

TMS800 Bike Hauler – *Mods & Fixes*

by: *TwoManyXS1Bs*

There are several previous threads discussing various hitching, towing, trailering:

<http://www.xs650.com/threads/what-do-you-tow-your-bike-around-with.27752/>

<http://www.xs650.com/threads/trailering-questions.43990/>

<http://www.xs650.com/threads/has-anyone-used-a-tow-dolly-carrier-like-this.50114/>

So, I took the plunge and acquired a TMS800 motorcycle *lever-up* type tow hitch rated at 800lbs.



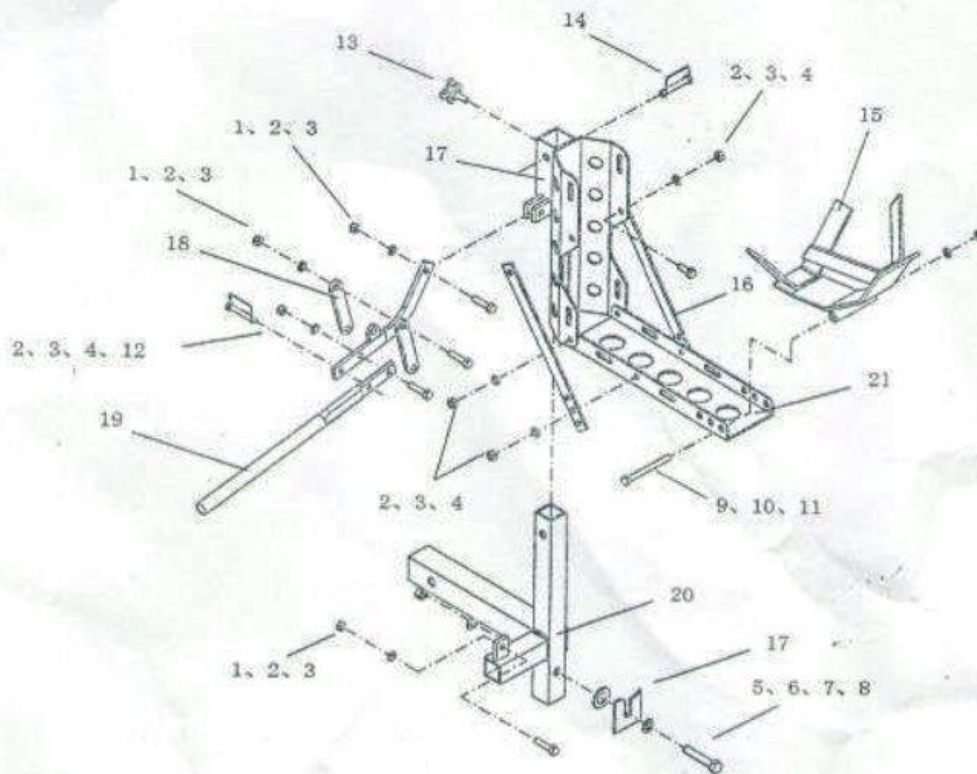
**Motorcycle 2" Receiver Trailer Hitch
Carrier Pull Behind Hauler Tow
Towing Rack**

Blowout Prices! Premium Quality!! Ships in 24
hours!!!

\$93.95

This thing gets mixed reviews, which I believe are largely from folks who can't figure out how to assemble it, since it comes without instructions, and the parts sheet is often missing. For anybody needing one, here is the parts sheet.

800LBS Motorcycle carrier TMS



PART	DESCRIPTION	QTY
1	Bolt M10 X 35	3
2	Washer $\varnothing 10$	10
3	Nut M10	10
4	Bolt M10 X 25	7
5	Bolt M14 X 70	1
6	Washer $\varnothing 14$	2
7	Big Washer $\varnothing 14$	1
8	Nut M14	1
9	Bolt M12 X 130	1
10	Washer $\varnothing 12$	1
11	Nut M12	1

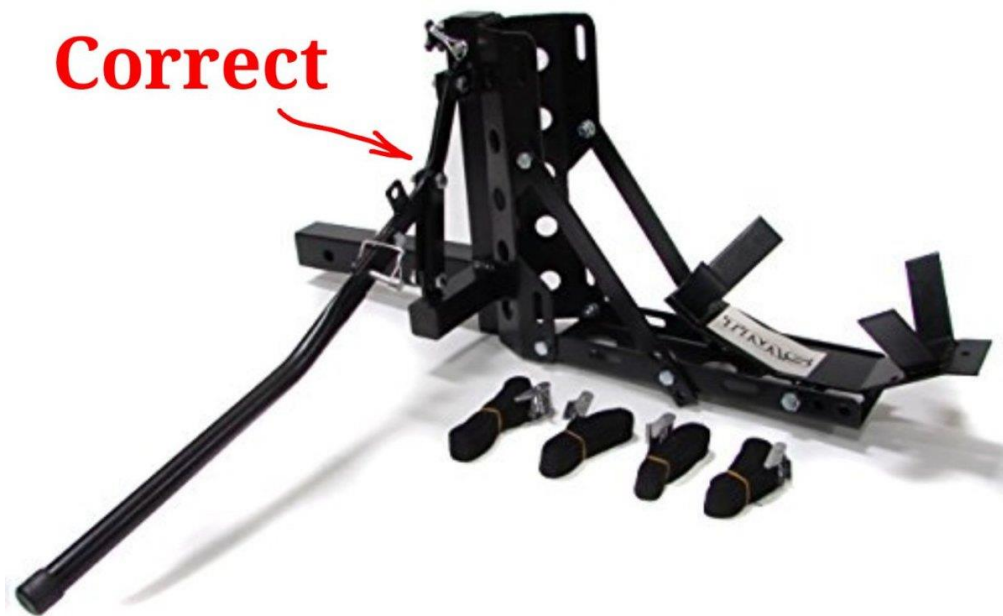
PART	DESCRIPTION	QTY
12	Small Pin	1
13	Bolt M10	1
14	$\varnothing 12$ Pin	1
15	Part 1	1
16	Part 2	1
17	Support 1	1
18	Plate	2
19	Handle	1
20	Support 2	1
21	Base 1	1

These things are priced anywhere from \$135 down to \$70. I think some outfits are dumping them cheap because of a perceived design or manufacturing issue. BUT – here is your chance to save some bucks. What I've seen out there is numerous professional marketing photos of the units assembled wrong, which would render them difficult or dangerous in use.

This photo shows the lever arm installed upside-down, using wrong pivot hole.



The unit won't work well, if at all, assembled that way. The proper lever arm assembly looks like this:



The little tab on the lever arm is meant to hold the lever handle upright in the transport configuration.



A safety hitch pin is used to position the lever handle in one of two positions, for levering the unit, or for the storage position.

The unit comes with (4) cam-lock straps, again without instructions.

The supplied straps are fairly weak, and I wouldn't recommend using them as tie-downs.

Some online photos show dangerous methods of strapping the front wheel to the tow hauler (see photo at right).



The bike should be attached to the tow vehicle itself by the tie-down straps for safety.

ASSEMBLY

When I first assembled and operated the unit, I noticed a lot of drag / friction in the mechanism. There are a lot of sharp corners and rough surfaces on the square pipe slider. To fix these issues, I filed the inner surfaces flat/smooth, chamfer the top and bottom inner edges.



The lever mechanism uses M10 bolts as pivots, and they are quite sloppy. Yeah, this works, but I don't like having bolt threads as bearing surfaces. So, my fussiness dictated a change to stronger 7/16" shoulder bolts. The holes are 7/16", or just a hair under. You just need to skim a 7/16" drill bit through them if need be.

These pivot bolts use locking nuts. On assembly, you run them down until they just start to tighten, then back off 1/4 to 1/2 turn to allow the mechanism to pivot.

I think that some folks just fully tightened them, and then wondered why things didn't move very well.

I also don't like hitch attachments that hang way out there.

So, I drilled new 5/8" hitch pin holes 3" from the original holes to position the assembly closer to my vehicle bumper.



The pivoting front tire entry ramp is a sloppy fit. I figured that this could allow the front wheel to shift during the first part of bike loading and lifting, before the diagonal tie-downs are attached.

Obviously, I'd rather the bike stay perfectly upright during this loading procedure.

So, I changed the supplied M12 bolt to a better-fitting 1/2" bolt, and added washers as shims to reduce the side-play in the assembly.



Edit: All the pictures that I have seen of this device show the longer end of the rocking entry ramp (with the 1/4" hole) positioned to the outside. With this entry ramp installed backwards, that 1/4" hole lines up with a hole in the base tray.

I chose to mount mine with the longer end to the inside, and have plans for using that 1/4" hole for mounting an anti-rocking lock mechanism which will make the whole thing a lot steadier and easier for one-person operation.

The supplied lever handle is a 1" dia. pipe. To increase leverage and make it easier to lift my bike, I made a 4.5" extension from phenolic, press-fitted it into the handle pipe, and repurposed an old throttle grip. Also, I changed out the M10 pivot bolt to a stronger 7/16" bolt.



I assembled the unit to see how it works. To ease operation, I applied a thin smear of grease on all of the sliding and pivoting surfaces.

I fitted it up to the 2" receiver and checked fit of the hitch pin.

Here is the unit in the lowered position with the lift handle in the active position (*sorry about the really bad lighting, but I was racing the clock*).



To raise the unit, just lever the handle down and the slider tray comes up – then insert the top safety pin.



To put the handle into the “UP” position, just uncouple the handle's safety pin, swing it up to the travel position and reinsert the safety pin into the hole in the little tab.

The total wheel tray vertical travel is 7.5".
Some web pics show it as less.



The front channel width is 5" and my front tire is 3.5" wide.

A pair of 3/4" x 3.5" x 16" long oak planks should close up that gap and keep the front wheel centered.

I chamfered the entry edges, installed a couple of 3/8" T-nuts and painted them black to seal them and match the black *bike hauler* mechanism.



Here are the oak planks bolted to the inside of the front channel.



So, let's give it a try. Here is the Green Slug (EDIT: *actually, it is a beautiful 1971 Yamaha XS1B 650*) ready for loading with the tow unit in the lowered loading position.



You just roll the bike onto and over the rocking entry ramp and the front tire just slides into the front channel and is sandwiched between those (2) 3/4" oak planks.



Amazing, the bike stays upright and strongly resists attempts to lean it to one side or the other.

Now, just lever it up and insert the top safety pin to secure the bike in the travel position.



Amazing - the bike stays vertical and still resists any attempt to lean it over. The effort to lever it up to the travel position is quite reasonable. In fact, as the unit reaches the top of its travel, the lever ratio of the mechanism approaches infinity which means that the effort to "hold" it in the raised position is near zero (easily held with one hand) and so the other hand is free to insert the locking pin.

The ground clearance is about 8". This is a very stable setup for the solo user. No need for extra hands to keep things from falling over.

Now swing the handle up to the travel position. I like to use quality old-school cam buckle tie-downs.



A proper tie-down is triangulated off to the sides, keeping the strap as parallel to the forks as possible. The tie-down strap is tightened while pulling one side of the handlebar down, compressing the forks a

bit. Alternate the tightening process on left and right side, the goal is to get the forks at least halfway compressed with the bike vertical.

Quick to load and unload, very stable and easy for one person to use. Weighs about 30lbs.

My inspector signed it off (*phew!*).



OIL LEVEL & DRIVE CHAIN CONCERNS

I wanted to address the issues of leaving the drive chain connected, and possible shift lever movement engaging a gear while the rear wheel of the bike is spinning during travel.

When mounted on the hauler, the bike is angled upward about 10°. The oil level in the transmission came up about 1.5".

It is hard to see, it's where the pencil is pointing at the dipstick.

This rear tranny cutaway shows where this new, higher oil level would be. (NOTE: green line in the photo below).



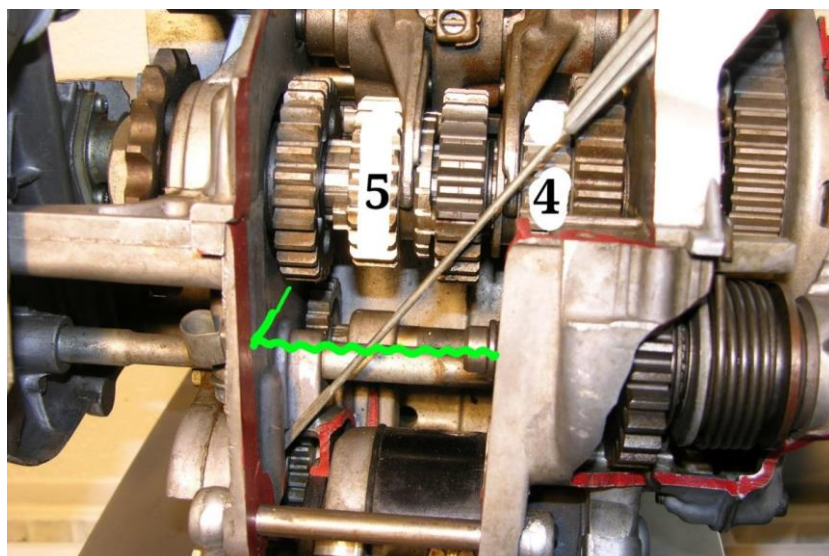
During transport, the sprocket and the output shaft will be spinning. The only gears that will spin with the output shaft are the splined 4th and 5th. All other gears, and the main shaft, won't turn.

In a static scenario, the oil level won't reach the 4th and 5th gears. During transport, with sufficient jostling and hill climbing, the oil may splash about enough to keep things lubricated.

(EDIT: *I suggest adding ½ quart of oil and then drawing it back out with a big syringe - before starting the bike.)*

My shifter's neutral detent has sufficient retaining force to prevent the shifter from jumping out of neutral.

I don't see shift lever jostling to be an issue, otherwise we would've heard about it by now, what with all the off-road activity done over the years. This was a problem however, but it occurred on the super-long, redesigned, swapped right-to-left shifters of the '70s H-D AMF Sportsters...



--- End of report ---