

PI-1023

PENNTEX HIGH IDLER
'98 4.6L LINCOLN TOWN CAR (98-2002)
Installation and Testing

PI-1023

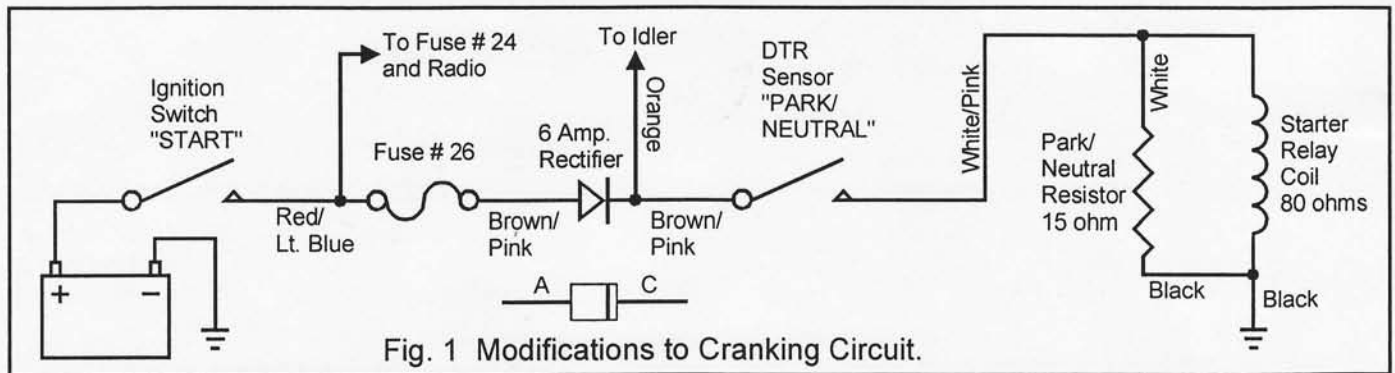
INSTALLATION:

NOTE: The air cleaner has air flow sensors mounted in it that feed information to the PCM. The engine will not run properly without the air cleaner and all air intake ducts connected to the throttle body! Modifications to chassis and idler may be necessary in some applications. OBD II software in the PCM could possibly misinterpret the high idle condition as a throttle body problem and inadvertently set a trouble code and turn on the "CHECK ENGINE" warning lamp. Penntex has been unable to intentionally duplicate this in high idle testing.

***** **DISCONNECT THE GROUND CABLE FROM ALL BATTERIES.** *****

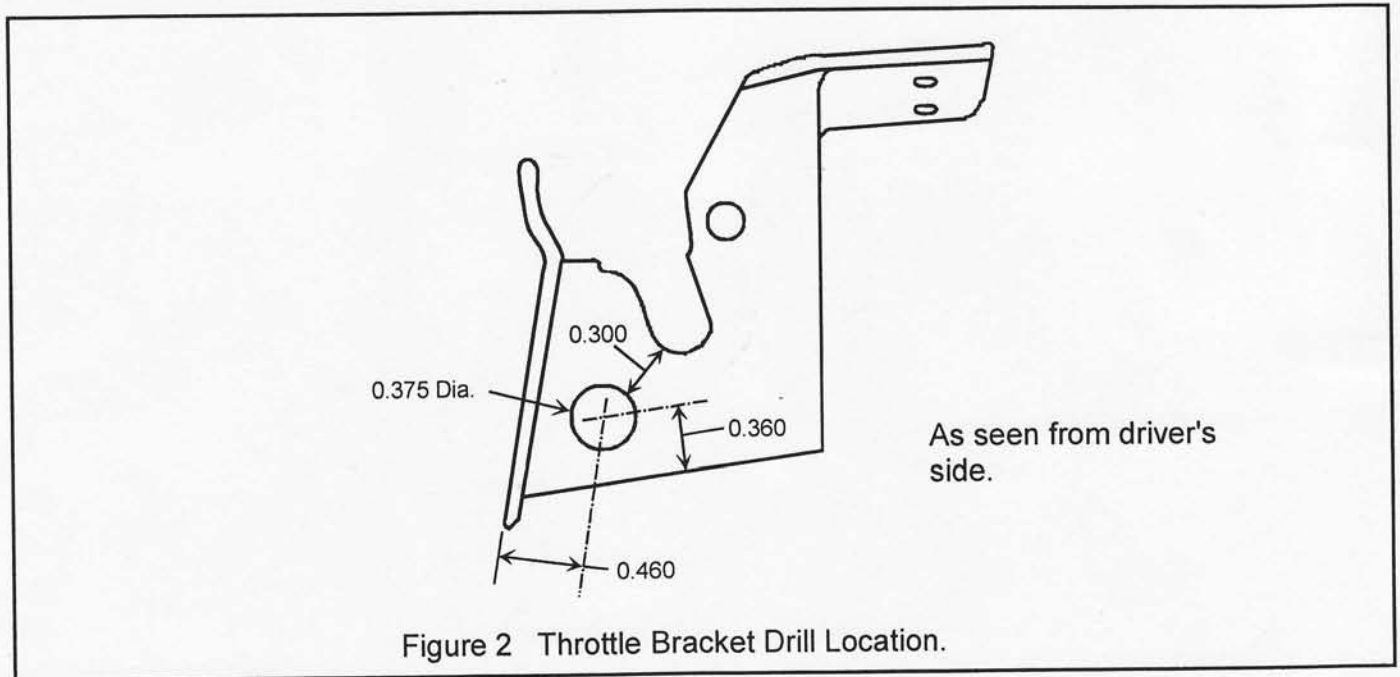
1. Remove the black under-dash panel from the bottom of the driver's side of the dash.
2. Remove the driver's knee panel. Using a 9/32" socket remove the two sheet metal screws from the bottom and carefully pull on the top of the panel to release the 3 retainer clips at the top.
3. Remove the steel knee brace by removing five sheet metal screws (5/16" socket).
4. Remove the plastic trim piece from the driver's kick panel and lower door jam. First remove the trim piece from around the hood release, then starting at the back of the door carefully pull to release five retainer clips.
5. Lower the I/P fuse panel from the bottom of the dash by removing two sheet metal screws (5/16" socket).
6. Connect the red wire from the idler to a red w/ black stripe (18 AWG.) wire from fuse # 6 (15 amp.) at the back of the I/P fuse panel. This fuse is labeled "EATC, Heated Seats". It should be HOT (+12 volts) only when the ignition switch is in the "RUN" position. The Idle Controller gets its power and senses the battery voltage from this wire.
7. Connect the green wire from the idler to a red w/ light green stripe (20 AWG.) wire from fuse # 20 (7.5 amp.) at the back of the I/P fuse panel. This fuse is labeled "Lighting Control Module (LCM), ABS, Shift Lock". It should be HOT (+12 volts) only when the brake pedal is pressed. The Idle Controller uses this wire to sense the brake pedal and to disengage when it is pressed.
8. Connect the black wire from the idler to chassis ground. Make certain that the connection is a low resistance connection to chassis ground. Do not assume that any screw or piece of metal under the dash is a good ground.
9. The Idle Controller is designed to only engage high idle when the vehicle's transmission is in "PARK" or "NEUTRAL". The Idle Controller senses ground through the park/neutral section of the Digital Transmission Range Sensor and the coil of the starter relay. Lincoln (FORD) is using a new starter that has a low current solenoid. Because the starter solenoid requires less current a smaller 30 amp. starter relay is used instead of the high current starter relay used in the past. The new starter relay has a higher coil resistance of 80-90Ω. This resistance is too high for the Idle controller to sense ground when the park/neutral section of the DTR sensor is closed. To lower the resistance and solve this problem a 15Ω resistor must be installed in parallel with the coil of the starter relay. Follow the steps below and see Figure 1 to install this 15Ω Park/Neutral Resistor:
 - a) In the engine compartment, locate the small (approx. 3" x 3.5") black relay box attached to the air cleaner bracket on the driver's fender. Remove the top cover. This box should contain 4 relays.
 - b) Remove the relay box from the air cleaner bracket by releasing the clips on the side.
 - c) Remove the bottom cover by releasing 2 clips one at each end of the box. These clips can be released with a small flat blade screwdriver carefully inserted into the cavities on the top side of the box.
 - d) The following connections should be properly soldered to insure reliable corrosion resistance. If these connections fail then the starter could be engaged when the Idler Engages! Connect the white wire from the park/neutral resistor (gold, 15Ω, 25W) to a white w/ pink stripe (20 AWG.) wire that connects terminal # 86 of the starter relay to the DTR sensor.

- e) Connect the black wire from the park/neutral resistor to the black (20 AWG.) wire that connects terminal # 85 to ground.
 - f) Tape the connections and re-assemble the relay box.
 - g) Using the #4-40 x 1/2" screws, locks, washers, nuts and 3/32" hex key (provided) mount the park/neutral resistor to the plastic fender skirt between the relay box and the under hood power distribution box.
 - h) Before continuing the resistor installation must be tested. Using a multimeter set on resistance (ohms or Ω) measure the resistance from the red w/ light blue stripe (12 AWG.) wire at the ignition switch (top of steering column) to chassis ground. This resistance should be 12-17 Ω with the transmission in "PARK"..
10. On some models the starting (cranking) circuit is connected to a reset input on the stereo system. This causes the sound to be muted for a few seconds when the vehicle is started. The 6 amp. rectifier soldered to the end of the idler's orange wire prevents the idler from triggering the mute function if the Brake pedal is pressed when the transmission is in "DRIVE". This rectifier must be spiced into the circuit with the correct polarity! To connect the rectifier follow the instructions and see figure 1:
- a) Cut the brown w/ pink stripe (20 AWG.) wire from fuse # 26 (5 amp.) at the back of the I/P fuse panel. This fuse is labeled "Digital Transmission Range (DTR) sensor". It connects the ignition switch to the DTR sensor.
 - b) Connect the brown w/ pink stripe wire from the DTR sensor to the end of the rectifier that has the silver stripe and the orange wire soldered to it (cathode lead). This brown w/ pink stripe wire should measure approximately 15 Ω to ground.
 - c) Connect the brown w/ pink stripe wire from fuse # 26 to the other lead from the rectifier (anode lead). **This is the lead that does not have a silver stripe or the orange wire!**
 - d) Tape and secure all connections properly.
 - e) Temporarily reconnect the battery ground and make sure that the starter cranks.



- 11. Remove a small section of insulation from the firewall approximately 4-5" down and to the left of the steering column. Just below the double wall construction is best. Drill a 1/2" hole through the firewall. Be careful not to damage any hydraulic lines or wiring harnesses. A short multi step drill bit is safest. Be cautious of the insulation on the engine side of the firewall because it contains fiberglass that will irritate the skin.
- 12. Feed the end of the harness with the blue and gray wires through the hole to the grommet and seat the grommet properly into the hole. Rout the harness up along the top of the firewall, over the engine, to the passenger fender skirt. **Secure the harness away from heat sources (engine, exhaust), moving components (steering column), and sharp edges that could damage the wiring.**
- 13. Using the #8-32 x 1 3/4" flat head screws, washers and nuts mount the Idle Controller in a location that is both visible and within reach of the driver. **Secure all wires and harness away from moving components and sharp edges that could damage the wiring.** Re-assemble the I/P fuse panel, kick panel trim, knee brace, knee panel and under dash cover.
- 14. **Be very careful not to drop any parts or tools under the intake manifold!** Using a 1/4" drive ratchet and extension remove the throttle body cover.
- 15. Using a 5/16" socket, loosen the clamp on the air intake duct at the throttle body. Remove the two hard plastic air tubes from the air intake duct at the throttle body.

16. Using a 7/16" deep socket remove the nut from the air intake muffling chamber. Remove the air duct from the throttle body.
17. If installed, remove the cruise control linkage from the throttle pivot by carefully pulling upward at both ends with a rocking motion. Using a 5/16" socket, remove the cruise control cable from the throttle bracket.
18. Using a 5/16" socket, remove the throttle cable from the throttle bracket and move the cable to a safe area. Disconnect the throttle return spring from the throttle bracket.
19. Using a 10mm deep socket, remove 1 stud and 2 bolts from the throttle bracket.
20. Using a 5/16" socket, remove the vacuum valve from the throttle bracket and remove the bracket.
21. Using a center punch, mark and drill a 3/8" hole in the throttle bracket as shown in figure 2. This hole must be drilled in exactly the correct spot so that the idler cable does not interfere with the throttle cable mount or the cruise cable bolt. Take time to do this right the first time, it will save a lot of welding and grinding time.



22. Using a couple of 9/16" wrenches, mount the Idler cable to the throttle bracket with one lock washer and one flat washer exactly as shown in Figure 3-a.
23. Re-install the vacuum valve, throttle bracket, throttle return spring, throttle cable and cruise cable (if installed). If the Idler cable inhibits the mounting of the throttle or cruise cable bolt, then the hole must be welded up, ground smooth, painted and re-drilled in the proper location.
24. Slide the linkage adapter and cable clamp onto the idler cable. Slide the linkage adapter onto the cruise control pivot. The tabs on the linkage adapter should be pointing toward the front of the vehicle with the cable passing through them. The tabs and cable should be below the cruise control pivot. Re-attach the cruise linkage to the cruise pivot as in Figure 3-b. If the vehicle does not have cruise control then slide the U-shaped retainer clip onto the cruise control pivot in front of the linkage adapter and crimp the open end closed as in Figure 3-c.
25. Leaving approximately 1/4" of slack between the linkage adapter and the cable clamp, tighten the set screw with the 3/32" hex key (provided). Leaving approximately 1" past the cable clamp, cut off any excess cable. Use hardened cutters to cut the stainless steel cable.

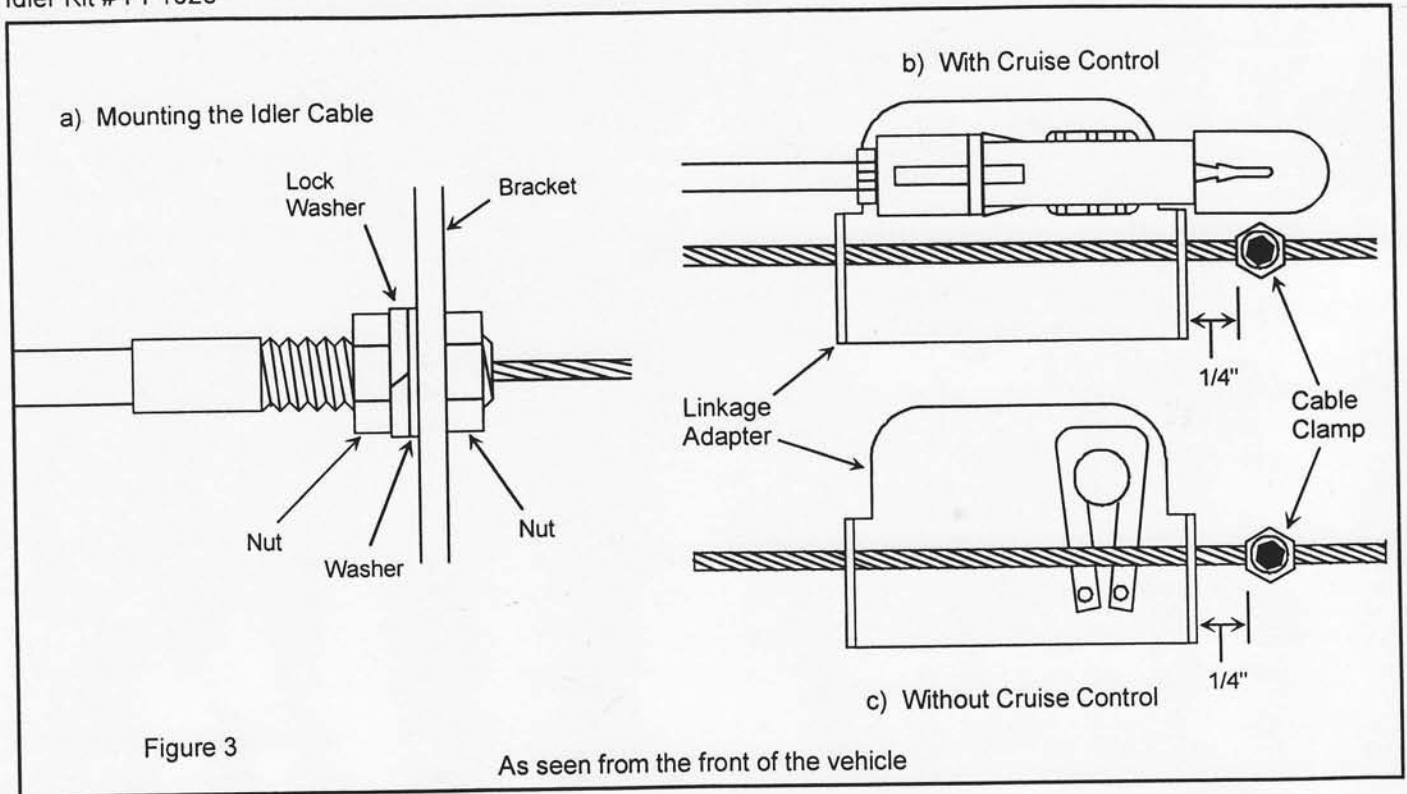


Figure 3

As seen from the front of the vehicle

26. Manually operate the throttle to make certain that nothing can hang or jam. The idler cable should slide freely and smoothly through the linkage adapter.
27. Reconnect the air intake duct, hard plastic air tube and throttle body cover.
28. Using the 1/4"-28 x 3/4" hex bolts (7/16" socket), locks, flats and nuts mount the idler solenoid on the passenger side fender skirt. Make a loop with the excess cable and secure it away from heat sources, moving components or sharp edges that could cause damage.
29. Using the #10-32 x 3/4" screws, locks, flats and nuts mount the relay and circuit breaker on the passenger side fender skirt within reach of both the solenoid and the power stud.
30. Connect the blue wire from the idle controller to relay terminal # 85. Connect the gray wire from the idle controller to relay terminal # 86. Connect the red wire from the solenoid to relay terminal # 87.
31. Remove the cover from the +12 volt power stud beside the battery. Using a 10mm deep socket, connect the red wire from the circuit breaker to the +12 volt power stud. Replace the power stud cover.
32. Using a 5/16" socket connect the black wire from the solenoid to the ground bolt on the fender next to the battery.
33. Reconnect all battery grounds.

TESTING AND ADJUSTMENT:

1. Set the park brake. Turn the ignition switch to the "RUN" position, but **DO NOT START THE ENGINE**. The "LOW" battery indicator (red) should be lit. After 10 seconds the "HIGH IDLE" indicator (yellow) should light up.
2. Press the brake pedal. The "HIGH IDLE" indicator should turn off. Release the brake and it should come back on with no delay.
3. Press the brake pedal and move the gear shift to "DRIVE". Release the brake pedal. The "HIGH IDLE"

indicator should not be lit. Put the shifter in "NEUTRAL". The "HIGH IDLE" indicator should light. Put the shifter in "PARK". The "HIGH IDLE" indicator should light.

4. Start the engine and press the "MANUAL ENGAGE" button. Allow the engine to fully warm up. Turn on all possible engine and electrical loads. Using the solenoid's adjustment nut, adjust engine RPM to a level adequate to maintain battery voltage above 12.75 volts (1000 to 1500 RPM). Tighten the solenoid's locking nut after final adjustment. The alternator may take a few minutes to recharge batteries before the voltage can rise. The alternator must also be capable of putting out more current than the vehicle draws at a given RPM.
5. Press the brake to insure that the idle speed returns to normal.

Installation complete.