

# **Ducati Sport Touring**

## **Dzus Fastener**

### **Installation Steps**

(Revision 1.0)

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By

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#### **1. Summary:**

This document describes how Mike wolf and I have installed Dzus 1/4 turn fasteners on our Ducati ST bikes (Wolfie's ST2S project bike and my ST4). Our installation is based on Mike West's installation in England. Mike West is one of Yahoo's ST Owners group members, who has installed Dzus 1/4 turn Fastener on his bike and has written a write-up regarding his installation and the parts that he has used. You can read about Mike's installation at:

[http://groups.yahoo.com/group/st2\\_owners/files/Dzus/st2\\_fairing\\_01b.htm](http://groups.yahoo.com/group/st2_owners/files/Dzus/st2_fairing_01b.htm)

Wolfie's and My installation are different from Mike West's where Mike has glued some of receptacles and we have riveted or used clip-on receptacles.

#### **2. Overview:**

Anyone who has ever worked on his or her Ducati ST bike, knows what a pain it is to remove the fairing. It is strange that to change the oil, the headlight fairing and the mirrors have to be removed (Ducati boys in Italy, I hope you are taking notes)!

On their Super bikes (748/9\*6/998), Ducati offers 1/4 turn quick release fasteners. I have those on my Ducati 748. The first time I had to remove the stock fasteners on my ST4, I knew that they had to go. I used Mike West's write-up as the basis for my conversion (thanks Mike). It was great to have Mike's write-up and parts list to look at. I understood what Mike had done. Since he had the fasteners on his bike already, I knew that the parts are going to work and I can at least duplicate Mike's setup. Mike has glued some of the receptacles to the frame and the Ram Air fairing. For some reason or another I did not want to

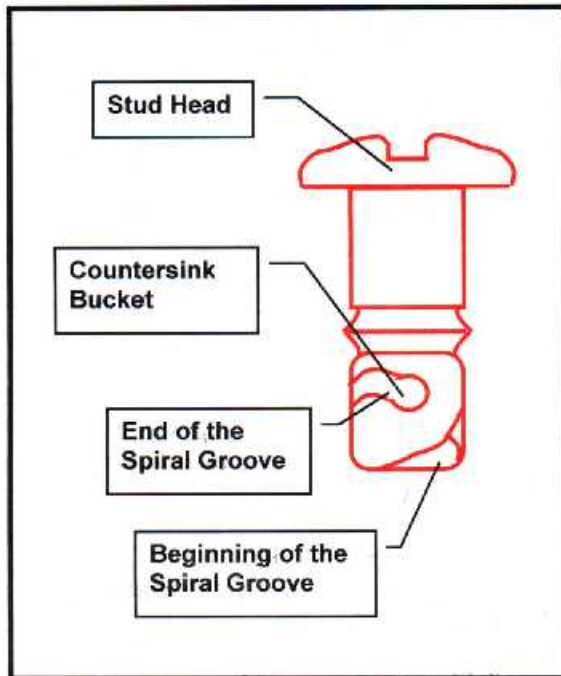
glue any receptacles. To be honest with you, I do not know why, I just didn't. Now that I have done the conversion, I am not sure which is better glueless or with glue (more on that later). I exchanged emails with Mike few times before I ordered any parts. Mike told me that he has installed his Dzus Fasteners 6000 miles ago. Since his installation only one of the fasteners that he has glued had come off. That remark by Mike made me want to do the conversion without the glue, even more. Using Mike West's parts list, I started doing a little research to figure out what was involved. Following is what happened next.

### **3. Some Background Information:**

#### **What is a "1/4 Turn" fastener?**

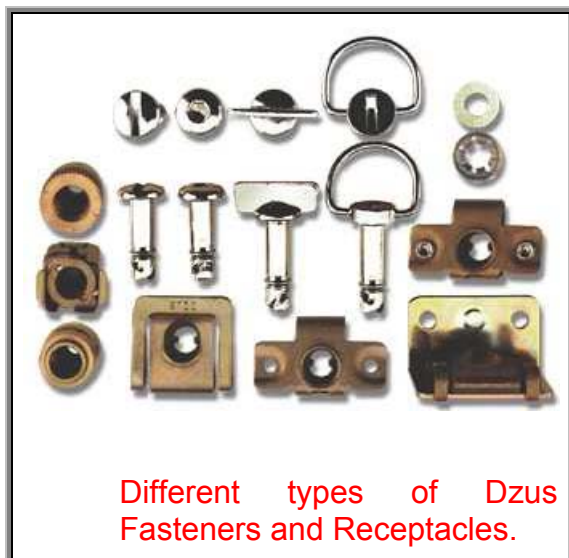
A 1/4 turn fastener is a fastener that only requires 1/4 of a turn (90 degrees) to go from fully unlocked position to fully locked position. It works on a principle of using a stud that has two 45-degree grooves on the outer perimeter of the stud. These grooves move in a spiral shape around the outside of the stud from the tip toward the head of the stud. The two spiral grooves toward the end of their travel, lose their slope and become perpendicular to the sides of the stud. At the end of each groove there is a slightly recessed half circle countersink bucket. Once the stud is inserted into a receptacle, two protrusions (pins) from the receptacle ride in the 45-degree grooves. After the pins move up the spiral grooves, they fall into the countersink buckets. It takes 90 degrees or 1/4 of a turn of the stud for the pins to travel along the grooves to reach the countersink buckets and lock, hence the name "1/4 Turn Fasteners".

Since at that the end of the their travel, the grooves are perpendicular to the sides of the stud and the countersinks are partially recessed, the pins on the receptacle act as a spring wanting to go back to where they were at rest. The pins cannot slide out unless a force is exerted to push them out of the pocket and back into the grooves.



Since the 1/4 turn of the stud goes from complete unlock position to lock position, the length of the stud is critical for proper fit and operation of the fastener. The thickness of the pieces that the stud goes through (holds together) plus the type of the receptacle that is used for the application determine the length of the stud.

Dzus (<http://www.dzus.co.uk>) offers a variety of 1/4 fasteners. Their Panex line is best suited for motorcycle fairing application. They offer their fasteners and receptacles in variety of shapes, sizes and finishes. Visiting their site, one can get a pretty good idea on the application of the fasteners. Additionally Dzus offers a simple way to calculate the proper stud length for each application.



Different types of Dzus Fasteners and Receptacles.

*Because of the different thickness mounting plates and fairing pieces, it is not possible to use a single size stud for the whole Ducati ST fastener conversion.*

## **What is wrong with the stock ST fairing and fasteners?**

I do not understand why Ducati has designed the ST fairing the way they have done it. The right side fairing and the front Ram Air fairing are attached to the plastic radiator reservoir. The reservoir is made of two injected molded plastic pieces that are either heat or sonic welded together. The dimensional tolerances of this operation are not great. Additionally I made multiple thickness measurements on different fairing pieces. There is a large variation in the thickness of the different fairing panels where the stock fasteners are mounted on the fairing.

The stock ST fasteners are typical screws and rubber wellnuts. On my bike where the rubber wellnuts are attached on the fairing, majority of the holes are fairly large. I guess large holes and rubber wellnuts can provide some give and therefore additional tolerance, if the fairing pieces do not go well together. A rubber wellnut is soft and fairly flexible. Once it is placed in a relatively larger hole, it can provide some X and Y mounting tolerance or give. Depending on much one turns the screw into the wellnut, there is also some Z dimensional give when putting the fairing pieces together.

In order to fully remove each screw one needs to turn the screw close to 15 full rotation of the screw. As you can imagine due to the number of stock fasteners used on the Ducati ST fairing, the removal of the fairing can take a significant amount of time. Additionally it is very easy to "over torque" the screws into the wellnuts during the tightening of the screws. If this happens, the nut strips from the rubber and starts rotating within the rubber piece. It would be almost impossible to remove the stripped wellnut from the fairing when that happens.

I love the shape, and look of the ST fairing. Once installed, the fairing does a great job in providing wind and noise protection. Somehow, when the designers gave the engineers the drawings, the fastening of the fairing to the bike was completely overlooked. More than likely some kid who had never worked on a bike was responsible for coming up with a solution of how to mount the fairing on the bike.

Since the rubber wellnuts can provide a lot of play and give, how the fairing panels come together is not critical and does not have to meet a tight tolerance (cheap but not elegant solution). But on the other hand, when I work on my bike, the last thing that I want to do is to spend 20 minutes or more to just remove fairing pieces so that I can get started.

Having experienced the 1/4 fasteners on my 748, I could not wait to replace the stock fasteners.

#### 4. Where to get Dzus fasteners?

I am not sure if Dzus is originally from United States or United Kingdom (U.K.)! I have a feeling that they are originally from U.K.

They are two Web Sites that represent Dzus:

UK site: <http://www.dzus.co.uk>

US site: <http://www.dzus.com>

The US site now refers to itself as "**DFCI Solutions Inc.**". When I started, DFCI was carrying the Panex line. Just visiting their site recently, they do not carry that line anymore. Anyway I tried contacting DFCI Solution and their distributors in California. I do not want to go through what I went through with them. To put it mildly, I was extremely disappointed on how they dealt with me, in particular with their sales and customer service or lack of. They never treated me as a customer. I was trying to get pricing information and how I could place an order. I always felt that I was a thorn on their side and they just wanted to get me out of their radar screen. They were giving me "200 part minimum" ordering clauses and 16 to 18 weeks delivery dates. After wasting more than three weeks with DFCI and their distributors (WESCO Aircraft) and not getting anywhere, I ended up contacting Dzus UK. Due to some US distribution right issues, Dzus UK could not sell the fasteners to me directly. But Dzus UK was great. After describing my situation with DFCI, they put me in contact with "Just Fasteners" in Scotland!

**David Kelly, Sales Manager**

[sales@justfasteners.co.uk](mailto:sales@justfasteners.co.uk)

**Just Fasteners**  
**Unit 4 Alpha Center**  
**Rothesay Dock**  
**Clydebank**  
**Glasgow**

**Scotland G81 1PD**

**Tel: 0044 141 941 0066**  
**Fax: 0044 141 941 0088**

Apparently "Just Fasteners" does not have the same distribution right issues as

Dzus UK does. David Kelly at Just Fasteners is an extremely nice guy. He not only tried to understand what my needs were; he also recommended some other options (different receptacles) to consider. I am so glad that I did. I will provide a parts list of what Wolfie and I ended up using later. I ended up purchasing multiple kits from David Kelly for Wolfie, myself and some other people in Northern California. This reduced the shipping cost per person. Our kits included the parts listed in Mike West's write-up plus a wider range of receptacles and special brackets. I decided that it was not going to break the bank having some different parts in the garage to fool around with. I am so glad that I did that. Now that Wolfie and I have done the conversion we will list exactly what we used for people who may want to duplicate either of the setups.

## 5. Parts

Since we were basically using Mike West's parts list, we ordered both 4mm and 6mm studs. Additionally Wolfie and I ordered some different receptacles to see if we can eliminate the gluing. I think it is important to note that different people will use different mounting options. It is not a bad idea for people to order few spare parts. Especially the receptacles which are fairly cheap. This will allow people to experiment with different setup options.

Here is a comparison of what our part lists looks like:

**Note:** This is an actual parts list and does not include any spare parts. If people are trying to use this list to order parts, I strongly recommend they order spare parts for every part.

|                                   |               | Quantity  |        |          |
|-----------------------------------|---------------|-----------|--------|----------|
| Dzus Description                  | Dzus Part No. | Mike West | Wolfie | Fariborz |
| Panex Fastener 4mm Ringhead short | 314-413-190   | 17        | 17     | 18       |
| Panex Fastener 4mm Ringhead long  | 314-419-190   | 5         | 5      | 4        |
| Panex Fastener 6mm Ringhead short | 316-415-190   | 2         | 2      | 4        |
| Panex Fastener 6mm Ringhead long  | 316-419-190   | 2         | 2      | 0        |
| Panex 4mm Retainer (washer)       | 324-100-040   | 40*       | 40*    | 40*      |
| Panex 6mm Retainer (washer)       | 326-100-040   | 10*       | 10*    | 10*      |
| Panex Receptacle 4mm clip-on      | 334-300-190   | 19        | 20     | 20       |

|                                     |             |   |   |   |
|-------------------------------------|-------------|---|---|---|
| Panex Receptacle 4mm (glued)        | 334-100-300 | 3 | 0 | 0 |
| Panex Receptacle 4mm (Rivet plate)  | 334-400-190 | 0 | 3 | 4 |
| Panex Receptacle 6mm clip-on        | 336-300-190 | 2 | 4 | 2 |
| Panex Receptacle 6mm (glued)        | 336-100-300 | 2 | 0 | 0 |
| Panex Receptacles 6mm (Rivet Plate) | 336-400-190 | 0 | 0 | 2 |

\* Order more of these nylon washers. They are \$0.03 each and extremely useful. I ordered 30 or 40 extras.

The 4mm Ringhead fasteners (long and short) are used to attach:

- 1) Upper and lower side fairing pieces to each other.
- 2) The side fairing pieces to the frame and radiator reservoir.
- 3) The side fairing pieces to the headlight fairing.
- 4) The side fairing pieces to the front Ram Air.

The 6mm Ringhead fasteners (long and short) are used to attach:

- 1) The left and right side fairing to each other under the bike.

Wolfie and I also purchased some 4mm L Bracket receptacles (Part number 334-310-190) with the anticipation that we eventually might be able to modify the upper side fairing panels to eliminate the need to remove the front headlight fairing to work on the bike. Our goal is to cut off some of the angle mounting plastic pieces (mounted to the reservoir on one side and the frame on the other side) and replace them with the L bracket. We will need to add two new holes to the headlight fairing and upper side fairing panels. This will eliminate the need to remove the headlight fairing to access the side fairing mounting studs (possible future project).

We also purchased some extra 6mm fasteners and different receptacles (336-100-300, 336-400-190, 336-300-190) to possibly modify the mirror mounts on our bikes to use the Dzus fasteners.

## 6. Installation

While the fairing are still on the bike, I recommend taping a scotch tape and attaching a piece of the tape on the fairing next to the existing screws but on the

panel that will hold the receptacles. Using a pencil mark exactly where the center location of each screw is on the mating panel. This will help to make sure that the receptacles are installed exactly where they should, when the fairing is perfectly mounted on the bike. I found out that on my bike the existing holes that hold the wellnuts are fairly large. Because of the "give" that the wellnuts provide, when the fairing is properly installed on the bike, the screws may not be perfectly centered in the holes. The scotch tape can be later removed from the fairing with no ill effect.

### ● **Wellnut Removal:**

The wellnuts on my bike were old and dry. If the wellnuts are old and have been on the bike for a while, or if they have been over tightened with a lot of torque, they may still be compressed after the screws are removed.



Front view of a wellnut.



Rear view of a wellnut when compressed.



To remove an old or compressed wellnut, I inserted a small Allen wrench from the backside until the head of the Allen wrench was inside the nut. I tilted the Allen wrench until the rubber was decompressed on one side, I then moved the Allen wrench around until the whole rubber piece was decompressed. In some cases I ended up squeezing the compressed side walls using my fingers. I peeled the front piece of the wellnut that was compressed against the other panel. Holding the wellnut from the backside, I then pulled the whole wellnut out of the hole.



Using an Allen wrench to decompress the wellnut from the backside.



Squeezing the wellnut to decompress the rubber and making it narrower and easier to hold.



Peeling off the front face of the wellnut from fairing where it was pressed to the surface.



Holding the rubber with two fingers and pulling from the rear to remove the wellnut.



Finally the wellnut is removed from the panel.

I was actually surprised on how many of the wellnuts on my bike were over torqued. Almost 60% of the wellnuts were showing signs of the actual "metal nut" separating from the rubber.

### ● **Attaching Side Panel Receptacles (Clip-ons and Rivet Plates)**

I first attached all the clip-on receptacles to the lower and upper side fairing panels. If you have used the scotch tape and pencil to mark the screw locations before removing the panels, it can become handy. You can always slide the clip-ons from side to side. But it will be best if you can get it right, the first time. The clip-ons are very tight and can damage the paint if they are moved around. I tried to reduce installation mistakes by taking my time for each clip-on. All the side fairing panels use the standard 4mm clip-ons. The upper right fairing has a strange angle cut close to the mounting hole to the Ram Air fairing piece. This angle causes a clip-on to not fit properly on this hole. Wolfie cut the fairing slightly to fit a clip-on at that spot. I used a rivet plate that I cut to fit. Following pictures show the side fairing panels in different stages of conversion.

*If you see an awesome looking yellow bike, it is Wolfie's Project STS bike. You have got to see this bike from close to **really** appreciate it. This is one of the nicest Ducati Sport Touring bikes I have ever seen. I want to thank Mike Wolf for taking these pictures and supplying them for use in this write-up.*



Marking the location of the center each screw on a Post-it or scotch tape. This picture was taken after the Dzus fastener was attached. It should have been done when the stock screws were on the fairing.



The center of the clip-on is lined up with the marking from the Post-it or the scotch tape.



How a Clip-on looks on the right side fairing.



Dzus fasteners connecting the upper and lower left side fairing panels.





Single Clip-on on the left frame mount.



Front view of a modified rivet plate on the upper right fairing under the Ram Air panel.

Single Clip-on on the Right frame mount.



Rear view of a modified rivet plate on the upper right fairing under the Ram Air panel.



Dzus fasteners and clip-ons on Wolfies upper left fairing.



Dzus fasteners and clip-ons on Wolfies upper right fairing.



Dzus fasteners Wolfies lower left fairing.



Dzus fasteners Wolfies lower right fairing.

### ● **Reservoir Mount (Right Side)**

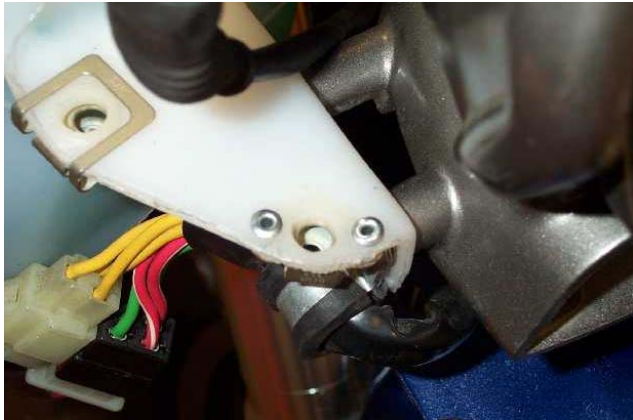
Mounting the upper right side-fairing panel to the radiator, Wolfie and Mike west used clip-on receptacle. On my bike, I used a Clip-on on back of the reservoir but I could not fit one to the front hole too well. I ended up adding a rivet plate. Using a bench grinder, I also machine the edges of the rivet plate to the contour of the reservoir. I think every one used the longer 4mm studs attaching the upper right fairing to the radiator reservoir. We also ended up using multiple nylon retainers (washers) to take up some of the slack.



Modified rivet plate to follow the contour of the front of the reservoir.



Extra holes drilled on the reservoir for mounting the rivet plate.



Rivet plate and clip-on mounted on the reservoir.



Two long Dzus fasteners connecting the front Ram Air and upper right fairing panels to the reservoir. Notice the three nylon washers to take some of the slack.



Side view of the two long Dzus fasteners connecting the front Ram Air and upper right fairing panels to the reservoir. Notice the three nylon washers to take some of the slack.

### ● **Frame Mount (Left Side)**

Attaching the Ram Air panel and the side-fairing to the bike on the left side there is a frame mounting plate. Mike West has glued one of the receptacles to this plate. Wolfie and I riveted ours to this plate. The shape of this plate is kind of strange. Clip-ons did not really work on this mounting plate. Even the rivet plates



needed to be modified. I cut my rivet plates and attached them by using only one rivet! I bent one side of my rivet plates exactly where the edge of the mounting plate was. Using the bench grinder, I then machined it bent piece until there was just a ledge holding the edge of the mounting plate (see pictures). Wanting more security and stability, Wolfie added some JB Weld to his rivet. It looks very sturdy. Comparing the three solutions, I have to say that Mike West's solutions for this area is the nicest looking. If I had to do it again, this will be an area that I may consider gluing.



After marking a rivet plate the side of the plate was bent to follow the contour of the frame mounting plate.



The bent piece was grounded using a bench grinder to provide a ledge for better mounting on the left frame mounting plate.



The modified rivet plate after it was riveted to the left frame mount. Notice the edge of the rivet plate holding the mounting plate.



Similar approach was taken for the rear rivet plate.



This is how the Ram Air and upper left-fairing panels are attached to the upper left frame mounting plate.



Wolfie's Setup (Using JB Weld). Notice how Wolfie is barely fitting the front rivet plate and how the rear rivet plate is better fastened using the JB Weld.

### ● *Air Ram Fairing*

In order to attach the clip-ons to the Ram Air panel, both Wolfie and I ended up grinding some of the fairing close to the front facing holes. This is another area that Mike West has used the glue receptacles. I like the clip-on better at this location versus the glue receptacles. I used a Dremel tool to grind a very small piece of the Ram Air panel close to the side fairing mount.



Top view of Ram Air panel modification. A section of the plastic was cut off using a Dremel tool to fit a clip-on on the front facing hole.



This is another view of the same section from back/side view. The white section is where some plastic was removed.





This is how a clip-on looks on the Ram Air. Mike West has used glue in this area. I recommend the clip-on. The holes on my bike were too large for securely gluing a receptacle!



This is how the Ram Air looks after it is attached to the frame mount. Wolfie and I came up with the same exact modification, independent of each other.



Clip-ons on Wolfie's bike.



Clip-ons on Wolfie's bike with same plastic cut-off section.

### ● Radiator V Cowl

This is an area where Mike West, Wolfie and I have used three different methods. Mike has glued his receptacles. Wolfie used clip-ons and I used the rivet plates. Comparing all three methods, I like Wolfie's approach the best. I think I will modify my Cowl to attach the Clip-ons.

The lower part of the Radiator Cowl, is not symmetric! Don't ask me why, because I do not know. I actually made some measurements with a caliper to prove to myself that I was not going crazy. Since I wanted to rivet my receptacles

and I also wanted the D-Ring of the fasteners to be at a special orientation after they were in the lock position, I assembled the fairing pieces on the bench to get the parts line up the way I wanted them. I then marked the outline of the rivet receptacles on the Radiator Cowl so that I knew exactly how to mount the rivet plates. This was a pain but I got it to work!

Since the Radiator Cowl mounting area is not symmetric and the holes are too far away from the edge, the clip-on receptacles cannot be mounted without some kind of modifications to the lower part of the cowl. Using a bench grinder and Dremel tool, Wolfie cut-off the extra material to use the clip-ons. I have to admit, I like Wolfie's method the best. I will not consider gluing receptacles in this area, it gets too dirty and the lower part of the cowl is partially curved.

The following pictures show my rivet mounting and Wolfie's clip-on approach.



This is to show that the two holes on the V Cowl on my bike were at different distance from the edge of the cowl. (Clip-on will not work without modifying the cowl piece)



This is the distance of the left hole from the edge. The holes were too far away from the edge for the clip-on to work.



I mounted the side fairing pieces and the Radiator V Cowl on the bench to



While the fastener were at the orientation shown in the picture on



figure out where exactly to drill the holes for the rivet plates. Note the orientation of the D-rings.

the left and while the fastener was holding the rivet plate, I marked the hole locations.



Another view.



Since I could not drill from one the inside (too close to the side of the cowl), I held one rivet plate by hand from the outside and visually aligned the mirror image of the plate for correct hole locations.



It is important to mark the drill locations using a punch; so that the drill bit does not walk on the plastic during the drilling.



This is how the rivet plate looks after it is riveted on the V Cowl.



This is the inside view of how the rivet plates look like after they are riveted on the V Cowl. Note how they are not parallel.



Top view of the Clip-ons on the connecting plate that is used for connecting the lower right and left panels under the bike.



Side view of the Clip-ons on the connecting plate that is used for connecting the lower right and left panels under the bike.



The inside view of how the lower two side- panels are fastened together. The front receptacles are rivet plates attached to the Radiator V Cowl, the rear receptacles are clip-ons attached to the connecting plate.



This is how the fasteners look under my bike after they are fully mounted. Note the direction of the D-rings. On Wolfie's bike they are side ways.



This is underneath Wolfie's bike. Because how Wolfie has mounted the clip-ons on the V Cowl and the connecting metal plate, the D-rings when locked are side ways on his bike.



To get the clip-ons on the V Cowl, Wolfie has removed some of the plastic using a bench grinder/Dremel tool.



This is another view of the V Cowl. Notice the alignment of the clip-ons to the holes.

### ● **Headlight Fairing**

There is nothing special about the headlight fairing. Everything goes together well! The only thing to remember is that the front facing fasteners are the longer ones and they require two or three washers.





This is the left side view of the headlight fairing on Wolfie's bike.



This is the right side view of the headlight fairing on Wolfie's bike.

## 7. What is next?

Wolfie and I are thinking about adding Dzus the Mirror mount. Wolfie is slightly ahead of me at this time. He has drilled the threaded holes on the base and has attached some receptacles using JB Weld.



Receptacles JB Welded into the mirror base. (Wolfie's bike)



Side view of the mirror base. (Wolfie's bike)



Another Side view of the mirror base.  
(Wolfie's bike)



6mm Dzus fasteners holding the mirror in  
place. (Wolfie's bike)



6mm Dzus fasteners holding the mirror in  
place. (Wolfie's bike)



Mirror mounted on the bike with Dzus  
fasteners. (Wolfie's bike)

I am adding a spacer between the mirror base and the fairing. I am attaching the mirror base to this spacer. The mirror base bolts will be counter bored into the spacer. I am attaching two receptacles to the spacer. These receptacles will be sitting inside the mirror body. I will be drilling two new holes to the mirror frame mounts through the fairing. I have partially completed the spacer but have not drilled the holes for the receptacles yet.



Mirror spacer. This side will be facing the mirror spring.



Mirror spacer. This side will be facing the fairing.



Mirror spacer mounted. The holding bolts are counter bored to be flush with the fairing panel.



Mirror spacer mounted side view. As you can see the holding bolts are not visible from the side.

Once Wolfie or I complete the mirror base conversion to Dzus, I will post a new revision of this document.