Thank you for purchasing the

SwapHelper.com Tach Adapter

Firstly, please solder all wire connections and cover in the included shrink wrap for best performance. Wire nuts, butt connectors and other similar connection methods can lead to intermittent signal issues. These methods are only suitable in temporary testing situations.

Your tach adapter has a total of seven wires, and not all will be used in every scenario. Here is the list of the wire colors and their use:

Black : Ground, **please connect directly to battery ground**

Red : **Switched** +12v (FYI, the adapter only consumes a fraction of an amp)

Orange : Truck Output 1 (See attached diagrams for wiring)

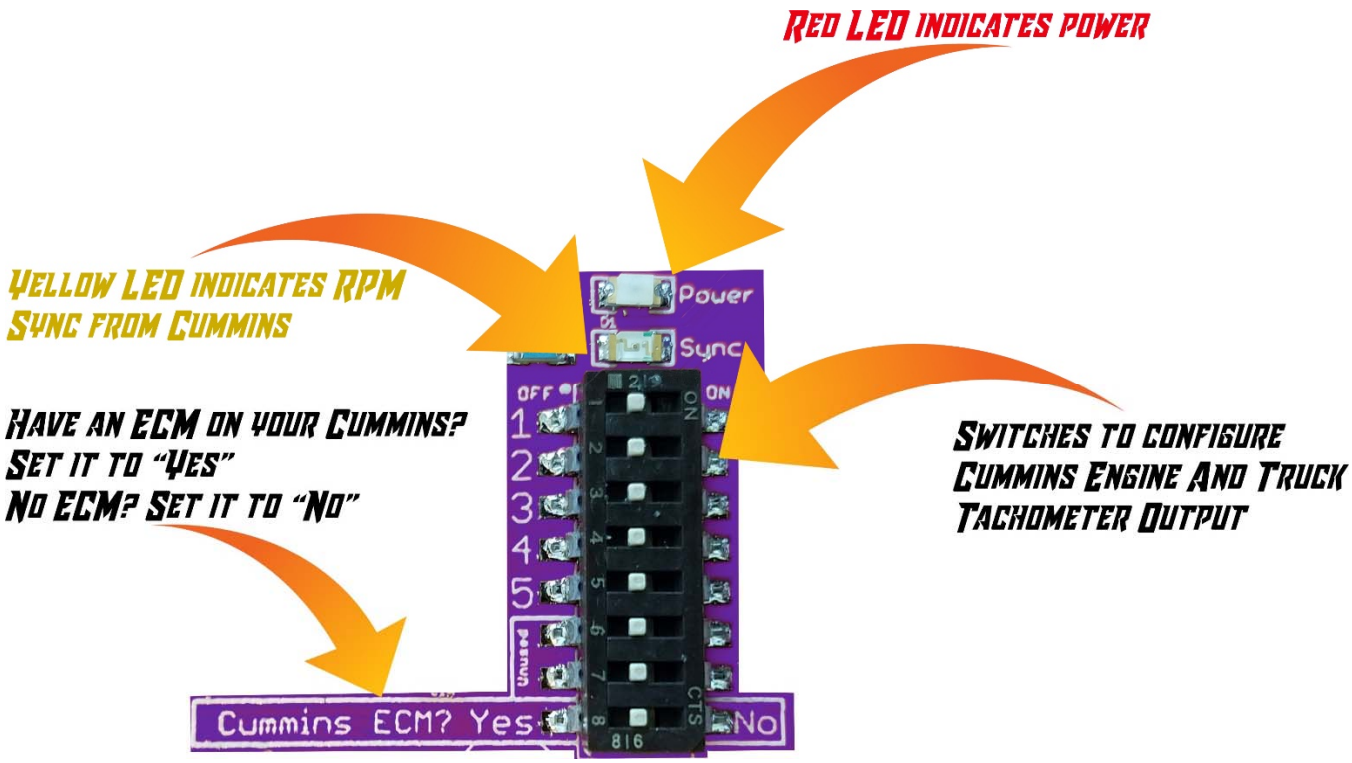
Blue : Truck Output 2 (See attached diagrams for wiring)

Brown : Cummins RPM Sensor Ground (Typically only used on 12 Valves)

Grey : Cummins RPM Sensor Signal

White : Cummins RPM Sensor Positive (Typically only used on 12 Valves)

The adapter typically comes preconfigured for a Cummins 12v engine and ’03 to ’10 Ford Diesel truck (6.0L or 6.4L). If you need to change this configuration, you can open the enclosure which will expose the configuration switches and diagnostic LEDs. The red “power” LED will illuminate when the adapter is powered, and the yellow “sync” LED will illuminate when the adapter is receiving a proper signal from the Cummins RPM sensor. The yellow “sync” LED will also blink three times on initial power up.



The tach adapter has switches to allow you to change the configuration. Setting switches 1 and 2 control what Cummins engine is used for input, while switches 3,4 and 5 control what truck signals to output.

Cummins Engine Configuration:

Switch settings:	Switch 1	Switch 2	ECM	Description
	Off	Off	No	Cummins 12v, stock RPM sensor
	On	Off	Yes	’98.5-’00 Cummins 24v (Crank Sensor)
	Off	On	Yes	‘01-’02 Cummins 24v (Cam Sensor)
	On	On	Yes	’03 & up Cummins Commonrail

Truck Configuration:

Switch settings:	Switch 3	Switch 4	Switch 5	Description
	Off	Off	Off	60-2 w/ Cam
	On	Off	Off	40-1 wo/ Cam
	Off	On	Off	36-1 wo/ Cam
	On	On	Off	53 Pulse wo/ cam
	Off	Off	On	12 Pulse wo/ cam
	On	Off	On	4 Pulse wo/ cam

The following is a list of common truck configurations:

2003.5 – 2010 Ford Diesel (6.0L & 6.4L)	Switch 3 Off, Switch 4 Off, Switch 5 Off
1999 – 2010 Ford 6.8 L Gas	Switch 3 On, Switch 4 Off, Switch 5 Off
1999 – 2010 Ford 5.4 L Gas	Switch 3 Off, Switch 4 On, Switch 5 Off

Supported, but untested:

1983 – 1997 Ford Diesel IDI	Switch 3 On, Switch 4 On, Switch 5 Off
1994 – 2003 Ford 7.3 Powerstroke	Switch 3 Off, Switch 4 Off, Switch 5 On
1968 – 2001 Ford Gas & Diesel (Non-IDI or PS)	Switch 3 On, Switch 4 Off, Switch 5 On
1973 – 1999 Chevy Gas	Switch 3 On, Switch 4 Off, Switch 5 On

Cummins ECM switch:

This switch provides power to the signal wire. You want to avoid powering the signal wire with both the tach adapter and the Cummins ECM. Rule of thumb, if you are "tapping into" an RPM signal wire, you have an ECM or a PCM. On the 24 valve and Common Rail Cummins, the ECM is mounted on the side of the engine, requiring this switch to be set to the "Yes" position. Cummins 12 valves do not have an ECM, so the switch would be set to the "No" position, unless you retained the Dodge PCM for some reason and are tapping into the signal wire. Cummins "P-pumped" 24v (mechanical injection pump swap) typically will no longer have an ECM, requiring the switch to be set to "No".

Assembly:

The cover is included but is not fully installed at the time of shipping. After configuring the adapter switches (if needed), install the cover using the four supplied screws. Be careful not to overtighten the screws, or enclosure damage may result!

Mounting:

Mount the tach adapter in such a way to avoid excessive moisture and heat. While the adapter is sealed from the elements, prolonged submersion and/or exposure to moisture could possibly damage the adapter.

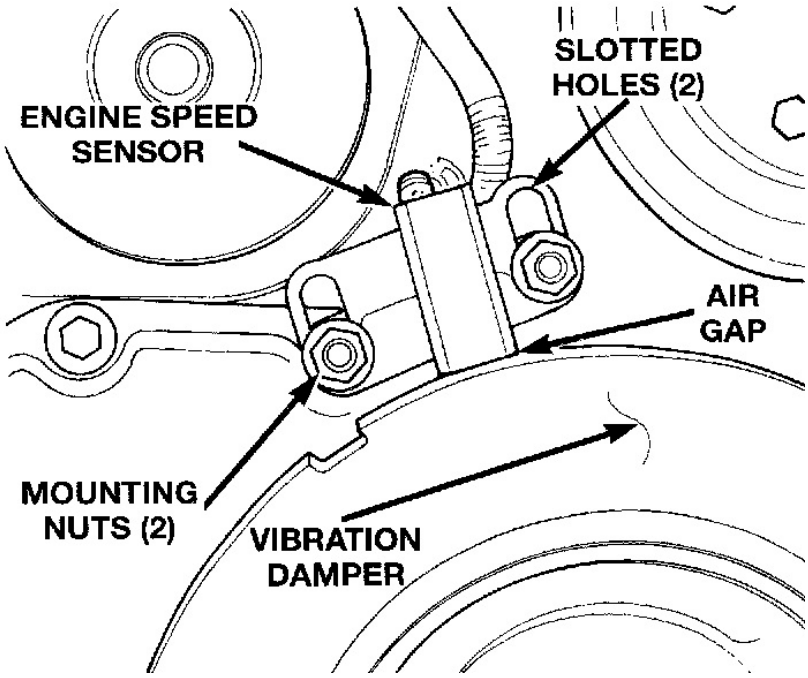
The adapter is designed to operate in temperatures from -40*F to 185*F (-40*C to 85*C) but should be kept as cool as possible to increase adapter longevity. Do NOT mount near exhaust, turbos, hot/charge pipes, radiators, fan exhaust, etc., as this will severely degrade the adapter's life span! If the adapter is overheated, it will shut off temporarily until it cools down.

If space is limited under hood, or you are concerned about excessive heat exposure, you can mount the adapter in the cab as long as the wires are kept as short as needed – long or bundled wires increase the chance for interference.

Cummins Wiring:

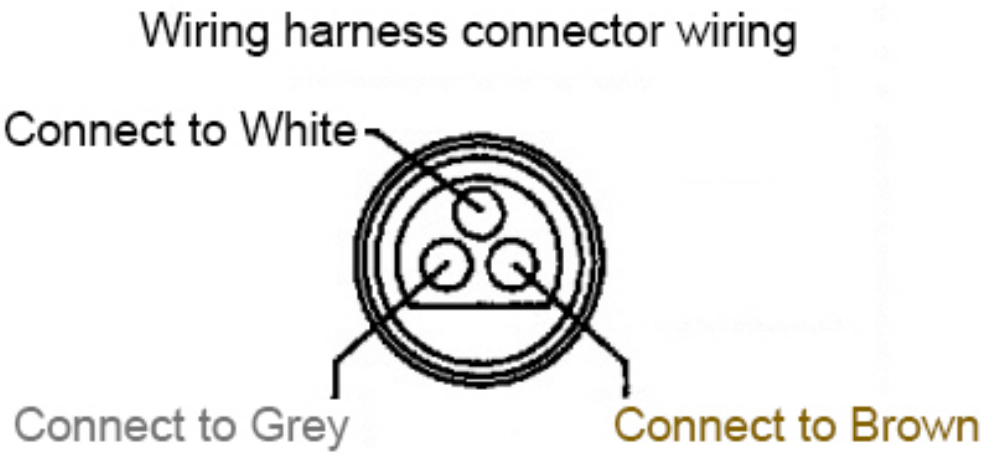
Cummins 12v ('89 to '98, aka 6BT):

You will be wiring into the stock tachometer pickup, as seen below.



The “air gap” of the sensor (how far the sensor is from the balancer) should be 0.049” (1.25mm) to 0.051” (1.3mm).

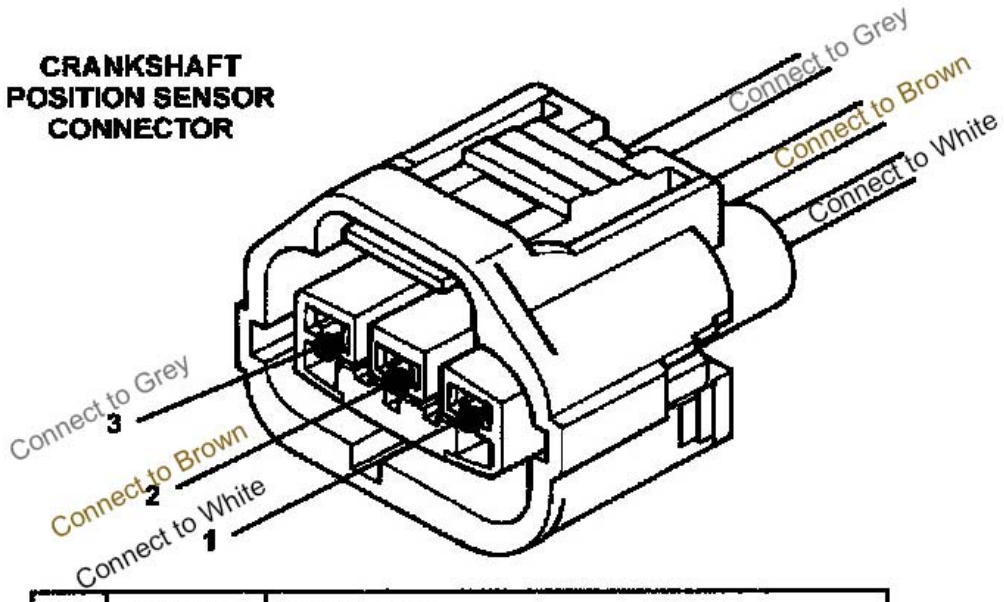
The sensor has three wires and came in two different connector variants. You will be wiring directly to the sensor wiring harness connector. The connector from ‘89 to late ’97 was a circular one, and came with various wire colors across the different years, but the wiring is the same:



The above diagram is for the female side of the connector, on the wiring harness side, and is from the perspective of looking into the connector.

NOTE: If you are using the Dodge PCM, do not connect the Brown or White wire.

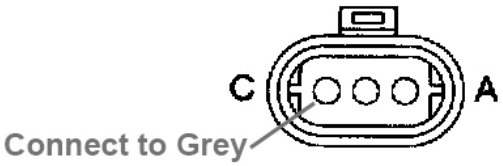
The late model (‘97/’98) 12v and/or 6BT sensor wiring:



CAV	COLOR	FUNCTION
1	VT/WT	5-VOLT SUPPLY
2	BK/LB	SENSOR GROUND
3	GY/BK	CRANKSHAFT POSITION SENSOR SIGNAL

‘98.5 - ’02 Cummins 24v:

While different years had different sensor locations (crankshaft or camshaft), the sensor connector and wiring colors are the same. When connecting to either the crankshaft or camshaft sensor on the 24v, you will need to splice into the signal wire. You do not want to break the connection between the sensor itself and the Cummins ECM. Doing so will cause a no-start condition.



CRANKSHAFT
POSITION SENSOR
(DIESEL)

CRANKSHAFT POSITION SENSOR (DIESEL) - 3 WAY

CAV	CIRCUIT	FUNCTION
A	K6 18VT/WT	5V SUPPLY
B	K14 18BK/DB	SENSOR GROUND
C	K124 18GY	CRANKSHAFT POSITION SENSOR SIGNAL Connect to Grey

Cummins “Common Rail” (’03 and up 5.9L and 6.7L):

When connecting to the crankshaft position sensor on the Common Rail, you will need to splice into the signal wire. You do not want to break the connection between the sensor itself and the Cummins ECM. Doing so will cause a no-start condition. While the wire colors vary by year, the sensors are the same:

Wiring harness connector wiring

SENSOR-CRANKSHAFT POSITION (DIESEL)

SENSOR-CRANKSHAFT POSITION (DIESEL) - 3 WAY

CAV	CIRCUIT	FUNCTION
1	K853 18DB/BR	5 VOLT SUPPLY
2	K975 18BR/OR	SENSOR GROUND
3	K24 18LB/BR	CKP SIGNAL Connect to Grey

Cummins "P-Pumped" or VE swapped 24 Valve:

If you have swapped a mechanical pump on to your 24 valve (or even common rail), you will need to provide power to the sensor in the absence of the Cummins ECM. Find the corresponding diagram above for your sensor and connect the Brown wire from the tach adapter to the "Sensor Ground" and connect the White wire from the tach adapter to the "5 Volt Supply". You will also need to set the "Cummins ECM" dipswitch to the "No" position.

Wiring into a Cummins with an ECM (24 valve or CR, or Dodge PCM on a 12 valve):

Assume this tan wire is the signal wire you need to tap into. Cut the wire:

Strip the wire back and put the provided shrink wrap over one end:

Wrap the two stripped sections:

Strip the Grey wire from the tach adapter and wrap it around the signal wire:

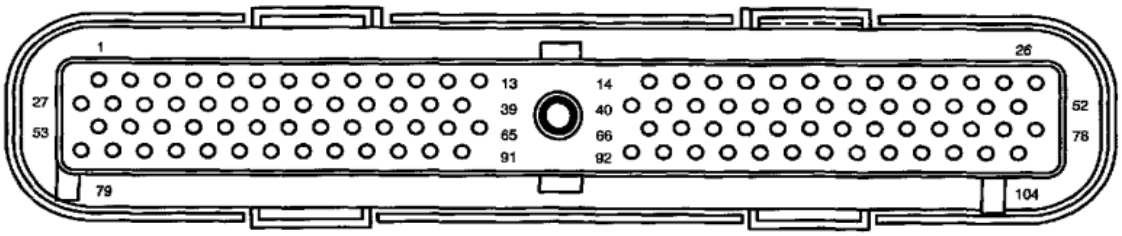
Solder the three sections together, making sure the solder is sucked into the wire strands. This step is imperative – a cold or poor solder joint will impact engine operation.

Lastly, slide the shrink wrap over the solder joint and heat until you see the adhesive:

Truck Wiring:

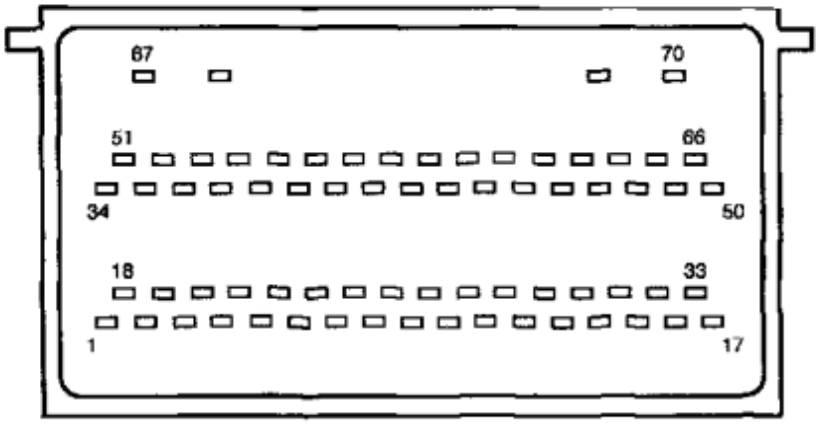
The tach signal to your truck is output on the orange and blue wires. Not all trucks use both wires. Below is a list of common configurations. The color listed in parentheses is the wire color in the truck. While every effort has been made to provide the correct wire color on the truck side, your truck may vary. If your truck wiring had foil covering, it can be removed.

'99 to '04 Ford 6.8L & 5.4 Gas: Orange – Crank- (Dark Blue) / Blue – Crank+ (Grey)



21	349 (DB)	Crankshaft position sensor (6C315) –
22	350 (GY)	Crankshaft position sensor (6C315) +

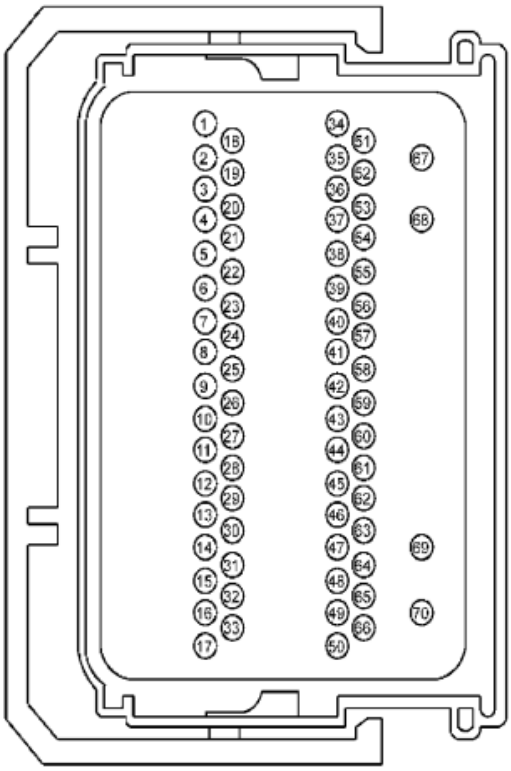
'05 to '07 Ford 6.8L & 5.4 Gas: Orange – Crank- (Grey) / Blue – Crank+ (Dark Blue)



FEMALE

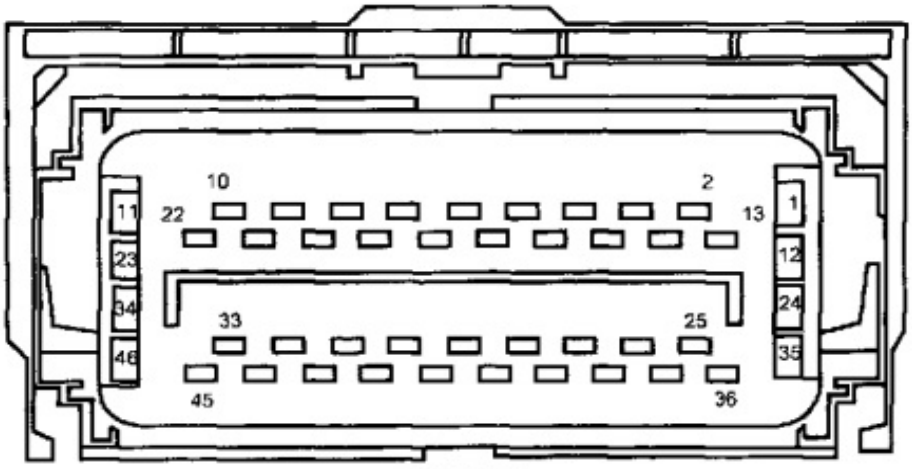
46	350 (GY)	Crankshaft position sensor (6C315) –
47	349 (DB)	Crankshaft position sensor (6C315) +

‘08 to ‘10 Ford 6.8L & 5.4 Gas: Orange – Crank- (Green/Brown) / Blue – Crank+ (Yellow/Violet)



46	RE135 (GN-BN)	CRANKSHAFT POSITION SENSOR (CKPN)	
47	VE711 (YE-VT)	SENSOR - CRANKSHAFT POSITION (CKPP)	

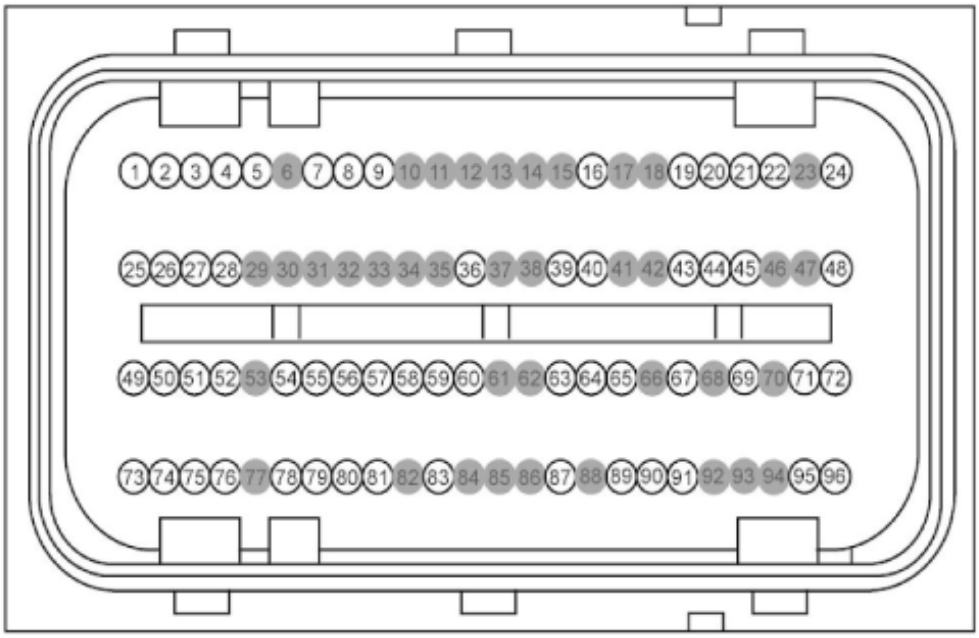
‘03.5 to ‘07 Ford 6.0L Diesel: Orange – Crank+ (Dark Blue) / Blue – Cam+ (Red)



FEMALE

Pin		
30	349 (DB)	Crankshaft position sensor (6C315) +
31	50 (RD)	Camshaft position sensor (6B288) +

‘08 to ‘10 Ford 6.4L Diesel: Orange – Crank+ (Yellow/Violet) / Blue – Cam+ (Brown/Blue)



80	VE711 (YE-VT)	SENSOR - CRANKSHAFT POSITION	
7	VE706 (BN-BU)	SENSOR - CAMSHAFT POSITION	

Troubleshooting:

A few common points to check:

1. Grounds – You must have your ground straps in place for the adapter to work properly. This means you need a strap from the battery to the frame, frame to engine, engine to other side of frame, frame to body, and engine to body. This is a common issue point and is especially important in the Common Rail and 24v applications.

2. Connectors and plugs – We get many support requests for connectors that are not fully inserted, including the PCM connector(s). Double check all connectors are fully seated.

3. Solder joints – Improper, poor or cold solder joints can cause intermittent issues. It is recommended that you use rosin core lead solder – leaded solder is much easier to work with and creates a lasting solder joint. If you are new to soldering or do not have much experience, watch a tutorial on YouTube. Here is a link to a decent tutorial:

https://www.youtube.com/watch?v=Zu3TYBs65FM

Or, a QR Code to scan with your phone:

*Please note, we are not affiliated with the above YouTube video or it's creator,

we just thought it was a good tutorial for those new to soldering.

Troubleshooting, continued:

Issue: Red Power LED is not illuminated

Answer: Check that you have +12v on the red wire, and the black wire is going to ground. You can also try temporarily connecting the wires directly to the battery for testing.

Issue: Yellow Sync LED is not illuminated when engine is running

Answer: Check wiring to Cummins RPM sensor. For 24v and Commonrails, only one wire is required, the grey signal wire. Check wiring diagram to make sure you are connected to the proper wire on the Cummins ECM, and that proper ground straps are in place to the truck's chassis.

Issue: Red Power LED and Yellow Sync LED are on when engine is running, but there is no tachometer output in the truck, or the tachometer is bouncy or unstable.

Answer: Firstly, double check the switch configuration. If switch configuration is changed, the tach adapter must be power cycled to recognize the changes (Red Power led must turn off). Secondly, check that the crank and/or cam wires are not reversed. Thirdly, check truck PCM connector is fully inserted. Lastly, check wiring connections for proper soldering and shrink wrapping.

Issue: After running the vehicle for a period of time, the Red Power LED is dim, Yellow Sync LED is not illuminated when engine is running, and the tach is not functioning.

Answer: The adapter has been overheated. Find a cooler location to mount the adapter, such as the cab.

Still can't figure out your issue? Shoot us an e-mail for additional support:

Contact@SwapHelper.com

Technical specs:

Operating temperature range	**: -40*C to 85*C (-40*F to 185*F)**
Thermal shutdown temperature	**: 110*C (230*F) at 13.5v**
Maximum Input RPM	**: 6,000 RPM (Software Limited)**
Operating voltage range	**: 6v to 18v, DC only**
Reverse Polarity Protection	**: Yes**
Load dump protection	**: Yes**
Water Resistance	**: IP66**
Suitable for ignition or injection timing	**: No**
Error	**: 0% Min to 0.0651% Max (Engine/Truck Combo Dependent)**

Return Policy:

Unopened, unused tach adapter(s) may be returned within 30 days of purchase date by original purchaser for full refund, minus shipping costs. Customer is responsible for return shipping. Used tach adapters are not eligible for return but may be repaired or replaced under Warranty policy. Return requests must be made by submitting a request to Contact@SwapHelper.com.

Warranty:

Nentec Corporation (SwapHelper.com) warranties this product to be free of defects in material and workmanship for one (1) year from date of purchase. This warranty is limited to the correction of any such defect, or the replacement of any such defective item, provided that: (a) item(s) was/were purchased from SwapHelper.com or an authorized Nentec Corporation distributor; (b) we are properly notified and consent to the return of the item(s) in question; (c) the item(s) is/are returned with proof of purchase date; and (d) it is found upon inspection by us that the item(s) is/are defective as noted above; (e) the return request is made by original purchaser. This warranty does not cover labor costs, consequential damages, nor does it apply to any item(s) that have been improperly installed, overloaded, altered, or otherwise abused by the customer, its agent(s) or employee(s). Other than the described obligation, we assume no further liability with respect to the sale or use of our products. We make no warranty, expressed or implied, and disclaim any warranty of merchantability or fitness for a particular purpose. Warranty requests must be made by requesting a Return Merchandise Authorization from Contact@SwapHelper.com.