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HOWTO: Run PCM standalone (eg engine swap). PATS disable and Speed Source Setup.

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HOWTO: Run PCM standalone (eg engine swap). PATS disable and Speed Source Setup.

howto



By Roland@pcmt

April 30, 2018 in Falcon HOWTO Guides

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...

This guide explains how to disable PATS and change the vehicle speed source to prevent security lockouts or vehicle speed related limiting in the cases of swaps that have a different sensor setup.

**Roland@pcmt
ec**

Posted April 30,
2018

Notes:

- This guide requires the Professional Version or higher as it requires editing the VID block.
- This guide only works for BA/BF and earlier PCMs. The FGs have a different CAN setup and the vehicle speed source setting is ignored, hence without an ABS module the vehicle will not run correctly.
- Disabling PATS will stop your BCM/ICC from functioning properly, hence it is only recommended for swaps that do not have this hardware or cars that have this removed (e.g. race/drag).
- This guide may not work for early model BA Falcons (eg 2004 and earlier) that run the 5.4L. A workaround for these models is to use a later model strategy from a manual 5.4L
- PCMTEC doesn't offer technical support for any swaps, because there are so many variables it makes them impossible for us to support and generally outside of the scope of PCMTEC. We will, however, offer technical support for the relevant functions of our software.

BA/BF:

To run the BA/BF PCM standalone there are two items that must be set up. Firstly the PATS security system must be disabled.

First locate auF16527 (PATS Alternate Switch) and auF16595 (PATS Switch). From the factory you will have:

auF16527: 0

auF16595: 1

auF1977	Output speed sensor hardware pr...	0	Unitless	Output speed sensor hardware pr...
auF16527	PATS Alternate Switch	0	Unitless	BETS enable/disable switch.
auF16595	PATS Switch	1	Unitless	Enable/disable for PATS.

Flip both values. So now you will have:

auF16527: 1

Now that the PATS security system is disabled the BCM/ICC will no longer function, you should only do this if you are not utilising the dash cluster in your new vehicle.

The next step is to change the speed source. From the factory the VSS (Vehicle Speed Source) would most likely have been set to use the speed from the ABS module or the TCM sent via CANBUS. We will now change this to use the output shaft speed (OSS) sensor. You'll obviously need to wire an actual speed sensor as well up to [Pin B7](#). Most people mount this on the rear of the manual gearboxes.

Speed_Control_Enabled	Speed Control Enabled	Enable	Use VID Speed Control
VSS_Source	Speed Control Source	TCM via CAN	Vehicle Speed Source. Select from Drop Down or enter manually via the = button

Now change VSS_Source to Transmission Output Shaft Sensor.

Speed_Control_Enabled	Speed Control Enabled	Enable	Use VID Speed Control
VSS_Source	Speed Control Source	Transmission Output Shaft sensor	Vehicle Speed Source. Select from Drop Down or enter manually via the = button

Whilst you are in the VID block editor it is recommended to adjust the final drive ratio and other gear ratios that may have changed.

This file will now allow the PCM to run standalone with no other modules.

FG/FG-X:

The FG/FG-X only support a CAN source (e.g. OEM TCM or ABS) for vehicle speed so *VSS Source* parameter is effectively ignored.

In this case, if you are using a FG/FG-X there are several options:

- Run the PCM with no speed reference and tune out the various FMEM torque limiting that occurs and speed related tables. There are some workshops that may offer a mail-in service for this sort of tuning.
- Using a CAN emulator to process an available speed sensor and emulate the ABS or TCM messages on the CAN bus.

+ Quote



5 yr Roland@pcmtec pinned this topic

3 months later...



Roland@pcmt
ec

Posted October 11,
2018

Update. We don't officially support engine/trans swaps due to the large amount of support time they consume.

We recommend talking to one of the many conversions shops to do this work for you, as we have seen countless cases of people buying 4 or 5 PCMs and randomly swapping modules generally making a mess of the vehicle (and spending a lot of cash in the process) only to go see one of these guys in the end. You will save yourself a lot of time and money to go see them from the start. They will ensure you buy the correct loom, PCM and various modules and then provide a tune that will run the vehicle without any of the hundreds of possible limp modes kicking in.

Brett Hogno at Custom Machine Works in QLD (PCM mail service for engine swaps)

<https://www.facebook.com/Custom-Machine-Works-856789001022313/>

Killa Kustom Kables & Conversions in QLD (Looms for conversion)

<https://www.facebook.com/Killa-Kustom-Kables-Conversions-202181769825285/>

Whiteford (VIC only) He can reprogram TCMs (BF → FG and vice versa)

<https://www.facebook.com/WhitefordTech>

Matt at BPR can also do conversions, general tuning etc. He can reprogram TCMs as well (BF → FG and vice versa)

<http://www.bulletperformanceracing.com.au/>

+ Quote

Sam and 80gus





If your a workshop with the workshop version and wanting to get into the Ford engine conversions will you offer help?.

will15

Posted October 17, 2018

[+ Quote](#)

...

**Roland@pcmt
ec**

Posted October 17, 2018

On 10/17/2018 at 7:18 AM, will15 said:

If your a workshop with the workshop version and wanting to get into the Ford engine conversions will you offer help?.

We will help with any pcmtec software issues but not with conversion specific issues.

Eg we have had a lot of cases of wiring issues, incompatible abs modules, people wanting help with how to relink modules and recode keys using other software. We regularly have people swap multiple PCMs and want us to refund credits as they end up licensing the car 4x.

Conversions are very difficult due to the fact you will need at least 2 other software packages to do the module relinking and key recoding. You'll also need experience knowing which abs modules match which pcm calibration and which tcm calibration matches which pcm calibration. You also run into wiring loom and speed sensor input issues.

All of the above is beyond the scope of our support. If you do want support doing the above we have people who would be willing to give it to you for a fee. You could possibly even approach them to train you, eg hire them to fly down for a week (depending where you are).

[+ Quote](#)**will15**

Posted October 18, 2018

I'm more looking at just doing stand alone ecu into older model cars the same as we do with ls1's. I was doing some reading and it looks like the fg is more of an issue due to speed sensor being can. If we use bf as a stand alone it should be pretty straight forward for us I assume?

[+ Quote](#)**Roland@pcmt
ec**

Posted October 18, 2018

Yes you can just follow the guide step by step for a BF. You'll need to wire an aftermarket speed sensor in if you are using a manual.

[+ Quote](#)

3 months later...

**Barra.AU**

Posted January 19, 2019

is it possible to use an abs sensor with a tone wheel and wire that to the vss input and calibrate it??

[+ Quote](#)

**Barra.AU**Posted January 19, 2019 [+ Quote](#)

...

also, would i select OSS or hall effect to make that work??

**Roland@pcmt
ec**Posted January 19, 2019 [+ Quote](#)

...

Yes any hall effect sensor will work in a BA/BF, you will need to modify the pulses per rev to suit. You use the "transmission output shaft sensor" option and wire it to the same input (B7)



3 months later...

**Roland@pcmt
ec**

Posted May 1, 2019

...

When you do an engine swap and leave the NA ABS module (or vice versa) and have a turbo calibration in the PCM you will normally get a permanent ABS/DSC fault. If this occurs I have a theory on a possible way to fix it without swapping or reprogramming the ABS module. This is not tested or verified, but it is worth experimenting with.

There are two configuration words which are sent via canbus to the ABS module.

auF2531 Encode calibration of engine configuration

This flag is broken down into the following bits

Upper Half Byte

0x10 = NA

0x20 = Turbo Charged

Lower Half Byte

0x01 = petrol

0x02 = petrol also??

You could try changing this word to say the vehicle is actually NA despite it being Turbo, or vice versa.

Eg if you have a turbo calibration you would see auF2531 equals 34 (0x22) which is turbo and petrol. You could change this to 18 (0x12) and see if this works.

In the case where you have Turbo'd a RWD Territory (never came in turbo with RWD) you could try changing the following word:

auF2193 Encode calibration of transmission and axle type

Upper Half Byte

0x80 = 4WD

0x40 = RWD

0x20 = AWD

Lower Half Byte

0x08 = Auto PCM Controlled (BTR)

0x04 = Auto TCM Controlled (ZF)

In the case of a RWD NA BTR Territory (0x88) which you have converted to turbo, you could try telling it the vehicle is a AWD by changing the value to 0x28

You could also try toggling the auF1678 (4 wheel drive) option.

[Quote](#)

nat and Whiteford

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2 weeks later...



So I was doing some comparisons of plenty of PCMs (19 different ones in fact!) and ended up with this bit breakdown for those two config words:

nat

Posted May 12, 2019

The only car I couldn't get was a N/A Territory (I'll likely go on carsales/pickles salvage to get an ID) to check if bit 7 of auF2193 was in fact used. (as mentioned with the 0x88? above) I couldn't verify the 4WD vs AWD part of auF2193 either; as there is no true 4WD anyway!

auF2531 - Encode calibration of engine configuration

Bit breakdown

7	6	5	4	3	2	1	0
Unused	Unused	Turbo	NA	LPG (BA/BF)	Unused	Always 1	Unused

Exception: Supercharged Miami V8 has both bit 4 and 5 set

auF2193 - Encode calibration of transmission and axle type

Bit breakdown

7	6	5	4	3	2	1	0
Unused	RWD	AWD	Manual	ZF (TCM)	BTR (PCM)	Unused	Unused

Edited May 12, 2019 by nat

[Quote](#)

mickyb90

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Apparently I can't edit the one above again: another thing to note is auF2193 does not exist in the FGmk2 onward or the SZ territory.

nat

Posted May 12, 2019

I went and found a couple of N/A and Turbo Territory IDs and sure enough; there's no reference of a 4WD 0x80 bit. All fall into the bits I've posted above. Quite mysterious!

[Quote](#)

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Great work Nat. If you have the workshop version of the software in the strategy list we have pulled out common auF parameters and put them in there, we could add this to the list if you want as we can automate extracting a specific param from all calibrations into a CSV.

Roland@pcmtc.ec

Posted May 12, 2019

OSID	Turbo L...	Cylinders	Displacement	Average...	Low Slope	High Slope	Minimum PW	Breakpoint	Stoch	O2 Sensors	LPG	LPG Dual Fuel	Axle/Term	Front Axle...	4WD	Tyre rev/mph	AUTO TRNS	TCM Calibration Le...	Auto ECM No.	Dif Ratio
HAFDA	0	8	54	13.55	0.013574	0.009291	0.00035	0.0000094	14.54	2	68	3	Disable	011	1	4	1	2.73		
HAFDA	0	8	54	13.55	0.013574	0.009291	0.00035	0.0000094	14.54	2	68	3	Disable	011	1	5	1	2.73		
HAFDA	0	8	54	13.64	0.013574	0.009291	0.00035	0.0000094	14.54	2	68	3	Disable	006	1	6	1	2.73		
HAFDA	0	8	54	13.64	0.013574	0.009291	0.00035	0.0000094	14.54	2	68	3	Disable	006	0	6	0	3.73		
HAFDA	0	8	54	13.64	0.013574	0.009291	0.00035	0.0000094	14.54	2	68	3	Disable	006	1	7	1	2.73		

[Quote](#)

nat

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nat

Posted May 15, 2019

On 5/12/2019 at 12:16 PM, Roland@pcmtec said:

Great work Nat. If you have the workshop version of the software in the strategy list we have pulled out common auF parameters and put them in there, we could add this to the list if you want as we can automate extracting a specific param from all calibrations into a csv.

OSID	Turbo L...	Cylinders	Displacement	Average...	Low Slope	High Slope	Minimum PW	Breakpoint	Stoch	O2 Sensors	LPG	LPG Dual Fuel	Auto/Tans	Front Avh...	4WD	Tyre rev/mph	AUTO TRNS	TCM Calibration Le...	Auto ECM No.	Diff Ratio
HAFDA	0	8	54	13.55	0.013574	0.000291	0.0000094	14.54	2				68	3	Disable	811	1	4	1	2.73
HAFDA	0	8	54	13.55	0.013574	0.000291	0.0000094	14.54	2				68	3	Disable	811	1	5	1	2.73
HAFDA	0	8	54	13.64	0.013574	0.000291	0.0000094	14.54	2				68	3	Disable	806	1	6	1	2.73
HAFDA	0	8	54	13.64	0.013574	0.000291	0.0000094	14.54	2				80	3	Disable	806	0	6	0	3.73
HAFDA	0	8	54	13.64	0.013574	0.000291	0.0000094	14.54	2				68	3	Disable	806	1	7	1	2.73

Cheers Roland - I personally don't have the workshop edition so wouldn't get to use that function - whether or not it's useful I suppose comes down to how many possible conversions any workshop would be doing to ever use this functionality (and whether or not it truly works!)

+ Quote



8 months later...



AdamR

Posted January 27, 2020

Help me please! I've got a BA barra in a boat, PATS is gone on original PCM but are going into limp mode due to the lack of speed input. Now, obviously my problem is, REPLICATING an input to keep the PCM happy, I don't need transmission or speedo control , but I can't give a relevant/meaningful speed input. Any form of signal from the motor will simply be mirroring the revs (direct drive).

Does the PCM need an actual variable/true speed pulse, or will just any (i'm assuming 5v sq wave) input keep the ECU from going into limp mode?

I don't need any further performance or tunes, as I am more than happy with the power, before it goes into limp mode!

FYI, its an old 200000++KM n/a motor BA(2004???) , bog stock, in a 21' Hallet hull with Panther jet unit...Would put all the old 350 Chevs I/Bs to shame.....

+ Quote

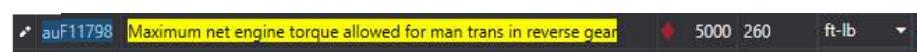


Roland@pcmtec

Posted January 29, 2020

Another fun one. If you have no speed sensor and you are using a Mk1 FG. You might get caught out with the PCM thinking it is stuck in reverse and limiting torque even with all of the torque limiters disabled.

In this case you need to modify auF11798 to set an out of range figure. This will stop the torque source from being "trans truncation" due to the calculated torque output being greater than 260 ft/lb



+ Quote



Roland@pcmtec

Posted January 29, 2020

On 1/27/2020 at 4:30 PM, AdamR said:

Does the PCM need an actual variable/true speed pulse, or will just any (i'm assuming 5v sq wave) input keep the ECU from going into limp mode?

10/26/23, 2:45 PM

HOWTO: Run PCM standalone (eg engine sw ap). PATS disable and Speed Source Setup. - Falcon HOWTO Guides - PCMTEC F...

I'm not sure if it uses a pulse width measurement or a frequency counter. So you'd need to replicate this, I think it uses a pulse width measurement. So as long as the frequency matches any square wave into pin B7 should do the job.

One way to find out is just use a 555 timer to make one.

edit: These guys may make something that will do the trick for you.

<https://www.facebook.com/CANBarra/>

+ Quote



4 months later...



FIXR7

Posted June 1, 2020

On 4/30/2018 at 2:26 PM, Roland@pcmtc said:

Edit: This guide may not work for early model BA Falcons (eg 2004 and earlier) that run the 5.4L. A workaround for these models is to use a later model strategy from a manual 5.4L

...



In this case Roland, Does that rule out the use of BA 3V or 4V in 4spd auto form? Because V8/4spd is what I need to use.

+ Quote



Roland@pcmtc

Posted June 1, 2020

On 6/1/2020 at 12:32 AM, FIXR7 said:

In this case Roland, Does that rule out the use of BA 3V or 4V in 4spd auto form? Because V8/4spd is what I need to use.

No way to know without testing unfortunately. We don't have an V8 BA PCMs here.

+ Quote



Shakeranyday

Posted August 1, 2021

If I have a Bf turbo pcm , ZF6 turbo box, zf shifter, BF turbo ABS and wheel sensors grafted onto another car

If I turn off pats, will these modules still talk together on the can network so I can utilise ABS module to pickup road speed and get the trans to operate properly.

or do I have to keep bem, cluster, keys and code the pats so the abs and tcu will talk to pcm.

thanks for your time

+ Quote



On 8/1/2021 at 10:49 AM, Shakeranyday said:

...



10/26/23, 2:45 PM

Bill

Posted August 1, 2021

HOWTO: Run PCM standalone (eg engine sw ap). PATS disable and Speed Source Setup. - Falcon HOWTO Guides - PCMTEC F...

If I have a Bf turbo pcm , ZF6 turbo box, zf shifter, BF turbo ABS and wheel sensors grafted onto another car

If I turn off pats, will these modules still talk together on the can network so I can utilise ABS module to pickup road speed and get the trans to operate properly.

or do I have to keep bem, cluster, keys and code the pats so the abs and tcu will talk to pcm.

thanks for your time

I've seen what you're proposing used & whilst it was successful, there were a lot of problems encountered. Unless you really want to have ABS, you're probably better off using a CANBarra module. It can be used for other CAN related signals

<https://www.facebook.com/CANBarra>

Edited August 1, 2021 by Bill

+ Quote



1 month later...

7



79xd250

Posted September 29, 2021

Is it possible to run an old type engine off say a bf na 6 pcm? I'm wondering if I can use this in my Xd falcon to run my 250 crossflow for an efi conversion .

79xd250

Posted September 29, 2021

It would be ITB's , COP with fg coils. I'm wondering if it's at all possible to run an engine with the bf pcm as mentioned without having things like knock sensors, speed input sensor, abs, cam control functions actually being used?

basically use it the same you would with an aftermarket unit such as a haltech and just use what I need to control the engine. I'd just need a tach output signal for the dash.

any info is appreciated.

+ Quote



PCM



Roland@pcmtec

Posted September 29, 2021

It would be possible, but unless you have a lot of time I wouldn't personally do it. Unless you have a very competent tuner who understands the barra pcm well however I imagine their time is not cheap.

Roland@pcmtec

Posted September 29, 2021

You would need the Workshop edition to adjust the crank pulses and global timing offsets etc.

Are you looking to save money or for a cool project?

+ Quote

79xd250

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79xd250

Posted September 29, 2021

On 9/29/2021 at 12:44 PM, Roland@pcmtec said:

It would be possible, but unless you have a lot of time I wouldn't personally do it. Unless you have a very competent tuner who understands the barra pcm well however I imagine their time is not cheap.

You would need the Workshop edition to adjust the crank pulses and global timing offsets etc.

Are you looking to save money or for a cool project?

10/26/23, 2:45 PM

HOWTO: Run PCM standalone (eg engine sw ap). PATS disable and Speed Source Setup. - Falcon HOWTO Guides - PCMTEC F...

Ahhh righto, thanks for the info.

yeah mate, my Xd Ute I've had for 14 years now. Been through many progression stages with it. It's got a heavily worked na crossflow in it which was running triple webers, I'm now running a four barrel and looking to step into efi world with it . Was thinking it may have been a cheaper option then haltech but seems not haha.

+ Quote



Roland@pcmt

Posted September 30, 2021

On 9/29/2021 at 12:56 PM, 79xd250 said:

Ahhh righto, thanks for the info.

yeah mate, my Xd Ute I've had for 14 years now. Been through many progression stages with it. It's got a heavily worked na crossflow in it which was running triple webers, I'm now running a four barrel and looking to step into efi world with it . Was thinking it may have been a cheaper option then haltech but seems not haha.

The poor man pays twice! Good luck with the project.

+ Quote



8 months later...



Jake

Posted June 23, 2022

Hey guys,

Ive got a miami brand new PCM with NO VIN programmed. Trying to run it as a standalone, just checking, with PATS disabled will it bypass the VIN check?

We are getting no fuel pump prime and obviously no fire, but also no comms through the vehicle OBD port. its fine on the bench.

Put it in my f6 to check and we have comms but no prime.

does this point to wiring? or does it need a VIN? File attached

Thanks in advance.

Jake.



HAFJ2Y2 - GT40 - BASE - PATS OFF x ...

1 MB · 6 downloads

+ Quote



Roland@pcmt
ec

They don't have a fuel pump output. It's driven via canbus from the pcm to the the cluster output which you don't have.

10/26/23, 2:45 PM

HOWTO: Run PCM standalone (eg engine sw ap). PATS disable and Speed Source Setup. - Falcon HOWTO Guides - PCMTEC F...

Posted June 23,
2022

+ Quote



Jake

Posted June 23,
2022

That's what I thought they did.

Thanks Roland.

+ Quote



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