



# PRODUCT INFORMATION

## DF90/115

FOUR STROKE / Electronic Fuel Injection

**SUZUKI**

*Four*  
Electronic Fuel Injection



# Fully Committed to the Future

Expanding Suzuki's four-stroke DF line of outboards, the new DF90 and DF115 are the product of years of experience in the design, development and manufacturing of motorcycle, automotive and outboard engines. Experience that has resulted in environmentally friendly, award-winning designs.

Suzuki engineers have gone to great lengths to keep both 1950cc engines as compact as possible. The utilization of an offset drive shaft, combined with a two-stage mixed cam drive—a first for any outboard—offers overall compactness as well as increased performance. Suzuki engineers also worked hard to make these outboards as quiet as possible. A larger silencer, a very low 620 rpm idle speed and stiffer crankshaft, crankcase, engine holder and cowling all work together to reduce engine noise and vibration.

Performance is delivered with the engine's superior power and enhanced prop efficiency due to the use of a 2.59 gear ratio, large pitch and diameter prop.

These motors not only pass the 2006 EPA exhaust emission standards, their clean, efficient operation has allowed them to comply with the 2008 CARB\* which represents a 65% reduction from the 2006 EPA\*\* emission standards.

Committed to the future, Suzuki has and will continue to provide boaters with the best in performance, reliability and durability it has to offer.



DF90

DF115

\* Exhaust emission regulation set by the California Air Resources Board.

\*\* Exhaust emission regulation set by the U.S. Environmental Protection Agency.

The following points have been kept in mind in the design of the DF90 and DF115 outboard motors.

- ① Create an overall design that is as compact as possible.
- ② Offer boaters low fuel consumption, low noise level and low vibration.
- ③ Provide boaters with an outboard that delivers maximum power and performance.
- ④ Incorporate Sequential Electronic Fuel Injection into a 4-stroke outboard.
- ⑤ Ensure Compliance with CARB (California Air Resources Board) exhaust emission standards set to take effect in the year 2008 and EPA 2006 exhaust emission standards.

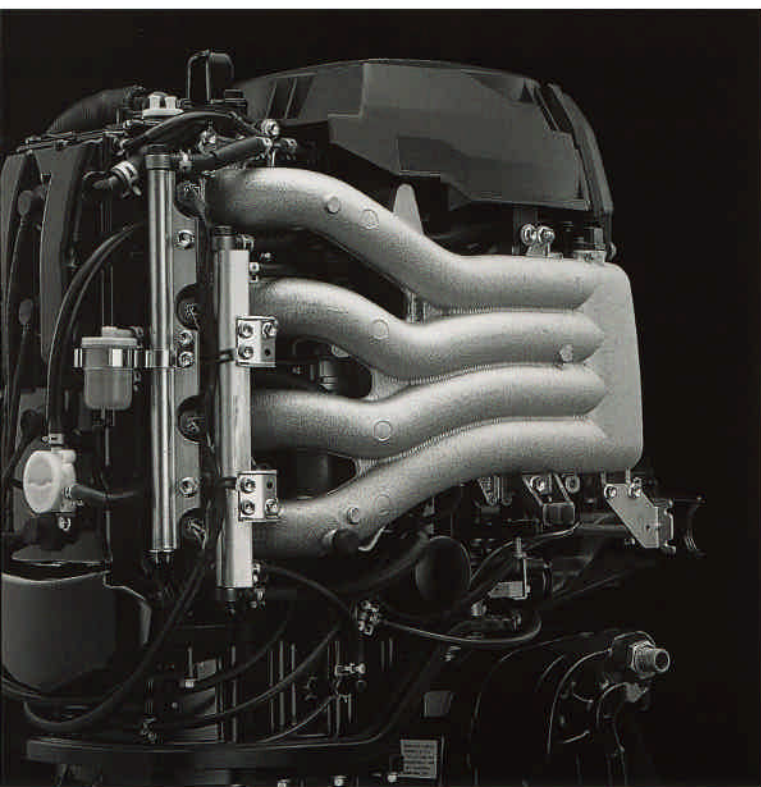
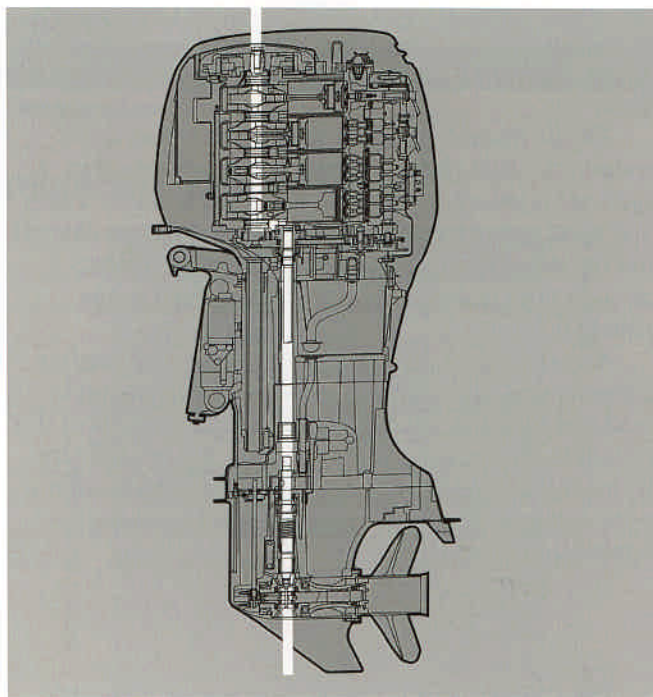
## Compact Outboards

Along with creating clean-running outboards, another important goal that Suzuki engineers set for the DF series was to create as compact an outboard as possible. With the DF90 and DF115 they have surpassed their goal. The overall design has the same sleek, flowing lines that have been found throughout the entire DF series.

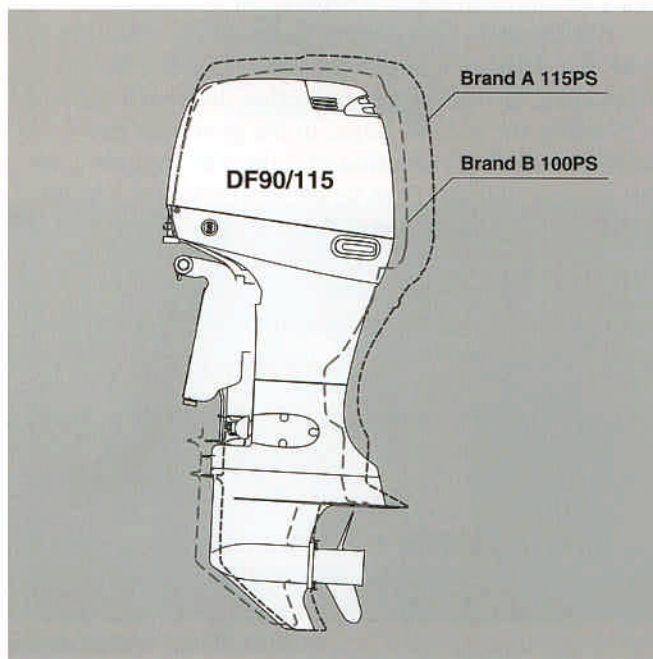
But it is underneath the body is where Suzuki's engineers have been hard at work. In order to create as compact an outboard as possible, they incorporated an offset drive shaft into the system. The use of the offset drive shaft allowed for other size-reducing measures such as the utilization of two-stage mixed cam system, which in turn has allowed the use of a smaller cam sprocket, smaller cylinder head and cover.

After so much size reduction, what's left are two outboards that are much more compact than the competition yet deliver the power and performance users demand.

## OFFSET DRIVE SHAFT



## FOUR-STROKE ENGINE SIZE/PROFILE COMPARISON



## Suzuki's Advanced Engineering

A long history in the design and manufacture of motorcycle, automotive and marine engines gives Suzuki an unrivaled ability to blend the best of its advanced technology and know-how into the creation of the DF90 and DF115 outboard engines. Based on proven automotive designs, engines for both outboards have been specifically redesigned for use in marine applications.

The same DOHC, 4-valve cylinder head design as found on the DF40 and DF50 is utilized on the DF90 and DF115. To keep overall size to a minimum our engineers utilized an offset drive shaft system with a reduction gear incorporated at the bottom of the power head to transfer power from the crankshaft to the drive shaft.

The utilization of a two-stage mixed cam drive system, the first time this system has been used in outboards, incorporates both gears and a chain. The first stage gears transfer power between the crankshaft and the drive shaft while the second stage utilizes a chain to deliver power from the drive shaft to the camshaft.

As gear reduction allows for the use of a smaller diameter cam sprocket as well as a smaller cylinder head and cylinder head cover, the greatest merit of this system is the significant reduction in the overall size of the engine. Valve angles are also reduced to offer a more compact combustion chamber for increased combustion efficiency.

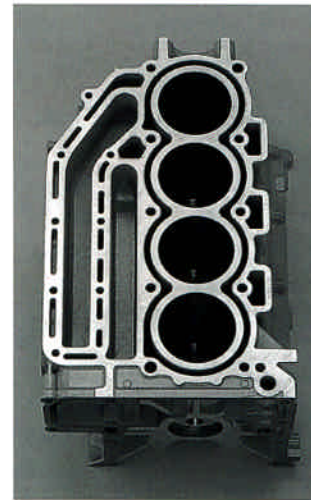
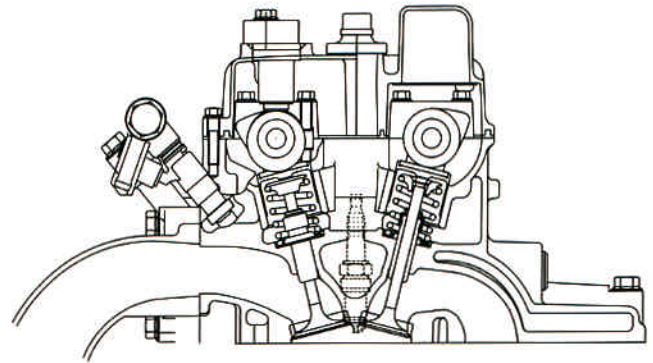
The Cam Drive System utilizes a highly durable timing chain. The timing chain is equipped with an automatic hydraulic tensioner to keep the chain properly tensioned. The system will provide users with years of maintenance-free operation.

Both models also feature a two-stage reduction gear that delivers a larger gear ratio of 2.59. On the drive shaft, the first stage reduction delivers a ratio of 1.25 while the second stage, in the gear case itself, delivers a further reduction of 2.08. The biggest gain this system delivers is in its capability to use a highly efficient, large pitch, large diameter propeller.

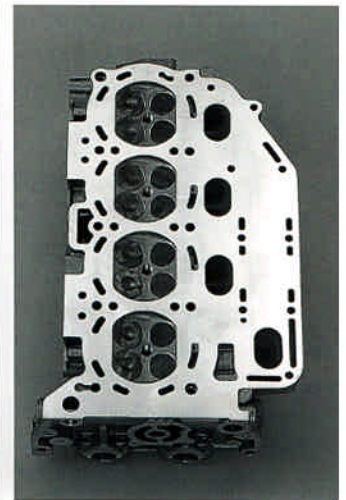
A group exhaust system utilized in the cylinder head and cylinder block increases power output by reducing drag in the exhaust system with better exhaust flow through its 4-2-1 design.

Compared to previous outboards, the offset drive shaft system puts the center of gravity closer to the front of the outboard allowing the upper mount to be positioned above the torque roll. Also, increasing the mounts capacity—by 1.8 times on the upper mount and 1.6 times on the lower compared to our 2-stroke V6 outboards—has led to an effective reduction in engine vibration.

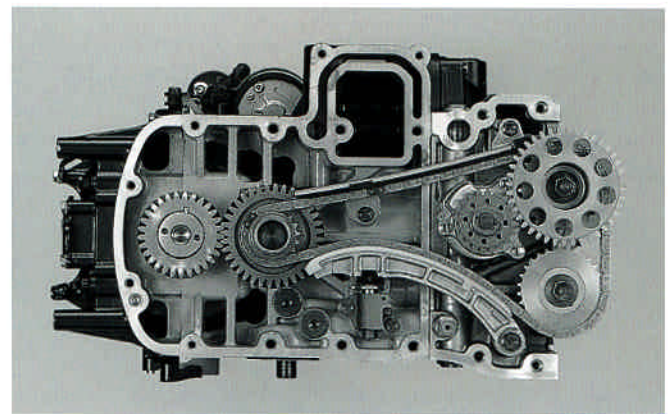
## CYLINDER HEAD ASSY



Cylinder Block



Cylinder Head



Reduction Gear & Cam Drive System

## Fuel Delivery System

The DF90 and DF115 use a high-volume diaphragm type fuel pump that runs off the cam drive. Upstream of the pressure regulator, a Fuel Cooler is now incorporated in place of a water jacket to cool the fuel. All fuel-related components are located on the intake manifold.

## Intake Manifold

The aluminum-cast intake manifold is designed with a comparatively long branch to boost the engine's mid range torque. The intake manifold consists of the IAC (Idle Air Control), a newly designed Fuel Cooler and Vapor Separator, two types of Fuel Filters, the Throttle Body and related fuel system components. The entire system is assembled into a compact module that is easy to maintain.

A new ventilation system is designed to force air from within the upper cover to the outside. Fan blades on the magneto flywheel ventilate air out through the mag cover and upper cover reducing the air temperature within the engine cover. This provides a cooler intake air temperature, which in turn improves engine performance while enhancing reliability and durability of the outboard's electronics, etc. and keeps air temperature under control.

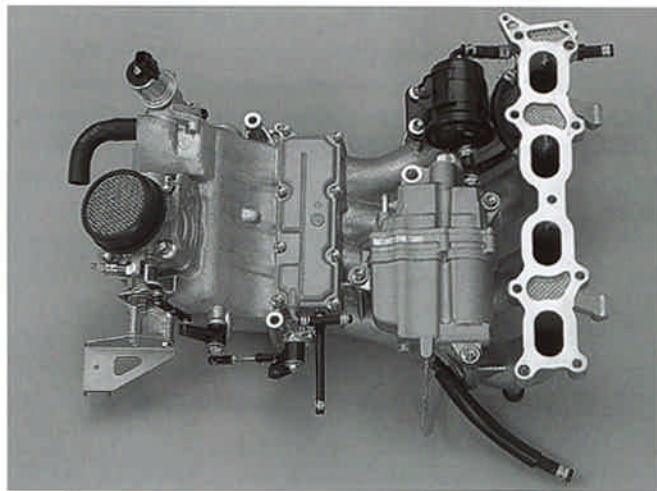
Fresh air is channeled through intake ducts to the silencer. The large capacity silencer is equipped with a baffle plate inside for further noise reduction.

## Outstanding Fuel Efficiency

The graph shows a comparison in the performance of the DF115 engine with the 2-stroke DT115S. At idle, fuel consumption of the DF115 is 75% less than the DT115S. Even at maximum performance levels, the DF115 consumes over 31% less fuel than its 2-stroke counterpart. A relatively flat torque curve also provides plenty of power throughout the entire speed range from low to high speeds and increases its overall drivability.

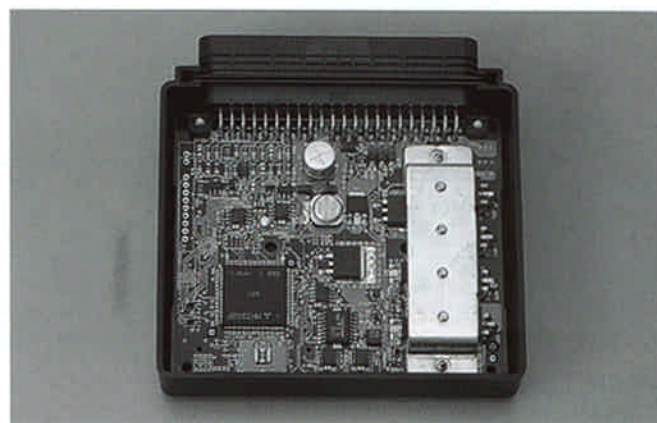
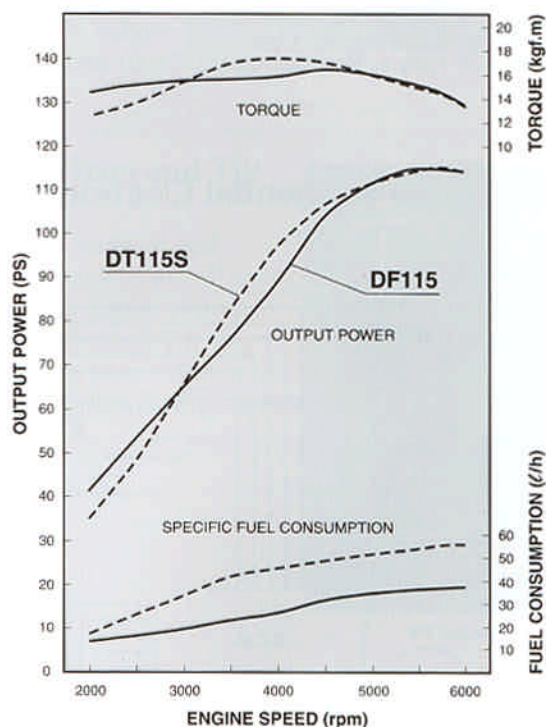
## Multi Point Sequential Electronic Fuel Injection

The DF90 and DF115 both utilize the same Multi Point Sequential Electronic Fuel Injection of the Speed-Density type that is found in the DF40, DF50, DF60 and DF70. The use of this particular system enables these outboards to pass future emission regulations while providing lower fuel consumption, smoother starting, stable idling, better drivability and outstanding throttle response.



Intake Manifold

## PERFORMANCE CURVES



E.C.M. (Engine Control Module)

The E.C.M. (Engine Control Module) system controls the engine's ignition system and provides an ideal fuel supply under all running conditions. The E.C.M. constantly monitors crucial data, in real time, from a series of sensors placed in critical areas in the engine. The sensor system is made up of the Manifold Pressure Sensor, Crankshaft Position Sensor, Intake Air Temperature Sensor, Cylinder Temperature Sensor, Cam Position Sensor and Exhaust Jacket Temperature Sensor. The data from these sensors is conveyed to a computer that instantly calculates (Speed-Density type) the optimum amount of fuel to be injected at high pressure into each of the cylinders.

The DF90 and DF115 also incorporate an IAC (Idle Air Control) which consists of an Idle Speed Control, Fast Idle Function, and a Dash Pot System to further enhance engine performance with stable operation at all times.

The Idle Speed Control uses a linear solenoid system and is programmed to let the engine idle at a very low 620 rpm's. Regulating intake air under

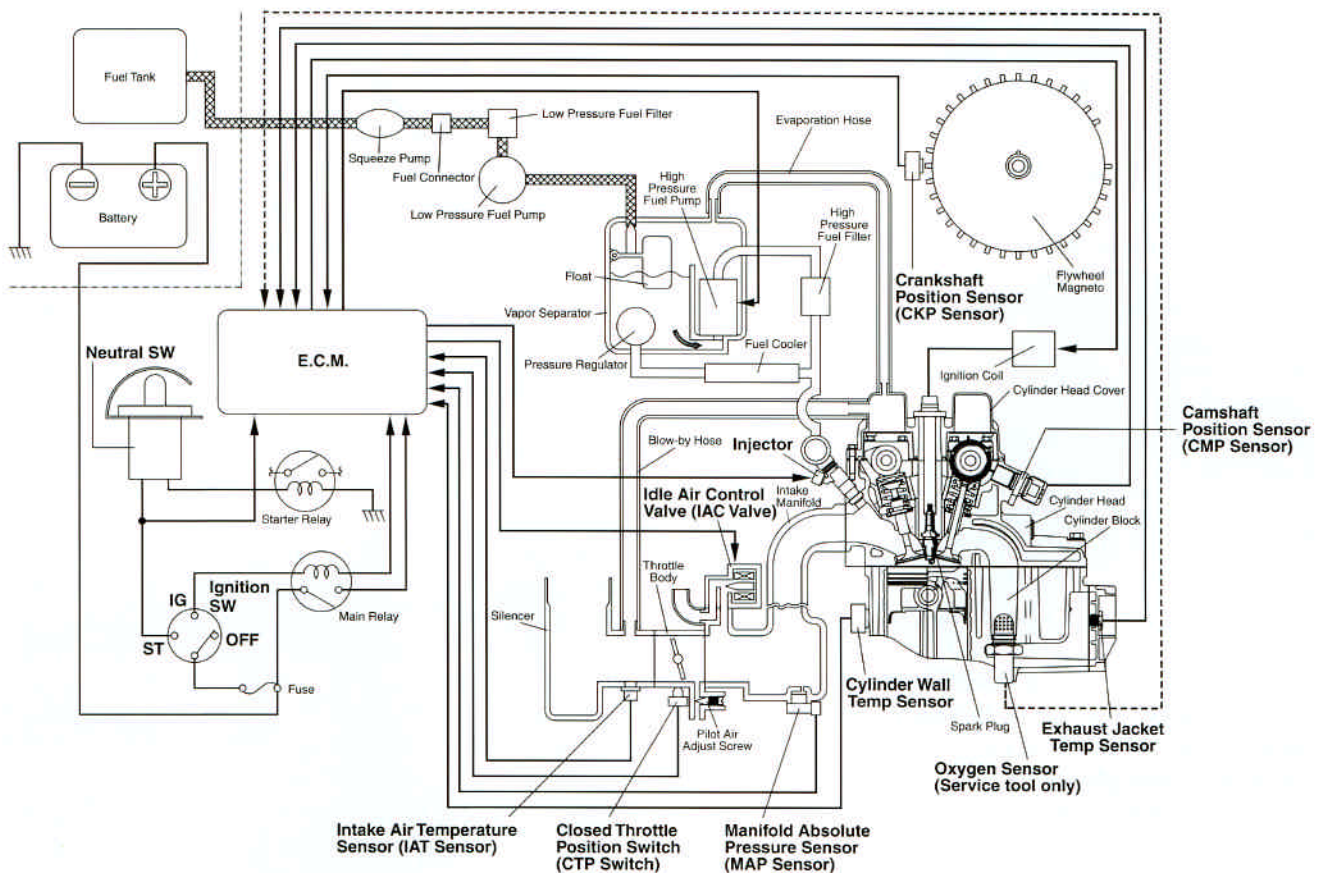
different running conditions, intake air is increased when the engine's rpm's are low, and decreased when rpm's are high.

A Fast Idle Function provides smooth, quick starts and stable engine warm-ups. When the engine is started, the IAC valve fully opens to let an increased flow of air into the cylinder.

Suzuki's Dash Pot System is electronic. Other manufacturers generally use mechanical systems. The Electronic Dash Pot System only functions when there is a sudden throttle transition from open to closed, smoothly reducing rpm's to lessen stress on the engine.

Blow-by gas generated inside the crankcase is separated into liquid and gas components inside the breather chamber. Only the resulting gas component is sent via the breather hose to the silencer. After this, it is mixed with fresh air, and the resulting mixture is drawn into the combustion chamber and burnt instead of being released as pollution into the atmosphere.

## Multi Point Sequential Electronic Fuel Injection



## High Output Alternator

Both the DF90 and DF115 are equipped with high output alternators that deliver a total of 40A(12V) for increased electrical power. Fan blades incorporated on the large diameter flywheel magneto circulate air out of the engine cover to reduce air temperature. A water-cooled regulator makes use of a large capacity power generator.

The DF90 and DF115 are the first Suzuki outboards to utilize a 1.4kw dust-proof starter motor.

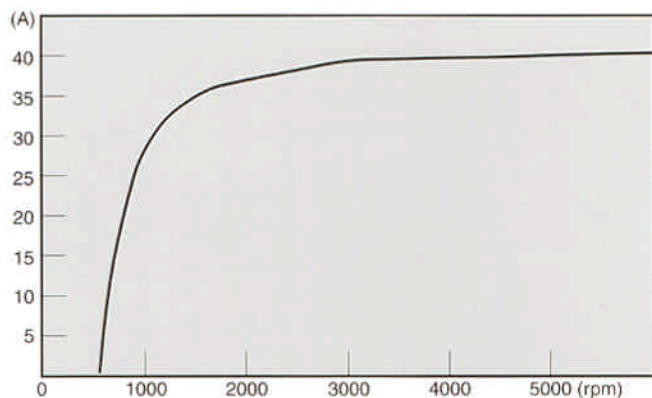


Flywheel magneto



Alternator

## ALTERNATOR OUTPUT

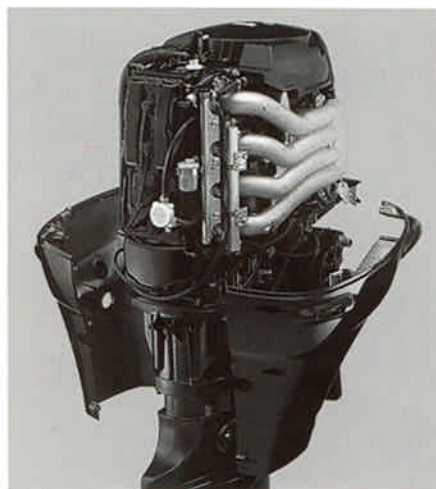


## Distinctive Styling With Easy Engine Access for Maintenance

The distinctive styling found throughout Suzuki's DF series is evident in the new DF90 and DF115 as well. Smooth, flowing lines present a refined image that promotes their clean running characteristics. The lower covers are held in place with fasteners at three locations, one in front and the other two on either side at the rear of the engine. The lower cover separates into two sections, the port and starboard, to allow easier access to the 4-stroke engine.

Oil changes are easy with the drain plug located on the front of the oil pan making draining of the oil possible with the engine in the tilt up position. A spin on oil filter is utilized and the oil filler cap is attached to the top of the cylinder head to provide easy access from the boat.

The water pressure valve is attached to the oil pan with its cover attached from the exterior of the oil pan for easy cleaning and replacement without having to remove the power head.



## Power Trim and Tilt (PTT)

Both transom and swivel brackets are all new and a new single cylinder Power Trim and Tilt is utilized in place of the old triple cylinder PTT system.



PTT

## Multi-Function Tachometer

The DF90 and DF115 are equipped with a Multi-Function Tachometer that includes a comprehensive monitoring system to provide you with an excellent backup to the performance of the outboard engine. This system detects abnormalities in the running of the outboard, giving you the needed information and alerts before problems arise, so that appropriate measures can be taken before the problem becomes serious.



MULTI-FUNCTION TACHOMETER



## DF90/115 SPECIFICATIONS

| MODEL  | DF90   | DF115           |
|--|--|-----------------|
| ENGINE TYPE  | In-line 4-Stroke DOHC 16 Valves  |                 |
| FUEL DELIVERY SYSTEM                                 | Multi Point Sequential Electronic Fuel Injection                         |                 |
| TRANSOM HEIGHT in.                                   | L:20, UL:25  |                 |
| STARTING SYSTEM                                      | Electric   |                 |
| WEIGHT kg (lbs.)                                     | L: 188.9 (416.4)<br>UL: 193.9 (427.5)                                    |                 |
| NO. OF CYLINDERS                                     | 4  |                 |
| PISTON DISPLACEMENT<br>cm <sup>3</sup> (cu. in.)     | 1,950 (119.0)  |                 |
| BORE × STROKE m/m (in.)                              | 84 × 88 (3.3 × 3.5)  |                 |
| MAXIMUM OUTPUT<br>kw (PS)/rpm                        | 66.2 (90)/5000   | 84.6 (115)/5500 |
| FULL THROTTLE<br>OPERATING RANGE rpm                 | 4500-5500  | 5000-6000       |
| STEERING   | Remote   |                 |
| OIL PAN CAPACITY ℓ<br>(US/Imp. pt.)                  | 5.5 (11.6/9.7)   |                 |
| FUEL TANK CAPACITY ℓ<br>(US/Imp. gal.)               | 25 (6.6/5.5)   |                 |
| IGNITION SYSTEM                                      | Fully-transistorized   |                 |
| ALTERNATOR   | 12V 40A  |                 |
| ENGINE MOUNTING                                      | Shear Mount  |                 |
| TRIM METHOD (POSITIONS)                              | Power Trim and Tilt (5)  |                 |
| GEAR RATIO   | 2.59:1   |                 |
| GEAR SHIFT   | F.N.R.   |                 |
| EXHAUST  | Through Prop Hub Exhaust   |                 |
| DRIVE PROTECTION                                     | Rubber Hub   |                 |
| PROPELLER SIZE (in.)                                 | 14 × 17 (x1700)<br>14 × 19 (x1900)<br>14 × 21 (x2100)<br>14 × 23 (x2300) |                 |
| All propellers are the new<br>3-blade aluminum type. |  |                 |

\* Boats and motors come in a large variety of combinations. See your authorized dealer for correct prop. selection to meet recommended RPM range at W.O.T.

SUZUKI MOTOR CORPORATION reserves the right to change, without notice, equipment, specifications, colours, materials and other items to apply to local conditions. Each model may be discontinued without notice. Please inquire at your local dealer for details of any such changes.

Actual body colours may differ slightly from the colours in this brochure.

## DF90/115 FEATURES

- Electronic Fuel Injection
- Multi-Function Tachometer
- Check Engine Indicator
- Rev-Limit Indicator
- Overheat Warning Indicator
- Oil Pressure Indicator
- Over-Rev Limiter
- Low Oil Pressure Caution
- Emergency Stop Switch
- Fully-Transistorized Ignition
- Trough Tube Bracket
- Spiral Bevel Gear
- Temp Activated Fast Idle
- Full Shifting
- Neutral rpm Limiter
- Start-in-Gear Protection
- Tilt Stopper
- Dual Water Intakes
- S.S. Water Pump Housing
- Anti-Corrosion System
- Fishing Line Cutter
- Freshwater Engine Flush Port
- Throttle Tension Adjuster



**CARB Three-Star Label**  
The three-star label identifies engines that meet the California Air Resources Board's 2008 exhaust emission standards. Engines meeting these standards have 65% lower emissions than EPA 2006 exhaust emission standards.



**EPA 2006 Label**  
Suzuki's 4-stroke technology ensure compliance with EPA 2006 exhaust emission standards set by the U.S. Environmental Protection Agency.



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