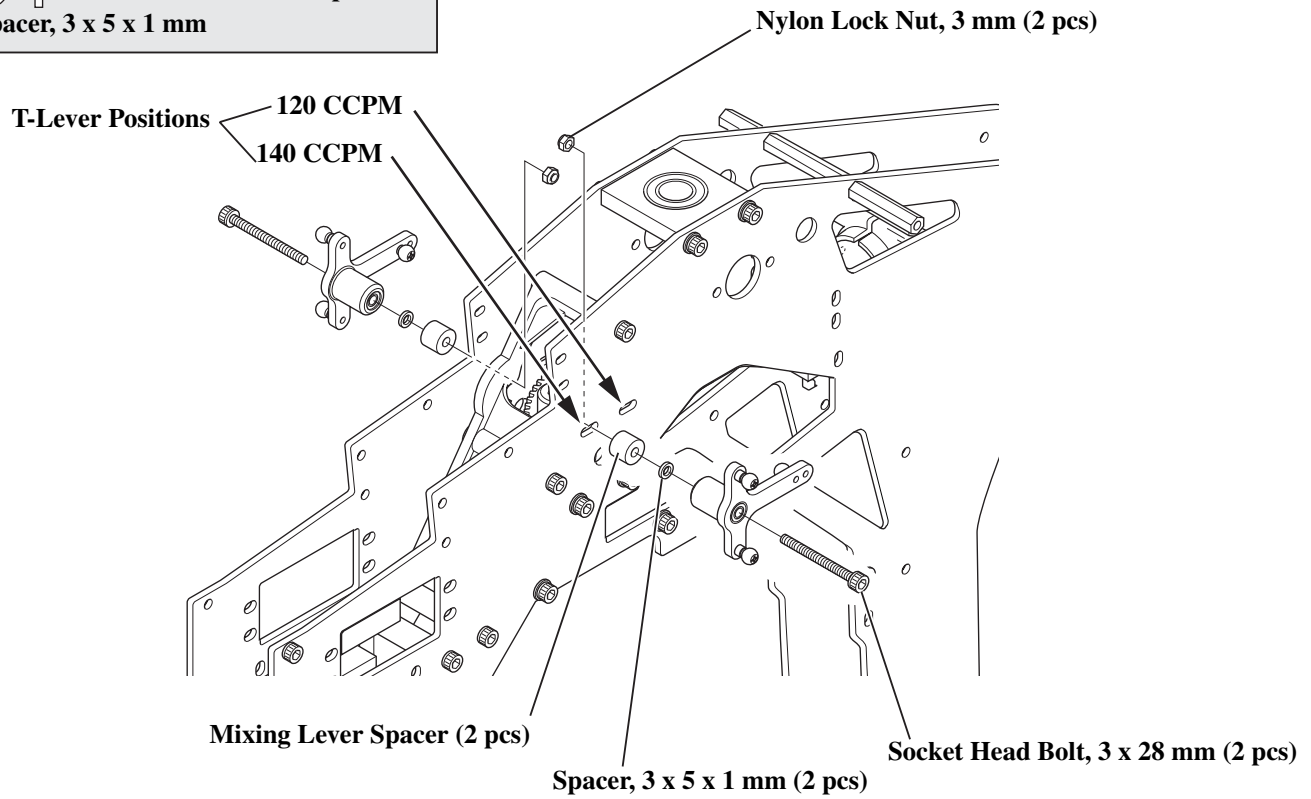
Nylon Lock Nut, 3 mm



.....2 pcs

Mixing Lever Spacer

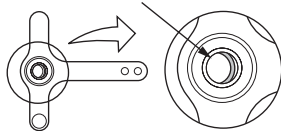


..... 2 pcs

Spacer, 3 x 5 x 1 mm



TEAM TIP: *If you have difficulty reaching the 3 mm T-lever nuts, remove the two top bolts from the plastic cross member and slide the cross member forward.*

If a collar in T-arm is too one-sided, please correct the collar to center before inserting the bolts.




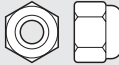

Note:

T-Lever Position on Main Frame Slots

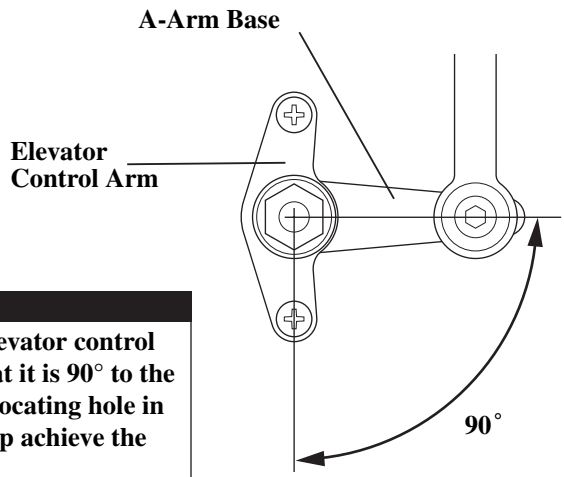
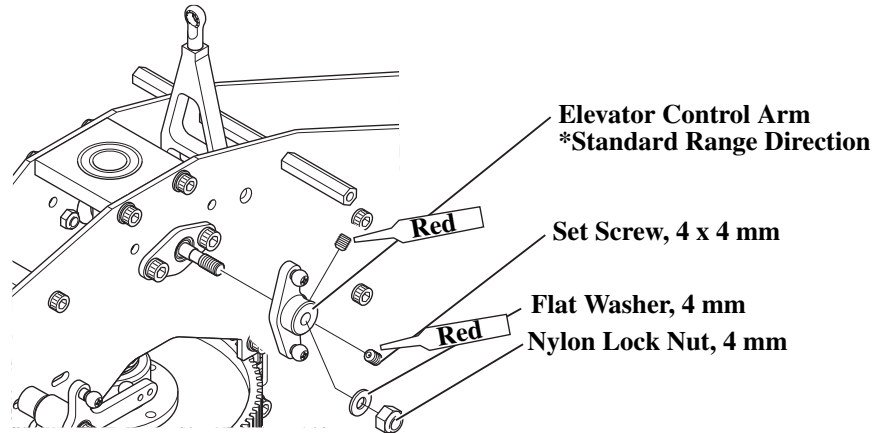
120 CCPM/Standard Range
140 CCPM/Standard Range

2-3B

ELEVATOR CONTROL ARM INSTALLATION

- 2 pcs
Set Screw, 4 x 4 mm
- 1 pc
Nylon Lock Nut, 4 mm
- 1 pc
Flat Washer, 4 mm




 Use Red Threadlock

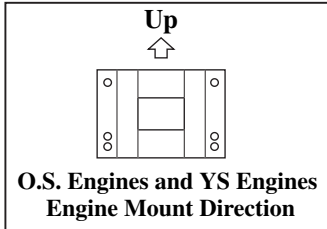


Note:
Make sure that the elevator control arm is installed so that it is 90° to the A-arm base. Use the locating hole in the main frame to help achieve the 90-degree position.

2-4

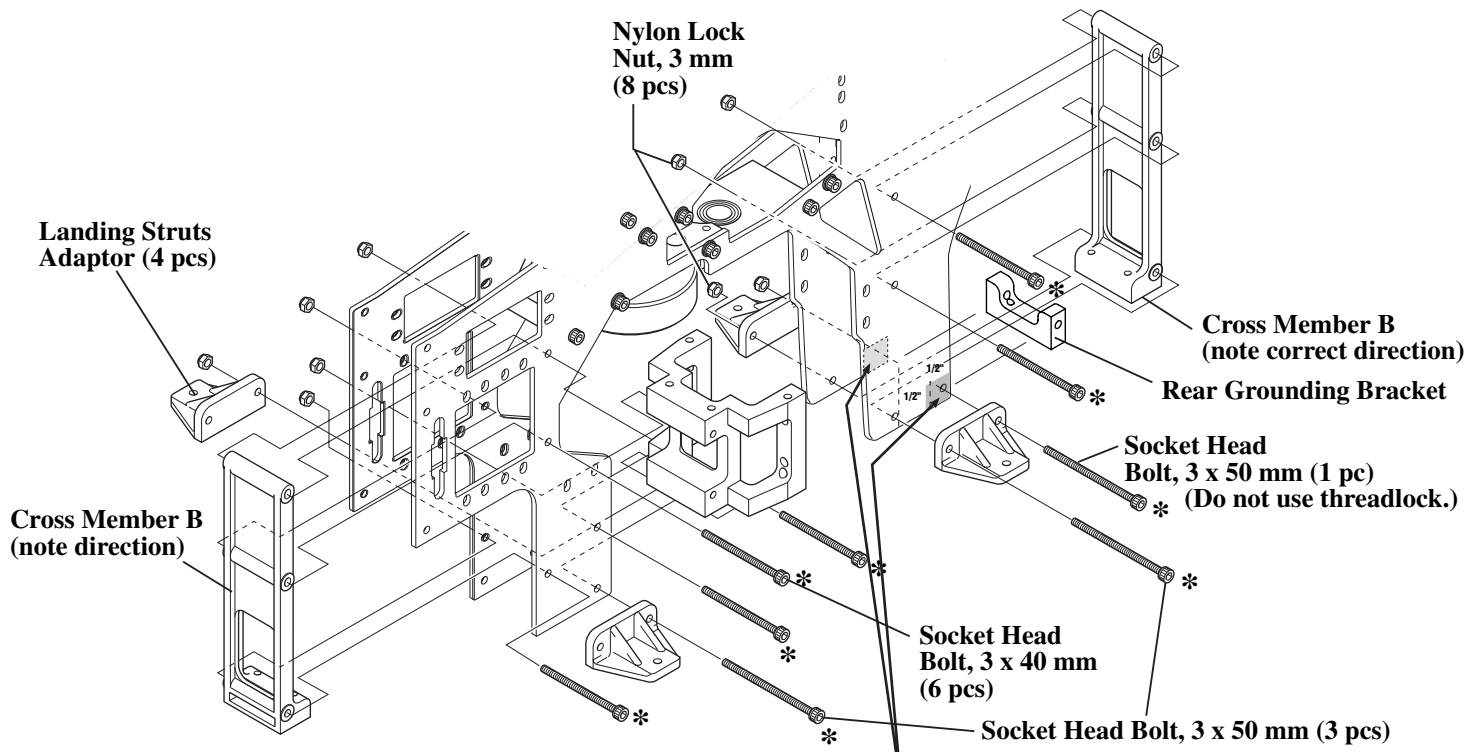
MAIN FRAME ASSEMBLY: ENGINE MOUNT/CROSS MEMBER INSTALLATION

	Socket Head Bolt, 3 x 40 mm6 pcs	9 pcs
	Socket Head Bolt, 3 x 50 mm3 pcs		





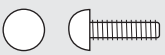

***TEAM TIP:** Do not tighten bolts completely at this time. These bolts will be tightened in Step 3-8.

Remove a 1/2" x 1/2" portion of the clear coating from the inside of each main frame as shown.

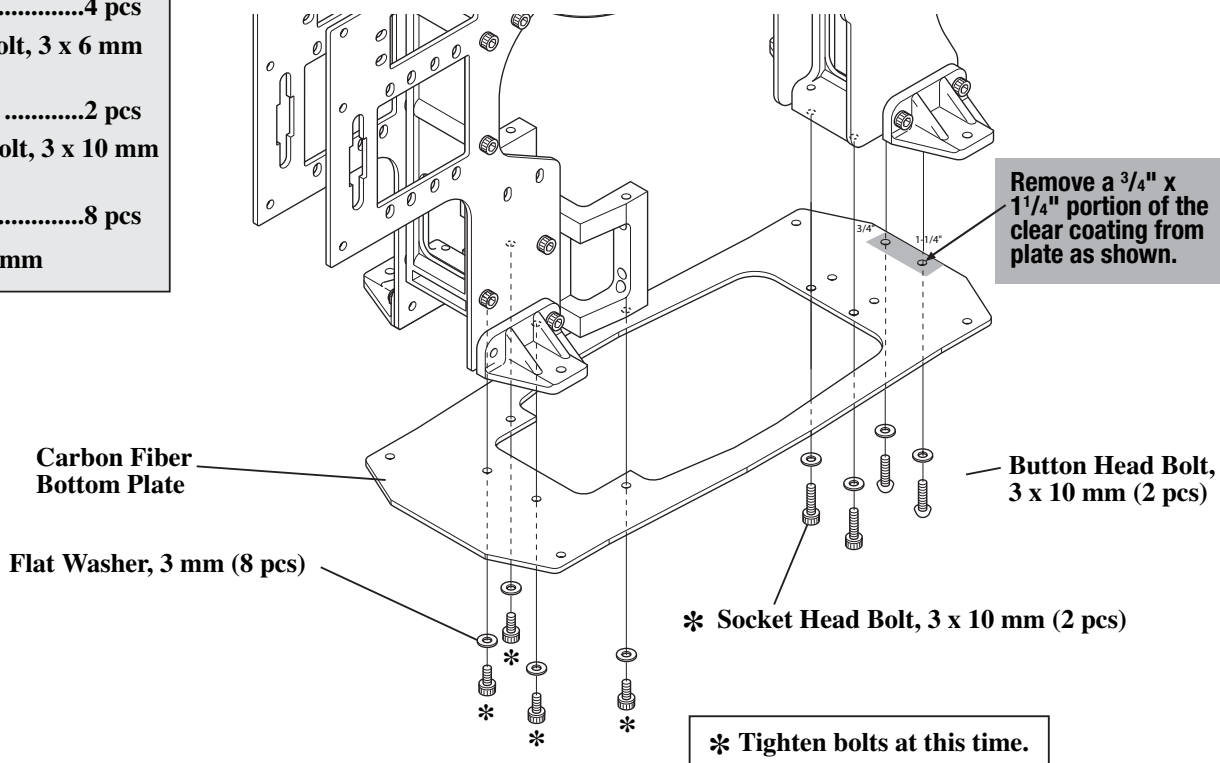


Remove a 1/2" x 1/2" portion of the clear coating from the inside of each frame plate as shown.

Remove a $\frac{3}{4}$ " x $1\frac{1}{4}$ " portion of the clear coating from the top of the bottom carbon fiber plate as shown.

- 2 pcs
Socket Head Bolt, 3 x 10 mm
- 4 pcs
Socket Head Bolt, 3 x 6 mm
- 2 pcs
Button Head Bolt, 3 x 10 mm
- 8 pcs
Flat Washer, 3 mm

Use Red Threadlock








When properly installed, the RF grounding bracket will make contact with both the two main frames and the bottom carbon plate in the areas where the clear coating has been removed. This will properly complete the ground between the main frame and the bottom carbon plate.



2-6

FUEL TANK INSTALLATION

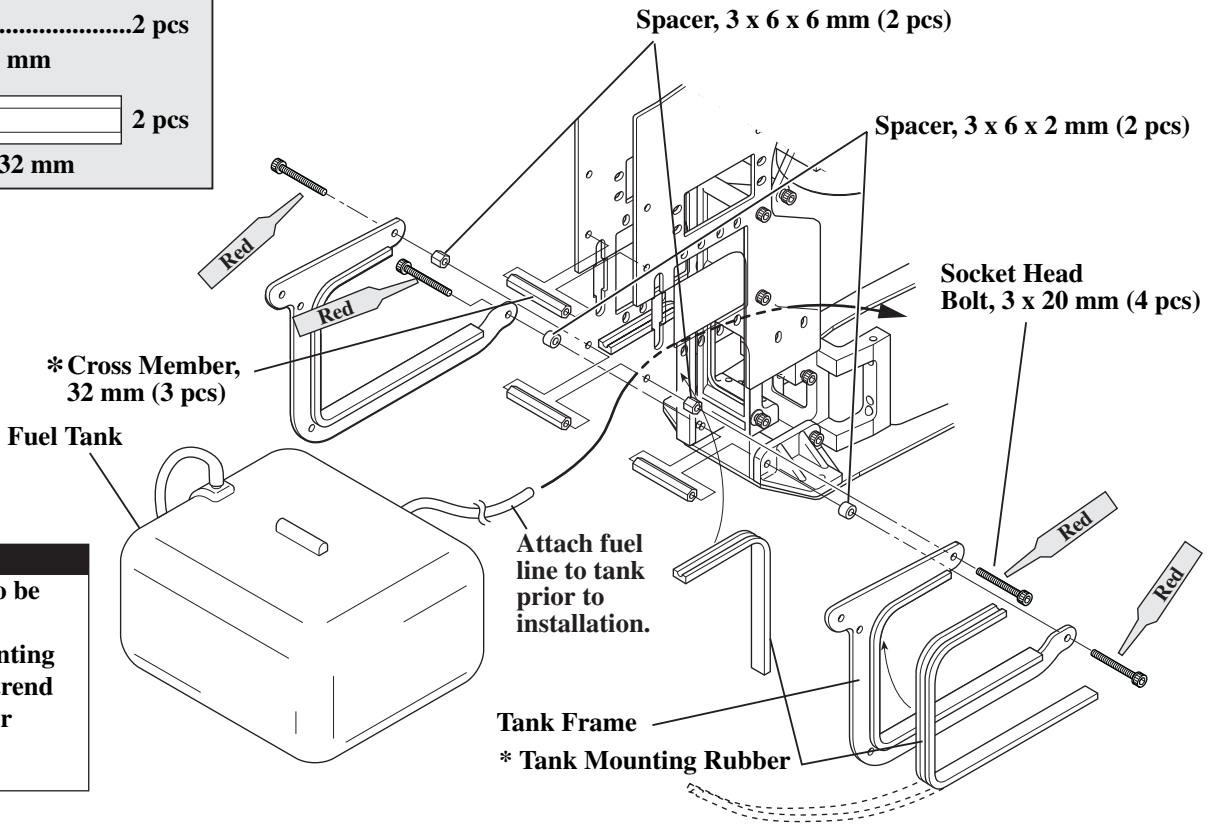
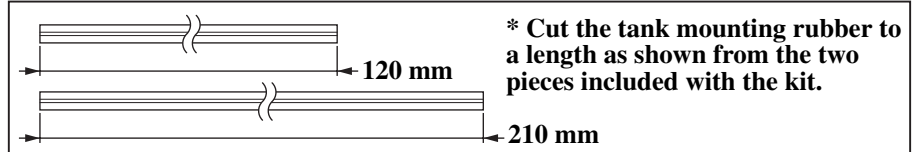
 4 pcs
Socket Head Bolt, 3 x 20 mm

 2 pcs
Hex Spacer, 3 x 6 x 6 mm

 2 pcs
Spacer, 3 x 6 x 2 mm

  2 pcs
Cross Member, 32 mm

Use Red Threadlock



*** Cross Member, 32 mm (3 pcs)**

Fuel Tank

Attach fuel line to tank prior to installation.

Tank Frame

*** Tank Mounting Rubber**

Socket Head Bolt, 3 x 20 mm (4 pcs)

Spacer, 3 x 6 x 6 mm (2 pcs)






Spacer, 3 x 6 x 2 mm (2 pcs)

*** Note:**
 If a YS engine is to be used, replace the existing tank mounting rubber with Aerotrend large fuel tubing or equivalent.

*** TEAM TIP:** Insert 32 mm cross members before installing the fuel tank.

2-7

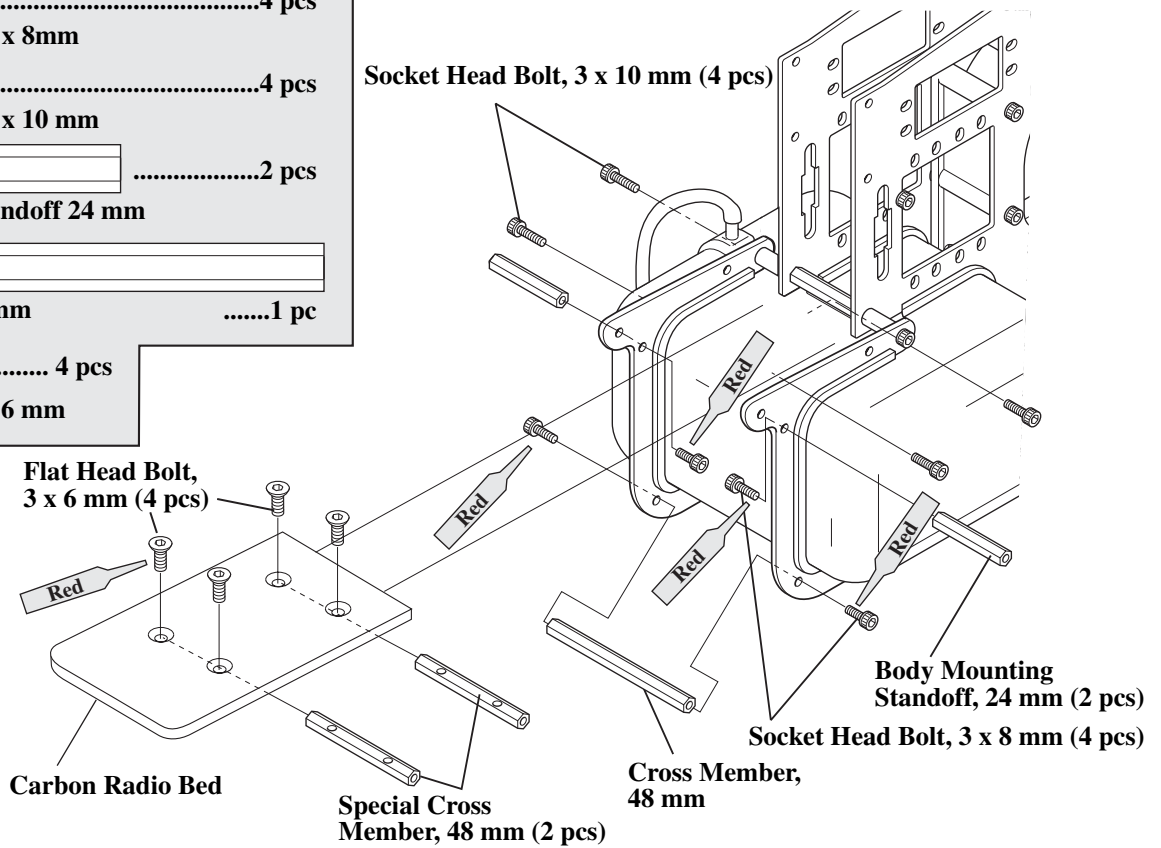
FRONT RADIO BED INSTALLATION

- 4 pcs
Socket Head Bolt 3 x 8mm
- 4 pcs
Socket Head Bolt 3 x 10 mm
- 2 pcs
Body Mounting Standoff 24 mm
- 1 pc
Cross Member 48 mm
-  4 pcs
Flat Head Bolt, 3 x 6 mm

Use Red Threadlock



Note:
Body mounting standoffs attach to the forward-most holes in the tank mounts as shown.


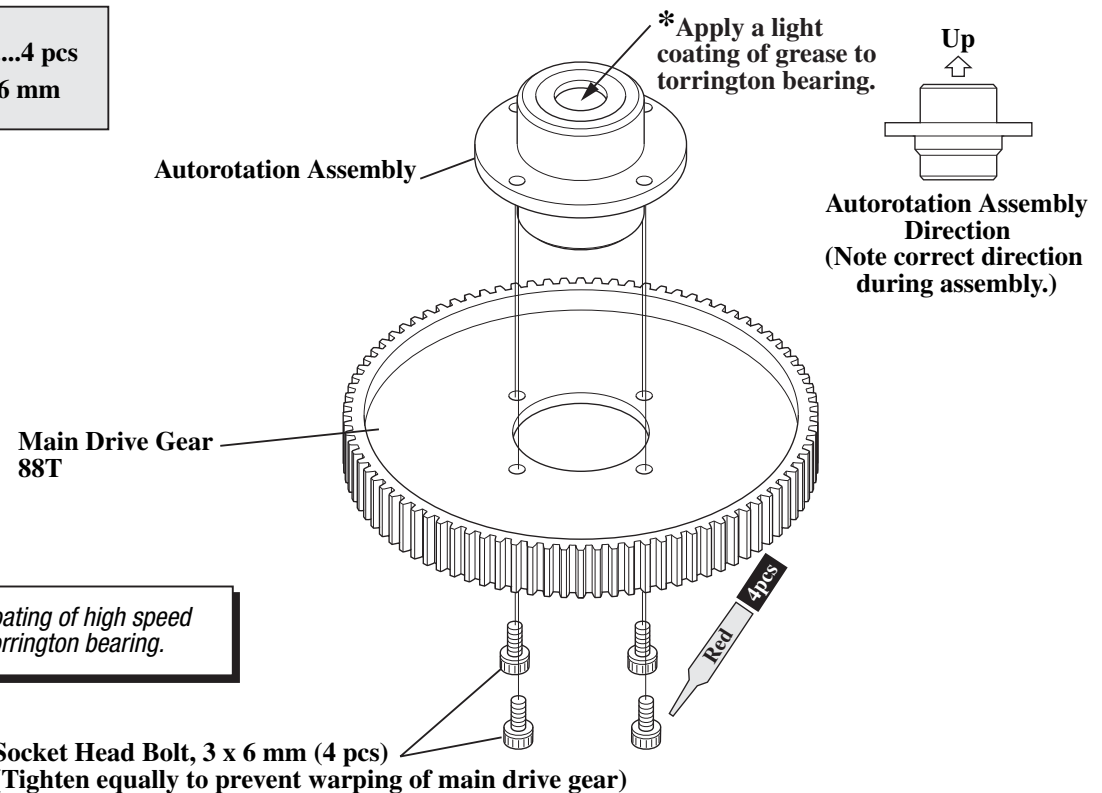


3-1A

MAIN DRIVE GEAR/AUTOROTATION ASSEMBLY

- 4 pcs
Socket Head Bolt, 3 x 6 mm

Use Red Threadlock





***TEAM TIP:** Apply a light coating of high speed grease to the inside of the Torrington bearing.

Socket Head Bolt, 3 x 6 mm (4 pcs)
(Tighten equally to prevent warping of main drive gear)

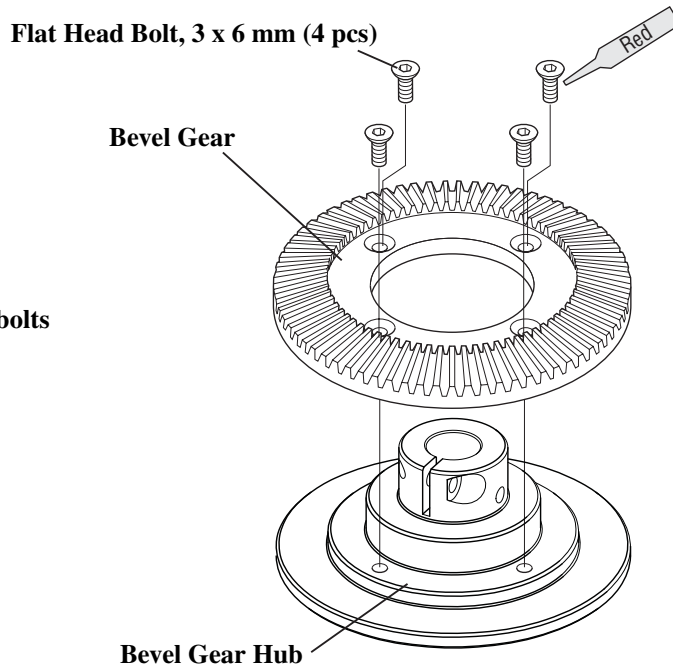
3-1B

BEVEL GEAR ASSEMBLY

 4 pcs
Flat Head Bolt, 3 x 6 mm


 Use Red Threadlock


Attach the bevel gear hub as shown. Be sure not to overtighten the four 3 mm bolts as this could distort the bevel gear.




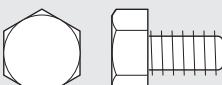
3-2


MAIN SHAFT/MAIN DRIVE GEAR INSTALLATION

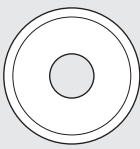
 1 pc
Socket Head Bolt, 3 x 12 mm

 ... 1 pc
Socket Head Bolt, 3 x 20 mm

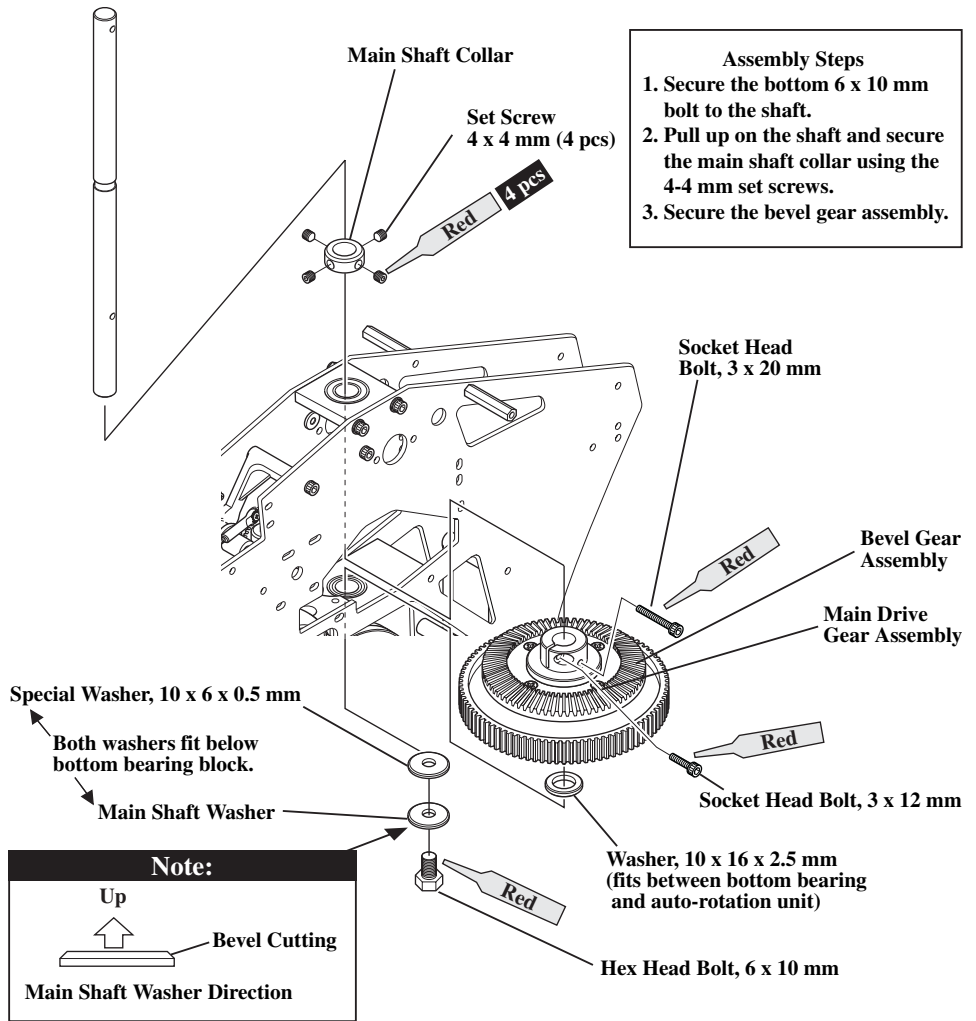
4 pcs
Set Screw, 4 x 4 mm

1 pc
Hex Head Bolt, 6 x 10 mm

1 pc
Steel Washer, 10 x 16 x 2.5 mm

1 pc
Main Shaft Washer









 Use Red Threadlock

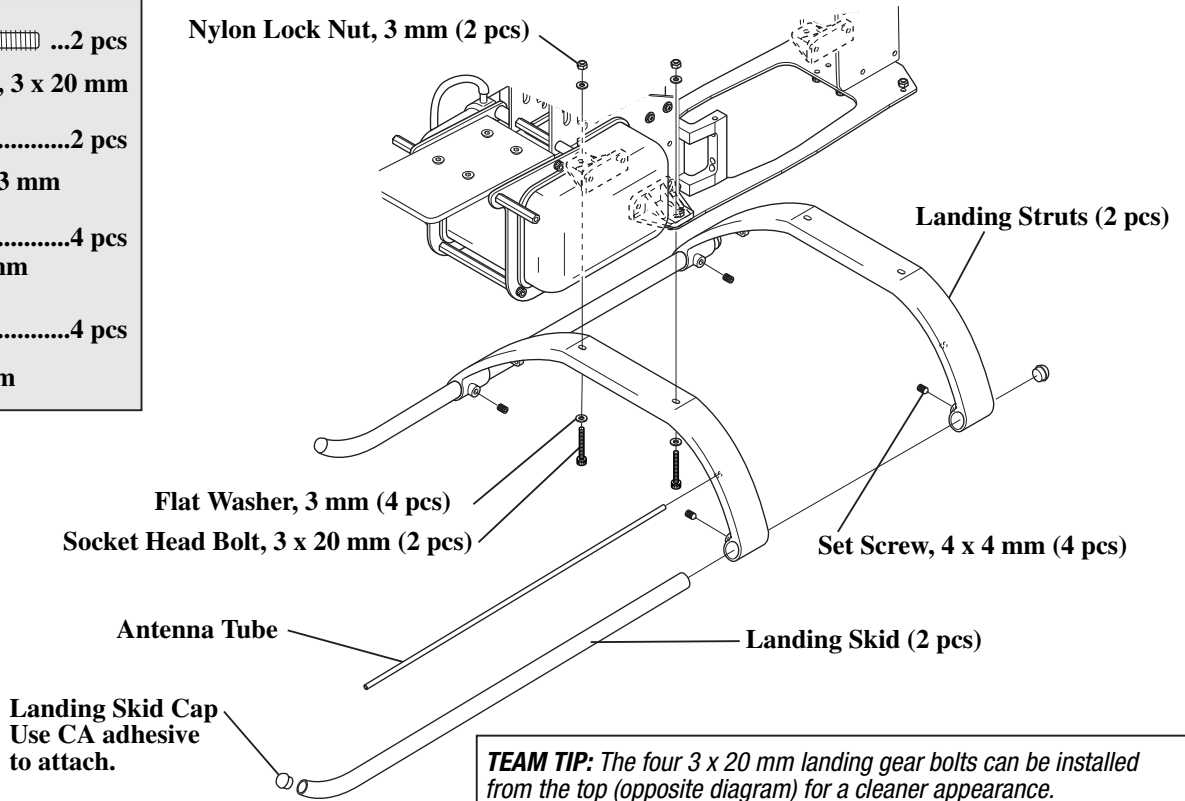


- Assembly Steps**
1. Secure the bottom 6 x 10 mm bolt to the shaft.
 2. Pull up on the shaft and secure the main shaft collar using the 4-4 mm set screws.
 3. Secure the bevel gear assembly.

3-3

LANDING GEAR ASSEMBLY INSTALLATION



-   ...2 pcs
Socket Head Bolt, 3 x 20 mm
-  2 pcs
Nylon Lock Nut, 3 mm
-  4 pcs
Set Screw, 4 x 4 mm
-  4 pcs
Flat Washer, 3 mm




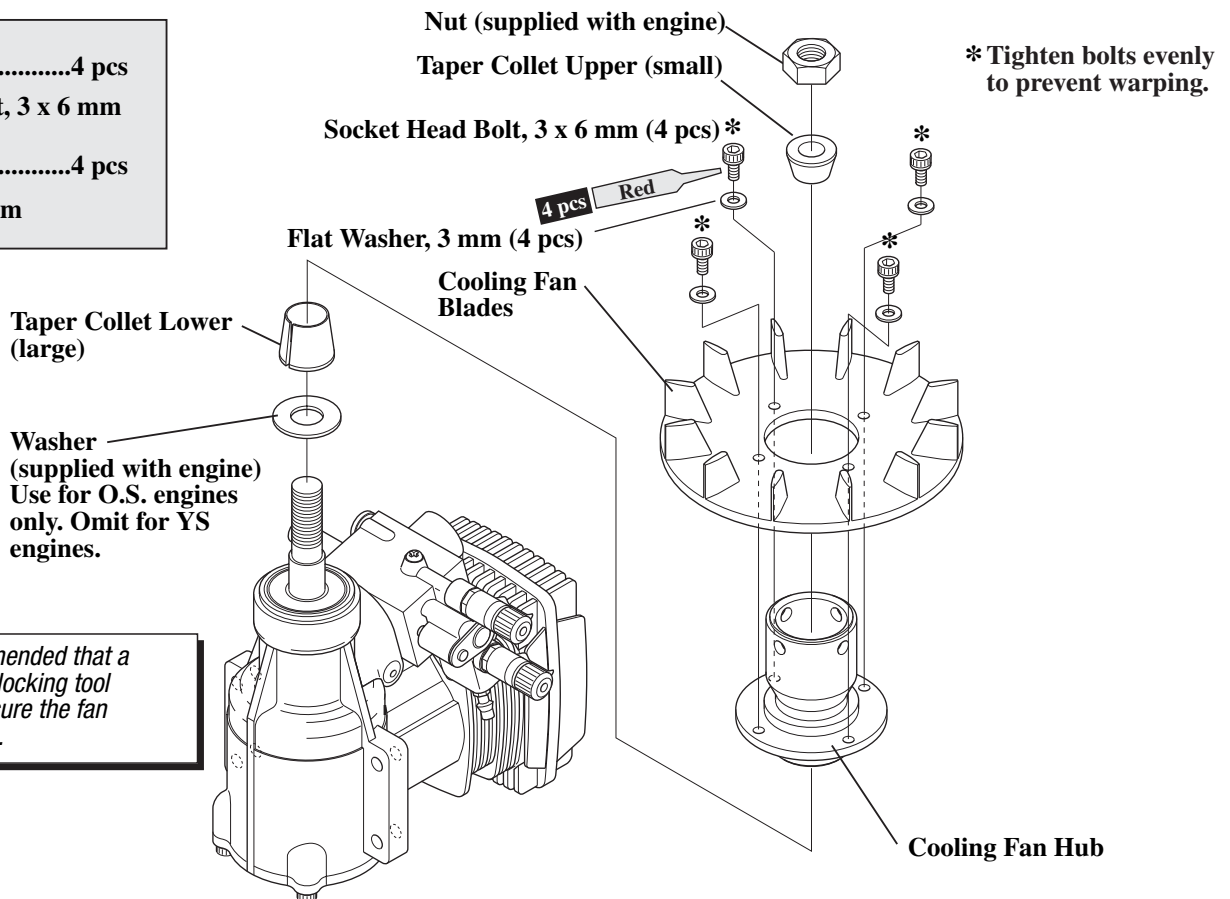
TEAM TIP: The four 3 x 20 mm landing gear bolts can be installed from the top (opposite diagram) for a cleaner appearance.

3-4

COOLING FAN/HUB INSTALLATION

- 4 pcs
Socket Head Bolt, 3 x 6 mm
- 4 pcs
Flat Washer, 3 mm





Use Red Threadlock

TEAM TIP: It is recommended that a crankshaft (not piston) locking tool be used to properly secure the fan assembly to the engine.

3-5

CLUTCH ASSEMBLY ATTACHMENT

- 2 pcs
Socket Head Bolt, 4 x 6 mm
- 1 pc
Flat Head Screw, 2 x 8 mm
- 1 pc
Steel Joint Ball
- 1 pc
Hex Nut, 2 mm

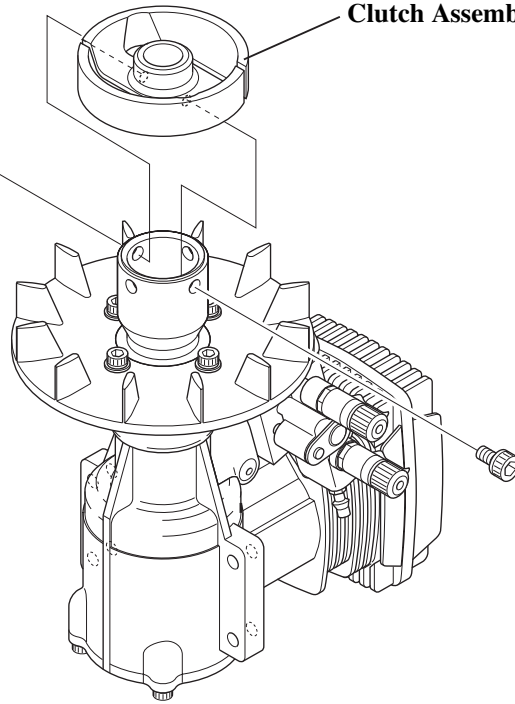
Use Red Threadlock



Socket Head Bolt, 4 x 6 mm (2 pcs)

2 pcs Red

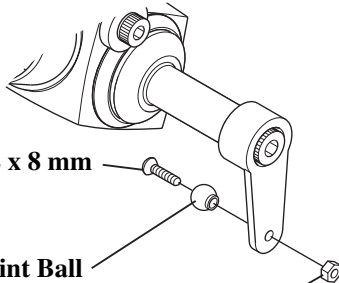
Clutch Assembly



Flat Head Screw, 2 x 8 mm

Steel Joint Ball



Hex Nut, 2 mm



TEAM TIP: Before the clutch is permanently attached, rotate the clutch/fan assembly to check for trueness. If any clutch runout is detected, reposition the clutch at 90° intervals through the use of the four holes in the fan hub until optimum clutch trueness is achieved.

3-6

ENGINE INSTALLATION

- 4 pcs
Socket Head Bolt, 4 x 15 mm
- 4 pcs
Flat Washer, 4 mm

Use Red Threadlock



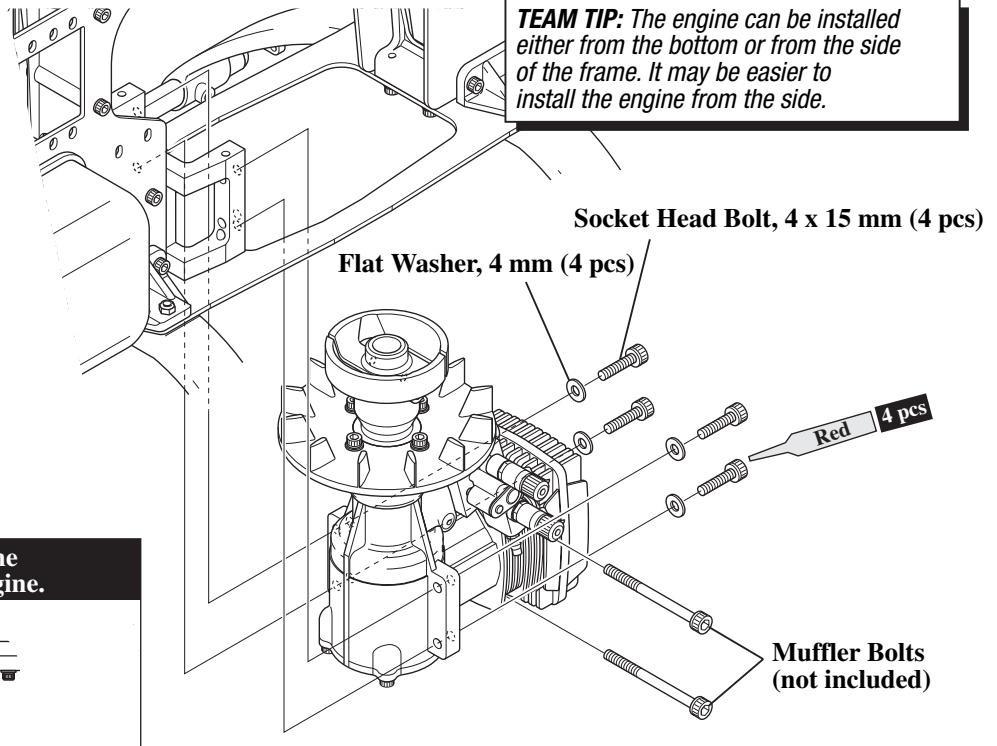
TEAM TIP: The engine can be installed either from the bottom or from the side of the frame. It may be easier to install the engine from the side.

Socket Head Bolt, 4 x 15 mm (4 pcs)

Flat Washer, 4 mm (4 pcs)

Red 4 pcs

Muffler Bolts (not included)



Caution: Be sure to note the correct installation of the engine.




1. Adjust the position of the engine as shown so the bottom of the clutch assembly is flush with the bottom of the clutch bell. Also check to insure that the engine and clutch bell are parallel.
2. It is highly recommended that you insert the muffler bolts into the engine case prior to installing the engine in the frame.

3-7

COOLING FAN SHROUD BRACKET ATTACHMENT

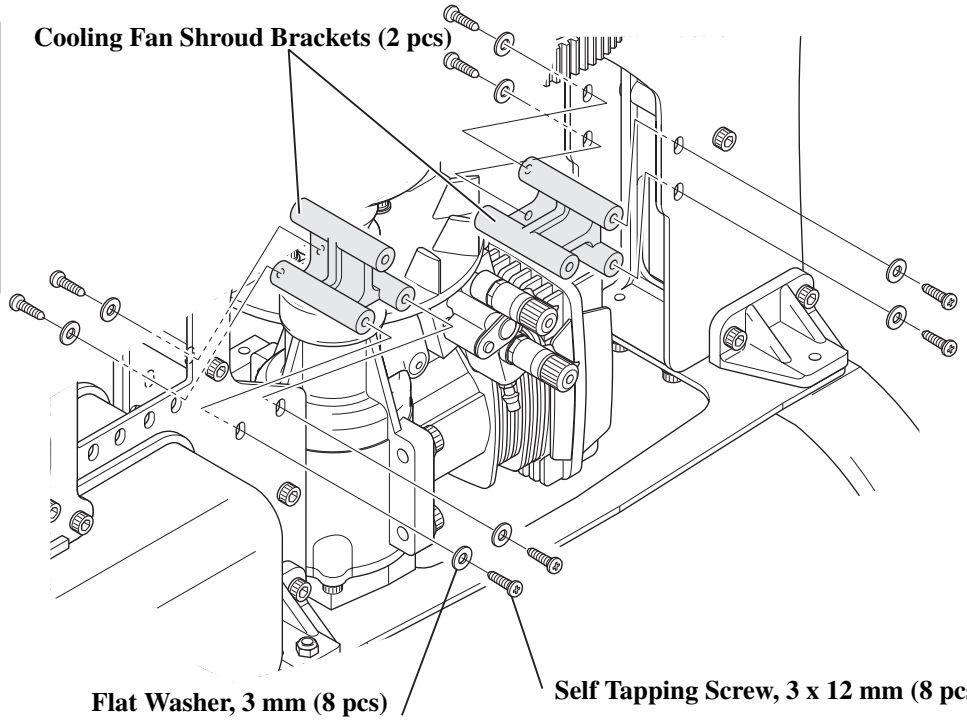
8 pcs
Self Tapping Screw, 3 x 12 mm

8 pcs
Flat Washer, 3 mm

Note:

Do not tighten screws at this time. They will be tightened in Step 3-9.

Cooling Fan Shroud Brackets (2 pcs)



3-8

BOLT TIGHTENING ORDER/GEAR MESH ADJUSTMENT

Use Red Threadlock



Bolt Tightening Order:

1. Motor Mount to Main Frame Plates
2. Start Shaft Bearing Block/Bearing Blocks "A" & "B"
3. Cross member "A", and front Crossmember "B" to Main Frame Plates
4. Upper Main Shaft Bearing Block to Main Frame Plates
5. Rear Cross member "B" to Main Frame Plates
6. Tighten all remaining bolts on frame left loose from Steps 2-1, 2-2, and 2-4

6 Tighten all remaining bolts.

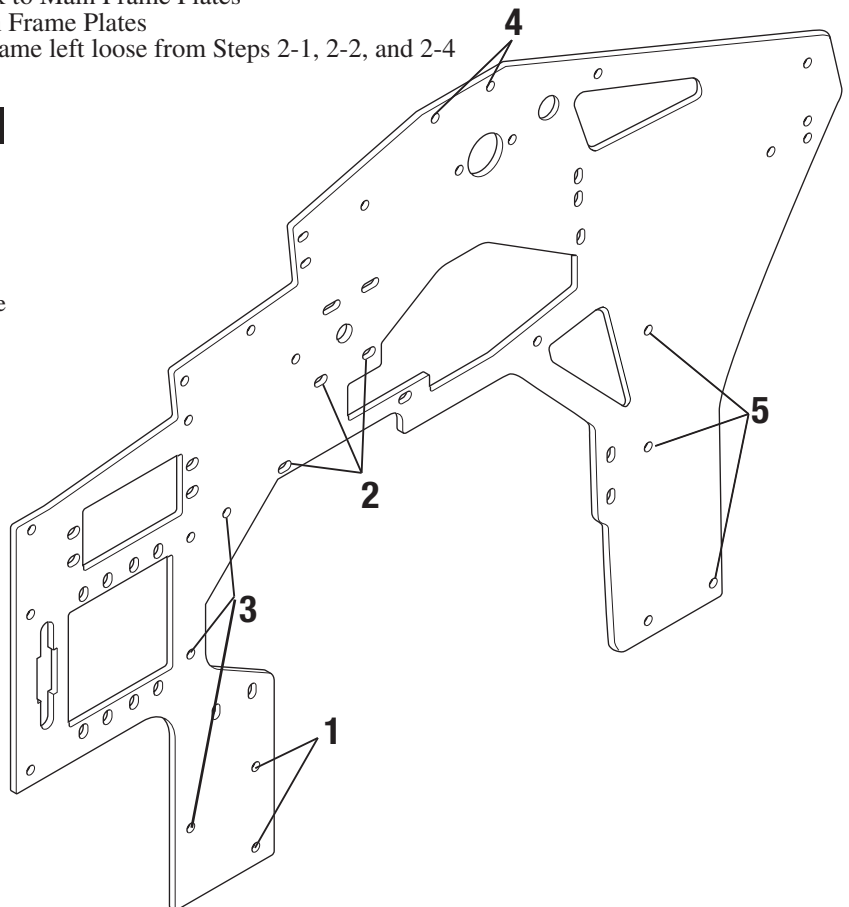
Gear Mesh Adjustment

Once the engine has been installed, adjust the gear mesh of the main pinion so that a slight amount of "backlash" is achieved. One method for achieving the proper clearance is to insert a folded piece of paper between the two gears, press the gears together, then secure the bearing blocks in place. When setting the gear mesh, make sure that the pinion gear remains parallel to the main drive gear teeth, as it is possible to alter the pinion gear angle during adjustment.

If you find difficulty achieving proper alignment of the pinion, it is also possible to loosen the six bolts that attach the engine/mount to the main frame. This will allow the engine/mount to be repositioned to achieve the proper gear mesh.

Once the desired gear mesh has been achieved, tighten all loose bolts from Step 2-1. Please remember to use threadlock on the bolts securing the upper start shaft pinion block.


Please also remember to apply threadlock and tighten the two 3 x 14 mm socket head bolts that connect bearing block "A" to bearing block "B". (see Step 1-1 for details).





TEAM TIP: Once the gear mesh/engine alignment has been established, rotate the start shaft assembly first counterclockwise, then clockwise. When moved clockwise, the start shaft assembly should move freely with little or no resistance. If resistance is present, the clutch/start shaft assembly are not aligned properly. Readjust as necessary.

3-9

COOLING FAN SHROUD INSTALLATION

  ...4 pcs
Self Tapping Screw, 3 x 12 mm

 6 pcs
Self Tapping Screw, 2.6 x 8 mm

 |4 pcs
Flat Washer, 3 mm

Cooling Fan Shroud (Right)

Glow Plug Opening
(can be enlarged if
necessary)

Tighten after right
shroud half has
been aligned.

Cooling Fan
Shroud (left)

TEAM TIP: The best alignment of the fan shroud can be achieved by attaching only the right half of the shroud. Next, align the mounts so the shroud is centered around the fan. Tighten the fan mounts then attach the left half of the shroud. With some engines and Ni-starters, you may need to trim the glow plug opening in the shroud for additional clearance.

Flat Washer, 3 mm (4 pcs)
Self Tapping Screw, 3 x 12 mm (4 pcs)
Self Tapping Screw, 2.6 x 8 mm (6 pcs)

3-10

INSTALLATION OF THE MUFFLER/FUEL LINE CONNECTIONS

Muffler Bolts

Pressure Fuel Line Attachment
(not included)



.90-Size Muffler
(not included)


For muscle pipe
installation, please refer
to the muscle pipe instructions
for proper mounting.

Fuel Line Connection
Main Fuel Line
(Connect to carburetor.)


4-1


SWASHPLATE ASSEMBLY


 1 pc
Set Screw, 3 x 3 mm

4 pcs
Flat Head Screw, 2 x 10 mm

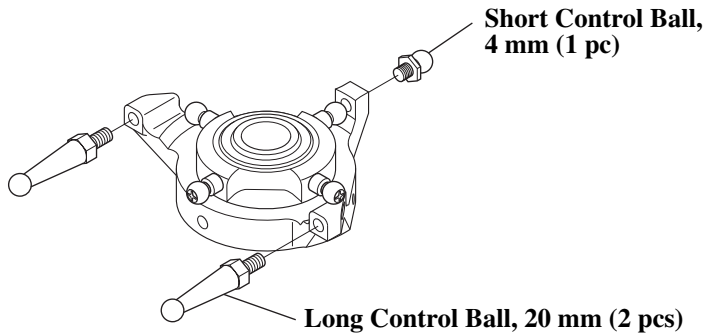
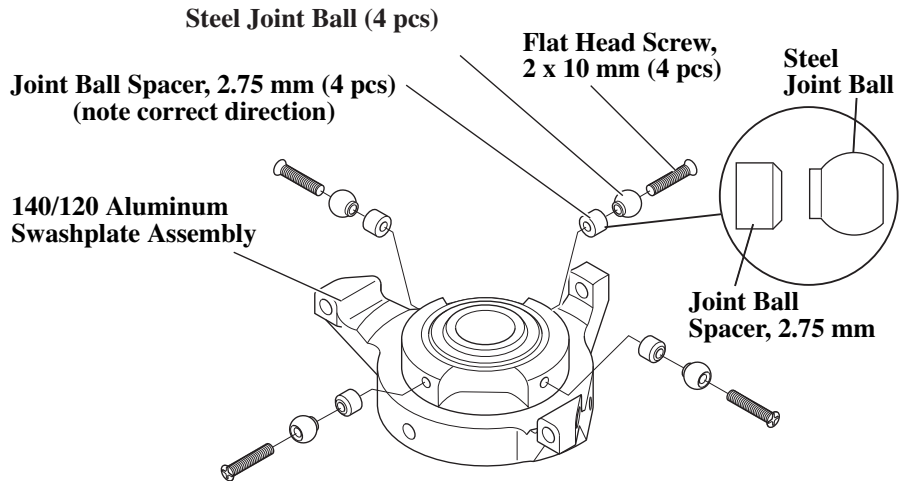
4 pcs
Steel Joint Ball

4 pcs
Joint Ball Spacer, 2.75 mm

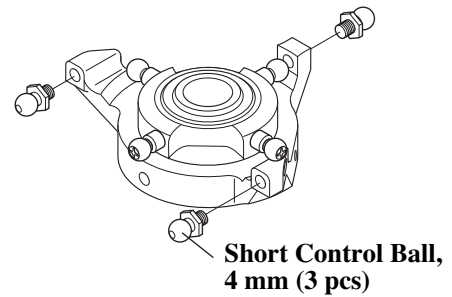
3 pcs
Control Ball, 4 mm

2 pcs
Control Ball, 20 mm (140 CCPM)

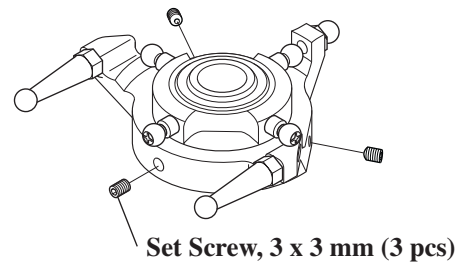
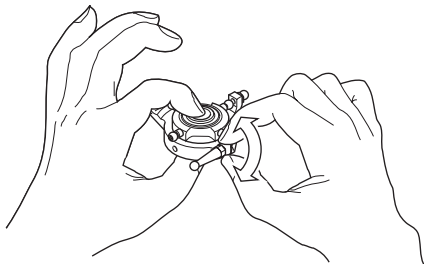
 Use Red Threadlock on all screws



140 CCPM Swash Type



120 CCPM Swash Type



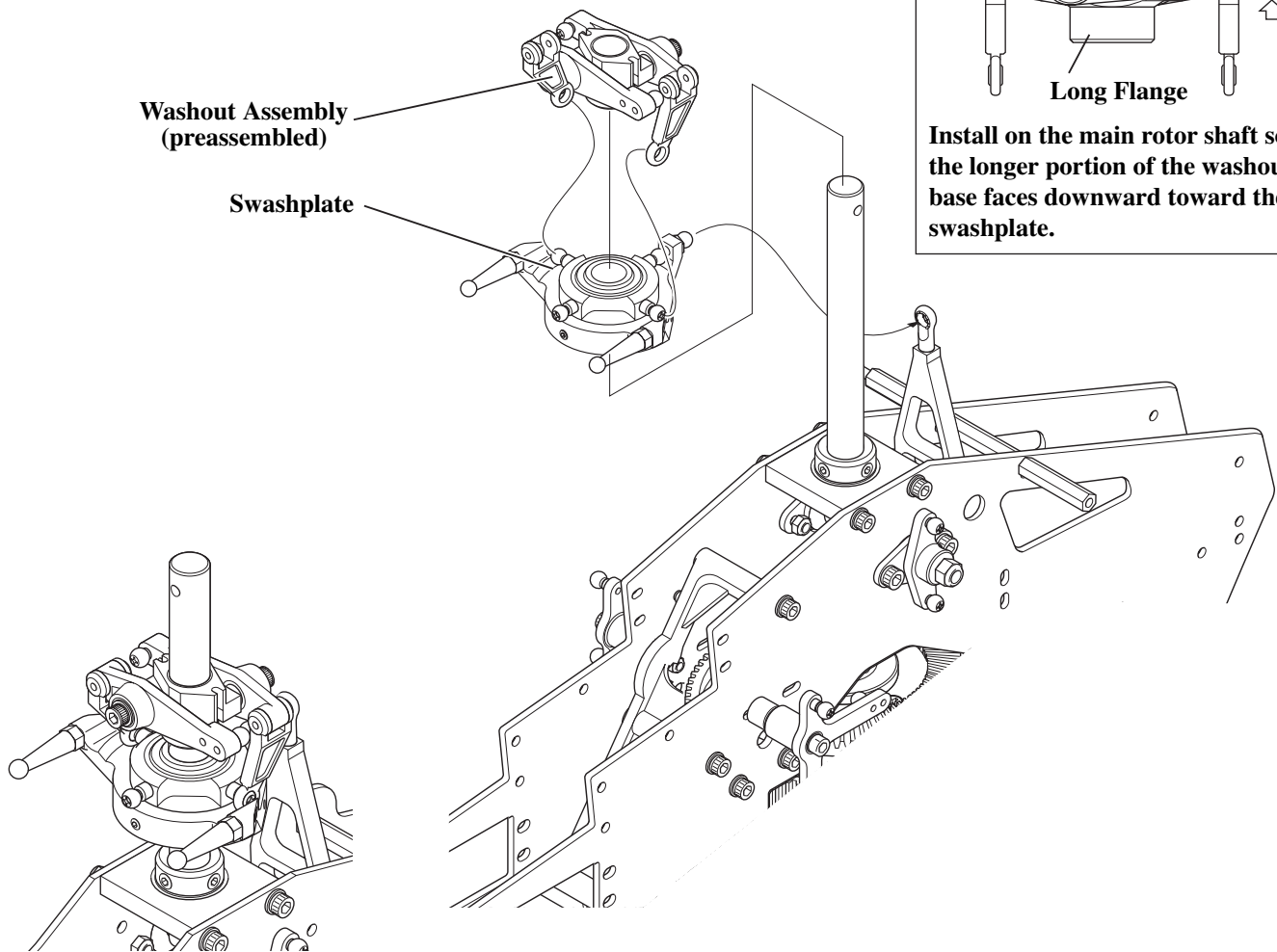
Note:

If there is play between the upper and lower swashplate, tighten set screw 3 x 3 mm to the lower of swashplate little by little.

***CAUTION :** Do not overtighten as binding and damage to the bearing can occur.

4-2

SWASHPLATE/WASHOUT INSTALLATION



Install on the main rotor shaft so the longer portion of the washout base faces downward toward the swashplate.

Note:

Please note the proper upper swashplate ring position as shown before attaching the washout unit. When attached properly, the relief areas in the upper swashplate ring will allow increase clearance for the washout arms.

Use caution when connecting the ball links to the swashplate balls to prevent damage. It is also a good idea to size the ball links with the JR Ball Link Sizing tool prior to attachment.

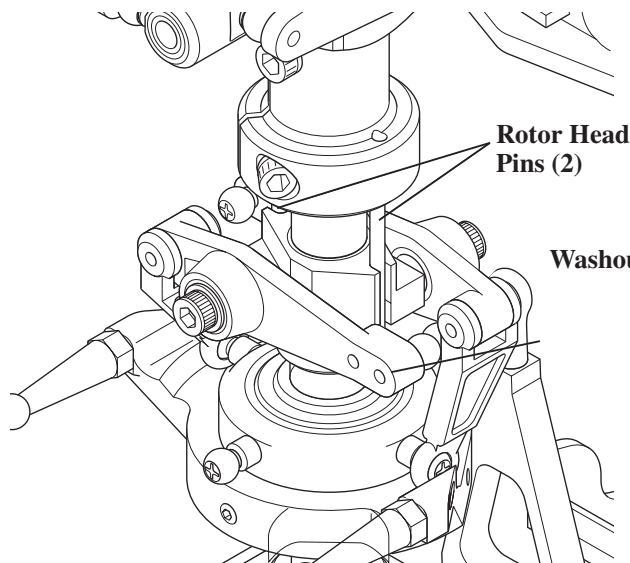
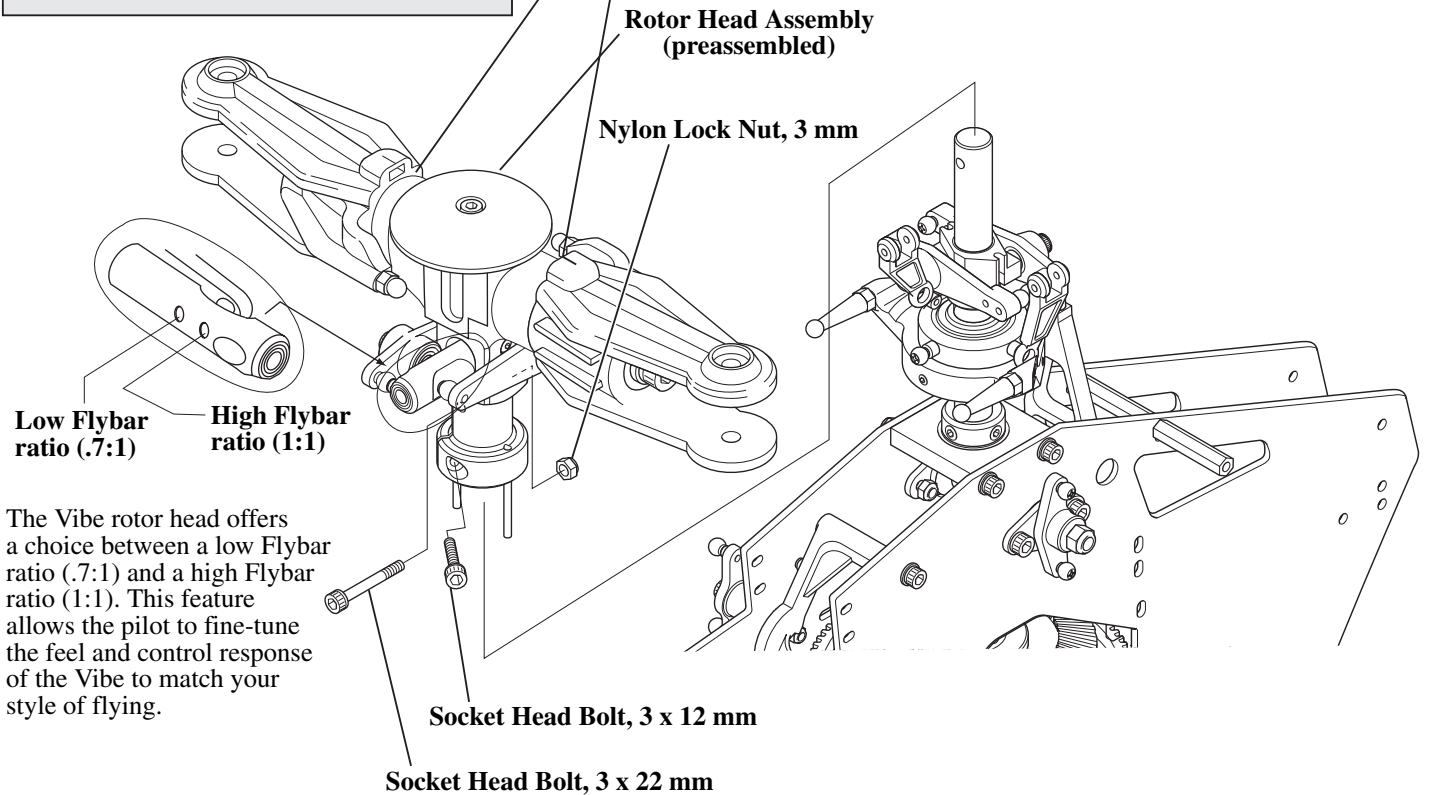
4-3

ROTOR HEAD INSTALLATION

-1 pc
Special Socket Head Bolt, 3 x 22 mm
(Long Shank)
-1 pc
Socket Head Bolt, 3 x 12 mm
-1 pc
Nylon Lock Nut, 3 mm

Main Rotor Head Dampeners Maintenance

The main rotor head dampeners should be inspected after 30 to 50 flights and replaced as needed. When replacing the dampeners, it is also suggested that the thrust bearings be greased using a high speed grease to prolong bearing life.






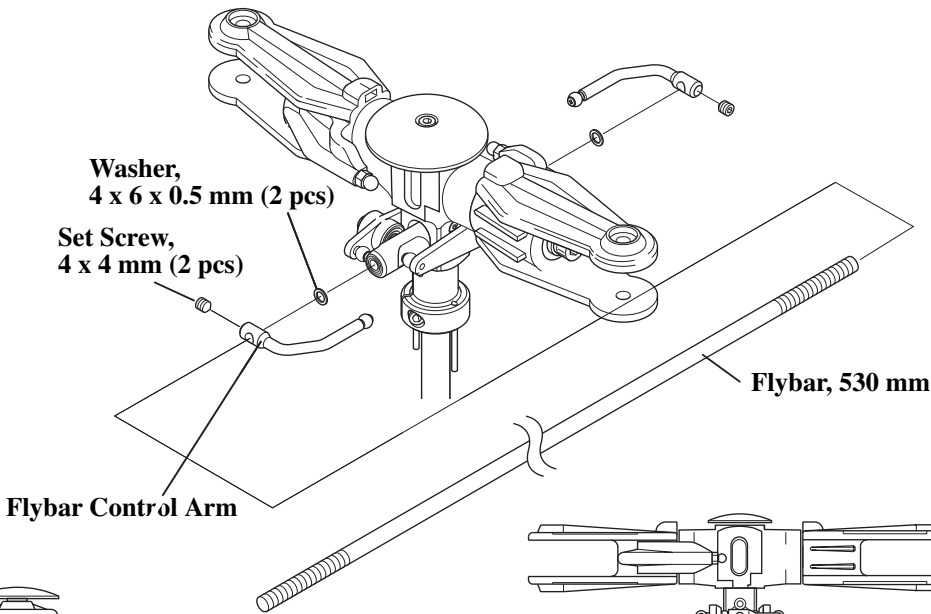
TEAM TIP: For safety, it's important to note that a hardened bolt with a long shank should be used to attach the rotor head. We have seen many people, over time, replace these with standard bolts. This increases the chances of failures in flight.

Note:
Be sure to engage the rotor head pins (2) into the washout base driver before securing the rotor head assembly in place.

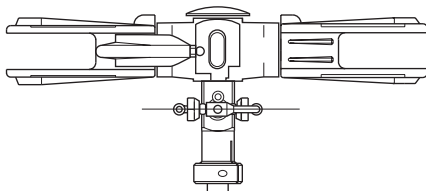
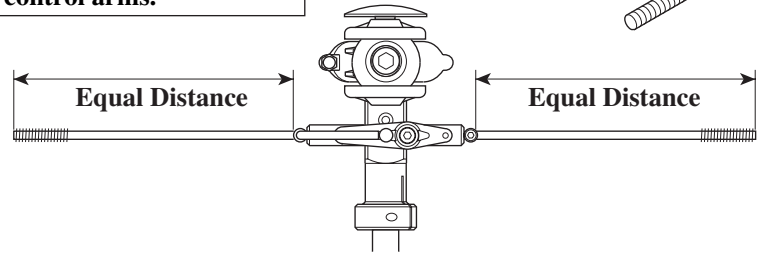
4-4

FLYBAR INSTALLATION

-  2 pcs
Set Screw, 3 x 4 mm
-  |2 pcs
Washer, 4 x 6 x 0.5 mm





Caution:
Center the flybar in the seesaw shaft before securing the two flybar control arms.

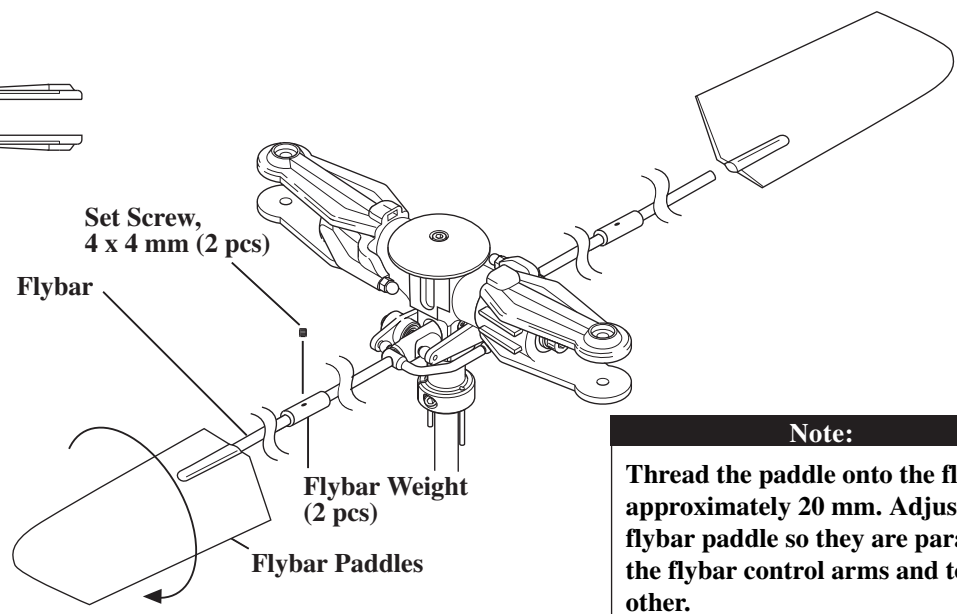
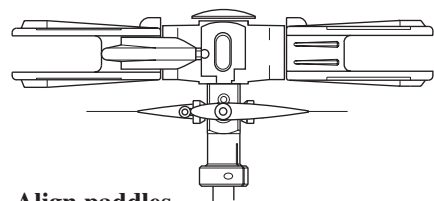


Caution:
Check to ensure that the two flybar control arms are parallel to the center line of the flybar.

4-5

FLYBAR PADDLE ATTACHMENT

-  2 pcs
Set Screw, 4 x 4 mm

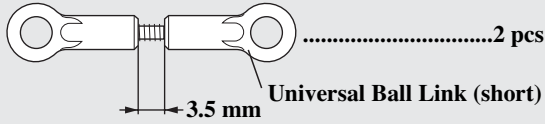


Note:
Thread the paddle onto the flybar approximately 20 mm. Adjust each flybar paddle so they are parallel to the flybar control arms and to each other.

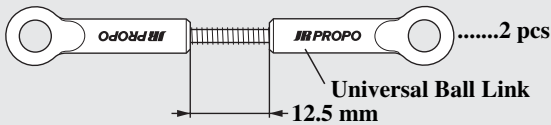
TEAM TIP: Flight tune your Vibe to achieve the desired cyclic rate by moving the flybar weights in and out on the flybar (in=more cyclic rate, out=less). Make sure that they are set to the same distance or vibration can occur.

TEAM TIP: Use JB-weld (epoxy steel) to glue the flybar paddles to the flybar. The glue prevents the paddles from turning in flight.

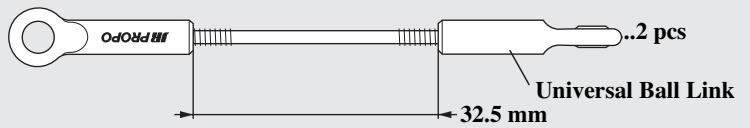
- ① SEESAW ARM TO MAIN BLADE HOLDER
(Threaded Rod 2.3 x 15 mm)



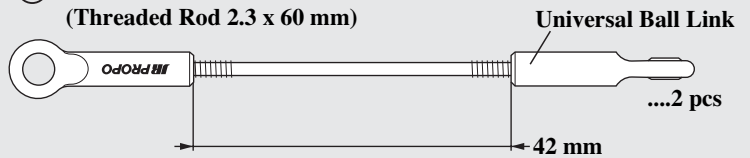
- ② WASHOUT ARM TO FLYBAR CONTROL ARM
(Threaded Rod 2.3 x 30 mm)



- ③ SWASHPLATE TO SEESAW ARM
(Threaded Rod 2.3 x 50 mm)



- ④ SWASHPLATE TO T-ARM
(Threaded Rod 2.3 x 60 mm)



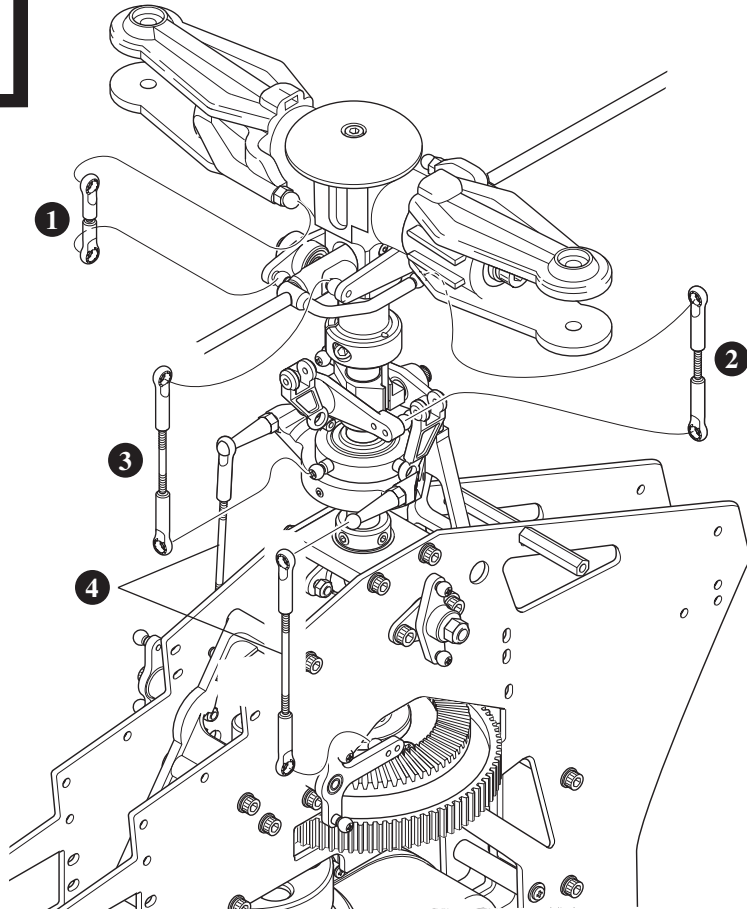
TEAM TIP: The JR ball links are designed with little ridges around the lip of the link. These ridges, in conjunction with the JR ball link sizing tool, are there to help you custom fit the link to the ball. If the link fits on the ball too tight, you can use the reaming tool to enlarge the link hole size. If the link fits too loose on the ball, you can push in on the ridges on the link with a small pair of pliers. This reduces the size of the link hole and makes the link fit tighter. JR links are some of the best links available. It is important to note that very little force is needed on the ridges to resize the link. Using pliers on any other part of the link can cause the links to break.



TEAM TIP: After many flights there can be excess play between the ball and link. It is usually the ball that has actually worn. So when replacing parts, you will actually get the best results by replacing the balls.

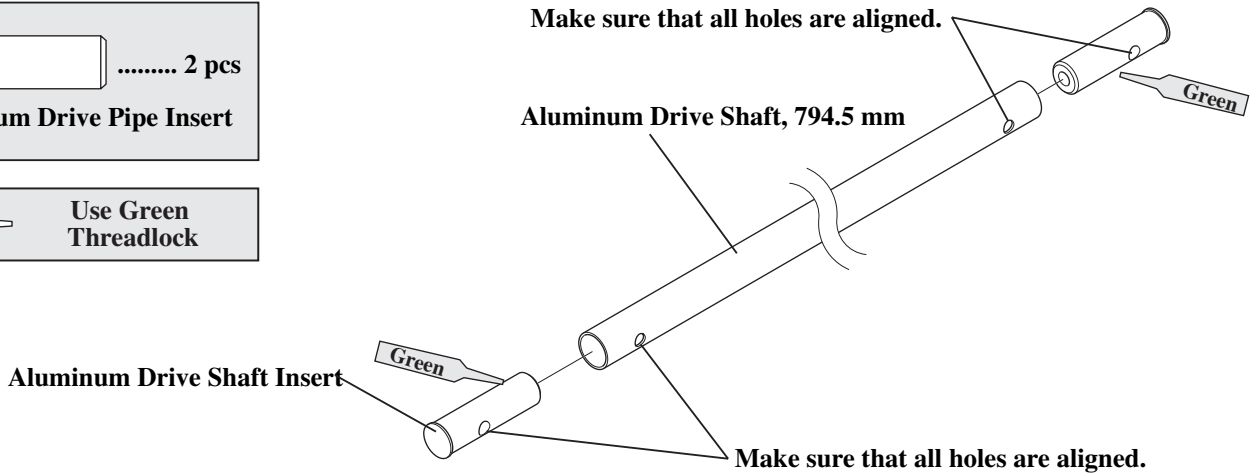
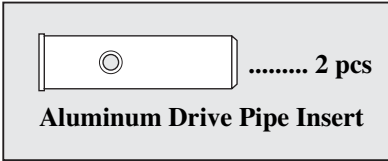
Caution:

Please note that all universal links should be adjusted so that when attached to the control ball, the words "JR PROPO" are to the outside.



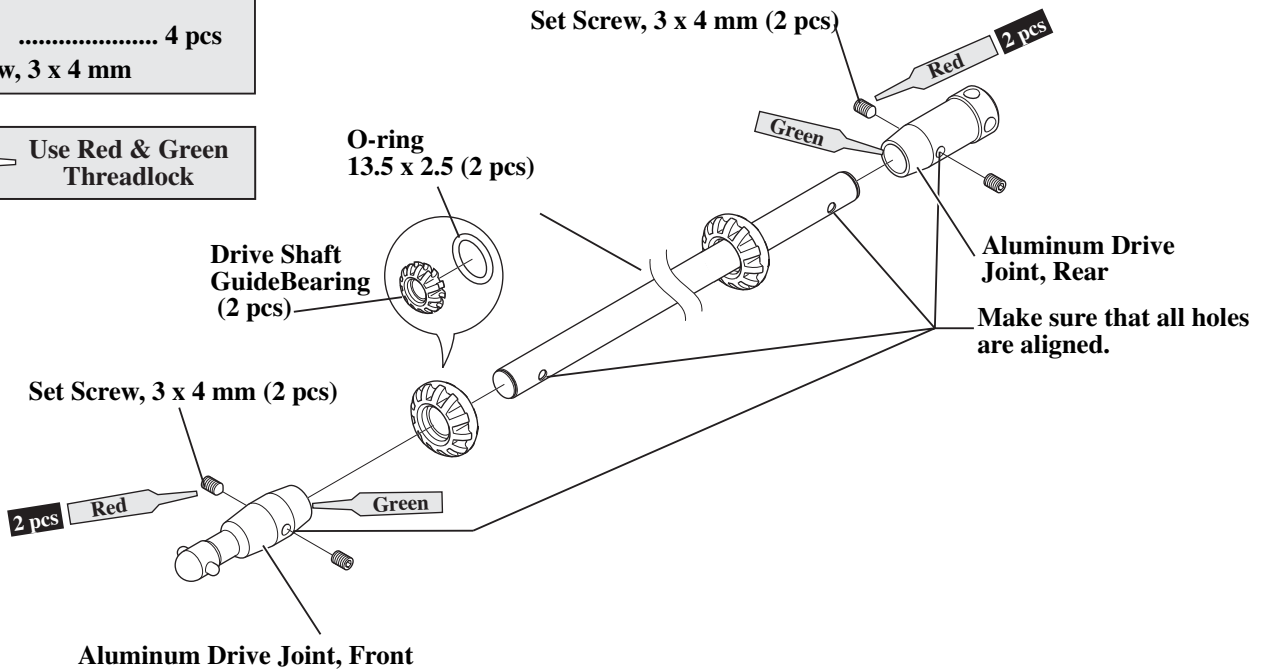
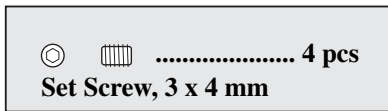
5-1

TAIL DRIVE SHAFT PREPARATION



5-2

TAIL DRIVE SHAFT ASSEMBLY



Note:

When secured, the 4 mm set screws should be nearly flush with the outside surface.

