

U-02e: Replace Feedback Device (Tachometer)

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.

EQUIPMENT

- basic Electrician hand tools
- DVM

RESOURCES

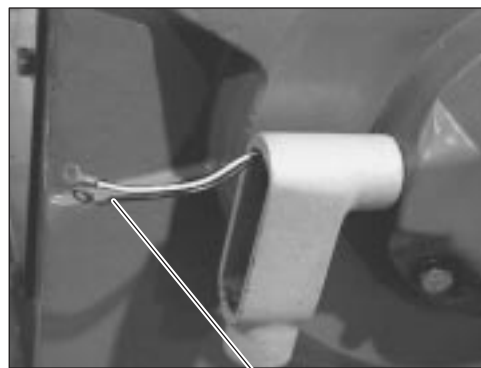
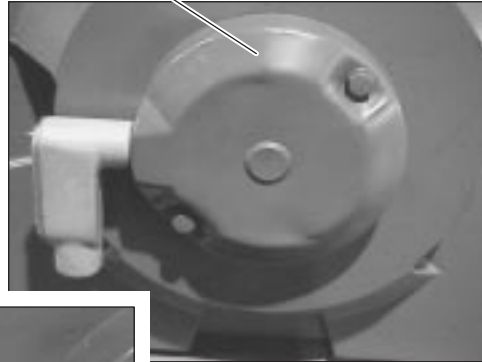
- tachometer nameplate data
- electrical print

Replace Feedback Device (Tachometer)

- 1. Communicate with the Operator to locate the tachometer needing replacement.**
- 2. Obtain a replacement tachometer, if possible.**
 - Check the electrical print for the required tachometer.
 - Check for the manufacturer's model number and the output voltage per revolution.
- 3. Perform a lockout/tagout on the machine.**

4. **Disconnect electrical wires from the tachometer leads, making note of the polarity.**

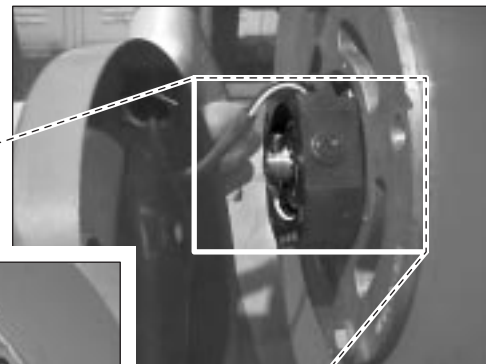
Tachometer Cover



Disconnected Tachometer Leads

5. **Remove the tachometer cover.**

- Use a screwdriver to pry the cover from the motor housing.
- Pull the disconnected wire through the cover.



Tachometer

Note: Some tachometers are enclosed units and are removed as units.

6. Remove the brush assembly.



Brush Assembly

Note: Retain all washers or spacers that are used to position the brushes on the commutator.

- Retain the brush assembly screws, washers, and spacers.

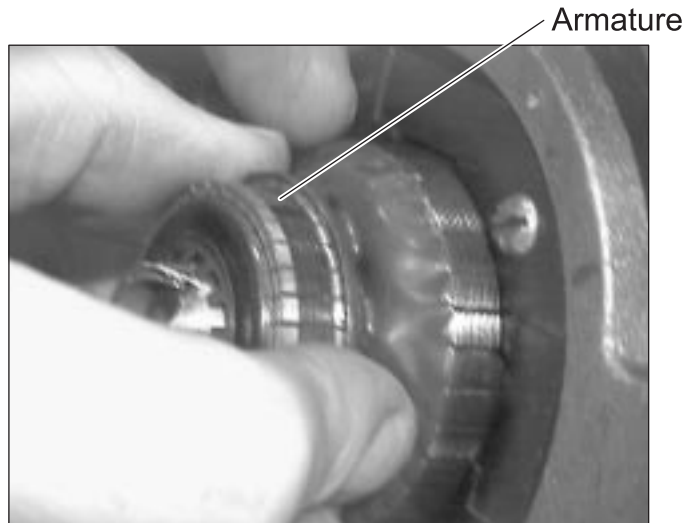
7. Remove the retaining set screw.

Retaining Set Screw



8. Slide the armature off the shaft.

- Pull the armature straight off the shaft.



- Retain all spacers and/or washers.

9. Remove the permanent magnet.

- Remove the permanent magnet, retaining the mounting screws and any spacers.

Permanent Magnet

**10. Obtain/Compare the tachometer with the replacement.**

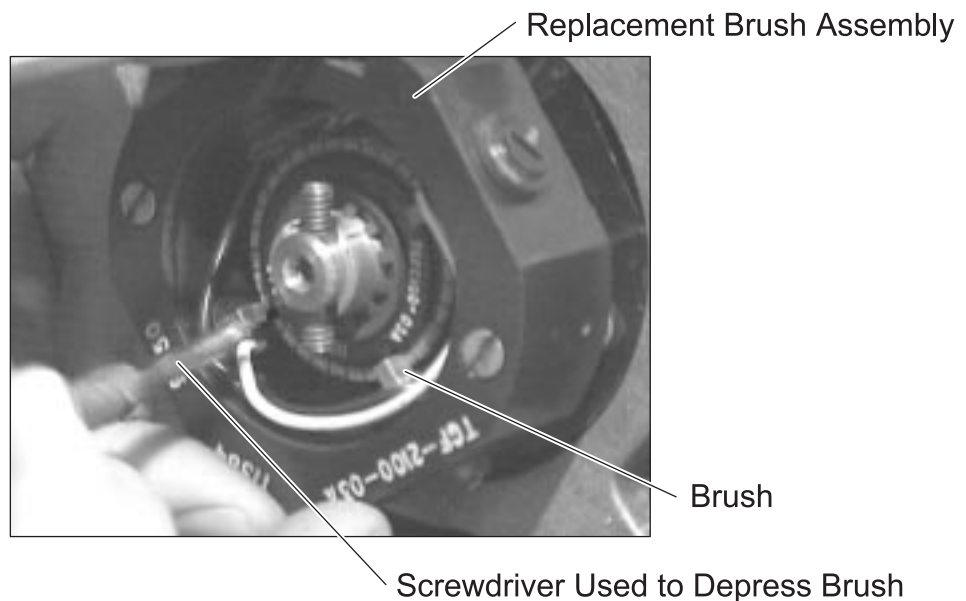
- Make sure the manufacturer's model numbers match.

11. Clean the mounting surfaces.

- Wipe the housing mounting surface and tachometer surface to remove grime and debris.

12. Install the replacement permanent magnet and the spacers and/or washers.**13. Install the replacement armature and the spacers and/or washers.****14. Install the replacement brush assembly and the spacers and/or washers.**

Note: Use care not to damage the brushes when sliding the assembly over the commutator. Check for the proper brush orientation and tension against the commutator.



15. Clean the commutator, if necessary.

- Use a soft commutator cleaning stone to clean the surface while an assistant turns the motor shaft.



Commutator
Cleaning Stone



Caution: Incorrect tachometer feedback may cause motor runaway. Verify tachometer polarity before restoring machine power.

16. Reconnect the tachometer leads, observing polarity.**17. Restore machine power.****18. Ask the Operator to cycle the machine to test the tachometer.****19. Verify that the tachometer operates correctly.**

- Check voltage with a DVM on the tachometer leads at the drive.
- Verify spindle rpm and tachometer output according to the manufacturer's specifications.
- Adjust the drive, as necessary.

20. Replace the tachometer cover and pick up all hand tools.