

# AirMax Mach 3™ Maintenance Overview



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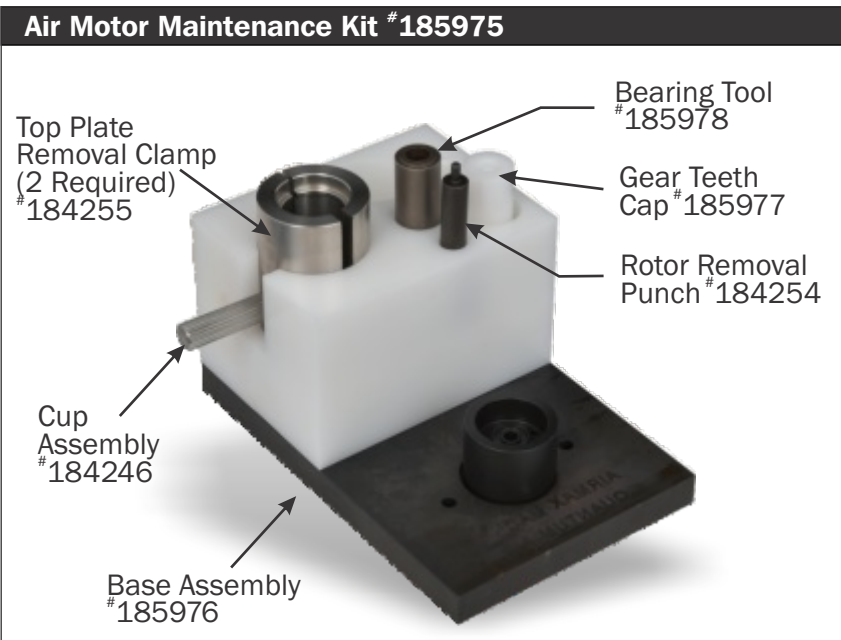
## The Proper Tools

To perform maintenance on the AirMax power unit it is essential to have the proper Bettcher maintenance tools and lubricants. Proper maintenance and lubrication will improve tool performance and parts life.



**Note:** This is an interactive PDF. Click on the blue hyperlinks and Video icons to see additional content.

**Air Motor Maintenance Kit #185975**



- Top Plate Removal Clamp (2 Required) #184255
- Cup Assembly #184246
- Base Assembly #185976
- Bearing Tool #185978
- Gear Teeth Cap #185977
- Rotor Removal Punch #184254

**Additional Maintenance Kit Tools**



- Spanner Wrench #184134
- Large Hex Wrench #184128

Please review Operating Instructions for complete instructions & safety information.



# AirMax™ Mach 3 Lubrication

*Proper lubrication improves both performance and parts life.*

## Lubrication

Proper lubrication of the AirMax™ power unit is an important part of daily operation. It is essential to maintain a proper amount of lubrication inside the power unit while the tool is running. The absence of proper lubricant will destroy the vanes and cause premature wear on cylinder parts. In addition, be sure the air pressure and volume are optimal and the air supply is clean and dry.

## Daily Checklist

1. Constant air pressure of 90 psi (6,2 bars). Do not exceed 100 psi.
2. Air volume is 14 cfm (396 lpm).
3. The filter bowl (on FRL) should be drained and the lubricator refilled with [Bettcher Whizard® Food Grade Multipurpose Oil](#) (Whizard Oil - Part #103603).
4. Lubrication on FRL is set at three drops per minute.

## After Every 80 Hours

1. Completely disassembly the power unit. Disassembly information on this can be found on the following pages.
2. Lubricate the gear head by injecting [Max-Z-Lube™](#) high performance grease into Gear Head Assembly. See *Figure 2* on this page. Max-Z-Lube Part #184282.
3. Lubricate air motor with Whizard® Oil through the exhaust ports. *See Image Directly Below.*



**1**  
**Inspect the seal plate for nicks, dents or wear. Inspect the O-Ring seal for cracks or cuts. Replace if damaged.**



**2**  
**Re-grease gear head using Max-Z-Lube grease every 80 hours. The new grease will push out the old, dirty grease. Part #184282**



### [Max-Z-Lube Lubricant](#)

is a high performance lubricant that provides valuable protection for moving parts. This super slick formula provides optimum protection from friction, oxidation and high temperatures. This is the best lubricant for your AirMax® motor.

Order Part #184282.



# AirMax™ Mach 3 Power Unit Maintenance

Maintenance tips that improve both performance and tool life



The AirMax™ Mach 3 motor delivers high levels of torque over a wide range of speeds. To keep the motor operating at peak efficiency, it should be cleaned and inspected after every 80 hours of usage.

As long as there is no performance loss, most of the inspection of the air motor can be done without disassembly. However, if the operator mentions a loss in power, use the following procedure. For complete instructions refer to the AirMax™ Mach 3 Operating Instructions.

## Air Motor Disassembly

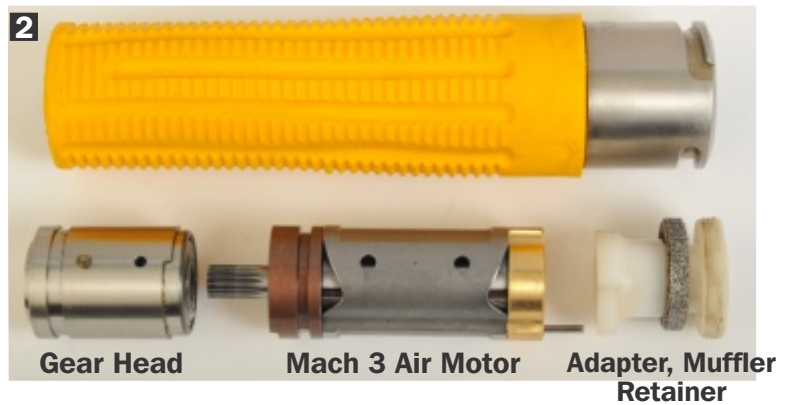
1. Tool and Maintenance Kit #185975 is required to disassemble a Mach 3 trimmer.
2. Unscrew retainer using the spanner wrench. Note: This is a left-hand thread and must be turned right (clockwise) to unscrew. Slide components out of handle. If parts don't slide out easily, tap the handle lightly against a plastic block to dislodge.
3. Separate the motor from the gear head and adapter.
4. Place the upper bearing plate removal clamps around the upper bearing as shown in Figure 3.
5. Using a hammer and plastic sleeve, tap the gear teeth cap until the rotor is free from the upper bearing plate. Figure 4. Remove the upper bearing and cylinder.
6. Remove vanes from the rotor and inspect for chipped or broken tips, grooves and vane height. Replace vanes with grooves more than .010" (.25 mm) deep or with a height less than .195" (.5 mm). Next, inspect the rotor for cracked, broken teeth, or excessive wear.

## Inspect

- Clean buildup out of inlet and exhaust ports
- Check gear teeth for cracks or damage. Worn teeth are indicated by rounded or pointed tops
- Inspect guide pin to verify it is not bent
- Check the cylinder interior for grooves
- Replace any parts that are damaged or worn
- Check vanes as shown in Figure 5
- Verify the O-Ring is in place inside handle Figure 6



**Note:**  
Left-hand thread



Place air motor in bearing plate assembly tool and tap to remove.



Make sure O-Ring is seated.





# Mach 3 Air Motor — Reassembly

## Reassembly



Oil is the lifeblood of any motor. Not only does it lubricate moving parts, it dissipates heat and prevents corrosion. The quality of oil is equally important ... too little, too thin or too thick will either reduce performance or motor life. Use only [Whizard® Food Grade Multipurpose Lubricating Oil Part #103603](#) (Whizard® Oil) as a high quality, long-lasting lubricant that will protect your trimmer investment.

## Lubricate and Reassemble Air Motor

1. Saturate vanes with [Whizard® Oil](#) before assembly.
2. Insert the vanes with the curved side toward the rotor center.
3. Slide the cylinder over the rotor and add a small amount of [Whizard® Oil](#) around the top of the rotor assembly. Note: The alignment pin in the bearing plate inserts into the alignment hole in the cylinder. Make sure the exhaust notches line up.
4. The upper bearing plate is installed by first inserting the alignment pin of the lower bearing plate into the alignment hole in the base of the assembly tool fixture.
5. Place the upper bearing plate onto the cylinder and then the bearing. Using a hammer and the bearing tool, tap the bearing tool until the bearing plate is fully seated on the cylinder.
6. The air motor is now assembled and the shaft should rotate freely.



**1** Saturate vanes and insert in rotor, curved side towards rotor.



**3** Add a small amount of Whizard® Oil and then place in the maintenance tool block.



**5** Using the bearing tool and hammer, tap bearing onto cylinder. Make sure notches are aligned (note circle).



## Performance Tip



- Use one FRL for each trimmer.
- Constant 90 psi (6,2 bars) at a volume of 14 cfm (396 lpm).
- Filter bowls should be drained and lubricator refilled daily.
- Oil should be set for three drops per minute of Whizard® Oil for proper lubrication and protection.



# Power Unit Alignment & Installation

## Assembly of the Power Unit



Holding the handle 'up' and all the power unit components together, slide them up into the handle. With all the components together and the handle in the 'up' position, components are less likely to get misaligned.

## Spin and Tighten

To insure power unit components stay aligned when installed into the handle, use the following procedure:

1. Using the spanner wrench, snug the retainer (*Figure 2*). This is a left-hand thread. Counter-clockwise tightens.
2. Place the driver adapter into position and rotate the air motor back and forth a few times (*Figure 3*).
3. Snug the retainer again, using the spanner wrench (*Figure 2*), then rotate the driver and air motor back and forth (*Figure 3*) with the driver adapter.
4. Repeat the process one last time.
5. The drive adapter should turn freely in the power unit.
6. Using the spanner wrench, make sure the retainer is tight after each days use, as the retainer may loosen with time or usage.
7. When the motor is properly installed one or two threads will be visible (*Figure 4*). If there are more threads the O-Ring may be missing. No threads visible – either Step 1 or 3 was not done correctly.



## Performance Tip

### What happens with an improperly seated power unit ...

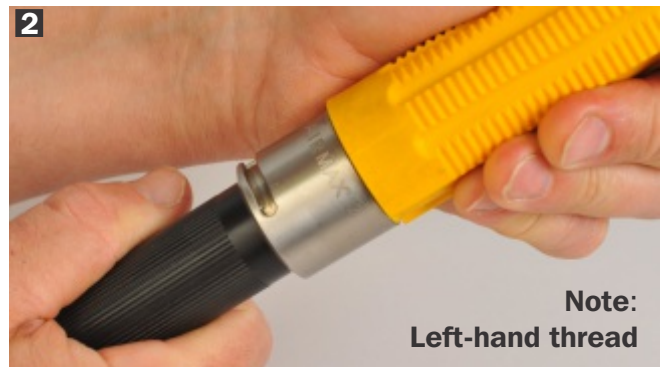
An improperly tightened power unit will spin inside the handle, causing a total loss of power and damage to the handle. The procedures on this page will prevent this.



Cut-a-way  
of AirMax™ Handle



**1** Align the power components and push up inside the AirMax™ handle.

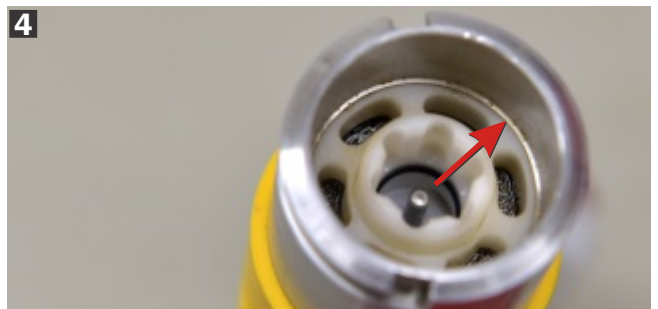


**2** Snug the retainer using the spanner wrench.

**Note:**  
Left-hand thread



**3** Using the driver adapter, rotate the air motor back and forth.



**4** When the air motor is properly installed there will be one or two threads visible — too many or no threads means miss installation.





# AirMax™ Mach 3 Head Attachment

## Attachment and Adjustment

To ensure a proper, comfortable fit, several options are available for the AirMax™. Select from left- or right-handed frame configurations, and the thumb support or spacer ring. The frames are designed with several notches to allow the most comfortable position of the handle and thumb support for the operator.

AirMax™ Mach 3 handles are available in either yellow or dark blue. The dark blue handle is typically used with the TrimVac™ for processing cattle over the age of 30 months.

### Step 1

Select the spacer ring or optional thumb supports. If a *spacer ring* is used, slide the spacer ring onto the frame, small end first.

If the *thumb support* is used, it should be positioned on the side opposite the grease cup. Align the thumb support tab with a notch on the frame and slide the thumb support onto the frame.

### Step 2

While holding the AirMax™ frame, align the pin in the handle with one of the notches on the frame. For the initial adjustment the short groove on the handle should be facing up.

Next, let the operator test the assembly. Make adjustments for the most comfortable fit.

### Step 3

Insert the attachment screw in the frame and tighten firmly using the supplied hex wrench.

Note: Recommended torque:

115-140 lb-in ( 13-16 N-m ).



The operator can choose whether to use the thumb support or not.



Align the short groove with the notch in the frame.



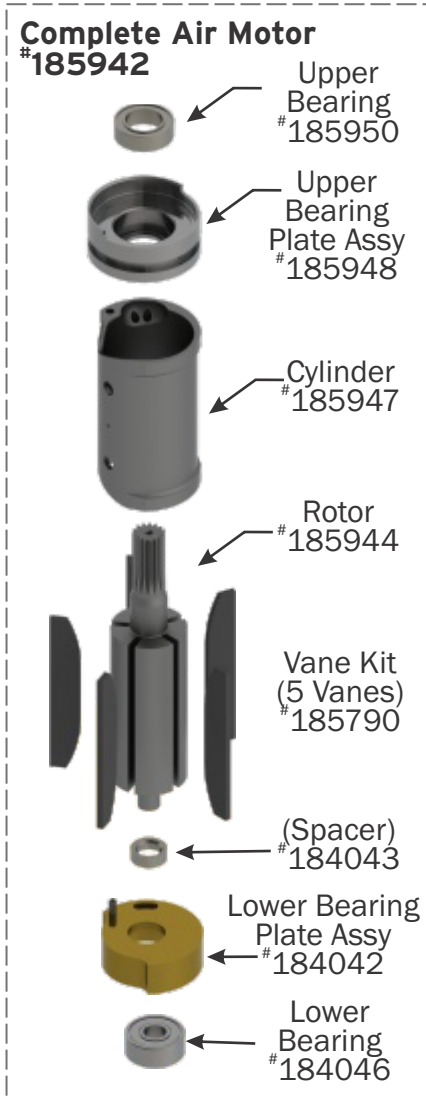
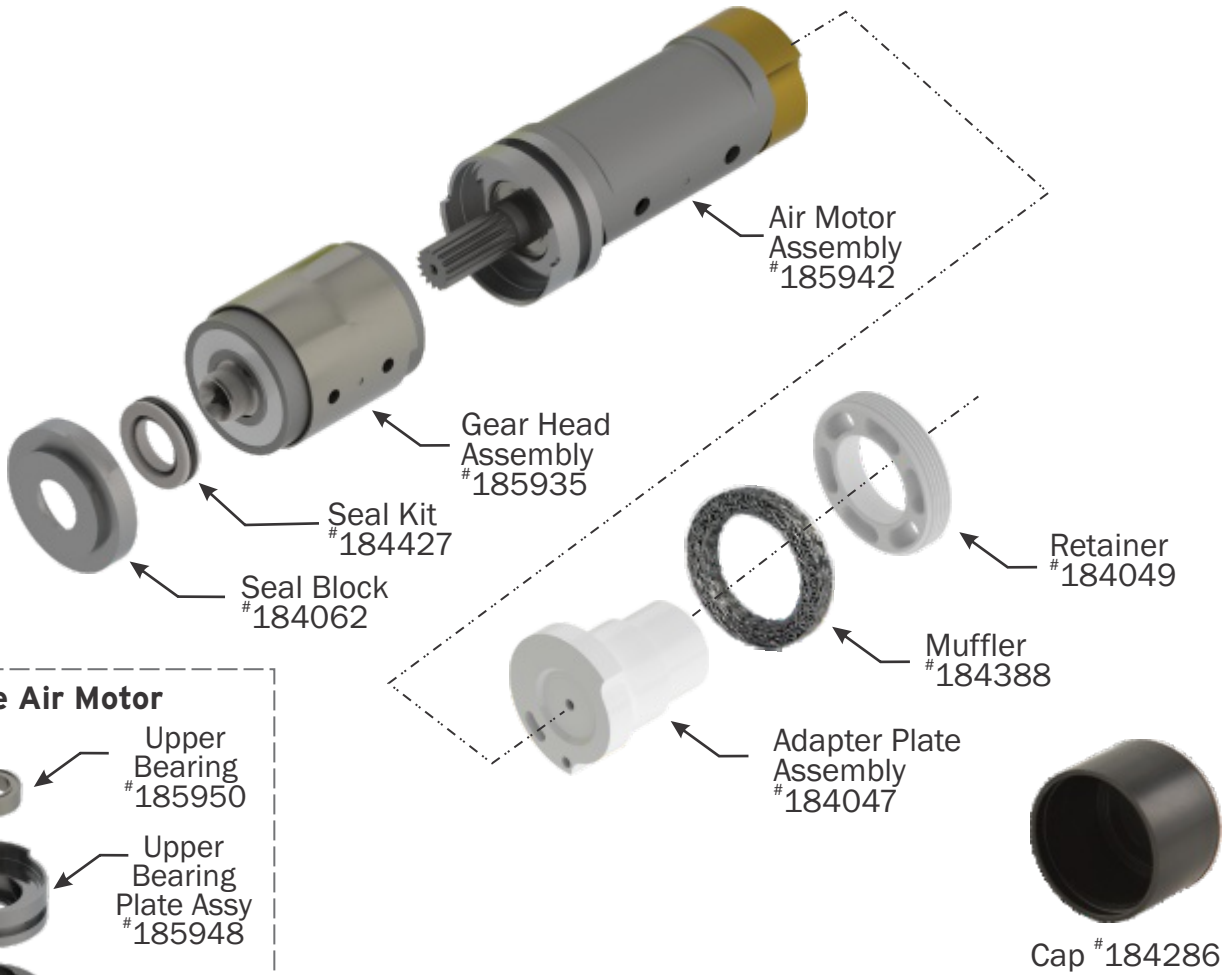
Secure the Hex Wrench in a vice and turn the trimmer to the recommended 115 - 140 lb-in of torque.



Never put the AirMax™ handle into a vice, this will crush the hollow handle.



# Mach 3 Power Unit and Motor Parts List



## AirMax™ Mach 3 – Handle Color Options



**Complete Power Unit Assembly #185923**  
**Handle with O-Ring #185927**



**Dark blue handle for cattle over 30 months.**  
**Complete Power Unit Assembly #185924**  
**Handle with O-Ring #185928**

# AirMax Lubrication

*Proper lubrication improves both performance and parts*



## Whizard Oil

Specially formulated oil for air tools. Essential for adding protective lubrication to the AirMax motor, AirShirz® and all FRL (Filter, Regulator, Lubricator)

Whizard Multipurpose  
Lubricating Oil  
16 Fluid oz #103603



Whizard Multipurpose  
Lubricating Oil #103603



## **MAX-Z-LUBE** HIGH PERFORMANCE LUBRICANT

Performance lubricant that delivers superior protection for high RPM gear-head. Super-slick formula provides premium protection from friction, oxidation and high temperatures. This is the best lubricant for your AirMax® gear head assembly.

4 oz. Tube  
#184282



Formulated for extended high  
RPM performance and superior  
gear head protection #184282



## **WHIZARD** **Quantum** HIGH PERFORMANCE GREASE

Premium, high-speed, long-lasting synthetic lubricant tailored to exceed the demanding conditions of USDA inspected meat, poultry and food processing facilities. Formulated for all Whizard Trimmer grease cups for better performance and protection.

13.5 oz. Cartridge  
#102609



Performance and protection for  
all trimmer models #102609

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TS102 3.7.2018