



KnockLite

Instruction Manual

Please read this instruction manual to ensure proper use prior to powering up the KnockLite. Store this manual inside the vehicle for future reference.



General Precautions

- This manual is subject to change without prior notification.
- Do not adjust the unit while driving. Obey all road rules & regulations.
- This unit is designed for 12V DC vehicles with negative chassis ground.
- Never disassemble, modify or tamper with this unit.
- Keep this unit away from water.

ESD (Electrostatic Discharge) Precautions

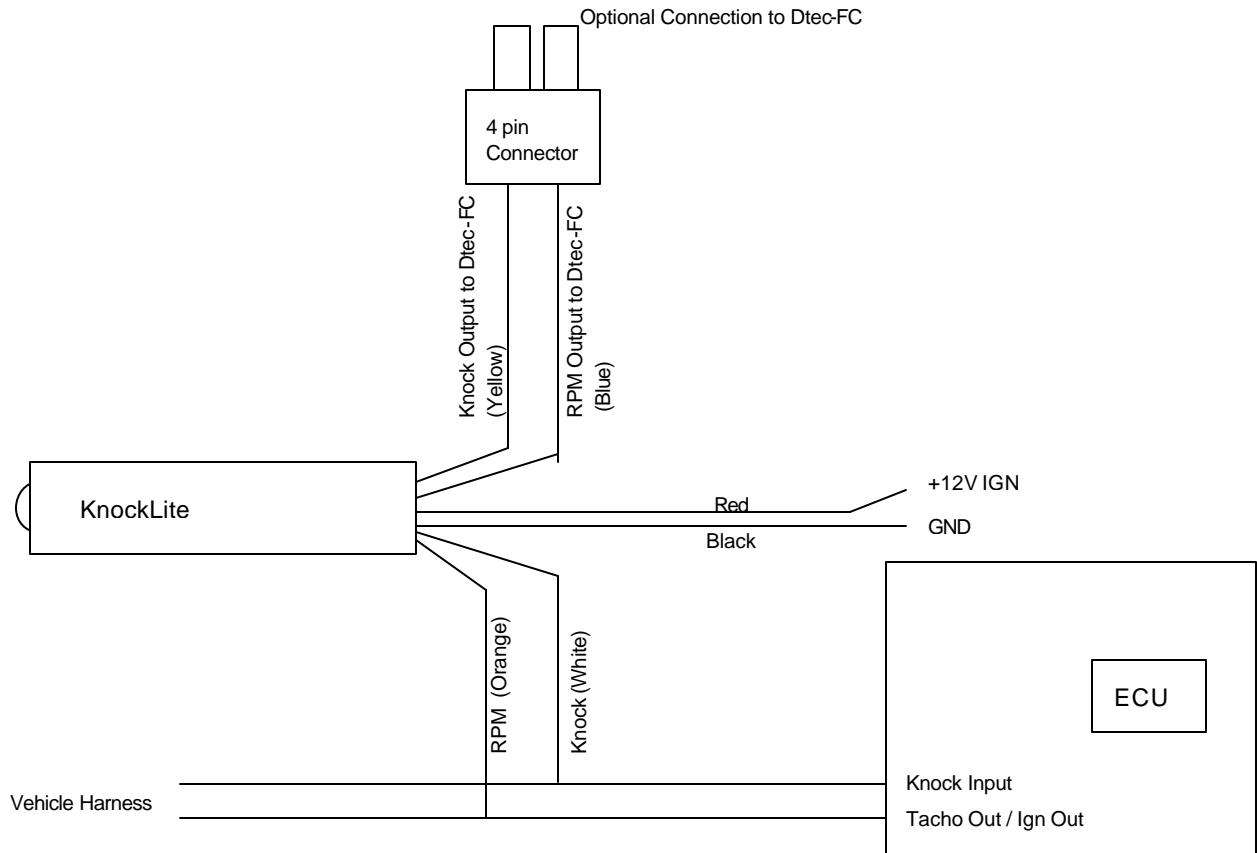
ESD is the multi thousand-volt zap you feel when you get out of your car on a dry day. This ESD zap can damage electronic devices and should be discharged prior to handling any electronic device. To Prevent ESD, follow the steps below when installing, removing or handling the KnockLite:

1. Always turn off the ignition before removing or installing the KnockLite.
2. Handle the KnockLite as little as possible.
3. Do not slide the KnockLite over any surface.
4. Do not touch the connector pins of the KnockLite.

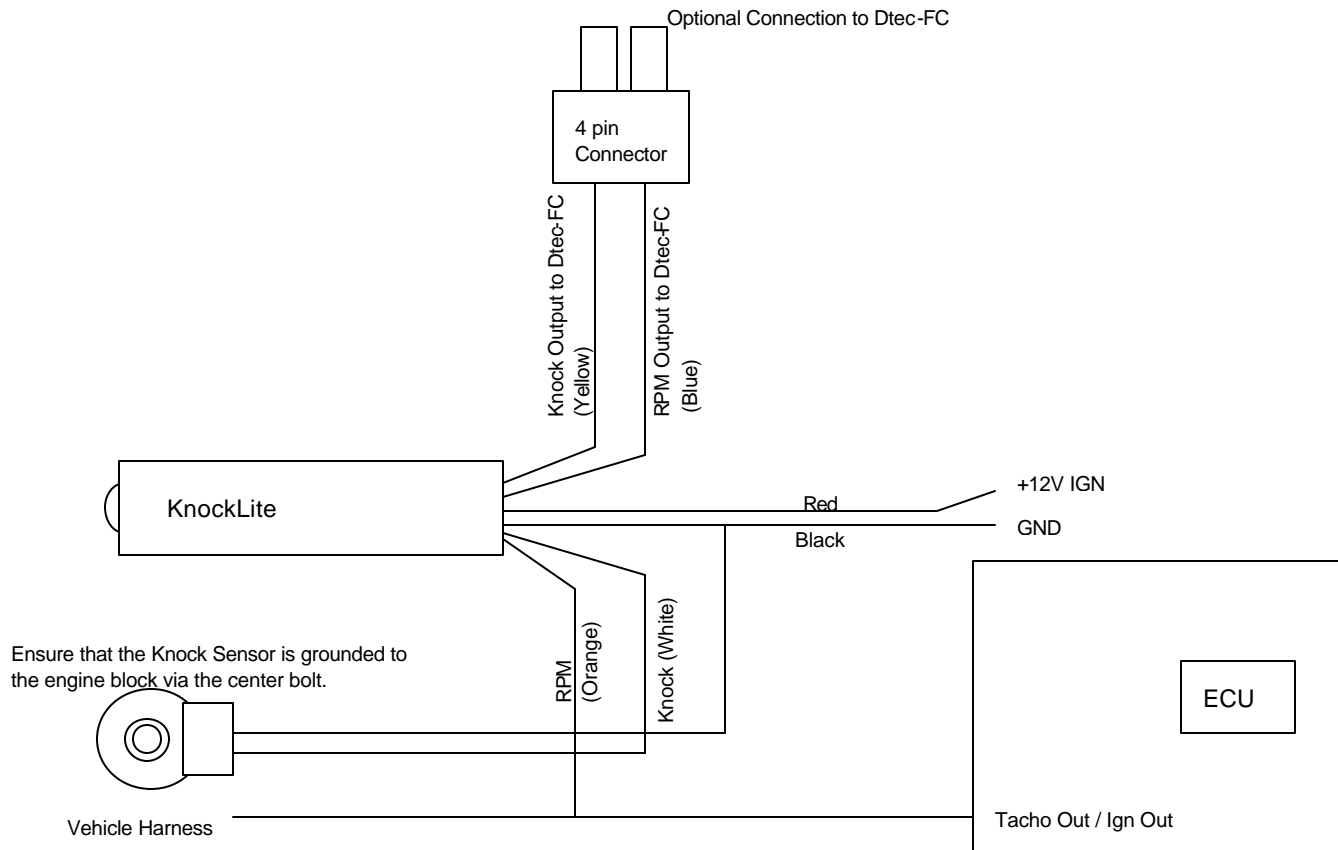
Avoid handling the KnockLite in areas that have floor or work-surface covering capable of generating a static charge.

Wiring Diagram

USING FACTORY ECU KNOCK SENSOR



USING BOSCH KNOCK SENSOR



KnockLite Mounting

The KnockLite is designed to be mounted in clear view of the driver. The KnockLite should be positioned so that it does not obstruct vision to the road or to instruments, but be clearly visible with your peripheral vision. Use the adhesive Velcro tape to mount the KnockLite to your chosen location.

KnockLite Setup

Before using your KnockLite, the wiring must be completed and the following parameters must be setup for your vehicle.

CALIBRATING KNOCK SENSITIVITY

Warning:

- Free revving your engine at high RPM poses a minor risk of engine damage. To minimize this risk, ensure that your engine is at operating temp and in good running order.
- Do not adjust the KnockLite whilst driving. Have a passenger assist in programming or bring the vehicle safely to a standstill before adjusting the KnockLite.

The knock sensitivity must be configured for your particular engine, so that the engine's background noise does not trigger the knock indication. The ability of the KnockLite to detect knock is dependent upon the knock sensor used and the location of the knock sensor.

The KnockLite has three programming points for background noise threshold detection. Read the whole procedure before beginning.

Setup procedure:

1. Start the car and warm the engine up to operating temperature.
2. **Entering Programming Mode**
Press the KnockLite programming button four (4) times in moderately rapid succession. The LED should flash Red at about a 1 second interval to indicate knock programming mode. If the LED fails to flash red as described, try pressing the programming button 4 times again.
3. **Programming Engine Sound Threshold 1**
With the car at idle, press the programming button once. The LED will glow red for a period while it captures the sound level, then it will enter into a double flash sequence to indicate programming of the second point.
4. **Programming Engine Sound Threshold 2**
Rev the engine to an RPM approximately halfway between the maximum recommended engine revs and the idle speed. Typically this is 3000 to 4000 rpm. Once the engine is at the desired RPM, press the programming button once. The LED will glow red for a period while it captures the sound level, then it will enter into a triple flash sequence to indicate programming of the third point.
5. **Programming Engine Sound Threshold 3**
Rev the engine to an RPM near the maximum recommended engine revs and press the programming button once. The LED will glow red for a period while it captures the sound level, then turn off. Programming of the base noise thresholds is now complete.
6. **Test Knock Thresholds**
To test the base threshold settings, rev the engine and watch the LED. If the LED lights in an *amber* or *red* color under free rev, then desensitize the KnockLite by pressing the programming button two (2) times in moderately rapid succession. The LED will flash amber a number of times to indicate the level of sensitivity. E.g. two flashes means Level 2 sensitivity. Low numbers more sensitive, high numbers less sensitive. There are 10 levels of sensitivity, from 1 flash to 10 flashes.

FINE TUNING KNOCK SENSITIVITY

When fine tuning knock, it is recommended to use a quality knock listening system under controlled conditions to determine if knock is present or not. Light knock can occur and go undetected in the vehicle cabin under normal driving. If specialized equipment is unavailable, extra care in listening for knock is recommended.

Test drive the vehicle under normal conditions and check to see if the knock light triggers. If the KnockLite triggers when knock is not present, then desensitize the KnockLite by double pressing the programming button. The LED should flash amber a number of times to indicate the new level of sensitivity.

If the KnockLite is not sensitive enough, then triple press the programming button to increase the sensitivity. The LED should flash amber to indicate the new level of sensitivity.

If the threshold levels bottom out on desensitization, the LED will flash red instead of amber to indicate the sensitivity level number. If you reach this sensitivity level, then you may need to try an alternative knock sensor or re-position your knock sensor.

Similarly, if the sensitivity level reaches the highest level, the LED will flash red to indicate the maximum sensitivity level.

Setting your Shift Point

The KnockLite also doubles as a shift light. To set the shift light, follow the procedure below.

Shift Light Setup procedure:

1. Start the car and warm the engine up to operating temperature.
2. Press and hold the programming button until the LED glows green. Release the programming button and the LED should flash green.
3. Rev the engine to $\frac{1}{2}$ the engine speed that you wish the shift light to illuminate and press the programming button once. The LED will turn off after recording the engine speed.
4. Rev the engine to the shift light trigger point to test the shift light.

KnockLite Operation

LED SIGNALS

RED SIGNAL

When the KnockLite detects moderate or severe knock, the LED will illuminate in Red.

AMBER SIGNAL

When the KnockLite detects light knock, the LED will illuminate in Amber.

GREEN SIGNAL

The LED will appear green when the shift light RPM has been reached.

NOTE: If knock is detected, the knock signal will take priority over the shift signal.
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STARTUP TEST SEQUENCE

When the KnockLite is powered up and receives an RPM signal, the LED's will cycle through Red, Amber and Green.

CONTROL SUMMARY

These are the controls available when the KnockLite is in its normal mode of operation.

Programming Button Sequence	Action
Press and Hold	Enter shift light programming mode
Press 4 times	Enter knock threshold programming mode
Press 3 times	Increase sensitivity of knock detection.
Press 2 times	Decrease sensitivity of knock detection.
Press 1 time	No effect in normal operation. (Used in programming modes).

Product Specification

Knock Input:	0.0 – 12.0 volt DC
RPM Input	0.0 – 12.0 volt DC
Digital Frequency Input:	0.0 – 1,000 Hz
Power Supply Input:	9.0 to 15.0 volts

END OF INSTRUCTION MANUAL