

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 1-24] pump oil from bottom drain screw [Fig 3-32]

Recommended oil change intervals 20-30 hours. Heavy use or high HP change more often.

Serial Number	
Date of Purchase	
Purchased From	

UPPER GEARHEAD – 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 drive shaft, center socket, and U-joints. The following drawings show the upper drive complete. It is not necessary to remove the gearhead from the mid section. 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 the rear cover [1-3], shift detent ball & spring [1-13].
- 2. Remove 12 point, 3/8-16 screws [1-7], top cap [1-2], and "O" ring [1-21].
- 3. Remove 1/4-28 socket cap screws [2-22] from shift shaft.
- 4. Remove the cooling jet "O" rings [1-22] & cooling jets [1-23].**
- 5. Remove the upper shift shaft seal disc [1-10]. Shift shaft [2-21], & yoke and cam [2-23].
- 6. Remove the shift linkage cotter key, washer, shift linkage assembly [2-19], & shift cable retainer** (Shift linkage is removed from the front of the gearhead)
- 7. Remove the pinion retainer nut [2-25], retainer nut "O" ring [1-29], & pinion/yoke assembly [30-42].

Note; In steps 8 and 10, be sure to maintain correct assembly position of the upper & lower thrust bearings & races.

- 8. Remove the upper thrust race [2-7] & upper thrust bearing [2-8].
- 9. Remove the clutch shaft [2-17] and gear assembly [2-(9-17)].
- 10. Remove the lower thrust bearing [2-8], and lower thrust race [2-7].
- 11. Remove the shift shaft bushings [2-20] & shift shaft seals [2-24].** (note position of components if replacement is required).

PINION / YOKE DISASSEMBLY**

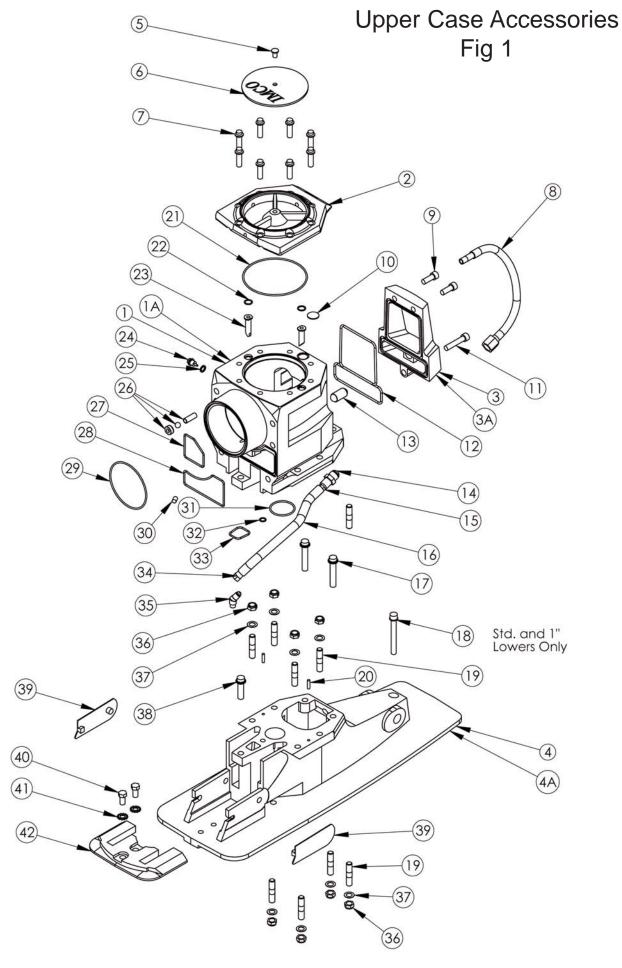
- 1. Remove 5/8-18 locknut [2-30] & washer [2-31]
- 2. Remove the pinion gear with bearings, pinion shim(s) [2-33], pinion shoulder washer [2-40], & pinion seal carrier [2-42] from the yoke (gear end) [2-26].

Note; If the yoke (gear end) seal [2-41] needs replacement it <u>must</u> be removed and installed from the side of the pinion seal carrier which faces the large pinion bearing cup.

3. Remove the large bearing [2-37,38], pinion bearing spacer [2-40], small bearing [2-34,35], & pinion shim(s) [2-33] from the pinion gear.

UPPER DRIVE SHAFT DISASSEMBLY

1. Press down on the upper clutch gear [2-13] to release the upper drive shaft retainer keepers [2-9] and remove all components from the clutch shaft [2-17].

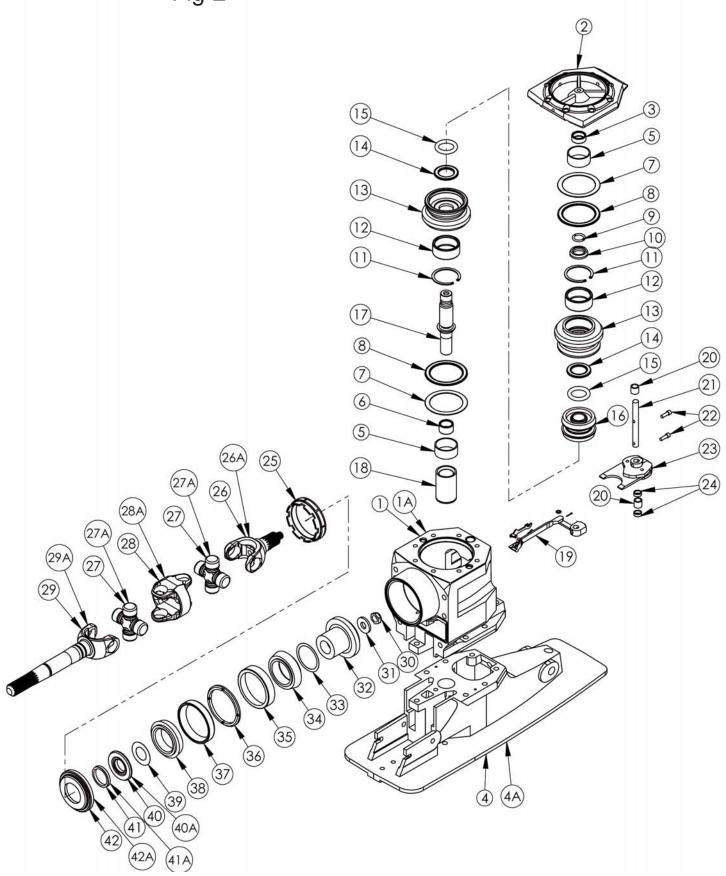


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Upper Case Accessories Fig-1

Item	ltom	Description	Otv	Part Number
1				
2			-	
3 Rear Cap Black 3A Rear Cap Silver 4 Mid Section Black 4 Mid Section Black 5 Screw (5/16-18 x 1/2" Button Head) 6 Top Cap Lid 7 Screw (3/8-16 x 1 1/4" S/S 12 Point) 8 Upper Cooling Hose 9 Screw (3/8-16 x 1 "S/S Allen Head) 10 Shift Shaft Seal Disc (Upper) 11 Screw (3/8-16 x 2" S/S Allen Head) 12 "O" Ring (Rear Cap) 13 Detent Kit (Ball Cylinder) 14 Fitting (3/8" NPT to -8JIC S/S) 15 Fitting (1/4" Hose to 1/8" S/S Allen Head) (Std & 1") 16 Screw (7/16-18 x 2" J/8" S/S Allen Head) (Std & 1") 17 Screw (7/16-18 x 1" S/S Allen Head) (Std & 1") 18 Screw (3/8-16 x 2" S/S Allen Head) (Std & 1") 19 Stud (7/16 x 2") 20 Dowel Pin (1/8" x 7/8" Long) 21 1-213 22 "O" Ring (Deper Cap) 23 Cooling Hose 24 Oil Level Screw Washer 25 Oil Level Screw Washer 26 Spring Kit 27 "O" Ring (Gentain Shift) 28 "O" Ring (Gentain Shift) 29 "O" Ring (Lower Oil Pressure Seal) 30 Screw (5/16-18 x 1/2" Allen Sea) (1 11-2157 31 "O" Ring (Gentain Shift) 32 "O" Ring (Gentain Shift) 33 "O" Ring (Lower Oil Pressure Seal) 34 Fitting (1/4" Hose to -4 JIC Brass) 45 Fitting (1/4" Hose to -4 JIC Brass) 46 Screw (5/16-18 x 1/2" Allen Sea) (1 11-2157 47 "O" Ring (Gombal Shift) 47 "O" Ring (Lower Oil Pressure Seal) 48 Screw (5/16-18 x 1/2" Allen Sea) (1 11-2132 49 "O" Ring (Lower Shaft Seal) 40 Screw (5/16-18 x 1/2" Allen Sea) (1 11-2132 40 "O" Ring (Lower Shaft Seal) 41 11-4012 43 Screw (5/16-18 x 1/2" Allen Sea) (1 11-2132 44 Fitting (1/4" Hose to -4 JIC Brass) 45 Fitting (1/4" Hose to -4 JIC Brass) 46 Lock Nut (7/16-20 S/5 Thin Nylock Nut) 47 Screw (7/16-14 x 1 1/2" S/5 I2 Point) 48 Screw (7/16-14 x 1 1/2" S/5 I2 Point) 49 Screw (7/16-14 x 1 1/2" S/5 I2 Point) 40 Screw (7/16-14 x 1 1/2" S/5 I2 Point) 40 Screw (7/16-14 x 1 1/2" S/5 I2 Point) 41 10-2066 42 OB-008006081 43 Fitting (1/4" Hose to -4 JIC Brass) 44 Washer (7/16-20 S/5 Thin Nylock Nut) 45 Screw (7/16-14 x 1 1/2" S/5 I2 Point) 46 Screw (7/16-14 x 1 1/2" S/5 I2 Point) 47 Washer (7/16-20 S/5 Thin Nylock Nut) 48 Screw (7/16-14 x 1 1/2" S/5 I2			-	
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27	25	Oil Level Screw Washer	1	11-1017
28	26	Spring Kit	1	01-2045
29	27	"O" Ring (Gimbal Shift)	1	11-2139
30 Screw (5/16-18 x 1/2" Allen Set) (Tower Retainer) 1 08-050705041 31 "O" Ring (Lower Shaft Seal) 1 11-2132 32 "O" Ring (Lower Oil Pressure Seal) 1 11-4012 33 "O" Ring (Lower Water Seal) 1 11-2124 34 Fitting (1/4" Hose to -4 JIC Brass) 1 09-2002 35 Fitting (1/8" NPT to -4 JIC 45° Brass) 1 09-2001 36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	28	"O" Ring (Gimbal Water)	1	11-4021
31 "O" Ring (Lower Shaft Seal) 1 11-2132 32 "O" Ring (Lower Oil Pressure Seal) 1 11-4012 33 "O" Ring (Lower Water Seal) 1 11-2124 34 Fitting (1/4" Hose to -4 JIC Brass) 1 09-2002 35 Fitting (1/8" NPT to -4 JIC 45° Brass) 1 09-2001 36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	29	"O" Ring (Retainer Nut, Pinion Gear)	1	11-2154
32 "O" Ring (Lower Oil Pressure Seal) 1 11-4012 33 "O" Ring (Lower Water Seal) 1 11-2124 34 Fitting (1/4" Hose to -4 JIC Brass) 1 09-2002 35 Fitting (1/8" NPT to -4 JIC 45° Brass) 1 09-2001 36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	30	Screw (5/16-18 x 1/2" Allen Set) (Tower Retainer)	1	08-050705041
33 "O" Ring (Lower Water Seal) 1 11-2124 34 Fitting (1/4" Hose to -4 JIC Brass) 1 09-2002 35 Fitting (1/8" NPT to -4 JIC 45° Brass) 1 09-2001 36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	31	"O" Ring (Lower Shaft Seal)	1	11-2132
34 Fitting (1/4" Hose to -4 JIC Brass) 1 09-2002 35 Fitting (1/8" NPT to -4 JIC 45° Brass) 1 09-2001 36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	32	"O" Ring (Lower Oil Pressure Seal)	1	11-4012
35 Fitting (1/8" NPT to -4 JIC 45° Brass) 1 09-2001 36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	33	"O" Ring (Lower Water Seal)	1	11-2124
36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	34	Fitting (1/4" Hose to -4 JIC Brass)	1	09-2002
36 Lock Nut (7/16-20 S/S Thin Nylock Nut) 8 08-090904001 37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001	35	Fitting (1/8" NPT to -4 JIC 45° Brass)	1	09-2001
37 Washer (7/16" AN S/S Flat Washer Thin) 8 08-160900001 38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001			8	
38 Screw (7/16-14 x 1 1/2" S/S 12 Point) 1 08-070907101 39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001		, , ,		
39 Guide Pads (Port & Starboard) 1 01-2066 40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001				
40 Screw (3/8-16 x 3/4" S/S Hex Head) 2 08-010806061 41 Washer (3/8" S/S Star Washer 2 08-110800001				
41 Washer (3/8" S/S Star Washer 2 08-110800001				
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		,		

Upper Case Gears & Components Fig-2



Page 4

Upper Case Gears & Components Fig-2

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PINION / YOKE REASSEMBLY

- 1. Place the pinion shim(s) [2-33] onto the pinion gear [2-32].
- 2. Press the small pinion bearing cone [2-34] onto the pinion gear.
- 3. Place the small pinion bearing cup [2-35], pinion bearing spacer [2-40] (flat side against small bearing cup), & large pinion bearing cup [2-37] onto the pinion gear.
- 4. Press the large pinion bearing cone [2-38] onto the pinion gear making sure that the pinion bearing spacer can move freely, between the bearing cups.
- 5. Place the pinion seal carrier [2-42] (with seal), pinion shoulder washer [2-40], & yoke (gear end) shim(s) [2-39] onto the yoke (gear end) [2-26].
- 6. Assemble the pinion (with bearings), washer (yoke gear end) [2-31], & nut (yoke gear end) [2-30] onto the input yoke.
- 7. Torque the nut (yoke gear end) to 75 lb/ft.
- 8. Check for proper pinion bearing pre-load by measuring the rolling torque of the pinion assembly (correct torque is 6 to 10 lb/in.). Re-shim the yoke if required.

UPPER CLUTCH SHAFT REASSEMBLY

Note; Optimum performance of the upper gearhead requires "setting up" the pinion & clutch gears with IMCO "SC Setup Diagrams" (Fig 3) and "SC Work Sheet" (Fig 4).

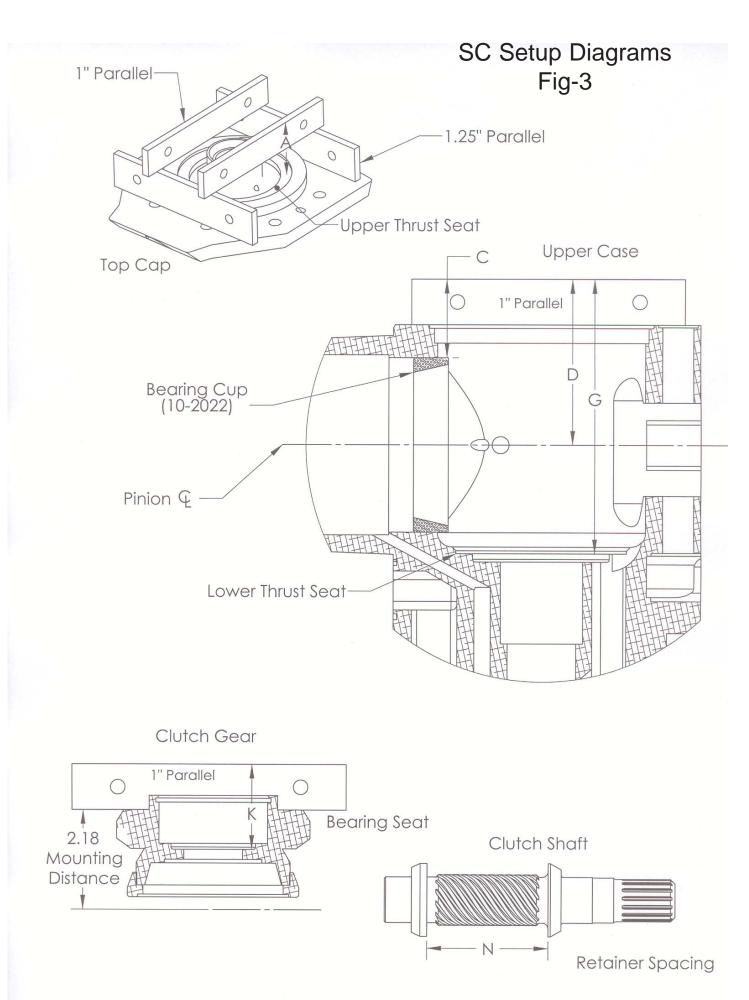
- 1. Place the lower clutch gear [2-13] onto the upper clutch shaft [2-17], allowing it to rest on the thrust collar.
- 2. Place the lower thrust bearing (clutch spring) [2-14] (silver side "up"), lower clutch spring [2-15], clutch cone [2-16], upper clutch spring [2-15] upper thrust bearing (clutch spring) [2-14] (silver side "down", upper clutch gear [2-13] and clutch shaft retainer (thrust collar) [2-10] onto the upper clutch shaft.
- 3. Compress the upper clutch gear and install the keepers [2-9]. Release the upper gear and check that the retainer keepers are seated correctly.

UPPER GEARHEAD REASSEMBLY

- 1. Position the lower clutch gear thrust race [2-7] into the upper gearhead.
- 2. Place the lower clutch gear thrust bearing [2-8] onto the lower race and "center".
- 3. Install the upper drive shaft / gear assembly [2-9 thru 17] into the gearhead.
- 4. Place the upper clutch gear thrust bearing [2-8] & thrust race [2-7] onto the upper clutch gear.
- 5. Align the clutch gear timing marks ("+" over "-", or, "-" over "+") with the center of the rear face of the gearhead.
- 6. Install the yoke / pinion assembly [2-26-42] into the gear head.
- 7. Place the "O" ring (retainer nut) [1-29] over the yoke, making sure that the "O" ring is fully contained in the outer groove of the pinion seal carrier.
- 8. Install the pinion retainer nut [2-25] until contact is made.
- 9. Rotate the yoke and recheck alignment of clutch gear timing marks.
- 10. Torque the pinion retainer nut to 200 lb/ft. (When using an extension tool, remember to recalculate torque value).
- 11. Place the yoke & cam [2-23] into the clutch cone groove with the nuts facing down.

UPPER GEARHEAD REASSEMBLY CONTINUED

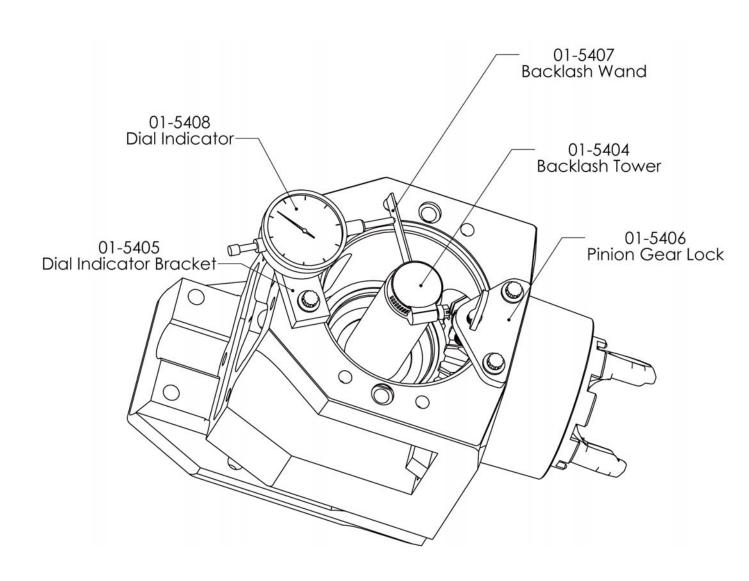
- 11. Insert the shift linkage [2-19] with shift cable retainer into the shift link cavity from the front side of the gearhead.
- 12. From the rear of the gearhead, place the small hole of the shift arm onto the "pin" of the shift linkage and secure with washer & cotter key. (Be sure that the shift arm is positioned correctly)
- 13. Install the shift shaft [2-21], align holes in shift shaft with the yoke and cam and the shift arm.
- 14. Install the two 1/4-28 socket cap screws [2-22] and torque to 100 lb/in.
- 15. Place the cooling jets [1-23] into the gear head. (Rotate to position correctly)
- 17. Replace the upper shift shaft seal disc [1-10], cooling jet "O" rings [1-22], and "O" ring (upper cap) [1-21].
- 18. Attach the top cap [1-2], with bearings, torquing the screws alternately to 20 lb/ft.
- 19. Attach the rear cap [1-3] including the detent kit [1-13].



Page 8

	SC WORK SHEET Fig	j 4	S	erial#		
				UPPER CA	NP	
	Parallels			2.250		
	Measurement	А	-		Norm	1.994
Cap Deck to Thrust Seat	Total	В	=		Norm	0.256
				DECK TO	PINION C	ENTERLINE
Deck to Tool	Measurement	С			Norm	1.719
	Less Parallel		-	1.000		
	Total				Norm	0.719
	Plus 1/2 tool		+	1.9065		
Deck to Pinion CL	Total	D	=		Norm	2.6255
				UPPER THI	RUST SEAT	
Deck to Pinion CL		D			Norm	2.6255
		В	-		Norm	0.256
Pinion CL to Upper Thrust Seat	Total	E	=		Norm	2.3695
	Bearing Thickness		-	0.125		
	Mounting Distance		-	2.183		
	Race Thickness	F	=	200	Norm	0.061
	Na de miennos	<u>'</u>	+	LOWER TH		
	Measurement	G		LOWERT	Norm	5.994
	Parallel			1.000	NOITH	3.774
Deck to Lower Thrust Seat	Total		=	1.000	Norm	4.994
Deck to Pinion CL	lotai	D	+=		Norm	2.6255
Pinion CL to Lower Thrust Seat	Total	Н	-		Norm	2.3685
Fillion CL to lower fillust seat		111	+	0.105	NOIIII	2.3000
	Bearing Thickness Mounting Distance		-	0.125 2.183		
	Race Thickness	1	-	2.103	Norm	0.061
	Race mickness	J	=	OF A D A 4F		0.061
	h.4	1/ 1	-	GEAR MEA		
Gear One	Measurement	K1		1 000	Norm	1.874
	Less Parallel		-	1.000	,	0.074
Gear Depth One	Total	L			Norm	0.874
Gear Two	Measurement	K2			Norm	1.874
	Less Parallel			1.000		
Gear Depth Two	Total	M	=		Norm	0.874
				GEAR ASS		
Gear Depth One		L			Norm	0.874
Gear Depth Two		M	+		Norm	0.874
	Race Thickness	F	+		Norm	0.061
	Race Thickness	J	+		Norm	0.061
	2 x Bearing Thickness		+	0.250		
Retainer Spacing	Measurement	N	+		Norm	2.650
Gear Assembly	Total	0	=			4.768
				CAP CRU	SH	
Pinion CL to Upper Thrust Seat		E	+		Norm	2.3695
Pinion CL to Lower Thrust Seat		Н	+		Norm	2.3695
Upper Thrust Seat to Lower Thrust Seat	Total	Р	=		Norm	4.739
Gear Assembly	Total	0	=		Norm	4.768
	· ·		_			

Backlash Assembly Fig-5

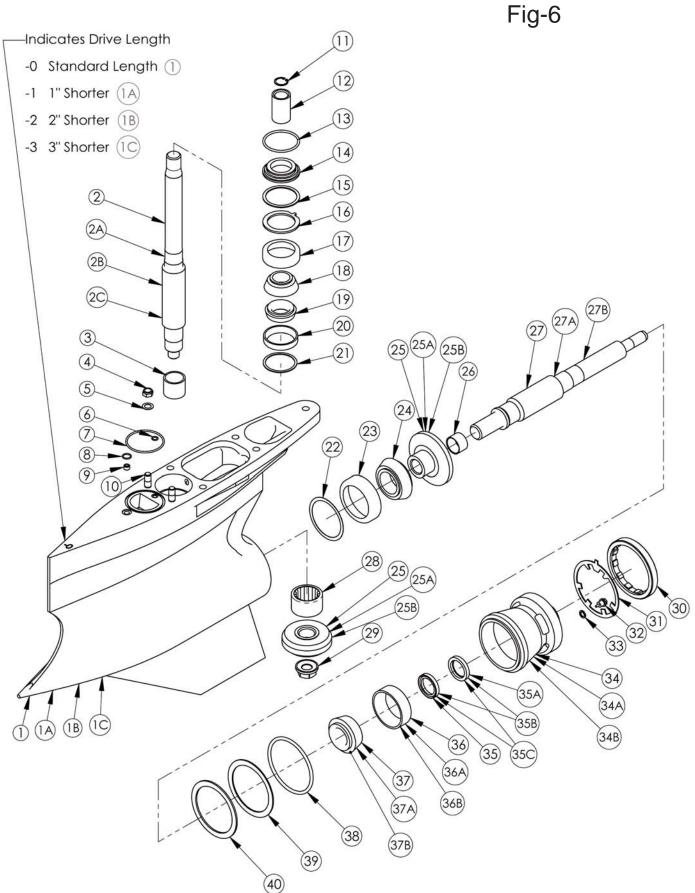


LOWER GEAR CASE - DISASSEMBLY

Note; The following instructions assume that the lower unit has already been separated from the upper gearhead. Steps followed by asterisks (**) are required only if inspection indicates component replacement. Brackets following the part name represent the drawing figure # and item #.

- 1. Bend the tabs of the bearing carrier tab washer [6-31] away from the bearing carrier retainer nut [6-30].
- 2. Remove the bearing carrier retainer nut [6-30].
- 3. Remove the bearing carrier [6-34].
- 4. Remove the prop shaft [6-27]. (The prop shaft bushing [6-26], used only with the 01-8244 & 01-8248 gear sets, may come out with the prop shaft).
- 5. Remove the bearing carrier "O" ring [6-38], shims [6-39], & thrust washer [6-40].
- 6. Remove the vertical shaft flange nut [6-29].
- 7. Remove "O" ring [6-13], & alignment spacer [6-14], shims [6-15], & tab washer [6-16].
- 8. Remove the vertical shaft [6-2] (with bearings) & pinion gear [6-25].
- 9. Remove the prop gear [6-25], (with bearing). (The prop shaft bushing [6-26] may be removed from the gear at this time, if it was not removed in step #4).
- 10. Remove the lower vertical shaft bearing cup [6-20], & shims [6-21].
- 11. Remove the vertical shaft roller bearing [6-28]. **
- 12. Remove the upper [6-18], & lower [6-19] bearing cones from the vertical shaft. **
- 13. Remove the roller bearing race [6-3] from the vertical shaft. **
- 14. Remove the bearing cup [6-36] from the bearing carrier. **
- 15. Remove the prop shaft seals [6-35] from the bearing carrier. **
- 16. Remove the prop gear bearing cone [6-24] from the prop gear. **
- 17. Remove the prop gear bearing cup [6-23], & shims [6-22]. **
- 18. Remove the bearing cone [6-37] from the prop shaft. **
- 19. Remove the "O" ring [6-6]. "O" ring [6-7], & "O" ring [6-8]. **

Lower Gear Case



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Lower Gear Case

Fig-6

	Description	Qty	Part Number
1	Lower Case (-0) Standard Length	1	01-1120
1A	Lower Case (-1") Shorter	1	01-1121
1B	Lower Case (-2") Shorter	1	01-1122
1C	Lower Case (-3") Shorter	1	01-1123
2	Vertical Shaft-Standard Length	1	01-3255
2A	Vertical Shaft-1" Shorter	1	01-3256
2B	Vertical Shaft-2" Shorter	1	01-3257
2C	Vertical Shaft 3" Shorter	1	01-3258
3	Bearing Race	1	10-6005
4	Nut (7/16-20 Nylock S/S Thin)	2	08-090904001
5	Washer (7/16" AN S/S Thin)	2	08-160900001
6	"O" Ring (Oil Passage)	1	11-4011
7	"O" Ring (Water Passage)	1	11-2143
8	"O" Ring (Cooling Water Passage)	1	11-2014
9	Pipe Plug - 1/8 NPT S/S	1	09-2007
10	Stud (7/16 x 2" S/S)	2	08-130904121
11	Retainer Ring (Vertical Shaft Coupler)	1	08-121500001
12	Vertical Shaft Coupler	1	01-2148
13	"O" Ring (Alignment Spacer)	1	11-2228
14	Alignment Spacer	1	01-2015
15	Shim (Vertical Shaft Upper)	Kit	01-2012
16	Tab Washer (Vertical Shaft)	1	01-2043
17	Bearing Cup (Vertical Shaft Upper)	1	10-2012
18	Bearing Cop (Vertical Shaft Upper)	1	10-1011
19	Bearing Cone (Vertical Shaft Lower)	1	10-1010
20	Bearing Cone (Vertical Shaft Lower)	1	10-2009
21	Shim (Vertical Shaft Lower)	Kit	01-2013
22	Shim (Prop Gear)	Kit	01-2014
23	Bearing Cup (Prop Gear)	1	10-2007
24		1	
	Bearing Cone (Prop Gear)		10-1008
25	Prop & Pinion Gear 1:50	Set	01-8240
25A	Prop & Pinion Gear 1:34	Set	01-8244
25B	Prop & Pinion Gear 1:25	Set	01-8248
26	Bushing - Prop Shaft, -X	1	01-2178
27	Prop Shaft, 1"	1	01-3009
27A	Prop Shaft, 1 1/4"	1	01-3010
27B	Prop Shaft, 1 7/16"	1	01-3570
28	Bearing (Roller)	1	10-3006
29	Nut (Pinion Gear)	1	01-2251
30	Cover Nut	1	01-2065
31	Tab Washer (Bearing Carrier)	1	01-2042
32	Drain Screw	1	01-2504
33	Drain Screw Sealing Washer	1	11-1017
34	Bearing Carrier (1" Prop Shaft)	1	01-2130
34A	Bearing Carrier (1 1/4" Prop Shaft)	1	01-2131
34B	Bearing Carrier (1 7/16" Prop Shaft)	1	01-2575
35	Seal (Prop Shaft 1")	1	11-3035
35A	Seal (Prop Shaft 1" Line Cut)	1	11-3032
35B	Seal (Prop Shaft 1 1/4")	2	11-3033
35C	Seal (Prop Shaft 1 7/16")	2	11-3034
36	Bearing Cup (I" Prop Shaft)	1	10-2014
36A	Bearing Cup (1 1/4" Prop Shaft)	1	10-2016
36B	Bearing Cup (1 7/16" Prop Shaft)	1	10-2018
37	Bearing Cone (1" Prop Shaft)	1	10-1013
37A	Bearing Cone (1 1/4" Prop Shaft)	1	10-1015
37B	Bearing Cone (1 7/16" Prop Shaft)	1	10-1017
38	"O" Ring (Bearing Carrier)	1	11-2344
39	Shim (Bearing Carrier)	Kit	01-2011
40	Thrust Washer (.109 Thick) Page 13	1	01-2590
	l age 10	•	

LOWER GEAR CASE - ASSEMBLY

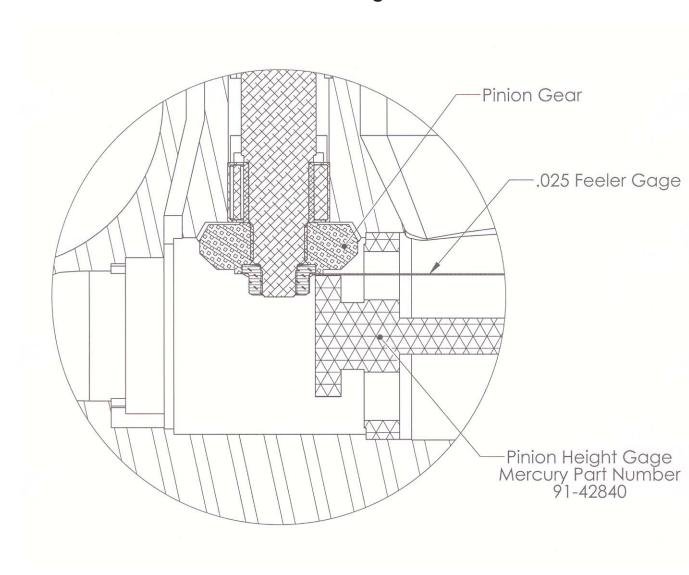
Note; Optimum performance of lower gears requires pinion height setup, use "Lower Pinion Gear Height Measurement" (Fig. 7) sheet to set pinion gear.

- 1. Install the vertical shaft roller bearing [6-28] into the gear case.
- 2. Install the vertical shaft lower bearing cup [6-20], & shims [6-21].
- 3. Install the lower [6-19], upper [6-18] bearing cones, and roller bearing race [6-3] onto the vertical shaft [6-2].
- 4. Install the vertical shaft into the gear case.
- 5. Install the upper bearing cup [6-17]. Tab washer [6-16], shims [6-15], & alignment spacer [6-14] onto the vertical shaft.
- 6. Install the vertical shaft clamp plate onto the gear case. (Mercury Part # 43559T)
- 7. Check the rolling torque of the vertical shaft (optimum 3 to 5 lb/in).
- 8. Adjust the thickness of the upper shim to obtain the correct rolling torque.
- 9. Temporarily install the pinion gear [6-25], & flange nut [6-29].
- 10. Check the pinion gear height (optimum .025) (see "Lower Pinion Height Measurement" (Fig. 7)
- 11. If pinion gear height requires correction remove all associated components and adjust the lower bearing shims. Any adjustment here requires that the upper bearing shims be compensated by the same amount.
- 12. Remove the vertical shaft & pinion.
- 13. Install the prop gear bearing shims [6-22], & bearing cup [6-23] into the gear case.
- 14. Install the prop gear bearing cone [6-24] onto the prop gear [6-25].
- 15. Install the prop gear with bearing into the gear case. (The prop shaft bushing [6-26], used only with the 01-8244 and 01-8248 gear sets, must be installed into the prop gear at this time).
- 16. Re-install the vertical shaft components described above, and install the vertical shaft clamp plate.
- 17. Install the bearing carrier bearing cone [6-37] onto the prop shaft.
- 18. Install the prop shaft with bearing into the gear case.
- 19. Install the prop shaft seals [6-35], & bearing carrier bearing cup [6-36] into the bearing carrier [6-34].
- 20. Temporarily install the bearing carrier into the gear housing.
- 21. Install the bearing carrier tab washer [6-31], & retainer nut [6-30], and torque the retainer nut to 150 lb/ft.
- 22. Rotate the vertical shaft at least 3 turns and check the prop gear backlash (optimum .012 to .015).
- 23. Adjust the thickness of the prop gear bearing cup shims [6-22] to obtain the correct backlash readings.
- 24. During final assembly be sure to clean & loctite the vertical shaft flange nut [6-29]. Torque the nut to 100 lb/ft.
- 25. Temporarily install the bearing carrier thrust washer [6-40], & shims [6-39] prior to prop shaft & bearing carrier installation.
- 26. Torque the bearing carrier retainer nut to 150 lb/ft.
- 27. Check overall rolling torque at the vertical shaft (optimum 11 to 17 lb/in).

LOWER GEAR CASE - ASSEMBLY CONT.

- 28. Adjust the thickness of the bearing carrier shims [6-39] to obtain the correct rolling torque readings.
- 29. Upon final assembly be sure to install the bearing carrier "O" ring [6-38] prior to installation of the bearing carrier.
- 30. After applying final torque of the bearing carrier retainer nut [6-30], bend one tab of the tab washer [6-31] to engage with one of the slots in the retainer nut.

Lower Pinion Height Measurement Fig-7



Disassembly-Assembly Tools

SC Upper

1. 2. 3. 4. 5. 6. 7.	Tower & Cap Race Puller Kit Pinion Retainer Nut Wrench Bearing & Race Installer (Tower) Tower Internal Bearing Puller Tower Removal Tool Bearing & Race Installer (Cap) Backlash Tool Kit A. Backlash Tower B. Indicator Bracket C. Pinion Gear Lock D. Backlash wand E. Dial Indicator	01-5401 01-5402 01-5403 01-8018 01-5404 01-5405 01-5406 01-5407 01-5408	Mercury 91-90774 91-17256 91-90773
7. 8. 9.	Cover Nut Wrench (1" Prop Shaft) Cover Nut Wrench (1 1/4" Prop Shaft) Lower Pinion Height Gauge Prop Gear Cup Installer Vertical Shaft Roller Bearing Driver A. Pilot B. Driver Rod C. Bearing Remover Vertical Shaft Roller Bearing Installer A. Pilot B. Threaded Rod C. Bearing Installer Clamp Plate Dial Indicator Vertical Shaft Bearing Cup Puller Prop Gear Cup Puller Bearing Carrier Cup & Seal Installer (1 1/4")	01-5409 01-5410 01-5411	91-61069T 91-840393 91-42840 91-31106 91-813653 91-37323 91-63638T 91-813653 91-31229 91-89867 91-43559T 91-58222A1