

S-02: Perform Vibration Analysis

SAFETY FIRST

- Follow all Caterpillar facility safety standards when performing this task.
- The vibration sensor sometimes must be set close to rotating equipment and in other hazardous locations. Use extreme caution.
- A ladder may be needed to reach some vibration analysis points; follow all safety procedures.

EQUIPMENT

- CMVA 55 Microlog Vibration Data Collector/Analyzer SKF with accelerometer sensor
- PC with the Prism 4 software program installed
- CMVA 6112 Support Module

RESOURCES

- CMVA Microlog Training Guide (Appendix H – Vibration Diagnostic Table)



Perform Vibration Analysis

Part A: Prepare the Data Collector

1. Check the battery.

Caution: To avoid damaging the components, be sure the power is off whenever connecting serial cables to a computer.

- Connect the serial cable from the PC to the Data Collector.

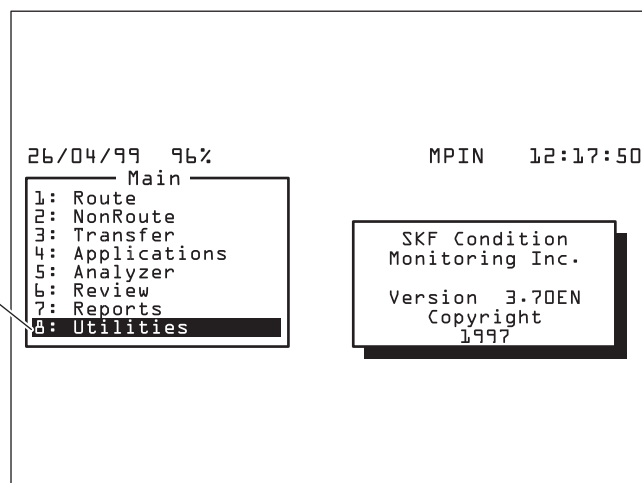


Serial Cable from PC

Serial Port on
Data Collector

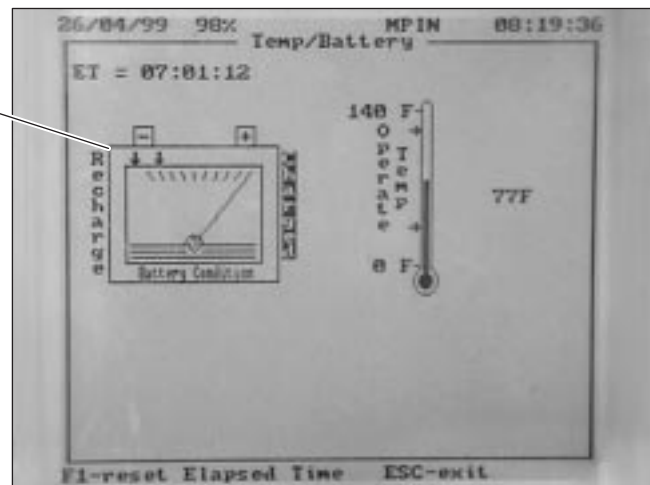
- Turn on the Data Collector.
- Select the Utilities Menu (8) from the Main Menu on the Data Collector.

Select Utilities



- ❑ Select the Temp/Battery Menu (2) from the Utilities Menu on the Data Collector.

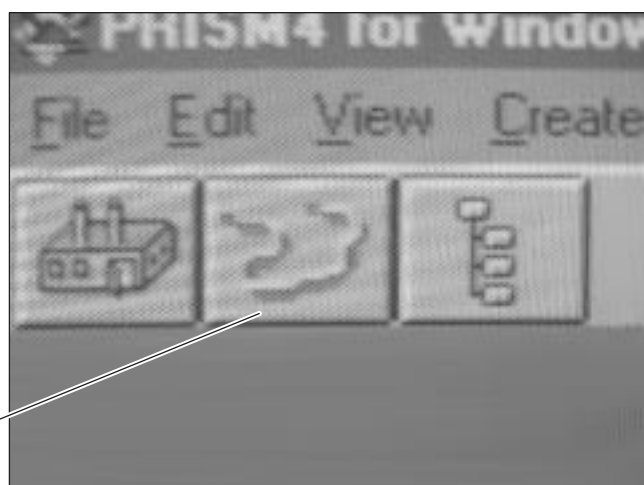
Battery Condition Indicator



- ❑ Perform the action for the battery indicated on the support module.

2. Load the Route.

- ❑ Press <Esc> key until the Main Menu appears.
- ❑ Select Transfer (3) from the Main Menu on the Data Collector and press <Enter>.
- ❑ Double-click on the Prism 4 icon on the PC to launch the program.
- ❑ Click on the Route icon in the Prism 4 software.

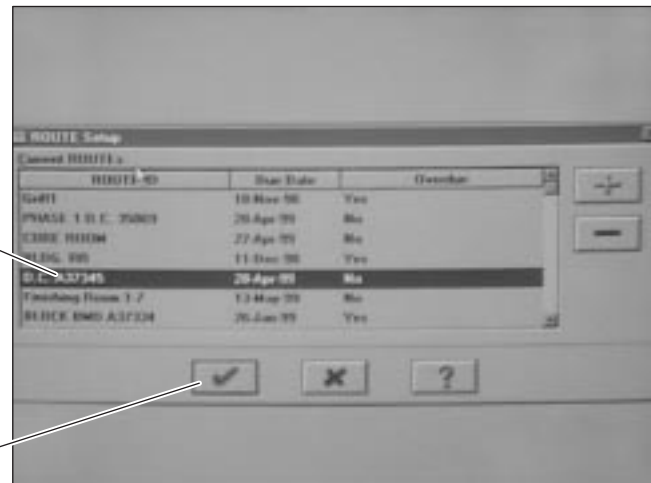


Route Icon

- Select the desired route(s) to download to the Data Collector and click on the check icon.



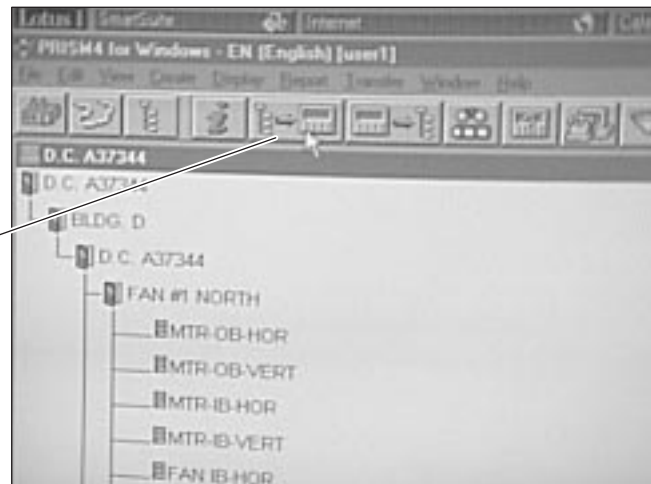
Select Desired Route



Check Icon

- If more than one route, select the Window pull-down menu option and select Tile Vertical to view all of the Route windows at once.
- Select the icon to “Load Active Route to the current target data collector.”

"Load Active Route to The Current Target Data Collector" Icon



- Click on the Download Route icon.

- Observe as the Sets and Points increment on the Data Collector Transfer screen.



Values Increment as the Route is Loaded

```
26/04/99  97%                               MPIN  08:59:34
----- Main -----
Sets.....= 20
Points.....= 110
Instructions..= 1
Overalls.....= 0
Spectrum.....= 0
----- Transfer -----
```

- Note any instructions that load on the Data Collector. You will need to review the Route to see if any special tools are required to collect data.
- Continue loading the routes until all desired routes are loaded on the Data Collector.
- Turn off the Data Collector.
- Unplug the pin connector.
- Zip the data collector into its case.
- Select an accelerometer and connect it to the data collector.

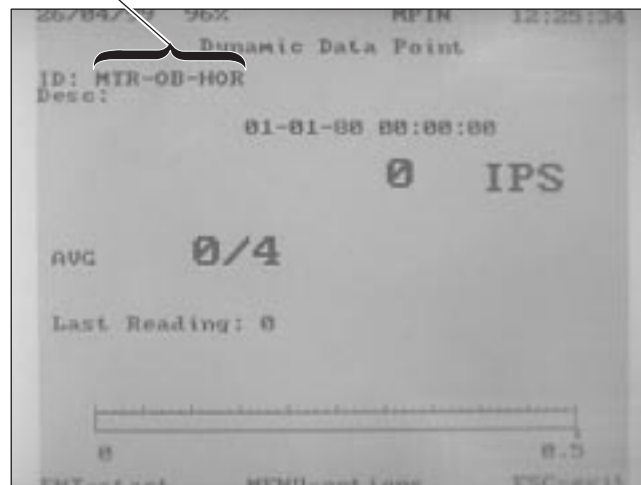
Caution: The accelerometer is a fragile communications device, handle it with care.

Part B: Take Vibration Readings

1. Turn on the data collector.
2. Select Route (1) from the Main Menu on the Data Collector.
3. Select the desired route from the Route Menu.
4. Check the route number and confirm the point by machine number, description, and location.
5. Go to point 1 of the route.
6. Attach the accelerometer to the machine at, or as close as possible to, the described point.

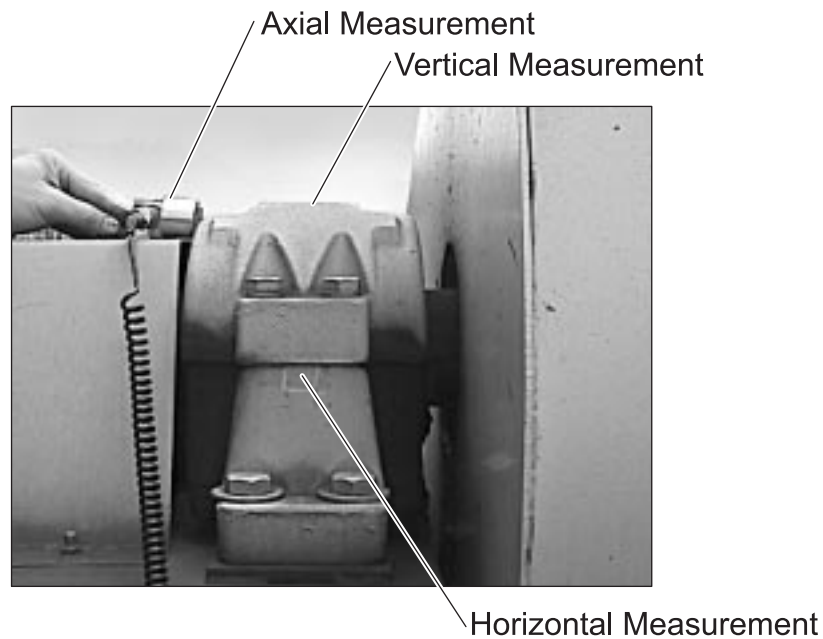


Description of the
Data Point

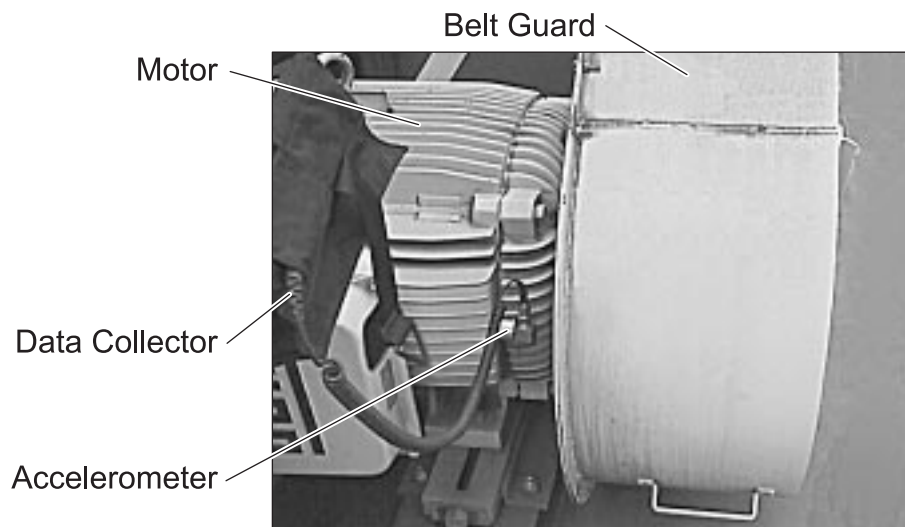


7. **Attach the accelerometer consistently in the same location as previous readings. Mark the location if necessary.**

- Make sure the accelerometer is not touching any component except through its magnets. The accelerometer must be on solid machine parts, not covers, shrouds, or housings attached to the machine.



Caution: Some readings require attaching the accelerometer close to rotating shafts, sheaves, sprockets, blower wheels, etc. Be careful when working around rotating or moving equipment.

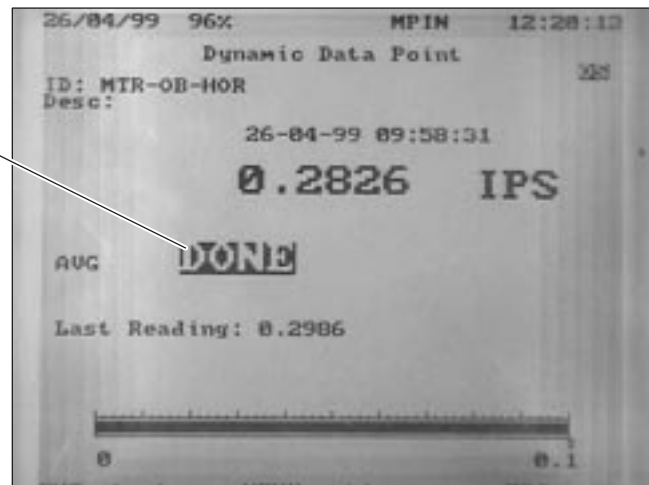


8. Press the <Enter> key.

- The data collector will take readings in averages.
- Observe the graphic display and follow the prompts.
- When it has finished, "DONE" is displayed.



Data Collector Indicates Completed Data Reading

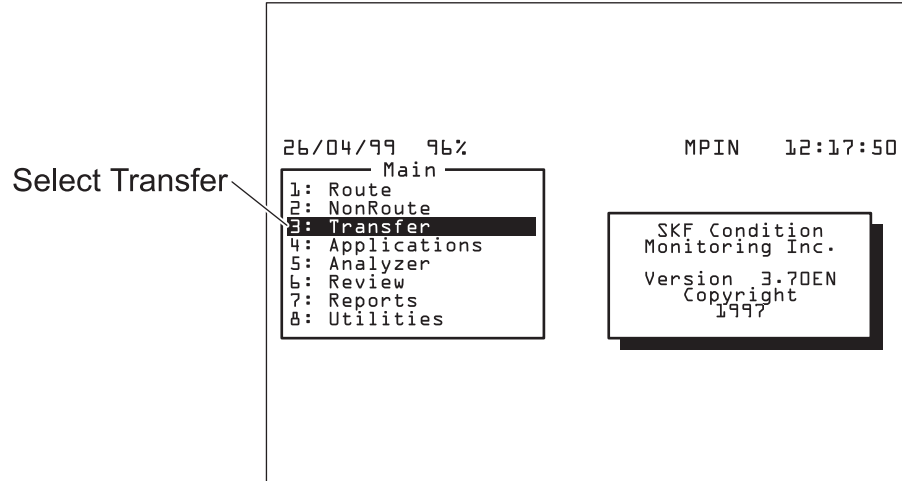


- Press Enter.
- The next point in the route will display. Continue until all points are entered.
- Turn off the data collector when "End of Route" is displayed.

Part C: Upload the Vibration Readings

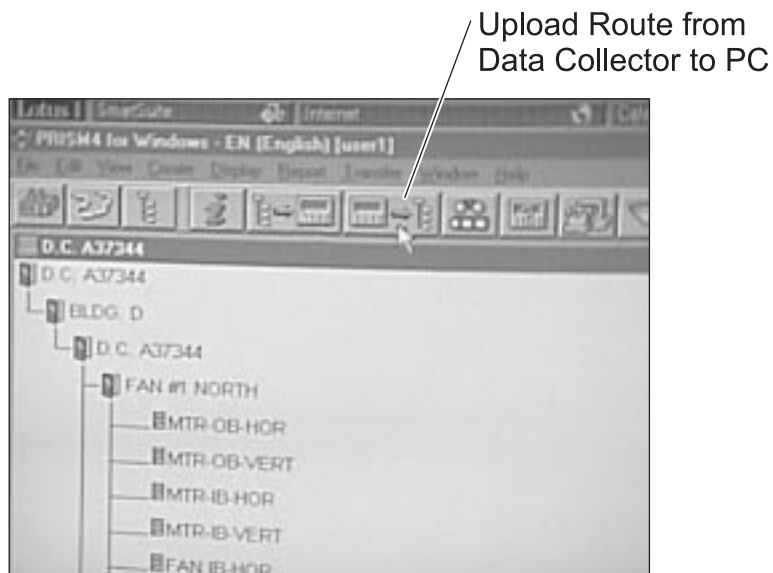
- 1. Plug the serial cable from the PC into the Data Collector.**
- 2. Start the Prism 4 program as shown in step 2 of part A.**
- 3. Turn on the Data Collector.**

4. Select the Transfer Menu from the Main Menu of the Data Collector.



5. Select the route to upload on the PC.

6. Select Transfer on the icon bar of the Data Collector to the PC.



7. Select Transfer on the PC menu bar.

8. Select Process Upload Data on the PC, continue uploading all routes.

9. Clear the upload report setup or create a report from that data.

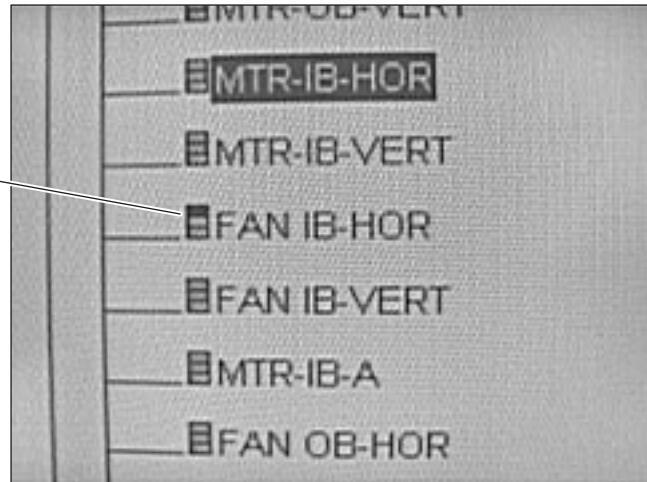
10. When the upload is completed, turn off the data collector and disconnect the serial cable from the PC at the data collector.

Part D: Analyze the Data

1. **Check the PC for any yellow or red alarm indicators within each route.**

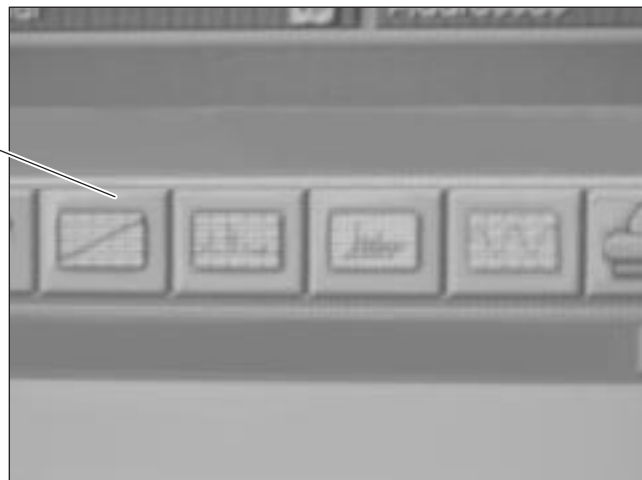


Example of Red Alarm



2. **Select “Window” and “Tile Vertically” to split the screen vertically and view the routes.**
3. **Click on any yellow or red alarm indicators within a route until you display the exact point in alarm within the route.**
 - The icon for an entire building will be in alarm if one point within the building is in alarm. Continue clicking the alarm icons until you reach a measurable point.
4. **With the point highlighted, click on the Trend icon to view the previous and active data on that icon.**

Trend Icon



- Determine if the vibration problem is worsening.
- Consult experienced Maintenance Personnel, if necessary, to determine if the alarm data is relevant.
- Continue to step 6 if the data is not relevant.

5. Click on the Spectrum icon.

- To identify the vibration cause, consult the charts correlating peak distribution in the spectrum to typical machine problems.
- Consult the CMVA Microlog Training Guide (Appendix H – Vibration Diagnostic Table).

6. Perform a corrective action, if necessary, to prevent damage to the machine.

