

MODEL AF EVINRUDE / JOHNSON SERIES  
ASSEMBLY INSTRUCTIONS  
2 CYLINDERS, 44.99 CU. IN., STARTING 1989

1. Place the engine on the transom of your boat so that it is mounted vertically, in the normal fashion. Disconnect the shift rod inside the motor compartment. Remove the 5 bolts holding the gearbox to the exhaust housing and remove the gearbox assembly.
2. Remove the water pump assembly from the propeller drive, including the lower stainless steel plate.
3. Install the jet driveshaft assembly into the spiral pump housing locking it in place with the four 1/4-20 x 3/4 bolts and lockwashers. Use grease on the threads.
4. Install the water pump assembly on top of 3/4 inch thick aluminum adapter plate. No gasket under the stainless pump plate. Be sure to install the water pump impeller drive key. Lock in place with 4 – 1/4-20 x 2-1/8 bolts. No washers are used. Grease the threads.
5. The large 3/4 inch adapter plate is attached to the exhaust housing to hold the jet drive. Use 4 3/8-16 x 1-1/4 bolts and lockwashers. Grease the threads.
6. Next, attach the jet drive to the motor. Use two 5/16-18 x 2-1/2 bolts (front), two 5/16-18 x 2-3/4 bolts (rear) from below with lockwashers and one 3/8-16 x 1-1/4 bolt, no lockwasher, above rear.

Grease the bolt threads, driveshaft spline generously, and rubber water tube inlet and guide the jet into place. Tighten the 5 bolts.

7. Next, install the impeller. Grease the shaft threads, key and impeller bore. Place the plastic sleeve inside the impeller, hold the key in the nose of the impeller with your forefinger and slide onto the driveshaft. Install the 8 shim washers and nut retainer on the shaft, up against the impeller, and bring the nut up snug by hand. Be careful that the retainer does not fall into the thread groove and jam the nut.

Place the water intake in position and secure with 2 bolts. Observe the clearance between the impeller blade edge and the intake liner. Then remove the intake.

When, after use in sand and gravel, the blade clearance becomes more than about 1/32” between the impeller edge and the water intake liner, one or more of the stainless shim washers can be transferred from the bottom stack to the top of the impeller, which moves the impeller down into the tapered casing to reduce the clearance.

Shims should not be used above the impeller on new installations where no wear has occurred unless the blade clearance exceeds 1/32 inch. Insufficient blade clearance will do more harm than good from any performance gains it might provide.

When the impeller clearance is satisfactory, bump the nut up tight with a wrench. If the ears of the retainer do not line up with the flats on the nut, spin the nut off, turn the retainer over, and tighten the nut again. In one of these two positions you will have alignment and can fold the ears up against the nut to retain it. The flat in the retainer is angled to the ears to allow this.

8. Place the intake casing in position with the lower end at the rear and tighten the six 1/4-20 x 3/4 bolts. No lockwashers are used. Grease the threads.
9. If your jet drive was ordered for use with a steering tiller handle, a cable shifting mechanism is used. See attached page following “Tiller Handle Steering Motors.”

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If your motor is equipped for remote controls, proceed as follows:

Attach the shift cable and cable anchor bracket to the jet drive.

Using a light finger pressure on the gate, move the gate toward reverse until the cam roller is nested in the neutral notch of the cam.

Adjust the shift cable end and the cable anchor bracket on the jet drive such that the roller is in the neutral notch when the shift handle is in neutral. Tighten hardware.

Shift to forward. The roller should be well onto the flat section of the cam such that the gate cannot be forcibly rotated toward reverse. Pull on the gate by hand to verify this.

If this forward lock condition is not met, readjust the cable positions, giving less importance

10. If the neutral position is too far out of adjustment, the tendency of the gate to move toward reverse, under water pressure, will put tension on the cable in neutral. In some remote control boxes, this makes it difficult to re-engage the shift mode with the motor running in the high speed idle, cold start setting. It is then necessary to stop the motor, operate the shift handle to engage the shifting pin and then restart the motor.

Proper cable adjustment will prevent this problem but it is most important that the forward locking condition be met if a compromise is to be made.

11. When converting to jet drive, your motor will have to be raised to height shown in diagram on page 3, using a straight edge under the boat. Test run the boat and then raise or lower the motor 5/16 inch at a time to obtain the best results.

The motor has four sets of upper mounting holes. You will use one set to begin with. Mark pencil lines on the boat transom through the other sets. Then if you wish to go up or down 5/16 inch, you can drill one alternate set of holes 5/16 inch up or down from the pencil marks. By alternating between these two sets of transom holes and the four sets of motor holes, the motor can be moved in 5/16 inch increments over almost one inch. The transom height should be about 21 inches measured vertically from the boat bottom for short shaft motors and 26 inches for long shaft.

If you raise it too much it will suck air and cavitate, either on start up or when banking on turns. When cavitating, the engine overspeeds in spurts and shakes considerably in the engine mount. This is not a normal condition and should be avoided by proper adjustment of engine height on each individual boat. If you lower it too much you will have excessive drag, therefore mount the engine as high as possible without allowing cavitation.

#### CAUTION

When starting the engine for the first time, watch to see that cooling water comes out of the small hole at the rear side of engine just below the powerhead. This is to check your assembly of the cooling water pump and its connections.

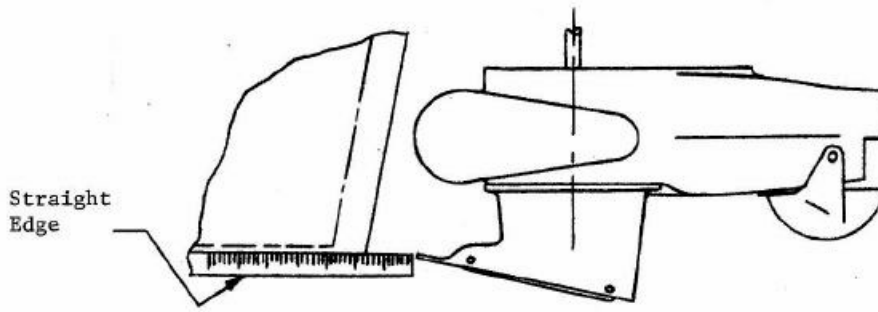
The cooling system can be flushed by removing the slotted screw next to the grease fitting. A hose coupling No. 24789A1 is available from a Mercury dealer. Turn on the water gently, start the motor, set

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to idle and watch for cooling water at the tell tale. Adjust water pressure if needed. Replace the screw after flushing.

GOOD BOATING AND HAVE FUN!

**SETTING MOTOR HEIGHT**



**CAUTION**

BEFORE MOUNTING THE JET, THE HOLE IN THE EXHAUST HOUSING, THROUGH WHICH THE SHIFT ROD PASSED, MUST BE PLUGGED. PLUG THE RUBBER GROMMET WITH RTV RUBBER

**MAINTENANCE AND LUBRICATION**

See last page.

Specialty Manufacturing Company  
Outboard Jets  
2035 Edison Ave  
San Leandro, CA 94577

# MAINTENANCE AND LUBRICATION OUTBOARD JET DRIVE

## **BEARING LUBRICATION**

A grease gun and tube of grease is supplied with your jet drive. We recommend greasing the bearing every 10 hours. Make greasing a part of your cleanup after the days use. Pump in just enough grease to fill the lube hose. Then reconnect the lube hose coupling to the zerk grease fitting.

Every 30-40 hours, pump in extra grease so as to purge any moisture. The texture of the grease coming out gives an indication of conditions inside the bearing housing. A gradual increase in moisture content indicates seal wear. If the grease begins to turn dark, dirty gray, the bearing and seals should be inspected and replaced if necessary. Some discoloration of the grease is normal during the break in period on new sets of seals.

We have selected a water resistant grease of the proper consistency for this application. If you use a substitute grease, be sure it is water resistant and of the same consistency.

## **IMPELLER**

Your jet drive is equipped with a key to protect the unit in the event of a rock jam. This can be reached by removing the water intake, and then the driveshaft nut, similar to a propeller drive. After replacing the key, pull the shaft nut up tight to remove any play between the impeller and shaft. Note the position of the impeller shim washers, and replace them in the same order.

## **REVERSE GATE MECHANISM**

Occasionally check adjustment of the gate shifting linkage. In "forward" the gate should be firmly locked in position. Pull on the gate by hand to verify this. This will prevent wave action from accidentally shifting the gate into reverse as the boat is violently maneuvered

## **GENERAL**

Check all mounting bolts, intake screws, linkage connections, etc., occasionally to be sure they are tight.

## **SALT WATER USE**

Aluminum and stainless steel have been used in the construction of your jet drive. These materials have either been treated or are inherently resistant to corrosion. It is recommended, however, that when not in use the motor be tipped up so that the jet unit is out of the water. When used in salt water more than in fresh water, remove mounting hardware, grease, and reassemble once a year. Failure to do this may result in hardware that is difficult if not impossible to remove at a later date.

## **GUARANTEE**

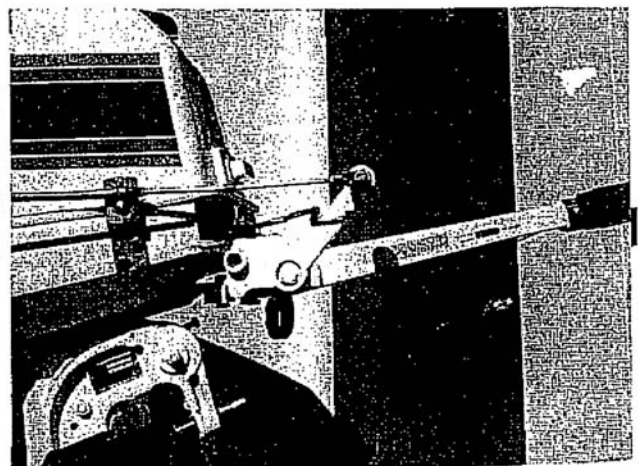
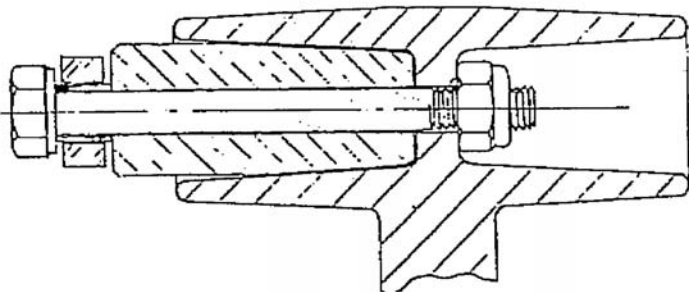
Due to inflexible government regulation, we do not have a written warranty. We have, however, a good reputation for fairness with our customers which we intend to maintain. If you think you have a warranty situation, regarding material, workmanship, call us before making repairs.

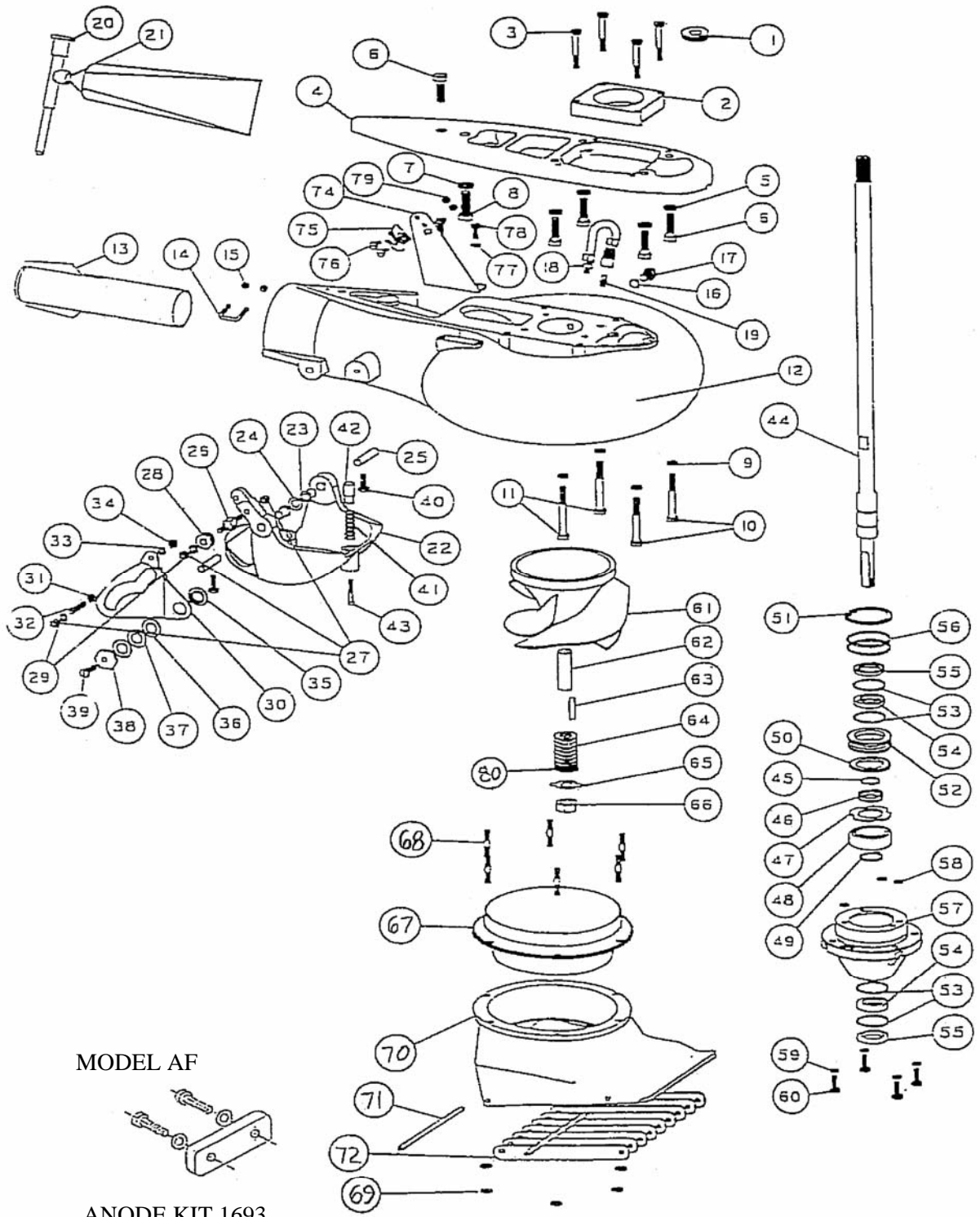
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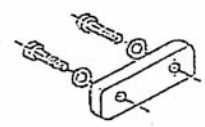
MODELS AFC, ABC, L60CL-89 TILLER HANDLE STEERING MOTORS  
Shift Cable Assembly- Cam Gate  
Kit No. 778 for Short Shaft Motors  
Kit No. 779 for Long Shaft Motors

1. Place the tapered end of the aluminum plug into the outer bore of the shift handle grip. Insert a ¼ inch drill into the plug hole, and drill through the center web of the handle grip. Do not attach the cable end yet. See diagram below.
2. Attach the triangle shaped lower cable support to the jet drive, using two 1/4 -20 x 5/8 bolts and plain washers. Slide the support as far forward as it will go and lock the bolts.
3. Attach the lower cable end, using the thin wall bushing, plain washer and locknut. The nut and washer go on the outside and lock firmly against the bushing. The red cable end should be threaded onto the cable as far as it will go.
4. The upper red cable end should be threaded on the cable at a mid position to allow about 3/16 inch adjustment in either direction on the thread.
5. Place the motor shift handle in neutral position and lock the cable end to the handle as shown in step 1.
6. Using a light finger pressure on the gate, move the gate toward reverse until the cam roller is nested in the neutral notch of the cam. Hold in this position while performing step 7. Drill two ¼ inch mounting holes through the cover. Secure the bracket with two ¼-20 x 5/8 bolts with lockwashers and plain nuts inside.
7. Hold the 1/8 inch thick upper cable bracket against the lower motor cover rim, as shown below. Drill two ¼ inch mounting holes through the cover. Secure the bracket with two ¼-20 x 5/8 bolts with lockwashers and plain nuts inside.
8. Shift to forward. The cam roller should be at the end of the slot in the cam such that the gate cannot be forcibly rotated toward reverse. Pull on the gate by hand to verify this. Readjust red cable end if necessary to favor gate being locked in forward position. Neutral position is less important.





MODEL AF



ANODE KIT 1693

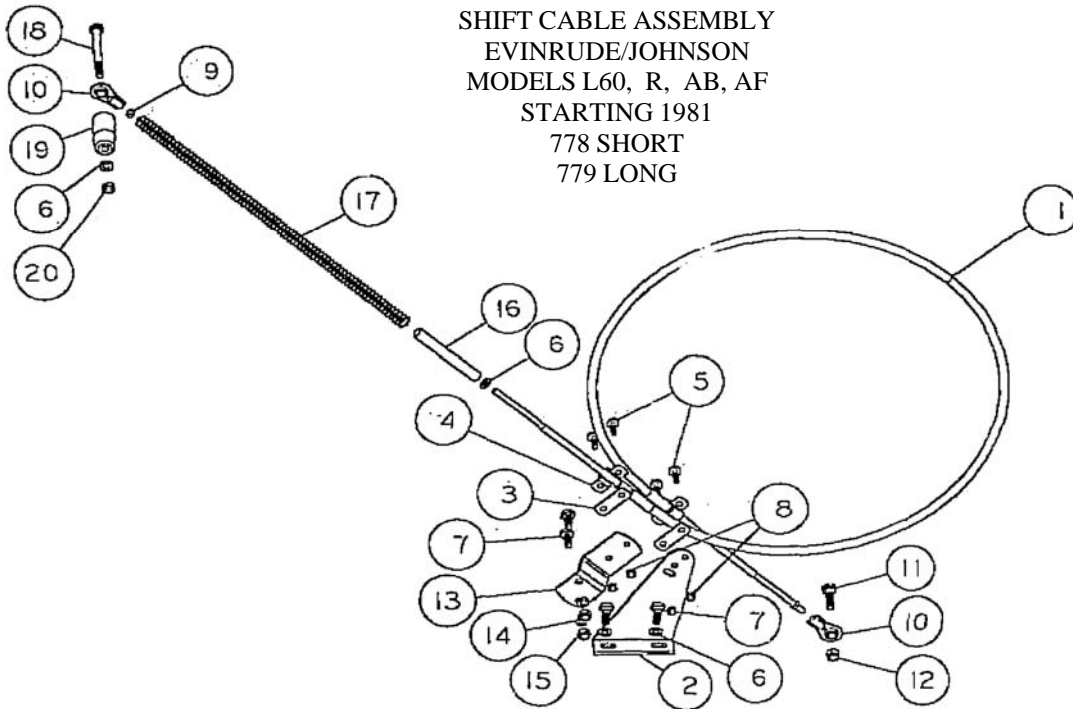
## MODEL AF, AF93 JOHNSON/EVINRUDE

REF	QTY	PART NO.	DESCRIPTION	REF	QTY	PART NO.	DESCRIPTION
1	1	298.2	RUBBER PLUG, EXHAUST HSG	45	1	41	SHAFT BEARING THRUST RING
2	1	984	PUMP ADAPTER AB, AF	46	1	477	COLLAR BACKFIT 7205
3	4	578.1	BOLT HEX HD 1/4-20 X 2	47	1	832	THRUST WASHER
4	1	1152	ADAPTER PLATE AF	48	1	504	BEARING 7205B-UA
5	4	636	WASHER SPRING LOCK M10	49	1	511	TRUARC S100-98
6	5	606	BOLT HEX HD 3/8-16 X 1 1/4	50	1	833	SPACER
7	1	641.1	WASHER SPRING LOCK 7/16	51	1	512	TRUARC N5002-212ZD
8	1	614.1	BOLT HEX HD 7/16-14 X 1 1/4	52	1	433	UPPER SEAL CARRIER W/SEALS & O RINGS
9	4	640	WASHER SPRING LOCK 5/16	53	4	517	SPIROLOX RR-150S
10	2	603	BOLT HEX HD 5/16-18 X 2 1/2	54	2	506	SEAL INNER
11	2	599	BOLT HEX HD 5/16-18 X 2 3/4	55	2	507	SEAL OUTER 6324-S
		11620	VOLUTE WITH GATE AF	56	2	525	O RING 568-135 3/32X1 15/16X2 1/8
12	1	1163	VOLUTE WITH EXHAUST TUBE AF	57	1	1168	BEARING CARRIER W/SEALS & O RINGS AF
13	1	80	EXHAUST TUBE ASSY MEDIUM 2	58	3	521	O RING 568-011 1/16X5/16X7/16
14	1	846	CLIP EXHAUST TUBE 1	59	4	638	WASHER SPRING LOCK 1/4
15	2	621	NYLOC 10-32	60	4	574	BOLT HEX HD 1/4-20 X 3/4 PATCH
16	1	1023	WASHER FIBER 3/8	61	1	8.23	IMPELLER 6 1/8, ALUM/ZINC, W/36.1 SLEEVE
17	1	1022	BOLT HEX HD 3/8-16 X 1/2	61	1	1737	IMPELLER 6 1/8, STAINLESS STEEL, W/36.1 SLEEVE
18	1	975	LUBE HOSE ASSY	62	1	36.1	SHAFT SLEEVE PLASTIC MED.
19	1	539	ZIRC FITTING 1/4-28	63	1	782	IMPELLER TEE KEY-SQUARE
20	1	550	GREASE GUN	63	1	1705	IMPELLER TEE KEY- 1/2 ROUND
21	1	552	GREASE TUBE NO 630-AA	64	8	21	SHIM WASHER MEDIUM
22	1	1175	REVERSE GATE, MEDIUM	65	1	805	NUT KEEPER MED/PKG 2 PER BAG
23	2	535	NYLINER 3/8 1D X 11/16	66	1	22.1	SHAFT NUT 5/8-18 BRASS
24	1	1177	SPRING GATE PIVOT 3/8 MEDIUM			1447	INTAKE ASSY 6 1/8 FLANGED W/ GRILL & LINER
25	2	822	PIN GATE PIVOT 3/8 MEDIUM	67	1	1521	LINER 6 1/8 FLANGED
26	1	1043	SHAFT ROLLER	68	6	1300	STUD- INTAKE MEDIUM
27	3	624	NYLOC 1/4-28	69	6	623	NYLOC 1/4-20
28	1	1042	ROLLER ASSY	70	1	1326	INTAKE PAINTED ONLY MED FLANGED
29	2	636	1/4 WASHER AN960C416	71	2	14	GRILL ROD
30	1	1035	SHIFT CAM MEIDUM	72	9	16	GRILL BAR MEDIUM
31	1	62	NUT HEX JAM 1/4-28			170	BRACKET ASSY OMC W/CLIP & HARDWARD
32	1	1199	PIVOT-CABLE END	74	1	156	BRACKET CABLE SUPPORT
33	1	638	WASHER SPRING LOCK 1/4	75	1	646	CLIP OMC 305736
34	1	622	NUT HEX 1/4-28	76	2	562	PAN HD SLOTTED 10-32 X 1/2
35	1	1037	BUSHING CAM	77	2	635	1/4 WASHER AN960C416
36	1	1038	WASHER CAM	78	2	572	BOLT HEX HD 1/4-20 X 5/8
37	2	1039	SHIM- CAM	79	2	621	NYLOC 10-32
38	1	1036	CAM ECCENTRIC DRILLED	80	1	1718	TORSIONAL DAMPER 5/8
39	1	574.1	BOLT HEX HD 1/4-20 X 1 PATCH				
40	2	574	BOLT HEX HD 1/4-20 X 3/4 PATCH				
41	1	1170	SPRING GATE BUMPER				
42	1	1169	GATE BUMPER				
43	1	559.2	FIL HD SLOTTED 10-32 X 1 1/4 PATCH				
		1156	SHAFT ASSY COMPLETE, AFS, 14T				
44	1	1155	SHAFT ONLY, AFS 14T				
		1160	SHAFT ASSY COMPLETE, AFI, 14T				
44	1	1159	SHAFT ONLY, AFL, 14T				
		1278	SHAFT ASSY COMPLETE AF93S, 17T				
44	1	1277	SHAFT ONLY, AF93S, 17T				
		1281	SHAFT ASSY COMPLETE, AF93L, 17T				
44	1	1280	SHAFT ONLY, AF93L, 17T				

SIZE	TORQUE
1/4-20 (M6)	8-9 FT-LBS
5/16-18 (M8)	12 FT-LBS
3/8-16 (M10)	22 FT-LBS

TILLER STEERING:  
 SHIFT CABLE ASSY 778, 779, SEE  
 PAGE 29  
 BEARING, SEAL, SNAP & "O" RING  
 KIT 803.1

SHIFT CABLE ASSEMBLY  
 EVINRUDE/JOHNSON  
 MODELS L60, R, AB, AF  
 STARTING 1981  
 778 SHORT  
 779 LONG



REF	QTY	PART NO.	DESCRIPTION
1	1	549	CABLE 3 1/2 FT MOR 33C SUPREME SHORT
1	1	547	CABLE 4 FT MOR 33C SUPREME LONG
2	1	156	BRACKET CABLE SUPPORT
3	1	542	SHIM MORSE A035777
4	2	543	CLAMP CHRYS 154317
5	4	561	FIL HD SLOTTED 10-24 X 5/8
6	4	635	1/4 WASHER AN960C416
7	4	572	BOLT HEX HD 1/4-20 X 5/8
8	4	619	NYLOC 10-24
9	2	621.1	HEX NUT 10-32 JAM
10	2	553.2	BALL END 1/4X10-32 CABLE
11	1	583	BOLT HEX HD 1/4-28 X 1
12	1	624	NYLOC 1/4-28
13	1	775	BRACKET CABLE L50C
14	2	638	WASHER SPRING LOCK 1/4
15	2	628	NUT HEX 1/4-20
16	1	1285	GUIDE-T BAR HANDLE
17	1	1284	SPRING, T BAR HANDLE
18	1	581	BOLT HEX HD 1/4-20 X 2 3/4
19	1	776	PLUG HANDLE L50C
20	1	623	NYLOC 1/4-20