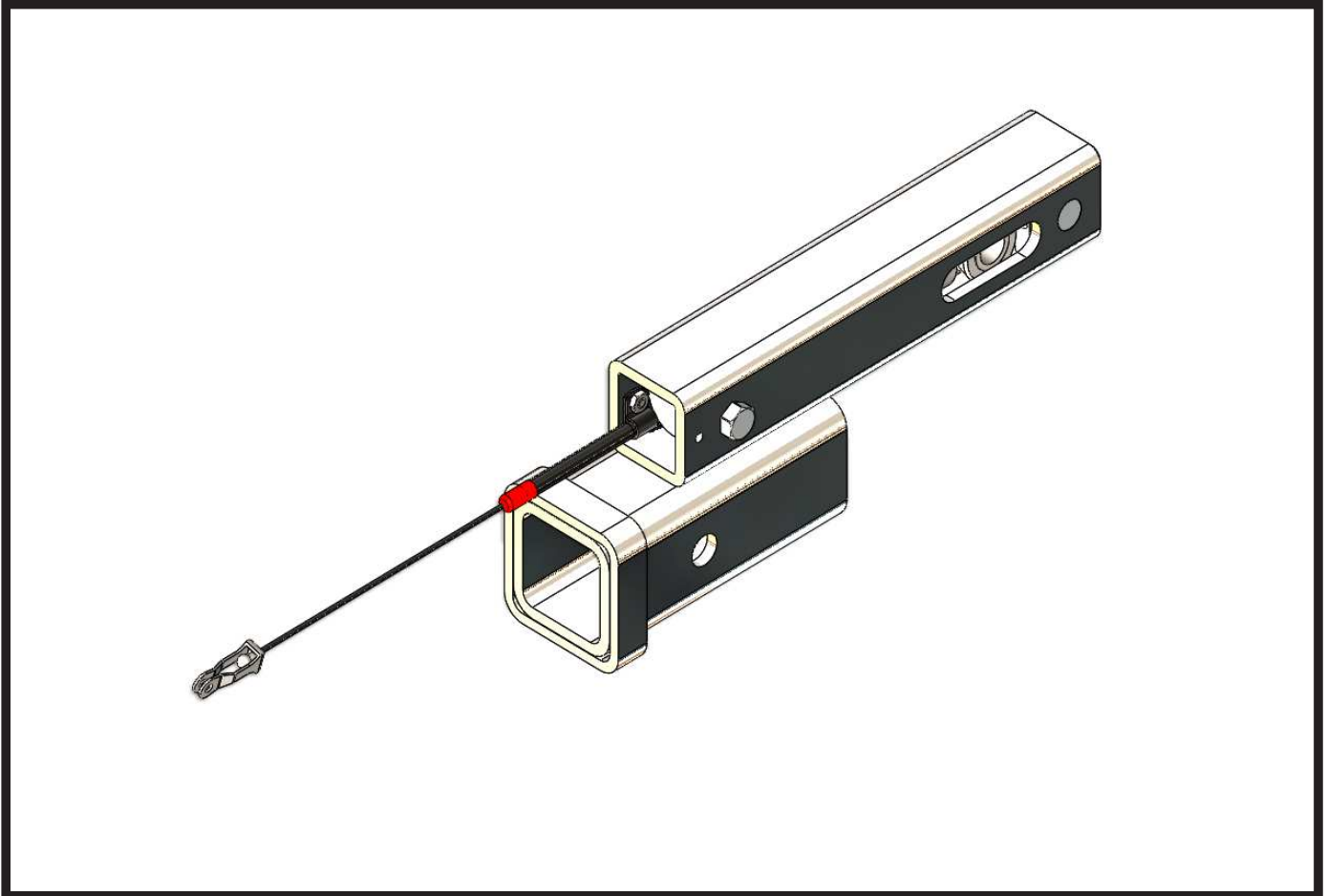




BX88100
Universal AutoStop™
Operator Manual &
Installation Instructions


Serial Number



AutoStop™ Hitch Connector
2" Receiver

BX88100
Universal AutoStop™
Operation Manual & Installation Instructions

AutoStop™ uses the forward momentum of your towed vehicle to effect a smooth quick stop, reducing braking distances as much as 30 percent. When your RV slows down, the momentum of the towed vehicle pushes AutoStop™ into the hitch. AutoStop™ retracts the cable, proportionally activating your car's brakes. The more force applied to AutoStop™, the tighter the cable - for even more supplemental braking power. The AutoStop™ cable wraps around your car's brake pedal arm and connects to the receiver hitch. You determine when the car's brakes will activate by adjusting the preload compression of the power spring. AutoStop™ does not invade the car's or motorhome's brake system in any way. The adjustable preload and power return is easily modified but still proportional in braking.

 **CAUTION:** The loaded vehicle weight must not exceed the weight of any of your towing accessories such as: the tow bar, safety cables, pins or the AutoStop™.

AutoStop™ Installation

1. Insert the AutoStop™ into the receiver tube **with the actuating cable on the drivers side of the opening**. Align the holes and insert the locking pin and safety clip. If the receiver tube is open at the front, it must be closed to keep road dust out of the mechanism. Clean the area and cover with tape.
2. Install the tow bar into the receiver tube of the AutoStop™ and secure with the locking pin and clip. **Note: Be sure the tow bar and AutoStop™ are both parallel with the ground.**
3. Hook up the towed vehicle to the towing vehicle and gently back the towed vehicle until all the slack is out of the AutoStop, moving it to its fully extended towing position. **If a self aligning tow bar is being used, be sure both arms, are fully extended to the locked towing position. Drive the towing vehicle forward a few feet if necessary and pull on the AutoStop™ actuating cable to remove all slack.** It is very important that the connecting cables have 4 inches of vertical slack when in the towing position. This assures the AutoStop™ will not be active when towing and allows for turns in either direction. This does not reduce the effectiveness of the AutoStop™.

Before the adjustment is made: (1) Be sure the AutoStop™ is fully retracted to the towing position. (2) Be sure the locking pin is inserted through the pulley hole. (3) Be sure both tow bar arms are fully extended. (4) Be sure both arms are locked in the towing position.

4. Now you are ready to install the brake pedal cable on the towed vehicle. This cable should run from the end of the AutoStop actuating cable in a line about parallel to the bottom plane of the tow bar coupler, but staying inboard of the driver's side arm, probably through the bumper or bumper skirt and up to the brake pedal through the floor board. Visually select a route that will not interfere with any moving components or possibly contact electrical terminals. Also, make sure cable doesn't come into contact with any aluminum components, such as a transmission housing, which could cause significant wear. Make sure cable route will lead to the general area where the steering column goes through the floor.

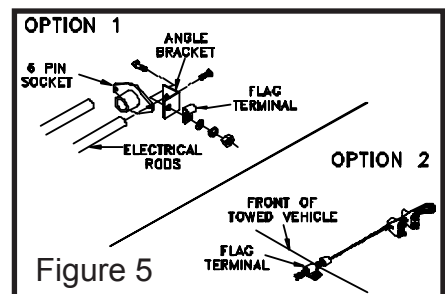
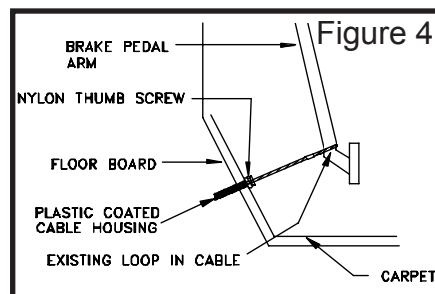
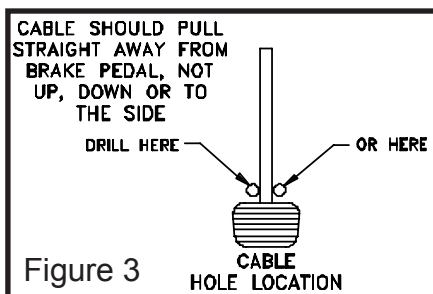
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AutoStop™ Cable Attachment

1. From the driver's seat note the distance and direction from the steering column to the brake pedal when the brake pedal is fully depressed. This will normally be a little below and a little inboard of the steering column. Mark the spot on the carpet with chalk where the cable should pass through the floor. Measure the distance and direction and confirm that a drilled hole will not interfere with anything fastened or close to the drilled hole. When selecting the location for the hole, it should be positioned so the cable is pulling straight back on the brake pedal arm, not to either side and not up or down. (Figure 3 & 4)
2. After you have confirmed that the location for the hole will not cause any problems, pull the carpet back and drill a 1/8 inch pilot hole. Allow the drill bit to just barely break through the metal floor. Next, inspect where the hole actually is from the engine compartment side to verify that this location will not cause problems and to see how the cable aligns with the brake arm. If the hole needs to be relocated, redrill and seal the previous hole with a rivet or sealant. When alignment is correct, enlarge the pilot hole with a 5/16 inch bit. Cut a slit in the carpet to correspond to the hole in the floor.
3. Now you are ready to install the coated brake cable housing in the towed vehicle. Pull the inside cable from the housing and set aside. The cable housing should run thru the hole drilled in the floor board into the engine compartment with the nylon thumb screw showing on top of the carpet. Visually select a route that will not interfere with any moving components or possibly contact electrical terminals. Route the cable to the central area of the fascia (preferably the opening where the electrical rods extend thru the front fascia). The cable housing should be fastened in the engine compartment (to the frame) with flag type terminals provided in parts bag. Fasten the end of the plastic housing to the baseplate with the supplied angle bracket (Figure 5).

Note: Flag terminals are used so the cable housing is stationary allowing the inside cable to move freely. Avoid abrupt bends in the cable housing as this will cause friction and premature wear of the cable. The cable housing should protrude a 1/2" beyond the fascia or where ever the flag terminal is mounted.

4. Lubricate the cable with silicon spray and feed the cable back thru the cable housing from the driver's side compartment. Loop the cable around the brake pedal arm allowing the cable to feed directly and straight into the cable housing. If alignment is proper, the cable will feed into the cable housing when the brake pedal is depressed (Figure 4).



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5. Run the loose end of the brake cable around the cable thimble, double it back on itself and loosely secure it with the two cable clamps. Place the first clamp as close as possible to the thimble and the second cable clamp about 4 inches from the first. Adjust the thimble position so it sticks out approximately 4-5 inches from the fascia and tighten the clamps fully.
6. Hook the cable fork end of the connector cable assembly to the cable fork on the AutoStop™ receiver cable assembly with the detent pin. Run the loose end of the connector cable thru the closed end of the s-hook, double it back on itself and loosely secure it with the two cable clamps. Before tightening the clamps adjust the cable length so there is about 4 inches of vertical play in the cable before the towed vehicle's braking lights come on. (Figure 6)
7. Cut off and discard any excess cable. Recheck this adjustment after a trial run. If the towed vehicle's brake lights come on at the slightest touch of the cable, with the cable properly adjusted, the brake lights are coming on during pedal free travel. Most brake light switches are not adjustable, so install a bungee cord from the pedal to the driver's seat base to reduce the free travel movement of the pedal while towing.
8. Install all other safety and towing equipment as required. The AutoStop™ only actuates the towed vehicles brakes. It does not eliminate the necessity of safety chains, towing lights, transmission pumps or driveshaft disconnects.

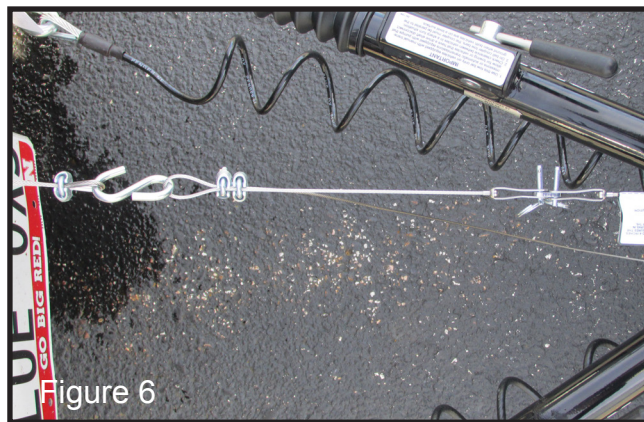
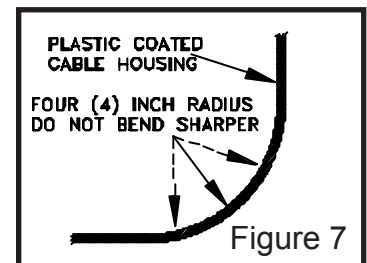


Figure 6

MECHANICAL INSTALLATION NOTES

When routing the housing, do not make a turn tighter than a four (4) inch radius (Figure 7). Anchor the housing in the middle of the bend. There are plastic cable ties and extra flag terminals included with the kit. You will also need to anchor the housing as close as possible to the end that sticks out of the grill of the car. After you have the housing installed and the cable inserted, lay under the vehicle and have someone pull on the cable. When pressure is applied to the cable the housing will tend to try to "straighten out" through the bends. If there are several places where this happens, most of the cable pull will be used up straightening the housing rather than pulling on the brake pedal. Note where the housing is trying to straighten and anchor these areas.



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AutoStop™ Electrical Installation

The AutoStop™ uses the towed vehicles brakes. Most vehicle's brake lights work with the key in the off or in the accessory position. This creates the possibility of the towed vehicle's battery being drained while towing as the brake lights are activated each time the brake pedal is depressed by the AutoStop™. Included are electrical parts which bypass the towed vehicles battery while towing. The only change you will notice to the towed vehicle is that the brake lights will only be activated by the brake pedal when the ignition is in the "on" position. We also include a light indicator that is installed in the dash of the towing vehicle which lights up when the brake pedal in the towed vehicle is pulled on by the AutoStop™. (Figure 8)

1. Locate the brake light switch which is activated when the brake pedal is pressed down. Locate the hot wire into the switch and the wire from the switch to the brake lights. You will need to splice into the wire coming from the switch to the brake lights. Cut the wire at a convenient place and strip the two ends.
2. If there is room, you can locate the relay where you cut the wires. If there isn't room, splice wires onto the ones you cut to give yourself working room. Black wire and butt connectors are supplied in the parts sack.
3. Strip one end of the yellow wire and twist it together with the wire coming from the brake switch. Crimp a female spade terminal on the twisted pair. Slide the terminal over the male terminal on the relay labeled "87".
4. Crimp a female spade terminal on the end of the wire going to the brake lights. Slide this terminal over the male terminal on the relay labeled "30".
5. Locate a bolt to use as a ground. Cut a piece of the black wire long enough to reach from the relay to the bolt. Strip both ends of the black wire and crimp a ring terminal on one end and a female spade terminal on the other. Put the ring terminal under the head of the bolt and the spade terminal on the male terminal on the relay labeled "85".
6. In the car's fuse panel locate a fuse that is "hot" only when the ignition switch is in "on" position. Use the mini fuse tapper with fuse, crimp a female spade terminal on the end of black wire and attach it to fuse tapper. Cut a piece of black wire to reach from the fuse to the terminal on the relay labeled "86".
7. Route the yellow wire from the relay through the engine compartment of the car into the wiring disconnect plug. Then from the wiring disconnect plug on the back of the coach along the bottom of the coach and into the dash of the coach. Tie the wire to the frame of the coach with cable ties or other suitable means.
8. Locate a suitable place in the dash and drill a half (1/2) inch hole for the light indicator. Crimp a butt connector to both wires and insert the indicator into the dash.
9. Cut the yellow wire to length and attach it to one of the wires on the indicator. Locate a bolt to use as a ground. Cut a piece of black wire to length and connect it to the other indicator wire, crimp a ring terminal on the other end of the black wire and fasten it to the grounding bolt.

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10. Gather up the wires and the relay. Anchor them up out of the way so they will not interfere with driving the vehicle with wire ties.

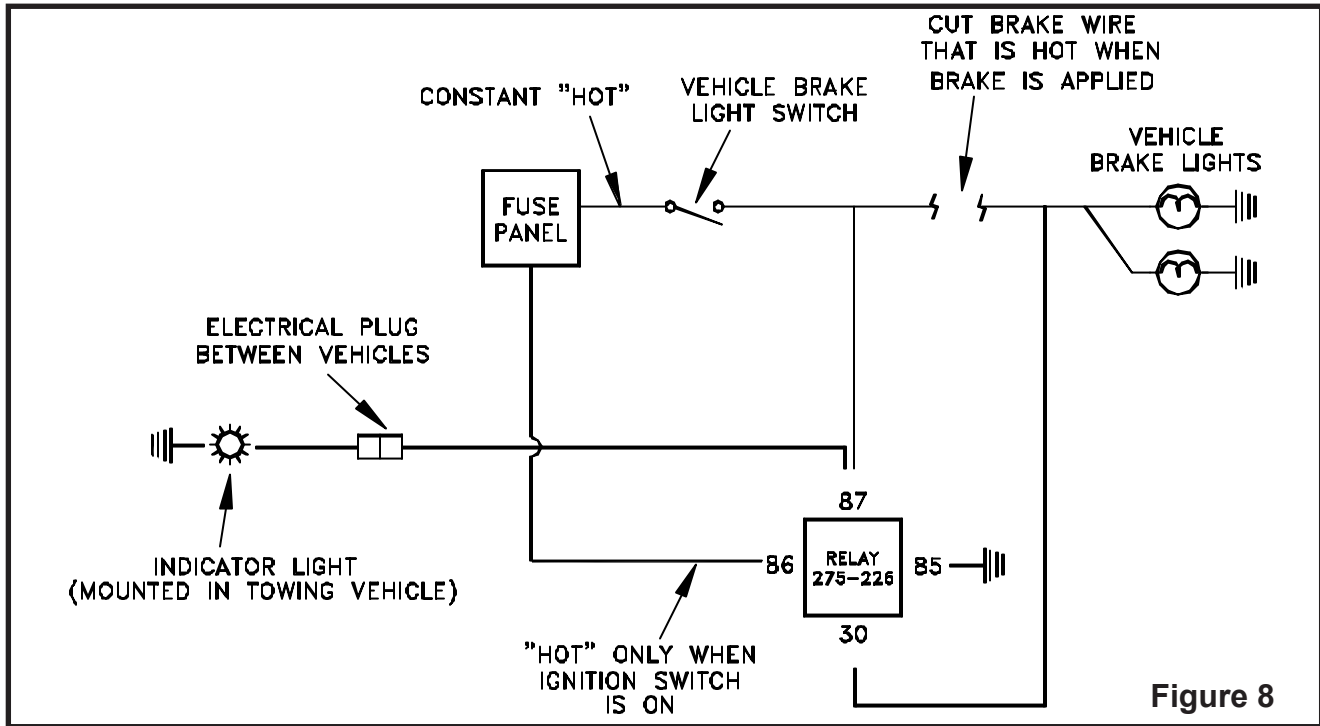


Figure 8

WARNING: Motorhome dash light must be installed according to installation instructions or warranty will be void.

RV DASH LIGHT

1. Dash light will allow a visual indication that the towed vehicles' brakes are activated.
2. Should light remain "ON" after braking, corrective action must be taken. "STOP" the RV to investigate. You may be experiencing a malfunction of the system, which would require you to check, the braking system for proper operation.
 - a. Cable tension should comply with the installation instructions.
 - b. Check wiring of relay in towed vehicle to insure proper installation.
 - c. If breakaway device is installed, refer to its installation instructions.
3. Should dash light activate while turning, corrective action must be taken. "STOP" the RV to investigate.
 - a. If readjustment of cable is needed, this is usually an indication that the cable is too tight or is hanging up on one of the towing components.

TESTING

The electrical installation can be tested to see if it is installed correctly. When applying the brakes with the key in the off and the accessory position, the rear brake lights should not come on, but when applying the brakes with the key in the on position, the brake lights should come on.

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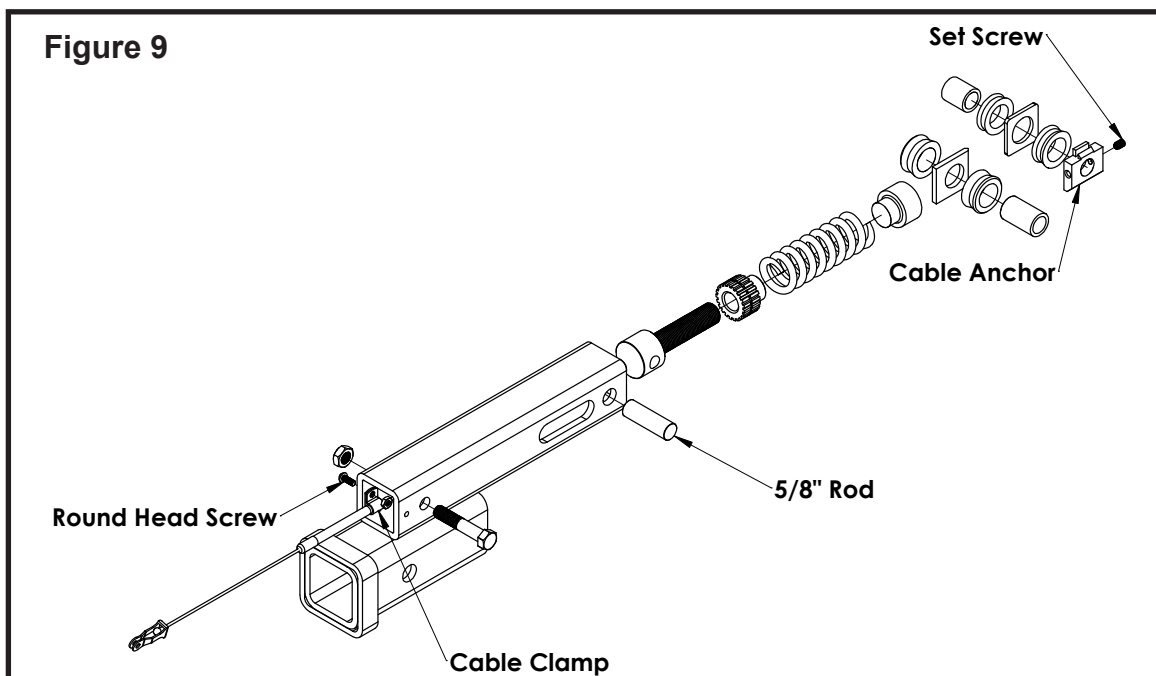
AutoStop™ Maintenance

The AutoStop™ and the inside of the receiver tube should be cleaned and lubricated with silicon spray at 1,000 mile intervals to prevent the buildup of road dust preventing the action to slide with ease. The AutoStop™ should be disassembled, thoroughly cleaned and lubricated every 10,000 miles. At this time the actuating cable should be replaced if there are any signs of cable wear.

DISASSEMBLY INSTRUCTIONS

If your AutoStop™ becomes sluggish or you are in need of replacing a broken part, the following disassembly instructions will step you through how to dismantle, clean and reassemble your AutoStop™.

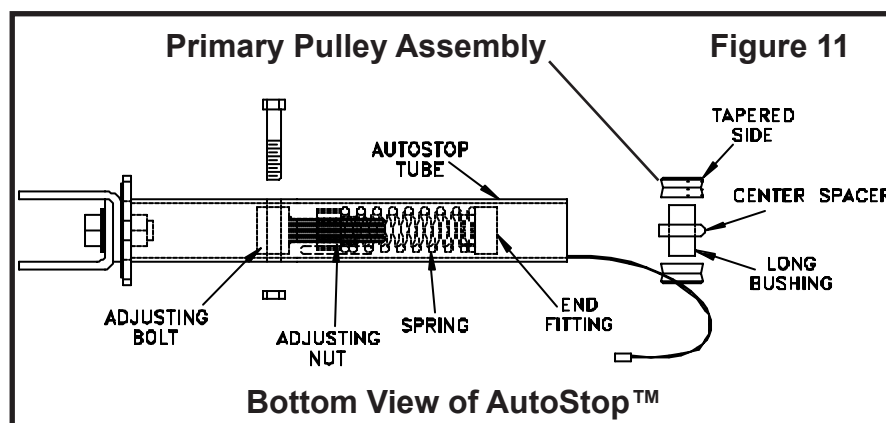
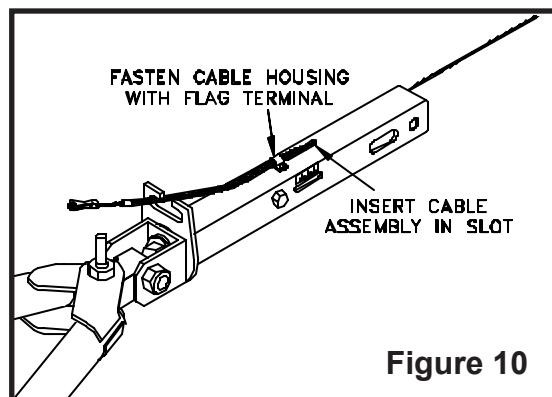
1. Remove the AutoStop™ from the receiver hitch. Remove the hex bolt. (Figure 9)
2. Loosen the set screw in the cable anchor and remove the 5/8" rod going through the AutoStop™ tube. **NOTE:** You may need to tap out the 5/8" rod with a punch.
3. At this point, slide the pulleys and adjusting bolt assembly out of the AutoStop™ tube. **NOTE:** Use caution when removing the pulleys. The cable is coiled around the pulleys several times and may unwind when removed from of tube. This is normal, reassembly will be explained in a later section.
4. Remove the round head screw holding the cable clamp, then pull the cable assembly out of the AutoStop™ tube.
5. Clean all parts with a mild solvent such as WD-40 and be sure to dry all parts. Use a brush to insure the inside of the AutoStop™ tube is clean as well.



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ASSEMBLY INSTRUCTIONS

1. Slide the cable assembly back into the AutoStop™ tube and secure the cable clamp with the flag terminal and the round head screw. Be sure the plastic cable housing is inserted in the slot so the inside cable does not rub at the slot, but also be sure the cable assembly isn't inserted too far that it interferes with the spring inside the tubing. See Figure 10.
2. Lay the AutoStop™ tube on a table or bench with the hitch mount end towards you. (Figure 11) Thread the adjusting nut onto the adjusting bolt all the way on the threads. Slide the compression spring onto the adjusting bolt all the way onto the adjusting nut. Then place the end fitting on the other end of spring. Slide this assembly into the AutoStop™ tube until adjusting bolt hole is lined up with the two front holes of AutoStop™ tube, then insert the 7/16" hex bolt through the AutoStop™ tube and secure bolt with hex jam nut.
3. Place one of the two identical pulleys with the beveled edge on the table. Place the long bushing through this pulley, next place the center spacer with chamfers on the bottom right side. Place on top of the spacer the other pulley with the beveled edge on top.
4. Set the tube aside and find the narrow pulley. Please note that the narrow pulley's groove is off center. Set the pulley on the bench with the groove oriented closest to the bench. (Figure 12&16) Insert the short bushing into the pulley and the 5/8 rod into the bushing. (Figure 13)



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Secondary Pulley Assembly

5. Place the pulley divider on the pulley. (Figure 13) NOTE: The pulley divider is NOT square. It is slightly wider one direction than the other. During use, the pulley divider must be oriented long side horizontal, to keep the cable from jumping between pulleys.

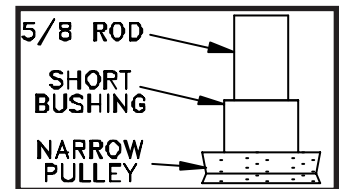


Figure 12

6. Set the wide pulley on top of the pulley divider. It is symmetrical so it can be put on either way. (Figure 14) Set the cable anchor on top of the wide pulley with the groove facing you and the notch out of the corner to your right. (Figure 15)

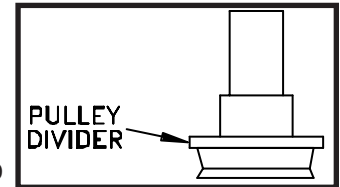


Figure 13

7. Set the movable pulley assembly next to the AutoStop™ tube, and next to it place the stationary pulley assembly. (Figure 16) You are now ready to route the cable around the pulleys.

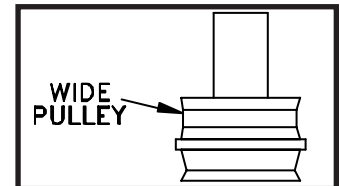


Figure 14

8. Pull the cable through so you have all the slack at the back where you will be wrapping the cable. The AutoStop™ tube should still be positioned with the tongue flat side towards you. (Figure 16)

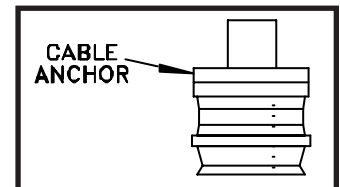


Figure 15

9. Refer to (Figure 17) while wrapping cable around the pulleys. The cable should protrude from the AutoStop™ tube at the lower corner of the tongue flat side facing you. From here, route the cable in front of pulley "A" and counterclockwise around pulley "B". Continue on the back side back to pulley "A" and go around it counterclockwise also. From here, route the cable around pulley "C" counterclockwise then pulley "D" counterclockwise. Lay the cable in the groove in the cable anchor and set the cable swage into the notch in the cable anchor.

10. Once you have the cable wrapped properly, pull slowly on the other end of the cable while holding the pulleys and swage in place with the other hand to prevent the cable from unwrapping. Keep tension on the cable and slide the pulleys into the AutoStop™ tube. (Figure 18) When the second set of pulleys start into the tube, stop and remove the 5/8 rod.

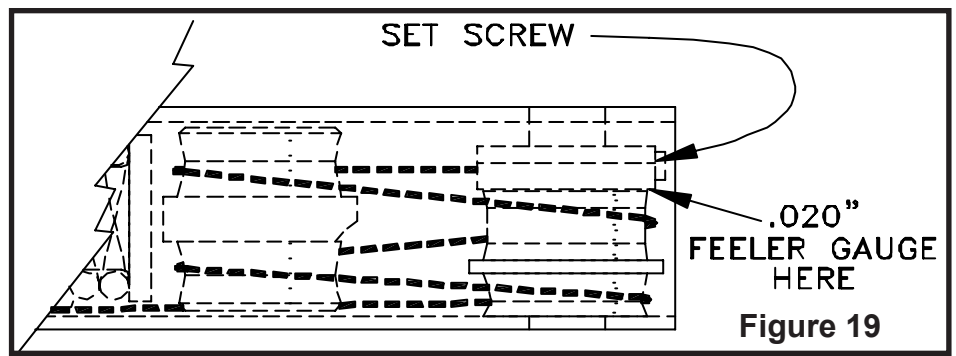
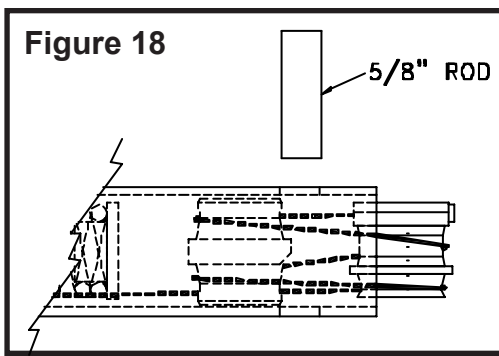
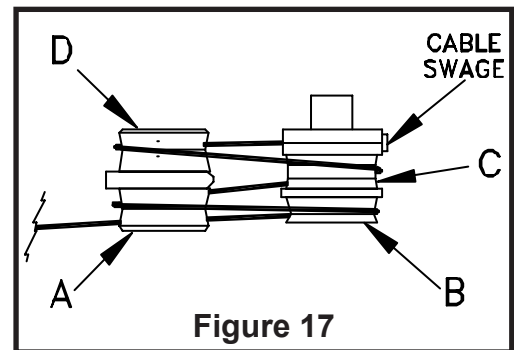
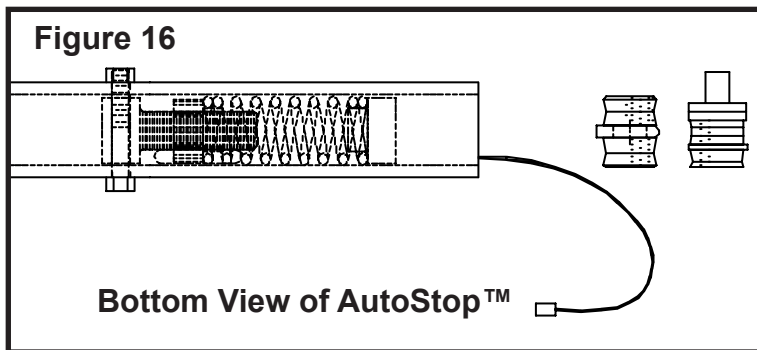
11. Pull slowly on the cable until the holes in the second set of pulleys line up with the holes in the end of the AutoStop™ tube and insert the 5/8 rod.

12. With the AutoStop™ still on its side, be sure that the pulleys, cable anchor, and pulley divider are all together and pressed down to the side of the tube. Place a 20 thousandths inch (.020") feeler gauge between the cable anchor and wide pulley and tighten the set screw in the end of the cable anchor. (Figure 19) **NOTE: Be sure to keep the 5/8 rod centered in the AutoStop™ tube while tightening the set screw.**

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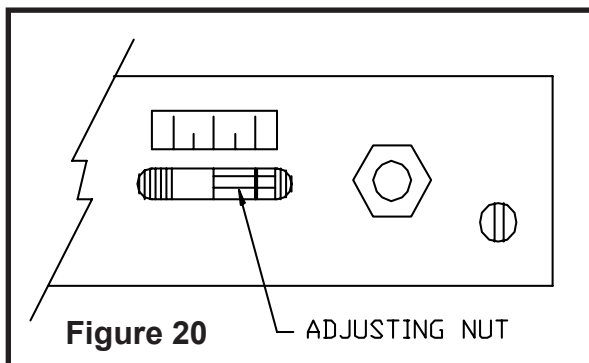
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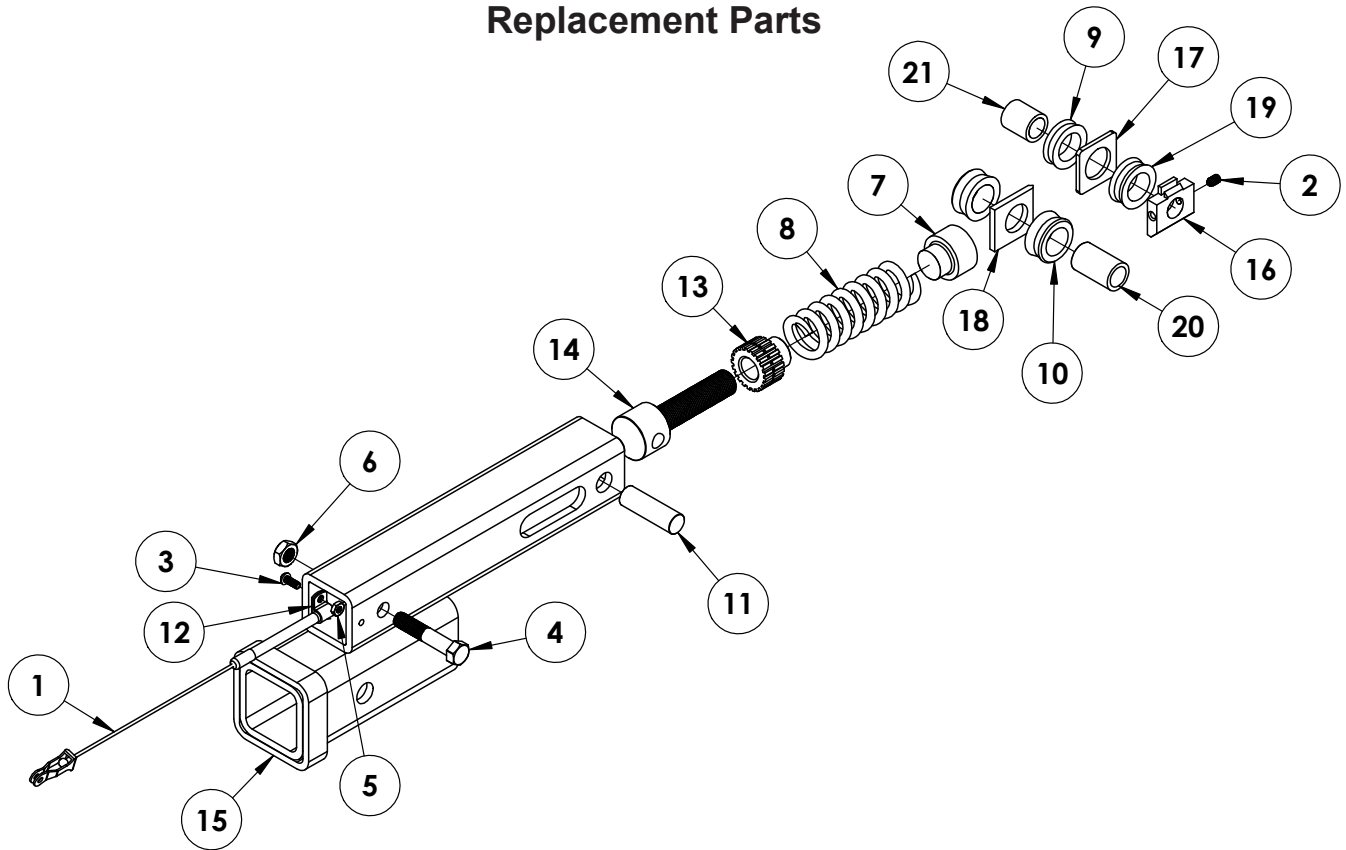
AutoStop™ Adjustment

The AutoStop™ "Load Ranger" is equipped with a return spring and an adjusting nut to set the spring pre-load in proportion to the weight of the towed vehicle. This pre-load will not allow the activation of the towed vehicle's brakes during light braking of the towing vehicle. This also prevents application of the towed vehicle's brakes when descending a moderate grade against engine compression, Jake brake or exhaust brake, but still allows proportional braking when the towing vehicle's service brakes are applied. Before making any adjustment, drive the rig a few blocks and re-check the installation for proper cable slack. With a flat blade screwdriver, rotate the adjusting nut upward with a down motion of the screwdriver handle to increase the preload. This will move the nut in the direction of the towing vehicle, compressing the return spring. Continue to rotate the adjusting nut to the desired preload. If you desire the AutoStop™ to activate only during very heavy braking, adjust to the max. setting. After your initial setting, adjust to your driving preference if needed. The location of the adjusting nut is shown in Figure 20. The initial preload ranges are listed below.



Suggested initial preload ranges are:	
1/4"	Towed vehicle under 2,000 lbs.
1/2"	2,000 to 3,500 lbs.
3/4"	3,500 to 5,000 lbs.
1"	Maximum preload

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Replacement Parts



Item No.	Part No.	Description	Qty.
1.....	62-3161	Cable Assembly	1
2.....	201-0150	1/4"-20 x 3/8" Socket Head Cap Set Screw	1
3.....	201-0192	#10-32 x 1/2" Round Slot Head Screw	1
4.....	201-0366	7/16"-20 x 2-1/4" Hex Head Bolt, Grade 5.....	1
5.....	202-0047	#10-32 Hex Nut	1
6.....	202-0110	7/16"-20 Hex Jam Nut	1
7.....	207-0842	Spring Cap.....	1
8.....	222-0076	Compression Spring	1
9.....	229-0354	Narrow Rear Pulley	1
10.....	229-0356	Shock Absorber Pulley	2
11.....	229-0369	5/8" x 2" Rod.....	1
12.....	294-0811.....	5/16" Metal Cable Clamp.....	1
13.....	299-0255	Adjusting Nut	1
14.....	299-0256	Adjusting Bolt.....	1
15.....	299-0277	Universal AutoStop Housing.....	1
16.....	299-0286	Cable Anchor	1
17.....	299-0289	Pulley Divider.....	1
18.....	299-0382	Narrow Spacer.....	1
19.....	299-0383	Front Pulley	1
20.....	299-0384	Front Bushing	1
21.....	299-0385	Rear Bushing.....	1

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Important:

Use only genuine factory replacement parts on your AutoStop™. Do **NOT** substitute homemade or non-typical parts. If a bolt is lost or in need of replacement, for your safety and the preservation of your equipment, be sure to use a replacement bolt of the same grade (In most cases it will be Grade 5, please reference the parts list above). Replacement parts may be ordered through your nearest Blue Ox® Dealer or Distributor. Failing to follow and/or altering these installation instructions in either installation or required equipment will void the manufacturer's warranty.

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Item No.	Part No.	Description	Qty.
Items Not Shown			
22	62-3366	Brake Cable Assembly	1
23	290-0159	13" Nylon Cable Tie	4
24	194-0139	14Ga Black Wire x 48"	1
25	290-0131	5-7/8" White Nylon Cable Tie	2
26	194-0140	16Ga Yellow Wire x 65'	1
27	101-6452	Indicator Light Bracket	1
28	294-0732	18-22Ga Insulated Butt Connector	2
29	225-0052	3/32" U-Bolt Wire Rope Clip	2
30	229-0362	3/32" SS Cable Thimble	1
31	229-0363	3/16" x 13/16" Detent Pin	1
32	294-0811	5/16" Metal Cable Clamp	3
33	101-6377	Cable Housing Mount Bracket	1
34	201-0050	1/4"-20 x 3/4" Hex Head Bolt, ZP	1
35	202-0001	1/4"-20 Hex Nut	1
36	203-0008	1/4" Lock Washer, ZP	1
37	203-0001	1/4" Flat Washer, ZP	1
38	201-0192	#10-32 x 1/2" Round Slot Head Screw	3
39	202-0047	#10-32 Hex Nut	?
40	290-0324	Red Cap, 0.207" x 3/4"	1
41	294-0250	14-16Ga Insulated Butt Connector	2
42	294-0187	14-16Ga x 5/16" Ring Terminal	3
43	294-0518	14-16Ga Insulated Female Coupling Terminal	8
44	294-0807	Mini Fuse Tapper	1
45	294-0813	Solid State Indicator Light	1
46	294-0729	AR401 Automotive Relay	1
47	62-3298	Connector Cable Assembly	1

CUSTOMER SERVICE COMMITMENT

Blue Ox® is committed to providing you with exceptional customer care throughout your lifetime with our products. Our team is here to assist you with any questions you may have regarding the performance of your product. Simply call (402) 385-3051 and you can speak with our technical service team.

Additionally, please visit our website to see which rallies our Destination America team will be attending. For a nominal fee, our service technician will service your towing system to ensure it's in proper working condition. Also, as a commitment to our customers, should you visit our factory, you can stay at our full service Blue Ox® campground at no charge along with enjoying a factory tour.

Again, thank you for being our customer and for the confidence you have shown in the performance of our products. It is because of customers like you we enjoy the success we have today.

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