OPERATIONS MANUAL FOR PORTABLE PROFILER – INSTALLING AND USING THE PORTABLE PROFILER

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Installing and Using the Portable Profiler

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INTRODUCTION

This manual is divided into two sections. The first is using the UTA-Profiler Program with the portable profiler for generating surface profilers. The second is installing the portable profiler module on a typical van or truck. The calibration and initialization files used by the UTA-Profiler Program are compatible with the standard TxDOT files used with VAMOS and WinTK. Information on, deriving these files are explained in the TxDOT Profiler Operations Manual. The generated profile obtained when using the the UTA-Profiler Program with the portable profiler is consistent with the TxDOT PF9 VNET data file specifications and as such the generated profile can be directly used with current TxDOT and PROVAL application programs.

The second section, installing the portable profiler module on a typical van or truck, provides a step by step process for mounting the portable profiler sensor module.

USING THE UTA-Portable Profiler Program

The UTA-Portable Profiler Program is written in C++ and designed to run in the Windows console mode for use on multiple Windows platforms. Using the program requires three files - UTA-Portable.exe, UTA-Profiler.ini, and Header.ini. Typical TxDOT files for these two files are illustrated in Figures 1 and 2.

Header.ini File

Record1,HEAD3;
District,17;
County,21;
HighwaySystem,SH;
HighwayNumber,47;
HighwayDirection,S;
ReferenceStart,0;
ReferenceSuffix,A;
ReferenceOffset,2.2;
LaneMark,K;
LaneNum,6;
Record2,CMET3;
Model,Portable Profiler;
Reserved1,;
Reserved2,;
Reserved3,;
Reserved4,;
CertCode,1FTSW21P76EB82581;
CertDate,09092006;
Manufacturer,KPRF01
ElevationUnits,mil;
Wheelpath,LR;
Comment1,Comment Card;
Comment2,Comment Card;

Figure 1 Typical TxDOT Profiler Header.ini File

UTA-Profiler.ini File

```
AccelLeftAD1,-6117;
AccelLeftAD2,6224;
AccelLeftChannel,3;
AccelLeftD1,0.00;
AccelLeftD2,19600.00;
AccelRightAD1,-6067;
AccelRightAD2,6232;
AccelRightChannel,5;
AccelRightD1,0.00;
AccelRightD2,19600.00;
FilterLength,60.96;
LaserLeftAD1,17668;
LaserLeftAD2,20829;
LaserLeftChannel,2
LaserLeftD1,0.00;
LaserLeftD2,-25.40;
LaserRightAD1,20166;
LaserRightAD2,23782;
LaserRightChannel,4;
LaserRightD1,0.00;
LaserRightD2,-25.40;
NumberOfBuffers,Auto;
SamplingRate,4000.00;
SizeOfBuffers,Auto;
SpeedCount,40876.00;
```

Figure 2 Typical UTA-Profiler.ini File

The following steps are used for running the UTA-Profiler Program:

1. Edit the Header.ini and UTA-Profiler.ini files (Figures 1 and 2) and change the wheel path entry to LR, L, or R so that the output data file will provide the appropriate wheel path. Use either UTA's CalConsole or TxDOT Calibration program for obtaining calibration values. The Portable Profiler Module is wired as follows:
    a. Channel 0 - DMI sensor signal (See Figure 3-4)
    b. Channel 1 - Infrared start sensor (See Figure 3-4)
    c. Channel 2 and 4 – Selcom SLS 5000 Laser
    d. Channel 3 and 5 - Columbia Research ±4 g accelerometer

Screw	Signal Terminal	Screw	Signal Terminal
20	USB +5 V Out	40	Ext Trigger
19	Ground	39	Ext Clock
18	Counter 0 In	38	Ground
17	Counter 0 Out	37	Digital Output 7
16	Counter 0 Gate	36	Digital Output 6
15	Ground	35	Digital Output 5
14	Reserved	34	Digital Output 4
13	Reserved	33	Digital Output 3
12	Reserved	32	Digital Output 2
11	Reserved	31	Digital Output 1
10	2.5 V Reference	30	Digital Output 0
9	Ground	29	Ground
8	Reserved	28	Digital Input 7
7	Reserved	27	Digital Input 6
6	Analog In 5	26	Digital Input 5
5	Analog In 4	25	Digital Input 4
4	Analog In 3	24	Digital Input 3
3	Analog In 2	23	Digital Input 2
2	Analog In 1	22	Digital Input 1
1	Analog In 0	21	Digital Input 0

Accelerometer Sensor

Laser Sensor

DMI Start Sensor

DMI sensor sign al

Figure 3 DT 9816-A Pin Assignments (See Data Translation http://www.datx.com/)

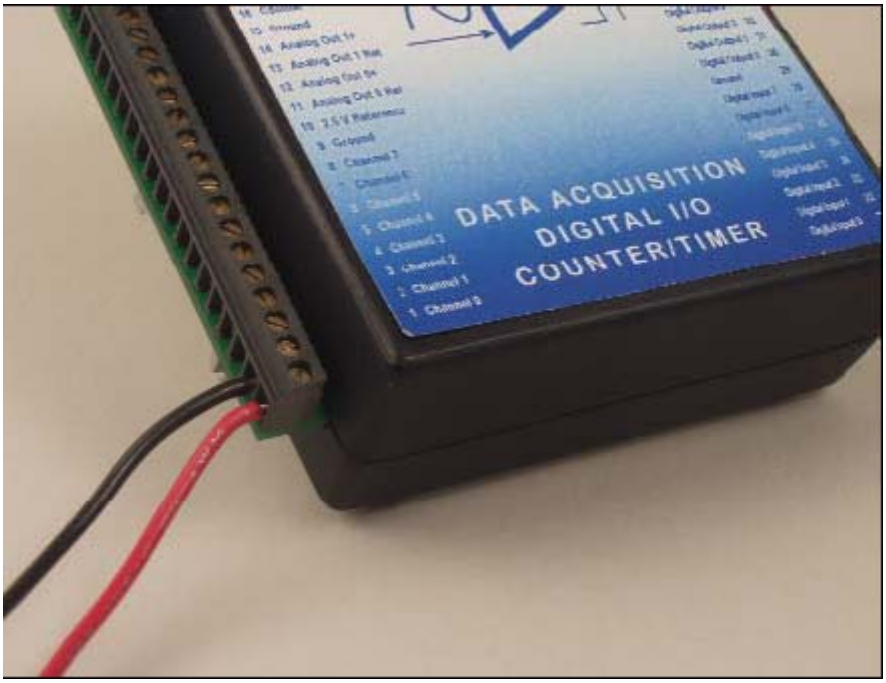


Figure 4 Connect Distance Input to Channel 0, Start Sensor to Channel 1

2. Start the UTA-Profiler by clicking on the UTAProfiler.exe icon.

3. Once the program starts, type “y” and press “ENTER” to accept the header.ini as the default header file or type in the header file name that you will be using (Figure 5).

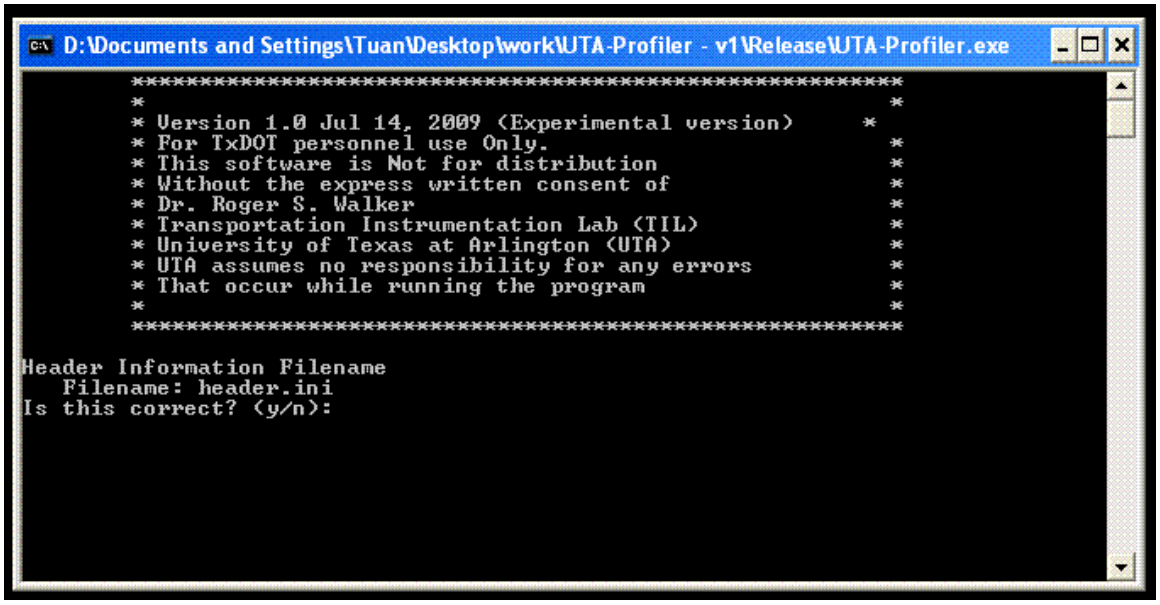


Figure 5 Entering Header.ini File Name/Location

4. Type “y” and press “ENTER” to accept UTA-Profiler.ini as the default configuration file or type in the configuration file name that you will be using (Figure 6).

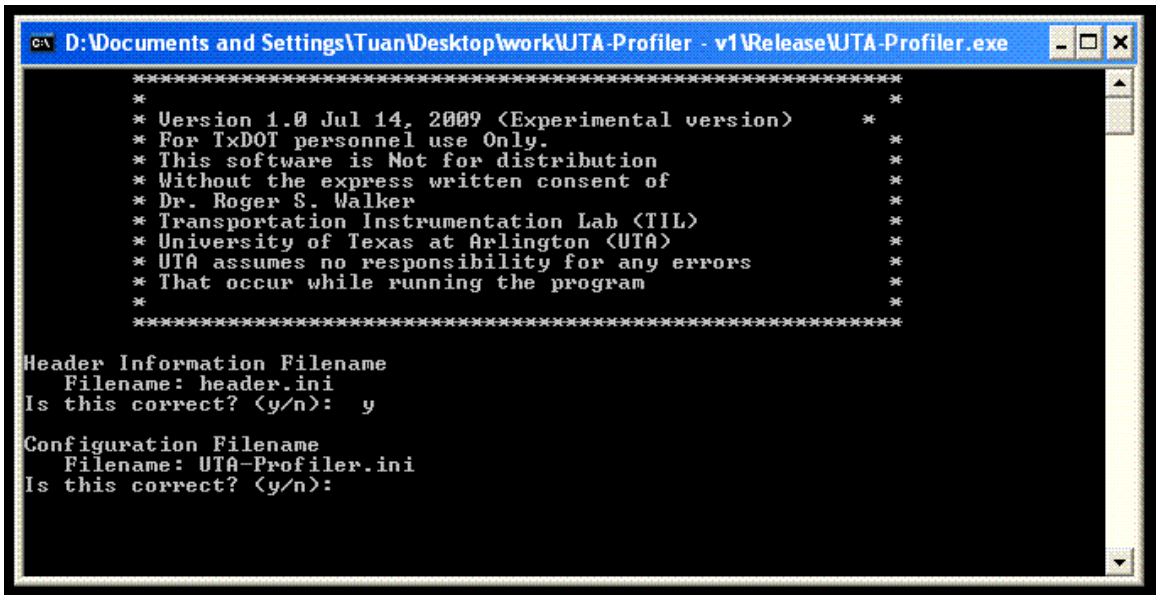


Figure 6 Entering UTA-Profiler.ini File Name/Location

5. Type “y” and press “ENTER” to accept Output.pro as the default output file or type in the output file name that you want to have. (Figure 7)

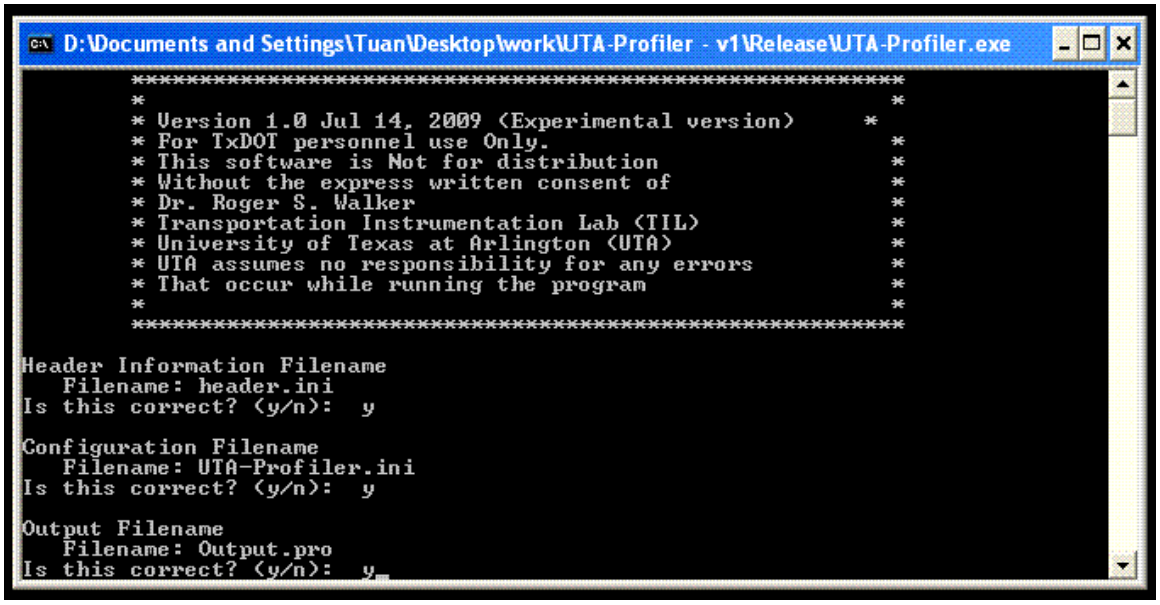


Figure 7 Entering Profile Output File Name/Location

6. Press any key to continue. The UTA-Profiler should display the current header information specified in the header file. Verify that this information is correct. (Figure 8)

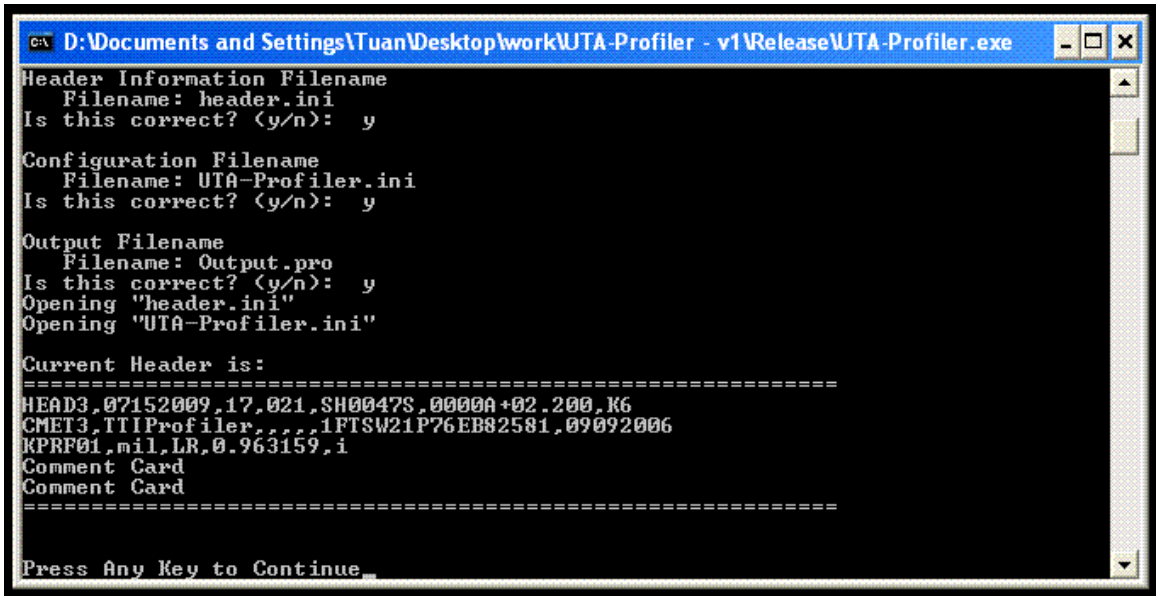


Figure 8 Verifying Initialization and Header File Information

7. Press any key twice to continue after the header information is verified. The UTA-Profiler should display the Data Translation board status. Press any key to continue after you have verified this information (Figure 9).

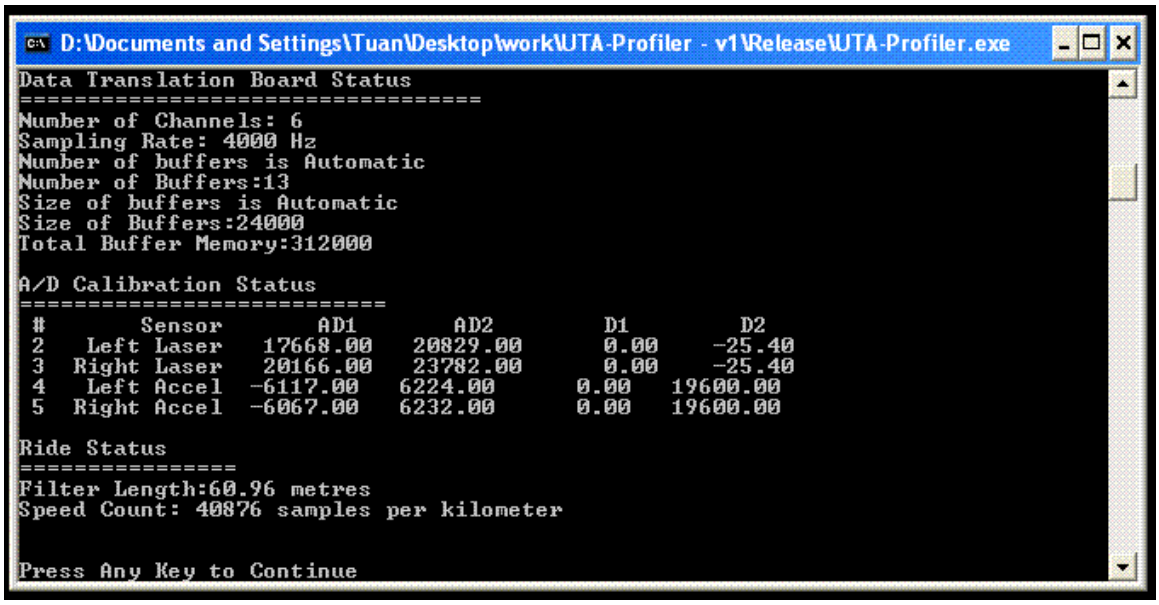


Figure 9 Verifying Initialization and Header File Information and Prepare for Data Collection

8. At the “Command Menu” (See Figure 10) select one of the following:

   a. The “S” or Start key to immediately start profile data collection, writing the profile file to the specified profile output file.
   b. The “P” or Pre-section key to begin computing profile. The computed profile is not stored but used to preload the digital filters and other initialization parameters consistent with the section to be measured. The pre-section should typically be should be at least 300 ft or about 100 feet further than the specified filter length.
   c. The “O” or Stop key to halt profile data collection

d. The “R” or Real section key to immediately start profile data collection, writing the profile file to the specified profile output file. This is used to distinguish between the pre-section and the section that profile is to be measured and kept (Real).

e. The “A” or Arm key to tell the Profiler Program to automatically start the ‘Real’ data collection when a negative going pulse is sensed on the infrared start channel (channel 1).

f. The “Q” or Quit key to end data collection and close the specified profile output file.

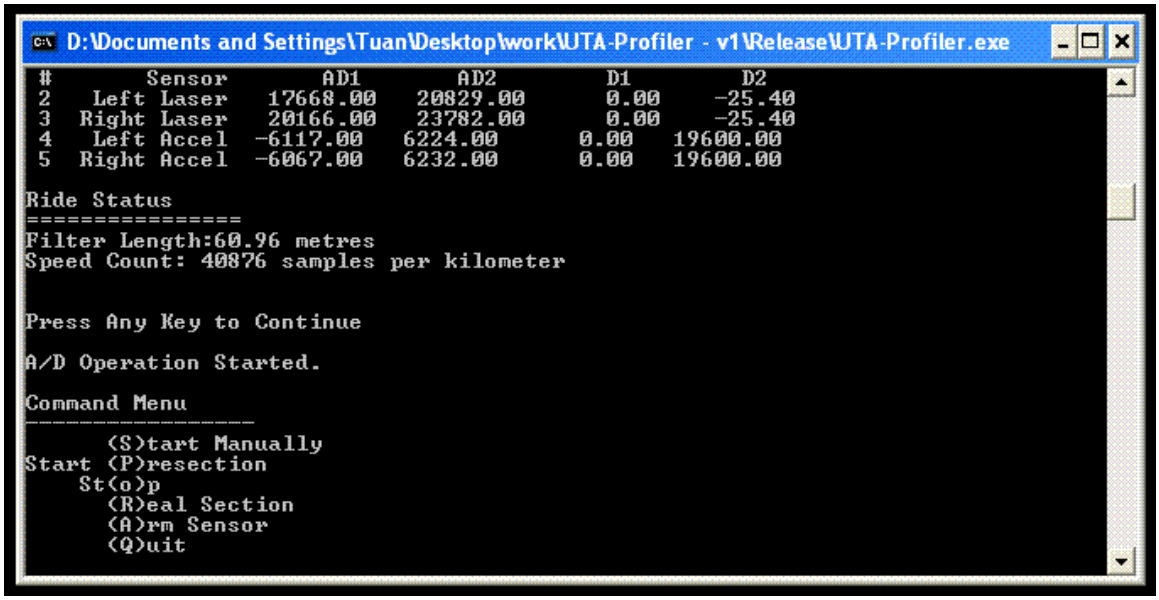


Figure 10 Verifying Initialization and Header File Information and Prepare for Data Collection

Figures 11 thru 15 depict the screens for each of the above options a. thru f.

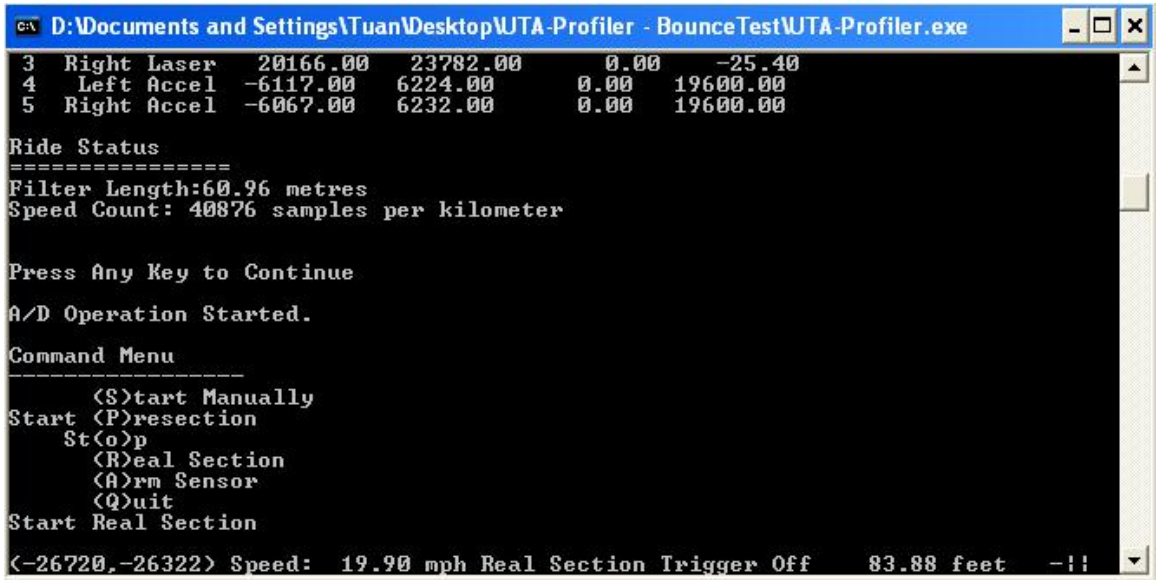


Figure 11 Selecting the Start Manually option

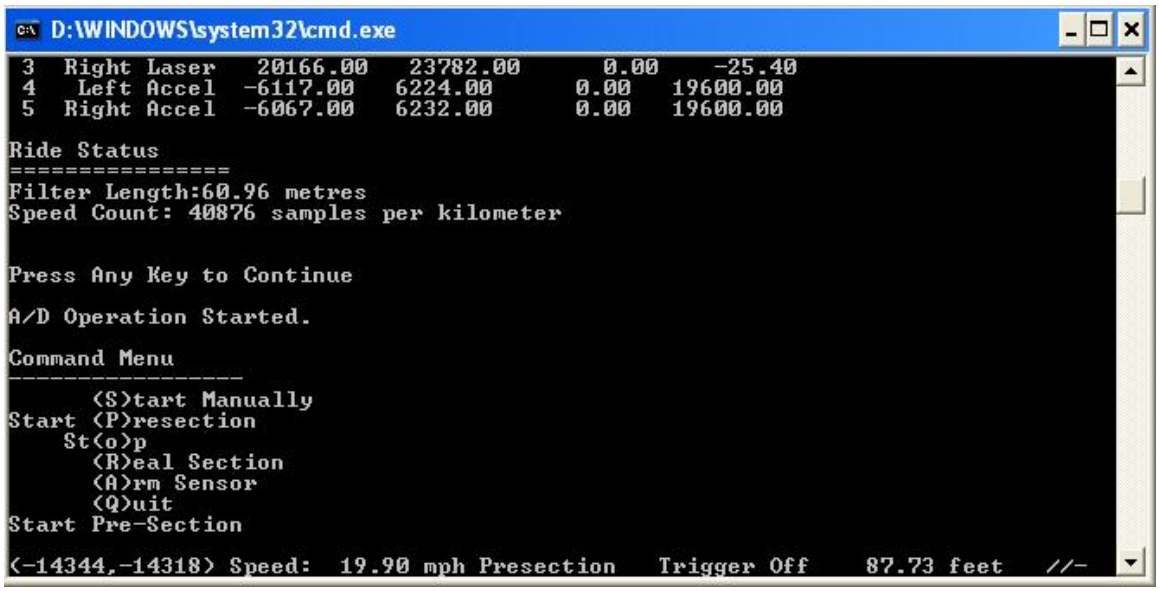


Figure 12 Selecting the Start (P)resection option

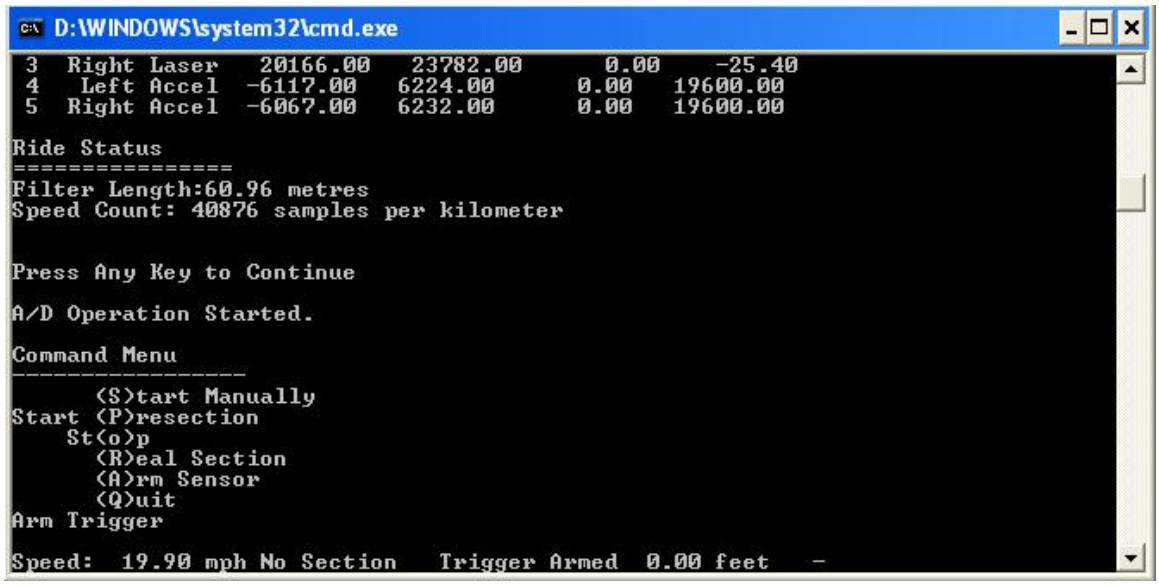


Figure 13 Selection the (A)rm sensor option

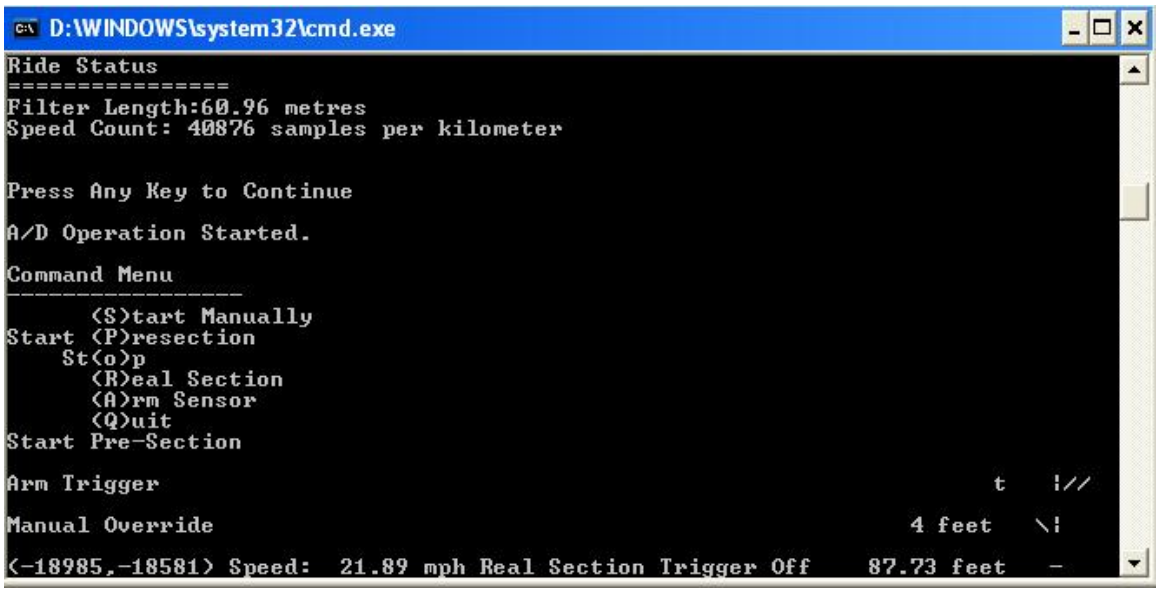


Figure 14 Selecting the (R)eal Section option

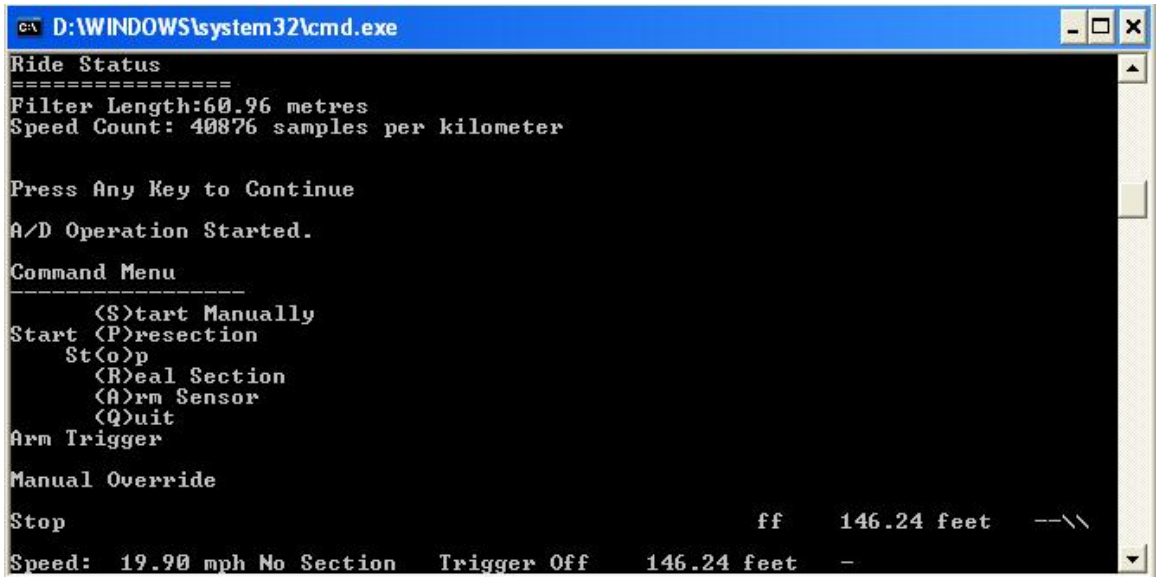


Figure 15 Selecting the St(o)p option

Portable Profiler Installation Guide

The following illustrations depict the installation of the Portable Profiler Mounting and Installation procedures.

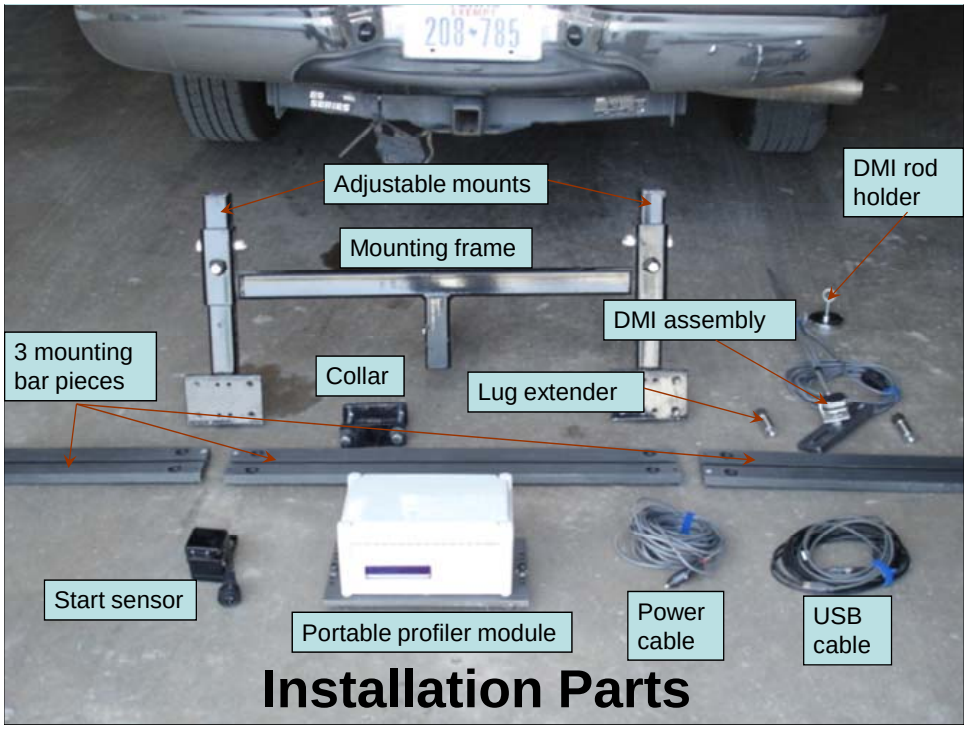
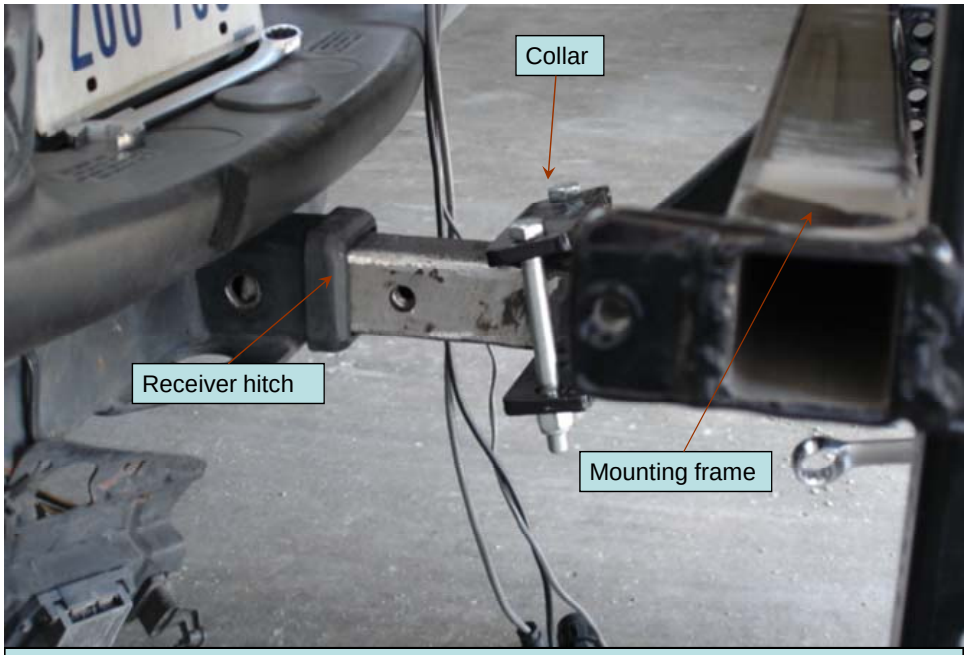


Figure 16 Installation Parts

Mounting the Portable Profiler Module



Place collar on mounting frame and slide adjustment mounts into the frame sleeves. Then, insert mounting frame into vehicle receiver hitch.

Figure 17 Place Collar on Mounting Frame

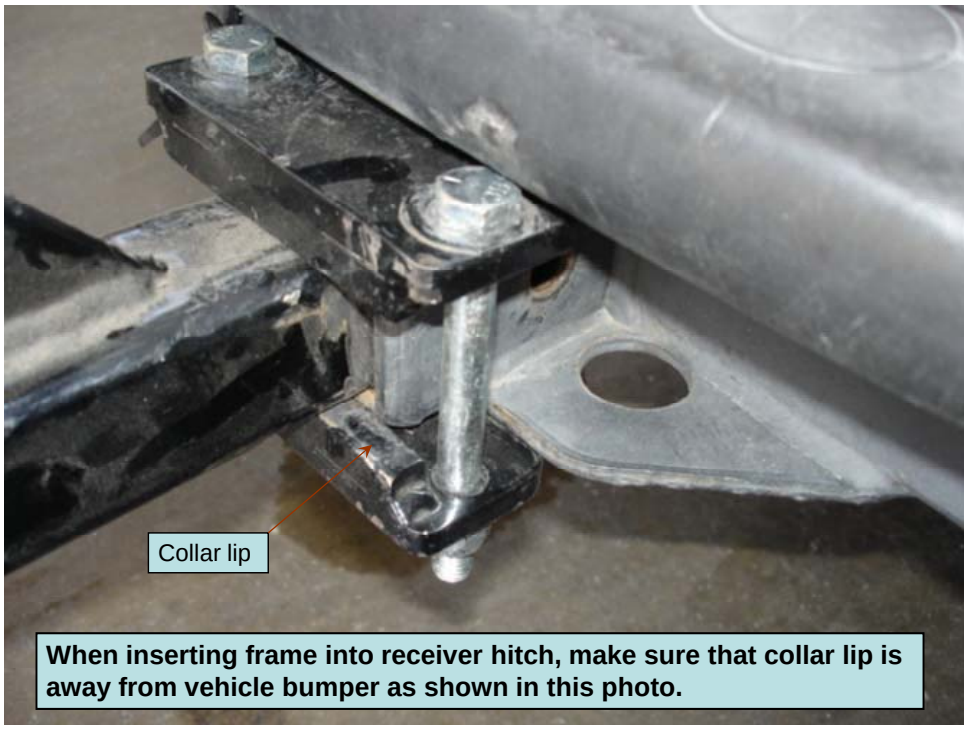


Figure 18 Insert Frame into Receiver Hitch

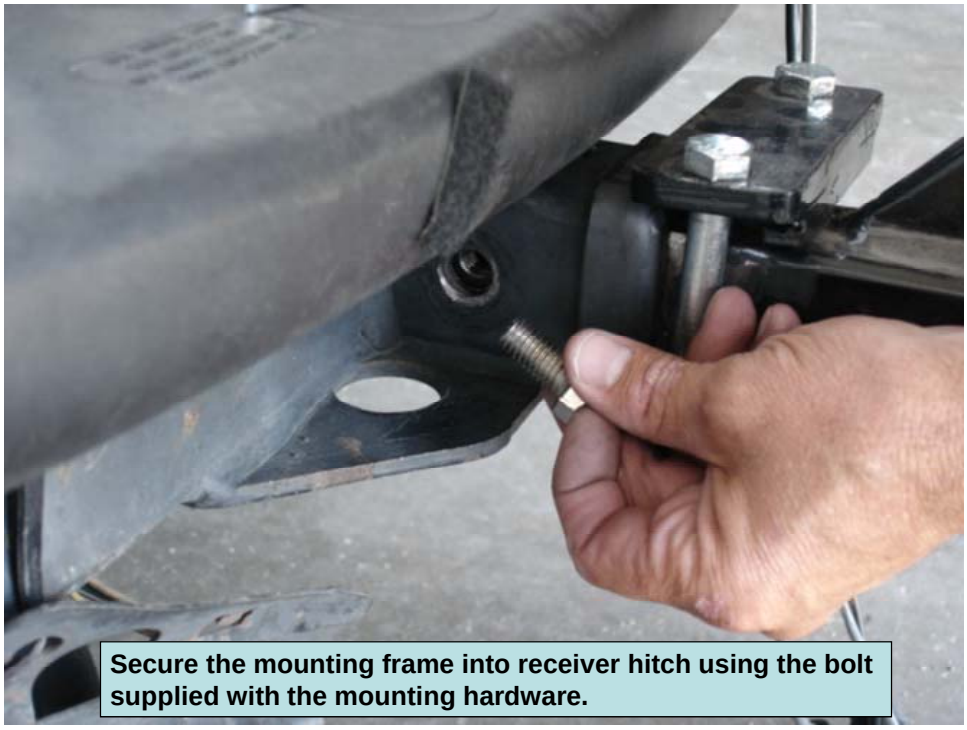


Figure 19 Secure Mounting Frame

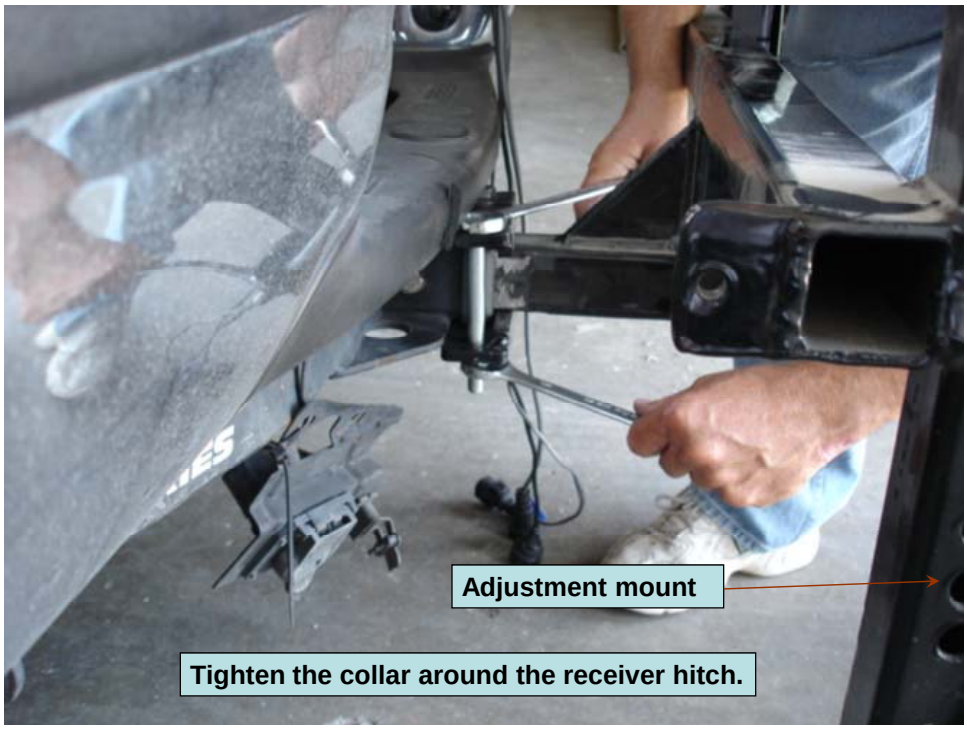


Figure 20 Adjust Mount

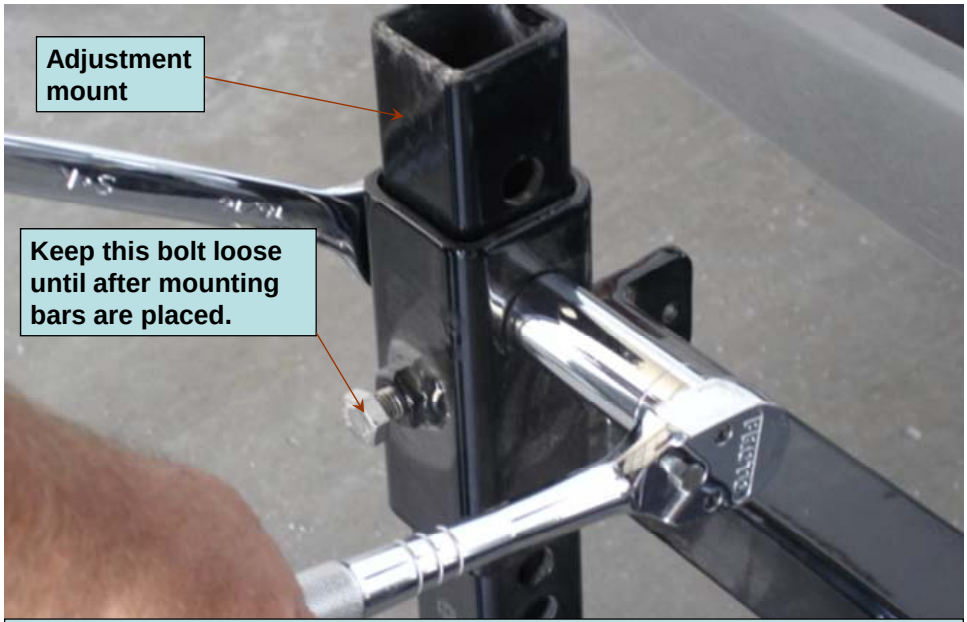


Figure 21 Adjust Height

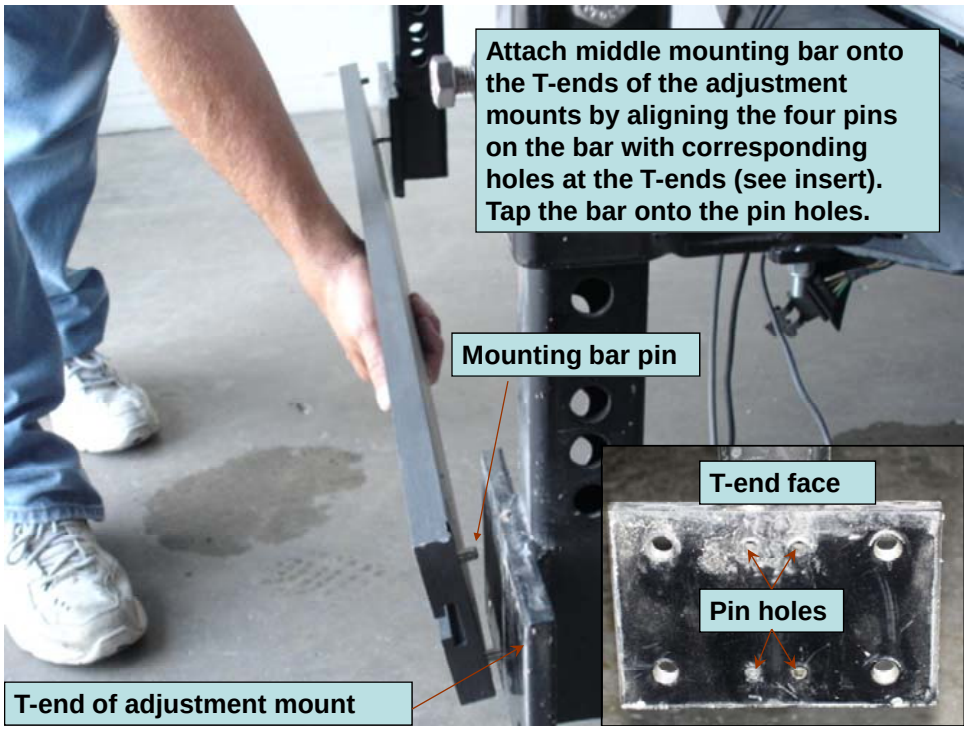


Figure 22 Attach Middle Mount

Attach the passenger side mounting bar onto the adjustment mount by aligning the bar pins with the corresponding pin holes on the T-end. Then, tap the bar in place. Do the same for the driver side mounting bar.

Figure 23 Attach Side Mount

Figure 24 Secure Mounting Bars

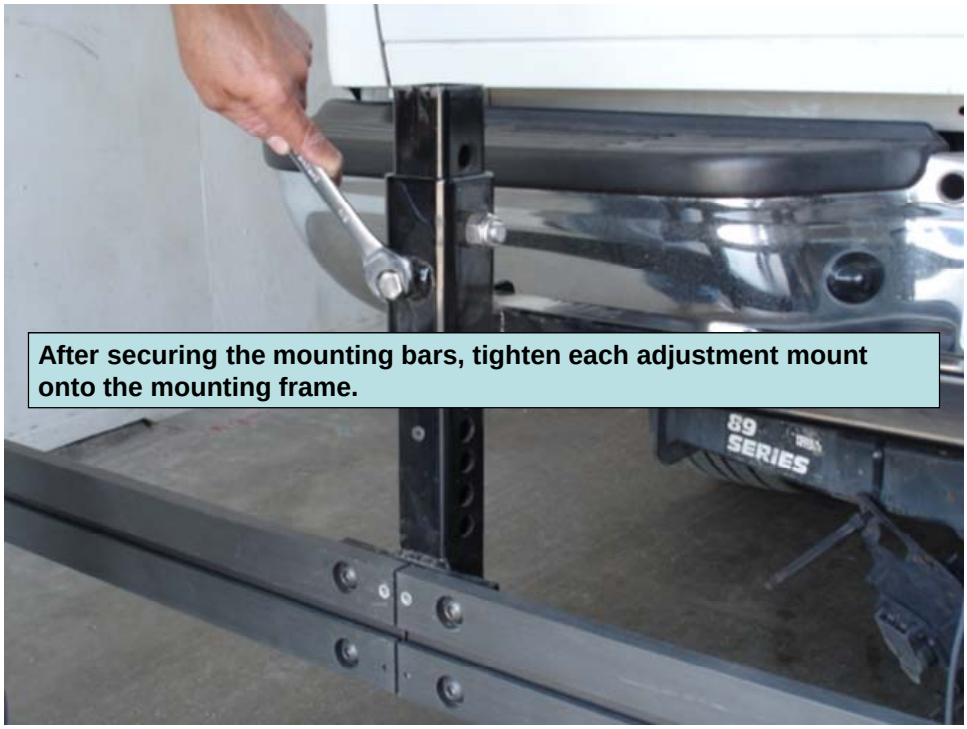


Figure 25 Tighten Mounting Bars

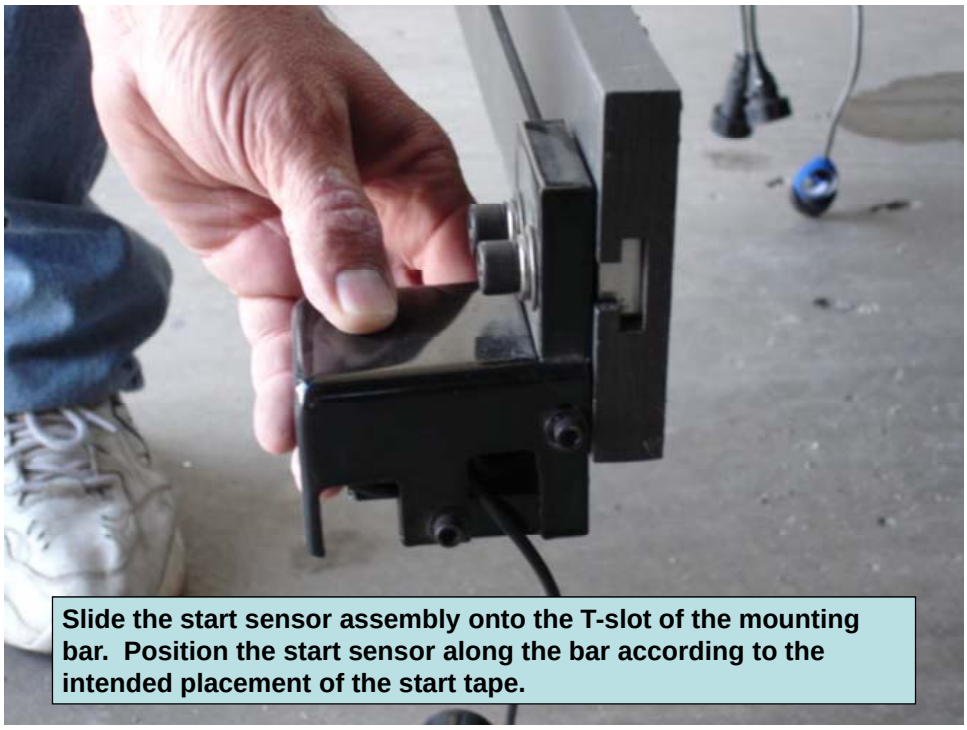


Figure 26 Mount Start Sensor

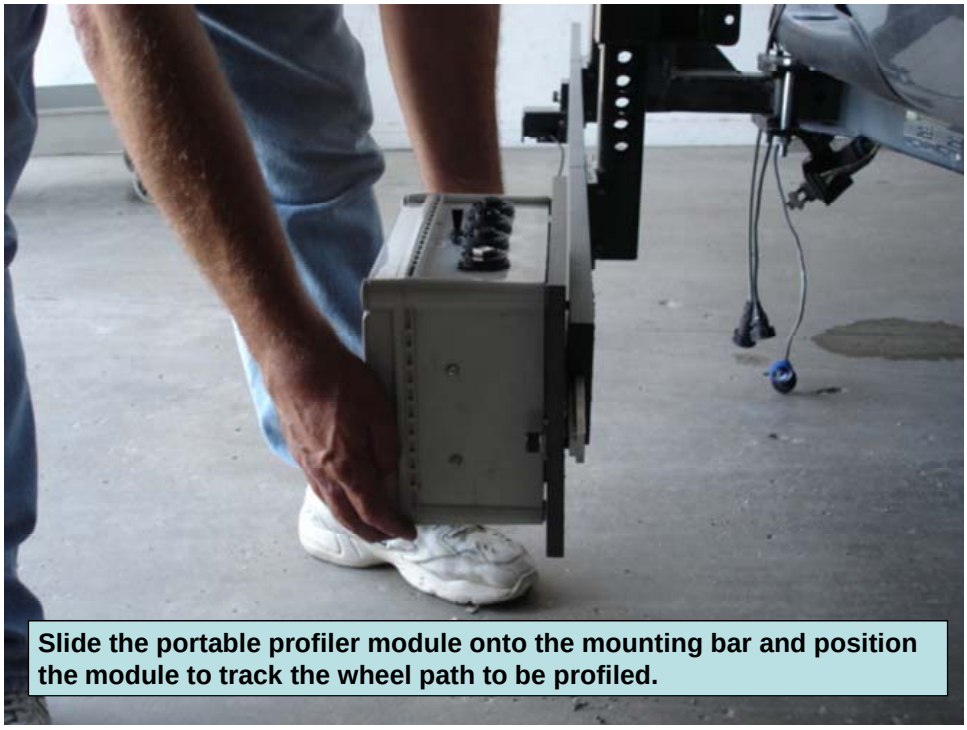


Figure 27 Mount Profiler Module

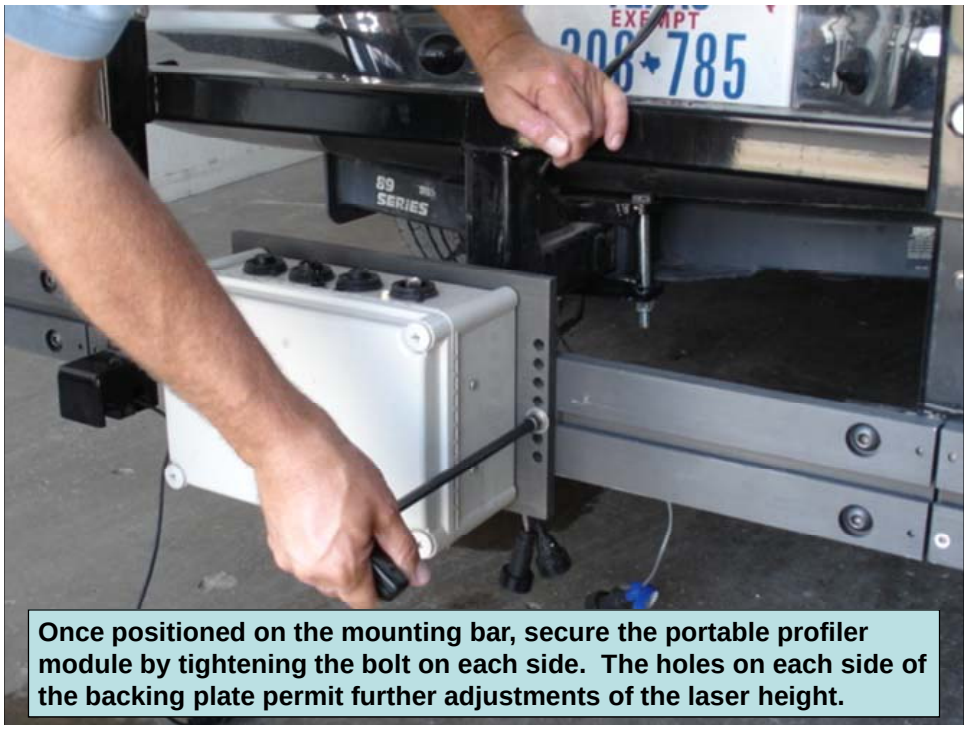


Figure 28 Position Profiler Module to Desired Location

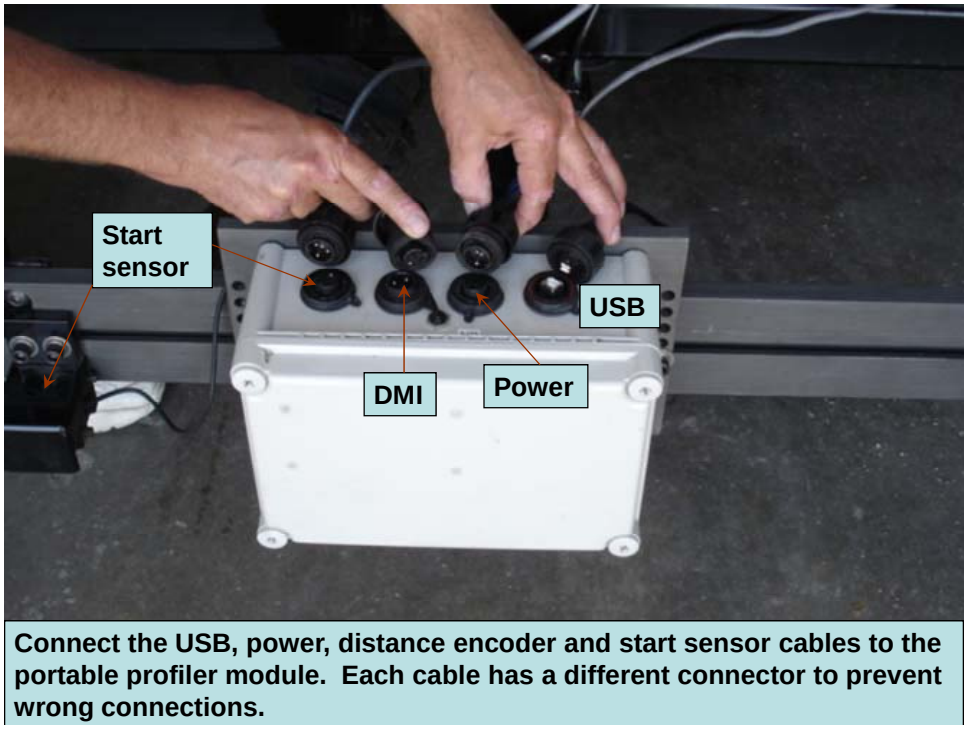


Figure 29 Connect Cables

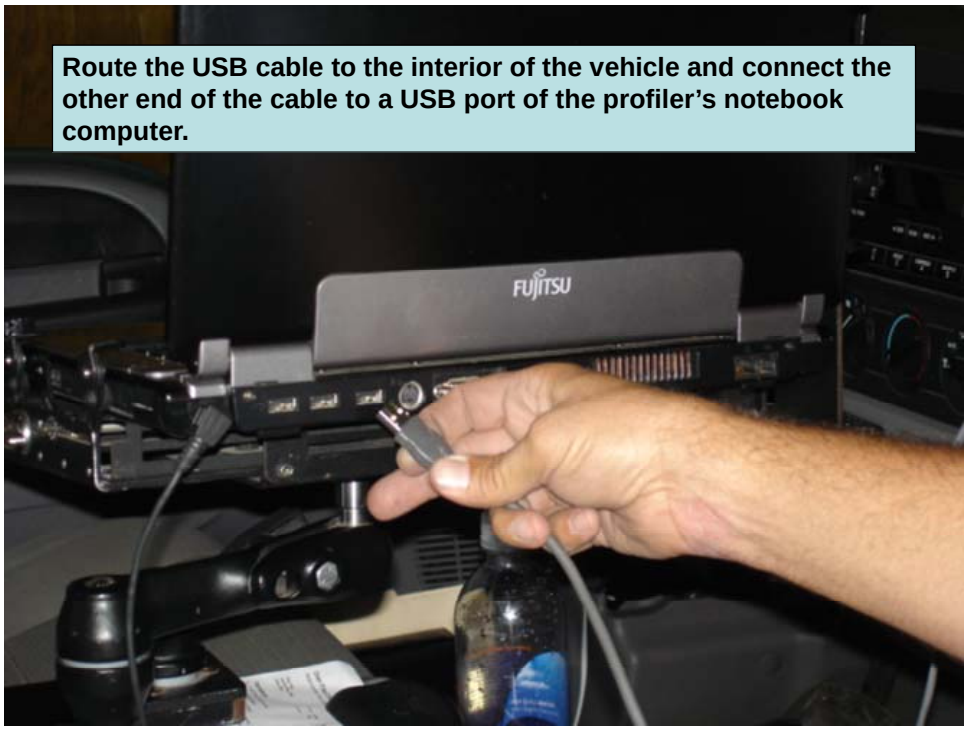


Figure 30 Route USB Cable to PC

Figure 31 Connect Power Cable

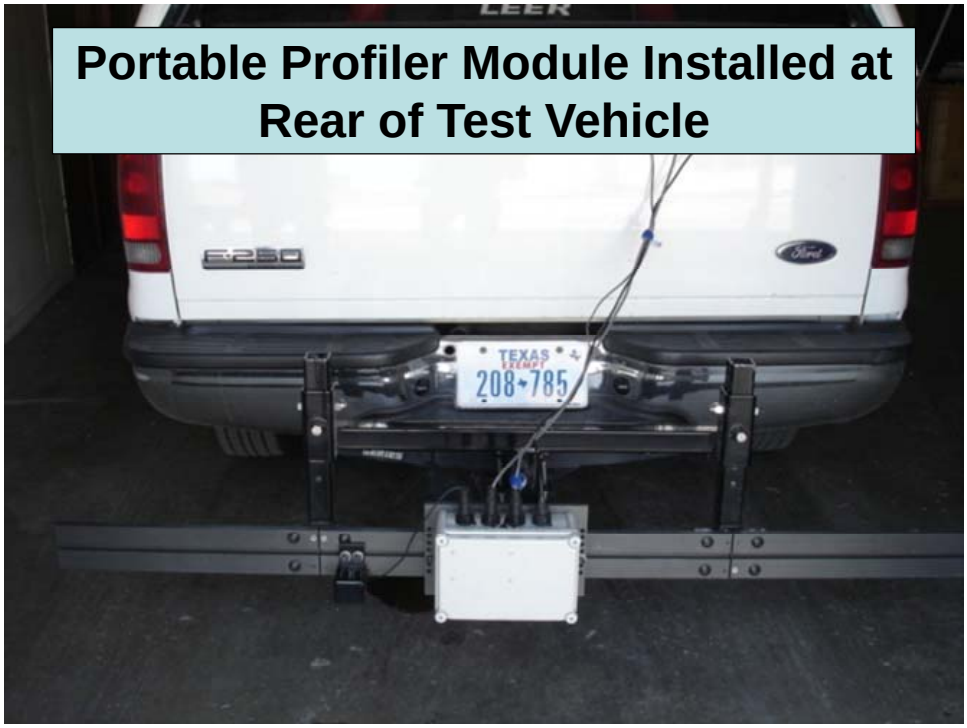


Figure 32 Completing Profiler Module Installation

Distance Encoder Installation

Figure 33 Mounting Lug Extenders

Figure 34 Encoder Holder Rod

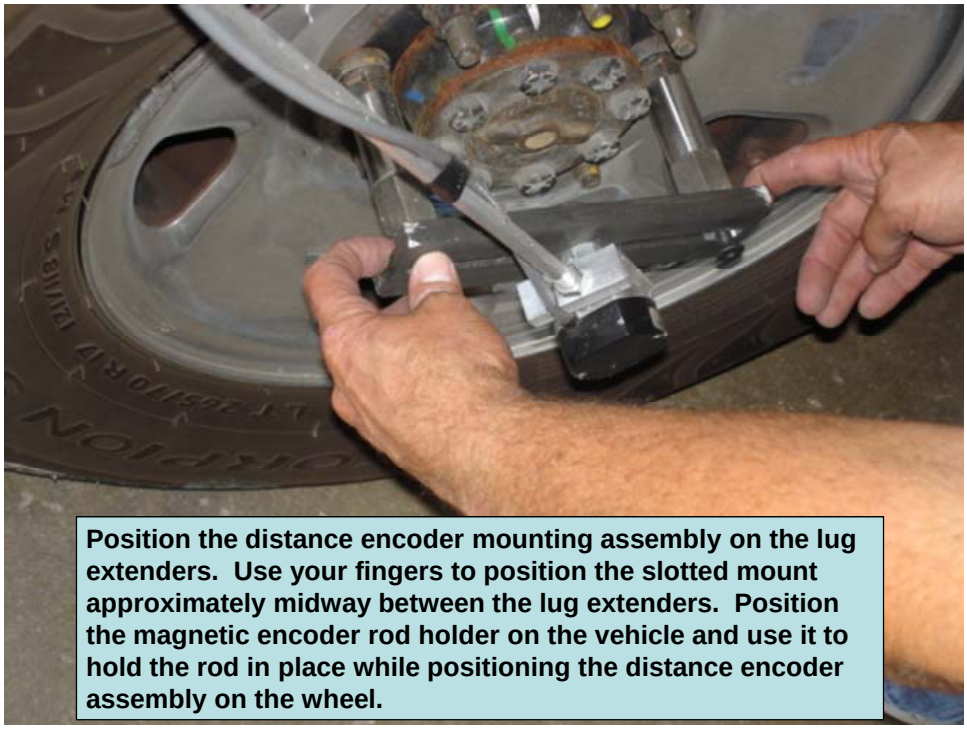


Figure 35 Position Encoder into Mounting Assembly

Figure 36 Secure Distance Encoder

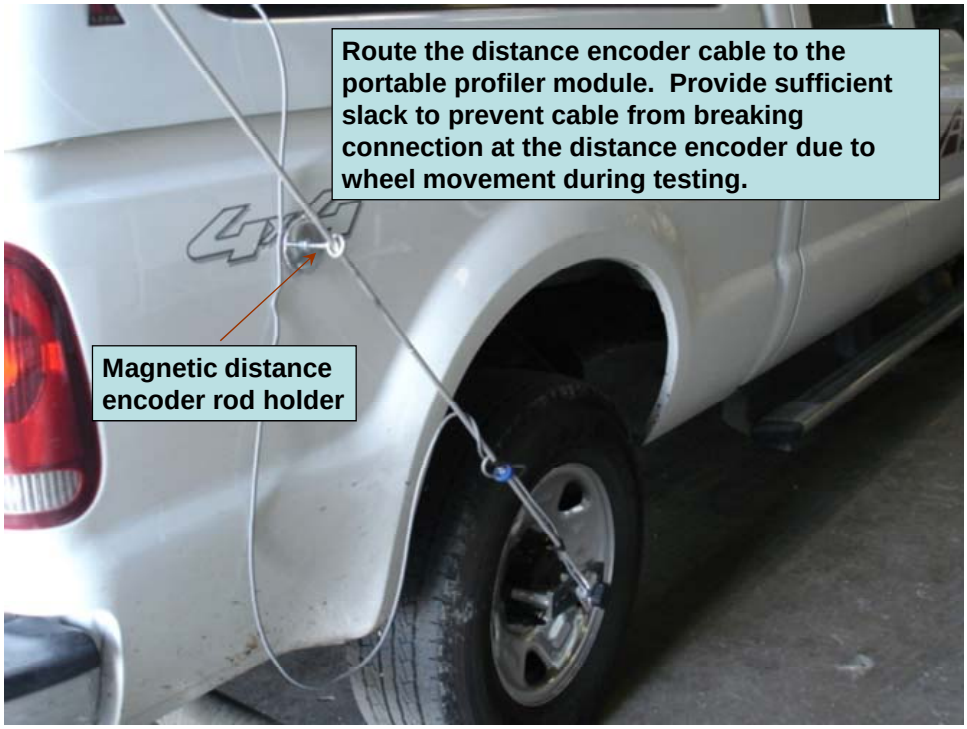


Figure 37 Complete Encoder Installation