

SUZUKI DF350A

A REVOLUTION IN INNOVATION



GEKI: PARTING SEAS





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DESIGNED AND ENGINEERED LIKE NO OTHER

It's no secret that bigger boats are growing in popularity, and that is driving demand for more powerful outboard motors. In fact, whether it's offshore fishing boats, cruisers and runabouts, even pontoon boats, many boat builders are looking to replace stern drives and inboard designs with newer, bigger outboards.

Why?

Because outboards are more efficient, more compact, easier and less expensive to maintain, and more straightforward when it comes time to repower. But building a bigger, more powerful outboard is not without its challenges. Bigger can mean heavier, which impacts fuel efficiency and the balance of the boat. More power can require a more complex design, which affects reliability and durability.

MORE THAN 350 HORSEPOWER

It's not all that hard to make more horsepower. You can increase displacement, add a turbocharger or supercharger, or make other performance tweaks. The hard part is using all that power effectively, getting it to the water so the boat performs at its peak.

I'm sure you've all seen incredibly powerful drag racing cars spinning their tires because they lack traction. They can simply bolt on bigger tires or adjust the chassis to get the power to the ground. It's definitely not that simple when it comes to power and water.

So, odd as it may sound... Generating more power is not enough to guarantee better performance. You have to be able to harness that power and transfer it to water efficiently. Which brings in other factors such as gear and propeller design, lower unit hydrodynamics, engine mounting, and a lot more.

Suzuki Marine decided to take on these challenges and embark on a major, multi-year engineering program to build the biggest, most powerful outboard in our history...

WE CALL IT "GEKI"

When facing that challenge, Suzuki engineers came up with a symbol to inspire the team in their work. In Japanese it's called Geki, which translates to "parting seas." In other words, a force to match the power of nature and the sea.

And that is also the perfect description of the newest, biggest, most powerful engine in the Suzuki lineup.



GEKI: PARTING SEAS

A Force To Match The Power Of Nature
And The Sea Representing Suzuki's Identity
And Heritage. A Symbol Of Our
Passion And Commitment To The
Ultimate In Marine Innovation.





THE 350 HORSEPOWER SOLUTION

Designing an outboard with 350 horsepower may sound like a fairly straightforward task, but when you add in the parameters of lighter weight, improved fuel economy and rock-solid reliability, things get much more challenging.

We started with a V6 engine with 4.4 liter displacement, which would be the largest displacement in the V6 category. Then we had to figure out how to get 80 horsepower per liter and still achieve our other goals.

Our solution was to increase the compression ratio to 12.0:1, the highest compression ratio ever for a production outboard engine. In order to make this work without knocking (a typical problem at this ratio), we developed a dual injector system that mixes highly atomized fuel with cooler air to provide optimal conditions for complete and controlled combustion.



DUAL INJECTORS FOR BOTH COOLING AND POWER

Our decision to use a 12.0:1 compression ratio provided us with the power we wanted, but also introduced several design challenges. With the Dual Louver System and the Direct Intake System, we got the dryer and cooler intake air that we needed. Next was fuel delivery.

Injecting fuel does two things, it atomizes the fuel and, incidentally, it cools the cylinder. Cooling the cylinder was an important factor in minimizing knock. To achieve the power we wanted, we needed to inject 100% of the fuel into the cylinder at once, at a precise time, and at a precise angle to both cool the cylinder and to allow combustion in the combustion chamber.

We developed a new Dual Injector System to accomplish these objectives. Using two smaller injectors provided the precision we needed, plus it achieved improved atomization. In fact, we were able to increase output by 3% without causing knocking.




DUAL INJECTOR



THE HUMBLE PISTON MEETS ADVANCED TECHNOLOGY

To help the piston withstand the added lateral pressure, we switched from the standard surface texture treatment to shot peening. Shot peening creates fine dimples on the surface that evenly distribute the pressure created during combustion. It's a more expensive, and far more involved manufacturing process, but one that makes it possible to create a piston worthy of the "ULTIMATE" title.



DIRECT INTAKE SYSTEM AND DUAL LOUVER SYSTEM FOR COOL AND DRY AIR



While riding a fast-moving train on a rainy day, one of our engineers noticed the water particles streaming across the window. That was it! He realized that, at speed, water particles could be directed, trapped and drained away.

After countless trials, we developed a Dual Louver System that resulted in eliminating water intake, even in the face of the most severe on-the-water testing.

The Dual Louver System incorporates a double shield of blades, each one designed in a dog-leg shape. The outer row of blades capture any spray from the boat and the inner louvers catch and drain the remaining mist.

As a result, intake air temperature is free of moisture and no higher than 10° above ambient.

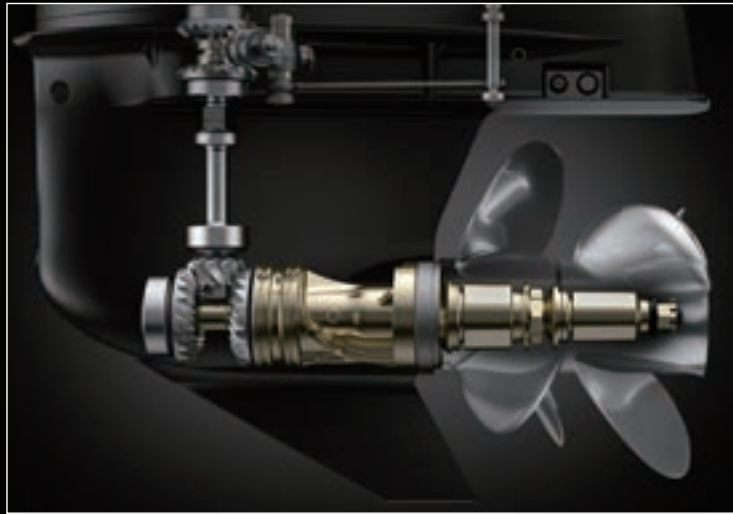


SUZUKI DUAL LOUVER SYSTEM

DEVELOPMENT OF SUZUKI'S FIRST CONTRA-ROTATING PROPELLER



After years of outboard design, Suzuki engineers knew that the shape of the lower unit and the design of the propeller would have a critical impact on performance. The increased power of the new engine required more powerful gears, and more powerful gears were typically larger. After considering alternatives, an innovative idea was proposed: design a contra-rotating dual propeller system. The contra-rotating propeller would certainly provide more “grip” underwater, and because contra-rotating propellers distribute the engine torque evenly over two propellers, the torque per propeller decreases and gear diameter can be reduced. A reduction in gear diameter could then lead to the design of a smaller, more hydrodynamic gear case.



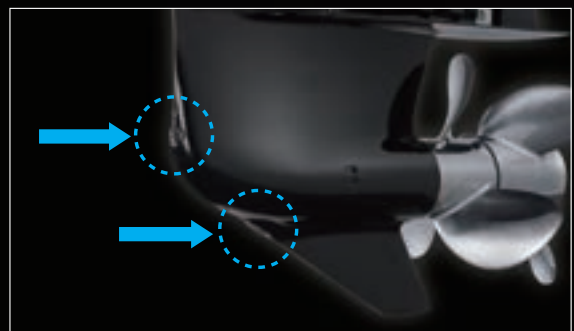
SUZUKI DUAL PROP SYSTEM

GEAR CASE DESIGN

Designing the actual shape of the gear case was another significant challenge. Top speeds, even with the new contra-rotating propeller, were not up to expectations. Analysis revealed that cavitation voids around the gear case were still causing excessive resistance. While Suzuki engineers had extensive experience in designing gear case profiles, these new, faster speeds presented new challenges. After many late nights, repeated simulations using computational fluid dynamics (CFD) and countless test drives, a breakthrough design was developed that both minimized resistance and provided the most efficient flow of water to the propellers.

DUAL WATER INTAKES

Designing the shape of the gear case also required repositioning the water intakes. It was important to arrange the main and sub intakes as far apart from each other as possible, and to design them to ensure a reliable amount of cooling water, especially at high speeds. On the DF350A, the best results were achieved when the main intake was positioned at the front of the gear case, with the secondary intake located just above the skeg.



DUAL WATER INLET



OUR PROVEN TECHNOLOGIES ARE BACK IN THE DF350A



SUZUKI'S LEAN BURN CONTROL SYSTEM

Suzuki's innovative Lean Burn Control System was first introduced on the DF90A and 70A to great acclaim. The system predicts fuel needs according to operating conditions, allowing the engine to run on a leaner, more efficient air-fuel ratio. It delivers its benefits over a wide operating range, providing significant improvements in fuel economy from low-speed operation into the cruising range. In combination with Suzuki Precision Control electronic throttle and shift system, the operator can precisely, and smoothly, increase or decrease engine RPM for significantly improved fuel economy.

LEAN BURN



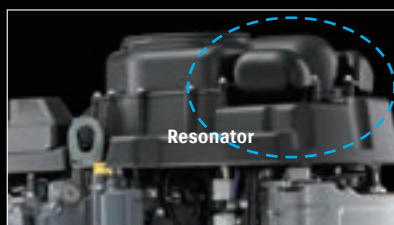
QUIET OPERATION

Suzuki outboards have long been noted for their quiet operation. In fact, they run so quietly that some users have thought the engine was switched off. To ensure this same level of quiet operation, The DF350A is fitted with a resonator on the intake manifold. Often overlooked as a noise source, air drawn into the intake manifold

at high velocities can generate a harsh noise.

Adding the resonator reduces such noise, keeping the engine operation exceptionally quiet.

We have taken sound quality into consideration over the entire speed range and both skipper and passengers alike will be impressed with both the quietness and engine sound, especially when idling or trolling.



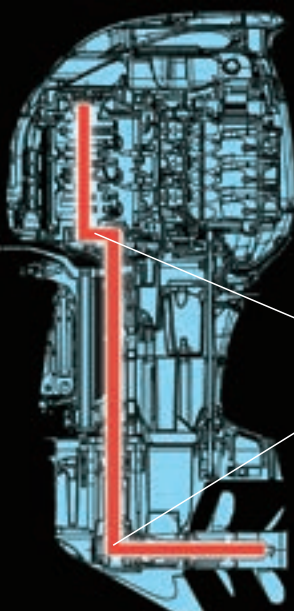
LARGE REDUCTION GEAR RATIO (Powerful Propulsion)

Suzuki's sophisticated technologies deliver a large reduction gear ratio.



OFFSET DRIVESHAFT

Suzuki outboards are among the most compact outboards in their respective classes. That's due in part to Suzuki's proven offset driveshaft system. This design places the crankshaft in front of the driveshaft through the use of intermediate gear reduction. In addition to providing an increase in power performance and adding to the compactness of the outboard, this system moves the outboard's center of gravity forward, resulting in better weight distribution and balance, more directional stability, and less vibration.



1st Stage Reduction
32:40=1.25

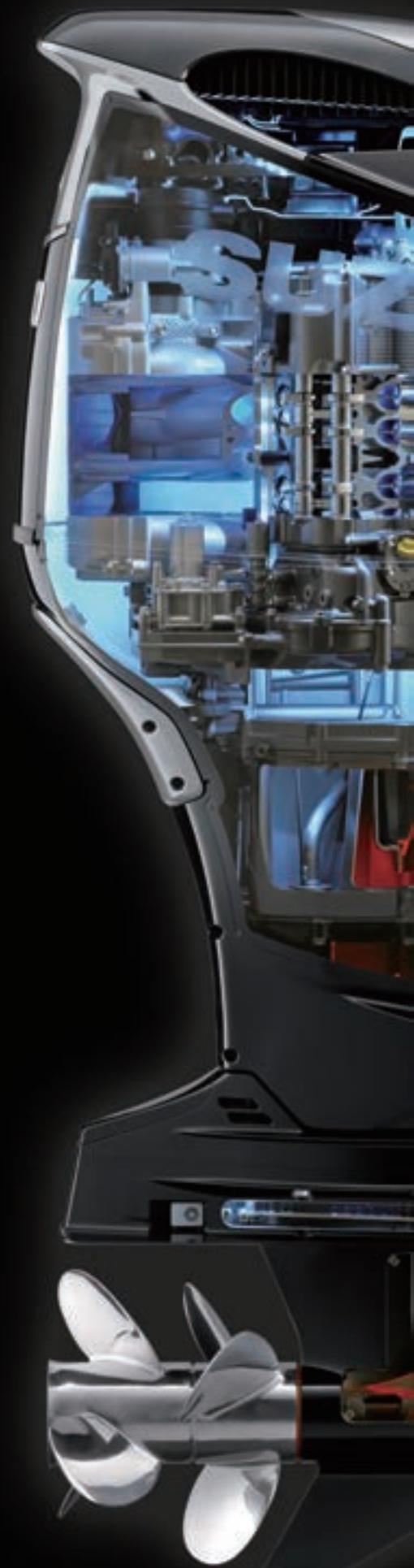
2nd Stage Reduction
12:22=1.83

Total Gear Ratio=2.29:1



2-STAGE GEAR REDUCTION

The DF350A outboard also incorporates a 2-Stage Gear Reduction which results in a large reduction gear ratio. It delivers powerful torque for quick acceleration and great top-end speed.





SUZUKI'S ADVANCED TECHNOLOGY DELIVERS THE UTMOST IN PERFORMANCE VVT (Variable Valve Timing)

Suzuki's engineers designed the 4.4-liter V6 engine with an aggressive cam profile that delivers maximum output and performance at high rpm. In coupling this cam profile with

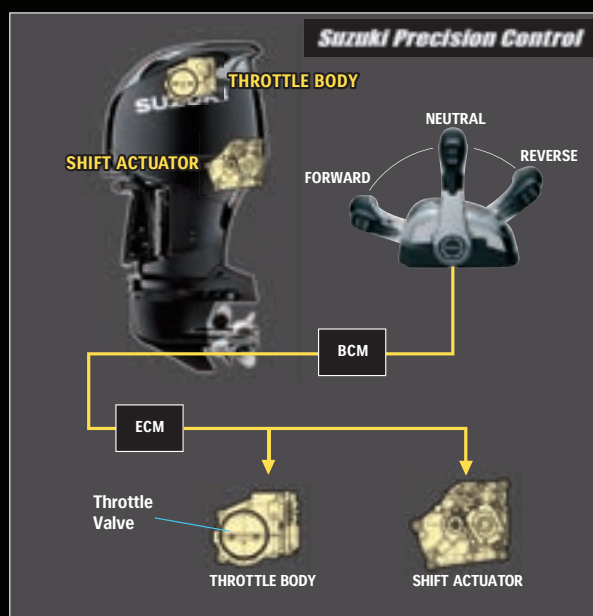
Suzuki's advanced Variable Valve

Timing (VVT), the DF350A delivers the additional torque that outboards need for accelerating in the low to mid-range. VVT achieves this by adjusting the timing of the intake valves, allowing them to open before the exhaust valves are fully closed, creating a momentary overlap in the timing where both sets of valves are open. Using VVT, this overlap can be increased or decreased by altering intake timing with the camshaft resulting in optimum timing for low and mid-range operation.



SUZUKI PRECISION CONTROL (Electronic Throttle and Shift Systems)

This technologically advanced system is a computer-based drive-by-wire control system that eliminates the friction and resistance of mechanical control cables. Operation is smooth and precise with crisp, immediate shifting that is most evident in the low rpm range and when maneuvering around the marina and in close quarters. The system can be configured for single, twin, triple, or quad installations, and for dual stations.



SUZUKI TROLL MODE SYSTEM

Suzuki's Trolling Mode system provides fine control over engine speed at low rpms to keep your boat moving at a constant speed while trolling. When the system is engaged, revs are controlled with an independent control switch that adjusts engine revs in 50rpm increments over a range spanning from idle to 1,200rpm. The system includes a control switch, which can be mounted nearly anywhere on the console, and a tachometer, and is compatible with Suzuki's SMIS digital gauges or the dual scale analog gauges.



SELF-ADJUSTING TIMING CHAIN

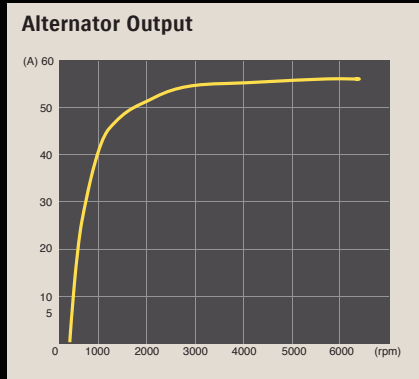
The timing chain runs in an oil-bath, so it never needs lubricating, and is equipped with an automatic hydraulic tensioner, so it remains properly adjusted at all times. Simple, effective and maintenance-free.



OUR PROVEN TECHNOLOGIES ARE BACK IN THE DF350A

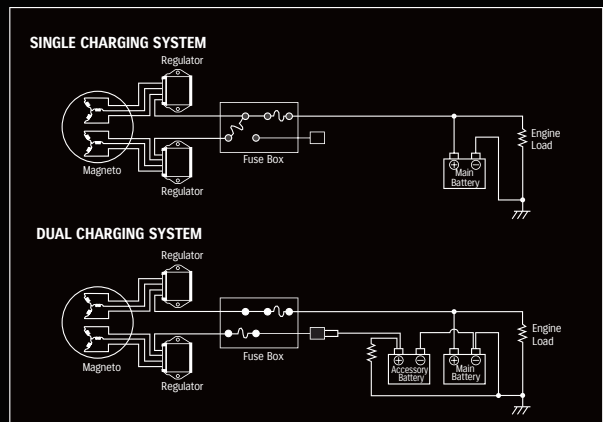
HIGH OUTPUT ALTERNATORS

Today's boats are equipped with a wide array of electronics that demand an ample flow of power to keep them running. With that in mind, Suzuki engineers have equipped the DF350A with an alternator that produces a majority of its maximum 54A (12V) output with the motor running at a low 1,000 rpm—enough power for most circumstances.



KNOCK SENSOR

The knock sensor monitors combustion to provide the ECM with information needed for precise management of engine timing for optimum performance. In addition to maximizing power output, the system also helps increase engine durability.



CONVENIENT DUAL CIRCUIT CHARGING SYSTEM

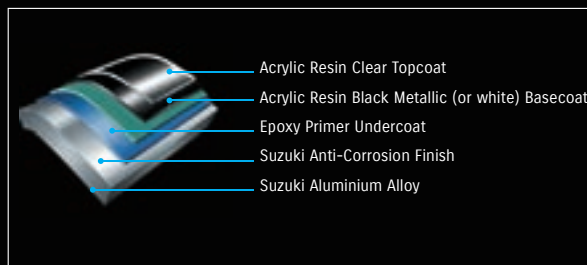
The DF350A incorporates a dual circuit charging system that can be adapted* to accommodate the dual-battery configurations often used on large boats. When used in this configuration the system is designed to charge both the main and auxiliary batteries simultaneously but on independent circuits. With this you can drain down the accessory battery powering your electronics and still have a fully charged main battery for starting the motor.

*Utilization of this system requires the purchase of an optional wiring harness.



FUEL COOLER

Cooler fuel is more dense, and dense fuel delivers more performance. A fuel cooler in the DF350A's fuel delivery system cools the fuel before it enters the engine, resulting in better combustion and improved performance.



SUZUKI'S ANTI CORROSION FINISH

Suzuki's Anti-Corrosion Finish is specially formulated to increase the durability of the engine and help protect parts of the aluminum exterior that are constantly exposed to fresh and saltwater. This advanced finish offers maximum bonding to the outboard's aluminum surface, creating an effective treatment against corrosion.



Directive 2013/53/EU



CARB Three-Star Label

CLEANER, MORE EFFICIENT OPERATION

Suzuki's advanced four-stroke engines conform to the emissions standards set forth by the Recreational Craft Directive (RCD II)- Directive 2013/53/EU of the European Parliament and of the Council, and have received three-star Ultra Low Emissions ratings from the California Air Resources Board (CARB).



DF350A SPECIFICATIONS

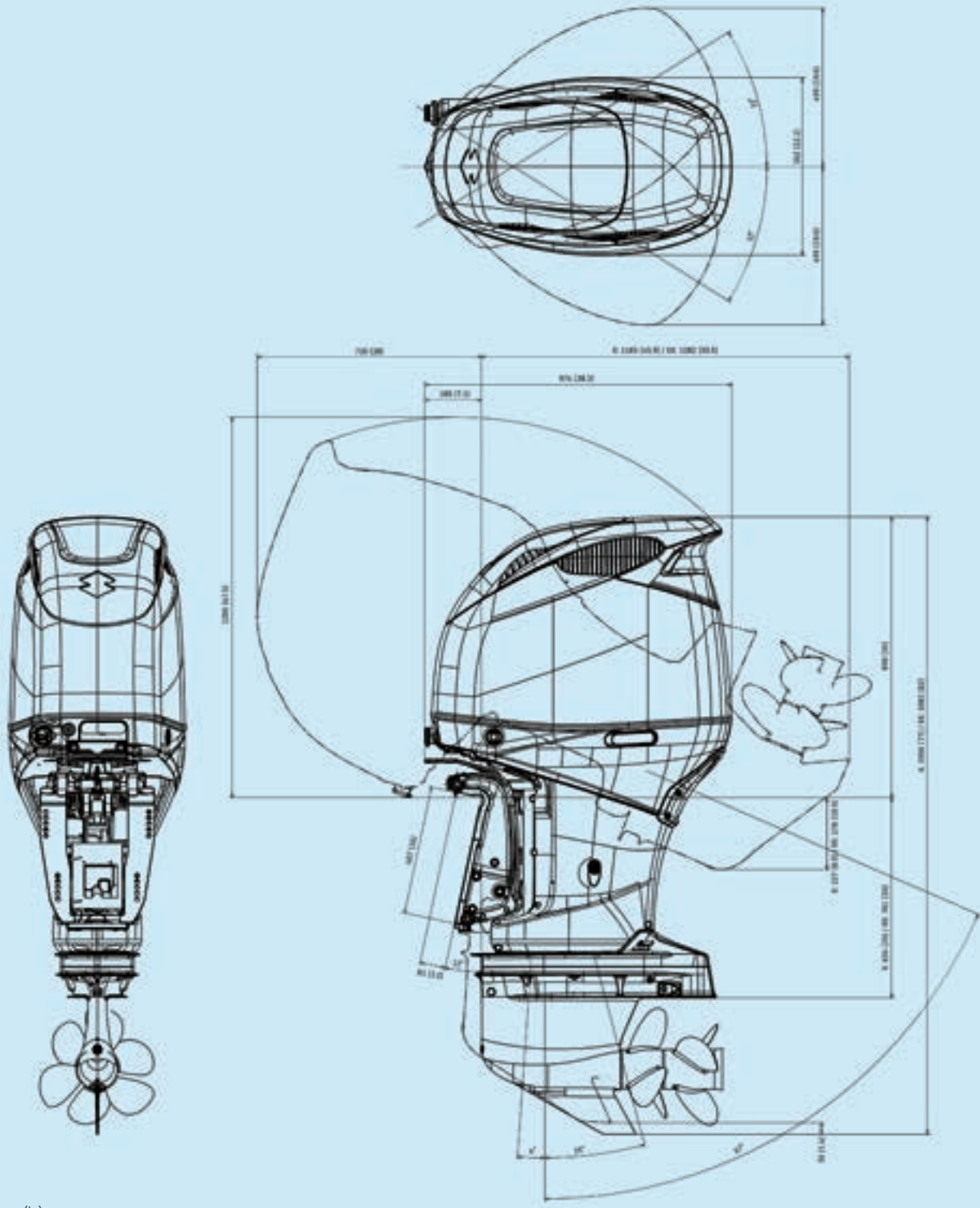
MODEL	DF350A	
RECOMMENDED TRANSOM HEIGHT (in.)	X : 25"	XX : 30"
STARTING SYSTEM	Electric	
WEIGHT (lbs.) *1	X : 727 Lbs	XX : 747 Lbs
ENGINE TYPE	V6 - 55° DOHC 24-Valve	
Valve Train Drive	Chain with Variable Valve Timing	
FUEL DELIVERY SYSTEM	Electronic Fuel Injection with Dual Injectors Per Cylinder	
NO. OF CYLINDERS	6	
PISTON DISPLACEMENT cu.in. (cm ³)	267.9 (4,390)	
BORE × STROKE in. (mm)	3.74 (98) x 3.82 (97)	
MAXIMUM OUTPUT (HP)	350	
FULL THROTTLE OPERATING RANGE rpm	5,700 - 6,300	
STEERING	Remote	
OIL PAN CAPACITY U.S./Imp. qt. (ℓ)	8.5 (8.0)	
IGNITION SYSTEM	Fully-transistorized	
ALTERNATOR	12V 54A	
ENGINE MOUNTING	Shear Mount	
TRIM METHOD	Power Trim and Tilt	
GEAR RATIO	2.29:1	
GEAR SHIFT	F-N-R (Drive-by-Wire)	
EXHAUST	Through Prop Hub Exhaust	
PROPELLER SELECTION (Pitch)*2 All propellers are the 3-blade type	FRONT: 3×15 1/2×19.5-31.5 REAR: 3×15 1/2×19.5-31.5	

*1: Dry Weight: Including battery cable, not including propeller and engine oil.

*2: Please inquire at your local dealer for details of the propeller.

Specifications are subject to change by manufacturer at any time without notice and they may vary depending on local conditions or requirements. Please inquire at your local dealer for details of any such changes.

DIMENSIONS



Unit: mm (in)



**THE
ULTIMATE™
4-STROKE OUTBOARD**



Way of Life!

Part No. 99953-DF350-018
Product Info
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