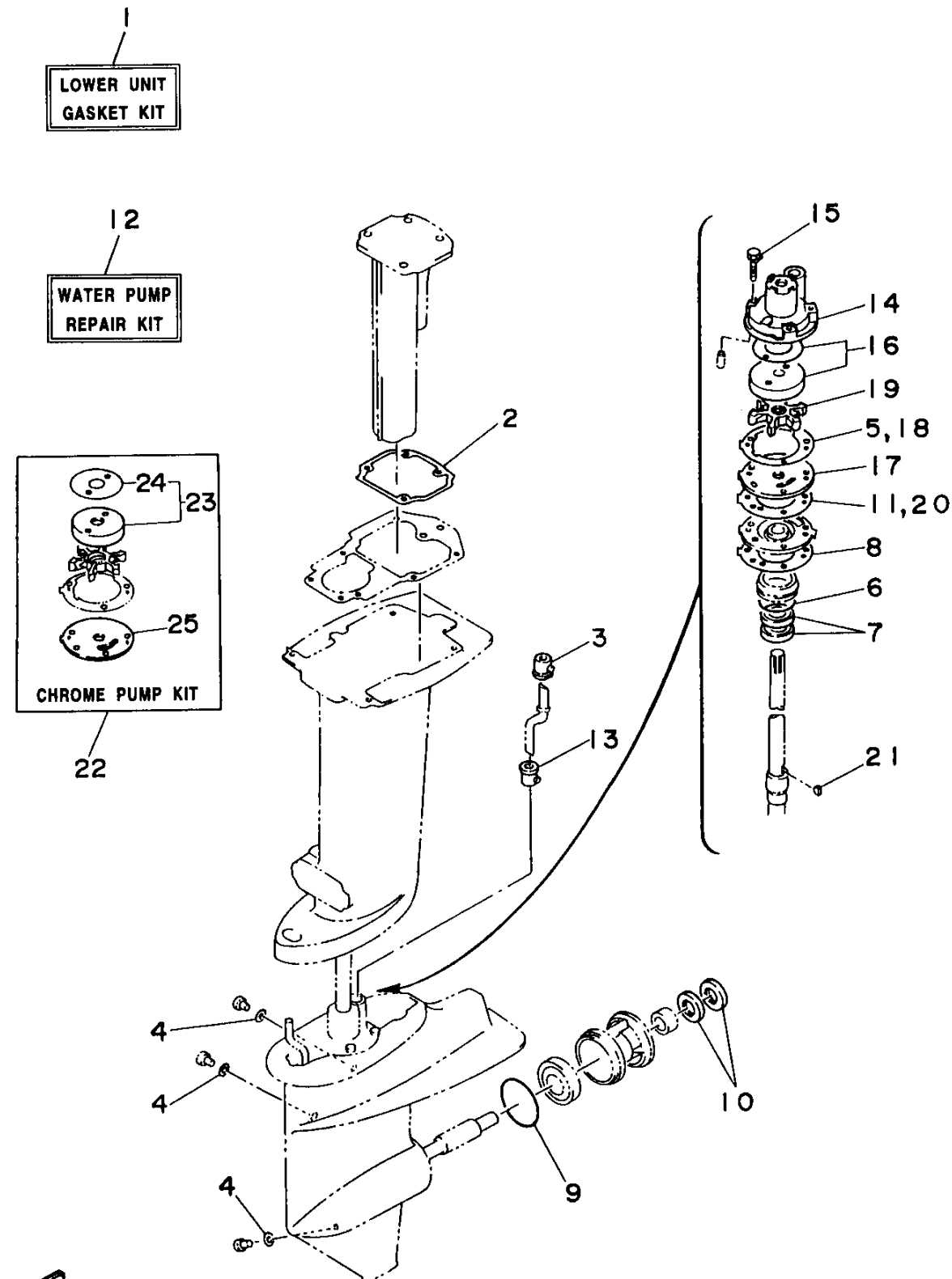


REPAIR KIT 2



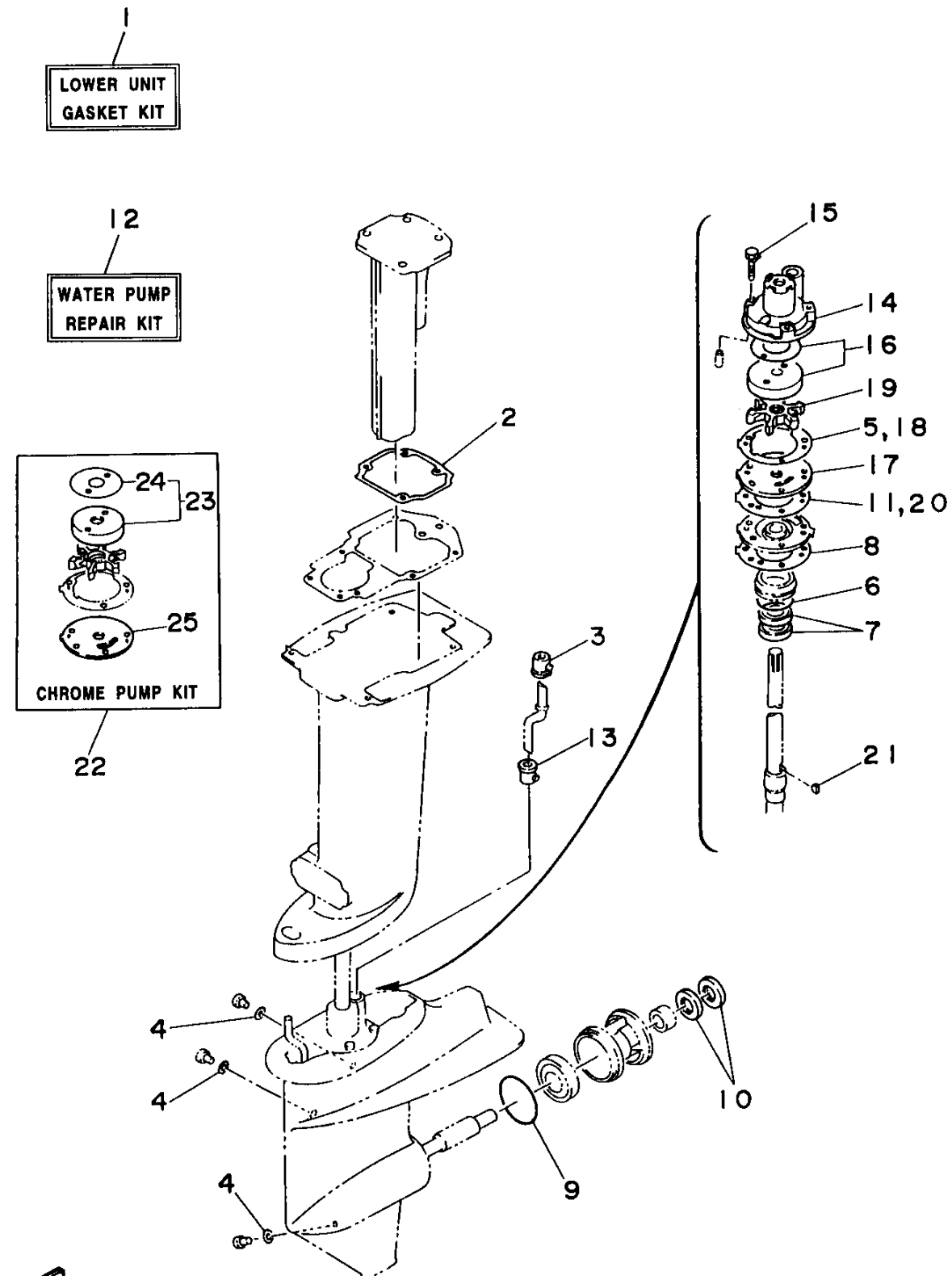
Ref No.	Part Number	Description	Qty	Remarks
1	689-W0001-23-00	LOWER UNIT GASKET KIT	1	
2	664-41134-A0-00	. GASKET, EXHAUST MANIFOLD	1	
3	689-44366-00-00	. DAMPER, WATER SEAL	1	
4	90430-08020-00	. GASKET	3	
5	689-44324-A0-00	. GASKET, CARTRIDGE	1	
6	93210-40M10-00	. O-RING	1	
7	93101-22067-00	. OIL SEAL	2	
8	689-44315-A0-00	. GASKET, WATER PUMP	1	
9	93210-60MA3-00	. O-RING	1	
10	93101-20M07-00	. OIL SEAL	2	
11	689-44316-A0-00	. GASKET, WATER PUMP	1	
12	689-W0078-A6-00	WATER PUMP REPAIR KIT	1	
13	626-44365-01-00	. DAMPER, WATER SEAL	1	
14	689-44311-03-00	. HOUSING, WATER PUMP	1	
15	90119-06M07-00	. BOLT, WITH WASHER	3	
16	689-W4432-02-00	. INSERT CARTRIDGE COMP	1	
17	689-44323-03-00	. OUTER PLATE, CARTRIDGE	1	
18	689-44324-A0-00	. GASKET, CARTRIDGE	1	
19	689-44352-02-00	. IMPELLER	1	
20	689-44316-A0-00	. GASKET, WATER PUMP	1	

CONTINUED ON NEXT FRAME >



REPAIR KIT 2

Ref No.	Part Number	Description	Qty	Remarks
21	664-44338-00-00	. .KEY, WOODRUFF	1	
22	689-W0078-3A-00	CHROME PUMP KIT	1	
23	689-W4432-61-00	. INSERT CARTRIDGE COMP	1	
24	689-44367-01-00	. . DAMPER, WATER SEAL	1	
25	689-44323-43-00	. OUTER PLATE, CARTRIDGE	1	





- SUBJECTS:** 1. Oxygenated Fuels
2. Overheating When Using Flush Attachment

Oxygenated Fuels

Beginning in 1992, all gasoline sold during the winter months (usually October through February) in 39 designated metropolitan areas (and all of California) must be oxygenated as mandated by the 1990 Amendments to the Federal Clean Air Act. The purpose of the oxygenated fuel is to reduce the amount of carbon monoxide in the air. Internal combustion engines tend to emit more carbon monoxide at low operating temperatures such as when first started and during longer warm-up times in the colder, winter months.

The information provided in this Tech Exchange clarifies some concerns that customers and dealers may have about the use of oxygenated fuels in Yamaha outboards.

What is "Oxygenated Gasoline"?

Oxygenated gasoline is a blend of gasoline and one or more combustible liquids containing oxygen. Presently, two different classes of oxygenates are being added to gasoline: alcohol (both ethanol and methanol) and ethers (methyl tertiary-butyl-ether; MTBE). The oxygen content of the gasoline must be 2.7%.

Can oxygenated fuels be used in Yamaha Outboards?

Yes, oxygenated fuel can be used in Yamaha outboards. This Tech Exchange addresses concerns regarding its use.

Service, Storage, & Usage Information PRACTICE GOOD FUEL MANAGEMENT . . .

Don't worry about instructing customers about testing or identifying oxygenated fuel. If they are in one of the mandated areas, oxygenated fuel is all they can purchase. Instead, educate your customers about oxygenated gasoline using the following tips:

- Match gasoline purchases to consumption. Don't buy more than will be used in one month.
- Store gasoline in a tightly-closed, approved container in a cool, dry place.
- Store boats with built-in fuel tanks FULL with fresh fuel and treat the fuel with a stabilizer such as Yamaha Fuel Conditioner & Stabilizer

NOTE: Yamaha Ring Free Fuel Additive can be used with all oxygenated gasoline and is recommended for use in all Yamaha outboard engines. For more information about Ring Free, refer to Technical Bulletin O91-014.

Carburetor Jetting

Oxygenated fuels have a very slight leaning affect on the fuel mixture. This will not cause any problems with the performance of Yamaha outboards. At times the leaner mixture may cause the idle to be slightly rougher than normal. If this occurs, richen the pilot screws 1/4 turn.

Water Absorbing Additives

If the oxygenated gasoline being used contains an alcohol blend, **do not use** additional alcohol based water absorbing additives. If there is water in the fuel tank prior to refueling, **do not use** oxygenated gasoline until all water has been removed from the tank.

⚠WARNING

Gasoline and oxygenated gasoline are extremely flammable and can be explosive under certain conditions. Follow the recommendations in the owner's and service manuals for handling and storing gasoline.

Phase Separation

Although small amounts of water in the fuel will normally not affect or interfere with engine operation, problems can develop if too much water is present in alcohol oxygenated gasoline. If there is enough water in the oxygenated fuel, the alcohol and gasoline will separate into two liquid

phases: a top phase or layer which is almost entirely gasoline, (and oil, in the case of 2-stroke premix fuel) and a bottom phase of water and alcohol. Phase separation makes the engine difficult or often impossible to start. Replace the separated fuel with fresh gasoline.

Parts Information

Part Number	Description	Remarks	Dealer Cost
LUB-RNGFR-EE-12	Ring Free Fuel Additive	Case/12	
LUB-FUELC-12-00	Fuel Conditioner & Stabilizer	Case/12	

Overheating When Using Flush Attachment

Yamaha Marine Field Service has received some reports about overheating when using a flush attachment, especially aftermarket flush attachments. NEVER TROUBLESHOOT AN OVERHEATING PROBLEM ON A YAMAHA OUTBOARD WHILE USING A FLUSH ATTACHMENT!

When using a flush attachment, the water entry into the engine's cooling system is directly related to the supply of water pressure, size of the hose used, and the design of the attachment. All these areas are of no concern when the motor is being operated in the water. The Yamaha water

intake screens on the lower unit are designed to direct water into the intake as the lower unit travels through the water. A flush attachment commonly directs water at the side of the intake. This produces excessive turbulence around the intake screen reducing the amount of water entering the intake. If you must operate an engine on a flush attachment with inferior water flow, the intake screens can be temporarily removed to increase water flow. **Do not** forget to reinstall the intake screens after removing the flush attachment.

For best results, use the flush attachment available from Yamaha Parts and Accessories, Part No. ABB-MOTOR-FL-SH.

Technical BULLETIN

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GENERAL

OUTBOARD DIAGNOSTIC REFERENCE LIST

I INTRODUCTION

This bulletin contains a reference list of Technical Bulletins and Update Seminars materials to help you in servicing Yamaha outboards. The list is arranged by engine size, for your convenience.

DIAGNOSTIC REFERENCE LIST

Model	Year	Problem/Title	Location	Comments
250	90,91	IGNITION STATOR REPLACEMENT	BUL O90-013	90KF MISFIRE PROBLEM
250	90-92	REVISED L/U SHIM SPECIFICATION	BUL O92-005	
250	90-91	IMPROVED FUEL HOSE ROUTING	MTG 92-P42	HOSE CAN BE KINKED
250	90-95	PRIMESTART OPER. & TROUBLESHOOTING	MTG 94-P40	SEE ALSO MTG 95-P59
250	90-95	LINKAGE ADJUSTMENT PROCEDURES	MTG 94-P41	SEE ALSO MTG 95-P60
225-250	94	WIRING ADAPTERS	BUL O93-007	FOR RIGGING
225X & 250	94	CRANKSHAFT BALANCER CORROSION PROTECT.	MTG 94-P6	CAUSES NOISE
225X & 250	94	CHANGE IN CHARGING VOLTAGE	MTG 94-P6	NEW VOLTAGE REGULATOR
225X	94-95	PRIMESTART OPER. & TROUBLESHOOTING	MTG 94-P40	SEE ALSO MTG 95-P59
225X	94	LINKAGE ADJUSTMENT PROCEDURES	MTG 94-P41	
225	90,91	SPARK PLUG FOULING	BUL O91-013	
225	87,88,89	SPARK PLUG FOULING	BUL O90-005	
225	87,88	EXCESSIVE OIL CONSUMPTION	BUL O87-009	
225	87-94	POWER DROP WHILE CRUISING	MTG 92-P64	COMPUTER RELATED
225	87-89	REPLACEMENT CARBURETOR USAGE	MTG 93-P9	
225	90-94	PRIMESTART OPER. & TROUBLESHOOTING	MTG 94-P39	SEE ALSO MTG 95-P58
220-250	84-95	YMIS OPERATION & TROUBLESHOOTING	MTG 94-P16	SEE ALSO MTG 95-P47
150-225	87-90	TRIM TAB RETAINING MODIFICATIONS	MTG 92-P67	P/N 6J9-45371-01-00
150-225	90	TOP COWLING BRACE - COWL. HITTING P/H	BUL O90-011	90KD1 or 90KD2
150-200	90	ENGINE MISFIRE AND/OR HIGH PITCH NOISE	MTG 92-P62	CDI FILTER & COWLING
L150,L200	87	OVERHEAT SYSTEM MALFUNCTION	BUL O86-007	TRIM PLATES TRIGGER HORN
P150	All	REPLACEMENT LOWER UNIT GEARS	BUL O93-017	NEW BACKLASH SPECS.
P150	92-94	LOWER UNIT GEAR REPLACEMENT	BUL O94-003	90LR1 OR 90LR2
115-250	94-95	FUEL MANAGEMENT GAUGE REPAIR	TCX O94-006	ERRATIC FUEL FLOW /NO MPG
115-250	94	BATTERY DRAIN	BUL O94-002	OTHER MODELS W/94 SPEEDO
115-250	94	INCORR. WIRE CONNECT. & TACHO. DAMAGE	BUL O93-010	FOR RIGGING
115-250	94	INCORRECT SPEEDOMETER OPERATION	BUL O93-016	REMOVE DAMPER
115-250	92	MODIFIED TRIM SENDER	MTG 93-P7	P/N 6R3-83672-01-00
115-250	92	IMPROVED GEAR SHIFT SHAFT	MTG 93-P8	
115-250	86-92	DRILLING A CARB. CLEAN-OUT PASSAGE	MTG 95-P77	
115-250	All	ENGINE V-BLOCK IDENTIFICATION	MTG 95-P78	
115-225	94	WIRING ADAPTERS	BUL O93-006	FOR RIGGING
115-225	84-89	IMPROPER OIL PUMP SELECTION	BUL O91-017	SEE ALSO BUL 91-016
115-225	84-89	REPLACEMENT OIL PUMP CONVERSION	BUL O90-016	SEE ALSO BUL 91-017
115-225	84-87	IMPROVED SHIFTER SHAFT SUPPORT	BUL O87-005	GREASE FITTING ADDED
115-225	84-90	LOWER UNIT SHIMMING	BUL O90-017	
115-225	84-89	IMPROVED FUEL PUMP DIAPHRAGM	MTG 92-P41	TORQUE TO 65 IN-LBS
115-225	86-87	NIKKI CARBURETOR MIXTURE SCREWS	MTG 92-P60	FROM BRASS TO STEEL
115-225	90-94	FLASHING GAUGES AND RPM REDUCTION	MTG 91-P11	LOOSE MAIN FUSE/MTG 92-P66
115-225	90-94	BATTERY ISOLATOR USAGE	MTG 92-P52	
115-225	92	SERVICE MANUAL ERRORS	MTG 92-P58	
115-225	90	SERVICE MANUAL ERRORS	BUL O91-010	ELECTRICAL & SHIMMING
115-225	91-93	EXHAUST GASKET REPLACEMENT PROGRAM	BUL O92-012	90LF
115-220	84,85	ROTOR AND PULSER COIL CHANGES	BUL O86-004	MISFIRE IF MISMATCHED
115-220	84,85	OIL TANK CHECK VALVE	BUL O86-001	NO OIL TRANSFER
115-220	84	OIL PUMP REPLACEMENT PROGRAM	BUL O85-002	SEE ALSO BUL 90-009

DIAGNOSTIC REFERENCE LIST (Cont'd.)

Model	Year	Problem/Title	Location	Comments
90-250	94	LOWER UNIT IDENTIFICATION INFORMATION	MTG 94-P10	
P60-250	95	IMPROVED PT&T PAN SWITCH	MTG 95-P29	
50-250	94-95	MULTIFUNCTION SPEEDO CHANGES & UPDATES	MTG 95-P65	
50-250	All	PT&T PAN SWITCH REPAIR	TCX 094-011	
50-250	93	IMPROVEMENTS TO POWER TILT	MTG 94-P6	SEE ALSO MTG 95-P34
40-250	All	PWR TRIM & TILT SENDER TROUBLESHOOTING	MTG 94-P21	SEE ALSO MTG 95-P37
40-250	84-94	GENERAL PISTON REPLACEMENT INFO.	MTG 94-P11	SEE ALSO MTG 95-P42
40-250	All	PT&T TROUBLESHOOTING & REPAIRS	BUL 093-019	
C55-C115	All	WIRING ADAPTERS	BUL 093-009A	
90	84,85	ROTOR AND PULSER COIL CHANGES	BUL 086-004	MISFIRE IF MISMATCHED
CV85E	89,90,91	SERVICE MANUAL ERRORS	BUL 091-008	SHIMMING
C75 & C85	94	LOWER UNIT IDENTIFICATION INFORMATION	MTG 94-P10	
70,90	84-87	IMPROVED SHIFTER PARTS	BUL 093-020	SEE ALSO MTG 95-P79
70,90	84-87	NEW WATER INTAKE COVERS	BUL 086-009	HIGH SPEED OVERHEATING
70,90	84	OIL PUMP REPLACEMENT PROGRAM	BUL 085-002	SEE ALSO BULL 90-009
70,90	84-90	LOWER UNIT SHIMMING	BUL 090-017	
70,90	84-89	IMPROVED FUEL PUMP DIAPHRAGM	MTG 92-P41	TORQUE TO 65 IN-LBS
70,90	90	SERVICE MANUAL ERRORS	BUL 091-004	ELECTRICAL & SHIMMING
70,90	89	OIL PUMP SEAL HOUSING REPLACEMENT	BUL 089-003	SEE ALSO BUL 91-015
70,90	89	OIL PUMP DISTANCE COLLAR	BUL 091-015	
P60,70,90	92-94	IGNITION SYSTEM OPERATION	BUL 092-001	#2 NO FIRE
P60,70,90	91	SERVICE MANUAL ERRORS	BUL 091-009	ELECTRICAL
P60,70,90	91	TRIM CAP SEAL POPPING OUT	MTG 93-P10	P/N 6H1-4384E-20-00
P60,70,90	92	INCORRECT SPARK PLUG SPECIFICATIONS	MTG 93-P11	B8HS-10
P60,70,90	92-94	YMIS OPERATION & TROUBLESHOOTING	MTG 94-P16	
P60,70,90	92-94	PRIMESTART OPERA. & TROUBLESHOOTING	MTG 94-P38	SEE ALSO MTG 95-P57
50, 70, 90	94	WIRING ADAPTERS	BUL 093-008	FOR RIGGING
70	88	ERRATIC TACHOMETER READING	BUL 088-001	
P60,70	92	LIGHTING COIL CHANGED SPECIFICATIONS	MTG 93-P11	
CV55E	89,90,91	SERVICE MANUAL ERRORS	BUL 091-007	SHIMMING
40,50,P50	95	PRIMESTART OPER. & TROUBLESHOOTING	MTG 95-P56	
40,50,P50,	95	RIGGING COMPONENT INFORMATION	BUL 094-005	40/50 PSH TO OPN.
CV40E	90 & 91	SERVICE MANUAL ERRORS	BUL 091-006	SHIMMING
C40MSH	92	INCORRECT STARTING I.D. NUMBER	MTG 93-P12	
40EJ	91 & 92	INCORRECT MOUNTING BOLTS	MTG 93-P12	USE 12MM BOLTS
40,50	84-88	OIL SEAL HOUSING IMPROVEMENTS	MTG 92-P61	PREVENTS CHATTERING NOISE
40,50	84-89	IMPROVED FUEL PUMP DIAPHRAGM	MTG 92-P41	TORQUE TO 65 IN-LBS
40,50	84,85	RECONDITIONING PROGRAM	BUL 085-001	SEE ALSO BULL 90-009
40,50	89	OIL PUMP SEAL HOUSING REPLACEMENT	BUL 089-003	SEE ALSO BUL 91-015
40,50	89	OIL PUMP DISTANCE COLLAR	BUL 091-015	
40,50	84-90	LOWER UNIT SHIMMING	BUL 090-017	
40,50	90	SERVICE MANUAL ERRORS	BUL 091-003	SHIMMING
40,50	84-87	NEW STYLE LOWER UNIT HOUSING	BUL 087-008	REPLACEMENT PART
40,50	89-94	PRIMESTART OPER. & TROUBLESHOOTING	MTG 94-P37	SEE ALSO MTG 95-P51
30	84-90	LOWER UNIT SHIMMING	BUL 090-017	
25,30, C25/30	84-87	DISCONTINUED USE OF EXH. MANIFOLD UPP. CASE	MTG 95-P18	
25,30	84-87	NEW STYLE LOWER UNIT HOUSING	BUL 087-008	REPLACEMENT PART
25,30	84-87	CHANGE IN PROPELLER SHAFT	MTG 92-P49	MUST USE NEW PARTS
25	88-94	UNSTABLE SPEED	MTG 95-P19	
25	88,89,90	MIDRANGE ENGINE SURGING	BUL 090-006	
25	88,89,90	IMPROVED LOWER UNIT PINION BEARING	BUL 090-001	REPLACEMENT PARTS
25	91	SERVICE MANUAL ERRORS	BUL 091-002	ELECTRICAL
25	90	SERVICE MANUAL ERRORS	BUL 091-001	ELECTRICAL
9,9,F9,9,15	84-87	NEW STYLE LOWER UNIT NEEDLE BEARING	BUL 087-010	
F/T9,9, T9,9	85-94	PRIMESTART OPER. & TROUBLESHOOTING	MTG 94-P35	SEE ALSO MTG 95-P52
F9,9	84-87	NEW STYLE LOWER UNIT NEEDLE BEARING	BUL 087-010	
F9,9, FT9,9	85-86	REPL. EXHAUST GUIDE OR OIL PAN	MTG 91-P8	
F9,9, FT9,9	85-90	MODIFIED UPPER CASING	MTG 92-P42	TO PREVENT CORROSION
F9,9, FT9,9	85-93	FUEL STARVATION WHEN USED AS AUX.	MTG 92-P57	
FT9,9	85-90	IMPROVED RETENTION OF PROPELLER	MTG 92-P43	NUT AND RING SEPARATED
FT9,9,F9,9	84-89	TACHOMETER INSTALLATION	BUL 085-007	NEW RECTIFIER CHANGED
F9,9Q T9,9Q	92	MODIFIED ELECTRICAL PARTS	BUL 092-002	EARLY '92s
F9,9 & T9,9	92	ACCELERATOR PUMP BLEEDING	BUL 091-018	SEE ALSO TECH 93.P13
F9,9 & T9,9	92	HARD STARTING & STALLING WHEN COLD	MTG 93-P13	DRILL STARTER JET
			BUL 093-002	

DIAGNOSTIC REFERENCE LIST (Cont'd.)

Model	Year	Problem/Title	Location	Comments
6,8 3	84-90 88	TEARING OF SHIFT SHAFT BOOT IMPROVED CARBURETOR JETTING	MTG 91-P1 BUL O88-005	HESITATION
All	All	OXYGENATED FUELS	TCX O94-012	
All	All	OVERHEATING WHEN USING FLUSH ATTACHMENT	TCX O94-012	
All	All w/oil inj.	CHECKNG PRECISION BLEND OIL PUMP OUTPUT	MTG 95-P20	
All	All w/oil inj.	PRECISION BLEND SYSTEM INF.	MTG 95-P21	
All	All	REPLACEMENT IGNITION KEYS	TCX O94-011	

KEY: BUL - SEE SERVICE TECHNICAL BULLETIN. EXAMPLE: BUL O92-012; SEE BULLETIN O92-012 FOR EXHAUST GASKET REPLACEMENT INFORMATION.
 TCX - SEE TECH EXCHANGE - TECH EXCHANGES CONTAIN TWO OR MORE SUBJECTS AND ARE NUMBERED AND FILED IN YOUR TECHNICAL LIBRARY AS TECHNICAL BULLETINS
 MTG - SEE MARINE TECHNICAL GUIDE 19XX PAGE XX (Available on micro fiche). EXAMPLE: MTG93-P12; SEE 93 TECH., GUIDE, PAGE 12, FOR INFO ABOUT INCORRECT MOUNTING BOLTS ON THE '91 & '92 40EJ-JETDRIVE.
 MARINE TECHNICAL GUIDES ARE DISTRIBUTED *ONLY* AT YAMAHA'S ANNUAL UPDATE SEMINARS AND ARE NO LONGER AVAILABLE IN BOOK FORM. IF YOU DID NOT ATTEND THE UPDATE SEMINAR, MICROFICHE MUST BE USED. SEE ORDERING INSTRUCTIONS BELOW.

NOTE: AT THE END OF EACH CALENDAR YEAR, ALL TECHNICAL BULLETINS, FLAT RATE TABLES, AND UPDATE SEMINAR MATERIALS ARE FILMED ON MICROFICHE. IF YOU DID NOT ATTEND A SEMINAR OR IF YOU NEED MICROFICHE COPIES OF OLDER TECHNICAL BULLETINS, CALL 1-800-221-5362 TO ORDER THESE MATERIALS ON MICROFICHE.



WARRANTY INFORMATION

This bulletin is for information only. No special warranty applies.

ROUTE TO: SERVICE PARTS WARRANTY SALES



OUTBOARD

2/27/95

O95-005

SUBJECTS: 1. Reformulated Gasoline
2. Areas Exceeding Federal Ozone Standards

Reformulated Gasoline

Beginning January 1, 1995, extreme and severe non-ozone attainment cities are required to sell only reformulated gasoline (RFG) year round, not seasonally like Oxygenated fuels. Topic number 2 in this Tech Exchange contains a list of affected cities. Other serious, moderate, and marginal attainment areas will phase in this gasoline to fulfill their individual agendas for pollution abatement.

What is RFG?

As the name indicates, it is the next generation of fuels reformulated to reduce pollutants and protect the environment. The main focus of RFG is to reduce pollutants that affect the ozone, however, it will contain the same Oxygenates used in fuels that are currently being used (seasonally) in various mandated areas to lower CO emissions. Oxygenated fuels are primarily used between the months of October and February in these selected areas. The following table illustrates the major ingredients of RFG that will be reformulated and the environmental benefits of reformulation.

FOCUS OF FUEL REFORMULATING

Potential Reformulation

Reduce Sulfur
Reduce Benzene
Reduce Aromatics & Olefins
Reduce fuel volatility
Increase oxygen contents
Alter distillation characteristics
Deposit control additives

Environmental Benefits

Reduces acid rain, improves vehicle catalyst efficiency
Reduces incidence of cancer, reduces toxicity of emissions
Reduces photochemical reactivity/smog formation
Reduces evaporative emissions/smog formation
Reduces tailpipe/exhaust CO emissions, replaces toxic components
Control of evaporative & exhaust emissions
Reduce engine deposits, thus reducing exhaust emissions

Can Yamaha Products Operate On Reformulated Gasoline?

Extensive testing has been done on the affects of RFG on lubricity and material compatibility, **particularly with 2-stroke engines**. Results show no adverse affects or catastrophic failures when using RFG. Tests also indicate that no increase in service intervals beyond the existing Yamaha recommendations were necessary.

RUNNING CHARACTERISTICS WITH RFG

Because RFG contains oxygenates, the fuel mixture can lean-out slightly causing a rougher than normal idle. This can usually be corrected by small adjustments to the idle mixture screws. **Be sure to refer to your Yamaha technical specifications for correct fuel mixture settings!**

GUIDELINES FOR RFG USAGE

- Become familiar with the areas where RFG is sold. Normally the gas station will post a sign about the type of fuel they sell.
- Storage life of RFG is shorter than the fuel sold in the past. Treat stored fuel with Yamaha Fuel Stabilizer and Conditioner. Be sure to store gasoline in an approved container and place in a cool, dry place.
- In the case of large fuel tanks (such as in a boat or a large touring motorcycle), be sure to keep the tank completely full to prevent water accumulation. The expanding and contracting of the fuel causes air to enter the fuel tank. Water in the air will condense in the tank if the tank is not kept full.
- Be sure to use fresh fuel when doing a tune-up on any unit that has been in storage for a long time.

If you have technical tips you think other dealers could use, let us know. You'll receive credit in the Tech Exchange for ideas we use, and we'll send you an exclusive Yamaha Tech Exchange hat as our thanks.
Send your tips to: Yamaha Motor Corporation, U.S.A., Attn: Tech Exchange, P.O. Box 6555, Cypress, CA 90630

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Reformulated Gasoline (Cont'd.)

SUMMARY

More information will become available during the next year as RFG penetrates the market. If you want more information on gasoline, send for the technical manual, *Changes in Gasoline II* at:

Changes in Gasoline II
Technicians Manual
Downstream Alternatives, Inc.
PO Box 190
Bremen, IN 46506-0190

The cost of this manual is \$2.00 each.

Areas Exceeding Federal Ozone Standards

The following charts show the areas of the country that exceed the Federal Ozone Standards. The nine cities in the **Extreme and Severe** areas are required to start selling RFG during 1995. This program is optional in the other listed areas.

RFG FUEL AREAS EXCEEDING FEDERAL OZONE STANDARDS			
Extreme Areas*	Moderate Areas	Marginal Areas	
Los Angeles*	Atlantic City, NJ	Albany, NY	South Bend, IN
	Bowling Green, KY	Allentown, PA-NJ	Stockton, CA
Severe Areas*	Charleston, WV	Altoona, PA	Sussex County, DE
Baltimore, MD	Charlotte, NC-SC	Birmingham, AL	Tampa, FL
Chicago, IL-IN-WI	Cincinnati, OH-KY-IN	Buffalo, NY	Waldo County, ME
Houston, TX	Cleveland, OH	Canton, OH	York, PA
Milwaukee, WI	Dallas, TX	Columbus, OH	Youngstown, OH-Sharon, PA
Muskegon, MI	Dayton-Springfield, OH	Erie, PA	
New York, NY-NJ-CT	Detroit, MI	Essex County, NY	
Philadelphia, PA-NJ-DE-MD	Grand Rapids, MI	Evansville, IN-KY	
San Diego, CA	Greensboro, NC	Fayetteville, NC	
	Jefferson County, NY	Greenbrier County, WV	
Serious Areas*	Kewaunee County, WI	Greenville-Spartanburg, SC	
Atlanta, GA	Knox County, ME	Hancock County, ME	
Bakersfield, CA	Louisville, KY-IN	Harrisburg, PA	
Baton Rouge, LA	Memphis, TN-AR-MS	Indianapolis, IN	
Beaumont, TX	Miami, FL	Johnson City-Kingsport-Bristol, TN	
Boston, MA-NH	Modesto, CA	Johnstown, PA	
El Paso, TX	Nashville, TN	Kansas City, MO-KS	
Fresno, CA	Pittsburgh, PA	Knoxville, TN	
Hartford, CT	Portland, ME	Lake Charles, LA	
Huntington, WV-KY-OH	Raleigh-Durham, NC	Lancaster, PA	
Parkersburg, WV-OH	Reading, PA	Lewiston, ME	
Portsmouth, NH-ME	Richmond, VA	Lexington, KY	
Providence, RI	Salt Lake City, UT	Lincoln County, ME	
Sacramento, CA	San Francisco-Oakland-San Jose, CA	Manchester, NH	
Sheboygan, WI	Santa Barbara, CA	Montgomery, AL	
Springfield, MA	Smyth County, VA	Norfolk, VA	
Washington, DC-MD-VA	St. Louis, MO-IL	Owensboro, KY	
	Toledo, OH	Paducah, KY	
	Visalia, CA	Poughkeepsie, NY	
	Worcester, MA	Scranton, PA	

*Nine cities with highest ozone levels designated extreme or severe will be required to implement reformulated gasoline programs in 1995. Other ozone non-attainment areas may elect to "opt-in" to this program.

Oxygenated Fuel Sold Seasonally in These Areas Exceeding Federal Carbon Monoxide Standards			
Albuquerque, NM	Fairbanks, AK	Memphis, TN	Reno, NV
Anchorage, AK	Ft Collins, CO	Minneapolis, MN	Sacramento, CA
Baltimore, MD	Fresno, CA	Missoula, MT	San Diego, CA
Boston, MA	Grants Pass, OR	Modesto, CA	San Francisco, CA
Chico, CA	Greensboro, NC	New York/Northern NJ	Seattle, WA
Cleveland, OH	Hartford, CT	Philadelphia, PA	Spokane, WA
Colorado Springs, CO	Klamath County, OR	Phoenix, AZ	Stockton, CA
Denver/Boulder, CO	Las Vegas, NV	Portland, OR	Syracuse, NY
Duluth, MN	Los Angeles, CA	Provo/Orem, UT	Washington, DC
El Paso, TX	Medford, OR	Raleigh, NC	

Technical BULLETIN

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OUTBOARD

i INTRODUCTION

WARRANTY POLICIES

In the new **Yamaha Warranty and Y.E.S. Handbook** we have put together both the Motorsports and Marine versions of the previous Warranty Handbook, as well as the information contained in the *Yamaha Extended Service Policies and Procedures Manual*. This new handbook is much simpler and therefore easier to use.

Specific details about each product line's particular policies and procedures are no longer in the **Yamaha Warranty and Y.E.S. Handbook**. Instead, we provide this specific information to you in "Warranty Policies" Technical Bulletins like this one for each Yamaha product line you carry.

This makes finding the information you want even easier. When you want general policy and procedure information about Yamaha warranty, check the Handbook. When you know the policy but want to check the specific details that apply to the product line you carry, just check this quick-reference bulletin. This is also an advantage to you if a policy detail changes. We can provide the specifics in a new version of this bulletin rather than having you update your Warranty Handbook with several new pages.

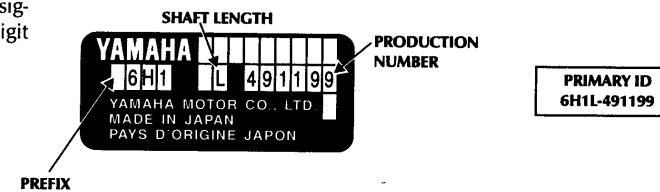
LIMITED WARRANTY STATEMENT INFORMATION

See **Yamaha Warranty and Y.E.S. Handbook**, Page 1-3 for more information.

Model	Warranty Period	Remarks	Limited Warranty Statement Part Number
Outboard Motor	Pleasure use: 2 Years Commercial use: 1 Year	Second year of warranty has some limitations. Refer to warranty statement.	LIT-18790-00-89
Jetdrive Outboard Motor	1 Year		LIT-18790-01-86

PRIMARY ID

The Primary ID of an outboard motor is the serial number which is on a label on the bracket. This number consists of a 3-digit model prefix, the shaft length designator, a hyphen, and a 6-digit production number.



AUTHORIZATIONS

Warranty repairs¹ on in-warranty units require authorization only if the *total repair* cost exceeds the following:

\$1,000.00 or below	Authorization NOT needed
\$1,000.01 or above	Call RTA for authorization

Total repair cost includes:

	Warranty	Y.E.S.
Parts	Dealer cost + 10% NOTE: There is a maximum handling reimbursement of \$150.00	YPAD Suggested Retail (except Major Assemblies ²)
Labor	Flat rate time at approved hourly rate + any extra labor claimed	Flat rate time at approved hourly rate + any extra labor claimed

¹See Page 7-5 of the **Warranty and Y.E.S. Handbook** if an accident or fire occurred.

²Major Assembly Replacement (Y.E.S.-only)

Three major assemblies are exceptions to the retail parts price policy. They are:

- Power Head Assembly
- Lower Unit Assembly
- Power Trim and Tilt Assembly

If you need to replace one of these assemblies as part of a Y.E.S. repair, you will need to call your RTA for authorization first. If the repair is authorized, Yamaha will send you the assembly at no charge. You do not put the assembly part number as the Primary Failed Part. Instead, to receive a parts handling reimbursement amount, use the appropriate part number shown below:

Y.E.S. Claim Primary Failed Part Number	Assembly Replacement	Reimbursement Amount
YES-PWRHD-00-00	Power Head	
YES-LOWER-00-00	Lower Unit	
YES-PTTRR-00-00	Power Trim & Tilt	

REIMBURSEMENT POLICY

Warranty labor reimbursement is initially set at 80% of your approved labor rate. Participation in Yamaha technical training programs increases reimbursement.

Base Reimbursement	80% of approved hourly rate
Attendance at annual Service Seminar	+ 10%
Attendance at Yamaha regional school	+ 10%

To get or maintain the full 100% reimbursement, both the annual Service Seminar and technical training course must be attended each year, unless Yamaha waives part of the requirement. See the annual Technical Training bulletin for more information.

Warranty and Y.E.S. Phone Numbers (Cont'd.)

Department	Phone Number	Purpose	Handbook Ref.
Warranty	1-800-227-5963	Registration questions Labor Rate Questions Recall questions	Chapter 5 Chapter 1 Chapter 8
Warranty FAX	(714) 761-7303	FAXing (rather than mail): • Registration transfer or correction documents • Warranty Appeals form • Other Warranty or Y.E.S. documents	Chapter 5 Chapter 10
Regional Technical Advisor	See "Toll-Free Service Assistance" Technical Bulletin	• Warranty Authorizations • Y.E.S. Authorizations • Out-of-Warranty Authorizations • Customer Relations Assistance • Technical Assistance	Chapter 7 Chapter 7 Chapter 7 Chapter 7
Y.E.S.	1-800-227-5963	Y.E.S. questions (except authorizations)	Chapters 2, 5
Customer Relations (Dealer Calls)	1-800-635-0736	• Return calls to Customer Relations • Accident or fire-related reports/authorizations	Chapter 7
Customer Calls: • Customer Relations	1-800-962-7926	• For customers who insist on talking to Yamaha instead of letting you help • Any recall questions	Chapter 7 Chapter 8
Distribution	(714) 761-7650	Shipping Damage Authorizations	Chapter 3
Technical Publications	(714) 761-7462	Replacement copies of: • Technical Bulletins (current) • Flat Rate Tables (current)	
Bell & Howell	1-800-221-5362	Microfiche of Service Manuals, Technical Bulletins or Flat Rates for previous year models, and seminar literature from past years — Ask for "Yamaha Customer Service."	
YCS or DOES PLUS Support	1-800-854-4876	Questions related to the use of your on-line entry computer program	

WARRANTY AND Y.E.S. LITERATURE

Outboard-Only Forms

Description	Part Number	Handbook Reference and Usage Notes
Outboard Pre-Delivery Inspection Checklist (25/pkg.)	LIT-18161-01-90	See Page 4-2. Checklist for procedures required before delivery to customer.
Outboard Motor Warranty Registration	LIT-18790-00-00	See Page 5-2. This is an alternative method for registration if DOES PLUS or YCS is not used, and neither the paper registration form or Owner's Manual registration card are available.

Warranty and Y.E.S. Forms (for all product lines)

Description	Part Number	Handbook Reference and Usage Notes
Warranty and Y.E.S. Handbook	LIT-11760-00-95	New edition — covers warranty and Y.E.S. for all products.
Warranty Request Worksheets (25/pkg.)	LIT-11801-00-02	See Chapter 6. Fill out before submitting warranty or Y.E.S. claim on DOES PLUS or YCS.
Warranty Request Forms (25/pkg.)	LIT-11791-01-00	See Chapter 6. Mail-in warranty or Y.E.S. claim form if YCS or DOES PLUS is not used.
Warranty Request Parts Supplement (25/pkg.)	LIT-11791-00-01	See Page 6-7. For mail-in requests if request has more than 10 parts.
Transfer of Owner Registration (10/pkg.)	LIT-11790-07-83	See Page 5-7. Update registration records with new owner and transfer any warranty or Y.E.S. coverage.
Warranty Registration Correction Form (5/pkg.)	LIT-11792-00-00	See Page 5-6. For correcting warranty or Y.E.S. registration errors.
Warranty Return Envelopes (25/pkg.)	LIT-11784-00-01	Pre-addressed envelopes for mailing documents to Warranty Department.
Warranty Status Chart Pads (50/pad)	LIT-11790-00-00	See Chapter 10. Track status of warranty and Y.E.S. claims.
Warranty Parts Tags (50/pkg.)	LIT-11790-02-00	See Page 9-1. Identify parts claimed on warranty requests.
Warranty Document ID Form (25/pkg.)	LIT-11791-00-04	See Page 1-6. Identify any supporting documents mailed to Warranty.
Recall Reimbursement Request (10/pkg.)	LIT-11790-00-94	See Page 8-2. Mail-in form to request reimbursement for Factory Modification Campaign if YCS or DOES PLUS is not used.
Warranty Labor Rate Change Request	LIT-11791-02-95	See Page 1-5. Request setup or change of the labor rate amount used to calculate warranty reimbursement.
Service Schedule Pad (25/pkg.)	LIT-11561-00-95	Used to schedule service work. Includes column for warranty request information.
Warranty Error Notification Explanation Booklet	LIT-11791-01-94	See Page 10-3. Used only if registrations and warranty requests are mailed in on paper forms, and there are errors.

Y.E.S.-Only Forms

Description	Part Number	Handbook Reference and Usage Notes
Y.E.S. Plan Highlights Form for Outboards (10/pkg.)	LIT-11580-00-30	See Page 2-2. Sales tool to explain benefits of Y.E.S. plan to customer.
Sample Y.E.S. Contract for Outboard (10/pkg.)	LIT-11580-00-31	See Page 2-2. Given to each customer at the time of sale. The actual "live" contract is mailed to the customer separately by Yamaha.
Y.E.S. Plan Registration Card (10/pkg.)	LIT-11580-00-04	See Page 5-5. Used to register Y.E.S. coverage sold after unit purchase (not needed if DOES PLUS or YCS is used).
Y.E.S. Lienholder Information (20/pkg.)	LIT-11580-00-08	See Page 5-4. Used when lienholder requests additional documentation about the Y.E.S. coverage.
Y.E.S. Plan Request to Cancel (5/pkg.)	LIT-11580-00-10	See Page 2-5. Required for cancellation of Y.E.S. Plan.
Y.E.S. Outboard Hangtags (10/pkg.)	LIT-11580-00-32	For product display. Lists main customer benefits of coverage.
Y.E.S. Price Tags (20/pkg.)	LIT-11580-00-17	For product display. Promotes Y.E.S. coverage with convenient monthly payment information.
Y.E.S. Poster for Outboard (20/pkg.)	LIT-11580-00-33	Point-of-purchase poster with key benefits.
Factory Service Brochures for Outboard (20/pkg.)	LIT-11580-00-34	Sales brochure for Y.E.S. with features and benefits.

Florida Y.E.S. Forms

Description	Part Number	Handbook Reference and Usage Notes
Florida Y.E.S. Plan Highlights & Contract	Call Y.E.S.	See Page 2-2. A "live" contract required when Y.E.S. is sold in Florida.
Florida Envelopes (10/pkg.)	LIT-11580-FL-02	Used to mail contracts to Yamaha.

ROUTE TO: SERVICE PARTS WARRANTY SALES PAGE 5 OF 5



- SUBJECTS:** 1. Fuel Pump/Fuel System Testing - All Outboard Models
2. Power Trim & Tilt Main Valve Availability - 70, 90
3. Tiller Handle Kit P/N Correction - C60U, 70U

Fuel Pump/Fuel System Testing - All Outboard Models

When a fuel starvation problem is suspected (e.g., engine hesitation or engine stopping), perform the following fuel system test:

TOOLS REQUIRED

- 1 Vacuum Gauge
- 1 "T" Fitting (P/N 6E5-24378-00-00)
- 1 2" Clear Fuel Hose (5/16" or 8mm ID)
- 1 Long Fuel Hose (10' - 15')
- 2 Hose Clamps or Quick Ties

TEST PROCEDURE

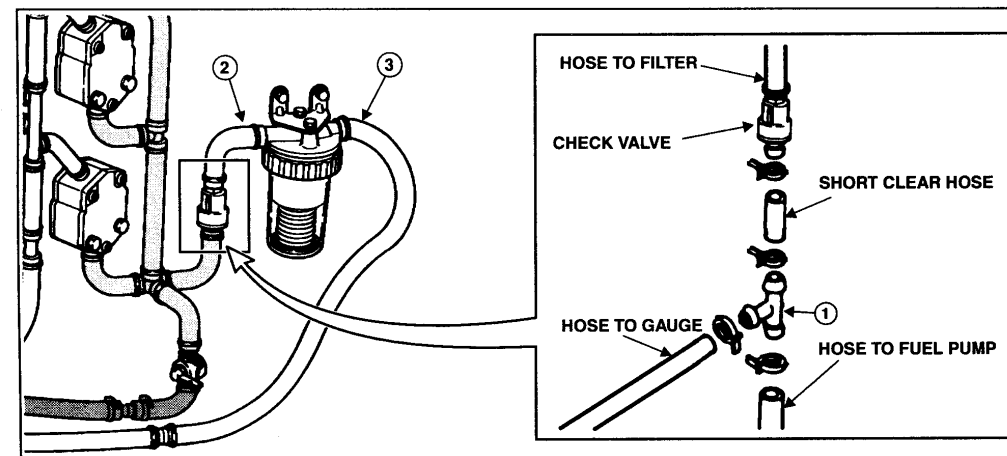
- 1. Connect the piece of clear fuel hose to a side barb of the "T" fitting (1).
- 2. Connect one end of the long piece of fuel hose to the vacuum gauge and the other end to the center barb of the "T" fitting.

NOTE: Use a long enough piece of fuel hose so the vacuum gauge may be read at the helm.

- 3. Remove the existing fuel hose from the fuel tank side of the fuel pump, and connect the remaining barb of the "T" fitting to the fuel hose (see diagram below).
- 4. Connect the short piece of clear fuel hose to the fuel check valve leading from the fuel filter. If a check valve does not exist, connect the clear fuel hose directly to the fuel filter (see diagram below).
- 5. Check the vacuum gauge reading after running the engine long enough to stabilize at full power.

IMPORTANT: The vacuum is to not exceed 4.5 inches for up to 200hp engines. The vacuum is to not exceed 6.0 for engines greater than 200hp.

An anti-siphon valve (required if the fuel system drops below the top of the fuel tank) will cause a 1.5 to 2.5 inches increase in vacuum.



If you have technical tips you think other dealers could use, let us know. You'll receive credit in the Tech Exchange for ideas we use, and we'll send you an exclusive Yamaha Tech Exchange hat as our thanks. Send your tips to: Yamaha Motor Corporation, U.S.A., Attn: Tech Exchange, P.O. Box 6555, Cypress, CA 90630

RESULTS

High Vacuum - Move the "T" fitting to the fuel filter outlet (2) and retest. Continue to the fuel filter inlet (3) and along the remaining fuel system until a large drop in vacuum locates the problem.

- a. A good clean water separator fuel filter will increase vacuum about 0.5 inch.
- b. Small internal passages inside a fuel selector valve, fuel tank pickup, or fuel line fittings may cause excessive fuel restriction and high vacuum.

- c. Unstable and slowly rising vacuum readings (especially with a full tank of fuel) usually indicates a restricted vent line.

NOTE: Bubbles in the clear fuel line section indicate an air leak; making for an inaccurate vacuum test. Check all fittings for tightened clamps and a tight fuel filter.

IMPORTANT: Vacuum gauges are not calibrated and some may read as much as 2 inches lower than the actual vacuum. It is recommended to perform a fuel system test while no problems exist to determine vacuum gauge accuracy.

Power Trim & Tilt Main Valve Availability - 70, 90 (1984N ~ '87H)

*The following Tech Exchange was submitted by Mark Corbett of Tide Runner Boats, Inc. in Tacoma, WA.
Thanks Mark! Your Tech Exchange hat is on the way!*

The original main valve (6H1-43802-00-00) on the Power Tilt & Trim Assembly (6H1-43800-01-EK) is no longer available and was incorrectly superseded to an incorrect main valve. The main valve 6G5-43802-00-00 reportedly does work

properly with the power tilt & trim assembly. The superseded main valve has been discontinued, and the correct 6H1 main valves are now being ordered by YPAD.

Tiller Handle Kit P/N Correction- C60U, 70U

The Tiller Handle Kit specified in the 1996 Accessory Catalog (pages 6 & 20) and the 1996 Outboard Rigging Specs (page 6-37) lists the

incorrect part number. The correct part number is 6H3-W0086-D0-00. Please correct your books accordingly.

Technical BULLETIN

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Repainting Yamaha Marine Products

i INTRODUCTION

Proper painting of Yamaha marine products is very important for both appearance and corrosion protection. Yamaha has conducted considerable research developing paint and painting processes to provide customers with a long lasting, high quality paint. YPAD has also spent considerable time developing touch up spray paint to allow paint repairs of similar quality as the original. Paint matching is achieved through following proper preparation and painting procedures. This bulletin provides the needed information to insure this match is obtained.

PREPARATION MATERIAL: Salt Water Cleaning Solution = 75% Vinegar & 25% Water
400 & 600 Grit Wet and Dry Sandpaper
Standard Painting Tack Cloth

PAINT: (All paints are 13oz. spray cans).

Color	Code	Part Number	Comments/Usage
Dark Blue Gray Metallic	04D	PNT-93000-S0-4D	1994(S) and later models. Use with clear coat for 08D.
Clear Top Coat		PNT-65000-04-00	Use with 04D to produce 08D 1996 and later color. Includes UV protection.
Marine Primer		PNT-00000-SP-WV	Epoxy based Marine Primer
Gray Primer		PNT-00000-00-86	Older Optional Primer
Metallic Marine Silver Spray	0EK	PNT-87000-S0-EK	1984 to '93 Standard Outboard
YEMS Silver	0EK	PNT-92YEM-SP-00	All YEMS Stern Drives
EST Silver	0EK	PNT-92EST-SP-00	All EST Stern Drives
Shiny Black Spray	0NA	PNT-91000-S0-NA	1990 and later Pro V Lower Unit and Lower Mount Covers. V76X Cowlings
Marine Dark Silver	0NG	PNT-92000-S0-NG	1986 to '89 Pro V Lower Unit and Lower Mount Covers
Metallic Marine Blue	0EJ	PNT-90000-S0-EJ	1989 to '91 C Models

TOUCH UP PAINT: (1/2 oz. brush in the cap).

Color	Code	Part Number	Comments/Usage
Metallic Marine Silver	0EK	PNT-84000-T0-EK	1984 to '93 Standard Outboard
Shiny Black	0NA	PNT-86000-T0-NA	1990 and later Pro V Lower Unit and Lower Mount Covers. V76X Cowlings
Harbor White	0EL	PNT-85000-T0-EL	FT, T9.9 1985 to '94

PREPARATION

1. Select a dust free and wind protected area with adequate ventilation.
2. Clean all unpainted surfaces of any salt water deposits by using a solution of 75% vinegar and 25% water.
3. Rinse all surfaces being painted with clean water and allow to dry.
4. Be sure all surfaces being painted are completely dry and free from moisture, grease, oils and lubricants.
5. Sand all fiberglass, aluminum, and molded plastic surfaces to be painted with 400 grit wet and dry sandpaper. The purpose is to rough-up the surface so the primer will adhere better.
6. Mask off all areas not being painted. For best results, mask an area to a clean break point such as an edge, gap, etc.

PRIMING

1. Apply Yamaha Marine Primer in several thin coats at 5 to 8 minute intervals.
2. Apply the primer by spraying in one direction from top to bottom.
3. Use long even strokes, and be sure to spray past the area to be painted by several inches.
4. After thirty minutes to one hour, lightly sand the primer with 600 grit wet and dry sandpaper.

IMPORTANT: If scratches, pitting or imperfections appear, repeat steps 1~4 above until a smooth even surface is achieved.

5. Apply at least two primer coats to match the original factory process.
6. Allow the primer to set at least 4 hours in temperatures of over 75°F (overnight if temperatures are less or humidity is high).
7. Before applying the finish coat, wipe the surface with a tack cloth. Be careful to remove all dust from the surfaces to be painted.

FINAL PAINTING

IMPORTANT: Heavier paint products will eventually settle to the bottom of a spray can. The longer the can has set on the shelf the longer you will need to shake the can to properly mix the paint or proper color match will not occur. Shake the paint can at least one minute after hearing the ball rattle (most clear coating paints do not contain a ball). Extend the shaking time for any paint can that has been in storage an extended time.

It is difficult to properly match older Yamaha paint products. The EK color is difficult to match, because the EK spray paint may change color during long time storage. Proper shaking of the can with EK paint is especially important.

Yamaha Marine Finishes are made from the highest grade polyurethane resins available. They are formulated to set-up slowly; allowing the clear resin to surface as it dries.

1. Apply a Yamaha Marine Finish Paint over the primer in several thin coats.

NOTE: Applying thick, uneven coats may not allow the coating to dry properly, which may result in a loss of adhesion.

2. Apply several fog coats at 5 to 8 minute intervals holding the aerosol can approximately 14 inches from the surface being painted.
3. After several fog coats have been applied, move the aerosol can 10 inches from the surface. Apply thin even coats until the proper color is achieved.
4. When ready to apply the final coat, move the spray can 6 inches from the surface, and applying a single heavier final coat.

IMPORTANT: Be careful not to run the paint. If the paint is allowed to completely dry between coats, be sure to sand between coats with 600 grit wet & dry sandpaper.

FINAL CLEAR COAT

Yamaha Clear Coat may be added to provide a physical protection layer and match the Yamaha original factory finish. Other clear coats are not recommended, since they may have a chemical imbalance with the new finish coat and cause a mismatch, foggy look or paint lifting.

FINAL DRYING AND CURING

It is not recommended to use heat as an aid in curing paint. Excessive heat may damage the fresh paint. If heat is used, be sure to wait 4 hours before applying it to the final paint. Although the finish will appear dry overnight, it will not be totally cured for several days. If possible, do not subject painted surfaces to water for 6 to 7 days.

NOTE: If some dull spots appear on the surface, they may be rubbed out using a quality grade polishing compound. Wax the painted surfaces with a good marine wax before using the marine item. Do not apply polishing compounds and wax until the paint is completely cured.

PAINT CAN STORAGE

1. If you are going to let the can stand idle for more than twenty minutes, be sure to turn the can upside down, and spray until no paint comes out of the nozzle. Another method of clearing a spray nozzle before storing, is to put the nozzle on a can of contact cleaner and spray for a few seconds.
2. Store partially used spray cans upside down to reduce the chance of the paint thickening and stopping up the nozzle as you begin to spray.

NOTE: Empty spray cans are recyclable in most cities. Check with your local disposal or recycle company.



WARRANTY INFORMATION

Following the above procedure will produce a paint finish virtually equal to the factory finish in both appearance and corrosion protection. The above repainting procedure may be used to repair any shipping damage or other paint & finish problem covered by the normal Yamaha warranty.

ROUTE TO: SERVICE PARTS WARRANTY SALES

PAGE 3 OF 3



- SUBJECTS:** 1. Rough Idle - 25HP Engines
2. Finding Oil Leaks - All Models
3. Cleaning Gasket Surfaces - All Models

Rough Idle - 25HP Engines

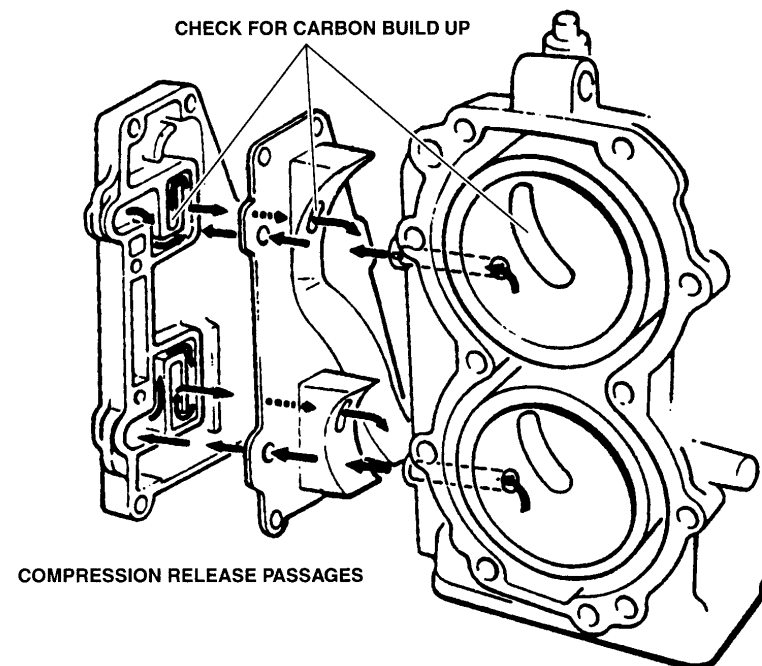
The following Tech Exchange was submitted by Jerry Herota of Buck's Outboard Repair, Inc. in Sacramento, CA. Thanks Jerry! Your Tech Exchange hat is on its way!

If you have a 1988 or later model (20hp or 25hp) outboard engine with a rough idle, examine the carburetion, engine compression, and spark. If they all check out okay and the manual starter seems harder to pull than usual, check for carbon build up in the built in compression release

(refer to pg. 2-6 in the 1996 Marine Technical Guide).

NOTE: Carbon build up is more common if the customer is using some other oil than "Yamalube for Outboards."

AIR FLOW DURING STARTING



If you have technical tips you think other dealers could use, let us know. You'll receive credit in the Tech Exchange for ideas we use, and we'll send you an exclusive Yamaha Tech Exchange hat as our thanks. Send your tips to: Yamaha Motor Corporation, U.S.A., Attn: Tech Exchange, P.O. Box 6555, Cypress, CA 90630.

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Finding Oil Leaks - All Models

If you have trouble finding an oil leak, try performing a powder check. A powder check is performed as follows:

1. Clean the suspected area fully of all oil residue and dry fully. Yamaha Mud, Grease and Engine Cleaner (ACC-MUDGR-CL-NR) and Simple Green (ACC-SMPGR-00-24) both work well for this. Make sure the area is completely dry.
2. Sprinkle some talcum powder, baby powder or other light powder over the area of the suspected leak. An aerosol can that dispenses light powder (e.g., deodorant or foot powder) may also be used. Make sure the suspected area has a remaining coat of the

dry powder. If any wet spots appear, this may be where the leak is located. If the spot is wet from incomplete cleaning, note the spot and repeat steps 1 and 2.

⚠ WARNING

Use the powder in a well ventilated area and use adequate protection from breathing any of the powder. Read the label on the powder container to insure it is safe to use.

3. Briefly start the engine or operate the device in question (e.g., the power trim and tilt). Inspect the dry powder for a new wet spot indicating the start of a leak. **NOTE:** Additional engine running may be necessary if there is no indication of a leak.

Cleaning Gasket Surfaces - All Models

When repairing an engine, lower unit, or other item using fabric gaskets, the removal of all the small pieces of old gasket may be quite time consuming. First, apply several coats of MEK (Methyl Ethyl Ketone) with a brush to the old gasket. While thoroughly soaked, remove the large pieces of the old gasket using a scraper, if necessary. Then, use a standard 1" to 2" by 6" to 8" flat sharpening stone with solvent to rub (as if using sandpaper) the remaining gasket material from the casting. This will not only easily

remove the small pieces of old gasket, but will remove any glue and smooth out any nicks to produce a nice, clean surface for the new gasket.

NOTE: Use a standard, double sided medium/fine grit sharpening stone large enough to span the openings when preparing the crankcase or other large castings. The stone may be readily purchased from sporting goods stores and some tool suppliers.

Technical BULLETIN

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1997 MODELS OUTBOARD SERVICE LITERATURE

This bulletin contains a comprehensive listing of service literature available for 1997 models. Certain models will not have new literature if the prior year's information is still current. Those literature part numbers will still be listed, but "Same as . . ." will occur in the Remarks column. Other information on publications interchangeability may also be found in the Remarks column. This bulletin also lists other publications related to your dealership operations. All publications can be ordered from Yamaha Parts and Accessories.

Model	Publication	Part Number	Remarks
2V	Owner's Manual Service Manual	LIT-18626-02-59 LIT-18616-01-31	
3V	Owner's Manual Service Manual	LIT-18626-02-59 LIT-18616-01-63	
4V, 5V	Owner's Manual Service Manual	LIT-18626-02-59 LIT-18616-01-33	
6V, 8V	Owner's Manual Service Manual	LIT-18626-02-60 LIT-18616-01-64	
9.9V, 15V	Owner's Manual Service Manual	LIT-18626-02-60 LIT-18616-01-65	
F9.9V, T9.9V	Owner's Manual Service Manual	LIT-18626-02-66 LIT-18616-01-35	
20V, 25V, 25V(2)	Owner's Manual Service Manual	LIT-18626-02-61 LIT-18616-01-66	
C25V/C30V	Owner's Manual Service Manual	LIT-18626-02-68 LIT-18616-01-67	
25V(3), 30V	Owner's Manual Service Manual	LIT-18626-02-61 LIT-18616-01-68	
C40V	Owner's Manual Service Manual	LIT-18626-02-68 LIT-18616-01-50	
40V, 50V	Owner's Manual Service Manual	LIT-18626-02-62 LIT-18616-01-38	
28 & 35 Jet Drive Models	*Operation & Service Manual (Supp.)	LIT-18619-00-95	
E48V	Owner's Manual Service Manual	LIT-18626-02-70 LIT-18616-01-28	Same as E48T
F50V, T50V	Owner's Manual Service Manual	LIT-18626-02-67 LIT-18616-01-48	Supp. to LIT-18616-01-23

Model	Publication	Part Number	Remarks
E60V	Owner's Manual Service Manual	LIT-18626-02-70 LIT-18616-01-72	
P60V, 70V, P75V, 90V, B90V 65 Jet Drive Model	Owner's Manual Service Manual *Operation & Service Manual (Supp.)	LIT-18626-02-63 LIT-18616-01-69 LIT-18619-00-95	
E75V	Owner's Manual Service Manual	LIT-18626-02-70 LIT-18616-01-73	
C60, C80V	Owner's Manual Service Manual	LIT-18626-02-69 LIT-18616-01-69	
C115V	Owner's Manual Service Manual	LIT-18626-02-69 LIT-18616-01-70	
115V, 130V, L130V 80 Jet Drive Model	Owner's Manual Service Manual *Operation & Service Manual (Supp.)	LIT-18626-02-64 LIT-18616-01-70 LIT-18619-00-95	
C150V 105 Jet Drive Model	Owner's Manual Service Manual *Operation & Service Manual (Supp.)	LIT-18626-02-69 LIT-18616-01-71 LIT-18619-00-95	
150V, P150V, 175V, P175V, 200V, P200V, 225(L), L150V, L200V	Owner's Manual Service Manual	LIT-18626-02-64 LIT-18616-01-71	
D150V	Owner's Manual Service Manual	LIT-18626-02-80 LIT-18616-01-71	
225(X/U)V, L225V, 250V, L250V	Owner's Manual Service Manual	LIT-18626-02-65 LIT-18616-01-61	

*This manual is included with all Jet Drive models along with the standard Owner's Manual for the particular propeller drive model the Jet Drive model is based on.

OTHER OUTBOARD PUBLICATIONS

Dual Station System Owner's Manual	LIT-18626-01-59	
Warranty Statement—Outboard	LIT-18790-00-89	
Warranty Statement—Jet Drive	LIT-18790-01-86	
Outboard Rigging Specs (1996)	LIT-18865-00-96	
Outboard Rigging Specs (1996-1997) (Supp.)	LIT-18865-00-97	
1996 Service Data Poster	LIT-18531-00-14	
Warranty & Y.E.S. Handbook	LIT-11760-00-95	
Parts Policies & Procedures Manual	LIT-10080-05-00	
Service Appointment Pad	LIT-11561-00-80	
Heavy-Duty Service Binder	LIT-18501-00-87	

NOTE: Pages 77 and 78 of the "1997 Marine Power Marketing Guide" are incorrect. Please remove these pages and insert a copy of this Technical Bulletin in their place.