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Product Safety Policy Statement

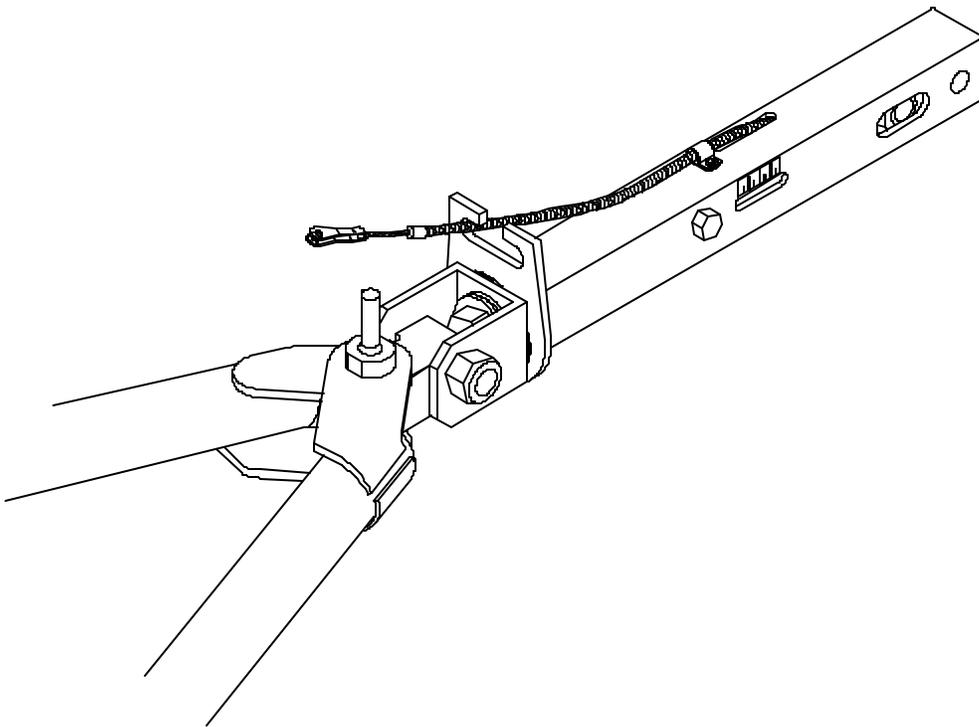
It is, and shall continue to be, a primary objective of Automatic Equipment Manufacturing Company to provide customers with safe and reliable products. Automatic will, and has, established safety procedures in product design, manufacture, promotion and sales; and will coordinate efforts to promote customer safety to the greatest extent possible. Each department has primary responsibility for the promotion of safety under the guidelines of the Product Safety Committee.

BX8893
AutoStop™

Automatic



AutoStop™



OPERATOR, PARTS & INSTALLATION MANUAL

BX8893 AutoStop™

Automatic

TOWING PRODUCTS DIVISION

REPLACEMENT PARTS

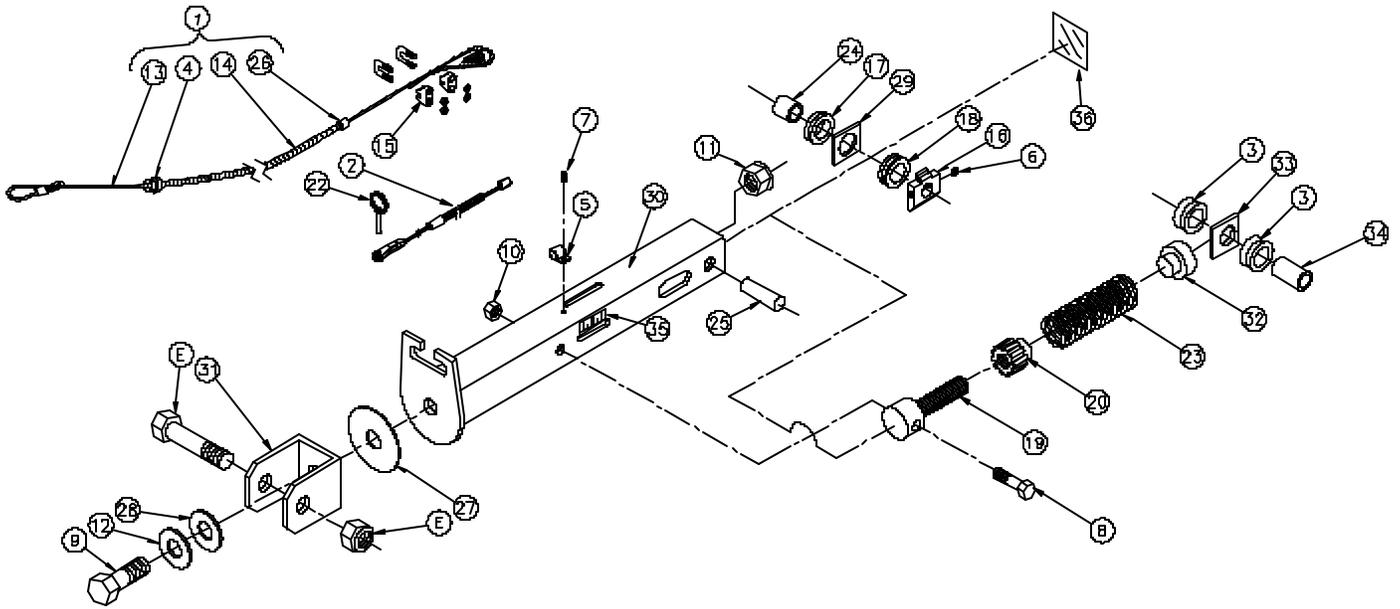
Parts List

Ref. No.	Qty.	Part No.	Description
1	1	62-3366	Brake Cable Assembly
2	1	62-3326	Receiver Cable Assembly
3	2	229-0356	Pulley, Shock Absorber, AutoStop
4	1	290-0392	5/16-18 Nylon Thumb Nut
5	6	294-0248	Flag Terminal
6	1	201-0150	1/4-20 x 3/8 Knurled Set Screw
7	6	201-0192	10-32 x 1/2 Round Head Screw
8	1	201-0366	7/16-20 x 2 1/4 Hex Bolt, Grade 5
9	1	201-0622	3/4-16 x 2 1/2 Hex Head Bolt
10	1	202-0110	7/16-20 Hex Jam Nut
11	1	202-0152	3/4-16 Hex Lock Nut w/ Nylon Insert
12	1	203-0064	3/4 Flat Washer
13	1	100-0953	Cable, 3/32 (7 x 19) SS x 120
14	1	100-1101	Cable Housing, Coated, 9/32 x 72
15	2	225-0052	Cable Clamp, 3/32 Wire Rope
16	1	299-0286	Cable Anchor, AutoStop
17	1	229-0354	Pulley, Narrow Front, AutoStop
18	1	299-0383	Pulley, Front, Medium, AutoStop
19	1	299-0256	Bolt, Adjusting, AutoStop ZP
20	1	299-0255	Nut, Adjusting, AutoStop ZP
21	1	229-0362	3/32 SS Cable Thimble
22	1	229-0363	Ring Detent Pin, 3/16 x 1
23	1	222-0076	Spring, Comp., AutoStop
24	1	299-0385	Bushing, Rear, AutoStop
25	1	229-0369	Rod, 5/8 x 2
26	1	290-0324	Red Cap, .207 ID x 3/4
27	1	290-0348	Plastic Spacer, 3 OD x 1/16 Thick
28	1	290-0360	Plastic Spacer, 1 1/2 OD x 1/16 Thick
29	1	299-0289	Pulley Divider, ZP, AutoStop
30	1	299-0260	Receiver Connector
31	1	100-1103	Cast Yoke
32	1	207-0842	Cap, Spring, AutoStop
33	1	299-0382	Flat, Center Spacer, AutoStop
34	1	299-0384	Bushing, Front, AutoStop
35	1	292-2331	Decal, Spring Compression, AutoStop
36	1	192-0025	Tape, End Cover
E	1	100-1050	Pivot Bolt

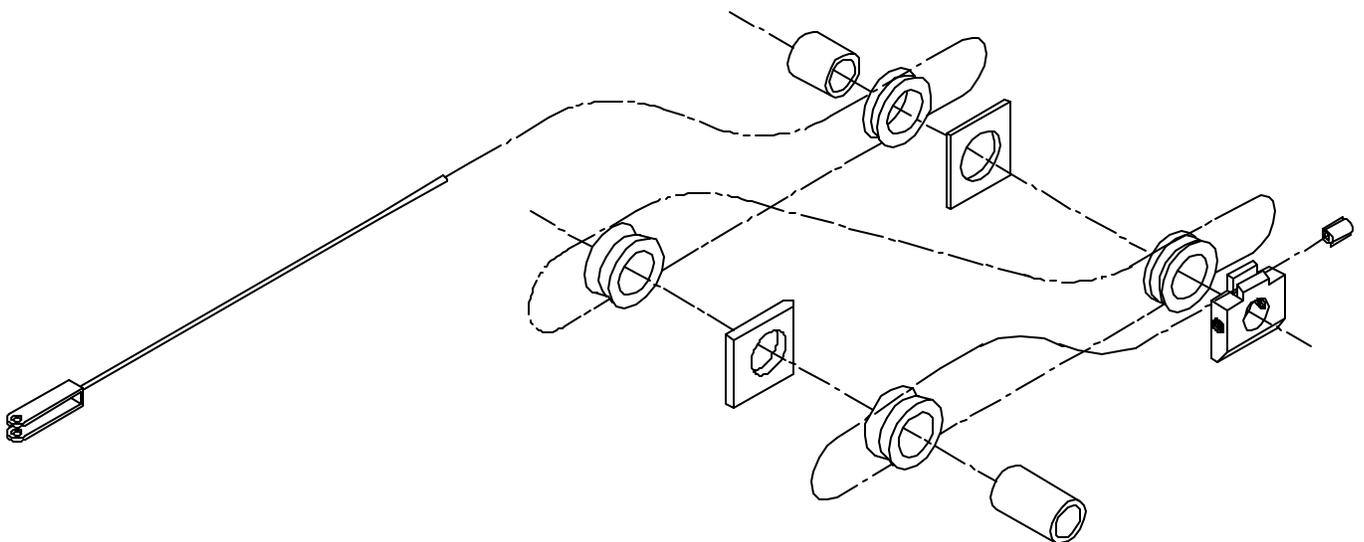
Parts Not Shown

37	5	202-0047	10-32 Hex Nut
38	1	194-0139	4 Ft. 14 Ga. Black Wire
39	1	194-0140	65 Ft. Coil 16 Ga. Yellow Wire
40	2	290-0131	5 7/8" Nylon Cable Tie
41	4	290-0159	13" Nylon Cable Tie
42	1	292-2089	Decal, ID Sticker
43	1	292-2085	Decal, Important, AutoStop Backing
44	3	294-0187	Ring Terminal. 5/16 Stud, 16-14 Ga.
45	2	294-0250	Butt Connector, 16-14 Ga.
46	8	294-0518	Term. Coupler, Female, 16-14 Ga.
47	1	294-0813	Light Indicator, Red
48	1	294-0729	Automotive Relay
49	3	294-0811	5/16 Metal Cable Clamp
50	1	294-0807	Mini Fuse Tapper
51	1	101-6377	Cable Housing Mount

REPLACEMENT PARTS



CABLE ROUTING



ASSEMBLY / ADJUSTING INSTRUCTIONS

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.*

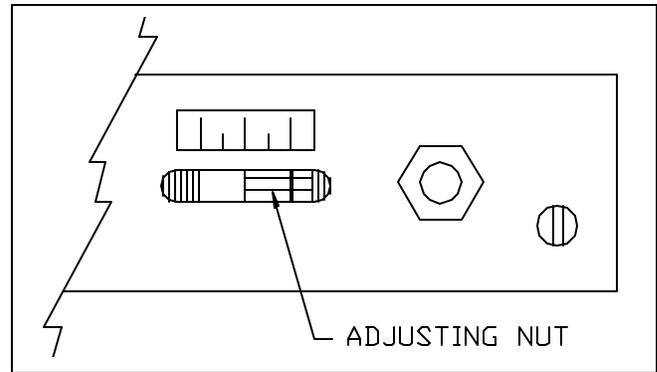


Figure 20

ADJUSTMENT INSTRUCTIONS

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 in Figure 21.

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

Figure 21

ASSEMBLY INSTRUCTIONS

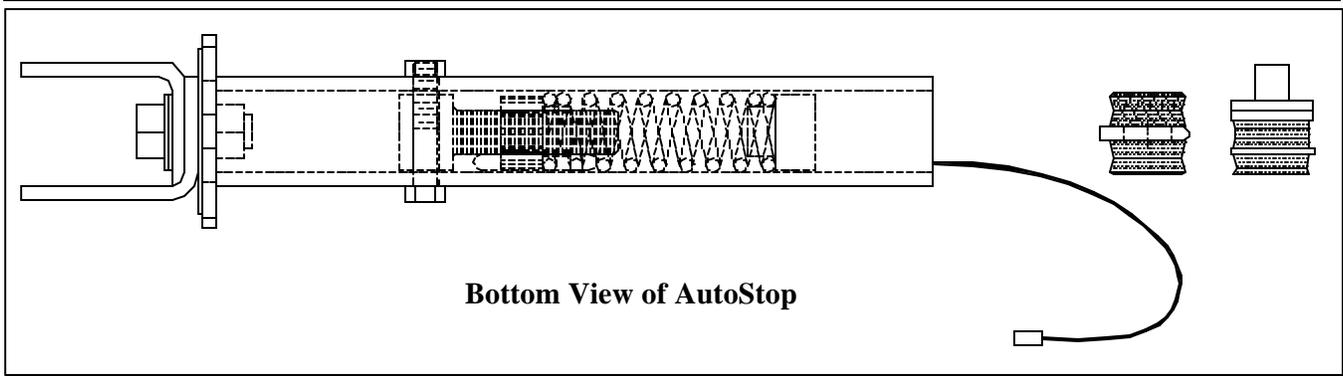


Figure 16

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.
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)
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.

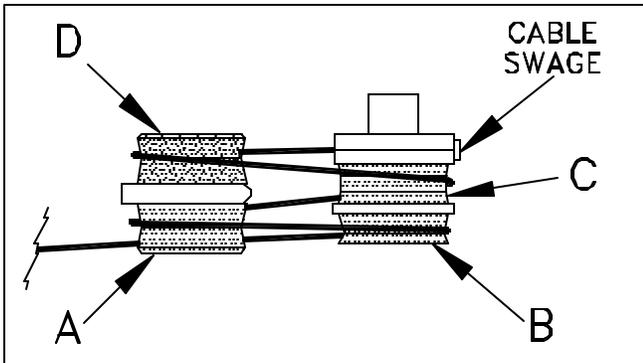


Figure 17

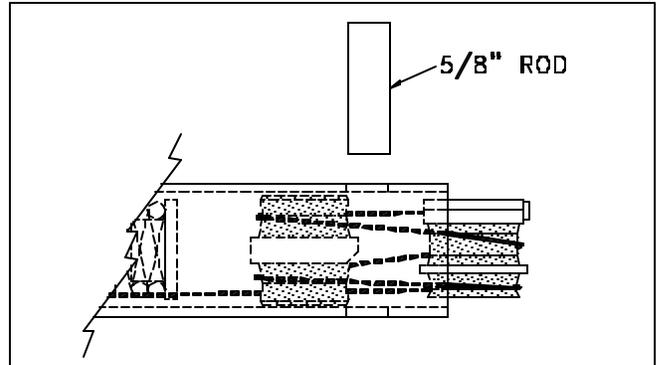


Figure 18

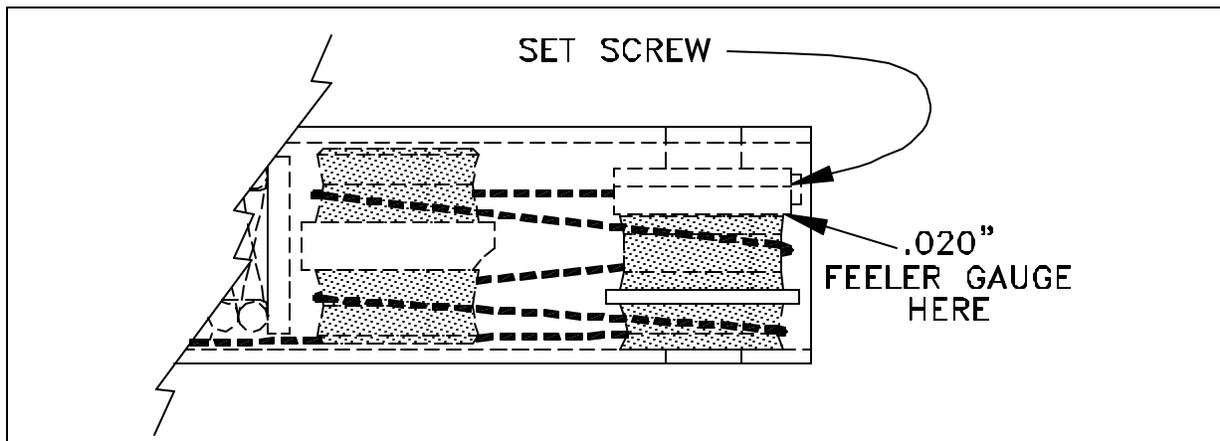


Figure 19

ASSEMBLY INSTRUCTIONS

- 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.
- Remove the round head screw holding the cable clamp, then pull the cable assembly out of the AutoStop tube.
- Clean all parts with a mild sovent 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.

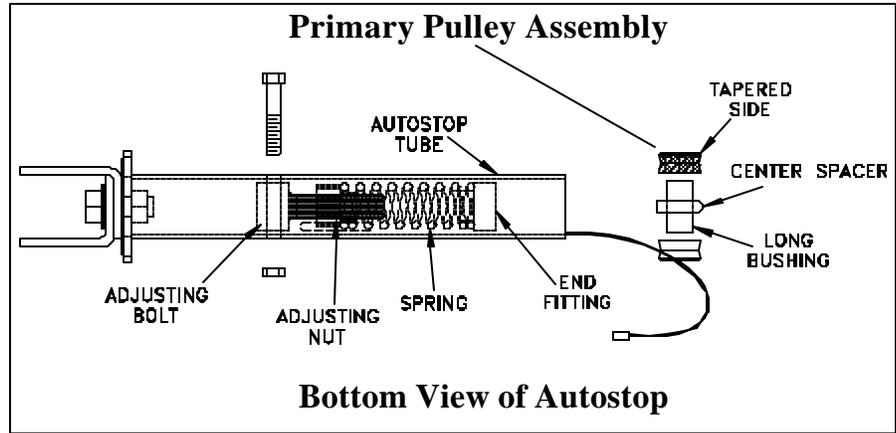


Figure 11

ASSEMBLY INSTRUCTIONS

- Slide the cable assembly back into the slotted hole in 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.
- 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.
- 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.
- Set the AutoStop 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)
- 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.
- 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)

Secondary Pulley Assembly

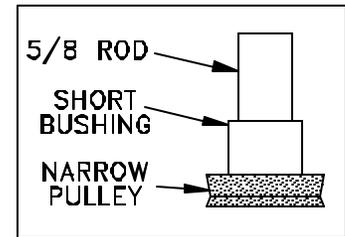


Figure 12

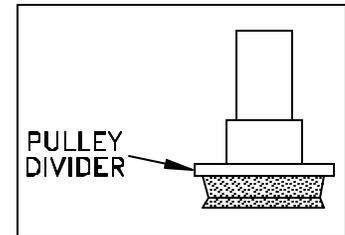


Figure 13

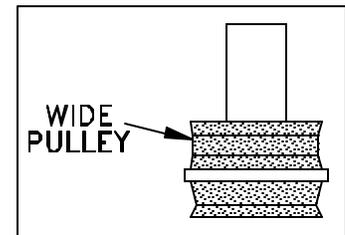


Figure 14

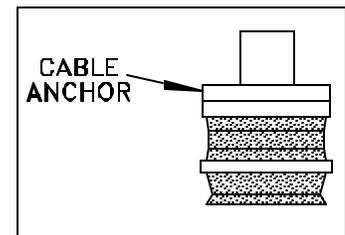


Figure 15

DISASSEMBLY / ASSEMBLY INSTRUCTIONS

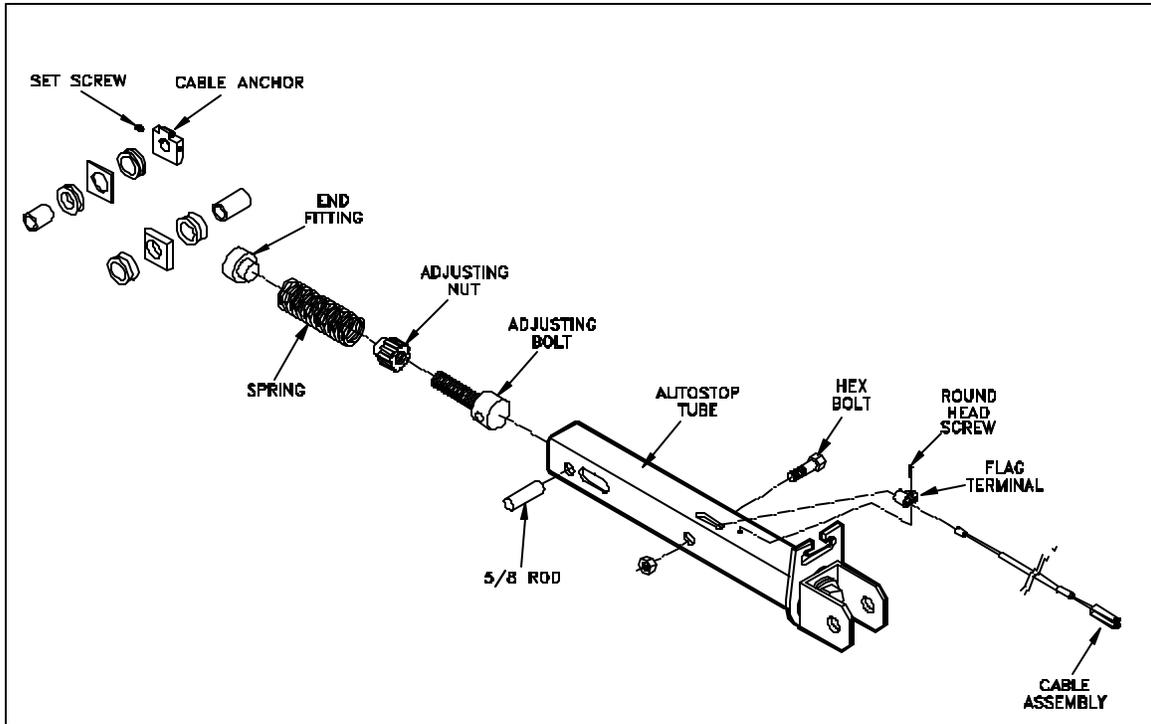


Figure 9

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.
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.

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.

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. Pages 5 - 9 show actuator cable routing and parts assembly of the AutoStop.

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.

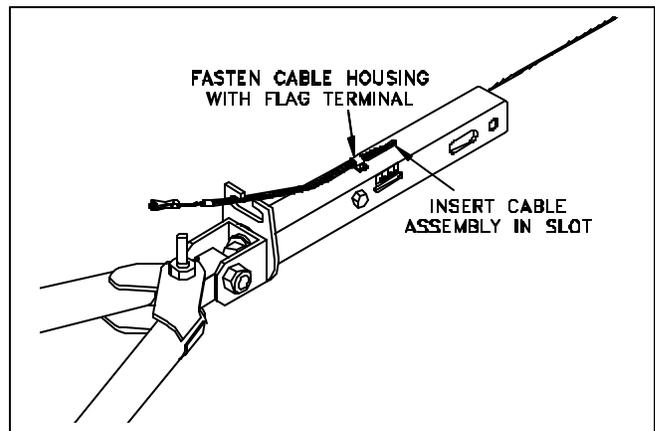


Figure 10

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.

INSTALLATION / MAINTENANCE

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.

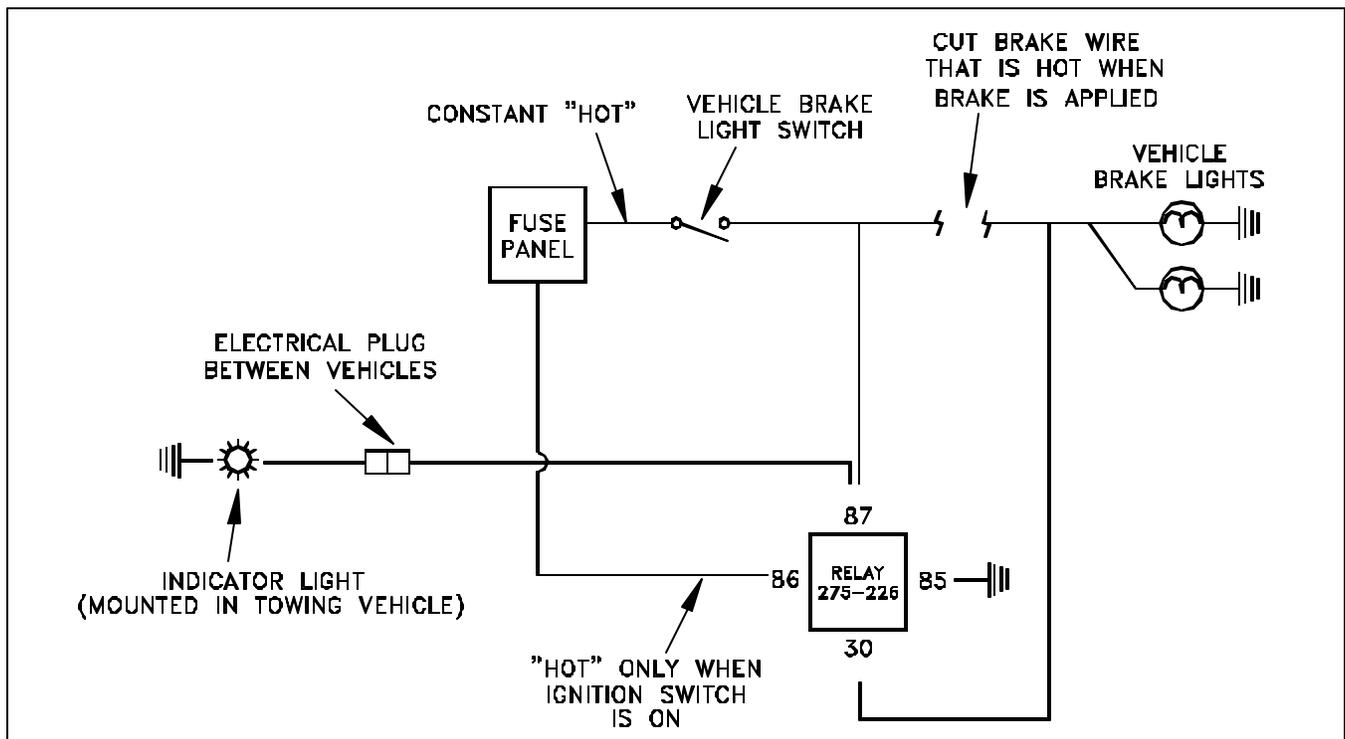


Figure 8

INSTALLATION

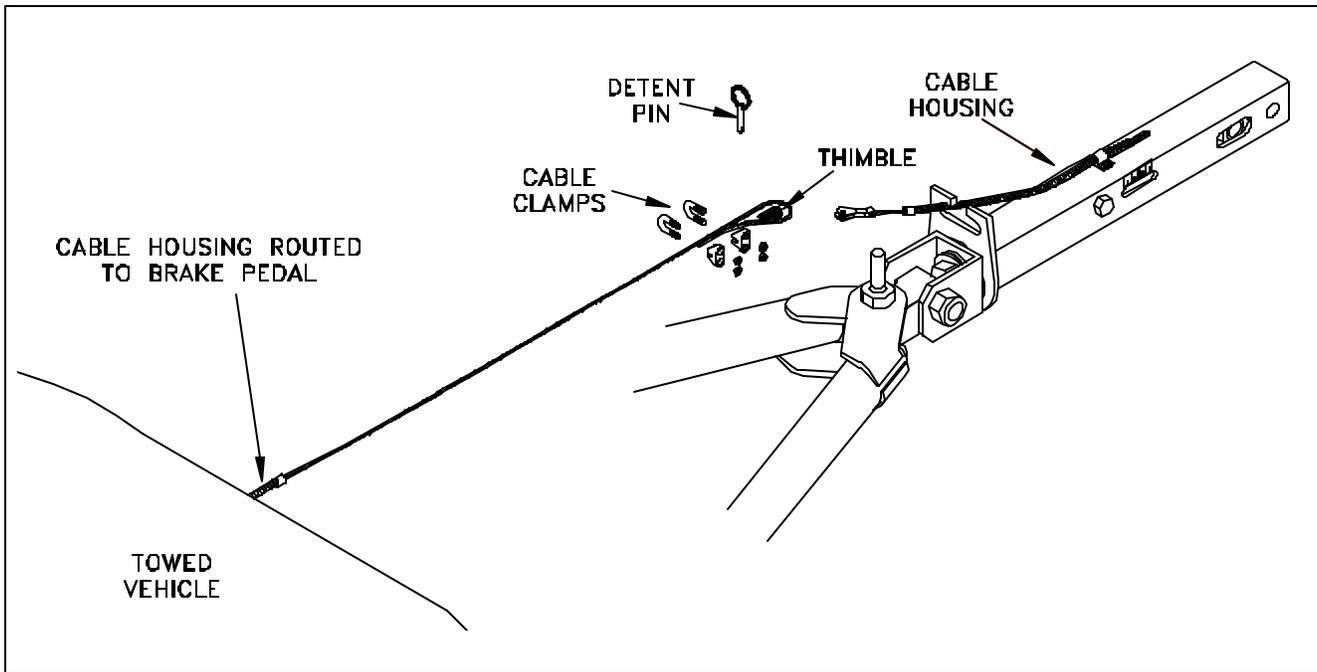


Figure 6

- Lubricate the cable with silicon spray and feed the cable back through the front end of the cable housing into the passengers 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. See Figure 4. Leave 1/2" of cable housing extending from the flag terminal on the front of the vehicle. See Figure 5.
- Attach the cable thimble into the cable fork on the AutoStop receiver cable assembly with the detent pin. (Figure 6) Run the loose end of the brake cable through the fork and thimble, double it back on itself and secure it with the two cable clamps. Place the first clamp as close as possible to the thimble and the second cable clamp about four (4) inches from the first. Before tightening the clamps adjust the cable length so there is about four (4) inches of vertical play in the cable before the towed vehicle's braking lights come on.
- 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.
- 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.

MECHANICAL INSTALLATION NOTES

When routing the housing, do not make a turn tighter than a four (4) inch radius. See 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

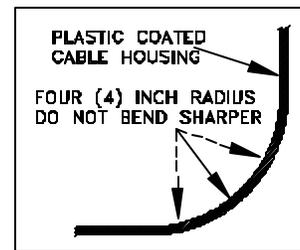


Figure 7

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.

ELECTRICAL INSTALLATION

The AutoStop uses the towed vehicles brakes. Most vehicle's brake lights work with the key in the off and 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

- 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.

CABLE ATTACHMENT

1. Install the new tow bar assembly into the receiver hitch of the towing vehicle.
2. 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. Be sure both legs are fully extended to the locked towing position. Drive the towing vehicle forward a few feet if necessary and pull on the AutoStop receiver cable assembly to remove all slack.

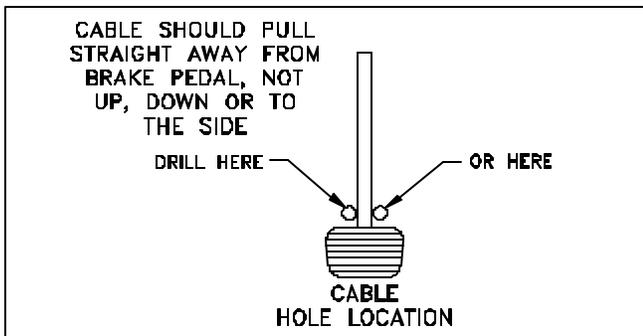


Figure 3

3. From the drivers 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)
4. 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.

5. 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 should run through the hole drilled in the floor board into the engine compartment. Visually select a route that will not interfere with any moving components or possibly contact electrical terminals. Route the cable to the central area (preferably through the opening where the attachment tabs extend through) of the front plastic fascia. The cable housing should be fastened in the engine compartment (on 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. When installed properly, the nylon thumb screw should be showing on top of the carpet. 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 inch beyond the bumper, or bumper skirt or wherever the flag terminal is mounted, pointing directly at the hitch ball. Figure 5

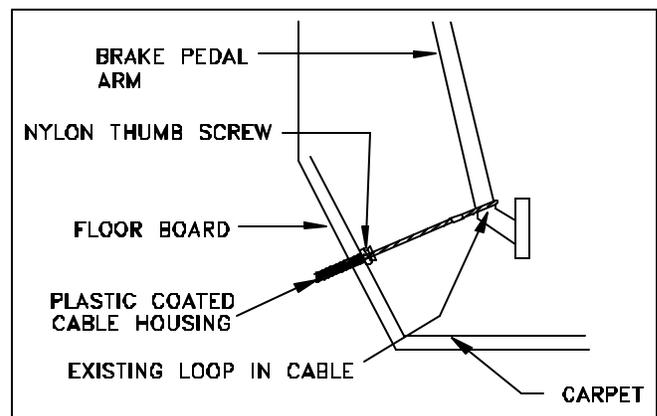


Figure 4

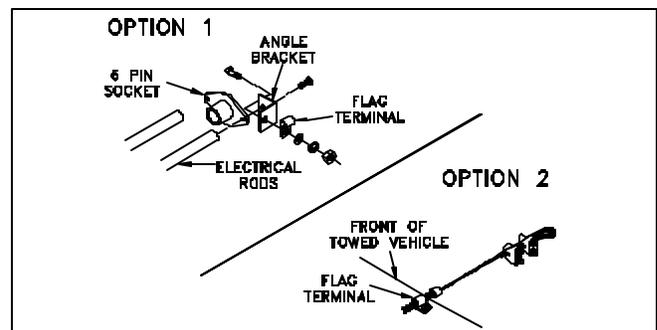


Figure 5

REQUIREMENTS / INSTALLATION

REQUIREMENTS FOR PROPER OPERATION

- A. You must have a two (2) inch square receiver type hitch on your towing vehicle that aligns within one (1) to two (2) inches of the height of the baseplate.

NOTE: The tow bar may slope upward toward the towing vehicle, but should not slope downward toward the towing vehicle.

The AutoStop receiver connector needs a level push into the hitch receiver tube to operate properly. This requires that the height of the receiver tube be adjusted.

The correct height can be obtained by using a drop receiver. (Figure 1) The drop receiver can be positioned with the receiver hanging down or turned up, what ever is needed for a level connection. Two (2), four (4), six (6), eight (8) and ten (10) in drop receivers are available.

- B. This AutoStop is designed to be installed in place of the receiver connector of the Aladdin tow bar. (Figure 2)

- C. You must tow the vehicle with all four (4) wheels on the ground.

- D. The loaded weight of the towed vehicle must not

exceed the weight rating of any of the towing accessory components such as; the tow bar, the receiver hitch, the receiver cross pin, the safety chains, or the AutoStop.

IMPORTANT: The AutoStop does not allow you to tow more than the ratings of your towing hardware, it just reduces the stopping distance of the combination.

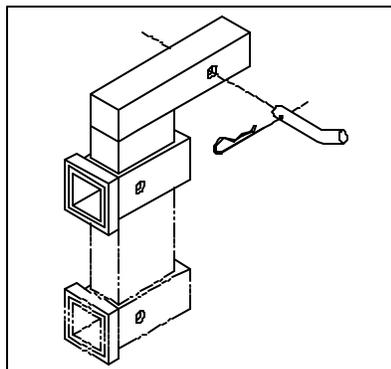


Figure 1

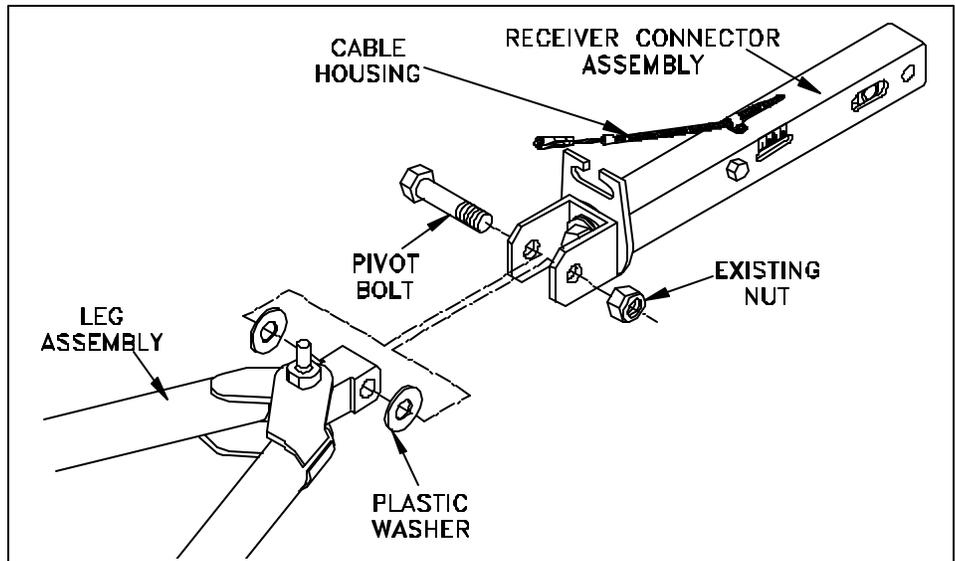


Figure 2

RECEIVER CONNECTOR REPLACEMENT

1. Remove the 3/4 x 3 1/4 bolt holding the receiver connector to the leg assembly. Save the existing nut and plastic washers.
2. Replace your existing aluminum receiver connector with the new chromed steel AutoStop receiver connector assembly using the new pivot bolt provided in this kit, and the existing nut and plastic washers.

NOTE: Be sure to place the pivot bolt through from the drivers side of the assembly. Tighten the bolt until snug.

ILLUMINATED DASH INDICATOR LIGHT IN RV

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

A. 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.