

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 gimble 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.

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 5-8 hours	After Break in 20-30 hours
SCX4 Upper & SCX4 Lower	New Break in 5-8 hours	After Break in 20-30 hours
SCX Upper & SC Lower	New Break in 5-8 hours	Check Drain Plug Magnet 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.



XXTREME ADVANTAGE **SCX4**

Parts and Service Manual



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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 _____

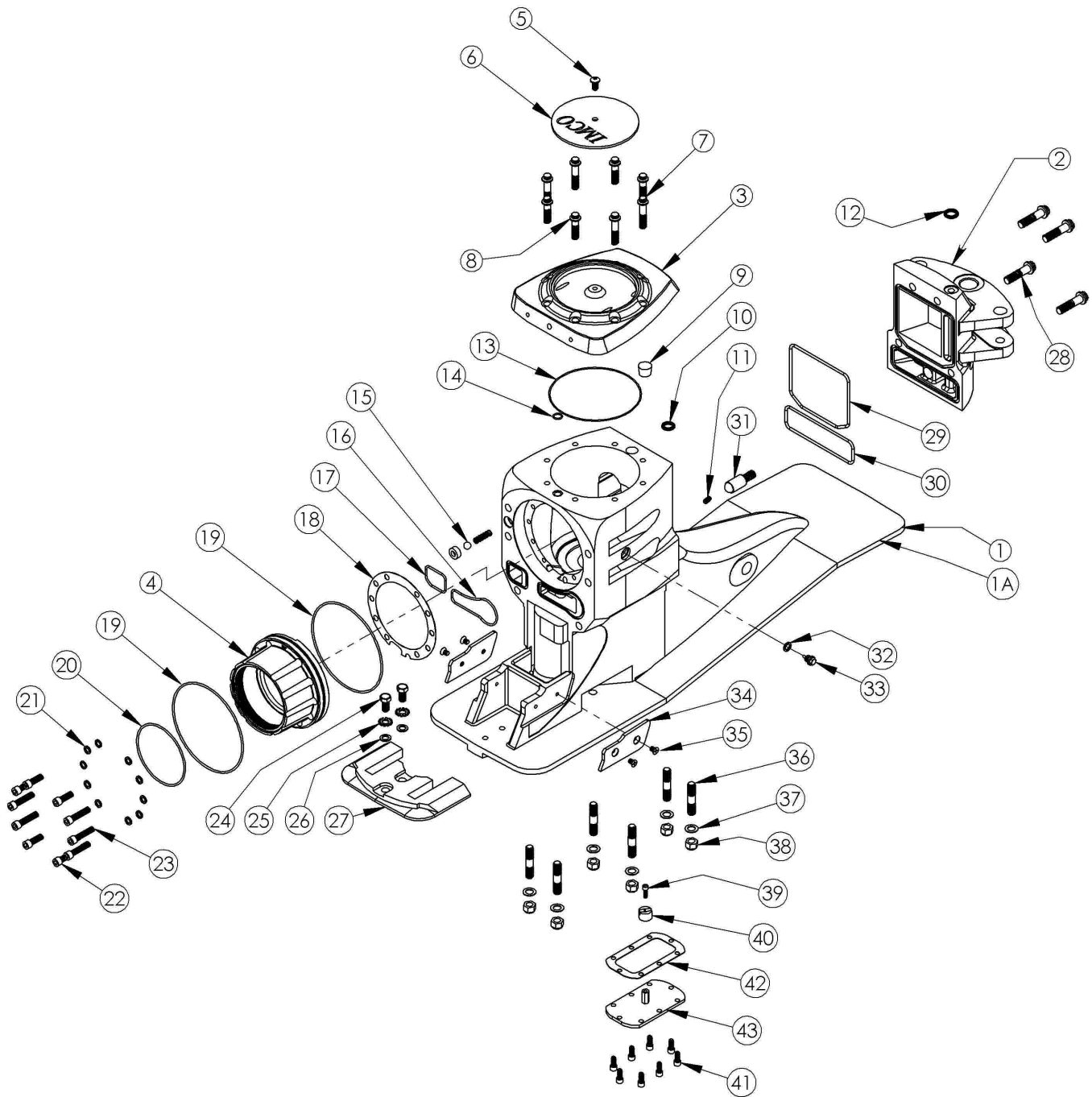
UPPER GEAR CASE-DISASSEMBLY

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 detent kit from steering cap [1-31].
4. Remove cotter key [2-23].
5. Remove shift link [2-24], shift cable retainer [2-21], shift arm [2-22]. (Shift link removes out front of gear case).**
6. Remove shift shaft screws [2-27].
7. Remove shift shaft plug [1-9], shift shaft [2-26], yoke & cam [2-28].
8. Remove pinion hub screws [1-(22,23)].
9. Remove pinion hub assembly [2-(31-45)].
10. Disassemble pinion hub assembly.
11. Remove yoke nut [2-36], and washer [2-37].
12. Remove yoke [2-32].
13. Remove retainer nut [2-31].
14. Remove Yoke gear end shims [2-42], pinion shoulder washer [2-43], and pinion seal carrier [2-45].
15. 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.
16. Remove upper thrust race [2-6], and upper thrust bearing [2-7].
17. Remove gear assembly [2-(7-17)].
18. Disassemble gear assembly, press down on upper clutch gear to release the clutch shaft retainer keepers and remove all components from the clutch shaft.
19. Remove lower thrust race [2-6], lower thrust bearing [2-7].
20. Remove oil tank cover [1-43], inspect magnet [1-40].

Upper Case Hardware & Seals

Fig-1



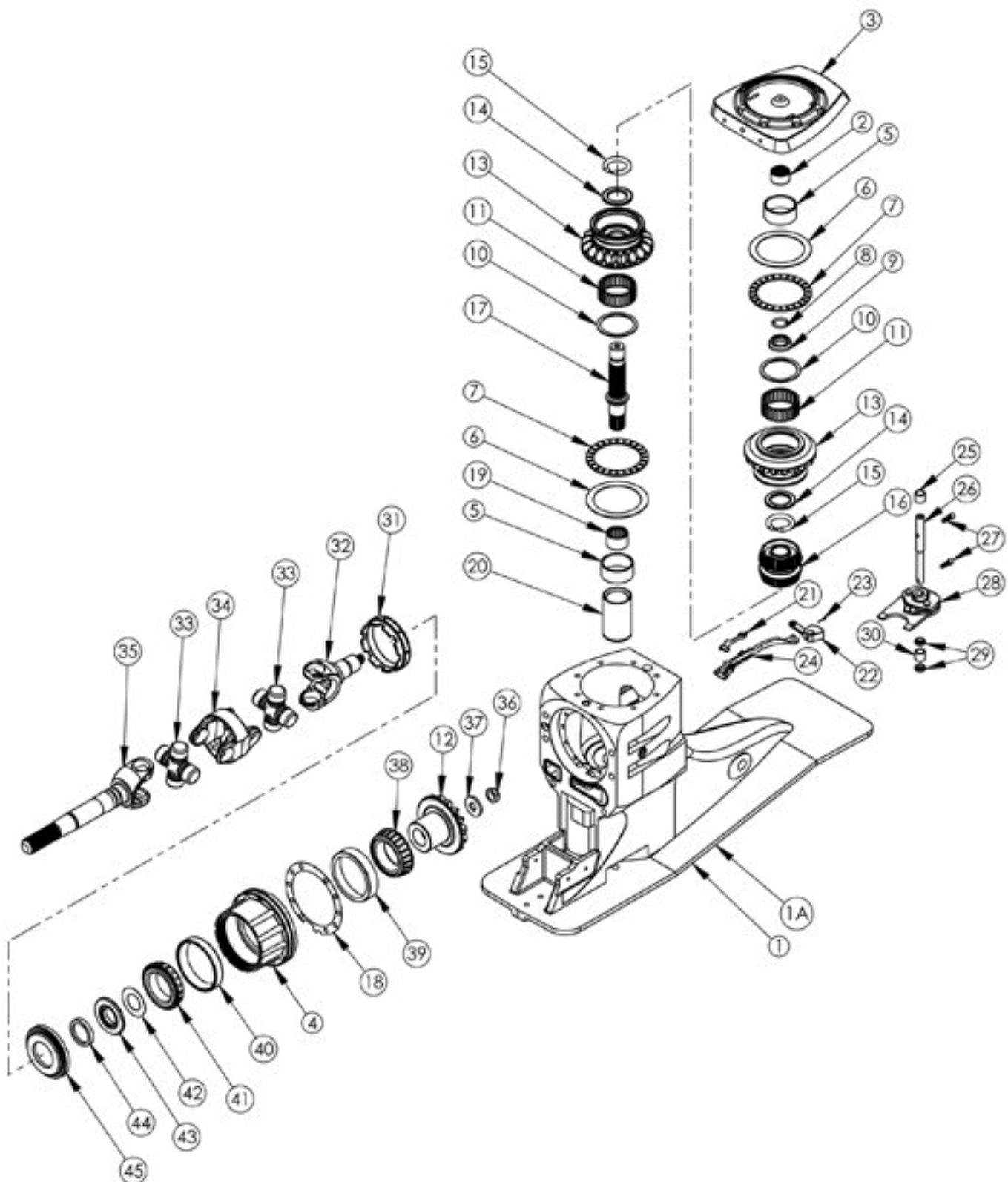
Upper Case Hardware & Seals

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")	6	08-130904741
37	Washer (7/16" AN S/S)	6	08-100900001
38	Nut (7/16-20 Nylock S/S)	6	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 & ComponentsFig-2

Item	Description	Qty	Part Number
1	Upper Case Black	1	01-1579
1A	Upper Case Silver	1	01-1580
2	Roller Bearing (Clutch Shaft Cap)	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	Keepers (Clutch Shaft)	2	01-2047
9	Clutch Shaft Retainer (Thrust Collar)	1	01-2189
10	Spirol Retainer Ring	2	01-2055
11	Roller Bearing (Internal Gear)	2	10-3046
12	SCX Pinion Gear	1	01-4538
13	SCX Clutch Gear	2	01-4539
14	Thrust Bearing (Clutch Spring)	2	10-4020
15	Clutch Spring	2	01-2056
16	SCX Clutch	1	01-2562
17	SCX Clutch Shaft	1	01-3556
18	Pinion Hub Shims	Kit	01-2548-X
19	Roller Bearing (Clutch Shaft Tower)	1	10-3043
20	SCX Tower	1	01-2561
21	SCX Shift Cable Retainer	1	01-2573
22	SCX Shift Arm	1	01-1578
23	Cotter Key	1	08-150200141
24	SCX Shift Link	1	01-1577
25	Shift Shaft Bushing	1	10-7018
26	SCX Shift Shaft	1	01-3559
27	Screw (1/4-28 x 3/4" Socket Cap)	2	08-060602062
28	Yoke & Cam	1	01-8095
29	Seal, Shift Shaft	2	11-3030
30	Shift Shaft Bushing	1	10-7019
31	Retainer Nut	1	01-2239
32	Yoke Gear End	1	01-2085
33	Cross & Bearing	2	01-2086
34	Center Socket	1	01-2087
35	Yoke Coupler End	1	01-2088
36	Nut (Yoke Gear End)(5/8-18 Thin Nylock Steel)	1	08-091105002
37	Washer (Yoke Gear End)	1	08-121100002
38	Bearing Cone (Pinion Bearing)	1	10-1021
39	Bearing Cup (Pinion Bearing)	1	10-2022
40	Bearing Cup (Pinion Bearing)	1	10-2024
41	Bearing Cone (Pinion Bearing)	1	10-1023
42	Yoke Gear End Shims	Kit	01-2020-X
43	Pinion Shoulder Washer	1	01-2241
44	Yoke Gear End Seal	1	11-3029
45	Pinion Seal Carrier	1	01-2240
	SCX, SCX4 Pinion Bearing Kit (No Spacer)	Kit	10-8021
	SCX, SCX4 Upper Bearing Kit	Kit	10-8076

UPPER GEAR CASE-ASSEMBLY

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

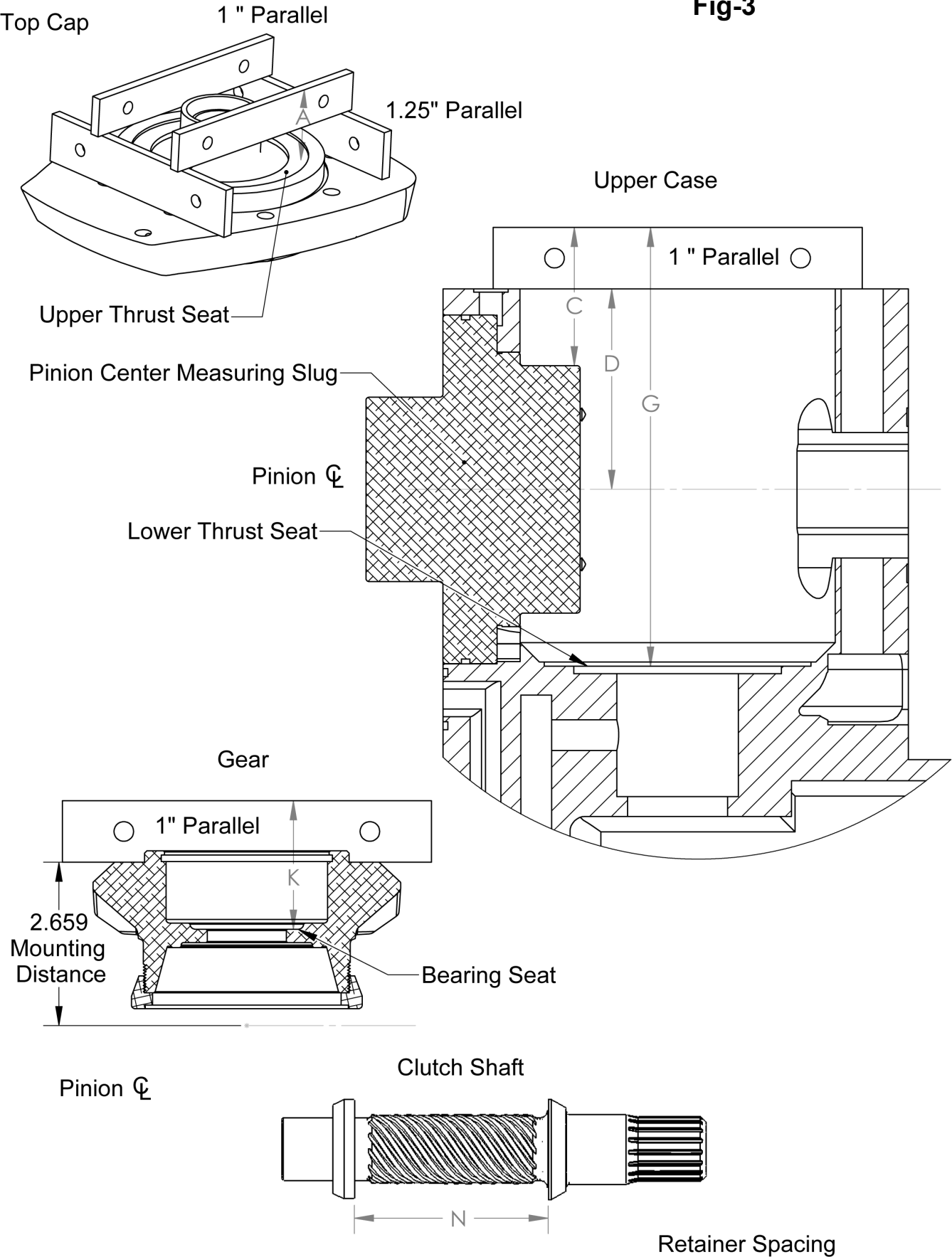
1. Take all measurements using the “SCX4 Setup Diagrams” (Fig 3) and the “SCX Work Sheet” (Fig-4).
2. After all measurements are taken and proper race thickness has been determined, place lower race [2-6] and thrust bearing [2-7] in case.
3. Place lower clutch gear [2-13] with attached tool (backlash tower 01-5579) into case.
4. Adjust rolling preload (8-10 in/lbs) on pinion gear by changing Yoke Gear End Shims [2-42]. Tighten nut [2-36] 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 [2-45] and retainer nut [2-31].
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 [2-36] 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 .006-.008).
10. Once backlash is determined check upper clutch gear by placing gear in lower position with lower thrust race and backlash tower. This will insure backlash is 006 -.008 is correct on upper gear.
11. Assemble drive shaft gear assembly [2-(8-17)].
12. Place the lower clutch gear [2-13] onto the clutch shaft [2-17], allowing it to rest on the thrust collar.
13. Place the lower clutch spring thrust bearing [2-14] (silver side “up”), lower clutch spring [2-15], clutch cone [2- 16], upper clutch spring [2-15], upper clutch spring thrust bearing [2-14], (Note; use a thin layer of grease between the bearing and the gear to keep bearing in place during assembly), (silver side “down”), upper clutch gear [2-13], clutch shaft retainer [2-9] onto the upper clutch shaft [2-17].
14. Compress the upper clutch gear and install the upper drive shaft retainer keepers [2-8].
15. Install complete clutch shaft assembly into gear case.
16. Align the clutch gear timing marks (“+” over “-“, or “-“ over “+”) with the center of the rear face of the gear case.
17. Install pinion pack with “O” ring [1-19] and shims [2-18] (shims must be properly aligned).
18. Torque pinion pack screws [1-(22-23)] (Important: make sure copper sealing washers [1-21] are in place, short screws in 2 top holes & 2 bottom holes [1-22] longer screws in 3 port & 3 starboard holes [1-23] to 20 ft/lbs. Use “Loctite 242” on all screws. Note: make sure that the clutch gear timing marks align to case timing marks, roll pinion to check.

UPPER GEAR CASE-ASSEMBLY

19. Place the shift yoke & cam assembly [2-28] into the clutch cone groove with the nuts facing down.
20. Insert the shift link [2-24] with shift cable retainer [2-21] through front of gear case.
21. From the rear of gear case, place the small hole of the shift arm [2-22] onto the "pin" of the shift link and secure with cotter pin [2-23]. (Be sure that the shift arm is positioned to except the detent kit [1-31]
22. Install shift shaft [2-26] through the yoke & cam (note; use caution while installing to avoid cutting seals) and shift arm [2-22].
23. Torque the 2 shift shaft screws [2-27] to 100 in/lbs. Use "Loctite 262" on screws.
24. Install quad ring [1-10] steering cap [1-2] including detent kit [1-31], insure "O" rings [1-29 & 1-30] are in place.
25. Torque steering cap screws to 35 ft/lbs. Use "Perfect Seal" on threads.
26. Install quad ring [1-12] in steering cap, shift shaft plug [1-9], top cap "O" ring [1-13] top cap oil pre sure "O" ring [1-14]
27. Install top cap.
28. Torque top cap screws [1-8] (important: short screws in 2 front & 2 rear holes [1-7] longer screws in 2 port and 2 starboard holes) to 25 ft/lbs. Use "Perfect Seal" on threads.
29. Install oil tank cover [1-43], oil tank gasket [1-42] with "Permatex Form-Gasket 2" (note; use a very thin layer on gasket), oil tank cover screws [1-41] with "Loctite 242", torque to 10 ft/lbs.

SCX4 Setup Diagrams

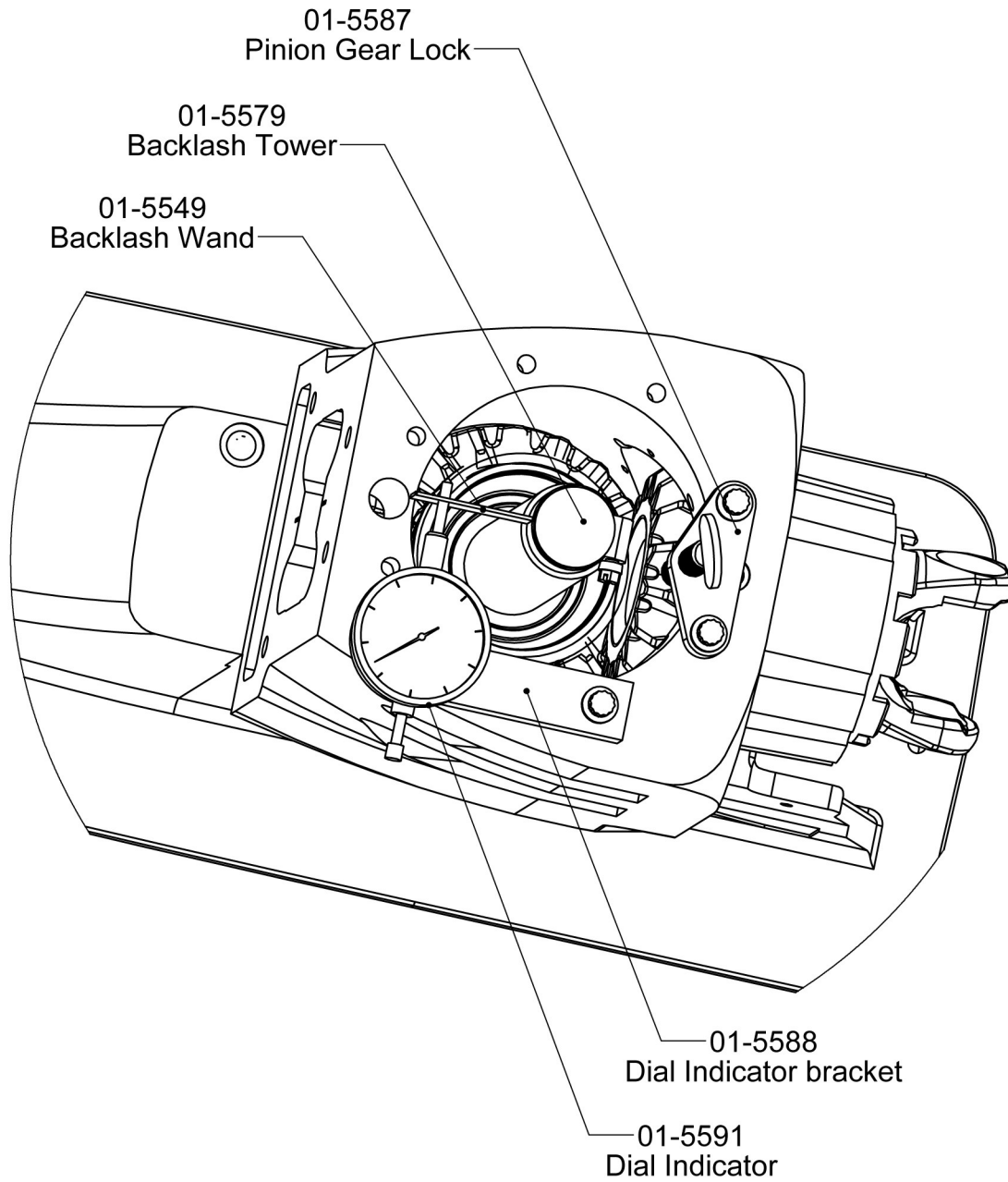
Fig-3



SCX, SCX4 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 CENTERLINE		
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 One	Measurement	K1			Norm	2.091
	Less Parallel		-	1.000		
Gear Depth One	Total	L			Norm	1.091
Gear Two	Measurement	K2			Norm	2.091
	Less Parallel			1.000		
Gear Depth Two	Total	M	=		Norm	1.091
				GEAR ASSEMBLY		
Gear Depth One		L			Norm	1.091
Gear Depth Two		M	+		Norm	1.091
	Race Thickness	F	+		Norm	0.060
	Race Thickness	J	+		Norm	0.060
	2 x Bearing Thickness		+	0.314		
Retainer Spacing	Measurement	N	+		Norm	3.162
Gear Assembly	Total	O	=			5.778
				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	5.778
Cap Crush			=		Norm	.020-.030

Backlash Assembly

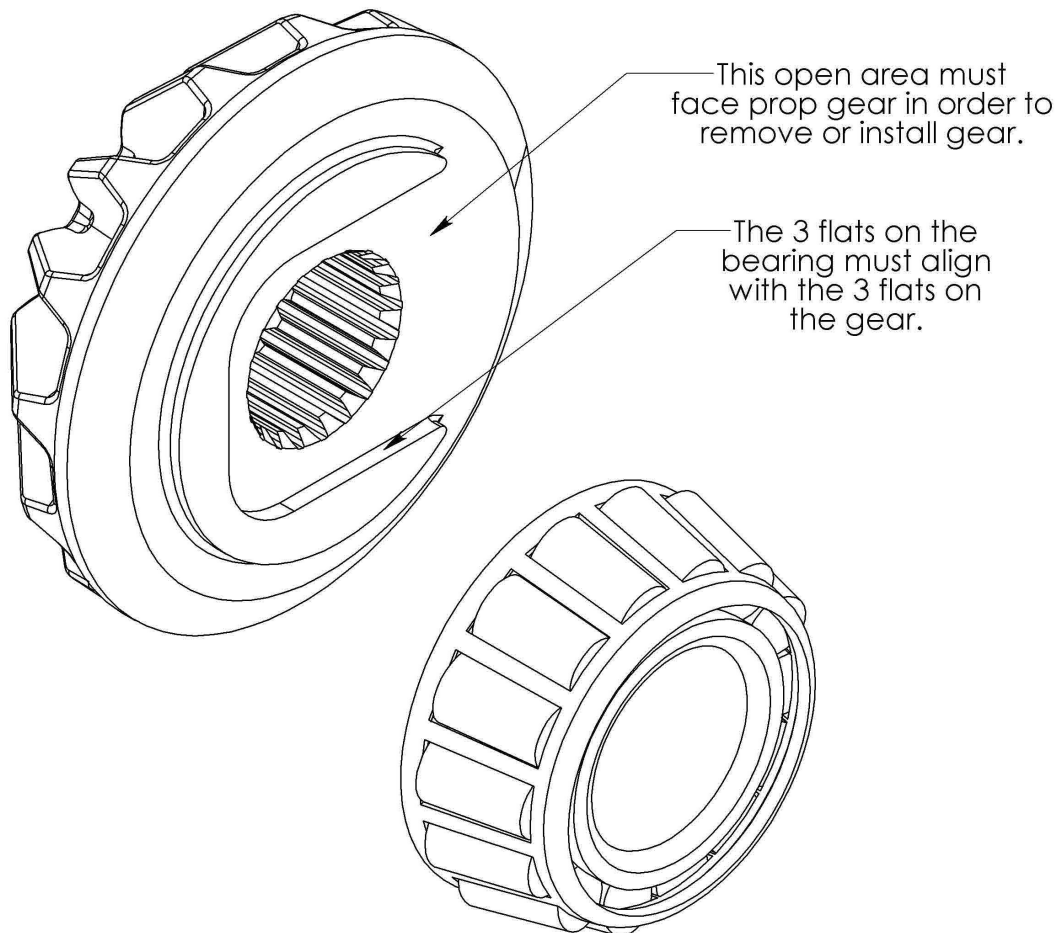
Fig-5



LOWER GEAR CASE-DISASSEMBLY

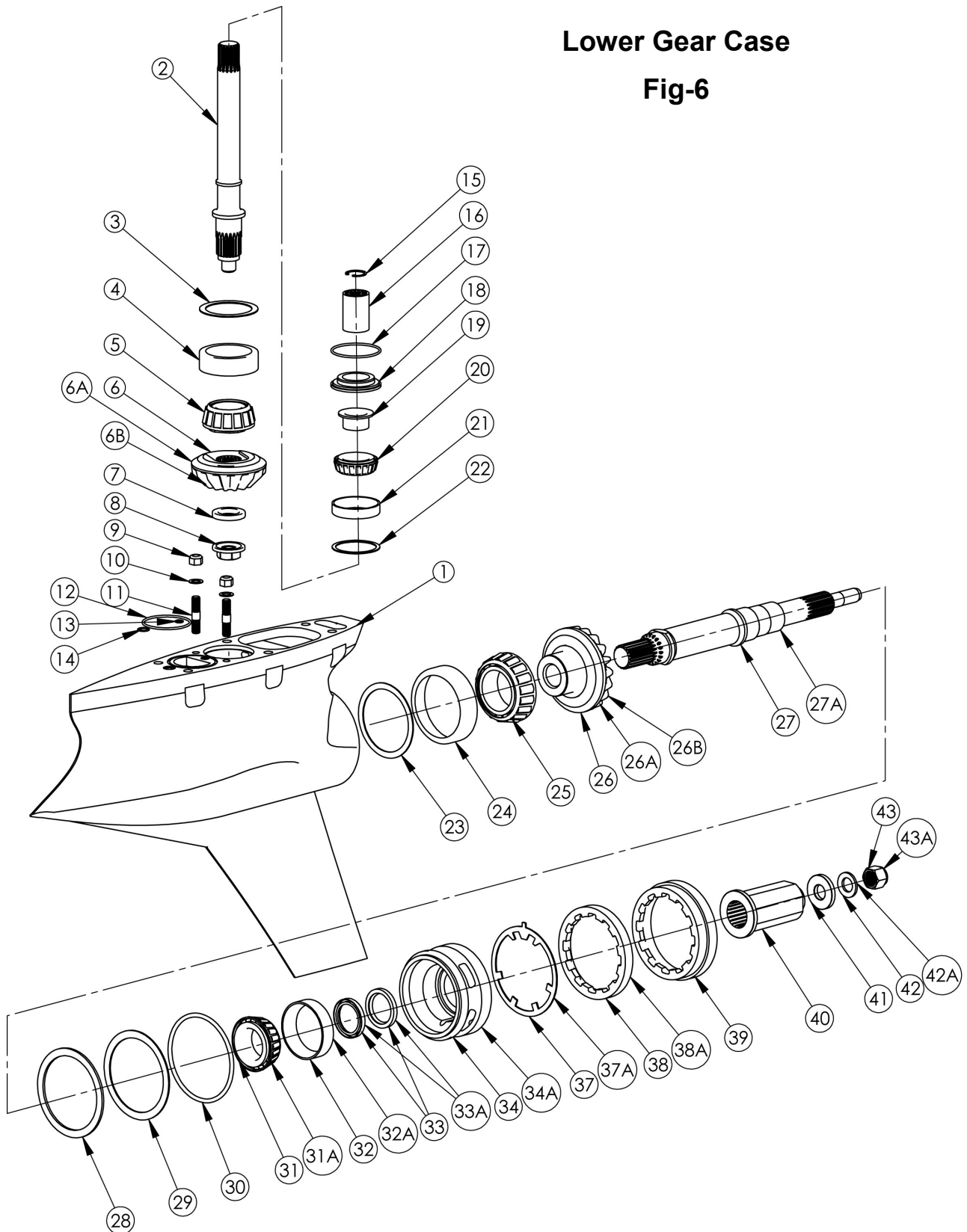
NOTE; The following instructions assume that the lower gear case has already been separated from the upper gear case. Brackets following the part name represent the drawing figure # and item #.

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	01-1392
2	Vertical Shaft (SCX4)	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

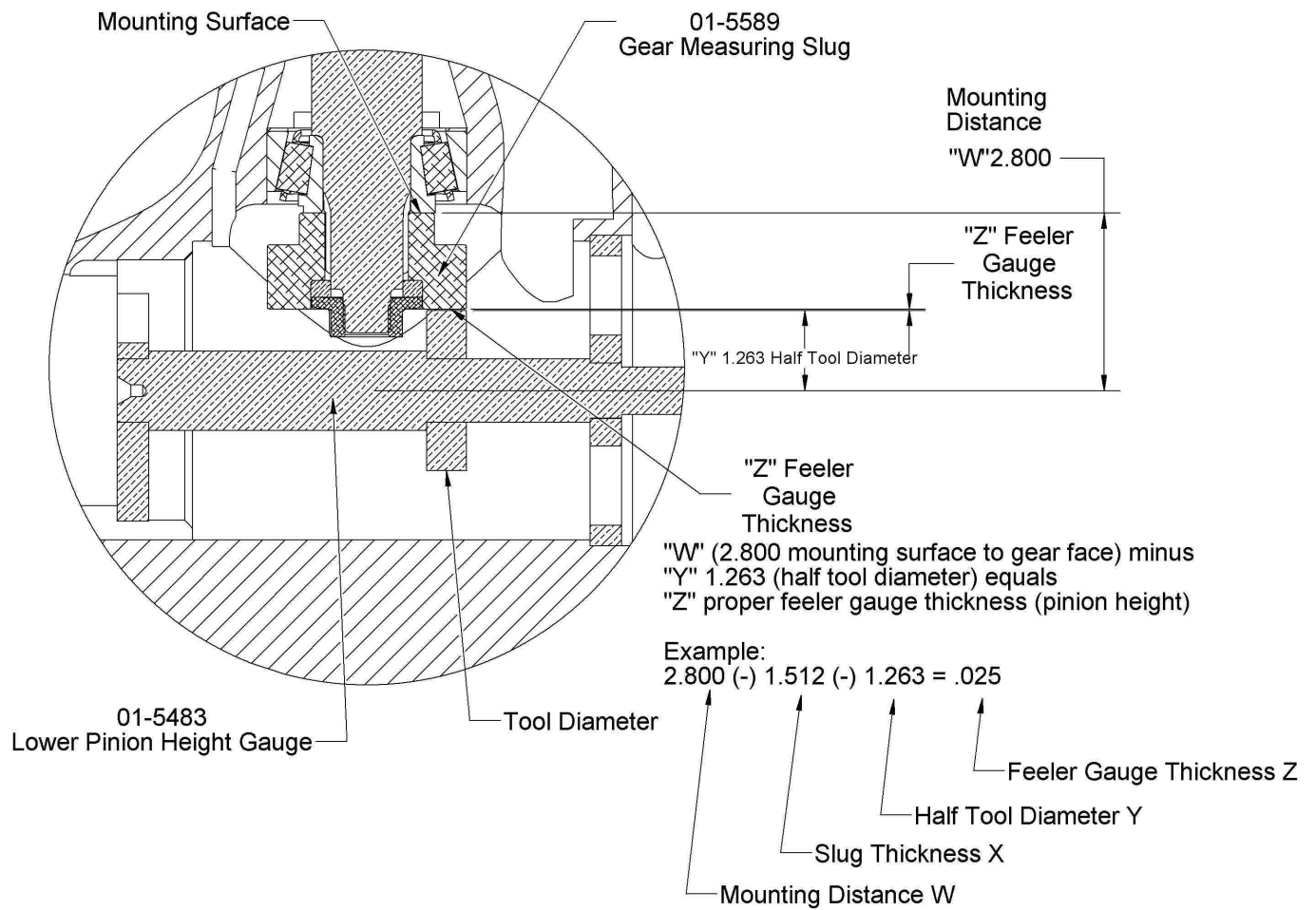
LOWER GEAR CASE-ASSEMBLY

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

SCX4Upper

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

