SHIFT UPGRADE GEAR KIT

Models Covered

Model	Serial Number or Year
Bravo Sterndrive Units	All

Notice

NOTICE
After completing installation, these instructions should be placed with the product for the owner's future use.

NOTICE
The number stamped on the housing will now correspond to thinner shims. Refer to the table in the text for specific information.

Parts List

883473A4, 883476A4, 883479A4

Description	Qty.	Part Number
Bearing/Gear/Clutch Assembly	1	
Gear Tooth Count 32 / 27		43-883473A4
Gear Tooth Count 29 / 27		43-883476A4
Gear Tooth Count 30 / 23		43-883479A4
Yoke and Cam Assembly	1	806552A2
Shift Shaft	1	12711
Screw	2	10-38615
Thrust Bearing	2	31-861787
Needle Bearing Race	2	31-861791
Upper Drive Shaft	1	45-812773T

883473A3, 883476A3, 883479A3

Description	Qty.	Part Number
Bearing/Gear/Clutch Assembly	1	
Gear Tooth Count 32 / 27		43-883473A3
Gear Tooth Count 29 / 27		43-883476A3
Gear Tooth Count 30 / 23		43-883479A3
Garter Spring	2	24-93505
Thrust Bearing	2	31-861792
Needle Bearing Race	2	31-861791
Thrust Bearing	2	31-861787

Specifications

Shim Race Used With Old Gear	Shim Race Used With New Gear
23-87560091 = .091	23-861782051 = .051
23-87560094 = .094	23-861782054 = .054
23-87560097 = .097	23-861782057 = .057

Torque Specifications

Description	Nm	lb-in.	lb-ft
Retainer Nut	271		200
Shift Cam Cap Screw	13	115	
Shift Linkage Cap Screw	13	115	
Top Cover Screws	27		20
Rear Cover Screws	27		20

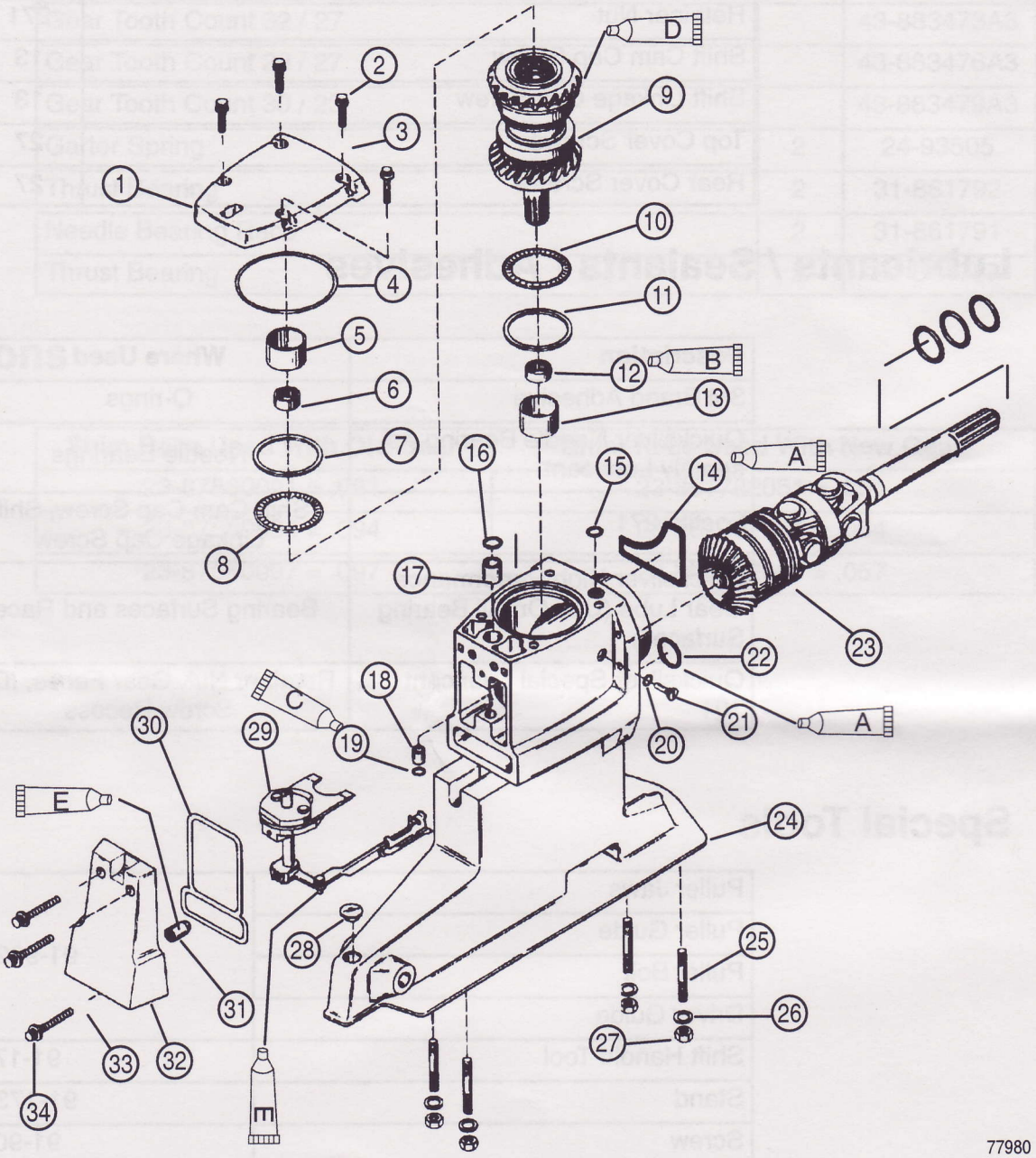
Lubricants / Sealants / Adhesives

Description	Where Used	Part Number
3M Brand Adhesive	O-rings	92-86166Q1
Quicksilver Needle Bearing Assembly Lubricant	Needle Bearings	92-82565A1
Loctite 271	Shift Cam Cap Screw, Shift Linkage Cap Screw	92-809820
Quicksilver High Performance Gear Lube (Use On All Bearing Surfaces)	Bearing Surfaces and Races	92-850743A1
Quicksilver Special Lubricant 101	Retainer Nut, Gear Faces, ID of Screw Recess	92-13872A1

Special Tools

Puller Jaws	91-90244A1
Puller Guide	
Puller Bolt	
Driver Guide	
Shift Handle Tool	91-17302
Stand	91-17301A1
Screw	91-90775
Puller Guide	91-90774
Driver Head (S/N 0M099999 and Below)	91-864220
Driver Head (S/N 0M100000 and Above)	91-862530

Drive Shaft Housing Exploded View



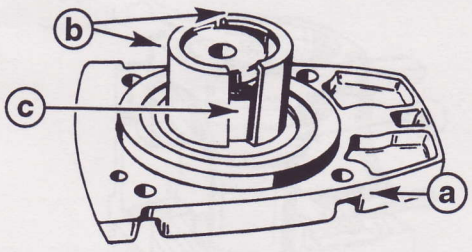
1 - Top Cover
2 - Screw (4)
3 - Flat Washer (4)
4 - O-ring
5 - Bearing Sleeve
6 - Needle Bearing
7 - Thrust Race (Shim)
8 - Thrust Bearing
9 - Clutch Assembly
10 - Thrust Bearing
11 - Thrust Race (shim)
12 - Needle Bearing
13 - Bearing Sleeve
14 - O-ring
15 - O-ring
16 - O-ring
17 - Shifter Shaft Bushing-Upper
18 - Shifter Shaft Bushing-Lower
19 - Shifter Shaft Seal
20 - Vent Plug Seal
21 - Vent Plug
22 - O-ring
23 - U-joint Assembly
24 - Drive Shaft Housing
25 - Stud (4)
26 - Flat Washer (4)
27 - Locknut (4)
28 - Plastic Plug
29 - Shifter Assembly
30 - O-ring
31 - Ball Detent Canister
32 - Back Cover
33 - Flat Washer (3)
34 - Screw (3)

Description		Where Used	Part Number
A	3M Brand Adhesive	O-rings	92-86166Q1
B	Quicksilver Needle Bearing Assembly Lubricant	Needle Bearings	92-82565A1
C	Loctite 271	Shift Cam Cap Screw, Shift Linkage Cap Screw	92-809820
D	Quicksilver High Performance Gear Lube (Use On All Bearing Surfaces)	Bearing Surfaces and Races	92-850743A1
E	Quicksilver Special Lubricant 101	Retainer Nut, Gear Faces, ID of Screw Recess	92-13872A1

Removal

Bearing Sleeve Removal (Top Cover)

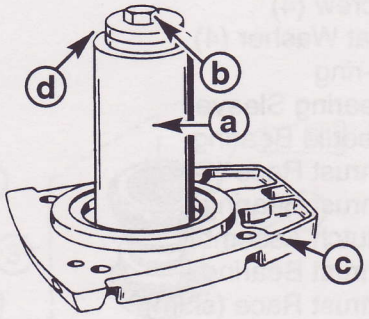
1. Place puller jaws around sleeve.



22083

a - Top Cover
b - Puller Jaws (2 Halves) – (91-90244A1)
c - Bearing

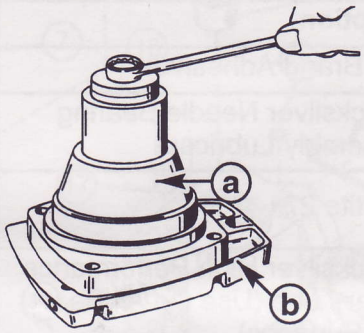
2. Position puller guide over jaws and install bolt.



22084

a - Puller Guide
b - Puller Bolt
c - Top Cover
d - Washers

3. Install driver guide.



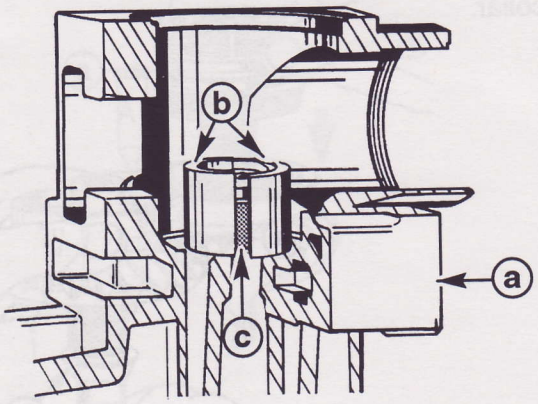
22082

a - Driver Guide
b - Top Cover

4. Remove sleeve by rotating bolt clockwise.

Bearing Sleeve Removal (Drive Shaft Housing)

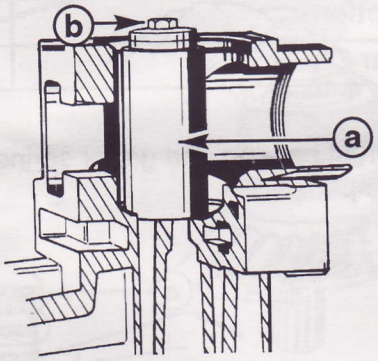
1. Place puller jaws around sleeve.



22219

a - Drive Shaft Housing
b - Pull Jaws (2 Halves)
c - Sleeve

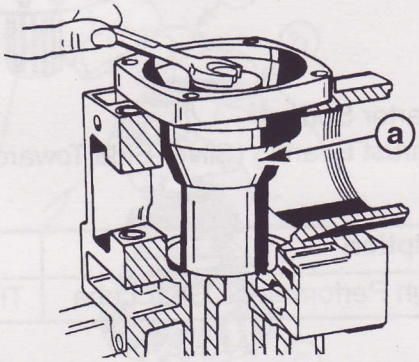
2. Position puller guide over jaws and install bolt.



22263

a - Puller Guide
b - Puller Bolt

3. Install driver guide.



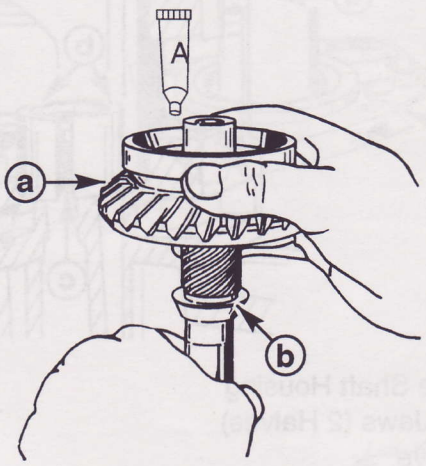
22258

a - Driver Guide

4. Remove sleeve by rotating bolt clockwise.

Installation

1. Apply gear oil to splines and install bottom gear on shaft and allow it to rest on thrust collar.

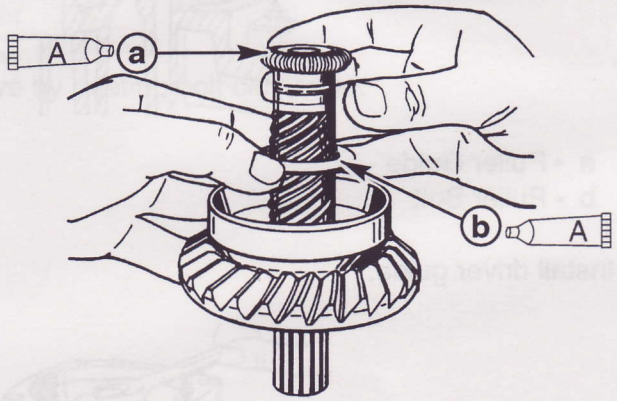


22106

a - Bottom Gear
b - Thrust Collar

Description		Where Used	Part Number
A	Gear Oil	Splines	Obtain Locally

2. Install thrust bearing and garter spring with silver side of bearing toward garter spring. Lubricate parts.

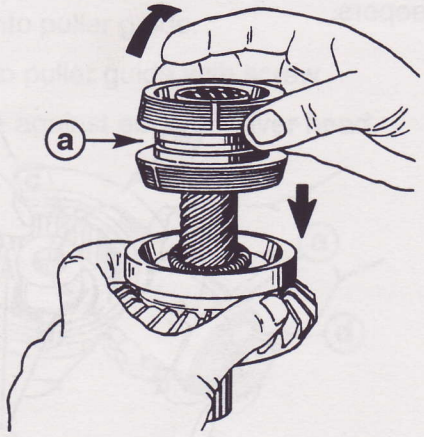


76848

a - Garter Spring
b - Thrust Bearing (Silver Side Toward Garter Spring)

Description		Where Used	Part Number
A	High Performance Gear Lube	Thrust Bearing, Garter Spring	92-805743A1

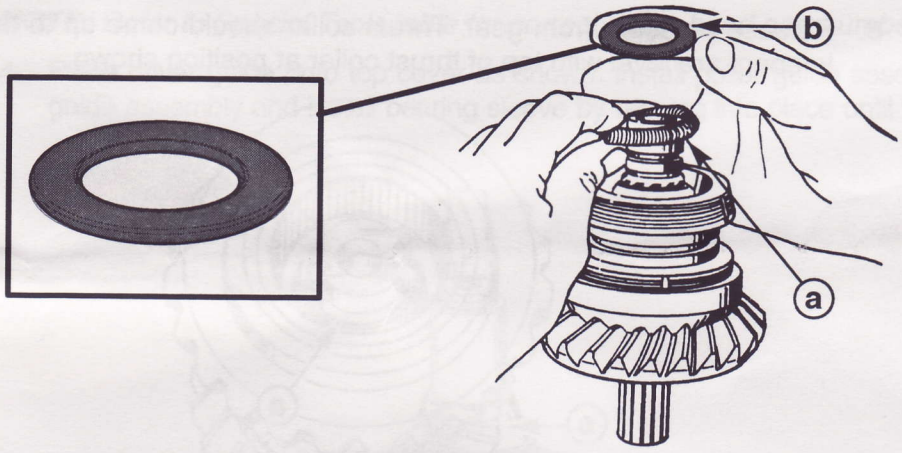
3. Lower clutch over shaft while allowing it to turn clockwise.



22106

a - Clutch

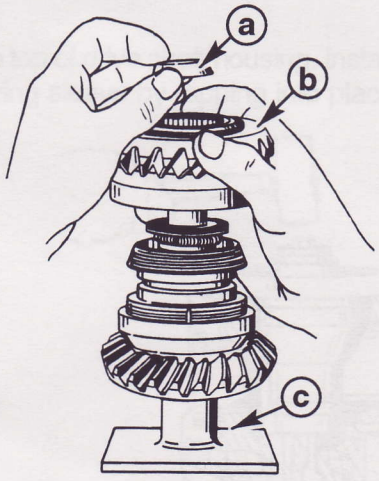
4. Install top garter spring and thrust bearing with silver side of bearing toward garter spring.



76862

a - Garter Spring (Silver Side Toward Garter Spring)
b - Thrust Bearing

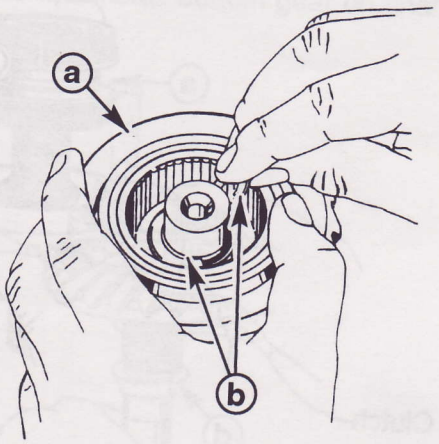
5. Place top gear and then thrust collar over shaft.



76847

a - Thrust Collar
b - Top Gear
c - Stand

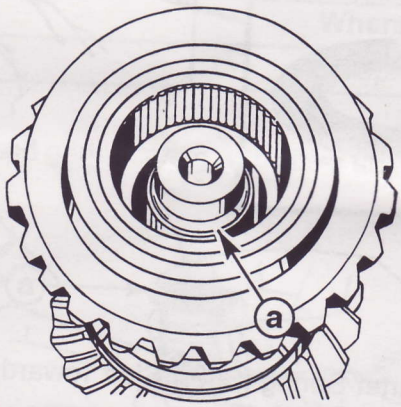
6. Press gear and thrust collar down so that groove in shaft is completely exposed.
7. Install keepers.



a - Top Gear
b - Keepers (2)

22105

8. Release pressure from gear. Thrust collar should come up to the point where top of keepers are level with top of thrust collar at position shown.

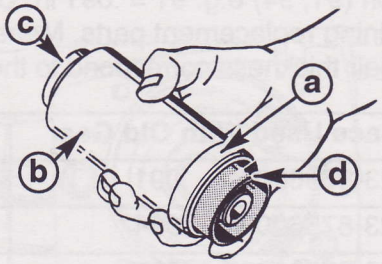


a - Keepers Level With Thrust Collar

22105

Bearing Sleeve Installation

1. Install driver head onto puller guide.
2. Secure driver head to puller guide with screw.
3. Place bearing sleeve against edge of driver head.

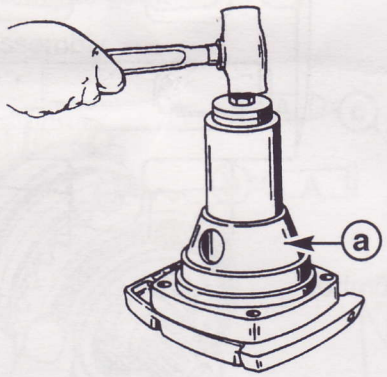


22084

a - Driver Head
b - Puller Guide
c - Screw
d - Bearing Sleeve

NOTE: *Refer to Special Tools table for correct driver head part number.*

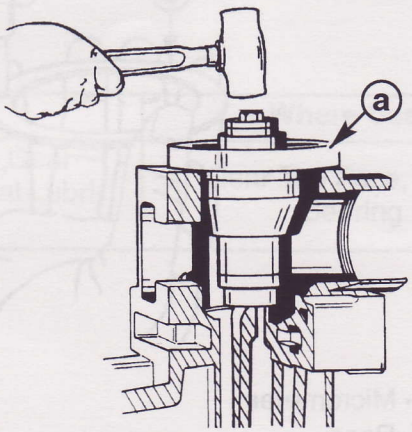
4. Place driver guide onto top cover as shown. Install puller guide assembly through driver guide assembly and install bearing sleeve by tapping into place until tool contacts.



22082

a - Driver Guide

5. Place driver guide into top of drive shaft housing. Install puller guide assembly through driver guide and install bearing sleeve by tapping into place until tool contacts.



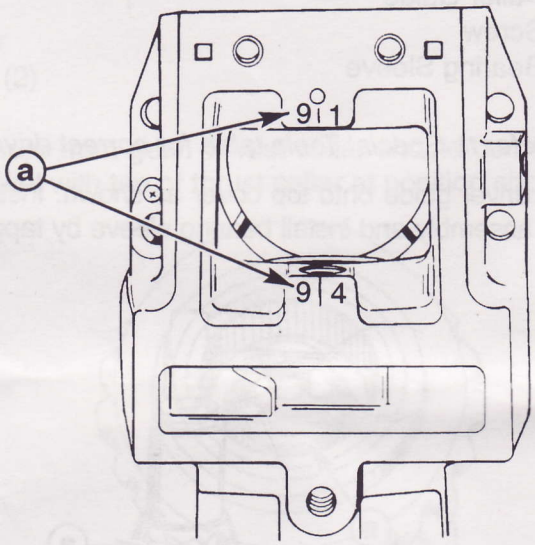
22263

a - Driver Guide

Drive Shaft Housing Reassembly

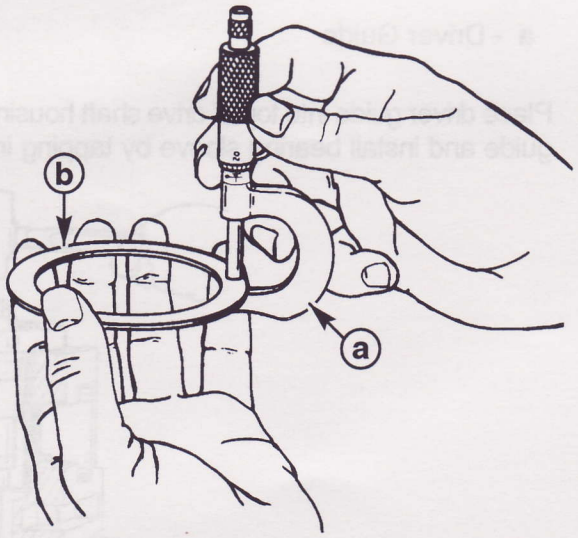
Two numbers are stamped in the shifter cavity on the back of the drive shaft housing. The top number designates the thickness of the top thrust bearing race, and the bottom number designates the thickness of the bottom thrust bearing race. One of three numbers appears in each position (91, 94) e.g. 91 = .091 in. Use numbers that are stamped in housing as a guide for obtaining replacement parts. Measure thrust bearing races with a micrometer to be sure that their thickness correspond to the numbers stamped in the drive shaft housing.

Shim Race Used With Old Gear	Shim Race Used With New Gear
23-87560091 = .091	23-861782051 = .051
23-87560094 = .094	23-861782054 = .054
23-87560097 = .097	23-861782057 = .057



76849

a - Stamped Number

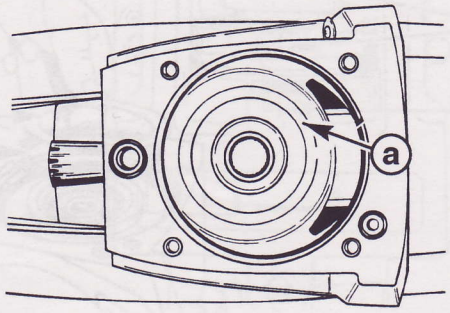


22100

a - Micrometer
b - Race

NOTE: *If using original thrust bearing race, race should be installed so that the side of original contact area is in the same position as removed. Prelube all races and bearings with High-Performance Lube.*

1. Position correct thrust bearing race in drive shaft housing.

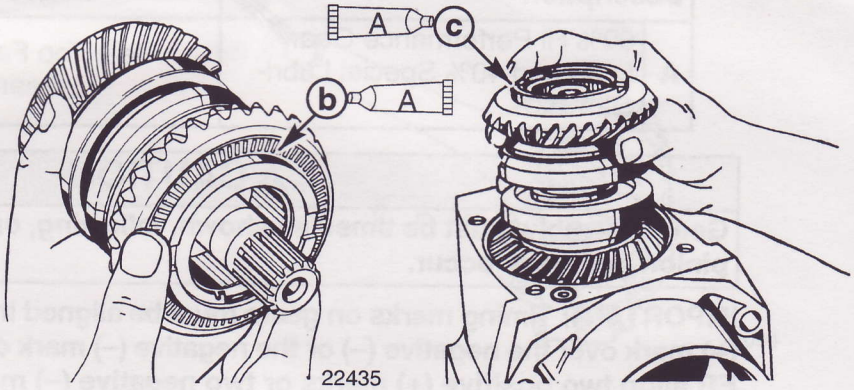


22437

Standard Bravo

a - Thrust Bearing Race

2. Apply a mixture of 60% Hi Performance Gear Lube and 40% Special Lubricant 101 to bottom face of bottom gear.
3. Stick thrust bearing to gear.
4. Install clutch assembly.

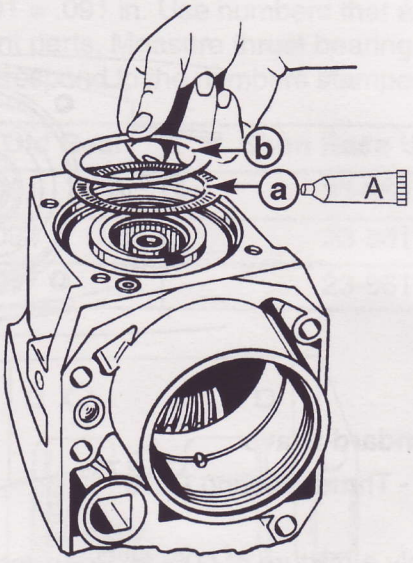


22435 22099

b - Thrust Bearing
c - Gear Assembly

Description		Where Used	Part Number
A	60% Hi Performance Gear Lube and 40% Special Lubricant 101	Gear Top Face, Thrust Bearing	92-850743A1 92-13872A1

5. Apply a mixture of 60% Hi Performance Gear Lube and 40% Special Lubricant 101 to the top face top gear and the thrust bearing.
6. Place thrust bearing on gear.
7. Position correct thrust bearing race on top of thrust bearing.



50304

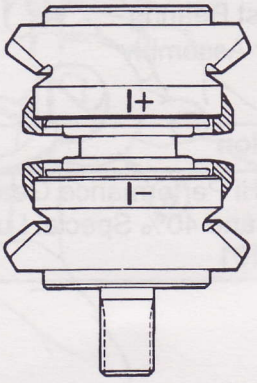
a - Thrust Bearing
b - Thrust Race

Description		Where Used	Part Number
A	60% Hi Performance Gear Lube and 40% Special Lubricant 101	Gear Top Face, Thrust Bearing	92-850743A1 92-13872A1

⚠ CAUTION

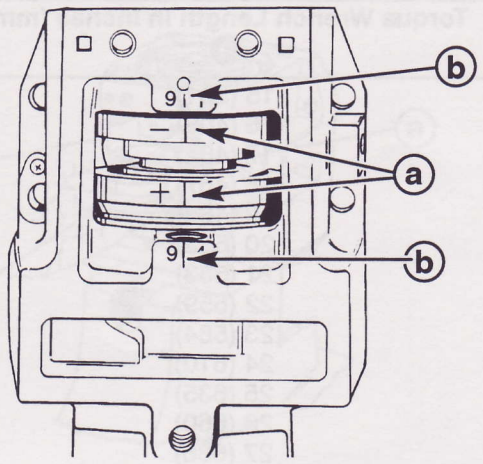
Gear assembly must be timed as shown, following, or damage to gears and U-joint pinion gear may occur.

IMPORTANT: Timing marks on gears must be aligned in one of two ways. The positive (+) mark over the negative (–) or the negative (–) mark over the positive (+) mark. NEVER align two positive (+) marks or two negative (–) marks.



22107

8. Align clutch gear timing marks with index marks on drive shaft housing as close as possible.

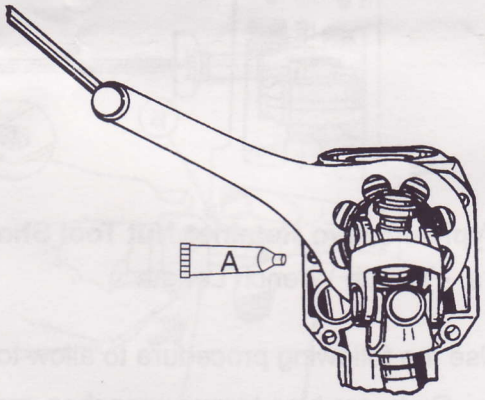


76805

a - Timing Marks
b - Index Marks

IMPORTANT: *Ensure that the retainer nut is not cross-threaded by turning the retainer nut counterclockwise until thread engagement is felt; then turn retainer nut clockwise.*

9. Install U-joint assembly into drive shaft housing.
10. Apply Special Lubricant 101 to threads of retainer nut and install. Torque retainer nut.



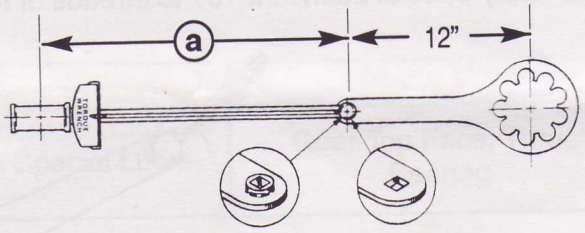
22094

Description		Where Used	Part Number
A	Quicksilver Special Lubricant 101	Retainer Nut	92-13872A1

Description	Nm	lb-in.	lb-ft
Retainer Nut	271		200

TORQUE CONVERSION CHART FOR U-JOINT RETAINER NUT TOOL

Torque Wrench Length in Inches (mm) (a)	Torque Wrench Reading in lb-ft (Nm) to Achieve 200 lb-ft (271 Nm)
15 (381)	111 (151)
16 (406)	114 (155)
17 (432)	117 (159)
18 (457)	120 (163)
19 (483)	123 (167)
20 (508)	125 (170)
21 (533)	127 (172)
22 (559)	129 (175)
23 (584)	131 (178)
24 (610)	133 (180)
25 (635)	135 (183)
26 (660)	136 (184)
27 (686)	138 (187)
28 (711)	140 (190)
29 (737)	141 (191)
30 (762)	143 (194)
31 (787)	144 (195)
32 (813)	145 (197)
33 (838)	147 (200)
34 (864)	148 (201)
35 (889)	149 (202)
36 (914)	150 (203)



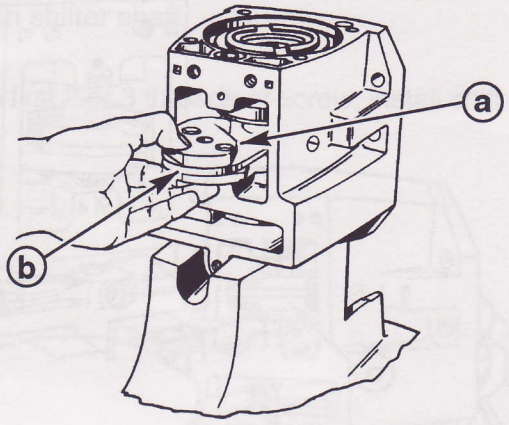
26363

Typical Bravo Retainer Nut Tool Shown

a - Torque Wrench Length

11. Use the following procedure to allow torquing retainer nut with a torque wrench.
    a. On beam-type torque wrenches, measure from square drive to fulcrum (pivot) point of handle.
    b. On click-stop or dial type torque wrenches, measure from square drive to reference mark on handle (2 bands, etc.).
12. Check that timing marks are still properly aligned (by turning U-joint, if necessary). If marks have moved; remove U-joint assembly and start over beginning with step (3).
    - Refer to "Special Information" in Service Manual 11 (90-17431-4) if shift cam assembly is being replaced.

13. Install shift cam assembly into shifter cavity in drive shaft housing with the shift cam nuts facing the bottom of the drive shaft housing.

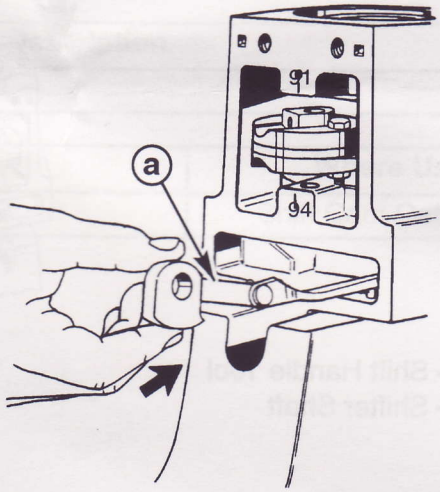


76838

Shift Cam Assembly

a - Shift Cam Assembly
b - Boss

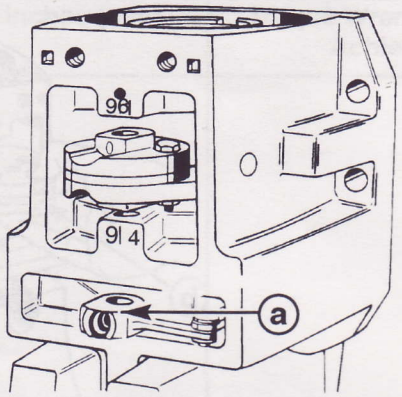
14. Push shift linkage assembly in. If linkage binds, move assembly gently from side to side while pushing.



76853

a - Linkage Assembly

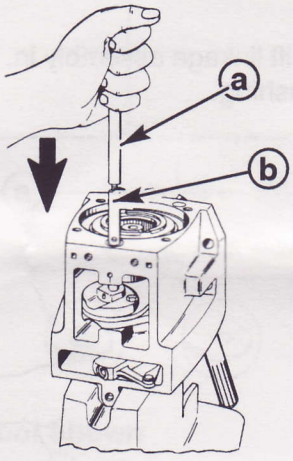
15. Turn linkage assembly 1/4 turn counterclockwise and position as shown.



76852

a - Linkage Assembly

16. Install shift handle tool in shifter shaft and push shaft down. Remove tool.



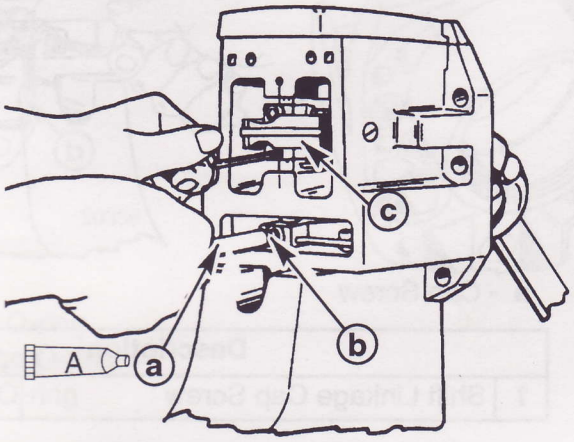
50306

a - Shift Handle Tool
b - Shifter Shaft

17. Install shift handle tool through shift linkage and into shifter shaft.

18. Move shifter shaft back and forth as necessary to align lower hole in shift cam assembly with threaded hole in shifter shaft.

19. Apply Loctite 271 to first 2 or 3 threads of screw, install shift cam cap screw and torque.



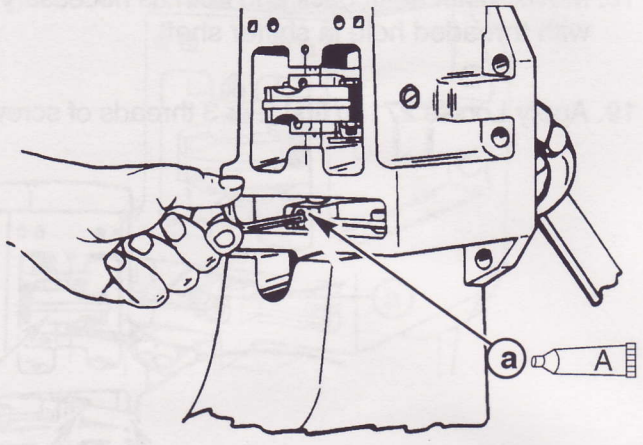
76864

a - Shift Handle Tool
b - Shift Linkage
c - Shift Cam Assembly

Description	Nm	lb-in.	lb-ft
Shift Cam Cap Screw	13	115	

Description		Where Used	Part Number
A	Loctite 271	Shift Cam Cap Screw	92-809820

20. Apply Loctite 271 to first 2-3 threads of shift linkage cap screw and install. Torque screw.



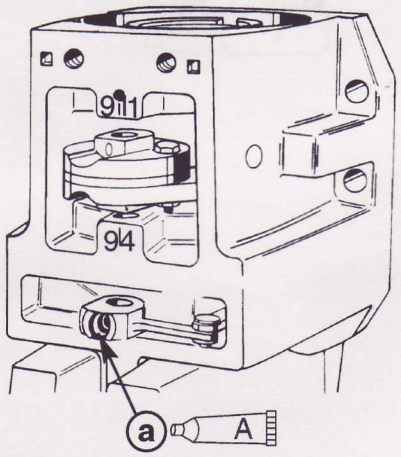
76854

a - Cap Screw

Description			Nm	lb-in.	lb-ft
1	Shift Linkage Cap Screw		13	115	

Description		Where Used	Part Number
A	Loctite 271	Shift Linkage Cap Screw	92-809820

21. Move shift linkage to the neutral detent position as shown. Apply liberal amount of Special Lubricant 101 to I.D. of screw recess.

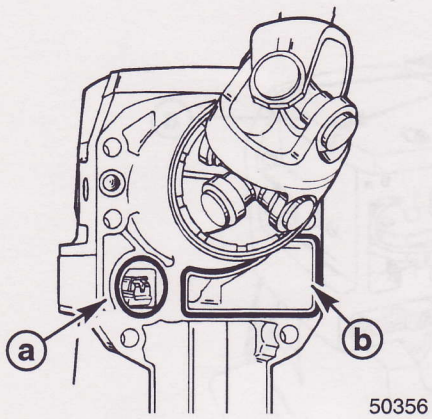


76852

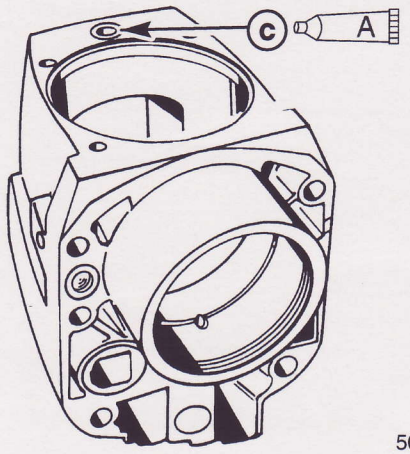
a - Screw Recess

Description		Where Used	Part Number
A	Quicksilver Special Lubricant 101	ID of Screw Recess	92-13872A1

22. Replace O-rings in drive shaft housing. Apply 3-M Adhesive to O-rings before installation.

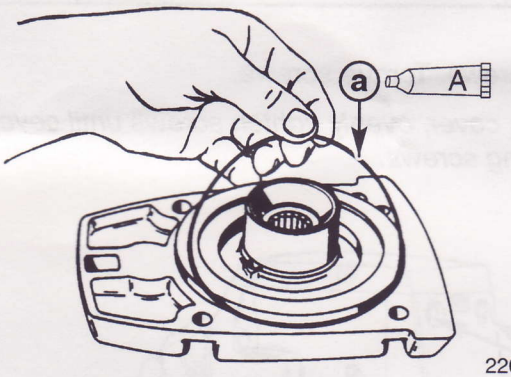


50356

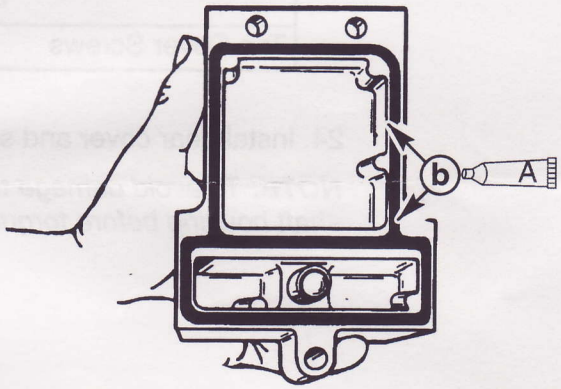


50306

a - Shift Linkage O-ring
b - Water Passage O-ring
c - Shifter Shaft O-ring



22088

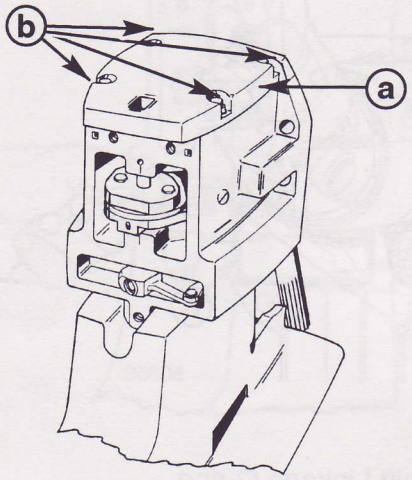


22100

a - Top Cover O-ring
b - Back Cover O-ring

Description		Where Used	Part Number
A	3M Adhesive	O-rings	92-86166Q1

23. Install top cover. Torque screws.



76835

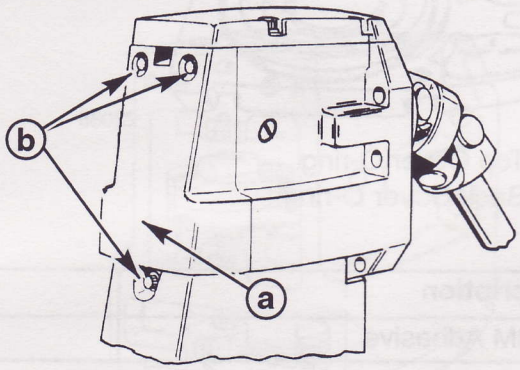
50304

a - Top Cover
b - Screws

Description	Nm	lb-in.	lb-ft
Top Cover Screws	27		20

24. Install rear cover and screws. Torque screws.

NOTE: *To avoid damage to cover, evenly tighten screws until cover is flush against drive shaft housing before torquing screws.*



76805

a - Rear Cover
b - Screws (3)

Description	Nm	lb-in.	lb-ft
Rear Cover Screws	27		20

Products of Mercury Marine
W6250 Pioneer Road
Fond du Lac, WI 54936-1939