

Clockspring Replacement

2000 has an air bag sensor module located under the driver's seat. See [Fig. 2](#).

CAUTION

Do not turn the steering wheel or the steering shaft at any time during this procedure. Doing so may damage the clockspring.

1. Park the vehicle on a level surface with the wheels straight ahead. Shut down the engine and set the parking brakes. Chock the rear tires.

2. Disconnect the batteries and wait two minutes before proceeding.

WARNING

Wait two minutes after disconnecting the batteries to allow the internal components to discharge. Failure to allow the components to discharge could cause the air bag to deploy, resulting in severe bodily injury or death.

3. Disconnect the AS2 connector. See [Fig. 2](#).

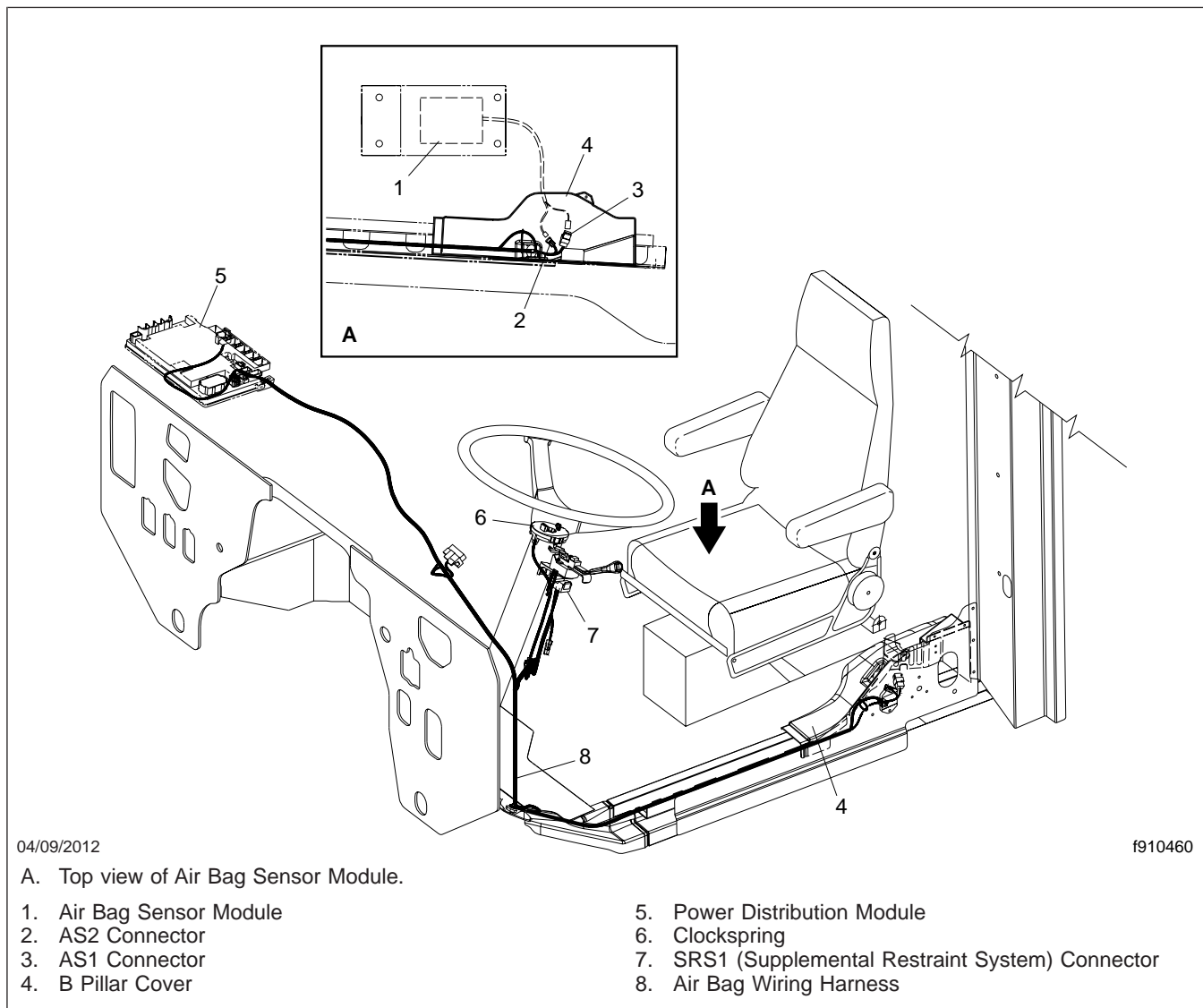


Fig. 2, Air Bag Harness Routing on Air Bag Only Systems Installed From May 12, 2000

Clockspring Replacement

4. Remove the air bag. For instructions, see [Subject 100](#).
5. Remove the steering wheel. For instructions, see [Section 46.06, Subject 100](#).
6. Tape the upper and lower portions of the clockspring together to prevent it from turning.
7. Disconnect the connector located under the clockspring mounting plate on top of the steering column.
8. Loosen the screws that attach the clockspring to the clockspring bracket. It is not necessary to remove the screws in order to remove the clockspring.
9. Remove the clockspring.
10. If the steering column shaft has been allowed to rotate independently of the front wheels since the clockspring replacement procedure began, re-center the clockspring.
 - 10.1 While holding the lower portion of the clockspring stationary, rotate the upper portion counterclockwise until resistance is felt. Stop rotation as soon as some resistance is felt or the clockspring may become damaged.
 - 10.2 While holding the lower portion of the clockspring stationary, rotate the upper portion clockwise four full turns.
 - 10.3 Turn the upper portion of the clockspring clockwise until the the mounting holes in the upper portion of the clockspring are aligned with the screws in the lower portion of the clockspring. Tape the upper and lower portions together until the steering wheel is installed.
11. Using screws, attach the clockspring to the clockspring bracket.
12. Reconnect the connector from the clockspring to the air bag wiring harness. If the clockspring is taped together, remove the tape.
13. Install the steering wheel. For instructions, see [Section 46.06, Subject 100](#).
14. Install the air bag. For instructions, see [Subject 100](#).
15. Reconnect the AS2 connector. See [Fig. 2](#).
16. Make sure nobody is in the cab, then connect the batteries.
17. While standing outside the cab and away from the front of the air bag, turn the ignition on. The SRS indicator should come on for several seconds and then go out. If the SRS indicator goes out and there are no active fault codes, the system is functioning properly.

Follow the appropriate procedure in [Section 91.05, Troubleshooting 300](#), if:

 - There are active fault codes;
 - The SRS indicator remains on;
 - The SRS indicator does not come on for several seconds before going out.

Air Bag Disposal Procedure

 **WARNING**

Air bags are designed to work in specific vehicle makes and models. Air bag modules and components can not be adapted, reused, or installed in any vehicle other than the vehicle they are designed and manufactured for. Any attempt to adapt, reuse, or install an air bag module or component in any other vehicle can result in death or severe injury to vehicle occupants in the event of an accident.

IMPORTANT: The storage, transportation, disposal, or recycling of air bag modules or components must be performed in accordance with all applicable federal, state, and local regulations including, but not limited to, those governing building and fire codes, environmental protection, occupational health and safety, and transportation.

NOTE: If a vehicle is going to be scrapped and the air bag or SPACE system has not been deployed, contact your District Service Manager for instructions on how to proceed.

1. Remove the inflator from a deployed air bag module. Send the inflator to a recycler for reclamation of the steel and aluminum components.
2. Separate the air bag from the recyclable steel and aluminum components.
3. The plastic materials may be recycled or disposed of in common trash.

Air Bag Sensor Module Replacement

Replacement

NOTE: Before replacing the air bag sensor due to a lighted SRS warning lamp, make sure that all historic (inactive) fault codes are cleared. The SRS warning lamp will stay on even after the repairs indicated by the fault codes are corrected. After correcting the faults, use Service-Link to clear all historic (inactive) codes. The SRS lamp should now be off, unless an uncorrected fault exists.

 **WARNING**

Consider undeployed air bags to be dangerous and capable of deploying at any time. Before performing any work on the air bag system, review all service literature and comply with the warnings and precautions in [Subject 110](#) and in this subject. Unintentional or improper air bag deployment can result in injury or death.

Damaged or deployed air bag systems should be inspected for leaking propellant chemicals before any attempt is made to remove, replace, or handle the components. If a leak is found, contact LifeGuard Technologies (1-866-765-5835) for handling instructions.

- Do not attempt to service or to disassemble the air bag sensor module. The sensor module cannot be serviced.
- Do not cut, drill, braze, solder, weld, strike, or probe any part of the air bag sensor module.
- Keep all liquids, acids, halogens, heavy metals, and heavy salts away from the air bag sensor module.
- Do not attempt to adapt, reuse, or install an air bag sensor module in any vehicle other than the specific vehicle for which it is designed.
- Do not cut wires or tamper with the connectors between the vehicle wiring harness and the air bag sensor module. Cutting or removing the electrical connectors could cause unintentional deployment of the air bags.
- Do not expose the air bag sensor module to electricity. Never probe a circuit.

1. Park the vehicle on a level surface, shut down the engine, and set the parking brake. Chock the tires.

 **WARNING**

Before removing the mounting capscrews from the sensor module, be sure to disconnect the batteries and disconnect the wiring from the sensor module. Failure to follow these precautions may result in the air bag being unintentionally deployed, which could cause severe bodily injury or death.

2. Disconnect the batteries and wait two minutes before proceeding.

 **WARNING**

Wait two minutes after disconnecting the batteries to allow the internal components to discharge. Failure to allow the components to discharge could cause the air bag to deploy, resulting in severe bodily injury or death.

3. Raise the seat to its maximum position. If the seat is equipped with a seat shroud, lift the shroud to access the air bag sensor module.
4. Remove the plastic retainers that attach the sensor module cover to the sensor module and remove the cover. See [Fig. 1](#) or [Fig. 2](#).
5. Disconnect the wiring from the sensor module at the AS2 connector under the B pillar cover.
6. Remove the sensor module.
 - On vehicles with an EzyRider seat, remove the capscrews that attach the sensor module to the cab floor. See [Fig. 1](#).
 - On vehicles with a nonproprietary seat, remove the capscrews that attach both the sensor module and the seat to the cab floor. The front mounting capscrews for the seat may need to be loosened to remove the sensor module. See [Fig. 2](#).

 **WARNING**

Do not substitute the air bag sensor mounting fasteners. Use the fasteners provided with the sensor to ensure adequate engagement.

7. Install the new sensor module.

Air Bag Sensor Module Replacement

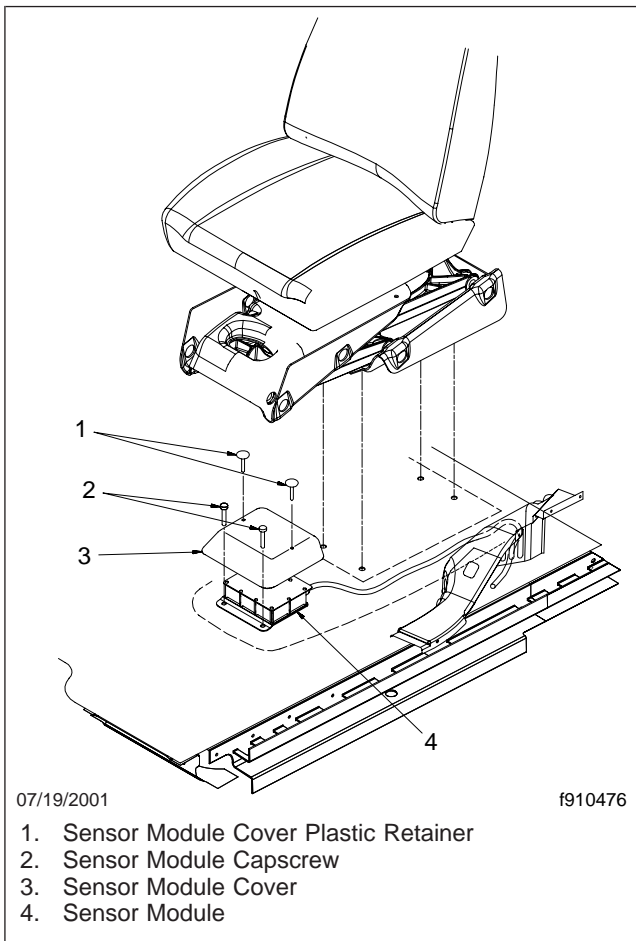


Fig. 1, EzyRider Seat With Air Bag Sensor Module

- On vehicles with an EzyRider seat, use two capscrews to attach the sensor module to the cab floor. Tighten the capscrews 25 to 29 lbf-ft (34 to 39 N-m).
- On vehicles with a nonproprietary seat, use two capscrews to attach both the sensor module and the seat to the cab floor. If the front mounting capscrews for the seat were loosened, tighten the capscrews. Tighten the capscrews 35 to 40 lbf-ft (47 to 54 N-m).

 **WARNING**

Before attaching the wiring to the sensor module and before connecting the batteries, be sure to attach and tighten the mounting capscrews to the

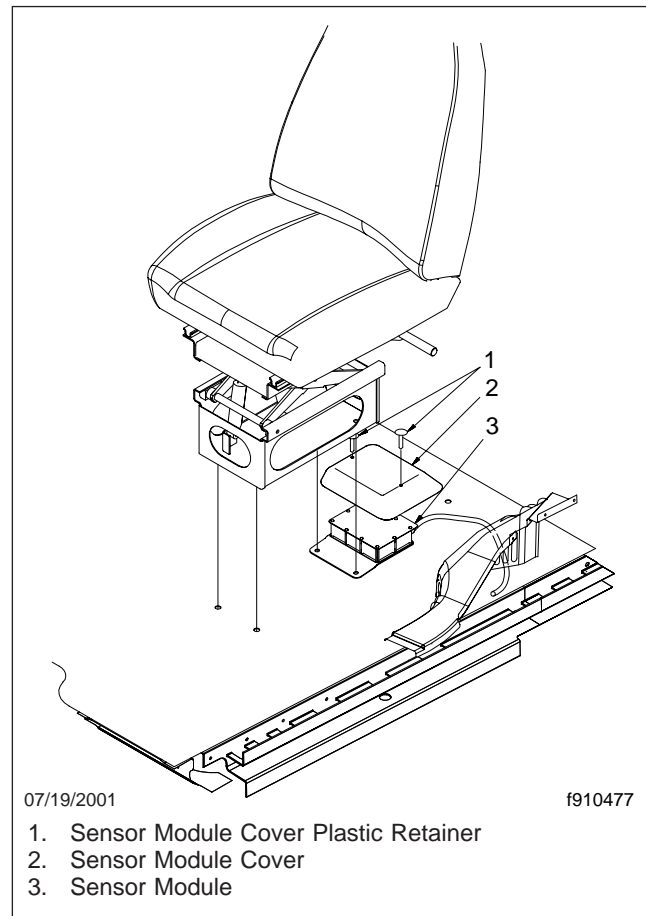


Fig. 2, Nonproprietary Seat With Air Bag Sensor Module

sensor module. Failure to follow these precautions may result in the air bag being unintentionally deployed, which could cause personal injury or property damage.

8. Attach the wiring to the sensor module.
9. Using two plastic retainers, attach the sensor module cover to the sensor module.
10. Lower the seat. If the seat is equipped with a seat shroud, lower the shroud around the base of the seat.
11. Connect the batteries.

General Information

The LuK Automotive Hydraulics LF 80 power steering pump supplies power steering fluid for the operation of the power steering gear.

The LF 80 power steering pump, used only on the MBE4000 engine with air brakes, is mounted on the air compressor. See Fig. 1. The power steering pump is driven by the air compressor through the cross plate.

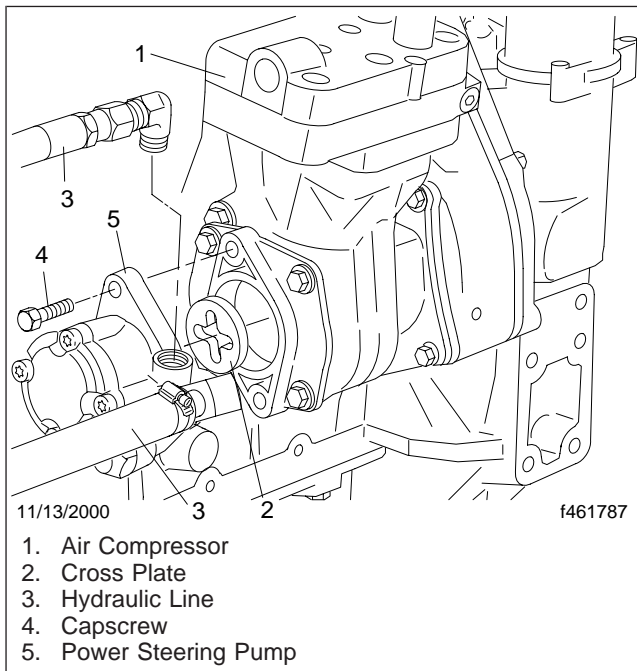


Fig. 1, Power Steering Pump Mounting

The main parts of the power steering pump are the housing, driveshaft, cam ring, rotor, vanes, and control valve.

Principles of Operation

The power steering pump driveshaft is driven by the air compressor, which is powered by an adaptor gear connected to the engine crankshaft.

As the pump driveshaft turns the pump rotor, centrifugal force throws the vanes out against the surface of the cam ring. When fluid enters the cam ring through the inlet port, the rotor vanes force it out through the outlet port and into the system.

The fluid enters the steering gear, providing the gear with enough fluid to steer the vehicle. Eventually the fluid returns to the power steering reservoir and then back to the power steering pump. See Fig. 2.

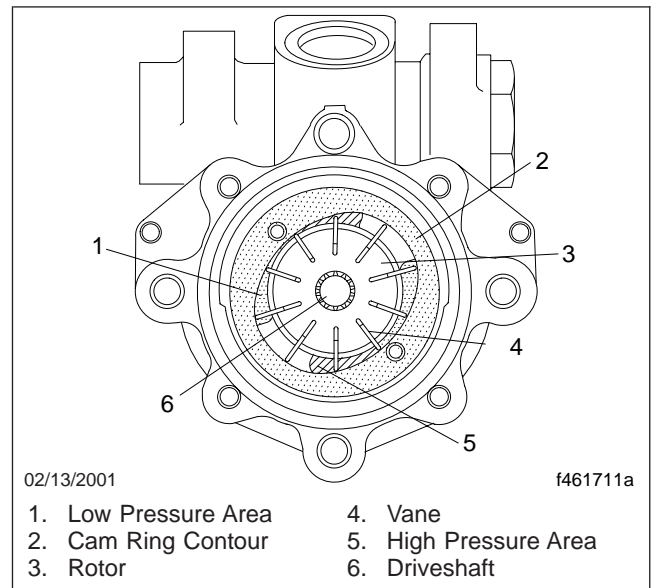


Fig. 2, Power Steering Pump, Section View

If the system pressure gets too high, a poppet inside the control valve is forced off its seat, shunting fluid into a relief passage connected to the inlet port. The fluid then recirculates inside the pump, instead of going to the outlet port.

When the system pressure drops to the correct level, the poppet seats and closes off the relief passage to the inlet port. The fluid flow returns to normal, flowing from the inlet port to the outlet port, and then into the power steering system.

Steering Pump Replacement

Replacement

1. Turn off the engine, apply the parking brakes, chock the tires, and open the hood.
2. Clean the dirt from around the inlet and outlet ports and from the hydraulic fittings.
3. Drain the power steering fluid and remove the hydraulic lines. See Fig. 1.

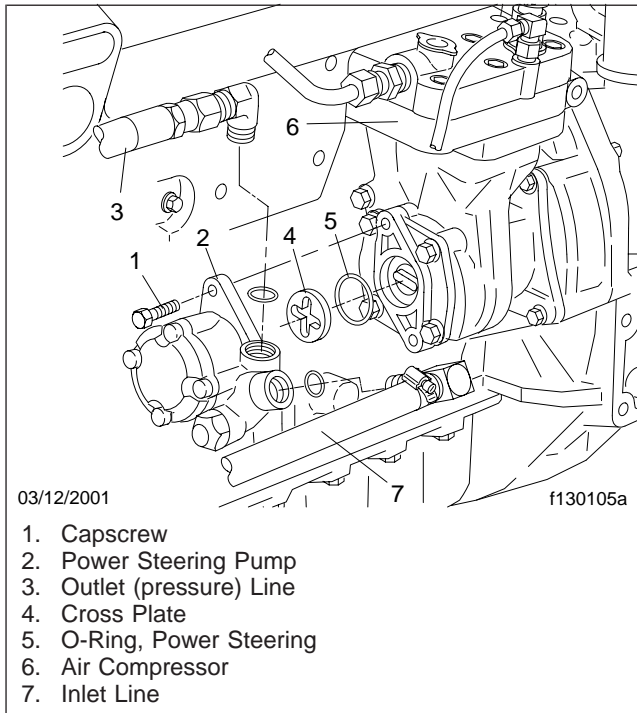


Fig. 1, Power Steering Pump Removal

- 3.1 Put a suitable container under the power steering pump.
- 3.2 Disconnect the inlet line and fitting from the inlet port.
- 3.3 Disconnect the outlet line and fitting from the outlet port.
- 3.4 Remove the O-rings from both fittings. Inspect the O-rings for wear and replace them if necessary.
- 3.5 Drain the fluid into the container.
- 3.6 Plug the lines to keep out dirt.

4. Remove the capscrews that attach the power steering pump to the air compressor. Remove the steering pump from the air compressor.
5. Remove the cross plate and inspect it for excessive wear. Replace it if necessary. Discard the O-ring.
6. Lubricate the new O-ring with a light coating of power steering fluid, and install it in the pilot diameter of the power steering pump. See Fig. 2.

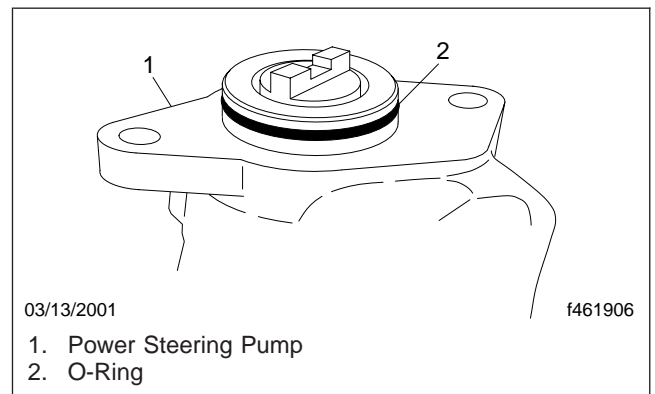


Fig. 2, O-Ring Installation

IMPORTANT: Some power steering gears use automatic transmission fluid. Others use heavy-duty engine oil. Do not mix power steering fluids. Lubricate parts with the same fluid used in the power steering system.

7. Install the cross plate. Use grease to hold it in place while installing the pump.

IMPORTANT: Before installing a new steering pump, make sure the cross plate aligns with the air compressor shaft.

8. Using capscrews, attach the power steering pump to the air compressor. Tighten the capscrews 27 to 32 lbf-ft (37 to 43 N·m).
9. Lubricate the O-rings with a light coating of power steering fluid, and install them in the fittings of the two hydraulic lines.

IMPORTANT: Lubricate parts with the same fluid used in the power steering system.

10. Connect the inlet line, O-ring, and fitting to the steering pump inlet port. Tighten the fitting 26 lbf-ft (35 N·m).