UOW Series
Repair Manual
UOW-11 & UOW-T60 Series
1. **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
Disassembly and Reassembly of the Air Motor

**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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Front Plate Bearing</td>
<td>13</td>
<td>Air Inlet Bushing</td>
</tr>
<tr>
<td>2</td>
<td>Front Plate</td>
<td>14</td>
<td>Roll Pin</td>
</tr>
<tr>
<td>3</td>
<td>Blade</td>
<td>15</td>
<td>Valve Bushing</td>
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<tr>
<td>4</td>
<td>Rotor</td>
<td>16</td>
<td>Reverse Valve</td>
</tr>
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<td>Cylinder</td>
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<td>Valve Rod</td>
</tr>
<tr>
<td>6</td>
<td>Rear Plate</td>
<td>18</td>
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<tr>
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<td>9</td>
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<td>Motor Casing</td>
<td>22</td>
<td>Valve Rod Cap</td>
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<tr>
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<td>Throttle Lever</td>
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<td>Valve</td>
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<tr>
<td>12</td>
<td>Roll Pin</td>
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## Disassembly and Reassembly of the Air Motor (cont.)

### UOW-T60 Air Motor

<table>
<thead>
<tr>
<th>Part Number</th>
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<td>Pin</td>
<td>17</td>
<td>Cylinder</td>
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<tr>
<td>3</td>
<td>Blade</td>
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<td>4</td>
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<td>Valve Plug</td>
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<td>Throttle Lever</td>
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<td>O-Ring</td>
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<td>Air Inlet Bushing</td>
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<td>Valve Rod Cap</td>
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<td>14</td>
<td>Front Plate Bearing</td>
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<tr>
<td>15</td>
<td>Front Plate</td>
<td>30</td>
<td>Silencer</td>
</tr>
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</table>
**Disassembly and Reassembly of the Clutch**

**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.
### UOW-T60 Clutch

<table>
<thead>
<tr>
<th>Part Number</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Hammer Casing Nut</td>
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7
Disassembly and Reassembly of the Gear Section

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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
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<th>Description</th>
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<tbody>
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<td>Planet Gear</td>
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<td>6</td>
<td>Spacer</td>
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<td>Spacer</td>
</tr>
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</table>
Disassembly and Reassembly of the Gear Section (cont.)

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

<table>
<thead>
<tr>
<th>Part Number</th>
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<tbody>
<tr>
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<td>Gear Casing</td>
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<td>Hammer Casing Nut</td>
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<td>Needle Roller</td>
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<td>4</td>
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<td>First Gear Cage</td>
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<td>6</td>
<td>Second Internal Gear</td>
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</tr>
</tbody>
</table>
Disassembly and Reassembly of Bevel Gear Casing
Assembly

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.
Disassembly and Reassembly of Bevel Gear Casing Assembly

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.
### UOW Bevel Gear Casing

<table>
<thead>
<tr>
<th>Part Number</th>
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</table>
# Troubleshooting

## UOW-T60

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

## UOW-11

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<td>Replace filter</td>
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<tr>
<td>Tool runs all the time</td>
<td>Value rod is stuck down</td>
<td>Disassemble, clean, and reassemble</td>
</tr>
<tr>
<td>Air motor runs but socket does not turn</td>
<td>Broken gear in front head</td>
<td>Disassemble front head; inspect and replace broken parts</td>
</tr>
<tr>
<td>Low torque</td>
<td>Worn air motor</td>
<td>Rebuild air motor</td>
</tr>
<tr>
<td>Socket does not stop in reverse</td>
<td>Broken checker spring</td>
<td>Replace checker spring</td>
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**Recommended Preventative Maintenance:**

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