

Thank you for purchasing the Problem Solvers Cable Doubler. This versatile product allows one cable-actuated brake lever to operate two brakes simultaneously. Potential applications include recumbents, tandems, touring bikes, time-trial bicycles and special setups for the physically challenged. Please determine which version of the installation you will be performing and verify that you have purchased the correct version of the Cable Doubler.

Note: In addition to the Cable Doubler you will need to purchase brake cables and housing that are appropriate to your installation.

Note: Adjusting barrels are very convenient for properly installing the Cable Doubler. If you don't have any, consider adding in-line adjusters at any convenient place in the lower cable housings.

WARNING: Read these instructions completely before beginning installation of this product. If you lack the knowledge or tools to perform installation, please have your local professional bicycle mechanic perform the installation. Improper installation can result in loss of control or damage to the bicycle and/or serious injury or death to the rider.

WARNING: Different length cables stretch at different rates. Frequent re-adjustment during initial stretching periods is critical to maintaining proper balance between the two levers. Failure to maintain lever synchronization can mean one brake lever works properly while the other delays before actuating the brake. Check frequently before riding and always adjust any lever free-play.

WARNING: Check the brake system frequently. If there is significant free-play in your brake lever, this indicates that the slider may have bottomed-out on the double housing stop, or that the upper brake cable may be slipping out of the slider. Either condition could result in loss of braking. Inspect the system and correct as necessary.

PARTS:

- One (1) upper housing piece (required)
- One (1) slider (Included)
- One (1) single housing stop (included)
- One (1) double housing stop (included)
- One (1) slider set screw (included)
- One (1) outer tube (included)
- Two (2) over housing pieces (required)
- Two (2) Additional road-style brake cables (required)
- In-line adjusters (optional)

REQUIRED TOOLS

- FOR INSTALLATION**
- One (1) cable & housing cutter
 - One (1) 2mm hex key
 - Zip ties (optional)
 - Light grease or lubricant (optional)

CABLE DOUBLER INSTALLATION: ONE BRAKE LEVER OPERATING TWO BRAKES

This setup is ideal for city bikes, tandems, touring bikes, and most any bicycle with more than two brakes, and for users who are not physically able to squeeze more than one brake lever.

Note: Because one hand operates two brakes, increased effort is required to actuate them. For best results, ensure the bicycle's braking system (cables, housings, pads, etc) is in proper working order per manufacturer's instructions, and does not have excessive friction.

ASSUMPTIONS:

- The bicycle has cable-operated brakes: calipers, cantilevers, V-brakes, drums or disks.
- The brake lever pulls the amount of brake cable required (both brakes do not need to be identical but they must require the same amount of cable pull to operate).
- Cables are standard road- or mountain-type 1.5 or 1.6mm diameter cables.

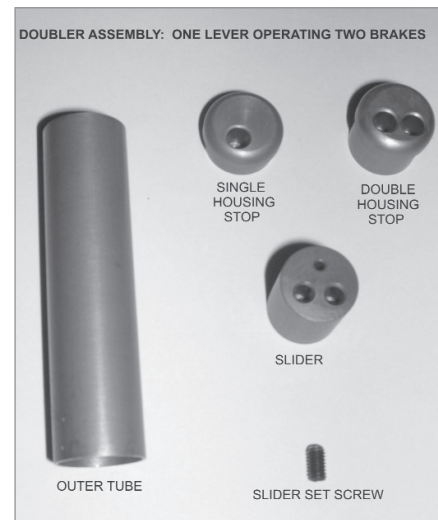


Figure 1

INSTALLATION

1. Determine the type of brake cable the lever requires, road- or mountain-style. Use one of the selected cables and two additional road-style brake cables for this installation, as well as bulk-lined brake cable housing of the appropriate length.
2. Determine a suitable location for the Cable Doubler. Any place that provides rattle-free operation for the Cable Doubler and a smooth, kink-free path of entry and exit for housings is acceptable.

Note: One cable goes from the brake lever into the top of the Cable Doubler, and two cables exits out of the bottom of the Cable Doubler to the brakes. **Note:** The Cable Doubler can be immobilized by mounting it to a frame tube. This is not necessary but may prove to be helpful for your setup.
3. Cut the upper housing piece to the appropriate length and deburr the ends.
4. Install a brake cable in the brake lever (the upper cable), slide the upper housing piece over the cable, and then slide the single housing stop over the cable. Note: Make certain the housing is fully seated in the brake lever and housing stop, and that any adjusting barrels on the lever are set to the desired location.
5. Prepare the slider for installation by installing the two road-style brake cables (the "lower cables") into the slider (fig. 2). Be sure the cable ends fit all the way down into the slider counterbores. A snug fit is desirable, but do not force it. Note: Sometimes there is flashing on the cable ends that needs to be filed off for this to be completed.
6. Install the slider over the upper cable and move it up until there is approximately 30mm between the top of the slider and the bottom of the single housing stop (fig. 3). Firmly tighten the slider set screw with a 2mm hex key, and cut off all the upper cable protruding from the bottom of the slider. Do not leave more than 3mm protruding, and do not use a cable crimp.
7. (Optional) Apply a small amount of a very lightweight grease or lubricant inside the outer tube.
8. Slide the outer tube over the two lower cables and slider until it is seated onto the single housing stop. Rotate the outer tube so that the alignment arrows on the tube and the housing stop point at each other.
9. Slide the double housing stop onto the outer tube by sliding over the lower cables and seat. Be sure that the cables come straight from the slider, through the tube, and out of the housing stop without any tangling or twisting. If done properly, it should be easy to align the arrows on the double housing stop with those on the outer tube. The completed Cable Doubler assembly should look like fig. 4.
10. Cut to length, deburr and install the lower cable housings on the lower cables. Attach lower cables to brakes, trim cables, install crimps, and adjust per the brake manufacturer's instructions. If you planned to affix the Cable Doubler to a frame tube, do so now.
11. After installation, squeeze the lever several times to check for problems and to stretch and seat the cables and housings. Synchronize the two brakes by letting more cable in or out of the individual brakes manually or with adjusting barrels. Do so until the desired lever travel is reached and the brakes hit the rims at the same time. Failure to do this accurately can result in unbalanced braking and loss of handling.

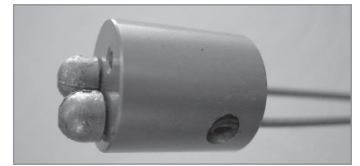


Figure 2

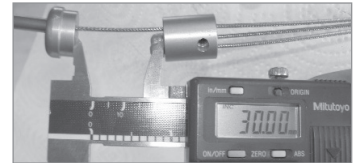


Figure 3



Figure 4

LIMITED 2-YEAR WARRANTY

This Problem Solvers product is warranted against defects in materials and workmanship for two (2) years, from the original date of retail purchase by the consumer, subject to the limitations detailed below. This limited warranty is expressly limited to the repair or replacement of the original product, at the option of Problem Solvers, and is the sole remedy of the warranty. This limited warranty applies only to the original purchaser of the Problem Solvers product and is not transferable. In no event shall Problem Solvers be liable for any loss, inconvenience or damage, whether direct, incidental or consequential or otherwise resulting from breach of any express or implied warranty or condition, of merchantability, fitness for a particular purpose, or otherwise with respect to this product except as set forth herein.

This warranty does not cover the following:

- Damage due to improper assembly or follow-up maintenance or lack of skill, competence or experience of the user.
- Products that have been modified, neglected, used in competition or for commercial purposes, misused or abused, involved in accidents or anything other than normal use
- Damage or deterioration to the surface finish, aesthetics or appearance of the product
- Normal wear and tear
- Labor required to remove and/or refit and re-adjust the product within the bicycle assembly

This warranty gives the consumer specific legal rights, and those rights and other rights may vary from state to state.