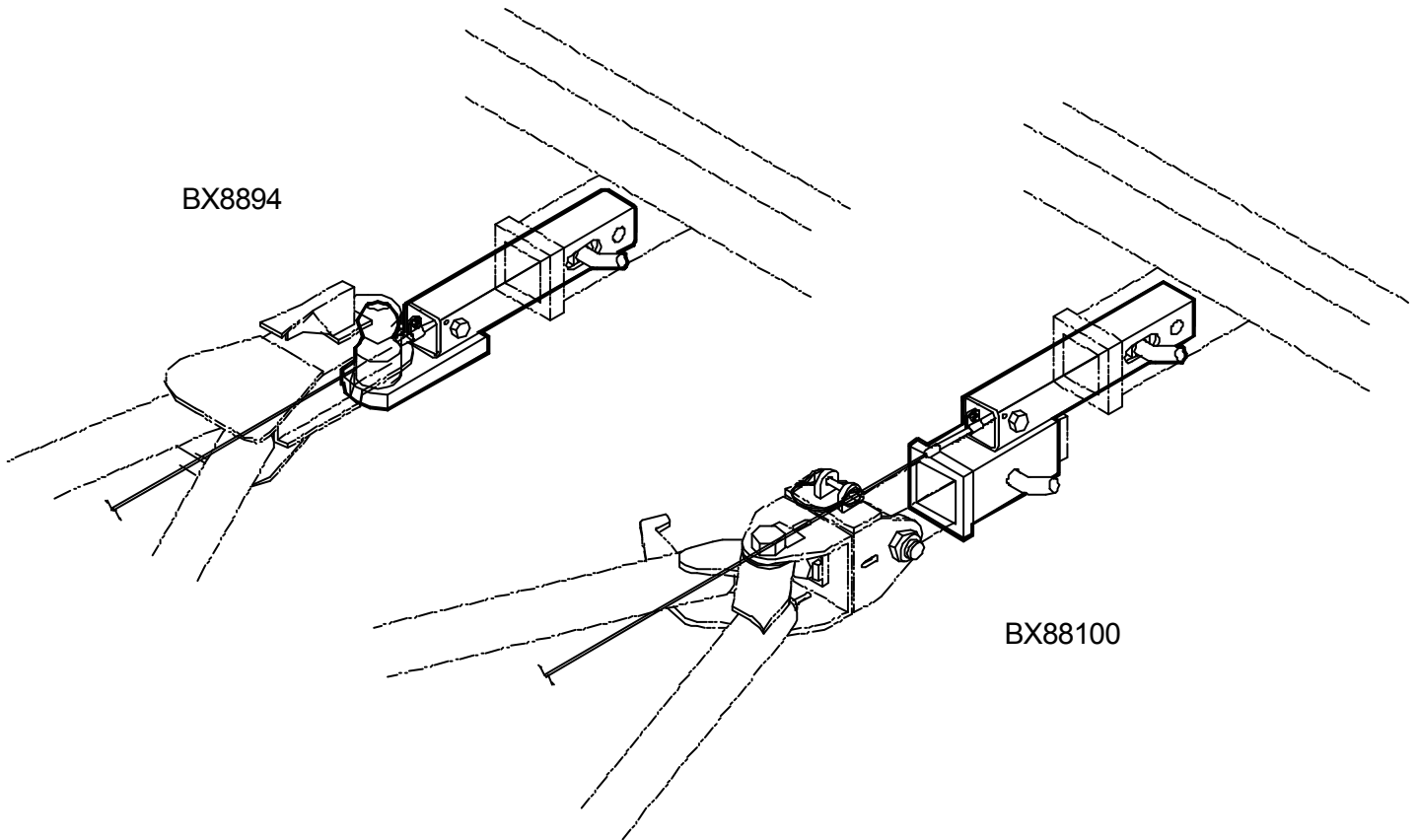




AutoStop™



OPERATOR, PARTS & INSTALLATION MANUAL

BX8894, BX88100 AutoStop™

Automatic

TOWING PRODUCTS DIVISION

REQUIREMENTS

REQUIREMENTS FOR PROPER OPERATION

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

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

The AutoStop needs a level push on the ball mount tube to operate properly. This requires that the height of the receiver tube be adjusted rather than the height of the ball as happens normally.

There are several options available if you need to adjust the receiver tube height. A two (2) inch drop can be achieved by welding another receiver tube under the existing receiver tube. (Figure 1) A six (6) inch drop receiver is available that pins into the existing receiver. (Figure 2)

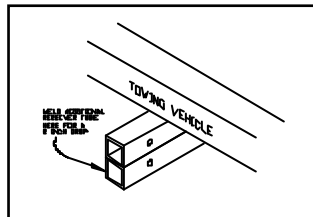


Figure 1

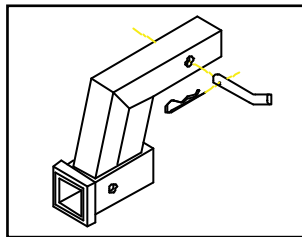


Figure 2

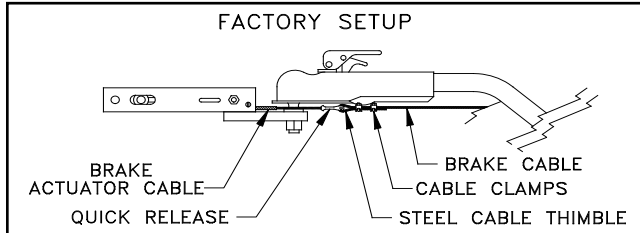


Figure 3

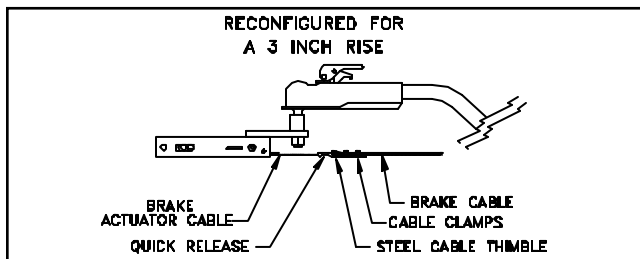


Figure 4

The AutoStop shown in Figure 3 is set up as it comes from the factory.

The AutoStop can be reconfigured to give a three (3) inch rise as shown in Figure 4.

NOTE: *If this configuration is used, the internal parts will need to be rotated so that the actuator cable still protrudes from the lower driver's corner of the AutoStop. See Disassembly / Assembly instruc-*

tions Page 5-8.

Combining the drop receiver and a rise in the Au-

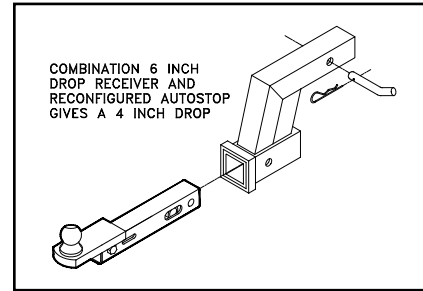


Figure 5

toStop will give a four (4) inch drop. (Figure 5)

- B. You may use any conventional style tow bar with the hitch ball at the towing vehicle. (No reversed tow bars).
- 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 hitch ball, the receiver hitch, the receiver cross pin, the safety chains, or the AutoStop.

NOTE: *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.*

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.
- 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

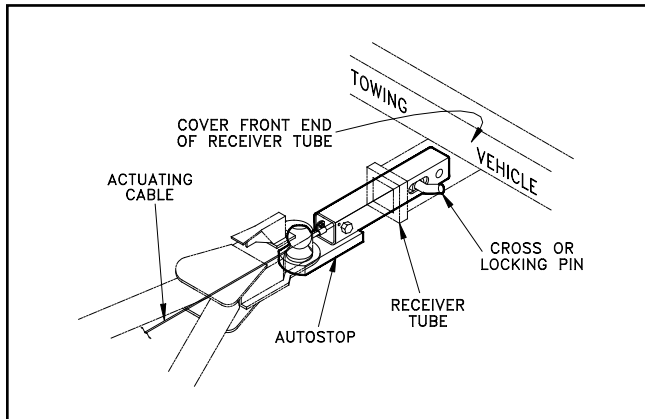


Figure 6

tight or is hanging up on one of the towing components.

MECHANICAL INSTALLATION

1. Insert the AutoStop into the receiver tube **with the actuating cable on the drivers side of the opening.** (Figure 6) Align the holes and insert the cross pin and safety clip (or locking pin). 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. **For coupler style tow bars** install a hitch ball of the matching size for the tow bar coupler, preferably using a one inch diameter shank and a one inch nut and lock washer. Do not use a hitch ball that has a bolt which threads into the ball. For added safety, it is recommended that after tightening the hitch ball nut to the required torque, drill the hitch ball nut and install a cotter key. **Note: Be sure 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 cross 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.

5. 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

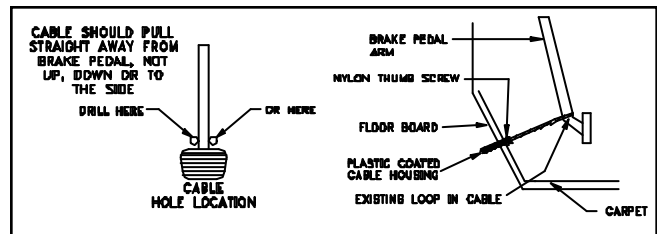


Figure 7

steering column. Mark the spot on the carpet with chalk where the cable should pass through the floor after making a loop around the brake pedal arm. (Figure 7) Measure the distance and direction and confirm that a drilled hole will not interfere with anything as stated in Step 4. When selecting the location for the hole, it should be positioned so the cable is pulling straight away on the brake pedal arm, not to either side and not up or down. (Figure 7)

6. 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 slightly, redrill and seal the previous hole with a rivet or sealant.

INSTALLATION

- 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. Feed the cable housing through the carpet and hole in the floor following your selected route as mentioned above. When installed properly, the nylon thumb nut 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. If the cable housing runs through the bumper or the bumper skirt, drill a 5/16 inch hole there to align the cable as previously mentioned with the actuat-

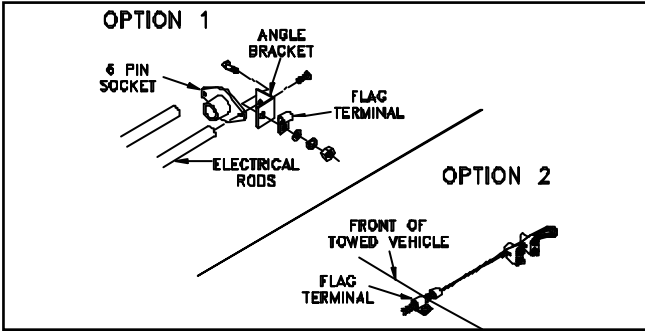


Figure 25

ing cable. The cable housing should protrude a 1/2 inch beyond the bumper, or bumper skirt or where ever the flag terminal is mounted, pointing directly at the hitch ball. Retract the cable and cut off any excess cable housing with side cutters.

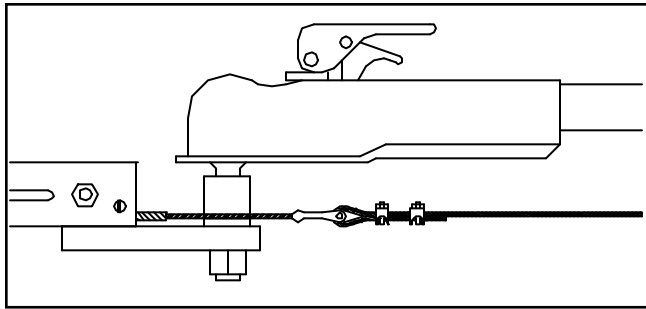


Figure 8

Fig.25

- Lubricate the cable with silicon spray and feed the cable back through the cable housing, and secure the loop around the brake pedal arm allowing the

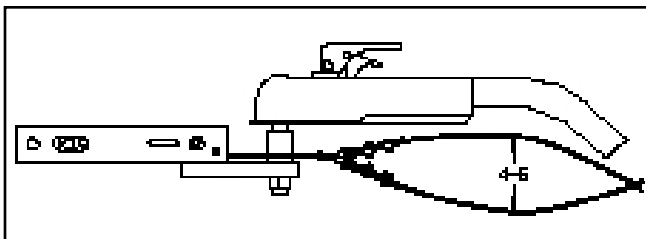


Figure 22

cable to feed directly and straight into the cable housing. Use wire ties or wrap with electrical tape to insure that the loop around the pedal arm does not loosen when the brake pedal is being used. If alignment is proper, the cable will feed into the cable housing when the brake pedal is depressed.

- Attach the cable thimble into the clevis on the AutoStop actuating cable with the quick release pin. (Figure 3 or 4) Run the loose end of the pedal cable through the clevis and thimble and secure this loop 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 to five (4-5) inches of vertical play in the cable before the towed vehicle's braking lights come on. (Fig. 22) Cut off and discard any excess cable. **Recheck this adjustment after a short 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

In Steps 4 and 7 when routing the housing, do not make a turn tighter than a four (4) inch radius. If you need to make a bend in the housing you will need to anchor the housing in the middle of the bend. There are plastic cable ties and two clamps and stove bolts 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.

ELECTRICAL INSTALLATION

If the towed vehicle's brake lights will work with the key off, there is a possibility that the towed vehicle's battery may be drained after towing as the brake lights will be activated each time the brake pedal is

INSTALLATION / MAINTENANCE

depressed by the AutoStop. To keep this from happening we have included electrical parts with the kit to automatically disconnect the brake lights when the key is off. The only change you will notice to the towed vehicle is that the brake lights on the car will only be activated by the brake pedal when the ignition is in the "on" position. We also include in the kit a lighted switch that should be installed in the dash of the towing vehicle and will light up when the brake pedal in the towed vehicle is pulled on by the AutoStop. If the operator is distracted by the light, the switch can be turned off. (Figure 9)

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 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, you may want to splice wire onto the wires you cut to give yourself working room. The black wire and butt connectors supplied can be used for this.
3. Strip one end of the yellow wire and twist it together with the wire coming from the brake pedal 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 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 or another convenient place, locate a power wire that is "hot" only when the ignition switch is on. Cut a piece of black wire to reach from the "hot" wire to the relay. Use a butt connector to splice into the "hot" wire and crimp a spade terminal on the other end and slide it over the remaining terminal on the relay labeled "86".
7. Route the yellow wire from the relay through the engine compartment of the car, along the bottom of the coach and into the dash of the coach. You will need to provide a disconnect between the car and the coach if you don't have any extra terminals in the plug you are currently using between the coach and the car. Tie the wire to the frame of the coach with cable ties or other suitable means.
8. Locate a suitable place in the dash for the switch. With the switch mounted, cut the yellow wire to length, strip and crimp on a female spade terminal, and plug the spade into the switch on the terminal marked "3".
9. Locate a bolt to use as a ground. Cut a piece of the black wire long enough to reach from the switch to the bolt. Strip both ends of the black wire and crimp a ring terminal on one end and a female

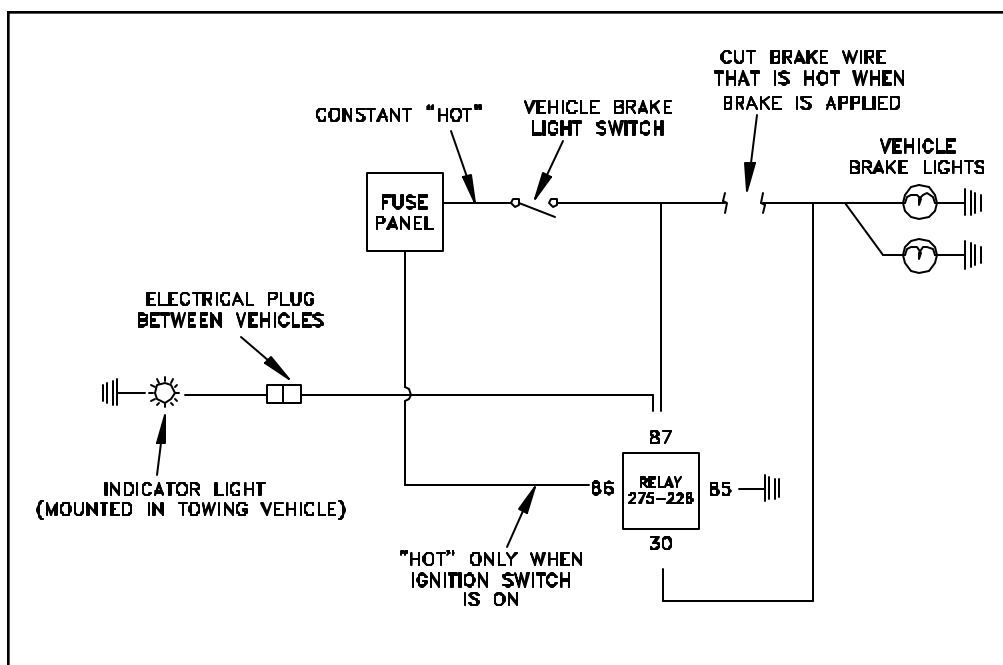


Figure 9

DISASSEMBLY / ASSEMBLY INSTRUCTIONS

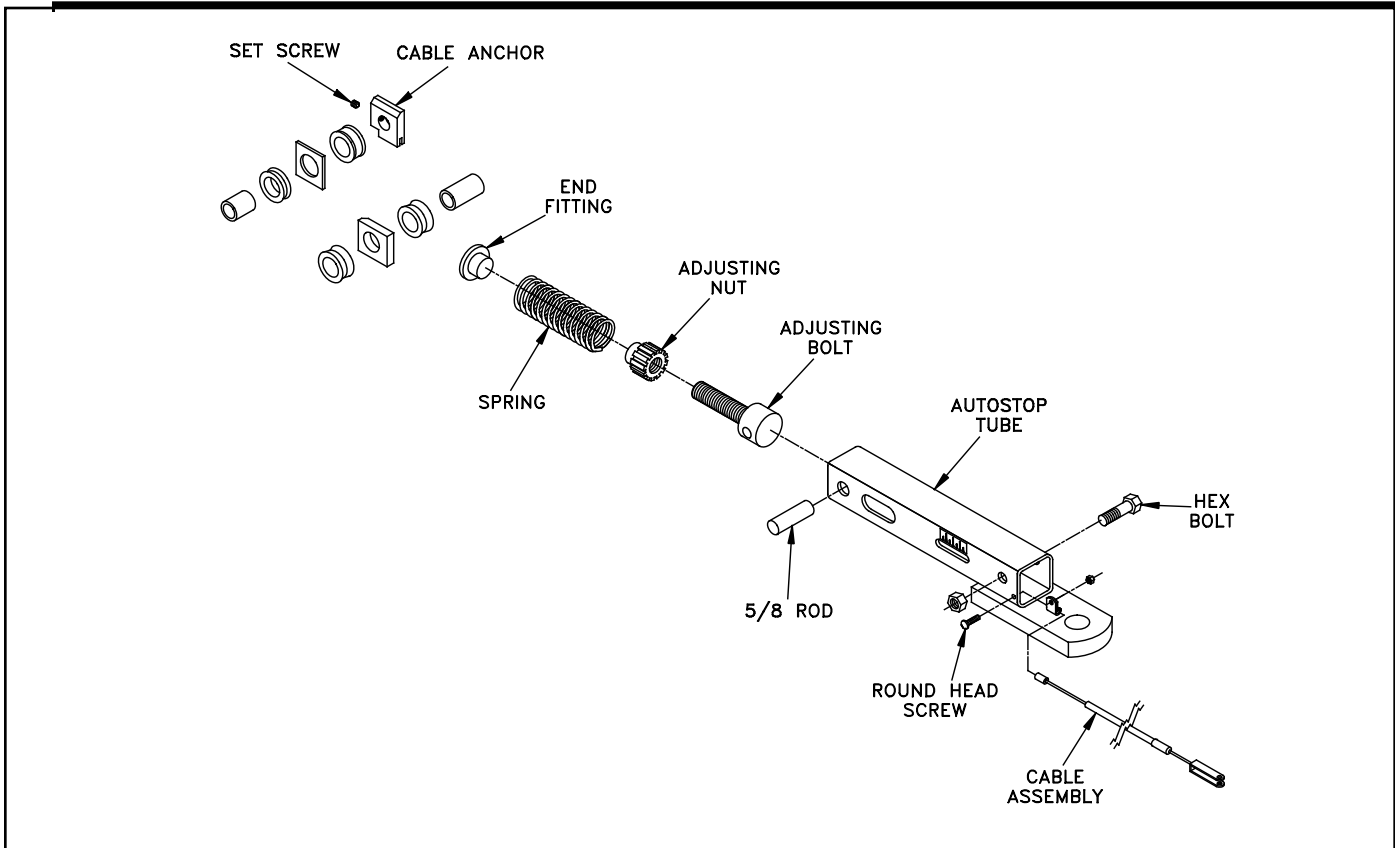


Figure 10

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 switch labeled "2".
NOTE: The terminal marked "1" will not be used.

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

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.

1. Remove the AutoStop from the receiver hitch. Remove the hex bolt. (Figure 10)

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.

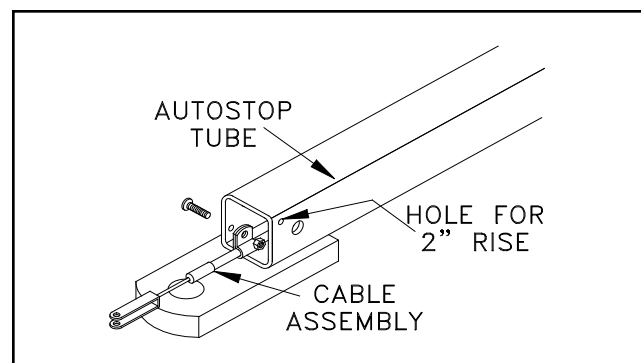


Figure 11

ASSEMBLY INSTRUCTIONS

5. Clean all parts with a mild solvent such as WD-40 and be sure to dry all parts thoroughly. Use a brush to insure the inside of the AutoStop tube is clean as well.

ASSEMBLY INSTRUCTIONS

1. Slide the cable assembly back into the AutoStop tube and secure the cable clamp with the round head screw and hex nut. (Figure 11) Leave approximately one inch of cable sheathing extending outside of the AutoStop tube. **NOTE:** As described earlier on page 1, your AutoStop can be configured to give a 2 inch rise. If this is necessary, the AutoStop tube must be rotated 180 degrees and the cable assembly attached to the opposite hole. Remember, the cable assembly MUST protrude out of the lower, driver side of the AutoStop tube when in use.
2. Lay the AutoStop tube on a table or bench with the tongue flat side towards you. (Figure 13) Thread the adjusting nut onto the adjusting bolt half 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 nut. **NOTE:** If you are configuring the AutoStop for a 2 inch rise as described on page 1, flip the AutoStop tube over so the tongue flat side is away from you before sliding in the shock absorber.
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 the chamfer on the bottom right side. Place on top of the spacer the other pulley with the beveled edge on top.
4. 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 14) Insert the short bushing into the pulley and the 5/8 rod into the bushing. (Figure 14)

5. Place the pulley divider on the pulley. (Figure 15) **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

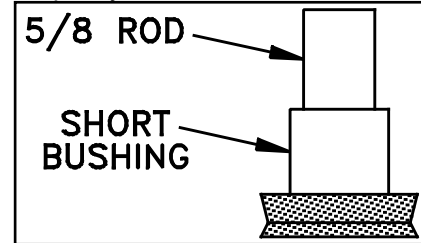


Figure 14

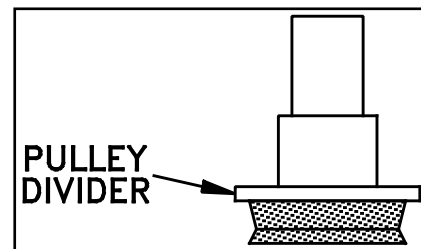


Figure 15

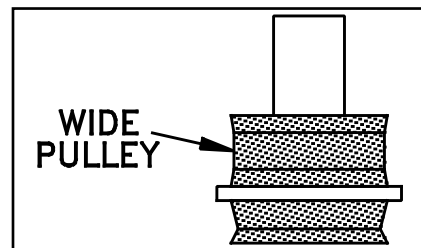


Figure 16

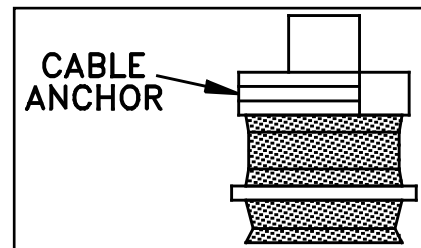


Figure 17

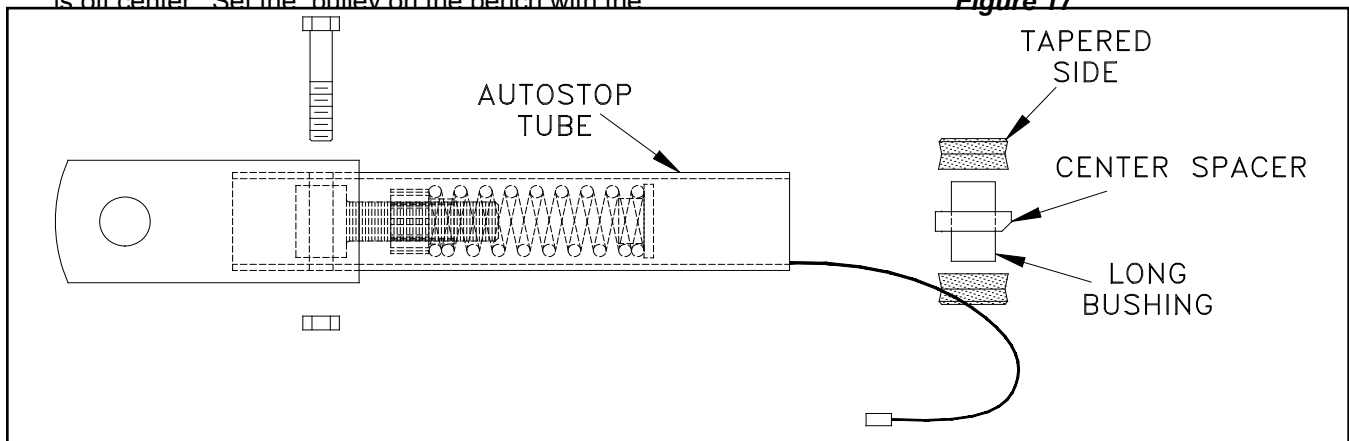


Figure 13

ASSEMBLY / ADJUSTING INSTRUCTIONS

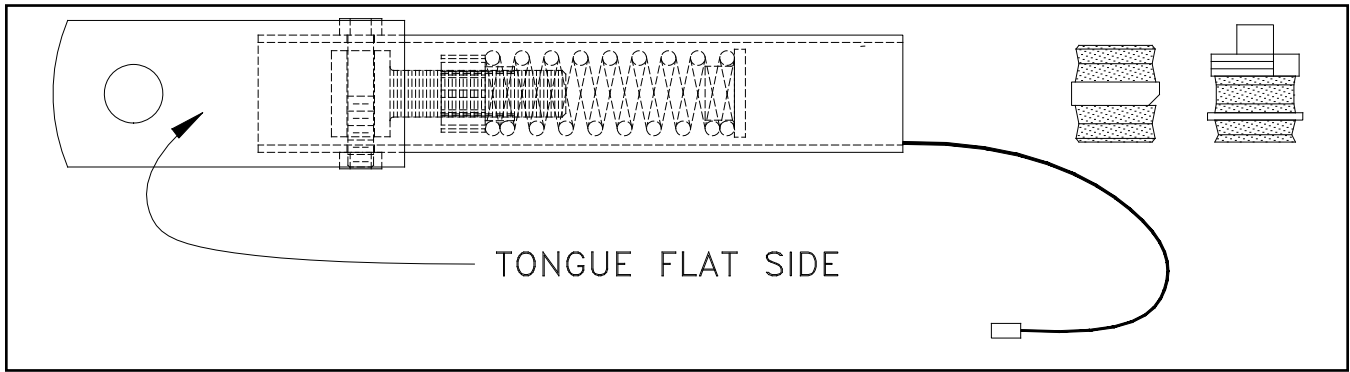


Figure 18

vertical, to keep the cable from jumping between pulleys.

6. Set the wide pulley on top of the pulley divider. It is symmetrical so it can be put on either way. (Figure 16) 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 17)
7. Set the movable pulley assembly next to the Auto-Stop tube, and next to it place the stationary pulley assembly. (Figure 18) 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 18)
9. Refer to (Figure 19) 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.

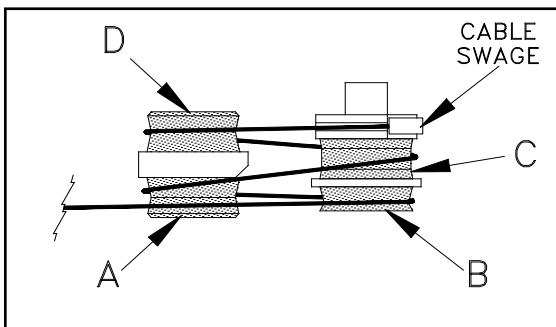


Figure 19

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.

<p>Suggested initial preload ranges are:</p> <p>1/4" - Towed vehicle under 2,000 lbs.</p> <p>1/2" - 2,000 to 3,500 lbs.</p> <p>3/4" - 3,500 to 5,000 lbs.</p> <p>1" - Maximum preload</p>
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Figure 24

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

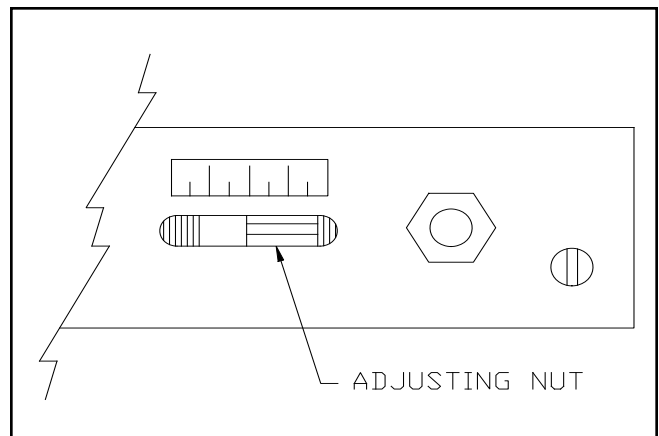


Figure 23

ASSEMBLY INSTRUCTIONS

initial setting, adjust to your driving preference if needed. The location of the adjusting nut is shown in Figure 23. The initial preload ranges are listed in Figure 24.

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 20) When the second set of pulleys start into the tube, stop and remove the

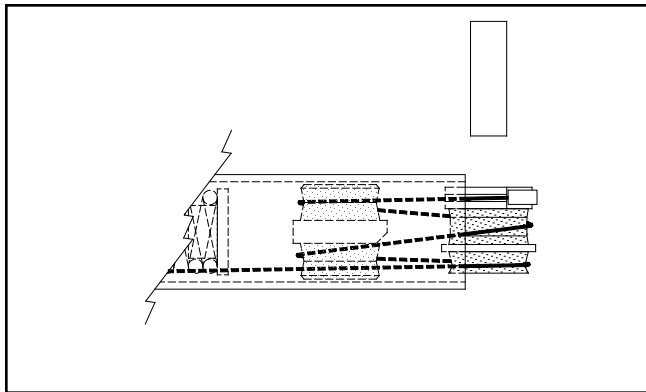


Figure 20

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 21) **NOTE:** Be sure to keep the 5/8 rod centered in the AutoStop tube while tightening the set screw.

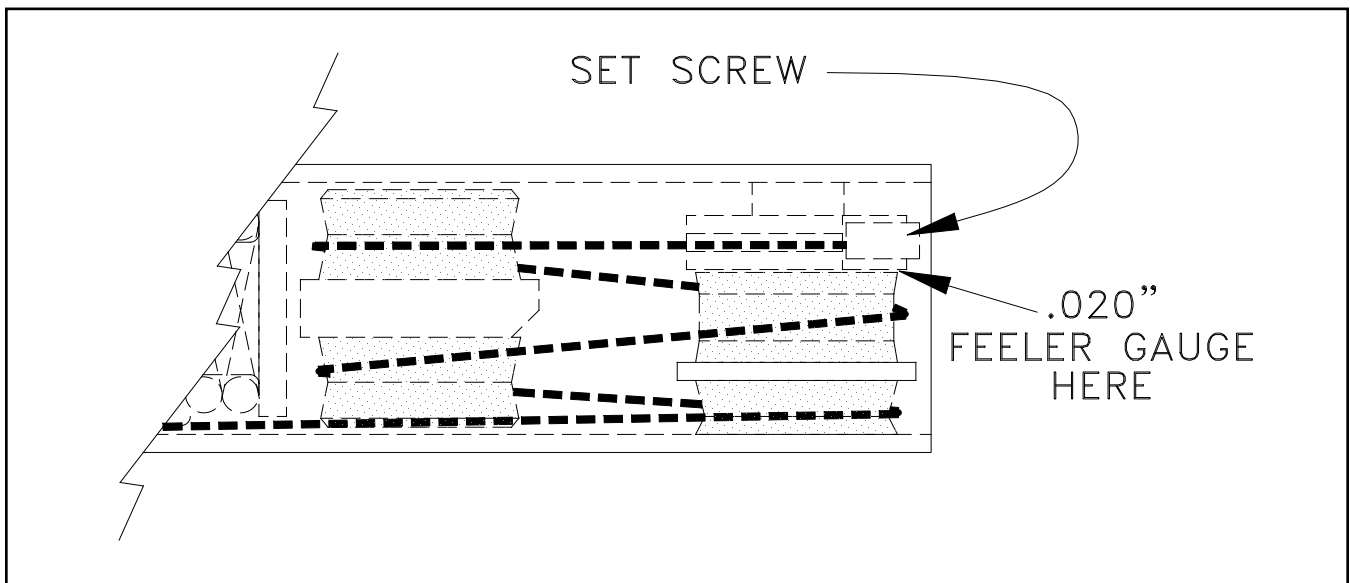
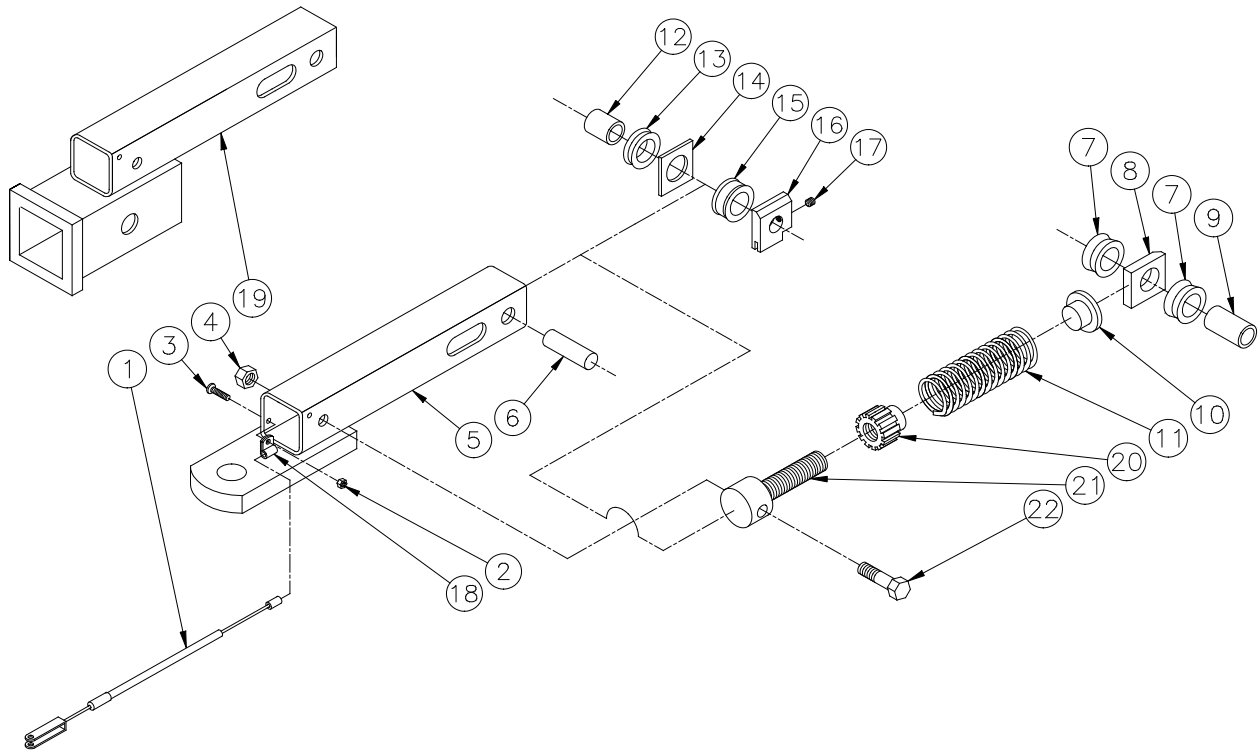
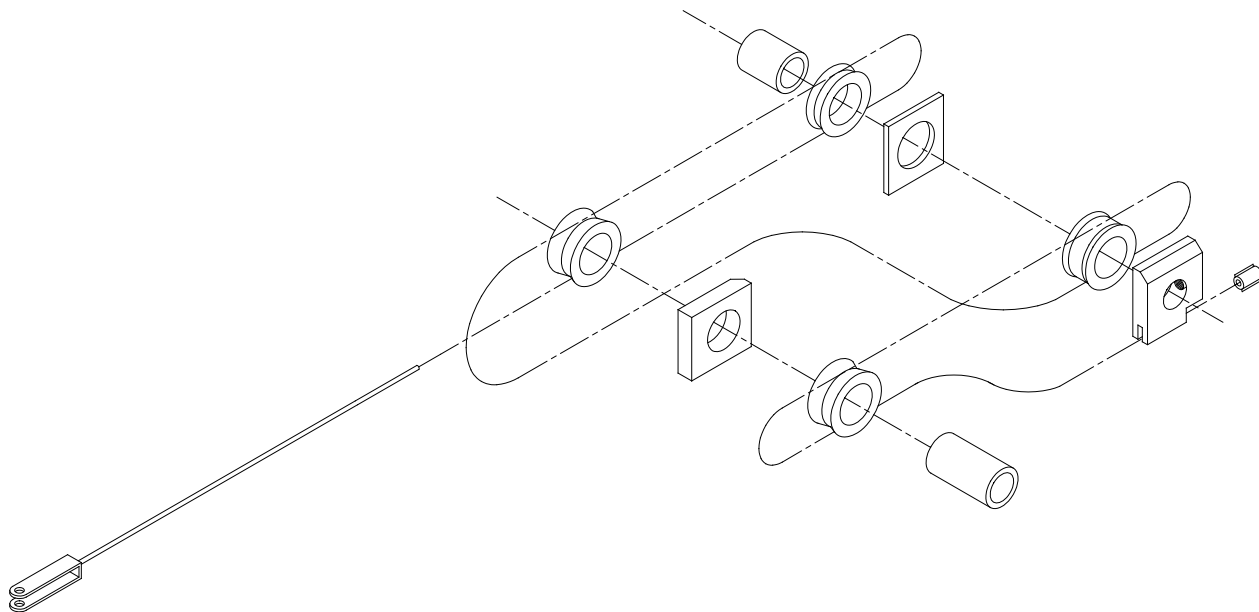


Figure 21

REPLACEMENT PARTS



CABLE ROUTING



REPLACEMENT PARTS

Parts List

Ref. No.	Qty.	Part No.	Description
1	1	62-3161	Receiver Cable Assembly
2	1	202-0047	10-32 Hex Nut
3	1	201-0192	10-32 x 1/2 Round Head Screw
4	1	202-0110	7/16-20 Hex Jam Nut
5	1	299-0259	Ball Mount, Spring Autostop, Chrome, BX8894
6	1	229-0369	Rod, 5/8 x 2, Autostop
7	2	229-0356	Pulley, Shock Absorber, Autostop
8	1	299-0382	Flat, Spacer, Narrow, Autostop
9	1	299-0384	Bushing, Front, Autostop
10	1	207-0842	Cap, Spring, Autostop
11	1	222-0076	Spring, Comp., Autostop
12	1	299-0385	Bushing, Rear, Autostop
13	1	229-0354	Pulley, Narrow Rear, Autostop
14	1	299-0289	Flat, Pulley Divider, Autostop
15	1	299-0383	Pulley, Front, Med., Autostop
16	1	299-0286	Cable Anchor, Autostop
17	1	201-0150	1/4-20 x 3/8 Knurled Set Screw
18	1	294-0811	5/16 Metal Cable Clamp
19	1	299-0277	M H Universal A-Stop, Chrome
20	1	299-0255	Nut, Adjusting, Autostop, ZP
21	1	299-0256	Bolt, Adjusting, Autostop, ZP
22	1	201-0366	7/16-20 x 2 1/4 Hex Head Bolt, Grd. 5

Parts not shown:

Ref. No.	Qty.	Part No.	Description
23	2	225-0052	Clip, 3/32 Wire Rope
24	1	229-0362	3/32 SS Cable Thimble
25	1	229-0363	Ring Detent Pin, 3/16 x 1
26	3	294-0811	5/16 Metal Cable Clamp
27	3	201-0192	10-32 x 1/2 Round Head Screw
28	3	202-0047	10-32 Hex Nut
29	1	290-0324	Red Cap, .207 ID x 3/4
30	2	294-0250	Butt Connector, 16-14 Ga.
31	3	294-0187	Ring Terminal. 5/16 Stud, 16-14 Ga.
32	8	294-0518	Term. Coupler, Female, 16-14 Ga.
33	1	294-0813	Indicator Light
34	1	294-0729	Automotive Relay
35	1	62-3366	Brake Cable Assembly, Coated
36	1	194-0140	65 Ft Coil 16 Ga. Yellow Wire
37	1	194-0139	4 Ft 14 Ga. Black Wire
38	4	290-0159	13" Nylon Cable Tie
39	2	290-0131	5 7/8" Nylon Cable Tie
40	1	101-6377	Bracket, Cable Housing Mount
41	1	201-0050	1/4-20 x 3/4 Hex Bolt, Grd.5, ZP
42	1	202-0001	1/4-20 Hex Nut
43	1	203-0008	1/4 Lock Washer, ZP
44	1	203-0001	1/4 Flat washer, ZP
45	1	294-0807	Mini Fuse Tapper



TO BE VALID, WARRANTY CARD MUST BE COMPLETED IN ITS ENTIRETY BY AN AUTHORIZED DISTRIBUTOR OR DEALER AND SENT TO AUTOMATIC EQUIPMENT MFG. CO., PENDER, NEBRASKA. FAILURE TO DO SO WILL VOID THE WARRANTY.

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.

**BX8894, BX88100
AutoStop™**

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