

## NEW DDFI CALIBRATION AND REMOTE IDLE ADJUSTER KITS

### GENERAL

The purpose of this service bulletin is to inform you of the release of two new kits and to provide installation instructions. Buell Motorcycle Company is offering an improved calibration for 1999 X1 and S3 bikes equipped with Dynamic Digital Fuel Injection (DDFI). The new calibration will improve cold start idle quality and address engine stutter issues. Motorcycles built after April 13, 1999 will already have the new calibration installed. See below for VIN break of vehicles that are equipped with the new calibration from the factory:

- X1 World after VIN 4MZSS11J7X3202791
- X1 CA after VIN 4MZSS56J4X3220228
- S3 World after VIN 4MZRS11J8X3000802
- S3 CA after VIN 4MZRS56J3X3020097

Buell Motorcycle Company is also offering a remote idle adjuster cable kit for late 1999 model year DDFI motorcycles that are equipped with an idle adjuster screw. This kit can be ordered to upgrade idle adjuster screw-equipped motorcycles.

The ECM recalibration can be performed without installing the remote idle adjuster cable. One multiple use recalibration cartridge is all that is required to reprogram all the motorcycles in your dealership.

A kit containing the new calibration cartridge kit and a sample remote idle adjuster kit will be shipped to your dealership beginning on or before May 6, 1999. The kit will consist of:

- Recalibration cartridge (Part No. 29653-99Y)
- Calibration Labels (10) (Market Specific-See Below)
- (Sample) Remote Idle Adjuster Cable Kit (Part No. 56482-99Y)

Additional Remote Idle Adjuster Kits (Part No. 56482-99Y) will be available May 6, 1999 and can be ordered free of charge.

Additional calibration labels can be ordered free of charge in quantities of 10 labels per sheet using the part numbers below:

- US06G (US, Canada, Japan, New Zealand) Part No. 29654-99Y (yellow label).
- EC14G (England, Europe) Part No. 29655-99Y (blue label)
- AU14G (Australia) Part No. 29656-99Y (orange label)

### VEHICLES INVOLVED

Select 1999 X1 and S3 model Buell motorcycles.

### DEALER ACTION

See below for an overview of the five steps required to complete the installation after recalibration is performed:

1. Install remote idle adjuster cable (select vehicles).
2. Verify Throttle Position Zero (TP0) setting.
3. Set warm idle speed.
4. Verify correct ignition timing (select vehicles)
5. Identify/repair intake leaks (select vehicles)

The new calibration is contained in the recalibration cartridge. Installation requires a scanalyzer (Part No. HD-41325) and cable (Part No. HD-42921). It is critical that ALL steps under System Checks be completed to ensure proper operation of the DDFI system with the new calibration. In the interest of customer satisfaction, the new calibration and remote idle adjuster cable can be installed under warranty. Vehicles beyond the warranty period will not require a prior authorization. See CREDIT PROCEDURES.

The remote idle adjuster kit includes the cable, spring and cable tie. Installation of this kit is highly recommended and will simplify the warm idle adjustment procedure. Vehicles beyond the warranty period will not require a prior authorization. See CREDIT PROCEDURES.

### RECALIBRATION PROCEDURE

1. Locate Data Link connector [91] (pin side of 4-place Deutsch). Remove protective plug from open end of Data Link connector.
2. Connect scanalyzer (Part No. HD-41325) with **diagnostic application cartridge (Part No. B-41325-99)** into scanalyzer to data link connector [91] with cable (Part No. HD-42921).
3. Turn the ignition/light key switch to IGNITION. Turn the handlebar mounted Engine Stop Switch to the RUN position (but do not start the engine).
4. During the next few seconds, the Scanalyzer sequences through a series of screens that reflect a power-on self test, the system copyright, and then an attempt at communications with the ECM. Once communications is established, the Diagnostic Menu appears on the Scanalyzer data display.
5. Start engine and bring temperature to a minimum of 265° F (129.4° C).

ROUTING	SERVICE MANAGER	SALES MANAGER	PARTS MANAGER	LEAD TECHNICIAN	TECHNICIAN NO. 1	TECHNICIAN NO. 2	TECHNICIAN NO. 3	TECHNICIAN NO. 4	RETURN THIS TO:
INITIAL HERE									

6. With engine idling and scanalyzer connected, select mode #3, Data Monitor, and print the data or copy the information on the scanalyzer data sheet provided. This provides a record of starting conditions if further diagnosis is needed.
7. Turn motorcycle off.
8. Remove diagnostic application cartridge and insert scanalyzer Recalibration Cartridge Part No. 29653-99Y included with kit into scanalyzer.
9. Turn the ignition/light key switch to IGNITION. Turn the handlebar mounted Engine Stop Switch to the RUN position (but do not start the engine).
10. See Figure 3. From the Diagnostic Menu, press the number "1" key to view the software version code listed under the System ID. Verify that the software version code displayed on the scanalyzer matches the market codes listed below:
  - BUEGC0B0 A - US, California, Canada, Japan, New Zealand
  - BUEGC0B0 B - Europe, England
  - BUEGC0B0 C - Australia
11. See Figure 3. Return to Diagnostic Menu of scanalyzer. From the Diagnostic Menu, press the number "2" key to begin reprogramming the ECM.
12. A screen will then appear on the scanalyzer "ARE YOU SURE YOU WANT TO REPROGRAM THE ECM WITH (calibration number)?" One of the calibration numbers below (in bold) will appear.  
 For BUEGC0B0 A the new calibration will be **US06G**.  
 For BUEGC0B0 B the new calibration will be **EC14G**.  
 For BUEGC0B0 C the new calibration will be **AU14G**.  
 Press the number "1" key to begin reprogramming the ECM.
  - The scanalyzer will show the progress it is making when reprogramming the ECM. Do not disconnect the scanalyzer or interrupt the process until the UPDATE SUCCESSFUL prompt appears in the scanalyzer.
13. Upon completion of the recalibration routine, the scanalyzer will display UPDATE SUCCESSFUL/PRESS MODE. Press the mode key to return to the diagnostic menu. Disconnect the Scanalyzer and turn the Ignition/Light Key Switch to OFF or LOCK. Turn the handlebar mounted Engine Stop Switch to the OFF position.

#### IMPORTANT NOTE

**A new calibration label is enclosed with the recalibration kit and must be installed to the ECM to comply with federal regulations. Failure to label recalibrated ECM may result in fines and potential criminal prosecution.**

14. See Figure 1. Locate the ECM on the motorcycle. There are two labels on the upper right hand corner of the ECM. The lower label is the calibration label. Remove the old calibration label from the ECM. Leave the top label in place.
15. Locate the **new** adhesive calibration label that is packaged with the recalibration kit. Remove adhesive backing and install new calibration label to the ECM in the same position that the previous label was in.
16. Perform all steps listed under System Checks.

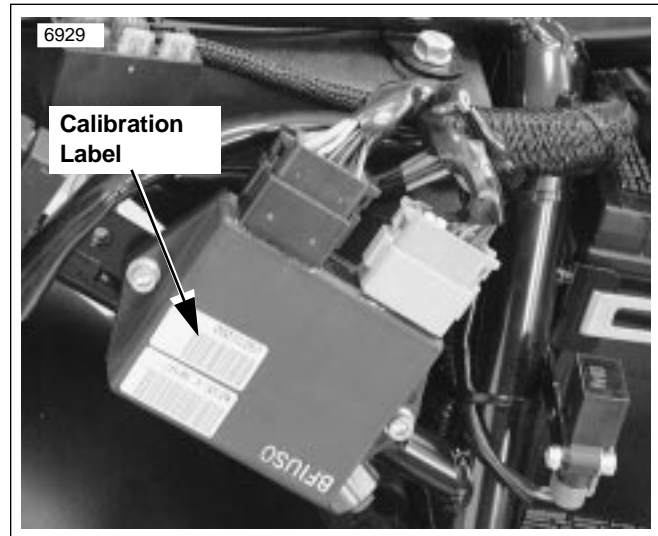


Figure 1. ECM Calibration Label Location (S3 Shown)

## Remote Idle Adjuster Cable Installation

#### NOTE

*Perform the following procedures according to the guidelines given in the service manual for the model being serviced.*

1. Remove seat and fuel tank cover (X1 only) and fuel tank. See appropriate service manual for instructions.
2. See Figure 2. Remove idle adjuster screw and spring from throttle body bracket/stop plate.
3. Install spring to remote idle adjuster cable.
4. Install cable to throttle body bracket. Route cable between cylinder heads to left side of motorcycle.
5. Back out idle adjustment cable, turning knurled end counterclockwise until there is no contact between the tip of the adjustment cable and the throttle cam. Open and close the throttle 2-3 times to verify there is no contact.
6. Install fuel tank and cover (X1 only). See appropriate service manual for instructions and torque specifications.

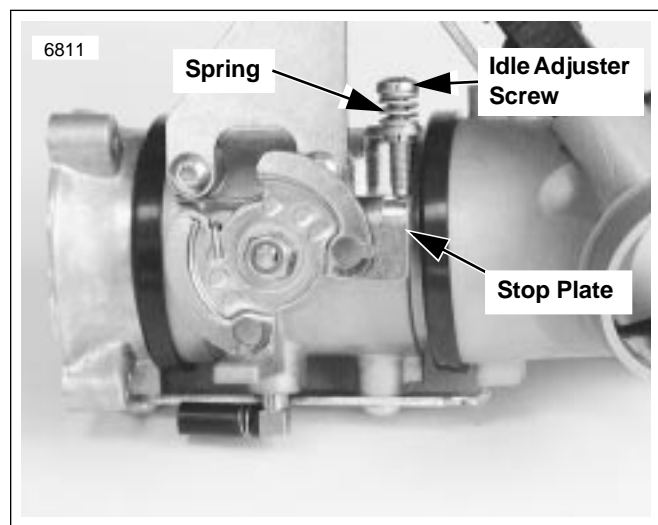


Figure 2. Idle Adjuster Screw

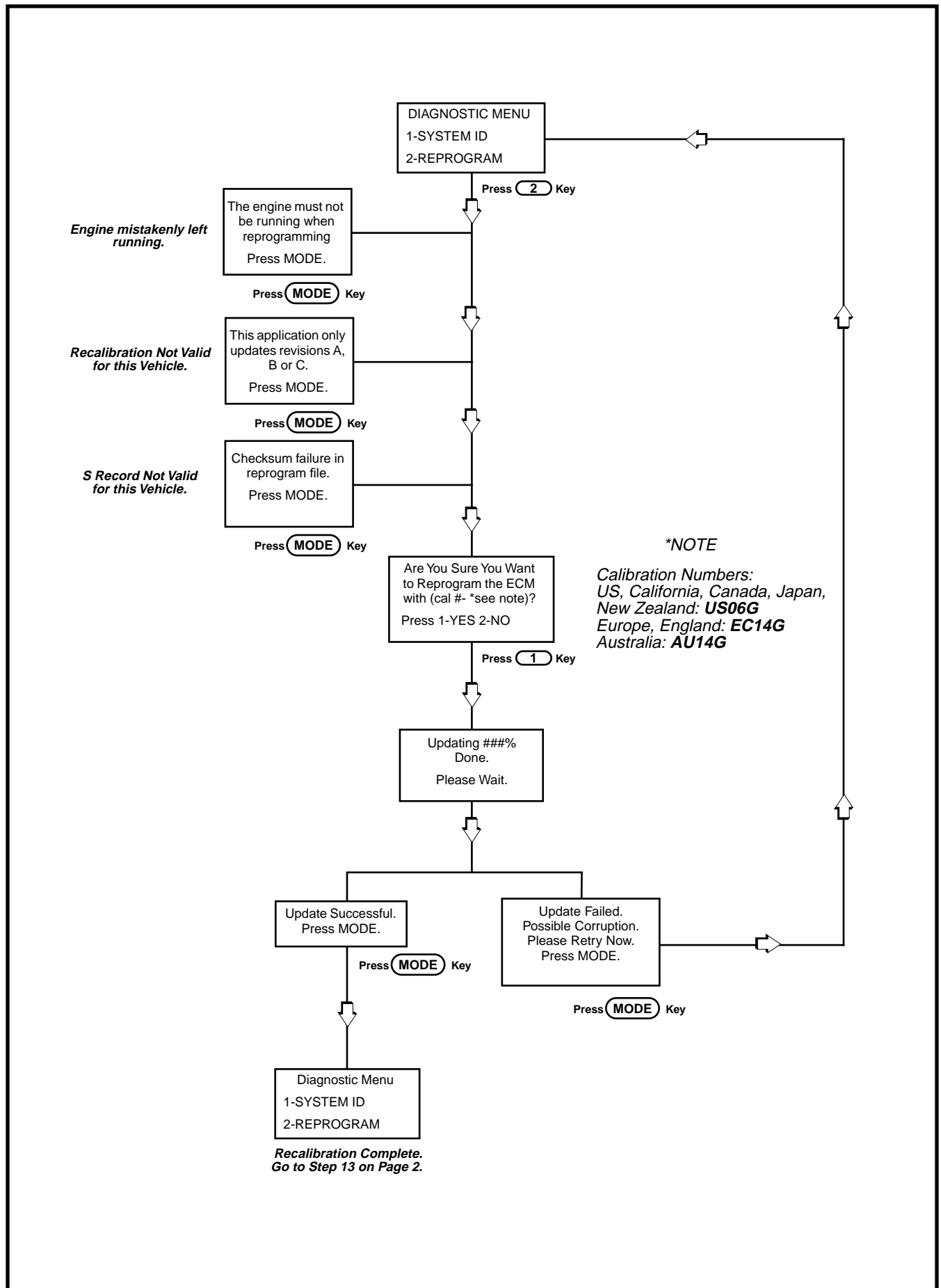


Figure 3. ECM Recalibration Routine

## System Checks (Required)

### Verify Throttle Position Zero Setting

1. Back out idle screw until it no longer touches the throttle plate stop. Back out idle screw one to two additional turns.
2. Connect scanalyzer (Part No. HD-41325) to data link connector [91] with cable (Part No. HD-42921).
3. Turn the ignition/light key switch to IGNITION. Turn the handlebar mounted Engine Stop Switch to the RUN position (but do not start the engine).

#### NOTE

Observe that step 4 uses the standard diagnostic application cartridge and NOT the recalibration cartridge used previously.

4. Insert **diagnostic application cartridge (Part No. B-41325-99)** into scanalyzer. During the next few seconds, the Scanalyzer sequences through a series of screens that reflect a power-on self test, the system copyright, and then an attempt at communications with the ECM. Once communications is established, the Diagnostic Menu appears on the Scanalyzer data display.
5. Press number "3" key (Data Monitor) on scanalyzer and scroll down to last screen which has 3 Throttle Position (TP) readings.
  - a. Open throttle to wide open throttle (95-100% open on first scanalyzer TP reading) and release throttle, allowing it to snap shut.
  - b. Record Throttle Position Sensor voltage reading from scanalyzer (last of the TP readings).
  - c. Repeat steps a and b a total of 3 to 5 times, recording voltage reading after each.
    - If the readings differ by less than 0.02V, go to step g.
    - If the readings differ by 0.02V or more, go to Step d.
  - d. Open the throttle then gently force the throttle closed.
  - e. Record Throttle Position Sensor Voltage reading from scanalyzer (last of the TP readings).
  - f. Repeat steps d and e a total of 3 to 5 times, recording the voltage reading after each.
    - If the readings differ by less than 0.02V, go to step g
    - If the readings differ by 0.02V or more, replace the throttle body and repeat procedure from Step 1.
  - g. Select mode #7 on scanalyzer menu. Select #1 re-zero TPS. A "calibration successful" message will appear.
  - h. Press the mode key to return to Options Data Screen. Scroll to TP degrees. Turn idle adjustment cable clockwise until TP degree reading reaches 5.8.
6. Press the mode key and press #3 to return to the diagnostic menu. Disconnect the Scanalyzer and turn the Ignition/Light Key Switch to OFF or LOCK. Turn the handlebar mounted Engine Stop Switch to the OFF position.

### Reset Warm Idle Speed

1. Start engine and bring the engine temperature to a minimum of 265° F (129.4° C).
2. Set the warm idle speed at 1000-1100 rpm with the remote idle adjuster cable.

#### NOTE

Cold idle start quality is affected by the warm idle setting. The higher the RPM range that the warm idle is set to, the better the cold start idle quality will be. High RPM warm idle speed will also result in cleaner unassisted (not having to roll on the throttle) cold starts. Do not set the warm idle speed above 1100 RPM.

The following three procedures, marked with an asterisk, only apply to select vehicles, listed by VIN. Check and write down the VIN number of the vehicle being serviced to determine if next three procedures must be performed. For vehicles not affected, go to *Conclusion*.

### \*Verify Base Ignition Timing

Verify base ignition timing **only** on select vehicles manufactured before September 30, 1998 listed below:

- X1 World: all before VIN 4MZSS11J7X32000762
- X1 CA: all before VIN 4MZSS56J3X3220057
- S3 World: all before VIN 4MZRS11JX3000166
- S3 CA: all before VIN 4MZRS56J6X3020017

See appropriate service manual for instructions.

### \*Check for Intake Leaks

Check for intake leaks **only** on select vehicles manufactured before February 26, 1999 listed below:

- X1 World: all before VIN 4MZSS11J3X3202240
- X1 CA: all before VIN 4MZSS56J3X3220172
- S3 World: all before VIN 4MZRS11JXX3020081
- S3 CA: all before VIN 4MZRS56J8X3020080

1. Check for intake leaks around the intake manifold seals at the cylinder head and around the fuel injector o-rings.
2. Replace intake manifold seals and/or injector o-rings as required.

### \*Replace Intake Manifold Seals

Replace intake manifold seals **only** on select vehicles listed below:

- X1 World: all before VIN 4MZSS11J0X3201854
- X1 CA: all before VIN 4MZSS56J9X3220158
- S3 World: all before VIN 4MZRS11J1X3000544
- S3 CA: all before VIN 4MZRS56J6X3020062

#### NOTE

The **new black viton intake manifold seals (Part No. 26995-86B)** supersede the black hydrin seals (Part No. 26995-86A) and grey viton seals (Part No. 26992-99).

1. Replace previous intake manifold seals with current black viton seals (Part No. 26995-86B).
2. Check for intake leaks around the intake manifold seals at the cylinder head and around the fuel injector o-rings. Replace seals/o-rings as required.

## Conclusion

### WARNING

After installing seat, pull upward on front of seat to be sure it is locked in position. If seat is loose, it could shift during vehicle operation and startle the rider, causing loss of control. These events could result in death or serious injury.

1. Install seat.
2. Road test vehicle.
3. If problems persist, perform the following:
  - a. Ride motorcycle in closed loop operation (2500-3500 rpm, approximately 40-60 m.p.h. in 4th or 5th gear with engine under load) consistently for 2-3 minutes. This allows the ECM to learn a new Adaptive Fuel Value (AFV).
  - b. Verify proper fuel pressure (46-53 psi). See Section 4 of appropriate service manual for procedure.
4. Repeat Steps 1-7 of *Recalibration Procedure* to recapture screen data after riding with system in closed loop (see 2a. above for conditions required to enter closed loop operation). This is especially important to do if performance issues continue after installation.
5. If performance problems continue, contact the Buell Initial Care Line for assistance at tele. (414) 343-7430. Please have the before recalibration and after recalibration captured screen data available when calling.

## CREDIT PROCEDURE

After servicing each vehicle, complete a regular Warranty Claim referencing Service Bulletin B-017 in the "DESCRIPTION OF REPAIR" section. Fill in the rest of the claim as follows:

### NOTE

The following claim filing procedure applies to ALL vehicles serviced for idle adjuster cable installation, recalibration and system checks.

CLAIM TYPE	BMC, BGW*
QTY.	0
EVENT 1, PROBLEM PART NO.	31652-99Y
PART DESCRIPTION	ECM
PRIMARY LABOR CODE	7266
TIME	0.7 hr. (for All Models)
CUSTOMER CONCERN	9203
CONDITION CODE	9103

\* If the vehicle is under warranty, use claim type BMC. If the vehicle is out of warranty, use claim type BGW. No prior authorization is required.

After processing of the claim form, you will be credited for the labor. No credit will be issued for parts as they were sent no charge.

For vehicles requiring any additional services listed in the bulletin, you must list the additional parts and/or labor as a separate event on the claim. Example:

Time and labor code for checking for intake leaks:

PRIMARY LABOR CODE	3509
TIME	0.1 hr.

Time and labor code for replacing intake manifold seals:

EVENT 2, PROBLEM PART NO.	26995-86A
QTY.	0
PART DESCRIPTION	Intake Manifold Seals
EVENT 2, ADDITIONAL PART	26995-86B
QTY.	2
PART DESCRIPTION	Intake Manifold Seals
PRIMARY LABOR CODE	3511
TIME	(Applicable per model)
CUSTOMER CONCERN	9203
CONDITION CODE	9102

Time and labor code for verifying ignition timing:

PRIMARY LABOR CODE	7522
TIME	0.3 hr.