



# **UOW Series Repair Manual**

**UOW-11 & UOW-T60 Series**



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## Tools Needed for Repair

### UOW Series Open-End Wrenches

1. Flat-Head Screwdriver
2. Dental Pick
3. Needle Nose Pliers
4. Pin Punch
5. Ball Peen Hammer
6. Pin Spanner Wrench (Hook Type)
7. Snap Ring Pliers
8. Crescent Wrench
9. Phillips Impact Driver
10. Spanner Wrench (Expanding Type)
11. Propane Torch
12. Thread Locker

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# Disassembly and Reassembly of the Air Motor

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## **Disassembly**

1. Remove the air motor casing from the gear casing connector.
2. Take hold of the end of the rotor and pull the air motor out of the casing.
3. Remove the front plate spacer and locking pin.
4. Pull the front plate off and remove the bearing.
5. Remove blades from the rotor.
6. Press the rotor out of the rear plate bearing and remove the bearing from the rear plate.
7. Thoroughly clean all parts.

## **Inspection**

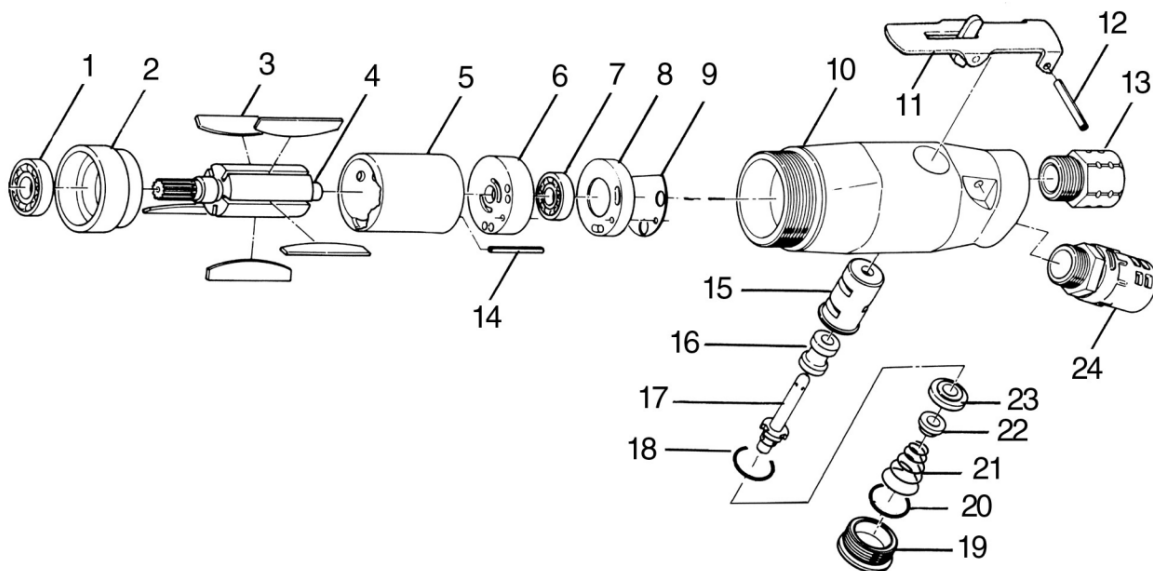
1. **Bearings:** Inspect bearings for knocking and side play.
2. **Cylinder:** Inspect cylinder for waviness.
3. **Plates:** Inspect plates for grooving.
4. **Blades:** Inspect blades for splitting and grooving on the sides and ends.
5. **Silencer:** Inspect silencer for dirt.
6. Replace all worn parts.

## **Assembly**

1. Press greased bearing into the rear plate and over the rotor. **Note:** There should be a slight drag between the rotor and the rear plate
2. Lightly oil the blade and install into the rotor flat-side out.
3. Slide the cylinder down over the rotor, and line up the roll pin with the center hole in the rear plate.
4. Grease bearing and press into the front plate. Install the front plate onto the rotor with bearing-side up.
5. Slide the air motor assembly into the casing, lining up the pinion with the side of the front plate with the slot in the casing.
6. Install locking pin and front plate spacer.
7. Thread the gear motor casing assembly onto the air motor casing and test the tool.

## Disassembly and Reassembly of the Air Motor (cont.)

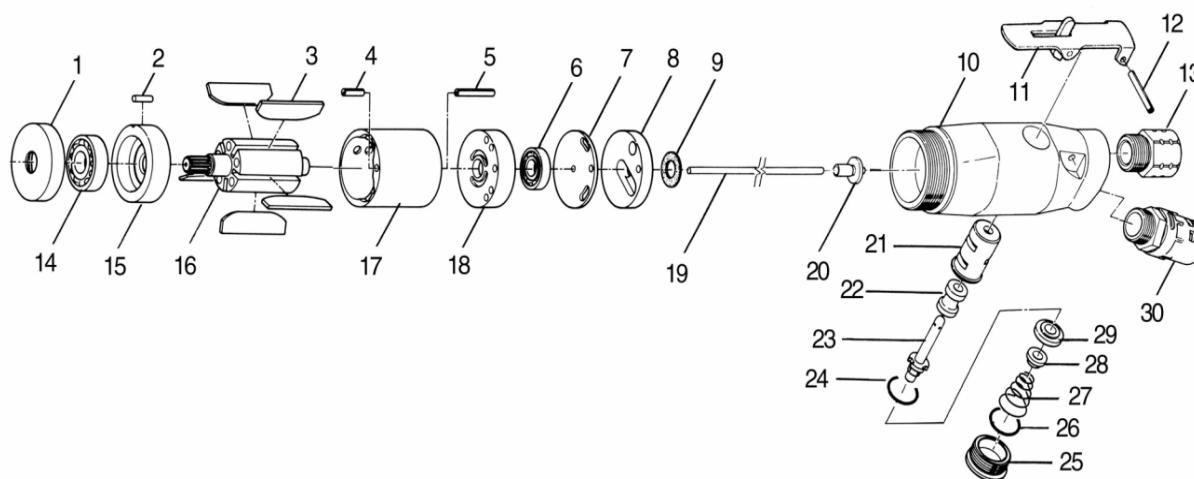
### UOW-11 Air Motor



Part Number	Description	Part Number	Description
1	Front Plate Bearing	13	Air Inlet Bushing
2	Front Plate	14	Roll Pin
3	Blade	15	Valve Bushing
4	Rotor	16	Reverse Valve
5	Cylinder	17	Valve Rod
6	Rear Plate	18	O-Ring
7	Rear Plate Bearing	19	Valve Plug
8	Rear Plate Spacer	20	O-Ring
9	Packing	21	Cone Spring
10	Motor Casing	22	Valve Rod Cap
11	Throttle Lever	23	Valve
12	Roll Pin	24	Silencer

## Disassembly and Reassembly of the Air Motor (cont.)

### UOW-T60 Air Motor



Part Number	Description	Part Number	Description
1	Front Plate Spacer	16	Rotor
2	Pin	17	Cylinder
3	Blade	18	Rear Plate
4	Roll Pin	19	Valve Rod
5	Roll Pin	20	Shut-off Valve
6	Rear Plate Bearing	21	Valve Bushing
7	Rear Plate Spacer	22	Reverse Valve
8	Casing Bushing	23	Valve Rod
9	Packing	24	O-Ring
10	Casing	25	Valve Plug
11	Throttle Lever	26	O-Ring
12	Roll Pin	27	Cone Spring
13	Air Inlet Bushing	28	Valve Rod Cap
14	Front Plate Bearing	29	Valve
15	Front Plate	30	Silencer

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# Disassembly and Reassembly of the Clutch

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## UOW-T60 Clutch

### **Disassembly**

1. Separate the hammer casing from the hammer casing connector and remove the clutch assembly.
2. Remove the clutch spring, spring retainer, and backup ring from cam guide.
3. Carefully slide the cam ring up and remove the four balls from under it. Now remove the cam ring.
4. Lift the hooked end of the band spring out of the hole in the cam guide and slide it around the cam guide until the end of the notch pin is exposed. Now remove the notch pin. **CAUTION:** Do not bend or stretch the band spring.
5. Remove the retaining ring from the back of the cam guide.
6. Slide the cam and pilot pin out of the cam guide. Remove the pilot pin from the cam.
7. Remove the ball and spring out of the cam guide.
8. Clean all parts thoroughly.

### **Inspection**

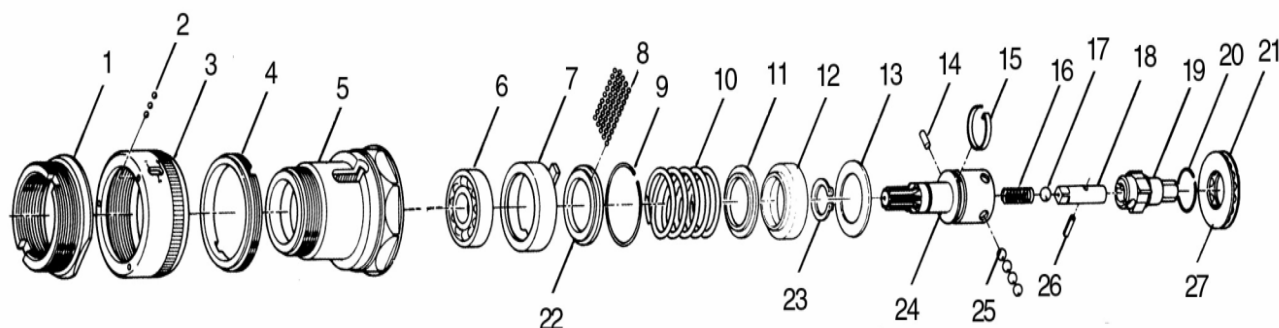
1. **Cam:** Inspect the cam lobes for grooving where they push the balls out against the cam ring.
2. **Pilot Pin:** Inspect the shoulder that is pushed up against the notch pin for rounding.
3. **Notch Pin:** Inspect the ends for rounding.
4. **Cam Ring:** Inspect the inside surface where the balls ride for pitting and grooving.
5. **Balls:** Inspect for pitting.
6. **Spring:** Inspect all springs for tension.
7. Replace all worn parts.

### **Assembly**

1. Press the “G” pin into the pilot pin and install the pilot pin into the cam with the square-end up.
2. Put the spring and ball into the cam guide and slide the cam into the cam guide.
3. Install the retaining ring into the back of the cam guide.
4. Install the notch pin into the cam guide and slide the band spring back into place. Now rotate the cam and make sure the notch pin is pushing the band up.
5. Put a small amount of grease into each of the holes in the cam guide and install the balls.
6. Slide the cam ring down onto the balls.
7. Put the backup ring and spring retainer down onto the cam ring.
8. Install the clutch spring and set the clutch assembly back in the tool.
9. Test the tool.

## Disassembly and Reassembly of the Clutch (cont.)

### UOW-T60 Clutch



Part Number	Description	Part Number	Description
1	Hammer Casing Nut	15	Notch Pin Band
2	Ball	16	Spring
3	Regulating Dial	17	Ball
4	Regulating Screw	18	Pilot Pin
5	Hammer Casing	19	Cam
6	Bearing	20	Snap Ring
7	Spring Setter	21	Thrust Bearing
8	Ball	22	Retainer
9	Snap Ring	23	Outer Snap Ring
10	Torque Spring	24	Cam Guide
11	Spring Retainer	25	Ball
12	Cam Ring	26	G-Pin
13	Spacer	27	Trust Washer
14	Notch Pin		

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# Disassembly and Reassembly of the Gear Section

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## UOW-11 Gear Section

### **Disassembly**

1. Remove the gear casing from the air motor casing (right-hand threads).
2. Remove the first and second gear cage and planet gears.
3. Remove bearing from the gear case.
4. Clean all parts thoroughly.

### **Inspection**

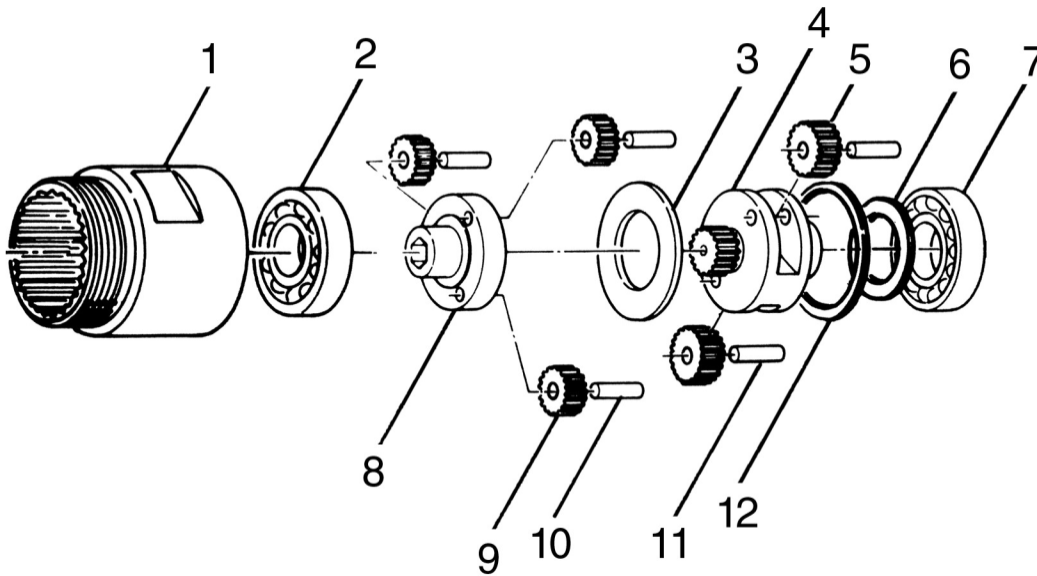
1. **Gears:** Inspect the teeth of the gear casing and the planet gears for pitting and grooving.
2. **Needle Rollers:** Inspect the needle rollers for wear.
3. **Bearings:** Inspect bearing for side play and knocking.
4. Replace all worn parts.

### **Assembly**

1. Install the bearing into the gear case.
2. Install the second gear cage into casing.
3. Install the needle roller and second planet gears. Put a small amount of grease by each planet gear and on the gear cage.
4. Install the gear cage spacer.
5. Install the needle roller and planet gear onto the first gear cage, then slide assembled gear cage into gear casing (lightly grease all parts during assembly).
6. Install the gear casing assembly onto the air motor casing and test the tool.

## Disassembly and Reassembly of the Gear Section (cont.)

UOW-11 Gear Section



Part Number	Description	Part Number	Description
1	Gear Casing	7	Bearing
2	Bearing	8	Second Gear Cage
3	Spacer	9	Planet Gear
4	First Gear Cage	10	Needle Roller
5	Planet Gear	11	Needle Roller
6	Spacer	12	Spacer

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## Disassembly and Reassembly of the Gear Section (cont.)

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### UOW-T60 Gear Section

#### **Disassembly**

**Note:** The UOW-T60 has gearings both before and after the clutch.

1. Remove the hammer casing connector from the air motor casing.
2. Remove the gear from the rotor.
3. Remove the gear cage and planet gear from the internal gear.
4. Remove the bearing from the internal gear.
5. Clean all parts thoroughly

#### **Second Set of Gearing**

1. Remove the gear casing from the hammer casing nut.
2. Remove the gear cage and planet gear from the internal gear.
3. Remove the bearing from the gear casing.
4. Clean all parts thoroughly.

#### **Inspection**

1. **Gears:** Inspect the teeth of the gear casing and planet gears for pitting and grooving.
2. **Needle Rollers:** Inspect the needle rollers for wear.
3. **Bearings:** Inspect the bearing for side play and knocking.
4. Replace all worn parts.

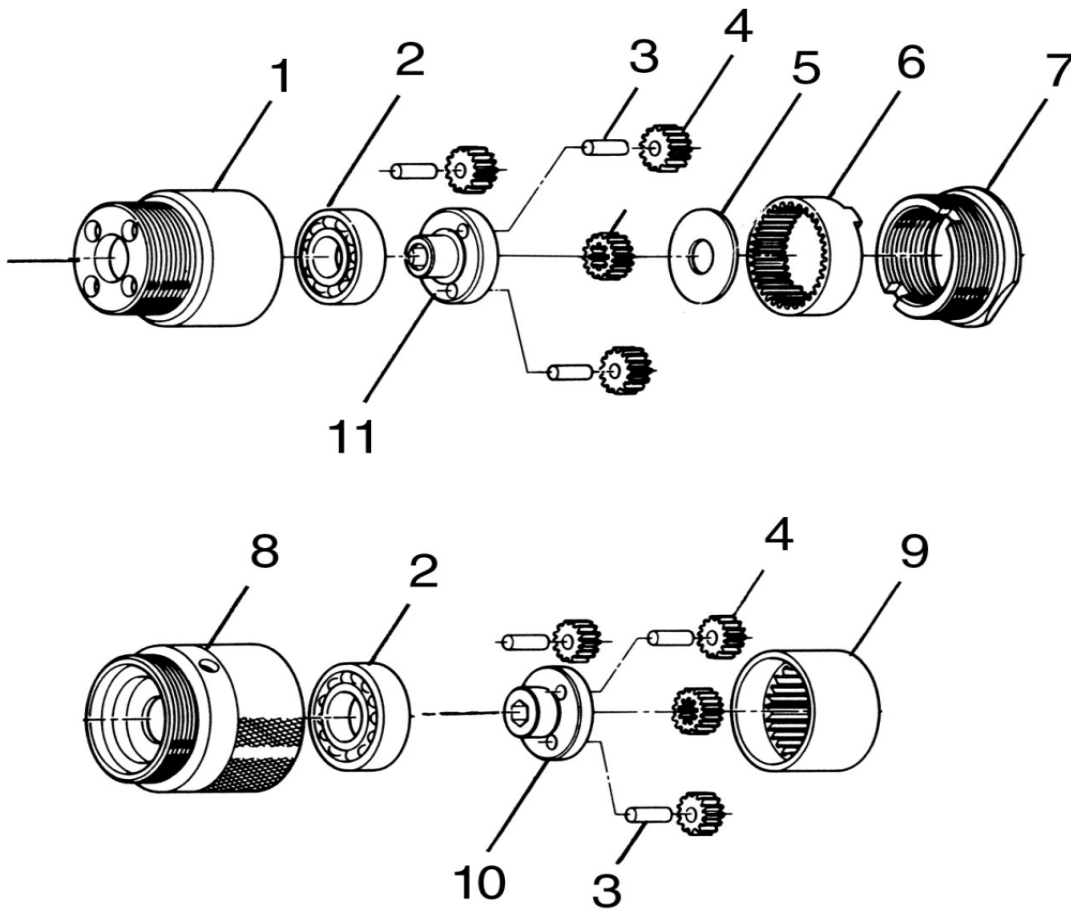
#### **Assembly**

**Note:** Assembly is the same on both gear assemblies.

1. Install the bearing into the gear cage.
2. Install the gear cage into the gear casing.
3. Install the needle roller and planet gears into the gear casing. Put a small amount of grease by each planet gear and on the gear cage.
4. On the first gear assembly, install the rotor gear onto the rotor. On the second gear assembly, install the second middle gear and gear cage spacer onto the cam guide.
5. Install the gear casing assembly onto the tool and test.

## Disassembly and Reassembly of the Gear Section (cont.)

UOW-T60 Gear Section



Part Number	Description	Part Number	Description
1	Gear Casing	7	Hammer Casing Nut
2	Bearing	8	Hammer Casing Connector
3	Needle Roller	9	First Internal Gear
4	Planet Gear	10	First Gear Cage
5	Spacer	11	Second Gear Cage
6	Second Internal Gear		

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# Disassembly and Reassembly of Bevel Gear Casing Assembly

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## Pinion and Bevel Gear Section

### **Disassembly**

1. Remove the bevel gear casing from the gear casing.
2. Remove the clamp ring (left-hand thread) and slide the pinion gear and bearing out of the housing.
3. Remove the four flush head screws from the bevel gear casing cover and remove the cover.
4. Remove the driven gear spindle assembly from the housing.
5. Press the bearing and bevel gear off of the driven gear spindle.
6. Clean parts thoroughly.

### **Inspection**

1. **Gears:** Inspect gears for pitting and grooving.
2. **Bearings:** Inspect bearings for side play and knocking.
3. Replace all worn parts.

### **Assembly**

1. Press the greased Bearing and spacer onto the driven gear spindle. Align the bevel gear up with the key and press onto the driven gear spindle. Lightly grease all gears.
2. Install the pinion gear, shim, and greased bearing. Lightly grease all gears.
3. Install and tighten the Ball Bearing Support.

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# Disassembly and Reassembly of Bevel Gear Casing Assembly

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(cont.)

## Socket and Gearing Section

### **Disassembly**

1. Remove the flush head screws holding down the cover plate.
2. Remove the cover plate.
3. Remove the gears, socket, and needle roller.
4. Remove the spring, checker, and notch pin.
5. Clean parts thoroughly.

### **Inspection**

1. **Gears:** Inspect gears for pitting and grooving.
2. **Needle Bearings:** Inspect the needle bearings in gears for loose and/or missing needles.
3. **Needle Rollers:** Inspect the needle rollers for wear.
4. Inspect needle roller alignment holes in the bevel gear casing and gear casing cover for wear and out of roundness.
5. **Checker:** Inspect the checker and checker spring for wear.
6. Replace all worn parts.

### **Assembly**

1. Install the needle roller and notch pin into the bevel gear casing.
2. Install the checker and gearing.
3. Install the checker spring and rotate gearing in reverse by hand until it is stopped by the checker.
4. Align the socket opening with the casing.

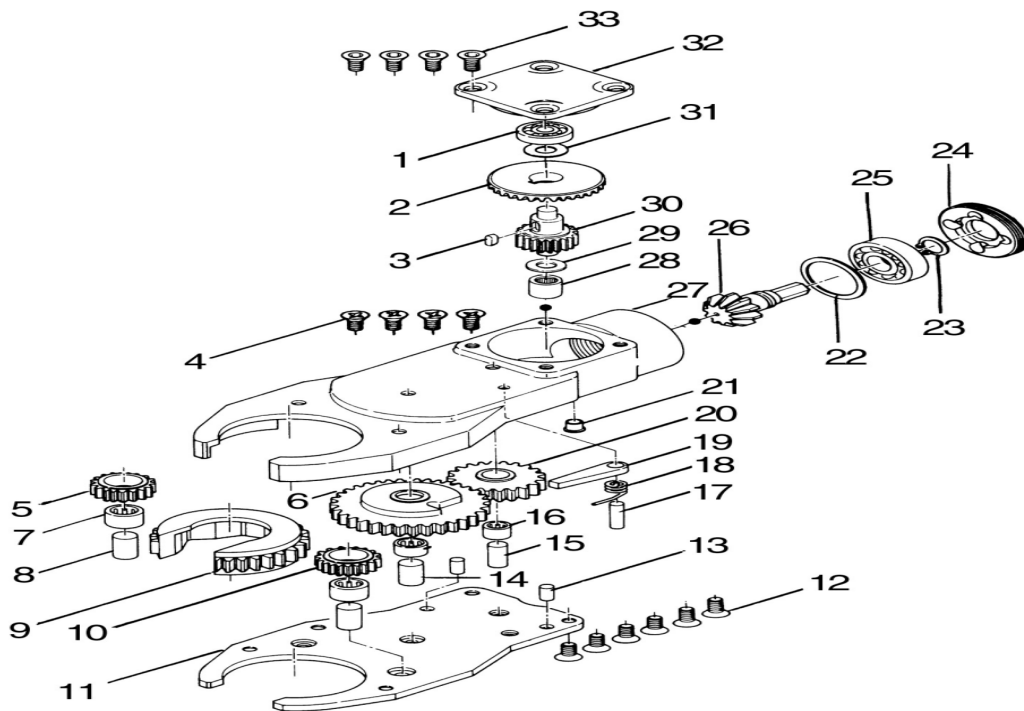
Lightly grease all gears. **Note:** Do not over grease as this will cause the excess grease to come out as the socket rotates through the casing opening.

5. Replace the gear casing cover and screws. **Note:** Torque the screws to 30 in. lbs. of torque and use a good quality thread locker on the screws. These screws are one-time use only and should be replaced with new screws.
6. Run and test the tool.

# Disassembly and Reassembly of Bevel Gear Casing Assembly

(cont.)

## UOW Bevel Gear Casing



Part Number	Description	Part Number	Description
1	Bearing	18	Checker Spring
2	Driven Gear	19	Checker
3	Key	20	Middle Gear
4	Flush Head Screw	21	Grease Cup
5	Spur Gear	22	Spacer
6	Ratchet Gear	23	Outer Snap Ring
7	Needle Roller Bearing	24	Ball Bearing Support
8	Needle Roller	25	Bearing
9	Socket	26	Driving Gear
10	Spur Gear	27	Bevel Gear Casing
11	Gear Casing Cover	28	Needle Roller Bearing
12	Flush Head Screw	29	Cam Spacer
13	Needle Roller	30	Driven Gear Spindle
14	Needle Roller	31	Adjusting Spacer
15	Needle Roller	32	Bevel Gear Casing Cover
16	Needle Roller Bearing	33	Flush Head Screw
17	Needle Roller		

# Troubleshooting

## UOW-T60

TROUBLE	CAUSE	SOLUTION
Tool operates intermittently	One or more of the shoulders on the pilot pin is rounded	Replace pilot pin
Tool shuts off as soon as it is started, or tool shuts off but will not restart	Spring under pilot pin has lost tension; notch pin is rounded.	Replace notch pin, band and/or pilot pin. Replace spring
	Band spring is stretched out of shape.	
	The shoulders on pilot pin are rounded	
Loss of RPM	Exhaust filter is dirty causing back pressure	Replace filter
Tool runs all the time	Value rod is stuck down	Disassemble clean and reassemble
Air motor runs but socket does not work	Broken gear in front head	Disassemble front head; inspect and replace broken parts
Low torque	Worn cam or worn air motor	Replace cam or rebuild air motor
Socket does not stop in reverse	Broken checker spring	Replace checker spring

## UOW-11

TROUBLE	CAUSE	SOLUTION
Loss of RPMs	Exhaust filter is dirty causing back pressure	Replace filter
Tool runs all the time	Value rod is stock down	Disassemble, clean, and reassemble
Air motor runs but socket does not turn	Broken gear in front head	Disassemble front head; inspect and replace broken parts
Low torque	Worn air motor	Rebuild air motor
Socket does not stop in reverse	Broken checker spring	Replace checker spring

### **Recommended Preventative Maintenance:**

Clean and inspect the tool every six months or 250,000 cycles.



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