

AutoWake Engineering Manual

A practical guide distilled from all 87 forum posts by Matt Brown (“goose”)

Source: Moomba Forum thread “AutoWake questions”

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Coverage: 499 thread posts; 87 posts by goose; August 2017–July 2019

Prepared from the user-supplied printable PDF. Forum wording and model-year references are historical; verify service procedures and software compatibility with a qualified dealer before modifying a boat.

How to Use This Manual

This manual reorganizes the thread by concept rather than chronology. It preserves Goose’s central reasoning while removing repetition and side conversation. It is not a factory service manual. Values quoted from the thread are examples tied to particular model years, hulls and software revisions.

The companion archive contains all 87 Goose posts in chronological order. References such as “Thread Post #70” use a reconstructed sequence across all 499 posts because the printable PDF omits the forum’s native post anchors.

Executive Summary

The central model

AutoWake controls the boat toward repeatable pitch and roll targets. It does not create mass. Goose repeatedly reduces the system to four practical inputs: pitch, roll, displacement and speed. Pitch and roll shape the wake; displacement supplies size and energy; speed changes the way that displaced water forms into a wake.

The operating priority

Maximize useful displacement first, then use pitch, roll and plates to shape it. An aggressive target that forces AutoWake to drain hundreds of pounds can produce a worse wave than a milder factory target with more ballast retained.

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The driver’s job

Begin with calibrated sensors and factory defaults, place people reasonably evenly, let the system achieve, then observe actual pitch, roll, ballast and amplitude before changing anything. Passenger placement is part of the ballast plan, not an afterthought.

1. The Physics: Displacement, Pitch, Roll and Speed

Displacement creates size and push

Total boat weight, ballast, passengers and gear determine how much water is displaced. A lighter setup cannot be transformed into a much heavier one with plate or angle changes. Rider weight, board size and board style affect how much wave energy is required.

Pitch shapes fore-and-aft geometry

More bow-up pitch generally makes the wave steeper or taller; less pitch can lengthen it. The tradeoff is crucial: achieving a larger pitch target may require draining bow ballast, reducing total displacement and therefore reducing push.

Roll shapes surf-side asymmetry

Roll controls how the hull presents itself from side to side. More surf-side lean is not automatically better. Excessive roll can require major ballast reduction on the opposite side and may shorten or destabilize the useful pocket.

Speed is a full tuning variable

Speed changes length, firmness and cleanliness. Goose treats speed as one of the four core parameters, not merely a cruise-control setting. Small changes should be evaluated only after the boat has settled at its target attitude.

2. Amplitude and AMP

Amplitude bar

The 2018 draft sensor gives a live indication of how deeply the boat is sitting. It captures passenger and gear mass that timer-based ballast gauges cannot. Goose recommends learning a personal “magic line”: the minimum displayed displacement that produces enough push for a particular rider and board.

AMP setting

AMP scales how much ballast AutoWake is allowed to use while still controlling pitch and roll. Lower values can make a smaller teaching wave, support recreational skiing or kneeboarding, or simply level the boat while cruising without filling ballast.

Do not confuse the two

Amplitude is a measurement of displacement potential. AMP is a user command that scales ballast demand. The names and screen location are related, but the functions are different.

3. Sensors and Calibration

Inclinometer

The inclinometer under the dash is the foundation of pitch and roll control. A calibration error means the system is faithfully steering toward the wrong attitude: classic “garbage in, garbage out.”

Calibration check

At wakeboard speed, first establish that the boat is actually running level by comparing the wakes. Then compare the displayed roll. Goose considered about half a degree acceptable; a reading beyond roughly one degree when the boat is visibly level justified recalibration.

2017 versus 2018

For 2017, calibration resets pitch and roll together and should be performed stationary. The 2018 system can calibrate pitch and roll independently, allowing roll calibration while running level. Once correctly calibrated, a software upgrade should not require repeated calibration.

Draft sensors

Goose described different implementations: a pressure-transducer approach on Supra and a water-column tube approach on Moomba. Correct installation position is critical, particularly for retrofits.

4. Static Mode, Dynamic Mode and Predictive Logic

Static mode

Before reaching operating speed, AutoWake uses static conditions and expected behaviour to begin arranging ballast. Static readings are not the final surf attitude because the running hull, plates and water forces change the boat.

Dynamic mode

At surf or wakeboard speed, the system uses live pitch and roll to complete the correction. The target is achieved only after the readings settle within the control window.

Response filtering

The boat constantly moves in chop, wind and rider pull. The system deliberately damps and delays reaction so it does not chase every transient. This is why a wakeboard rider cutting outside does not cause instant ballast corrections.

Predictive improvements

Later software added predictive logic and passenger-movement prompts. The goal was to reduce unnecessary ballast loss and show users how to reposition people before the system had to drain a compartment deeply.

5. Why AutoWake Drains Ballast

It is obeying the target

If the boat is too rolled, AutoWake drains the side that prevents the commanded roll. If pitch is too low, it may drain bow ballast to raise the bow. The system cannot physically transfer water directly from one bag to another; it fills or drains available zones.

Passenger movement can cost hundreds of pounds

A person moving across the boat changes roll; another moving to the bow changes pitch. If the driver leaves the targets unchanged, AutoWake may remove enough ballast to counter both moves. The wave can lose push even though the displayed targets are perfect.

Extreme settings create self-inflicted loss

Large pitch, large roll and high plate deployment can technically be achieved with very little ballast remaining. Goose's recurring warning: an achieved number is not proof of a good wave.

Best prevention

Move passengers to help the target rather than fight it. Use the factory targets first. Watch the 2018 prompts when a compartment drops below roughly 80%, and treat them as optimization advice rather than nuisance alerts.

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6. Factory Defaults and a Reliable Setup Workflow

Baseline first

Start with factory pitch, roll and Flow settings. On the 2018 Mojo example Goose used 9 degrees pitch and -3 degrees roll for port surfing, with the opposite Flow plate at 60%. These are examples, not universal values for every hull or software version.

Balance the crew

Seat passengers close to neutral before filling. Let AutoWake complete static and dynamic adjustment. Avoid people roaming during a rider's run.

Confirm four things

Verify speed, actual pitch, actual roll and displacement/amplitude. Then look at retained ballast. If the wave lacks push and ballast was drained, solve the weight-placement conflict before asking for more angle.

Change one variable

For advanced tuning, change only one target at a time and use small increments. Give the system time to settle, compare the rider's experience, and record the result. Return to baseline when a change costs too much ballast.

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7. Flow Plates and Wakeplate

Plates shape; they do not replace weight

Flow plates and the centre wakeplate change lift and the way water releases from the hull. They can clean, lengthen or steepen a wave, but cannot create the energy of missing displacement.

Opposite-side surf plate

The deployed plate on the non-surf side creates lift and helps the boat roll toward the surf side. Excessive deployment can add too much lift and reduce the effective displacement of the stern.

Advanced tuning caution

Goose observed that users often copy another owner's plate percentage without matching hull, crew, ballast, pitch, roll or speed. Plate values should be treated as part of a complete state, never as a magic standalone setting.

Pre-AutoLaunch technique

On older boats, leaving a Flow plate down could help the boat plane; it automatically retracted near 15 mph. Some 2016 systems could not command both surf plates simultaneously.

8. Wakeboarding and AutoLaunch

Level wakes

In wakeboard mode, AutoWake keeps port and starboard wakes more symmetrical despite uneven passenger seating. Response delay prevents it from chasing the brief roll created when the rider cuts.

AutoLaunch

AutoLaunch deploys both Flow plates during acceleration to help a heavily ballasted boat get on plane, then retracts them. Goose described the improvement as substantial on heavily weighted boats.

Heavy ballast

The system can make an otherwise difficult planing event manageable, but propeller choice, legal loading, engine load and safe visibility still matter. The thread's examples are observations, not permission to exceed ratings.

9. Advanced Tuning: How to Improve Without Outsmarting the System

Earn the advanced settings

Goose explicitly cautioned users not to skip calibration, factory baselines and displacement understanding. AutoWake can be a learning instrument because it exposes the actual angles that previously had to be guessed.

Preserve mass

Before increasing pitch or roll, ask what ballast must be removed to reach the new target. A lower angle with greater retained mass often wins.

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Reproduce a manual wave

An advanced driver can manually create a preferred wave, note the stable pitch, roll, speed and amplitude, then program those values so AutoWake reproduces it with varying crew loads.

Use repeatable records

Record hull, side, speed, pitch, roll, plate setting, ballast retained, amplitude, passenger count/positions, rider and board. Without the whole state, another person's "perfect settings" are incomplete.

10. Troubleshooting Decision Tree

Wave lacks push

Check amplitude/displacement and retained ballast first. Then check rider/board demand. Only after sufficient weight is confirmed should you tune pitch, roll, speed or plates.

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AutoWake drains one rear bag

The crew is likely creating more roll than the target allows, or the target is too mild/aggressive for the seating arrangement. Move weight toward the draining side's opposite correction as prompted, then let the system refill.

AutoWake drains the bow

The commanded pitch is higher than the current mass distribution permits. Move people aft or reduce the pitch target; do not assume more bow-up angle will offset the lost displacement.

Displayed level but wakes are uneven

Check inclinometer calibration, ballast reality versus timer display, plate reset/actuation and speed accuracy. A sensor or actuator input error can defeat otherwise correct settings.

Works manually but not in AutoWake

Recreate the manual wave, record the actual stable numbers, check calibration, and use those numbers as the AutoWake targets. Also inspect whether AutoWake must drain weight to achieve them.

Intermittent or strange software behaviour

Document the exact sequence, software version, boat model and screen state. Goose repeatedly used detailed owner reports to reproduce glitches and route them to the supplier/dealer network.

11. Model-Year and Retrofit Notes

2017 to 2018

Goose said the draft sensor system was designed with retrofit potential and that 2018 software could work on 2017 AutoWake boats, but installation accuracy and dealer involvement were important.

Software compatibility is conditional

Later posts discuss backward compatibility for selected models and hardware. Treat any historical “should be compatible” statement as model-specific and verify current parts, display hardware and dealer procedures.

Ballast and capacity

Factory ballast selection balances storage, capacity-plate calculations and broad customer use. Goose explained that NMMA calculations do not treat ballast and passenger capacity as simple one-for-one interchangeable pounds.

Factory testing

The manufacturer performs real float testing at rated configurations in addition to standards-based calculations. Owners should still follow the current capacity plate and manufacturer instructions.

12. Practical Setup Worksheets

Surf baseline worksheet

Record model/year, software, surf side, rider weight, board, water depth/chop, speed, pitch, roll, opposite Flow percentage, wakeplate, ballast percentages, amplitude and crew positions.

Change log

For each test, note exactly one change, ballast retained after achievement, rider feedback on push/length/height/cleanliness, and whether the change is worth keeping.

Crew plan

Assign seats before the run. Mark which person should move when a port, starboard, bow or stern correction prompt appears. This turns passengers into movable ballast without sacrificing stored water.

Known-good profile

Save the complete state of a successful day. On the next outing, use amplitude to determine whether the crew/gear load is comparable before expecting the same wave.

15. Final Operating Checklist

1. Confirm legal loading and adequate visibility.
2. Verify speed source, ballast operation, plate operation and inclinometer calibration.
3. Begin with factory pitch, roll and plate defaults for the correct model and activity.
4. Seat the crew near neutral and keep them stable during a rider's run.
5. Allow static and dynamic modes to settle before judging the wave.
6. Check displacement/amplitude and retained ballast before adding more angle.
7. Respond to passenger-placement prompts instead of ignoring them.
8. Change one variable at a time and record the full setup.
9. Use a known-good profile as a baseline, not another boat's isolated percentage.