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 Younghblood—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-though-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 140º 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.

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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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

---

**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**

- JRP1666** PCM 10X, 120° & 140° CCPM
- JRP8622** XP8103FM, 120° CCPM
- JRP8653** XP8103PCM, 120° CCPM
- JRP9252** XP9303 PCM 120/140 CCPM
- JRP6622** XP662 FM, 120° CCPM
- JR G500T Gyro or equivalent

---

**ITEMS REQUIRED TO COMPLETE THE JR VIBE 90 3D**

- JRPS8311 Ultra Torque Digital Aileron, Elevator, Collective Servo
- 8700G High Speed Super Throttle, Tail Rotor Servo
- JRPB4440 1800mAh Battery Pack
2. ENGINE REQUIREMENTS (not included):

A .90 – 91 R/C helicopter engine is required. A special helicopter type muffler is also required.

![Double-Sided Servo Mounting Tape](image1)

![Nylon Wire Ties](image2)

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

RVO180 (YS)

RVO190 (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 (JBM8285S)
- Heavy-Duty Servo Wheels (3 pcs) w/Screws
  JRPA216 or equivalent

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

YS 91 ST4 Heli Engine
Or
OS 91 C-Spec Heli Engine
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 (JRP60326)
- Ball Link Pliers (RVO1005)
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:

- **A** 3 x 8 mm Socket Head Bolt
  - C Socket Head Bolt

- **A** 2.6 x 10 mm Self Tapping Screw
  - C Self Tapping Screw

- **A** 3 mm Flat Washer
  - B Flat Washer

- **A** 4 x 4 mm Set Screw
  - C Set Screw

- **A** 2 x 8 mm Flat Head Screw
  - C Flat Head Screw

- **A** 3 mm Lock Nut
  - B Lock Nut

- **A** 3 mm Star Washer
  - B Star Washer

- **A** 3 x 8 mm Flat Head Cap Screw
  - C Flat Head Cap Screw

- **A** 2 mm Hex Nut
  - B Hex Nut
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.
- Use Red & Green Threadlock
- Lightly Oil
- Position so that bearing is at the top of the bearing block.
- Do not fully tighten at this time.

TEAM TIP: Clean areas with rubbing alcohol to remove any oil residue before applying threadlock.
ELEVATOR A-ARM ASSEMBLY

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

**Note:**
- Use Red Threadlock

**Universal Link**
- Remove 1 mm from the bottom of this link using a hobby knife
- Push link into A-Arm, then insert 2.3 x 15 mm Socket Head Bolt

**Elevator A-Arm**
- Apply a very thin coating of Threadlock so that it will not seep into the bearing.

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

**Set Screw, 4 x 4 mm**
- 2 pcs Socket Head Bolt, 3 x 8 mm

**A-Arm**
- Bearing Collar (2 pcs)

**Wide Range**
- Standard Range*
1-3  T-ARM LEVER ASSEMBLY

Flat Head Screw, 2 x 8 mm (2 pcs)
Steel Joint Ball

Flat Head Screw, 2 x 8 mm (4 pcs)
Steel Joint Ball (6 pcs)

Nut, 7 mm
Washer, 7 x 12 x 1 mm

Use Red Threadlock on all screws

1-4  FUEL TANK ASSEMBLY

Nut, 7 mm
Washer, 7 x 12 x 1 mm

Use two wrenches if necessary to secure tank nipple.

Use Red Threadlock on all screws

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.

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.

3. Insert 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.

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.

Silicone Tube (small)
Use tubing included in separate package in kit.

T-Arm Assembly

Fuel Tank Grommet

Nipple

Washer, 7 x 12 x 1 mm

Steel Joint Ball (2 pcs)

T-Arm Assembly

Steel Joint Ball

Flat Head Screw, 2 x 8 mm

Fuel Tank Grommet

Elevator Control Arm

Flat Head Screw, 2 x 8 mm (4 pcs)

Fuel Tank Grommet

Steel Joint Ball (2 pcs)

Steel Joint Ball (6 pcs)

Steel Joint Ball (2 pcs)

Flat Head Screw, 2 x 8 mm

Flat Head Screw, 2 x 8 mm

Flat Head Screw, 2 x 8 mm
**2-1A MAIN FRAME ASSEMBLY: BEARING BLOCK/CLUTCH INSTALLATION**

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<td>.............8 pcs</td>
</tr>
<tr>
<td>Top Bearing Case</td>
<td></td>
</tr>
</tbody>
</table>

**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.
- Position so that bearing faces upward.

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

**Use Red Threadlock**

---

**Top Bearing Case**
- Flat Washer, 3 mm (8 pcs)
- Socket Head Bolt, 3 x 8 mm (4 pcs)
- Threaded Rod, 3 x 50 mm
- Cross Member, 32 mm (2 pcs)
- Flat Washer, 3 mm (8 pcs)
- Socket Head Bolt, 3 x 40 mm (4 pcs)
- Main Frame (2 pcs)
ELEVATOR ARM INSTALLATION

Direction of Installation

Long
Front
Short
Rear

Socket Head Bolt, 3 x 8 mm

..4 pcs

Socket Head Bolt, 4 x 10 mm

....1 pc

Nylon Lock Nut, 3 mm

........4 pcs

Spacer, 4 x 5 x 1 mm

........................ 1 pc

Use Red Threadlock

Socket Head Bolt, 3 x 8 mm (4 pcs)

Nylon Lock Nut, 3 mm (4 pcs)

Socket Head Bolt 4 x 10 mm

Spacer, 4 x 5 x 1 mm

Elevator Arm Bearing Case (2 pcs)
MAIN FRAME ASSEMBLY: CROSS MEMBER INSTALLATION

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

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

Use Red Threadlock

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Screw, 3 x 18 mm</td>
<td>2 pcs</td>
</tr>
<tr>
<td>Cross Member, 32 mm</td>
<td>1 pc</td>
</tr>
<tr>
<td>Nylon Lock Nut, 3 mm</td>
<td>3 pcs</td>
</tr>
<tr>
<td>Cross Member, 24 mm</td>
<td>2 pcs</td>
</tr>
<tr>
<td>Set Screw, 3 x 18 mm (2 pcs)</td>
<td></td>
</tr>
<tr>
<td>Cross Member, 24 mm (2 pcs)</td>
<td></td>
</tr>
<tr>
<td>Cross Member, 32 mm</td>
<td></td>
</tr>
<tr>
<td>Socket Head Bolt, 3 x 40 mm</td>
<td>3 pcs</td>
</tr>
</tbody>
</table>

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

*Red* 

Cross Member, 24 mm
Set Screw, 3 x 18 mm (2 pcs)
2-3A  T-LEVER INSTALLATION

Socket Head Bolt, 3 x 28 mm (2 pcs)
Nylon Lock Nut, 3 mm (2 pcs)
Mixing Lever Spacer (2 pcs)
Spacer, 3 x 5 x 1 mm (2 pcs)

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

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.

**Note:**

T-Lever Position on Main Frame Slots

120 CCPM/Standard Range
140 CCPM/Standard Range
**ELEVATOR CONTROL ARM INSTALLATION**

**Use Red Threadlock**

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Screw, 4 x 4 mm</td>
<td>2 pcs</td>
</tr>
<tr>
<td>Nylon Lock Nut, 4 mm</td>
<td>1 pc</td>
</tr>
<tr>
<td>Flat Washer, 4 mm</td>
<td>1 pc</td>
</tr>
</tbody>
</table>

**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.
MAIN FRAME ASSEMBLY: ENGINE MOUNT/CROSS MEMBER INSTALLATION

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

**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 frame plate as shown.

Nylon Lock Nut, 3 mm (8 pcs)

Cross Member B (note correct direction)

Rear Grounding Bracket

Socket Head Bolt, 3 x 40 mm (6 pcs)

Socket Head Bolt, 3 x 50 mm (3 pcs)

Landing Struts Adaptor (4 pcs)

Cross Member B (note correct direction)

Socket Head Bolt, 3 x 50 mm (1 pc) (Do not use threadlock.)

O.S. Engines and YS Engines

Engine Mount Direction
Remove a \( \frac{3}{4}'' \times 1\frac{1}{4}'' \) portion of the clear coating from the top of the bottom carbon fiber plate as shown.

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.

- **Socket Head Bolt, 3 x 10 mm (2 pcs)**
- **Button Head Bolt, 3 x 10 mm (2 pcs)**
- **Flat Washer, 3 mm (8 pcs)**
- **Use Red Threadlock**
**FUEL TANK INSTALLATION**

**Use Red Threadlock**

- **Socket Head Bolt, 3 x 20 mm** (4 pcs)
- **Hex Spacer, 3 x 6 x 6 mm** (2 pcs)
- **Spacer, 3 x 6 x 2 mm** (2 pcs)
- **Cross Member, 32 mm** (3 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.

*Cut the tank mounting rubber to a length as shown from the two pieces included with the kit.*

*Attach fuel line to tank prior to installation.*

*Spacers, 3 x 6 x 6 mm (2 pcs)*

*Spacers, 3 x 6 x 2 mm (2 pcs)*

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

**Fuel Tank**

**Tank Frame**

**Tank Mounting Rubber**
**2-7**

**FRONT RADIO BED INSTALLATION**

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

**Note:**

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

**3-1A**

**MAIN DRIVE GEAR/AUTOROTATION ASSEMBLY**

- **Socket Head Bolt, 3 x 6 mm** .............................................4 pcs

**Use Red Threadlock**

**Autorotation Assembly**

- **Main Drive Gear 88T**
- **Socket Head Bolt, 3 x 6 mm (4 pcs)** (Tighten equally to prevent warping of main drive gear)

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

**Autorotation Assembly Direction**

(Note correct direction during assembly.)

**Up**

*Apply a light coating of grease to torrington bearing.*
**3-1B BEVEL GEAR ASSEMBLY**

- **Flat Head Bolt, 3 x 6 mm (4 pcs)**
- **Set Screw, 4 x 4 mm (4 pcs)**
- **Hex Head Bolt, 6 x 10 mm**
- **Steel Washer, 10 x 16 x 2.5 mm**
- **Main Shaft Washer**
- **Socket Head Bolt, 3 x 12 mm**
- **Socket Head Bolt, 3 x 20 mm**
- **Fastener, 4 x 4 mm**

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

**Note:**
- Both washers fit below bottom bearing block.
- Use Red Threadlock

**3-2 MAIN SHAFT/MAIN DRIVE GEAR INSTALLATION**

- **Flat Head Bolt, 3 x 6 mm (4 pcs)**
- **Socket Head Bolt, 3 x 12 mm**
- **Socket Head Bolt, 3 x 20 mm**
- **Special Washer, 10 x 6 x 0.5 mm**
- **Main Shaft Washer**
- **Main Shaft Washer Direction**
- **Bevel Cutting**

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

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

**TEAM TIP:** 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

- **Socket Head Bolt, 3 x 6 mm**: 4 pcs
- **Flat Washer, 3 mm**: 4 pcs
- **Nut (supplied with engine)**
- **Taper Collet Upper (small)**
- **Socket Head Bolt, 3 x 6 mm**: 4 pcs
- **Flat Washer, 3 mm**: 4 pcs
- **Cooling Fan Blades**
- **Use Red Threadlock**
- **Washer (supplied with engine)**
- **Use for O.S. engines only. Omit for YS engines.**

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

* Tighten bolts evenly to prevent warping.*
**3-5 CLUTCH ASSEMBLY ATTACHMENT**

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

Use Red Threadlock

**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**

- **Socket Head Bolt, 4 x 15 mm** (4 pcs)
- **Flat Washer, 4 mm** (4 pcs)
- **Steel Joint Ball**
- **Hex Nut, 2 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.

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.

**Caution:** Be sure to note the correct installation of the engine.
**COOLING FAN SHROUD BRACKET ATTACHMENT**

**Self Tapping Screw, 3 x 12 mm**
- **8 pcs**

**Flat Washer, 3 mm**
- **8 pcs**

**BOLT TIGHTENING ORDER/GEAR MESH ADJUSTMENT**

**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

**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.

**Use Red Threadlock**

**6** Tighten all remaining bolts.

**Note:**
Do not tighten screws at this time. They will be tightened in Step 3-9.
COOLING FAN SHROUD INSTALLATION

<table>
<thead>
<tr>
<th>Components</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self Tapping Screw, 3 x 12 mm</td>
<td>4 pcs</td>
</tr>
<tr>
<td>Self Tapping Screw, 2.6 x 8 mm</td>
<td>6 pcs</td>
</tr>
<tr>
<td>Flat Washer, 3 mm</td>
<td>4 pcs</td>
</tr>
</tbody>
</table>

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.

INSTALLATION OF THE MUFFLER/FUEL LINE CONNECTIONS

.90-Size Muffler (not included)

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

Pressure Fuel Line Attachment (not included)

Fuel Line Connection Main Fuel Line (Connect to carburetor.)
Use Red Threadlock on all screws

**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.
Washout Assembly (preassembled)

Swashplate

WASHOUT ASSEMBLY

Long Flange

Up

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.
ROTOR HEAD INSTALLATION

- Nylon Lock Nut, 3 mm
- Rotor Head Assembly (preassembled)
- Socket Head Bolt, 3 x 12 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.
- Nylon Lock Nut, 3 mm
- Low Flybar ratio (.7:1)
- High Flybar ratio (1:1)
- The Vibe rotor head offers a choice between a low Flybar ratio (.7:1) and a high Flybar ratio (1:1). This feature allows the pilot to fine-tune the feel and control response of the Vibe to match your style of flying.
- Socket Head Bolt, 3 x 22 mm
- 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**

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

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

**Flybar Control Arm**

**Equal Distance**

- **Set Screw, 4 x 4 mm** (2 pcs)
- **Washer, 4 x 6 x 0.5 mm** (2 pcs)

**Flybar, 530 mm**

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

**4-5**  
**FLYBAR PADDLE ATTACHMENT**

- **Set Screw, 4 x 4 mm** 2 pcs

**Align paddles so they are parallel to each other.**

**Flybar**

- **Flybar Weight** (2 pcs)
- **Flybar Paddles**

**Set Screw, 4 x 4 mm** (2 pcs)

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

**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.
**SWASHPLATE/T-ARM CONTROL ROD INSTALLATION**

1. **SEESAW ARM TO MAIN BLADE HOLDER**  
   (Threaded Rod 2.3 x 15 mm)  
   Universal Ball Link (short)  
   3.5 mm  
   2 pcs

2. **WASHOUT ARM TO FLYBAR CONTROL ARM**  
   (Threaded Rod 2.3 x 30 mm)  
   Universal Ball Link  
   12.5 mm  
   2 pcs

3. **SWASHPLATE TO SEESAW ARM**  
   (Threaded Rod 2.3 x 50 mm)  
   Universal Ball Link  
   32.5 mm  
   2 pcs

4. **SWASHPLATE TO T-ARM**  
   (Threaded Rod 2.3 x 60 mm)  
   Universal Ball Link  
   42 mm  
   2 pcs

**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**

- Aluminum Drive Pipe Insert: 2 pcs

- Aluminum Drive Shaft Insert

- Use Green Threadlock

- Make sure that all holes are aligned.

- Aluminum Drive Shaft, 794.5 mm

**5-2 TAIL DRIVE SHAFT ASSEMBLY**

- Set Screw, 3 x 4 mm: 4 pcs

- O-ring 13.5 x 2.5: 2 pcs

- Drive Shaft Guide Bearing (2 pcs)

- Set Screw, 3 x 4 mm (2 pcs)

- Aluminum Drive Joint, Front

- Aluminum Drive Joint, Rear

- Make sure that all holes are aligned.

**Note:**

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