

Three Arm Caliper (9074, 8074 & 7074)

User Guide

Use Proper Users Guide

The three arm caliper tool has optional sensors selections which are determined at the time the tool is manufactured.

1. Model 7074 Sensors: Casing Collar Locator and Three Arm Caliper
2. Model 8074 Sensors: Three Arm Caliper only
3. Model 9074 Sensors: Natural Gamma and Three Arm Caliper

Compu-Log System Check

Before attempting to use the 9074, 8074 or 7074 check to insure that the required program files are in place on the Compu-Log system (Ultra-Lite or Desk Top).

1. Using Windows Explorier, open the C:Century/log/tm folder and check for a file 9074.tm, 8074.tm or 7074.tm (only the file whose name corresponds to the three arm caliper model number is required) with a date of June 27, 2000 or more recent. This file is the tool module file which contains all the engineering data on the tool, such as the distance to each sensor, the equation for the conversion from CPS to engineering units, the sensors that are calibratable and the telemetry format for the data being sent from the tool. If this tool module file is not in the tm folder it must be copied into the folder before the tool can be used. The most recent version of the tool's tool module file is attached to the tool (on a floppy disk) when it arrives from Century. If the floppy disk tool module file is no longer available, the tool module file can be downloaded from www.century-geo.com.
2. Using Windows Explorier, open the C:Century/log/cal folder and check for a file XXXX.cal (substitute the individual tool serial number (S/N) for XXXX). This file is the calibration file that contains the identification of the tool model, the sensor cabibration data and the calibration date. If this cal file is not in the cal folder it must be copied into the folder before the tool can be used.

NOTE 1: If the S/N number for the tool is not known it can be determined by 1) connect the tool to the drawworks, 2) turn on the computer, 3) start the Log program, 4) click on the LOG button, 5) the S/N will appear in one of two places, either beside the S/N or at the end of the message "NO CAL FILE FOR TOOL XXXX".

NOTE 2: A calibration file can be created by following the following steps: 1) start the Log program, 2) click on the CAL button, 3) click on the TOOL button, 4) enter the tool S/N followed by .cal (XXXX.cal), 5) enter the generic tool name (same as tool model) 8074, 6) click OK, 7) message should appear "CAL FILE CREATED".

Three Arm Caliper Sensor Names

The three arm caliper tool can be run with three different caliper arm lengths. The length are used is described to the logging system by answering the configurability questions. The Compu-Log logging system records the log data using the sensor the sensor name which corresponds to the arm length. The calibration data corresponding to the sensor name is also used.

IT IS VERY IMPORTANT THAT THE CONFIGURATION QUESTIONS BE ANSWERED CORRECTLY OR THE LOG DATA WILL BE BAD!

1. Short Arms (40.5 cm long): Sensor Name = CALIPER

Answers to configurability questions:

IS CALIPER LONG ARM (63.4 CM): ANSWER NO

IS CALIPER EXTRE LONG ARM (86.2 CM): ANSWER NO

2. Long Arms (63.4 cm long): Sensor Name = CALIPERL

Answers to configurability questions:

IS CALIPER LONG ARM (63.4 CM): ANSWER YES

IS CALIPER EXTRE LONG ARM (86.2 CM): ANSWER NO

3. Long Arms (86.2 cm long): Sensor Name = CALIPERX

Answers to configurability questions:

IS CALIPER LONG ARM (63.4 CM): ANSWER NO

IS CALIPER EXTRE LONG ARM (86.2 CM): ANSWER YES

NOTE: Measure caliper arm from end of carbide tip to the caliper pivot point.

Three Arm Caliper Range

Three configurations of the tool are possible.

1. Short-armed configuration: hole sizes from 5.1 to 61.0 cm (2.0 to 24.0 in.) can be measured.
2. Long-armed configuration: hole sizes from 5.1 to 91.4 cm (2.0 to 36 in.) can be measured.
3. Extra-long-armed configuration: hole sizes from 5.1 to 116.8 cm (2.0 to 46.0 in.) can be measured.

NOTE: THE EXTRA LONG CONFIGURATION EXCEEDS THE DESIGN LIMITS FOR THE 9074; THEREFORE, THE TOOL WARRANTY DOSE NOT COVER BREAKAGE THAT OCCURS WHEN EXTRA LONG ARMS ARE USED. BE VERY CAREFUL WHEN USING THE EXTRE LONG ARMS!

Default Calibrations

The 9074 tool natural gamma sensor is a sentalation detector and is bench calibrated by the technician by setting the threshold and pulse height of the detector. The conversion factor from CPS to GAM (NAT) units is 1 CPS = 1.175 API units.

The 7074 tool casing collar locator sensor is not calibrated. The units are in CPS and the change in CPS relates to the voltage change across the sensor coil.

The 9074, 8074 and 7074 tools short arm caliper sensor is bench calibrated by the technician. This

bench ("default") calibration numbers may be used when logging the tool or for improved accuracy the tool can be field calibrated using the "Calibration Procedures" section of this users guide. If the default calibration is to be used, it is recommended that a pre log calibration check be made to verify the tool accuracy prior to logging. The default calibration is used by the logging system any time the values of 0 cps equals 0 engineering units are listed in the calibration.

The 9074, 8074 and 7074 tools long and extra long arm sensors are not bench calibrated. Do not use the default calibrations for these sensors! Follow the calibration procedures to calibrate these sensors. The default (bench) calibration points limits are the following:

Name/Sensor	Standard	Response
CALIPER (short arms)	7.62 cm (3 in.)	112,320 cps
	20.3 cm (8 in.)	98,580 cps

Notes On Logging The Three Arm Caliper Tool

Prior to logging, calibration of the tool is recommended. If logging a known hole size, such as surface casing, one calibration point would then be the pipe ID. A second point near the hole size is also recommended. Upon reaching hole TD, the arms are opened by using the tool current reverse switch. When the reverse switch is activated, the tool will "turn off" until the arms are opened. Once fully opened, the tool parameters will come back on, and the tool can be logged in the upwards direction only.

CALIPER, CALIPERL, CALIPERX Calibration Procedures

1. Connect probe to drawworks.
2. Start the computer.
3. Start the Log program.
4. Click on the LOG button to open the Control Menu.
5. Configure tool. Do not create a log header or set tool position.
6. To calibrate caliper click on open caliper and wait for the caliper to open completely.
7. Click on the CAL button then click on the TOOL button.
8. The calibration window will automatically open for the tool, which is connected and ID to the system.
9. Select CALIPER, CALIPERL OR CALIPERX depending on the configuration of your caliper arm on the tool being calibrated from the list of curves to calibrate.
10. Double click on the curve name or click once on the curve name and click on the word calibrate.
11. This is a two- (2) point calibration. The value in inches or cm will be determined by the value of the calibration device used. It is recommended that you use two measurements, which bracket the borehole diameter, which is to be logged. Example: use 6 inch and 10 inch calibration fixtures to calibrate a probe, which will be used to measure a borehole of 8 inches in diameter. Cut pieces of PVC pipe or old casing can be used as a calibration fixture for this purpose. It is only important that you know the diameter of the fixture used to perform the calibration.
12. Enter the diameter of the first calibration fixture in the inches/cm window for point 1. Place your calibration fixture on the probe so that the caliper arm is fully opened against the inside diameter of your calibration fixture.
13. Enter the tool response from the data display in the next slot, Caliper (CPS).
14. Repeat steps 10 and 11 for point 2.
15. Click on OK and save your calibration changes.
16. Exit calibration.

17. Close caliper.
18. Turn tool power off.
19. Exit Log.

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