

ALPHA ONE GENERATION II STERNDRIVE

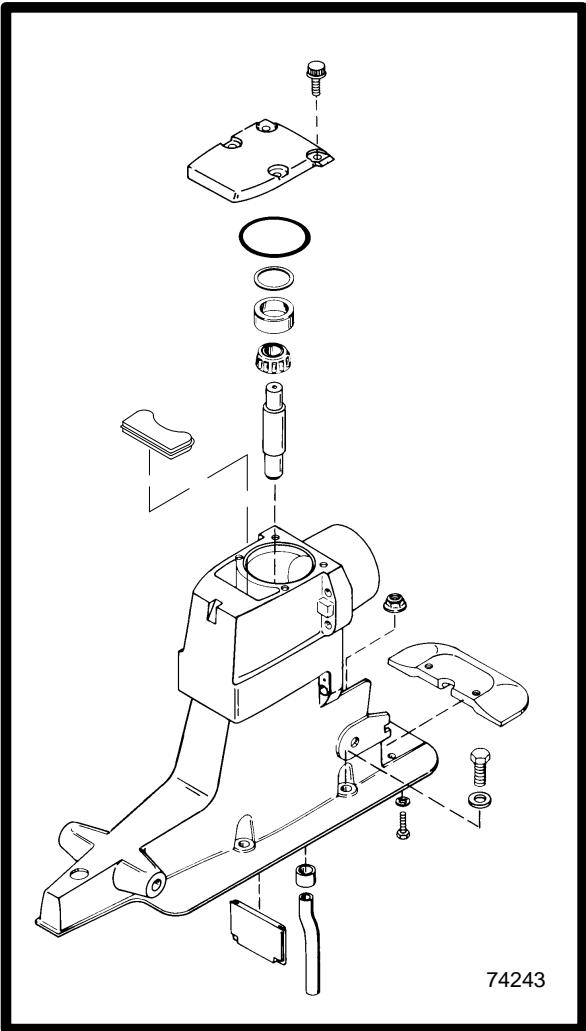


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Installation Specifications

Torque Specifications

NOTE: Securely tighten all fasteners not listed below.

ITEM	TORQUE		
	lb. in.	lb. ft.	N-m
Exhaust Pipe to Gimbal Housing Screws		23	31
Propeller Nut ¹		55	75
Steering Cable Coupler Nut	Tighten Nut Until It Bottoms Out Against Flat Washer, then Loosen 1/2 Turn		
Steering Cable Coupler Nut		35	48
Steering system Pivot Bolts		50	68
Transom Assembly Attaching Screws and Nuts		23	31
Power Steering Hydraulic Hose Fittings		23	31
Stern Drive Unit to Bell Housing Attaching Nuts		50	68

1: Amount specified is MINIMUM.

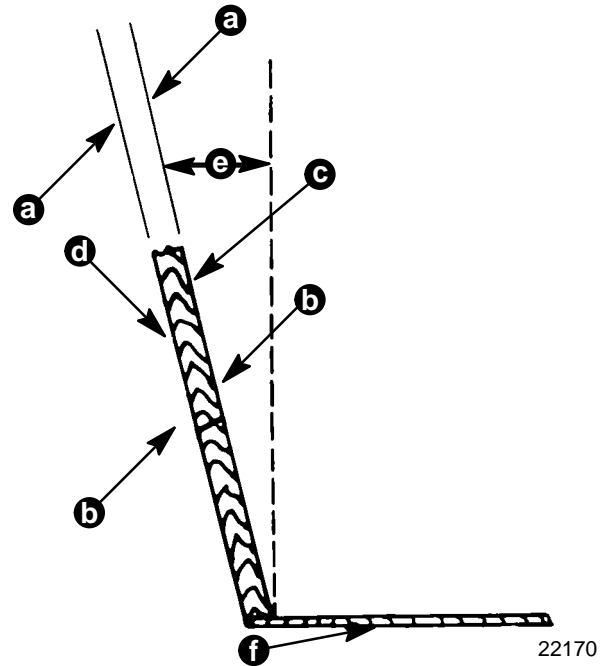
Lubricants, Sealers, and Adhesives

DESCRIPTION	PART NUMBER
Quicksilver 2-4-C Marine Lubricant with Teflon	92-825407A3
Quicksilver Special Lubricant 101	92-13872A1
Perfect Seal	92-34227-1
Liquid Neoprene	92-25711--2
Quicksilver Engine Coupler Spline Grease	92-816391A4

Special Tools

DESCRIPTION	PART NUMBER
Alignment Tool Assembly	91-805475A1

Transom Specifications



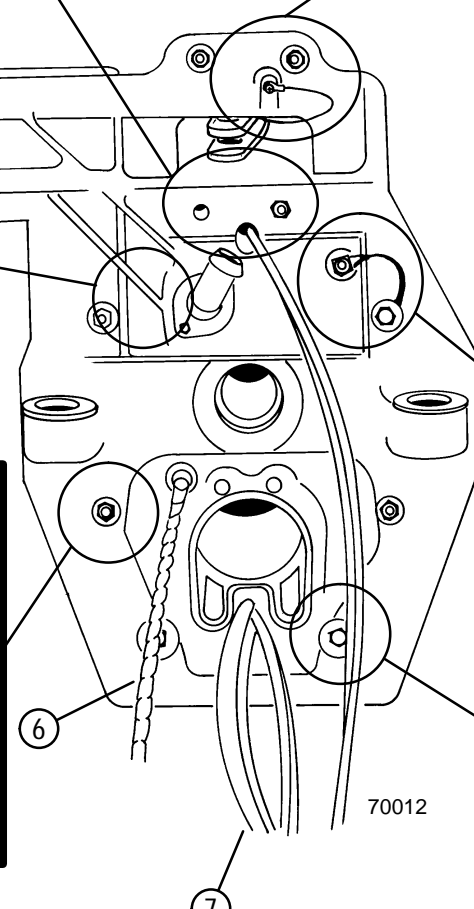
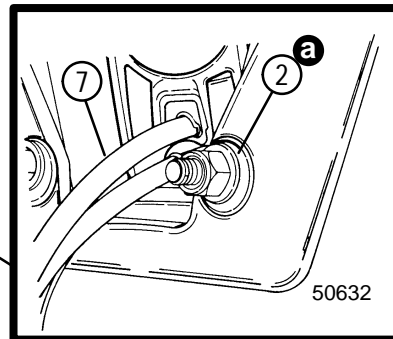
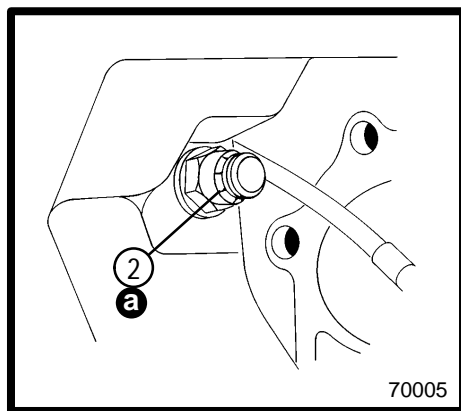
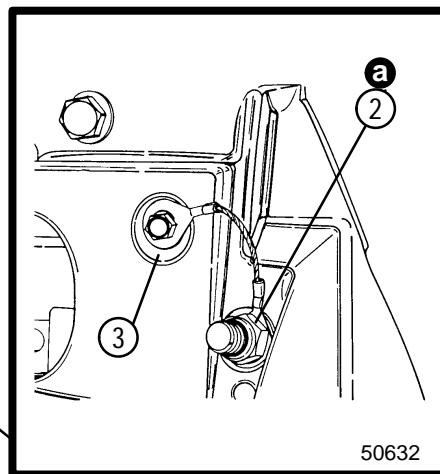
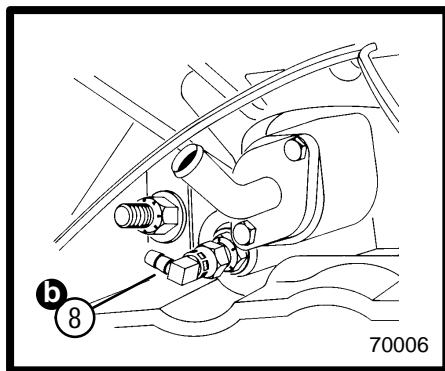
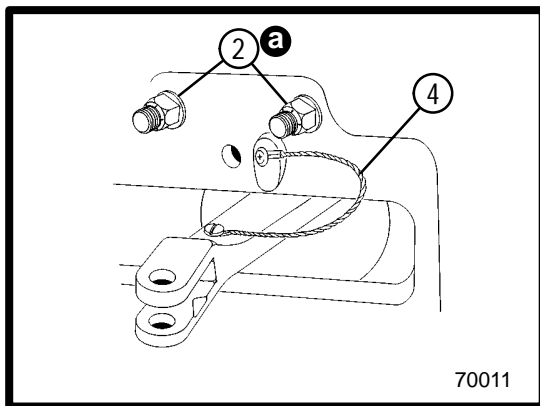
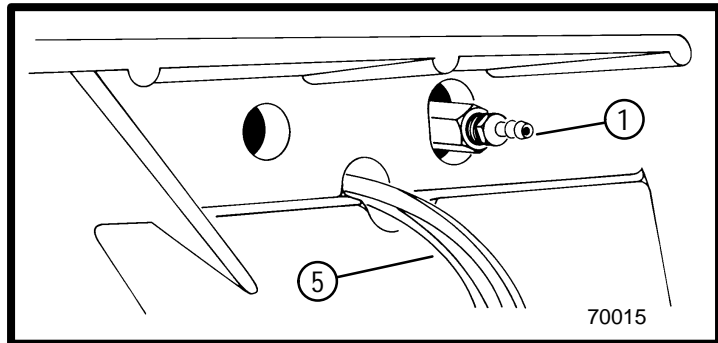
- a - Transom Thickness-2-2 1/4 in. (51-57mm)
- b - Transom Surfaces-Parallel to within 1/8 in. (3.2 mm)
- c - Area Covered by Inner Transom Plate - Flat to within 1/8 in. (3.2 mm)
- d - Area Covered by Gimbal Housing Assembly - Flat to within 1/16 in. (1.6 mm)
- e - Transom Angle-10° to 16°
- f - Keel (if Equipped) - Remove 4 ft. (1.2 m) forward of transom

Installation Procedures

Transom Assembly Installation

CAUTION

Steering lever ground wire **MUST** be positioned as shown or wire may fatigue.

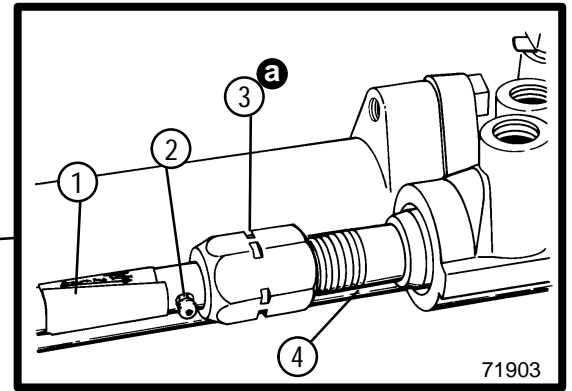
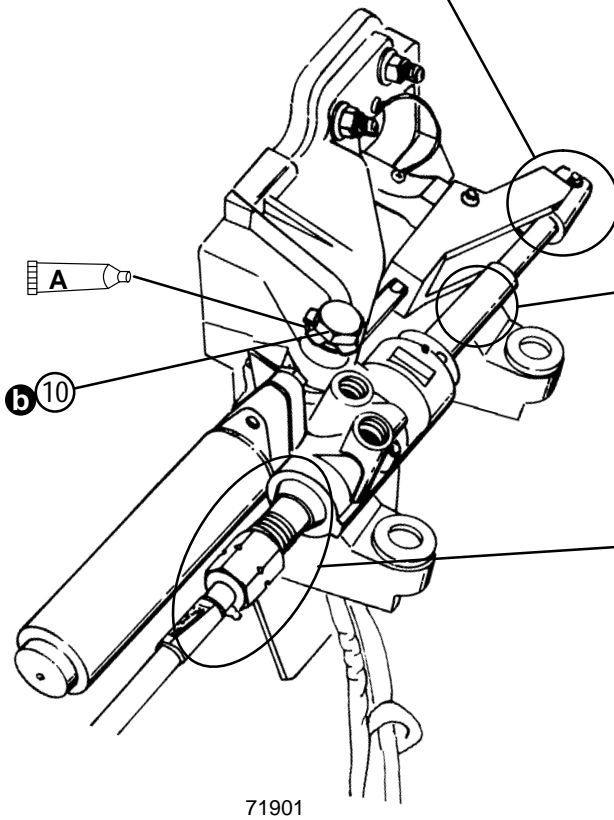
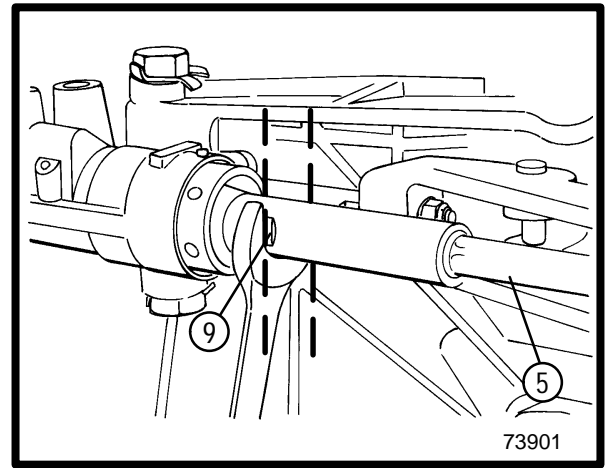
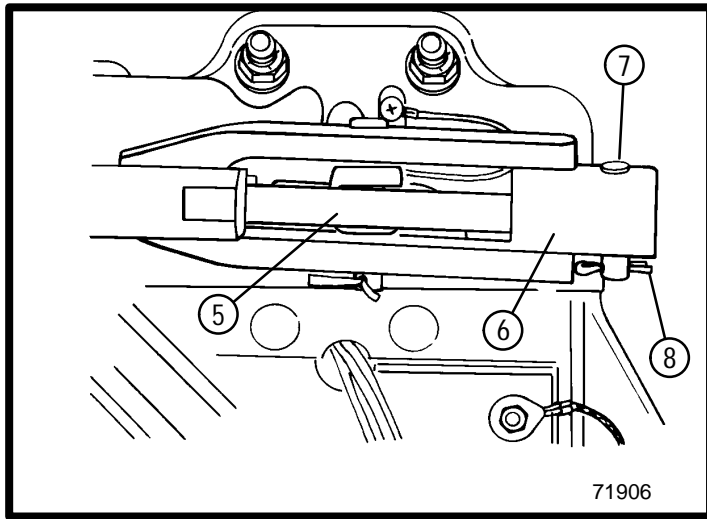


- 1 - Speedometer Tube Pick-up Connection
- 2 - Locknuts and Flat Washers
- 3 - Screw
- 4 - Steering Lever Continuity Wire
- 5 - Trim System Wires
- 6 - Shift Cable
- 7 - Trim Hoses (and MerCathode Wires, if so equipped)
- 8 - Gear Lube Hose Fitting

Torque Specification

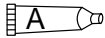
- a** 23 lb. ft. (31 N·m)
- b** 70-90 lb.in. (8-10 N·m)

Power Steering Control Valve and Cable Installation



- 1 - Steering Cable
- 2 - Grease Fitting
- 3 - Cable Coupler Nut
- 4 - Cable Guide Tube
- 5 - Cable End
- 6 - Clevis
- 7 - Clevis Pin
- 8 - Cotter Pin
- 9 - Flats on Guide Tube MUST Be Vertical
- 10- Pivot Bolt

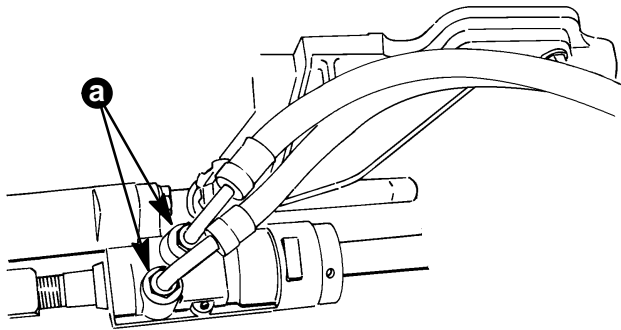
Lubricants, Sealers, and Adhesives

 - Quicksilver Special
Lubricant 101 92-13872A1

Torque Specification

- a** 35 lb. ft. (47 N-m)
- b** 50 lb. ft. (68 N-m)

Power Steering Hose Connections



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Typical Hose Routing

a - Hose Fittings - Torque Both Fittings to 23 lb. ft. (31 N·m).

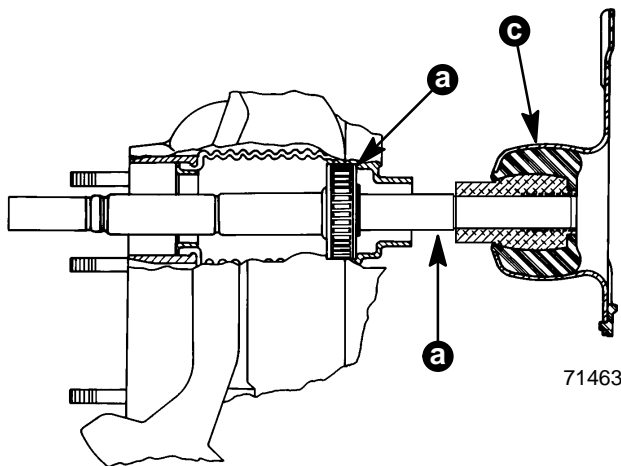
Stern Drive Unit Installation

USING THE ALIGNMENT TOOL

CAUTION

Forcing the alignment tool into position may damage the Gimbal Bearing or Engine Coupler. Do not attempt to force the alignment tool!

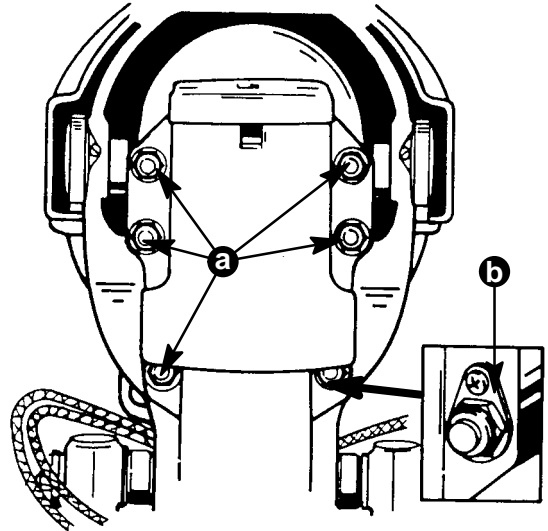
Raise or lower the engine as necessary until alignment tool moves freely.



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- a - Alignment Tool
- b - Gimbal Bearing
- c - Engine Coupler

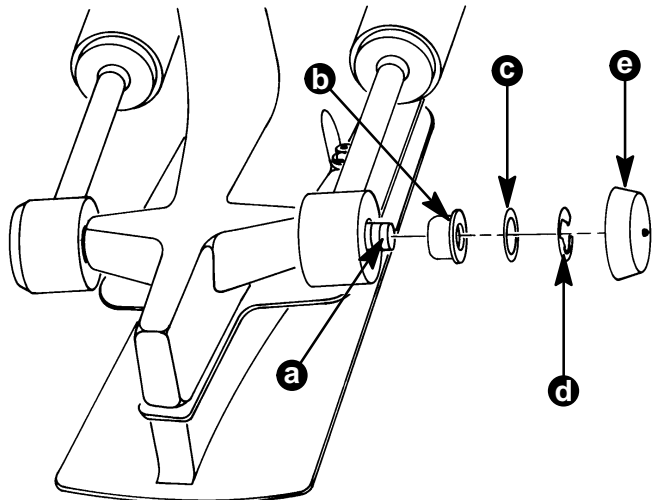
STERN DRIVE TO BELL HOUSING CONNECTION



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- a - Locknut and Flat Washers - Torque to 50 lb. ft. (68 N·m)
- b - Locknut and Continuity Circuit Washer - Torque to 50 lb. ft. (68 N·m)

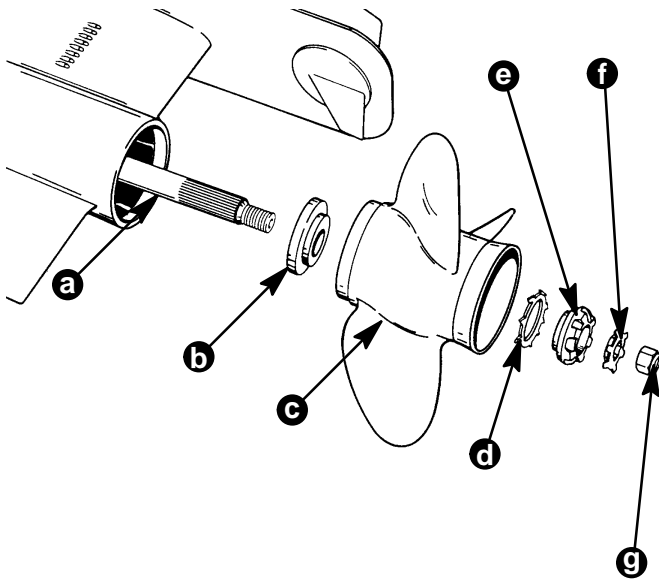
Trim Cylinder Connection



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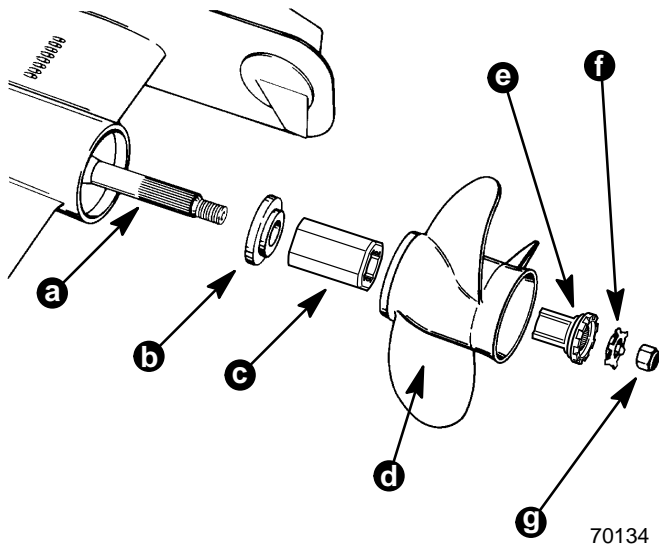
- a - Aft Anchor Pin
- b - Bushings
- c - Flat Washers (2)
- d - E-ring Clips (2)
- e - Plastic Caps (2)

Propeller Installation



Typical Propeller

- a - Propeller Shaft
- b - Forward Thrust Hub
- c - Propeller
- d - Continuity Washer
- e - Spline Washer
- f - Tab Washer
- g - Propeller Nut-Torque to 55 lb. ft. (75 N·m)



Propeller With Flo-Torque Hub

- a - Propeller Shaft
- b - Forward Thrust Hub
- c - Drive Sleeve
- d - Propeller
- e - Drive Sleeve Adapter
- f - Tab Washer
- g - Propeller Nut-Torque to 55 lb. ft. (75 N·m)

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Drive Shaft Housing Specifications

Torque Specifications

NOTE: Securely tighten all fasteners not listed below.

DESCRIPTION	TORQUE		
	lb. in.	lb. ft.	N·m
Top Cover Screws		17-23	23-31
U-joint Retainer Nut		200	271
Oil Vent Screw	30-50		3.4-5.6

Upper Drive Shaft Bearing Preload

DESCRIPTION	TORQUE	
	lb. in.	N·m
New Bearings	6-15	0.7-1.7
Used Bearings*	3-7.5	0.3-0.8

*Bearings are considered used if spun under load once.

U-joint Bearing Preload

DESCRIPTION	TORQUE	
	lb. in.	N·m
New Bearings	6-10	0.7-1.1
Used Bearings*	3-7.5	0.3-0.8

*Bearings are considered used if spun under load once.

Gear Shimming Specifications

DESCRIPTION	GEAR LOCATION	
	inches	millimeters
Drive Gear	.025	0.64
Driven Gear	.025	0.64

Lubricants, Sealers, and Adhesives

DESCRIPTION	PART NUMBER
Quicksilver 2-4-C Marine Lubricant with Teflon	92-825407A3
Quicksilver U-Joint and Gimbal Bearing Grease	92-828052A2
3M Brand Adhesive	92-25234-1
Quicksilver Bellows Adhesive	92-86166
Quicksilver Needle Bearing Assembly Lubricant	92-825265A1
Quicksilver Perfect Seal	92-34227-1
Permatex Ultra Blue Silicone Sealant	Obtain Locally
Quicksilver Special Lubricant 101	92-13872A1
Quicksilver High Performance Gear Lube	92-816026A4

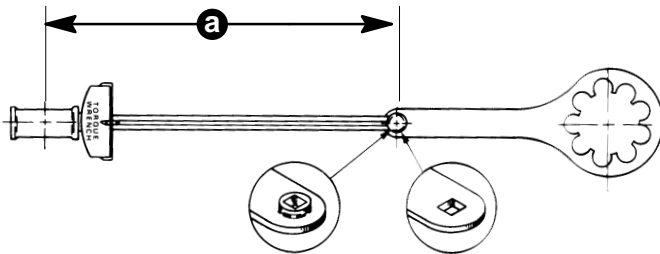
Special Tools

DESCRIPTION	PART NUMBER
Adaptor	91-38756
Bearing Cup Driver	91-38918
Bearing Driver Cup	91-33493
Driver Cup	91-36577
Driver Rod	91-37323
Driver Tool	91-90774
Oil Seal Driver	91-817570
Shimming Tool (Driven Gear)	91-60526
Shimming Tool (Drive Gear)	91-60523
Slide Hammer Puller	91-34569A1
Torque Wrench (lb. in.)	91-66274
U-joint Bearing Retainer Wrench	91-17256
Universal Puller Plate	91-37241

TORQUE CONVERSION CHART

Use the following table to torque the u-joint retainer to 200 lb. ft. (271 N-m).

Torque Wrench Length in Inches (cm) a	Torque Wrench Reading in lb. ft. (N-m) to Achieve 200 lb. ft. (271 N-m) of Torque
15 (38)	111 (151)
16 (41)	114 (155)
17 (43)	117 (159)
18 (46)	120 (163)
19 (48)	123 (167)
20 (51)	125 (170)
21 (53)	127 (172)
22 (56)	129 (175)
23 (58)	131 (178)
24 (61)	133 (180)
25 (64)	135 (183)
26 (66)	136 (184)
27 (69)	138 (187)
28 (71)	140 (190)
29 (74)	141 (191)
30 (76)	143 (194)
31 (79)	144 (195)
32 (81)	145 (197)
33 (84)	147 (200)
34 (86)	148 (201)
35 (89)	149 (202)
36 (91)	150 (203)

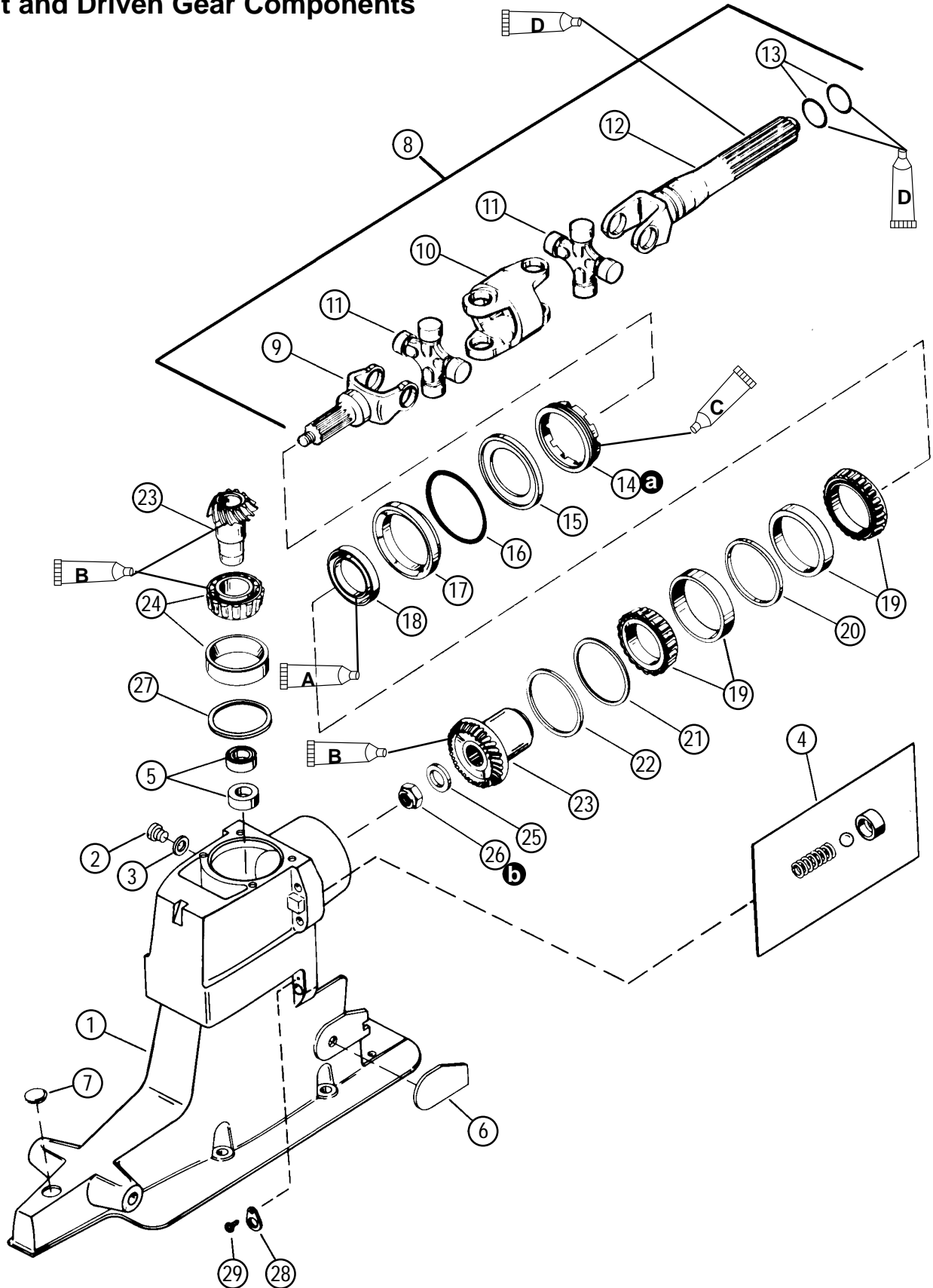


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a - Torque Wrench Length


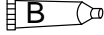


Drive Shaft Housing Exploded Parts View

U-Joint and Driven Gear Components



- 1 - Drive Shaft Housing
- 2 - Screw
- 3 - O-ring
- 4 - Spring Assembly
- 5 - Oil Seal
- 6 - Wear Pad
- 7 - Plug
- 8 - Universal Joint
- 9 - Yoke, Universal Joint - Gear End
- 10- Socket, Center - Universal Joint
- 11- Cross and Bearing
- 12- Yoke Assembly, Universal
Joint - Coupling End
- 13- O-ring
- 14- Retainer
- 15- Ring
- 16- O-ring
- 17- Carrier Assembly
- 18- Oil Seal
- 19- Roller Bearing and Cups
- 20- Cup Spacer
- 21- Shim
- 22- Shim
- 23- Drive Gear Assembly
- 24- Roller Bearing and Cup
- 25- Washer
- 26- Nut
- 27- Shims
- 28- Ground Plate
- 29- Screw

Lubricants, Sealers, and Adhesives

-  - 2-4-C Marine Lubricant
with Teflon 92-825407A12
-  - Quicksilver High Performance
Gear Lube 92-816025A4
-  - Quicksilver Special
Lubricant 101 92-13872A1
-  - Quicksilver Engine
Coupler Spline Grease ... 92-816391A4

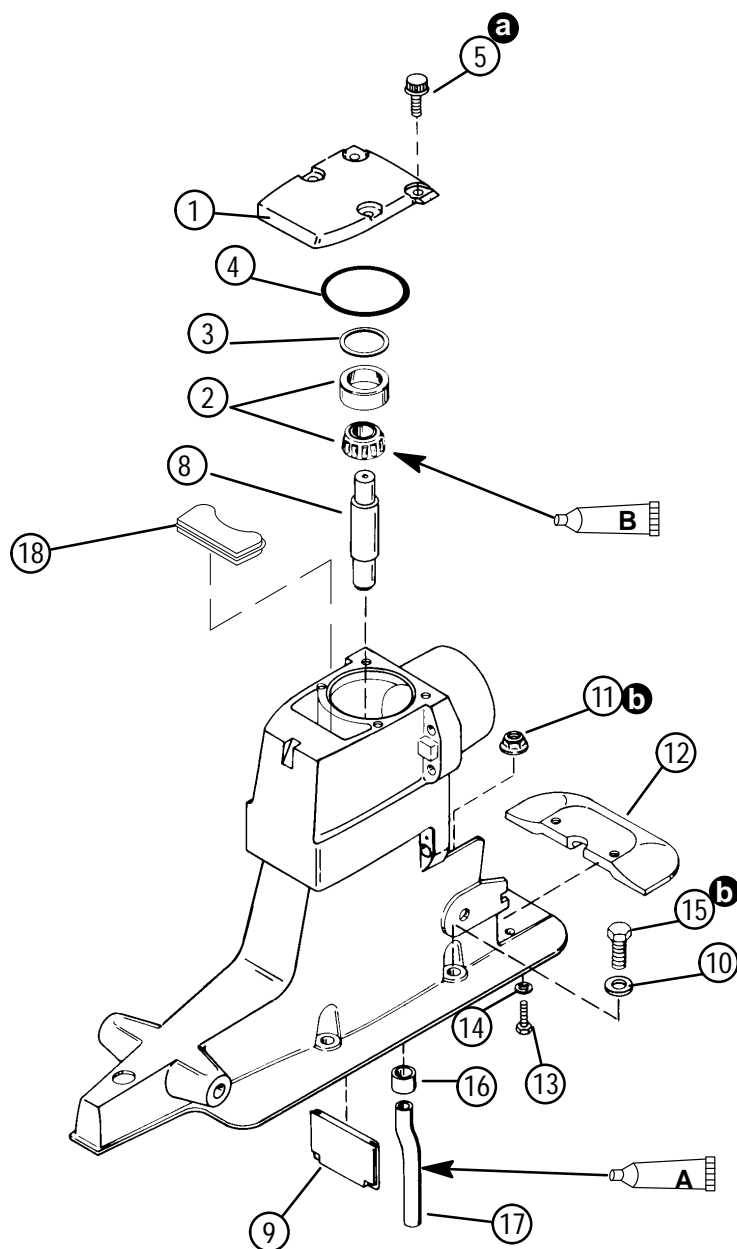
Torque Specification

- a** 200 lb. ft. (271 N·m) - See Chart on Page 7

Rolling Preload

- b** Tighten in Small Increments Until
6-10 lb. in. (.07-1.1 N·m) of Rolling Preload

Drive Shaft Components



74243

- 1 - Cover, top
- 2 - Bearing and Cup
- 3 - Shim
- 4 - O-ring
- 5 - Screw
- 8 - Drive Shaft, upper
- 9 - Filler Wall
- 10 - Washer
- 11 - Nut
- 12 - Anodic Plate
- 13 - Screw
- 14 - Lockwasher
- 15 - Screw
- 16 - Seal
- 17 - Water Tube
- 18 - Stuffer Plug

Lubricants, Sealers, and Adhesives

A - Quicksilver 2-4-C Marine
Lubricant with Teflon . . . 92-825407A12

B - Quicksilver High
Performance Gear Lube . 92-816026A4

Torque Specifications

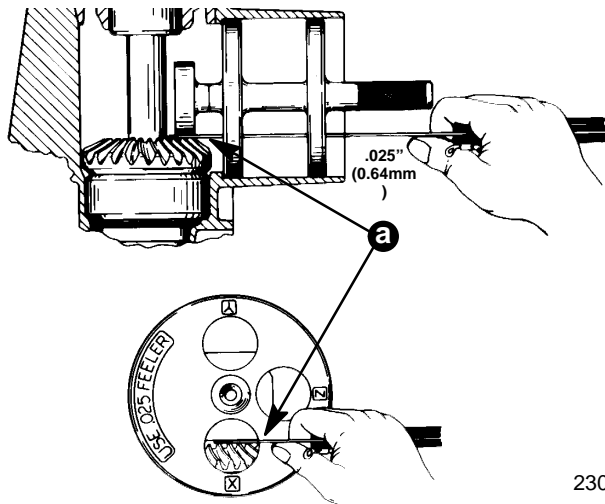
a 20 lb. ft. (27 N·m)

b 35 lb. ft. (47.5 N·m)

Drive Shaft Housing Shimming

Gear Distance, Driven Gear

SHIMMING TOOL 91-60526	
Overall Drive Unit Gear Ratio	Tool Position
1.47:1	Z
1.62:1	X
1.81:1	Y
1.94:1	Y
2.40:1	Y

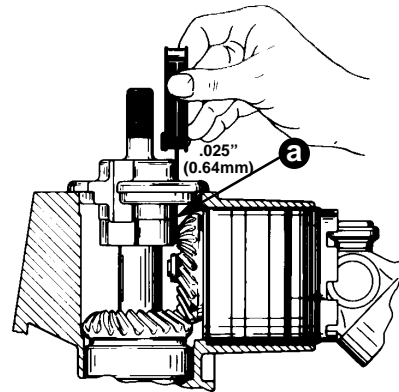


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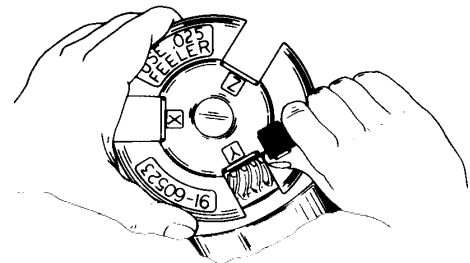
a - Feeler Gauge - .025 in. (0.635mm)

Gear Distance, Drive Gear

SHIMMING TOOL 91-60523	
Overall Drive Unit Gear Ratio	Tool Position
1.47:1	Z
1.62:1	Y
1.81:1	Y
1.94:1	Y
2.40:1	Y



23012



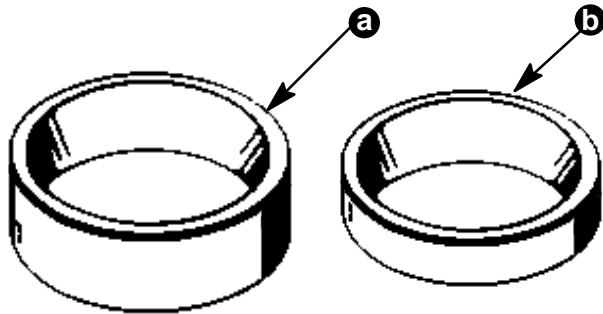
23012

a - Feeler Gauge - .025 in. (0.635mm)

Drive Shaft Housing Special Information

Top Cover Bearing Cup

The later style bearing cup is thinner than the earlier style cup.

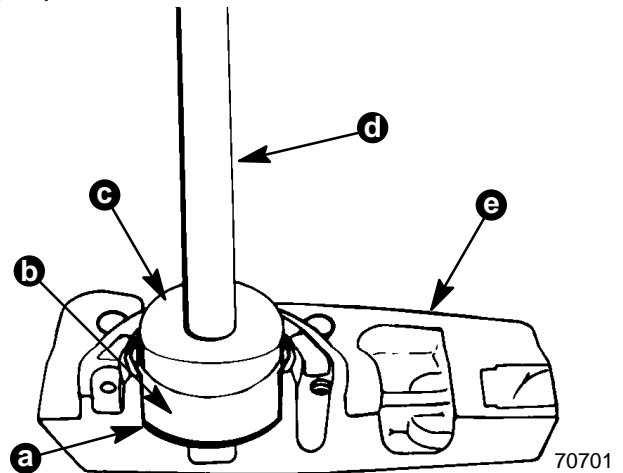


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- a - Earlier Style Bearing Cup 1.938 in. Diameter (Prior to S/N OF680000)
- b - Later Style Bearing Cup 1.781 in. Diameter (S/N OF680000 and Above)

Top Cover Bearing Cup Drivers

Use the appropriate driver for installation of the bearing cup.



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- a - Shims
- b - Bearing Cup
- c - Bearing Cup Driver (91-38918) used with 31-61100 A1 Bearing OR Bearing Cup Driver (91-808053) used with 31-32575 A1 Bearing
- d - Driver Rod (91-37323)
- e - Top Cover

Standard Rotation Gear Housing Specifications

Torque Specifications

NOTE: Securely tighten all fasteners not listed below.

DESCRIPTION	TORQUE		
	lb. in.	lb. ft.	N-m
Water Pump Body Screws	60		6.8
Pinion Gear Nut		70	95
Gear Housing to Drive Shaft Housing Screws		28	38
Gear Housing to Drive Shaft Housing Nuts		35	47
Trim Tab Screw		23	31
Shift Shaft Bushing Screws	60		6.8
Drive Shaft Retainer		100	136
Bear Carrier Retainer		210	285
Oil Fill/Drain Screw	30-50		3.4-5.6
Propeller Nut ¹		55	75

¹: Amount specified is **MINIMUM**.

Shimming Specifications

DESCRIPTION	GEAR LOCATION	
	inches	millimeters
Pinion Gear Height	.025	0.64
Forward Gear Backlash	.017-.028	0.43-0.71
Reverse Gear Backlash	.034-.054	0.86-1.37

Lubricants, Sealers, and Adhesives

DESCRIPTION	PART NUMBER
Quicksilver 2-4-C Marine Lubricant with Teflon	92-825407A3
3M Brand Adhesive	92-25234-1
Quicksilver Bellows Adhesive	92-86166
Quicksilver Needle Bearing Assembly Lubricant	92-825265A1
Quicksilver Perfect Seal	92-34227-1
Permatex Ultra Blue Silicone Sealant	Obtain Locally
Quicksilver Special Lubricant 101	92-13872A1
Loctite 8831	92-823089-1
Quicksilver High Performance Gear Lube	92-816026A4

Special Tools

DESCRIPTION	PART NUMBER
Backlash Indicator Rod	91-53459
Bearing Carrier Retainer Wrench	91-61069
Bearing Preload Tool	91-14311A2
Belleville Washer	12-54048
Dial Indicator	91-58222A1
Dial Indicator Holding Tool	91-89897
Drive Shaft Nut Wrench	91-56775
Cup Driver	91-36577
Drive Shaft Bearing Wrench	91-43506
Needle Bearing Driver	91-15755
Needle Bearing Driver	91-33491
Oil Seal Driver	91-31108
Oil Seal Driver	91-817569
Pinion Gear Shimming Tool	91-56048
Pinion Nut Adapter	91-61067A3
Drive Shaft Adapter	91-61077
Puller Bolt	91-85716
Puller Jaws	91-46086A1
Slide Hammer Puller	91-34569A1
Torque Wrench (Inch Pound)	91-66274
Water Pump Alignment Pins	91-821571A1
Universal Bearing Removal and Installation (Includes the Following Items)	91-31229A5
Bearing Adapter	91-37263
Bearing Installation Tool	91-38628

DESCRIPTION	PART NUMBER
Collar	91-30366
Driver Head	91-32366
Driver Head	91-36569
Driver Head	91-37311
Driver Head	91-37312
Driver Head	91-52393
Driver Head Rod	91-37323
Nut	11-24156
Pilot Washer	91-36571
Pilot Washer	91-37324
Pilot Washer	91-37350
Puller Plate	91-29310
Puller Head	91-36379
Puller Head	91-32325
Puller Head	91-38628
Puller Rod	91-52394
Puller Shaft	91-31229
Roller Bearing Removal and Installation Tool	91-37292
Washer	12-34961

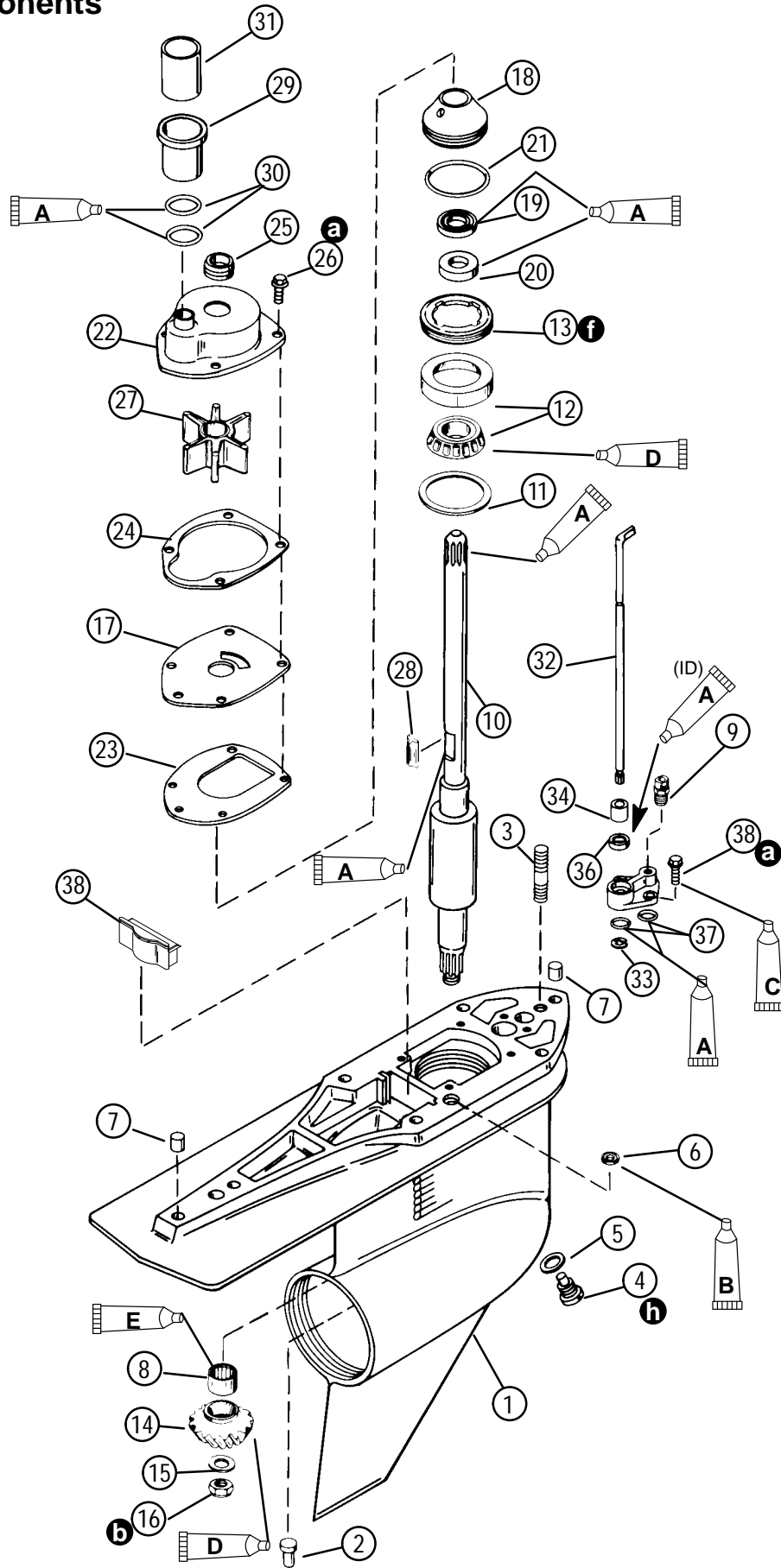
*The 91-14311A2 Bearing Preload Tool is also used on Mercury and Mariner V-6 gear cases. Check your inventory before buying.

NOTE: *Water Pump Face Seal Tool is not available separately, 26-816575A2 is a kit part number which includes the tool and the face seal.*

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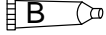



Standard Rotation Gear Housing Exploded Parts View

Drive Shaft Components



- 1 - Gear Housing
- 2 - Pin
- 3 - Stud
- 4 - Oil Fill/Drain Screw
- 5 - O-ring
- 6 - Seal
- 7 - Dowel Pin
- 8 - Roller Bearing
- 9 - Speedometer Fitting
- 10- Drive Shaft
- 11- Shim
- 12- Bearing and Cup
- 13- Nut
- 14- Gear Drive
- 15- Washer
- 16- Nut
- 17- Face Plate
- 18- Carrier
- 19- Oil Seal
- 20- Oil Seal
- 21- O-ring
- 22- Water Pump
- 23- Gasket
- 24- Gasket
- 25- Face Seal
- 26- Screw
- 27- Impeller
- 28- Key
- 29- Coupling
- 30- O-rings
- 31- Sleeve
- 32- Shift Shaft
- 33- Retaining Ring
- 34- Sleeve
- 35- Bushing Assembly
- 36- Oil Seal
- 37- O-rings
- 38- Screw

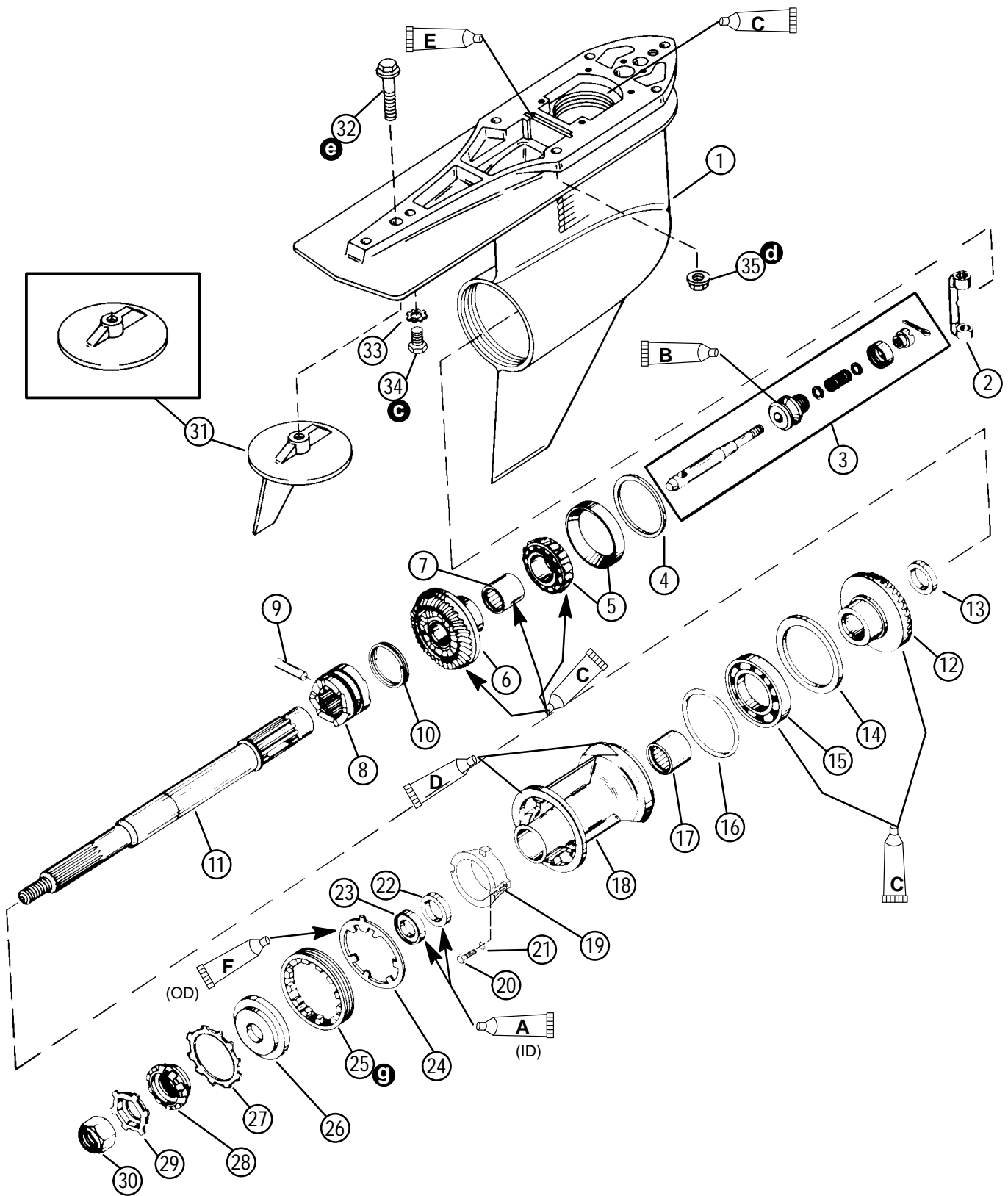
Lubricants, Sealers, and Adhesives

-  - Quicksilver 2-4-C Marine
Lubricant with Teflon . . . 92-825407A12
-  - 3M Brand Adhesive 92-25234-1
-  - Loctite 8831 92-823089-1
-  - Quicksilver High
Performance Gear Lube . 92-816026A4
-  - Quicksilver Needle Bearing
Assembly Lubricant 92-825265A1

Torque Specifications


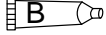



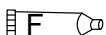
- a** 60 lb. in. (6.8 N·m)
- b** 70 lb. ft. (95 N·m)
- c** 28 lb. ft. (38 N·m)
- d** 35 lb. ft. (47 N·m)
- e** 23 lb. ft. (31 N·m)
- f** 100 lb. ft. (136 N·m)
- g** 210 lb. ft. (285 N·m)
- h** 30-50 lb. in. (3.4-5.6 N·m)

Propeller Shaft Components



- 1 - Gear Housing
- 2 - Shift Crank
- 3 - Shift Spool Assembly
- 4 - Shim, Bearing Outer Race
- 5 - Bearing and Cup
- 6 - Forward Gear
- 7 - Roller Bearing
- 8 - Sliding Clutch
- 9 - Cross Pin
- 10- Spring
- 11- Propeller Shaft
- 12- Reverse Gear
- 13- Thrust Washer
- 14- Thrust Hub
- 15- Ball Bearing
- 16- O-ring
- 17- Roller Bearing
- 18- Bearing Carrier Assembly
- 19- Anode
- 20- Screw
- 21- Star Washer
- 22- Oil Seal (Inside)
- 23- Oil Seal (Outside)
- 24- Tab Washer
- 25- Retainer
- 26- Thrust Hub
- 27- Continuity Washer
- 28- Spline Washer
- 29- Tab Washer
- 30- Locknut - Propeller
- 31- Anodic Trim Tab (Anodic Plate - Some Models)
- 32- Screw
- 33- Star Washer
- 34- Screw
- 35- Nut

Lubricants, Sealers, and Adhesives

-  **A** - Quicksilver 2-4-C Marine
Lubricant with Teflon 92-825407A12
-  **B** - Loctite 8831 92-823089-1
-  **C** - Quicksilver High
Performance Gear Lube . . . 92-16026A4
-  **D** - Quicksilver Perfect Seal 92-34277-1
-  **E** - Permatex Ultra Blue
Silicone Sealant Obtain Locally
-  **F** - Quicksilver Special
Lubricant 101 92-13872A1

Torque Specifications

- a** 60 lb. in. (6.8 N·m)
- b** 70 lb. ft. (95 N·m)
- c** 28 lb. ft. (38 N·m)
- d** 35 lb. ft. (47 N·m)
- e** 23 lb. ft. (31 N·m)
- f** 100 lb. ft. (136 N·m)
- g** 210 lb. ft. (285 N·m)

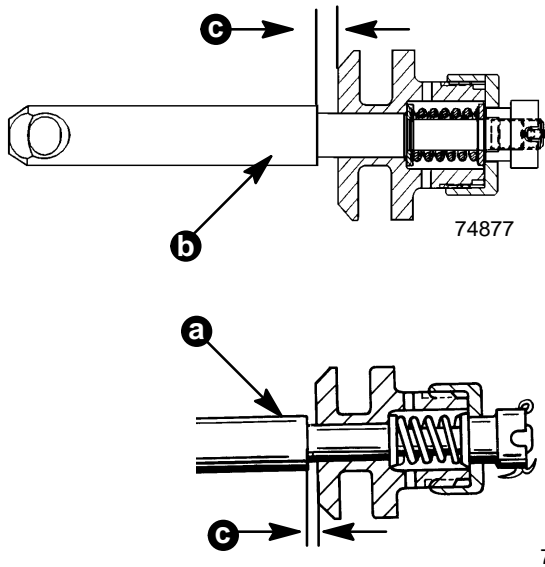
Special Information For Standard Rotation Gear Housing

CAUTION

Avoid damage to stern drive unit. Drive unit damage will occur if Later Style parts are intermixed with Earlier Style parts.

SHIFT SPOOL ASSEMBLY

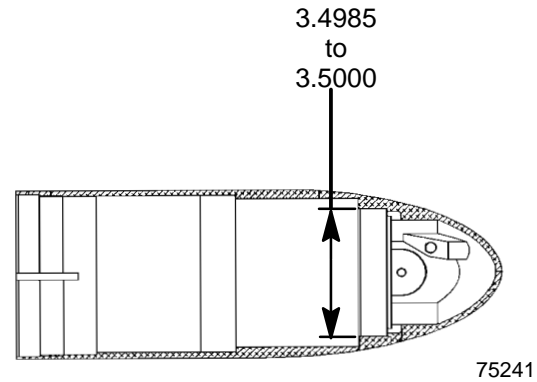
The later style shift spool assembly has a larger gap than the earlier style. This later style shift spool beginning with serial number 0K041000 is sold as a whole assembly and can be used when replacing the earlier style (Prior to S/N 0K041000). The end play for the spool will remain the same as the earlier models (.002-.010 in. .051-.254 mm).



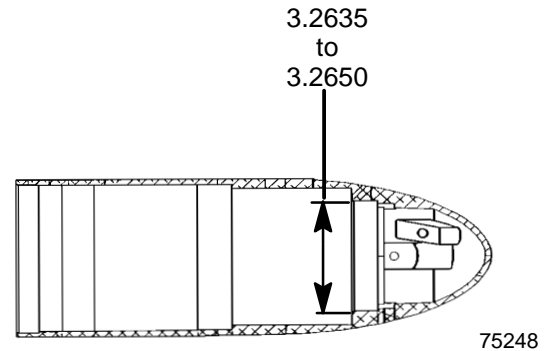
- a - Earlier Style Shift Spool Assembly (Prior to S/N 0K041000)
- b - Later Style Shift Spool Assembly (S/N 0K041000 and Above)
- c - Measure End Play Here at Gap

FORWARD GEAR BEARING BORE

The later style forward gear bearing bore is smaller (3.2635 to 3.2650 in.) than the earlier style (3.4985 to 3.5000 in.) This slightly smaller bearing bore for the forward gear bearing adapter is approximately 1/4 in. (6.3 mm) smaller.

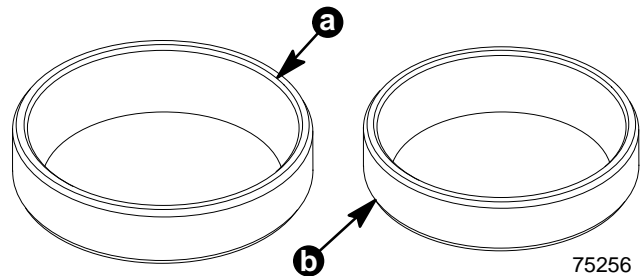


Earlier Style Forward Gear Bore (Prior to S/N OF680000)



Later Style Forward Gear Bore (S/N OF680000 and Above)

The later style bearing cup is thinner and has a smaller diameter than the earlier style.

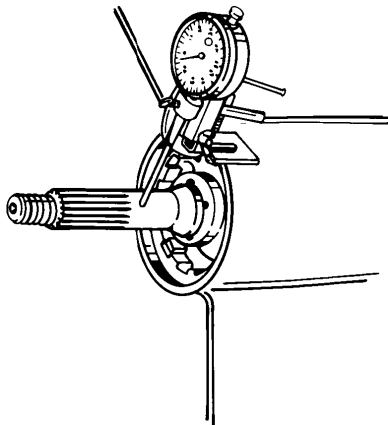


- a - Earlier Style Gear Bearing Cup 3.500 in. diameter (Prior to S/N OF680000)
- b - Later Style Gear Bearing Cup 3.265 in. diameter (S/N OF680000 and Above)

Standard Rotation Gear Housing Assembly Specifications

Pre-Disassembly Inspection

Action	Reading
Move propeller shaft from one side to another	Less than .003 in. (0.08 mm)
Rotate propeller shaft	.005 in. (.127 mm) or less

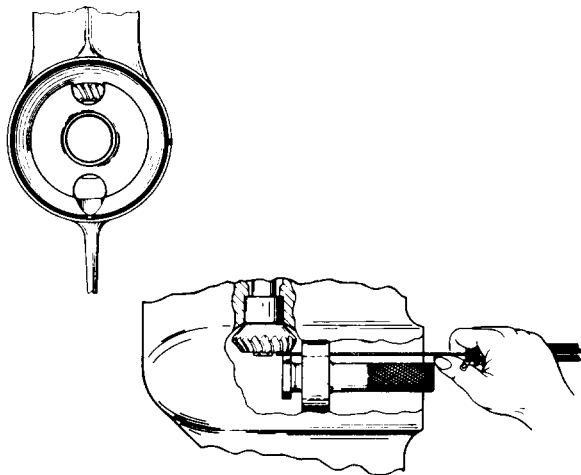


22086

Pinion Gear Height

Check pinion height at four locations.

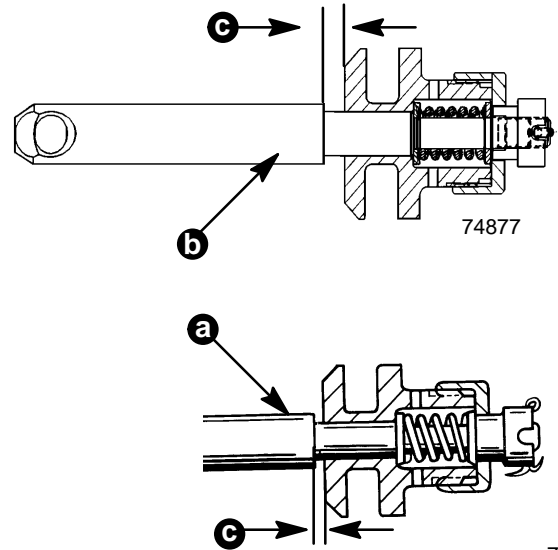
Average pinion gear height: .025 in. (0.64 mm).



26410

Shift Spool End Play

NOTE: The later style shift spool assembly has a larger gap than the earlier style. This later style shift spool beginning with serial number OK041000 is sold as a whole assembly and can be used when replacing the earlier style (Prior to S/N OK041000). The end play for the spool will remain the same as the earlier models (.002-.010 in. .051-.254 mm).

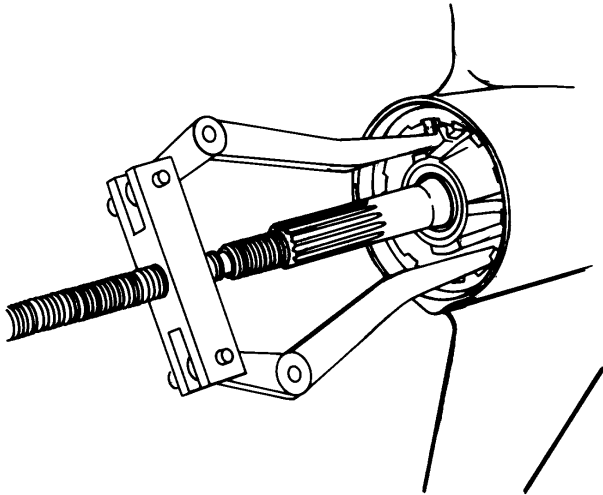


75219

- a - Earlier Style Shift Spool Assembly (Prior to S/N OK041000)
- b - Later Style Shift Spool Assembly (S/N OK041000 and Above)
- c - Measure End Play Here at Gap

Forward Gear Backlash

Apply forward pressure to the propeller shaft with puller jaws. Torque the puller bolt to 45 lb. in. (5 N-m).

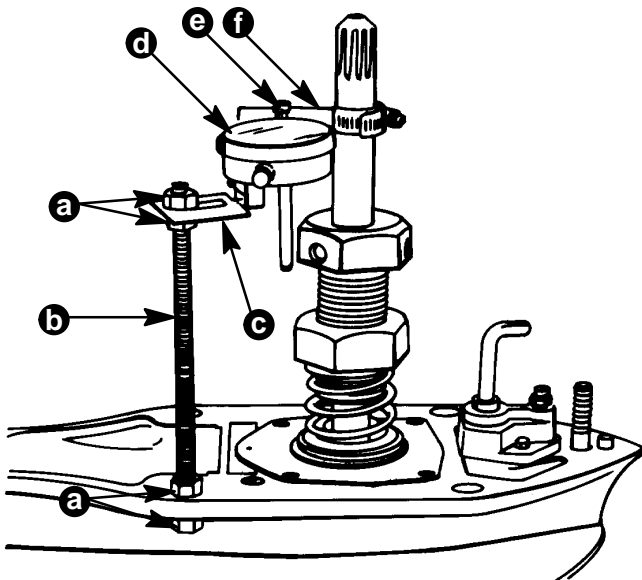


70719

- a - Puller Jaws
- b - Puller Bolt

Take readings at four different locations, 90° apart, and average them for the backlash reading.

Backlash reading: .017-.028 in. (0.43-0.71 mm)

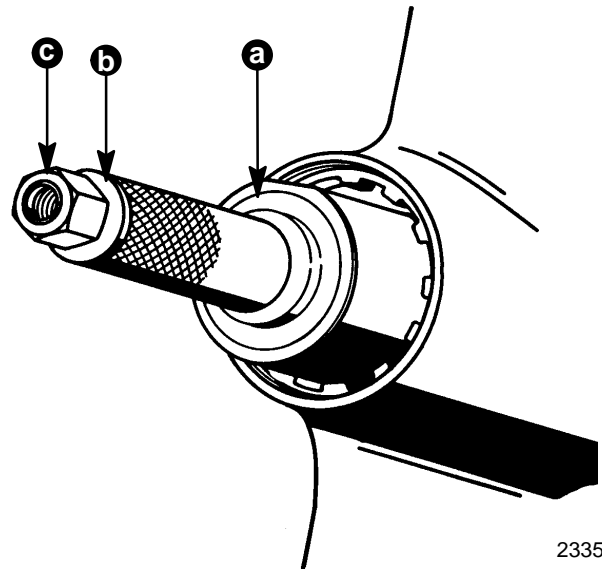


70717

- a - Nuts (4)
- b - Threaded Rod
- c - Dial Indicator Holding Tool
- d - Dial indicator
- e - Indicator Pointer-Set at "I" on Backlash Indicator Rod
- f - Backlash Indicator Rod

Reverse Gear Backlash

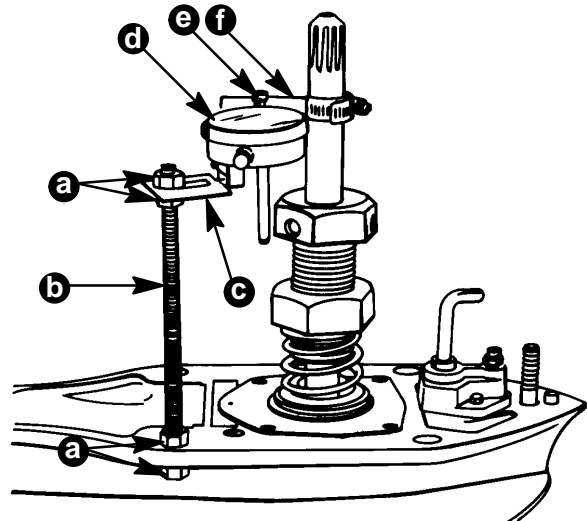
Use the pinion nut adaptor to apply backward pressure on the propeller shaft. Torque Propeller nut to 45 lb. in. (5 N-m).



23355

- a - Pinion Nut Adaptor
- b - Washer
- c - Propeller Nut

Backlash reading: .034-.054 in. (0.86-1.37 mm).



70717

- a - Nuts (4)
- b - Threaded Rod
- c - Dial Indicator Holding Tool
- d - Dial indicator
- e - Indicator Pointer-Set at "I" on Backlash Indicator Rod
- f - Backlash Indicator Rod

Counter-Rotation Gear Housing Specifications

Torque Specifications

NOTE: Securely tighten all fasteners not listed below.

DESCRIPTION	TORQUE		
	lb. in.	lb. ft.	N-m
Water Pump Body Screws	60		6.8
Pinion Gear Nut		70	95
Gear Housing to Drive Shaft Housing Screws		28	38
Gear Housing to Drive Shaft Housing Nuts		35	47
Trim Tab Screw		23	31
Shift Shaft Bushing Screws	60		6.8
Drive Shaft Retainer		100	136
Bear Carrier Retainer		210	285
Oil Fill/Drain Screw	30-50		3.4-5.6
Propeller Nut ¹		55	75

1: Amount specified is **MINIMUM**.

Shimming Specifications

DESCRIPTION	GEAR LOCATION	
	inches	millimeters
Pinion Gear Height	.025	0.64
Forward Gear Backlash	.017-.028	0.43-0.71
Reverse Gear Backlash	.040-.050	1.02-1.27

Lubricants, Sealers, and Adhesives

DESCRIPTION	PART NUMBER
Quicksilver 2-4-C Marine Lubricant with Teflon	92-825407A3
3m Brand Adhesive	92-25234-1
Quicksilver Bellows Adhesive	92-86166
Quicksilver Needle Bearing Assembly Lubricant	92-825265A1
Quicksilver Perfect Seal	92-34227-1
Permatex Ultra Blue Silicone Sealant	Obtain Locally
Quicksilver Special Lubricant 101	92-13872A1
Loctite 8831	92-823089-1
Quicksilver High Performance Gear Lube	92-816026A1

Special Tools

Description	Tool Part Number
Backlash Indicator Rod	91-53459
Bearing Adaptor Installation Tool	91-18605 A1
Bearing Carrier Retainer Wrench	91-61069
Bearing Driver	91-816244
Bearing Preload Tool	91-14311 A2
Bearing Removal Tool	91-816245
Belleville Washer	12-54048
Dial Indicator	91-58222 A1
Dial Indicator Holding Tool	91-89897
Drive Shaft Nut Wrench	91-56775
Drive Shaft Bearing Retainer Wrench	91-43506
Guide Plate	91-816243
Needle Bearing Driver	91-15755
Oil Seal Driver	91-31108
Oil Seal Driver	91-817569
Pinion Gear Shimming Tool	91-56048
Pinion Nut Adaptor	91-61067 A3

Special Tools (continued)

Description	Tool Part Number
Drive Shaft Adaptor	91-61077
Puller Bolt	91-85716
Puller Shaft	91-31229
Puller Jaws	91-46086 A1
Puller Jaws	91-816242
Slide Hammer Puller	91-34569 A1
Forward Gear Installation Tool	91-815850
Torque Wrench (Inch Pound)	91-66274
Universal Puller Plate	91-37241
Water Pump Alignment Pins	91-821571 A1
Universal Bearing Removal and Installation Tool	91-31229 A5
Driver Head	91-36569
Driver Head Rod	91-37323
Nut	11-24156
Pilot Washer	91-36571
Puller Plate	91-29310
Puller/Driver Head	91-38628

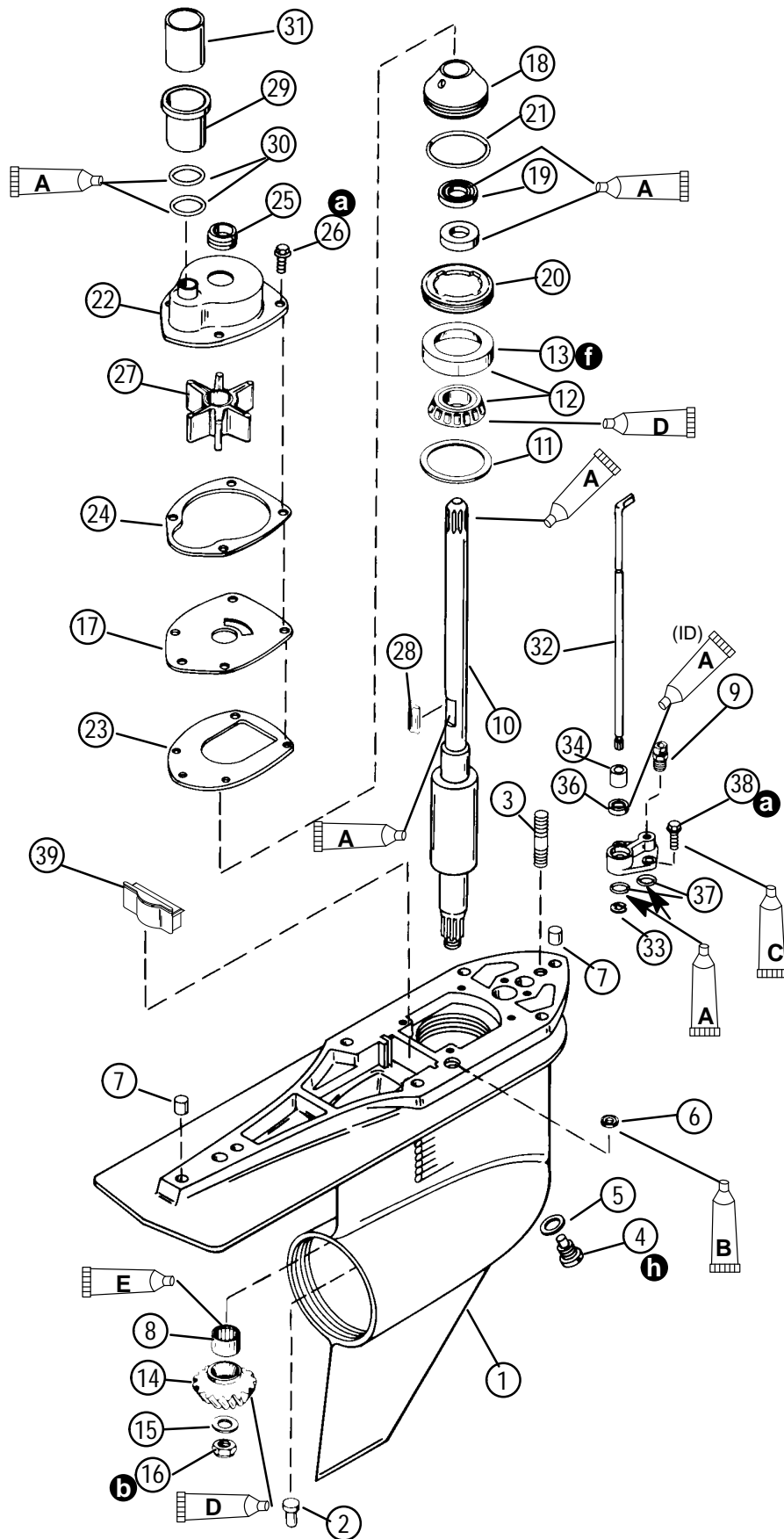
*The 91-14311A2 Bearing Preload Tool is also used on Mercury and Mariner V-6 gear cases. Check your inventory before buying.

NOTE: *Water Pump Face Seal Tool is not available separately, 26-816575A2 is a kit part number which includes the tool and the face seal.*

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Counter-Rotation Gear Housing Exploded Parts View


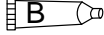
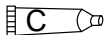


Drive Shaft Components



74242

- 1 -Gear Housing
- 2 -Pin
- 3 -Stud
- 4 -Screw
- 5 -Oil Fill/Drain Screw
O-ring
- 6 -Seal
- 7 -Dowel Pin
- 8 -Roller Bearing
- 9 -Speedometer Fitting
- 10-Drive Shaft
- 11 -Shim
- 12-Bearing and Cup
- 13-Nut
- 14-Gear Drive
- 15-Washer
- 16-Nut
- 17-Face Plate
- 18-Carrier
- 19-Oil Seal
- 20-Oil Seal
- 21-O-ring
- 22-Water Pump
- 23-Gasket
- 24-Gasket
- 25-Face Seal
- 26-Screw
- 27-Impeller
- 28-Key
- 29-Coupling
- 30-O-rings
- 31-Sleeve
- 32-Shift Shaft
- 33-Retaining Ring
- 34-Sleeve
- 35-Bushing Assembly
- 36-Oil Seal
- 37-O-rings
- 38-Screw
- 39-Stuffer Plug

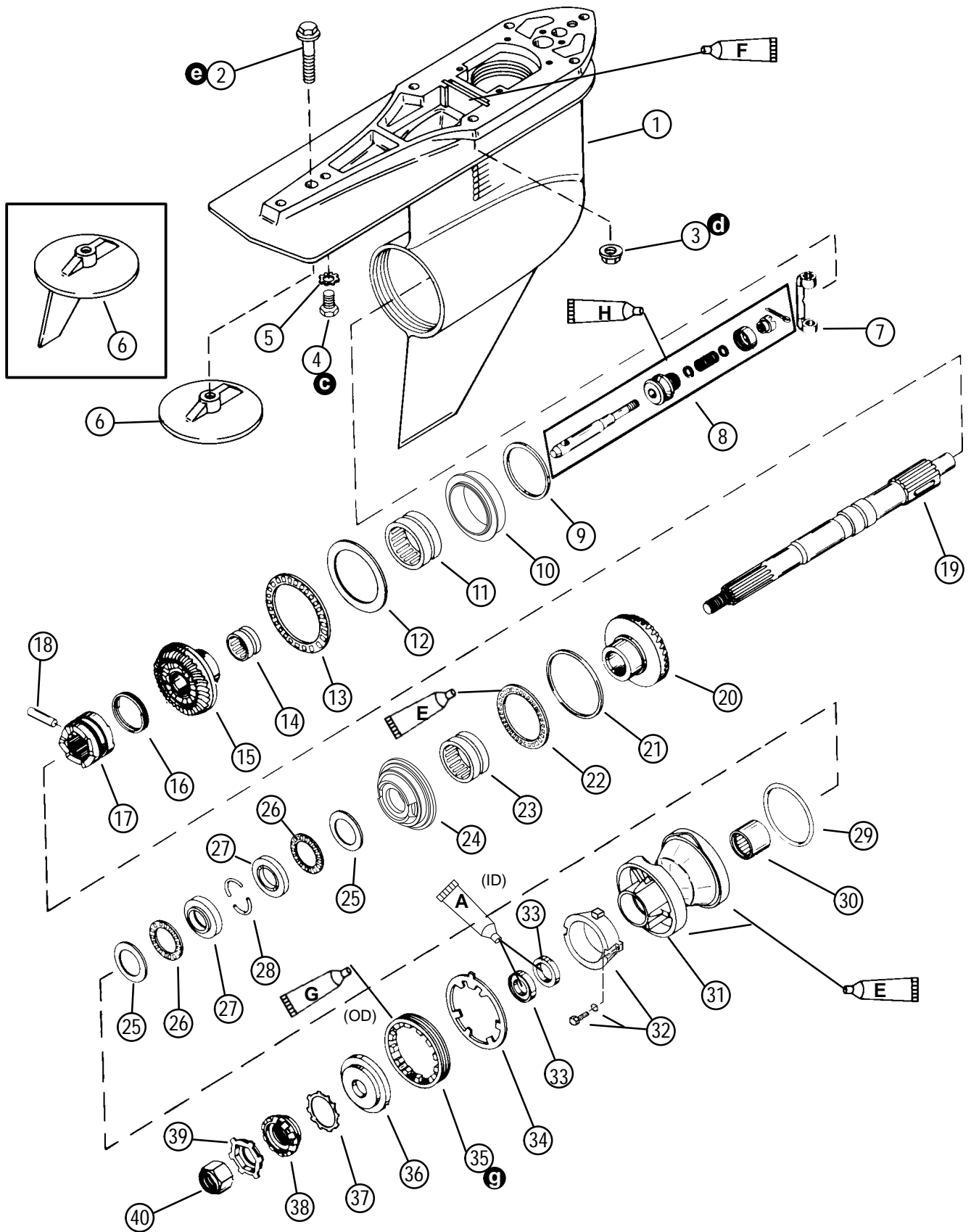
Lubricants, Sealers, and Adhesives

-  - Quicksilver 2-4-C Marine
Lubricant with Teflon . . . 92-825407A12
-  - 3M Brand Adhesive 92-25234-1
-  - Loctite 8831 92-823089-1
-  - Quicksilver High
Performance Gear Lube . 92-816026A4
-  - Quicksilver Needle Bearing
Assembly Lubricant 92-825265A1

Torque Specifications

- a** 60 lb. in. (6.8 N·m)
- b** 70 lb. ft. (95 N·m)
- c** 28 lb. ft. (38 N·m)
- d** 35 lb. ft. (47 N·m)
- e** 23 lb. ft. (31 N·m)
- f** 100 lb. ft. (136 N·m)
- g** 210 lb. ft. (285 N·m)
- h** 30-50 lb. in. (3.4-5.6 N·m)


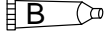


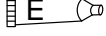

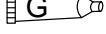
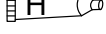

Propeller Shaft Components



74723

- 1 - Gear Housing
- 2 - Screw - Trim Plate or Tab
- 3 - Nut
- 4 - Screw
- 5 - Lockwasher
- 6 - Anodic Plate or Tab
- 7 - Shift Crank
- 8 - Shift Spool Assembly
- 9 - Shims
- 10- Bearing Adapter - Reverse Gear
- 11- Roller Bearing
- 12- Thrust Washer
- 13- Thrust Bearing
- 14- Roller Bearing
- 15- Reverse Gear
- 16- Retainer Spring - Cross Pin
- 17- Clutch
- 18- Cross Pin
- 19- Propeller Shaft
- 20- Forward Gear
- 21- Shim Spacer
- 22- Thrust Bearing
- 23- Roller Bearing
- 24- Bearing Adapter - Forward Gear
- 25- Thrust Washer
- 26- Thrust Bearing
- 27- Thrust Race
- 28- Keepers
- 29- O-ring
- 30- Needle Bearing
- 31- Bearing Carrier
- 32- Propeller Anode and Screws
- 33- Seals
- 34- Tab Washer
- 35- Retaining Nut
- 36- Thrust Hub
- 37- Continuity Washer
- 38- Spline Washer
- 39- Tab Washer
- 40- Locknut

Lubricants, Sealers, and Adhesives

-  - Quicksilver 2-4-C Marine Lubricant with Teflon 92-825407A3
-  - 3M Brand Adhesive 92-25234-1
-  - Quicksilver Bellows Adhesive 92-86166
-  - Quicksilver Needle Bearing Assembly Lubricant 92-825265A1
-  - Quicksilver Perfect Seal 92-34227-1
-  - Permatex Ultra Blue Silicone Sealant Obtain Locally
-  - Quicksilver Special Lubricant 101 92-13872A1
-  - Loctite 8831 92-823089-1
-  - Quicksilver High Performance Gear Lube . 92-816026A4

Torque Specifications

- a** 60 lb. in. (6.8 N·m)
- b** 70 lb. ft. (95 N·m)
- c** 28 lb. ft. (38 N·m)
- d** 35 lb. ft. (47 N·m)
- e** 23 lb. ft. (31 N·m)
- f** 100 lb. ft. (136 N·m)
- g** 210 lb. ft. (285 N·m)

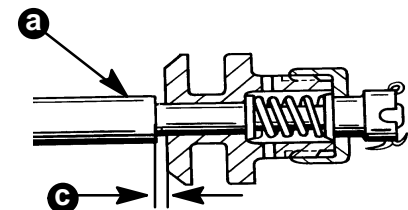
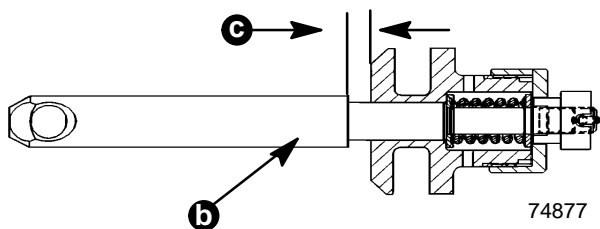
Special Information For Counter-Rotation Gear Housing

CAUTION

Avoid damage to stern drive unit. Drive unit damage will occur if Later Style parts are intermixed with Earlier Style parts.

SHIFT SPOOL ASSEMBLY

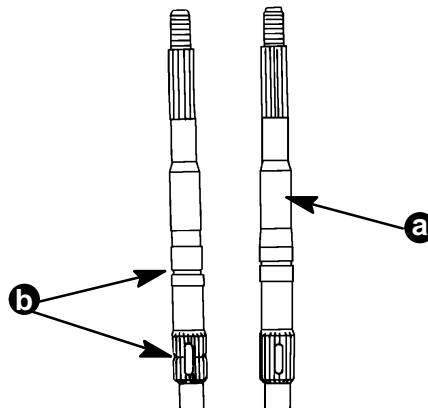
The later style shift spool assembly for the counter rotation has a larger gap than the earlier style. This later style shift spool beginning with serial number OF726586 is sold as a whole assembly and must be used when replacing the earlier style (Prior to S/N OF726586).



- d - Earlier Style Shift Spool Assembly (Prior to S/N OF726586)
- e - Later Style Shift Spool Assembly (S/N OF726586 and Above)
- f - Measure End Play Here at Gap.

PROPELLER SHAFT

The later style propeller shaft has a groove on the shaft where the clutch slides onto the shaft. The keeper slot is also moved toward the forward end of the shaft.

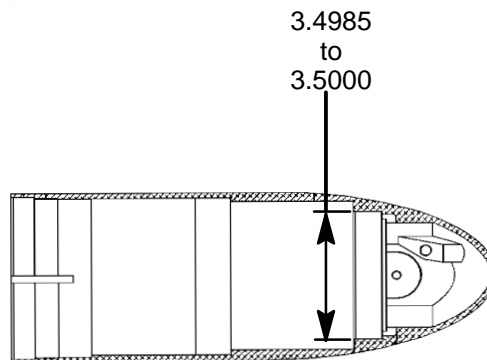


75223

- a - Earlier Style Propeller Shaft (Prior to S/N OF680000)
- b - Later Style Propeller Shaft (S/N OF680000 and Above)

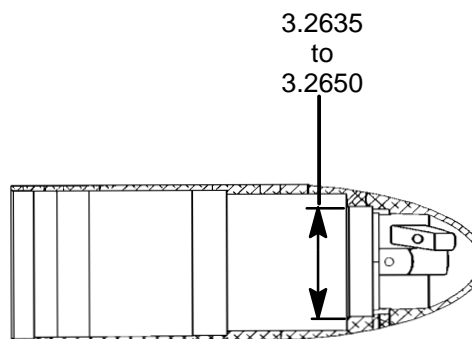
FORWARD GEAR BEARING BORE

The later style forward gear bearing bore is smaller (3.2635 to 3.2650 in.) than the earlier style (3.4985 to 3.5000 in.) This slightly smaller bearing bore for the forward gear bearing adaptor is approximately 1/4 in. (6.3 mm) smaller.



75241

Earlier Style Forward Gear Bore (Prior to S/N OF680000)

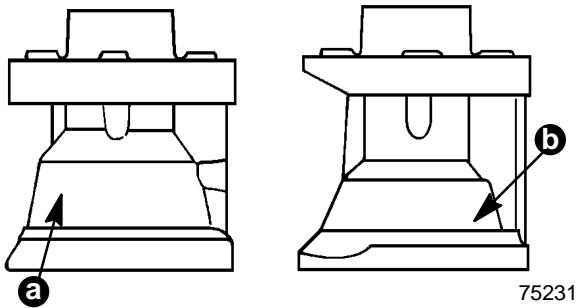


75248

Later Style Forward Gear Bore (S/N OF680000 and Above)

BEARING CARRIER

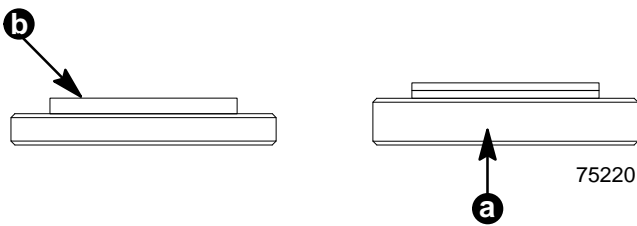
The later style bearing carrier is somewhat slimmer and about an 1/8 of an inch taller than the earlier style bearing carrier.



- a - Earlier Style Bearing Carrier (Prior to S/N OF680000)
- b - Later Style Bearing Carrier (S/N OF680000 and Above)

THRUST COLLAR

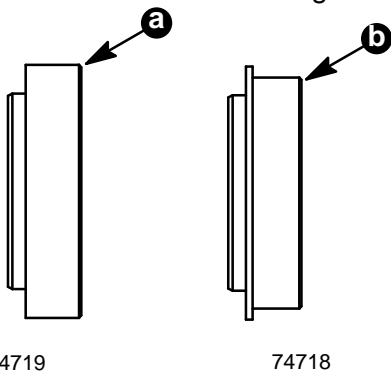
The later style thrust collar is thinner than the earlier style, but still maintains the same diameter.



- a - Earlier Style Thrust Collar (Prior to S/N OF680000)
- b - Later Style Thrust Collar (S/N OF680000 and after)

REVERSE GEAR BEARING ADAPTOR

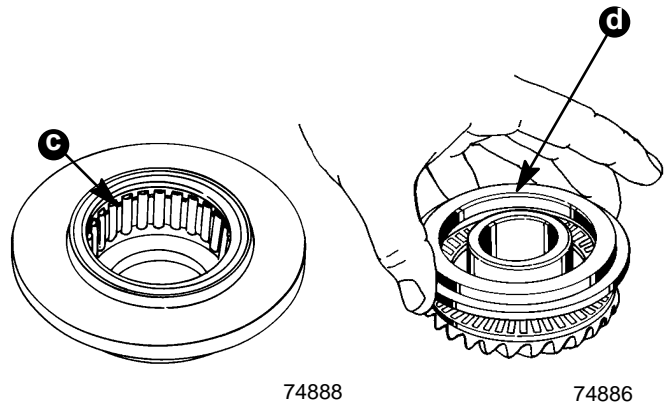
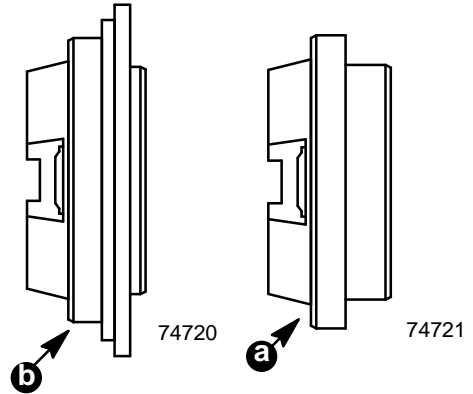
The later style reverse gear bearing adaptor has a smaller diameter than the earlier style adaptor and is designed to fit into the smaller bore gear housing.



- a - Earlier Style Reverse Gear Bearing Adaptor (Prior to S/N OF680000)
- b - Later Style Reverse Gear Bearing Adaptor (S/N OF680000 and Above)

FORWARD GEAR BEARING ADAPTOR

The forward gear bearing adaptor has the needle bearing pressed into the adaptor. For future reference, the needle bearing inside the bearing adaptor does not require a special driver. The needle bearing is pressed into the adaptor until the bearing is flush with the edge of the adaptor bore.

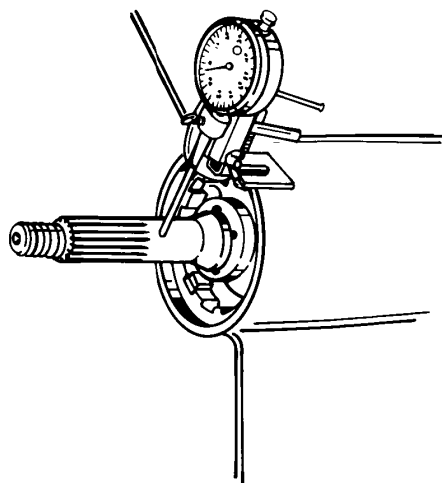


- a - Earlier Style Forward Gear Bearing Adaptor (Prior to S/N OF680000)
- b - Later Style Forward Gear Bearing Adaptor (S/N OF680000 and Above)
- c - Later Style Forward Gear Bearing Adaptor Needle Bearing
- d - Earlier Style Thrust Washer

Counter-Rotation Gear Housing Assembly Specifications

Pre-Disassembly Inspection

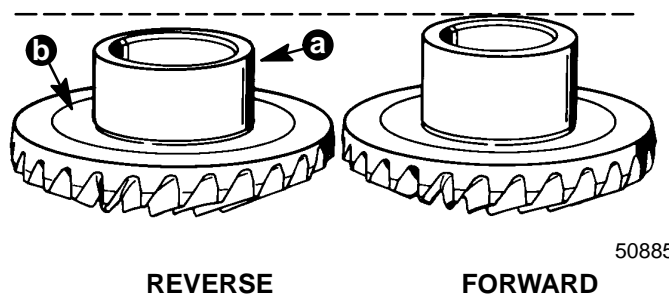
ACTION	READING
Move propeller shaft from one side to another	Less than .003 in. (0.08 mm)
Rotate propeller shaft	.005 in. (.127 mm) or less



22086

Forward and Reverse Gear Identification

IMPORTANT: The forward and reverse gears look almost identical. There are two ways to distinguish between the reverse and forward gears. The reverse gear has a shorter hub and it has a groove cut into the back of the gear just inside the thrust bearing race.

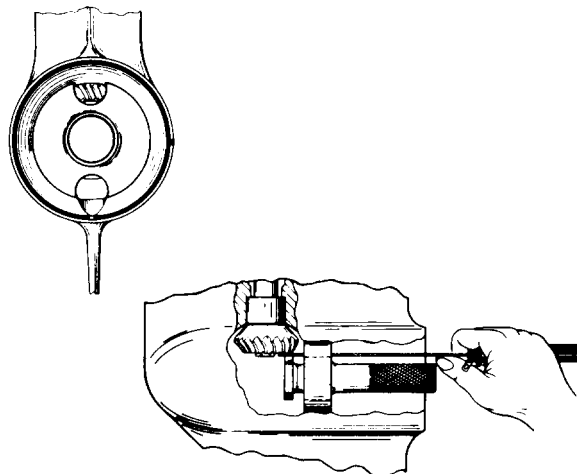


5088f

a - Shorter Hub
b - Groove

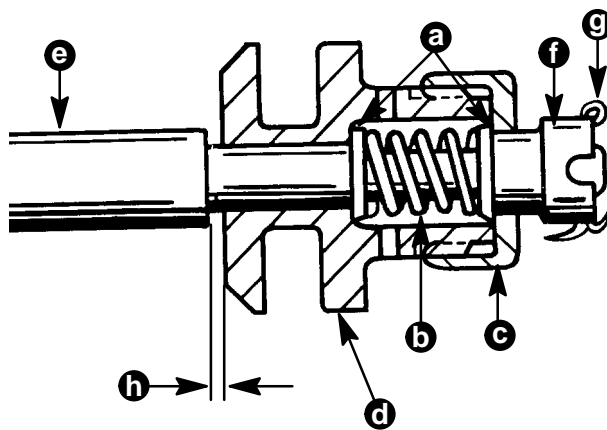
Pinion Gear Height

Take readings in three locations, 120° apart.
Readings: .025 in. (0.64 mm).



26410

Shift Spool End Play

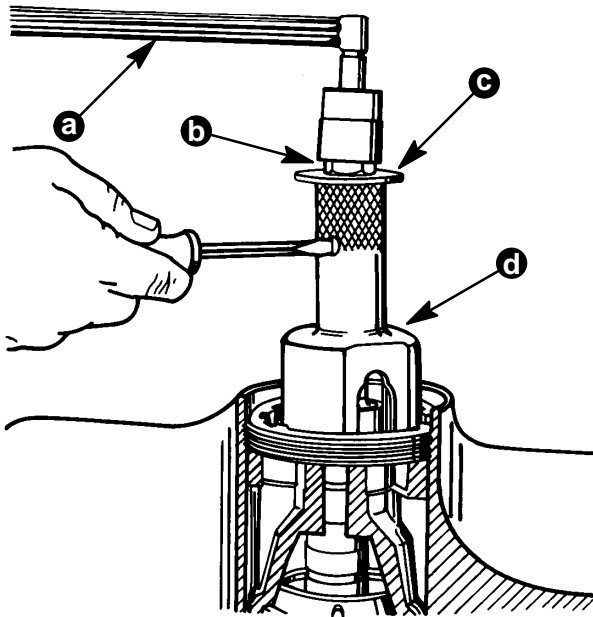


74877

a - Washers (2)
b - Spring
c - Retainer
d - Spool
e - Shift Shaft
f - Castle Nut
g - Cotter Pin
h - End Play Measurement: .002 in. (.05mm) to .010 in. (.25mm)

Forward Gear Backlash

Apply a slight preload on forward gear using tools as shown.

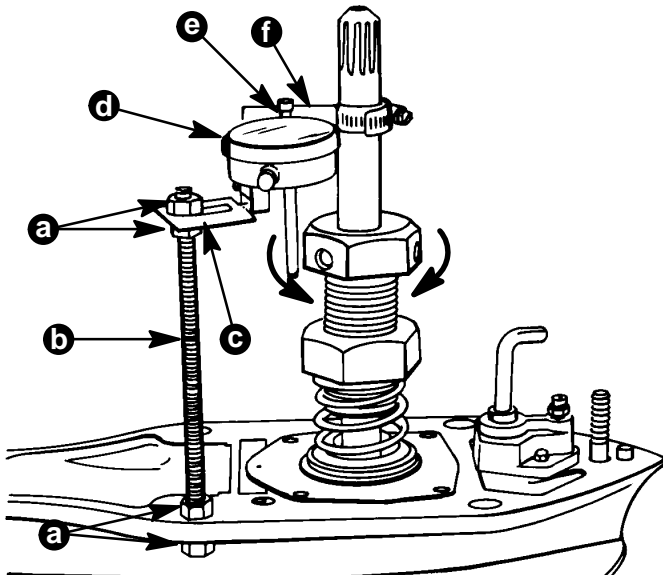


50880

- a - Torque Wrench (91-66274)
- b - Propeller Nut [Torque to 45 lb. in. (5 N·m)]
- c - Washer (91-54048)
- d - Pinion Nut Adaptor (91-61067A3)

Check Backlash in four places. Rotate the drive shaft 90° after each check.

Backlash Reading: .017-.028 in (0.43-0.71mm).

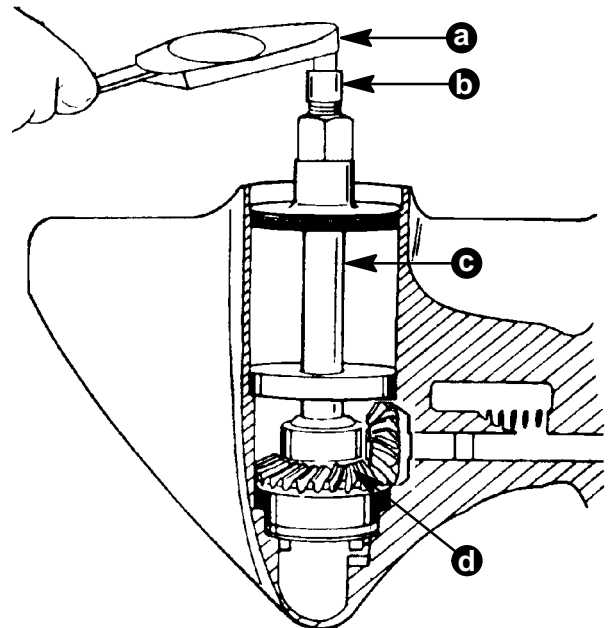


70717

- a - Nuts (4) (obtain locally)
- b - Threaded Rod [3/8 in. (9.5 mm) obtain locally]
- c - Dial Indicator Holding Tool (91-89897)
- d - Dial Indicator (91-58222A1)
- e - Indicator Pointer-set indicator pointer at "I" on backlash indicator rod
- f - Backlash Indicator Rod (91-53459)

Reverse Gear Backlash

Apply a slight preload on reverse gear using tools as shown.

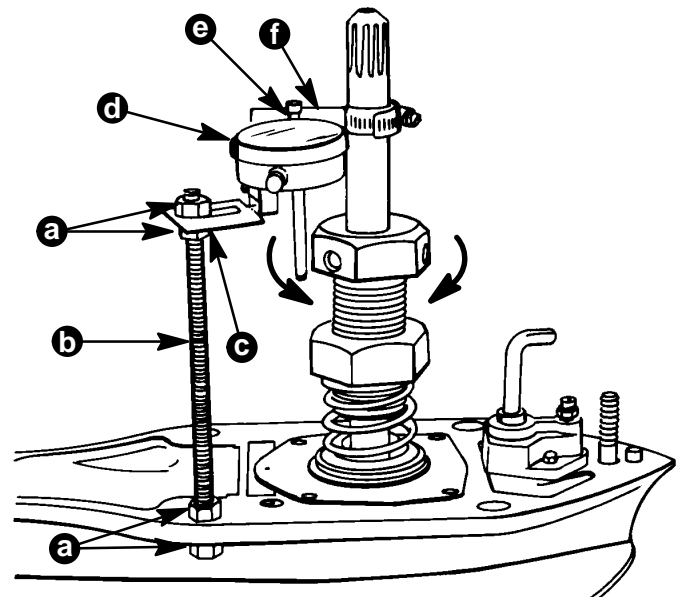


70973

- a - Torque Wrench (91-66274)
- b - Driver Bolt [Torque to 45 lb. in. (5N·m)]
- c - Bearing Adaptor Installation Tool (91-18605A1)
- d - Reverse Gear

Check Backlash in four places. Rotate the drive shaft 90° after each check.

Backlash Reading: .050-.060 in. (1.27-1.52 mm).



70717

- a - Nuts (4) (obtain locally)
- b - Threaded Rod [3/8 in. (9.5 mm) obtain locally]
- c - Dial Indicator Holding Tool (91-89897)
- d - Dial Indicator (91-58222A1)
- e - Indicator Pointer-set indicator pointer at "I" on backlash indicator rod
- f - Backlash Indicator Rod (91-53459)

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Transom Assembly Specifications

Torque Specifications

NOTE: Securely tighten all fasteners not listed below.

DESCRIPTION	TORQUE		
	lb. in.	lb. ft.	N-m
Shift Cable Core Wire Anchor Screws	20		2.3
Bellows Hose Clamps	35		4
Gimbal Ring to Bell Housing Hinge Pins		102	143
Gimbal Ring Screws		55	74
Steering Screw and Nut		60	81
Transom Assembly Attaching Screws, Nut		20-25	27-34
90° Fitting Nut		10-14	14-19
90° Fitting	70-90		8-10
Oil Fill/Drain Screw		23	30

Special Tools

DESCRIPTION	PART NUMBER
Bearing Removal and Installation Tool	91-31229A5
Bellows Expander Tool	91-45497A1
Slide Hammer Puller	91-34569A1
Shift Cable Removal and Installation Tool	91-12037
Driver	91-33492
Driver	91-33491
Driver	91-33489
Driver Head	91-32325
Driver Rod	91-37323
Drive Shaft Nut Wrench	91-56775
Alignment Tool Assembly	91-805475A1
Expander Tool	91-45497A1
Hinge Pin Tool	91-78310
Mandrel	91-30366
Nut	11-24156

Special Tools (continued)

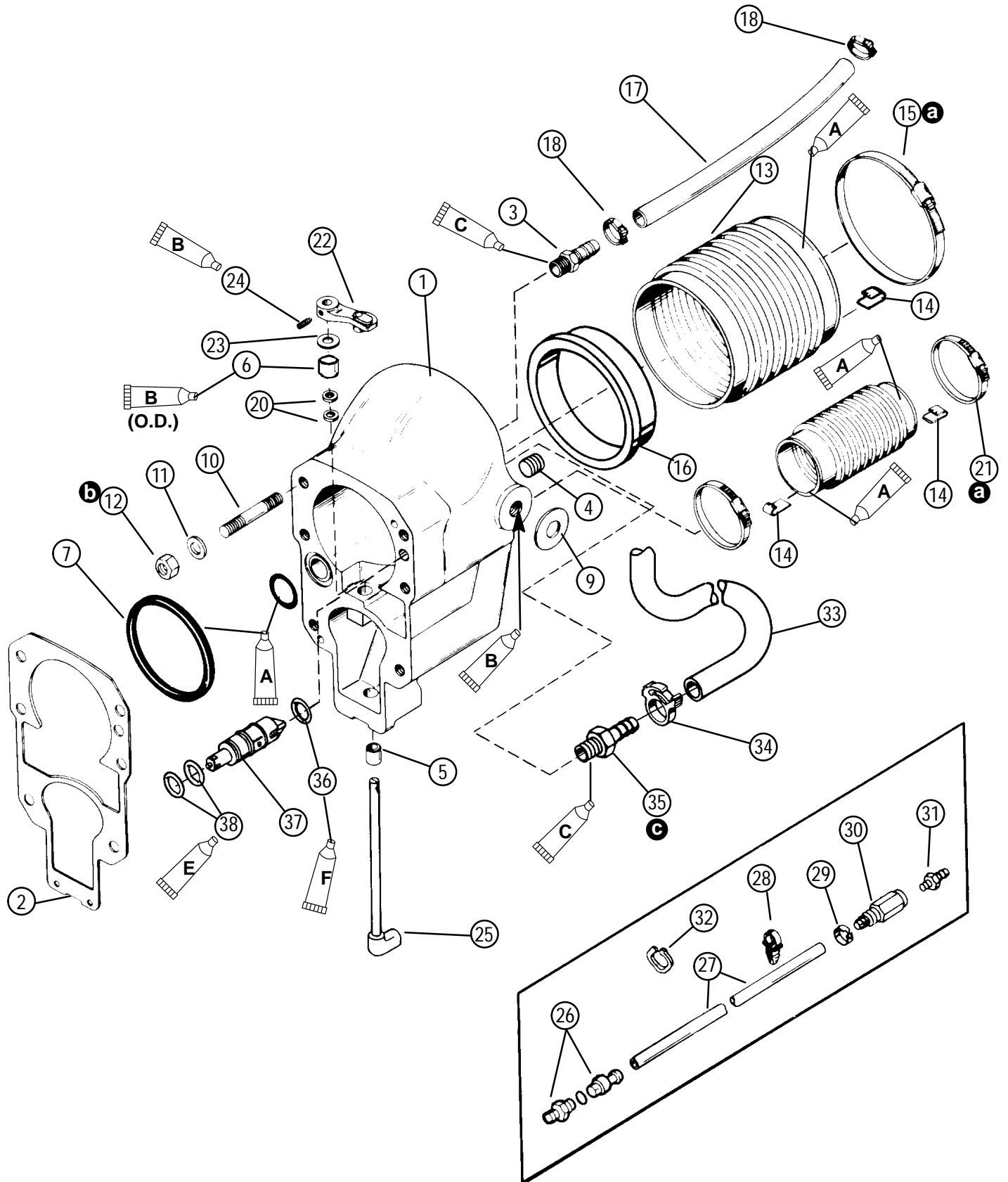
DESCRIPTION	PART NUMBER
Plate (2)	91-29310
Puller	91-63616
Puller Head	91-38919
Puller Shaft	91-31229
Washer	12-34961
Bushing Installation Tool	91-806928T
Sleeve Installation Tool	91-818169
Sleeve Removal Tool	91-818162

Lubricants, Sealers, and Adhesives

DESCRIPTION	PART NUMBER
Quicksilver Bellows Adhesive	92-86166
Quicksilver 2-4-C Marine Lubricant with Teflon	92-825407A12
Quicksilver U-Joint and Gimbal Bearing Grease	92-828052A2
Perfect Seal	92-34227-1
Anti-Corrosion Grease	92-78376-12
Locquic Primer "T"	92-59327-1
Loctite 8831	92-823089-1
Quicksilver Special Lubricant 101	92-13872A1

Alpha One Transom Assembly Exploded View


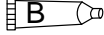
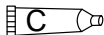



Bell Housing Components



73316

- 1 - Bell Housing Assembly
- 2 - Gasket
- 3 - Connector
- 4 - Pipe Plug
- 5 - Bushing
- 6 - Bushing
- 7 - Gasket (Rubber)
- 8 - O-ring
- 9 - Washer (Synthane)
- 10- Stud
- 11- Washer
- 12- Nut
- 13- Universal Joint Bellows
- 14- Ground Clip
- 15- Clamp
- 16- Sleeve
- 17- Hose
- 18- Clamp
- 19- Exhaust Bellows
- 20- Seals
- 21- Clamp
- 22- Lever Assembly
- 23- Washer
- 24- Screw
- 25- Shift Shaft (Upper)
- 26- Coupling Assembly
- 27- Tubing
- 28- Clip
- 29- Clamp
- 30- Fitting Assembly
- 31- Connector
- 32- Clamp
- 33- Hose
- 34- Clamp
- 35- Connector
- 36- O-ring
- 37- Valve Assembly
- 38- O-ring

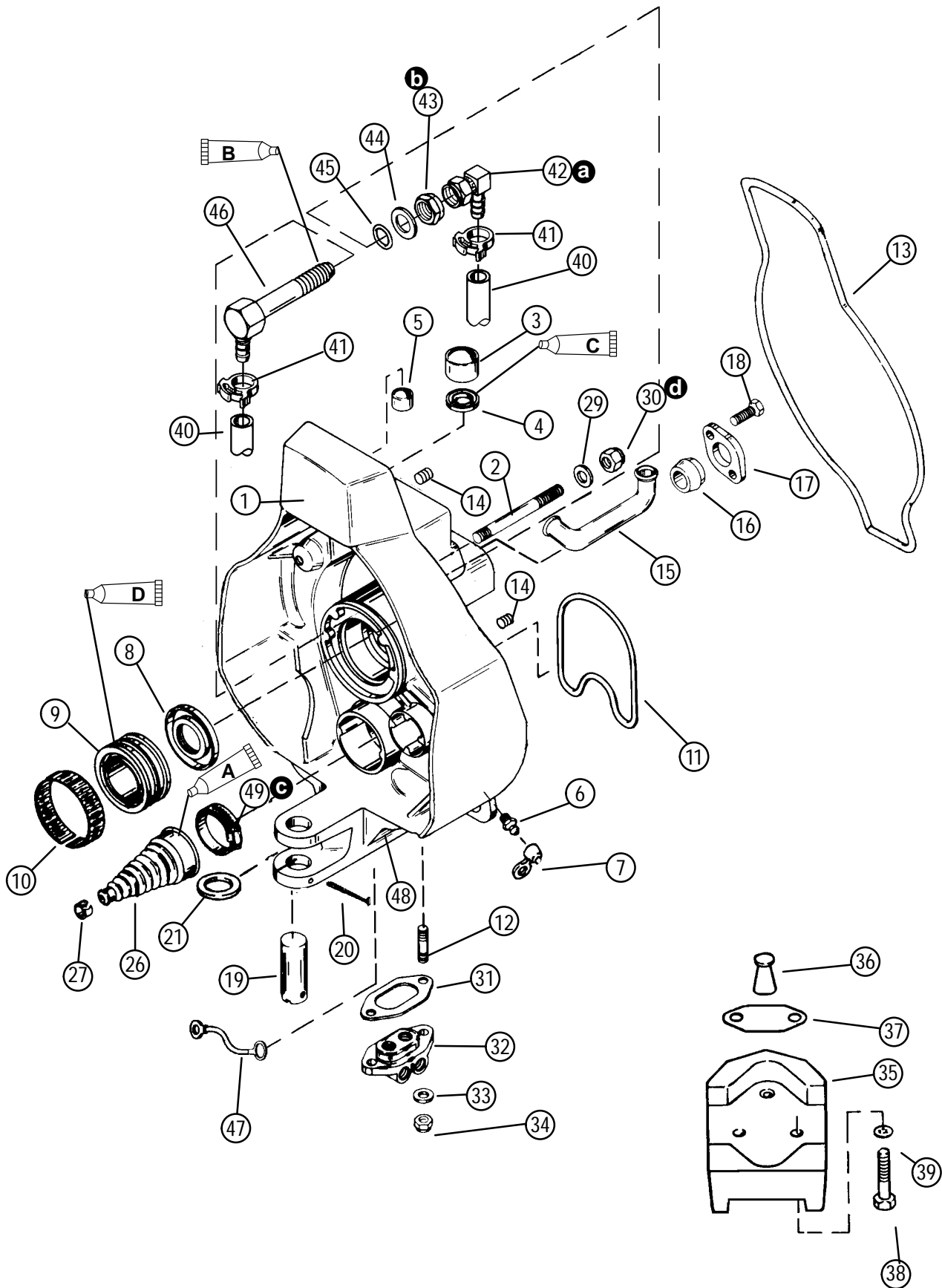
Lubricants, Sealers, and Adhesives

-  - Quicksilver Bellows
..... Adhesive 92-86166
-  - Loctite 8831 92-823089-1
-  - Perfect Seal 92-34227-1
-  - Special Lubricant 101 92-13872A1
-  - Quicksilver High Performance
..... Gear Lube 92-816026A4
-  - 3M Brand Adhesive 92-25234-1

Torque Specifications


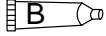


- a** Tighten Securely
Approximately 35 lb. in. (4 N·m)
- b** 50 lb. ft. (68 N·m)
- c** 8 lb. ft. (11 N·m)

Gimbal Housing Components



- 1 - Gimbal Housing
- 2 - Stud
- 3 - Lower Bushing
- 4 - Oil Seal
- 5 - Upper Bushing
- 6 - Grease Fitting
- 7 - Lubricap
- 8 - Grease Seal
- 9 - Bearing Assembly
- 10- Tolerance Ring
- 11- O-Ring
- 12- Stud
- 13- Seal
- 14- Pipe Plug
- 15- Water Tube
- 16- Bushing
- 17- Cover
- 18- Screw
- 19- Lower Swivel Pin
- 20- Cotter Pin
- 21- Washer
- 22- Bolt
- 23- Washer
- 24- Washer
- 25- Nut
- 26- Bolt
- 27- Clamp
- 28- Clamp
- 29- Washer
- 30- Nut
- 31- Gasket
- 32- Connector
- 33- Lockwasher
- 34- Nut
- 35- Anodic Plate
- 36- Seal
- 37- Gasket
- 38- Screw
- 39- Lockwasher
- 40- Hose
- 41- Clamp
- 42- 90° Fitting
- 43- Nut
- 44- Washer
- 45- O-ring
- 46- Connector
- 47- Continuity Wire
- 48- Continuity Wire
Connection
- 49- Hose Clamp

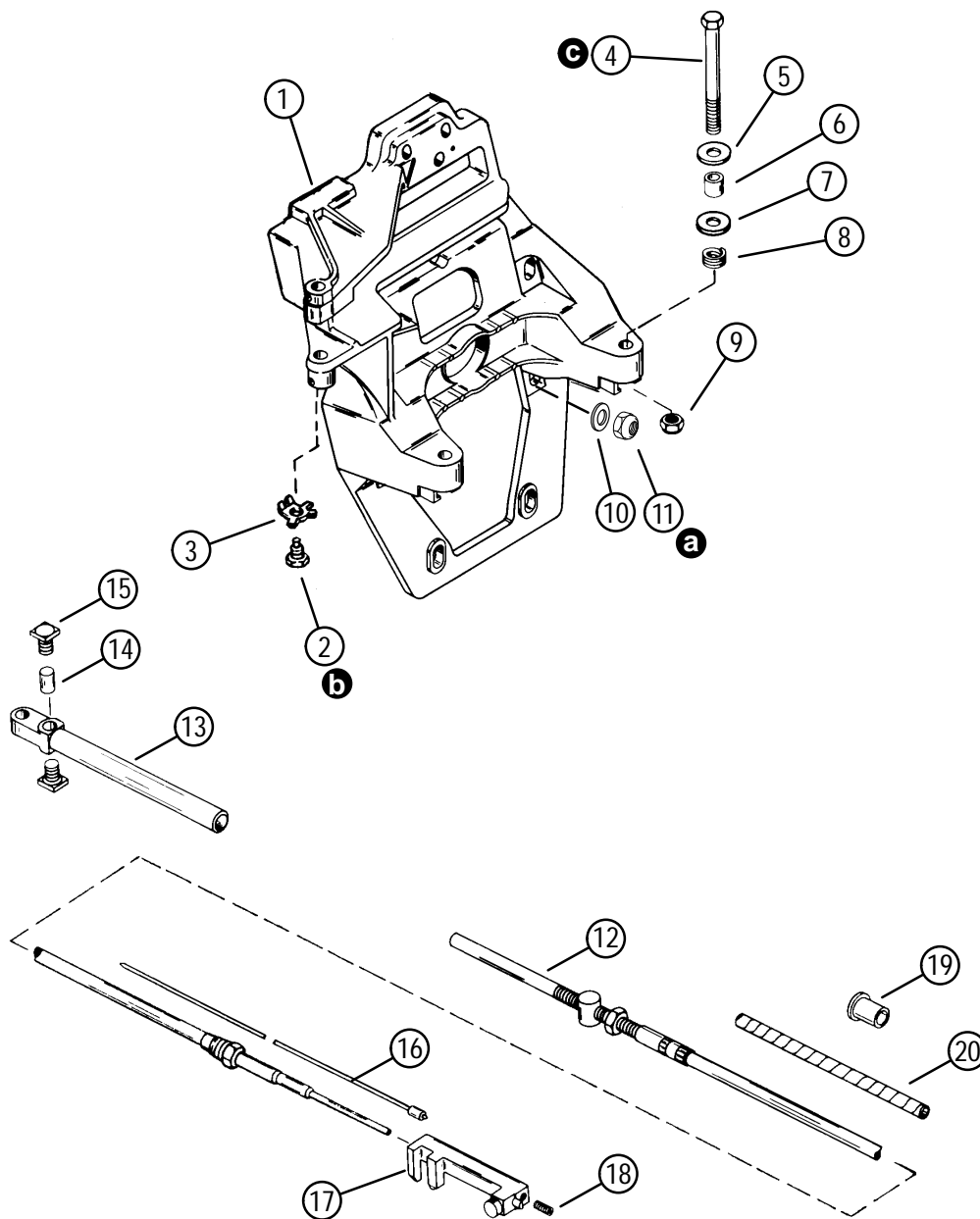
Lubricants, Sealers, and Adhesives

-  - Quicksilver Bellows
Adhesive 92-86166
-  - Quicksilver Perfect Seal 92-34227-1
-  - Loctite 8831 92-823089-1
-  - Quicksilver U-Joint and
Gimbal Bearing Grease .. 92-828052A2

Torque Specifications

- a** 70-90 lb. in. (8-10 N·m)
- b** 10-14 lb. ft. (14-19 N·m)
- c** 35-42 lb. in. (3.96-4.75 N·m)
- d** 25 lb. ft. (34 N·m)

Inner Transom Plate Components



74850

74865

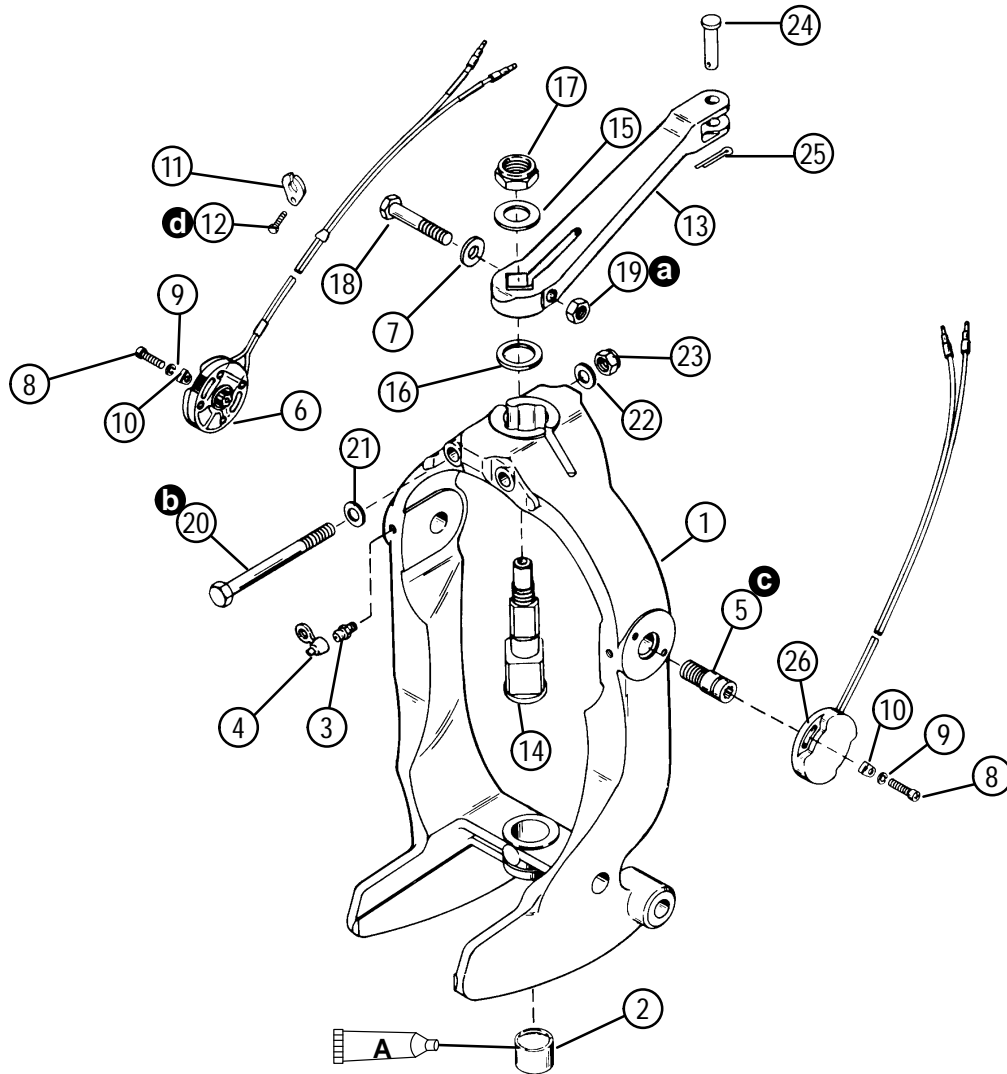
- 1 - Transom Plate Assembly
- 2 - Pivot Bolts
- 3 - Tab Washers
- 4 - Screw Engine Mounting
- 5 - Washer
- 6 - Spacer
- 7 - Washer - Fiber
- 8 - Lockwasher - Double Wound
- 9 - Locknut
- 10 - Washer
- 11 - Locknut
- 12 - Shift Cable Outer Casing
- 13 - End Guide
- 14 - Core Wire Anchor

- 15 - Anchor Screws
- 16 - Core Wire
- 17 - Shift Slide
- 18 - Screw - Core Wire Cavity
- 19 - Gimbal Housing Eyelet
- 20 - Cable Wrapping

Torque Specifications

- a** 25 lb. ft. (34 N·m)
- b** 23 lb. ft. (30 N·m)
- c** 37 lb. ft. (50 N·m)

Gimbal Ring and Steering Lever Components



- 1 - Gimbal Ring
- 2 - Bushing
- 3 - Grease Fitting
- 4 - Lubricap
- 5 - Hinge Pin
- 6 - Trim Limit Switch
- 7 - Washer
- 8 - Screw
- 9 - Lockwasher
- 10- Retainer
- 11- Trim Wire Clamp
- 12- Screw
- 13- Steering Lever
- 14- Swivel Shaft
- 15- Washer
- 16- Washer
- 17- Nut
- 18- Screw
- 19- Nut
- 20- Screw
- 21- Washer

- 22- Washer
- 23- Locknut
- 24- Clevis Pin
- 25- Cotter Pin
- 26- Trim Position Sender

Lubricants, Sealers, and Adhesives

A - Resiweld Sealer 92-65150-1

Torque Specifications

- a** 60 lb. ft. (81 N·m)
- b** 55 lb. ft. (74 N·m)
- c** 110 lb. ft. (148 N·m)
- d** 90-100 lb. in. (10-11 N·m)

73318