

Basic Engine Maintenance

April 8, 2023

Why is it Important?

- Protects your investment
- Helps prevent breakdowns on the water
- Helps prevent extensive/expensive repairs
- Helps insure safe boating

B. O. A. T.

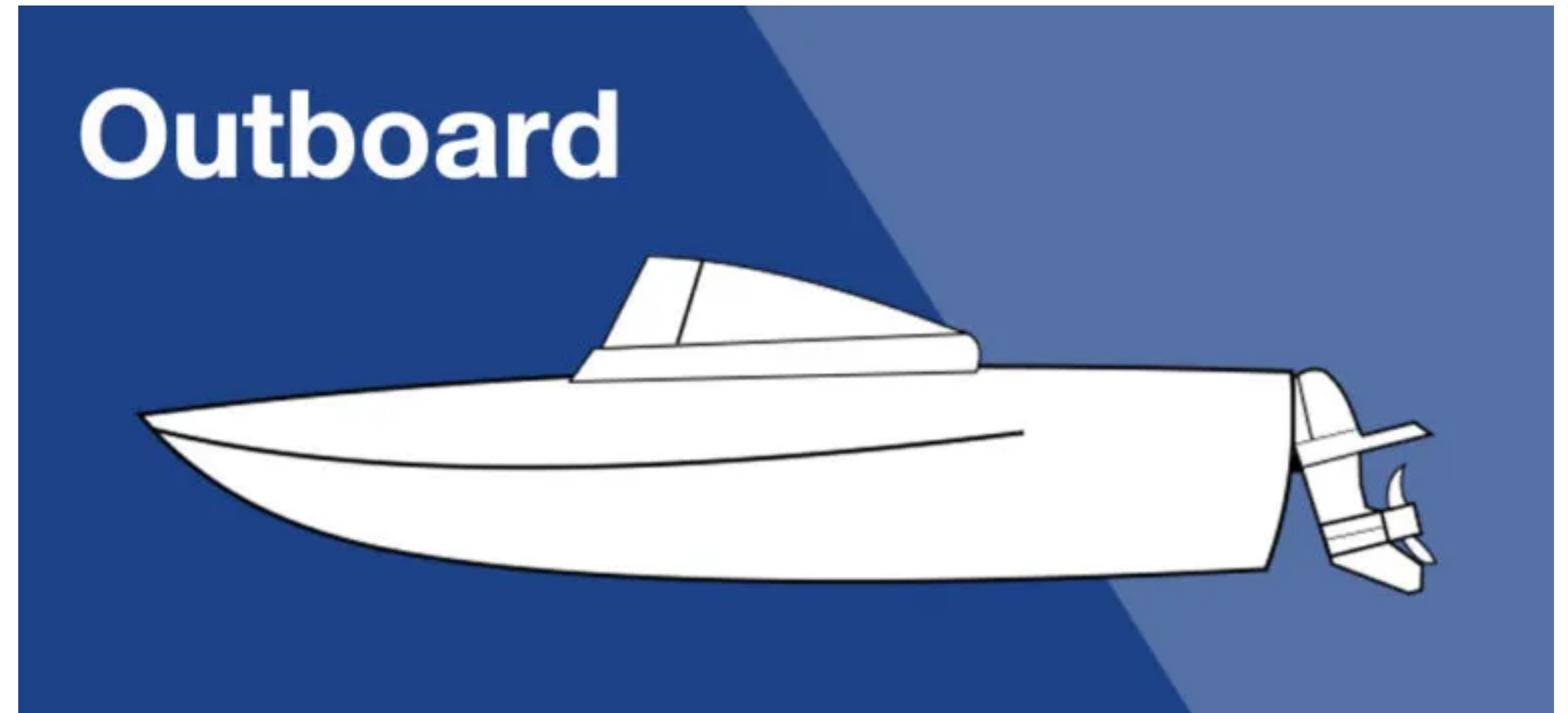


Bout Oh Another Thousand

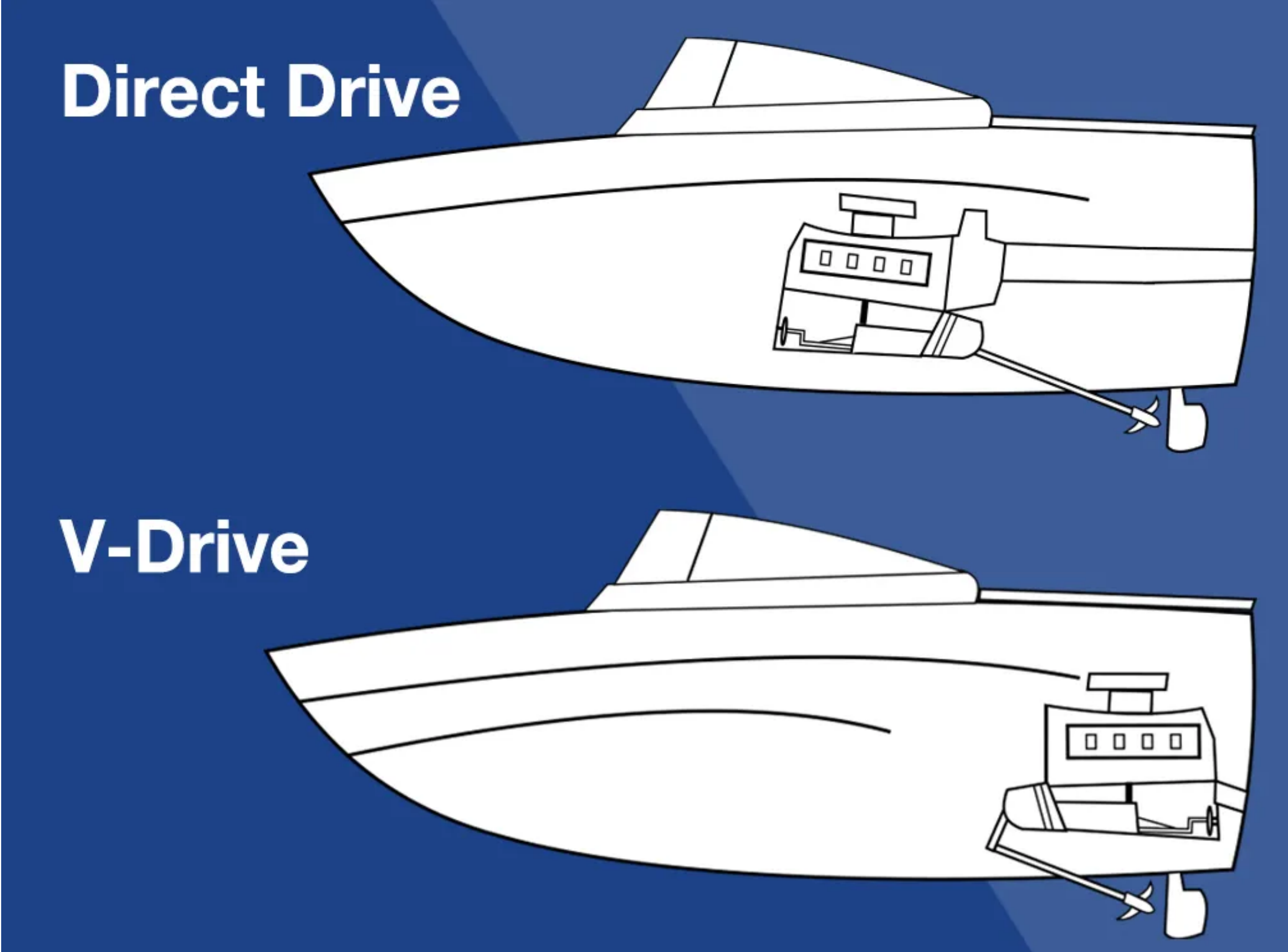
Marine Engines

- Can be gas or diesel powered
- Heavy duty vs comparable auto engine
- Operate in harsh environment
- Operate at higher rpm

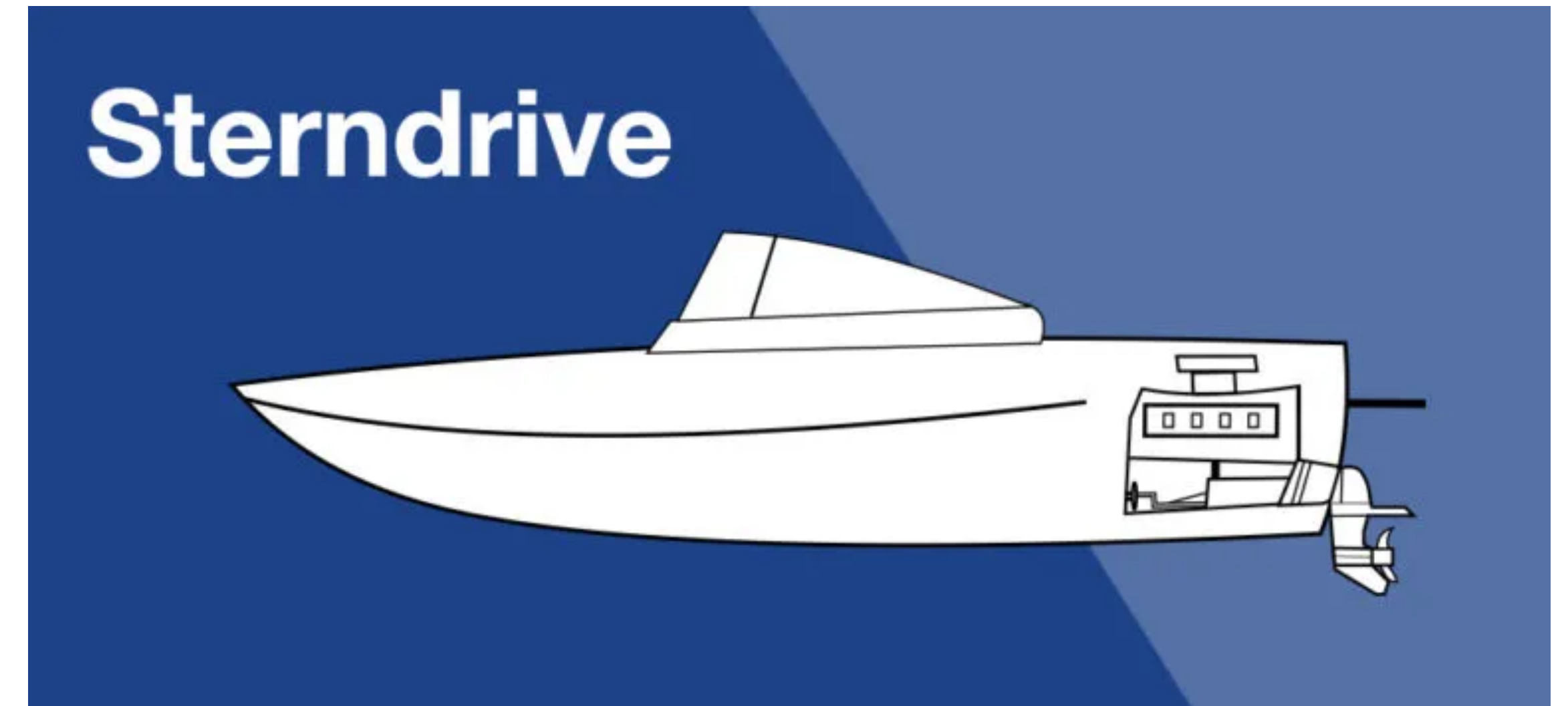
Outboard Engines



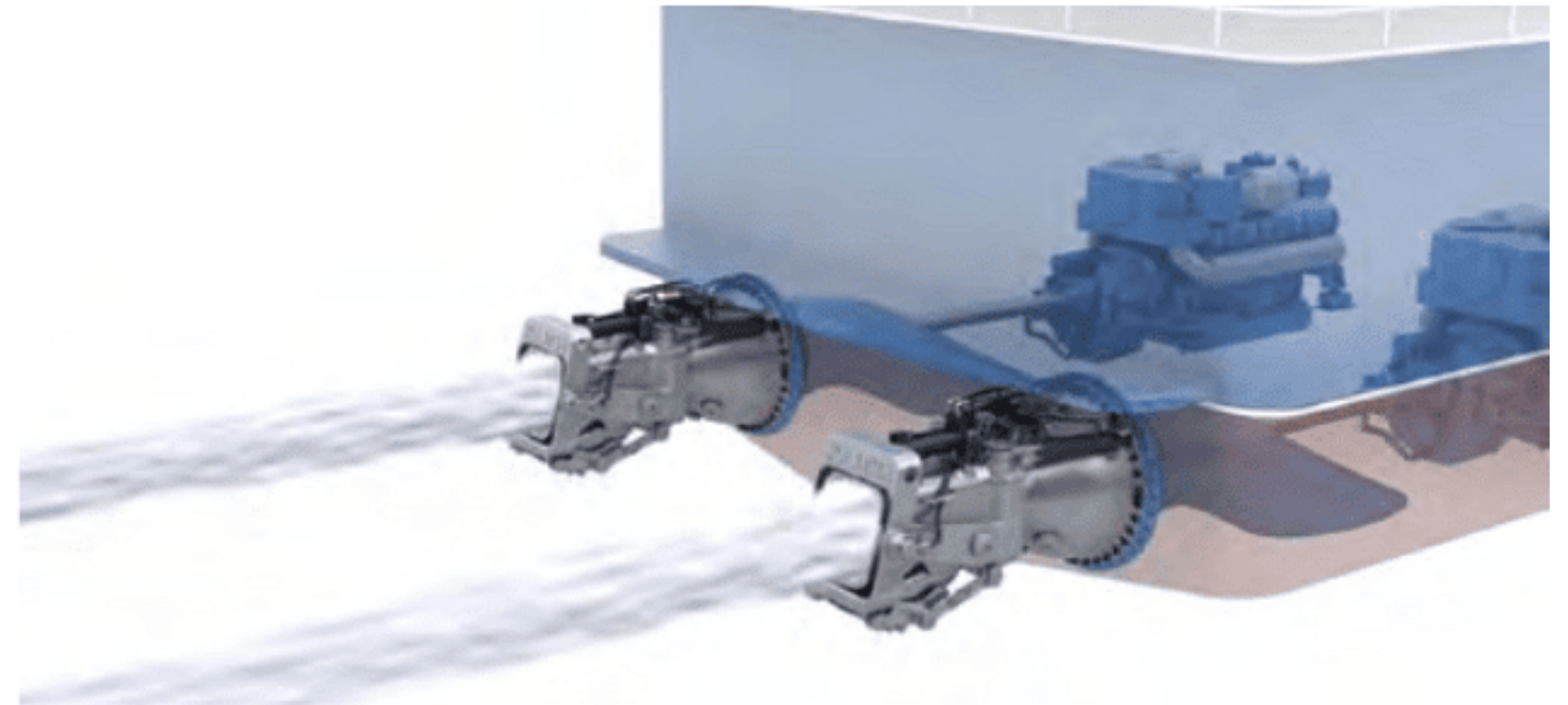
Inboard Engine



Inboard/Outboard - Sterndrive



Jet Boat Engine



Average Life Expectancy

- Gas engine 1500-2000 hours
- Diesel engine 5000-8000 hours
- Average yearly use 50-200 hours for recreational boating
- ~10-year life gas engine / ~40-year diesel engine
- Salt water can shorten engine life

Cooling Systems

- Raw water (open) cooling. Water is drawn from outside the boat and is circulated through the engine.
- Fresh water (closed) cooling. Uses anti-freeze (fresh water) to cool the engine and also raw water to cool the antifreeze.
- Both use a seawater pump with an enclosed impeller to draw water from the source. Depending on model may be located in the lower unit or mounted to the engine.
- Raw water can cause corrosion and mineral build up in manifolds, risers exhaust elbows and heat exchangers.

SPECIFICATIONS AND MAINTENANCE
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Inspection

Inspect your power package often, and at regular intervals, to help maintain its top operating performance and correct potential problems before they occur. The entire power package should be checked carefully, including all accessible engine parts.

Check for loose, damaged or missing parts, hoses and clamps; tighten or replace as necessary.

Check plug leads and electrical leads for damage.

Remove and inspect the propeller. If badly nicked, bent or cracked, contact your authorized Mercury MerCruiser dealer.

Repair nicks and corrosion damage on power package exterior finish. Contact your authorized Mercury MerCruiser dealer.

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Sterndrive Maintenance Chart

Routine Maintenance *	Each Day Start	Each Day End	Weekly	Every Two Months
Check the crankcase oil (interval can be extended based on experience).	★			
If operating in salt, brackish or polluted waters, flush the cooling system after each use.		★		
Check the drive unit oil level, the trim pump oil level and the power steering pump fluid level.			★	
Check the water inlets for debris or marine growth. Check the seawater strainer and clean. Check the coolant level.			★	
Inspect the drive unit anodes and replace if 50 percent eroded.			★	
Lubricate the propeller shaft and retorque the nut (if operating in only freshwater, this maintenance may be extended to every four months).				★
Operating in Saltwater Only: treat the engine surface with corrosion guard.				★
Check the battery connections and the fluid level.				★
Ensure that the gauges and the wiring connections are secure. Clean the gauges. ¹				★ or 50 hours

* Only perform maintenance which applies to your particular power package
¹ If operating in saltwater, interval is reduced to every 25 hours or 30 days whichever occurs first

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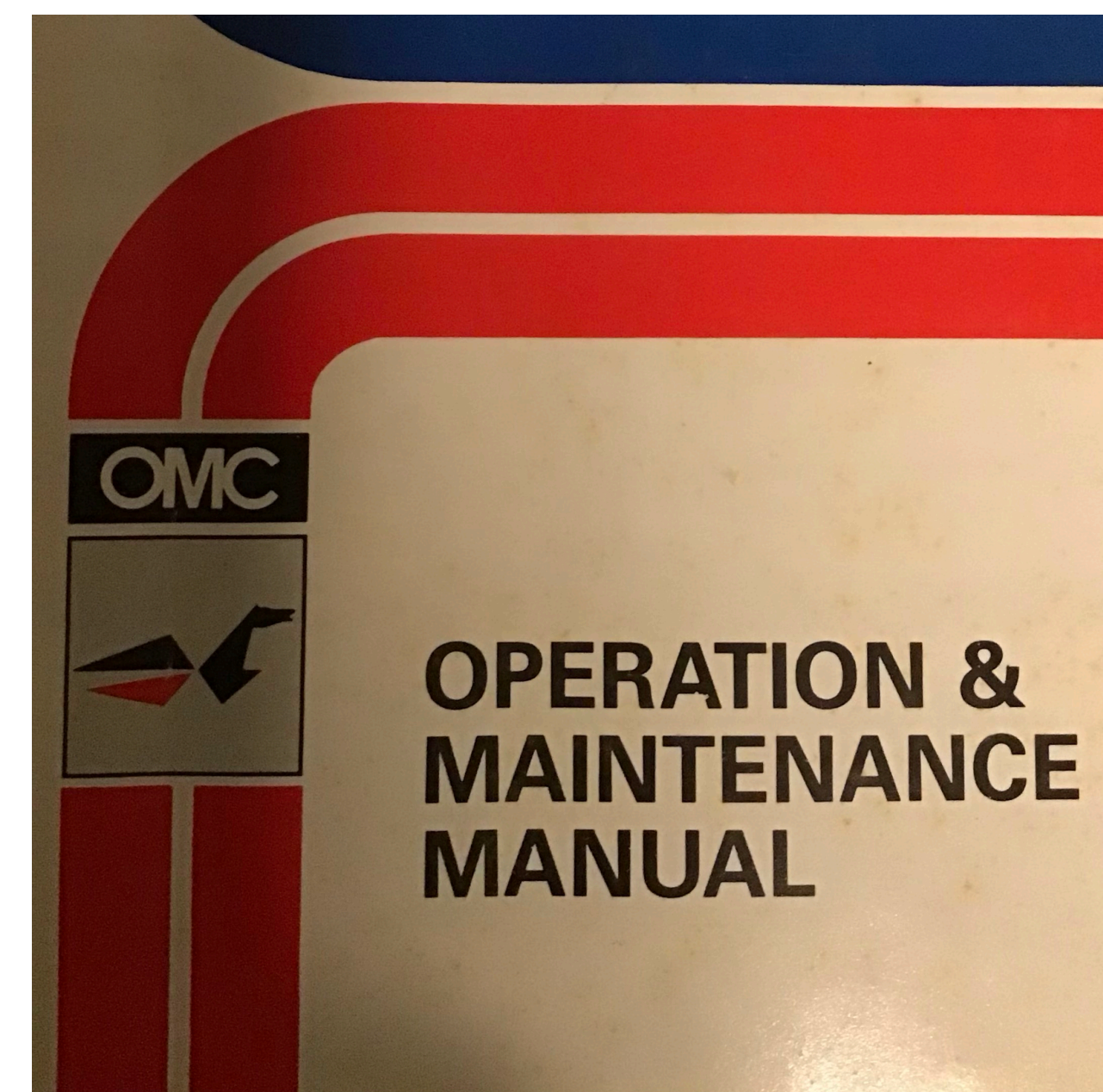
SPECIFICATIONS AND MAINTENANCE
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Sterndrive Maintenance Chart (continued)

Scheduled Maintenance *	Annually	Every 100 hours or Annually	Every 200 hours or 3 years	Every 300 hours or 3 years	Every 2 years	Every 5 years
Touch-up paint the power package and spray with corrosion guard.	★					
Change the crankcase oil and filter.		★				
Change the drive unit oil and retorque the connection of the gimbal ring to the steering shaft.		★				
Replace the fuel filters.		★				
Check the steering system and the remote control for loose, missing or damaged parts. Lubricate the cables and the linkages.		★				
Inspect the U-joints, the splines and the bellows. Check the clamps. Check the engine alignment. Lubricate the U-joint splines.				★		
Lubricate the gimbal bearing and the engine coupler.				★ ⁸		
Check the continuity circuit for loose or damaged connections. Test the MerCathode® unit output on Bravo Models.				★		
Retorque the engine mounts.					★	
Check the spark plugs, the wires and the distributor cap.					★	
Clean the flame arrestor and the crankcase ventilation hoses. Replace the PCV valve.					★	

* Only perform maintenance which applies to your particular power package
 ◆ Whichever occurs first
⁸ Lubricate the engine coupler every 50 hours if operated at idle for prolonged periods of time

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Yearly Maintenance Items

- Oil & filter change
- Water separator change
- Fuel filter check/replace
- Raw water flush
- Replace coolant as necessary
- Check cooling hoses (cracked or brittle)
- Hose clamps
- Check/replace impeller as necessary
- Check/replace tune up parts
- Check manifolds, heat risers & heat exchangers
- Lubricate shift, throttle, steering cables
- Check battery (distilled water)
- Check fuel lines, filler & vent hoses
- Clean air filters & flame arresters
- Electrical connections
- Check belts

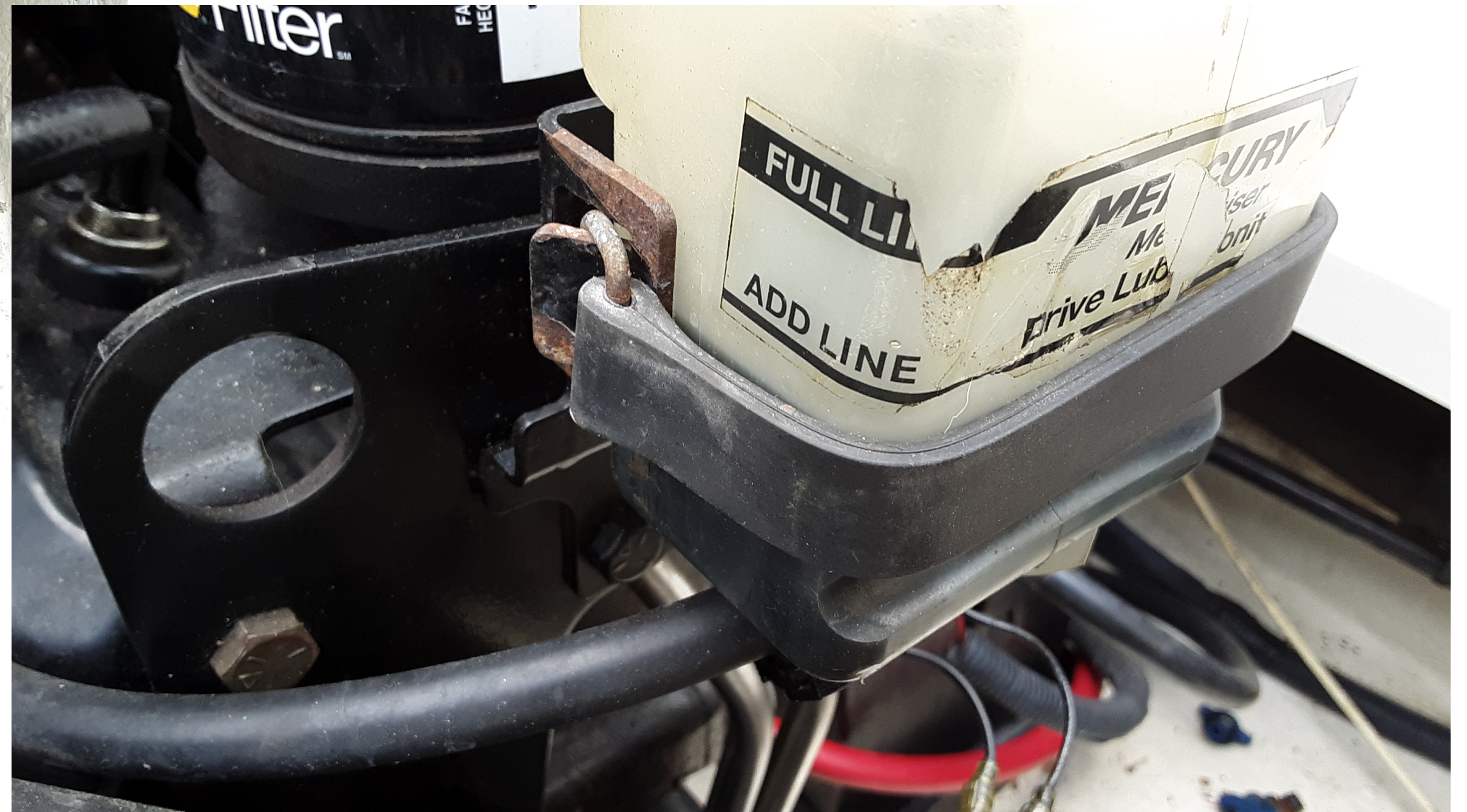
Yearly Maintenance Items

- Check outdrive to engine alignment
- Check bellows (outdrive)
- Change gear lube (outdrive)
- Transmission service (inboard)
- Check stuffing box (inboard)
- Check seacocks and strainers
- Check prop shaft for play
- Check anodes (replace if 50% worn)
- Remove prop - check
- Lube prop shaft

Pre-Trip Inspections

- Open engine space
- Use senses: look, smell, touch
- Check all fluid levels, oil, coolant, drive, p/steering, hydraulic, transmission
- Belts, hoses
- Stuffing box for leaks
- Fuel level
- Lights

Oil Leak in Bilge



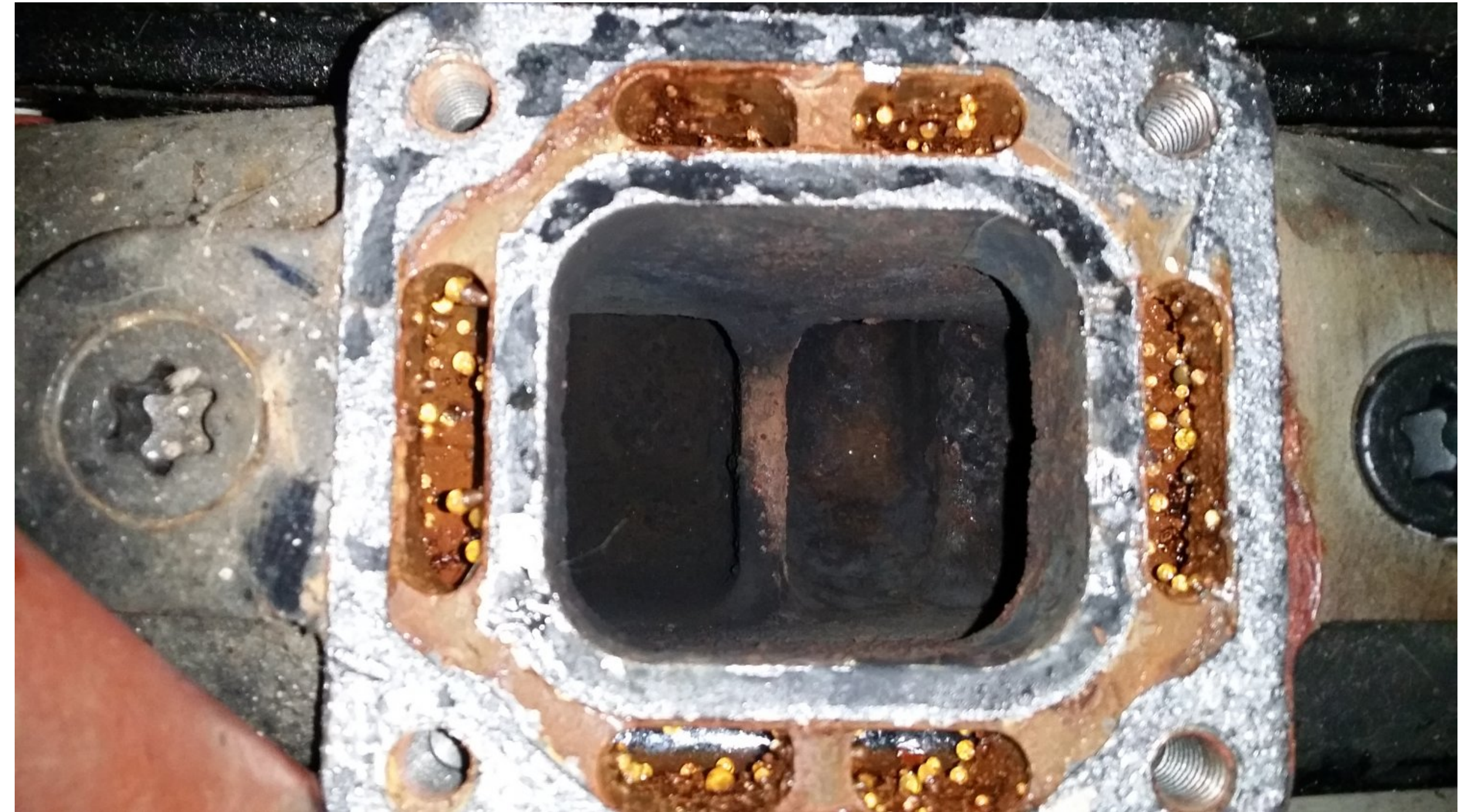
Drive Belt



Leaking Stuffing Box



Plugged Manifold



Water in Outdrive Oil



Worn Impeller



Breakdowns Happen

Carry spare parts

- Fuses
- Light bulbs
- Belts
- Hose clamps
- Length of hose
- Spark plugs
- Fuel filter
- Wire ties
- Propeller
- Check website, blogs, forums for common issues

Tool Kit

- Jumper pack or cables
- Telescoping mirror & magnet
- Flashlight
- Screwdrivers (Flat & Phillips)
- Pliers
- Wrenches
- Socket set
- Scissors, wire stripper or utility knife
- Electrical tape
- Multi tool
- Small Ball peen hammer
- Rags



Use Marine Parts vs. Auto Parts

- Designed to prevent sparks from entering bilge & igniting fumes
- Examples:
 - Alternators
 - Starters
 - Distributors
 - Fuel pumps
 - Batteries

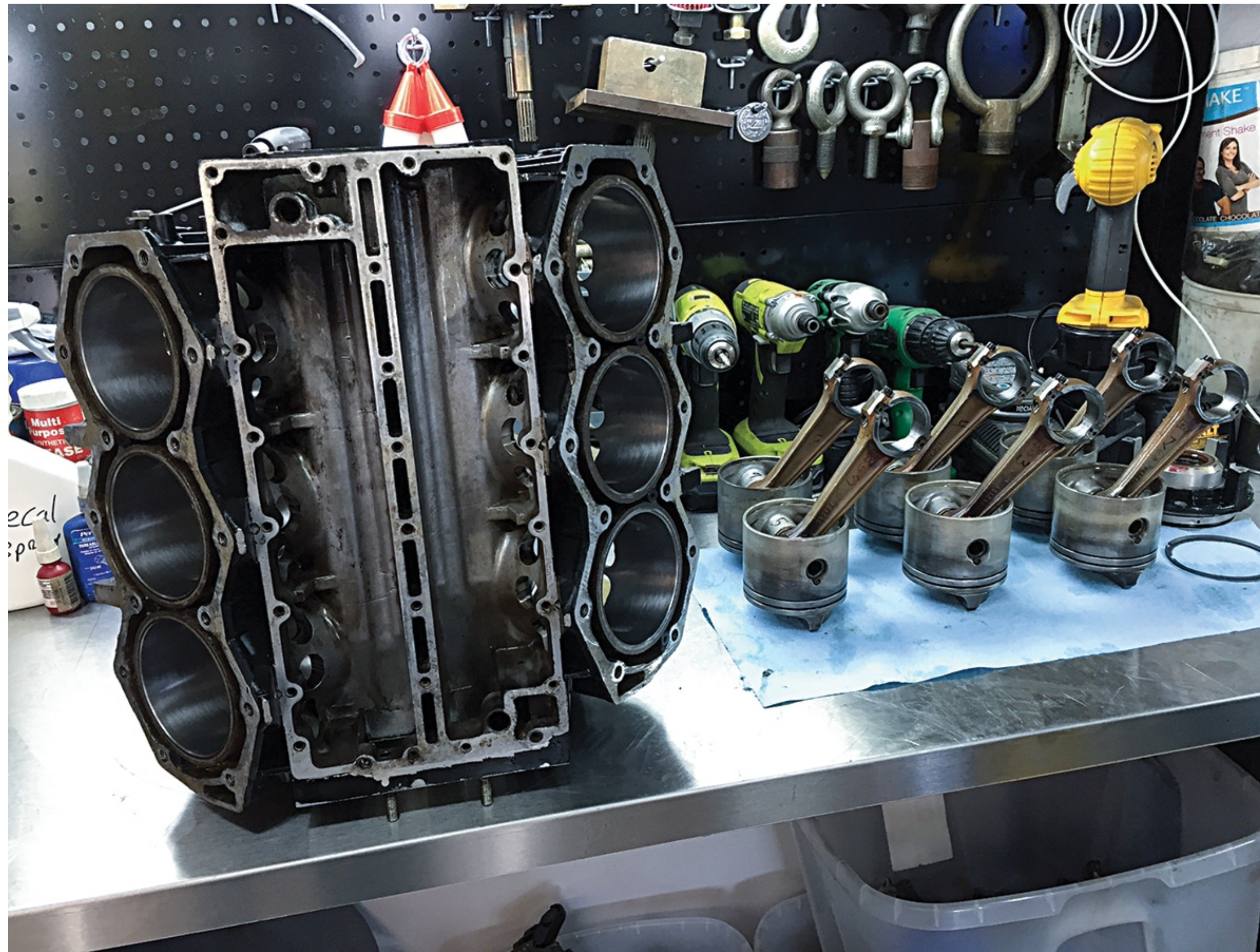
Documentation

- Keeps track of when and what maintenance or repairs were done.
- May be beneficial in the event of an insurance loss.

In conclusion :



You can pay me now ...



....Or pay me later