

*Section 06-05: Brake System, Parking*  
*DIAGNOSIS AND TESTING*

*1997 Aerostar, Ranger Workshop Manual*


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## **Inspection and Verification**

Check operation of the parking brake with vehicle on a hoist and parking brake fully released. If there is any slack in the cables or if the rear brakes drag when the wheels are turned, adjust as required. Check for any cable damage and replace as necessary.

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**Symptom Chart — Parking Brake System****PARKING BRAKE SYSTEM**

Condition	Possible Source	Action
<ul style="list-style-type: none"> <li>Squeals or Groans</li> </ul>	<ul style="list-style-type: none"> <li>Glazed linings.</li> <li>Misaligning of parts.</li> <li>Dirt in brake drum.</li> </ul>	<ul style="list-style-type: none"> <li>REMOVE glaze from linings using sandpaper or emery cloth.</li> <li>CORRECT misalignment with correct installation. REFER to <a href="#">Section 06-02</a>.</li> <li>REMOVE brake drum and CLEAN OUT lining dust and dirt.</li> </ul>
<ul style="list-style-type: none"> <li>Scraping Noise</li> </ul>	<ul style="list-style-type: none"> <li>Worn out lining part of rear brake shoe and lining.</li> <li>Bent or misaligned shoe part of rear brake shoe and lining.</li> </ul>	<ul style="list-style-type: none"> <li>CHECK for lining worn down to rivets — REPLACE shoes if necessary.</li> <li>CHECK for misaligned shoe, rubbing against brake drum. REPLACE shoes if necessary. REFER to <a href="#">Section 06-02</a>.</li> </ul>
<ul style="list-style-type: none"> <li>Clicks</li> </ul>	<ul style="list-style-type: none"> <li>Excessive clearance.</li> <li>Eccentric or wobbling brake drum. .</li> <li>Excessive linkage friction.</li> </ul>	<ul style="list-style-type: none"> <li>CHECK parking brake shoe and lining installation specification.</li> <li>INSPECT drum runout.</li> <li>CHECK linkage pivot points for rust, binding, or lack of lubrication.</li> </ul>
<ul style="list-style-type: none"> <li>Brake Does Not Apply or Hold</li> </ul>	<ul style="list-style-type: none"> <li>Excessive clearance prevents complete brake application.</li> <li>Grease soaked linings.</li> <li>Excessive linkage friction.</li> <li>Worn out linings.</li> </ul>	<ul style="list-style-type: none"> <li>CHECK brake cable for slack. REFER to <a href="#">Pinpoint Test A</a>.</li> <li>REPAIR source of leak, INSTALL new linings. REFER to <a href="#">Section 06-02</a>.</li> <li>CHECK for linkage binding, and misalignment. LUBRICATE all friction points.</li> <li>REPLACE rear brake shoe and lining. CHECK brake drum for scoring and REPLACE if necessary. REFER to <a href="#">Section 06-02</a>.</li> </ul>
<ul style="list-style-type: none"> <li>Excessive Lining Wear</li> </ul>	<ul style="list-style-type: none"> <li>Brake drag.</li> <li>Rough brake drum surface.</li> </ul>	<ul style="list-style-type: none"> <li>CHECK parking brake cables or binding condition. INSPECT for broken or missing springs.</li> <li>SMOOTH brake drum with emery paper, or REPLACE brake drum, if brake drum is badly scored.</li> </ul> <p> <b>CAUTION: Brake drum to be replaced if inside diameter exceeds 229.36mm (9.030 inches).</b></p>

	<ul style="list-style-type: none"><li>• Several dynamic stops.</li></ul>	<ul style="list-style-type: none"><li>• INSPECT the brake shoe and lining. REPLACE as necessary.</li></ul>
<ul style="list-style-type: none"><li>• Parking Brake Will Not Release</li></ul>	<ul style="list-style-type: none"><li>• Brake drag.</li><li>• Worn or damaged parking brake control.</li></ul>	<ul style="list-style-type: none"><li>• REFER to <a href="#">Pinpoint Test B</a>.</li></ul>

## Pinpoint Tests

### PINPOINT TEST A: PARKING BRAKE WILL NOT APPLY

#### A1 CHECK PARKING BRAKE CONTROL

- Operate the parking brake control.

Does parking brake control operate smoothly?

Yes	No
GO to <a href="#">A2</a> .	SERVICE binding condition in parking brake control and RETEST system.

#### A2 CHECK PARKING BRAKE CABLES

- Raise and support vehicle.
- Inspect for broken or binding parking brake cables.

Is there a parking brake cable concern?

Yes	No
SERVICE parking brake cables as required. RETEST system.	GO to <a href="#">A3</a> .

#### A3 CHECK PARKING BRAKE COMPONENTS

- Raise and support the vehicle.
- Remove the brake drums.
- Operate the parking brake control and observe the parking brake components.

Do the parking brake components operate?

Yes	No
CHECK the parking brake shoe and lining installation specification. REFER to the procedure in this section. RETEST system.	SERVICE worn or damaged parts. RETEST the system.

## PINPOINT TEST B: PARKING BRAKE WILL NOT RELEASE

### B1 CHECK PARKING BRAKE CABLE

- Release parking brake control.
- If the vehicle can't be moved, raise and support the vehicle.
- Release parking brake cable tension.
- Remove brake drum or rear disc brake rotor and disconnect parking brake rear cable and conduit.

Does the parking brake release?

Yes	No
GO to <a href="#">B2</a> .	SERVICE the worn or damaged rear brake component. RETEST the system.

### B2 PARKING BRAKE CABLE CHECK

- Release the parking brake control.


Does the parking brake control release?

Yes	No
INSPECT parking brake cable for binding. SERVICE as necessary. RETEST system.	SERVICE the worn or damaged parking brake control. RETEST the system.

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## Control, Aerostar

### Removal

1. Remove the front and inboard rear screws attaching the boot to the floor. Pivot boot back on hinge and remove two rear screws. Remove the boot.
2. Disconnect the parking brake indicator light switch connector.
3. Place the control in the "released" position and insert the lock pin in the parking brake control (2780). Refer to Adjustments, [Cable Tension Release](#) in this section for procedure.
4.  **CAUTION: Do not remove the steel lock pin from the parking brake control until the cable is connected to the control assembly. Pin removal releases the tension in the ratchet wheel causing the spring to unwind and release tension. If the pin is prematurely removed, spring tension in the parking brake control must be reset. Refer to Adjustments, [Cable Tension, Resetting](#) in this section.**

Remove the cable anchor pin from the pivot hole in the control assembly ratchet plate. Guide the front parking brake cable and conduit (2853) from the parking brake control.

5. Remove the bolts retaining the parking brake control to the floor panel. Remove the parking brake control.

### Installation

1. Route the front parking brake cable and conduit around the control assembly pulley and insert the cable anchor pin in the pivot hole in the ratchet plate.
2. Position the parking brake control with the front parking brake cable and conduit attached to it on the floor panel. The floor support is installed between the parking brake control and the floor. Install and tighten the retaining bolts.
3. Connect the parking brake light switch connector.
4. Remove the lock pin from the parking brake control to reset cable tension. Remove self-adjusting pawl lockout pin also, if one is installed.
5. **NOTE: For proper adjustment procedure, both pins must be removed from the parking brake control.**

Position the boot over the parking brake control. Install and tighten the screws.

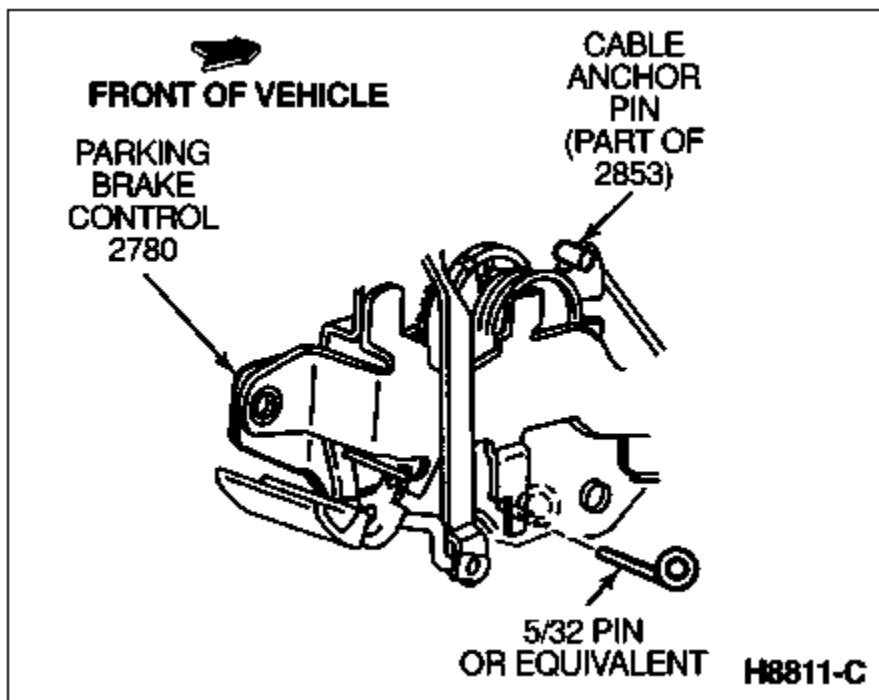
6. Apply and release the parking brake control several times. Make sure the parking brakes are applied and released and not dragging. Make sure the brake warning lamp is illuminated when the parking brake is applied.
-



## Control, Ranger

### Removal

1. Remove the left cowl side trim panel (02345).
2. Disconnect the parking brake indicator light switch connector from the control assembly connector.
3. While an assistant relieves tension on the system by pulling on the parking brake intermediate cable or front parking brake cable and conduit (2853), insert a 4mm (5/32-inch) steel pin or equivalent drill bit into the hole provided in the parking brake control (2780).



4. Remove the cable anchor pin from the pivot hole in the control assembly ratchet plate. Guide the front parking brake cable and conduit from the parking brake control.
5. **CAUTION:** Do not remove the steel lock pin from the parking brake control until the cable is connected to the parking brake control. Pin removal releases the tension in the ratchet wheel causing the spring to unwind and release tension. If the pin is prematurely removed, spring tension in the parking brake control must be reset. Refer to Adjustments, [Cable Tension, Resetting](#) in this section.

Remove the screw attaching the instrument panel to the parking brake control.



6. Remove bolts retaining the parking brake control to the left side cowl and remove the parking brake control from the vehicle.

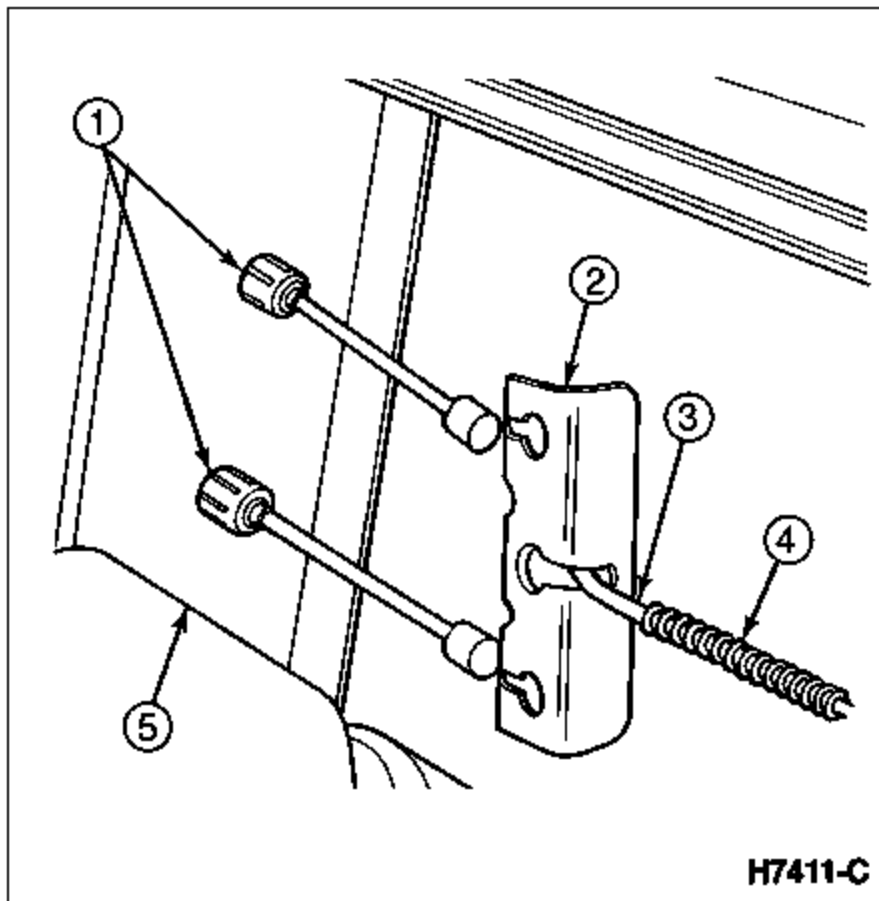
### Installation

1. Route the front parking brake cable and conduit around the parking brake control and insert the cable anchor pin in the pivot hole provided in the ratchet plate.
  2. Position the parking brake control and install the attaching bolts. Tighten bolts to 17-23 Nm (13-17 lb-ft).
  3. Install the screw attaching the instrument panel to the parking brake control.
  4. Connect the parking brake warning indicator light switch to the parking brake control connector.
  5. Carefully remove the lock pin (drill bit) from the parking brake control.
    - The system will automatically tension itself when the pin is removed.
  6. Install the left cowl side trim panel.
  7. Apply and release the parking brake several times to verify correct operation. Also, verify proper operation of the parking brake warning indicator light.
-

**Cable and Conduit, Front, Aerostar****Removal**

1. Place parking brake control (2780) in the "released" position and insert the lock pin in the control assembly. Refer to Adjustments, [Cable Tension, Release](#) in this section for procedure.
2. **NOTE: It may be necessary to loosen the fuel tank straps and partially lower the fuel tank to gain access to the cover.**

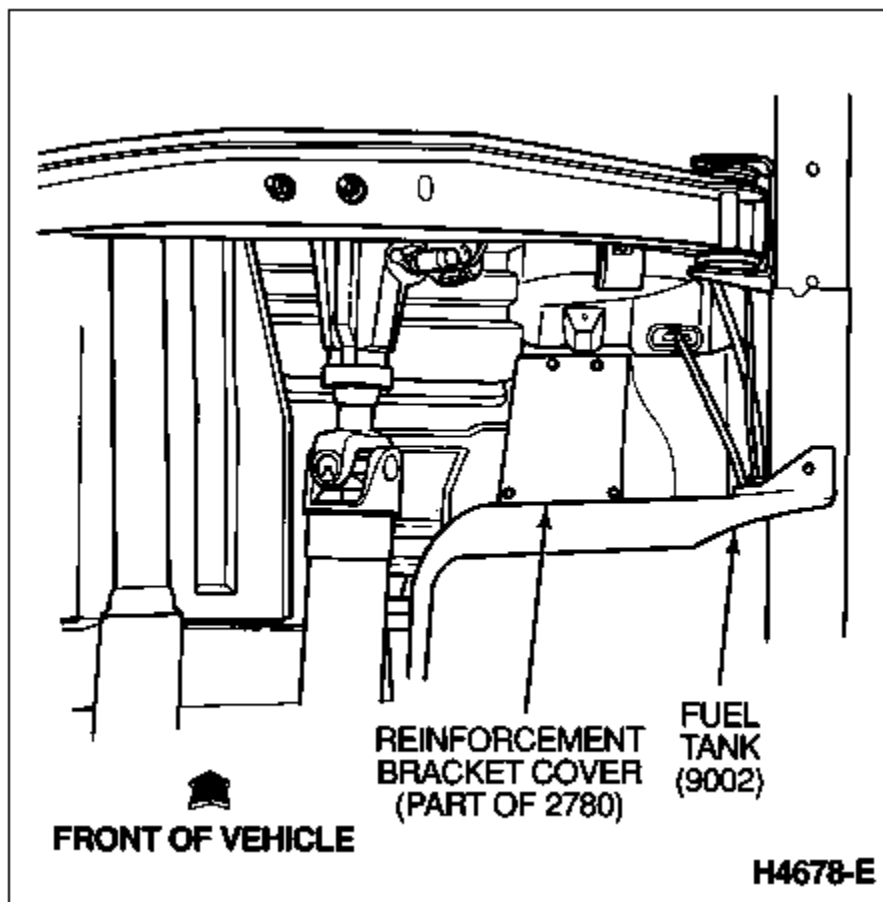
Disconnect the parking brake rear cable and conduits (2A635) from the parking brake cable equalizer (2A602). Remove the parking brake cable equalizer from the front parking brake cable and conduit (2853).



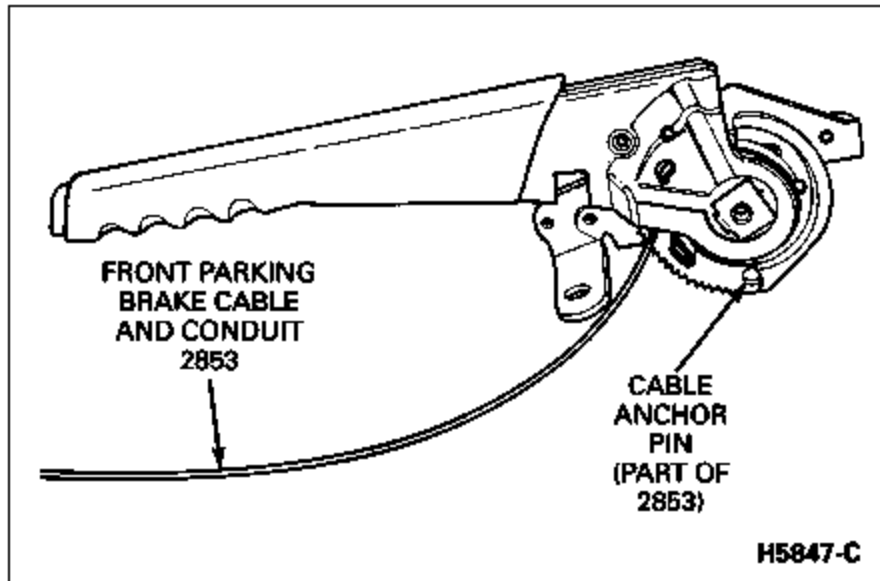
Item	Part Number	Description
1	2A635	Parking Brake Rear Cable and Conduit

2	2A602	Parking Brake Cable Equalizer
3	2853	Front Parking Brake Cable and Conduit
4	2A651	Parking Brake Equalizer Cable Spring
5	5035	Rear Frame Crossmember

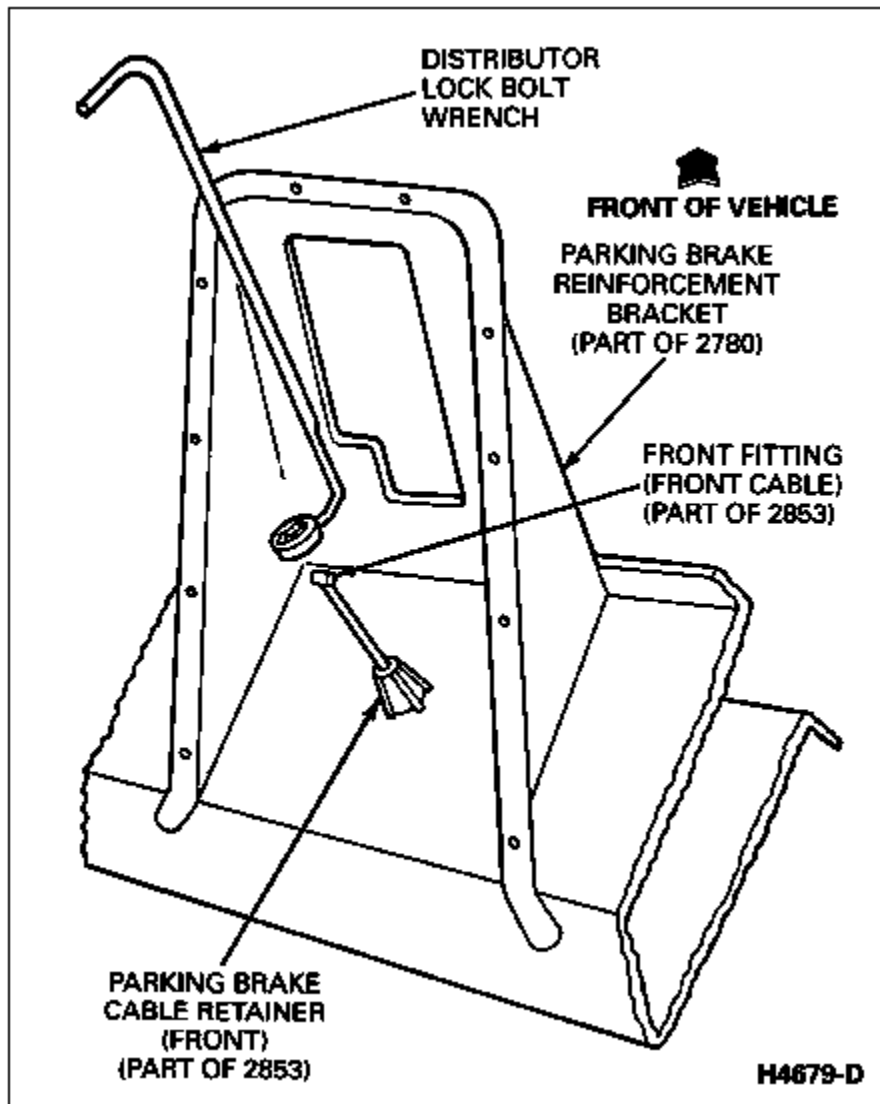
3. Remove the bolts retaining the cover to the underbody reinforcement bracket. Remove the cover.



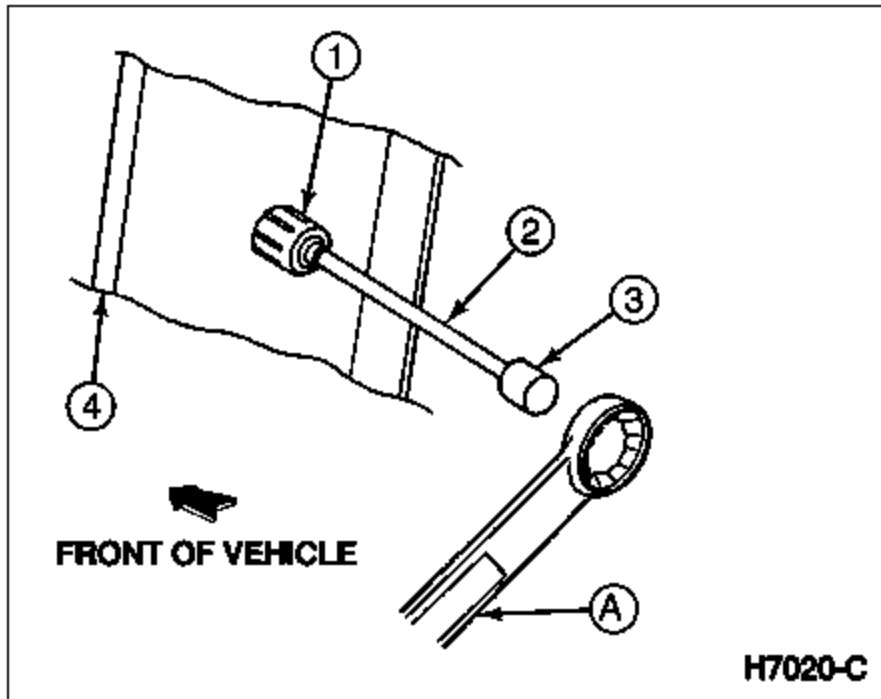
4. Remove the cable anchor pin from the pivot hole in the control assembly ratchet plate. Guide the front parking brake cable and conduit from the parking brake control.



5. Insert a 1/2-inch box end 12-point distributor lock bolt wrench over the front fitting of the front parking brake cable and conduit. Push the wrench onto the rear parking brake cable retainer (2A709) in the rear frame crossmember (5035). Compress the retainer fingers and push the rear parking brake cable retainer rearward through the hole.



6. Insert a 1/2-inch box end 12-point wrench over the rear fitting of the front parking brake cable and conduit. Push the wrench onto the rear parking brake cable retainer fitting in the rear frame crossmember. Compress the retainer fingers and push the rear parking brake cable retainer forward through the hole. Pull the cable ends through the rear frame crossmembers and remove the front parking brake cable and conduit.



Item	Part Number	Description
1	—	Parking Brake Cable Retainer (Front) (Part of 2853)
2	2853	Front Parking Brake Cable and Conduit
3	—	Rear Fitting, Front Parking Brake Cable and Conduit (Part of 2853)
4	5035	Rear Frame Crossmember
A	—	Wrench, 12-Point Box End

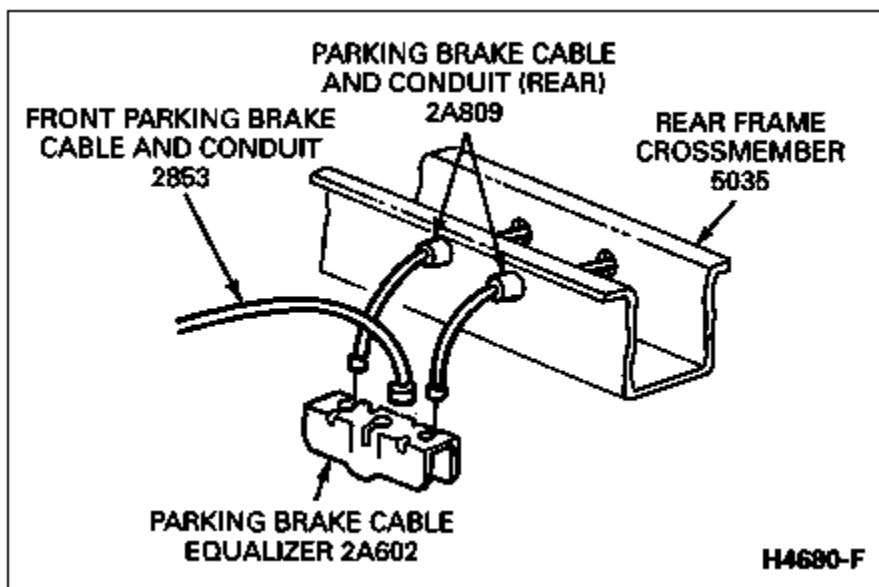
### Installation

1. Feed the front parking brake cable and conduit through the holes in both rear frame crossmembers. Push the rear parking brake cable retainers through the holes so the fingers expand over each hole.
2. Route the front parking brake cable and conduit around the control assembly pulley and insert the cable anchor pin in the pivot hole in the ratchet plate.
3. **NOTE: Before connecting front and rear cables verify that both rear cables are routed in front of the shocks and through clips.**

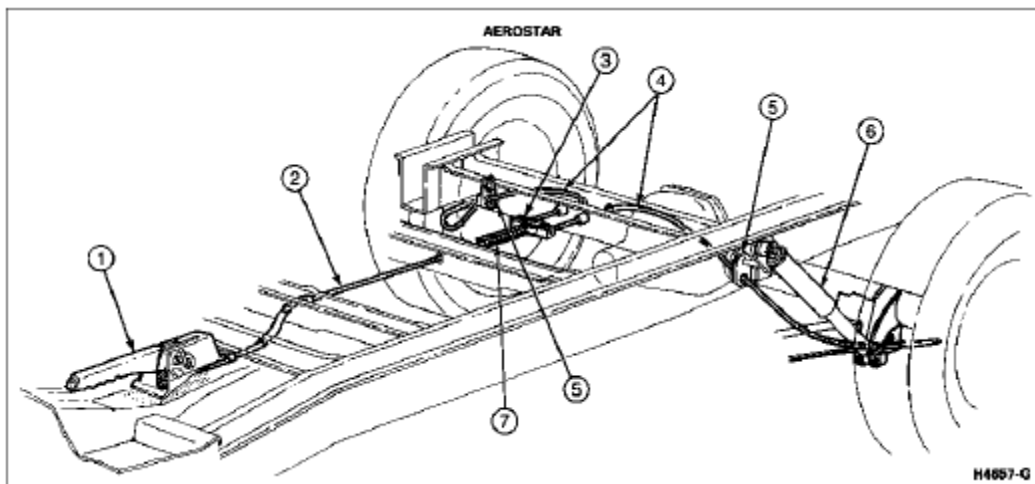
Slide rear parking brake cable retainer over rear end of front parking brake cable and conduit.

4. Connect the equalizer to front and rear cables by bending and inserting cables into equalizer then straighten.

5. Remove the lock pin from the parking brake control to apply cable tension.
6. Position the cover on the reinforcement bracket.
  - **Install and tighten the bolts AFTER visually checking to be sure the front parking brake cable and conduit is attached to the parking brake control.**
7. Position the boot over the parking brake control. Install and tighten the screws.
8. Apply and release the parking brake control several times. Make sure the parking brakes are applied, and not dragging when released.
  - Pin must be removed for proper adjustment.



### Parking Brake System, Aerostar



<b>Item</b>	<b>Part Number</b>	<b>Description</b>
1	2780	Parking Brake Control
2	2853	Front Parking Brake Cable and Conduit
3	2A602	Parking Brake Cable Equalizer
4	2A635	Parking Brake Rear Cable and Conduit
5	N805422-S100	Clip
6	18125	Rear Shock Absorber
7	2A651	Parking Brake Equalizer Cable Spring

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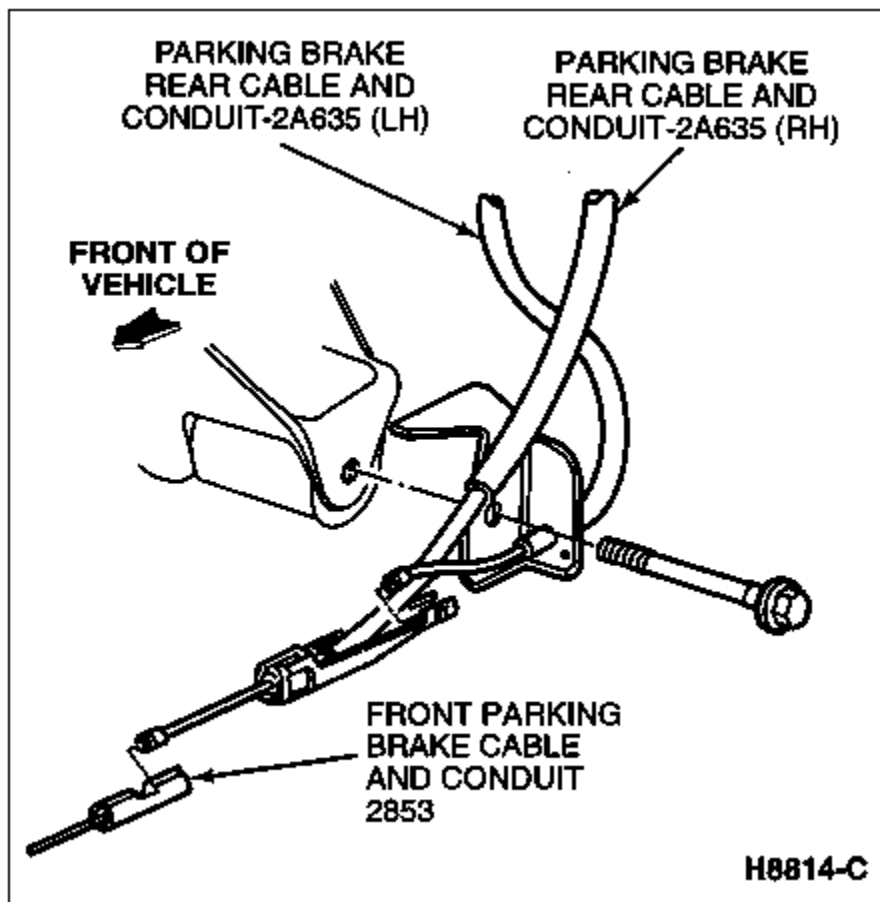


## Cable and Conduit, Front (Ranger)

### Removal

1. While an assistant relieves tension on the system by pulling on the parking brake intermediate cable or front parking brake cable and conduit (2853) insert a 4mm (5/32-inch) steel pin or equivalent drill bit into the hole provided in the parking brake control (2780).
2. Disconnect the parking brake intermediate cable or front parking brake cable and conduit from the LH parking brake rear cable and conduit (2A635).
3. To replace the front parking brake cable and conduit, remove the cable anchor pin from the pivot hole in the control assembly ratchet pin.
4. Guide the front parking brake cable and conduit from the parking brake control and disconnect it from the frame mounting bracket. Remove cable-to-frame attaching bolt, if bolt is present, and slide front parking brake cable and conduit from vehicle.

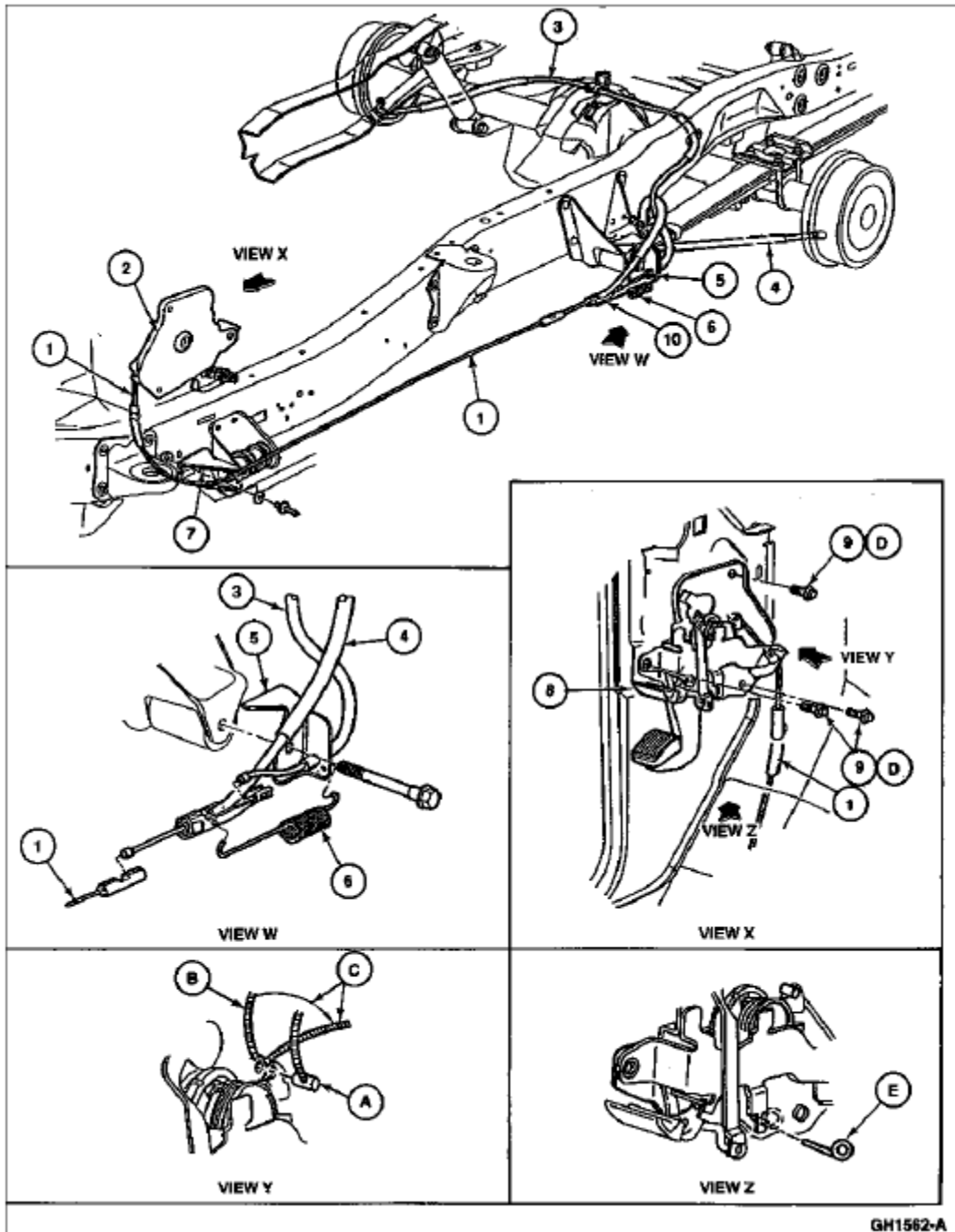
### Ranger



## Installation

1. Feed the front parking brake cable and conduit through the hole in the front frame mounting bracket. Push the retainer through the hole so the fingers expand over the hole.
2. Route the front parking brake cable and conduit around the control assembly pulley and insert the cable anchor pin in the pivot hole in the ratchet assembly.
3. If removed, install cable-to-frame attaching bolt.
4. Connect the front parking brake cable and conduit to the left rear parking brake rear cable and conduit.
5. For intermediate cable installation, feed cable through holes in center frame bracket.
6. Attach cable to front parking brake cable and conduit and to left rear parking brake rear cable and conduit.
7. Carefully remove the lock pin (drill bit) from the parking brake control.
  - a. The system will automatically tension itself when the pin is removed.
8. Apply and release the parking brake several times to verify correct operation. Also, verify proper operation of the parking brake warning indicator light.

## Parking Brake System, Ranger



Item	Part Number	Description
1	2853	Front Parking Brake Cable and Conduit
2	2780	Parking Brake Control
3	2A635	Parking Brake Rear Cable and Conduit (RH)
4	2A635	Parking Brake Rear Cable and Conduit (LH)
5	2530	Parking Brake Cable Bracket (Rear)
6	2A651	Parking Brake Equalizer Cable Spring

7	2530	Parking Brake Cable Bracket (Front)
8	—	Parking Brake Release Handle (Part of 2780)
9	N806497-S2	Bolt, Parking Brake Control-to-Cowl Side
10	2A602	Parking Brake Cable Equalizer
A	—	Parking Brake Front Cable and Conduit, Before Inserting into Ratchet Plate Pivot Hole
B	—	Parking Brake Front Cable and Conduit, After Inserting into Ratchet Plate Pivot Hole
C	—	Parking Brake Front Cable and Conduit, Installed
D	—	Tighten to 17-23 Nm (13-17 Lb-Ft)
E	—	4mm (5/32-Inch) Steel Pin or Equivalent Size Drill Bit

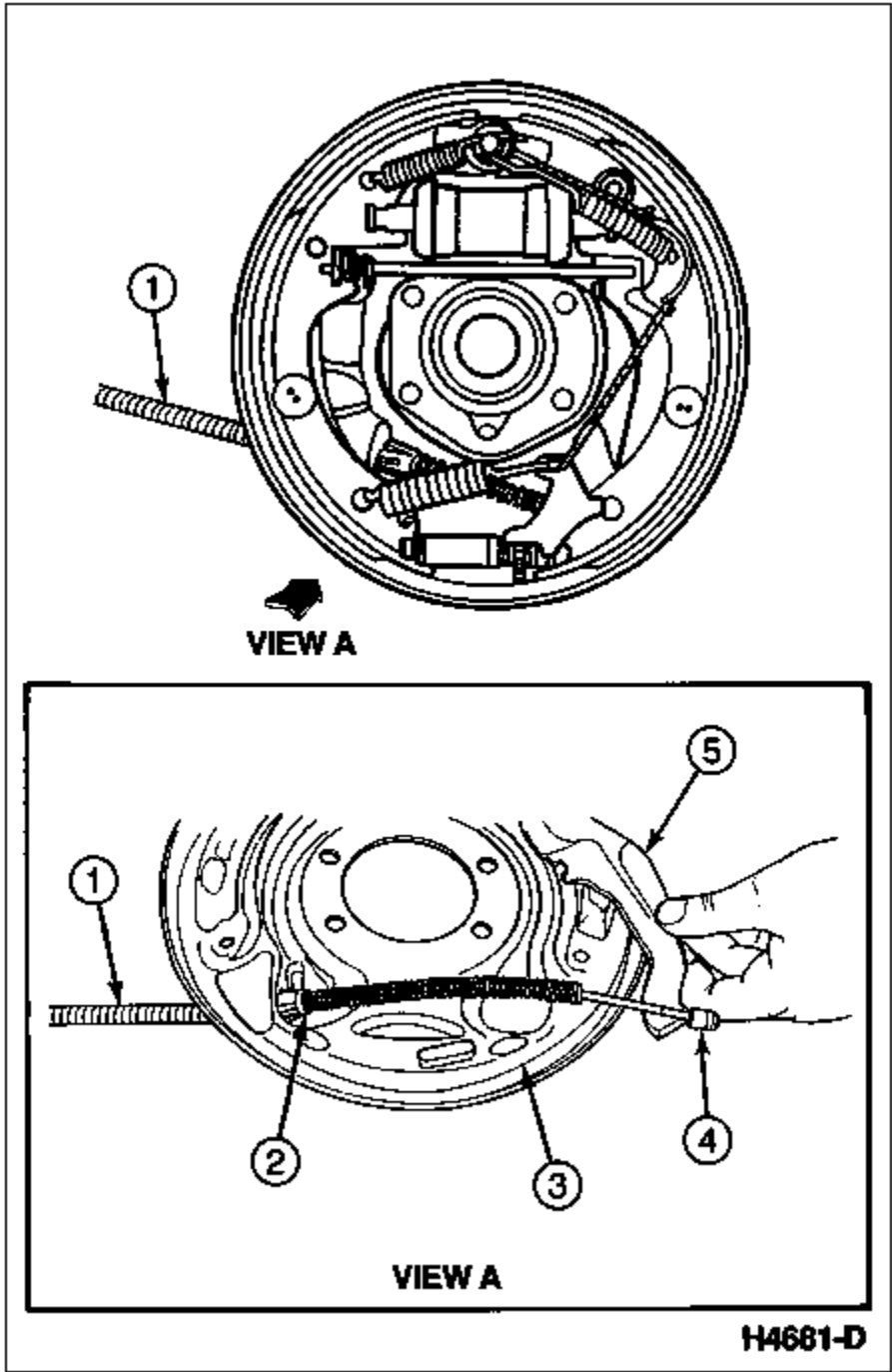
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## Cable and Conduit, Rear

### Removal

1. While an assistant relieves tension on the system by pulling on the parking brake intermediate cable or front parking brake cable and conduit (2853), insert a 4mm (5/32-inch) steel pin or equivalent size drill bit into the hole provided in the parking brake control (2780).
2. Raise the vehicle and remove the hub cap, wheel and tire, and remove the brake drum (1126).
3. Disconnect the left parking brake rear cable and conduit (2A635) from the front parking brake cable and conduit (Ranger). For Aerostar, disconnect the left and right rear cables from the parking brake cable equalizer (2A602).
4. Using a 9/16-inch flare nut wrench, compress the prongs that retain the cable housing to the rear frame crossmember (5035) (Aerostar) and pull out the parking brake rear cable and conduit and housing.
5. For Ranger, disconnect right parking brake rear cable and conduit from the parking brake cable equalizer and from the rear guide bracket.
6. At the wheel side of the brake backing plate (2211), compress the retainer fingers with a 9/16-inch flare nut wrench and remove the parking brake rear cable and conduit through the hole in the brake backing plate.
7. Lift the parking brake rear cable and conduit out of the slot in the parking brake lever (attached to the brake secondary shoe). Remove the parking brake rear cable and conduit through the backing plate hole.

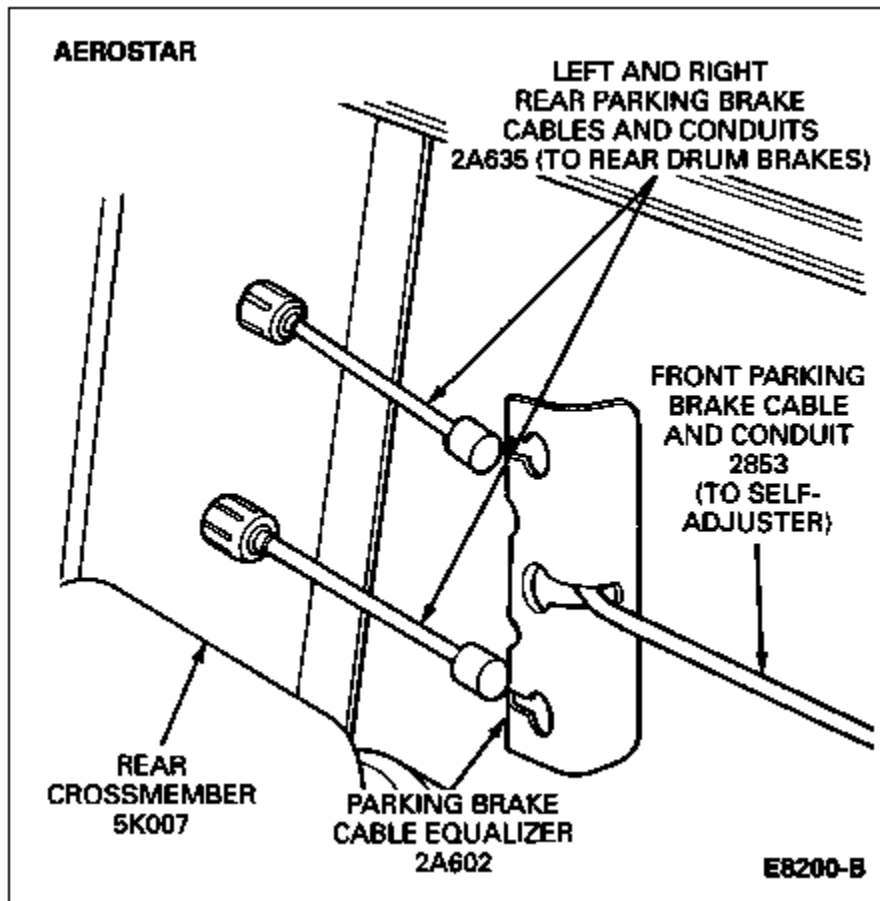
### Parking Brake Components



Item	Part Number	Description
1	2A635	Parking Brake Rear Cable and Conduit
2	—	Parking Brake Cable Retainer (Part of 2A635)
3	2211	Brake Backing Plate
4	—	Cable Anchor (Part of 2A635)
5	2A637	Parking Brake Lever

## Installation

1. Route the parking brake rear cable and conduit through the hole in the brake backing plate.
2. Insert the cable anchor behind the slot in the parking brake lever. Make sure the parking brake rear cable and conduit is securely engaged in the parking brake lever so the rear parking brake cable retainer (2A709) is holding the parking brake rear cable and conduit in the parking brake lever.
3. Push the parking brake cable retainer clip (2A826) through the hole in the brake backing plate so the retainer fingers engage the brake backing plate.
4. Route the parking brake rear cable and conduit as shown in the illustrations.
5. Insert the front of the left and right parking brake rear cable and conduits through the rear frame crossmember until the prongs expand (Aerostar). For Ranger insert the front of the right parking brake rear cable and conduit into the rear guide bracket until the prongs expand.
6. For Aerostar, connect both right and left rear cables to the parking brake cable equalizer.



7. Connect the left rear parking brake cable to the front parking brake cable and conduit (Ranger).
8. Remove the lock pin from the parking brake control to apply cable tension.

9. Adjust rear brakes. Refer to [Section 06-02](#).
  10. Install the brake drum, wheel, and hub cap.
  11. Apply and release the parking brake control several times. Rotate both wheels to be sure that the parking brakes are not dragging.
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## Warning Indicator Switch, Aerostar

### Removal

1. Remove the screws attaching the boot to the floor panel (remove the front screw first). Remove the boot.
2. Place the parking brake control (2780) in the released position and disconnect the wire from the parking brake warning indicator switch.
3. Remove the screw from the parking brake warning indicator switch and remove the parking brake warning indicator switch.

### Installation

1. Position the parking brake warning indicator switch. Make sure the locator tab on the parking brake warning indicator switch is in the locator hole on the parking brake control. Tighten the screw to 1.4-2.3 Nm (12-20 lb-in).
  2. Install the wire connector to the parking brake warning indicator switch and place the parking brake lever in the released position.
  3. Install the boot over the lever and tighten the screws.
-

## Warning Indicator Switch, Ranger

### Removal

**NOTE: The parking brake warning indicator switch is located on the parking brake pedal assembly.**

1. From under the instrument panel, disconnect the wire from the parking brake warning indicator switch.
2. Remove the screw securing the parking brake warning indicator switch to the pedal assembly, and remove the switch.

### Installation

1. Position the parking brake warning indicator switch carefully, making sure that locator tab on switch is in locator hole on parking brake control (2780). Tighten the retaining screw to 1.4-2.3 Nm (12-20 Lb-In).
  2. Connect the wire to the parking brake warning indicator switch and test for parking brake warning indicator operation.
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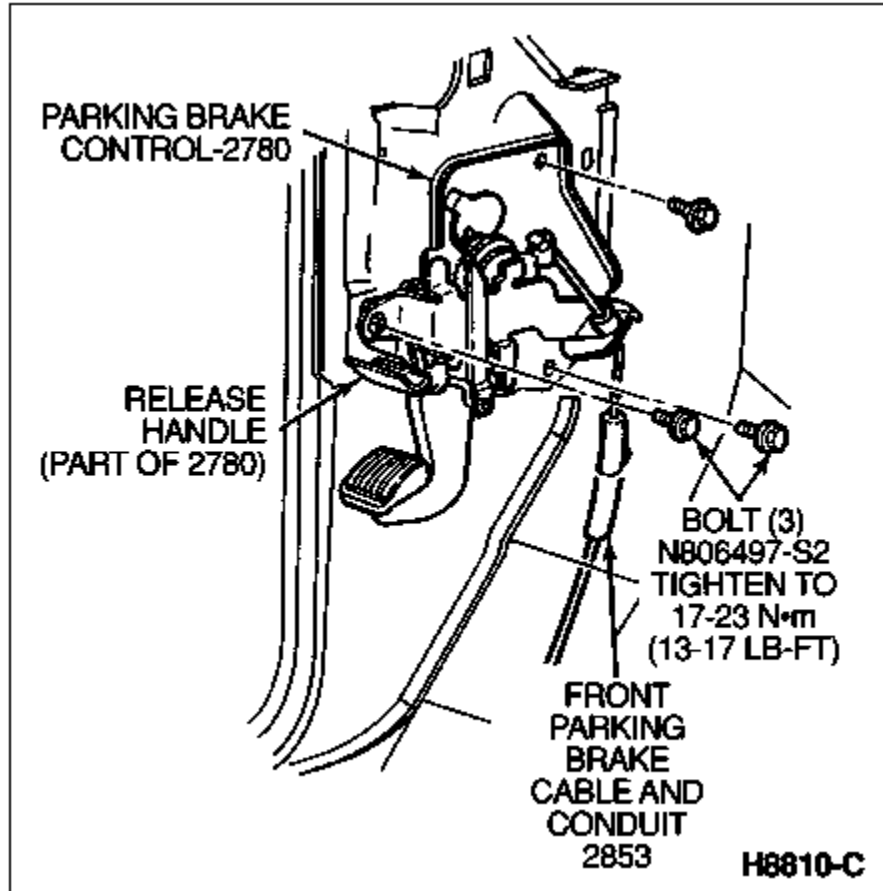


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5035

Rear Frame Crossmember

## Ranger



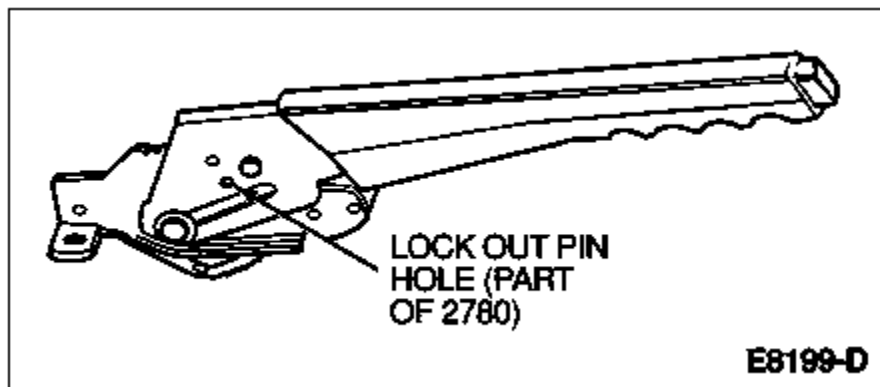


## Cable Tension, Release

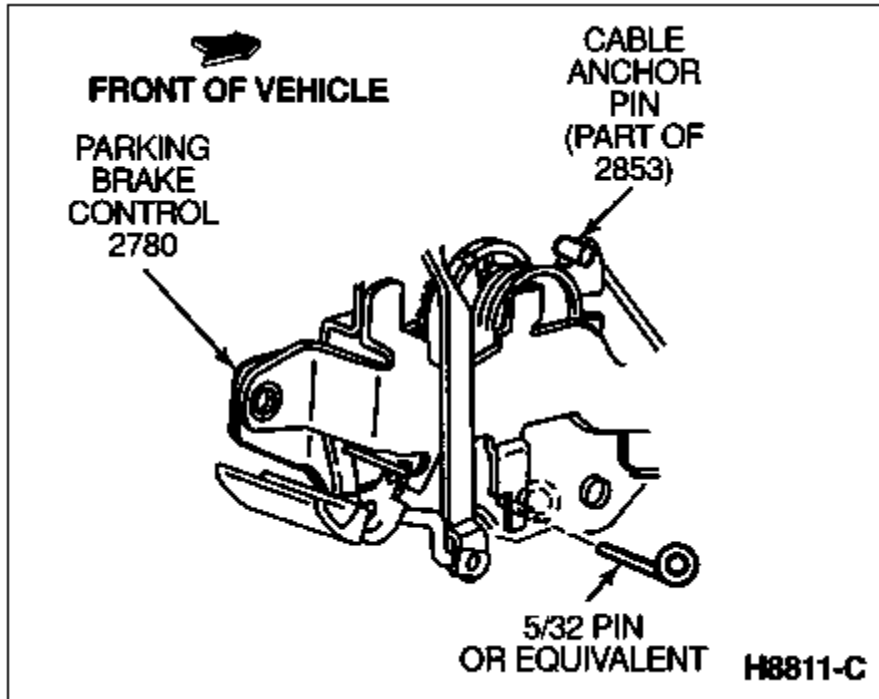
Release the parking brake cable tension as follows:

1. Place the parking brake control (2780) in the "released" position.
2. While an assistant relieves tension on the system by pulling on the parking brake intermediate cable, insert a 4mm (5/32-inch) steel pin or equivalent drill bit into the hole provided in the parking brake control.
3. On the Aerostar, insert a steel pin through the pawl lock out pin hole. The pin must be inserted from the inboard side of the parking brake control (larger hole) at a slightly upward and forward angle, then swept downward and rearward to displace the self-adjusting pawl. This locks out the self-adjusting pawl.

### Aerostar



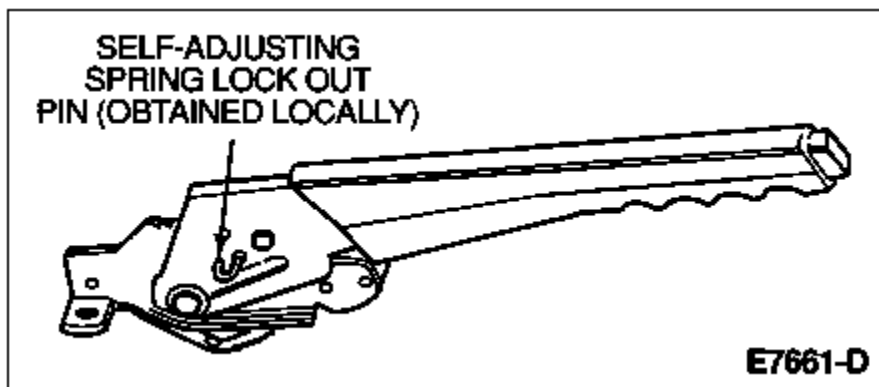
### Ranger



**NOTE:** Be careful not to damage the plastic coating on the cable strand. Remove the parking brake rear cable and conduits (2A635) from the parking brake cable bracket (2530).

4. Another method, which releases tension on the parking brake rear cable and conduits only, is to pull rearward on the parking brake rear cable and conduit about 25-50mm (1.0-2.0 inches) and place a clamp on the parking brake rear cable and conduit behind the rear frame crossmember (5035).
5. To reapply tension, connect all cables and remove the clamping device.
6. Another method which can be used on Aerostar vehicles is to remove the bolts attaching the parking brake control to the floor pan, and pull the parking brake control upward and forward to rotate the spring-loaded ratchet wheel as far as possible.

#### Aerostar



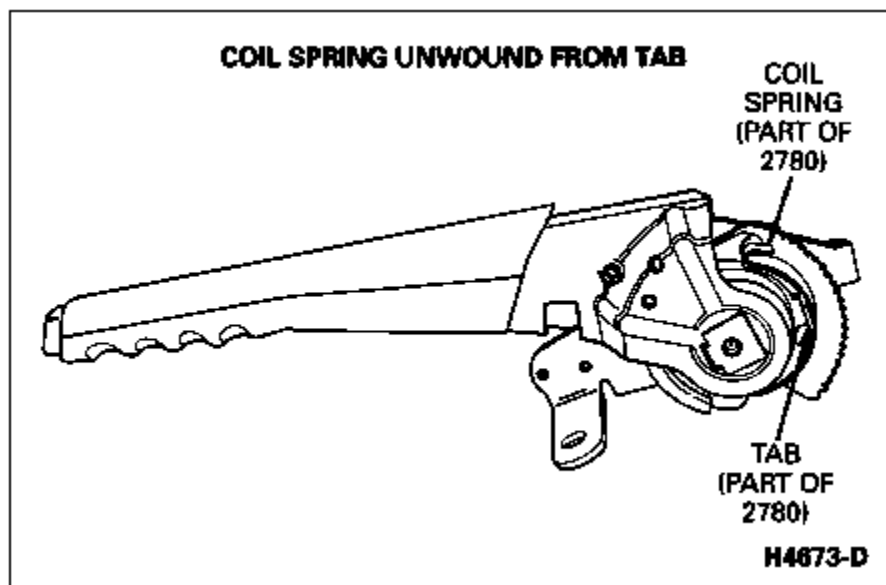




## Cable Tension, Resetting

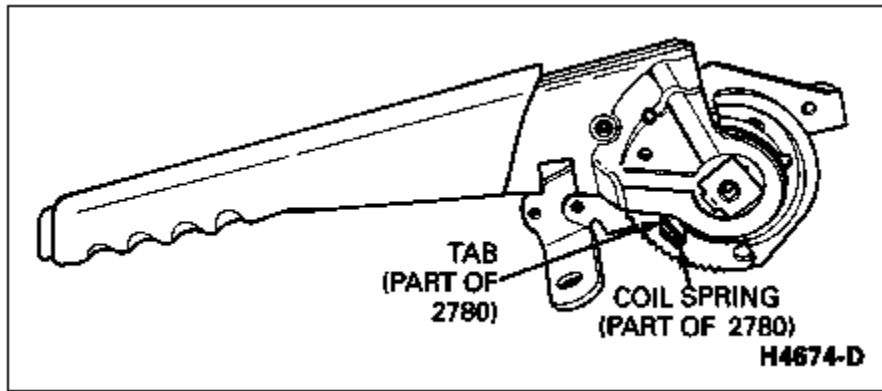
**NOTE:** Parking brake control spring tension is lost when the coil spring unwinds and disengages from the tab on the wheel. This can occur when the cables break, when servicing the system without inserting the lock pin or when the lock pin is removed before the cables are connected. **DO NOT SERVICE THE PARKING BRAKE SYSTEM WITHOUT INSERTING THE LOCK PIN IN THE CONTROL ASSEMBLY. DO NOT REMOVE THE LOCK PIN FROM THE CONTROL WITH THE CABLES DISCONNECTED.**

### Aerostar



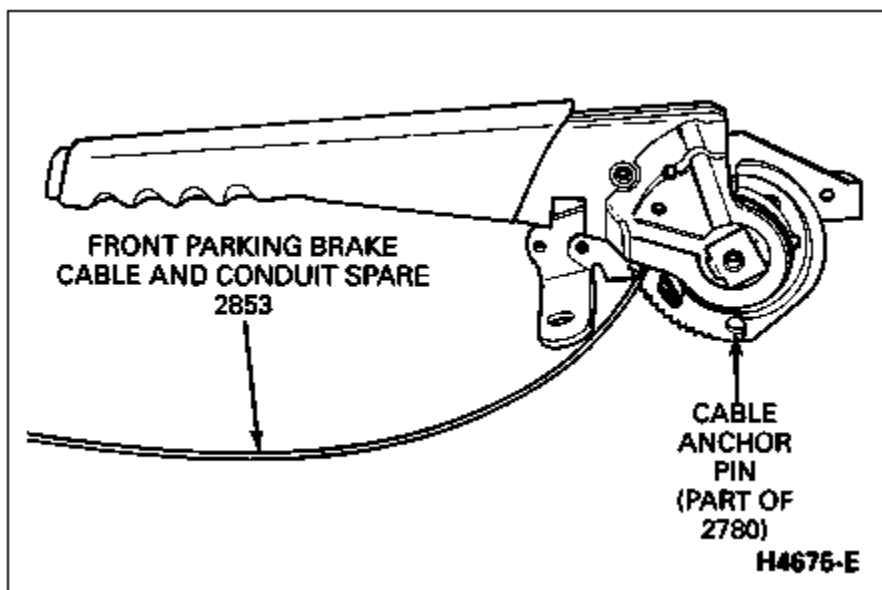
1. Remove the parking brake control as described in Removal and Installation, Control, [Aerostar](#) or [Ranger](#) in this section.
2. Engage the coil spring on the tab on the wheel in the parking brake control.

### Aerostar

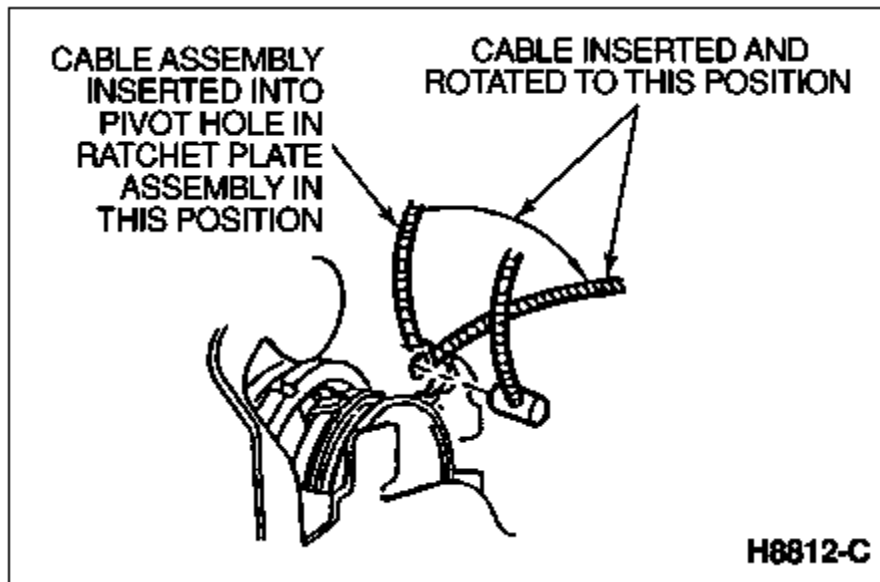


3. Place the control handle in the released position to unlock the self-adjusting pawl.
4. Slip a spare front parking brake cable and conduit (2853) around the pulley and insert the cable anchor pin into the pivot hole in the ratchet plate assembly.

#### Aerostar

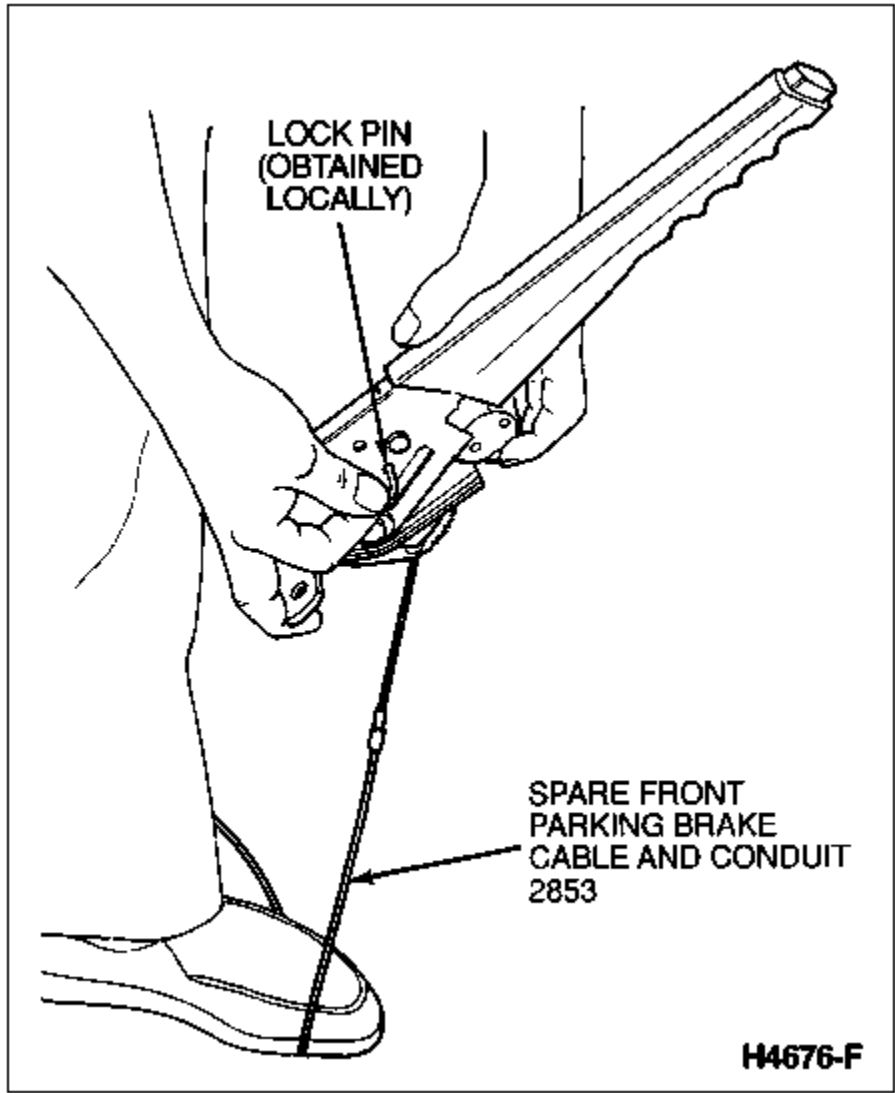


#### Ranger

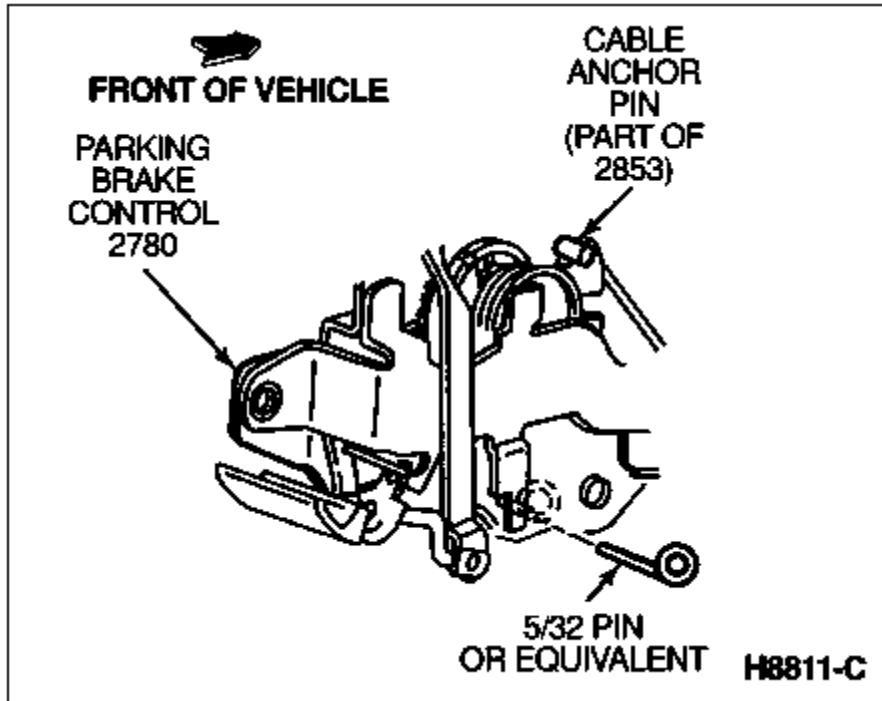


5. With the front parking brake cable and conduit on the floor, step on the front parking brake cable and conduit or clamp the end of the front parking brake cable and conduit in a vise.
6. Pull on the assembly, holding the mounting bracket tightly against the body of the control, until cable tension rotates the cable track assembly so the lock pin can be fully seated through the plate.
7. Insert the lock pin so the assembly is in the "cable released" position.
8. Install the parking brake control. Refer to the Removal and Installation, Control, [Aerostar](#) or [Ranger](#) procedure in this section.

**Aerostar**



Ranger



*Section 06-05: Brake System, Parking*  
**ADJUSTMENTS**

*1997 Aerostar, Ranger Workshop Manual*

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## **Brake Fluid Level Check**

Check the brake fluid level in the brake master cylinder reservoir and if necessary, fill to the MAX FILL line with High Performance DOT 3 Brake Fluid C6AZ-19542-AB or DOT 3 equivalent fluid meeting Ford specification ESA-M6C25-A, DOT 3.

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Section 06-05: Brake System, Parking  
SPECIFICATIONS

1997 Aerostar, Ranger Workshop Manual

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## SPECIFICATIONS

### TORQUE SPECIFICATIONS

Description	Nm	Lb-Ft	Lb-In
Bolt, Front Parking Brake Cable Clamp	15-20	11-14	—
Bolt, Parking Brake Control-to-Cowl Side	17-23	13-17	—
Bolt, Parking Brake Cable Retainer Clip	6-8	—	54-70
Screw, Parking Brake Warning Indicator	1.4-2.3	—	12-20

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