

PROFURL IN-BOOM REEFING SYSTEM

MK 0

SERIAL NUMBER :

INSTALLATION MANUAL

IMPORTANT NOTICE TO RIGGERS :
PLEASE GIVE THIS MANUAL TO THE BOAT OWNER AND ASK HIM
(HER) TO CAREFULLY READ IT BEFORE USING THE SYSTEM.

RECEIPT OF GOODS

All goods must be checked on delivery and the Buyer should claim from the carrier verbally within three days in the event of loss or damage, and in writing within seven days.



Congratulations for the purchase of your PROFURL in-boom reefing furling system.
Please read carefully this manual. It will give you to all information for fitting and using your system in order to give you many years of dependable service.

IMPORTANT WARNING FOR USING YOUR SYSTEM :



The PROFURL boom is obviously heavier than a conventional boom.

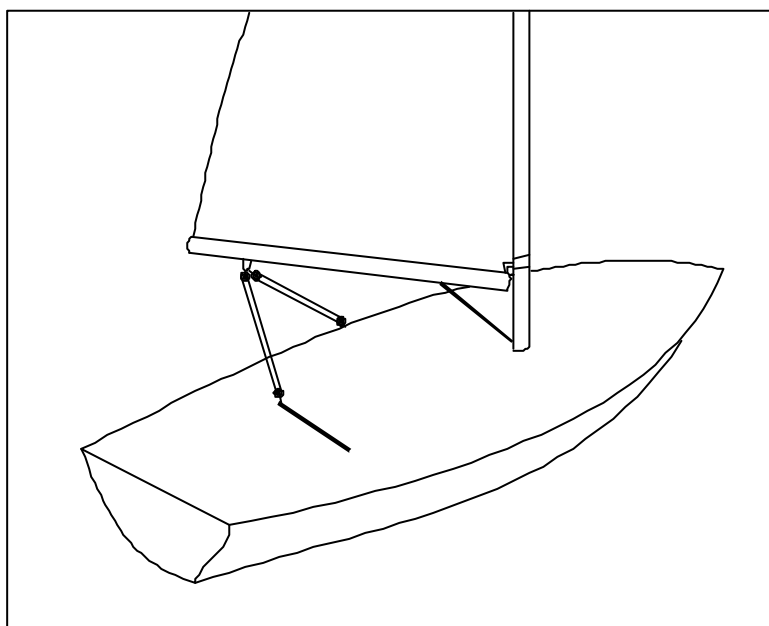
Avoid uncontrolled gibing, specially with strong wind, as you could permanently damage your system.

Reminder to gibe :

- 1 - take in or winch your main traveller and main sheet
- 2 - turn your boat to gibe
- 3 - gradually release your main traveller and main sheet.

You can even better fit a tackle as **boom preventer** (see drawing).

You can also fit a **boom brake**, but you must not forget to **completely release** it each time you want to operate your system.



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PRELIMINARY CAUTIONS

The PROFURL in-boom mainsail reefing system is not designed to be installed on wooden masts, or aluminium masts with track added with screws, rivets, glue or any similar assembly. Fitting on a carbon mast is not recommended and requires special skills. Please contact us.

Please check that there is no sign of severe corrosion on the mast which would compromise the strength of the assembly.

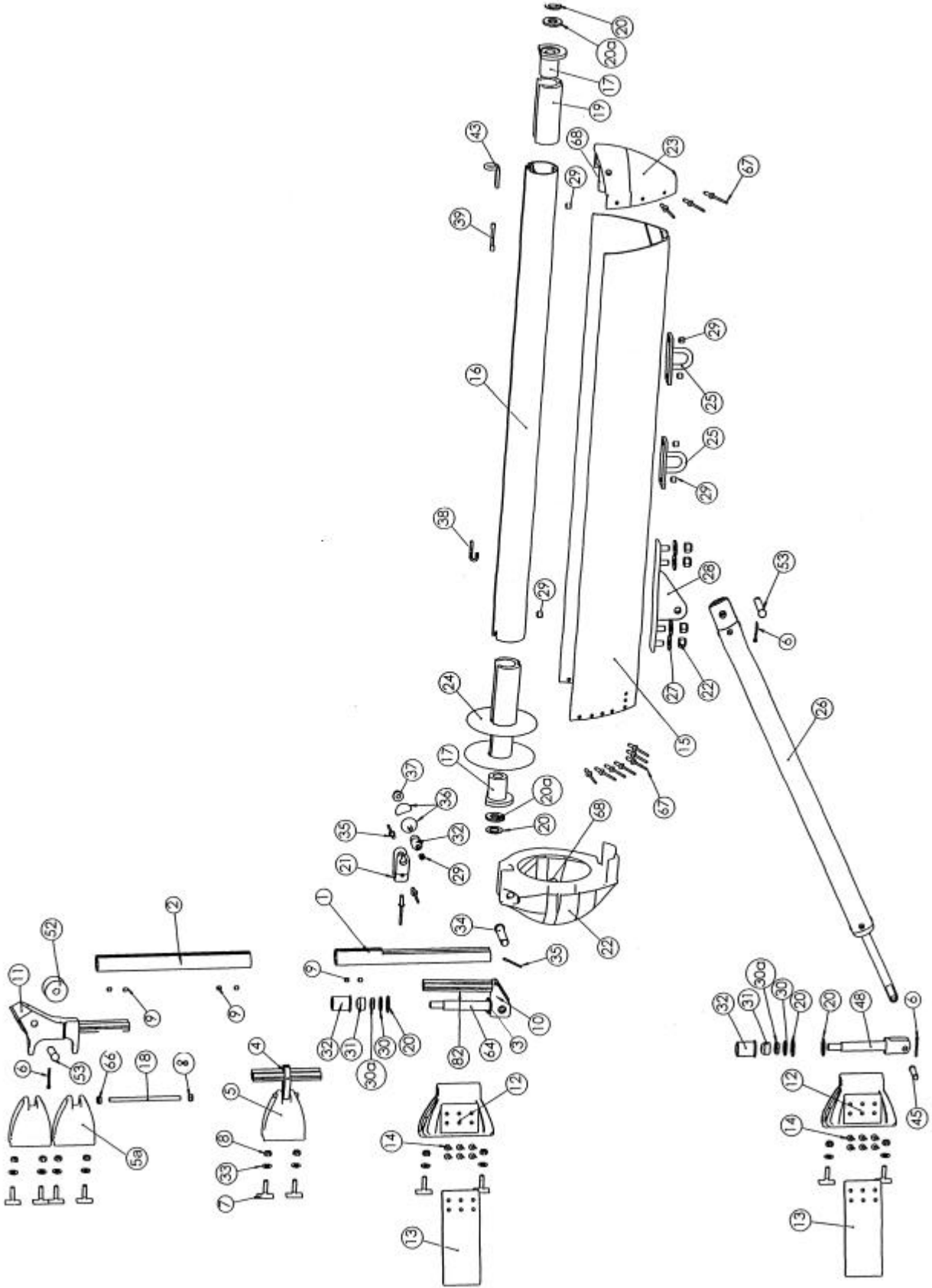
The person in charge with fitting will be fully responsible for installation and adaptation on board according to the specifications shown in this manual.

I - GENERAL DESCRIPTION

Note : names in bold refer to parts shown on the exploded view (next page)

The PROFURL MK0 in-boom furling system includes :

1. One set of **luff profiles** (1 and 2) articulated on the aft face of the mast .
There are 2 different kinds of **luff profiles**: one 0.40 m long **feeder profile** (1) on which the **feeder** (21) is attached, and several 2 meters long **normal luff profiles** (2) depending on the mainsail's luff length. One of these 2 meters long **normal luff profiles** (2) will be re-cut to length at its upper end to match the expected luff length of the mainsail. The different **luff profiles** (1 et 2) are connected to each other by mean of **connectors/articulations** (4), which are fitted to **articulation brackets** (5) that will be attached to the mast track.
2. **Articulation brackets** (5) attached to the mast with 2 **slide screws** (7) slipped in the mast groove. Every **slide screw** (7) has a thread and a flat end going through a hole of the **articulation brackets** (5). The thread of the **slide screws** (7) receives a **washer** (33) and a **locknut** (8) for attachment.
3. **Connectors/articulations** (4) are also used to connect the different **luff profiles** (1 and 2), held by **set screws** (9). The lower end of the 0.40 m long **feeder profile** (1) will be connected onto the **gooseneck articulation** (10), thus allowing the **luff profiles** (1 and 2) to rotate together with the boom.
4. A **sheave box** (11) through which the original mainsail halyard is passing. The sheave box (11) will be fit at the top of the **luff profiles** (1 and 2). It is assembled on the **end brackets** [2 times 5a], themselves being attached by mean of **slide screws** (7) **washers** (33) and **locknuts** (8) and pin (66).
5. A **gooseneck** (12) fit on the mast with 2 **slide screws** (7), and two **gooseneck plates** (13) cambered at the mast shape while fitting, and which will be riveted onto the mast with the **pop rivets** (14) supplied.
6. A **boom profile** (15) which has been delivered in 3.20 meter (10' 6"). It may be necessary to re-cut the boom profile to length when fitting to match the expected boom length.
7. A **mandrel** (16) turning on **bearings** (17) fit on a **bearing holder** (19) at the rear end of the boom, and on the **drum-bearing holder** (24) front, turning around a pin inserted in each of the **boom end fittings** (22 and 23). When re-cutting the **boom profile** (15) to length, the **mandrel** (16) should also be re-cut by the same amount.
8. A **drum boom end fitting** (22). It includes the **drum-bearing holder** (24) fit on the **mandrel** (16): the drum being loaded with the furling line, pulling on the furling line while releasing the mainsail halyard will rotate the **mandrel** (16), which will furl the sail.
9. 2 adjustable **mainsheet bails** (25).
10. A special **boomvang** (26). It is attached :
 - to the mast by mean of a **boomvang attachment**, including an **gooseneck** (12) attached onto the mast with 2 **slide screws** (7) **washers** (33) and **locknuts** (8) and two **gooseneck plates** (13) which will be riveted to the mast with the **pop rivets** (14) supplied. The boomvang lower end will be attached onto an **articulation fitting** (48) rotating in the boomvang gooseneck.
 - onto the boom with an adjustable **boomvang hound** (28).



TOOLS NEEDED FOR FITTING

In all cases of fitting

- A tape line
- An electric drill
- A set of drills
- A hack saw with a (new) blade with small teeth
- A file
- A pencil
- A plastic hammer
- A metric 10 mm pipe-wrench
- A metric 17 mm pipe-wrench
- A dynamometrical wrench (1daN/m)
- 1 set of Allen wrenches (supplied)
- 2 clamps with a minimum opening 200 mm (7")
- Universal pliers
- A cutter blade (with new blades)
- A large sheet of paper with corners perfectly at 90° and adhesive tape
- Several small plywood or rubber shims.
- A pop rivet gun for 5 mm rivets.

Note : the plates to fit the gooseneck and boomvang attachments are 4 mm thick and made out of aluminium. A convenient set of clamps with minimum 150 mm (6") opening should be used to bend them at the mast shape.

If the fitting is made on a standing mast

- A Boson's chair
- Some short ropes of 6 or 8 mm (1/4" or 5/16") diameter

Please purchase a 6 mm furling line and a ball bearing block to lead the furling line to the cockpit.

II - PREPARATION

II.1 - UNFITTING THE HARDWARE FROM THE MAST

II 1 a - Dismantle the original gooseneck, as well as cleats, winches and winches brackets on the mast, as well as any piece of equipment which would interfere with the fitting of the new gooseneck and with the ability for the forward boom end fitting to rotate when the boom will swing from one side to the other. *Please see § III 1 b and drawing 1 for dimensions of the new gooseneck in relation with mark « C » on the mast.*

II 1 b - The original boomvang attachment should not be used, as the rotation axis of the boom and of the new gooseneck need to be in line, which would never be the case with the original boomvang attachment.

II 1 c - Dismantle the original feeder (if any) at the mast track entrance.

II 1 d - Check that the slide screws (7) supplied have suitable dimensions for the mast track. If not, their width should be modified (turned, machined, grinded, filed) accordingly.

In all other cases please contact us.

III - INSTALLATION

III 1 - DETERMINING THE HEIGHT OF THE GOOSENECK

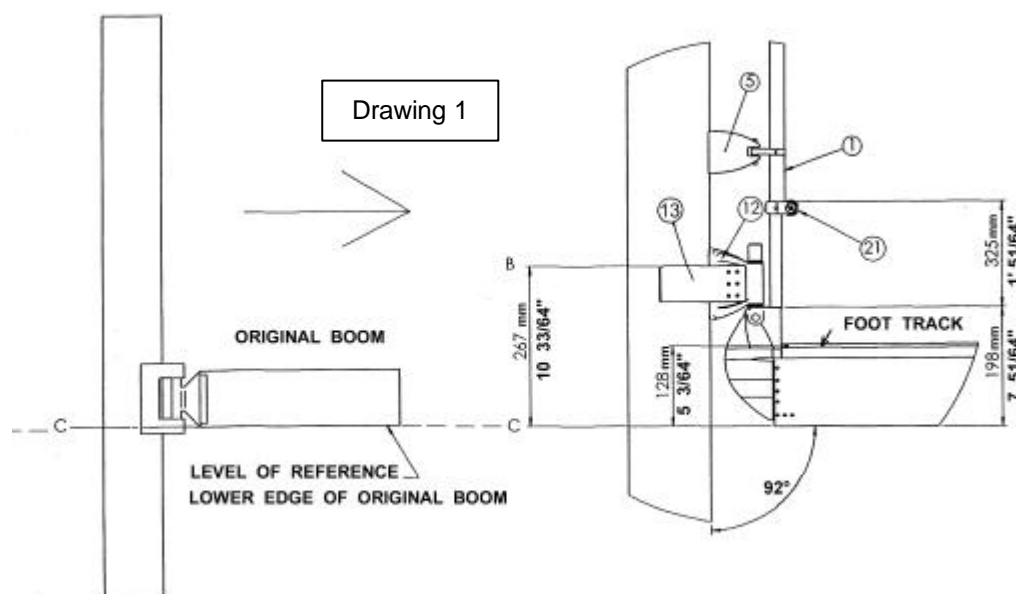
III 1 a - To avoid any potential conflict between the boom and the cabin top, a bimini, a lifeline or any other piece of equipment, please accurately mark the level of the lower edge of the original boom. Please see drawing 1.

III 1 b - Check that the boomvang delivered with your system will make once installed a minimum 30° angle with the mast and the boom. Should it not be the case, the position of the new gooseneck must be raised on the mast in order to obtain at least this 30° angle .

Note pin to pin boomvang length : 1100 mm (5' 8 7/8") open / 1005 mm (5' 3 3/16") closed

III 1 c - Draw a line « C » on the mast at the level of the lower edge of the original boom. Please see drawing 1.

III 1 d - Draw a line « B » on the mast at **267mm (10' 2 33/64")** above line « C ». The line « B » will correspond to the level of the upper edge of the gooseneck plates (13) once fit on the mast.



III 2 - FITTING THE SLIDE SCREWS INTO THE MAST TRACK

III 2 a - Insert the head of the slide screws (7) into the mast track. The number of slide screws you need to insert depends on the number of articulation brackets :

A - 2 slide screws are needed for the boomvang attachment. Slide these slide screws down to the mast foot to later fit the boomvang attachment .

B - Slide 4 slide screws (7) into the mast track for the upper end brackets (5).

C - Slide as many times 2 slide screws (7) into the mast track as the quantity of articulation brackets (5) to be fit. See drawing 12.

III 2 b - Move the stacked slide screws mentioned in **B** and **C** upwards on the mast above the mast track opening, and temporarily hold them with adhesive tape to prevent them slipping out of the track.

III 2 c - Slide 2 extra slide screws (7) into the mast track for fitting the gooseneck.

III 3 - FITTING THE GOOSENECK

III 3 a - Attach the gooseneck at the convenient height (§ III 1) with the 2 corresponding slide screws (see § III 2 c), washers (33) and locknuts (8). Tightening torque must be 1 daN/m. Please see drawing 1.

III 3 b - Bend the aluminium gooseneck sideplates (13) with clamps to accurately camber them to the mast shape. During bending please protect the plates from dings and dents.

III 3 c – Fit the gooseneck onto the sideplates with the rivets. Would the sideplates be too long, they can be re-cut if necessary, keeping in mind too much length is always better than too little.

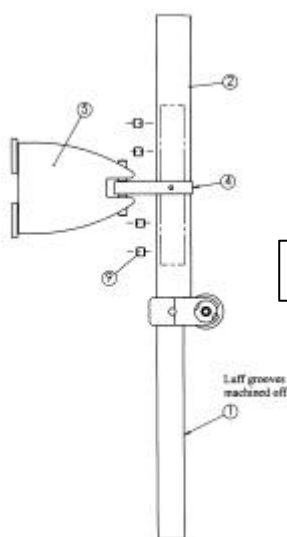
III 3 d - Draw lead lines for drilling on the side plates (13). Press the side plates on the mast with clamps (please protect the plates with convenient means). There should have at least 8 pop rivets (14) on the mast on each side plate (13).

III 3 e -Temporarily fit the gooseneck articulation (10) onto the gooseneck (12) as well as washers 20 and 30, and tighten the counternut (30a) and locknut (31).

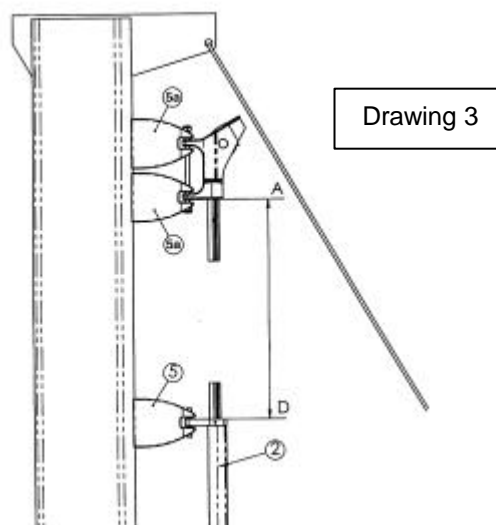
III 4 - ASSEMBLING THE LUFF PROFILES

Note: assembling the luff profiles will be easier flat on the ground.

III 4 a - Fit the luff profiles (1 et 2) together starting with the feeder profile (1) where the feeder (3) is attached. The lower end of this feeder profile can be identified by the luff grooves have been machined off. Please see drawing 2.



Drawing 2



III 4 b - Completely insert a connector/articulation (4) at the upper end of the feeder profile (1) . Please see drawing 2.

III 4 c - Fit and tighten the set screws (9) at the upper end of the feeder profile.

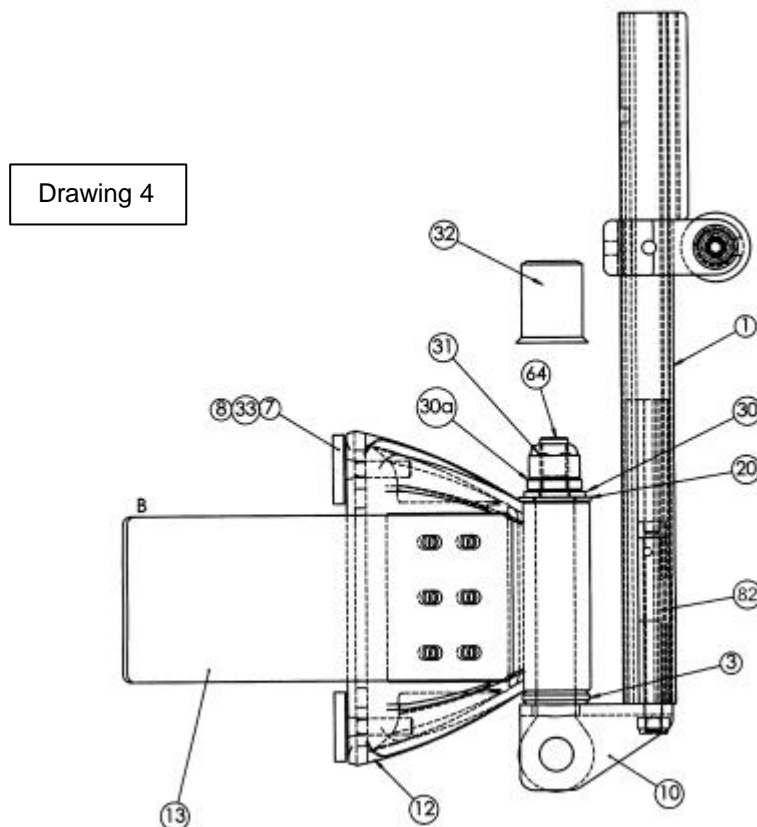
III 4 d - Fit a 2 meter long normal luff profile (2) onto the connector/articulation (4) which has been fit as described above.

III 4 e - Fit and tighten the set screws (9) onto the luff profiles. Fit all the luff profiles (2) with the same method **except the last 2 meter normal profile**. Please see drawing 3.

III 4 f -Hoist the above luff profiles column from the aft side of the mast by preferably using the existing topping lift.

Caution: during hoisting check that the luff profiles are kept as straight as possible.

III 4 g - Completely insert the lower end of the feeder profile (1) into the striped aluminium connector of the gooseneck articulation (10) . Please see drawing 4.



III 4 h – Check fitting order of washers and nuts (3, 20 ,30, 30a, 31) onto the vertical stainless steel pin. Please see drawing 4. Permanently fit the Nylock nut (31) with a 17 mm tube wrench onto the thread of the stainless steel vertical pin. Fit the plastic cap (32) over the locknut.

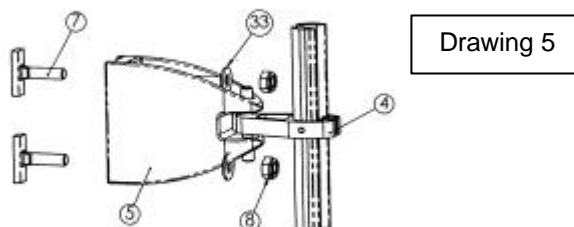
III 4 i – Go to mast head taking with you :

- the 2 end brackets (5a)
- all the articulation brackets (5)
- the sheave box (11)
- all the slide screws (7) to be slipped up in the mast track, washers (33) and locknuts (8).

III 5 - FITTING THE ARTICULATIONS BRACKETS ONTO THE MAST

III 5 a - Consider the 2 lower slide screws (7) stacked above track entrance.

III 5 b - Fit an articulation bracket (5) on the mast with these slide screws (7). Please see drawing 5.



III 5 c - Fit the washers (33) and locknuts (8) onto the thread of the slide screws (7). Tightening torque should be 1 daN/m.

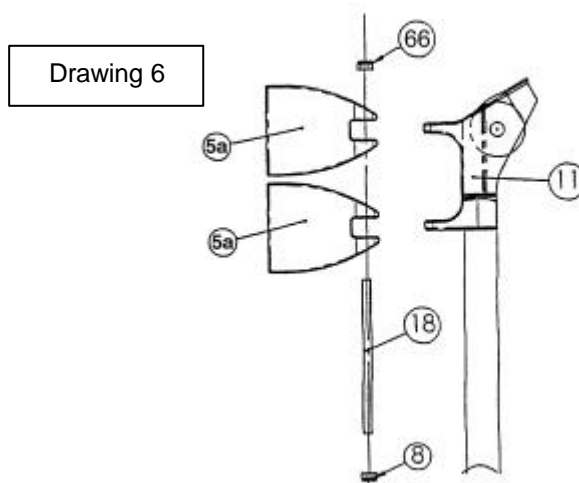
***Caution** : during fitting the articulation brackets (5) onto the connector/articulations (4), double check that the feeder profile is permanently and fully inserted in the gooseneck articulation (10).*

III 5 d - Continue fitting all the articulation brackets (4 & 5) with the same procedure.

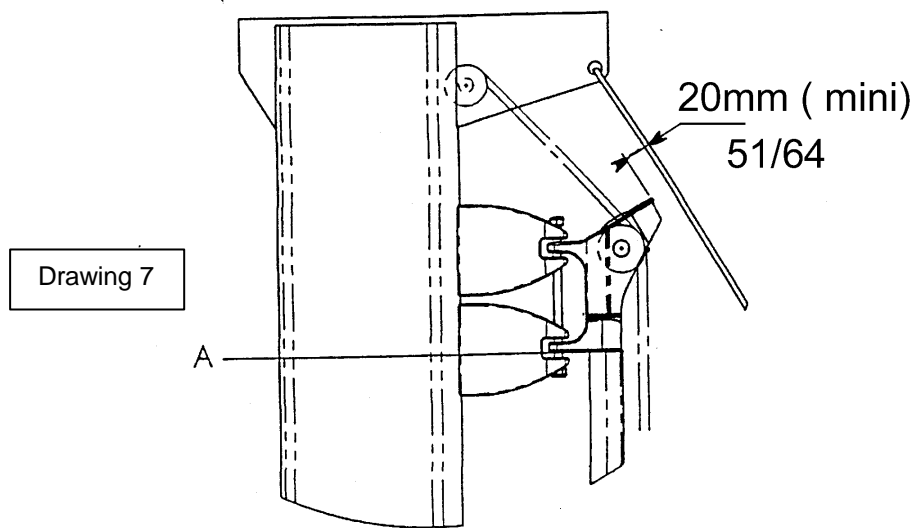
III 6 - FITTING THE SHEAVE BOX

III 6 a - Slide up in the mast track the 4 uppermost remaining slide screws (7).

III 6 b - Temporarily fit the 2 end brackets (5a) and the sheave box (11) so that the rear upper end of the sheave box leaves a minimum clearance of 20 mm with the backstay(s). Please see drawing 6.



III 6 c - Draw an « A » line on the mast corresponding to the position shown on drawing 7.



III 7 - MEASURING AND FITTING THE UPPER (CUT) LUFF PROFILE

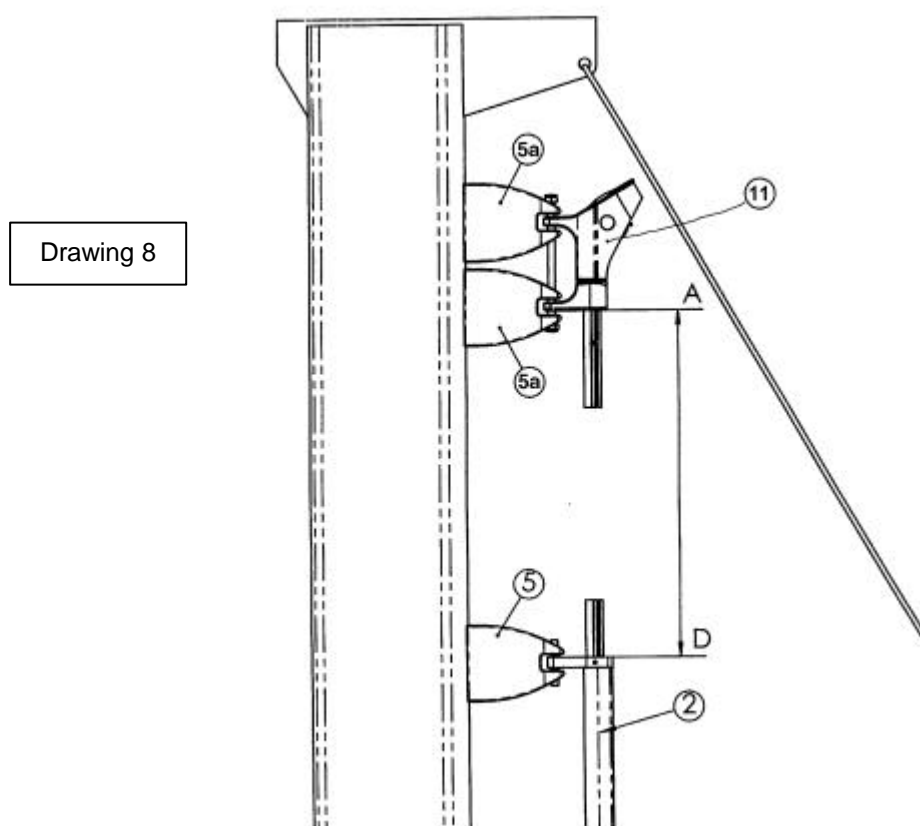
III 7 a - Accurately measure the length « A to D », D being the upper edge of the articulation bracket. Please see drawing 8.

III 7 b - Mark the « A to D » length on the remaining luff profile (2) and cut it at this exact length. File smooth the cut edge .

Note : in case you have a fractional rig or a very flexible mast, please cut upper profile at A/D minus 5 mm (13/64"), but keep the sheave box at the same position, thus giving 5 mm play between "A" and the upper edge of the cut profile.

III 7 c - Fit without tightening the 2 set screws (9) on the threads located at the opposite side of the cut end.

III 7 d - Assemble the cut luff profile onto the next to last 2 m profile (2).



III 8 - FITTING THE UPPER (CUT) LUFF PROFILE ONTO THE SHEAVE BOX

III 8 a - Completely insert the striped aluminium bar of the sheave box (11) into the upper cut end of the luff profile (2).

III 8 b - Insert the bottom end of the luff profile (2) into the next lower connector/articulation (4).

III 8 c - Fit again the sheave box (11) onto/between both end brackets (6) and fit and fasten the 4 slides screws (7) to permanently secure this assembly.

III 8 d - Tighten the set screws (9) at the bottom end of the cut luff profile (2).

III 8 e - Follow the path for the mainsail halyard as shown on drawing 8.

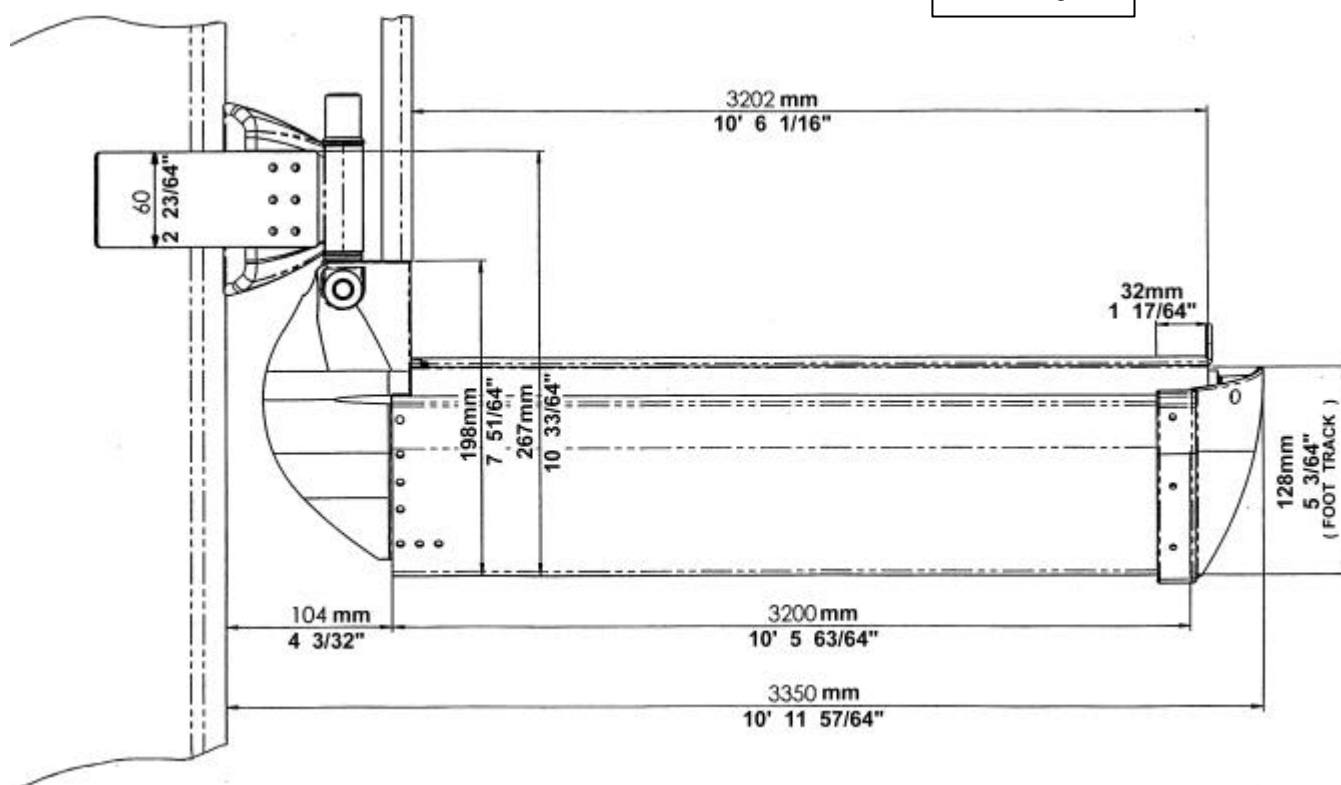
III 9 - CUTTING THE BOOM PROFILE AND THE MANDREL TO LENGTH

III 9 a -HOW TO CALCULATE THE LENGTH OF THE BOOM PROFILE.

- Case # 1: The PROFURL boom overall length should be the same as the one delivered.
- Case # 2: The PROFURL boom being delivered in over length, the opportunity may be taken to make the boom longer. *Caution : changing the boom length could affect the balance at the helm when sailing under sails.* In this case check that the aft end of the boom cannot touch the backstay or any other piece of equipment on board.

In both cases please refer to drawing 9 for dimensions.

Drawing 9



The PROFURL in-boom reefing system is delivered pre-assembled. The boom profile (15) and the mandrel (16) may have to be re-cut to length to match the boat's requirements when fitting the system.

CAUTION : should the complete length of the boom profile be used, the rear boom end fitting is just temporarily attached to the boom profile for shipping. Please follow the rear end boom fitting assembly procedure from § III 9 c 5 and on as if the boom profile had been recut.

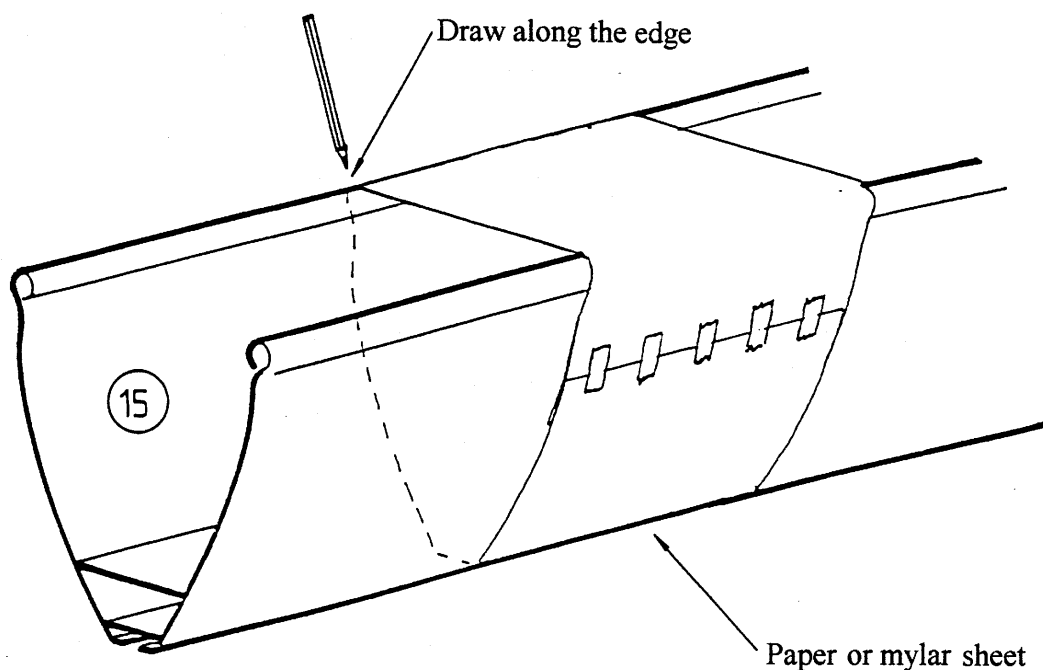
III 9 a 1 - To cut the boom profile (15) and the mandrel (16) to length, first dismantle the rear boom end fitting (23) from the boom profile and pull out the mandrel (16) from the boom profile.

Caution : during dismantling, the mandrel (16) will not be held any more. Please keep control about the mandrel potentially falling down when pulled backwards. Also mind not to lose the washers (20 & 20a) located forward of the drum (24) .

III 9 a 2 - To re-cut the boom profile (15) to length, and to make sure that the cut section is accurately perpendicular to the profile, wrap a sheet of paper or mylar (with accurate right angle corners) so that the edges are in perfect line, and attach it with adhesive tape. Please see drawing 10. Draw a line on the boom profile, following the edge of the sheet where the boom profile will be cut.

III 9 a 3 - Cut the boom profile according to the line and file smooth.

Drawing 10



III 9 b -CUTTING THE MANDREL TO LENGTH

The mandrel (16) should be re-cut of exactly the same length of the one having been cut off from the boom profile.

III 9 b 1 – Remove the bearing holder (19) + bearing (17) assembly from the rear end of the mandrel (16).

III 9 b 2 - Cut the mandrel (16) at its rear end with the same method as the one having been used for cutting the boom profile (15). Same as § III 9 a2. File the rear (cut) end of the mandrel and foot track ends smooth.

Caution : the forward (drum) end of the mandrel (16) must not be cut !

III 9 b 3 - Fit again the bearing (17) and bearing holder (19) into the cut/rear end of the mandrel. Tap at M6 (6mm) at 30 mm from the cut end. Fit and tighten the screw (29).

III 9 b 4 - In case the mandrel has been cut a little too short, the fore and aft play must be reduced to a minimum. To do this, loosen screw (29), push the mandrel forward, pull out the bearing holder (19) so that the washer (20) touches backwards, tighten again screw (29).

III 9 c - FITTING THE MANDREL ONTO THE BOOM

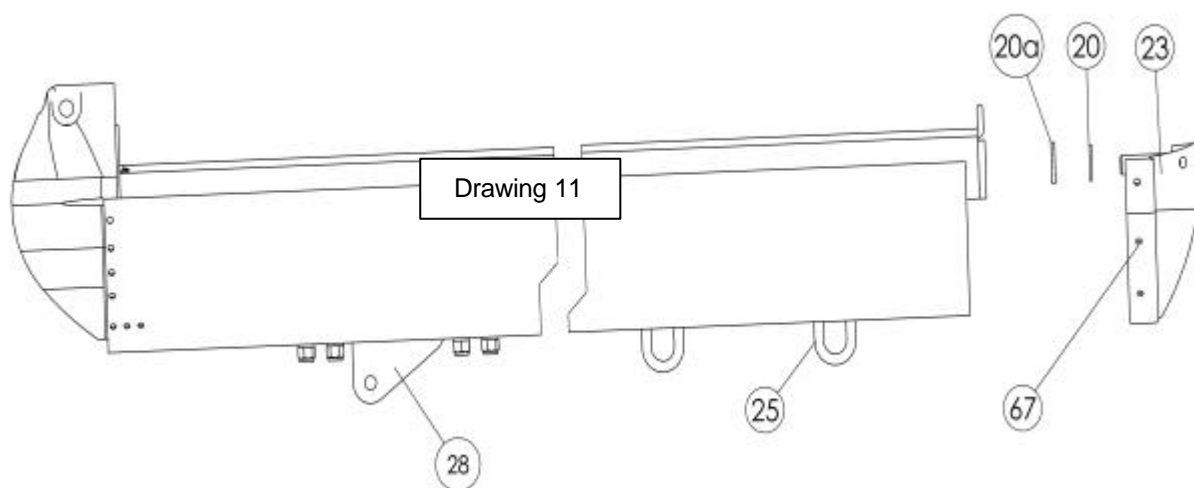
III 9 c 1 - Fit the mandrel (16) into the boom profile (15), fit the washer (20) and the drum bearing (18) onto the stainless steel pin (36) inserted in the drum boom end fitting (22).

III 9 c 2 - Check that the mainsheet bails (25) and boomvang hound (28) are properly fit in the bottom track of the boom as shown on drawing 12.

III 9 c 3 - Slide the bearing (17) located at the rear end of the mandrel (16) onto the stainless steel pin inserted in the rear boom end fitting (23).

III 9 c 4 - Completely insert the rear boom end fitting over the rear (cut) end of the boom profile (15). A *ratchet tie down strap* is a handy tool to do this.

III 9 c 5 - Drill holes \varnothing 5mm at the rear end of the boom profile (15) through the pre-drilled holes of the rear boom end fitting (23). Fit the corresponding pop rivets (37) supplied into these holes to permanently attach the boom end fitting onto the boom profile.



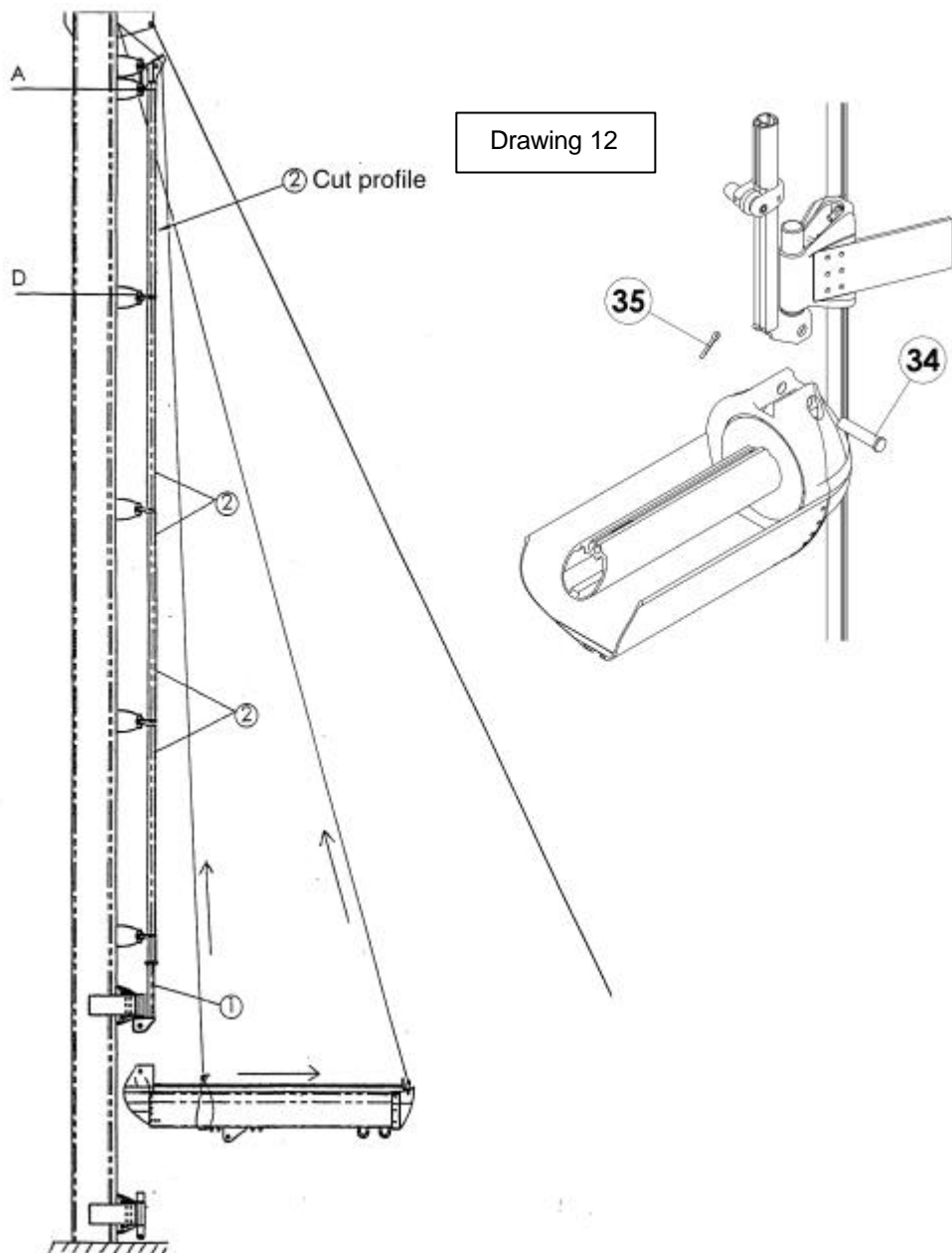
III 10 - FITTING THE BOOM ONTO THE GOOSENECK

III 10 a - Hoist the boom with a halyard and a topping lift (see drawing 12) by keeping it as horizontal as possible.

III 10 b – Fit horizontal pin (34) . Fit and open split pin (35)

Caution : do not drop or raise the boom more than 15° from horizontal position as it could cause permanent damage to the gooseneck.

From this stage and on the luff profiles and the boom must turn together.



III 11 - FITTING THE BOOMVANG HOUND AND THE BOOMVANG

Reminder: the ideal working angle of the boomvang being 45° the boomvang must not angle less than 30 ° with the mast or boom.

III 11 a - Fit the boomvang attachment (12) with the 2 slide screws which had been stored at the mast foot (please see § III 2 a A).

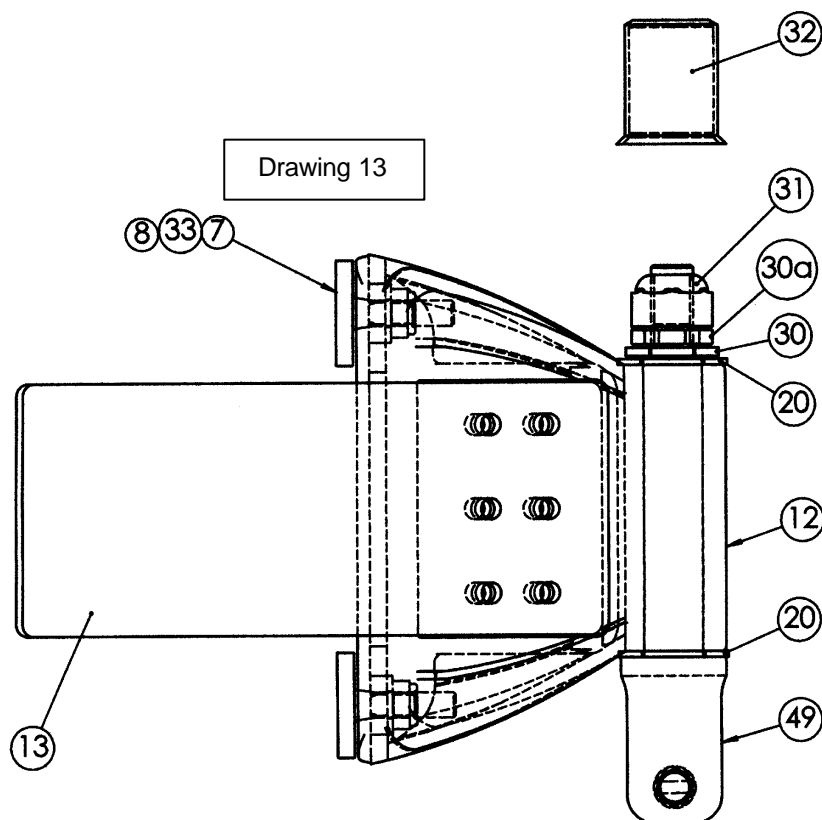
III 11 b - Bend the aluminium gooseneck sideplates (13) to the mast shape. During bending please protect the plates from dings and dents.

III 11 c - Would the sideplates be too long, they can be re-cut if necessary, keeping in mind too much length is always better than too little.

III 11 d - Draw lead lines for drilling on the side plates (13). Drill at Ø 5 mm and fit the pop rivets (14) on the side plates . There should have at least 8 pop rivets (14) on the mast on each side plate.

III 11 e – Fit washer 20 onto the articulation eye. Fit the articulation eye (49) with the eye preferably downwards onto the gooseneck attachment, fit in this order washers 20 (plastic) and (SS) 30, low nut 30a and Nylock 31 . Please see drawing 13. *Note - in some cases you maybe brought to fit the articulation eye (49) upside down: providing the boomvang angle to the boom is still more than 30°, it is a mechanically acceptable option.*

III 11 f - Fit the boomvang onto the articulation eye (49) and onto the boomvang hound (28). Fit the pins and the split pins.



III 12 - ADJUSTING THE POSITION OF THE MAINSHEET BAILS (25)

III 12 a - Adjust the position of the mainsheet bails (25) with the set screws which can be reached from underneath. Fasten the mainsheet blocks on the mainsheet bails.

CAUTION : on boats with a mainsail track or mainsail block attachment on deck ahead of the main hatch the mainsheet bails (25) must be re-positioned as far backward as possible.

III 12 b - Push the boom by hand over the lifelines as far as possible and tie a knot on the mainsheet so that in no case the boom profile can be damaged by the rearmost shrouds when running downwind or jibing.

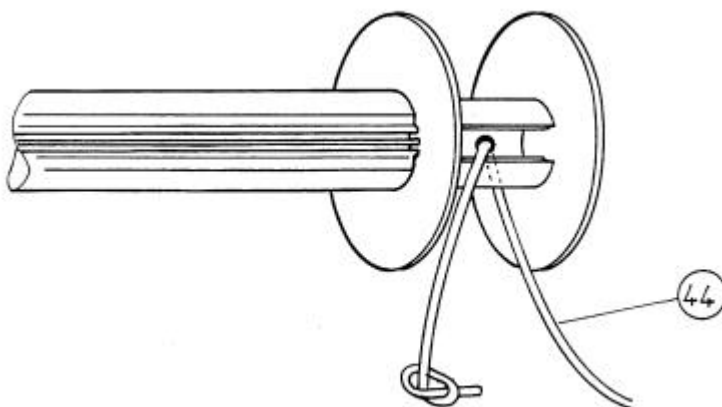
III 13 - INSTALLATION OF THE CONTROL LINES TO THE COCKPIT

REMINDER TO AVOID FRICTION

1. Only use good quality ball bearing blocks, which will have to be cleaned and lubricated from time to time as per manufacturer's specifications.
2. Use ball bearing blocks with a sheave of large diameter.
3. Reduce as much as possible the number of lead blocks between the drum and the cockpit.
4. Reduce as much as possible the angle of deviation of the control lines.

III 13 a - Attach on starboard a ball bearing block (not supplied) to the mast foot at the convenient position to lead the line into the middle of the drum at 90° angle .

III 13 b - Pass the furling line from underneath through the block, then through the hole of the drum's shaft and a tie small knot at its end so that the knot will be completely hidden inside the drum's shaft. Please see drawing 14.



III 13 c - To fill the drum with line turn the mandrel (16) by hand towards port side (seen from above) : the furling line should exit from the drum on the starboard side.

III 13 d - Fit another ball bearing block on the mast foot to lead the mainsail halyard to the cockpit. Remind to use the right type and dimensions of blocks.

III 13 e - Check that the exit from the mast of the mainsail halyard does not bring too much chafe.

IV - FITTING THE MAINSAIL

⇒ Please check again that the foot track rear end has been smooth filed before starting inserting the foot tape into the mandrel's foot track.

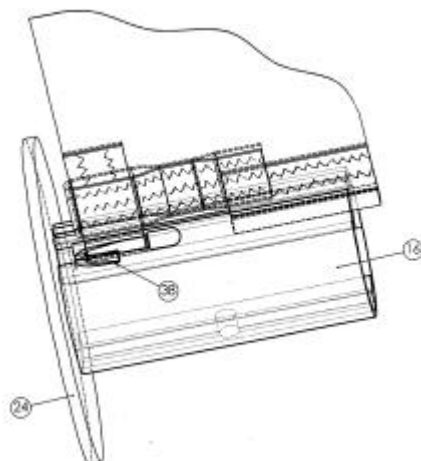
CAUTION : before operating the PROFURL in-boom reefing system please make sure that :

- 1) the mainsail construction and design are in accordance with the attached specifications. Please refer to attached mainsail design specifications.
- 2) the boomvang angle adjustment (see § VI) is correct. This adjustment is an essential point to get a good quality furling of the mainsail as well as ease of operation.

IV 1 - Turn the mandrel (16) by hand so that the foot track of mandrel is upwards.

IV 2 - Do not yet insert the mainsail battens into the batten pockets.

IV 3 - Insert the tack slide (38) with the "hook" to the front into the tack webbing of the sail. Insert together both webbing and tack slide into the port side foot track. Please see drawing 15.



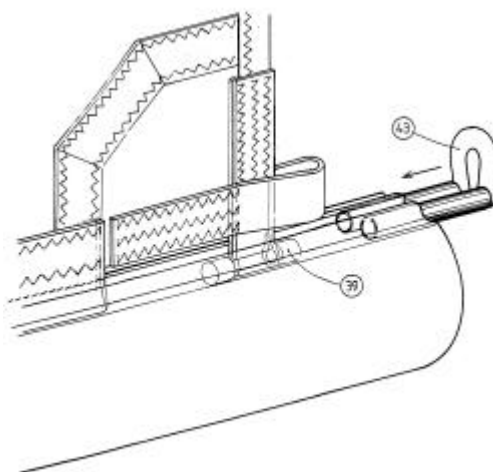
Drawing 15

IV 4 - Insert the bolt rope foot tape into the track and gently pull the sail forward.

IV 5 - Once almost at the end insert the clew slide (39) into the clew webbing so that the webbing is locked between the two small plastic cylinders of the clew slide (39), and insert the clew slide into the groove of the mandrel (16). Please see drawing 16.

IV 6 - Lock the "flat" part of the tack slide to port into the machining of the front end of the foot track and pull the sail backwards to lock.

IV 7 - Slide the « finger » of the clew pin (43) with the ring upwards into the foot track (16). Please see drawing 16.



Drawing 16

- IV 9** - Lash a line between the clew webbing and the ring of the clew pin (43) and adjust foot tension.
Check to tie or cut any loose extra length of lashing line.
- IV 10** - Insert the battens into the batten pockets.
- IV 12** - Attach the halyard onto the head of the mainsail.
- IV 13** - Unscrew by about 3 turns only the starboard side plastic knob (32) of the feeder (21) to increase the gap between the bronze rollers (36).
- IV 14** - Slide the « continuous » port side luff tape between the bronze rollers and hoist by hand only a few centimetres/inches of sail.

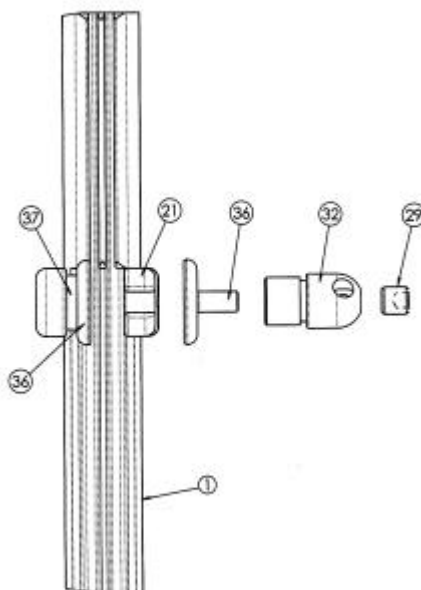
V - FEEDER ADJUSTMENT

The feeder has features allowing :

- * to very accurately trim the gap between the 2 bronze rollers (36) to exactly match the bolt rope diameter.*
- * to quickly increase the gap between the bronze rollers to easily insert the bolt rope/luff tape into the groove of the luff profiles after the sail has been furled or removed.*
- * to instant bring back the correct gap for feeding the sail into the groove of the luff profile to use the system .*

V 1 - ADJUSTMENT OF THE GAP BETWEEN THE ROLLERS (Please see drawing 17)

- V 1 a** - Screw by hand **but do not over tighten** the starboard side knob (32) of the feeder.
- V 1 b** - Adjust the starboard side screw (29) with an Allen wrench, till feeling that the luff tape is pinched. Then unscrew it back by about ¼ of turn to make the luff tape free to slide up and down. The adjustment is now correct.
- V 1 c** - Hoist the sail by gently pulling on the halyard.
- V 1 d** - To lower or furl the sail, gradually release the halyard while pulling on the furling line.



Drawing 17

V 2 - TO INSERT THE BOLT ROPE INTO THE FEEDER

- V 2 a** - Unscrew the starboard side plastic knob (32) by a few turns to increase the gap between the bronze rollers (36).
- V 2 b** - Insert the bolt rope/luff tape between the bronze rollers (36) and push it upwards into the luff track.
- V 2 c** - Completely tighten by hand **without over-tightening** the port side plastic knob (32).
- V 2 d** - The mainsail is now ready to be hoisted.

VI - ADJUSTMENT OF THE BOOMVANG ANGLE TO THE MAST

This essential procedure must be achieved either with no wind at all, or with extremely calm wind and the boat heading into the wind.

- VI 1** - Hoist the sail as previously described and tension your halyard quite hard.
- VI 2** - Completely loosen the nuts of the boomvang hound (28), and make sure the hound is totally free to move fore and aft in the lower track of the boom.
- VI 3** - Make sure the mainsheet is completely loose and let the boom hang in this position, just held by the mainsail.
- VI 4** - Tighten again the nuts of the boomvang hound (28) with the boom in this position.
- VI 5** - The sail can now be furled by gently releasing the halyard and pulling together on the furling line.

VI 6 - Fine tuning of the boomvang position adjustment may be necessary :

1. If the luff tape rolls too much backwards, adjust the boomvang hound (28) position so that the boom angles up a little more.
2. If the luff tape rolls too much forward, adjust the boomvang hound position so that the boom angles down a little more.

VII - USING THE PROFURL IN-BOOM REEFING SYSTEM

IMPORTANT WARNING : when gibing please keep constant control of the boom with the mainsheet.

You can also install a boom brake. If a boom brake is added release it each time before operating the system.

Rules of thumb :

1. Make the boat's angle with the wind corresponding to a broad reaching or closer to the wind.
2. Before using the system completely release the mainsheet so that the boomvang push effect brings back the angle between the boom and the mast to its « operating » position.
3. If the mainsail is not properly do not attempt to correct this immediately, but hoist the sail completely, check points as per § VI 6 and try again.

After a short period of time you will feel how much drag is to be given to the halyard to get the right tension to obtain a smooth furling of the sail.

During hoisting the sail a slight drag should be applied to the furling line in order to allow the furling line to be rolled tight enough in the drum : this will make next furling easier.

Should you wish to just a reef your sail, please carefully check that the head of the sail is just above a connector/articulation in order to prevent the luff profile to sag too much. Please stick insignia reefing marks on the luff of the sail which will be at feeder level to show when the head is at the convenient position.

When in **harbor**, or **sailing under power**, please **remove the halyard** from the head of the mainsail, **attach it** onto the rear end of the boom and **tension it**.

VIII - LIMITS FOR USING THE SYSTEM IN RELATION WITH APPARENT WIND

Some boats have spreaders at 90° from boat's axis, some other have spreaders angling backwards. Some other have aft shrouds.

In these last cases the sail will drag on the standing rigging earlier than with boats having spreaders at 90°. This means that the sailcloth will touch the standing rigging sooner or later depending on each boat. A smooth operation is obtained as long as the sail is not touching any shroud or spreader when the mainsheet is completely released. In other terms it is necessary to come into the wind to reef or furl the sail just as you would have done with conventional mainsail reefing.

However in case of emergency the sail can be rolled at larger angles to the wind till the stage when the friction on the standing rigging will make the system more and more difficult to operate. Friction would also obviously increase with the wind's speed. In this case a smooth furling can't be guaranteed

WARRANTY

1- The PROFURL in-boom reefing system is warranted for 3 years from date of purchase against parts and materials, provided the warranty card is returned within fifteen days from date of purchase. The warranty covers the original owner and is not transferable.

2 -The warranty is limited to the repair and replacement of defective parts only by an authorised PROFURL dealer and only after the written consent of PROFURL France or PROFURL USA .

3 - This warranty covers only the PROFURL parts and materials. Any accidental damages or expenses are not covered.

4 - This warranty is void if the system is modified or repaired without prior written notification to PROFURL France/USA.

5 - This warranty does not cover damages caused by systems which has not been properly installed.

6 - This warranty does not cover the malfunctioning of the system due to a sail having been made without strictly following the attached specifications.

7 - After installation the customer should check the following :

- the sail dimensions are accurately adapted to the system's dimensions.
- the sail has been designed and made according to the attached specifications.
- all screws are properly tightened.
- the fitting and adjustment procedures described in this manual are strictly followed.

✂-----

Please return this portion within 15 days of purchase to :

PROFURL
Z.I. des Marais
32 rue des Osiers
78310 - COIGNIERES
France

Owner's name :

Date of purchase :

Boat's type.....

Boat's length.....

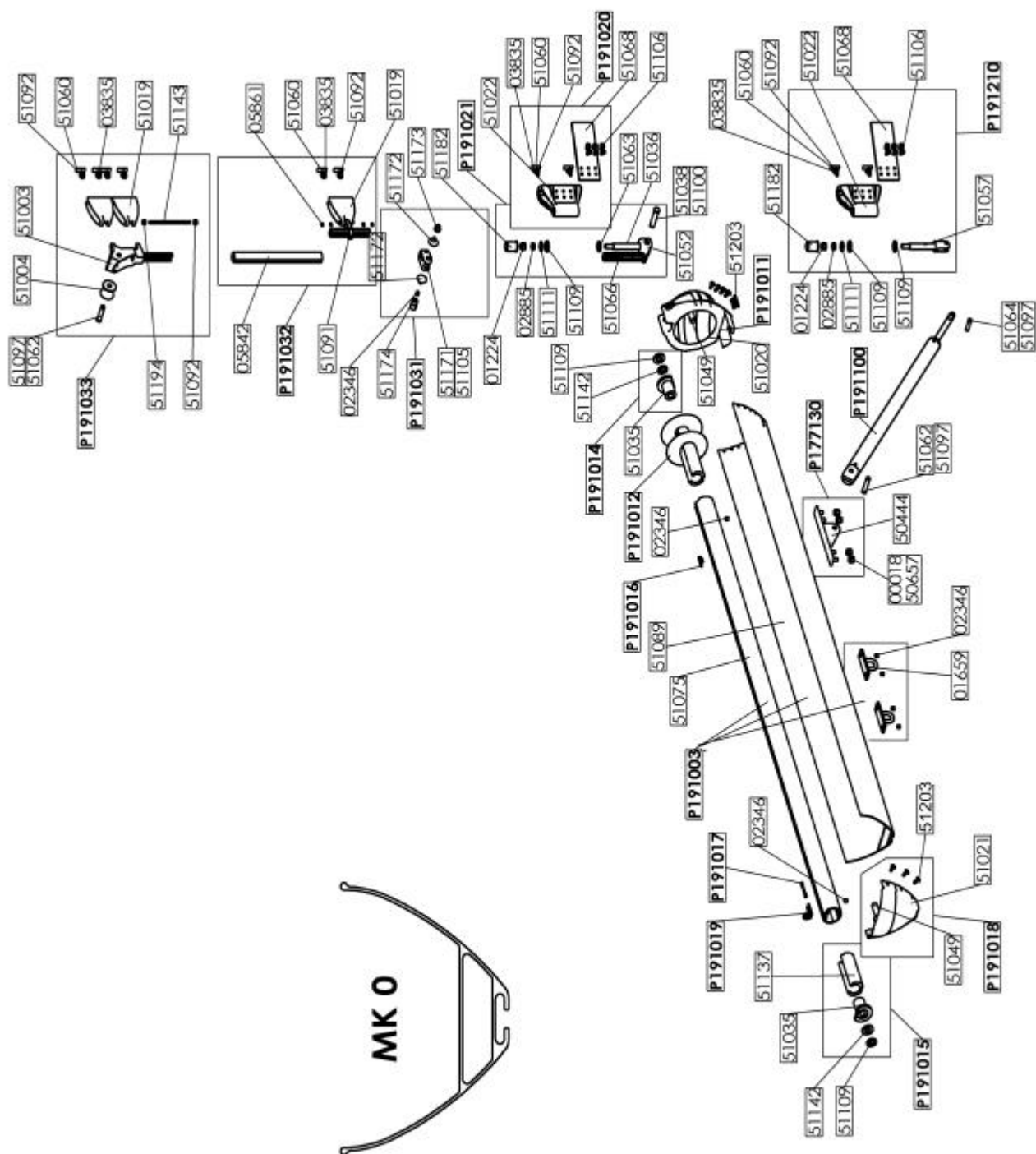
Boat's displacement.....

Mainsail's luff length.....

Mainsail's foot length.....

Installed by.....

Date.....Owner's signature :



MK0 SPARE PARTS LIST

MK 0

Ref	Designation	Rep
P177130	COMPLETE BOOMVANG HOUND	
00018	Locknut M8 A2	22
50444	Boomvang hound	28
50657	Washer LN 8	27
P191003	COMPLETE BOOM	
01659	Mainsheet bale	25
02346	Set screw STHc M8x8	29
51075	Mandrel	16
51089	Boom profile	15
P191011	COMPLETE DRUM BOOM END FITTING	
51020	Drum boom end fitting	22
51203	Pop rivets 5X14	67
P191012	DRUM ONLY MK0	24
P191014	DRUM BUSHING	
51142	14mm washer type Z A2	20a
51109	Washer Sk.26/15-003 1403 000 01	20
51035	Drum bushing	17
P191015	BOOM END BUSHING	
51142	14mm washer type Z A2	20a
51109	Washer Sk.26/15-003 1403 000 01	20
51137	Bearing holder	19
51035	Rear bushing	17
P191016	TACK SLIDE	38
P191017	CLEW SLIDE	39
P191018	COMPLETE REAR BOOM END FITTING	
51021	Rear boom end fitting	23
51203	Pop rivets 5X12	67
P191019	CLEW PIN	43
P191020	COMPLETE GOOSENECK	
03835	Washer MN6 A2	33
51022	Gooseneck only	12
51060	Slide screw	7
51068	Gooseneck sideplates	13
51092	Locknut M6 A2	8
51106	Pop rivets alu TR 6,4x15	14
P191021	COMPLETE GOOSENECK ARTICULATION	
51182	Locknut cap Kapsto	32
01224	Locknut M10	31
02885	Locknut Hm M10 A2	30a
51109	Washer Sk.26/15-003 1403 000 01	20
51036	Vertical gooseneck pin	64
51038	Horizontal gooseneck pin	34
51052	Gooseneck toggle	10
51063	SS washer 24-14,2mm	3
51066	Connector	82
51100	Split pin d=3mm	35
51111	10mm washer Mu A2	30

Ref	Designation	Rep
P191031	COMPLETE FEEDER PROFILE	
03835	Washer MN6 A2	33
05861	Set screw STHc M6x5	9
51019	Articulation bracket	5a
51060	Slide screw	7
51077	Feeder profile only	1
51092	Locknut M6	8
51171	Feeder housing	21
51172	Feeder roller	36
51173	Feeder spacer	37
51174	Feeder rollers adjustment screw	32
02346	Set screw STHc M8x8	29
51091	Complete articulation	4
51105	Pop rivets 4x10 alu	35
P191032	COMPLETE LUFF PROFILE	
03835	Washer MN6 A2	33
05842	Luff profile only	2
05861	Set screw STHC M6x5	9
51019	Articulation bracket	5
51060	Slide screw	7
51092	Locknut M6	8
51091	Complete articulation	4
P191033	COMPLETE SHEAVE BOX	
03835	Washer MN6 A2	33
51003	Sheave box only	11
51004	Sheave	52
51019	Articulation bracket	5a
51060	Slide screw	7
51062	Sheave pin	53
51092	Locknut M6	8
51097	Split pin d:2,5	6
51143	Threaded pin	18
51194	Blind nut	66
P191100	COMPLETE BOOMVANG	26
51097	Split pin d:2,5	6
51062	High pin	53
51064	Low pin	45
P191210	COMPLETE BOOM VANG ATTACHEMENT	
01224	Locknut M10	31
03835	Washer MN6 A2	33
02885	Locknut Hm M10	30a
51022	Gooseneck only	12
51057	Articulation fork	48
51060	Slide screw	7
51068	Gooseneck sideplates	13
51092	Locknut M6	8
51182	Locknut cap Kapsto	32
51106	Aluminium pop rivets 6,4x15	14
51109	Washer Sk.26/15-003 1403 000 01	20
51111	10mm washer Mu A2	30



IN-BOOM MAINSAIL REEFING-FURLING SYSTEM

MK 0

MAINSAIL DESIGN SPECIFICATIONS

1. GEOMETRY

a) Luff curve design:

The luff curve design is one of the most essential points in the design of the mainsail as it will determine how the sail will roll back and forth on the furling mandrel to avoid overlapping of the luff tape, avoiding also the rear end of the boom to go down when the sail is being rolled.

Starting with the mainsail fully hoisted :

Stage 1 : when beginning to roll the luff tape has to move backwards up to the stage where a small crease appears between the feeder and the clew.

Stage 2 : the luff tape has to move to forward till the stage where the luff tape gets close to the forward end of move backwards till the sail is completely furled.

b) Luff curve:

In reference with a straight line between the tack and the head, if the angle due to the luff curve is backwards the luff of the sail will roll backwards.

- Luff curve has to be "S" shaped from tack to head: negative in the lower part of the luff, positive in the upper part.
- Maximum value of the curve (from straight line between head and tack) in % : 0.2% of luff length. **If the mast has a camber just follow the same correction to luff curve as you would do with a conventional sail.**
- Point of maximum negative curve at 20% of luff length measured from the tack.
- Point of maximum positive curve at 60% of luff length measured from the tack.

c) Foot curve design.

Value : maximum 1% of foot length at 50% of foot length.

d) Roach:

Value: **maximum 6% of leech length** measured at 50% of leech length.

e) Angle between luff and foot (luff and foot being a straight line) : **88°**

2. LUFF TAPE MATERIAL

Luff tape material must be made with a plastic PVC material with 4,5mm diameter, and sailcloth tape with Teflon, to obtain a 5mm finished luff tape diameter.

3. FOOT TAPE DIAMETER

Finished 6mm

4. LUFF AND FOOT TAPE DIAMETER

- As with any reefing sail, the fullness of the mainsail is to be somewhat flatter than with a conventional sail.
- On the leech broadseams are as usual.
- On the luff broadseams are to be design to obtain the suitable sail profile in relation with the luff curve as described above.

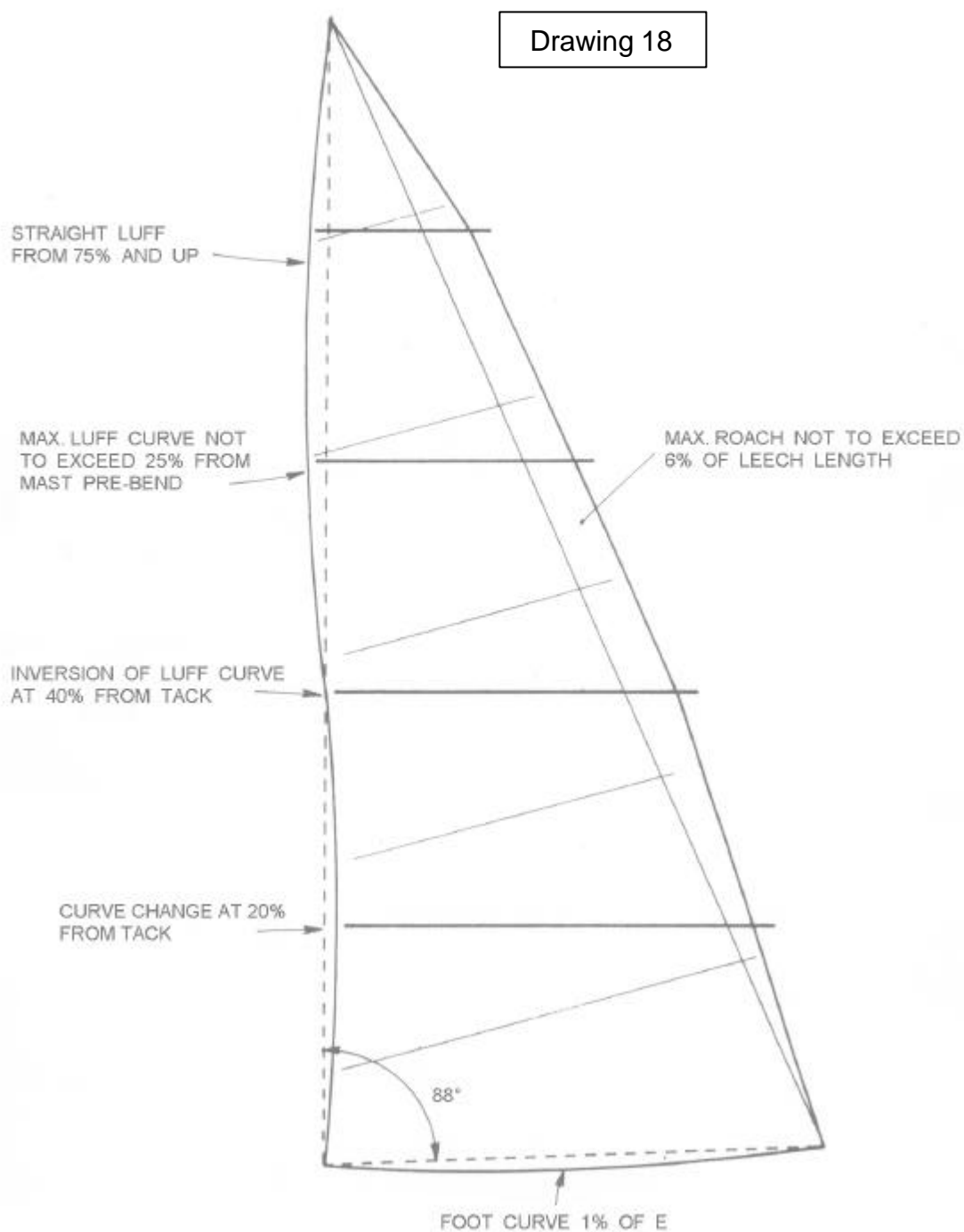
5. BATTENS

- 4 battens are to be used
- Mainsail will be semi-fully battened (please see drawing)
- Batten pockets must be sewn on the **port side of the sail**.
- Batten pockets nose should not go further than 35mm (1 5/16") from the front edge of the luff tape to allow for the luff tape to pass over the feeder (please see drawing).
- Flat battens should be used, at equal distance from each other (please see drawing).
- Angles between batten pockets and luff : please refer to drawing. Note : these angles refer to the straight line between head and tack.

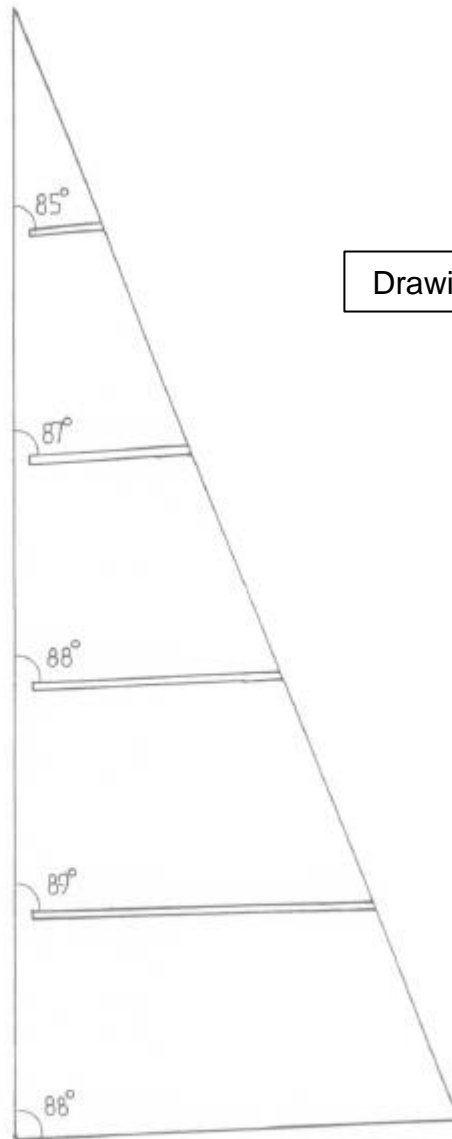
6 –CLEW TACK AND HEAD ASSEMBLY : Please see drawings.

No grommets should be used, but webbing straps only for attachments at the 3 corners of the sail.

4 BATTEN MAINSAIL
LUFF CURVE DESIGN



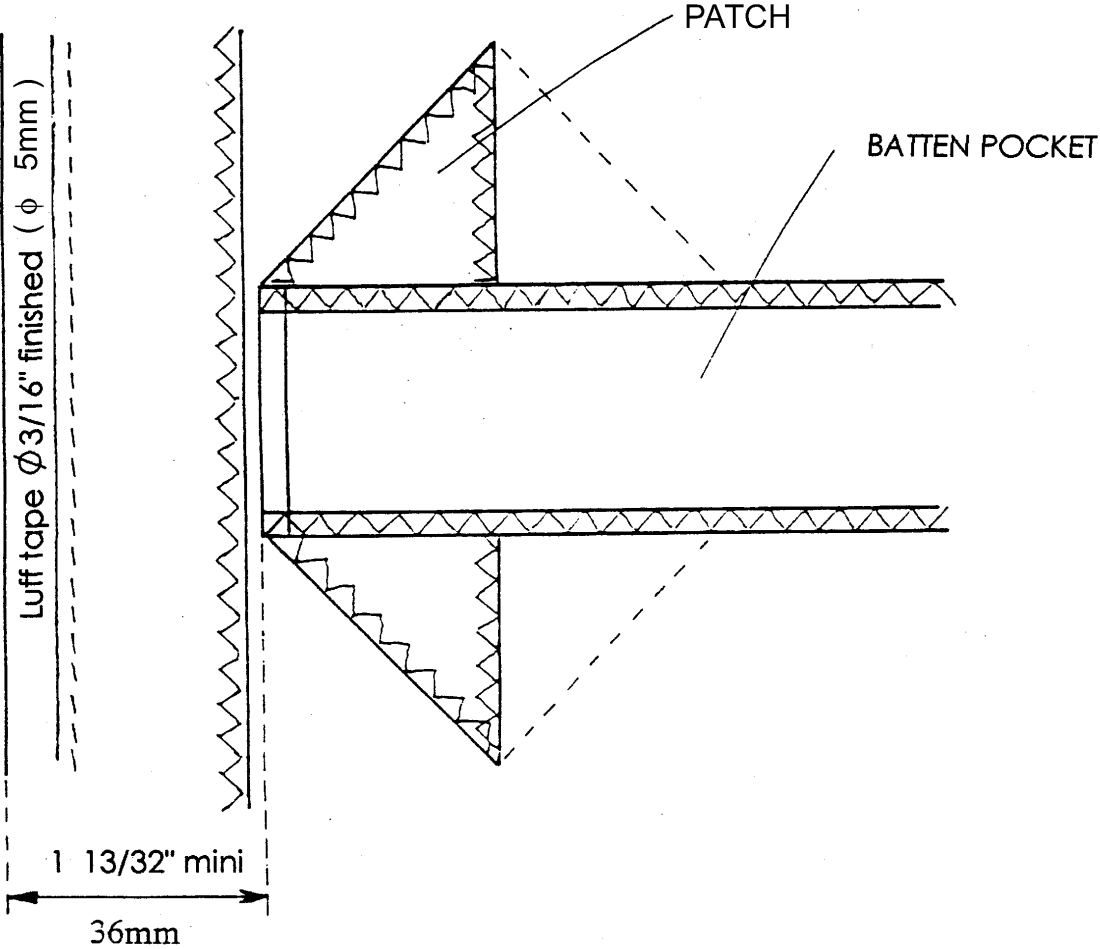
BATTENS ANGLE TO THE LUFF
CONSIDERED AS A STRAIGHT LINE



Drawing 19

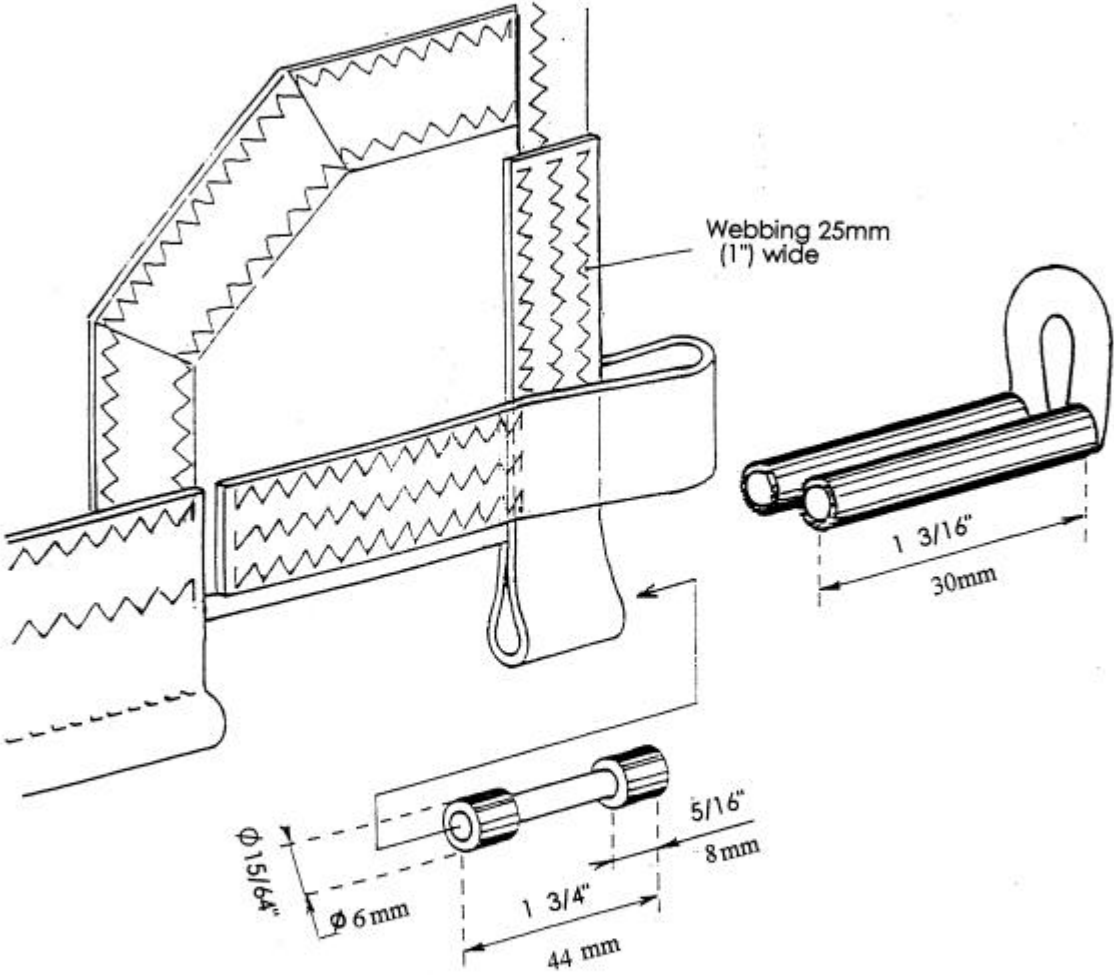
BATTEN POCKET
CONSTRUCTION

Drawing 20



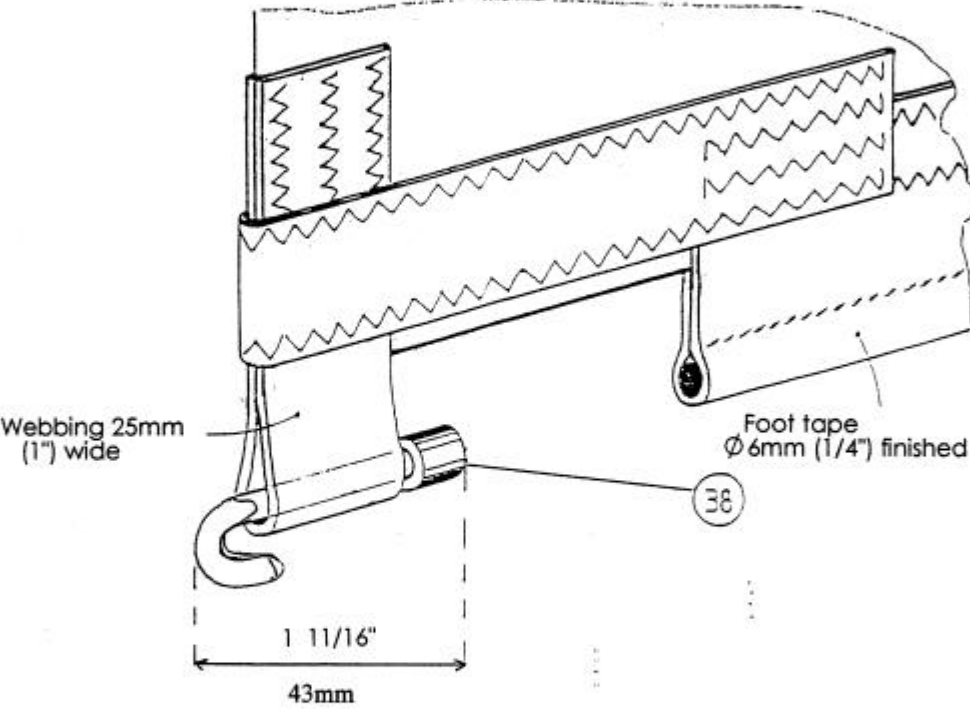
CLEW

Drawing 21



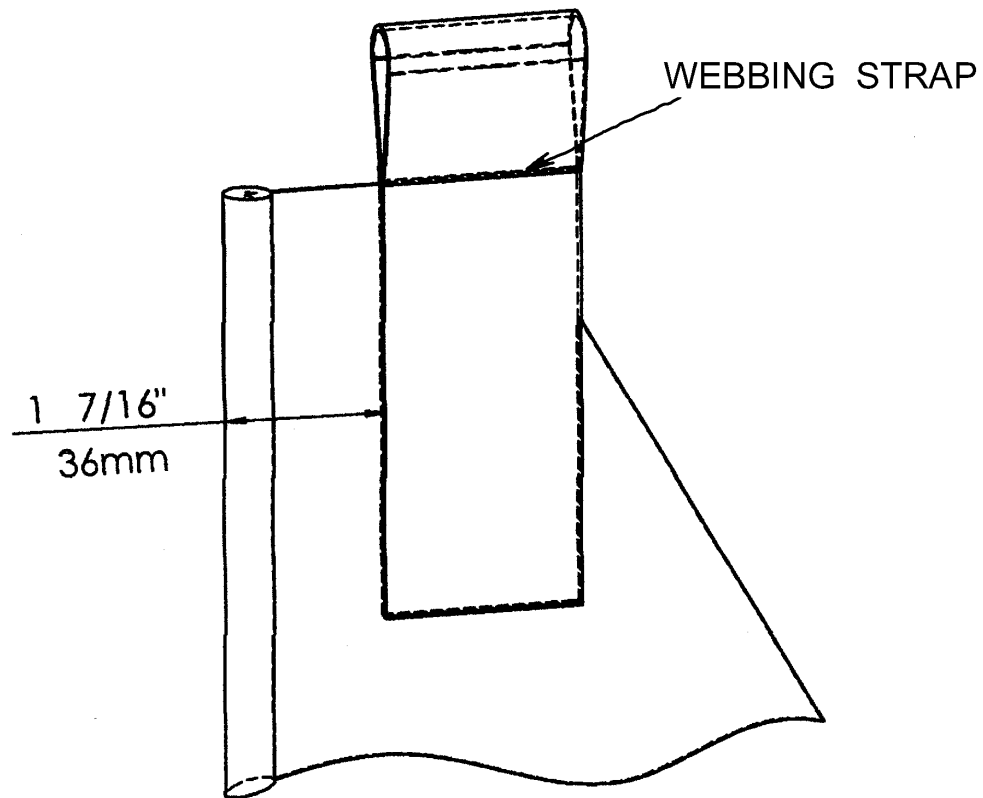
TACK

Drawing 22



HEAD
CONSTRUCTION

Drawing 23



CONDITIONS DE GARANTIE

Sans préjudice de la garantie légale, votre produit PROFURL est garanti 3 (trois) ans à partir de la date de sa mise en service, la facture d'achat au revendeur ou au constructeur faisant foi.

La garantie se limite au remplacement ou à la réparation en nos ateliers des pièces reconnues défectueuses.

La garantie disparaît immédiatement et complètement si le client modifie ou fait réparer sans l'accord de Wichard le matériel fourni. La réparation, la modification ou le remplacement des pièces pendant la période de garantie ne peuvent avoir pour effet de prolonger le délai de garantie du matériel.

La garantie ne couvre pas les dommages consécutifs à un mauvais montage, à une utilisation inappropriée ou abusive, à un accident ou à toute fortune de mer.

PROCEDURE A SUIVRE EN CAS D'APPEL EN GARANTIE

En cas d'impossibilité de faire constater par une personne compétente la nature des dommages, le client prendra contact directement avec WICHARD S.A. - France.

La ou les pièce(s) défectueuse(s) devra (devront) impérativement être retournée(s) pour inspection à WICHARD S.A.S (France), à WICHARD, Inc aux USA ou à WICHARD PACIFIC Pty Ltd, port aux frais du client, dans les 14 (quatorze) jours suivant le constat de l'avarie.

En cas de réexpédition du matériel depuis un pays tiers, les frais de dédouanement éventuels correspondant à l'entrée en France ou aux USA restent à la charge du client.

Au cas où le client exige une réexpédition des pièces avant réception des pièces défectueuses par WICHARD S.A.S (France), WICHARD Inc (USA) ou WICHARD PACIFIC Pty, celles-ci seront facturées et payables avant l'expédition, règlement par carte bancaire, transfert bancaire ou tout autre moyen. Si la responsabilité de WICHARD est reconnue, WICHARD remboursera le client dans les meilleurs délais.

LIMITED WARRANTY

Your PROFURL product is warranted for a period of 3 (three) year from the date of purchase against parts and materials.

This warranty is limited to the repair and replacement of defective parts by an authorized PROFURL dealer and only after the written consent of WICHARD S.A.S (France), WICHARD Inc, or WICHARD PACIFIC (addresses below).

The warranty is void if the system is modified or repaired prior written consent of WICHARD S.A.S (France), WICHARD Inc or WICHARD PACIFIC.

This warranty covers only the WICHARD parts and materials. Any accidental damage or expenses are not covered by the warranty.

This warranty does not cover damages caused by a system which was installed or used improperly, damaged by collision, or any act of God.

In the event of a warranty claim, WICHARD's liability is limited to the value of the system at the date of purchase. Packaging costs, shipment or custom charges are at customer's expense.

WHICH PROCEDURE SHOULD YOU FOLLOW IN CASE OF WARRANTY CLAIM?

- In case it is impossible for the owner to have the damage checked by a skilled person, the owner will contact WICHARD S.A.S (France), WICHARD, Inc (USA) or WICHARD PACIFIC Pty Ltd. Please see address below.*
- The defective part should be returned at owner's expenses to WICHARD S.A.S (France), WICHARD Inc or WICHARD PACIFIC Pty Ltd within 14 (fourteen) days after the damage occurred to the system.*
- In case the parts are shipped from a country outside France, USA or Australia, custom duties for return to WICHARD should be prepaid by the owner.*
- In case the owner will demand urgent replacement of part before the defective part is received by WICHARD, the replacement part will be charged to the owner, and paid before shipping (credit cards accepted). In case WICHARD's responsibility is finally acknowledged, WICHARD will refund the owner.*
- No replacement part purchased from a PROFURL dealer will be refunded to the owner.*
- In the normal warranty procedure, the parts will be returned to the owner, shipping and customs at owner's expenses.*

www.profurl.com

WICHARD France

Hotline / Support technique / SAV
33 rue de l'Etoile du matin
44600 Saint Nazaire,
France
Tel +33 (0)2 51 76 00 35
Fax +33 (0)2 40 01 40 43
Email : hotline@wichard.com

WICHARD, Inc

148a Bryce Blvd
Fairfax - VT05454
USA
Tel : +1 401 683 5055
Fax : +1 802 655 4689
Free toll number: + 1 800 852-7084
Email : info@wichard-usa.com

WICHARD PACIFIC Pty Ltd

Unit 13, 2 Bishop Street
St Peters NSW 2044,
Australia
Tel : + 61 2 9516 0677
Fax : + 61 2 9516 0688
Freecall from Australia: 1800 639 767
Email : info@wichard.com.au