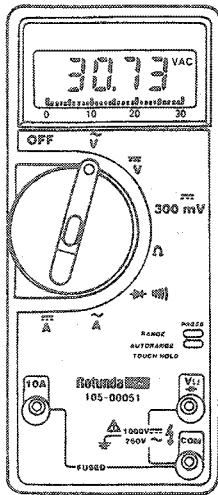


## DIAGNOSTIC TESTS (A-J)

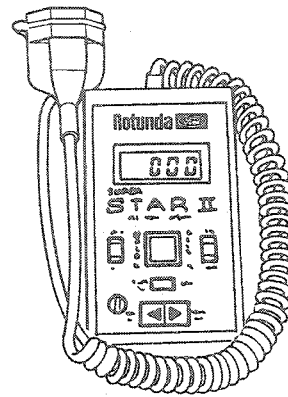
## Equipment Required

- Anti-Lock Test Adapter T90P-50-ALA.
- EEC-IV Breakout Box T83L-50-EEC-IV, Rotunda Breakout Box 014-00322 or equivalent.

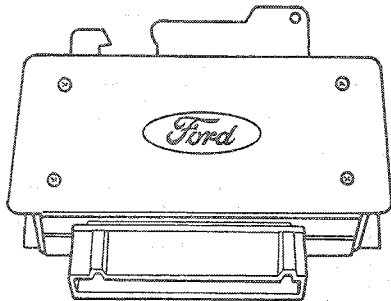
- Rotunda Digital / Analog Volt-Ohmmeter 007-00001 or equivalent.
- Rotunda SUPER STAR II Tester 007-0041B or equivalent.



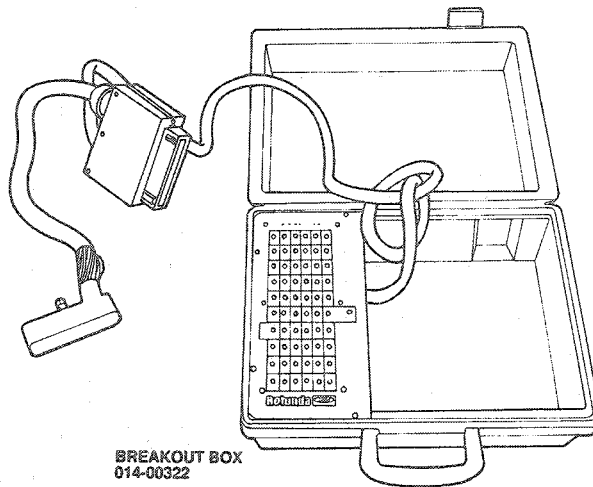
ROTUNDA DIGITAL/ANALOG  
VOLT-OHMMETER  
105-00051



ROTUNDA SUPER STAR II  
TESTER 007-0041B



ANTI-LOCK TEST ADAPTER  
T90P-50-ALA



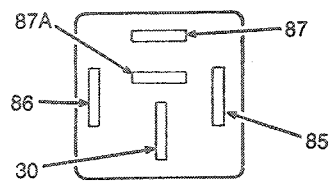
BREAKOUT BOX  
014-00322

H6994-E

Refer to the wiring diagram when performing the Diagnostic Tests to locate wire circuits indicated in the tests. Each test is completely independent of the other tests and within each test are sequences that can identify a concern without requiring completion of the entire test procedure.

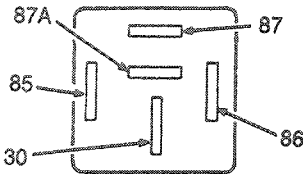
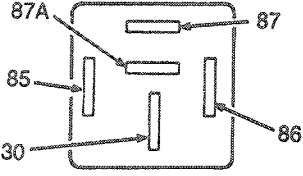
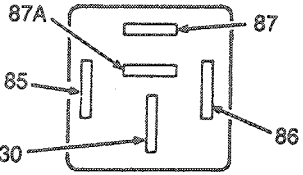
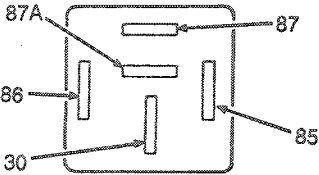
DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST A:  
ANTI-LOCK WARNING INDICATOR ON  
(WITH BRAKE WARNING INDICATOR OFF)**

TEST STEP		RESULT	ACTION TO TAKE
<b>A1</b>	<b>CHECK POWER TO ABS MODULE</b>		
	<ul style="list-style-type: none"> <li>● Disconnect 55-pin plug from ABS Module.</li> <li>● Connect EEC-IV Breakout Box 014-00322 with Anti-Lock Test Adapter T90P-50-ALA or equivalent to the Anti-Lock 55-pin plug wiring harness.</li> <li>● Set multi-meter to read volts DC.</li> <li>● Turn ignition switch ON.</li> <li>● Measure voltage between breakout box Pins 53 and 60.</li> </ul>	Over 10 volts Under 10 volts	GO to A4. GO to A2.
<b>A2</b>	<b>CHECK ABS MODULE TO GROUND WIRE</b>		
	<ul style="list-style-type: none"> <li>● Check continuity between breakout box Pin 60 and body ground.</li> </ul>	Continuity No continuity	GO to A3. SERVICE or REPLACE cable harness Circuit 530 (Taurus/Sable). Circuit 57 or 530 (Taurus SHO).
<b>A3</b>	<b>CHECK IGNITION TO ABS MODULE WIRE</b>		
	<ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pin 53 and ignition switch wire 687.</li> </ul>	Continuity No Continuity	REVERIFY reading at Test Step A1. SERVICE or REPLACE cable harness Circuit 687, or fuse.
<b>A4</b>	<b>CHECK GROUND</b>		
	<ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 19 and 60.</li> </ul>	Continuity No Continuity	GO to A5. SERVICE or REPLACE cable harness Circuit 530 (Taurus/Sable). Circuit 57 or 530 (Taurus SHO).
<b>A5</b>	<b>CHECK MAIN RELAY OPERATION</b>		
	<ul style="list-style-type: none"> <li>● Jumper Pins 34 and 60 at breakout box.</li> <li>● Turn ignition to ON.</li> <li>● Measure voltage between breakout box Pins 33 and 19.</li> </ul>	Over 10 volts DC Under 10 volts DC	GO to A12. GO to A6.
<b>A6</b>	<b>CHECK MAIN RELAY COIL</b>		
	<ul style="list-style-type: none"> <li>● Turn ignition to OFF.</li> <li>● Remove jumper from breakout box Pins 34 and 60.</li> <li>● Measure resistance between breakout box Pins 53 and 34.</li> </ul>	45 to 90 ohms Any other reading	GO to A8. GO to A7.
<b>A7</b>	<b>CHECK MAIN RELAY COIL (Continued)</b>		
	<ul style="list-style-type: none"> <li>● Remove main power relay.</li> </ul> <div style="text-align: center;">  <p><b>MAIN POWER RELAY</b> H7782-B</p> </div> <ul style="list-style-type: none"> <li>● Measure resistance between main relay Pins 85 and 86.</li> </ul>	45 to 90 ohms Any other reading	SERVICE or REPLACE cable harness Circuit 513 or 687. REPLACE main relay.

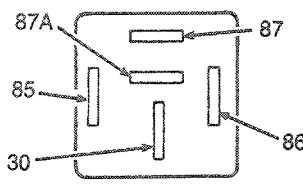
**DIAGNOSTIC TESTS (A-J) (Continued)**

**PINPOINT TEST A:  
ANTI-LOCK WARNING INDICATOR ON  
(WITH BRAKE WARNING INDICATOR OFF) (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>A8</b>	<b>CHECK POWER TO MAIN RELAY COIL</b> <ul style="list-style-type: none"> <li>Turn ignition ON.</li> </ul>  <p><b>MAIN POWER RELAY CONNECTOR (HARNESS SIDE) H7783-A</b></p> <ul style="list-style-type: none"> <li>Measure voltage between main relay connector Pin 86 and ground.</li> </ul>	Over 10 volts DC Under 10 volts DC	<ul style="list-style-type: none"> <li>GO to A9.</li> <li>SERVICE cable harness Circuit 687.</li> </ul>
<b>A9</b>	<b>CHECK POWER TO RELAY</b> <ul style="list-style-type: none"> <li>Turn ignition ON.</li> </ul>  <p><b>MAIN POWER RELAY CONNECTOR (HARNESS SIDE) H7783-A</b></p> <ul style="list-style-type: none"> <li>Measure voltage between main relay connector Pin 87 and ground.</li> </ul>	Over 10 volts DC Under 10 volts DC	<ul style="list-style-type: none"> <li>GO to A10.</li> <li>SERVICE cable harness Circuit 533 or 30 A fuse.</li> </ul>
<b>A10</b>	<b>CHECK CIRCUIT 532</b> <ul style="list-style-type: none"> <li>Turn ignition OFF.</li> </ul>  <p><b>MAIN POWER RELAY CONNECTOR (HARNESS SIDE) H7783-A</b></p> <ul style="list-style-type: none"> <li>Check for continuity between main relay connector Pin 30 and breakout box Pin 33.</li> </ul>	Continuity No Continuity	<ul style="list-style-type: none"> <li>GO to A11.</li> <li>SERVICE or REPLACE cable harness Circuit 532.</li> </ul>
<b>A11</b>	<b>CHECK RELAY OPERATION</b> <ul style="list-style-type: none"> <li>With main power relay removed from connector.</li> <li>Apply battery + to Pin 86 and battery - to Pin 85 on relay.</li> <li>Check continuity between relay Pins 30 and 87.</li> </ul>  <p><b>MAIN POWER RELAY H7782-B</b></p>	Continuity No Continuity	<ul style="list-style-type: none"> <li>REVERIFY reading at Test Step A5.</li> <li>REPLACE main power relay.</li> </ul>

DIAGNOSTIC TESTS (A-J) (Continued)

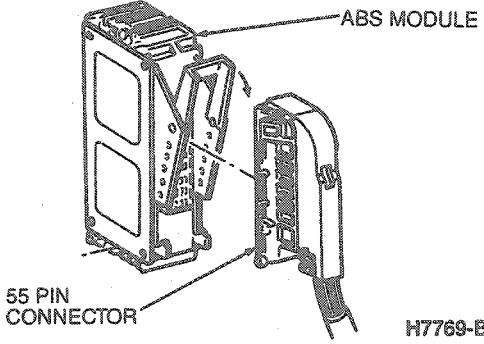
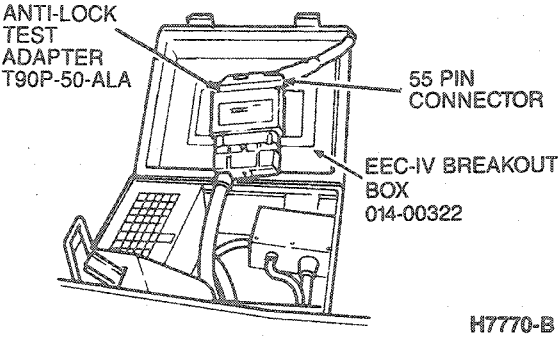
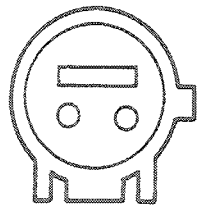
**PINPOINT TEST A:  
ANTI-LOCK WARNING INDICATOR ON  
(WITH BRAKE WARNING INDICATOR OFF) (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>A12</b>	<b>CHECK CIRCUIT 57</b>		
	<ul style="list-style-type: none"> <li>Check for continuity between relay connector Pin 87A and ground.</li> </ul>  <p><b>MAIN POWER RELAY CONNECTOR (HARNES SIDE) H7783-A</b></p>	Continuity No Continuity	GO to A13. SERVICE or REPLACE cable harness Circuit 57.
<b>A13</b>	<b>CHECK CIRCUIT 606</b>		
	<ul style="list-style-type: none"> <li>Jumper Pins 34-19.</li> <li>Turn ignition ON.</li> <li>Check voltage between breakout box Pins 52 and 60.</li> </ul>	Over 10 volts DC Under 10 volts DC	GO to A14. SERVICE or REPLACE cable harness Circuit 606.
<b>A14</b>	<b>CHECK FLS NO. 2 AND CIRCUITRY</b>		
	<ul style="list-style-type: none"> <li>Measure resistance between breakout box Pins 8 and 26.</li> </ul>	Less than 5 ohms Any other reading	GO to A16. GO to A15.
<b>A15</b>	<b>CHECK FLS NO. 2</b>		
	<ul style="list-style-type: none"> <li>Disconnect 2-pin plug from FLS No. 2, located on HCU reservoir.</li> <li>Measure resistance between Pins 1 and 2 on HCU reservoir.</li> </ul>	Less than 5 ohms Any other reading	SERVICE or REPLACE cable harness Circuit 542 or 535 (Taurus / Sable). Circuit 550 or 535 (Taurus SHO). REPLACE HCU reservoir.
<b>A16</b>	<b>ABS MODULE CHECK</b>		
	<ul style="list-style-type: none"> <li>If Self-Diagnostics, ABS Quick Test and Test A did not find problem, replace ABS Module with a known good module.</li> <li>Is ABS indicator still on?</li> </ul>	Yes No	REVERIFY that all tests have been performed. REPLACE ABS Module.

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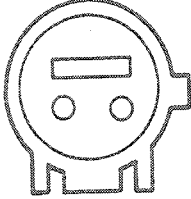
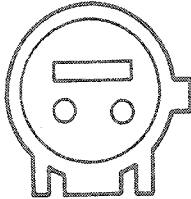
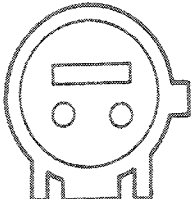
DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST B:  
ANTI-LOCK INDICATOR ON AFTER ENGINE STARTS  
(BRAKE WARNING INDICATOR OFF)**

TEST STEP	RESULT	ACTION TO TAKE
<p><b>B1</b> CHECK CONTINUITY OF CIRCUITS 518 AND 519</p> <ul style="list-style-type: none"> <li>● Turn ignition switch OFF.</li> <li>● Disconnect 55-pin plug from ABS Module.</li> <li>● Check continuity between breakout box Pins 28 and 60.</li> </ul>  <p>ABS MODULE 55 PIN CONNECTOR H7769-B</p> <ul style="list-style-type: none"> <li>● Connect EEC-IV breakout box 014-00322 with Anti-Lock Test Adapter T90P-50-ALA or equivalent to the Anti-Lock 55-pin plug on the wiring harness.</li> </ul>  <p>ANTI-LOCK TEST ADAPTER T90P-50-ALA 55 PIN CONNECTOR EEC-IV BREAKOUT BOX 014-00322 H7770-B</p> <ul style="list-style-type: none"> <li>● Is continuity present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to B2.</p> <p>▶ GO to B3.</p>
<p><b>B2</b> CHECK LH REAR SENSOR TO GROUND</p> <ul style="list-style-type: none"> <li>● Disconnect LH rear wheel sensor plug.</li> <li>● Check for continuity between each sensor pin (sensor side) and vehicle ground.</li> <li>● Is continuity present?</li> </ul>  <p>LH REAR SENSOR H7776-A</p>	<p>Yes</p> <p>No</p>	<p>▶ REPLACE LH rear sensor.</p> <p>▶ REPLACE or SERVICE cable harness Circuit 518 or 519.</p>
<p><b>B3</b> CHECK CONTINUITY OF CIRCUITS 523 AND 524</p> <ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 27 and 60.</li> <li>● Is continuity present?</li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to B4.</p> <p>▶ GO to B5.</p>

DIAGNOSTIC TESTS (A-J) (Continued)

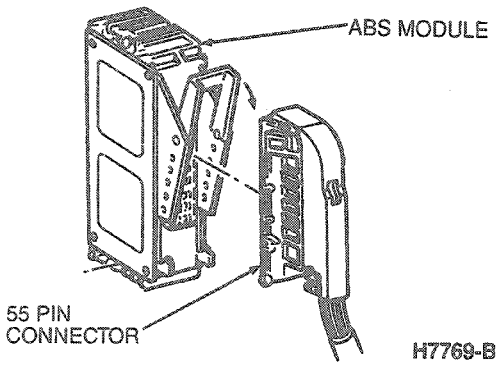
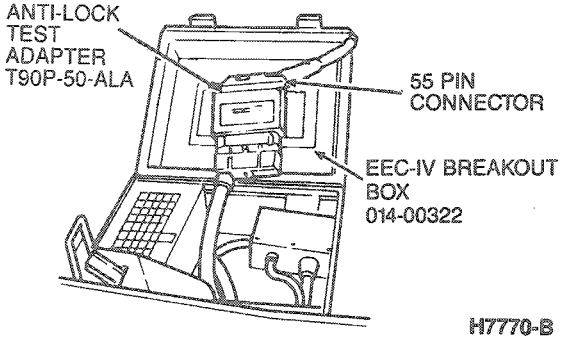
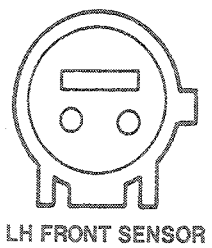
**PINPOINT TEST B:  
ANTI-LOCK INDICATOR ON AFTER ENGINE STARTS  
(BRAKE WARNING INDICATOR OFF) (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>B4</b>	<b>CHECK RH REAR SENSOR TO GROUND</b> <ul style="list-style-type: none"> <li>● Disconnect RH rear wheel sensor plug.</li> <li>● Check for continuity between each sensor pin (sensor side) and vehicle ground.</li> <li>● Is continuity present?</li> </ul>  <p><b>RH REAR SENSOR H7775-A</b></p>	Yes No	<ul style="list-style-type: none"> <li>▶ REPLACE RH rear sensor.</li> <li>▶ REPLACE or SERVICE cable harness Circuit 523 or 524.</li> </ul>
<b>B5</b>	<b>CHECK CONTINUITY OF CIRCUITS 514 AND 516</b> <ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 29 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	<ul style="list-style-type: none"> <li>▶ GO to B6.</li> <li>▶ GO to B7.</li> </ul>
<b>B6</b>	<b>CHECK RH FRONT SENSOR TO GROUND</b> <ul style="list-style-type: none"> <li>● Disconnect RH front wheel sensor plug.</li> <li>● Check for continuity between each sensor pin (sensor side) and vehicle ground.</li> <li>● Is continuity present?</li> </ul>  <p><b>RH FRONT SENSOR H7774-A</b></p>	Yes No	<ul style="list-style-type: none"> <li>▶ REPLACE RH front sensor.</li> <li>▶ REPLACE or SERVICE cable harness Circuit 514 or 516.</li> </ul>
<b>B7</b>	<b>CHECK CONTINUITY OF CIRCUITS 521 AND 522</b> <ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 30 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	<ul style="list-style-type: none"> <li>▶ GO to B8.</li> <li>▶ Test Complete. If Anti-Lock indicator pattern remains, REPEAT Test B.</li> </ul>
<b>B8</b>	<b>CHECK LH FRONT SENSOR TO GROUND</b> <ul style="list-style-type: none"> <li>● Disconnect LH front wheel sensor plug.</li> <li>● Check for continuity between each sensor pin (sensor side) and vehicle ground.</li> <li>● Is continuity present?</li> </ul>  <p><b>LH FRONT SENSOR H7773-A</b></p>	Yes No	<ul style="list-style-type: none"> <li>▶ REPLACE LH front sensor.</li> <li>▶ REPLACE or SERVICE cable harness Circuit 521 or 522.</li> </ul>

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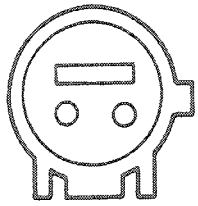
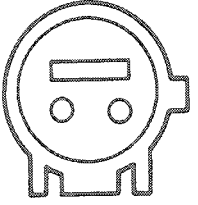
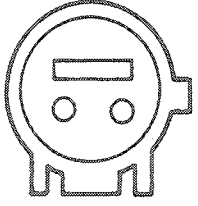
**DIAGNOSTIC TESTS (A-J) (Continued)**

**PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM**

TEST STEP		RESULT	ACTION TO TAKE
<b>C1</b>	<b>MEASURE LH FRONT SENSOR CIRCUIT RESISTANCE</b> <ul style="list-style-type: none"> <li>● Turn ignition switch to OFF position.</li> <li>● Disconnect 55-pin connector from ABS module.</li> </ul>  <ul style="list-style-type: none"> <li>● Connect EEC-IV breakout box 014-00322 with Anti-Lock Test Adapter T90P-50-ALA or equivalent to the 55-pin connector on wiring harness.</li> </ul>  <ul style="list-style-type: none"> <li>● Set multi-meter to read resistance.</li> <li>● Measure resistance between Pins 30 and 48.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul>	Yes No	<ul style="list-style-type: none"> <li>▶ GO to C3.</li> <li>▶ GO to C2.</li> </ul>
<b>C2</b>	<b>CHECK LH FRONT SENSOR RESISTANCE</b> <ul style="list-style-type: none"> <li>● Disconnect LH front sensor plug.</li> <li>● Measure resistance of sensor at sensor plug.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul> 	Yes No	<ul style="list-style-type: none"> <li>▶ SERVICE or REPLACE cable harness Circuit 521 or 522.</li> <li>▶ REPLACE LH front sensor.</li> </ul>
<b>C3</b>	<b>MEASURE RH FRONT SENSOR CIRCUIT RESISTANCE</b> <ul style="list-style-type: none"> <li>● Measure resistance between breakout box Pins 29 and 47.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul>	Yes No	<ul style="list-style-type: none"> <li>▶ GO to C5.</li> <li>▶ GO to C4.</li> </ul>

## DIAGNOSTIC TESTS (A-J) (Continued)

## PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>C4</b>	<b>CHECK RH FRONT SENSOR RESISTANCE</b>		
	<ul style="list-style-type: none"> <li>● Disconnect RH front sensor plug.</li> <li>● Measure resistance of sensor at sensor plug.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul>  <p style="text-align: center;"><b>RH FRONT SENSOR</b>      <b>H7774-A</b></p>	Yes  No	SERVICE or REPLACE cable harness Circuit 514 or 516.  REPLACE RH front sensor.
<b>C5</b>	<b>MEASURE RH REAR SENSOR CIRCUIT RESISTANCE</b>		
	<ul style="list-style-type: none"> <li>● Measure resistance between breakout box Pins 27 and 45.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul>	Yes No	GO to C7. GO to C6.
<b>C6</b>	<b>CHECK RH REAR SENSOR RESISTANCE</b>		
	<ul style="list-style-type: none"> <li>● Disconnect RH rear sensor plug.</li> <li>● Measure resistance of sensor at sensor plug.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul>  <p style="text-align: center;"><b>RH REAR SENSOR</b>      <b>H7775-A</b></p>	Yes  No	SERVICE or REPLACE cable harness Circuit 523 or 524.  REPLACE RH rear sensor.
<b>C7</b>	<b>MEASURE LH REAR SENSOR CIRCUIT RESISTANCE</b>		
	<ul style="list-style-type: none"> <li>● Measure resistance between breakout box Pins 28 and 46.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul>	Yes No	GO to C9. GO to C8.
<b>C8</b>	<b>CHECK LH REAR SENSOR RESISTANCE</b>		
	<ul style="list-style-type: none"> <li>● Disconnect LH rear sensor plug.</li> <li>● Measure resistance of sensor at sensor plug.</li> <li>● Is resistance between 800 and 1400 ohms?</li> </ul>  <p style="text-align: center;"><b>LH REAR SENSOR</b>      <b>H7776-A</b></p>	Yes  No	SERVICE or REPLACE cable harness Circuit 518 or 519.  REPLACE LH rear sensor.
<b>C9</b>	<b>CHECK LH FRONT SENSOR AND CIRCUITRY TO GROUND</b>		
	<ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 30 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	GO to C10. GO to C11.



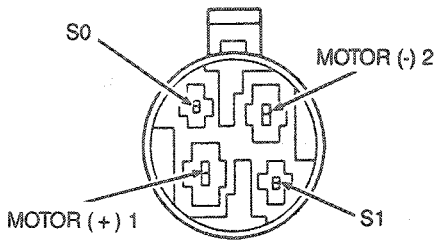
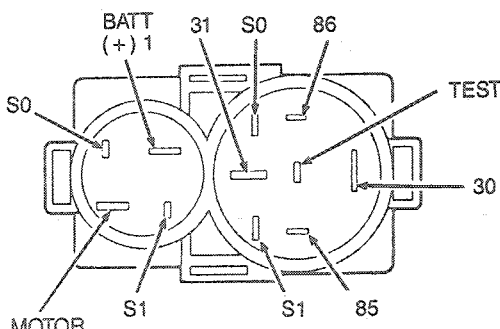
## DIAGNOSTIC TESTS (A-J) (Continued)

## PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>C10</b>	CHECK LH FRONT SENSOR TO GROUND		
	<ul style="list-style-type: none"> <li>● Disconnect LH front sensor plug.</li> <li>● Check for continuity between each sensor pin and body ground.</li> <li>● Is continuity present?</li> </ul>	Yes No	REPLACE LH front sensor. SERVICE or REPLACE cable harness Circuit 521 or 522.
<b>C11</b>	CHECK RH FRONT SENSOR AND CIRCUITRY TO GROUND		
	<ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 29 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	GO to C12. GO to C13.
<b>C12</b>	CHECK RH FRONT SENSOR TO GROUND		
	<ul style="list-style-type: none"> <li>● Disconnect RH front sensor plug.</li> <li>● Check for continuity between each sensor pin and body ground.</li> <li>● Is continuity present?</li> </ul>	Yes No	REPLACE RH front sensor. SERVICE or REPLACE cable harness Circuit 514 or 516.
<b>C13</b>	CHECK RH REAR SENSOR AND CIRCUITRY TO GROUND		
	<ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 27 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	GO to C14. GO to C15.
<b>C14</b>	CHECK RH REAR SENSOR TO GROUND		
	<ul style="list-style-type: none"> <li>● Disconnect RH rear sensor plug.</li> <li>● Check for continuity between each sensor pin and body ground.</li> <li>● Is continuity present?</li> </ul>	Yes No	REPLACE RH rear sensor. SERVICE or REPLACE cable harness Circuit 523 or 524.
<b>C15</b>	CHECK LH REAR SENSOR AND CIRCUITRY TO GROUND		
	<ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 28 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	GO to C16. GO to C17.
<b>C16</b>	CHECK LH REAR SENSOR TO GROUND		
	<ul style="list-style-type: none"> <li>● Disconnect LH rear sensor plug.</li> <li>● Check for continuity between each sensor pin and body ground.</li> <li>● Is continuity present?</li> </ul>	Yes No	REPLACE LH rear sensor. SERVICE or REPLACE cable harness Circuit 518 or 519.
<b>C17</b>	CHECK LH FRONT SENSOR VOLTAGE OUTPUT		
	<ul style="list-style-type: none"> <li>● Measure voltage between breakout box Pins 30 and 48 while spinning LH front wheel at approximately 1 revolution per second.</li> </ul>	Between 0.10 and 1.40 volts AC Less than 0.10 or more than 1.40 volts AC	GO to C18. CHECK wheel sensor mounting, air gap or toothed wheel. CORRECT as required.
<b>C18</b>	CHECK RH FRONT SENSOR VOLTAGE OUTPUT		
	<ul style="list-style-type: none"> <li>● Measure voltage between breakout box Pins 29 and 47 while spinning RH front wheel at approximately 1 revolution per second.</li> </ul>	Between 0.10 and 1.40 volts AC Less than 0.10 or more than 1.40 volts AC	GO to C19. CHECK wheel sensor mounting, air gap or toothed wheel. CORRECT as required.

**DIAGNOSTIC TESTS (A-J) (Continued)**

**PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>C19</b>	<b>CHECK RH REAR SENSOR VOLTAGE OUTPUT</b>		
	<ul style="list-style-type: none"> <li>Measure voltage between breakout box Pins 27 and 45 while spinning RH rear wheel at approximately 1 revolution per second.</li> </ul>	Between 0.10 and 1.40 volts AC  Less than 0.10 or more than 1.40 volts AC	<ul style="list-style-type: none"> <li>GO to C20.</li> <li>CHECK wheel sensor mounting, air gap or toothed wheel. CORRECT as required.</li> </ul>
<b>C20</b>	<b>CHECK LH REAR SENSOR VOLTAGE OUTPUT</b>		
	<ul style="list-style-type: none"> <li>Measure voltage between breakout box Pins 28 and 46 while spinning LH rear wheel at approximately 1 revolution per second.</li> </ul>	Between 0.10 and 1.40 volts AC  Less than 0.10 or more than 1.40 volts AC	<ul style="list-style-type: none"> <li>GO to C21.</li> <li>CHECK wheel sensor mounting, air gap or toothed wheel. CORRECT as required.</li> </ul>
<b>C21</b>	<b>CHECK MOTOR SPEED SENSOR AND CIRCUITRY</b>		
	<ul style="list-style-type: none"> <li>Measure resistance between breakout box Pins 31 and 49.</li> <li>Is resistance between 5 and 100 ohms?</li> </ul>	Yes  No	<ul style="list-style-type: none"> <li>GO to C27.</li> <li>GO to C22.</li> </ul>
<b>C22</b>	<b>CHECK PUMP MOTOR SPEED SENSOR</b>		
	<ul style="list-style-type: none"> <li>Disconnect 4-pin plug on pump motor.</li> <li>Measure resistance between Pins S0 and S1 on pump motor.</li> <li>Is resistance between 5 and 100 ohms?</li> </ul>	Yes  No	<ul style="list-style-type: none"> <li>GO to C23.</li> <li>REPLACE pump and motor.</li> </ul>
 <p><b>4 PIN PUMP MOTOR CONNECTOR</b> H7784-B</p>			
<b>C23</b>	<b>CHECK PUMP MOTOR RELAY</b>		
	<ul style="list-style-type: none"> <li>Disconnect 7-pin plug on pump motor relay and remove relay.</li> <li>Check continuity from Pin S0 on 7-pin side to Pin S0 on 4-pin side of relay.</li> <li>Is continuity present?</li> </ul>	Yes  No	<ul style="list-style-type: none"> <li>GO to C24.</li> <li>REPLACE pump motor relay.</li> </ul>
 <p><b>PUMP MOTOR RELAY</b> H7780-B</p>			

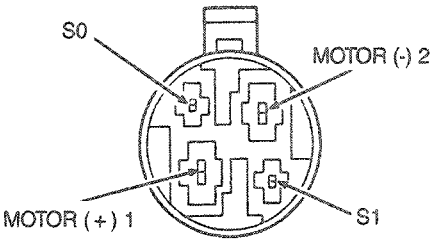
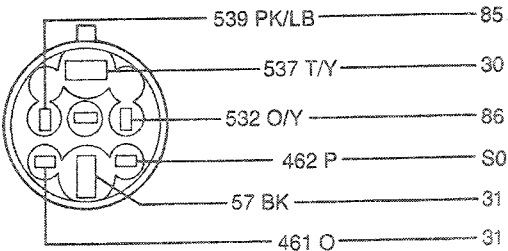
## DIAGNOSTIC TESTS (A-J) (Continued)

## PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM (Continued)

TEST STEP		RESULT	ACTION TO TAKE
<b>C24</b>	<b>CHECK PUMP MOTOR RELAY</b>		
	<ul style="list-style-type: none"> <li>Check continuity from Pin S1 on 7-pin side to Pin S1 on 4-pin side of relay.</li> <li>Is continuity present?</li> </ul>	Yes No	GO to C25. REPLACE pump motor relay.
<b>C25</b>	<b>CHECK CIRCUIT 462</b>		
	<ul style="list-style-type: none"> <li>Check continuity between breakout box Pin 31 and Pin S0 on pump motor connector 7-pin plug (harness side).</li> <li>Is continuity present?</li> </ul>	Yes No	GO to C26. SERVICE or REPLACE cable harness Circuit 462.
<p style="text-align: center;">7 PIN PUMP MOTOR RELAY CONNECTOR HARNESS SIDE H7781-B</p>			
<b>C26</b>	<b>CHECK CIRCUIT 461</b>		
	<ul style="list-style-type: none"> <li>Check continuity between breakout box Pin 49 and Pin S1 on pump motor connector 7-pin plug (harness side).</li> <li>Is continuity present?</li> </ul>	Yes No	REVERIFY reading at C21. SERVICE or REPLACE cable harness Circuit 461.
<b>C27</b>	<b>CHECK MOTOR SPEED SENSOR SHORT TO BATTERY +</b>		
	<ul style="list-style-type: none"> <li>Turn ignition switch to ON.</li> <li>Measure voltage between breakout box Pins 31 and 60.</li> </ul>	No voltage 12 volts	GO to C31. GO to C28.
<b>C28</b>	<b>CHECK PUMP MOTOR</b>		
	<ul style="list-style-type: none"> <li>Disconnect pump motor relay 4-pin plug connector.</li> <li>Turn ignition switch to ON.</li> <li>Measure voltage between breakout box Pins 31 and 60.</li> </ul>	No voltage 12 volts	REPLACE pump and motor. GO to C29.
<b>C29</b>	<b>CHECK CIRCUIT 462</b>		
	<ul style="list-style-type: none"> <li>Disconnect wire harness to relay 7-pin plug.</li> <li>Turn ignition switch to ON.</li> <li>Measure voltage between breakout box Pins 31 and 60.</li> </ul>	No voltage 12 volts	GO to C30. SERVICE or REPLACE cable harness Circuit 462.
<b>C30</b>	<b>CHECK CIRCUIT 461</b>		
	<ul style="list-style-type: none"> <li>Turn ignition switch to ON.</li> <li>Measure voltage between breakout box Pins 49 and 60.</li> </ul>	No voltage 12 volts	REPLACE pump motor relay. SERVICE or REPLACE cable harness Circuit 461.
<b>C31</b>	<b>CHECK MOTOR SPEED SENSOR SHORT TO GROUND</b>		
	<ul style="list-style-type: none"> <li>Check for continuity between breakout box Pins 31 and 60.</li> <li>Is continuity present?</li> </ul>	No Yes	GO to C34. GO to C32.

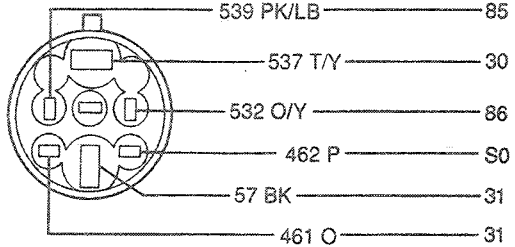
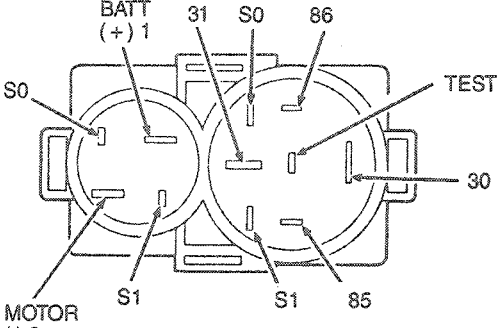
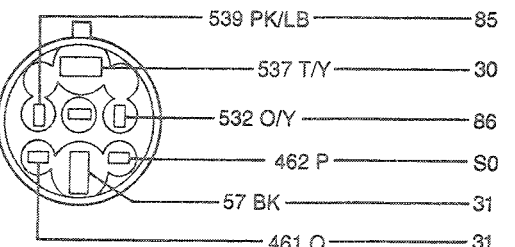
DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>C32</b>	<b>CHECK CIRCUIT 462</b>		
	<ul style="list-style-type: none"> <li>● Disconnect wire harness to relay 7-pin plug.</li> <li>● Check for continuity between breakout box Pins 31 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	SERVICE or REPLACE cable harness Circuit 462. GO to C33.
<b>C33</b>	<b>CHECK CIRCUIT 461</b>		
	<ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 49 and 60.</li> <li>● Is continuity present?</li> </ul>	Yes No	SERVICE or REPLACE cable harness Circuit 461. REPLACE pump motor relay.
<b>C34</b>	<b>CHECK PUMP MOTOR OPERATION</b>		
	<ul style="list-style-type: none"> <li>● Reconnect pump motor relay to pump and wire harness.</li> <li>● Jumper Pins 15, 34 and 60 at breakout box.</li> <li>● Turn ignition to ON position.</li> <li>● Does pump motor run?</li> </ul>	Yes No	REPLACE ABS module. GO to C35.
<b>C35</b>	<b>CHECK PUMP MOTOR OPERATION</b>		
	<ul style="list-style-type: none"> <li>● Disconnect pump motor relay from pump motor.</li> <li>● Ground Pin 2 and apply 12 volts to Pin 1 of pump motor connector.</li> <li>● Does pump motor run?</li> </ul>	Yes No	GO to C36. REPLACE pump motor.
 <p><b>4 PIN PUMP MOTOR CONNECTOR</b> H7784-B</p>			
<b>C36</b>	<b>CHECK POWER TO RELAY</b>		
	<ul style="list-style-type: none"> <li>● Disconnect wire harness from pump motor relay.</li> <li>● Check voltage between Pin 30 on wire harness to pump motor relay connector and ground.</li> </ul>	Over 10 volts Less than 10 volts	GO to C37. SERVICE or REPLACE battery, circuit 537 or Anti-Lock Motor 40 A fuse.
 <p><b>7 PIN PUMP MOTOR RELAY CONNECTOR HARNESS SIDE</b> H7781-B</p>			

DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM (Continued)**

TEST STEP	RESULT	ACTION TO TAKE
<p><b>C37</b> CHECK POWER TO RELAY COIL</p> <ul style="list-style-type: none"> <li>● Jumper Pins 34 and 60 at breakout box.</li> <li>● Turn ignition to ON position.</li> <li>● Measure voltage between Pin 86 and ground.</li> </ul>  <p>7 PIN PUMP MOTOR RELAY CONNECTOR HARNESS SIDE H7781-B</p>	<p>Over 10 volts</p> <p>Less than 10 volts</p>	<p>▶ GO to C38.</p> <p>▶ SERVICE or REPLACE cable harness Circuit 532.</p>
<p><b>C38</b> CHECK PUMP MOTOR RELAY COIL</p> <ul style="list-style-type: none"> <li>● Measure resistance between Pins 85 and 86 on pump motor relay.</li> <li>● Is resistance between 45 and 105 ohms?</li> </ul>  <p>PUMP MOTOR RELAY H7780-B</p>	<p>Yes</p> <p>No</p>	<p>▶ GO to C39.</p> <p>▶ REPLACE pump motor relay.</p>
<p><b>C39</b> CHECK CIRCUIT 539</p> <ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pin 15 and Pin 85 on wire harness to pump motor relay connector.</li> <li>● Is continuity present?</li> </ul>  <p>7 PIN PUMP MOTOR RELAY CONNECTOR HARNESS SIDE H7781-B</p>	<p>Yes</p> <p>No</p>	<p>▶ GO to C40.</p> <p>▶ SERVICE or REPLACE cable harness Circuit 539.</p>

**DIAGNOSTIC TESTS (A-J) (Continued)**

**PINPOINT TEST C: ANTI-LOCK WARNING INDICATOR ON AFTER VEHICLE STARTS TO MOVE OR FALSE CYCLING OF ANTI-LOCK SYSTEM (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>C40</b>	<b>CHECK CIRCUIT 57</b>	Yes No	GO to <b>C41</b> . SERVICE or REPLACE cable harness Circuit 57.
	<ul style="list-style-type: none"> <li>Check for continuity between wire harness to pump motor relay connector Pin 31 and ground.</li> <li>Is continuity present?</li> </ul>		
<b>C41</b>	<b>CHECK PUMP MOTOR RELAY</b>	Yes No	GO to <b>C42</b> . REPLACE pump motor relay.
	<ul style="list-style-type: none"> <li>Connect battery + to Pin 86 and battery - to Pin 85 of pump motor relay.</li> <li>Check for continuity between Pin 30 and Pin 1 on relay.</li> <li>Is continuity present?</li> </ul>		
<b>C42</b>	<b>CHECK PUMP MOTOR RELAY</b>	Yes No	REVERIFY results at Test Step <b>C34</b> . REPLACE pump motor relay.
	<ul style="list-style-type: none"> <li>Check continuity between Pins 2 and 31 on pump motor relay.</li> <li>Is continuity present?</li> </ul>		

**H7780-B**

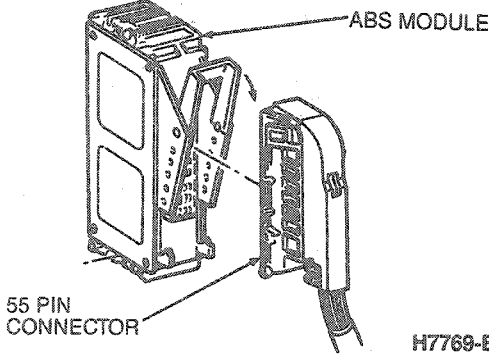
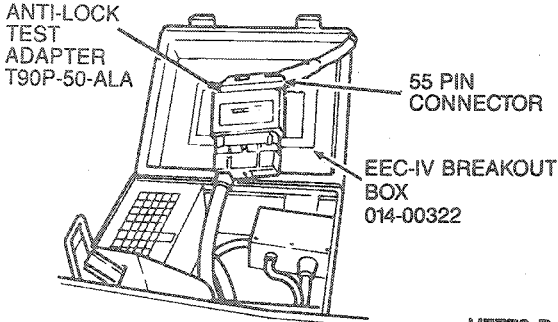
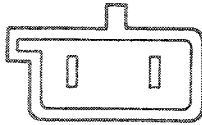
TH7930B

**PINPOINT TEST D:  
ANTI-LOCK WARNING INDICATOR SEQUENCE NORMAL —  
BRAKE PEDAL RISES OR DROPS EXCESSIVELY DURING ABS CYCLING**

TEST STEP		RESULT	ACTION TO TAKE
<b>D1</b>	<b>CHECK PEDAL SWITCH ADJUSTMENT</b>	Yes No	Condition corrected. GO to <b>D2</b> .
	NOTE: Before running Test Step D, adjust pedal position switch as outlined in this section. <ul style="list-style-type: none"> <li>Is pedal feel normal during ABS cycling?</li> </ul>		

DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST D:  
ANTI-LOCK WARNING INDICATOR SEQUENCE NORMAL —  
BRAKE PEDAL RISES OR DROPS EXCESSIVELY DURING ABS CYCLING (Continued)**

TEST STEP	RESULT	ACTION TO TAKE
<p><b>D2</b> CHECK PEDAL TRAVEL SWITCH AND CIRCUITRY</p> <ul style="list-style-type: none"> <li>● Turn ignition switch to OFF position.</li> <li>● Disconnect 55-pin plug from ABS Module.</li> </ul>  <p>ABS MODULE 55 PIN CONNECTOR H7769-B</p> <ul style="list-style-type: none"> <li>● Connect EEC-IV Breakout Box 014-00322 with Anti-Lock Test Adapter T90P-50-ALA or equivalent to the anti-lock 55-pin plug on the wiring harness.</li> </ul>  <p>ANTI-LOCK TEST ADAPTER T90P-50-ALA 55 PIN CONNECTOR EEC-IV BREAKOUT BOX 014-00322 H7770-B</p> <ul style="list-style-type: none"> <li>● Check continuity between breakout box Pins 5 and 26.</li> <li>● <b>Is continuity present?</b></li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to D4.</p> <p>▶ GO to D3.</p>
<p><b>D3</b> CHECK PEDAL TRAVEL SWITCH</p> <ul style="list-style-type: none"> <li>● Disconnect pedal travel switch 2-pin plug.</li> <li>● Check for continuity between Pins 1 and 2.</li> <li>● <b>Is continuity present?</b></li> </ul>  <p>2 PIN BRAKE PEDAL POSITION SWITCH H7785-A</p>	<p>Yes</p> <p>No</p>	<p>▶ SERVICE or REPLACE cable harness Circuit 535 or 549.</p> <p>▶ REPLACE pedal travel switch.</p>
<p><b>D4</b> CHECK PEDAL TRAVEL SWITCH FUNCTION</p> <ul style="list-style-type: none"> <li>● Push brake pedal down at least 3 inches and hold down.</li> <li>● Check for continuity between breakout box Pins 5 and 26.</li> <li>● <b>Is continuity present?</b></li> </ul>	<p>Yes</p> <p>No</p>	<p>▶ GO to D5.</p> <p>▶ GO to D6.</p>

**DIAGNOSTIC TESTS (A-J) (Continued)**

**PINPOINT TEST D:  
ANTI-LOCK WARNING INDICATOR SEQUENCE NORMAL —  
BRAKE PEDAL RISES OR DROPS EXCESSIVELY DURING ABS CYCLING (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>D5</b>	<b>CHECK PEDAL TRAVEL SWITCH</b>		
	<ul style="list-style-type: none"> <li>● Disconnect pedal travel switch 2-pin plug from wire harness.</li> <li>● Check continuity between Pins 1 and 2 (switch side) with brake pedal down at least 3 inches.</li> <li>● Is continuity present?</li> </ul>	Yes	▶ REPLACE pedal travel switch.
		No	▶ SERVICE or REPLACE cable harness Circuit 535 or 549.
<b>D6</b>	<b>CHECK PUMP PRESSURE</b>		
	<ul style="list-style-type: none"> <li>● Jumper Pins 15, 34 and 60 at breakout box.</li> <li>● Apply moderate pressure on brake pedal and hold.</li> <li>● Turn ignition switch to ON position.</li> <li>● Does brake pedal rise?</li> </ul>	Yes	▶ REVERIFY symptom.
		No	▶ REPLACE pump and motor.

TH8101A

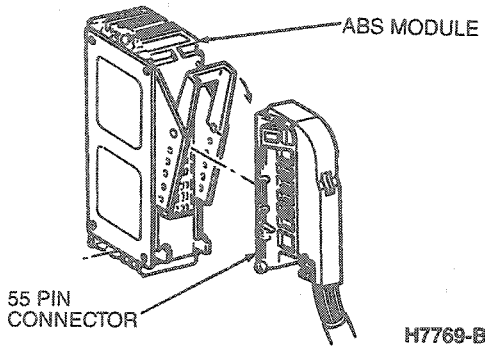
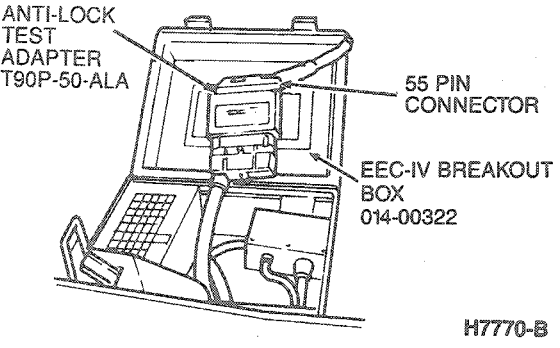
**PINPOINT TEST E:  
ANTI-LOCK WARNING INDICATOR SEQUENCE NORMAL — ABS PUMP MOTOR RUNS CONTINUOUSLY (IGNITION ON/IGNITION OFF)**

TEST STEP		RESULT	ACTION TO TAKE
<b>E1</b>	<b>VERIFY PUMP MOTOR CONDITION</b>		
	<ul style="list-style-type: none"> <li>● With vehicle standing still:</li> <li>● Check if pump motor runs with ignition switch in ON or OFF position.</li> </ul>	Pump runs with ignition in OFF position	▶ GO to E2
		Pump runs with ignition in ON position	▶ GO to E3.
<b>E2</b>	<b>CHECK PUMP MOTOR RELAY</b>		
	<ul style="list-style-type: none"> <li>● Remove pump motor relay.</li> <li>● Check for continuity between Pin 30 and test pin on the relay.</li> <li>● Is continuity present?</li> </ul>	Yes	▶ REPLACE pump motor relay.
		No	▶ REVERIFY that pump motor runs with ignition in OFF position.



DIAGNOSTIC TESTS (A-J) (Continued)

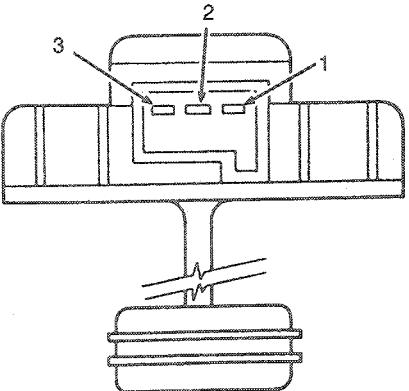
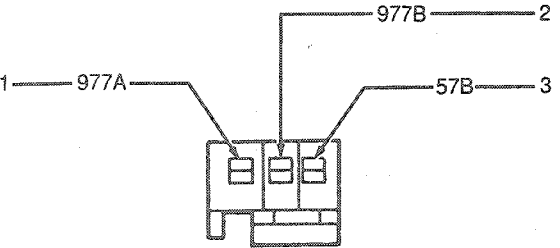
**PINPOINT TEST E:**  
**ANTI-LOCK WARNING INDICATOR SEQUENCE NORMAL — ABS PUMP MOTOR RUNS CONTINUOUSLY (IGNITION ON/IGNITION OFF) (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>E3</b>	<b>CHECK CIRCUIT 539 TO GROUND</b> <ul style="list-style-type: none"> <li>● Turn ignition switch OFF.</li> <li>● Disconnect 55-pin plug from ABS module.</li> </ul>  <ul style="list-style-type: none"> <li>● Connect EEC-IV Breakout Box 014-00322 with Anti-Lock Test Adapter T90P-50-ALA or equivalent to the anti-lock 55-pin plug wiring harness.</li> </ul>  <ul style="list-style-type: none"> <li>● Check for continuity between breakout box Pins 15 and 60.</li> <li>● <b>Is continuity present?</b></li> </ul>	Yes No	► GO to E4. ► GO to E5.
<b>E4</b>	<b>CHECK CIRCUIT 539</b> <ul style="list-style-type: none"> <li>● Disconnect pump motor relay from wire harness.</li> <li>● Check for continuity between breakout box Pins 15 and 60.</li> <li>● <b>Is continuity present?</b></li> </ul>	Yes No	► SERVICE or REPLACE cable harness Circuit 539. ► REPLACE pump motor relay.
<b>E5</b>	<b>CHECK ABS MODULE</b> <ul style="list-style-type: none"> <li>● Reconnect pump motor relay and ABS module.</li> <li>● Turn ignition to ON.</li> <li>● <b>Does pump motor run?</b></li> </ul>	Yes No	► REPLACE ABS module. ► REVERIFY symptom.

TH6411D

DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST F:**  
**BRAKE WARNING INDICATOR ON (WITH ANTI-LOCK INDICATOR OFF, PARKING BRAKE RELEASED AND BRAKE LINING WEAR CHECKED)**

TEST STEP		RESULT	ACTION TO TAKE
F1	CHECK BRAKE FLUID LEVEL	Low	CHECK system for external leaks. SERVICE as required.
	<ul style="list-style-type: none"> <li>Check that brake fluid is no more than 4mm (0.16 inch) below MAX line located on side of master cylinder reservoir.</li> </ul>	Normal	GO to F2.
F2	CHECK FLUID LEVEL SWITCH	Yes	REPLACE reservoir fluid cap.
	<ul style="list-style-type: none"> <li>Disconnect 3-pin plug on master cylinder fluid reservoir cap.</li> <li>Check for continuity between Pins 1 and 3 on reservoir cap.</li> <li>Is continuity present?</li> </ul>	No	GO to F3.
 <p>3 PIN FLUID RESERVOIR CAP H7786-A</p>			
F3	CHECK FOR GROUND CONCERN	Yes	SERVICE or REPLACE cable harness Circuit 977A.
	<ul style="list-style-type: none"> <li>Check for grounded wire harness, Circuit 977.</li> <li>Is wire harness grounded?</li> </ul>	No	REVERIFY "BRAKE" indicator on.
 <p>3 PIN FLUID RESERVOIR CAP CONNECTOR HARNESS SIDE H7927-A</p>			

TH7916A

**PINPOINT TEST G:**  
**NO ANTI-LOCK WARNING INDICATOR ON WHEN IGNITION SWITCH TURNED ON**

TEST STEP		RESULT	ACTION TO TAKE
G1	CHECK IGNITION FEED AND FUSE	12 volts	GO to G2.
	<ul style="list-style-type: none"> <li>Check for 12 volts to lamp socket with ignition ON.</li> </ul>	No voltage	SERVICE ignition feed or fuse as required.

## DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST G:**  
**NO ANTI-LOCK WARNING INDICATOR ON WHEN IGNITION SWITCH TURNED ON (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
G2	CHECK WARNING INDICATOR BULB		
	<ul style="list-style-type: none"> <li>● Check warning indicator bulb.</li> <li>● Is bulb good?</li> </ul>	Yes	▶ GO to G3.
		No	▶ REPLACE bulb.
G3	CHECK CIRCUIT 603		
	<ul style="list-style-type: none"> <li>● Check continuity between lamp socket and breakout box Pin 52.</li> <li>● Is continuity present?</li> </ul>	No	▶ SERVICE or REPLACE cable harness Circuit 606.
		Yes	▶ GO to G4.
G4	CHECK DIODE		
	<ul style="list-style-type: none"> <li>● Inspect diode for damage or loose or bad connection.</li> <li>● Check if diode is installed backwards.</li> </ul>	Diode good	▶ REVERIFY symptom.
		Diode damaged or installed backwards	▶ REPLACE diode.

TH7914B

**PINPOINT TEST H:**  
**SPONGY BRAKE PEDAL WITH/WITHOUT ANTI-LOCK FUNCTION**  
**(NO WARNING INDICATOR)**

TEST STEP		RESULT	ACTION TO TAKE
H1	CHECK COMPONENT MOUNTING		
	<ul style="list-style-type: none"> <li>● Check for proper brake pedal and booster/master cylinder attachment.</li> <li>● Bleed brake system as outlined.</li> <li>● Is pedal spongy?</li> </ul>	Yes	▶ GO to H2.
		No	▶ Condition corrected.
H2	BLEED BRAKE SYSTEM		
	<ul style="list-style-type: none"> <li>● Rebleed brake system.</li> <li>● Is pedal spongy?</li> </ul>	Yes	▶ REPLACE master cylinder.
		No	▶ Condition corrected.

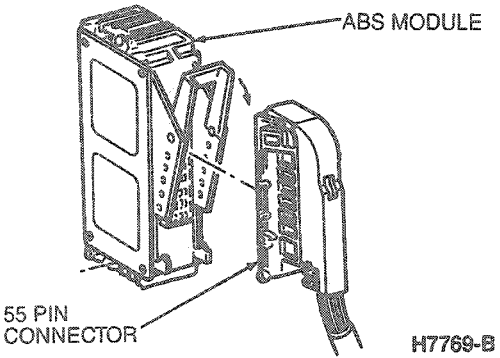
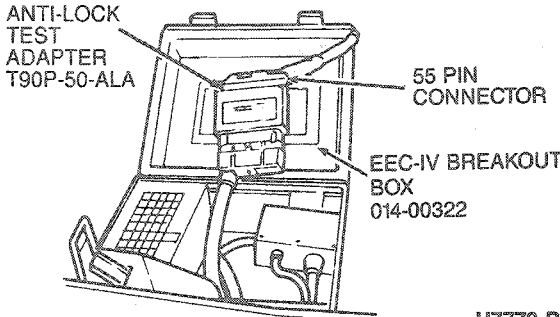
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**PINPOINT TEST J:**  
**POOR VEHICLE TRACKING DURING ANTI-LOCK FUNCTION**  
**(WARNING INDICATOR OFF)**

TEST STEP		RESULT	ACTION TO TAKE
J1	VERIFY CONDITION		
	<ul style="list-style-type: none"> <li>● Verify condition exists as reported.</li> <li>● Bleed brake system as outlined.</li> <li>● Does vehicle track poorly?</li> </ul>	No	▶ Condition corrected.
		Yes	▶ GO to J2.

DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST J:  
POOR VEHICLE TRACKING DURING ANTI-LOCK FUNCTION  
(WARNING INDICATOR OFF) (Continued)**

	TEST STEP	RESULT	ACTION TO TAKE
<p><b>J2</b></p>	<p><b>CHECK ANTI-LOCK VALVE OPERATION</b></p> <ul style="list-style-type: none"> <li>● Turn ignition switch OFF.</li> <li>● Disconnect 55-pin plug from ABS module.</li> </ul>  <p>ABS MODULE</p> <p>55 PIN CONNECTOR</p> <p>H7769-B</p> <ul style="list-style-type: none"> <li>● Connect EEC-IV breakout box 014-00322 with Anti-Lock Test Adapter T90P-50-ALA or equivalent to the Anti-Lock 55-pin connector on wire harness.</li> </ul>  <p>ANTI-LOCK TEST ADAPTER T90P-50-ALA</p> <p>55 PIN CONNECTOR</p> <p>EEC-IV BREAKOUT BOX 014-00322</p> <p>H7770-B</p> <ul style="list-style-type: none"> <li>● Lift vehicle and rotate wheels to ensure they turn freely.</li> <li>● Jump Pins 19 and 34 at breakout box.</li> <li>● Short Pins 20, 2 and 60 to each other at breakout box.</li> <li>● Apply moderate brake pedal effort and check that LH front wheel will not turn.</li> <li>● Check to see that LH front wheel turns freely when ignition switch is ON.</li> </ul> <p><b>CAUTION: Do not leave ignition on for more than 1 minute, or valve damage may result.</b></p>	<p>Wheel turns freely</p> <p>Wheel does not turn freely or pedal drops</p>	<ul style="list-style-type: none"> <li>▶ TURN ignition switch OFF. DISCONNECT wire leads. GO to J3.</li> <li>▶ VERIFY correct wiring between 55-pin connector and 19-pin connector on valve block per wiring diagram.</li> <li>▶ If wiring is correct, REPLACE solenoid valve block.</li> </ul>
<p><b>J3</b></p>	<p><b>CHECK ANTI-LOCK OPERATION RH FRONT WHEEL</b></p> <ul style="list-style-type: none"> <li>● Jump Pins 19 and 34 at breakout box.</li> <li>● Short Pins 38, 21 and 60 to each other at breakout box.</li> <li>● Apply moderate brake pedal effort. Check that RH front wheel will not turn with ignition OFF.</li> <li>● Check that RH front wheel turns freely with ignition ON.</li> </ul> <p><b>CAUTION: Do not leave ignition on for more than 1 minute or valve damage may result.</b></p>	<p>Wheel turns freely</p> <p>Wheel does not turn freely or pedal drops</p>	<ul style="list-style-type: none"> <li>▶ TURN ignition switch OFF. DISCONNECT wire leads. GO to J4.</li> <li>▶ VERIFY correct wiring between 55-pin connector and 19-pin connector on valve block per wiring diagram.</li> <li>▶ If wiring is correct, REPLACE solenoid valve block.</li> </ul>

## DIAGNOSTIC TESTS (A-J) (Continued)

**PINPOINT TEST J:  
POOR VEHICLE TRACKING DURING ANTI-LOCK FUNCTION  
(WARNING INDICATOR OFF) (Continued)**

TEST STEP		RESULT	ACTION TO TAKE
<b>J4</b>	<b>CHECK ANTI-LOCK OPERATION RH REAR WHEEL</b>		
	<ul style="list-style-type: none"> <li>● Jump Pins 19 and 34 at breakout box.</li> <li>● Short Pins 55, 18 and 60 to each other at breakout box.</li> <li>● Apply moderate brake pedal effort. Check that RH rear wheel will not turn with ignition OFF.</li> <li>● Check that RH rear wheel turns freely with ignition ON.</li> </ul> <p><b>CAUTION: Do not leave ignition on for more than 1 minute or valve damage may result.</b></p>	<p>Wheel turns freely</p> <p>Wheel does not turn freely or pedal drops</p>	<p>TURN ignition switch OFF. DISCONNECT wire leads. GO to J5.</p> <p>VERIFY correct wiring between 55-pin connector and 19-pin connector on valve block per wiring diagram.</p> <p>If wiring is correct, REPLACE solenoid valve block.</p>
<b>J5</b>	<b>CHECK ANTI-LOCK OPERATION LH REAR WHEEL</b>		
	<ul style="list-style-type: none"> <li>● Jump Pins 19 and 34 at breakout box.</li> <li>● Short Pins 36, 54 and 60 to each other at breakout box.</li> <li>● Apply moderate brake pedal effort. Check that LH rear wheel turns freely with ignition ON.</li> </ul> <p><b>CAUTION: Do not leave ignition on for more than 1 minute or valve damage may result.</b></p>	<p>Wheel turns freely</p> <p>Wheel does not turn freely or pedal drops</p>	<p>TURN ignition switch OFF. DISCONNECT wire leads and breakout box. LOWER vehicle. REVERIFY symptom.</p> <p>VERIFY correct wiring between 55-pin connector and 19-pin connector on valve block per wiring diagram.</p> <p>If wiring is correct, REPLACE solenoid valve block.</p>

TH7915B

## REMOVAL AND INSTALLATION

**Master Cylinder Reservoir Checking and Filling**

Brake fluid level in the master cylinder reservoir should be between 4mm (0.16 inch) below the MAX line on the side of the reservoir and the MAX line. If brake fluid is low, the red BRAKE indicator will illuminate. To add brake fluid, clean and remove cap and pour clean brake fluid into the top of the reservoir. Fill to specification mentioned above. Use Heavy-Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or DOT-3 equivalent. If brake fluid has to be added often, check all hydraulic connections for leaks.

**Brake Booster Assembly****Removal**

1. With engine turned OFF, pump brake pedal until all vacuum is removed from booster. This will prevent master cylinder seal from being sucked into booster during disassembly.
2. Disconnect manifold vacuum hose from booster check valve.
3. Disconnect electrical connector from master cylinder reservoir cap (fluid level indicator).

4. Remove brake tubes from primary and secondary outlet ports of the master cylinder, and remove HCU supply hose. Plug ports and reservoir feed to prevent brake fluid from leaking onto paint and wiring.
5. Inside the passenger compartment, remove stoplamp switch wiring connector from switch (under instrument panel). Disengage pedal position switch from stud.
6. Remove hairpin retainer and outer nylon washer from pedal pin. Slide stoplamp switch off brake pedal just far enough for outer arm to clear pin.
7. Remove switch. Be careful not to damage switch during removal.
8. Remove booster-to-dash panel retaining nuts. Slide bushing and booster push rod off brake pedal pin.
9. From inside engine compartment, move booster forward until booster studs clear dash panel. Remove booster and master cylinder assembly.
10. Place booster and master cylinder assembly on a clean bench. Remove two nuts retaining master cylinder to booster. Slide master cylinder away from booster.

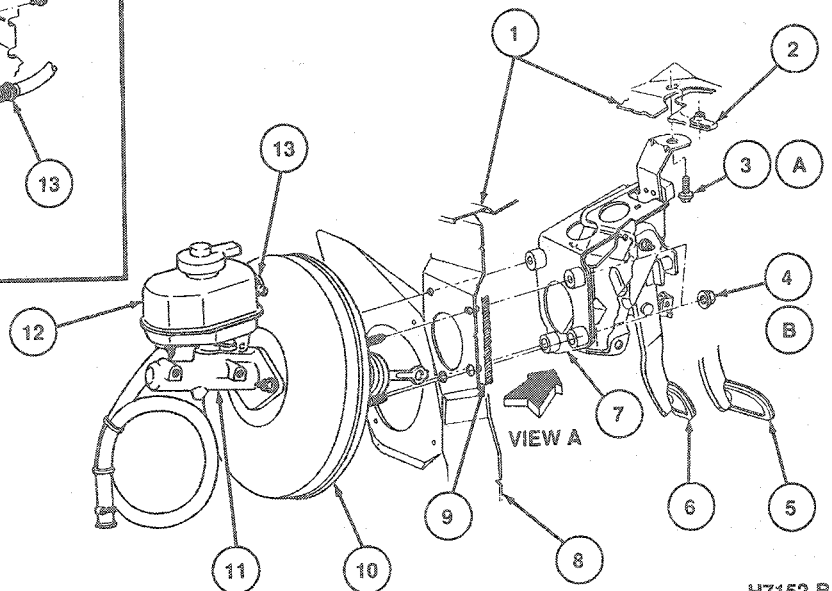
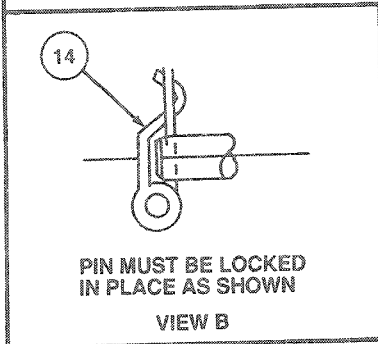
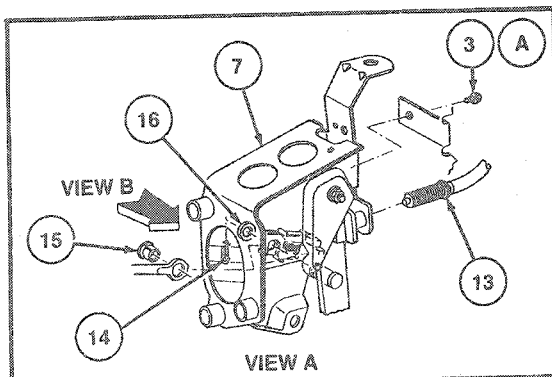
## REMOVAL AND INSTALLATION (Continued)

## Installation

- Slide master cylinder onto booster studs. Ensure seal is in place in groove on master cylinder and install two retaining nuts. Tighten nuts to 21-29 N·m (16-21 lb-ft).
- Place booster and master cylinder assembly in position on dash.
- Inside passenger compartment, install booster push rod and bushing on brake pedal pin with head of bushing away from pedal. Secure booster to dash panel with self-locking nuts. Tighten nuts to 21-29 N·m (16-21 lb-ft).

**CAUTION:** Use care not to bend or deform switch.

- Position stoplamp switch so that it straddles booster push rod with switch slot toward pedal blade and hole just clearing pin. Slide switch completely onto pin.
- Install outer nylon washer on pin and secure all parts to pin with hairpin retainer. Make sure retainer is fully installed and locked over pedal pin. Install stoplamp switch wiring connector.
- Install pedal travel switch as outlined. Adjust switch as outlined under Adjustments.
- Connect brake tubes to master cylinder and tighten to 15-20 N·m (11-15 lb-ft). Connect HCU supply hose to reservoir.
- Connect manifold vacuum hose to booster check valve and electrical connector to master cylinder reservoir cap.
- Bleed brake system as outlined.



H7152-B

Item	Part Number	Description
1	—	Cowl
2	N800538-S100	Nut
3A	N606689-S2	Bolt
4B	N620481-S2	Nut (4 Req'd)
5	—	Brake Pedal (Auto)
6	—	Brake Pedal (Manual)
7	2450	Pedal Bracket Assy
8	—	Dash Panel
9	—	Dash

(Continued)

Item	Part Number	Description
10	2B195	Vacuum Booster
11	2B195	Master Cylinder
12	2B195	Reservoir
13	9C727	Speed Control Valve
14	380699-S100	Pin
15	2A309	Bushing
16	2B129	Spacer
A		Tighten to 18-30 N·m (12-22 Lb-Ft)
B		Tighten to 21-29 N·m (16-21 Lb-Ft)

**REMOVAL AND INSTALLATION (Continued)****Master Cylinder****Removal**

1. With engine OFF, pump brake pedal until all vacuum is removed from booster. This will prevent master cylinder seal from being sucked into booster during disassembly.
2. Disconnect electrical connector from master cylinder assembly (fluid level indicator).
3. Remove brake tubes from primary and secondary outlet ports of master cylinder. Plug ports to prevent brake fluid from leaking onto paint and wiring.
4. Remove two nuts retaining master cylinder to brake booster assembly.
5. Slide master cylinder forward and upward from vehicle.

**Installation**

1. Install new seal into groove in master cylinder. Ensure seal is seated properly or booster will leak.
2. Position master cylinder assembly onto two studs on booster assembly.
3. Install two retaining nuts and tighten to 21-29 N·m (16-21 lb-ft).
4. Install front and rear brake tubes to master cylinder outlet ports and tighten to 14-24 N·m (10-18 lb-ft).
5. Connect fluid level indicator electrical connector to master cylinder assembly.
6. Fill master cylinder reservoir with specified brake fluid to full mark on side of reservoir. Use Heavy Duty Brake Fluid C6AZ-19542-AA or BA (ESA-M6C25-A) or DOT-3 equivalent.
7. Bleed master cylinder and primary and secondary brake systems as outlined.
8. Bleed entire brake system using special bleeding adapter as outlined.
9. Operate brake several times, then check for external leaks.

**Hydraulic Control Unit (HCU)****Taurus/Sable****Removal**

1. Disconnect and remove battery from vehicle.
2. Remove battery tray from vehicle.
3. Remove three plastic push pins holding acid shield to HCU mounting bracket and remove acid shield.
4. Disconnect 19-pin connector from HCU to wire harness, and disconnect 4-pin connector from HCU to pump motor relay.

5. Remove two tubes from inlet ports and four tubes from outlet ports of HCU. Plug each port to prevent brake fluid from spilling onto paint and wiring.

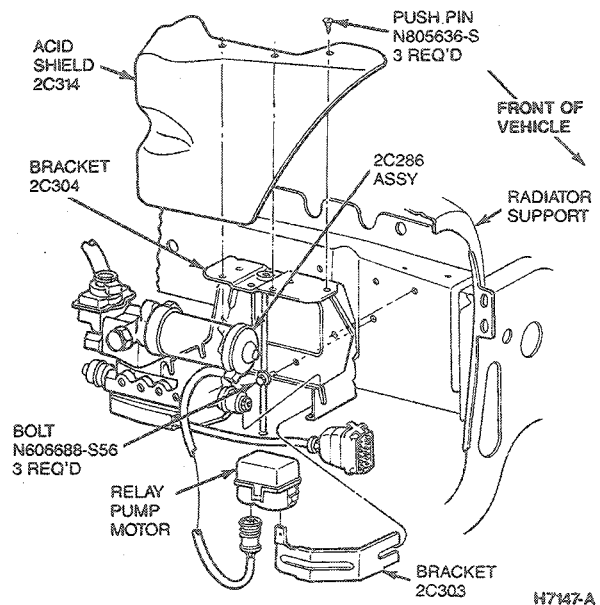
NOTE: Nut on front of HCU also retains the relay mounting bracket.

6. Remove three nuts retaining HCU assembly to mounting bracket and remove assembly from vehicle.

**Installation**

NOTE: Attach relay mounting bracket with nut on front of HCU.

1. Position HCU assembly into mounting bracket. Install three retaining nuts and tighten to 16-24 N·m (12-18 lb-ft).
2. Connect four tubes to outlet ports on side of HCU and two tubes to inlet ports on rear of HCU and tighten to 15-20 N·m (11-15 lb-ft).
3. Connect 19-pin connector to harness and 4-pin connector to pump motor relay.
4. Install acid shield and three plastic push pins holding acid shield to HCU mounting bracket.
5. Install battery tray.
6. Install battery and connect cables.
7. Bleed brake systems, as outlined and check for fluid leaks.

**Taurus SHO****Removal**

1. Disconnect battery ground cable. Remove ABS module and mounting bracket from top of HCU mounting bracket.
2. Disconnect 19-pin connector retaining HCU to wire harness and disconnect 4-pin connector HCU to pump motor relay.

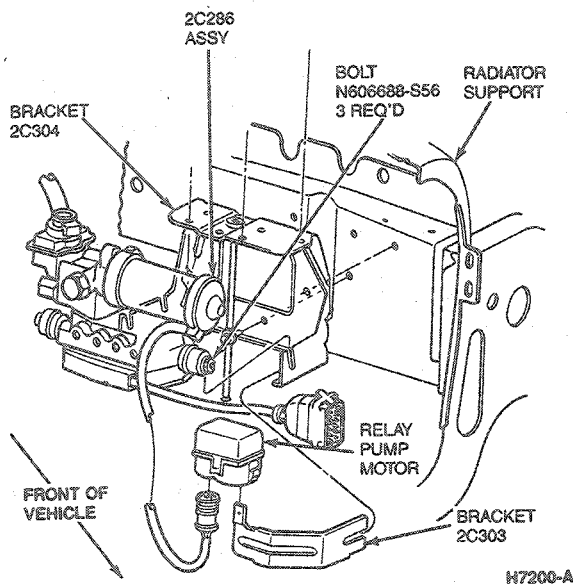
## REMOVAL AND INSTALLATION (Continued)

- Remove two tubes from inlet ports and four tubes from outlet ports of HCU, plug each port to prevent brake fluid from spilling on paint and wiring.
- Remove three nuts that attach the HCU assembly to mounting bracket and remove assembly from vehicle.

NOTE: Nut on front of HCU also retains the relay mounting bracket.

### Installation

- Position HCU assembly into mounting bracket. Install three retaining nuts and tighten to 16-24 N·m (12-18 lb-ft).  
NOTE: Install relay mounting bracket with nut on front of HCU.
- Connect four tubes to outlet ports on side of HCU and tighten to 15-20 N·m (11-15 lb-ft).
- Connect 19-pin connector to harness and 4-pin connector to pump motor relay.
- Install ABS module mounting bracket and ABS module to top of HCU mounting bracket.
- Connect battery and bleed brake system as outlined and check for fluid leaks.



### ABS Module

#### Removal

- Disconnect negative battery cable.
- Remove trim panel in luggage compartment (behind rear seat) to expose electronic control unit. Refer to Section 01-05.

- Disconnect 55-pin connector from ABS module. Unlock connector by pulling up lever completely. Move top of connector away from ABS module until all terminals are clear, then pull connector up out of slots in ABS module.
- Remove three screws attaching ABS module to mounting bracket and remove ABS module.

### Installation

- Align ABS module with bracket so that lever is facing up and side with two mounting holes is flat against bracket at top.  
NOTE: If all three mounting holes in ABS module do not line up with holes in mounting bracket, ABS module is incorrectly aligned with bracket.
- Install three retaining screws and tighten to 1.7-2.3 N·m (15-20 lb-in).
- Connect 55-pin connector by installing bottom part of connector into slots in ABS module and pushing top portion of connector into ABS module. Then, pull locking lever completely down to ensure proper installation.
- Install trim panel cover.
- Connect negative battery cable.

### Wheel Sensors, Front

#### Removal

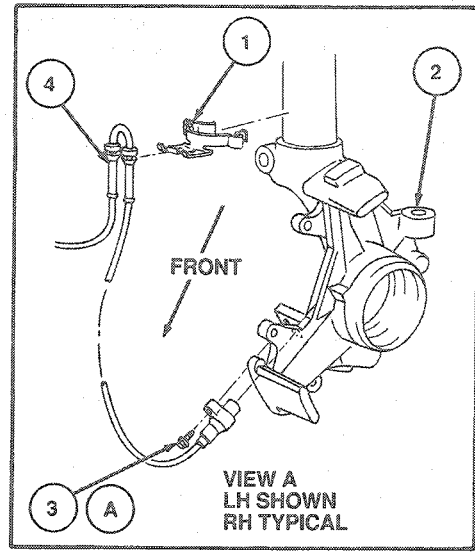
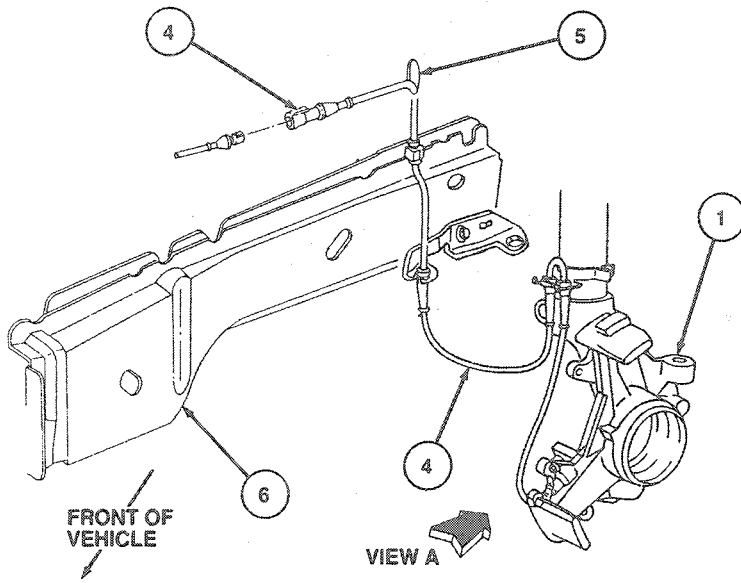
- Disconnect sensor connector located in engine compartment.
- For RH front sensor, remove two plastic push studs to loosen front section of splash shield in wheel well. For LH front sensor, remove two plastic push studs to loosen rear section of splash shield.
- Thread sensor wire through holes in fender apron. For RH front sensor, remove two retaining clips behind splash shield.
- Raise vehicle on a hoist. Refer to Section 00-02. Remove wheel and tire assembly.
- Disengage sensor wire grommets at height sensor bracket and from retainer clip on shock strut just above spindle.
- Loosen sensor retaining screw and remove sensor assembly from front knuckle.

#### Installation

- Align front wheel speed sensor with its mounting holes on front knuckle. Tighten retaining screw to 4.5-6.8 N·m (40-60 lb-in).
- Install grommets at height sensor bracket and the retainer clip at shock strut.
- Thread wire through holes in fender apron. Install retainer clips (for RH sensor only). Secure splash shield with plastic push studs.
- Connect sensor connector to wiring harness from engine compartment.



**REMOVAL AND INSTALLATION (Continued)**



H7202-C

Item	Part Number	Description
1	2C194	Retainer Clip
2	3K170 RH 3K171 LH	Spindle Assy
3A	N805151-S100	Bolt

(Continued)

Item	Part Number	Description
4	2C204	Sensor Assy
5	—	Hole in Spring Tower
6	—	LH Side Member
A		Tighten to 4.5-6.8 N·m (40-60 Lb·in)

**Wheel Sensor, Rear**

**Sedan**

**Removal**

1. Remove rear seat and seat back insulation. Refer to Section 01-10.
2. Disconnect sensor from harness and tie one end of string or wire to sensor connector, and tie other end to rear seat sheet metal bracket.
3. Push sensor wire grommet and connector through floorpan, drawing string or wire with sensor connector.
4. Disconnect string or wire from the sensor from underneath vehicle.
5. Raise vehicle on hoist. Refer to Section 00-02.
6. Disconnect routing clips from suspension arms and remove sensor retaining bolts from rear brake adapters.

**Installation**

1. Insert rear wheel speed sensor into hole in adapter and install retaining bolt. Tighten to 4.6-6.8 N·m (40-60 lb-in).
2. Install sensor routing clips to suspension arms.
3. Attach string or wire to new sensor connector, then pull sensor connector through hole in floorpan using string or wire.

4. Install sensor wire grommet into hole in floorpan.
5. Remove string or wire and connect sensor to harness.
6. Install rear seat back.

**Station Wagon**

**Removal**

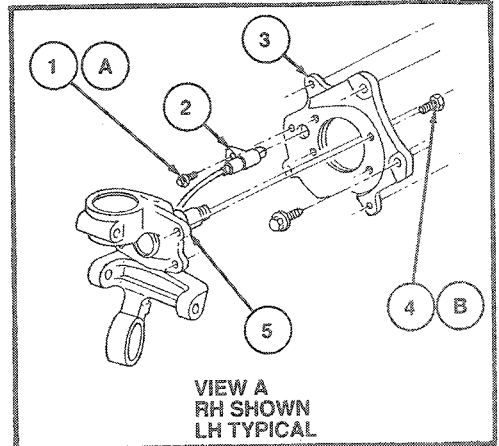
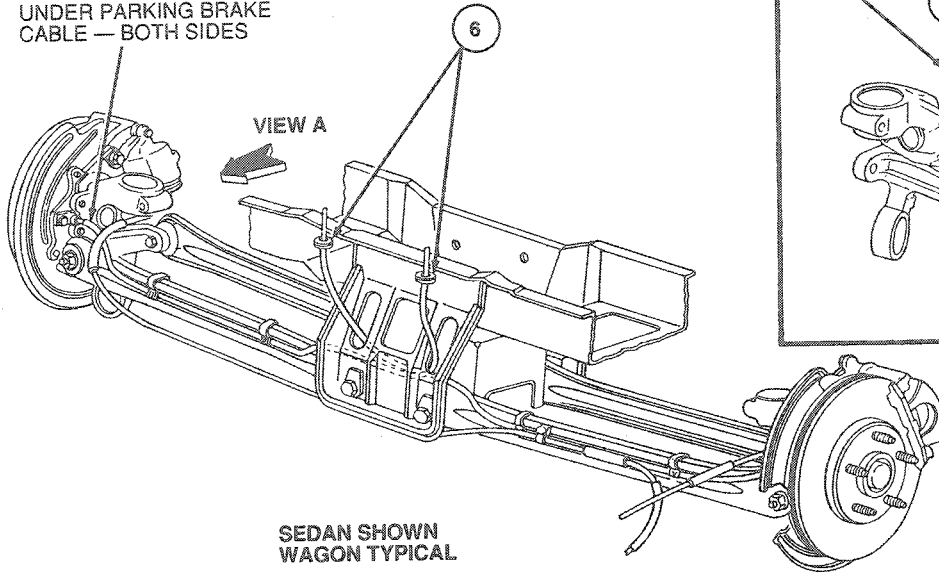
1. Raise vehicle on hoist. Refer to Section 00-02.
2. Remove sensor wire with attached grommet from hole in floorpan.
3. Disconnect sensor from harness.
4. Remove routing clips then remove sensor retaining bolt and sensor.

**Installation**

1. Install rear wheel speed sensor and retaining bolt. Tighten to 4.6-6.8 N·m (40-60 lb-in).
2. Route sensor harness and install clips.
3. Connect sensor to harness. Push through hole in floorpan and install grommet.
4. Lower vehicle.

REMOVAL AND INSTALLATION (Continued)

ROUTE ANTI-LOCK WIRE UNDER PARKING BRAKE CABLE — BOTH SIDES



H7203-C

Item	Part Number	Description
1A	N805151-S100	Bolt
2	2C216 LH 2C190 RH	Sensor Assy
3	2C101 LH 2C100 RH	Hub Adapter

(Continued)

Item	Part Number	Description
4B	N805086-S100	Bolt (4 Req'd)
5	—	Rear Knuckle Assy
6	—	Floor Grommets
A		Tighten to 4.5-6.8 N·m (40-60 Lb·in)
B		Tighten to 60-80 N·m (45-60 Lb·Ft)

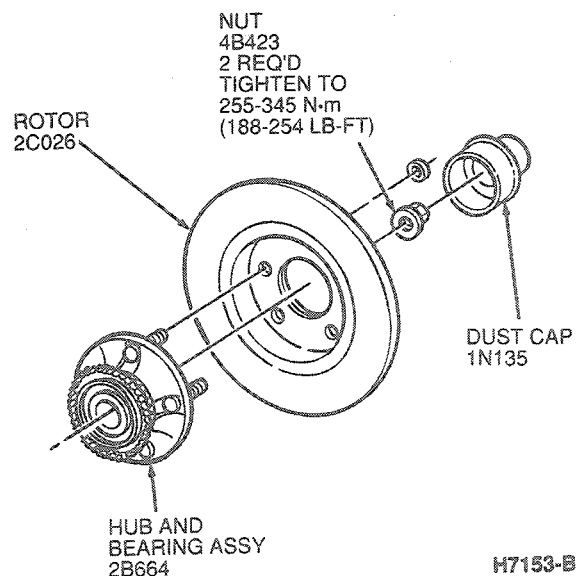
**Speed Indicator Ring, Front**

Refer to Section 05-04 for Front Speed Indicator Removal and Installation procedures.

**Speed Indicator Ring, Rear**

**Removal**

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Remove wheel and tire assembly.
3. Remove caliper, rotor and rear hub assemblies. Refer to Sections 04-02 and 06-04.



H7153-B

**REMOVAL AND INSTALLATION (Continued)**

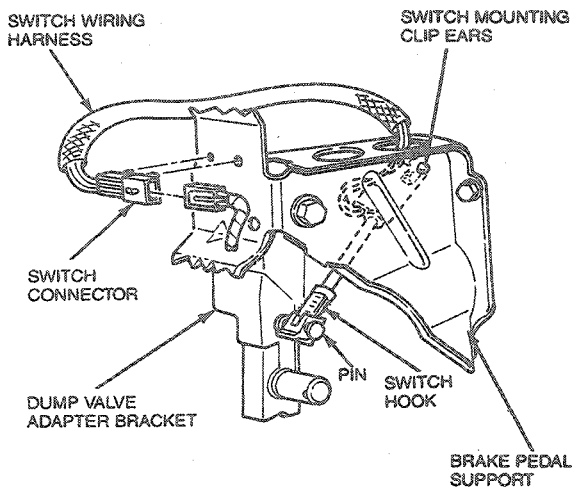
4. Position hub assembly in an arbor press and press hub out of speed sensor ring.

**Installation**

1. Position speed sensor ring over hub.
2. Using a flat piece of steel or similar tool, press ring down until it is flush with top of hub.
3. Install rear hub, rotor and caliper. Refer to Sections 04-02 and 06-04 for procedures.
4. Install wheel and tire assembly. Tighten wheel lug nuts to 115-142 N·m (85-105 lb-ft).

**Pedal Travel Switch****Removal**

1. Disconnect wiring harness lead at switch connector.
2. Using a flat-bladed screwdriver, or similar tool, pry connector locator from holes in brake pedal support.
3. Unsnap switch hook from pin on dump valve adapter bracket.
4. Using needlenose pliers, or similar tool, squeeze tabs on switch mounting clip and push clip through hole in brake pedal support.
5. Remove switch by feeding switch harness through hole in top of brake pedal support bracket.



H7154-A

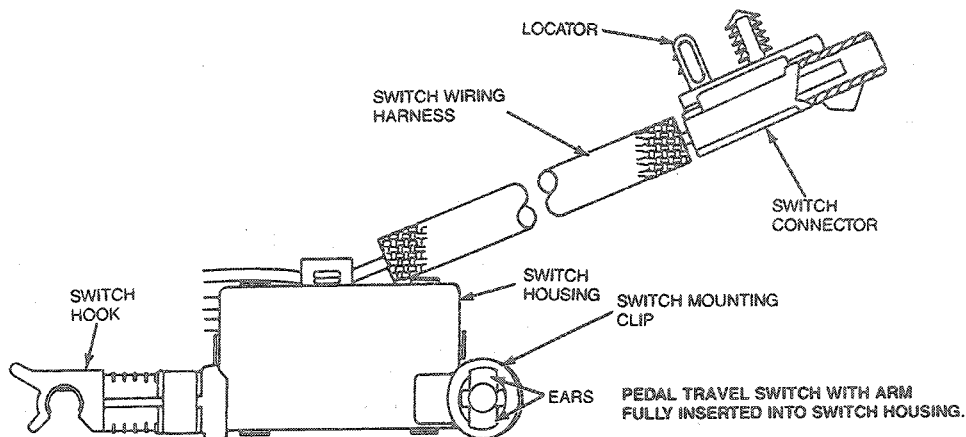
**Installation**

1. Feed switch harness through forward hole in top of brake pedal support. Route harness around the LH side of support and install locators to holes in vertical tab with open side of connector facing center of vehicle.  
NOTE: Ensure wiring from harness is restricted from coming in contact with steering universal joint.
2. Connect switch to vehicle harness.
3. Insert switch mounting clip to hole in brake pedal support and press firmly toward brake pedal support sidewall until a click is heard.
4. Rotate switch and ensure that mounting clip tabs are fully engaged.
5. Adjust switch as outlined.

### ADJUSTMENTS

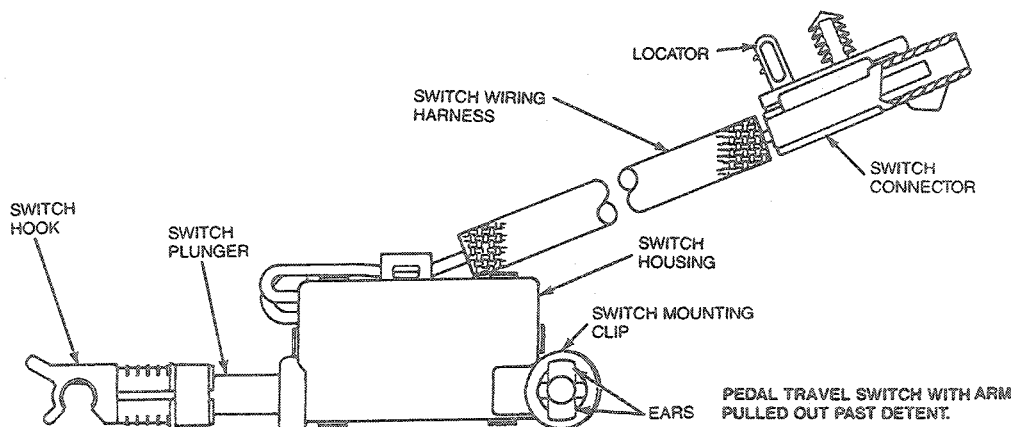
#### Pedal Travel Switch

To adjust the pedal travel switch, push the switch plunger fully into the switch housing as shown. This zeroes out the switch adjustment so that it can be automatically reset to the correct dimension during the following steps.



H7150-A

Slowly pull the arm back out of the switch housing past the detent point. At this point it should be impossible to reattach the arm to the pin unless the brake pedal is forced down. To complete the adjustment, depress the brake pedal until the switch hook can be snapped onto the pin. Snap hook onto pin and pull brake pedal back up to its normal at rest position. This automatically sets the switch to the proper adjustment. Any time the switch is unhooked from the pin for any reason, the above resetting procedure should be performed to ensure correct switch adjustment.



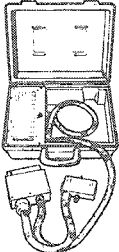

H7151-A

## SPECIFICATIONS


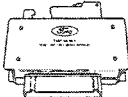
## TORQUE SPECIFICATIONS

Description	N-m	Lb-Ft
Booster to Dash Panel—Nut	21-29	16-21
Brake Tube to Master Cylinder—Fitting	16-20	12-15
Master Cylinder to Booster—Nut	21-29	16-21
Hydraulic Control Unit to Bracket—Nut	16-20	12-15
Brake Tubes to Hydraulic Control Unit	14-24	10-18
ABS Module to Bracket Screws	1.7-2.3	15-20 (Lb-In)
Front Wheel Speed Sensor—Bolt	4.5-6.8	40-60 (Lb-In)
Hub Adapter Bolts	60-80	45-60
Hub Nut	257-352	190-260
Wheel Lug Nuts	115-142	85-105
ABS Module Bracket Bolts	8-12	6-8

## SPECIAL SERVICE TOOLS

Tool Number/ Description	Illustration
T83L-50-EEC-IV Breakout Box	 T83L-50-EEC-IV
T85T-4616-AH Pinion Bearing Cup Replacer	 T85T-4616-AH

(Continued)

Tool Number/ Description	Illustration
T89P-20202-A Sensing Ring Installer	 T89P-20202-A
T90P-50-ALA Anti-Lock Test Adapter	 T90P-50-ALA

## ROTUNDA EQUIPMENT

Model	Description
007-0041B	SUPER STAR II Tester
014-00322	EEC-IV 60 Pin Breakout Box
105-00051	Digital/ Analog Volt-Ohmmeter