

PRODUCT INFORMATION



FOUR STROKE
DF40/50
Electronic Fuel Injection

 **SUZUKI**

Ready for the Future

Suzuki Marine has accepted the challenge of providing boaters with powerful, cleaner running outboards that meet EPA emissions regulations to be phased in by the year 2006. Suzuki engineers have applied years of research in motorcycle, automotive and marine engine design to the development of these new, environmentally friendly outboards.

The new DF40 and DF50 outboard motors are the latest in Suzuki's line of four-stroke outboards to meet the EPA 2006 regulations. These compact 40- and 50-horsepower outboards look sleek, with flush fittings and contemporary graphics. Underneath lies advanced technology that delivers quick starts, outstanding power, excellent fuel economy and smooth, quiet running, even at idle. In addition to a dual overhead cam, 12-valve powerhead, these outboards are also the first to be equipped with a timing chain and automatic hydraulic tensioner for greater reliability and durability over the life of the engine.

A newly-designed multi-function center tiller handle is also available, with operating controls mounted on the handle and a gas assisted tilt mechanism for easy, single-handed operation.

Suzuki Marine is committed to the future of boating and will continue to provide boaters with outboard motors that offer outstanding performance and unmatched reliability and durability.



DF50T

DF40T

DF50QH

DF40QH

The following points have been kept in mind in the design of the DF40 and DF50 4-stroke outboard motors.

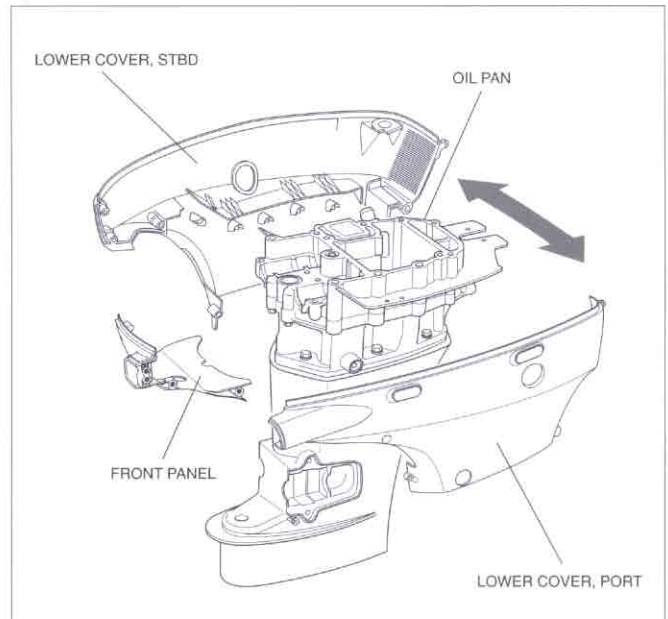
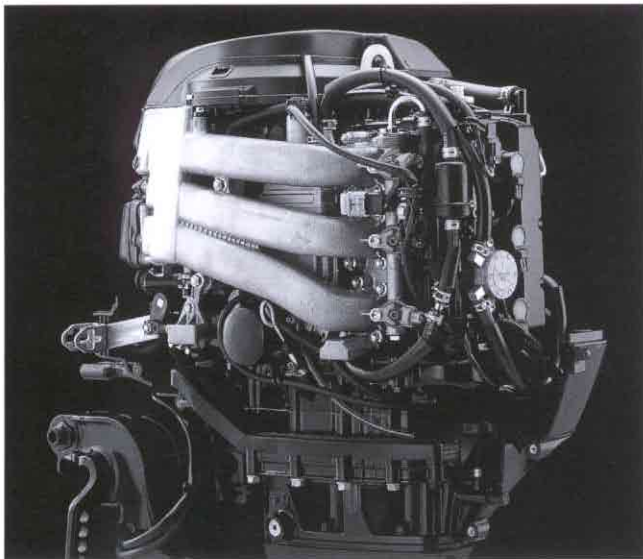
- ❶ Ensure compliance with future EPA regulations set to take effect in the year 2006.
- ❷ Provide low fuel consumption, low noise level and low vibration.
- ❸ Incorporate Sequential Electronic Fuel Injection into a 4-stroke outboard.
- ❹ Design a compact outboard with distinctive styling.
- ❺ Base the engine on Suzuki's high performance, DOHC automotive engine.

Distinctive Styling With Easy Engine Access

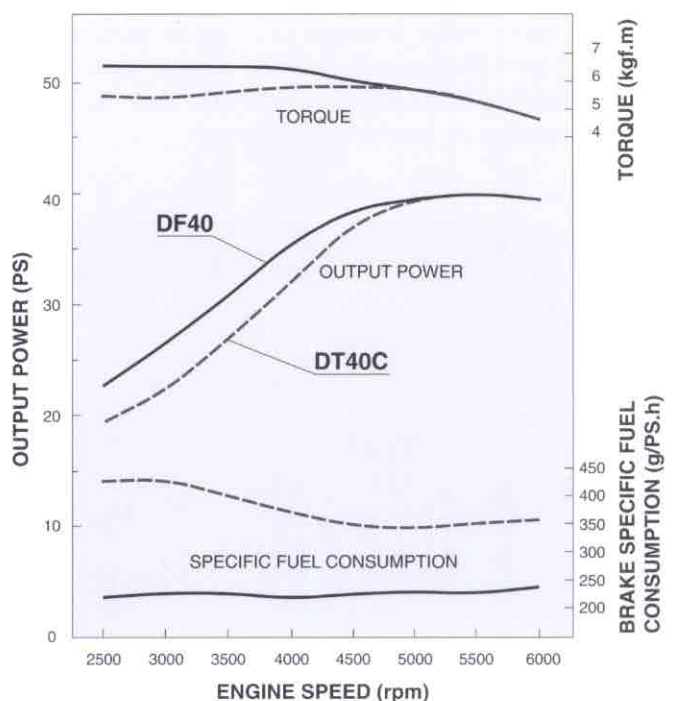
The distinctive styling found in Suzuki's DF series is evident in the new DF40 and DF50 as well. Smooth, flowing lines present a refined image that promotes their clean running characteristics. The lower cover also separates into two sections, the port and starboard. This design allows easier access to the 4-stroke engine for maintenance, and repairs. Both models, except tiller handle models are also equipped with Suzuki's exclusive Multi-Function Tachometer.

Outstanding Fuel Efficiency

The graph shows a comparison in the performance of the DF40 engine with the 2-stroke DT40C. At idle, fuel consumption of the DF40 is a mere 40% of the DT40C. Even at maximum performance levels, the DF40 consumes over 30% 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.



PERFORMANCE CURVES



Suzuki's Advanced Engineering

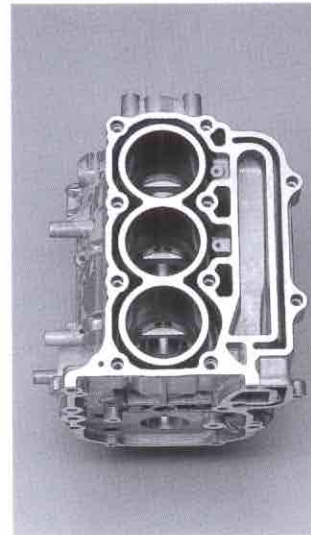
Drawing upon a long history in the design and manufacture of motorcycle, automotive and marine engines, Suzuki has flawlessly combined its advanced technology and know-how into the creation of the DF40 and DF50 outboard engines. Both outboards are based on Suzuki's high performance DOHC, 12-valve, three-cylinder automotive engines. The valve layout is the same as found in the engine's automotive counterpart. Components such as valves/valve springs, tappets, sprockets, timing chain, and fuel filter are identical to those used in Suzuki automotive engines. Because of the difference in operating conditions and environment, the engines have been given a larger bore and longer stroke to provide maximum power in a marine application. Suzuki has also redesigned and strengthened critical structural parts such as the cylinder head, cylinder block, crankshaft, connecting rods, camshafts, and pistons in order to provide maximum reliability and durable operation. Metal gaskets have also been employed in such critical areas as the cylinder head, engine holder, and oil pan for maximum durability.

Compact Design

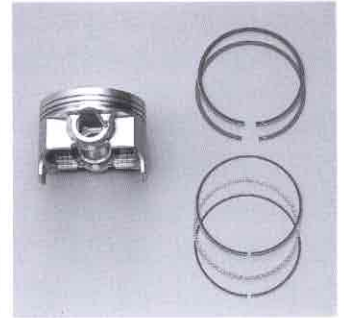
The cylinder head is a DOHC (Double Over Head Camshaft) design with four valves for each cylinder. In order to optimize combustion efficiency and engine compactness, a Pent Roof design has been utilized, allowing for closer placement of the intake and exhaust valves. The angle of the intake valve has been set to 17 degrees, the angle of the exhaust valve to 19 degrees, and the intake valve diameter is 24.6mm while the exhaust valve diameter is 21.5mm. Center mount spark plugs and a high compression ratio are also incorporated to maximize engine performance.

The First 4-stroke Outboards Equipped With a Timing Chain

The DF40 and DF50 are the first ever outboard motors to be equipped with a timing chain. Chain tension is kept in check with an automatic hydraulic tensioner. Highly durable, the system will provide users with years of maintenance free operation.



Cylinder Block

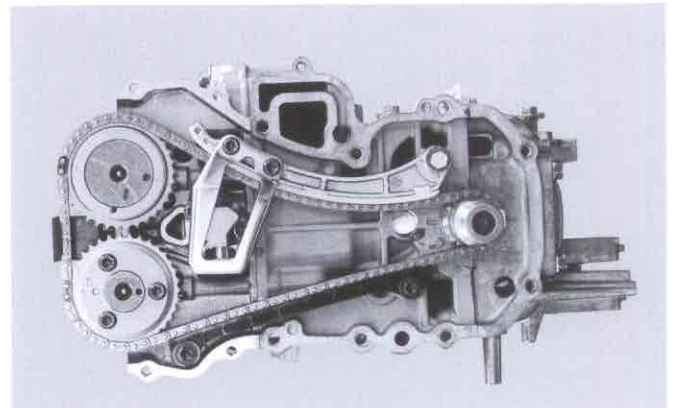
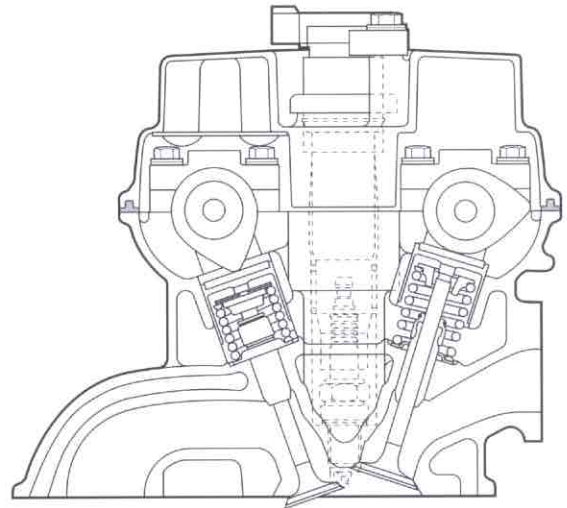


Piston & Piston Rings



Connecting Rod

CYLINDER HEAD ASSY



Cam Drive System

Lubrication

A crankshaft driven lubrication system with a trochoid type oil pump has been adopted. With the adoption of a newly designed, compact, cartridge type oil filter the durability of the crank journals have been greatly improved. The oil drain is positioned on the front side of the engine making oil changes easy, and allows for easy servicing and maintenance in the full tilt position.

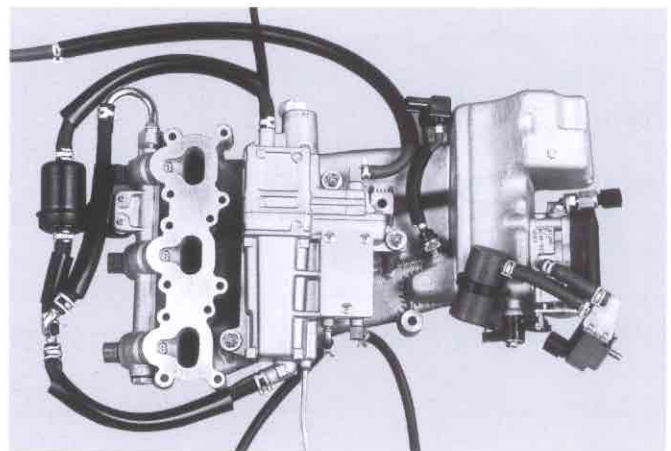


Oil Pump Roter, Oil Filter & Oil Strainer

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) valve, a newly designed Vapor Separator with a built-in High Pressure Pump and Pressure Regulator, MAP Sensor, Fuel Injectors, High Pressure Fuel Filter, Throttle Body and related fuel system components. The entire system is assembled into a compact module that is easy to maintain. In the off season, it is simply a matter of inspecting one side of the engine in order to check on the fuel line and fuel related components.

The hollow flywheel cover housing is utilized for two additional purposes. Changes in air temperature are effectively reduced as intake air passes through the housing. This results in increased power output from the engine. The housing also acts as a large volume silencer reducing engine noise levels.

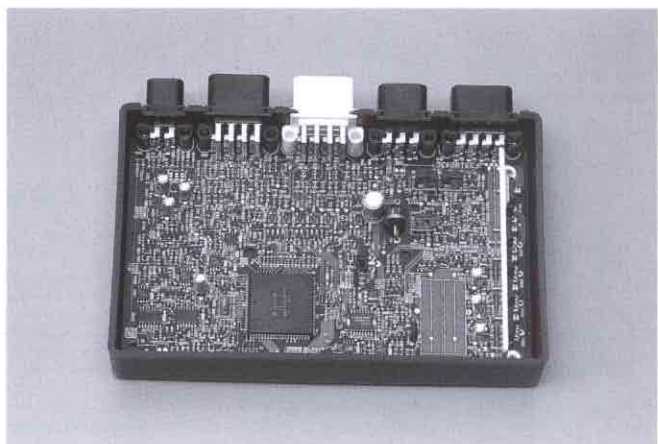


Intake Manifold

Multi Point Sequential Electronic Fuel Injection

The DF60 and DF70 were the first four-stroke outboards to ever be equipped with Multi Point Sequential Electronic Fuel Injection of the Speed-Density type. Likewise, the DF40 and DF50 incorporate the same Electronic Fuel Injection System. 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.

The E.C.M. (Engine Control Module) system used in the DF40 and DF50 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



E.C.M. (Engine Control Module)

sensors placed in critical areas in the engine. The sensor system is made up of the Manifold Pressure Sensor, Engine RPM Sensor, Intake Air Temperature Sensor, Cylinder Temperature Sensor, Cam Position Sensor and Exhaust Manifold 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 DF40 and DF50 also incorporate IAC (Idle Air Control), a Fast Idle Function, and a Dash Pot System to further enhance engine performance with stable operation at all times

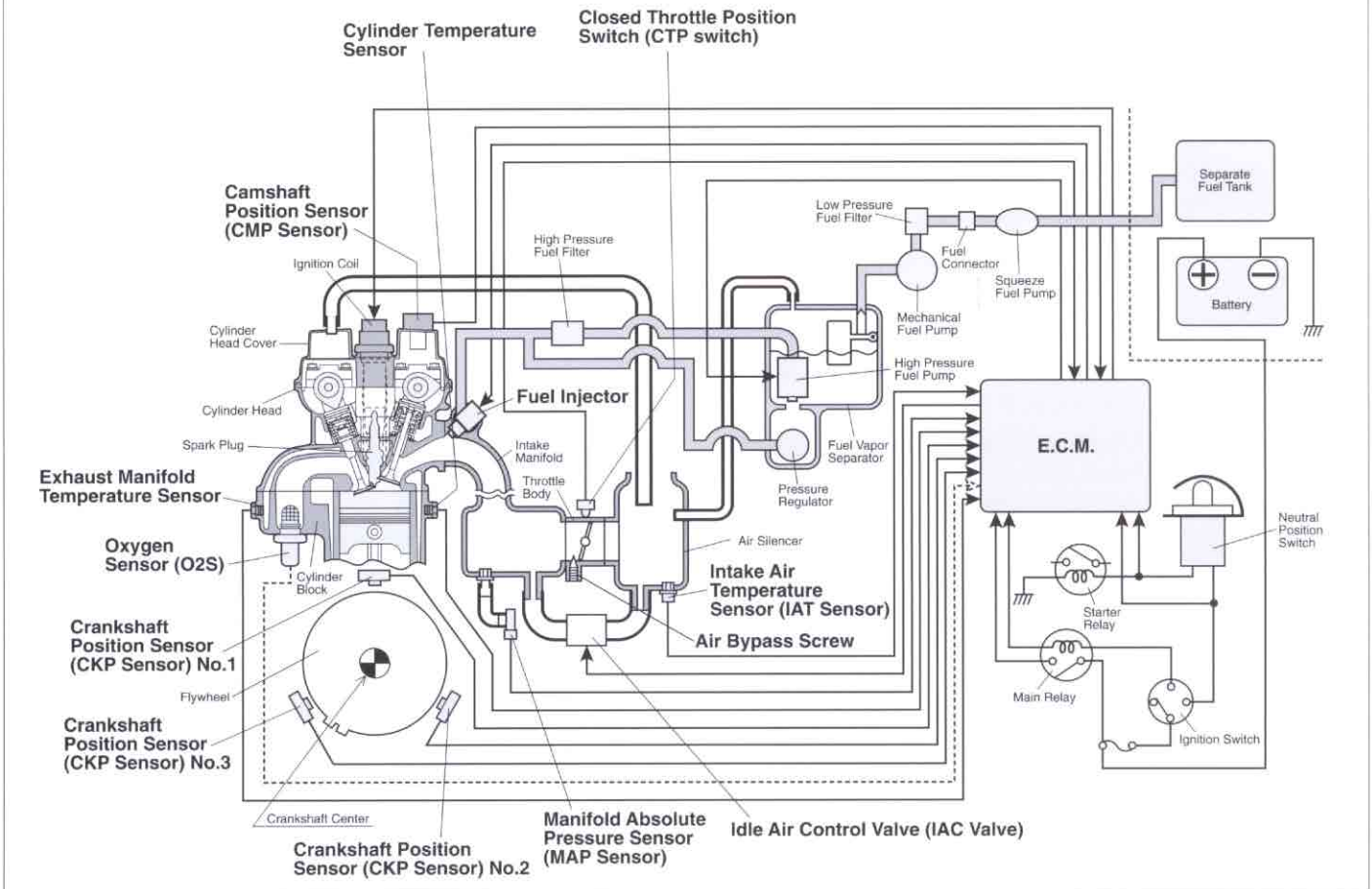
The IAC is programmed to let the engine idle at a low 850 rpm's. Regulating intake air under different running conditions, intake air is increased when the engine's rpm's are low, and decreased when rpm's are high.

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 rpms to lessen stress on the engine.

Common in automotive applications, Suzuki was the first to incorporate a Solid State Full Transistor Ignition system into an outboard engine application with the DF60 and DF70. That system, also utilized in the DF40 and DF50, taps into voltage supplied by the battery enabling it to increase spark duration regardless of engine speed. A nine-fold increase in spark duration, as well as a 2.4 times greater spark strength, is realized compared to conventional CDI units. It is controlled with only 1/10th the voltage and the circuit design is simple, therefore increasing durability and reliability. A self-diagnostic system is incorporated to constantly monitor and correct the system's performance.

Multi Point Sequential Electronic Fuel Injection



The DF40 and DF50 also incorporate a Direct Ignition system. Integral type spark plug caps with ignition coils are utilized thus reducing the number of parts and simplifying the wiring system. This system also greatly reduces electronic engine “noise” which can interfere with VHF radios, fishfinders and other marine electronics.



Direct Ignition System

The DF40 and DF50 are equipped with a new non-linear throttle to improve throttle controllability, especially in the lower speed range. Slight adjustments in speed are easily obtained with its wider control zone at the lower end of the power curve.

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-Function Center Tiller Handle

A new multi-function tiller handle, specially designed for DF40QH and DF50QH, is equipped with the starter key switch, engine kill switch, emergency stop switch, throttle and shift lever within easy reach for maximum efficiency. Since tiller handle models are not equipped with the Multi-Function Tachometer, the Self-Diagnostic system and Warning system alert the operator by means of a buzzer before problems arise. A Gas Assisted Tilt Mechanism is also incorporated to raise the engine easily.



Multi-Function Tachometer

The DF40T and DF50T 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.

A Warning System alerts you to changes in oil pressure, over heating, low voltage and over rev. The Self-Diagnostic system uses internal circuitry placed in the Electronic Fuel Injection system to inform the operator of any abnormal conditions. This system also has an operation mode that permits return to the launch site under reduced power in the unlikely event of E.C.M. failure. Finally, an Operation Time Indicator shows approximately how many hours the outboard has been run. Useful for keeping track of routine maintenance.



MULTI-FUNCTION TACHOMETER

DF40/50 OTHER FEATURES

- A more powerful Power Trim & Tilt motor is utilized for quicker, easier trim adjustment. (DF40T/50T)
- An Oxygen Feedback system makes automatic adjustments to compensate for changes in performance as they occur over the life of the motor. (Optional)
- Large gear ratio enhances the motor’s power.
- The direction of the Pilot Discharge is adjustable.



DF40/50 SPECIFICATIONS

MODEL	DF40T/50T	DF40QH/50QH
ENGINE TYPE	4-Stroke DOHC 12-Valve	
FUEL DELIVERY SYSTEM	Multi Point Sequential Electronic Fuel Injection	
TRANSOM HEIGHT in.	S:15, L:20	
STARTING SYSTEM	Electric	
WEIGHT kg (lbs.)	S:105 (231) L:108 (238)	S:107 (236) L:110 (243)
NO. OF CYLINDERS	3	
PISTON DISPLACEMENT cm ³ (cu. in.)	815 (49.7)	
BORE × STROKE m/m (in.)	71 × 68.6 (2.80 × 2.70)	
MAXIMUM OUTPUT kw (PS)	DF40:29.4 (40)/5500, DF50:36.8 (50)/6200	
FULL THROTTLE OPERATING RANGE rpm	DF40:5200-5800, DF50:5900-6500	
STEERING	Remote-Control	Center Tiller Handle
CHOKE	-	
OIL PAN CAPACITY ℓ (US/Imp. pt.)	2.2 (4.6/3.9)	
FUEL TANK CAPACITY ℓ (US/Imp. gal.)	25 (6.6/5.5)	
IGNITION SYSTEM	Full-transistorized	
ALTERNATOR	12V 216W	
ENGINE MOUNTING	Shear Mount	
TRIM METHOD (POSITIONS)	Power Trim and Tilt (5)	Manual Trim and Gas Assisted Tilt (5)
GEAR RATIO	11: 25 (2.27)	
GEAR SHIFT	F.N.R.	
EXHAUST	Through Prop Hub Exhaust	
DRIVE PROTECTION	Rubber Hub	
PROPELLER SIZE in.*	11-1/2 × 9 (S900) 11-1/2 × 10 (S1000) 11-1/2 × 11 (S1100) 11-5/8 × 12 (S1200) 11-1/2 × 13 (S1301) 11-3/8 × 14 (S1400) 11-1/4 × 15 (S1500) 11-1/8 × 16 (S1600)	
All propellers are the 3-blade type.		

DF40/50 FEATURES

- Electronic Fuel Injection
- Multi-Function Tachometer (40T/50T)
Check Engine Indicator (40T/50T)
Rev-Limit Indicator (40T/50T)
Overheat Warning Indicator (40T/50T)
Oil Pressure Indicator (40T/50T)
- Over-Rev Limiter
- Low Oil Pressure Caution
- Emergency Stop Switch
- Full-Transistorized Ignition
- Through Tube Bracket
- Spiral Bevel Gear
- Temp Activated Fast Idle
- Full Shifting
- Neutral rpm Limiter
- Start-in-Gear Protection
- Shallow Water Drive (40QH/50QH)
- Tilt Stopper
- Dual Water Intakes
- S.S. Water Pump Housing
- Anti-Corrosion System
- Fishing Line Cutter
- Steering Tension Adjuster
- Throttle Tension Adjuster



Winner of 1998 International Marine Trades Exhibit and Convention (IMTEC) Innovation Award.



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*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.

Please read your owners manual carefully. Remember, boating and alcohol or other drugs don't mix. Please operate your outboard safely and responsibly.

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.