**LUBRICATION NOTES:**

**Type GE 00 Urethyn Grease**
No. 49-08-5355, 2.8 oz./80g tube

- Lightly coat all parts highlighted here with GE 00 grease unless directed otherwise.
- No grease to the face of ram.
- Coat the inside cavity of the sleeve and spindle with GE 00 grease.
- Coat the o-ring on the shift lever with grease.

**NOTE:** The entire contents of the grease tube will not be used. Use a total of approximately 3/16 oz./5.4g.

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**LUBRICATION NOTES:**

**Type ‘S2’ Grease**
No. 49-08-5265, 7.0 oz./198g tube

- Place approx. 38.4 grams, (1.3 oz.) of ‘S2’ grease in the gear cavity of the gearcase.
- Place a liberal amount of grease along the whole length of the reduction gear shaft.
- Place approx. 38.4 grams, (1.3 oz.) of ‘S2’ grease in the crankcase, between the bevel gear and the wobble plate.

**NOTE:** The entire contents of the grease tube will not be used. Use a total of approximately 2.8 oz./80g.

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Prior to reinstalling, clean gear assemblies with a clean, dry cloth. Lightly coat all parts highlighted here with ‘S2’ grease. Apply a greater amount of grease to all internal and external gear teeth.

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**SERVICE NOTES** on pages 3, 4 and 5 are included for general servicing of the tool and ARE NOT complete step by step instructions.
Assembly of internal Spindle components:

1. Lubricate Ram Catcher and O-Rings. Assemble O-Rings onto and into Ram Catcher.
2. Lubricate Striker and O-Ring. Assemble O-Ring onto Striker.
3. Assemble Striker Assembly into Ram Catcher Assembly (large end into Ram Catcher as shown).
4. Place the chamfered end of the Stop Washer over the small end of the Striker.
5. Place the assembled components from step 4 into the cavity of an old piston as shown. Use the old piston as an aid to push the assembled components deep into the Spindle cavity.
6. C-Ring (9s) will be used to secure the internal components inside the spindle. It is recommended to modify a flat blade screwdriver by filing or grinding a notch into the blade. Place the C-Ring upright as shown with the opening of the ring straight up. Use the modified screwdriver to push the C-Ring down into the Spindle cavity. Rotate the C-Ring in the spindle cavity as shown. Place the old piston into the Spindle cavity and tap the piston with a mallet to secure the C-Ring in the groove.

Assembly of external Spindle components:

7. Place C-Ring 9a onto Spindle. With the aid of a snap ring pliers, work the C-Ring into the rear most spindle groove and snap into place.

As an aid, put a dab of grease on your finger to pick up and place the three Steel Balls 9f into the three small holes on the Spindle just above the previously installed C-Ring.

Lubricate and install the Clutch Plate 9e onto the Spindle. Be sure to orient the part as shown and position with the three notches on the back of the plate over the three steel balls.

Lubricate and install the Clutch Gear 9d. Place the Clutch Spring 9c over the Clutch Gear and the Washer 9b over the Spring.

Place C-Ring 9x onto Spindle. With the aid of a snap ring pliers, work the C-Ring down to the other parts assembled onto spindle.

8. Place Spindle Service Fixture 61-30-0290 over the assembled parts and the spindle. Position so the fixture rests on Flat Washer 9b. Place the fixture and spindle assembly in an arbor press and carefully compress the Clutch Spring enough to expose the spindle groove for C-Ring 9x.

While compressed, use a screwdriver to work C-Ring 9x into the groove.
Apply Blue Loctite® to the threads of Hex Head Screw. Thread onto Wobble Shaft but do not tighten at this time.

9. The flat side of the Bearing Bar 9u has a rounded recess area that will receive the Spindle Bearing 9t. Coat the recess area and place the Spindle Bearing in the recess. Place the two parts onto the Spindle Assembly as shown. Next place the Washer 9v on top of the Bearing Bar and secure with Spiral Retaining Ring 9w.

Mounting the Spindle Assembly onto the Crankcase Assembly

10. Lubricate the inside cavity of the Crankcase Assembly 54 with grease. Place Wobble Shaft Assembly into Crankcase Assembly as shown. Use 9mm Hex Head Screw 20 to secure Wobble Shaft Assembly to Crankcase Assembly. NOTE: Prior to installing screw, place a few drops of Blue Loctite® thread locking sealant to the threads. At this time, DO NOT tighten screw completely.

11. Place Washers 12 and Wrist Pin 13 into rear area of Piston 11. While holding those parts in place, be sure the Washers are separated, one on each side of the hole in the Wrist Pin. Connect the Piston Assembly to the Wobble Shaft Assembly by sliding the hole on the Wrist Pin over the arm on the wobble bearing.

12. Lubricate O-Ring 10b and Striker (Ram) 10a. Be sure not to have any lubrication on the rear (flat side) of Striker. Place O-Ring onto Striker 10a. Insert assembled parts into Piston 11 as shown.

13. Mount the Spindle Assembly onto the Crankcase Assembly by inserting the Piston into the Spindle. Use four Screws to secure the Spindle Assembly to the Crankcase Assembly. NOTE: Prior to installing screws, place a few drops of Blue Loctite® thread locking sealant to the threads.
14. Install the Crankcase / Spindle Assembly into the Gearcase Assembly while following the lubrication instructions on page two.

15. Install the Rotor Assembly 27 into the bottom of the Crankcase. To prevent uneveness, start one screw 31 but do not tighten. Install the other screw and tighten both to 21-26 in/lbs (25-30 kg/cm).

16. The Hex Head Screw 20 on the back of the crankcase can now be tightened. Use a 9mm socket on the screw while holding the Rotor firmly by hand. Torque to 15-20 in/lbs (18-23 kg/cm).

17. Install the front components onto the Spindle.
   Place the small end of the Conical Spring 6 onto the spindle first.
   Place the Ball Plate 5 over the spring (flat side up).
   Compress the Conical Spring to install the two Steel Balls 4.
   Place the Chuck Sleeve Assembly 3 onto the Spindle over the Steel Balls. Notice the notches in the sleeve that correspond to the Steel Balls.
   Install one of the C-Rings onto the bottom most groove on the front of the Spindle. Be sure the C-Ring is seated properly in that groove. Check the Chuck Sleeve Assembly for proper functionality.
   As an aid to installing the Rotor into the Stator, partially tighten the bottom two screws as shown. Once rotor bearing is properly seated in the bearing cavity of the motor housing halves, the bottom screws can be tightened.

17. Continued...
   Install the second C-Ring onto the front most groove of the Spindle. Be sure the C-Ring is seated properly in that groove.
   Place the Dust Cap 1 over the front of the Spindle and that last C-Ring. Once again check that the Chuck Sleeve Assembly is functioning properly.

18. Place Stator Assembly 34c into Motor Housing Support 33.
   Place the Motor Housing Cover 32 over the Stator. Tighten the top two screws. Drive but do not seat the bottom two screws. Leave the bottom two screws out as shown above. This is done as an aid for easier installation of the Rotor and Rotor Bearing into the Stator/Motor Housing Assemblies.
   Once rotor bearing is properly seated in the bearing cavity of the motor housing halves, the bottom screws can be tightened.
   All four screws are to be tightened to 30-34 in/lbs (35-40 kg/cm).