



## Rule 42 Most Common Breaches – RS Aero 5, 6, 7 & 9

**This guidance document is intended as a valuable addition to improve sailors' understanding and judges' consistency around the world. The document is agreed by the RS Aero Class Association for use at events where it is the Organising Authority. It is not a rule and cannot supersede the Racing Rules of Sailing nor the World Sailing Interpretations of Rule 42 which are the authoritative documents.**

The rule references below in upper case (e.g. BASIC 4) refer to the Interpretations of Rule 42 document at: <https://www.sailing.org/documents/racingrules/documents.php>.

### **PRINCIPLE:**

Judges will give sailors the benefit of doubt. However, when they are sure a sailor is breaking Rule 42, judges will act to protect the sailors who are complying with the rule.

### **CLASS RULES CHANGING RULE 42:**

Class Rule C1.1(c) states:

RRS 42.3 is changed by adding: "Where stipulated in the SI, if the average wind speed is clearly over 10 knots across the course the race committee may signal in accordance with RRS Appendix P5 that pumping, rocking and ooching are permitted, except (i) prior to the start and (ii) when the boat is on a leg of the course designated in the SI as a windward leg." This changes RRS 42.2(a), RRS 42.2(b), RRS 42.2(c).

This class rule is not usually invoked by the SI at major events where the class association policy is to encourage the Organising Authority to apply the standard Rule 42.

### **BOAT CHARACTERISTICS IMPACTING RULE 42:**

The RS Aero is designed to accept four different rigs: Aero 5, Aero 6, Aero 7 and Aero 9 with sail areas of approximately 5m<sup>2</sup>, 6m<sup>2</sup>, 7m<sup>2</sup> and 9m<sup>2</sup> respectively. The rigs race as separate classes but usually share the same race course at major events. The very light hull (only 30Kg) compared to the sailors' weight of between 35-95Kg means that sailor-to-hull weight ratios vary between 1 and 3. Therefore, the impact of body kinetics is significant and varies considerably both across the classes and within each class depending on the individual sailor.

The hull shape is characterised by a fine bow, flat aft section and wide transom. It planes easily at wind speeds above 8 knots but may sometimes nose dive when accelerating rapidly in high winds and steep waves causing temporary instability and background rolling. The two-part carbon composite mast is unstayed and very thin at the top. When combined with a sail having a powerful battened square top section, the result is a very flexible rig which bends easily in response to (i) body kinetics and (ii) changes in wind speed. When running downwind, changes in wind speed can create instability and cause the sail leech to flick. They can also cause the boat to roll significantly, particularly to windward. The large square sail roach means that the sail leech flicks easily in response to waves and wind speed changes. In light winds the boat is often sailed with crew weight well forward and heeled to windward which promotes instability and increased background rolling.

The tapered rudder is hung vertically and generally has neutral helm. In low-speed manoeuvres (e.g. during the pre-start or after a bad tack) the boat tends to stall and often requires repeated forceful movements of the rudder, sail and body to turn the boat.

## **STARTS**

During the pre-start while manoeuvring slowly in light winds, the RS Aero stalls easily and may become stuck in irons. Forceful sculling or sail backing may be required to get the boat moving again. This may be permitted if the boat is above close-hauled and does not cause crabbing to windward. Sail leech flicks at the start may be due to waves or gusts. Judges should connect flicks to the body movement to justify a penalty. On a congested start line, sailors will often take up a position early in the starting sequence. In order to prevent stalling, sailors sometimes use their bodies to roll the boat slightly to leeward and then immediately back upright followed by a luff. This manoeuvre briefly propels and then slows the boat to maintain steerage way. A single roll is permitted, but if the manoeuvre is repeated later in the starting sequence or at the starting signal it breaks Rule 42.2(b)(1). Just before the starting signal a combination of bear away, leeward roll, luff, rapid sheet trim and body pump in one action is then used to accelerate the boat to full speed. This so-called “trigger pull” manoeuvre is legal if the steering through the change of course from reach to luff is consistent with the degree of leeward roll and no prior rolling has occurred earlier in the starting sequence. If there is no or insufficient steering the manoeuvre breaks the basic Rule 42.1. The manoeuvre is legal when the acceleration to full speed is achieved by the luff and sheet trim prior to or concurrent with the single body pump.

### **1. One Roll and / or One Body Pump**

A roll or body pump at the start is permitted when accompanied by a change of course. Any action of the body that clearly propels the boat is prohibited unless it facilitates steering in the appropriate direction. Heeling to windward to facilitate bearing away and heeling to leeward to facilitate heading up are permitted provided the amount of heel is consistent with the boat's turn. Very often a roll is combined with a strong body pump at the completion of the roll and this is permitted unless it clearly propels the boat.

#### **Permitted actions:**

- One roll or one body pump that does not clearly propel the boat.

#### **Prohibited actions:**

- One roll or one body pump that clearly propels the boat - BASIC 4.
- One roll and one body pump that both cause the sail to flick - 42.2(a).
- A “trigger pull” manoeuvre with no or insufficient steering – ROCK 6
- Repeatedly rolling the boat - 42.2(b)(1). A second roll at the starting signal which follows a first roll earlier in the starting sequence breaks this rule.
- Repeated body pumps - 42.2(a).

#### **Gathering evidence:**

- Is the sailor causing the boat to roll?
- Does a single roll by the sailor clearly propel the boat?
- Is the rolling by the sailor repeated (more than once)?
- Is the roll by the sailor consistent with steering?

### **2. Sculling**

Sculling an RS Aero tends to be forceful as gentle movements have little effect when the boat is stalled or moving slowly. Sculling may be observed in light wind especially when the boat is trapped between other boats or to windward of the committee boat at the starting line. Sculling which continues below a close-hauled course is not permitted. Following a penalty at the start, sculling to bear away to start taking the penalty and which continues below close-hauled will attract a second penalty. Sailors sometimes challenge a penalty on the grounds that the rudder did not cross the centreline, this action is still prohibited if the repeated forceful rudder movement occurs when the boat is below close-hauled.

#### **Permitted actions:**

- Gentle rudder movements through the centreline that are for steering only and do not propel the boat or prevent it from moving astern.
- Sculling, even forceful, when a boat is above close-hauled course and clearly changes direction to a close-hauled course – 42.3(d), SCULL 1.
- Repeatedly moving the helm to reduce the speed – 42.3(f).

**Prohibited actions:**

- Sculling below a close-hauled course often in an effort to stop the boat immediately going back to head to wind or to duck in to leeward of another boat – SCULL 1.
- Sculling in one direction followed by further connected sculling in the opposite direction – SCULL 2.
- Sculling to offset steering of the boat caused by backing a sail (crabbing), but only if the rudder movements are forceful enough to offset the steering caused by backing the sail. This will result in the boat moving to windward, parallel to the starting line – SCULL 3.

**Gathering evidence:**

- Are the tiller movements forceful?
- Are they propelling the boat forward or preventing it from moving astern?
- When combined with sail backing, are the tiller movements propelling the boat to windward?
- Is the boat above a close-hauled course and clearly changing direction towards a close-hauled course?
- Is the sculling offsetting previous connected sculling?

## UPWIND

### 1. Pumping and Rocking

Pumping breaches in the RS Aero do not often happen on the beat. The likelihood of breaches grows in tactical situations or in light air, especially in the larger rigs, when sailors want to increase boat speed by using body movement when approaching a windward mark below the lay line, when trying to cross ahead of a starboard tack boat or when slowed by big waves. Competitive sailors will often be seen continuously shifting position. This is usually a combination of torquing to change the fore and aft trim as well as hiking to keep the boat flat. In lighter wind and flat water, athwartships body movement can cause the sail leech to flick. In stronger winds the wave action can also cause the leech to flick. For body pumping breaches to be properly observed and identified, judges should position themselves behind the boat and connect the body movements to the sail flicks. In light wind the RS Aero can be repeatedly rolled upwind to cause forward propulsion. Repeatedly rolling the boat upwind is rocking but becomes body pumping if it causes the sail leech to flick. Both prohibited actions are clearly observable from astern.

**Permitted actions:**

- Torquing to change the fore and aft trim of the boat in phase with waves – OUCH 1.
- Vertical or athwartships body movement that does not cause the leech to flick, the boat to roll or break the basic rule.

**Prohibited actions:**

- Body pumping or aggressive torquing causing repeated leech flicks – PUMP 6.
- Torquing on flat water – OUCH 2.
- Repeatedly rolling the boat – 42. 2(b)(1).

**Gathering evidence:**

- Are there waves?
- Is the sailor's body movement in phase with waves?

- Is the sailor's body movement vertical or athwartships?
- Can the sailor's body movements be connected with the flicks?
- Are the flicks repeated?
- May the flicks on the leech be caused by waves?
- How does it appear compared to the other boats?
- Is the sailor causing the boat to roll?
- Is the rolling repeated (more than once)?

## 2. Roll tacking

Sailors are permitted to move their bodies to roll the boat and steer it through the tack. The only restriction is that the body movement does not cause the boat speed to be faster than that in the absence of the tack. A problem occurs when the sailor delays bringing the boat upright after reaching close-hauled on the new tack. At this point the exception allowing body movement no longer applies. Any vigorous righting movement is judged under the basic rule and if it increases the boat speed beyond normal it is prohibited. The RS Aero top two sail battens have adjustable tension. If left too tight in light wind, the sailor may need to pump the sail repeatedly to invert a batten after a tack (or gybe). This is legal provided the action does not clearly propel the boat.

### Permitted actions:

- Body movements that exaggerate rolling and cause the boat to sail out of a tack at the same speed as she had just before the manoeuvre – ROCK 8.
- Moving the mast to windward of vertical at the completion of the tack – ROCK 9.
- Repeated tacks related to wind or tactical considerations.
- If a batten is inverted, pumping the sail until the batten is no longer inverted, provided this action does not clearly propel the boat – 42.3(e).

### Prohibited actions:

- Body movements exaggerating rolling and causing the boat to sail out of the tack at a speed greater than that she had just before the manoeuvre. This is usually only observable in very light wind conditions by a clear drop in speed after accelerating out of the tack – BASIC 7.
- Delaying bringing the boat upright after reaching the new close-hauled course followed by a strong body pump that clearly propels the boat – BASIC 6.
- In very light wind, delaying bringing the boat upright after it has reached a close-hauled course and then rolling it further to leeward before rolling it flat and then repeating this action in a subsequent tack – 42.2(b)(1).
- Repeated tacks unrelated to wind or tactical considerations – 42.2(e).

### Gathering evidence:

- Is the sailor delaying bringing the boat upright after the tack is complete?
- Is it followed by a vigorous trim of the sheet or a body pump?
- Is it clearly propelling the boat faster than the speed before the tack?
- Do individual tacks increase the speed of the boat beyond normal upwind speed?
- Does sailor's body movement cause the increased speed?
- Is the increase in speed after the tack followed by a sudden and significant decrease in speed?
- Can the tacks be justified by wind shifts or tactical considerations?

## DOWNWIND

### 1. Pumping

Most RS Aero pumping breaches occur on downwind legs. On reaches, particularly in the larger rigs, sailors use aggressive sail trimming and vigorous body movements to keep the

boat flat. This is due to rapid apparent wind changes in response to gusts and wave effects. Sailors will also change course continuously as they surf the waves and trim the mainsheet accordingly. They may also sheet pump once per wave or gust to initiate surfing or planing. The resulting combinations of movements need to be carefully observed to determine which movements are permitted and which are not. Leech flicks may be caused by waves or gusts or by connected body movements to control the boat. However, an athwartships body movement directly causing the leech to flick is not permitted. Repeated sheet pumping when the boat is already planing or surfing is not permitted. There are significant differences between the conditions required to initiate surfing or planing in the RS Aero 5, 7 and 9. In medium winds it is not uncommon to see RS Aero 9s planing and surfing, RS Aero 7s surfing but not planing and RS Aero 5s neither planing nor surfing. Judges should monitor the conditions for each class regularly. Illegal sheet and or body pumping may also be observed during the run. Positioning of the judges is crucial to be able to distinguish between aggressive but legal sailing and Rule 42.2(a) breaches. On a reach, body pumping may best be seen from behind and to leeward, in order to observe the athwartships body movement and the effect it has on the leech. On a run, sheet pumping best seen from a position abeam and to leeward of the observed boat.

**Permitted actions:**

- Trimming the sail and moving the body in order to trim the boat in the prevailing conditions – PUMP 2
- Pumping the sail once per wave or gust of wind to initiate surfing or planing. Note that to qualify as surfing the boat must rapidly accelerate down the front of the wave – 42.3(c).

**Prohibited Actions:**

- Body pumping directly causing repeated flicks on the leech – PUMP 6.
- Trimming a sail repeatedly in order to fan it – PUMP 1.
- Pumping the sail justified as a trim by pulling and then releasing the sheet - PUMP 1.
- Pumping the sail when already surfing or planing – PUMP 12.
- A third unsuccessful attempt to initiate surfing or planing – PUMP 8.

**Gathering evidence:**

- Are there surfing or planing conditions?
- Does one pump per wave or gust of wind initiate surfing or planing?
- Is the sailor sheet pumping while surfing or planing?
- Could the trim and release be a response to wind shifts, gusts, waves or to change course?
- Is the repeated trim and release fanning the sail?
- Are leech flicks connected with body movements?

## **2. Rocking**

Rocking caused by body movement is, by far, the most common reason for Rule 42 penalties. Sailing downwind, RS Aero sailors tend to change course continuously in a series of linked S-turns by luffing then bearing away and using their bodies to facilitate steering the boat. This technique, most common in the larger rigs, alternates between sailing by the lee and broad reaching. This is permitted under Rule 42.3(a) as long as there are waves and the boat changes course in phase with them. It is also permitted if there are gust corridors and the boat changes course to stay in stronger wind. The degree of heel must be consistent with the angle through which the boat turns. On the run, these S-turns are often combined with a heel to windward or leeward. This reduces the stability of the boat and increases background rolling which is permitted. Sailors may anticipate the arrival of a wave or gust by reducing the amount of heel before the wave or gust arrives. If this body movement is excessive or not in phase with the wind and waves and causes the mast to move in the same direction as the

body, or causes subsequent repeated rolling of the boat it may break Rule 42.1(b)(1). Whilst bearing away with windward heel, sailors sometimes roll the boat to leeward which offsets the steering and breaks Rule 42.2(b)(1) when repeated. The best position for judges to observe both the effect of body movement on the boat and any steering by the sailor is from directly astern. Judges should observe whether the body and mast move in opposite directions which is legal, or if the body movement repeatedly promotes a mast movement in the same direction which breaks Rule 42.2(b)(1).

**Permitted actions:**

- Heeling the boat to leeward to facilitate luffing and heeling the boat to windward to facilitate bearing away, provided it is linked to wave or gust patterns – ROCK 6.
- Adopting static crew position, a static setting of sail or daggerboard that reduces the boat's stability – ROCK 4.

**Prohibited actions:**

- Repeated rolling of the boat that is not linked to wave or gust patterns – ROCK 7.
- Repeated rolling of the boat caused by big body movements followed by a relatively small change of course – ROCK 6.
- Repeated rolling of the boat by body movement in the absence of waves or gusts – ROCK 7.
- A single body movement followed by repeated rolling especially after inducing a roll to windward and before the roll is complete moving the body to leeward to counteract it or vice-versa – ROCK 5.

**Gathering evidence:**

- Is the competitor causing the boat to roll?
- Does the body movement cause the mast to move in the same direction?
- Is the rolling helping to steer the boat?
- Are there waves to steer the boat through?
- Are there gust corridors?
- Is the heeling of the boat consistent with the turn?
- Is the turning linked to wave or gust patterns?

### **3. Roll Gybing**

In light winds roll gybing is common and sailors may make repeated gybes to gain speed especially when approaching the zone or trying to break cover by another boat. As with roll tacking, delaying the roll to windward to trim the boat flat after the gybe is completed puts the sailor at risk that the movement will not be covered by the exception in Rule 42.3(b) but instead judged against the basic rule. Top battens with too much tension may fail to invert after a gybe in light winds. Repeated pumps to correct a batten are legal provided the action does not clearly propel the boat.

**Permitted actions:**

- Repeated gybes that are each related to changes in the wind or to tactical considerations.
- Body movements that exaggerate rolling and cause the boat to sail out of the gybe at the same speed as she had before the manoeuvre -ROCK 8.
- If a batten is inverted, the sailor may pump the sail until the batten is no longer inverted, provided this action does not clearly propel the boat – 42.3(e)

**Prohibited actions:**

- Repeated gybes unrelated to changes in wind or to tactical considerations – 42.2(e).
- Body movements that exaggerate rolling and cause the boat to sail out of the gybe with greater speed than it had just before the manoeuvre. This can be observed by the clear drop in speed after accelerating out of the gybe – ROCK 7.

**Gathering evidence:**

- Do the individual gybes increase the speed of the boat?
- Does the sailor's body movement cause the increase in speed?
- Is the increase in speed after the gybe followed by a sudden and significant decrease in speed?
- Is there a delay between the completion of the gybe and rolling of the boat upright?
- Is the gybe accompanied by a sheet pump?
- Can the gybes be justified by wind shifts or tactical considerations?

## SUMMARY

The top six most common breaches of Rule 42 in the RS Aero based on judge observations at recent major events are:

1. Sculling below close-hauled at the start.
2. A "trigger pull" at the start with no or insufficient steering.
3. Repeated rolling in the prestart or repeated body pumps producing leech flicks at the starting signal.
4. Rocking downwind with no or insufficient turning.
5. Sheet and or body pumping downwind when already planing or surfing.
6. Delayed windward roll to bring the boat upright after a tack is completed in light winds.

The first five of these common breaches can be seen demonstrated in an RS Aero in the RYA Video *Top 5 Rule 42 Mistakes in Single-Handed Dinghy Racing* at: <https://www.youtube.com/watch?v=ixxuoTn8hew>.

## TIPS

1. If you get a yellow flag penalty take a moment to decide the best way to sail clear of other boats before starting to take the penalty.
2. Be careful not to break Rule 42 again as you turn the boat to start taking penalty turns.
3. After the race, ask the judges for an explanation of what they saw and why it breaks Rule 42.
4. Remember that the more important the event, the higher the ratio of judges to sailors so your sailing technique will be under closer scrutiny when it matters the most.

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