

COMMANDER

POWER BY



OWNERS MANUAL

302 CID & 351 CID

COMMANDER MARINE
CORPORATION
4760 N.W. 128th St. Rd.
Miami, Florida 33054

Power House Marine

4760 N.W. 128th Street Road
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WELCOME ABOARD . . .

Welcome to the COMMANDER fleet. Your engine is built of the finest materials available and is designed to give you maximum performance. To insure long and dependable service we recommend you read carefully the following information. Make it a habit to check your engine each time before starting and follow the break-in instructions.

Thank you for your confidence in COMMANDER. I take great pride, as I know you will, in knowing that your COMMANDER is the best marine engine available.

Dudley Whitman, President
Power House Marine Corporation

manufactured by:

Power House MARINE

4760 N.W. 128th STREET ROAD - MIAMI, FLORIDA 33054

Telephone 305 / 685-5786

Power House Marine Corporation reserves the right to discontinue models at any time or change specifications or design without notice and without incurring obligation.

INSTALLATION AND OPERATION

Your boat builder and COMMANDER dealer who installs your engine is an expert in his field. When taking delivery have him go over the engine installation and components. Get thoroughly checked-out on proper procedures and operating instructions.

Your COMMANDER engine must have the proper propeller to allow the engine to run 4200-4500 RPM (revolutions per minute) when the throttle is fully advanced. If the weight of your craft increases or decreases it is *YOUR RESPONSIBILITY* to see that the proper propeller is installed to allow the engine to run at the maximum 4500 RPM at full throttle. Propeller requirements to satisfy this condition will change as the loading of your craft is changed. Any marine growth on bottom or propeller, will have a very adverse effect. Improper propellers causing engine RPM lower or higher than stated will result in deterioration of valves and pistons, and unnecessary wear.

WARNING

When using the COMMANDER 302 CID or 351 CID engine with the 270 Volvo outdrive the craft must be propped-out to allow the engine to run a **minimum** of 4500 RPM at full throttle. This is mandatory otherwise warranty on the outdrive is void.

STARTING ENGINE THE FIRST TIME

1. After gas tanks are filled and before starting newly installed engine, make certain all fuel shut-off valves are open.
2. Make sure the engine compartment and bilge is free of gasoline fumes and carefully inspect all fuel lines and connections for leakage.

CAUTION

IF GASOLINE FUMES ARE DETECTED THE BILGE AND ENGINE COMPARTMENT MUST BE COMPLETELY AIRED OUT PRIOR TO TURNING ANY SWITCHES OR STARTING THE ENGINE.

3. Check fresh water cooled engine for proper water or coolant level.
4. Check engine, transmission, or outdrive for proper oil level.
5. Check all electrical connections, making sure *negative* battery cable is grounded to the engine *block*.
6. Check that all the drain cocks and plugs on the engine are closed.
7. Advance throttle four or five times to pump fuel into carburetor.
8. Open throttle by advancing it slightly forward with transmission gears disengaged (shift at neutral).
9. Turn ignition on with key to "START" position and crank engine. It should start within twenty seconds.
10. Check oil pressure gauge to see that it registers immediately.
11. Warm up engine by advancing throttle to 1000 or 1200 RPM, maximum.
12. Check water temperature gauge for a reading not to exceed approximately 160 degrees when engine is warm. Fresh Water cooled engine not to exceed 200 degrees.
13. Close throttle and check tachometer for idle speed of 700 RPM.
14. Check steering, throttle, and shift controls for proper and smooth operation. If equipped with outdrive, read outdrive manual before operating engine.

NOTE
SHUT DOWN ENGINE AT ONCE
IF ANY SYSTEM MALFUNCTIONS.

CAUTION
Do not operate engine without cooling water flowing through water pump, as water pump impeller will be damaged.

DAILY BEFORE STARTING ENGINE

1. Turn bilge-blower "ON". If not equipped with bilge-blower, remove engine hatch to ventilate the engine compartment, and check for the odor of gasoline fumes.
2. Check the amount of fuel in the tanks and open the valves in the line to the engine. At the same time check the entire fuel system for possible leaks.
3. On fresh water cooled engine check coolant level.
4. Check engine and transmission or outdrive oil level.
5. Lower the outboard drive by using the UP - DOWN outdrive lift switch. **DO NOT START THE ENGINE WITH THE OUTDRIVE UNIT IN ITS TIPPED-UP POSITION.**
6. Check all controls for proper operation.
7. Make sure that you have a fire extinguisher, life vests, anchor, mooring lines, and other safety equipment on board.

FUEL AND LUBRICATION SPECIFICATIONS

Gasoline Grade: Regular (94 octane, minimum) Leaded or low lead.

**DO NOT USE NO-LEAD OR LEAD-FREE GASOLINES
AS VALVE RECESSON WILL OCCUR!**

Engine Oil: SAE 10W-40 type MS. When water temperature is below 45°F use SAE 10W-30 type MS.

We do not recommend the use of any lubricant which does not have both an SAE designation and type MS service classification on the container. Oil and oil filter must be changed every 50 hours. Use only oil filters approved by Ford Motor Company.

Outdrive Oil: SAE 10W-30 type MS only, *NO ADDITIVES*.

Clutch & Reverse Gear Lubricant: See specifications on gear housing.

ENGINE BREAK-IN SCHEDULE

- 1500 RPM for the first 15 minutes
- **2000 RPM for the next 2 hours
- **3000 RPM for the next 3 hours
- **4000 RPM for the next 4 hours

DO NOT OPERATE CONTINUOUSLY IN EXCESS OF THE ABOVE PRESCRIBED RPM

***During this period operate at higher RPM occasionally and for short durations of 1 to 2 minutes.*

Watch temperature and oil pressure gauge very carefully during break-in period.

WARNING

During break in period do not use antifriction additives in oil lubricant. Use SAE 10W-40 Type MS with NO ANTIFRICTION ADDITIVES.

CAUTION: Do not race engine before turning ignition key off or turn key off with engine running above idle speed. This could cause water to be drawn into engine via exhaust system and result in internal damage.

25 HOUR MAINTENANCE INSPECTION

Some of these operations require specialized mechanical knowledge and the use of special tools. For this reason, these operations should be carried out by an authorized service station.

1. Check alignment of engine and tighten engine mounts.
2. Change oil and oil filters.
3. Inspect and adjust belts.
4. Check hoses and hose clamps.
5. Check fuel system and replace fuel filters.
6. Check battery and all electrical connections.
7. Check distributor points and lubricate distributor.
8. Check timing with timing light.
9. Inspect and adjust spark plugs.
10. Torque all engine bolts as required.
11. Clean and inspect oil cooler and sea strainers.
12. Fresh water cooled engine should have clean coolant with rust inhibitor, Ford 8A-19546-C, or equivalent.
13. Check heat exchanger zinc on fresh water cooled engine.
14. Check positive crankcase ventilator valve.
15. Clean flame arrestor and oil breather cap.
16. Lubricate distributor cam lobe.

Change engine oil and filters every 50 hours and at end of boating season. All of the above items to be checked every 50 hours.

GENERAL SPECIFICATIONS

	302 CID-2V	302 CID-4V	351 CID-4V
Horsepower	185 h.p.	215 h.p.	235 h.p.
Max. Recommended RPM	4500 RPM	4500 RPM	4500 RPM
Total Weight (Not including outdrive)	617 lbs.	617 lbs.	672 lbs.
Number of Cylinders	8	8	8
Piston Displacement	302 cu. in.	302 cu. in.	351 cu. in.
Bore	4 in.	4 in.	4 in.
Stroke	3 in.	3 in.	3.5 in.
Compression Ratio	9:1	9:1	9:1
Direction of Rotation (Viewed from Flywheel)			
Std. Rotation	L/H Counter Clockwise		
Opp. Rotation	R/H Clockwise		
Valve Tappet Clearance	Hydraulic Tappets, Self Adjusting		
Crankcase oil capacity (including oil filter)			
Inboard/Outboard	5 qts.	5 qts.	5 qts.
Inboard	Depends on installation angle		
Water or Coolant Capacity	12 qts.	12 qts.	12 qts.
Firing Order			
Std. Rotation, L/H	1-3-7-2-6-5-4-8	Same	Same
Opp. Rotation, R/H	1-8-7-3-6-2-4-5	Same	Same
Spark Plugs, Autolite	BTF-3	BTF-3	BTF-3
Spark Plug Gap	.032-.036	.032-.036	.032-.036
Contact Breaker Point Gap	.017	.017	.019-.025
Voltage (negative ground)	12 volts	12 volts	12 volts
Alternator Output	38 amp.	38 amp.	38 amp.
TIGHTENING TORQUES (ft. lbs.) – Tighten Bolts in Proper Sequence			
Cylinder head, first step	50	50	55
Cylinder head, second step	60	60	65
Cylinder head, third step	65-72	65-72	95-100

	302 CID-2V	302 CID-4V	351 CID-4V
Connecting Rod Bolts	19-24	19-24	40-45
Flywheel	75-85	75-85	75-85
Spark Plug	15-20	15-20	15-20
Harmonic balancer to camshaft	70-90	70-90	70-90
Tensioner to flywheel hsg.	15-20	15-20	15-20
Intake Manifold Bolts	20-25	20-25	20-25
Rocker Arm Studs	18-22	18-22	18-22
Exhaust Manifold Bolts	18-24	18-24	18-24
Oil Pan Bolts, 1/4"	7-9	7-9	7-9
Oil Pan Bolts, 5/16"	9-11	9-11	9-11
Timing Gear Cover	12-15	12-15	12-15
Oil Pump to Cylinder Block	23-28	23-28	23-28
Camshaft Sprocket	40-45	40-45	40-45
Camshaft Thrust Plate	9-12	9-12	9-12

Model	Mallory No.	Distributor Ford No.	Initial Ignition Timing at 500 to 650 RPM	Point Set In.	Dwell Deg.
302	YL 512 CV	DIJJ-12100-A	10° BTDC	.020	*
302	YL 512 DV	DIJJ-12100-B**	10° BTDC	.020	*
302		C9JF-12127-B	12° BTDC	.017	26°-29°
351	YL 554 EV	D2JL-12100-A	10° BTDC	.020	26°
351	YL 554 FV	D2JL-12100-B**	10° BTDC	.020	26°
351	YL 554 CV	DIJJ-12100-C	10° BTDC	.020	*
351	YL 554 DV	DIJJ-12100-D**	10° BTDC	.020	*
351	YC 563 HP		6° BTDC	.025	*
351	YC 563 DV		10° BTDC	.025	*

*Use of dwell meter not recommended

**Opposite Rotation

ENGINE IDENTIFICATION

Model	Typical Serial No.	Location
302	CM 521 - 7 FR	Number stamped into top-rear of cylinder block
351	CM 135 - 7	Number stamped into left-rear of cylinder block just below cylinder head

CODE:

F - Fresh water Cooled

R - Right hand rotation

Absence of letter indicates engine is standard left hand rotation and raw water cooled.

NOTE

When ordering spare parts always give model and serial number of engine and drive.

If it should become necessary to contact factory the following information is necessary:

1. Engine Model and Serial Number.
2. Drive Model and Serial Number.
3. Date Purchased.
4. Name of selling dealer.
5. Boat Manufacturer, model and length.
6. Engine-hours operated.
7. Date of previous correspondence.

JOIN YOUR POWER SQUADRON
GOOD SEAMANSHIP IS NO ACCIDENT

COMMANDER WARRANTY

POWER HOUSE MARINE CORPORATION warrants that the COMMANDER engine and each part of such engine will be free from defects in material and workmanship under normal use when selected for proper service, correctly installed and adequately maintained and operated, for a period of six months or 400 hours, whichever comes first, from date of delivery to the original retail purchaser. However, all warranty is limited to 18 months from the shipping date from the POWER HOUSE MARINE CORPORATION plant.

During the warranty period POWER HOUSE MARINE CORPORATION will replace or repair as required free of charge any part or parts returned with transportation charges prepaid after the company has determined part or parts to be defective to its satisfaction; provided it receives *written* notice of any such claimed defect within thirty (30) days from the date of discovery.

The company will not reimburse expenses for transportation, towing, hauling or storage. The company will not accept liability for physical damage to property attributable to and arising out of warranty claims nor is the company responsible for loss or use of other consequential effects of any engine failure however caused.

This warranty will not apply to any engine if it has been subject to misapplication, abuse, overload, misuse, negligence, racing, accident, or if parts not supplied or approved by POWER HOUSE MARINE CORPORATION or FORD MOTOR COMPANY has been used in connection with it if, in the sole judgement of the company such use affects its performance, stability or reliability, or if it has been altered or repaired outside of its authorized service facilities in a manner which in the sole judgement of the company affects its performance, stability or reliability.

This warranty will not apply to normal maintenance services (such as engine tune up and adjustments, and fuel cleaning of water or foreign material from carburetor and fuel system. Normal replacement of service items (such as filters, impellers, lubricants, spark plugs, belts, hoses, ignition points and condensers), or to electrical system if failure is due to water.

This warranty is expressly in lieu of any other express or implied warranty on the engine or any part thereof including any implied warranty of merchantability or fitness, and of any other obligation or liability on the part of POWER HOUSE MARINE CORPORATION. No person is authorized to make any representations beyond those herein expressed.

POWER HOUSE MARINE CORPORATION reserves the right to make changes in the design of and other changes in its products at any time and from time to time without notice and without incurring any obligation with respect to any product theretofore ordered from it or sold or shipped by it.

IMPORTANT

The OWNERS WARRANTY CERTIFICATE included with each engine must be completed and the registration portion mailed to POWER HOUSE MARINE CORPORATION within *10 days* of the date of delivery to the original retail purchaser to validate the WARRANTY.