POLARIS
INDUSTRIES INC.

1992 • 1998
PERSONAL WATERCRAFT
SERVICE MANUAL

Foreword

This manual is designed primarily for use by Polaris personal watercraft service technicians in a properly equipped shop. Persons using this manual should have a sound knowledge of mechanical theory, tool use, and shop procedures in order to perform the work safely and correctly. The technician should read the text and be familiar with service procedures before starting the work. Certain procedures require the use of special tools. Use only the proper tools, as specified. Cleanliness of parts and tools as well as the work area is of primary importance.

This manual includes procedures for disassembly and reassembly, inspection, maintenance, component identification and unit repair, along with service specifications for all 1992 - 1998 Polaris personal watercraft. A table of contents is placed at the beginning of each chapter to aid the user in locating specific areas of information. The alphabetic index at the end of the manual will help the user find specific information quickly.

Care is take"n to ensure that all information in this manual was technically correct at the time of publication. However, all materials and specifications are subject to change without notice.

Comments or suggestions about this manual may be directed to: Service Publications, Supervisor, Polaris Industries Inc., 1225 Highway 169 North, Minneapolis, MN 55441-5078.

Technical Training Center

Minneapolis, MN 55441

1992-1998 Personal Watercraft Service Manual (PN 9912201)

Printed in U.S.A.

UNDERSTANDING SAFETY LABELS AND INSTRUCTIONS

Throughout these instructions, important information is brought to your attention by the following symbols:

The Safety Alert Symbol means ATTENTION! BECOME ALERT' YOUR SAFETY IS INVOLVED'

DANGER

Failure to follow DANGER instructions will result in severe injury or death to the operator, passenger, bystander or person inspecting or servicing the watercraft.

WARNING

Failure to follow WARNING instructions could result in severe injury or death to the operator, passenger, bystander or person inspecting or servicing the watercraft.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid minor personal injury, or watercraft or property damage.

NOTE:

A NOTE provides key information to clarify instructions.

Polaris acknowledges the following products mentioned in this manual:

Loctite, Registered Trademark of the Loctite Corporation
FLEXLOC, Registered Trademark of SPS Technologies
MityVac, Registered Trademark of Neward Enterprises
Torx, Trademark of Textron
Teflon, Trademark of DuPont
Vortex, Trademark of Ocean Pro
Alemite, Trademark of Alemite Corporation

SPECIAL TOOLS

Special tools described in this manual may be ordered directly from the Victor Specialty Tool Company. The toll free order FAX number is 1-800-716-3938 (orders only please). Phone 716-742-1790.
Address:
Victor Specialty Tool Co
66 School St.
Victor, NY 14564

CHAPTER 1
GENERAL INFORMATION

Watercraft Publication Part Numbers

Year	Model	Model No. (International)	Owner's Manual	Parts Book	Micro-Fiche (Set)
1992	SL650	8924058	9912153	9912292	9913434
1993	SL650	8934058	9912443	9912473	(9913435)
	SL750	8934070	9912443	9912475	
	SLT	8934170	9912484	9912594	
1994	SL650	8944058	9912645	9912699	(9913436)
	SL750	8944070	9912645	9912701	
	SLT	8944170	9912484	9912594	
1995	SL650 (SL650 International)	8954058 (1954058)	9912969	9913048	(9913437)
	SL650 STD (SL650 STD International)	8954358 (1954358)	9912969/ 9913375'	9913292	
	SL750 (SL750 International)	8954070 (1954070)	9912969	9913052	
	SLTI50 (SLTI50 International)	8954170 (1954170)	9912993	9913056	
	SLX780 (SLX780 International)	8954287 (1954287)	9913290	9913395	
1996	SL700 (SL700 International)	8964066 (1964066)	9913562	9913563	(9913438)
	SLTlOO (SLTlOO International)	8964166 (1964166)	9913287	9913392	
	SL780 (SL780 International)	8964087 (1964087)	9913551	9913552	
	SL900 (SL900 International)	8964291 (1964291)	9913557	9913558	
	SLX780 (SLX780 International)	8964287 (1964287)	9913551	9913744	
	SLTI80 (SLTI80 International)	8964588 (1964588)	9913567	9913568	
	Hurricane (Hurricane International)	8964466 (1964466)	9913572	9913573	
	SLTX (SLTX International)	8964590 (1964590)	9913577	9913578	
1997	SL700	8974071	9913919	9914087	(9914732)
	SL700 Deluxe	8974072	9913919	9914087	
	SLT700	8974572	9914111	9914112	
	Hurricane	8974473	9913926	9914104	
	SL780	8974088	9914091	9914092	
	SLTI80	8974588	9914116	9914117	
	SLX PRO 785	8974978	9913923	9914125	
	SL900	8974091	9914102	9914097	
	SL1050	8974090	9914096	9914097	
	SLTX	8974590	9914120	9914121	
1998	SLH	8984673	9914731	9914516	9914517
	SLTH	8984573	9914731	9914655	9914656
	SLXH	8984690	9914731	9914511	9914512
	SLTX	8984590	9914731	9914631	9914632

, Addendum

GENERAL INFORMATION
Service Bulletin Index

Service/Information Bulletins· 1992

PWC-92-01	1. Driveshaft Coupler Lubrication Interval
	2. Flame Arrestor Intake Cover Sealing on Craft Before Ser. # 00097
	3. Storage Cover Hinges and Insert Bolt Torque
PWC-92-02	Dnveshaft Seal/Bearing Housing Oil Reservoir Tube
PWC-92-03	Engine Oil Injection Line Damage
PWC-92-04	SL 650 Carburetion Setup and Adjustments
PWC-92-05	1. Paint Codes and Refinishing Procedure for SL 650
	2. SL 650 Cylinder Head Gasket Positioning
	3. Optional Jet Pump Impeller for SL 650
PWC-92-06	SL 650 Engine Cooling System Revision
PWC-92-07	SL 650 Engine Cooling System Check Valve Installation
PWC-92-08	Lanyard Cord Switch Adjustment
PWC-92-09	SL650 Engine Spark Plugs
PWC-92-10	SL650 Engine Draining Procedures for Cold Weather Storage

Service/Information Bulletins· 1993

PWC-93-01	Incorrect Ride Plate Installed on Some 1993 SL750 Model Watercraft
PWC-93-02	1992 SL650 Fuel Tank Drop Tube Retaining Cap
PWC-93-03	1992 SL650 Update Kit PN 2200475
PWC-93-04	Lanyard Cord Switch Adjustment
PWC-93-05	1993 Model PWCs with Low Oil Warning Buzzers That Remain On After Oil Tank Has Been Filled
PWC-93-06	Air Intake Silencer Mounting Bolts
	1993 SL650 Model #B934058 (all)
	1993 SL750 Model #B934070 through Serial #PLE07000C393
PWC-93-07	1. All 1992 and 1993 SL650 and SL750 Fuel Tank Drop Tube Retaining Cap
	2. Fuel Tank Drop Tube Lines and Clamps
	3. Oil Tank Lower Elbow Fitting Inspection
PWC-93-08	1. Speedometer Kit Installation on 1992 SL650 Watercraft
	2. Quick Trim System not Staying in Set Position
	3. Inspection of Oil System, Fuel System Vent Lines and Check Valves
PWC-93-09	Oil Tank Lower Elbow Fitting Replacement

Service/Information Bulletins - 1994

PWC-94-01	1. Spark Plug Caps Improperly Installed on the Coil High Tension Leads 2. Insufficient Torque on Cylinder Head Nuts 3. Spark Plug Type Listed Incorrectly in Owner's Manual
PWC-94-02	Retention of the air Intake Duct Drain Hose
PWC-94-03	1. Fiberglass Gel Coat Surface Crazing (Spider Webbing) 2. A Limited Number of 1994 SLTs may need Fiberglass Trimmed from the area below the rub rails in the rear corners
PWC-94-04	Possible Water Leak on SLT Drive Shaft Through-hull Fitting
PWC-94-05	Engine Cooling Water Inlet Hose
PWC-94-06	1. Exhaust Manifold Fasteners 2. Prevention of Water Leakage
PWC-94-07	1994 SLT Seat and Compartment Door Seals
PWC-94-08	Front Seat Latch Plate Wear Into Gel Coat on some 1994 SLTs
PWC-94-09	All 1994 SL650, SL750 & SLT, Fuel Tank Drop Tube Retaining Cap
PWC-94-10	1994 SL750 Power Trim Nozzle Fasteners
PWC-94-11	1. 1994 SLT Water Leaks at Steering and Reverse Cable 2. All 1994 Watercraft. Rear Muffler Bracket may wear through water supply hose
PWC-94-12	All 1994 Watercraft. Possible water ingestion through the air intake
PWC-94-13	1994 SLT Fuel Tank Vent Relocation

Service/Information Bulletins - 1995

PWC-95-01	1994 SLT - Reinforcement Of Driveshaft Through Hull Fitting
PWC-95-02	1994 SLT - Fuel Tank Vent System Update
PWC-95-03	All 1994 Models - Failure Of Vacuum Controlled Fuel Valve
PWC-95-04	1995 SLT - Loose Hose Clamp On Exhaust Cross-Over Hose
PWC-95-05	All 1995 Models - Cracked Or Broken Stems On Fuel Tank Pick-up/Sender Unit
PWC-95-06	All 1995 Models - Defective Oil Tank Fitting
PWC-95-07	All 1995 Models - Kinked Fuel Lines
PWC-95-08	1995 SL650/750 - Incorrect Fuel Line Routing
PWC-95-09	1995 SL650/750 - Loose Front Bumper
PWC-95-10	All 1995 Models - Bilge Siphon Fitting Restricted Or Plugged
PWC-95-11	All 1995 Models - Steering Cable Adjustment Procedure
PWC-95-12	All 1995 Models - Grab Handle Cracking
PWC-95-13	1995 SLX 780 - Intermittent Hard Starting

Service/Information Bulletins - 1995 (Cont.)

PWC-95-14	1995 SL650/SL650 STD - Piston Damage Or Lean Condition At High Throttle Settings
PWC-95-15	All 1992-1995 SL650; SL650 STD; SL750; SLX780 - Improved Seat Seal Kit
PWC-95-16	All 1993-1995 Model Watercraft - Cooling Water Hose Damage
PWC-95-17	1995 SL650 STD; 1995 SLX 780 - Threaded Through Hull Fitting May Loosen
PWC-95-18	All 1992-1995 Model Watercraft - Fuel Valve Restriction May Cause Lean Condition
PWC-95-19	1994 - 1995 SLT 750 - Fuel Cap Cracking
PWC-95-20	All 1995 Watercraft - Improved Steering Cable Retention
PWC-97-05	All 1995-1996 Watercraft Fuel Inlet and Cap Replacement

Service/Information Bulletins - 1996

PWC-96-01	1996 SLT700 - Flywheel Replacement and Cylinder Head Bracket Installation
PWC-96-02	All Except SUSLT 700 - MFD Malfunction
PWC-96-03	SLTX - Temperature Sensors Incorrect Or Missing
PWC-96-04	All 1996 PWC - Loose Handgrips
PWC-96-05	1996 SL900 and SLTX - Improved Throttle Response On Initial Acceleration
PWC-96-06	1996 SLT 780 - Steering Cable May Contact The Drive Coupler
PWC-96-07	All 1992-1995 Models; All 1996700,780, & Hurricane Models - Fuel Valve Restriction May Cause Lean Condition
PWC-96-08	1996 SLTX - Revised Carburetor Jetting For SLTX
PWC-96-09	1996 Hurricane - Loose Engine Mounting Bolts and Air Filter Mounting Studs
PWC-96-10	All 1996 Model Watercraft (Except Hurricane) - Leaks At Bilge Plug
PWC-96-11	1996 SL700; SLT700; Hurricane; SL900; - Oil Pump a-Ring Leakage
PWC-96-12	1996 SL700; SLT700; Hurricane; SL900; SLTX; - Loose Or Broken Cylinder Head Bolts
PWC-96-13	1996 Hurricane - Handlebars May Develop Cracks
PWC-96-14	1996 SL780; SLT780; SLX 780 - Carburetor Hi/Low Screw Settings
PWC-96-15	1996 Hurricane - Hood Seal Replacement
PWC-97-05	All 1995-1996 Watercraft Fuel Inlet and Cap Replacement

Service Bulletins - 1997

PWC-97-01	1997 SL1050 - Quality Assurance Upgrades To Engine And Pump
PWC-97-02	1997 SLTX - Quality Assurance Upgrades To Engine, Pump, and Compartment Door
PWC-97-03	1997 SLTX Compartment Door Latch Plate Replacement
PWC-97-04	1997 SLX Pro 785 Compartment Door Latch Plate Replacement
PWC-97-05	All 1995-1996 Watercraft Fuel Inlet and Cap Replacement

Service Bulletins - 1998

PWC-98-01	1998 SLX Pro 785 Cooling Water Outlet Hose Restrictor

1996 PWC Bulletin Index By Model

Model	Bulletin #	Type	Notes
All 1996 Models			
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-97-05	Service	Fuel Inlet and Cap Replacement
1996 SLTX			
	PWC-96-02	Service	Multi Function Display-Erratic RPM / Water Damage
	PWC-96-03	Service	Engine Temp Sensor Incorrect Or Missing
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-05	Service	Improved Throttle Response On Initial Acceleration
	PWC-96-08	Service	Revised Carburetor Jetting For SLTX
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-96-11	Service	Oil Pump a-Ring Leakage
	PWC-96-12	Information	Loose Or Broken Cylinder Head Bolts
1996 SL 900			
	PWC-96-02	Service	Multi Function Display-Erratic RPM / Water Damage
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-05	Service	Improved Throttle Response On Initial Acceleration
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-96-11	Service	Oil Pump a-Ring Leakage
	PWC-96-12	Information	Loose Or Broken Cylinder Head Bolts
1996 SLX 780			
	PWC-96-02	Service	Multi Function Display-Erratic RPM / Water Damage
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-07	Information	Fuel Valve Restriction May Cause Lean Condition
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-96-14	Service	Carburetor High/Low Screw Settings
1996 SLT780			
	PWC-96-02	Service	Multi Function Display-Erratic RPM / Water Damage
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-06	Service	Steering Cable May Contact Drive Coupler
	PWC-96-07	Information	Fuel Valve Restriction May Cause Lean Condition
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-96-14	Service	Carburetor High/Low Screw Settings
1996 SL780			
	PWC-96-02	Service	Multi Function Display-Erratic RPM / Water Damage
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-07	Information	Fuel Valve Restriction May Cause Lean Condition
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-96-14	Service	Carburetor High/Low Screw Settings

1996 PWC Bulletin Index By Model (Cont.)

Model	Bulletin #	Type	Notes
1996 SLT700			
	PWC-96-01	Service	Flywheel Replacement And Cyl. Head Bracket
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-07	Information	Fuel Valve Restriction May Cause Lean Condition
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-96-11	Service	Oil Pump a-Ring Leakage
	PWC-96-12	Information	Loose Or Broken Cylinder Head Bolts
1996 SL700			
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-07	Information	Fuel Valve Restriction May Cause Lean Condition
	PWC-96-10	Information	Leaks At Bilge Plug (Except Hurricane)
	PWC-96-11	Service	Oil Pump a-Ring Leakage
	PWC-96-12	Information	Loose Or Broken Cylinder Head Bolts
1996 Hurricane			
	PWC-96-02	Service	Multi Function Display-Erratic RPM / Water Damage
	PWC-96-04	Service	Loose Hand Grips - All 1996 Models
	PWC-96-07	Information	Fuel Valve Restriction May Cause Lean Condition
	PWC-96-09	Service	Loose Engine Mounting Bolts And Air Filter Mounting Studs
	PWC-96-11	Service	Oil Pump a-Ring Leakage
	PWC-96-12	Information	Loose Or Broken Cylinder Head Bolts
	PWC-96-13	Safety Alert	Handlebars May Develop Cracks
	PWC-96-15	Service	Seat Seal Replacement - 1996 Hurricane

1997 PWC Bulletin Index By Model

Model	Bulletin #	Type	Notes
All 1997 Models			
1997 SLTX	PWC-97-02	Service	Quality Assurance Upgrades To Engine, Pump, Door
	PWC-97-03	Service	Compartment Door Latch Plate Replacement
1997 SL1050	PWC-97-01	Service	Quality Assurance Upgrades To Engine and Pump
1997 SL900			
1997 SLT780			
1997 SL780			
1997 SLT700			
1997 SL700/Deluxe			
Hurricane			

1998 PWC Bulletin Index By Model

Model	Bulletin #	Type	Notes
All 1998 Models			
1998 SLTX			
1998 SLXH			
1998 SLH			
1998 SLTH			
1998 SLX Pro785	S-98-01	Service	Cooling Water Outlet Hose Restrictor

Paint Codes'

Year	Model	Model No.	Color (See Note Below)	Polaris Reference No.	PPG / Ditzler Number
1992	SL650	B924058	Bright White (P133)	8520113	*2185 / 91473*
1993	SL650	B934058	Bright White (P133)	8520113	*2185 / 91473*
	SL750	B934070	Bright White (P133) Carnation Pink (P189)	8520113 8520121	*2185 / 91473* N/A / N/A
1994	SL650	B944058	Bright White (P133) Rubine Red (P182)	8520113 8520129	*2185/91473* N/A / N/A
	SL750	B944070	Bright White (P133) Black Metallic (P177)	8520113 8520106	*2185/91473* *9000 1* N/A
	SLT	B944170	White (Gel Coat Repair Kit) Caribbean Blue (P196)	2871287 8520133	 N/A / 19717
1995	SL650	B954058	Rubine Red (P182)	8520129	N/A *1* N/A
	SL650 STD	B954358	Bright White (P133)	8520113	*2185 / 91473*
	SL750	B954070	Purple Velvet (P194)	8520160	N/A *1* N/A
	SLT750	B954170	Caribbean Blue (P196)	8520133	N/A / 19717
	SLX780	B954287	Bright White (P133) Rubine Red (P182) Black Metallic (P177)	8520113 8520129 8520106	*2185 / 91473* N/A *1* N/A *9000 1* N/A
1996	SL700	B964066	Bright White (P133) Lazer Blue (P217)	8520113 8520231	*2185 / 91473* N/A *1* N/A
	SLT700	B964166	Bright White (P133) Caribbean Blue (P196) Purple Velvet (P194)	8520113 8520133 8520160	*2185/91473* N/A *119717* N/A *1* N/A
	Hurricane	B964466	Bright White (P133) Porsche Red (P136)	8520113 8520066	*2185 / 91473* N/A *172060*
	SL780	B964087	Bright White (P133) Porsche Red (P136)	8520113 8520066	*2185 / 91473* N/A *172060*
	SLT780	B964588	Bright White (P133) Purple Wave (P214) Caribbean Blue (P196)	8520113 8520230 8520133	*2185 / 91473* N/A *152113* N/A / 19717
	SLX780	B964287	Bright White (P133) Black Metallic (P177) Porsche Red (P136)	8520113 8520106 8520066	*2185 / 91473* *90001* N/A N/A *172060*
	SL900	B964291	Bright White (P133) Porsche Red (P136)	8520113 8520066	*2185 / 91473* N/A *172060*
	SLTX	B964590	Bright White (P133) Purple Wave (P214) Caribbean Blue (P196)	8520113 8520230 8520133	*2185/91473* N/A / 52113 N/A / 19717

*Includes International models

*. Bright White (P133) Is Ditzler #91473 or PPG 2185

NOTE: Order Polaris "P" Number from Midwest Industrial Coatings (612)-934-8252. Mix as directed.
N/A = Not Available

Paint Codes

Paint Codes*

Year	Model	Model No.	Color (See Note Below)	Polaris Reference No.	PPG / Ditzler Number.
1997	SL700	B974071	Bright White (P133) Lazer Blue (P217)	8520113 8520231	*2185 / 91473* N/A *1* N/A
	SL700 Deluxe	B974072	Bright White (P133) Teal Metallic (P168)	8520113 8520199	*2185 / 91473* *4300 1* N/A
	SLT700	B974572	Bright White (P133) Lazer Blue (P217)	8520113 8520231	*2185 / 91473* N/A *1* N\A
	Hurricane	B974473	Bright White (P133) Porsche Red (P136) Screamin Yellow (P216)	8520113 8520066 8520242	*2185 / 91473* N/A *172060* N/A *1* NIA
	SL780	B974088	Bright White (P133) Wild Grape (P237)	8520113 -	*2185 / 91473* N/A / N/A
	SLT780	B974588	Bright White (P133) Wild Grape (P237)	8520113 -	*2185 / 91473* N/A *1* N/A
	SL900	B974091	Bright White (P133) Violet Metallic (P242)	8520113 8520249	*2185 /9 1473* N/A / N/A
	SL 1050	B974090	Bright White (P133) Screamin Yellow (P216) Black Metallic (P177)	8520113 8520242 8520106	*2185 / 91473* N/A *1* N/A *90001* N/A
	SLTX	B974590	Bright White (P133) Violet Metallic (P242)	8520113 8520249	*2185/91473* N/A *1* N/A

*Includes International models

** Bright White Is Ditzler #91473 or **PPG** 2185

NOTE: Order Polaris "P" Number from Midwest Industrial Coatings (612)-934-8252. Mix as directed.

N/A = Not Available

Gel Coat Repair Kits - For repair of gel coat on fiberglass hulls and decks.

White - 2871287 Caribbean Blue - 2200735

Paint - Top Coat / Metallic

All Models	Clear Topcoat with Sparkle Metallic powder. Order direct from Midwest Industrial Coatings (612-934- 8252). Mix as directed.

2-Part Structural Adhesive - For repair of SMC hulls and decks.

SMC repair kits containing 3M™ #08101 structural adhesive are available in two sizes. This 2-part structural adhesive is recommended for bonding and general repair of SMC hulls and decks.

2 Oz. - 2871520 1 Quart - 2871519

Paint Codes*

Year	Model	Model No.	Color (See Note Below)	PPG / Ditzler Number
1998	SLH	B984673	Bright White (P133) PWC Violet (P250)	*2185/91473* N/A *1*N/A
	SLTH	B984573	Bright White (P133) Dark Cloissone Non Metallic (P252)	*2185/91473* N/A *1*N/A
	SLXH	B984690	Bright White (P133) Screamin Yellow (P216)	*2185/91473* N/A *1N/A*
	SLTX	B984590	Bright White (P133) PWC Violet (P250)	*2185/91473* *N/A 1*N/A

*Includes International models

** Bright White Is Ditzler #91473 or PPG 2185

NOTE: Order Polaris "P" Number from Midwest Industrial Coatings (612)-934-8252. Mix as directed.

NIA = Not Available

Gel Coat Repair Kits - For repair of gel coat on fiberglass hulls and decks.

White - 2871287 Caribbean Blue - 2200735

Paint - Top Coat / Metallic

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2-Part Structural Adhesive - For repair of SMC hulls and decks.

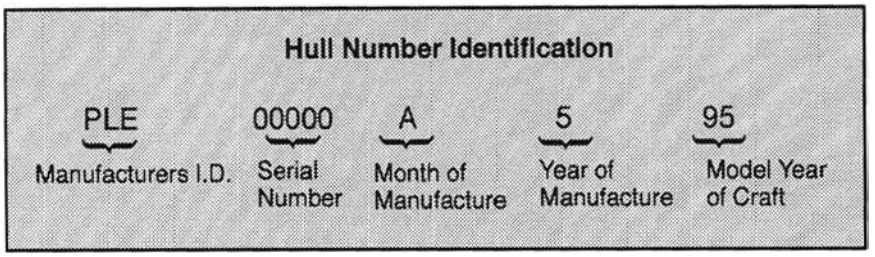
SMC repair kits containing 3MTM#08101 structural adhesive are available in two sizes. This 2-part structural adhesive is recommended for bonding and general repair of SMC hulls and decks.

2 Oz. - 2871520 1 Quart - 2871519

Identification Numbers

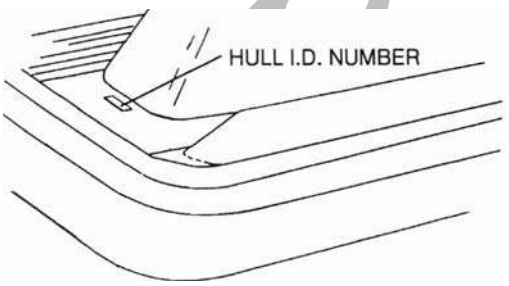
The engine 1.0. number and hull 1.0. number are used to register the watercraft. They are unique numbers that distinguish each watercraft from others of the same model.

If the watercraft is ever stolen these numbers will help identify it. The owner should keep a record of these numbers in a place other than the watercraft.

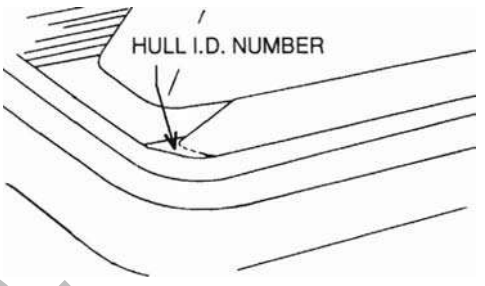


Month Code: A = January; B = February; etc.

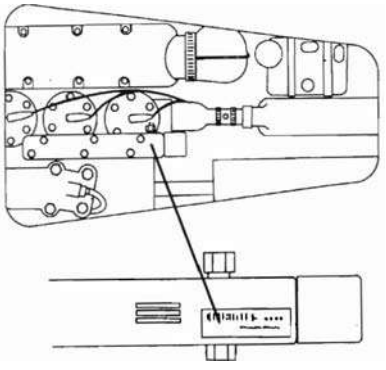
Year Of Manufacture: 5 = 1995; 6 = 1996; etc.



All SLT Models and Hurricane

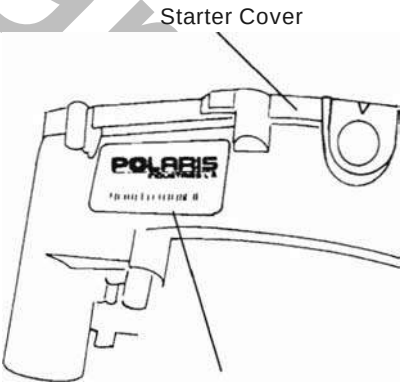


All SL and SLX Models



Engine 1.0. Number
(Polaris / Fuji Engine)

All 650, 750, 780 Models



Engine 1.0. Number
(Polaris Domestic Engine)

All 700, 900, 1050, Models

GENERAL INFORMATION
Model Specifications

Polaris resarves the right to change specilications at any time without Incurring obllgatlona.	1992 SL650 8924058	1993 SL650 8934058	1993 SL750 8934070
Dimensions/Materials			
Length (inches)	105.5"	105.5"	105.5"
Width (inches)	45"	45"	45"
Height (inches)	37.5"	37.5"	37.5"
Draft (stationary, unloaded in inches)	9	9	9
Dry Weight (lbs.)	510	495	499
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Top Deck Material	SMC	SMC	SMC
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	TPO	TPO
Base Color	White	White	White
Accent Colors	Hot Pink, Blue, Gray	Hot Pink, Blue, Gray	Hot Pink, Blue, Gray
Capacities			
Rider Capacity	2 person/400 lbs.	2 person/400 lbs.	2 person/400 lbs.
Front Storage Capacity (cubic feet)	1.03	1.03	1.03
Rated Fuel Capacity including reserve	9.8	9.8	9.8
Fuel Reserve (U.S. gallons)	2.5	2.5	2.5
Oil Reservoir Capacity (U.S. quarts)	3.5	3.5	3.5
Engine			
Engine Model No.	EC65PW/01	EC65PW01	EC75PW01
Oil Type	Polaris Injection Oil or NMMA Certified TC-W3	Polaris Injection Oil or NMMA Certified TC-W3	Polaris Injection Oil or NMMA Certified TC-W3
Engine Cooling	Liquid, open system	Liquid, open system	Liquid, open system
Engine Cylinders	3	3	3
Engine Displacement	647cc	647cc	744cc
Bore & Stroke	65mmx 65mm	65mm x 65mm	69.72mm x 65mm
Compression Ratio	6.4 to 1 (corrected)	6.6 to 1 (corrected)	6.7 to 1 (corrected)
Timing Degrees BTDC	24° at 3000 rpm	18° at 3000 rpm	16° at 3000 rpm
Ignition System	COI, Flywheel Magneto	COI, Flywheel Magneto	COI, Flywheel Magneto
Lubrication	Oil Injected	Oil Injected	Oil Injected
Horsepower	68 HP@6500 rpm	68 HP @ 6500 rpm	78 HP @ 6500 rpm
Maximum Static Thrust (lbs.)	Approximate 550	Approximate 550	Approximate 550
Maximum Torque	58 ft./lbs. @ 6000 rpm	62 ft.llbs. @ 5750 rpm	72.5 ft.llbs. @ 5500 rpm
Carburetlon			
Carburetion Intake	Reed Valve	Reed Valve	Reed Valve
Carburetors	3-38mm, 34mm venturi	3-38mm, 34mm venturi	3-38mm, 34mm venturi
Electrical			
Alternator Output	120 watt at 4500 rpm	120 watt at 4500 rpm	120 watt at 4500 rpm
Spark Plug Type	NGK BR8ES, Champion RN-3C	NGK BR8ES, Champion RN-3C	NGK BR8ES, Champion RN-3C
Spark Plug Gap (inches)	.028"	.028"	.028"
Idle RPM (in water)	1550 ± 100 rpm	1300 ± 100 rpm	1300 ± 100 rpm
Propulsion			
Jet Pump Type	Single Stage Axial Flow	Single Stage Axial Flow	Single Stage Axial Flow
Impeller Rotation	Counter Clockwise	Counter Clockwise	Counter Clockwise
Impeller Type	Stainless sleel, 3 blade	Stainless steel, 3 blade	Slainless sleel, 3 blade
Impeller Pitch (degrees)	14.5° (13/15°)*	15/18°	17/20°
Bilge Pump Type	Siphon 2 GPM	Siphon 2 GPM	Siphon 2 GPM
DB Noise Level	74 Decibels	74 Decibels	74 Decibels

• 2nd Production

Polaris resarves the right to changa specifications at any time without Incurring obligatlona.	1994 SL650 8944058	1994 SL750 8944070	1994 SLT750 8944170
DImenslons/Materlals			
Length (inches)	105.35"	105.35"	120.3"
Width (inches)	44.86"	44.86"	47.3"
Height (inches)	37.5"	37.5"	37.0"
Draft (stationary, unloaded in inches)	9	9	8
Dry Weight (lbs.)	495	499	530
Hull Design	Modified V	Modified V	Full V
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)	Polyester/glass/foam composite
Top Deck Material	SMC	SMC	Polyester/glass composite
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	TPO	TPO
Base Color	White	White	White
Accent Colors	Rubine Red *1* Purple	Rubine Red *1* Black	Caribbean Blue *1* Magenta
Capacities			
Rider Capacity	2 person/400 lbs.	2 person/400 lbs.	3 *person/500* lbs.
Front Storage Capacity (cubic feet)	1.03	1.03	1.2
Rated Fuel Capacity including reserve	9.8	9.8	11
Fuel Reserve (U.S. gallons)	2.5	2.5	2.5
Oil Reservoir Capacity (U.S. quarts)	3.5	3.5	5
Engine			
Engine Model No.	EC65PW02	EC75PW02	EC75PW02
Engine Cooling	Liquid, open system	Liquid. open system	Liquid, open system
Engine Cylinders	3	3	3
Engine Displacement	647cc	744cc	744cc
Bore & Stroke	65mmx 65mm	69.72mm x 65mm	69.72mm x 65mm
Compression Ratio (Full Stroke)	10.7:1	10.7:1	10.7:1
Timing Degrees BTDC	18° at 3000 rpm	25° at 3000 rpm	25° at 3000 rpm
Horsepower	68 HP @6350 rpm	80 HP @ 6150 rpm	80 HP @ 6250 rpm
Lubrication	Oil Injected	Oil Injected	Oil Injected
Carburetion			
Carburetion Intake	Reed Valve	Reed Valve	Reed Valve
Carburetors	3-38mm, 34mm venturi	3-38mm. 34mm venturi	3-38mm, 34mm venturi
Electrical			
Ignition System	CDI, Flywheel Magneto	Digital CDI, Flywheel Magneto	Digital CDI, Flywheel Magneto
Alternator Output	10 Amps *1* 120 watt at 4500 RPM	10 Amps *1* 120 watt at 4500 RPM	10 Amps *1120* watt at 4500 RPM
Spark Plug Type	NGK BPR 7ES	NGK BPR 7ES	NGK BPR 7ES
Spark Plug Gap (inches)	.028"	.028"	.028"
Propulsion			
Jet Pump Type	Single Stage Axial Flow - Polaris	Single Stage Axial Flow - Polaris	Single Stage Axial Flow - Polaris
Impeller Rotation	Counter Clockwise	Counter Clockwise	Counter Clockwise
Impeller Type	Progressive pitch. Stainless steel, 4 blade PN 5131056	Progressive pitch, Stainless steel, 4 blade PN 5131079	Progressive pitch, Stainless steel, 4 blade PN 5131035
OptlonslAccessories			
RPM Limiter	Standard	Standard	Standard
Low Oil Monitoring	Buzzer	Warning Light	Warning Light
Overheat Warning	Buzzer	Warning Light	Warning Light
Bilge Pump Type	Siphon 2 GPM	Siphon 2 GPM	Siphon 2 GPM
Speedo (Analog)	Option	N/A	*N/A*
Fuel Gauge (Analog)	Standard	*N/A*	*N/A*
Multi-Function Display	*N/A*	Standard	Standard

"Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning

GENERAL INFORMATION
Model Specifications

Polaris reserves the rtght to chenge specifications at any time without Incurring obligations.	1995 SL65Q	1995 SL65Q STO	1995 SL75Q
Model Number	B954058 (1954058)	B954358 (1954358)	B954070 (1954070)
Dimensions/Materials			
Length (inches)	105.5"	105.5"	105.5"
Width (inches)	45"	45"	45"
Height (inches)	37.5"	37.5 '	37.5"
Draft (stationary, unloaded in inches)	9	9	9
Dry Weight (lbs.)	495	495	499
Hull Design	Modified V	Modified V	Modified V
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Top Deck Material	SMC	SMC	SMC
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	TPO	TPO
Base Color	White	White (Bottom Hull - Easter Purple)	White
Accent Colors	Purple Velvet / Rubine Red	Purple Velvet / Rubine Red	Purple Velvet / Rubine Red
Capacities			
Rider Capacity	2 person/400 lbs.	2 person/400 lbs.	2 person/400 lbs.
Front Storage Capacity (cubic feet)	1.03	1.03	1.03
Rated Fuel Capacity including reserve	9.8	9.8	9.8
Fuel Reserve (U.S. gallons)	2.5	2.5	2.5
Oil Reservoir Capacity (U.S. quarts)	3.5	3.5	3.5
Engine			
Engine Model No.	EC65PWE03	EC65PWE03	EC75PWE03
Engine Cooling	Liquid, open system	Liquid, open system	Liquid, open system
Engine Cylinders	3	3	3
Engine Displacement	647cc	647cc	744cc
Bore & Stroke	65mmx 65mm	65mm x65mm	69.72mm x Ei5mm
Compression Ratio (Full Stroke)	10.7:1	10.7:1	10.5:1
Timing Degrees BTDC	*18°* at 3000 rpm	*18°* at 3000 rpm	24° at 3000 rpm
Horsepower	68 HP @ 6500 rpm	68 HP @ 6500 rpm	80 HP @ 6000 rpm
Lubrication	Oil Injected	Oil Injected	Oil Injected
Carburetlon			
Carburetion Intake	Reed Valve	Reed Valve	Reed Valve
Carburetors	3-38mm, 34mm venturi	3-38mm, 34mm venturi	3-38mm, 34rnm venturi
Electrical			
Ignition System	COl, Flywheel Magneto	COl, Flywheel Magneto	Digital COl, Flywheel Magneto
Starting System	Electric Starter	Electric Starter	Electric Starter
Alternator Output	10 Amps /120 watt at 4500 RPM	10 Amps / 120 watt at 4500 RPM	10 Amps /1 20 watt at 4500 RPM
Spark Plug Type	NGK BPR 7ES	NGK BPR 7ES	NGK BPR 7ES
Spark Plug Gap (inches)	.028"	.028"	.028"
Propulsion			
Jet Pump Type	Single Stage Axial Flow - Polaris	Single Stage Axial Flow - Polaris	Single Stage Axial Flow - Polaris
Impeller Rotation	Counter Clockwise	Counter Clockwise	Counter Clockwise
Impeller Type	Progressive pitch, Stainless steel, 4 blade PN 5131056	Progressive pitch, Aluminum, 4 blade PN 5131188	Progressive pitch, Stainless steel, 4 blade PN 5131079
Options/Accessories			
RPM Limiter	Standard	Standard	Standard
Low Oil Moritoring	Hitone	Hitone	MFD Warning Light! Display
Overheat Warning	Hitone	Hitone	MFD Warning Light / Display
Quick Trim (Power) with Gauge	Option	Option	Standard
'Multi-Function Display	N/A	N/A	Standard

'Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning

Polaris reserves the right to change specifications at any time without Incurring obligations.	1995 SLT750	1995 SLX780
Model Number	B954170 (1954170)	B954287 (1954287)
Dimensions/Materials		
Length (inches)	120.3"	108.5"
Width (inches)	47.3"	47.5"
Height (inches)	37.0"	37.5"
Draft (stationary, unloaded in inches)	8	9
Dry Weight (lbs.)	530	499
Hull Design	Full V	Modified V
Hull Material	Polyester/glass/foam composite	Sheet Molded Compound (SMC)
Top Deck Material	Polyester/glass composite	SMC
Side Rail Material	PVC	PVC
Front Bumper Material	PVC	TPO
Base Color	Caribbean Blue	White
Accent Colors	Purple Velvet / Caribbean Blue	Rubine Red / Black
Capacities		
Rider Capacity	3 person/500 lbs.	2 person/400 lbs.
Front Storage Capacity (cubic feet)	1.2	1.03
Rated Fuel Capacity including reserve	11	9.8
Fuel Reserve (U.S. gallons)	2.5	1.5
Oil Reservoir Capacity (U.S. quarts)	5	3.5
Engine		
Engine Model No.	EC75PWE03	EC78PWE02
Engine Cooling	Liquid, open system	Liquid, open system
Engine Cylinders	3	3
Engine Displacement	744cc	779 cc
Bore & Stroke	69.72mm x 65mm	71 .3mm x 65mm
Compression Ratio (Full Stroke)	10.5:1	11.8:1
Timing Degrees BTDC	24° at 3000 rpm	28° at 3000 rpm
Lubrication	Oil Injected	Oil Injected
Horsepower	80 HP @ 6000 rpm	90+ HP @ 6250 rpm
Carburetion		
Carburetion Intake	Reed Valve	Reed Valve
Carburetors	3-38mm, 34mm venturi	3-38mm, 34mm venturi
Electrical		
Ignition System	Digital COI, Flywheel Magneto	Digital COI, Flywheel Magneto
Starting System	Electric Starter	Electric Starter
Alternator Output	10 Amps / 120 watt at 4500 RPM	10 Amps / 120 watt at 4500 RPM
Spark Plug Type	NGK BPR 7ES	NGK BPR 8ES
Spark Plug Gap (inches)	.028"	.028"
Propulsion		
Jet Pump Type	Single Stage Axial Flow - Polaris	Single Stage Axial Flow - Polaris
Impeller Rotation	Counter Clockwise	Counter Clockwise
Impeller Type	Progressive pitch, Stainless steel, 4 blade PN 5131035	Progressive pitch, Stainless steel, 4 blade PN 5131079
Options/Accessories		
RPM Limiter	Standard	Standard
Low Oil Monitoring	MFD Warning Light / Display	Warning Light
Overheat Warning	MFD Warning Light / Display	Warning Light / RPM Limiter
Low Fuel	MFD Warning Light / Display	Warning Light / RPM Limiter
Bilge Pump Type	Siphon 2 GPM	Siphon 2 GPM
Speedo	Standard (MFD)	(MFD)
Fuel Gauge	Standard (MFD)	(MFD)
Quick Trim (Power) with Gauge	N/A	Standard
Multi-Function Display	Standard	Standard

*Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning

Model Specifications

Polaris reserves the right to change apeclfIcatlons at any time without Incurring obllgatlona.	1996 SL7QQ	1996 SLT7QQ	1996 Hurricane
Model Number	B964066 (1964066)	B964166 (1964166)	B964466 (1964466)
Dimensions/Materials/Capacities			
Length (inches)	105.5"	120.3"	104.8"
Width (inches)	45"	47.3"	37.5"
Height (inches)	37.5"	37"	40.8"
Dry Weight (lbs.)	485	502	480
Rider Capacity	2 person/400 lbs.	3 person/500 lbs.	2 person/350 lbs.
Rated Fuel Capacity including reserve	9.8 U.S. Gal (37.1L)	11 U.S. Gal (41.6L)	8.6 U.S. Gal (32.6L)
Fuel Reserve	15 minutes	15 minutes	15 minutes
Oil Reservoir Capacity (U.S. quarts)	3.5 (3.31L)	5 (4.73L)	4 (3.78L)
Hull Material	Sheet Molded Compound (SMC)	Polyester/Glass/Foam Composite	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	61 miles (99km)	68 miles (11 Okm)	53 miles (85km)
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	PVC	TPO
I::nglne/Coollng			
Engine Model No.	WC70DCSP01/02	WC70DCSP01 /02	WC70DCSP02
Engine Displacement	700cc	700cc	700cc
Engine Type (# Of Cylinders)	Polaris 2-Stroke (2)	Polaris 2-Stroke (2)	Polaris 2-Stroke (2)
Bore &Stroke	81mmx68mm	81mm x 68mm	81mm x 68mm
Gompression Ratio (Full Stroke)	11.0:1	11 .0:1	11.5:1
Horsepower	80 HP@ 6250 RPM	80 HP@6250 RPM	90 HP @ 6700 RPM
Gooling System	Water cooled	Water cooled	Water cooled
Thermostat Open	140· F (60· C)	140· F (60· C)	140· F (60· C)
Overheat/Low Oil Warning	Buzzer (On @ 160· F)	Buzzer (On @ 160· F)	Light (MFD)(On@160·F)
Induction Type	Case Reed	Case Reed	Case Reed
Lubrication	Oil Injected	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	6700 RPM ± 50	6700 RPM ± 50	6700 RPM ± 50
Carburetlon			
Carburetors (Keihin)	2-38mm, CDK II	2-38mm, CDK II	2-38mm, CDK II
Fuel Type	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1250±50	1250±50	1350±50
1:lectrlcal			
Magneto Generator Output	5A /60W at 4500 RPM	5A 160W at 4500 RPM	5A 160W at 4500 RPM
Ignition System	Digital CDI	Digital CDI	Digital CDI
Spark Plug Type	NGK BPR7ES	NGK BPR7ES	NGK BPR7ES
Spark Plug Gap (inches)	.028"	.028"	.028"
Timing Degrees BTDC	18· at 3000 RPM	18· at 3000 RPM	20· at 3000 RPM
Battery	12V 19A YB16CL-B	12V 19A YB16CL-B	12V 19A YB16CL-B
Starting System	Electric	Electric	Electric
Fuse	15A resettable circuit breaker	15A resettable circuit breaker	15A resettable circuit breaker
Propulsion			
Jet Pump Type	Single Stage Axial Flow	Single Stage Axial Flow	Single Stage Axial Flow
Impeller Rotation (viewed from rear)	Counterclockwise	Counterclockwise	Counterclockwise
Coupling Type	Rubber	Rubber	Rubber
Bilge Pump Type	Electric and Siphon	Electric and Siphon	Electric and Siphon
Minimum Water Level For Jet Pump.	2 Feet (60cm)	2 Feet (60cm)	2 Feet (60cm)
Pivoting Angle	30·	30·	30·
Impeller Type	Progressive Pitch Stainless 4 Blade	Progressive Pitch Stainless 4 Blade	Progressive Pitch Stainless 3 Blade
Impeller Diameter.	5.83" (14.8cm)	5.83" (14.8cm)	5.83" (14.8cm)
Reverse System	Option	Standard	N/A

"Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Engine Overheat Warning

Polaris ressrves the right to change specifications at any time without Incurring obligations.	1996 SL780	1996 SLX780	1996 SLT780
Model Number	B964087 (1964087)	B964287 (1964287)	B964588 (1964588)
Dimensions/Materials/Capacities			
Length (inches)	105.5"	108.5"	120.3"
Width (inches)	45"	47.5"	49.3"
Height (inches)	39.5"	39.5"	39"
Dry Weight (lbs.)	499	499	595
Rider Capacity	2 person/400 lbs.	2 person/400 lbs.	3 person/500 lbs.
Rated Fuel Capacity including reserve	9.8	9.8	14.5
Fuel Reserve	Rev limit/Reserve @4200 RPM	Rev limit/Reserve @4200 RPM	Rev limit/Reserve @4200 RPM
Oil Reservoir Capacity (U.S. quarts)	3.5	3.5	5.5
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	50 miles (80.45 km)	50 miles (80,45 km)	50 miles (80,45 km)
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	TPO	TPO
Engine/Cooling			
Engine Model	EC78PWE02 or 03	EC78PWE04	EC78PWE02,03,or05
Engine Displacement	779cc	779cc	779cc
Engine Type (# Of Cylinders)	Fuji 2-Stroke (3)	Fuji 2-Stroke (3)	Fuji 2-Stroke (3)
Bore &Stroke	71.3mm x 65mm	71.3mm x 65mm	71.3mm x 65mm
Compression Ratio (Full Stroke)	11.85:1	11.85:1	11.85:1
Horsepower	90+ HP@ 6250 RPM	90+ HP@ 6250 RPM	90+ HP @ 6250 RPM
Cooling System	Water cooled	Water cooled	Water cooled
Thermostat Open	140° F (60° C)	140· F (60· C)	140° F (60° C)
Overheat/Low Oil Warning	Light (On @ 180°F)	Light (On @ 180°F)	Light (MFD) (On 180°F)
Induction Type	Case Reed	Case Reed	Case Reed
Lubrication	Oil Injected	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	6700 RPM ±70	6700 RPM ±70	6700 RPM ± 70
Carburetlon			
Carburetors (Mikuni)	3-38mm, 34mm venturi	3-38mm, 34mm venturi	3-38mm, 34mm venturi
Fuel Type	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1250±50	1250±50	1250±50
Electrical			
Magneto Generator Output	10 Amps *1*120 watt at 4500 RPM	10 Amps *1*120 watt at 4500 RPM	10 Amps *1*120 watt at 4500 RPM
Ignition System	Digital Ignition	Digital Ignition	Digital Ignition
Spark Plug Type	NGK BPR8ES	NGK BPR8ES	NGK BPR8ES
Spark Plug Gap (inches)	.028"	.028"	.028"
Timing Degrees BTDC	28° at 3000 rpm (03=24°)	28° at 3000 rpm	28° at 3000 rpm *(03/05=24°)*
Battery	12V 19A YB16CL-B	12V 19A YB16CL-B	12V 19A YB16CL-B
Starting System	Electric	Electric	Electric
Fuse	15A resettable circuit breaker	15A resettable circuit breaker	15A resettable circuit breaker
Propulsion			
Jet Pump Type	Single Stage Axial Flow	Single Stage Axial Flow	Single Stage Axial Flow
Impeller Rotation	Counterclockwise	Counterclockwise	Counterclockwise
Coupling Type	Rubber	Rubber	Rubber
Bilge Pump Type	Electric and Siphon	Electric and Siphon	Electric and Siphon
Minimum Water Level For Jet Pump	2 Feet (60cm)	2 Feet (60cm)	2 Feet (60cm)
Pivoting Angle	30°	30°	30°
Impeller Type	Progressive Pitch Stainless 4 Blade	Progressive Pitch Stainless 3 Blade	Progressive Pitch Stainless 3 Blade
Impeller Diameter	5.83" (14.8cm)	5.83" (14.8cm)	5.83" (14.8cm)
Reverse System	Option	Option	Standard

-Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Engine Overheat Warning

GENERAL INFORMATION
Model Specifications

Polaris reserves the right to change specifications at any time without Incurring obligations.	1996 SL900	1996 SLTX
Model Number	8964291 (1964291)	B964590 (1964590)
Dimensions/Materials/Capacities		
Length (inches)	108.5"	120.3"
Width (inches)	47.5"	49.3"
Height (inches)	39.5'	39"
Dry Weight (lbs.)	520	615
Rider Capacity	2 person/400 lbs.	3 person/500 lbs.
Rated Fuel Capacity induding reserve	9.8	14.5
Fuel Reserve	Rev limit/Reserve @4200 RPM	TBA
Oil Reservoir Capacity (U.S. quarts)	3.5	5.5
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	50 miles (80.45 km)	50 miles (80.45 km)
Side Rail Material	PVC	PVC
Front Bumper Material	TPO	TPO
Engine/Cooling		
Engine Model No.	WC90TCSPOI	WC105TCSPOI
Engine Displacement	889cc	1050cc
Engine Type (# Of Cylinders	Polaris 2 Stroke (3)	Polaris 2 Stroke (3)
Bore & Stroke	74.5mm x 68mm	81mm x 68mm
Compression Ratio (Full Stroke)	11.01 :1	12:1
Horsepower	100+ HP @ 6250 RPM	115+
Cooling System	Water cooled	Water cooled
Thermostat Open	140° F (60° C)	140° F (60° C)
Overheat Warning	Light On @ 160° F (71° C)	Light On @ 160° F (71° C)
Induction Type	Case Reed	Case Reed
Lubrication	Oi/Injected	Oi/Injected
Oil Type	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	6700 RPM ± 70	6700 RPM ± 70
Carburetlon		
Carburetors (Keihin)	3-38mm, CDK "	3-38mm, CDK II
FuelType	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1250±50	1250±50
Electrical		
Magneto Generator Output	5A / 60W at 4500 RPM	5A / 60W at 4500 RPM
Ignition System	Digital Ignition	Digital Ignition
Spark Plug Type	NGK BPR8ES	NGK BPR8ES
Spark Plug Gap (inches)	.028"	.028"
Timing Degrees BTDC	18°@3000	18°@3000
Battery	12V 19A YB16CL-B	12V 19A YB16CL-B
Starting System	Electric	Electric
Fuse	15A resettable circuit breaker	15A resettaole circuit breaker
Propulsion		
Jet Pump Type	Single Stage Axial Flow	Single Stage Axial Flow
Impeller Rotation	Counterclockwise	Counterclockwise
Coupling type	Rubber	Rubber
Bilge Pump Type	Electric and Siphon	Electric and Siphon
Minimum Water Level For Jet Pump	2 Feet (60cm)	2 Feet (60cm)
Pivoting Angle	30°	30°
Impeller Type	Progressive Pitch Stainless 3 Blade	Progressive Pitch Stainless 3 Blade
Impeller Diameter	5.83" (14.8cm)	5.83' (14.8cm)
Reverse System	Option	Standard

'Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oi/ Level, Trip Meter, Low Oil Warning, Fuel Level. Volts, Low Fuel Warning, Engine Overheat Warning

Polaris reserves the right to change specifications at any time without Incurring obligations.	1997 SL7QQ	1997 SL7QQ Deluxe	1997 SLT7QQ
Model Number	B974071	B974072	B974572
Dimensions/Materials/Capacities			
Length (inches)	105.5" (268 cm)	105.5" (268 cm)	120.3" (306 cm)
Width (inches)	45″ (114.3cm)	45″ (114.3 cm)	49.3" (123.22cm)
Height (inches)	37.5" (95.25 cm)	37.5" (95.25 cm)	39″ (99.06 cm)
Dry Weight (lbs.)	480 (218.4 kg)	485 (220.68 kg)	595 (269.89)
Rider Capacity	2 person/400 lbs.	2 person/400 lbs.	3 person/500 lbs.
Rated Fuel Capacity including reserve	12.5 U.S. Gal (47.3L)	12.5 U.S. Gal (47.3L)	15 U.S. Gal (56.8L)
Fuel Reserve	15 minutes	15 minutes	15 minutes
Oil Reservoir Capacity - U.S. quarts	3.5 (3.31L)	3.5 (3.31L)	5.5 (5.2L)
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	61 miles (99 km)	61 miles (99 km)	68 miles (110 km)
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	TPO	TPO
Engine/Cooling			
Engine Model No. .	WC70SCSP01	WC70DCSP05	WC70DCSP05
Engine Displacement	700cc	700cc	700cc
Engine Type (# Of Cylinders)	Polaris 2-Stroke (2)	Polaris 2-Stroke (2)	Polaris 2-Stroke (2)
Bore & Stroke	81mmx68mm	81mm x 68mm	81mm x 68mm
Compression Ratio (Full Stroke)	11.5:1	10.4:1	10.4:1
Horsepower	82.5 HP @ 6200 RPM	85 HP @ 6350 RPM	85 HP @ 6350 RPM
Cooling System	Water cooled	Water cooled	Water cooled
Thermostat Open	140· F (60· C)	140· F (60° C)	140· F (60· C)
Overheat/Low Oil Warning	Buzzer (On @ 160· F)	Buzzer (On @ 160° F)	Buzzer (On @ 160° F)
Induction Type	Case Reed	Case Reed	Case Reed
Lubrication	Oil Injected	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	6700 RPM ± 100	6700 RPM ± 100	6700 RPM ± 100
Carburetlon			
Carburetors (Keihin)	1-40mm, CDK II	2-38mm, CDK II	2-38mm, CDK II
Fuel Type	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1250±50	1250±50	1250±50
Electrical			
Magneto Generator Output	5A / 60W at 4500 RPM	5A / 60W at 4500 RPM	5A / 60W at 4500 RPM
Ignition System	Digital COl	Digital CDI	Digital COl
Spark Plug Type	NGK BPR8ES	NGK BPR7ES	NGK BPR8ES
Spark Plug Gap (inches)	.028"	.028"	.028"
Timing Degrees BTDC	18° at 3000 RPM	18° at 3000 RPM	18° at 3000 RPM
Battery	12V 19A YB16CL-B	12V 19A YB16CL-B	12V 19A YB16CL-B
Starting System	Electric	Electric	Electric
Fuse	15A resettable circuit breaker	15A resettable circuit breaker	15A resettable circuit breaker
Propulsion			
Jet Pump Type	Single Stage Axial Flow	Single Stage Axial Flow	Single Stage Axial Flow
Impeller Rotation (viewed from rear)	Counterclockwise	Counterclockwise	Counterclockwise
Coupling Type	Rubber	Rubber	Rubber
Bilge Pump Type	Electric	Electric	Electric
Minimum Water Level For Jet Pump	2 Feet (60cm)	2 Feet (60cm)	2 Feet (60cm)
Pivoting Angle	3D·	30·	30·
Impeller Type	Progressive Pitch Stainless 3 Blade 12-17 Swirl	Progressive Pitch Stainless 3 Blade 12-17 Swirl	Progressive Pitch Stainless 3 Blade 12-17 Swirl
Impeller Diameter	5.83" (14.8cm)	5.83" (14.8cm)	5.83" (14.8cm)
Reverse System	Option	Option	Option

'Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning

GENERAL INFORMATION
Model Specifications

Polaris reserves tha right to change specIllcatJons at any time without Incurring obligations.	1997 Hurricane	1997 SL78Q	1997 SLT78Q
Model Number	B974473	B974088	B974588
Dimensions/Materials/Capacities			
Length (inches)	104.8" (266.2 em)	105.5" (268 em)	120.3" (305.56 em)
Width (inches)	37.5" (95.25 em)	45" (114.3 em)	49.3" (125.22 em)
Height (inches)	40.8" (103.6 em)	39.5" (100.33 em)	39" (99.06 em)
Dry Weight (lbs.)	480 (218.4 kg)	499 (226.3 kg)	605 (274.42 kg)
Rider Capacity	2 person/350 lbs.	2 person/400 lbs. (182 kg)	3 person/500 lbs. (227 kg)
Rated Fuel Capacity including reserve	8.6 U.S. Gal (32.6L)	12.5 (47.31)	15 (56.781)
Fuel Reserve	15 minutes	15 rrinutes	15 minutes
Oil Reservoir Capacity - U.S. quarts	3.5 (3.31L)	3.5 (3.31L)	5.5 (5.21)
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	53 miles (85 km)	65 miles (104.6 km)	80 miles (128.75 km)
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	TPO	TPO
Engine/Cooling			
Engine Model	WC70DCSP04	EC78PWE03	EC78PWE03
Engine Displacement	700cc	779cc	779cc
Engine Type (# Of Cylinders)	Polaris 2-Stroke (2)	Fuji 2-Stroke (3)	Fuji 2-Stroke (3)
Bore & Stroke	81mm x 68mm	71.3mm x 65mm	71.3mm x 65mm
Compression Ratio (Full Stroke)	11.5:1	11.85:1	11.85:1
Horsepower	90 HP @ 6700 RPM	93 HP @ 6250 RPM	93 HP @ 6350 RPM
Cooling System	Water cooled	Water cooled	Water cooled
Thermostat Open	140· F (60· C)	140· F (60· C)	140· F (60· C)
Overheat/Low Oil Warning	Light (MFD)(On@160·F)	4200 Rev Limit @ 180·F	4200 Rev Limit @ 180·F
Induction Type	Case Reed	Case Reed	Case Reed
Lubrication	Oil Injected	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	7200 RPM ± 100	6700 RPM ± 70	6700 RPM ± 70
Carburetlon			
Carburetors (Mikuni)	2-38mm, CDK II	3-38mm/34mm venturi Mikuni	3-38mm/34mm venturi Mikuni
Fuel Type	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1350±50	1250±50	1250±50
Electrical			
Magneto Generator Output	5A / 60W at 4500 RPM	10 Amps / 120 watt at 4500 RPM	10 Amps / 120 watt at 4500 RPM
Ignition System	Digital COl	Digital Ignition	Digital Ignition
Spark Plug Type	NGK BPR8ES	NGK BPR8ES	NGK BPR8ES
Spark Plug Gap (inches)	.028"	.028"	.028"
Timing Degrees BTDC	20· at 3000 RPM	24· at 3000 rpm	24· @ 3000 rpm
Battery	12V 19A YB16CL-B	12V 19A YB16CL-B	12V 19A YB16CL-B
Starting System	Electric	Electric	Electric
Fuse	15A resettable circuit breaker	15A resettable circuit breaker	15A resettable circuit breaker
Propulsion			
Jet Pump Type	Single Stage Axial Flow	Single Stage Axial Flow	Single Stage Axial Flow
Impeller Rotation	Counterclockwise	Counterclockwise	Counterclockwise
Coupling Type	Rubber	Rubber	Rubber
Bilge Pump Type	Electric	Electric	Electric
Minimum Water Level For Jet Pump	2 Feet (60cm)	2 Feet (60cm)	2 Feet (60cm)
Pivoting Angle	30·	30·	30·
Impeller Type	Progressive Pitch Stainless 3 Blade	Progressive Pitch Stainless 4 Blade	Progressive Pitch Stainless 3 Blade
Impeller Diameter	5.83" (14.8cm)	5.83" (14.8cm)	5.83" (14.8cm)
Reverse System	N/A	Option	Standard

'Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning

Polaris raservea the rig ht to chenge apeclfIcatlona at any time without Incurring obligations.	1997 SL900	1997 SL 1050	1997 SLTX
Model Number	B974091	B974090	B974590
Dimensions/Materials/Capacities			
Length (inches)	108.5" (276 cm)	108.5" (276 cm)	120.3" (305.56 cm)
Width (inches)	47.5" (120.65)	47.5" (120.65)	49.3" (125.22 cm)
Height (inches)	39.5" (100.33 cm)	39.5" (100.33 cm)	39" (99.06 cm)
Dry Weight(lbs.)	520 (236.08 kg)	520 (236.08 kg)	615 (278.96 kg)
Rider Capacity	2 person/400 lbs. (182 kg)	2 person/400 lbs. (182 kg)	3 person/500 lbs.
Rated Fuel Capacity including reserve	12.5 (47.31)	12.5 (47.31)	15 (56.781)
Fuel Reserve	N/A	N/A	N/A
Oil Reservoir Capacity - U.S. quarts	3.5 (3.31 L)	3.5 (3.311)	5.5 (5.201)
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	50 miles (80.45 km)	40 miles (64.37 km)	55 miles (88.5 km)
Side Rail Material	PVC	PVC	PVC
Front Bumper Material	TPO	TPO	TPO
Engine/Cooling			
Engine Model No.	WC90TCSP01	WC105TCSP02	WC105TCSP03
Engine Displacement	900cc	1050cc	1050cc
Engine Type (# Of Cylinders)	Polaris 2 Stroke (3)	Polaris 2 Stroke (3)	Polaris 2 Stroke (3)
Bore & Stroke	74.5mm x 68mm	81mm x 68mm	81mmx 68mm
Compression Ratio (Full Stroke)	12:1	12:1	12:1
Horsepower	107 HP @ 6350 RPM	119 HP@6500	119 @ 6500
Cooling System	Water cooled	Water cooled	Water cooled
Thermostat Open	140° F (60° C)	140° F (60° C)	140· F (60· C)
Overheat Warning	Light On @ 160° F (71 ° C)	4500 Rev Limit @ 160°F (71°C)	4500 Rev Limit @ 160°F (71 0C)
Induction Type	Case Reed	Case Reed	Case Reed
Lubrication	Oil Injected	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	6800 RPM ±100	6800 RPM ±100	6800 RPM ±100
Carburetlon			
Carburetors (Keihin)	3-38mm, CDK II	3-40mm, CDK II	3-38mm, CDK II
Fuel Type	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1200-1300	1200-1300	1250±50
Electrical			
Magneto Generator Output	5A /60W at 4500 RPM	5A /60W at 4500 RPM	5A *160W* at 4500 RPM
Ignition System	Digital / Sequential Ignition	Digital/ Sequential Ignition	Digital/ Sequential Ignition
Spark Plug Type	NGK BPR8ES	NGK BPR8ES	NGK BPR8ES
Spark Plug Gap (inches)	.028"	.028"	.028"
Timing Degrees BTDC	18°@3000	18°@3000	18°@3000
Battery	12V 19A YB16CL-B	12V 19A YB16CL-B	12V 19A YB16CL-B
Starting System	Electric	Electric	Electric
Fuse	15A resettable circuit breaker	15A resettable circuit breaker	15A resettable circuit breaker
Propulsion			
Jet Pump Type	Single Stage Axial Flow-4" Ext	Single Stage Axial Flow-4" Ext	Single Stage Axial Flow-4" Ext
Impeller Rotation	Counterclockwise	Counterclockwise	Counterclockwise
Coupling type	Rubber	Rubber	Rubber
Bilge Pump Type	Electric	Electric	Electric
Minimum Water Level For Jet Pump	2 Feet (60cm)	2 Feet (60cm)	2 Feet (60cm)
Pivoting Angle	30°	30°	30°
Impeller Type	Progressive Pitch Stainless 3 Blade	Progressive Pitch Stainless 3 Blade	Progressive Pitch Stainless 3 Blade
Impeller Diameter	5.83" (14.8cm)	5.83" (14.8cm)	5.83" (14.8cm)
Reverse System	Option	Option	Standard

'Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning

GENERAL INFORMATION
Model Specifications

Polaris reserves the right to change specifications at any time without incurring obligations.

	1998 SLH	1998 SLTH
Model Number	B984673	B984573
Dimensions/Materials/Capacities		
Length (inches)	108.5" (276 cm)	120.3" (305.56 cm)
Width (inches)	47.5" (120.7 cm)	49.3" (123.22 cm)
Height (inches)	39.5" (100.3 cm)	39" (99.06 cm)
Dry Weight (lbs.)	460 (209 kg)	595 (270 kg)
Rider Capacity	2 person/400 lbs. (182 kg)	3 person/SOC lbs. (227 kg)
Rated Fuel Capacity including reserve	t2.5 U.S. Gal (47.3L)	15 U.S. Gal (56.8L)
Fuel Reserve	N/A	N/A
Oil Reservoir Capacity - U.S. quarts	5 (4 73L)	5.5 (5.203L)
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	61 miles (85 km)	68 miles (104.6 km)
Side Rail Material	PVC	PVC
Front Bumper Material	TPO	TPO
Engine/Cooling		
Engine Model	WC70DCSP-06A2	WC70DCSP- 06A1
Engine Displacement	700cr;	700cc
Engine Type (# Of Cylinders)	Polaris 2-Stroke (2)	Polaris 2-Stroke (2)
Bore & Stroke	81mm x 68mm	81mm x 68mm
Compression Ratio (Full Stroke)	11.5: I	11.5:1
Horsepower	95 HP @ 6700 RPM	95 HP @ 6700 RPM
Cooling System	Water cooled	Water cooled
Thermostat Open.	140' F (60° C)	140° F (60° C)
Overheat/Low Oil Warning	Light (MFD)(On @160°F)	Light (MFD)(On @160°F)
Induction Type	Case Reed	Case Reed
Lubrication	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	7200 RPM ± 100	7200 RPM ± 100
Carburetion		
Carburetors	2-38mm, CDK II	2-38mm, CDK II
FuelType	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1350±50	1350±50
Electrical		
Magneto Generator Output	5A / 60W at 4500 RPM	SA / 60W at 4500 RPM
Ignition System	Digital COI	Digital CDI
Spark Plug Type	NGK BPR8ES	NGK BPR8ES
Spark Plug Gap (inches)	.028"	028"
Timing Degrees BTDC	18°±2 at 3000 RPM 13°±2 at 6250 RPM	18°±2 at 3000 RPM 13°±2 at 6250 RPM
Battery	12V 19A YB16CL-B	12V 19A YB16CL-B
Starting System	Electric	Electric
Fuse	15A resettable circuit breaker	15A resettable circuit breaker
Propulsion		
Jet Pump Type	Single Stage Axial Flow	Single Stage Axial Flow
Impeller Rotation	Counterclockwise	Counterclockwise
Coupling Type	Rubber	Rubber
Bilge Pump Type	Electric	Electric
Minimum Water Level For Jet Pump	2 Feet (60cml	2 Feet (60crn)
Pivoting Angle	30'	30°
Impeller Type	Progressive Pitch Stainless 3 Blade	Progressive Pitch Stainless 3 Blade
Impeller Diameter	5.83" (14,8cm)	5.83" (14.8crn)
Reverse System	N/A	Standard

'Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level. Volts, Low Fuel Warning, Hot Engine Warning

Polaris reserves the right to change specifications at any time without incurring obligations.

	1998 SLXH	1998 SLTX
Model Number	B984690	B984590
Dimensions/Materials/Capacities		
length (inches)	108.5" (276 cm)	120.3" (305.56 cm)
Width (inches)	47.5" (120.65)	49.3" (125.22 cm)
Height (inches)	39.5" (100.33 cm)	39" (99.06 cm)
Dry Weight (lbs.)	530 (241 kg)	615 (279 kg)
Rider Capacity	2 person/400 lbs. (182 kg)	3 person/500 lbs. (227 kg)
Rated Fuel Capacity including reserve	12.5 U.S. Gal (47.3l)	15 (56.8l)
Fuel Reserve	N/A	N/A
Oil Reservoir Capacity - U.S. quarts	5 (4.731)	5.5 (5.201)
Hull Material	Sheet Molded Compound (SMC)	Sheet Molded Compound (SMC)
Full Throttle Cruising Range (Approx)	40 miles (64.37 km)	55 miles (88.5 km)
Side Rail Material.	PVC	PVC
Front Bumper Material	TPO	TPO
Engine/Cooling		
Engine Model No.	WC105TCSP-05	WC105TCSP-04
Engine Displacement	1050cc	1050cc
Engine Type (# Of Cylinders)	Polaris 2 Stroke (3)	Polaris 2 Stroke (3)
Bore & Stroke	81mmx 68mm	81mm x 68mm
Compression Ratio (Full Stroke)	10.4:1	10.4:1
Horsepower	120 HP @ 6500	120 @ 6500
Cooling System	Water cooled	Water cooled
Thermostat Open	140° F (60° C)	140° F (60° C)
Overheat Warning	4500 Rev limit @ 160°F (71 °C)	4500 Rev Limit @ 160°F (71 °C)
Induction Type	Case Reed	Case Reed
lubncation	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	6800 RPM ± 100	6800 RPM ± 100
Carburetion		
Carburetors (Keihin)	3-40mm, CDK II	3-40mm, CDK II
Fuel Type	RegUlar Unleaded Gasoline (87 Octane or 89 if oxygenated)	Regular Unleaded Gasoline (87 Octane or 89 if oxygenated)
Idle Speed (In Water)	1350150	1350±50
Electrical		
Magneto Generator Output	5A / 60W at 4500 RPM	5A /60W at 4500 RPM
Ignition System	Digital/ Sequential Ignition	Digital/ Sequential Ignition
Spark Plug Type	NGK BPR8ES	NGK BPR8ES
Spark Plug Gap (inches)	.028"	.028"
Timing Degrees BTDC	18°+0,-2 @3000 11°+0,-2 @6250	18°+0,-2 @3000 11°+0,-2 @6250
Battery	12V 19A YB16CI-B	12V 19A YB16CI-B
Starting System	Electric	Electric
Fuse.	15A resettable circuit breaker	15A resettable circuit breaker
Propulsion		
Jet Pump Type.	Single Stage Axial Flow-4" Ext	Single Stage Axial Flow-4" Ext
Impeller Rotation	Counterclockwise	Counterclockwise
Coupling type	Rubber	Rubber
Bilge Pump Type	Electric	Electric
Minimum Water level For Jet Pump	2 Feet (60cm)	2 Feet (60cm)
Pivoting Angle	30°	30°
Impeller Type	Progressive Pitch Stainless 3 Blade	Progressive Pitch Stainless 3 Blade
Impeller Diameter	5.83" (14.8cm)	5.83" (14.8cm)
Reverse System	N/A	Standard

'Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low Oil Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning, Compass (SLTX only)

The following torque specifications are to be used as a general guideline. Use standard torque values for the appropriate size fastener when torque values are not specified. **Always consult the specific manual section for torque values of fasteners and use of locking agent.**

RECOMMENDED TORQUE SPECIFICATION STAINLESS STEEL FASTENERS (SAE)		
Bolt Size	**Threads/Inch**	**Torque**
8	18 & 32	28 in.lbs.
10	24 &32	40 in. lbs.
1/4	20 &28	8 ft. lbs.
5/16	18 & 24	14 ft. lbs.
3/8	16	25 ft. lbs.
3/8	24	28 ft. lbs.
7/16	14	40 ft. lbs.
1/2	13	58 ft. lbs.
1/2	20	70 ft. lbs.

RECOMMENDED TORQUE SPECIFICATION STAINLESS STEEL FASTENERS (METRIC)	
Bolt Size	**Torque**
5mm	45-52 in. lbs.
6mm	66-78 in. lbs.
8mm	13-16 ft. lbs.
10mm	26-30 ft. lbs.
12mm	40-44 ft. lbs.

- To convert in. lbs. to ft. lbs. divide by 12
- To convert ft. lbs. to kg-m multiply foot pounds by .138.
- To convert kg-m to Nm move the decimal to the right one position.

Decimal Equivalents

1/64	.0156	
1/32	.0312	1 mm = .0394"
3/64	.0469	
1/16	.0625	
5/64	.0781	2 mm = .0787"
3/32	.0938	
7/64	.1094	3 mm = .1181"
1/8	.1250	
9/64	.1406	
5/32	.1563	4 mm = .1575"
11/64	.1719	
3/16	.1875	5 mm = .1969"
13/64	.2031	
7/32	.2188	
15/64	.2344	6 mm = .2362"
1/4	.25	
17/64	.2656	7 mm = .2756"
9/32	.2813	
19/64	.2969	
5/16	.3125	8 mm = .3150"
21/64	.3281	
11/32	.3438	9 mm = .3543"
23/64	.3594	
3/8	.375	
25/64	.3906	10 mm = .3937"
13/32	.4063	
27/64	.4219	11 mm = .4331"
7/16	.4375	
29/64	.4531	
15/32	.4688	12 mm = .4724"
31/64	.4844	
1/2	.5	13 mm = .5118
33/64	.5156	
17/32	.5313	
35/64	.5469	14 mm = .5512"
9/16	.5625	
37/64	.5781	15 mm = .5906"
19/32	.5938	
39/64	.6094	
5/8	.625	16 mm = .6299"
41/64	.6406	
21/32	.6563	17 mm = .6693"
43/64	.6719	
11/16	.6875	
45/64	.7031	18 mm = .7087"
23/32	.7188	
47/64	.7344	19 mm = .7480"
3/4	.75	
49/64	.7656	
25/32	.7813	20 mm = .7874"
51/64	.7969	
13/16	.8125	21 mm = .8268"
53/64	.8281	
27/32	.8438	
55/64	.8594	22 mm = .8661"
7/8	.875	
57/64	.8906	23 mm = .9055"
29/32	.9063	
59/64	.9219	
15/16	.9375	24 mm = .9449"
61/64	.9531	
31/32	.9688	25 mm = .9843
63/64	.9844	
1	1.0	

Unit of Measure	Multiplied by	Converts to
ft. lbs.	x12	= in.lbs.
in.lbs.	x .0833	= ft. lbs.
ft. lbs.	x .1383	= kg-m
in.lbs.	x .0115	= kg-m
kg-m	x 7.233	= ft. lbs.
kg-m	x 86.796	= in. lbs.
kg-m	x10	= Nm
in.	x 25.4	=mm
mm	x .03937	= in.
in.	x 2.54	=cm
mile (mi.)	x 1.6	=km
km	x .6214	= mile (mi.)
Ounces (oz)	x 28.35	= Grams (g)
Grams (g)	x 0.035	= Ounces (oz)
lb.	x .454	= kg
kg	x 2.2046	= lb.
Cubic inches (cu in)	x 16.387	= Cubic centimeters (cc)
Cubic centimeters (cc)	x 0.061	= Cubic inches (cu in)
Imperial pints (Imp pt)	x 0.568	= Liters (l)
Liters (l)	x 1.76	= Imperial pints (Imp pt)
Imperial quarts (Imp qt)	x 1.137	= Liters (l)
Liters (l)	x 0.88	= Imperial quarts (Imp qt)
Imperial quarts (Imp qt)	x 1.201	= US quarts (US qt)
US quarts (US qt)	x 0.833	= Imperial quarts (Imp qt)
US quarts (US qt)	x 0.946	= Liters (l)
Liters (l)	x 1.057	= US quarts (US qt)
US gallons (US gal)	x 3.785	=Liters (l)
Liters (l)	x 0.264	= US gallons (US gal)
Pounds - force per square inch (psi)	x 6.895	= Kilopascals (kPa)
Kilopascals (kPa)	x 0.145	= Pounds - force per square inch (psi)
Kilopascals (kPa)	x 0.01	= Kilograms - force per square cm
Kilograms - force per square em	x 98.1	= Kilopascals (kPa)

°C to of: 9 (0C + 40) ÷ 5 - 40 = of
of to °C: 5 (0F + 40) ÷ 9 - 40 = °C

SAE Tap Drill Sizes

Thread Size	Drill Size	Thread Size	Drill Size
#0-80	3/64	1/2-13	27/64
#1-64	53	1/2-20	29/64
#1-72	53	9/16-12	31/64
#2-56	51	9/16-18	33/64
#2-64	50	5/8-11	17/32
#3-48	5/64	5/8-18	37/64
#3-56	45	3/4-10	21/32
#4-40	43	3/4-16	11/16
#4-48	42	7/8-9	49/64
#5-40	38	7/8-14	13/16
#5-44	37	1-8	7/8
#6-32	36	1-12	59/64
#6-40	33	1 1/8-7	63/64
#8-32	29	1 1/8-12	1 3/64
#8-36	29	1 1/4-7	1 7/64
#10-24	24	1 1/4-12	1 11/64
#10-32	21	1 1/2-6	1 11/32
#12-24	17	1 1/2-12	1 27/64
#12-28	4.6mm	1 3/4-5	1 9/16
1/4-20	7	1 3/4-12	1 43/64
1/4-28	3	2-41/2	1 25/32
5/16-18	F	2-12	1 59/64
5/16-24	I	21/4-41/2	2 1/32
3/8-16	0	2 1/2-4	2 1/4
3/8-24	Q	2 3/4-4	2 1/2
7/16-14	U	3-4	2 3/4
7/16-20	25/64		

Metric Tap Drill Sizes

Tap Size	Drill Size	Decimal Equivalent	Nearest Fraction
3 x .50	#39	0.0995	3/32
3 x .60	3/32	0.0937	3/32
4 x .70	#30	0.1285	1/8
4 x .75	1/8	0.125	1/8
5 x .80	#19	0.166	11/64
5 x .90	#20	0.161	5/32
6 x 1.00	#9	0.196	13/64
7 x 1.00	16/64	0.234	15/64
8 x 1.00	J	0.277	9/32
8 x 1.25	17/64	0.265	17/64
9 x 1.00	5/16	0.3125	5/16
9 x 1.25	5/16	0.3125	5/16
10 x 1.25	11/32	0.3437	11/32
10 x 1.50	R	0.339	11/32
11 x 1.50	3/8	0.375	3/8
12 x 1.50	13/32	0.406	13/32
12 x 1.75	13/32	0.406	13/32

ABDC: After bottom dead center.

ATOC: After top dead center.

ACV: Alternating current voltage.

Alternator: Electrical generator producing voltage alternating current.

BBOC: Before bottom dead center.

BDC: Bottom dead center.

BTOC: Before top dead center.

Bow: The front of a watercraft

C: Celsius

CC: Cubic centimeters.

COI: Capacitor discharge ignition. Ignition system which stores voltage generated by the stator plate exciter coil in a capacitor or condenser (in COI box). At the proper moment a voltage generated by the stator plate pulser coil closes an electronic switch (thyristor) in the COI box and allows the voltage in the capacitor to discharge into the primary windings of the ignition coil.

CI: Cubic inches.

Condenser/Capacitor: A storage reservoir for electricity, used in both E.T. and COI systems.

Crankshaft Run-Out: Run-out or "bend" of crankshaft measured with a dial indicator while crankshaft is supported between centers on V blocks or resting in lower half of crankcase. Measure at various points especially at the PTa end.

DCV: Direct current voltage.

Detonation: The spontaneous ignition of the unburned fuel/air mixture *afternormal* ignition spark occurs. Piston looks "hammered" through, rough appearance around hole. Possible causes: 1) Compression ratio too high for the fuel octane; 2) low octane fuel; 3) over-advanced ignition timing.

Dial Bore Gauge: A cylinder measuring instrument which uses a dial indicator. Good for showing taper and out-of-round in the cylinder bore.

End Seals: Rubber seals at each end of the crankshaft.

F: Fahrenheit

ft.: Foot/feet.

Foot Pound: Ft. lb. A force of one pound at the end of a lever one foot in length, applied in a rotational direction.

g: Gram. Unit of weight in the metric system. There are 28 grams in one ounce.

gal.: Gallon.

Head Volume (UnInstalled): Cylinder head capacity in cc, head removed from engine with spark plug installed.

High Tension Lead: The heavy insulated wire which carries the high secondary voltage from the coil to the spark plug.

Holed Piston: Piston in which a hole has formed on the dome. Possible causes: 1) detonation; 2) pre-ignition.

HP: Horsepower.

10: Inside diameter.

Ignition Coil: A type of transformer which increases voltage in the primary windings (approx. 200V) to a higher voltage in the secondary windings (approx. 14KV - 32KV) through induction. Secondary voltage must be high enough to ionize the air gap at the spark plug.

Ignition Generating Coil: Exciter coil, primary charge coil. Stator plate coil which generates primary ignition voltage.

in.: Inch/inches.

kg/cm ^{2} : Kilograms per square centimeter.

Kg-m: Kilogram meters.

Km: Kilometer.

Kilogram meter: A force of one kilogram at the end of a lever one meter in length, applied in a rotational direction.

Glossary Of Terms

l or ltr: Liter. One liter = 1.0567 U.S. quarts.

lbs/in 2 : Pounds per square inch.

Inch Pound: In. lb. 12 in. lbs. = 1 ft. lb.

Left Side: The left hand side of the vehicle. Referred to based on normal operating position of the driver.

m: Meter/meters.

Mag: Magneto.

Magnetic Induction: As a conductor (coil) is moved through a magnetic field, a voltage will be generated in the windings. This is how mechanical energy is converted to electrical energy in the lighting coil, ignition generating coils and trigger coil.

mi.: Mile/miles.

mm: Millimeter. Unit of length in the metric system. 1mm = .040".

N-m: Newton meters.

OD: Outside diameter.

Ohm: The unit of electrical resistance opposing current flow.

Open Circuit: An electrical circuit which is incomplete. (e.g. poor connections or broken wire preventing the flow of current).

oz.: Ounce/ounces.

Piston Clearance: Total distance between piston and cylinder wall.

Piston Erosion: Piston dome melts. Usually occurs at the exhaust port area. Possible causes: 1) lean fuel/air mixture; 2) improper spark plug heat range.

Pre-Ignition: A problem in combustion where the fuel/air mixture is ignited before normal spark ignition. Piston looks melted at area of damage. Possible causes: 1) Spark plug heat range incorrect (too hot) 2) spark plug not properly torqued; 3) "glowing" piece of head gasket, metal burr or carbon in the combustion chamber; 4) lean fuel/air mixture.

Primary Circuit: This circuit is responsible for the voltage build up in the COI capacitor. In a COI system the parts include the exciter coil, the trigger coil, the wires from stator plate to COI box and to the ignition coil primary windings.

psi.: Pounds per square inch.

pts: Pint/pints

PTO: Power take off.

qt.: Quart/quarts.

RPM: Revolutions per minute.

Resistance: In the mechanical sense, friction or load. In the electrical sense, ohms. Both result in energy conversion to heat.

Right Side: The right hand side of the vehicle. Always Referred to based on normal ooerating position of the rider.

RPM: Revolutions per minute.

Running Time: Ignition timing at specified RPM.

Secondary Circuit: This circuit consists of the ignition coil secondary windings, high tension wire and ground through the spark plug air gap.

Seized Piston: Galling of the sides of a piston. Usually there is a transfer of aluminum from the piston onto the cylinder wall. Possible causes: 1) improper lubrication; 2) excessive temperatures; 3) insufficient piston clearance; 4) stuck piston rings.

Short Circuit: An electrical circuit which is completed before the current reaches the intended component. (e.g. a bare wire touching a grounded component.

Spark Plug Reach: Length of threaded portion of spark plug. Polaris uses 3/4" (2 em) reach plugs.

Static Timing: Ignition timing when engine is at zero RPM.

Stator Plate: The plate mounted under the flywheel supporting the primary ignition components and lighting coil.

TOC: Top dead center. Piston's most outward travel from crankshaft.

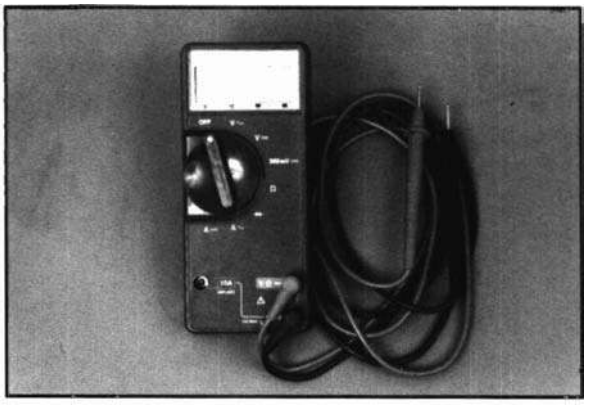
Trigger Coil: Pulser coil. Generates the voltage for triggering (closing) the thyristor and timing the spark in COI systems. Small coil mounted at the top of the stator plate next to the ignition generating coil.

Voltage Regulator: An electrical device which prevents overcharging of the battery or overloading of electrical components as engine RPM increases.

ELECTRICAL

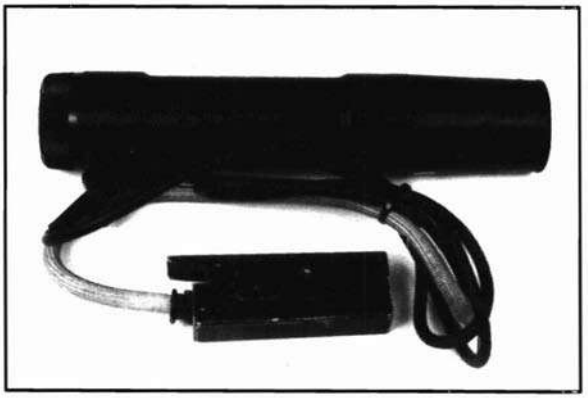
Fluke 73 Analog/Digital Multitester

Tests all electrical circuits and components.
PN 2870659



Strobe Timing Light

High intensity strobe, works on all types of ignition systems (self-contained).
PN 2870630



Digital Tachometer

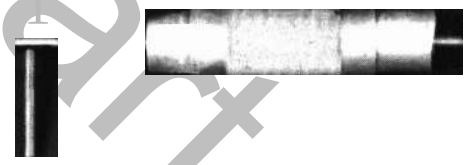
See page 1.26

ENGINE

Piston Pin Puller

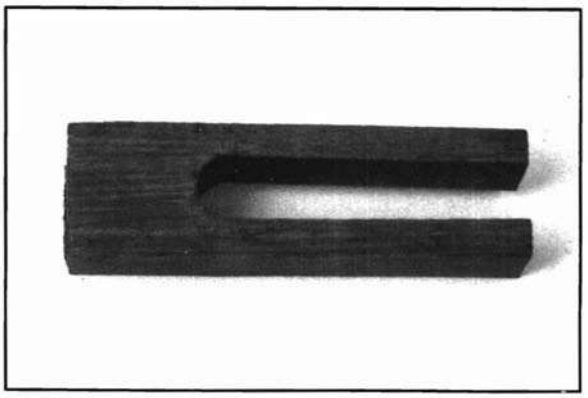
Removes 18mm piston pins from all Polaris/Fuji PWC engines.
PN 2870386

Piston Pin Puller Adaptor
(For Use With 2870386)
PN 2871445 (700, 900, 1050) Pol/Domestic Engines



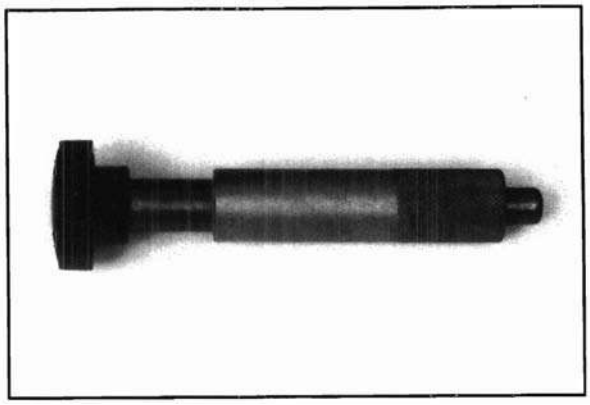
Piston Support Block

Supports piston and prevents piston skirt damage during cylinder installation.
PN 2870390



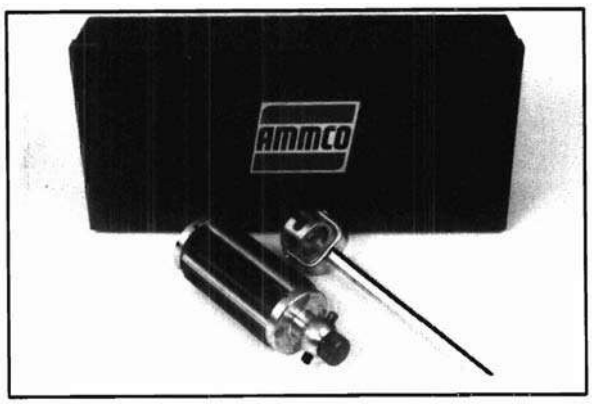
Piston Pin C-clip Installation Tool

Used to install C-clip style piston pin retainers to prevent clip distortion or piston damage. Fits 18mm C-clips.
PN 2870773



Cylinder Hone (Ammco Model No. 3950)

Rigid cylinder hone for de-glazing and truing heat distorted cylinders.
PN 2870303



Replacement Ammco Hone Sets

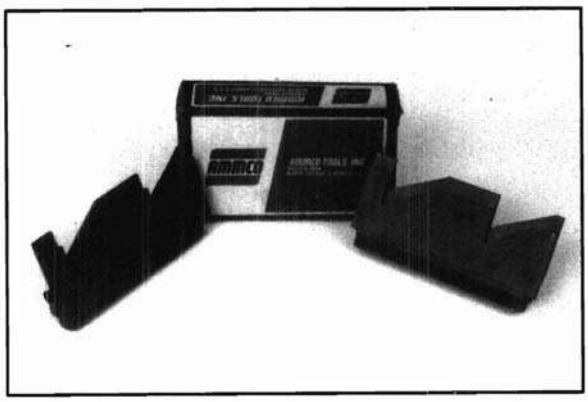
Cylinder Hone Fine Stone Set Std. (Ammco No. 3952)
PN 2870305

Cylinder Hone Course Stone Set Std. (Ammco No. 3951)
PN 2870304

Cylinder Hone Fine Stone Set O.S. (Ammco No. 3954)
PN 2870307

Cylinder Hone Course Stone Set O.S. (Ammco No. 3953)
PN 2870306

NOTE: O.S. Stone Sets range from 21/2" to 3 3/8"



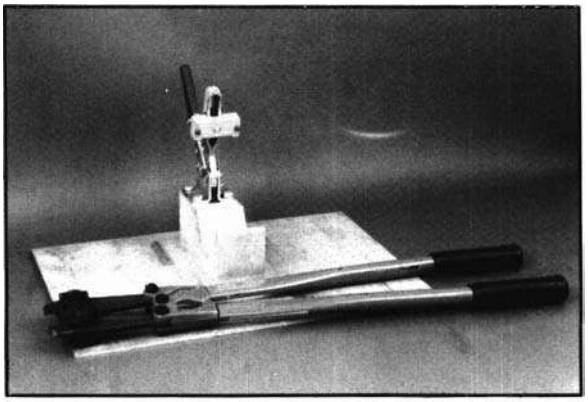
Honing Oil

Improves hone operation and prevents stone loading.
PN 2870588

ENGINE

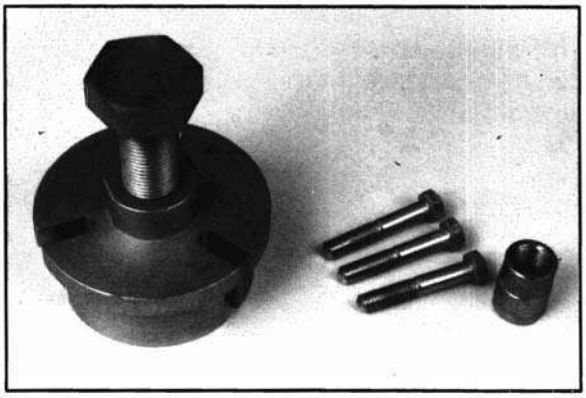
Crankshaft Alignment Kit

Used for checking and straightening crankshafts on all engines.
PN 2870569



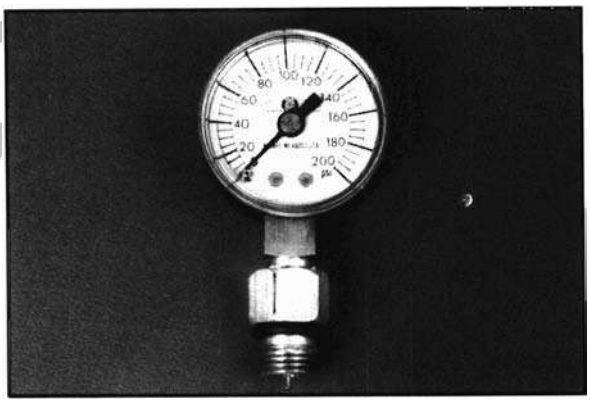
Flywheel Puller

For all 3 bolt pattern flywheels.
Items in square are for watercraft only.
PN 2871043



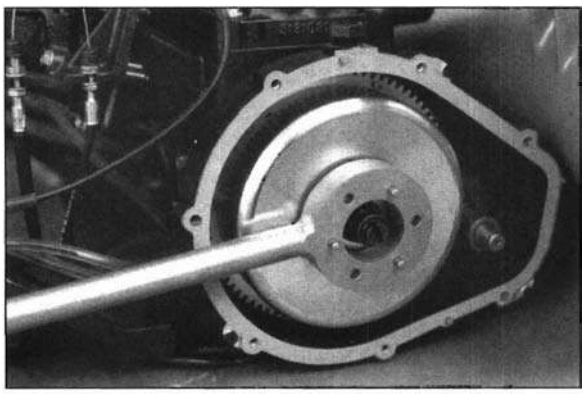
Engine Cylinder Compression Gauge

PN 2870852



Flywheel Holder

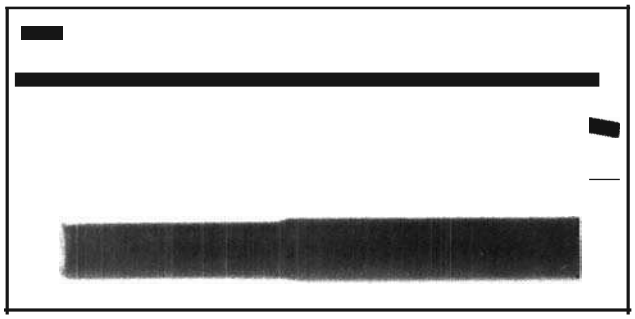
PN 8700229
PN 8700229-Adapt Adapter for Fuji PWC Engines



PUMP

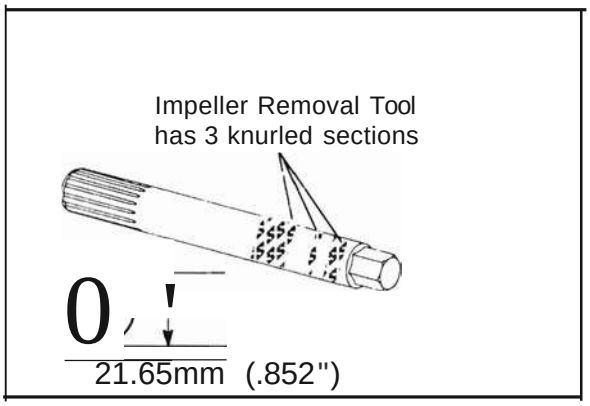
Pump Alignment Tool

This tool is used to obtain proper alignment between the engine and the jet pump.
PN 2871343



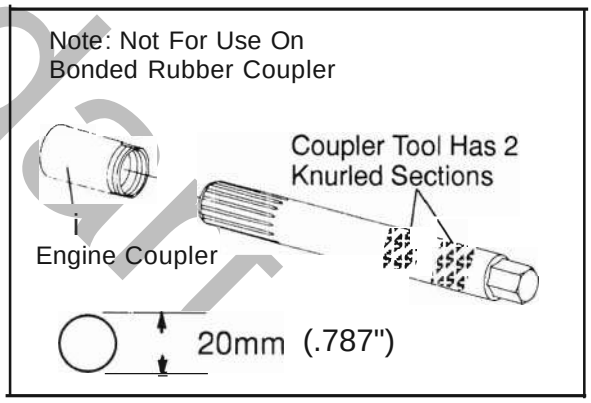
Impeller Removal Tool

This tool is used to remove the pump impeller on all models of watercraft. Can be identified by 3 knurled sections on the shaft of the tool, and by diameter.
PN 2871036



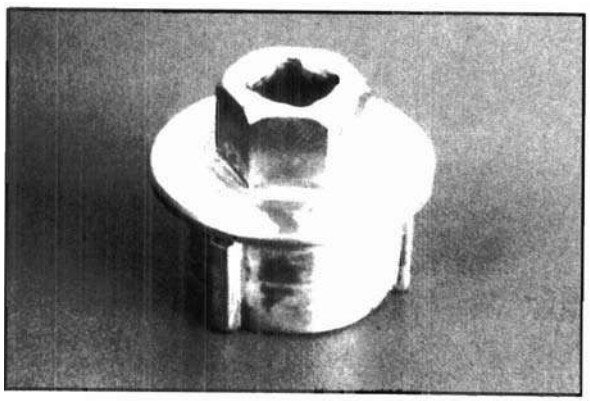
I)rive Coupler Removal Tool

This tool is used to remove the (1-piece) drive shaft coupler from the end of the crankshaft. Can be identified by 2 knurled sections on shaft, and by diameter. This tool is not for use on bonded rubber couplers.
PN 2871037



Driveshaft Through Hull Fitting Socket

This tool is used to remove and install the threaded drive shaft through-hull fitting used on 1995 SL650 STD and 1995 SLX780 model watercraft.
PN 2871425



GENERAL

Ignition Timing Dial Indicator

0-1 Range

Indicates piston BTDC position for timing all engines.

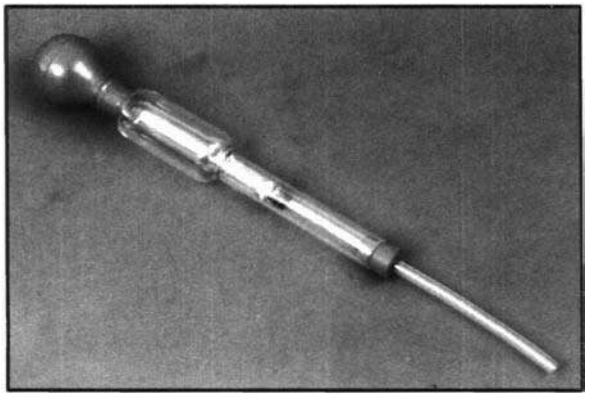
PN 2870459

Dial Indicator Extension 2870459-6484

Battery Hydrometer

Accurate small battery specific gravity hydrometer.

PN 2870836



Mity Vac™ Pump Kit

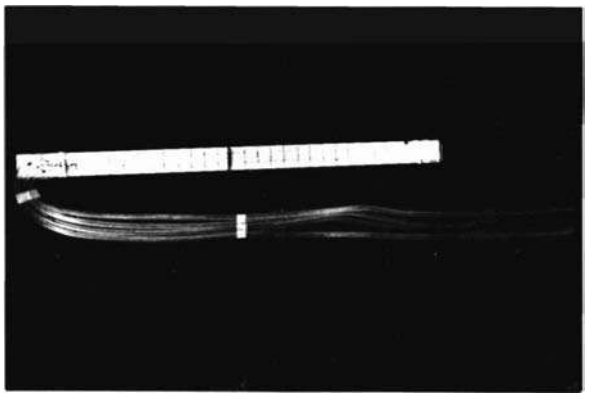
This tool is used for many service functions on Polaris Personal Watercraft including fuel system pressure and vacuum testing, and pop-off pressure testing.

PN 2870975

Carburetor Synchronizing Manometer

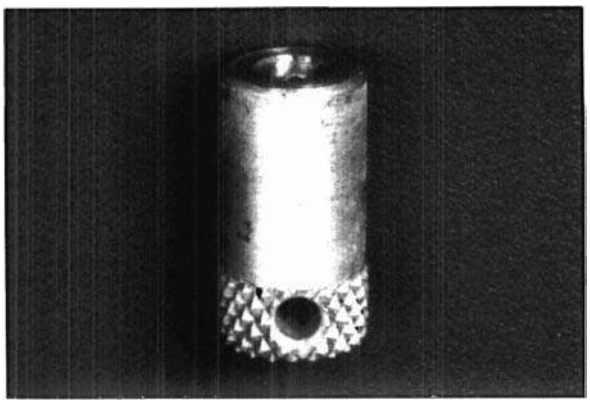
Accurate synchronization of multi carbureted engines which are equipped with vacuum spigots.

PN 2870672



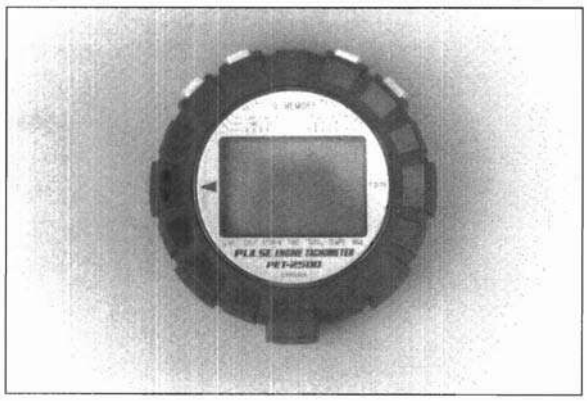
GENERAL

Carburetor Mixture Needle Adjuster
PN 2871080

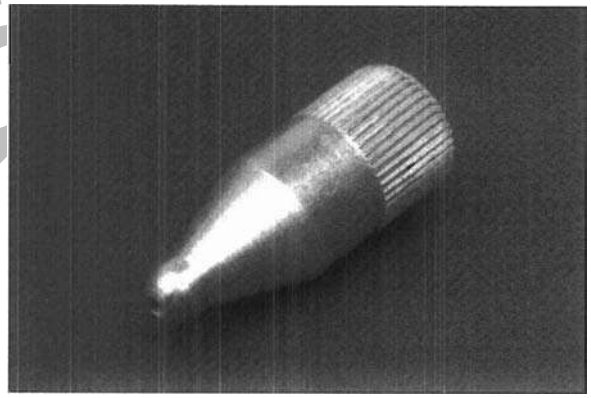


Digital Tachometer /8712500
PN 8712100 - Provides accurate RPM readings for all Polaris products. 6500 RPM limit in 2-stroke three cylinder mode. For all gasoline engines.

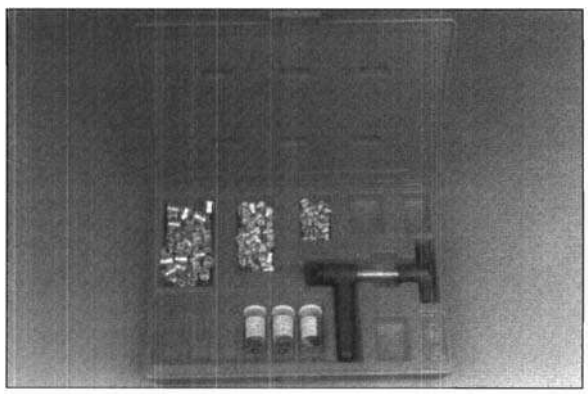
PN 8712500 - Provides RPM readings for all Polaris products. Upper limit of 40,000 RPM with an accuracy of ± 10. Loaded with features. For all gasoline engines.



Adaptor, Alemite™ Grease Fitting
Grease gun adaptor fits drive shaft coupler and driveshaft bearing carrier on all PWC.
PN 2871174



Siponson Insert Tool
This Tool Is Used To Install Threaded Inserts For Sponsons
PN 2871555



In order to perform service work efficiently and to prevent costly errors, the technician should begin by reading the text in this manual to become familiar with procedures before beginning. Pictures and illustrations have been included with the text as an aid. Notes, cautions and warnings have also been included for clarification of text and safety concerns. However, a knowledge of mechanical theory, tool use, and shop procedures is necessary to perform the service work safely and satisfactorily. Use only genuine Polaris service parts.

⚠ Cleanliness of parts and tools as well as the work area is of primary importance. Dirt and foreign matter will act as an abrasive and cause damage to precision parts. Clean the vehicle before beginning service. Clean new parts before installing.

⚠ Watch for sharp edges which can cause personal injury. Protect hands with gloves when working with sharp components.

⚠ If difficulty is encountered in removing or installing a component, look to see if a cause for the difficulty can be found. If it is necessary to tap the part into place, use a soft face hammer and tap lightly.

⚠ Some of the fasteners were installed with locking agents. Use of impact drivers or wrenches will help avoid damage to fasteners.

⚠ Always follow torque specifications as outlined throughout this manual. Incorrect torquing may lead to serious machine damage or, as in the case of steering components, can result in injury or death for the rider(s).

⚠ If a torquing sequence is indicated for nuts, bolts or screws, start all fasteners in their holes and hand tighten. Then, following the method and sequence indicated in this manual, tighten evenly to the specified torque value. When removing nuts, bolts or screws from a part with several fasteners, loosen them all about 1/4 turn before removing them.

⚠ If the condition of any gasket or O-Ring is in question, replace it with a new one. Be sure the mating surfaces around the gasket are clean and smooth in order to avoid leaks.

⚠ Some procedures will require removal of retaining rings or clips. Because removal weakens and deforms these parts, they should always be replaced with new parts. When installing new retaining rings and clips use care not to expand or compress them beyond what is required for installation.

⚠ Because removal damages seals, replace any oil or grease seals removed with new parts. A suitable driver should be used when installing a new seal to prevent distortion or damage.

⚠ Polaris recommends the use of Polaris lubricants and greases, which have been specially formulated for the top performance and best protection of our machines. In some applications, such as the engine, warranty coverage may become void if other brands are substituted.

⚠ Grease should be cleaned from parts and fresh grease applied before reassembly of components. Deteriorating grease loses lubricity and may contain abrasive foreign matter.

⚠ Whenever installing batteries, care should be taken to avoid the possibility of explosion resulting in serious burns. Always connect the positive (red) cable first and the negative (black) cable last. When working with batteries. always wear safety glasses or a face shield and protective gloves. Battery electrolyte contains sulfuric acid and is poisonous! Serious burns can result from contact with the skin, eyes or clothing. **ANTIDOTE:** External - Flush with water. Internal - Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately. Eyes - Flush with water for 15 minutes and get prompt medical attention.

GENERAL INFORMATION
Warranty Policy

LIMITED WARRANTY

Polaris Industries Inc., 1225 Highway 169 North, Minneapolis, Minnesota 55441-5078, gives a ONE YEAR LIMITED WARRANTY (90 days on SLX PRO 785) on all components of the Polaris personal watercraft against defects in material or workmanship. This warranty covers the parts and labor charges for repair or replacement of defective parts which are covered by this warranty. This warranty begins on the date of purchase. This warranty is transferrable to another consumer during the warranty period through a Polaris dealer. There is a charge of $35.00 payable to Polaris Industries Inc.

REGISTRATION

At the time of sale, the Warranty Registration Form must be completed by your dealer and submitted to Polaris within ten days. Upon receipt of this registration, Polaris will record the registration for warranty. No verification of registration will be sent to the purchaser as the copy of the Warranty Registration Form will be the warranty entitlement. If you have not signed the original registration and received the "customer copy", please contact your dealer immediately. NO WARRANTY COVERAGE WILL BE ALLOWED UNLESS YOUR PERSONAL WATERCRAFT IS REGISTERED WITH POLARIS.

Initial dealer preparation and set-up of your personal watercraft is very important in ensuring trouble-free operation. Purchasing a machine in the crate or without proper dealer set-up will void your warranty coverage.

WARRANTY COVERAGE AND EXCLUSIONS:

LIMITATIONS OF WARRANTIES AND REMEDIES

This Polaris limited warranty covers all parts and components except for impeller damage caused by ingestion of rocks, sand, or gravel or any other damage caused by operation in shallow water. The warranty also excludes any other failures that are not caused by a defect in material or workmanship.

This warranty does not cover accidental damage, normal wear and tear, abuse or improper handling. This war"anty also does not cover any personal watercraft that has been altered structurally, modified, neglected, improperly maintained, used for racing, or used for purposes other than for which it was manufactured, or for any damages which occur during trailer transit or as a result of unauthorized service or the use of unauthorized parts. In addition, this warranty does not cover physical damage to paint or finish, gel coat stress cracks, tearing or puncturing of upholstery material, corrosion, or defects in parts, components or personal watercraft due to fire, explosions or any other cause beyond Polaris' control.

This warranty does not cover the use of unauthorized lubricants, chemicals, or fuels that are not compatible with watercraft. In addition this warranty does not cover stress cracks, submersion, or growth of marine organisms on hull and deck.

The exclusive remedy for breach of this warranty shall be, at Polaris' exclusive option, repair or replacement of any defective materials, or components or products. THE REMEDIES SET FORTH IN THIS WARRANTY ARE THE ONLY REMEDIES AVAILABLE TO ANY PERSON FOR BREACH OF THIS WARRANTY. POLARIS SHALL HAVE NO LIABILITY TO ANY PERSON FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY DESCRIPTION, WHETHER ARISING OUT OF EXPRESS OR IMPLIED WARRANTY OR ANY OTHER CONTRACT, NEGLIGENCE, OR OTHER TORT OR OTHERWISE. Some states do not permit the exclusion or limitation of incidental or consequential damages or implied warranties, so the above limitations or exclusions may not apply to you if inconsistent with controlling state law.

ALL IMPLIED WARRANTIES (INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) ARE LIMITED IN DURATION TO THE ABOVE ONE YEAR WARRANTY PERIOD. POLARIS FURTHER DISCLAIMS ALL EXPRESS WARRANTIES NOT STATED IN THIS WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you if inconsistent with controlling state law.

HOW TO OBTAIN WARRANTY SERVICE

If your personal watercraft requires warranty service, you must take it to a Polaris Servicing Dealer. When requesting warranty service you must present your copy of the Warranty Registration form to the dealer. (THE COST OF TRANSPORTATION TO AND FROM THE DEALER IS YOUR RESPONSIBILITY). Polaris suggests that you use your original selling dealer; however, you may use any Polaris Servicing Dealer to perform warranty service.

Please work with your dealer to resolve any warranty issues. Should your dealer require any additional assistance they will contact the appropriate person at Polaris.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

If any of the above terms are void because of state or federal law, all other warranty terms will remain in effect.

Engine Oil

1. Always use Polaris engine oil.
2. Never substitute or mix oil brands as serious engine damage and voiding of warranty can result.

CHAPTER 2
MAINTENANCE/TUNE UP

Periodic Maintenance Schedule

NOTE: Maintenance intervals are based upon average operating conditions. Watercraft operated in saltwater require daily corrosion protection and engine flushing, and more frequent maintenance and lubrication.

DESCRIPTION	Refer to Page.	Pre-ride Daily	Pre-season	1 Mo.! 25 Hrs	3 Mo.! 50 Hrs	6 Mol 100 Hrs	Tune Up Item
ENGINE							
Engine corrosion protection/fogging (daily-salt water)	2.35-38	L"	L	L			
Cooling system flushing (daily after use in salt water)	2.33-35	I"	I				•
Exhaust cooling hose screen	2.14		I/C		I/C		•
Exhaust hose condition			I		I		
Engine mounts (Replace if removed for engine service)	2.11		I			I	•
Thermostat/popoff valve assembly / spring	2.15		I/C	I/C'		R[1]	•
Water inlet and outlet hoses and clamps	4.104-109		I	I	I	R	
Spark plugs / Compression test	2.11		I/R		I	I/R	•
Engine fastener re-torque (cyl head / cyl base, exhaust)	2.13		I			I	•
Oil pump adjustment (where applicable)	2.17-18		I		I		•
FUEL SYSTEM							
Fuel/water separator (drain water)	2.27-28	I/C	I/C				•
Inspect and clean fuel water separator/filter	2.27-28	I	I			R[2]	
Fuel filter and oil filter	2.17/3.61		R	I			•
Throttle and choke cables	2.3/2.19	I	I/UA		L		•
Carburetor (see engine fogging procedure) synchronize	2.37-38		AIC			A	•
Fuel cap/oil cap gaskets		I	I	I	I	R	
Fuel lines, oil lines, related hose clamps, check valves and hose inspection, fuel system pressurization	2.29		I			I	•
Vent system (oil and fuel) check-valves; hose routing	3.94-3.98		I				•
Fuel system pressure/vacuum test	3.106		I				
Air intake silencer/water separator drain line(s)	3.30-39		IIC				•
JET PUMP							
Drive shaft coupler and bearing housing'" 1992-95 models (rigid coupler) grease every 20 hours	2.6/5.38		iIL	I/L'		I/L'"	•
Drive shaft shroud condition	5.39		I	I			•
Bilge system pick-up screens and hoses	2.40	I/C	I/C				•
Cooling water inlet screen / hoses, clamps	2.43	I/C	IIC				•
Jet pump intake grate fasteners and condition	2.43		I		I		•
Impeller condition and impeller clearance	2.43/Ch 5		I			I	•
Pump Sacrificial Anode	2.44		I		I		•
Reverse mechanism / Power trim adjustment	2.25/2.41		I/A		I/A		•
ELECTRICAL							
Battery condition, fluid level	2.8-9	I	I				•
Battery vent hose condition/routing (must be clear)	2.8-10		I		I		•
Battery and starter cables (clean connections / tight)	2.7		I		I	I	•
Ground cables-condition, corrosion, fastener torque	2.7		I		I	I	
Engine overheat warning/tone/electrical connections	7.25		I			I	
Oil level warning system test	7.28		I			I	
Lanyard cord/engine stop switch	7,15	I	I				•

, Perform every 15 hrs. or one month when operated in salt water. '*Perform daily when operated in salt water.
"'Bonded rubber couplers-Pre-Season (Annually), 100 hrs, or when pump is disassembled for maintenance.
[1] Replace pop-off valve, spring, and seals
[2] Replace water separator filter element and o-ring

KEY

1=Inspect, adjust, service, or replace if necessary A=Adjust C=Clean R=Replace item
L=Lubricate with recommended lubricant

MAINTENANCE/TUNE UP
Maintenance Schedule

Periodic Maintenance Schedule

NOTE: Maintenance intervals are based upon average operating conditions. Watercraft operated in saltwater require daily corrosion protection and engine flushing, and more frequent maintenance and lubrication.

HULL / DECK / STEERING / CONTROLS							
Steering support hub bushings/fasteners/handgrips	2.51 Ch. 6		IIL			*IIL*	•
Steering cable	2.22		I/UA		IIL		•
Steering Nozzle Bushings	2.22	I				R	
Reverse cable inspection, lubrication	2.25	I	I/UA		I/UA		
Handlebarlsteering operation (turns fully/freely/fasteners)	2.21	I	I				•
Hull, clean and inspect for cracks, damage, or leaks	2.39	I	*C/I*				
Drain Plug Condition	2.40	I	I				•
Bilge system inpection, should not leak	Ch 6	I	I			I	
Seat and compartment seals (condition of seal)	2.45-47		I/A	I/A			•
Fire extinguisher	2.39		I			I	•
Inspect and tighten aI/fasteners, including carburetor mounts engine mounts, exhaust system, all hose clamps; inspect muffler, battery, oil and fuel tank fastening devices, pump, steering fasteners. Agressive riding requires more frequent service.			I	I			•

Fogging kits should be added to all Polaris watercraft. The engine should be fogged it the PWC will not be used for more than 48 hours.

* Perform every 15 hrs. or one month when operated in salt water. **Perform daily when operated in salt water.

'''Bonded rubber couplers-Pre-Season (Annually), 100 hrs, or when pump is disassembled for maintenance.

[1] Replace pop-off valve. spring. and seals

[2] Replace water separator filter element and o–ring

KEY

1=lnspect, adjust, service, or replace if necessary A=Adjust C=Clean R=Replace item
L=Lubricate with recommended lubricant

After washing the engine compartment of the watercraft, protect the metal components with a heavy duty silicone based spray lube or other *non-flammable* metal protectant. Do not use flammable sprays or protectants in the engine compartment. Do not use petroleum based protectants or lubricants in the engine compartment, as most are flammable and also may deteriorate rubber components.

MAINTENANCE/TUNE UP

Recommended Lubricants

As with all watercraft, proper lubrication and corrosion protection are necessary to maintain performance and ensure years of trouble free service. Use the recommended lubricant for each component as indicated in the chart below.

Product	Application
Polaris Premium All Season Grease	-Driveshaft coupler splines -Driveshaft impeller splines -Steering post bushings -Driveshaft bearing housing -Steering cable ends -Pump to hull O-ring -Carburetor shafts, springs -Seat latch and hooks
Dielectric Grease	-All electrical connections and connectors -Battery cable bolts -Engine ground connection at mount plate, reed cage, etc.
Marine Grade Silicone Sealant (PN 8560054)	-Pump inlet scoop -Pump mating surfaces -Ride plate -Area where cables pass through hull, -All underwater areas,
Cable Lube	-Throttle, choke, and steering inner cables -Ends of throttle and choke cable -Oil pump control rod ends (1995 models)
T-9 Metal protectant	-All external metal parts (For internal engine protection use Polaris fogging oil)

Part Number	Maintenance Products
8560054	Marine Grade Silicone Sealant (14 oz.)
2870652	Fuel Stabilizer (16 oz.)
2871557	Crankcase Sealant 3 Bond 1215
2871066	Premium Marine Grease 14 oz. tube
2871423	All Season Grease 14 oz. tube
2871322	All Season Grease 3 oz. tube
2871326	Premium Carbon Clean Fuel Treatment
2871044	Corrosion Resistant Dielectric Grease
2870587	515 Gasket Eliminator
2870791	Engine Fogging Oil (Aerosol Spray)
2871517	Liquid (non-aerosol) fogging oil for use with kit 2871480
2871518	Liquid (non-aerosol) fogging oil for use with kit 2871480
2871064	T-9 Metal Protectant
2870510	Polaris Cable Lube
2871460	Starter Drive Grease
2871715	Handgrip Adhesive, 25g
	Accessories
2871237	Bilge Pump Kit (Electric)
2200536	Offshore Kit (Includes fuel/water separator)
2200595	FuellWater Separator Kit
2871480	Fogging Kit (Use liquid fogging oil PN2871517 or 2871518)
2371456	Vortex™ Air Intake Kit
2871552	Air Box Update Kit
2530016	Water Inlet Filter

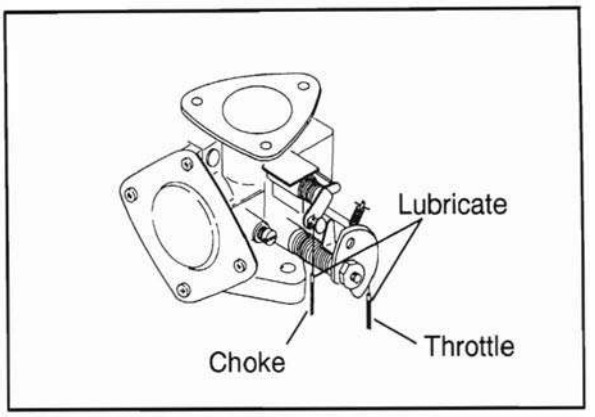
Throttle Cable And Choke Cable

Lubricate the inner throttle cable and choke cable using Polaris Cable Lube.

1. Depress throttle lever and apply lube onto cable.

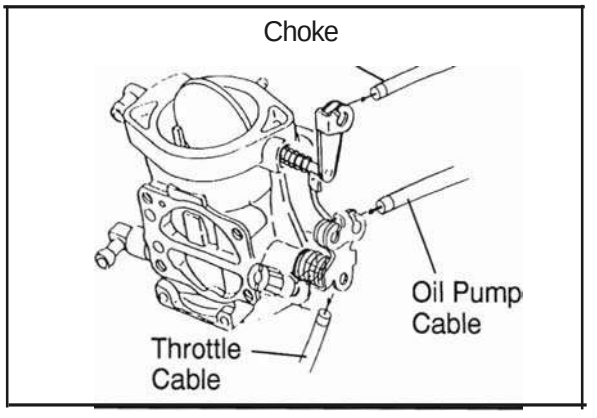
2. Push and release throttle several times to work lubricant down cable.

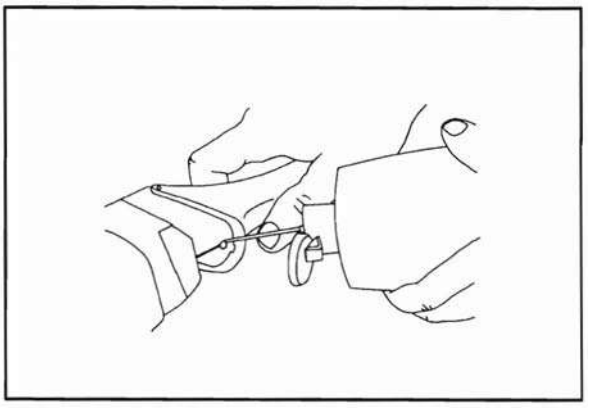
NOTE: Cable seals can be moved to allow oil into the cable. Make sure seals are put back in proper location after oiling.



Polaris Cable Lube

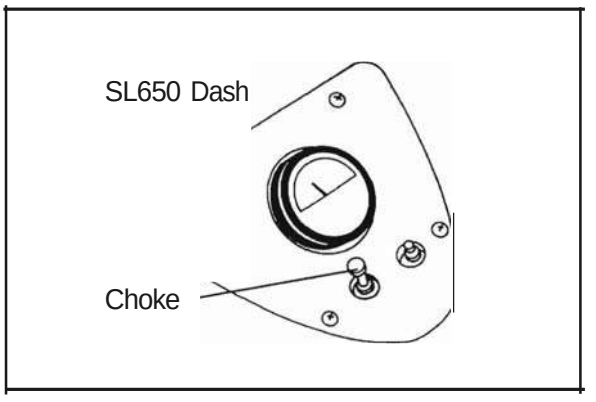
PN 2870510





Choke Knob

Pullout choke knob and apply Polaris Cable Lube to knob shaft.

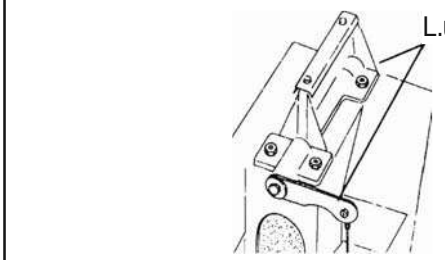


Steering Cable

Lubricate steering cable joints on steering nozzle end and steering post end using Polaris Cable Lube.

1. Expose inner cable and apply lube.

NOTE: Cable seals can be moved to allow oil into the cable. Make sure seals are put back in proper location after oiling.

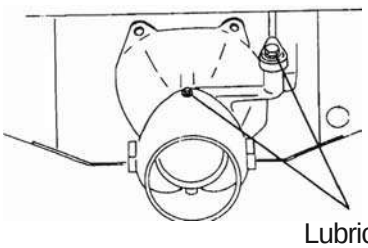


Steering Nozzle Pivot

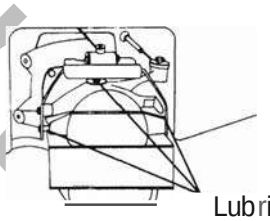
Lubricate steering nozzle pivot with Polaris cable lube or grease.

Polaris Cable Lube

PN 2870510



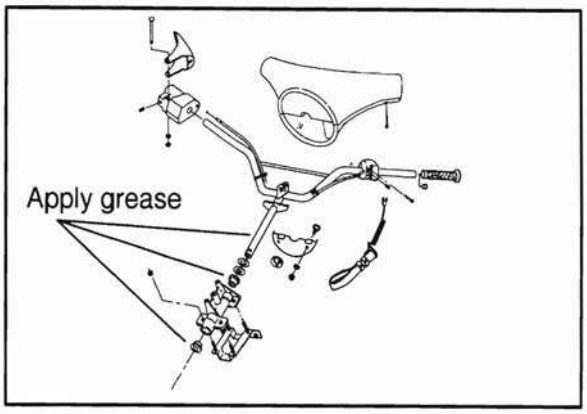
SL650 Shown



Steering (Handlebar) Pivot Shaft

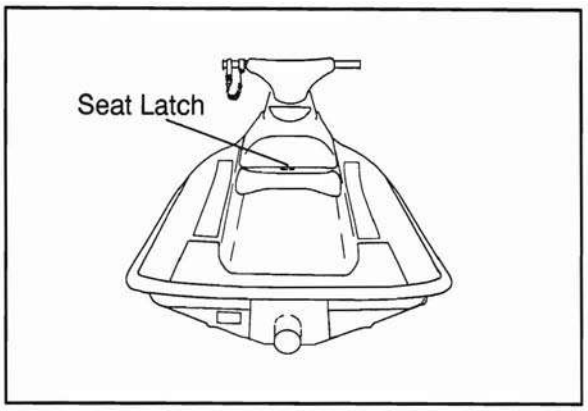
Lubricate handle pivot shaft and bushing using Polaris Premium Marine Grease or All Season Grease.

Premium Marine Grease PN 2871066
Premium All Season Grease PN 2871423
14 1/2 oz. Tube



Seat Latch And Hooks

Grease locking mechanism of seat latch at rear of seat opening.



Throttle and Choke Shaft

Grease springs, exposed portions of cable, idle stop screw, and throttle and choke shafts at carburetor.

NOTE: Grease often if used in salt water.

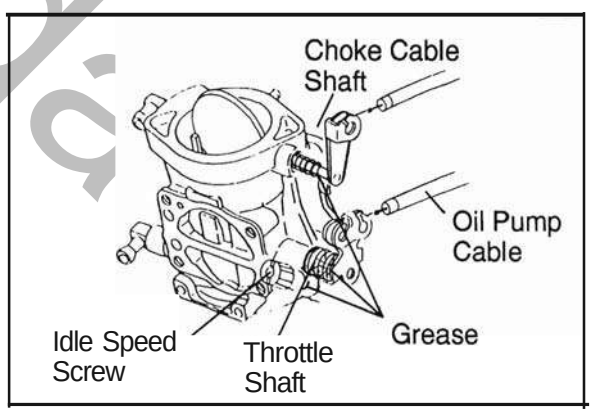
Steering Nozzle Pivot

Lubricate steering nozzle pivot with Polaris cable lube or grease.

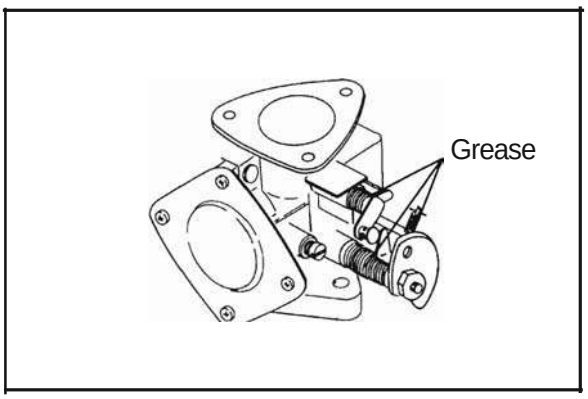
Carburetor and Oil Injection Pump

Grease springs, exposed portions of cable, and shafts at carburetor.

NOTE: Grease often if used in salt water.



Polaris Cable Lube
PN 2870510



MAINTENANCE/TUNE UP
Lubrication
Drive Shaft Lubrication

⚠ WARNING

The plastic driveshaft shroud is designed to protect you from dangerous moving parts. It must be rotated out of the way to lubricate the driveshaft coupler. Follow the instructions below in order to avoid personal injury.

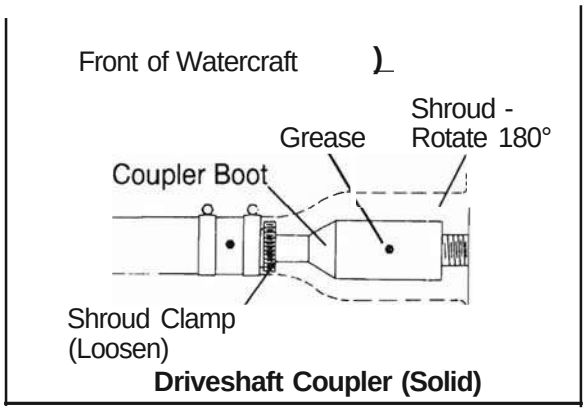
CAUTION:

Grease drive shaft coupler and bearing housing anytime water in the craft has been at or above the coupler level to avoid damage to these parts. Lubrication after every 25 hours of operation is also recommended.

1. Remove lanyard cord and lock plate from engine stop switch.
2. Remove seat. Remove battery ground (negative) cable.
3. Loosen clamp holding plastic driveshaft shroud in place and rotate shroud 180°.

All Season Grease (14oz.) PN 2871423
All Season Grease (3oz.) PN 2871322
Needle Point Adaptor PN 2871174

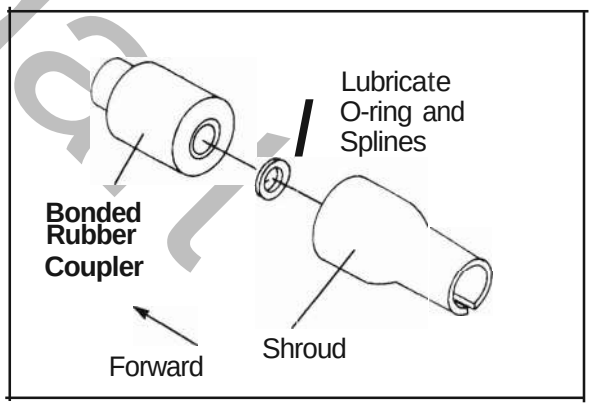
4. Turn driveshaft coupler until grease fitting is accessible. Using a grease gun with a needle point, lubricate coupler at grease fitting until coupler boot just begins to expand.
5. Reposition driveshaft shroud (open side down) and torque clamp screw to 25 in. lbs.
6. Reconnect battery ground (negative) cable.
7. Reinstall seat.



Driveshaft Coupler (Solid)

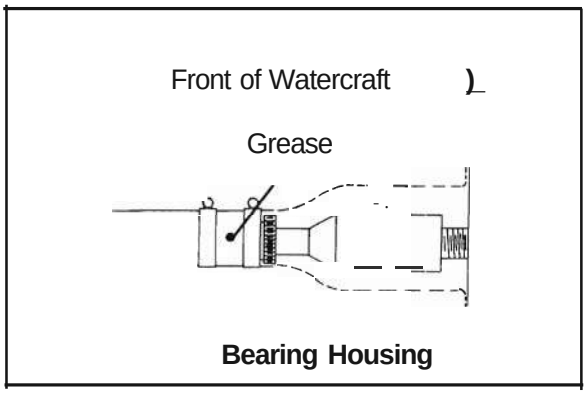
Models With Bonded Rubber Coupler (1996-Current)

Driveshaft splines should be lubricated during pre season maintenance, every 100 hours, or when pump is disassembled. Sealing O-rings at impeller end and inside coupler should be inspected and replaced if worn or damaged. Refer to Final Drive section for driveshaft removal procedure. Use Premium All Season Grease.



Bearing Housing

Using a grease gun with a needle tip lubricate bearing housing at grease fitting until grease purges past seals.



Bearing Housing

Electrical Connections

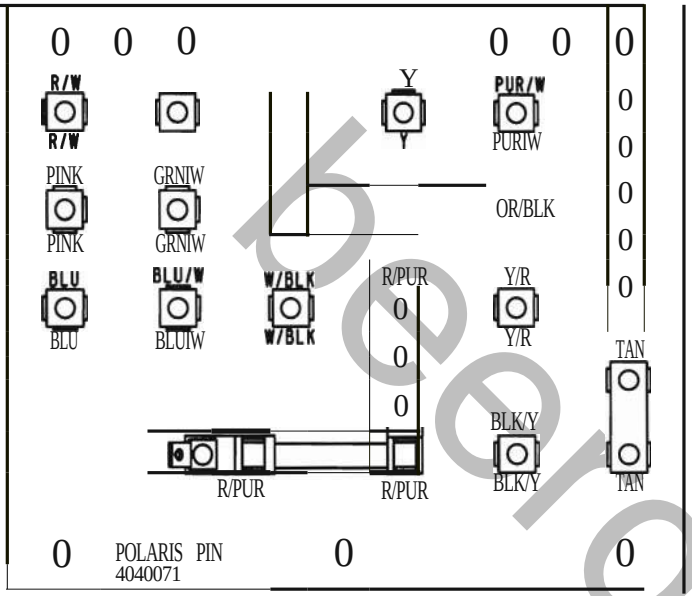
Apply dielectric grease to battery posts and exposed cable connections.

Inspect electrical box for moisture, check wire sealing grommets, and apply di-electric grease to terminal board connections.

Corrosion Resistant Dielectric Grease

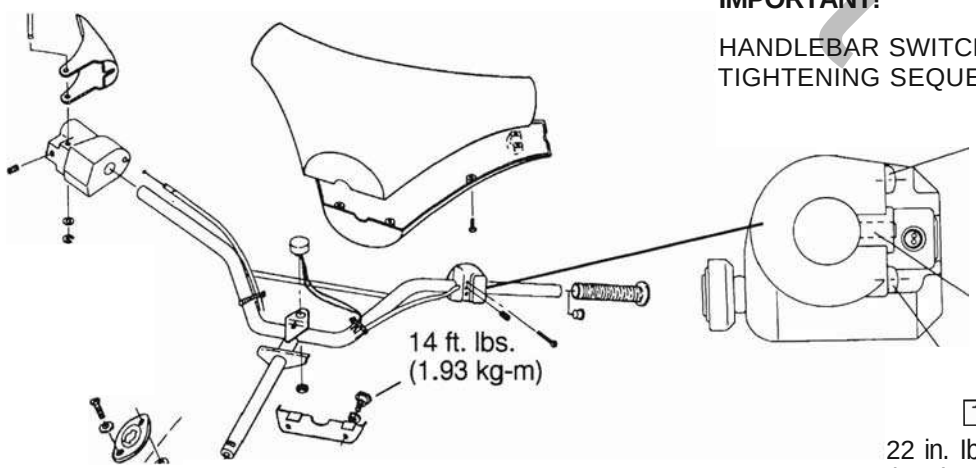
PN 2871027

Terminal Board, Typical



Handlebar Switch Tightening Sequence

IMPORTANT! Follow the screw tightening sequence shown below when installing the left hand handlebar switch.



IMPORTANT!

HANDLEBAR SWITCH
TIGHTENING SEQUENCE

2
22 in.lbs.
(.25 kg-m)

3
30 in. lbs.
(.35 kg-m)

1
22 in. lbs.
(.25 kg-m)

Battery Safety

When removing and installing the battery, or when performing battery maintenance always heed the following warnings and cautions:

⚠ WARNING

Battery electrolyte is poisonous. It contains sulfuric acid., Serious burns can result from contact with the skin, eyes or clothing.

Antidote:

EXTERNAL - Flush with water.

INTERNAL - Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call a physician immediately.

EYES - Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in closed space. Always shield eyes when working near batteries. KEEP OUT OF THE REACH OF CHILDREN.

CAUTION:

The battery must be removed from the watercraft for maintenance and charging. Battery electrolyte may spill and damage the watercraft.

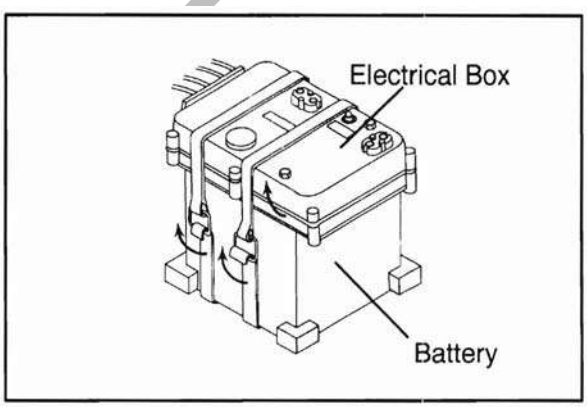
⚠ WARNING

Always disconnect the black (negative) cable first. Electrolyte or fuel vapors may be present in the engine compartment and a spark could ignite them which could cause personal injury. When re-installing battery connect black (negative) cable last.

Whenever installing batteries, care should be taken to avoid the possibility of explosion resulting in serious burns. Always connect the positive (red) cable first and the negative (black) cable last. When working with batteries, always wear safety glasses or a face shield and protective gloves. Battery electrolyte contains sulfuric acid and is poisonous! Serious burns can result from contact with the skin, eyes or clothing. **ANTIDOTE:** External- Flush with water. Internal - Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately. Eyes - Flush with water for 15 minutes and get prompt medical attention.

Battery Removal

1. Remove straps holding electrical box and battery in position.
2. Move electrical box out of the way. It does not have to be opened for battery removal. **NOTE:** Some wiring may have to be removed from wire clips for easier access.
3. Remove battery vent tube from battery.
4. Disconnect black (negative) battery cable first.
5. Disconnect red (positive) battery cable next.
6. Lift battery out of watercraft, being careful not to tip it sideways and spill any electrolyte.



CAUTION:

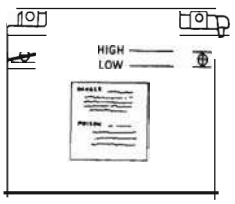
Battery electrolyte can damage the watercraft finish if spilled. If an electrolyte spill occurs, apply a generous amount of baking soda to the area and then rinse with fresh water.

Replenishing Battery Fluid

The fluid level should be kept between the upper and lower level marks.

To refill use only distilled water. Tap water contains minerals which are harmful to a battery.

Maintain Between Upper and Lower Level Marks

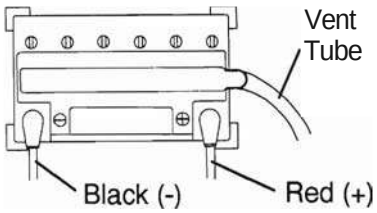


Battery Connections

Battery terminals and connections should be kept free of corrosion. If cleaning is necessary, remove the corrosion with a stiff wire brush. Wash thoroughly with a solution of baking soda and water (one tablespoon of baking soda to one cup of water). Rinse well with tap water and dry off with clean shop cloths. Coat the terminals and terminal bolts with dielectric grease.

Corrosion Resistant Dielectric Grease
PN 2871027

Top View of Battery



Battery Charging

CAUTION:

The battery must be removed from the watercraft for maintenance and charging. Battery electrolyte may spill and damage the watercraft.

Always disconnect the black (negative) cable first. Electrolyte or fuel vapors may be present in the engine compartment and a spark could ignite them which could cause personal injury. When re-installing battery connect black (negative) cable last.

WARNING

Keep the battery away from sparks and open flames during charging because the battery gives off gases which are explosive. If you smell fuel do not attempt to charge the battery. When using a battery charger connect the battery to the charger before turning on the charger. This prevents the possibility of sparks at the terminals which could ignite the battery gases. Do not connect charger cables to the battery unless the charger is unplugged.

1. Remove caps from cells. Add distilled water if necessary to bring electrolyte up to proper level.
2. Connect battery to a charger. Set charging rate at 1.9 amps (maximum) and charge battery for ten hours.

CAUTION:

During charging, if the electrolyte temperature rises above 115°F (45°C) or if battery feels hot when touched, reduce the charging rate to lower the temperature and increase the charging time.

3. After battery is charged, check fluid level. If it has dropped add distilled water to bring electrolyte up to proper level.
4. Check results of charging. The specific gravity of each cell must be 1.270 at room temperature. The voltage should be 14.5 - 15.5 V during charging; 12.2 - 12.8 V after charging.

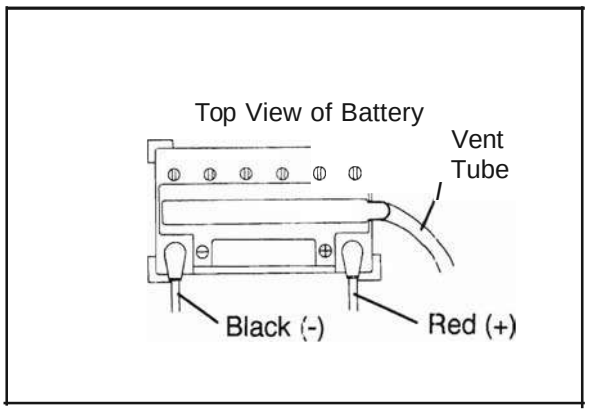
Specific Gravity
1.270 or greater - each cell

Battery Installation

WARNING

Always connect battery cables in the order specified. Red (positive) cable first, black (negative) cable last.

1. Install battery in its holder.
2. Install battery vent tube. It must be free from kinks, obstructions, or restrictions and securely installed. If not, battery gases could accumulate and cause an explosion. Avoid skin contact with electrolyte, severe burns could result.
3. Apply dielectric grease to each cable bolt.



Corrosion Resistant Dielectric Grease
PN 2871027

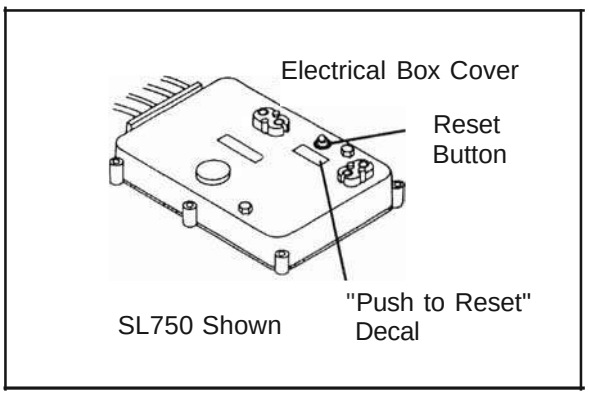
4. First, connect and tighten red (positive) cable.
5. Second, connect and tighten black (negative) cable.
6. Apply dielectric grease to each cable end and to terminal post area.
7. Reinstall battery cover and electrical box over battery and reconnect straps.
8. Verify that cables are properly routed.
9. Verify that vent hose is not kinked.

Battery Storage

1. Remove battery. Clean casing and terminals with baking soda and water (one tablespoon of baking soda to one cup water). Apply dielectric grease to battery terminals and all exposed cable connectors.
2. Top off battery with distilled water and charge to a specific gravity of 1.270 (test each cell). Recharge monthly as required to prevent battery discharge, sulfation, and freezing.
3. Store battery in a cool, dry place out of direct sunlight.

Circuit Breaker

The electrical system is protected with a 15A circuit breaker. In order to reset the circuit breaker, locate and push the reset button on top of the electrical box.



Engine Mounts

Check tightness of all engine mounts including bolts that secure mounting plate to engine. Inspect rubber mounts for cracks. Tighten or replace if necessary.

Compression Test

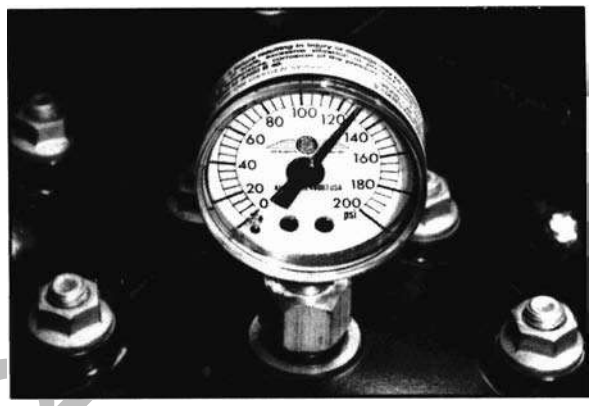
A compression test is a good indicator of engine condition. For accurate readings, use a high quality gauge and make sure the battery is in good condition and fully charged.

Compression Gauge PN 2870852

WARNING

The spark plug high tension leads must be securely grounded to the engine block to prevent a spark which may ignite fuel or fumes, causing a fire or explosion.

1. Remove all spark plug high tension leads and connect securely to ground on engine block.
2. Remove all spark plugs and install compression gauge in cylinder to be tested.
3. Using the starter motor, turn engine over with throttle wide open until a maximum reading is obtained (approximately 3-5 seconds). Record reading.
4. Repeat for the other cylinders and compare to each other cylinder. All readings must be within 5% of each other. 1997 1050cc models-Center cylinder will have approximately 15 PSI less than Mag and PTO.



Compression (Open Throttle at Sea Level)

Standard - 120-150 lbs./sq. in
8.40-10.5 kg/sq. cm

Service Limit - Greater than 5% variance between cylinders.

Spark Plugs

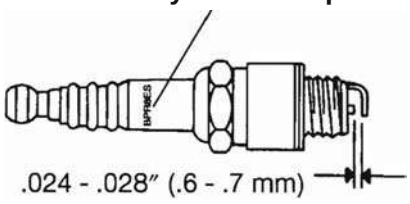
1. Disconnect high tension leads and remove spark plugs. Refer to page 7.1 for spark plug application.
2. Inspect electrodes for wear, carbon buildup, or fouling (wet oily residue). Replace plugs if edges of electrodes are rounded or eroded.

CAUTION:

Severe engine damage may occur if the incorrect spark plug is used. Refer to General section for spark plug type.

3. Clean with electrical contact cleaner or a glass bead spark plug cleaner only. A wire brush or coated abrasive should not be used.

Important! Use Only Resistor Spark Plugs



Spark Plugs

6. Measure gap with a wire gauge. Recommended spark plug gap is .024 - .028" (.6 - .7 mm) Adjust if necessary by bending the side electrode carefully.
7. Coat spark plug threads with a small amount of anti-seize compound.
8. Install spark plug and torque to specifications.
9. Make sure spark plug caps are screwed completely onto end of plug wire.
10. Apply a small amount of dielectric grease to inside of plug caps and install.

Corrosion Resistant Dielectric Grease
PN 2871027

SparkPlug Gap: .024 - .028" (.6 - .7 mm)

Torque:
18 ft. lbs. (2.49 kg-m) (Used)
11 ft. lbs. (1.52 kg-m) (New)

Alternate Spark Plugs:
For NGK BPR7ES -
NGK BR8ES
Champion RN3C
NDW24ESR-U

For NGK BPR9ES -
NGKBR9ES
Champion RN2C

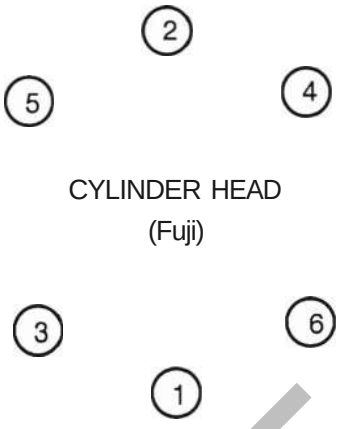
Ignition Timing Specifications and Degrees to Piston Position Conversion Chart

Refer to Electrical Section for ignition timing adjustment procedure.

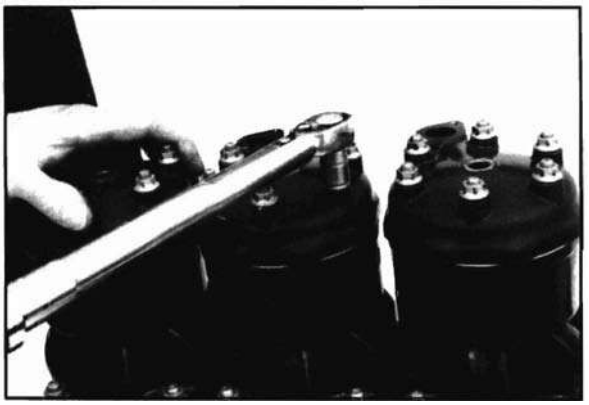
Model	Ignition Timing @ 3000 RPM			Tolerance @ 3000 RPM
	Degrees BTDC	Inch.	MM	Inches (millimeters)
1992 SL650	24° ± 1.5	.139	3.54	.123-.156"(3.30-3.78mm)
1992 SL650	24° ± 1.5	.139	3.54	.123-.156"3.30-3.78mm)
1993 SL650	18° ± 1.5	.079	2.01	.066-.094"(1.89-2.13mm)
1993 SL750	16° ± 1.5	.063	1.59	.055-.071 "(1.89-2.13mm)
1994/95 SL650/STD	18° ± 2	.079	2.01	.062-.097"(1 .59-2.47mm)
1994/95 SL750 / SLT750	24° ± 2	.139	3.54	.117-.162"(2.98-4.13mm)
1995 / 1996 SLX780	28° ± 2	.188	4.77	.162-.214"(4.13-5.41 mm)
1996 SLT780 (EC78PWE02)	28° ± 2	.188	4.77	.162-.214"(4.13-5.41 mm)
(EC78PWE03)	24° ± 2 (26@1500)	.139	3.54	.123-.156"(2.98-4.13mm)
(EC78PWE05)	24° ± 2 (26@1500)	.139	3.54	.123-.156"2.98-4.13mm)
1996 SL780 (EC78PWE02)	28° ± 2	.188	4.77	.162-.214"(4.13-5.41 mm)
(EC78PWE03)	24° ± 2 (26@1500)	.139	3.54	.123-.156"2.98-4.13mm)
1996 -1997 SUSLT 700	18° ± 2	.081	2.06	.065-.100"(1 .65-2.55mm)
1996 - 1997 Hurricane	20° ± 2	.100	2.55	.081-.121 "(2.06-3.07mm)
1996 - 1997 SL900	18° ± 2	.081	2.06	.065-.100"(1.65-2.55mm)
1996 -1997 SLTX	18° ± 2	.081	2.06	.065-.100"(1.65-2.55mm)
1997 SL780/SLT780	24° ± 2	.139	3.54	.117-.162"(2.98-4.13mm)
1997 SL1050	18° ± 2	.081	2.06	.065-.100"(1 .65-.2.55mm)
1998 SLH	18° ± 2(13° ± 2@6250)	.081	2.06	.065-.100"(.031-.057"@6250)
1998 SLTH	18° ± 2(13° ± 2@6250)	.081	2.06	.065-.100"(.031-.057"@6250)
1998 SLXH	18°+0,-2(11 °+0,-2@6250)	.081	2.06	.065-.081 "(.019-.031 "@6250)
1998 SLTX	18°+0,-2(11 °+0,-2@6250)	.081	2.06	.065-.081 "(.019-.031"@ 6250)

Cylinder Head Re-Torque (Fuji)

With engine at room temperature (68° F or 20° C), re-torque cylinder heads in a criss-cross pattern .



CYLINDER HEAD
(Fuji)



Cylinder Head Torque
18 ft. lbs. (2.49 kg-m)

Cylinder Base Gasket Re-Torque

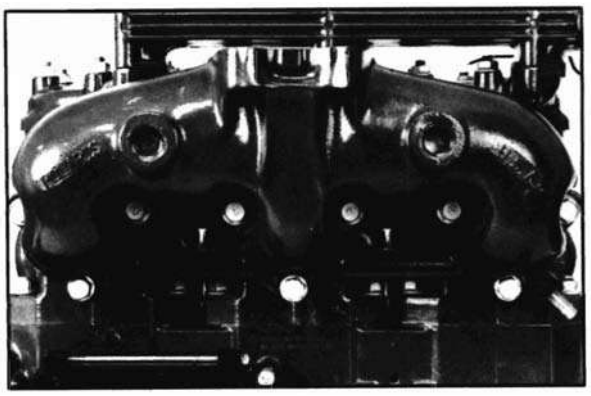
With engine at room temperature (68° For 20° C), re-torque cylinder base nuts following the pattern described in the Engine Section.

Cylinder Base Nut Torque
700, 900, 1050 - 40 ft. lbs. (5.53 kg-m)
650, 750, 780 - 28 ft. lbs. (3.87 kg-m)

Exhaust Manifold

With engine at room temperature (68° F or 20° C), re-torque exhaust manifold bolts following torque pattern shown in General Information section.

Exhaust Manifold Torque
700, 900, 1050 - 22 ft. lbs. (3.04 kg-m)
650, 750, 780 - 18 ft. lbs. (2.49 kg-m)



Exhaust Cooling Orifice/Screen Cleaning

The exhaust pipe rubber hoses and muffler are cooled by injecting a small amount of water through an orifice from the main cooling system into the exhaust stream. The orifice and screen (if applicable) should be inspected and cleaned periodically to ensure proper cooling of the exhaust muffler and connector hoses. Be sure hoses are not restricted (kinked or collapsed internally).

CAUTION:

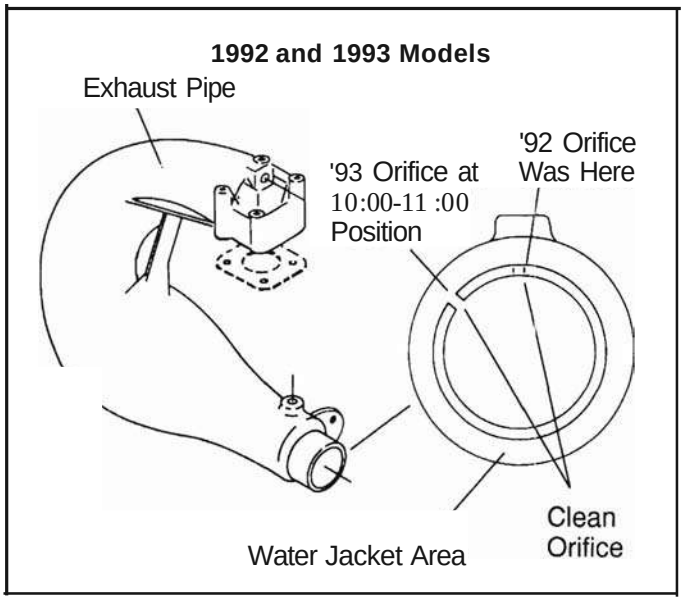
Do not enlarge the orifice or a decrease in performance will result.

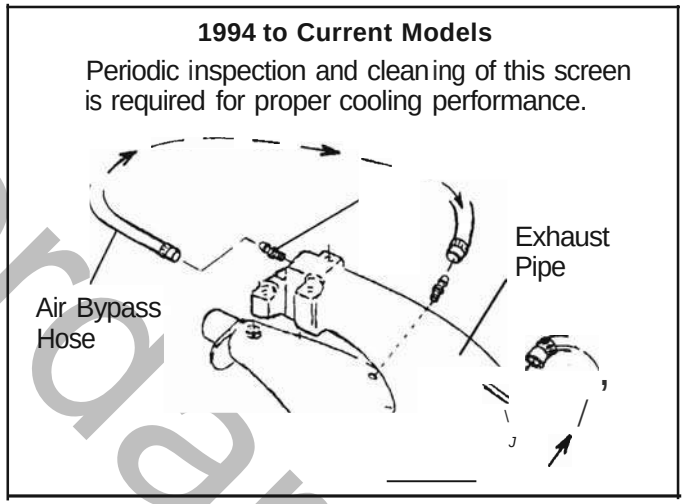
1992·1993 Models

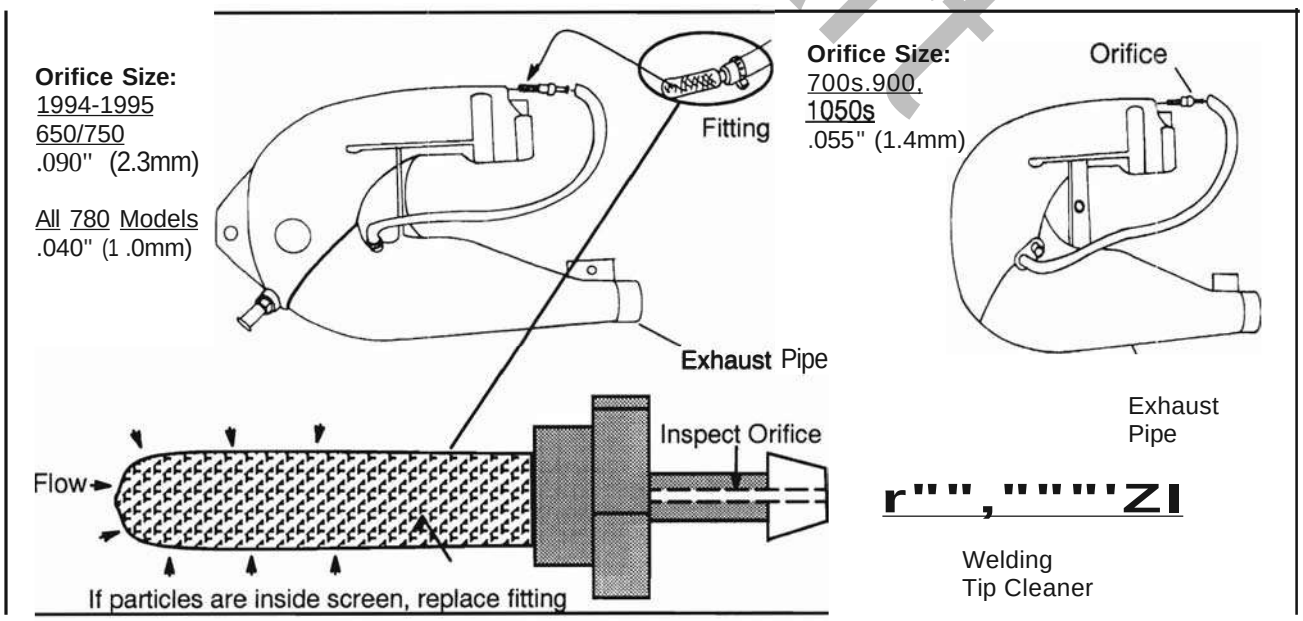
1. Remove hose at end of exhaust pipe.
2. Remove muffler/water box.
3. Clean orifice through end of exhaust pipe with soft wire.

1994 to Current Models

1. Loosen clamp connecting hose to fitting and remove line.
2. Using a deep well 9/16" socket or flare nut wrench, remove fitting from exhaust pipe. Inspect fitting for debris or restriction and clean if necessary.
3. Inspect and clean orifice and screen.
4. Apply pipe thread sealant to threads of fitting and re-install. Tighten securely.
5. Re-install air bypass hose and tighten clamp.







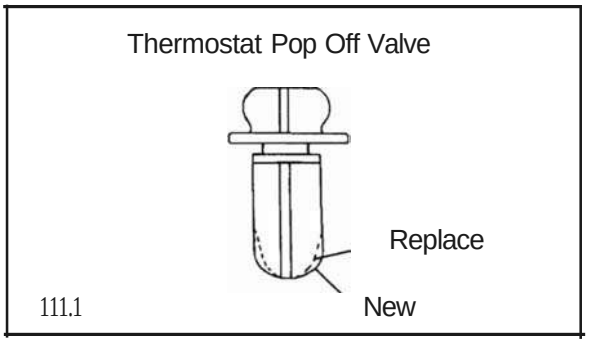
Thermostat/Pop Off Valve Cleaning

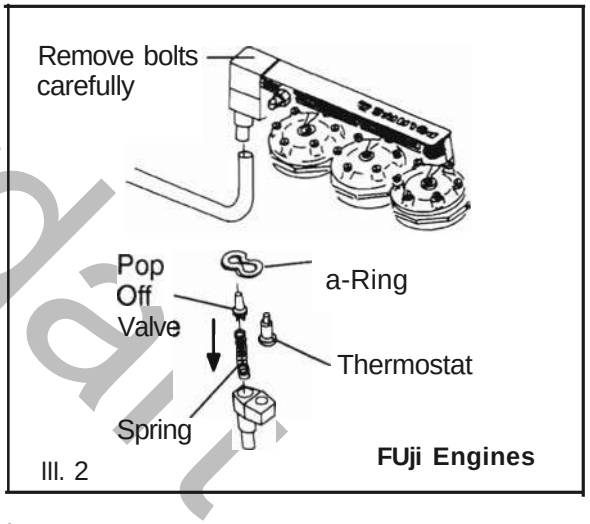
If low end performance of the watercraft begins to deteriorate, and the jet pump intake area is free of debris and weeds; or if the overheat alarm sounds, the thermostat pop off assembly should be checked for debris and cleaned. Inspect the thermostat pop off assembly if the watercraft has been stored for more than 30 days or has been used in salt water.

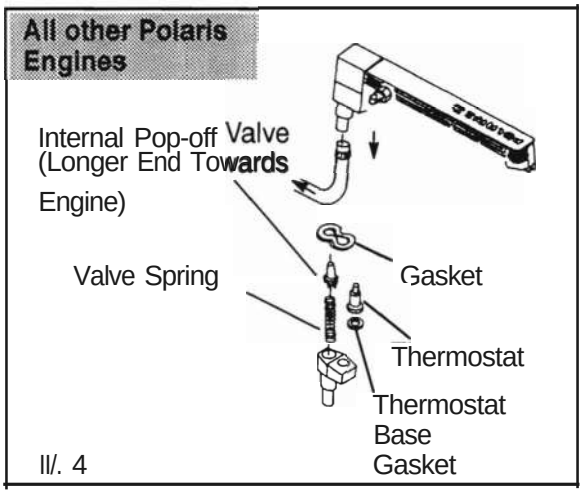
CAUTION:

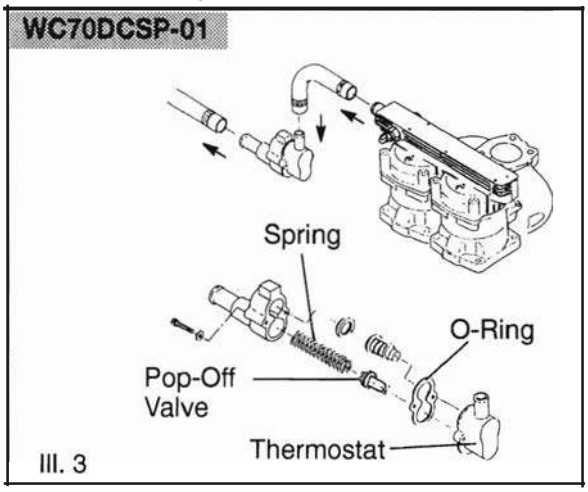
Note the location of all parts when cleaning the thermostat/popoff valve assembly. Be sure all parts are positioned correctly during reassembly, or severe engine damage will result within a very short period of operation. Do not perform this maintenance while the watercraft is in the water. The thermostat pop off assembly is under tension from an internal spring. When the screws are removed, the assembly will come apart quickly if not held together firmly.

1. Using a 3/16" (.5 cm) hexagonal wrench and a flat screwdriver, remove screws while holding thermostat pop off assembly firmly together. Carefully take assembly apart. Be careful not to lose any parts.
2. Inspect thermostat pop off assembly for debris, such as sand or seaweed, and clean thoroughly with water. Inspect pop off valve for wear. See Ill. 1.
3. Inspect condition of gaskets and rubber parts. Replace any parts that appear cracked, damaged, or distorted.
4. Inspect thermostat and housing for corrosion. Visually inspect thermostat for damage or distortion. It should be closed at room temperature.
5. Apply Loctite 242 (Blue) to bolts. Carefully assemble thermostat pop off assembly in the correct sequence. Verify proper alignment of all parts and gasket/a-ring during assembly. The arrow in the illustration indicates the direction of water flow (away from engine). See Ill. 2-4.









Idle Speed

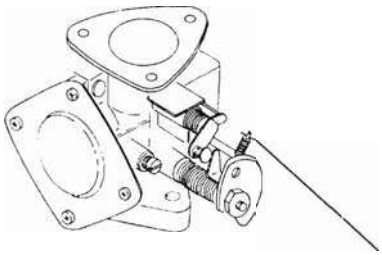
1. Connect a tachometer according to the manufacturer's instructions.
2. With craft in the water or test tank, start engine and let it idle.
3. Adjust idle speed to specifications by turning the idle speed screw in (clockwise) to increase or out (counterclockwise) to decrease idle speed.
4. Check throttle cable free play and oil pump adjustment and adjust if necessary.

Idle Speed - In Water

1 50 RPM All Models Except Hurricane

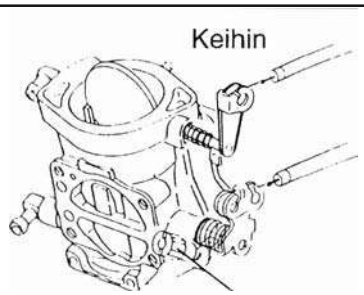
1350 ± 50 Hurricane Models

Mikuni



Idle Speed Screw

Keihin



Idle Speed Screw

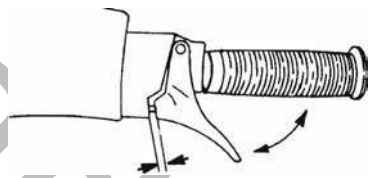
Throttle Lever Freeplay

1. Start engine and adjust idle speed to specifications. Stop engine.
2. Adjust throttle lever freeplay to specifications by loosening locknut and turning cable adjuster.
3. Adjust 700/900/1050 oil pump cable as outlined on page 2.18. Check tightness of oil pump fasteners.

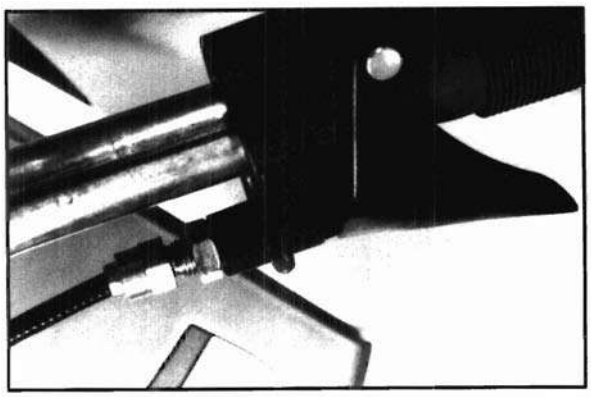
Throttle Lever Freeplay

.020 - .060" (.5 - 1.5 mm)

Throttle Lever Free Play



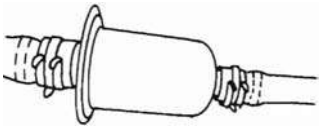
.020 - .060" (.5 - 1.5 mm)



Oil Filter

The oil filter is located in-line between the oil tank and the oil pump on all models. The in-line oil filter is a special type and must not be substituted. Replace the oil filter annually or whenever water or debris has entered the oil tank. Do not attempt to clean this filter.

1. Cut cable tie straps, or remove clamps, securing lines to filter.
2. Remove lines and replace filter with arrow pointing in direction of oil flow (towards pump).
3. Install new cable tie straps, or reinstall clamps, on each line and check for leaks.



Oil Filter

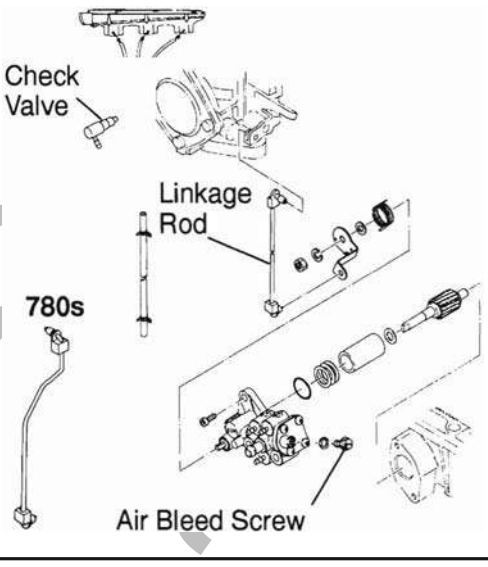
Oil Pump Adjustment· FUji Engines

1992·1994 Models

The oil pump on 1992-1994 models is non-adjustable. No periodic maintenance or adjustment is required.

1995 - 1996 Models Except SLX780

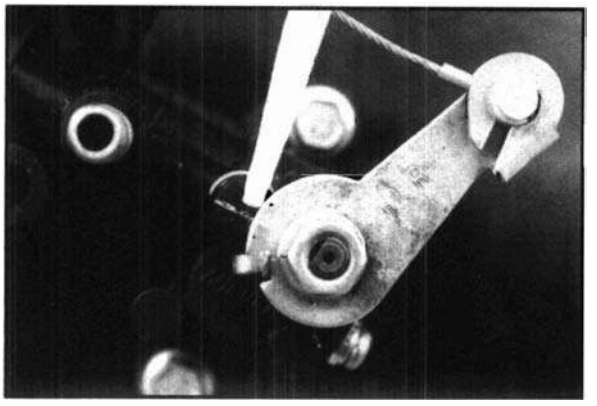
1995 - 1996 models feature a variable oil pump which is non-adjustable. The linkage rod between the carb rack and oil pump arm has a fixed length. Should the linkage rod be removed for any reason or left off, the oil pump will go to full open to prevent engine damage. See illustration at right.



Oil Pump Adjustment - Polaris Engines

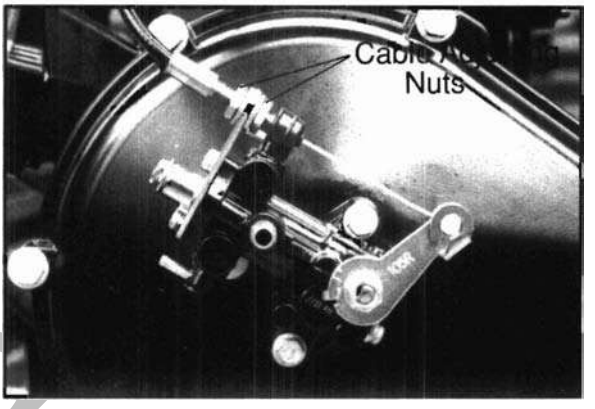
NOTE: Adjust idle speed and throttle lever freeplay before performing oil pump adjustment.

1. Inspect mark on oil pump lever and index mark on oil pump body. The marks should align with throttle released (idle speed). The lever should move immediately when the throttle is opened slightly.



2. If marks are not aligned, loosen cable adjuster nuts and adjust until marks are aligned.

3. Tighten nuts securely and recheck adjustment.



Throttle Cable Inspection/Adjustment

Cable Inspection

1. Check for smooth throttle opening and closing in all handlebar positions. Throttle operation should be smooth and lever must return freely without binding.
2. Inspect cable for proper routing, kinks, or damage.
3. Inspect both ends of cable and replace if frayed, kinked or damaged.

Cable Adjustment

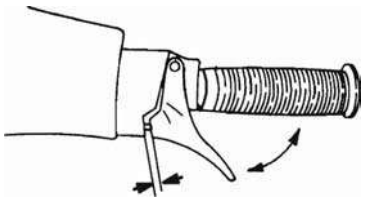
Adjustments are made by turning the lock nuts at the carburetor and then fine tuning at the throttle block adjuster bolt.

1. Set idle speed to specifications. See idle speed adjustment, page 2.30.
2. Measure throttle lever free play between lever block and lever as shown in Ill. 1.

Throttle Lever Freeplay

.020 - .060" (.5 - 1.5 mm)

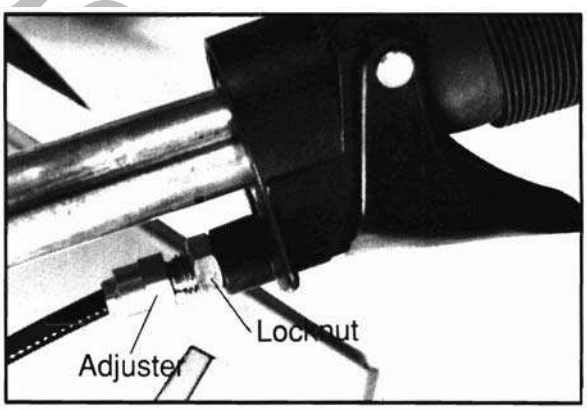
Throttle Lever Free Play



.020 - .060" (.5 - 1.5 mm)

Ill. 1.

3. To adjust, loosen lock nut on upper throttle cable adjuster. Turn adjuster in (clockwise) to increase or out (counterclockwise) to decrease free play.
4. Tighten lock nut securely when adjustment is complete.
5. Start engine and turn handlebars to left and right through entire turning range. If engine RPM increases re-check cable condition, routing, and lever free play, and correct or adjust as necessary.



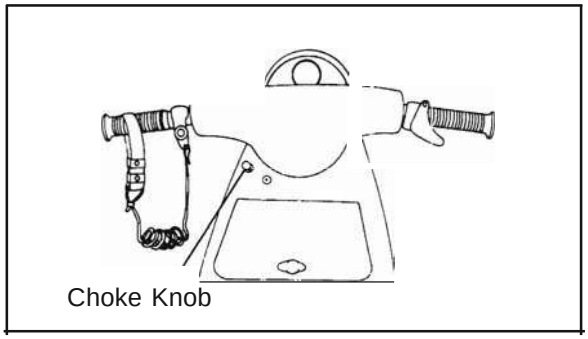
CAUTION:

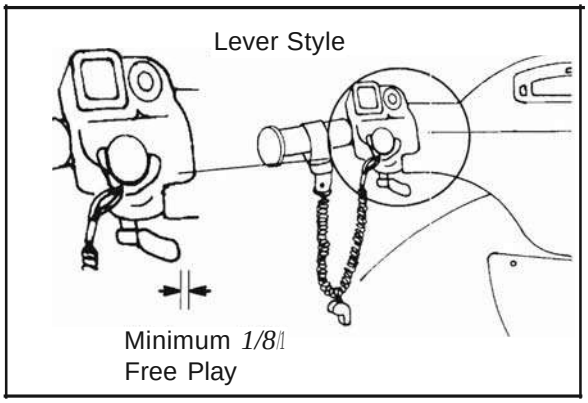
Never operate the engine for more than 15 seconds without cooling water. Severe engine damage may occur from overheating.

Choke Cable Inspection

Cable Inspection

1. Choke operation should be smooth when opening and closing.
2. Inspect cable for proper routing, kinks, or damage and replace if necessary.


Choke Knob



Cable Adjustment

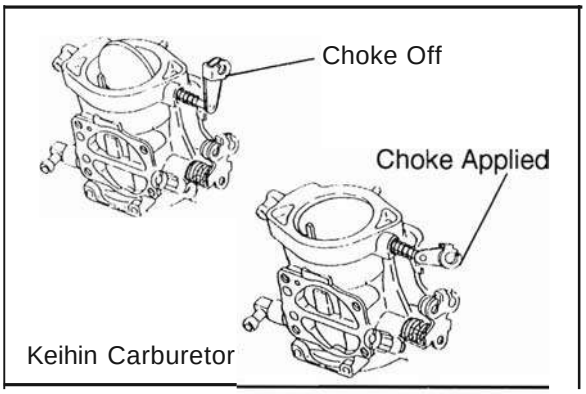
Choke Knob

Choke cable adjustments are made by loosening the lock nuts at the carburetor and moving cable up or down in holder. The choke knob should just touch the bottom of its travel when the choke butterflies are open completely (vertical).

Choke Lever

1. Adjust choke cable by loosening lock nuts at carburetor and moving cable up or down in holder until lever has specified free play. Remove air intake cover and observe choke plate position. The choke plate(s) in carburetor(s) must close completely when choke is fully on, and be completely vertical when the knob or lever is returned to the off position.
2. Tighten nuts securely and re-check lever free play. Turn bars from full left to full right through entire range of motion and verify that at least the minimum lever play is present in all handlebar positions. Be sure cable is routed properly through the handlebar pad and down the steering post.

Choke Lever Free Play
1/8-1/4" (3-6mm)



Steering Cable Inspection

Cable Inspection

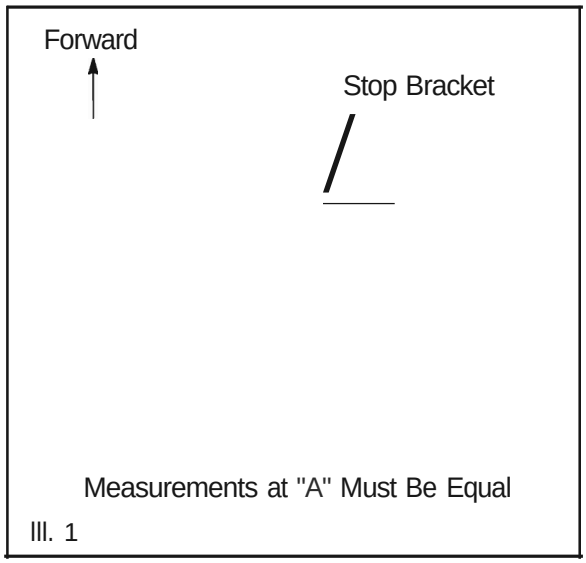
1. Check handlebars for free movement throughout their full range. Visually inspect steering control cable for damage. Check cable ends for damage.

2. Make sure cable is routed and secured properly. Inspect fasteners at ends of cable and re-torque. Inspect steering nozzel bolts and bushings for wear.

Steering Cable Adjustment

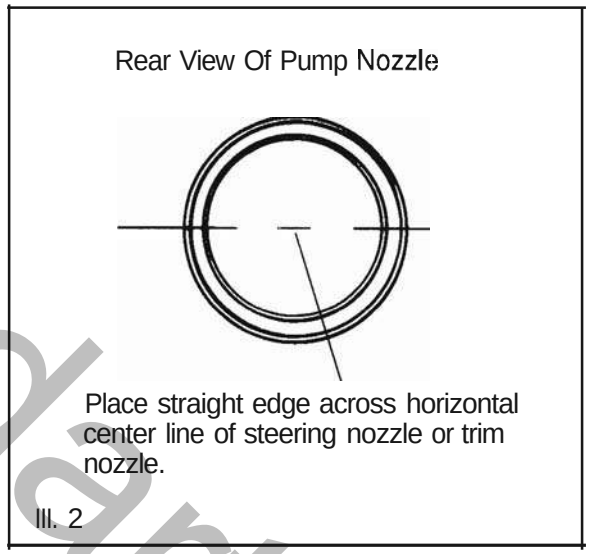
1. Remove handlebar pad.

2. Visually center handlebars. Verify proper centering by measuring distance from stop bracket to stop post on each side. Move handlebars left or right until distance on each stop is equal. Be sure to measure at the same points on both sides.
See Ill. 1.



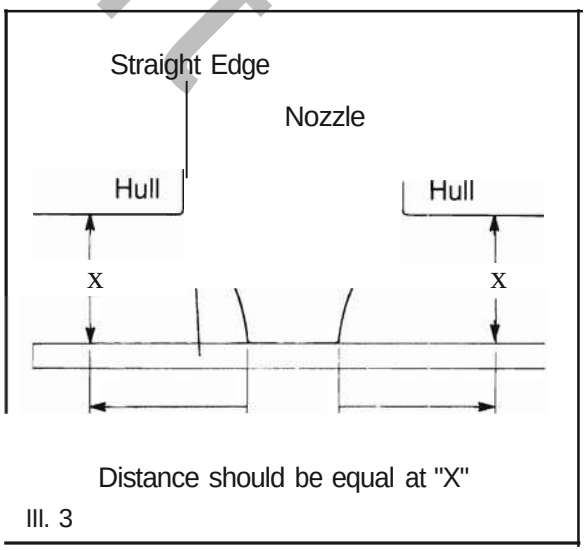
Ill. 1

3. Place a straight edge across horizontal center line of steering nozzle or trim nozzle. **NOTE:** The trim nozzle mounting bolts can be used as a reference for the center line on models with Quick Trim.
See Ill. 2.



Ill. 2

4. Measure distance from straight edge to hull on left and right side. Be sure to measure at right angles to the straight edge and at equal distances from the nozzle. The distance at "X" should be equal when handlebars are straight.
See Ill. 3.



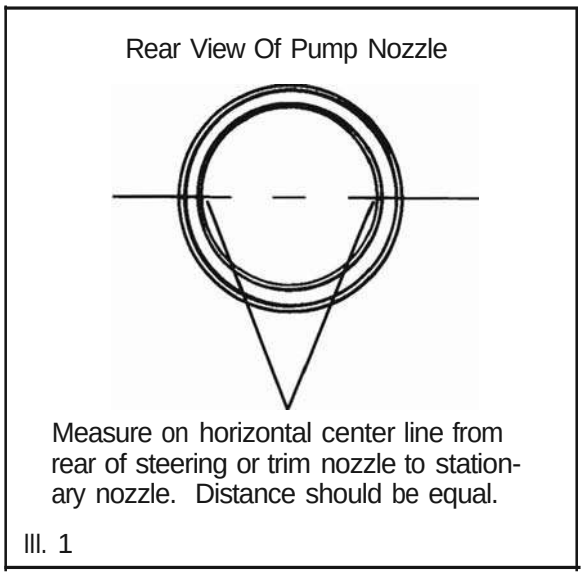
Ill. 3

Alternate Method Of Measuring Nozzle

Following is an alternate method for checking nozzle centering.

1. Perform steps 1 and 2 on page 2.22 to center handlebars.

2. Measure distance from rear-most edge of steering nozzle (or trim nozzle) to stationary pump nozzle (extension housing) with a 6" steel rule or a vernier caliper. Measure at the same point on both left and right sides along horizontal center line. The distance should be equal. See Ill. 1.



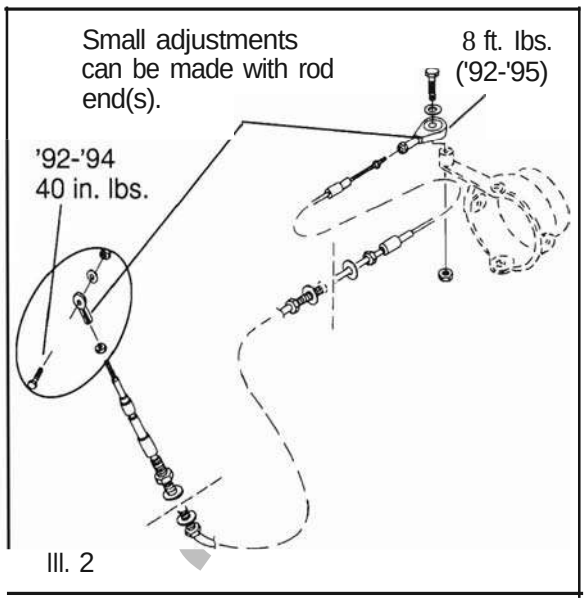
Ill. 1

Adjustment Procedure

1. Minor adjustments can be made using the steering cable rod end(s). Loosen jam nut on rod end(s). Remove end from top of steering nozzle (or steering arm on 1992-1994 models). Turn rod end in or out to adjust. Reinstall rod end, apply Loctite 242 (Blue) and tighten bolt to specifications. See Ill. 2.

CAUTION:

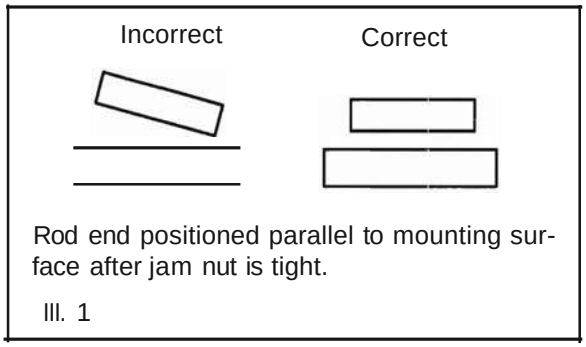
The cable must be threaded into the rod end a *minimum* of 3/8" (10mm). Do not attempt major adjustments with the rod ends.



Ill. 2

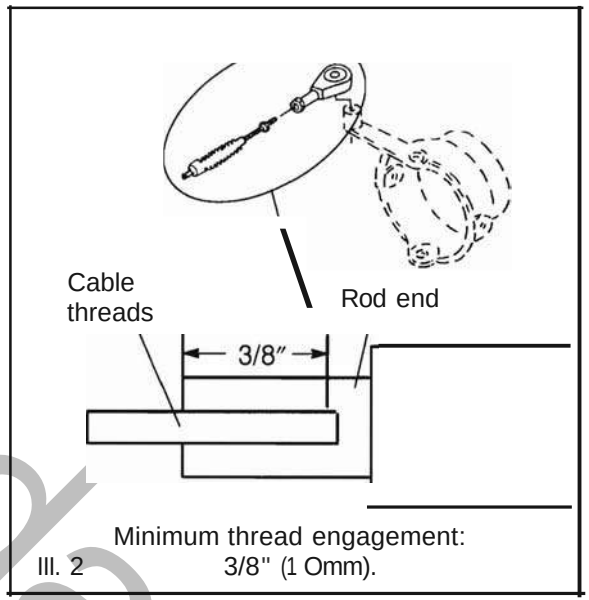
Adjustment Procedure Cont.

2. Apply Loctite 242 (Blue) to threads of cable and securely tighten jam nut with rod end positioned parallel to mounting surface. See Ill. 1 and 2.



Rod end positioned parallel to mounting surface after jam nut is tight.

Ill. 1



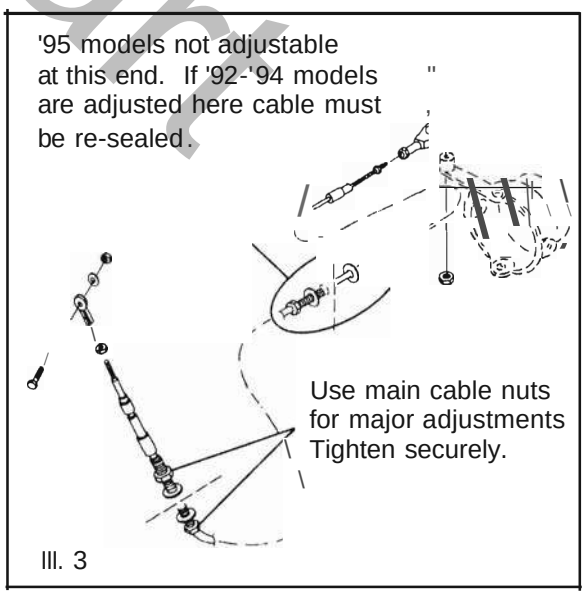
Minimum thread engagement: 3/8" (1 Omm).

Ill. 2

3. Use main cable adjuster nuts to make major adjustments. Adjuster nuts are located at forward end of cable near steering pod. Open front compartment and remove storage tray for access to bottom nut. The cable is mounted on a bracket on SLT models. On 1995 models, the cable is not adjustable at the through-hull end. On 1992-1994 models, the cable and hull must be cleaned and re-sealed with RTV silicone if adjustments are made at the through hull end. See Ill. 3.

4. Using two 11/16" open end wrenches, hold one nut and loosen the other. Lengthen or shorten cable to adjust nozzle centering. Tighten cable nuts securely after adjustment is complete.

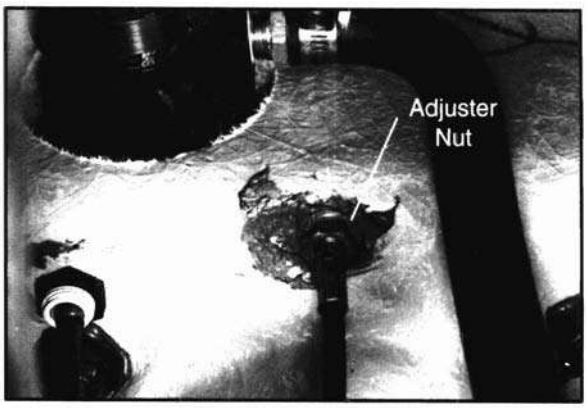
5. Turn handlebars to left and right through entire steering range. The bars should move freely and smoothly without binding. If resistance or binding is evident check rod end positioning, cable condition, and routing to locate and correct the cause.



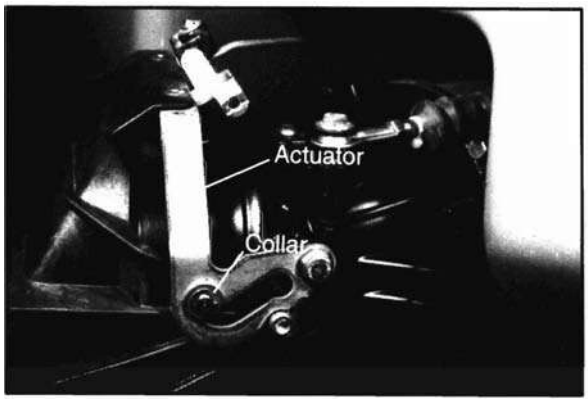
Ill. 3

Reverse Cable Adjustment

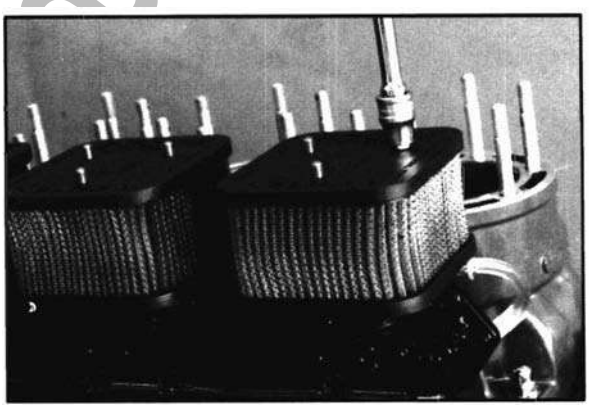
The reverse cable does not require periodic adjustment. If the reverse linkage does not function properly, inspect the cable for damage. Inspect all linkage, fasteners, brackets, and pivots for wear or damage. When a new cable is installed the cable must be adjusted.



1. Place reverse shift lever in reverse position.
2. Loosen cable adjuster nuts.
3. Adjust cable until reverse gate locating collars engage fully into reverse actuator locating slot when slight upward pressure is applied to reverse gate. Reverse gate must float in the notch and should not be forced in.
4. Tighten adjuster nuts securely.
5. Move lever from Reverse to Forward position. Be sure reverse gate is clear of jet stream. Readjust if necessary.
6. Seal the cable threads and adjuster nuts with Marine Grade Silicone Sealant and tighten securely. Allow sealant to cure fully before operating craft.



Carb Air Intake· Vortex™ Style



1. Remove (9) nuts and washers, and remove each air intake. Cover carburetor with a clean shop towel to prevent foreign material from entering.
2. Clean element with high flash point solvent, followed by hot soapy water.
3. Rinse in clear water and dry thoroughly using low pressure air.

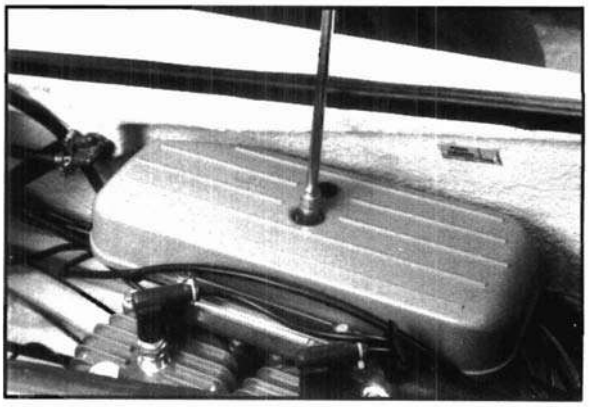
CAUTION:

Wear safety glasses when using compressed air to avoid injury to eyes.

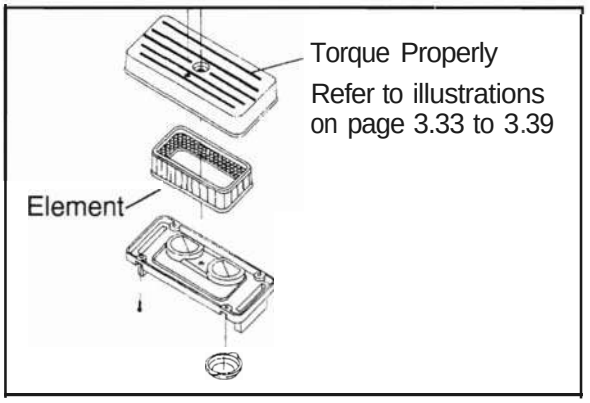
4. Reinstall air intakes and tighten clamps securely.

Carb Air Intake· Single Element

1. Remove carburetor air intake cover.



2. Inspect element for damage or debris.
3. Clean with hot water and mild detergent. Rinse thoroughly in clear water.
4. Dry completely and reinstall parts. Torque cover bolt to specifications found in illustrations on page 3.33 -3.39.



Gasoline Safety

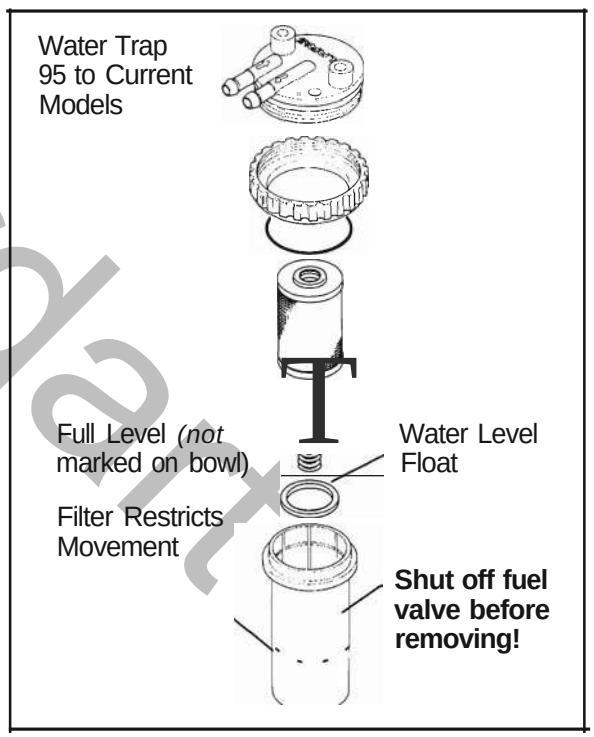
⚠ WARNING

Gasoline is highly flammable and explosive under certain conditions.

- Always exercise extreme caution whenever handling gasoline.
- Always refuel with the engine stopped and outdoors or in a well ventilated area.
- Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.
- Do not over fill the tank. (Do not fill the tank neck.)
- If you get gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.
- Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.
- Shut off fuel valve whenever the watercraft is stored, parked, or transported.

Fuel/Water Separator

The fuel/water separator should be checked daily and/or whenever refueling. 1"-2" (2.5-5 cm) of water depth in water trap can cause the engine to run poorly due to restricted fuel flow. If water trap fills quickly, check for water in the fuel tank.



⚠ WARNING

Gasoline is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in the work area. Be sure the work area is well ventilated. See gasoline handling warnings found above. Failure to heed these warnings may result in serious injury or death.

1. Visually inspect bowl for water collected at bottom of bowl.

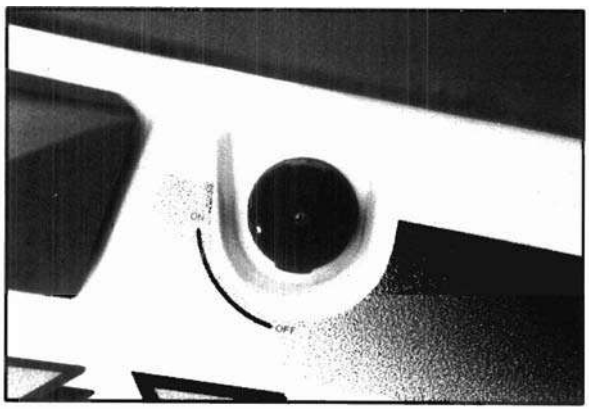
NOTE: If water is present it will appear as a clear liquid at the bottom of the bowl. 1995 and later water traps include a filter to improve water separation, and a colored float to indicate water level. The maximum travel of the float is to the base of the filter, or approximately one half the depth of the bowl. Empty bowl if float appears to be off the bottom.

⚠ WARNING

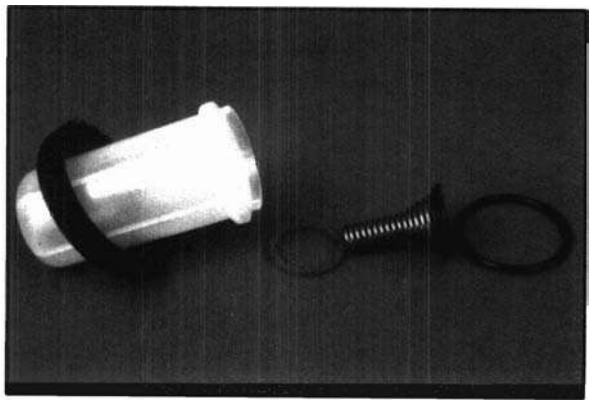
Turn fuel valve to "OFF" position before removing bowl.

IMPORTANT!

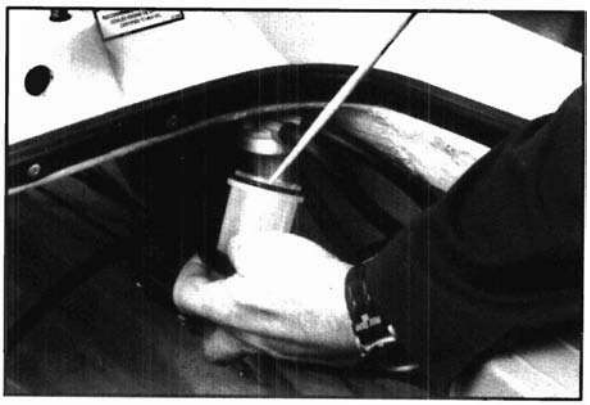
2. Turn off fuel valve.
3. Wrap a shop towel around top of bowl.
4. Remove bowl slowly by turning counterclockwise. Take care not to spill fuel while removing. Wipe up spills immediately with a shop cloth. Dispose of fuel properly and follow all gasoline handling precautions found on page 2.27.



5. Clean and inspect all parts. Replace a-rings if worn, damaged or deteriorated. Install a-ring on bowl.



6. Reinstall separator bowl taking care that the a-Ring is undamaged and in the proper place.
7. Hand tighten securely. Turn fuel valve on, start engine momentarily and check carefully for fuel leaks around bowl.



CAUTION:

Never operate the engine for more than 15 seconds without cooling water. Severe engine damage may occur from overheating.

Fuel LineslVent Lines

1. Check fuel lines and vent lines for signs of wear, deterioration, damage or leakage. Replace if necessary. Insure that clamps are tight.

2. Be sure all lines are routed properly and secured with cable ties away from any moving parts.

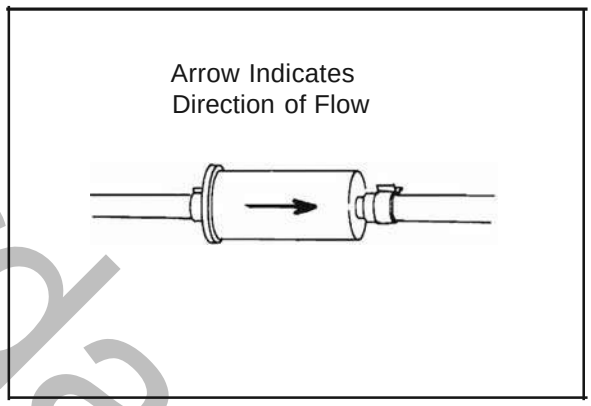
CAUTION:

Make sure lines are not kinked or pinched.

Fuel Filter

The fuel filter should be replaced annually or whenever sediment is visible in the filter.

1. Loosen line clamps at both ends of filter.
2. Remove fuel lines from filter.
3. Install new filter with arrow pointed in direction of fuel flow.
4. Re-install and tighten clamps on fuel line.
5. Start engine and inspect for leaks.



CAUTION:

Never operate the engine for more than 15 seconds without cooling water. Severe engine damage may occur from overheating.

Carburetor Adjustments

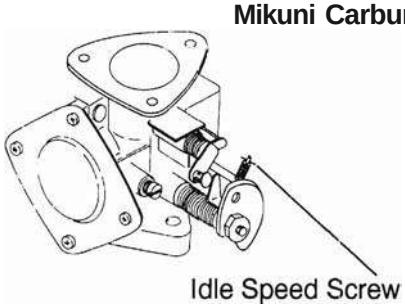
CAUTION:

DO NOT attempt to perform carburetor adjustments with the engine attached to a flush kit or inaccurate adjustment will result. Idle speed and low speed mixture screw adjustments should only be performed in a test tank or in the water while secured to a trailer or dock. See page 3.66 - 3.67 before making any adjustments to the mixture screws.

Idle Speed

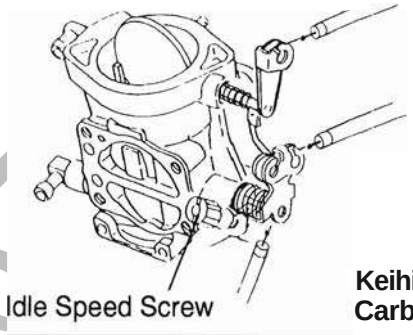
1. Adjust idle speed to specifications.
2. Start engine and warm to operating temperature in a test tank or with the craft safely secured to a trailer or dock.
3. Install tachometer to one of the spark plug high tension leads. Adjust idle speed to specified **RPM** by turning idle speed screw clockwise (to increase) or counterclockwise (to decrease) speed.

Mikuni Carburetor



Idle Speed (In Water)	
All Except Hurricane	1250 ± 50
Hurricane	1350 ± 50

Digital Tachometer	
PET 2500	PN 8712500
PET 2100	PN 8712100



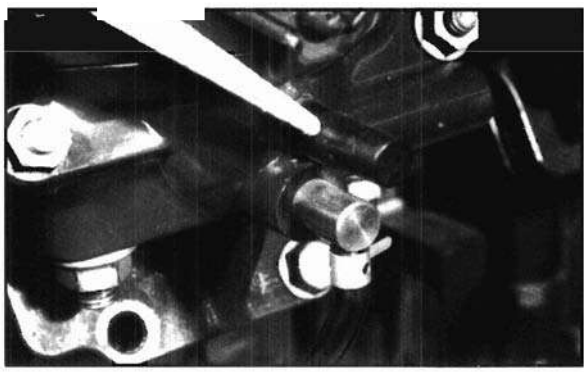
Keihin Carburetor

Carburetor Synchronization - Manometer

NOTE: 1992 **-** 1994 models have vacuum fittings and can be synchronized with a manometer if desired.

1. Turn engine off. Remove rubber caps from carburetor vacuum fittings and attach hoses from a manometer or vacuum gauges.

Carburetor Synchronization Manometer
PN 2870672



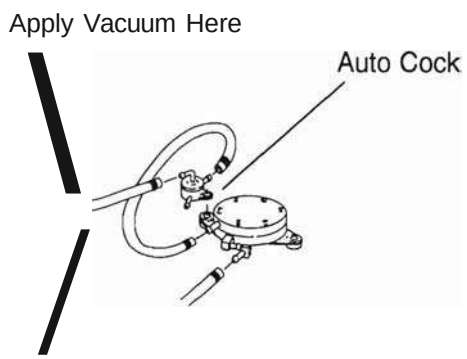
Carburetor Synchronization

2. On 1993 and 1994 models with auto cock in place, the vacuum line must be removed from the PTO cylinder carburetor and an external vacuum source must be applied to the vacuum line in order to provide fuel flow. Use Mity Vac™ to apply 5 inches of mercury vacuum to the auto cock during synchronization.

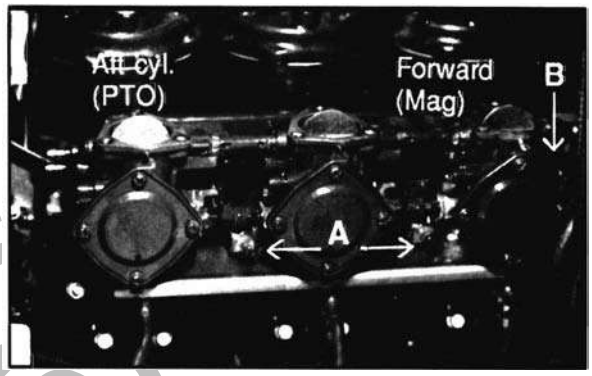
NOTE: The auto cock can be permanently removed. Refer to Service Bulletin PWC-95-03 for more information.

Mity Vac™
PN 2870672

1993-1994 Models With Auto Cock



3. Start engine and let it idle.
4. The front (Magneto end) carburetor is the base carburetor. Synchronize center and rear carburetors to forward carburetor by turning throttle plate adjustment screws (A). When carburetors are correctly synchronized all mercury columns or vacuum gauges will be equal.
5. Recheck idle speed and adjust if necessary.
6. Recheck throttle lever freeplay and adjust if necessary.

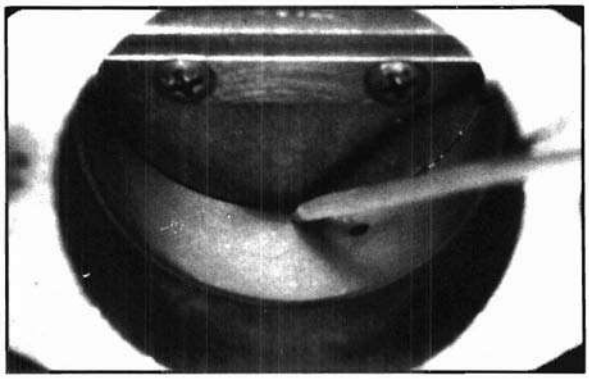


Manual Carburetor Synchronization

NOTE: An alternative to synchronization with a manometer is the manual synchronization method. This procedure is very accurate when performed carefully and correctly. Manual synchronization can be performed with the carburetors installed. Perform this procedure in a well lit area. See next page.

All Models

1. Turn idle screw out until mag end throttle plate is closed completely. It may be necessary to open the other throttle plates slightly with synchronizing screws to allow the mag end plate to close completely.



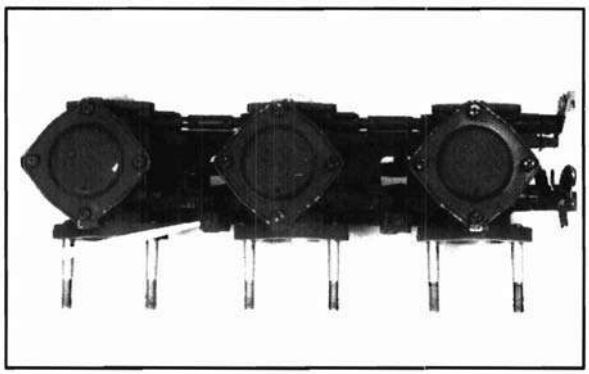
Note on 780 Models:

Follow procedure above, however, note that the idle screw is on the PTa end. Turn idle screw out until PTa ,end throttle plate is closed completely.

2. To verify proper sync, observe all plates and back idle screw out. All plates should close at the same time.

3. Turn idle adjuster screw in while observing bypass port. Turn screw in until port appears at edge of plate.

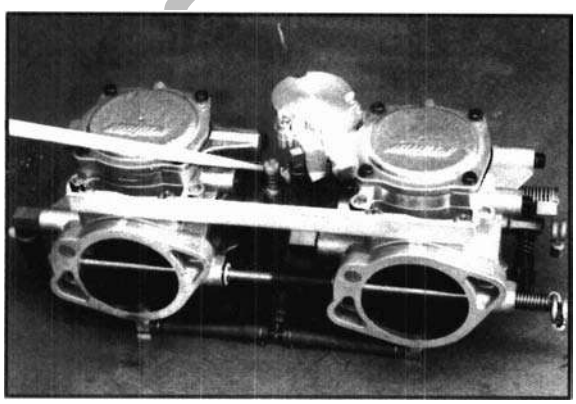
4. Adjust center (3 cylinder) or PTa (twin cylinder) throttle plate to the same position as idle stop screw end using synchronizing screw (see photo at right.)



5. Adjust throttle plate to the same position as the other carburetor(s).

6. If carburetors are off the engine, verify proper sync using a 1/16" diameter twist drill or a rigid wire gauge approximately .060" in diameter. apen throttle with idle screw until the drill bit or wire passes under mag end plate with very slight drag. Adjust all carbs in the same manner with sync screws.

7. After adjustment, set idle speed initially by closing plates and turning idle screw back in one half turn.



CAUTION:

Do not damage throttle plate with wire gauge.

8. Readjust throttle lever freeplay.

Throttle Lever Freeplay

.020 - .060" (.5 - 1.5 mm)

Cooling System Flushing and Salt Water Maintenance

When the watercraft is operated in salt water or water containing impurities like silt, sand, alkali and other particulates, additional care is required to prevent damage and corrosion of the engine. Flush the engine with fresh water immediately after use to neutralize the corrosive effect of salt water or impure water.

CAUTION:

Always follow the recommended flushing procedure below when flushing the watercraft cooling system to avoid engine damage.

Neverflush a hot engine. Severe engine damage could result.

Do not flush engine with engine turned off. Water will fill engine and severe engine damage may result.

WARNING

Do not touch any electrical part when the engine is running. Severe personal injury or death could result.

Flushing Procedure

1992 Models

A flush kit must be installed to flush the engine on 1992 models. Follow installation instructions provided with the kit.

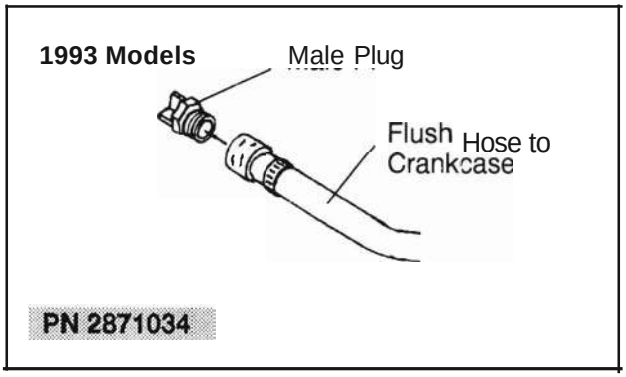
Flush Kit (1992 - 1993 Models)
PN 2871034

1. Remove cap from flush kit coupler on water "in" line.
2. Connect a water (garden) hose to coupler. *Do not* turn on water tap yet.
3. Start engine and immediately (within 10 seconds) open water tap.
4. Run engine at fast idle for one minute. Rev engine intermittently for one minute. Do not run for over three minutes at a time or overheating of drive line components may result. Rinse engine externally with fresh water.
5. Turn off water tap first, then immediately stop engine.
6. Disconnect water hose from coupler and reinstall cap.
7. Wipe off any water which may have spilled on engine.
8. Perform corrosion prevention steps as outlined on page 2.35 and fog engine following procedures on page 2.37 and 2.38.

Flushing Procedure

1993 Models

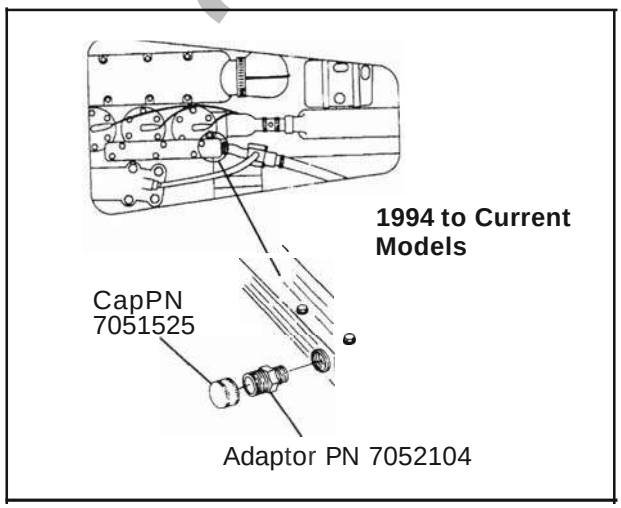
1. Remove seat. The flush adaptor is located at the end of a hose near the driveshaft.
2. Attach a garden hose to a water faucet and to female end of flush hose. (Do not turn on water yet).
3. Start watercraft engine.
4. Immediately turn on water faucet. (Within 10 seconds).
5. Slightly rev engine intermittently for **one minute** to completely flush cooling system. Rinse outside of engine with fresh water. Do not run for over three minutes at a time or overheating of drive components may result.
6. Turn off water faucet.
7. Once all of the water has exited the cooling and exhaust system, turn off engine. (Within 10 seconds after turning off water).
8. Remove garden hose and reconnect male plug. *Tighten securely.*
9. Wipe off any water which may have spilled on engine.
10. Perform corrosion prevention steps outlined on page 2.35 and fog engine following procedures on page 2.37 and 2.38.



1994 to Current Models

Flush Kit (1994 to Current Models)
PN 2871443

1. Remove seat.
2. Locate water manifold plug without wires (blind plug). Remove and discard plug.
3. Apply pipe sealant to threaded adaptor in kit and install.
4. Insert gasket (PN 5810881) into cap (PN 7051525). Hand tighten.
5. Remove cap.
6. Attach a garden hose to a water faucet and to female coupler. Do not turn water on yet.
7. Connect other end of coupler to adaptor on engine.



Flushing Procedure

1994 to Current Models (Cont.)

8. Start watercraft engine.
9. Immediately turn on water faucet. (Within 10 seconds.)
10. Slightly rev engine intermittently for one to two minutes to completely flush cooling system. Do not run for over three minutes at a time or over-heating of drive components may result.
11. Turn off water. Rev engine slightly to purge water from exhaust muffler. Shut off engine within 10 seconds.
12. Remove coupler hose and tightly reinstall cap on adaptor.
13. Wipe off any water which may have spilled on engine.
14. Perform corrosion prevention steps outlined below and fog engine following procedures on page 2.37 and 2.38.

External Engine Corrosion Prevention

After flushing the engine for off-season storage or after salt water use, rinse external engine surfaces with fresh water, dry thoroughly and spray all metal components in the engine compartment with a *non-flammable* lubricating type rust inhibitor.

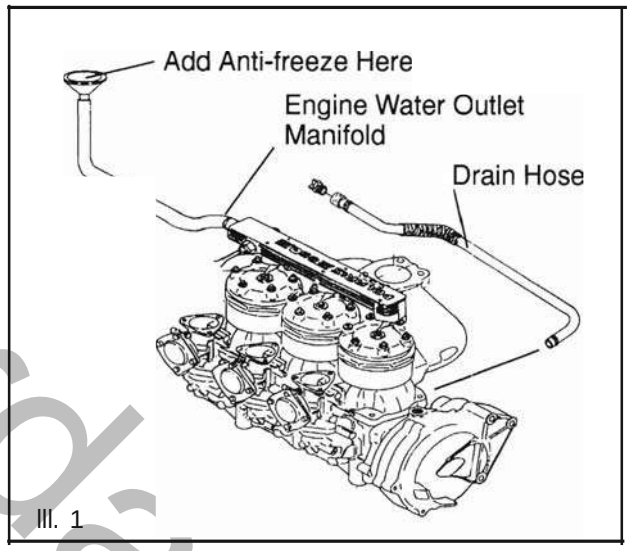
Off Season Storage Procedures

When the craft will not be operated for periods greater than 30 days, the following maintenance items should be performed:

- Fuel System Storage - See page 2.37
- Flush Engine - See pages 2.33-2.35
- Fog Engine - See page 2.37 and 2.38
- Drain Engine/Freeze Protection - See pages 2.36-2.37
- Corrosion Protection - See page 2.35
- Battery Storage - See page 2.10
- Complete Lubrication - See pages 2.2-2.6
- Cleaning Hull Interior and Exterior - See page 2.39

Engine Draining 1992-1993

1. Remove exhaust muffler (water box) and drain.
2. Disconnect hose from pump to exhaust pipe.
3. Remove cap from engine crankcase drain hose at bottom of engine. (This is the same hose used for flushing the cooling system).
4. Lower rear of craft to drain any water that may be inside. **NOTE:** Tip the right side of the craft up slightly to aid in the draining process.
5. Reinstall drain hose plug. Connect hose to exhaust pipe and reinstall muffler (water box). Tighten all clamps securely. If freezing temperatures will be encountered, continue with the following steps.

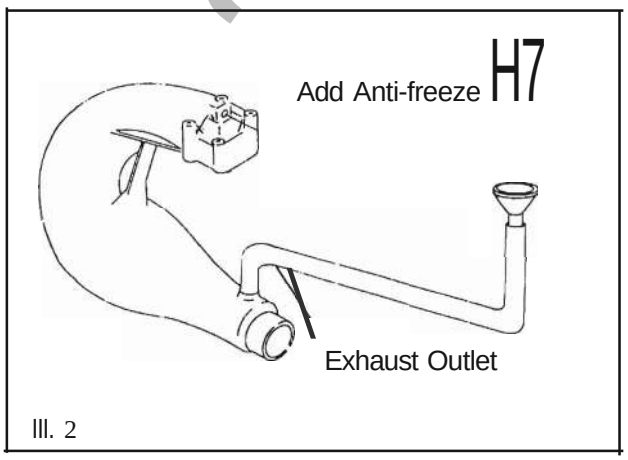


Ill. 1

Freezing Temperature Procedure 1992-1993 Models

In freezing temperatures it is necessary to add approximately 1/2 US gallon (1.9 l) of environmentally safe, biodegradable recreational vehicle (RV) type antifreeze to the engine and 1/2 gallon (1.9 l) to the exhaust pipe. Perform the following steps on 1992 and 1993 models.

1. Remove drain hose plug.
2. Disconnect hose from water outlet manifold, and fill engine as shown until antifreeze begins running out of flush/drain hose. See **Ill.** 1.
3. Reinstall drain hose plug.
4. Add about 1/2 US gallon (1.9 l) of RV antifreeze to the 5/8" (1.6 em) coolant hose located at the exhaust outlet. See Ill. 2.
5. Reattach hose to exhaust pipe, and muffler (water box). Tighten all clamps securely.



Ill. 2

Engine Draining 1994 to Current

Engine draining is automatic. You will, however, need to make sure the exhaust system is drained. To do so, start and briefly rev up engine. This will remove enough water from the exhaust system to prevent any damage from freezing. Do not run the engine for more than 15 seconds or engine damage from overheating may result.

Fuel System Storage

Top off the fuel tank with fresh fuel and add fuel conditioner/stabilizer. It is recommended that the craft be operated for approximately 10-15 minutes after stabilizing fuel to ensure treated fuel reaches the entire fuel system and all components. Follow the directions on the container for recommended amount to add for long term storage. On models equipped with a fuel/water separator, drain any water present in the bowl before storage.

Polaris Premium Carbon Clean Fuel System Additive	**PN 2871326**
Fuel Stabilizer	**PN 2870652**

NOTE: Using a fuel stabilizer and topping off the fuel tank eliminates the need to drain the fuel system.

If you prefer to drain the fuel tank, refer to fuel handling warnings on page 2.27 and use the following procedure:

1. Drain fuel tank with a siphon or pump and inspect fuel/water separator. Drain if necessary.
2. Leave fuel cap loose to prevent condensation from forming in fuel tank.

Engine Fogging Procedure

CAUTION:

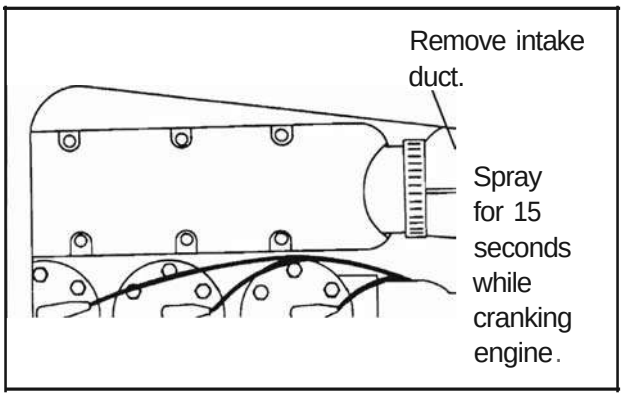
Failure to perform the following preventive maintenance can result in serious engine corrosion during off season storage. **In** order to prevent rust and corrosion on internal engine parts (Le. crankshaft, bearings, pistons, rings cylinder walls), Polaris highly recommends the use of Polaris fogging oil before storage.

Polaris Premium Fogging Oil and Corrosion Inhibitor	**PN 2870791**

When properly applied, fogging oil coats all internal engine parts for prevention of rust and corrosion, which in turn will extend the service life of the engine.

1992-1995 (Except SLX780)

1. Remove lanyard cord lock plate from engine stop switch.
2. Loosen large clamp and remove air intake silencer duct.
3. Crank engine with electric starter for 15 seconds while spraying Polaris fogging oil into the intake manifold to ensure that all internal parts are properly coated.
4. Reinstall air intake silencer duct.



Engine Fogging - SLX780 / Hurricane

1. Remove lanyard cord lock plate from engine stop switch.
2. Remove (3) nuts and washers securing each individual air intake.
3. Crank engine with electric starter for 15 seconds while spraying Polaris fogging oil into each carburetor alternately.
4. Reinstall air intakes. Reinstall washers and nuts. Torque to 72 in. lbs. (.83 kg-m)

Air Intake Bolt Torque

72 in. lbs. (.83 kg-m)

Engine Fogging Procedure SL700, SLTH, SLT700, SLT780, SL780, SL900 SL1050, SLXH,SLTX

CAUTION:

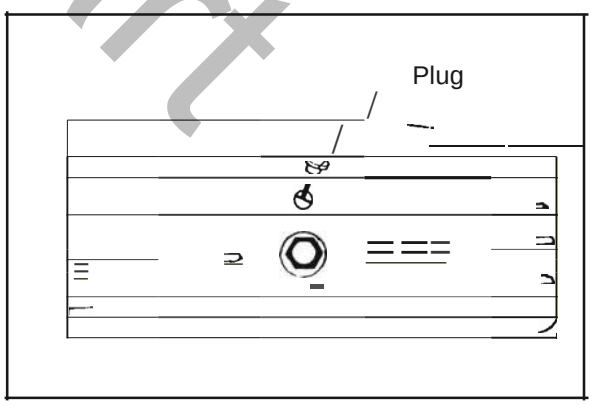
Failure to perform the following preventive maintenance can result in serious engine corrosion during off season storage. In order to prevent rust and corrosion on internal engine parts (i.e. crankshaft, bearings, pistons, rings cylinder walls), Polaris highly recommends the regular use of Polaris fogging oil. The engine should be fogged daily when operated in salt water.

Polaris Premlum Fogging Oil and Corrosion Inhibitor

PN **2870791**

When properly applied, fogging oil coats all internal engine parts for prevention of rust and corrosion, which in turn will extend the service life of the engine.

1. Loosen plug at air intake manifold.
2. Start the engine and spray Polaris fogging oil towards each carburetor throat to ensure that all internal parts are properly coated. Spray fogging oil for two to three seconds in each carburetor throat and repeat until the engine is flooded with fogging oil. Then stop the engine immediately.



CAUTION:

Never operate the engine for more than 15 seconds while the watercraft is out of the water. Overheating of engine and drive line components will result.

3. Reinstall plug into air intake manifold.

Cleaning

1. Remove drain plug and clean bilge and engine area with hot water and mild detergent (such as dish soap) or with bilge cleaner. Rinse and drain thoroughly. Wipe up remaining water with clean, dry shop cloths. Do not use abrasive cleaners.. Spray all external metal surfaces with Silicone Spray. Coat all surfaces inside the engine compartment with Silicone Spray or a non-flammable protectant. Do not use petroleum based protectants or lubricants in the engine compartment, as most are flammable and also may deteriorate rubber components. Store watercraft with drain plug removed and the seat propped open slightly to inhibit condensation from forming in engine compartment.
2. Wash exterior of watercraft with fresh water and a mild detergent. Rinse thoroughly.
3. Inspect and thoroughly clean jet pump intake, outlet, and impeller area.
4. Inspect entire deck and hull area for damage. Inspect rub rails to be sure they are fastened securely.

T-9 Metal Protectant
For Use On External Metal Surfaces
PN 2871064

Silicone Spray
Non-Flammable For Use Inside the Engine Compartment
(Available Commercially)

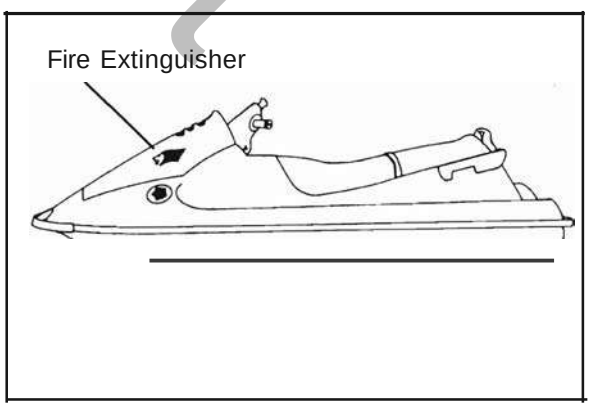
CAUTION:

Never clean the watercraft with strong detergents, abrasives, de-greasers, paint thinner, acetone, window cleaners, ammonia or products containing alcohol. They can damage finishes, decals, vinyl, and plastics, and can accelerate UV breakdown which could cause color change and premature deterioration of parts.

5. After cleaning, protect and shine watercraft using a regular furniture polish or non-abrasive silicone wax. Protect seat and handlebar unit with a vinyl protector.
6. Cover watercraft with a Polaris cover and store in a clean, dry place. Do not use plastic or coated materials as condensation and corrosion may occur.

Fire Extinguisher

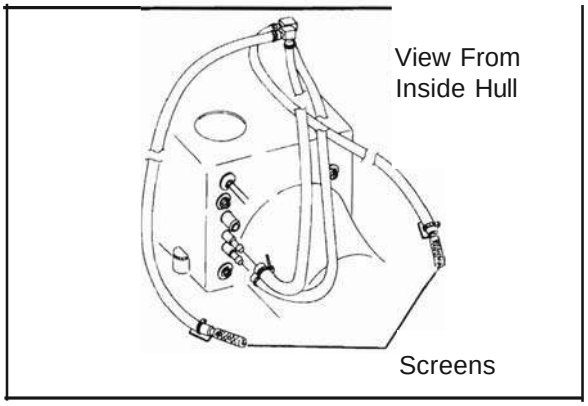
1. Remove and inspect fire extinguisher condition and state of charge. Replace if necessary.



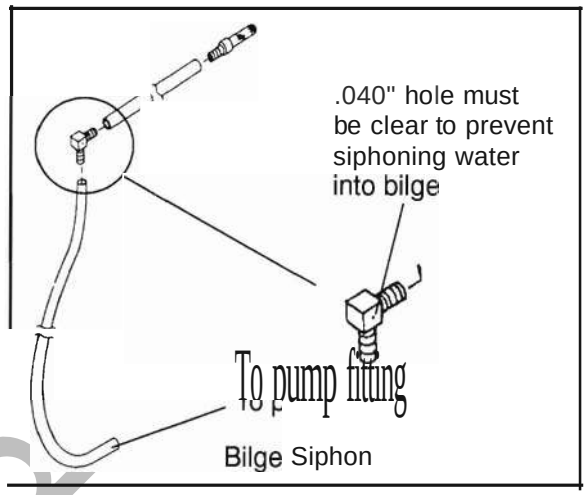
Bilge Siphon System

1. Clean bilge siphon pickup screens whenever debris is present.

NOTE: On some models, there is only one siphon hose and the electric bilge pump. Other models have only the electric bilge pump.

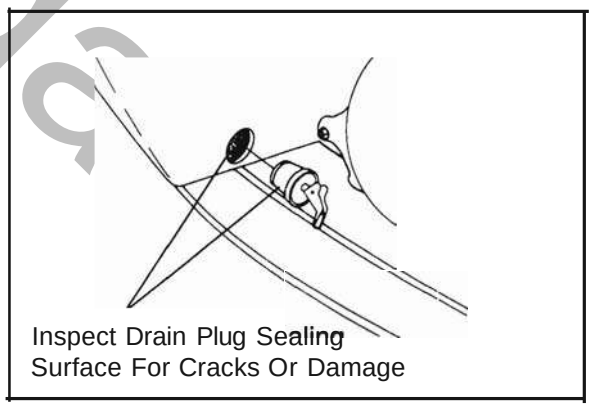


2. Inspect the .040" hole in fitting elbow. It must be clear to prevent siphoning of water into bilge.
3. Inspect all tie straps to be sure they are tight and in position.

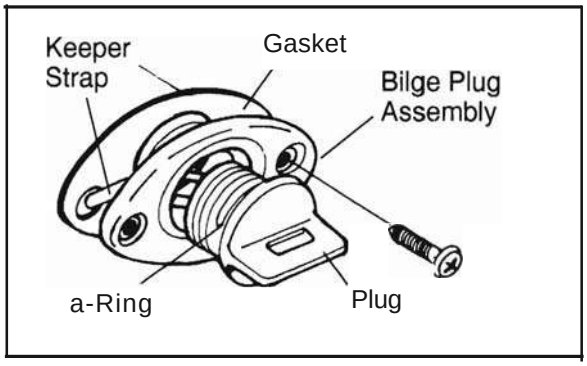


Bilge Drain Plug

1. Inspect bilge plug for cracks or damage from over-tightening. Pressure seal type (shown at right) can be replaced with threaded style (shown below) by installing Bilge Plug Kit PN 2871751. Instructions are provided in the kit.

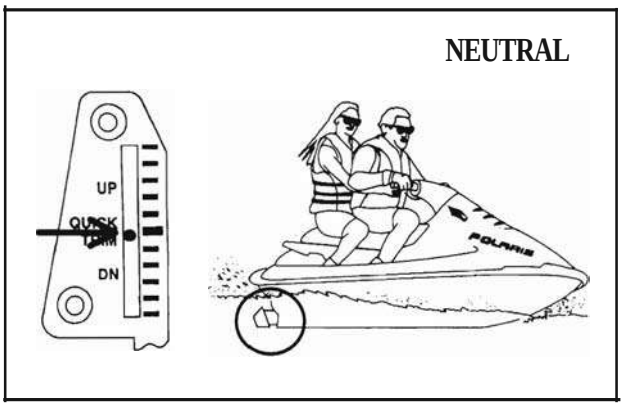


2. Periodically inspect sealing a-ring on threaded style bilge drain plug and replace if worn or damaged. Inspect drain plug, gasket, keeper strap and tightness of screws.



Trim Linkage Adjustment

1993-1994 Mechanical Trim Indicator



1. Start engine and move trim indicator to neutral position.

CAUTION:

Never operate the engine for more than 15 seconds while the watercraft is out of the water. Severe engine damage may occur from overheating.

2. Shut off engine.
3. Place a straight edge on the vertical centerline of the trim nozzle.
4. Measure distance from straightedge to stationary nozzle on pump. It should be equal at top and bottom.
5. If adjustment is necessary, remove cotter pin from nozzle end of trim rod.
6. Loosen lock nut at trim motor end of rod. Rotate trim rod to shorten or lengthen it as required to achieve equal distance between trim nozzle and stationary nozzle at top and bottom.
7. Start engine and move trim indicator to "full up". Shut off engine.
8. Check for at least .015" *(Amm)* clearance between top steering nozzle bolt and trim nozzle.
9. Readjust trim rod slightly if necessary to provide clearance.

Trim Rod Pivot Clearance
Minimum .015" (.4mm)

1995 - Current Models with Multi-Function Display (MFD)

1. Start engine.

CAUTION:

Never operate the engine for more than 15 seconds while the watercraft is out of the water. Severe engine damage may occur from overheating.

2. Actuate trim switch to full up or full down position until a ratcheting (clicking sound) is heard at trim motor. The MFD will automatically readjust the indicator.

Submerged Engine (Hydrolocked)

CAUTION:

If the engine becomes water-flooded, follow these procedures immediately. If water is left in the engine it will cause severe engine damage.

1. Remove watercraft from water.
2. Remove lanyard cord from engine stop switch.
3. Put watercraft onto a flat surface protected by a mat or cardboard; leaving room to roll it.
4. Remove drain plug to empty water out of bilge, and remove seat.
5. Remove spark plugs and tip watercraft *counterclockwise* (to port side) until spark plug holes are just below horizontal.

⚠ WARNING

Be sure the lanyard cord and lock plate are removed from the engine stop switch to kill the ignition or severe injury could result.

6. While holding the watercraft in this position, turn drive shaft by hand to rotate engine until water has run out.
7. Depress starter button for one second at a time until no more water exits the spark plug holes.

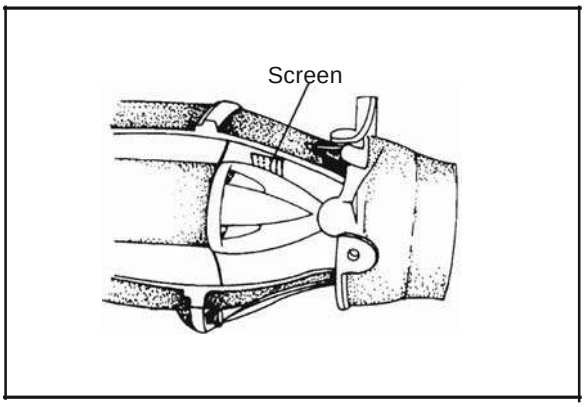
⚠ WARNING

Depressing the starter turns the engine, driveshaft, and pump. Stay clear of all moving parts to avoid severe personal injury.

8. Turn the watercraft upright.
9. Inspect, dry and install new spark plugs.
10. Check battery vent hose for obstruction; drain water from hose if present.
11. Check fuel and oil for the presence of water and drain if necessary. *Do not* run watercraft if water is present. Verify that no air is present in oil line.
12. Grease driveshaft and bearing housing. See Lubrication, page 2.6.
13. Turn fuel valve "On". Install lanyard cord and lock plate. Pull choke and attempt to start engine. The spark plugs may have to be removed, cleaned, and dried with electrical contact cleaner until the engine starts.
14. Reinstall drain plug. Reinstall seat.
15. Test ride unit and verify proper operation. Check the fuel/water separator (if applicable) after test ride and remove water if necessary. See page 2.27.

Cooling Water Pickup Screen (1995 Models)

1995 models are equipped with a cooling water pickup screen. Inspect the screen in the pump stationary nozzle for debris and clean if necessary.

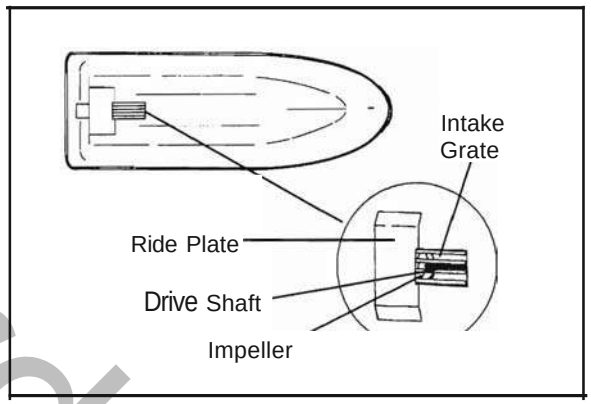


Fasteners

Inspect all fasteners in the pump area and make sure they are tight. These include the steering nozzle mounting bolts, steering cable bolt, trim nozzle mounting bolts (where applicable), and all reverse mechanism fasteners (SLT). Inspect pump mounting nuts and extension housing bolts. Refer to specific torque values listed in the General Information section or Final Drive/Jet Pump section.

Scoop/Ride Plate/Intake Grate

Verify fastener torque on the scoop, ride plate, and intake grate. Inspect all components for damage. Inspect the scoop sealing area for signs of black exhaust trails which indicate a leak in the sealant around the scoop. Even a small leak will ventilate the pump area, creating cavitation of the pump and reducing performance. If a leak is evident, remove the scoop and re-seal. Refer to Final Drive/Jet Pump section for procedures. Excess silicone sealant can be trimmed until flush with edges.

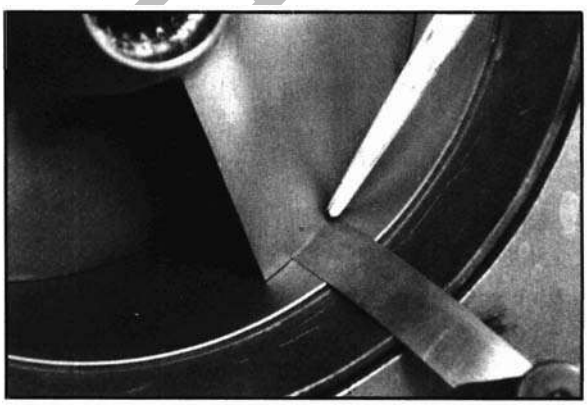


Impeller Clearance

⚠ WARNING

Be sure the lanyard cord and lock plate are removed from the engine stop switch to kill the ignition or severe injury could result.

1. Remove intake grate.
2. Use a feeler gauge to measure impeller clearance along each blade in three spots. If measurement exceeds service limit, replace impeller. If clearance is excessive with a new impeller, the pump housing must be replaced.



Impeller Clearance
Standard .002-.008″.05-.20 mm)
Service Limit .020″ (.5 mm)

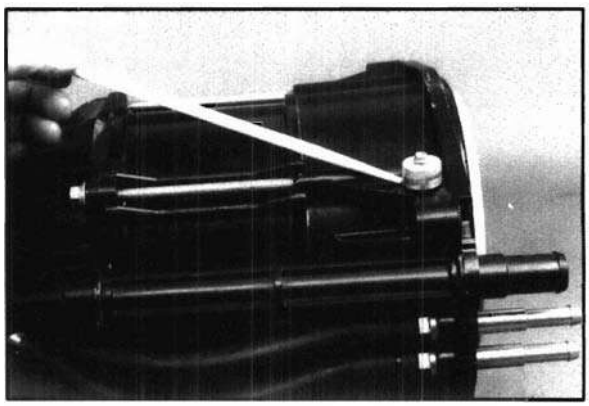
Pump Housing Inspection

Inspect pump housing for excessive wear, cracks, or deep gouges. Replace if necessary.

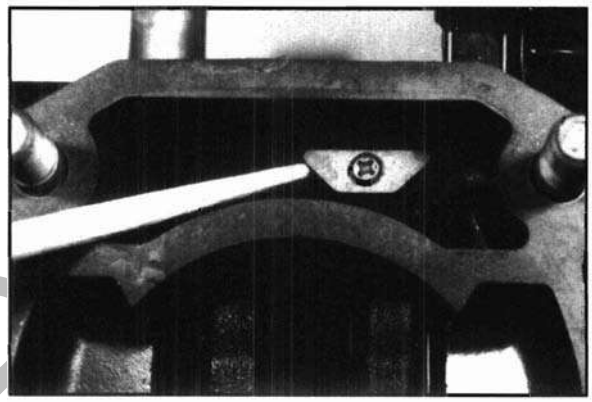
Sacrificial Anode

A zinc sacrificial anode is in place on all models on the pump housing. 1992 and 1993 models have an additional anode located inside the crankcase beneath the magneto end cylinder. The purpose of these anodes is to prevent corrosion of metal parts due to electrolysis. The mounting surfaces must be clean and the mounting bolt tight to maintain a good connection between the pump and anode.

1. Periodically inspect anode for excessive wear.
2. Check bolt to be sure it is tight. If the bolt is loose, remove anode and clean mounting surfaces on pump and anode.
3. Apply dielectric grease to bolt threads and contact surfaces.



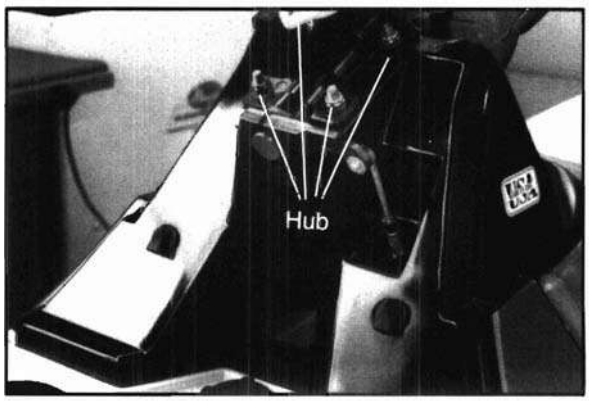
4. Tighten bolt securely.



Handlebars/Hand Grips

1. Pull and twist on hand grips to ensure they are not loose. If loose, refer to handgrip installation installation instructions, page 6.26.

2. Check steering support hub fasteners and make sure they are tight. Check handlebars and hub for cracks or damage. Replace if cracked or damaged. Refer to page 6.26.
3. Inspect steering arm bolt torque.



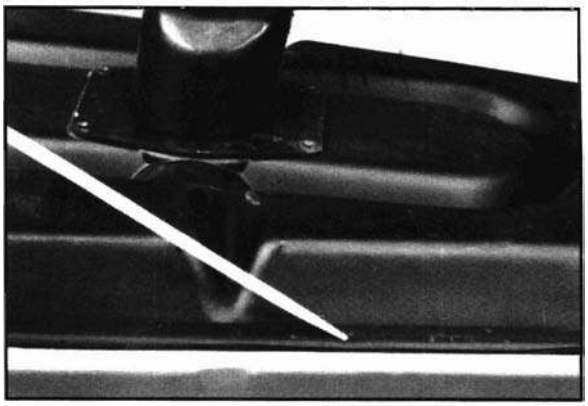
Steering Arm Bolt Torque
14 ft. lbs. (1.93 kg-m)

Fasteners/Parts/Hoses

Inspect the watercraft for any loose nuts, bolts, fasteners and hoses. Be sure that all hose clamps are tight. Replace cracked, damaged, or deteriorating hoses.

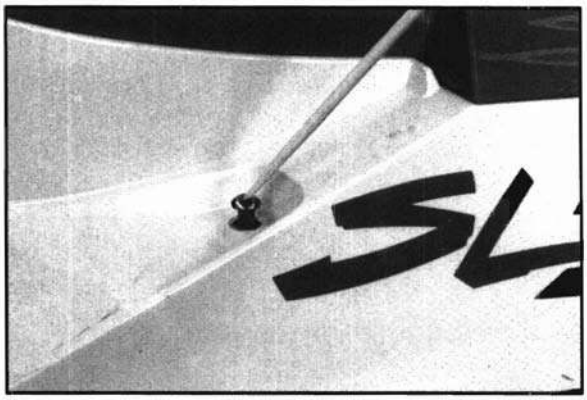
Seat SealInspection/Seat Adjustment

The seat seal (gasket) must be in good condition to prevent water from entering the craft. Carefully inspect the condition of the seal and make sure it is securely fastened to the deck along the entire circumference and in the corners.



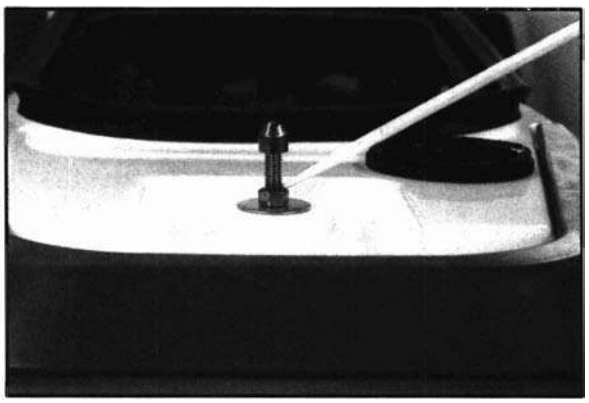
Seat Adjustment· SL and SLX Models

The front seat posts and rear seat latch post must be adjusted properly to maintain enough pressure on the seal and prevent up and down movement of the seat. Install the seat and check for movement in the area of the posts. If adjustment is required, perform the following steps:

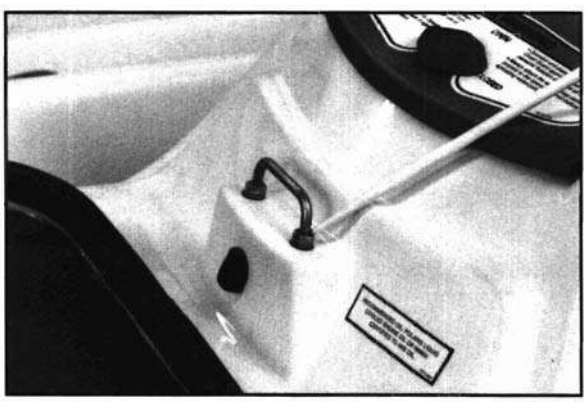


1. Remove seat and loosen lock nut on bottom of both front posts.
2. Turn both posts equally with a 3/16" Allen wrench to adjust. Turn clockwise to provide more seal pressure and counterclockwise to reduce pressure (if seat is too tight or new seal installed).
3. Reinstall seat and make sure it latches securely with no up and down movement in post area.

Seat Adjustment· SLT Models



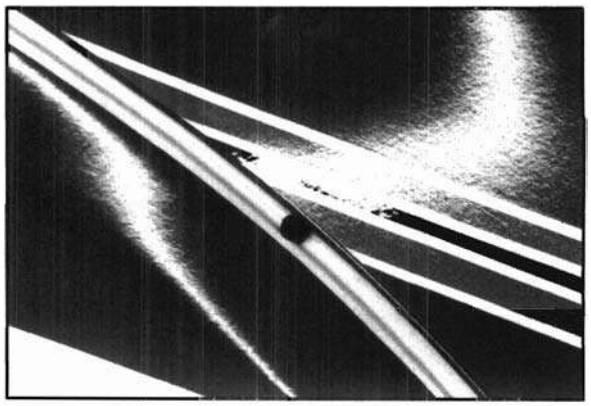
1. Remove seat and loosen lock nut on rear post.
2. Turn clockwise to provide more seal pressure and counterclockwise to reduce pressure (if seat is too tight or new seal installed).
3. Reinstall seat and make sure it latches securely with no up and down movement at front or rear.



4. Adjust front latch bracket up or down equally in the same manner.

Storage Compartment Door Adjustment

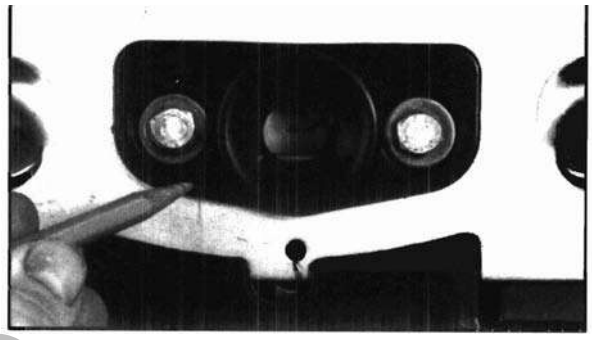
The storage compartment seal must be in good condition to prevent water from entering. Carefully inspect the condition Df the seal and make sure it is securely fastened.



Compartment Door Alignment· SLT Models

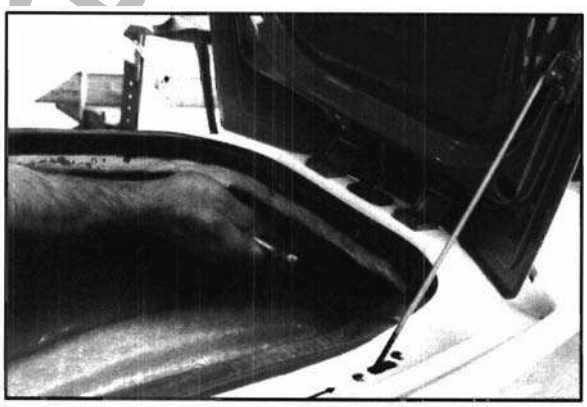
NOTE: On SLT models, *do not* close compartment door with hinge nuts, latch striker plate, or latch post loose. The door may be extremely difficult to re-open.

1. Open storage compartment door and make sure rubber guide bumpers are in place and in good condition.
2. Visually check alignment of door along both edges. The gap should be equal on both sides.
3. If adjustment is necessary, mark location of hinges with a pencil for reference. Remove storage bucket and loosen two main hinge nuts (inside under top deck) just enough to allow adjustment of door.
4. Shift door to side of smaller gap until equal on both sides.
5. Hold door in position and tighten nuts.
6. Carefully close door and check alignment.
7. Re-adjust if necessary until door is aligned along both edges.
8. When properly aligned, check to make sure it latches securely and tightly.



Compartment Door Latch Adjustment· SLT Models

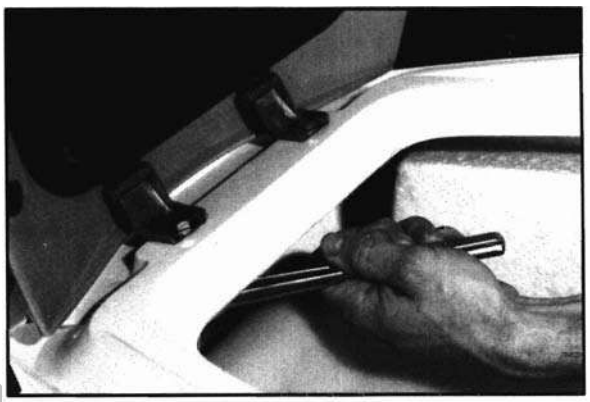
If the door has excessive up and down movement, or if it does not latch properly, adjust the latch striker plate and latch post as follows:



1. Lower door slowly and observe alignment of striker plate and latch post. Post should be centered on hole in striker plate.
2. If not, mark position of plate lightly with a pencil to use as a reference. Note the amount the plate must move to be centered.
3. Loosen two plate bolts and adjust plate until centered on latch post.

NOTE: On SLT Models, *do not* close compartment door with hinge nuts, latch striker plate, or latch post loose. The door may be extremely difficult to re-open.

1. Hold plate in position and tighten bolts. Re-check alignment.
2. Loosen lock nut on latch post.
3. Turn post clockwise to provide more seal and latch pressure or counterclockwise to reduce pressure (if door is too tight or new seal installed). Tighten lock nut on post. Check operation and repeat procedure if necessary.



Compartment Door Alignment - SL and SLX Models

1. Open storage compartment door and make sure rubber guide bumpers on corners of steering pod and along edges of door are in place and in good condition.
2. Visually check alignment of door along both edges and at top corner of pod. The gap should be equal on both sides.
3. If adjustment is necessary, mark location of hinges with a pencil for reference. Remove storage bucket and loosen two main hinge nuts (inside under top deck) just enough to allow adjustment of door.
4. Shift door to side of smaller gap until equal on both sides.
5. Hold door in position and tighten nuts.
6. Carefully close door and check alignment.
7. Re-adjust if necessary until door is aligned along both edges.
8. When properly aligned, check to make sure it latches securely and tightly.

Door Latch Adjustment

1992-1993 Models

1. Loosen (2) screws and adjust to center latch plate on latch.

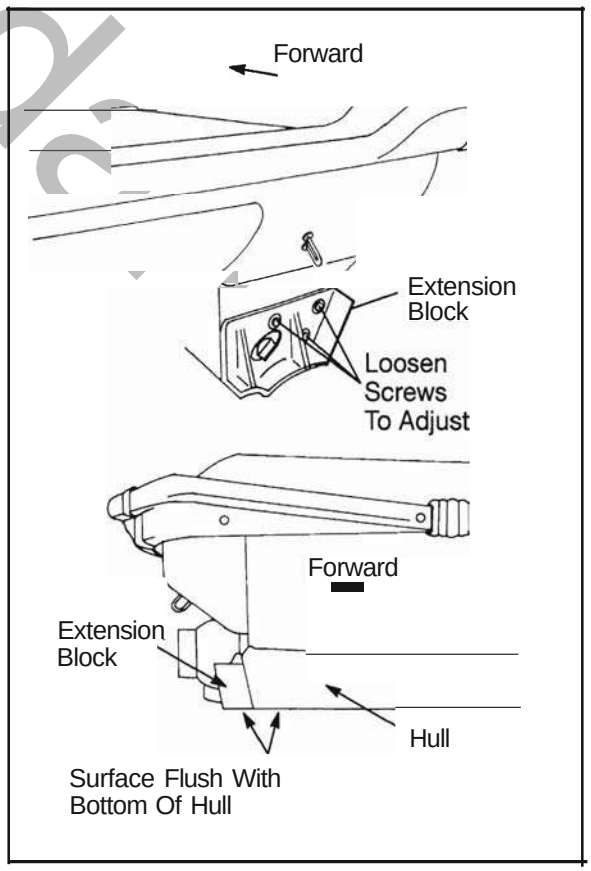
1994-1995 Models

The latch plate floats on pillar bolts. No adjustment is necessary. Check fasteners to be sure they are tight.

Hull Extension Adjustment (Hurricane)

The rear hull extension blocks on Hurricane models must be aligned properly to prevent excessive porpoising.

1. Loosen extension block screws and align block flush with bottom of hull.
2. Apply Loctite™ 262 to screws and torque to 14 ft. lbs. (1.94 k-gm). If the block is removed completely, re-seal with Marine Grade Silicone Sealant PN 8560054.



The following information is provided to help you identify possible causes for conditions/symptoms listed. Always verify tune-up adjustments and all related basic maintenance has been performed. These items are randomly listed, and are not necessarily in order of most common occurrence.

Lean Condition

Symptoms: Hard starting; bogging; hesitation; backfire; surging; detonation; engine noise; low power; spark plug light colored or eroded; engine runs hot; high or unstable idle; piston failure; application of choke improves condition. Stalling (may restart immediately or soon afterward); high speed surging; high speed or sharp turns makes condition worse (may hesitate or stall only in turns). Too lean at full throttle, turning high speed adjuster screw out improves condition or has no affect.

- Fuel level low or fuel contaminated
- Restricted fuel filter, fuel pump, or fuel shut-off valve
- Water in fuel valve, pump, or lines
- Water present in fuel system
- Water in carb fuel chambers between diaphragm, jet block and jets
- Kinked or restricted fuel tank vent or fuel lines
- Fuel tank inlet check valve damaged, faulty, or improperly installed
- Vent lines kinked
- Air leaks at fuel pickup connections or lines between pump and tank
- Fuel pickup tube disconnected or loose in tank
- Primer bulb restricted or malfunctioning, air leaks at clamps (1992-1993)
- Fuel pump impulse line pinched, kinked, restricted with oil or water, or leaking
- Carburetors dirty; main pilot or bypass orifices restricted; fuel inlet screen plugged
- Carburetor synchronization incorrect
- Water separator full or restricted
- Water in fuel tank
- High or low speed screws adjusted incorrectly; jets too small or restricted
- Fuel valve (autocock) restricted, water contaminated or faulty (remove per Information Bulletin PWC-95-03)
- Fuel pump diaphragm or check valve damaged
- Fuel filter restricted
- Carburetor jetting incorrect
- Fuel tank pickup screen plugged
- Air leaks in engine intake tract (carburetor base gaskets, reed gaskets, synchronizing plugs, etc.)
- Misaligned carburetor mounting flanges (92-93 models)
- Carburetor inlet needle or control lever arm stuck or adjusted incorrectly
- Fuel line "T" restricted
- Inlet needle valve restricted or size too small
- Air leaks at: cylinder base, crankcase drain plugs, fuel pump impulse line or fitting, carburetor base gaskets, reed cage gaskets, crankshaft end seals, crankcase mating surfaces

Poor Performance

- Rich or lean fuel condition (see rich and lean condition troubleshooting this section)
- Jet pump impeller damage, pump cavitationlventilation (see pump troubleshooting this section)
- Ignition timing incorrect, weak or intermittent spark on one or more cylinders, low compression
- RPM is limited or timing retarded due to low fuel or overheating (where applicable)
- Crankshaft out of index due to hydrolock by fuel or water (see hydrolock troubleshooting this section)
- Fuel lines connected improperly
- Ignition timing retarded or RPM limited due to overheat or low fuel (where applicable)
- Water leak into exhaust system (i.e. exhaust pipe to manifold: exhaust manifold to cylinders; etc.)

Rich Fuel Mixture

Symptoms: Fouled spark plugs; black sooty exhaust; rough idle, idle unstable; poor fuel economy; rough running ("four cycling"); misses; poor performance; bogs; loads up; backfires (plug fouling).

- Thermostat/popoff leak, dirty or damaged
- Carburetor mixture needles damaged or adjusted incorrectly
- Needle and seat damaged
- Misuse of choke
- Fouled spark plugs
- Fuel pump diaphragm damaged (ruptured)
- Carburetor synchronization incorrect
- Needle and seat control arm too high or sticking
- Collapsed exhaust hose or pipe (restricted)
- Air intake restricted
- Broken, cracked or poorly sealing reed valve
- Low compression
- Ignition problem (RPM limiting due to low fuel or overheat)
- Anti-siphon valve worn or broken

Symptoms: Engine backfires.

- Weak spark from fouled, defective, worn or wrong spark plugs
- Broken reed petals

Symptoms: Engine "pinging" or "knocking".

- Lean fuel mixture
- Poor quality, low octane gasoline
- Incorrect ignition timing
- Spark plug heat range too high

Symptoms: Engine power loss.

- Weak spark
- Incorrect fuel or fuel mixture
- Water in fuel system or oil tank
- Fuel filter restricted
- Jet intake clogged
- Cooling system clogged

Symptoms: Engine noise.

- Detonation (see causes for holed or eroded pistons, this section)
- Excessive piston clearance
- Exhaust leak, loose exhaust pipe or muffler (water box)
- Engine mounts or mount plate loose or rubber mounts broken
- Drive coupler splines dry
- Driveshaft run out excessive
- Driveshaft end play incorrect; rubber dampers worn or missing
- Broken ring or ring land
- Oil pump bushing end play excessive
- Ignition timing incorrect
- Piston pin damaged or bent
- Connecting rod bearing failure (small end or big end)
- Crankshaft main bearing failure or wear
- Flywheel loose

Piston Damage

Symptoms: Hole in piston.

- Water in carburetors or fuel
- Lean fuel mixture (see lean condition troubleshooting)
- Detonation from incorrect ignition timing, poor quality fuel, modified cylinder heads, excessive carbon buildup, etc.
- Incorrect spark plug
- Overheated engine
- Flywheel key sheared, keyway damaged, flywheel damage
- Crankshaft out of index

Symptoms: Eroded piston (exhaust edge of crown) or scuffed piston.

- Lean fuel mixture (see lean condition troubleshooting)
- Detonation from incorrect ignition timing, poor quality fuel, modified cylinder heads, excessive carbon buildup, etc.
- Engine overheating (inspect cooling system)
- Crankshaft out of index (see engine section)
- Flywheel key sheared

Symptoms: Seized or scuffed piston.

- Water in oil
- Oil pump failure
- Oil tank vent problem restricted, check valve in backward
- Pinched or restricted lines
- Lean fuel mixture (see carburetion)
- Poor quality fuel
- Water in fuel
- Engine overheating

Symptoms: Cracked piston crown.

- Hydrolocked engine (water or fuel)
- Foreign material in engine

Symptoms: Cracked/broken piston skirt.

- Excessive piston to cylinder clearance
- Foreign material in engine
- Sharp ports
- Modified engine
- Hydrolocked engine (water or fuel)

Engine Overheating/Misc.

Symptoms: Engine overheats.

- Cooling water passages in pump restricted (check screen and passages)
- Impeller or pump housing damage
- Pump housing passage plugs missing
- Thermostat/popoff valve restricted
- Cooling water passages in engine restricted with sand or debris
- Loose or damaged cooling hoses or clamps
- Collapsed exhaust hose or pipe (restricted)

Symptoms: Hard starting (engine turns over with electric starter but engine won't start)

- Out of fuel
- Low compression
- Weak spark or no spark (see ignition troubleshooting)
- Lean mixture (see lean mixture troubleshooting)
- Choke inoperative or not closing completely
- Fouled spark plug(s)
- Water in fuel
- Worn, broken or cracked reeds
- Restricted or plugged low speed/idle passages

Symptoms: Low compression.

- Choke or throttle closed (both must be wide open for test)
- Loose cylinder head or head gasket failure
- Rings stuck or broken, or excessive end gap
- Piston damage (see piston damage)
- Cylinder worn, improperly honed or bored, damaged

Symptoms: Erratic idle/no idle.

- Idle speed improperly adjusted
- Plugged or restricted low speed fuel passages
- Incorrectly adjusted low speed mixture screw
- Ignition problem
- Throttle linkage worn or sticking
- Air leaks in intake tract

Symptoms: Hissing sound when removing gas cap.

- Hose kinked (1992-1994)
- Outlet check valve clogged
- Vent line plugged

NOTE: 1.5 PSI tank pressure is normal on 1995-current models and 1994 models with vent kit installed (PWC-95-02).

Troubleshooting - Electrical/Final Drive

Electrical

NOTE: A yellow color may develop on spark plugs over time due to salt water mist ingestion. This is a conductive coating which will eventually cause fouling.

Symptoms: No spark or weak spark on one cylinder.

- Non-resistor spark plugs in use
- Poor connection (spark plug cap to high tension lead)
- Poor connection (high tension lead to ignition coil)
- Fouled spark plug
- Faulty spark plug cap

  Poor grounds or connections in electrical box
- Faulty ignition coil
- Poor connections to Hall Effect sensors (trigger)
- Faulty Hall Effect sensor (trigger)

Symptoms: No spark or weak/intermittent spark on all cylinders.

- Non-resistor spark plugs in use
- Fouled spark plug
- Engine stop switch faulty (shorted)
- Low battery voltage / crank speed too low with spark plugs installed

  Wiring incorrect or disconnected

  Terminal board or connectors corroded
- Poor grounds or connections in electrical box or at engine mount plate
- Poor connections at primary winding of secondary coil (blk/blk-white on Polaris-Fuji engines)

  Faulty ignition coil
- Faulty exciter coil, trigger, or pulsel' coil (test stator)
- Excessive crankshaft runout on Magneto end (digital COl only) (> .004″ or .10 mm)

Vibration / Pump

- Damaged impeller or stator vanes in pump
- Driveshaft bent or engine alignment incorrect
- Pump cavitation/worn pump bearings

  Engine mounting plate bolts loose
- Loose, worn, or broken rubber engine mounts

  Rich running - carb synchronization, popoff valve stuck open, excessive pisto'l to cylinder clearance, ring end gap, needle and seat dirty or stuck open
- Exhaust pipe/bracket loose
- Muffler loose or rubbing on hull

  Fasteners loose or broken
- Crankshaft out of index or runout excessive
- Misfire on one or more cylinders

Porpoising / Hull

- Misaligned hull extension (Hurricane)
- Ride plate incorrect, misaligned, or damaged (dented/warped)

  Water in hull
- Trimmed up too far
- Wrong pump wedge

  (Hurricane) To reduce porpoising for larger riders, install an accessory ride plate with a length approximately flush with the back of the hull. Remove both hull extension blocks.

Hydrolock

When an engine has been hydrolocked from water or fuel it is important to find the cause and inspect all components which may have been damaged. Be sure to check the items on this list to ensure maximum service life from the engine. If fuel hydrolocked, check carburetor fuel inlet needle and seat condition.

Find the cause of excess water in the hull. (i.e. Was the craft submerged? Righted improperly after being capsized? Is the bilge siphon system functioning properly? Does the cooling system have a leak inside the craft? Is the hull leaking, allowing water into the engine compartment? Are seat or compartment seals in place and fitting tightly? [jet pump O-ring, driveshaft through hull fitting, speedometer pitot fitting, steering cable seal, air/water separator drain line, bilge siphon fittings through hull, cooling water supply through hull, etc.]. Was the engine left running when the craft capsized?)

- Engine Compression - verify within specifications (See Engine Section)
- Reeds - inspect for damage (See Carburetion Section)

  Fuel Tank/Venting - check fuel tank and vent system for water
- Crankshaft Indexing - verify crankshaft has not been forced out of index (See Engine Section)
- Remove Auto-Petcock Fuel Valve - vacuum operated auto petcocks should be removed from 1994 models (if so equipped) per Information Bulletin PWC-95-03. (See Carburetion Section)
- Flywheel and Key - Inspect flywheel, key, and keyways for damage. Check ignition timing marks on flywheel with a dial indicator before the engine is disassembled to verify proper positioning. (See Electrical Section)

  Fuel Pump - check diaphragm condition (stretched from water pressure)
- Cylinder Condition - check base mounting flange area for cracks
- Check Applicable Service and Information Bulletins

If damage is suspected and engine is disassembled, or if water was left in the engine:

- Bearings - inspect all bearings for rust or damage
- Connecting Rods - inspect for damage, inspect small end carefully for dents, pitting in bearing surface
- Piston and Piston Pin - Inspect for cracks or damage

CHAPTER 3
FUEL SYSTEM/CARBURETION

FUEL SYSTEM/CARBURETION
Carburetor Specifications and Initial Settings

1994 SL650

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	*95
	**90
Pilot Jet	#75
High Speed Screw[1]	*3/4M 1/4C 1/2P
	**7/8M 1/2C 3/4P
Low Speed Screw	*1 *114* turn (All)
	**1 turn (All)
Idle Speed (in water)	1300±50 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

'Engine SN 94-0001 through 94-02010
'*Engine SN 94-02011 →

1994 SL750/SLT750

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	#90
Pilot Jet	#75
High Speed ScrewOJ	1 *114M 3/8C 7/8P*
Low Speed Screw	*112* turn
Idle Speed (in water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

1995 SL650/SL650 STO

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	#87.5
Pilot Jet	#77.5 SL650 / 82.5 (STD)
High Speed ScrewOJ	*15/8M 1/4C 13/8P*
Low Speed Screw	1 turn
Idle Speed (in water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

[1] M - Magneto or Front Garb
G - Genter Garb
P - PTO or Rear Garb

FUEL SVSTEM/CARBURETION
Carburetor Specifications and Initial Settings

1994 SL650

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	"95
	""90
Pilot Jet	#75
High Speed Screw 0J	"314M 1/4C 1/2P
	""7/8M 1/2C 3/4P
Low Speed Screw	"1 *114* turn (All)
	""1 turn (All)
Idle Speed (in water)	1300±50 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

"Engine SN 94-0001 through 94-02010
""Engine SN 94-02011 →

1994 SL750/SLT750

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	#90
Pilot Jet	#75
High Speed Screw [1]	1 *114M 3/8C 7/8P*
Low Speed Screw	*112* turn
Idle Speed (in water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

1995 SL650/SL650 STO

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	#87.5
Pilot Jet	#77.5 SL650 / 82.5 (STD)
High Speed Screw [1]	1 *118M 1/4C 7/8P*
Low Speed Screw	1 turn
Idle Speed (in water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

[1] M - Magneto or Front Garb
G - Genter Garb
P - PTO or Rear Garb

1995 SL750/SLT750

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	#90
Pilot Jet	#75
High Speed Screw [1]	1M *1/2C 3/4P*
Low Speed Screw	*1/2* turn
Idle Speed (in water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

1995 SLX780

Carburetor Type	Mikuni Super BN
Size	38 mm *w/34* mm venturi
Main Jet	#105
Pilot Jet	#72.5
High Speed Screw [1]	*7/8M 3/4C* 1 *1/8P*
Low Speed Screw	*1/2* turn
Idle Speed (in water)	1250 ± 50 RPM
Needle & Seat Pop Off Pressure	10-18 PSI (See test procedure this section)

1996SL700/SLT700

Carburetor Type	Keihin CDK II
Size	38mm
Main Jet	#80
Mid-Range Jet	#70
Slow Jet	#55
High Speed Screw	*11/2turn*
Low Speed Screw	*518* turn
Idle Speed (in water)	1250-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section)

[j] M - Magneto or Front Carb
C - Center Carb
P - PTO or Rear Carb

Carburetor Specifications and Initial Settings

1996 Hurricane

Carburetor Type	Keihin CDK II
Size	38mm
Main Jet	#155
Mid-Range Jet	*N/A*
Slow Jet	#70
High Speed Screw	*N/A*
Low Speed Screw	*5/8* turn
Idle Speed (In water)	1300-1400 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section) (70g spring) Valve Seat 1.6

1996 SL780, SLT 780 EC78PWE·02I05 EC78PWE·03/04

Carburetor Type	Mikuni	Mikuni
Size	38 mm *w/34* mm venturi	38 mm *w/34* mm venturi
Main Jet	#107.5	#110
Slow Jet	#72.5	#67.5
High Speed Screw [1]	M = *3/4*, C = *3/4*, P = 1	M = 1 *1/8*, C = *7/8*, P = 1 *1/4*
Low Speed Screw	*5/8* turn	1 *3/8* turn
Idle Speed (In water)	1200-1300 RPM	1200-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section) (80g black spring) Valve Seat 2.0	20-24 PSI (See test procedure this section) (80g black spring) Valve Seat 2.0

NOTE: On EC78PWE-02 engines, the first transition hole (closest to the throttle plate at idle) is on the engine side of the throttle plate. On the EC78PWE-03 engine, it is on the air box side. This is the reason for the change in low screw setting and pilot jet.

1996 SLX780 EC78PWE04

Carburetor Type	Mikuni
Size	38 mm *w/34* mm venturi
Main Jet	#110
Slow Jet	#67.5
High Speed Screw [1]	*M=11/8, C=7/8, P=11/4*
Low Speed Screw	1 *3/8* turn
Idle Speed (In water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section) (80g black spring) Valve Seat 2.0

[1] M - Magneto or Front Carb
C - Center Carb
P - PTO or Rear Carb
All high speed screw settings are ± 1/8 turn

1996 SL900

Carburetor Type	Keihin CDK II (3)
Size	38mm
Main Jet [1]	M = 138, C = 140, P = 135
Mid-Range Jet	#65
Slow Jet	#60
High Speed Screw	*N/A*
Low Speed Screw	*5/8* turn
Idle Speed (in water)	1250-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section)

1996 SLTX

Carburetor Type	Keihin CDK II (3)
Size	38mm
Main Jet [1]	M = 142, C = 142, P = 138
Mid-Range Jet	#58
Slow Jet	#58
High Speed Screw	*N/A*
Low Speed Screw	1 turn
Idle Speed (in water)	1250-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section)

[1] M - Magneto or Front Carb
C - Center Carb
P - PTO or Rear Carb

FUEL SYSTEM/CARBURETION
Carburetor Specifications and Initial Settings

1997 SUSLT700/SL700Dlx

	SL700	SLT700/SL700 Deluxe
Carburetor Type	Keihin CDK II	Keihin CDK II W / Accelerator pump
Size	40mm	38mm
Main Jet	Primary - #158 Secondary - #120	#80
Mid-Range Jet	None	#70
Slow Jet	#78	#55
High Speed Screw	None	1 5/8 - 1 3/4 turn
Low Speed Screw	7/8 turn	5/8 turn
Idle Speed (in water)	1200-1300 RPM	1200-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section) (70g spring) Valve Seat 2.0	20-24 PSI (See test procedure this section) (70g Spring) Valve Seat 1.6

1997 Hurricane

Carburetor Type	Keihin CDK II
Size	38mm
Main Jet	#155
Mid-Range Jet	None
Slow Jet	#70
High Speed Screw	None
Low Speed Screw	5/8 turn
Idle Speed (in water)	1300-1400 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section) (70g spring) Valve Seat 2.0

1997 SL780/SLT780

Carburetor Type	Mikuni
Size	38 mm w/34 mm venturi
Main Jet [1]	M=125 C=122.5 P=130
Slow Jet	#70
High Speed Screw [1]	1/8 turn (All) ± 1/8
Low Speed Screw	1 1/4 turn
Idle Speed (in water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section) (80g black spring) Valve Seat 2.0

[1] M - Magneto or Front Garb
G - Center Garb
P - PTO or Rear Garb

1997SL900

Carburetor Type	Keihin CDK II (3) W / accelerator pump
Size	38mm
Main Jet [1]	M = 138, C = 140, P = 135
Mid-Range Jet	#65
Slow Jet	#60
High Speed Screw	None
Low Speed Screw	5/8 turn
Idle Speed (in water)	1200-1300 RPM
Needle & Seat Pop Off Pressure	20-24 PSI (See test procedure this section) (70g spring) Valve Seat 2.0

1997 SL1050 *J*SLTX

	SL1050	SLTX
Carburetor Type	Keihin CDK II (3)	Keihin CDK II (3) W / accelerator pump
Size	40mm	38mm
Main Jet [1]	M = 158, C = 152, P = 152	M = 148, C = 142, P = 142
Mid-Range Jet	None	#58
Slow Jet	75	#55
High Speed Screw	None	None
Low Speed Screw	7/8 turn	1 turn
Idle Speed (in water)	1200-1300 RPM	1200-1300 RPM
Needle & Seat Pop Off Pressure	10-12 PSI (See test procedure this section) (49g spring) Valve Seat 2.0	20-24 PSI (See test procedure this section) (70g spring) Valve Seat 2.0

[1] M - Magneto or Front Carb
C - Center Carb
P - PTO or Rear Carb

FUEL SYSTEM/CARBURETION
Carburetor Specifications and Initial Settings

1998 SLH/SLTH	SLH	SLTH
Carburetor Type	Keihin CDK II	Keihin CDK II
Size	38 mm	38 mm
Main Jet	#142	#142
Mid-Range Jet	None	None
Slow Jet	#68	#68
High Speed Screw	None	None
Low Speed Screw	1 7/8 turn	1 7/8 turn
Idle RPM (in water)	1300-1400 RPM	1300-1400 RPM
Needle & Seat Pop Off Pressure	18-20 PSI (See test procedure this section) (70g spring) Valve Seat 2.0	18-20 PSI (See test procedure this section) (70g Spring) Valve Seat 2.0

1998 SLXH/SLTX	SLXH	SLTX
Carburetor Type	Keihin CDK II W / Accelerator pump	Keihin GDK II W / Accelerator pump
Size	40mm	40 mm
Main Jet	M140 G140 P135	M140 C140 P135
Mid-Range Jet	#35	#35
Slow Jet	#62	#62
High Speed Screw	None	None
Low Speed Screw	1 3/4 turn	1 3/4 turn
Idle Speed (in water)	1300-1400 RPM	1300-1400 RPM
Needle & Seat Pop Off Pressure	18-20 PSI (See test procedure this section) (70g spring) Valve Seat 2.0	18-20 PSI (See test procedure this section) (70g Spring) Valve Seat 2.0

[1] M - Magneto or Front Garb
G - Center Carb
P - PTa or Rear Garb

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Carburetor Jet Part Numbers

Keihin Carburetor Jet Part Numbers

The following chart lists all main and pilot jets and the part number of each that are presently available.

MAIN JET NO.	PART NO.	MAIN JET NO.	PART NO.	PILOT JET NO.	PART NO.
80	30501 01	160	3050194	40	3050118
82	3050102	165	3050195	42	3050119
85	3050103	170	3050196	45	3050120
88	3050104	175	3050197	48	3050121
90	3050105	180	3050198	50	3050122
92	3050106	185	3050199	52	3050123
95	3050107	190	3050201	55	3050124
98	3050108	195	3050202	58	3050125
100	3050109	200	3050203	60	3050126
102	3050110			62	3050127
105	3050111			65	3050128
108	3050112			68	3050129
110	3050113			70	3050130
112	3050114			72	3050131
115	3050115			75	3050132
118	3050116			78	3050133
120	3050117			80	3050134
122	3050179			82	3050171
125	3050180			85	3050172
128	3050181			88	3050173
130	3050182			90	3050174
132	3050183			92	3050175
135	3050184			95	3050176
138	3050185			98	3050177
140	3050186			100	3050178
142	3050187				
145	3050188				
148	3050189				
150	3050190				
152	3050191				
155	3050192				
158	3050193				

Mikuni Carburetor Jet Part Numbers

MAIN JET NO.	PART NO.	PILOT JET NO.	PART NO.
77.5	3140064	67.5	3140117
80	3140016	70	3140168
87.5	3140092	72.5	3140072
90	3140084	75	3140063
95	3140074	77.5	3140064
105	3140097	80	3140057
107.5	3140114	85	3140017
110	3140116		

Gasoline Safety

WARNING

Gasoline is highly flammable and explosive under certain conditions.

- Always exercise extreme caution whenever handling gasoline.
- Always refuel with the engine stopped and outdoors or in a well ventilated area.
- Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.
- Do not over fill the tank. (Do not fill the tank neck.)
- If you get gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.
- Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.
- Shut off fuel valve whenever the watercraft is stored or parked.

High Elevation Recommendations*

The following carburetor settings and impeller recommendations are for operation above 5000 feet (1500 meters) only. Serious engine damage may result if the craft is operated at elevations below 5000 ft. (1500 m) with these adjustments.

1995 Model	High Speed Screw			Low Speed Screw			Impeller	Impeller Part Number Or Kit	Operating RPM	Comments
	Mag	Cen	PTO	Mag	Cen	PTO				
SL750	3/4	1/4	1/2	3/4	3/4	3/4	035	5131035	5960-5970	See NOTE Below"
1996 Model	**High Speed Screw**			**Low Speed Screw**			**Impeller**	**Impeller Part Number Or Kit**	**Operating RPM**	**Comments**
	Mag	Cen	PTO	Mag	Cen	PTO				
SL700	1 1/2	-	1 1/2	1/2	-	1/2	Hurricane	5131457	6000-6050	-
SLT700	1 1/2	-	1 1/2	1/2	-	1/2	Hurricane	5131457	6000-6050	-
SL780 SLT780 *02105* Eng 03 Engine	5/8 1	5/8 3/4	7/8 1 1/8	5/8 1 3/8	5/8 1 3/8	5/8 1 3/8	13/18 Swirl 13/18 Swirl	2871554 2871554	6300-6400 6300-6400	Remove cone extension (if equipped) See NOTE: Below"
SLX780	5/8	5/8	7/8	1 1/4	1 1/4	1 1/4	13/18 Swirl	2871554	6375-6400	-
SL900	132 (Main Jet)	135 (Main Jet)	130 (Main Jet)	1	1	1	15/20	5131371	6500	60 Mid Jet
SLTX	135 (Main Jet)	135 (Main Jet)	130 (Main Jet)	1	1	1	15/20	5131371	6500	58 Mid Jet
1997 Model	**High Speed Screw**			**Low Speed Screw**			**Impeller**	**Impeller Part Number Or Kit**	**Operating RPM**	**Comments**
	Mag	Cen	PTO	Mag	Cen	PTO				
SL700	No Change			Turn screws in to limiter cap stops (approximately 1/8 turn in)			10/14	2871878	6200-6250	-
SL700Dlx							12/17	-	6350 (SL)	-
SLT700							12/17	-	6250 (SLT)	-
Hurricane	No Change			1/8 tum out from closed			10/14	2871878	6600	Idle RPM 1250
SL780	No Carburetor Changes						13/20	2871880	6400	Remove cone extension
SLT780							12/17	2871879	6350	-
SL900							16/21	2871881	6400	-
SL1050	No Change			Turn low speed screws in 1/8 turn			16/22	2871882	6500	-
SLTX	No Carburetor Changes						16/21	2871881	6400	-

* All high speed screw settings are ± *1/8* turn

** NOTE: Install 65 gram return springs (PN 2871984) on fuel inlet needle to obtain a 15 lb. popoff.

1998 Model High Elevation Recommendations

The following carburetor settings and impeller recommendations are for operation above 5000 feet (1500 meters) only. Serious engine damage may result if the craft is operated at elevations below 5000 ft. (1500 m) with these adjustments.

1998 Model	High Speed Screw			Low Speed Screw			Impeller	Impeller Part Number Or Kit	Operating RPM	Comments
	Mag	Cen	PTO	Mag	Cen	PTO				
SLH	No Change			Adjust for best throttle response			10/14	2871878	6600	Idle RPM 1250
SLTH							10/14	2871878	6600	Idle RPM 1250
SLXH	No Change			Adjust for best throttle response			16/22	2871882	6500	-
SLTX							16/22	2871882	6500	-

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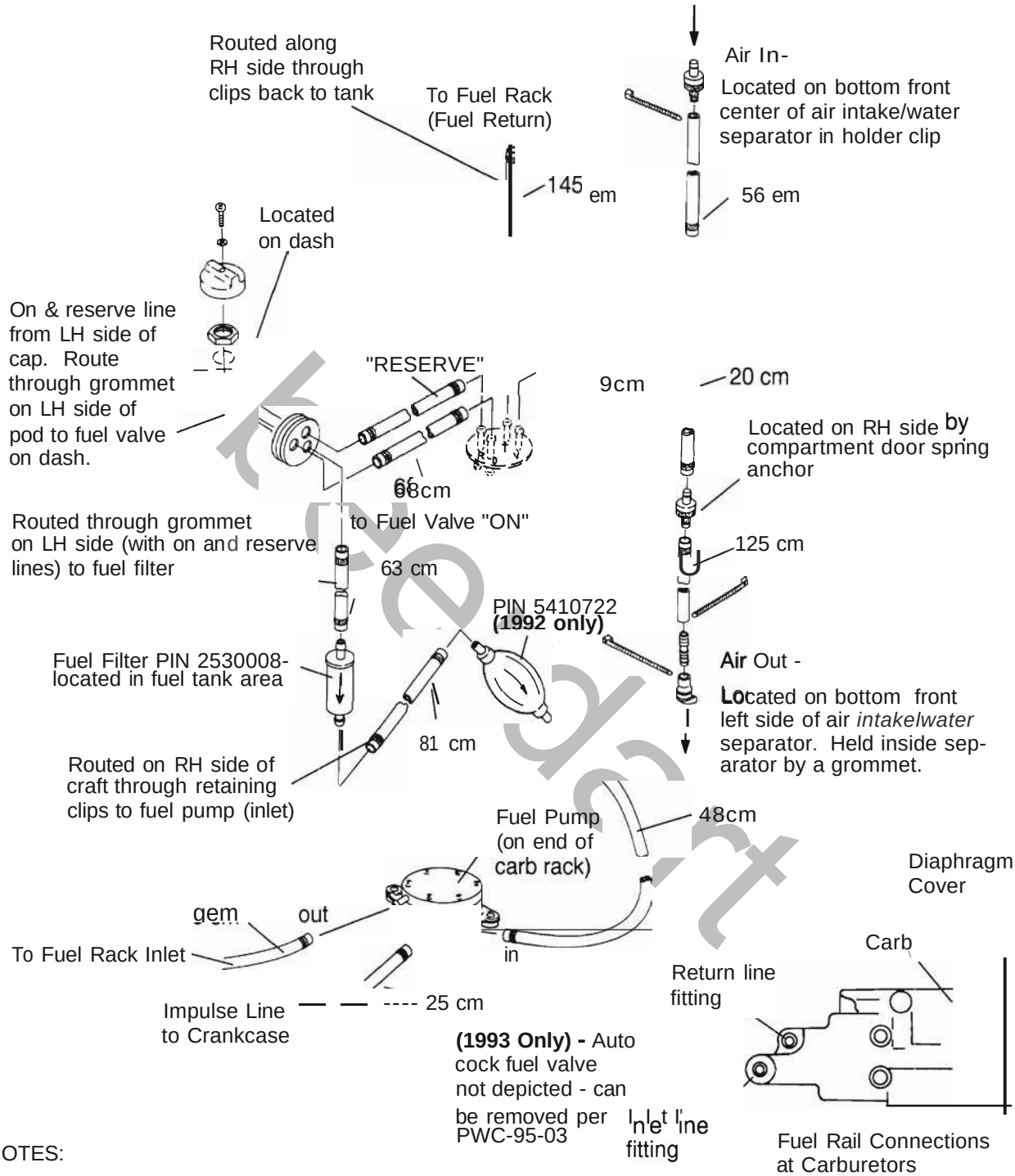
FUEL SYSTEM/CARBURETION
Vent/Fuel Delivery Exploded View

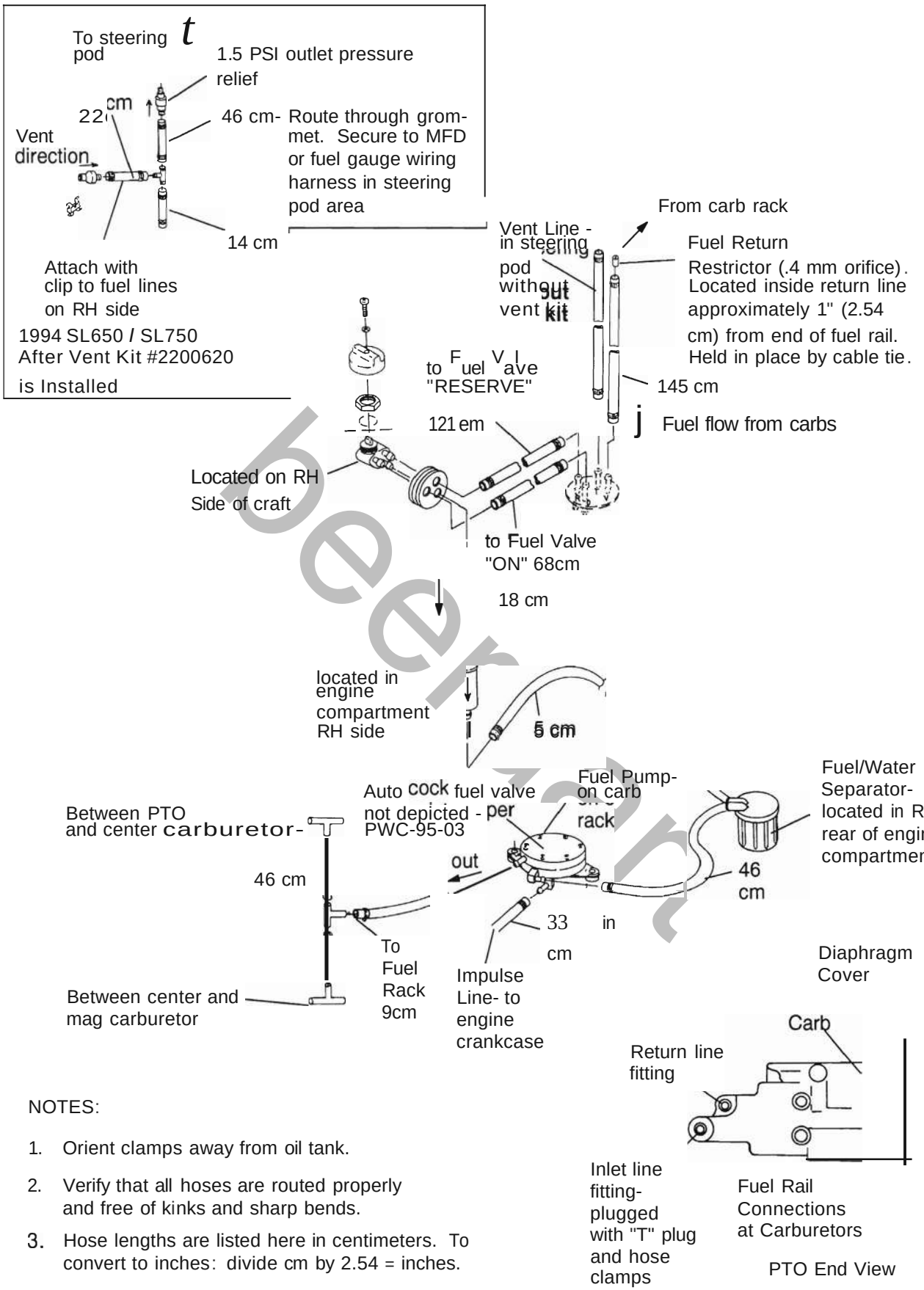
'1992-1993 Models



NOTES:

1. Orient clamps away from oil tank.
2. Verify that all hoses are routed properly and free of kinks and sharp bends,
3. Hose lengths are listed here in centimeters. To convert to inches: divide em by 2.54 = inches.

1994 SL650, SL750

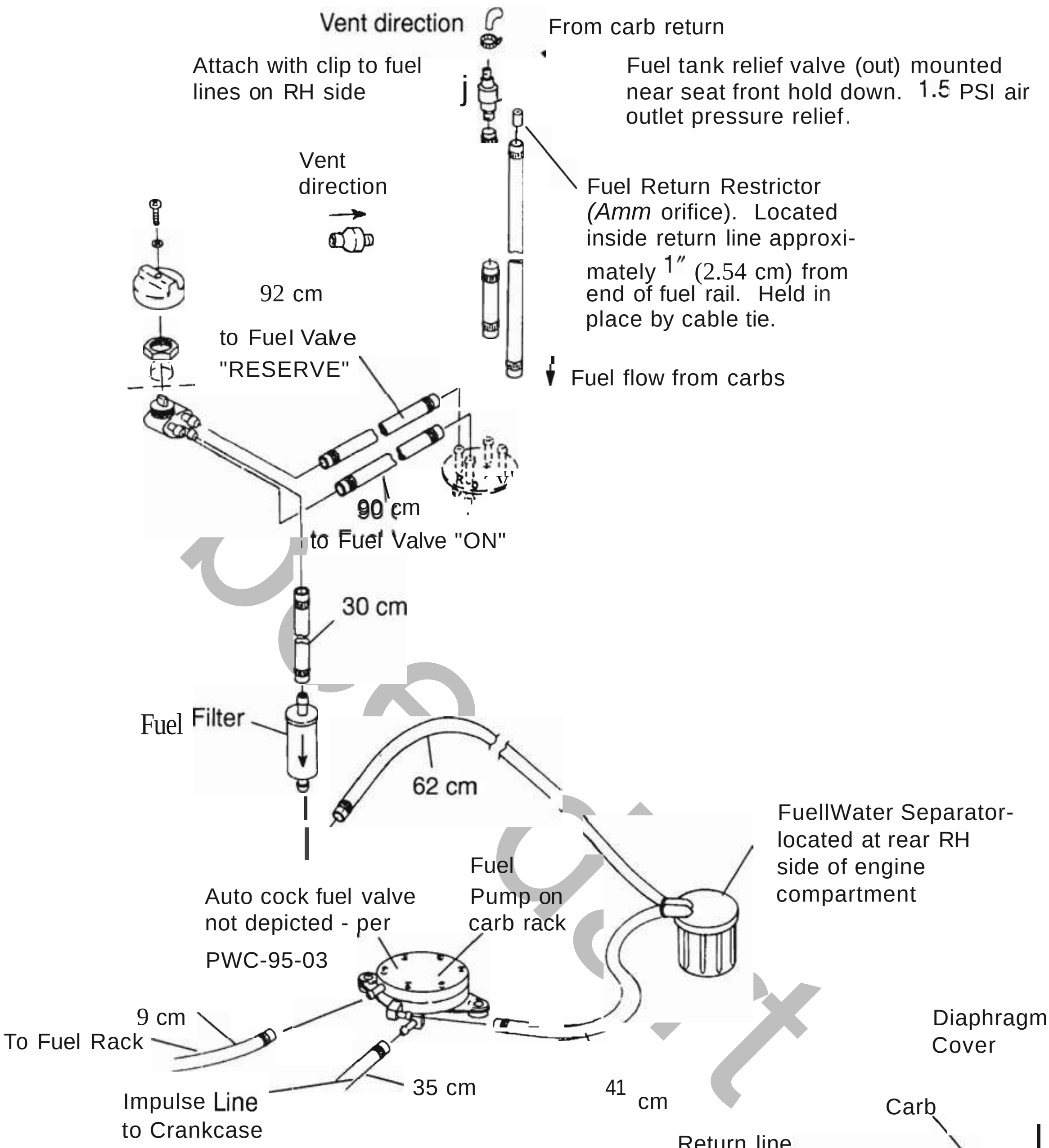


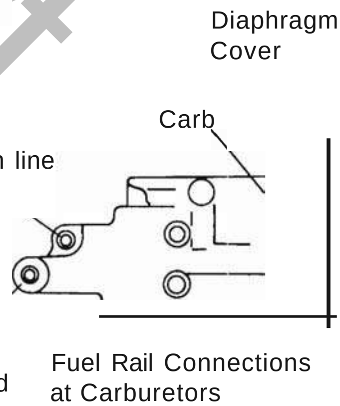
NOTES:

1. Orient clamps away from oil tank.
2. Verify that all hoses are routed properly and free of kinks and sharp bends.
3. Hose lengths are listed here in centimeters. To convert to inches: divide cm by 2.54 = inches.

Vent/Fuel Delivery Exploded View

1994 SLT750



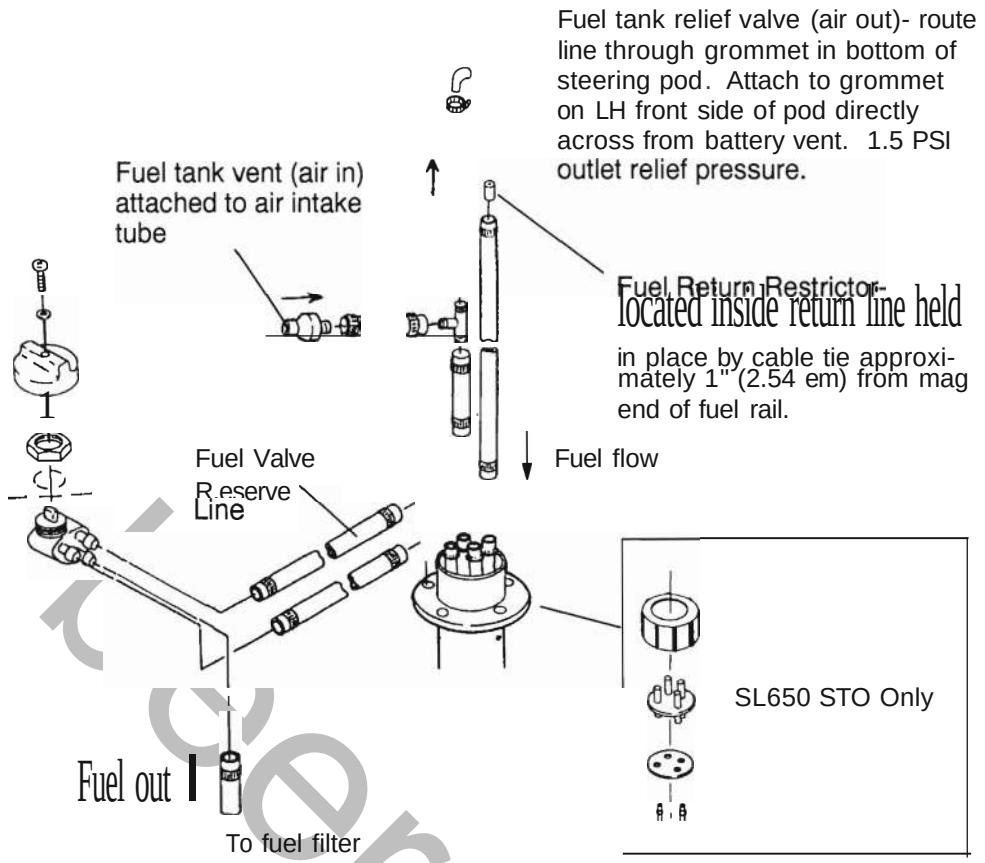


PTO End View

I\JOTES:

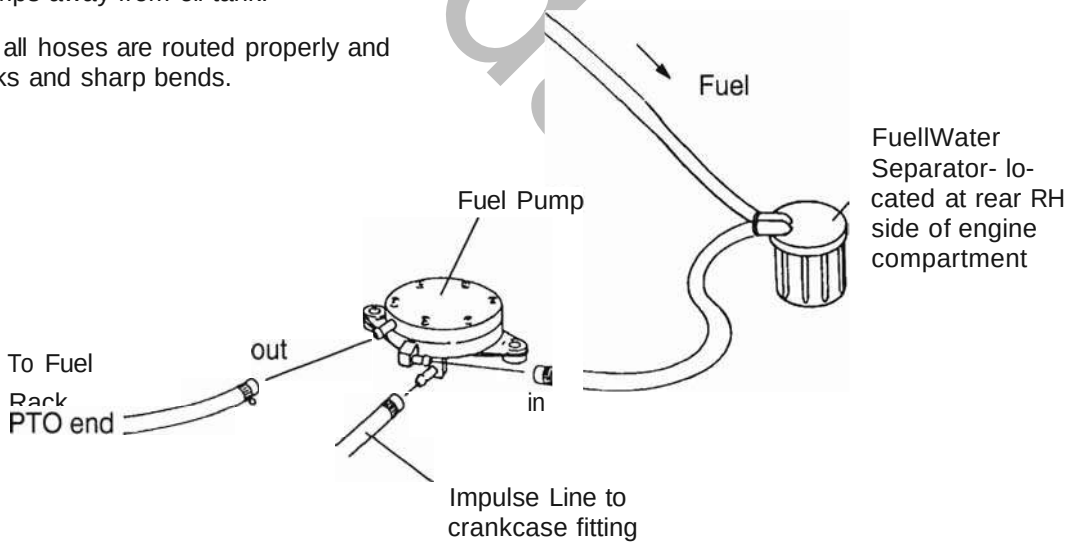
1. Orient clamps away from oil tank.
2. Verify that all hoses are routed properly and free of kinks and sharp bends.
3. Hose lengths are listed here in centimeters. To convert to inches: divide cm by 2.54 = inches

1995 SL650, SL650 STD, SL750 (Early Production)



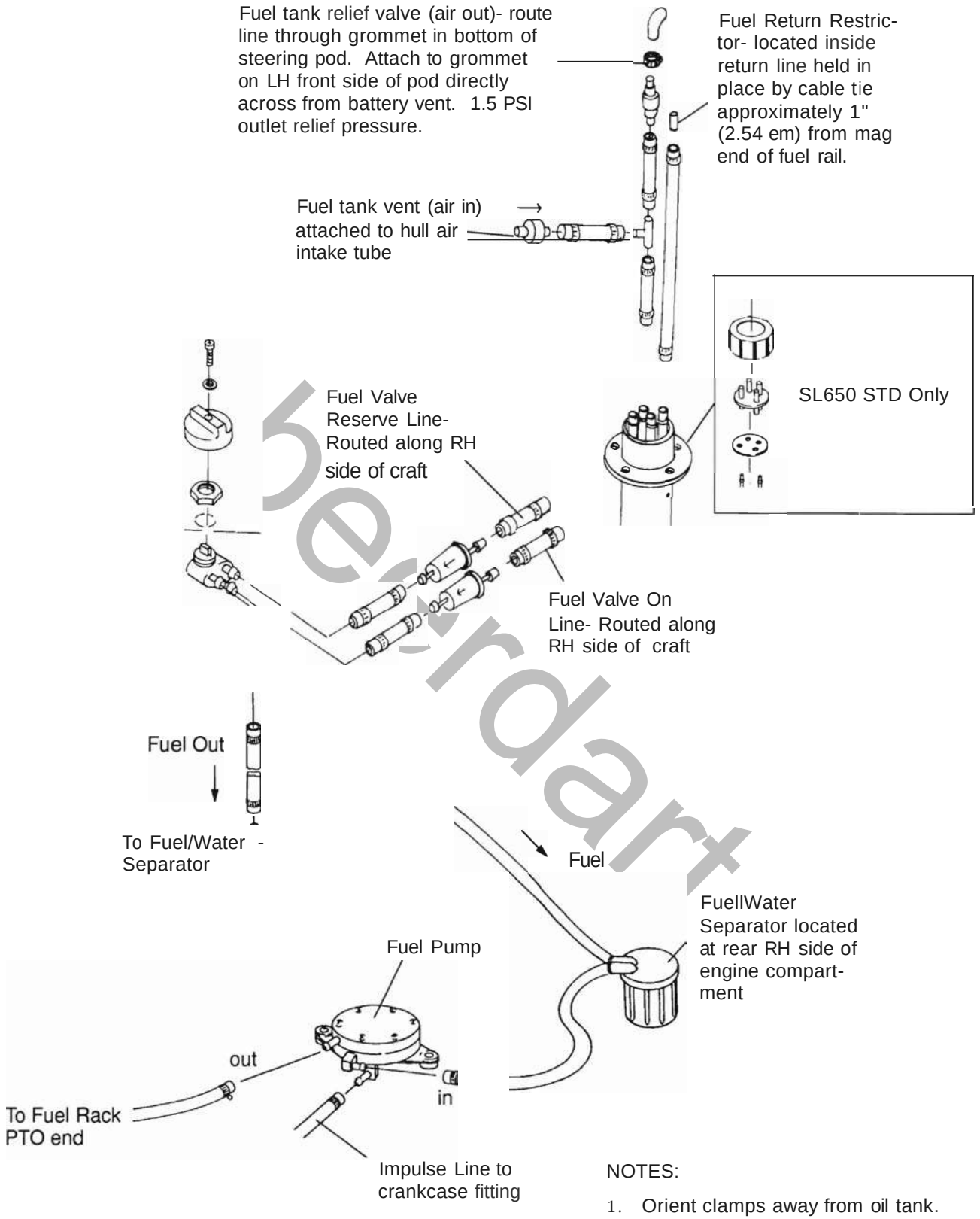
NOTES:

1. Orient clamps away from oil tank.
2. Verify that all hoses are routed properly and free of kinks and sharp bends.



FUEL SYSTEM/CARBURETION
Vent/Fuel Delivery Exploded View

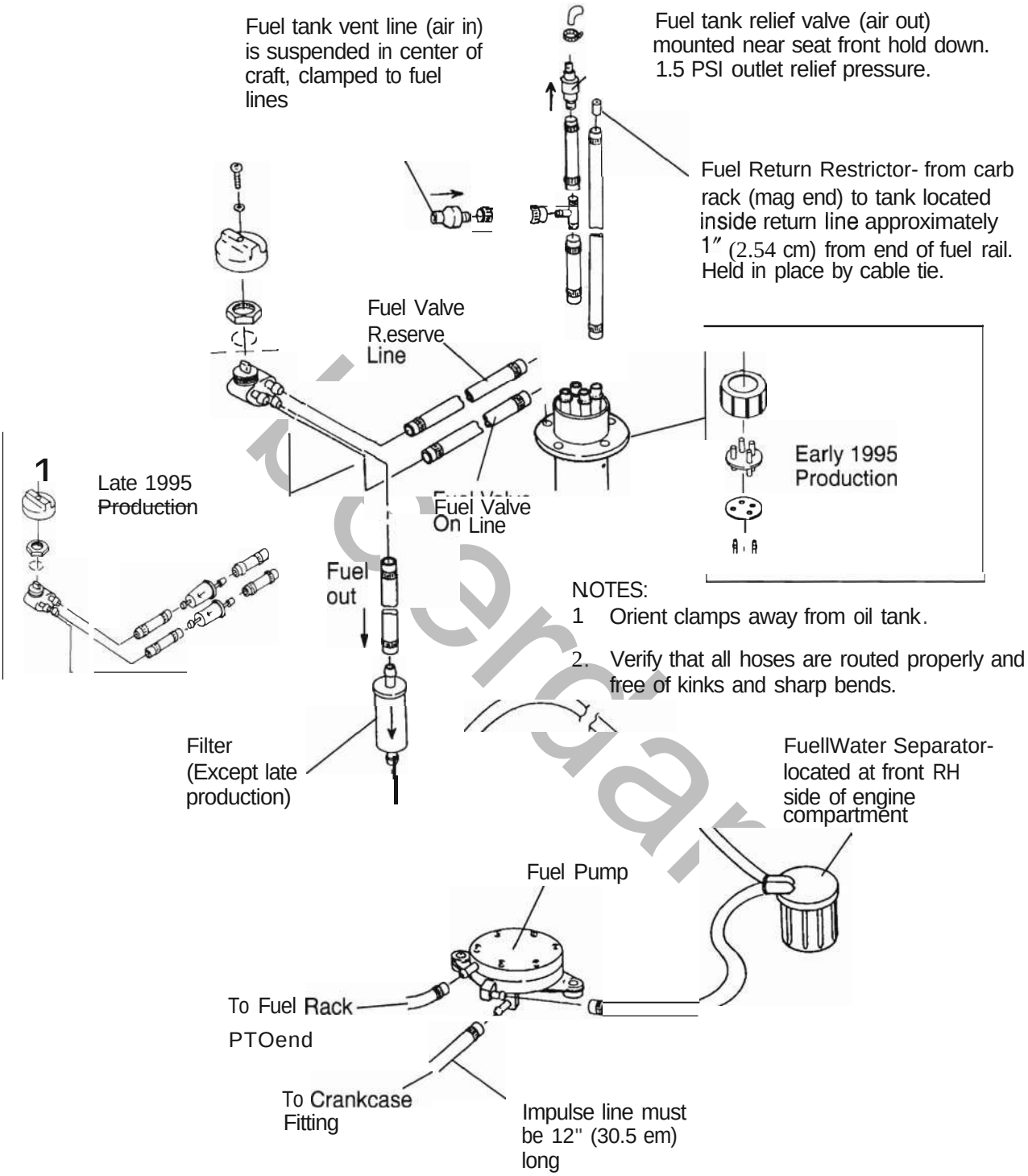
1995 SL650, SL650 STD, SL750 (Late Production)



NOTES:

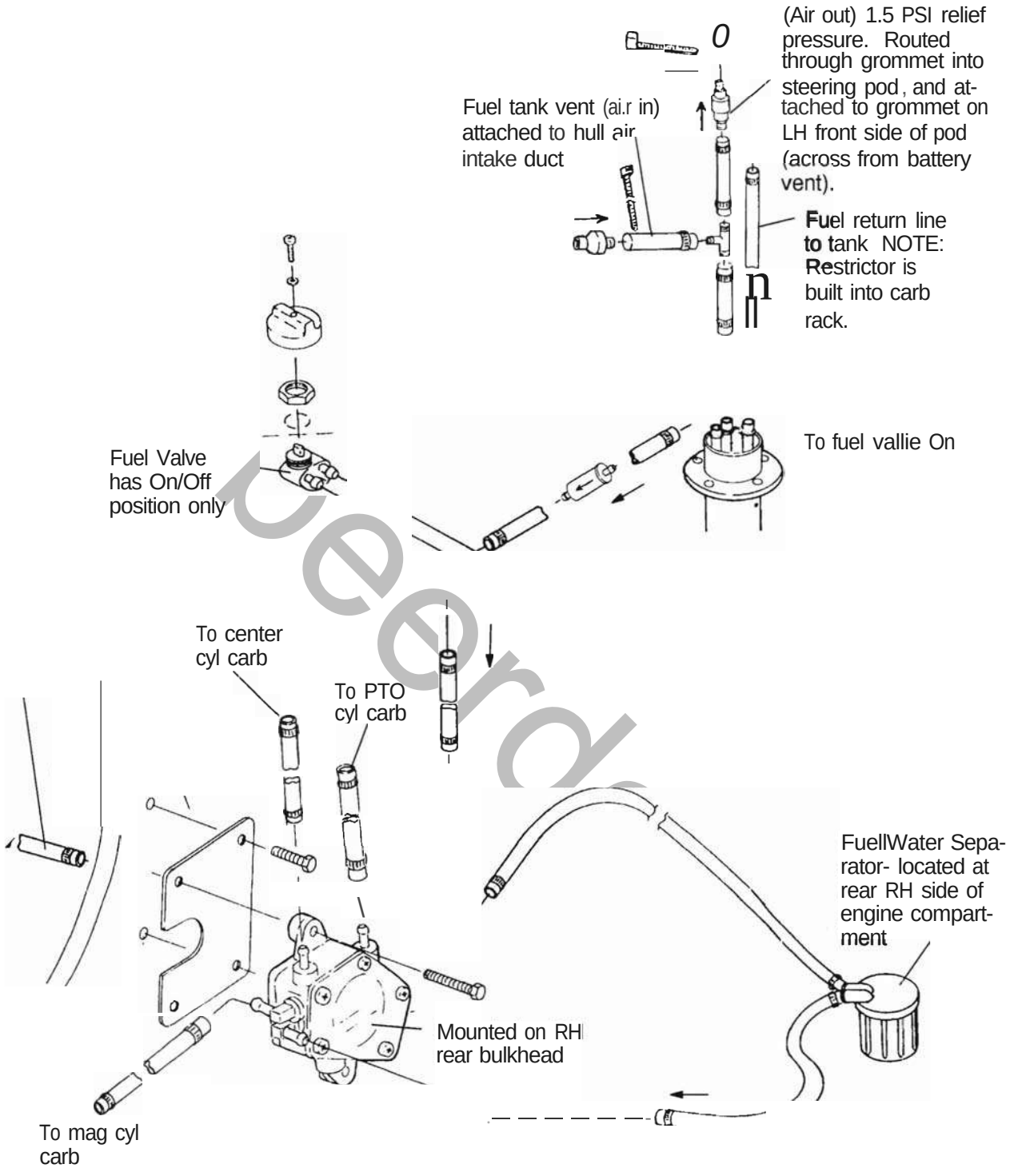
1. Orient clamps away from oil tank.
2. Verify that all hoses are routed properly and free of kinks and sharp bends.

1995 SLT750

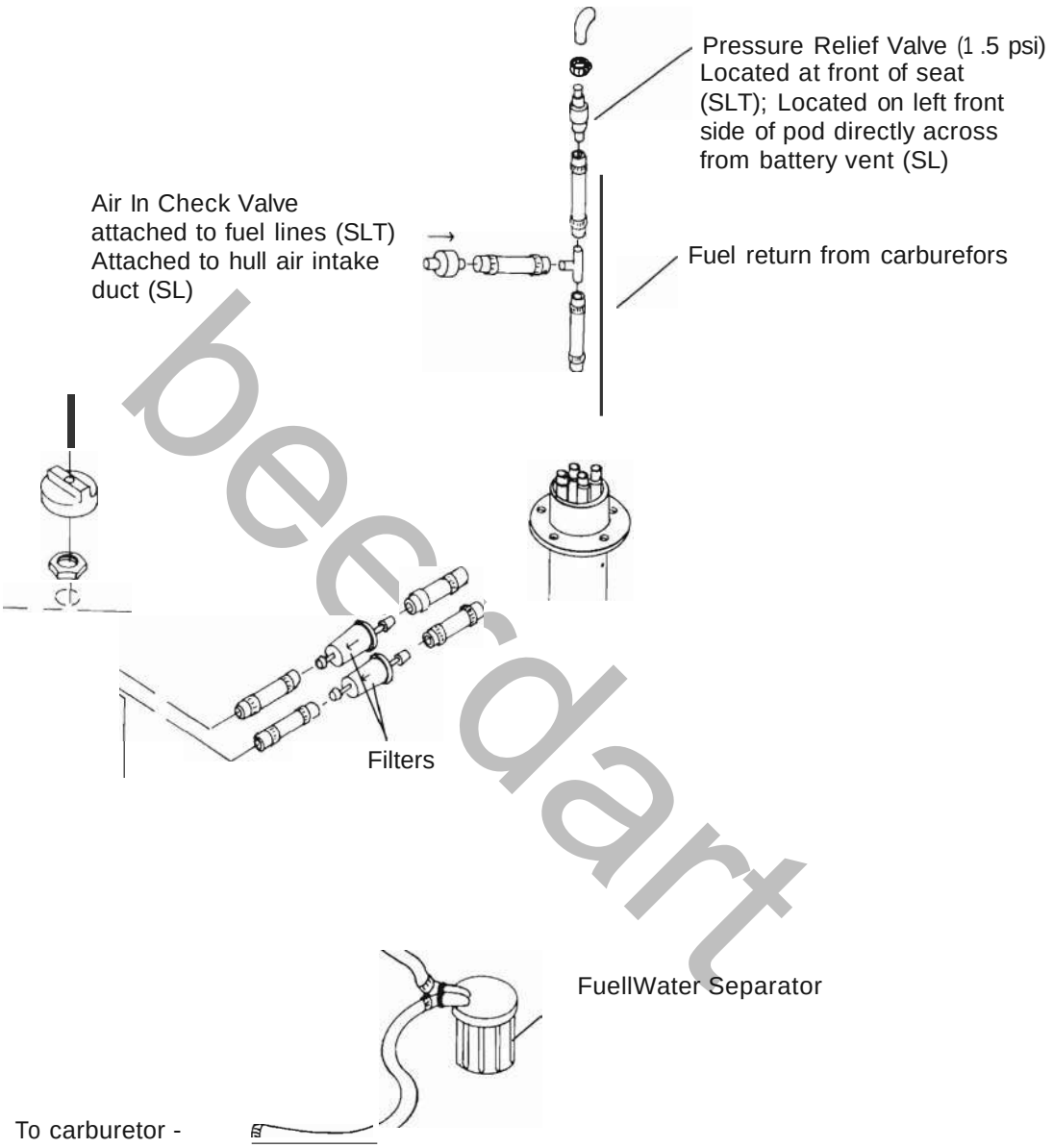


Vent/Fuel Delivery Exploded View

1995SLX780

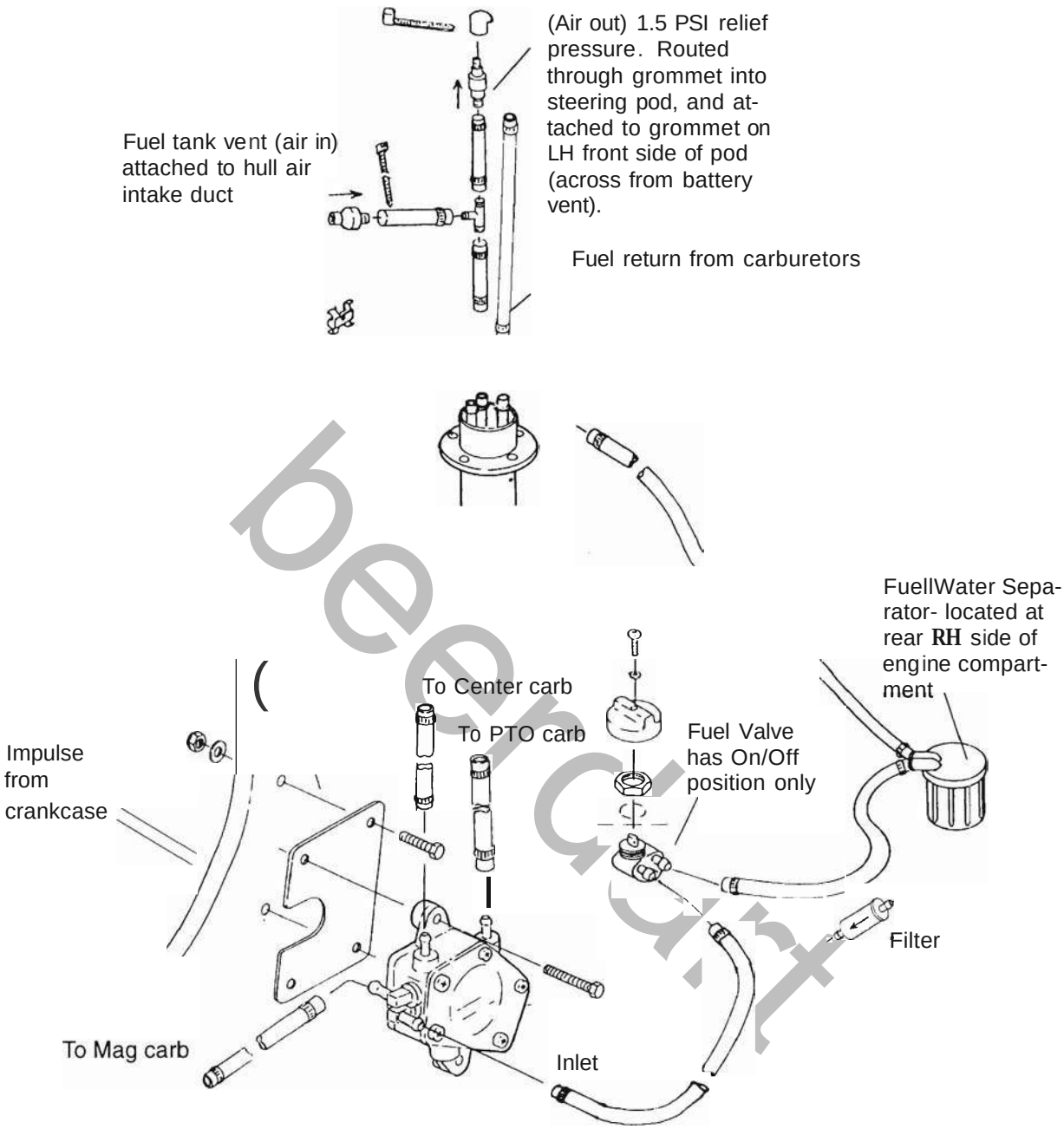


1996 SL700/SL700 Deluxe/SLT700
1997 SLT 700

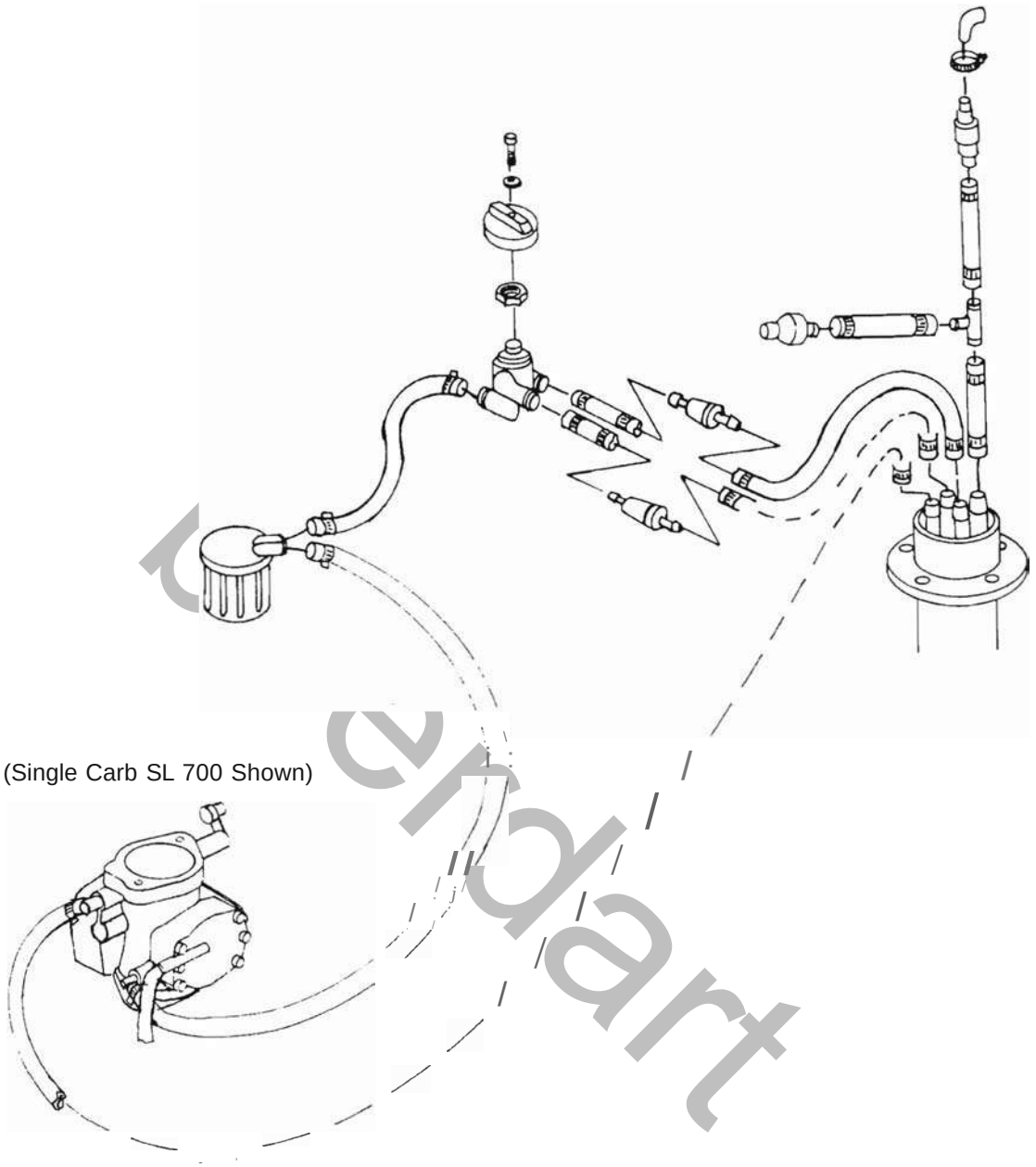


FUEL SYSTEM/CARBURETION
Vent/Fuel Delivery Exploded View

1996 -1997 SL780, SLX780



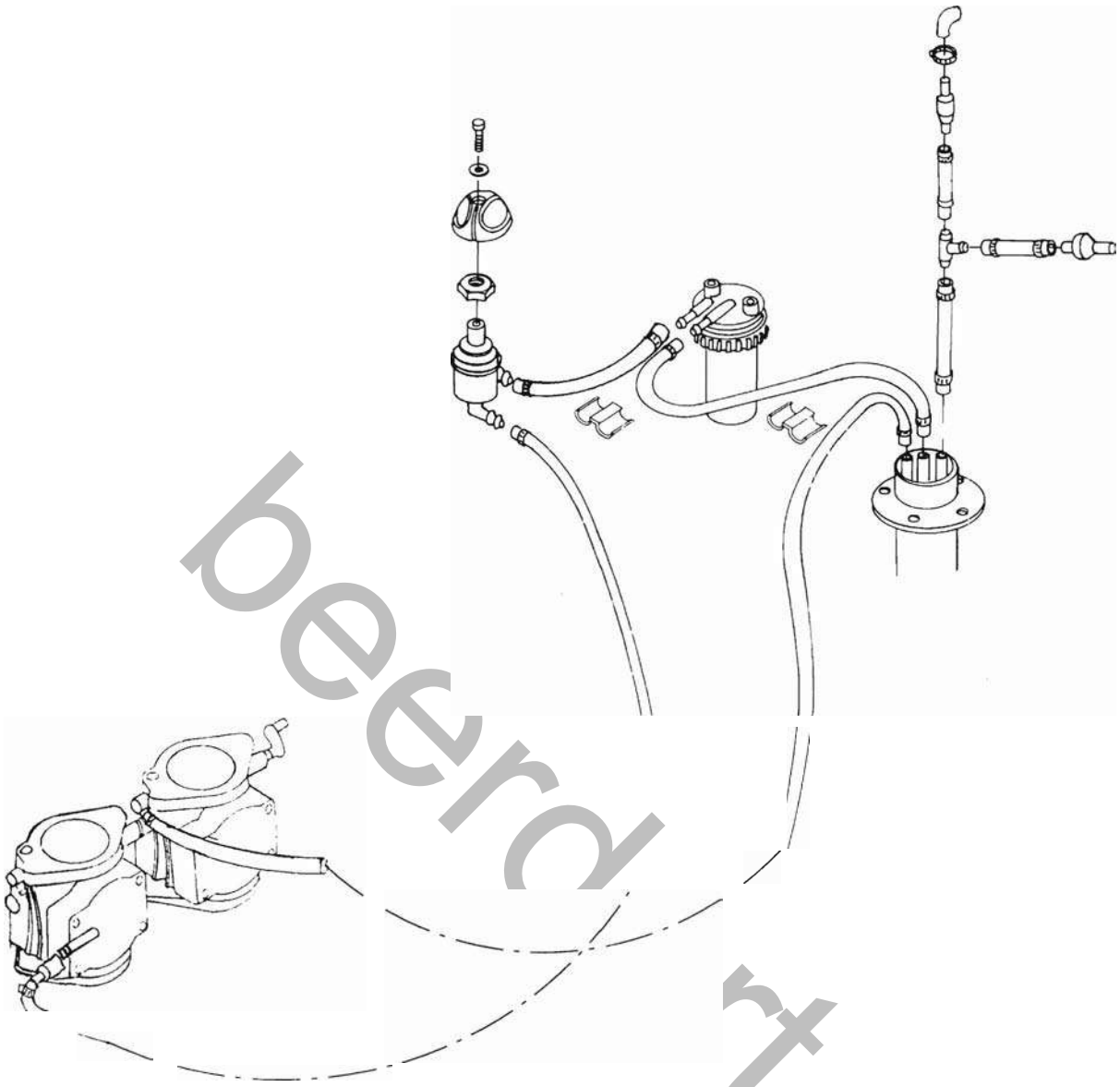
1997 SL 700/SL 700 Deluxe



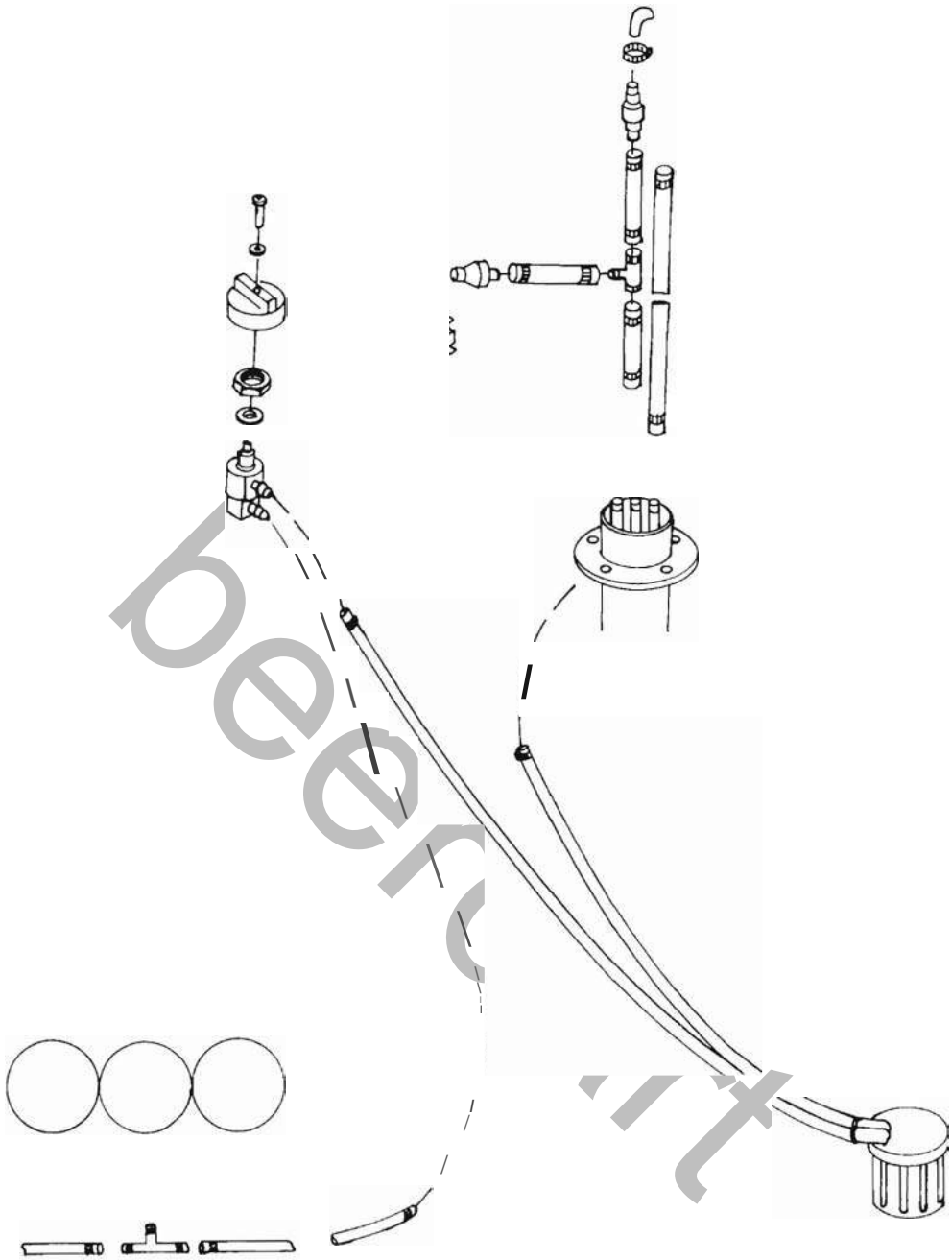
(Single Carb SL 700 Shown)

FUEL SYSTEM/CARBURETION
Vent/Fuel Delivery Exploded View

1998 SL / SLTH

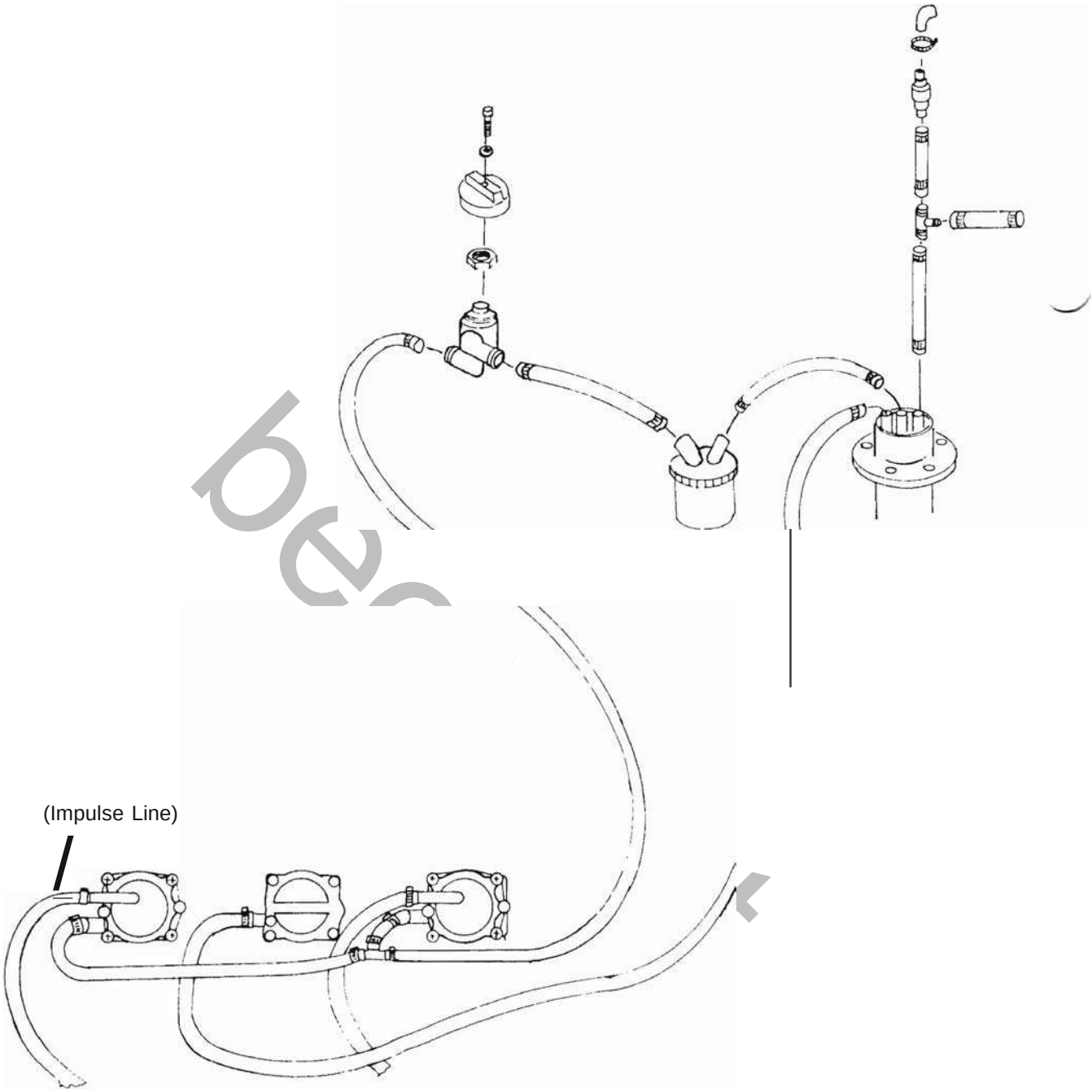


1996 SLTX



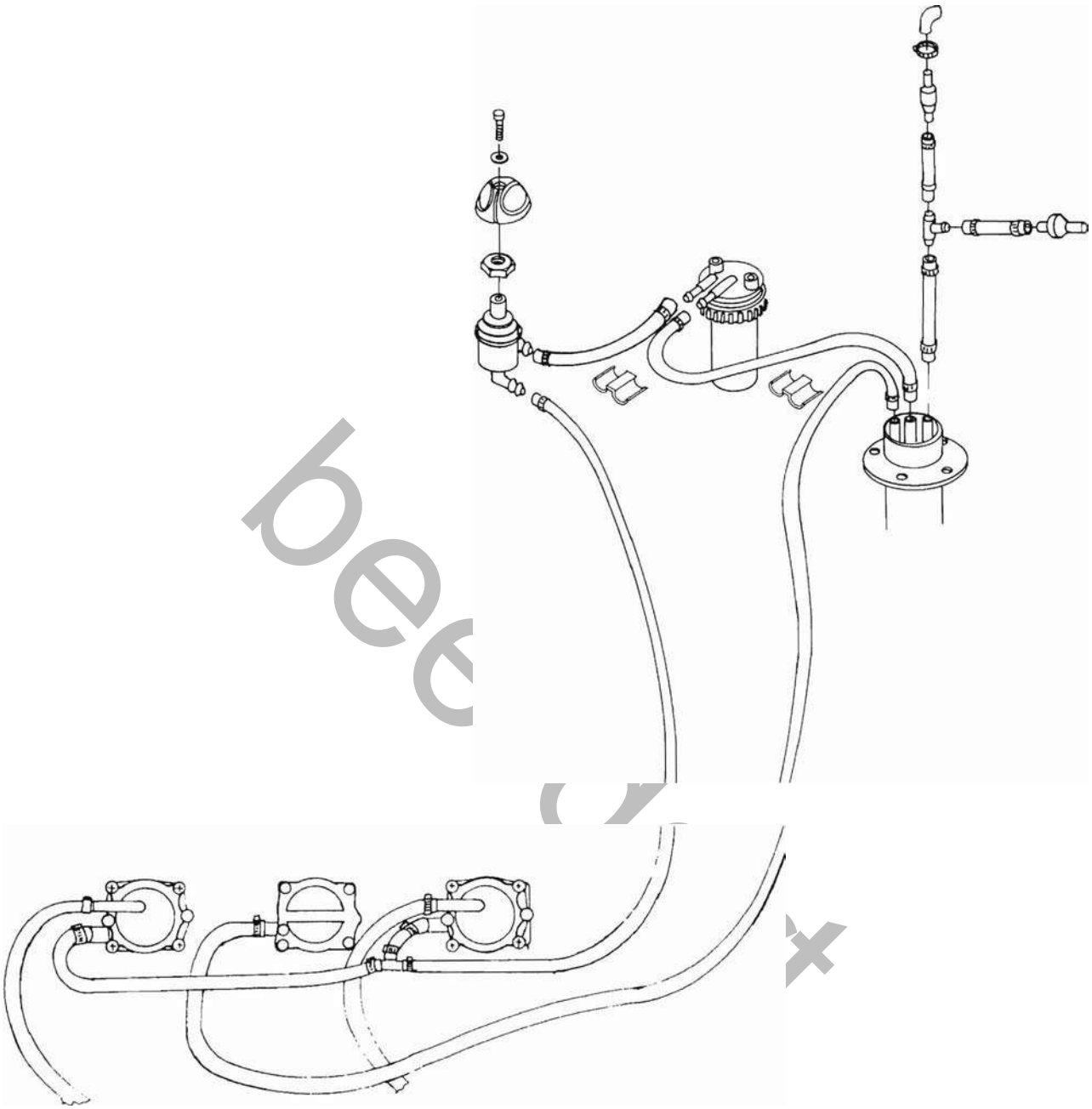
FUEL SYSTEM/CARBURETION
Vent/Fuel Delivery Exploded View

1997 SLTX / SL1050 / SL 900



FUEL SYSTEM/CARBURETION
Vent/Fuel Delivery Exploded View

1998 SLXH / SLTX



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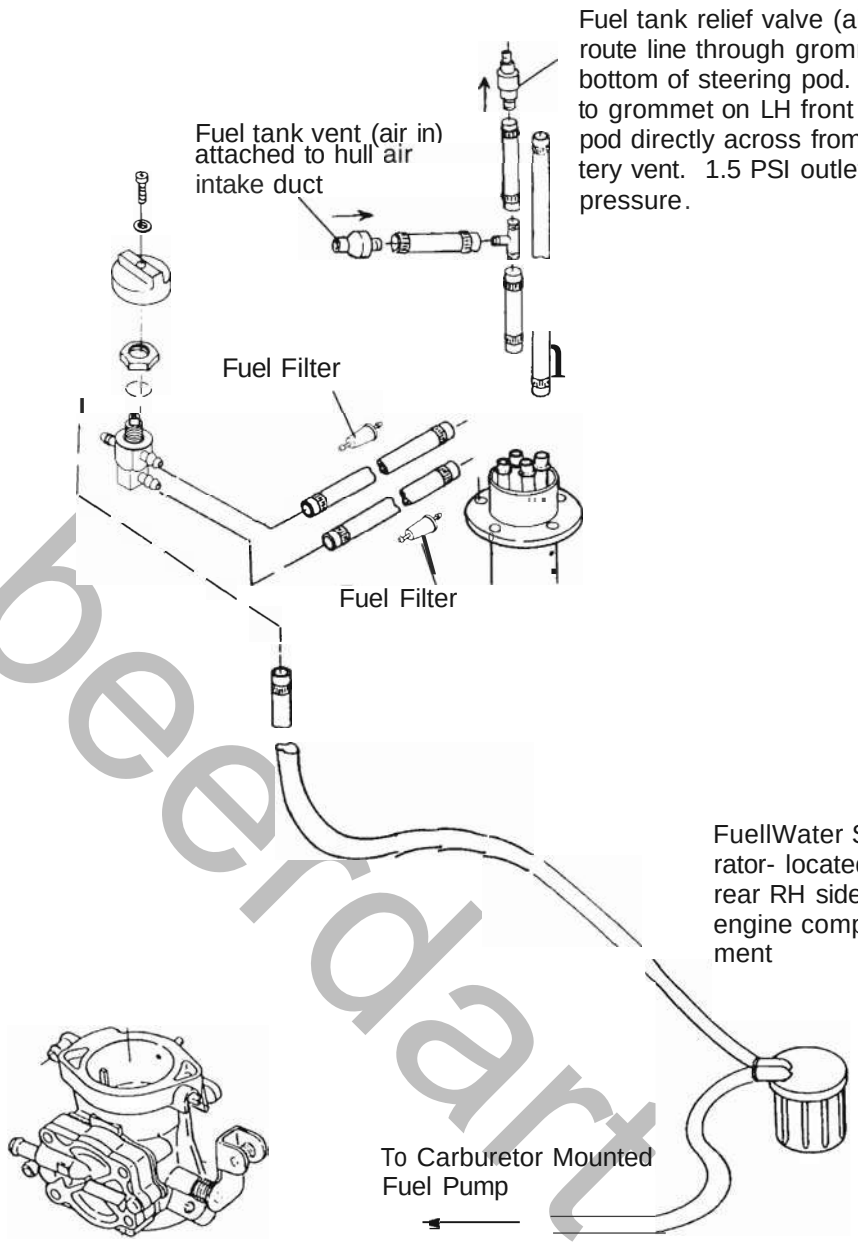
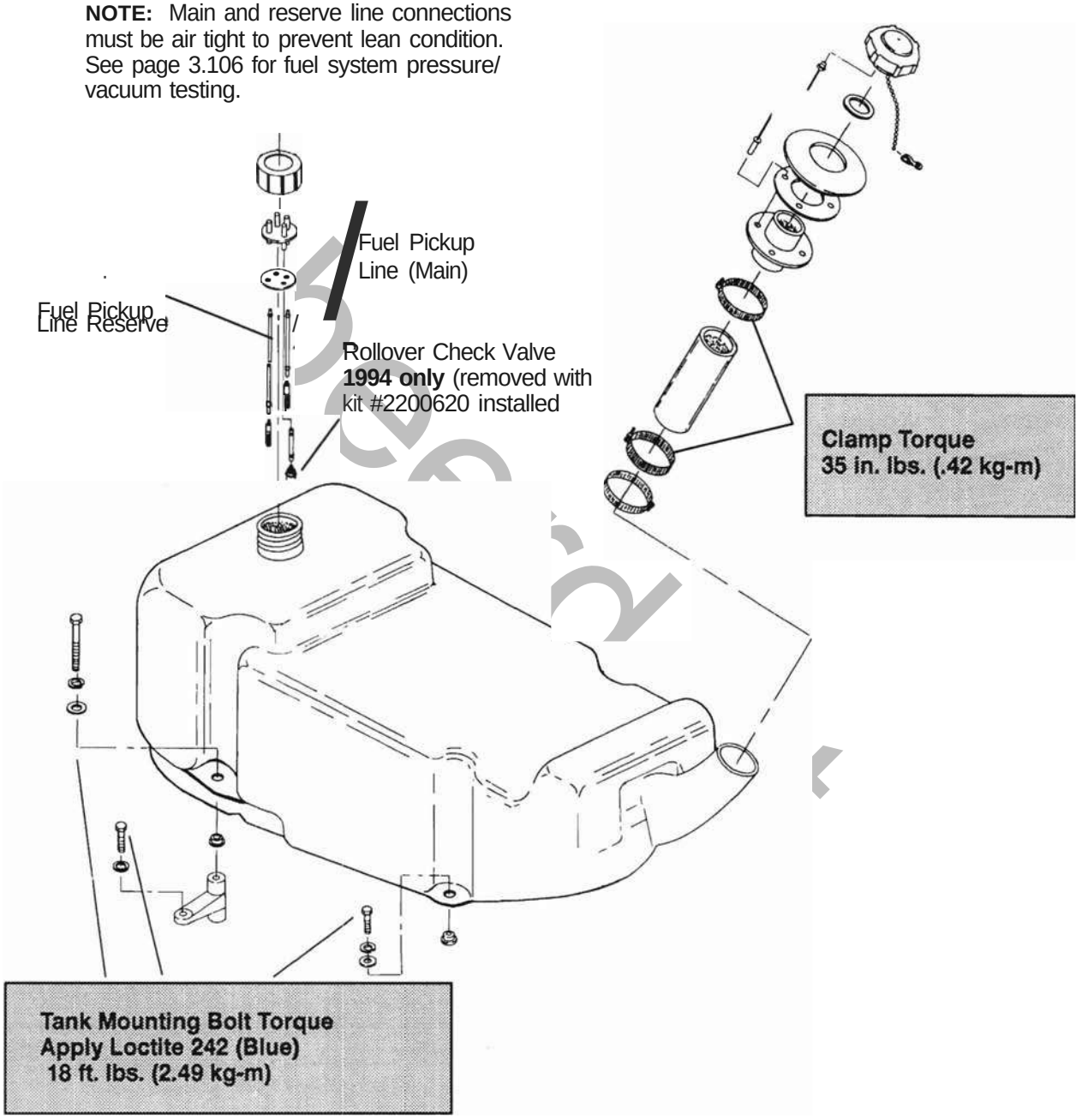
1996 SL900



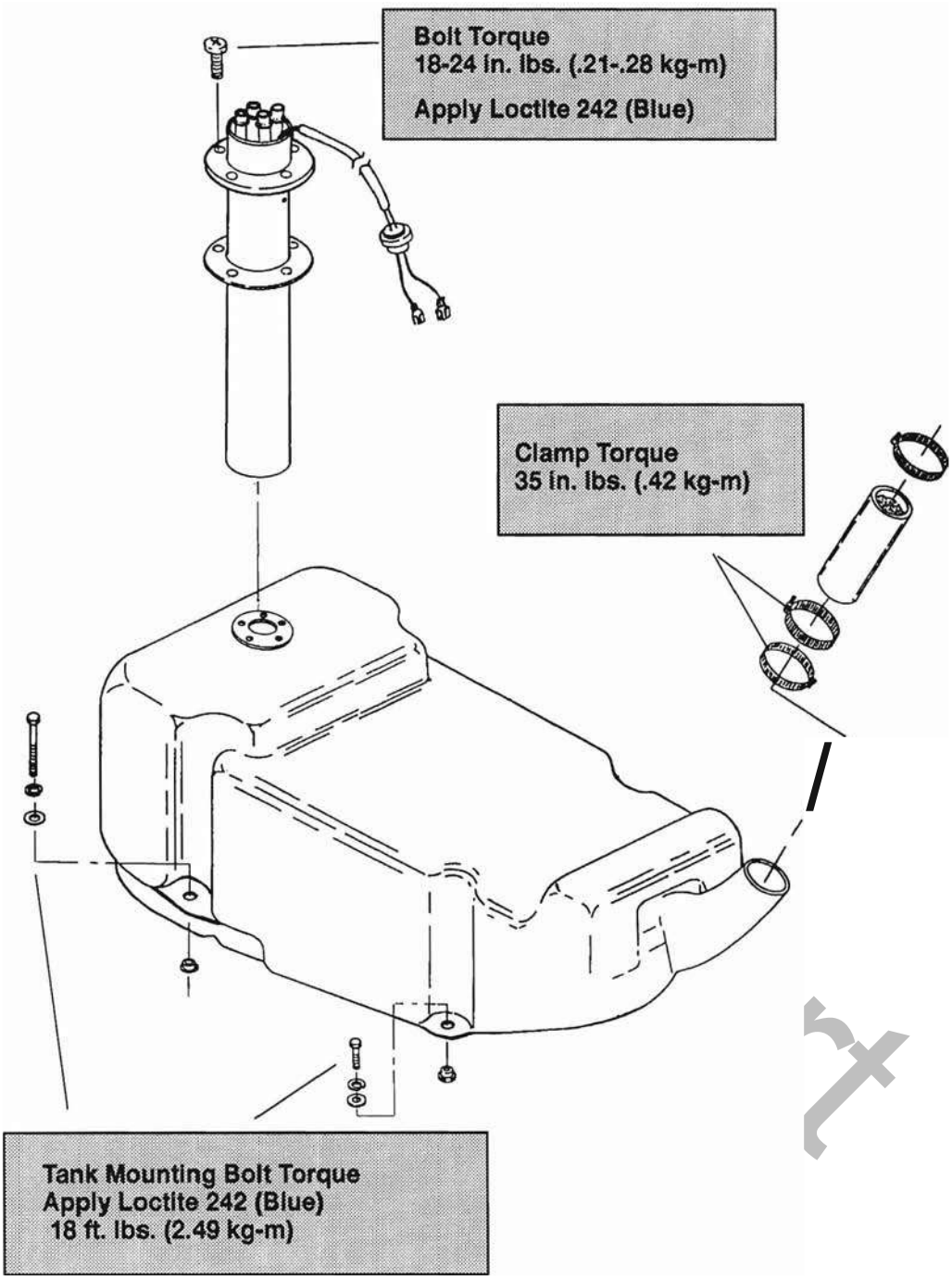
Fuel Tank/Fuel Pickup Exploded View

1992-1994 SL650, 1995 SL650 STO

NOTE: Main and reserve line connections must be air tight to prevent lean condition. See page 3.106 for fuel system pressure/ vacuum testing.



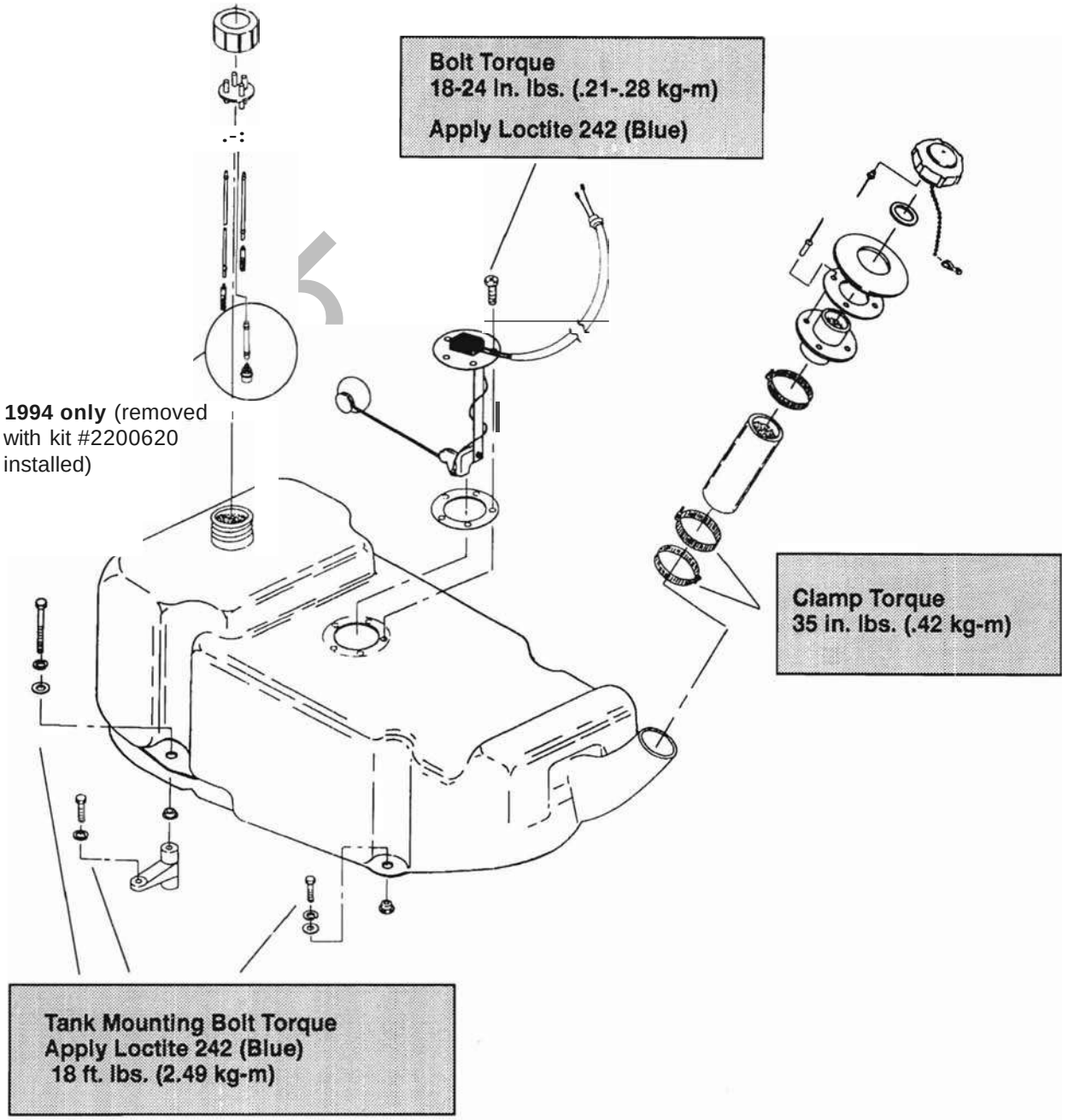
1995 SL650


Bolt Torque
18-24 in. lbs. (.21-.28 kg-m)
Apply Loctite 242 (Blue)
Clamp Torque
35 in. lbs. (.42 kg-m)
Tank Mounting Bolt Torque
Apply Loctite 242 (Blue)
18 ft. lbs. (2.49 kg-m)

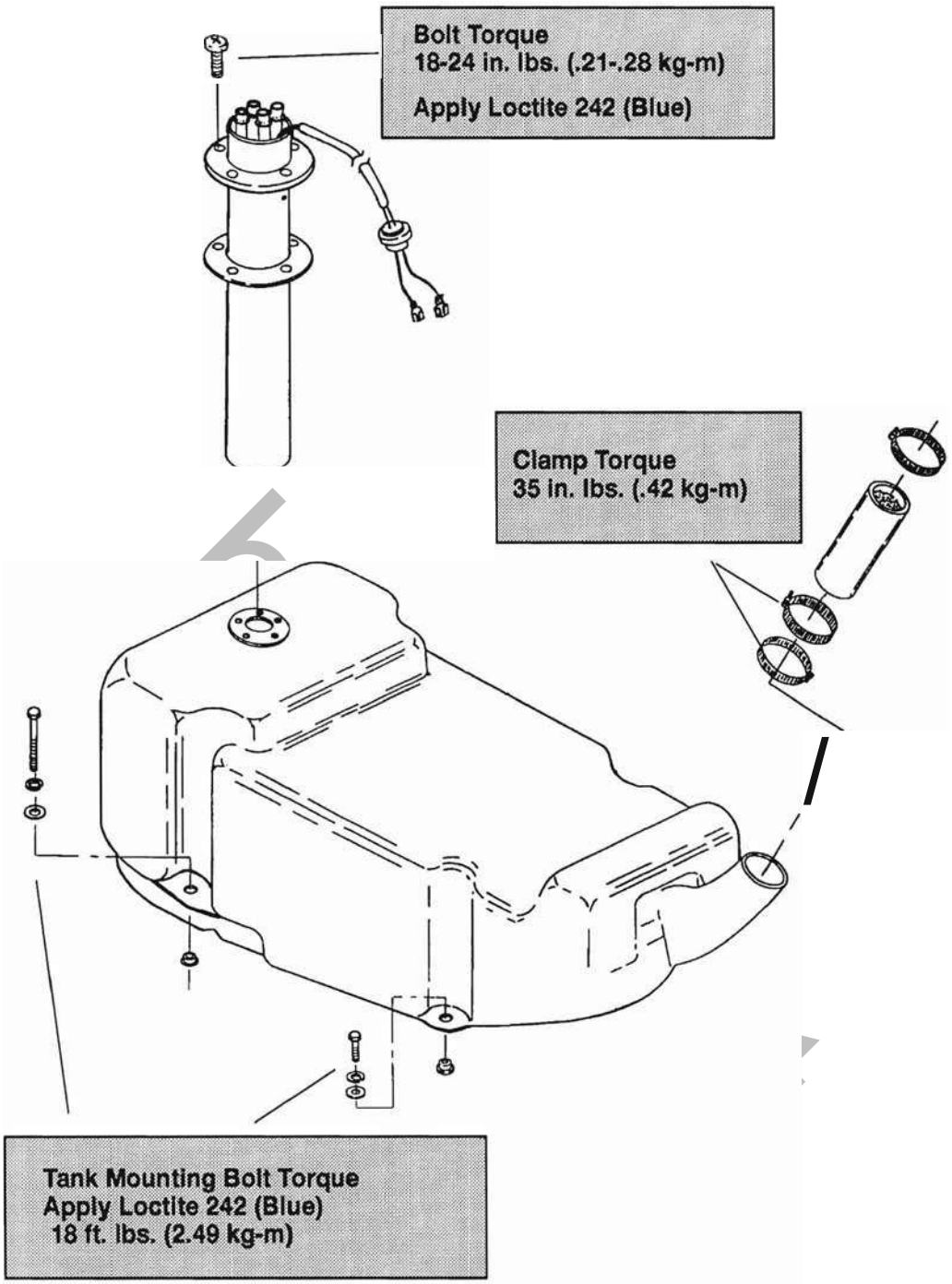
FUEL SYSTEM/CARBURETION
Fuel Tank/Fuel Pickup Exploded View

1993-1994SL750

NOTE: Main and reserve line connections must be air tight to prevent lean condition. See page 3.106 for fuel system pressure/ vacuum testing.

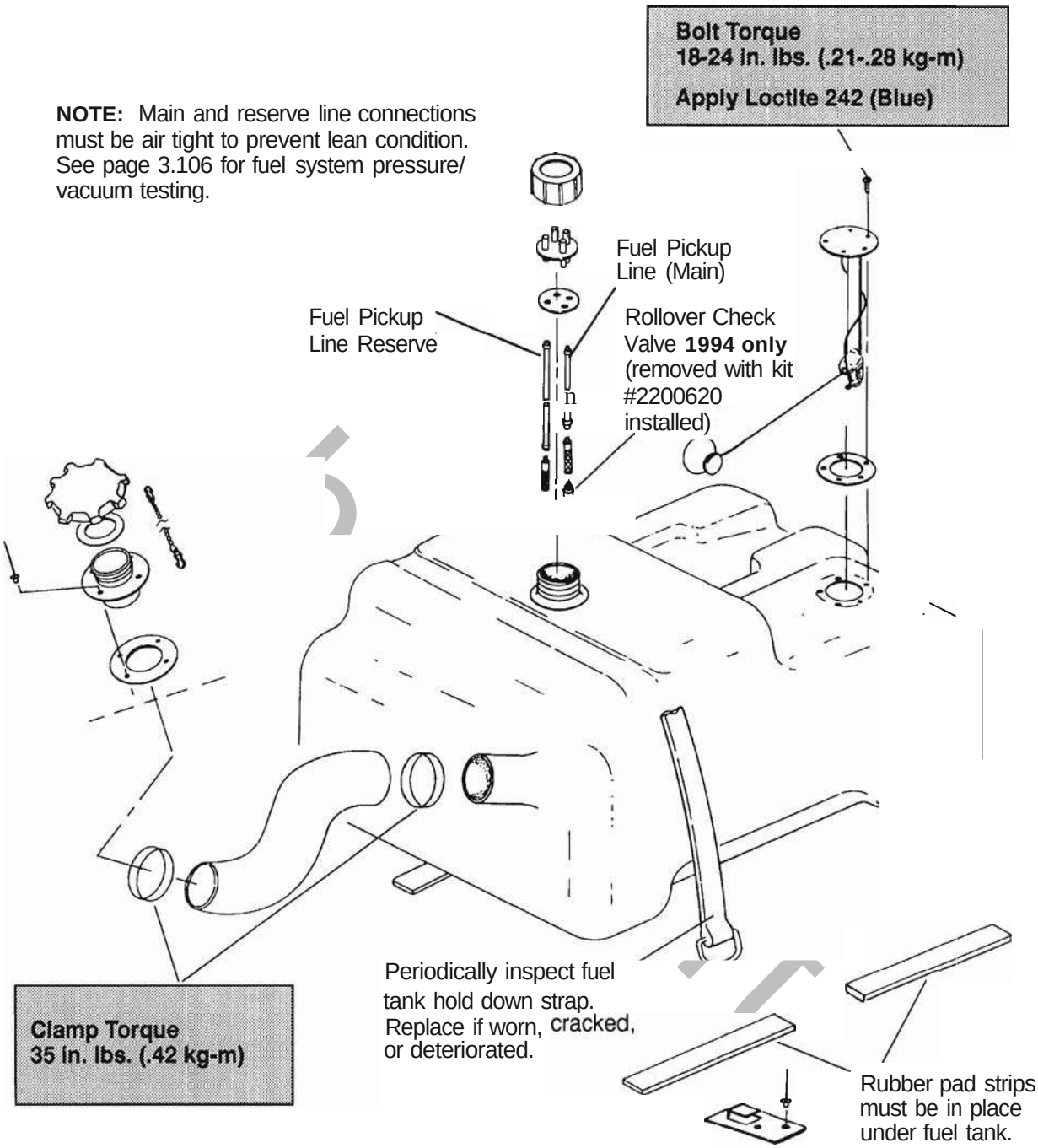


1995 SL750


Bolt Torque
18-24 in. lbs. (.21-.28 kg-m)
Apply Loctite 242 (Blue)
Clamp Torque
35 in. lbs. (.42 kg-m)
Tank Mounting Bolt Torque
Apply Loctite 242 (Blue)
18 ft. lbs. (2.49 kg-m)

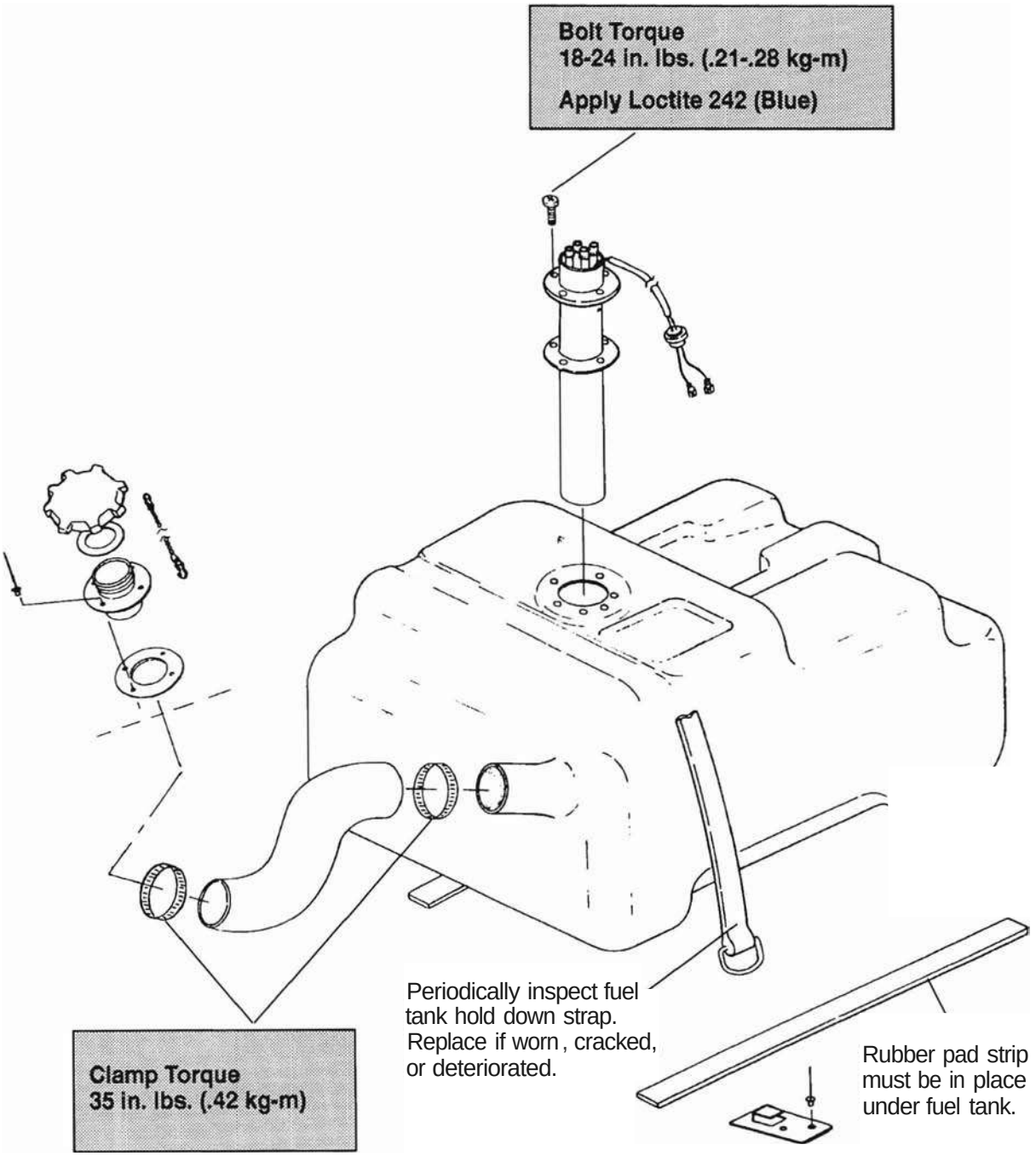
Fuel Tank/Fuel Pickup Exploded View

1994 SLT750 and Early Production 1995 SLT750



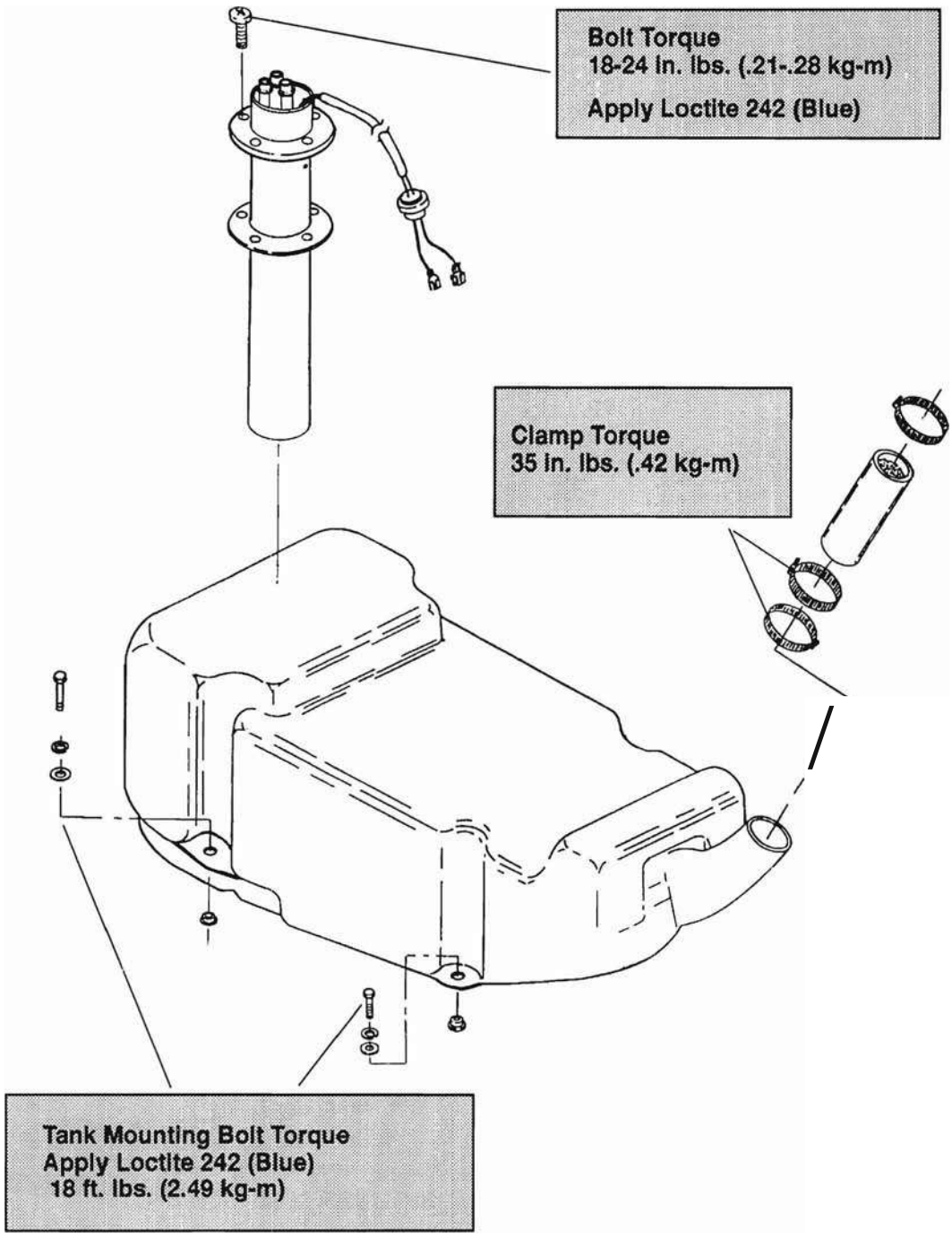
Fuel Tank/Fuel Pickup Exploded View

1995 SLT750 (Late Production)



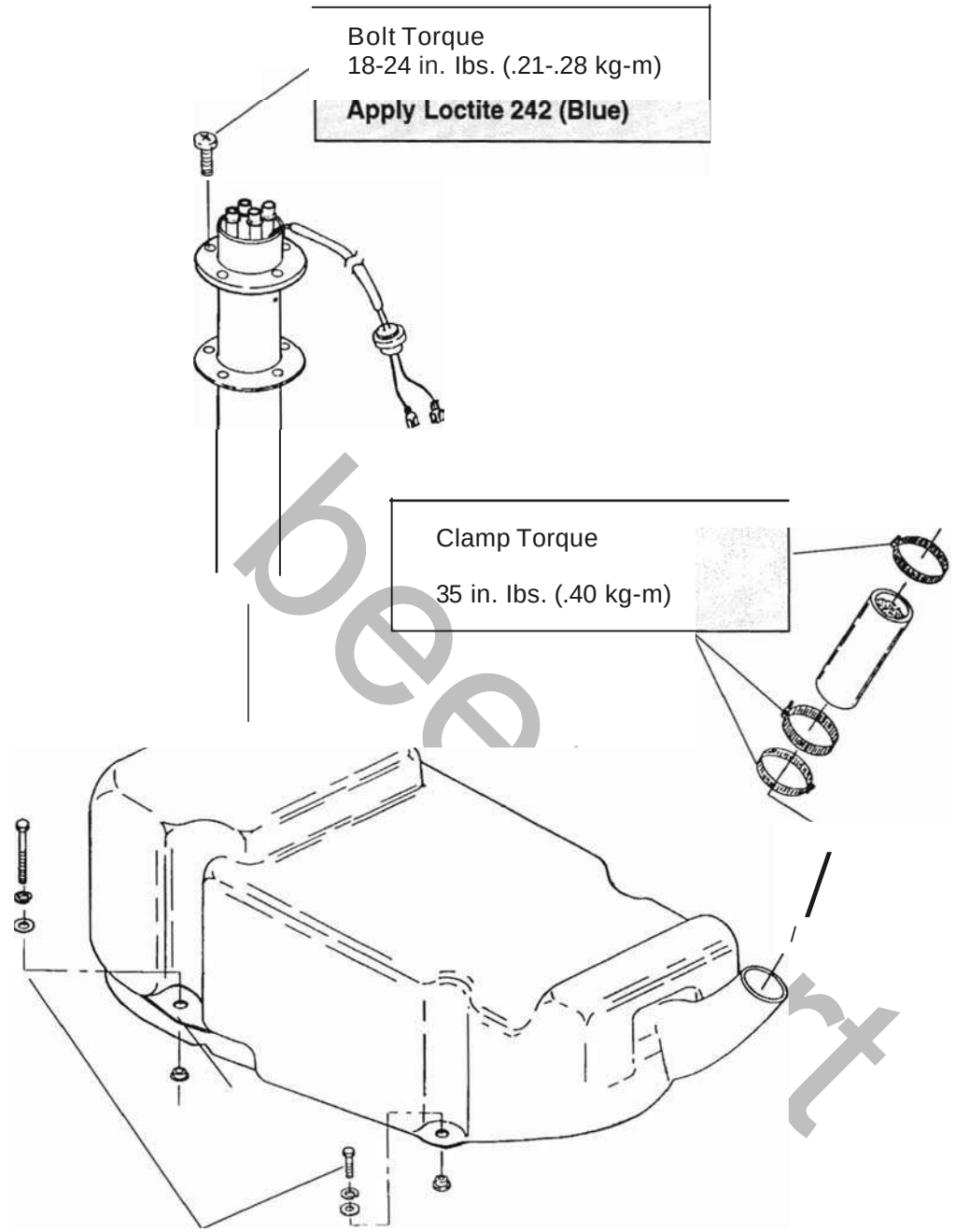
Fuel Tank/Fuel Pickup Exploded View

1995 SLX780



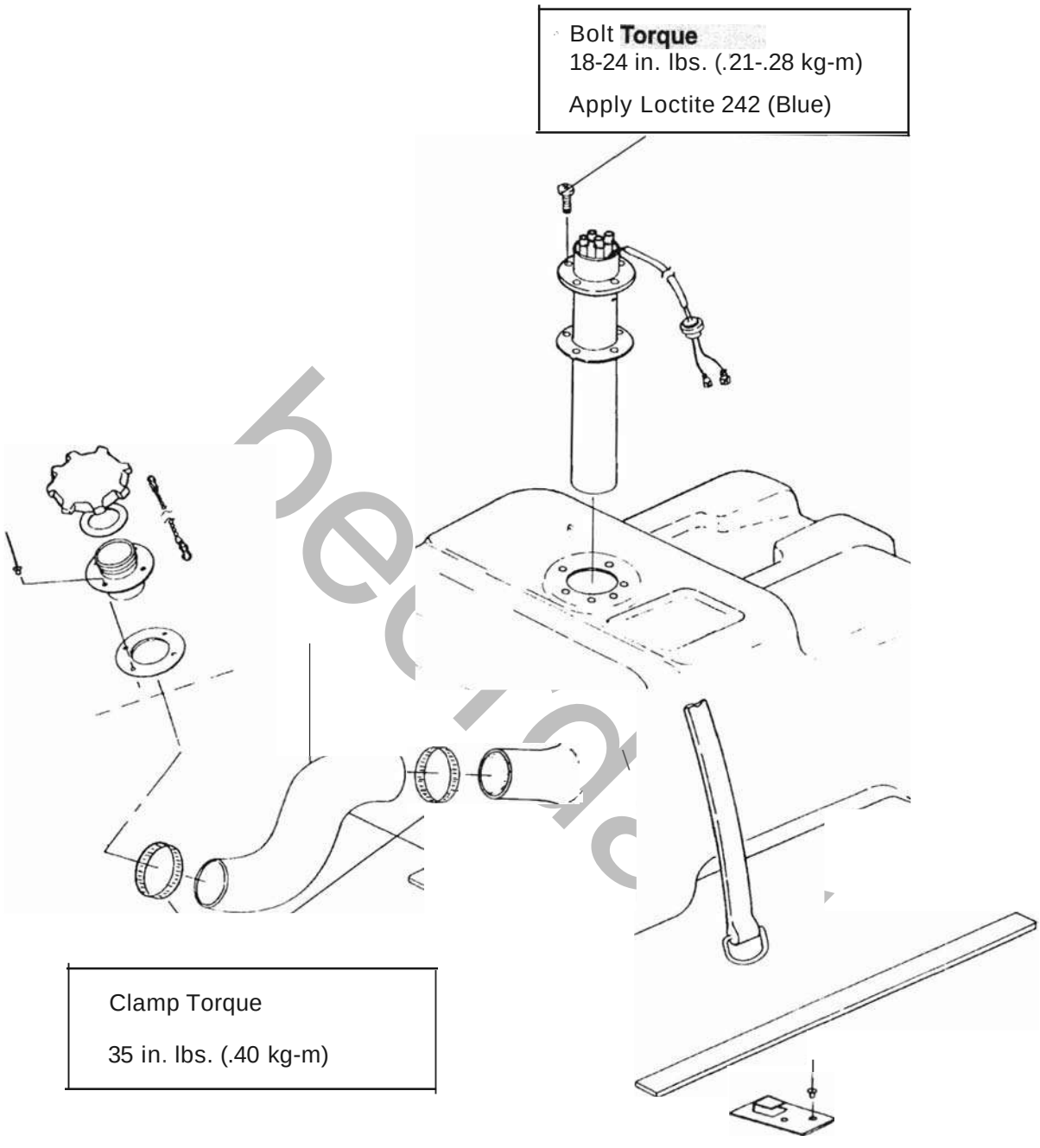
Fuel Tank/Fuel Pickup Exploded View

1996 SL700



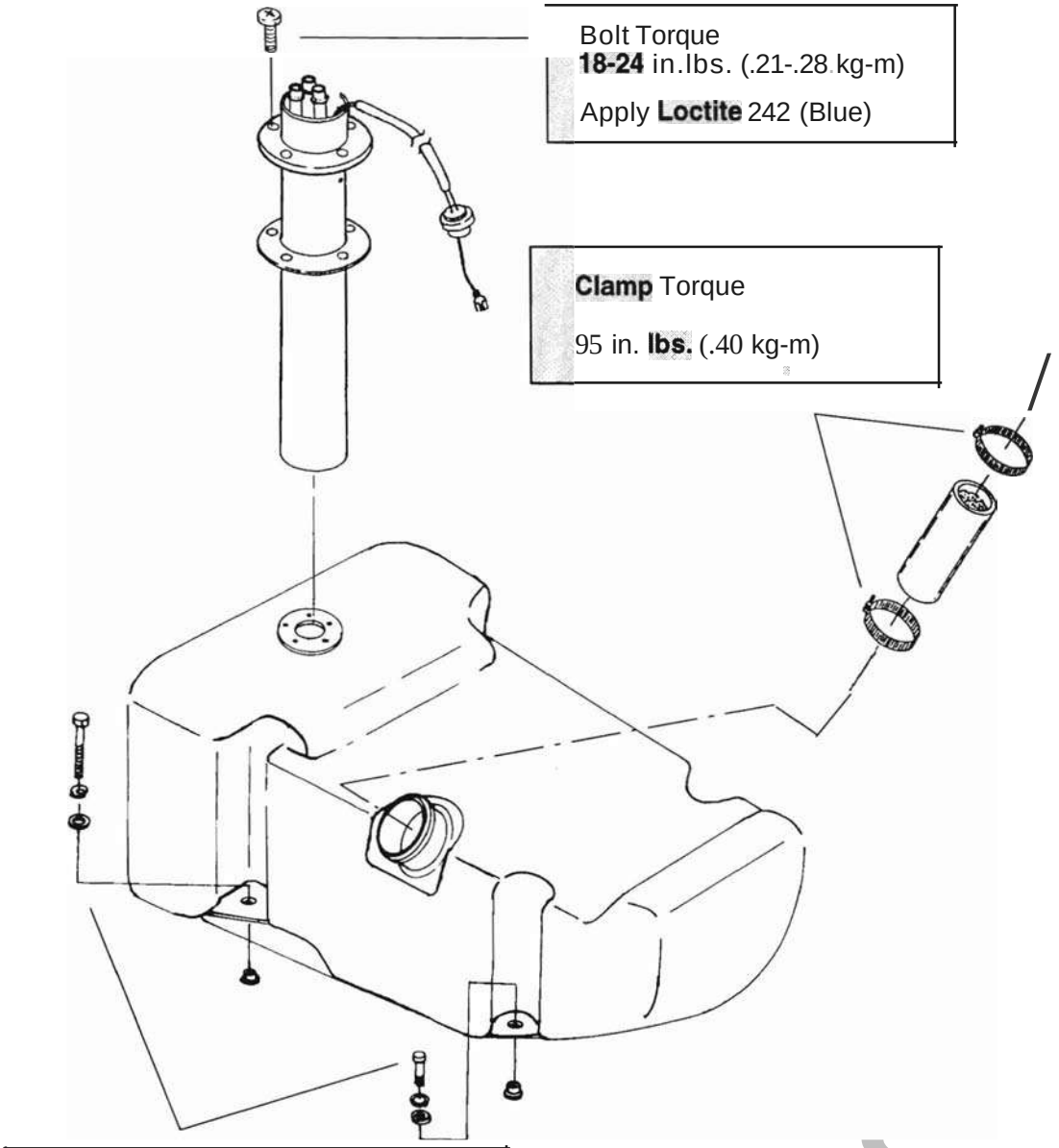
Fuel Tank/Fuel Pickup Exploded View

1996 SLT700



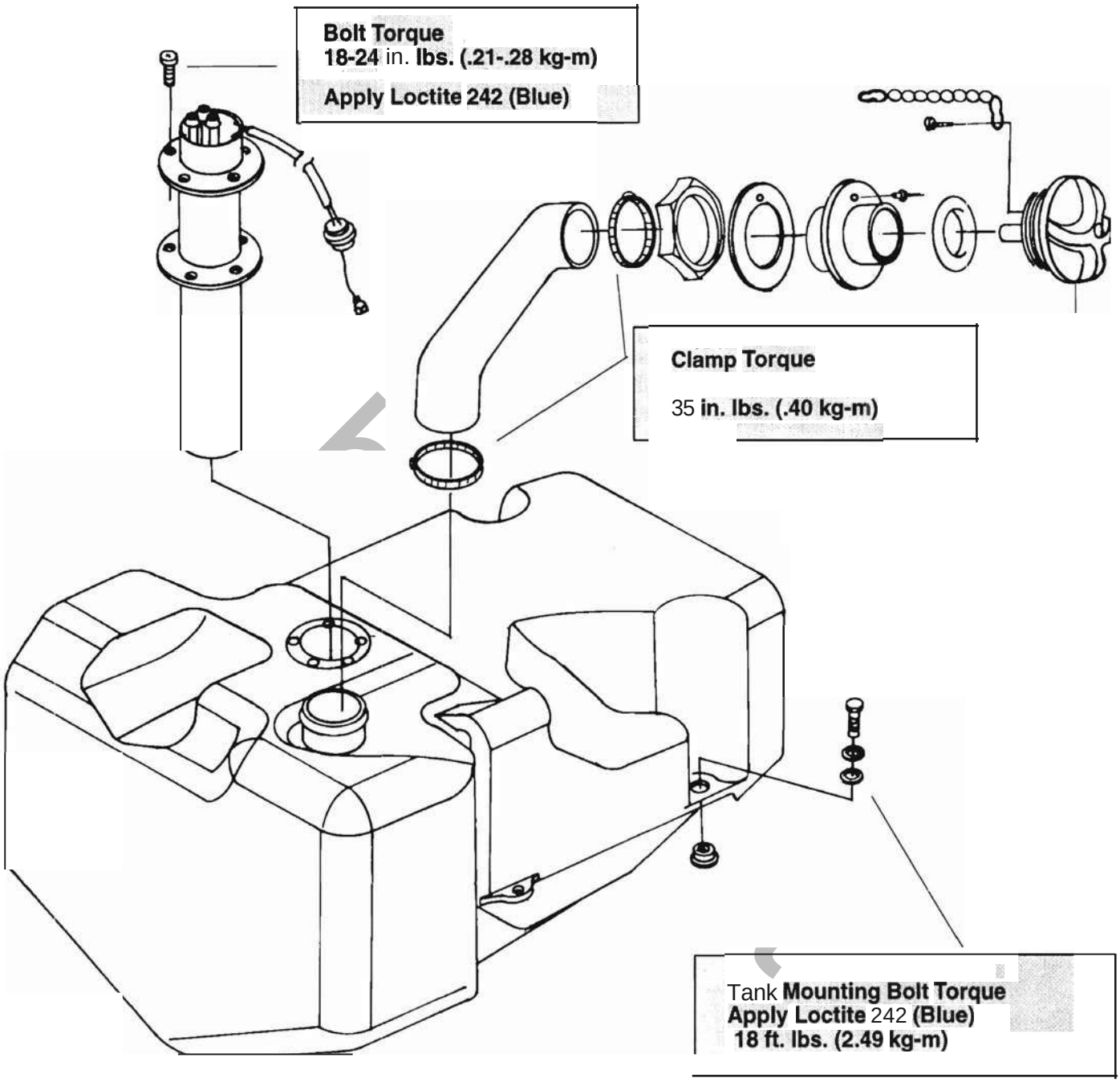
Fuel Tank/Fuel Pickup Exploded View

1997 SL700 / SL 700 Deluxe



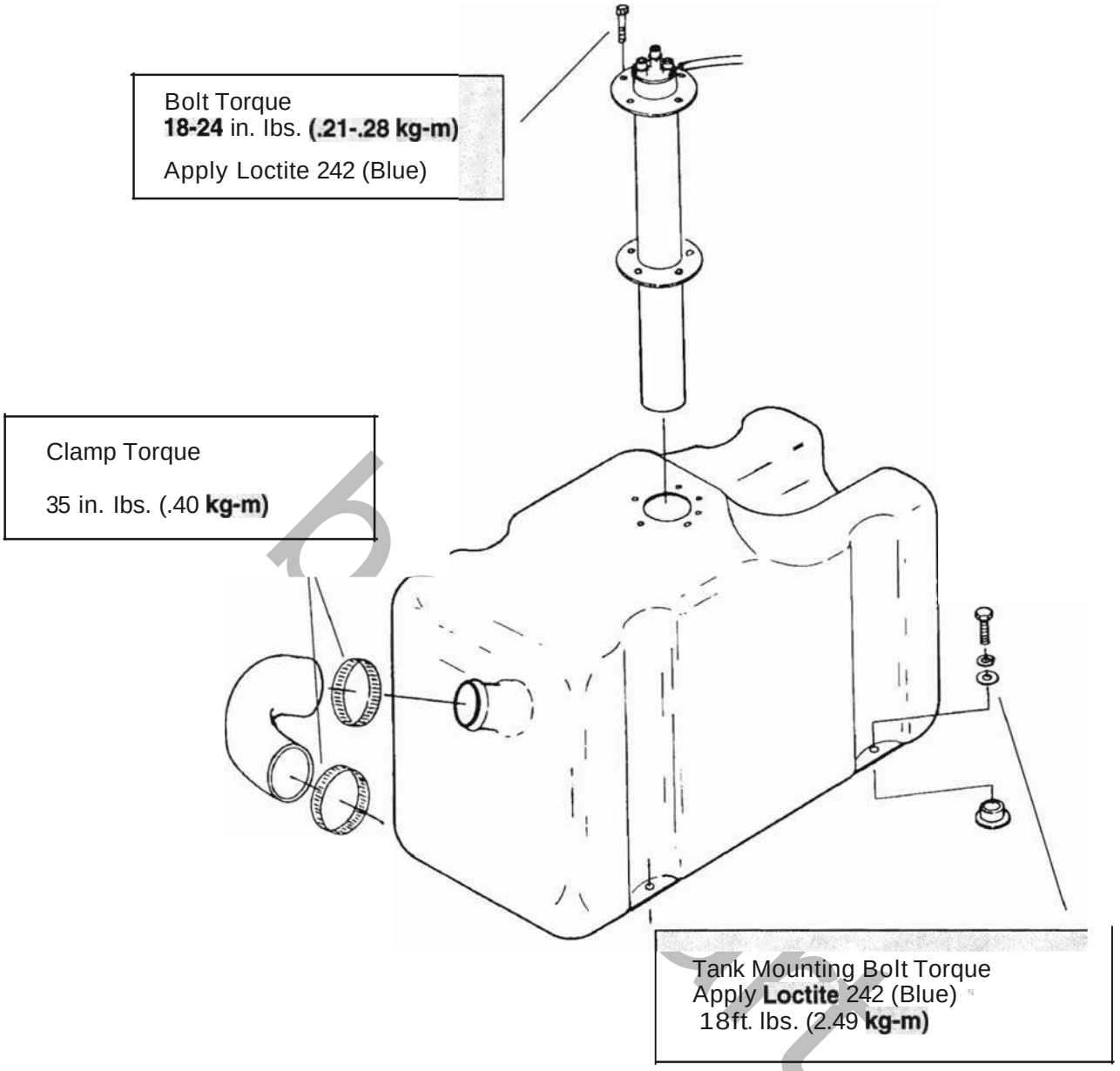
Fuel Tank/Fuel Pickup Exploded View

"1998 SLH



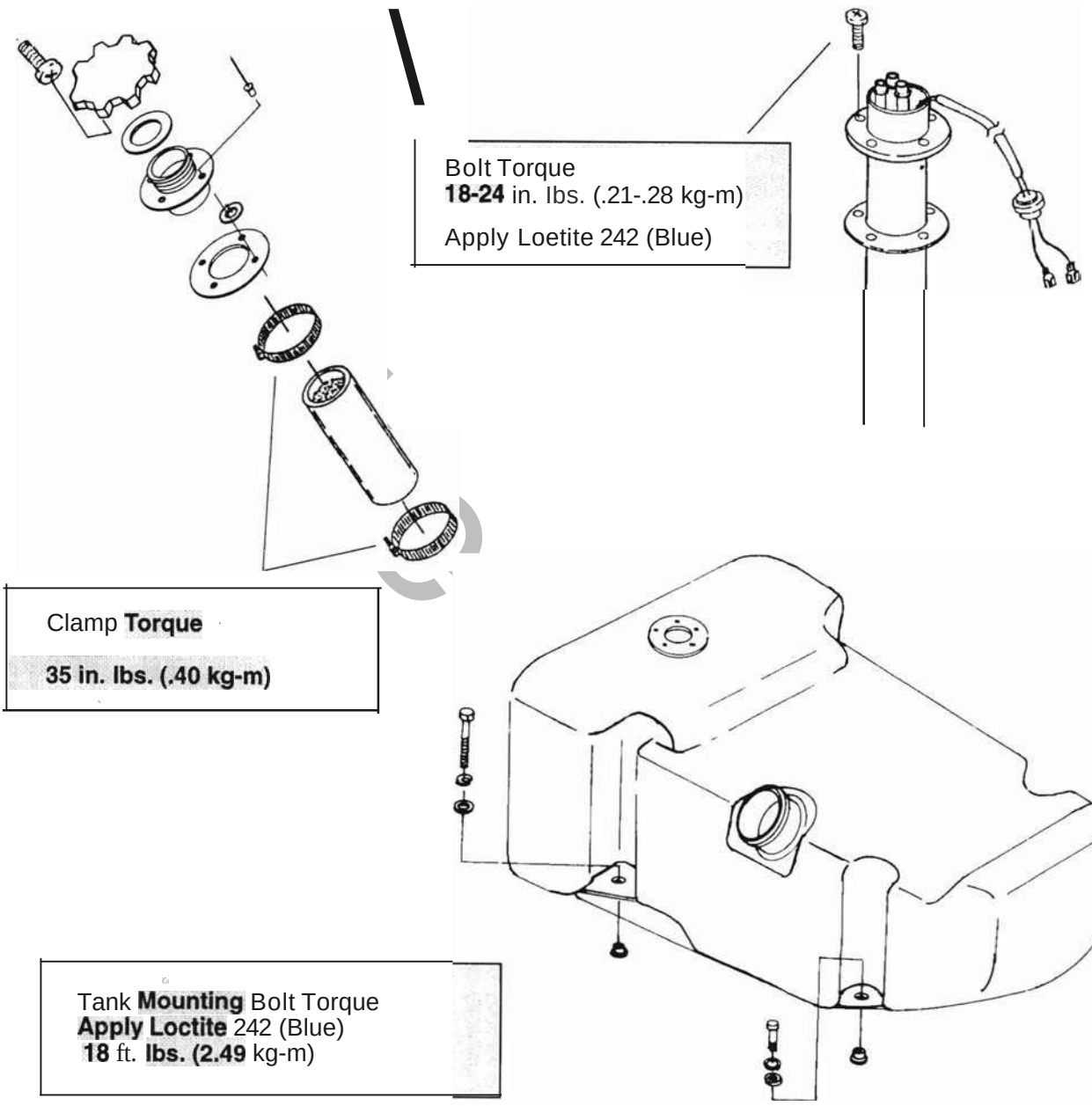
Fuel Tank/Fuel Pickup Exploded View

1997 SLT 700/1998 SLTH

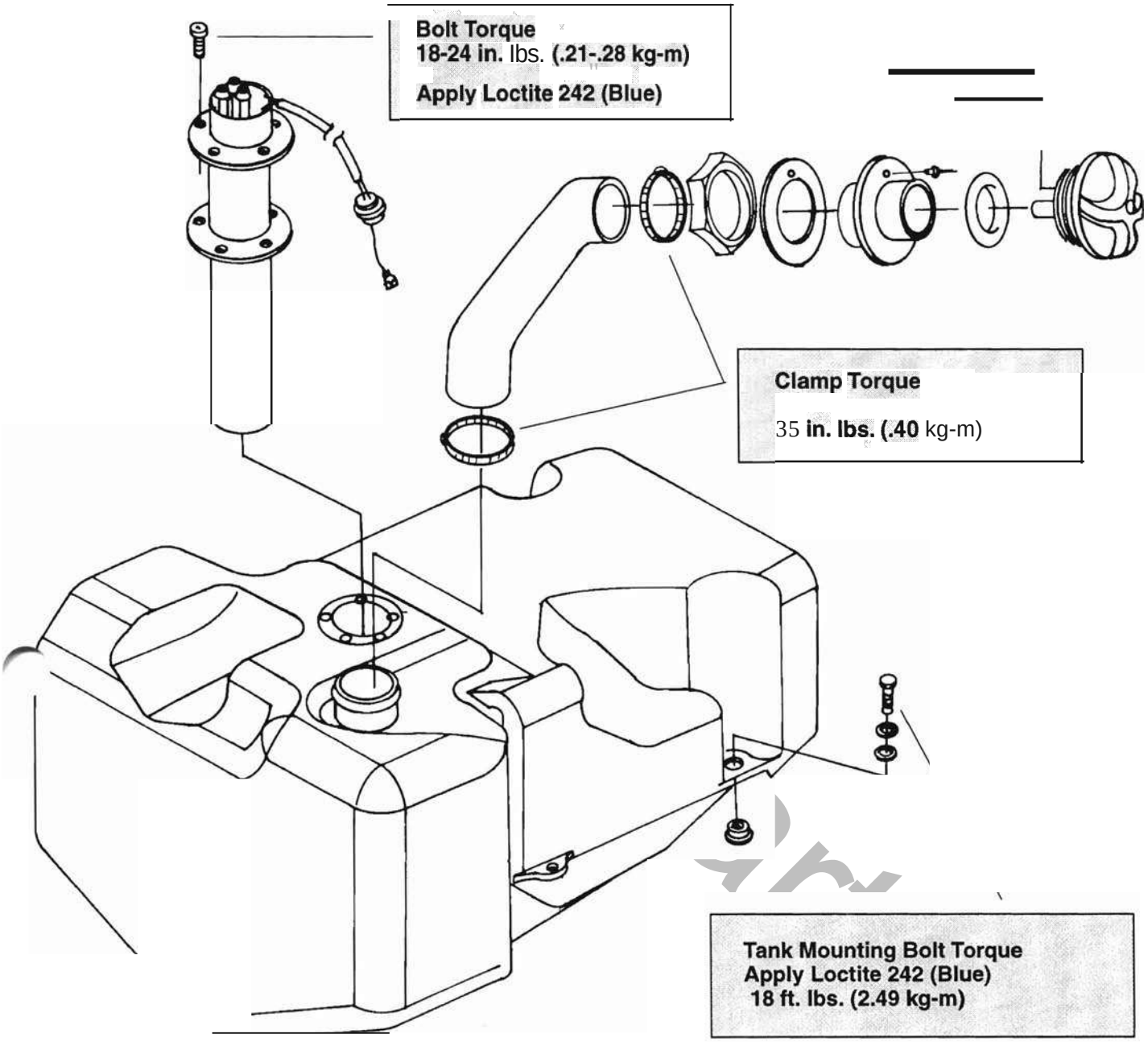


Fuel Tank/Fuel Pickup Exploded View

1997 SL 780 / SL 900 / SL 1050



1998 SLXH


Bolt Torque
18-24 in. lbs. (.21-.28 kg-m)
Apply Loctite 242 (Blue)
Clamp Torque
35 in. lbs. (.40 kg-m)
Tank Mounting Bolt Torque
Apply Loctite 242 (Blue)
18 ft. lbs. (2.49 kg-m)

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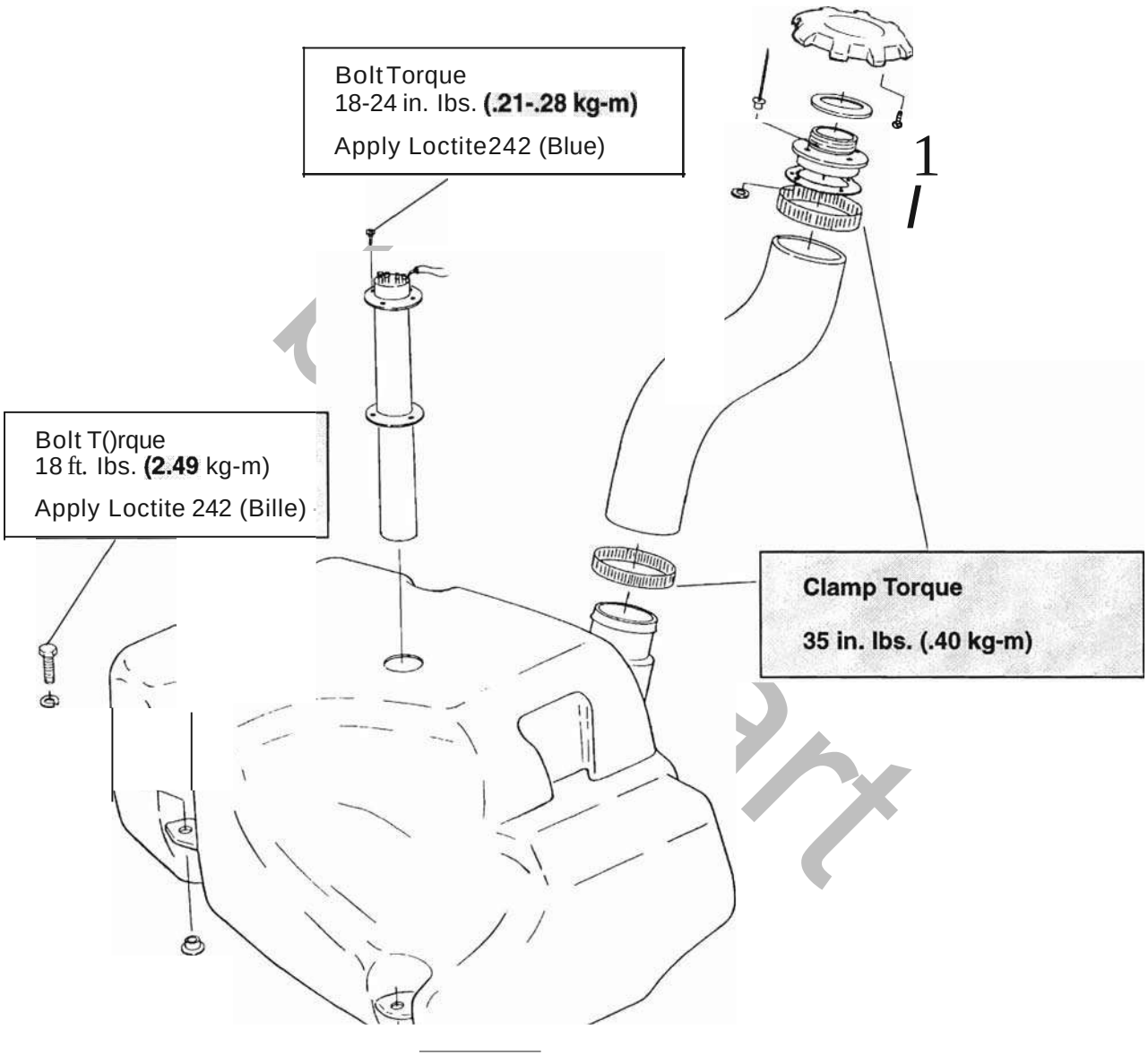
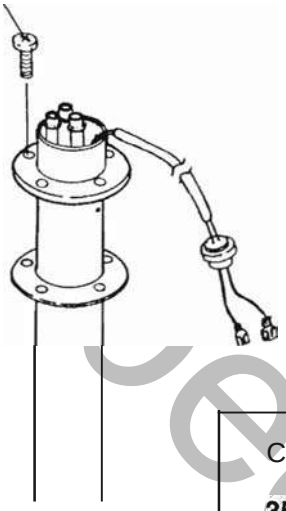

Bolt Torque
18-24 in. lbs. (.21-.28 kg-m)
Apply Loctite242 (Blue)
Bolt T()rque
18 ft. lbs. (2.49 kg-m)
Apply Loctite 242 (Bille)
Clamp Torque
35 in. lbs. (.40 kg-m)

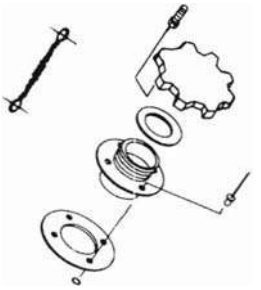
Fuel Tank/Fuel Pickup Exploded View

1996 SL780, SLX780, SL900

Bolt Torque,
18-24in.lbs. (.21-.28 kg-m)

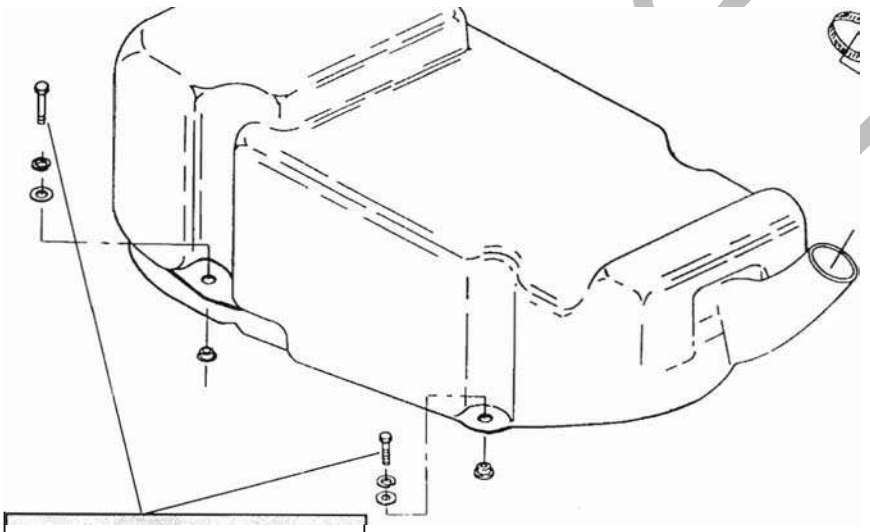
Apply Loctite 242 (Blue)





Clamp Torque

35 in. lbs. (.40 kg-m)

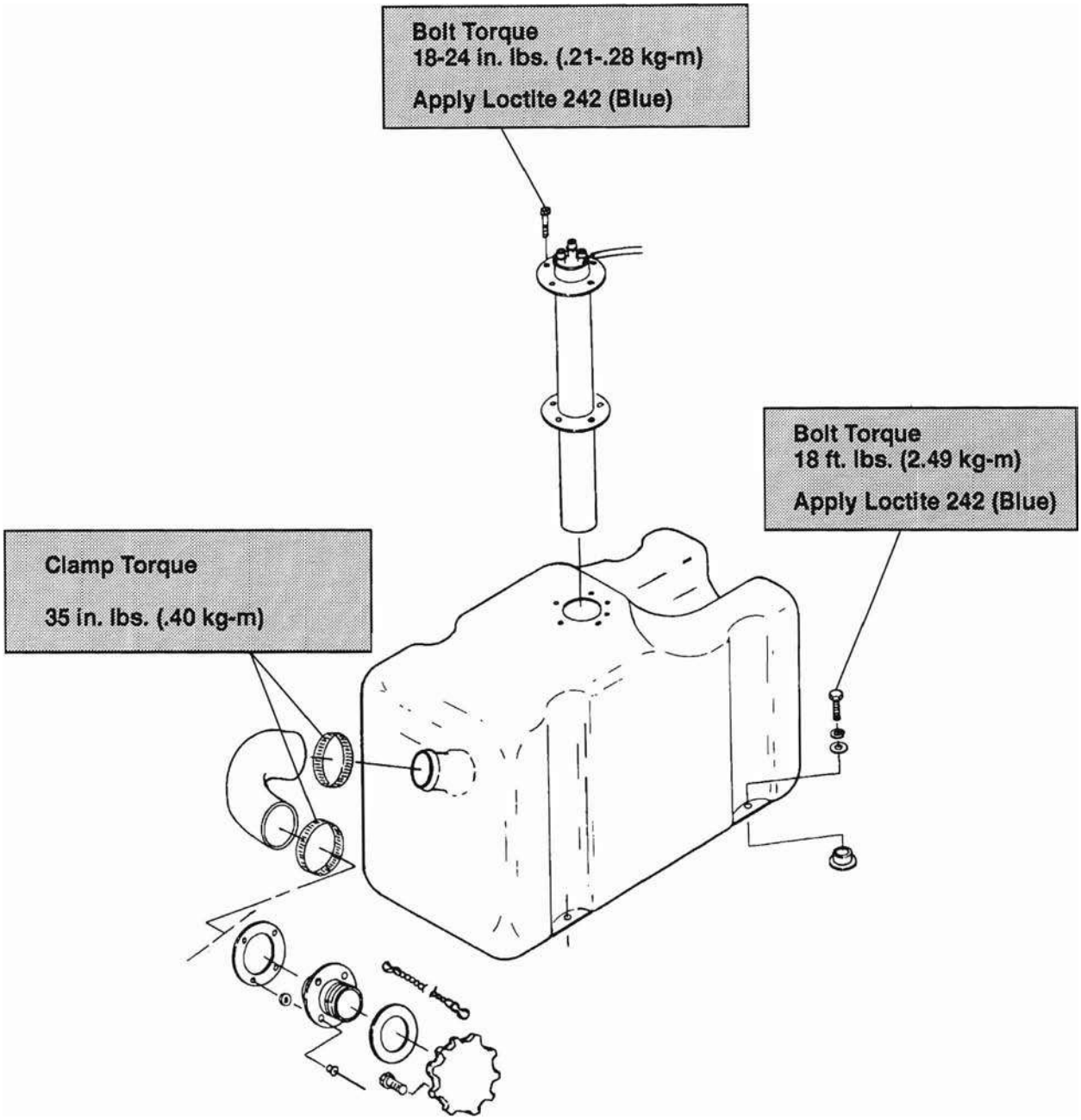


Bolt Torque
18 ft. lbs. (2.49kg-m)

Apply Loctite 242 (Blue)

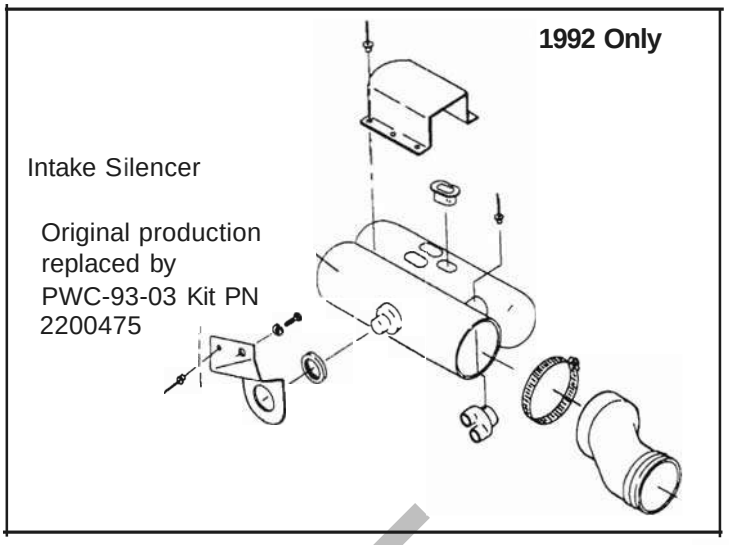
Fuel Tank/Fuel Pickup Exploded View

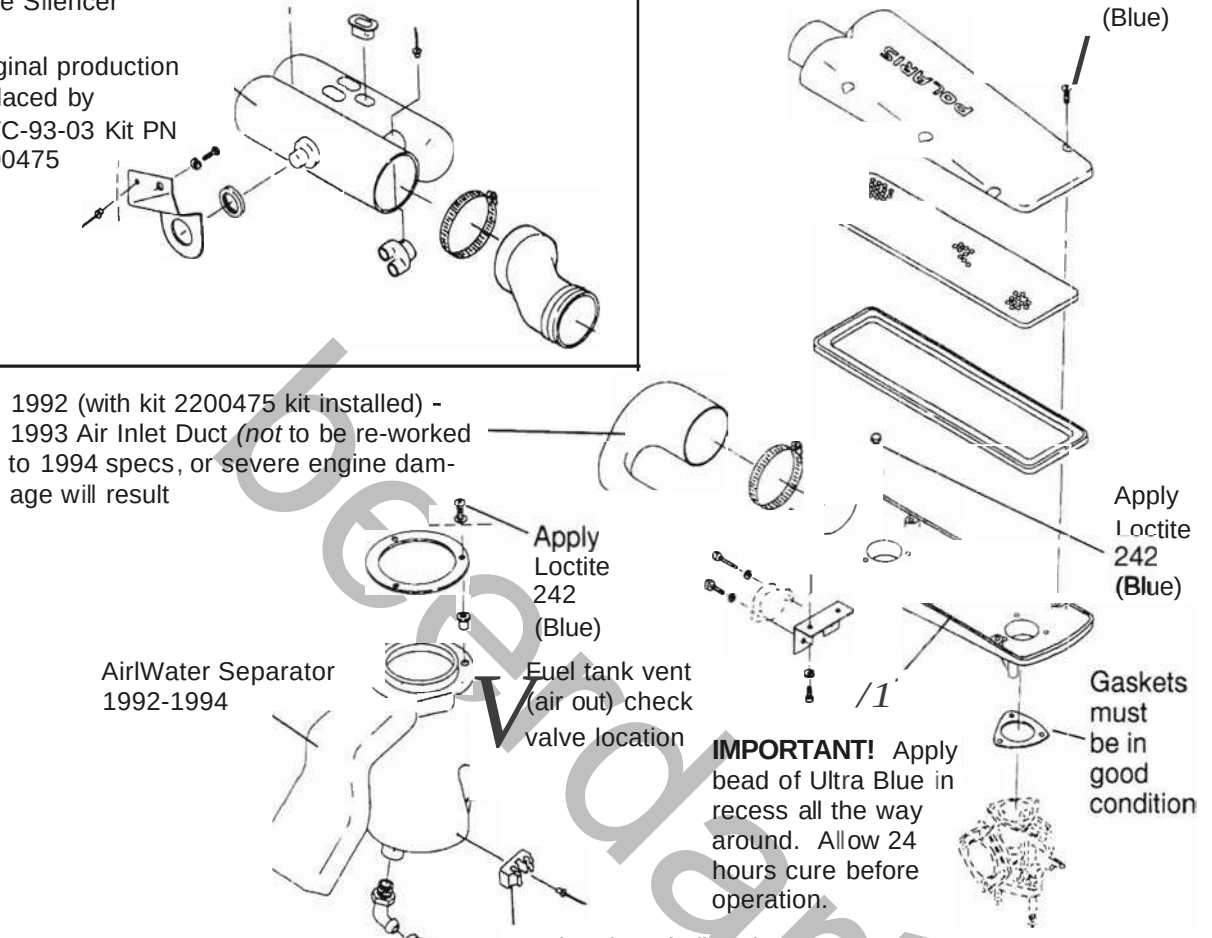
1996 to Current SLTX

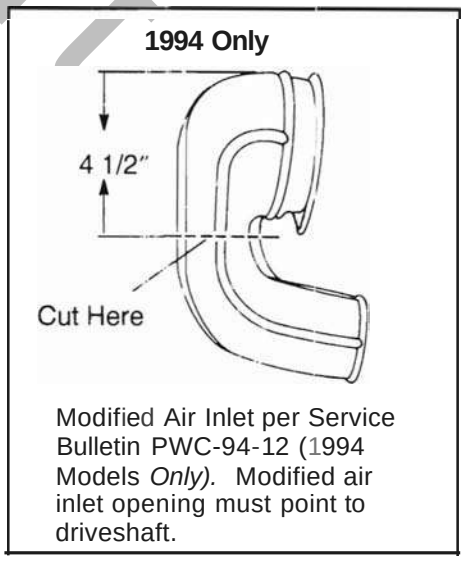


Air Intake Silencer and Water Separator

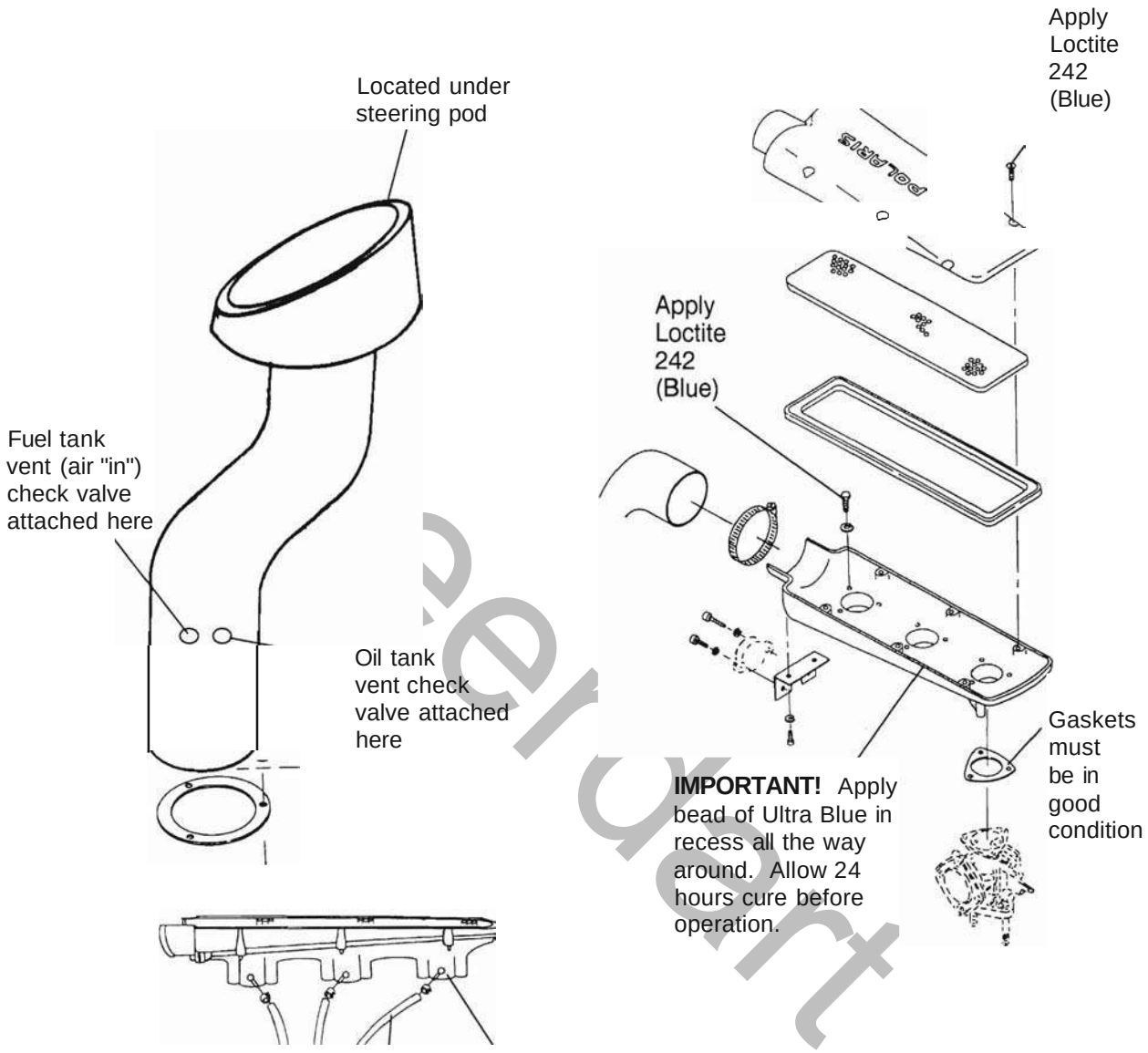
1992-1994 SL650, SL750



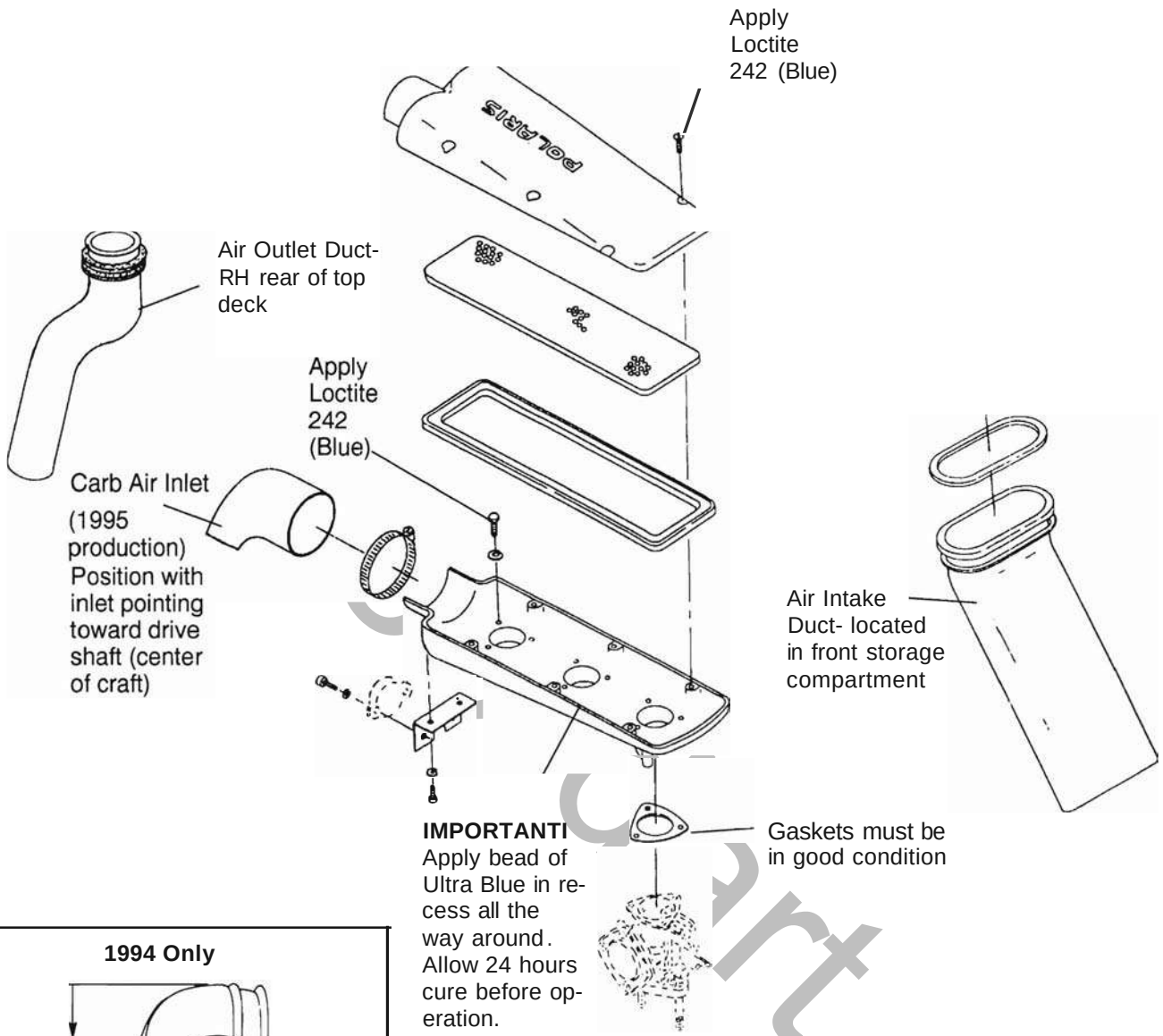




1995 SL650, SL650 STD, SL750

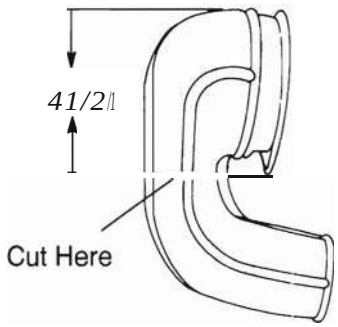


1994·1995 SLT750



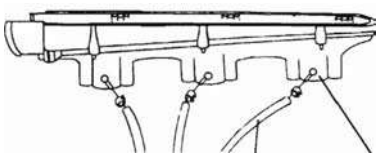
IMPORTANT! Apply bead of Ultra Blue in recess all the way around. Allow 24 hours cure before operation.

1994 Only



Modified Air Inlet per Service Bulletin PWC-94-12 (1994 Models *Only).* Modified air inlet opening must point to driveshaft.

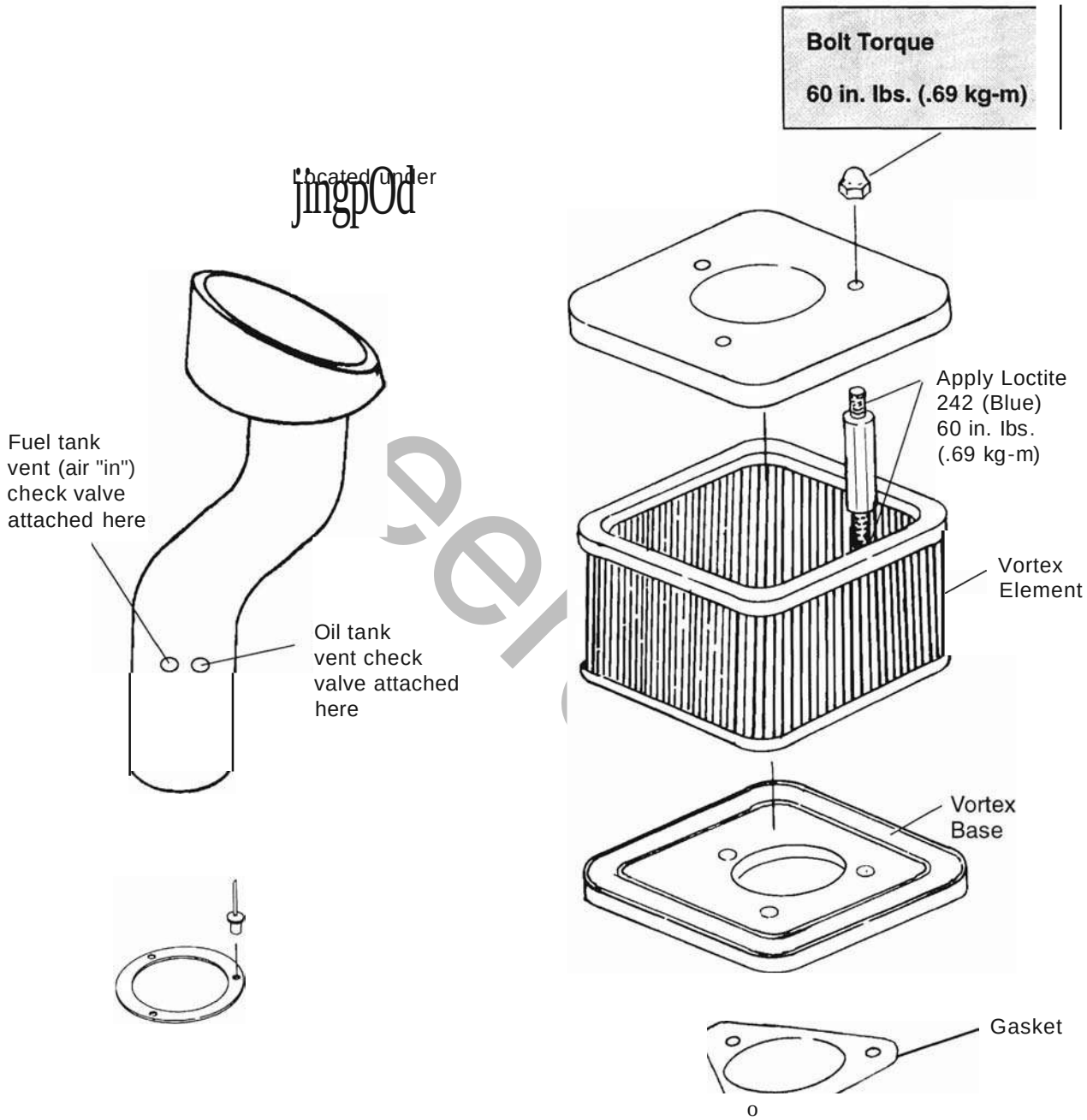
1995 Only



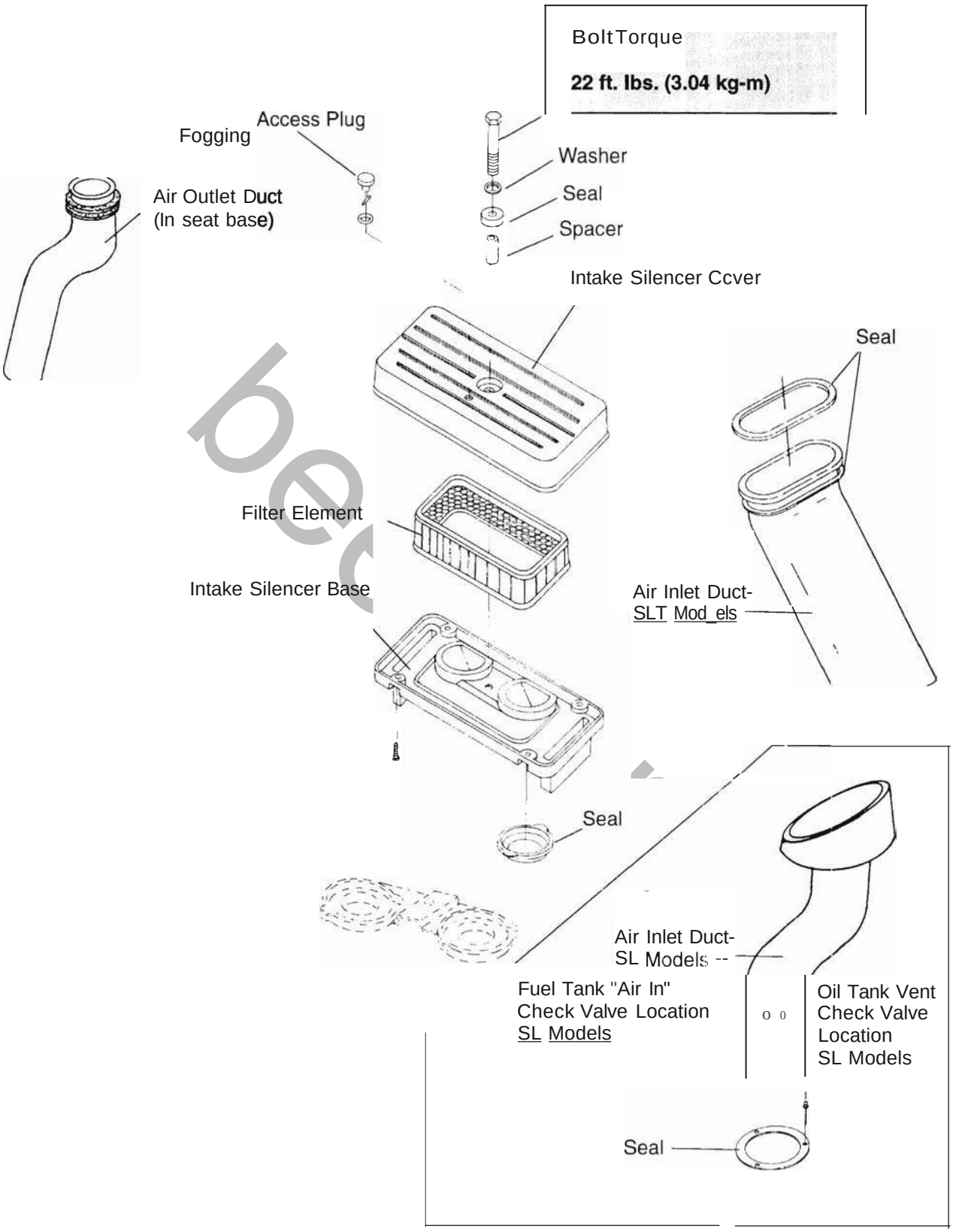
Oil Injection Lines

Check Valves 2-5 PSI release pressure. See oil check valve testing this section.

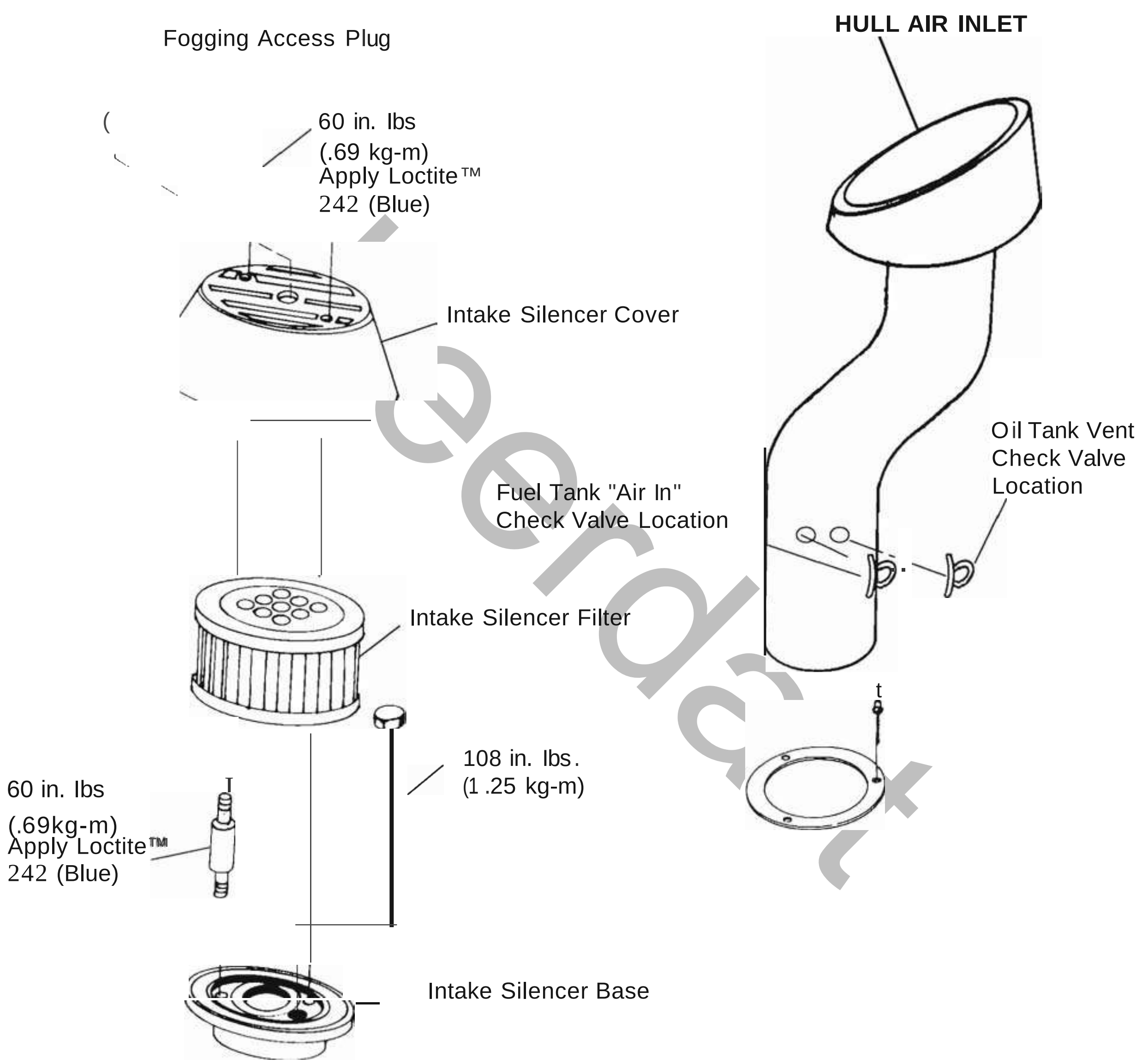
1995 - 1996 SLX780 /1998 SLH



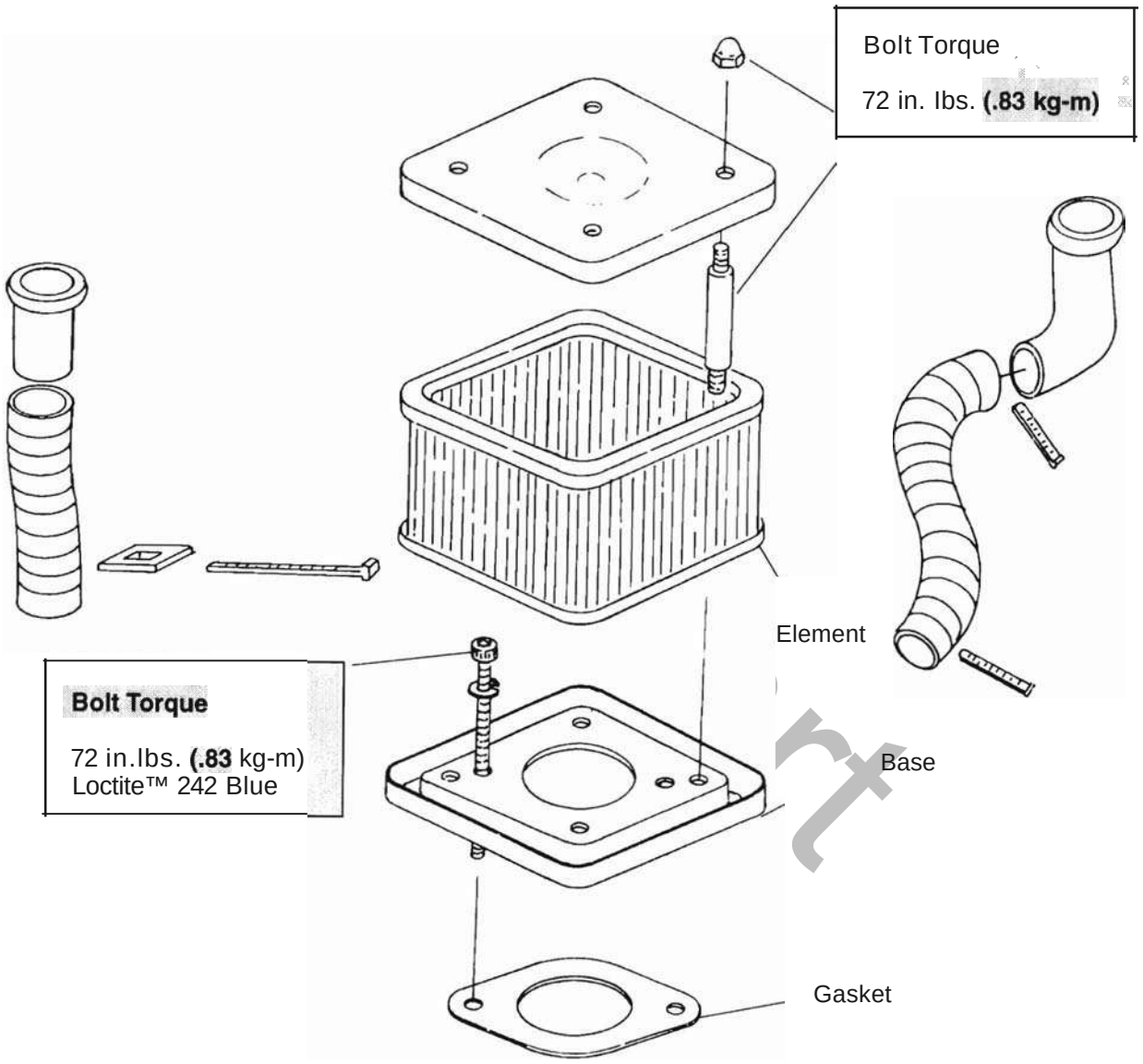
1996 SL700, 1996 - 1997 SLT700, 1997 SL700 Deluxe /1998 SLTH



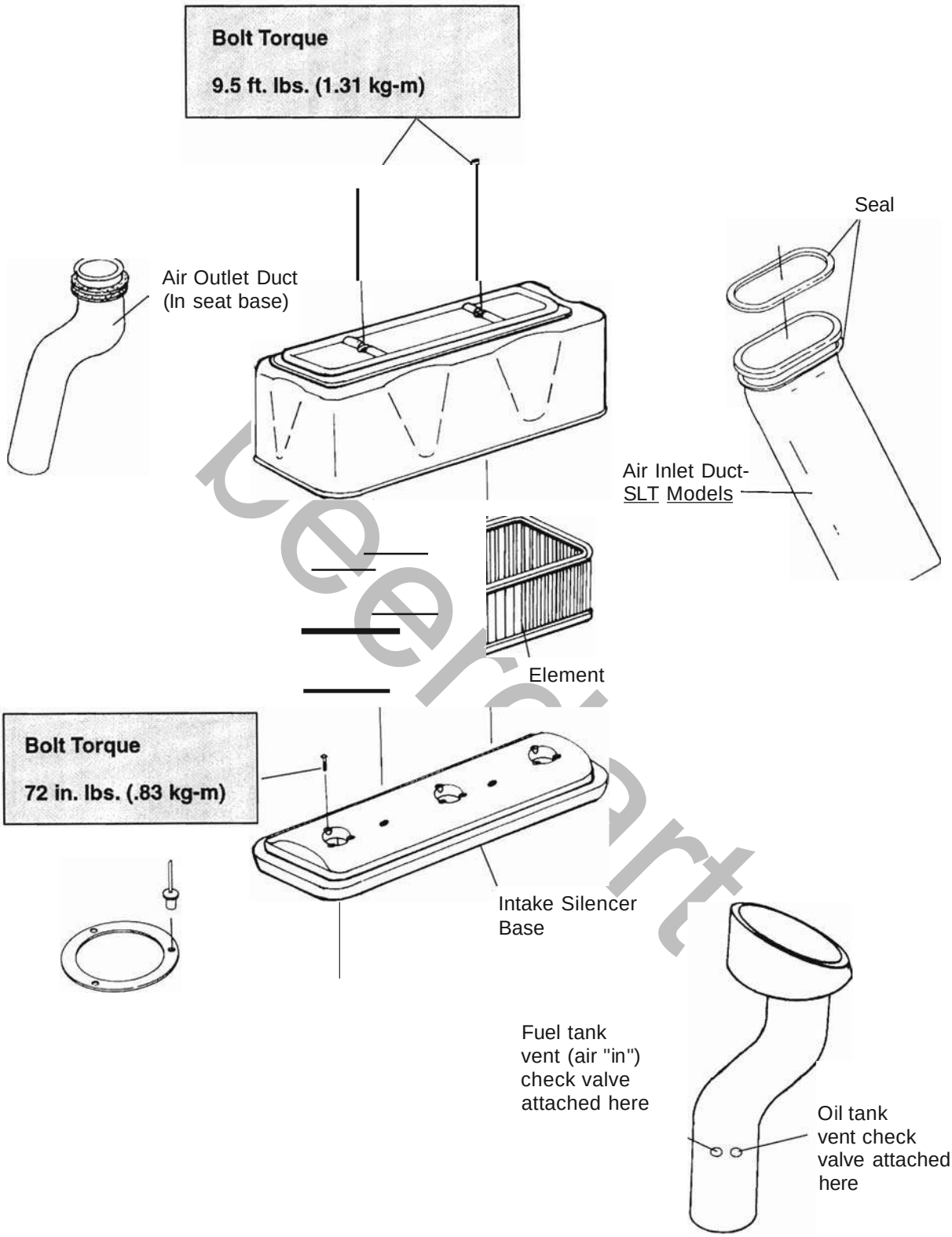
1997 SL700


Fogging Access Plug
60 in. lbs
(.69 kg-m)
Apply Loctite™
242 (Blue)
Intake Silencer Cover
Intake Silencer Filter
108 in. lbs.
(1.25 kg-m)
60 in. lbs
(.69kg-m)
Apply Loctite™
242 (Blue)
Intake Silencer Base
HULL AIR INLET
Oil Tank Vent
Check Valve
Location
Fuel Tank "Air In"
Check Valve Location

1996 -1997 Hurricane

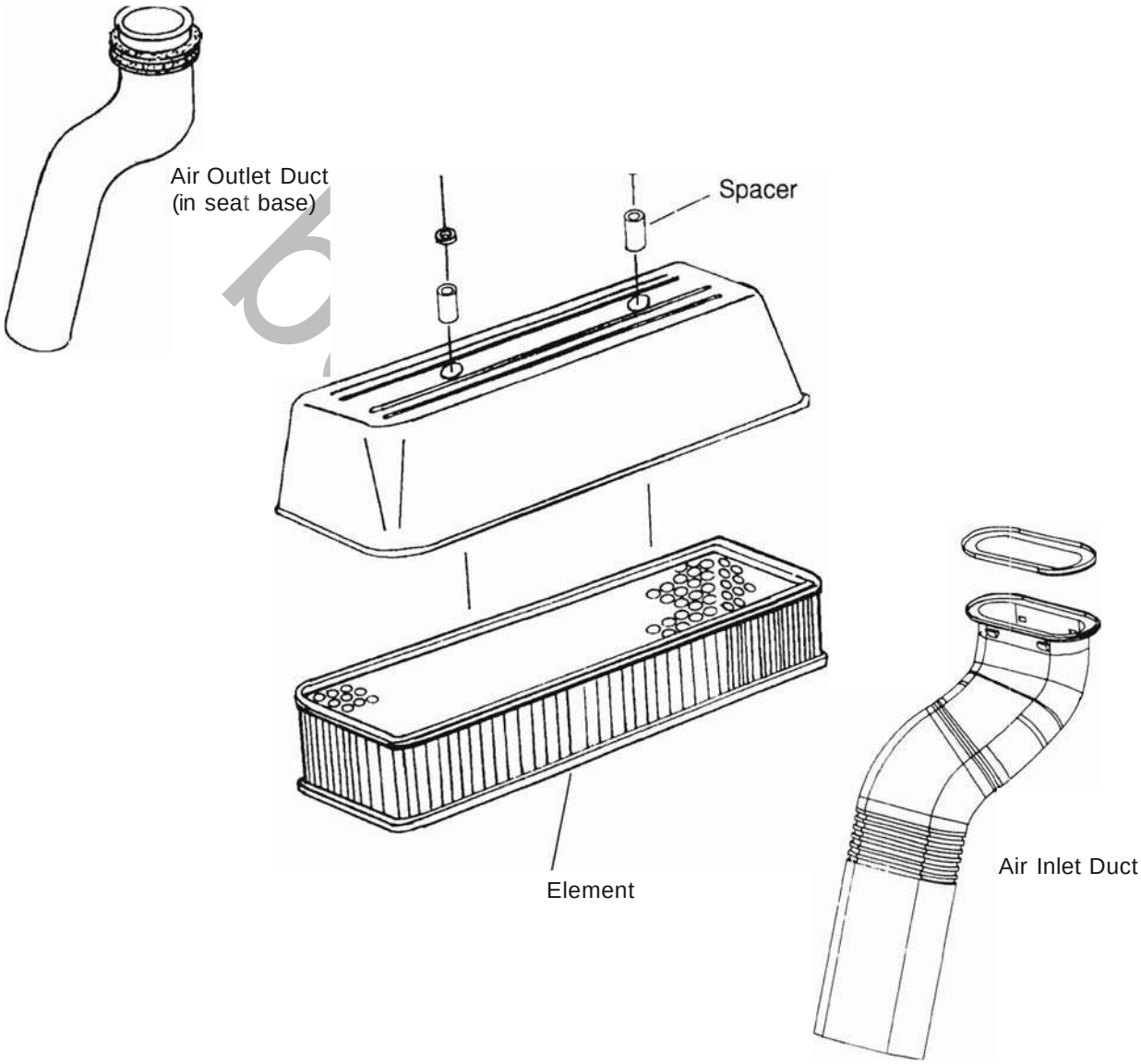


1996 - 1997 SL780 / SLT780

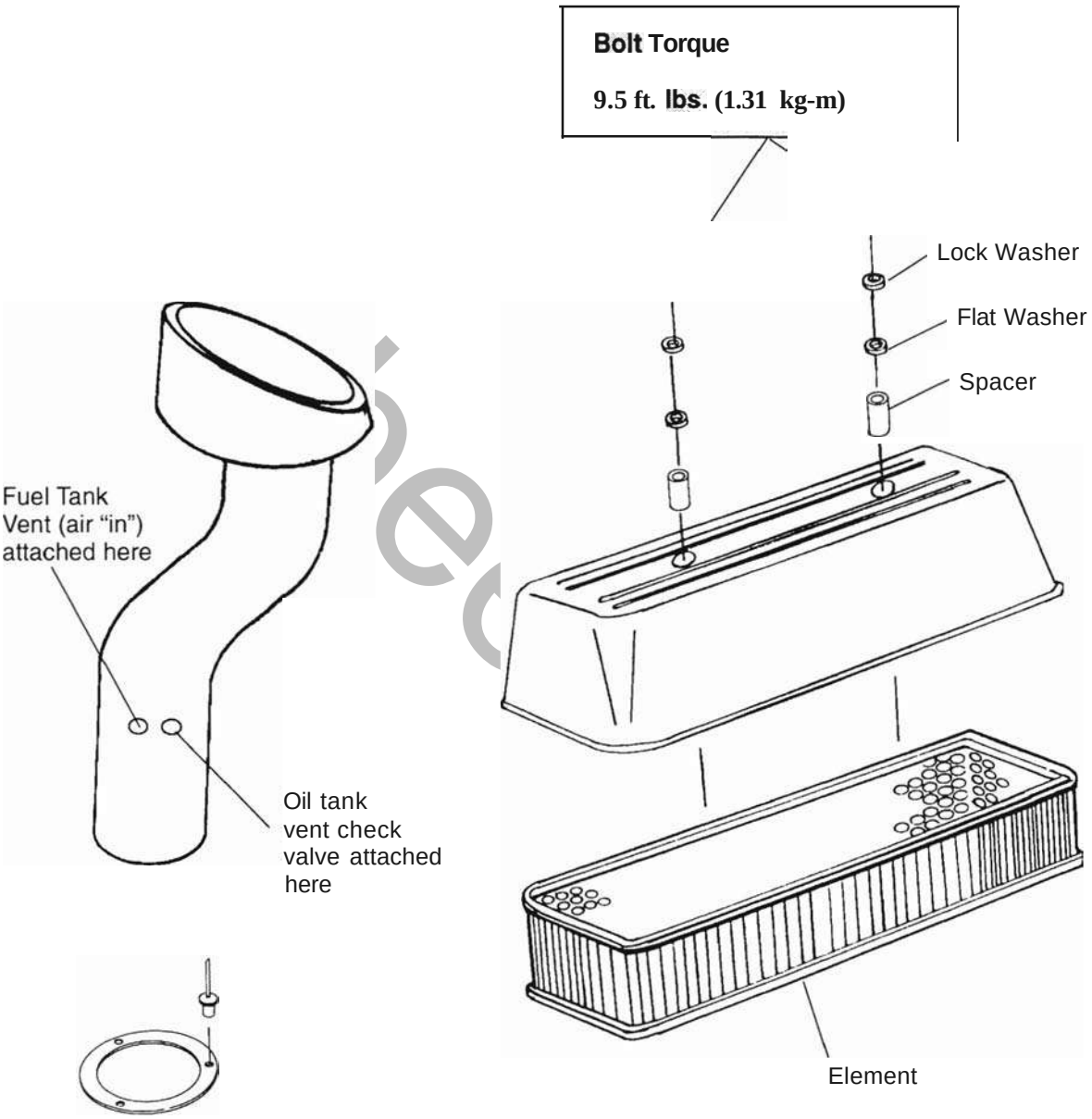


1996 to Current SLTX

Bolt Torque
9.5 ft. lbs. (1.31 kg-m)



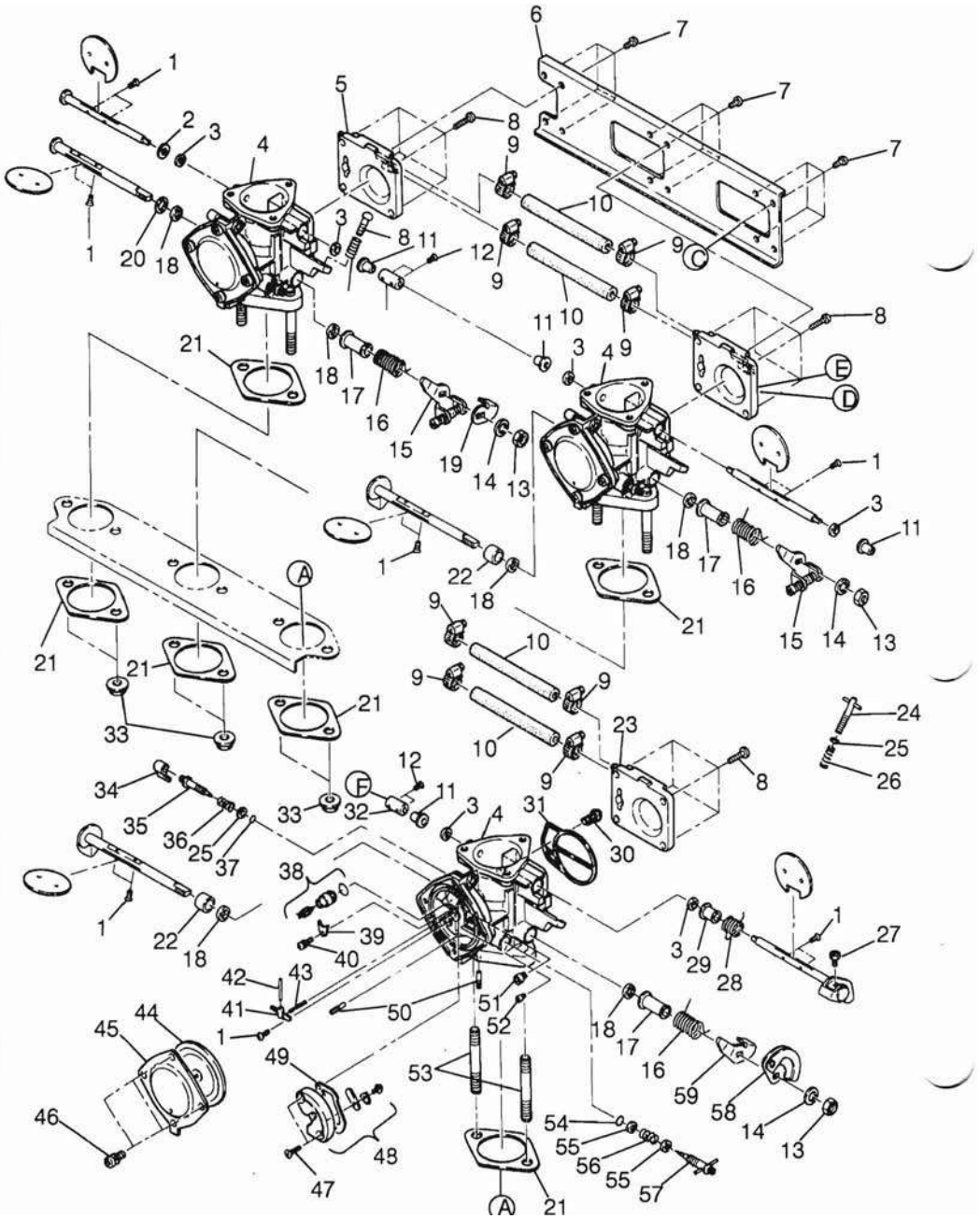
1996 - 1997 SL900, SL1050 /1998 SLXH



Carburetor Assembly Exploded View

1992·1993 Models

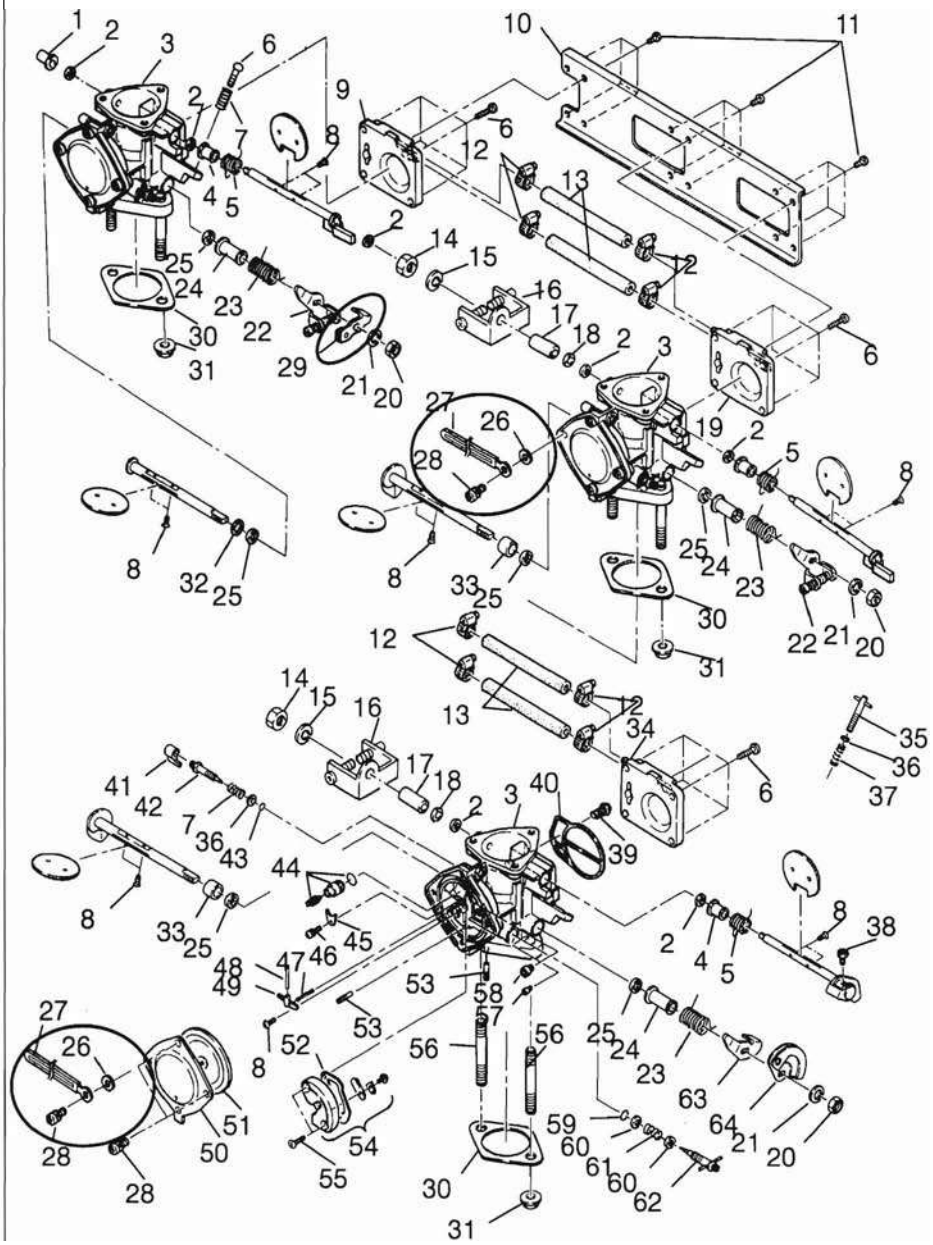
Ref.	Qty.	Description
1	15	Screw
2	1	Packing
3	6	Seal
4	1	Asm., Carburetor
5	2	Cover
6	1	Plate
7	12	Screw
8	13	Screw
9	8	Clamp
10	4	Hose
11	4	Ring
12	4	Screw
13	3	Nut
14	3	Washer, Spring
15	2	Asm., Throttle Lever
16	3	Spring
17	3	Ring
18	6	Seal
19	1	Lever, Throttle
20	1	Packing
21	6	Gasket, Carburetor
22	2	Ring
23	1	Cover
24	1	Asm., Screw
25	4	Washer
26	1	Spring
27	1	Screw
28	1	Spring
29	1	Ring
30	3	Filter
31	3	O-Ring
32	2	Plate
33	6	Nut, Flange
34	3	Cap
35	3	Adjuster
36	4	Spring
37	3	Ring
38	3	Asm., Needle Valve
39	3	Plate
40	3	Screw
41	3	Arm
42	3	Pin
43	3	Spring
44	3	Asm., Diaphragm
45	3	Cover
46	12	Screw
47	6	Screw
48	3	Asm., Body
49	3	Gasket
50	6	Screw
51	3	Jet, Main
52	3	Jet, Pilot
53	6	Bolt
54	3	O-Ring
55	6	Washer
56	3	Spring
57	3	Adjuster
58	1	Asm., Throttle Lever
59	1	Lever, Throttle



Carburetor Assembly Exploded View

1994-1995 Models (Except SLX780)

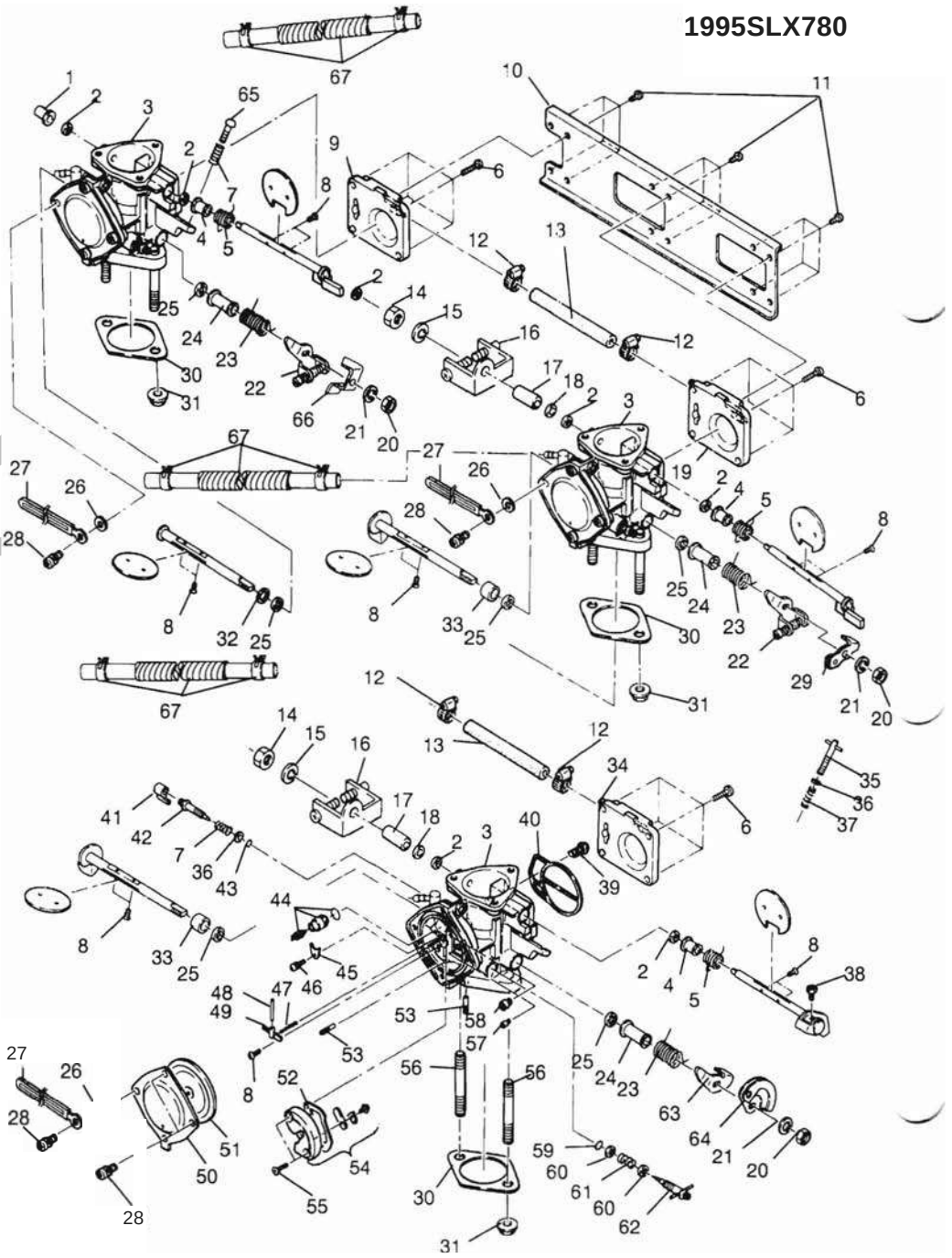
Ref.	Part No	Description
1	3140025	Ring
2	3140022	Seal
3	3140093	Asm., Carburetor
4	3140021	Ring
5	3140020	Spring
6	3140027	Screw
7	3140054	Spring
8	3140065	Screw
9	3140089	Asm., Cover, PTa
10	3140008	Plate
11	3140009	Screw
12	3140028	Clamp
13	3140029	Hose
14	3140079	Nut
15	3140078	Washer, Spring
16	3140077	Asm., Choke Shaft
17	3140076	Ring
18	3140080	Ring
19	3140075	Asm., Cover, CTR
20	3140011	Nut
21	3140012	Washer, Spring
22	3140088	Asm., Throttle Lever
23	3140003	Spring
24	3140002	Ring
25	3140001	Seal
26	3140091	Washer
27	3140090	Plate
28	3140046	Screw
29	3140081	Lever, Throttle
30	3240128	Gasket, Carburetor
31	3240058	Nut, Flange
32	3140030	Packing
33	3140032	Ring
34	3140087	Asm., Cover, MAG
35	3140015	Asm., Screw
36	3140014	Washer
37	3140013	Spring
38	3140019	Screw
39	3140039	Filter
40	3140006	a-Ring
41	3140047	Cap
42	3140048	Adjuster
43	3140049	Ring
44	3140040	Asm., Needle Valve
45	3140037	Plate
46	3140038	Screw
47	3130491	Spring
48	3140036	Pin
49	3140041	Arm
50	3140045	Cover
51	3140044	Asm., Diaphragm
52	3140043	Gasket
53	3140018	Screw
54	3140066	Asm., Body
55	3140034	Screw
56	3140026	Bolt
57	3140063	Pilot Jet
58	3140084	Main Jet
59	3140053	a-Ring
60	3140052	Washer
61	3140051	Spring
62	3140050	Adjuster
63	3140004	Lever, Throttle
64	3140010	Asm., Throttle Lever



Items in circles are on 1995 and later models only

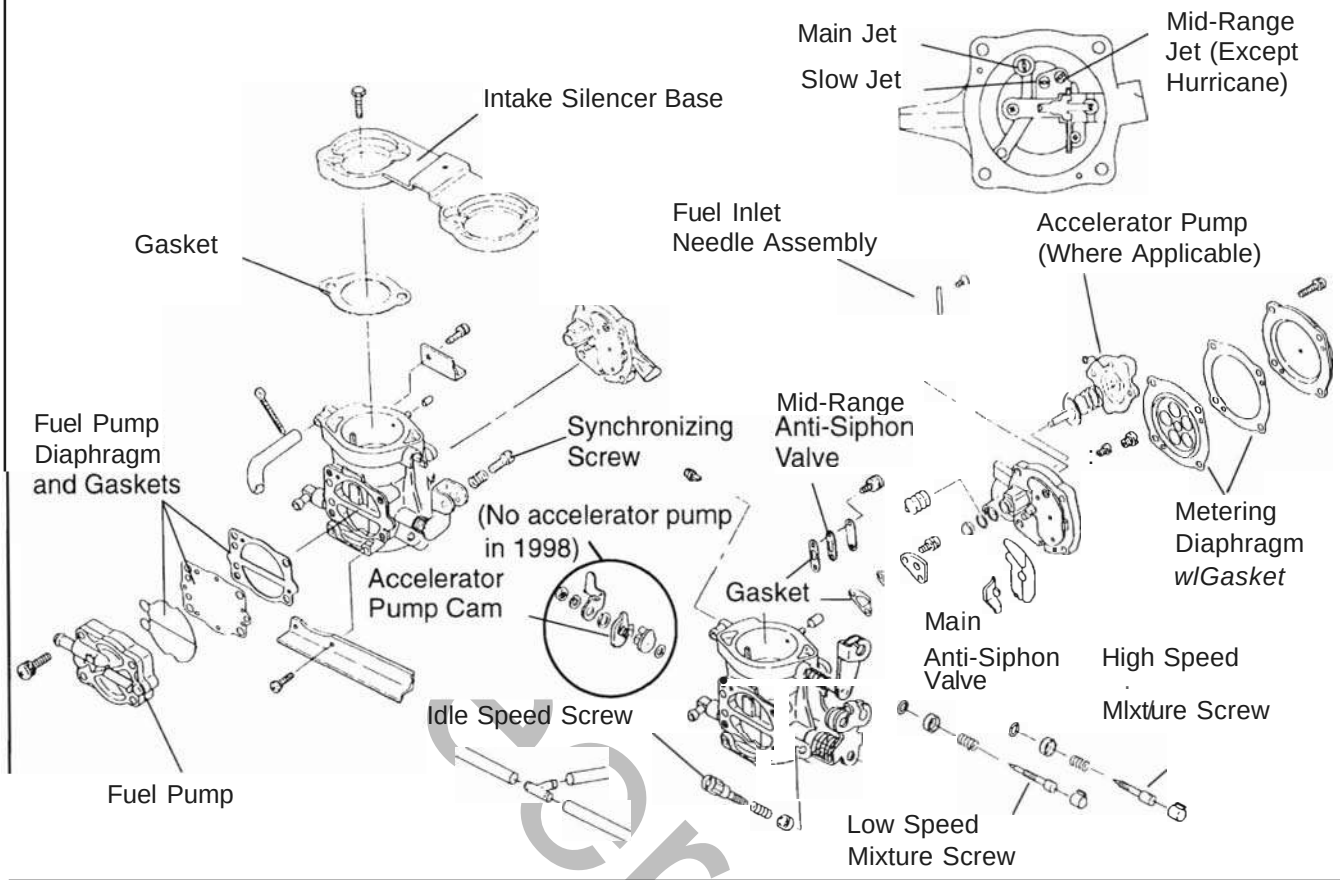
FUEL SYSTEM/CARBURETION
Carburetor Assembly Exploded View

1	3140025	Ring
2	3140022	Seal
3	3140094	Asm., Carburetor (Incl. 1-29 ,32-64)
4	3140021	Ring
5	3140020	Spring
6	3140098	Screw
7	3140054	Spring
8	3140065	Screw
9	3140099	Asm., Cover, PTJ
10	3140008	Plate
11	3140009	Screw
12	3140028	Clamp
13	3140029	Hose
14	3140079	Nut
15	3140078	Washer, Spring
16	3140101	Asm., Choke Shaft
17	3140076	Ring
18	3140080	Ring
19	3140102	Asm., Cover, CTR
20	3140011	Nut
21	3140012	Washer, Spring
22	3140088	Asm., Throttle Lever
23	3140003	Spring
24	3140002	Ring
25	3140001	Seal
26	3140091	Washer
27	3140090	Plate
28	3140100	Screw
29	3140081	Lever, Throttle
30	3240128	Gasket, Carburetor
31	3240058	Nut, Flange
32	3140030	Packing
33	3140032	Ring
34	3140095	Asm., Cover, MAG
35	3140096	Asm., Screw
36	3140014	Washer
37	3140013	Spring
38	3140019	Screw
39	3140039	Filter
40	3140006	O-Ring
41	3140047	Cap
42	3140048	Adjuster
43	3140049	Ring
44	3140040	Asm., Needle Valve
45	3140037	Plate
46	3140038	Screw
47	3130491	Spring
48	3140036	Pin
49	3140041	Arm
50	3140045	Cover
51	3140044	Asm., Diaphragm
52	3140043	Gasket
53	3140018	Screw
54	3140035	Asm., Body
55	3140034	Screw
56	3140026	Bolt
57	3140072	Pilot Jet
58	3140097	Main Jet
59	3140053	O-Ring
60	3140052	Washer
61	3140051	Spring
62	3140050	Adjuster
63	3140004	Lever, Throttle
64	3140010	Asm., Throttle Lever
65	3140027	Screw
66	3140070	Lever, Throttle
67	4140109	Asm., Vinyl Pipe (Incl. Spiral Tube, 2 Clamps)

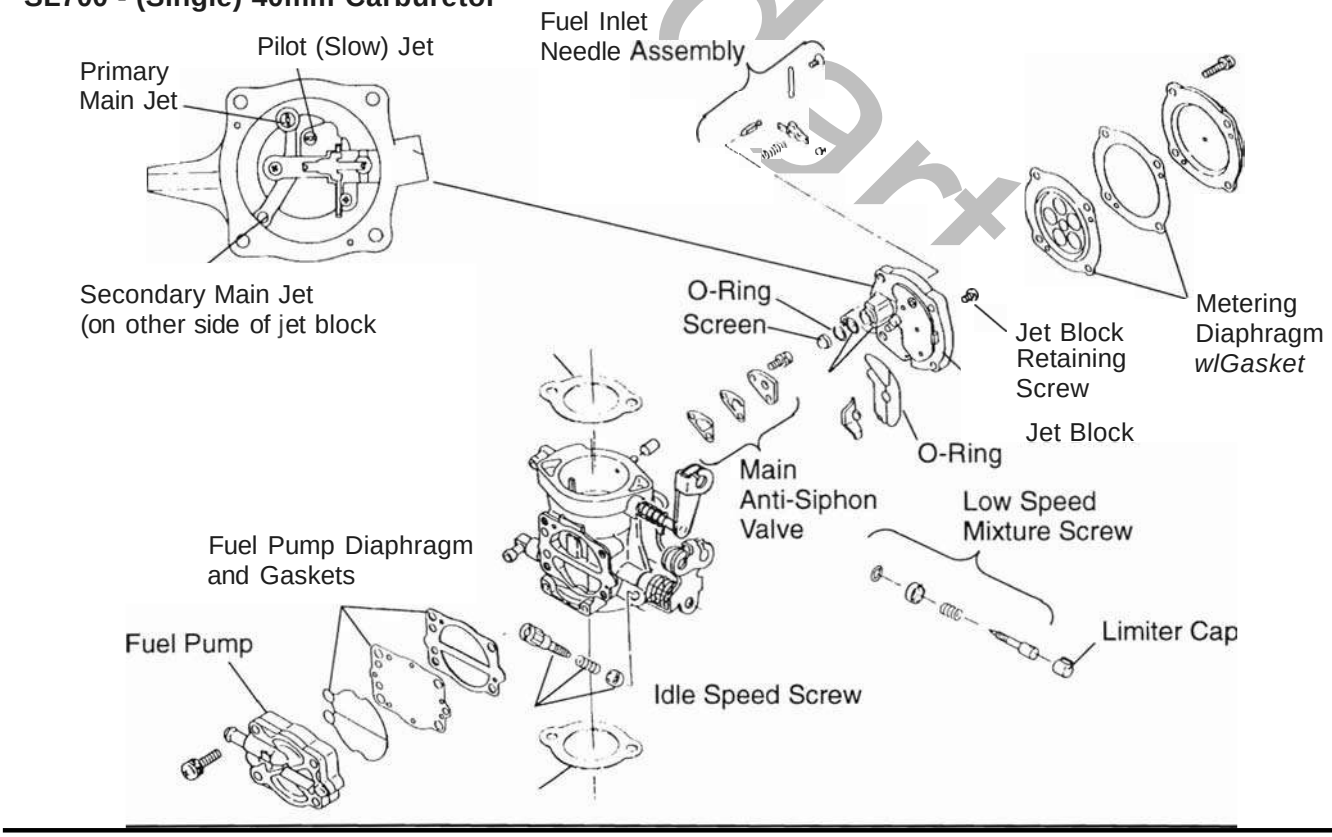


Carburetor Assembly Exploded View

1996 - 1997 SL700 and SL700 Deluxe, SLT700, Hurricane /1998 SLH, SLTH



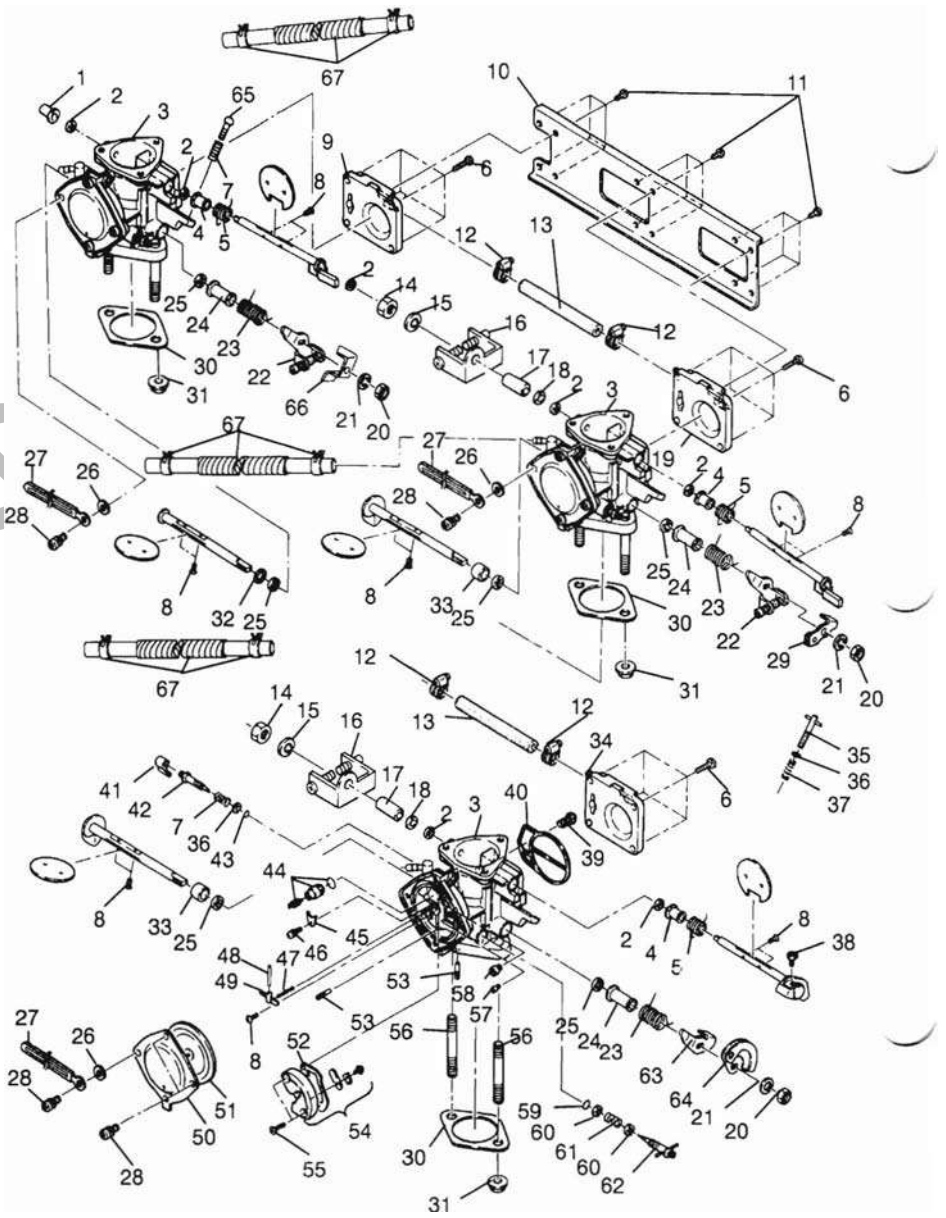
SL700 - (Single) 40mm Carburetor



Carburetor Assembly Exploded View

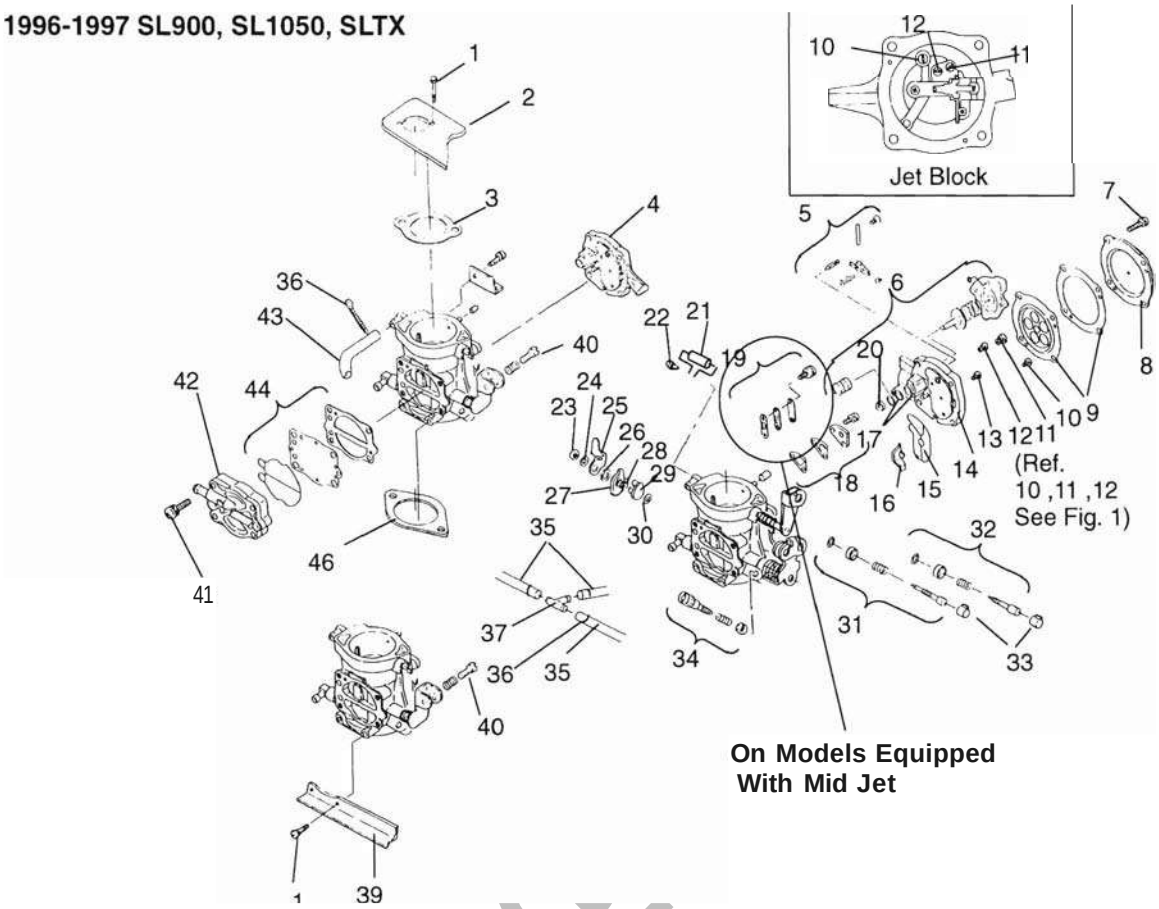
1 Ring
2 Seal
3 Asm., Carburetor (Incl. 1-29 ,32 -64)
4 Ring
5 Spring
6 Screw
7 Spring
8 Screw
9 Asm., Cover, PTa
10 Plate
11 Screw
12 Clamp
13 Hose
14 Nut
15 Washer, Spring
16 Asm., Choke Shaft
17 Ring
18 Ring
19 Asm., Cover, CTR
20 Nut
21 Washer, Spring
22 Asm., Throttle Lever
23 Spring
24 Ring
25 Seal
26 Washer
27 Plate
28 Screw
29 Lever, Throttle
30 Gasket, Carburetor
31 Nut, Flange
32 Packing
33 Ring
34 Asm., Cover, MAG
35 Asm., Screw
36 Washer
37 Spring
38 Screw
39 Filter
40 a-Ring
41 Cap
42 Adjuster
43 Ring
44 Asm., Needle Valve
45 Plate
46 Screw
47 Spring
48 Pin
49 Arm
50 Cover
51 Asm., Diaphragm
52 Gasket
53 Screw
54 Asm., Body
55 Screw
56 Bolt
57 Pilot Jet
58 Main Jet
59 a-Ring
60 Washer
61 Spring
62 Adjuster
63 Lever, Throttle
64 Asm., Throttle Lever
65 Screw
66 Lever, Throttle
67 Asm., Vinyl Pipe (Incl. Spiral Tube, 2 Clamps)

1996 SL780, SLT780, SLX780



Carburetor Assembly Exploded View

1996-1997 SL900, SL1050, SLTX



Ref.	Qty	Description
1	6	Screw
2	1	Base, Air Box
3	3	Gasket, Carb Upper
4	3	Jet Block Compl. (Rear)
5	1	Kit - Needle Valve (1 Per Carb)
6	1	Kit - Accelerator Pump'
7	12	Screw, Jet Block Cover
8	3	Cover, Jet Block
9	1	Kit - Diaphragm Jet Block (1 Per Carb)
10	1	Jet, Main (1 Per Carb)
11	1	Jet, Pilot Keihin (1 Per Carb)
12	1	Jet Pilot (1 Per Carb)
13	1	Screw, Jet Block
14	1	Jet Block (Front)
15	3	O-Ring, Jet Block
16	3	Collar
17	6	O-ring, Valve Seat
18	3	Kit - Check Valve (1 Per Carb)
19	3	Kit - Check Valve Mid Range (1 Per Carb)
20	3	Screen, Fuel Strainer
21	2	Tube, Rubber
22	2	Joint, Connecting
23	2	Nut, Throttle Shaft

Ref.	Qty	Description
24	2	Washer, Lock
25	1	Lever, Synchronizing
26	1	Washer, Plain
27	1	Cam, Accelerator Pump
28	1	Spring, Torsion
29	1	Collar
30	1	Clip, E
31	3	Kit - Idler Mixture Screw (1 Per Carb)
32	3	Kit - Main Mixture Screw (1 Per Carb)
33	6	Cap, Limiter
34	1	Kit - Idle Stop Screw
35	3	Hose, Fuel Acc. Pump
36	8	Strap
37	1	Fitting T
38	12	Screw, Connecting Plate
39	2	Plate, Connecting
40	1	Kit - Synchronizing Screw
41	8	Screw, Fuel Pump
42	2	Kit - Fuel Pump Body
43	2	Hose, Fuel
44	1	Kit - Gasket, Fuel Pump
45	2	Hose, Clamp
46	3	Gasket. Carbo

* See Carburetor Specs for Application (Not on SL1050)

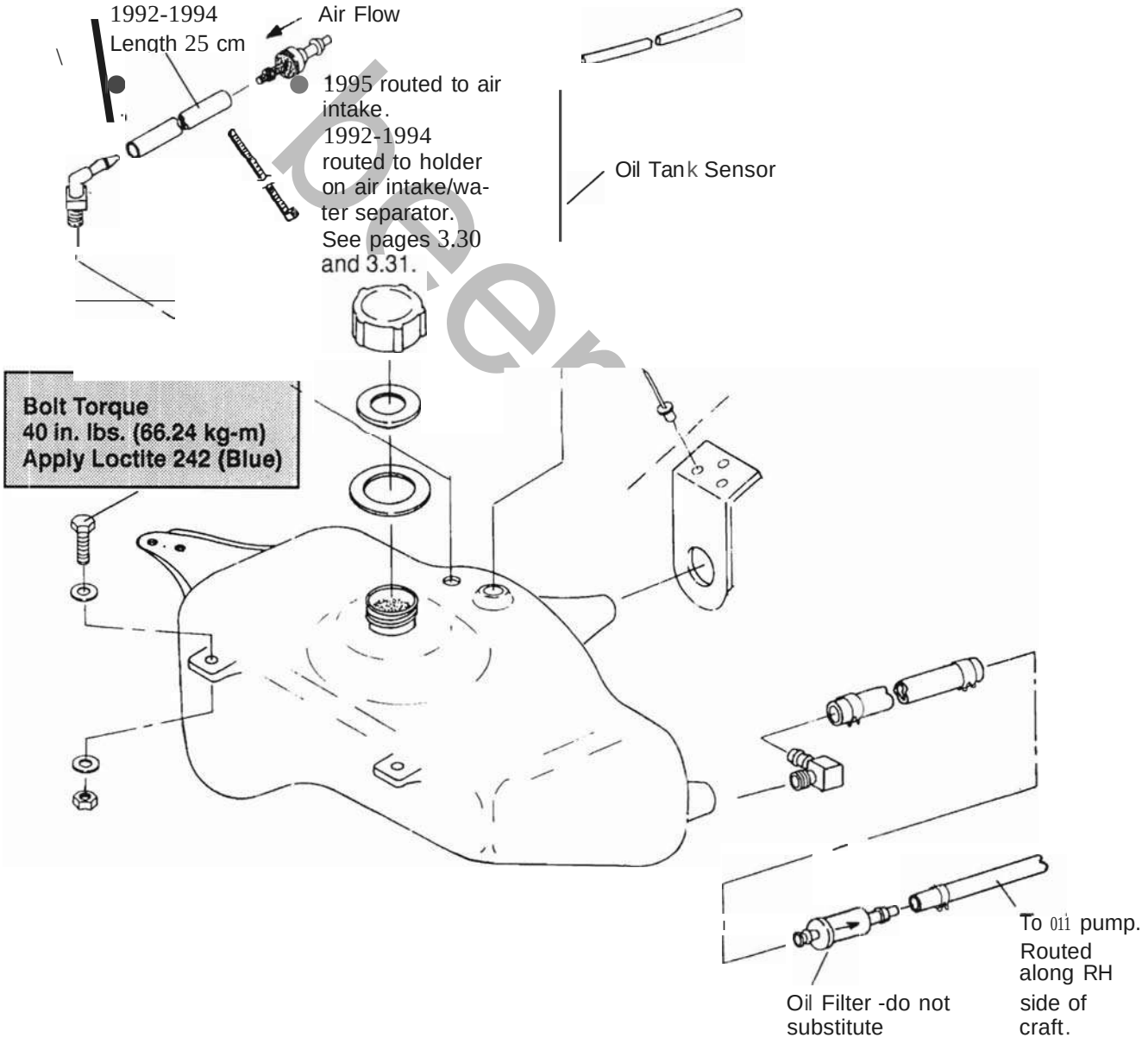
FUEL SYSTEM/CARBURETION
Oil Tank Removal/Exploded View

1992-1995 SL650, SL750

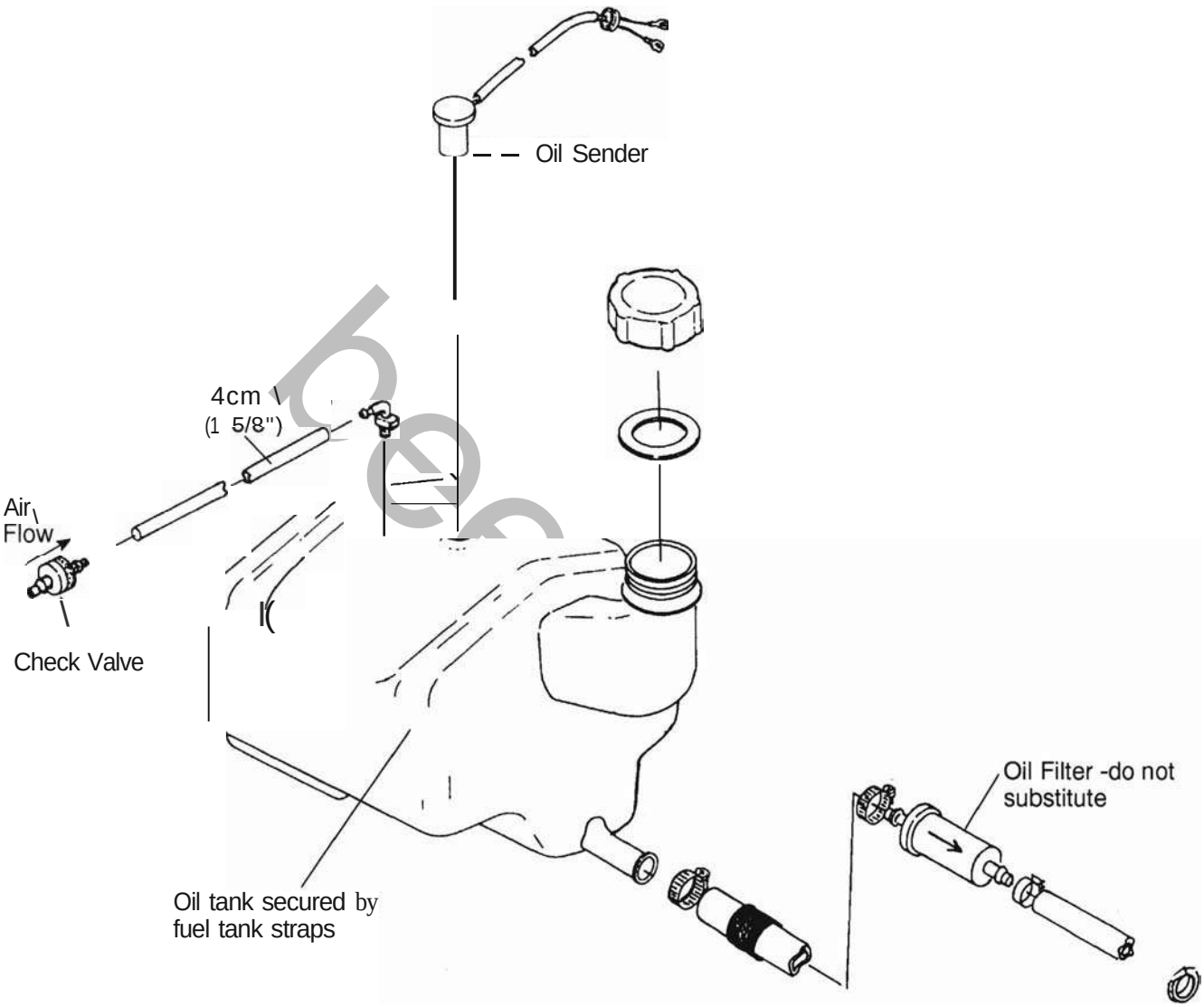
Oil Tank Removal Procedure

1. Open front compartment and remove storage tray.
2. Disconnect compartment support rod spring from tank.
3. Remove drop tube retainer cap assembly or disconnect fuel lines form drop tubes.
4. Remove (2) tank mounting bolts, nuts, and (4) washers.
5. Remove oil filler cap. Lower tank and pull forward.

Note: Do not damage oil line or tank vent line during removal or installation. Be sure lines are routed properly and not pinched after installation.

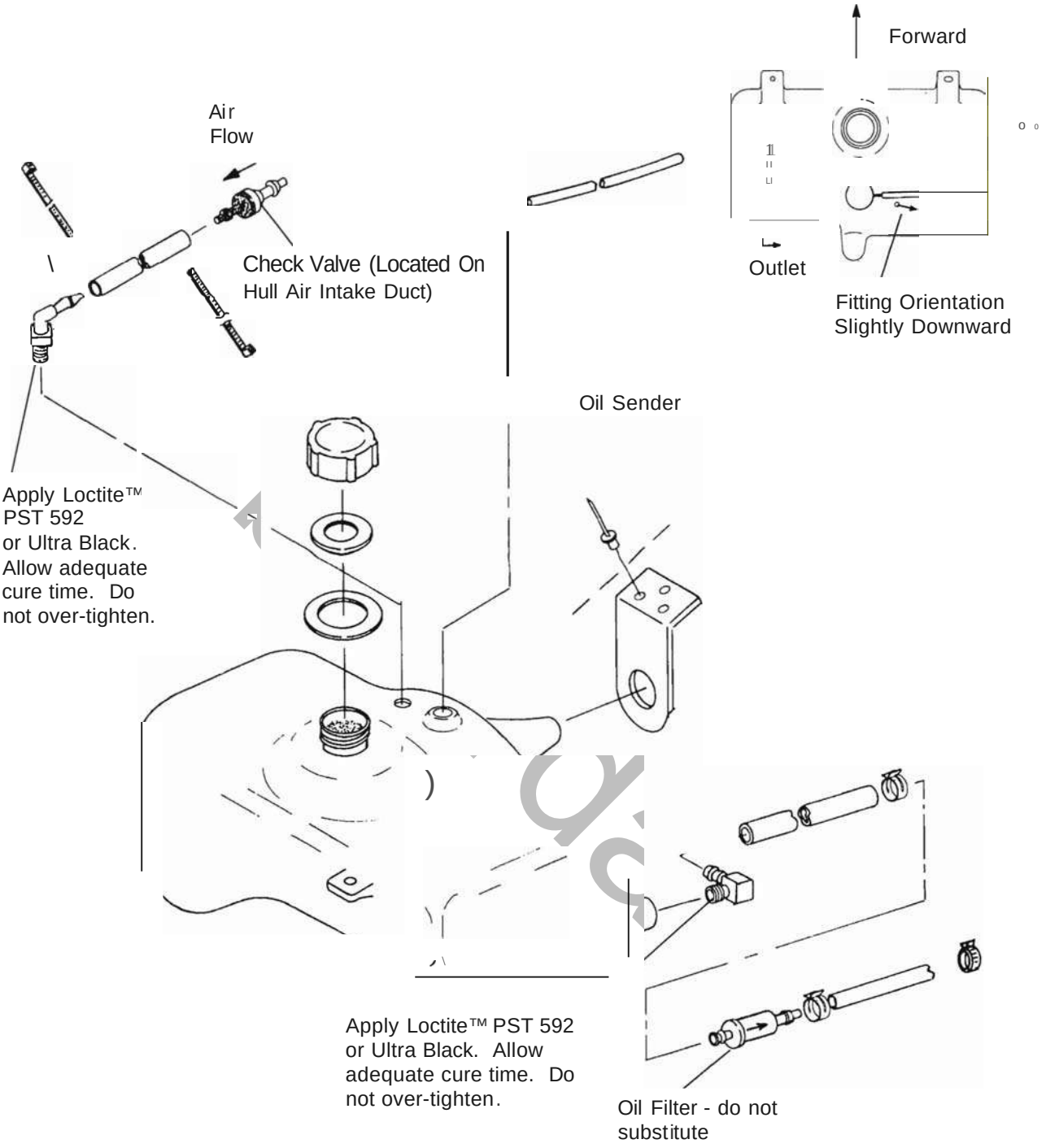


1994·1995 SLT750, 1996 SLT700

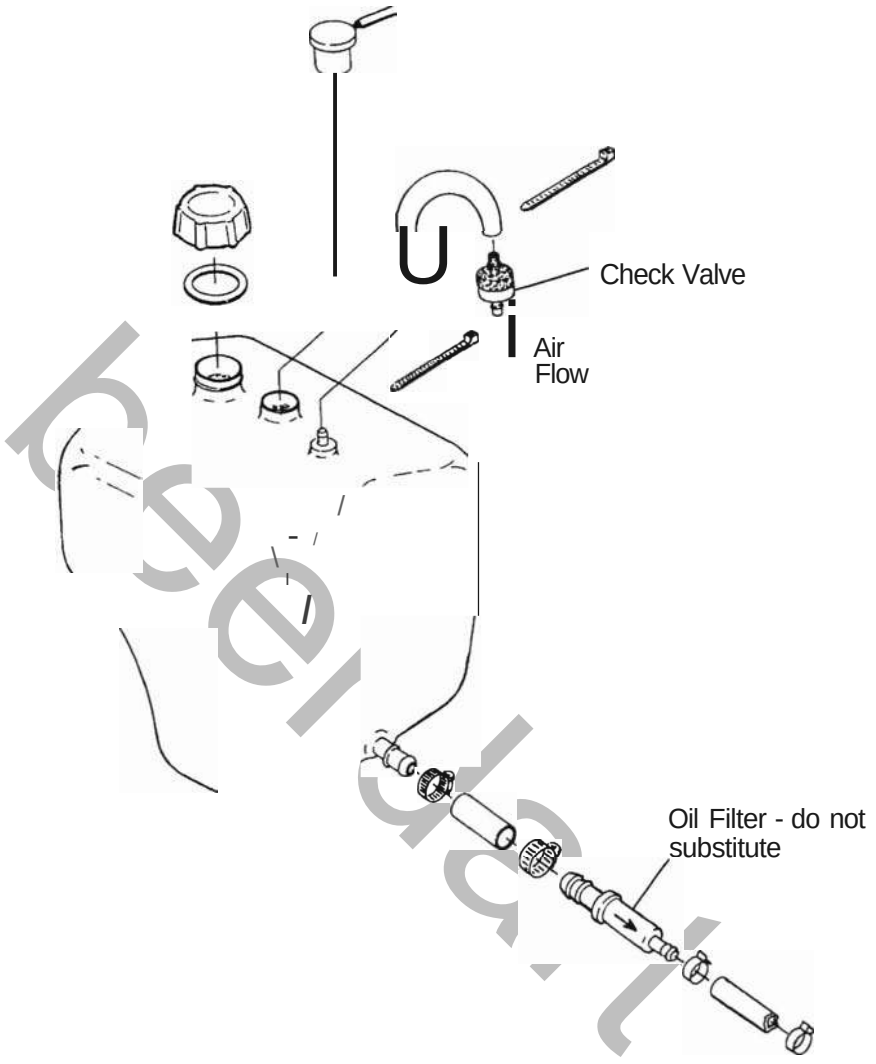


FUEL SYSTEM/CARBURETION
Oil Tank Exploded View

1996 SL700, SL780, SLX780, SL900

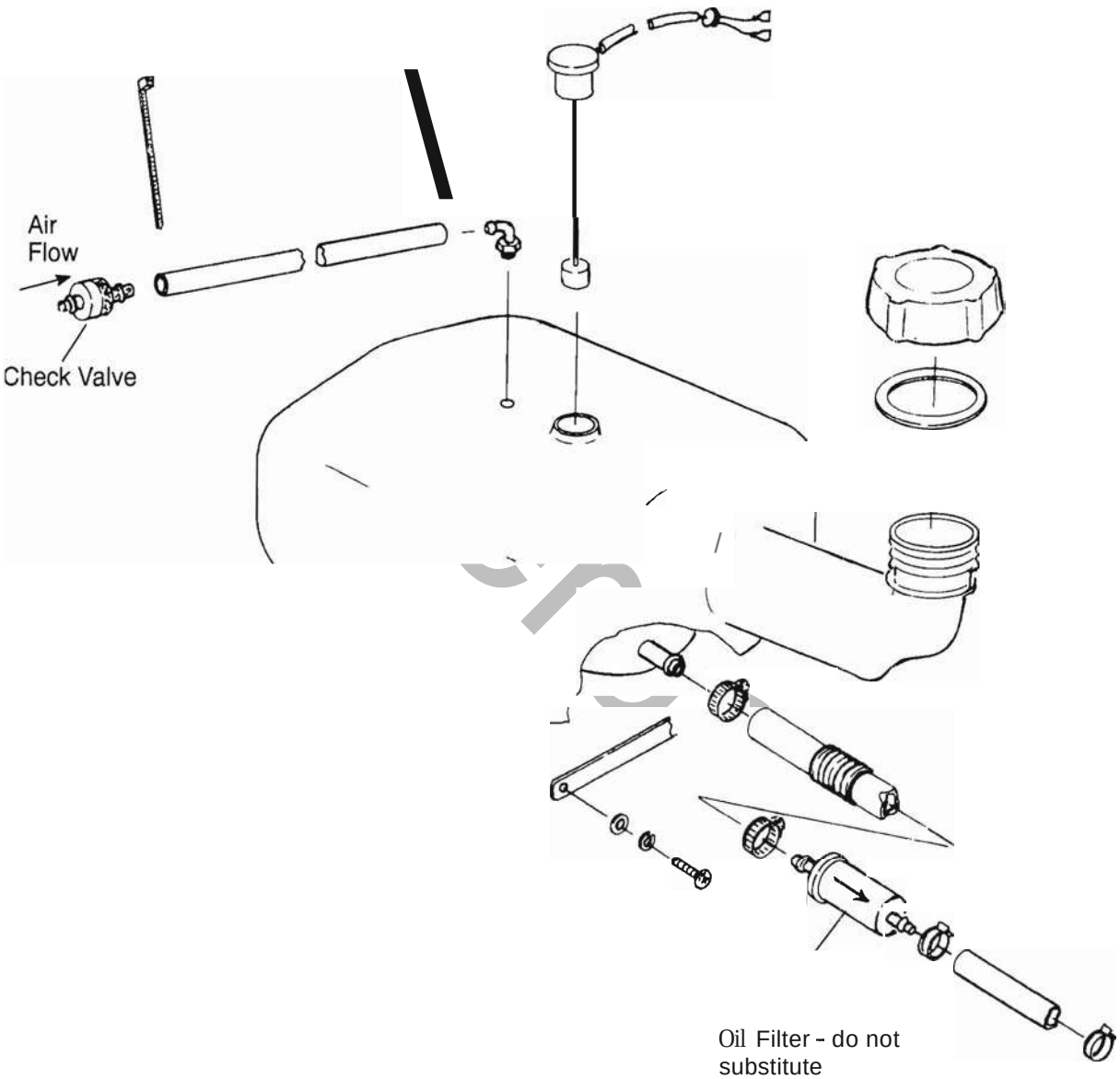


1996 Hurricane

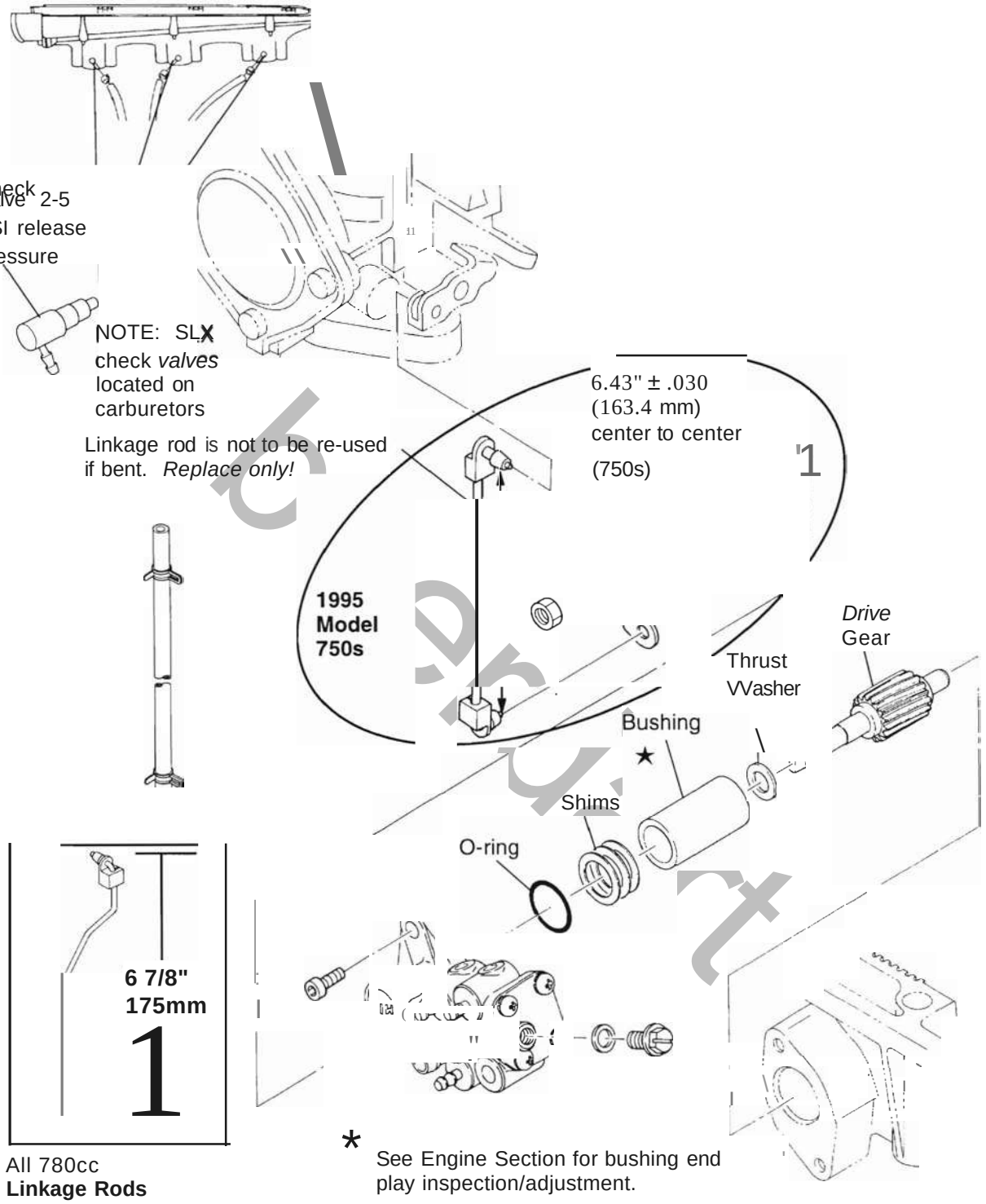


Oil Tank Exploded View

1996 SLT780, SLTX

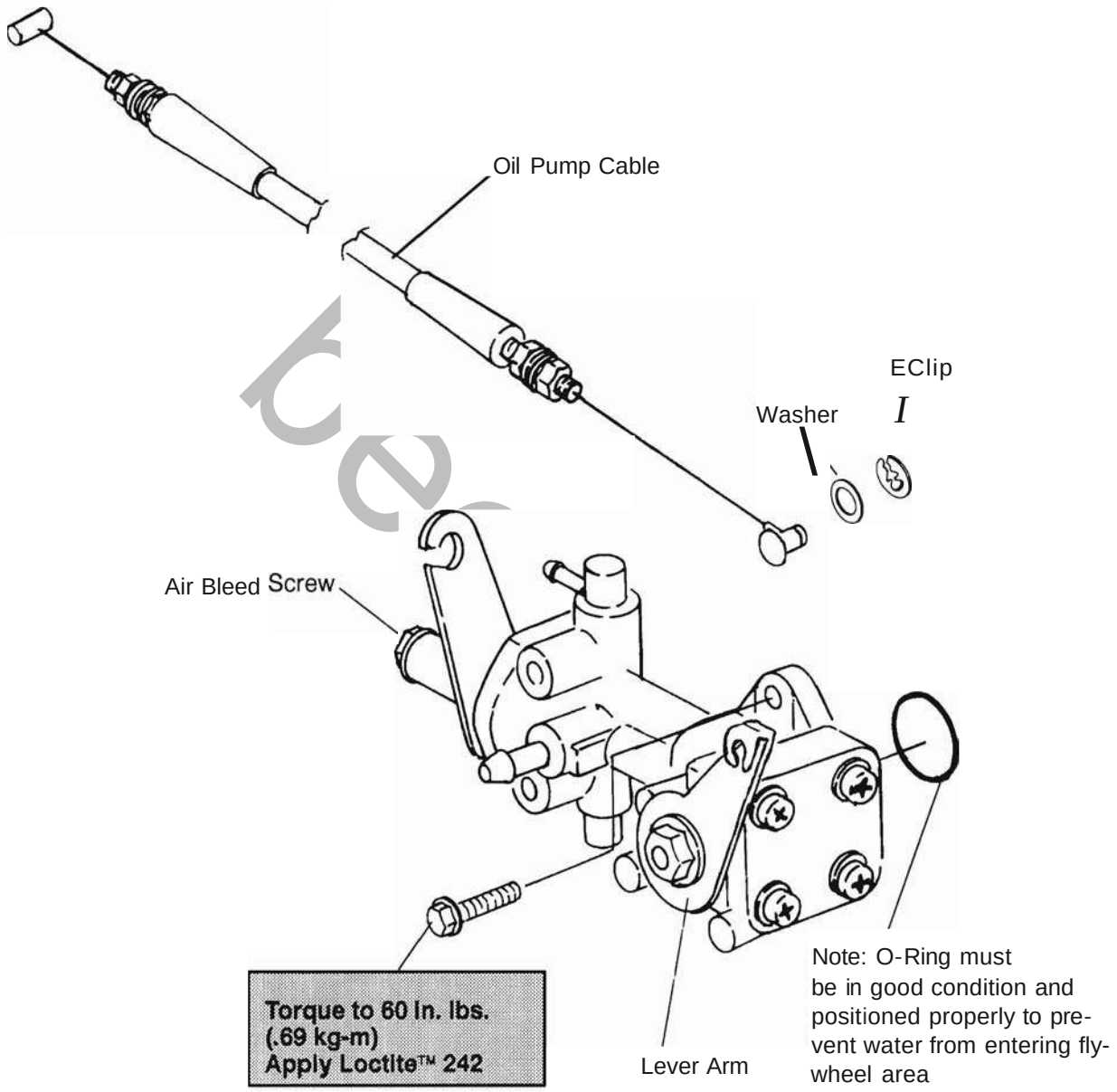


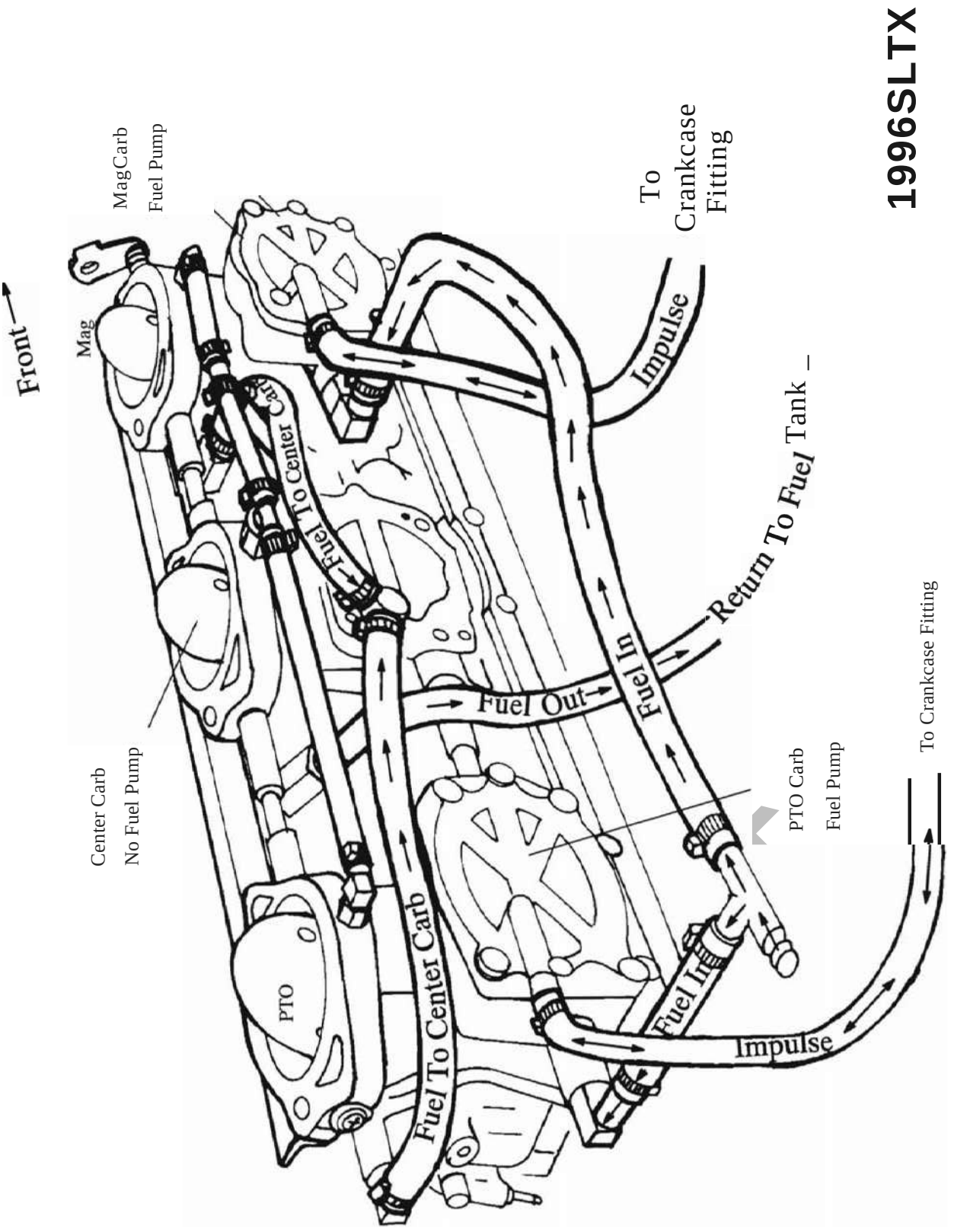
1995 SL650, SL750, SLT750, 1996 SL780, SLT780, SLX780



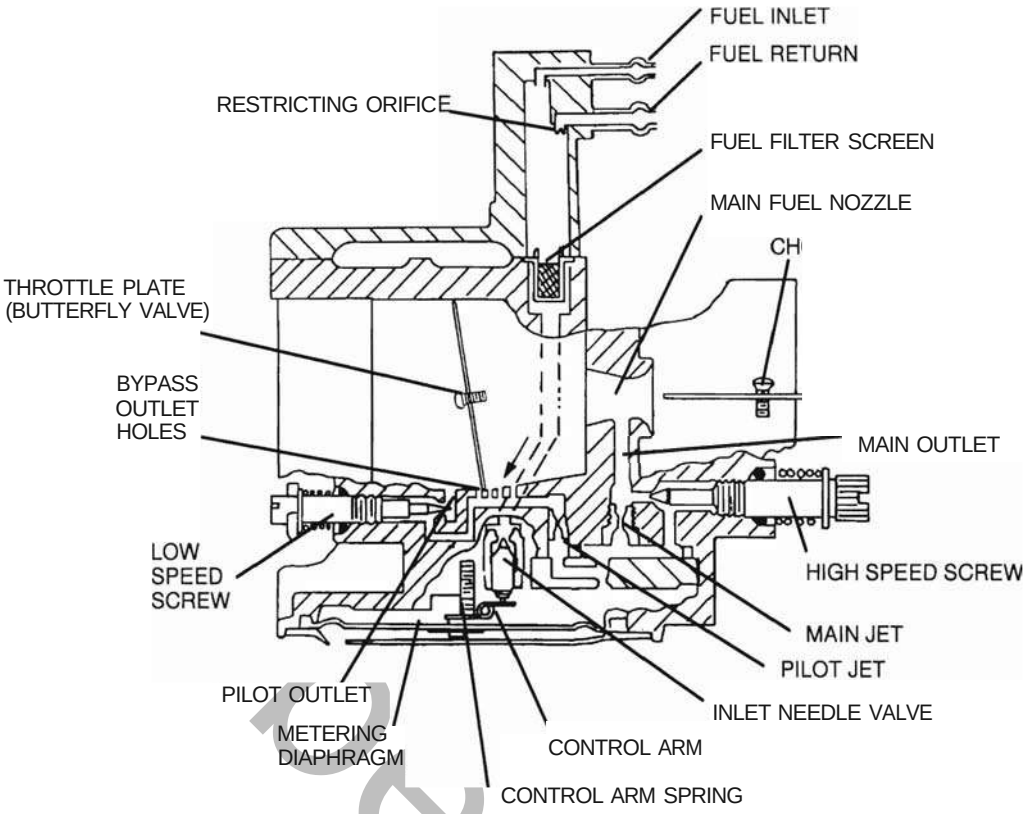
Oil Pump Assembly Exploded View

1996 to Current SL700, SLT700, Hurricane, SL900, SL1050, SLTX




1996SLTX
Front
Mag
MagCarb
Fuel Pump
To
Crankcase
Fitting
Impulse
Return To Fuel Tank
Fuel To Center Carb
Fuel Out
Fuel In
Center Carb
No Fuel Pump
PTO
Fuel To Center Carb
Fuel In
Impulse
PTO Carb
Fuel Pump
To Crankcase Fitting

1996/1997 SL900
1997 SL1050
1997 SLTX
1998 SLXH, SLTX



The Mikuni Super BN carburetor is a floatless diaphragm type. It uses several separate systems in orderto meter fuel and air properly.

1. Air Metering System

As air is drawn through the air inlet the metering is controlled by the throttle plate (butterfly valve). As the butterfly opens the area around the butterfly becomes larger than the area around the venturi. Once this happens the venturi controls the air metering.

2. Inlet Needle Valve System

The amount of fuel allowed into the fuel chamber is controlled by the inlet needle valve assembly. The opening and closing of the needle valve is controlled by the main diaphragm movement and spring pressure under the control arm. Engine vacuum drives the diaphragm toward the inlet needle control arm and allows fuel to enter the chamber.

3. Low Speed System

At idle and low RPM the fuel mixture is controlled by the low speed screw and pilot jet. When the throttle valve butterfly opening is small the fuel coming in through the pilot jet is mixed with incoming air through the bypass to atomize the air fuel mixture. As the butterfly opening increases fuel is introduced from the bypass hole and added to the pilot outlet to ensure proper mixture. It is important to note that if the idle speed is set too high, the pilot mixture screw cannot be properly adjusted.

The low speed adjusting screw controls the amount of fuel at idle. Turning the screw in leans the mixture, while turning the screw out richens the mixture. A fixed pilot jet controls the fuel flow from the bypass hole at the low speed range.

4. High Speed System

At medium to wide open throttle settings fuel is controlled by the high speed system. High speed air flow across the venturi increases vacuum at the main nozzle drawing fuel out of the nozzle. As the speed and throttle opening continue to increase fuel flow is also controlled by the high speed screw. Turning the screw in leans the mixture and turning the screw out richens the mixture.

5. Choke System

The purpose of the choke system is to supply an overly rich mixture for starting the engine when it is cold. When the choke butterfly is fully closed and throttle butterfly is fully open a strong vacuum is applied to the main nozzle and a very rich fuel air mixture is introduced to the engine.

Carburetor System Operation, 1992 to Current

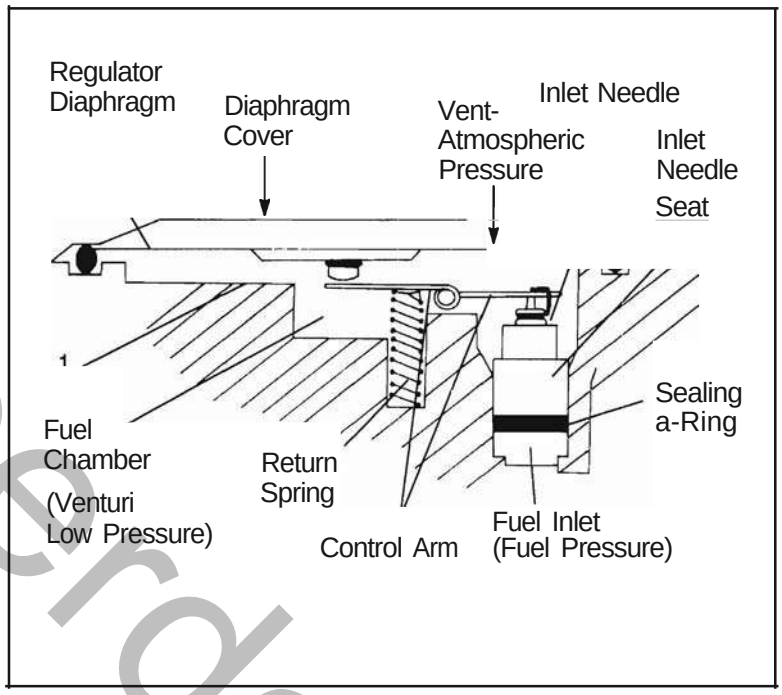
Pop Off Pressure

Carburetor pop-off pressure is pre-set at the factory for a given engine. Test as outlined on following page. If pop-off pressure is incorrect, follow the procedure below to find the cause. Pop-off pressure should not be changed to correct a running condition problem unless required by changes in elevation, or engine/carburetor modifications for racing.

Fuel inlet needle "pop off' pressure is influenced by many factors. Atmospheric pressure, venturi vacuum (low pressure), the amount of spring pressure on the control arm, fuel pressure from the fuel pump, and the size of the needle and seat all have an affect on operating pop off pressure. All of these forces combined regulate the amount of fuel that enters the carburetor fuel chamber and the engine.

Needle Valve/Diaphragm Operation

The amount of fuel allowed into the *fuel chamber* is controlled by the *inlet needle valve assembly.* Opening and closing of the valve is controlled by *regulator diaphragm* movement and spring pressure under the *control arm.*



The regulator diaphragm is sealed to the carburetor body forming two chambers. One side is vented to atmospheric pressure, the other side (fuel chamber) is connected to the venturi via the jets and passages. Atmospheric pressure pushes on one side of the diaphragm, applying pressure on the *control arm* in the fuel chamber. This reduces pressure on the *inlet needle* and allows it to lift more easily off the seat. When the engine is running, pressure in the carburetor venturi (and therefore the fuel chamber) is less than atmospheric. This increases the effect of the atmospheric pressure on the diaphragm and lever. When return spring pressure is overcome by these forces, the needle lifts off of the seat or "pops off', allowing pressurized fuel to enter the fuel chamber.

Pop off pressure cannot be tested with the engine running. However, a static pressure test can help identify problems within *each individual carburetor.*

The measurement indicates the amount of pressure required to force the fuel inlet needle off of the needle seat *without* the engine running. Thoroughly inspect *all* system components whenever a rich or lean condition is encountered.

NOTE: If inlet needle does not seal properly, fuel may enter the engine and cause flooding when the engine is off.

Low pop off pressure may be caused by:

- Foreign material in the tip of the needle or needle seat
- Worn, broken, or damaged lever arm return spring
- Leaking needle seat a-Ring
- Corrosion on lever arm, lever arm pin, and/or return spring
- Incorrect lever arm return spring (Use only genuine Polaris parts)
- Fuel return line kinked or return restrictor orifice plugged (in carburetors or in return line)

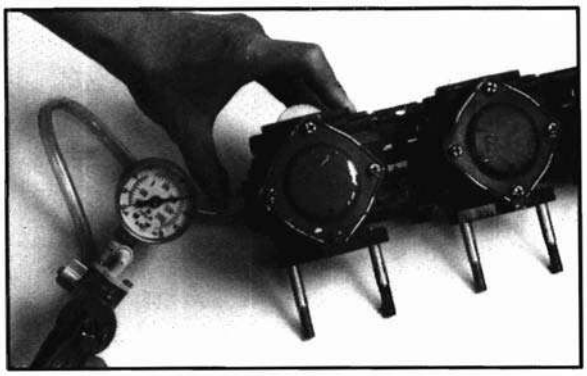
Carburetor System Operation, 1992 to Present

If operating pop off pressure is too high, the amount of fuel available to the engine will be reduced, causing a lean condition.

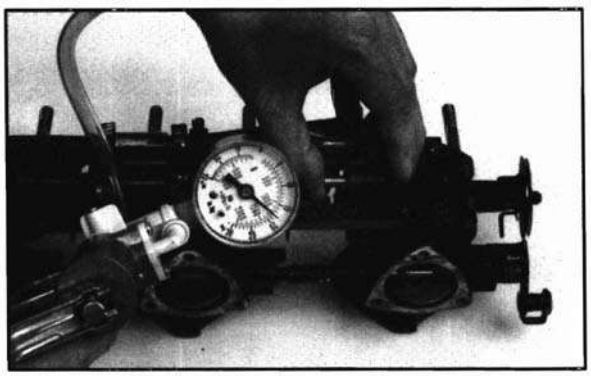
High pop off pressure may be caused by:

- Restricted fuel inlet passage
- Inlet needle stuck in seat
- Corrosion on lever arm, lever arm pin, and/or return spring
- Incorrect lever arm return spring (Use only genuine Polaris parts)
- Fuel return line orifice missing ('94-current)

Testing Needle and Seat Pop Off Pressure



Note: Carburetors can be tested as a set, but will only indicate the pop off pressure of the carburetor with the lowest pressure.



Individual pop off pressure testing.

1. **Pressure test each carburetor Individually.** To provide accu rate readings remove the regulator diaphragm and its cover before testing. Wet the needle with WD40™ or a similar substance. **NOTE:** Do not use gasoline due to the hazard of fire. Protect your eyes from the spray when the needle valve "pops off'.
2. Remove the fuel lines connecting the carburetors.
3. Attach the Mity Vac™ to the fuel inlet fitting of the carburetor to be tested.
4. Plug the fuel return outlet of the carburetor to be tested.
5. Pressurize the carburetor with the pump until the needle valve pops off. Pump slowly and note the pressure when the valve opens. Test the valve at least three times to ensure an accurate reading. Be sure to keep the needle valve wet. **NOTE:** The reason for wetting the needle valve is to duplicate actual conditions during operation. When the engine is running, the needle valve has fuel running through to wet it and engine vibrations to help the needle obtain a good seal.

For early production 1992 through serial # PLE04038E292, apply 25-28 PSI. For late production 1992 to current apply 10-18 PSI. The carburetors should hold pressure at no less than 5-8 PSI. Otherwise use pop off pressure on page 3.1. If the carbs do not hold pressure, needle and/or seat leakage is evident.

The Keihin CDK II carburetor is a floatless diaphragm type. Several separate but overlapping systems are used to meter fuel and air properly. Refer to the illustrations on page 3.57 and 3.58.

1. **Air Metering System**

The metering of air is controlled by the *throttle plate.* The position of the throttle plate determines which fuel delivery system or systems supply fuel from the *fuel chamber* to the engine.

2. **Inlet Needle Valve System/Fuel Chamber**

The amount of fuel allowed into the *fuel chamber* is controlled by the *inlet needle valve assembly.* Opening and closing of the valve is controlled by *regulator diaphragm* movement and spring pressure under the *control arm.* The regulator diaphragm is sealed to the carburetor body forming two chambers. One side is vented to atmospheric pressure, the other side (fuel chamber) is exposed to the venturi (low pressure) through the fuel delivery-jets and passages. Atmospheric pressure pushes on one side of the diaphragm, applying pressure on the *control arm* in the fuel chamber. This reduces pressure on the *inlet needle* and allows it to lift more easily off the seat. When the engine is running, pressure in the carburetor venturi (and therefore the fuel chamber) is less than atmospheric. This increases the effect of the atmospheric pressure on the diaphragm and lever and overcomes spring pressure. When the lever return spring pressure is overcome by these forces, the needle lifts off of the seat or "pops off", allowing pressurized fuel from the fuel pump to enter the fuel chamber. Fuel inlet needle "pop off" pressure is influenced by many factors. Atmospheric pressure, venturi low pressure, the amount of spring pressure on the control arm, and fuel pressure from the fuel pump all have an affect on operating pop off pressure. All of these forces combined regulate the amount of fuel that enters the carburetor fuel chamber and the engine. Changes to pop-off pressure are *not* recommended.

3. **Idle (Slow) System**

At idle and low throttle setti1gs, fuel mixture is controlled by the *idle mixture screw* and *slow jet.* At idle, the throttle plate is open only far enough to uncover the *idle port.* The idle mixture screw controls fuel delivery to the idle port. When the throttle plate is closed, fuel metered through the slow jet is mixed with incoming air through the *bypass ports* to atomize the air/fuel mixture. For this reason, the idle speed must be set accurately before any adjustments are performed to the idle mixture screw. As throttle opening increases, fuel from the slow jet is discharged through the bypass holes to ensure proper mixture. The low speed adjusting screw can be used to fine tune the idle and low speed system. Turning the screw in leans the mixture; turning the screw out richens the mixture.

4. **Mid-Range System**

Some models are equipped with a mid-range jet. At mid-range throttle openings (approximately 1/4 through 1/2 throttle) fuel mixture is determined primarily by the *mid-range jet.* The slow jet, idle mixture screw, *main jet,* and *high speed mixture screw* have a minor effect on mid-range mixture. Fuel is metered through the mid-range jet and discharged through the mid-range port. As throttle opening increases, the main jet has a greater effect and the mid-range jet a lesser effect. The mid-range system does not have an adjustable mixture screw.

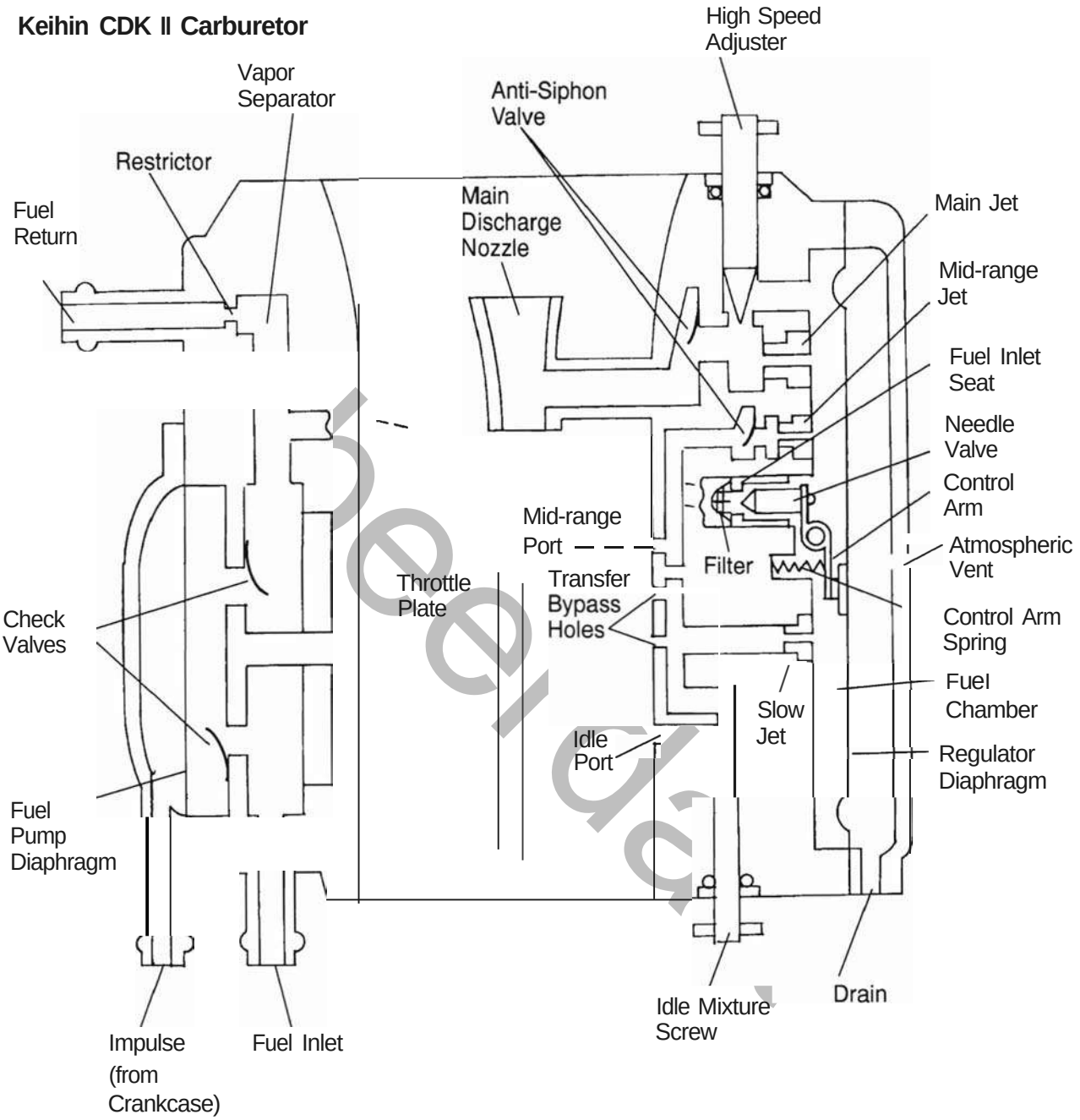
5. **High Speed System**

The high speed system consists of the *main jet* and and, on some models, *high speed mixture screw.* These have an effect on mixture from 1/4 to full throttle, with the greatest affect at 1/2 to wide open throttle. The mixture screw can be adjusted to compensate for changes in altitude and temperature. Turning the screw in (clockwise) leans the mixture and turning the screw out (counterclockwise) richens the mixture. The screw is effective from 0-2 turns out from lightly seated. See mixture adjustments in this section for more information.

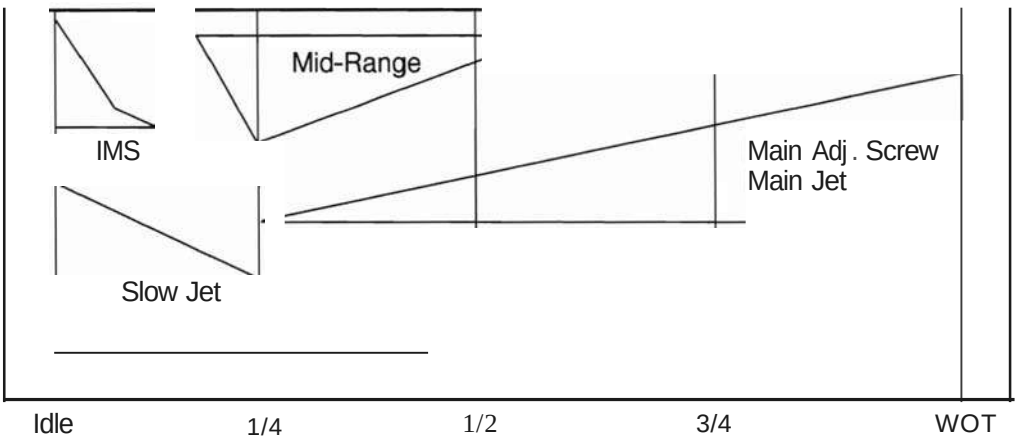
6. **Choke System**

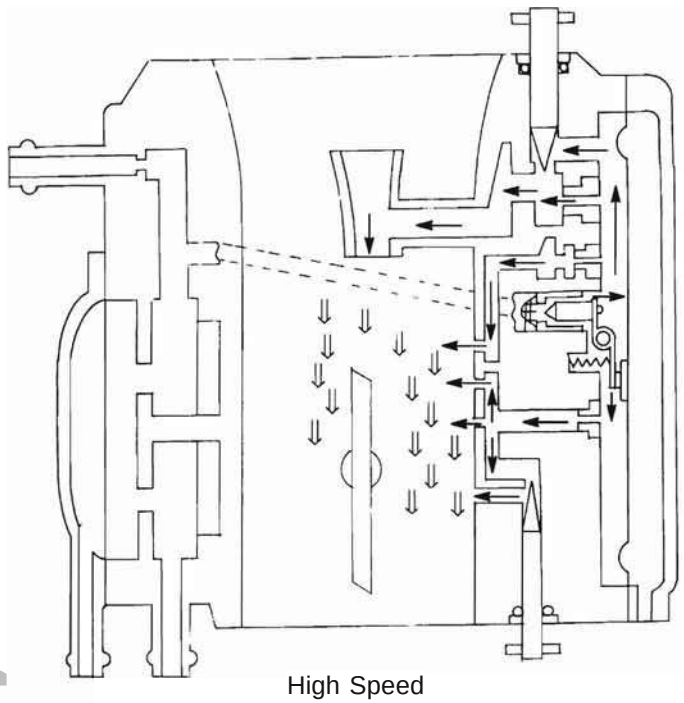
The purpose of the choke system is to supply an overly rich mixture for starting a cold engine. When the *choke plate* is fully closed and throttle plate is open a strong vacuum is applied to the main nozzle, mid-range, bypass, and idle ports, and a very rich fuel air mixture is discharged to the engine for starting.

Keihin CDK II Carburetor

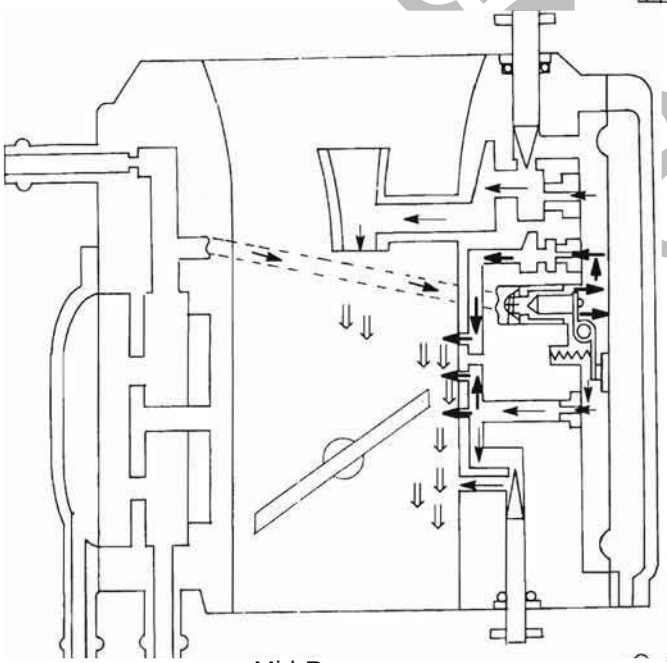


Fuel Delivery Effect Diagram

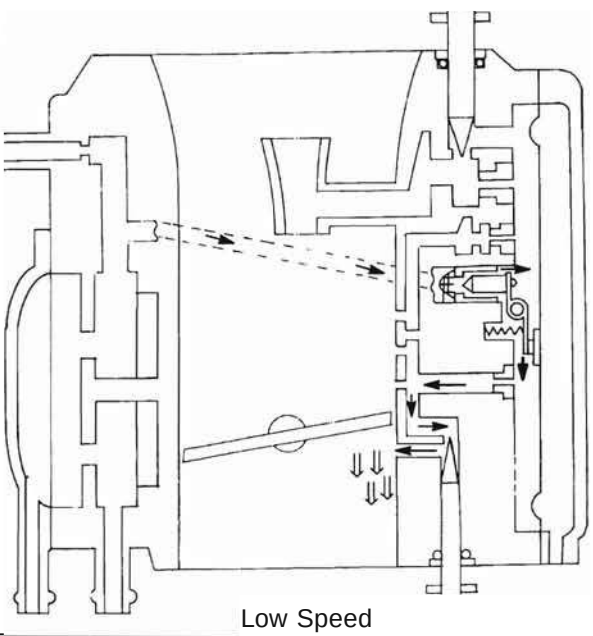




High Speed



Mid-Range



Low Speed

Fuel Pump Operation, 1992 to Present 650 and 750 FUji Engines Only

The fuel pump is connected to the engine crankcase via the impulse line.

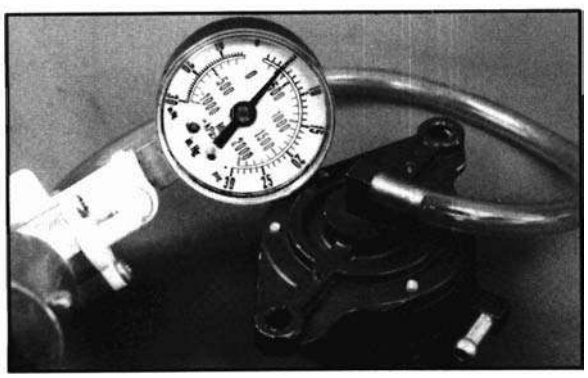
When the piston is on the upstroke crankcase pressure becomes less positive, the diaphragm in the fuel chamber moves toward the engine causing a negative pressure or vacuum in the fuel chamber which causes the check valve on the fuel supply side of the chamber to open, allowing fuel to enter. This vacuum causes the outlet check valve to close so fuel cannot return from the carburetor.

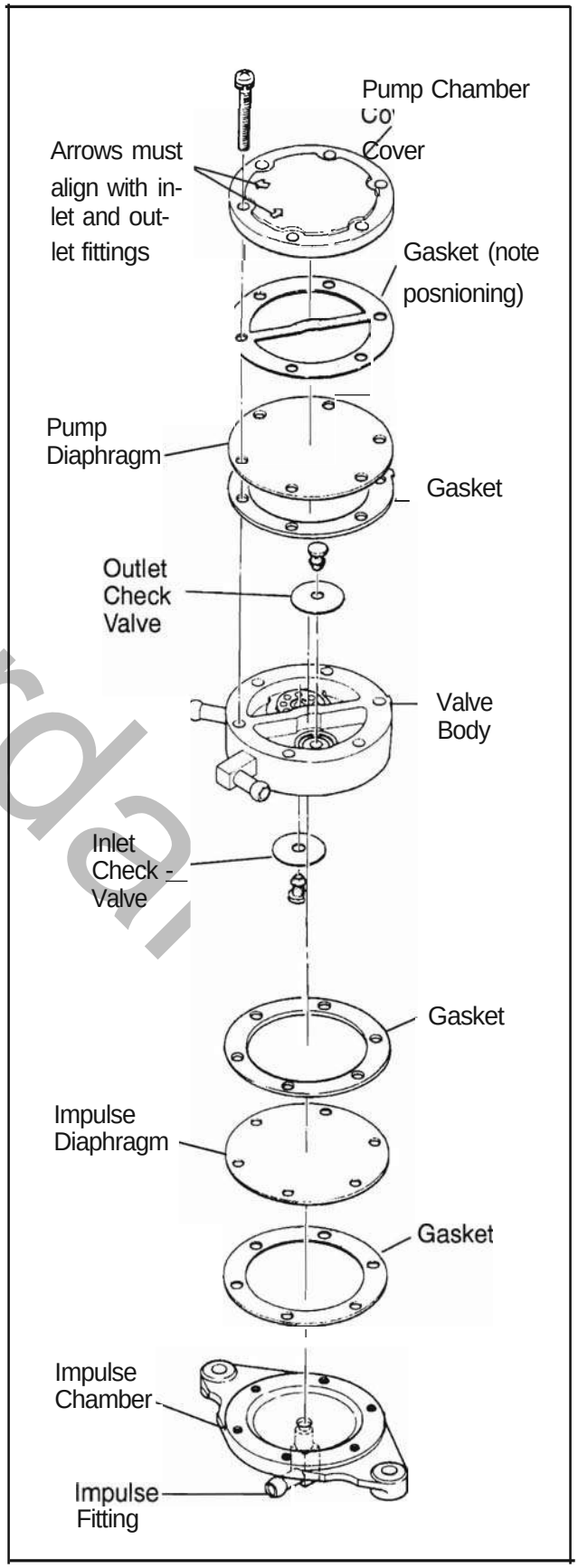
When the piston is on its downstroke, the pressure from the crankcase becomes positive causing the diaphragm to move in the opposite direction reversing the pressure in the pump chamber. This causes the inlet check valve to close and the outlet valve to the carburetor to open flowing pressurized fuel into the carburetor.

Maintenance

The fuel pump does not require any specific scheduled maintenance. However, the following should be observed:

1. **Operation:** The pump may be checked for operation by removing the fuel supply line from the carburetor and placing it into a container. With the engine idling a steady flow of fuel should be observed.
2. **Cleaning:** The pump and impulse line must be disassembled and cleaned of foreign material in the event of piston or other internal engine component failures which produce fragments, or whenever water is present in fuel or engine (beyond separator) .
3. **Inspection:** The diaphragms and check valves must be carefully examined for cracks, holes, distortion or fatigue (stretching). If in doubt as to the condition of any internal parts, replace all diaphragms, check valves and gaskets.
4. **Testing:** Apply 5 PSI pressure to impulse line fitting. The diaphragm should hold pressure indefinitely.





FUEL SYSTEM/CARBURETION
Fuel Pump Operation

Fuel Pump Operation, 1995 SLX780 1996 SL780, SLT780

The fuel pump used on the Polaris SLX780 watercraft is an impulse diaphragm type. It is connected to the engine crankcase via the impulse line.

When the piston is on the upstroke crankcase pressure becomes less positive. the diaphragm in the fuel chamber moves toward the engine causing a negative pressure or vacuum in the fuel chamber which causes the check valve on the fuel supply side of the chamber to open allowing fuel to enter. This same vacuum causes the outlet check valve to close so fuel cannot return from the carburetor.

When the piston is on its downstroke, the pressure from the crankcase becomes positive causing the diaphragm to move in the opposite direction reversing the pressure in the pump clamber. This causes the inlet check valve to close and the outlet valve to the carburetor to open flowing pressurized fuel into the carburetors.

Maintenance

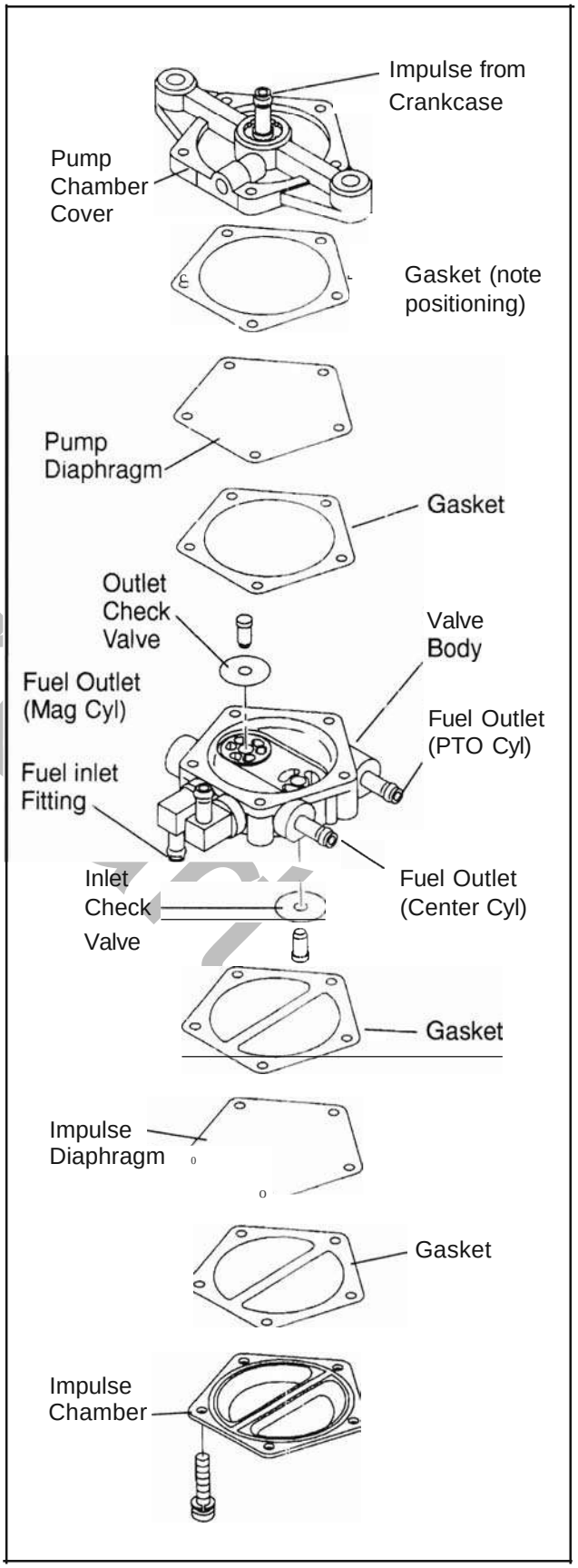
The fuel pump does not require any specific scheduled maintenance. However, the following should be observed:

1. **Operation:** The pump may be checked for operation by removing the fuel supply line from the carburetor and placing it into a container. With the engine idling a steady flow of fuel should be observed.

2. **Cleaning:** The pump and impulse line must be disassembled and cleaned of foreign material in the event of piston or other internal engine component failures which produce fragments, or whenever water is present in fuel (beyond separator) or engine.

3. **Inspection:** The diaphragms and check valves must be carefully examined for cracks, tears or holes. If in doubt as to the condition of any internal parts, replace all diaphragms, check valves and gaskets.

4. **Testing:** Refer to testing on page 3.59.



Gasoline Safety

WARNING

Gasoline is highly flammable and explosive under certain conditions.

- Always exercise extreme caution whenever handling gasoline.
- Always refuel with the engine stopped and outdoors or in a well ventilated area.
- Do not smoke or allow open flames or sparks in or near the area where refueling, maintenance, or repair work is performed or where gasoline is stored.
- Do not over fill the tank. (Do not fill the tank neck.)
- If you get gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.
- Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.
- Shut off fuel valve whenever the watercraft is stored, parked, or transported.

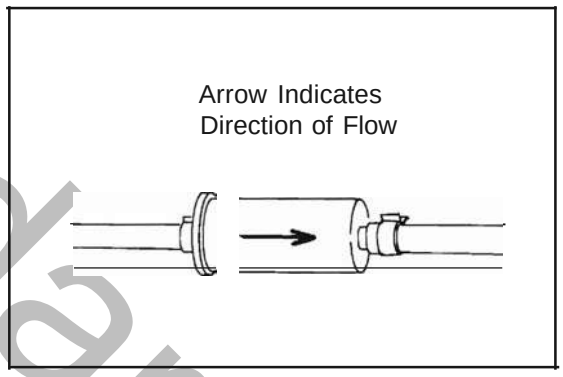
Fuel Filter

WARNING

Set fuel valve to "OFF". Gasoline is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in the work area. Be sure the work area is well ventilated. See gasoline warning above. Pressure may be present in the fuel tank. Remove the fuel cap slowly to release pressure before removing fuel filter clamps and lines.

The fuel filter is located under the tray in the storage compartment at the bow of the watercraft. It is an in-line type filter and should be replaced annually or when contaminated with fuel or water.

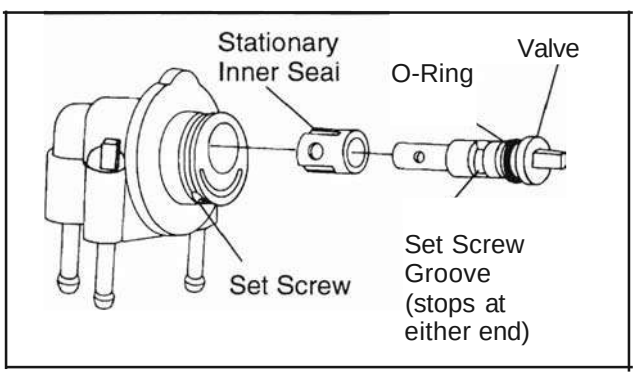
After replacement turn the fuel valve "ON" to check for leaks. Turn the fuel valve "OFF". If the filter leaks correct the problem before operating the craft.



Fuel Shut Off Valve Disassembly and Inspection - Typical

Note: Models with low fuel RPM limiter have two fittings.

1. Remove fuel shut off knob and retainer nut. Remove valve from craft.
2. Remove fuel lines from fuel valve. Plug lines to prevent fuel leaks. Mark lines for proper orientation during reassembly.
3. Remove set screw. Using a plier, twist and pull control shaft to remove.
4. Carefully, remove shaft seal and inspect for wear, cracks, or damage.
5. Verify lines and passages are not obstructed.
6. Thoroughly clean shut off valve housing with hot, soapy water. Rinse and dry thoroughly with compressed air.
7. Lubricate shaft seal with a light coating of TCW3 oil to ease installation. Align slots in seal with bosses in housing.
8. Install control shaft with set screw slot toward fuel line fittings. Press shaft into housing totally to seat shaft. Reinstall set screw and tighten.
9. Attach fuel lines to shut off valve, verifying proper placement of "Reserve", "On", and "Fuel Out" lines.
10. Reinstall shut off valve on craft and secure with knob and retainer nut removed in step 1.



Fuel Water Separator

IMPORTANT: Prior to performing any adjustments to carburetors check the following:

- Verify that no water is present in the fuel system. Check the water trap for presence of water.
- Check for proper choke operation.
- Verify all fuel and vent lines are routed and secured properly.
- Check the reed valves for damage.
- Check fuel pump diaphragms for damage.
- Verify all seal and gaskets are in good condition (no air leaks present).
- Check engine compression (see engine section).
- Verify proper fuel flow (i.e. fuel flow through shut off valve).
- Synchronize carburetors; inspect throttle plates (butterfly) for damage.

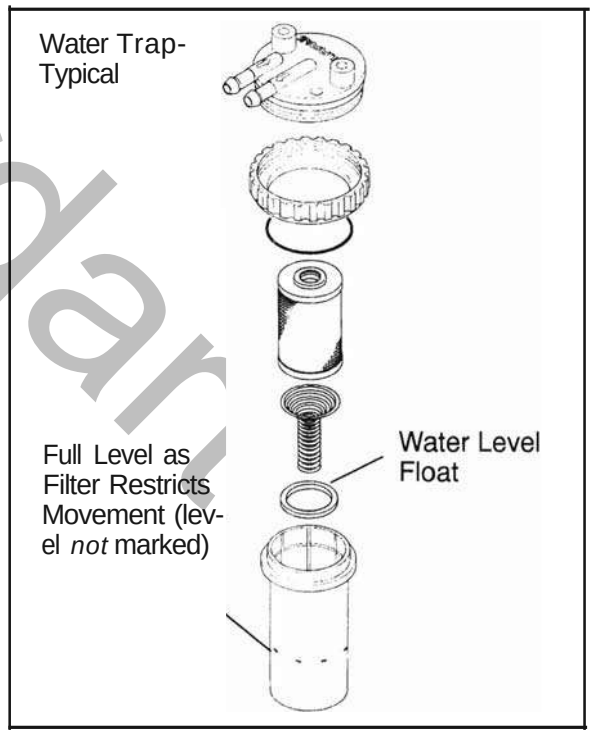
Fuel/Water Separator

The water trap should be checked daily and/or whenever refueling. 1"-2" (2.5-5 cm) of water depth in water trap can cause engine to run poorly. If water trap fills quickly, excessive water may be present in fuel tank.

The 1995 water trap includes a filter to improve water separation, and a colored float to indicate water level. Empty trap if float appears to be off the bottom.

Note: The maximum travel of the float is to the base of the filter, or approximately one half the depth of the bowl.

Visually inspect the bowl for water collected at the bottom of the bowl. See illustration. If water is present it will appear as a clear liquid at the bottom of the bowl. Turn off fuel valve. Wrap a shop towel around the bowl and remove bowl by turning counterclockwise. Take care not to spill fuel while removing. Wipe up spills immediately with a shop cloth. Dispose of fuel properly and follow all gasoline handling precautions found on page 3.61. Reinstall separator bowl taking care that the O-ring is undamaged and in the proper place. Hand tighten securely. Check carefully for fuel leaks around bowl.

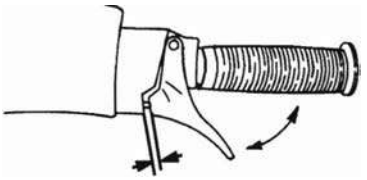


WARNING

Gasoline is extremely flammable and explosive under certain conditions. Do not smoke or allow flames or sparks in the work area. Be sure the work area is well ventilated. See gasoline handling warnings found on page 3.61. Failure to heed these warnings may result in serious injury or death.

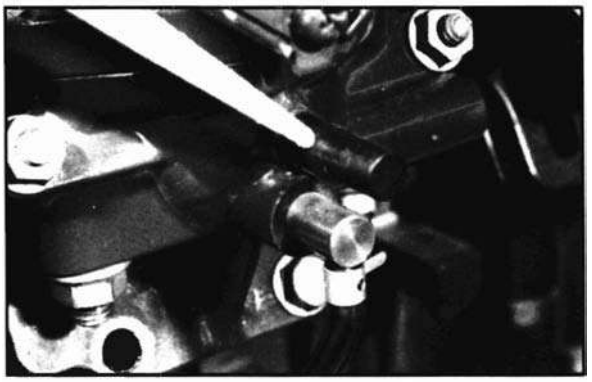
Carburetor Adjustment

1. Throttle cable freeplay adjustment should be maintained at .020 - .060" (.5 - 1.5 mm) at the throttle flipper. Adjust by turning the lock nuts at the carburetor and then fine tuning at the throttle block adjuster bolt. See Maintenance section for procedure.



.020 -.060"(.5 - 1.5 mm)

2. The choke cable is adjusted with the lock nuts at the carburetor. The choke knob should just touch bottom of its travel when the choke butterflies are open completely (vertical).



Carburetor Synchronization

CAUTION:

DO NOT attempt to synchronize carburetors while attached to a flush kit. Synchronize only in a test tank or in the water while secured to your trailer or dock. Idle speed out of the water becomes too erratic to properly adjust.

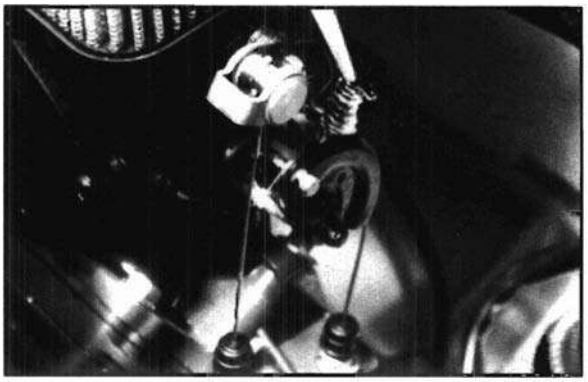
1. Remove rubber caps from carburetor vacuum fitting and attach hoses from manometer or vacuum gauges. **NOTE:** On 1993 and 1994 models with auto cock in place, an external vacuum source must be applied to the vacuum line in order to provide fuel flow. Use Mity Vac™ to apply 5 inches of mercury vacuum to the auto cock. Refer to Information Bulletin PWC-95-03 for more information.

Manometer PN 2870672

Mity Vac™ PN 2870975

Carburetor Synchronization

2. Install tachometer to one of spark plug high tension leads. Adjust idle speed to approximately 1200-1300 RPM using idle speed adjustment screw located near throttle cable mounting.



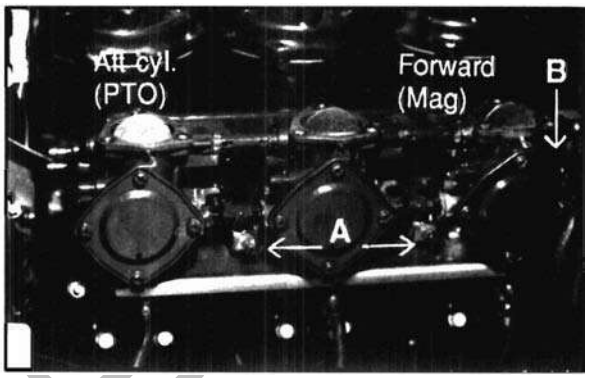
Champion Digital Tachometer
PN 2870788

Idle RPM 1200-1300

Note: On all models except the SLX780, the front (mag) carburetor is the base carburetor. The center and PTa carburetors must be adjusted to the mag carburetor. On the SLX780, the PTa carb is the base carburetor. The center and mag carburetors must be adjusted to the PTa carbo

3. Start the engine and let it idle.

4. Synchronize center and PTa carburetors to mag carburetor by adjusting throttle plate screws in or out (on SLX780, synchronize center and mag carburetors to PTa). When carburetors are correctly synchronized all mercury columns or vacuum gauges will be equal. Check idle speed and throttle lever freeplay and adjust if necessary.



Throttle Lever Freeplay

.020 - .060" (.5 - 1.5 mm)

Manual Carburetor Synchronization

Note: An alternative to synchronization with a manometer is the manual synchronization method. This procedure is accurate when performed carefully and correctly. Manual synchronization can be performed with the carburetors installed.

Be sure to verify and adjust final synchronization with a manometer. Perform this procedure in a well lit area.

Manual Carburetor Synchronization Cont.

Note: 650 and 750 models have the idle adjustment screw located on the Mag (front) end of the carburetors. The adjustment screw is located on the PTO (rear) end of the carburetor on 780cc models. To simplify this procedure we will refer to the carburetor with the idle adjustment screw as #1 , the center as #2, and the side opposite the idle screw as #3.

1. Turn idle screw out until #1 cylinder throttle plate is closed completely. It may be necessary to open the #2 and #3 throttle plates slightly with synchronizing screws to allow the #1 throttle plate to close completely.

2. To verify proper sync, observe all plates and back idle screw out. All plates should close at the same time.

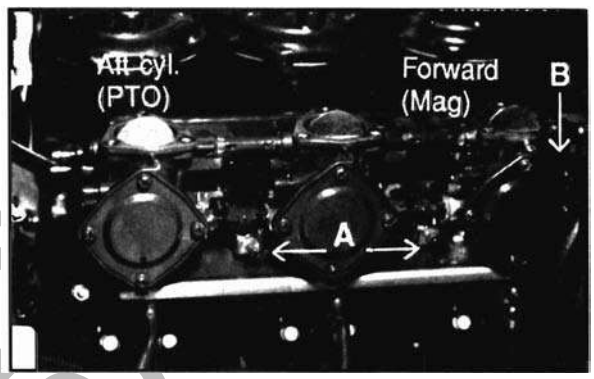
3. Turn idle adjuster screw in while observing bypass port. Turn screw in until port appears at edge of plate on #1 carburetor.

4. Adjust center throttle plate to the same position as #1 plate using synchronizing screw (A).

5. Adjust #3 throttle plate to the same position as the #1 and #2 carbo

6. If carburetors are off the engine, verify proper sync using a 1/16" diameter twist drill or a rigid wire gauge approximately .060" in diameter. Open throttle with idle screw until the drill bit or wire passes under #1 plate with very slight drag. Adjust all carbs in the same manner with sync screws.

7. After adjustment, set idle speed initially by closing plates and turning idle screw back in one half turn.



CAUTION:

Do not damage throttle plate with wire gauge.

8. Readjust throttle lever freeplay.

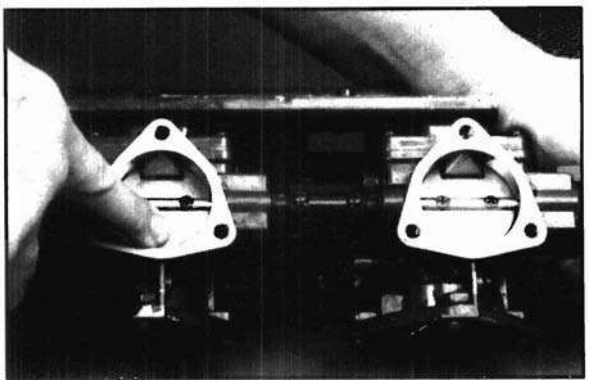
Throttle Lever Freeplay
.020 - .060" (.5 - 1.5 mm)

FUEL SYSTEM/CARBURETION
Carburetor Adjustment and Service - All

Carburetor Mixture Screw Adjustment

Carburetor mixture screws are pre-adjusted at the factory and usually no adjustment is necessary. Exceptions would be after cleaning or overhaul, or when minor adjustments are required for altitude. Refer to carburetor specifications at the beginning of this section and perform the following adjustments.

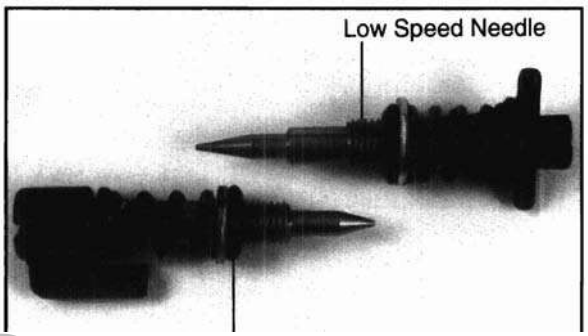
1. Loosen large clamp at air intake silencer and remove it.
2. Secure choke in its closed position using tape or a tie to prevent debris from entering carburetors or engine.
3. Remove air intake cover, (6) screws, air intake screen, gasket, and (9) attaching bolts. Remove air intake base from carburetors.



CAUTION:

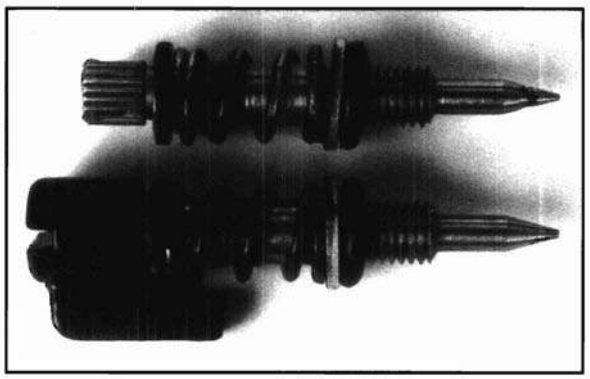
Use care to ensure lock washers are kept with bolts, and cover the carburetors to prevent debris from entering.

4. Remove high speed needle adjustment limiter caps from each carburetor.
5. Turn high speed adjustment needles clockwise until **lightly seated,** then back each out the specified number of turns. **NOTE:** This is a base setting only. Fine tuning may be necessary.



CAUTION:

Do not force the needle into the needle seat. If over-tightened, needle damage will occur, resulting in erratic carburetor performance. In the photo at right, the high speed needle (shown with limiter cap removed) is damaged and must be replaced. Refer to carburetor specifications at the beginning of this section.



Damaged Mixture Needle (Top)

NOTE: Water testing the craft is extremely important. The high speed mixture cannot be accurately determined in a test tank. If operated in a test tank, the wide open throttle settings needed to fine tune the high speed screws may damage the silicone sealant in the pump area.

High speed mixture screw adjustments and tuning must be verified by observing spark plug color under actual conditions. The main jet and high speed mixture screw control fuel mixture between 3/8 and wide open throttle. Test in an area where you can safely and legally operate the craft at full throttle for 10-15 seconds to obtain a spark plug color reading. Remove each spark plug and observe color of spark plug insulator - it should be medium to dark brown.

Adjust mixture screws out (to richen mixture) if plug color is light, or in (to lean) mixture if plug color is black or very dark. Change screw settings in small increments (1/8 turn) and record each new screw setting. Repeat test until a medium to dark brown spark plug color is obtained. NOTE: After obtaining a medium to dark brown color on the plugs, increase mixture screw settings by 1/6 to 1/8 (turn out). This will provide a safety margin for operation under heavy load such as pulling a skier or operating at maximum load capacity. When adjustment is complete, apply a small amount of Loctite 242 to each limiter cap and install onto needles. Position limiter tabs at the midpoint between stops.

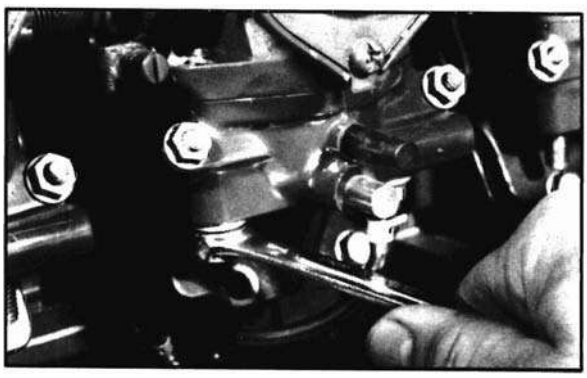
Low Speed Mixture Screw Adjustment (Mikuni and Keihin)

Note: Synchronize carburetors and adjust idle speed precisely with a tachometer (in the water) before adjusting low speed mixture screws.

1. Turn each low speed screw in clockwise to **lightly seat,** then back each out the specified number of turns. See charts at the beginning of this section. **NOTE:** *This is* a *base setting only.* Final adjustment must be made by warming the engine to operating temperature, and adjusting low speed screws in (to lean) or out (to richen) mixture until a smooth idle and good throttle response is obtained.

1992·1994 Carburetor Removal

1. Remove air intake cover, screen, and bolts. Move air intake aside.
2. Remove fuel inlet and outlet lines from carburetor assembly.
3. Remove choke and throttle cables from carburetor assembly.
4. Remove (6) nuts from underside of carburetor assembly and lift carburetors off as a unit.



1992-1994 Carb Removal

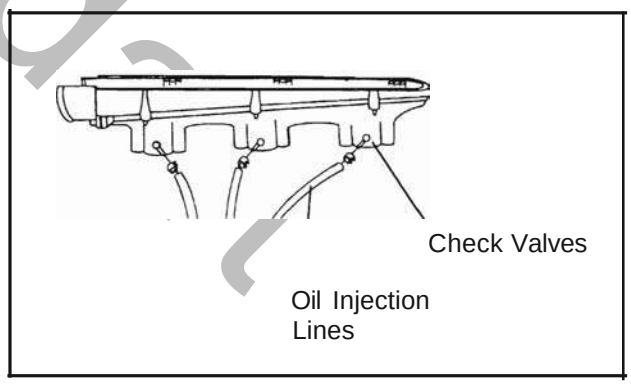
1995 to Current 650, 750 and 780 Carburetor Removal

1. Remove airbox cover screen and intake base bolts.
2. Carefully remove oil injection lines from intake base by removing spring clamps and pulling oil line from injection fittings. Move intake base aside.

Note: On *78Dcc* models, remove air intake silencer (or individual elements) and oil lines at carburetors.

3. Disconnect oil pump rod (where applicable).
4. Loosen (6) nuts from underside of carburetor assembly and lift carburetors off as a unit.

Note: When reassembling be sure to fill oil injection lines with oil, reinstall oil line clamps and install oil lines onto intake base or carbs with spring clamps.

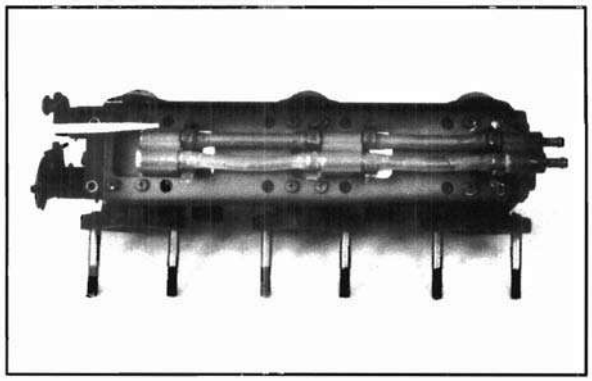


1995 Oil Line Location

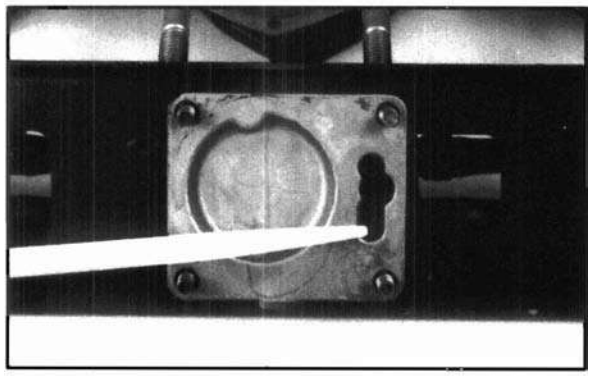
FUEL SYSTEM/CARBURETION
Carburetor Disassembly· Mikuni

Disassembly

1. Loosen four screws from each fuel inlet/outlet chamber. Continue to remove all screws evenly. The connecting plate need not be removed.



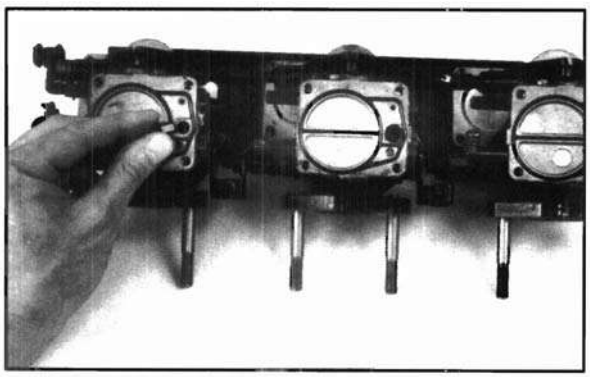
2. Lift the chambers off as an assembly. Blow all passages clean with compressed air (100 PSI max.) Note the fuel return restrictor orifice in each chamber.

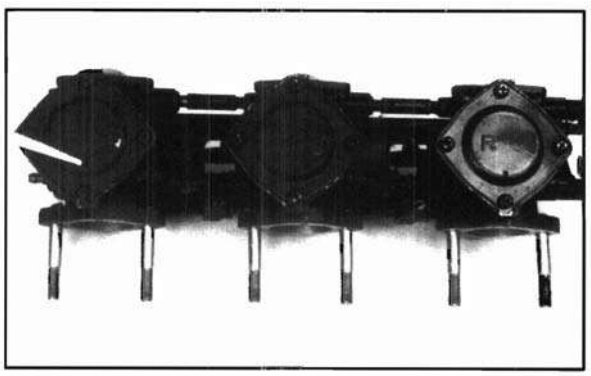


CAUTION:

During carburetor disassembly do not remove choke/ throttle butterflies or shafts. The plate retaining screws are staked to prevent loosening. Be extremely careful to ensure paint chips do not get inside the carburetors, resulting in clogged jets and/or passages.

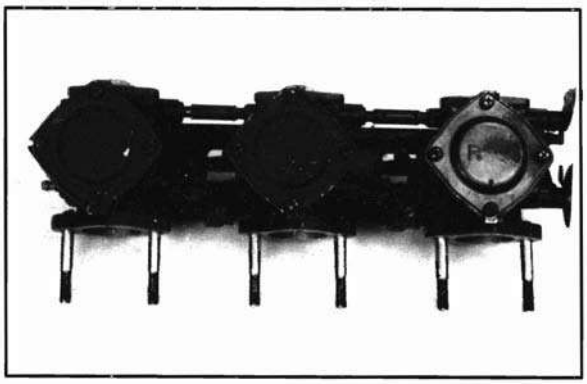
3. Pull out each fuel inlet screen and clean or replace them. The presence of water or debris will cause lean operating conditions. Remove the chamber O-ring and inspect it for any sign of damage. Distortion or damage will result in a lean operating condition.



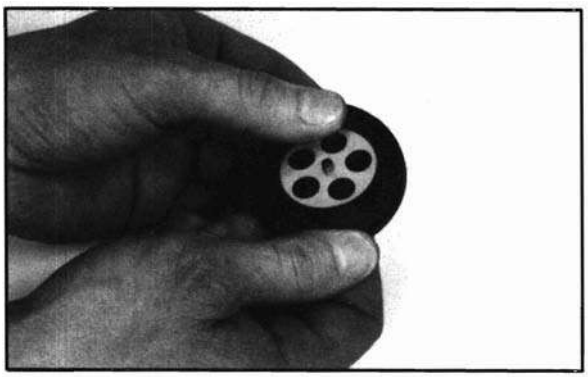


Disassembly

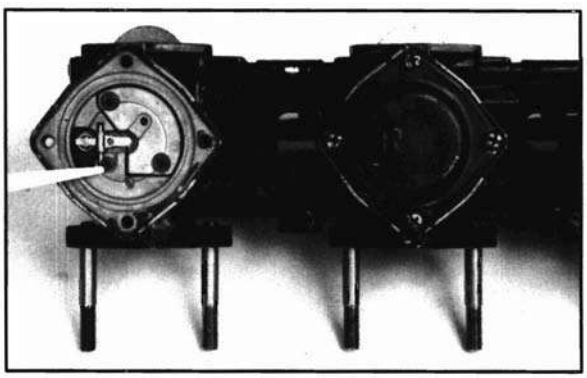
4. Remove the (4) diaphragm cover screws at each cover and lift off the diaphragm covers.

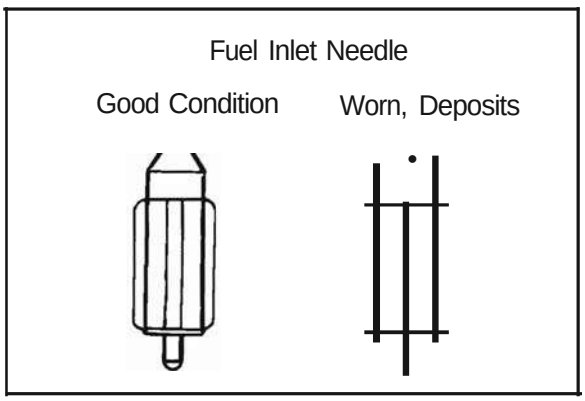


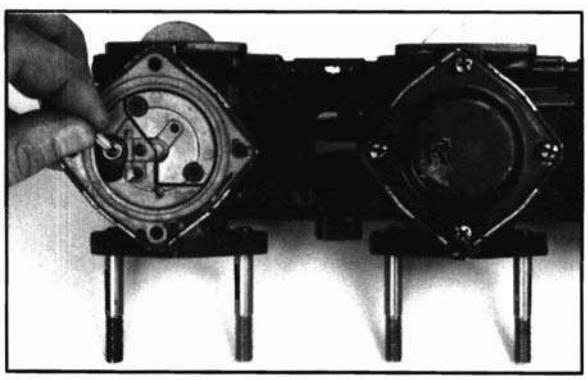
5. Remove each diaphragm and look for signs of hardening, stretched or weak areas, holes or tears. Replace if necessary.



6. Remove screw holding inlet needle control arm pin, and remove inlet needle control arm, pin, spring, and inlet needle. Inspect for wear at the pin, needle tip, or arm. Be sure the spring is in good condition. Replace any parts found to be worn or damaged.

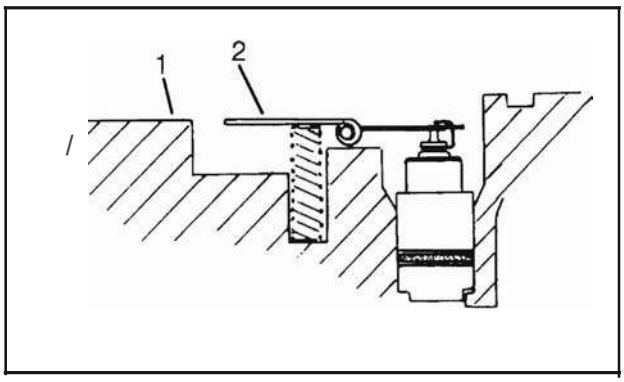






Disassembly

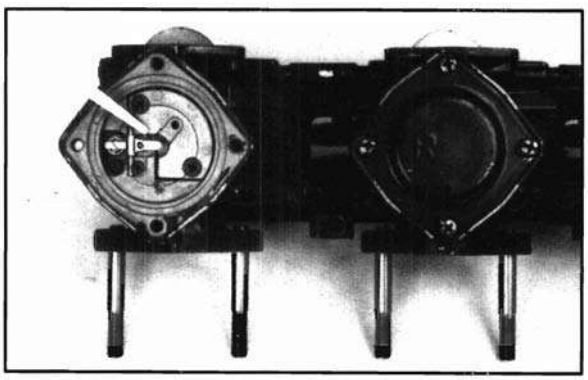
Note: Control arm #2 should be parallel to casting #1 as per illustration at right. Variances in control arm positioning will result in incorrect fuel supply. If the control arm is too close to the diaphragm, fuel levels will increase, resulting in a rich operating condition. If the control arm is below the casting parallel line a lean condition will result.



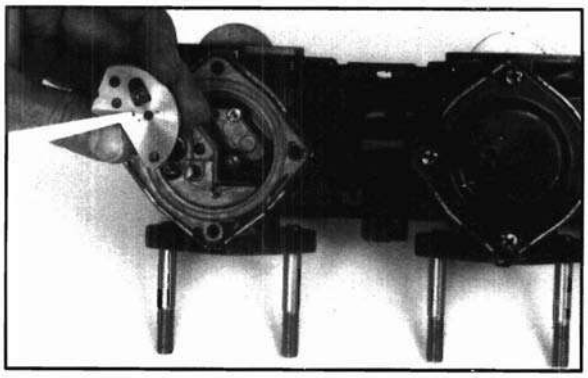
7. Remove the jet cover block/check valve assembly.

Note: The (2) attaching screws are secured with Loctite™, and may require the use of an impact driver to loosen screws without stripping the heads. To ease removal, leave one of the screws in the block and grasp it to tip the block assembly out of the carb body.

Note: Always remove this jet cover block if water is suspected to be in the system. Water will become trapped here and will not pass through the jets, resulting in a lean operating condition which cannot be adjusted.

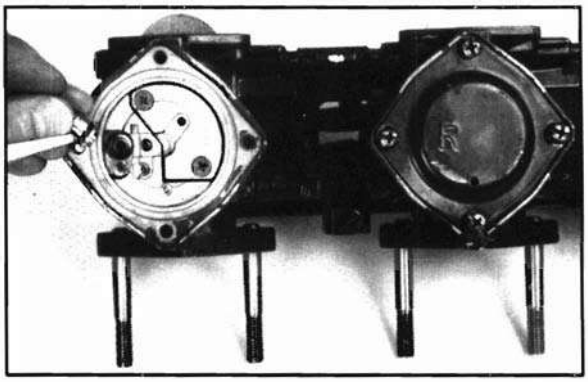


8. Check valve must at all times be flat to jet cover block. (Distorted valves may cause lean conditions and hard starting.) Replace valve if it becomes warped or damaged in any way.

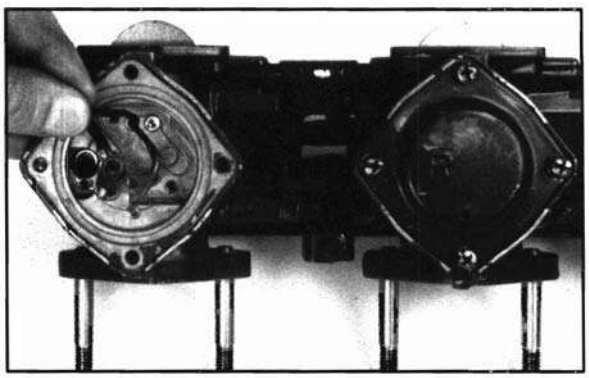


Disassembly

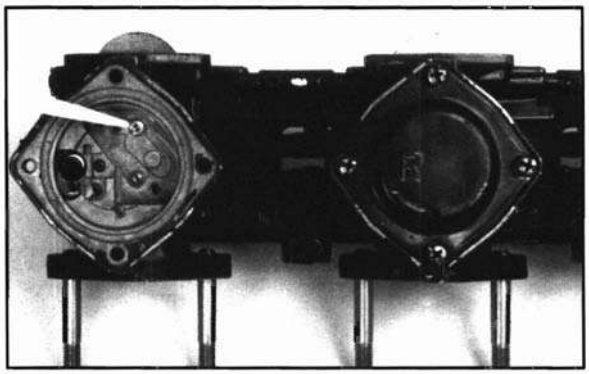
9. Remove the main jet, the pilot jet, and the needle valve seat.



10. Remove jet cover block O-ring.



11. Remove main jet.

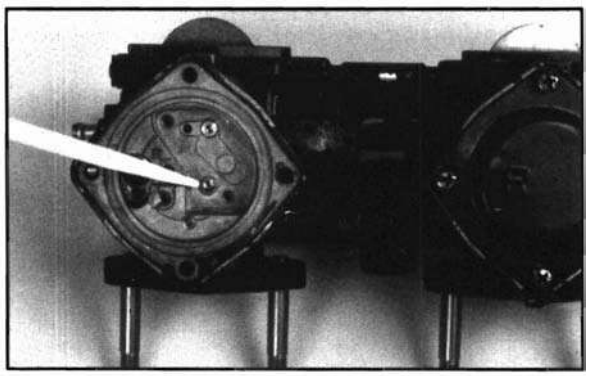


12. Remove pilot jet.

13. Blow all passages clean with compressed air and inspect components for damage or wear. Replace if necessary.

14. Remove needle valve seat. A new O-ring should always be used when reassembling the needle valve seat.

Note: For ease of pilot jet removal use a toothpick to lift it up and out of the carb body.

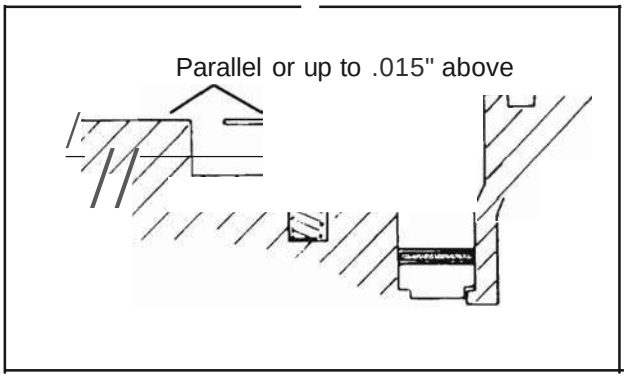


Carburetor Assembly - Mikuni

Assembly

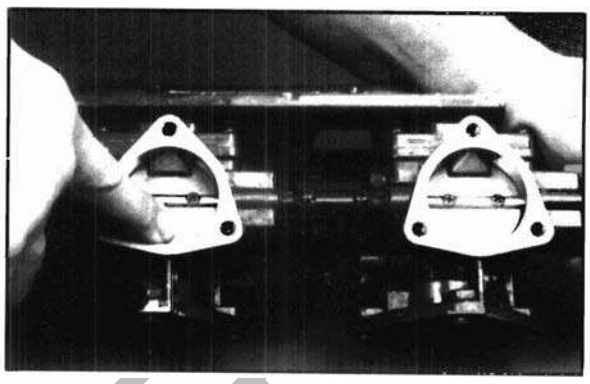
1. Reassemble carburetors in reverse order of disassembly keeping in mind the following:

   - Maintain cleanliness at all times, especially watching for paint chips caused by cover removal.
   - Proper needle valve control arm level, even with jet block surface or up to .015" above.
   - Do not apply pressure on top of the needle valve assembly during adjustment.
   - Use Loctite™ 242 to prevent corrosion of bolts in carb blocks and diaphragm cover.
   - Manually synchronize carburetors (see procedure this section).
   - Center the choke plates after carburetors are installed on engine.

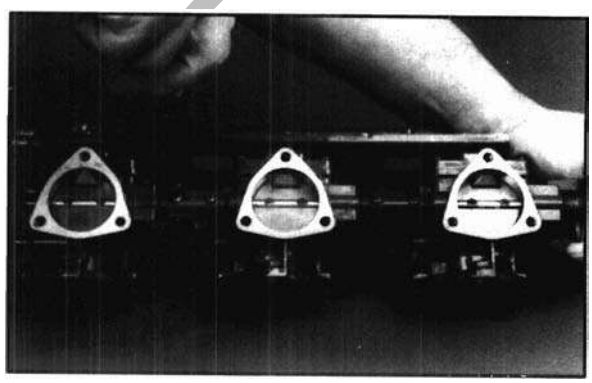


Choke Plate Centering

1. With carburetors installed, close choke plates completely and secure in place.



2. Loosen shaft screws and center each plate.
3. Tighten screws. The choke plate should close off the carburetor opening completely when closed.
4. Release choke and check operation. **All** choke plates should return qUickly to fully open (vertical) when knob is released.



Mixture Screw Adjustment

• See page 3.93

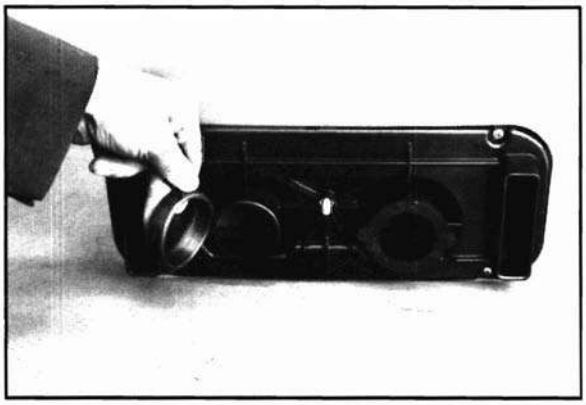
CAUTION:

When servicing Polaris carburetors, replace parts with genuine Polaris parts only. Serious engine damage may occur if genuine Polaris parts are not used. Always inspect fuel system components during disassembly.

Carburetor Removal

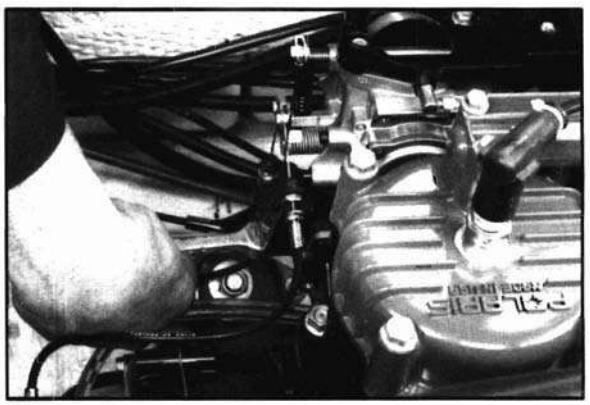
Note: Twin cylinder model shown. Differences noted where applicable for SL900 and SLTX.

1. Remove bolt securing air intake silencer assembly.



2. Inspect flange seal for damage or distortion.

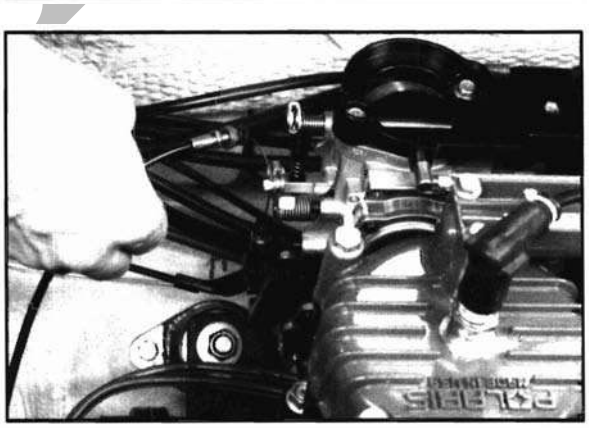
3. Loosen throttle and choke cable adjuster nuts and remove each cable from the bracket and shaft arm.



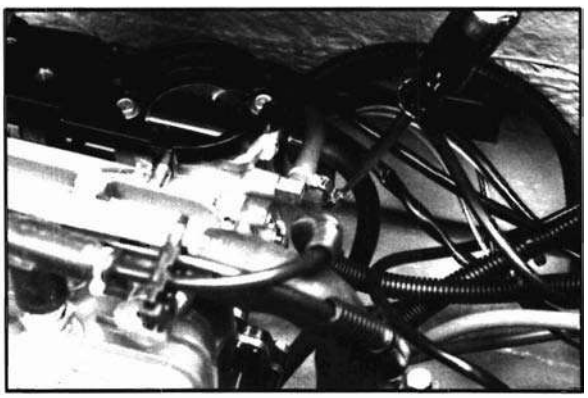
CAUTION:

Do not kink cable when removing.

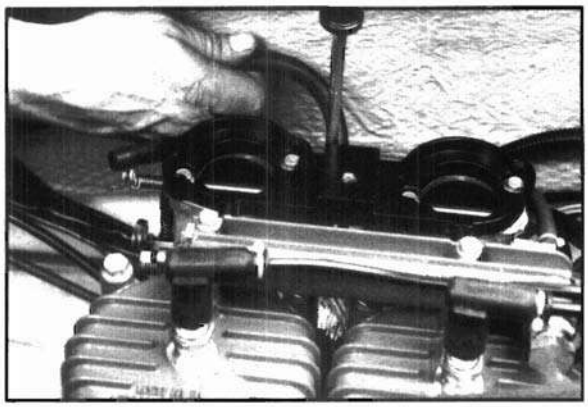
4. Remove oil pump cable from bracket and throttle shaft arm.



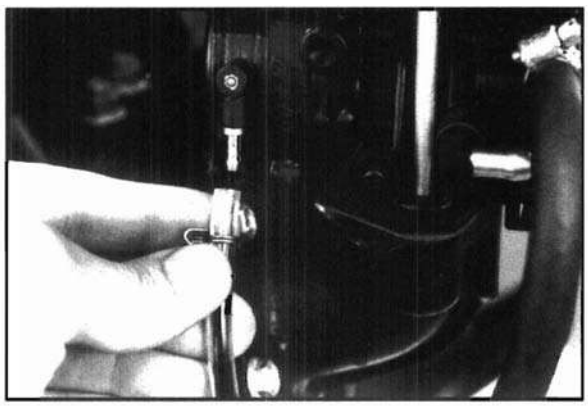
5. Loosen clamp and remove fuel supply line.



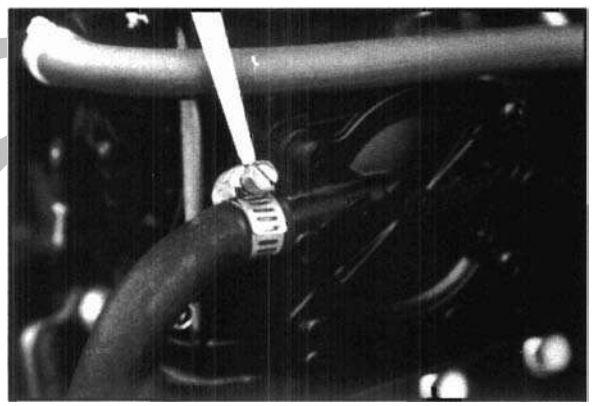
6. Loosen clamp and remove fuel return line.



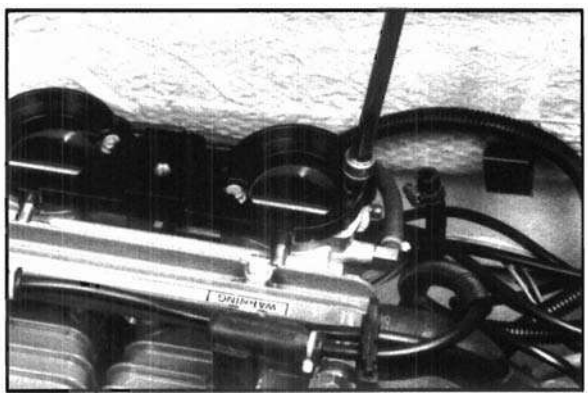
7. Remove oil lines from carburetors.



8. Loosen clamp and remove fuel pump impulse line.

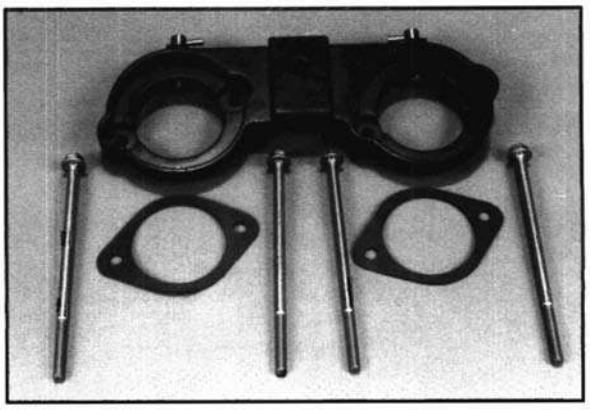


9. Remove carburetor mounting bolts and lift air intake silencer base with bolts.

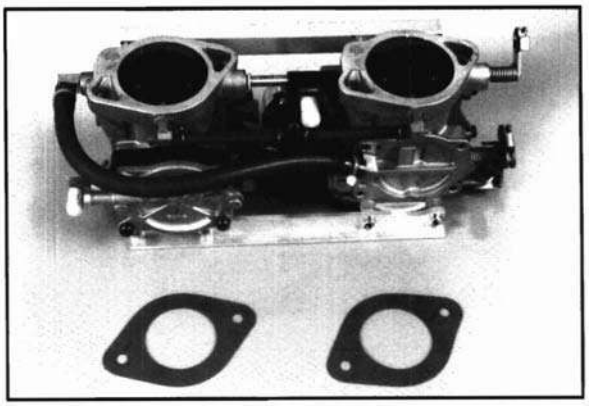


1. Inspect condition of intake silencer base plate gasket. Replace upon reassembly. Note the position of the intake base for reassembly.

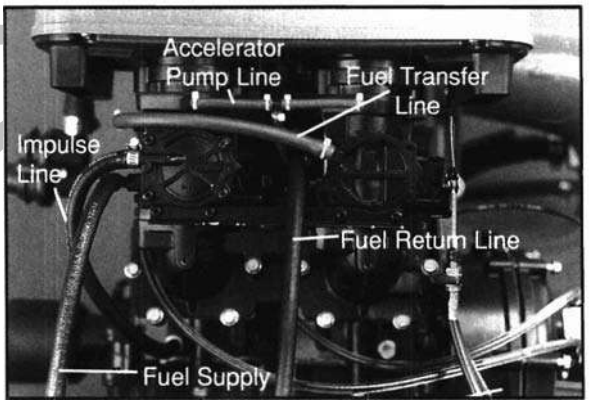
2. Remove carburetor assembly.



3. Inspect condition of carburetor base gaskets and replace upon reassembly.



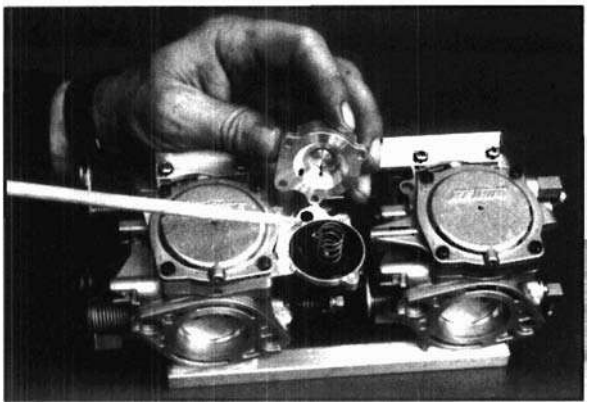
Twin cylinder line connections shown at right.
Refer to page 3.52a and 3.52b for 3 cylinder line connection diagrams and routing.



Carburetor Disassembly/Inspection

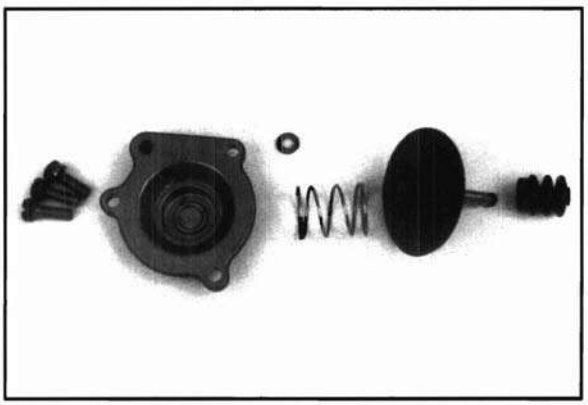
13. Remove accelerator pump cover (where applicable).

Note: The cover is under spring tension. Support during removal.

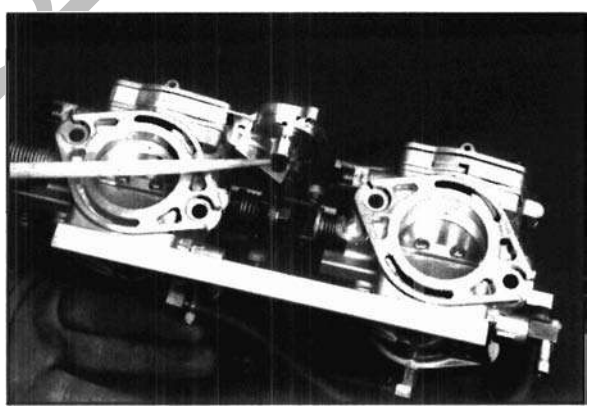


14. Inspect passage sealing O-ring and replace if worn or damaged. The flat surface of the O-ring faces the pump body (away from cover).

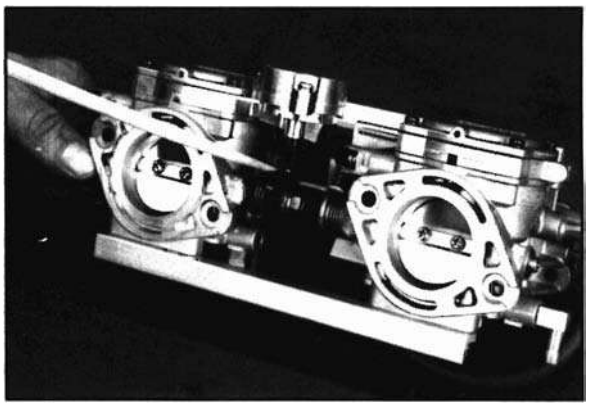
15. Remove accelerator pump components including spring, diaphragm, dust boot, and O-ring.



16. Check guide bushing in pump body and replace front carburetor jet block assembly if worn. The bushing is not replaceable.

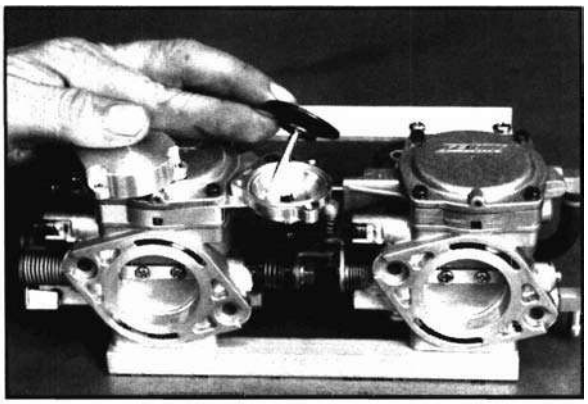


17. Check surface of actuator cam and replace if worn.

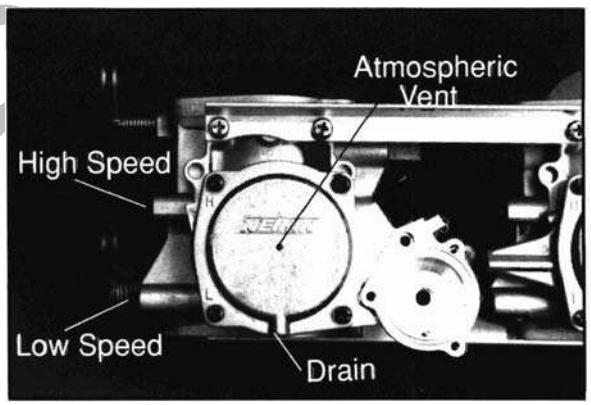


18. Inspect pump diaphragm for cracks, distortion or damage. Replace accelerator pump assembly if damaged.

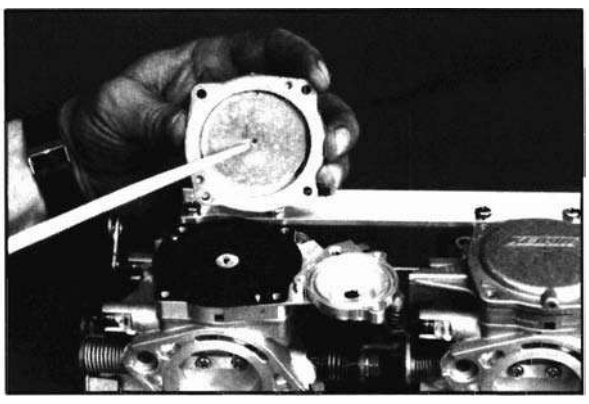
19. Clean all passages. See carburetor cleaning, page 3.82.



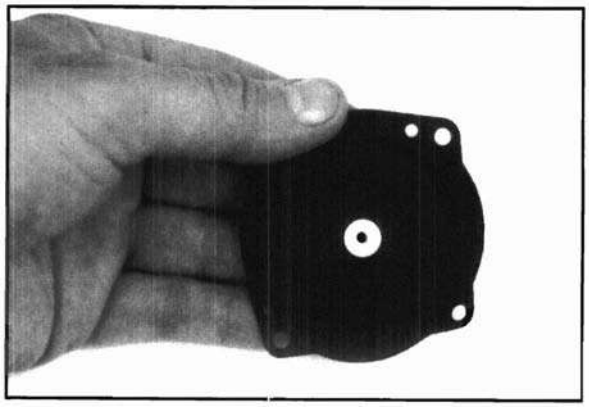
Note: Before removing metering diaphragm cover, note position of water drain and high (where applicable) and low speed screw indicators.



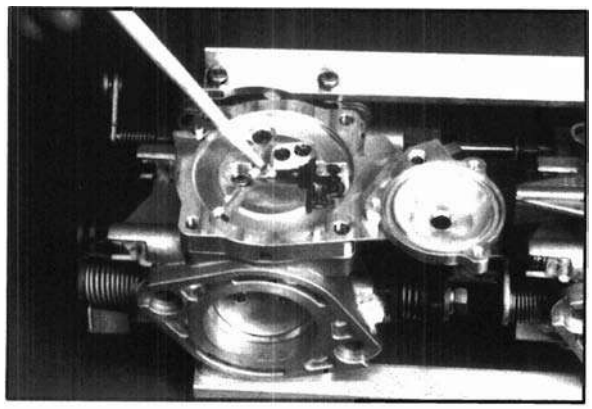
20. Remove metering diaphragm cover and check to make sure the atmospheric vent is clear.



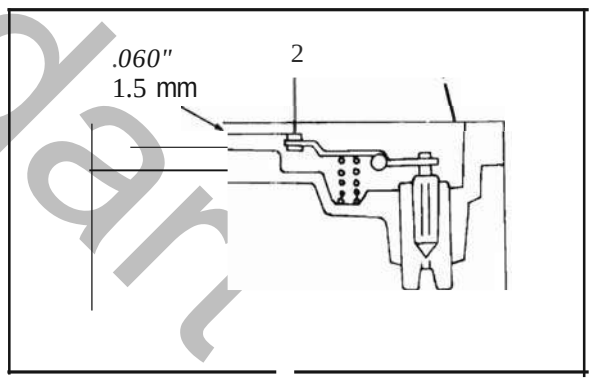
21. Inspect diaphragm for signs of hardening, stretched or weak areas, holes, or tears.



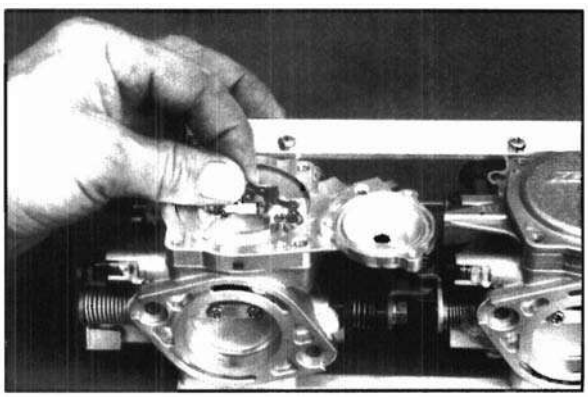
22. Measure control arm height from machined surface to top of plastic button on control arm.



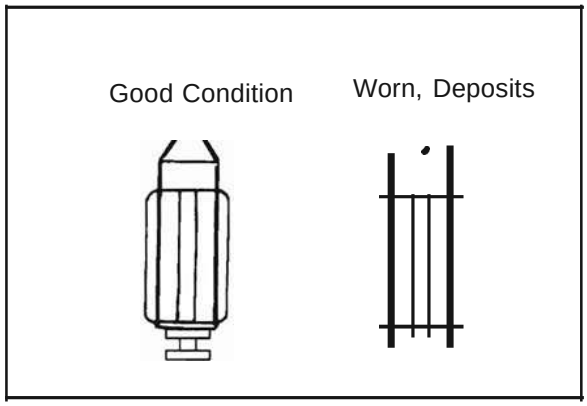
Note: Top of plastic button #2 should be .060 "(1.5 mm) below casting surface #1 as per illustration at right. Variances in control arm positioning will result in incorrect fuel supply. If the control arm is too close to the diaphragm, fuel levels will increase, resulting in a rich operating condition. If the control arm is too far below the casting parallel line a lean condition will result.



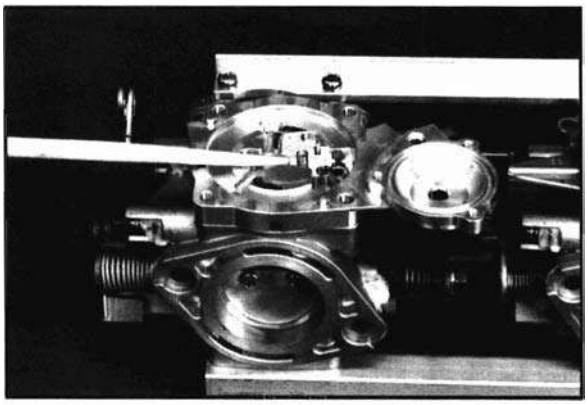
23. Loosen screw and remove control arm and inlet needle.



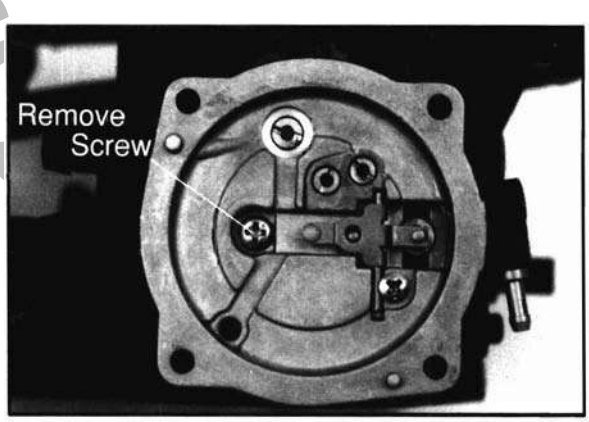
24. Inspect inlet needle for wear, damage, or foreign material.



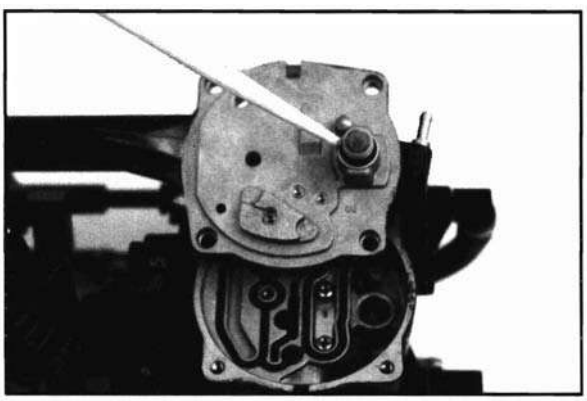
25. Inspect needle seat for wear or foreign material. Clean or replace jet block if seat is damaged. Inspect control arm return spring. Replace if corroded, damaged, or distorted.



26. Remove screw and carefully lift jet block from carb body.



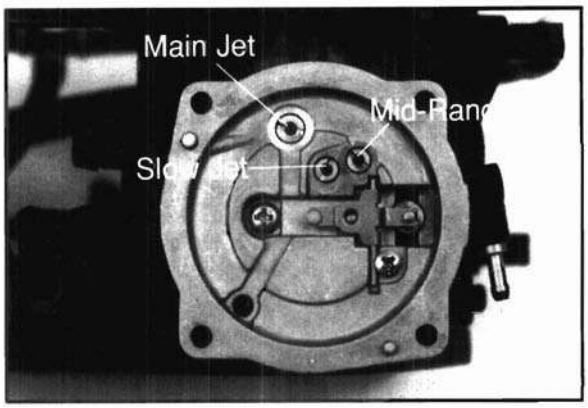
27. Inspect needle seat O-rings for damage. Replace O-rings upon reassembly. Clean screen of debris or replace if torn or damaged.



1. Note position of main, mid-range (where applicable), and slow jets in jet block. Removal is not necessary for cleaning. Inspect each jet for residue, varnish, or corrosion. Replace jets if build up of varnish, residue, or corrosion is present.

Note: Even a small amount of residue will reduce the flow characteristics of the jet. Be sure jet is thoroughly cleaned or replace if corroded or questionable.

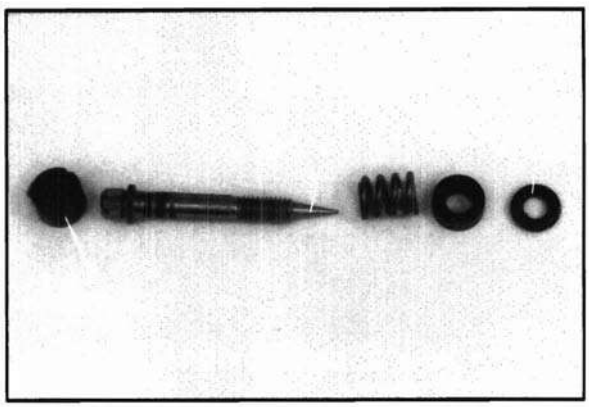
Note: Main jet is located on the other side of the jet block on some models. Note position of jets for reassembly.

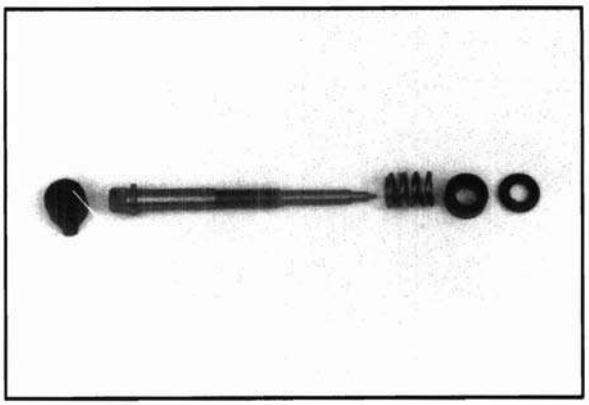


2. Note position of limiter caps on high (if applicable) and low speed mixture screws. Carefully remove the caps (pull off). Turn each mixture screw in (clockwise) while counting the exact number of turns until lightly seated. Record the number for future reference. Remove high speed and low speed mixture screws, springs, washers, and O-rings. Carefully inspect the tip of each needle for wear or damage. Replace if necessary.

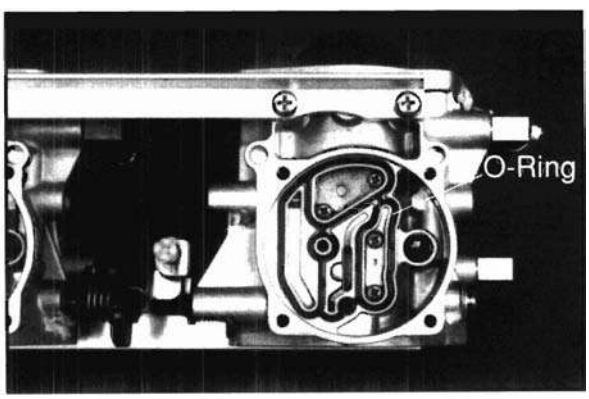
CAUTION:

Do not force screw past lightly seated or screw and/or carburetor body will be damaged.

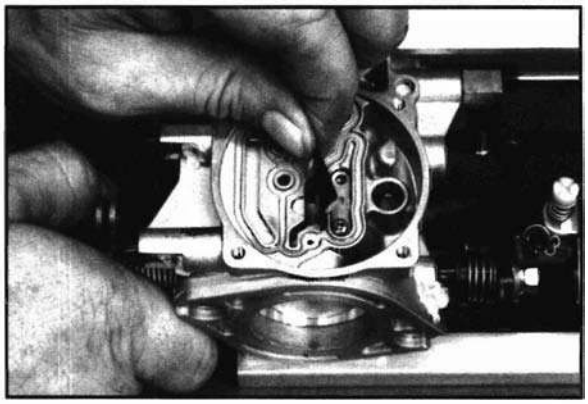




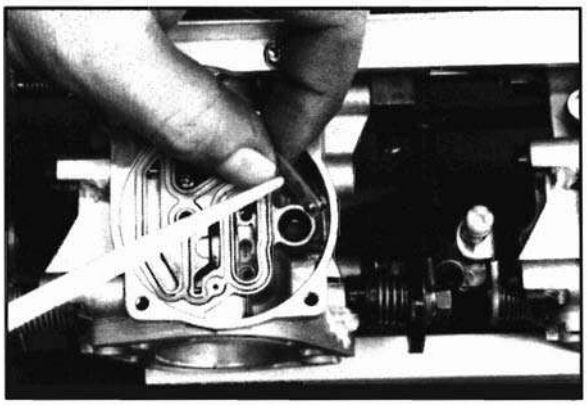
3. Inspect condition of jet block sealing O-ring. Replace upon reassembly.



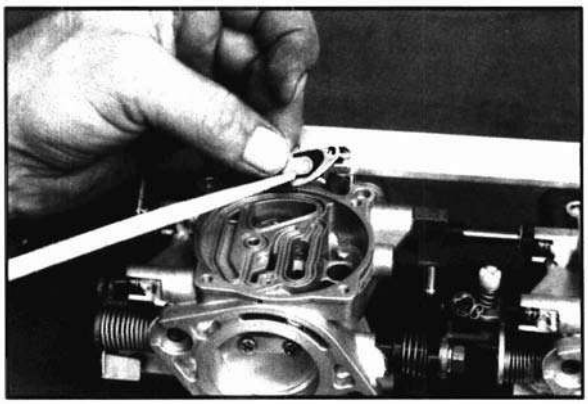
31. Tip carburetors and remove bypass port cover.



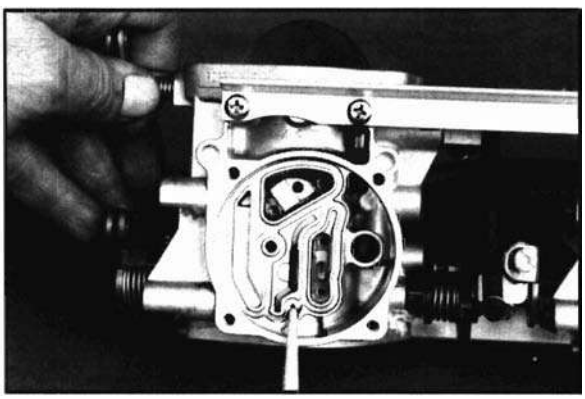
32. Remove mid-range jet anti-siphon valve cover plate and inspect the valve (where applicable). The valve must lay flat against the plate to seal properly. Replace if distorted or bent. Replace gasket if torn or damaged.



33. Remove main jet anti-siphon valve cover plate and inspect the valve. The valve must lay flat against the plate to seal properly. Replace if distorted or bent. Replace gasket if torn or damaged.



34. Note location of idle discharge port.



Carburetor Disassembly/Inspection· Keihin

Cleaning

1. Thoroughly clean all passages with carburetor cleaner or electrical contact cleaner.

⚠ WARNING

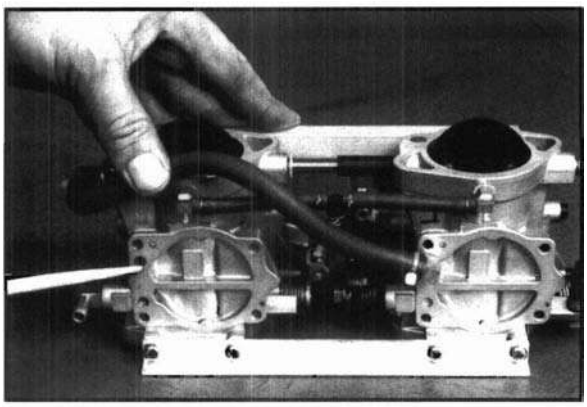
Wear eye protection when using compressed air or chemical spray cleaners. If you get cleaner in your eyes or if you swallow cleaner, see your doctor immediately. Some carburetor cleaners are extremely caustic and extended periods of soaking can loosen the adhesive sealer on passage drill-way plugs. *Do not* soak rubber or plastic components (such as diaphragms, needle seat screen, or O-Rings in caustic cleaning solutions. Irreparable damage will occur. Do not use agitator type carburetor cleaning equipment. Rubber parts must be cleaned with mild detergent and hot water only.

2. If the carburetor is extremely dirty or contaminated with fuel residue and varnish, soak for short periods only in carburetor cleaner, and rinse in hot water.
3. Replace the jets if they are extremely dirty or have a buildup of fuel residue, corrosion, or fungus. Even a small amount of foreign material will reduce the flow characteristics of a jet.
4. Verify all passages and jets are unobstructed by spraying electrical contact cleaner through the passages.

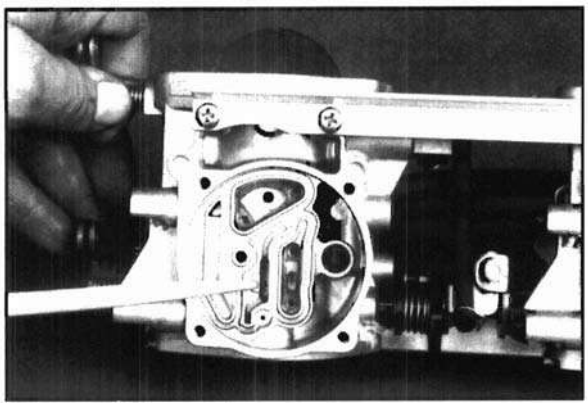
CAUTION:

Do not use wire or welding tip cleaners on the jets as the orifice size may be altered.

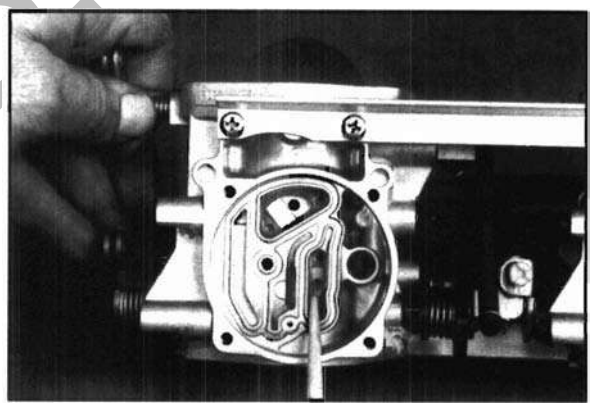
5. Use low pressure air to dry carburetor body and all components.



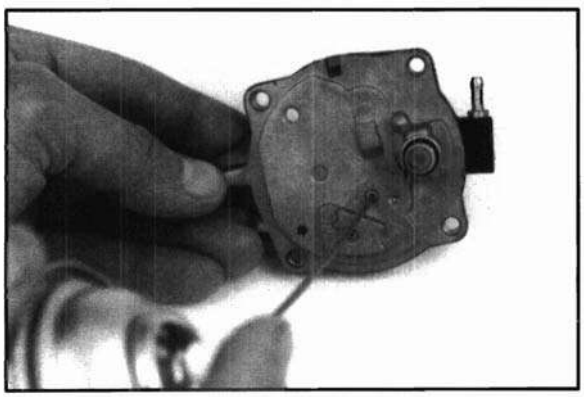
Clean Fuel Passages...



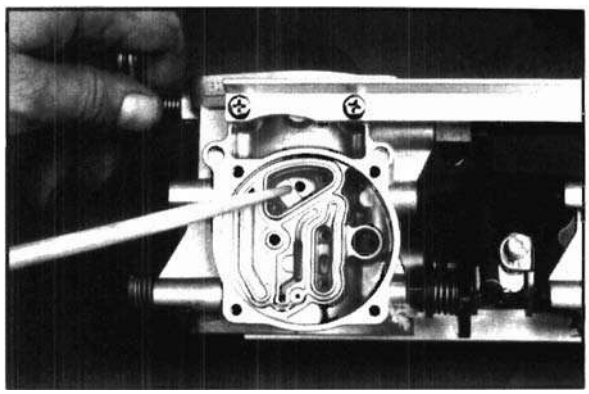
Bypass Ports...



Mid-Range Ports... where applicable



And All Jets...

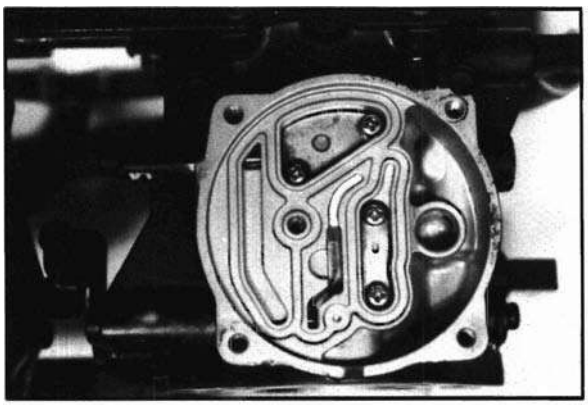


Main Discharge Nozzle...

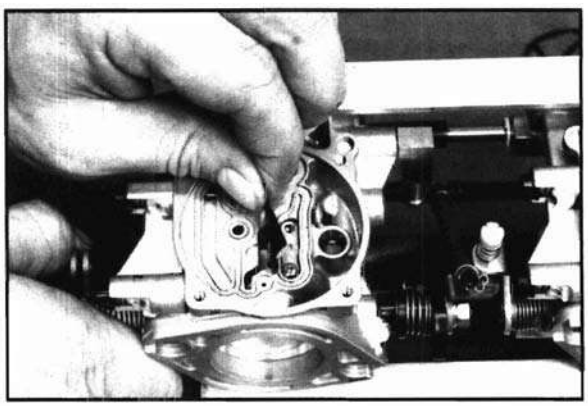
Note: When assembling carburetors, keep in mind the following:

- Maintain cleanliness at all times, especially watching for paint chips caused by cover removal.
- Proper needle valve control arm level, set to specification.
- Do not apply pressure on top of the needle valve assembly during adjustment.
- Use Loctite™ 242 to prevent corrosion of carburetor mounting bolts and diaphragm cover.
- Manually synchronize carburetors (see procedure this section).

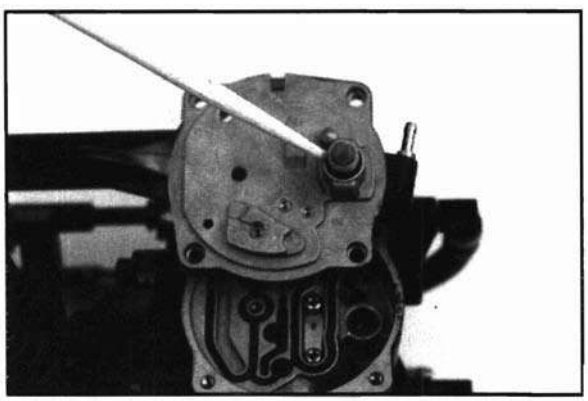
1. Install O-ring and anti-siphon valves with plates.



2. Install bypass port cover.



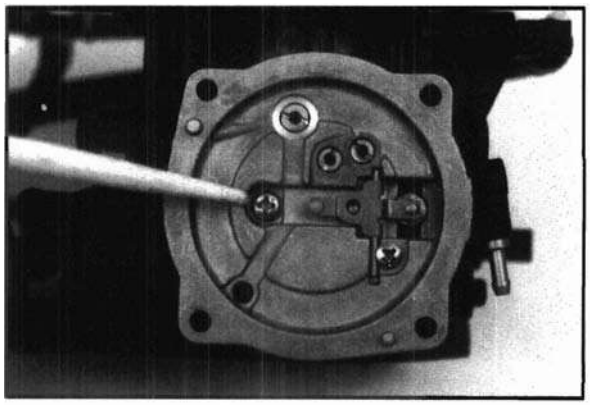
3. Install screen and new O-rings on inlet needle seat. Lubricate O-rings with Polaris Premium 2 Cycle Lubricant.



Polaris Premium 2 Cycle Lubricant

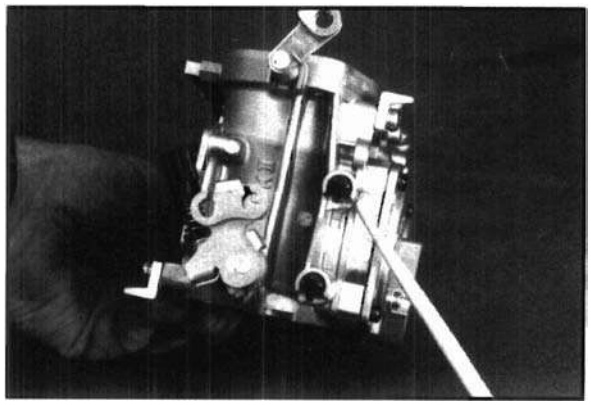
PN 2871098

4. Install jet block and tighten screw securely.



5. Grease high and low speed mixture screw a-rings. Install a-rings, washer, spring, and screw(s).

6. Turn screw in until *lightly* seated and then back it out the number of turns recorded during disassembly. If number was not recorded, turn out to the specified base setting found on page 3.3 - 3.5. Install limiter cap(s) with tab positioned midway between the stops.



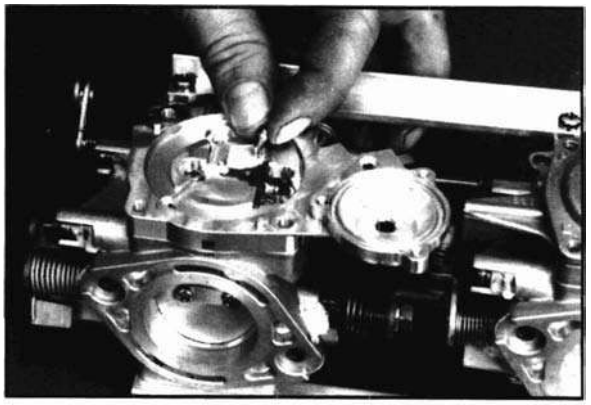
Note: These are initial settings from which additional fine tuning may be necessary.

CAUTION:

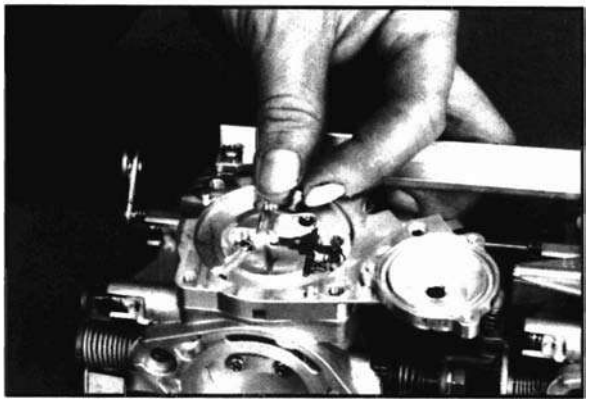
Do not force screw past lightly seated or screw and/or seat will be damaged. Operation of the craft with mixture screws improperly adjusted (too lean) may cause serious engine damage. Always read spark plugs under actual operating conditions after assembly to verify proper mixture.

7. Lubricate and install inlet needle, lever arm, and spring. Tighten screw securely. Inspect lever arm height outlined on page 3.78 and adjust if necessary.

1. If jets were removed, install mid-range jet where applicable...

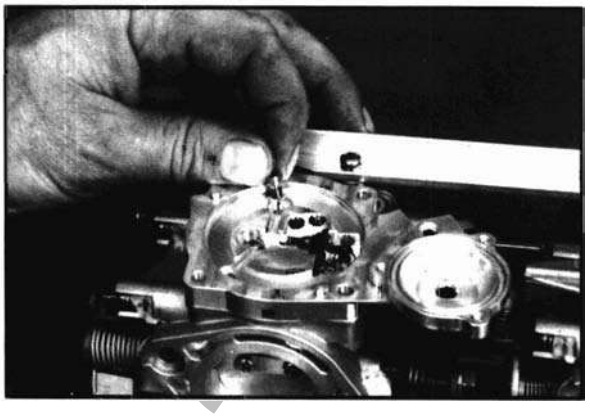


slow jet...

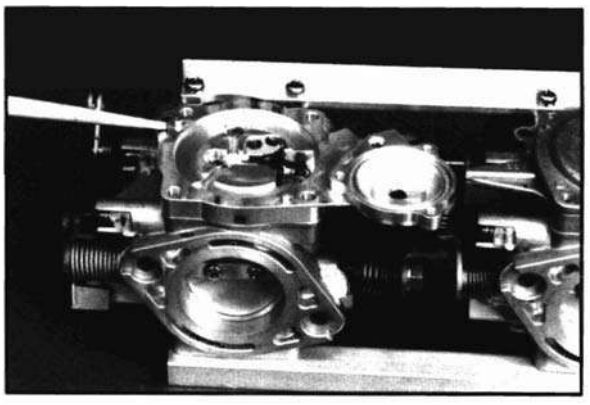


and main jet.

Note: The main jet is located on the reverse side of the jet block on some models.

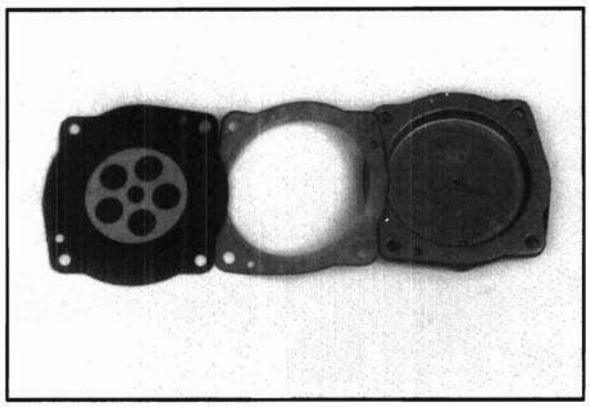


2. Install metering diaphragm and *then* gasket. aligning holes in diaphragm and gasket with pins.



10. Apply Loctite 242 (Blue) to screws and install diaphragm cover with drain hole facing downward, toward throttle plate.

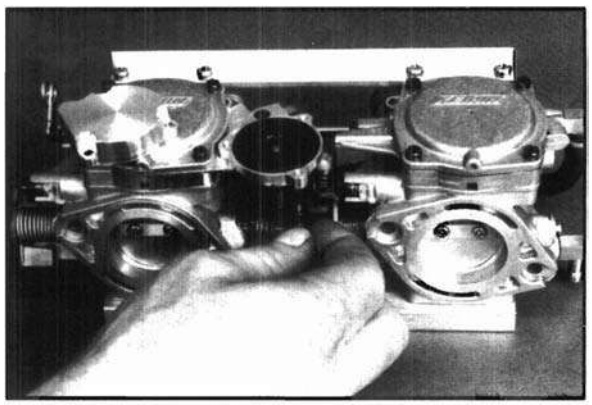
11. Lightly grease actuator cam and shaft of accelerator pump diaphragm (if equipped).



12. Install diaphragm and dust boot. Install O-ring with flat side facing the pump body (away from cover).

13. Install spring and cover. Tighten screws securely.

14. Grease all exposed shafts and springs with Polaris Premium All Season Grease.



Polaris Premium All Season Grease

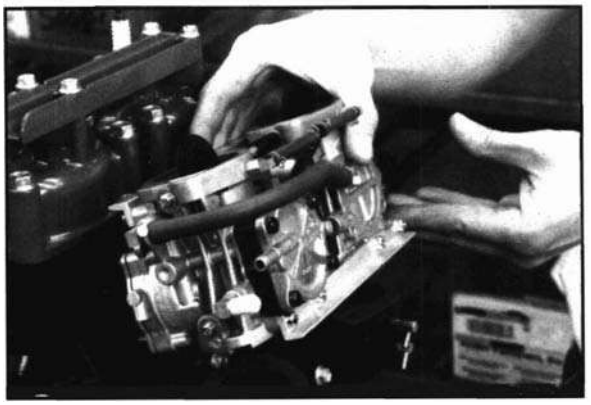
PN 2871322 3 oz. Cartridge
PN 2871423 14 oz. Cartridge

15. Synchronize carburetcrs. See page 3.89.

Carburetor Installation

1. Place new gaskets on intake manifold.

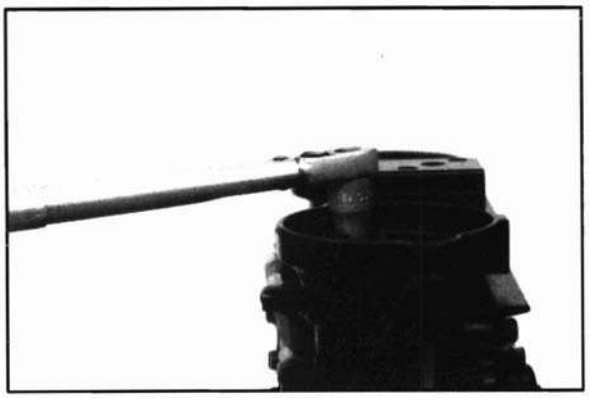
2. Carefully set carburetors in place.



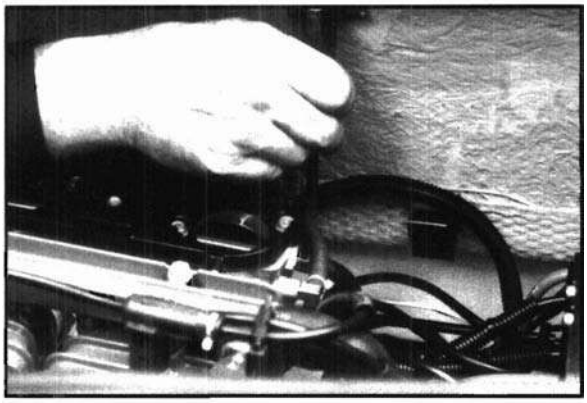
3. Install intake silencer base with new gaskets. The silencer bolt flange must be positioned as shown towards the engine.

4. Apply Loctite™ 242 Blue to mounting bolts. Install bolts aligning all gaskets. Torque to specifications.

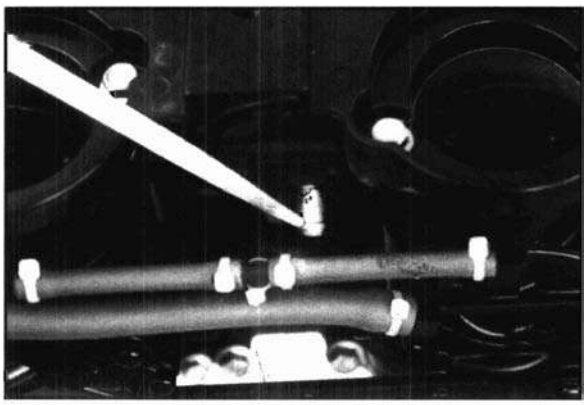
Carb Mounting Bolt Torque -
Apply Loctite 242 Blue
108 in. lbs. (1.25 kg-m)



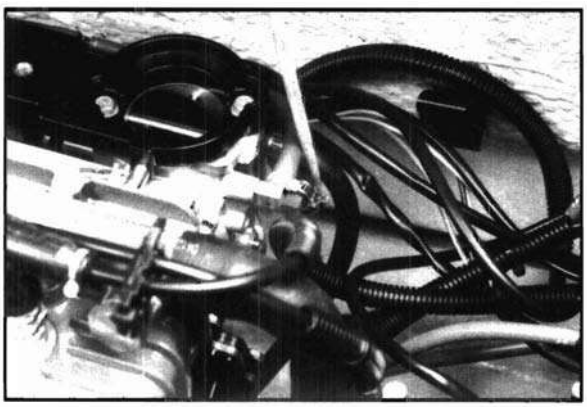
5. Install impulse line...



Fuel return line...



and fuel line.



6. Tighten clamps to specified torque.

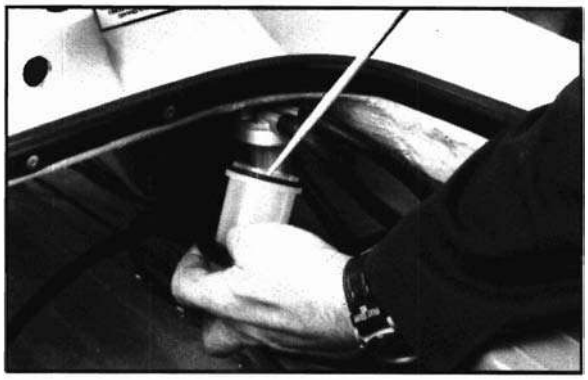
Fuel Line Clamp Torque -

10 in. lbs. (.14 kg-m)

7. Install and adjust throttle cable, choke cable, and oil pump cable. Referto page 3.91 for adjustment procedure.

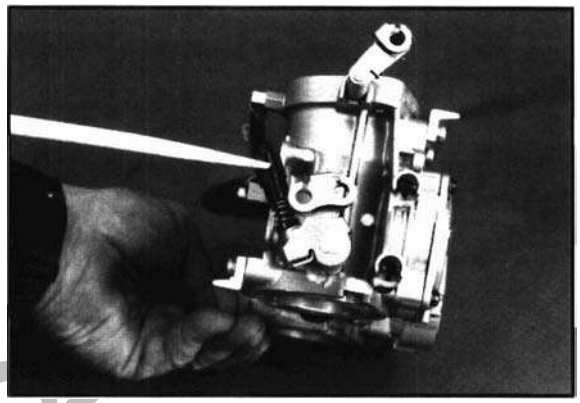
IMPORTANT: Priorto performing any adjustments to carburetors check the following:

- Verify that no water is present in the fuel system. Check the water trap for presence of water.
- Verify all fuel and vent lines are routed and secured properly.
- Verify all seal and gaskets are in good condition (no air leaks present).
- Check engine compression (see engine section).
- Verify proper fuel flow (Le. fuel flow through shut off valve passages, tank, lines, and filters).
- Synchronize carburetors; inspect throttle plates (butterfly) for damage.



Carburetor Synchronization· Twin Cylinder Models

1. Using a .040-.060" rigid wire as a gauge, turn idle speed adjuster screw in until gauge fits beneath throttle plate.
2. Turn idle adjuster screw out until there is a very slight drag on the gauge.
3. Open throttle plate and remove gauge.



CAUTION:

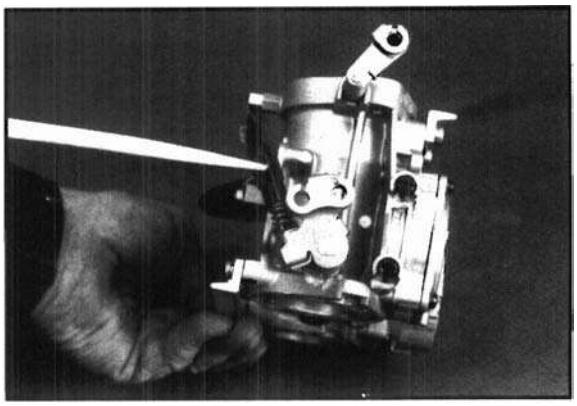
Do not remove wire gauge with tension on throttle plate or damage to plate may result.

4. Adjust PTa end throttle plate to same position as Mag end plate using synchronizing screw. Turn until there is very slight drag on gauge.
5. Open throttle plate and remove gauge.
6. Turn idle screw out (counterclockwise) while observing both throttle plates. They should close completely at the same time. Readjust if necessary.
7. Turn idle speed screw in 1 turn from closed position as an initial idle speed setting. Final idle speed must be adjusted with craft in the water.

Idle Speed (in water)

Refer to pages 3.3 - 3.5 for specification

Carburetor Synchronization· Three Cylinder Models

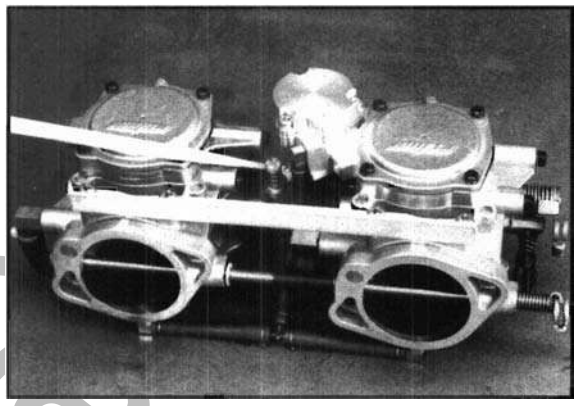


1. Using a .040-.060" rigid wire as a gauge, turn idle speed adjuster screw in until gauge fits beneath the Magneto end throttle plate.
2. Turn idle adjuster screw out until there is a very slight drag on the gauge.
3. Open throttle plate and remove gauge.

CAUTION:

Do not remove wire gauge with tension on throttle plate or damage to plate may result.

4. Adjust center carburetor throttle plate to same position as Mag end plate using synchronizing screw. Turn until there is very slight drag on gauge.
5. Open throttle plate and remove gauge.
6. Adjust PTO end carburetor throttle plate to same position as center and Mag end plate using synchronizing screw. Turn until there is very slight drag on gauge.
7. Open throttle plate and remove gauge.



8. Turn idle screw out (counterclockwise) while observing all throttle plates and idle ports. All plates should pass the ports at the same time and then close completely at the same time. Readjust if necessary.
9. Turn idle speed screw in 1 turn from closed position as an initial idle speed setting. Final idle speed must be adjusted with craft in the water.

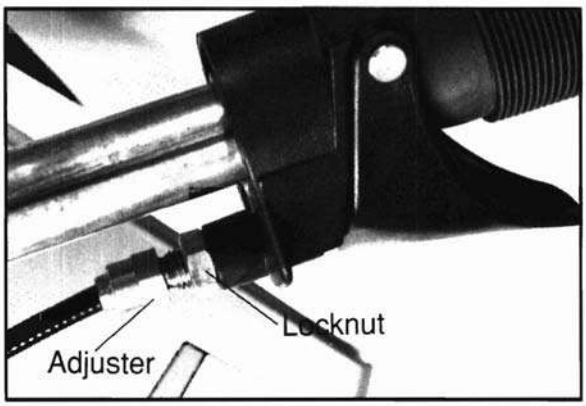
Idle Speed (In water)

Refer to pages 3.3 - 3.5 for specification

Throttle Cable

Minor adjustments to throttle cable freeplay can be performed at the throttle cable adjuster screw on the handlebar.

1. Loosen lock nut.
2. Turn adjuster screw in (to increase) or out (to decrease throttle cable freeplay until adjusted to specification.



Throttle Lever Freeplay -
.020 - .060" (.5 - 1.5 mm)

Major adjustments must be performed at the carburetor end of the throttle cable.

1. Loosen nuts and adjust throttle cable until lever freeplay is within specified range.
2. Tighten nuts securely and recheck adjustment.

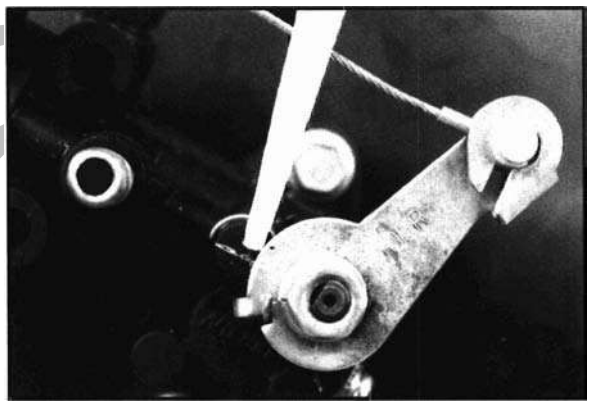
Choke Cable

Choke cable adjustments are made by turning the cable lock nuts at the carburetor. The choke knob should just touch the bottom of its travel when the choke plates are open completely (vertical).

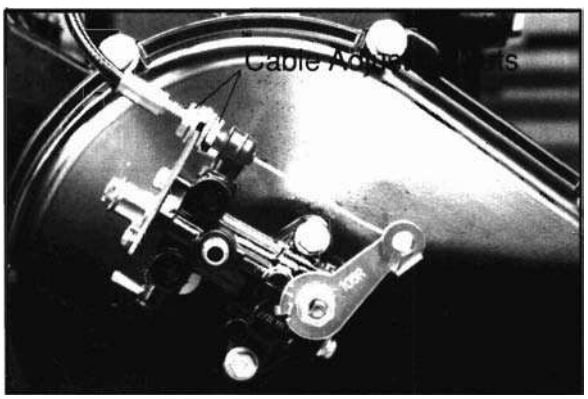
Oil Pump Cable

Note: Adjust idle speed and throttle lever freeplay before performing oil pump adjustment.

1. Inspect mark on oil pump lever and index mark on oil pump body. The marks should align with throttle released (idle speed).



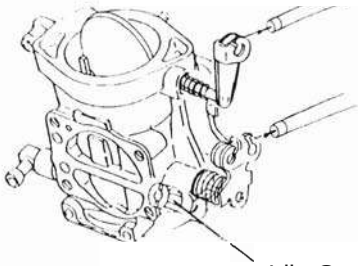
2. If marks are not aligned, loosen cable adjuster nuts and adjust until marks are aligned.
3. Tighten nuts securely and recheck adjustment.



FUEL SYSTEM/CARBURETION
Mixture Screw Settings

Idle Speed

1. Connect a tachometer according to the manufacturer's instructions.
2. With craft in the water or test tank, start engine and let it idle.
3. Adjust idle speed to specifications by turning the idle speed screw in (clockwise) to increase or out (counterclockwise) to decrease idle speed.
4. Check throttle cable free play and oil pump adjustment and adjust if necessary.


Idle Speed Screw

Idle Speed (in water)

Refer to pages **3.3- 3.5 for specification**

Mixture Screw Adjustment - Base Setting

CAUTION:

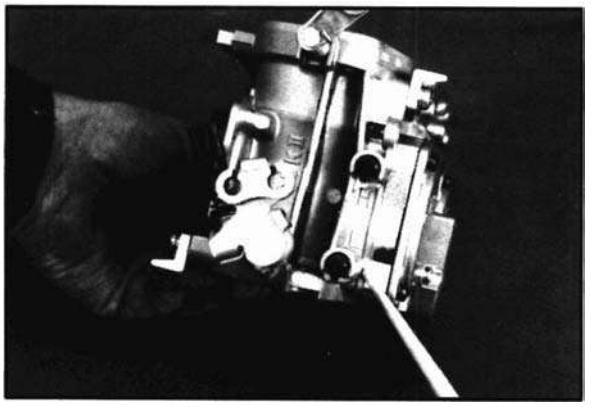
The high speed and low speed (idle) mixture screw base settings are determined at the factory using a flow meter. Limiter caps are then installed to allow only slight adjustment of the screws in each direction to compensate for changes in altitude and temperature. The base settings should not be changed. If large adjustments are necessary for proper mixture, the carburetors, fuel system, and engine should be inspectEd to find the cause of a rich or lean condition. (See Lean Condition Troubleshooting in Maintenance section.) If the carburetor has been tampered with or disassembled before exact base settings were recorded, use the following procedure to adjust each screw. Note:The base settings are for elevations between sea level and 3000 ft. (909 meters).

1. Remove limiter cap(s).
2. Turn mixture screw in until lightly seated, then turn screw out the specified number of turns (see specs at the beginning of this chapter).
3. Reinstall limiter cap(s) with tab positioned mid-way between the stops to allow slight adjustment in each direction.
4. Test the craft under actual operating conditions to verify proper mixture. For more information, see Mixture Screw Adjustment - Tuning, page 3.93.

Mixture Screw Adjustment - Tuning

Note: Keihin Carburetor Shown

Low Speed (Idle) Mixture Screw

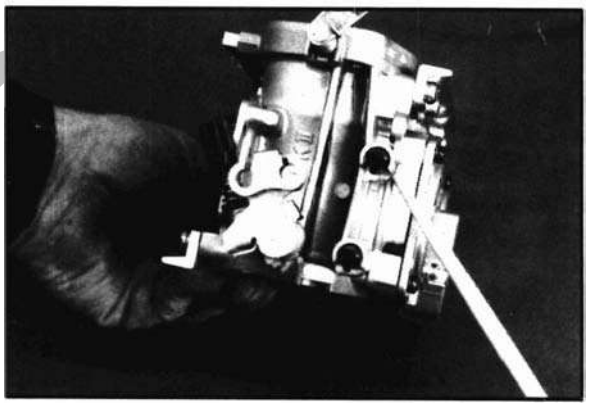


1. The low speed mixture screw is located lowermost on carburetor. Remove limiter cap (pull outward).
2. With craft in the water or test tank, adjust idle speed to specifications (see procedure this section).
3. Start engine, let it idle for one minute to normalize engine temperature. Rev engine slightly for 10-20 seconds and return to idle.
4. Turn each mixture screw to obtain highest idle RPM.
5. Turn each screw out approximately 1/4 turn from this point. Fine tune to achieve best throttle response.

High Speed Mixture Screw

CAUTION:

Some models are equipped with high speed mixture adjustment screws. Severe engine damage will result if high speed screws are adjusted too lean. See lean condition troubleshooting in Maintenance Section for more information.



1. The high speed mixture screw is located uppermost on carburetor. Remove limiter cap (pull outward).
2. Turn mixture screw in to lean or out to richen mixture as required to achieve a dark brown spark plug color when craft is operated at full throttle. While operating at full throttle, pull lanyard cord lock plate to stop engine. Do not allow engine to idle before stopping engine. Move craft to shore and inspect spark plug color.

Note: Always inspect spark plug color after adjusting high speed mixture screw.

FUEL SYSTEM/CARBURETION
Fuel Tank Vent System

All vent lines should be inspected periodically for smooth routing with no kinks or sharp bends. Be sure check valves are in place and operating properly, and all lines are secured with tie straps.

1992-1993 Models

Operation

The fuel tank vent system consists of two lines and two check valves. The *Dutletcheck* valve allows for expansion in the tank, and the *inlet* check valve allows air to enter the tank as the fuel supply is being used.

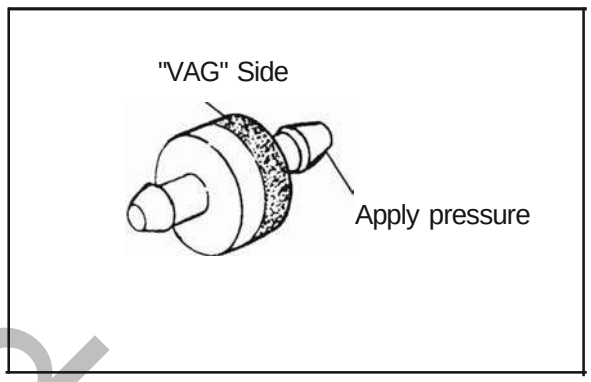
Routing

The outlet check valve line is connected to a "T" fitting at the drop tube cap on top of the fuel tank. The check valve is located approximately 8" (20.3 cm) from the "1" fitting. The line is routed to right side of craft and then forward, looped downward and rearward through a retainer clip (attached to the deck with adhesive), and then curved smoothly toward inside of craft and inserted into a grommet on lower front corner 01 air/water separator.

The air *inlet* check valve connects to the left hand side of the "T" and is routed to left side of craft, curved beneath oil tank, and secured in a holder on lower center of air/water separator. Gheck valve is on end of line.

Check Valve Inspection

The check valves can be tested for proper operation by applying pressure to one end with the Mity Vac™. Apply approximately 5 PSI to the end of the valve marked VAG. The valve should hold steady pressure. Try to apply pressure to the other end of the valve, it should allow air to go through easily with no pressure build up. Replace the check valve if found to be faulty.



1994 Models

In 1994, the tank venting system consists of only one check valve, located inside the fuel tank. It performs the same functions as earlier venting systems. In the upright position, the vent should allow free air movement in both directions in or out. In the inverted position it should check "closed".

Note: 1994 models with vent kit PN 2200620 installed - refer to illustrations and text for1995 vent system, pages 3.95 and 3.96.

1995 Models (And 1994 Models with PN 2200620 Vent Kit Installed)

Operation

The fuel tank vent system consists of an *inletcheck* valve and a *pressure relief valve.* The inlet check valve allows air to enter the tank as the fuel supply is being used. The pressure relief valve maintains a 1-1.5 PSI positive pressure in the fuel tank. If pressure in the tank exceeds 1.5 PSI, the valve releases and excess pressure is allowed to escape.

Routing

1995 - Present SUSLX Models

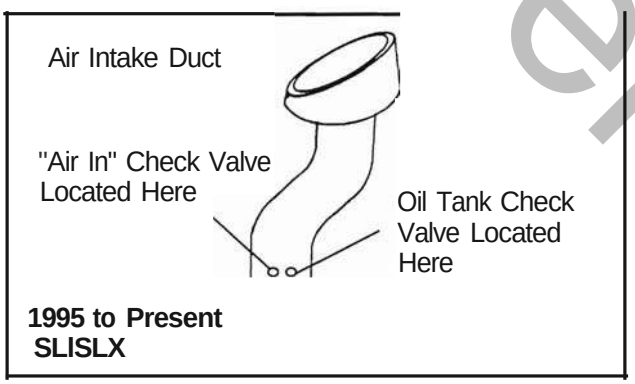
The inlet check valve line leads from the **"T"** fitting near the drop tube retainer cap to the air intake duct and is held in place on the duct by a retainer clip. The pressure relief valve line leads from the other side of the "T" fitting through a grommet into the steering pod, and is attached to a grommet on the front left side of the pod (directly across from battery vent grommet).

1994 SL Models With Vent Kit PN 2200620 Installed

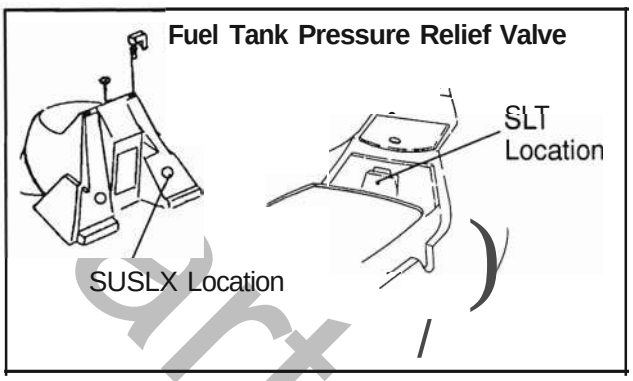
Refer to Illustration 1 on page 3.96. The inlet check valve line leads from the "T" fitting near the drop tube retainer cap and is attached to the main fuel line cluster with aT-Clip (PN 7080482). The pressure relief valve line leads from the other side of the "T" fitting through a grommet into the steering pod, and is secured to the MFD or fuel gauge wiring harness with a tie strap.

1995 SLT Models and 1994 SLT Models With Vent Kit PN 2200620 Installed

Refer to Illustration 2 on page 3.96. The inlet check valve line leads from the "T" fitting near the drop tube retainer cap around the right side of the craft and is attached to the main fuel line cluster with aT-Clip (PN 7080482). The pressure relief valve line leads from the other side of the "T" fitting, under the steering pod, to a grommet located near the front seat hold down latch.



1995 to Present SLISLX

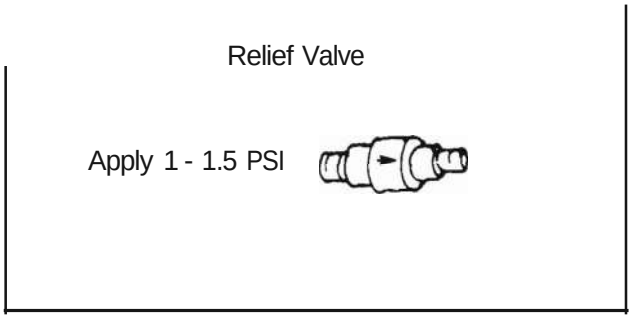


Inspection

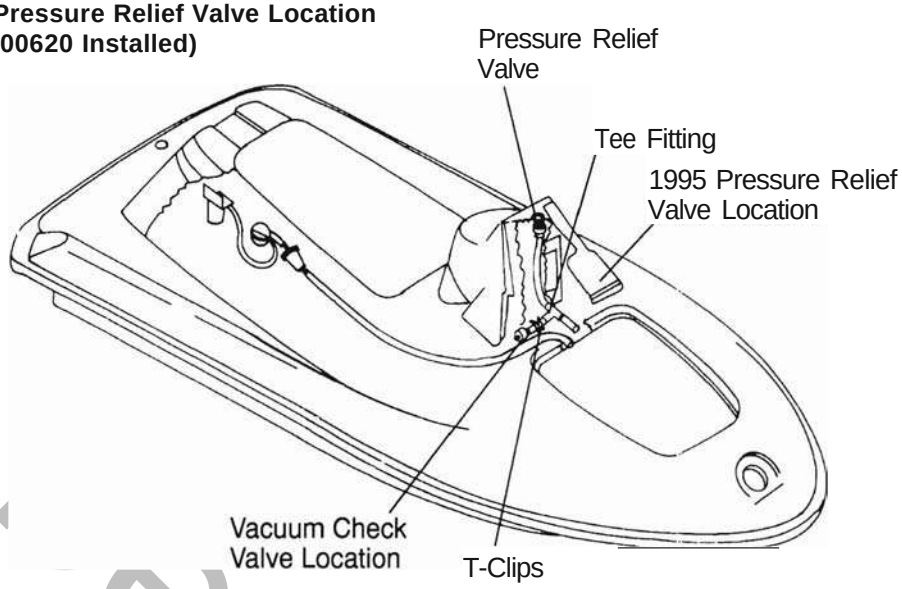
The check valves can be tested for proper operation by applying pressure to one end with the Mity Vac™. Apply approximately 5 PSI to the end of the valve marked VAC. The valve should hold steady pressure. Try to apply pressure to the other end of the valve, it should allow air to go through easily with no pressure build up. Replace the check valve if found to be faulty.

Relief Valve Testing

Apply air pressure with a Mity Vac™ to relief valve. With air pressure applied in the direction of the arrow, the valve should "pop" between 1.0 and 1.5 PSI. In the opposite direction it should hold pressure.

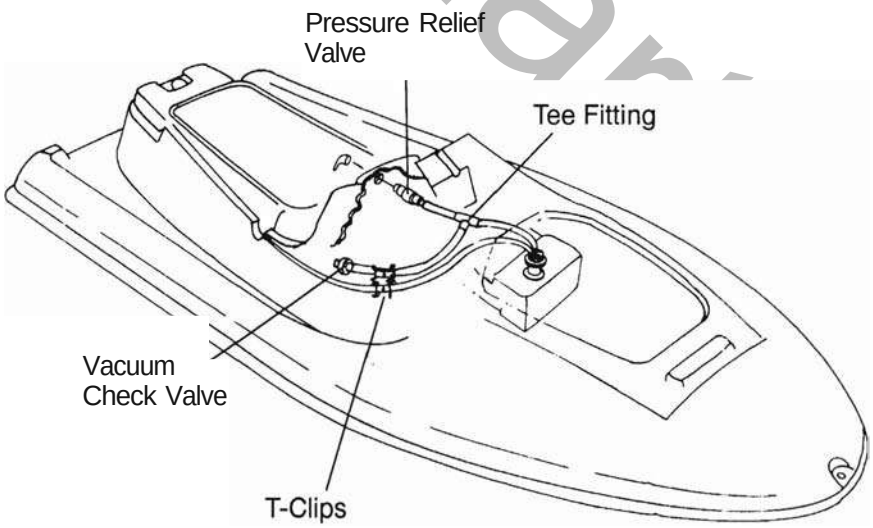


1994 SL650, SL750 Pressure Relief Valve Location (With Vent Kit PN 2200620 Installed)



Ill. 1

1994 SLT (With Vent Kit PN 2200620 Installed)
1995 SLT

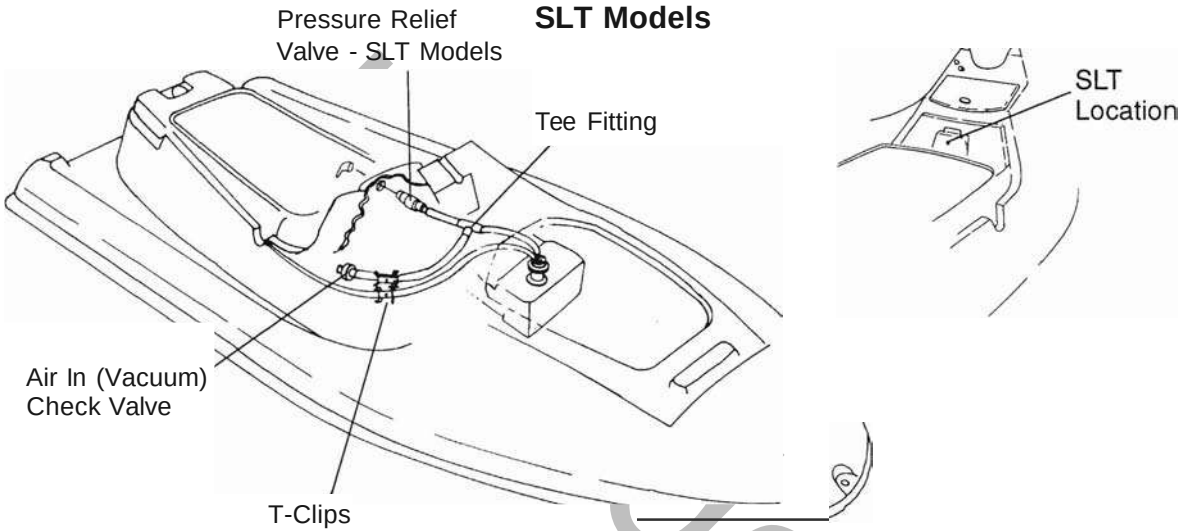


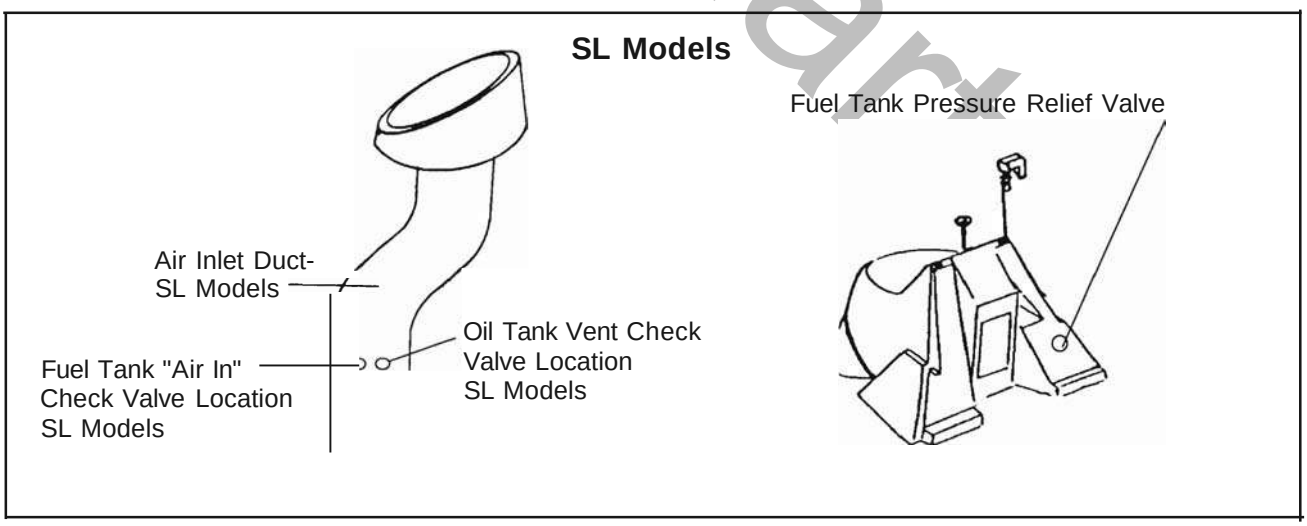
Ill. 2

Location

The inlet check valve is located on a line leading from the "1" fitting near the fuel tank pickup and is attached to the main fuel line cluster with aT-Clip (PN 7080482). The pressure relief valve line leads from the other side of the "1" fitting, under the steering pod, to a grommet located near the front seat hold down latch on SLTs, and to a grommet on the left side of the pod (under front compartment) on SL models.

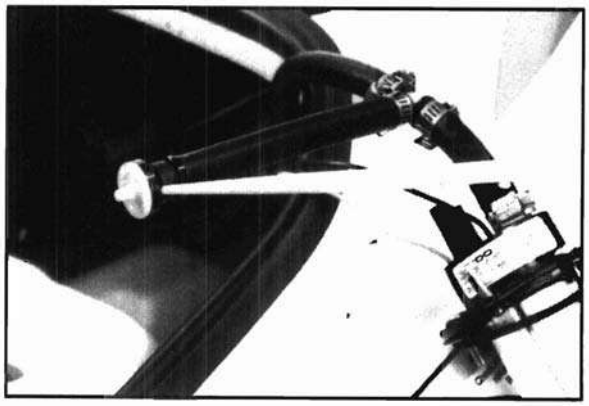
Fuel Tank Outlet Pressure Relief Valve-SLT.
Refer to diagrams on 3.8-3.17 for location.





Fuel Tank Check Valve Testing

To test the air inlet check valve, remove the valve and apply approximately 5 PSI pressure to the end of the valve marked "VAC". The valve should hold steady pressure. Connect the tester to the other end and apply pressure. Air should pass through the valve with no pressure build up. Replace the check valve if it holds pressure both ways or fails to hold pressure one way.



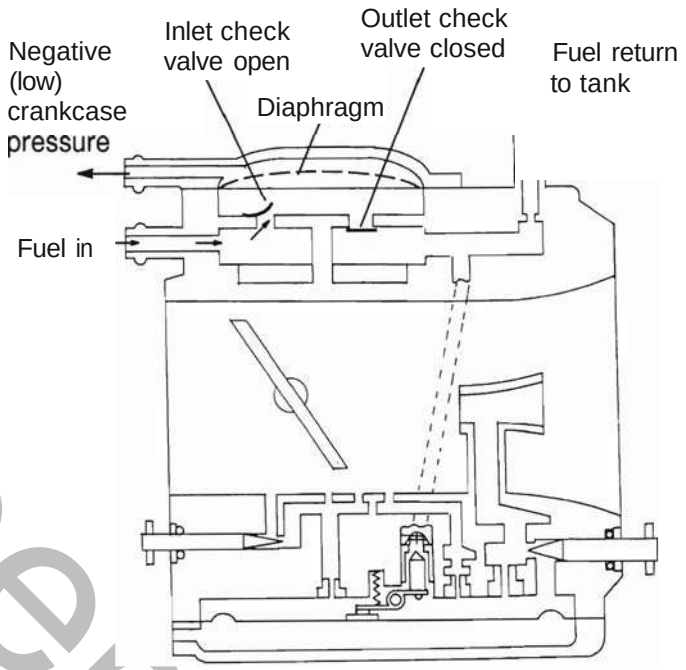
Air Inlet Check Valve

Fuel Pump Operation, SL700, SLT700, Hurricane, SL900, SLTX

The fuel pump is mounted to the rear cylinder (PTO end) carburetor on the SLT 700. The pump(s) supplies fuel to both carburetors. On three cylinder models (SL900 and SLTX) two fuel pumps supply fuel to each of the end carburetors and commonly to the center cylinder.

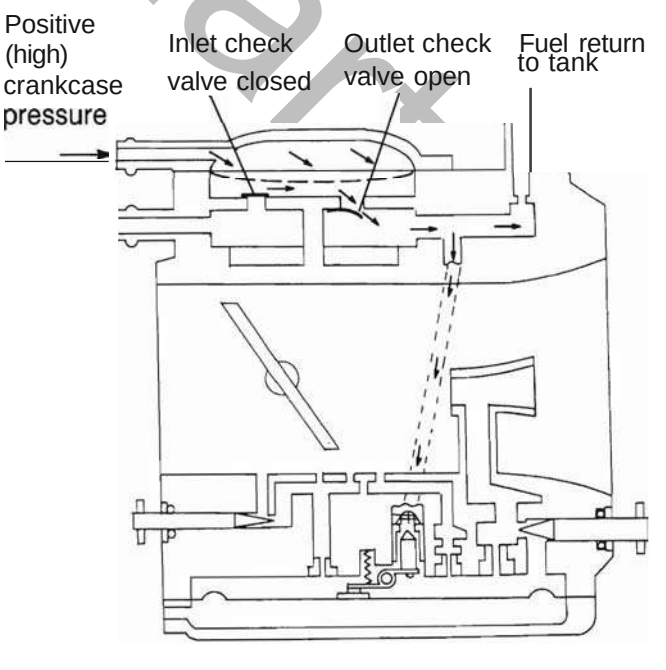
When the piston is on the upstroke crankcase pressure is low, the diaphragm in the fuel chamber moves outward toward the chamber cover. This causes a negative (low) pressure in the fuel chamber. The check valve on the fuel supply side of the chamber opens, allowing fuel to enter. This vacuum causes the outlet check valve to close so fuel cannot return from the carburetor. See Ill. 1.

Ill. 1 Piston on upstroke



When the piston is on its downstroke, the pressure from the crankcase becomes positive causing the diaphragm to move in the opposite direction, reversing the pressure in the pump chamber. This causes the inlet check valve to close and the outlet valve to open, delivering pressurized fuel to the carburetor fuel chambers. see Ill. 2.

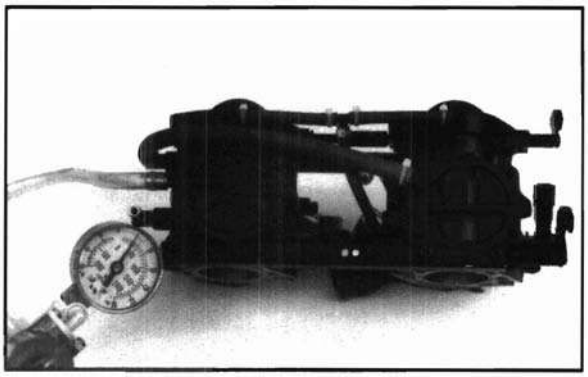
Ill. 2 Piston on downstroke



Fuel Pump Maintenance, SL700, SLT700, Hurricane, SL900, SLTX

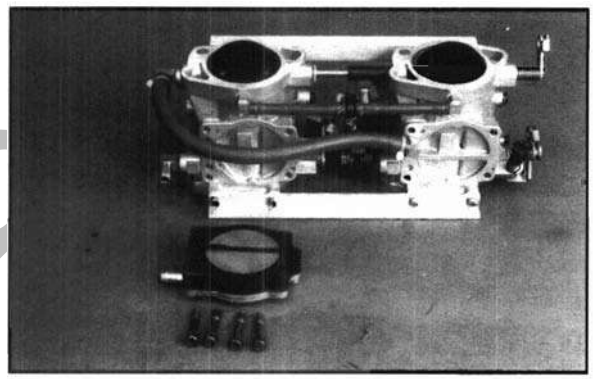
The fuel pump does not require any specific scheduled maintenance. However, the following should be observed:

- **Output:** The pump output may be checked by removing the fuel supply line from the rear cylinder carburetor (PTO end) and placing it into a container. With the engine idling a steady small stream of fuel should be observed.
- **Cleaning:** The pump and impulse line must be disassembled and cleaned whenever water is present in fuel (beyond separator) or in the engine.
- **Impulse Diaphragm Inspection:** Loosen clamp and remove impulse line from pump fitting. Apply 5 PSI pressure to impulse line fitting. The diaphragm should hold pressure indefinitely. Remove and inspect the pump diaphragms if the impulse chamber does not hold pressure.



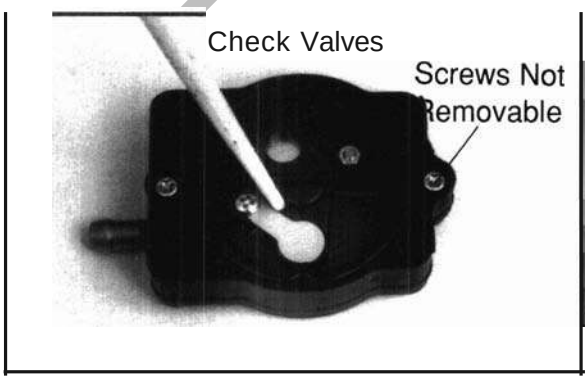
Disassembly/Inspection

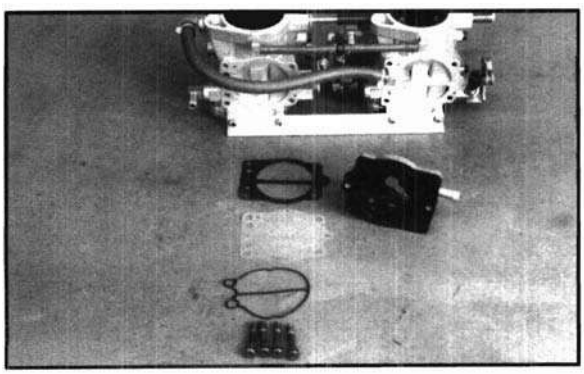
1. Remove fuel pump body screws (4) and carefully lift assembly from carburetor.



2. Remove gasket, diaphragm, and O-ring. Carefully examine each for cracks, holes, distortion or fatigue (stretching). Replace if necessary.

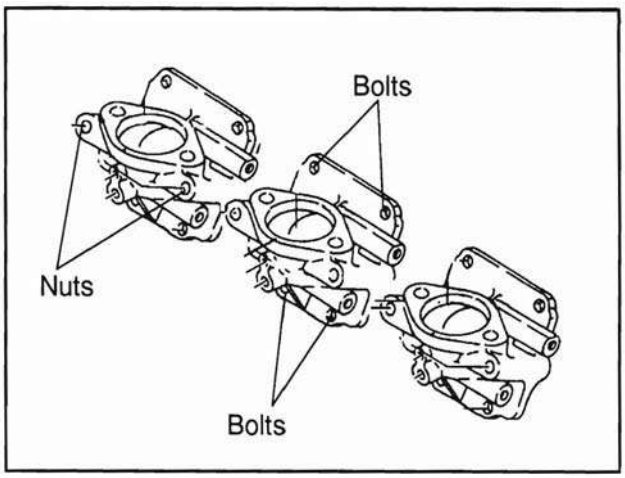
3. Inspect the check valves in the fuel pump body. The valve body cannot be disassembled and must be replaced as an assembly if check valves are damaged or bent.





Reed Valve Removal, 1992·1993 Models

1. Each cylinder has its own reed block. These must be removed in order to inspect the condition of each reed valve.



IMPORTANT: Before reinstalling carburetors the individual intake manifolds must be aligned. See installation of reed cage and carburetor mounting flange this section.

2. Remove the (4) bolts and (2) nuts attaching each reed block.

3. Remove reed block, gasket, reed valve stutter (most 1992 models and all 1993 models), reed cage and final gasket.

1994 to Present

1. Remove air box inlet and hose clamp. Remove air box cover and screen. Remove (9) intake base bolts and intake base.

CAUTION:

Cover carbs and use care not to drop washers or debris into carb openings.

2. Remove fuel inlet lines and plug to prevent fuel spills. See fuel warnings on page 3.61. Remove choke and throttle cables from carb assembly. Remove fuel return line and plug.

NOTE: 1995 production units will require disconnecting oil injection lines from intake base prior to base removal. When intake base has been removed, disconnect oil pump linkage rod from carb rack, and pivot the rod out of the way. If engine is to be removed, it will be necessary to remove linkage rod from oil pump arm to prevent bending arm and altering oil calibration.

3. Remove (6) flange nuts securing carb rack assembly to intake manifold and remove carb rack.

4. Remove (12) intake manifold bolts and (6) intake manifold flange nuts. Remove manifold. Inspect all gaskets and mating surfaces for possible air leaks.

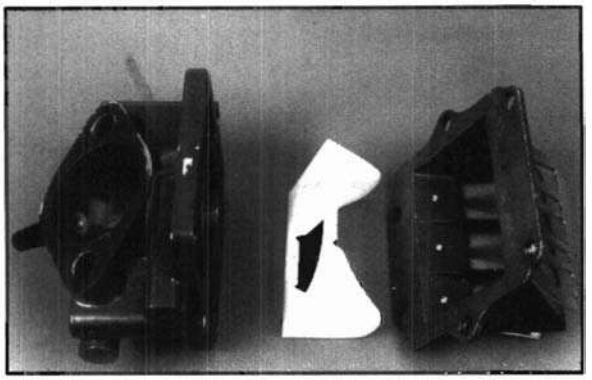
5. Remove reed stutters, reed gaskets, reed assembly, and lower reed gaskets.

Reed Valve Inspection· Mikuni Carburetor

Inspection

1. Thoroughly inspect condition of reed valve stutters, reed valves and gaskets. Replace if necessary.

2. Reed valves are sometimes held open by carbon or other small particles. Remove screws from reed stop. Remove the reed, making sure not to flip the reed if it is to be re-used. Reverse positioning of a reed will cause breakage.

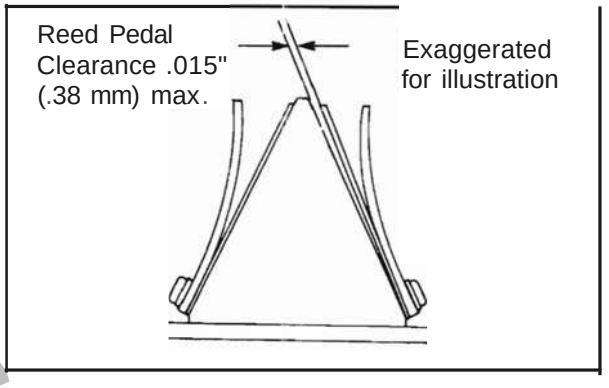


1992-1993 Shown

3. Wipe reed cage and reed valve clean. Reassemble reed, reed stop and screws to cage and tighten. **NOTE:** If a gap of greater than .015" (.4 mm) exists, replace the reed valve.

4. Clean and dry components for reassembly. Apply Loctite 242 to reed stop screws for reassembly to engine.

5. See installation of reed cage and intake manifold. page 3.103.



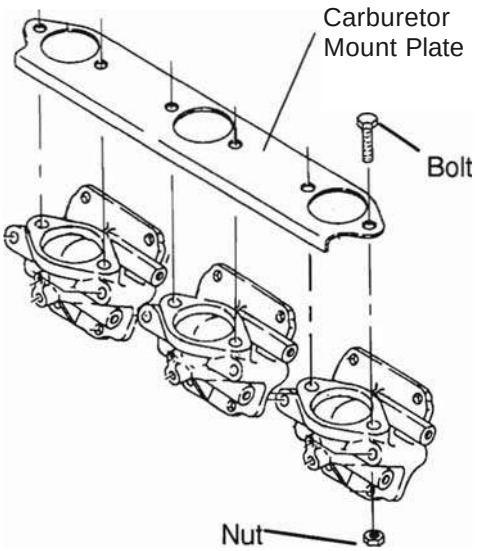
Reed Cage and Intake Manifold Installation· Mikuni Carburetor

1992·1993 Models

1. Clean and dry intake ports.
2. Place a new gasket on intake port. Install reed cage, reed stuffer, another new gasket, and intake manifold. Repeat for each cylinder.
3. Apply Loctite 242 to four reed block retaining bolts and two nuts. Repeat for each cylinder.
4. Loosely tighten bolts and two center retainer nuts by hand. Leave them loose enough to move the intake manifold. Check gasket placement for air tight seal. **Alignment of intake manifold is critical to prevent air leaks.**
5. Place the carburetor mount plate on all three reed blocks and secure it to the reed blocks with six 3/8 x 1 3/4" bolts and 3/8" nuts. This will align all intake manifolds.
6. Tighten center nuts of reed blocks, and torque to 72 in. lbs. Tighten bottom bolts of reed block and torque to 72 in. lbs. (.83 kg-m) Repeat for each cylinder.
7. Tighten remaining top bolts of each block and torque to 72 in. lbs. (.83 kg-m).

Reed Block Bolt Torque

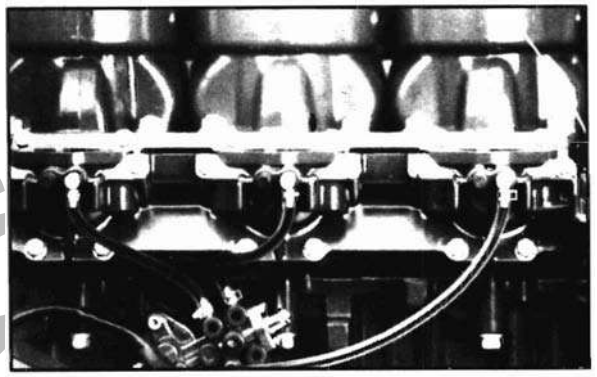
72 in. lbs. (.83 kg-m)

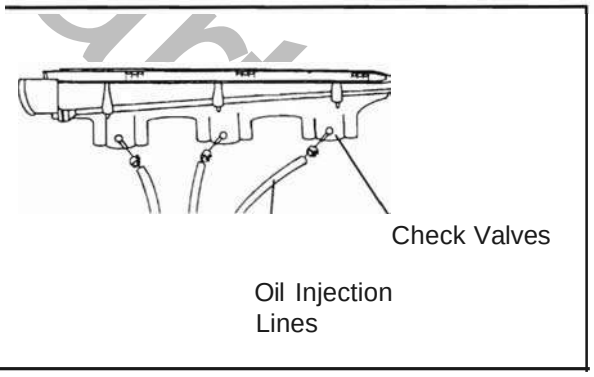


1994 to Present

In 1994, the three separate intake manifolds were changed to a one-piece manifold. This eases assembly by eliminating the intake manifold alignment procedure used in previous years.

1. Clean and dry intake ports.
2. Install a new gasket, reed cage, reed stuffer, and another new gasket to each cylinder.
3. Apply Loctite™ 242 to each of the twelve manifold bolts.
4. Reinstall intake manifold to engine intake ports starting each of the twelve bolts. Apply Loctite™ 242 to the (6) manifold studs and install (6) retaining nuts. Check gasket placement for air tight seal.
5. Tighten (6) center nuts of manifold and torque to 72 in. lbs. (.83 kg-m) Tighten remaining (12) bolts and torque to 72. in. lbs. (.83 kg-m).





Manifold Bolt Torque

72 in. lbs. (.83 kg-m)

Reed Valve Removal/Inspection - Keihin Carburetor

Reed Valve Removal

1. Remove carburetor assembly. Refer to page 3.73.

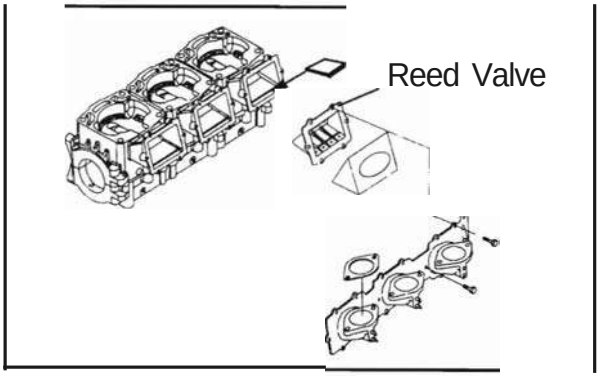
CAUTION:

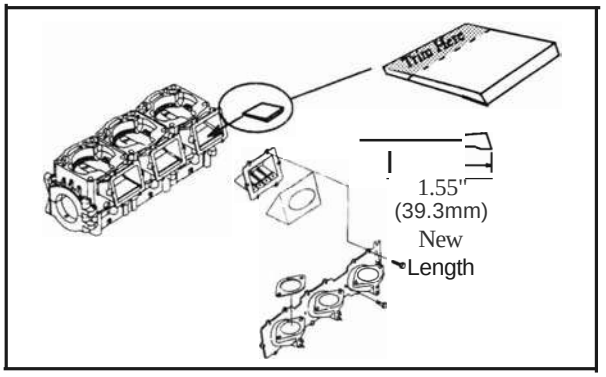
Cover carbs and use care not to drop washers or debris into carb openings.

2. Remove intake manifold bolts. Remove manifold. Inspect surfaces for damage or debris that may cause air leaks.

3. Remove reed *stutters* (where applicable) and reed assembly.

Note: Some models have reed *stutters* that are positioned on the bottom of intake tract as shown. Stutters can be trimmed to dimension shown.





Inspection

1. Thoroughly inspect condition of reed valve sealing rib on the outer edge of reed cage. Replace if necessary.

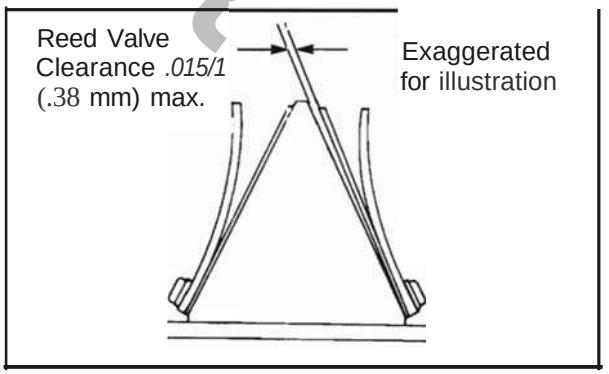
2. Replace reed stutters if distorted, cracked, or broken.

3. Inspect clearance between reed cage and reed valve. Replace reed valves if gap exceeds *.015/1* (.4 mm).

Reed valves are sometimes held open by carbon or other small particles. Remove screws from reed stop if reeds are to be replaced. Do not reverse reed. Reverse positioning of a reed will cause breakage.

4. Wipe reed cage and reed valve clean.

5. Clean and dry components for reassembly. Apply Loctite 242 to reed stop screws.



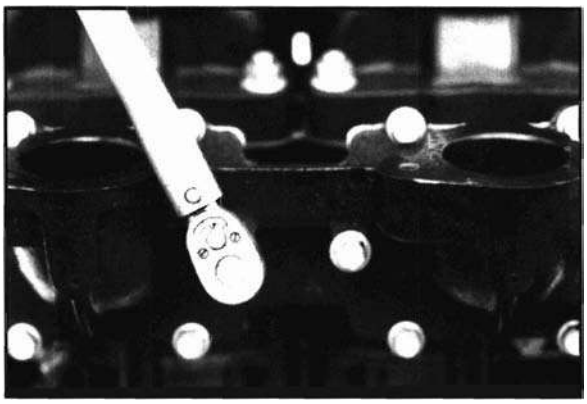
Assembly

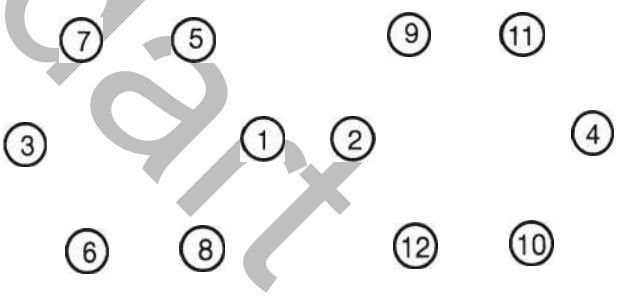
6. Install reed cage and reed stuffer.
7. Apply Loctite™ 242 to each of the manifold bolts.
8. Reinstall intake manifold to engine intake ports starting each of the bolts.

9. Tighten manifold bolts to specified torque.

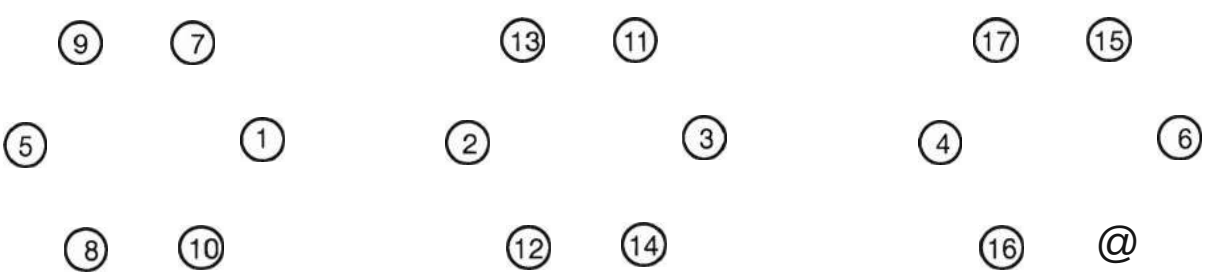
Manifold Bolt Torque

72 in. lbs. (.83 kg-m)





Intake Manifold Torque Pattern - Twin Cylinder



Intake Manifold Torque Pattern - Three Cylinder

Fuel Line Air Leak Testing

Fuel lines may develop air leaks causing the PWC to run lean or be hard to start. If you suspect this to be the case, the following would be suggested areas to check.

All fuel line clamps: Carb rack hose connections; fuel line from carb rack back to fuel pump; fuel pump back to shut off valve; shut off valve to fuel tank drop tube, then drop tube lines within tank. The return line may also cause lean conditions to exist regarding inlet needle and seat pop off.

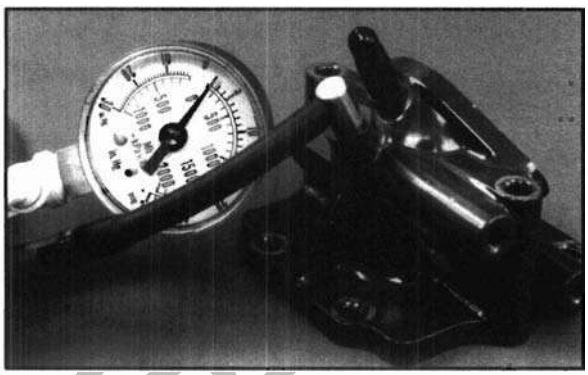
Fuel lines within the fuel tank may become distorted from fuel additives. In this case, lines should be replaced.

1. To check for air leaks in the main fuel line, remove fuel in line from fuel pump and fuel out lines from fuel tank. Attach a Mity Vac™ to one end and plug the opposite end. Pressurize the line with 10-14 PSI. The line should hold this pressure for five minutes. If pressure will not hold, check hose clamps and fuel shut off valve.
2. To verify if the shut off valve is leaking, bypass the valve. If it maintains pressure, the valve is faulty and should be repaired or replaced This test should be done on both main fuel line and reserve line, switching the shut off valve accordingly.
3. To check for air leaks from the fuel pump through the carb rack, remove the fuel line from the fuel pump out line, and remove the return line from the fuel tank.
4. Attach one end of the line and install the Mity Vac™ on the other end. Apply 8 to 9 PSI to the line. It should maintain that pressure for five minutes. If not, check hose clamps and inspect lines for damage. If after checking lines and clamps no leaks are found, carbs should be taken apart and inspected.

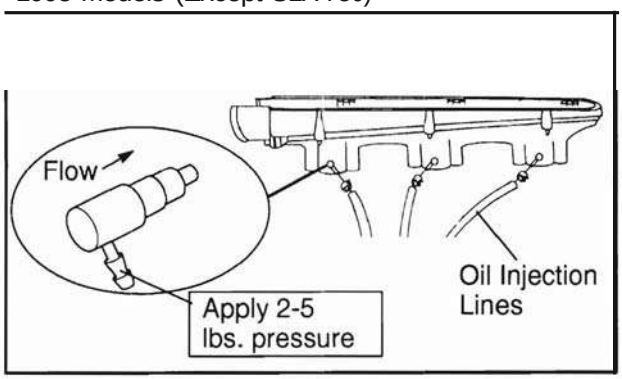
Oil Check Valve Testing

1. Apply pressure to end of check valve in direction of flow as shown. The valve should release when 2-5 PSI pressure is applied.

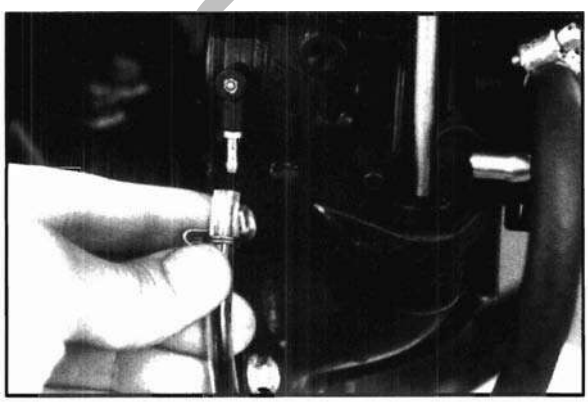
1992-1994 Models



1995 Models (Except SLX 780)



1995 SLX780 and all 1996 models on carburetors.



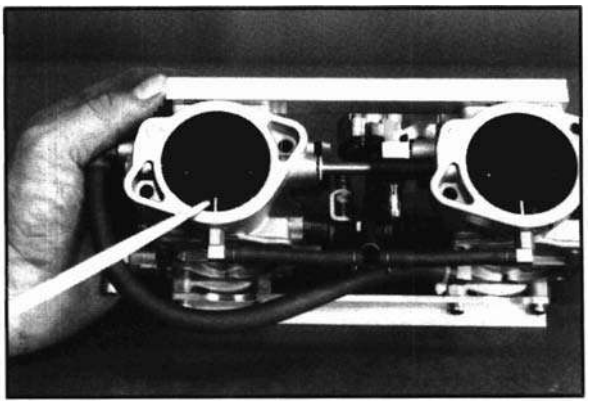
Accelerator Pump Testing

On models equipped with an accelerator pump, verify proper accelerator pump operation use the following procedure:

CAUTION:

Wear eye protection when performing this procedure.

1. Turn engine off.
2. Remove air intake silencer.
3. While observing pump outlet nozzle in carburetor quickly open throttle. A steady stream of fuel should be evident from each carburetor accelerator pump outlet nozzle as the throttle is opened. The pump reservoir must be full of fuel before performing this test. After operating the accelerator pump two or three times the reservoir will be empty and fuel will no longer spray from the nozzle until the engine is started.



Some causes of improper pump operation are:

- No fuel entering chamber
- Worn pump cam
- Diaphragm damaged or swollen
- Check valve in nozzle stuck open or closed
- Outlet nozzle restricted
- Passages or hoses restricted

Troubleshooting

Refer to Troubleshooting at the end of Maintenance section for carburetion troubleshooting information.

CHAPTER 4
ENGINE/COOLING

Engine Specifications

1992 SL650

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	1inches	mm	I inches
SL650	EC65PW	647	65.00	12.5591	65.00	1 2.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ±200 Limiter RPM ± 200
28.39 cc	23.05 cc	.008" to .016" (.20 to .41 mm)	New: .004 - .006 in. (.1 mm - .15mm Limit: .008 in.(.2mm)	Operating 6500 Limiter 7150

1993 SL650

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	1inches	mm	1inches
SL650	EC65PW	647	65.00	12.5591	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ±200 Limiter RPM ± 200
28.00 cc	23.40 cc	.008" to .016" (.20 to .41 mm)	.004 - .006 (.1mm to .15mm) Limit: .008 - (.2mm)	Operating 6300 Limiter 6700

1993 SL750

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	1inches	mm	I inches
SL750	EC75PW	744	69.72	12.7449	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ±200 Limiter RPM ± 200
31 cc	25.6 cc	.008" to .018" (.20 to .46 mm)	.004 - .006 (.1mm - .15mm) Limit: .008 - (.2mm)	Operating 6450 Limiter 6700

1994 SL650

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	1inches	mm	1inches
SL650	EC65PW	647	65.00	12.5591	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ±200 Limiter RPM ± 200
25.9cc	22.5 cc	.008" to .016" (.20 to .41 mm)	.005 - .007 (.13mm to .18mm) Limit: .008 - (.2mm)	Operating 6350 Limiter 6700

1994 SL750 & SLT750

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	1inches	mm	I inches
SL750, SLT750	EC75PW	744	69.72	12.7449	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring End Gap	Piston to Cylinder Clearance	Engine Operating RPM ±200
30.3cc	26.2	.008" to .018" (.20 to .46mm)	.004 - .006 (.1mm - .16mm) Limit: .008 - (.2mm)	Operating (SL750) 6150 (SLT) 6250

Piston 1.0.: SL650 - WVA or WV; SL750 - W7

ENGINE/COOLING
Service Data

Engine Specifications

1995 SL650 & SL650 STD

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL650, SL650 STD	EC65PW	647	65.00	12.5591	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
25.9cc	22.5 cc	.008" to .016" (.20 to.41 mm)	.005 - .007 (.13mm to .18mm) Limit: .009 - (.23mm)	Operating 6300 Limiter 6700

1995 SL750 & SLT750

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL750, SLT750	EC75PW	744	69.72	12.7449	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
30.3cc	26.2	.008" to .018" (.20 to .46mm)	.004 - .006 (.11mm - .16mm) Limit: .008 - (.20mm)	Operating 6200 Limiter 6700

Piston I.D.: SL650 - WVA or WV ; SL750 - W7

1995 SLX780

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLX780	EC78PW	779cc	71.30	12.8071	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 70
28.5cc	23.9cc	.012-.020" (.30 to .50mm)	.0035 - .005 (.09mm - .13mm) Limit: .008 - (.20mm)	Operating 6500 Limiter 6700

Piston I.D.: 78A

1996 SL700, SLT700

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLT700	WC70DCSp-01 / -02	700.8cc	81.00	3.1890	68.00	2.6771
SL700	WC70DCSP-02	700.8cc	81.00	3.1890	68.00	2.6771

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Ring Installed Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
44.6cc	37.2cc	.010" to .018" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6300 Limiter 6700

Piston I.D.: 80.89

Engine Specifications

1996 Hurricane

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	1inches	mm	1inches
Hurricane	WC70DCSP-03	700.8cc	81	13.1890	68	2.6771

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
40.7cc	33.0cc	.010-.018" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6700 Limiter 7200

Piston I.D.:80.89

1996 SL780

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL780	EC78PWE-02	779cc	71.30	12.8071	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 70
28.5cc	23.9cc	.012-.018" (.30 to .45mm)	.0035 - .005 (.09mm - .13mm) Limit: .008 - (.20mm)	Operating 6500 Limiter 6700

Piston I.D.: 78A

1996 SLT780

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLT780	EC78PWE-04	779cc	71.30	12.8071	65.00	2.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 70
28.5cc	23.9cc	.012-.018" (.30 to .45mm)	.0035 - .005 (.09mm - .13mm) Limit: .008 - (.20mm)	Operating 6500 Limiter 6700

Piston I.D.: 78A

1996 SLX780

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	1inches	mm	inches
SLX780	EC78PWE-03	779cc	71.30	12.8071	65.00	12.5591

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 70
28.5cc	23.9cc	.012-.018" (.30 to .45mm)	.0035 - .005 (.09mm - .13mm) Limit: .008 - (.20mm)	Operating 6500 Limiter 6700

Piston I.D.: 78A

Engine Specifications

1996 SL900

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL900	WC90TCSP-01	889cc	74.50	12.9331	68.00	12.6771

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
33.0cc	26.8cc	.010-.018" (.25 to .45mm)	.004" - .005" (.10mm - .13mm) Limit: .010" - (.25mm)	Operating 6550 Limiter 6800

Piston 1.0.:74.39

1996 SLTX

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLTX	WC105TCSP-01	1051 cc	81.00	13.1890	68.00	2.6771

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Ring End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
40.7cc	33.0cc	.010-.018" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6550 Limiter 6800

Piston 1.0.:80.89

Engine Specifications

1997 SL700

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL700	WC70SCSP-01	700.8cc	81.00	3.189	68.00	2.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Rings Installed Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
40.8cc	33.2cc	.010" to .018" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6200 Limiter 6700

Piston I.D.: ELKO 2102/6

1997 SL700 Deluxe, SLT700

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLT700 / SL700 Deluxe	WC70DCSP-05	700.8cc	81.00	[3.189	68.00	2.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume Installed	Piston Rings Installed Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
44.6cc	37.2cc	.010" to .018" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6350 Limiter 6700

Piston I.D.:ELKO 2102/6

1997 Hurricane

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
Hurricane	WC70DCSP-04	700.8cc	81	13.189	68	12.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
40.8cc	33.2cc	.010-.018" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6700 Limiter 7200

Piston I.D.:ELKO 2102/6

1997 SL780, SLT780

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL780/ SLT780	EC78PWE-03	779cc	71.3	[2.807	65	2.561

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 70
28.5cc	23.9cc	.012-.020" (.30 to .5mm)	.003 - .005 (.08mm - .013mm) Limit: .008 - (.20mm)	Operating 6250 (SL) 6350 (SLT) Limiter 6700

Piston 1.0.: 78A

Engine Specifications

1997SL900

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL900	WC90TCSP-01	889cc	74.5	12.933	68	12.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
33.0cc	26.8cc	.010-.018" (.25 to .45mm)	.004" - .005" (.10mm - .13mrn) Limit: .010" - (.25mm)	Operating 6350 Limiter 6800

Piston I.D.:ELKO 2141/174.39

1997SL1050

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SL 1050	WC105TCSP-02	1051 cc	81.0	13.189	68	12.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
40.8cc Mag / PTO 44.6cc Center	33.2cc Mag / PTO 37.2cc Center	.010-.022" (.25 to .55mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6500 Limiter 6800

Piston I.D.:ELKO 2194/7

1997SLTX

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLTX	WC105TCSP-03	1051 cc	81.0	13.189	68	12.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
40.8cc Mag / PTO 44.6cc Center	33.2cc Mag / PTO 37.2cc Center	.010-.022" (.25 to .55mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6500 Limiter 6800

Piston I.D.:ELKO 2194/7

Engine Specifications

1998 SLH, SLTH

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLH, SLTH	WC70DCSP-06A2IA1	700.8cc	81.0	13.189	68	12.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
40.8cc	33.2cc	.010-.018" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6600-6700 Limiter 7200

Piston I.D.:ELKO 2102/6

1998 SLXH, SLTX

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLXH, SLTX	*WC105TCSP-05/04*	1051cc	81.0	3.189	68	2.677

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± 100 Limiter RPM ± 100
44.6cc	37.2cc	.010-.022" (.25 to .45mm)	.0055" - .0065" (.14mm - .16mm) Limit: .010" - (.25mm)	Operating 6400-6500 Limiter 6800

Piston I.D.: ELKO 2194/7

NOTES:

Torque Chart - Engine Fasteners

Engine Fasteners	Pol/Fuji	Pol/Domestic	Apply:
Air Intake Cover Center Bolt (8mm)	Refer to Page 3.30 to 3.39 for specific torque values		242 or 243
Air Intake Cover Screws			242 or 243
Crankcase Bolts (8mm)	16 ft. lbs.	22 ft. lbs.	242 or 243
Crankcase Bolts (10mm)	26 ft. lbs.	28 ft. lbs.	242 or 243
Cylinder Head Nuts (8mm)	18 ft. lbs.	-	242 or 243
Cylinder Head Bolts (8mm)	-	20 ft. lbs.	242 or 243
Cylinder Head Cover Bolts (8mm)	-	22 ft. lbs.	242 or 243
Cylinder Base Nuts (10mm)	28 ft. lbs.	40 ft. lbs.	242 or 243
Carburetor Mounting Nuts (Mikuni) (8mm)	16ft.lbs.	-	242 or 243
Carburetor Mounting Bolts (Keihin) (6mm)	-	108 in. lbs.	242 or 243
Engine Mount Plate (To Engine) Bolts	45 ft. lbs.	50 ft. lbs.	271 or 262
Engine Mount Nuts	45 ft. lbs.	45 ft. lbs.	242 or 243
Engine Mount To Hull (5/16"-18)	14 ft. lbs.	14 ft. lbs.	242 or 243
Exhaust Manifold Bolts (8mm)	16 ft. lbs.	22 ft. lbs.	242 or 243
Exhaust Manifold To Pipe Bolts (12mm)	45 ft. lbs.	45 ft. lbs.	242 or 243
Flywheel Nut 14mm	-	90 ft. lbs.	271 or 262 on taper of flywheel. 242 on nut
Flywheel Nut 16mm 18mm	55 ft. lbs. 65 ft. lbs.	-	271 or 262 on taper of flywheel 242 on nut
Flywheel Housing Bolt (6mm)	78 in. lbs.	108 in. lbs.	242 or 243
Flywheel Housing Bolt (8mm)	16 ft. lbs.	22 ft. lbs.	242 or 243
Intake Manifold Nuts & Bolts (6mm)	78 in. lbs.	108 in. lbs.	242 or 243
Oil Pump Bolts/Screws (5mm)	48 in. lbs.	60 in. lbs.	242 or 243
Starter Motor Mounting Bolts	108 in. lbs.	108 in. lbs.	Dielectric Grease
Spark Plug	18 ft. lbs.	18 ft. lbs.	AS
Water Outlet Manifold Bolts (6mm)	78 in. lbs.	108 in. lbs.	242 or 243

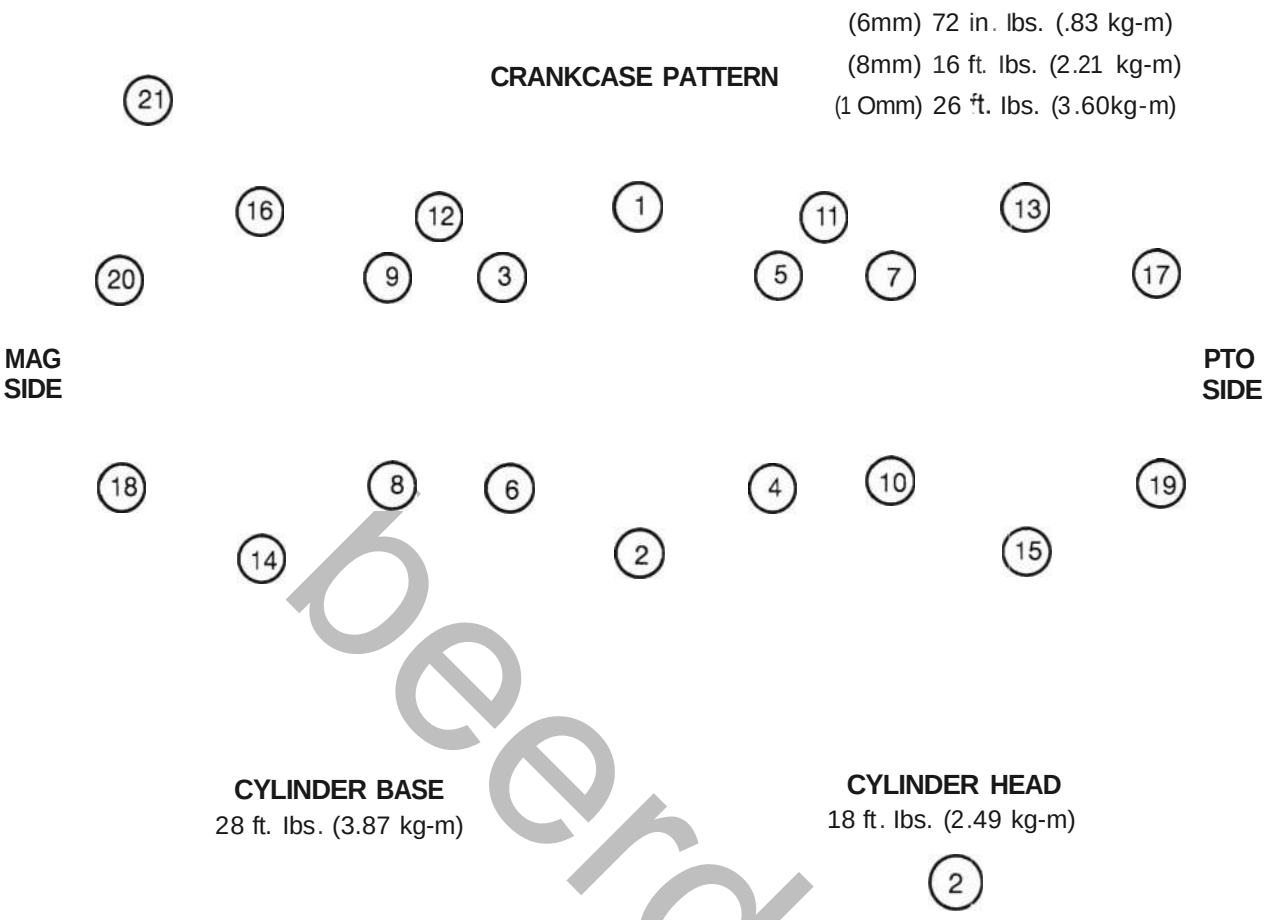
NOTES:

271 indicates use of Loctite 271 or 262 thread locking agent (red).
242 indicates use of Loctite 242 thread locking agent (blue).
AS indicates use of Anti Seize compound
Grease indicates use of a light coating of grease
Size 1/4" to 7/8" micro hose clamps torque to 10-12 in.lbs.
Size 1" and larger hose clamps torque to 20-25 in. lbs.

CAUTION:

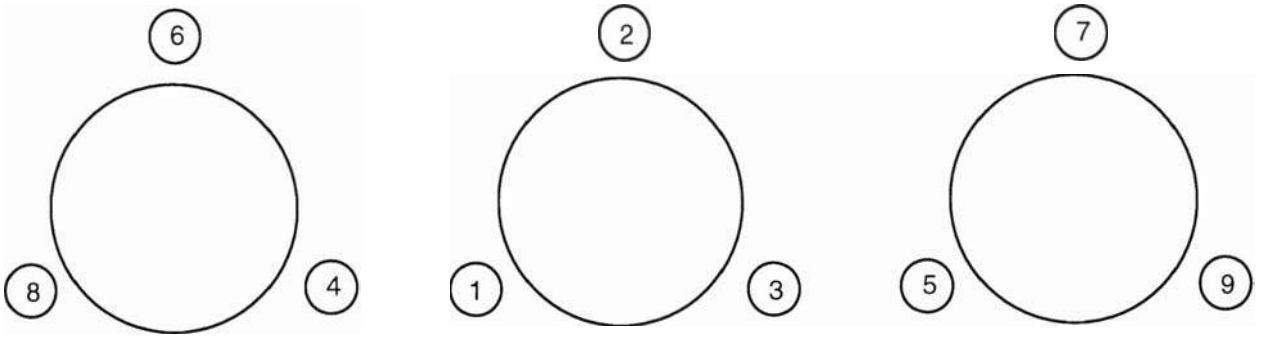
Do not install fasteners dry. Always clean fasteners before reusing. Cure time of locking agent is reduced when Loctite 'M Primer-N or Primer T is used to clean and prime fastener threads.

- To convert in. lbs. to ft. lbs. divide by 12
- To convert ft. lbs. to kg-m multiply foot pounds by .1383.
- To convert kg-m to Nm move the decimal to the right one position.


(6mm) 72 in. lbs. (.83 kg-m)
(8mm) 16 ft. lbs. (2.21 kg-m)
(10mm) 26 ft. lbs. (3.60kg-m)
CRANKCASE PATTERN
21
16
12
1
11
13
20
9
3
5
7
17
MAG SIDE
PTO SIDE
18
8
6
4
10
19
14
2
15
CYLINDER BASE
28 ft. lbs. (3.87 kg-m)
CYLINDER HEAD
18 ft. lbs. (2.49 kg-m)
2

Intake Manifold

78 in. lbs. (.9 kg-m)



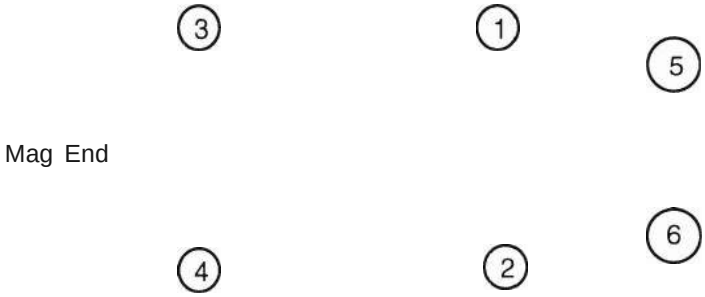
Exhaust Manifold

18 ft. lbs. (2.21 kg-m)

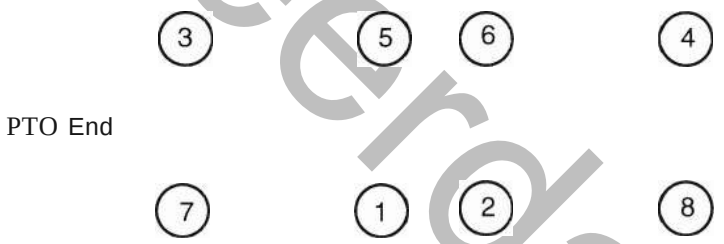
SLX780 Exhaust Manifold

18 ft. lbs. (2.21 kg-m)

Crankcase Bolts (Bottom View) 2 Cyl. (8mm) 22 ft. lbs. (3.04 kg-m)
(10mm) 28 ft. lbs. (3.86 kg-m)

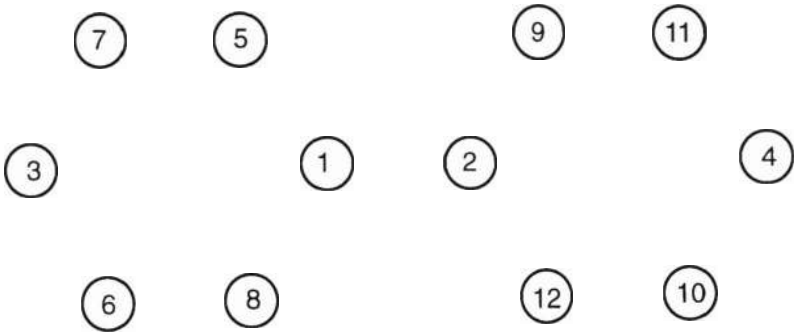


Cylinder Base Nuts (Top View) 2 Cyl 35-40 ft. lbs. (4.83-5.52 kg-m)



Exhaust Manifold 2 Cyl 22 ft. lbs. (3.04 kg-m)

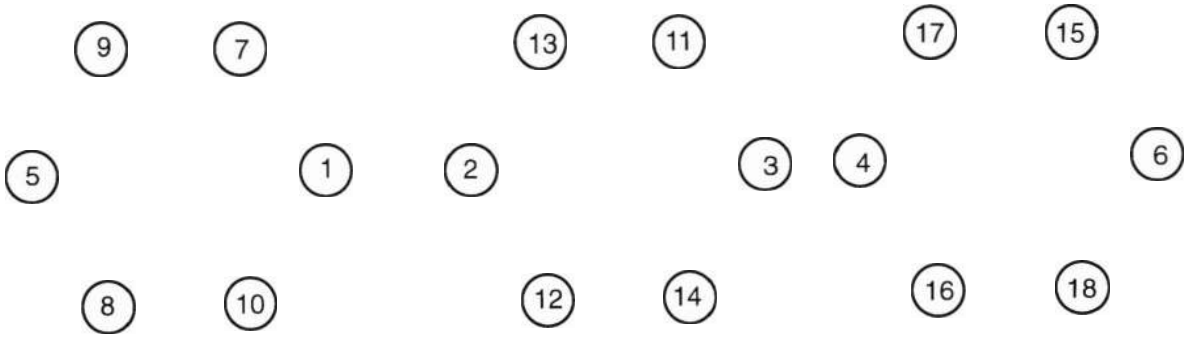
Intake Manifold 2 Cyl
72 in. lbs. (.83 kg-m)



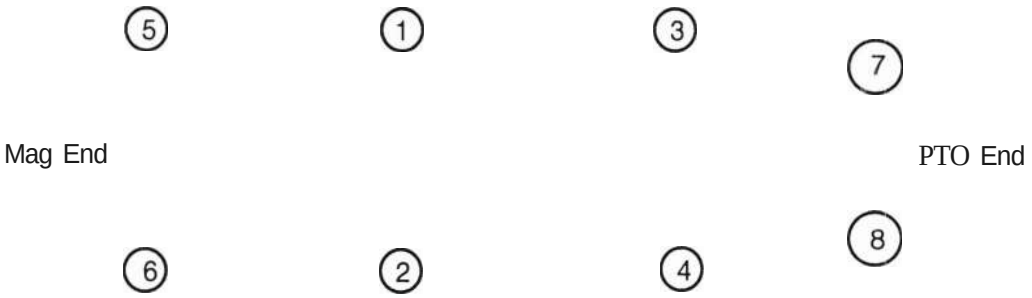
Cylinder Head Cover (All)
22 ft. lbs. (3.04 kg-m)

Cylinder Head (All)
20 ft. lbs. (2.76 kg-m)

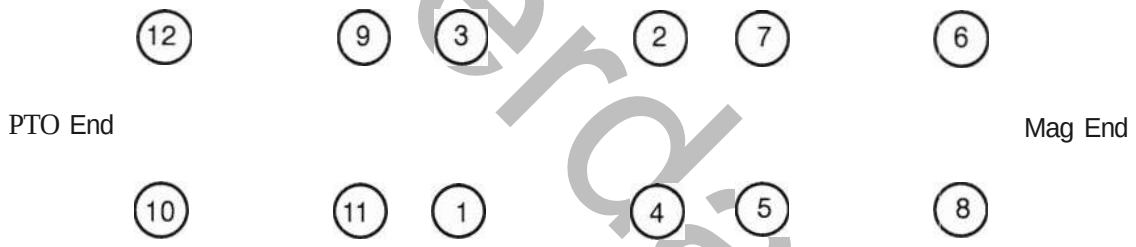
Intake Manifold (3 Cyl)
72 in. lbs. (.83 kg-m)



Crankcase Bolts (Bottom View) 3 Cylinder
(8mm) 22 ft. lbs. (3.04 kg-m)
(10mm) 28 ft. lbs. (3.86 kg-m)

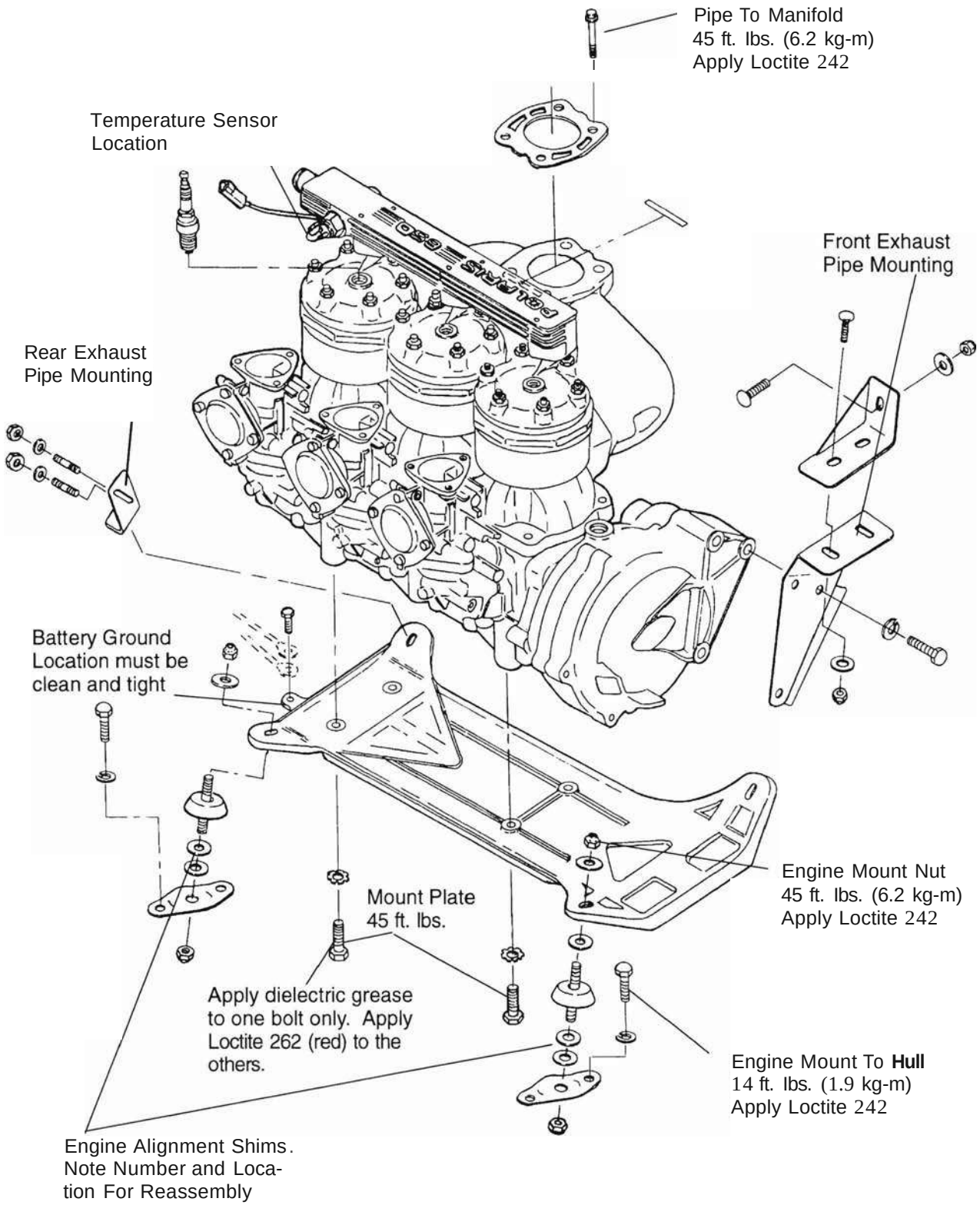


Cylinder Base Nuts (Top View) 3 Cylinder
35-40 ft. lbs. (4.83-5.52 kg-m)

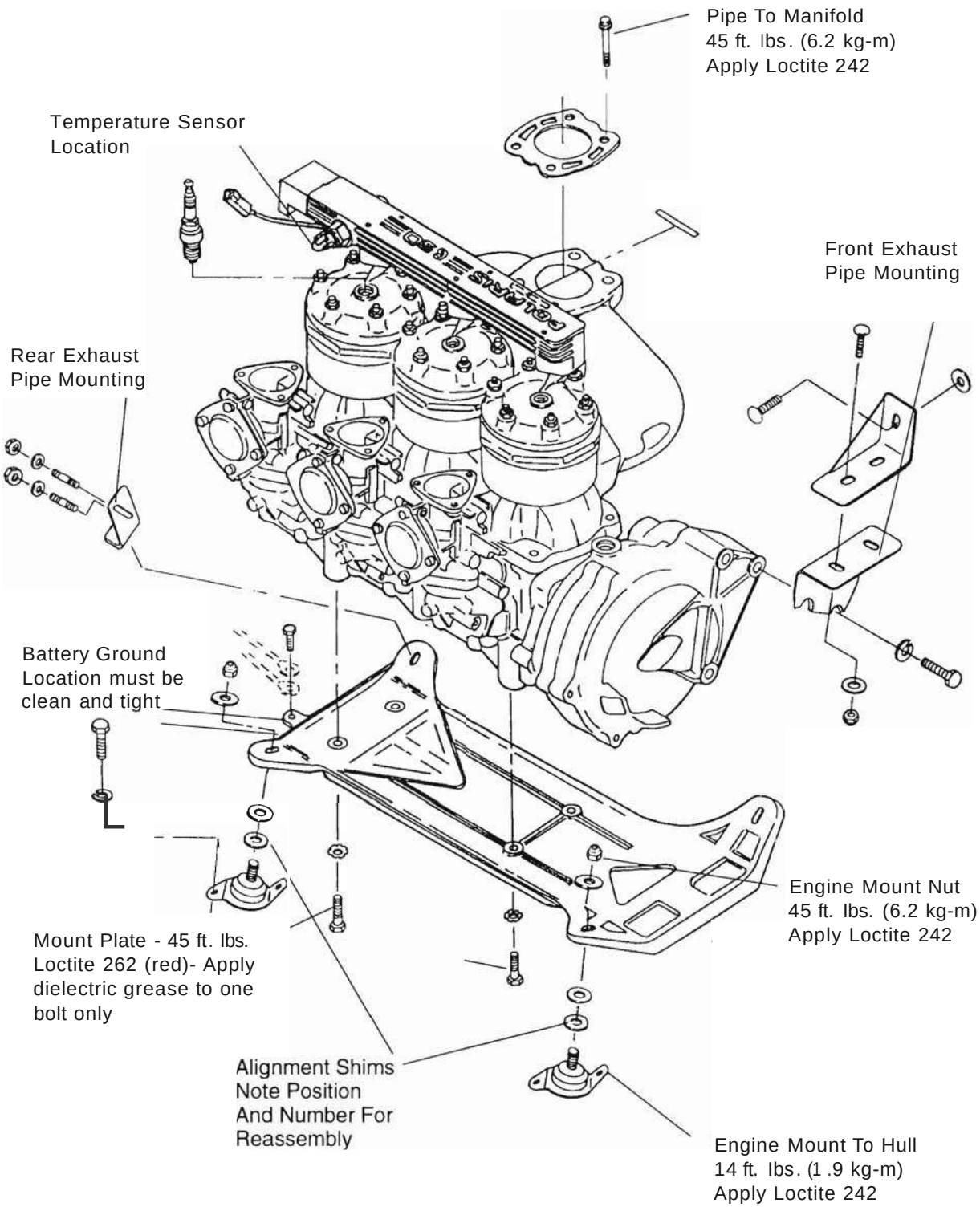


Exhaust Manifold (3 Cylinder) 22 ft. lbs. (3.04 kg-m)

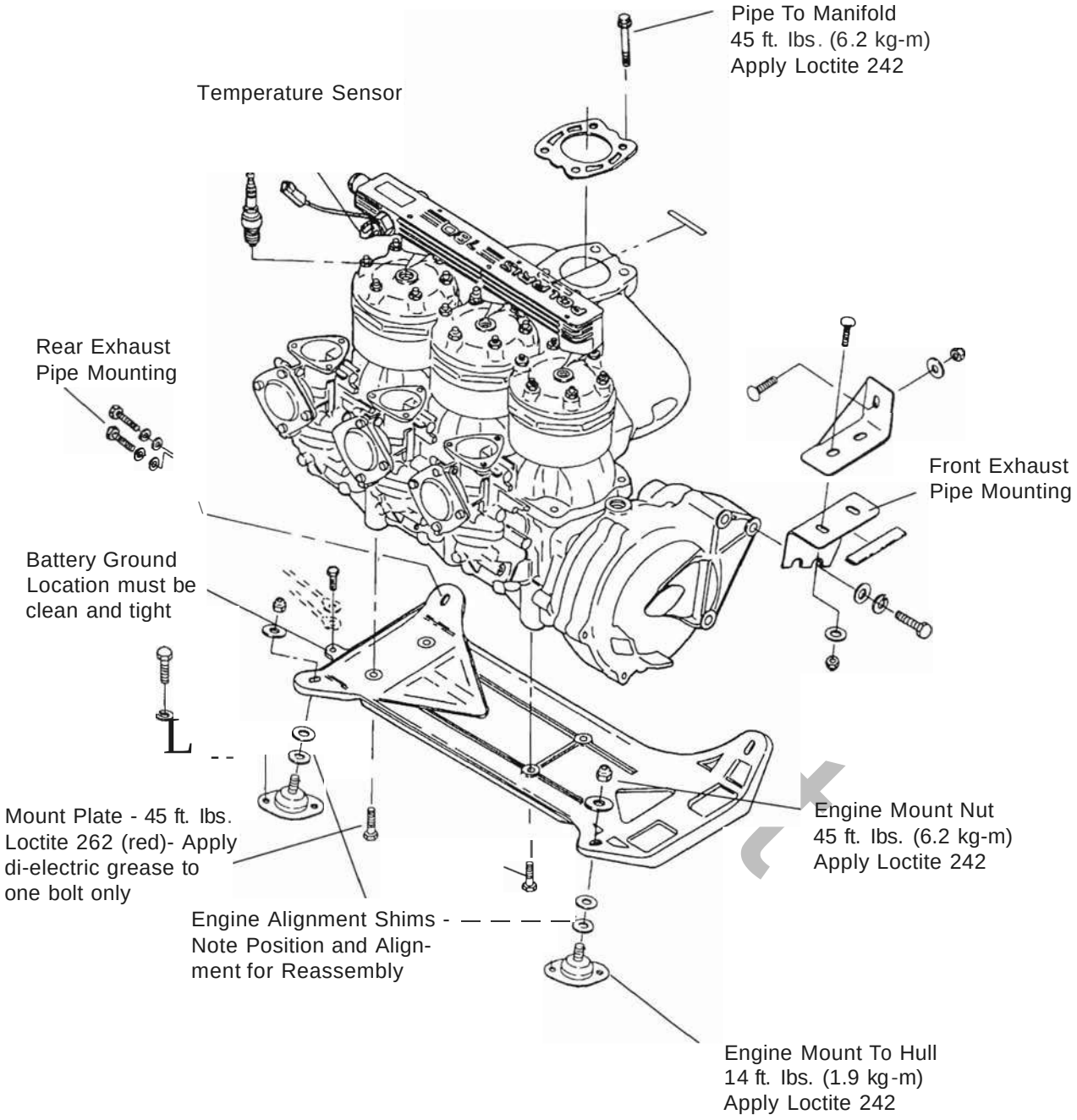
1992-1993 SL 650, SL750 Models



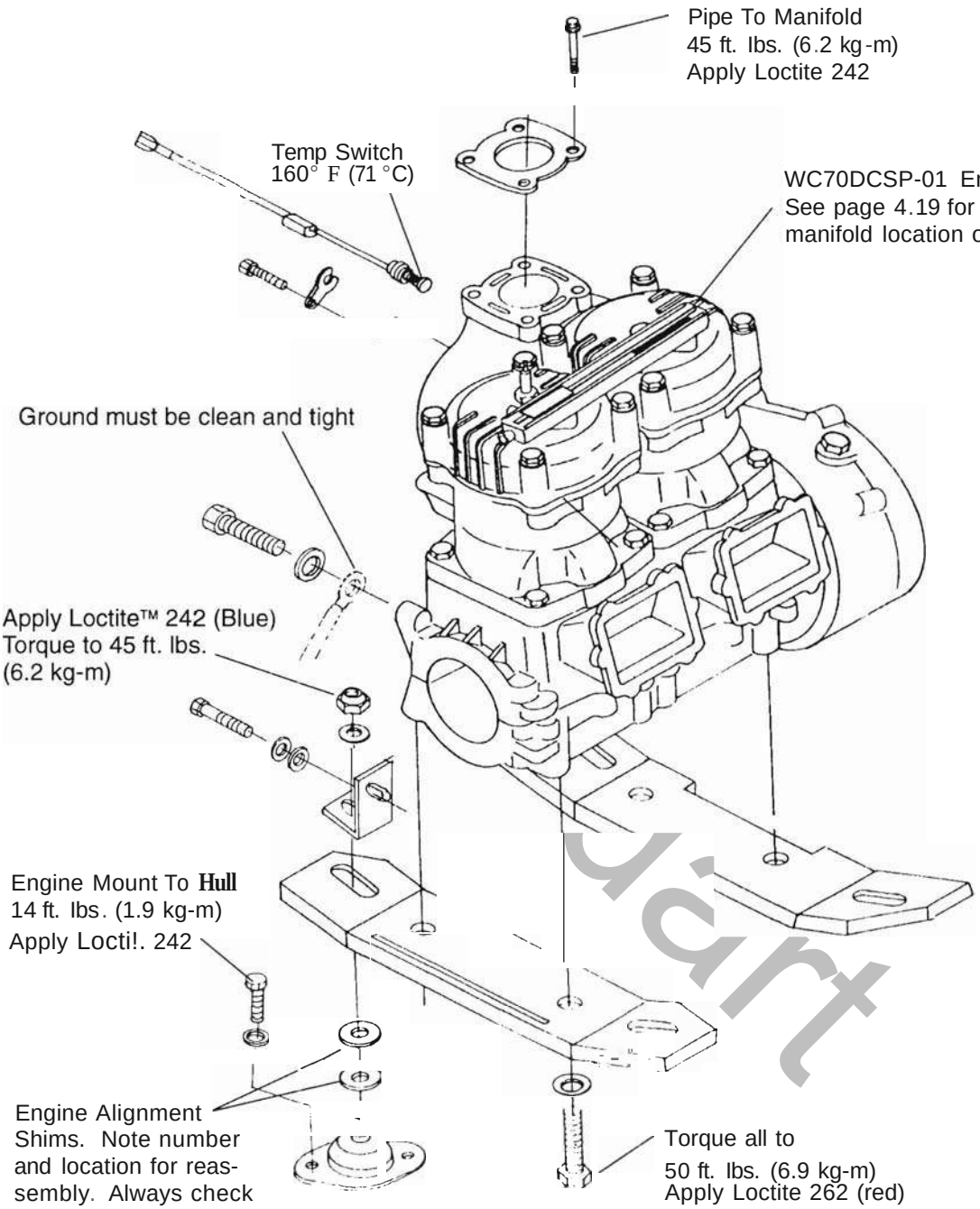
1994-1995 Models (Except SLX780)



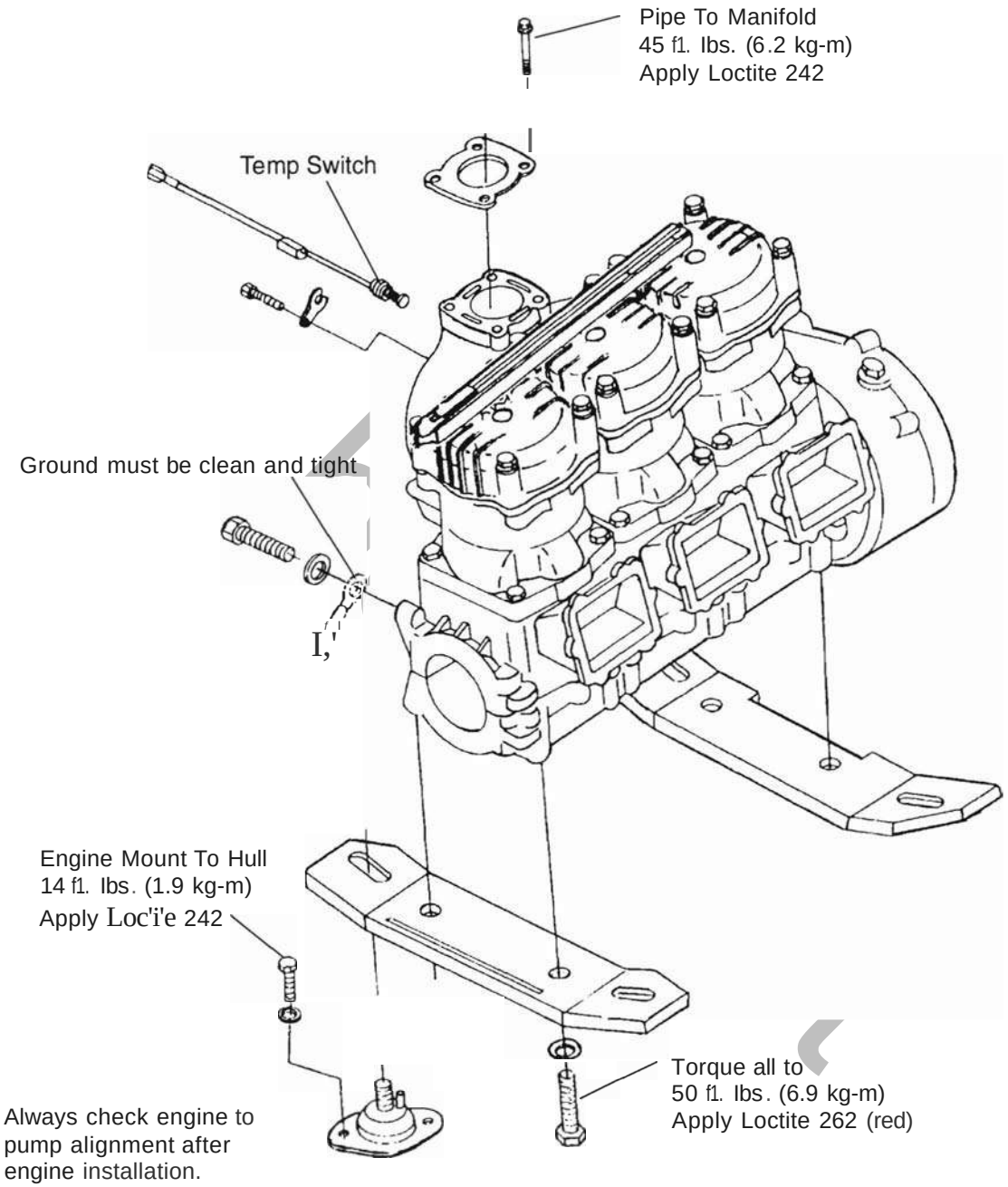
1995 SLX780, 1996 to Current SL, SLT, SLX780



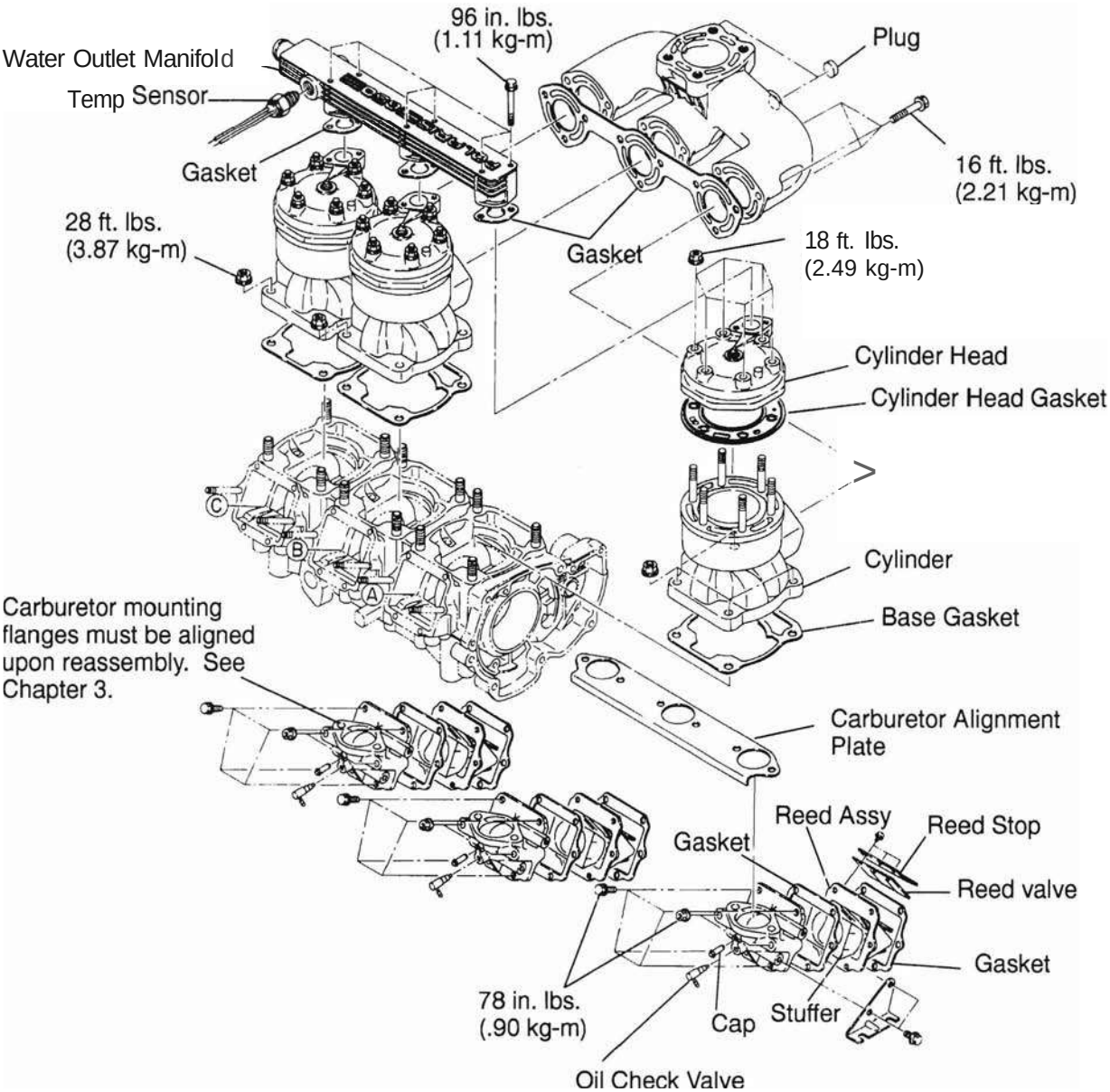
1996 to Current SL700, SLT700, Hurricane



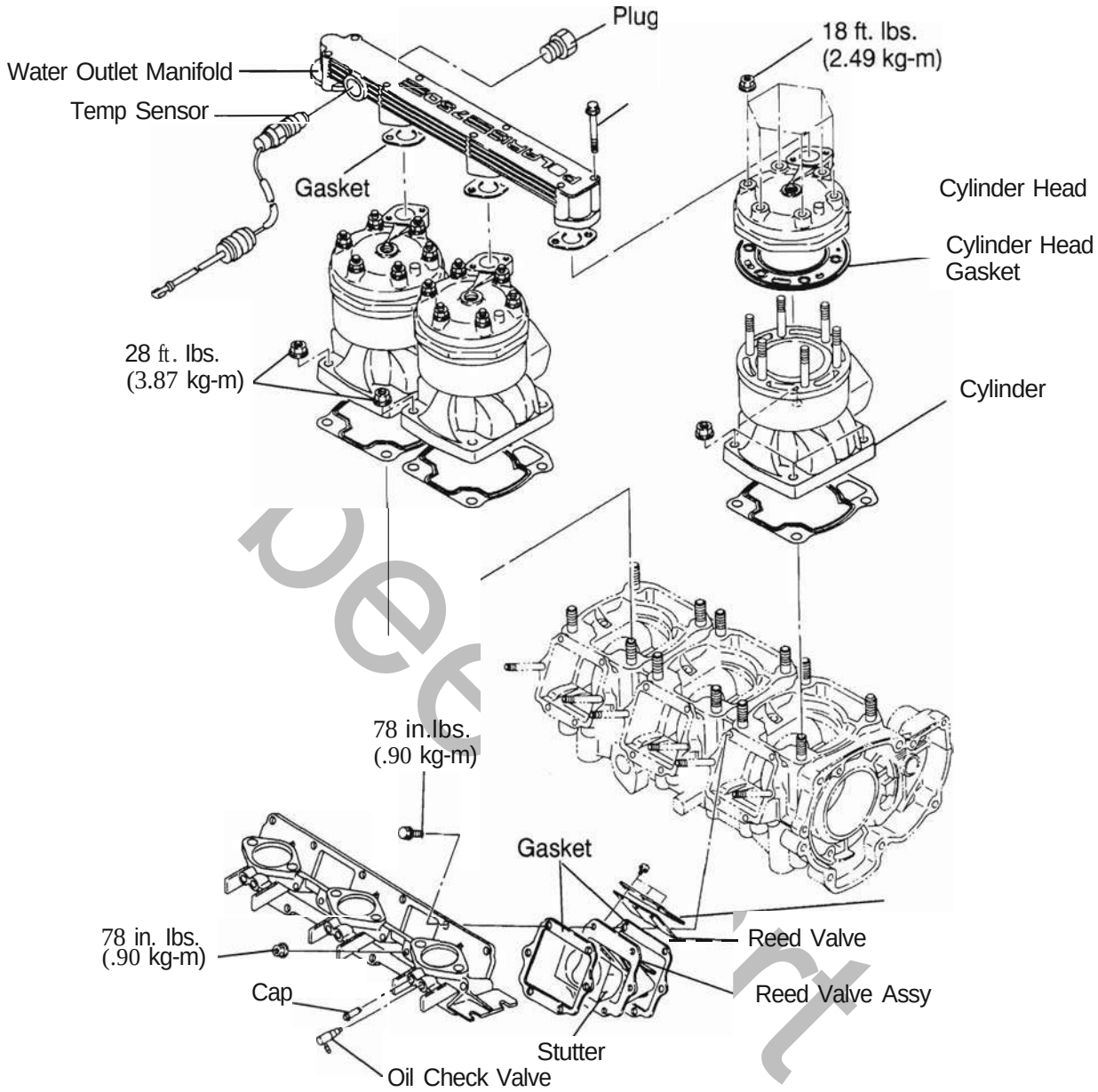
1996 to Current SL900, SL1050, SLTX



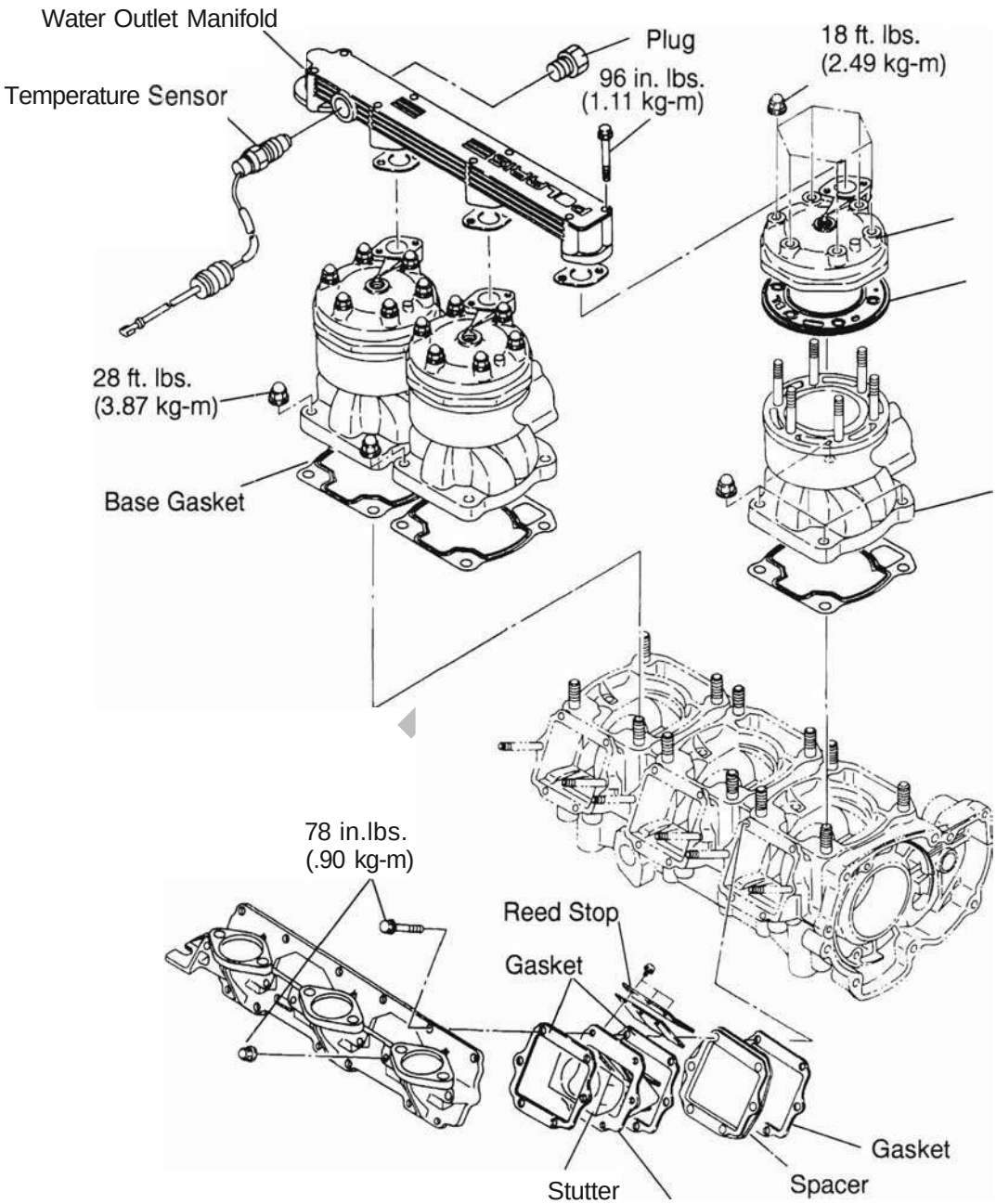
1992-1993 SL 650, SL750 Models



1994·1995 Models (Except SLX780)



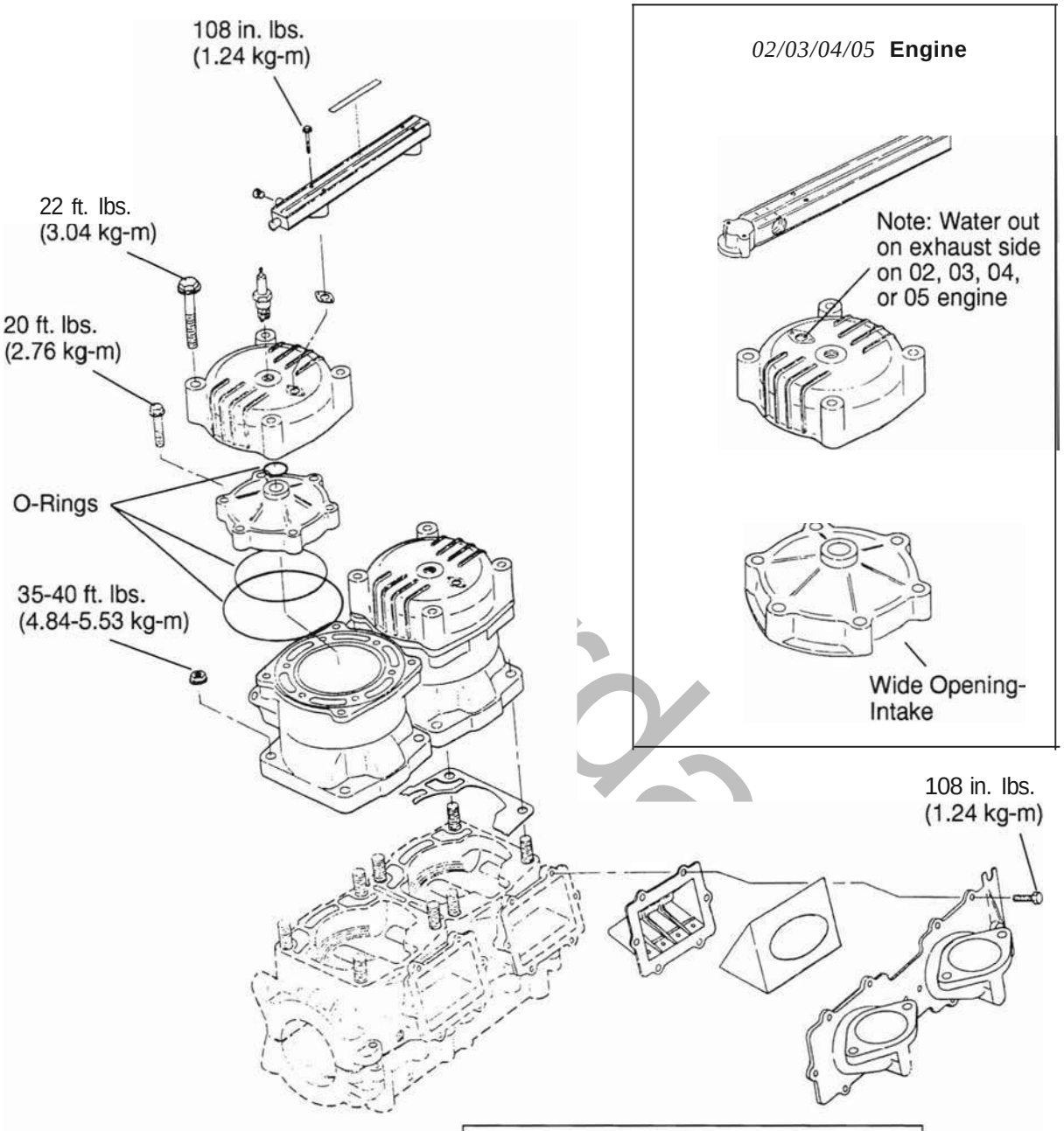
1995 SLX780, 1996 SL780, SLX780



Reed Valve Assy

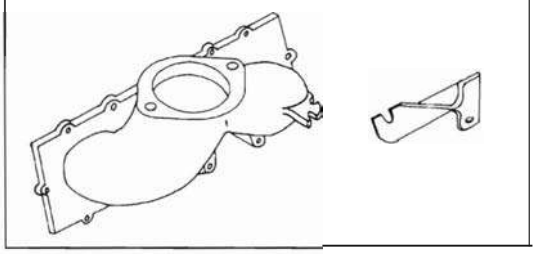
1996 to Current SL700, SL 700 Deluxe, SLT700, Hurricane

01 Engine

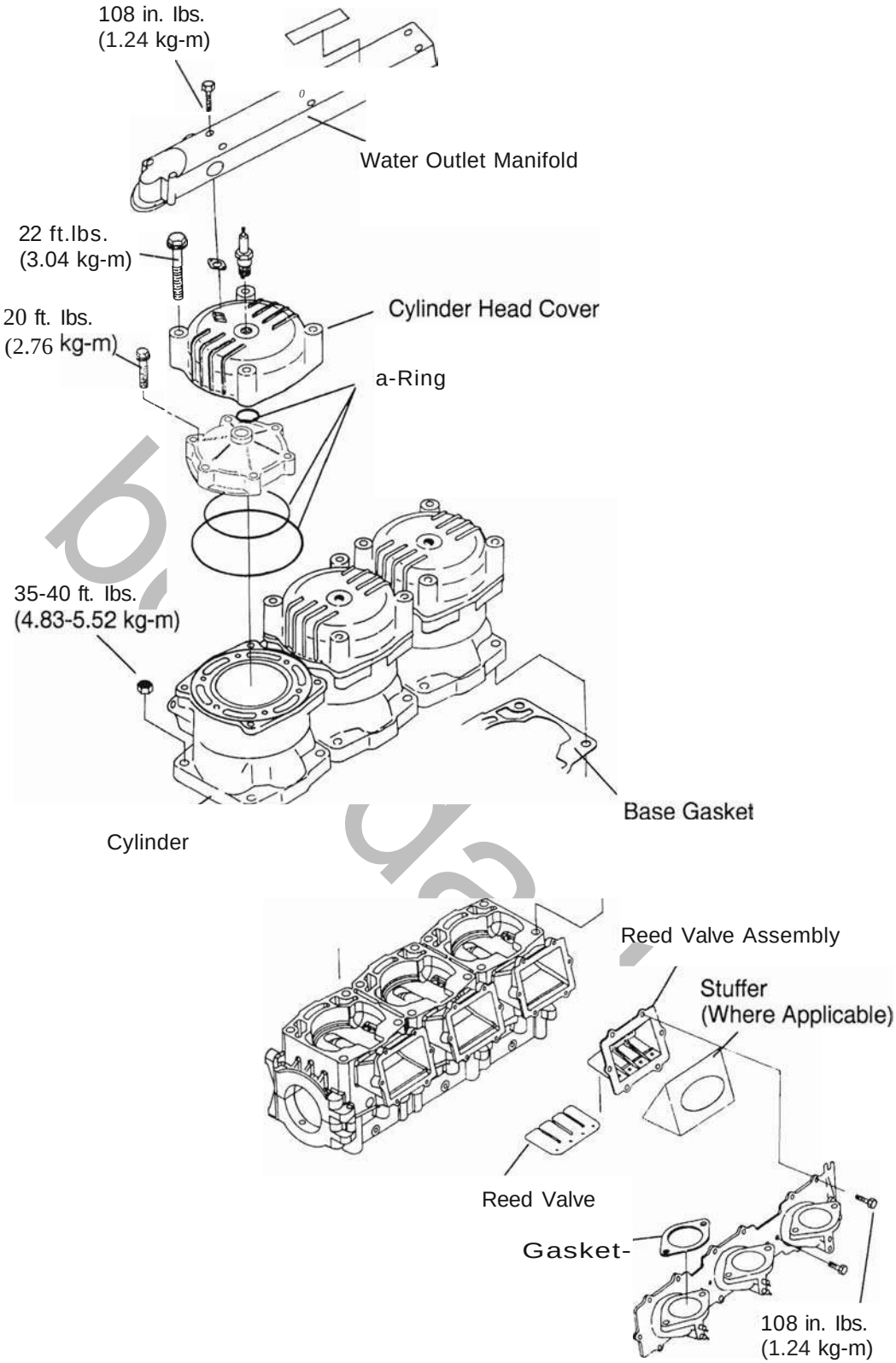


02/03/04/05 **Engine**

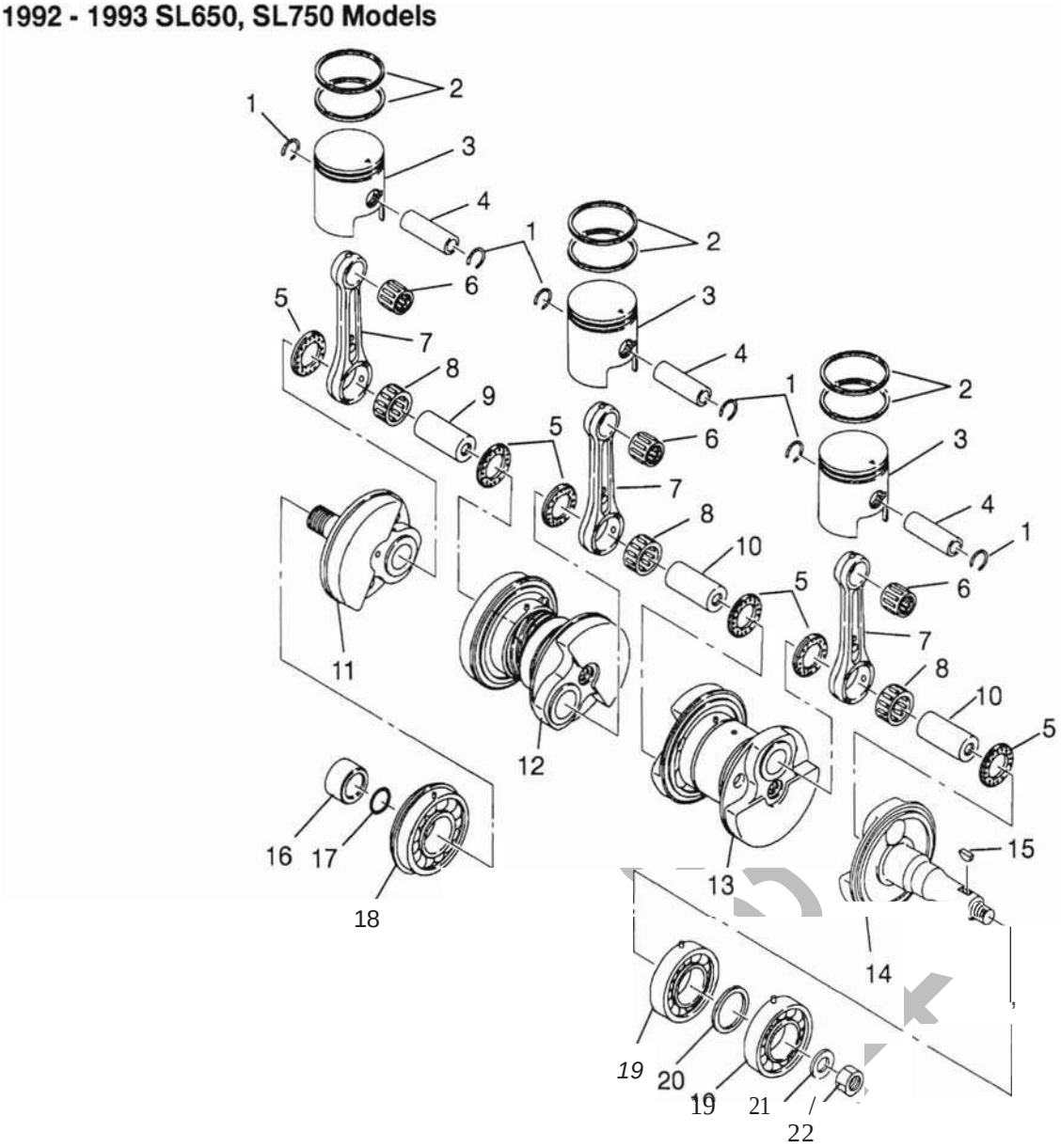
1997 to Current SL 700



1996 to Current SL900, SL1050, SLTX



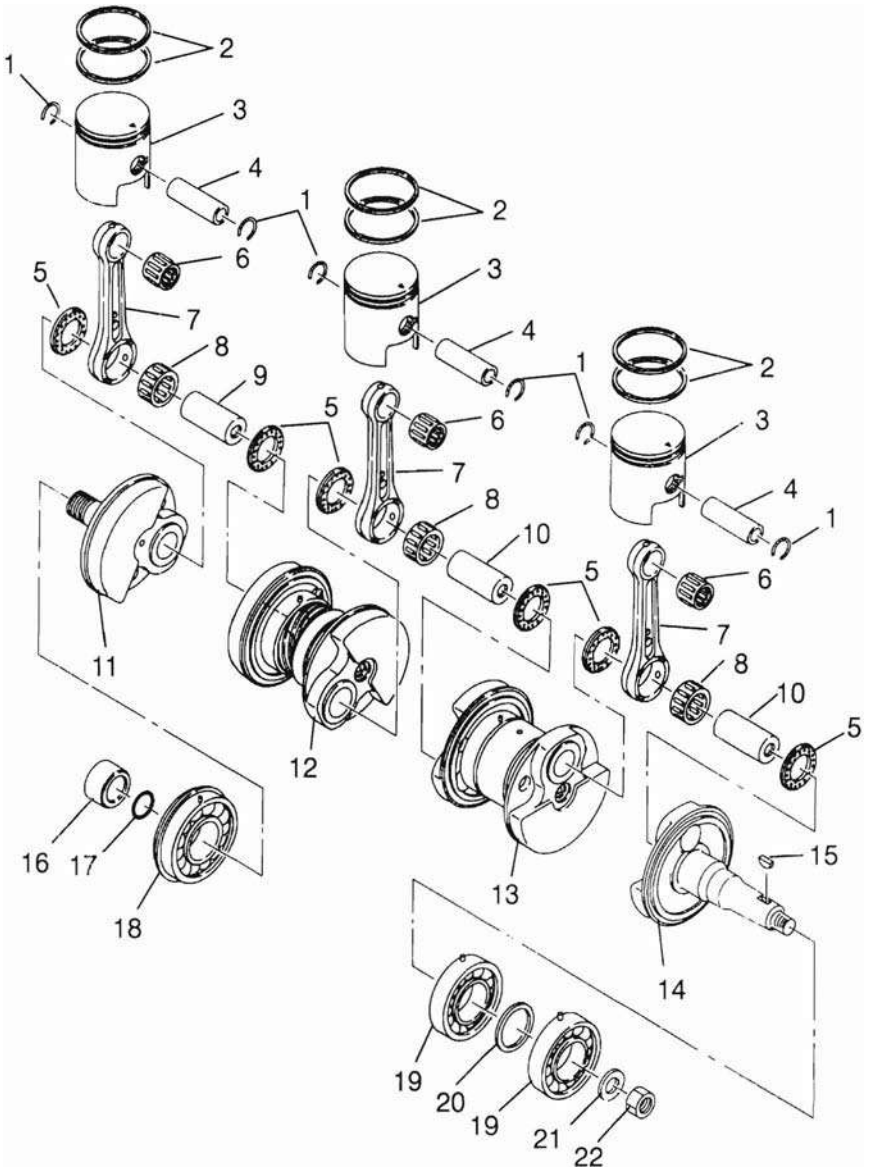
1992 - 1993 SL650, SL750 Models



Ref.	Qty.	Description
1	6	Clip, Piston Pin
2	6	Piston Ring, Std.
	6	Piston Ring, .01 *0"10.25mm OIS*
	6	Piston Ring, *.020"10.50mm OIS*
3	3	Piston Compl., Std.
	3	Piston Compl., .01 *0"10.25mm OIS*
	3	Piston Compl., *.020"10.50mm OIS*
4	3	Pin, Piston
5	6	Spacer, Crank Pin
6	3	Bearing, Small End
7	3	Rod, Connecting
8	3	Bearing, Large End
9	1	Pin, Crank
10	2	Pin, Crank, 2
11	1	Crankshaft 3

Ref.	Qty.	Description
12	1	Crankshaft Compl., PTO Side
13	1	Crankshaft Compl., Center
	1	Crankshaft Compl., Mag Side
14	1	Asm., Crankshaft
	1	Crankshaft 1
	1	Kit, Crankshaft Asm., (Incl. 15 , 21 ,22)
15	1	Key, Woodruff
16	1	Ring, Wear
17	1	O-Ring
18	1	Bearing, Ball
19	6	Bearing, Ball
20	1	Spacer
21	1	Washer
22	1	Nut

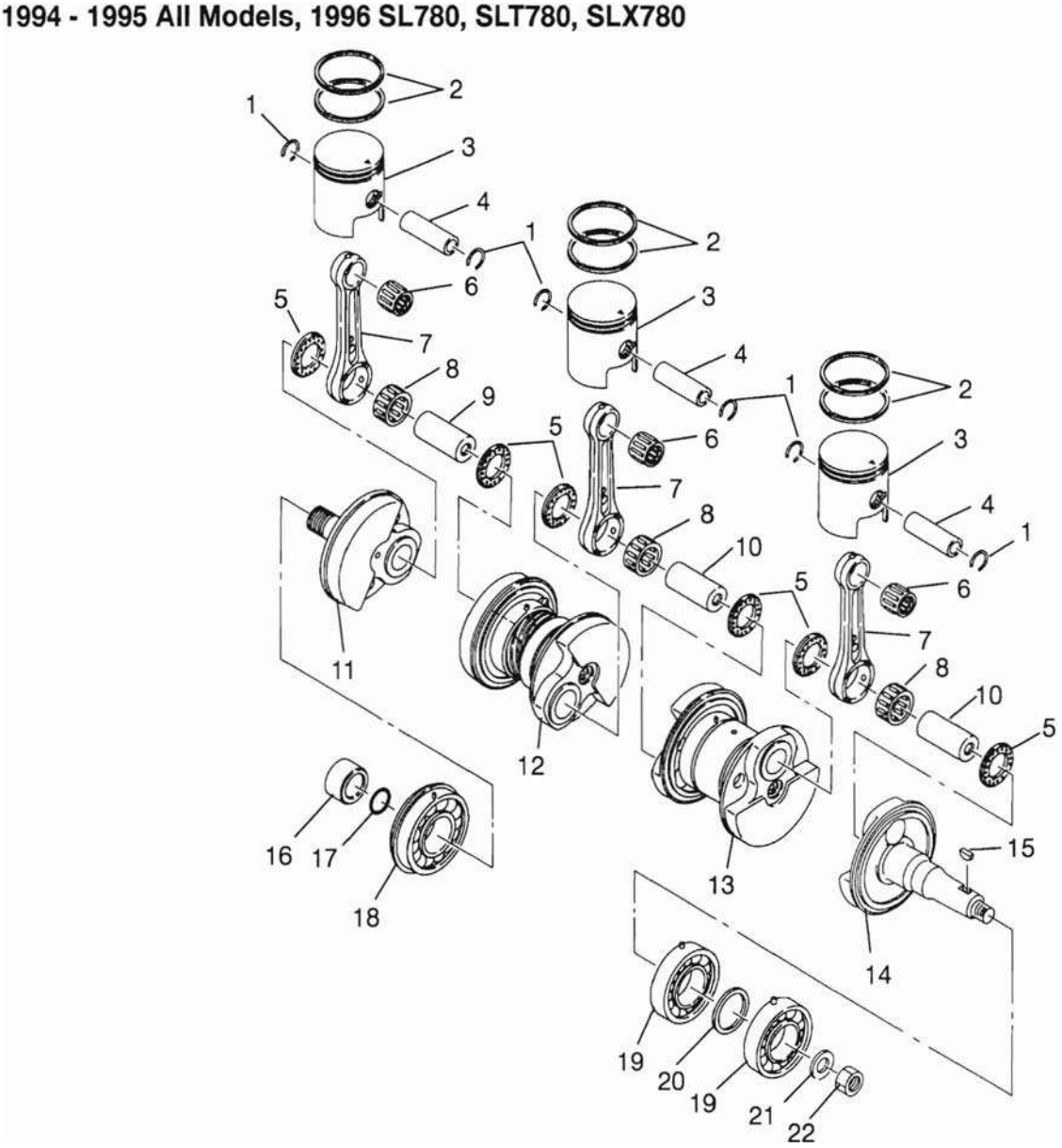
1994 - 1995 SL650, SL750 Models (Except SLX780)



Ref.	Qty.	Description
1	6	Clip, Piston Pin
2	6	Piston Ring, Std.
	6	Piston Ring, .01 *0"10.25mm OIS*
	6	Piston Ring, *.020"10.50mm OIS*
3	3	Piston Campl., Std.
	3	Piston Campl., .01 *0"10.25mm* O/S
	3	Piston Campl., *.020"10.50mm* O/S
4	3	Pin, Piston
5	6	Spacer, Crank Pin
6	3	Bearing, Small End
7	3	Rod, Connecting
8	3	Bearing, Large End
9	1	Pin, Crank
10	2	Pin, Crank, 2
11	1	Crankshaft 3

Ref.	Qty.	Description
12	1	Crankshaft Campl., PTO Side
13	1	Crankshaft Campl., Center
	1	Crankshaft Campl., Mag Side
14	1	Asm., Crankshaft
	1	Crankshaft 1
	1	Kit, Crankshaft Asm., (Incl. 15,21 ,22)
15	1	Key, Woodruff
16	1	Ring, Wear
17	1	O-Ring
18	1	Bearing, Ball
19	6	Bearing, Ball
20	1	Spacer
21	1	Washer
22	1	Nut

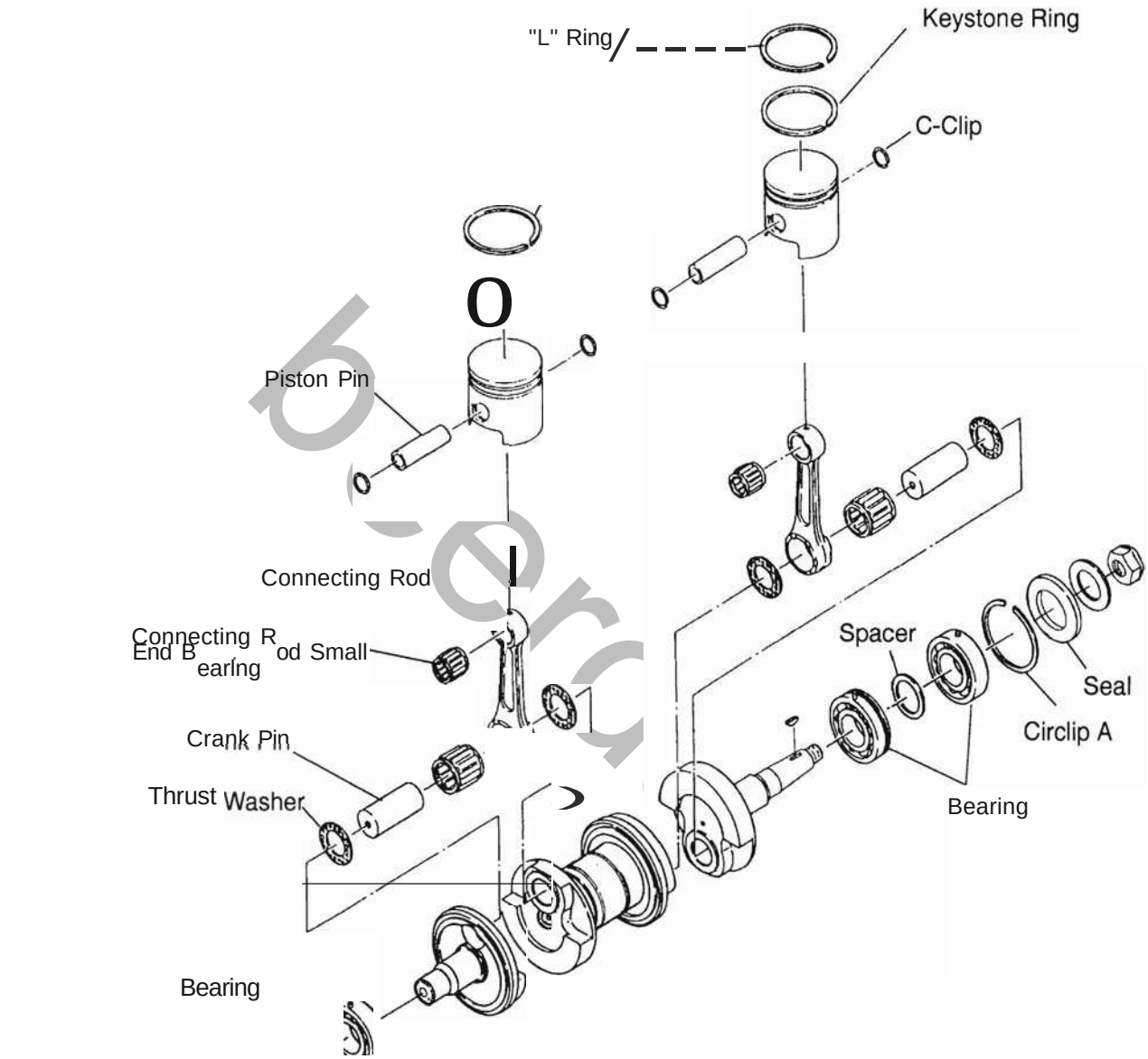
1994 - 1995 All Models, 1996 SL780, SLT780, SLX780

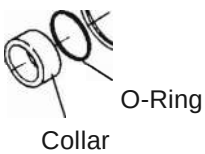


IRet.1	Qty. \	Description
1	6	Clip, Piston Pin
2	6	Piston Ring, Std.
	6	Piston Ring, .01 *0"10.25mm OIS*
	6	Piston Ring, *.020"10.50mm OIS*
3	3	Piston Compl., Std.
	3	Piston Compl., .01 *0"10.25mm OIS*
	3	Piston Compl., *.020"10.50mm OIS*
4	3	Pin, Piston
5	6	Spacer, Crank Pin
6	3	Bearing, Small End
7	3	Rod, Connecting
8	3	Bearing, Large End
9	1	Pin, Crank
10	2	Pin, Crank, 2
11	1	Crankshaft 3

Ref.	Qty.	Description
12	1	Crankshaft Compl., PTO Side
13	1	Crankshaft Compl., Center
	1	Crankshaft Compl., Mag Side
14	1	Asm., Crankshaft
	1	Crankshaft 1
	1	Kit, Crankshaft Asm., (Incl. 15,21 ,22)
15	1	Key, Woodruff
16	1	Ring, Wear
17	1	O-Ring
18	1	Bearing, Ball
19	6	Bearing, Ball
20	1	Spacer
21	1	Washer
22	1	Nut

1996 to Current SL700, SL700 Deluxe, SLT700, Hurricane





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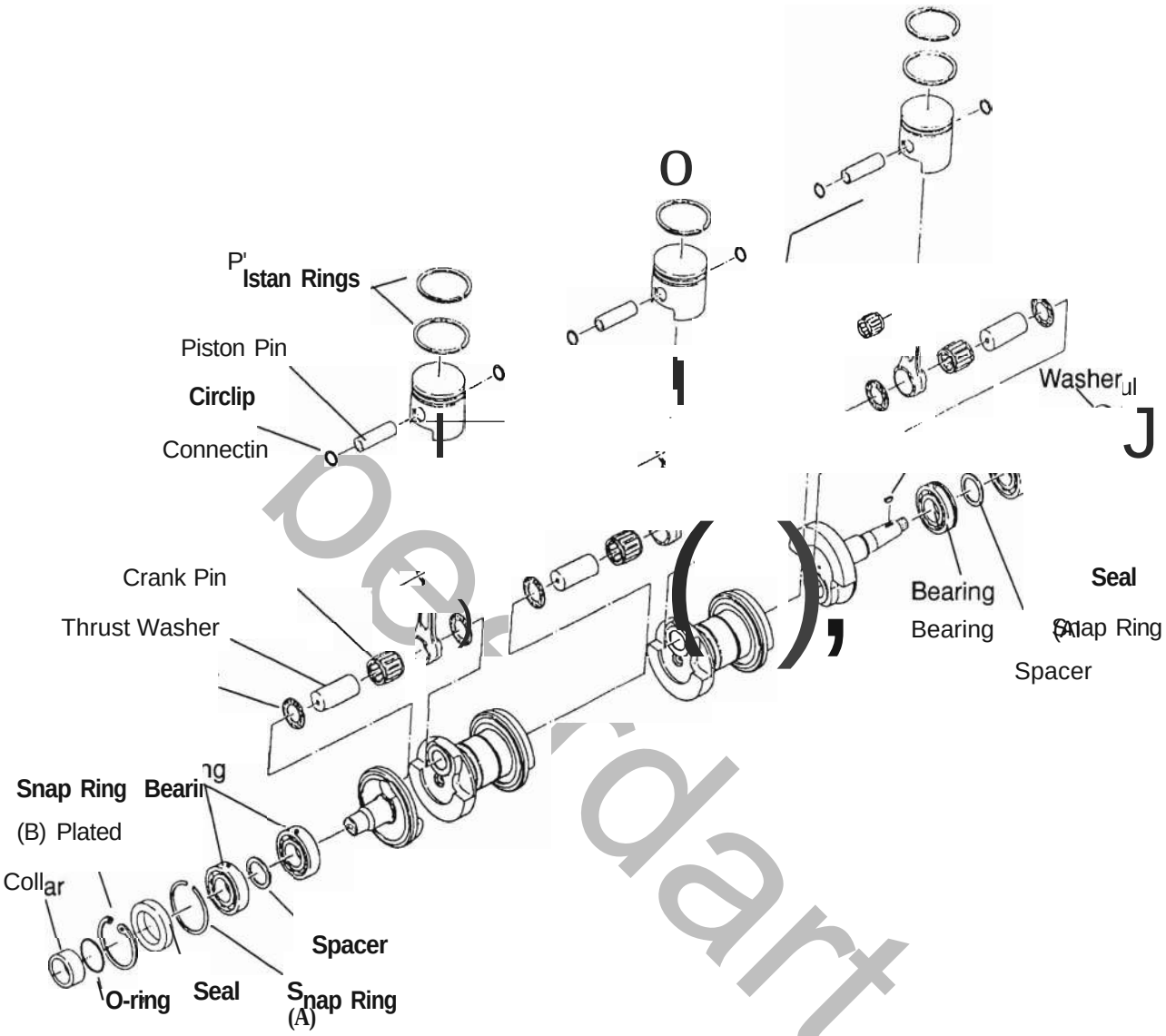
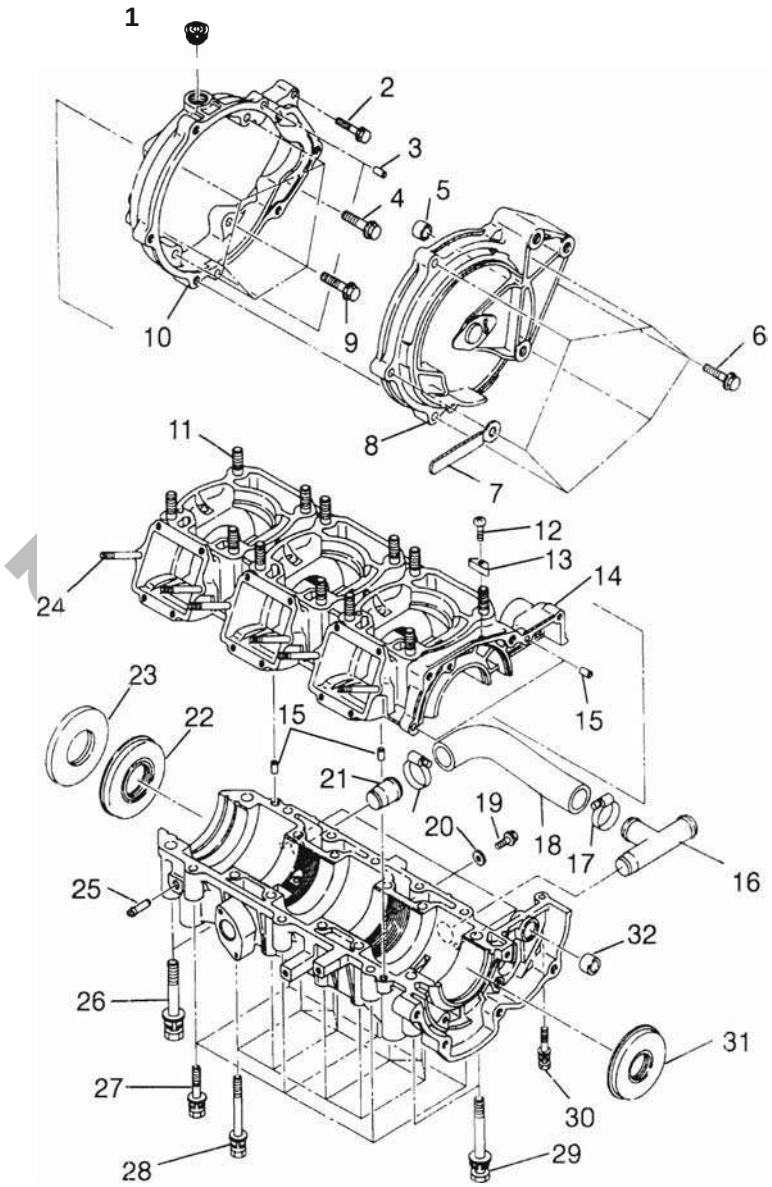
1996 to Current SL900, 5 L1050, SLTX



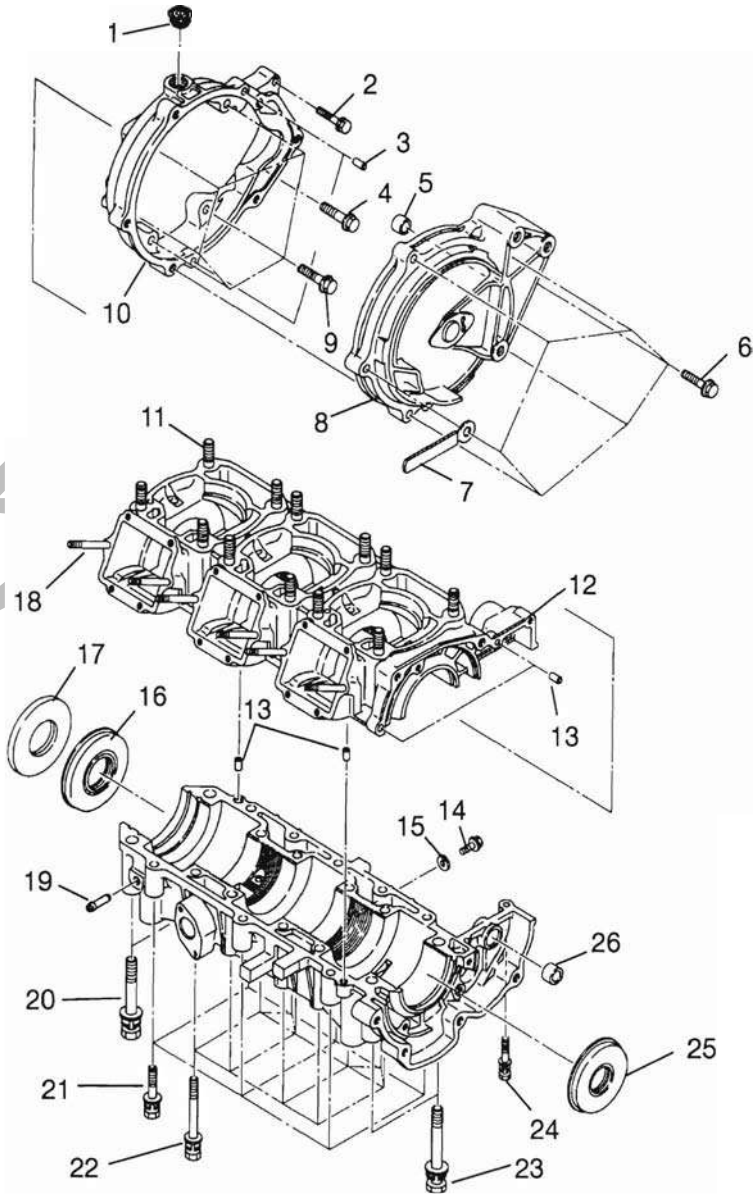
1992·1993 SL650, SL750 Models



Ref.	Qty.	Description
1	1	Plug, Rubber
2	1	Bolt, Flange
3	2	Pin, Dowel
4	1	Bolt, Flange
5	1	Bush, Starter
6	6	Bolt, Flange
7	1	Clamp
8	1	Cover, Mag, Complete
9	5	Bolt, Flange
10	1	Asm., Crankcase 3
11	12	Stud
12	1	Screw
13	1	Plale,Zln,
14	1	Asm., Crankcase
15	4	Pin, Dowel
16	1	Pipe 2 Complete, Water (93 Models)

Ref.	Qty.	Description
17	2	Clamp, Hose
18	1	Hose, Water
19	3	Bolt, Flange
20	3	Gasket
21	1	Pipe Complete, Water (2 on 92 Models)
22	1	Seal, Oil
23	1	Seal, Oil
24	6	Stud
25	1	Pipe, Pulse
26	2	Asm., Bolt and Washer
27	6	Asm., Bolt and Washer
28	10	Asm., Bolt and Washer
29	2	Asm., Bolt and Washer
30	1	Asm., Bolt and Washer
31	1	Seal, Oil
32	1	Bush, Starter

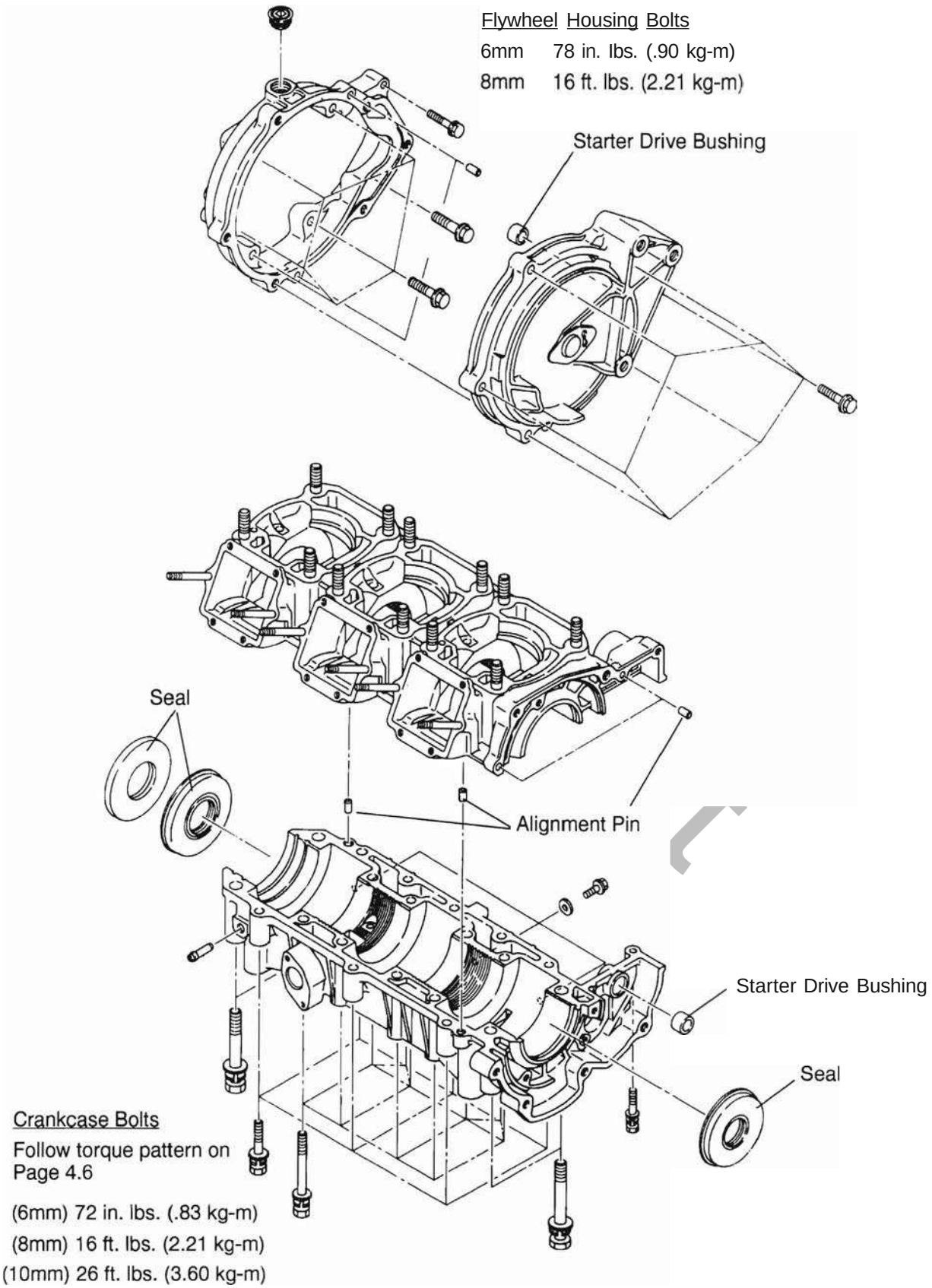
1994 - 1995 Models (Except SLX780)



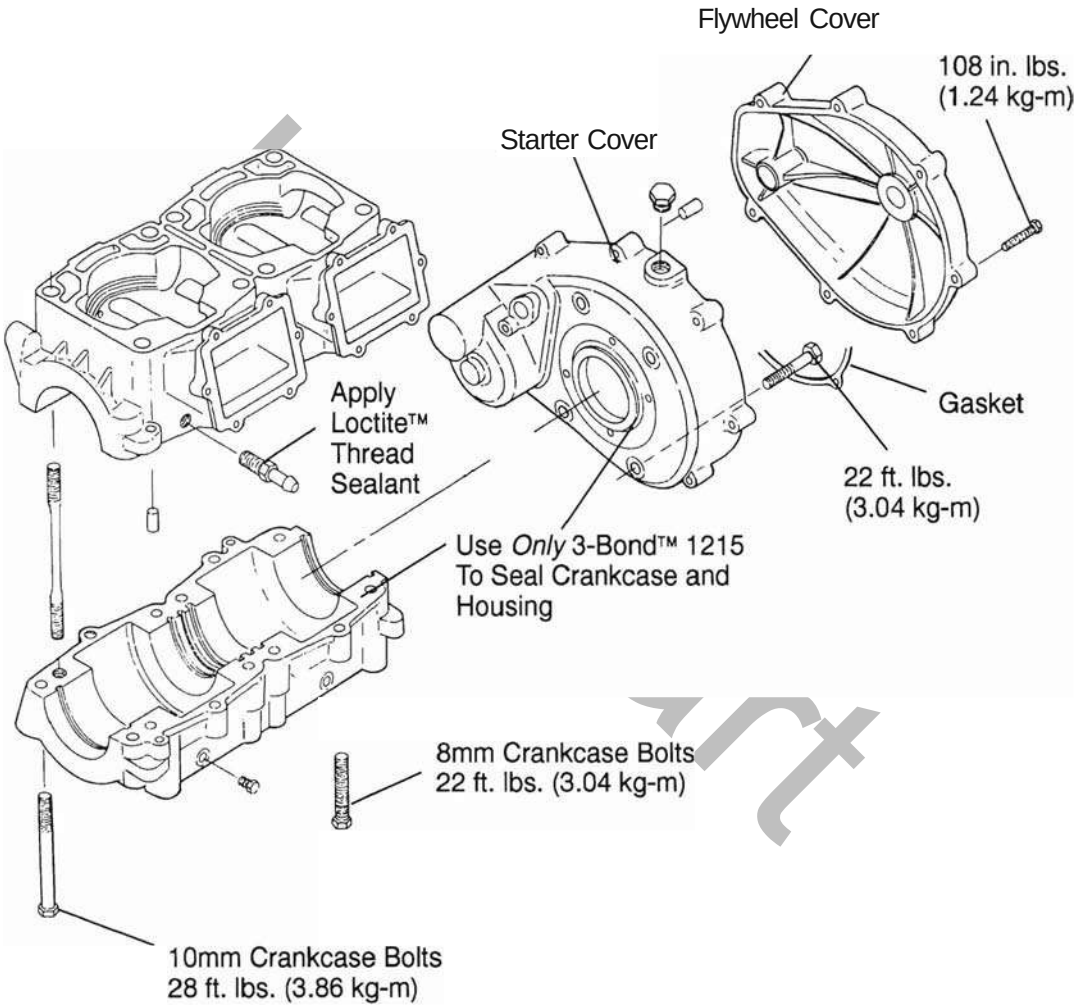
Ref.	Qty·1	Description
1	1	Plug, Rubber
2	1	Bolt, Flange
3	2	Pin, Dowel
4	1	Bolt, Flange
5	1	Bush, Starter
6	6	Bolt, Flange
7	1	Clamp
8	1	Cover, Mag, Complete
9	5	Bolt, Flange
10	1	Asm., Crankcase 3
11	12	Stud
12	1	Asm., Crankcase
13	4	Pin, Dowel

Ref.	Qty.	Description
14	3	Bolt, Flange
15	3	Gasket
16	1	Seal, Oil
17	1	Seal, Oil
18	6	Stud
19	1	Pipe, Pulse
20	2	Asm., Bolt and Washer
21	6	Asm., Bolt and Washer
22	10	Asm., Bolt and Washer
23	2	Asm., Bolt and Washer
24	1	Asm., Bolt and Washer
25	1	Seal, Oil
26	1	Bush, Starter

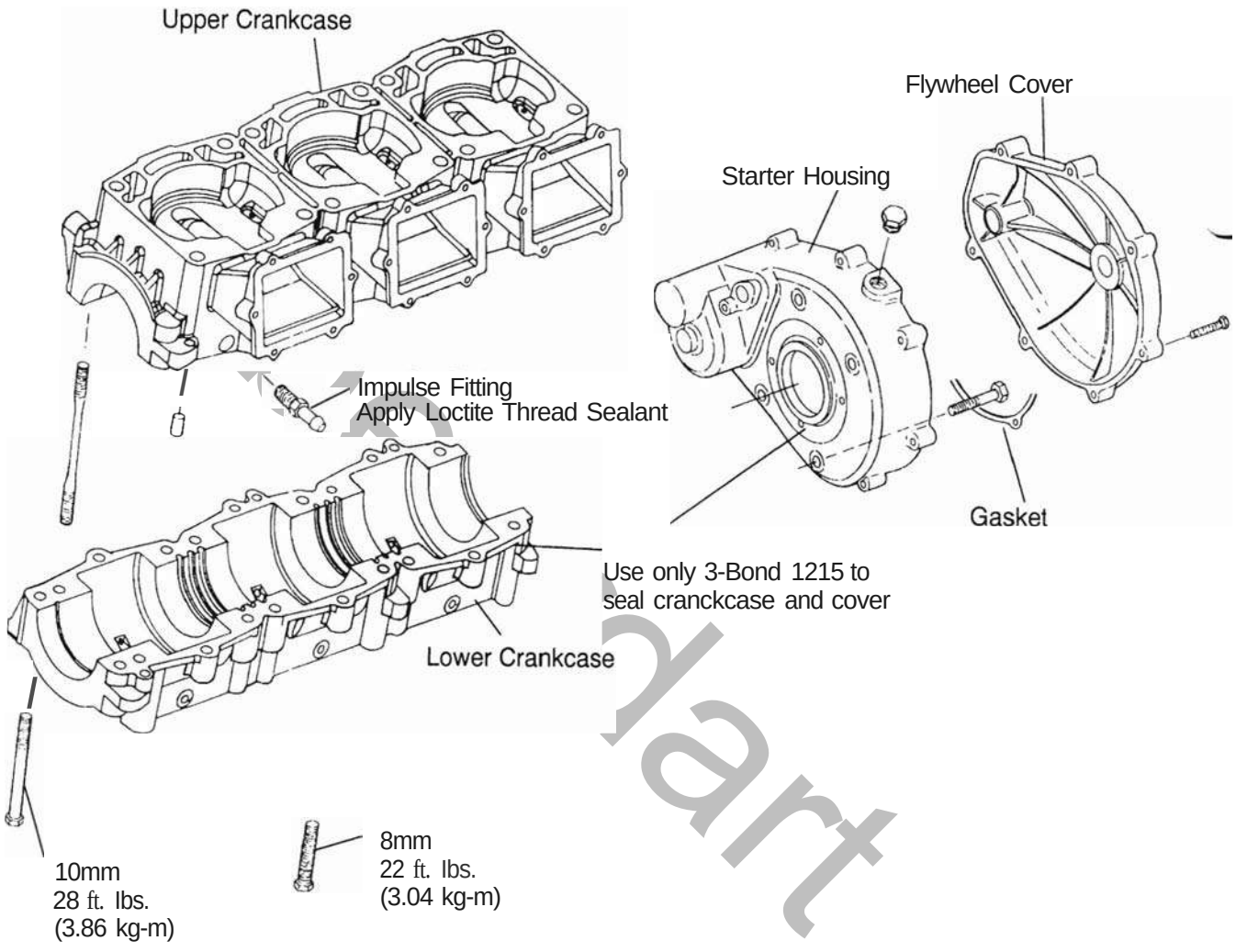
1995 SLX780, 1996 to Current SL780, SLT780, SLX780



1996 to Current SL700, SL700 Deluxe, SLT700, Hurricane

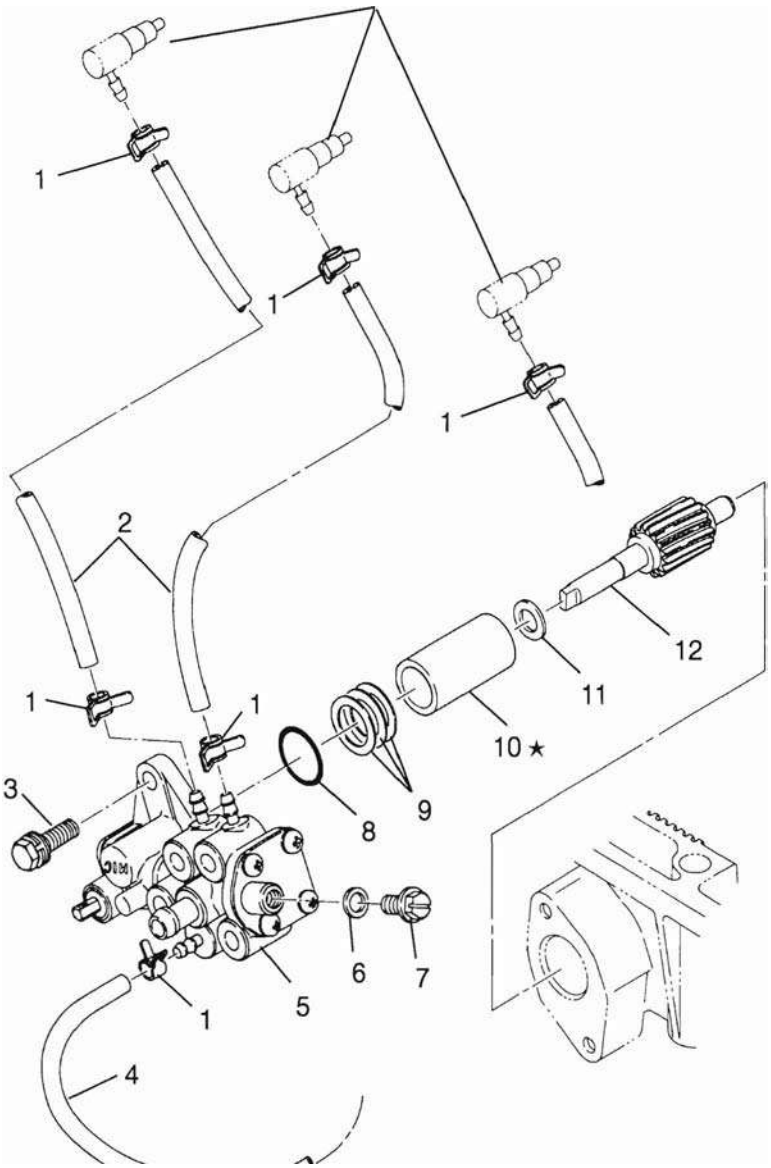


1996 to Current SL900, SL1050, SLTX



1992·1994 Models

Oil Check Valve

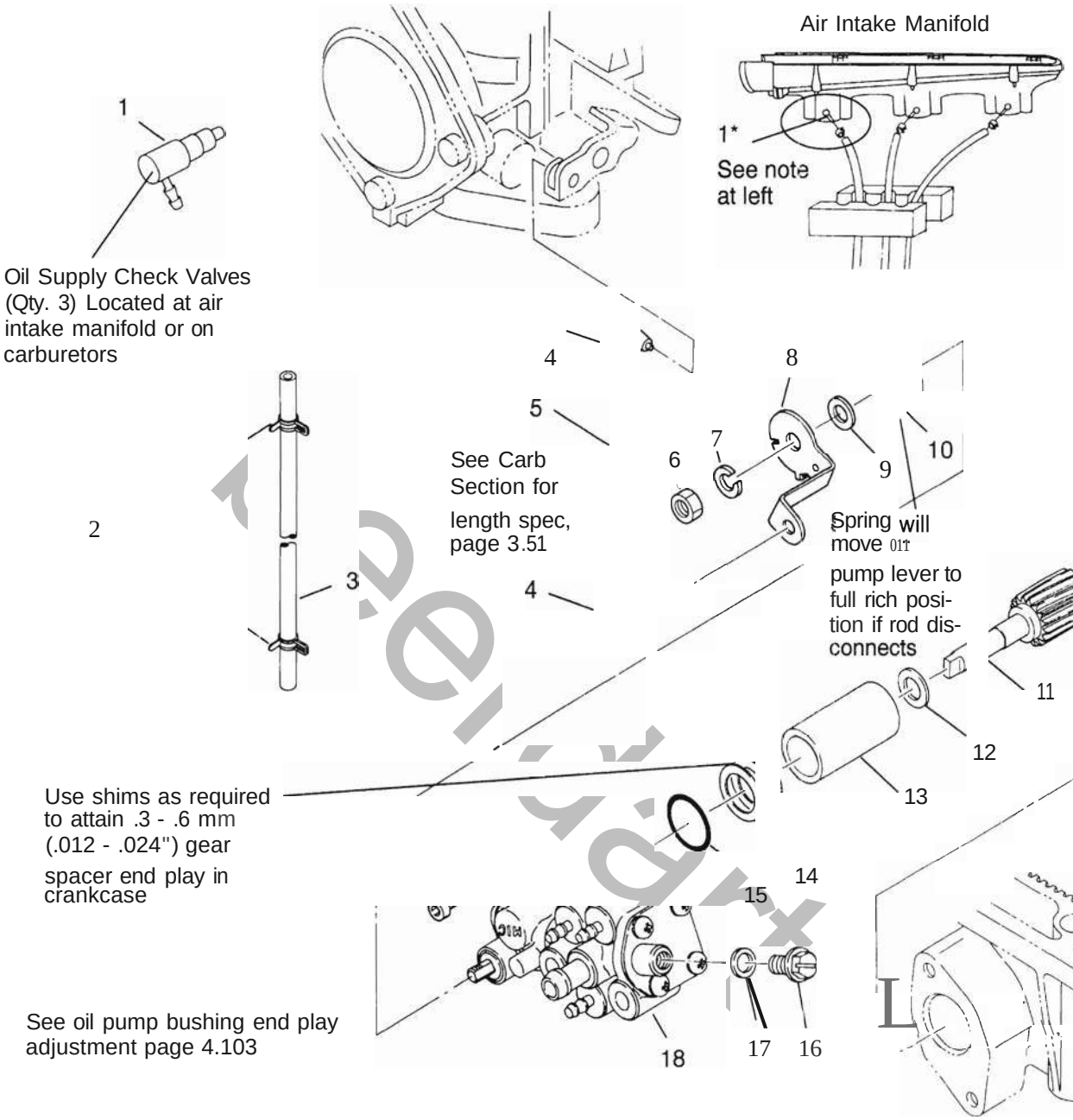


* See oil pump bushing end play adjustment page 4.105.

Ref.	Qty.	Description
1	6	Clamp, Hose
2	2	Pipe 1, Vinyl
3	2	Asm., Bolt and Washer
4	1	Pipe 2, Vinyl
5	1	Asm., Oil Pump
6	1	Packing
7	1	Screw, Air Vent

Ref.	Qty.	Description
8	1	O-Ring
9	AR	Spacer 1
	AR	Spacer 2
	AR	Spacer 3
10	1	Bush
11	1	Spacer
12	1	Gear, Small

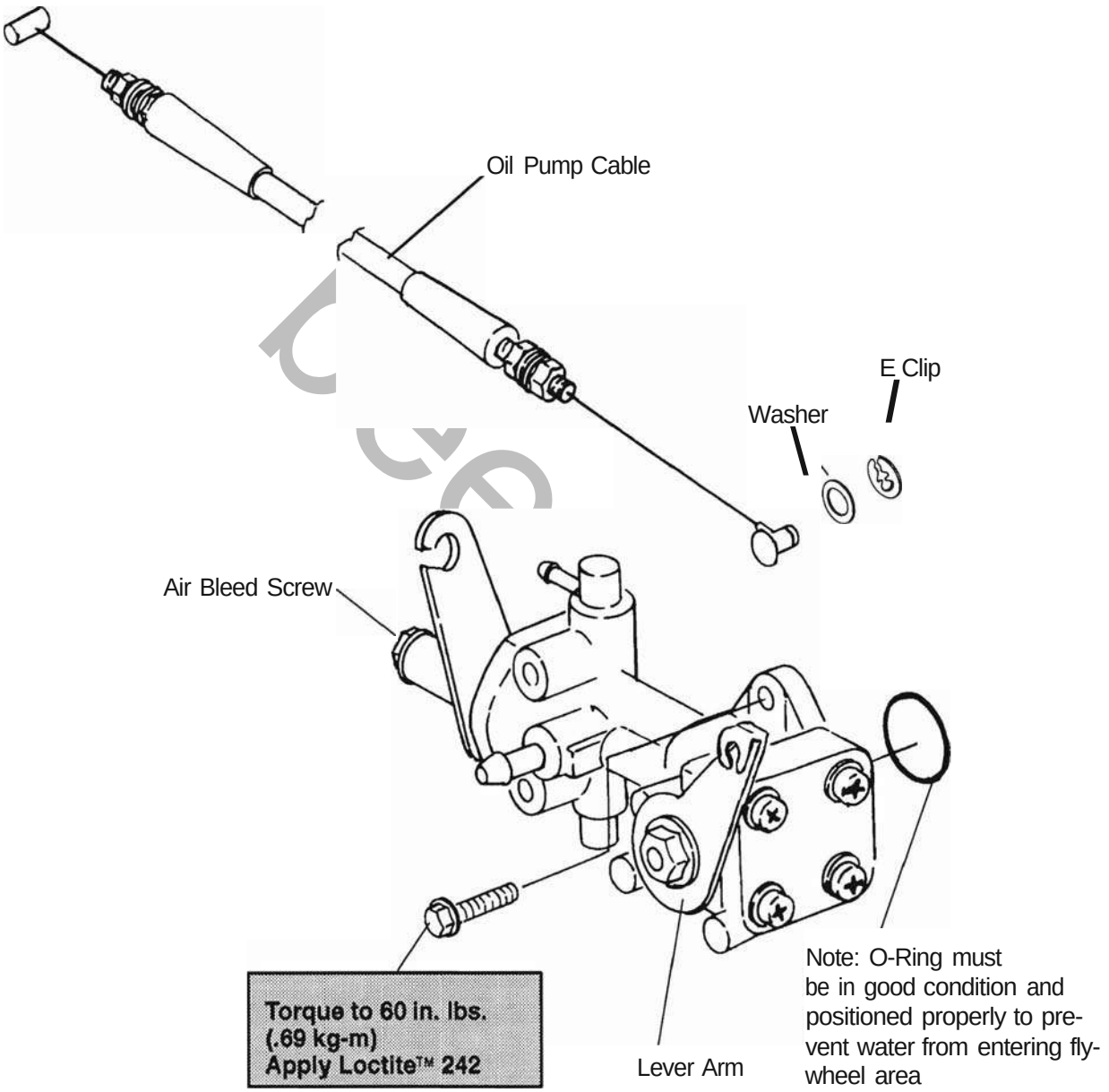
1995 SL650, SL750, SLT750, 1996 to Current SL780, SLT780, SLX780



Ref.	Qty.	Description
1	3	Check Valve Complete
2	6	Clamp, Hose
3	3	Vinyl Pipe Campl. (330mm)
4	2	Linkage Brush
5	1	Rod
6	1	Nut
7	1	Spring Washer
8	1	Control Lever
9	1	Camshaft Collar
10	1	Return Spring
11	1	Gear, Small

Ref.	Qty.	Description
12	1	Spacer
13	1	Bush
14	AR	Spacer 1
	AR	Spacer 2
	AR	Spacer 3
15	1	O-Ring
16	1	Screw, Air Vent
17	1	Packing
18	1	Asm., Oil Pump
19	2	Bolt, Socket Head

1996 to Current SL700, SL700 Deluxe, SLT700, Hurricane, SL900, SLTX

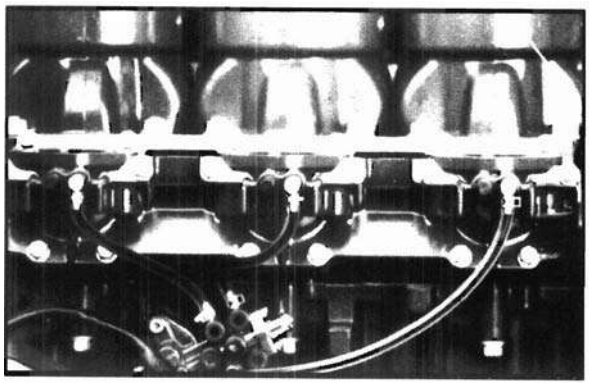


Engine Removal

Refer to illustrations on pages 4.11 to 4.13.

1. Turn off fuel valve.
2. Remove seat; apply masking tape around seat opening to protect hull from scratches during engine lifting procedures.
3. Loosen hose clamp and remove air intake duct. Remove air intake cover (6 screws). Lift out intake screen and gasket. (Protect carburetors from foreign debris at all times.) Remove air intake bolts (9).

1992 - 1994 Models



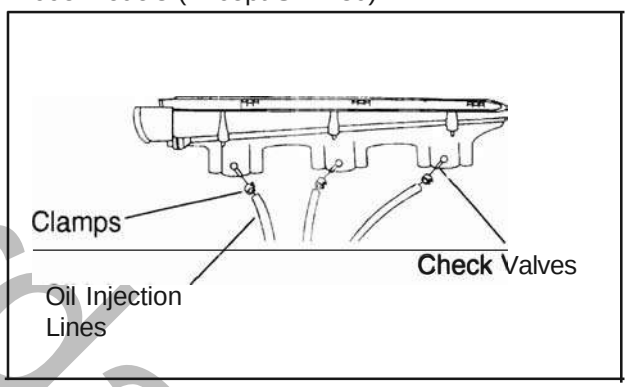
CAUTION:

1995 models are equipped with oil line fittings at air intake (on carburetor on 1995 SLX780, and 1996 SL, SLT and SLX 780). Slide back the clamps and remove the oil lines. Do not damage the lines.

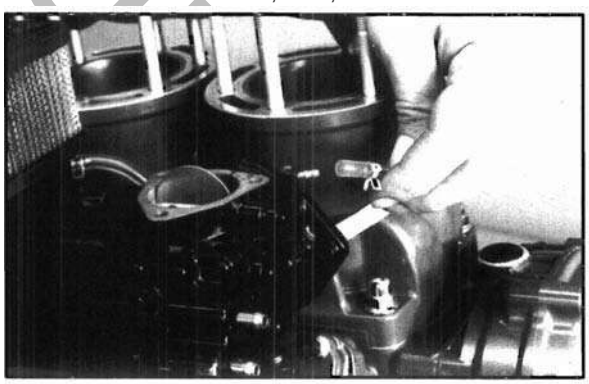
4. Remove two straps securing exhaust water box.
5. Remove battery ground (-) cable (black) at rear of engine mount plate.
6. Loosen battery hold down straps and remove electrical box cover (6 screws). Unplug engine wire harness connectors. Remove harness grommet bracket and pull harness out of electrical box. Move electrical box out of the way to complete battery ground H cable removal.

Oil Line Removal

1995 Models (Except SLX780)



1995 SLX and 1996 SL, SLT, SLX 780 Models



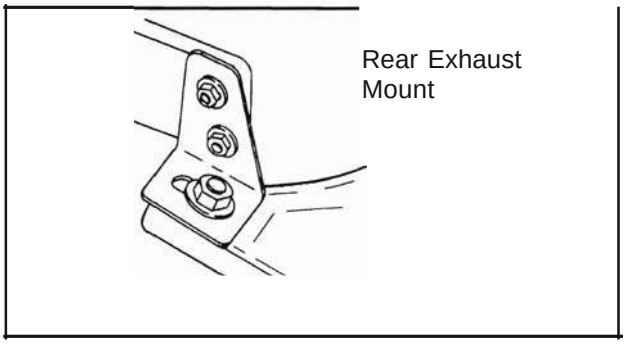
Engine Removal Cont.

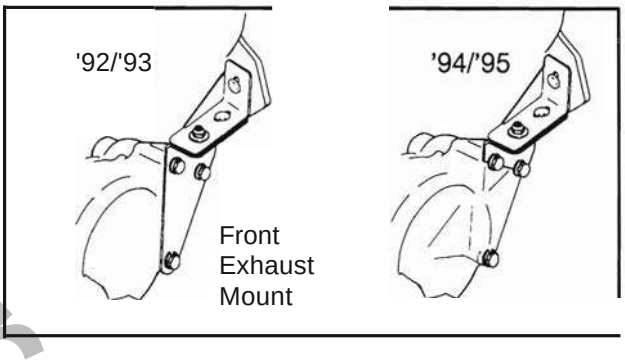
7 . Unplug water temperature sensor wire at engine.

8. Raise front hatch and lift out storage bucket (SLs).

9. Remove exhaust front and rear mount bolts.

NOTE: Oil tank may be moved aside for easier access to front mount bolts.





10 . Remove (4) 12mm bolts securing exhaust pipe to exhaust manifold. Slide pipe forward to gain access to exhaust manifold bolts. Remove exhaust manifold bolts (9) and manifold.

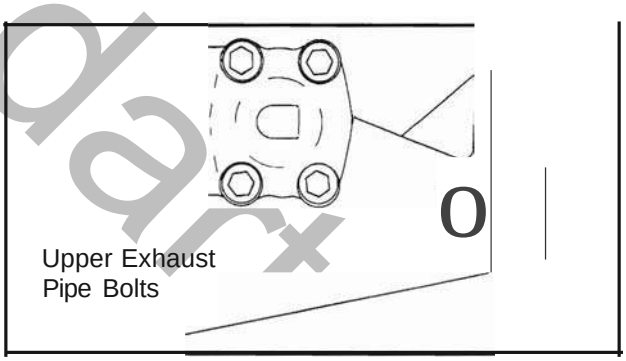
11 . Disconnect battery positive (+) cable at starter motor.

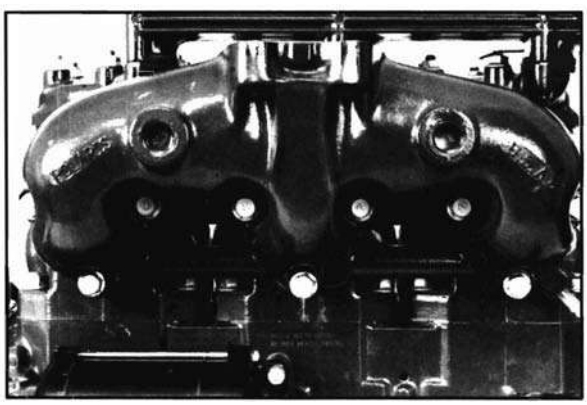
12 . Disconnect fuel supply line from fuel pump. Disconnect fuel return line from fuel rail. Remove and plug oil supply line at oil pump.

13 . Disconnect throttle and choke cables at carburetors.

14 . Disconnect cooling water hoses from engine.

15 . Remove jet pump and driveshaft assembly. (See Final Drive Section).





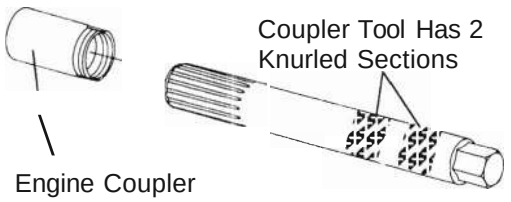
16. If engine will be completely disassembled, remove drive coupler from crankshaft *before* loosening (4) engine mount nuts.

17. Remove PTO spark plug. Find Top Dead Center of this piston.

18. Turn coupler clockwise (as viewed from rear of craft) until piston is approximately 1" (25.4 mm) before top dead center. **NOTE:** Estimate piston position using a screwdriver or similar probe through plug hole.

19. Remove screwdriver or probe and insert approximately 1 ft. (30 em) of 5/16" nylon rope through spark plug hole. Using coupler tool or a large wrench on flats of coupler, turn crankshaft counter clockwise until rope is trapped between piston and cylinder head. With crankshaft locked in position, remove coupler by turning counter clockwise (as viewed from the rear). The coupler is a right hand thread.

Note: Tool Not Intended For Use On Bonded Rubber Coupler



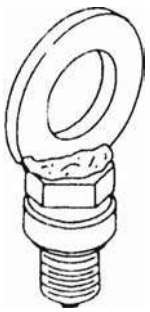
CAUTION:

Do not use impact tools for coupler removal. Damage may occur to the coupler or tool.

20. Remove engine mount nuts (4). With the aid of a chain hoist, slide engine rearward and upwards and lift out of hull. Engine alignment shim(s) may be in place on one or more of the engine rubber mount studs. Note the number and location for reinstallation. The number of shims installed in production is written next to each mount with permanent marker on later models. Engine rubber mounts are stressed during removal of mounting nuts. Be sure to inspect the mounts carefully and replace if damaged.

NOTE: Engine lifting eyes can be easily fabricated by removing the upper porcelain from a spark plug and welding a large washer to the spark plug base. Install one lifting eye in the PTO cylinder and one in the Mag cylinder spark plug hole.

Engine Lifting Eye
(2 Required)



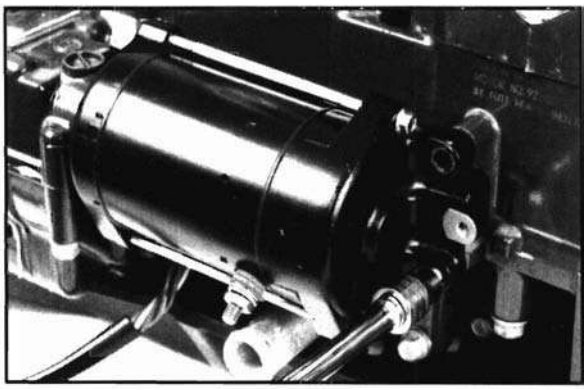
CAUTION:

When lifting use care to avoid damaging the oil check valves and oil lines at the intake manifolds (where applicable).

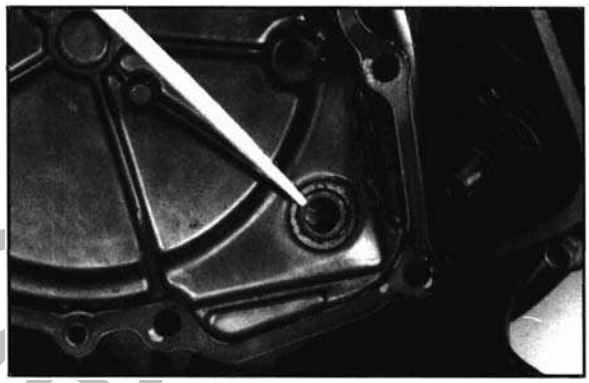
1992-1995 (Except SLX780)

NOTE: The following sequence of disassembly and reassembly procedures will be of aid to the service technician during diagnosis and repair. Care should be taken to ensure that all parts are kept extremely clean.

1. Remove starter motor bolts (2) and pull starter straight away from mag housing and then out.

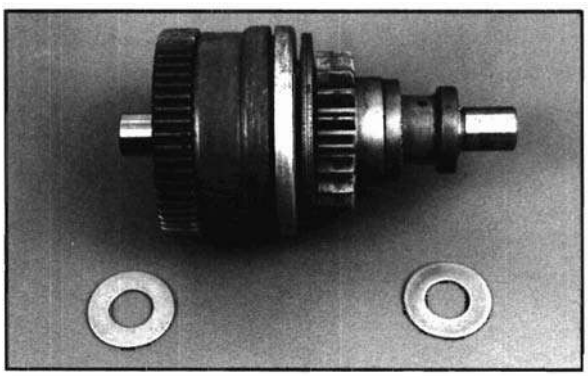


2. Remove flywheel outer cover. Inspect bushing in cover for wear, looseness, or damage.



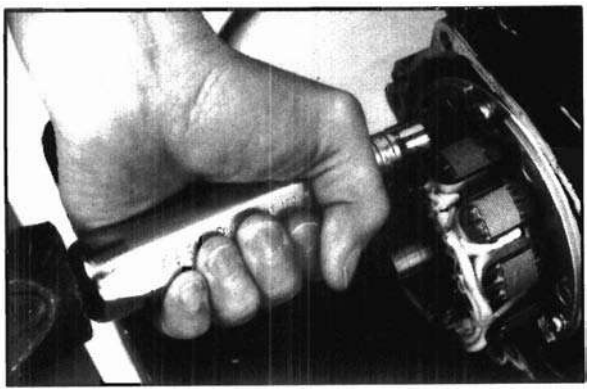
3. Remove flywheel nut. Install flywheel puller and remove flywheel.

4. Remove inner magneto cover and starter drive assembly and note position of thrust washer. Inspect starter drive for damage. Mark or note position of stator plate on crankcase to aid reassembly.



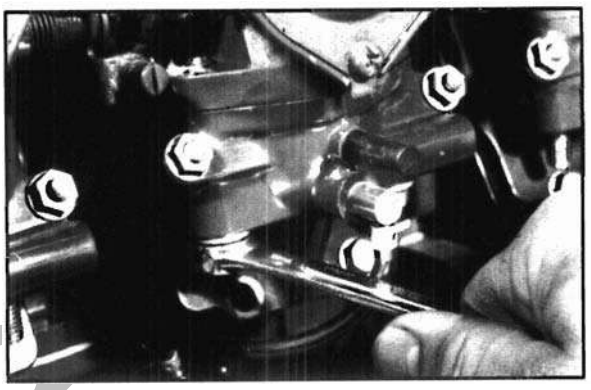
Engine DisassemblylInspection Cont.

5. Use a hand impact driver to remove (3) stator plate screws and (2) wire harness weatherproof grommet retainer screws. Remove grommet and stator plate assembly.



6. Remove carburetor assembly.

NOTE: 1995 to Current models are equipped with a variable oil pump controlled by a link rod between the carburetors and the pump arm. Open the retaining clip slightly and rotate it to allow removal of the pump control rod.

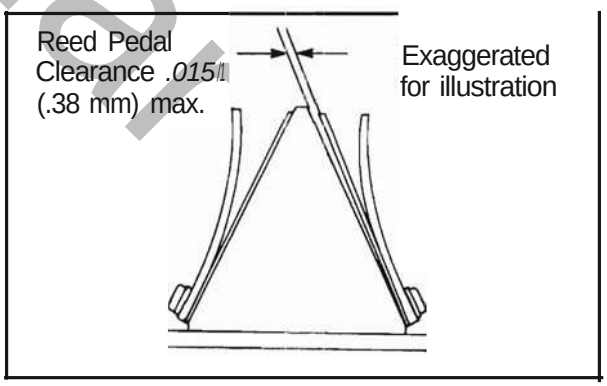


CAUTION:

Do not bend the pump control rod when removing the carburetors. The length of the rod determines the amount of oil delivered to the engine.

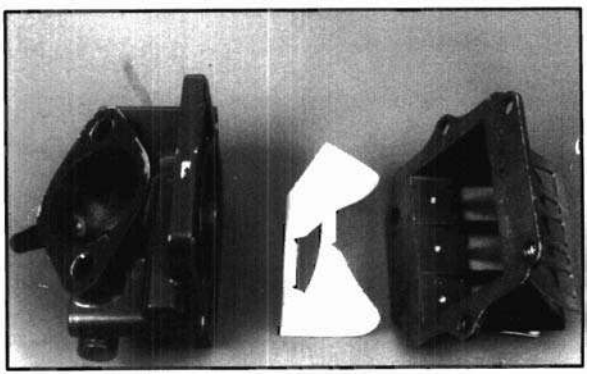
7. Remove the reed cage assembly and inspect the reed PEDALS at rest. They must be closed to a maximum of .015" (.38mm) clearance at the rubber sealing area. If clearance is excessive DO NOT attempt to reverse the PEDALS. *Always replace them if damaged.*

NOTE: 1993 to current models are equipped with reed stuffers. Inspect condition and replace if deformed or damaged.



Reed Pedal Clearance

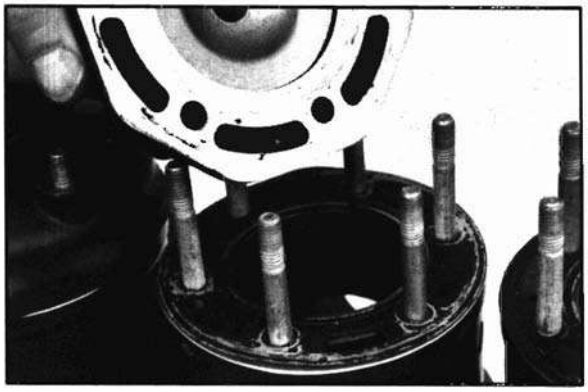
Max. .015" (.38 mm)



Engine DisassemblylInspection Cant.

8. Remove cooling water manifold bolts (6).

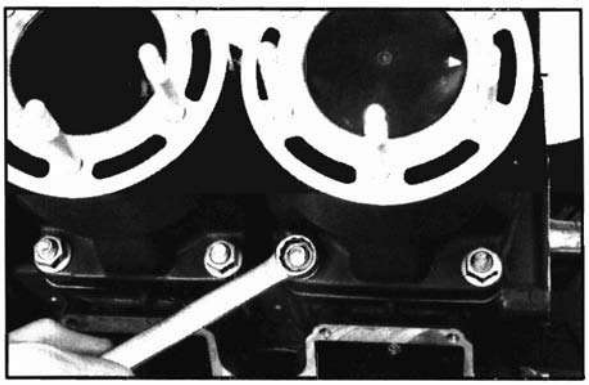
9. Remove cylinder heads (18-8mm nuts). Note the marking on the head gasket (exhaust side, up). Mark the cylinders "1,2,3" for reassembly reference.



CAUTION:

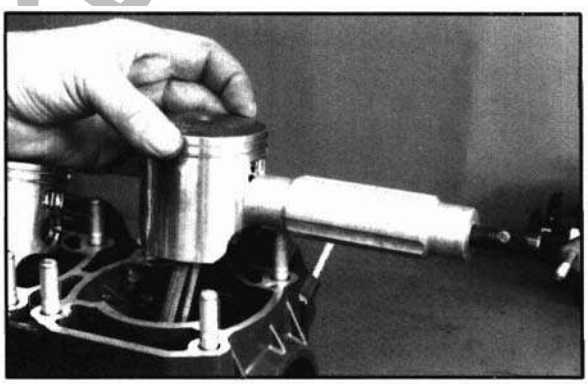
The engine will overheat if the gaskets are installed incorrectly. Install tab to left of exhaust port under water outlet on cylinder head.

10 . Remove cylinder base 10mm nuts (12) and remove cylinders.



11 . Remove piston pin circlips with the aid of an awl or a very small screwdriver. Using piston pin puller remove piston pins and mark pistons "1,2,3" for assembly reference.

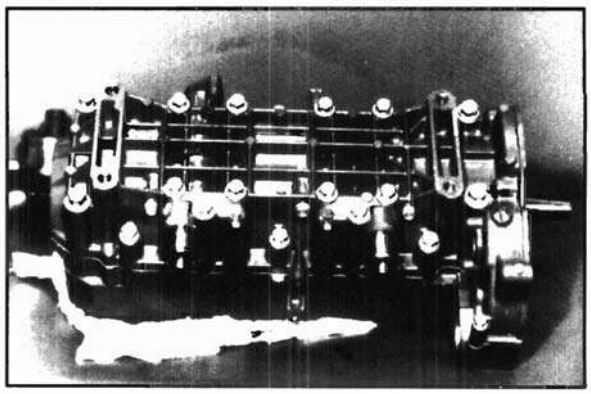
Piston Pin Puller PN 2870386



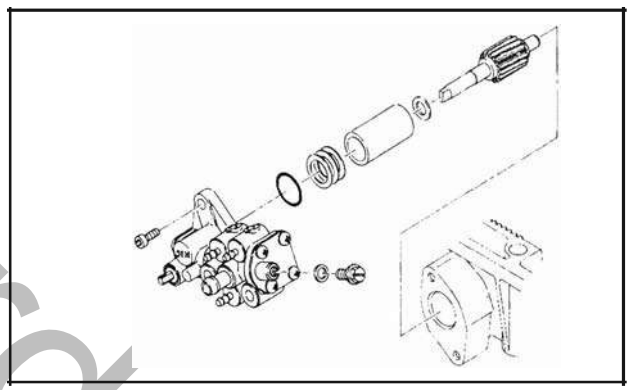
ENGINE/COOLING
Disassembly /Inspection - FUji

Engine DisassemblylInspection Cont.

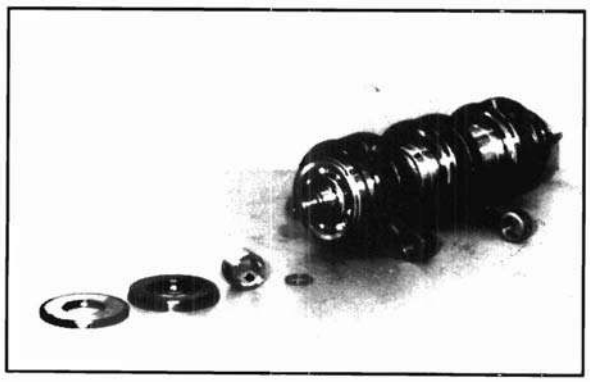
12 . Remove oil pump screws (2). Remove crankcase bolts (21) and separate halves. Inspect coolant passages to be sure they are open and clean (1992 and 1993 models).



13 . Remove crankshaft from crankcase noting location of bearing alignment anti-rotation pins. Remove oil pump drive gear, sleeve and thrust washers noting locations.



14 . Clean crankshaft, lightly oil bearings and check runout. (Refer to 780 Disassembly/Inspection for crankshaft and connecting rod bearing inspection procedures.) Note location of all oil seals, a-ring, and collar. Replace all O-rings and oil seals upon reassembly.

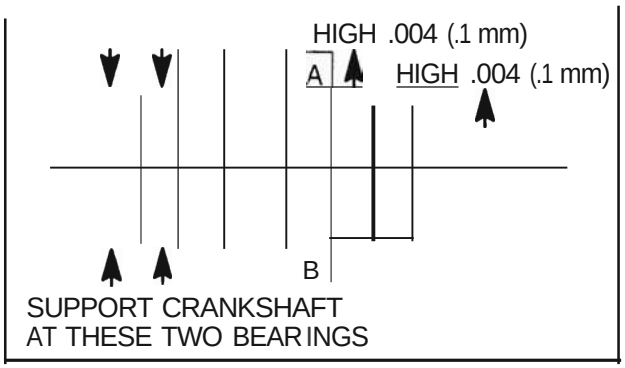


Crankshaft Truing

Lubricate the bearings and clamp the crankshaft securely in the holding fixture. On three cylinder crankshafts, straighten one of the ends (Magneto or PTa) and then straighten the center section. Place the center section in the holding fixture and then straighten the remaining end. If truing the crankshaft requires striking with a hammer, always be sure to re-check previously straightened areas to verify truing. Refer to the illustrations.

NOTE: The rod pin position in relation to the dial indicator position tells you what action is required to straighten the shaft.

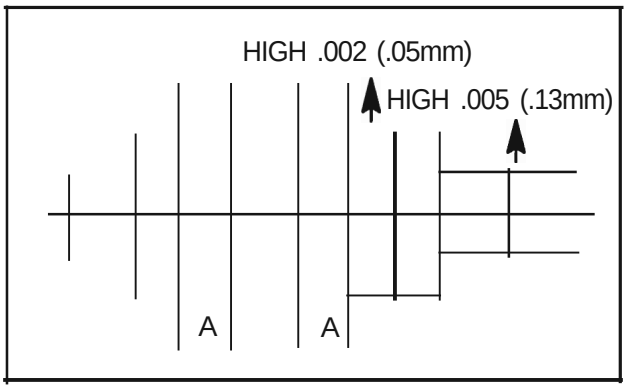
1 . To correct a situation like the one shown in the illustration at right, strike the crankshaft at point A with a brass hammer.



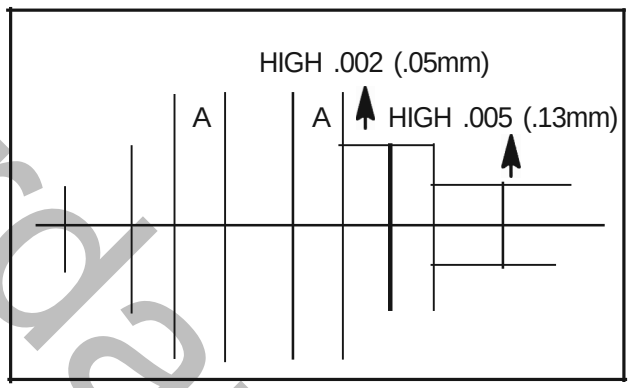
Crankshaft Runout Measurements Cant.

NOTE: Rod pin position in relation to dial indicator position tells what action is required to straighten the shaft.

2. To correct a situation like the one illustrated at right, squeeze the crankshaft at point A.



3. If the crank rod pin is located 180° from the dial indicator, it will be necessary to spread the crankshaft at position A, as shown in the illustration at right.

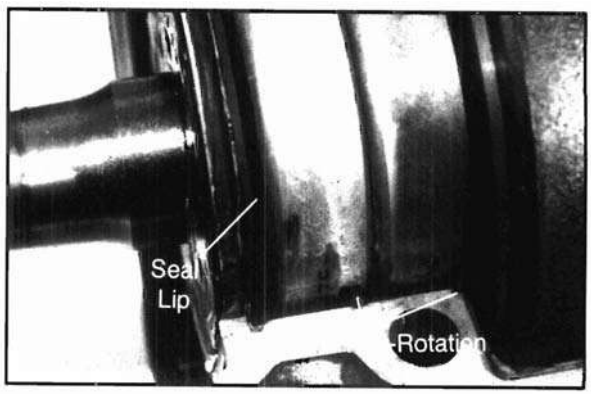


NOTE: When rebuilding and straightening a crankshaft, straightness is of utmost importance. Runout must be as close to zero as possible. Maximum allowable runout is .004" (.1 mm).

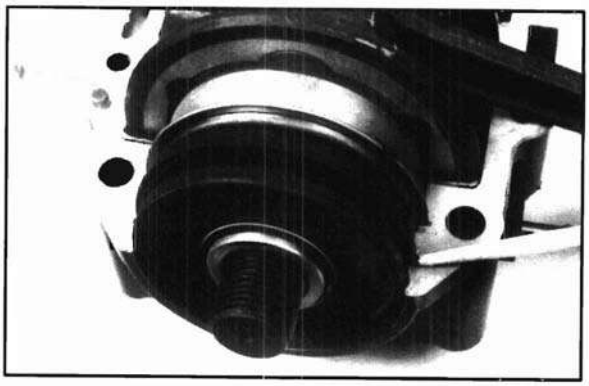
Maximum Runout - .004" (.1 mm)

Engine Assembly Procedures

1. Remove all old sealer from case halves. Grease end seals and oil pump drive gear area with Polaris Low Temp grease or All Season grease. *Make sure the bearing alignment anti-rotation pins are in their correct position in the case slots.*

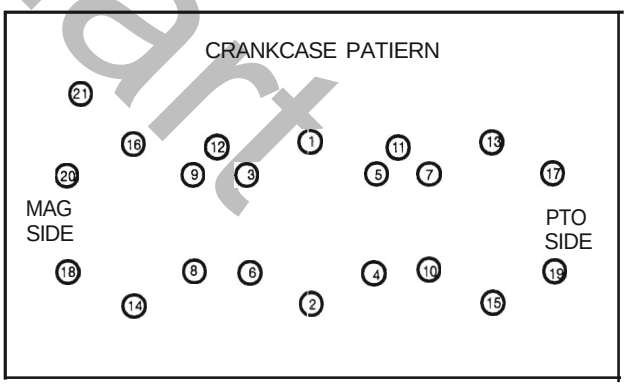


2. Apply 3-Bond 1215 to one case half. For proper placement of PTa-end double seals, install outer lip equipped seal first by guiding lip into groove in crankcase. Next, install narrow outer seal with rubber coated side facing outward (metal sides of seals should face each other). Grease and install a-ring first and then the sleeve onto crankshaft.



3-Bond 1215 PN 2871557

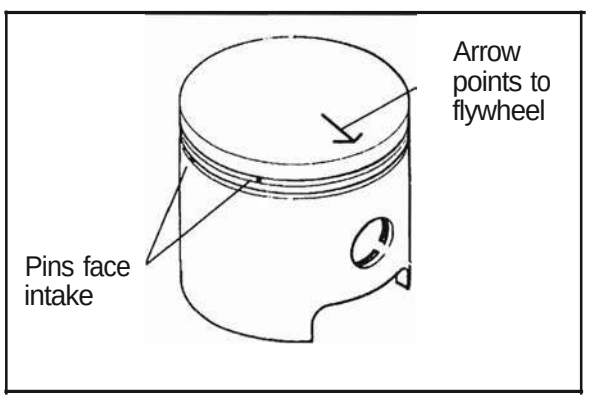
3. Torque crankcase bolts following correct tightening sequence as shown at right or on page 4.6.



Crankcase Bolt Torque

6 mm 72 in. lbs. (.83 kg-m)
8 mm 16 ft. lbs. (2.21 kg-m)
10 mm 26 ft. lbs. (3.60 kg-m)

4. Install pistons with arrow on piston crown toward flywheel (mag) side of crankcase. **NOTE:** Piston ring locator pins always face the intake side of the engine.

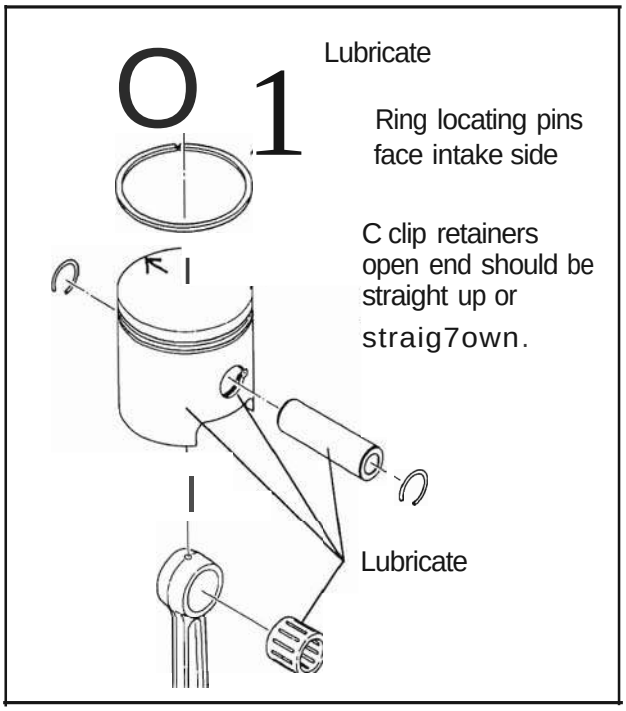


C-Clip Installation Tool

PN 2870773

5. Install piston C-c1ips with C-clip installation tool. Install keystone rings onto pistons with beveled side up and flat side down. Identification numbers are stamped on the *top side of rings.*

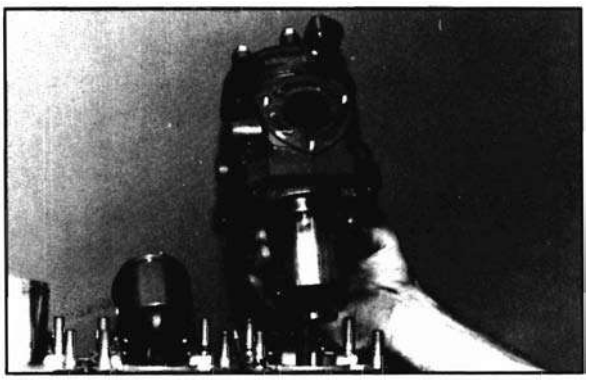
Before installing the cylinder, see honing and cleaning procedures at the end of this section. See piston/cylinder measurement in SLX780 Disassembly/Inspection section this chapter for procedures. Refer to pages 4.2 and 4.3 for specifications.

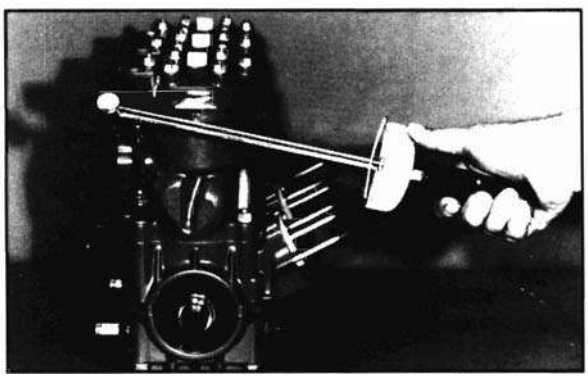


6. Always use new base gaskets. Install with sealant facing upward. Lubricate pistons with 2 cycle engine oil. Support piston with piston support block. With a ring compressor or your fingers, depress rings in alignment with anti-rotation pins on piston and very carefully slide cylinder down into place.

Piston Support Block

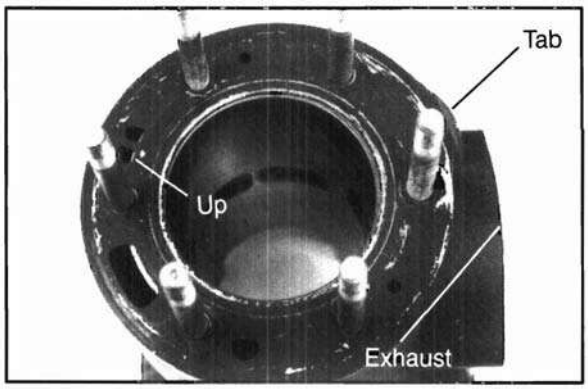
PN 2870390



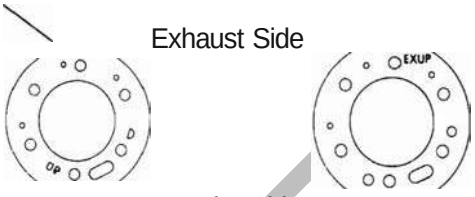


7. Torque cylinder base nuts in three steps using a criss-cross pattern.

8. If the head has been removed, install a new head gasket noting correct location and marking. (EX UP) Exhaust side and up. This is very important in order to provide the correct amount of cooling water through the engine.



Tab must be located under cylinder head water outlet·.



June '92 to Present- Early '92 Production
See Note above

CAUTION:

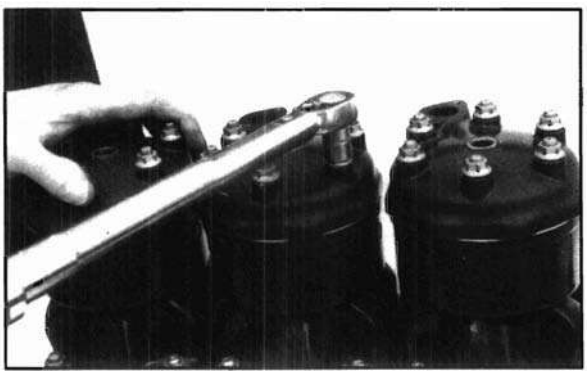
Different model year engines use different gaskets. Always install the correct head gasket for your engine. Severe engine damage can occur if the wrong gasket is used.

9. Torque cylinder head nuts in three steps using the pattern shown to 18 ft. lbs. (2.48 kg-m).

Cylinder Head Nut Torque
(Loctite 242 Blue)

18 ft. lbs. (2.48 kg-m)

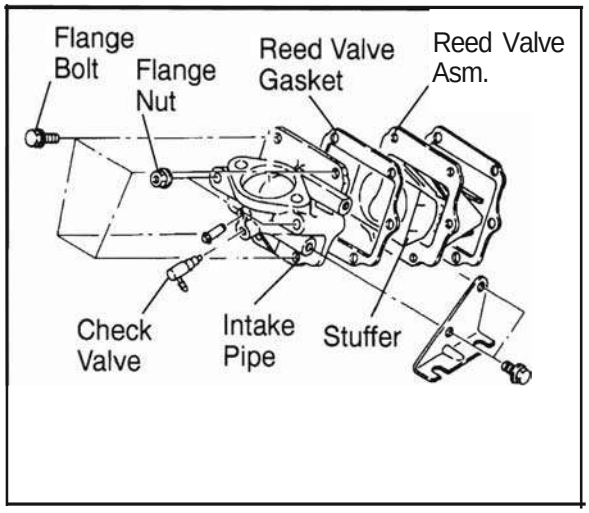
Cylinder Head Torque Pattern



Reed Valve and Intake Manifold Installation

IMPORTANT: 1992 and 1993 models with individual carburetor manifolds must be aligned properly to prevent air leaks.

1. Place a new gasket on intake port. Install reed cage, reed stutter, another new gasket, and intake manifold. Repeat for each cylinder. Apply Loctite 242 to four reed block retaining bolts and two nuts. Repeat for each cylinder.

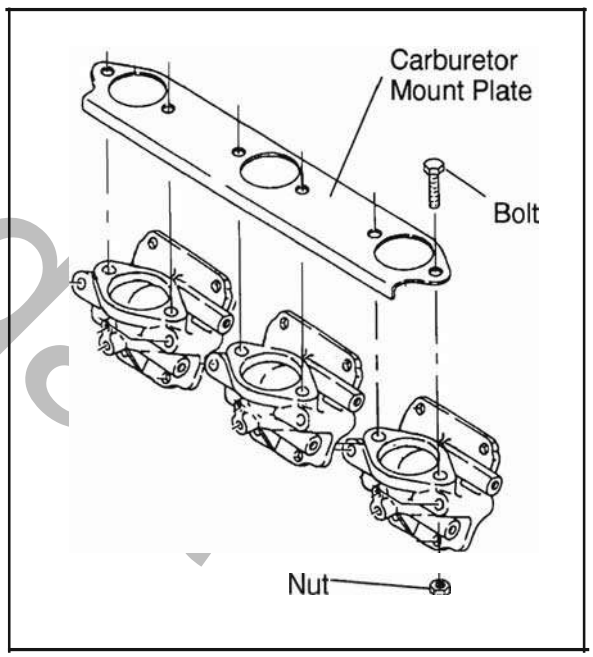


1992·1993 Models

2. Loosely tighten bolts and two center retainer nuts by hand. Leave them loose enough to move the intake manifold. **Alignment of intake manifold is critical to prevent air leaks.**

3. Place carburetor mount plate on all three manifolds and secure it to reed blocks with (6) 3/8 x 1 3/4" bolts and 3/8" nuts. This will align all intake manifolds.

4. Tighten center nuts and bottom bolts of reed block evenly to 78 in. lbs. (.9 kg-m). Repeat for each cylinder. Remove mount plate.



Reed Block Bolt Torque
(Loctite 242 Blue)

78 in. lbs. (.9 kg-m)

5. Tighten remaining top bolts of each block and torque to 78 in. lbs. (.9 kg-m). Proceed to step 2.

1994 to Present

1. Install reed valve gaskets and cage assemblies. Torque retaining bolts in three steps to 78 in. lbs. (.9 kg-m).

2. Install carburetor assembly and tighten nuts to 16 ft. lbs (2.21 kg-m).

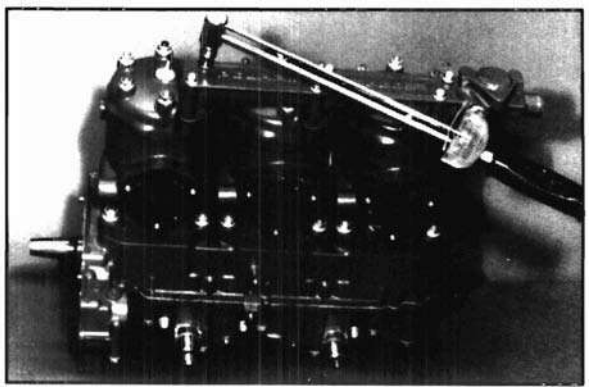
Carburetor Retaining Nut Torque
(Loctite 242 Blue)

16 ft. lbs. (2.21 kg-m)

3. Install water manifold with new gaskets and torque bolts to 78 in. lbs. (.9 kg-m).

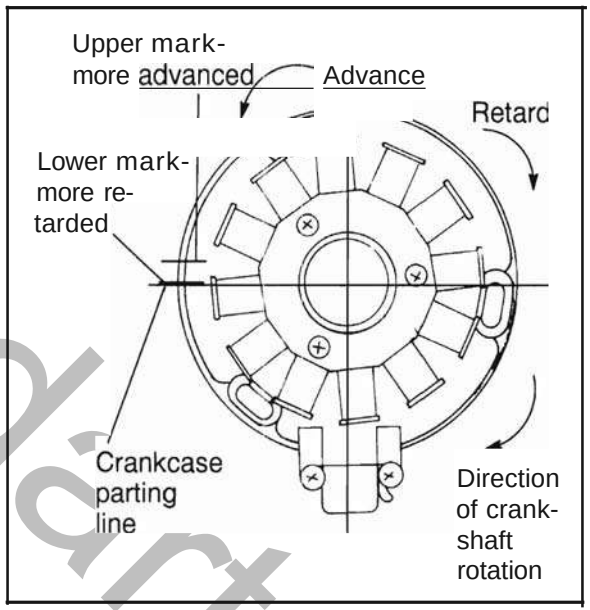
Manifold Retaining Bolt Torque
(Loctite 242 Blue)

78 in. lbs. (.9 kg-m)



4. Install stator plate and wire harness weatherproof grommet and retainer. Use the reference mark that was applied during removal to ensure proper ignition timing.

NOTE: 1993 stators have two marks. When installing a new stator on an SL650, align the upper mark on the stator plate (more advanced) with the crankcase parting line. On an SL750, align the lower mark on the stator plate (more retarded) with the crankcase parting line.



5. Install starter drive and thrust washers. Install inner magneto cover. Torque 8mm bolts to 14 ft.lbs. (1.93 kg-m) and 6mm bolt to 78 in. lbs. (.9 kg-m).

Inner Magneto Cover Bolt Torque
(Loctite 242 Blue)

6mm 78 in. lbs. (.9 kg-m)
8mm 14 ft. lbs. (1.93 kg-m)

IMPORTANT: Flywheel Installation Information

6. Apply Loctite 262 (Red) to flywheel crankshaft taper and install. Apply Loctite 242 (Blue) to crankshaft nut threads and torque nut to specification.

Flywheel Nut Torque

16mm 55 ft. lbs. (7.59 kgM)
18mm 65 ft. lbs. (8.97kgM)

7. Install outer magneto cover. Use Loctite 515 gasket eliminator on mag cover mating surfaces and torque bolts to 14 ft. lbs. (1.93 kg-m).

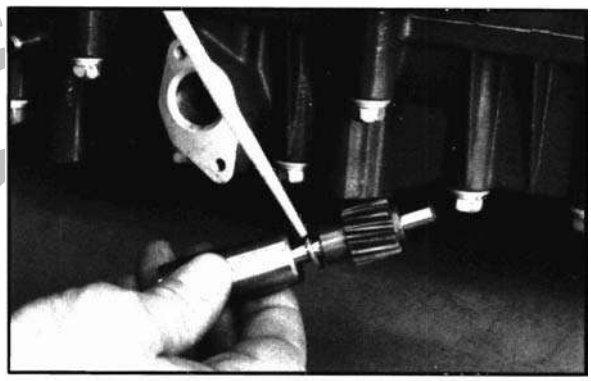
Outer Magneto Cover Bolt Torque
(Loctite 242 Blue)
14 ft. lbs. (1.93 kg-m)

8. Slide starter motor into place and torque the two retaining bolts to 78 in. lbs. (.9 kg-m). A small amount of grease should be used on the housing O-ring to aid in assembly.

Starter Motor Retaining Bolt Torque
(Loctite 242 Blue)
78 in. lbs. (.9 kg-m)

Oil Pump Installation

1. Apply engine oil to oil pump drive gear, thrust washer, and bushing, and install into crankcase. Be sure the pump drive gear is fully engaged in the crankshaft drive gear.



2. Apply a light film of grease to a new oil pump O-ring and place it in position on the pump. Install the shims removed during disassembly (if applicable).

NOTE: If the oil pump, crankcase, or any of the pump drive components were replaced, the bushing end play *mustbe* measured and the proper shims installed. Refer to *Oil Pump Bleeding, Operation, and Troubleshooting* at the end of this chapter for procedures

3. Install pump, engaging shaft in drive gear. Apply Loctite 242 to bolts and torque evenly to 72 in. lbs. (.83 kg-m)

Pump Retaining Bolt Torque
(Loctite 242 Blue)
72 in. lbs. (.83 kg-m)

Engine Installation

Engine installation is done in reverse order of the removal instructions.

WARNING

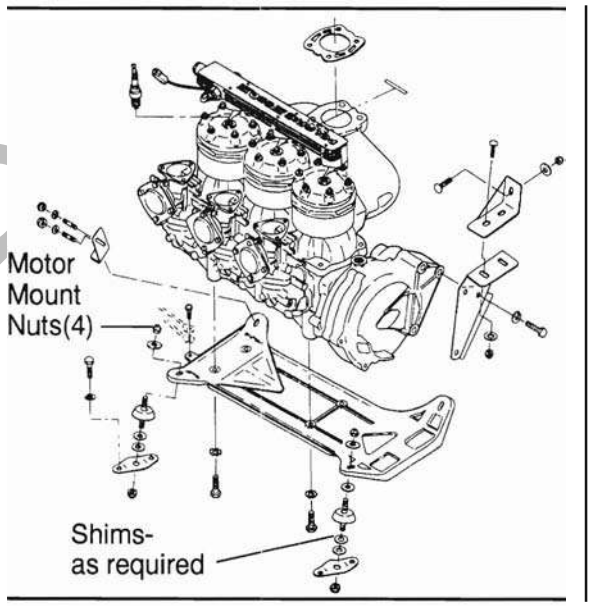
Do not install the battery ground (-) cable until all other fuel and electrical connections are done. Electrolyte or fuel vapors may be present in the engine compartment and a spark could ignite them, resulting in personal injury.

NOTE: Observe the following precautions:

- Engine rubber mounts are stressed during engine removal of mounting nuts. Be sure to inspect the mounts carefully and replace if damaged.
- Always clean residual Loctite™ out of threads before reinstallation.
  Always use new gaskets on the exhaust system and electrical box.
- Remember to inspect for damage on any wiring, hoses, or lines before and after reinstalling the engine.
- Make sure all cables, hoses, and wiring are routed and secured properly.
- After engine installation, pump alignment must be inspected. Refer to the Final Drive section for inspection and alignment procedures.

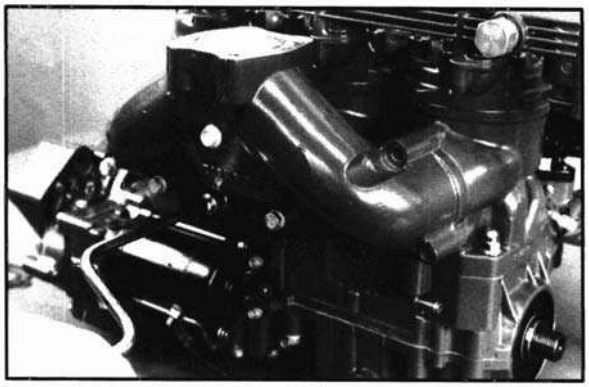
CAUTION:

Shims used for engine and driveshaft alignment must be reinstalled in their original locations. Do not allow them to be mixed up. Always verify proper engine to pump alignment after engine installation as outlined in the Final Drive section. Re-seal blue plastic air intake cover during installation using Loctite™ Ultra Blue silicone sealant.

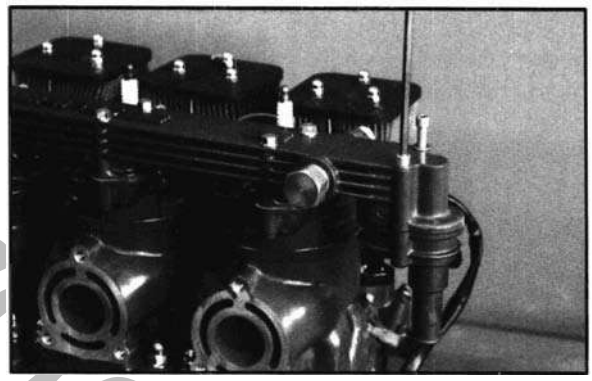


780 Engine DisassemblylInspection

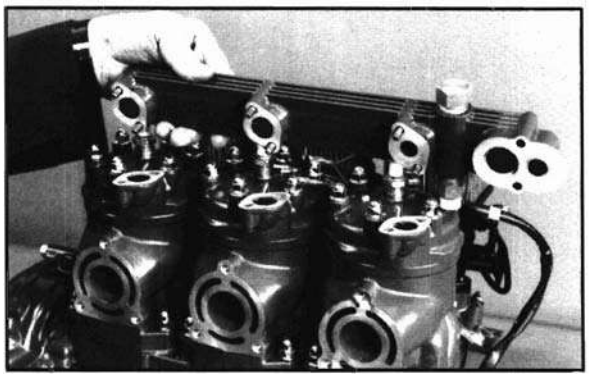
1. Refer to page 4.34 for engine removal procedures. Remove exhaust manifold bolts (9).



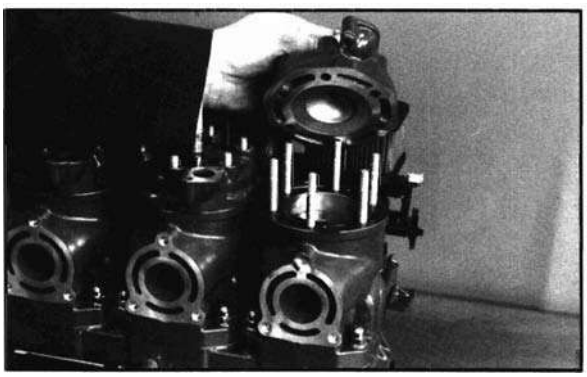
2. Loosen bolts evenly and remove thermostat pop-off assembly. Refer to page 4.109 for thermostat pop-off inspection procedures.



3. Remove water manifold bolts (6), the manifold, and gaskets (3). **NOTE:** The water passage on the PTO end is smaller than the Center and Magneto end passages.



4. Loosen nuts (6) on each head in 2-3 steps using a criss-cross pattern and remove the heads.



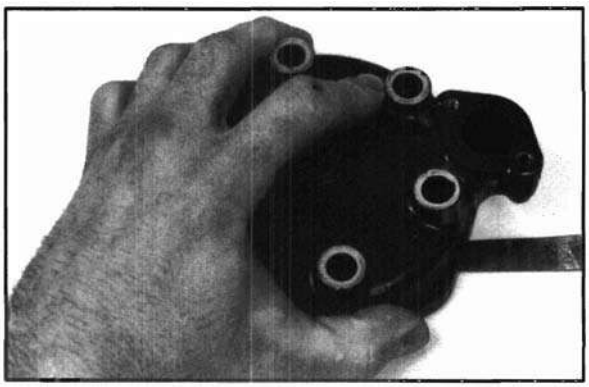
ENGINE/COOLING
Disassembly /Inspection . 780cc Models

780 Engine Disassembly/Inspection Cant.

5. Inspect each cylinder head for warping. Replace cylinder head if warp exceeds service limit.

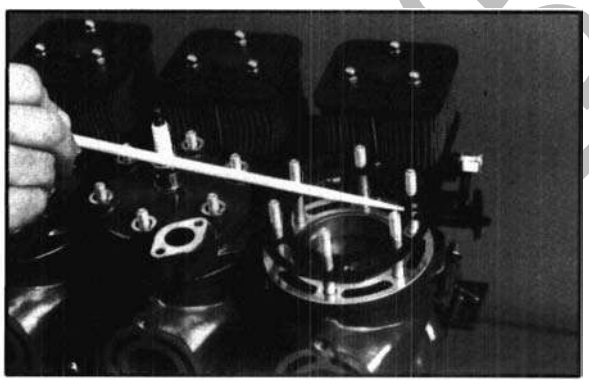
Cylinder Head Warp

Service Limit: .003" (.08mm)

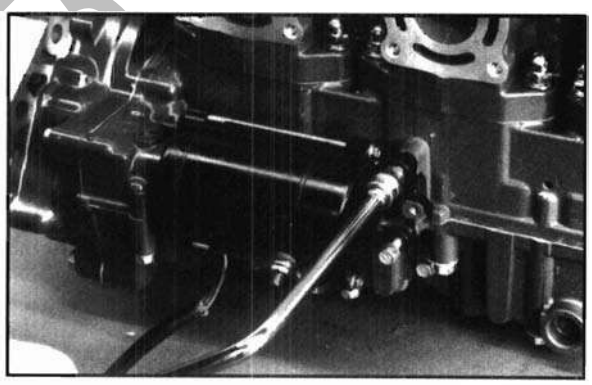


6. Remove head gasket.

NOTE: When reassembling, the gasket must be positioned with the tab under the water outlet on the cylinder head and the number "78" up and readable.

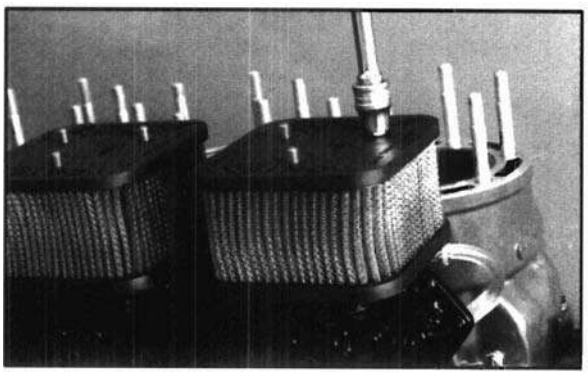


7. Remove starter motor.



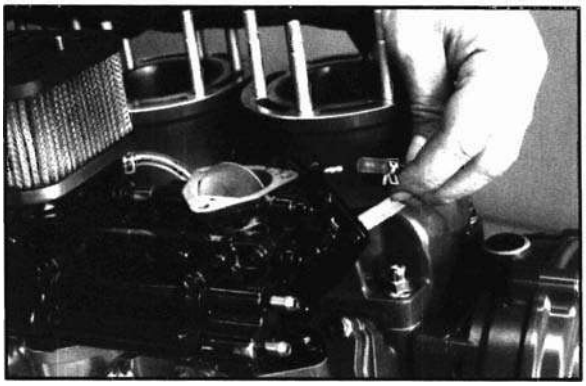
8. Remove Vortex™ air intakes.

NOTE: Removal of the studs, intake base, and gasket is not required unless necessary for carburetor repair or inspection of the gaskets.

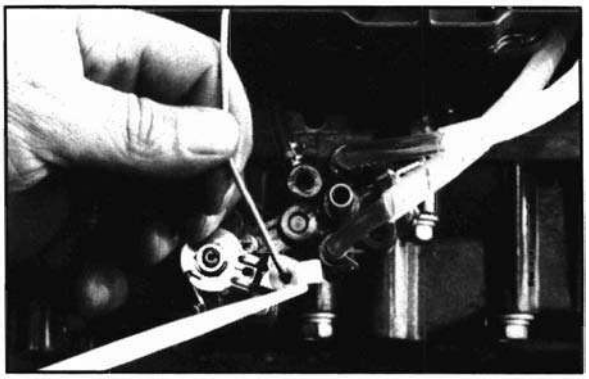


780 Engine Disassembly/Inspection Cant.

9. Slide back clamps and remove oil lines on each carburetor.

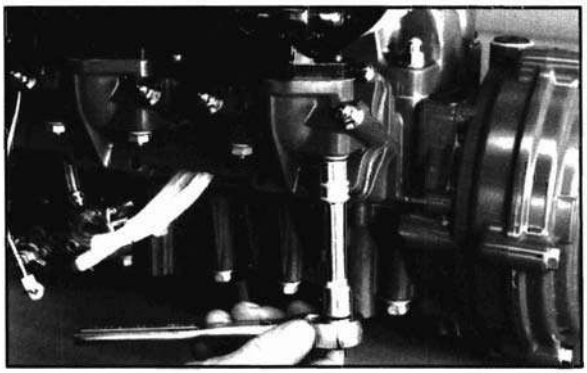


10. Open retaining clip slightly and rotate it to allow removal of pump control rod.



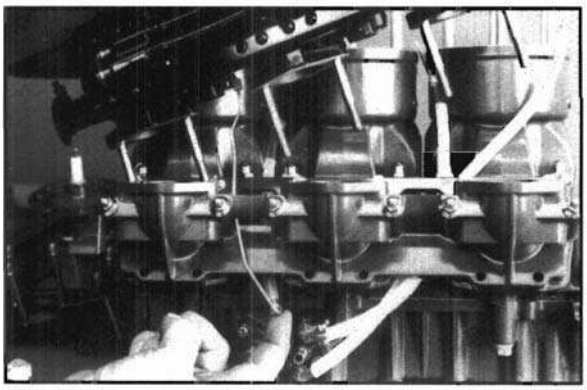
11. Remove bottom intake manifold bolts (6) to allow clearance for a socket on carburetor mounting nuts.

12. Remove carburetor mounting nuts.



780 Engine Disassembly/Inspection Cont.

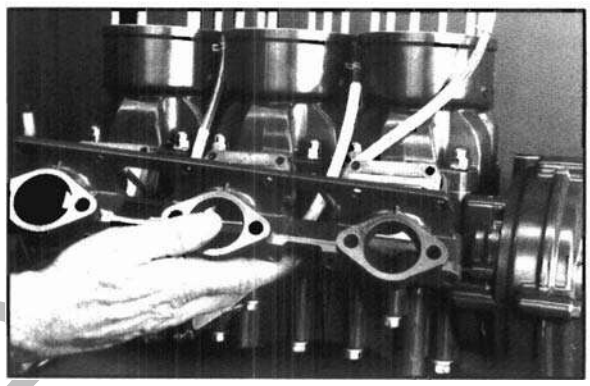
13 . Remove carburetors. Note routing of oil lines through manifold for proper reassembly later.



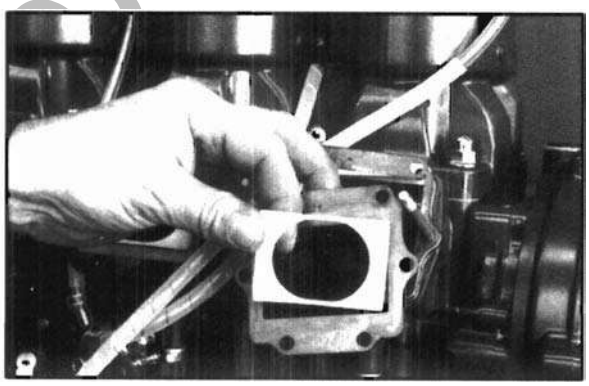
CAUTION:

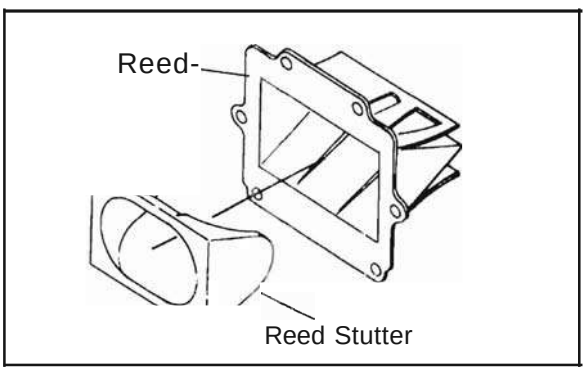
Do not bend the pump control rod when removing the carburetors. The length of the rod determines the amount of oil delivered to the engine.

14 . Remove remaining intake manifold bolts (6) and nuts (6), and remove manifold.



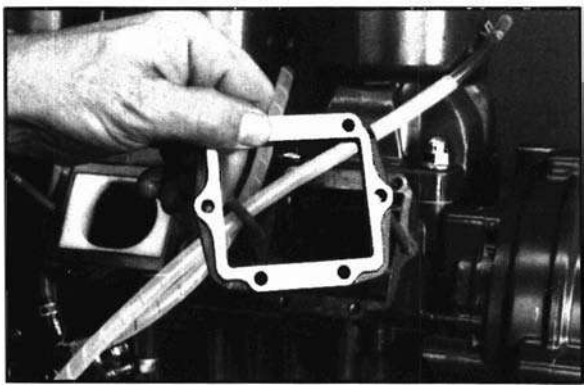
15 . Remove gasket and reed stutter. Inspect the condition of stutters and replace if deformed or damaged. The stutter should fit squarely into the reed block.



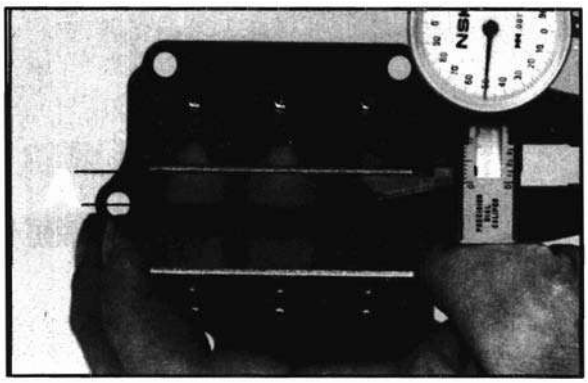


780 Engine Disassembly/Inspection Cont.

16 . Remove reed cage, reed spacer, and inner gasket.



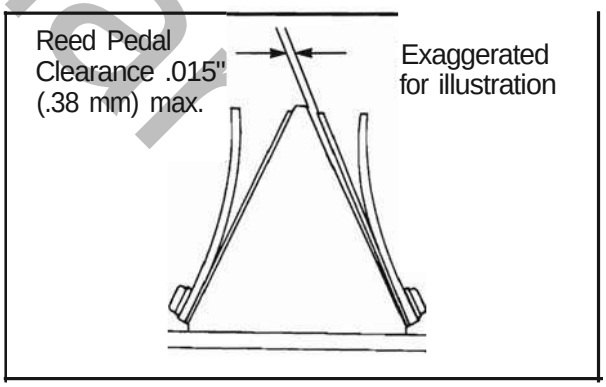
17 . Measure reed stop height between tip of reed and stop as shown (A). Stop height should be .350" (9 mm).



Reed Stop Height
.350″ (9 mm)

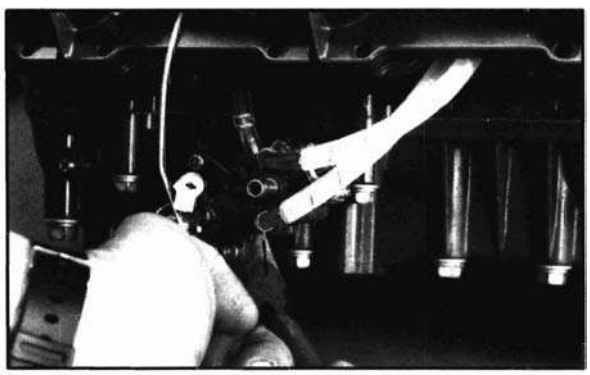
Reed Valve Inspection

18 . Measure air gap between fiber reed and reed block as shown. The air gap should not exceed .015" (.4 mm). If clearance is excessive DO NOT attempt to reverse the reeds to reduce the air gap. *Always replace them if damaged.* Check each fiber reed for white stress marks or missing material. Replace if necessary.



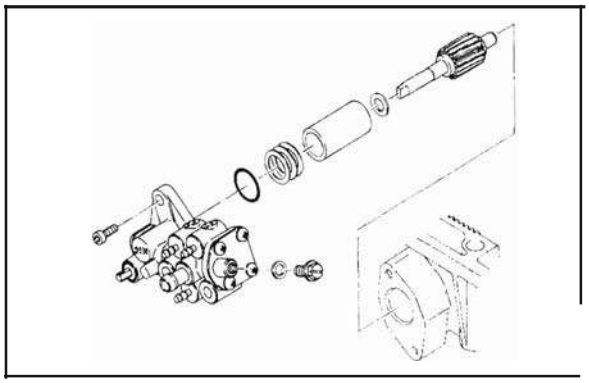
Reed Air Gap - Maximum
.015″ (.4 mm)

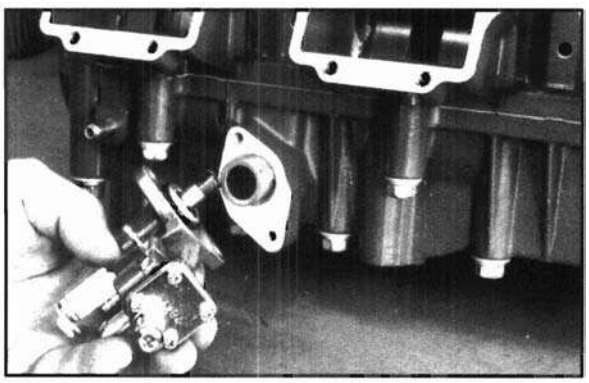
19 . Slide back clamps using a needle nose pliers and remove lines from oil pump. Replace lines if cracked or damaged.



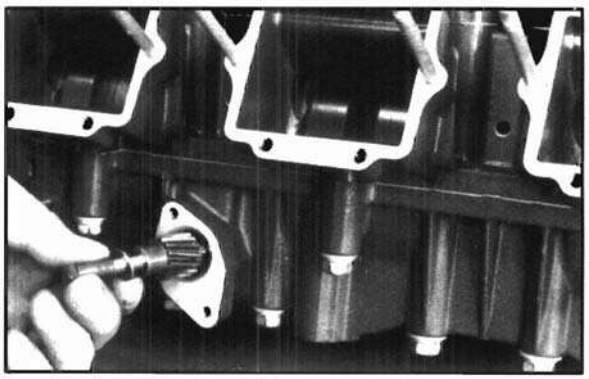
780 Engine Disassembly/Inspection Cont.

20 . Remove oil pump. **NOTE:** Shims may be installed between the oil pump and oil pump drive gear bushing to adjust clearance. Note the number and thickness for reinstallation. If the crankcase, oil pump, guide bushing, or drive gear is replaced the clearance must be measured and shims installed accordingly. See page 4.103.

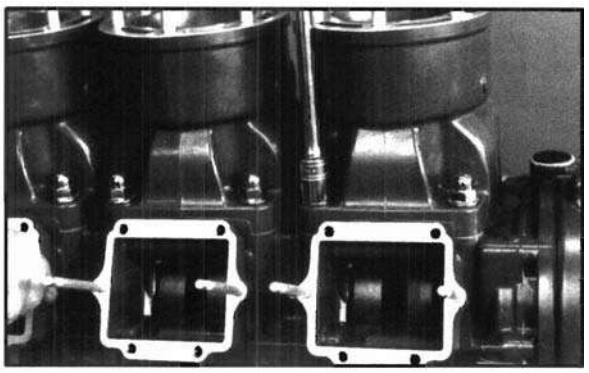




21 . Remove bushing, thrust washer, and drive gear as an assembly. Check drive gear for excessive wear and replace if necessary. Note the thrust washer between the drive gear and bushing.

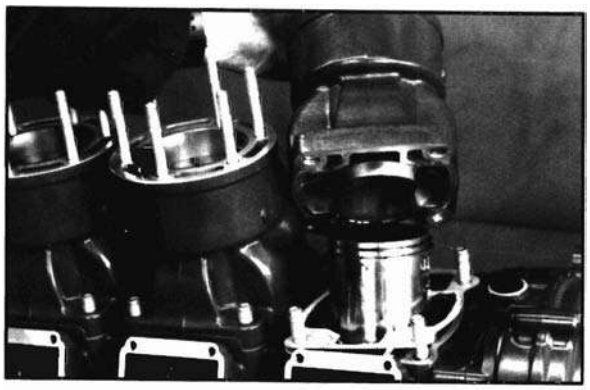


22 . Loosen cylinder base nuts 1/4 turn at a time in a criss-cross pattern until loose and remove them.



780 Engine Disassembly/Inspection Cant.

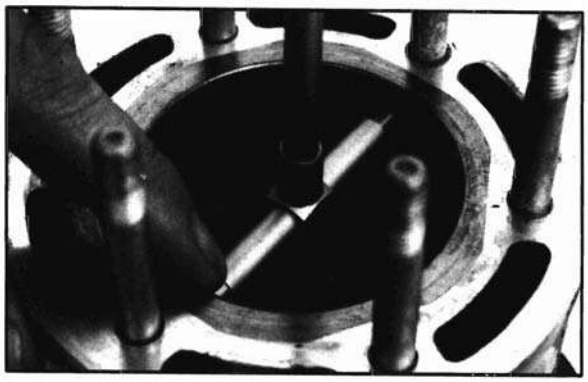
23 . Remove cylinders. Mark each cylinder and piston with a 1, 2, or 3 to keep each piston and cylinder set together for reassembly.

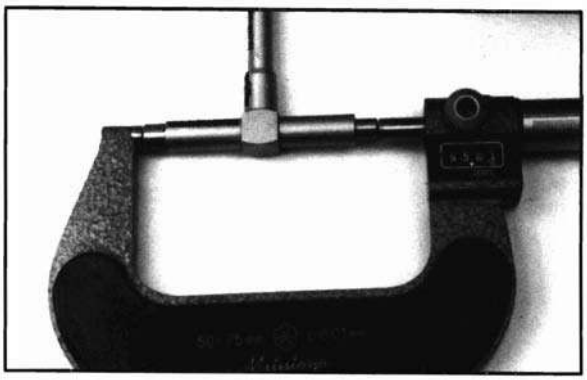


Cylinder Measurement

24 . Inspect each cylinder for wear, scratches, or damage. **If** no damage is evident, measure the cylinder for taper and out of round with a telescoping gauge or a dial bore gauge. Measure the bore 1/2" from the top of the cylinder; in line with the piston pin and 90° to the pin to determine if the bore is out of round. Repeat the measurements at the bottom of the cylinder to determine taper or out of round at the bottom. Record all measurements.

NOTE: If cylinders are worn or damaged, refer to page 4.100-4.101 for cylinder boring/honing and port chamfer procedure.





Cylinder Taper
Limit: .002 Max.

Cylinder Out of Round
Limit: .002 Max.

Standard Bore Size:
Refer to engine specifications at the beginning of this chapter

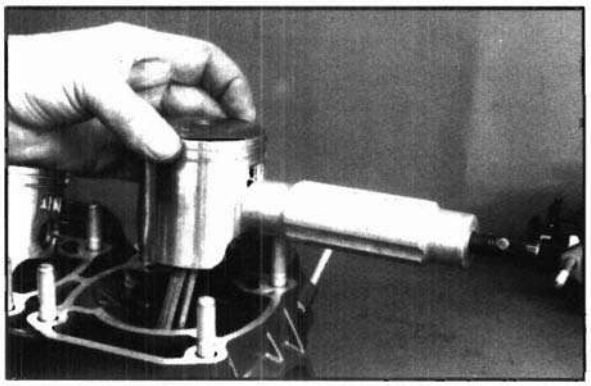
25 . Remove piston circlips using an awl, scribe, or very small screwdriver.

CAUTION:

The circlip is under tension. Wear eye protection. Keep your thumb on the edge of the clip to prevent it from springing out. Never re-use old circlips - always replace with new upon reassembly.

780 Engine Disassemblyllnspection Cont.

26 . Remove piston pin with piston pin puller. If necessary, heat crown of piston *slightly* with a propane torch.



CAUTION:

Do not apply heat to the piston rings. The rings may lose radial tension.

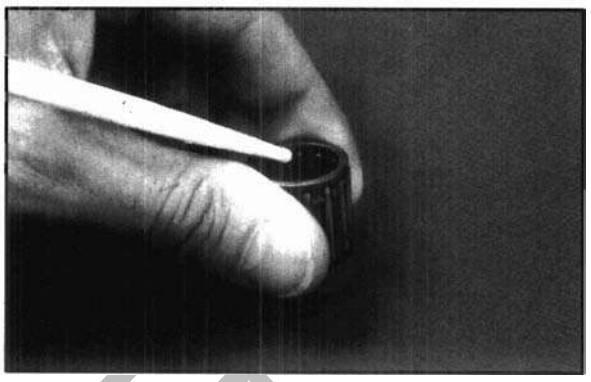
Piston Pin Puller
PN 2870386

Piston Pin / Needle Bearing Inspection

1 . Clean needle bearing in solvent and dry with compressed air.

2. Inspect needle cage carefully for cracks or shiny spots which indicate wear. Replace needle bearings if worn or cracked, and always replace them if piston damage has occurred.

3. Visually inspect piston pin for damage, discoloration, or wear. Run your fingernail along the length of the pin and replace it if any rough spots, galling orwear is detected.

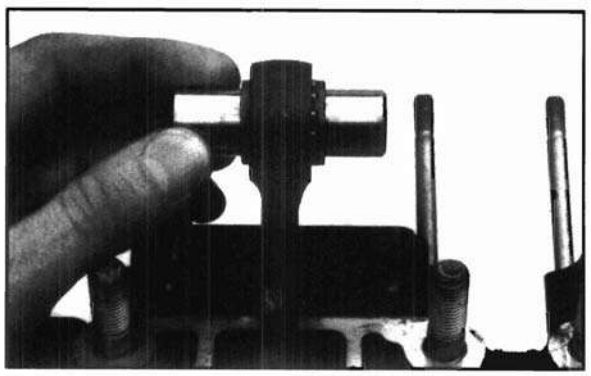


Connecting Rod Small End Inspection

1 . Clean small end of connecting rod and inspect inner bore with a magnifying glass. Look for any surface irregularities including pitting, wear, or dents.

2. Run your fingernail around the inside of the rod and check for rough spots, galling, or wear.

3. Oil and install needle bearing and pin in connecting rod. Rotate pin slowly and check for rough spots or any resistance to movement. Slide pin back and forth through bearing while rotating and check for rough spots.



Connecting Rod Small End Inspection Cont.

4. With pin and bearing centered in rod, twist ends back and forth in all directions to check for excessive axial play. Pull up and down evenly on both ends of pin to check for radial play. Replace pin *and* bearing if there is any resistance to rotation or excessive axial or radial movement. If play or roughness is evident with a new pin and bearing, replace the connecting rod.

Piston Inspection/Measurement

1. Check piston for scoring or cracks in piston crown or pin area. Excessive carbon buildup below the ring lands is an indication of piston, ring or cylinder wear.

2. Measure piston outside diameter at a point 10 mm (3/8") up from the bottom of the skirt at a 90° angle to the direction of the piston pin. Record the measurement for each piston.

NOTE: The piston must be measured at this point to provide accurate piston-to-cylinder clearance measurement.

3. Subtract this measurement from the minimum cylinder measurement recorded previously. If clearance exceeds the service limit, the cylinder should be re-bored and new pistons and rings installed.

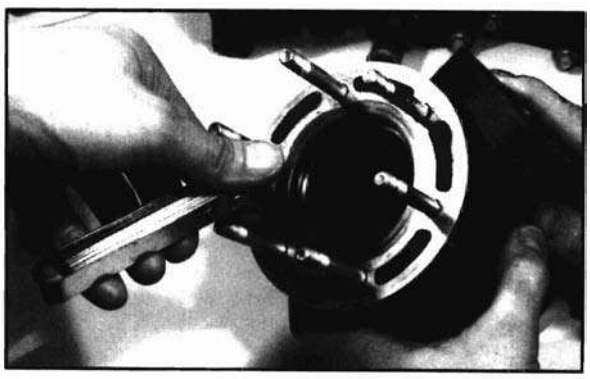
Piston to Cylinder Clearance
Refer to specifications at the beginning of this chapter

Piston Ring Installed Gap

1. Position ring 1/2" (1.3 cm) from the top of the cylinder using the piston to push it squarely into place. Measure installed gap with a feeler gauge at both the top and bottom of the cylinder.

NOTE: A difference in end gap indicates cylinder taper. The cylinder should be measured for excessive taper and out of round. Replace rings if the installed end gap exceeds the service limit.

NOTE: Always check piston ring installed gap after re-boring a cylinder or when installing new rings.

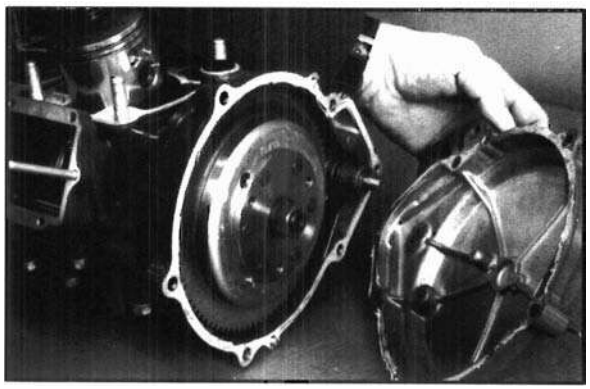


Piston Ring Installed Gap
Refer to specifications at the beginning of this chapter

ENGINE/COOLING
Disassembly / Inspection . 780cc Models

Flywheel Inspection

1. Remove flywheel cover bolts, tap cover lightly with a soft faced hammer and remove cover. Inspect starter drive bushing in cover for wear or damage. Measure inside diameter and replace if worn beyond service limit. Measure starter drive shaft O.D. and calculate clearance. Standard clearance between bushing and shaft is .0015"-.004" (.04 - .10mm). Service limit is .008" (.20mm).



NOTE: A thrust washer is in place between bushing and end of starter drive.

Starter Drive Bushing I.D.
.4735″-.4740″ (12.03-12.04mm)

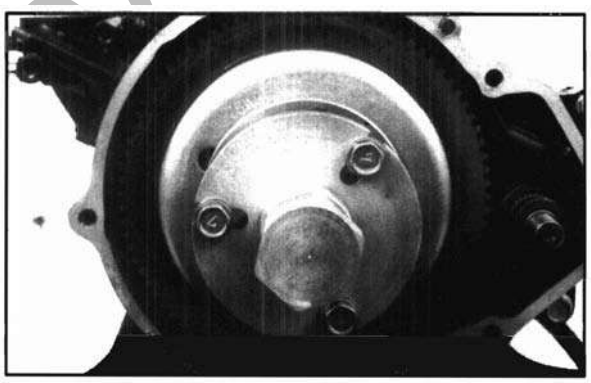
Std. Shaft O.D.
.470″-.472″ (11.94-11.99mm)

Starter Drive Bushing Clearance:
Std: .0015″-.004″ (.038-.102 mm)

Service Limit:
.008″ (.203 mm)

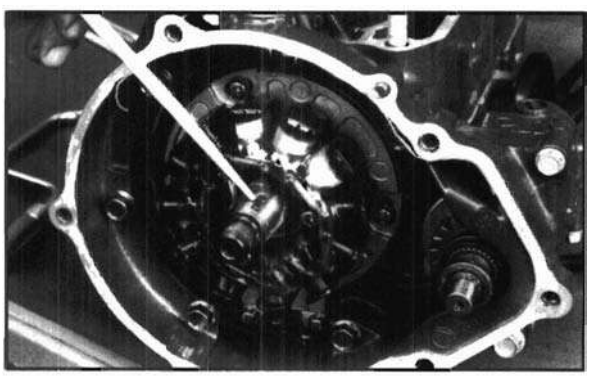
2. Remove flywheel nut and washer.

3. Install puller and remove flywheel. Inspect keyway in flywheel for damage.

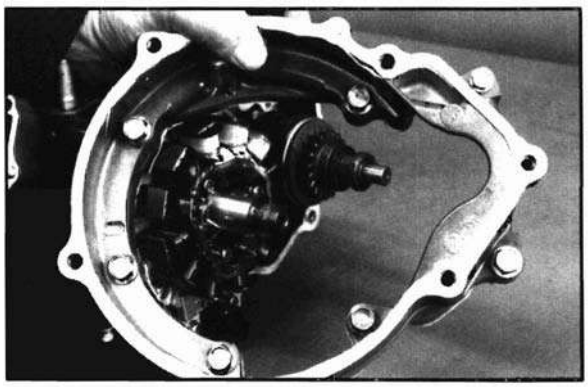


Flywheel Puller
PN 2871043

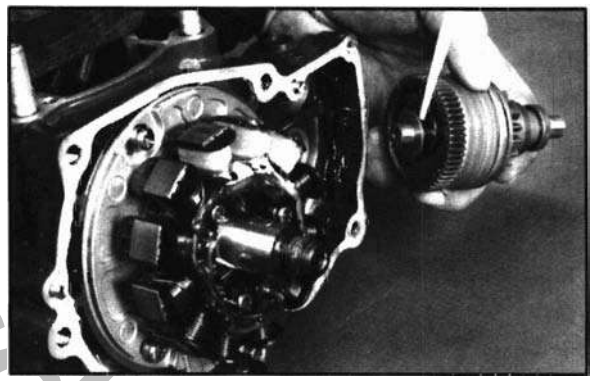
4. Inspect flywheel key for damage.



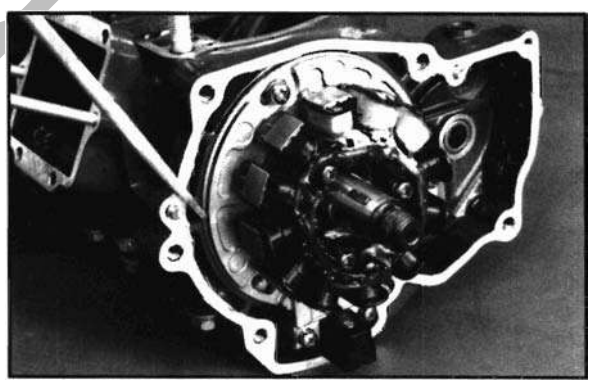
1. Remove the 8mm bolts (7) and the 6mm bolt (1) and remove inner flywheel cover.



2. Pull starter drive assembly outward to remove. Washer on back of starter drive (see photo at right) may be of different thickness than the front. Note location for proper re-assembly.



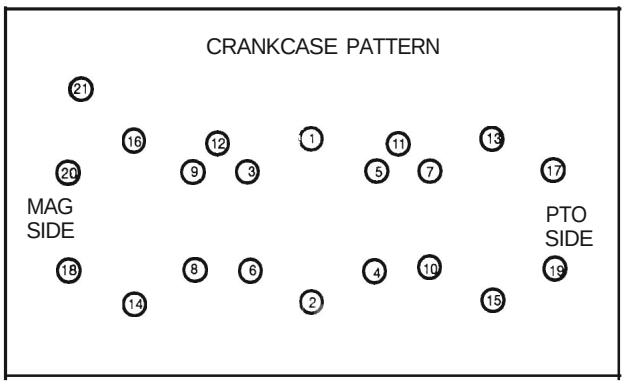
3. Place a mark on the crankcase in-line with stator plate mark so the stator can be re-installed in the same position.



4. Use a hand impact driver to remove stator plate screws (3) and pull stator plate outward. Remove the (2) screws holding the weatherproof grommet in place and pull wiring harness carefully through crankcase.

ENGINE/COOLING
Disassembly /Inspection - 780cc Models

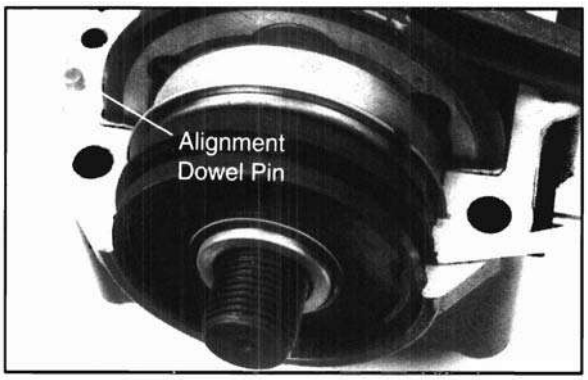
5. Loosen 6mm bolt, 8mm bolts (16), and 10mm bolts (4) from the crankcase 1/4 turn at a time in a criss-cross pattern until loose, then remove them completely.



6. Remove upper crankcase by tapping lightly with a soft faced hammer. Tap only in reinforced areas.

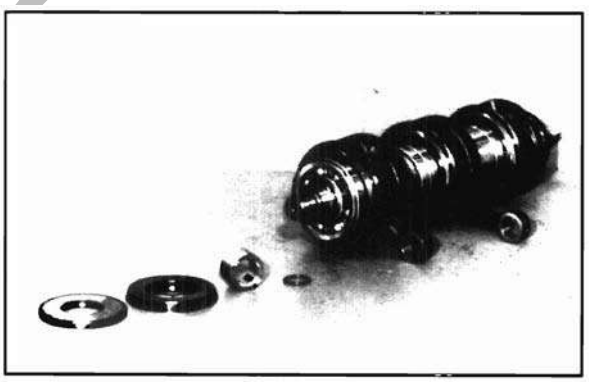
7. Note position of seal, bearing anti-rotational pins, and crankcase alignment dowel pins.

8. Remove crankshaft and clean crankcase sealing surfaces thoroughly to remove all old sealer.



9. Remove seals, a-ring, and spacer from PTa end of crank shaft. Remove seal from Magneto end.

NOTE: The metal sides of the PTa end seals face each other. The innermost seal has an outer rib to fit into the groove in the crankcase. Always replace crankshaft seals when removed. The metal side of seal faces fly-wheel.



Crankshaft Bearing Inspection

1. Clean crankshaft thoroughly and oil main and connecting rod bearings with Polaris Premium 2 engine oil. Carefully check each main bearing on the shaft.

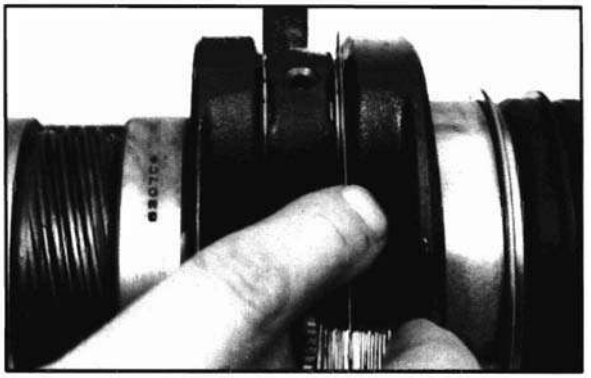
NOTE: Due to extremely close tolerances, the bearings must be inspected visually, and by feel. Look for signs of discoloration, scoring or galling. Turn the outer race of each bearing. The bearings should turn smoothly and quietly. The inner race of each bearing should fit tightly on the crankshaft. The outer race should be firm with minimal side to side movement and no detectable up and down movement. Replace any loose or rough bearings.

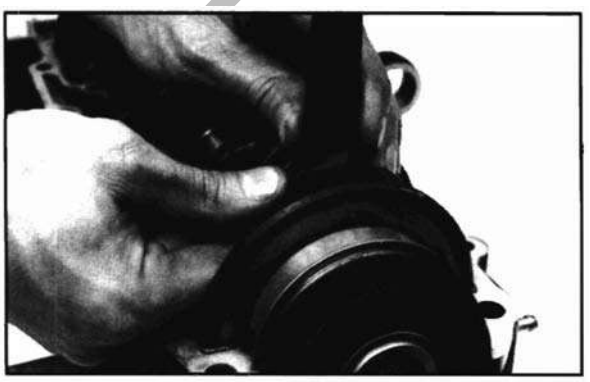
Connecting Rod (Big End) Bearing Inspection

1. Measure connecting rod big end side clearance with a feeler gauge. Compare to specifications. Rotate rod on crankshaft and check for rough spots. Check radial end play in rod by supporting rod against one thrust washer and alternately applying up and down pressure. Replace bearing, pin, and thrust washers if side clearance is excessive or if there is any up and down movement detectable in the big end bearing.

NOTE: Specialized equipment and a sound knowledge of crankshaft repair and straightening is required to perform crankshaft work safely and correctly. Crankshaft repair should be performed by trained Polaris service technicians in a properly equipped shop.

Connecting Rod Big End Side Clearance
Standard: .012-.024" (.30-.61mm)
Service Limit: .026" (.66mm)





ENGINE/COOLING
Disassembly /Inspection - 780cc Models

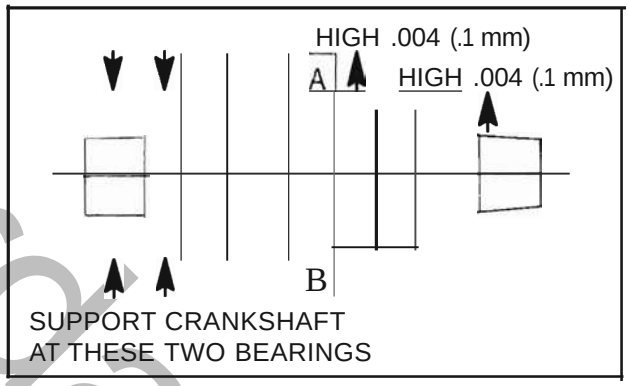
Crankshaft Truing

Lubricate the bearings and clamp the crankshaft securely in the holding fixture. On three cylinder crankshafts, straighten one of the ends (Magneto or PTO) and then straighten the center section. Place the center section in the holding fixture and then straighten the remaining end. If truing the crankshaft requires striking with a hammer, always be sure to re-check previously straightened areas to verify truing. Refer to the illustrations below.

Crankshaft Alignment Fixture
PN 2870569

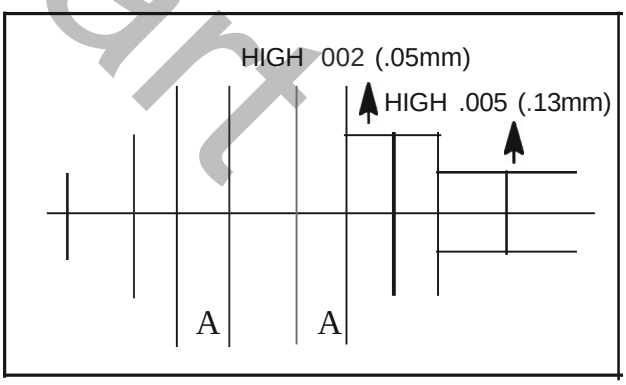
NOTE: The rod pin position in relation to the dial indicator position tells you what action is required to straighten the shaft.

2. To correct a situation like the one shown in the illustration at right, strike the shaft at point A with a brass hammer.



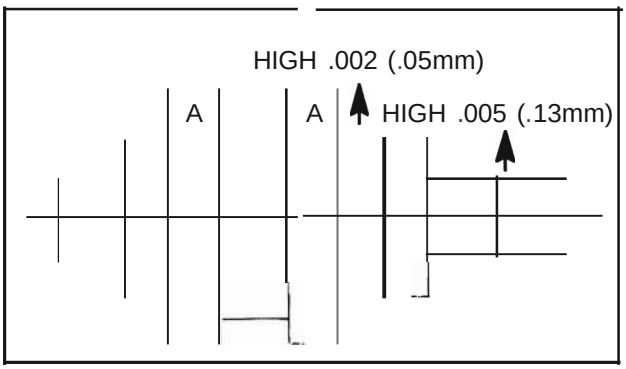
NOTE: The rod pin position in relation to the dial indicator position tells you what action is required to straighten the shaft.

3. To correct a situation like the one shown in the illustration at right, squeeze the crankshaft at point A. (Use tool from alignment kit).



4. If the crank rod pin location is 180° from the dial indicator (opposite that shown above), it will be necessary to spread the crankshaft at the A position as shown in the illustration at right. When rebuilding and straightening a crankshaft, straightness is of utmost importance. Runout must be as close to zero as possible.

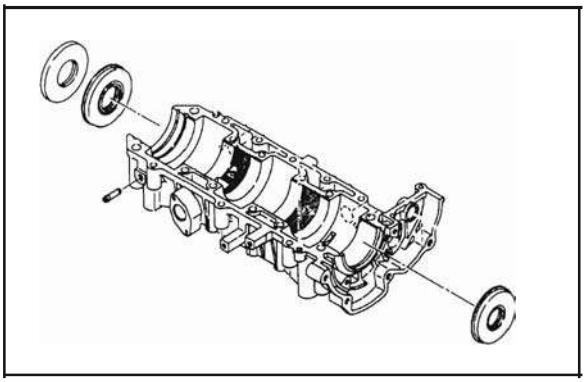
NOTE: Maximum ailowable runout is .004" (.1 mm).



Crankshaft Installation

1. Grease oil pump drive gear and seal lips of crankshaft seals with Polaris Low Temp or All Season Grease. Install Mag end seal and inner PTa end seal on crankshaft as shown.

NOTE: The metal sides of the PTa end seals face each other. The innermost seal has an outer rib to fit into the groove in the crankcase. The spring on the Magneto end seal faces inward toward the crankshaft.



2. Grease and install a-ring on shaft, followed by sleeve. Install sleeve carefully to be sure spring stays in position on seal lip during installation.

3. Install crankshaft in upper crankcase. Make sure bearing anti-rotation pins are in correct position in case slots, and seals are properly positioned.

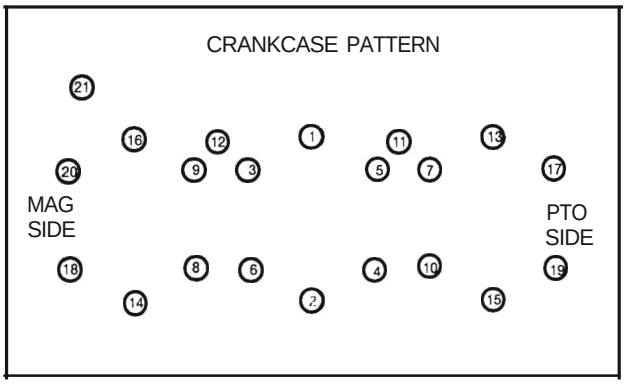
4. Nicks, burrs, or excessive sealer may affect main bearing fit. Inspect sealing surfaces of crankcase halves carefully to be sure they are free of nicks or burrs. Apply only a *thin* coat of sealer to both crankcase mating surfaces.

a-ring

Loctite™ 515 or 518 Gasket Eliminator

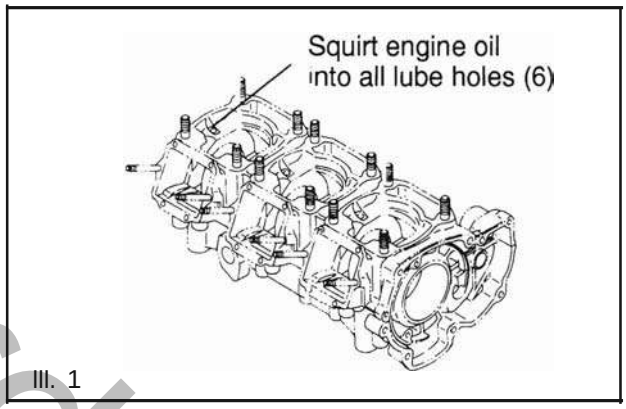
PN 2870587

5. Install lower case onto upper case. Apply Loctite™ 242 (Blue) to threads of bolts and tighten in 3 steps to proper torque following the pattern shown. Check crankcase drain bolts to make sure they are tight (78 in. lbs.l.9 kg-m).



Crankcase Bolt Torque (Apply 242 Blue)	
6mm (1) Bolt	78 in. lbs. (.9 kg-m)
8mm (16) Bolts	16 ft. lbs. (2.21 kg-m)
10mm (4) Bolts	26 ft. lbs. (3.59 kg-m)

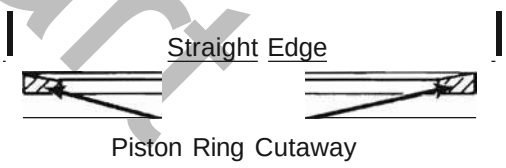
6. Lubricate crankshaft main bearings through oil holes with Polaris Premium 2 Cycle engine oil.



Ill. 1

7. Apply Polaris Premium 2 Cycle oil to piston rings and install them on piston with the beveled side up and the flat side down (see Ill. 2).

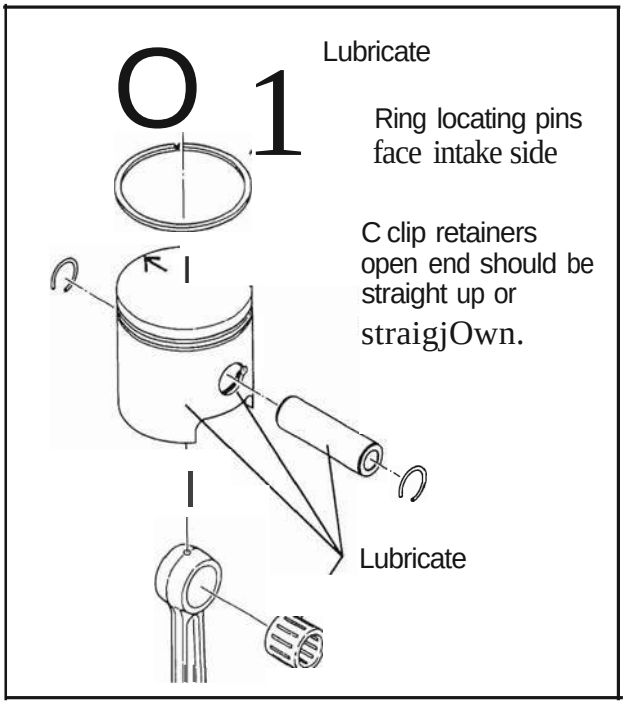
NOTE: Piston to cylinder clearance and piston ring installed end gap must be inspected prior to assembly. Refer to Disassembly/Inspection for procedure. Ring I.D. marks are stamped on top side of ring near end gap.



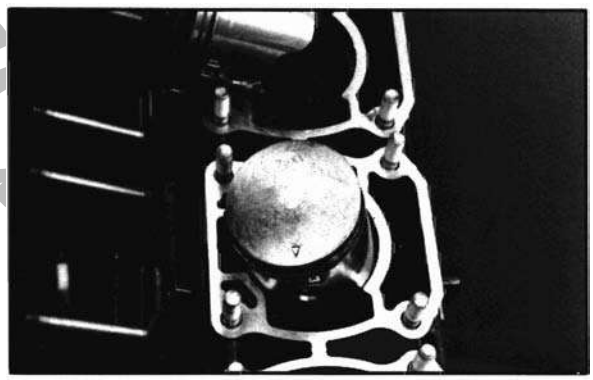
Ill. 2 Keystone Piston Ring

8. Apply engine oil to connecting rod small end bearing, piston pin bore, and piston pin.

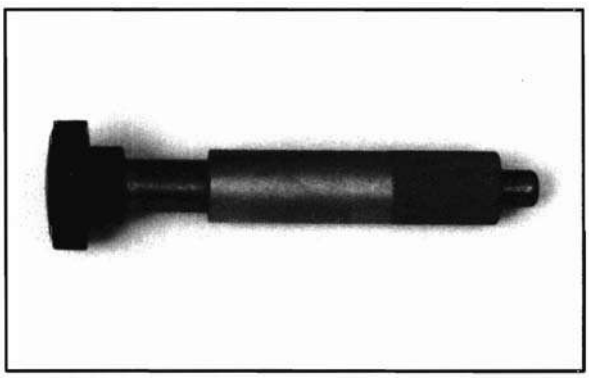
g. Install pistons with arrow on piston crown toward flywheel (Mag) side of crankcase.



NOTE: Alternate piston orientation marks: Piston ring locating pins *always* face the intake side of the engine.



10. To use C-clip installation tool, position new C-clip onto driver with open end down. Slide barrel over driver. Install driver guide pin into piston pin, support piston and position barrel up against piston. While holding barrel against piston, push driver in until you hear clip engage piston groove. Rotate driver to complete engagement of clip. Visually inspect each clip to verify proper placement in the groove.



Piston C-Clip Installation Tool
PN 2870773

Cylinder Installation

NOTE: Before installing the cylinder, see honing, measuring and cleaning procedures at the end of this section.

11. Thoroughly clean gasket material from cylinder base gasket mating surfaces. Always use new base gaskets.

12. Install base gaskets with sealant facing up. Support piston with piston support block. Apply engine oil to cylinder walls, piston, and rings.

Piston Support Block

PN 2870390

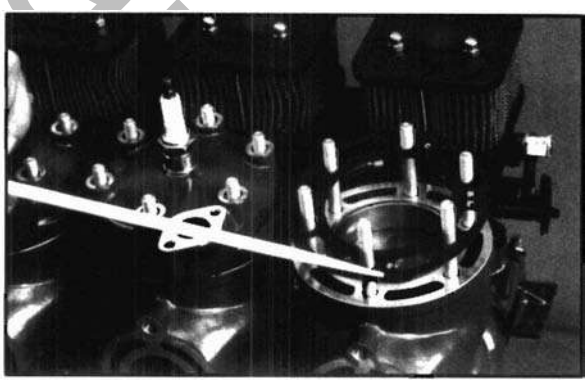
13. Using a ring compressor or your fingers, compress rings in alignment with anti-rotation pins on piston and very carefully slide cylinder down into place.

14. Apply Loctite™ 242 (blue) to studs and torque cylinder base nuts in 3 steps to 28 ft. lbs. (3.87 kg-m) using a criss-cross pattern.

Cylinder Base Nut Torque
(Apply Loctite 242 Blue)

28 ft. lbs.(3.87 kg-m)

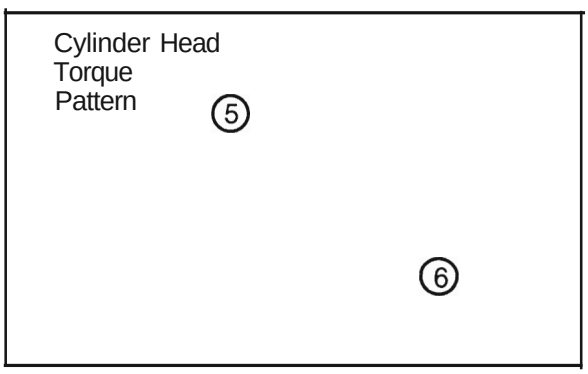
15. Install new head gaskets noting the correct location and marking. The number "78" must be up and readable and the tab on the outer edge of the gasket must be positioned under the water outlet in the cylinder head.



16. Apply Loctite™ 242 (Blue) to threads of cylinder head studs. Install nuts and torque in three steps to 16 ft. lbs. (2.20 kg-m) following the torque pattern shown.

Cylinder Head Nut Torque
(Apply Loctite 242 Blue)

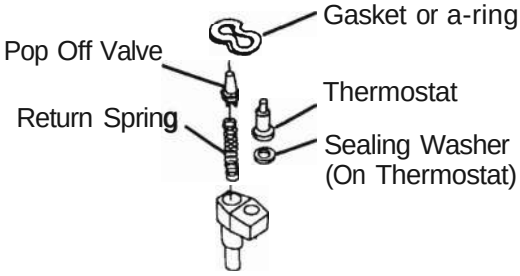
16 ft. lbs. (2.20 kg-m)



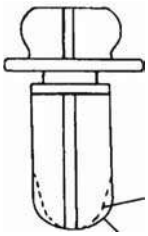
17. Install new water outlet manifold gaskets on the cylinder heads. Apply Loctite™ 242 (Blue) to threads of bolts and install manifold. Torque bolts evenly to 78 in. lbs. (.9 kg-m).

Manifold Retaining Bolt Torque
(Apply Loctite 242 Blue)
78 in. lbs. (.9 kg-m)

18. Assemble thermostat/popoff valve assembly. Assemble carefully to ensure proper alignment between all internal parts and be sure the gasket or a-ring is properly positioned. See Ill. 1. Inspect pop off valve for wear and replace if necessary. See Ill. 2.



Ill. 1

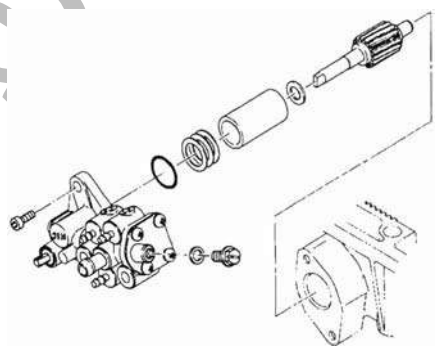


Ill. 2

19. Apply engine oil to oil pump drive gear, thrust washer, and bushing and install into crankcase. Be sure pump drive gear is fully engaged in crankshaft drive gear.

20. Apply a light film of grease to a new oil pump a-ring and place it in position on the pump. Install shims removed during disassembly (if applicable).

NOTE: If the oil pump, crankcase, or any of the pump drive components were replaced, the bushing end play must be measured and the proper shims installed. Refer to *Oil Pump Bleeding, Operation, and Troubleshooting* at the end of this chapter for procedures.

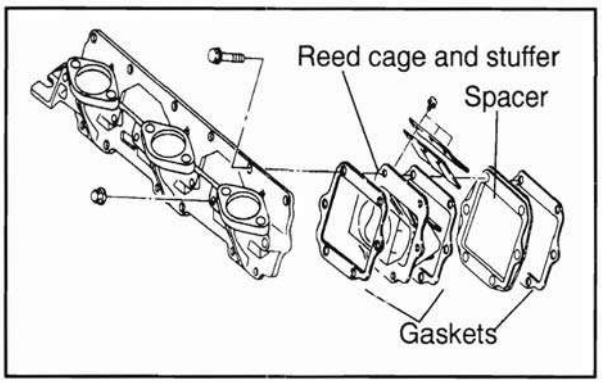


ENGINE/COOLING
Assembly· 780cc Models

21 . Install pump, engaging shaft in drive gear. Apply Loctite™ 242 to bolts and torque evenly to 72 in.lbs.

Pump Retaining Bolt Torque
(Apply Loctite 242 Blue)
72 In. lbs. (.83 kg-m)

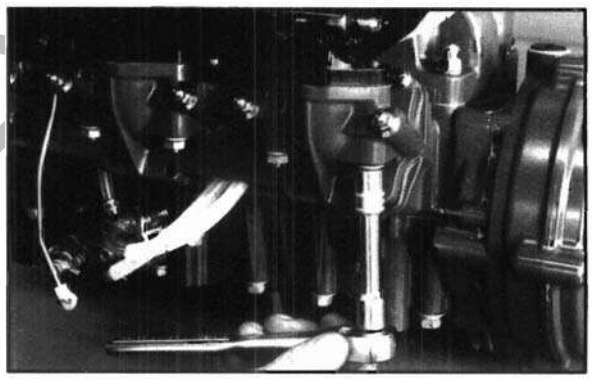
22 . Assemble carburetor intake manifold and reed assembly in this order: Gasket, spacer, gasket, reed cage, stuffer, gasket, and manifold.



23 . Apply Loctite 242 (Blue) to threads of bolts and studs and install (12) bolts and (6) nuts. Torque to 78 in. lbs. (.9 kg-m).

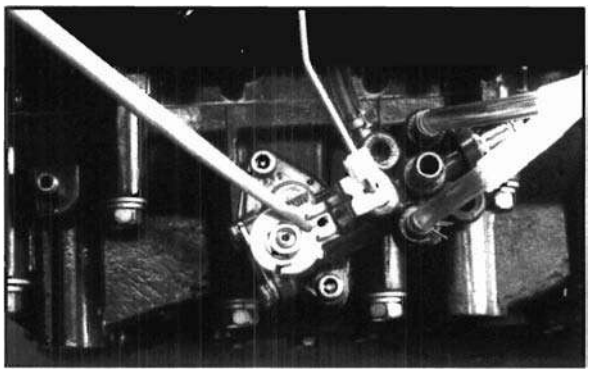
Intake Manifold Retaining Bolt Torque
(Apply Loctite 242 Blue)
78 In. lbs. (.9 kg-m)

24 . Install new carburetor gaskets on manifold and install carburetors, guiding oil pump rod carefully through manifold. Apply Loctite™ 242 (Blue) to threads of stud and torque carburetor mounting nuts evenly in 3 steps to 16 ft. lbs. (2.21 kg-m).

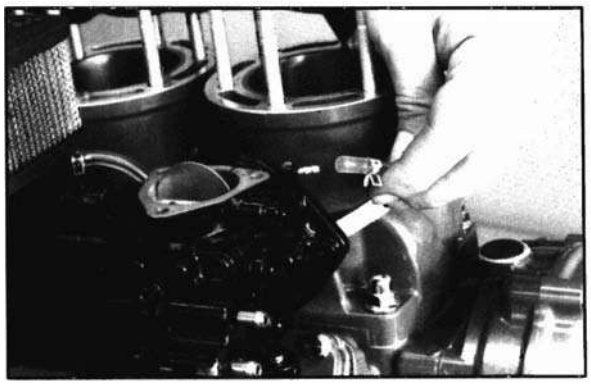


Carburetor Mounting Nut Torque
(Apply Loctite 242 Blue)
16 ft. lbs. (2.21 kg-m)

25 . Attach oil pump control rod to pump lever, and close clip. With throttle held wide open the marks on the pump body and pump lever should align.



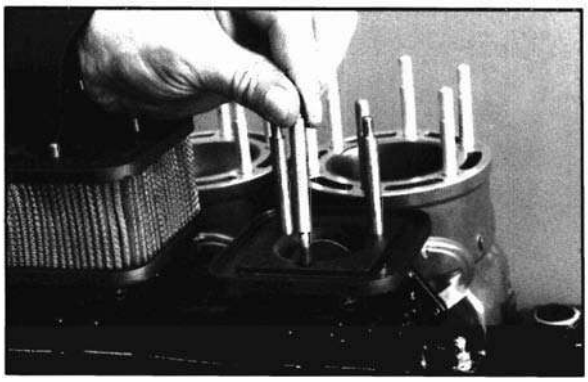
26 . Inspect oil lines carefully for cracks or abrasion. Inspect clamps for proper tension and concentricity. Replace any clamps that are distorted (out of round) or weak. Be sure the protective wrap on the line is in position at all possible wear points. Push lines completely onto the pump and carburetor fittings, sliding clamps fully to the end past barbed portion of fitting.



CAUTION:

Air or oil leaks at the lines will cause serious engine damage.

27 . If carburetor intake base and studs were removed, replace gaskets and install each intake assembly. Apply Loctite™ 242 (Blue) to both ends of studs and torque studs and nuts to 78 in. lbs. (.9 kg-m)



Intake Base Retaining Stud Torque
(Apply Loctite 242 Blue)
78 in. lbs. (.9 kg-m)

28 . Clean exhaust manifold gasket surfaces thoroughly. Apply Loctite™ 242 (Blue) to threads of exhaust manifold bolts. Install exhaust manifold with a new gasket and torque the (9) bolts to 16 ft. lbs. (2.21 kg-m).

Exhaust Manifold Bolt Torque
(Apply Loctite 242 Blue)
16 ft. lbs. (2.21 kg-m)

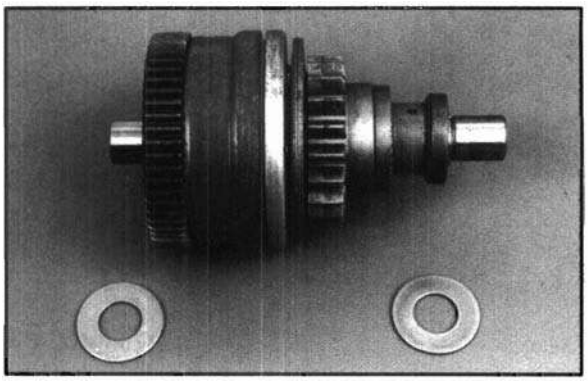
SLX780 Exhaust Manifold
Torque Pattern

(j)

③ ⑨

29. Install stator plate and wire harness weatherproof grommet and retainer. Apply Loctite™ 515/518 Gasket Eliminator to grommet. Use reference mark that was applied during removal to ensure proper ignition timing. If a new stator is installed align mark on plate with crankcase parting line. Apply Loctite™ 242 (Blue) to stator screws and grommet retainer screws.

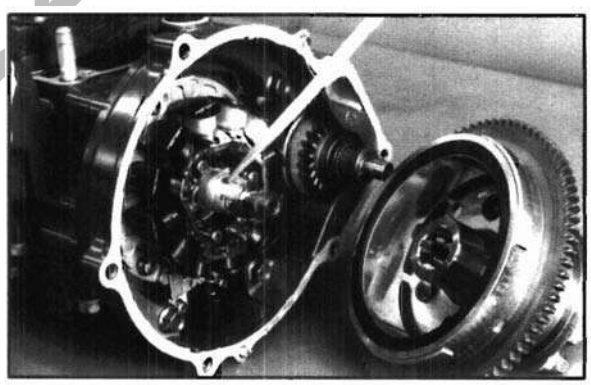
30. Install starter drive and thrust washers. Install inner magneto cover and torque the 8mm bolts to 14 ft. lbs. (1.93 kg-m) and the 6mm bolt to 78 in. lbs. (.9 kg-m).



Magneto Cover Retaining Bolt Torque	
6mm	78 in. lbs. (.9 kg-m)
8mm	14 ft. lbs. (1.93 kg-m)

IMPORTANT: Flywheel Installation Information

1. Apply Loctite™ 262 (Red) to flywheel crankshaft taper and install. Apply Loctite 242 (Blue) to crankshaft nut threads and torque nut to specification.



Flywheel Nut Torque Specification	
18mm Nut	65 ft. lbs. (8.97kg-m)

2. Install outer magneto cover. Use Loctite™ 515 gasket eliminator on mag cover mating surfaces and torque bolts to 14 ft. lbs. (1.93 kg-m).

Outer Magneto Cover Retaining Bolt Torque
14 ft. lbs. (1.93 kg-m)

3. Make sure starter motor mount is clean and free of corrosion. Slide starter motor into place and torque the two retaining bolts to 78 in. lbs. (.9 kg-m). A small amount of grease should be used on the housing O-ring to aid in assembly.

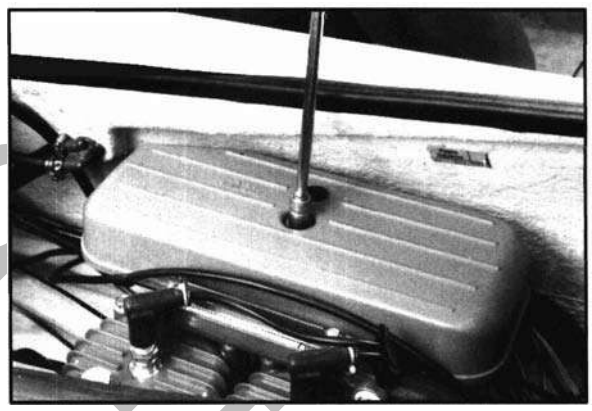
Starter Motor Retaining Bolt Torque (Apply Loctite 242 Blue)
78 in. lbs. (.9 kg-m)

Engine Removal

Refer to illustration on page 4.23 (700) or 4.27 (900 and 1050) during engine removal. Twin cylinder engine procedures are shown in this section. Three cylinder procedures are similar and differences are noted where applicable.

1. Turn off fuel valve.

2. Remove seat. Apply masking tape or duct tape around seat opening to protect hull from scratches during engine lifting procedures.



3. Loosen bolt and remove air intake silencer assembly.

4. Remove spark plug high tension leads from spark plugs.

5. Remove two straps securing exhaust water box.

6. Loosen battery hold down straps and remove electrical box cover. Disconnect stator wires and temperature sender wire from terminal board. Remove harness grommet bracket and pull harness out of electrical box. Move electrical box out of the way to complete battery ground cable removal.

7. Disconnect battery ground (-) cable from rear of engine crankcase.

8. Remove carburetors. Refer to Fuel System/ Carburetion section.

9. Loosen clamp and remove hose from water outlet manifold.

10. Remove exhaust pipe and exhaust silencer.

11. Remove cable from starter motor.

12. Loosen clamps and remove driveshaft coupler shroud.

13. Remove jet pump and driveshaft assembly. Refer to Final Drive-Jet Pump-Bilge section for procedure.

14. Disconnect oil supply line at oil pump and plug the line.

15 . If engine will be completely disassembled, remove drive coupler from crankshaft *before* loosening (4) engine mount nuts.

16 . Remove PTO spark plug. Find Top Dead Center of this piston.

17 . Turn coupler clockwise (as viewed from rear of craft) until piston is approximately 1" (25.4 mm) before top dead center. **NOTE:** Estimate piston position using a screwdriver or similar probe through plug hole.

18 . Remove screwdriver or probe and insert approximately 1 foot (30 cm) of *5/16"* (8mm) nylon rope through spark plug hole. Using coupler tool or a large wrench on flats of coupler, turn crankshaft counter clockwise until rope is trapped between piston and cylinder head. With crankshaft locked in position, remove coupler by turning counter clockwise (as viewed from the rear).

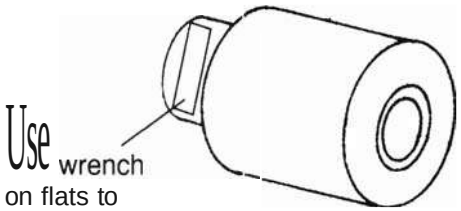
CAUTION:

Use a wrench on the flats of the coupler to remove. Do not use coupler removal tool PN 2871037 on the rubber dampened coupler or misalignment may occur.

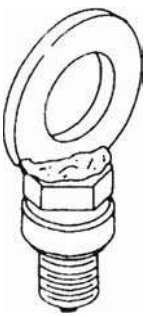
19 . Remove engine mount nuts (4). With the aid of a chain hoist, lift engine upward and out of hull. Engine alignment shim(s) may be in place on one or more of the engine rubber mount studs. Note the number and location for reinstallation. The number of shims installed in production is written next to each mount with permanent marker. Engine rubber mounts are stressed during removal of mounting nuts. Be sure to inspect the mounts carefully and replace if damaged. Always inspect engine to pump alignment when engine is reinstalled.

NOTE: Engine lifting eyes can be easily fabricated by removing the upper porcelain from a spark plug and welding a large washer to the spark plug base. Install one lifting eye in the PTO cylinder and one in the Magneto cylinder spark plug hole.

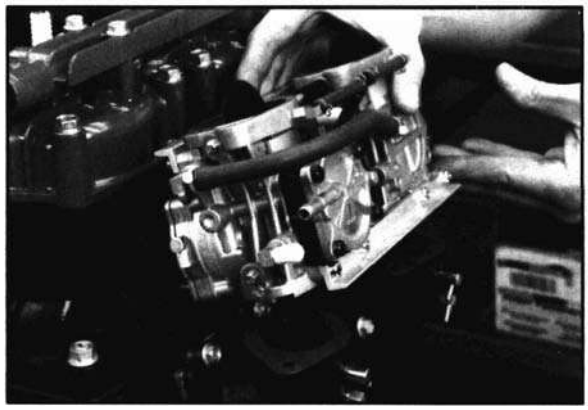
CAUTION: Do not use coupler removal tool on rubber dampened coupler.



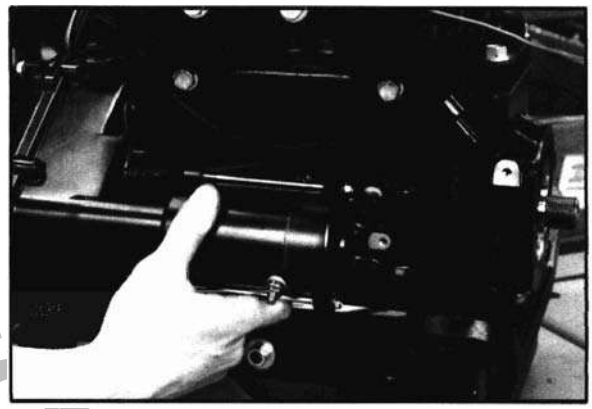
Engine Lifting Eye
(2 Required).



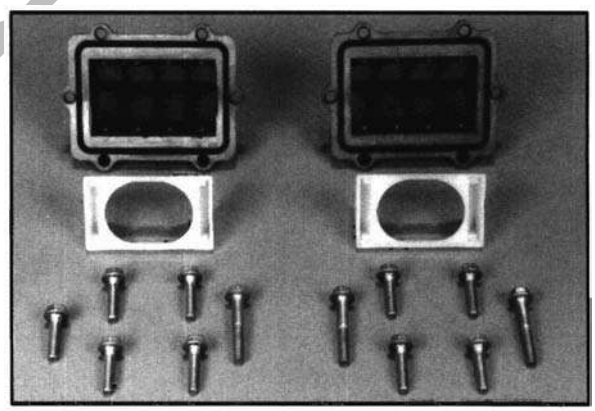
1. Remove carburetors.



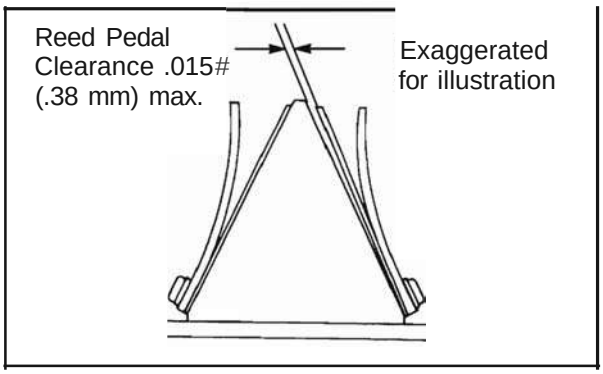
2. Remove starter motor. Inspect O-ring and bore in cover for damage.



3. Remove intake manifold. Inspect sealing surface for nicks or damage that may cause an air leak. Remove reed blocks and stutters.



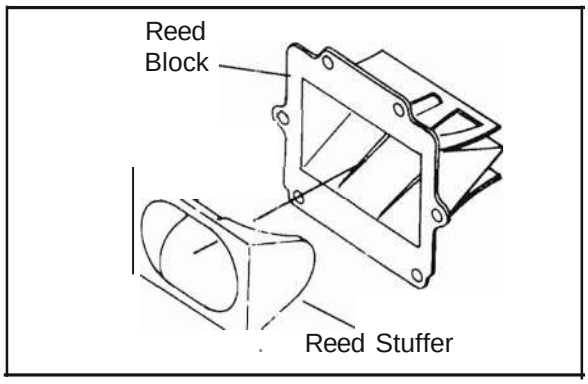
4. Measure air gap between fiber reed and reed block as shown. The air gap should not exceed .015# (.4 mm). If clearance is excessive DO NOT attempt to reverse the reeds to reduce the air gap. *Always replace them if damaged.* Check each fiber reed for white stress marks or missing material. Replace if necessary.



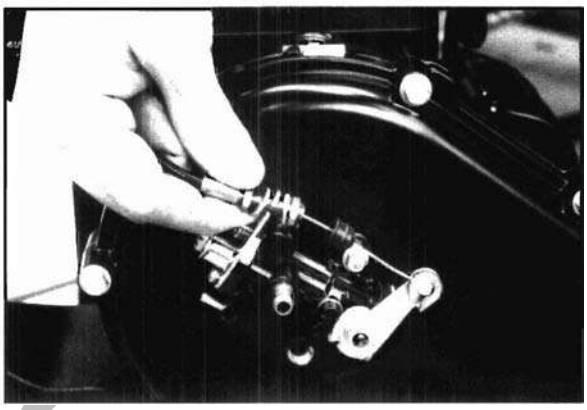
Reed Air Gap - Maximum

.015″ (.4 mm)

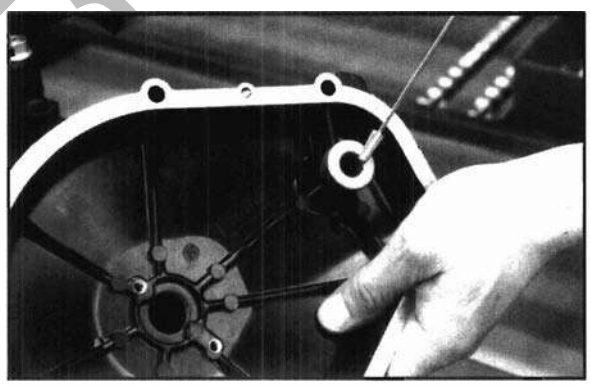
5 . Inspect condition of reed stuffers and replace if deformed or damaged. The stuffer should fit squarely into the reed block.



6 . Remove oil pump. Inspect a-ring condition and sealing surface.

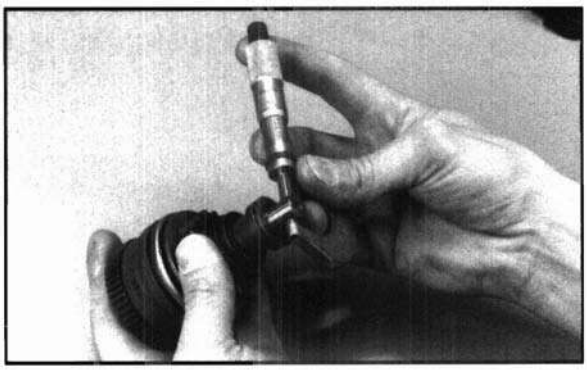


7 . Remove flywheel cover bolts, tap cover lightly with a soft faced hammer and remove cover and gasket. Inspect starter drive bushing in cover for wear or damage. Measure inside diameter and replace if worn beyond service limit. Measure starter drive shaft 0 .0., calculate clearance and compare to specifications.



Starter Drive Bushing I.D.
.4735″-.4740″ (12.03-12.04mm)

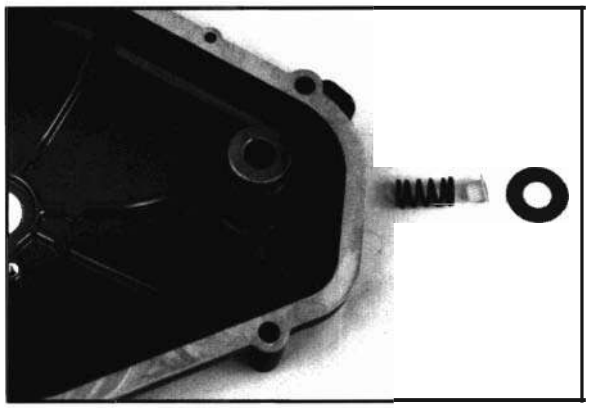
Std. Shaft O.D.
.470″-.472″ (11.94-11.99mm)



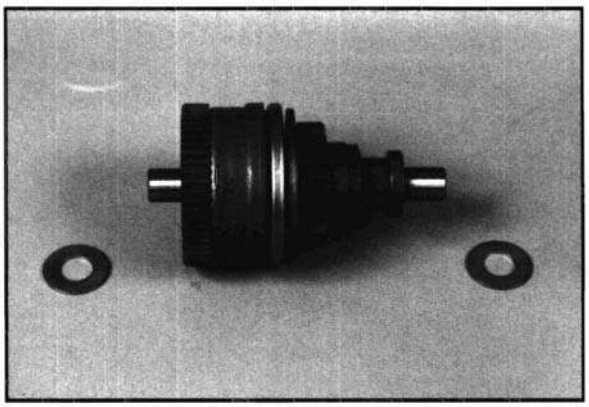
Starter Drive Bushing Clearance:
Std: .0015″-.004″ (.04-.10 mm)

Service Limit:
.010″ (.25 mm)

8. Remove thrust spring and plastic bushing from starter drive bushing in cover. Replace spring and bushing if worn.



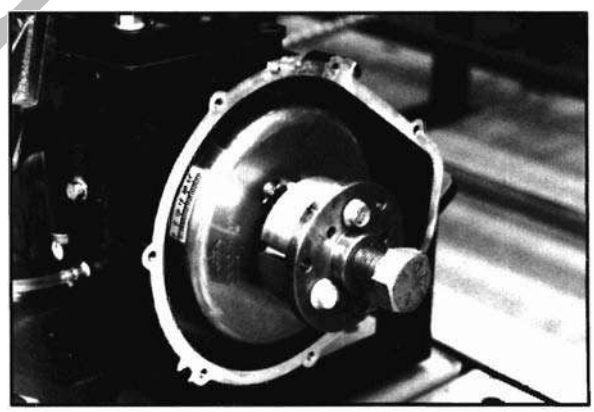
9. Remove starter drive. A thrust washer is located on each end. Inspect gear teeth for wear, cracks or damage. Hold drive body and rotate drive gear to check operation of drive assembly. The drive gear must slide smoothly outward without binding. Inspect bushing in starter housing as outlined for cover bushing on page 4.74.



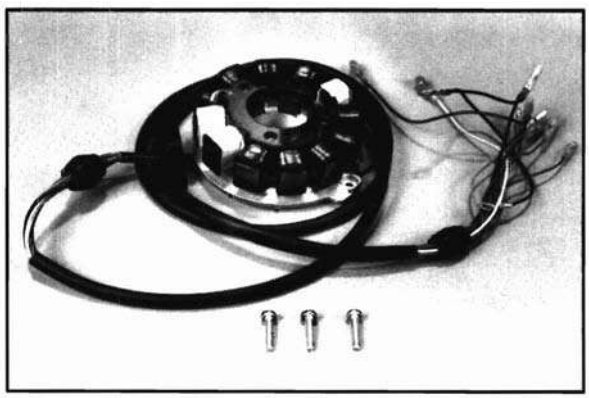
10. Remove flywheel nut and washer. Install puller and remove flywheel. Inspect flywheel key and keyway in flywheel for damage.

CAUTION:

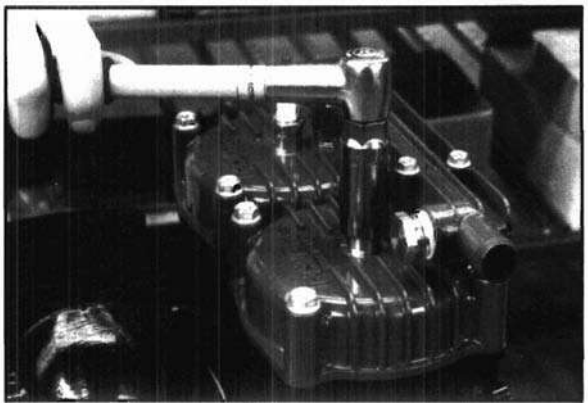
Do not thread the puller bolts into the flywheel more than 3/8" (.95 em) or stator damage may result. Do not tighten the flywheel puller against the magnet holder screws or damage to the screws or magnet holder may result.



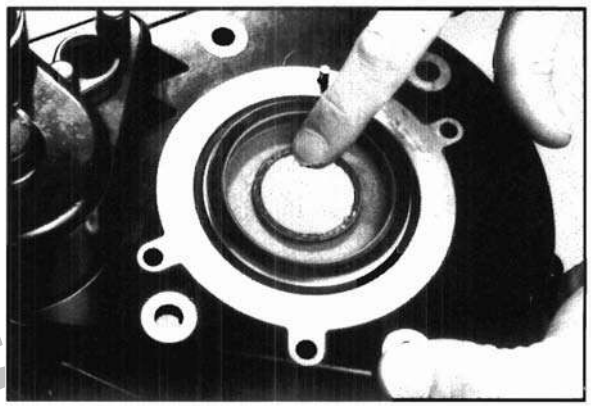
11. Remove bolt from wiring harness grommet. Remove stator assembly.



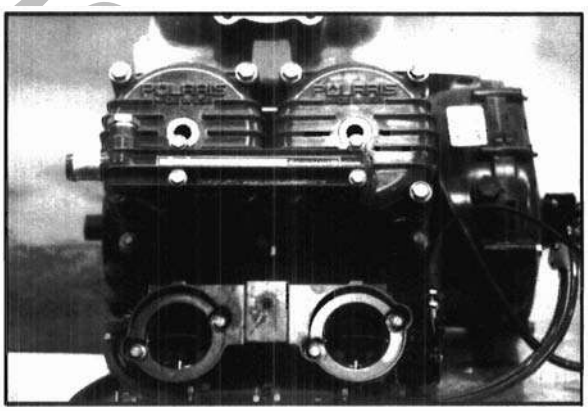
12 . Remove spark plugs.

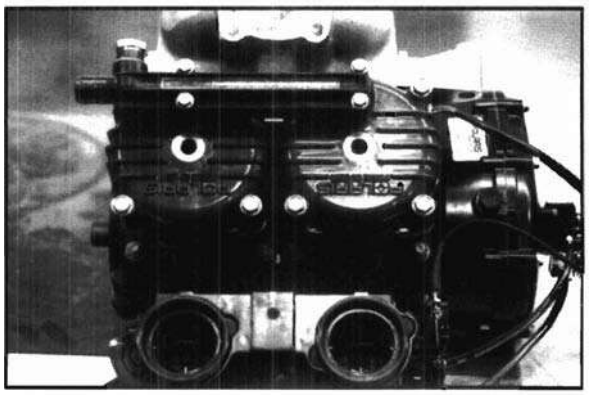


13 . Remove starter housing. Inspect condition of crankshaft seal in housing. See Engine Assembly for seal replacement procedure.

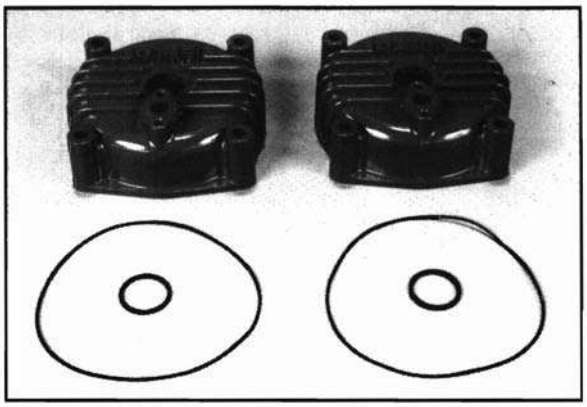


14 . Remove water outlet manifold. Clean and inspect gasket surfaces. Note location of water outlet manifold and orientation of cylinder covers. On the WC70DCSP-01 engine the manifold is located on the *intake* side as shown in photo at right. On all subsequent 700s, and all 900 and 10S0cc engines, the manifold is located on the *exhaust* side. See photo below right.

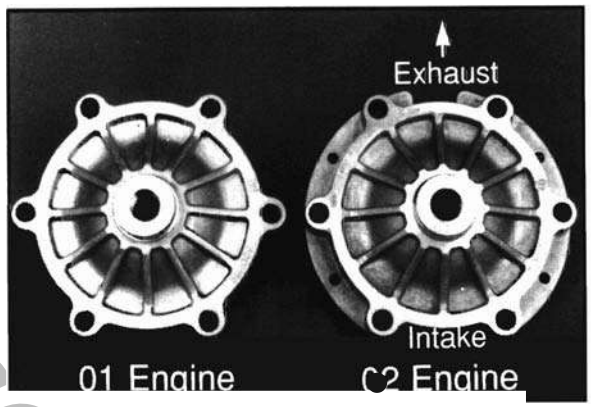




15 . Remove cylinder head cover and inspect sealing surface. Clean and inspect groove in cylinder for damage or debris. Replace both cover a-rings upon reassembly.



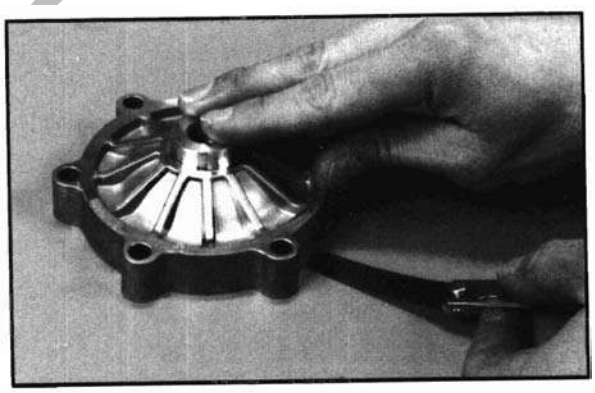
16 . Mark cylinder heads so they can be re-installed on their respective cylinders. Note: On 1997 1050cc engines, the center cylinder head is different from the Mag and PTa cylinder head, and must be installed only on the center cylinder. Remove cylinder heads and inspect sealing surface. Clean and inspect groove in cylinder for damage or debris. Inspect surface of cylinder head.



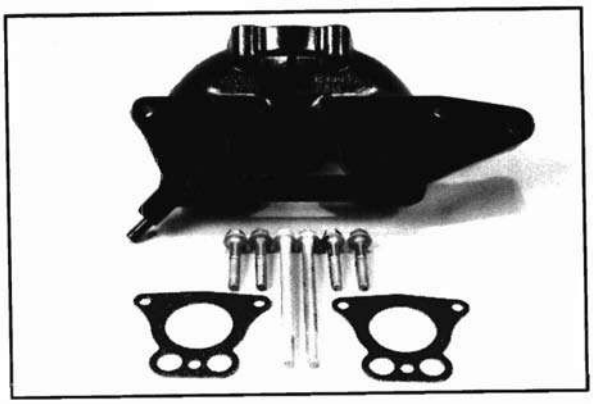
NOTE: WC70DCSP-01 Cylinder Heads Shown on left. All other engines on right.

17 . Check each cylinder head for warping as shown. Replace cylinder head if warp exceeds service limit.

Cylinder Head Warp
Service Limit: .003" (.08mm)

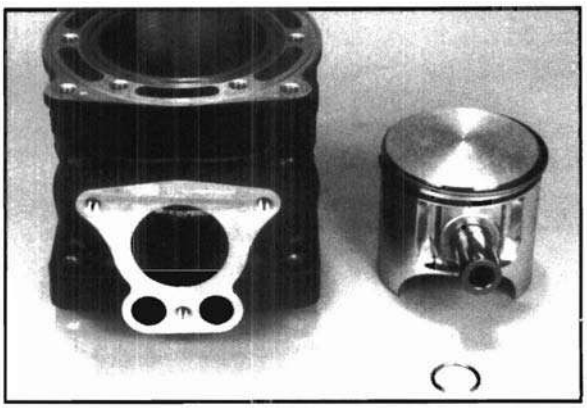


18 . Remove exhaust manifold and gaskets.



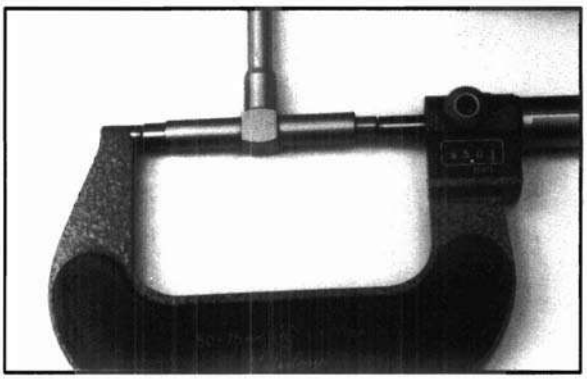
19 . Loosen cylinder base nuts evenly in a criss cross pattern. Support pistons while removing cylinders.

NOTE: Each cylinder and piston should be marked to keep all parts together as a matched set. If parts are to be reinstalled keep piston pins and top bearings together with their respective cylinders. Always use new piston pin C-clips upon reassembly.



20 . Inspect each cylinder for wear, scratches, or damage. If no damage is evident, measure cylinder for taper and out of round with a telescoping gauge and micrometer or a dial bore gauge. Measure bore 1/2" down from top of cylinder in two directions - in line with piston pin and 90° to the pin to determine if bore is out of round. Repeat measurements at bottom of cylinder to determine taper or out of round at the bottom. Record all measurements.

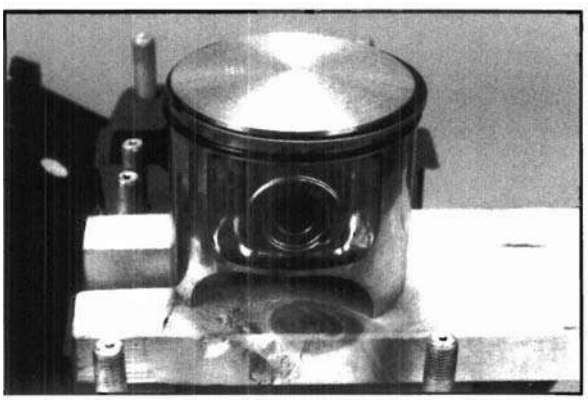
NOTE: If cylinders are worn or damaged refer to page 4.100-4.101 for boring/honing and port chamfer information.



21 . Remove piston circlips carefully using an awl, scribe, or very small screwdriver.

CAUTION:

The circlip is under tension. Wear eye protection. Keep your thumb on the edge of the clip to prevent it from springing out.



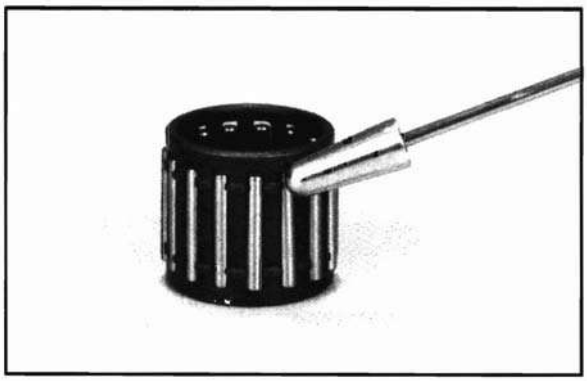
22 . Remove piston pin and piston. If necessary, heat piston crown slightly with a propane torch.

CAUTION:

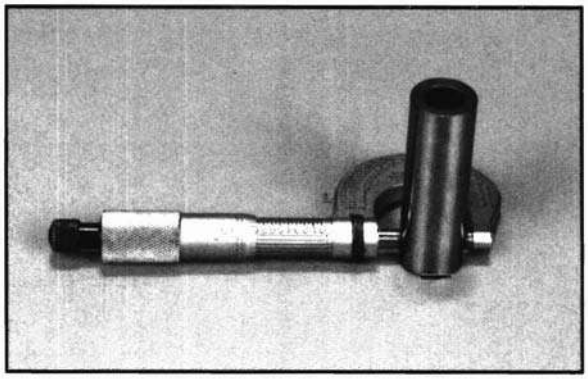
Do not apply heat to the piston rings. The rings may lose radial tension.

Piston Pin / Needle Bearing Inspection

1. Clean needle bearing in solvent and dry with compressed air.
2. Inspect needle cage carefully for cracks or shiny spots which indicate wear. Replace needle bearings if worn or cracked, and always replace them if piston damage has occurred.

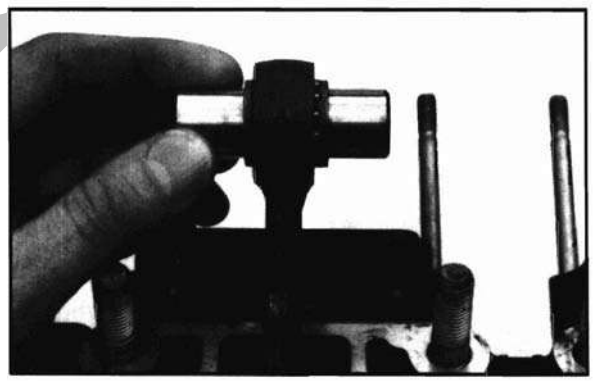


3. Visually inspect piston pin for damage, discoloration, or wear. Run your fingernail along the length of the pin and replace it if any rough spots, galling orwear is detected. Measure piston pin.



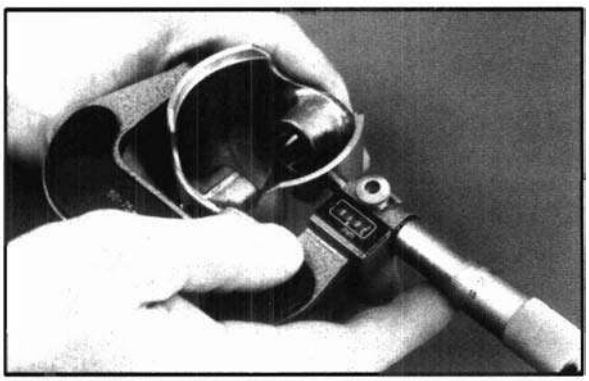
Connecting Rod Small End Inspection

1. Clean small end of connecting rod and inspect inner bore with a magnifying glass. Look for any surface irregularities including pitting, wear, or dents.
2. Run your fingernail around the inside of the rod and check for rough spots, galling, or wear.
3. Oil and install needle bearing and pin in connecting rod. Rotate pin slowly and check for rough spots or any resistance to movement. Slide pin back and forth through bearing while rotating and check for rough spots.
4. With pin and bearing centered in rod, twist ends back and forth in all directions to check for excessive axial play. Pull up and down evenly on both ends of pin to check for radial play. Replace pin *and* bearing if there is any resistance to rotation or excessive axial or radial movement. If play or roughness is evident with a new pin and bearing, replace the connecting rod.



Piston Inspection/Measurement

1. Check piston for scoring or cracks in piston crown or pin area. Excessive carbon buildup below the ring lands is an indication of piston, ring or cylinder wear.
2. Measure piston outside diameter at a point 10 mm (3/8") up from bottom of skirt at a 90° angle to the direction of the piston pin. Record the measurement for each piston.

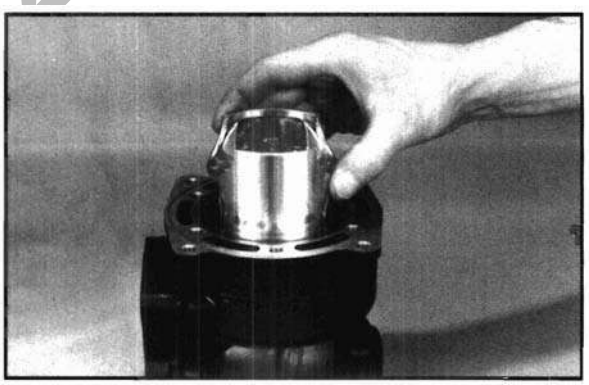


NOTE: The piston must be measured at this point to provide accurate piston-to-cylinder clearance measurement.

3. Subtract this measurement from the minimum cylinder measurement recorded previously. If clearance exceeds the service limit, determine if piston or cylinder is worn and recondition or replace as necessary.

Piston to Cylinder Clearance
STD: .0045 - .0055" (.12 - .14mm) Service Limit: .010" (.25 mm)

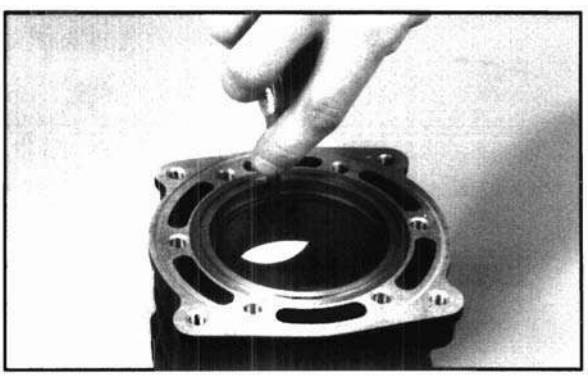
1. Position each piston ring 1/2" (1.3 cm) from the top of the cylinder using the piston to push it squarely into place. Measure installed gap with a feeler gauge at both the top and bottom of the cylinder.



NOTE: A difference in end gap indicates cylinder taper. The cylinder should be measured for excessive taper and out of round. Replace rings if the installed end gap exceeds the service limit.

NOTE: Always check piston ring installed gap after reboring a cylinder or when installing new rings.

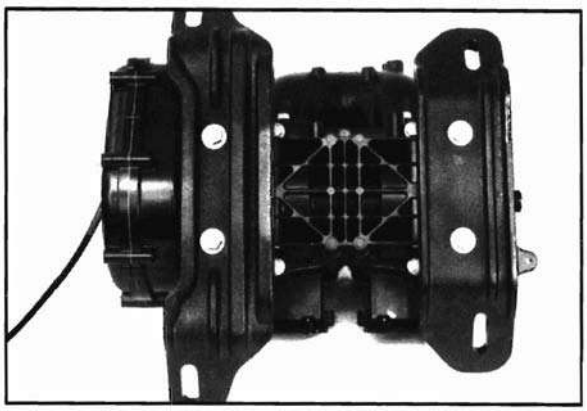
Piston Ring Installed Gap
STD: .010"-.018" (.25 - .45mm) Service Limit: .028" (.71mm)



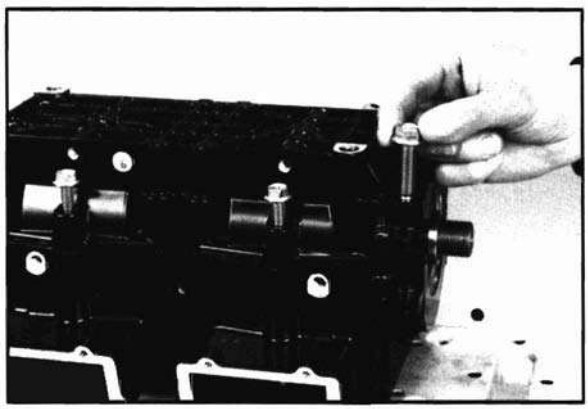
Cylinder Cleaning/Cylinder Reconditioning

Refer to page 4.100 for cylinder cleaning, honing, and reboring information.

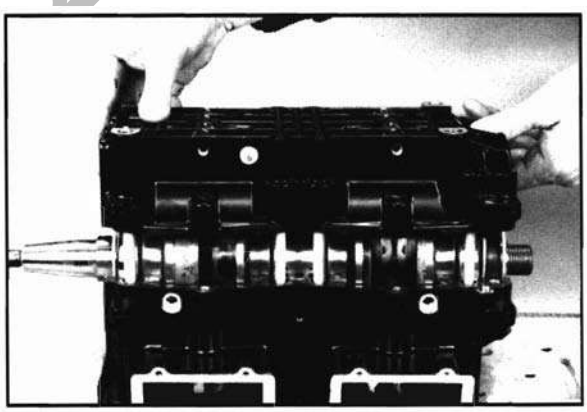
2. Scribe a mark on the engine mounts and crankcase. This will allow the mounts to be installed at nearly the same position and speed engine alignment after reassembly. Remove engine mounts. One bolt has dielectric grease applied. Note position of this bolt and orientation of mounts for reassembly.



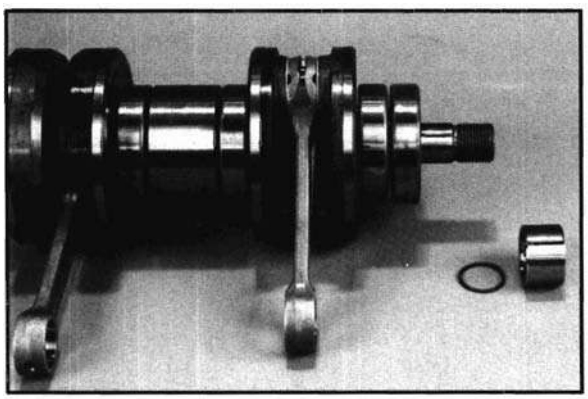
3. Loosen and remove crankcase bolts following reverse order of torque pattern on page 4.8 or 4.9.



4. Tap crankcase on reinforced areas to separate top from bottom. Remove top half of crankcase.



5. Remove crankshaft from bottom half of crankcase. Remove seal collar and a-ring. Inspect sealing surface on collar and crankshaft.



Crankshaft Main Bearing Inspection

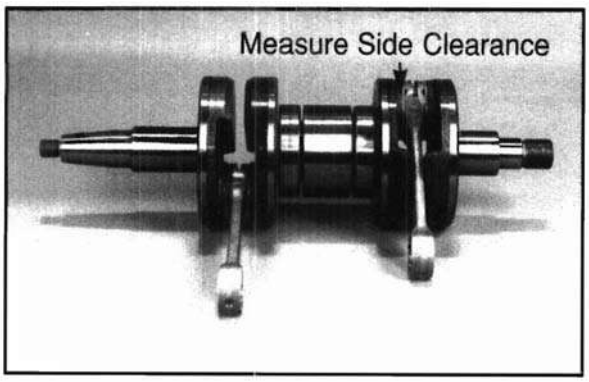
1. Clean crankshaft thoroughly and oil main and connecting rod bearings with Polaris Premium 2 engine oil. Carefully check each main bearing on the shaft.

NOTE: Due to extremely close tolerances, the bearings must be inspected visually, and by feel. Look for signs of discoloration, scoring or galling. Turn the outer race of each bearing. The bearings should turn smoothly and quietly. The inner race of each bearing should fit tightly on the crankshaft. The outer race should be firm with minimal side to side movement and no detectable up and down movement. Replace any loose or rough bearings.

Connecting Rod (Big End) Side Clearance

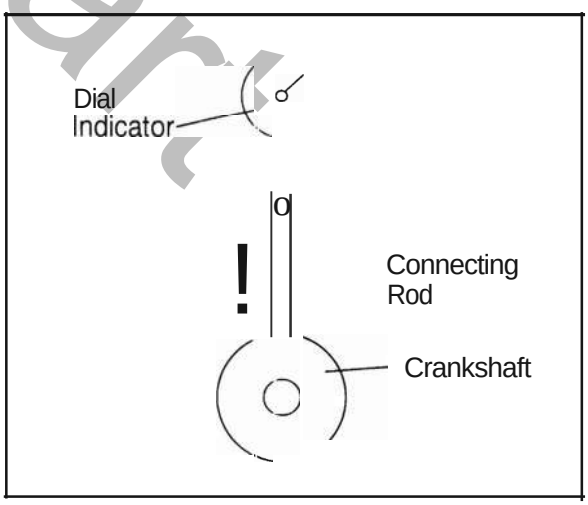
1. Measure connecting rod big end side clearance with a feeler gauge as outlined in the 92-95 PWC Manual. Compare to specifications.

Connecting Rod Big End Side Clearance
Standard: .014 - .020" (.36-.51mm)
Service Limit: .022" (.56mm)



Connecting Rod (Big End) Radial Clearance

1. Rotate rod on crankshaft and check for rough spots. Check radial end play in rod by securing crankshaft in a holding fixture. Set up a dial indicator as shown in illustration at right. Support connecting rod against one thrust washer and apply up and down pressure on connecting rod. Read total movement of indicator and compare to specifications. Replace rod, bearing, pin, and thrust washers if clearance is excessive. **Important Note:** A *very* small amount of radial play is normal and may be barely perceptible when inspecting by feel as described on page 4.61.



Connecting Rod Big End Radial Clearance
Standard: .0015 - .0018" (.038-.046mm)
Service Limit: .0021" (.053mm)

NOTE: Specialized equipment and a sound knowledge of crankshaft repair and straightening is required to perform crankshaft work safely and correctly. Crankshaft repair should be performed by trained Polaris service technicians in a properly equipped shop.

CAUTION:

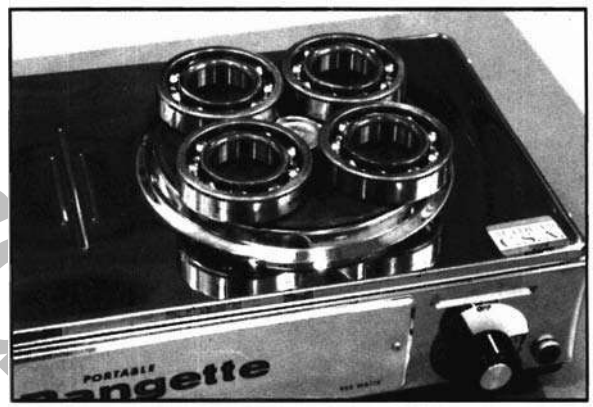
The cylinder mounting studs on Polaris engines are used to secure crankcase halves along with the crankcase bolts. Cylinder base nuts must be temporarily installed and torqued to maintain even pressure on the crankcase sealing surfaces during top end assembly. Do not allow crankcase sealer to cure before torquing base nuts or assembling the top end. Be sure all top end parts are clean, inspected, and ready for assembly priorto assembling engine lower end. Improper crankshaft main bearing clearance may result if sealer dries, causing premature engine wear. Be sure to follow the Crankcase Assembly procedure below when assembling crankcases.

1. Clean crankshaft and lubricate with Polaris Premium 2 Cycle Oil.

Polaris Premium 2 Cycle Oil

PN 2871098

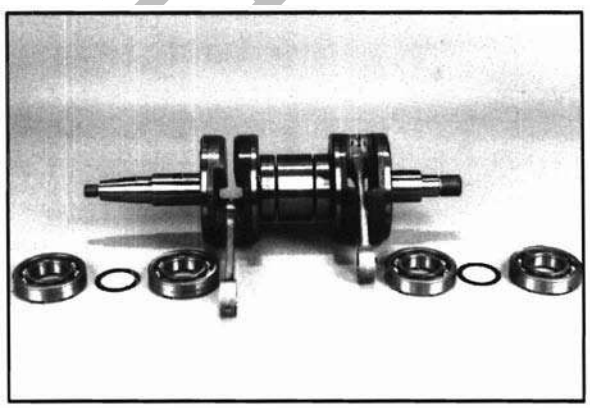
2. If new outer main bearings are being installed, heat new bearings on a hot plate.



CAUTION:

Wear protective gloves to avoid burns when installing bearings.

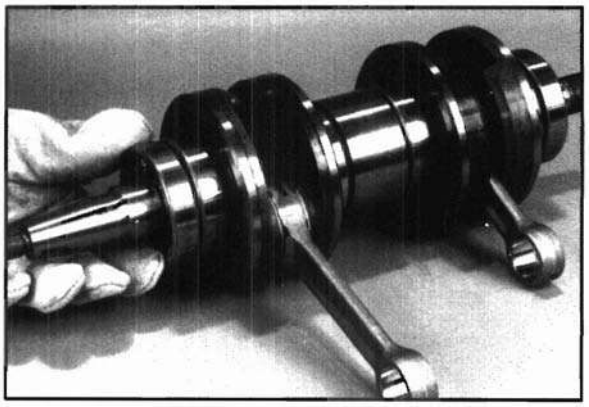
3. Install inner bearing on PTO end. Install spacer and outer bearing. Be sure bearings are fully seated. If necessary, tap bearing lightly *on inner race only* until fully seated.



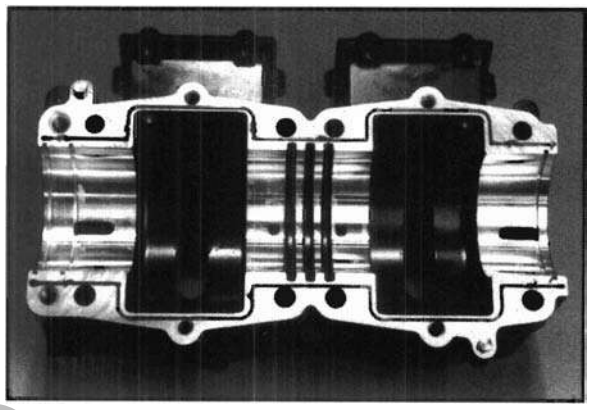
CAUTION:

Do not drive on outer race or bearing damage may occur.

4. Install inner Mag end bearing, spacer, and outer bearing.



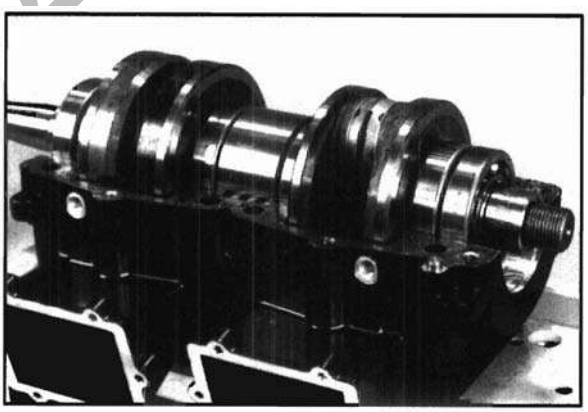
5. Clean crankcase halves thoroughly, rinse and dry completely. Be sure all old sealer is removed from surface.



6. Apply a *thin,* even layer of sealer to entire surface of upper crankcase half.

CAUTION:

Do not allow sealer to dry. Crankcase must be assembled immediately to ensure proper fit of main bearing outer race in crankcase.

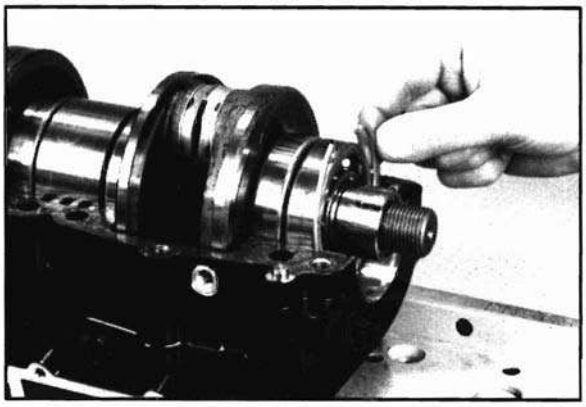


Crankcase Sealer -

3-Bond™ 1215 (Part Number TBA)

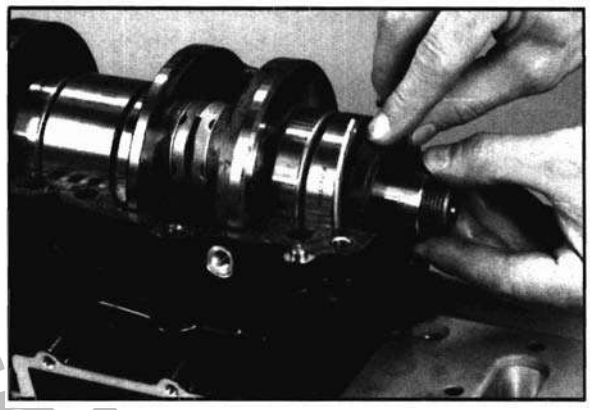
7. Install crankshaft in upper crankcase.

8. Install bearing retainer circlip with end gap facing directly upward as shown.



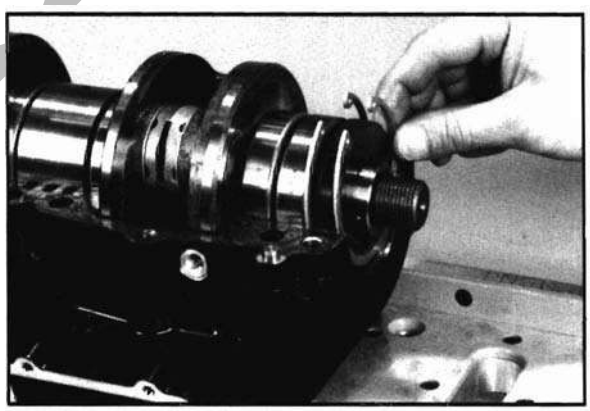
9. Apply grease to seal lip and install seal with lip and spring facing inward toward crankshaft.

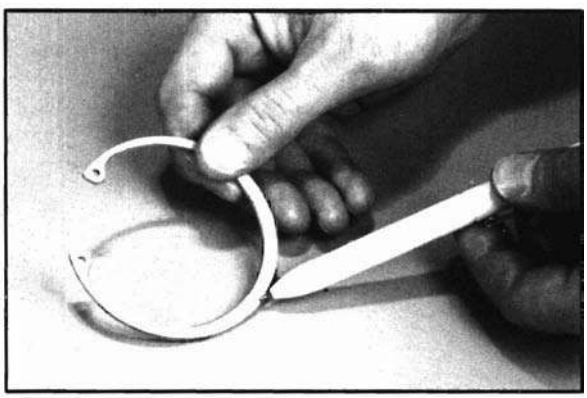
10. Apply a light film of grease and install O-ring and seal collar, being careful not to dislodge spring on seal during installation of collar.



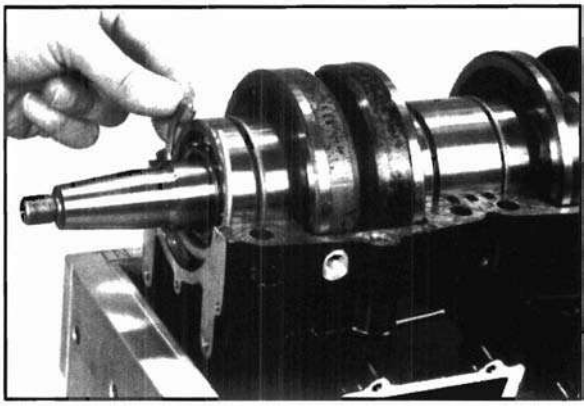
Polaris Premium All Season Grease
PN 2871322 (3 oz. tube)
PN 2871423 (14 oz. tube) or
Premium Marine Grease
PN 2871066 (14 oz. tube)

11. Install seal retaining circlip with end gap facing upward. The seal retainer circlip is plated to resist corrosion.

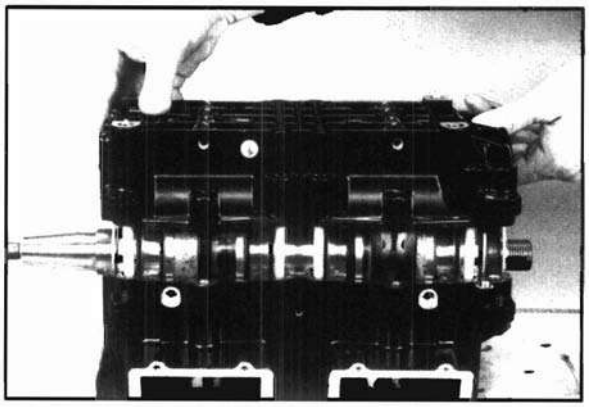




12 . Install Mag end bearing retainer circlip with ends facing upward as shown.

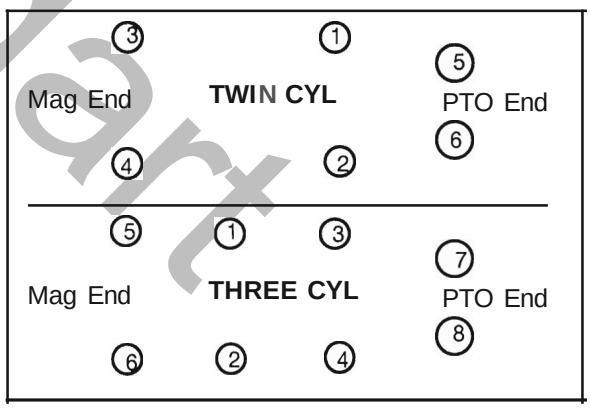


13 . Place lower crankcase half on upper half aligning circlips and seals. Press into place.



14. Apply Loctite™ 242 (blue) to crankcase bolts, install and tighten to specifications following torque pattern shown in illustration at right.

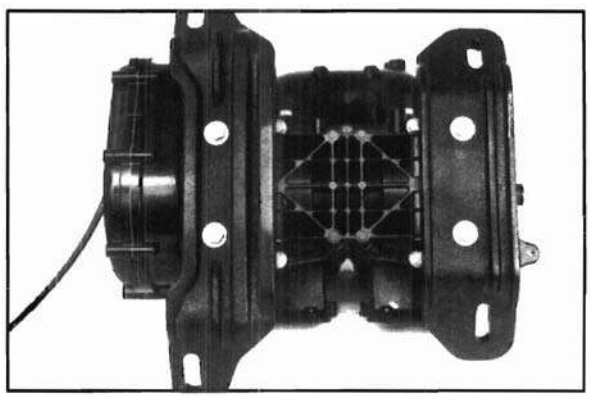
Crankcase Bolt Torque -
Apply Loctite 242 (Blue)
8mm – 22 ft. lbs. (3.03 kgm)
10mm – 28 ft. lbs (3.86 kgm)



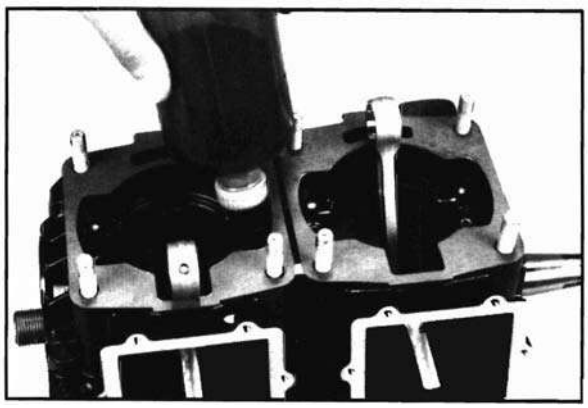
15 . Turn engine upright.

IMPORTANT: Temporarily install cylinder base nuts and torque to specifications following the pattern shown on page 4.8 and 4.9.

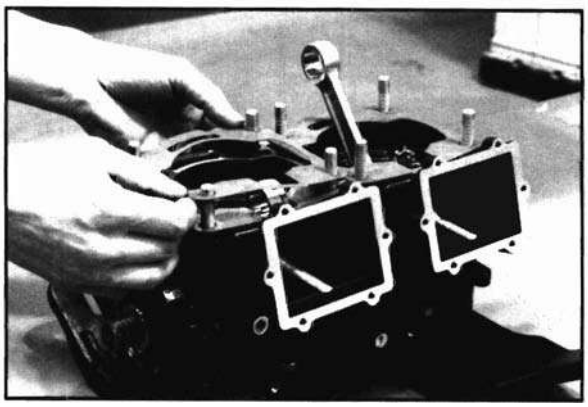
16 . Install front and rear engine mounts as shown. The two reinforcing ribs on each mount are positioned to the rear (PTO end) of engine. Torque to specification. Front (Mag end) has a relief for magneto housing. Rotate crankshaft to be sure crankshaft rotates freely without binding.



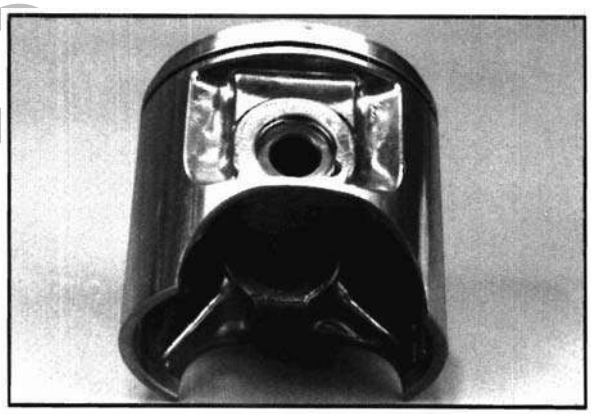
17 . Lubricate main bearing oil holes with Polaris Premium 2 Cycle engine oil and rotate crankshaft to distribute oil evenly.



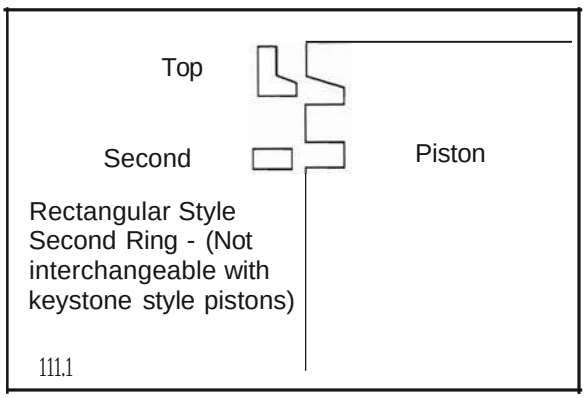
18 . Remove Mag end base nuts and install new base gasket. Be sure gasket surface is clean and free of nicks, burrs, or scratches.

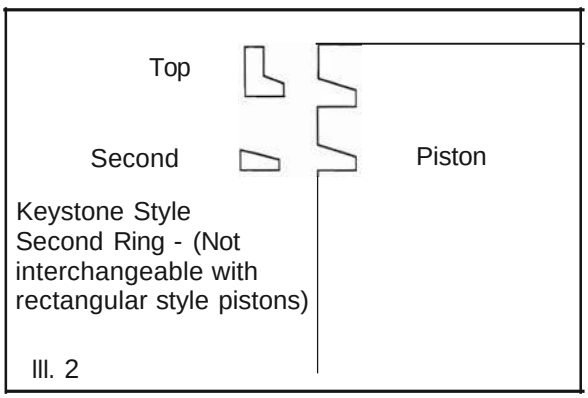


19 . Install one C-clip in piston with gap facing up or down. Be sure clip is fully seated in groove.

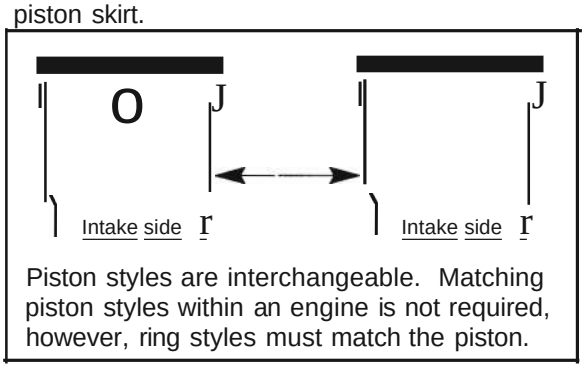


20 . Lubricate and install piston rings on piston as shown in illustration at right. Letter marked on end of ring faces upward. Profile of second ring may be rectangular (Ill. 1) or keystone type (Ill. 2). If piston and/or rings are replaced be sure to install rings with a profile that matches the piston. Refer to appropriate parts manual.

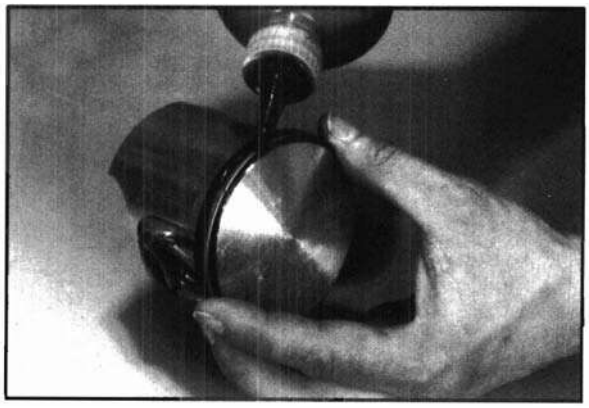




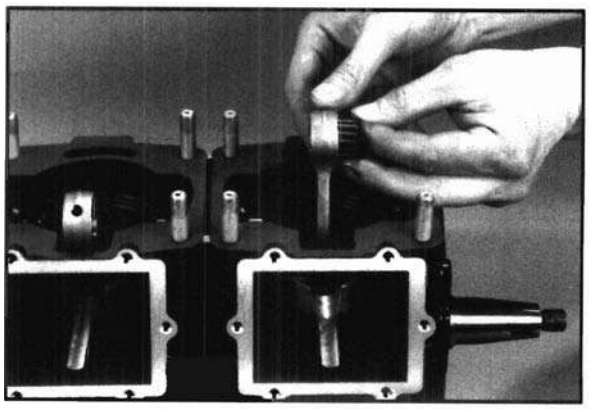
21 . Lubricate piston rings, pin bore, cylinder bore, and piston skirt.



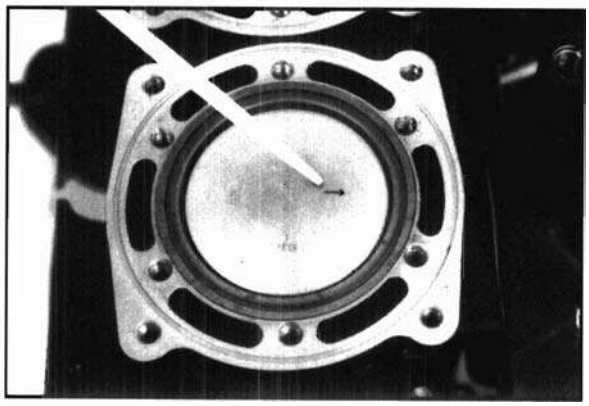
Piston styles are interchangeable. Matching piston styles within an engine is not required, however, ring styles must match the piston.



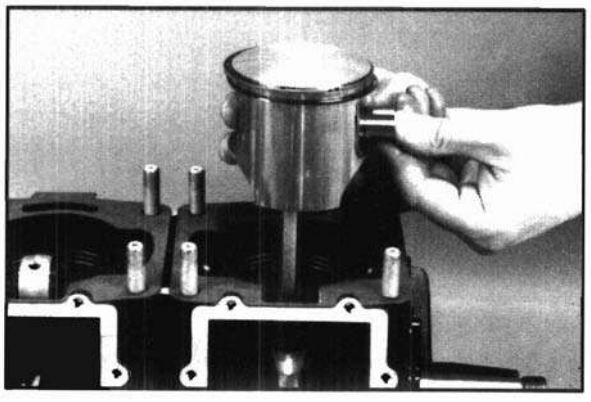
22 . Lubricate and install new connecting rod small end bearing in rod.



23 . Install piston with arrow facing exhaust (ring locating pins should be facing intake).



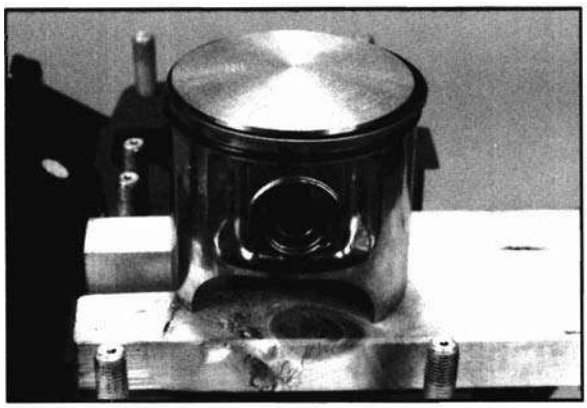
24 . Install remaining C-clip with gap up or down. Be sure both clips are fully seated on the groove.

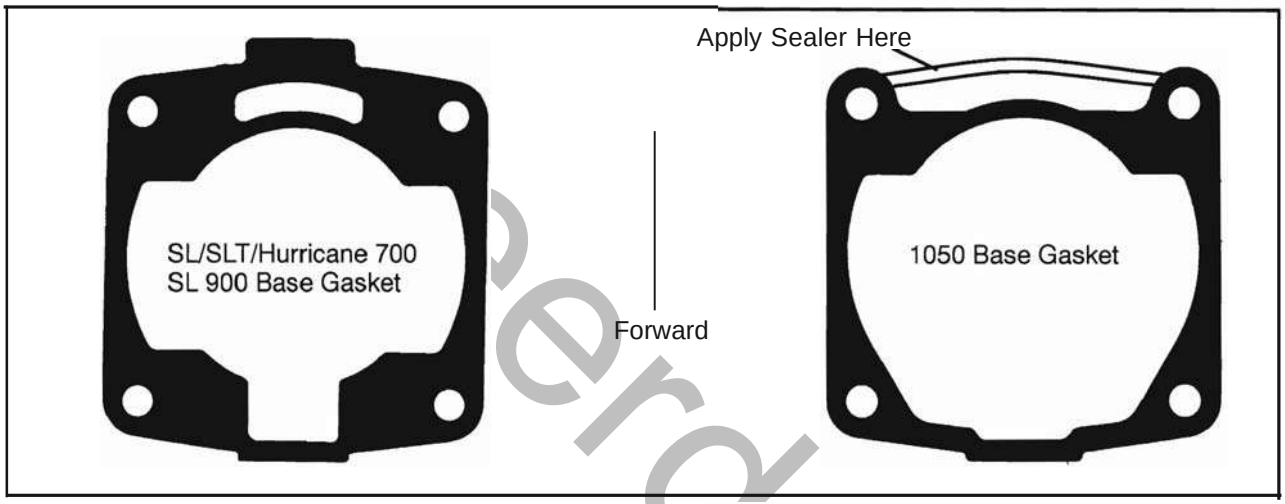


Cylinder Installation

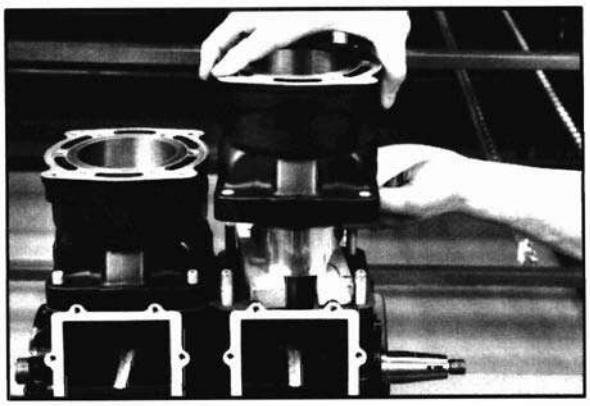
25 . Place piston support block under piston skirt.

NOTE: Refer to page 4.100-4.101 for cylinder boring/ honing and port chamfer information.





26 . Align ring end gaps with locating pins and compress rings. Install cylinder carefully with a gentle front to rear rocking motion. Install cylinder base nuts loosely. Do not tighten them at this time. Repeat Steps 18-26 for other cylinder(s).

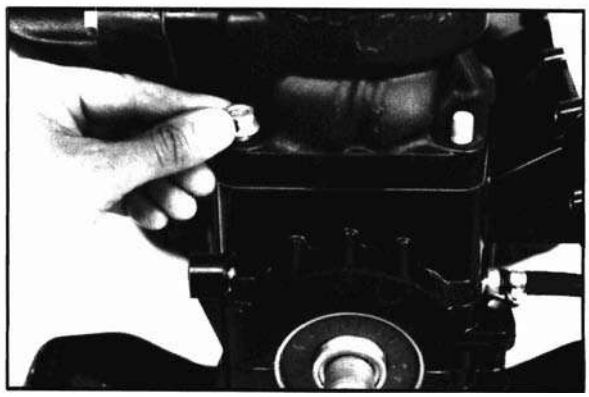


CAUTION:

Do not twist or force cylinder during installation.

IMPORTANT: To prevent possible water leaks at exhaust manifold, the cylinders must be aligned before the base nuts are tightened.

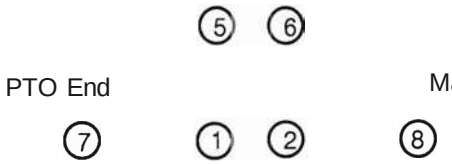
27 . Temporarily install exhaust manifold to cylinders without gasket and tighten bolts lightly. This will ensure proper alignment of cylinders to manifold.



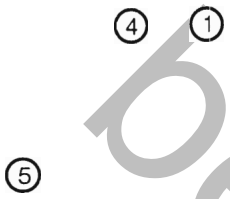
28 . Torque cylinder base nuts to specification following the torque pattern shown.

NOTE: After torquing base nuts, 1 to 3 threads of the stud must be visible above the top of the nut.

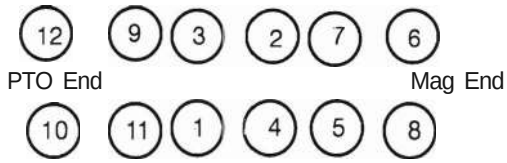
Cylinder Base Nut Torque -
35-40 ft. lbs. (4.83-5.52 kgm)



Cylinder Base Nut Torque Pattern
(Twin Cylinder Engines)



Exhaust Manifold Torque Pattern (Twin)



Cylinder Base Nut Torque Pattern
(Three Cylinder Engines)

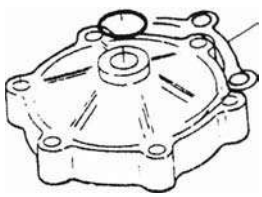
29 . Remove exhaust manifold. Install gaskets, making sure surfaces are clean and free from burrs. Torque evenly in three steps, as shown, to specification.

Exhaust Manifold Torque -
22 ft. lbs. (3.03 kgm)

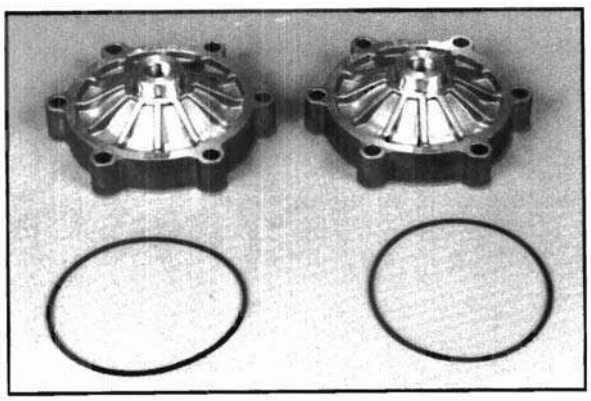
Exhaust Manifold Torque Pattern
(Three Cylinder)

30 . Be sure O-ring grooves in cylinders are clean. Inspect surfaces of cylinder and cylinder head for nicks or scratches.

31 . Lightly grease new cylinder head O-rings and install in groove. Be sure O-ring is properly positioned and groove is clean and free from debris.



Install Support Ring
(Where Applicable)

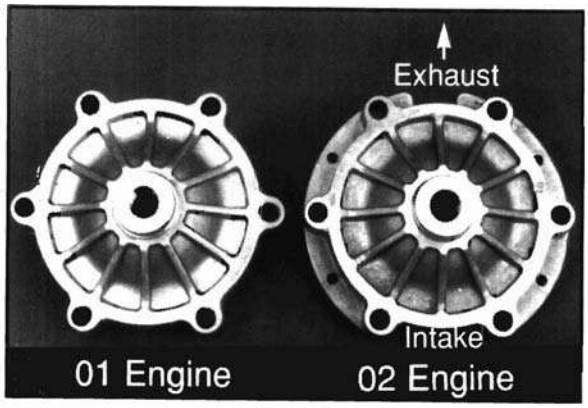


32 . Install cylinder heads carefully along with support rings (where applicable). Torque bolts evenly in three steps to specification.

NOTES: The WC70DCSP-01 engine cylinder head is symmetrical and can be installed in any direction. On all subsequent 700, 900 and 1050cc engines, cylinder heads must be positioned correctly with the wide opening toward the intake and the small opening (marked "ex") toward the exhaust.

Cylinder Head Torque -

20 ft. lbs. (2.76 kgm)

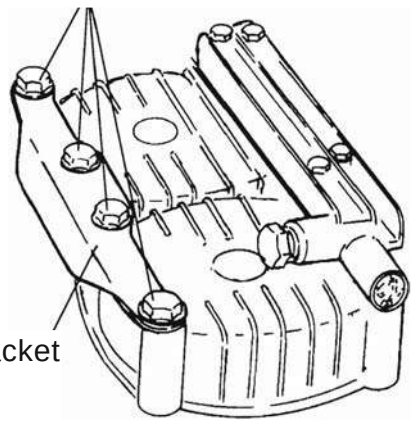


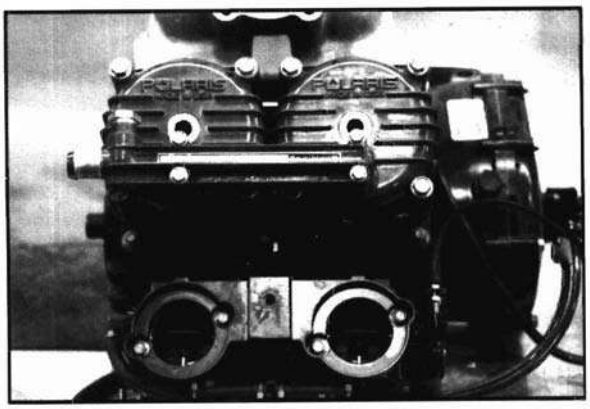
33 . Lightly grease new inner and outer cover O-rings and place in grooves. Be sure O-rings are properly positioned and grooves in cover are clean and free from debris.

34 . Install covers with water manifold outlets on intake side (WC70DCSP-01), or exhaust side on all subsequent 700,900, and 1050cc engines. Do not tighten the bolts at this time.

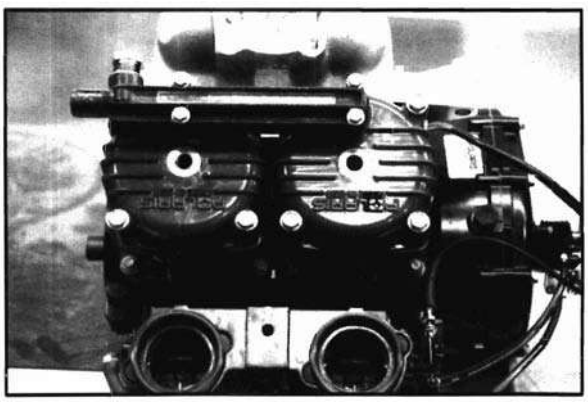
35 . Temporarily install water outlet manifold and bolts to ensure proper alignment of covers. Install cylinder head bracket on twin cylinder models (where applicable).

Torque Bolts To 22 tUbs. (3.04 kg-m)





Water Outlet Manifold Orientation
WC70DCSP-01 Engine



Water Outlet Manifold Orientation - All engines *except* WC70DCSP-01

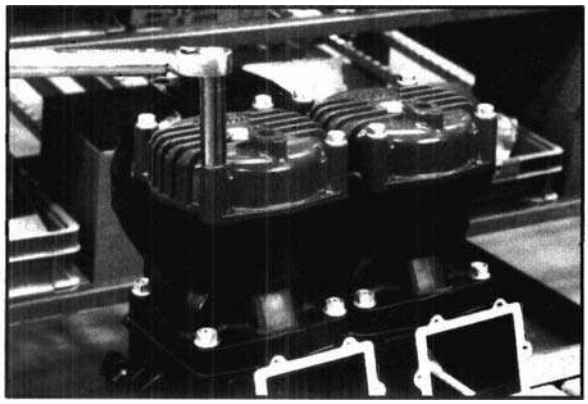
36 . Tighten all cover bolts lightly.

37 . Remove water outlet manifold.

38 . Torque cover bolts evenly in three steps to specification.

Cylinder Head Cover Bolt Torque -

22 ft. lbs. (3.03 kgm)

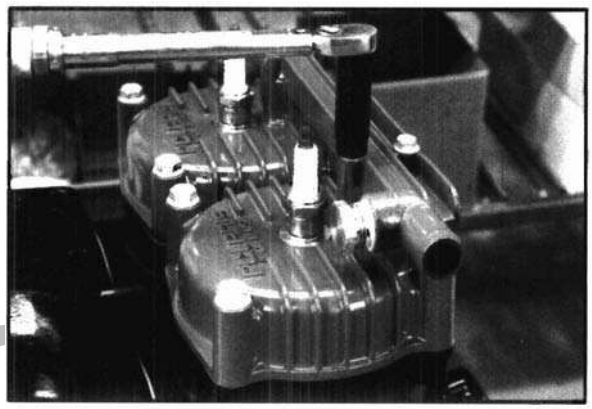


39 . Install water outlet manifold with new gaskets and torque bolts evenly in a criss-cross pattern to specification.

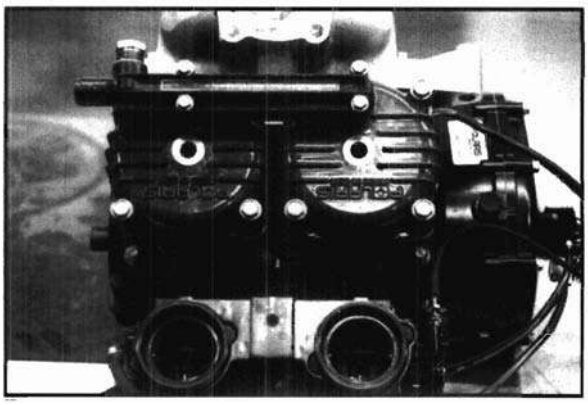
NOTE: If flush plug was removed, apply Loctite pipe sealant to threads and torque to 18 ft. lbs. (2.49 kg-m).

Water Outlet Manifold Bolt Torque -

108 in. lbs. (1.24 kgm)



WC70DCSP-01 Engine

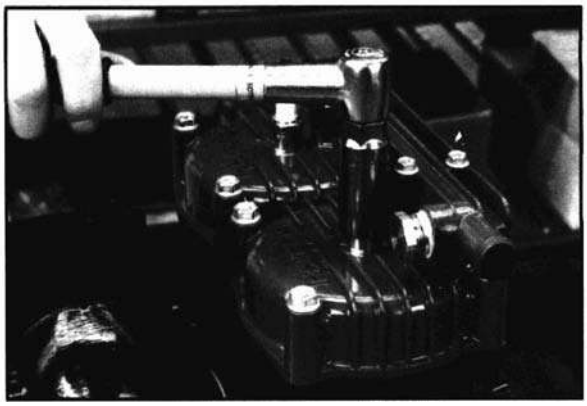


All *engines* except WC70DCSP-01

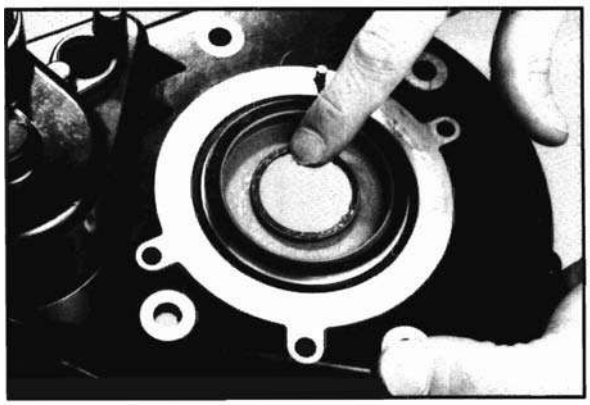
40 . Apply anti-seize to threads of spark plugs, install and torque to specification.

Spark Plug Torque -

18 ft. lbs (2.49 kg-m)



41 . Press a new seal into starter housing from inside to outside until outer seal flange bottoms on cover. The seal lip and spring face inward (toward crankshaft).



42 . Apply grease to lip of seal and a light film on crankshaft.

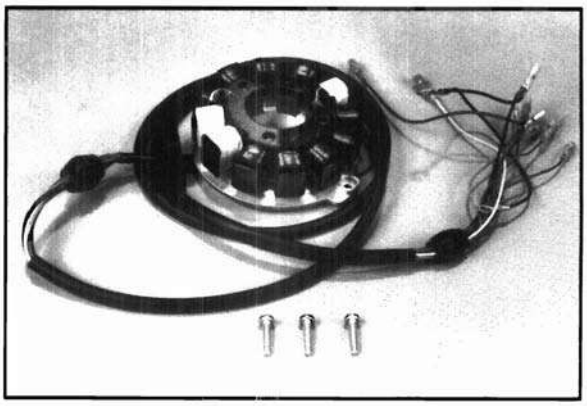
43 . Before installing cover, apply a thin film of 3 Bond 1215 to sealing surface and remove any hardened sealer from crankcase parting line.

44 . Install starter housing carefully and torque bolts to specification.

Starter Housing Bolt Torque-

22 ft. lbs. (3.04 kgm)

45 . Clean stator mounting surface. Feed stator wiring harness through hole and lubricate grommet. Apply Loctite™ 242 to stator mounting screws and torque.



Stator Mounting Screw Torque-

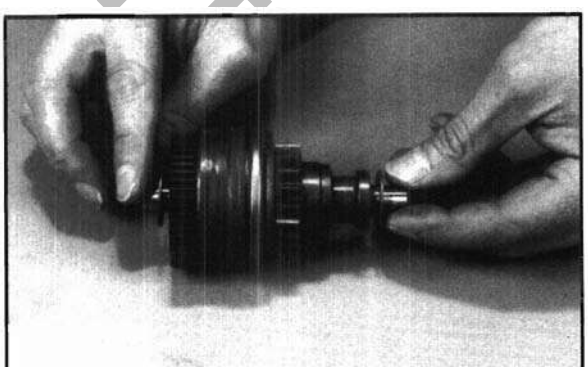
50 in. lbs. (.57 kgm) (Loctite™ 242)

46 . Push grommet into place in starter housing. Install grommet clamp and torque bolts. Be sure wire harness is positioned properly to clear the flywheel ring gear.

Grommet Clamp Bolt Torque-

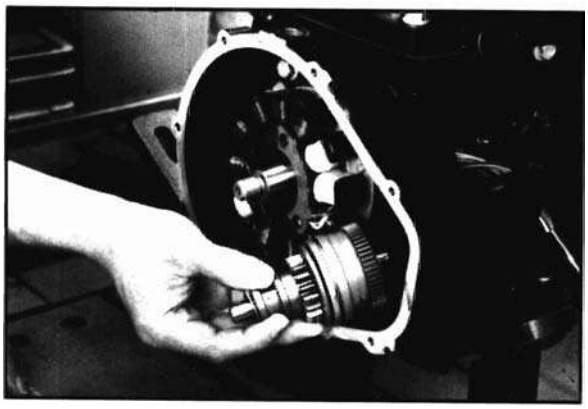
108 in. lbs. (1.24 kgm)

47 . Install washers on ends of starter drive.

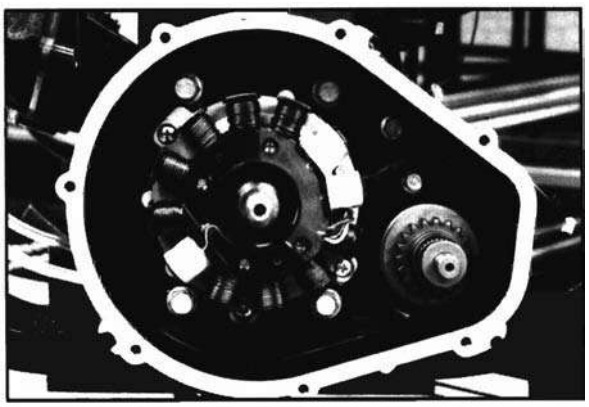


48 . Lightly grease ends of drive and install in starter housing.

Polaris Premium Starter Grease
PN 2871460 (2 oz. tube)



49 . Install flywheel key in crankshaft. Apply a small amount of Loctite ™ 262 (red) to taper and 242 (blue) to threads of the crankshaft.



50. Install flywheel, washer and nut. Torque to specification.

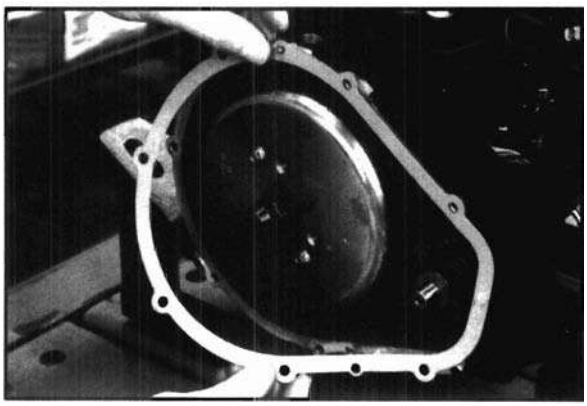
NOTE: Always check the condition and tightness of the two timing screws on the flywheel.

Flywheel Nut Torque-
90 ft. lbs. (12.44kgm)

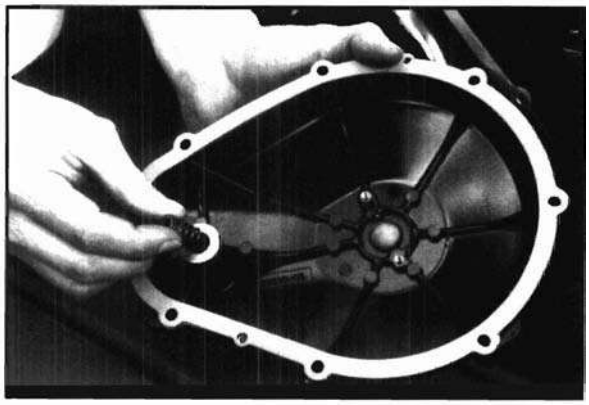
Flywheel Holder Tool **PN 8700229**

51 . Check for proper clearance between stator wires, harness, and flywheel ring gear.

52 . Place new cover gasket on starter housing.



53 . Grease and install spring and plastic bushing into flywheel cover.



54 . Install a new gasket on cover and tighten bolts in a criss-cross pattern.

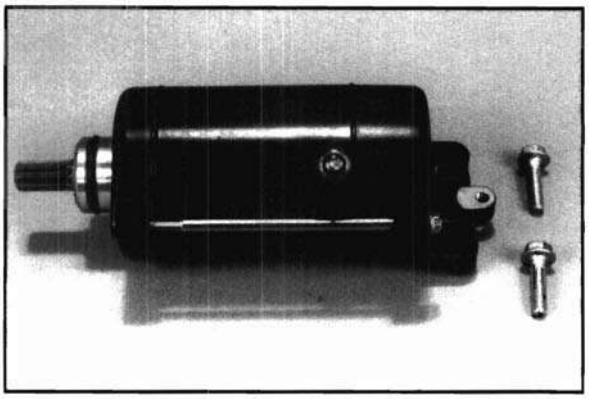
Flywheel Cover Bolt Torque-

108 In. lbs. (1.24 kgm)

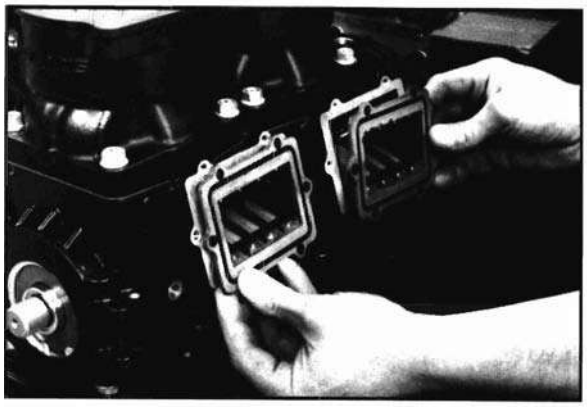
55 . Grease O-ring and install starter motor. Torque mounting bolts to specification.

Starter Motor Mounting Bolt Torque-

108 In. lbs. (1.24 kgm)

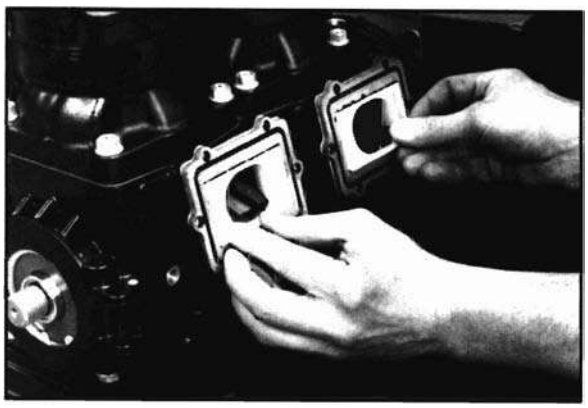


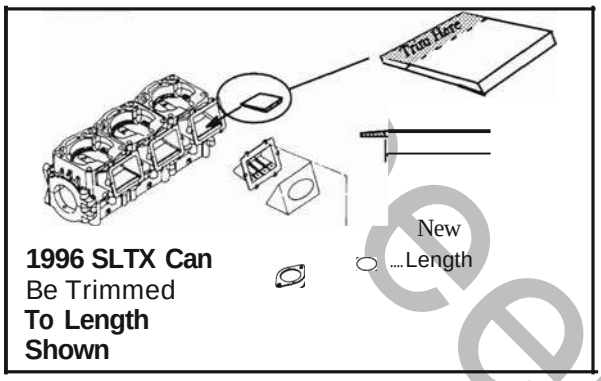
56 . Install reed valves in crankcase. Be sure surface of crankcase is clean.



57 . Install reed stutters.

NOTE: Some models have an additional reed stutter positioned on the bottom of intake tract as shown.





1996 SLTX Can Be Trimmed To Length Shown

58 . Install intake manifold and tighten bolts evenly in three steps to specification following torque pattern found on page 4.8-4.10.

Intake Manifold Bolt Torque-

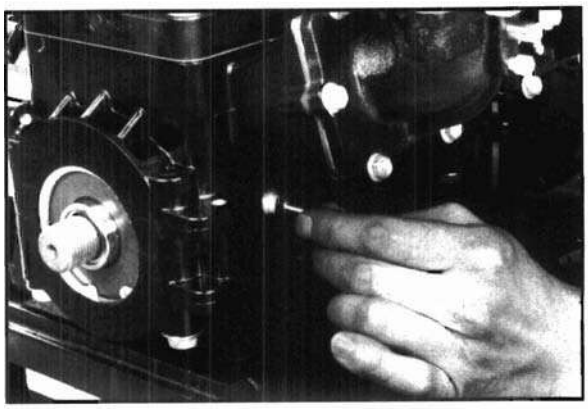
108 in. lbs. (1.24 kgm)

59 . Install new carburetor flange gaskets on manifold. Install carburetors, gaskets, and air intake mounting plate. Wire choke plate closed, or cover opening in manifold to prevent debris from entering. Torque carburetor to specification.

Carburetor Mounting Torque-

108 in. lbs. (1.24 kgm)

60 .If impulse fitting was removed, apply pipe sealant and reinstall. Torque to specification. If crankcase drain plugs were removed, re-install with new sealing washers and torque to specifications.



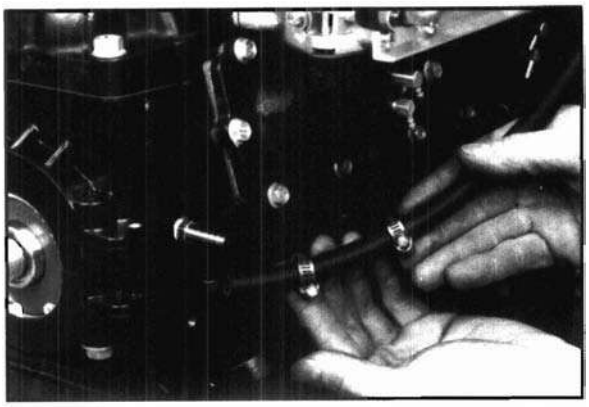
Impulse Fitting Torque-

18 ft. lbs. (2.48 kg-m)

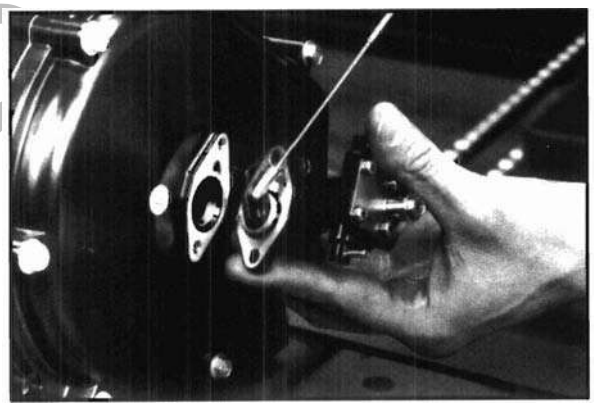
Crankcase Drain Plug Torque-

10 ft. lbs. (1.38 kg-m)

61 .Attach impulse line to fitting and fuel pump. Tighten clamps securely.



62 .Lubricate and install a new O-ring on oil pump. Line up drive spade on pump with slot in flywheel nut and install. Apply Loctite™ 242 (blue) to the bolts and torque evenly to specifications.



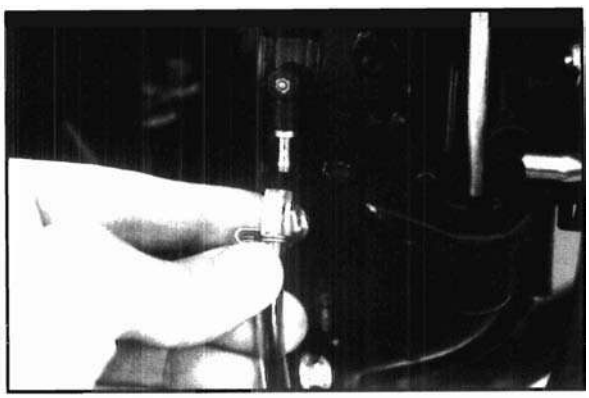
Oil Pump Bolt Torque-

60 in. lbs. (.69 kg-m)

63 .Install oil pump cable and connect oil lines to oil pump and carburetors. Adjust as outlined on page 2.18.

64 .Apply a light film of grease to crankshaft threads and install drive coupler. Tighten hand tight.

65 .Thoroughly grease splines inside coupler and replace sealing O-ring.



Engine Installation

Engine installation is done in reverse order of the removal instructions. A few important tips are listed below to ensure long and trouble free service.

⚠ WARNING

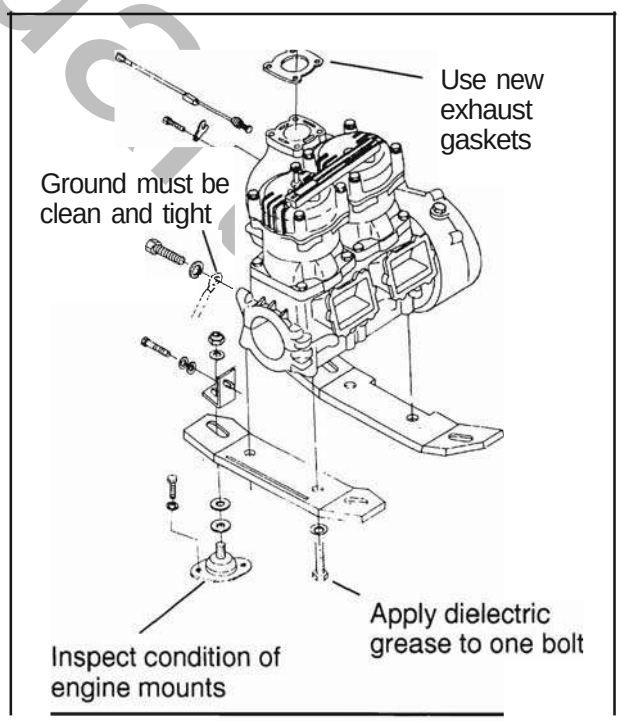
Do not install the battery ground (-) cable until all other fuel and electrical connections are done. Electrolyte or fuel vapors may be present in the engine compartment and a spark could ignite them, resulting in personal injury.

NOTE: Observe the following precautions:

- When installing the engine mounts to engine crankcase, use Polaris Anti-Corrosive Dielectric Grease on one of the four bolts. See page 4.88.
- Engine rubber mounts are stressed during removal of mounting nuts. Be sure to inspect the mounts carefully and replace if damaged.
- Always clean residual Loctite™ out of threads before reinstallation or applying new Loctite™ .
- Always use new gaskets on the exhaust system and electrical box.
- Remember to inspect for damage on any wiring, hoses, or lines before and after reinstalling the engine.
- Make sure all cables, hoses, and wiring are routed and secured properly.
- Adjust throttle cable and check throttle operation. It must operate freely and return completely when released.
- Verify proper operation of engine stop switCh.
- After engine installation, pump alignment must be inspected. Refer to the Final Drive section for inspection and alignment procedures.
- Synchronize carburetors and be sure they are clean.
- Adjust oil pump cable and bleed pump.
- The first tank of fuel should be pre-mixed with Polaris Premium 2 oil at a 50:1 ratio.

CAUTION:

Shims used for engine and driveshaft alignment must be reinstalled in their original locations. Do not allow them to be mixed up. Always verify proper engine to pump alignment after engine installation as outlined in the Jet Pump, Final Drive, Bilge section. In most cases, the number of shims used in production is marked in permanent marker next to each engine mount. The same number should be installed as a starting point, and in most cases adjustment will not be necessary. Always verify proper engine alignment before installing pump.



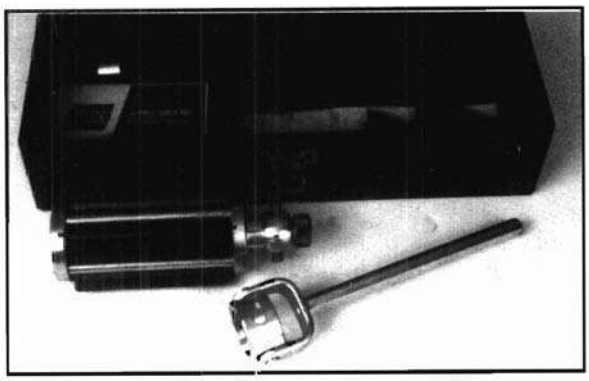
Cylinder Honing

The cylinder bore must be de-glazed whenever new piston rings are installed. A light honing with fine stones removes only a very small amount of material. A proper crosshatch pattern is important to provide a surface that will hold oil, and allow rings to seat properly. If the crosshatch is too steep, oil retention will be reduced. A cross-hatch angle which is too shallow will cause ring vibration, poor sealing, and overheating of the rings due to blow-by and reduced contact with the cylinder wall. Service life of the pistons and rings will be greatly reduced.

Cylinder Hone Selection

Selecting a hone which will straighten as well as remove material from the cylinder is very important. Honing a cylinder with a spring loaded glaze breaker is never advised. Polaris recommends using a rigid type hone which also has the capability of oversizing. These hones are manufactured by such companies as Sunnen Products Company of St. Louis, Missouri; and Ammco Tools, Inc., of North Chicago, Illinois.

Shown at right is the Ammco No. 3950 hone. This hone has roughing and finishing stone sets available to service engines with cylinder bores up to 75mm in diameter.



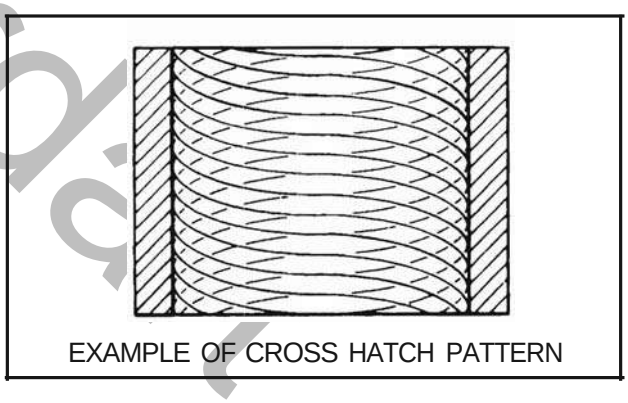
De-glazing

If cylinder wear or damage is minimal, hone the cylinder lightly with finish stones following the procedure outlined on page 4.101.

Honing To Oversize

If cylinder wear or damage is excessive, it will be necessary to oversize the cylinder using a new oversize piston and rings. This may be accomplished by either boring the cylinder and then finish honing to the final bore size, or by rough honing followed by finish honing.

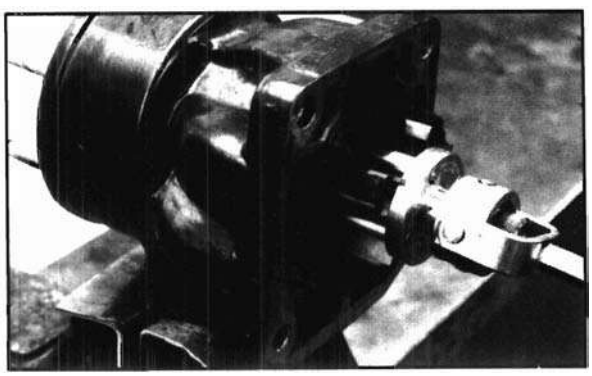
For oversize honing always wet hone using honing oil and a coarse roughing stone. Measure the piston (see piston measurement) and rough hone to the size of the piston or slightly larger. Always leave .002 - *.003/1 (.05* - .07 mm) for finish honing. Complete the sizing with fine grit stones to provide the proper cross-hatch finish and required piston clearance.



EXAMPLE OF CROSS HATCH PATTERN

Honing Procedure

1. Wash cylinder with solvent. Clamp cylinder in a soft jawed vise by screwing bolts into exhaust bolt holes.



Honing Procedure, Cont.

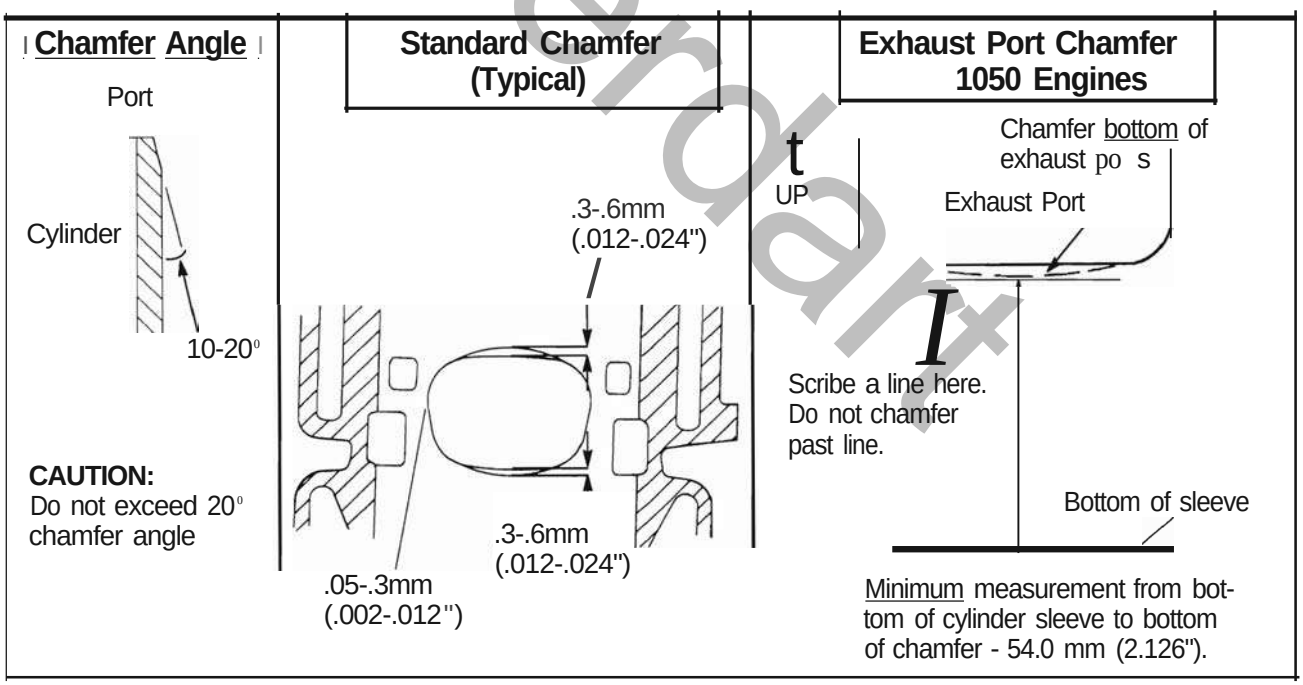
2. Place hone in cylinder and tighten stone adjusting knob until stone contacts the cylinder walls (DO NOT OVERTIGHTEN). Cylinders may be wet or dry honed depending on the hone manufacturer's recommendations. Wet honing removes more material faster and leaves a more distinct pattern in the bore. Using a 1/2" (13 mm) drill motor rotating at a speed of 300-500 RPM, run the hone in and out of the cylinder rapidly until cutting tension decreases. Remember to keep the hone drive shaft centered to prevent edge loading and always bring the stone approximately 1/2" (1.3 em) beyond the bore at the end of each stroke. Release the hone at regular intervals to inspect bore size and finish.

Port Chamfering

After honing the cylinders, chamfer all ports to remove sharp edges. To chamfer the ports, use a small hand grinder with a 1/2" - 1" (12-25mm) diameter cylindrical grinding stone or sanding roll, a half round file, or a 3 sided de-burring knife. Hold the cylinder securely by installing bolts in the exhaust mounting holes and clamping in a soft jaw vise. The corners, top and bottom edges of ports should receive a standard chamfer (.3 -.6mm) with the widest portion at the center of the port window. The sides of the ports require only de-burring (.05 - .3mm). Refer to illustration below.

Exhaust Port Chamfering· 1050cc Engines

A special chamfer **must** be applied to the bottom edge of the exhaust ports on 10S0cc engines (see illustration below). Apply layout fluid or Dykem to the area around the bottom edge of the exhaust port. Using a dial caliper, measure 54mm (2.126") from the bottom of the cylinder sleeve, in line with the center of the exhaust port. Scribe a line parallel with the bottom of the exhaust port. Holding the hand grinder, file, or knife at a 15-20° angle to the cylinder bore, relieve the bottom edge of the port as shown in the illustration below. **CAUTION:** To achieve the required 15-20° chamfer angle the tool must be held almost parallel to the cylinder bore (see Ill. 2). The chamfer should be at the specified width in the center of the port and taper evenly toward the outer edges. If a hand grinder is used, start chamfering the center area first, then, as the center approaches the scribed line, start moving the tool back and forth to obtain the tapered contour of the chamfer.



IMPORTANT: Cleaning the Cylinder After Honing

Scrub the cylinders thoroughly in hot, soapy water. Pay close attention to the area where the cylinder sleeve meets the aluminum casting and use electrical contact cleaner if necessary to remove all traces of debris. Rinse the cylinders in clear water and dry thoroughly with compressed air. Immediately apply Polaris Premium 2 Cycle Lubricant or 2-stroke engine oil to all areas of the cylinder sleeve to prevent rust. Wipe cylinders with an oil coated shop towel to clean all remaining honing material from the cross hatch of the cylinder bore, and re-oil.

Oil Pump Bleeding

The oil pump must be bled following any repair service to the injection system which might allow loss of oil and subsequent trapped air upon reassembly.

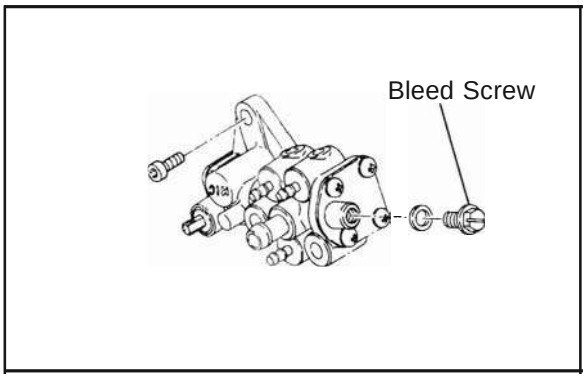
IMPORTANT: Always pre-mix the first tank of fuel used after oil pump or engine service to ensure proper lubrication of the engine.

1. Fill oil reservoir with Polaris injector oil.
2. Loosen hex head screw at top of oil pump. (B)
3. After a short period of time oil should begin to flow from beneath the screw head. Be sure that a steady flow of oil is evident to remove all air before tightening the screw.
4. Tighten screw.

CAUTION:

Do not over tighten. The screw is hollow.

5. Any time the engine is disassembled or repaired it is important that each oil supply line (A) from the pump to the engine be checked for signs of wear or air bubbles. If air bubbles greater than 1/2" (1.3 cm) in length are present, fill oil supply lines with oil using a small oil squirt can.

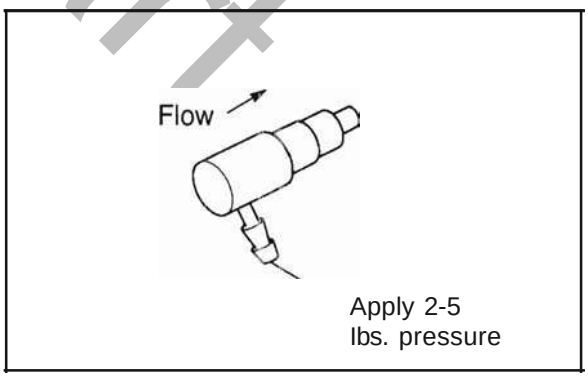


Troubleshooting

NOTE: See Maintenance section for adjustment/inspection information.

1. Remove lines from their fittings at the engine and pump. Blow through them to ensure they are not plugged or restricted.
2. Apply some pressure to the check valve fittings with the Mity Vac™ or similar tool. These valves should open with 2-5 lbs. of pressure.
3. Be sure oil feed lines fit tightly, are not cracked or leaking.
4. Be sure the in-line filter between oil pump and oil tank is clean and bleeding is complete.
5. If oil still won't flow, replace the oil pump.

NOTE: 1995 and later models are equipped with a variable oil pump controlled by a link rod between the carburetors and the pump arm. This is a non-adjustable rod. It is necessary to inspect the rod and linkage for correct installation and smooth operation before running the engine. Pre-1995 models are not adjustable.

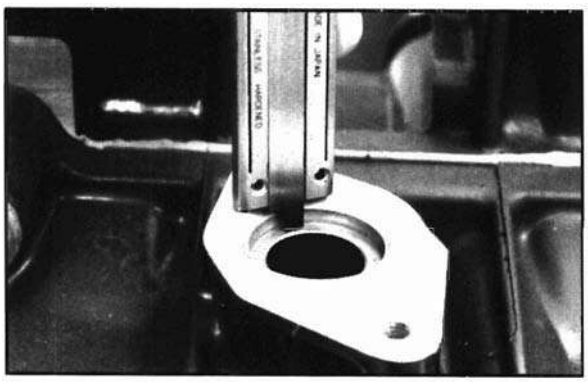


Oil Pump Bushing End Play Adjustment

If the oil pump, crankcase, or any other pump drive component is replaced, inspect the drive gear bushing end play using the following procedure:

1. Measure distance from oil pump mounting surface to bushing. Call this measurement "A".

NOTE: Make sure the bushing is fUlly seated in the crankcase.



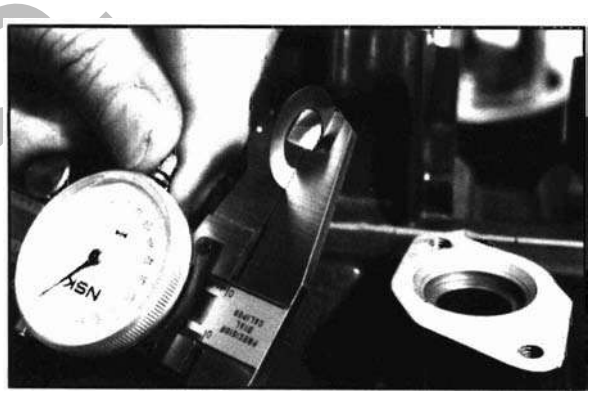
Oil Pump Bushing End Play
.012 - .024" (.3 - .6 mm)

2. Measure distance from oil pump mounting flange surface to end of seal flange as shown. Call this measurement "B".

3. Subtract measurement "B" from "A" to determine total bushing end play.

4. Measure thickness of existing shims and subtract from total bushing end play determined in step 3.

5. Add or subtract shims as required to provide specified end play.



6. Lightly grease a new O-ring and install it on the pump. Install pump, engaging slot in shaft with drive gear. Apply Loctite™ 242 to bolts and torque evenly to 78 in. lbs. (.9 kg-m).

Oil Pump Mounting Bolt Torque (242 Blue)
78 in. lbs (.9 kg-m)

Cooling System Flow Chart

1992 SL650 (After Reverse Flow Cooling Kit)

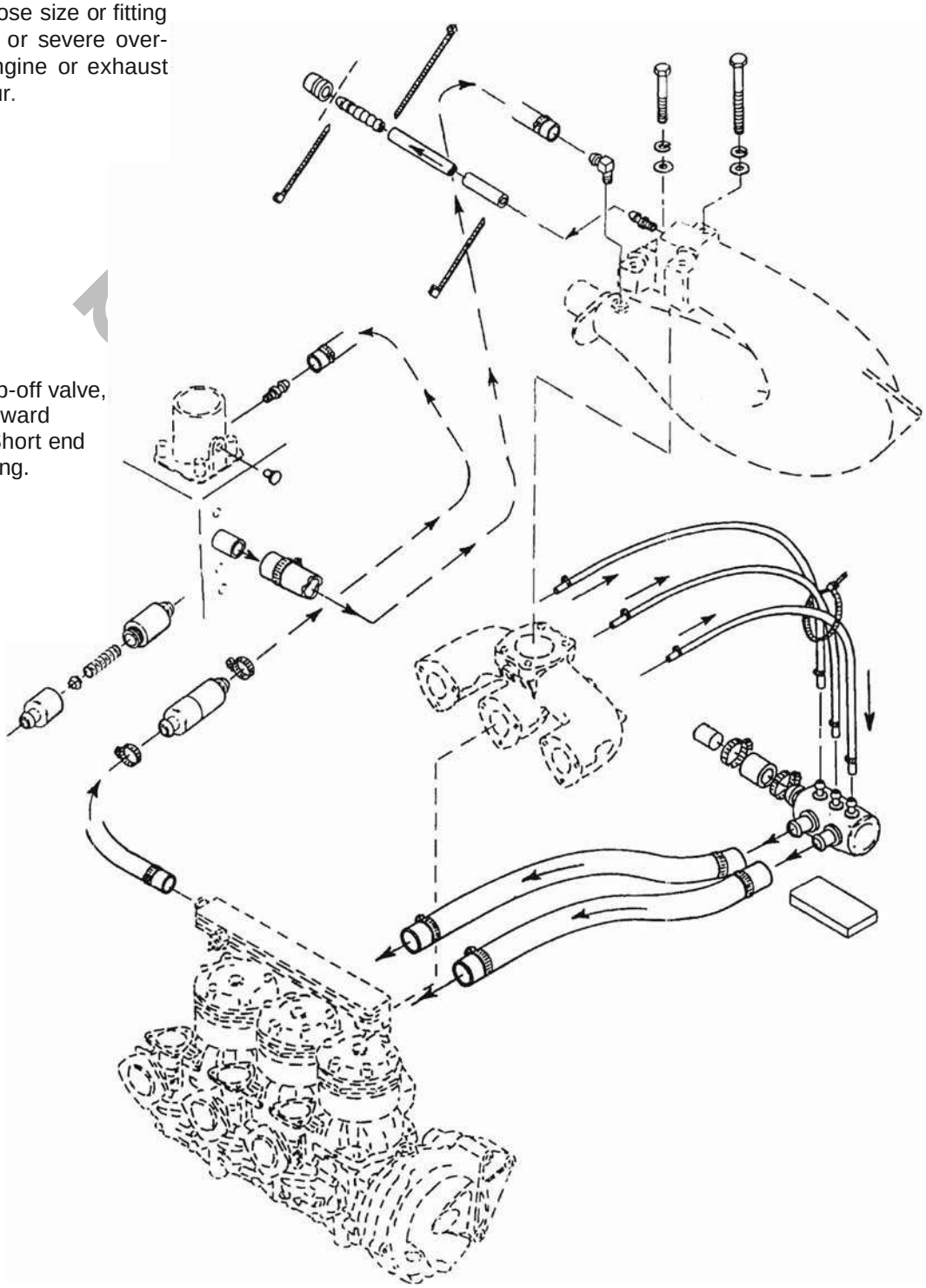
Operation

Cooling water is supplied to the engine and exhaust system from the jet pump via a water manifold separator. Water is split at this manifold and is directed to the crankcase and exhaust manifold. The system is balanced by careful use of fitting and passage diameters and hose sizes.

CAUTION:

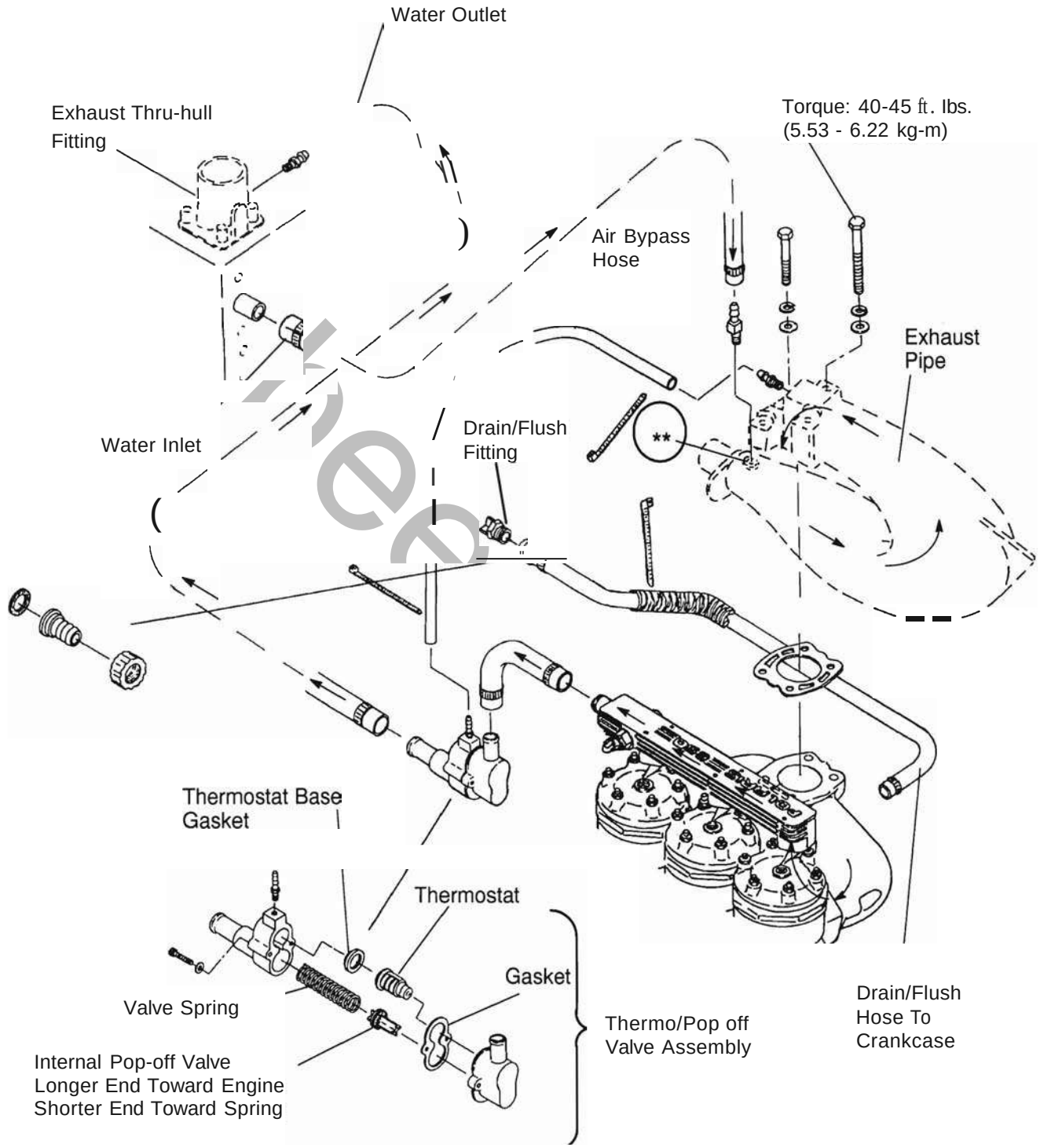
No deviation in hose size or fitting size is allowable or severe overheating in the engine or exhaust system may occur.

Internal pop-off valve, long end toward housing. Short end toward spring.



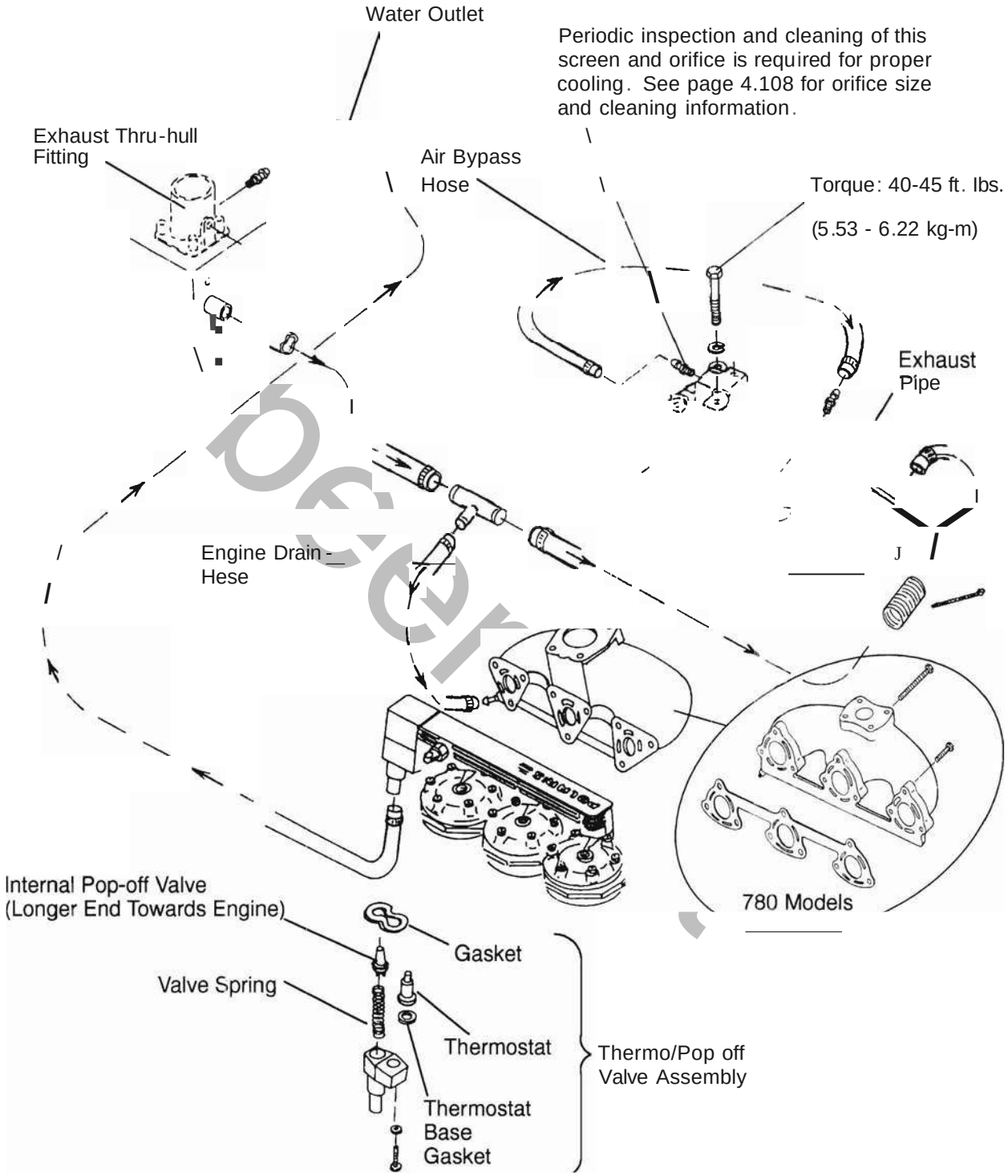
Cooling System Flow Chart

1993 SL650 and SL 750
(1992 with Kit PN 2200475 Similar)



Periodic cleaning and inspection is required to maintain proper performance.
the pop off valve releases normally at 3000-3200 RPM. The thermostat rating is *143°* F. The exhaust cooling orifice (indicated by **) must be clear in order to properly cool the exhaust hoses.

1994 - 1995 SI650, SI750, SIT750, SIX780 and all 1996 **to Current 780 models.**

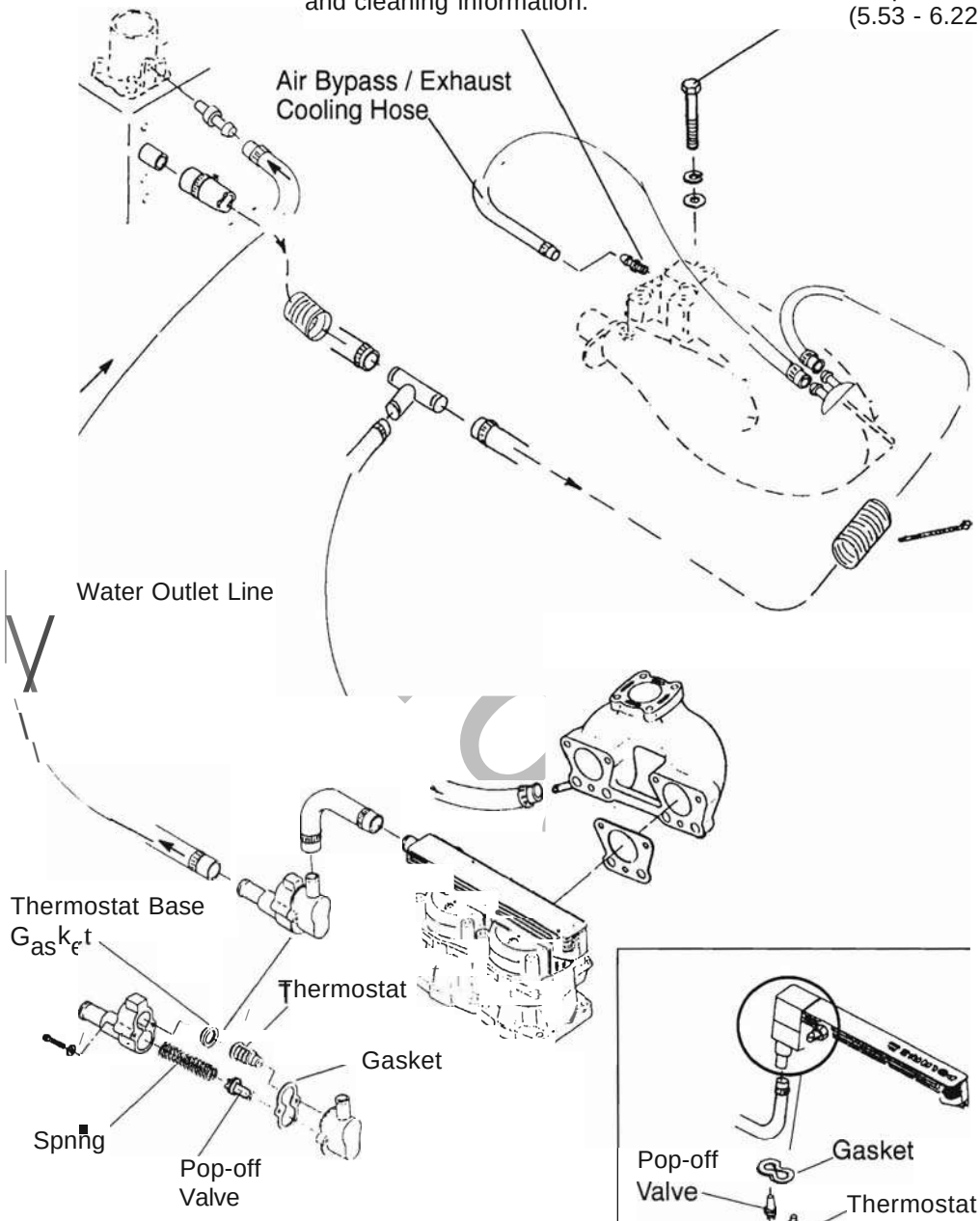


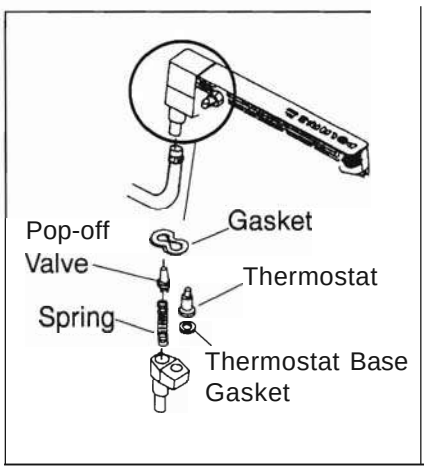
Periodic cleaning and inspection is required to maintain proper performance.
The pop off valve releases normally at 3000-3200 RPM. The thermostat rating is 143° F.

1996 to Current SL700, SL700 Deluxe, SLT700, Hurricane

Periodic inspection and cleaning of this screen and orifice is required for proper cooling. See page 4.109 for orifice size and cleaning information.

Torque: 40-45 ft. lbs. (5.53 - 6.22 kg-m)

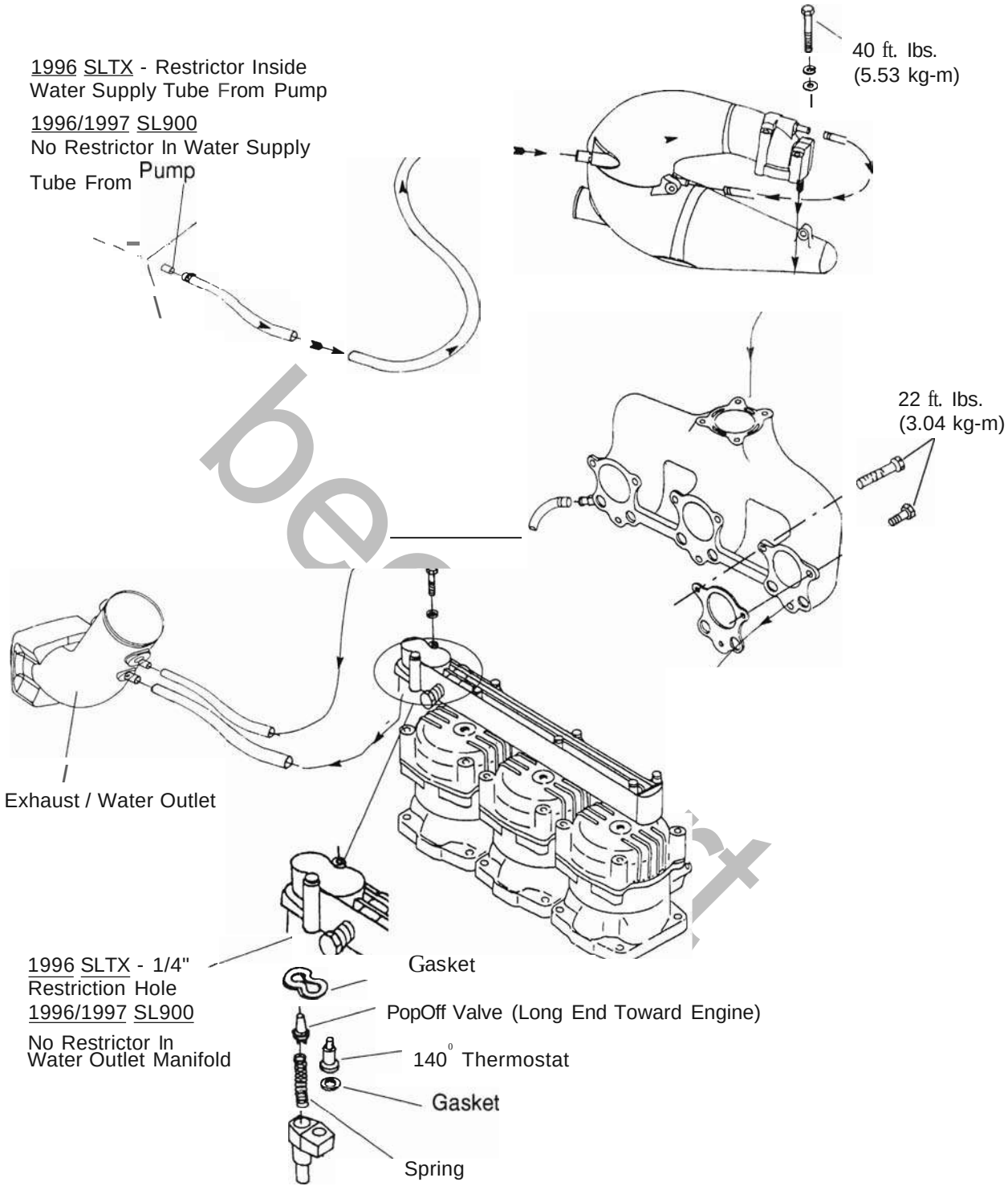




Periodic cleaning and inspection is required to maintain proper performance. The pop off valve releases normally at 3000-3200 RPM. The thermostat rating is 140° F.

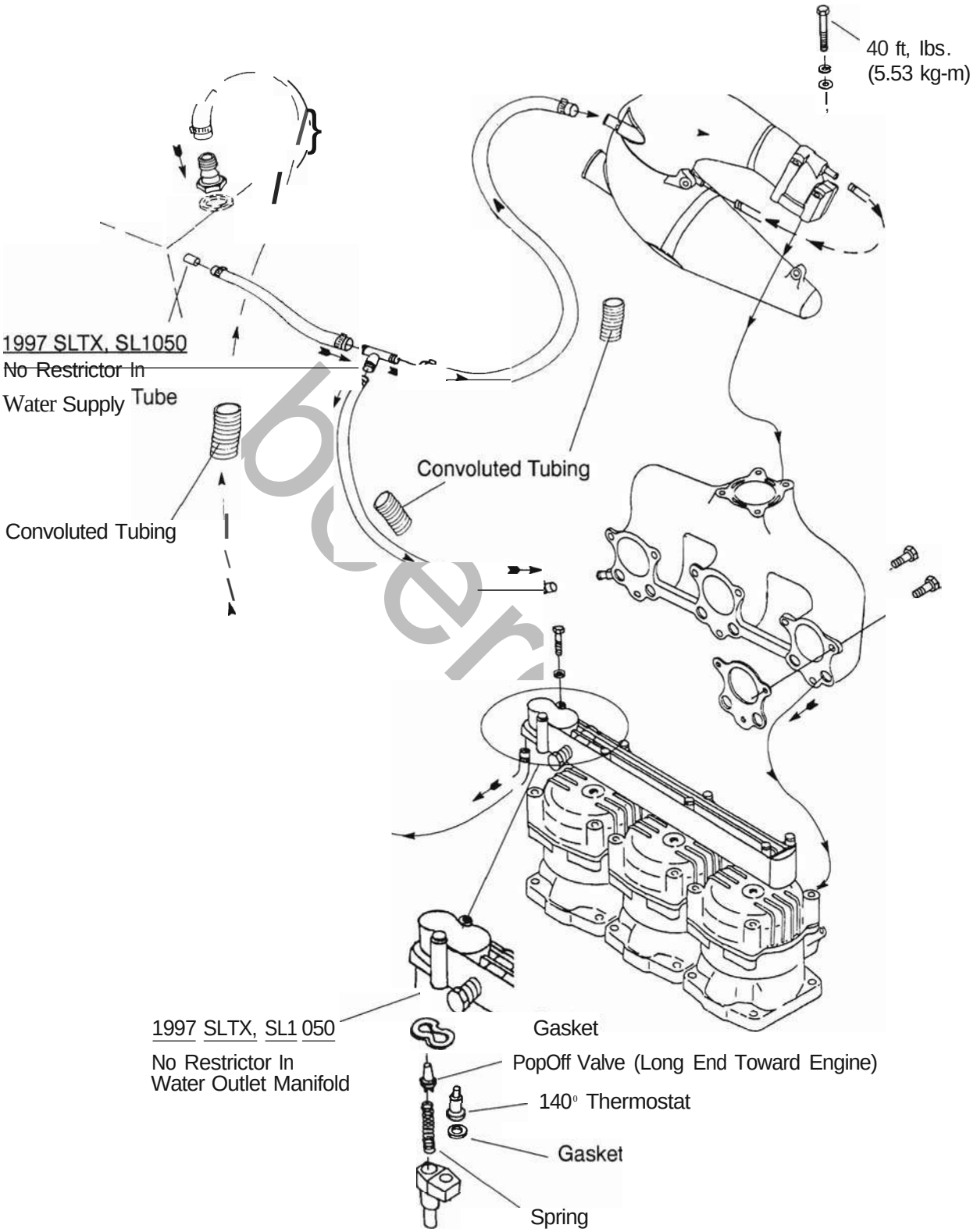
Cooling System Flow Chart

1996 to Current SL900, 1996 SLTX



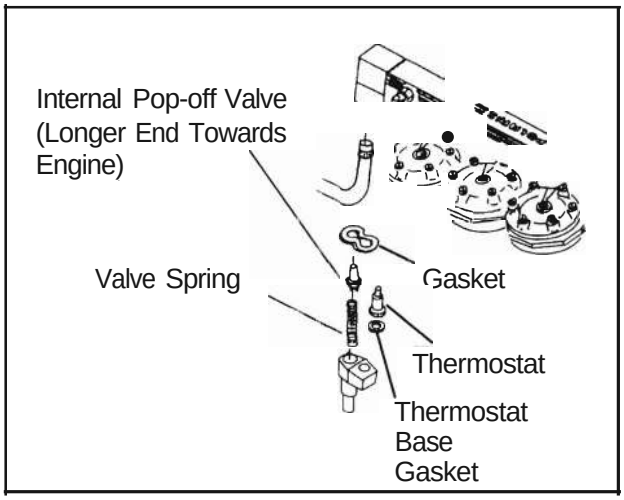
Cooling System Notes:
Periodic cleaning and inspection is required to maintain proper performance.
The pop off valve releases normally at 3000-3200 RPM. Temp switch on at 160° F.

1997 SLTX, 1997 SL1050



Thermostat Pop Off Assembly-All Models

If low end performance of the watercraft begins to deteriorate, and the jet pump intake area is free of debris and weeds; or if the overheat alarm sounds, the thermostat pop off assembly should be checked for debris and cleaned. Also inspect the thermostat pop off assembly if the watercraft has been stored for more than 30 days or has been used in salt water. To do this, use a 3/16" (.5 cm) Allen wrench and a flat screwdriver. See page 2.14 for cleaning information on 1992-1993 models.

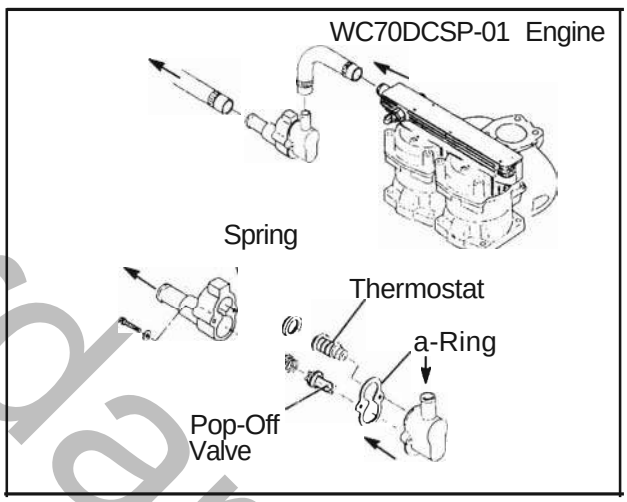


CAUTION:

If the thermostat pop off assembly is reassembled incorrectly severe engine damage will result within a very short period of operation.

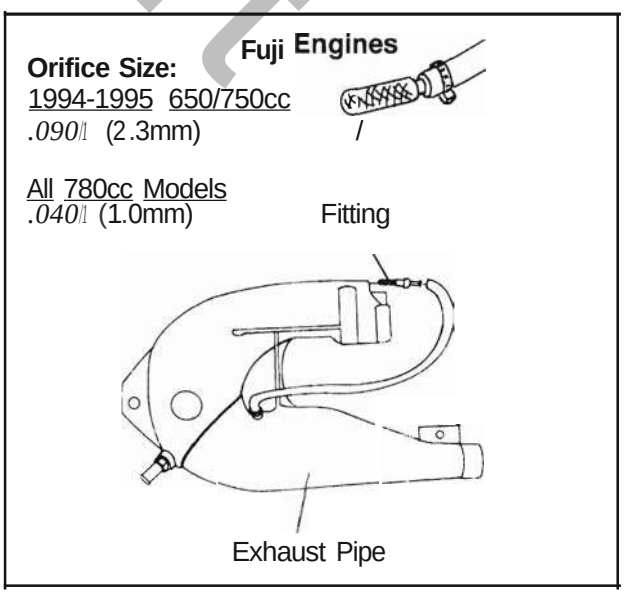
NOTE: Do not perform this maintenance while the watercraft is in the water. The thermostat pop off assembly is under tension from an internal spring. When the screws are removed, the assembly will come apart quickly if not held together firmly.

1. Remove screws while holding thermostat pop off assembly firmly together. Carefully take assembly apart. Be careful not to lose any parts.
2. Check thermostat pop off assembly for debris, such as seaweed, and clean it out.
3. Check condition of rubber elements. Also check thermostat and housing for corrosion. Replace any parts that appear in poor condition.
4. Assemble thermostat pop off assembly in correct sequence. Assemble carefully to ensure proper alignment between all internal parts and be sure the gasket or a-ring is properly positioned. The arrow indicates the direction of water flow (away from engine).
5. Attach thermostat pop off assembly using screws removed in step one and Loctite™ 242 (blue).



Exhaust Coolant Filter - Fuji Engines

The exhaust coolant filter is located on the top of the exhaust pipe. This filter traps debris that would otherwise enter the exhaust hose cooling orifice. This ensures the proper exhaust temperature for cooling and performance. See next page for more information.



Cleaning Procedure

1. Loosen clamp and remove hose from fitting.
2. Using a deep well 9/16" socket or flare nut wrench, remove fitting from exhaust pipe.
3. Inspect fitting for plugging. Flush with water to clean.
4. Reinstall fitting into exhaust pipe. Tighten securely.
5. Reinstall bleed hose and clamp. Tighten securely.

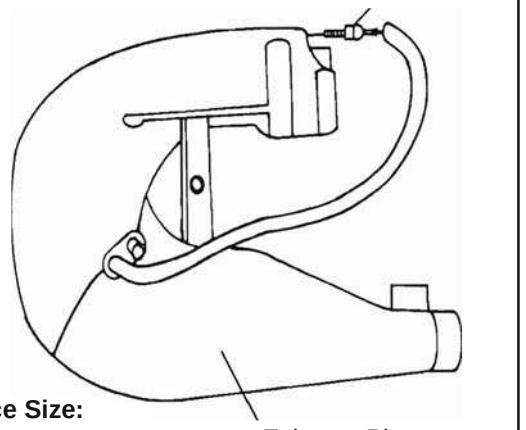
Exhaust Coolant Filter - Polaris Engines

The exhaust coolant filter is located on the top of the exhaust pipe. This filter traps debris that would otherwise enter the exhaust hose cooling orifice. This ensures the proper exhaust temperature for cooling and performance.

Cleaning Procedure

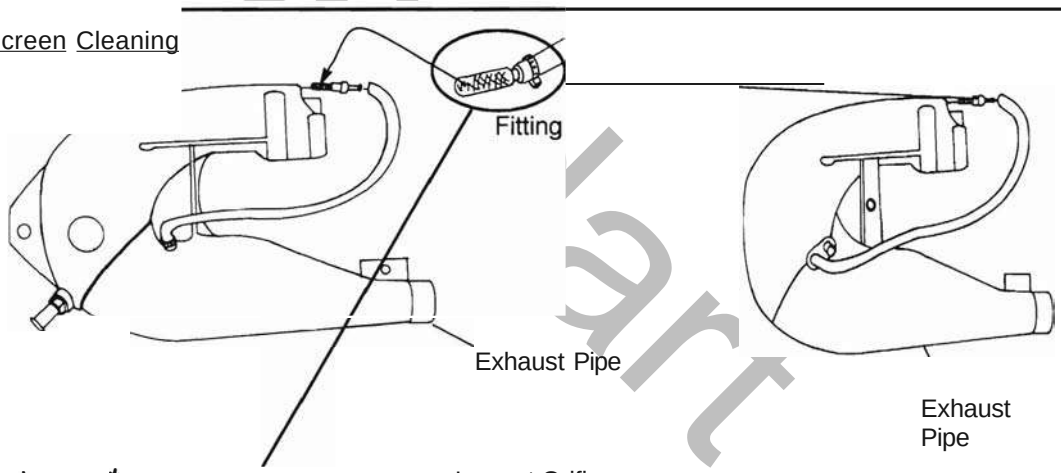
1. Loosen clamp and remove hose from fitting.
2. Using a deep well 9/16" socket or flare nut wrench, remove fitting from exhaust pipe.
3. Inspect fitting for plugging. Flush with water to clean.
4. Reinstall fitting into exhaust pipe. Tighten securely.
5. Reinstall bleed hose and clamp. Tighten securely.

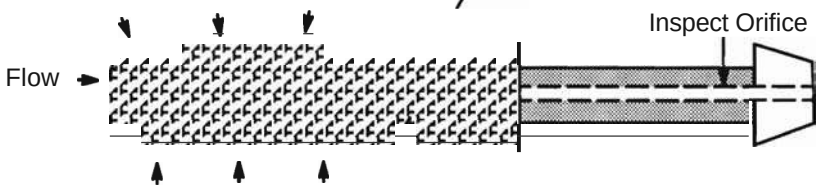
Polaris Engines



Orifice Size:
700s,900,1050cc
.055" (1.4mm)

All Engines - Screen Cleaning





If particles are inside screen, replace fitting

Welding
Tip Cleaner

Crankshaft Indexing

Polaris Watercraft crankshafts are pressed together or "indexed" so the connecting rod journal center lines are 120° apart from each other (180° on twin cylinders).

It is sometimes necessary to check multi-cylinder crankshafts to verify that one cylinder has not been forced out of position relative to the other cylinder or cylinders. Causes for out-of-index crankshafts include but are not not limited to:

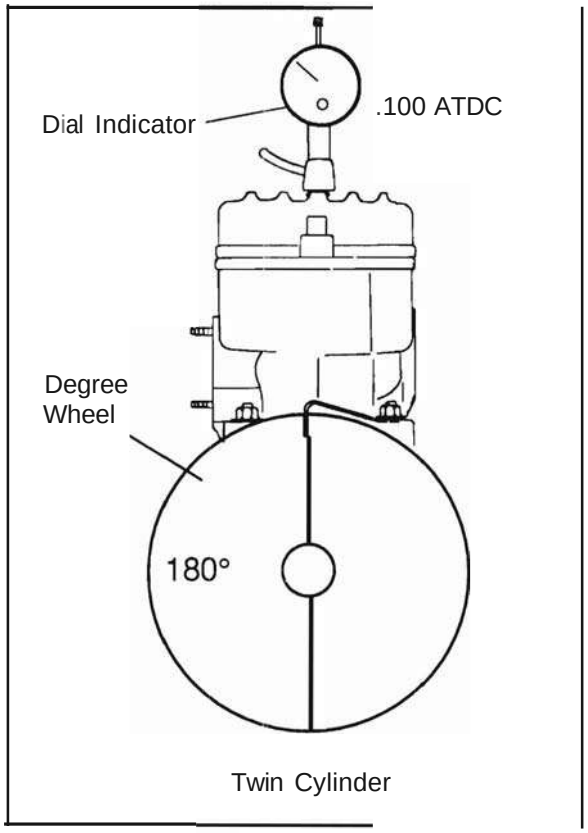
- Hydrolock from water or fuel; See Troubleshooting, Chapter 2.
- Impact to impeller from foreign object or accident;
- Abrupt piston or other mechanical failure;

Following is a method of checking:

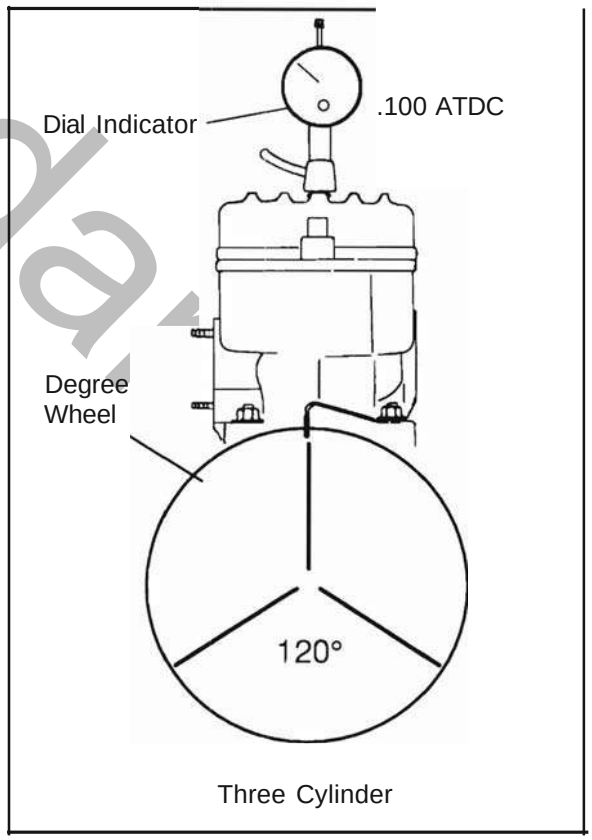
CAUTION:

Disconnect battery ground cable and **all** spark plug high tension leads; ground high tension leads to engine. Disconnect lanyard from engine stop switch before proceeding with the following steps.

1. Securely fasten a degree wheel on the flywheel or output coupler/driveshaft. Use a large degree wheel for more accuracy, and make sure it is mounted concentrically with the crankshaft center line. Cut a slot in a paper or cardboard degree wheel and slide it over the driveshaft if engine and pump shaft is installed in craft. Again, be sure to secure the degree wheel.
2. Sharpen a coat hanger or section of welding rod and anchor it to a convenient spot. Point the sharpened end at the outer perimeter of the flywheel or drive coupler mounted degree wheel.
3. Install a dial indicator into the magneto end cylinder spark plug hole (front) (#1). (The ignition timing is referenced by the magneto end.)
4. Rotate the engine to bring the piston to top dead center (TDC) on the cylinder with the indicator installed.
5. Locate TDC as accurately as possible by finding the center of the point where there is no piston movement. "Zero" the dial indicator at this point. Continue to rotate the crankshaft in the normal direction of rotation (counter clockwise as viewed from the rear of the craft) until the dial indicator reads .100" (2.54mm) after top dead center (ATDC). **IMPORTANT:** Do not allow the crankshaft to move from this position.
6. Bend the pointer or move the degree wheel until the pointer aligns with the 180 or 120° mark on the degree wheel.



Twin Cylinder



Three Cylinder

7. With the pointer aligned, make sure the degree wheel and pointer are secured and will not move out of position. Re-check accuracy of this location by repeating steps 4 and 5. The pointer should align with the 180 or 120° mark when the dial indicator reads .100" (2.54mm) ATDC.

IMPORTANT: Do not move the degree wheel or pointer after the initial setting on the mag end cylinder - simply read the wheel and dial indicator.

8. Remove the dial indicator and install in cylinder #2 (center). Repeat steps 4 and 5 for cylinder # 2. Note the degree wheel indication when the dial indicator reads .100" ATDC. It should be 180 or 120° (± 2°) from cylinder #1. Proceed to PTa cylinder (#3). Cylinder #3 should also be 120° (± 2°) from cylinder #1.

Symptoms of an out of index crankshaft can include:

- Difficulty calibrating carburetor (repetitive plug fouling on one cylinder with no other cause);
- Unexplained piston failure on one cylinder (Le. severe detonation, broken ring lands, piston holing);
- Excessive vibration of engine, backfiring, etc.;
- Rough idle, poor top speed.

Dial Caliper Crankshaft Indexing (Three Cylinder Engines Only)

Be sure to keep the dial caliper vertical, and in the center of the plug hole for greatest accuracy.

CAUTION:

Disconnect battery ground cable and **all** spark plug high tension leads. Ground high tension leads to engine. Disconnect lanyard from engine stop switch before proceeding with the following steps.

1. Remove all spark plugs
2. Install a dial indicator into the magneto end (Front) cylinder spark plug hole. (The ignition timing is referenced by the mag end).
3. Rotate the engine to bring the piston to top dead center (TDC) on the cylinder with the dial indicator installed.
4. Locate TDC as accurately as possible by finding the center of the point where there is no piston movement, and zero the dial indicator at this point. Do not move the crankshaft from this position.
5. Using the dial caliper, measure the distance from the spark plug gasket surface of the cylinder head to the top of the piston on the center and PTa (rear) cylinder. Be sure to measure both cylinders at the same position in the spark plug hole.
6. The measurements should be within .080" (2mm) of each other. **NOTE:** This measurement will NOT indicate how far the crankshaft is out of index ... it will only determine if further inspection is necessary. It is important to remember that the number two and three connecting rods are in the middle of their stroke and even a small amount of crankshaft rotation causes the piston to move a considerable distance. Be sure to accurately locate TDC on the Mag end piston. If within .080" (2 mm) crankshaft indexing is not the cause of a running condition problem or piston failure (usually PTa). If the difference exceeds the above specification, perform the degree wheel inspection on the next page.

CHAPTER 5
FINAL DRIVE/JET PUMP/

Final Drive Jet Pump Torque Values

Application	Torque	Apply (See Notes Below)
Driveshaft Through Hull Fitting (Threaded Style)	22 ft. lbs. (3.04 kg-m)	Marine Grade Silicone*
Engine Drive Coupler (Solid Coupler)	160 ft. lbs. (22.13 kg-m)	Grease or AS
Engine Drive Coupler (Bonded Rubber Style)	(Hand Tight)	Grease or AS
Extension Housing Bolts *(92/93* Models)	6 ft. lbs. (.83 kg-m)	242
Extension Housing Bolts (94-95 Models)	18 ft. lbs. (2.49 kg-m)	242
Impeller	100 ft. lbs. (13.83 kg-m)	Grease
Intake Grate Screw	8 ft. lbs. (1.11 kg-m)	242
Pump (to hull) Mounting Nuts	28 ft. lbs. (3.87 kg-m)	AS
Reverse Gate Actuator Pivot Bolt	14ft.lbs. (1.94 kg-m)	242
Reverse Gate Pivot Bolt	14 ft. lbs. (1.94 kg-m)	242
Ride Plate Screws	8 ft. lbs. (1.11 kg-m)	242
Steering Nozzle Mounting Bolts	18 ft. lbs. (2.49 kg-m)	242
Steering Cable Bolt (Nozzle End)	8 ft. lbs. (1.11 kg-m)	242
Trim Nozzle Mounting Bolts	18 ft. lbs. (2.49 kg-m)	242
1/4" to *7/8"* micro hose clamps	10-12 in. lbs. (16.56-19.87 kg-m)	Dry
1" and larger hose clamps	20-25 in. lbs. (33.12-41 .4 kg-m)	Dry

NOTES:

262 indicates use of Loctite™ 262 thread locking agent (red). Note: 271 is an acceptable substitute.

242 indicates use of Loctite™ 242 thread locking agent (blue). Note: 243 is an acceptable substitute.

AS indicates use of a light coating of grease or Anti Seize compound.

*Remove rubber gasket and apply Marine Grade or Loctite™ Ultra Blue silicone sealant per Service Bulletin PWC-95-17.

CAUTION:

Do not install fasteners dry. Always clean fasteners before installing.

Pump Service Special Tools		
Special Tool	**Part Number**	**Usage**
Impeller Removal Tool	2871036	Used to remove impeller
Coupler Removal Tool	2871037	Used to remove solid couplers only
Pump Alignment Tool	2871343	Check engine to pump alignment
Grease Gun Adaptor	2871174	Grease coupler and carrier bearing
Through-Hull Fitting Tool	2871425	Threaded Through-Hull Fittings
Refer to Maintenance Section for maintenance products and accessory part numbers)		

FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Data

1996 Pump Data

	Hurricane	SL700	SLT700	SL780	SLX780	SLT780	SL900	SLTX
Pump Extension	N/A	N/A	N/A	N/A	4″ Extension	4″ Extension	4″ Extension	4″ Extension
Cone Extension	N/A	N/A	N/A	5131245 0.750"	N/A	N/A	N/A	N/A
Pump Wedge	N/A	N/A	N/A	5630564 1.5° x 4°	5630564 1.5° x 4°	5630564 1.5° x 4°	5630564 1.5° x 4°	5630662 0° x 4°
Stationary Nozzle	5131308 Small Ports Dual holes side by side	5131308 Small Ports Dual holes side by side	5131308 Small Ports Dual holes side by side	5131332 Large Ports Single hole .344″ Orifice	5131309 Large Port Single hole .320″ Orifice	5131309 Large Port Single hole .320″ Orifice	5131309 Large Port Single hole .320″ Orifice	5131309 Large Port Single hole .320″ Orifice
Impeller"	5131457 (3) 12-17 Swirl	5131035 (4) Progressive	5131035 (4) Progressive	5131079 (4) Progressive	5131371 (3) 15-20 Swirl	5131371 (3) 15-20 Swirl	5131337 (3) 17-22	5131366 (3) 17-23
Drive Coupler	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber
Drive Shaft	5131227 32.38"	5131204 20.38″	5131204 20.38"	5131204 20.38"	6230103 24.38″	6230103 24.38"	6230103 24.38"	6230103 24.38″
Ride Plate	5630590	5630544	5630579	5630544	5630568	5630601	5630568	5630601
Inlet Grate	2871560	5630542	5630542	5630542	2871560	5630542	5630542	5630662
Sponsons	No	No	No	No	Yes - 28″	Yes - 24″	Yes - 28″	Yes - 28″

*Part number is located on impeller

1997 Pump Data

	Hurricane	SL700/DLX	SLT700	SL780	SLT780	SL900	SL10S0/SLTX
Pump Extension	N/A	N/A	4″ Extension	N/A	4″ Extension	4"' Extension	4″ Extension
Cone Extension	N/A	N/A	N/A	5131245 0.75″	N/A	N/A	N/A
Pump Wedge	N/A	5630662 0° x 4°	5630662 0° x 4°	5630662 0° x 4°	5630662 0° x 4°	5630662 0° x 4°	5630662 0° x 4°
Stationary Nozzle	5131570	5131570	5131569	5131666	5131569	5131569	5131569
Impeller" (# ofBlades)	5131457 (3) 12-17 Swirl	5131457 (3) 12-17 Swirl	5131457 (3) 12-17 Swirl	5131079 (4) Progressive	5131371 (3) 15-20	5131588 (3) 17-25	(SL-5131686) (3) 14-24 (SLTX-5131554) (3) 17-25
Drive Coupler	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber
Drive Shaft	5131227 32.38″	5131204 20.38"	5131204 20.38"	5131204 20.38″	6230103 24.38″	6230103 24.38″	6230103 24.38″
Ride Plate	5630655-067	5630791 (700) 5630776(Dlx)	5630659	5630776	5630659	5630759	5630759(1050) 5630659(SLTX)
Inlet Grate	2871560	5630542-067	5630542-067	5630542-067	5630542-067	5630542-067	5630542- 067
Sponsons	No	No	Yes 23″	No	Yes - 23″	Yes - 28″	Yes - 28″

*Part number is located on impeller

1998 Pump Data

	SLH	SLTH	SLXH	SLTX
Pump Extension	4″ Extension	4″ Extension	4″ Extension	4″ Extension
Cone Extension	N/A	N/A	N/A	N/A
Pump Wedge	5630662 0° x 4°	5630662 0° x 4°	5630662 0° x 4°	5630662 0° x 4°
Stationary Nozzle	1350038	5131569	5131569	5131569
Impeller' (# ofBlades)	5131457 (3) 12-17	5131457 (3) 12-17	5131554 (3) 17-25	5131554 (3) 17-25
Drive Coupler	1060119 Rubber	1060119 Rubber	1060119 Rubber	1060119 Rubber
Drive Shaft	6230103 24.38"	6230103 24.38"	6230103 24.38"	6230103 24.38"
Ride Plate	5630737	5630659	5630737	5630659
Inlet Grate	5630542- 067	5630542-067	5630542-067	5630542-067
Sponsons	Yes - 28″	Yes 23″	Yes - 28″	Yes - 28″

*Part number is located on impeller

NOTES

Impeller Part Numbers*			
Year / Model	**Part Number**	**Impeller Type**	**# Of Blades**
1992 SL650	5130874	14.5	3
1993 SL650	5130950	15-18	3
1993 SL750	5130949	17-20	3
1994 SL650	5131056	Progressive	4
1994 SL750	5131079	Progressive	4
1994 SLT750	5131035	Progressive	4
1995 SL650 / SL650 STD	5131056	Progressive	4
1995 SL750	5131371	15-20	3
1995 SLT750	5131035	Progressive	4
1995 SLX780	5131079	Progressive	4
1996 SL700 / SLT700	5131035	Progressive	4
1996 SL780	5131079	Progressive	4
1996 Hurricane	5131457	12-17 Swirl	3
1996 SLT780 / SLX780	5131371	15-20 Swirl	3
1996 SL900	5131337	17-22	3
1996 SLTX	5131366	17-23	3
1997 SL700	5131457	12-17 Swirl	3
1997 SL700Dlx / SLT700	5131457	12-17 Swirl	3
1997 Hurricane	5131457	12-17 Swirl	3
1997 SL780	5131079	Progressive	4
1997 SLT780	5131371	15-20	3
1997 SL900	5131588	17-25 Swirl	3
1997 SL1050	5131686	14-24 Swirl	3
1997 SLTX	5131554	17-25 Swirl	3
1998 SLH	5131457	12-17	3
1998 SLTH	5131457	12-17	3
1998 SLXH	5131554	17-25	3
1998 SLTX	5131554	17-25	3

Impeller Torque - (All) 100 ft. lbs. (13.83 kg-m) Apply grease to threads

***Refer to page 5.4 for high elevation recommendations.**

CAUTION:

Use of impellers other than those listed above may result in engine failure. Use *only* the impeller recommended above or on page 5.4 if the craft will be operated in high elevation areas.

High Elevation Recommendations·

The following carburetor settings and impeller recommendations are for operation above 5000 feel (1500 meters) only. Serious engine damage may result if the craft is operated at elevations below 5000 ft. (1500 rn) with these adjustments.

1995 Model	High Speed Screw			Low Speed Screw			Impeller	Impeller Part Number Or Kit	Operating RPM	Comments
	Mag	Cen	PTO	Mag	Cen	PTO				
SL750	3/4	1/4	1/2	3/4	3/4	3/4	Progressive	5131035	5960-5970	See NOTE Below"

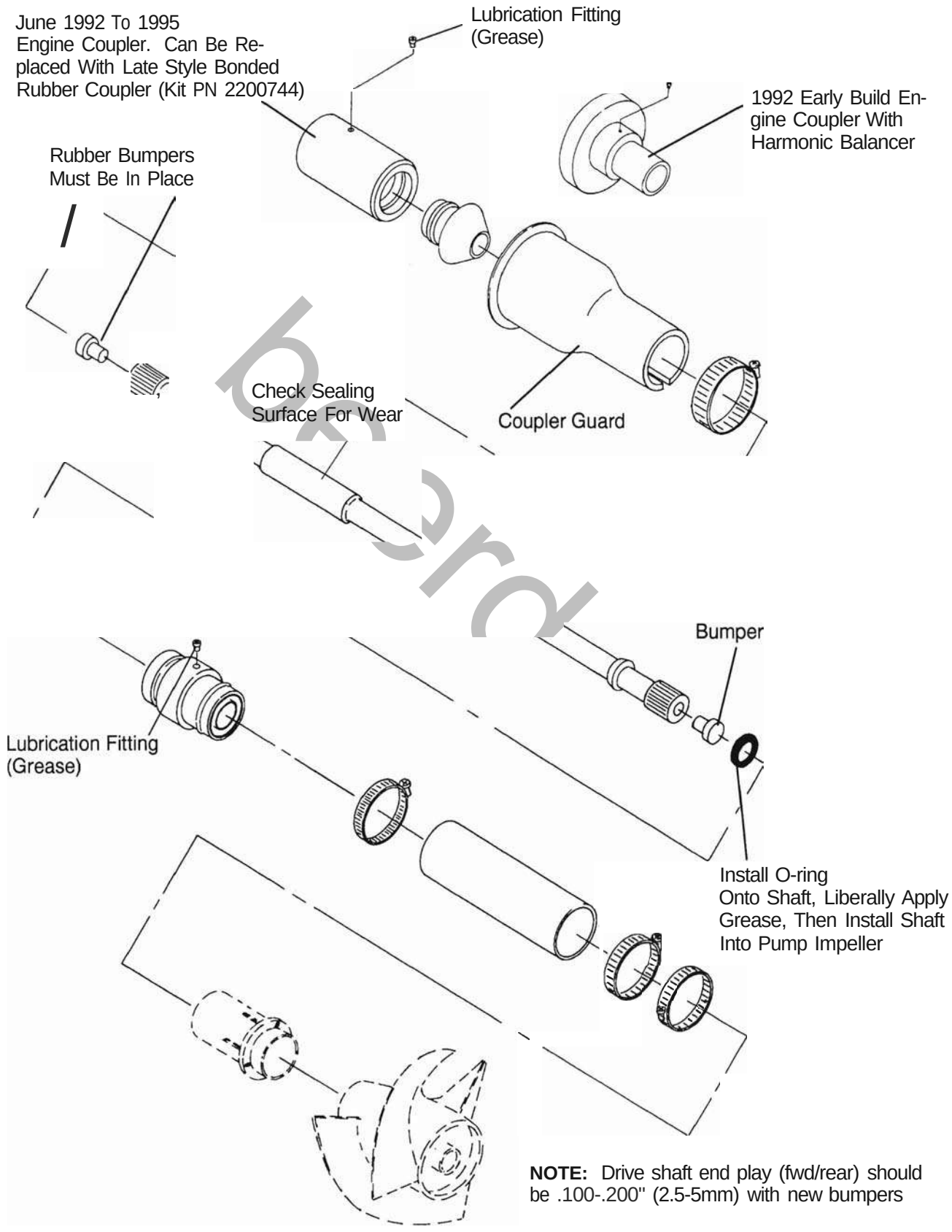
1996 Model	High Speed Screw			Low Speed Screw			Impeller	Impeller Part Number Or Kit	Operating RPM	Comments
	Mag	Cen	PTO	Mag	Cen	PTO				
SL700	1 1/2	-	1 1/2	1/2	-	1/2	12/17 Swirl	5131457	6000-6050	-
SLT700	1 1/2		1 1/2	1/2	-	1/2	12/17 Swirl	5131457	6000-6050	-
SL780 SLT780 02105 Eng 03 Engine	5/8 1	5/8 3/4	7/8 1 1/8	5/8 1 3/8	5/8 1 3/8	5/8 1 3/8	13/18 Swirl 13/18 Swirl	2871554 2871554	6300-6400 6300·6400	Remove cone extension (if equipped) See NOTE: Below"
SLX780	5/8	5/8	7/8	1 1/4	1 1/4	1 1/4	13/18 Swirl	2871554	6375-6400	-
SL900	132 (Main Jet)	135 (Main Jet)	130 (Main Jet)	1	1	1	15/20	5131371	6500	60 Mid Jet
SLTX	135 (Main Jet)	135 (Main Jet)	130 (Main Jet)	1	1	1	15/20	5131371	6500	58 Mid Jet

1997 Model	High Speed Screw			Low Speed Screw			Impeller	Impeller Part Number Or Kit	Operating RPM	Comments
	Mag	Cen	PTO	Mag	Cen	PTO				
SL700	N/A			Turn screws in to limiter cap stops (approximately 1/8 turn in)			10/14	2871878	6200-6250	-
SL700Dlx	No Change						12/17	-	6350 (SL)	-
SLT700	No Change						12/17	-	6250 (SLT)	-
Hurricane	N/A			1/8 turn out from closed			10/14	2871878	6600	Idle RPM 1250
SL780	No Carburetor Changes						13/20	2871880	6400	Remove cone extension
SLT780							12/17	2871879	6350	-
SL900							16/21	2871881	6400	-
SL1050	N/A			Turn low speed screws in 1/8 turn			16/22	2871882	6500	-
SLTX	No Carburetor Changes						16/21	2871881	6400	-

1998 Model	Mag	Cen	PTO	Mag	Cen	PTO	Impeller	Impeller Part Number Or Kit	Operating RPM	Comments
SLH	N/A			Adjust for best throttle response			10/14	2871878	6600	Idle RPM 1250
SLTH							10/14	2871878	6600	Idle RPM 1250
SLXH	N/A			Adjust for best throttle response			16/22	2871882	6500	-
SLTX							16/22	2871882	6500	-

* All high speed screw settings are ± 1/8 turn
** NOTE: Install 65 gram return springs (PN 2871984) on fuel inlet needle to obtain a 15 lb. popoff.

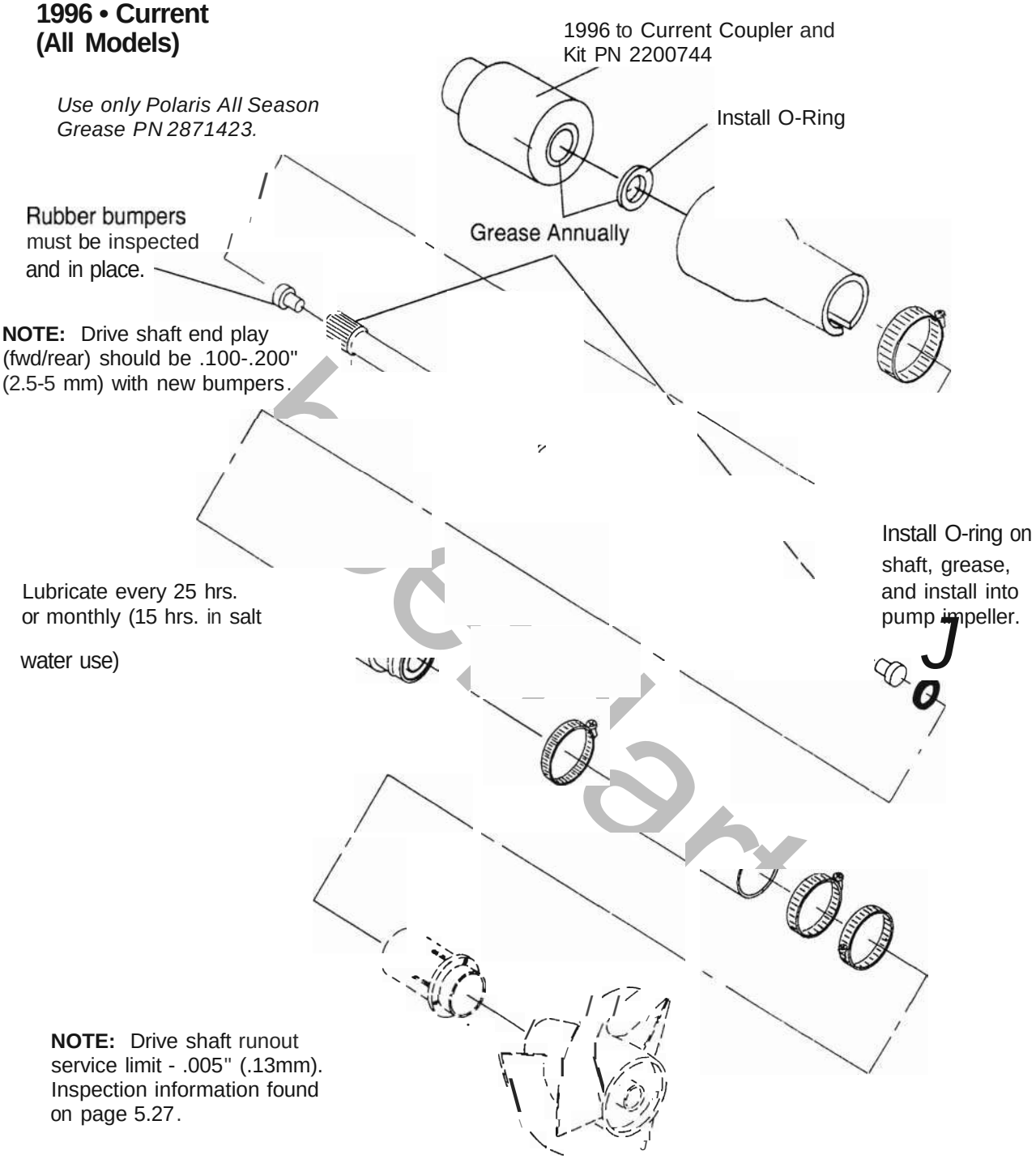
1992·1995 All Models



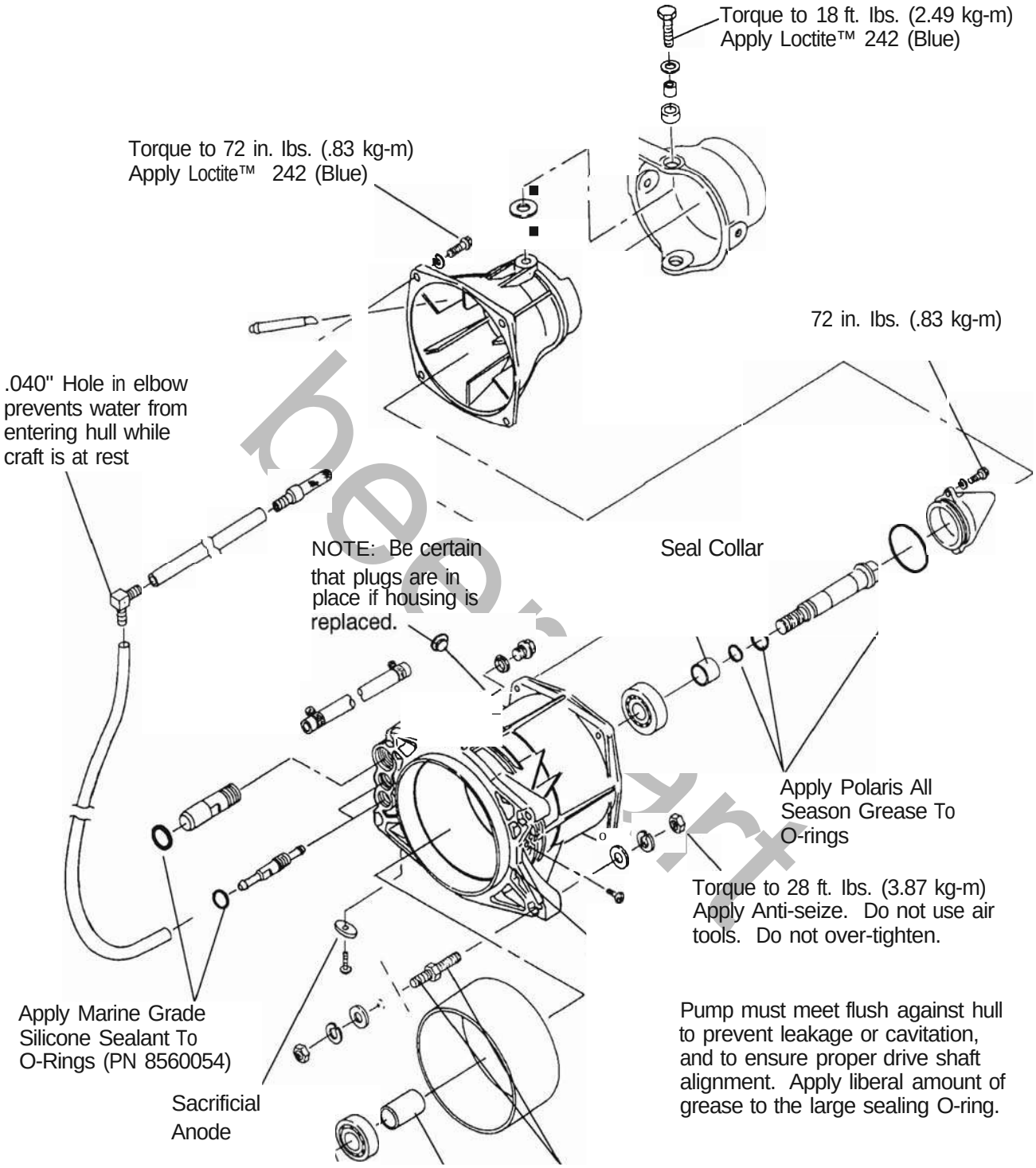
NOTE: Drive shaft end play (fwd/rear) should be .100-.200" (2.5-5mm) with new bumpers

Use only Polaris All Season Grease whenever grease Is recommended.

1996 • Current (All Models)

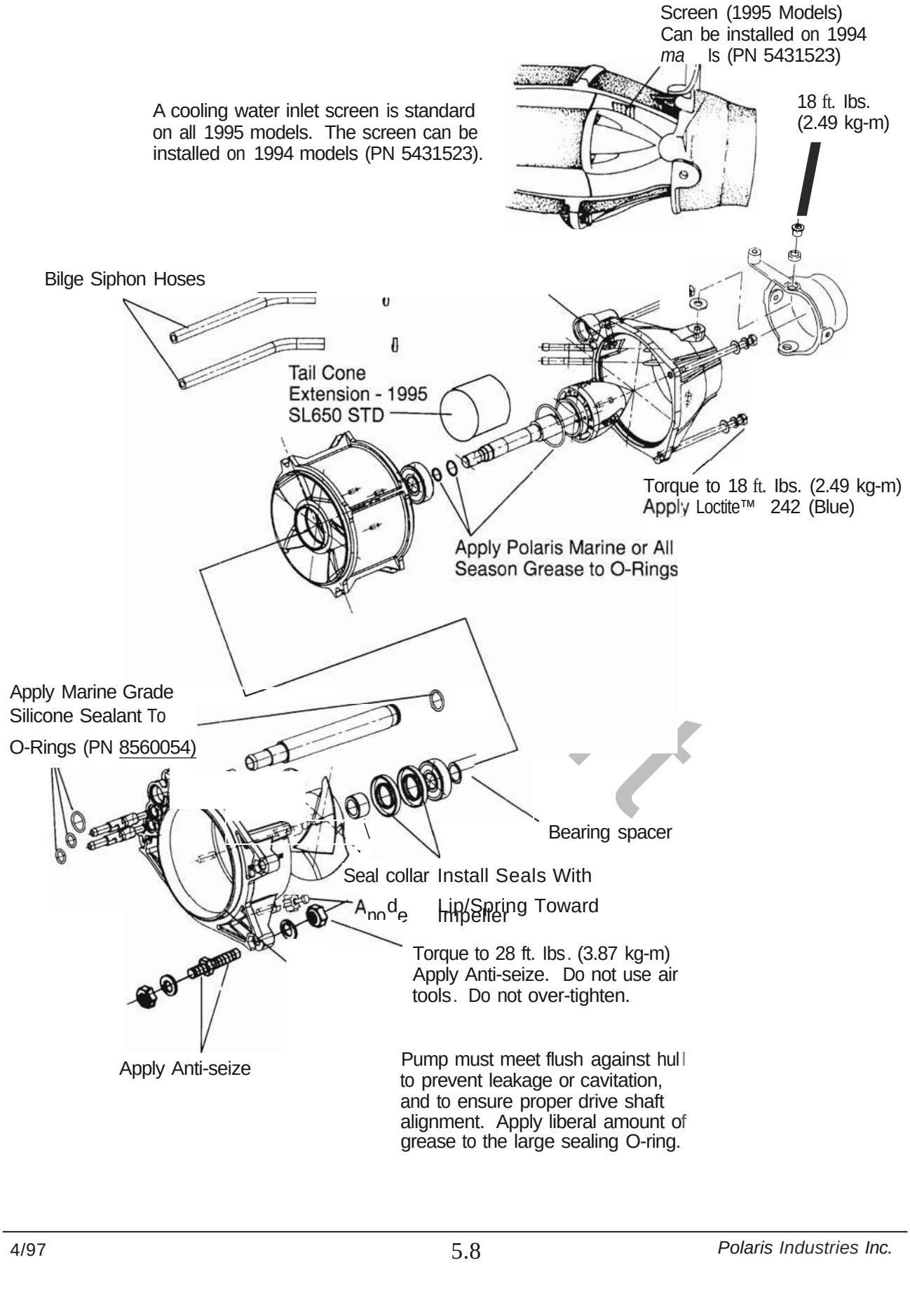


1992·1993 Models



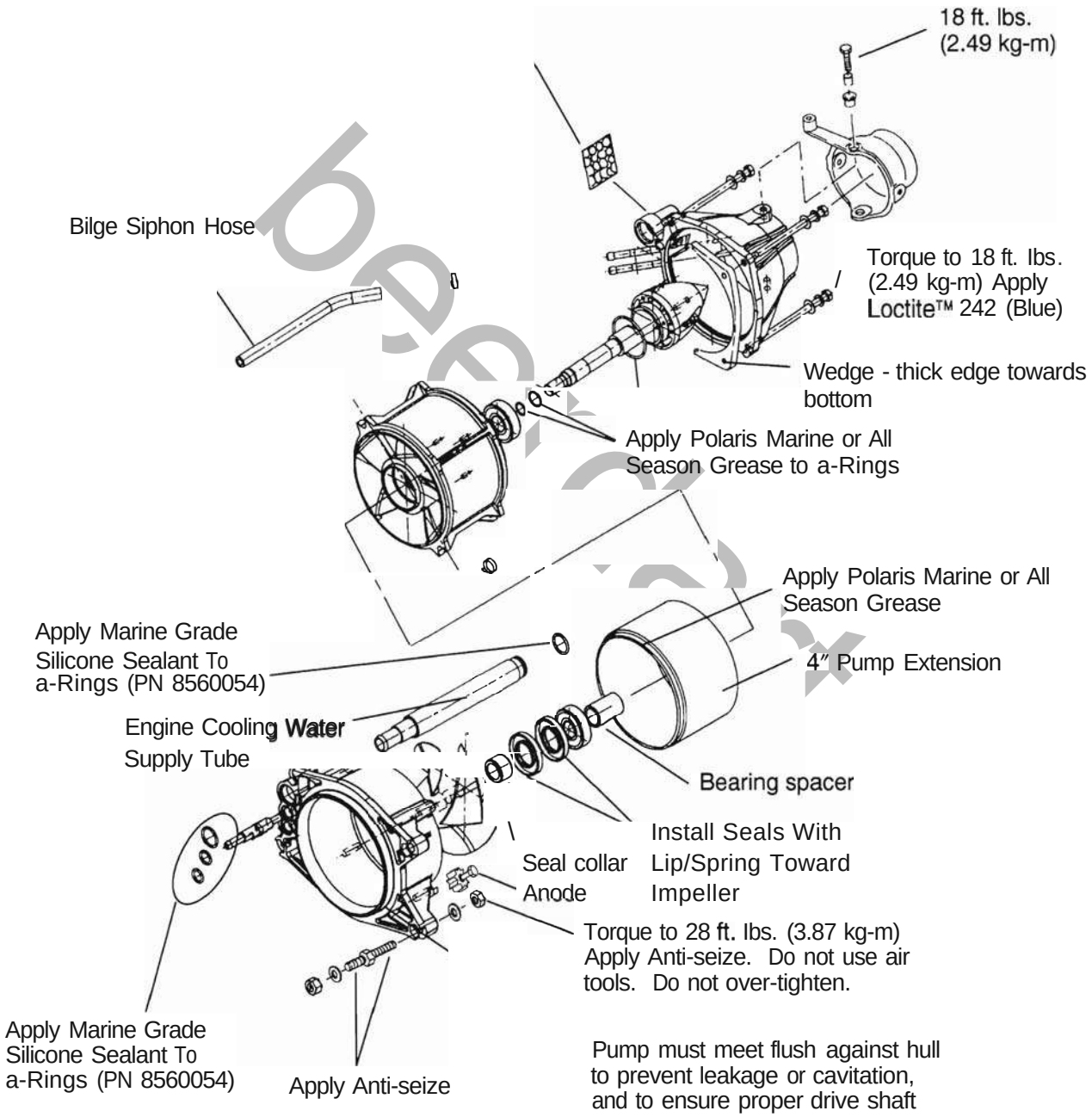
FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Assembly

1994·1995 Models (Except 1995 SLX)



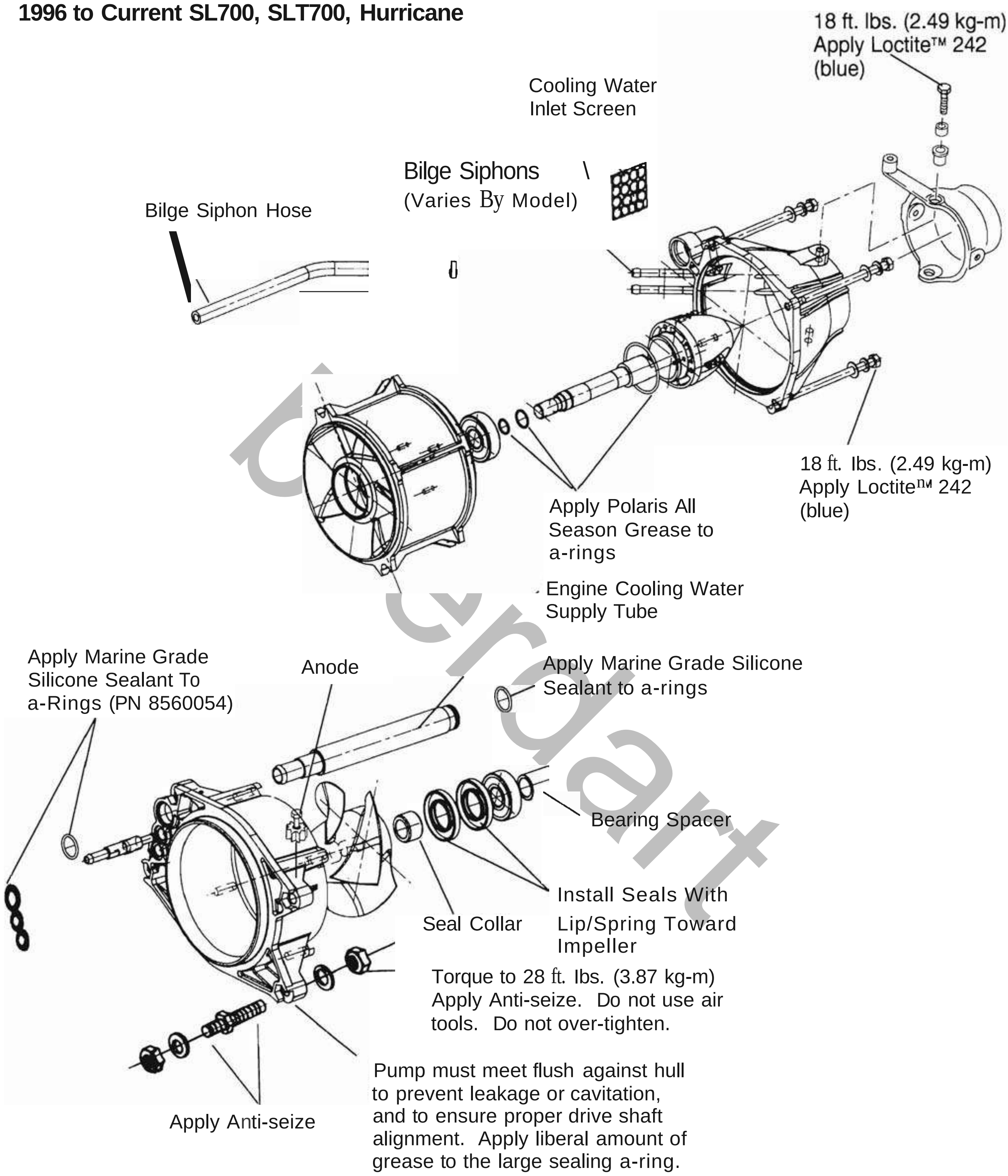
1995 SLX780

A cooling water inlet screen is standard on all 1995 models. The screen can be installed on 1994 models (PN 5431523).

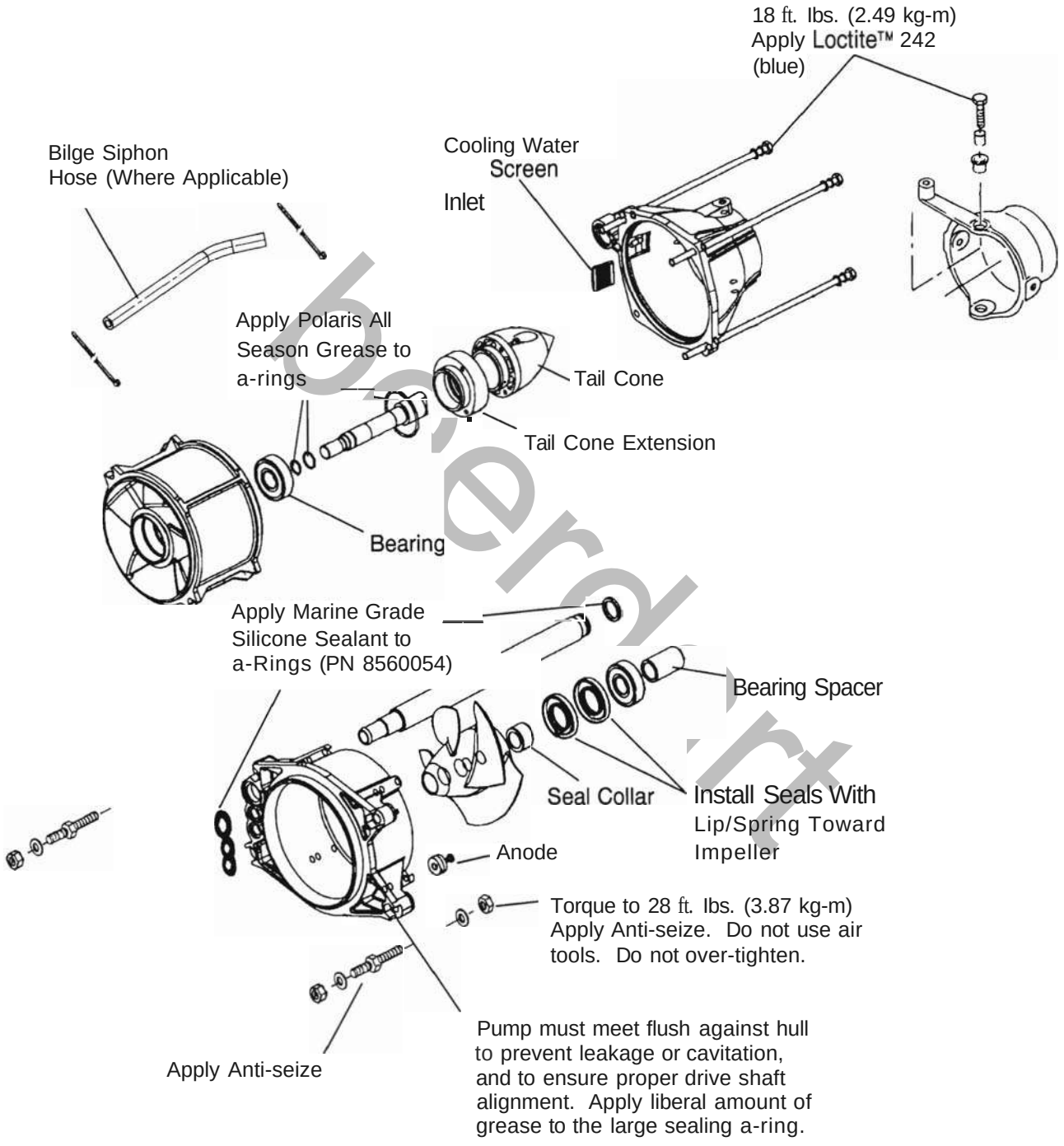


Pump must meet flush against hull to prevent leakage or cavitation, and to ensure proper drive shaft alignment. Apply liberal amount of grease to the large sealing a-ring.

1996 to Current SL700, SLT700, Hurricane

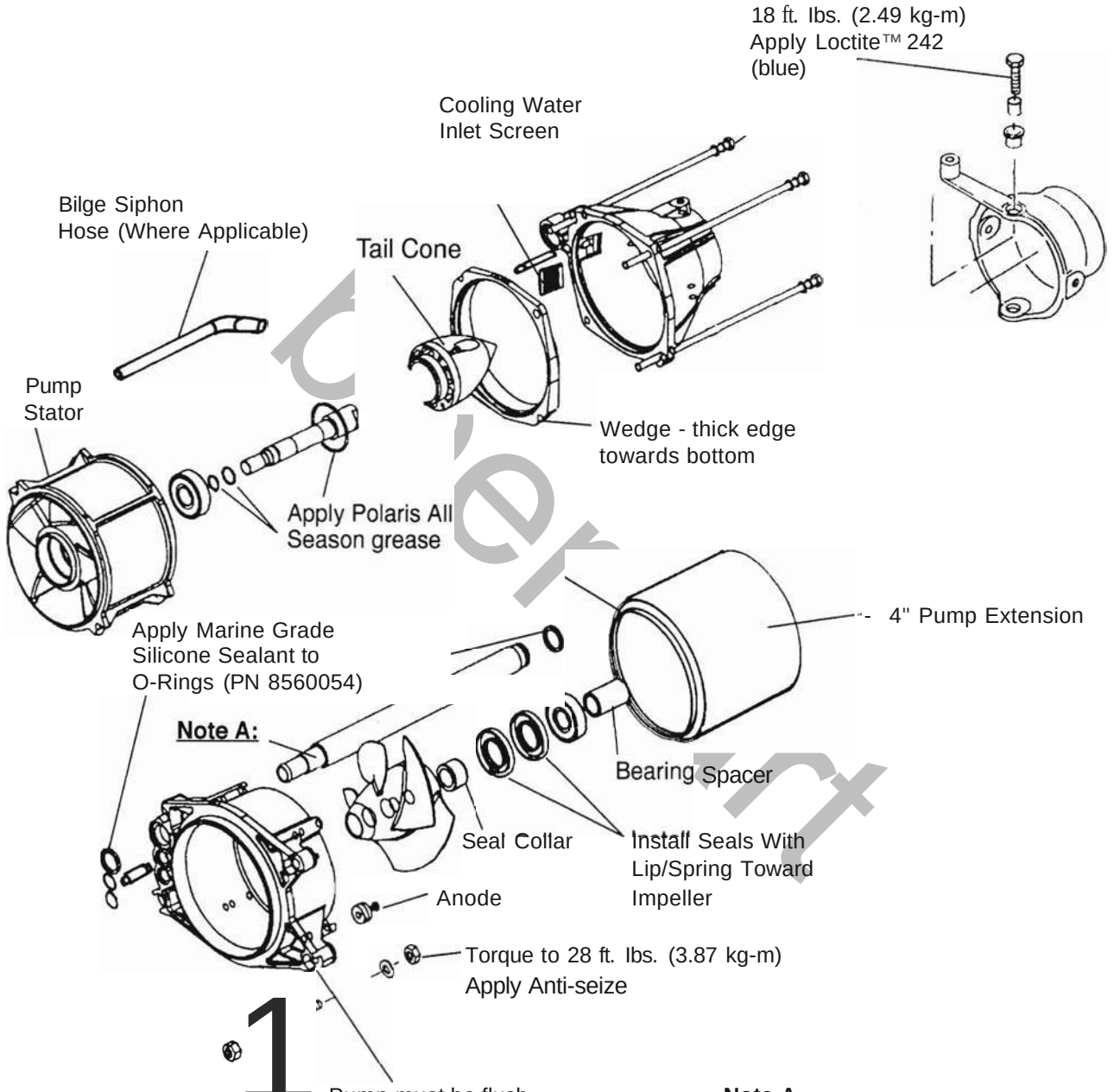


1996 to Current SL780



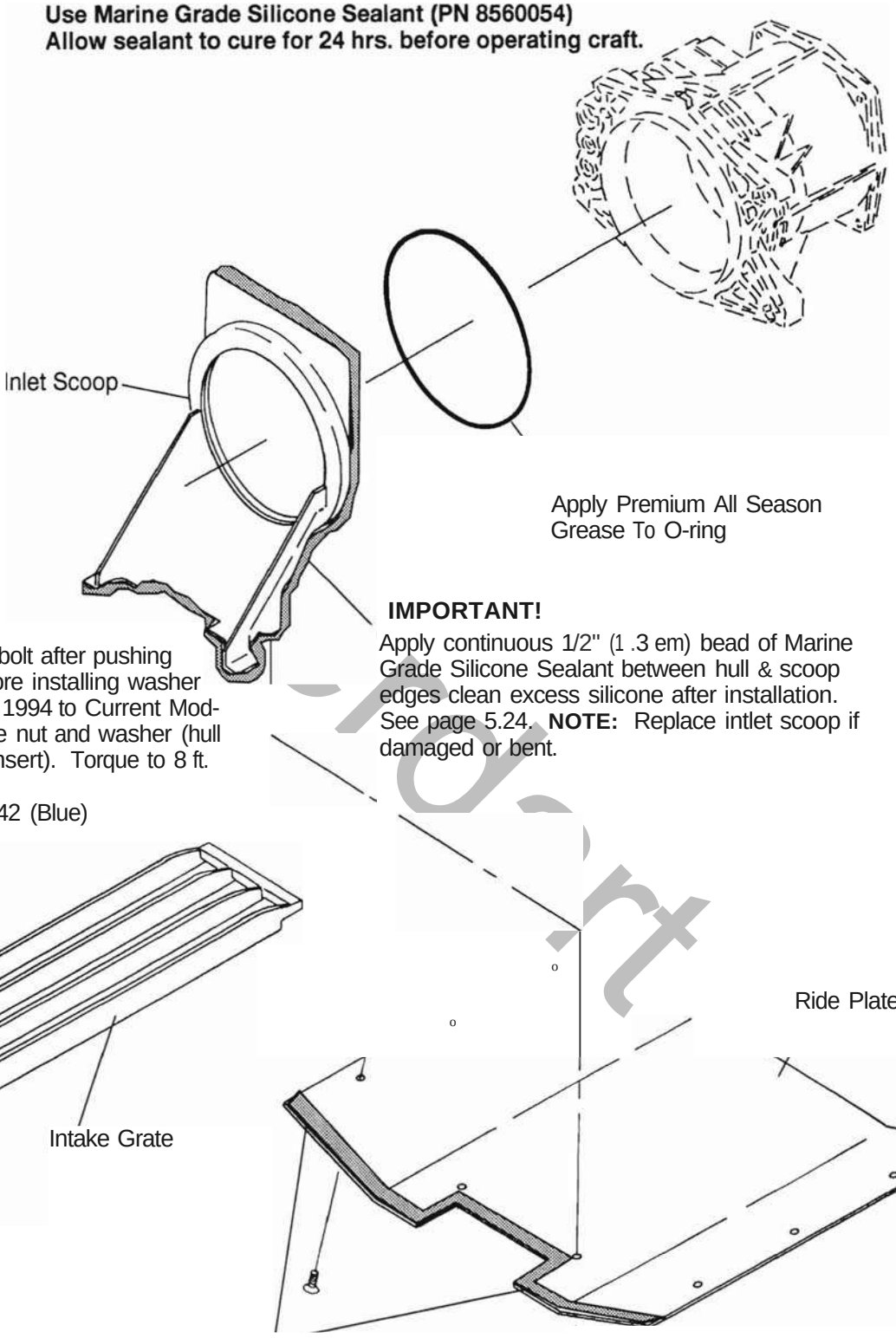
FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Assembly

1996 to Current SLX, SLT780, SL900, SL1050, SLTX



Note A:
Orifice size in water supply pipes are different depending on model. Be sure to verify proper orifice size if the pipe is replaced.

1992 . 1995 Models (Except SLX780)



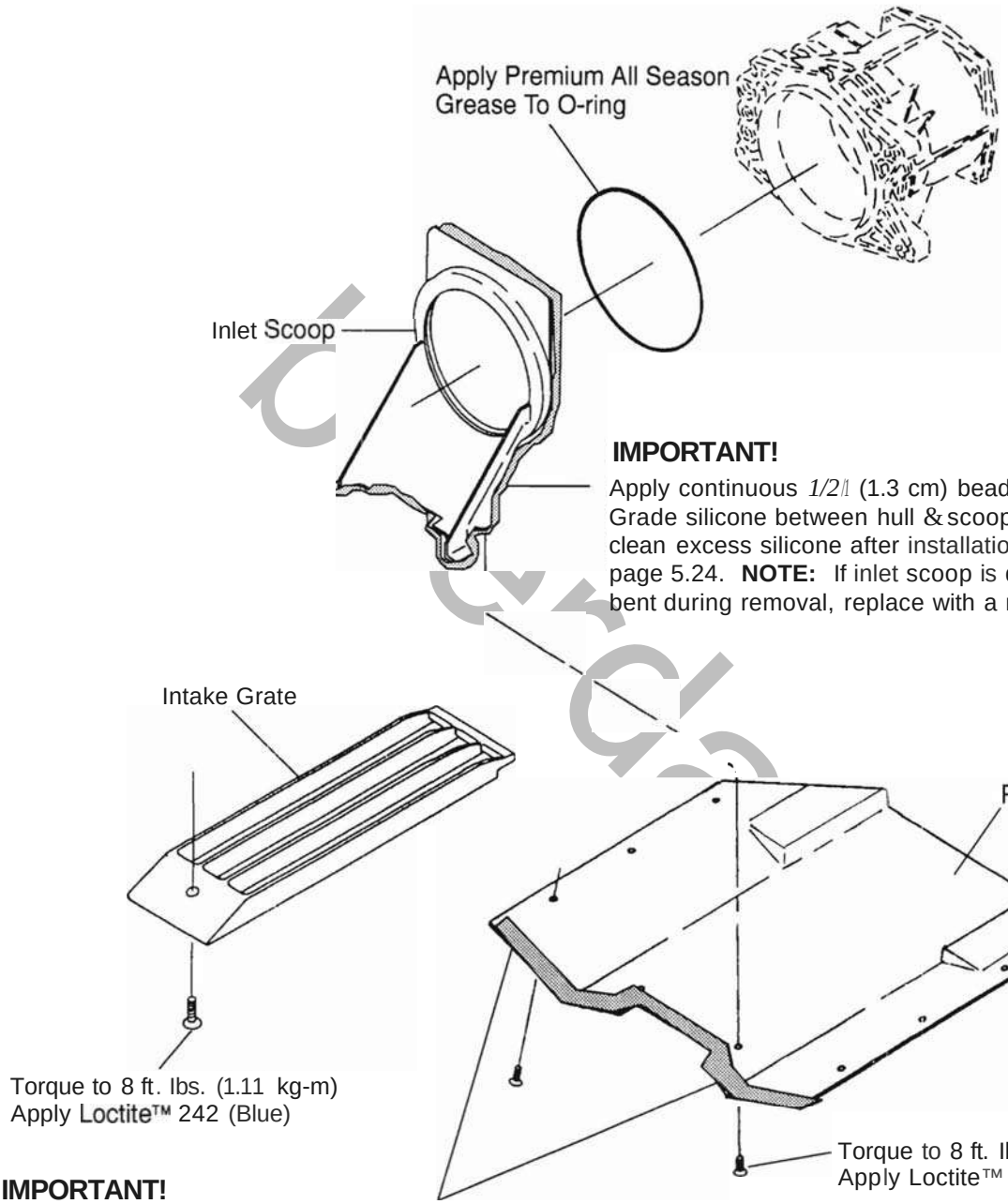
IMPORTANT!

Apply continuous bead of Marine Grade Silicone Sealant to outer front edges of hull to seal ride plate in the area shown. **NOTE:** Cavitation may result if sealant is *not* continuously applied; e.g. pin holes. separatlon, or damage.

Torque to 8 ft. lbs.(1.11 kg-m)
Apply Loctite™ 242 (Blue)

1995 5LX780

Use Marine Grade Silicone Sealant (PN 8560054)
Allow sealant to cure for 24 hrs. before operating craft.



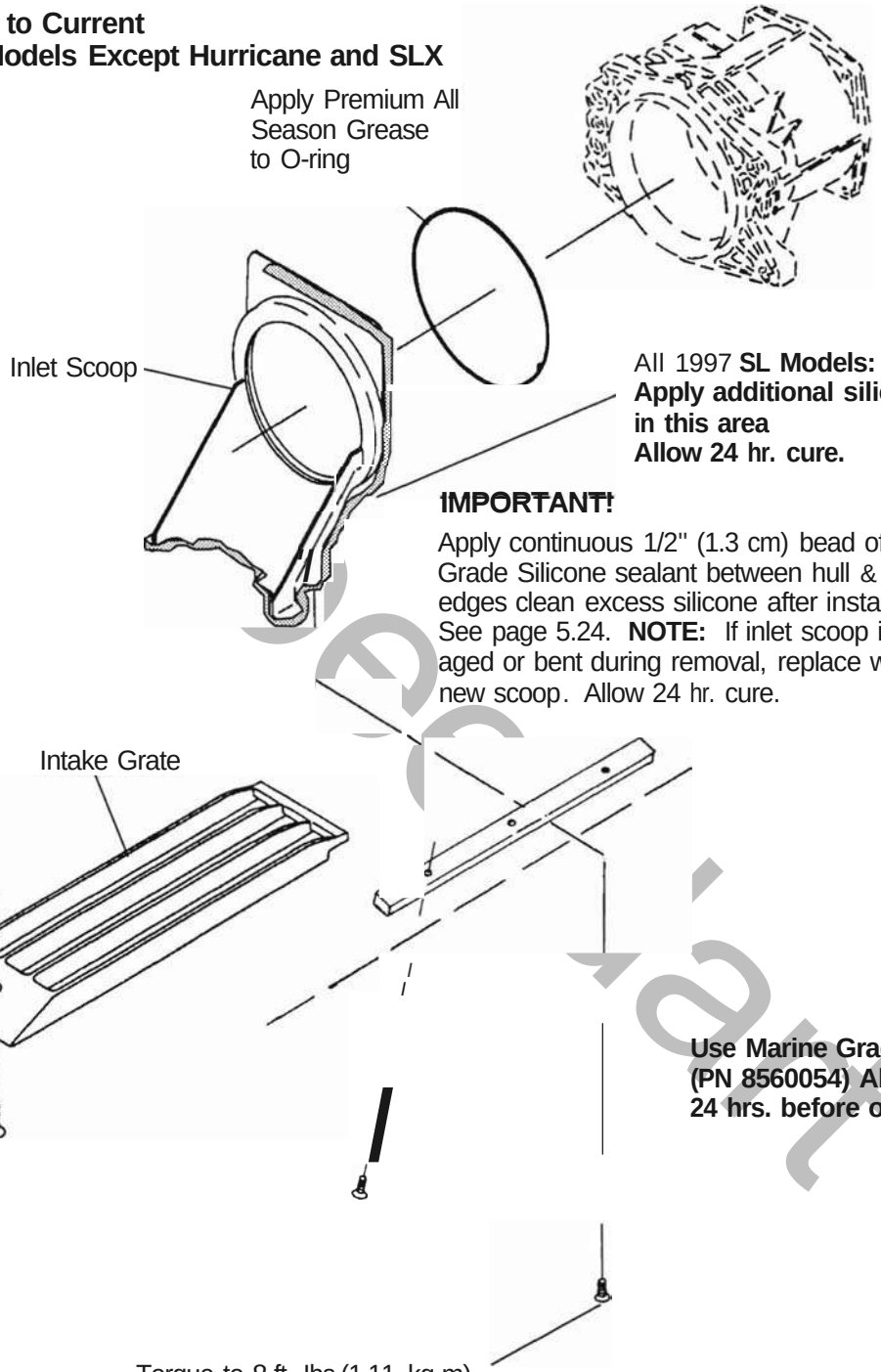
IMPORTANT!

Apply continuous 1/2" (1.3 cm) bead of Marine Grade silicone between hull & scoop edges clean excess silicone after installation. See page 5.24. **NOTE:** If inlet scoop is damaged or bent during removal, replace with a new scoop.

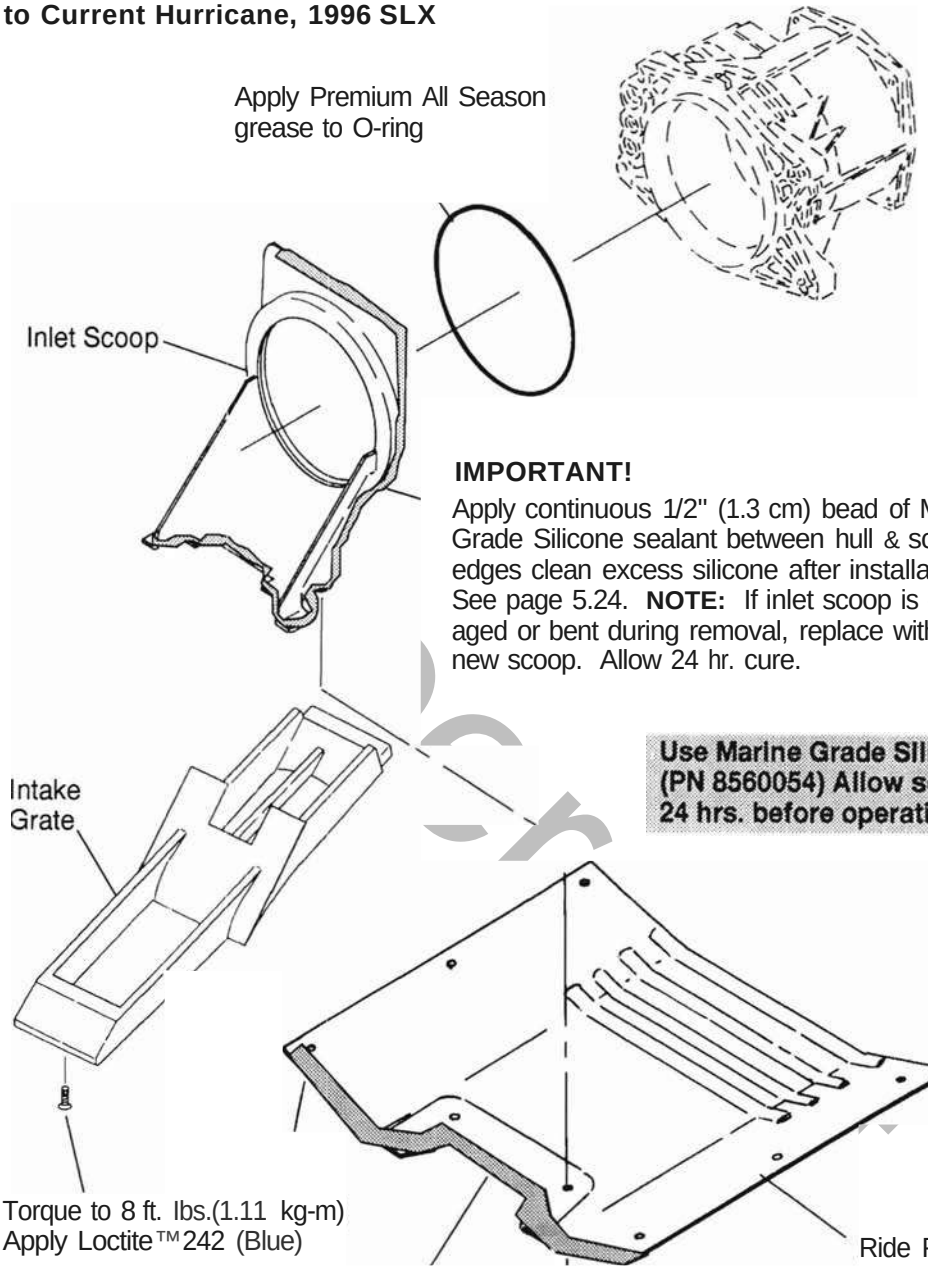
IMPORTANT!

Apply continuous bead of Marine Grade Silicone sealant to outer front edges of hull to seal ride plate in the area shown. **NOTE:** Cavitation may result if sealant is *not* continuously applied; e.g. pin holes, separation, or damage. Allow 24 hr. cure.

1996 to Current
All Models Except Hurricane and SLX



1996 to Current Hurricane, 1996 SLX



IMPORTANT!

Apply continuous bead of Marine Grade Silicone sealant to outer front edges of hull to seal ride plate in the area shown. **NOTE:** Cavitation may result if sealant is *not* continuously applied; e.g. pin holes, separation, or damage. Allow 24 hr. cure.

1992-1993 Models

The following items can be serviced with the pump installed in the watercraft:

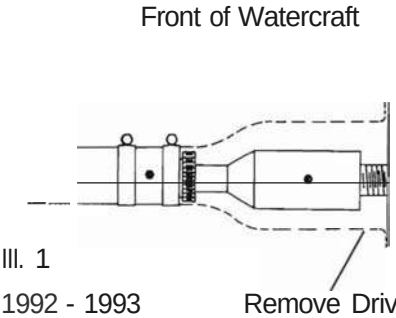
Impeller (clearance inspection), intake grate, ride plate, speedometer pitot fitting, steering nozzle, trim nozzle, and pump extension housing (rear).

The pump must be removed to service the following items:

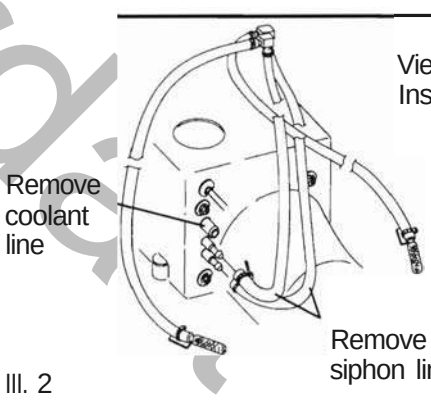
Inlet scoop, driveshaft, impeller, pump housing, stub shaft and bearings, through hull fitting, bearing housing (inside hull).

NOTE: The pump can be removed with the intake grate and ride plate installed. However, if pump cavitation is suspected the intake grate, ride plate, and inlet scoop should be removed and re-sealed.

1. Remove seat and battery hold down straps. Move the electrical box aside. Disconnect the battery ground (-) cable. Loosen clamp and remove driveshaft guard. Refer to 111.1. From inside the hull, disconnect cooling water and siphon hoses at jet pump.

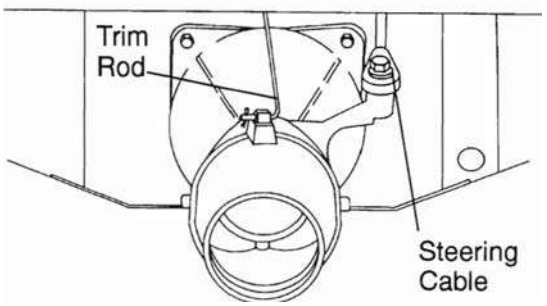


Ill. 1 1992 - 1993



Ill. 2

2. Disconnect steering cable from pump steering nozzle. On models equipped with Quick Trim remove cotter pin and trim rod from top of trim nozzle.



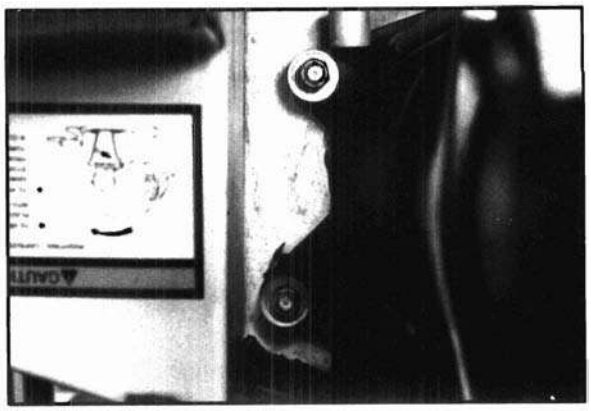
Ill. 3 SL750 Shown With Trim Nozzle

FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Disassembly/Inspection (1992-1993 Models)

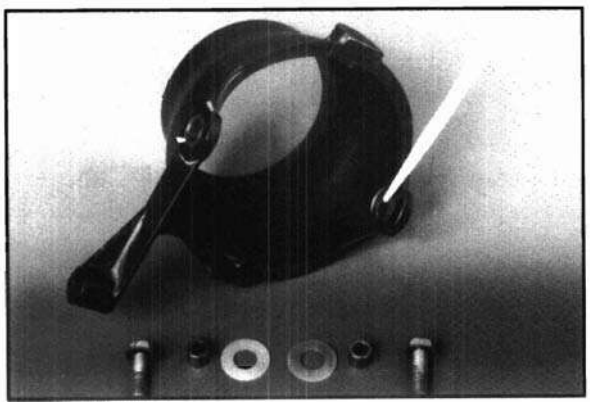
Pump Removal, 1992·1993 Models, Cant.

3. Remove pump mounting nuts (2 per side), lock washers and flat washers. Protect hull area and carefully pry and pull pump assembly and driveshaft out of hull.

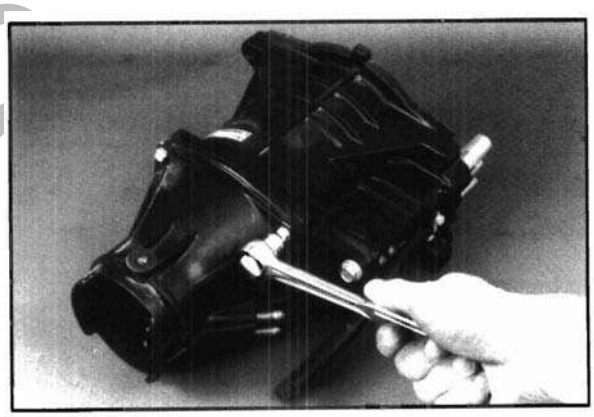
NOTE: Removal of pump is easier if an assistant pushes the driveshaft out of the engine coupler inside hull while the pump is removed.



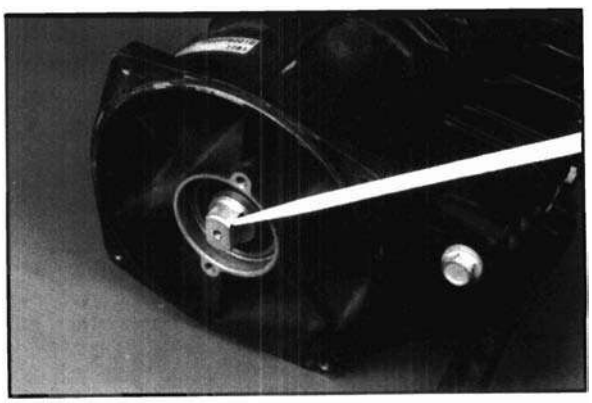
4. Remove driveshaft from impeller by pulling straight outward. Check steering nozzle for freeplay. Inspect bolts, pivot bushings, washers, and nozzle and replace if worn or damaged. Washers are located between steering nozzle and stationary nozzle.
5. Remove bilge siphon lines.



6. Remove (4) 6mm bolts holding extension housing assembly. Note length of bolts for reassembly.

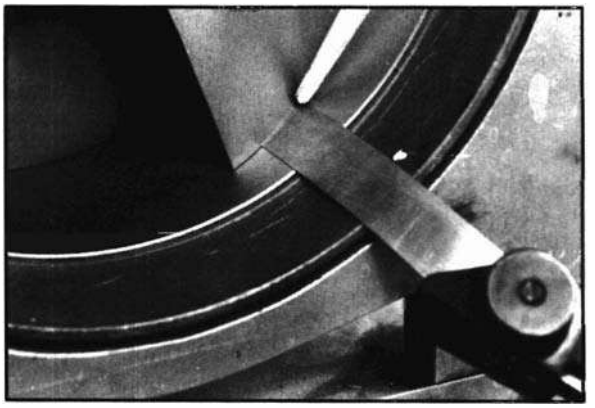


7. Remove (2) 6mm tail cone bolts (note length) and mount stub shaft flat surfaces in vise with impeller facing upward.



1992-1993 Models, Cont.

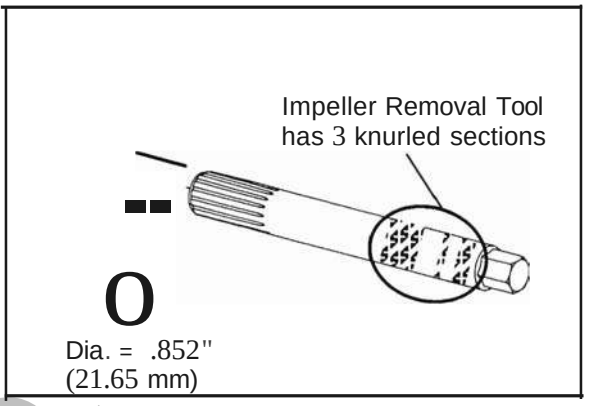
8. Check clearance of impeller to housing with a feeler gauge. Measure clearance at the leading edge, middle, and trailing edge of each blade. Replace impeller if clearance exceeds the service limit at any point. If clearance exceeds the service limit with a new impeller, replace the impeller housing.



NOTE: It is not necessary to remove pump to check impeller clearance. To check clearance only, remove lock plate from engine stop switch, remove negative (-) cable from battery, and remove intake grate for access.

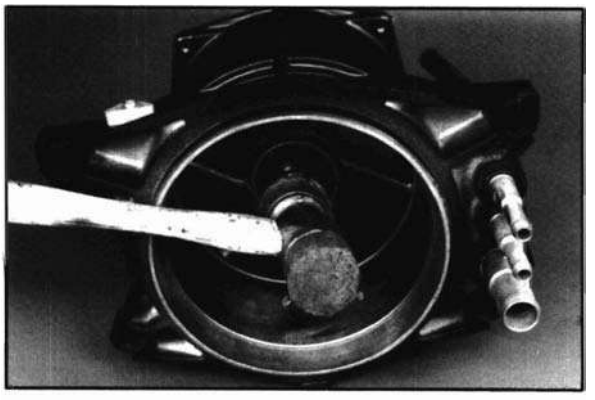
Impeller Clearance
Std: .002 - .008" (.05 - .20mm)
Service Limit: .020" (.5mm)

9. Install impeller removal tool and turn counterclockwise to remove. The tool can be identified by 3 sections of knurling on shaft. The diameter of the impeller removal tool is .852" (it is larger than the coupler removal tool). Inspect impeller, wear ring, and stator vanes for cracks, wear, or damage and replace if necessary.



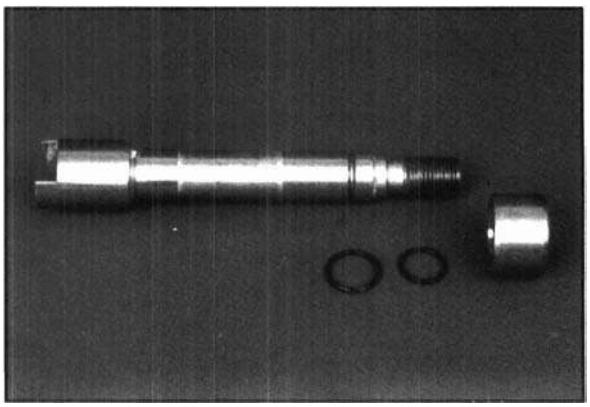
Impeller Removal Tool
PN 2871036

10. Using a soft faced hammer, tap stub shaft out of housing. Remove both O-rings and collar.

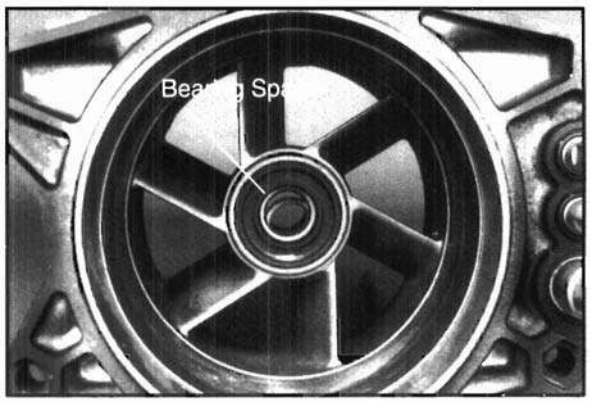


11. Inspect shaft and collar for wear, scratches, or damage. Install new O-rings upon re-assembly.

NOTE: Seals, bearings, and O-rings should be replaced if removed. Warming the impeller housing evenly with a heat gun will ease removal of bearings in next step.

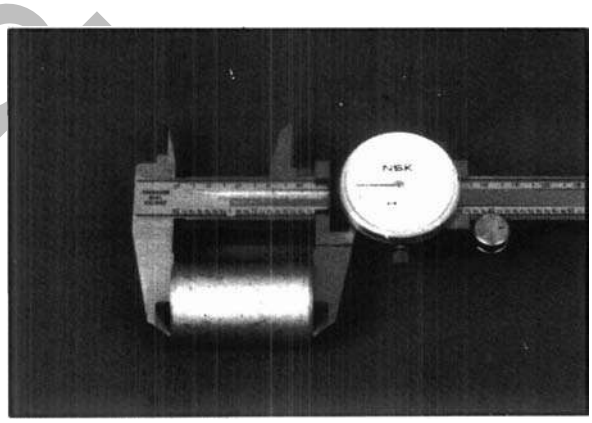


12. Using a brass or aluminum drift, tap the bearing spacer to one side enough to expose inner bearing races. Drive out tail cone end bearing and remove bearing spacer. Drive out other bearing, removing seals with bearing. See page 5.22 for bearing and seal installation procedJre.



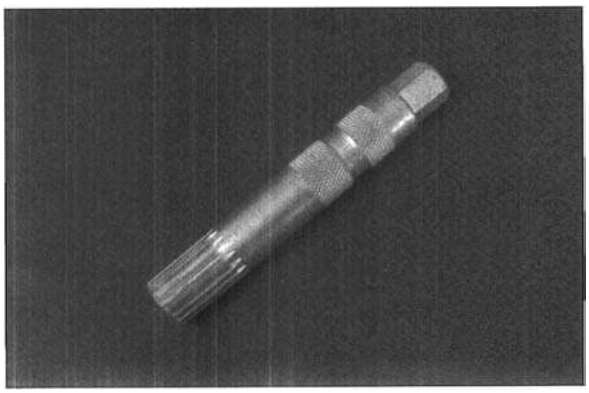
13. Measure spacer length with a vernier caliper. Replace if worn beyond the service limit. If the spacer is too short, the bearings will be side loaded and premature wear will result.

Bearing Spacer Length
Service Limit: 1.730″ (43.94 mm)



14. Engine driveshaft coupler can be removed with coupler removal tool, identified by double knurling on shaft. Diameter of coupler removal tool is .787″ (20 mm). Refer to engine section for procedure.

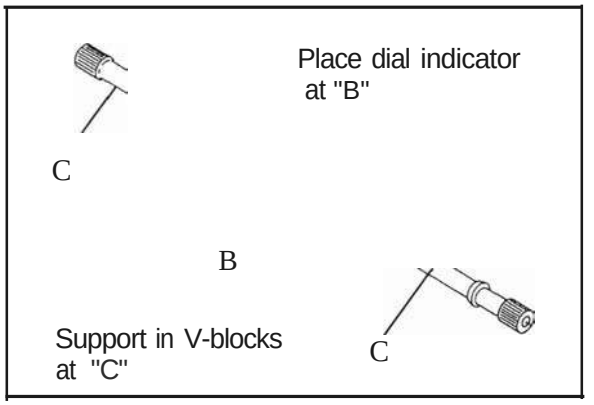
Drive Shaft Coupler Removal Tool
(Not for use on bonded rubber couplers)
PN 2871037



Drive Shaft Inspection, 1992·1993 Models, Cont.

1. Clean driveshaft and support in V - blocks as shown (C). Measure runout by rotating shaft and observing dial indicator at point "B". Replace if runout exceeds the service limit.

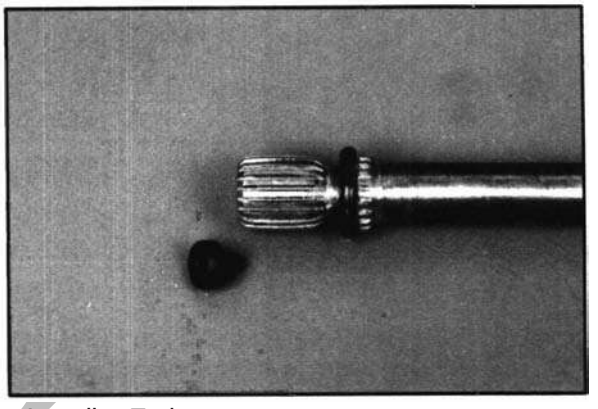
NOTE: Excessive driveshaft runout can cause vibration, bearing, and spline failure. See Pump/Final Drive Troubleshooting at the end of Chapter 2.

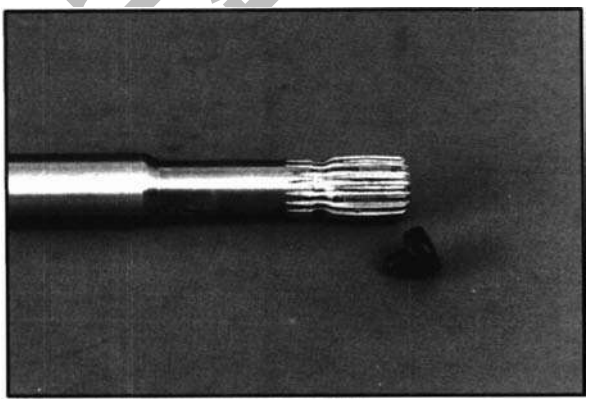


Drive Shaft Runout
Service Limit: .005" (.13mm)

2. Inspect the driveshaft splines carefully for wear or damage. Be sure to carefully inspect the coupler and impeller splines as well. If spline damage is evident, be sure to inspect driveshaft alignment as outlined on page 5.37-5.37d. Replace worn parts. Rubber bumpers control driveshaft end play at both ends of the shaft. An O-ring seals grease in splines of impeller. Replace bumpers or O-rings if worn.

NOTE: The bearing housing (near engine coupler) should be inspected when pump/driveshaft is removed. See page 5.39 for housing removal/inspection procedures.


Impeller End

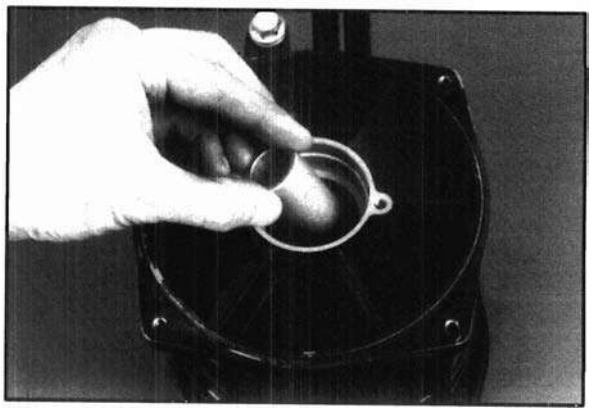

Coupler End

FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Assembly (1992-1993 Models)

1992-1993 Models, Cont.

NOTE: To ease installation, wrap bearings in wax paper and chill in a freezer for 30 minutes or longer. Warm the impeller housing evenly with a heat gun or a propane torch. DO NOT OVERHEAT.

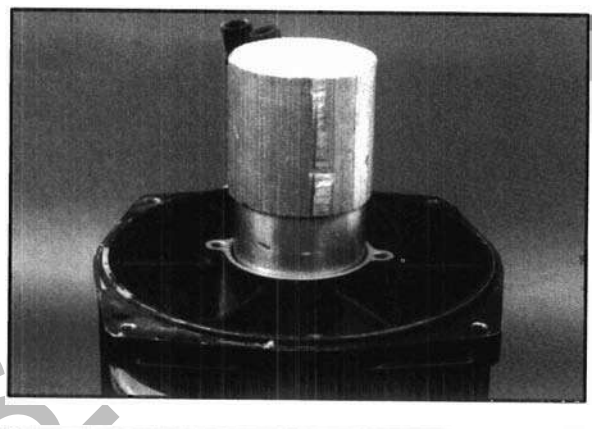
1. Press or drive one bearing into place until it bottoms against shoulder in pump housing. Grease and install center bearing spacer.



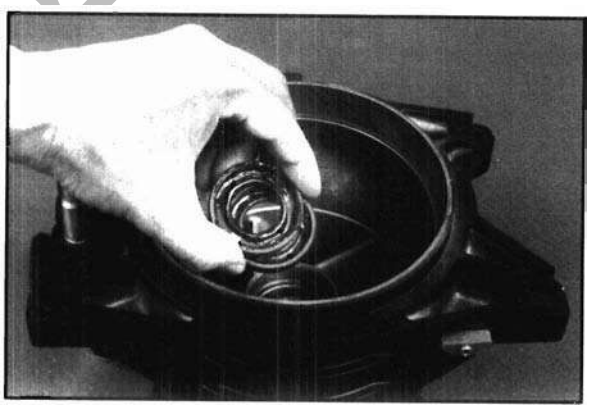
CAUTION:

Do not drive on the inner race. Bearing damage will result. Drive on outer race only.

2. Insert stub shaft to center the spacer and press the remaining bearing into opposite end of housing. Remove stub shaft.



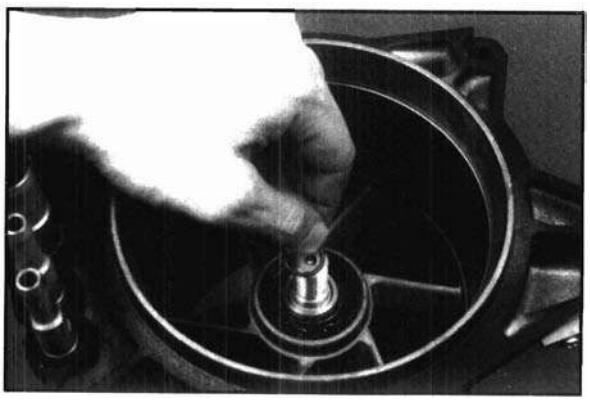
3. Apply marine grease to seal lips and between seals. Install two new oil seals as shown with both springs and lips up and visible (toward impeller). Press seals to bottom of chamfer on seal bore (about *1/8/1/.32* cm beyond end of bore).



Impeller Torque	
100 ft. lbs. (13.83 kg-m)	Apply Grease

NOTE: Before installing stub shaft, check pump alignment as outlined on page 5.37-5.37d. If drive shaft, coupler or impeller splines are damages, correct the cause of misalignment.

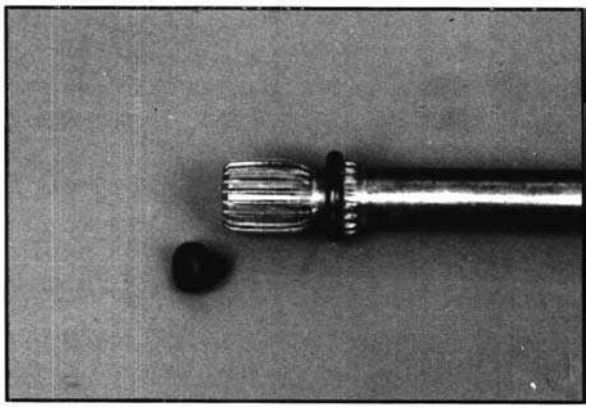
4. Grease and install two new O-rings on stub shaft. Align bearing spacer carefully and push shaft into pump housing. Liberally grease seal collar and push into place slowly and carefully to prevent dislodging of seal springs. The collar can be installed in either direction. Grease stub shaft threads, install impeller and torque to 100 ft. lbs. (13.8 kg-m).



5. If intake scoop and ride plate were removed, or if cavitation or ventilation problems are suspected, review important intake scoop and ride plate installation and sealing on page 5.24b.

1992·1993 Models, Cont.

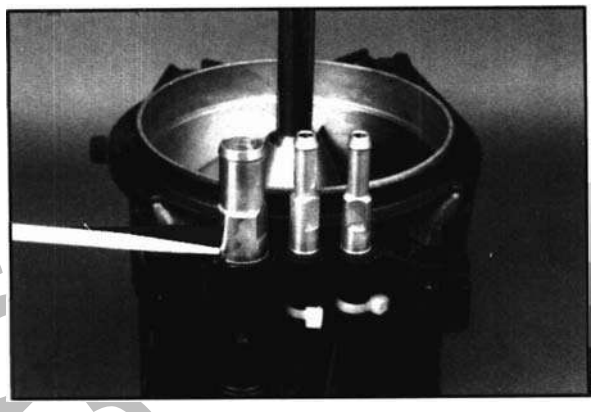
21. Inspect bearing housing bushings and seals. See page 5.39.
22. To prevent damage to bearing housing seals, wrap coupler end of driveshaft splines with electrical tape. Apply grease to tape and install driveshaft. Remove tape when driveshaft is past bearing housing seals.
23. Apply grease to a new driveshaft a-ring and to the splines of the shaft. Install rubber bumpers on ends of shaft. Install shaft in impeller.



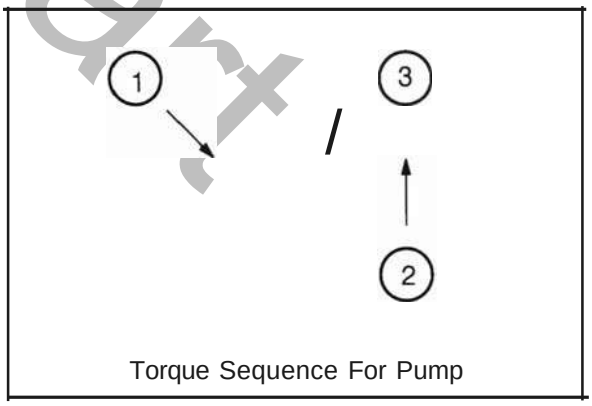
CAUTION:

Review important information regarding pump stud installation on page 5.37c and 5.37d before installing pump.

24. Liberally grease large pump-to-hull a-ring and apply Marine Grade Silicone sealant to a-rings on bilge siphon and cooling water supply fittings. Pushing the pump up to the hull will start the driveshaft splines into the coupler. If the splines aren't lined up, use a wrench on the stub shaft flats to align. Verify that the pump fits flush with the hull. Apply anti-seize to threads of pump mounting studs. Install washers, lock washers, and nuts. Torque in three steps to 28 ft. lbs. (3.87 kg-m) using a criss-cross pattern. Do not use air tools. Do not over-tighten the mounting nuts.



Pump Mounting Nut Torque
Apply Anti-seize
28 ft. lbs. (3.87 kg-m)



Torque Sequence For Pump

25. Apply grease to a new tail cone a-ring and install cone. Apply Loctite™ 242 (Blue) to bolt threads and torque to specifications.

Tail Cone Bolt Torque
Apply Loctite™ 242 (Blue)
72 in. lbs. (.83 kg-m)

26. Install extension housing. Apply Loctite™ 242 (Blue) to bolt threads and torque to 72 in. lbs. (.83 kg-m).

Extension Housing Bolt Torque
Apply Loctite™ 242 (Blue)
72 in. lbs. (.83 kg-m)

FINAL DRIVE/JET PUMP/BILGE SYSTEM
Intake Scoop and Ride Plate Installation

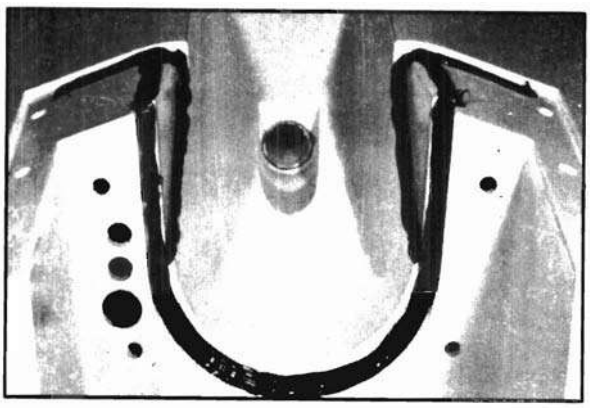
Intake Scoop / Ride Plate Installation and Sealing, All Models

IMPORTANT! The area around the intake scoop and ride plate must be completely sealed in order to prevent ventilation of the pump area (cavitation). Prepare pump housing for installation before applying sealant. See Ventilation/Cavitation page 5.41 for more information.

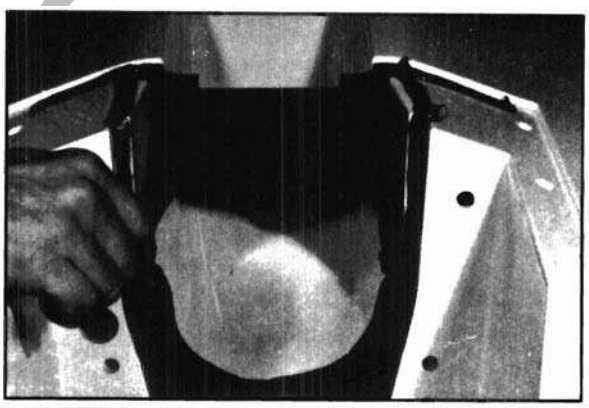
21. If ride plate or intake scoop has been removed, clean *all* old sealant from hull mounting area. Apply a 1/2" (1.3 cm) or larger continuous bead of Marine Grade Silicone sealant to the area shown.

Marine Grade Silicone Sealant

300 ml. Tube - PN 8560054

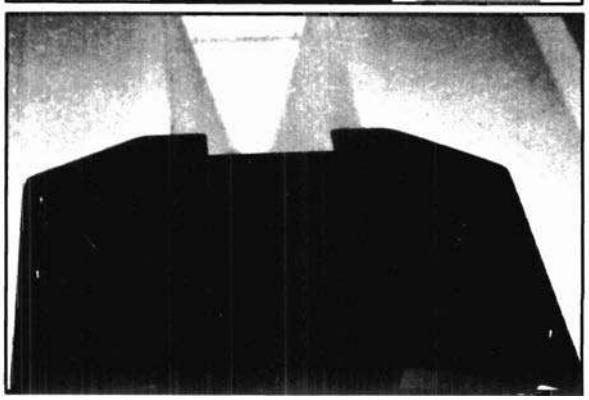


22. Install intake scoop, carefully push into place.



23. Set ride plate in place and secure it with attaching screws. Wipe off any excess sealant inside scoop area so water flow is unobstructed. To ensure precise alignment of the scoop, install the pump (1992-1993) or pump housing (1994 to Current) immediately.

IMPORTANT! Allow sealant to cure for 12 hours before operating the craft.



Ride Plate Screw Torque
Apply Loctite™ 242 (Blue)
8 ft. lbs. (1.11 kg-m)

1994 to Current Models

Modular jet pump design allows removal of many driveline and pump components without removal of the pump housing, which is sealed to the hull.

The following items can be serviced with the pump housing installed in the watercraft:

Impeller (for clearance inspection), intake grate, ride plate, speedometer pitot fitting, steering nozzle, trim nozzle, reverse gate and linkage, pump extension housing, impeller, driveshaft, stub shaft and bearings.

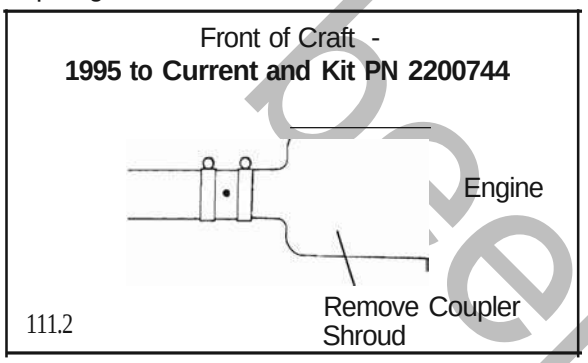
The pump housing must be removed to service the following items:

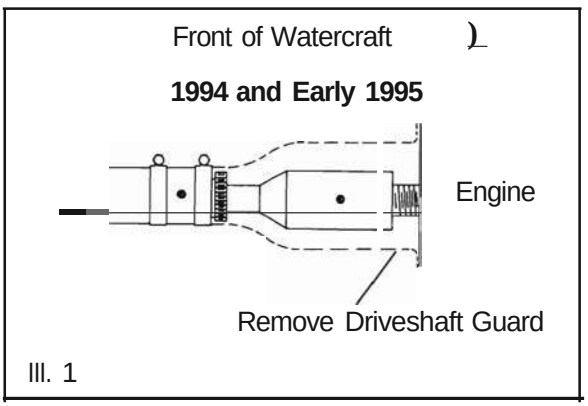
Pump-to-hull O-rings, (bilge siphon fittings and main pump housing) and inlet scoop.

NOTE: The pump can be removed with the intake grate and ride plate installed. However, if pump cavitation is suspected the intake grate, ride plate, and inlet scoop should be removed and re-sealed.

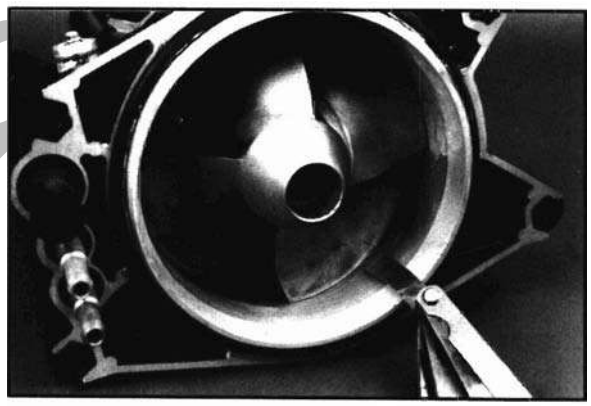
Impeller Clearance

21. Remove lanyard cord and lock plate from engine stop switch. Remove seat and battery hold down straps. Move electrical box aside. Disconnect battery ground (-) cable. Remove drive shaft coupler guard. See Ill. 1 and 2.





22. Remove intake grate and check impeller to housing clearance with a feeler gauge. Measure clearance at leading edge, middle, and trailing edge of each blade. Replace impeller if clearance exceeds service limit at any point. If clearance exceeds service limit with a new impeller, replace pump housing.

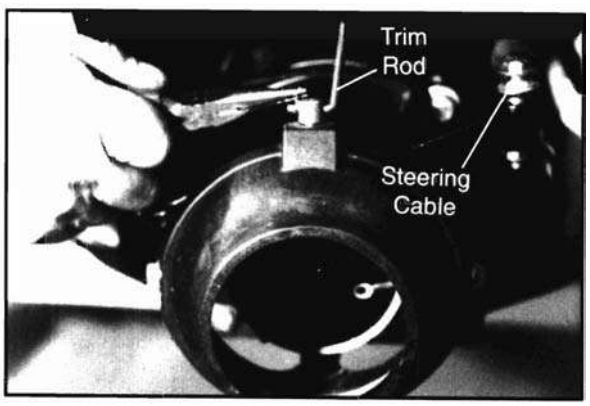


Impeller Clearance

Std: .002 - .008″ (.05 -.20 mm)
Service Limit: .020″ (.5 mm)

Pump Removal

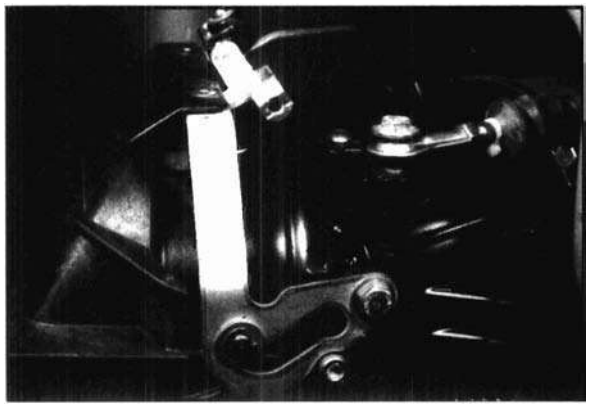
21. Disconnect steering cable end from steering nozzle (A). Remove the Quick Trim link rod. (8)



FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Removal· 1994 to Current Models

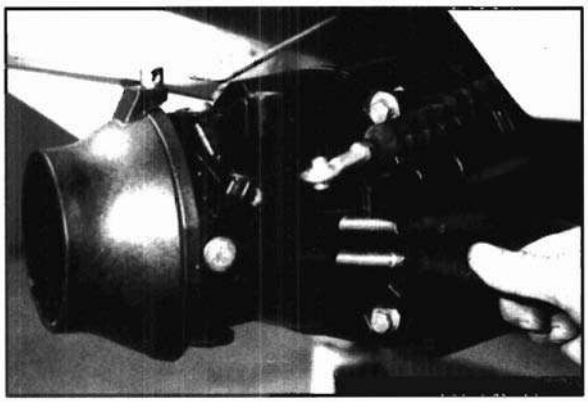
1994 to Current Models, Cant.

21. On models equipped with reverse, the reverse link can easily be removed if shifted into reverse position.

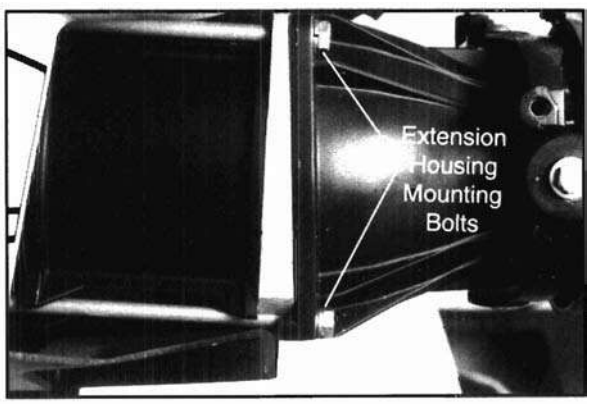


22. Remove bilge siphon hoses from extension housing.

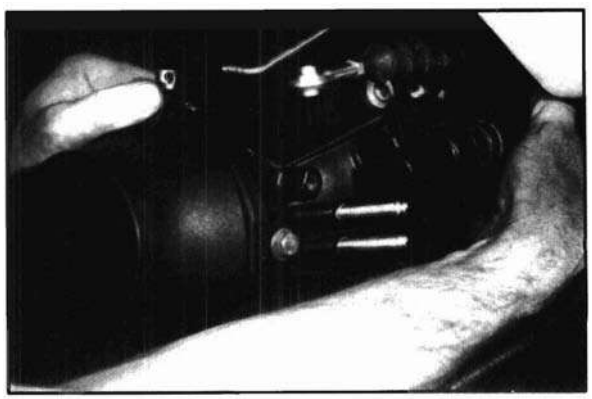
NOTE: On models equipped with an electric bilge pump, the number of siphon hoses will vary. Most 1997 to Current models do not have bilge siphons.



23. Loosen (4) 5/16" mounting bolts. Remove extension housing (and wedge where applicable).



24. Hold water inlet tube (C) toward main pump body at the hull so as not to dislodge the O-ring seal while removing extension housing.



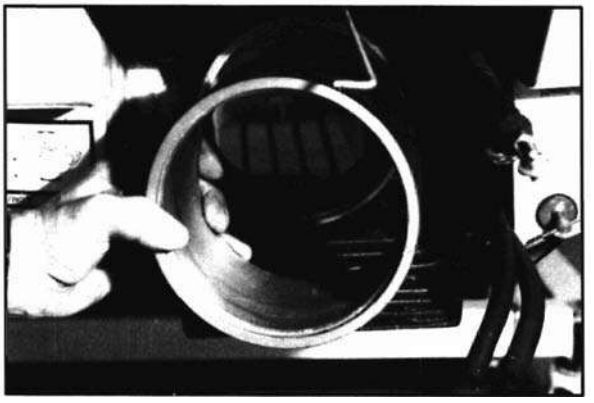
1994 to Current Models

21. Pump removal is easier if an assistant pushes the driveshaft out of the engine coupler (inside hull) while the pump is removed. Note interlocking tabs. They must be correctly aligned during reassembly.

22. Remove pump and shaft as an assembly.

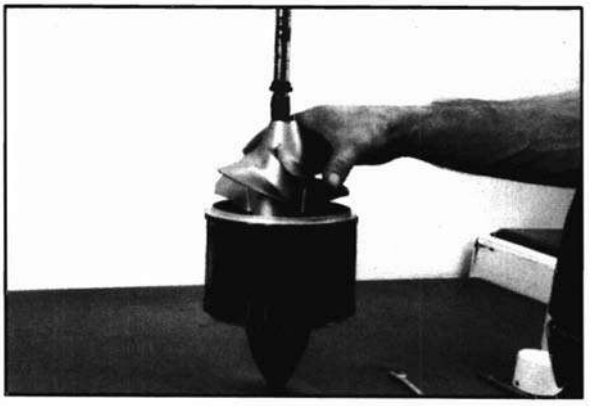
NOTE: The bearing housing (near engine coupler) should be inspected when pump/driveshaft is removed. See page 5.39 for housing removal/inspection procedures.

23. On models with extended pump, remove pump extension.



24. Remove driveshaft from impeller by pulling straight outward.

NOTE: If the pump housing, intake scoop, or ride plate must be removed, refer to page 5.35.

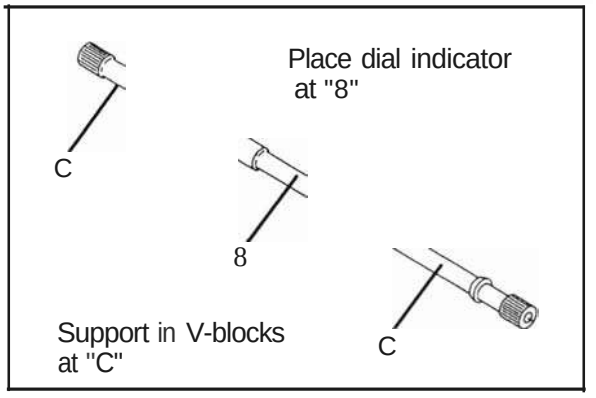


Drive Shaft Inspection

21. Clean driveshaft and support in V-blocks as shown (C). Measure runout by rotating shaft and observing dial indicator at point "8". Replace if runout exceeds the service limit.

NOTE: Excessive driveshaft runout can cause vibration, bearing, and spline failure. See Pump/Final Drive Troubleshooting at the end of chapter 2.

Drive Shaft Runout
Service Limit: .005" (.13mm)

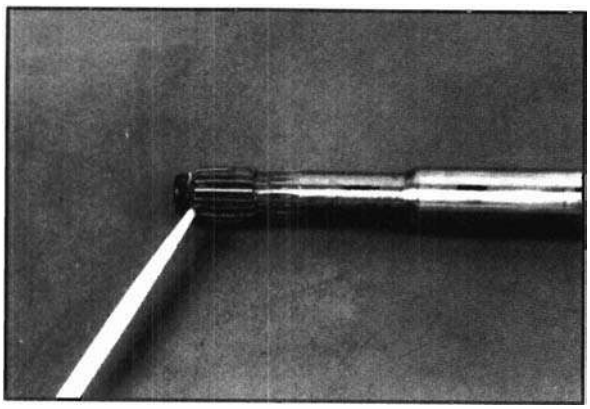


Pump Disassemblyllnspection (1994 to Current Models)

1994 to Current Models

Drive Shaft Inspection, Cont.

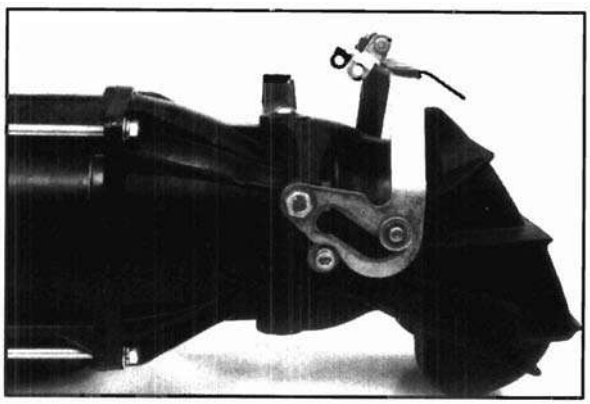
1. Inspect driveshaft splines and splines inside engine drive coupler and impeller carefully for wear or damage. Replace worn parts. Rubber bumpers control driveshaft end play. Replace if worn, cracked or damaged.



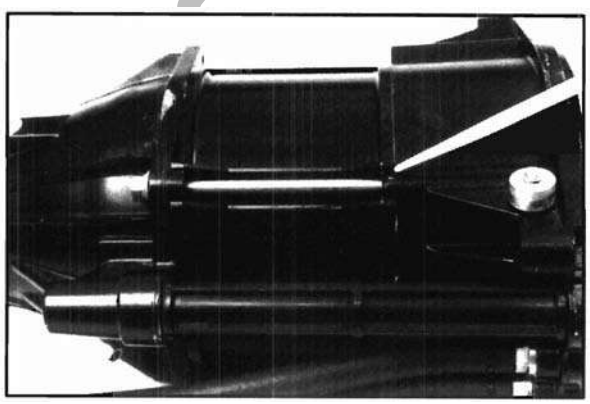
NOTE: If drive shaft, impeller, or coupler splines are worn or damaged, improper pump-to-hull, or pump-to-engine alignment should be suspected. Refer to Pump/Drive shaft Alignment on page 5.37 for more information.

Drive Shaft End Play
.100-.200" (2.54-5.08mm)

2. Inspect bolts and pivot bushings, steering nozzle, trim nozzle, and reverse gate linkage for wear, cracks, or damage. Replace worn parts. Remove these components as necessary for further pump disassembly.



3. Note position of interlocking tabs in section housings. They must be correctly aligned during reassembly.

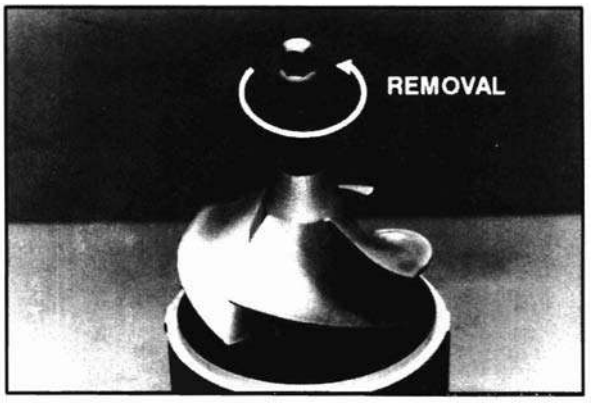


1994 to Current Models

Drive Shaft Inspection, Cant.

4. Remove tail cone screws (3) and tail cone. Inspect O-ring seal located in housing and replace if damage is evident.

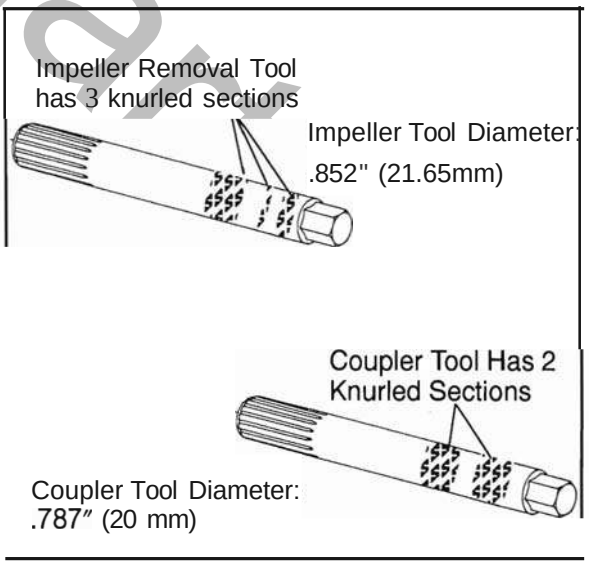
5. Mount stub shaft flat surfaces in a vise to keep the shaft from rotating.



6. Install impeller removal tool and turn counterclockwise to remove. The tool can be identified by 3 knurled sections on shaft (diameter is .852"). Inspect impeller and stator vanes for cracks, wear, or damage and replace if necessary.

Impeller Removal Tool

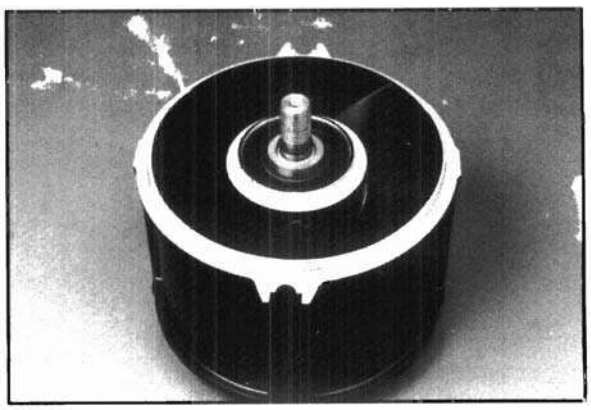
PN 2871036



1994 to Current Models

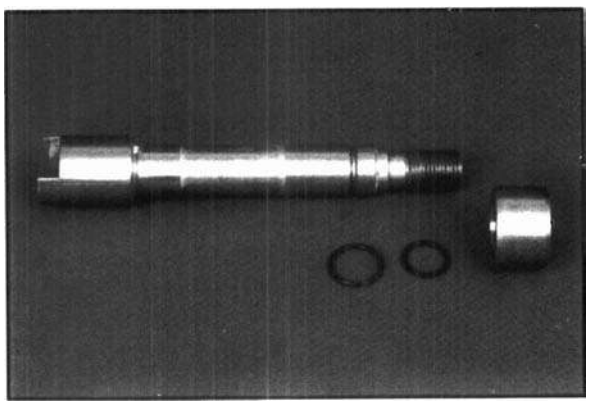
Drive Shaft Inspection, Cont.

1. Remove assembly from vise. Using a soft face hammer, tap stub shaft out of housing.

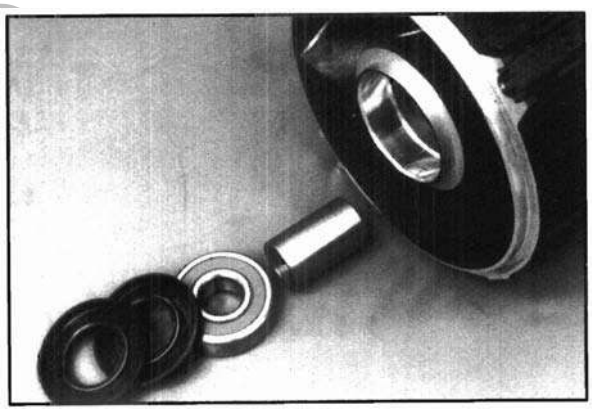


2. Inspect shaft and collar for wear, scratches, or damage. Install new a-rings upon reassembly.

NOTE: Seals, bearings, and a-rings should be replaced if removed. Heat the impeller housing evenly with a heat gun to ease removal of bearings in next step. Remove tail cone a-ring before applying heat.

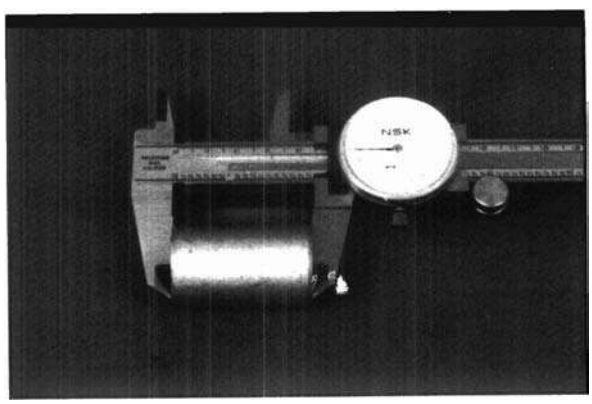


3. Using a brass or aluminum drift, tap bearing spacer to one side enough to expose inner bearing races. Drive out tail cone end bearing and remove spacer. Drive other bearing out removing seals with bearing. See page 5.31 for bearing and seal installation procedure.



4. Measure spacer length with a Vernier caliper. Replace if worn beyond service limit. **If** the spacer is too short, the bearings will be side loaded and premature wear will result.

Bearing Spacer Length
Service Limit: 1.730" (43.94 mm)



1994 to Current Models
Pump Assembly

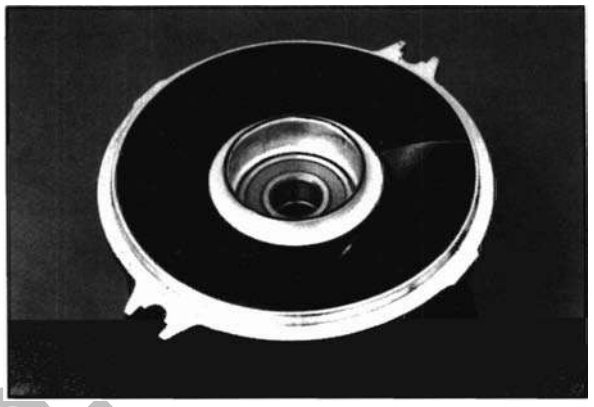
NOTE: To ease installation, wrap bearings in wax paper and chill in a freezer for 30 minutes or longer. Warm the impeller housing evenly with a heat gun or a propane torch. DO NOT OVERHEAT.

1. Press or drive one bearing into place until it bottoms against the shoulder in the pump housing. Apply grease to center bearing spacer and install.

CAUTION:

Do not drive on the inner race. Bearing damage will result. Drive on outer race only.

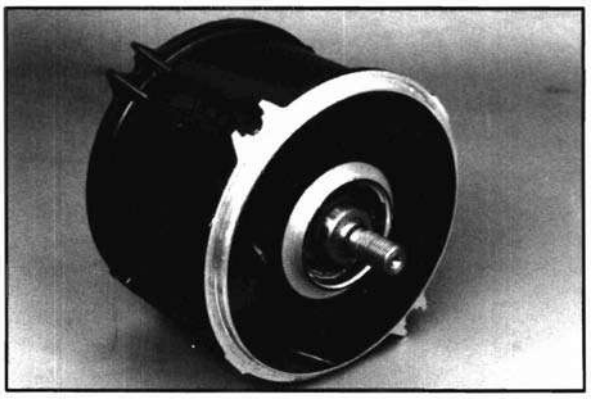
2. Insert stub shaft to center spacer and press remaining bearing into opposite end of housing. Remove stub shaft.



3. Apply marine grease to seal lips and also between the two seals. Install two new oil seals as shown with both springs and lips up and visible (toward impeller). Press seals to bottom of chamfer on seal bore (about 1/8"/.32 cm beyond end of bore).

NOTE: Check pump alignment before installing stub shaft and impeller. See page 5.37-5.37d.

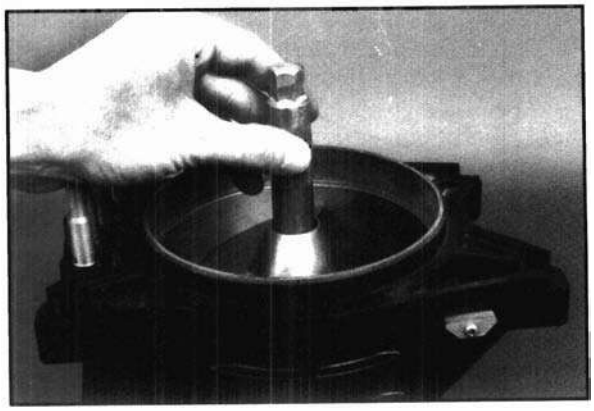
4. Grease and install two new O-rings on stub shaft. Align bearing spacer carefully and push shaft into pump housing. Liberally grease seal collar and push into place slowly and carefully to prevent dislodging seal springs. The collar can be installed in either direction.



FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Installation (1994 to Current Models)

1994 to Current Models

5. Mount stub shaft flats in a vise. Apply grease to threads of stub shaft, install impeller and torque to specifications.

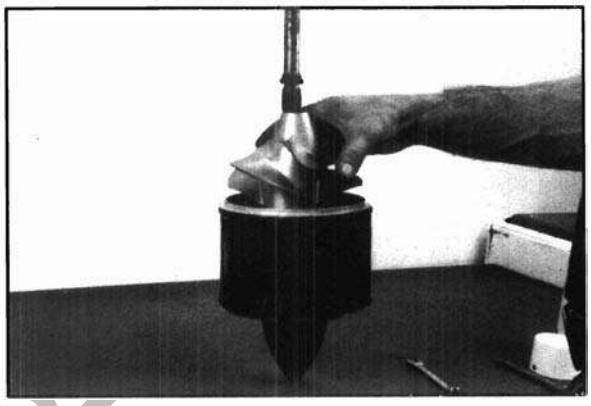


Impeller Torque
Apply Grease
100 ft. lbs. (13.83 kg-m)

Pump Installation

NOTE: Before installing pump review pump alignment information on page 5.37 - 5.37d.

1. Prevent damage to bearing housing seals by wrapping coupler end of driveshaft splines with electrical tape. Apply grease to tape and install driveshaft. Remove tape when driveshaft is past seals.



2. Liberally grease a new driveshaft O-ring and splines of shaft. Install shaft in impeller.

3. Install pump extension (where applicable), pump housing, and impeller and driveshaft assembly while lining up splines in drive coupler. If splines are not aligned, turn stub shaft with a wrench slowly while pushing inward on pump. Push assembly completely into place on pump housing while aligning interlocking tabs.

4. Apply grease to new stub shaft O-ring(s) and tail cone extension O-ring on extension pump models and install cone. Apply Loctite 242 (Blue) to bolt threads and torque to specifications.

Tail Cone Bolt Torque
Apply Loctite™ 242 (Blue)
72 In. lbs. (.83 kg-m)

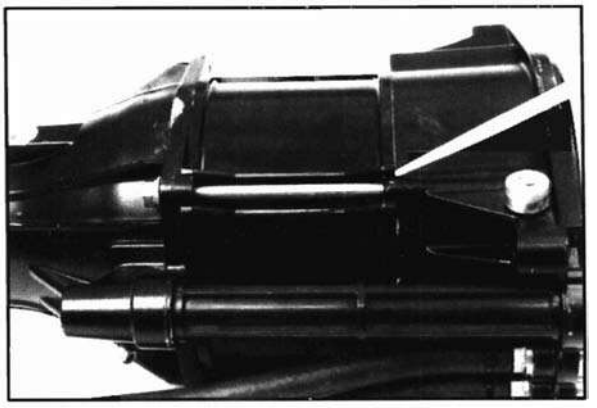
1994-1996 Models

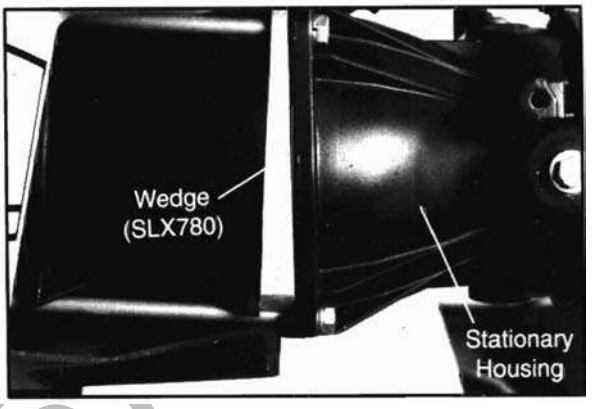
5. Apply a light film of grease to a new O-ring on the cooling water supply pipe.

6. Align interlocking tabs (0) and install stator housing to pump housing. Apply Loctite 242 (Blue) to the four 5/16" mounting bolts and torque to specification.

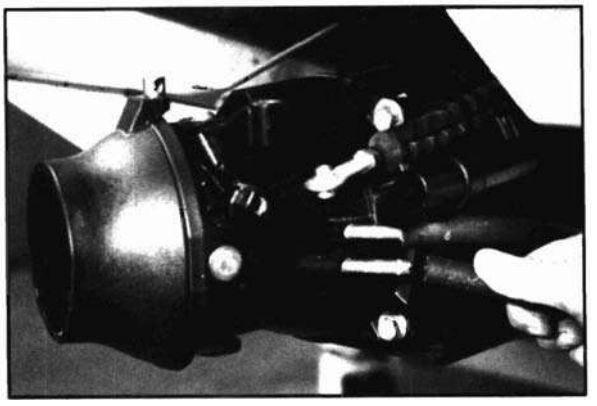
NOTE: Install wedge between stationary housing and stator housing (where applicable) . Thick edge is positioned toward bottom, and corner tabs must align. See photo at right.

Stator Section Mounting Bolt Torque
Apply Loctite™ 242 (Blue)
18 ft. lbs. (2.49 kg-m)





7. Install bilge siphon lines and secure with new cable ties. Tighten securely.



1994 to Current Models

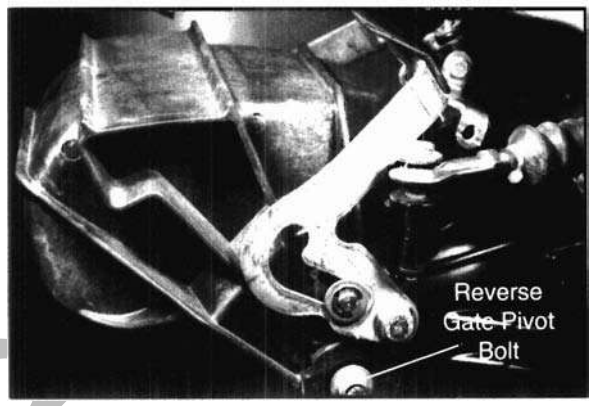
1. Install steering nozzle. Apply Loctite 242 (Blue) and torque to specifications.

Steering Nozzle Bolt Torque
Apply Loctite™ 242 (Blue)
18 ft. lbs. (2.49 kg-m)

2. Install trim nozzle and reverse mechanism, if applicable. Apply Loctite 242 (Blue) and torque to specifications. Inspect reverse cable adjustment. See Maintenance section.

Trim Nozzle Bolt Torque
Apply Loctite™ 242 (Blue)
18 ft. lbs. (2.49 kg-m)

Reverse Gate Actuator Pivot Bolt Torque
14 ft. lbs. (1.94 kg-m)
Reverse Gate Pivot Bolt Torque
14 ft. lbs. (1.94 kg-m)



3. Thoroughly grease bearing housing and coupler. Refer to pages 5.38 and 5.39.

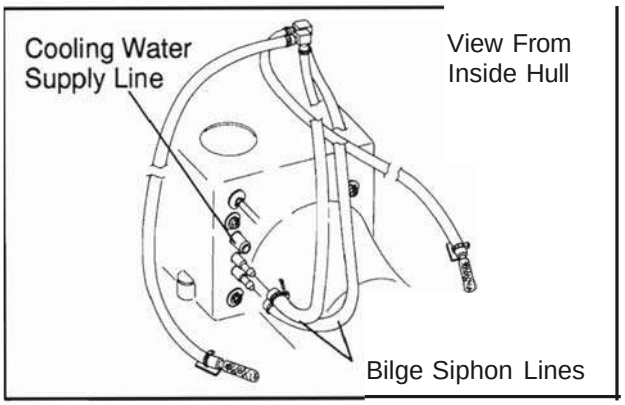
1994 to Current Models

Pump Housing Removal

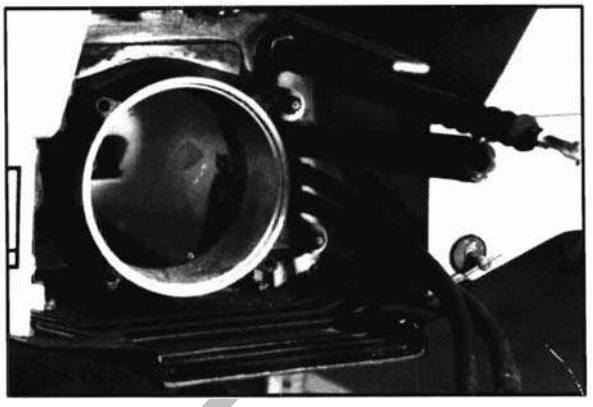
1. Remove pump and driveshaft. Refer to page 5.26 for procedure.

2. Remove bilge siphon and cooling water supply lines inside the hull.

NOTE: On some models, there is only one siphon hose and the electric bilge pump. Other models have only the electric bilge pump.



3. Remove pump housing nuts and washers (4) evenly in a criss-cross pattern. Pull the pump housing straight out to remove.



Intake Scoop / Ride Plate Installation and Sealing

IMPORTANT! The area around the intake scoop and ride plate must be completely sealed in order to prevent ventilation of the pump area. See Ventilation/Cavitation page 5.41 and pump alignment information on page 5.37 for more information.

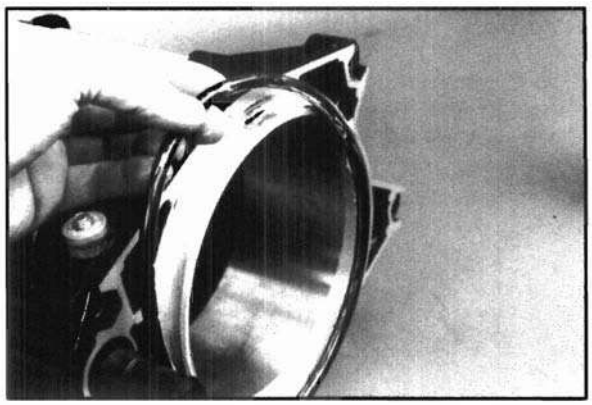
1994 to Current Models

Pump Housing Installation

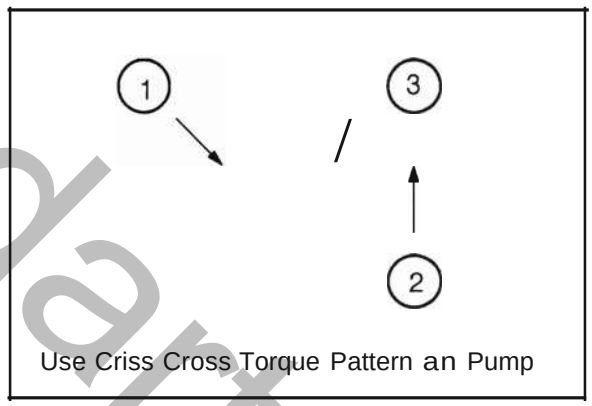
CAUTION:

Review important information regarding pump stud installation on page 5.37c and 5.37d *before* proceeding with pump housing installation'

1. Liberally grease large pump-to-hull a-ring and apply Marine Grade Silicone sealant to a-rings on bilge siphon and cooling water supply fittings.
2. Apply anti-seize to threads of pump mounting studs.
3. Install pump housing and hold inward against hull.



4. Torque pump housing nuts in three steps to 28 ft. lbs. (3.87 kg-m) using a criss-cross pattern. Do not use air tools. Do not over-tighten mounting nuts or hull damage may occur.



Use Criss Cross Torque Pattern an Pump

Pump Housing Mounting Nuts
Apply Anti-seize
28 ft. lbs. (3.87 kg-m)

Marine Grade Silicone Sealant
300 ml tube PN 8560054

The drive shaft must be properly aligned to prevent premature wear of driveline components. Always inspect drive shaft alignment if drive shaft, engine drive coupler, or impeller spline damage is evident. Wear or stripping of *engine coupler* splines is usually caused by engine misalignment. Wear or stripping of splines at the impeller is usually caused by *pump-fa-hull* misalignment. Inspect drive shaft alignment whenever engine has been removed or wear is evident on coupler, drive shaft splines, impeller splines, or through-hull fitting/bearing carrier.

Symptoms of drive shaft mis-alignment include:

- Excessive drive line noise or vibration;
- Premature wear of driveshaft, drive coupler, or impeller splines;
- Through-hull fitting or bearing housing failure.

Pump Alignment Inspection Procedure

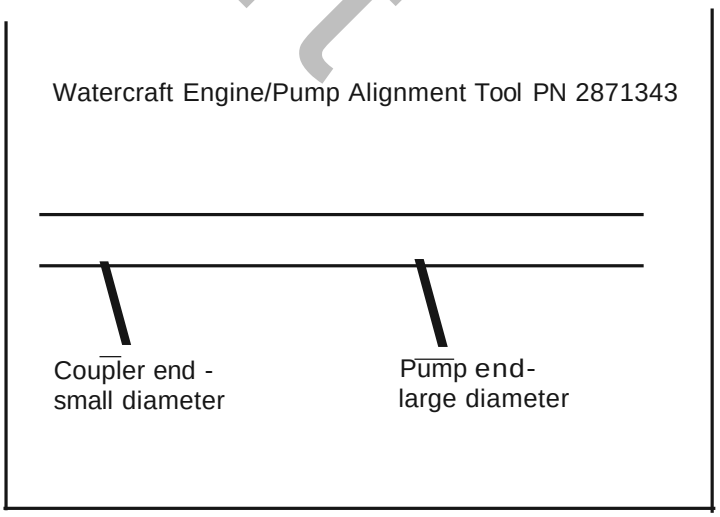
1. Disconnect lanyard cord lock plate from engine stop switch. Remove battery negative cable.
2. Remove driveshaft/pump assembly. (See pump removal this section).
3. Remove bearing housing from through-hull fitting.
4. Remove tail cone.
5. Remove impeller and stub shaft from pump housing. Inspect bearings for wear or damage and replace if necessary. See Pump Disassembly/Inspection this section.
6. Assemble pump without stub shaft, impeller, or tail cone.
7. Install pump assembly to hull (1992 and 1993 models) or stator housing to pump housing (1994 to current). Tighten mounting nuts to 28 ft. lbs. (3.86 kg-m) (1992 and 1993 models) or mounting bolts to 18 ft. lbs. (2.48 kg-m) (1994 and 1995 models).

Alignment Tool PN 2871343

1992-1993 Pump Mounting Bolt Torque 28 ft. lbs. (3.86 kg-m)

1994-Current Stator Housing Mounting Bolt Torque – 18 ft. lbs. (2.48 kg-m)

8. Install alignment tool into pump bearing housing with the smaller diameter coupler end facing toward engine.
9. Slide coupler end of alignment tool into drive coupler.
10. If engine and pump are properly aligned, the tool will slide freely into the engine coupler.
11. If mis-alignment is evident, determine the probable cause of misalignment from the following chart and correct the condition.



Pump Alignment Inspection, Cont.

Symptoms	Probable Cause	Repair Required
Splines worn or stripped at engine coupler end of drive shaft 'Jr inside of coupler; through-hull fitting failure or rapid wear of bushings in bearing housing.	Engine misaligned to pump Loose or broken engine mounts Engine loose on mount plate	Shim engine mounts Tighten cr replace mounts Tighten engine to mounting plate bolts
Splines worn or stripped at impeller end of drive shaft or inside impeller.	Pump mounting bolts loose Pump misaligned with hull (check for gap between hull and pump housing as shown on Page 5.37b).	Remove, re-seal, and install pump. Torque fasteners. Determine cause of pump to hull misalignnent: -Pump mounting studs installed incorrectly. See stud installation on page 5.37b. -Hull damage from over tightened or incorrectly installed studs. See Page 5.37b. -Scoop improperly installed (Remove and re-install inlet scoop). Ride plate should be flush with bottom of hull.
Excessive drive line vibration	Drive shaft runout excessive Loose or broken engine mounts Engine loose on mount plate Pump-to-hull or engine-to-pump alignment incorrect	Inspect d-ive shaft runout Tighten or replace mounts Tighten engine to mounting plate bolts See above

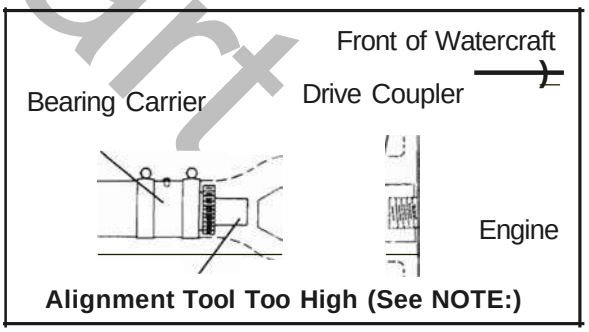
Engine Alignment Inspection (Vertical)

1. If vertical mis-alignment is evident, loosen engine mount nuts and add or remove shims between mount plate and rubber engine mounts (equally on both sides) to raise or lower the coupler.

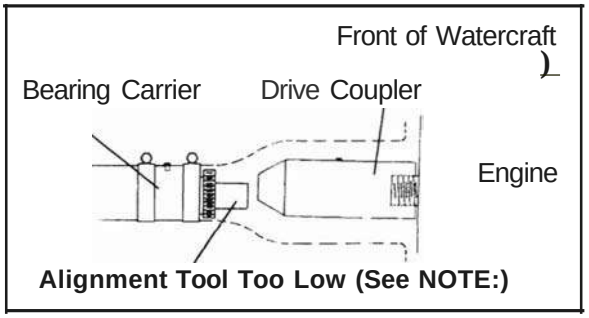
NOTE: Before shimming engine, be sure misalignment is not caused by a problem in the pump mounting area, such as loose mounting fasteners; improperly installed pump mounting studs; hull damage, etc.

2. To raise coupler: Add shim(s) to the rear mounts or remove shim(s) from front. To lower coupler: Remove shim(s) from rear mounts or add shim(s) to front. The number of shims installed in production is written next to each mount in permanent marker on late models.

Alignment Shims
PN 7555860



Alignment Tool Too High (See NOTE:)



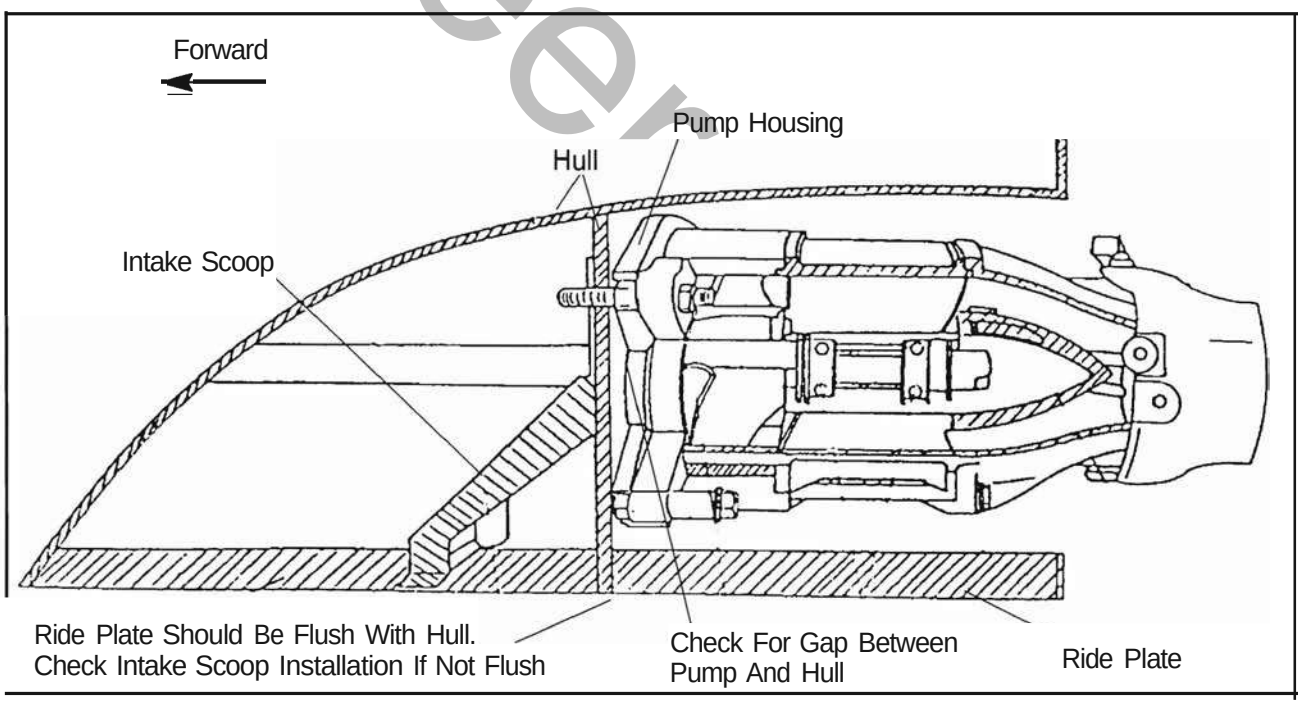
Alignment Tool Too Low (See NOTE:)

Pump-To-Hull Alignment Inspection
(Vertical or Horizontal Drive Shaft Misalignment)

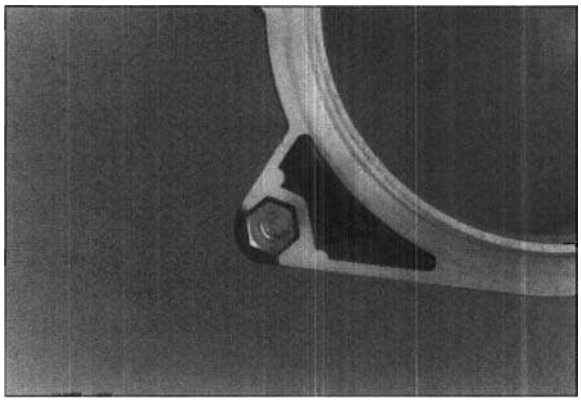
The pump must be mounted flush with the hull and intake scoop to ensure proper driveshaft alignment. Some of the causes of mis-alignment are listed below. A mis-aligned pump increases stress on driveline components such as the impeller and driveshaft (stripped splines), and pump bearings. Ventilation of the pump cavity may also occur due to leakage of the large pump sealing O-ring. Check pump-to-hull alignment after installing pump housing to hull or whenever splines are stripped on the impeller end of the driveshaft. A quick method of checking for a pump mis-alignment problem is measuring the gap between the hull and pump housing with a feeler gauge. The gap should not exceed .010" (.25mm). Pump-to-hull misalignment can be caused by:

- Improperly installed intake scoop (check ride plate - it should be flush with bottom of hull).
- Improperly installed studs or damage to the hexagonal recess in housing (see page 5.37c and 5.37d).
- Hull damaged in pump mounting area. Damage to hull may result if pump mounts are over-tightened (often due to the use of air tools), or if studs are improperly installed in pump. If the hex portion of the stud is not engaged properly in the pump housing recess, the hex portion of the stud may protrude past the edge of the pump housing, and prevent the housing from seating fully against the hull.

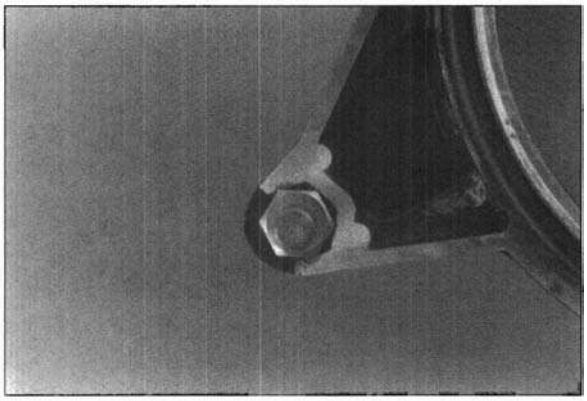
Review the information on pump alignment below and on Page 5.37c and 5.37d.



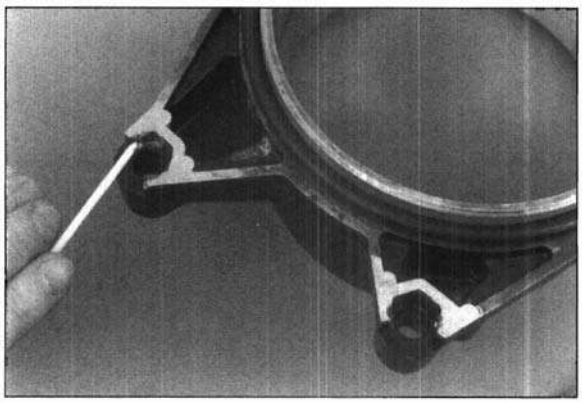
Pump Alignment Inspection, Cant.



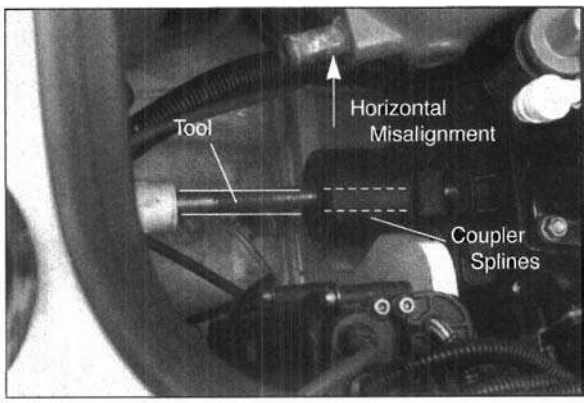
Stud must be fully engaged in hex.



This stud has rotated in hexagonal casting, causing damage to pump housing.



Pump housing damage can be caused by improper stud / pump housing installation



Alignment bar indicated mis-alignment to left (port). This may be caused by improper stud installation.

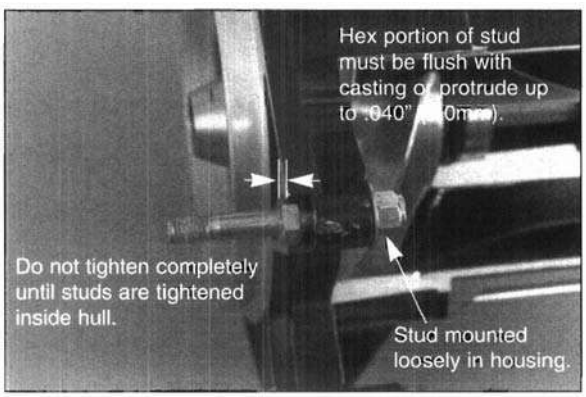
Pump Stud Installation

It will be necessary to remove studs from the hull if pump-to-hull mis-alignment is evident, or if hull or pump damage has occurred. Use the following procedure to install the studs and pump ('92 and '93 models) or pump housing on 1994 to Current models. The pump mounting surface must be clean and flat before installing pump housing.

1. Place stud in pump housing (long end first) and install flat washer, lock washer (where applicable) and nut.

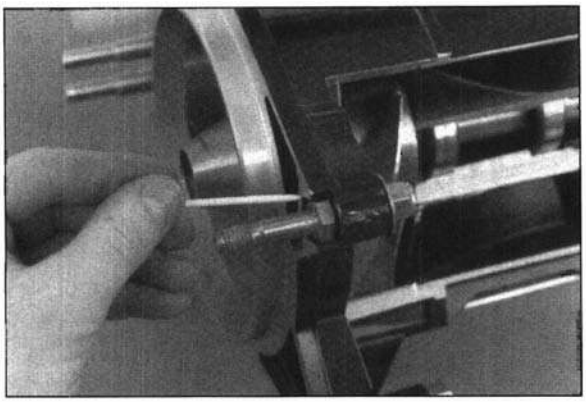
2. Tighten nut while aligning hex portion of stud with recess in housing. Tighten until hex of stud is flush with pump housing mounting surface or protrudes *slightly* - no more than .040" (1 mm). Do not tighten completely at this time.

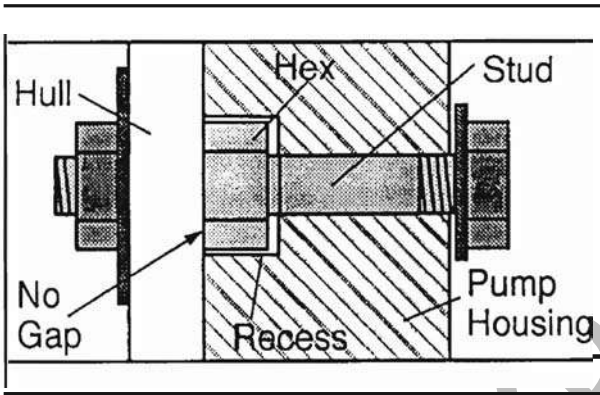
NOTE: The studs must not be tightened completely until the pump housing is installed in hull and mounting stud nuts inside hull are tight.



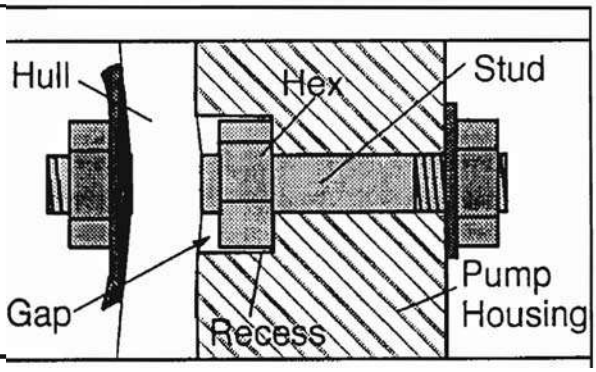
Pump Stud Installation, Cant.

3. If stud is tightened completely in housing *before* the stud nuts are tightened inside the hull, a gap may be created between the hex portion of the stud and the pump mounting surface, causing stress at the pump mounting surface around the stud as shown in Ill. 2 below.





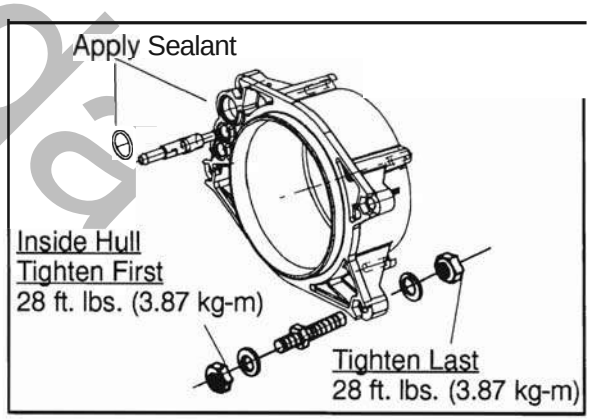
111.1 **CORRECT**



111.2 **INCORRECT**

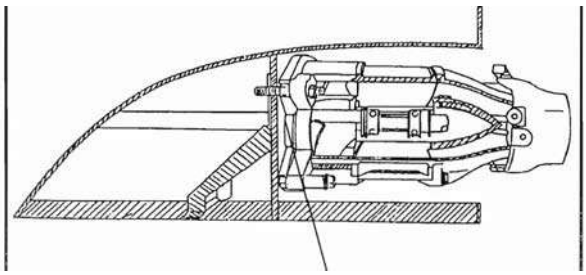
4. Grease the large pump sealing O-ring and apply Marine Grade Silicone Sealant (PN 8560054) to the bilge siphon tube(s), cooling water supply tube, and studs (to seal stud in hull). Install pump.

5. Hold pump inward tightly against hull while an assistant lightens stud mounting nuts *inside* hull. Torque evenly in three steps to 28 ft. lbs. (3.87 kg-m).



6. Torque pump mounting nuts (outside of hull) evenly in three steps to 28 ft. lbs. (3.87 kg-m) using a criss cross pattern.

7. Check to be sure pump housing is tight against hull. To inspect pump-to-hull fit, measure the gap between the hull and pump housing with a feeler gauge. If a gap is present it should not exceed .010" (.25mm).



Driveshaft Lubrication

CAUTION:

Grease the drive shaft coupler any time water in the watercraft has been at or above the coupler level to avoid damage to these parts. Lubricate after every 25 hours of operation (every 15 hours if operated in salt water). See Drive Shaft Coupler lubrication below. Bonded rubber couplers - drive shaft must be removed to grease splines. See maintenance guidelines in Maintenance Section, and refer to drive shaft removal in this section.

Be sure to lubricate drive shaft periodically and after reassembly.

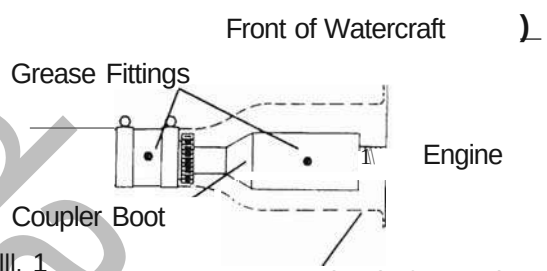
WARNING

The plastic drive shaft shroud is designed to protect you from dangerous moving parts. In order to lubricate the driveshaft coupler, the driveshaft shroud must be rotated. Follow the instructions below in order to avoid personal injury.

Driveshaft Coupler / Bearing Housing Lubrication

1. Remove lanyard cord and lock plate from the engine stop switch.
2. Remove seat. Remove battery ground (-) cable.
3. Loosen clamp holding plastic driveshaft shroud in place and rotate it 180° (See Ill. 1).
4. Solid Couplers - turn driveshaft coupler until grease fitting is accessible. Bonded rubber couplers - drive shaft must be removed to grease splines. See maintenance guidelines in Maintenance Section, and refer to drive shaft removal in this section.
5. Using a grease gun with Polaris grease gun adaptor lubricate coupler at the grease fitting until the coupler boot just begins to expand. Lubricate bearing housing at grease fitling until grease purges past the seals. Use *only* Polaris Premium Marine or All Purpose grease.

1992-1994 **Solid Coupler**
(Grease at fitting)



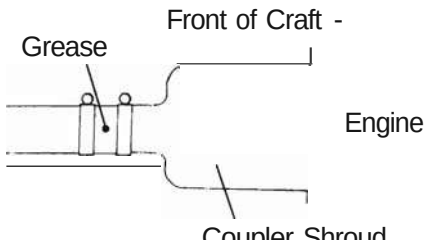
Ill. 1

Polaris Premium All Season Grease

14 oz. Tube PN 2871423
3 oz. Tube PN 2871322

Grease Gun Adaptor PN 2871174

Bonded Rubber Coupler
(Must remove drive shaft to grease)



Late 1995 to Current

Driveshaft Coupler / Bearing Housing Lubrication, Cont.

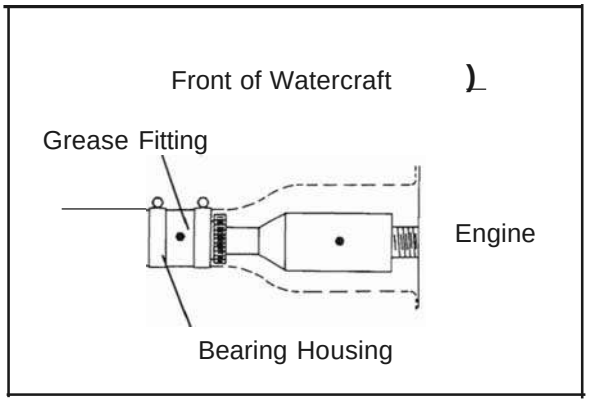
6. Reposition driveshaft shroud (open side down) and torque clamp screw to specifications.

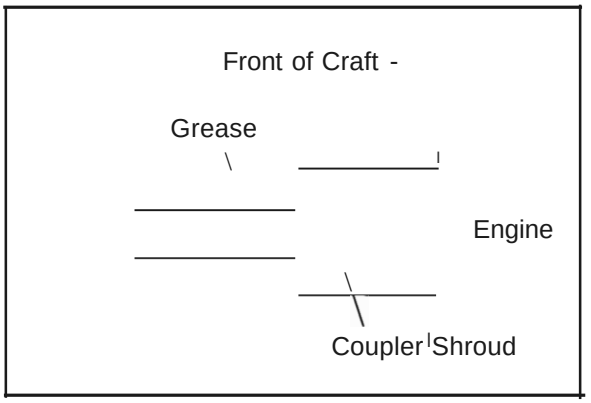
Drive Shaft Shroud Clamp Torque

20-25 in. lbs. (.23-.29 kg-m)

7. Reconnect battery ground (-) cable.

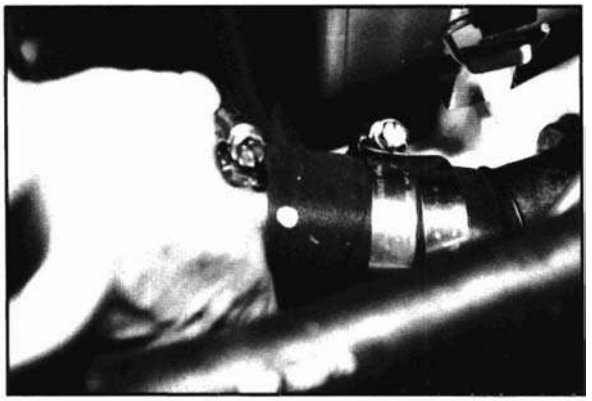
8. Reinstall seat.





Bearing Housing Removal/Inspection

1. With driveshaft and pump removed, loosen clamps securing housing assembly to through-hull fitting.



2. Inspect bushings and seals in bearing housing assembly for wear or damage that may allow water to leak into hull. The housing cannot be rebuilt. Replace as an assembly if wear is evident.

3. Check sealing and bearing surface on driveshaft for wear, nicks or damage that may accelerate seal or bushing wear.

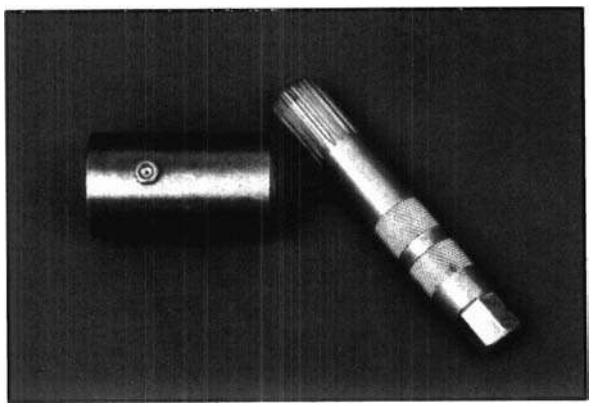
Coupler Removal

Driveshaft Coupler Removal

1. Solid engine driveshaft couplers can be removed with coupler removal tool, identified by 2 knurled sections on shaft, or by measuring the diameter (20mm or .787"). See Engine section page 4.36 (for removal of solid couplers) or 4.72 (for removal of bonded rubber couplers).

Drive Shaft Coupler Removal Tool
(For Solid Couplers Only)

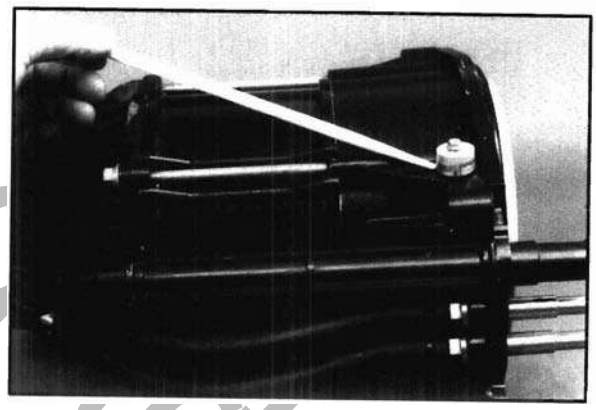
PN 2871037



Sacrificial Anode

A zinc sacrificial anode is in place on all models on the pump housing. 1992 and 1993 models have an additional anode located inside the crankcase beneath the magneto end cylinder. The purpose of these anodes is to prevent corrosion of metal parts due to electrolysis. The mounting surfaces must be clean and the mounting bolt tight to maintain a good connection between the pump and anode.

1. Periodically inspect anode for excessive wear.
2. Check bolt to be sure it is tight. If the bolt is loose, remove anode and clean mounting surfaces on pump and anode.
3. Apply dielectric grease to bolt threads and contact surfaces.
4. Tighten bolt securely.



If a watercraft exhibits poor performance, high engine RPM with little forward speed or power, inconsistent RPM, or difficulty pulling skiers out of the water, pump ventilation or cavitation may be the cause.

Ventilation

Ventilation results when air enters the pump inlet tract and is compressed by the impeller, causing a reduction in thrust and an increase in engine RPM. Small leaks are often difficult to diagnose. A hole or crack the size of a pin in the sealed area around the pump intake tract is enough to cause ventilation.

Some possible sources of air are:

1. Intake scoop - An improperly sealed intake scoop is the most common cause of ventilation. Make sure the scoop has a complete bead of Marine Grade silicone sealer all the way around without any gaps or pin holes. Sometimes, small leaks in the silicone sealer around the intake scoop are hard to detect with a visual inspection. The following method may make it easier to see. See page 5.23 for scoop installation.

1. Turn high speed fuel screws out (counterclockwise) 1/2 turn, and operate the craft.
2. Remove intake grate and look for exhaust trail (black smoke path) in the area around the scoop.
3. Remove intake scoop and re-seal with a complete bead of Marine Grade silicone sealant. Refer to illustration below for critical sealing points in the pump area.
4. Reinstall pump, ride plate, and intake grate and set high speed screws back to original position.

2. Ride plate - The ride plate must be completely sealed in the area around the intake scoop, and also in the area where the hull meets the pump cavity. Refer to Page 5.23.

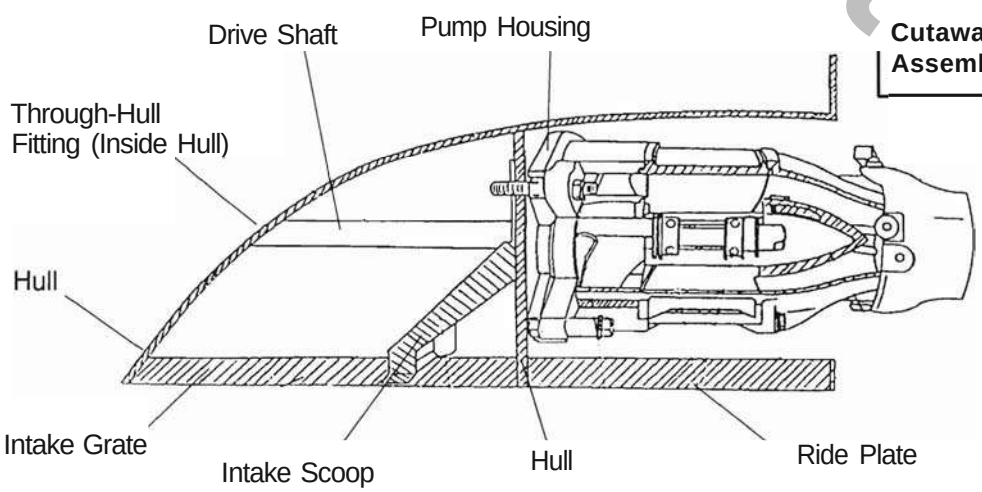
3. Drive shaft bearing housing or through hull fitting - If the drive shaft bearing carrier seals are worn or damaged, air may be drawn into the pump from the engine compartment. Also inspect the through-hull fitting. The entire circumference of the fitting must be sealed to prevent water from entering the hull, and air from entering the pump. Refer to page 6.33 for through hull fitting repair.

4. Incorrectly mounted pump (pump sealing O-ring leakage). This can be caused by a damaged pump sealing O-ring, an improperly installed intake scoop or a misaligned pump (there should be no detectable gap between pump housing and hull). See page 5.37 - 5.37d.

Cavitation

Cavitation results when a low pressure area is created in the vicinity of the impeller blades, causing the surrounding water to boil or more accurately, the gas bubbles within the water implode with a destructive force. Cavitation may be caused by cracked, damaged, bent or broken impeller blades, or an excessively worn impeller or housing (check impeller clearance).

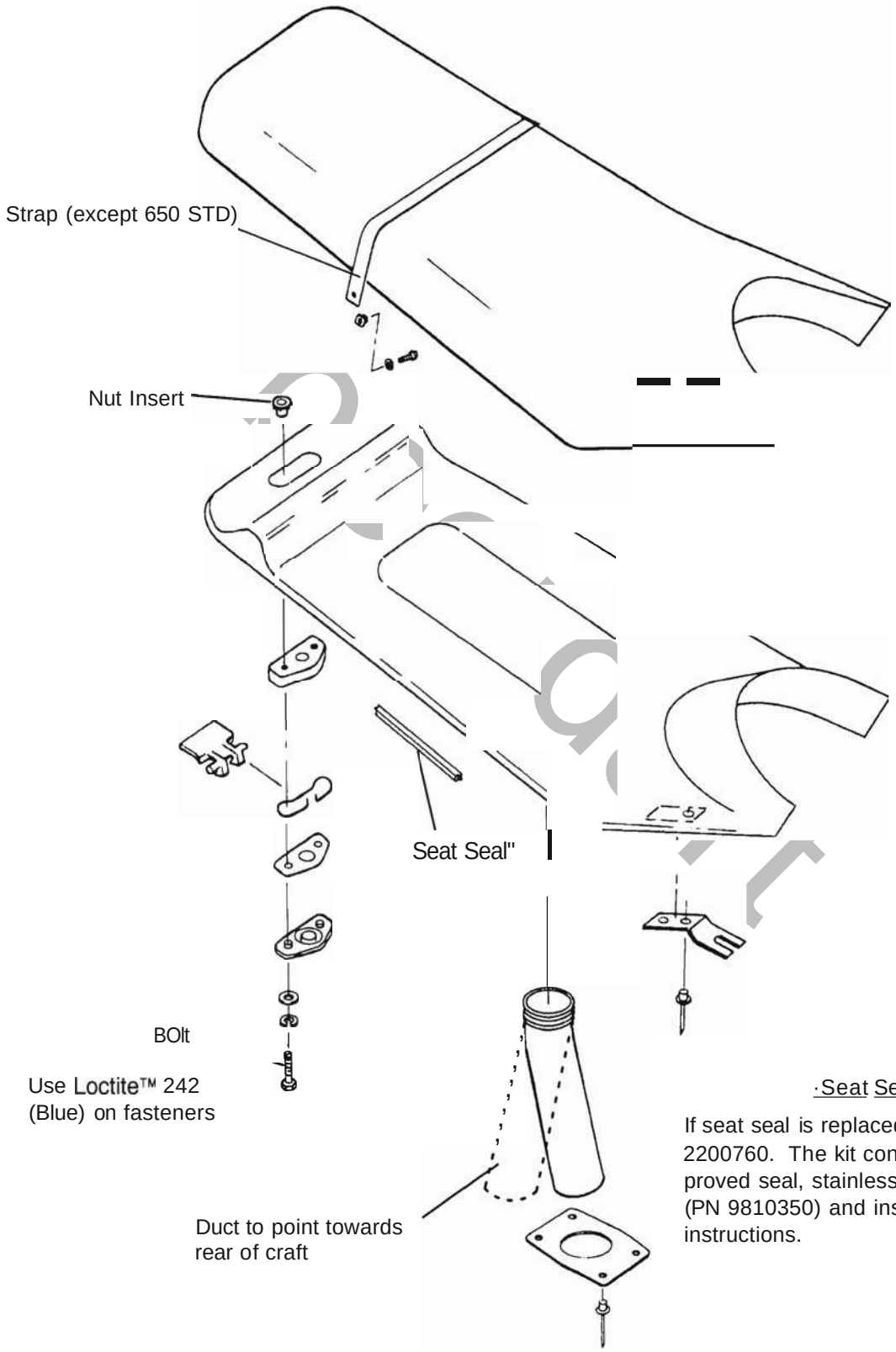
Ventilation or cavitation can drastically reduce the amount of output thrust produced by the pump. Evidence of either problem may appear as burn marks on the impeller and stator vanes in the pump.



Cutaway View Of Pump Assembly - Sealing Points

CHAPTER 6
HULL/DECK, STEERING AND CONTROLS

1992·1995 SL650, SL650 STD, SL750, 1996 to Current SL700, SL780

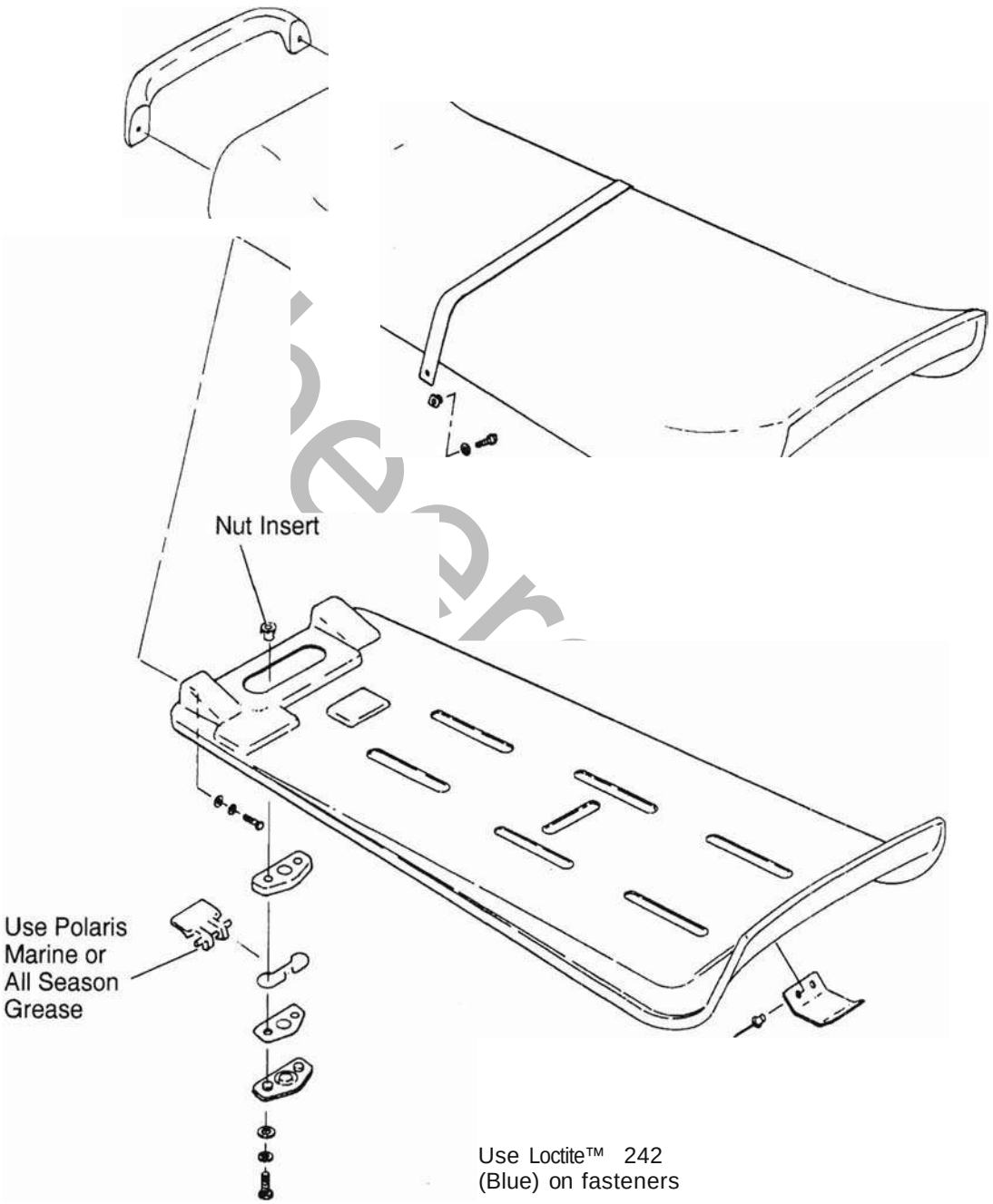


·Seat Seal

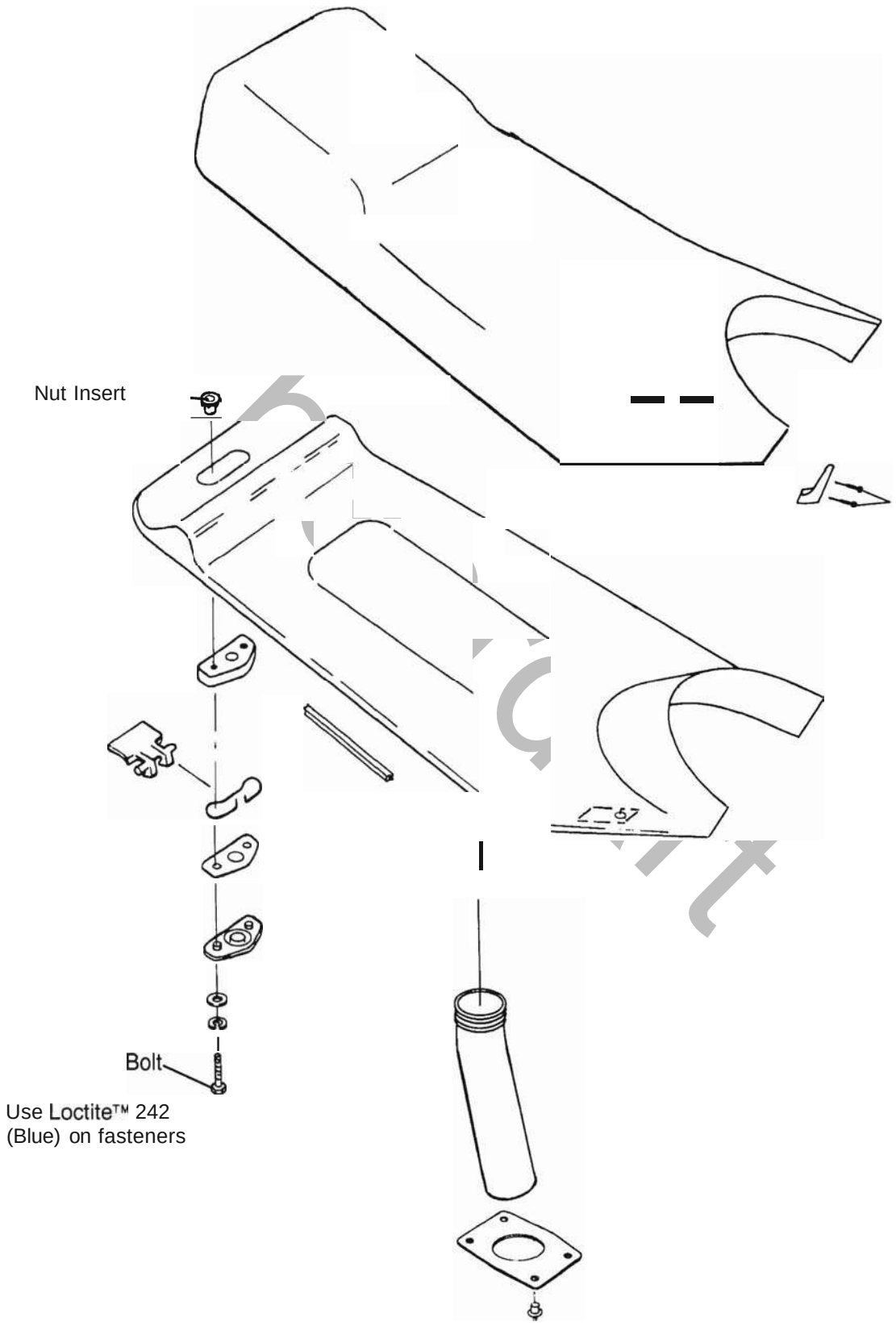
If seat seal is replaced use kit **PN** 2200760. The kit contains an improved seal, stainless steel staples (PN 9810350) and installation instructions.

Seat Assembly

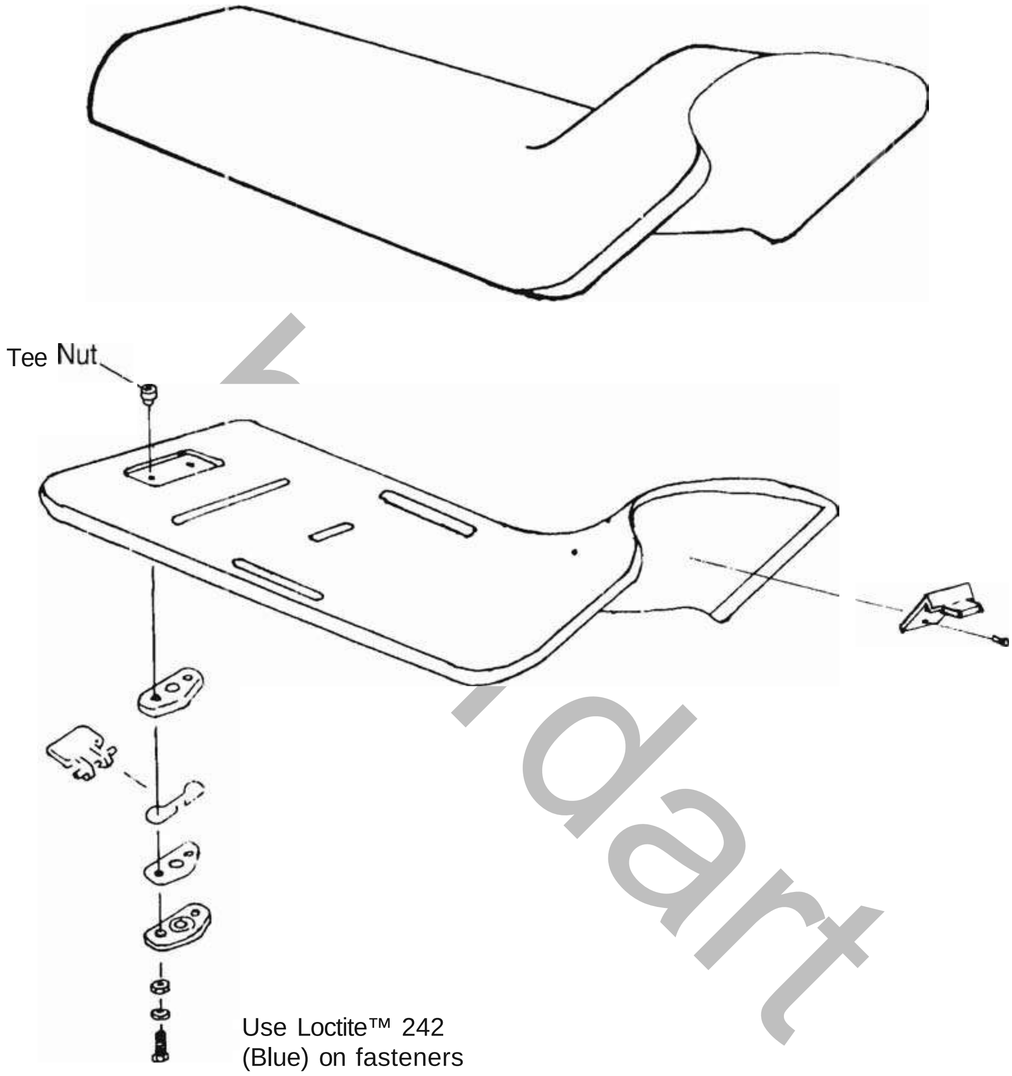
1994/1995 SLT750, 1996 to Current SLT Models



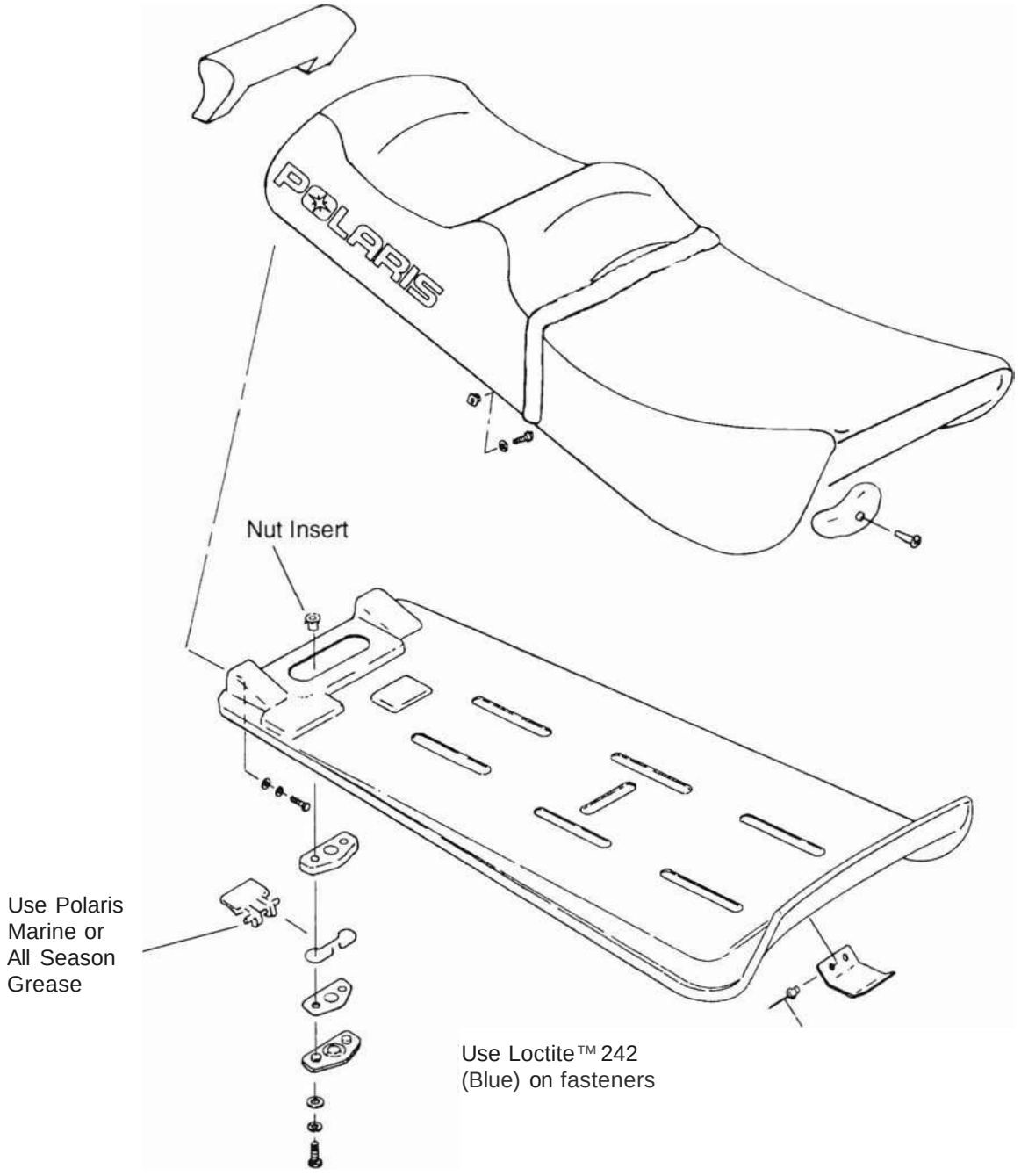
1996 to Current SL900 Models



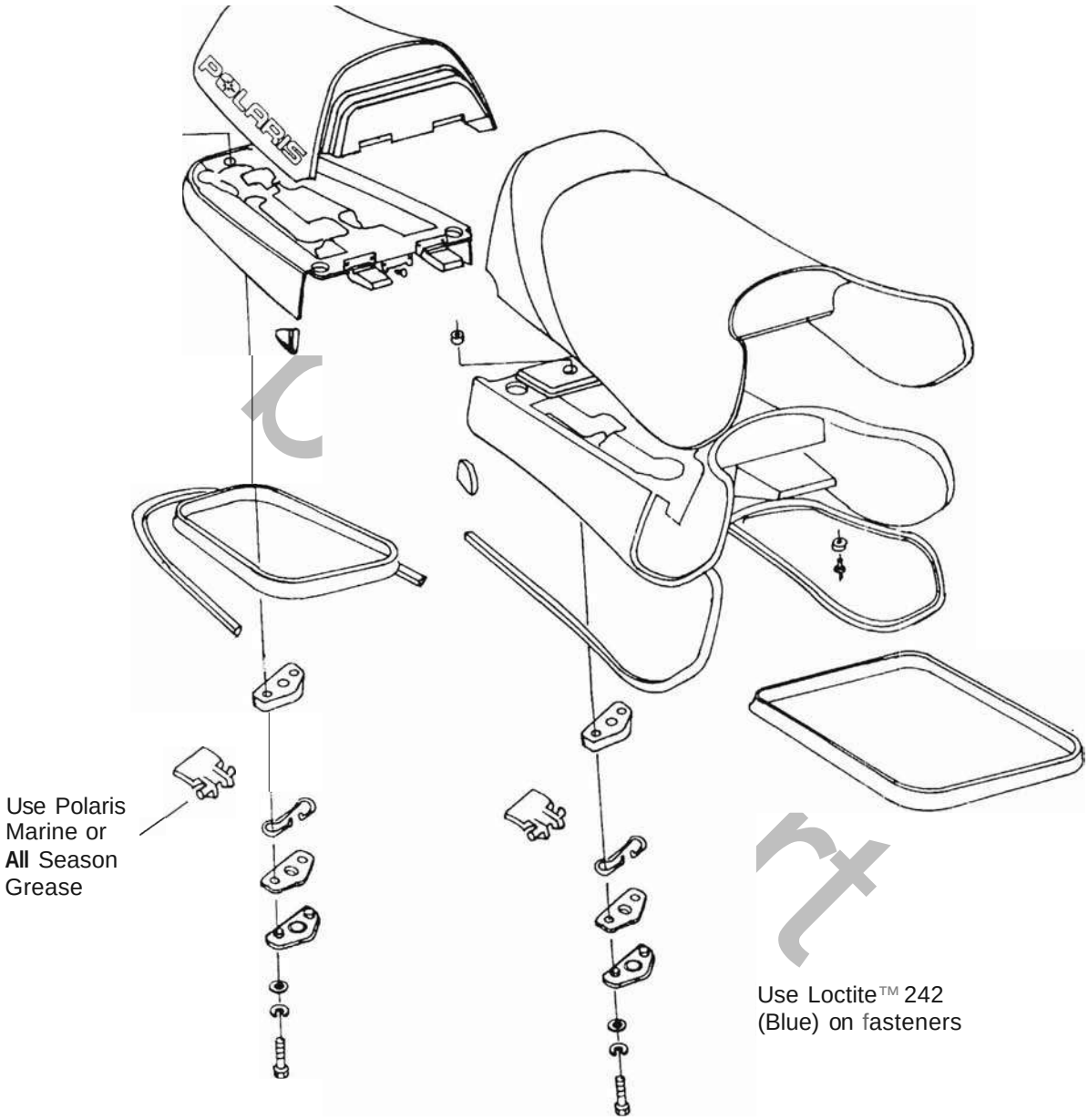
1996 to Current Hurricane



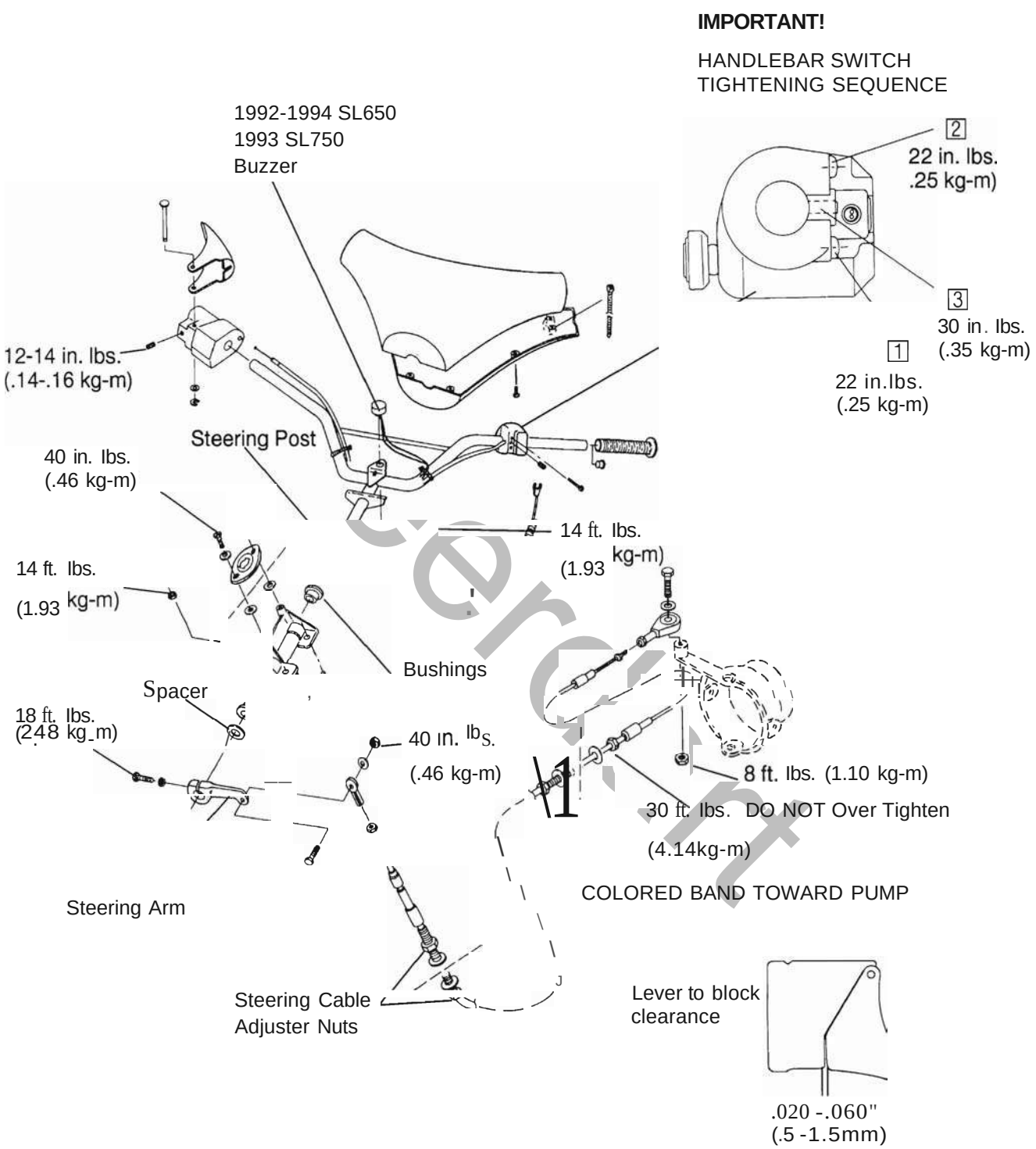
1997-1998 SLTX / SLH Models



1998 SLXH

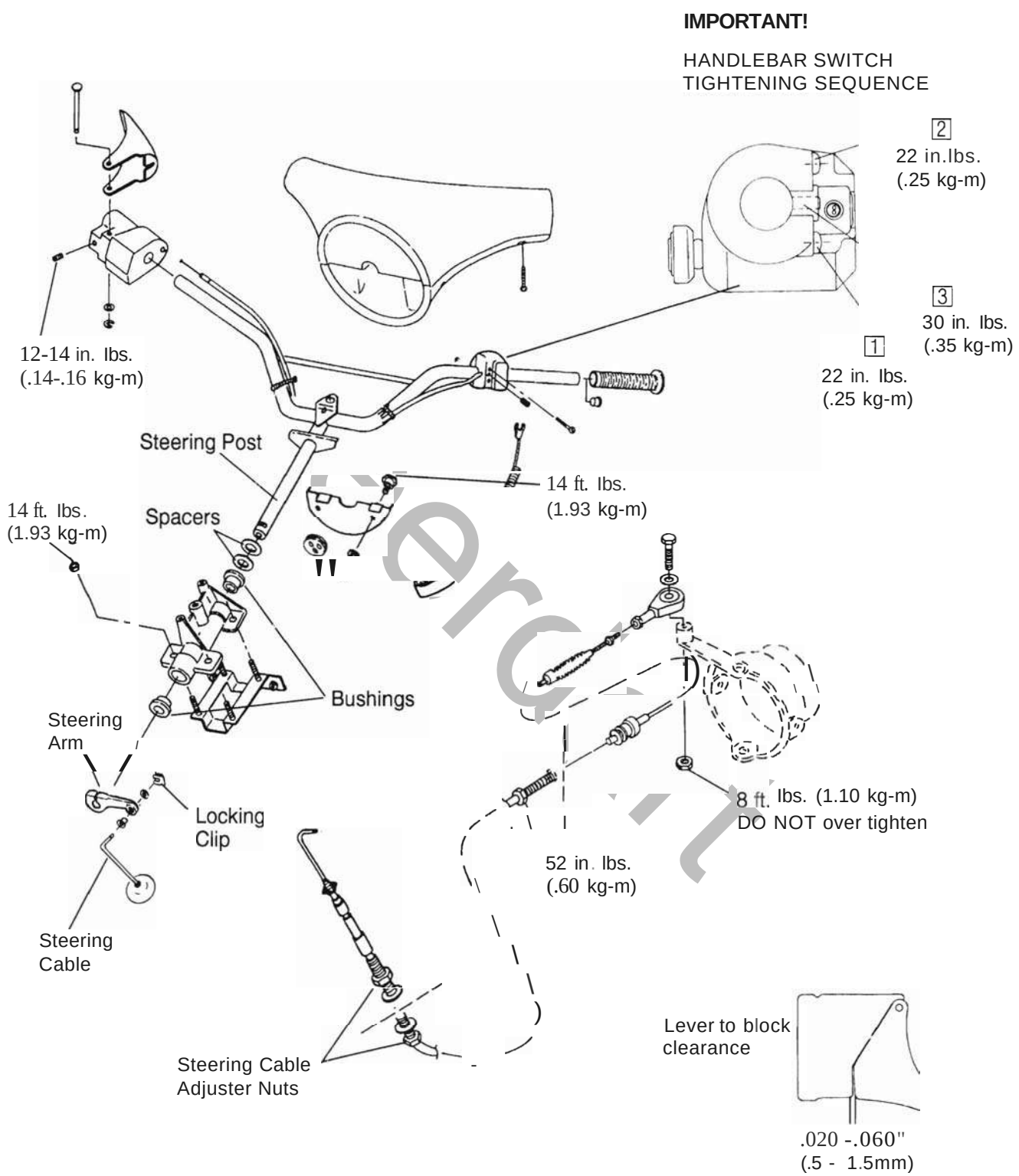

POLARIS
Use Polaris Marine or **All** Season Grease
Use Loctite™ 242 (Blue) on fasteners

1992 - 1994 SL650, SL750 Models



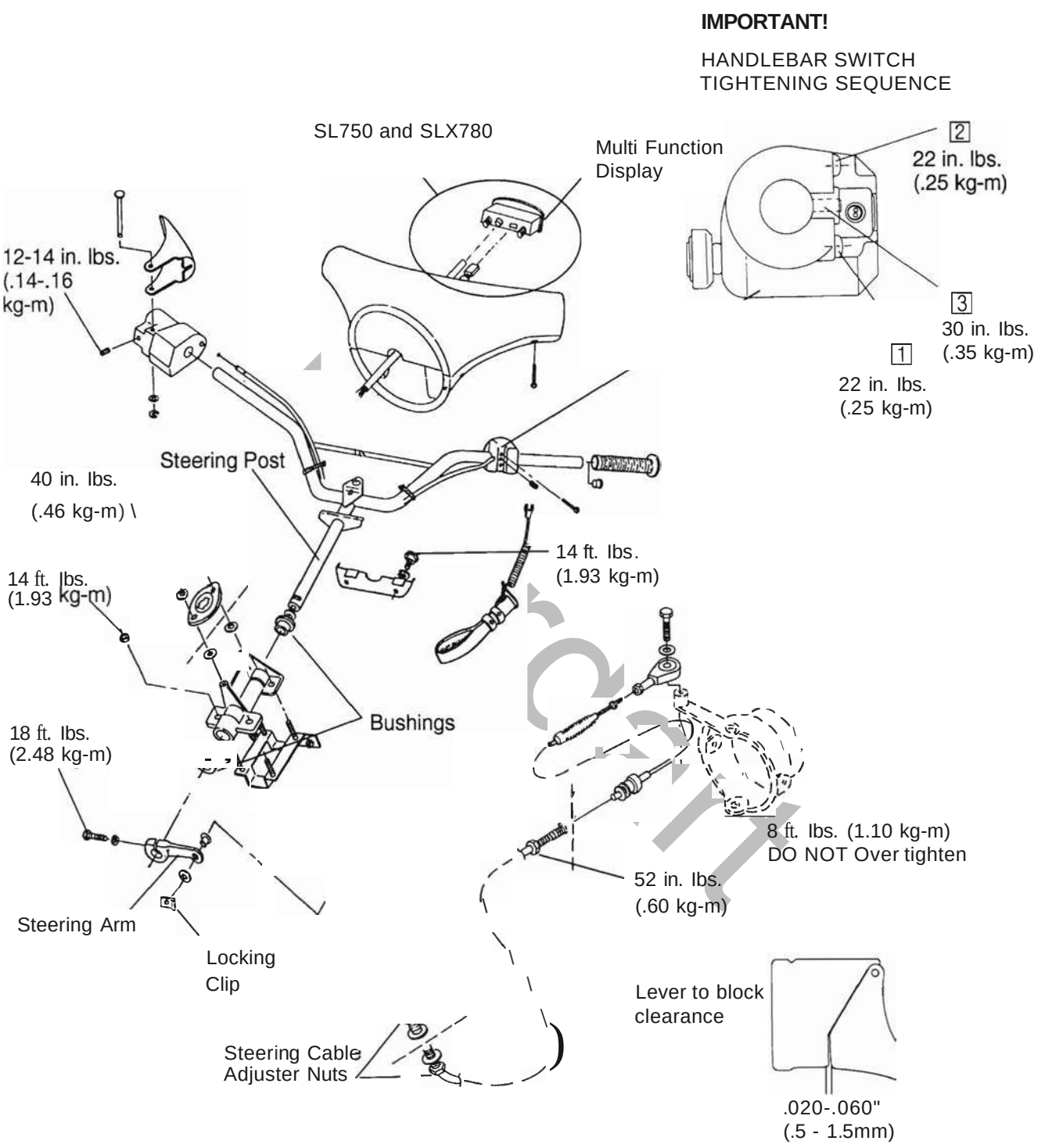
1. Apply Loctite™ 242 (Blue) to threaded fasteners.
2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

1994 - 1995 SLT750 Models



1. Apply Loctite™ 242 (Blue) to threaded fasteners.
2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

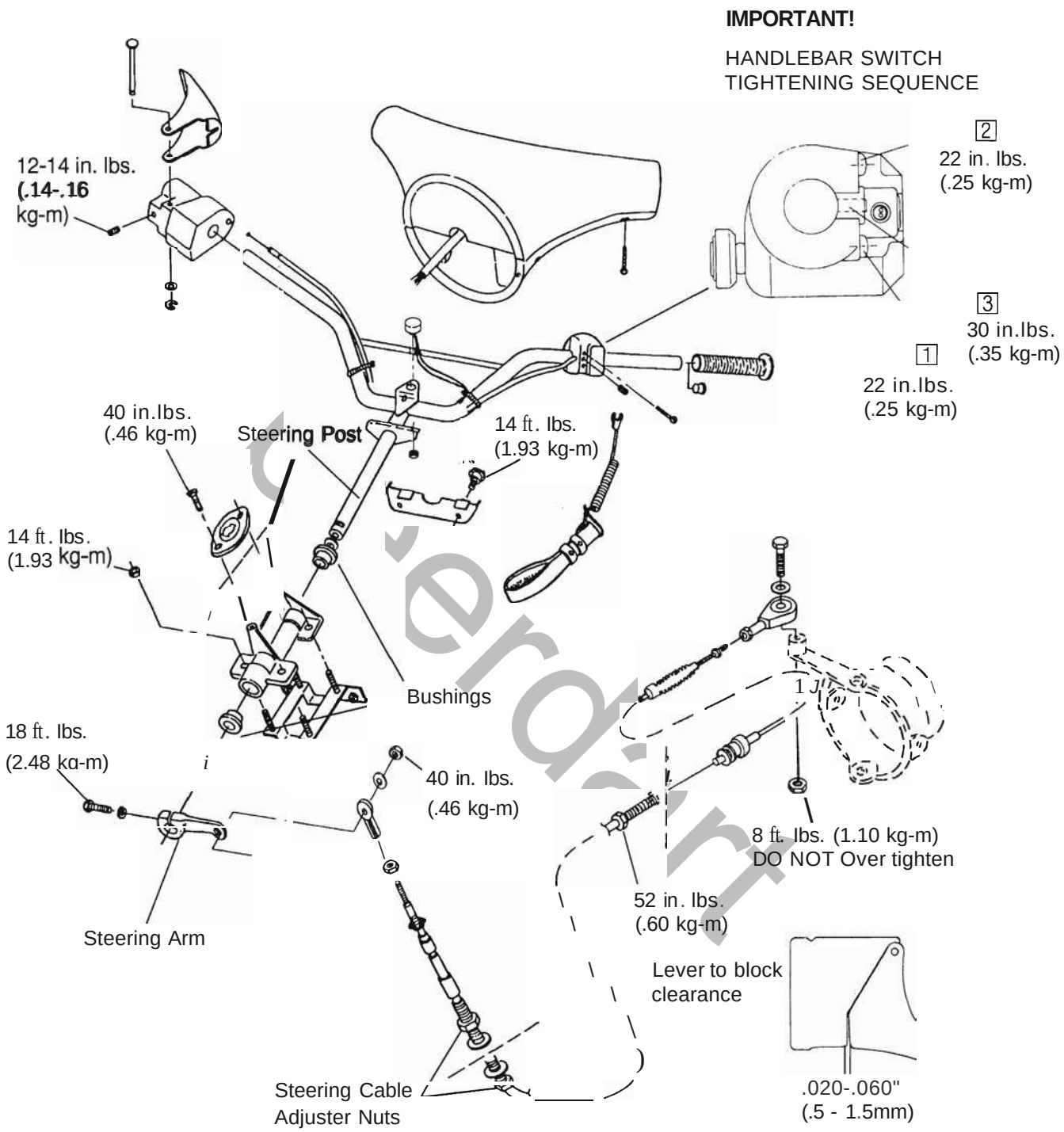
1995 SL650, SL750, SLX780 Models



1. Apply Loctite™ 242 (Blue) to threaded fasteners.

2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

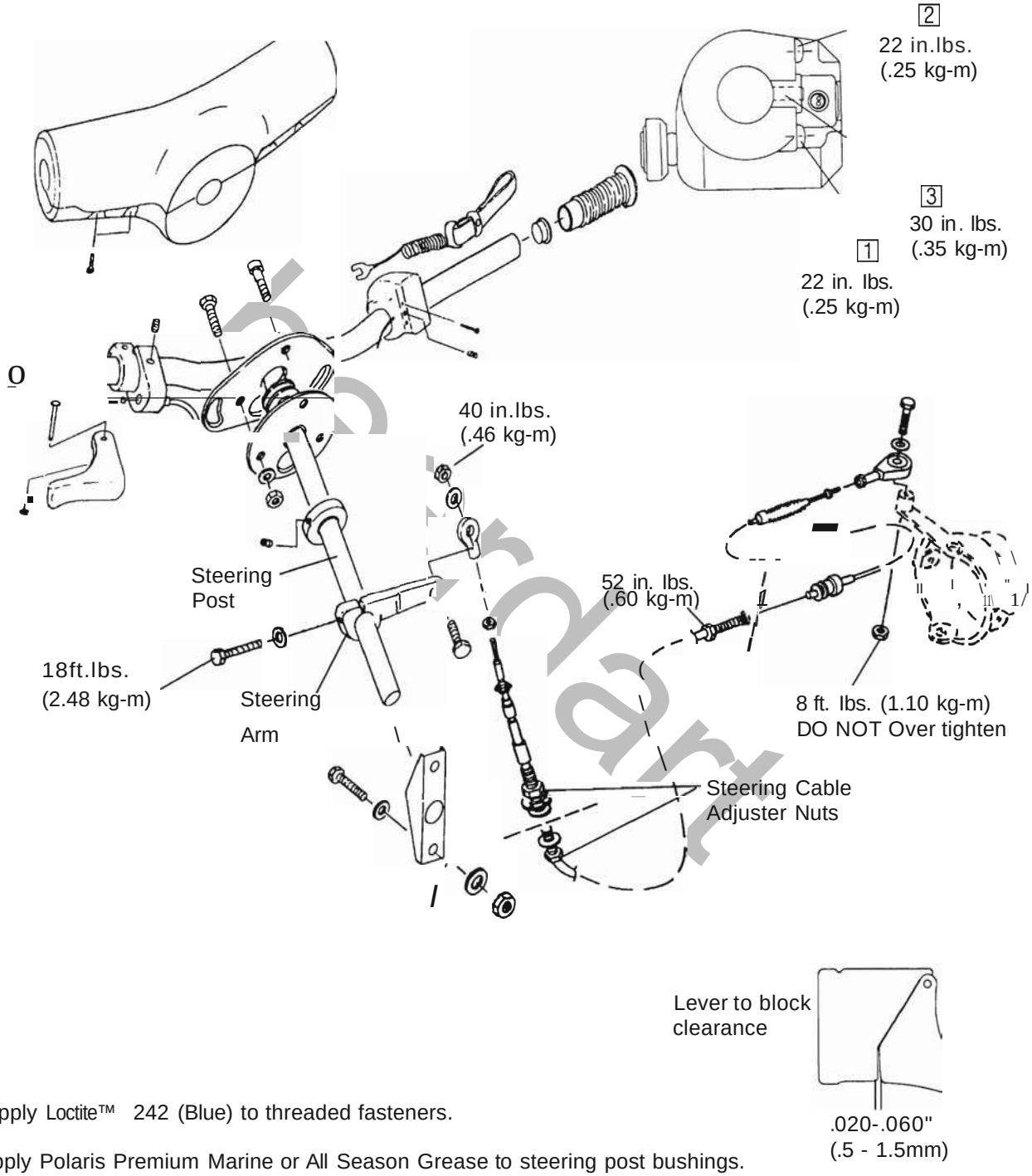
1996 to Current SL700 / SL700 Dlx



1. Apply Loctite™ 242 (Blue) to threaded fasteners.

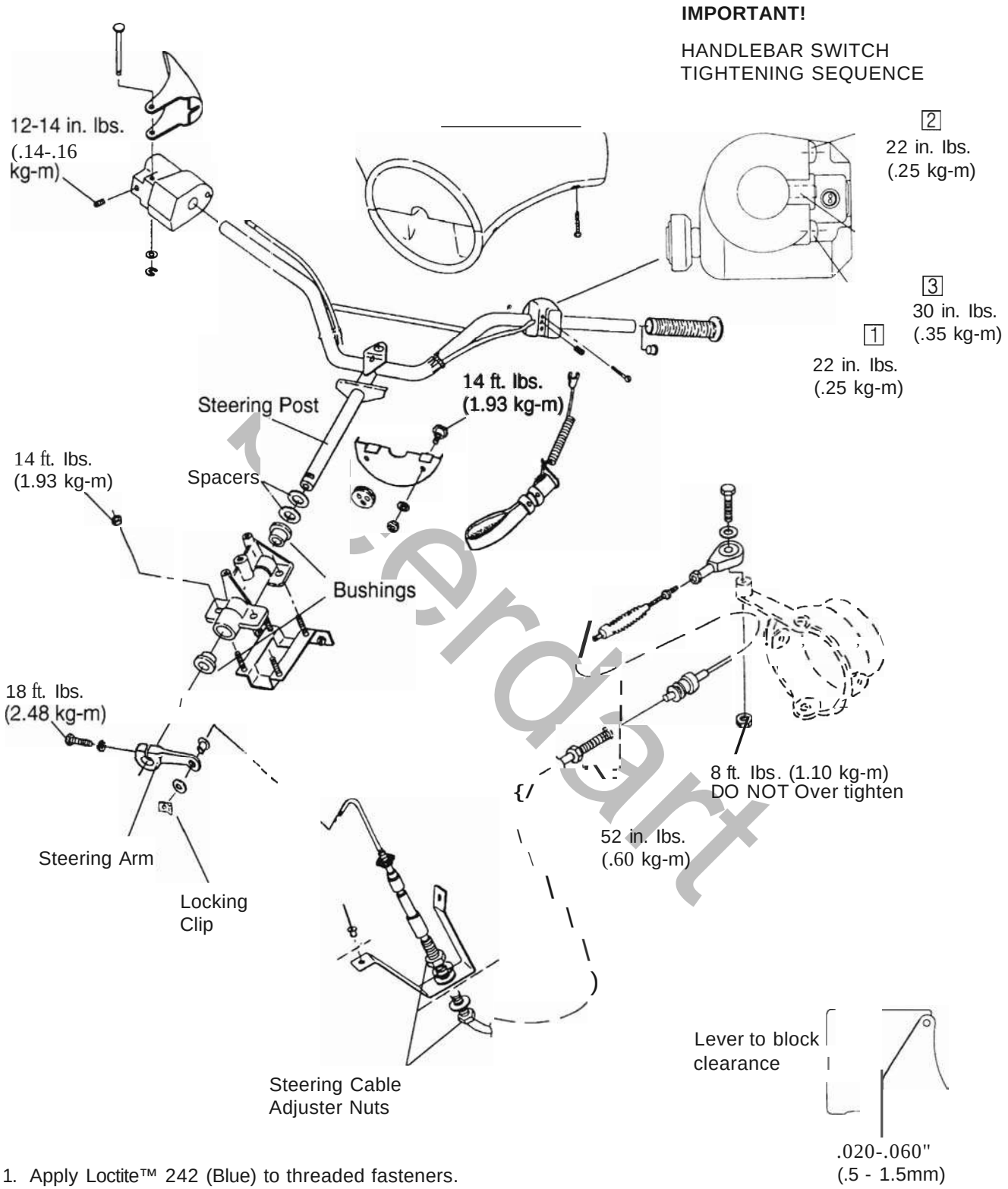
2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

1996 to Current Hurricane



1. Apply Loctite™ 242 (Blue) to threaded fasteners.
2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

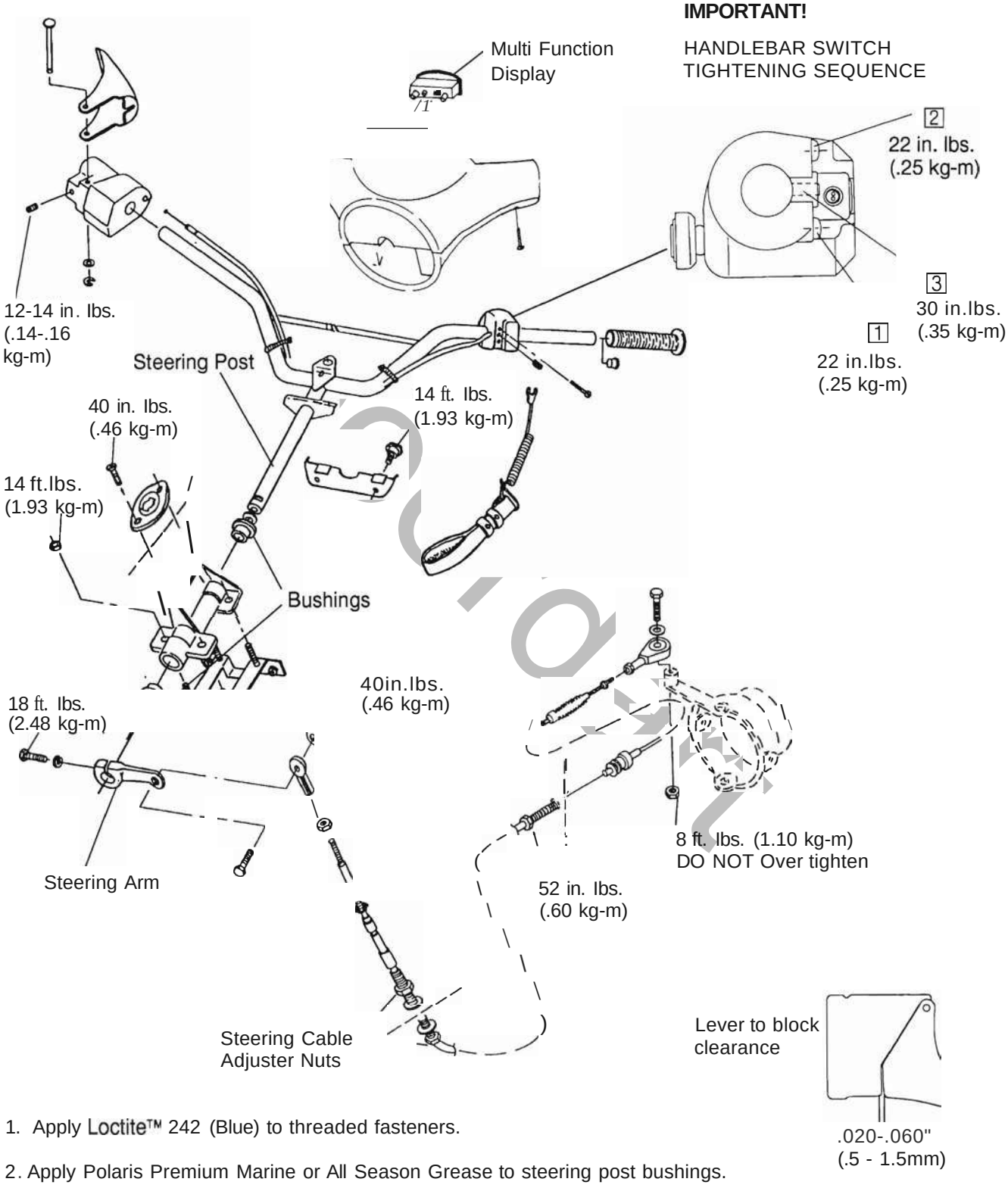
1996 to Current SLT700



1. Apply Loctite™ 242 (Blue) to threaded fasteners.

2. Apply Polaris Premium Manne or All Season Grease to steering post bushings.

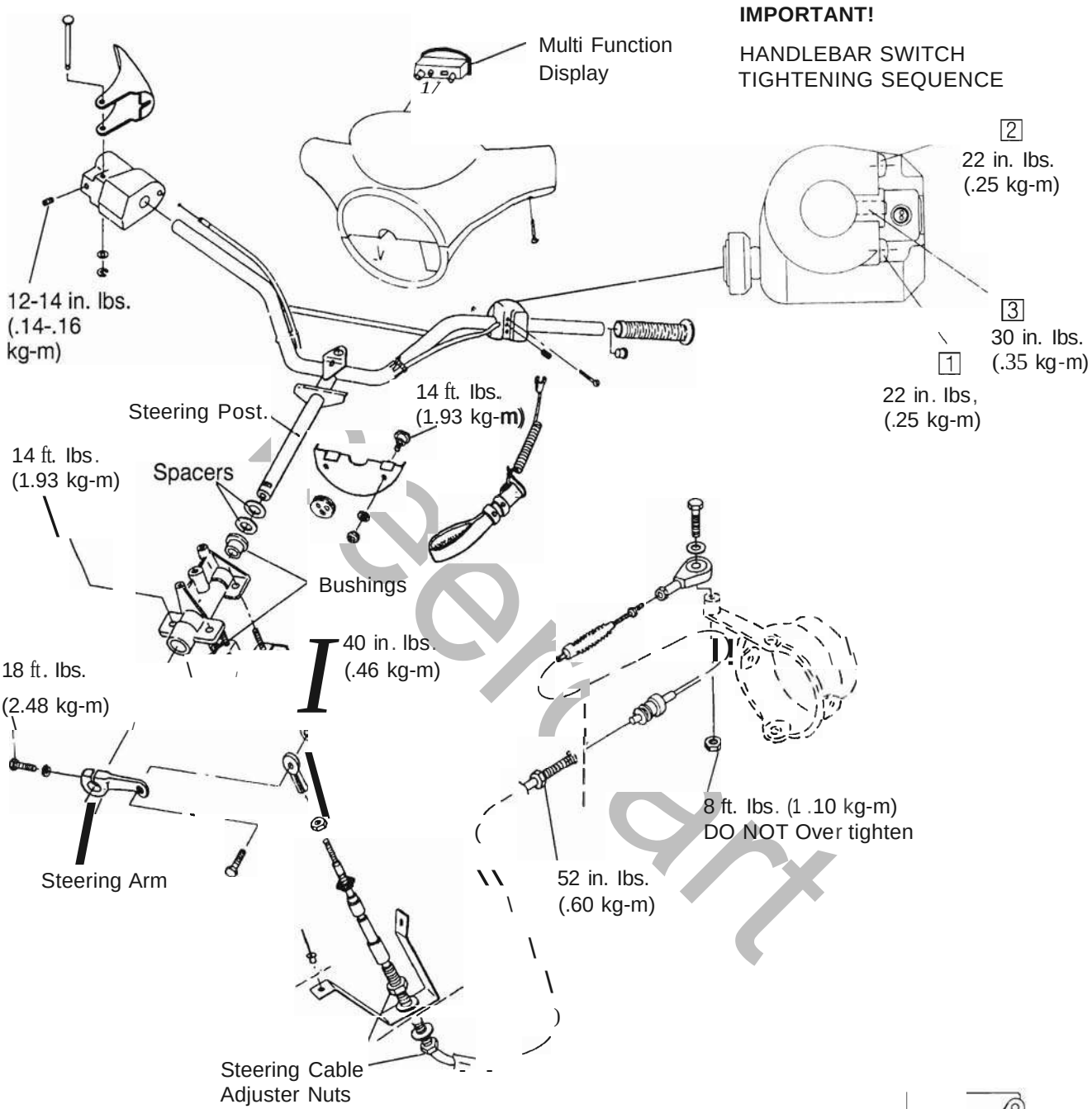
1996 SLX780, 1996 to Current SL780, SL900, SL1050



1. Apply Loctite™ 242 (Blue) to threaded fasteners.

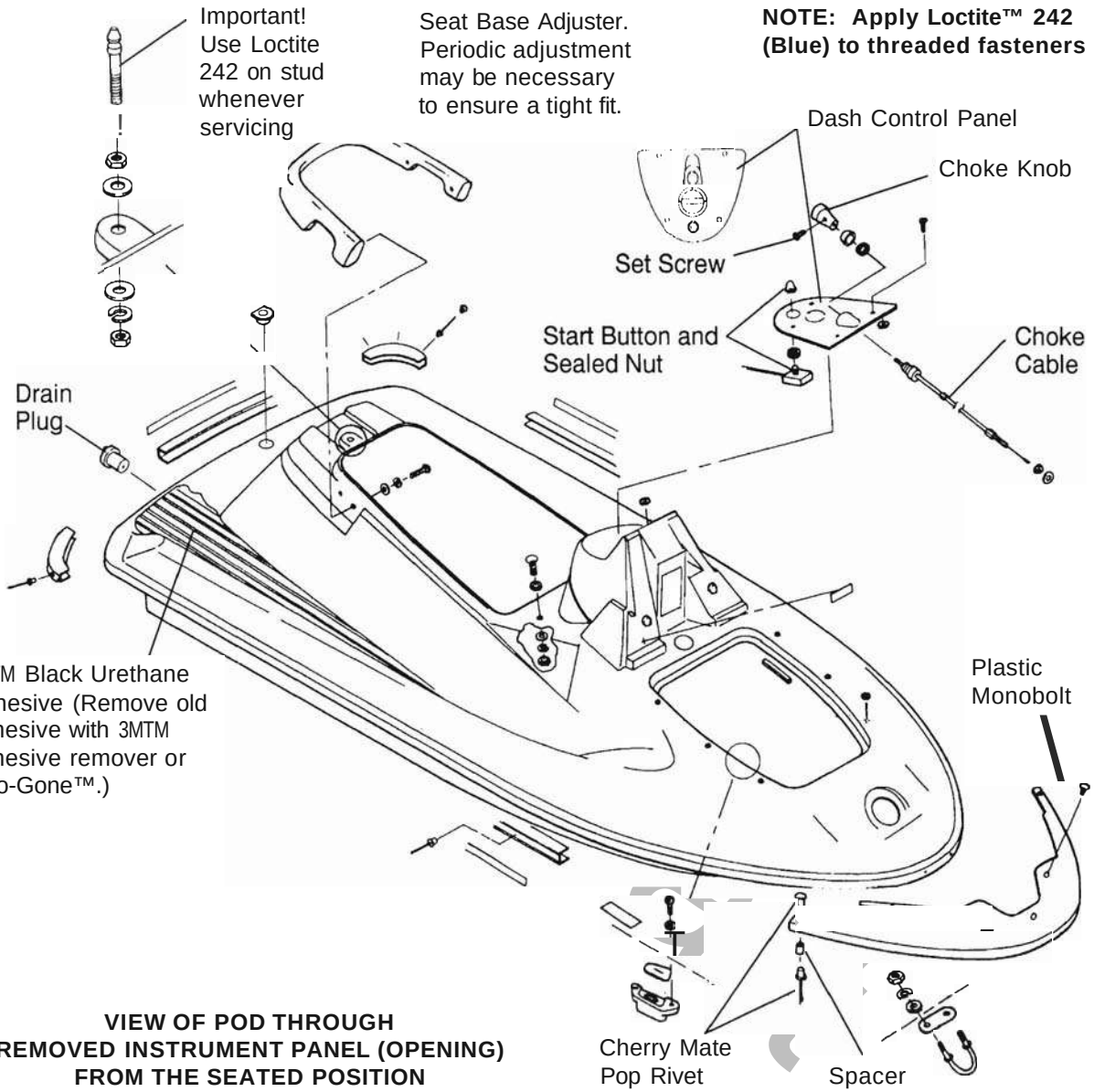
2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

1996 to Current SLTX, SLT780

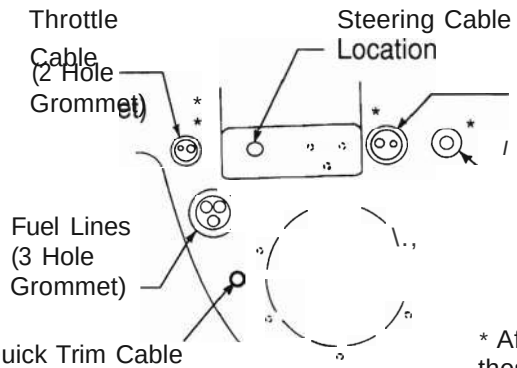


1. Apply Loctite™ 242 (Blue) to threaded fasteners.
2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

1992 SL650



VIEW OF POD THROUGH REMOVED INSTRUMENT PANEL (OPENING) FROM THE SEATED POSITION (1992/1993)

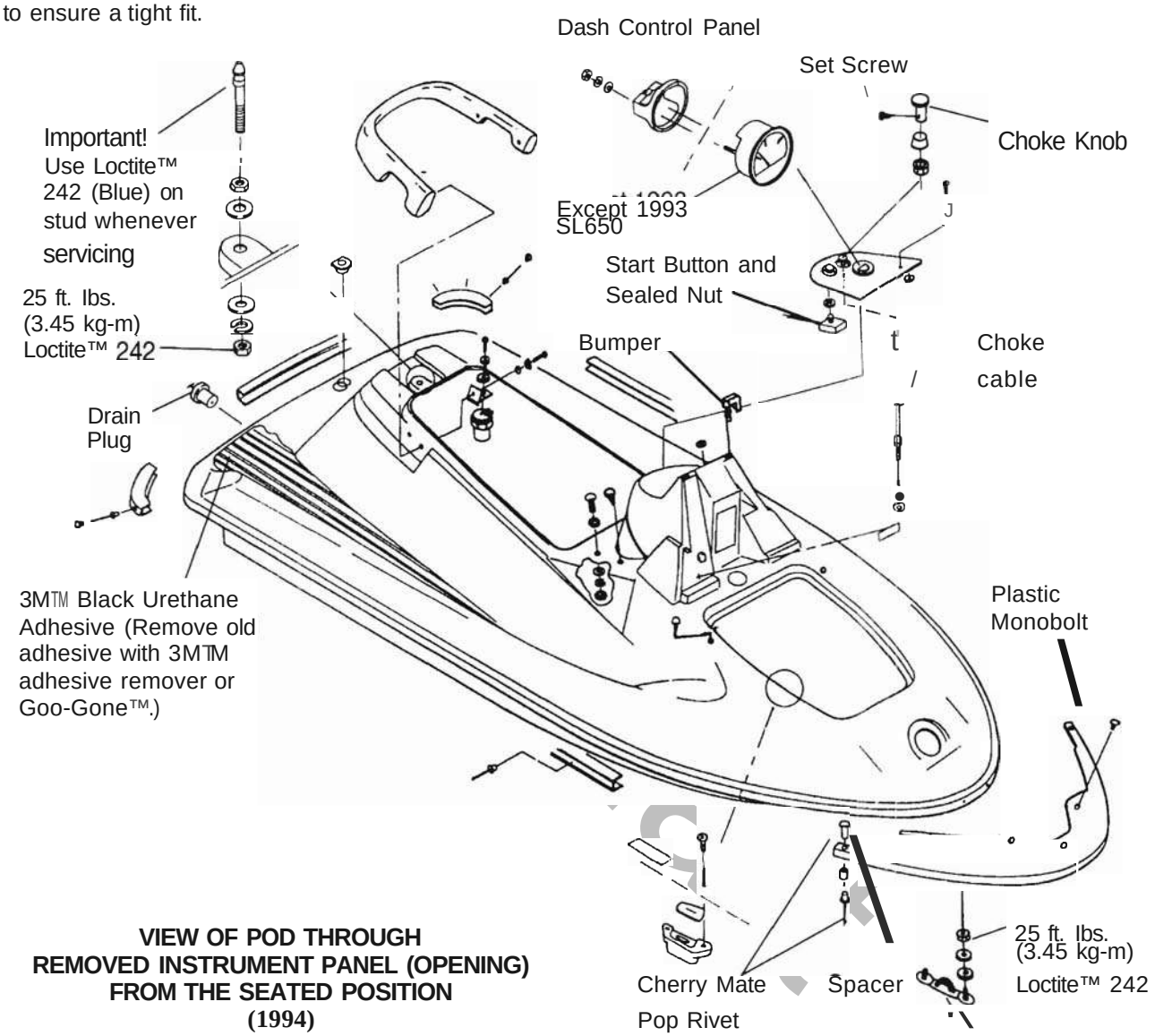


* After cables and wires are routed and in place these grommets should be filled with black RTV silicone to prevent water from entering the hull.

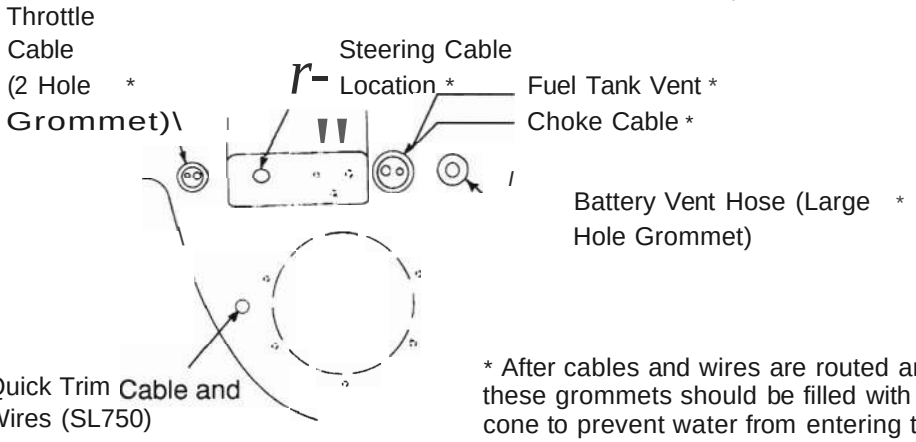
1993·1994 SL650, SL750

Seat Base Adjuster. Periodic adjustment may be necessary to ensure a tight fit.

NOTE: Apply Loctite™ 242 (Blue) to threaded fasteners



VIEW OF POD THROUGH REMOVED INSTRUMENT PANEL (OPENING) FROM THE SEATED POSITION (1994)

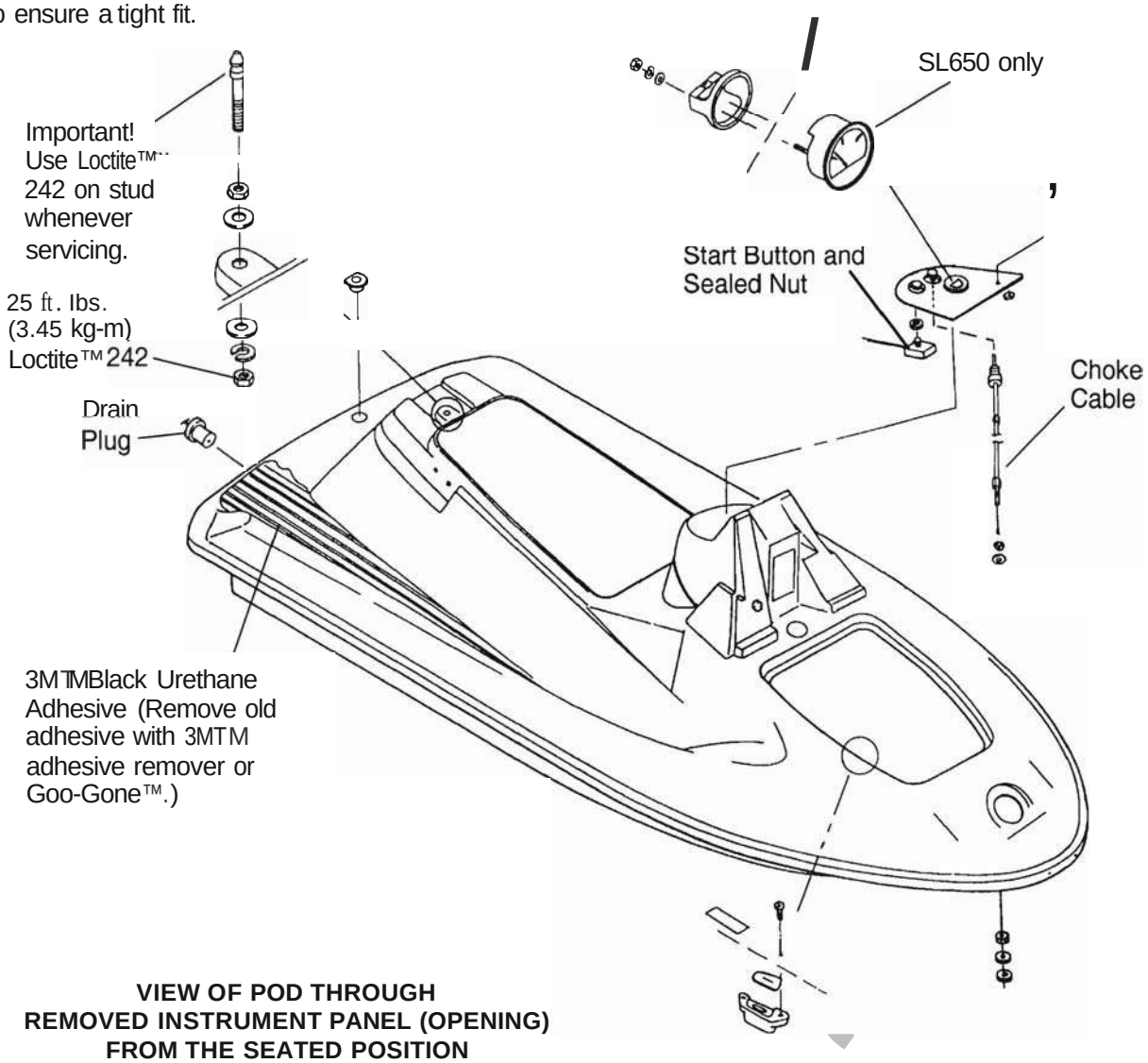


* After cables and wires are routed and in place these grommets should be filled with black RTV silicone to prevent water from entering the hull.

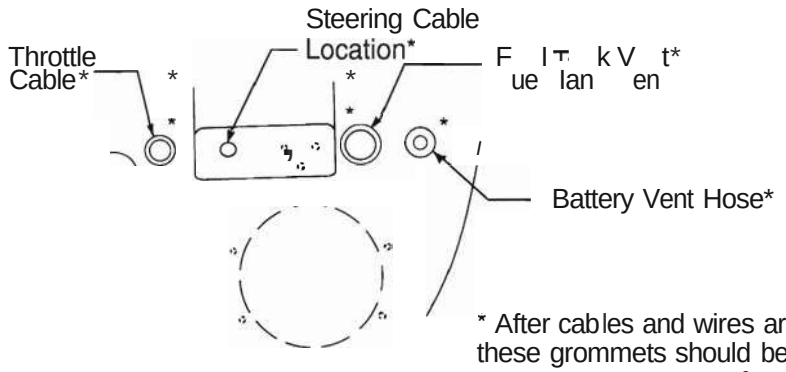
1995 SL650, SL750, SLX780

Seat Base Adjuster. Periodic adjustment may be necessary to ensure a tight fit.

NOTE: Apply Loctite™ 242 (Blue) to threaded fasteners

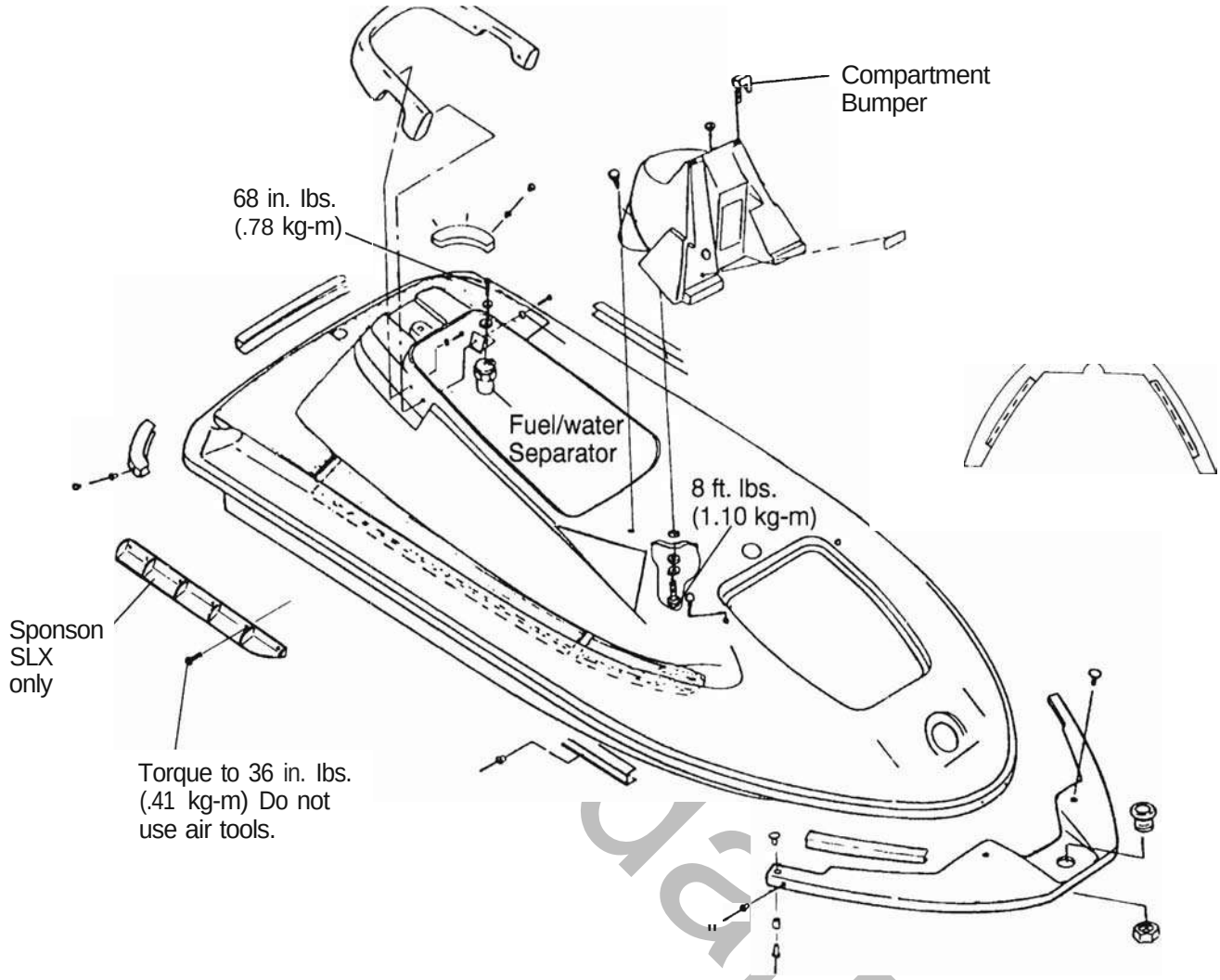


VIEW OF POD THROUGH REMOVED INSTRUMENT PANEL (OPENING) FROM THE SEATED POSITION (1995)



* After cables and wires are routed and in place these grommets should be filled with black RTV silicone to prevent water from entering the hull.

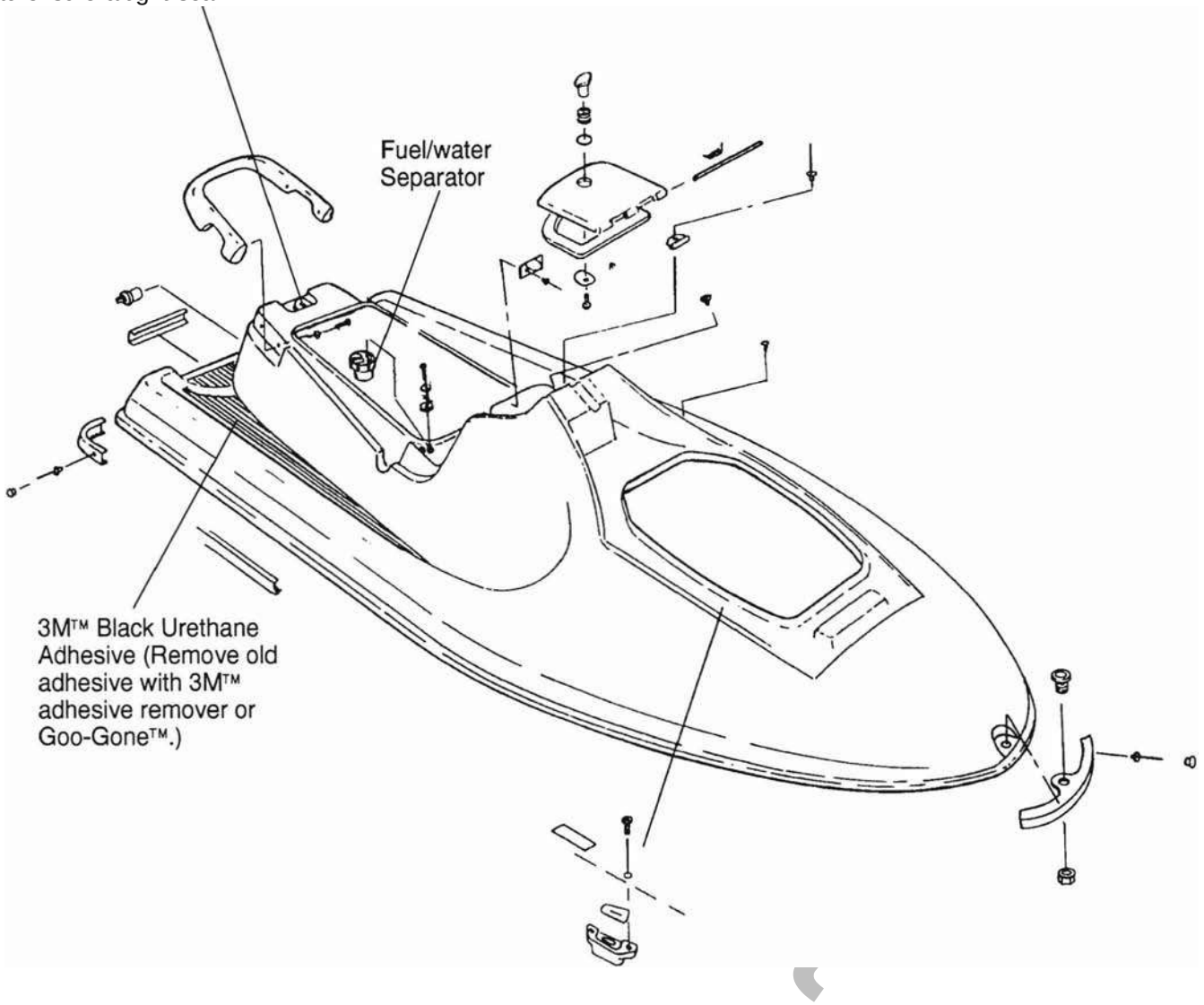
1995 SL650, SL750, SLX780 Cent.



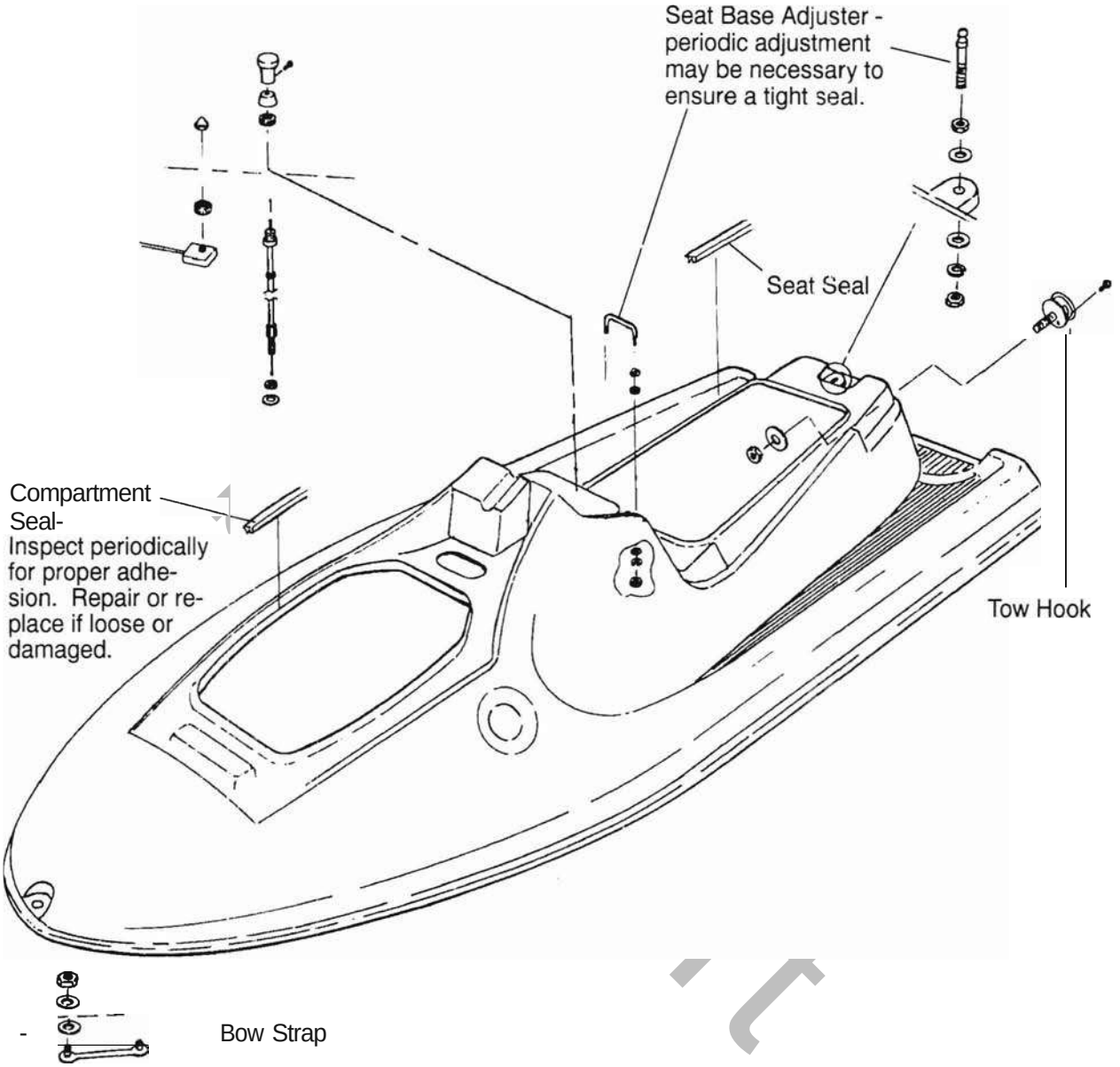
1994-1995SLT750

Seat Base Adjuster. Periodic adjustment may be necessary to ensure a tight seal.

NOTE: Apply Loctite™ 242 (Blue) to threaded fasteners



1994·1995 SLT750



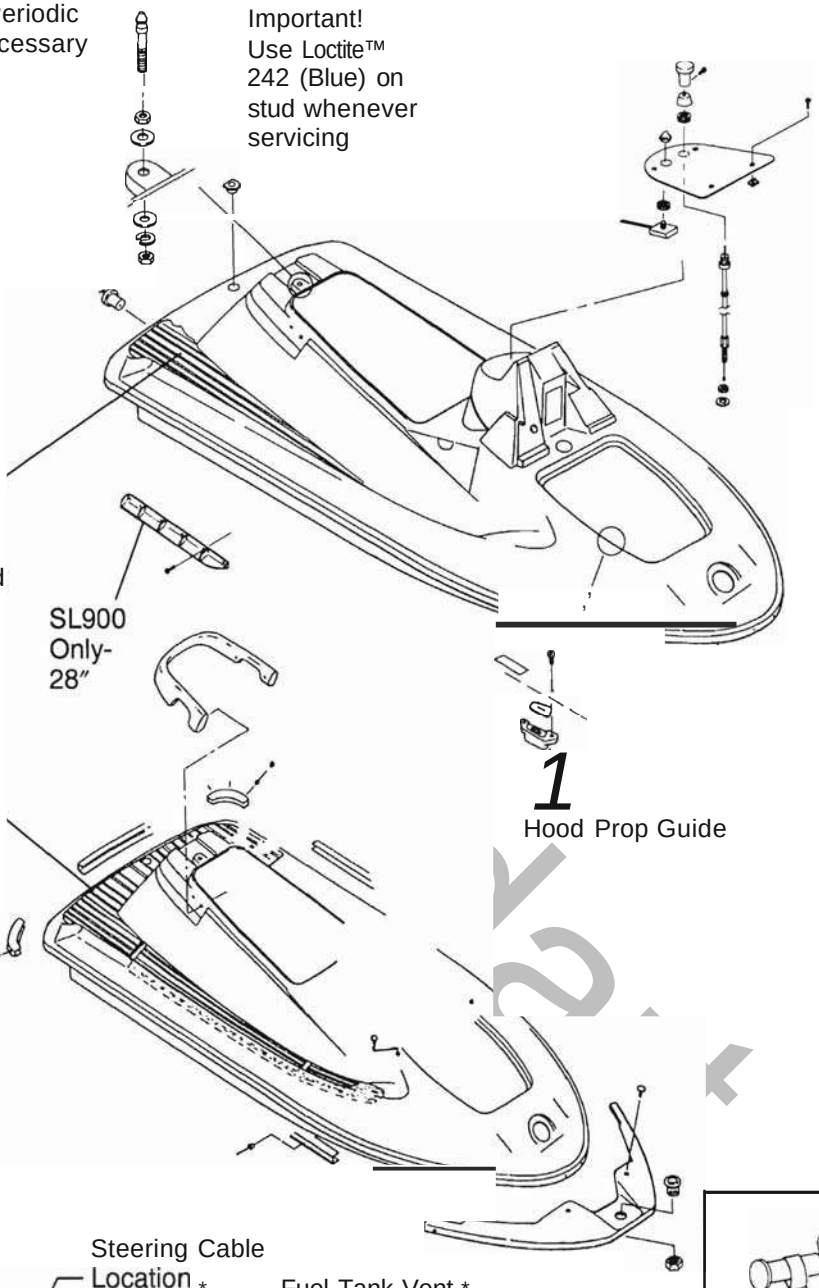
1996 to Current SL700, SL700 D1x, SL900

Seat Base Adjuster. Periodic adjustment may be necessary to ensure a tight fit.

Important! Use Loctite™ 242 (Blue) on stud whenever servicing

25 ft. lbs. (3.45 kg-m) Loctite™ 242

3MTM black urethane adhesive (Remove old adhesive with 3m™ adhesive remover or Goo Gone™).



Hood Prop Guide

Throttle Cable (2 Hole Grommet)*

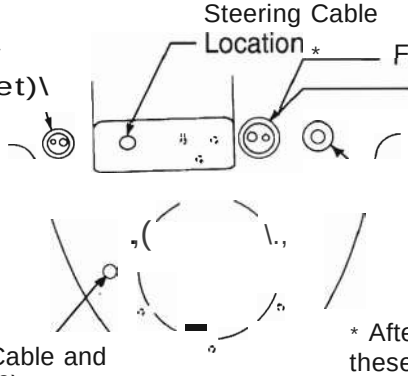
Steering Cable Location *

Fuel Tank Vent *

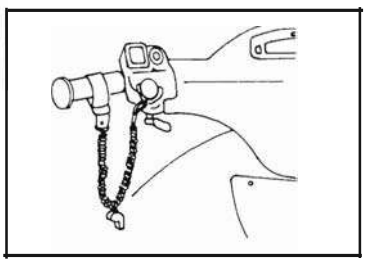
Choke Cable *

(Except 1997 to Current)

Battery Vent Hose (Large Hole Grommet)



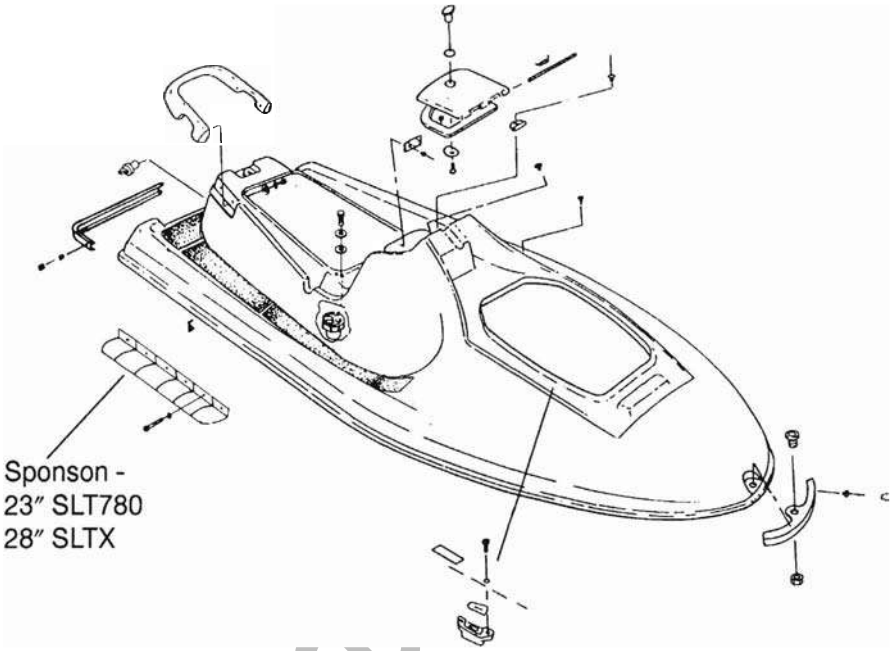
Quick Trim Cable and Wires (SL700)

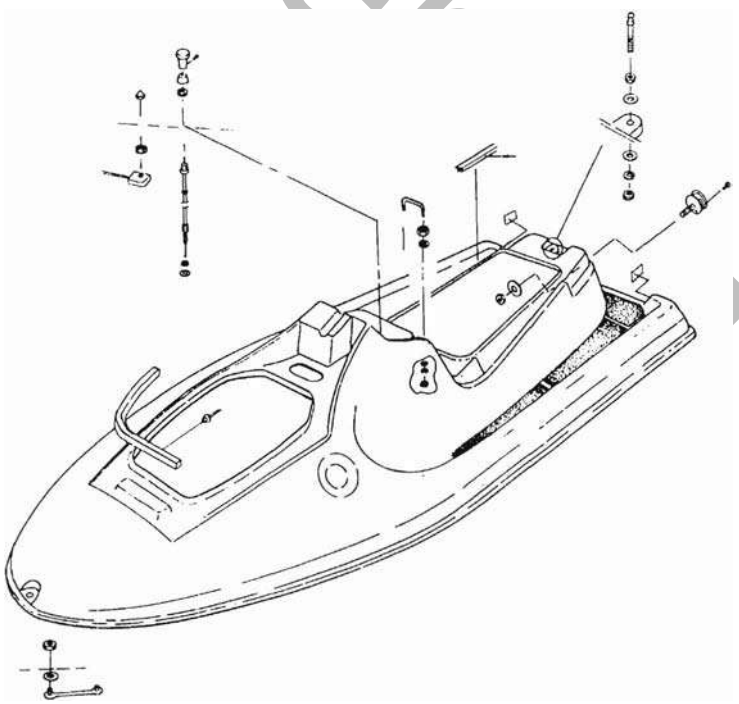


Choke Lever Location 1997 to Current Models

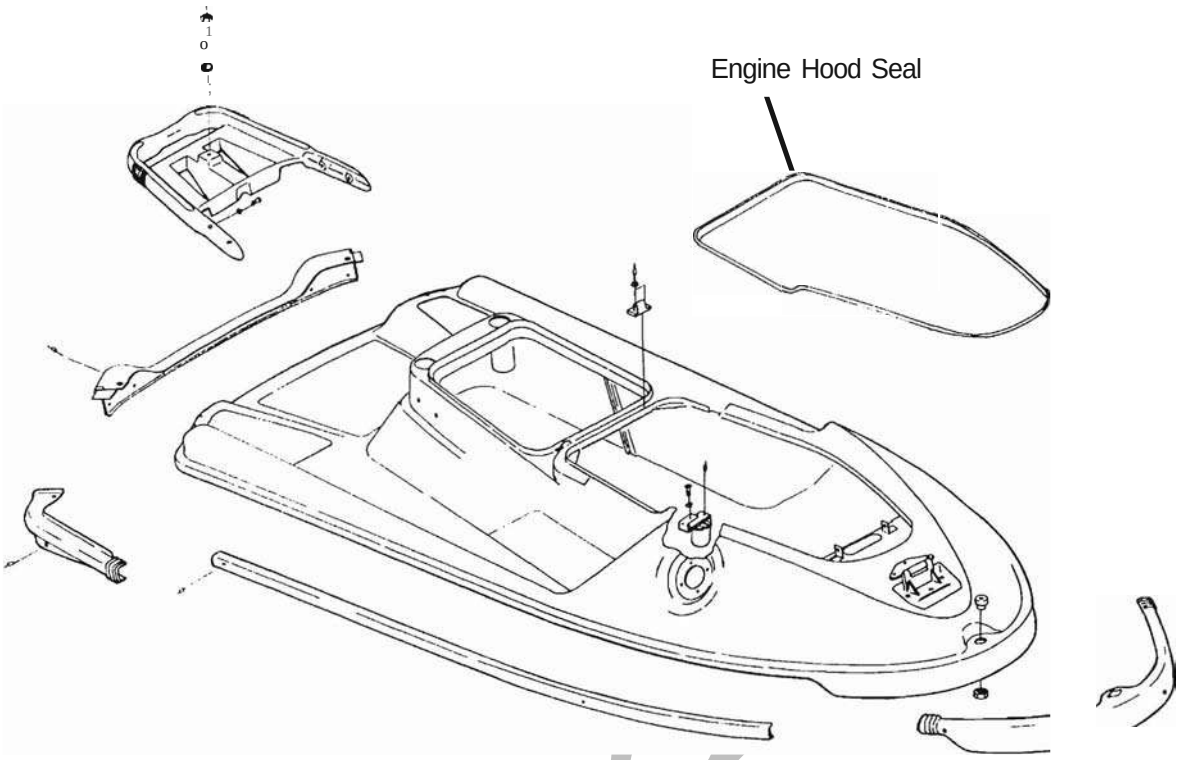
* After cables and wires are routed and in place these grommets should be filled with black RTV silicone to prevent water from entering the hull.

1996 to Current SLTX, SLT780

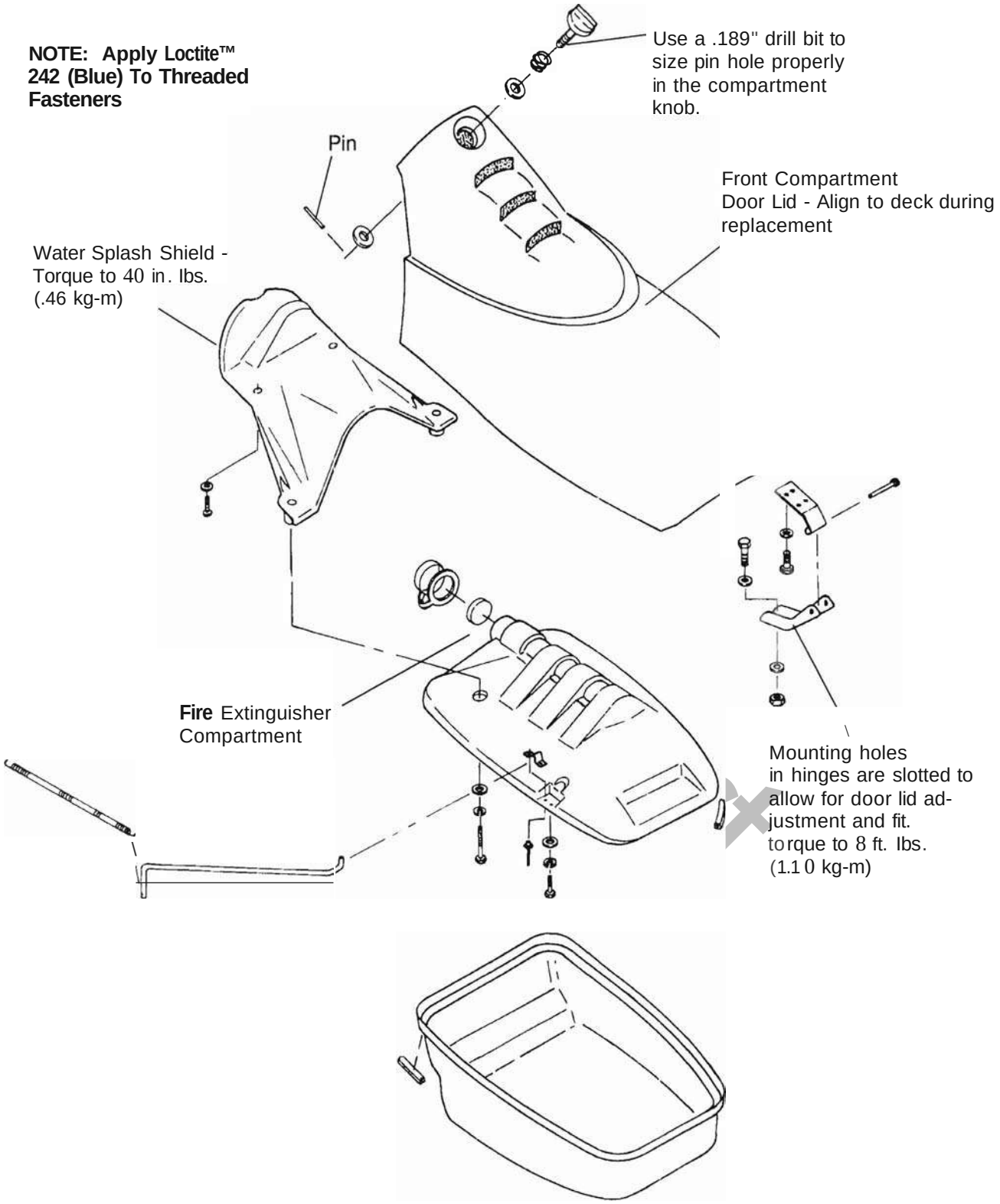




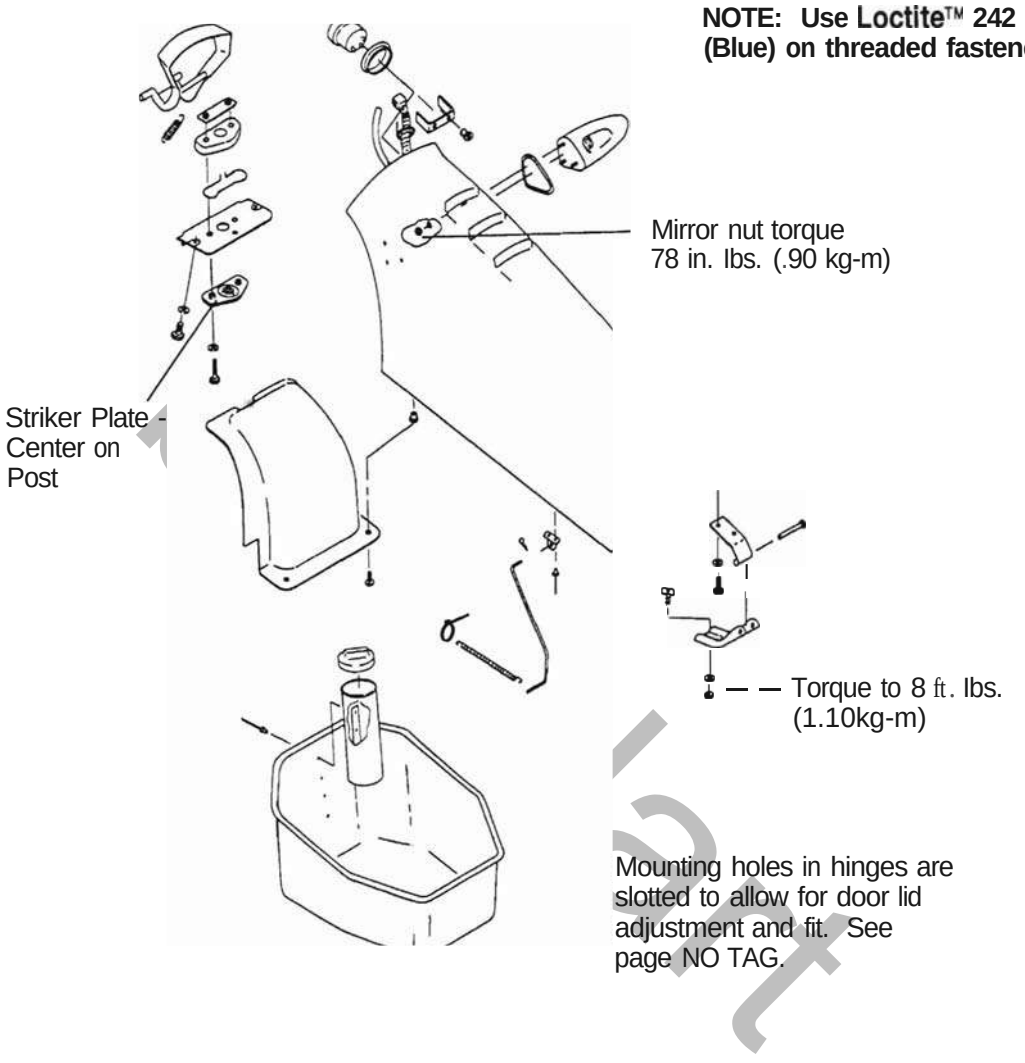
1996 to Current Hurricane



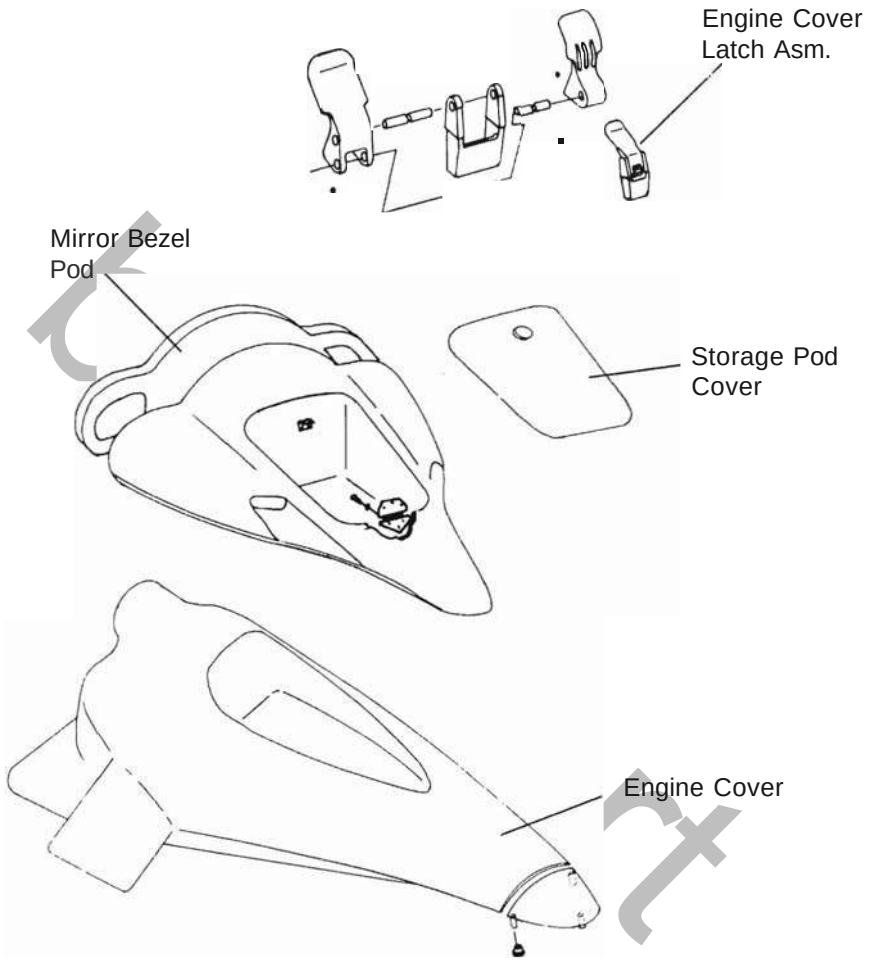
1992 to Current SL650, SL750, SLX780, 1996 to Current SL Models



1994-1995 SLT750, 1996 to Current SLT Models



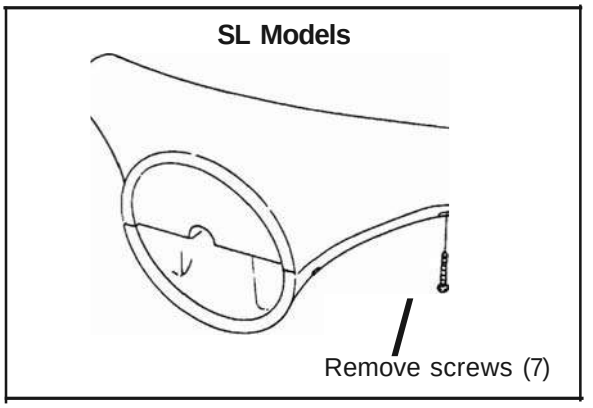
1996 to Current Hurricane



Steering Cover/Steering Post (Handlebar) Removal

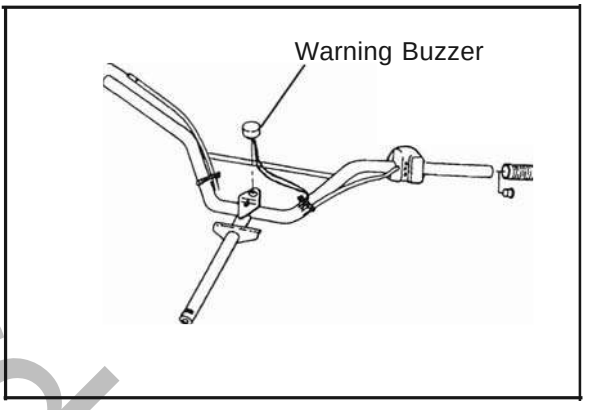
SL Models

1. Remove top steering cover (handlebar pad) by loosening the (7) screws located on underside of pad.
2. Lift top cover away from bottom cover. Cut the (2) tie straps to remove bottom half of cover.
3. If steering post (handlebar) is to be replaced, remove right hand grip, loosen set screw on throttle block and slide it off. If post is not being replaced disconnect cable from throttle lever. Remove cable from throttle block by loosening jam nut and unscrewing adjuster.



4. Remove warning buzzer by loosening nut.
5. Remove the (3) stop switch screws, separate the switch and set it aside.

NOTE: The switch screws must be tightened in the proper order upon reassembly for proper switch function. See pages 6.5-6.12.



6. Remove steering arm bolt and move arm aside with cable attached.

NOTE: Spacer washers may be located on top and bottom of post. Keep them in order for reassembly.

7. Slide post up and out of the support hub and remove bushings. Reverse procedure for reassembly. Grease post bushings. Inspect and adjust steering alignment. Refer to page 6.28-6.30.

Premium Marine Grease PN 2871066

All Season Grease 3 oz. PN 2871322
All Season Grease 14 oz. PN 2871423

Steering Arm Bolt Torque

18 ft. lbs. (2.48 kg-m)

WARNING

Be certain to check for free and correct operation of the steering system when reassembly is complete.

Steering Cover/Steering Post (Handlebar) Removal Cant.

SLT Models

1. Remove steering cover (handlebar pad) by loosening the (4) screws located on underside of pad.
2. Spread bottom of cover apart and lift it up and rearward. Note throttle cable and switch wire routing for reassembly.
3. If steering post (handlebar) is to be replaced, remove right hand grip, loosen set screw on throttle block and slide it off. If post is not being replaced disconnect cable from throttle lever. Remove cable from throttle block by loosening jam nut and unscrewing adjuster.
4. Remove the (3) stop switch screws, separate the switch and set it aside.

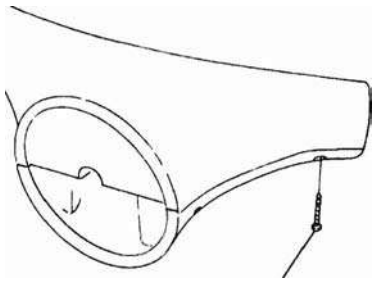
NOTE: The switch screws must be tightened in the proper order upon reassembly for proper switch function. See pages 6.5 - 6.12.

5. Remove steering arm bolt and move arm aside with cable attached.

NOTE: Spacer washers may be located on top and bottom of post. Keep them in order for reassembly.

6. Slide post up and out of the support hub and remove bushings. Reverse prccedure for reassembly. Grease post bushings.
7. Inspect and adjust steering alignment. Refer to page 6.28-6.30.
8. Re-install cover. Route wires and cable behind handlebar and through seal grommet in deck.

SLT Models



Remove screws (4)

Premium Marine Grease PN 2871066

All Season Grease 3 oz. PN 2871322
All Season Grease 14 oz. PN 2871423

Steering Arm Bolt Torque

18 ft. lbs. (2.48 kg-m)

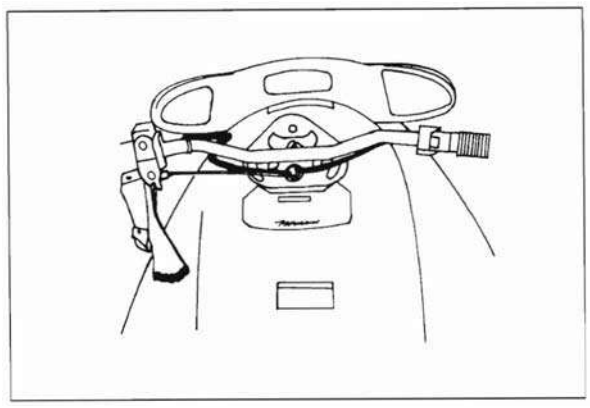
WARNING

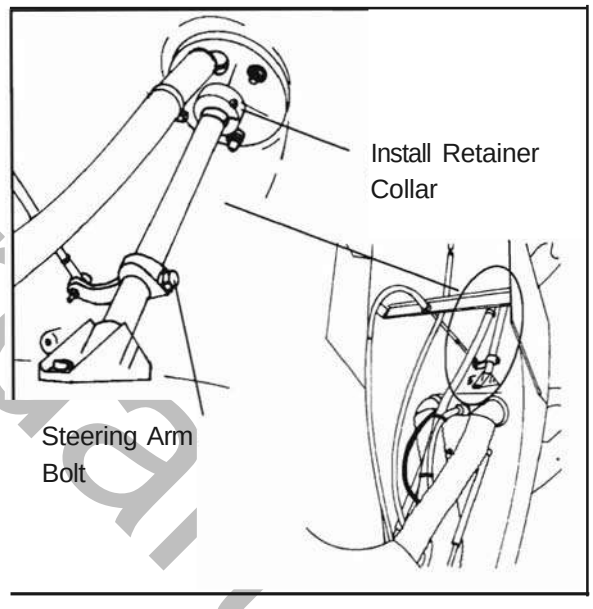
Be certain to check for free and correct operation of the steering system when reassembly is complete.

Steering Cover/Steering Post (Handlebar) Removal, cont.

Hurricane Handlebar Replacement Procedure

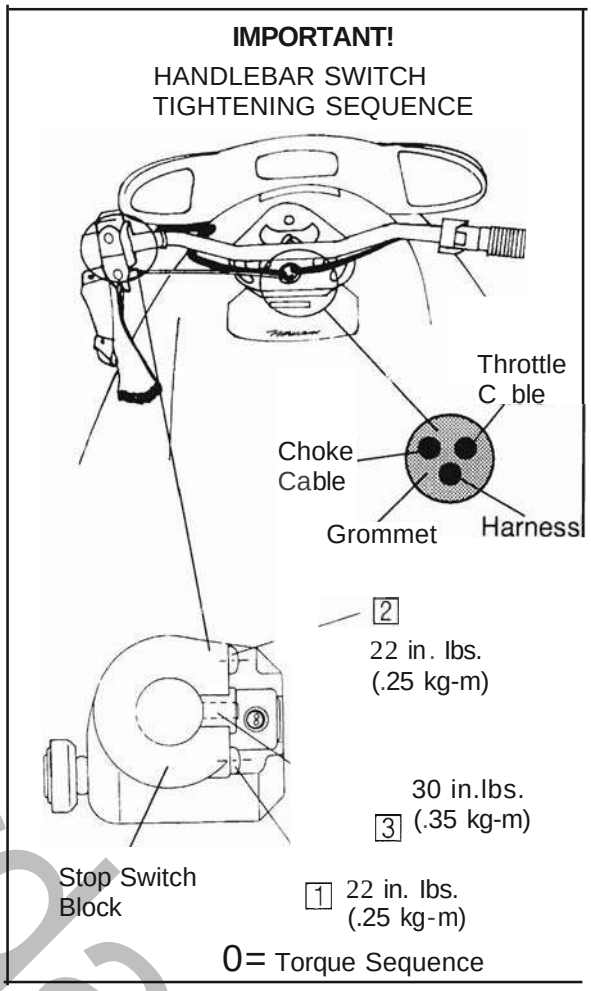
1. Remove handlebar pad. Take note of harness and cable routing before proceeding.
2. Remove handlebar grip retainer plugs.
3. Cut and remove RH handlebar grip.
4. Loosen set screw and slide throttle block assembly off handlebar.
5. Cut wire harness tie strap.
6. Loosen and remove stop switch.
7. Remove seat and open hood.
8. Remove steering arm bolt.
9. Loosen retainer collar set screw. Slide handlebar upward and remove steering arm and retainer collar.
10. Lower hood and remove handlebars. Be sure to note the number of shims on handlebar post for reinstallation.

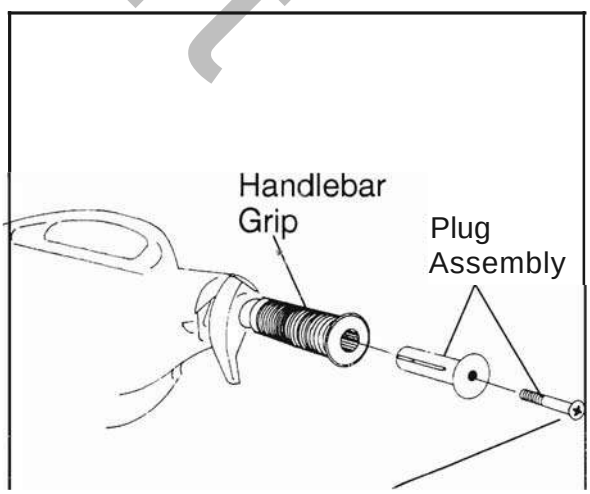




Installation

1. Slide shims removed in step 9 onto handlebars. Lubricate bushings with Polaris Premium All Season Grease and slide handlebars into place.
2. Open hood and slide retainer collar and steering arm onto handlebar post.
3. Hold handlebars firmly downward and push retainer collar upward. Tighten retainer collar set screw to 10-12 ft. lbs. (1.38-1.66 kg-m).
4. Position steering arm in place on handlebar post and tighten bolt to 12 foot pounds (1.66 kg-m). Close hood.
5. Position throttle block correctly on handlebar and tighten set screw to 12 inch lbs (.14 kg-m).
6. Install stop switch housing and tighten screws in the sequence shown in Illustration at right.
7. Fit throttle cable, choke cable, and wire harness correctly in grommet and install grommet (replace grommet if worn or damaged).
8. Secure wire harness to handlebars with tie strap.
9. De-glaze handgrip area on handlebar with 400 grit sandpaper. Clean with isopropyl (rubbing) alcohol.
10. Liberally apply Three Bond™ 1501 handgrip adhesive (PN 2871715) to entire surface of handlebar grip area. Also apply a bead of adhesive to inside of handgrip.
11. Immediately install handgrip and rotate one full turn. Wipe off excess glue. Allow 6-8 hours drying time at room temperature.
12. Apply Loctite™ 242 to handlebar end plug retaining screw and torque to 12 in. lbs (.14 kg-m).
13. Install handlebar pad, and seat.
14. Turn handlebars to left and right through the entire steering range. The bars should move freely and smoothly without binding.
15. Inspect and adjust steering alignment. Refer to page 6.28-6.30.





Hand Grip Replacement - All Models

1. Remove handgrip end plug (where applicable). Carefully cut along length of old handgrip with a knife and remove grip.
2. Thoroughly clean grip area on handlebars with a knife and non-oil base solvent (such as lacquer thinner or acetone).
3. Perform steps 9-12 above.

Steering Cable Replacement

1. Disconnect cable at steering arm and at steering nozzle by removing bolt, nut, and washer.

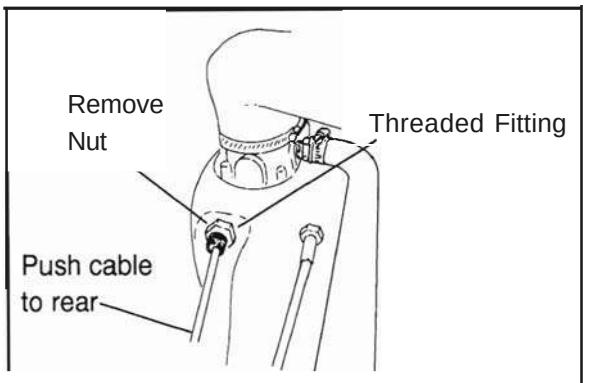
1995 Models: Remove the E-Clip and washer at the steering arm.

CAUTION:

Always install a new steering cable retainer locking clip. Clips may lose tension or become distorted when removed, causing the steering cable to dislodge. Refer to Bulletin PWC-95-20.

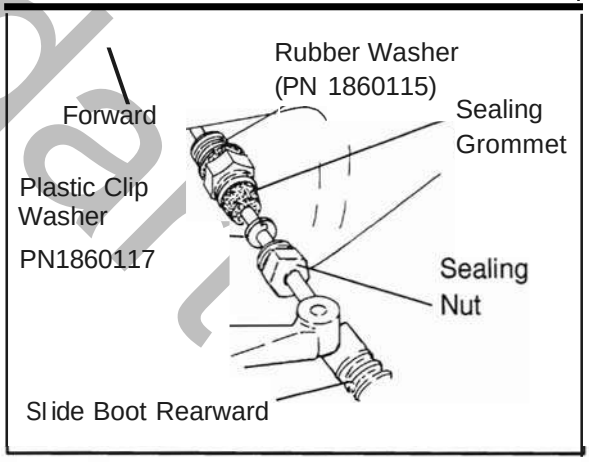
2. Loosen jam nut and unscrew tie rod ends. Remove adjusting nuts and washers at each end of cable housing (remove sealing nut at pump end of cable on 1995-Current models).

3. Pull cable out of hull and route new cable around left hand side of engine and battery. After passing cable through hull (or through threaded fitting on 1995 to Current models), seal the cable, nuts and washers with Marine Grade silicone sealant. Tighten nuts to proper torque. Refer to pages 6.5-6.12 for torque specifications.



1995 to Current

NOTE: On 1992-1994 models, the pump end of the cable can be identified by a white band on the cable housing.



4. Perform steering cable adjustment following procedures on pages 6.28-6.30. Make sure area where cable passes through hull is properly sealed (A).

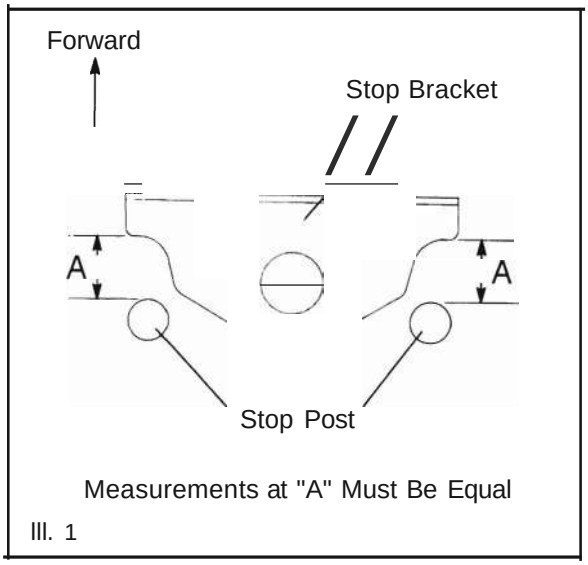
WARNING

Be certain to check for free and correct operation of the steering system when reassembly is complete.

Steering Cable Adjustment

1. Remove handlebar pad.

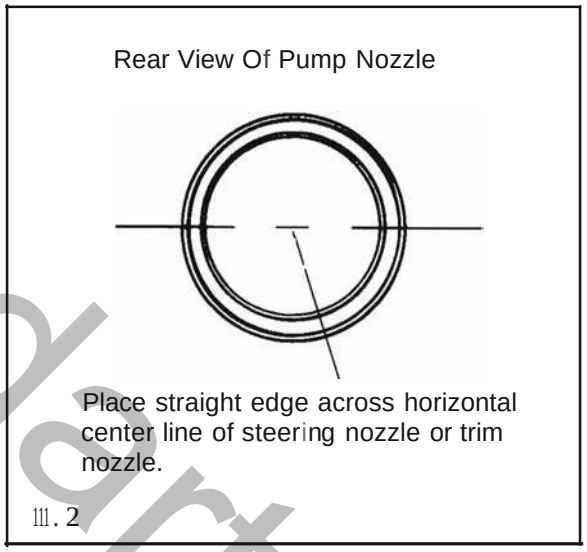
2. Visually center handlebars. Verify proper centering by measuring distance from stop bracket to stop post on each side. Move handlebars left or right until distance on each stop is equal. Be sure to measure at the same points on both sides. See Ill. 1.



Measurements at "A" Must Be Equal

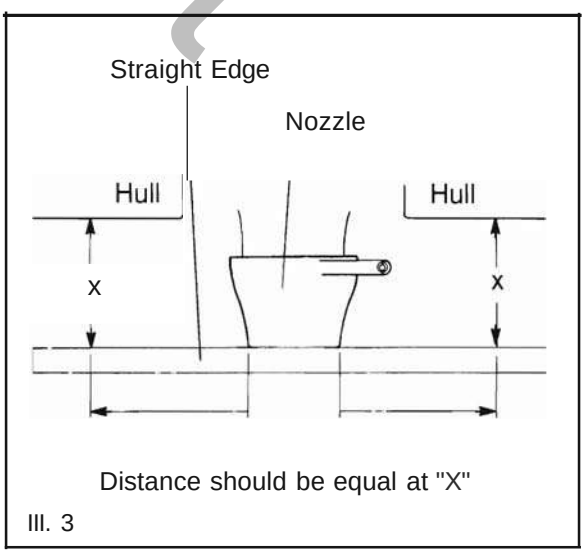
Ill. 1

3. Place a straight edge across horizontal center line of steering nozzle or trim nozzle. **NOTE:** The trim nozzle mounting bolts can be used as a reference for the center line on models with Quick Trim. See Ill. 2.



Ill. 2

4. Measure distance from straight edge to hull on left and right side. Be sure to measure at right angles to the straight edge and at equal distances from the nozzle. The distance at "X" should be equal when handlebars are straight. See Ill. 3.



Distance should be equal at "X"

Ill. 3

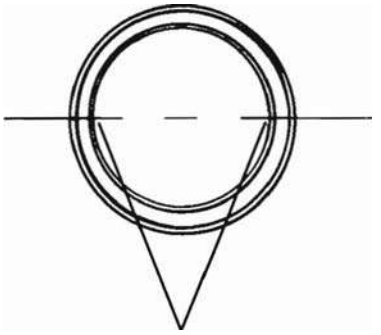
Alternate Method Of Measuring Nozzle

Following is an alternate method for checking nozzle centering.

1. Perform steps 1 and 2 on page 6.28 to center handlebars.

2. Measure distance from rear-most edge of steering nozzle (or trim nozzle) to stationary pump nozzle (extension housing) with a 6″ steel rule or a vernier caliper. Measure at the same point on both left and right sides along horizontal center line. The distance should be equal. See Ill. 1.

Rear View Of Pump Nozzle



Measure on horizontal center line from rear of steering or trim nozzle to stationary nozzle. Distance should be equal.

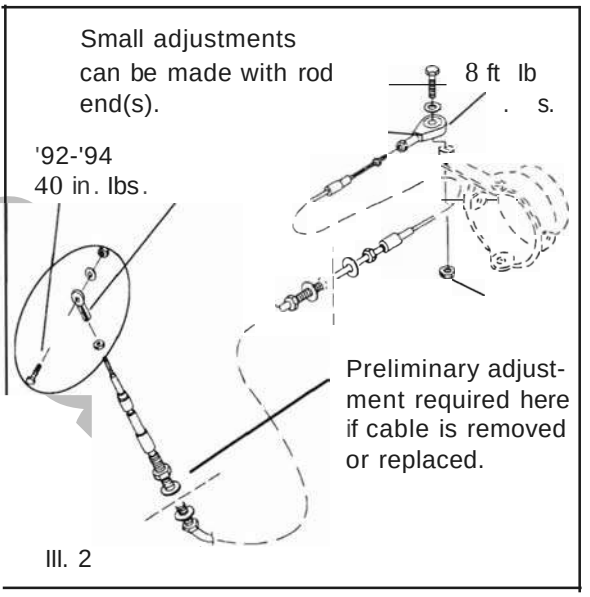
Ill. 1

Adjustment Procedure

1. Minor adjustments can be made using the steering cable rod end(s). Loosen jam nut on rod end(s). Remove end from top of steering nozzle (or steering arm on 1992-1994 models). Turn rod end in or out to adjust. Reinstall rod end, apply Loctite 242 (Blue) and tighten bolt to specifications. See Ill. 2.

CAUTION:

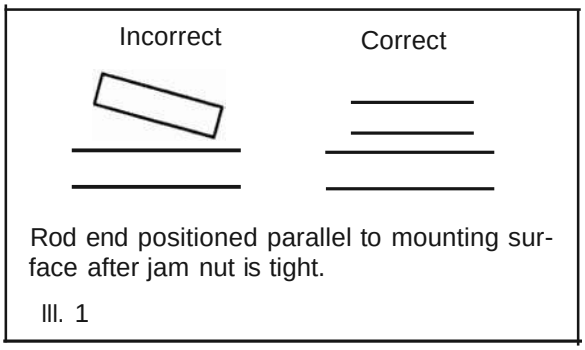
The cable must be threaded into the rod end a *minimum* of 3/8″ (10mm). Do not attempt major adjustments with the rod ends.



Ill. 2

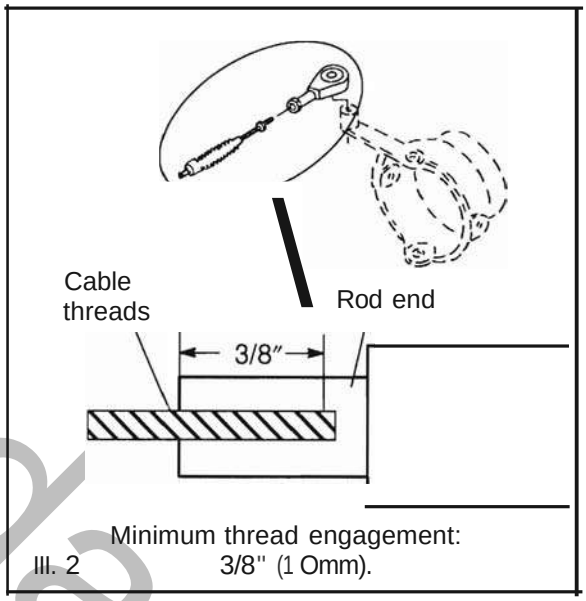
Adjustment Procedure Cant.

2. Apply Loctite 242 (Blue) to threads of cable and securely tighten jam nut with rod end positioned parallel to mounting surface. See Ill. 1 and 2.



Rod end positioned parallel to mounting surface after jam nut is tight.

Ill. 1



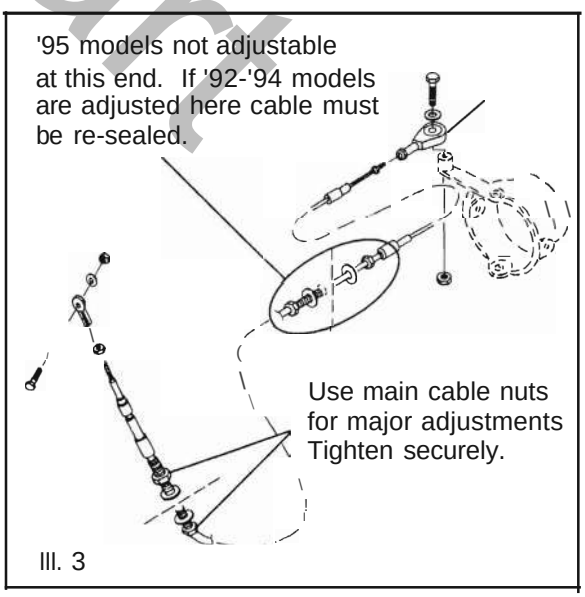
Minimum thread engagement: 3/8" (10mm).

Ill. 2

3. Use main cable adjuster nuts to make major adjustments. Adjuster nuts are located at forward end of cable near steering pod. Open front compartment and remove storage tray for access to bottom nut. The cable is mounted on a bracket on SLT models. On 1995 models, the cable is not adjustable at the through-hull end. On 1992-1994 models, the cable and hull must be cleaned and re-sealed with RTV silicone if adjustments are made at the through hull end. See Ill. 3.

4. Using two 11/16" open end wrenches, hold one nut and loosen the other. Lengthen or shorten cable to adjust nozzle centering. Tighten cable nuts securely after adjustment is complete.

5. Turn handlebars to left and right through entire steering range. The bars should move freely and smoothly without binding. If resistance or binding is evident check rod end positioning, cable condition, and routing to locate and correct the cause.



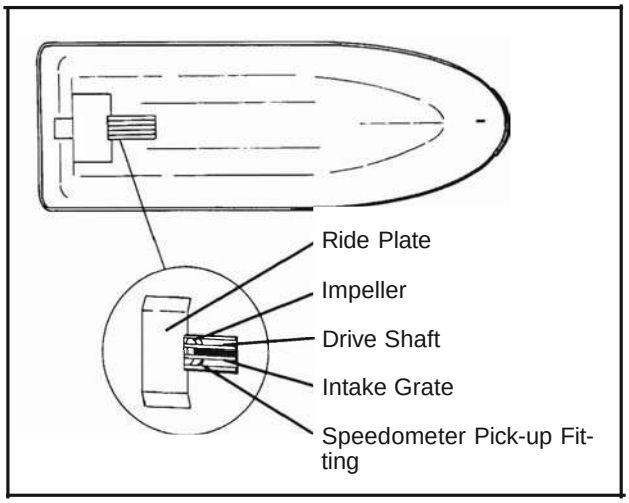
Ill. 3

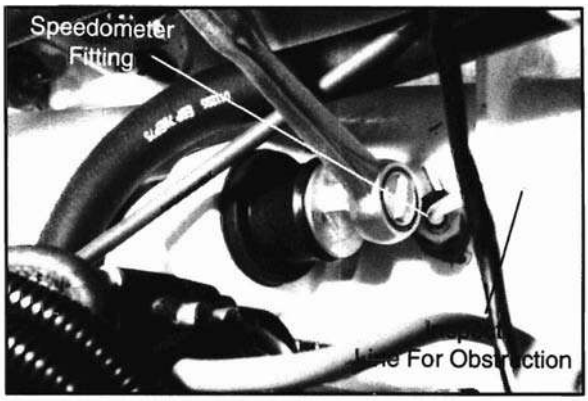
Speedometer Operation and Inspection

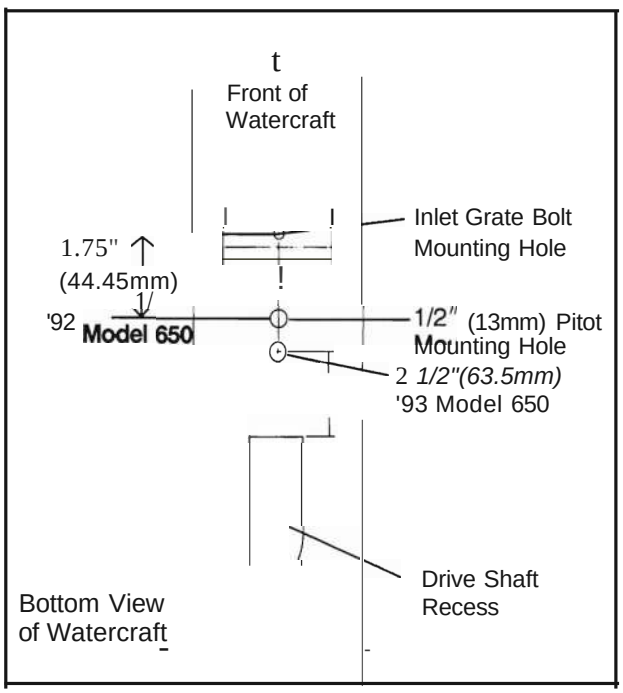
The speedometer is operated by water pressure. The pressure is supplied to the back of the speedometer through a hose connected to a fitting located inside the jet pump intake grate area.

1. If the speedometer becomes inoperative first check hose for kinks or restrictions. Check to see that it is connected properly to fitting and to back of speedometer. The fitting must be aligned with the pump intake grate to read accurately.
2. Occasionally foreign debris such as grass or weeds will lodge in the fitting or line. To clear hose and fitting, disconnect hose from speedometer and apply low pressure air to hose.
3. To test speedometer unit, connect a Mity Vac™ to the fitting on the speedometer. Apply pressure and compare the reading to the table below. Re-connect line and test for proper operation.

SPEEDOMETER PRESSURE/READING TABLE	
5 psi	= 21 MPH
10 psi	= 30 MPH
15 psi	= 37 MPH
20 psi	= 42 MPH
25 psi	=47 MPH
30 psi	= 51 MPH

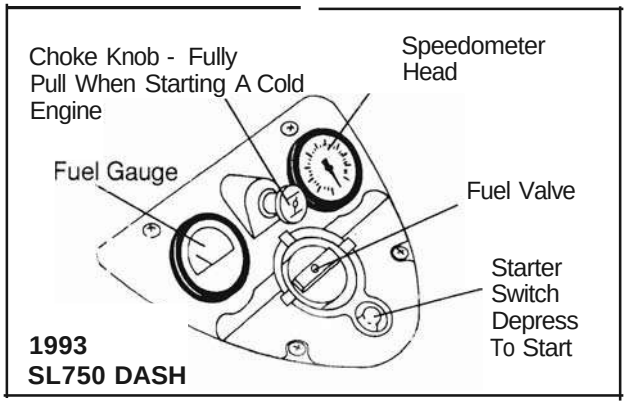




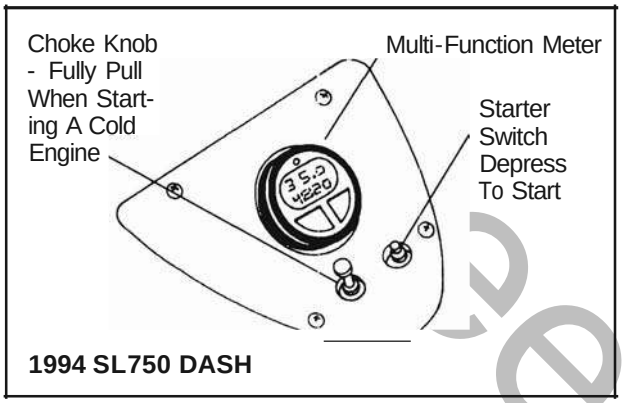


Dash/Control Panel

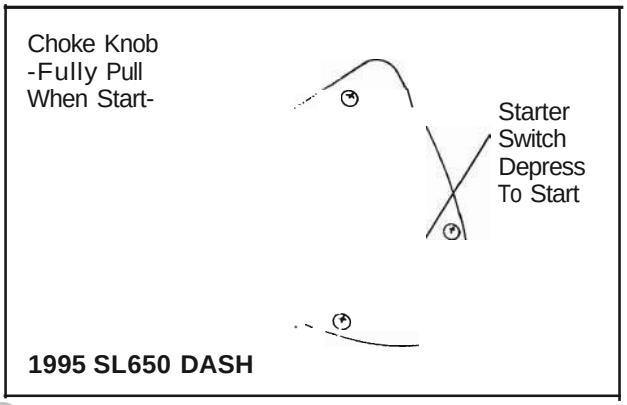
1. Loosen set screw at choke knob and remove knob. Remove cable retaining nut.
2. Remove start switch retaining nut and fuel valve screw (if applicable).
3. Remove panel screws and panel. Remove start switch. Lift out panel.



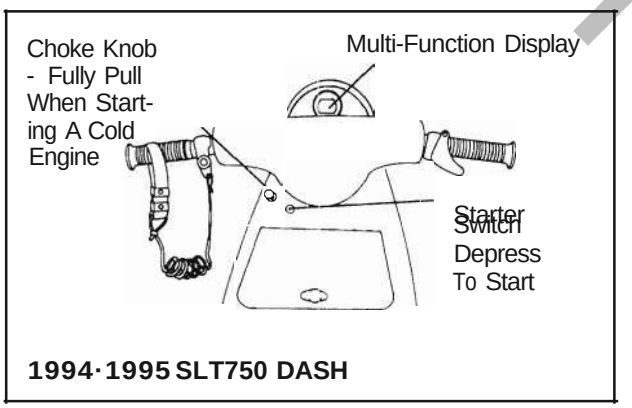
1993 SL750 DASH



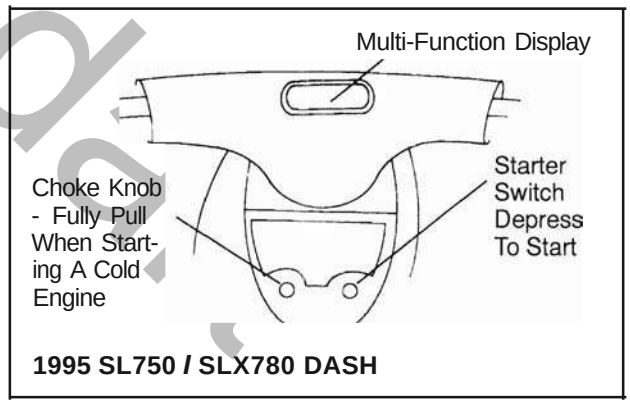
1994 SL750 DASH



1995 SL650 DASH



1994·1995 SLT750 DASH



1995 SL750 / SLX780 DASH

Decal Replacement

1. Decals are easily removable with the aid of a hot air gun. Heat the decal area first then peel back the decal, while intermittently applying some heat to the decal.
2. Wash the area where tile new decal is to be placed with mild soap and warm water. While the area is still wet apply the new decal. Smooth out any trapped air bubbles with a soft flexible plastic squeegee.

Wire Clip Replacement

1. If replacement of the wire clips becomes necessary, thoroughly clean the area around the anchor with lacquer thinner or acetone. Apply two part epoxy to the anchor and the hull.
2. Attach clip to hull area and hold pressure on it for a minute or so. Apply low heat with a heat gun to reduce cure time.

SMC Hull Repair (All Except 1994-1995 SLT and 1996 SLT700 Models)

The hull and top deck are constructed of sheet molded compound (SMC) which is an epoxy based, rigid, reinforced material. The processes used to manufacture the hull involve high heat and pressure. Once this process is complete it cannot be reversed. Therefore, hot air welding or similar methods cannot be used to repair damage.

A two part rigid structural adhesive such as 3M #08101 or equivalent is acceptable for SMC materials. Patch kits are locally available at most auto supply stores. Be sure to follow the directions carefully according to the repair kit package. **DO NOT use standard resin based fiberglass repair materials or polyester materials on SMC hulls - they will not adhere.** Use only materials made specifically for repair of SMC. After any repairs are made the hull can be prepped and painted using a base coat/clear coat marine quality paint. Be aware of the expiration date of the adhesive so old adhesive is not used.

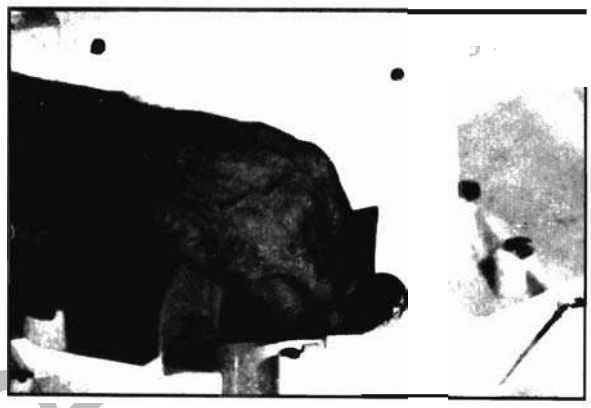
NOTE: See paint information in General Information section for paint colors.

CAUTION:

Do not use power sanding equipment on the repair area or bond strength may be affected. *Hand sand only.*

NOTE: For bonding use 3M #08101 structural adhesive or equivalent. Example shown is through hull fitting installation. Basic preparation procedure is the same for repairing damaged hull/deck components.

1. Remove all original adhesive and sand the area to be repaired with 80 grit paper. **Power sanding is not recommended - bond strength may be adversely affected.** Use acetone or lacquer thinner to clean and prime the area around the repair.



2. Mix parts 1 and 2 of the structural adhesive, apply to the fitting and hull, and immediately press the parts into place holding pressure for at least two minutes until the adhesive begins to set up.

3. Handling strength should be achieved within 30 minutes. Allow 24 hours for total cure time before painting or putting into service.

1995 SL650 STD Hull Repair

NOTE: Surface preparation is the same as outlined in SMC repair on previous page. Refer to General Section for hull material specifications.

Repair materials for the 1995 SL650 STD hull are available from: Applied Composite, 333 No. 6th St., St. Charles, Il, 60174, Phone 630-584-3130 or Fax 630-584-0659. See note below.

NOTE: Only #8062 filler paste and DDM-9 hardener are available from Applied Composite. Do not call Applied Composite for any other repair kits for Polaris personal watercraft.

1. Using #8062 filler paste (a purple paste similar to a body filler) with DDM-9 Hardener (liquid), add about 4 drops hardener to a golf ball size ball of paste.
2. Mix thoroughly and apply quickly with a body knife. The material will begin to harden in 1-2 minutes and is usually sandable in 5-10 minutes.
3. *Do not power sand the area!* Hand sand with 220 paper and a sanding block (dry). When area is shaped, wet sand with 400 paper on a sanding block.

CAUTION:

Do not use power sanding equipment on the repair area or bond strength may be affected. *Hand sand only.*

4. Wipe the area and hand rub with a medium rubbing compound. Follow with a high quality clear automotive paste wax.

Fiberglass Repair - SLT750, 1996 SLT700

Damaged fiberglass can be easily repaired by following a few basic steps. Refer to General Section for hull material specifications.

1. Remove all damaged material with a sabre saw or grinder.
2. Using a disc grinder or die grinder, taper fiberglass 1" (2.5 cm) back from patch area on inside of part.
3. Apply masking tape to outside of part to form a mold.
4. Mix enough polyester resin and catalyst to complete the repair, following instructions for resin being used.
5. Apply resin to inside of patch area using a disposable paint brush.
6. Lay in small pieces of shredded fiberglass matt. Use the paint brush to force air bubbles out. Add more resin and move matt around

NOTE: Pieces of matt between 1" to 2" (2.5 to 5 cm) square work best.

7. Keep adding matt and resin until patch area is filled up to the original thickness.
8. Let resin cure thoroughly.
9. Remove masking tape from outside of repair.
10. Remove any high spots from outside with a disc grinder.
11. Fill and smooth any defects with polyester auto body filler.
12. Sand smooth and feather with 360 to 400 grit sandpaper.
13. Paint outside of repair following instructions on paint container.

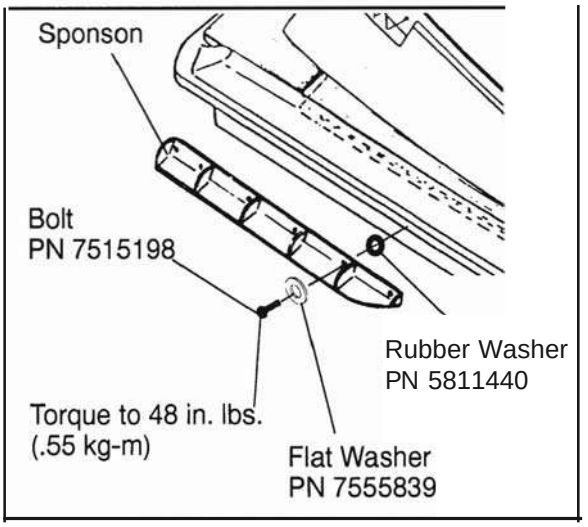
SLT750 Gel Coat Repair Kit
(includes instructions)

PN 2200735 Caribbean **Blue**
PN 2871287 White

Sponson Removal/Installation

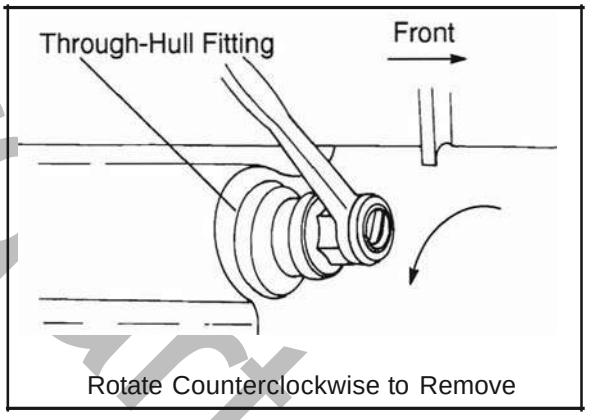
Sponsons are secured to the hull with (6) screws per side. New screws come with locking agent applied. If screws are re-used, apply Loctite 242 (Blue). Assemble the sponsons as shown at right. Torque screws to 48 in. lbs. (.55 kg-m). Inspect condition of rubber sealing washer and replace if missing or damaged.

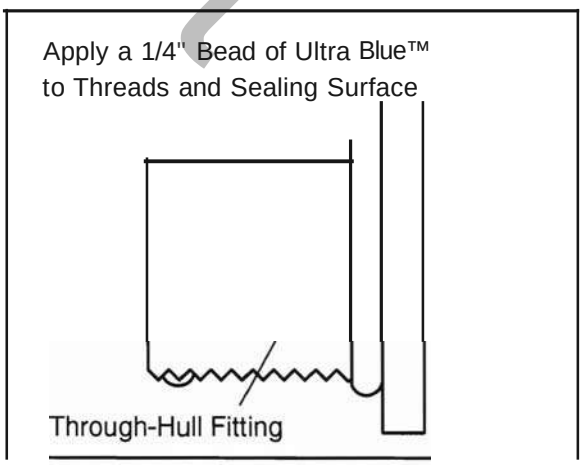
Sponson Kit PN 2871467



Threaded Through-Hull Fitting (1995 SLX780 and SL650 Std.)

1. Remove pump and driveshaft assembly.
2. Loosen clamp and remove bearing housing hose from through-hull fitting.
3. Loosen and remove fitting using special tool PN 2871425. Remove rubber gasket and discard.
4. Clean inside and outside of through-hull fitting area, and threads of fitting and nut plate to remove all oil or grease. Wipe sealing surfaces with lacquer thinner or acetone on a shop towel and dry thoroughly.
5. Apply a 1/4" (6mm) bead of Loctite Ultra Blue™ silicone sealant to sealing surface of fitting and to leading edge of fitting threads.
6. Reassemble fitting and torque to 22 ft. lbs. (3.04 kg-m) using the special tool. Allow sealant to cure for 24 hours.
7. Reinstall bearing housing with grease fitting facing upward and torque clamp to 35 in. lbs. (.42 kg-m).
8. Install pump and driveshaft assembly following procedure outlined in Section 5 of the 1992-1995 Personal Watercraft Service Manual.





CHAPTER 7
ELECTRICAL

Spark Plugs / Alternator

Refer to wiring diagrams in this section for more information

Model	Alternator Output	Spark Plug*	Plug Gap
1992-1995 SL650/STD SL750 SLT750	120 Watts @ 4500 RPM	NGK BPR7ES	.024 -.028 in. (.6 - .7 mm)
1995 SLX780	120 Watts @ 4500 RPM	NGK BPR8ES	.024 -.028in. (.6 - .7mm)
1996 SUSLT 700	60 Watts @ 4500 RPM	BPR7ES	.024 -.028 in. (.6 - .7 mm)
1996 Hurricane	60 Watts @ 4500 RPM	NGK BPR7ES	.024 -.028 in. (.6-.7 mm
1996 SL780 SLT780 SLX780	120 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1996 SL900 1996 SLTX	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1997 SL 700 Deluxe 1997 SLT 700	60 Watts @ 4500 RPM	BPR7ES	.024 -.028 in. (.6 - .7 mm)
1997 SL700 / Hurricane	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1997 SL780 / SLT780 1997 SLX 780	120 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1997 SL900	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1997 SL1050	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1997 SLTX	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1998 SLH	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1998 SLTH	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1998 SLXH	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)
1998 SLTX	60 Watts @ 4500 RPM	BPR8ES	.024 -.028 in. (.6 - .7 mm)

Alternate Spark Plugs

Alternate spark plugs For NGK BPR8ES, NGK BR9ES, or Champion RN2C
For NGK BPR7ES NGK BR8ES, or Champion RN3C

***NOTE: Use only Resistor type spark plugs in all Polaris products**

ELECTRICAL
Specifications

COl Box Identification

Refer to wiring diagrams in this section for more information and stator resistance specifications.

Model	COl Box 10 #	Ignition Timing @ 3000 RPM			Ignition Timing* ± 1.5°
		Degrees BTDC	Inches	MM	Deg / RPM
1992 SL650	F8T16271 (Used with large harmonic balancer)	24° ±1.5	.139	3.54	18° / 6000
1992 SL650	F8T16272 (Beginning serial number PLE04039F292)	24° ± 1.5	.139	3.54	18° / 6000
1993 SL650	F8T16273	18° ± 1.5	.079	2.01	12° / 6000
1993 SL750	F8T16273	16° ± 1.5	.063	1.59	10° / 6000
1994/95 SL650/STD	F8T16274 (65VV95)	18° ± 2	.079	2.01	12° / 6000
1994/95 SL750, SLT750	F8T32071 (75VV95)	24° ± 2	.139	3.54	16° /6000
1995 SLX780	78VV95	28° ± 2	.188	4.77	18° / 6250
1996 SLT780 (EC78PVVE02 Engine) (EC78PVVE03 Engine) (EC78PVVE05 Engine)	 F8T33071 (PN 3240271) F8T33074 (PN 3240289) F8T33074 (PN 3240289)	 28° ± 2 24° ± 2 (26@1500) 24° ± 2 (26@1500)	 .188 .139" .139'·	 4.78 3.54** 3.54**	 18° / 6250 18° / 6250 18° / 6250
1996 SLX780	F8T33073 (PN 3240290)	28° ± 2	.188	4.78	18° / 6250
1996 SL780 (EC78PVVE02 Engine) (EC78PVVE03 Engine)	 F8T33071 (PN 3240271) F8T33074 (PN 3240289)	 28° ± 2 24° ± 2 (26@1500)	 .188 .139**	 4.78 3.54**	 18° / 6250 18° / 6250
1996 SUSLT 700	105-552.02 (4060117)	18° ± 2	.0815	2.07	18° / 6250
1996 Hurricane	4060117	20° ± 2	.1003	2.55	15° / 6250
1996 SL900	4060137	18° ± 2	.0815	2.07	11° / 6250
1996 SLTX	4060137	18° ± 2	.0815	2.07	11° / 6250
1997 SL700	4060169	18° ± 2	.0815	2.07	18° / 6250
1997 SL 700 Deluxe 1997 SLT 700	105-552.02	18° ± 2	.0815	2.07	18° /6250
1997 Hurricane	4060148	20° ± 2	.1003	2.55	15° / 6250
1997 SL780/SLT780	F008T33074	24° ± 2	.1394	3.54	18° / 6250
1997 SL900	4060137	18° ± 2	.0815	2.07	11° / 6250
1997 SL1050	4060137	18° ± 2	.0815	2.07	11° / 6250
1997 SLTX	4060137	18° ± 2	.0815	2.07	11° / 6250
1998 SLH	4060148	18° ± 2	.0815	2.07	13°± 2/6250
1998 SLTH	4060148	18° ± 2	.0815	2.07	13°± 2/6250
1998 SLXH	4060180	18°+0,-2	.0815	2.07	11°+0,-2/6250
1998 SLTX	4060180	18°+0,-2	.0815	2.07	11°+0,-2/6250

*Ignition timing specification for high RPM - Check at specified RPM (6000 or 6250) *not* operating RPM.

**780 03 or 05 Engines - Timing should be checked at 1500 RPM on 780 03 and 05 engines for best accuracy. The 03/05 ignition timing specification is 26.5° at 1500 RPM *(.163"* or 4.14mm).

Warning Systems Operating Characteristics

Following is a quick reference chart showing how each model warns the operator and/or protects the engine when the engine overheats, or when a low fuel or oil condition exists.

Year	Model	Buzzer (No MFD)	Temp Sensor "ON" @ F°/C°	Light (MFD)	4200 RPM Limit	4500 RPM Limit	Ignition Timing (Retard)**
1992	SL650	Oil, Heat	*180 F/82* C*				
1993	SL650 / SL750	Oil, Heat	*180 F/82* C				
1994	SL650	Oil, Heat	*180 F/82* C				
1994	SL750 / SLT750		*180 F/82* C	Oil, Heat, Fuel			
1995	SL650 *ISL650* Std		*180 F/82* C	Oil, Heat, Fuel			
1995	SL750 / SLT750		*180 F/82* C	Oil, Heat, Fuel			
1995	SLX780		*180 F/82* C	Oil, Heat, Fuel	HeaVFuel		
1996	SL 700 / SLT700	Oil, Heat	160 F /71 C				
1996	Hurricane		160 F /71 C	Oil, Heat, Fuel			
1996	780s (All)		*180 F/82* C	Oil, Heat, Fuel	HeaVFuel		
1996	SL900 / SLTX		160 F /71 C	Oil, Heat, Fuel			Heat, Fuel
1997	SL 700	Oil, Heat	160 F /71 C				
1997	SLT 700 ISL 700 Dlx	Oil, Heat	160 F /71 C				
1997	Hurricane		160F/71 C	Oil, Heat, Fuel			
1997	780s (All)		*180 F/82* C	Oil, Heat, Fuel	Heat		
1997	SL900		160 F /71 C	Oil, Heat, Fuel			
1997	SL1050 / SLTX		160 F /71 C	Oil, Heat, Fuel		Heat	
1998	SLH		160 F /71 C	Oil, Heat, Fuel			
1998	SLTH		160F/71 C	Oil, Heat, Fuel			
1998	SLXH		160F/71C	Oil, Heat, Fuel		Heat	
1998	SLTX		160 F /71 C	Oil, Heat, Fuel		Heat	

* With thermostat pop-off kit PN 2200475 installed

** Ignition Timing Retard / RPM Limit

On the 1996 SL900 and SLTX, the ignition timing retards to 8 degrees BTDC when a low fuel or overheat condition exists. The craft will exhibit symptoms such as reduced performance during acceleration, and also reduced top speed.

Some models limit RPM to 4200 or 4500 in the event of an overheat or low fuel condition. Refer to the chart for the system in use on each model.

ELECTRICAL
Specifications

Stator Plate Assembly And Ignition System Test Specifications

All specifications are listed on the appropriate wiring diagram. Refer to the wiring diagram for the model you are working on. If resistance specifications are not listed on the wiring diagram, use specifications listed below. Refer to test procedures in this section.

All electrical resistance readings should be done at room temperature. Reading may vary ± 10%. Disconnect component to be tested. Always subtract meter lead resistance when measuring small resistance values. Meter readings were obtained using either a Fluke™73 or Tektronix-M DMM155 digital multitester. Use of other meters may produce different results.

NOTE: Use only Resistor type spark plugs in all Polaris products.

Fuji Engines

Component	Wire Colors (Connect Ohmmeter Leads To):	Reading ± 10%
Alternator Coil	Red/Purple to Yellow	.6 ohms
Trigger Coil	WhitelYeliow to Black	220 ohms
Pulser Coil	Blue/Red to RedlWhite	90 ohms
Exciter Coil	RedlWhite to Green/Red	490 ohms

Ignition Coils, Each	Connections	Readings ± 10%
Primary	Black to Black/white	.2-.6 ohms
Secondary	Black to high tension lead (cap removed)	3.3 K ohms (3300 ohms)
Spark Plug Cap	Lead inside to Spark Plug side	5.0 K ohms (5000 ohms)

Polaris Engines

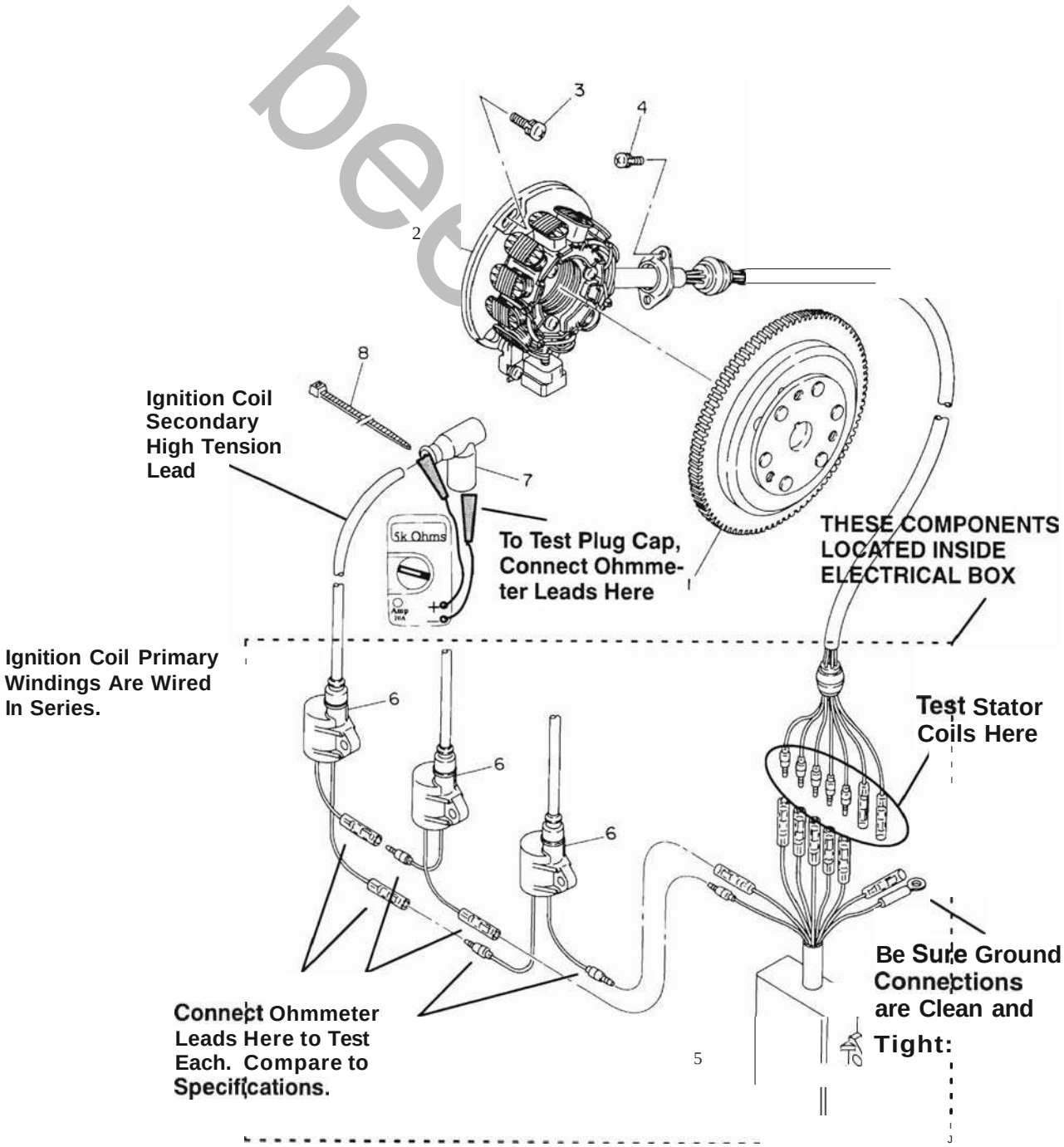
Component	Wire Colors (Connect Ohmmeter Leads To):	Reading ± 10%
Alternator Coil	Red/Purple to Yellow	.75 ohms (Continuity)
Alternator Coil	Red/Purple or Yellow to Ground	CXJ (No continuity)
Trigger Coil	Refer to test procedure in this section	
Exciter Coil	Black to Purple	1200 ohms
Exciter Coil	Black to Gray	80 or 130 ohms Refer to Wiring Diagram For Specifications
Exciter Coil	Black to Ground	O ohms

Ignition Coils, Each	Connections	Readings ± 10%
Primary	Yellow/Brown to BlklWhite; Blk/Green to BlklWhite; or Blk/Blue to Blk/White	.35 ohms (Continuity)
Secondary	Black to High Tension Lead (With Spark Plug Cap Removed)	1240 or 1550 ohms (See coil identification this section)
Spark Plug Cap	Lead inside to Spark Plug side	5.0 K ohms

1992/1993 - All Models

Magneto

Ref.	Qty.	Description
1	1	Flywheel wiRing Gear
2	1	Stator Plate Assembly
3	3	Screw and Washer Assembly
4	2	Screw and Washer Assembly
5	1	C.D.I. Module
6	3	Ignition Coil Complete
7	3	Spark Plug Cap
8	3	Panduit Strap



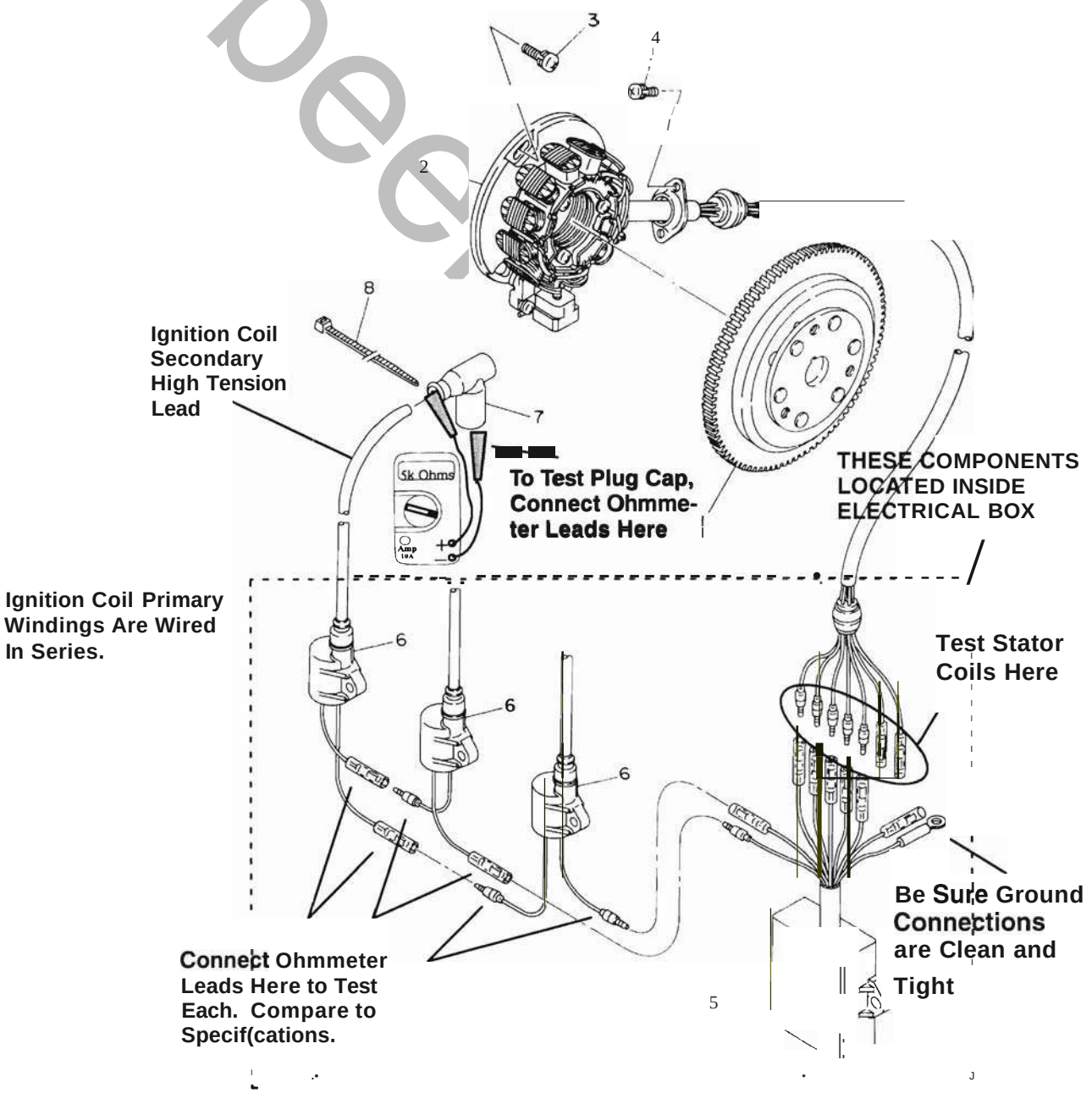
ELECTRICAL
Ignition System

1994-1995 All Models, 1996 SL780, SLX780

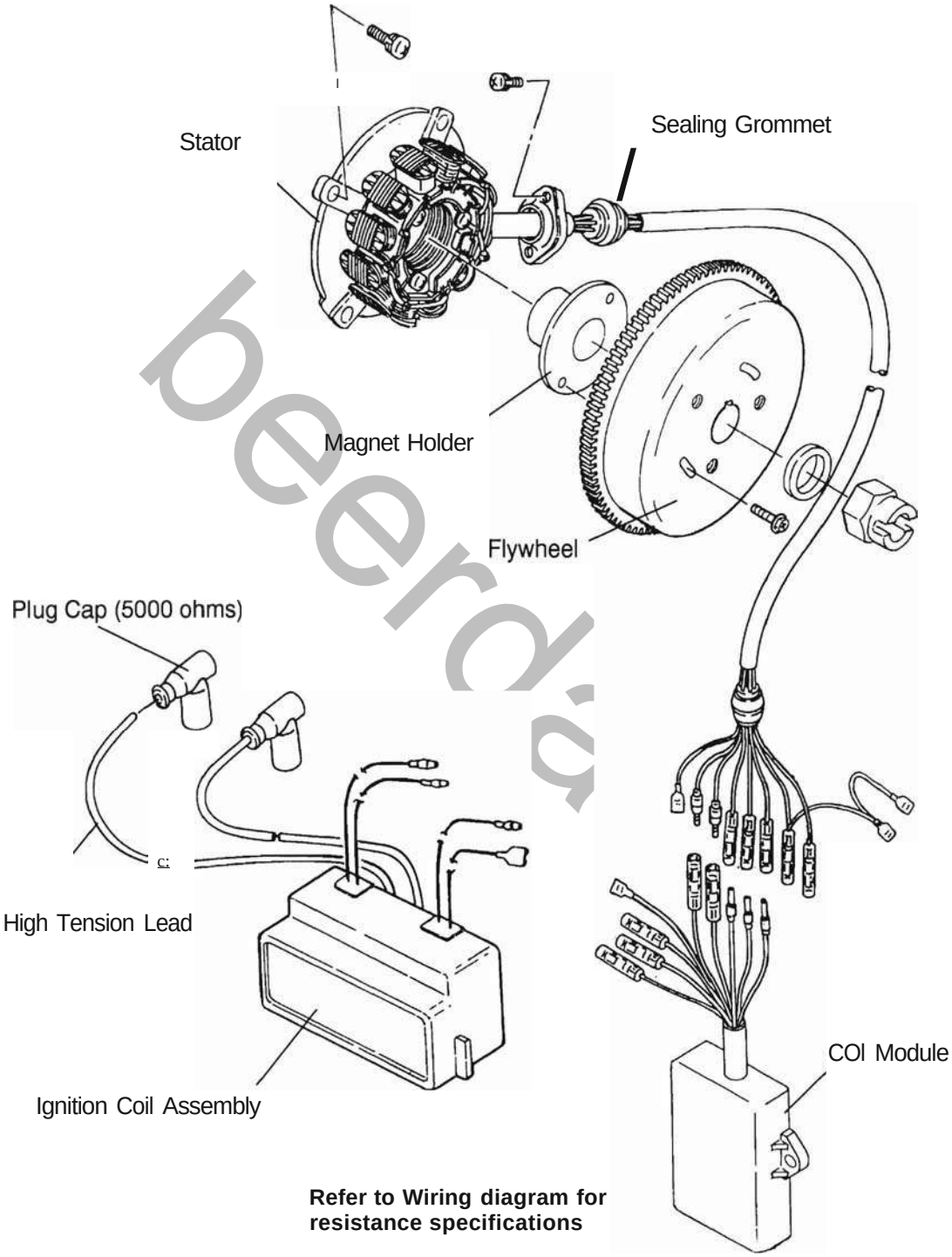
Magneto

Ref.	Qty.	Description
1	1	Flywheel wIRing Gea
2	1	Plate Assembly
3	3	Screw and Washer Assembly
4	2	Screw and Washer Assembly
5	1	CD.I. Module*
6	3	Ignition Coil Complete
7	3	Spark Plug Cap
8	3	Panduit Strap

* **NOTE:** 1994-95 SL650 COl box is not interchangeable with 1994-95 SL750 digital ignition parts.

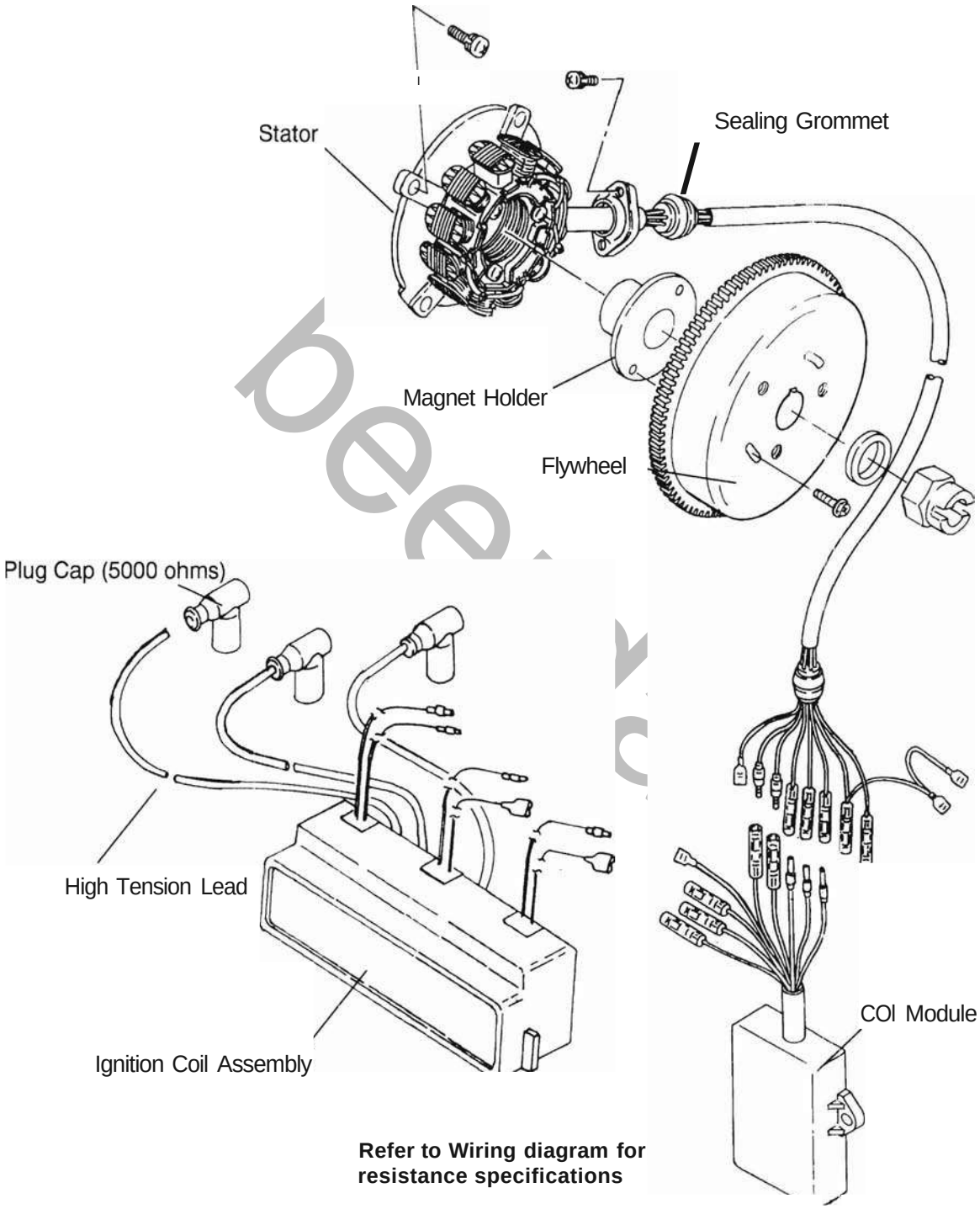


1996 to Current SL700, SL700 Dlx, SLT 700, Hurricane



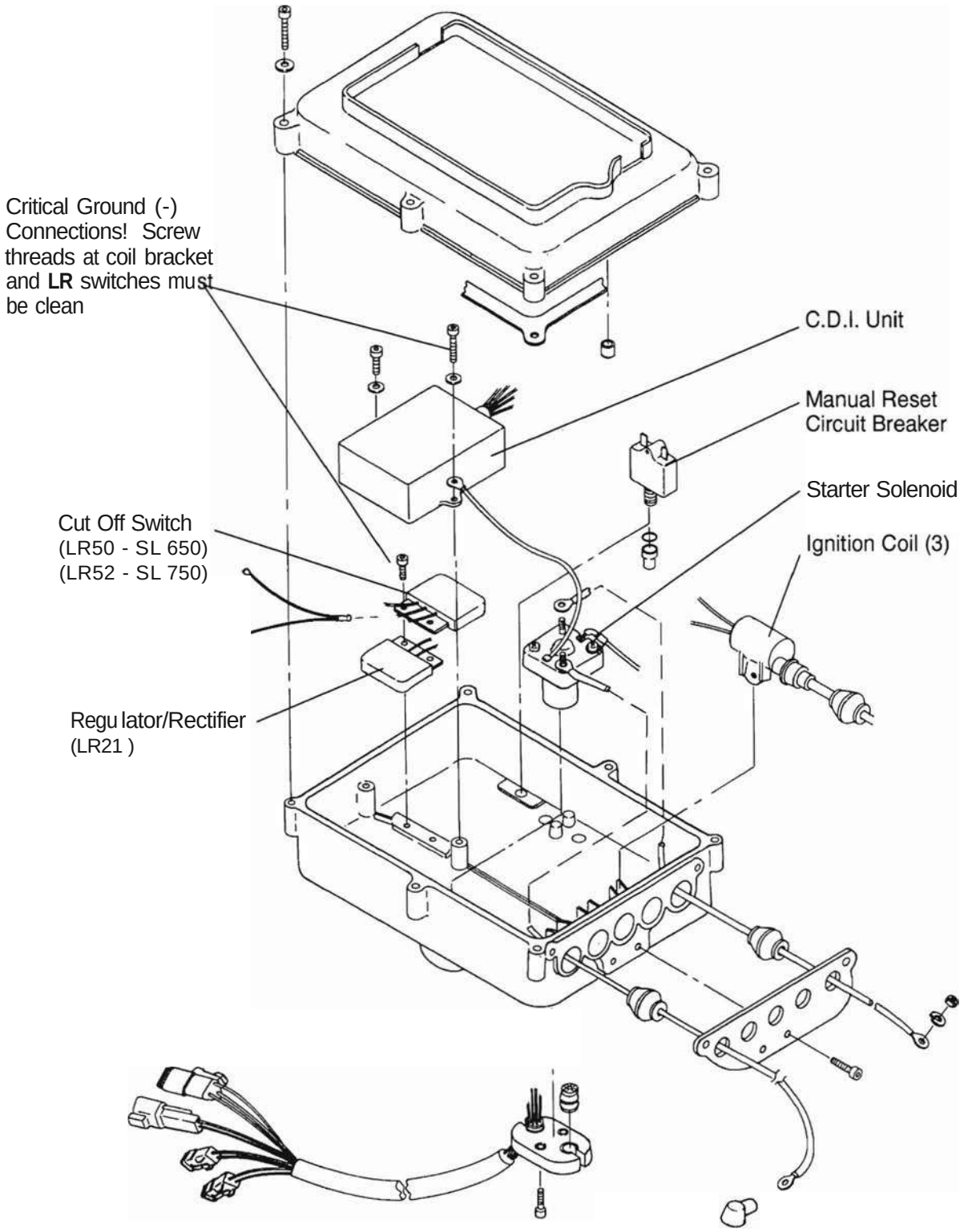
ELECTRICAL
Ignition System

1996 to Current SL900, SLTX, SL1050



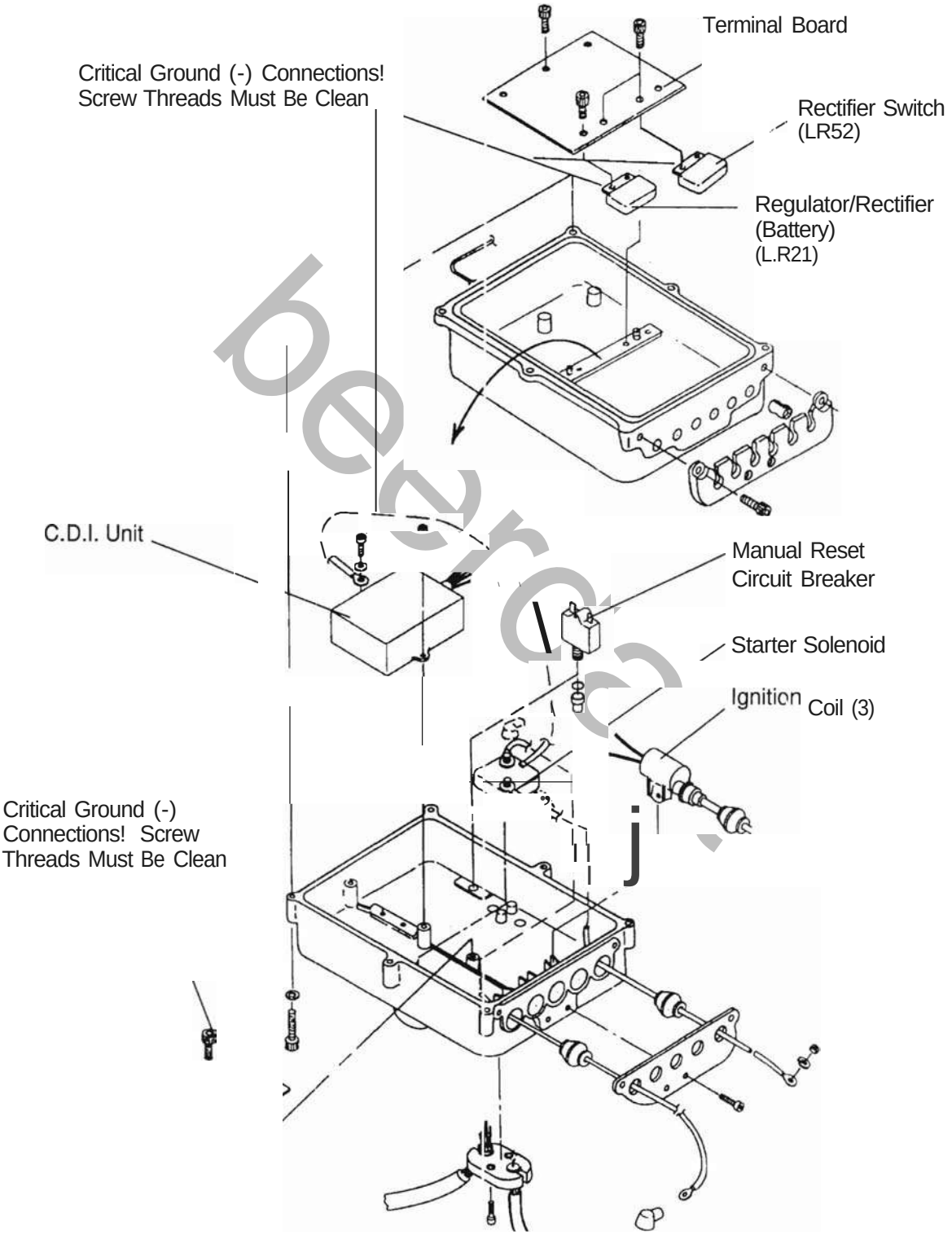
Refer to Wiring diagram for resistance specifications

1992/1993· SL650, SL750

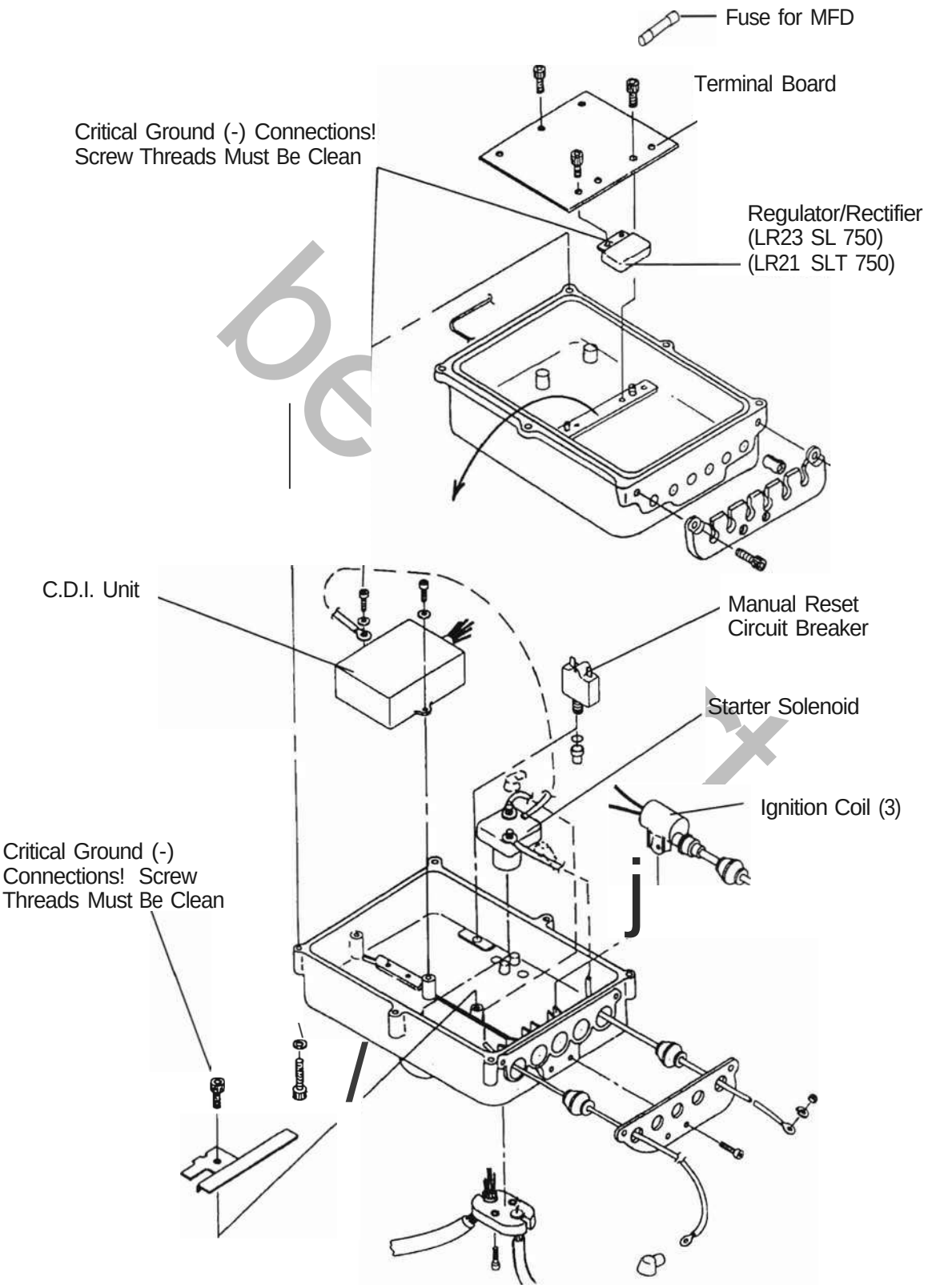


ELECTRICAL
Electrical Box

1994/1995 SL650

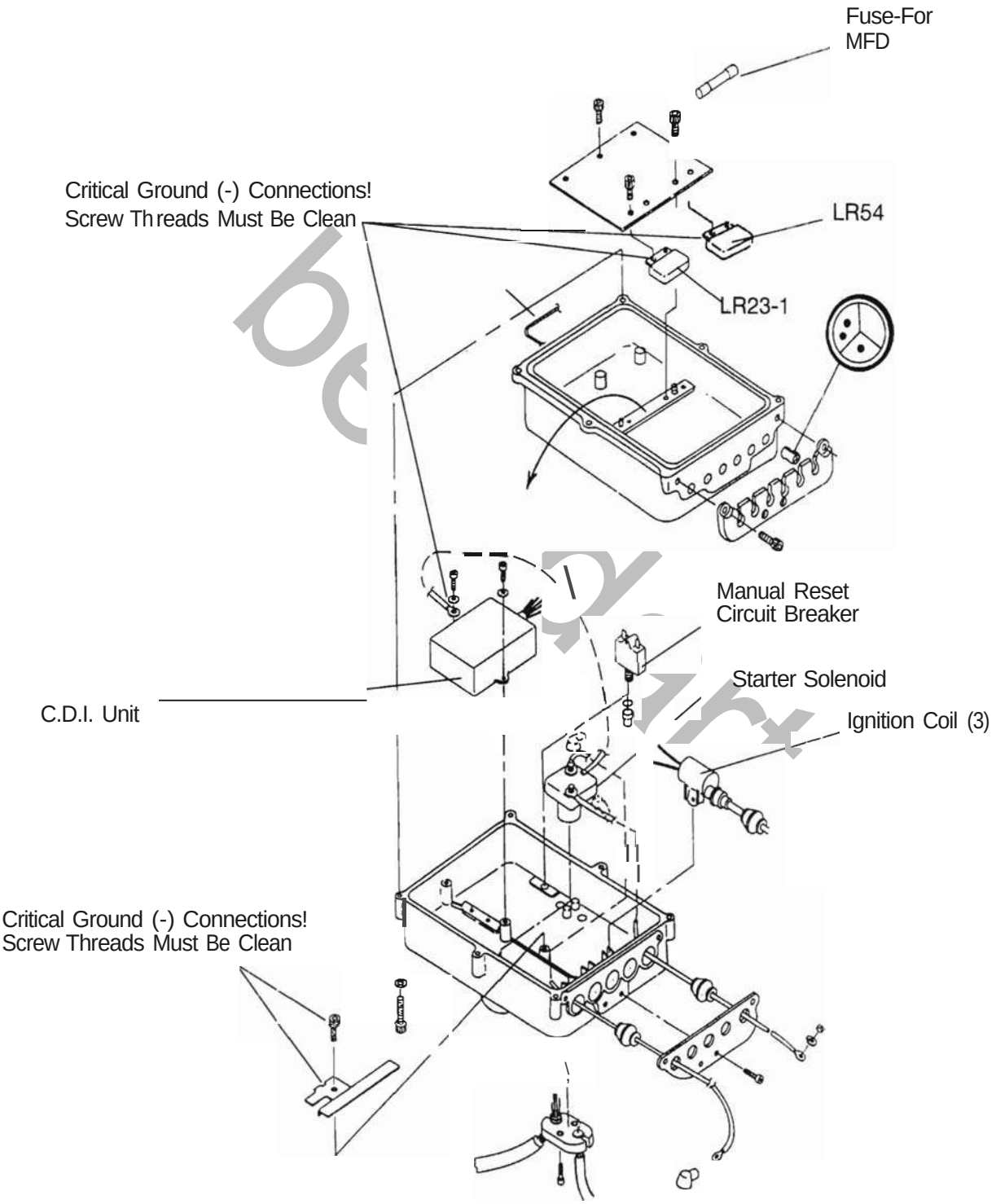


1994/1995 SL750, SLT750

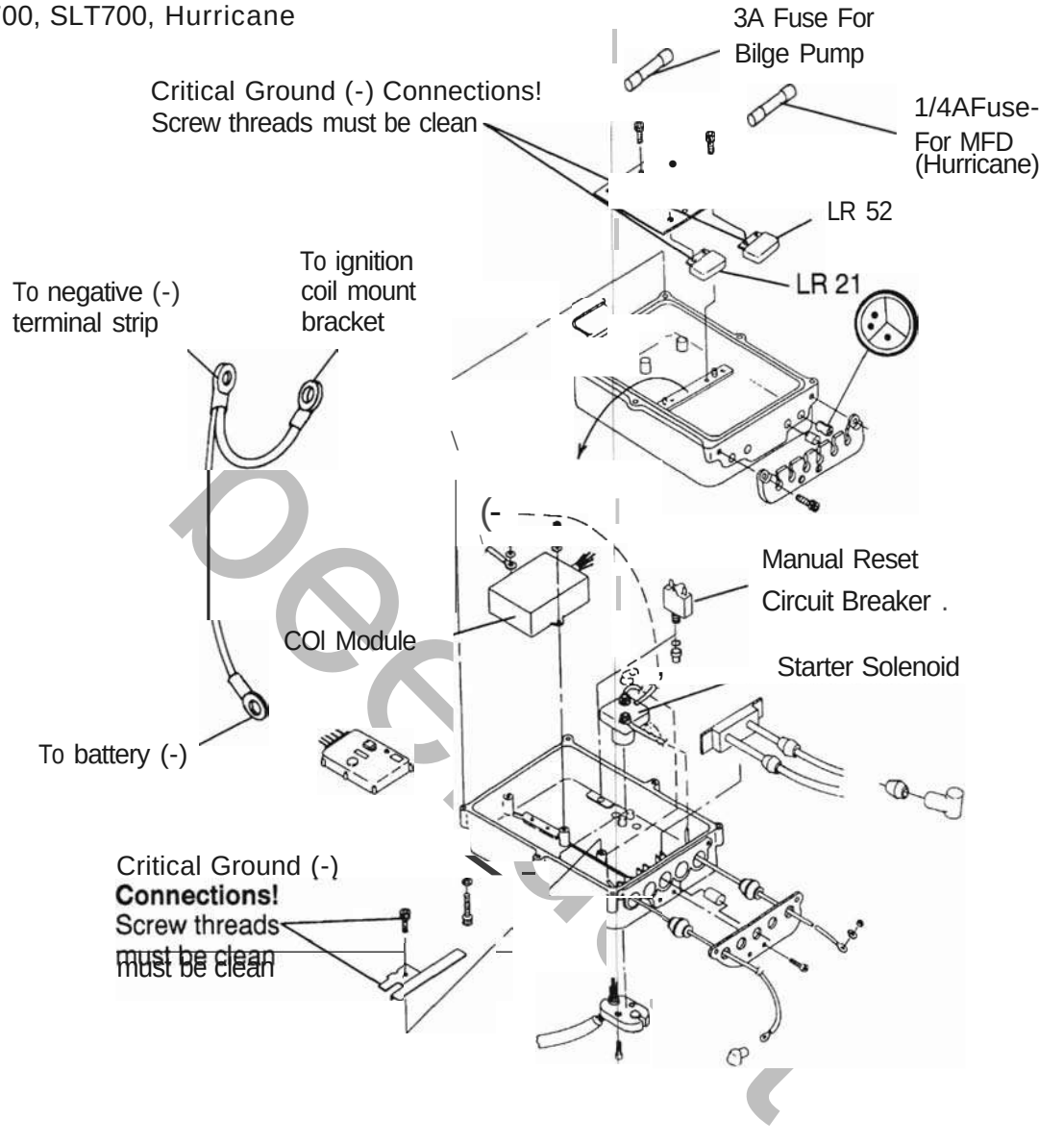


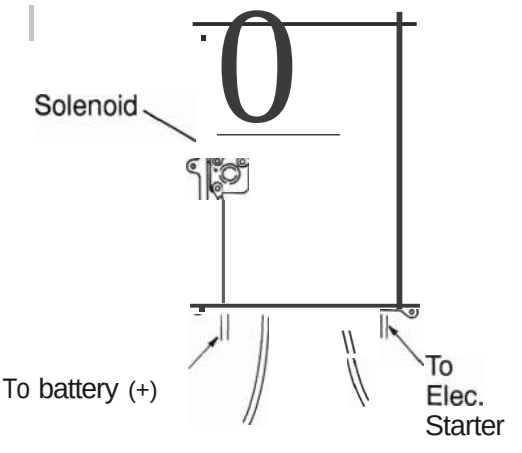
ELECTRICAL
Electrical Box

1995 SLX780



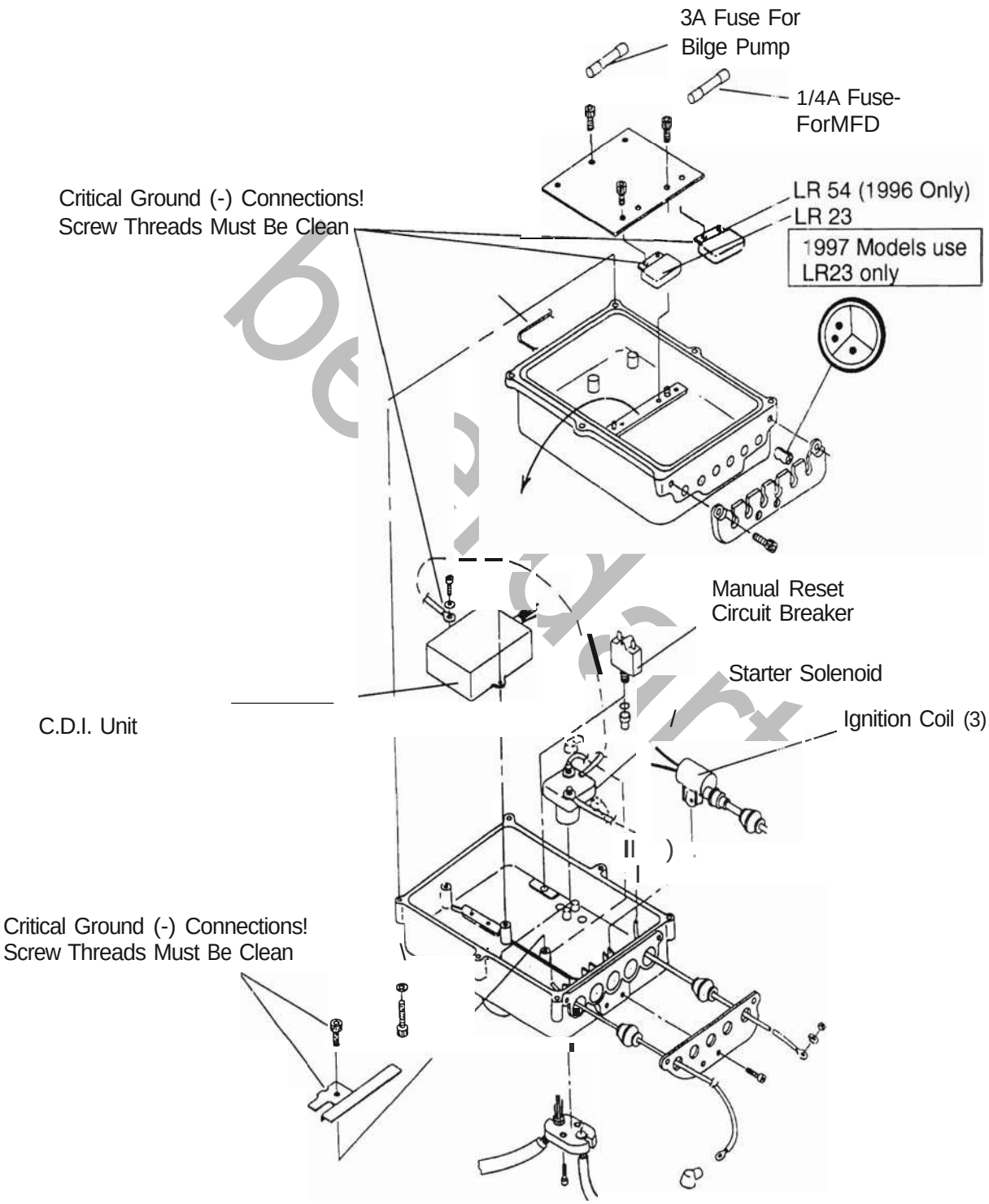
1996 SL700, SLT700, Hurricane



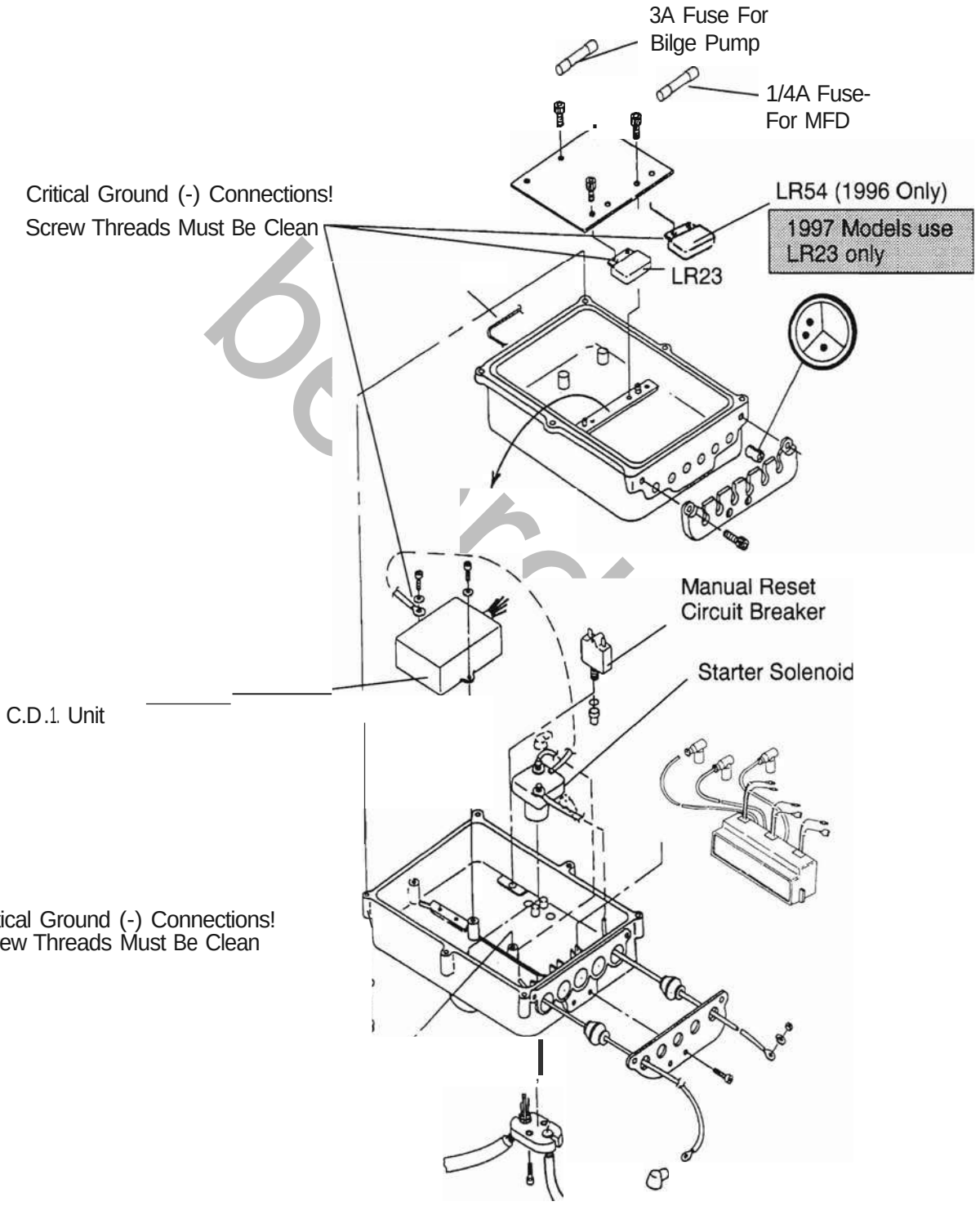


ELECTRICAL
Electrical Box

1996 to Current SL780, SLT780, SLX780



1996 to Current SL900, SLTX

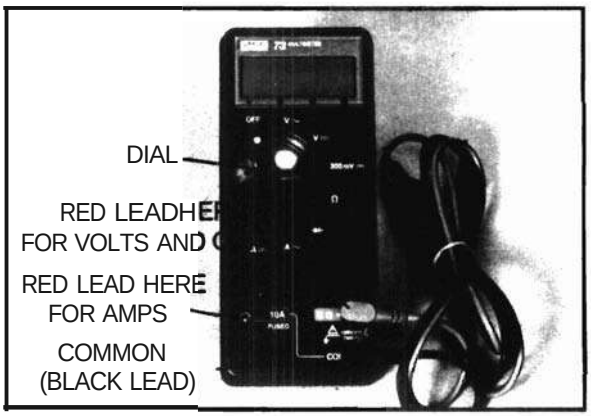


ELECTRICAL
Charging System

Electrical Testing

Digital Multitester • The Fluke 73

The easiest and most accurate method for testing modern electrical components is with a digital multitester. Any good quality multitester will work. However, due to ease of operation and durability, Polaris recommends the Fluke Model 73 (see photo) or Tektronix DMM155. This instrument will provide a digital readout value on the test being performed. Listed below are the dial symbols, their meaning and what the dial setting can be used for.



Fluke Model 73 Digital Multitester
PN 2870659

Tektronix DMM 155 Digital Multitester

Off= Instrument Off

V~=Volts AC - measuring alternator output

V⎓ =Volts DC - measuring battery voltage, volt drop, etc.

300mv⎓ =Milli Volts DC - measuring small DC voltages

Ω=Ohms, resistance - measuring component resistance values - testing coils, wiring, etc.

⊣⊢=Diode check - checking the condition of rectifier diodes; cannot be used for testing except when the diodes are out of circuit

A~= Amps AC - not used

A⎓ = Amps DC - used to check battery charge rate, system draws, etc.

*NOTE: When using the Amp settings, the red test lead must be moved to the 10A (unfused) socket on the front of the instrument.

Charging System Testing (Unregulated Voltage)

1. Remove electrical box cover for component access.
2. Turn multitester dial to Volts AC (~) position.
3. Disconnect alternator-to-main harness connector at electrical box. Connect one of the tester leads to the yellow alternator wire and the other lead to the red/purple alternator wire.
4. Start engine. While observing voltage reading, increase engine speed to about 3000 RPM. Readings should be above 20 VAC. If output is low, test stator coils with an ohmmeter. Refer to page 7.2 for connections and resistance specifications.

CAUTION:

Do not run engine out of the water for more than 15 seconds as severe engine damage may result from overheating.

Charging System Testing (Regulated Voltage)

1. Turn multitester dial to volts DC ($V\overline{\overline{\ldots}}$) and connect leads across battery terminals.
2. Start and briefly run engine at 3000 RPM. Measured voltage should be around 14.5 VDC. A higher reading may indicate a regulator problem or a poor ground at the regulator heat sink. A lower reading may indicate an excessive system load, alternator problem, or a faulty regulator.
3. If DC Volt reading is low, charge and test battery as outlined on page 7.16-7.18, and re-test.

***NOTE:** The regulator/rectifier is a solid state unit and no repair or adjustment is possible.

Start Switch Testing

1. Set multitester to ohms (Ω) position.
2. Unplug starter switch connector (red/purple and yellow/red wires) from terminal board and starter solenoid or MFD wire.
3. Connect one of the test leads to the red/purple wire and the other lead to the yellow/red wire. Depress start button. The reading should be .3 ohms or less. A high resistance or open reading indicates a faulty switch.
4. Release start button. An open reading (OI) should be indicated. If low resistance is measured, replace the switch.

Engine Stop Switch Testing

1. Set multitester to ohms (Ω) position.
2. Unplug stop switch connector (black/yellow and black wires).
3. Connect one of the test leads to the black/yellow pin and the other lead to the black pin. Push kill button or disconnect tether cord. The reading should be .3 ohms or less.
4. Connect tether cord and release button. An open reading should be indicated. If not, replace the switch.

ELECTRICAL
Battery Testing

⚠ WARNING: Whenever installing batteries, care should be taken to avoid the possibility of explosion resulting in serious burns. Always connect the positive (red) cable first and the negative (black) cable last. When working with batteries, always wear safety glasses or a face shield and protective gloves. Battery electrolyte contains sulfuric acid and is poisonous! Serious burns can result from contact with the skin, eyes or clothing. **ANTIDOTE:** External- Flush with water. Internal- Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately. Eyes - Flush with water for 15 minutes and get prompt medical attention.

Preparing A New Battery For Service

***NOTE:** Do not service the battery unless it will be put into regular service within 30 days.

To assure maximum service life and performance from a battery, it must have proper initial servicing. To service a new battery, the following steps must be taken:

- Remove vent plug from vent fitting.
- Fill battery with electrolyte to upper level marks on case.
- Set battery aside and allow it to cool and stabilize for 1/2 hour.
- Add electrolyte to bring level back to upper level mark on case. **NOTE:** This is the last time that electrolyte should be added. If the level becomes low after this point, add only distilled water.
- Charge battery at 1/3 of its amp/hr rating for up to 2 hrs. **NOTE:** This charge rate is to be used only on new batteries during the first-time charge. After this charge, they should be charged at the normal charge rate of 1/10 of amp/hr.
- Check specific gravity of each cell with a hydrometer to assure each has a reading of 1.270 or higher.

Battery Testing

There are three tests which can easily be made to determine a battery's condition. Whenever the complaint is related to either the starting or charging systems, the battery should be checked first.

OCV - Open Circuit Voltage Test

Battery voltage should be checked with a digital multitester. Readings of 12.4 or less require further battery testing and charging.

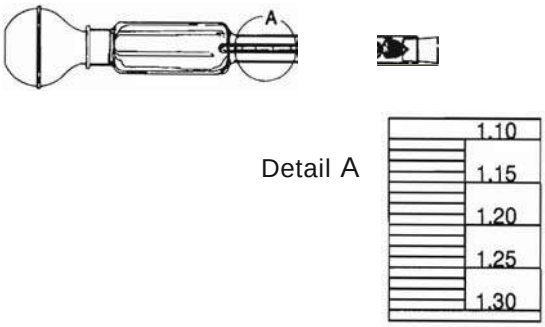
***NOTE:** Lead-acid batteries should be kept at or as near full charge as possible. If the battery is stored or used in a partially charged condition, hard crystal sulfation will form on the plates, reducing their efficiency and possibly ruining the battery.

Specific Gravity Test

A tool such as the battery hydrometer can be used to measure electrolyte strength or specific gravity. As the battery goes through the charge-discharge cycle, the electrolyte goes from a heavy (more acidic) state at full charge to a light (more water) state when discharged. The hydrometer can measure state of charge and differences between cells in a multi-cell battery. Readings of 1.270 or greater should be observed in a fully charged battery. Differences of more than .025 between the lowest and highest cell readings indicate a need to replace the battery.

Open Circuit Voltage

STATE OF CHARGE	CONVENTIONAL LEAD-ACID	YUMICRON TYPE
100% Charged	12.60V	12.70V
75% Charged	12.40V	12.50V
50% Charged	12.10V	12.20V
25% Charged	11.90V	12.0V
0% Charged	less than 11 .80V	less than 11 .9V



Specific Gravity

STATE OF CHARGE"	CONVENTIONAL LEAD-ACID	YUMICRON TYPE
100% Charged	1.265	1.275
75% Charged	1.210	1.225
50% Charged	1.160	1.175
25% Charged	1.120	1.135
0% Charged	less than 1.100	less than 1.115

" At 80° F

NOTE: Subtract .01 from the specific gravity reading at 40° F.

Battery Hydrometer

PN 2870836

Load Test

A battery may indicate a full charge condition in the OCV test and the specific gravity test, but still not have the storage capacity necessary to properly function in the electrical system. For this reason a battery capacity or load test should be conducted whenever poor battery performance is encountered.

*NOTE: This test cannot be performed with an engine or starting system that is not working properly.

1. Attach a multitester to the battery. The reading should be 12.4 volts or greater.

2. Engage electric starter and view registered battery voltage while cranking engine. Continue the test for 15 seconds. During this cranking period, the observed voltage should not drop below 9.5 volts. If the beginning voltage is 12.4 or higher and the cranking voltage drops below 9.5 volts during the test, replace the battery.

ELECTRICAL
Battery Maintenance

Refilling a Low Battery

The normal charge/discharge cycle of a battery causes the cells to give off hydrogen and oxygen. These gases are the ingredients of water. Because of the loss of these gases and the lowering of the electrolyte level, it will be necessary to add pure, clean distilled water to bring the fluid to the proper level. After filling, charge the battery to raise the specific gravity to the fully charged (1.270 or greater) position.

Off-season Storage

To prevent battery damage during extended periods of non-use, the following basic battery maintenance items must be performed:

- Remove battery from machine and wash case and battery tray with a mild solution of baking soda and water. Rinse with lots of fresh water after cleaning. **NOTE:** Do not get any of the baking soda into the battery or the acid will be neutralized.
- Using a wire brush or knife, remove any corrosion from cables and terminals.
- Make sure electrolyte is at proper level. Add distilled water if necessary.
- Charge at a rate no greater than 1/10 of the battery's amp/hr capacity until the electrolyte's specific gravity reaches 1.270 or greater.
- Store battery either in machine with cables disconnected, or store in a cool dry place. **NOTE:** Stored batteries lose their charge at the rate of 1% per day. They should be recharged to a full charge every 60 to 90 days during a non-use period. If stored during the winter months, the electrolyte will freeze at a higher temperature as the battery discharges. The chart below indicates freezing points by specific gravity.

ELECTROLYTE FREEZING POINTS	
Specific Gravity of Electrolyte	Freezing Point
1.265	-75°F
1.225	-35°F
1.200	-17°F
1.150	+5° F
1.100	+18°F
1.050	+27°F

Charging Procedure

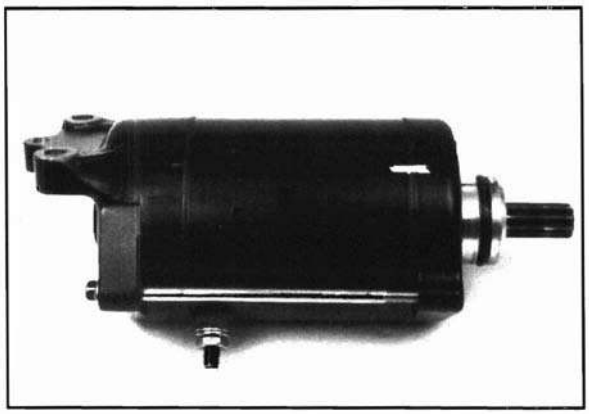
Charge the battery with a charger no larger than 1/10 of the battery's amp/hr rating for as many hours as needed to raise the specific gravity to 1.270 or greater.

⚠ WARNING

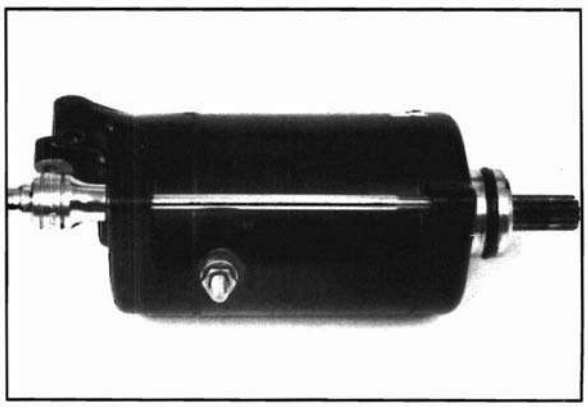
The gases given off by a battery are explosive. Any spark or open flame near a battery can cause an explosion which will spray battery acid on anyone close to it. Battery acid will cause burns to skin. In case of contact with battery acid, wash the affected area with large quantities of cool water and seek immediate medical attention.

Starter Motor Disassembly

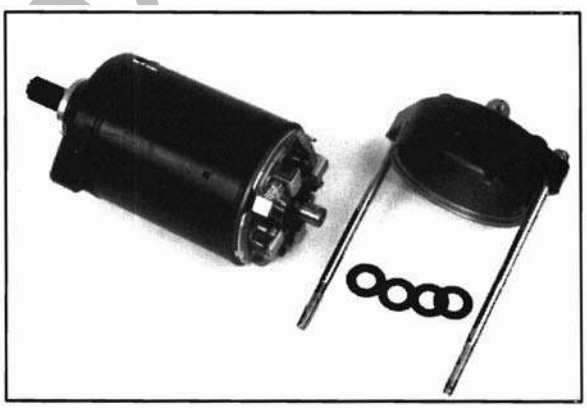
1. Remove starter motor and disassemble. Mark end covers and housing for proper reassembly.



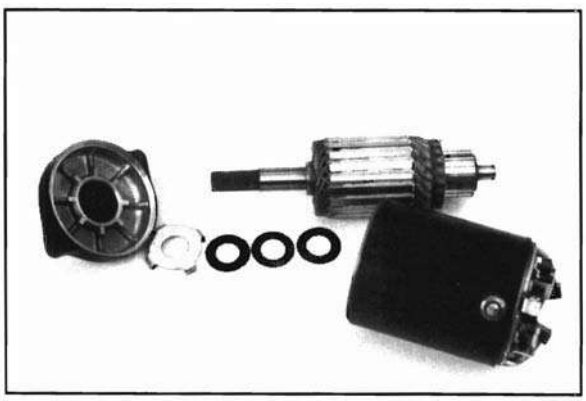
2. Remove housing through bolts.



3. Remove brush end bushing dust cover and armature thrust washers. Keep washers in order for reassembly.



4. Remove drive end cover and armature. Remove thrust washer, phenolic washer, and shim washers. Keep washers in order for reassembly.



Starter Motor Disassembly

5. Measure resistance between starter input terminal and insulated brushes Reading should be .3 ohms or less. Remember to subtract meter lead resistance.

6. Measure resistance between insulated brush and starter housing. Reading should be infinite. (OL). Inspect insulation on brush wires for damage and repair or replace as necessary.

7. Slide positive brush springs to the side, pull brushes out of their guides and remove brush plate. Slide brush end frame off end of starter. **NOTE: The** electrical input post must stay with the field coil housing.

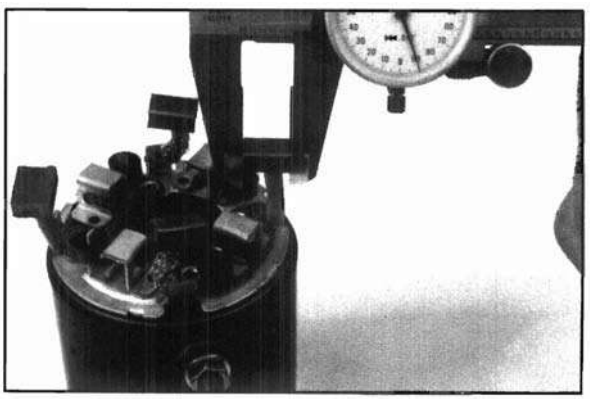
8. Measure resistance between ground brush and brush plate. Resistance should be .3 ohms or less.

Brush Inspection

1. Measure length of each carbon brush. Replace brush assembly when worn to 5/16" (8 mm) or less. The brushes must slide freely in their holders.

Carbon Brush

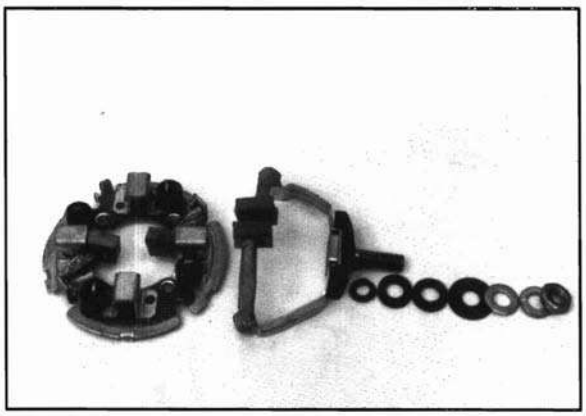
Service Limit 5/16" (8mm)



Brush Replacement

1. Remove terminal nut with lock washer, flat washer, large phenolic washer, 2 small phenolic spacers, and sealing a-ring. Inspect a-ring and replace if damaged.

2. Slide positive brush springs to the side, pull brushes out of their guides and remove brush plate.



Cleaning

CAUTION:

Some cleaning solvents may damage the insulation in the starter. Care should be exercised when selecting an appropriate solvent. If the commutator needs cleaning use only an electrical contact cleaner.

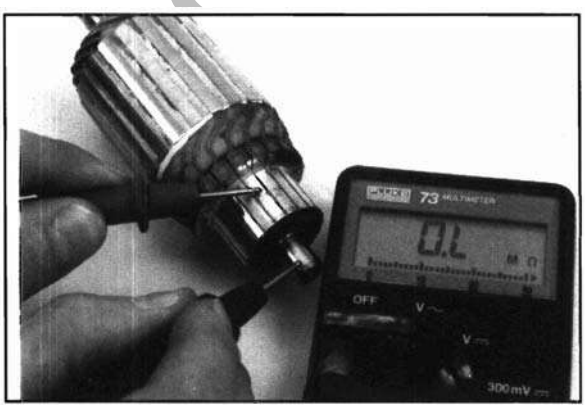
Armature Testing

1. Using a digital multitester, measure resistance between each of the segments of the commutator. The reading should indicate .3 ohms or less.

2. Measure resistance between commutator and armature shaft. Reading should be infinite (∞). Inspect surface of commutator wear or discoloration. Replace if excessively worn or damaged.

3. Place armature in a growler. With growler on, position a hacksaw blade lengthwise, 1/8" (.3 cm) above armature coil laminates. Rotate armature 360°. If the hacksaw blade is drawn toward the armature on any point, the armature is faulty and must be replaced.

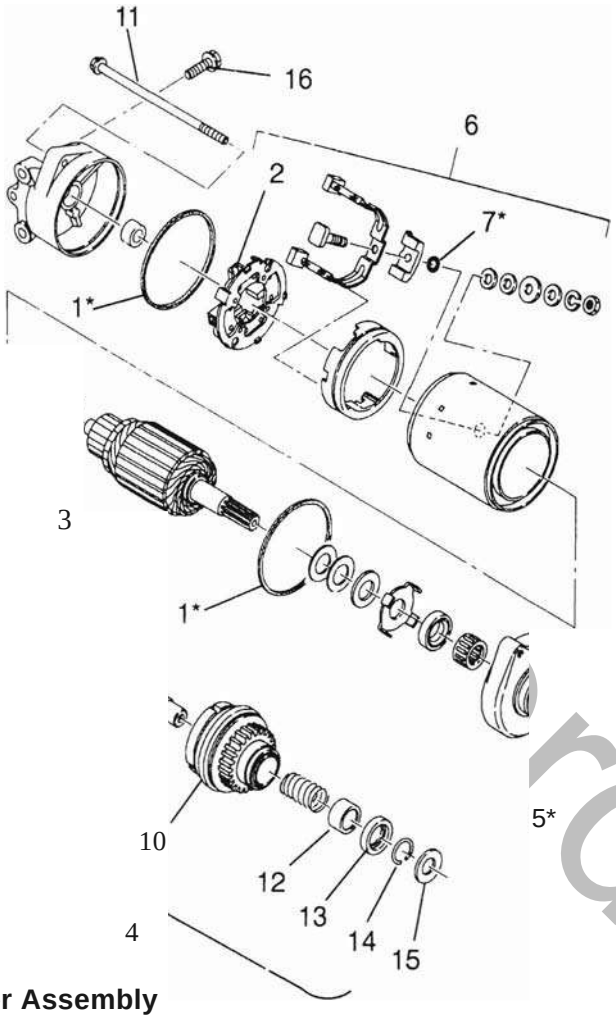
4. Inspect permanent magnets in starter housing. Make sure they are not cracked or separated from housing.



CAUTION:

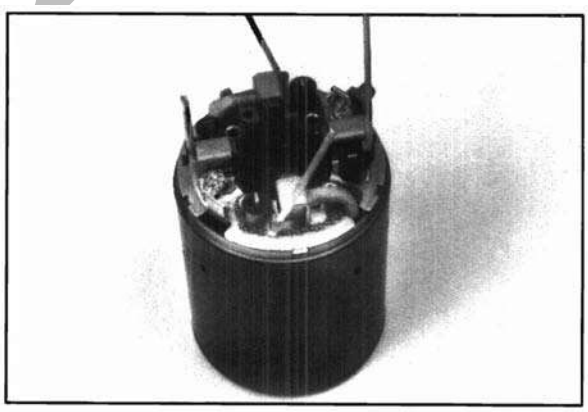
Use care when handling starter housing. Do not drop or strike the housing as magnet damage is possible. If magnets are damaged, starter must be replaced.

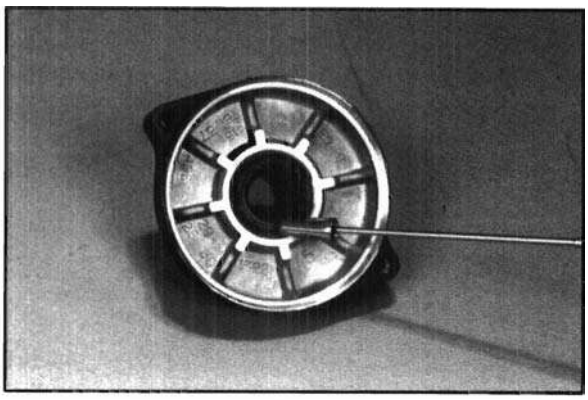
ELECTRICAL
Starter Motor



Ref.	Qty.	Description
1	2	Rubber Ring>
2	4	Brush Spring
3	1	Thrust Washer
4	1	Gear Assembly
5	1	O-Ring>
6	1	Brush Complete
7	1	O-Ring>
8	AR	Thrust Washer
9	1	Shaft Complete
10	1	Gear Assembly
11	1	Through Bolt
12	1	Cover
13	1	Stopper
14	1	Snap Ring
15	2	Washer
16	2	Flange Bolt

>00 not reuse. Replace with new parts.





Starter Assembly

1. Install brush plate to field magnet housing aligning index tab.
2. Install O-ring, two small phenolic spacers, large phenolic washer, flat washer, lock washer, and terminal nut.
3. While holding brush springs away from brushes, push brushes back and hold in place.
4. Slide armature into field magnet housing. Release brushes.
5. Lightly grease drive end bushing and reinstall drive end frame on armature. Inspect seal for wear or damage. Replace drive end cap if necessary.

Starter Drive Grease

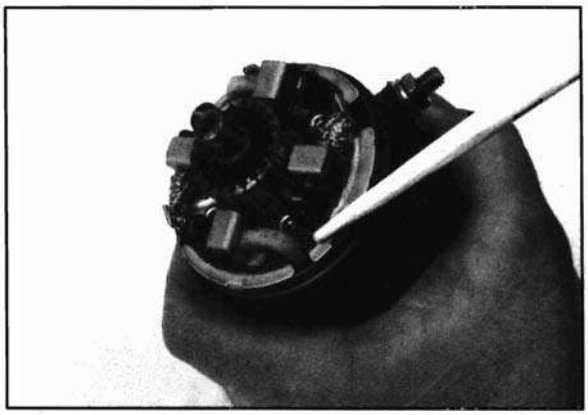
PN 2871460

Starter Assembly Cont.

6. Be sure wire insulation is in place around positive brush wire and pushed completely into slot on phenolic plate.

7. Using a non-petroleum grease, .lubricate brush end bushing and install shims.

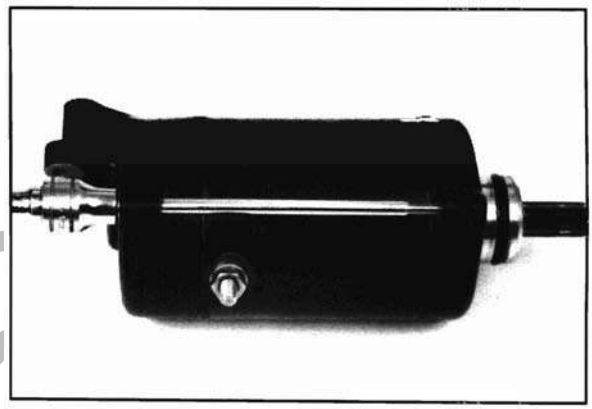
Dielectric Grease PN 2871044



8. Align brush plate and install cover and screws.

9. Reinstall bolts and tighten evenly and securely.

10. Lightly grease pinion shaft and install pinion, spring stopper, and snap ring.



Starter Solenoid Bench Test

To measure the resistance of the pull-in coil, connect one meter lead to the Yellow/Red wire and the other to ground. The resistance should be 2.8-3.6 ohms. Refer to Electric Starter System Testing in this section to further test the solenoid.

ELECTRICAL
Electric Starter Testing

Electric Starter System Testing

Condition: Starter fails to turn motor or motor turns slowly.

Dynamic testing of starter system (for this test, a digital multitester must be used).

CAUTION:

Make sure that engine crankshaft is free to turn before proceeding.

With the tester on VDC, place the tester black lead on the battery negative (-) terminal and the tester red lead on the battery positive (+) terminal. Reading should be 12.4 v or greater. Is it? No→ Yes↓	Remove battery, test and/or service. Install a fully charged shop battery to continue the test. (Continue on with left column.)
Disconnect the red engagement coil wire from the starter solenoid. Connect the black tester wire to an appropriate ground and the red lead to the red harness wire at the solenoid. Push the start button. The meter should read battery voltage. Does it? No→ Yes↓	With the black tester lead on ground, check for voltage at the large relay in terminal, the circuit breaker in and out terminals, and across both sides of the start switch with the switch on start. Repair or replace any defective part(s).
Reconnect the solenoid. Connect the tester black lead to the battery positive terminal and the red tester lead to the solenoid end of the battery-to-solenoid cable. Push the start button. The reading must be less than .1 v DC. Is it? No→ Yes↓	Clean the battery to solenoid cable ends or replace the cable.
Connect the black tester lead to the solenoid end of the battery-to-solenoid cable and the red tester lead to the solenoid end of the solenoid-to-starter cable. Push the start button. The reading must be less than .1 v DC, Is it? No→ Yes↓	Replace the starter solenoid.
Connect the black tester lead to the solenoid end of the solenoid-to-starter cable and the red tester lead to the starter end of the same cable. Push the start button. The reading must be less than .1v DC. Is it? No→ Yes↓	Clean the solenoid-to-starter cable ends or replace the cable.
Connect the black tester lead to the starter frame. Connect the red tester lead to the battery negative terminal. Push the start button. Reading should be less than .1 v DC. Is it? No→ Yes↓	Clean the ends of the battery negative (-) cable at battery and engine mount plate (or engine block). Check for loose engine mount bolts. Ground path from starter motor to battery negative terminal must be complete.
If all these tests indicate a good condition, yet the starter still fails to turn, or turns slowly, the starter must be removed for static testing and inspection.	

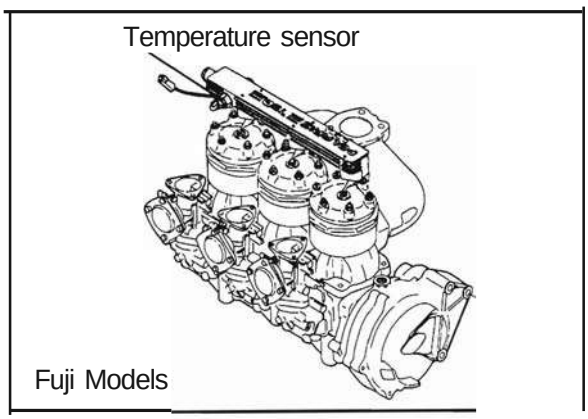
Coolant Temperature Warning Circuit Operation

The warning buzzer or MFD light is controlled by a temperature/warning switch installed into the engine coo!ing system. When engine coolant temperature sensor reaches its "ON" temperature (see page 7.1b) the sWitch closes, completing the current flow from the wire harness through the warning buzzer and to ground. The system should be tested periodically for proper operation.

Temperature Warning Circuit Test

1992-1993 Models

1. Remove wire from temperature sensing switch located on upper water manifold.
2. Connect wire securely to engine ground.
3. Start engine. The temperature warning buzzer should activate. If not, replace buzzer assembly or inspect wiring for shorts or open circuit.



1994-1995 (SL650 Models)

1. Remove electrical box cover to expose terminal board.
2. Disconnect tan wire leading from temperature *buzzer* and connect it securely to ground.
3. Start engine. The temperature warning buzzer should activate. If not, replace the buzzer assembly or inspect wiring for shorts or open circuit.

Models Equipped With MFD

Warning light in MFD is activated when temperature switch contacts are closed (overheat condition) and ground path is complete. On Fuji engines, the temperature sensor is located on the water outlet manifold. On Polaris engines, the sensor is located on the exhaust manifold. Ground the sensor wire from MFD with engine running to see if temp light activates. Refer to MFD function/testing in this section.

Temperature Sensor Test

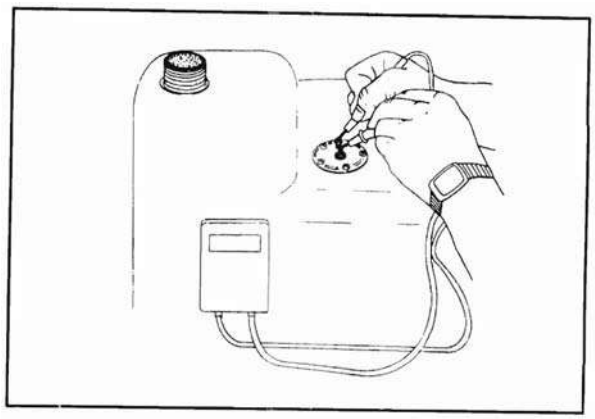
The temperature/warning switch is normally open. Using a digital VOM set in the Ohms position, and with the wires disconnected, contact one test probe to the switch terminal and the other test probe to engine ground. The meter should show an open circuit. Heat the switch in a water bath to the "on" temperature listed on page 7.1 b. Measure resistance of the switch. Reading should be less than .4 ohms.

CAUTION:

When testing the switch, heat only in a water bath. Never subject the sensor to an open flame or sensor damage will result. Do not immerse the wires in the water bath.

Fuel Gauge Operation and Sender Testing

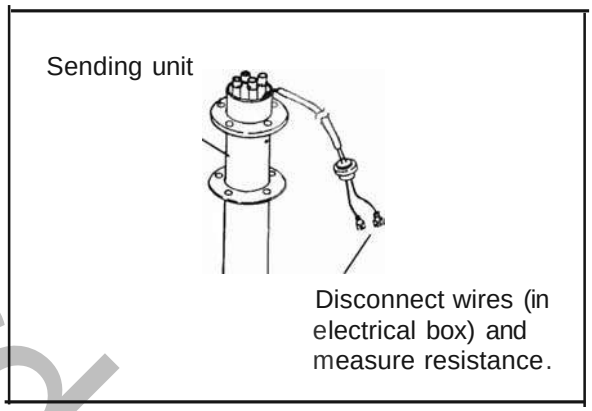
The fuel gauge is operated through a voltage signal at the fuel tank sending unit. The sending unit resistance changes with the height of the float arm in the fuel tank. To check for proper sending unit operation connect an ohmmeter to the terminals (or wires) as shown.



Fuel Sending Unit Resistance (All Models)

Full (Float up) - 35 Ohms
Empty (Float down) - 240 Ohms
All readings ± 10% at room temperature.

Check all wiring connections and refer to the wiring diagram at the end of this section for correct connections at the gauge assembly.



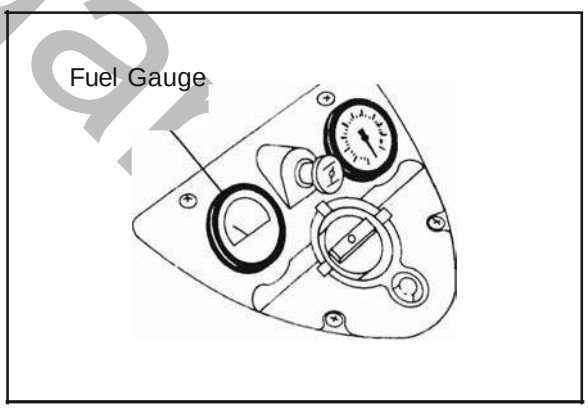
Fuel Gauge Testing (Analog Gauge)

Testing Voltage Input:

1. Remove (4) gauge panel screws, choke knob, knurled nut, fuel valve selector knob, and fuel valve retaining nut to gain access to gauge terminal posts.

2. Set digital VOM to Volts DC. Attach red (+) lead to Input (Red/White wire) terminal stud on gauge and black (-) lead to G (Black wires) terminal stud.

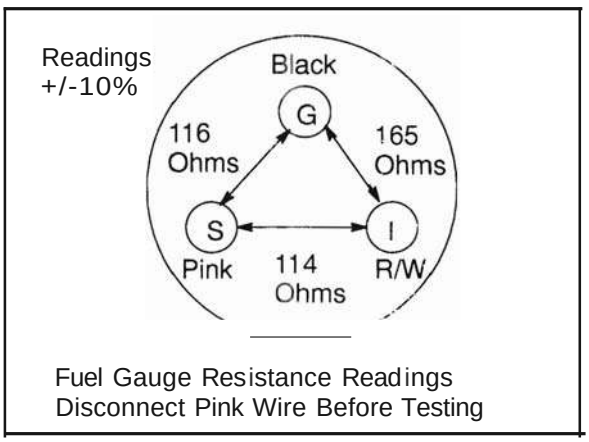
3. Start engine and read meter. Voltage should be approximately 2 - 2.5 VDC, Stop engine. Do not run engine longer than 15 seconds or overheating may result.



Testing Gauge Unit:

1. With engine stopped, disconnect pink (Sender) wire from "S" terminal stud.

2. Measure the resistance between each terminal as shown in illustration. Replace gauge if readings are more than 10% out of specification.



Fuel Gauge Resistance Readings
Disconnect Pink Wire Before Testing

RPM Limiter Function (1995 SLX780, 1996 SL780, SLT780, SLX780)

An RPM limiting system (see models listed above) protects the engine by electronically limiting RPM in the event of engine overheat or low fuel. This feature is designed to help prevent engine damage due to engine overheating or running out of fuel at full throttle.

Engine Overheat

If the engine overheats, the thermal switch becomes conductive and provides a ground path for the tan wire leading from the LR 54 module. The Multi-Function Display will display a "HOT' warning message, the warning light will flash, and the engine RPM will be limited to approximately 4200 RPM. A circuit within the LR 54 senses this overheat condition, connects the gray wire from the COI unit to ground, and limits RPM to approximately 4200. See diagram below.

Low Fuel

When the fuel level is low, the voltage on the pink wire (averaged over a 3 second period) becomes greater than 3.1 volts. A circuit within the LR 54 senses this condition, connects the gray wire from the COI unit to ground, and limits RPM to 4200. The Multi-Function Display will display a "FUEL" warning message, and the warning light will flash. When the engine RPM limits due to low fuel, the watercraft can continue running for approximately 15 minutes before the remaining fuel is consumed. See diagram below.

Important Note: When one (or both) of these conditions has caused the system to limit, it will *continue* to limit until *both* of the following conditions are met:

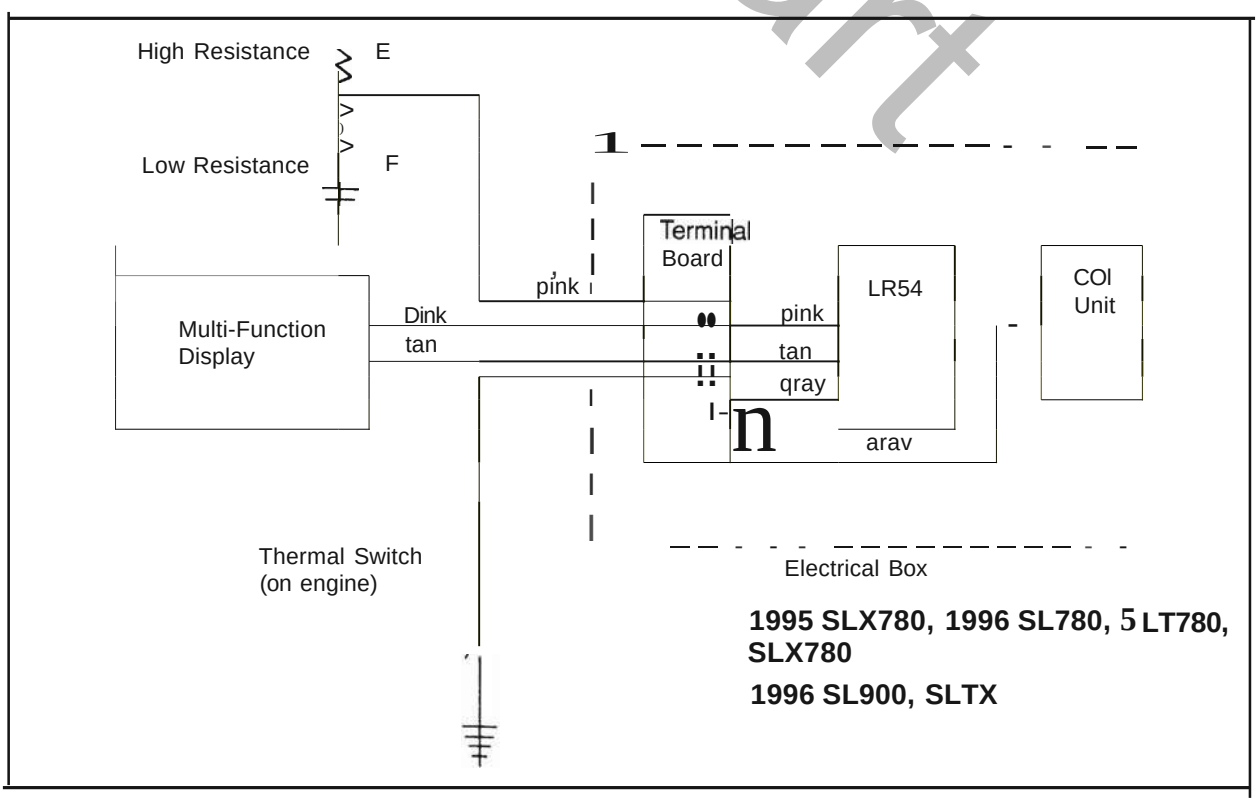
1. The problem that caused the initial limiting must be corrected (fill tank or cool engine);

AND

2. The operator must momentarily release the throttle and allow the RPM to fall below 4200.

Ignition Timing Retard Circuit (1996 SL900, SLTX)

An ignition timing retard system for the 1996 SL900 and 1996 SLTX protects the engine by electronically setting ignition timing to 8 degrees BTDC in the event of engine overheat or low fuel. This feature is designed to help prevent engine damage due to engine overheating or running out of fuel at full throttle. This protection circuit operates the same way as the RPM limiter system in the 1995 SLX780, 1996 SL780, SLT780 and the SLX780. See the section above for a description of the operation.



ELECTRICAL
RPM Limiter Circuits

RPM Limiter Function (1997 SL780, SLT780, SLTX, SL1050)

An RPM limiting system (see models listed above) protects the engine by electronically limiting RPM in the event of engine overheat. This feature is designed to help prevent engine damage due to engine overheating.

Engine Overheat

If the engine overheats, the thermal switch becomes conductive and provides a ground path for the tan wire leading from the COl module and the Mult-Function Display. The Multi-Function Display will display a "HOT" warning message, the warning light will flash, and the engine RPM will be limited to approximately 4200 on 780 models, or 4500 on 1050cc models. A circuit within the COl senses the ground path connection and activates the limiting function. See diagrams below.

Low Fuel

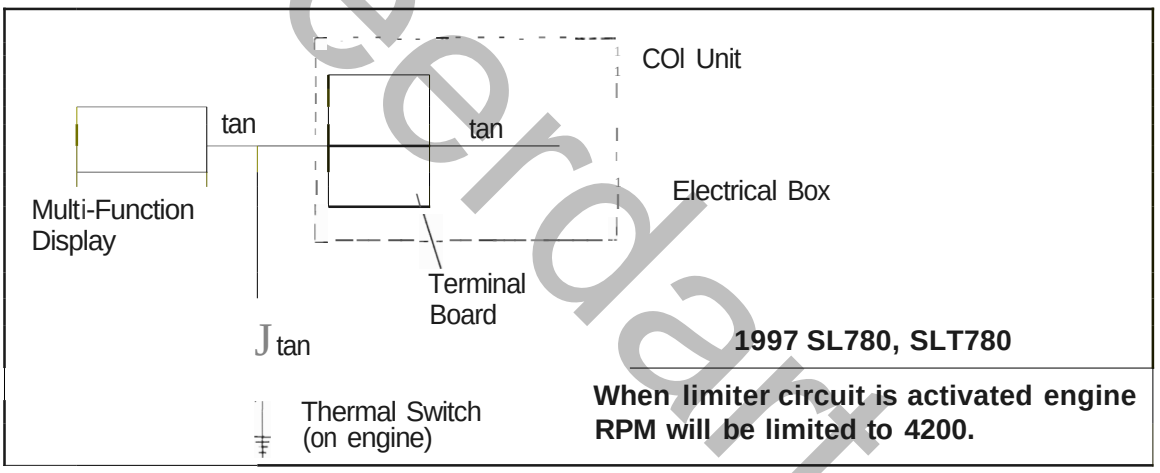
No low fuel limiters are present on these models.

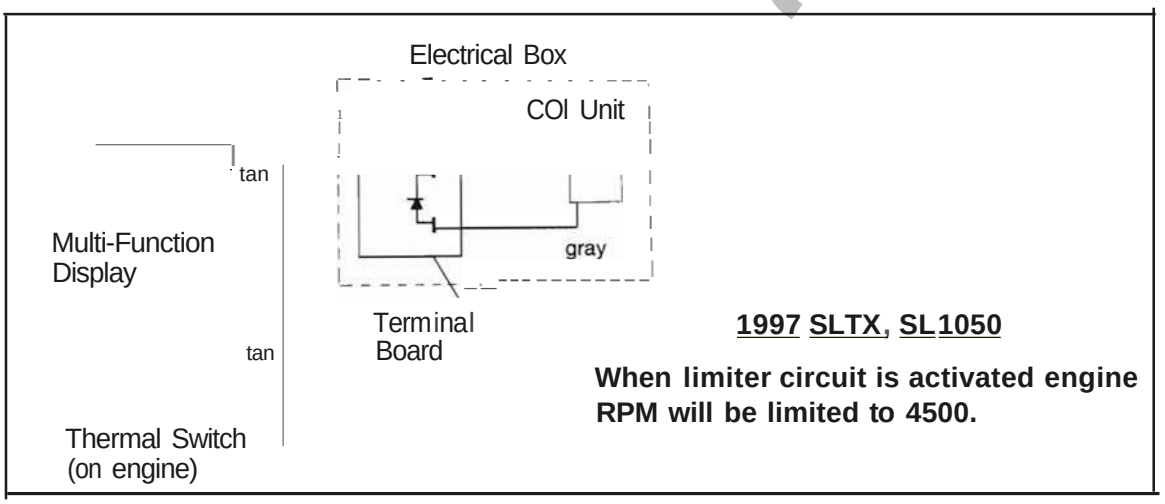
Important Note: When the engine overheat circuit has caused the system to limit, it will *continue* to limit until *both* of the following conditions are met:

1. The problem that caused the initial limiting must be corrected (cool engine);

AND

2. The operator must momentarily release the throttle and allow the RPM to fall below 4200 or 4500.





1997SL900

There are no Engine Protection Circuits present on the 1997 SL900. Only MFD warnings are displayed.

RPM Limiter / Ignition Timing Retard Troubleshooting

RPM Limiter System Troubleshooting

RPM Limiter System Troubleshooting flowcharts are shown below. System operation and wiring is shown on page 7.27 and 7.27a. Be sure to follow the chart that applies to the specific model you're working on.

1995 SLX780, 1996 SL780, SLT780, SLX780 - Limits to 4200 RPM 1996 SL900 and SLTX - Retards ignition timing to 8° BTDC	
Check fuel level in tank. Low → 1/2 tank or more ↓	Fill fuel tank and re-test.
Open electrical box. Disconnect COI module Gray wire from the terminal board. Does the system still limit or retard timing? Yes → No ↓	1. COI Gray wire shorted to ground. a. Repair wire or terminal board and re-test 2. COI module is faulty a. Replace COI module and re-test 3. Problem is not in limiting system (inspect ignition)
Re-connect Gray wire from COI to terminal board. Disconnect Pink wire from fuel sender. Ground pink wire leading from LR54. Does the system still limit or retard timing? No → Yes ↓	Fuel level system is faulty. Inspect wiring / terminal board and repair as necessary. If problem is not in the wiring, remove fuel sender from fuel tank and test fuel sender as outlined on page 7.26.
Re-connect Pink wires to terminal board. Disconnect Tan wire from temperature sensor at the terminal board. Does system still limit / retard with Tan sensor wire disconnected? No → Yes ↓	1. Test temperature sensor. See page 7.15. 2. Inspect Tan wire on sensor for shorts to ground. a. Replace / repair sensor and/or wiring. 3. Inspect cooling system for restrictions, leaks, or another problem which would cause overheating.
Inspect all Tan wires in terminal board area for contact with ground (should not be grounded). Is there a short? Yes → No ↓	Repair wires/terminal board.
Replace LR-54 module and re-test.	
1997 SL780, SLT780 (Limits to 4200 RPM). 1997/98 SL1050, SLTX, SLXH (Limits to 4500 RPM)	
Open electrical box. Disconnect temperature sensor Tan wire from terminal board. Does system still limit with Tan sensor wire disconnected? No → Yes ↓	1. Test temperature sensor. See page 7.15. 2. Inspect Tan wire on sensor for shorts to ground. a. Replace / repair sensor and/or wiring. 3. Inspect cooling system for restrictions, leaks, or another problem which would cause overheating.
Inspect all Tan wires in terminal board area for contact with ground (should not be grounded). Is there a short? Yes → No ↓	Repair wires/terminal board.
Replace COI module and re-test.	

ELECTRICAL
Oil Level Sensor Testing

Oil Level Sensor Troubleshooting

An Oil Level Sensor troubleshooting flowchart is shown below for models with a buzzer. Refer to wiring diagram at end of this section.

CAUTION:

While performing this test, do not run engine for more than 15 seconds or engine / drive line damage may occur due to overheating. Allow sufficient time between tests to allow engine and drive line to cool completely.

Problem: Buzzer not audible when oil level is low.

All models with buzzer.	
Open electrical box to gain access to buzzer. Start engine and check for battery voltage on Orange wire terminal or buzzer harness connection. Is battery voltage present? No →Stop Engine→ Yes ↓ Stop engine.	Problem is in LR module, wiring harness, or stator. Inspect and repair/replace as required.
Connect Tan wire from buzzer to ground. Start engine. Does buzzer work? No →Stop engine→ Yes ↓ Stop engine.	Inspect wires between electrical box and buzzer. Repair if damaged. If wires are in good condition replace buzzer.
Replace Oil Level Sensor	

Oil Level Sensor Troubleshooting - Models with Multi-Function Display (MFD)

Problem: No oil level **indication and/or low oil warning at MFD.**

1. Open electrical box and disconnect oil level sensor wires. Measure resistance of sender wires and compare to specifications. Consult the appropriate wiring diagram for specifications and wire colors.

2. Inspect all electrical connections including the pins in the harness connector on the back of the MFD. Connections must be clean and tight. Refer to MFD troubleshooting tips at the end of this chapter for more information.

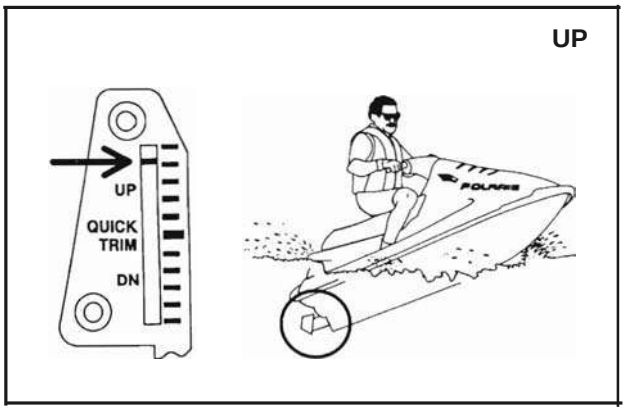
Oil Level Sending Unit Resistance

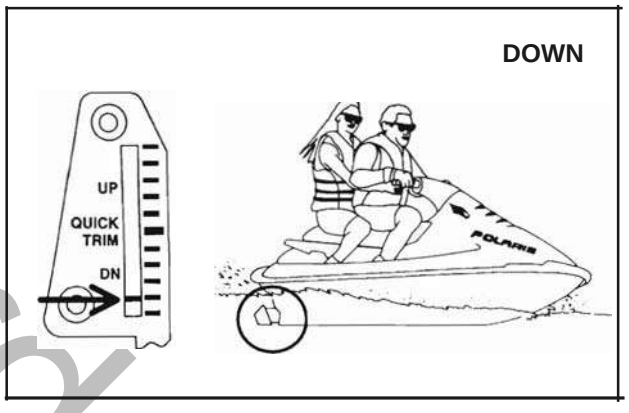
Full (Float up) - 35 Ohms
Empty (Float down) - 240 Ohms
All readings ± 10% at room temperature.

Polaris Electric Quick Trim System Operation

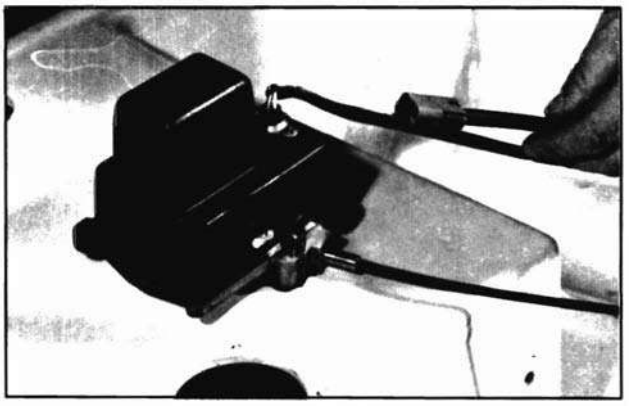
The Quick Trim system is operated by a thumb activated rocker switch located on the left side handlebar control. An electric motor controls the attitude of the steering nozzle end cone via a control link rod. On non-MFD models, a cable connected at the link area routes to an indicator mounted in the dash to tell the operator what position the nozzle is in. If the model is equipped with a Multi Function Display (MFD), this indicator is incorporated into the MFD. See pages 7.40-7.43 for more information. See Maintenance Section page 2.41 for trim nozzle adjustment procedure.

As the indicator moves upward with the nozzle, the front of the craft will lift. When the indicator moves downward with the nozzle the front of the craft will push downward, helping to prevent the front of the bow from jumping up and down (porpoising).



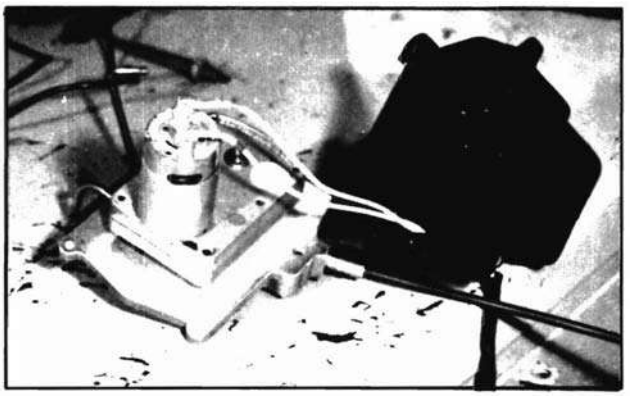


The trim motor is located in the rear of the craft.



Trim Motor Operation Check

1. Remove outer cover. Apply 12VDC in one direction, then reverse polarity at the two leads and apply voltage again to verify that both forward and reverse motor operation are functioning.



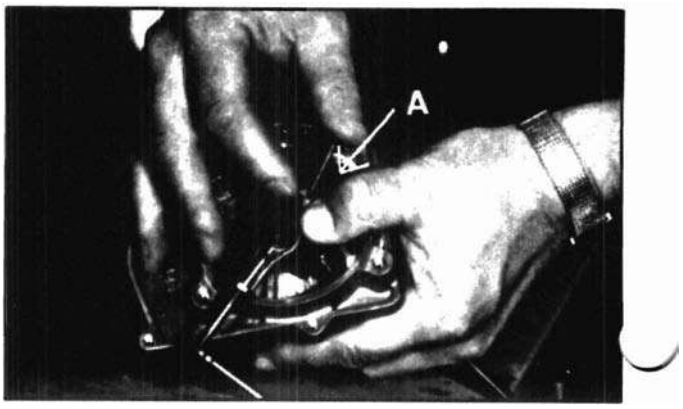
ELECTRICAL
Quick Trim

Polaris Quick Trim System Cant.
Indicator Cable Replacement - Non-MFD Models

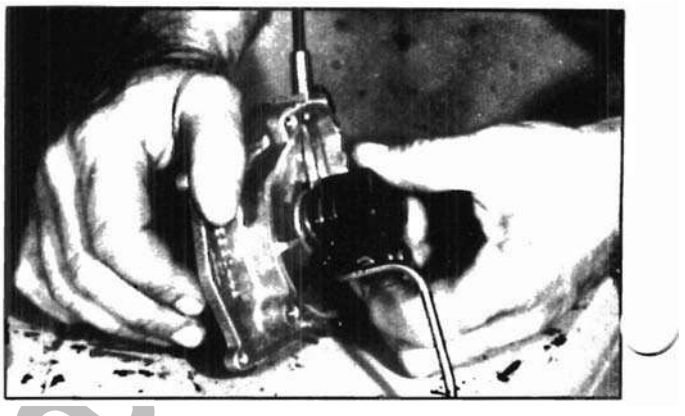
1. Remove four mounting bolts located in hull above jet pump body at rear of craft.

2. Lift trim body assembly away from hull and push in against plastic trim arm to release retaining pin.

3. Remove pin. trim arm, and spring.

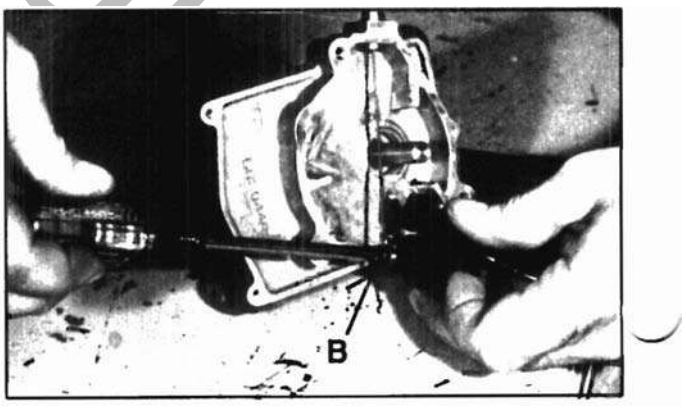


4. Loosen and remove cable retaining screw from trim arm.



5. Remove indicator cable from housing. Lubricate cable O-ring and push new cable into housing. Re-attach cable end with retaining screw.

***NOTE:** Prior to reassembly of the spring, arm, and pin, inspect the condition of the motor shaft oil seal and replace if any damage is found. Test for proper operation and reinstall the trim assembly to the hull.



Fuji Engines

650, 750, 780 Engines - 120mm Rod, 65mm Stroke Degrees to Piston Position Conversion Chart BTDC

Degree BTDC	Inches/MM
10	.024/0.61
11	.029/0.75
12	.035/0.90
13	.041/1.05
14	.048/1 .22
15	.055/1.40
16	.062/1 .59
17	.070/1 .79
18	.079/2.01
19	.088/2.23
20	.097/2.47
21	.107/2.72
22	.117/2.98
23	.128/3.25
24	.139/3.54
25	.150/3.83
26	.162/4.13
27	.175/4.45
28	.188/4.77

Polaris Engines

700,900,1050 Engines -136mm Rod, 68mm Stroke Degrees to Piston Position Conversion Chart - BTDC

Degrees BTDC	Inches/MM
10	.025/.64
11	.031/.78
12	.037/.93
13	.043/1 .09
14	.050/1 .26
15	.057/1.45
16	.065/1.65
17	.073/1 .85
18	.081/2.06
19	.090/2.29
20	.100/2.55
21	.110/2.81
22	.121/3.07
23	.132/3.35
24	.144/3.64
25	.155/3.95
26	.168/4.26
27	.181/4.58
28	.194/4.92

ELECTRICAL
Ignition System Testing

Ignition System Testing - Fuji Engines

All ignition system connections and components are contained within the electrical box with exception of the stator coils, stator wiring harness, ignition coil high tension leads and spark plug caps. Verify that all ignition circuit wire connections are clean and tight. Refer to electrical box exploded view at the beginning of this section for critical ground connection locations. Disconnect component wires before testing resistance. Refer to individual wiring diagram for resistance specifications and wire color.

Condition: No Spark

Disconnect the black/yellow wire from the CDI Module to the engine stop switch. Does it have a spark? Yes→ No↓	Measure the resistance of the stop switch. In the run position (lanyard lock plate installed) the reading must be infinite. Repair or replace as necessary.
Disconnect the stator to CDI module wires. Test the resistance values of the stator coils and compare results to the individual wiring diagram or to the chart on page 7.2. Are the resistance values within specs? Yes→ No↓	Disconnect and check the secondary ignition coil resistance. Refer to the resistance values listed on the wiring diagram or on the chart on page 7.2. If the coil resistance values are within specs, replace the CDI module. Note: The primary windings of the ignition coils are connected in series. It is important to test each coil individually as one faulty winding may affect ignition on all three spark plugs.
Isolate which component is faulty. Remove the flywheel and stator. Recheck the resistances; look for pinched or bare harness wires; or replace the stator assembly. Reference engine section for replacement procedure. Note: Ground connections and ignition coil primary connections are extremely important for proper system function. Be sure to thoroughly clean and tighten all wiring connections in the system.	

PVL Ignition Troubleshooting (700, 900, 1050 Engines)

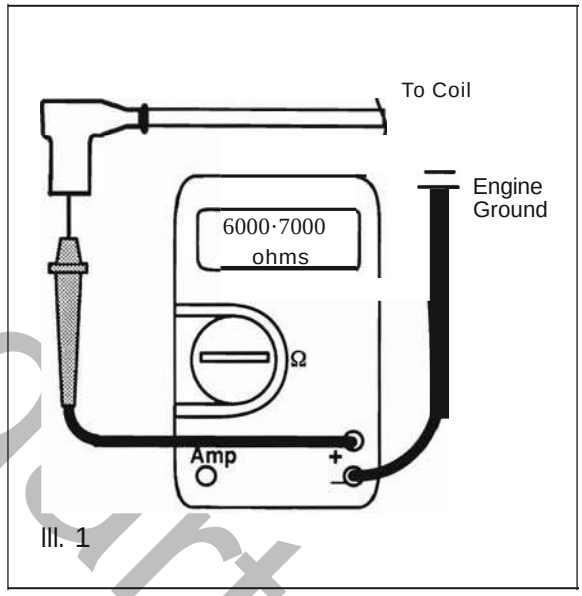
CAUTION:

- Verify spark plugs are RESISTOR TYPE!
- If the battery voltage is low, cranking rpm will be down. The ignition system may show weak spark with a plug out of the cylinder, but not spark under compression or it may show no spark at all. Install a charger on the battery to ensure good cranking rpm.
- Verify the firing order. Refer to PWC Trouble Shooting Guide, page 17. If the plug leads are all the same length, trim them so they can only be installed on the correct cylinder.
- Read through the entire procedure before proceeding. Some steps are repeated. The correct sequence depends on the readings obtained in step one (1).

1. Check continuity from inside spark plug caps to engine stud.

SPECIFICATION: 6000 to 7000 ohms (Ill. 1)

If reading is OK, proceed to Step 2 on page 7.33a.



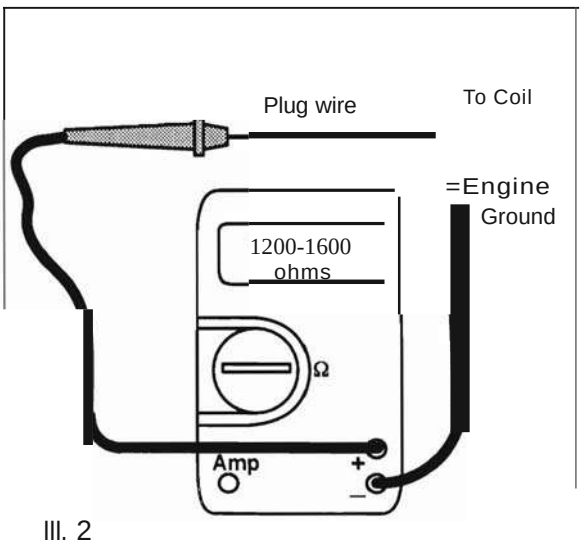
Ill. 1

A. If one of the spark plug leads tests OK, retest the *faulty* plug wire(s) with the spark plug cap removed.

SPECIFICATION: 1200 to 1600 ohms (Ill.2)

Be certain the center conductor is visible at the end of the plug wire.

If the center conductor is not visible: Trim 1/8" (3mm) off the end of the plug wire.



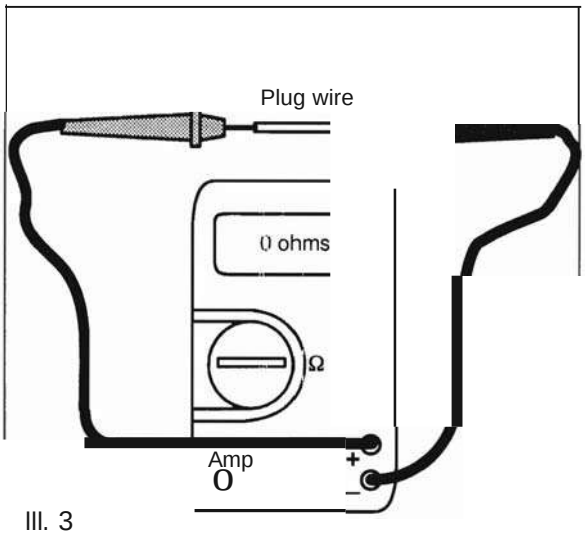
Ill. 2

PVL Ignition Troubleshooting, Cont.

B. If the readings are still out of range, open the electrical box and remove the plug wire(s) that are showing incorrect readings.

a. Measure the resistance of the plug wire(s).

SPECIFICATION: 0 ohms (Ill. 3)

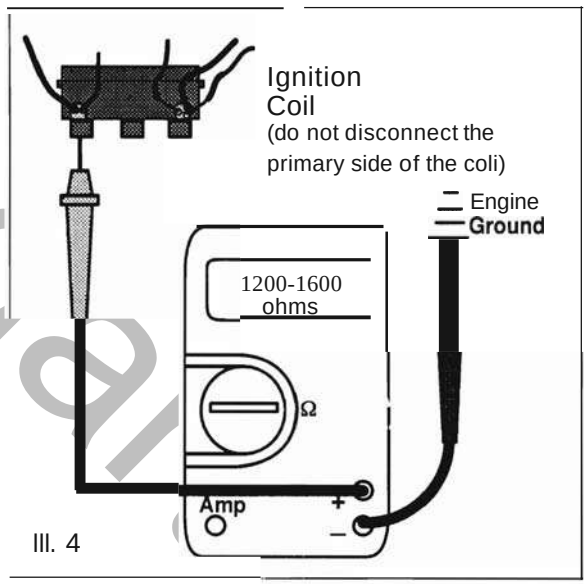


Ill. 3

b. Check the resistance of the coil without the plug wires installed.

SPECIFICATION: 1200 to 1600 ohms (Ill.4)

C. If all three plug wires show open, remove plug caps and recheck continuity from center conductor of plug wires to engine ground. If still bad, open box and check coil ground path.



Ill. 4

2. Open the electrical box and check for correct connections between the stator, COI, coils, and terminal board. Inspect the wiring for incorrect connections or physical damage.

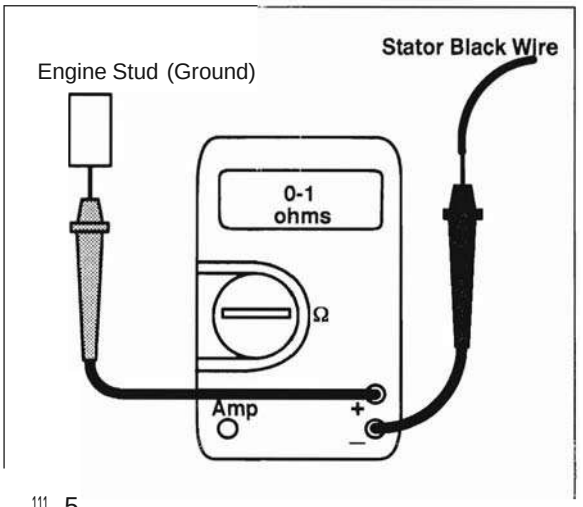
A. Verify the correct installation of the Yellow stator wire and Yellow/Purple jumper wire if so equipped. (Refer to PWC-96-02)

a. Disconnect the stator from the electrical box (within the electrical box).

b. Connect the negative test lead of the ohm meter to the black wire coming from the stator and leave it connected for the duration of test 2.

c. Connect the positive test lead to an engine ground.

SPECIFICATION: 0 to 1 ohms (Ill. 5)

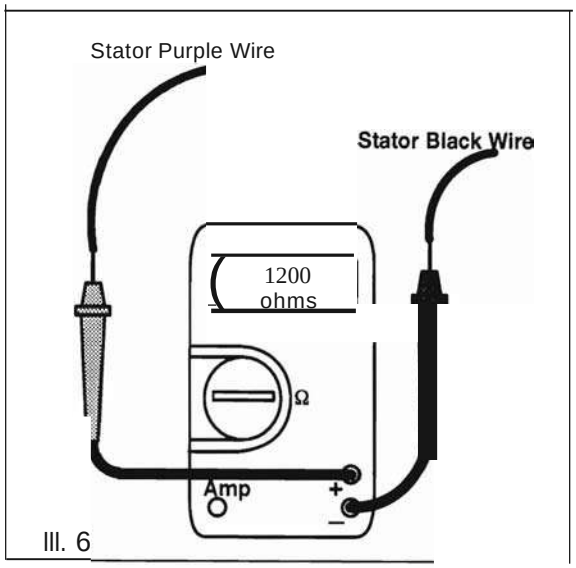


Ill. 5

PVL Ignition Troubleshooting, Cont.

d. Connect the positive test lead to the purple wire:

SPECIFICATION: 1200 ohms (Ill. 6)

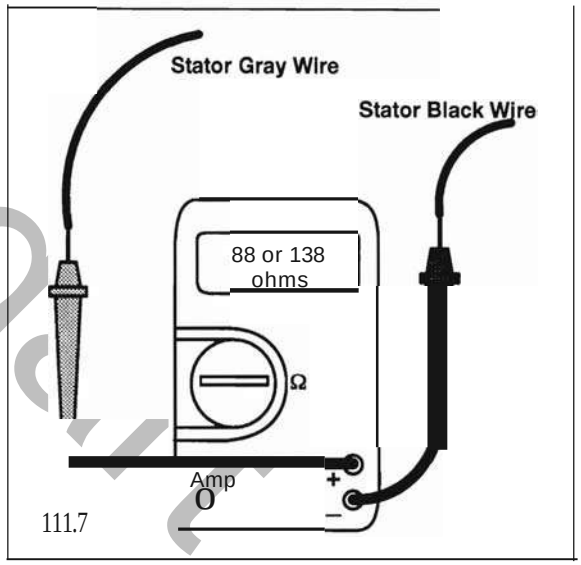


Ill. 6

e. Connect the positive test lead to the gray wire.

SPECIFICATIONS: (Ill. 7)
88 ohms
138 ohms for later 3 cylinder engines.

Refer to specific wiring diagram for specifications.



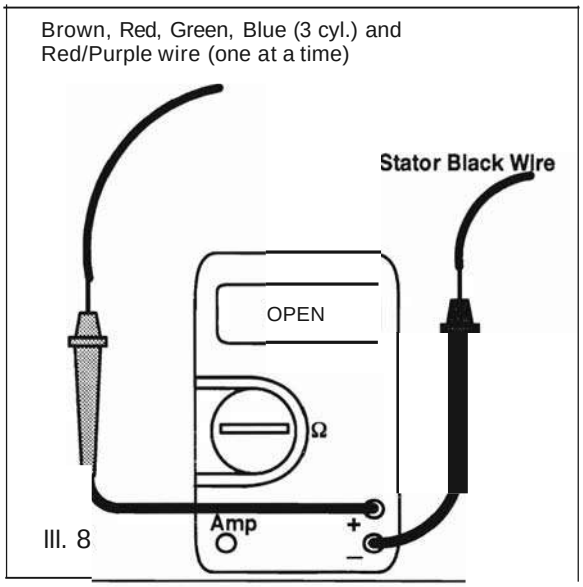
111.7

f. Connect the positive meter lead to the following wires (one at a time).

SPECIFICATIONS: (Ill. 8)

BROWN:	**OPEN**
RED:	**OPEN**
GREEN:	**OPEN**
BLUE (3 cylinder):	**OPEN**
RED/PURPLE:	**OPEN**

Open readings are correct for Tektronix DMM 155 meter. Other meters may show a very high Meg–ohm reading.



Ill. 8

PVL Ignition Troubleshooting, Cont.

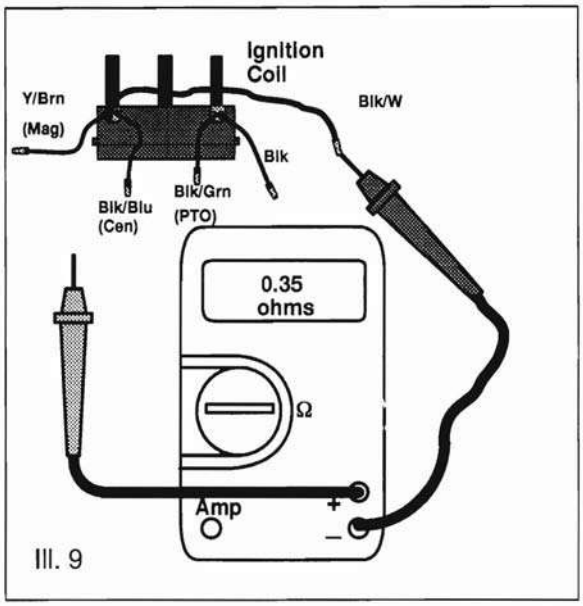
g. Check the primary side resistance of the ignition coils:

SPECIFICATIONS: (III. 9)
Magneto Cylinder
Black/White to Yellow/Brown: **0.35 ohms**

Center Cylinder
Black/White to Black/Blue: **0.35 ohms**

PTO Cylinder
Black/White to Black/Green: **0.35 ohms**

Black/White to Black Coil wire: **OPEN**

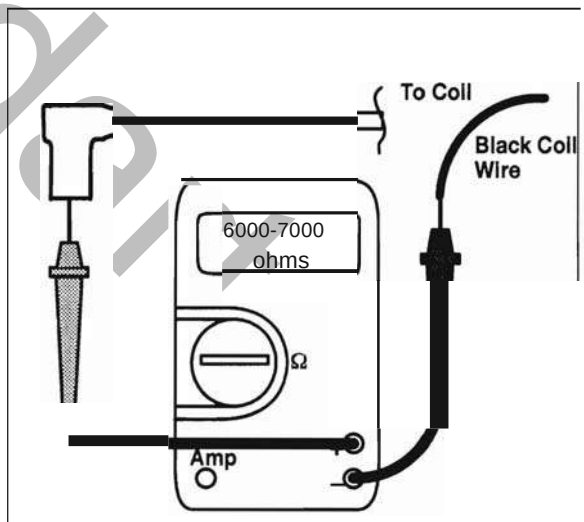


III. 9

h. Check the secondary side resistance of the ignition coils. (III. 10)

BLACK coil wire to each secondary lead:

SPECIFICATIONS: (III. 10)
1200 - 1600 ohms without plug cap
6000 - 7000 ohms with plug cap



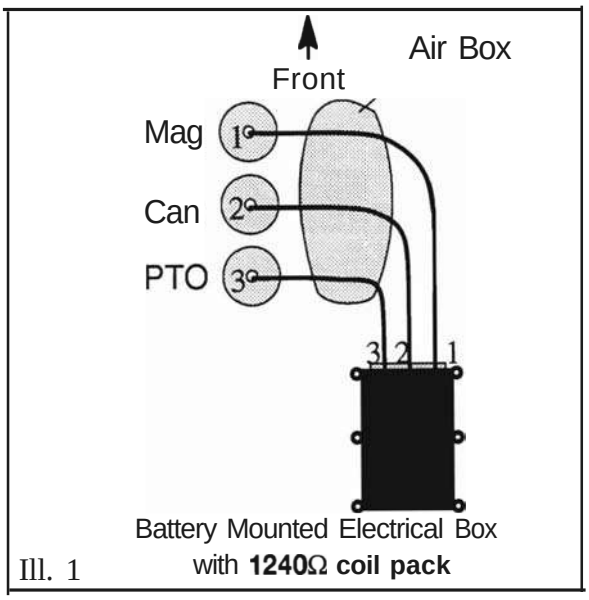
III. 10

900/1050cc Ignition Coils

NOTE: The ignition system used on all Polaris 700, 900, and 1050cc personal watercraft engines are sequential firing types. Ignition spark on each cylinder occurs independently of the others using a separate trigger pulse from each Hall Effect sensor in the stator.

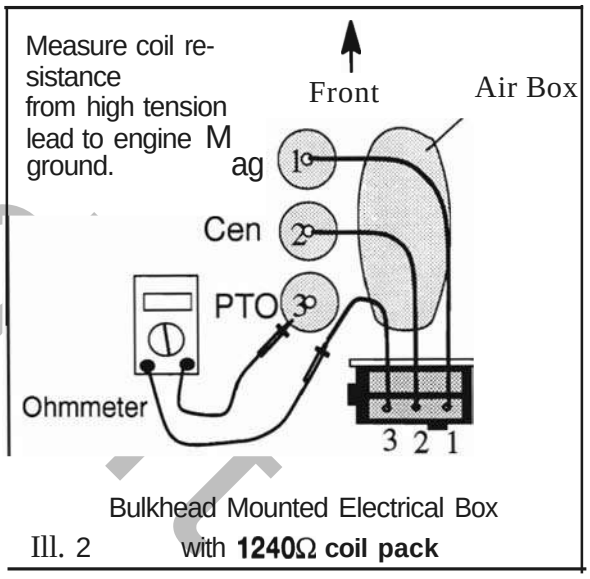
On models with sequential firing, the high tension leads (spark plug wires) must be installed on their respective cylinders or the engine will not run properly.

There are two different coil packs in use on 900 and 1050 cc watercraft. The spark plug wire sequence is different for each type of coil pack. Test secondary coil resistance and refer to Illustrations 1-6 to determine coil type and correct routing of the spark plug wires to their respective plugs. Recommended plug wire lengths are shown in Ill. 3 (for 1240Ω coil pack) and Ill. 6 (for 1550Ω coil pack).



Battery Mounted Electrical Box with **1240Ω coil pack**

Ill. 1

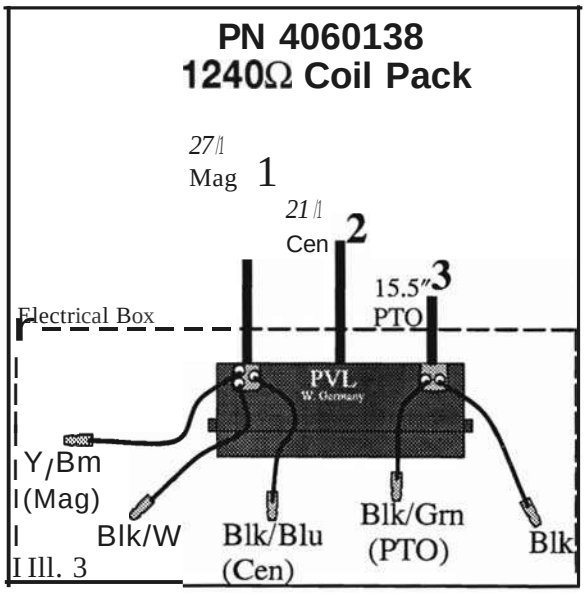


Bulkhead Mounted Electrical Box with **1240Ω coil pack**

Ill. 2

To Determine Wire Sequence

1. Unscrew spark plug cap from one high tension lead.
2. Measure resistance of ignition coil secondary winding by attaching one lead of an ohmmeter to the end of the spark plug wire, and the other lead to a good engine ground (see Ill 2. for connections). Resistance should be measured with the coil at room temperature. Measured resistance must be within ± 10% of the specifications listed below.
   - 1240Ω coil = PN 4060138
   - 1550Ω coil = PN 4060153
3. If the coil you are measuring is the 1240Ω (PN 4060138) coil refer to Ill. 1, 2, and 3 for the correct wire sequence.

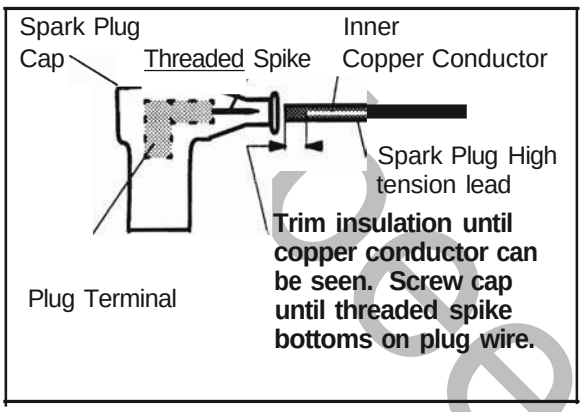


Ill. 3

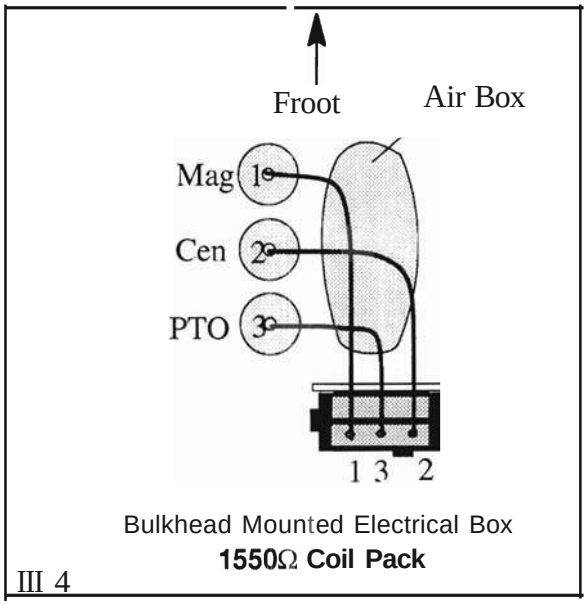
ELECTRICAL
Ignition Coil Identification

Wire Sequence, Cant.

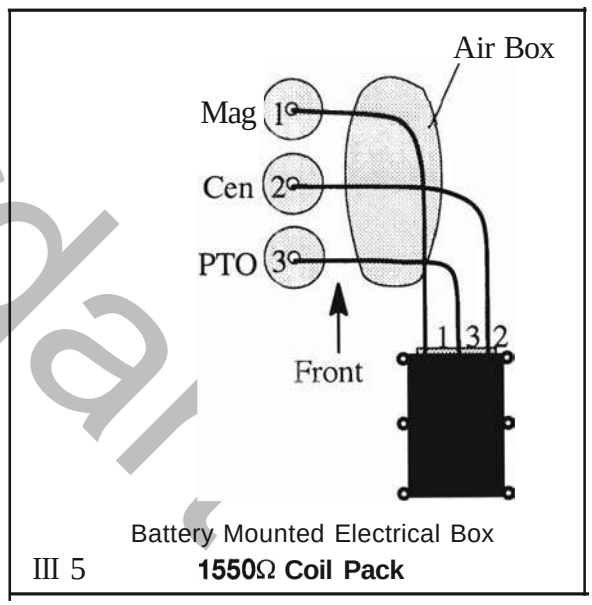
4. The 1550Ω coil wire sequence can be found in Ill 4, 5, and 6 on page 7.34b.
5. Apply Corrosion Resistant Oi-electric grease PN 2871044 to both ends of the spark plug cap. Screw the cap onto wire until tight.



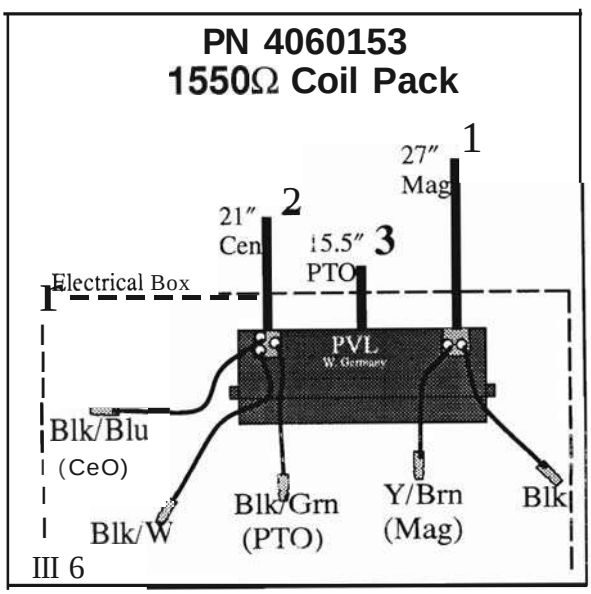
NOTE: Be sure threaded spike contacts solid inner core of high tension lead.



Bulkhead Mounted Electrical Box
1550Ω Coil Pack
III 4



Battery Mounted Electrical Box
1550Ω Coil Pack
III 5

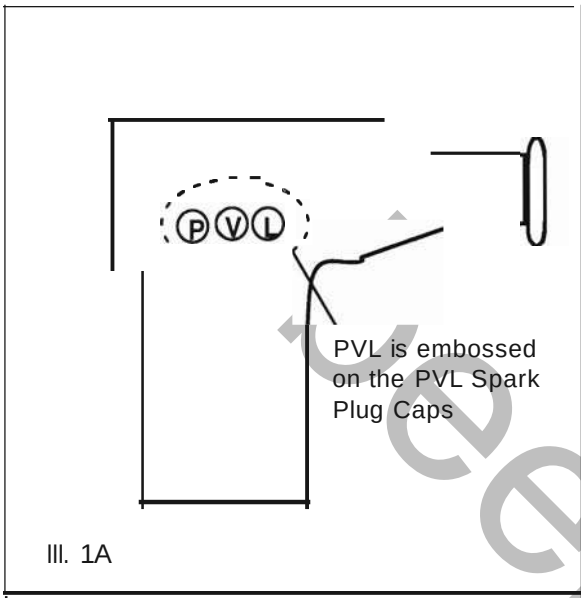


III 6

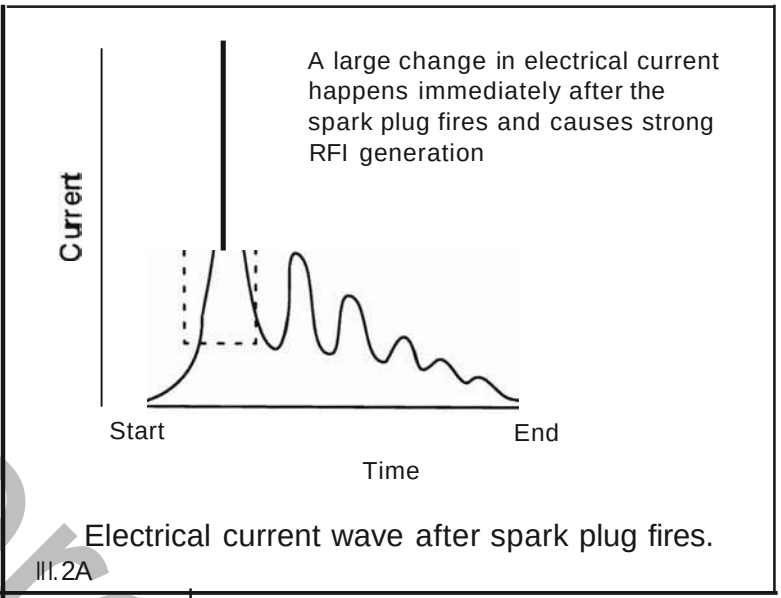
PVL Ignition Troubleshooting (700, 900, **1050 Engines)**

CAUTION:

- Verify spark plugs are RESISTOR TYPE!
  Verify spark plug caps are PVL resistor caps. See illustration 1A and explanations below.

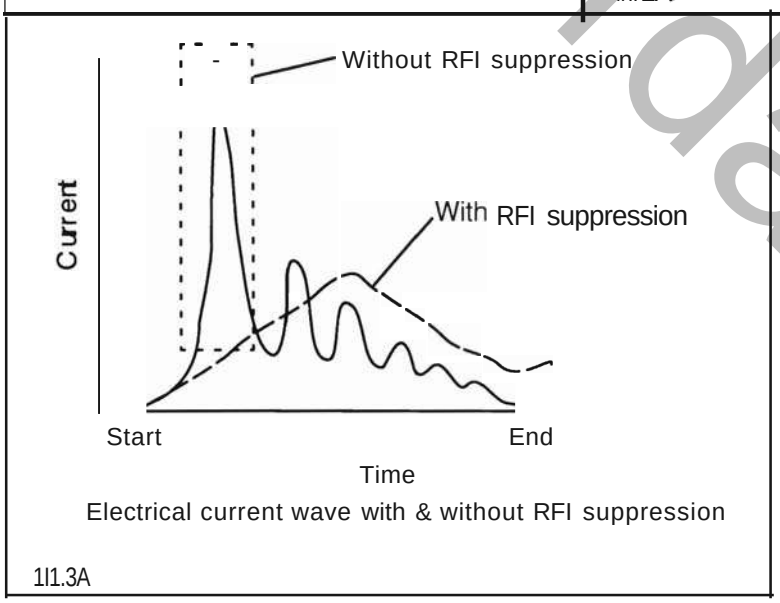


Ill. 1A



Electrical current wave after spark plug fires.

Ill. 2A



Electrical current wave with & without RFI suppression

1I1.3A

RFI is caused by the tendency of plug voltage to rise and fall rapidly once the spark plug is fired. These alternating currents are suppressed by the use of resistor spark plugs and resistor spark plug caps.

Although all resistor spark plug caps that Polaris uses have 5000 ohms of resistance, they arrive at this resistance value differently. The construction of the resistor within the PVL spark plug cap enables it to dampen spikes of ignition current and therefore better control RFI (Radio Frequency Interference) than other resistor spark plug caps.

The creation of RFI can distrupt the the micro-processors within the COI box and cause ignition misfiring. For these reasons it is extremely important that Polaris Domestic Engines utilize the PVL spark plug caps and resistor spark plugs.

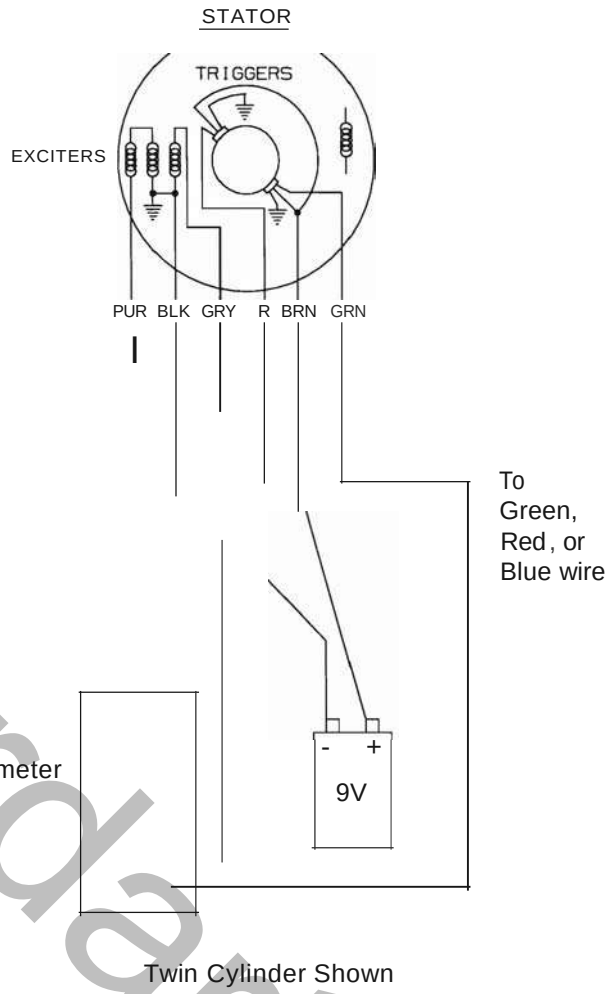
Trigger Coil (Hall Effect Sensor) Testing - Polaris Engines

The "trigger coils" are *Hall Effect* sensors and require a constant DC power source via the brown wire out of the COI module. The wire is powered when the engine is cranked for starting and while running. When a magnet (sealed in the magnet holder on the flywheel) is passed by the sensor, the sensor becomes conductive and triggers the release of the energy stored in the capacitor, creating the ignition spark.

1. To test trigger coils, disconnect the stator wires and attach a 9 volt battery to the brown and black wires from the stator plate. Connect one lead of an ohmmeter to the black stator wire. Connect the other lead to the red, green, or blue sensor wire. Refer to the illustration at right.

2. Rotate flywheel *slowly* while observing the ohmmeter indication. The ohmmeter should indicate an open circuit (00) until the magnet in the magnet holder passes by the sensor. At this point the reading should switch to low resistance (under 25 ohms). It should go back to infinite as flywheel rotation continues.

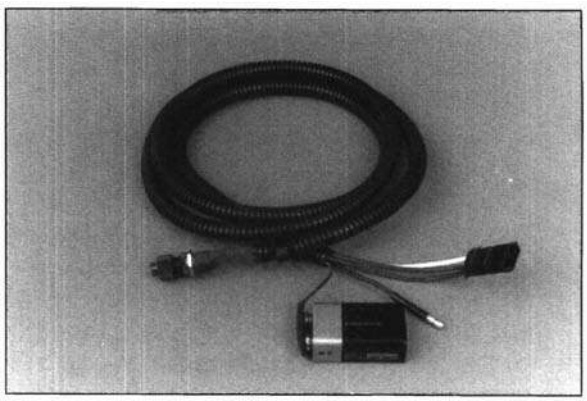
3. Repeat the test for the other trigger coils.



***NOTE:** Actual resistance readings may vary with different meters. A specific resistance reading is not critical. The reading must, however, switch sharply from high to low resistance, and then back again as the flywheel is rotated.

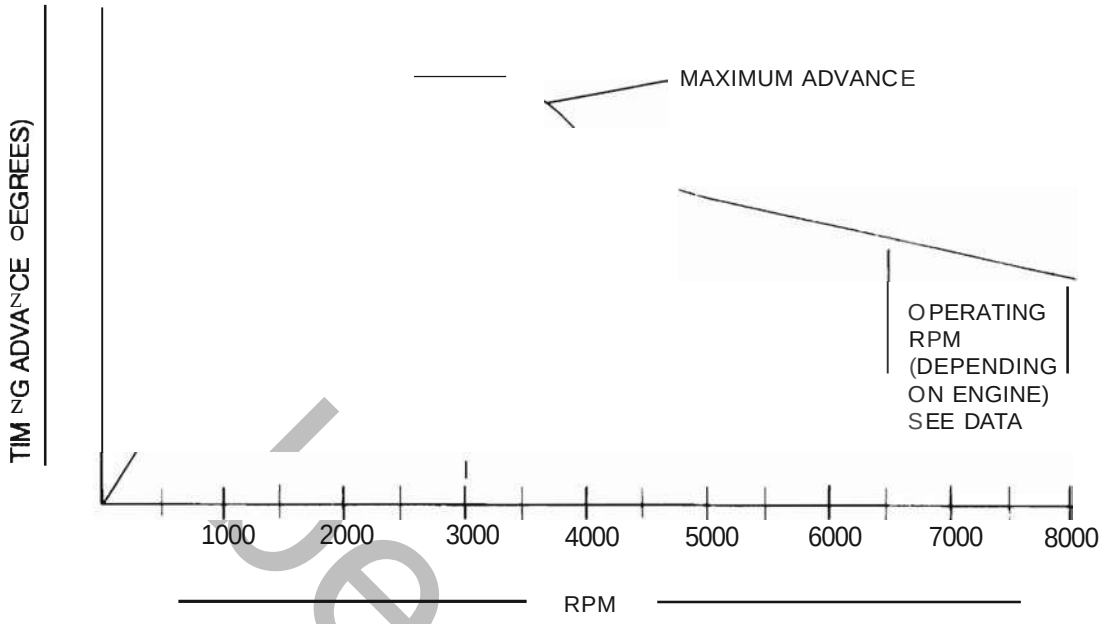
Alternate Method Of Testing Hall Effect Sensors - Polaris Engines

Static liming Light tool (PN 2871745) can used to test Hall Effect sensors. Simply connect the white test wire to the Red (Mag), Blue (Cen), or Green (PTO) wire from the stator. If the sensor is functioning properly, the light will turn on and off as indicated in Static Timing Procedure page 7.39.



Static Timing Tool PN 2871745

Ignition Timing - Fuji Engines



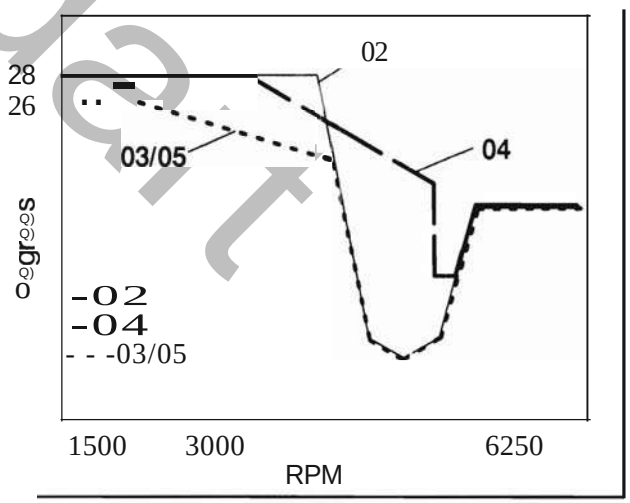
*NOTE: Always verify timing of engine at room temperature only (68° F/20° C).

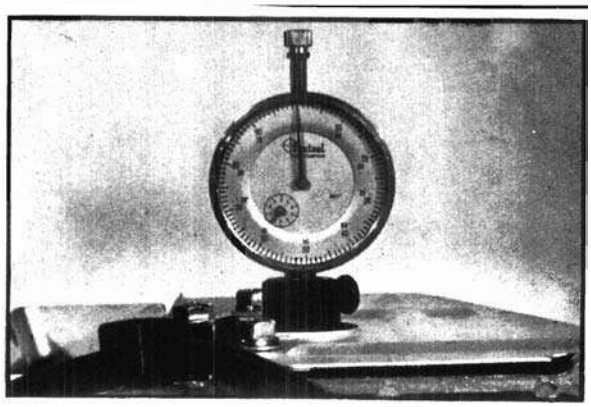
The ignition maximum advance is at or near 3000 RPM on all current style ignition systems. Verify the ignition position at maximum advance when checking the timing. Note: Timing should be checked at 1500 RPM on 780 03 and 05 engines for best accuracy. The 03/05 ignition timing specification is 26.5° at 1500 RPM.

If engine damage has occurred due to a suspected ignition related problem, check the ignition timing at the specified high RPM also.

Flywheel timing marks should be verified on all engines before attempting to adjust the ignition timing. To verify the marks:

1. Remove mag cylinder spark plug and install dial indicator.
2. Rotate crankshaft by hand while observing dial indicator. As the piston touches the indicator plunger, the dial will begin to rotate. Find the point where the pointer stops rotating and reverses direction. This will be TDC (Top Dead Center).
3. While holding crankshaft with piston at TOC, zero indicator by rotating bezel until "0" on dial and pointer align.
4. Rotate crankshaft *opposite* the direction of rotation about .250 BTDC (2 1/2 pointer revolutions).
5. Determine correct ignition timing position from ignition data charts and rotate the crankshaft in the normal direction of rotation to that position. (Example: 1994 SL750 ignition timing is .139" (3.54 mm) BTDC. Rotate the crankshaft in the normal direction of rotation so that the dial indicator pointer reads .139 BTDC.
6. Attach a piece of wire to the PTO cylinder base bolt and bend it so it lays across the engine output coupler. NOTE: This end may be sharpened for ease of reading.

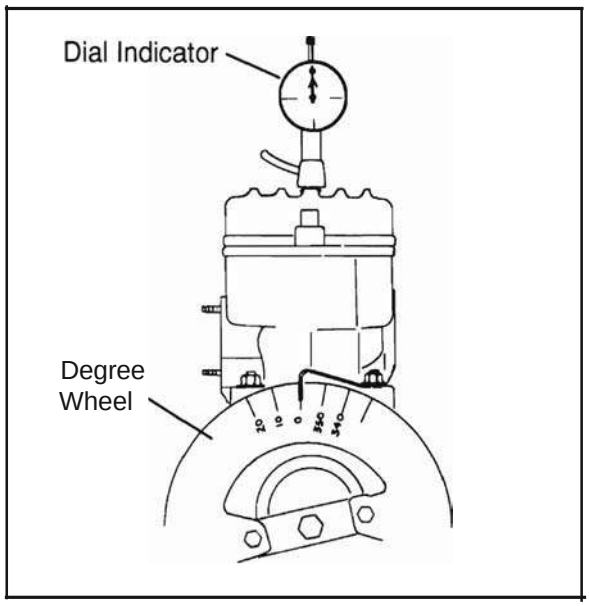




7. Scribe a line, aligned with the pointer, across face of coupler.
8. Verify proper piston position by repeating steps 2 - 5. Reposition pointer if necessary.
9. Remove dial indicator and install spark plug.
10. Connect a timing light to the **PTO** cylinder. Start engine and increase engine **RPM** to 3000.

Timing Light
PN 2870630

11. Point timing light at pointer. Using the same sight line as when you dial indicated the mark, note the position of the scribed mark in relation to the pointer.
12. If marks do not align, dial indicate the exact position sighted on the coupler. Compare dial indicator reading to Degrees to Piston Chart on page 7.31.



If out of specification

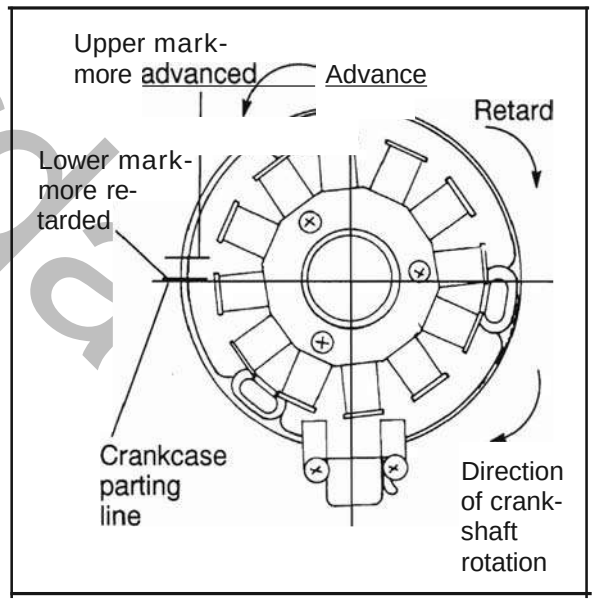
1. Remove inner and outer magneto covers. **NOTE:** On 1992 and 1993 models, engine removal is required.
2. Remove flywheel nut and washer. Remove flywheel using puller. Inspect flywheel key and key-way for damage.

Flywheel Puller
PN 2871043

3. Loosen stator plate screws.
4. Rotate stator plate in the direction the mark must move to align with the pointer. Move the plate approximately the same amount as the mark must move. Tighten stator plate.
5. Reinstall flywheel. Apply Loctite™ 242 (Blue) to the threads of the crankshaft. Reinstall flywheel nut and torque to specifications.

Flywheel Nut Torque
55 ft. lbs. (7.6 kg-m)

6. Verify proper ignition timing with a timing light.



ELECTRICAL
Ignition Timing Adjustment - Polaris

Dynamic (Running) Ignition Timing - Polaris Engines

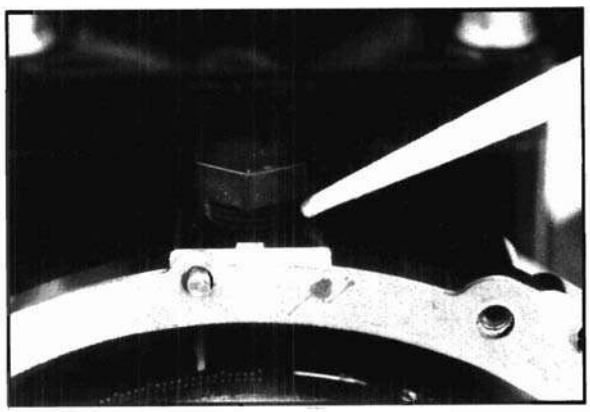
***NOTE:** Always verify timing of engine at room temperature only (68° F/20° C).

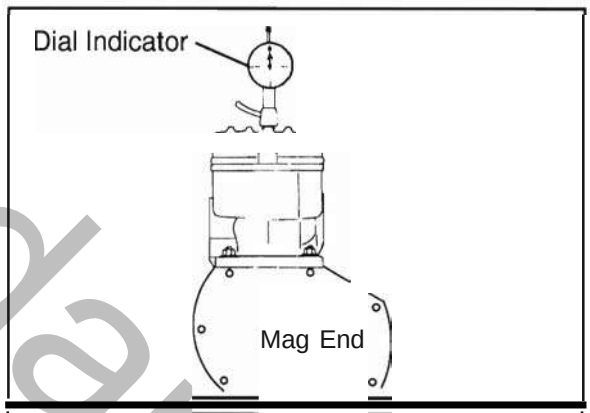
Verify the ignition position at maximum advance (3000 RPM) when checking the timing.

If engine damage has occurred due to a suspected ignition related problem, check the ignition timing at the specified operating RPM.

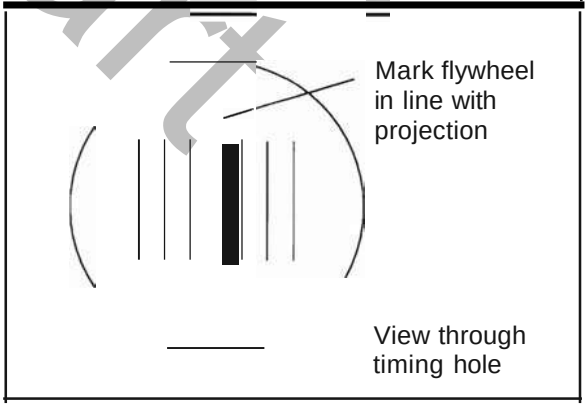
Always dial indicate the timing mark before attempting to adjust the ignition timing. To indicate the marks:

1. Remove timing inspection plug from starter cover.
2. Remove front (Mag) cylinder spark plug and install dial indicator.
3. Rotate crankshaft by hand while observing dial indicator. As the piston touches the indicator plunger, the dial will begin to rotate. Find the exact point where the pointer stops rotating and reverses direction. This will be Top Dead Center (TDC).
4. While holding crankshaft with piston at TDC, zero indicator by rotating bezel until "0" on dial and pointer align.
5. Rotate crankshaft *opposite* the direction of rotation about .200" BTDC (2 pointer revolutions).
6. Rotate the crankshaft in the normal direction of rotation to .081" (2.06mm) BTDC.





7. Using a fast drying white ink, mark the flywheel in line with the projection in the inspection hole to make it easier to see with a strobe light.
8. Verify proper piston position by repeating steps 2 - 5.
9. Remove dial indicator and install spark plug.
10. Connect a tachometer according to manufacturer's instructions.
11. Connect a timing light to the front (Mag) cylinder. Start engine and increase RPM to 3000.



Timing Light

PN 2870630

CAUTION:

Never operate engine for more than 15 seconds without cooling water. Severe engine damage may occur from overheating.

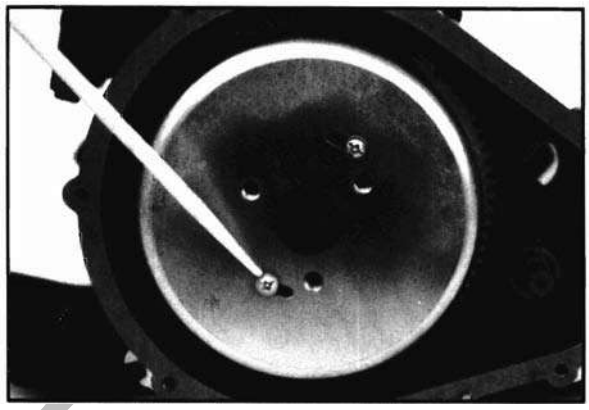
Dynamic Ignition Timing, Cant.

12. Point timing light at inspection hole. Be sure to view the mark at 90° to the window to avoid misreading. Note the position of the scribed mark in relation to the pointer.
13. If marks do not align, stop engine and reinstall dial indicator in Mag end cylinder. Rotate the engine until the mark is in the same position as sighted with the strobe light. Read dial indicator and compare reading to Degrees to Piston Chart on page 7.31.

Ignition Timing Adjustment

To adjust ignition timing:

9. Remove flywheel cover.
10. Loosen magnet holder screws.
11. Rotate magnet holder to adjust ignition timing. Rotating the magnet holder clockwise (as viewed from the front) will advance the timing and rotating counterclockwise will retard timing. Move the magnet holder in the *opposite direction* approximately the same amount as the mark must move. Tighten screws securely.
12. Verify proper ignition timing with the timing light.



Static Ignition Timing Adjustment

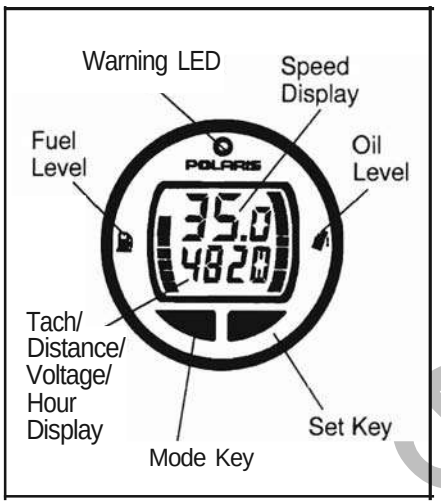
Static Timing Light tool (PN 2871745) can used to check ignition timing on Polaris engines equipped with hall effect sensors. Be sure to set the timing to the "Static Timing Reference Location" shown in *Static Timing Table* when using the Static Timing Light.

9. Make sure there is a good 9v battery in the tool.
10. Open electrical box, disconnect brown stator lead and connect it to brown lead of tester.
11. Disconnect black stator lead and connect it to black lead of tester.
12. Connect white wire to Red (Magneto cylinder-#1) stator wire. NOTE: The white wire on the tool is the sensor wire and must be connected to the Mag cylinder Hall-Effect sensor wire. Red = Mag (#1) cylinder.
13. Remove spark plugs and install dial indicator (with extension) in the Magneto (1) cylinder. Find Top Dead Center (TDC).
14. Rotate crankshaft counterclockwise (as viewed from front) until light comes on. Continue rotating in same direction until light goes off. Rotate an additional 1/8 turn or so, then reverse rotation direction (turn clockwise). Read the dial indicator at the instant the light comes on.
15. Static timing is correct if the dial indicator reads within the static timing reference limits listed in the table below. The COI box uses this reference location to determine when to fire the ignition.
16. If timing is out of specification, refer to adjustment procedure above.
17. This tool can also be used to test Hall Effect sensors. Simply connect the white test wire to the Blue (Cen) or Green (PTa) wire from the stator. The light should come on and go out sharply (as indicated in static timing) if the sensor is functioning properly. If the light glows or is slow to react, the Hall Effect sensor is damaged.

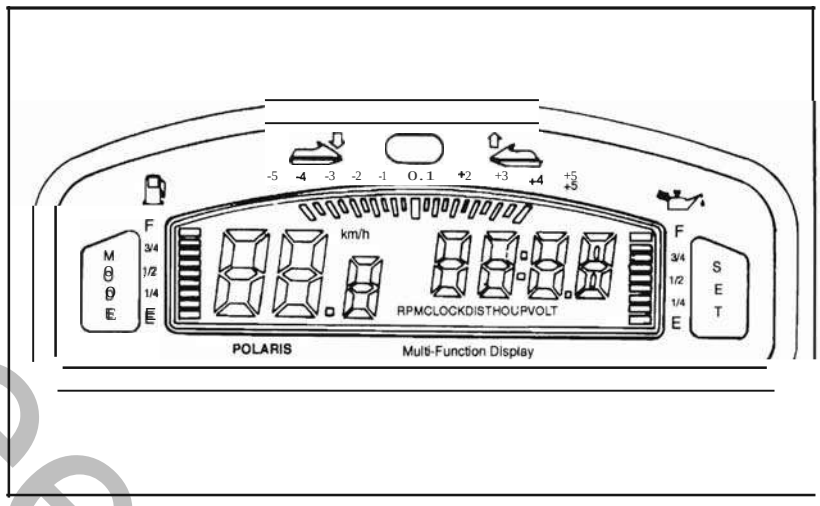
Model	Ignition Timing ° BTDC	Piston Location BTDC (Spark occurs)	Piston Location BTDC (Static Timing Reference Location)
All 700's except Hurricane	18 ± 2°	.0815" (2.071 mm)	.271"-.286" (6.88-7.26mm)
Hurricane	20 ± 2°	.1003" (2.549mm)	.271"-.286" (6.88-7.26mm)
All 900's & 1050's	18 ± 2°	.0815" (2.071 mm)	.240"-.260" (6.09-6.60mm)

Multi-Function Display

The Polaris Multi-Function Display (MFD) allows the operator to see such important information as time run, distance run, maximum speed, current speed, fuel level and more at the touch of a button. Following is a summary of operating instructions for both styles of MFDs. A description of Operating Modes and Key Function is listed below followed by Troubleshooting the MFD system.



TYPE 1



TYPE 2

OPERATION AND MODES

HOUR: (Type 1 and 2) Secondary display function controls multi-LCD when selected by mode key. HOUR annunciator is on when in HOUR mode. Actual engine run hours are displayed in .1 hour increments from 0 to 999.9 hours. HOURS can be neither reset nor lost when power is removed due to nonvolatile EEPROM memory.

CLOCK: (Type 1) While in TACH mode, a single press of the SET key will display the clock for several seconds. To set the time, first enter HOUR mode and then hold the SET key for 4 seconds to enter CLOCK SET mode. Both keys are now used to adjust the time. MODE selects the digit, SET advances the digit. Press MODE when complete to start the clock (colon begins to flash).

CLOCK: (Type 2) CLOCK is a secondary display function and controls multi-LCD when selected by mode key. CLOCK annunciator is on when in CLOCK mode. Clock setting procedure is same as Type 1.

PEAK SPEED/RPM: (Type 1) While the time is being displayed in CLOCK mode, a single press of the MODE key will display both the peak speed and maximum sustained RPM since the last reset or auto-off occurred. While displayed, holding the SET key for 4 seconds will reset the peak memories.

PEAK SPEED/RPM: (Type 2) While in TACH mode, pressing the SET key will display both the peak speed and maximum sustained RPM since the last reset or auto-off occurred. While displayed, holding the SET key for 4 seconds will reset the peak memories.

KEY FUNCTIONS AND DISPLAY

MODE KEY: (Type 1 and 2) Toggles multi-LCD display modes as pressed. Annunciators scroll from left to right to indicate selection.

SET KEY: (Type 1) Function varies with selected mode. Used to temporarily disable warning indications, to access clock, peak speed and RPM while in TACH mode. reset distance in DIST mode. select MPH - Km/H while in VOLT mode. and to set time while in HOUR mode.

SET KEY: (Type 2) Function varies with selected mode. Used to temporarily disable warning indications, to access peak speed and RPM while in TACH mode, reset distance in DIST mode, select MPH - Km/H while in VOLT mode, and to set time while in CLOCK mode.

LCD DISPLAY: (Type 1) Displays variety of both essential and performance data: speed, RPM, fuel level, oil level, distance, voltage, engine hours, clock, peak speed, peak RPM, and warning conditions (low fuel, low oil, low power, high temperature).

LCD DISPLAY: (Type 2) Displays variety of both essential and performance data: speed, RPM, fuel level, oil level, trim position, distance, voltage, engine hours, clock, peak speed, peak RPM, and warning conditions (low fuel, low oil, low power, high temperature).

WARNING LED: (Type 1 and 2) Super bright LED flashes to alert rider of warning condition. Actual condition is then displayed in multi-LCD readout.

SPEED: (Type 1) Primary display function, controls upper LCD at all times. Displays speed with .1 MPH resolution from 5-75 MPH. Input is received from a tube in the jet pump intake.

SPEED: (Type 2) Primary display function, controls left LCD at all times. Displays speed with .1 MPH resolution from 5-75 MPH. Input is received from a tube in the jet pump intake.

TACH (Type 1 and 2) Yellow wire from alternator: Default secondary display function, controls Multi-LCD at power on or when selected by MODE key. RPM annunciator is on when in TACH mode. Displays RPM with 10 RPM resolution.

FUEL (Type 1 and 2) Pink wire from sending unit at fuel tank: Primary display function controls left hand bar graph at all times. Displays in 1/8 tank increments. Toggles low "FUEL" display and warning LED when fuel reaches 1/8 level. "FUEL" will flash in display regardless of Multi-LCD display mode.

OIL (Type 1 and 2) Blue wire from sending unit at oil tank: Primary display function controls right hand bar graph at all times. Displays in 1/4 tank increments. Toggles low "OIL" display and warning LED when oil reaches 1/4 level. "OIL" will flash in display regardless of Multi-LCD display mode.

DIST (Distance) (Type 1 and 2) Internal function: Secondary display function controls Multi-LCD when selected by mode key. DIST annunciator is on when in DISTANCE mode. Distance is displayed in .1 mile increments from 0 to 999.9. Distance can be reset by pressing the SET key for 4 seconds while in DIST mode.

VOLT (Type 1 and 2) Red wire, purple tracer: Secondary display function controls Multi-LCD when selected by mode key. VOLT annunciator is on when in VOLT mode. Voltage is displayed in .1 volt increments from 5 to 18 volts.

ENGLISH/METRIC: (Type 1 and 2) While in the VOLT mode, pressing and holding SET will toggle the instrument between MPH and KPH. The distance function is automatically toggled at the same time.

LOW POWER: (Type 1 and 2) If battery voltage drops below 10.9 volts, the Multi-LCD display will flash "LOPR". If this occurs, the speed and distance functions will cease until power is restored.

HIGH TEMP: When a hot engine signal is received, the Multi-LCD display will flash "HOT" and the warning LED will light.

WARNING RESET: When warning conditions occur, pressing the SET key will deactivate the warning depending on the condition: HOT: Only LED is disabled for 5 minutes: FUEL: Both LED and LCD are disabled for 5 minutes; OIL: Both LED and LCD are disabled for 15 minutes.

ON/AUTO ON: When system is off, a single press of MODE key will turn the MFD on. When the engine is started, the MFD will automatically power on.

AUTO OFF: After 5 minutes of no activity, the system automatically shuts itself off. The internal clock continues to keep time. Memory functions (distance, hours, MPH/KILO) are retained, and the clock, fuel level, and oil level will be displayed.

TRIM (Type 2)(SL Only): Primary display function controls top bar graph at all times. Trim position is shown from -5 to +5 in .5 increments. Because of the safety clutch in the trim motor, it may be necessary to re-synchronize the TRIM display if the nozzle should be deflected upward. This is accomplished by simply running the trim motor until both the trim nozzle and display are at their limits (either up or down).

MFD Troubleshooting

If the MFD is not working check the following items:

- Battery connections for corrosion;
- Fuse inside electrical box;
- Pins in MFD connector for corrosion or loose fit;
- Power and ground at the connector to the MFD;
- Component inputs are functioning properly.

Following are some of the common symptoms of a malfunctioning MFD and possible causes:

Display is stuck on one function / display shows all 8s / buttons don't work

Although uncommon, this malfunction may occur after the battery has been removed from the craft or when the power is disconnected. It may freeze on anyone function, or with all "8s" displayed, as if the MFD is performing it's self-check during power up. It is possible that when the battery negative cable is re-connected after service, power glitches may cause the micro-processor to temporarily malfunction. This has no damaging or permanent affect on the MFD, and can be corrected by disconnecting the negative battery cable for approximately 1 minute to reset the microprocessor.

When reconnecting the battery negative cable, take care to make it as "clean" a connection as possible. Only contact the battery terminal once while connecting the cable. Do *not* contact the terminal repeatedly. Hold pressure on the cable until the terminal bolt is tight.

CAUTION:

To avoid the possibility of explosion, always disconnect the negative cable first and connect it last.

One part of display malfunctions

Determine which function (or functions) are not working. If only one or two parts of the display are affected, chances are the input for that function is the problem. Test individual senders and inputs including related wiring. Refer to the electrical wiring diagram. Check for clean, tight connections at the back of the gauge and inside the electrical box. If water is present in the electrical box, be sure the wire sealing grommets and box sealing O-ring are properly positioned. Route wires carefully when assembling the box to prevent pinched wires. On new units, make sure the wires are located correctly in the connector clip by comparing wire color to the key on the schematic wiring diagram.

Intermittent malfunctions

Be sure to get an accurate description of the problem from the customer if a malfunction is intermittent. Intermittent malfunctions are usually traced to a loose connection on the sender or signal wire power supply or ground path. If the display is completely dead concentrate on the power supply to the display and the ground wire from it. Disconnect the coupler from the back of the display unit and check for battery voltage on the Red/Purple wire. If no power is present test the black wire for good continuity to ground. If the ground path is complete check the 1/4 amp fuse in the electrical box. Be sure to check for power across the fuse terminals even if it appears to be good. In some cases the fuse will have good continuity but will not pass current.

Blowing fuses

Power surges or "spikes" are the most common cause of blown fuses. These power surges can be caused by loose connections in the electrical box, poor ground at the engine mount plate, and even corroded or loose battery terminals (not necessarily visible to the naked eye). Any time the battery charging path is interrupted there is a potential for a voltage "spike". Concentrate your effort there for blown fuses.

In order to display accurate information, the MFD must receive accurate data. This data may be in the form of a variable ground path such as the fuel and oil level senders, a pressure input such as the speedometer pitot tube, or a specific voltage signal like the alternator input for RPM.

Speedometer reading inaccurate

The MFD electronically converts a pressure input from the pitot tube (located in the pump inlet area) to a graphic display of MPH or (KPH). The MFD can be checked by connecting a pressure pump to the back of the MFD and comparing the reading to the chart on page 6.31. Inaccurate reading can be caused by kinks or obstructions in the pressure line or pitot tube, cavitation of the pump, or wrong operating RPM.

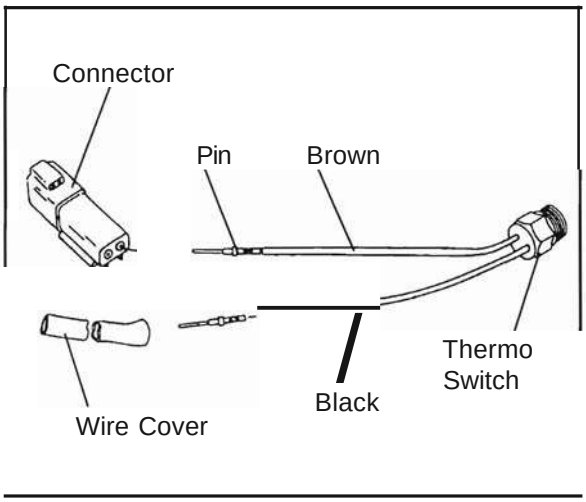
In some cases, an improperly functioning display may be corrected by disconnecting the battery for two hours. If all items above have been checked and verified, it may be necessary to replace the MFD.

Weatherproof Connector Servicing· FUji Engines

1. Grasp crimped contact approximately 1" (2.5 cm) behind contact barrel.

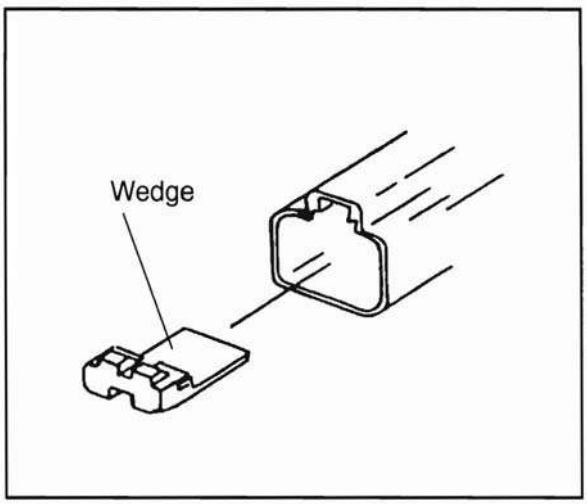
2. Hold connector with rear grommet facing you.

3. Push contact straight into connector grommet until a click is felt. A slight tug will confirm that it is properly locked in place. **NOTE:** Use a liberal amount of dielectric grease in connectors.

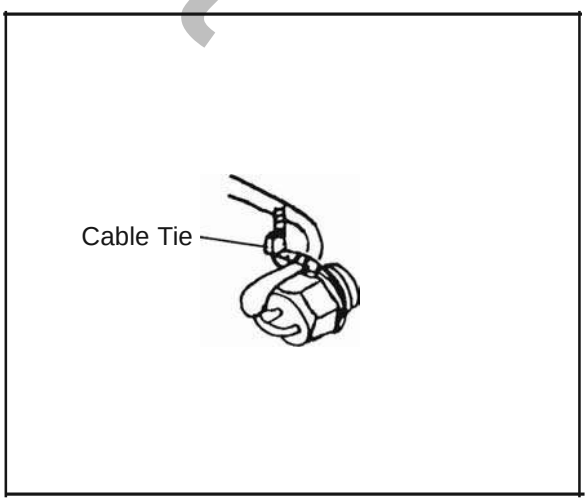


Dielectric Grease PN 2871044

4. Once contacts are in place, insert orange wedge. The orange wedge will snap into place. **NOTE:** The receptacle is shown. Use the same procedure for the plug.



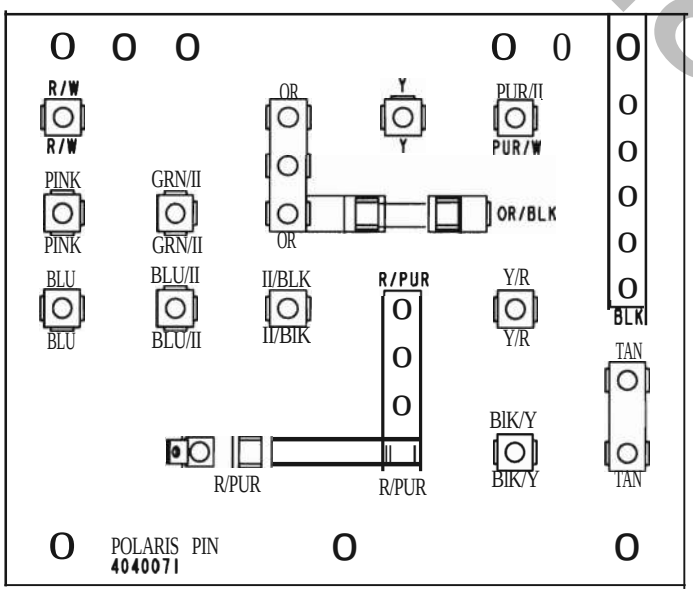
5. Pull wires back over switch and secure them in place with cable ties.

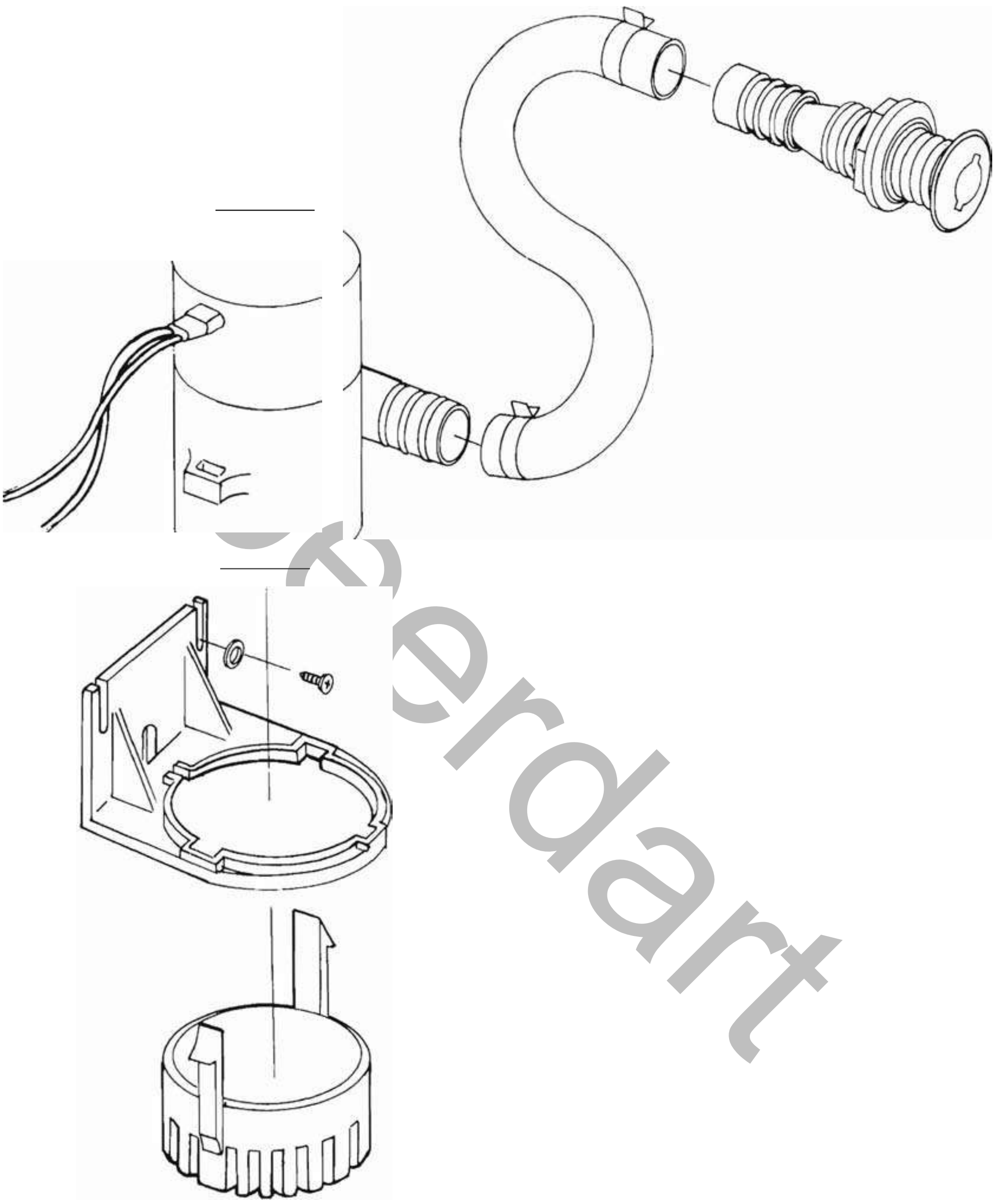


ELECTRICAL
Electronic Module Function

Module	Function	Comments
LR21	1/2 wave rectifier and voltage regulator.	-
LR23	1/2 wave rectifier, voltage regulator, and alternator controlled switch. DC (battery voltage) supplied to orange wire when engine is running.	-
LR23-1	Same as LR23. Has additional internal circuit for use with LR54 RPM limiter on SLX780.	1995 SLX780 Only
LR50	Alternator controlled switch. Battery voltage supplied to orange wire when engine is running.	-
LR52	Alternator controlled switch with voltage reduction for fuel gauge. Battery voltage supplied to orange wire when engine is running. Low voltage (approximately 2.5 DeV) supplied to red/white fuel gauge wire when engine is running.	Analog Fuel Gauge Models
LR54	Hot or low fuel RPM limit command to CDI unit.	SL780, SLT780, SLX780, SL900, SLTX

Terminal Board, Typical



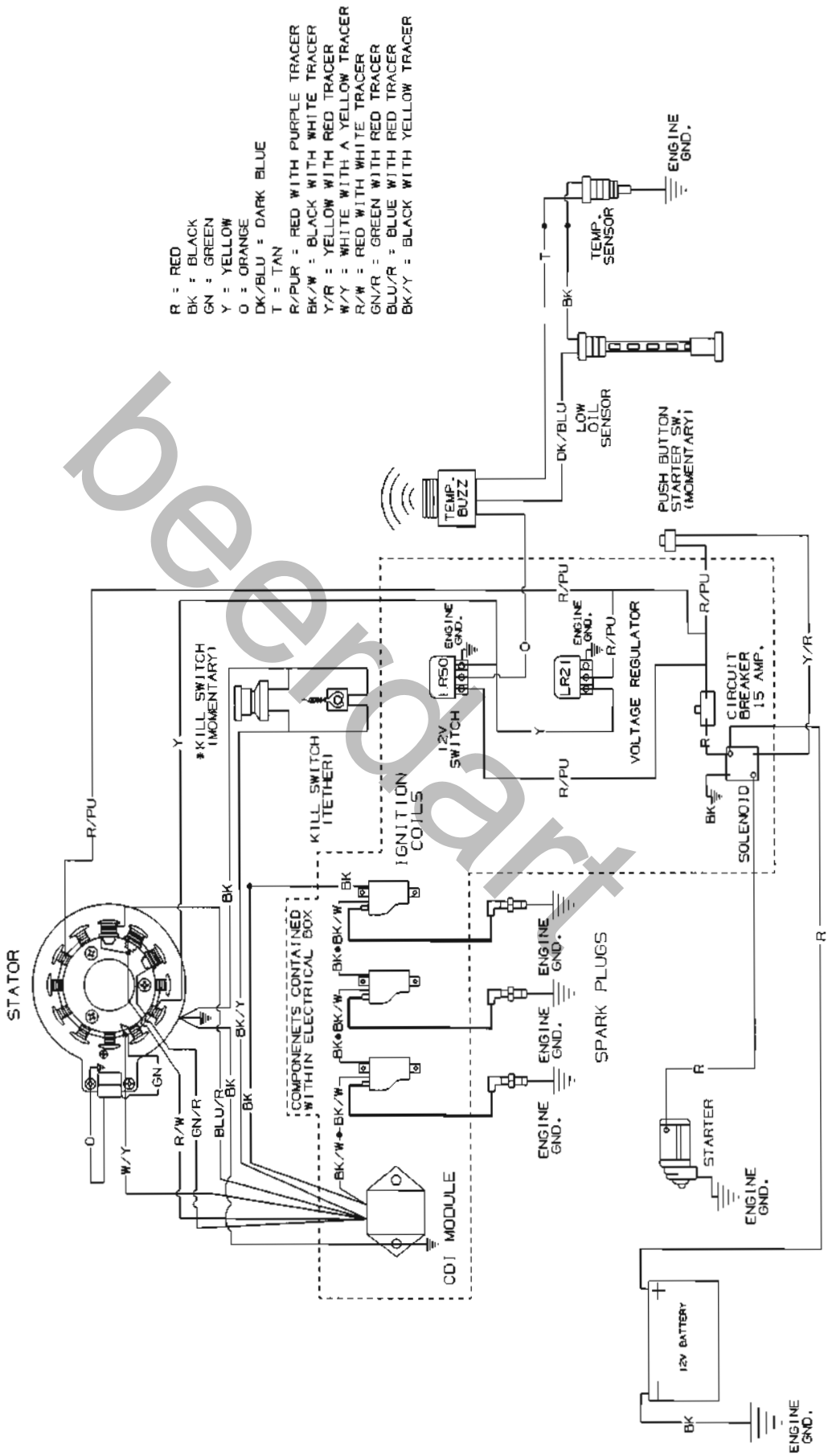


Bilge Pump

Battery voltage is supplied to pump on orange wire from LR23 or LR52 when engine is running. To test pump apply alternate power and ground. If pump does not run replace bilge pump. If pump runs with alternate power and Qround start engine and check for battery voltage on Orange wire terminal. If no power replace LR module or repair connection. If power is present on Orange terminal inspect pump ground circuit.

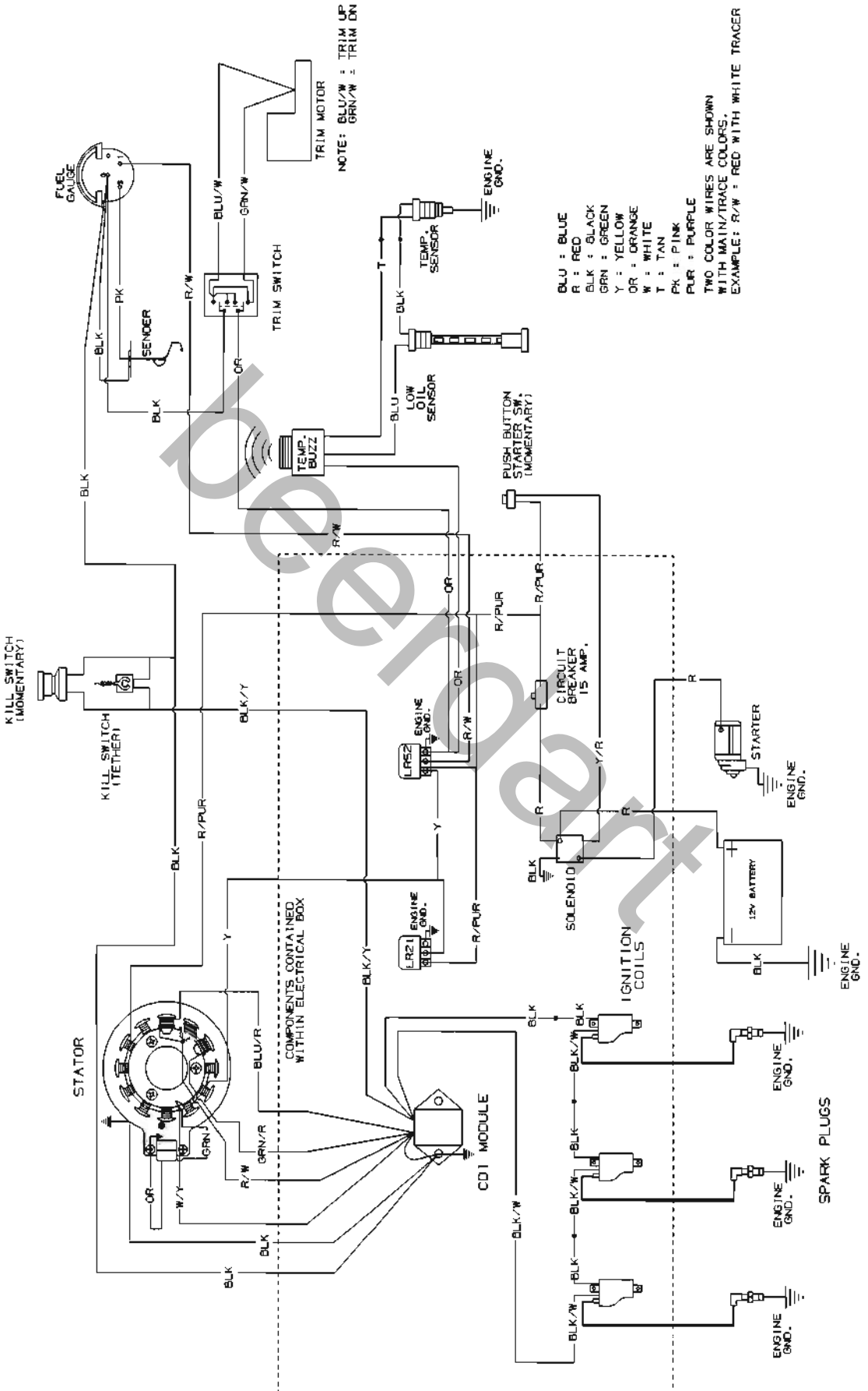
- If pump continues to run after engine is off replace LR module.
- Inspect inlet area regularly for debris.

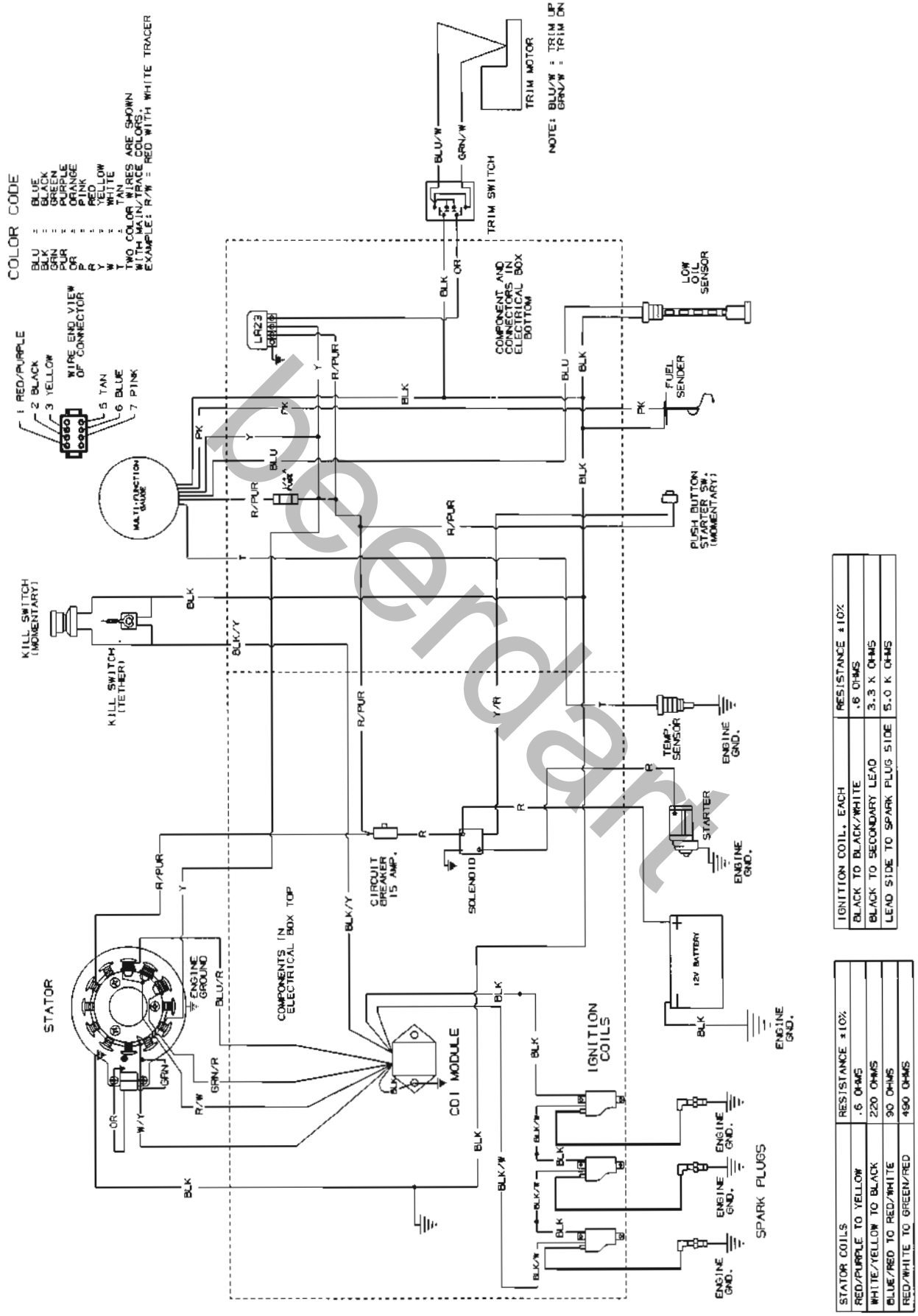
1992 SL650 Wiring Diagram



* NOTE: KILL SWITCH MOMENTARY OPERATION WILL SHUT OFF ENGINE EVEN THOUGH THE SWITCH IS NOT HELD DOWN. CDI INTERNALLY CONTROLS THE ENGINE KILL.

1993 SL750 Wiring Schematic

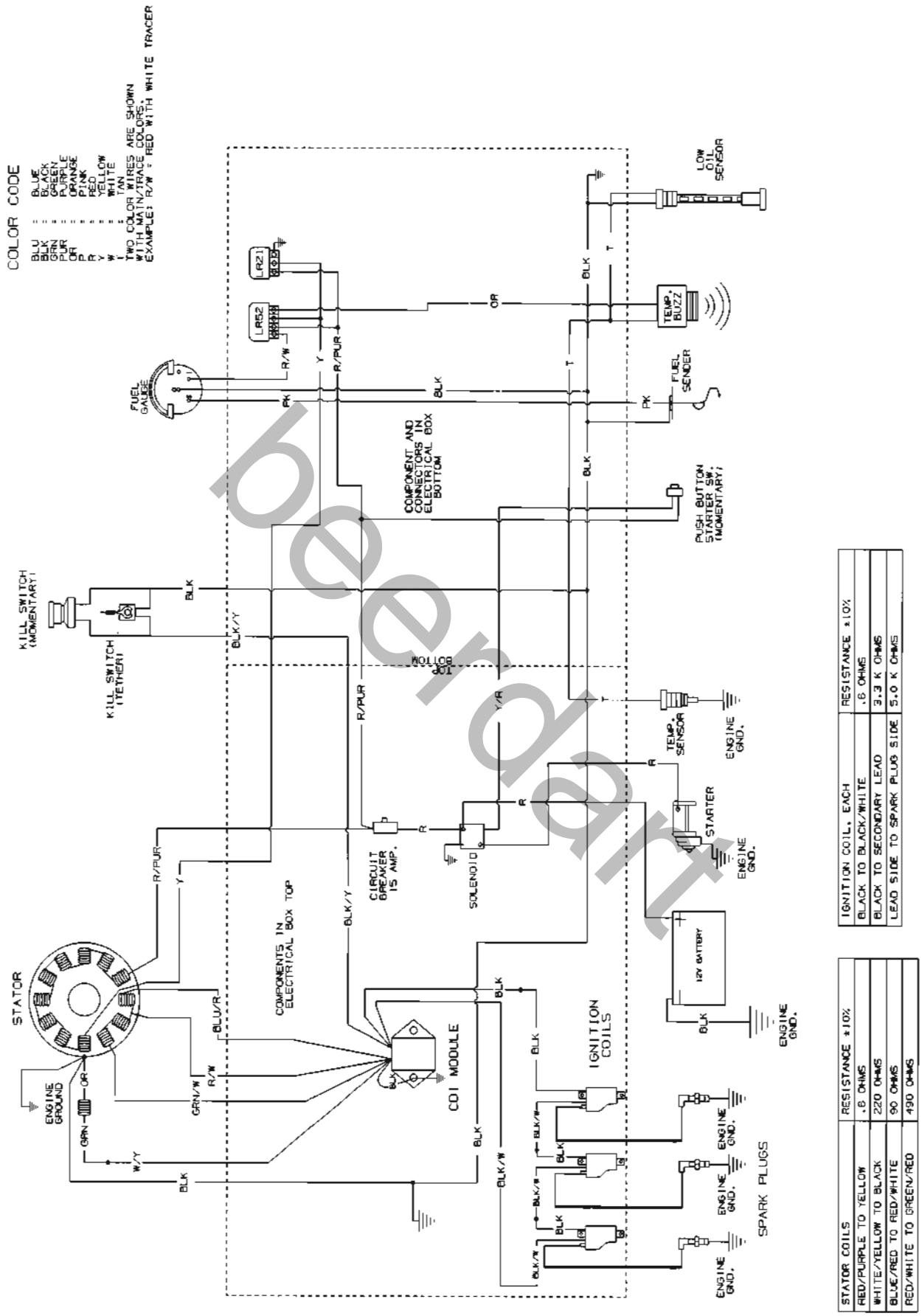




STATOR COILS	RESISTANCE ±10%
RED/PURPLE TO YELLOW	.6 OHMS
WHITE/YELLOW TO BLACK	220 OHMS
BLUE/RED TO RED/WHITE	90 OHMS
RED/WHITE TO GREEN/RED	490 OHMS

IGNITION COIL, EACH	RESISTANCE ±10%
BLACK TO BLACK/WHITE	.6 OHMS
BLACK TO SECONDARY LEAD	3.3 K OHMS
LEAD SIDE TO SPARK PLUG SIDE	5.0 K OHMS

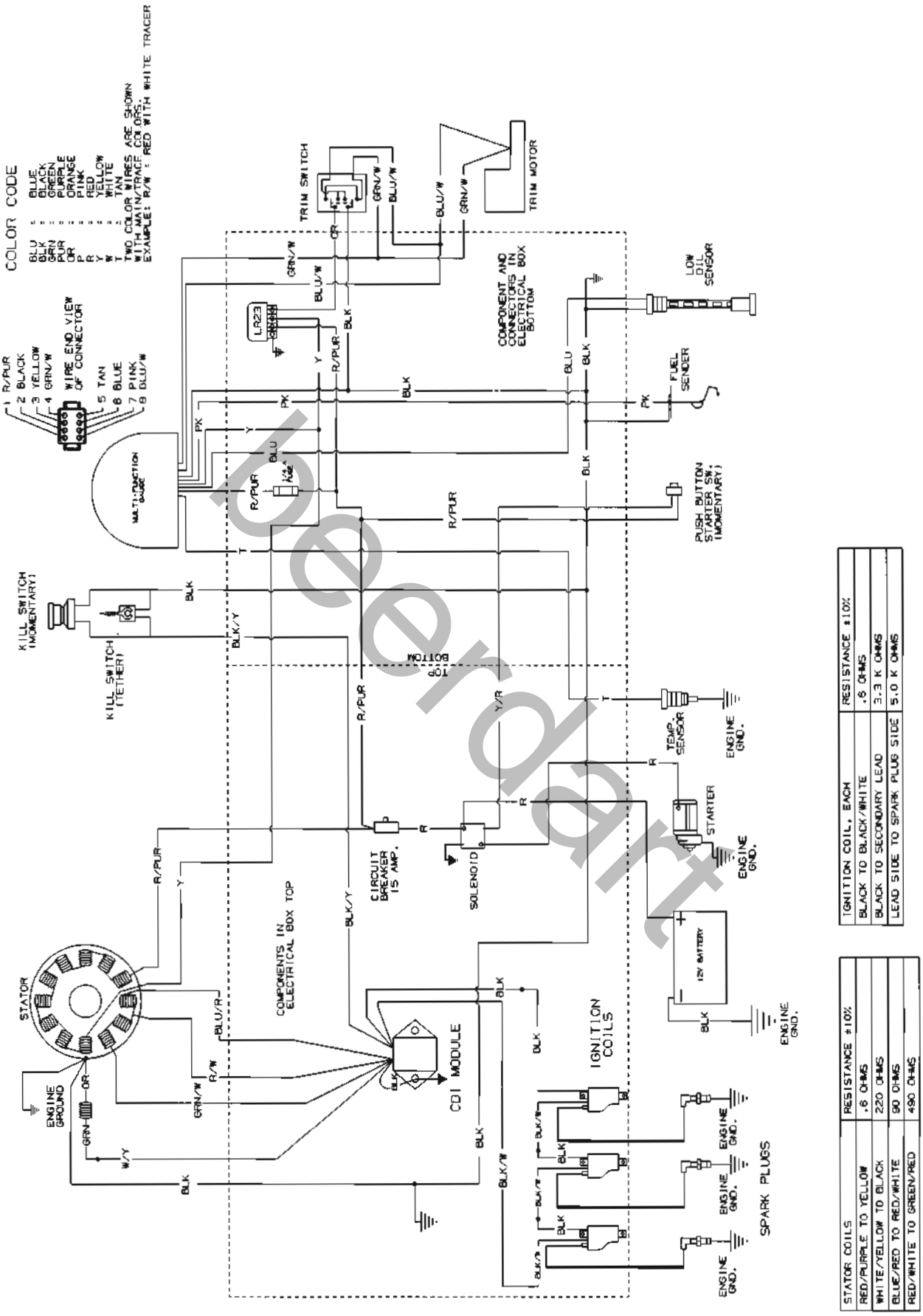
1995 SL650 Wiring Diagram



IGNITION COIL, EACH	RESISTANCE ±10%
BLACK TO BLACK/WHITE	.6 OHMS
BLACK TO SECONDARY LEAD	3.3 K OHMS
LEAD SIDE TO SPARK PLUG SIDE	5.0 K OHMS

STATOR COILS	RESISTANCE ±10%
RED/PURPLE TO YELLOW	.6 OHMS
WHITE/YELLOW TO BLACK	220 OHMS
BLUE/RED TO RED/WHITE	90 OHMS
RED/WHITE TO GREEN/RED	490 OHMS

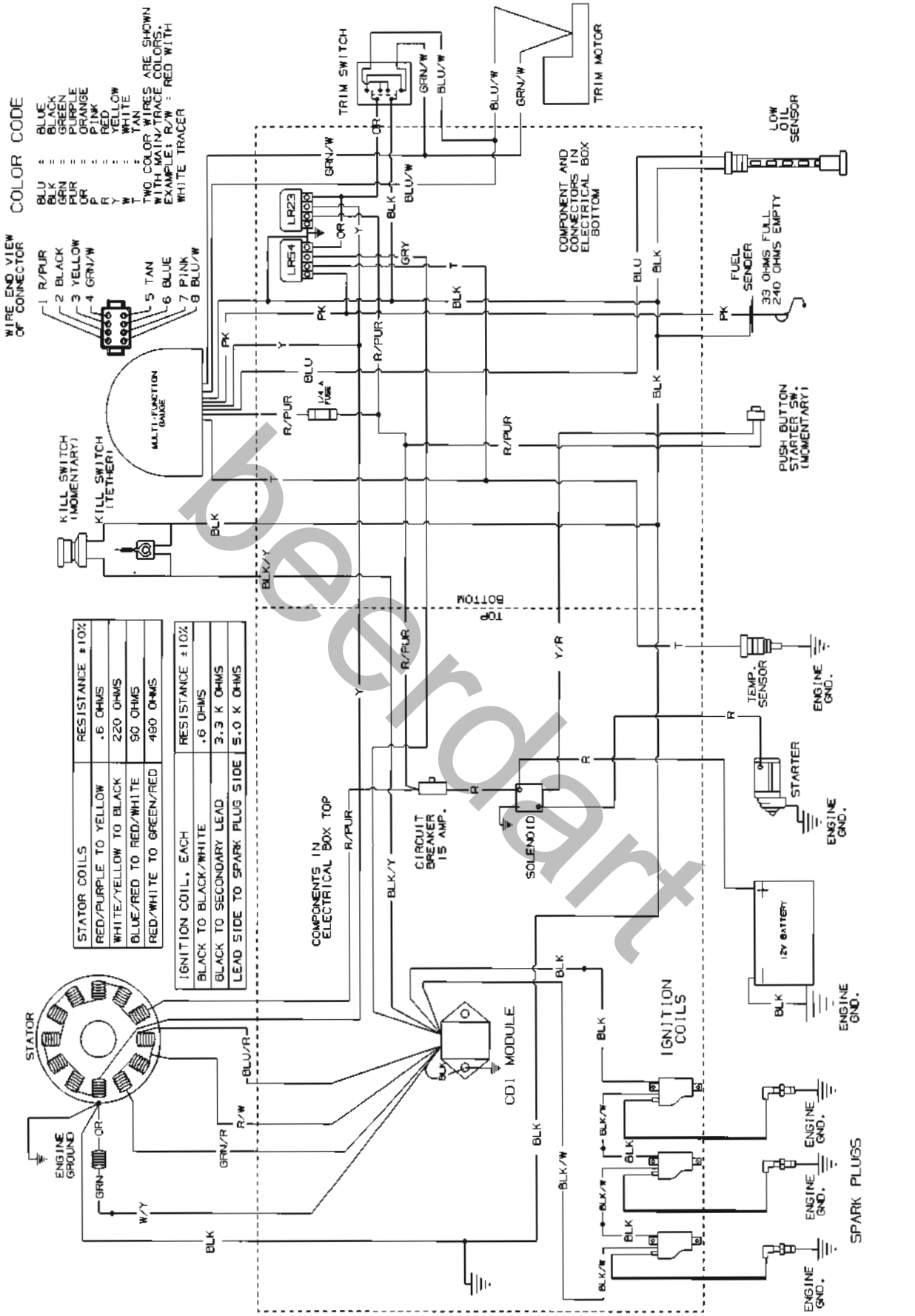
1995 SL750 Wiring Diagram



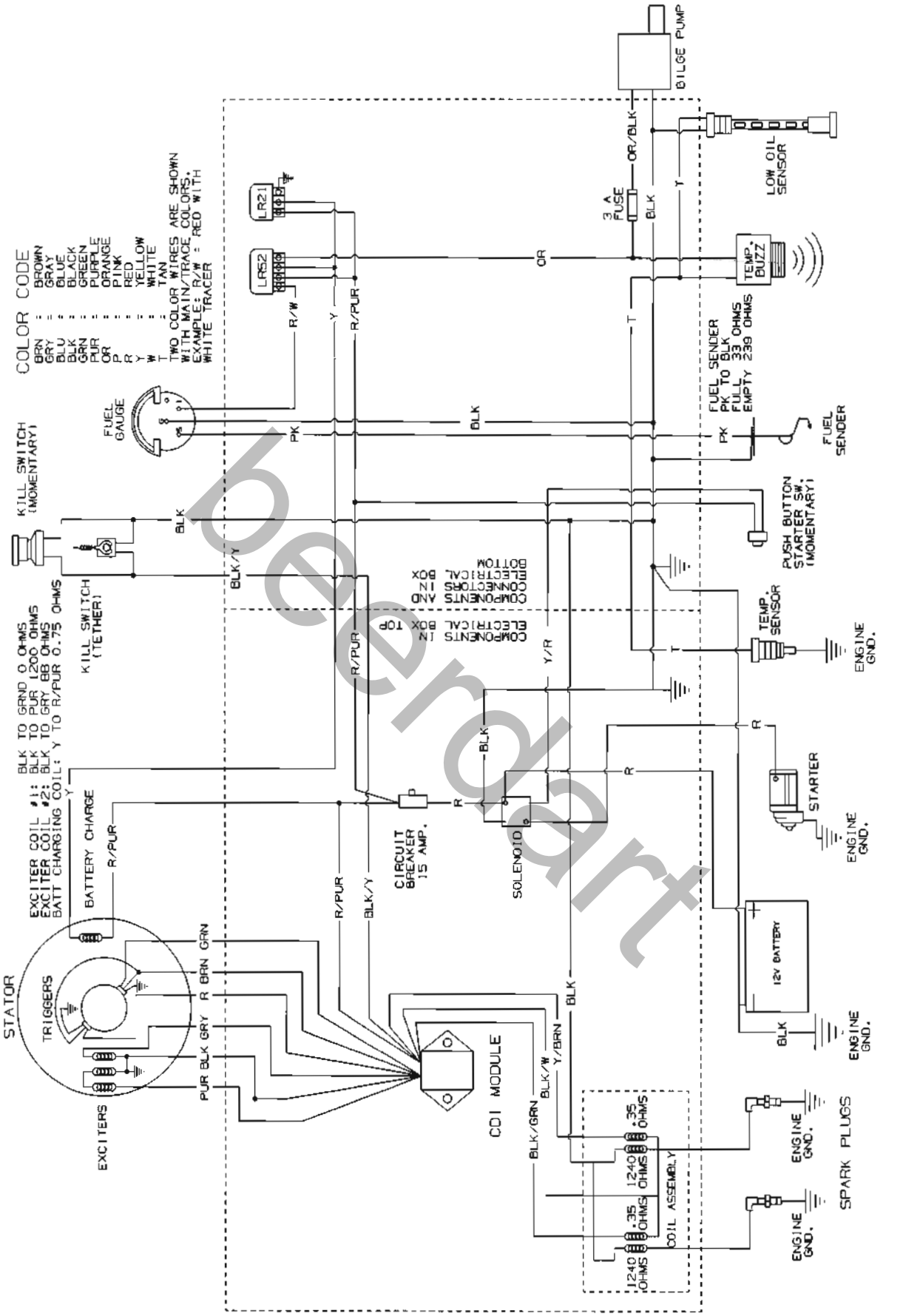
STATOR COILS	RESISTANCE ±10%
RED/PURPLE TO YELLOW	.6 OHMS
WHITE/YELLOW TO BLACK	220 OHMS
BLUE/RED TO RED/WHITE	90 OHMS
RED/WHITE TO GREEN/RED	490 OHMS

IGNITION COIL, EACH	RESISTANCE ±10%
BLACK TO BLACK/WHITE	.6 OHMS
BLACK TO SECONDARY LEAD	3.3 K OHMS
LEAD SIDE TO SPARK PLUG SIDE	5.0 K OHMS

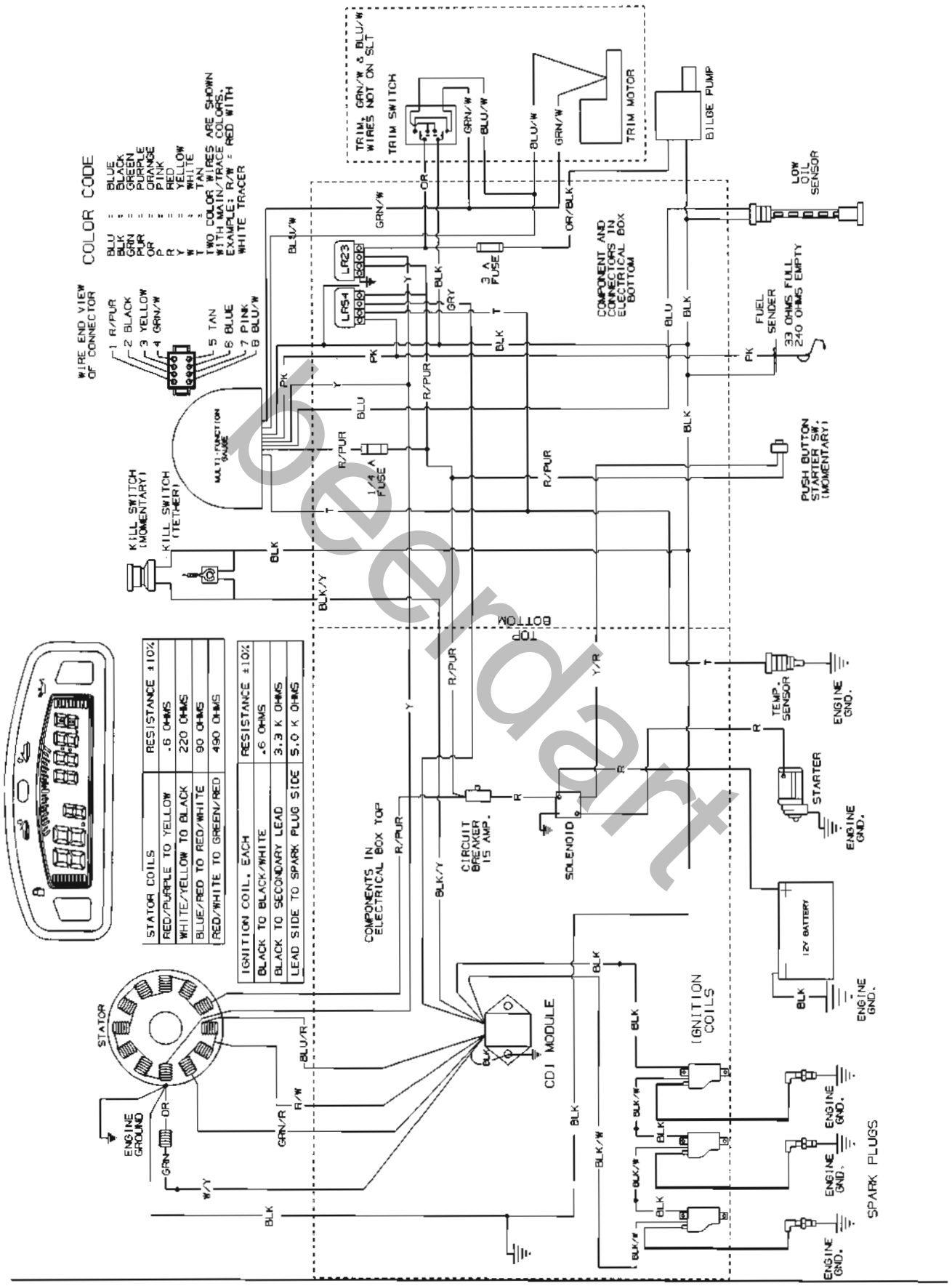
1995 SLX780 Wiring Diagram

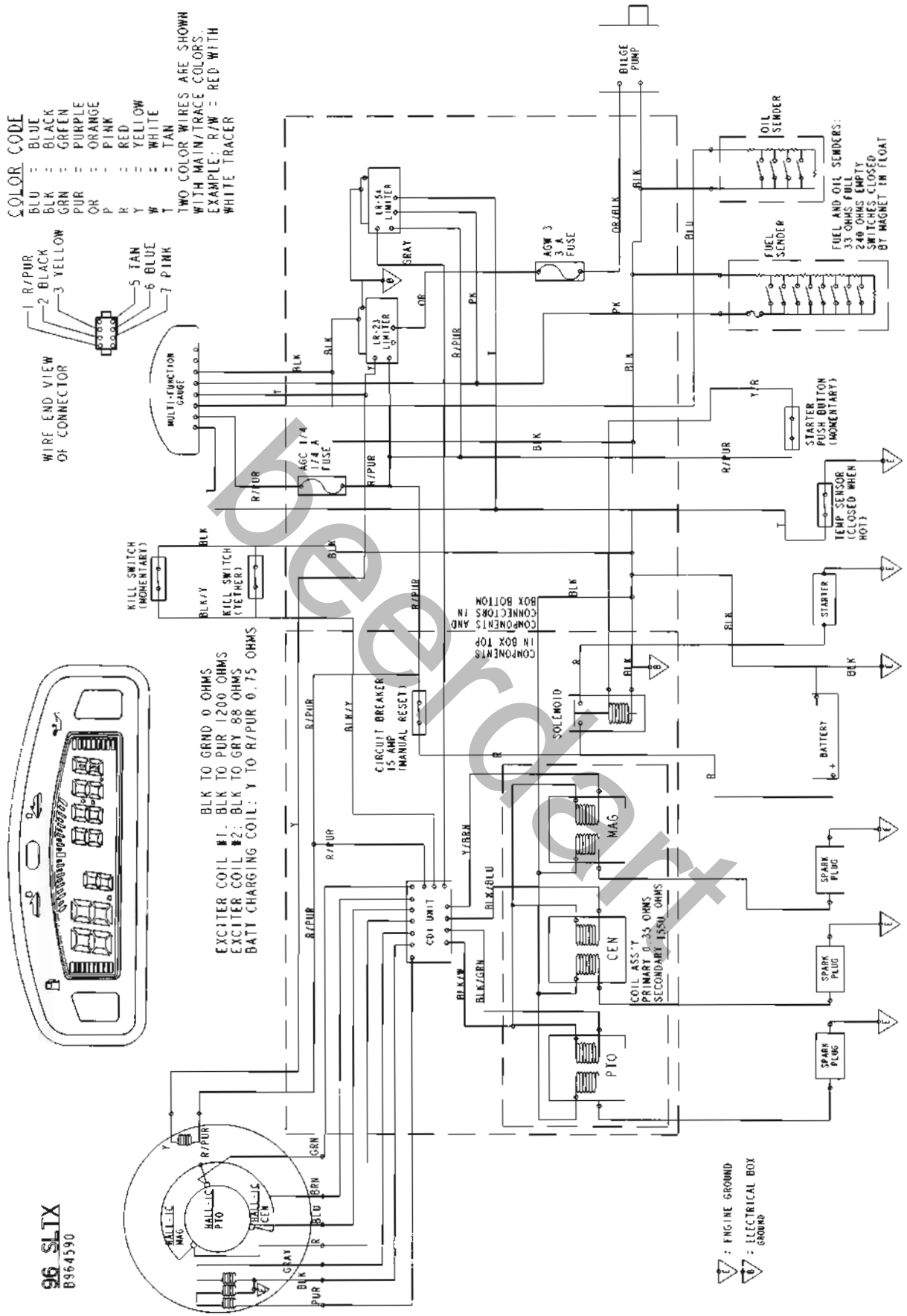


1996 SLT700 Wiring Diagram

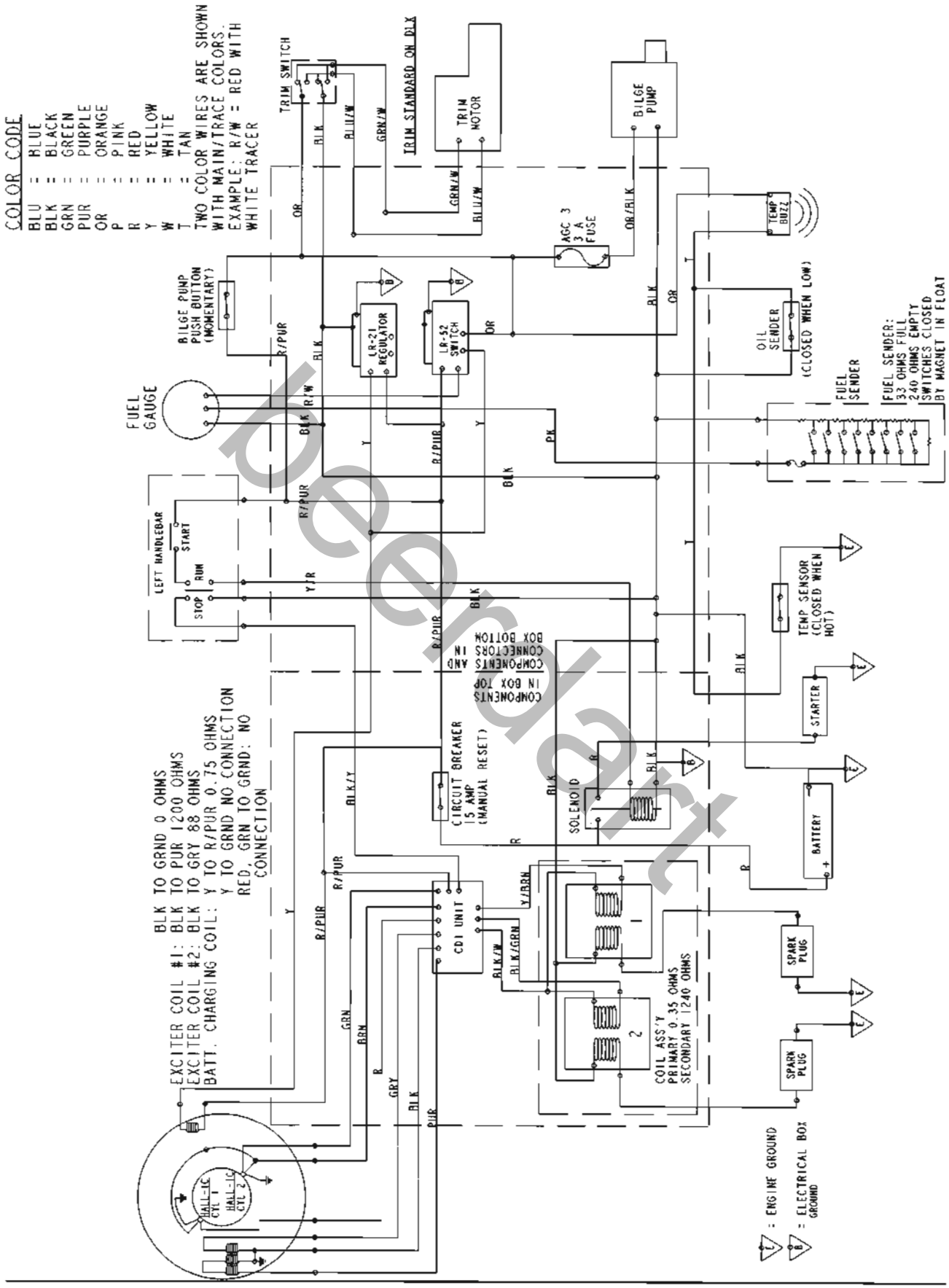


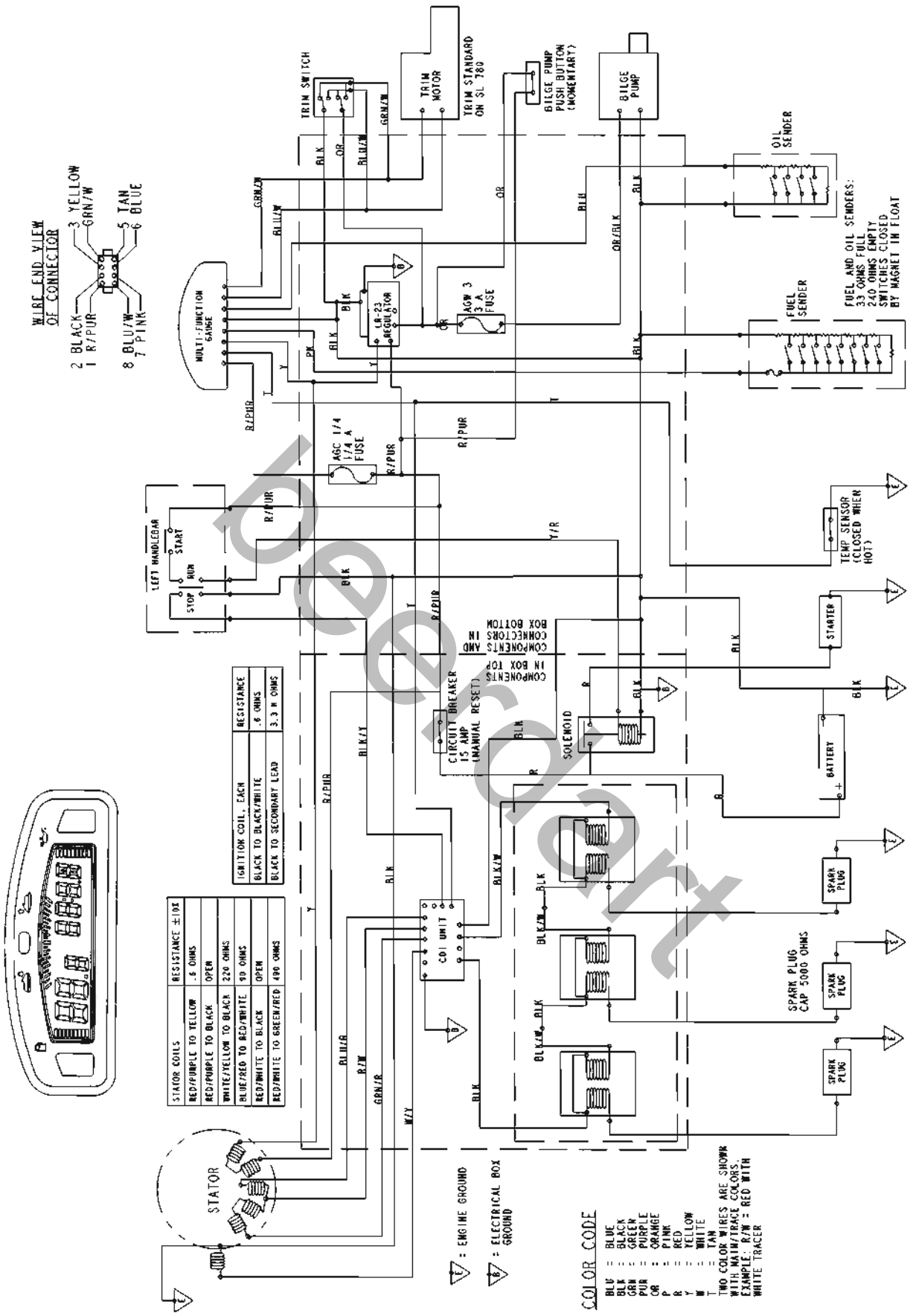
1996 SL780, SLT780, SLX780 Wiring Diagram

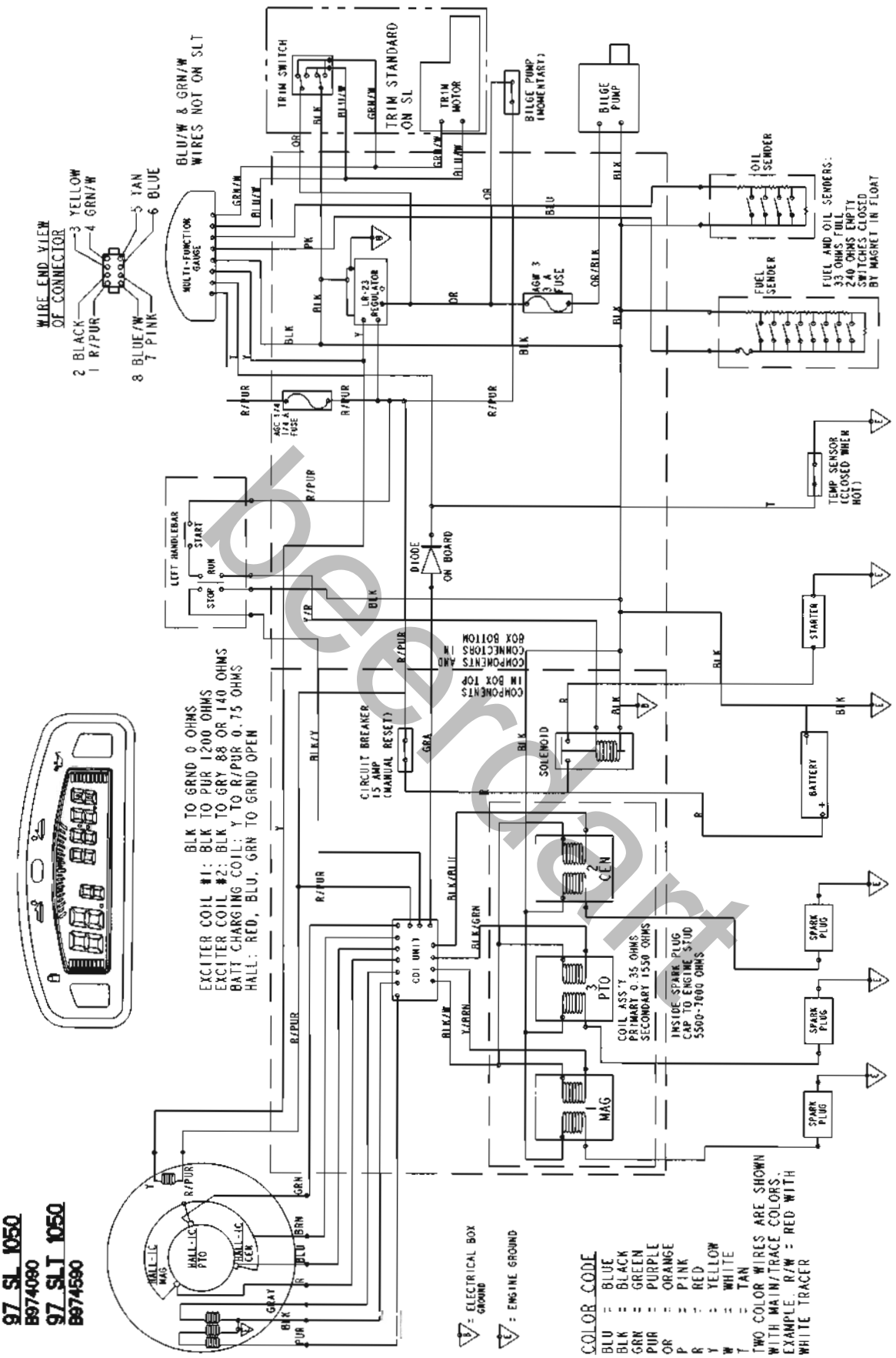


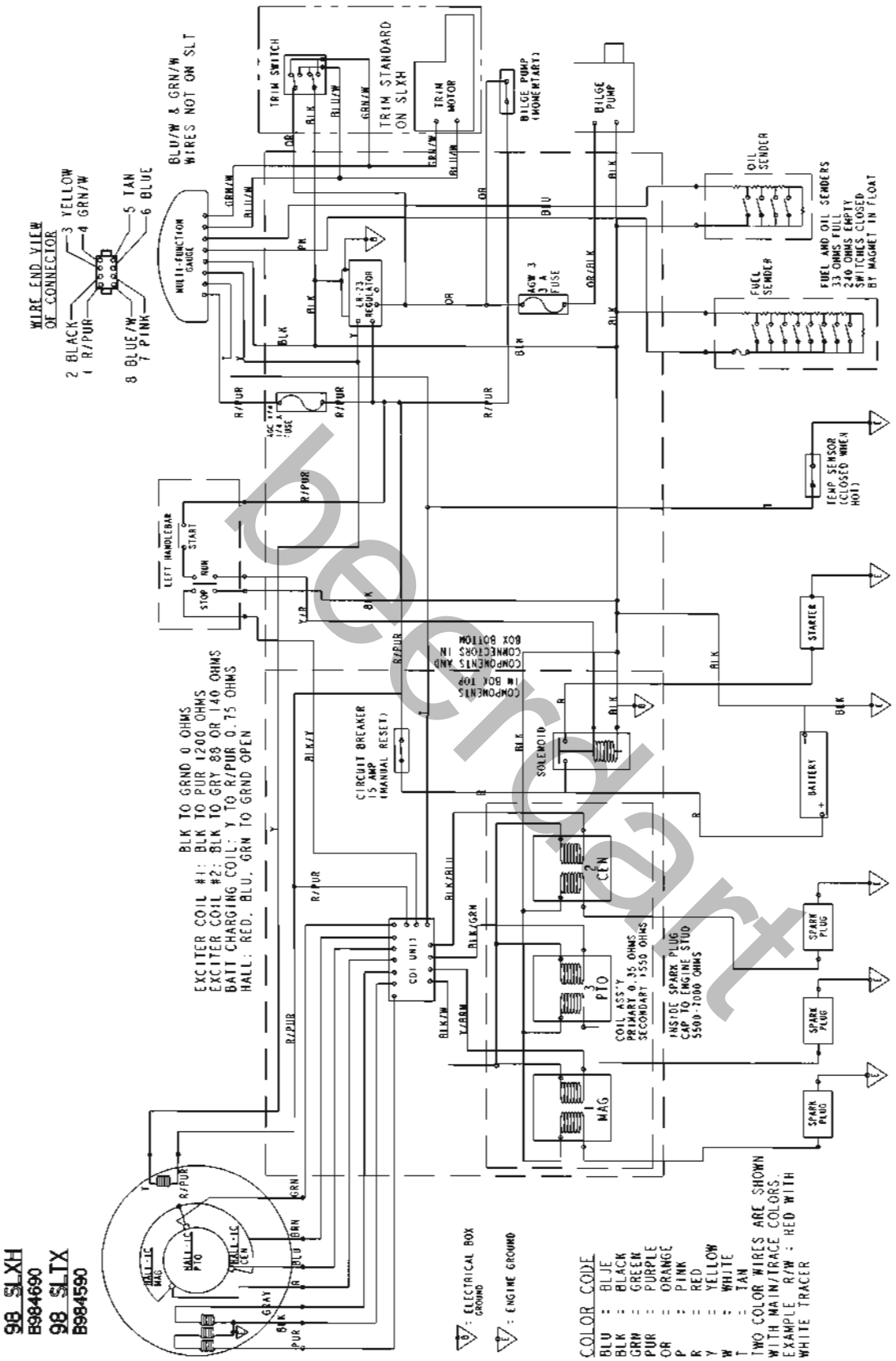


1997 SLT700 / SL700 Dlx Wiring Diagram




WIRE END VIEW OF CONNECTOR
2 BLACK
1 R/PUR
3 YELLOW GRN/W
8 BLU/W
7 PINK
5 TAN
6 BLUE
TRIM SWITCH
TRIM MOTOR
TRIM STANDARD ON SL 780
BILGE PUMP PUSH BUTTON (MOMENTARY)
BILGE PUMP
OIL SENDER
FUEL SENDER
FUEL AND OIL SENDERS: 33 OHMS FULL 240 OHMS EMPTY SWITCHES CLOSED BY MAGNET IN FLOAT
MULTI-FUNCTION GAUGE
LR-23 REGULATOR
AGW 3 3 A FUSE
AGC 1/4 1/4 A FUSE
LEFT HANDLEBAR
START
RUN
STOP
TEMP SENSOR (CLOSED WHEN HOT)
STARTER
BATTERY
SOLENOID
CIRCUIT BREAKER 15 AMP (MANUAL RESET)
COMPONENTS IN BOX TOP
COMPONENTS AND CONNECTORS IN BOX BOTTOM
CDI UNIT
SPARK PLUG
SPARK PLUG CAP 5000 OHMS
STATOR
STATOR COILS | RESISTANCE ±10%
RED/PURPLE TO YELLOW | .6 OHMS
RED/PURPLE TO BLACK | OPEN
WHITE/YELLOW TO BLACK | 220 OHMS
BLUE/RED TO RED/WHITE | 90 OHMS
RED/WHITE TO BLACK | OPEN
RED/WHITE TO GREEN/RED | 490 OHMS
IGNITION COIL, EACH
BLACK TO BLACK/WHITE | .6 OHMS
BLACK TO SECONDARY LEAD | 3.3 K OHMS
= ENGINE GROUND
= ELECTRICAL BOX GROUND
COLOR CODE
BLU = BLUE
BLK = BLACK
GRN = GREEN
PUR = PURPLE
OR = ORANGE
P = PINK
R = RED
Y = YELLOW
W = WHITE
T = TAN
TWO COLOR WIRES ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE: R/W = RED WITH WHITE TRACER


97 SL 1050
B974080
97 SLT 1050
B974590
WIRE END VIEW OF CONNECTOR
2 BLACK
1 R/PUR
3 YELLOW
4 GRN/W
8 BLUE/W
7 PINK
5 TAN
6 BLUE
BLU/W & GRN/W WIRES NOT ON SLT
MULTI-FUNCTION GAUGE
TRIM SWITCH
TRIM STANDARD ON SL
TRIM MOTOR
BILGE PUMP (MOMENTARY)
BILGE PUMP
OIL SENDER
FUEL SENDER
FUEL AND OIL SENDERS: 33 OHMS FULL 240 OHMS EMPTY SWITCHES CLOSED BY MAGNET IN FLOAT
LR-23 REGULATOR
AGC# 3 3 A FUSE
AGC 1/4 1/4 A FUSE
TEMP SENSOR (CLOSED WHEN HOT)
LEFT HANDLEBAR
START
RUN
STOP
DIODE ON BOARD
STARTER
BATTERY
SOLENOID
CIRCUIT BREAKER 15 AMP (MANUAL RESET)
COMPONENTS IN BOX TOP AND COMPONENTS IN BOX BOTTOM
CDI UNIT
SPARK PLUG
CEN
PTO
MAG
HALL-IC MAG
HALL-IC PTO
HALL-IC CEN
EXCITER COIL #1: BLK TO GRND 0 OHMS
EXCITER COIL #2: BLK TO GRY 88 OR 140 OHMS
BATT CHARGING COIL: Y TO R/PUR 0.75 OHMS
HALL: RED, BLU, GRN TO GRND OPEN
COIL ASS'Y PRIMARY 0.35 OHMS SECONDARY 1550 OHMS
INSIDE SPARK PLUG CAP TO ENGINE STUD 5500-7600 OHMS
= ELECTRICAL BOX GROUND
= ENGINE GROUND
COLOR CODE
BLU = BLUE
BLK = BLACK
GRN = GREEN
PUR = PURPLE
OR = ORANGE
P = PINK
R = RED
Y = YELLOW
W = WHITE
T = TAN
TWO COLOR WIRES ARE SHOWN WITH MAIN/TRACE COLORS. EXAMPLE: R/W = RED WITH WHITE TRACER



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POLARIS
INDUSTRIES Inc.

1997 - 1998
SERVICE MANUAL SUPPLEMENT
for
SLX Pro785

Foreword

This supplementary service manual has been produced to aid Polaris technicians in properly maintaining and repairing the Pr0785 which incorporates many new features not seen on previous models.

Please refer to the 1992 -1998 PWC MRM for information that is not covered in this publication.

This manual is designed primarily for use by Polaris personal watercraft service technicians in a properly equipped shop. Persons using this manual should have a sound knowledge of mechanical theory, tool use, and shop procedures in order to perform the work safely and correctly. The technician should read the text and be familiar with service procedures before starting the work. Certain procedures require the use of special tools. Use only the proper tools, as specified. Cleanliness of parts and tools as well as the work area is of primary importance.

Care is taken to ensure that all information in this manual was technically correct at the time of publication. However, all materials and specifications are subject to change without notice.

Comments or suggestions about this manual may be directed to: Engineering Services, Technical Writer, Polaris Industries Inc., 1225 Highway 169 North, Minneapolis, **MN** 55441.

Technical Training Center

Minneapolis, MN 55441

1998 SLX Pro785 Personal Watercraft Service Manual Supplement

Printed in U.S.A.

CHAPTER 1
GENERAL INFORMATION

Watercraft Publication Part Numbers

Year	Model	Model No.	Parts Book	Micro-Fiche	Owner's Manual
1997	SLX Pro785	8974978	9914125	9914126	9913923
Year	Model	Model No.	Parts Book	Micro-Fiche	Owner's Manual
1998	SLX Pro785	8984978	9914583	9915125	9914731

Paint Codes

1997 SLX PRO 785	Deck	Hull
Material	Resin Transfer Molding	Hand Laid Fiberglass Composite with Balsa Wood Core
Color	White	Porsche Red
Polaris Part Number	P-133	P136
Repair Procedure	Same as SMC	Same as Fiberglass
1998 SLX PRO 785	Deck	Hull
Material	Resin Transfer Molding	Hand Laid Fiberglass Composite with Balsa Wood Core
Color	White	Porsche Red
Polaris Part Number	P-133	P136
Repair Procedure	Same as SMC	Same as Fiberglass

Bright White Is Ditzler #91473 or PPG 2185

Porsche Red is Ditzler #72060

Red Gelcoat (P-136) is available from Midwest Industrial Coatings. Specify gelcoat when ordering.

Order Polaris uP" Number from Midwest Industrial Coatings (612)-934-8252. Mix as directed.

GENERAL INFORMATION
Model Specifications

Polaris reserves the right to change specifications at any time without incurring obligations.	1997 SLX 785 PRO	1998 SLX 785 PRO
Model Number	B974978	B984978
Dimensions/Materials/Capacities		
Length (inches)	108.5" (276cm.)	108.5" (276cm.)
Width (inches)	45.0" (114cm)	45.0" (114cm)
Height (inches)	39.5" (100.33cm)	39.5" (100.33cm)
Dry Weight (lbs.)	480lbs.	480lbs.
Rider Capacity	(1) 400lbs. (182kg)	(1) 400lbs. (182kg)
Rated Fuel Capacity including reserve	9.8 gal. (37.09L)	9.8 gal. (37.09L)
Fuel Reserve	N/A	N/A
Oil Reservoir Capacity (U.S. quarts)	3.5 (3.31L)	3.5 (3.31L)
Hull Material	Hand Laid Fiberglass With Balsa Wood Core	Hand Laid Fiberglass With Balsa Wood Core
Deck Material	Resin Transfer Molding(RTM)	Resin Transfer Moldlng(RTM)
Full Throttle Cruising Range (Approx)	Approx. 40 miles (64.4km)	Approx. 40 miles (64.4km)
Side Rail Material	PVC	PVC
Front Bumper Material	TPO	TPO
Engine/Cooling		
Engine Model No.	EC78ZPWE01	EC78ZPWE01
Engine Displacement	779 cc	779 cc
Engine Type (# Of Cylinders)	3 Cylinder	3 Cylinder
Bore & Stroke	69.705 x 68	69.705 x 68
Compression Ratio (Full Stroke)	11.8 : 1	12.3 : 1
Horsepower	135 @ 7500	135 @ 7250
Cooling System	Water Cooled	Water Cooled
Thermostat Open	140° F (60° C)	N/A
Overheat Warning	Light (MFD) (On @ 160° F) Limits RPM to 4200	Light (MFD) (On @ 160° F) Limits RPM to 4200
Low Oil Warning	light (MFD)	Light (MFO)
Induction Type	Case Reed	Case Reed
LUbrication	Oil Injected	Oil Injected
Oil Type	Polaris TC-W3	Polaris TC-W3
RPM Limiter Operation	7800 RPM	7950 RPM
Exhaust Valve(s)	CDI controlled Servo Motor/Cable Actuated	CDI controlled Servo Motor/Cable Actuated
Carburetion		
Carburetors (Mikuni)	3-44mm Super BN	3-44mm Super BN
Fuel Type.	91 Octane (minimum)	91 Octane (minimum)
Idle Speed (In Water)	1350± 50 rpm	1350 ± 50 rpm
Electrical		
Magneto Generator Output	10A 120 Watt @ 4500 RPM	10A 120 Watt @ 4500 RPM
Ignition System	Digital/Sequential COl	Digital /Sequential COl
Spark Plug Type	BR9ES	BR9ES
Spark Plug Gap (inches)	*0.7mmlO.028"*	0.7mm/0.028"
Timing Degrees BTDC	32° @ 3000 rpm	36° @ 3000 rpm 12° @ 7500 rpm
Battery	YB14A-A2	YB14A-A2
Starting System	Electric	Electric
Fuse	15 Amp Manual Resettable Circuit Breaker	15 Amp Manual Resettable Circuit Breaker
Propulsion		
Jet Pump Type	Axial Flow; Single Stage; Polaris	Axial Flow; Single Stage; Polaris
Impeller Rolation (viewed from rear)	Counter Clockwise	Counter Clockwise
Coupling Type	Steel	Steel
Bilge Pump Type	Electric Bilge Pump + 1 siphon line	Electric Bilge Pump + 1 siphon line
Minimum Water Level For Jet Pump.	2 Feet (60cm)	2 Feet (60cm)
Steering Nozzle Pivoting Angle	30°	300
Impeller Type	3 blade swirl	3 blade stainless
Impeller Diameter	5.78" (14.8cm)	5.78" (14.8cm)
Reverse System	N/A	N/A

*Multi-Function Display includes: Speedometer, Peak Speed, Peak RPM, Tachometer, Clock, Hour Meter, Oil Level, Trip Meter, Low 011 Warning, Fuel Level, Volts, Low Fuel Warning, Hot Engine Warning

Standard Torque Specifications

The following torque specifications are to be used as a general guideline. Use standard torque values for the appropriate size fastener when torque values are not specified. **Always consult the specific manual section for torque values of fasteners and use of locking agent.**

RECOMMENDED TORQUE SPECIFICATION STAINLESS STEEL FASTENERS (SAE)		
Bolt Size	**Threads/Inch**	**Torque**
8	18 & 32	28 in. lbs.
10	24 & 32	40 in. lbs.
1/4	20 & 28	8 ft. lbs.
5/16	18 & 24	14 ft. lbs.
3/8	16	25 ft. lbs.
3/8	24	28 ft. lbs.
7/16	14	40 ft. lbs.
1/2	13	58 ft. lbs.
1/2	20	70 ft. lbs.

RECOMMENDED TORQUE SPECIFICATION STAINLESS STEEL FASTENERS (METRIC)	
Bolt Size	**Torque**
5mm	45-52 in. lbs.
6mm	66-78 in. lbs.
8mm	13-16 ft. lbs.
10mm	26-30 ft. lbs.
12mm	40-44 ft. lbs.

- To convert in. lbs. to ft. lbs. divide by 12
- To convert ft. lbs. to kg-m multiply foot pounds by .138.
  To convert kg-m to Nm move the decimal to the right one position.

CHAPTER 2
MAINTENANCE/TUNE UP

Periodic Maintenance Schedule

NOTE: Maintenance intervals are based upon average operating conditions. Watercraft operated in saltwater require daily corrosion protection and engine flushing, and more frequent maintenance and lubrication.

DESCRIPTION Refer to 1992-1997 PWC Repair Manual Except Where a Specific Page Number is Listed	Pre-ride Daily	Pre-season	1 Mo./ 25 Hrs	3 Mo./ 50 Hrs	6 Mo./ 100 Hrs	Tune Up Item
ENGINE						
Engine corrosion protection/fogging (daily-salt water) Pg. 2.10	L**	L	L			
Cooling system flushing (daily after use in salt water) Pg. 2.9	I**	I				•
Engine mounts		I			I	•
Thermostat/popoff valve assembly / spring		I/C	I/C*			•
Spark plugs / Compression test		I/R		I	I/R	•
Engine fastener re-torque (cylinder head & exhaust) Pg. 2.5		I	I			•
Exhaust valve clean & adjust Pg 2.7 & 2.8			I			•
FUEL SYSTEM						
Fuel/water separator (drain water)	I/C	I/C				•
Oil filter		R	I			•
Throttle and choke cables	I	I/L/A		L		•
Carburetor (see engine fogging procedure) synchronize		A/C			A	•
Fuel lines, oil lines, related hose clamps		I		I		•
Vent system (oil and fuel) check-valves; hose routing		I				•
Fuel system pressure/vacuum test		I				
Air intake silencer/water separator drain line(s)		I/C				•
JET PUMP						
Drive shaft coupler and bearing housing		I/L	I/L*		I/L*	•
Drive shaft shroud condition		I	I			•
Bilge system pick-up screens and hoses	I/C	I/C				•
Cooling water inlet screen / hoses, clamps	I/C	I/C				•
Jet pump intake grate fasteners and condition		I		I		•
Impeller condition and impeller clearance		I			I	•
Pump Sacrificial Anode		I		I		•
ELECTRICAL						
Battery condition, fluid level	I	I				•
Battery vent hose condition/routing (must be clear)		I		I		•
Battery and starter cables (clean connections / tight)		I		I		•
Engine overheat warning/electrical connections		I			I	
Oil level warning system test		I			I	
Lanyard cord/engine stop switch	I	I				•
HULL / DECK / STEERING / CONTROLS						
Steering support hub bushings/fasteners/handgrips		I/L			I/L	•
Steering cable		I/L/A		I/L		•
Handlebar/steering operation (turns fully/freely/fasteners)	I	I				•
Hull, clean and inspect for cracks, damage, or leaks	I	C/I				
Drain Plug Condition	I	I				•
Seat and compartment seals (condition of seal)		I/A	I/A			•
Fire extinguisher		I			I	•
Inspect and tighten *all* fasteners, including carburetor mounts engine mounts, exhaust system, all hose clamps; inspect muffler, battery, oil and fuel tank fastening devices, pump(1), steering fasteners		I	I			•

* Perform every 15 hrs. or one month when operated in salt water. **Perform daily when operated in salt water.

KEY

I=Inspect, adjust, service, or replace if necessary A=Adjust C=Clean R=Replace item
L=Lubricate with recommended lubricant

MAINTENANCE/TUNE UP
Recommended Lubricants

As with all watercraft, proper lubrication and corrosion protection are necessary to maintain performance and ensure years of trouble free service. Use the recommended lubricant for each component as indicated in the chart below.

Product	Application
Polaris Premium All Season Grease	-Driveshaft coupler splines -Driveshaft impeller splines -Steering post bushings -Driveshaft bearing housing -Steering cable ends -Pump to hull a-ring -Carburetor shafts, springs -Seat latch and hooks
Dielectric Grease	-All electrical connections and connectors -Battery cable bolts -Engine ground connection at mount plate. reed cage, etc.
Marine Grade Silicone Sealant (PN 8560054)	-Pump inlet scoop -Pump mating surfaces -Ride plate -Area where cables pass through hull, -All underwater areas,
Cable Lube	-Throttle, choke, and steering inner cables -Ends of throttle and choke cable
T-9 Metal protectant	-All external metal parts (For internal engine protection use Polaris fogging oil)

Part Number	Maintenance Products
8560054	Marine Grade Silicone Sealant (14 oz.)
2870652	Fuel Stabilizer (16 oz.)
2871557	Crankcase Sealant 3 Bond 1215
2871066	Premium Marine Grease 14 oz. tube
2871423	All Season Grease 14 oz. tube
2871322	All Season Grease 3 oz. tube
2871326	Premium Carbon Clean Fuel Treatment
2871044	Corrosion Resistant Dielectric Grease
2870587	515 Gasket Eliminator
2870791	Engine Fogging Oil (Aerosol Spray)
2871517	Liquid (non-aerosol) fogging oil for use with kit 2871480
2871518	Liquid (non-aerosol) fogging oil for use with kit 2871480
2871064	T-9 Metal Protectant
2870510	Polaris Cable Lube
2871460	Starter Drive Grease

Drive Shaft Lubrication (The SLX Pro785 Uses a Solid Coupler)

WARNING

The plastic driveshaft shroud is designed to protect you from dangerous moving parts. It must be rotated out of the way to lubricate the driveshaft coupler. Follow the instructions below in order to avoid personal injury.

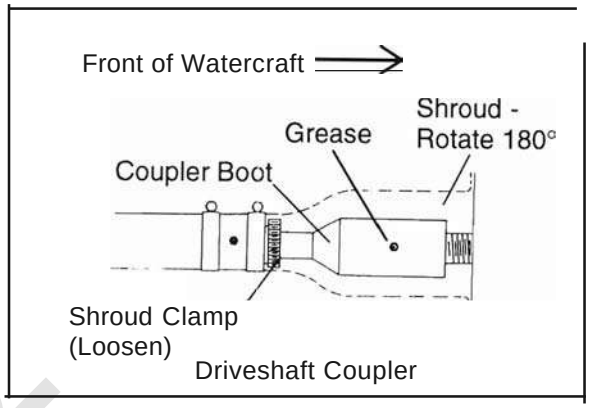
CAUTION:

Grease drive shaft coupler and bearing housing anytime water in the craft has been at or above the coupler level to avoid damage to these parts. Lubrication after every 25 hours of operation is also recommended.

Remove lanyard cord and lock plate from engine stop switch.

Remove seat. Remove battery ground (negative) cable.

Loosen clamp holding plastic driveshaft shroud in place and rotate shroud 180°.



All Season Grease (3oz.) PN 2871322

Needle Point Adaptor PN 2871174

Turn driveshaft coupler until grease fitting is accessible. Using a grease gun with a needle point, lubricate coupler at grease fitting until coupler boot just begins to expand.

Reposition driveshaft shroud (open side down) and torque clamp screw.

Driveshaft Shroud Clamp Screw Torque

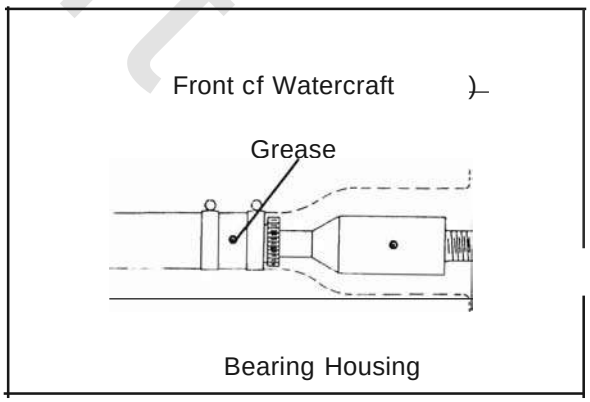
20-25 in. lbs. (.23-.29 kg-m)

Reconnect battery ground (negative) cable.

Reinstall seat.

Bearing Housing

Using a grease gun with a needle tip lubricate bearing housing at grease fitting until grease purges past seals.



MAINTENANCE/TUNE UP

Ignition Timing Specifications

Model	Ignition Timing		
	Degrees BTDC	Inches	MM
1997 SLX 785 PRO	*32° @* 3000 rpm	0.255" BTDC	6.47mm BTDC
	14° @ 7500 rpm	0.050" BTDC	1.28mm BTDC
Model	Degrees BTDC	Inches	MM
1998 SLX 785 PRO	*36° @* 3000 rpm	0.318" BTDC	8.08mm BTDC
	12° @ 7500 rpm	0.0371" BTDC	0.943mm BTDC

EC78ZPWE01-125mm Rod, 68mm Stroke Degrees to Piston Position - BTDC

Degree BTDC	(mmlinch)	Degree BTDC	(mm/Inch)
10	0.656mm *I 0.025"*	25	4.014mm *I 0.158"*
11	0.793mm *10.031"*	26	4.332mm *I 0.170"*
12	0.943mm *I 0.037"*	27	4.662mm *I 0.183"*
13	1.105mm *10.043"*	28	5.00mm *I 0.196"*
14	1.280mm *I 0.050"*	29	5.354mm *I 0.210"*
15	1.468mm *I 0.057"*	30	5.716mm *I 0.225"*
16	1.668mm *I 0.065"*	31	6.088mm *I 0.239"*
17	1.881 mm *I 0.074"*	32	6.471mm *I 0.254"*
18	2.106mm *I 0.082"*	33	6.864mm *I 0.270"*
19	2.343mm *I 0.092"*	34	7.267mm *I 0.286"*
20	2.592mm *I* 0.102"	35	7.679mm *I 0.302"*
21	2.853mm *I 0.112"*	36	8.08mm *I 0.318"*
22	3.126mm *I 0.123"*	37	8.51mm *I 0.335"*
23	3.41 Omm *I 0.134"*	38	8.94mm *I 0.352"*
24	3.706mm *I 0.145"*	39	9.37mm *I 0.370"*

Spark Plugs

Disconnect high tension leads and remove spark plugs.

Inspect electrodes for wear, carbon buildup, or fouling (wet oily residue). Replace plugs if edges of electrodes are rounded or eroded.

CAUTION:

Severe engine damage may occur if the incorrect spark plug is used.

Clean with electrical contact cleaner or a glass bead spark plug cleaner only. A wire brush or coated abrasive should not be used.

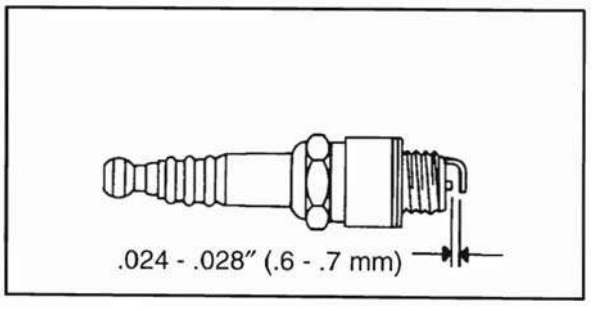
Measure gap with a wire gauge. Recommended spark plug gap is .024 - .028" (.6 - .7 mm) Adjust if necessary by bending the side electrode carefully.

Coat spark plug threads with a small amount of anti-seize compound.

Install spark plug and torque to specifications.

Make sure spark plug caps are screwed completely onto end of plug wire.

Apply a small amount of dielectric grease to inside of plug caps and install.



Spark Plug Gap: .024 - .028" (.6-.7 mm)

Torque:
11 ft. lbs. (1.52 kg-m)
Recommended Spark Plug: BR9ES

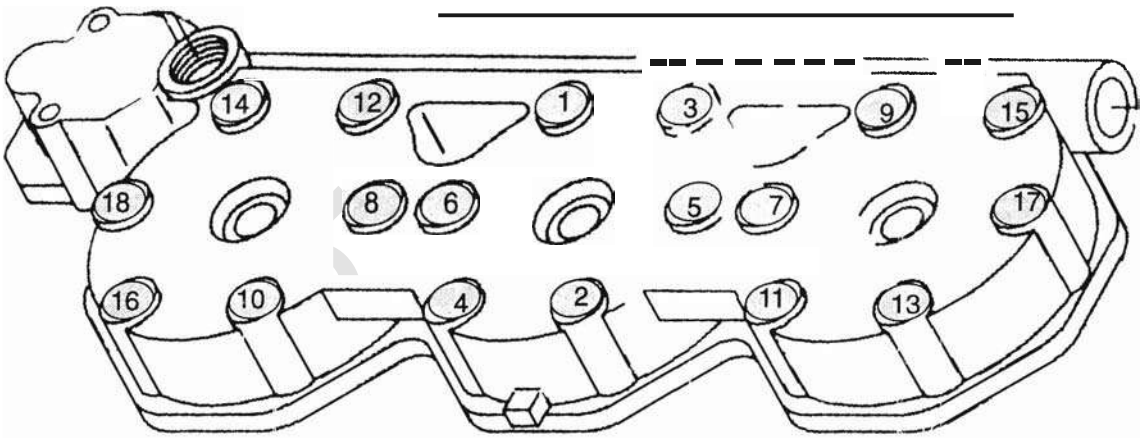
Corrosion Resistant Dielectric Grease

PN 2871027

Cylinder Head

With engine at room temperature (68° F or 20° C), re-torque cylinder heads in a criss-cross pattern

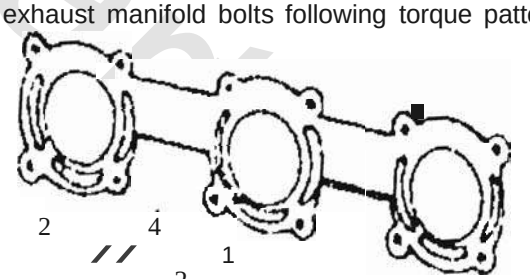
Cylinder Head Torque
18 ft. **lbs.(2.49 kg-m)**

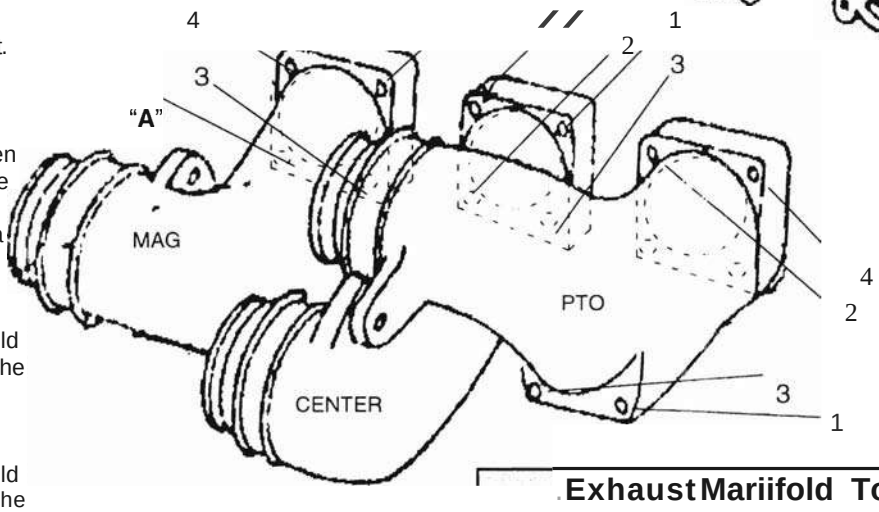


1. Torque the head in 3 steps following the sequence marked on the illustration.
2. 1st @ 1/2 torque (9 ft. lbs)
3. 2nd @ 3/4 torque (13.5ft.lbs)
4. Last @ full torque (18 ft. lbs)

Exhaust Manifold

With engine at room temperature (68° F or 20° C), re-torque exhaust manifold bolts following torque pattern shown. The exhaust manifold bolts have shallow bolt heads and a 6 point box end wrench should be used on all bolts except for the bolt marked "A". A 12 point box end wrench is needed for this bolt for access. (The 1998 SLX Pro 785 utilizes Allen bolts for improved access.)





1. Install the MAG Exhaust manifold 1st. The bottom left mounting hole is slotted, install this bolt first and tighten and then install the other 3 bolts and torque to specification (13-16 ft. lbs)
2. Install the CEN exhaust manifold. Torque the manifold to 13-16 ft. lbs in the sequence shown.
3. Install the PTO exhaust manifold. Torque the manifold to 13-16 lt. lbs in the sequence shown.

Exhaust Mariifold Torque
13-16 ft. lbs

MAINTENANCE/TUNE UP
Engine

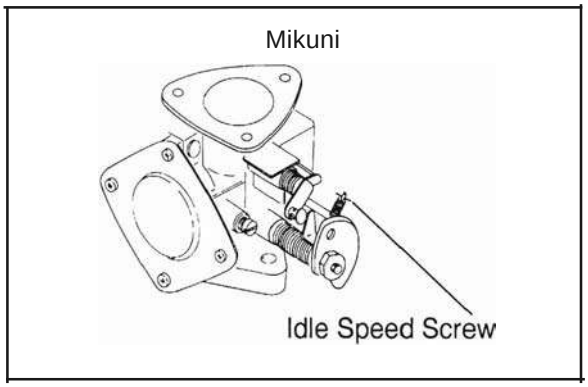
Idle Speed

Connect a tachometer according to the manufacturer's instructions.

With craft in the water or test tank, start engine and let it idle.

Adjust idle speed to specifications by turning the idle speed screw in (clockwise) to increase or out (counterclockwise) to decrease idle speed.

Check throttle cable free play and adjust if necessary.



Idle Speed - In Water
1350 ± 50 RPM

Oil Pump Adjustment

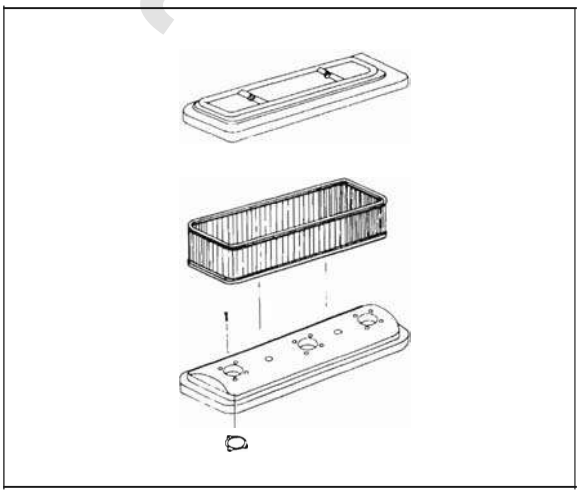
The oil pump on this model is non-adjustable. No periodic maintenance or adjustment is required.

Carb Air Intake

Remove air intake. Cover carburetors with a clean shop towel to prevent foreign material from entering.

Clean element with high flash point solvent, followed by hot soapy water.

Rinse in clear water and dry thoroughly using low pressure air.



CAUTION:

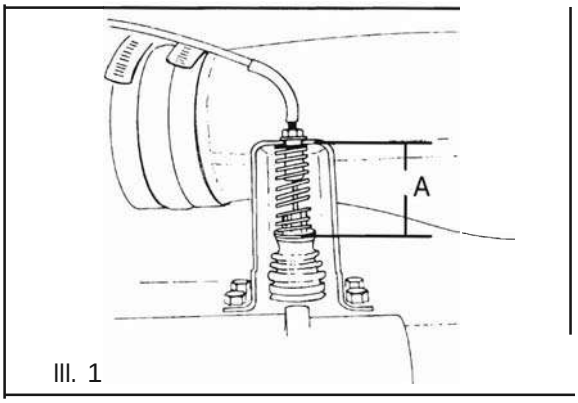
Wear safety glasses when using compressed air to avoid injury to eyes.

Inspect air intake base fasteners to ensure they are tight and the locktabs are secure.

Reinstall air intake and tighten bolts securely. (9.5 fUbs /1.31 kg-m)

Adjustment

The correct position of the exhaust valves is 1/4 turn above seated.



Ill. 1

1. Ensure that each exhaust valve is fully closed.
   A. Lift each exhaust valve up (one at a time) about 1/8" - *3/16"* and release. Do not lift the valve above 3/16" or the bellows may restrict free movement.
   S. Upon releasing the exhaust valve should make an audible "click" indicating contact of the valve against the seat.

NOTE: If you do not hear an audible "click", first check for adequate cable free-play. Loosen the adjustment lock nuts and turn cable adjust cable length until an audible click is heard. If free-play is adequate but no click can be heard, clean the exhaust port and valve to remove any carbon deposits.

   C. Adjust cable out until freeplay is removed from cable, but an audible click can still be heard when repeating Step A and S.

   D. Turn the adjuster out *1/4* turn from the point found in Step C (raise the exhaust valve) and tighten the lock nut securely.

Exhaust Valve Operation

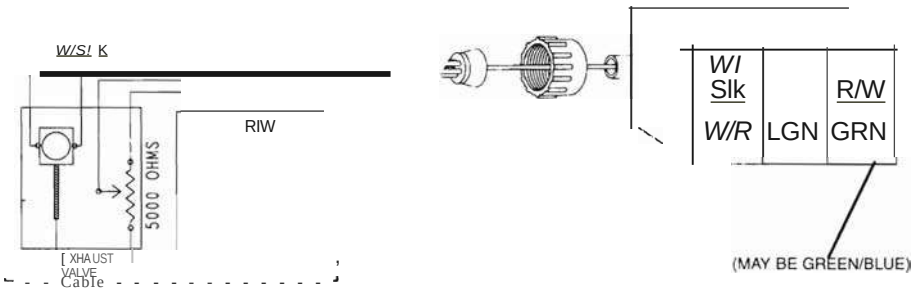
To check the operation of the valves:

1. Disconnect the multi-pin connector at the exhaust valve actuator box.
2. Using a 12 volt shop battery, probe the terminals as listed in the chart below to open and close the valves.

CAUTION: Do not leave battery connected to the exhaust valve actuator wire terminals. Contact the terminals momentarily to move the valves in the desired direction, and then disconnect the probes.

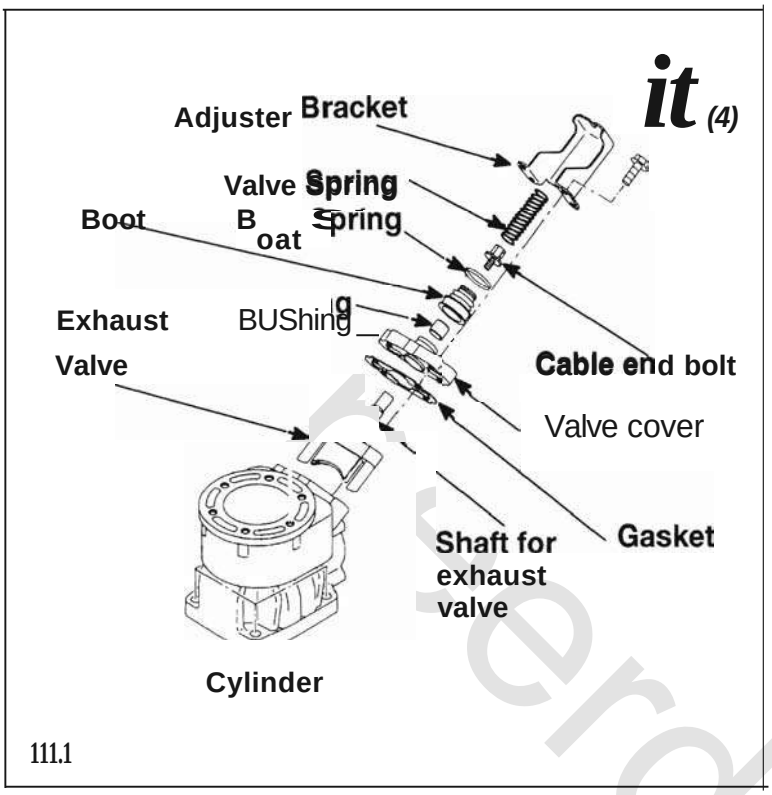
3. Verify the exhaust valves open and close completely.
4. Re-connect the multi-pin connector.

(Mounted on left rear of deck with grab handle bolts)
EXHAUST VALVE ACTUATOR CONTROL BOX

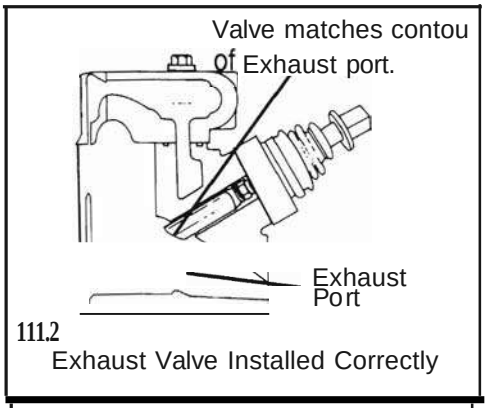


	Battery +	Battery -	Effect
Wire Color	W/R	W/Blk	Opens Valve
(terminal)	W/Blk	W/R	Closes Valve

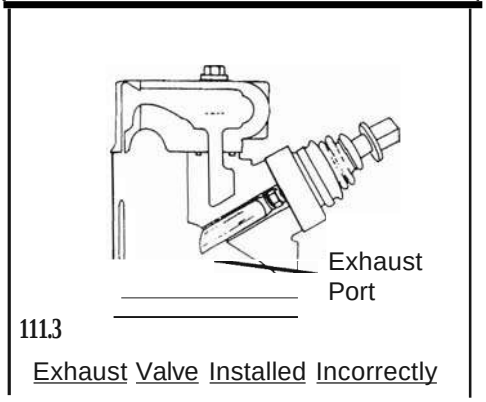
MAINTENANCE/TUNE UP
Exhaust Valve Cleaning Procedure



111.1



111.2
Exhaust Valve Installed Correctly



111.3
Exhaust Valve Installed Incorrectly

The exhaust valves should be inspected and/or cleaned periodically (every 25 hrs.) to ensure optimum valve functioning.

1 Loosen exhaust valve cable adjuster nuts,.pull spring upward and disconnect cable from cable end bolt.

2. Remove the 4 bolts for the adjuster bracket and the valve cover.

3. Remove exhaust valve assembly from cylinder.

4. Visually inspect the exhaust valve bore within the cylinder. Small carbon deposits can be removed from exhaust valve bore with a soft scraping tool. The piston should be positioned at TDC to prevent carbon from entering the engine.

5. Cover the exhaust valve opening with a shop rag to prevent debris from entering the cylinder.

6. Remove cable end bolt and exhaust valve from valve cover.

7. Remove rubber boot from valve cover.

8. Wash valve assembly with solvent or soft wire brush to remove accumulated oil and carbon. Difficult deposits may be removed by carefully scraping with a piece of wood or similar material. Do not scrape the valve with any hardened material as the valve can be damaged. Slight scratches may be removed with Crocus cloth (do not use coarse abrasives).

9. Inspect the exhaust valve, exhaust valve shaft, cover bushing, rubber boot and spring. Replace any parts that show unusual wear, cracks, distortion, or damage.

10. Clean the exhaust valve gasket surfaces and install a new gasket.

12. The exhaust valve must be installed correctly as shown in 111.2.

13. Assemble the valve assembly in reverse order of disassembly.

14. Adjust the exhaust valves per the instructions on the previous page.

Cooling System Flushing and Salt Water Maintenance

When the watercraft is operated in salt water or water containing impurities like silt, sand, alkali and other particulates, additional care is required to prevent damage and corrosion of the engine. Flush the engine with fresh water immediately after use to neutralize the corrosive effect of salt water or impure water.

CAUTION:

Always follow the recommended flushing procedure below when flushing the watercraft cooling system to avoid engine damage.

Never flush a hot engine. Severe engine damage could result.

Do not flush engine with engine turned off. Water will fill engine and severe engine damage may result.

WARNING

Do not touch any electrical part when the engine is running. Severe personal injury or death could result.

Flushing Procedure

A flush kit must be installed to flush the engine. Follow installation instructions and procedure outlined below.

Flush Kit
PN: 2871193

Remove cap from flush kit coupler on water "in" line.

Connect a water (garden) hose to coupler. *Do not* turn on water tap yet.

Start engine and immediately (within 10 seconds) open water tap.

Run engine at fast idle for one minute. Rev engine intermittently for one minute. Do not run for over three minutes at a time or overheating of drive line components may result. Rinse engine externally with fresh water.

Turn off water tap first, then briefly rev the engine a couple of times (no more than 5 seconds total running time) to purge water from the cooling system, then stop the engine.

Disconnect water hose from coupler and reinstall cap.

Wipe off any water which may have spilled on engine.

Perform corrosion prevention steps and fog engine following procedures on pages 2.10, 2.12.

MAINTENANCE/TUNE UP
External Engine Corrosion Prevention

After flushing the engine for off-season storage or after salt water use, perform the following procedures.

Cleaning

Remove drain plug and clean bilge and engine area with hot water and mild detergent (such as dish soap) or with bilge cleaner. Rinse and drain thoroughly. Wipe up remaining water with clean, dry shop cloths. Do not use abrasive cleaners. Spray all external metal surfaces with T-9 Metal Protectant. Spray all surfaces inside the engine compartment with Silicone Spray or a non-flammable protectant. Do not use WD-40™, LPS™, or other lubricants of this type in the engine compartment. These lubricants may cause damage to the rubber components of the watercraft. Store watercraft with drain plug removed and the seat propped open slightly to inhibit condensation from forming in engine compartment.

Wash exterior of watercraft with fresh water and a mild detergent. Rinse thoroughly.

Inspect and thoroughly clean jet pump intake, outlet, and impeller area.

Inspect entire deck and hull area for damage. Inspect rub rails to be sure they are fastened securely.

T-9 Metal Protectant **For Use On External Metal Surfaces** **PN 2 8 7 1 0 6 4**	**Silicone Spray** **Non-Flammable For Use Inside** the Engine **Compartment** **(Available Commercially)**

CAUTION:

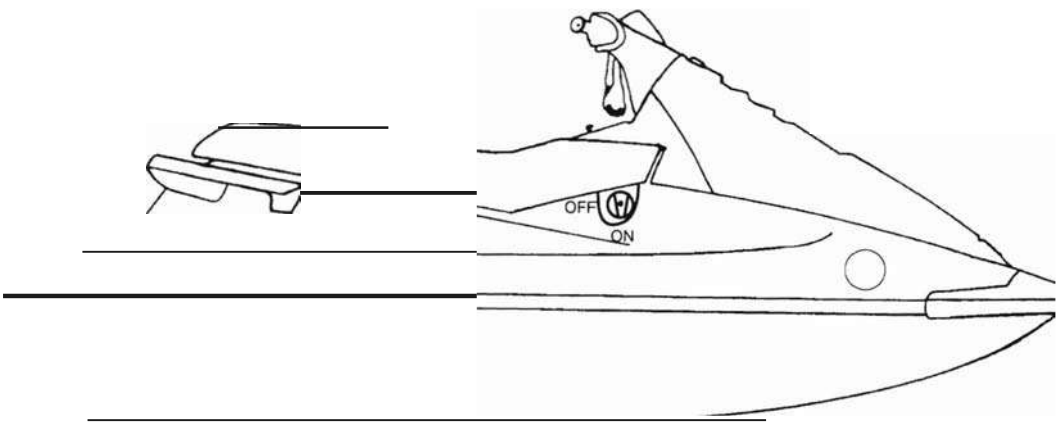
Never clean the watercraft with strong detergents, abrasives, de-greasers, paint thinner, acetone, window cleaners, ammonia or products containing alcohol. They can damage finishes, decals, vinyl, and plastics, and can accelerate UV breakdown which could cause color change and premature deterioration of parts.

After cleaning, protect and shine watercraft using a regular furniture polish or non-abrasive silicone wax. Protect seat and handlebar unit with a vinyl protector.

Cover watercraft with a Polaris cover and store in a clean, dry place. Do not use plastic or coated materials as condensation and corrosion may occur.

Fire Extinguisher

Remove and inspect fire extinguisher condition and state of charge. Replace if necessary.



Off Season Storage Procedures

When the craft will not be operated for periods greater than 30 days, the following maintenance items should be performed:

- Fuel System Storage*
- Flush Engine
- Fog Engine
- Corrosion Protectiol
- Battery Storage *
- Complete Lubrication'
- Cleaning Hull Interior and Exterior *

*Follow the procedures outlined in the 1992-1997 PWC **MRM**

Freezing Temperature Procedure

Follow all Off Season Storage Procedures listed above.

Disconnect the inlet hose at the the water distribution manifold*.

Disconnect the exhaust outlet (stinger) cooling water hose* (located after the ThermoiPop off valve assembly.

Lift the front of the boat to allow any standing water in the exhaust system to drain.

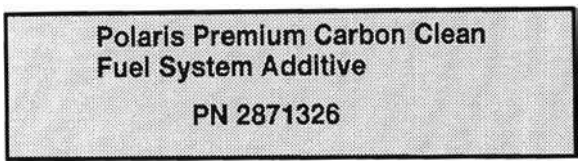
Remove any standing water from the craft.

Reconnect the hoses.

*See Page 4.15 for pictorial description and location of the water distribution manifold and the exhaust outlet (stinger) cooling water hose.

MAINTENANCE/TUNE UP
Fuel System Storage

Top off the fuel tank with fresh fuel and add fuel conditioner/stabilizer. It is recommended that the craft be operated for approximately 10-15 minutes after stabilizing fuel to ensure treated fuel reaches the entire fuel system and all components. Follow the directions on the container for recommended amount to add for long term storage. On models equipped with a fuel/water separator, drain any water present in the bowl before storage.



NOTE: Using a fuel stabilizer and topping off the fuel tank eliminates the need to drain the fuel system.

If you prefer to drain the fuel tank, refer to fuel handling warnings on page 3.1 and use the following procedure:

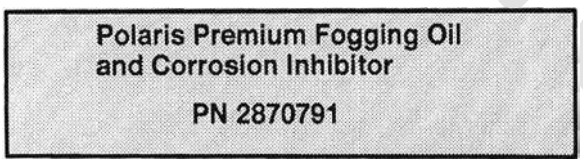
Drain fuel tank with a siphon or pump and inspect fuel/water separator. Drain if necessary.

Leave fuel cap loose to prevent condensation from forming in fuel tank.

Engine Fogging Procedure

CAUTION:

Failure to perform the following preventive maintenance can result in serious engine corrosion during off season storage. In order to prevent rust and corrosion on internal engine parts (i.e. crankshaft, bearings, pistons, rings cylinder walls), Polaris highly recommends the use of Polaris fogging oil as a recommended storage procedure.



When properly applied, fogging oil coats all internal engine parts for prevention of rust and corrosion, which in turn will extend the service life of the engine.

Remove air intake.

Start engine & spray fogging oil into throats of carburetors (alternate evenly between cylinders) for 15 seconds.

Allow engine to cool completely and repeat the procedure.

Adjusting Trim Display for the Multi-Function Display (MFD)

Start engine.

CAUTION:

Never operate the engine for more than 15 seconds while the watercraft is out of the water. Severe engine damage may occur from overheating.

Actuate trim switch to full up or full down position until a ratcheting (clicking sound) is heard at trim motor. The **MFD** will automatically readjust the indicator.

Submerged Engine (Hydrolocked)

CAUTION:

If the engine becomes water-flooded, follow these procedures **immediately.** If water is left in the engine it will cause severe engine damage

Remove watercraft from water.

Remove lock plate from engine stop switch.

Put watercraft onto a flat surface protected by a mat or cardboard; leaving room to roll it.

Remove drain plug to empty water out of bilge, and remove seat.

Remove the High Tension Leads (spark plug wires) and connect them securely to ground with a jumper wire.

Remove spark plugs and tip watercraft *counterclockwise* (to port side) until spark plug holes are just below horizontal.

WARNING

Be sure the spark plug wires are connected securely to ground or severe injury could result.

While holding the watercraft in this position, turn drive shaft by hand to rotate enqine until water has run out.

Depress starter button for one second at a time until no more water exits the spark plug holes.

WARNING

Depressing the starter turns the engine, driveshaft, and pump. Stay clear of all moving parts to avoid severe personal injury.

Turn the watercraft upright.

Install new spark plugs.

Check battery vent hose for obstruction; drain water from hose if present.

Check fuel and oil for the oresence of water and drain if necessary. *Do not* run watercraft if water is present. Verify that no air is present in oil line.

Grease driveshaft and bearing housing. See Lubrication, page 2.3.

Turn fuel valve "On". Pull choke and attempt to start engine. The spark plugs may have to be removed, cleaned, and dried with electrical contact cleaner until the engine starts.

Reinstall drain plug. Reinstall seat.

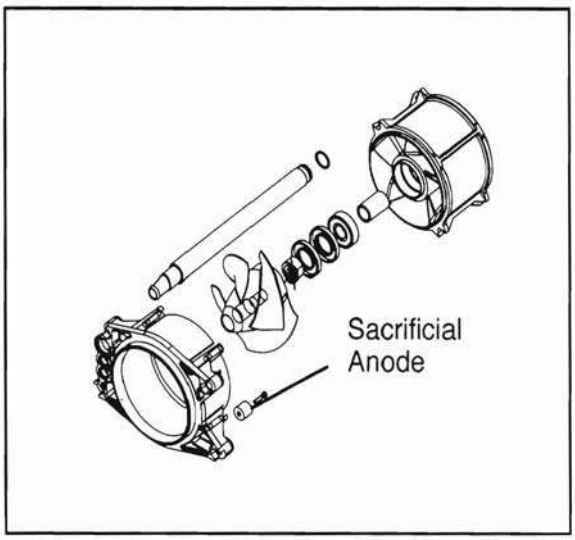
Test ride unit and verify proper operation. Check the fuel/water separator (if applicable) after test ride and remove accumulated water if necessary.

MAINTENANCE/TUNE UP
Hull/Deck

Sacrificial Anode

A zinc sacrificial anode is in place on the pump housing. The purpose of this anode is to prevent corrosion of metal parts due to electrolysis. The mounting surface must be clean and the mounting bolt tight to maintain a good connection between the pump and anode.

1. Periodically inspect anode for excessive wear.
2. Check bolt to be sure it is tight. If the bolt is loose, remove anode and clean mounting surfaces on pump and anode.
3. Apply dielectric grease to bolt threads and contact surfaces.
4. Tighten bolt securely.



Handlebars/Hand Grips

The hand grips are molded onto the handlebars and are not replaceable. If new handgrips are needed it is necessary to replace the handlebars.

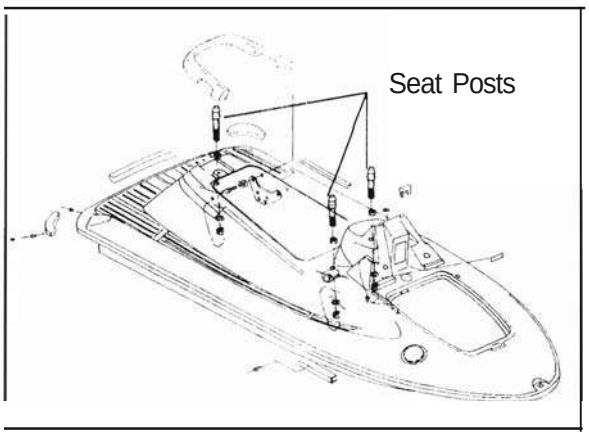
Seat Adjustment

The front seat posts and rear seat latch post must be adjusted properly to maintain enough pressure on the seal and prevent up and down movement of the seat. Install the seat and check for movement in the area of the posts. If adjustment is required, perform the following steps:

1. Remove seat and loosen lock nut on bottom of both front posts.

2. Turn both posts equally with a 3/16" Allen wrench to adjust. Turn clockwise to provide more seal pressure and counterclockwise to reduce pressure (if seat is too tight or new seal installed).

3. Reinstall seat and make sure it latches securely with no up and down movement in post area on either side. If movement is noted on one side or if seat is difficult to latch, adjust that post individually Jntil seat latch functions properly.



Compartment Door Alignment

1. Open storage compartment door and make sure rubber guide bumpers on corners of steering pod and along edges of door are in place and in good condition.

2. Visually check alignment of door along both edges and at top corner of pod. The gap should be equal on both sides.

3. If adjustment is necessary, mark location of hinges with a pencil for reference. Remove storage bucket and loosen two main hinge nuts (inside under top deck) just enough to allow adjustment of door.

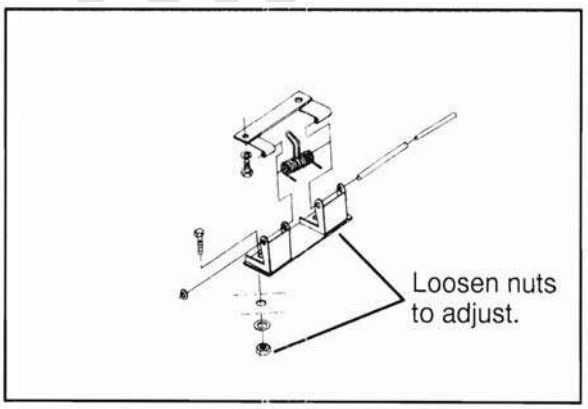
4. Shift door to side of smaller gap until equal on both sides.

5. Hold door in position and tighten nuts.

6. Carefully close door and check alignment.

7. Re-adjust if necessary until door is aligned along both edges.

8. When properly aligned, check to make sure it latches securely and tightly.



CHAPTER 3
FUEL SYSTEM/CARBURETION

1997 SLX PRO 785

Jetting specifications # 1 and #2 listed below perform identically and either can be used.

	Jetting Option 1	Jetting Option 2
Carburetor Type	Mikuni Super BN	Mikuni Super BN
Fuel Requirement	91-93 Octane Only	91-93 Octane Only
Size	44mm	44mm
Main Jet	Mag-180 Center-175 PTO-180	Mag-170 Center-165 PTO-170
Pilot Jet	82.5 (All)	85 (All)
High Speed Screw	0 Turns Out From Lightly Seated	*3/4* Turns Out From Lightly Seated
Low Speed Screw	1 *3/8* From Lightly Seated	*1/2* Turns Out From Lightly Seated
Idle Speed (in water)	1350 ± 50 rpm	1350 ± 50 rpm
Needle & Seat Pop Off Pressure	15-18 PSI.	15-18 PSI.

1998 SLX PRO 785

Carburetor Type	Mikuni Super BN
Fuel Requirement	91-93 Octane Only
Size	44mm
Main Jet	Mag-155 Center-150 PTO-155
Pilot Jet	105
High Speed Screw	0 Turns Out
Low Speed Screw	1 From Lightly Seated
Idle Speed (in water)	1350 ± 50 rpm
Needle & Seat Pop Off Pressure	15-18 PSI.

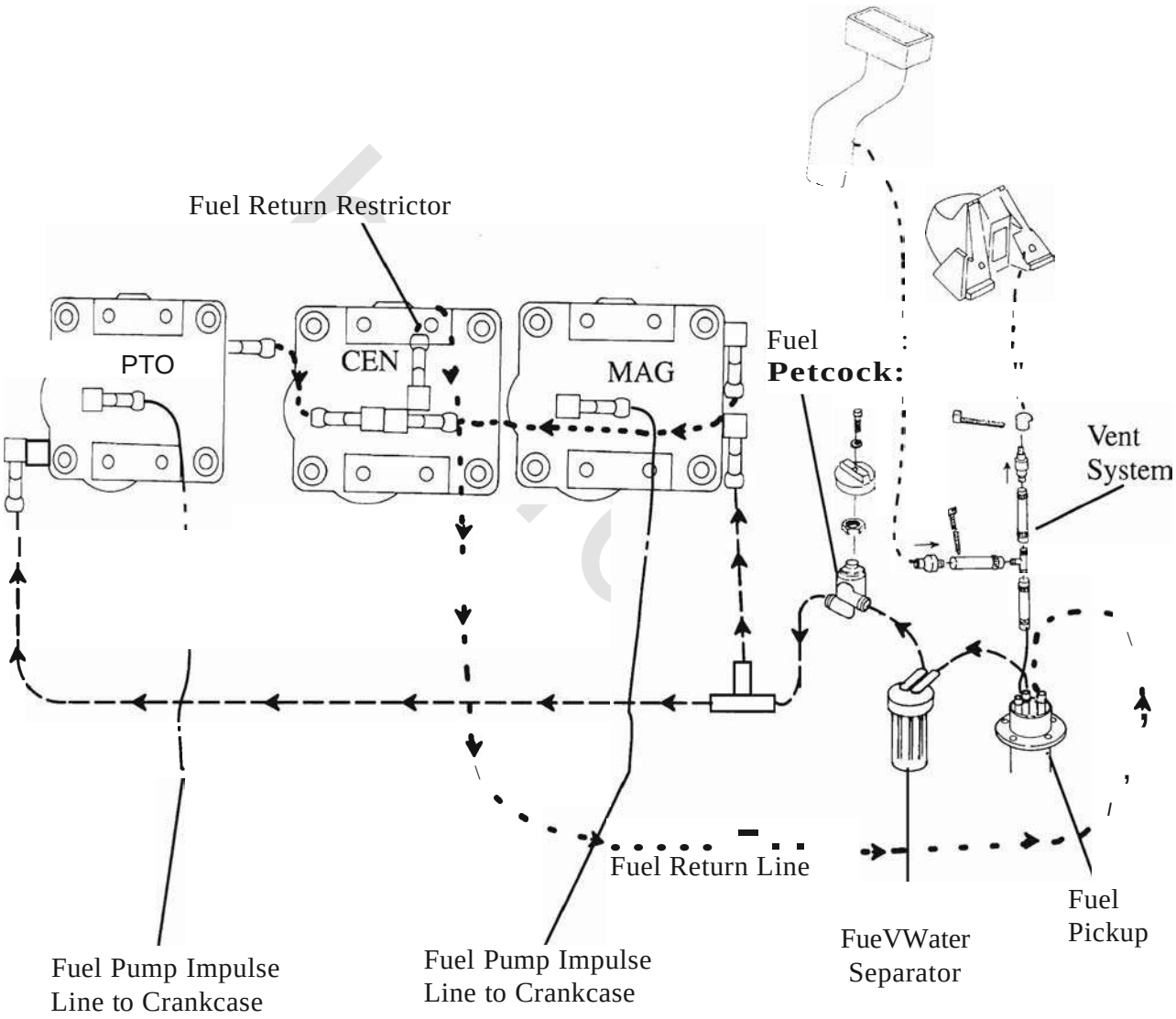
WARNING

GASOLINE IS HIGHLY FLAMMABLE AND EXPLOSIVE UNDER CERTAIN CONDITIONS

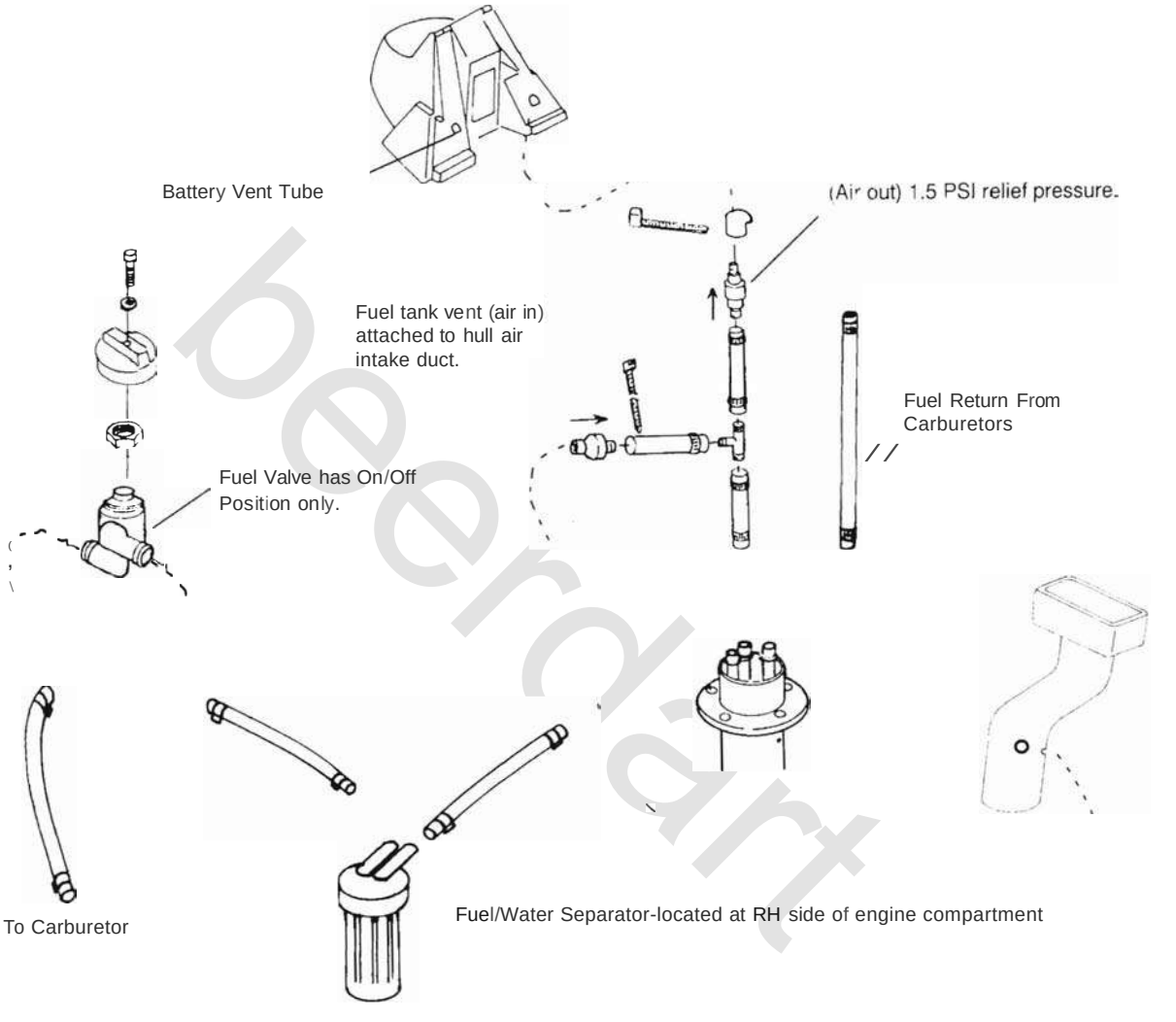
* Always exercise extreme caution whenever handling gasoline.
* Always refuel with the engine stopped and outdoors or in a well-ventilated area.
* Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.
* Do not over fill the tank. (Do not fill the tank neck)
* If you get gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.
* Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.
* Shut off the fuel valve whenever the watercraft is stored or parked.

FUEL SYSTEM/CARBURETION

Fuel Delivery Exploded View

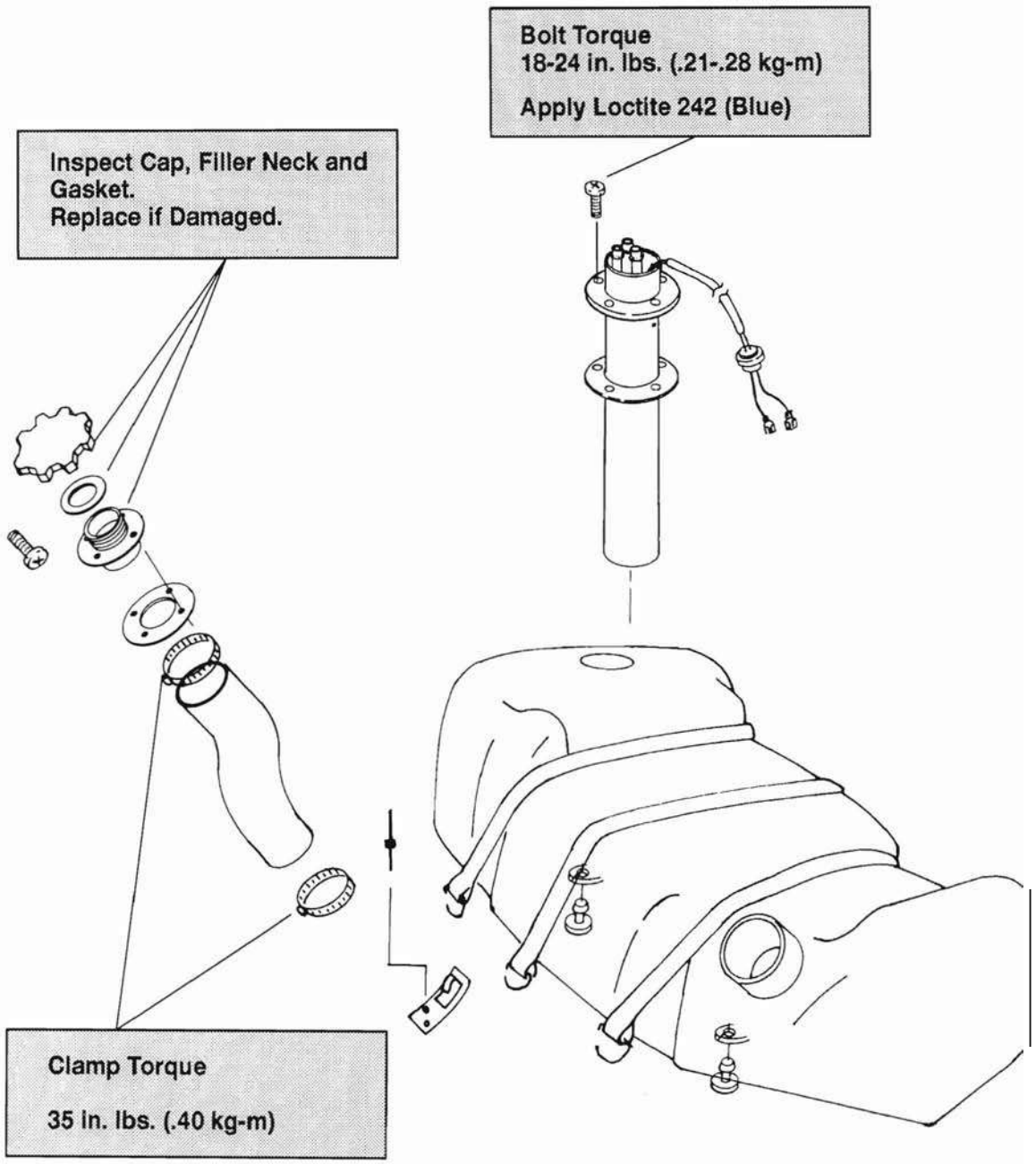


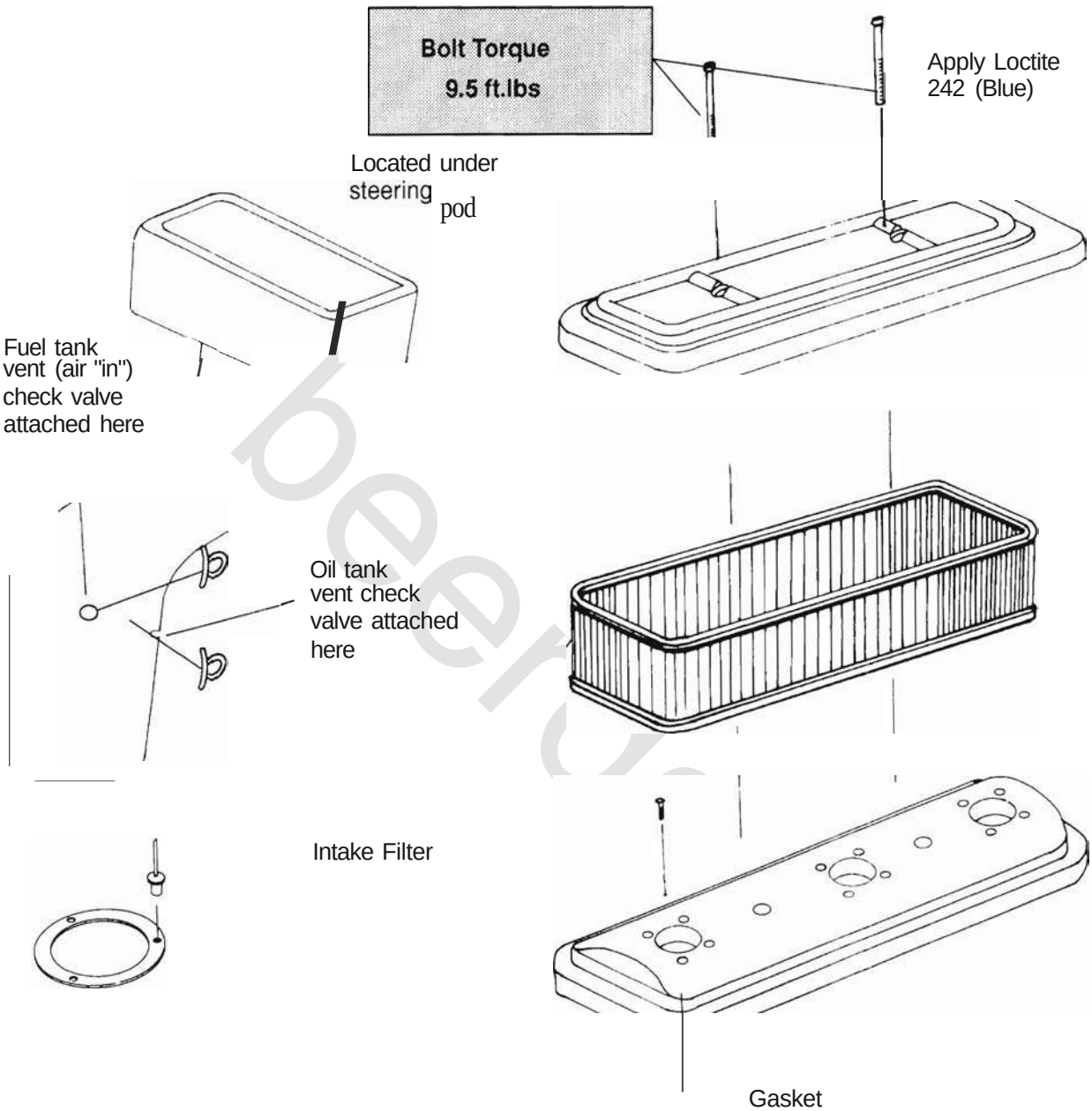
FUEL SYSTEM



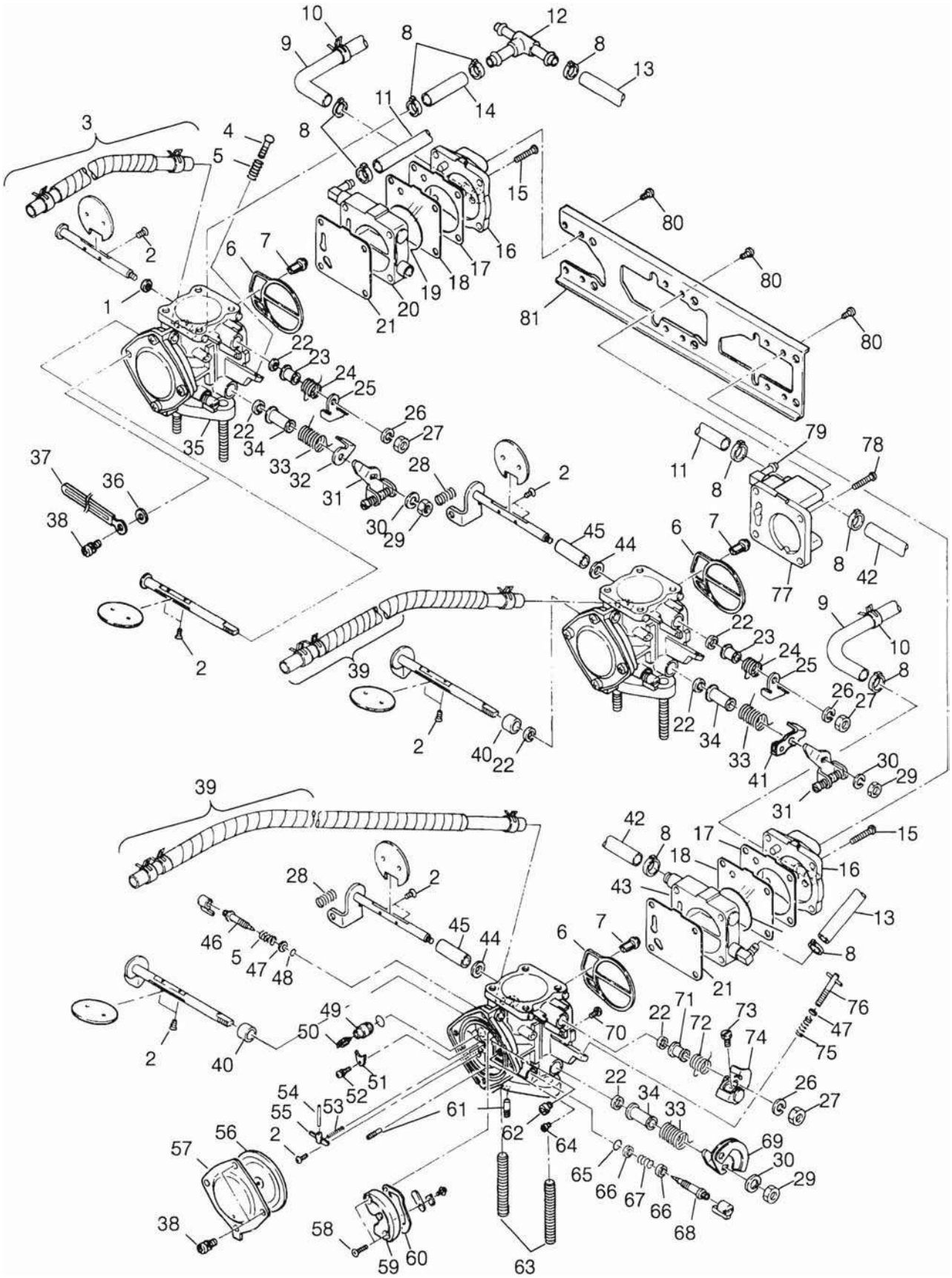
FUEL SYSTEM/CARBURETION

Fuel Tank/Fuel Pickup Exploded View




Bolt Torque
9.5 ft.lbs
Apply Loctite
242 (Blue)
Located under
steering pod
Fuel tank
vent (air "in")
check valve
attached here
Oil tank
vent check
valve attached
here
Intake Filter
Gasket

FUEL SYSTEM/CARBURETION
Carburetor Exploded View

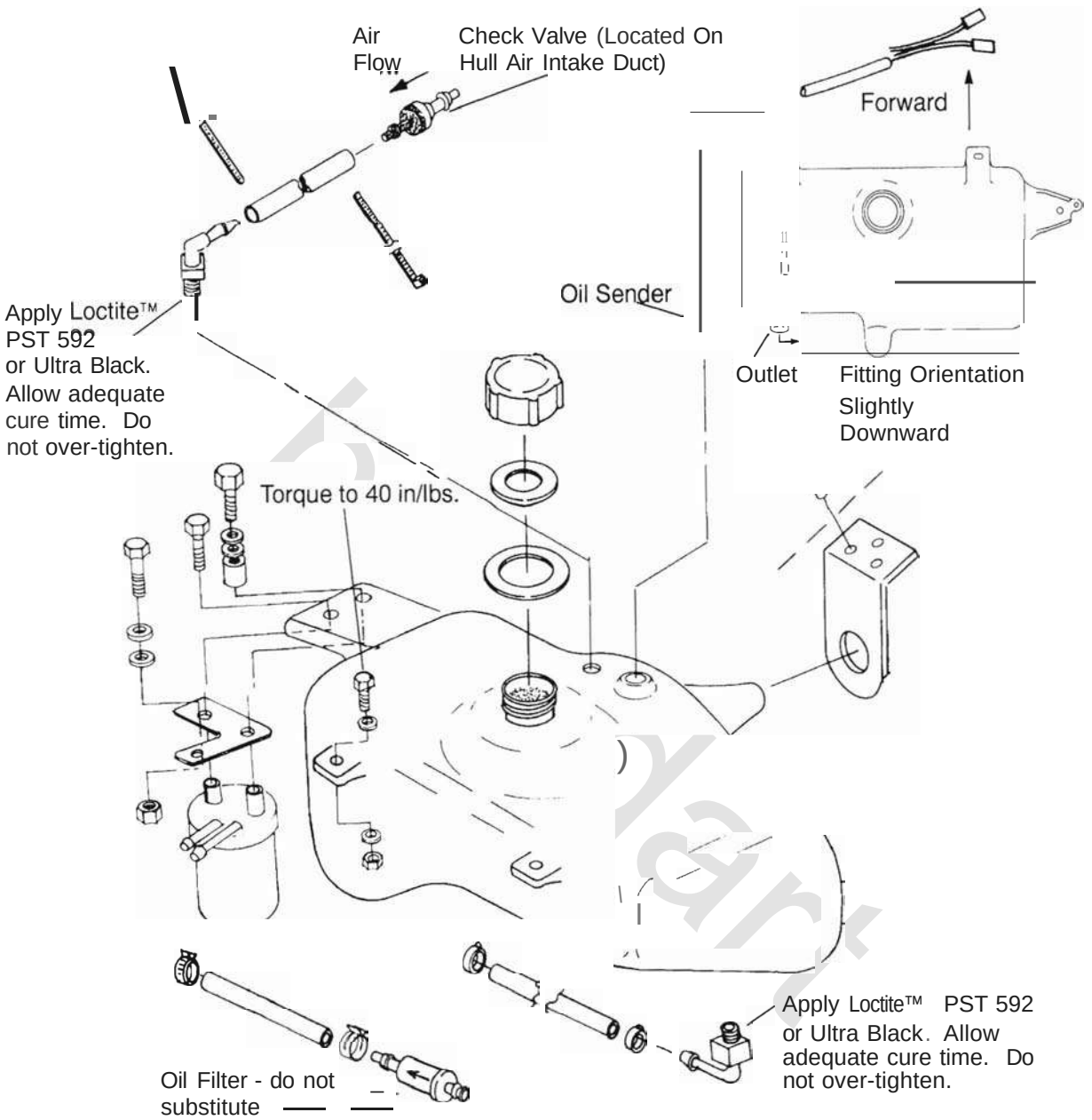


SLX PRO 785 8974978

Ref.	Qty.	Description
1	1	Packing
2	15	Screw
3	1	Asm., Hose (Inc!. Spiral Tube, 2 Clamps)
4	1	Screw
5	4	Spring
6	3	O-Ring
7	3	Filter
8	10	Clip
9	2	Hose
10	2	Clip
11	1	Hose
12	1	Nipple
13	1	Hose
14	1	Hose
15	8	Screw (MAG & PTO)
16	1	Asm., Cover, MAG
17	2	Gasket
18	2	Diaphragm
19	2	O-Ring
20	1	Asm., Pump Body
21	2	Diaphragm
22	6	Seal
23	3	Ring
24	2	Spring
25	2	Lever, Choke
26	3	Washer, Spring
27	3	Nut
28	2	Spring
29	3	Nut
30	3	Washer, Spring
31	2	Asm., Throttle Lever
32	1	Lever, Throttle
33	3	Spring
34	3	Ring
35	1	Asm., Carburetor (Incl. 10 -39)
36	1	Washer
37	1	Plate
38	12	Screw
39	2	Asm., Hose (Inc!. Spiral Tube, Clamps)
40	3	Ring
41	1	Lever, Throttle
42	1	Hose
43	1	Asm., Pump Body
44	2	Ring
45	2	Ring
46	3	Adjuster
47	4	Washer
48	3	O-Ring
49	3	Needle Valve 2.0
50	3	Clip
51	3	Plate
52	3	Screw
53	3	Spring
54	3	Pin
55	3	Arm
56	3	Asm., Diaphragm
57	3	Cover
58	6	Screw
59	3	Asm., Body
60	3	Gasket
61	6	Blind Plug Screw
62	2 1	Main Jet (#170) MAG & PTO Main Jet #165 Center
63	6	Bolt
64	3	Pilot Jet (#72.5)
65	3	O-Ring
66	6	Washer
67	3	Spring
68	3	Adjuster
69	1	Asm., Throttle Lever
70	3	Screw
71	6	Seal
72	1	Spring
73	1	Screw
74	1	Asm., Choke Lever
75	1	Spring
76	1	Screw
77	1	Asm., Pump Cover, Center
78	4	Screw
79	1	Jet (fuel return restrictor)
80	12	Screw
81	1	Plate

4/97

Oil Tank Exploded View



Fuel Pump Operation

The SLX Pr0785 uses two fuel pumps which are component parts of the carburetors.

One fuel pump is part of the MAG carburetor and the other is part of the PTO carburetor.

Operation, function, repair and troubleshooting procedures are the same as previous Mikuni fuel pumps. Refer to the exploded view of the carburetors on pages 3.6 & 3.7. Refer to the 1992-1997 PWC MRM for more information.

CHAPTER 4
ENGINE/COOLING

1997 /1998 SLX PRO 785

Model	Engine Model No.	Cylinder Displacement	Bore		Stroke	
			mm	inches	mm	inches
SLX PRO 785	EC78ZPWE01	779 cc	69.705	12.744	68	12598

Cylinder Head Volume Uninstalled (Bench)	Cylinder Head Volume (Installed)	Piston Rings End Gap	Piston to Cylinder Clearance	Operating RPM ± limiter RPM +100
27.5cc	24cc	0.012" - 0.020" 0.30-0.51 mm Service Limit: 0.028"(.71 mm)	0.003-0.005" 0.076-0.13mm Service Limit: 0.008" (.20mm)	Operating 7500 (1997) Limiter 7800 (1997) Operating 7750 (1998) Limiter 7950 (1998)

Piston 1.0.: 78ZB

Torque Chart - Engine Fasteners

Engine Fasteners	Torque	Apply:
Air Intake Cover Bolts	9.5ft. lbs.	242
Crankcase Bolts (8mm)	16 ft. lbs.	242
Crankcase Bolts (10mm)	26 ft. lbs.	242
Carburetor Mounting Nuts (8mm)	16 ft. lbs.	242
Cylinder Base Nuts (10mm)	28 ft. lbs.	242
Cylinder Head Bolts (8mm)	18 ft. lbs.	242
Engine Mount Nuts	45 ft. lbs.	242
Engine Mount Plate (To Engine) Belts	45 ft. lbs.	242
Exhaust Manifold Bolts (8mm)	16 ft. lbs.	242
Flywheel Housing Bolt (6mm)	78 in.lbs.	242
Flywheel Housing Bolt (8mm)	16 ft. lbs.	242
Flywheel Nut 18mm	65 ft. lbs.	262 on taper of flywheel 242 on nut
Intake Manifold Nuts & Bolts (6mm)	78 in. lbs.	242
Oil Pump Bolts/Screws (5mm)	48 in. lbs.	242
Starter Motor Mounting Bolts	108 in. lbs.	Dielectric Grease
Spark Plug	11 ft. lbs.	AS
Water Outlet Manifold Bolts (6mm)	78 in. lbs.	242
Exhaust Valve Cover Bolts (6mm)	78 in. lbs	242

NOTES:

262 indicates use of Loctite 262 thread locking agent (red) (271 is an acceptable substitute)

242 indicates use of Loctite 242 thread locking agent (blue) (243 is an acceptable substitute)

AS indicates use of Anti Seize compound

Grease indicates use of a light coating of grease

Size 1/4" to 7/8" micro hose clamps torque to 10-12 in. lbs.

Size 1" and larger hose clamps torque to 20-25 in. lbs.

CAUTION:

Do not install fasteners dry. Always clean fasteners before reusing.

To convert in. lbs. to ft. lbs. divide by 12

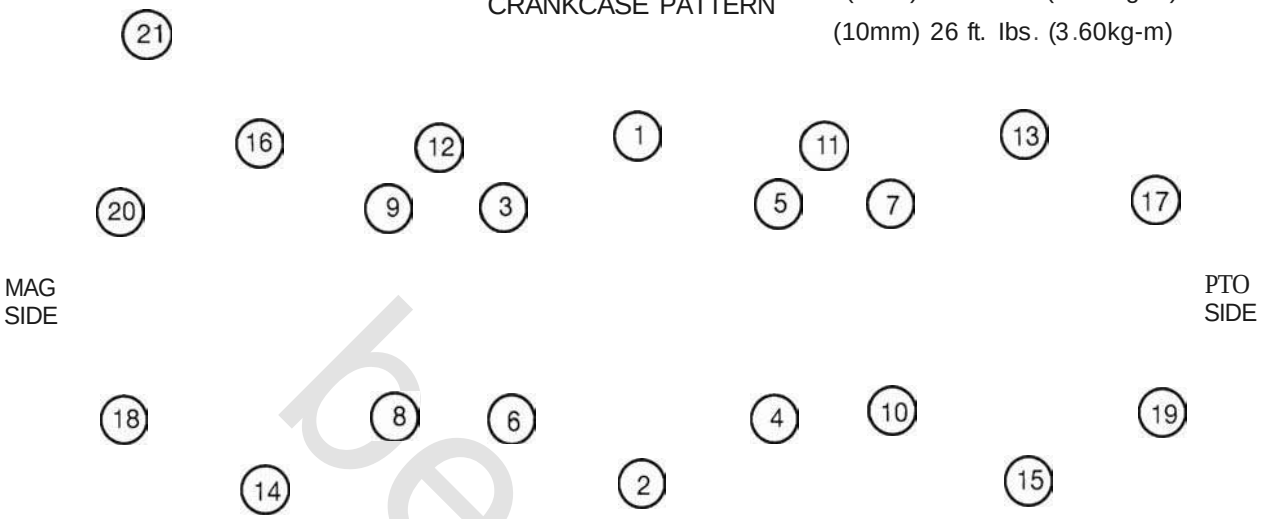
To convert ft. lbs. to kg-m multiply foot pounds by .1383.

To convert kg-m to Nm move the decimal to the right one position.

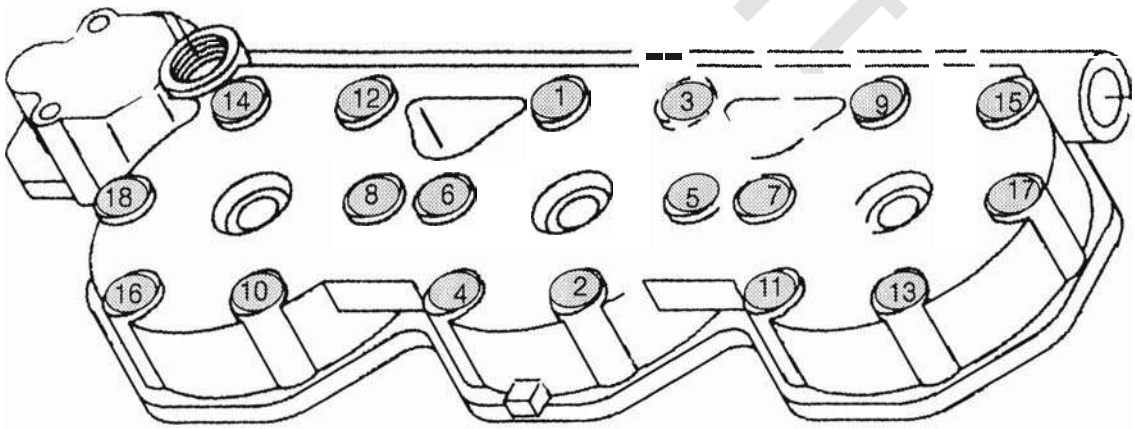
ENGINE/COOLING
Torque Patterns/Crankcase &Cylinder Head

(6mm) 72 in. lbs. (.83 kg-m)
(8mm) 16 ft. lbs. (2.21 kg-m)
(10mm) 26 ft. lbs. (3.60kg-m)

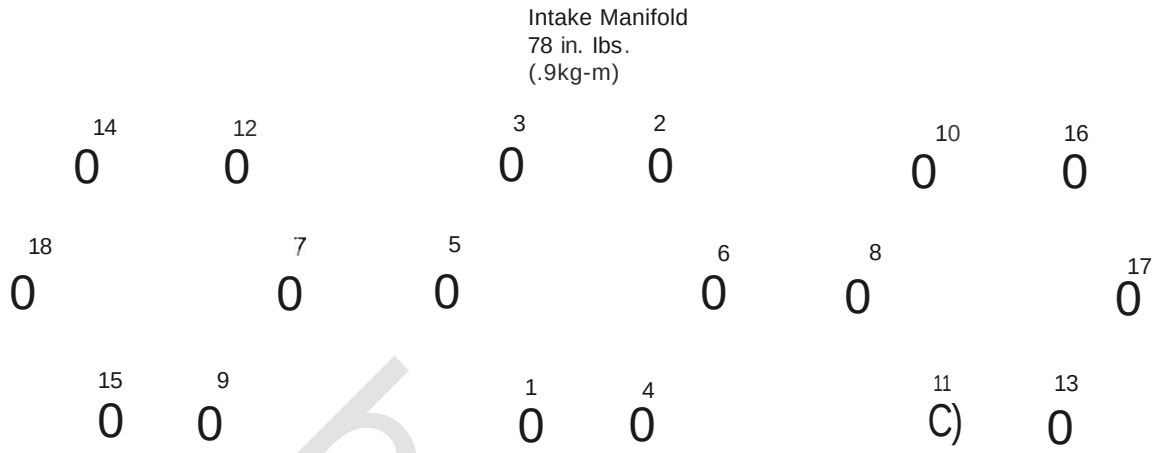
CRANKCASE PATTERN



CYLINDER HEAD 18 ft. lbs. (2.49 kg-m)

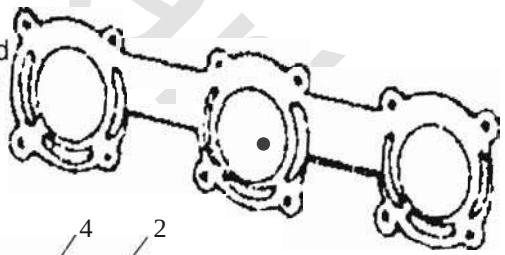


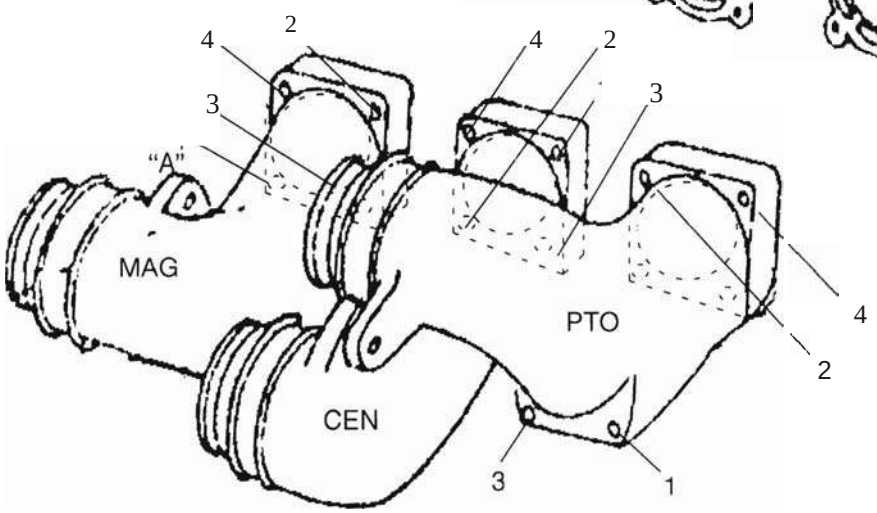
1. Torque the head in 3 steps following the sequence marked on the illustration.
2. 1st @ 1/2 torque (9 ft. lbs)
3. 2nd @ 3/4 torque (13.5 ft. lbs)
4. Last @ full torque (18 ft. lbs)



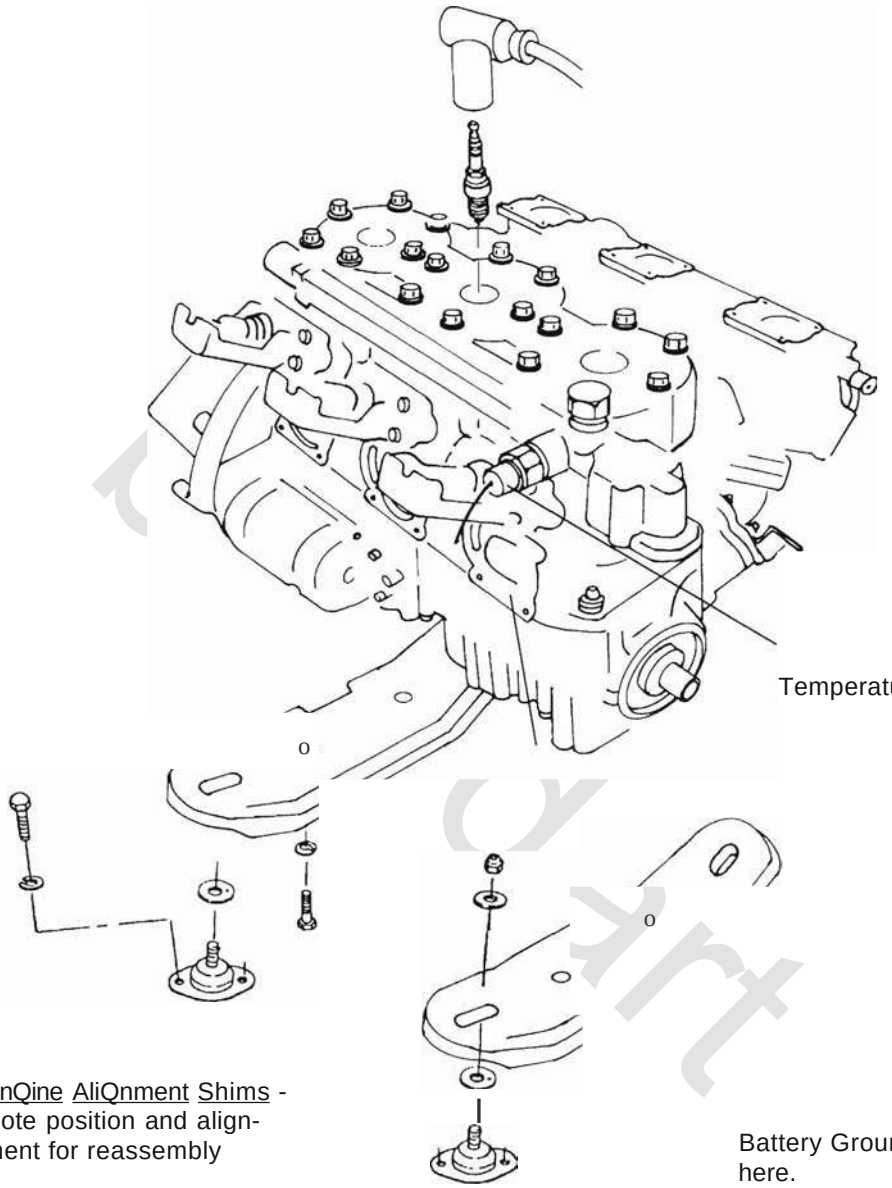
1. Install the MAG Exhaust manifold 1st. The bottom left mounting hole is slotted, install this bolt first and tighten and then install the other 3 bolts and torque to specification (16 ft. lbs)
2. Install the CEN exhaust manifold. Torque the manifold to 16 ft. lbs in the sequence shown.
3. Install the PTO exhaust manifold. Torque the manifold to 16 ft. lbs in the sequence shown.

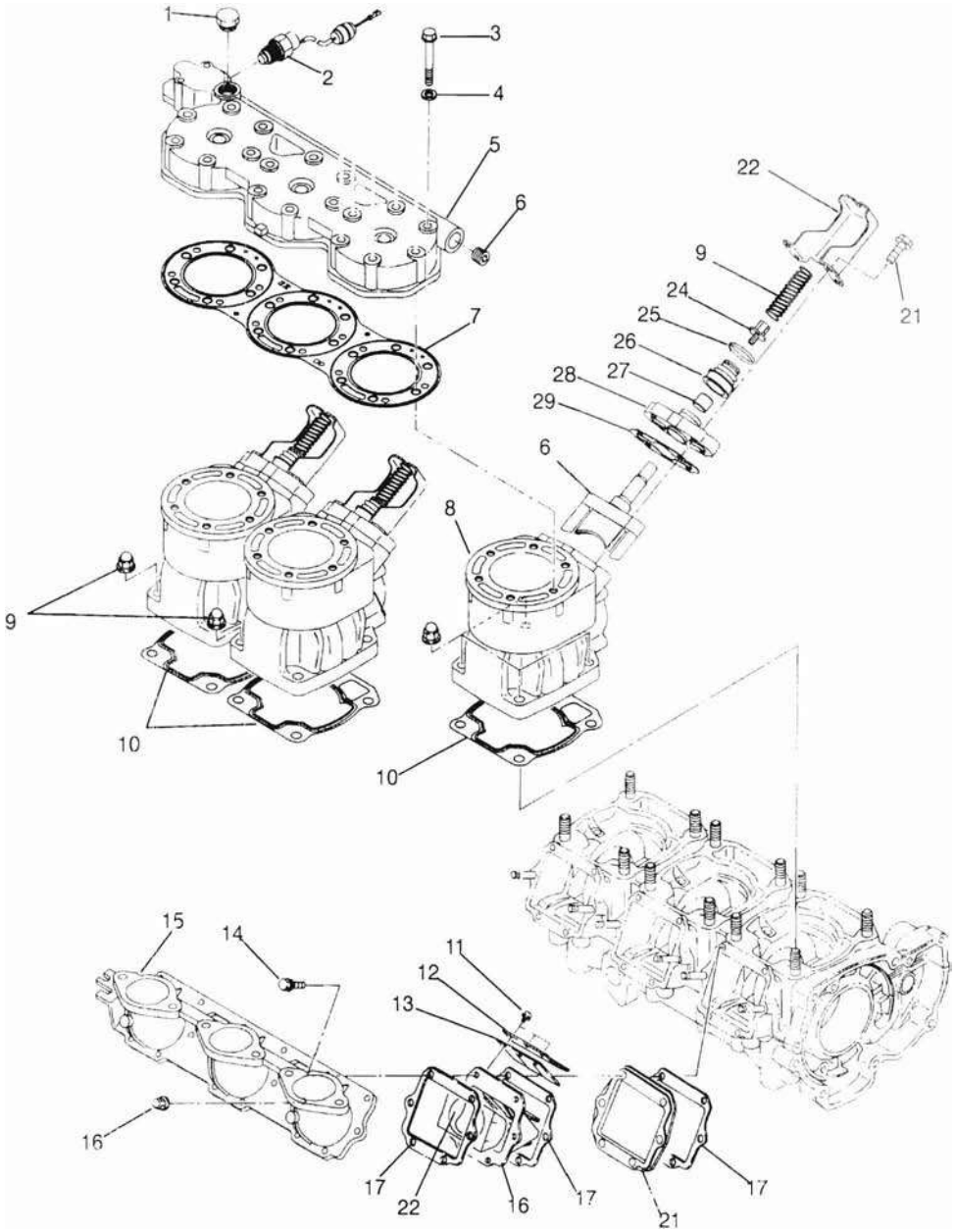
The exhaust manifold bolts have shallow bolt heads and a 6 point box end wrench should be used on all bolts except for the bolt marked "A". A 12 point box end wrench is needed for this bolt for access





Engine and Mount Assembly





Ref	DESCRIPTION	Ref	DESCRIPTION
1	Plug	18	Stuffer
2	Thermo Switch, 82° C	19	Asm., Reed Valve (Incl. 11 13)
3	Bolt, Flange	20	Spacer, Reed Valve
4	Gasket, Aluminum	21	Bolt, Flange
5	Head, Cylinder	22	Bracket, Adjuster
6	Plug	23	Spring
7	Gasket, Head	24	Bolt, Wire End
8	Asm., Cylinder (Incl. 9)	25	Band, Wire
9	Nut, Flange, Cap	26	Boot
10	Gasket, Cylinder	27	Bushing
11	Screw and Washer	28	Valve Cover
12	Stopper	29	Gasket, Valve Cover
13	Valve	30	Exhaust Valve
14	Bolt, Flange		
15	Intake Fipe		
116	1Nut, Flange, Cap		
17	Gasket, Reed Valve		

ENGINE/COOLING
Engine Removal

1. Turn off fuel valve.

2. Remove seat; apply masking tape around seat opening to protect hull from scratches during engine lifting procedures.

3. Remove battery ground cable from the battery.

4. Remove air intake cover). Lift out intake screen and gasket. (Protect carburetors from foreign debris at all times.) Remove air intake bolts.

CAUTION:

The oil line fittings are located at the carburetors. Slide back the clamps and remove the oil lines. **Do not damage the lines.**

5. Raise the front hatch and lift out the storage bucket.

6. Remove the straps for the fuel tank and move the fuel tank to gain access to the pipes.

7. Remove the stinger hose.

8. Remove the 4 bolts from the PTO head pipe.

9. Remove the hose from the PTO head pipe.

10. Remove the hose from the PTO pipe body.

11. Remove two nuts from the pipe mounts. (front of pipe.)

12. Remove the water overboard hose.

13. Disconnect the exhaust valve cables at the exhaust valves.

14. Remove the pipe through the seat opening.

15. Follow the same procedure to remove the MAG pipe.

16. Follow the same procedure to remove the Center pipe.

17. Remove electrical box cover. Unplug engine wire harness connectors. Remove harness grommet bracket and pull harness out of electrical box.

18. Remove the battery ground cable at the engine.

19. Unplug water temperature sensor wire at engine.

20. Disconnect battery positive (+) cable at starter motor

21. Disconnect fuel supply line from MAG fuel pump. Disconnect fuel return line from fuel rail. Remove and plug oil supply line at oil pump.

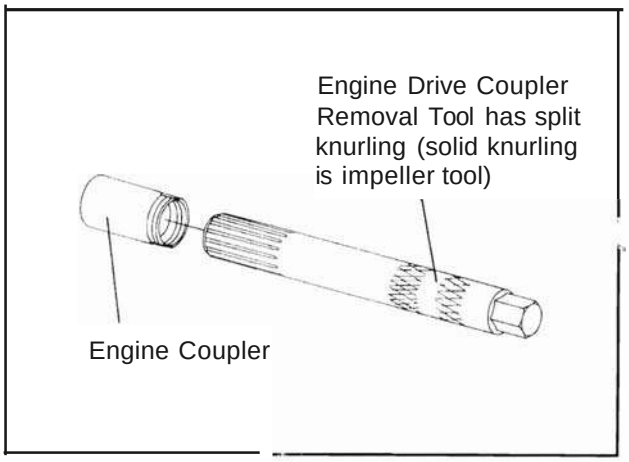
22. Disconnect throttle and choke cables at carburetors.

23. Disconnect cooling water hoses from engine.

24. Remove jet pump and driveshaft assembly.

25. If engine will be completely disassembled, remove drive coupler form crankshaft before loosening (4) engine mount nuts.

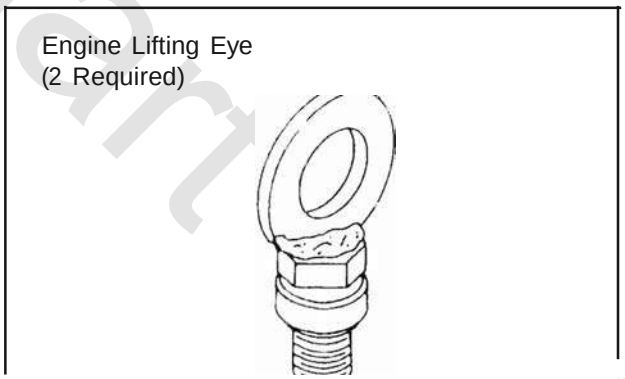
26. Remove PTO spark plug. Find Top Dead Center of this piston.



27. Turn coupler clockwise (as viewed from rear of craft) until piston is approximately 1" (25.4mm) before Top Dead Center. **NOTE:** Estimate piston position using a screwdriver or similar probe through plug hole.

28. Remove screwdriver or probe and insert approximately 1 ft. (30cm.) of 5/16" nylon rope through spark plug hole. Using coupler tool or a large wrench on flats of coupler, turn crankshaft counter clockwise until rope strapped between piston and cylinder head. With crankshaft locked in position, remove coupler by turning counter clockwise (as viewed from the rear).

Do not use impact tools for coupler removal. Damage may occur to the coupler or tool.



29. Remove engine mount nuts (4). With the aid of a chain hoist, slide engine rearward and upwards and lift out of hull. Engine alignment shim(s) may be in place on one or more of the engine rubber mount studs. Note the number and location for reinstallation. The number of shims installed in production is written next to each mount with permanent marker on later models. Engine rubber mounts are stressed during removal of mounting nuts. Be sure to inspect the mounts carefully and replace if damaged.

NOTE: Engine lifting eyes can be easily fabricated by removing the upper porcelain from a spark plug and welding a large washer to the spark plug base. Install one lifting eye in the PTO cylinder and one in the MAG cylinder spark plug hole.

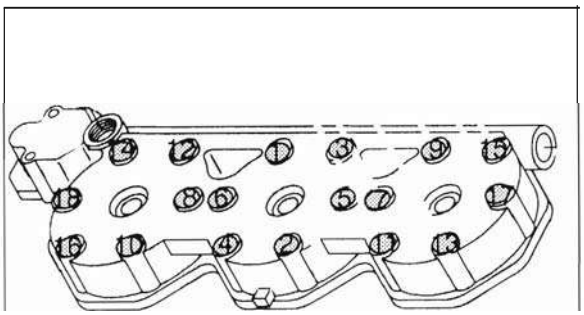
CAUTION:

When lifting use care to avoid damaging the oil check valves and 011 lines at the carburetors.

Engine Removal (Continued)

The engine disassembly and inspection procedures that differ from the 780 Fuji engines are listed as follows for the SLX Pr0785. Refer to the 1992-1997 PWC MRM for procedures that are common to both engine types.

1. Remove exhaust manifold bolts. caution: use a 6 point box end wrench to remove the exhaust manifold bolts.
2. Loosen nuts on head in 2-3 steps using a criss-cross pattern and remove the head.



3. Inspect cylinder head for warping. Replace cylinder head if warp exceeds service limit.

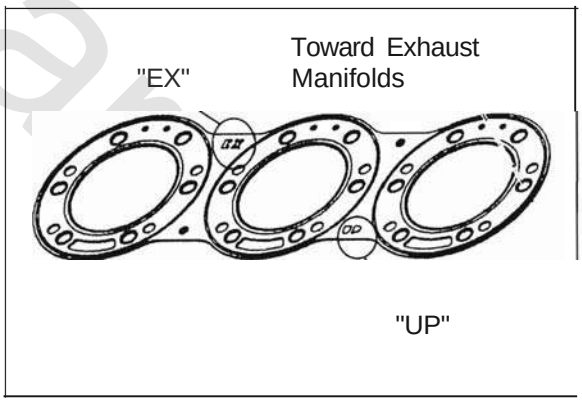
Cylinder Head Warp
Service Limit: .003″ (.08mm)

4. Remove head gasket.

When reassembling, the gasket must be positioned with "EX" towards exhaust manifold & the word "UP" must be readable.

Removal of the studs, intake base, and gasket is not required unless necessary for carburetor repair or inspection of the gaskets.

NOTE: When reassembling, the gasket must be positioned with "EX" towards exhaust manifold & the word "UP" must be readable.

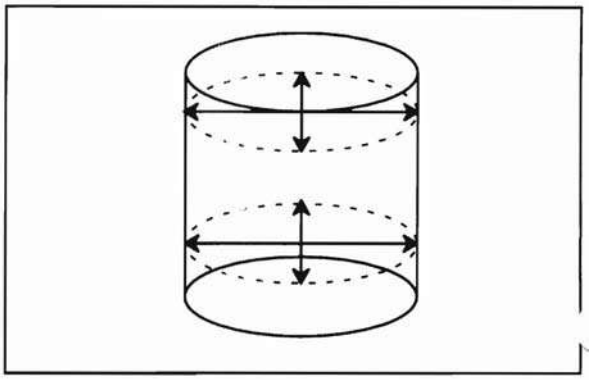


NOTE: Removal of the studs, intake base, and gasket is not required unless necessary for carburetor repair or inspection of the gaskets.

Remove cylinders. Mark each cylinder and piston with a 1, 2, or 3 to keep each piston and cylinder set together for reassembly.

Cylinder Measurement

Inspect each cylinder for wear, scratches, or damage. If no damage is evident, measure the cylinder for taper and out of round with a telescoping gauge or a dial bore gauge. Measure the bore 1/2" from the top of the cylinder, in line with the piston pin and 90° to the pin to determine if the bore is out of round. Repeat the measurements at the bottom of the cylinder to determine taper or out of round at the bottom. Record all measurements.



Cylinder Taper
Limit: .002 Max.

Cylinder Out of Round
Limit: .002 Max.

Standard Bore Size:
69.705 mm

Exhaust Valve Inspection

Refer to page 2.8 in the maintenance section for exhaust valve inspection procedures.

ENGINE/COOLING

Connecting Rod Small End Inspection

With pin and bearing centered in rod, twist ends back and forth in all directions to check for excessive axial play. Pull up and down evenly on both ends of pin to check for radial play. Replace pin and bearing if there is any resistance to rotation or excessive axial or radial movement. If play or roughness is evident with a new pin and bearing, replace the connecting rod.

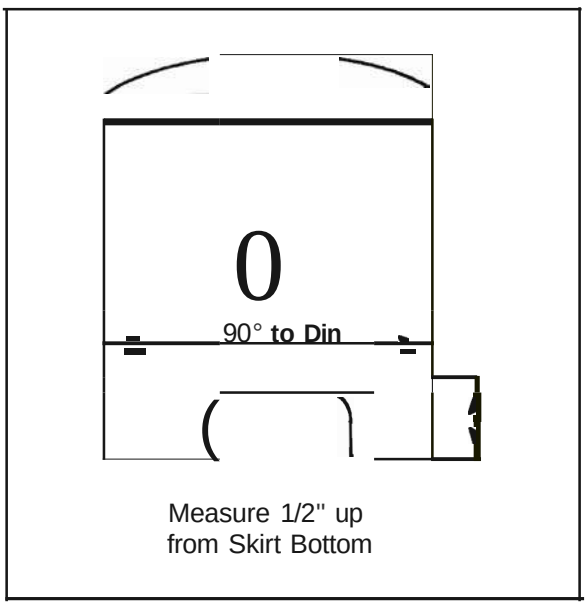
Piston Inspection/Measurement

Check piston for scoring or cracks in piston crown or pin area. Excessive carbon buildup below the ring lands is an indication of piston, ring or cylinder wear.

Measure piston outside diameter at a point 13mm (1/2") up from the bottom of the skirt at a 90° angle to the direction of the piston pin. Record the measurement for each piston.

NOTE: The piston must be measured at this point to provide accurate piston-to-cylinder clearance measurement.

Subtract this measurement from the minimum cylinder measurement recorded previously. If clearance exceeds the service limit, measure a new piston & calculate clearance. If clearance is excessive with a new piston, the cylinder is worn and must be replaced.



Measure 1/2" up
from Skirt Bottom

Piston to Cylinder Clearance
SLX780

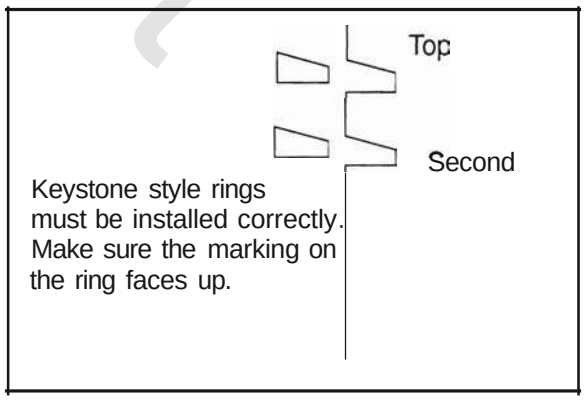
STD: .003 - .005" (0.075-0.13mm)
Service Limit: .008" (.20 mm)

Piston Ring Installed Gap

Position ring 1/2" (1.3mm) from the top of the cylinder using the piston to push it squarely into place. Measure installed gap with a feeler gauge at both the top and bottom of the cylinder.

NOTE: A difference in end gap indicates cylinder taper. The cylinder should be measured for excessive taper and out of round. Replace rings it the installed end gap exceeds the service limit.

NOTE: Always check piston ring installed gap when installing new rings and/or cylinder.



Keystone style rings must be installed correctly. Make sure the marking on the ring faces up.

Piston Ring Installed Gap
SLX780

STD: .012-.020" (.30-.50mm)
Service Limit: .028" (.71mm)

All other disassembly & inspection procedures are the same as other Fuji 780 engines. Refer to the 1992-1997 PWC MRM for procedures. All specifications specific to the SLX Pr0785 are listed in this manual supplement.

Engine Installation

Engine installation is done in reverse order of the removal instructions.

⚠ WARNING

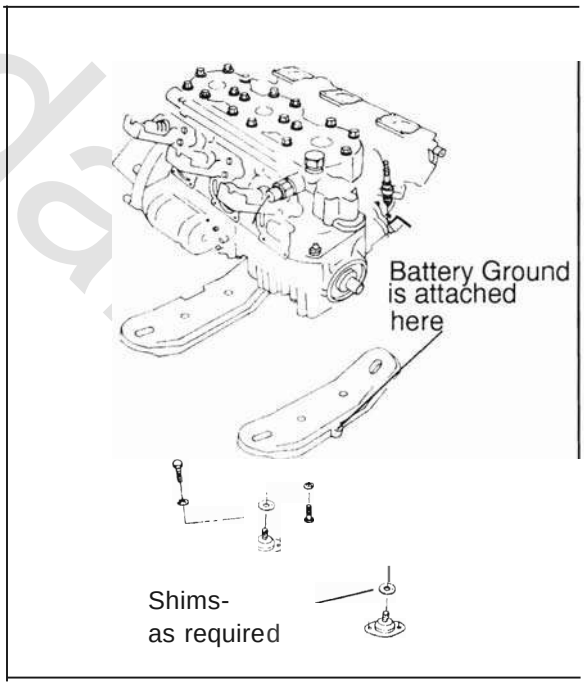
Do not install the battery ground (-) cable until all other fuel and electrical connections are done. Hydrogen gas or fuel vapors may be present in the engine compartment and a spark could ignite them, resulting in personal injury.

NOTE: Observe the following precautions:

- Engine rubber mounts are stressed during engine removal of mounting nuts, Be sure to inspect the mounts carefully and replace if damaged.
- Always clean residual Loctite™ out of threads before reinstallation.
- Always use new gaskets on the exhaust system and electrical box.
- Remember to inspect for damage on any wiring, hoses, or lines before and after reinstalling the engine.
- Make sure all cables, hoses, and wiring are routed and secured properly.
- After engine installation, pump alignment must be inspected. Refer to the Final Drive section for inspection and alignment procedures.

CAUTION:

Shims used for engine and driveshaft alignment must be reinstalled in their original locations. Do not allow them to be mixed up. Always verify proper engine to pump alignment after engine installation as outlined in the Final Drive section.



ENGINE/COOLING
Cylinder Honing

The Ni-Ca-Sil cylinders used on the SLX Pr0785 can be honed to remove light deposits or scuffing if the proper stone is used.

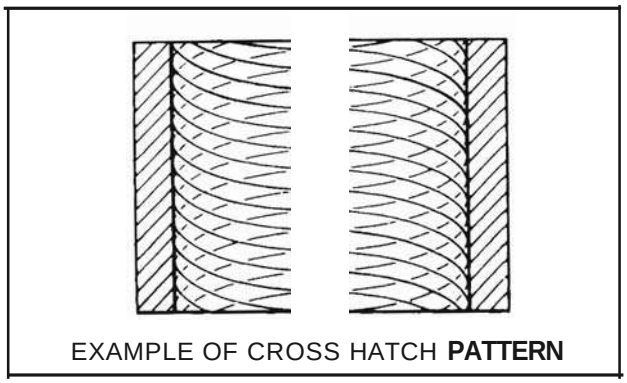
"Soft" stones like those used to hone aluminum cylinders are recommended.

Follow normal honing procedures and use honing oil.

Ammco Hone 3950
PN: 2870588

Honing Oil
PN: 2870588

Ni-Ca-Sil Honing Stones for Ammco 3950
PN: 8713956



EXAMPLE OF CROSS HATCH **PATTERN**

Do Not Use Hard Abrasive Stones!

Clean Cylinders Thoroughly After Honing

Honing Procedure

1. Wash cylinder with solvent. Clamp cylinder in a soft jawed vise by screwing bolts into exhaust bolt holes.

2. Place hone in cylinder and tighten stone adjusting knob until stone contacts the cylinder walls (DO NOT OVERTIGHTEN). Using a 1/2" (13 mm) drill motor rotating at a speed of 300-500 RPM, run the hone in and out of the cylinder rapidly. Remember to keep the hone drive shaft centered to prevent edge loading and always bring the stone approximately 1/2" (1.3 cm) beyond the bore at the end of each stroke. Release the hone at regular intervals to inspect the bore surface.

IMPORTANT: Cleaning the Cylinder After Honing

It is very important that the cylinder be thoroughly cleaned after honing to remove all grit material. Wash the cylinder in a solvent, then in hot soapy water. Pay close attention to the port areas. Use electrical contact cleaner if necessary to clean these areas. Rinse thoroughly, dry with compressed air, and oil the bore immediately with Polaris Premium 2 Cycle Lubricant.

Oil Pump Bleeding

The oil pump must be bled following any repair service to the injection system which might allow loss of oil and subsequent trapped air upon reassembly.

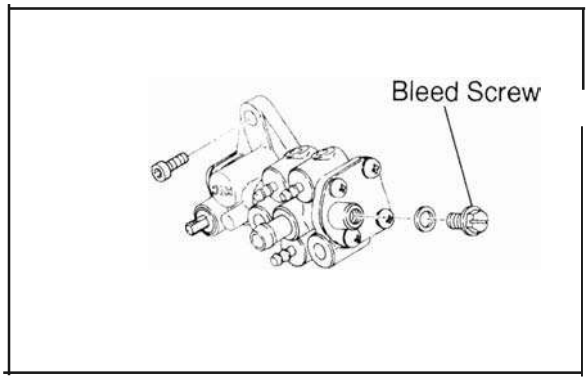
IMPORTANT: Always pre-mix the first tank of fuel used after oil pump or engine service to ensure proper lubrication of the engine.

3. Fill oil reservoir with Polaris injector oil.
4. Loosen hex head screw at top of oil pump.
5. After a short period of time oil should begin to flow from beneath the screw head. Be sure that a steady flow of oil is evident to remove all air before tightening the screw.
6. Tighten screw.

CAUTION:

Do not over tighten. The screw is hollow.

7. Any time the engine is disassembled or repaired it is important that each oil supply line from the pump to the engine be checked for signs of wear or air bubbles. If air bubbles greater than 1/2" (1.3 cm) in length are present, fill oil supply lines with oil using a small oil squirt can.



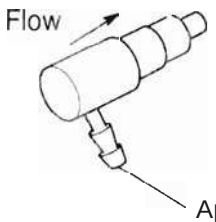
Troubleshooting

NOTE: See Maintenance section for adjustment/inspection information.

8. Remove lines from their fittings at the engine and pump. Blow through them to ensure they are not plugged or restricted.
9. Apply some pressure to the check valve fittings with the Mity Vac™ or similar tool. These valves should open with 2-5 lbs. of pressure.
10. Be sure oil feed lines fit tightly, are not cracked or leaking.
11. Be sure the in-line filter between oil pump and oil tank is clean and bleeding is complete.
12. If oil still won't flow, replace the oil pump.

NOTE: This machine is equipped with a variable oil pump controlled by a link rod between the carburetors and the pump arm. This is a non-adjustable rod. It is necessary to inspect the rod and linkage for correct installation and smooth cperation before running the engine.

Oil Pump Check Valve
(Located on Carburetor)



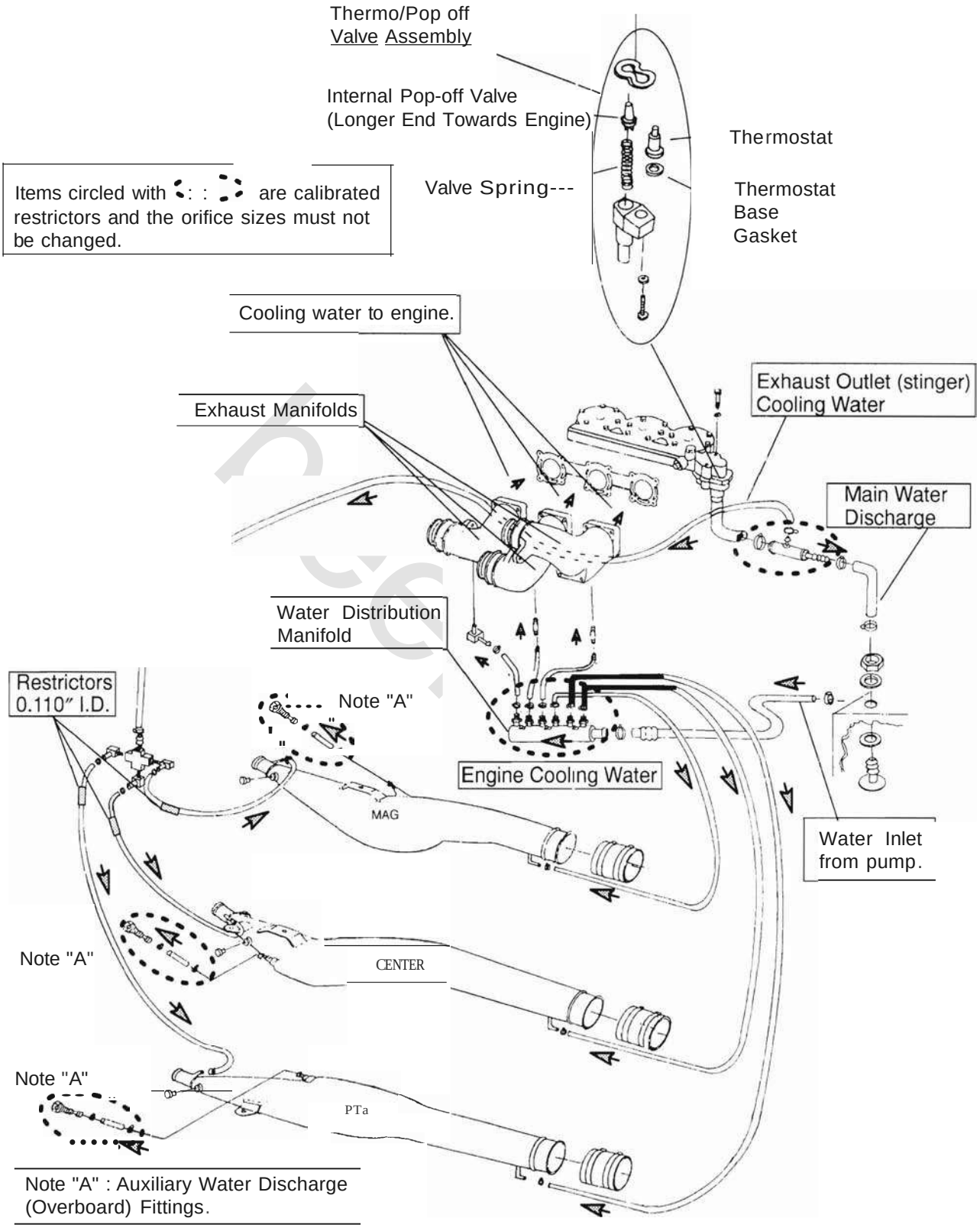
Oil Pump Bushing End Play Adjustment

If the oil pump, crankcase, or any other pump drive component is replaced, inspect the drive gear bushing end play using the procedure found in the 1992-1997 PWC MRM.

13 .

Oil Pump Bushing End Play
.012 - .024″ (.3 - .6 mm)

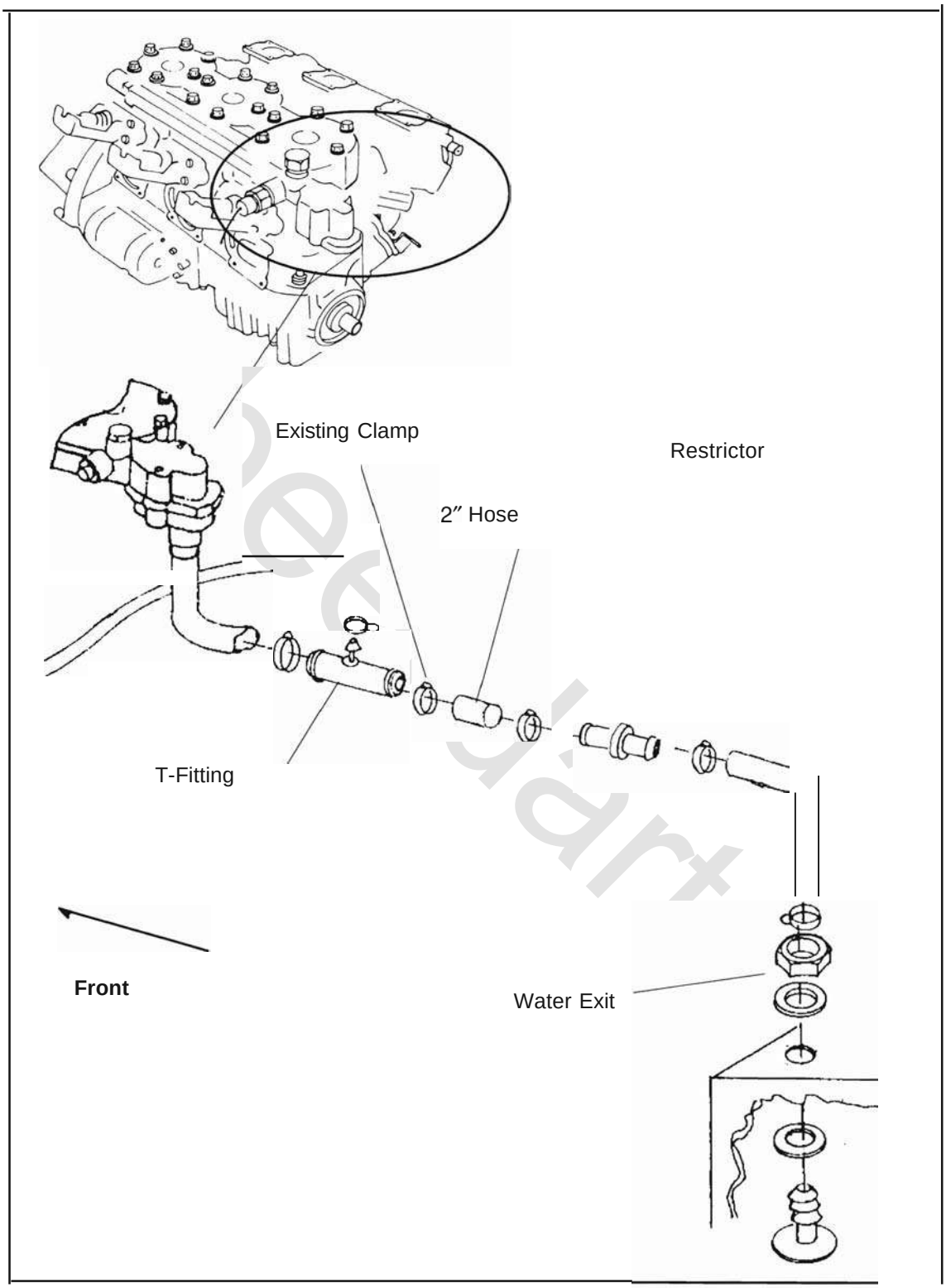
Oil Pump Mounting Bolt Torque (242 Blue)
78 in. lbs (.9 kg-m)



Proper orientation of the cooling lines is critical for engine cooling. Refer to this diagram and the stampings on the water distribution manifold for proper assembly.

ENGINE/COOLING

Exhaust Cooling Hoses



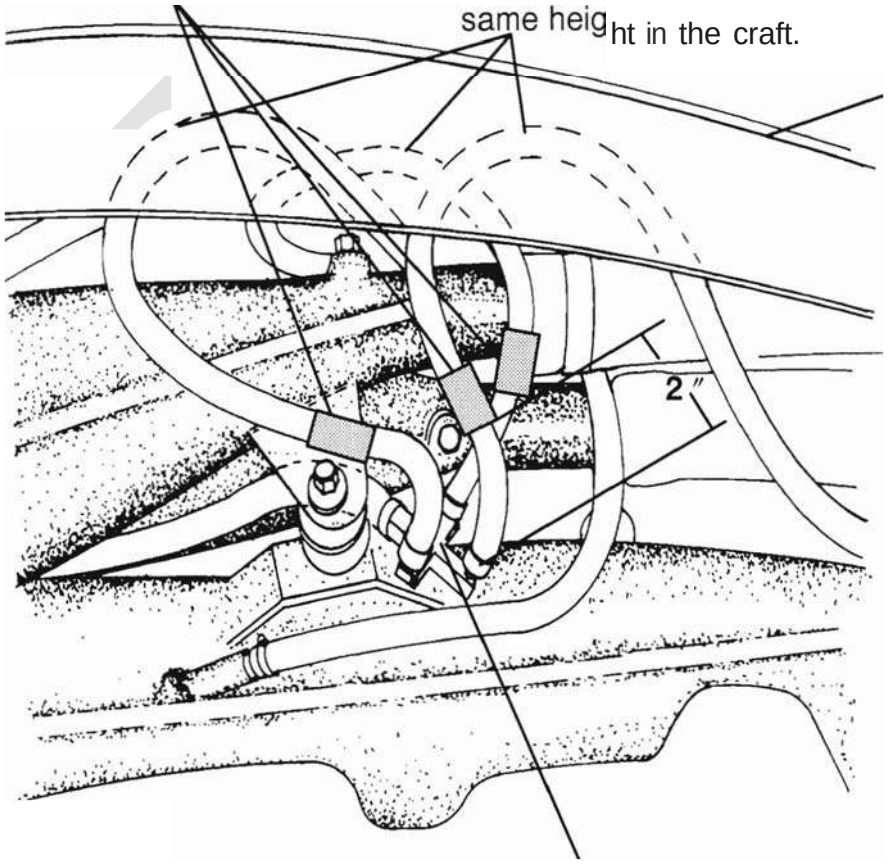
1998 SLX Pro 785 Coolant Hose Restrictor

NOTES

Exhaust Cooling Hoses

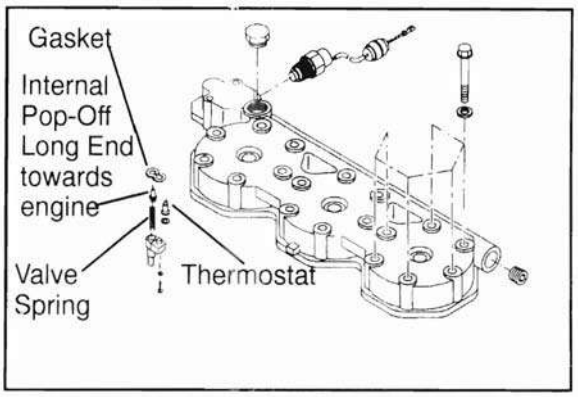
The orientation of the exhaust stinger cooling hoses is critical for proper operation.

Refer to the diagram below when installing the exhaust stinger hoses.



Thermostat Pop Off Assembly

If low end performance of the watercraft begins to deteriorate, and the jet pump intake area is free of debris and weeds; or if the overheat alarm sounds, the thermostat pop off assembly should be checked for debris and cleaned. Also inspect the thermostat pop off assembly if the watercraft has been stored for more than 30 days or has been used in salt water. To do this, use a 3/16" (.5 cm) Allen wrench and a flat screwdriver.



CAUTION:

If the thermostat pop off assembly is reassembled incorrectly severe engine damage will result within a very short period of operation.

NOTE: Do not perform this maintenance while the watercraft is in the water. The thermostat pop off assembly is under tension from an internal spring. When the screws are removed, the assembly will come apart quickly if not held together firmly.

1. Remove screws while holding thermostat pop off assembly firmly together. Carefully take assembly apart. Be careful not to lose any parts.
2. Check thermostat pop off assembly for debris, such as seaweed, and clean it out.
3. Check condition of rubber elerrents. Also check thermostat and housing for corrosion. Replace any parts that appear in poor condition.
4. Assemble thermostat pop off assembly in correct sequence. Assemble carefully to ensure proper alignment between all internal parts and be sure the gasket or O-ring is properly positioned. The arrow indicates the direction of water flow (away from engine).
5. Attach thermostat pop off assembly using screws removed in step one and Loctite™ 242 (blue).

CHAPTER 5
FINAL DRIVE/JET PUMP/ BILGE SYSTEM

Final Drive Jet Pump Torque Values

Application	Torque	Apply (See Notes Below)
Driveshaft Through Hull Fitting	Bonded to hull	
Engine Drive Coupler	160 ft. lbs. (22.13 kg-m)	Grease or AS
Extension Housing Bolts	18 ft. lbs. (2.49 kg-m)	242
Impeller	100 ft. lbs. (13.83 kg-m)	Grease
Intake Grate Screw	8 ft. lbs. (1.11 kg-m)	242
Pump Housing (to hull) Mounting Nuts	28 ft. lbs. (3.87 kg-m)	AS
Reverse Gate Pivot Bolt	14 ft. lbs. (1.94 kg-m)	242
Ride Plate Screws	8 ft. lbs. (1.11 kg-m)	242
Steering Nozzle Mounting Bolts	18 ft. lbs. (2.49 kg-m)	242
Steering Cable Bolt (Nozzle End)	8 ft.lbs. (1.11 kg-m)	242
Trim Nozzle Mounting Bolts	18 ft. lbs. (2.49 kg-m)	242
1/4"to 7/8" micro hose clamps	10-12 in. lbs. (16.56-19.87 kg-m)	Dry
1" and larger hose clamps	20-25 in. lbs. (33.12-41.4 kg-m)	Dry
Tail Cone	78 in. lbs (.83 kg-m)	

NOTES:

262 indicates use of Loctite™ 262 thread locking agent (red).

242 indicates use of Loctite™ 242 thread locking agent (blue).

AS indicates use of Anti Seize compound.

Grease indicates use of a light coating of grease.

Polaris Premium All Season Grease
14 oz. Tube PN 2871423
3 **oz. Tube** PN **2871322**

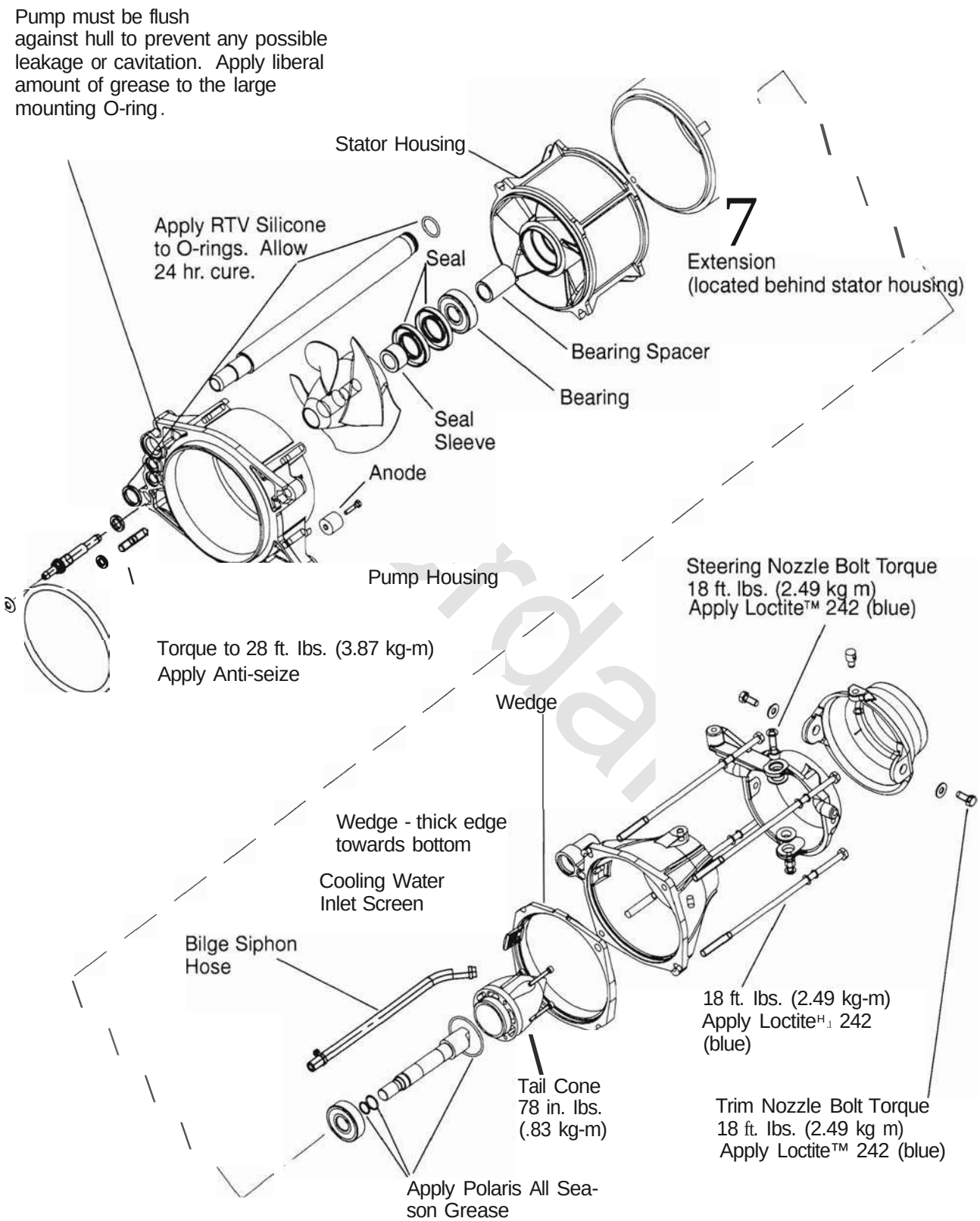
CAUTION:

Do not install fasteners dry (with exception of through hull fitting). Always clean fasteners before installing.

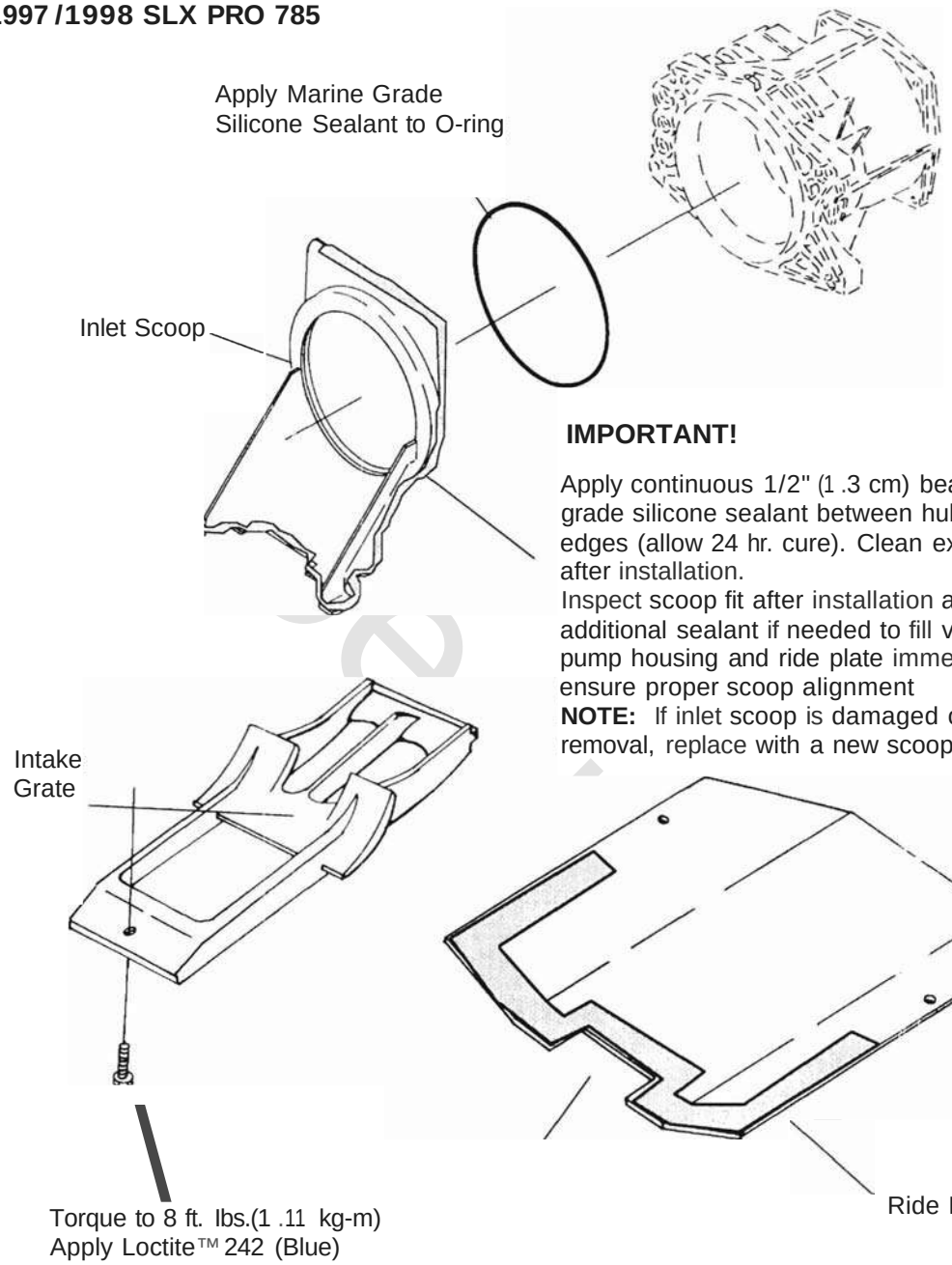
1997/1998 SLX PRO 785 Pump Data

	1997 SLX PRO 785	1998SLX PRO 785
Pump Extension	4" Extension after the pump stator	4" Extension after the pump stator
Cone Extension	Not Used	Not Used
Pump Wedge	Ox 4° Wedge	N/A
Stationary Nozzle	1350021	1350038
Impeller	51 31457 3 Blade, Swirl	5131949 3 Blade
Drive Coupler	51 30844 Steel	5130844 Steel
Drive Shaft	5131 204 20.38"	5131 204 20.38"
Ride Plate	5242019	5242019
Inlet Grate	2871560: Grate, Inlet Scoop, 3 Bar	2871560: Grate, Inlet Scoop, 3 Bar
Sponsons	27 "	26 "

FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Exploded View



1997 /1998 SLX PRO 785



IMPORTANT!

Apply continuous 1/2" (1 .3 cm) bead of Marine grade silicone sealant between hull & scoop edges (allow 24 hr. cure). Clean excess silicone after installation.

Inspect scoop fit after installation and apply additional sealant if needed to fill voids. Install pump housing and ride plate immediately to ensure proper scoop alignment

NOTE: If inlet scoop is damaged or bent during removal, replace with a new scoop.

IMPORTANT!

Apply continuous bead of Marine Grade silicone sealant to outer front edges of the hull. **NOTE:** Cavitation may result if silicone is *not* continuously applied; e.g. pin holes, separation, or damage. Allow 24 hr. cure.

FINAL DRIVE/JET PUMP/BILGE SYSTEM
Pump Removal

Modular jet pump design allows removal of many driveline and pump components without removal of the pump housing.

The following items can be serviced with the pump housing installed in the watercraft:

Impeller (for clearance inspection), intake grate, ride plate, speedometer pitot fitting, steering nozzle, trim nozzle, reverse gate and linkage, pump extension housing, impeller, driveshaft, stub shaft and bearings.

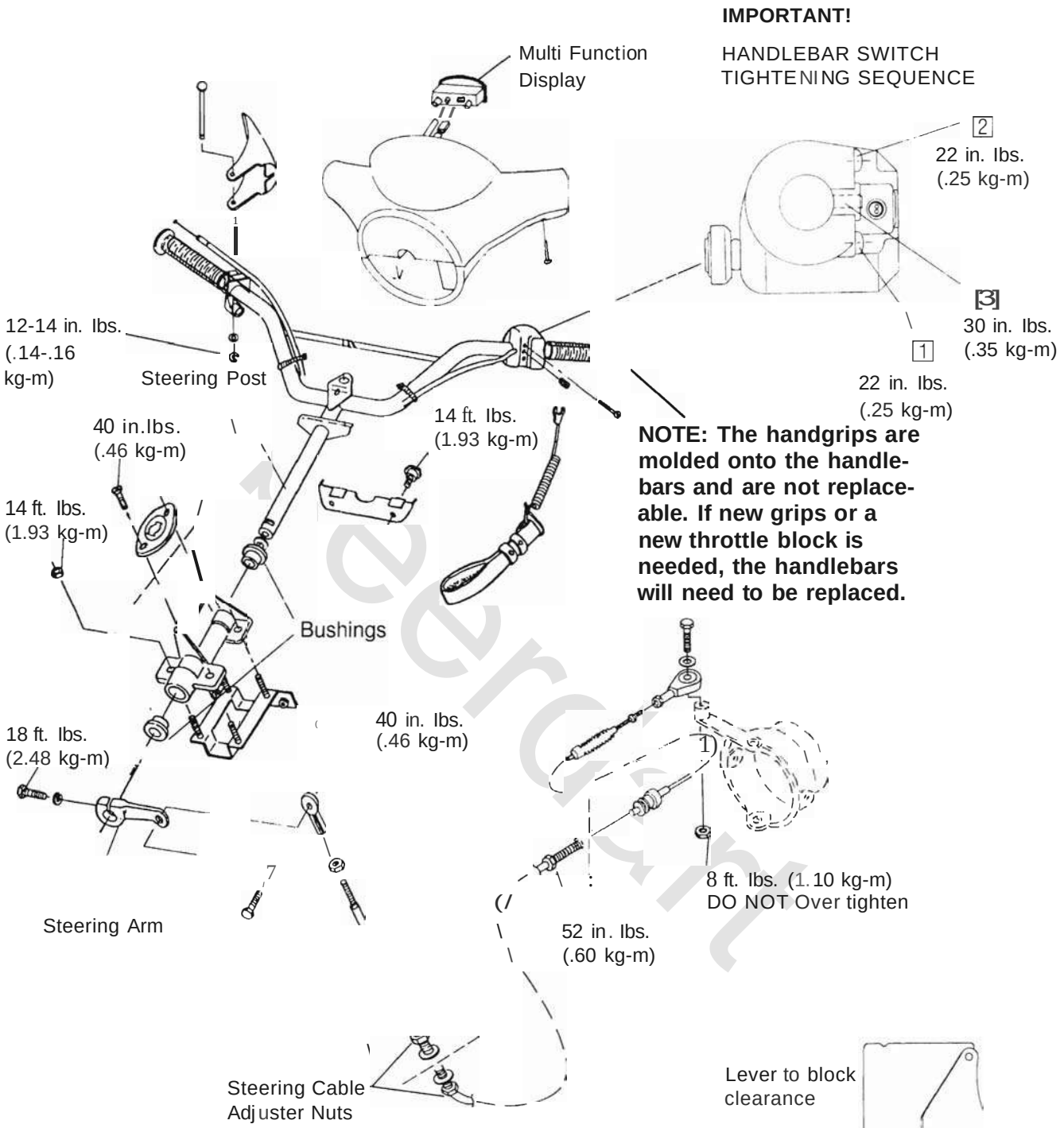
The pump housing must be removed to service the following items:

Pump-to-hull O-rings, (bilge siphon fittings and main pump housing) and inlet scoop.

NOTE: The pump can be removed with the intake grate and ride plate installed. However, if pump cavitation is suspected the intake grate, ride plate, and inlet scoop should be removed and re-sealed.

The repair procedures, disassembly and assembly procedures for the SLX Pr0785 are similar to the procedures used on all late **model SLXs. Refer to the exploded view of the pump assembly on Page 5.2 for the specific differences. Refer to the 1992-1997 PWC MRM for maintenance and repair procedures.**

CHAPTER 6
HULL/DECK, STEERING AND CONTROLS

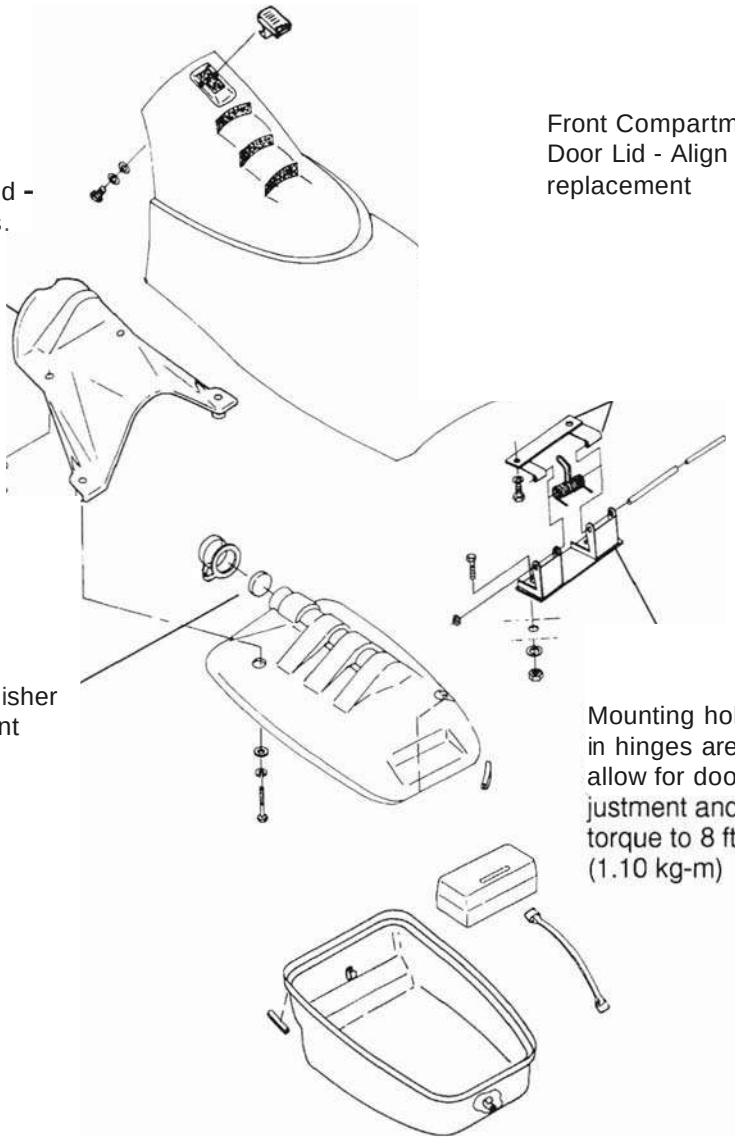


1. Apply Loctite™ 242 (Blue) to threaded fasteners.

2. Apply Polaris Premium Marine or All Season Grease to steering post bushings.

Front Compartment Assembly

NOTE: Apply Loctite™ 242 (Blue) To Threaded Fasteners



The top deck is constructed of RTM (Resin Transfer Molding). The processes used to manufacture the deck involves high heat and pressure. Once this process is complete it cannot be reversed. Therefore, hot air welding or similar methods cannot be used to repair damage.

A two part rigid structural adhesive such as 3M #08101 or equivalent is acceptable for RTM materials. Patch kits are locally available at most auto supply stores. Be sure to follow the directions carefully according to the repair kit package. After any repairs are made the hull can be prepped and painted using a base coat/clear coat marine quality paint.

NOTE: See paint information in General Information section for paint colors.

CAUTION

Do not use power sanding equipment on the repair area or bond strength may be affected. *Hand sand only.*

NOTE: For bonding use 3M #08101 structural adhesive or equivalent.

RTM Cosmetic/Surface Repair Processes (DECK)

Low Gloss

1. Wipe on thin film of Aqua Buff 2000 ™
2. Buff to gloss using buffing pad

Lack of Gel Coat

1. Sand area lightly with 600 grit paper
2. Wipe down with acet01e or equivalent
3. Add 2% resin catalyst to gel coat material
4. Spray area feathering in edges
5. Clean out gun before gel coat material hardens
6. Allow to cure
7. Sand with 600 paper
8. Buff using Aqua Buff 2000 ™

Gel Coat Nick or High Spot Repair

1. Lightly sand area using 600 grit paper & water
2. Wipe down with dry cloth
3. Brush on thin film of Aqua Buff 2000™
4. Buff clean

Fiberglass Repair (HULL)

The hull is constructed of hand laid fiberglass. Normal fiberglass repair procedures apply.

Damaged fiberglass can be easily repaired by following a few basic steps.

1. Remove all damaged material with a sabre saw or grinder.
2. Using a disc grinder or die grinder, taper fiberglass 1" (2.5 cm) back from patch area on inside of part.
3. Apply masking tape to outside of part to form a mold.
4. Mix enough polyester resin and catalyst to complete the repair, following instructions for resin being used.
5. Apply resin to inside of patch area using a disposable paint brush.
6. Lay in small pieces of shredded fiberglass matt. Use the paint brush to force air bubbles out. Add more resin and move matt around.

NOTE: Pieces of matt between 1" to 2" (2.5 to 5 cm) square work best.

7. Keep adding matt and resin until patch area is filled up to the original thickness.
8. Let resin cure thoroughly.
9. Remove masking tape from outside of repair.
10. Remove any high spots from outside with a disc grinder.
11. Fill and smooth any defects with polyester auto body filler.
12. Sand smooth and feather with 360 to 400 grit sandpaper.
13. Paint outside of repair following instructions on paint container.

CHAPTER 7
ELECTRICAL

Electrical System

Model	Alternator Output	Spark Plug	Plug Gap
SLX Pr0785	10 Amp /120 Watt @ 4500 RPM	BR9ES	.024 -.028 in. (.6 - .7 mm)

COI Box Identification

COI Box 10 #	Ignition Timing @ 3000 RPM		
	Degrees BTDC	Inches (BTDC)	MM (BTDC)
1997-F8T34371	32° @ 3000 RPM	0.25479"	6.47mm
1998-F6T535	36° @ 3000 12°@7500	0.318" 0.037"	8.08mm O.94mm

Stator Plate Assembly Test Specifications

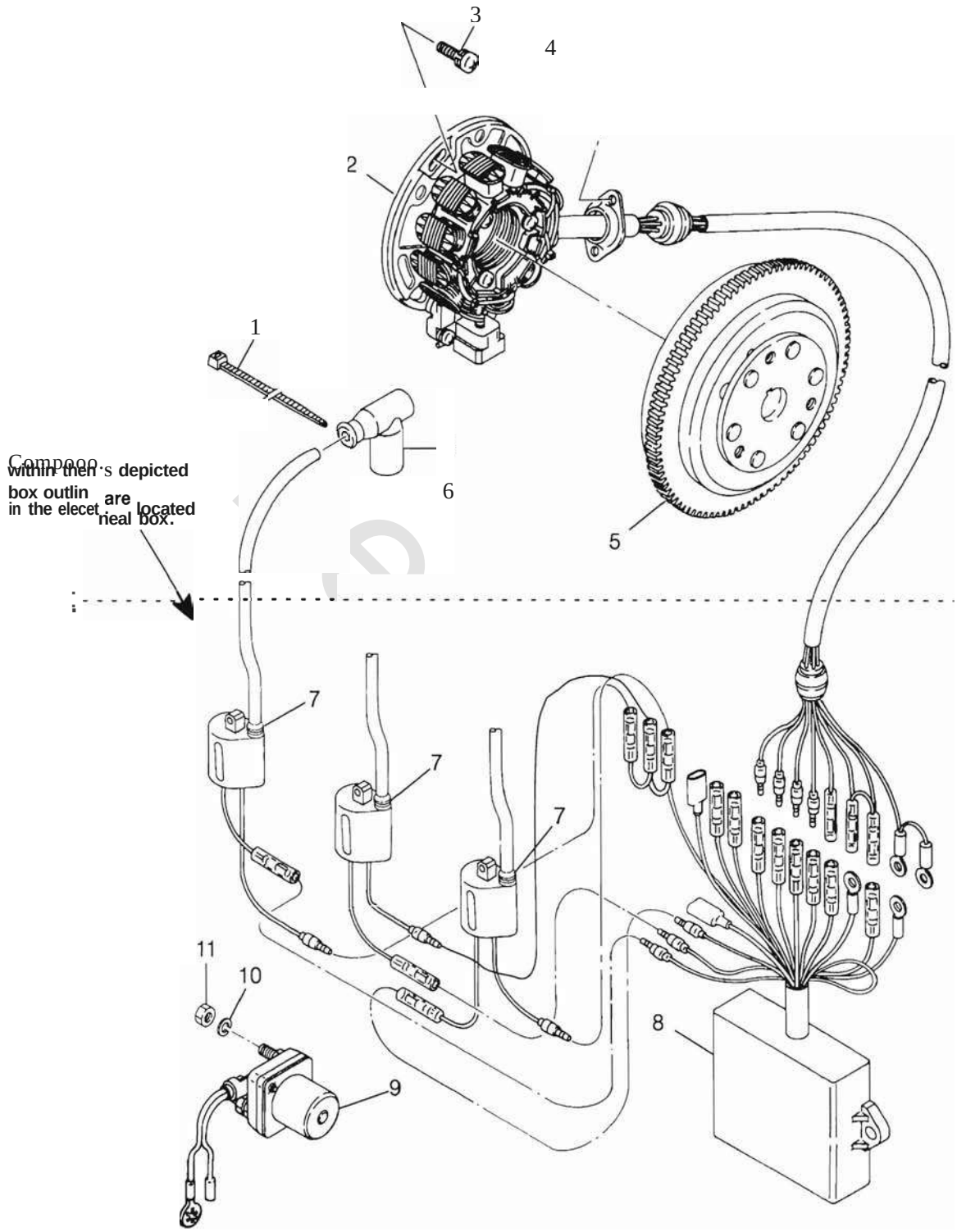
Component	Wire Colors (Connect Ohmmeter Leads To):	Reading*
Alternator Coil	Red/Purple to Yellow	0.6 ohms
Trigger Coil	WhitelYeliow to Black	210 ohms
Pulser Coil	Blue/Red to RedlWhite	22 ohms
Exciter Coil	Green/Red to RedlWhite	520 ohms

Ignition Coils, Each	Connections	Readings*
Primary	Black to BlacklWhite	0.050hms**
Secondary	Black to Secondary lead	570 ohms
Spark Plug Cap	Lead inside to Spark Plug side	5000 ohms

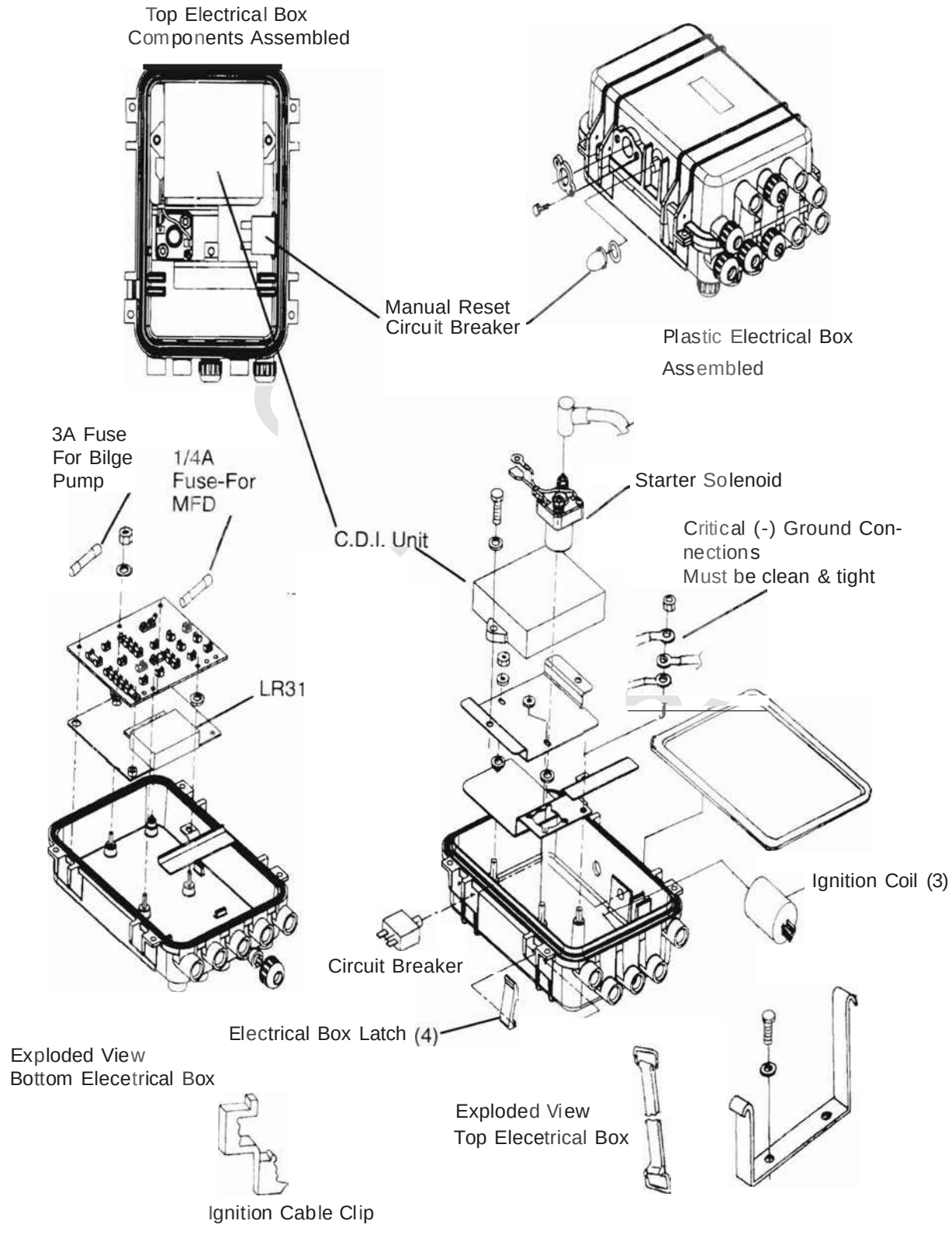
***NOTE:** All electrical resistance readings should be done at room temperature. Reading may vary ± 10%. Disconnect component to be tested. Always subtract meter lead resistance when measuring small resistance values. Meter readings were obtained using either a Fluke™ 73 or Tektronix™ DMM 155 digital multitester. Use of other meters may produce different results.

****NOTE:** Most meters will not be able to measure this low of a resistance. Before measuring components with a low resistance value (less than 1 ohm), connect meter leads together, record the reading, and subtract this amount from the measured resistance to obtain actual resistance value of the component. Measure from Black to BlacklWhite. The reading should be the same as what you recorded when the meter leads were shorted together.

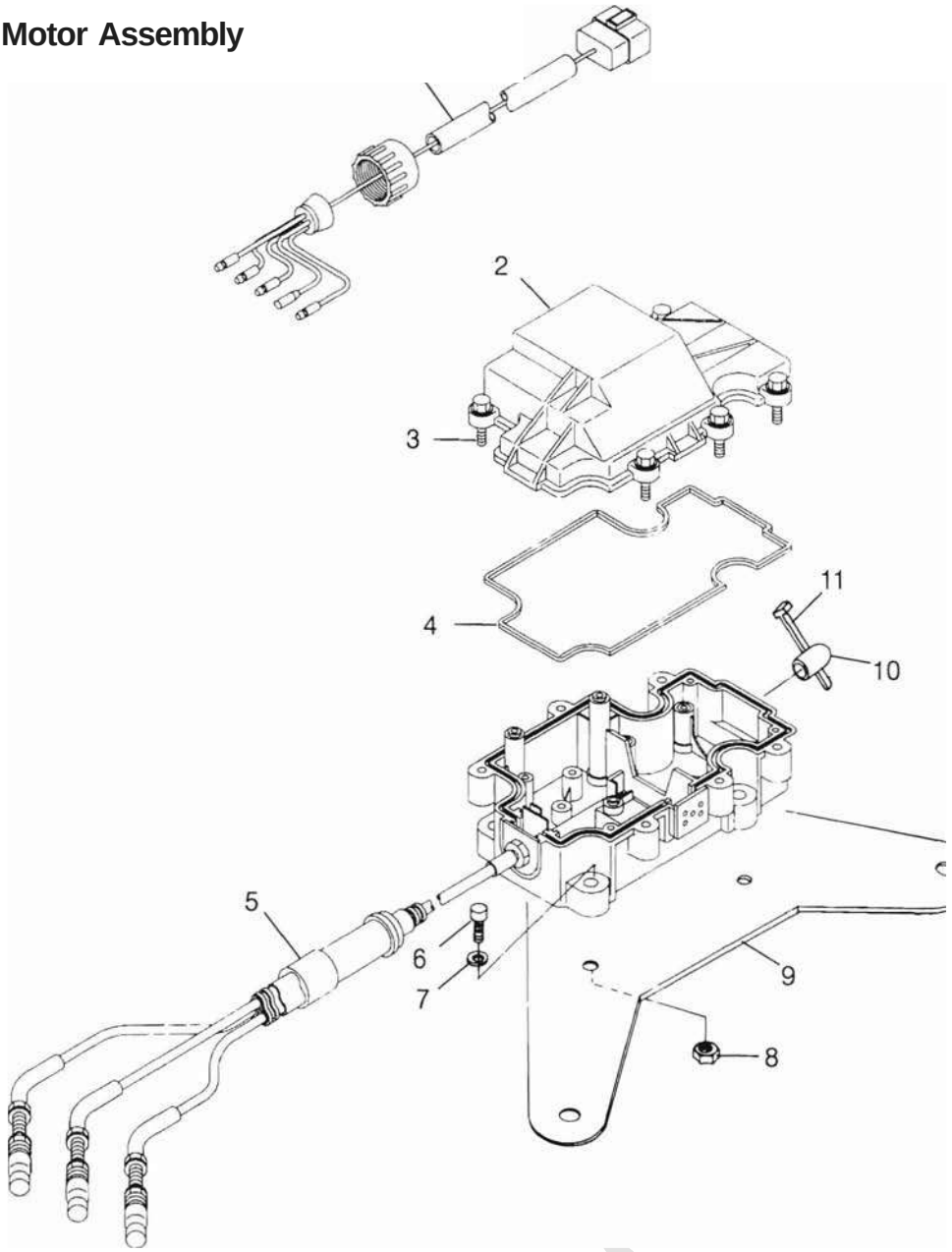
ELECTRICAL
Ignition System



1	3	Band. Wire
2	1	Asm., Plate
3	3	Screw and Washer
4	1	Asm., Screw and Washer
5	3	Comp., Flywheel w/Ring Gear
6		Cap. Spark Plug
7	3	Ignition Coil
8	1	CDI. System
9	1	Switch. Magnetic
10	2	Washer, Spring
11		Nut


Top Electrical Box
Components Assembled
Manual Reset
Circuit Breaker
Plastic Electrical Box
Assembled
3A Fuse
For Bilge
Pump
1/4A
Fuse-For
MFD
C.D.I. Unit
Starter Solenoid
Critical (-) Ground Con-
nections
Must be clean & tight
LR31
Ignition Coil (3)
Circuit Breaker
Electrical Box Latch (4)
Exploded View
Bottom Elecetrical Box
Exploded View
Top Elecetrical Box
Ignition Cable Clip

Exhaust Valve Motor Assembly



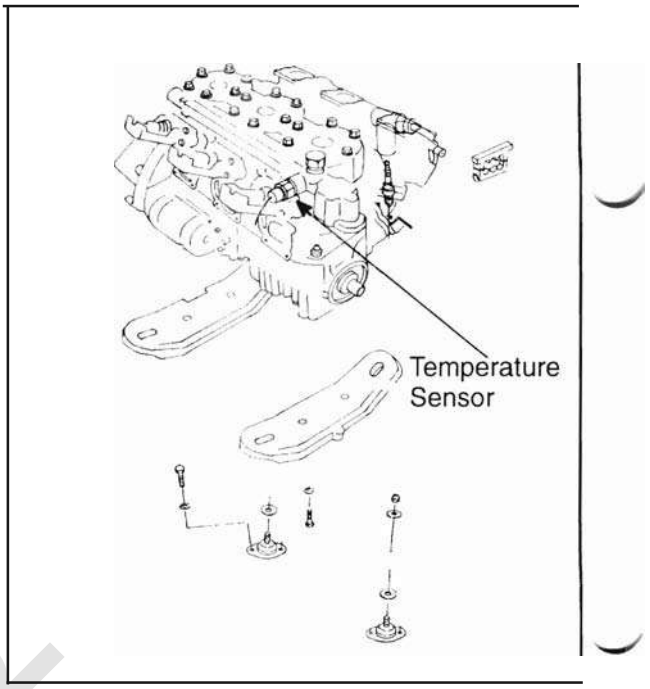
Ref.	Qty.	Description
1	1	Wire Terminal
2	1	Asm., Actuator (Incl. 3 ,4 ,5)
3	1	Bolt and Washer
4	1	O-Ring
5	1	Cable, Wire
6	4	Screw
7	4	Washer
8	4	Nut
9	1	Bracket, Valve Actuator (See Pg. NO TAG, Ref. NO TAG)
10	1	Plug, Actuator Box
11	1	Cable Tie

Coolant Temperature Warning Circuit Operation

The MFD light is controlled by a temperature/warning switch installed into the engine cooling system. When engine coolant temperature sensor reaches its "ON" temperature the switch closes, completing the current flow from the wire harness through the warning buzzer and to ground. The system should be tested periodically for proper operation.

Temperature Warning Circuit Test

1. Remove wire from temperature sensing switch located on upper water manifold.



Warning light in MFD is activated when temperature switch contacts are closed (overheat condition) and ground path is complete. The temperature sensor is located on the cylinder head/water nutlet manifold. Ground the sensor wire from MFD with engine running to see if temp light activates.

Temperature Sensor Test

The temperature/warning switch is normally open. Using a digital VOM set in the Ohms position, and with the wires disconnected, contact one test probe to the switch terminal and the other test probe to engine ground. The meter should show an open circuit. Heat the switch in a water bath to the "on" temperature listed below. Measure resistance of the switch. Reading should be less than .4 ohms.

CAUTION:

When testing the switch, heat only in a water bath. Never subject the sensor to an open flame or sensor damage will result. Do not immerse the wires in the water bath.

Warning Systems Operating Characteristics

Following is a quick reference chart showing how each model warns the operator and/or protects the engine when the engine overheats, or when a low fuel or oil condition exists.

Year	Model	Temp Sensor "ON" @ F/C	Light (MFD)	RPM Limit
1997	1997 SLX Pro785	180 F/82 C	Oil, Heat, Fuel	Heat 4200 rpm
1998	1998 SLX Pro 785	180 F/82 C	Oil, Heat. Fuel	Heat 4500 rpm

ELECTRICAL

RPM Limiter Circuits

RPM Limiter Function

An RPM limiting system (see models listed above) protects the engine by electronically limiting RPM in the event of engine overheat. This feature is designed to help prevent engine damage due to engine overheating.

Engine Overheat

If the engine overheats, the thermal switch becomes conductive and provides a ground path for the tan wire leading from the COI module and the Mult-Function Display. On the SLX Pro 785, the Multi-Function Display will displaya "HOT" warning message, the warning light will flash, and the engine RPM will be limited to approximately 4200 RPMs (4500 on 1998). A circuit within the COI senses the ground path connection and activates the limiting function. See diagram below.

Low Fuel

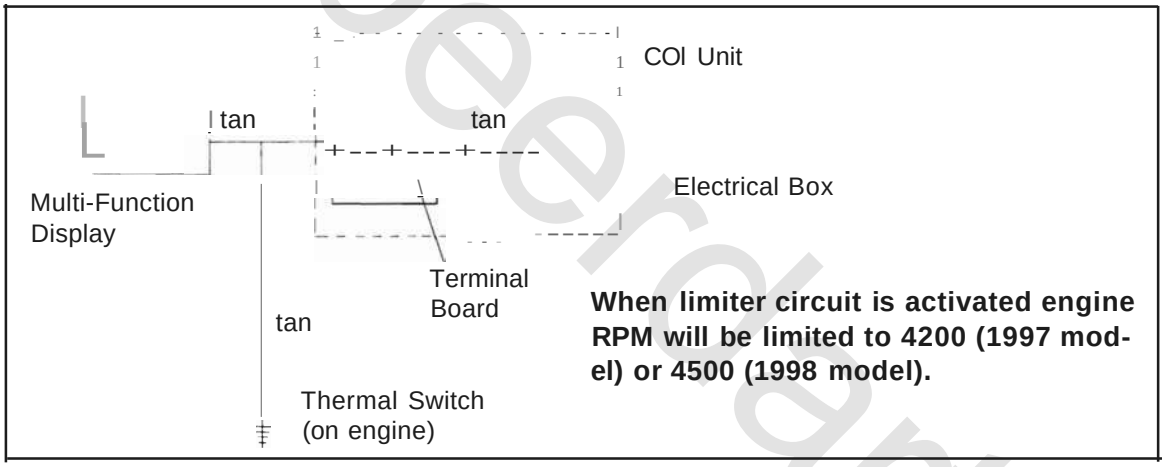
No low fuel limiters are present on this model.

Important Note: When the engine overheat circuit has caused the system to limit, it will *continue* to limit until *both* of the following conditions are met:

1. The problem that caused the initial limiting must be corrected (cool engine);

AND

2. The operator must momentarily release the throttle and allow the RPM to fall below 4200 (4500).



RPM Limiter System Troubleshooting

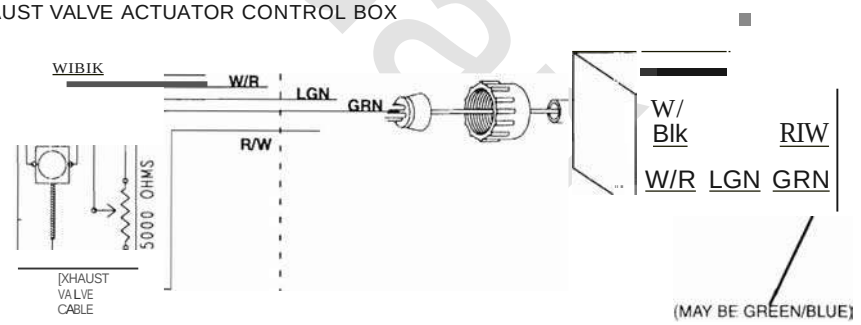
RPM Limiter System Troubleshooting flowchart is shown below.

1997 SLX Pro 785 (ILimits to 4200 RPM) 1998 SLX Pro (Limits to 4500 RPM)	
Open electrical box. Disconnect temperature sensor Tan wire from terminal board. Does system still limit with Tan sensor wire disconnected? No → Yes ↓	1. Test temperature sensor. See page 7.15. 2. Inspect Tan wire on sensor for shorts to ground. a. Replace / repair sensor and/or wiring. 3. Inspect cooling system for restrictions, leaks, or another problem which would cause overheating.
Inspect all Tan wires in terminal board area for contact with ground (should not be grounded). Is there a short? Yes → No ↓	Repair wires/terminal board.
Replace COI module and re-test.	

Exhaust Valve Electrical Control System Troubleshooting

The exhaust valve actuator can be checked by taking resistance measurements and applying a 12 volt DC battery source to the exhaust valve actuator motor. Follow the procedure below to determine if the actuator control unit is faulty or if the COI unit, or related wiring is at fault.

(Mounted on left rear of deck with grab handle bolts)
EXHAUST VALVE ACTUATOR CONTROL BOX



CAUTION: **Do not leave battery connected to the exhaust valve actuator wire terminals. Contact the terminals momentarily to move the valves in the desired direction, and then disconnect the probes.**

	Battery +	Battery -	Effect
Wire Color	*WIR*	WlBlk	Opens Valve
(terminal)	WlBlk	*WIR*	Closes Valve

ELECTRICAL
Exhaust Valve Electrical Control System Troubleshooting Continued.

1. Disconnect the multi-prong connector at the exhaust valve actuator.

2. Measure the resistance between the RIW and Green wires on the exhaust valve motor harness.
   SPECIFICATION: 5000 ohms ± 10%

3. Using a 12 volt shop battery, probe the W/Blk terminal with the negative side of the battery and probe the W/R terminal with the positive side of the battery. The exhaust valves should open.
   NOTE: Do not leave wires connected. Make only temporary connections with the probes.

4. Measure the resistance between the LGN wire and the Green wire on the exhaust valve motor harness.
   SPECIFICATION: 5000 ohms ± 10%

5. Reverse your connections ((W/R to the ground side of the battery and W/Blk to the positive side of the battery), The exhaust valves should close.

6. Measure the resistance between the LGN wire and the Green wire.
   SPECIFICATION: 860 ohms ± 10%

If the exhaust valve actuator successfully passes all of the above tests and the unit fails to function properly, either the COI unit or the wiring is at fault and must be either repaired (if wiring problem) or replaced.

Ignition System Testing -

All ignition system connections and components are contained within the electrical box with exception of the stator coils, stator wiring harness, ignition coil high tension leads and spark plug caps. Verify that all ignition circuit wire connections are clean and tight. Refer to electrical box exploded view at the beginning of this section for critical ground connection locations. Disconnect component wires before testing resistance. Refer to individual wiring diagram for resistance specifications and wire color.

Condition: No Spark

Disconnect the black/yellow wire from the COI Module to the engine stop switch. Does it have a spark? Yes-+ No↓	Measure the resistance of the stop switch. In the run position (lanyard lock plate installed) the reading must be infinite. Repair or replace as necessary.
Disconnect the stator to COI module wires. Test the resistance values of the stator coils and compare results to the individual wiring diagram or to the chart on page 7.1. Are the resistance values within specs? Yes-+ No↓	Disconnect and check the secondary ignition coil resistance. Refer to the resistance values listed on the wiring diagram or on the chart on page 7.1. If the coil resistance values are within specs, replace the COI module
Isolate which component is faulty. Remove the flywheel and stator. Recheck the resistances; look for pinched or bare harness wires; or replace the stator assembly. Reference engine section for replacement procedure. Note: Ground connections and ignition coil primary connections are extremely important for proper system function. Be sure to thoroughly clean and tighten all wiring connections in the system.	

Ignition Timing Chart

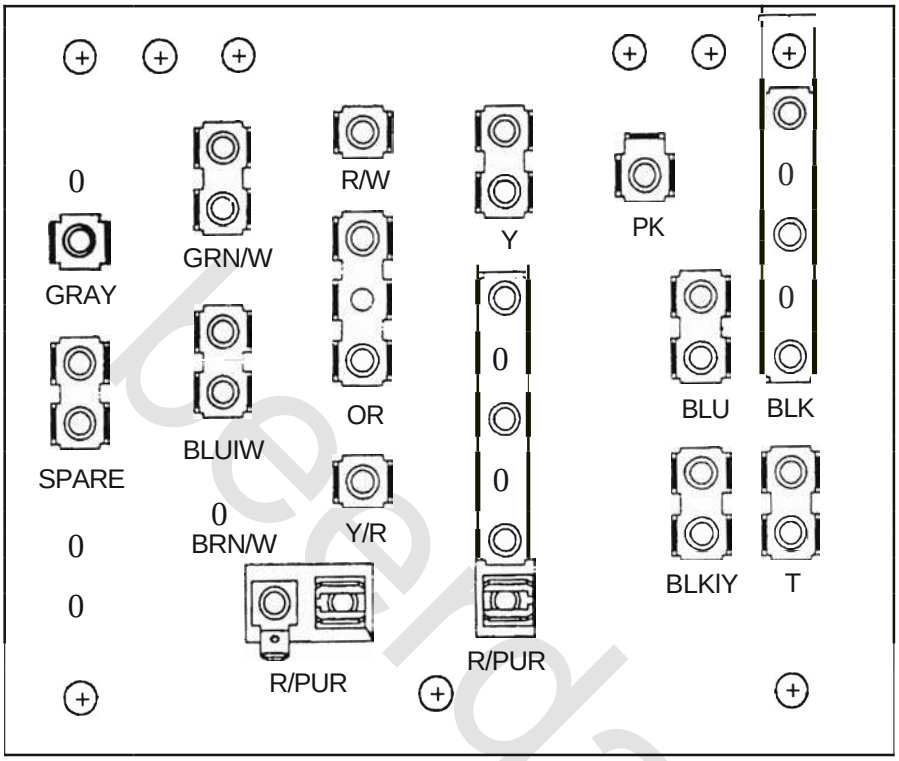
EC78ZPWE01- 125mm Rod, 68mm Stroke Degrees to Piston Position - BTDC

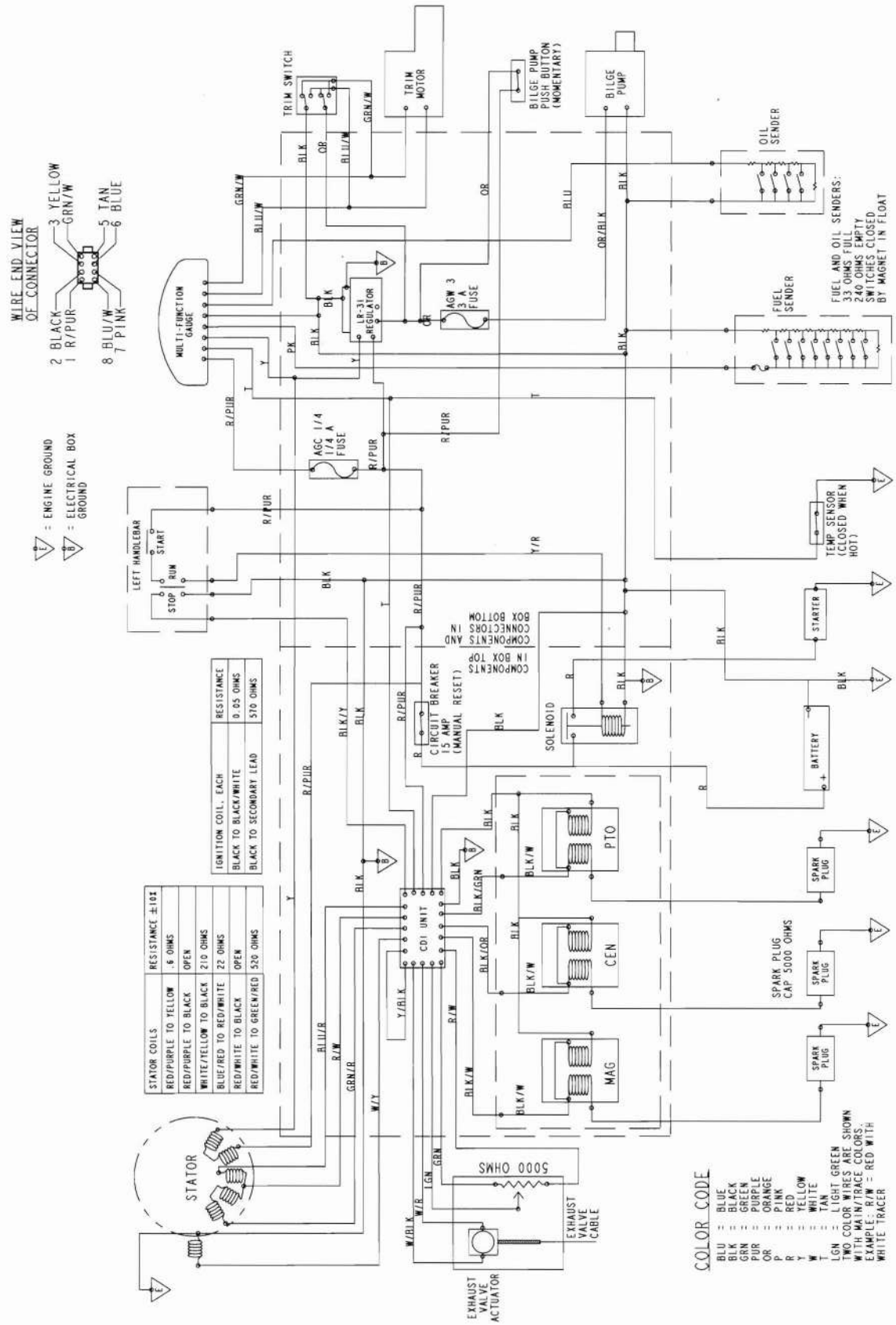
Degree BTDC	*(mm/inch)*	Degree BTDC	(mm/Inch)
12	0.94mm *10.037"*	25	4.01mm *10.158"*
13	*1.11mm / 0.044"*	26	*4.33mm/0.171"*
14	1.28mm *10.050"*	27	4.66mm *10.184"*
15	1.47mm *10.058"*	28	*5.00mm / 0.197"*
16	1.67mm *10.066"*	29	5.35mm *10.211"*
17	1.88mm *10.074"*	30	5.72mm *10.225"*
18	2.11 mm *10.083"*	31	6.09mm *10.240"*
19	2.34mm *10.092"*	32	6.47mm *10.255"*
20	2.59mm *10.102"*	33	6.86mm *10.270"*
21	2.85mm *10.112"*	34	7.27mm *10.286"*
22	*3.13mm / 0.123"*	35	7.68mm *10.302"*
23	3.41mm *10.134"*	36	8.10mm *10.319"*
24	3.71mm *10.146"*	37	8.51mm *1.336*

ELECTRICAL
Electronic Module Function

Module	Function	Comments
LR31	*112* wave rectifier and voltage regulator.	Switched Load Alternator Controlled Switch (ACS). (for open battery protection)-

Terminal Board, Typical




WIRE END VIEW OF CONNECTOR
3 YELLOW GRN/W
2 BLACK
1 R/PUR
5 TAN
6 BLUE
8 BLU/W
7 PINK
= ENGINE GROUND
= ELECTRICAL BOX GROUND
TRIM SWITCH
TRIM MOTOR
BILGE PUMP PUSH BUTTON (MOMENTARY)
BILGE PUMP
OIL SENDER
FUEL SENDER
FUEL AND OIL SENDERS: 33 OHMS FULL 240 OHMS EMPTY SWITCHES CLOSED BY MAGNET IN FLOAT
MULTI-FUNCTION GAUGE
LR-31 REGULATOR
AGW 3 3 A FUSE
AGC 1/4 1/4 A FUSE
LEFT HANDLEBAR
START
RUN
STOP
TEMP SENSOR (CLOSED WHEN HOT)
STARTER
BATTERY
SOLENOID
CIRCUIT BREAKER 15 AMP (MANUAL RESET)
COMPONENTS IN BOX TOP
COMPONENTS AND CONNECTORS IN BOX BOTTOM
IGNITION COIL, EACH | RESISTANCE
BLACK TO BLACK/WHITE | 0.05 OHMS
BLACK TO SECONDARY LEAD | 570 OHMS
STATOR COILS | RESISTANCE ±10%
RED/PURPLE TO YELLOW | .6 OHMS
RED/PURPLE TO BLACK | OPEN
WHITE/YELLOW TO BLACK | 210 OHMS
BLUE/RED TO RED/WHITE | 22 OHMS
RED/WHITE TO BLACK | OPEN
RED/WHITE TO GREEN/RED | 520 OHMS
CDI UNIT
PTO
CEN
MAG
SPARK PLUG
SPARK PLUG CAP 5000 OHMS
STATOR
5000 OHMS
EXHAUST VALVE CABLE
EXHAUST VALVE ACTUATOR
COLOR CODE
BLU = BLUE
BLK = BLACK
GRN = GREEN
PUR = PURPLE
OR = ORANGE
P = PINK
R = RED
Y = YELLOW
W = WHITE
T = TAN
LGN = LIGHT GREEN
TWO COLOR WIRES ARE SHOWN WITH MAIN/TRACE COLORS.
EXAMPLE: R/W = RED WITH WHITE TRACER