Steering Column — Automated Equipment

Special Tool(s)

<table>
<thead>
<tr>
<th>Tool Name</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Steering Column Locking Lever Tool</td>
<td>ST2000-A</td>
</tr>
</tbody>
</table>

Material

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignition Lock Grease</td>
<td>ESA-M1C232-A</td>
</tr>
<tr>
<td>FOAZ-19584-A</td>
<td></td>
</tr>
<tr>
<td>Rust Penetrant and Inhibitor</td>
<td>ESR-M99C56-A</td>
</tr>
<tr>
<td>F2AZ-19A501-A</td>
<td></td>
</tr>
<tr>
<td>Steering Gear Grease</td>
<td>ESW-M1C87-A</td>
</tr>
<tr>
<td>C3AZ-19578-A</td>
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</tr>
</tbody>
</table>

Disassembly

All vehicles

1. Remove the multifunction switch. For additional information, refer to Section 211-05.

2. Remove the clockspring. For additional information, refer to Section 501-20B.

3. Remove the ignition lock cylinder. For additional information, refer to Section 501-14.

4. **WARNING:** To reduce the risk of serious personal injury, read and follow all warnings, cautions, notes and instructions in the steering column removal and installation procedure.

   Remove the steering column (3C529). For additional information, refer to Column — Super Duty or Column — Motorhome in this section.

5. **CAUTION:** Carefully note the position of the steering column lock gear, bearing and retainer prior to removal.

   Remove the bearing retainer (3C610).
6. Remove the steering column lock housing bearing (3E700).

7. Remove the steering column lock gear (3E717).

8. Remove the gearshift lever pin and the gearshift lever.

**Vehicles with tilt column**

9. Remove the sensor ring.
   1. Remove the steering column lower bearing spring.
   2. Remove the sensor ring.
Vehicles with fixed column

10. Remove the snap ring from the bottom of the steering column shaft.

All vehicles

11. Remove the steering column bearing tolerance ring (3L539) from the steering column shaft.

12. Remove the two lock cylinder housing pivot screws.

13. **WARNING:** The steering column position spring is under tension and can come out with great force.

   Remove the steering column lock cylinder housing (3511) and the steering column shaft from the steering actuator housing (3F723).
   1. Pry up on the steering column locking levers (3B661) using a shop fabricated tool.
   2. On tilt steering columns, remove the steering column position spring (3D655).
14. Remove the turn signal cancel cam.

15. Remove the snap ring.

16. Remove the steering column upper bearing spring (3520).

17. Remove the steering column bearing sleeve (3518).
18. Remove the steering column bearing tolerance ring.
   1. Slide the steering column shaft in toward the steering column lock cylinder housing.
   2. Slide the steering column bearing tolerance ring off the steering column shaft and remove the shaft.

19. Using a suitable punch, remove the steering column bearing (3517) from the steering column lock cylinder housing.

Vehicles with tilt column

20. Use a suitable punch to remove the steering column bearing from the steering column lock cylinder housing.
All vehicles

21. Remove the brake shift interlock solenoid.
   1. Remove the three bolts.
   2. Remove the brake shift interlock solenoid.

22. Remove the shift tube.
   1. Remove the four bolts.
   2. Remove the two shift tube clamps.
   3. Remove the shift tube.

23. Remove the transmission selector lever arm and support (7302).
   1. Remove the two bolts.
   2. Remove the transmission selector lever arm and support.
24. Remove the spring.

25. Drive out the gearshift lever pin (7W441) from the shift tube.

26. Remove the gearshift lever (7210).

27. Remove the column shift selector lever plunger (7361).
   - If it is bent, install a new column shift selector lever plunger.
28. Remove the two gearshift lever socket bushings and the transmission control selector lever spring clip.

29. Remove the steering column lock pawl (3E691).
   1. Drive out the steering column lock lever pin.
   2. Remove the steering column lock pawl.

30. Remove the ignition switch (11572).
   1. Remove the screws.
   2. Remove the ignition switch.
31. Remove the lower steering column bearing and sleeve.

32. Remove the steering column lower bearing retainer.
   1. Remove the three bolts.
   2. Remove the steering column lower bearing retainer.

33. Remove the upper steering column lock actuator and the lower steering column lock actuator.
Assembly

All vehicles

1. Install the steering column lock actuators.
   1. Use ignition lock grease to lubricate the steering column lock actuators.
   2. Install the steering column lock actuators.

2. **NOTE:** Coat all surfaces with ignition lock grease.

   Install the steering column lock pawl.
   1. Position the steering column lock pawl.
   2. Drive in the steering column lock lever pin (3B663).

3. Install the steering column lower bearing retainer (3D681).
   1. Position the steering column lower bearing retainer.
   2. Install the three bolts.
4. **NOTE:** The "UP" position of the bearing must be facing forward, toward the engine.

**NOTE:** Install the steering column bearing and sleeve so that the inner race is visible when installed.

Install the steering column bearing and sleeve.

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<thead>
<tr>
<th>Item</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>1</td>
<td>—</td>
<td>Outer Race</td>
</tr>
<tr>
<td>2</td>
<td>3517</td>
<td>Bearing (In the &quot;UP&quot; Position)</td>
</tr>
<tr>
<td>3</td>
<td>—</td>
<td>Ball</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
<td>Inner Race</td>
</tr>
</tbody>
</table>

5. Install the ignition switch. Align the ignition switch with the slot and index mark on the steering column.
   - Install the screws.
6. Install the transmission control selector lever spring clip and the gearshift lever socket bushings (7335) on the shift tube.
   - Coat the gearshift lever socket bushings with steering gear grease.

7. Install the column shift selector lever plunger.
   - Coat the column shift selector plunger with steering gear grease.

8. Position the gearshift lever in the shift tube.
9. **CAUTION:** Gearshift lever pin must be installed correctly or 1st gear position may be blocked.

Install the gearshift lever pin in the shift tube.

10. Install the gearshift selector tube spring in the shift tube.
    - Coat the end of the spring with steering gear grease.

11. Install the transmission selector lever arm and support on the shift tube.
    1. Position the transmission selector lever arm and support.
    2. Install the bolts.
12. Install the shift tube.
   1. Position the shift tube.
   2. Position the shift tube clamps.
   3. Install the bolts.

13. Position the brake shift interlock solenoid and install the bolts.

14. **CAUTION:** Install the upper steering column bearing so that the inner race is visible when installed.

   Using an appropriate bearing installer or socket, install the upper steering column bearing on the steering column lock cylinder housing.
Vehicles with tilt column

15. **CAUTION:** Install the large steering column bearing so that the inner race is visible when
installed.

**NOTE:** Use an appropriate bearing installer or socket.

On tilt steering columns, install the large steering column bearing into the steering column lock cylinder housing.

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<tr>
<td>1</td>
<td>—</td>
<td>Bearing Slot</td>
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<tr>
<td>2</td>
<td>3511</td>
<td>Steering Column Lock Cylinder Housing</td>
</tr>
<tr>
<td>3</td>
<td>—</td>
<td>Outer Race</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
<td>Bearing (In the &quot;UP&quot; Position)</td>
</tr>
<tr>
<td>5</td>
<td>—</td>
<td>Ball</td>
</tr>
<tr>
<td>6</td>
<td>—</td>
<td>Inner Race</td>
</tr>
</tbody>
</table>
All vehicles

16. Position the steering column shaft in the steering column lock cylinder housing.
   - Install the steering column bearing tolerance ring on the steering column shaft.

17. Install the steering column bearing sleeve.

18. Install the steering column upper bearing spring.
19. Install the snap ring.

20. **CAUTION:** The turn signal cancel cam has a flat surface and a surface that has 4 lobes. Make sure to install the cam with the flat surface upwards. Push the cam onto the shaft until it makes contact with the snap ring.

Install the turn signal cancel cam.

21. Install the lock cylinder housing screws loosely and position the steering actuator housing in a vise.
   - Lubricate the lock cylinder housing screws with rust penetrant.
22. **NOTE:** Lubricate the lock cylinder housing bushings with rust penetrant.

Position the steering column lock cylinder housing and the steering column shaft in the steering actuator housing.
- Make sure the upper and lower steering column lock actuators are aligned.

23. Position the steering column locking levers on the steering actuator housing.
   1. Use a shop fabricated tool.
   2. On tilt steering columns, install and compress the steering column position spring.

24. Position the lock cylinder housing and steering actuator housing, and tighten the lock cylinder housing screws.

25. Install the steering column bearing tolerance ring.
Vehicles with tilt column

26. Install the sensor ring.
   1. Install the sensor ring.
   2. Install the steering column lower bearing spring.

Vehicles with fixed column

27. Install the snap ring.

All vehicles

28. Install the ignition switch. Align the ignition switch with the slot and index mark on the steering column.
   - Install the bolts. Tighten to specification.
29. **NOTE:** The narrow section of the keyhole in the lock gear must be in the 1 o'clock position.

Install the steering column lock gear.
- Use ignition lock grease to coat the steering column lock gear.

30. Install the steering column lock housing bearing.
- The narrow section of the keyhole should be in the 1 o'clock position, with the tab inboard at the 3 o'clock position and rotate it counterclockwise.
- Lubricate the steering column lock housing bearing with ignition lock grease.

31. Install the bearing retainer firmly to engage the four retention tabs into the lock housing.
32. Install the gearshift lever and the gearshift lever pin.

33. Install the ignition lock cylinder. For additional information, refer to Section 501-14.

34. Install the clockspring. For additional information, refer to Section 501-20B.

35. Install the multifunction switch. For additional information, refer to Section 211-05.

36. **WARNING:** To reduce the risk of serious personal injury, read and follow all warnings, cautions, notes and instructions in the steering column removal and installation procedure.

   Install the steering column. For additional information, refer to Column — Super Duty or Column — Motorhome in this section.