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COMMANDER 950™ MPI SERVICE PARTS

Fuel Injector Kits (Universal)

These injector kits will enable you to upgrade the fuel delivery system of your engine. This is a definite necessity when you begin modifying a stock engine with such items as a performance fuel pump and camshaft or modifying the stock cylinder heads or upgrading to new performance cylinder heads, adding headers, high-flow throttle bodies, etc.

The fuel injectors here are all top-fed, Bosch-style with various flow ratings as shown below. The chart also equates the injector fuel flow potential to a engine horsepower rating.

NOTE: Maximum marine horsepower ratings are lower (more conservative) because marine engines typically run at a higher brake specific fuel consumption (B.S.F.C.) than comparable automotive applications. Due to the fact that marine engines are run at extended periods of time at wide open throttle, the maximum recommended injector duty cycle is 85%. Applications that only run for short periods of time at wide open throttle can safely run at a slightly higher duty cycle.



MAXIMUM HORSEPOWER	INJECTOR FLOW (lbs/hr)	IMPEDANCE	QTY	PART NUMBER	
			1	522-1401	
200 LID	14		4	522-1404	
200 HP	14	High	6	522-1406	
			8	522-1408	
			1	522-1901	
275 LID	19	Himb	4	522-1904	
275 HP	19	High	6	522-1906	
			8	522-1908	
			1	522-2401	
250 UD	24	Himb	4	522-2404	
350 HP	24	High	6	522-2406	
			8	522-2408	
		High	1	522-3001	
405 UD	00		4	522-3004	
425 HP	30		6	522-3006	
			8	522-3008	
			1	522-3601	
505 110	00		4	522-3604	
525 HP	36	High	6	522-3606	
			8	522-3608	
		High	1	522-4201	
200 110	40		4	522-4204	
600 HP	42		6	522-4206	
				8	522-4208

MAXIMUM HORSEPOWER	FLOW (lbs/hr)	IMPEDANCE	QTY	NUMBER	
			1	522-5001	
750 HP	50	High	4	522-5004	
730111			6	522-5006	
			8	522-5008	
			1	522-5501	
850 HP	55	Low	4	522-5504	
630 HF	55	LOW	6	522-5506	
			8	522-5508	
			1	522-6501	
1000 HP	65	Low	4	522-6504	
1000 HF	65		6	522-6506	
			8	522-6508	
			1	522-7501	
1150 HP	75	Low	4	522-7504	
1130 HF	73		6	522-7506	
			8	522-7508	
			1	522-8501	
4000 115		Low	4	522-8504	
1300 HP	85		6	522-8506	
			8	522-8508	
		_	1	522-9501	
4450 UD		Low	4	522-9504	
1450 HP	95		6	522-9506	
				8	522-9508

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CHASHAFTS

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WATER COMPONENTS	

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COMMANDER 950™ MPI SERVICE PARTS

Part #



Intake Manifolds-Small Block Chevrolet V-8

350 early & late cylinder heads

4 bbl square flange 9901-102-1

350 Vortec/Gen 1 cylinder heads

4 bbl square flange 9901-107

9901-102-1

Intake Manifolds-Big Block Chevrolet V-8

Oval port cylinder heads

Standard deck with square flange 9901-211

Rectangular port cylinder heads

Standard deck with square flange
Standard deck with DOMINATOR flange
Tall deck with square flange
Tall deck with DOMINATOR flange
Tall deck with DOMINATOR flange
9901-207
9901-208



9901-205



9901-206



9901-207



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COMMANDER 950	O™ MP	PI SERVICE PARTS	Part #	CARB
		O-ring, Holley fuel injector		CARBURETORS
	400		534-104	NECTION .
534-104		Plate, Fuel Pump Block-Off		2
		Chevrolet – Small Block V8 Chevrolet – Big Block V8	12-814	RIEL PLAPS
1	2-814	Pump, Fuel Electric		N N
512-105			512-105	NEKE MANTEDS
1.00	534-78	Rails, universal billet aluminum high-flow le	vel	SIPEROWRIGES
		12" length	534-78	
512-503		18" length	534-79	FLAME ARRESTORS
		36" length	534-80	
	O),	Regulator, Fuel pressure		HENTION SYSTEMS & COMPONENTS
2			512-503	STRAS
0040.407		Relay, 35 amp		CAMSHAFTS
9912-137			9912-137	AFTS
	The same of the sa	Retainer, Holley fuel injector		EALES
53	34-103		534-103	25
		Sensors		WAITE
9920-107		Air Temp.	9920-107	
		Coolant Temperature	9920-108	SHACO ATHA
992	20-108	Sensor, MAP		OVERS
9920-106		Sensor, Throttle position	9920-106	TEJHCAL Neoraatin
5=3(New style	9920-104	
		Old style	9920-103	N.
9920	0-104	2.2 3,12	67	

1733 [4] 1733 [4] 1741 [4] 174

COMMANDER 950™ MPI SERVICE PARTS

Part #





Software	
Commander 950 ECU (Mapping & Set-up)	534-144
Pro-Jection MPFI w/ E-PROM	534-117
Pro-Jection (version 3.35)	534-74
Pro-Jection TBI w/ E-PROM	534-77
Pro-Jection 4DI TBI w/ E-PROM(version 3.35)	534-118



Throttle Body Assemblies

Universal 1000 CFM	9900-135
Universal 2000 CFM	9900-139

Commander 950 ECU Primary Wiring Harness

534-142 ECU-to-sensors (Holley MPI systems)



Commander 950 ECU Injector Wiring Harness

Holley MPI system (over fuel rail routing)	534-129
Holley MPI system (under intake plenum routing)	534-130

Commander 950 ECU Accessory Wiring Harness



Cooling fan relay	534-134
Crank trigger w/ magnetic pick up	534-135
Knock sensor	534-136
Chevrolet HEI distributor	534-138
Ford TFI distributor	534-139

www.holley.com

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HOLLEY MARINE THROTTLE BODY FUEL INJECTION SYSTEMS

The rev of a finely-tuned engine. Bursts of lightning-quick acceleration. The feel of full power and the thrill of running at wide-open throttle. It all adds up to a successful and exciting day on the water. But how often does this really happen? If your answer is "less than always", you owe it to yourself to discover the one fuel system product that can change the way you think about boating every time you turn the key.

Introducing Holley Marine Throttle Body Fuel Injection.
An extensive line of universal throttle body fuel injection
systems for carbureted V6 and V8 marine engines. Holley throttle
body fuel injection systems are available to retro-fit V6 engines
and all small block and big block V8 carbureted marine engines up
to 500 horsepower. These Holley systems meet all U.S. Coast Guard
test specification and SAE marine requirements.



System Features

Holley marine throttle body fuel injection systems consist of a number of specially designed components that combine to form a very effective fuel delivery system for optimum performance. They're composed of three (3) key elements, the throttle body, fuel pump and electronic control unit (ECU). Two 2-bbl systems are available. The first includes a 670 CFM throttle body unit, an adjustable "2D" digital electronic control unit (ECU) and an in-line electric marine fuel pump. The other system is identical except that it features Commander 950 electronics for the ultimate engine management and control. Four barrel systems are available only with Commander 950 electronics and come with either a 650, 700 or 900 CFM throttle body.

Improved Throttle Bodies

Working in concert with fuel pressure is air volume. Holley marine throttle bodies are available in various CFM sizes for engines that are rated up to 500 horsepower. The two barrel design has been upgraded with an all-new injector pod casting. This pod houses a new and improved bottom-fed injector that will further improve performance and reliability parameters over the old design.

Holley four barrel throttle bodies also benefit from the new injector pod casting and bottom-fed injectors. In addition, however, the four barrel throttle linkage has been modified to a progressive action. The primary throttle plates are now the first to open as the throt the control is advanced off idle. When the primaries have been opened to a certain point, the secondary throttle plates begin to open. The throttle action is akin to a mechanical secondary, double pump carburetor. Performance and throttle response is enhanced with this configuration, throttle action is easier and power application more controllable, especially coming off idle or during docking.

Made of die cast aluminum, Holley marine TBIs feature an adjustable pressure regulator to accommodate the fuel require ments of most pleasure boat marine engines. They are factory pre-set at 21 PSI, but have an adjustment range of 12 to 25 PSI.

Finally, Holley marine TBIs incorporate a fuel/fume tube for those engines that don't have that provision on their flame arrestor.

Efficient Fuel Pump

The electric marine fuel pump provided is designed to provide the injectors with a steady supply of required fuel. It's a rugged gerotor design that works quietly and efficiently and offers long-lasting durability.





























HOLLEY MARINE THROTTLE BODY FUEL INJECTION SYSTEMS

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Holley digital marine ECUs are user-friendly, too. The two barrel systems, as previously mentioned, utilize either digital "2D" or Commander 950 electronics, depending on part number ordered. The "2D" ECU is a rugged and reliable micro-processor-based engine management controller that provides adjust ments for IDLE, ACCELERATOR PUMP, MAIN JET, HIGH RPM JET AND CHOKE. The Commander 950 ECU is discussed on page 56.

Four barrel systems utilize the awesome Commander 950 digital ECU. The advantages of the Commander 950 are especially obvious for those who need or want a customized fuel curve. Such capability would be desirable when installing such a system on a modified motor. Stock fuel curves, in such instances, may not have enough functional variability to accommodate the fuel requirements of such an engine over its operational range. The Commander 950 ECU, however, has all the power and capability needed to accomplish this task. The software included with each Commander 950 enables the user to view the fuel map on his laptop computer and modify it, accordingly. Pre-set, downloadable, base fuel maps are available at www.holley.com. A true, custom fuel map is required for the ultimate in performance and responsiveness. Features and benefits of the Commander 950 are detailed earlier in this section.

Summary

Because there are fewer moving mechanical parts, Holley throttle body fuel injection systems provide superior fuel handling and control over that afforded by conventional fuel systems which are sometimes affected by angularity, vibration and temperature and humidity variations. Inevitably, you spend less time crossing your fingers and more time enjoying your boat. The bottom line here is that whether you're a salt water or fresh water boating enthusiast, any one of these Holley systems can offer a practical, yet affordable way to get consistently better performance out of your marine engine. This, in turn, can provide superior control of and confidence in your vessel, over a wider range of weather and sea conditions.



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COMMANDER 950™ 4-BBL THROTTLE BODY FUEL INJECTION

Features

- Commander 950 ECU
- Complete stand-alone, speed-density systems
- Square flange throttle body
- Die cast aluminum throttle body has a tumble-polished finish
- Allows infinite adjustment of the fuel map via your IBM-compatible PC
- Programmable spark curve (see system requirement)
- MAP sensor
- Oxygen sensor
- Idle air control motor
- 45 PPH injectors used with 650 CFM throttle body
- 65 PPH injectors used with 700 CFM throttle body
- 85 PPH injectors used with 900 CFM throttle body
- Self-priming, in-line electric gerotor fuel pump (410 PPH @ 15 PSI)
- 5" airhorn facilitates use of performance carburetor air cleaner assembly
- Designed for bolt on, plug-in installation
- Installed height of throttle body is no greater than a carburetor
- Detailed installation/instruction booklet is included

System Requirements

- Four barrel (square flange) intake manifold (see Intake manifolds in this catalog)
- IBM-compatible personal laptop computer with WIN 3.1, 95, 98 or NT software
- The programmable timing feature of this system is available either by:
 - Using one of the following distributors: 1980-1/2 through 1990 GM 7-pin (coil-in-cap); 1984-96 GM (external coil); 1984 - later Ford 7-wire TFI. Use wiring harness adapter P/N 534-47 for GM distributors and P/N 534-48 for the Ford distributor.
 - Using a magnetic or Hall Effect crank trigger system when used in conjunction with an aftermarket CD ignition system such as the Holley ANNIHILATOR, P/N 800-150 or 800-250.

Benefits

- · Fantastic driveability
- Unbelievable throttle response
- Increased power
- Improved engine efficiency
- Great looks

Available Separately

- Holley 4-bbl intake manifold (see Intake manifolds in this catalog)
- Performance flame arrestor









NTEKE



FLAME ARRESTORS THROTTLE BOOKS

RATION SYSTEMS

CAMSHAFTS

HEADERS

WATER

VALVE COVERS

TECHNICAL NFORMATION

COMMANDER 950™ 4-BBL THROTTLE BODY FUEL INJECTION



The Holley line of 4-bbl throttle body fuel injection systems has been revamped and upgraded with all new electronics and injectors, and also some significant throttle body design improvements.

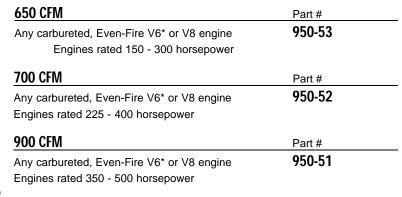
Electronic capability has been significantly upgraded with the inclusion of the Commander 950 ECU. Totally programmable, this digital ECU is defining the state-of-the-art in its sophistication and capability to control a myriad of engine functions relating to the management of an engine's fuel and ignition functions.

A new fuel injector design is now being used with functional capabilities that are more in line with the increased power and response of the Commander 950 ECU. As a result, a qualitative improvement has been realized in idle control, power application and overall throttle response.

Throttle bodies have been redesigned to accommodate a new injector pod and wiring harness for the new fuel injectors. Also, secondary throttle linkage is now progressive in operation, as opposed to the 1:1 ratio of the former design. This linkage reconfiguration, when combined with improvements noted above, has further contributed to the better overall driving experience of a Commander 950 throttle body system equipped vessel, especially in off-idle and during part-throttle cruise situations.

New system part numbers have been released to reflect these dramatic changes. The following systems are available.

NOTE: These systems are designed only for fuel and spark management.





^{*} Includes the Chevrolet 4.3LV6 engine

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COMMANDER 950™ 2-BBL THROTTLE BODY FUEL INJECTION



Commander 950™ 2-bbl Throttle Body Fuel Injection

Part#

All carbureted V8 and Even Fire V6 engines (*)

950-21

700-21

- · Complete stand-alone system
- Engines w/o computer control
- Engines rated up to 275 horsepower
- · 670 CFM die cast aluminum throttle body
- Idle air control motor (IAC)
- · Commander 950 features listed on page 56.

(*) Includes the Chevrolet 4.3L V6 motor





























PRO-JECTION® 2-BBL THROTTLE BODY FUEL INJECTION



All carbureted V8 engines

· Complete stand-alone system

- · Engines w/o computer control
- Engines rated up to 275 horsepower
- At least 15" of engine vacuum at idle 670 CFM die cast aluminum throttle body
- Digital "2D" computer (ECU) is rugged and reliable
- · ECU provides adjustments for

Choke

Idle
Accelerator pump
Main jet
High RPM jet

Features common to both 2-bbl systems

- 85 lb./hr. injectors
- Fuel pressure regulator fuel pressure is pre-set at 21 PSI fuel pressure is adjustable from 12 - 25 PSI
- Gerotor-type 12-Volt electric marine fuel pump flows 300 lbs. of fuel per hour at 15 PSI
- Stainless steel flame arrestor (5 3/4" x 3") is included
- Adapters included for either spread bore or square flange 4-bbl intake manifolds
- Wiring harness is designed for "plug-in" installation temperature insulated weather sealed
- Includes complete and detailed installation instructions.

System Requirements

- Adequate hatch clearance overall height of the installed system is approximately 1" higher than the carburetor.
- 950-21 system requires access to a IBM-compatible personal laptop computer with WIN 3.1, 95, 98 or NT software
- Programmable timing feature is available on 950-21 system with use of certain distributors. See 4-Bbl throttle body systems on page 71 for details.

















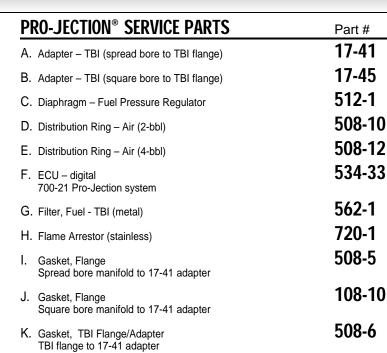












522-74







L. Injector, Fuel (65 PPH)

		PRO-JECTION® SERVICE PARTS	Part #	CARE
		A. Injector, Fuel (85 PPH)	522-26	CARBURETORS
A.		B. Kit, Renew - 2-bbl	503-3	Z_
	\	C. Kit, Renew - 4-bbl	503-6	MOLCEN
C.	B. C	D. Plate, Fuel Pump Block-Off Chevrolet – Big Block V-8 Chrysler – Big Block V-8 Chrysler – Small Block V-8	12-813	RIEL PLAPS RESULATURS
	n n	E. Plate, Fuel Pump Block-Off Chevrolet – Small Block V-8	12-814	SULPENAM
	υ.	F. Pump, Electric Fuel (300 PPH @ 15 PSI)	512-103	
<u>© 111 0</u> E.		G. Pump, Electric Fuel (410 PPH @ 15 PSI)	512-105	SIPROHREERS
		H. Sensor, Coolant Temperature	534-2	
	F.	I. Sensor, Throttle Position	543-3	FLANE ARRESTORS THROTTLE BOOKS
		J. TBI Assembly (670 CFM) 700-21 Pro-Jection system	500-13	
G.		K. TBI Assembly (900 CFM) 700-51 Pro-Jection system	500-19	RAITON SYSTEMS & COMPONENTS
0.0	Н.	L. TBI Assembly (700 CFM) 700-42 & 700-52 Pro-Jection systems	500-20	CHAISHAFTS
l.		M. Wiring Harness	534-34	<u> </u>
4				HEALENS
	J.			WHEN
K.				WHUTE COVERS
	L.			TECHNICAL PECRAATON
M.				MEX
			75	

FUEL PUMPS



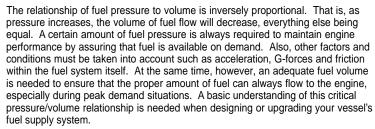
Holley carries a selection of both mechanical and electric marine fuel pumps for carbureted engines installed in pleasure boats, performance boats or race boats. Electric pumps are also available for fuel injected applications. See the listings below. Before selecting the correct fuel pump for your vessel, however, a basic understanding of the engine's fuel requirements is necessary.

Fuel Requirements

Typically, at wide open throttle, full power, an engine requires 0.5 lbs. of fuel per horsepower every hour. A gallon of gasoline weighs approximately 6 lbs. Therefore an engine rated at 300 horsepower will require about 25 gallons (150 lbs.) of fuel every hour.

(300 HP x .5 lbs. = 150 lbs. of fuel 150 lbs./6 lbs. = 25 gallons per hour)





Fuel Line System

You must follow all applicable U.S. Coast Guard regulations when running fuel lines. Do not use a rubber hose when hard lines should be used or are required. You should, however, avoid running lines near hot spots if at all possible. Avoid sharp bends in the fuel line in favor of more gradual curves. Use quality high-flow filters. They will be a lot less restrictive than standard filters and will filter the fuel just as effectively. If you're pushing a lot of horsepower out of the engine, a larger size fuel line may be required to assure that the fuel system will be able to supply the engine's fuel demand.





Fuel line sizes

HOLLEY ELECTRIC MARINE FUEL PUMPS - CARBURETED ENGINES



67 GPH Electric Fuel Pump

Part #

Part #

712-802-1

712-815-1

712-801-1

























Features

- Flows 67 gallons per hour @ 5 PSI
- Pressure pre-set at 7 PSI
- Regulator not required
- Pressure relief valve is externally accessible
- Pump design is more tolerant of contaminated fuels
- •Total pump weighs less than 3 lbs.
- Includes mounting bracket
- 3/8" inlet and outlet ports
- Fuel/fume tube provision
- Motor draws only 2 Amps.
- 7-1/2 Amp fuse recommended
- Gasoline and alcohol compatible
- Meets U.S. Coast Guard regulations
- Not designed or recommended for use with fuel injection systems

70 GPH Electric Fuel Pump

Features

- Flows 70 gallons per hour @ 9 PSI
- Pressure pre-set at 14 PSI
- Includes regulator P/N # 12-803
- Pressure relief is externally accessible
- Pump design is more tolerant of contaminated fuels
- •Total pump weighs less than 3 lbs.
- · Includes mounting bracket
- 3/8" inlet and outlet ports
- Fuel/fume tube provision
- Motor draws around 3 Amps.
- 7-1/2 Amp fuse recommended
- Gasoline and alcohol compatible
- Meets U.S. Coast Guard regulations
- Not designed or recommended for use with fuel injection systems

120 GPH Electric Fuel Pump

Part #

Features

- Flows 120 gallons per hour @ 9 PSI
- Pressure pre-set at 14 PSI
- Includes regulator
- Compatible with alcohol or methanol fuel
- Pressure relief is externally accessible
- · Pump design is more tolerant of contaminated fuels
- •Total pump weighs less than 3 lbs.
- · Includes mounting bracket
- 3/8" inlet and outlet ports
- Fuel/fume tube provision
- · Motor draws around 4 Amps. • 7-1/2 Amp fuse recommended
- · Gasoline and alcohol compatible
- Meets U.S. Coast Guard regulations
- Not designed or recommended for use with fuel injection systems



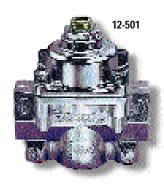




Le Lucier Les FUEL SYSTEMS

CARBURETOR FUEL PRESSURE REGULATORS

Part #



Features

• 3/8" NPTports

.220" (7/32") restriction

• Includes mounting bracket

• Low Pressure (1-4 PSI)

• High Pressure (4-1/2-9 PSI)

 $_{4^{1/2}-9}$ PSI, Standard 12-803

Chrome **12-501**

1-4 PSI, Standard **12-804**

Chrome **12-500**

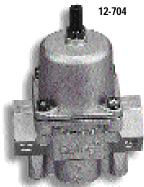
Features

• Regulates from 4-1/2 to 9 PSI

• One 1/2" NPTinlet and two 1/2" NPToutlet ports

• .437" (7/16") restriction

· Includes mounting hardware and AN style fittings



Features

• Regulates from 4-1/2 to 9 PSI

· One -8 inlet port and four -6 outlet ports

• .437" (7/16") restriction

• Aluminum billet body and top casting cover are hard coat anodized

• Three fuel pressure gauge mounting options (fuel pressure gauge not included)

• Includes mounting hardware and AN style fittings



12-704

12-707

















ELECTRIC FUEL PUMP SERVICE KITS

Application
712-801-1, 712-802-1 and 712-815-1 Fuel Pumps

112-001-1, 11	12-002-1 and / 12-013-1 Fuel Fullips	
PART NO.	DESCRIPTION	APPLICATION
A. 12-805	Check valve kit	712-801-1 pump
A. 12-806	Check valve kit	712-802-1 pump
A. 12-816	Check valve kit	712-815-1 pump
B. 12-807	Diaphragm repair kit	12-803, 12-804 regulators
C. 712-808	Lower housing/seal kit	712-801-1, 712-802-1 pumps
C. 712-817	Lower housing/seal kit	12-815 pump
D. 12-811	Rotor and vane kit	712-801-1, 712-802-1, 712-815-1
E. 12-855	Armature cap and brush kit	712-801-1, 712-802-1, 712-815-1
F. 36-183	Master repair kit and parts assortment	712-801-1, 712-802-1, 712-815-1

Application 712-703 VoluMAX Electric Pumps

Fuel Pump Block-Off Plates – Chrome		
PART NO.	DESCRIPTION	APPLICATION
l. 12-813	Mechanical fuel pump mou	unting pad cover
		Big block Chrysler
		Small block Chrysler
1 12-814	Mechanical fuel nump mounting had cover	

Small block Chevrolet Big block Chevrolet

























HOLLEY ELECTRIC MARINE FUEL PUMPS - FUEL INJECTED ENGINES

Holley universal marine electric fuel pumps for fuel injected engines meet all applicable U.S. Coat Guard regulations and will work well either on pleasure boats equipped with stock motors or performance and race boats equipped with engines built for maximum performance. Utilizing a reliable and quiet gerotor pump design, they will provide a smooth and continuous fuel flow whatever the engine's fuel demand. Two are available in different flow ratings:



50 GPH Electric Fuel Pump

Part #

712-500

Features

• Designed only for use on throttle body injected engines

- Flows 50 gallons per hour (300 lbs./hr.) @ 15 PSI &40 GPH @ 45 PSI
- Pressure deadheads at 85 PSI
- Motor draws around 7.8 Amps @ 15 PSI
- 3/8" inlet and outlet ports
- Meets U.S. Coast Guard regulations
- · Not designed or recommended for use with carburetors



68 GPH Electric Fuel Pump

Part #

Features

- Designed only for use on fuel injected engines
- Flows 68 gallons per hour (410 lbs./hr.) @ 15 PSI & 50 GPH @ 45 PSI
- Pressure deadheads at 120 PSI
- Motor draws around 9.5 Amps @ 15 PSI
- 3/8" inlet and outlet ports
- Meets U.S. Coast Guard regulations
- · Not designed or recommended for use with carburetors



Fuel Line Safety Valve (Anti Siphon Valve)

Part #

This safety valve is designed to mount between the fuel pump 10-10038 and fuel cell or tank of a vessel. It opens by vacuum as the pump draws fuel from the tank or cell. It is non-restrictive and can flow up to 180 gallons per hour. Should the fuel pump or engine stop running or the fuel line become disconnected, the valve instantly closes and prevents additional fuel from escaping from the tank or cell. In case of an accident, fuel will be prevented from puddling onto the ground, under the vehicle. It also prohibits possibility of fire traveling through the fuel line to the tank. The Holley fuel line safety valve is probably the single most important safety device that you can install on your vessel.

Fitting Size: 3/8 NPT



512-105