ECOJET

OPERATOR'S MANUAL

ECOJET BY Indmar | Indmar MARINE ENGINES

CONTENTS

NOTES

INTRODUCTION

INDM_0206

FIGURE 1.1 | ECOJET

This manual will acquaint you with basic information needed to safely operate and maintain your Indmar EcoJet. We suggest you and all other operators read the entire manual before using your boat.

We recommend you contact your Indmar dealer for all engine service. Certified Indmar Technicians are trained to service your Indmar engine and drive train. They have current specifications, parts and the special equipment needed to service your Indmar engine and drive train. To find your nearest Indmar dealer, please visit our website at www.indmar.com or call (800) 970-3744.

In the unlikely event that you experience a major drive train or engine failure, please be aware that the failure may not be covered by the Indmar Limited Warranty. The Complete Indmar Limited Warranty Statement can be found online at www.indmar.com.

Some failures may be covered under your boat owner's insurance policy. We strongly recommend you contact your insurance company immediately and advise them of the situation until the final determination for eligibility is made.

To ensure that the proper information is available, note the serial number. The serial number is stamped on the back of the intake on the starboard side. Refer to Figure 1.2 for locations.

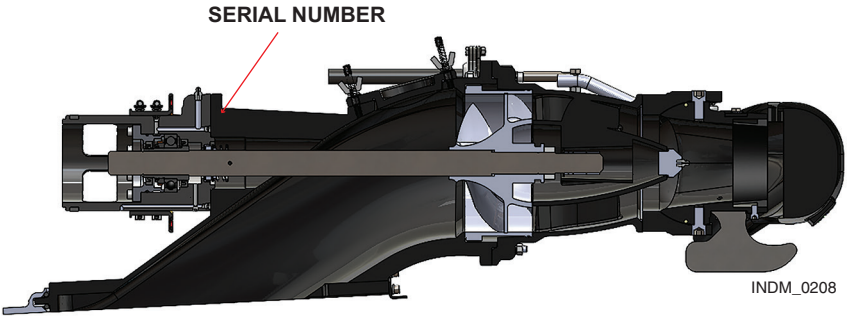

FIGURE 1.2 | SERIAL NUMBER LOCATION

WARRANTY REGISTRATION

The Federal Boat Safety Act of 1971 requires registrations of marine products sold in the United States be maintained by the manufacturer and dealers of those products. Your dealer should have completed your warranty registration to comply with federal regulations. This registration enables us to contact you, if it should become necessary, to change or improve your product. The EcoJet serial number is stamped on the back of the intake on the starboard side. Refer to Figure 1.2. Always retain a copy of the serial number for your personal records.

Warranty registration must be received within 10 days after date of purchase by the first owner. The EcoJet package must be registered with Indmar Customer Service before any warranty diagnosis or repairs can be performed. If the EcoJet has not been previously registered the start of warranty will be either the date of sale or date put in service, whichever is earlier.

WARRANTY REGISTRATION TRANSFER

The remainder of the warranty is transferable to a second owner. Warranty transfers must be completed within 10 days of the transfer of ownership.

If the trade-in and resale is handled by an authorized Indmar dealer, the dealer must fill out the warranty registration transfer form and send it and other paperwork specified along with the warranty transfer fee and the transfer will be processed after approval by Indmar.

If the sale of the boat is from a private owner to another individual, the EcoJet package must be inspected by an authorized Indmar dealer, at the seller or purchaser's expense, and the Inspection Form, Warranty Transfer Form, specified paperwork and transfer fee and the transfer will be processed on approval by Indmar.

The new boat owner will be notified within 10 days of Indmar's receipt of the transfer form whether the transfer has been accepted or not. If the transfer has been accepted, the warranty expiration date will also be provided for the new owner.

To obtain enjoyment from your boat, follow recommendations described in this manual. The knowledge you gain through careful review will help you experience lasting satisfaction.

Further information regarding the care, operation, required equipment or specifications for your boat can be obtained from your local US Coast Guard Auxiliary, US Power Squadron, state boating authorities, or the American Red Cross. Know the law and your responsibilities as a boat owner.

Any alteration, change, improper maintenance or abnormal use by you which renders the EcoJet or any of its components unreasonably dangerous will void all warranties and Indmar will not be liable for the resulting damages or injuries.

NOTES

Section One
SAFETY

The words DANGER, WARNING, CAUTION and NOTICE are used throughout this manual to highlight important information. Be certain that the meanings of these alerts are known to all who work on or near the equipment.

Follow the safety information throughout this manual in addition to the safety policies and procedures of your employer.

This safety alert symbol appears with most safety statements. It means attention, become alert, your safety is involved! Please read and abide by the message that follows the safety alert symbol.

⚠ DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a situation which can cause damage to the engine, personal property and/or the environment, or cause the equipment to operate improperly.

NOTE: *Indicates a procedure, practice or condition that should be followed in order for the engine or component to function in the manner intended.*

CARBON MONOXIDE GAS

⚠ DANGER

Carbon monoxide gas (CO) is colorless, odorless and extremely dangerous. All engines and fuel burning appliances produce CO as exhaust. Direct and prolonged exposure to CO will cause BRAIN DAMAGE or DEATH. Signs of exposure to CO include nausea, dizziness and drowsiness. Ensure adequate ventilation to prevent accumulation of CO in the boat.

Each year, boaters are injured or killed by carbon monoxide. Virtually all of these injuries and deaths are preventable. Carbon monoxide is a potentially deadly gas produced anytime a carbon-based fuel, such as gasoline, burns. Carbon monoxide sources on your boat include gasoline engines and generators, cooking ranges, space heaters and water heaters.

Do not confuse carbon monoxide poisoning with seasickness, intoxication or heat stress. If someone complains of irritated eyes, headache, nausea, weakness, dizziness or drowsiness, or you suspect carbon monoxide poisoning, immediately move the person to fresh air, investigate the cause and take corrective action. Seek medical attention if necessary.

Indmar engines are equipped with catalytic converters which significantly reduce harmful CO emissions, but it is important that all of the DOs and DON'Ts still be followed.

Please follow these **DOs** and **DON'Ts** to ensure a safe boating experience every time.

DON'T start the engine or let it run for any length of time in an enclosed area. Always operate the engine in an open area.

DON'T swim or sit near the swim platform when any engine is running.

DON'T hold on to the swim platform while the boat is underway (no "Teak Surfing").

DON'T moor next to another boat whose engine is running.

DON'T confuse carbon monoxide poisoning with seasickness or intoxication.

DO immediately move the person to fresh air, investigate the cause and take corrective action if someone on board complains of irritated eyes, headache, nausea, weakness or dizziness. Seek medical attention if necessary.

DO make sure generators are properly ventilated and keep engine and generator exhausts clear.

DO always shut off engine and generator when moored, anchored or standing still.

DO be aware that the station wagon effect, or backdrafting, can cause carbon monoxide to accumulate inside the cabin, cockpit and bilge when the boat is underway, moving at slow speed or idling.

DO keep your boat's engine well-maintained and regularly check to make sure carbon monoxide detectors in the cabin are working properly.

DO always wear a properly fitted life jacket while in or around water.

For more information on carbon monoxide and boats, contact the US Coast Guard Office of Boating Safety at www.uscgboating.org or your state boating law administrator at 1-859-225-9487 or www.nasbla.org.

FUEL

⚠ DANGER

Gasoline (petrol) is extremely flammable and highly explosive under certain conditions. Explosive gasoline fumes may accumulate in the engine compartment. Failure to properly ventilate fumes with the bilge blower may result in explosive atmosphere.

Indmar marine engines use gasoline (petrol) for fuel. The area under the engine and around the gasoline tank and supply lines is not open to outside air. Ventilation around these areas must be provided by your bilge blower system and air vents located around the boat. We recommend taking time out to carefully inspect your boat at least once a day for gasoline fumes, oil leaks, and areas where wiring may be worn or damaged.

⚠ WARNING

Always operate the bilge blower at least 4 minutes prior to starting the engine. Raise the engine cover to ventilate fumes. Inspect the engine and compartment for any fluid or fuel leaks.

- Do not smoke or allow open flames or sparks nearby when refueling.
- Always stop the engine before refueling.
- Maintain contact between the fuel nozzle and the fuel tank or container to prevent electrostatic spark. Do not use a plastic funnel.
- Do not block fuel vents.
- Do not store fuel in any containers or compartments which are not designated for fuel storage and do not use these storage areas for any other purpose.

While refueling close all hatches and have all guests move off the boat during the refueling process.

BATTERY

⚠ DANGER

Explosive battery fumes may accumulate in the engine compartment. While the engine is running or the battery is charging, hydrogen gas is being produced by a lead acid battery and can be easily ignited. Failure to properly ventilate fumes with the bilge blower may result in explosive atmosphere.

- Wear personal protective equipment when working on or around batteries.
- Do not smoke or bring a flame near a battery.
- Do not check for a dead battery by placing a metal object between the battery posts. Sparks could cause an explosion.
- Do not place your head directly above a battery when making or breaking electrical connections.

ENGINE OIL

⚠ WARNING

Wear protective equipment and use caution when checking and changing the engine oil. Engine oil may be hot.

- Prolonged and repeated contact with used engine oil may cause skin cancer.
- Avoid direct skin contact with used engine oil. If skin contact is made, wash thoroughly with soap or hand cleaner as soon as possible.
- Keep used engine oil out of the reach of children.
- Used engine oil is a hazardous material. Dispose of properly.

CLEANING SOLVENTS

⚠ WARNING

Always read and comply with the solvent manufacturer's recommendations for proper use and handling of solvents.

- Do not use gasoline, paint thinners or other highly volatile fluids for cleaning.
- Do not mix cleaning agents together; harmful vapors may be released.

ENTANGLEMENT

⚠ WARNING

Rotating or moving parts can entangle or sever body parts.

- Do not wear jewelry, unbuttoned cuffs, ties or loose-fitting clothing.
- Tie long hair back when working near moving or rotating parts.
- Keep hands, feet and tools away from all moving parts.

ENVIRONMENTAL

NOTICE

Always be environmentally responsible. Follow the guidelines of the EPA or other governmental agencies for the proper disposal of hazardous materials such as engine oil, anti-freeze and fuel. Consult the local authorities or reclamation facility.

RETRIEVING SKIERS

The following guidelines are for the boat operator while a participant is in the water.

- Always have a “spotter” (designated observer) other than the boat operator on board to ensure the safety of the participants in the water and provide communication to and from the boat operator and the participants.
- Always turn the engine off from a safe distance when approaching participants in the water and allow them to reach the boat. Never run the engine near a person in the water.
- Never operate the boat in reverse to retrieve anyone in the water.
- Always return immediately to a fallen water sports participant. Always approach the participant on the operator’s side while keeping the participant in view from a direction opposite the wind or seas. Never drive directly at a person in the water or directly behind another boat.
- Always maintain a safe distance from people and objects in and on the water.
- Always look in the direction you plan to turn before turning the boat to pick up a fallen skier.
- Never retrieve any object from the water while the engine is running.
- Always keep the skier in view when the skier is entering or exiting the boat.
- Always watch the skier as the line begins to tighten (in case the rope wraps around ski or skier).
- Always look ahead before starting.
- Always start from a safe place with good forward and peripheral visibility.
- Always check direction of steering before starting, ensuring that the boat steers straight.
- Always be aware of what is occurring in front of the boat, and of a participant’s condition.

- Always display a “skier down” flag whenever a skier is in the water and not skiing.
- Always follow the approved towing pattern for the waterway in which you are operating.

SKI ROPES

Ski ropes should be avoided if possible to ensure that they are not sucked into the pump. Should you run over the rope, turn the engine off immediately. Shut off the engine while retrieving the rope. There is a certain amount of danger in retrieving the rope with the engine running (i.e., should the line be sucked up and a person become entangled, it could be possible for them to be drawn under water and drown).

⚠ DANGER

PERSONAL INJURY HAZARD

Before attempting to clean debris from the jet drive, disable the engine by removing the engine stop switch lanyard to prevent the engine from accidentally starting.

⚠ DANGER

PERSONAL INJURY HAZARD

Never get into the water to clear the restriction. Entering the water in highly congested vegetative areas can severely restrict your mobility.

⚠ WARNING

SEVER HAZARD

Always use extreme caution when attempting to clear vegetation or debris from the jet drive, as the impeller and intake grate have sharp edges.

SHALLOW WATER OPERATION

When the boat is operated in shallow, rocky water, ingestion of small rocks can cause damage to internal parts. No system can keep all the debris and rocks and allow enough water through to operate properly.

Shallow Water Boat Stability

Boat designs for flats, bays, poles and skiffs are very similar. Because of the unique requirements for a shallow draft, stability issues can arise under certain conditions, especially during quick turns. Take time to learn the characteristics of the boat alone and in open water away from other boaters. Make gradual increases in speed and radius to get the feel of stability under various conditions and be ready to make adjustments quickly. Slow down when boating with passengers to avoid possible ejection from the boat.

BRAKING AT SPEED

Be sure to use the braking action conservatively because the effect is much the same as an emergency stop in an automobile.

Reverse thrust is commonly used to slow and stop a boat. The amount of reverse thrust needed to stop will vary due to boat design, load and speed.

⚠ WARNING

CONTROL HAZARD

Always reduce engine speed to idle and pause in NEUTRAL before shifting from FORWARD to REVERSE or REVERSE to FORWARD. Abrupt stopping and steering loss can occur if the propulsion unit is shifted quickly from FORWARD to REVERSE or REVERSE to FORWARD. Never shift into REVERSE at planing or high forward speeds.

A boat does not have brakes. Controlling the boat to a stop and while stopped are important skills that must be learned. Reverse thrust is commonly used to slow and stop a boat. The continued momentum of a boat will vary according to the boat design, load and speed. You must also consider and learn to compensate for the effects of wind and current. Stopping in wind or water currents is difficult and requires skill to be able to anticipate and compensate for these effects.

Jet boat shift controls differ from conventional propeller-driven boats in that shifting into REVERSE can occur quickly, as there are no gears to change.

A jet-powered boat typically has no rudder below the water to create drag; therefore, it will glide farther in the water than a propeller-driven boat when slowed or stopped. Some jet boats and jet drives may be equipped with a rudder to enhance steering control.

- To stop or slow forward motion, always gradually return the throttle(s) to the slow IDLE position, pause and shift into NEUTRAL, then pause and shift into REVERSE.

⚠ WARNING

CONTROL HAZARD

Gradually return the throttle(s) to the slow IDLE position. Failure to do so can cause loss of boat control and engine propulsion system damage.

- If the boat has been driven for a long period of time at high speed, allow the engine a two- to three-minute cool-down period at low idle in NEUTRAL.
- Turn the ignition key to the OFF position.

NOTICE

Never pull the lanyard from the engine cut-off switch for normal shutdown. Doing so may impair your ability to restart the engine quickly.

- Avoid collisions; at high speeds the boat will require more time and distance to stop or slow.
- If you are new to boating or before your first outing of the season, practice slowing and stopping in open water. Seek on-water training if needed.

ENGINE COOLING

Do not operate the engine out of the water as severe damage to the engine and jet drive could result.

NOTES

Section Two
PRE-OPERATION INSPECTION

The following inspection should be performed with the help from the **SELLING DEALER** prior to jet drive operation. The same inspection should be performed by the user or selling dealer after the first 10- 20 hours of use and regularly thereafter every three months. If any items of the inspection list do not meet inspection guidelines, they should be corrected before using the jet drive.

NOTE: *This jet is equipped with reverse sense steering, which means that your boat will operate differently from an automobile when in reverse. This is easily overcome by steering in the direction you want the bow to go when in reverse.*

1. **Thrust Bearing Lubrication.** The bearing is lubricated at the factory before shipment. Lubricate every thirty hours or if the boat sits for more than 2 months. Lubricate before you take it out, about 4-5 pumps in the thrust bearing. Do not force grease in the bowl bearing. Refer to Figure 6.2 for the location of the grease zerk.
2. **Hand Hole Cover.** Check to make sure that the hand hole cover is tightly fastened. Refer to Figure 6.2 for the location of the hand hole cover.
3. **Steering.** Check the steering by rotating the wheel right and left with the engine off and verify that the nozzle turns completely against the housing to which it is attached.
4. **Reverse Shift Control.** With the control in full reverse, the reverse bucket should completely cover the nozzle's discharge opening. In full forward, the reverse bucket should clear the entire nozzle discharge opening. In neutral, the reverse bucket should cover about 3/4 of the discharge opening. The reverse bucket should have a provision to lock it in the forward position so that the bucket cannot fall into the water stream.
5. **Throttle.** Check to see that the throttle is operating smoothly.

6. **Transom Seals.** There should be no leaks at the housing seal to the boat or the housing seal to the bowl.
7. **EcoJet Weep Hole Inspection.** A weep hole is provided to indicate the condition of the mechanical seal. Refer to Figure 6.2 for the weep hole location. Water running out of the hole is an indication of a failed seal or that there is foreign debris between the seal faces, i.e., fishing line. A blast of compressed air in the weep hole will sometimes clear the obstruction. If it continues to leak, consult your dealer.
8. **Engine Cooling Connections.** Check to make sure all hose connections are tight.
9. **Stomp Grate (if equipped).** Check to make sure the cotter pins are in place and secure.

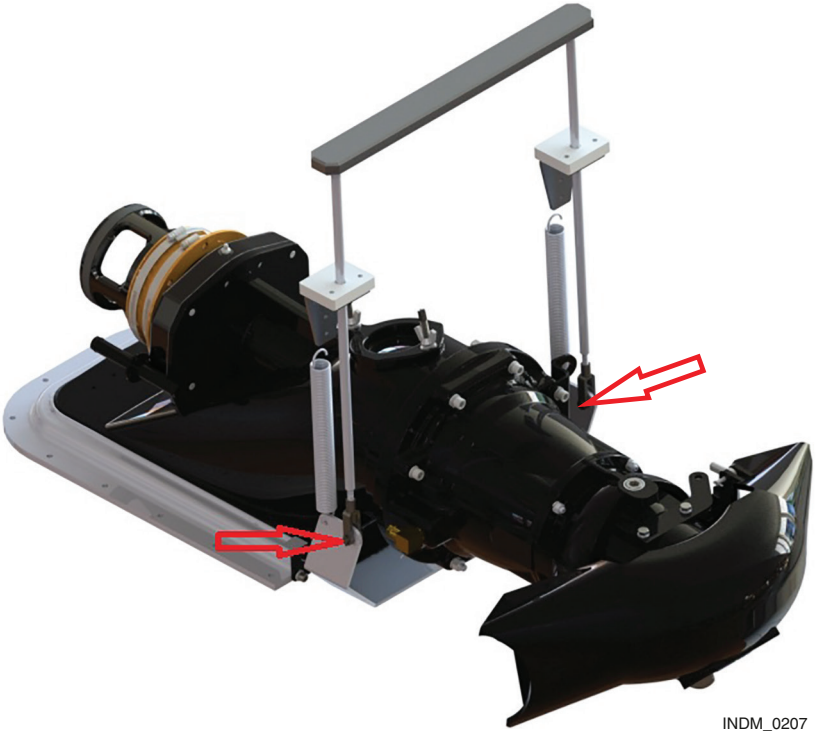

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FIGURE 2.1 | STOMP GRATE COTTER PINS

Section Three
BREAK-IN PROCEDURE

Before operating or maintaining the engine, review “Safety” on page 1-1.

⚠ WARNING

Always operate the bilge blower at least 4 minutes prior to starting the engine. Raise the engine cover to ventilate fumes. Inspect the engine and compartment for any fluid or fuel leaks.

⚠ WARNING

Jet boats are not required to have “start in gear” protection under U.S.C.G. Regulations. “Start in gear” protection is required by Indmar and boats built to ABYC standards and holding ABYC Certification status. Depending on how your boat is configured by the manufacturer it may be possible to start the engine in either forward or reverse. Consult your dealer or boat manufacturer for details regarding your vessel. Verify shift lever is in neutral position before cranking the engine.

NOTICE

A new engine may use a more than normal amount of engine oil before it is broken in. Check your oil level hourly during the break-in period. Once the engine is broken in, check the oil level before each day's use and more often during sustained periods of high RPM or heavily loaded operation. Marine usage is different from automobile usage and oil consumption is EXPECTED. Do not be alarmed if you have to add oil between oil changes.

FIRST-TIME OPERATION

NOTE: *As of April 1, 2021, U.S. federal law mandates the use of the emergency stop switch by the operator under most conditions. Please familiarize yourself with the laws in your area.*

1. Perform the Pre-Operation Inspection. Refer to Section 2.
2. Back the trailer into the water. *NOTICE: Make sure the engine water intakes are not blocked by the trailer bunk and the water intake is submerged.*

NOTICE

Priming the fuel system is required before starting your engine for the first time. This allows the electric fuel pump to fill the fuel injection lines with gasoline. Each time you advance the ignition switch to the ON position, the fuel pump cycles for 2 seconds.

3. This procedure is only necessary for the first time the engine is started or in the event the fuel tank is run dry. Prime the fuel system by cycling the fuel pump three to four times before the engine is started for the first time. To prime:
   - Turn the ignition key ON for 5 seconds.
   - Turn the ignition key OFF for 5 seconds.
   - Repeat above three to four times.

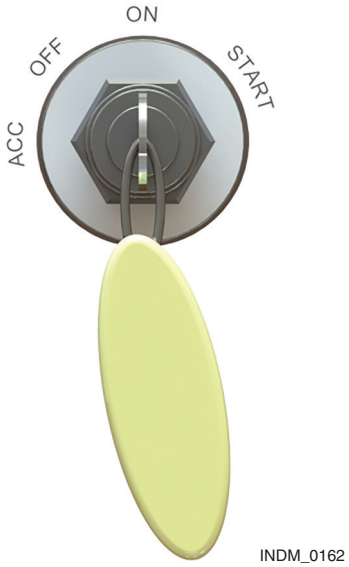

FIGURE 3.1 | ENGINE ON SWITCH

Typical Start/Stop Keypad

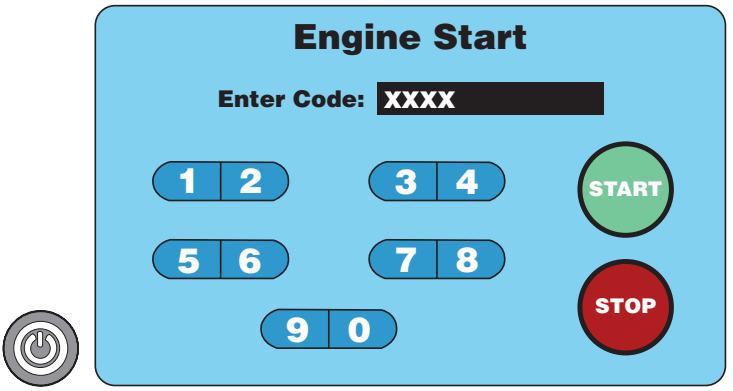

FIGURE 3.2 | BASIC KEYPAD

NOTE: *Some boat manufacturers use touch pad starting rather than key switches. Refer to the boat operator's manual if your boat is so equipped.*

4. **WARNING! Operate the bilge blower for at least 4 minutes.** Start the engine and allow it to reach normal operating temperature; keep a close eye on the gauges. If any of the gauges indicate an engine problem, stop the engine immediately and bring the boat to your Indmar dealer for assistance. *NOTICE: Do not operate the starter motor for more than 15 seconds without a 2-minute cooldown period. Excessively long cranking times will permanently damage the starter motor and drain the battery.*

BREAK-IN

Taking care now to break in your new Indmar engine is VERY important. When properly broken in, your engine will last longer, run better and require fewer repairs over its lifetime. Your new Indmar engine does not require an elaborate break-in procedure, just a little care and common sense for the first 10 hours.

Break-in Tips

- Always let engine warm up to normal operating temperature before accelerating.
- Avoid fast accelerations and don't carry (or pull) a heavy load during this period.
- If your boat is equipped with ballast tanks, do not use them during the first 10 hours.
- Check engine fluid levels frequently. During the first 50 to 100 hours, an engine can use more oil than usual. Maintain oil at proper levels at all times but do not overfill.
- Vary your boat speed during break-in. Do not run at the same speed for very long.
- Observe gauge readings and check for loose mountings, fittings, nuts, bolts and clamps.
- Report abnormal operation, noises or vibrations to your dealer.

Break-in Steps

NOTICE: Do not exceed maximum RPM recommended for your engine.

1. For the first 10 hours of operation vary the RPMs frequently along with multiple accelerations from idle to planing speed. Keep full throttle operation to a minimum < 1-2 minutes.
2. For hours 10 through 20 continue with step 1 with an increase in full throttle operation up to a maximum of 5 minutes.

After the first 10 hours but before 20 hours of operation, take your boat to the dealer for its first engine oil and filter change and engine checkup. Your Indmar dealer is best equipped to check the engine immediately after break-in.

After the break-in procedure is over, your boat may be operated at any speed. Be sure to check the wide open throttle operating range.

NOTES

Section Four
OPERATION

TRAILER LAUNCHING

Before launching, inspect the launch ramp for any problems that may hinder launching or make launching unsafe. Inspect the boat and trailer for damage. Do not launch if you detect damage or find that the engine or jet drive is not in good operating condition.

Ensure all drain plugs are securely in place. Remove all tie-downs from the boat. Attach the bow and stern docking lines. Disconnect the trailer's light harness from the vehicle. If applicable, trim or tilt the engine/outdrive up to avoid damage. Always launch with the help of another person. Back slowly down the ramp until the transom of the boat is a few inches in the water; then stop the vehicle. Manually back the boat clear of and off the trailer into the water and secure to the dock using mooring lines. Ensure the intake grate and drive nozzle are fully submerged before starting. Ensure there is sufficient clearance between the sea floor and intake grate. Remove any loose debris from the water that might be pulled into the drive or ejected from it before starting.

Remember, to drive off of the trailer, the intake part of the jet drive should be immersed in the water. Remove dock lines from the dock and proceed slowly away from the dock.

STARTING

Always start your boat in neutral. Warm up the engine properly.

BREAK-IN TIME

The thrust bearing and the mechanical seal need break-in time to ensure long life. (See Section Three Break-In Procedure.)

ECOJET WEEP HOLE INSPECTION

A weep hole is provided to indicate the condition of the mechanical seal. Water running out the hole is an indication of a failed seal or that there is foreign debris between the seal faces i.e. fishing line etc. A blast of compressed air in the weep hole will sometimes clear the obstruction. If it continues to leak, consult your dealer.

Practice. It is a good idea to use the recommended break-in period of the engine and jet drive to get the "feel" of your new jet drive powered boat. It should be handled in the beginning at low speeds and with gentle turns. Because of the jet drive's natural absence of torque, steering is much more responsive than propeller driven boats. Since tighter turns can be made in a jet drive boat, be sure to practice these carefully at lower speeds until you are completely familiar with the handling characteristics of your boat.

NOTE: *This jet is equipped with reverse sense steering, which means that your boat will operate differently than a traditional inboard boat when in reverse. This difference is easily overcome by steering in the direction you want the bow to go when in reverse, a little practice in a safe area is recommended.*

IMPORTANT: Jet boats will not steer without power to the jet.

A jet drive propelled boat has the ability to brake quickly unlike boats using a propeller that must contend with gears. At no-wake and low speeds the jet driven boat may be halted by pulling the control into reverse. ***Shifting into reverse at planing or high speed, can result in serious injury, death or boat damage.*** Always pause in NEUTRAL before shifting from FORWARD to REVERSE, or REVERSE to FORWARD. Most throttle and shift controls have a detent position for NEUTRAL, FORWARD and REVERSE engagement positions. These detent positions are important; when shifting into and out of gear, always pause in these positions. Never shift into REVERSE while your boat is in FORWARD gear when traveling at any speed above idle.

Section Five
GENERAL MAINTENANCE

Before operating or maintaining the engine, review “Safety” on page 1-1.

⚠ WARNING

- **You can be injured if you try to work on your marine engine without knowing enough about your engine.**
- **Be sure you have the knowledge, experience and the correct replacement parts BEFORE you attempt any repairs.**
- **Be sure all fasteners you use are approved and rated for marine use. Use of improper parts can cause component or engine failure which may result in death or serious personal injury.**

LUBRICATION

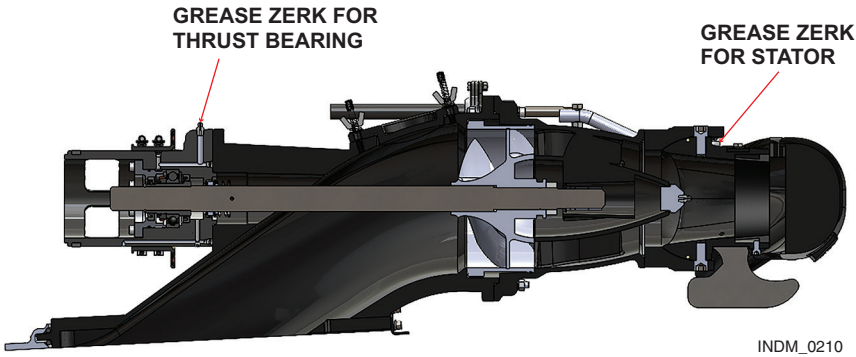

FIGURE 5.1 | GREASE ZERKS

Thrust bearing; inspect regularly, at least every 30 hours of operation or if the boat sits for more than two months. Grease the thrust bearing before you take it out. Lubricate the thrust bearing using VALVOLINE SYNTHETIC # 985, or the equivalent. Grease must be EXTREME PRESSURE, HIGH TEMPERATURE, and must contain MOLY.

NOTE: *DO NOT USE WHEEL BEARING GREASE. Bowl bearings, lubricate at the time of winterization, summarization, and once midway through the boating season. Use the same grease as the thrust bearing. The grease zerk is located at the discharge end of the jet drive. Access to the grease zerk is through the nozzle, a long extension on your grease gun will be required. NOTE: Be sure to grease the bearing before your first outing in the spring. Most thrust bearing failures occur then.*

REVERSE COMPONENTS

The reverse bucket should be inspected every thirty hours for proper function. The cable attaches to the reverse bucket with a pivot pin. Make sure this attachment is secure. Also make sure that the reverse cable is secure where it passes through the bracket. Adjustments to the reverse bucket position can be made by tightening the bulkhead fasteners at the bracket.

STEERING

You should check all steering cable connections, each trip for safety. These include the transom housing steering nut, the tiller arm-to steering tube connection, the tiller shaft set screw and the lower nozzle pin cap screw.

HAND HOLE COVER

Check the hand hole cover for tightness periodically.

LACK OF PERFORMANCE

If the pump over revs when trying to get on plane, it is probably due to a stick, leaf or something else in the impeller eye. Remove any foreign material from the impeller.

⚠ DANGER

PERSONAL INJURY HAZARD

Remove the ignition key before placing your hand inside the jet drive.

PRECAUTIONS AGAINST CORROSION

Salt Water Operation

The EcoJet is designed for trailer boats and is not intended for boats that are moored in salt or brackish water. It can be used in salt water but must be flushed with fresh water after daily use. It is recommended that your EcoJet be disassembled down to the impeller and remove all signs of corrosion and coat all mating parts with an anti-corrosion compound such as LANOCOTE. Also steering parts need to be cleaned and coated.

NOTES

Section Six
UNDERSTANDING YOUR BOAT

Most boat owners like to perform at least a certain amount of their boat maintenance themselves to ensure continuing good performance and reliability.

To avoid unnecessary trips to the service center, it might be useful to have a checklist, which can be run through systematically, in the hope of pinpointing the problem quickly. The boat can be divided into three categories: jet unit, engine, and hull.

If something is “wrong” with the boat it is usually poor acceleration and load carrying, coupled with excessive fuel consumption or engine RPMs. It could be unusual noise coming from the mechanicals, or possibly just poor top speed. All of these things may be present to some degree.

TACHOMETER

The single most important instrument on the boat, when considering performance drop-off, is the engine tachometer. The great thing about jet boats is that the engine RPMs should remain the same throughout the life of the boat, regardless of age, loading, water conditions, towing, whatever.

There is no situation where the RPMs should be different from when the boat was new, and as an owner, you will know what these are. At any time, you should be able to open the throttle fully and get exactly the same maximum reading you have been used to. Or perhaps you are finding it needs more RPMs to cruise your normal load? RPMs are a most important indicator of proper operation of the boat.

It is important at this stage to feel confident that your tachometer is reading accurately.

Now we come to our check list, to determine which major area is the problem. The simplest way is a check on the RPMs first. They could be normal, high, or low, and this will pinpoint the place to look:

A. Normal maximum RPM = hull problem

If the boat is performing poorly and the maximum RPMs are normal (4400 - 4600 RPM) and what you are used to, you can look to the hull and some of the external parts. These include:

- **Overload:** Too much weight aboard.
- **Balance:** Either too much weight aft, which will cause the nose to be too high and make planing difficult, or if the weight is too far forward, it will cause the nose to plow, difficult steering, wetness, and poor top speed.
- **Reverse bucket:** Is the bucket dragging in the reverse stream? Make sure the control is fully up.
- **Excessive hull drag:** Is there some external hull obstruction such as rough surface, broken keel strips, or other reason impeding the smooth flow of water over the hull bottom? A visual check on the trailer should reveal if there is. Metal hulls can have a “hook” bashed into them forward of the transom which can cause the bow to plow. The planing surface forward of the transom six to nine feet should be true and flat.

B. High RPM = jet unit problem

Higher than normal RPMs, lack of thrust, slipping clutch feel, engine racing and no go?

- **Blockage:** The most common problem is weeds and stones blocking the intake grate. Also be aware of ski rope, fishing line and plastic bags winding around the pump shaft. Small sticks and stones can become lodged in the impeller affecting operating temperature and the performance dramatically. Objects trapped in the impeller can cause the rotating assembly to be out of balance, causing severe vibration. Make sure the water passage through the jet is clear. To clear debris from the intake grate:
    1. Move to a deep enough section of the waterway where you can safely stop.

2. Turn off the engine.
3. Open and close the stomp grate by placing your foot on the bar and using your full weight to push in a downward motion. If available, use stern rails to help steady yourself, thereby reducing the chances of falling or injury.

FIGURE 6.1 | STOMP GRATE

4. If there is a blockage in the grate, you will feel resistance when depressing the bar but 2-3 solid presses should clear the grate. If resistance is still felt, continue pressing the bar until the stepping action becomes easier and the intake feels clear.

- **Impeller wear:** The heart of the jet is the impeller, and its condition. If you run in shallow gravel beds or across sandbars the leading edges will become dull and inefficient. Pumping sand will increase the wear-ring to impeller clearance. Causing cavitations and loss of performance.

- **Bowl / stator vanes:** It's not too much of a problem, but the leading edge of the fixed stator vanes can become blunt and damaged.
- **Air leaks:** If excessive air leaks into the intake ahead of the impeller, the jet unit will "slip". Possible sources of air leaks are through a faulty gland seal, which is usually accompanied by a static water leak into the boat when standing idle. So if the gland is worn out and leaking into the boat with the engine off, it can also suck air when accelerating on to plane, and if this happens, then the thrust is reduced dramatically. Air can also be introduced into the system via the inspection cover, so you will want to make sure the cover is tight.

C. Low RPM = engine problem

There is generally no way the jet unit can overload the engine and bring the RPMs down. If the RPMs are down from usual, it is almost certain to be an engine problem. A compression check will usually reveal leaking piston rings or valves, but the most common reasons for reduced engine power are:

- **Throttle:** Check that the throttle is opening fully.
- **Fuel:** The fuel supply must be adequate for the engine size. Racing boats frequently have a fuel pressure gauge which is, with the tachometer, probably the most important engine instrument. Sufficient fuel must be reaching the engine.
- **Air to the engine:** The engine must be getting its full quota of cool air. If the engine has to work to get adequate air, and if it is hot air, this will reduce power.
- **Ignition spark:** Be satisfied the ignition system is operating properly. A problem here is usually indicated by a rough running or missing engine.

- **Exhaust:** Check for a free flowing exhaust system. Some silencers can become blocked, rubber hoses disintegrate internally. Such things can cause excessive back pressure and reduce power. Provided your engine is getting its full quota of air and fuel, and is getting enough spark and at the right time, the engine will usually be OK, and maximum RPMs will result. However if the RPMs are down and you believe the tachometer, look for an engine problem. The hull, engine, and jet unit are the three main areas to look at when your performance is down.

D. Excessive noise

This can often be a concern even if there is not a reduction in performance. The most common causes of noise are:

- **Cavitation:** The jet unit is starved for water, and usually sounds like a rattle or a can of loose bolts in the back of the boat. Most likely a blocked intake grate.
- **Moan or whine:** The jet unit can exhibit some “turbine whine” not unlike a turbocharger noise but you will know what is usual with your boat. However, if you have a new more obvious moan/whine, especially if it is a very low frequency grumble at idle, that increases with engine RPM’s then it is likely to be a rough/worn/water damaged thrust bearing. If water has gotten into the bearing, it is usually as a result of a flooded bilge at some time on a warm bearing, then water can be sucked in as it cools.
- **Periodic vibration:** Often at specific RPM’s and disappearing at other throttle openings is probably a torsional vibration emanating most likely from the universal joints on the drive shaft.

COMPONENT LOCATIONS

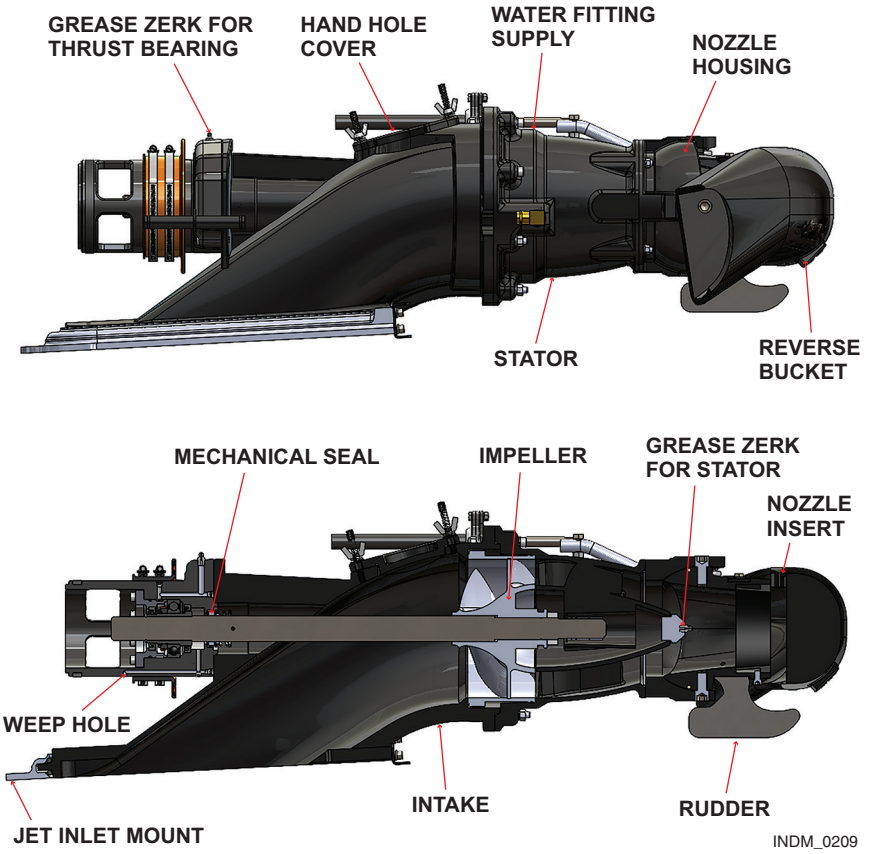

FIGURE 6.2 | ECOJET COMPONENTS

Section Seven
TROUBLESHOOTING

Before operating or maintaining the engine, review “Safety” on page 1-1.

Your Indmar engine is manufactured under strict quality control standards. It is tested along with a full spectrum gas analysis. It is operating at optimum levels before it is shipped.

Difficulties can occur. Use the following problem diagnosis charts to help pinpoint problems. In most cases, you will need the assistance of your Indmar dealer to correct the cause of the problem.

NOTE: *Modern boats are equipped with an on-board diagnostic system that displays a check engine indication and informs the operator of specific drive train faults.*

Excessive Fuel Consumption

- Fouled spark plugs
- Plugged flame arrestor
- Poor driving habits
- Plugged positive crankcase ventilation system
- Black smoke at exhaust outlet shows rich gas mixture
- Excessive boat loads (weight)
- Damaged or dirty hull

Hard Cold Start

- Weak or discharged battery
- Loose coil
- Engine flooded
- Fouled spark plugs
- Lack of fuel
- Battery cables loose or corroded

- Loose electrical grounds at engine
- Ignition switch problems
- Dirt or water in fuel system
- Engine needs tune-up

Poor High Speed Performance

- Fouled spark plugs, incorrect spark plug gap or heat range
- Dirt or water in fuel
- Lack of fuel
- Restricted exhaust system
- Plugged flame arrestor
- Insufficient air supply to engine
- Engine needs tune-up

Engine Cranks/Won't Start

- Weak or shorted coil; no spark at plugs
- Loose engine grounds
- Lack of fuel
- Weak or discharged battery
- Boat Engine Safety switch not attached
- Vapor lock

Idle – Misses or Runs Rough

- Spark plugs fouled or cracked
- Spark plug or wires loose or shorted
- Plugged positive crankcase ventilation system
- Engine in need of tune-up

Hard Start Hot

- Flooding condition
- Loose electrical ground at engine
- Plugged flame arrestor

- Fouled spark plugs
- Loose coil or ignition wires
- Battery cables loose or corroded
- Weak or discharged battery

Engine Won't Crank

- Weak or discharged battery; loose or corroded battery cables
- Defective neutral safety switch or adjustment needed
- Defective starter motor
- Ignition switch problems
- Hydrostatic lockup – remove spark plugs to look for water or gasoline in cylinders
- Seized engine – contact your authorized dealer

NOTES

Section Eight
WARRANTY

EMISSION-RELATED WARRANTY REQUIREMENTS

Your new engine is designed, built and equipped so it conforms at the time of sale to the ultimate purchaser with the requirements of EPA CFR 40, part 1045.120 and CARB Title 13, Division 3, Chapter 9, Article 4.7, 2445.1 and 2445.2. It is free from defects in materials and workmanship that may keep it from meeting these requirements.

The warranty period begins on the date the engine is delivered to an ultimate purchaser or first placed into service (e.g., a demonstration engine or watercraft). Does not apply in the state of California.

The emission-related warranty covers all components whose failure would increase an engine's emissions of any regulated pollutant, including components listed in the following section and components from any other system developed to control emissions.

EMISSIONS COMPONENTS WARRANTY

The following components are considered as part of the emissions control system and are covered under the Emissions Control Warranty.

1. Fuel Metering System
   - A. Fuel injectors
   - B. Fuel pressure regulator
   - C. Manifold Absolute Pressure Sensor
   - D. Throttle Position Sensor
   - E. Idle Air Control Valve
   - F. Throttle Body – Port Fuel Injection Models
   - G. Throttle Body Assembly – Throttle Body Fuel Injection Models
   - H. Coolant Temperature Sensor
   - I. Intake Valves
   - J. Oxygen Sensors

2. Air Induction System
   A. Intake Manifold
   B. Air Filter (Flame Arrestor)
   C. Supercharger
   D. Turbocharger
3. Ignition System
   A. Spark Plugs
   B. Electronic Ignition System
   C. Ignition coil and/or control module
   D. Ignition Wires
4. Lubrication System
   A. Oil pump and internal parts
5. Positive Crankcase Ventilation (PCV) System
   A. PCV valve
   B. Oil Filler Cap
6. Exhaust System
   A. Exhaust manifold(s)
   B. Exhaust riser(s)
   C. Exhaust valves
   D. Catalytic Converters
7. Miscellaneous Items Used on Above Systems
   A. Hoses, clamps, fittings, tubing, sealing gaskets or devices and mounting hardware
   B. Electronic Controls
   C. Electronic Control Module
   D. On board diagnostic system
   E. Pulleys, belts and idlers

NOTICE

The repair or replacement of any warranted part otherwise eligible for warranty coverage under the Emission Control Warranty may be excluded from such warranty coverage if Indmar demonstrates that the engine has been abused, neglected, or improperly maintained and that such abuse neglect or improper maintenance was the direct cause of the need for repair or replacement of the part.

The emission warranty covers damage to other engine components that is caused by the failure of a warranted part.

This manual contains written instructions for the proper maintenance and use of your inboard engine. All emission warranty parts are warranted by Indmar for the entire warranty period of the engine.

Emission warranted parts that are scheduled for regular inspection, but not regular replacement, are warranted by Indmar for the entire warranty period of the inboard engine.

Add-on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any non-exempt add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claim made in accordance with these warranty articles. The engine manufacturer will not be liable under this article to warrant failures or warranted parts caused by the use of a non-exempted add-on or modified part.

Any emission warranty part repaired or replaced under the terms of this warranty statement is warranted by Indmar for the remainder of the warranty period of the original part. All parts replaced under this limited warranty become the property of Indmar.

If the ownership of a product is transferred during Emission Components Warranty period, this warranty shall also be transferred and be valid for the remaining coverage period provided that Indmar is notified in the following way:

a. The former owner contacts Indmar and provides us with the required information listed below; or

b. Indmar receives a proof that the former owner agreed to the transfer of ownership and we are provided with the information listed below.

   - Current owner's name, address, telephone, engine serial number and date of purchase
   - New owner's name, address, telephone, engine serial number and date of transfer

Send the above information to:

Indmar Marine Engines
Attention: Emission Warranty Transfer
5400 Old Millington Rd
Millington, TN 38053

NOTICE

The above procedure is valid for the transfer of the Emission Components warranty only. Refer to the Limited Warranty in Appendix C of this manual for information regarding warranty transfer of the remaining engine components.

EMISSION MAINTENANCE REQUIREMENTS

Specific maintenance must be followed to maintain the integrity of the emission control system of your engine. Refer to Section 5, Maintenance, for details and Maintenance Schedule.

NOTICE

Ignition timing, engine idle speed and air-fuel mixture are not adjustable on this engine. NO OTHER ADJUSTMENTS NEEDED.

CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and Indmar Products are pleased to explain the emission control system warranty on your 2026 model year and later inboard engine. In California, new inboard engines must be designed, built and equipped to meet the State's stringent anti-smog standards.

Indmar Products must warrant the emission control system on your inboard engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your inboard engine.

Your emission control system may include parts such as the carburetor or fuel injection system, the ignition system, and catalytic converter. Also included may be hoses, belts, connectors and other emission-related assemblies.

Where a warrantable condition exists, Indmar Products will repair your inboard engine at no cost to you, including diagnosis, parts and labor.

Manufacturer's Warranty Coverage

For inboard marine engines 373 kilowatts (500 hp) and less; select emission control parts from your model year 2026 and later inboard engine are warranted for 3 years or 480 hours, whichever first occurs.

For inboard marine engines greater than 373 kilowatts (500 hp); select electronic emission-related control parts from your model year 2026 and later inboard engine are warranted for 3 years or 480 hours, whichever first occurs. Select mechanical emission related components are warranted for 3 years or 150 hours of operation, whichever first occurs.

However, warranty coverage based on the hourly period is only permitted for engines equipped with hour meters. If any emission related part on your engine is defective under warranty, the part will be replaced or repaired by Indmar Products.

Owner's Warranty Responsibilities

As the inboard engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Indmar Products recommends that you retain all receipts covering maintenance on your inboard engine, but Indmar Products cannot deny warranty solely for the lack of receipts or your failure to ensure the performance of all scheduled maintenance.

As the inboard engine owner, you should be aware that Indmar Products may deny you warranty coverage if your inboard engine or part has failed due to abuse, neglect, improper maintenance or unapproved modifications. The most common failures we see are due to unstable or old fuel and lack of proper lubrication. Failures that are attributed to old/unstable fuel or lack of lubrication are not warrantable.

You are responsible for presenting your inboard engine to an Indmar Products service center as soon as a problem exists. The warranty repairs will be completed in a reasonable amount of time, generally within 30 days.

If you have any questions regarding your warranty rights and responsibilities, you should contact Indmar Customer Service at customerservice@indmar.com or call (800) 970-3744.

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