

# IMCO SCX SERIES INFORMATION, OPERATION & MAINTENANCE

## Warning!

1. SCX & SCX4 Drives will not fit on a standard gimbal helmet, IMCO HELMET: #05-8025 Black or #05-8027 Silver or #05-8028 ITS Black is required.

## Warning!

2. Maximum engine idle speed is 800 RPM. Shift drive with a positive move, do not let clutch sit between neutral and in gear position.

## Warning!

3. Do Not! Install propeller until the drive shift linkage has been properly installed and tested with the engine running!

## Danger!

4. When using SCX or SCX4 drives it is necessary to have full hydraulic steering for your safety.

## Warning!

5. When tuning engine, remove propeller and shift drive into forward gear!

6. Do not run your boat with a worn or loose gimbal ring or helmet, worn clevis pins, or clevis bushings.

7. Every hull is different and requires a different setup: Many different things contribute to performance: water pickup location, cavitation plates, gear ratio, drive height, prop, weight distribution, water conditions, weather conditions.

8. If you are installing the drive on a new application, consult the manufacture or a dealer with experience with the hull to determine the proper drive height.

9. SCX Drive is 19 7/8" from crankshaft center line to prop shaft center line (2" shorter than standard Bravo).

10. The bolt pattern is different from the SCX to the SCX4, lowers cannot be interchanged.

## Warning!

11. Max propeller diameter on the SCX is 16 3/4", SCX4 is 17" (always check that there is at least 1/2" clearance between the propeller blades and the drive case).

12. Large diameter propellers installed on a #6 prop shaft will require a torque tab on single engine boats.

13. SCX and SCX 4 drives require a drive oil reservoir with a minimum capacity of 1 1/2 quarts.

14. When installing drive to gimbal or lower to upper always use anti-seize on all threads.

15. When installing lower to upper, inspect all "O" rings, replace as necessary, pressure check to insure proper seal.

16. If you do your own maintenance and repairs on your IMCO drive, you will need a service manual and the proper tools. Service manuals and tools are available at [www.imcomarine.com/cal\\_store](http://www.imcomarine.com/cal_store).

## Before Running!

17. Always wear proper safety equipment when operating your boat, testing or running at high speeds.

18. Inspect for: oil level in drive and reservoir, leaks, loose fasteners, worn parts.

Recommended oil: Torco RTF GL-6 Torco Part #A220015CE (unit) Part # S220015C (case) IMCO Part # 09-2600 (unit) Part # 09-2605 (5 Gal.) Part # 09-2610 (case) (100% Synthetic Racing Transmission Fluid) Replaces SAE 75W90.

To drain oil: remove drain screws form bearing carrier (right below the prop shaft) and on port side of upper.

To replace oil: pump oil in from lower drain screw until it comes out of upper drain screw hole. Replace drain screws and add oil to drive oil reservoir.

When changing oil, run the used oil through a strainer to check for metal particles, if there are metal particles in the oil, it is time for inspection of the gears and bearings. If oil appears milky or off colored check for leaks.

SCX, SCX4 capacity: 5 qts + reservoir - SCX Upper with SC Lower 4 1/2 qts + reservoir.

|                         |                           |                                           |
|-------------------------|---------------------------|-------------------------------------------|
| SCX Upper & SCX Lower   | New Break in<br>5-8 hours | After Break in<br>20-30 hours             |
| SCX4 Upper & SCX4 Lower | New Break in<br>5-8 hours | After Break in<br>20-30 hours             |
| SCX Upper & SC Lower    | New Break in<br>5-8 hours | Check Drain Plug Magnet<br>Every 20 Hours |

**Warning!** 19. Drive must be turning before shifting.

**Warning!** 20. Do not run engine when drive is trimmed extremely high, or in trailer tow mode.

**Caution!** 21. Do not use solvents or chemical cleaner to clean painted surfaces on the drive.

**Caution!** 22. When installing or changing propeller use extreme caution, propeller blades can be very sharp.

22. SCX Upper vertical shaft is 17 tooth spline, SC, Merc lowers are 15 tooth spline. A 17-15 tooth coupler is available 01-2150 (cannot be used with a spacer).

**Caution!** 24. Use extreme caution if modifying lower, case can be weakened or handling can be adversely.

25. Break in: Do not use full throttle until drive is fully warmed up, do not hold drive at wide open throttle for more than 2 minutes for the first 3 hours of use.

26. Inspect anode (located on front of cavitation plate) for corrosion or debris; if necessary clean or replace.

**Caution!** 27. Do not shift drive while running on hose with propeller installed.

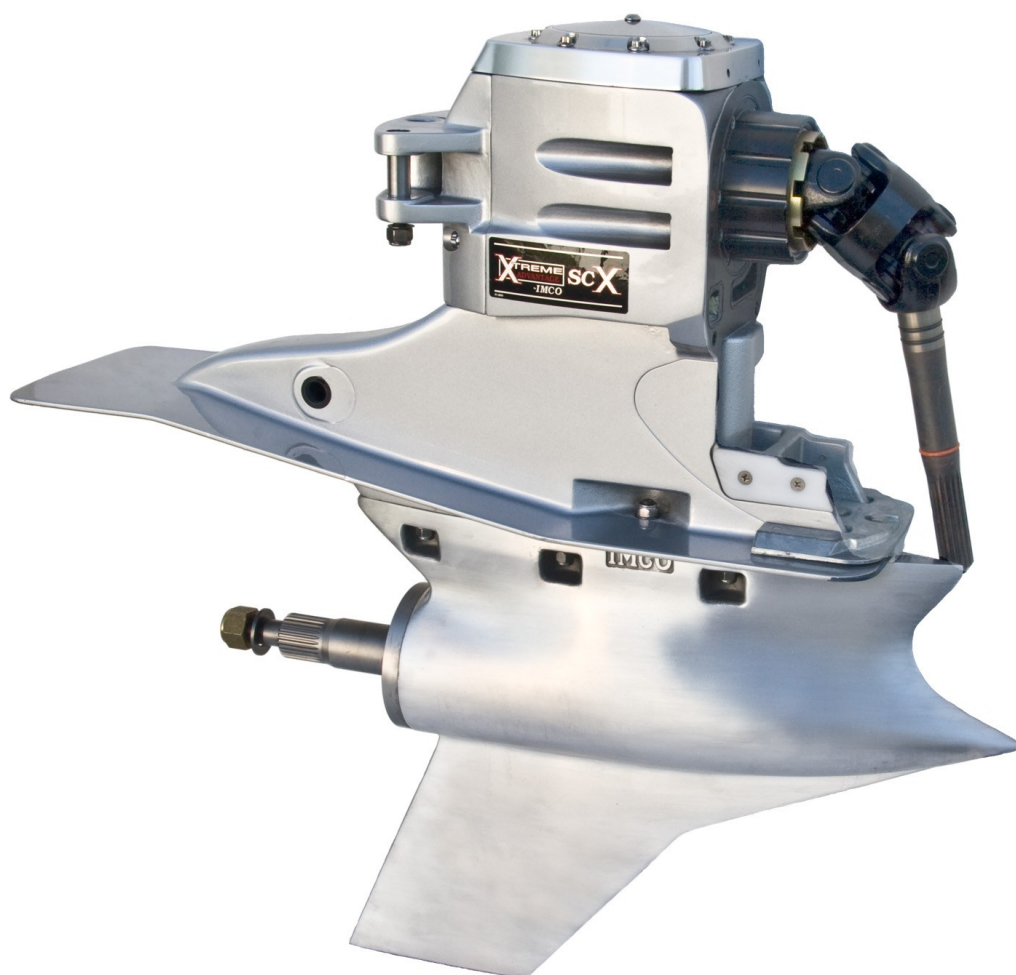
28. Rotation: shift linkage pushed in - right hand rotation, shift linkage pulled out - left hand rotation.

29. Serial # location: Port side below SCX,SCX4 sticker.



# **X**XTREME ADVANTAGE **SCX4T**

## Parts and Service Manual



***IMCO***

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### Check Oil Before Running

First break in oil change 5-8 hours

Oil is filled to upper drain screw [Fig 1-33]

Pump oil from bottom drain screw [fig 6-36]

Recommended oil change intervals 20-30 hours

Heavy use or high HP change more often.

Serial Number \_\_\_\_\_

Date of Purchase \_\_\_\_\_

Purchased From \_\_\_\_\_

# UPPER GEAR CASE-DISASSEMBLY

NOTE; The following instructions assume that the drive has been removed from the transom assembly and is shifted to the "neutral" position. The lower unit has also been removed, along with the yoke coupler end, center socket, and cross and bearings. Steps followed by asterisk (\*\*) are required only if inspection indicates component replacement. Brackets following the part name represent the drawing figure # and item #.

1. Remove upper cap screws [1-7,8], remove upper cap [1-3].
2. Remove steering cap screws [1-28], remove steering cap [1-2]
3. Remove pinion hub screws [1-(22,23)].
4. Remove pinion hub assembly [2-(31-45)].
5. Disassemble pinion hub assembly.
6. Remove yoke nut [2-36], and washer [2-37].
7. Remove yoke [2-32].
8. Remove retainer nut [2-31].
9. Remove Yoke gear end shims [2-42], pinion shoulder washer [2-43], and pinion seal carrier [2-45].
10. Remove bearings [2-(38,41)], bearing cups [2-(39,40)], and pinion gear [2-12].

Note; be sure to maintain correct assembly position of the upper & lower thrust bearings & races.

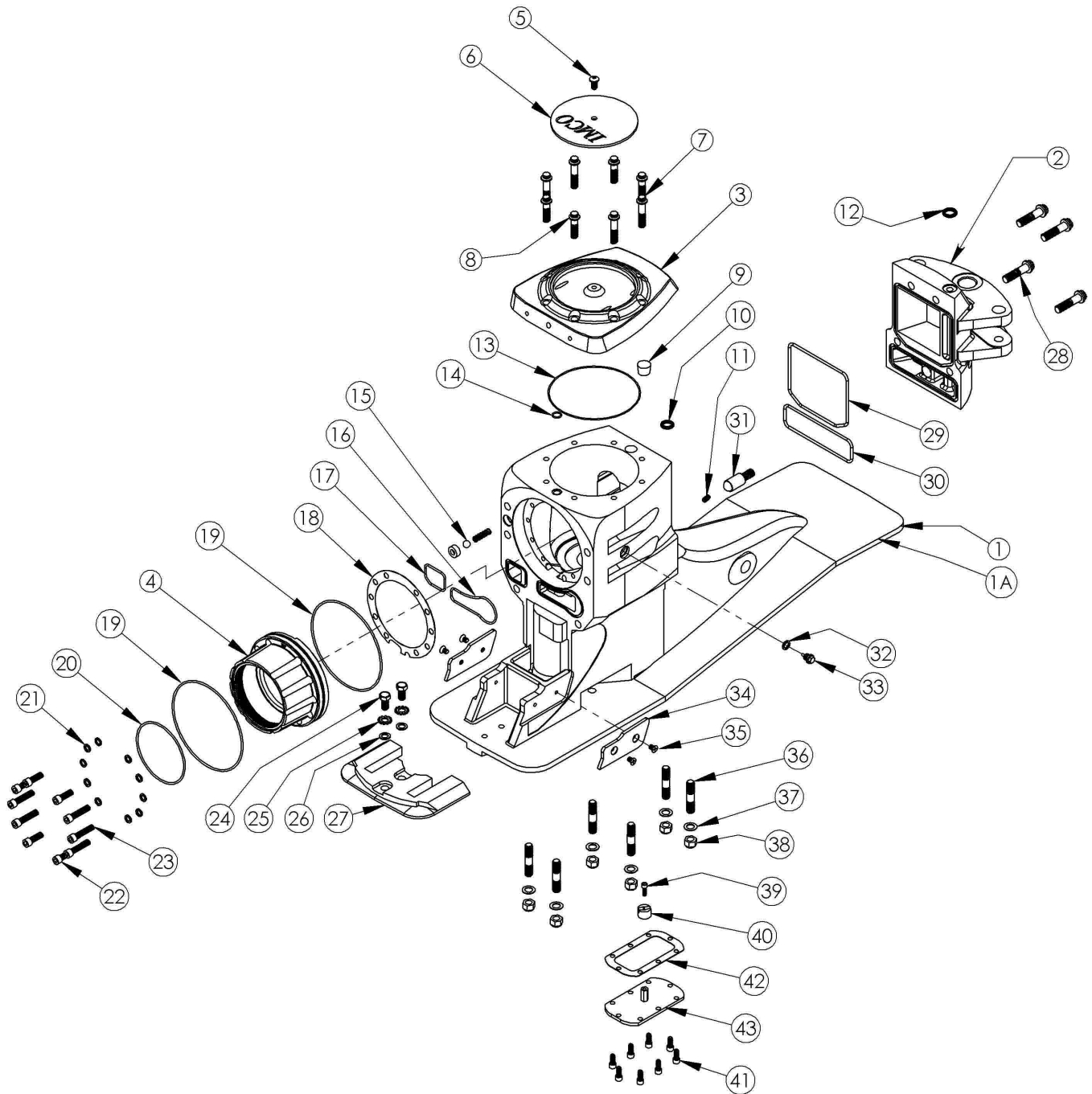
11. Remove upper thrust race [2-6], and upper thrust bearing [2-7].
12. Remove gear assembly [2-(8-13)].
13. Remove lower thrust race [2-6], lower thrust bearing [2-7].
14. Remove oil tank cover [1-41], inspect magnet [1-39].
15. Disassemble gear assy.

Note: Gear on bottom of gear assembly Right Hand Rotation.

Gear on top of gear assembly Left Hand Rotation

# Upper Case Hardware & Seals

Fig-1



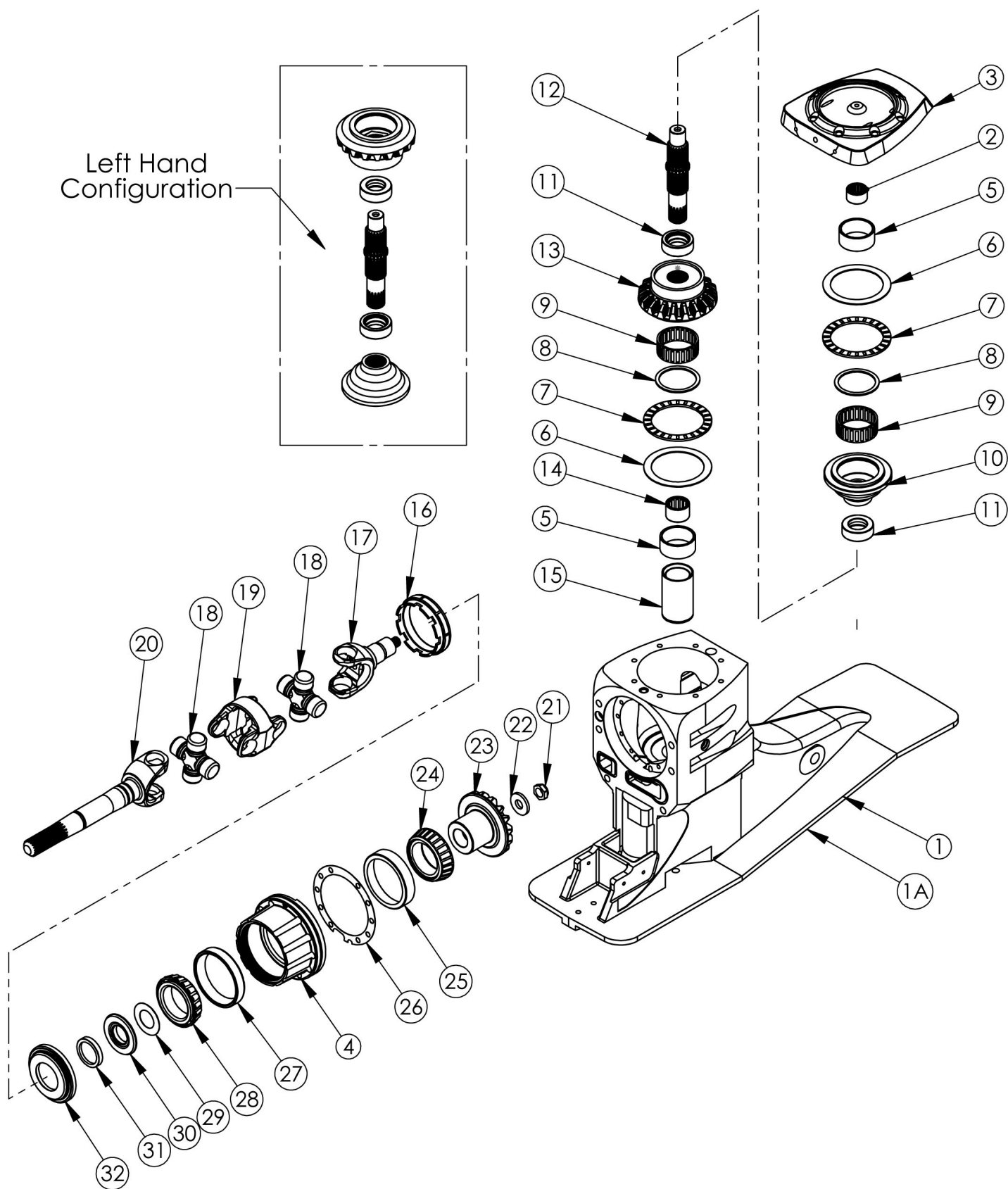
## Upper Case Hardware & Seals

**Fig-1**

| Item | Description                                      | Qty | Part Number  |
|------|--------------------------------------------------|-----|--------------|
| 1    | Upper Case Black                                 | 1   | 01-1579      |
| 1A   | Upper Case Silver                                | 1   | 01-1580      |
| 2    | See website for steering caps                    | 1   | n/a          |
| 3    | Upper Cap                                        | 1   | 01-2555      |
| 4    | Pinion Hub                                       | 1   | 01-2560      |
| 5    | Screw (5/16-18 x 1/2" Button Head)               | 1   | 08-040705041 |
| 6    | Top Cap Lid                                      | 1   | 01-2071      |
| 7    | Screw (3/8-16 x 1 3/4" S/S 12 Point)             | 4   | 08-070806111 |
| 8    | Screw (3/8-16 x 1 1/2" S/S 12 Point)             | 4   | 08-070806101 |
| 9    | Shift Shaft Plug                                 | 1   | 11-1024      |
| 10   | Quad Ring (Cooling Water, Bottom)                | 1   | 11-4024      |
| 11   | Screw (5/16-18 x 1/2" Allen Set)(Tower Retainer) | 1   | 08-050705041 |
| 12   | Quad Ring (Cooling Water, Top)                   | 1   | 11-4025      |
| 13   | "O" Ring (Top Cap)                               | 1   | 11-2049      |
| 14   | "O" Ring (Top Cap Oil Pressure)                  | 1   | 11-2013      |
| 15   | Spring Kit (Seal,Ball & Spring)                  | Kit | 01-2045      |
| 16   | "O" Ring (Water Passage-Upper to Gimbal)         | 1   | 11-2148      |
| 17   | "O" Ring (Shift Linkage)                         | 1   | 11-2129      |
| 18   | Pinion Hub Shims                                 | Kit | 01-2548      |
| 19   | "O" Ring (Pinion Hub)                            | 2   | 11-2161      |
| 20   | "O" Ring (Pinion Retainer Nut)                   | 1   | 11-2154      |
| 21   | Pinion Hub (5/16" Copper Sealing Washers)        | 10  | 08-120700004 |
| 22   | Screw (5/16-18 x 1" Socket Cap)                  | 4   | 08-060705082 |
| 23   | Screw (5/16-18 x 1 1/2" Socket Cap)              | 6   | 08-060705102 |
| 24   | Screw (3/8-16 x 3/4" HH)                         | 2   | 08-010806061 |
| 25   | Washer (3/8" Star)                               | 2   | 08-110800001 |
| 26   | Washer (3/8" AN)                                 | 2   | 08-100800001 |
| 27   | Anode                                            | 1   | 01-2067      |
| 28   | Screw (7/16-14 x 1 3/4" S/S 12 Point)            | 4   | 08-070907111 |
| 29   | "O" Ring (Steering Cap, Oil)                     | 1   | 11-2250      |
| 30   | "O" Ring (Steering Cap, Shift Cavity)            | 1   | 11-2242      |
| 31   | Detent Kit (Spring & Ball Cylinder)              | Kit | 01-2044      |
| 32   | Drain Screw Sealing Washer                       | 1   | 11-1017      |
| 33   | Drain Screw                                      | 1   | 01-2504      |
| 34   | Guide Pads (Port & Starboard)                    | 2   | 01-2471      |
| 35   | Screw (1/4-20 x 1/2" Flat Head Undercut)         | 4   | 08-020604041 |
| 36   | Stud (7/16 x 2 1/8")                             | 4   | 08-130904741 |
| 37   | Washer (7/16" AN S/S)                            | 4   | 08-100900001 |
| 38   | Nut (7/16-20 Nylock S/S)                         | 4   | 08-080904001 |
| 39   | Screw (10-32 x 5/8" Socket Cap)                  | 1   | 08-060403052 |
| 40   | Magnet                                           | 1   | 01-9587      |
| 41   | Screw (1/4-20x 5/8" Socket Cap)                  | 8   | 08-060604051 |
| 42   | Oil Tank Gasket                                  | 1   | 11-1030      |
| 43   | Oil Tank Cover                                   | 1   | 01-2574      |
|      | SCX, SCX4, SCXT, SCX4T Upper Seal Kit            | Kit | 11-8008      |

# Upper Case Gear & Components

Fig-2



## Upper Case Gear & Components

**Fig-2**

| Item | Description                                   | Qty | Part Number  |
|------|-----------------------------------------------|-----|--------------|
| 1    | Upper Case Black                              | 1   | 01-1579      |
| 1A   | Upper Case Silver                             | 1   | 01-1580      |
| 2    | Roller Bearing (Upper Vertical Shaft)         | 1   | 10-3042      |
| 3    | Upper Cap                                     | 1   | 01-2555      |
| 4    | Pinion Hub                                    | 1   | 01-2560      |
| 5    | Tower Race                                    | 2   | 10-6041      |
| 6    | Thrust Race                                   | 2   | 10-5045-X    |
| 7    | Thrust Bearing (Gear)                         | 2   | 10-4044      |
| 8    | Spirol Retainer Ring                          | 2   | 01-2055      |
| 9    | Roller Bearing (Internal Gear)                | 2   | 10-3046      |
| 10   | Gear Replacement                              | 1   | 01-4576      |
| 11   | Gear Spacer                                   | 2   | 01-9001      |
| 12   | Upper Vertical Shaft                          | 1   | 01-3562      |
| 13   | SCXT, SCX4T Driven Gear                       | 1   | 01-4540      |
| 14   | Roller Bearing (Upper Vertical Shaft)         | 1   | 10-4020      |
| 15   | Tower                                         | 1   | 01-2561      |
| 16   | Retainer Nut                                  | 1   | 01-2239      |
| 17   | Yoke Gear End                                 | 1   | 01-2085      |
| 18   | Cross & Bearing                               | 2   | 01-2086      |
| 19   | Center Socket                                 | 1   | 01-2087      |
| 20   | Yoke Coupler End                              | 1   | 01-2088      |
| 21   | Nut (Yoke Gear End)(5/8-18 Thin Nylock Steel) | 1   | 08-091105002 |
| 22   | Washer (Yoke Gear End)                        | 1   | 08-121100002 |
| 23   | Pinion Gear                                   | 1   | 01-4538      |
| 24   | Bearing Cone (Pinion Bearing)                 | 1   | 10-1021      |
| 25   | Bearing Cup (Pinion Bearing)                  | 1   | 10-2022      |
| 26   | Pinion Hub Shims                              | Kit | 01-2548-X    |
| 27   | Bearing Cup (Pinion Bearing)                  | 1   | 10-2024      |
| 28   | Bearing Cone (Pinion Bearing)                 | 1   | 10-1023      |
| 29   | Yoke Gear End Shims                           | Kit | 01-2020-X    |
| 30   | Pinion Shoulder Washer                        | 1   | 01-2241      |
| 31   | Yoke Gear End Seal                            | 1   | 11-3029      |
| 32   | Pinion Seal Carrier                           | 1   | 01-2240      |

## UPPER GEAR CASE-ASSEMBLY

NOTE: Optimum performance of the upper gear case requires “setting up” the pinion & clutch gears with IMCO procedure as follows:

1. Take all measurements using the “SCX4T Setup Diagrams” (Fig 3) and the “SCX4T Work Sheet” (Fig 4).
2. After all measurements are taken and proper race thickness has been determined, place lower race [2-6] and thrust bearing [2-7] in case.
3. Place lower right or left driven gear [2-13] with attached tool (backlash tower 01-5598) into case.
4. Adjust rolling preload (8-10 in/lbs) on pinion gear by changing Yoke Gear End Shims [2-28]. Tighten nut [2-21] to 75 ft/lbs.
5. After proper rolling preload is determined, assemble pinion pack with pinion retainer nut “O” ring [1-20] between pinion seal carrier [2-31] and retainer nut [2-16].
6. Torque retainer nut to 200 ft/lbs. (Tool: Pinion Retainer Nut Driver 01-5590). (Torque wrench centered on retainer nut or if using longer tool be sure to compensate on torque value). Use new lock nut [2-21] and torque to 75 ft/lbs.
7. Install pinion pack using 4 screws [1-23] for testing.
8. Install dial indicator (indicator bracket 01-5588) and pinion gear locking tool (pinion gear lock 01-5587) Fig-5.
9. Check backlash, adjust backlash with pinion hub shims [2-18] (average backlash should be .007-.010+).
10. Right Hand: Place driven gear [2-13] on thrust race [2-6] and thrust bearing [2-7]. Install one gear spacer [2-11] on each side of vertical shaft [2-12], align to engage splines. Install vertical shaft and gear spacers (coupler spline down) through gear spline. **Make sure gear spacers are engaged!** Install gear replacement [2-10]. Install thrust bearing [2-7] and thrust race [2-6].
11. Left Hand: Place driven gear replacement [2-10] on thrust race [2-6] and thrust bearing [2-7]. Install one gear spacer [2-11] on each side of vertical shaft [2-12], align to engage splines. Install vertical shaft and gear spacers (coupler spline down) through gear spline. **Make sure gear spacers are engaged!** Install driven gear [2-13]. Install thrust bearing [2-7] and thrust race [2-6].
12. Install upper cap [2-3] temporarily using 4 screws [1-8].
13. Check for rolling preload. There should be only a 2-3 in/lbs of rolling preload, no end play.

**Warning Note: When checking gear stack rolling, stack should never be larger than case to seat! Check work sheet measurements! Damage can be caused to bearings or races!**

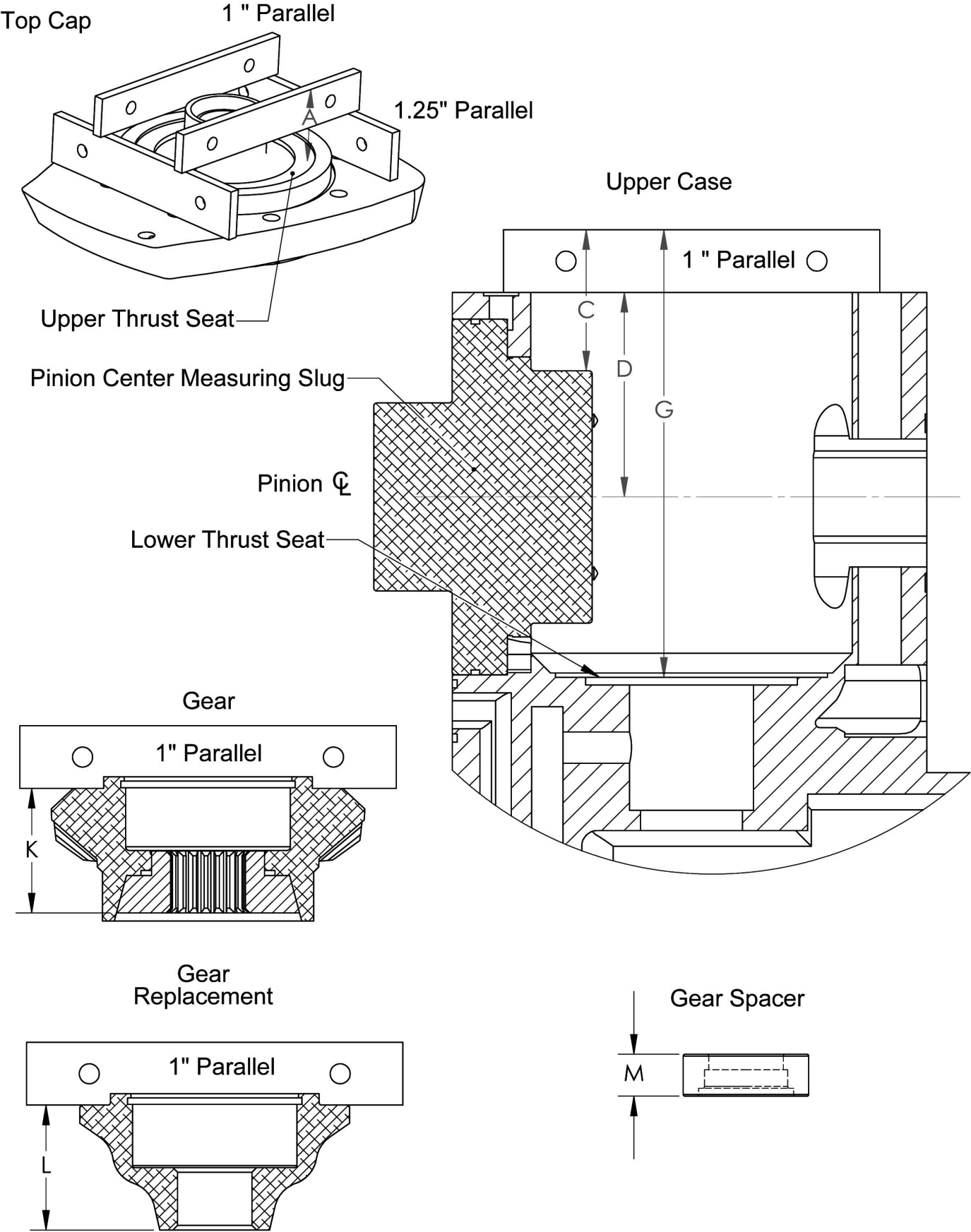
14. Rolling preload can be adjusted by changing race [2-6] on the gear replacement side.
15. Once rolling preload is set, remove upper cap [2-3].
16. Install quad ring [1-10] in case [1-1], install “O” Ring [1-29] and “O” Ring [1-30] in steering cap [1-2].
17. Install steering cap [1-2] using screws [1-28]. Use “Perfect Seal” on threads and torque screws to 35 ft/lbs.

## UPPER GEAR CASE-ASSEMBLY

18. Install quad ring [1-12] in steering cap. "O" Ring [1-14] in upper case.
19. Install "O" Ring [1-13] on upper cap [1-3] and install upper cap with screws {1-7,8} (**Important: short screws [1-8] in 2 front & 2 rear holes, long screws [1-7] in 2 port & 2 starboard holes**). Torque upper cap screws to 25 ft/lbs.
20. Install oil tank cover [1-43], oil tank gasket [1-42] with "Permatix Form-Gasket. (note; use a very thin layer on gasket) oil tank cover screws [1-41] with "Loctite 242", torque to 10 ft/lbs.

SCX Setup Diagrams

Fig-3



## SCXT, SCX4T WORK SHEET

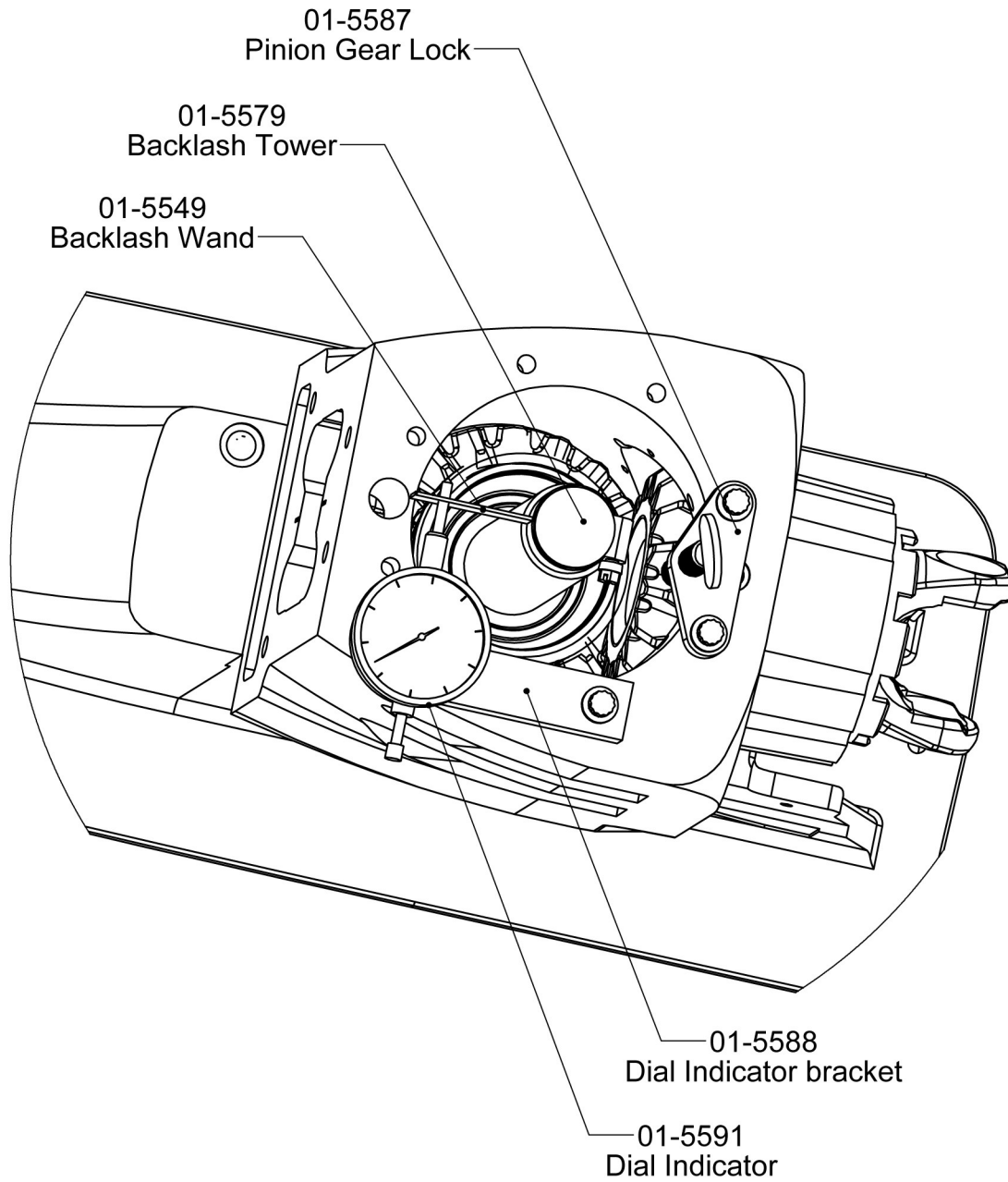
Serial #

|                                        |                       |   |   |                                |      |       |
|----------------------------------------|-----------------------|---|---|--------------------------------|------|-------|
|                                        |                       |   |   | UPPER CAP                      |      |       |
|                                        | Parallels             |   |   | 2.250                          |      |       |
|                                        | Measurement           | A | - |                                | Norm | 1.862 |
| Cap Deck to Thrust Seat                | Total                 | B | = |                                | Norm | 0.388 |
|                                        |                       |   |   | DECK TO PINION CEN-<br>TERLINE |      |       |
| Deck to Tool                           | Measurement           | C |   |                                | Norm | 2.252 |
|                                        | Less Parallel         |   | - | 1.000                          |      |       |
|                                        | Total                 |   |   |                                | Norm | 1.252 |
|                                        | Plus 1/2 tool         |   | + | 2.012                          |      |       |
| Deck to Pinion CL                      | Total                 | D | = |                                | Norm | 3.264 |
|                                        |                       |   |   | UPPER THRUST SEAT              |      |       |
| Deck to Pinion CL                      |                       | D |   |                                | Norm | 3.264 |
|                                        |                       | B | - |                                | Norm | 0.388 |
| Pinion CL to Upper Thrust Seat         | Total                 | E | = |                                | Norm | 2.876 |
|                                        | Bearing Thickness     |   | - | 0.157                          |      |       |
|                                        | Mounting Distance     |   | - | 2.661                          |      |       |
|                                        | Race Thickness        | F | = |                                | Norm | 0.060 |
|                                        |                       |   |   | LOWER THRUST SEAT              |      |       |
|                                        | Measurement           | G |   |                                | Norm | 7.138 |
|                                        | Parallel              |   | - | 1.000                          |      |       |
| Deck to Lower Thrust Seat              | Total                 |   | = |                                | Norm | 6.138 |
| Deck to Pinion CL                      |                       | D | - |                                | Norm | 3.262 |
| Pinion CL to Lower Thrust Seat         | Total                 | H | = |                                | Norm | 2.876 |
|                                        | Bearing Thickness     |   | - | 0.157                          |      |       |
|                                        | Mounting Distance     |   | - | 2.661                          |      |       |
|                                        | Race Thickness        | J | = |                                | Norm | 0.060 |
|                                        |                       |   |   | GEAR MEASUREMENTS              |      |       |
| Gear                                   | Measurement           | K |   |                                | Norm | 1.988 |
| Gear Replacement                       | Measurement           | L |   |                                | Norm | 1.990 |
|                                        | Total                 | M | = |                                | Norm | 3.978 |
|                                        |                       |   |   | GEAR ASSEMBLY                  |      |       |
| Gear & Gear Replacement                | Total                 | M | + |                                | Norm | 3.978 |
|                                        | Race Thickness        | F | + |                                | Norm | 0.060 |
|                                        | Race Thickness        | J | + |                                | Norm | 0.060 |
|                                        | 2 x Bearing Thickness |   | + | 0.314                          |      |       |
| Gear Spacer                            | 2 x Spacer Thickness  | M | + |                                | Norm | 1.340 |
| Gear Assembly                          | Total                 | O | = |                                |      | 5.752 |
|                                        |                       |   |   | CAP CRUSH                      |      |       |
| Pinion CL to Upper Thrust Seat         |                       | E | + |                                | Norm | 2.876 |
| Pinion CL to Lower Thrust Seat         |                       | H | + |                                | Norm | 2.876 |
| Upper Thrust Seat to Lower Thrust Seat | Total                 | P | = |                                | Norm | 5.752 |
| Gear Assembly                          | Total                 | O | = |                                | Norm | 5.752 |

P and O are to match

## Backlash Assembly

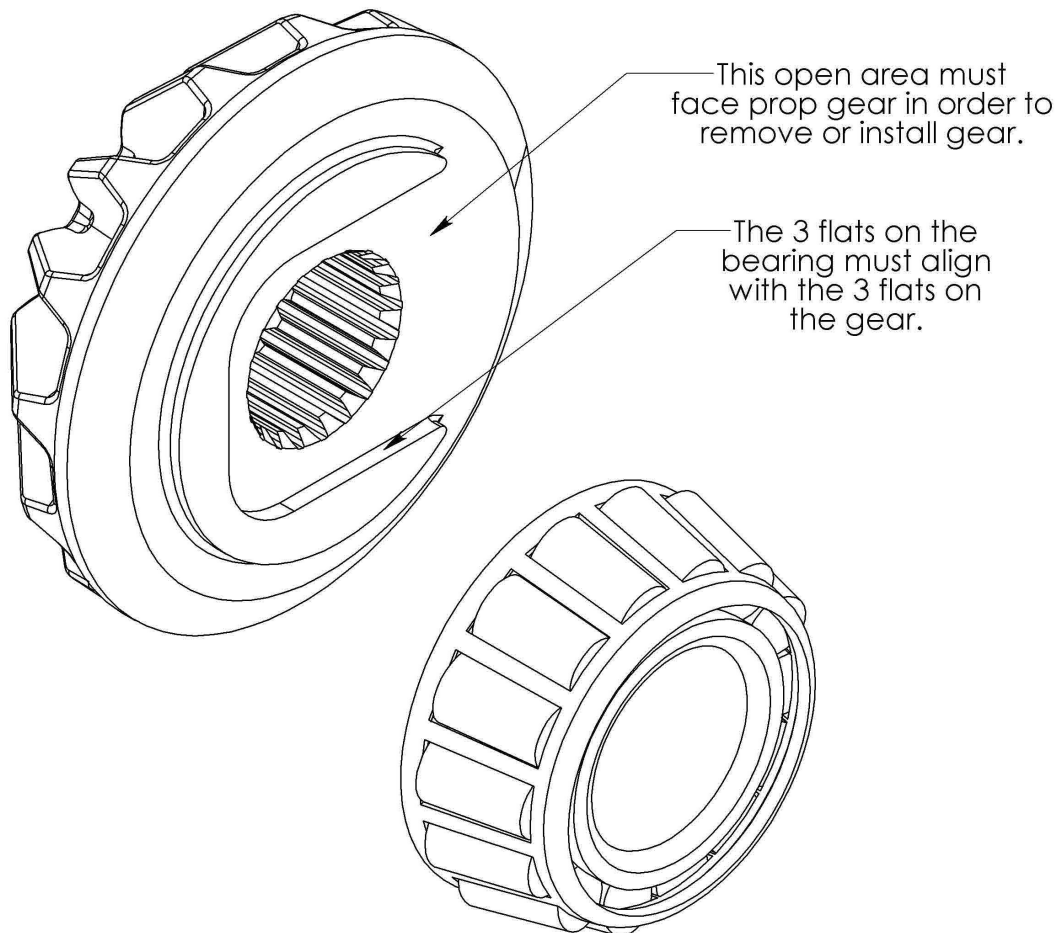
Fig-5



## LOWER GEAR CASE-DISASSEMBLY

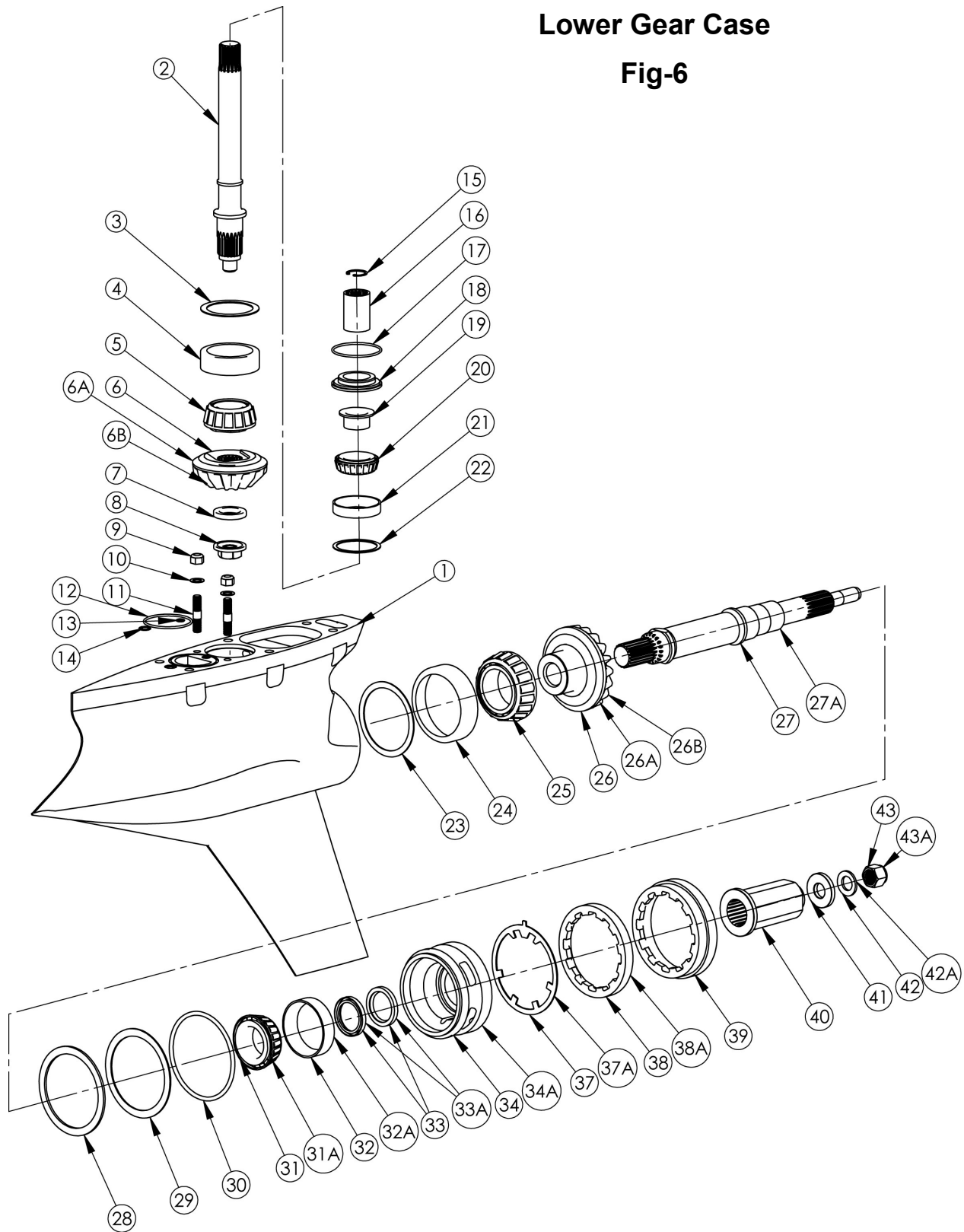
NOTE; The following instructions assume that the lower gear case has already been separated from the upper gear case. Brackets following the part name represent the drawing figure # and item #.

1. Remove prop adaptor ring [6-39]
2. Bend the tabs of the bearing carrier tab washer [6-37] away from the cover nut [6-38].
3. Remove cover nut [6-34]
4. Remove bearing carrier [6-34]
5. Remove bearing carrier thrust washer [6-28], bearing carrier shims [6-29] & bearing carrier "O" ring [6-30].
6. Align flats on prop shaft [6-27] to clear pinion gear nut [6-8], remove prop shaft.
7. Remove pinion gear nut [6-8] & pinion gear spud washer [6-7].
8. Remove vertical shaft [6-2].
9. Rotate pinion gear to align bearing driver lugs on pinion gear to align with flats on pinion bearing (see detail below) and remove pinion gear [6-6].
10. Remove prop gear [6-26].



## Lower Gear Case

Fig-6



| Item | Description                         | Qty | Part Number |
|------|-------------------------------------|-----|-------------|
| 1    | Lower Case                          | 1   | 01-5390     |
| 2    | Vertical Shaft (SCX)                | 1   | 01-3568     |
| 3    | Shim (Pinion Gear)                  | Kit | 01-2394-X   |
| 4    | Cup (Pinion Gear)                   | 1   | 10-2037     |
| 5    | Bearing Cone (Pinion Gear Modified) | 1   | 10-1036     |

## Lower Gear Case Fig-6

| Item | Description                              | Qty  | Part Number  |
|------|------------------------------------------|------|--------------|
| 6    | Pinion Gear (1:50)                       | 1    | 01-4563      |
| 6A   | Pinion Gear (1:34)                       |      | 01-4565      |
| 6B   | Pinion Gear (1:25)                       |      | 01-4597      |
| 7    | Pinion Gear Spud Washer                  | 1    | 01-2404      |
| 8    | Nut (Pinion Gear)                        | 1    | 01-2397      |
| 9    | Nut (7/16-20 Nylock S/S)                 | 2    | 08-080904001 |
| 10   | Washer (7/16" AN S/S)                    | 2    | 08-100900001 |
| 11   | Stud (7/16 x 2" S/S)                     | 2    | 08-130904121 |
| 12   | "O" Ring (Water Passage)                 | 1    | 11-2143      |
| 13   | "O" Ring (PTFE Oil Passage)              | 1    | 11-4011      |
| 14   | "O" Ring (Cooling Water Passage)         | 1    | 11-2014      |
| 15   | Retainer Ring (Vertical Shaft Coupler)   | 1    | 08-211700001 |
| 16   | Vertical Shaft Coupler                   | 1    | 01-2140      |
| 17   | "O" Ring (Alignment Spacer)              | 1    | 11-2144      |
| 18   | Alignment Spacer                         | 1    | 01-2401      |
| 19   | Vertical Shaft Bearing Sleeve (2 halves) | 1set | 01-2400      |
| 20   | Bearing Cone (Vertical Shaft)            | 1    | 10-1034      |
| 21   | Bearing Cup (Vertical Shaft)             | 1    | 10-2036      |
| 22   | Shim (Vertical Shaft)                    | Kit  | 01-2396-X    |
| 23   | Shim (Prop Gear)                         | Kit  | 01-2395-X    |
| 24   | Bearing Cup (Prop Gear)                  | 1    | 10-2031      |
| 25   | Bearing Cone (Prop Gear)                 | 1    | 10-1030      |
| 26   | Prop Gear (1:50)                         | 1    | 01-4564      |
| 26A  | Prop Gear (1:34)                         |      | 01-4566      |
| 26B  | Prop Gear (1:25)                         |      | 01-4598      |
| 27   | Prop Shaft 1 7/16"                       | 1    | 01-3571      |
| 27A  | Prop Shaft #6                            |      | 01-3446      |
| 28   | Bearing Carrier Thrust Washer            | 1    | 01-2392      |
| 29   | Shim (Bearing Carrier)                   | Kit  | 01-2393-X    |
| 30   | "O" Ring (Bearing Carrier)               | 1    | 11-2349      |
| 31   | Bearing Cone (Bearing Carrier)           | 1    | 10-1035      |
| 31A  | Bearing Cone (Bearing Carrier #6)        |      | 10-1038      |
| 32   | Bearing Cup (Bearing Carrier)            | 1    | 10-2035      |
| 32A  | Bearing Cup (Bearing Carrier #6)         |      | 10-2040      |
| 33   | Seal (Prop Shaft 1 7/16")                | 2    | 11-3037      |
| 33A  | Seal (Prop Shaft #6)                     |      | 11-3038      |
| 34   | Bearing Carrier (1 7/16" Prop Shaft)     | 1    | 01-2398      |
| 34A  | Bearing Carrier (#6 Prop Shaft)          |      | 01-2447      |
| 35   | Drain Screw Sealing Washer               | 1    | 11-1017      |
| 36   | Drain Screw                              | 1    | 01-2504      |
| 37   | Tab Washer (1 7/16" Prop Shaft)          | 1    | 01-2403      |
| 37A  | Tab Washer (#6 Prop Shaft)               |      | 01-2498      |
| 38   | Cover Nut (1 7/16" Prop Shaft)           | 1    | 01-2402      |
| 38A  | Cover Nut (#6 Prop Shaft)                |      | 01-2492      |
| 39   | Prop Adaptor Ring                        | 1    | 01-2399      |
| 40   | Prop Adaptor (1 7/16" Prop Shaft)        | 1    | 01-3569      |
| 41   | Thrust Washer (3/4" Heavy)               | 1    | 01-6579      |
| 42   | Washer (3/4" Spring)                     | 1    | 08-221300001 |
| 42A  | Washer (1" Spring, #6 Shaft)             |      | 08-221700001 |
| 43   | Nut (3/4-16 Nylock, Brass)               | 1    | 08-081306003 |
| 43A  | Nut (1-12 Nylock, Brass, #6 Shaft)       |      | 08-081712003 |
| 43A  | Nut (1-14 Nylock, Brass, #6 Shaft)       |      | 08-081712004 |
|      | SCX Lower Seal Kit (1 7/16" Prop Shaft)  |      | 11-8009      |
|      | SCX Lower Seal Kit (#6 Prop Shaft)       |      | 11-8010      |

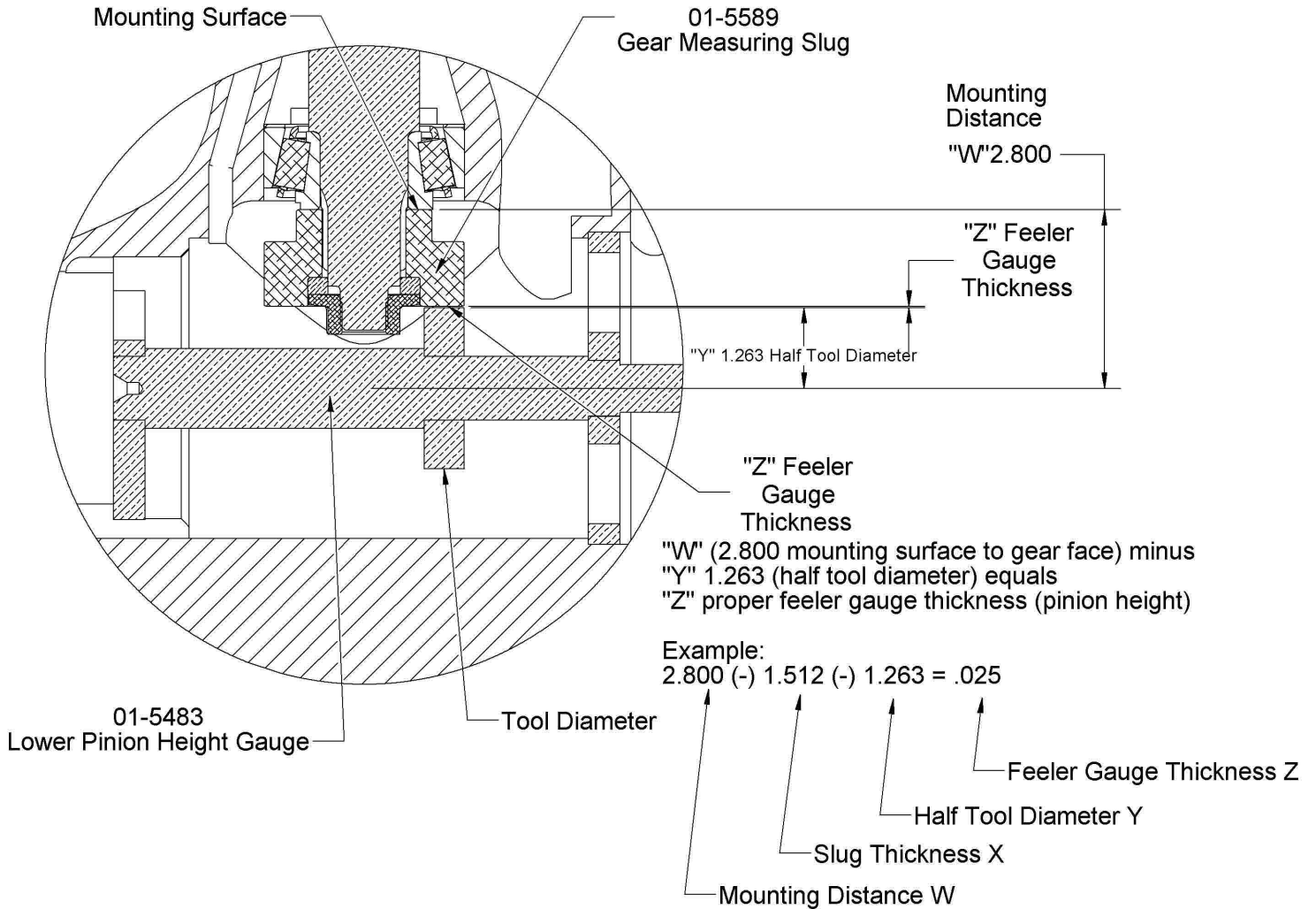
## LOWER GEAR CASE-ASSEMBLY

Note: Optimum performance of lower gears requires pinion height setup, use "lower pinion gear height instruction sheet" fig 7.

1. Install pinion gear bearing cup [6-4] with pinion gear shim [6-3] and vertical shaft bearing cup [6-21] with vertical shaft shim [6-22] in case.
2. Install modified pinion gear bearing [6-5] into cup.
3. Install pinion gear measuring slug (01-5589) onto pinion gear bearing.
4. Install vertical shaft [6-2] with vertical shaft bearing sleeves [6-19], and vertical shaft bearing [6-20] (preinstalled).
5. Install pinion gear spud washer [6-7] into pinion gear measuring slug.
6. Install pinion gear nut [6-8] and torque to 150 ft/lbs.
7. Set rolling preload of pinion gear by adjusting shim [6-3], and [6-22], (8-10 in/lbs.)
8. Once preload is set adjust pinion height by either removing or adding shim to upper bearing cup [6-21] and removing or adding equal shim to lower bearing cup [6-4]. Pinion height is set using feeler gauges and "Lower Pinion Height Gauge 01-5483 and "Gear Measuring Slug" 01-5589 as shown in fig 7.
9. Once preload and pinion height is correct, remove pinion gear measuring slug and vertical shaft.
10. Install prop gear shim [6-23] and prop gear bearing cup [6-24].
11. Install prop gear [6-26], with bearing installed [6-25].
12. Reinstall pinion gear bearing with flats aligned to accept pinion gear (see page 11), pinion gear, spud washer and nut. Torque to 150 ft/lbs.
13. Temporarily install prop shaft [6-27] with bearing cone [6-31], bearing carrier thrust washer [6-28] bearing carrier [6-34] with bearing cup [6-32], tab washer [6-37], and cover nut [6-38], torque to 150 ft/lbs for backlash testing.
14. Check backlash and adjust by changing prop gear shim to achieve .007-.010 average.
15. Once backlash is established, remove cover nut, tab washer, bearing carrier, thrust washer, and prop shaft.
16. Remove pinion nut, clean and reinstall with Loctite 262, torque to 150 ft/lbs.
17. Reinstall prop shaft, thrust washer, bearing carrier shims [6-29], (install enough shims to insure there is "prop shaft end play"), install bearing carrier, tab washer, and cover nut (torque cover nut to 200 ft/lbs, apply oil to threads to avoid galling).
18. Measure "end play" and remove enough shims to achieve 24-26 in/lbs total rolling preload with seals installed in bearing carrier. (Be very careful not to remove too many shims and get a false preload reading).
19. Once rolling preload is achieved, remove cover nut, tab washer, and bearing carrier.
20. Install "O" ring [6-30], bearing carrier (apply "Perfect Seal" around "O" ring, outside of bearing carrier, and threads of cover nut),
21. Install tab washer, and cover nut.
22. Torque cover nut to 200 ft/lbs.
23. Bend one tab on tab washer to engage with one of the slots in the cover nut.
24. Install prop adaptor ring [6-39] (apply "Perfect Seal" to threads) and torque to 200 ft/lbs.

# Lower Pinion Height Measurements

Fig-7



W 2.800

X- \_\_\_\_\_

Y- \_\_\_\_\_

Z= \_\_\_\_\_

# Disassembly-Assembly Tools

## SCX4T Upper

|     |                                      |         |
|-----|--------------------------------------|---------|
| 1.  | Tower & Cap Race Puller Kit          | 01-5443 |
| 2.  | Tower Internal Bearing Puller Kit    | 01-5445 |
| 3.  | Tower Removal Tool Kit               | 01-5448 |
| 4.  | Pinion Retainer Nut Driver           | 01-5590 |
| 5.  | Pinion Center Measuring Slug         | 01-5583 |
| 6.  | Pinion Bearing Cup Installer (Front) | 01-5580 |
| 7.  | Pinion Bearing Cup Installer (Back)  | 01-5592 |
| 8.  | Bearing & Race Installer (Cap)       | 01-5581 |
| 9.  | Bearing & Race Installer (Tower)     | 01-5582 |
| 10. | Backlash Tool Kit                    | 01-8017 |
|     | A. Backlash Tower                    | 01-5579 |
|     | B. Indicator Bracket                 | 01-5588 |
|     | C. Pinion Gear Lock                  | 01-5587 |
|     | D. Backlash Wand                     | 01-5449 |
|     | E. Dial Indicator                    | 01-5591 |
|     | Upper Tool Kit                       | 01-8088 |

## SCX4 Lower

|     |                                                     |         |
|-----|-----------------------------------------------------|---------|
| 1.  | Cover Nut Wrench Kit                                | 01-5441 |
| 2.  | Cover Nut Wrench #6 Kit                             | 01-5490 |
| 3.  | Lower Pinion Height Gauge                           | 01-5483 |
| 4.  | Vertical Shaft Bearing Cup Puller Kit               | 01-5460 |
| 5.  | Prop Gear Cup Puller Kit                            | 01-5467 |
| 6.  | Pinion Gear Cup Puller Kit                          | 01-5452 |
| 7.  | Lower Pinion Cup & Vertical Shaft Cup Installer Kit | 01-5439 |
| 8.  | Prop Gear Cup Installer Kit                         | 01-5469 |
| 9.  | Prop Shaft Seal Driver Kit                          | 01-5478 |
| 10. | Prop Shaft Seal Driver #6 Kit                       | 01-5438 |
| 11. | Bearing Carrier Cup Installer                       | 01-5477 |
| 12. | Bearing Carrier Cup Installer #6                    | 01-5489 |
| 13. | Gear Measuring Slug                                 | 01-5589 |
|     | Lower Tool Kit                                      | 01-8087 |