FORCE Outboards

service bulletin

No. 91-11

Broken Crankshafts 1991&1992 150 HP Models

Models Affected

1991 150 HP VERSIONS: B,D,F&J

1992 150 HP VERSION: A-SERIAL NUMBERS UNDER 60000

NOTE: Version letter is the last letter in the model number.

1991 and 1992 model year 150 hp outboard motors are susceptible to crankshaft failures as described in the Force Outboard Service Bulletin 91-2. This Service Bulletin (91-11) provides instructions for flywheel replacement and crankshaft inspection for outboards in dealer stock and for outboards delivered to customers. Customers were notified of this repair via certified mail.

Outboards that **have been run for any amount of time** require that the crankshaft be inspected for cracks.

Outboards that **have not been run** by the Dealer or customer require replacement of the flywheel only.

Dealers should place orders for replacement flywheels as needed with their Distribution Center. Initial quantities will be limited. **Order flywheels – part number 819490A3. Order 1 seal plate tool – 91-822342 – to be used when cleaning up crankshafts.**

Crankshaft Inspection/Flywheel Replacement – Outboards That Have Been Run

The flywheel taper on the crankshaft must be inspected for cracks if the outboard has been run for any amount of time. A magnetic particle test method must be used to detect the cracks. Force outboards has contracted with several Test Labs to perform this test at dealer locations. Dealers within 150 miles of any of the listed Test Labs should arrange for customers to return their outboard to the dealership and for the Test Lab to come to the dealership to inspect the crankshafts on customer and dealer outboards that have been run.

The Dealer should call Force Technical Service if the dealership is located more than 150 miles from a Test lab, or if the Dealer has less than 3 outboards that have been run, for special instructions.

Dealers are to prepare the outboard for Test Lab inspection per the instructions printed on the back of the attached Crankshaft Inspection Record. Dealers should gather as many customer outboards as possible to minimize the number of Test Lab visits to each dealership.

If Test Lab inspection **does not find a crack** in the crankshaft, the Dealer should replace the flywheel only per instructions detailed in the Flywheel Replacement Section.

If Test Lab inspection **does find a crack** in the crankshaft, the Dealer should call Force Technical Service at 414-929-5800 for instructions.

The Test Lab will provide a copy of the Crankshaft Inspection Record to the Dealer. Force Outboards will pay the Test Lab for all inspection services and travel. The Dealer should sign the Crankshaft Inspection Record to certify that the work was done.

Flywheel Replacement – Outboards That Have Been Run

Outboards that have been run and checked by a Test Lab and found not to have cracked crankshafts require replacement of the flywheel only. **The flywheel must be lapped to the crankshaft to assure a proper fit per the following procedure:**

- Carefully slide a paper towel over the crank taper until it rests on the block assembly.
- Slide the **SEAL PLATE TOOL 91-822342** over the crank until contact is made with the block.
- Using coarse valve grinding compound, apply a small amount at the base of the flywheel taper and install flywheel on crank. Align flywheel key slot and crank keyway slot.
- Oscillate flywheel back and forth (approximately 10-15 degrees either side of center line) but **DO NOT ROTATE FLYWHEEL**.
- After initial lapping, remove flywheel, thoroughly, clean both tapers and apply lay-out bluing to crank taper.
- Place flywheel on taper and rotate flywheel back and forth briefly.

– Remove flywheel and check for contact pattern on crankshaft.

  - Contact pattern should be approximately 50-60% along the taper length.
  - If contact pattern is less than 50-60%, repeat above procedure.
  - **DO NOT ATTEMPT** to achieve full contact along the taper, since this could lead to creating a step on the crankshaft.

– After proper contact has been achieved, remove the seal plate tool and **thoroughly clean** the crankshaft taper and flywheel taper with solvent.

  - **Avoid getting valve grinding compound in the upper ball bearings!**

– Install bearing cage and ignition/charging components per service manual.

– Assemble the new flywheel with key and nut. Torque the flywheel nut to **130 lb. ft**

– Assure proper assembly, then start engine and check for proper operation. Check and reset timing to **30**° **Advance** at WOT.

Flywheel Replacement – Outboards That Have Not Been Run

Outboards that have not been run require replacement of the flywheel only.

– Remove all grease, oil and dirt from the crankshaft and flywheel taper with solvent.

– Assemble the new flywheel with key and nut. Torque the flywheel nut to **130 lb. ft.**

– Assure proper assembly, then start engine and check for proper operation. Check and reset timing to **30**° **Advance** at WOT.

Warranty

– Complete and submit a warranty claim. One warranty claim can be used for several outboards.

  - List outboard serial number(s) and model number(s).
  - List the quantity of 819490A3 flywheels used.
  - List 2.0 hours of labor to replace each flywheel on outboards that have been run.
  - List 1.0 hour of labor to replace each flywheel on outboards that have not been run.
  - Send the warranty claim, a copy of the completed Crankshaft Inspection Records and old flywheels to:

    Warranty Receiving
    W 6250 West Pioneer Rd.
    Fond du Lac Wi, 54936

  - Include shipping costs on the warranty claim.

Test Lab Listing

Dealers...please call the Test Lab nearest you (within 150 miles) to arrange for Magnetic Particle Inspection on engines that have been run. Request Magnetic Particle Inspection per Force Service Bulletin 91-11. Allow several days to schedule the work. The Test Lab will confirm that there are at least three (3) engines ready to check before they visit your dealership.

Applied Technical Services
108A Castle Drive
Madison, AL 35758
(205) 837-7777

MQS/Phoenix Lab
2305 N. 35th Avenue
Phoenix, AZ 85009
(602) 269-7868

International Testing
P.O. Box 165672
Little Rock, AK 72216
(501) 224-5009

QC Services
23101 Foley Street
Hayward, CA 94545
(415) 782-3660

MQS/Los Angeles Lab
600 E. Washington Blvd.
Los Angeles, CA 90040
(213) 724-3811

MQS/Denver Lab
5475 Peoria St. Bldg 1, Unit A
Denver, CO 80239
(303) 371-1593

MQS/Hartford Lab
230 Murphy Road
Hartford, CT 06114
(203) 522-3253

MQS/Wilmington Lab
310 Cornell Drive Unit B-3
Wilmington, DE 19801
(302) 575-1818

QC Labs, Inc.
2870 Stirling Road
Hollywood, FL 33020
(305) 925-0499
(305) 949-3166 (Miami)

MQS/Jacksonville Lab
5151-12 Sunbeam Road
Jacksonville, FL 32257
(904) 731-2472

QC Labs, Inc.
Rt 4 Box 292
Lake City, FL 32056
(904) 963-1014

QC Labs, Inc.
3628 Silverstar Road
Orlando, FL 32808
(407) 290-3339

Apllied Technical Services
1190 Atlanta Industrial Drive
Marietta, GA 30065
(404) 423-1400

MQS/Chicago Lab
2301 Arthur Avenue
Elk Grove Village, IL 60007
(708) 981-0690

MQS/S. Holland Lab
521 Taft Street
S. Holland, IL 60473
(708) 331-7114

MQS/Wood River
P.O. Box 43
Wood River, IL 62095
(618) 255-3181

MQS/Indianapolis Lab
5307 W. 86th Street
Indianapolis, IN 46268
(317) 872-8196

International Testing
138 Keating Drive
Belle Chasse, LA 70037
(504) 392-7810

MQS/Detroit Lab
32063 Townley Avenue
Madison Heights, MI 48071
(313) 589-1215

MQS/Minneapolis/St. Paul Lab
1920 Oakcrest Avenue
Roseville, MN 55113
(612) 633-7616

PSI Inspection
1012 E. 10th Street

Kansas City, MO 64106
(816) 474-7393

MQS/Buffalo Lab
986 Oliver Street
N. Tonawanda, NY 14120
(716) 694-3432

Herron Testin Lab
1200 E Westinghouse Blvd.
Charlotte, NC 28273
(800) 333-3518
(704) 588-1131

MQS/Cleveland Lab
13810 Enterprise Avenue
Cleveland, OH 44135
(216) 267-4142

MQS/Cincinnati Lab
10520 Chester Road
Woodlawn, OH 45135
(513) 771-3292

MQS/Portland Lab
905 S.E. Grant Street
Portland, OR 97214
(503) 233-2682

WesTest
5555 N. Channel Avenue
Bldg 4, Annex
Portland, OR 97217
(503) 285-7959

MQS/Pittsburgh Lab
210 Vistal Park Drive
Parkway West
Pittsburgh, PA 15205
(412) 787-8690

MQS/Philadelphia Lab
270 Andrews Road
Scottsville Industrial
Trevose, PA 19053
(215) 322-4100

Applied Technical Services
1218 Donaldson Road
Greenville, SC 29605
(803) 299-0525

MQS/Memphis Lab
1742 Cherokee Blvd.
Memphis, TN 38111
(901) 743-1103

NDE, Inc.
P.O. Box 121326
Fort Worth, TX 76121
(817) 249-4760
metro 429-8823

MQS/Dunegan Testing
1416 N. Sam Houston Pkwy E.
Suite 160
Houston, TX 77032
(713) 449-6800

MQS/Houston Lab
3741 Trailmobile Drive
Houston, TX 77013
(713) 673-3660

MQS/Tidewater Lab
405 Industry Drive
Hampton, VA 23661
(804) 827-9184

WesTest, Inc.
8410 W. Mercer Way
Mercer Island, WA 98040-5633
(206) 236-1359

X-Ray, Inc.
7500 Perimeter Road South
Seattle, WA 98108
(206) 763-1919

Professional Service, Inc.
130 N. Stone Street
Spokane, WA 99202
(509) 535-3571

MQS/Milwaukee Lab
5512 W. State Street
Milwaukee, WI 53208
(414) 771-3060

Crankshaft Inspection Record

Engine Model Number: _____

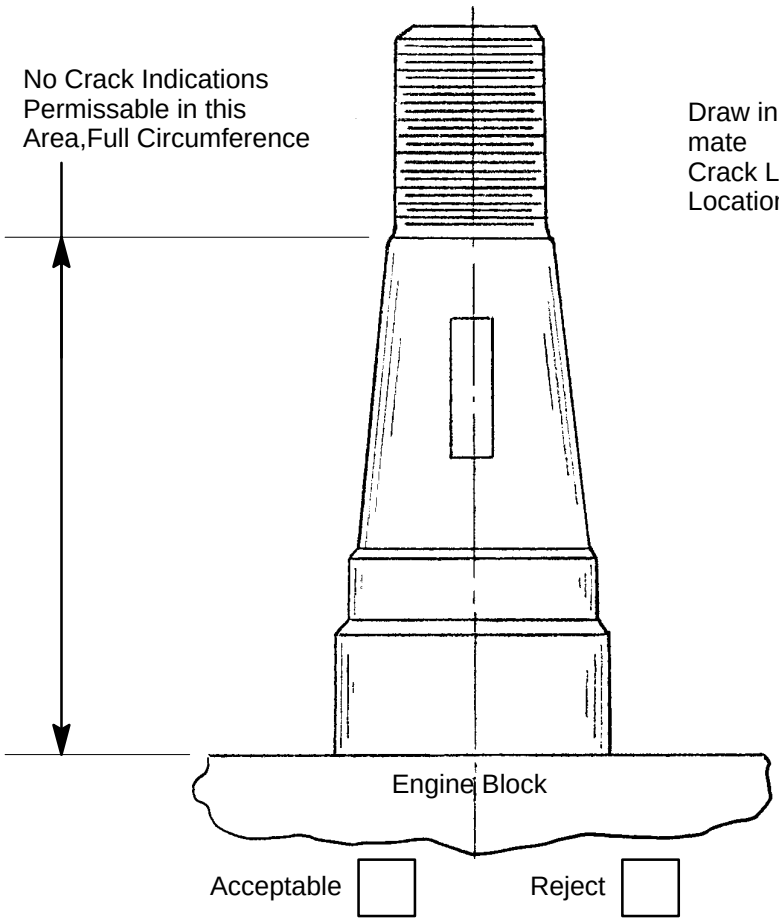
Engine Serial Number: _____

Approximate Hours of Operation: _____

Type/Model of Boat: _____

Location and/or Dealer Number: _____

Date Inspection Performed: _____



Comments/ Remarks: _____

_____

Inspector's Signature: _____

Dealer's Signature: _____

Date: _____

DEALER RESPONSIBILITY

1. Boat/Engine must be brought to a suitable location that has 115-120V AC availability for magnetic particle inspection. No engines will be inspected with boat in water at a dock.
2. Remove cowl, flywheel nut, flywheel, stator, trigger assembly, stator bracket and flywheel key.
3. Check the crankshaft taper for blue heat discoloration and upper crankshaft bearing race to insure is tight in the block assembly. If the crankshaft is discolored or the upper bearing is loose, powerhead replacement is required. Do not have the Test Lab magnetic particle inspect taper. Call Force Technical Service for instructions at (414) 929-5800.
4. Record model number, engine serial number, approximate hours of operation if known, dealer number, and type/model of boat on the Crankshaft Inspection Record.

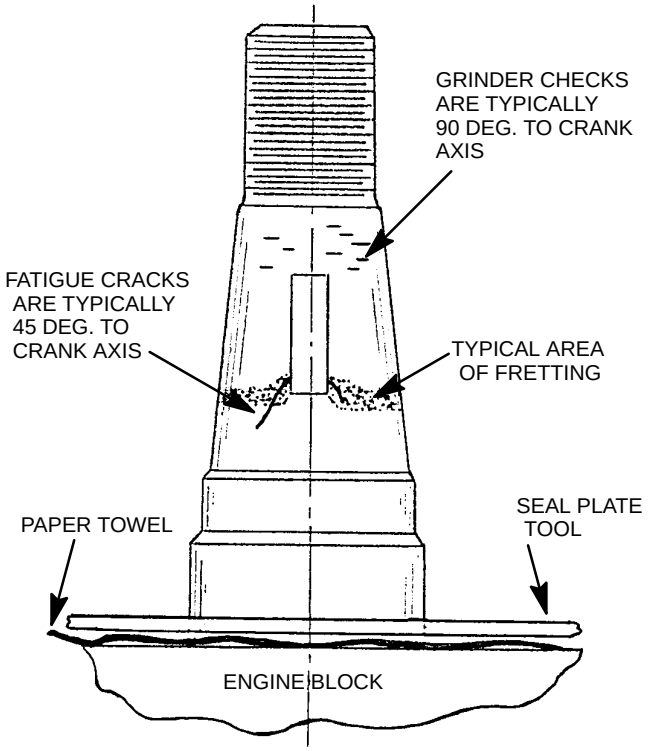
TEST LAB RESPONSIBILITY

1. Prior to preparing the crankshaft taper end for inspection, the crankshaft upper main ball bearing assembly must be protected from foreign debris,magnetic particles from entering the bearing. Slide a paper towel over the crankshaft end until it contacts the block assembly. Place seal plate tool 91-822342 over the crank until contact is made with the block.
2. Clean taper end with Magnaflux* SKC-NF cleaner.
3. Some sanding will be required in many cases because fo fretting on the crankshaft surface near the base of the taper. Use 320 or 400 grit paper to remove iron oxide particles/clean surface. After sanding, clean again with SKC-NF cleaner.
4. Magnetize crank using Magnaflux L-10 coil and apply Magnaglo 14 AM prepared bath.
5. Remove coil and check for induced field with a pocket or hand-held field indicator.
6. Inspect the crankshaft taper with a black light which meets ASTM E138 specifications.

MERCURY MARINE REQUIREMENTS:

No fatigue cracks or grinder checks allowed on taper length.

7. De-magnetize crank - field indicator reading must be less than 2 divisions on the field indicator.
8. Clean mag particle bath from crank taper end.
9. Record findings on Crankshaft Inspection Record and sign.
10. Have dealer sign Crankshaft Inspection Record. Provide copy to dealer.



NOTE: Please call Don Beier (414) 929-5851 or Scott Halkey (414) 929-5000 ext. 4286 at Mercury Marine with any questions about these instructions.

* Magnaflux or Equivalent

September 1991

Dear Force Outboard Product Owner:

Our records indicate you are the owner of a 150 HP outboard motor which is included in a recall. This recall is being performed per the Federal Boat Safety Act for your protection.

Force Outboards has found a harmonic condition in a narrow RPM range between 4150 and 4400 RPM's. Extensive operation within this range will cause one of two failures. One, the flywheel trigger magnet may come loose from the flywheel. Two, the crankshaft may fatigue and ultimately fail releasing the flywheel from the powerhead. Either condition will cause the engine to stop and not restart. A new rubber hub flywheel has been developed to eliminate this condition.

⚠ WARNING

OPERATE YOUR ENGINE ONLY WITH THE COWL ON AND SECURELY LATCHED. DO NOT ATTEMPT TO SERVICE OR ADJUST A RUNNING ENGINE.

Please contact your Authorized Dealer after September 9, 1991 to arrange an appointment for having the flywheel replaced. Limited quantities of the new flywheel will be available to Dealers after September 9, 1991. This repair will be done at no charge to you. Your dealer has been advised of this recall in Service Bulletin No. 91-2.

We regret the inconvenience this may have caused you. However, we have taken this action to ensure your boating enjoyment and continued satisfaction with our product.

Sincerely,

Bob Kachelek
National Service Manager
Mercury/Mariner/Force Outboards