

TO: SERVICE MANAGER  TECHNICIANS   
PARTS MANAGER

No. 87-18

## Bravo One Special Service Tools and Torque Specifications

### NOTICE

**Tools marked with (A) are new. Unmarked tools are special service tools that already are used on Alpha One or TR/TRS models.**

- (A) Transom Drilling Fixture 91-43693A2  
Used to cut and drill holes in boats transom, can be used on Alpha One models also.
- (A) Shift Cable Adjustment Tool 91-12427  
This tool must be used to set or check shift cable adjustment.

## Bravo One Stern Drive Tools and Torque Specifications

### Transom Assembly

#### TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
Trim Wire Clamp Nut (Gimbal Housing)	80 – 110 lb. in. (9 – 12 N.m)
U-bolt Nuts	30 – 40 lb. ft. (41 – 54 N.m)
Steering Lever Clamping Bolt and Nut	45 – 55 lb. ft. (61 – 74 N.m)
Hinge Pins	50 – 60 lb. ft. (68 – 81 N.m)
Shift Cable Outer Retaining Nut	50 – 70 lb. in. (5.7 – 7.9 N.m)
Shift Cable End Guide Anchor Screws	10 – 15 lb. in. (1.1 – 1.6 N.m)

### SPECIAL TOOLS

DESCRIPTION	TORQUE
Torque Wrench (lb. ft.)	91-36210
Torque Wrench (lb. in.)	91-66274
Slide Hammer Puller	91-34569A1
(A) Bearing and Seal Driver	91-43578A1
Hinge Pin Tool	91-78310
Exhaust Bellows Expander Tool	91-45497A1
(A) Sleeve Installation Tool (U-Joint Bellows)	91-43577
(A) Tapered Insert Tool (Water Hose)	91-43579
(A) Shift Cable Anchor Adjustment Tool	91-17262A1

### Drive Shaft Housing Assembly

#### TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
Shift Cam Assembly Lock Nuts	103 lb. in. (12 N.m)
U-joint Assembly Ring Nut	150 lb. ft. (203 N.m)
Shift Cam Assembly to Shifter Shaft, Screw	110 lb. in. (13 N.m)
Shift Linkage to Shifter Shaft, Screw	110 lb. in. (13 N.m)
Top Cover Screws	20 lb. ft. (27 N.m)
Back Cover Screws	20 lb. ft. (27 N.m)
Drive Shaft Housing to Gear Housing, Nuts and Screw	35 lb. ft. (48 N.m)
Drive Unit to Bell Housing	50 lb. ft. (68 N.m)

## BEARING PRELOADS

DESCRIPTION	TORQUE
U-Joint Bearings (New)	6 – 10 lb. in. (.7 – 1.1 N.m)
U-Joint Bearings (Used)	3 – 6 lb. in. (.4 – .7 N.m)

## SPECIAL TOOLS

DESCRIPTION	PART NO.
Torque Wrench (lb. ft.)	91-36210
Torque Wrench (lb. in.)	91-66274
Slide Hammer Puller	91-34569A1
U-Joint Bearing Retainer Wrench	91-36235
(A) Clutch Assembly Stand	91-17301A1
(A) Shift Handle Tool	91-17302
(A) Bearing Removal Tool	91-17273
(A) Bearing and Seal Driver Assembly	91-17275A1
(A) Bearing Driver	91-89868
(A) Driver & Puller Assembly	91-90244A1
U-Joint Adaptor	91-38756
Universal Puller Plate	91-37241

## Gear Case Housing Assembly

### TORQUE SPECIFICATIONS

DESCRIPTION	TORQUE
Pinion Nut	113 lb. ft. (150 N.m)
Bearing Carrier Retaining Nut	150 lb. ft. (203 N.m)
Drive Shaft Housing to Gear Housing Nuts and Screw	35 lb. ft. (48 N.m)
Trim Tab Screw	20 lb. ft. (27 N.m)

## PRELOADS

DESCRIPTION	TORQUE
Propeller Shaft Bearings (New Bearings)	8 – 12 lb. in. (.9 – 1.4 N.m)
Propeller Shaft Bearings (Old Bearings)	5 – 8 lb. in. (.6 – .9 N.m)

## SPECIAL TOOLS

DESCRIPTION	PART NO.
Dial Indicator Set	91-58222A1
Backlash Indicator Rod	91-53459
Dial Indicator Adaptor	91-83155
Slide Hammer Puller	91-34569A1
Torque Wrench (lb. ft.)	91-36210
Torque Wrench (lb. in.)	91-66274
(A) Shimming Tool	91-42840
Bearing Carrier Retainer Wrench	91-61069
(A) Bearing Carrier Puller	91-90338A1
(A) Clamp Plate	91-43559
(A) Drive Shaft Adaptor Tool	91-61077
Universal Puller Plate	91-37241
Bearing Driver	91-89868
Bearing Puller & Installing Tool	91-31229A5
(A) Bearing Remover	91-90337
(A) Bearing Driver	91-89867
(A) Cup and Seal Driver	91-89865
Cup Driver	91-31106
Cup Driver	91-67443