

U-02b: Replace Feedback Device (Resolver)

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- Be careful of rotating and moving equipment when setting up the resolver.

EQUIPMENT

- Electrician's hand tools
- flashlight
- replacement resolver
- replacement resolver gear (if necessary)
- equipment position measuring devices
- Allen wrench set

RESOURCES

- machine layout specifications
- resolver manufacturer's manual
- machine electrical prints
- Operator



Replace Feedback Device (Resolver)

1. Shut down the machine.
 - Stop any machine operations.
 - Lockout and tagout all energy sources.
2. Access the defective resolver.
 - Remove the end cover plate screws from the resolver housing with a screwdriver. See the figure below.



Cover Plate Screws

Resolver End Cover

- Remove the end cover from the resolver housing.

- Slide the round resolver housing from the resolver (see below).



Resolver Housing

Resolver Mount

Removed Resolver Housing

3. Remove the defective resolver.
 - Note the position of the wires. They should be marked according to the print.
 - Using needle nose pliers, disconnect the resolver wires.

Caution: If the resolver wire connections are the plug-in type, grasp the soldered connector pins, not the wire itself, to remove the wire connections.

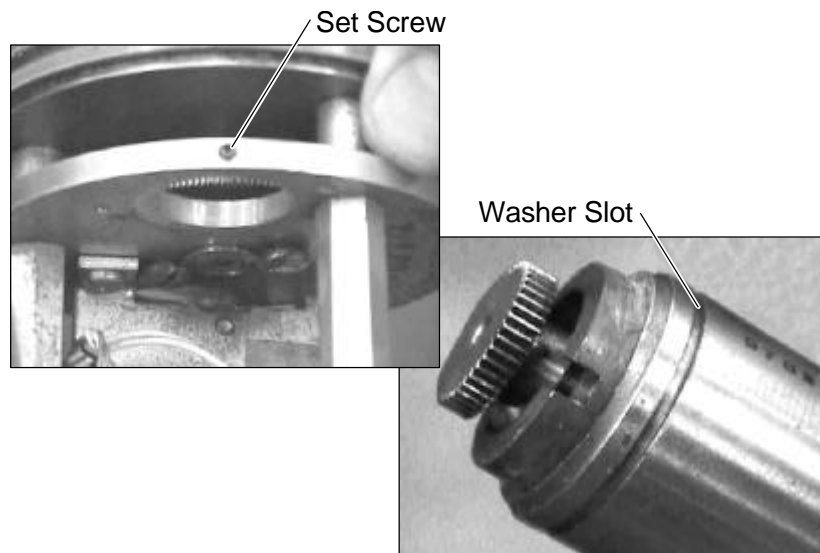
- Remove the resolver mounting screws with an appropriate Allen wrench.

- Pull the resolver carefully from the mounting bracket to avoid damaging the resolver gear or shaft gear.
- If the resolver is driven through a coupling, loosen or separate the coupling for disassembly. See the figure below.



Removing the Resolver

4. If the resolver is driven through a gear, remove and inspect it.
 - The brass eccentric mounting cam may come out attached to the resolver. This needs to be removed and retained for the new resolver.
 - Unscrew the setscrew on the gear with the appropriate Allen wrench. See the figure below.





- Inspect the gear or coupling for damage or wear, and replace if defective.
 - Note the position of the gear on the shaft for reassembly purposes.
5. If the resolver is driven through a coupling, remove and inspect it.
- Unscrew the set screw(s) holding the coupling or coupling halves to the resolver or driving shafts.
 - Inspect the coupling, checking it for any angular looseness.
6. Install the gear, coupling, or coupling half on the new resolver.
- If using a new gear or coupling, inspect the components for defects.
 - Place the gear, coupling, or coupling half on the shaft of the new resolver.
 - Tighten the setscrew(s) wrench-tight with an appropriate Allen wrench.

Note: With a coupling you may have to install the resolver before tightening the setscrews to ensure proper clearance.

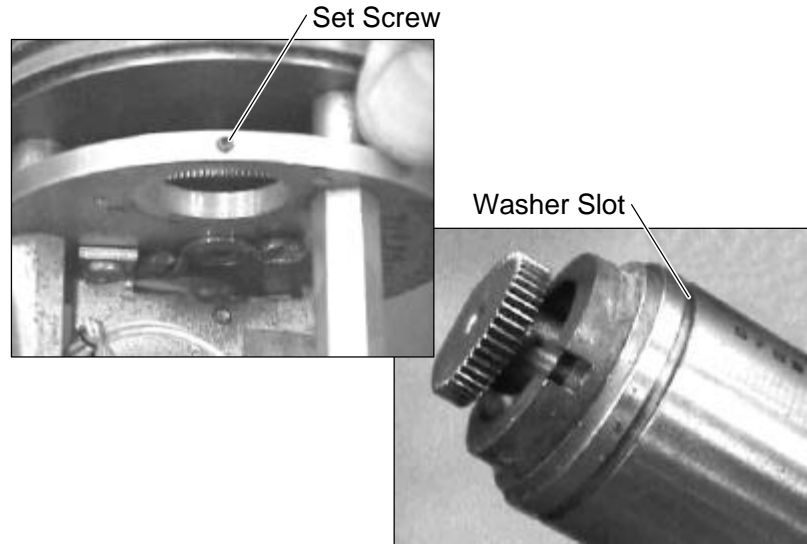
7. Install the new resolver onto the mounting bracket.
- Align the new (gear-driven) resolver into the eccentric mounting hole on the mounting bracket.
 - You should be able to turn the resolver if the gears are properly meshed.

Caution: Do not use excessive force to mesh the resolver gear and shaft gear.

- Connect the new (coupling-driven) resolver to the driving shaft.

Caution: Do not compress or stretch the coupling to extremes.

- Tighten the resolver mounting screws into the mounting bracket with an appropriate Allen wrench.
- The washers need to sit in the slot of the resolver. See the figure below.



- Reconnect the resolver wires to appropriate terminals.
8. Replace the resolver housing.
- Slide the round housing cover back over the mounting bracket.
 - Replace the end cover and screws.
 - Tighten end cover screws with a screwdriver hand-tight.
9. Adjust the resolver for correct machine operation.
- Release lockout/tagout and start the machine.
 - Ask the machine Operator to home the machine. Ask the Operator to move to a known point on the axis the resolver reads.
 - Measure the axis position and compare to machine specifications. If the axis is not correctly located, ask the Machine Operator to move the axis until it is physically positioned according to machine specifications.
 - Press the emergency stop on the machine control panel.
 - Loosen the screws on the resolver mounting housing that attach the housing to the machine.



- Turn the resolver housing gradually in the required direction until the digital readout on the machine control panel corresponds to the measured position of the device. Another approach is to mount the indicator on the axis you are moving and watch the needle for movement (while turning the resolver).

10. Check zero position alignment.

- Ask the Operator to home the machine and return to the known position.
- Measure the actual axis position.
- Adjust the resolver position.
- Repeat step 10, as necessary.

Note: If the resolver cannot be turned in its mounting bracket, you may need to change a grid parameter on the controls, if applicable.

11. Ask the Operator to confirm correct machine operation.

12. Clean up the work area.

13. Document the work history.