Lingenfelter TRG-002

58X to 24X Trigger Conversion Module

Installation Instructions

PN: L460065397

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Parts List

#	Part number	Description
1	TRG-002	LPE 58X trigger conversion module
1	971385	3/8” (10 mm) ring terminal
1	971145	1/4” (6 mm) ring terminal
2	1773	56” section of 1/4” convoluted loom
1	791201128	6” section of 3/4” flameguard heat sleeve
1	06483	hook & loop tape
2	AV16037	self-tapping screw
1	L920010000	LPE decal
1		instructions

The following parts are included with the kit but are ONLY needed for early to late Gen IV conversions such as a LS3 into a 2005 Corvette or GTO:

1	L480145305	E40 TRG camshaft output adapter harness
1	12131195	connector, E40 cam engine harness (GTO & HSV)
1	12129615	connector, E40 cam engine harness (except GTO & HSV)
1	12052845-B	terminal position assurance (TPA) component

Optional Items

Description	Part number
• MAP sensor extension harness, for LS2/LS7 MAP sensor	L480070000
• MAP sensor adapter extension harness, for LS3 MAP sensor	CE-109103-24
• Knock sensor extension harness	RX-LS2-KSRH
• USCar connector kit (each, 8 required)	L480080000
• USCar to minitimer (LS2 to LS1) injector adapter harness (set of 8)	CE-109077
• 90 mm mechanical four bolt throttle body (2004 GTO, 1998-2002 F-body)	UMI-EP-01111
• 90 mm electronic four bolt throttle body (1997-2004 Corvette, 2004-2005 CTS-V)	L270010197
• Mechanical throttle cable bracket (for a mechanical throttle on LS7, LS2 or LS3 intake manifolds)	CALL
• EFILive programming interface to recalibrate your ECM for proper injector size and engine characteristics (timing/fuel etc.)	EFIFS2-T

Specifications:

- The Lingenfelter Performance Engineering TRG-002 58X to 24X Trigger Conversion Module has been designed using the latest automotive qualified components with extended temperature range operation. A fast 16-bit microcontroller with an enhanced timer system has been utilized to achieve precise signal timing for late model GM engine applications.
- The TRG-002 allows Gen IV GM V8 engines with the 58X crankshaft trigger wheel and the 4X camshaft timing gear to be installed in earlier vehicles designed to accept the 24X crankshaft trigger wheel and the 1X camshaft trigger wheel without having to take the engine apart to change the camshaft timing gear or the crankshaft reluctor wheel. Examples include installing a LS7 Corvette or LS3 Corvette engine in a 1997-2005 Corvette or a 1998-2002 Camaro or Firebird.
- Fully encapsulated (potted) construction for increased durability.
- Custom molded high temperature glass filled Nylon low profile case.
- Transient voltage and over voltage protection have been incorporated into the design to accommodate the ever increasing electrical demands of modern vehicle control systems.
- The TRG-002 incorporates a bi-color LED to indicate the operating status. When first powered up and input signals are present the LED will be **RED** to indicate the processor is booted and ready. After a valid crankshaft and camshaft signal (engine rotating) is present the LED will switch to **GREEN** to indicate that the input signals are valid and that the 24X crankshaft and 1X camshaft outputs are active.

Notes:

- **Read these instructions before installing the TRG-002**
- General Motors Gen III V8 engines use a 24X crank trigger wheel and a reluctor wheel on the camshaft. The 24X reluctor wheel uses two different width notches (12° and 3°) that are 15° apart. The Gen III camshaft position sensor is mounted in the back of the block behind the intake manifold.
- Early Gen IV V8 engines use this same 24X reluctor wheel but then have the camshaft position sensor mounted in the timing cover and have a single tooth camshaft reluctor built into the timing gear.
- The newer Gen IV V8 engines use a 58X crank trigger wheel (60 evenly spaced teeth with 2 missing teeth) and a four tooth reluctor built into the timing gear.
- The TRG-002 takes the signals from the 58X based engines and converts them to what the PCM or ECM for 24X based engines are expecting to see. This allows the newer 58X engines to be installed in older vehicles that originally had 24X engines.
- The TRG-002 is designed to connect to the stock crankshaft (CKP) & camshaft (CMP) position sensors on a Gen IV V8 engine equipped with a 58X crankshaft reluctor and a 4X camshaft reluctor (timing gear).
- The 58X CKP sensor (GM part # 12585546) is gray in color and has a different connector key than the 24X CKP sensor.
- The 24X CKP sensor (GM part # 12560228) is black in color and will NOT work with the 58X crankshaft reluctor, so you cannot use the sensor from your existing Gen III V8 engine.
- Most crate engines or engines removed from other vehicles should already have the correct sensors installed but it is important that you check to be sure.
- The camshaft sensor mounted in the front timing cover used on the 1X and the 4X timing gears is the same for either gear (GM part # 12585545).
- Some early Gen IV V8 engines have the 24X crankshaft reluctor and the 1X camshaft reluctor (timing gear). If you are using one of these earlier Gen IV engines in your LS1, LS6 or other Gen III V8 equipped vehicle then you DO NOT need the TRG-002 trigger conversion module. See Table 1 on pages 12 and 13 for information on what make and model year vehicles have what type of crankshaft reluctor wheel. Be sure to go by the vehicle model year (in your owner's manual or indicated by the 10th digit of your VIN). Do not use the manufacturing date to determine model year.
- NOTE - special installation instructions are required for the early 24X Gen IV V8 engine equipped vehicles. This applies to all E40 ECM based vehicles such as:
  - 2005 6.0L LS2 equipped Chevrolet Corvette
  - 2005-2006 6.0L LS2 equipped Pontiac GTO
  - 2005-2006 6.0L LS2 equipped Holden Special Vehicles (HSV) cars
  - 2005-2006 5.3L V8 equipped Buick Rainer, Chevrolet Trailblazer & SSR, GMC Envoy, Isuzu Ascender, Saab 9-7x
  - 2006 6.0L LS2 equipped Chevrolet Trailblazer SS
    - On these vehicles you will also need to use the supplied additional wiring extension adapter

harness (part number L480145305) to go from the stock CMP harness connector to the TRG-002 CAM OUT connector. You will also need to install the correct connector on the harness depending on the type of vehicle. See the instructions on pages 8 and 9 for more detailed information.

- See the images on page 11 for examples of what the 58X and 24X trigger wheels look like and what the 4X and 1X camshaft timing gears look like.
  - To use the TRG-002 **DO NOT** change the front camshaft timing gear to a single tooth gear.
  - The TRG-002 is designed to work with the 4X camshaft timing gear (images A or B on page 11) and the 58X crank trigger wheel (right lower image also on page 11).
- If you are not sure what crankshaft reluctor wheel your engine has you can remove the crankshaft position sensor and look through the sensor mounting hole to see the reluctor wheel teeth. For an image of what the reluctor wheel teeth look like, look at the image found at the bottom of page 11.
- The "Crank In" and "Cam In" labels on the TRG-002 refer to sensor signal "In" from the sensors on the engine and "Crank Out" and "Cam Out" labels refer to the signal "Out" from the TRG-002 to the vehicle's ECM or PCM.
- 58X engines use 5 volt sensor signals and 24X engines use 12 volt sensor signals for the camshaft and crankshaft sensors. The TRG-002 supplies 5 volt sensor power for the 58X cam and crank sensors and provides 12 volt sensor based signals to the ECM.
  - This means the voltage measured on the "Crank In" and "Cam In" wires should be 5 volt signals and the voltage measured on the "Crank Out" and "Cam Out" wires should be 12 volt signals.

- In addition to using the TRG-002 to adapt the camshaft and crankshaft sensor signals, you will also probably need to change connectors, obtain adapter harnesses and/or change parts in order to use the injectors, MAP sensor and/or MAF sensor on the newer engines (see the Optional Items list on page 1 for some examples). Contact LPE or your LPE distributor for more detailed parts recommendations.
- The factory Powertrain Control Module (PCM) or Engine Control Module (ECM) will need to be reprogrammed in order to properly run the new engine due to the different engine characteristics including: engine displacement, injector size, spark requirement changes, MAP and MAF sensor type, RPM range, throttle size, etc. Reprogramming tools are available from LPE or many companies offer custom programming services and chassis dynamometer tuning services.
- Some vehicles may need a higher flow fuel pump in order to provide the correct amount of fuel for the new engine. Contact LPE or your LPE distributor for fuel pump recommendations.
- On camshaft phaser equipped engines (L92 etc.) you will need to switch to a non-camshaft phaser camshaft, timing gear and timing cover.
- The TRG-002 has not been tested in late model 24X 8.1L truck engine applications.
- The TRG-002 is currently NOT designed to work on the front wheel drive GM V8 applications such as the Chevrolet Impala SS, Chevrolet Monte Carlo SS & Pontiac Grand Prix GTP.
- **Important information regarding spark plug wires and spark plugs:**
  - As with most in-vehicle electronics, LPE recommends the use noise suppression ignition wires and resistor type spark plugs with this electronic control unit.

Installation:

- Disconnect the negative battery terminal.
- Connect the black wire to a suitable chassis ground.
  - Good ground locations include the front or the back of a cylinder head (see arrow in image to the right) or one of the existing vehicle chassis grounds.
  - For the cylinder head and other 10mm ground bolts, use the supplied 10mm ring terminal.
  - For the firewall ground stud and other 6 mm ground bolts, use the supplied 6mm ring terminal.
  - In order to provide a reliable ground connection, the supplied ring terminals are a crimp style terminal with built in solder and adhesive filled shrink tubing. To properly install a ring terminal:
    - Strip the wire 1/2”
    - Make sure the wire is properly seated and crimp the terminal barrel (the 1/4” of the barrel closest to the terminal end) using an insulated connector crimping tool nest that matches the color or gauge of the terminal. Do not crimp the solder sleeve.
    - Apply heat evenly around the length of the tubing (including the crimp area) until the tubing fully recovers and the adhesive flows. In order to heat the connector evenly it is recommended that you use a heat gun and not an open flame such as a lighter.
    - Continue distributing the heat over the solder sleeve until the solder flows into the terminal barrel. Remove the heat and let cool for the Ultimate connection.
- Connect the red wire to an ignition switched 12VDC source.
  - If you are connecting to a switch 12VDC source that is not fused, install a 5 amp fuse
  - Potential locations for a 12VDC switched source include the underhood fuse panel or the driver or passenger side footwell fuse panels
- Install the supplied high temperature convoluted loom over the red and black wires making sure to route the wires away from any sources of heat or moving parts. Secure the loom as needed.
- Connect the harness labeled CAM OUT to the connector on the engine wiring harness that was connected to the camshaft sensor connector
  - On GM Gen III V8 engine equipped vehicles (1997-2004 C5 Corvette, 1998-2002 Camaro, 2004 GTO, 2003-2004 SSR, 1999-2006 CK trucks etc.) the CAM OUT connector on the TRG-002 connects directly to the factory harness connection that was at the back of the engine.
    - **NOTE** - make sure you do **NOT** connect the CRANK IN connector to the manifold air pressure (MAP) sensor. The CRANK IN connector is the same as the MAP sensor connector. Also make sure you do **NOT** connect the CRANK OUT to the MAP sensor harness connector. Although the two won’t connect normally, you could force them together.
  - On early GM Gen IV V8 engine equipped vehicles that use the E40 ECM (2005 C6 Corvette, 2005-2006 GTO, 2005-2006 SSR, 2006 Trailblazer SS etc.) the CAM OUT connector on the TRG-002 **MUST** be connected to the “TRG-002 Cam Out” labeled connector on the supplied camshaft output adapter harness (L480145305) and then the adapter harness connects to the factory camshaft connector harness location near the front of the engine. **See the Addendum For E40 Controlled Vehicles on pages 8 and 9 for connecting the adapter harness on these vehicles.**

- Connect the harness labeled CAM IN to the camshaft sensor on the front timing cover. **NOTE** - this should connect directly to the sensor and not to the intermediate harness attached to the outside of the timing cover. See the image at the bottom of page 11 for further clarification.
- Connect the harness labeled CRANK OUT to the connector on the engine wiring harness that was connected to the crankshaft sensor connector (on the side of the engine block).
  - **Be careful to make sure you have this secured such that it does not get close to the exhaust. You may want to put a heat protective sleeve or heat shield over the harness connectors, especially if you have aftermarket exhaust manifolds on the vehicle.**
- Connect the harness labeled CRANK IN to the crankshaft position sensor on the side of the block.
  - **Depending on your installation you may also want to put a heat sleeve or heat shield over the wiring harness and connector, especially if you have aftermarket exhaust manifolds.**
- Secure the TRG-002 module using the supplied hook and loop tape or using the supplied self-tapping screws.
- Mounting location warnings/recommendations:
  - The TRG-002 is designed to withstand similar temperatures to the factory ECM/PCM. Care should be taken to make sure it is mounted in a location that does not expose it to temperatures in excess of 250 degree F (120 degree C).
  - **Do not place the module in direct exposure to hot exhaust manifolds or other exhaust system components.**
  - **If the unit will be in the line of site of exhaust system components make sure it is far away from the components and has a heat shield protecting it.**
  - **Do not mount directly to the engine.**
  - **Make sure all of the harness wires are clear of the exhaust and properly heat shielded.**
  - **Make sure all of the harness wires are clear of any moving components (engine accessory drive etc.).**
- Reconnect the negative battery terminal.

Light emitting diode (LED) STATUS light operation/diagnostic codes:

- Solid **RED** indicates powered on/no input signals present (normal for key on/engine off)
- Solid **GREEN** indicates the TRG-002 has a valid crankshaft and camshaft signal and is in synchronized operation
- Blinking **RED** indicates no crankshaft signal in with a camshaft signal detected
  - Check connections at the crankshaft sensor. Check the tachometer or the engine RPM with a scan tool while cranking the engine. If no RPM is shown while cranking then the TRG-002 is not outputting a crankshaft signal.
- Blinking **GREEN** indicates no camshaft signal in with a crank signal detected
  - The engine should start but you may sometimes have to crank the engine for a long time before it starts. You most likely do not have a proper camshaft sensor signal into the TRG-002. Check camshaft sensor connections and wiring pin-outs.
  - The ECM/PCM should set a camshaft sensor DTC.
- Blinking **RED RED RED GREEN** (three red blinks followed by a green blink) indicates the TRG-002 lost crank synchronization and recovered
  - Usually due to electrical noise or bad sensor/wiring.
- Blinking **GREEN GREEN GREEN RED** (three green blinks followed by a red blink) indicates a loss of camshaft signal.
  - Usually due to electrical noise or bad sensor/wiring.
- The TRG-002 will blink either of these two last error codes on the three (3) power up cycles after the problem occurs. If the error does not occur again during those three power ups then the code will clear. If another code occurs prior to the code clearing, the older code will be cleared and the new code will be stored and displayed.

Troubleshooting:

- If the TRG-002 **RED** LED does not come on when you turn on the ignition, check the power and ground wire connections (red and black wires). No **RED** LED indicates no power to the TRG-002.
- The production 24X engine crankshaft and camshaft harness power feeds are 12VDC. On key-on you should be able to measure 12VDC between power and ground pins from the engine harness for the crankshaft and camshaft sensors.
- The output from the TRG-002 (for the 58X type sensors) is 5VDC.
- The harness wire colors and signals/voltages are labeled in the wiring diagrams found on page 10.

- If you are experiencing erratic operation and intermittent diagnostic lights from the TRG-002 it may be due to electrical noise/interference.
  - Try rerouting the TRG-002 harness and/or relocating the TRG-002 itself away from high voltage ignition related components (spark plug wires, coils etc.)
  - Some aftermarket spark plug wires have been found to cause electronic interference. We highly recommend using spark plug wires that provide OEM levels of noise suppression (the lowest resistance wire is NOT the best wire) and that you use resistor type spark plugs. If you are having intermittent problems try switching to stock or another brand of spark plug wires to see if the problem goes away.
- If you are getting power to the TRG and the engine cranks over but the engine doesn't start, check the following:
  - Make sure the engine doesn't already have a 24x reluctor wheel and a 1x timing gear.
  - Make sure the engine doesn't have an incorrect combination of parts.
    - 24x crank reluctor wheel with 4x timing gear.
    - 58x crank reluctor wheel with 1x timing gear.
  - Check to see if the TRG-002 is outputting an engine RPM signal. It should show up on the dash in your tachometer or when viewed with a scan tool. If no RPM is shown then the TRG is not outputting an RPM signal.
  - Do you have fuel pressure.
  - Use a noid light and a spark plug simulator to check if you are getting spark and injector pulse.
  - What RPM is the starter able to achieve. The minimum synchronization engine speed is 60 RPM. Your starter must be able to get the engine speed to 60 RPM or higher in order for the TRG-002 to output a signal and for the engine to start.
- When contacting LPE for technical support on the TRG-002, please have the following information available:
  - Date of purchase and invoice #
  - TRG batch code (engraved into underside of the case)
  - Make, model and year of vehicle
  - Type of engine control module (ECM) or powertrain control module (PCM) in vehicle if not original equipment for that make, model and year
  - Type of engine that has been installed
  - Type of spark plug wires and spark plugs being used
  - Mounting location of TRG
  - Complete description of problem you are having

Addendum For E40 Controlled Vehicles

(see chart on pages 11 & 12 for vehicle applications)

WARNING - failure to use the supplied adapter harness or failure to wire the adapter harness correctly can result in voltage being applied to the incorrect terminals to the TRG-002 and can cause failure of the TRG-002. Damage to the TRG-002 due to incorrect wiring is NOT covered under warranty.

E40 equipped vehicles use the GM Gen IV V8 engines but these engines still have the 24X crank gear found on the Gen III engines. The camshaft position sensor is moved to the front timing cover on these vehicles (just like the newer 58X engines) except the timing gear has a 1X reluctor with a single tooth resulting in the same signal pattern as the camshaft mounted reluctor found on the Gen III engines.

On the Gen IV V8 Corvette, Trailblazer, SSR & other S/T platform vehicles, there is a jumper harness attached to the timing cover that connects the cam sensor to the engine harness (see image on page 9). On the E40 equipped 2005-2006 Pontiac GTO and Holden HSV vehicles the engine harness connects directly to the cam sensor and no such jumper harness exists on the engines. Because of this difference in factory wiring, the connection from the TRG-002 to the factory harness is different between these two applications.

On E40 equipped vehicles the included E40 TRG camshaft output adapter harness (L480145305) must be used between the TRG-002 Cam Out and the vehicle's engine harness. The supplied camshaft adapter harness has a connector already installed on one end that plugs into the TRG-002 Cam Out connector. The "Engine Harness Cam E40" end has sealed terminals that need to be installed into the appropriate connector for your vehicle application.

- Two connectors are included with the extension harness. See the images and diagrams on page 7 to determine the correct connector for your vehicle.
  - For all vehicles except the 2005-2006 Pontiac GTO and LS2 HSV applications, the 12129615 connector will be installed on the camshaft output adapter harness.
  - For the 2005-2006 Pontiac GTO and LS2 HSV applications, the 12131195 connector will be installed on the camshaft output adapter harness.
- The following pin-out should be used when terminating either connector (for both sets of vehicle applications):

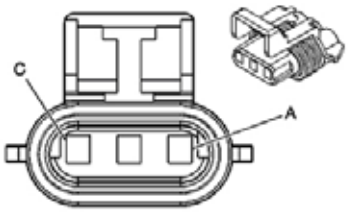
Pin	Wire Color	Circuit No.	Function
A	Red	631	12-volt reference
B	Black	632	Low reference
C	Green	633	CMP sensor signal

- The terminals will only go in the connectors one way and should be able to be inserted and locked into position without any undue force. The letter markings for the pins are molded into each connector.
- Once you have installed the wires into the connector, gently pull on the wires to make sure they are properly seated and locked in the connector.
- Now install the terminal position assurance (TPA) component over the connector and wires (see other TRG-002 harness connectors to see how this is done).

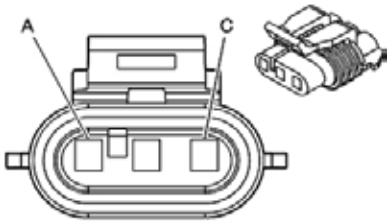
Connector and Wiring Diagrams for E40 Controlled Vehicles Addendum

Labeled connector images;

Vehicle ECM harness side connector views for the camshaft input into the ECM:



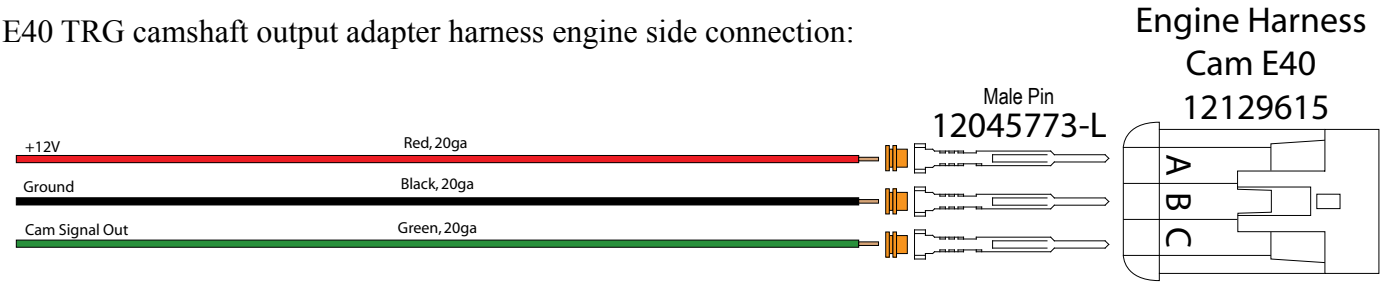
All E40 vehicles except GTO & HSV applications



E40 GTO & HSV applications

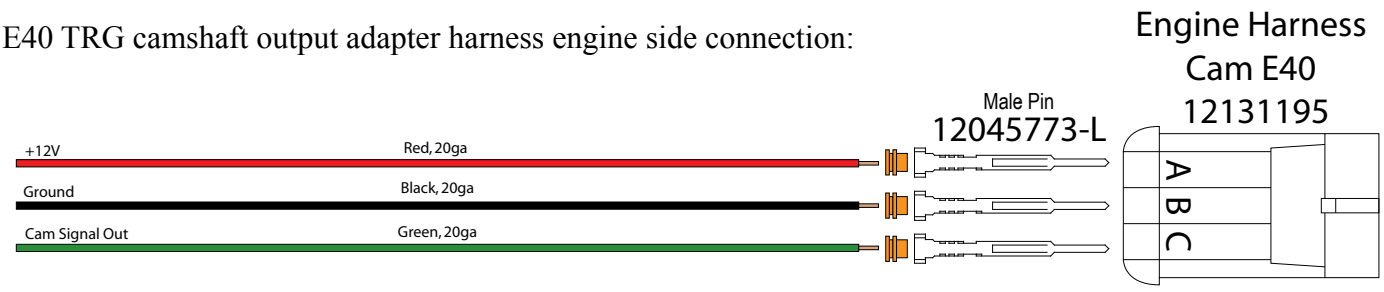
All E40 vehicles except GTO & HSV applications

E40 TRG camshaft output adapter harness engine side connection:



E40 GTO & HSV applications

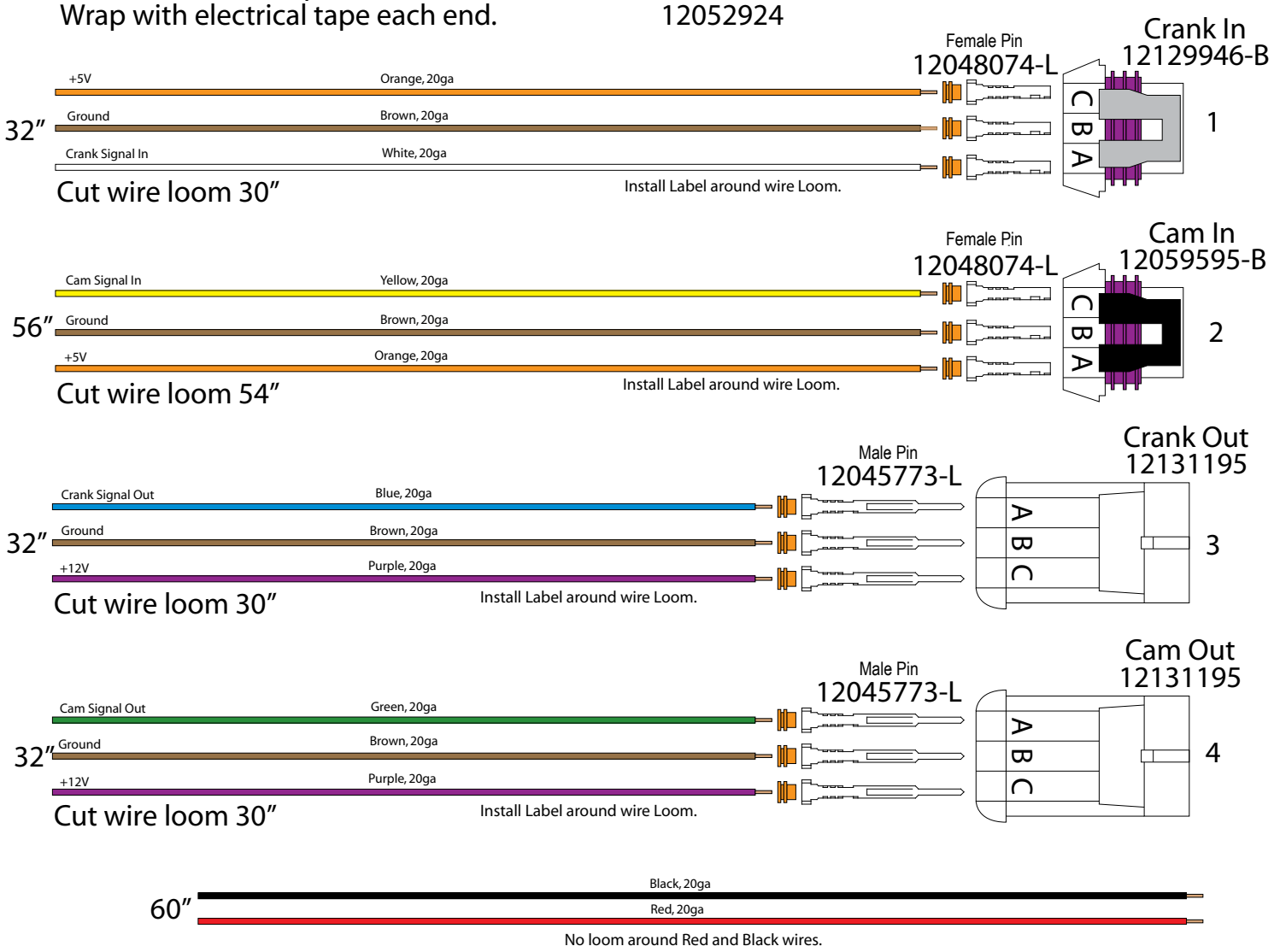
E40 TRG camshaft output adapter harness engine side connection:



TRG-002 Harness Wiring Schematics

Use 1/4" wire loom, part #1763
Wrap with electrical tape each end.

Orange Seal x 12
12052924



GM Gen III And Gen IV V8 Crankshaft and Camshaft Reluctor Wheel Images

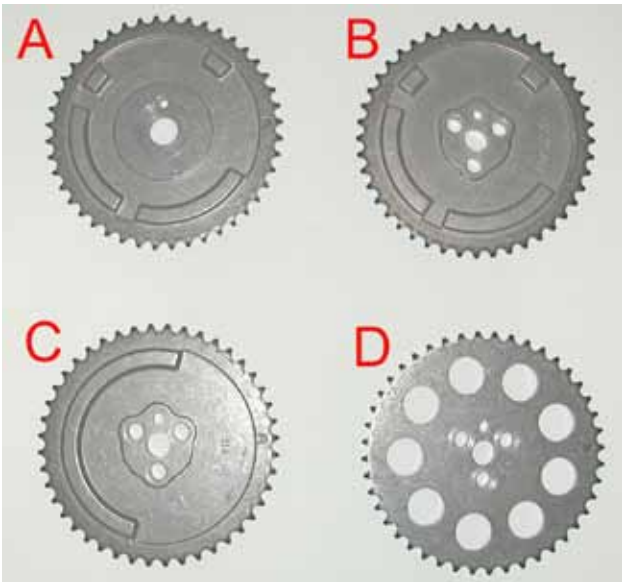
Camshaft timing gears:

A - Single bolt 4X camshaft gear from a 2007-2009 LS2 or LS3 engine. GM part number 12591689.

B - Three bolt 4X camshaft gear from a 2006 LS2 Corvette or from a 2006-2009 LS7 Corvette engine. GM part number 12586481.

C - Three bolt 1X camshaft gear from a 2005 LS2 Corvette or a 2005-2006 LS2 GTO/SSR/Trailblazer engine. GM part number 12576407.

D - Three bolt camshaft gear from a 1997-2004 LS1, LS6 or other Gen III V8 engines. No reluctor teeth are on the timing chain gear since the camshaft position sensor is at the back of the block and senses the camshaft speed from the reluctor machined into the back of the camshaft itself. GM part number 12552953.

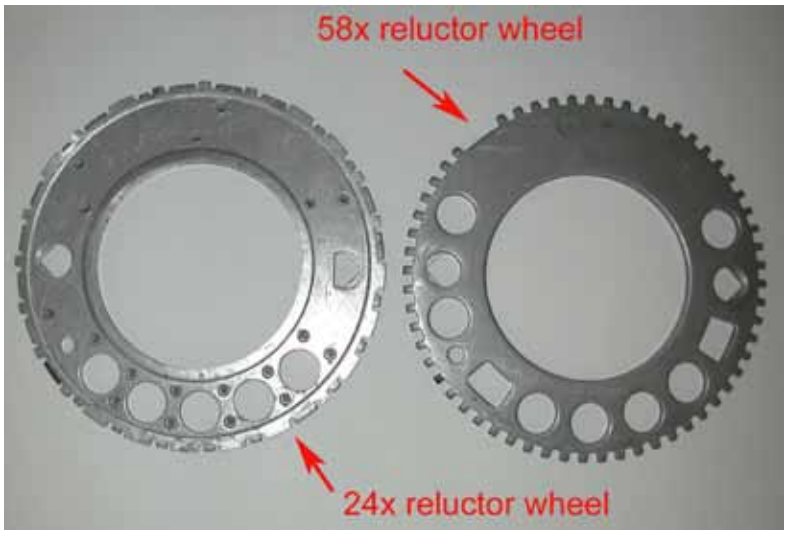


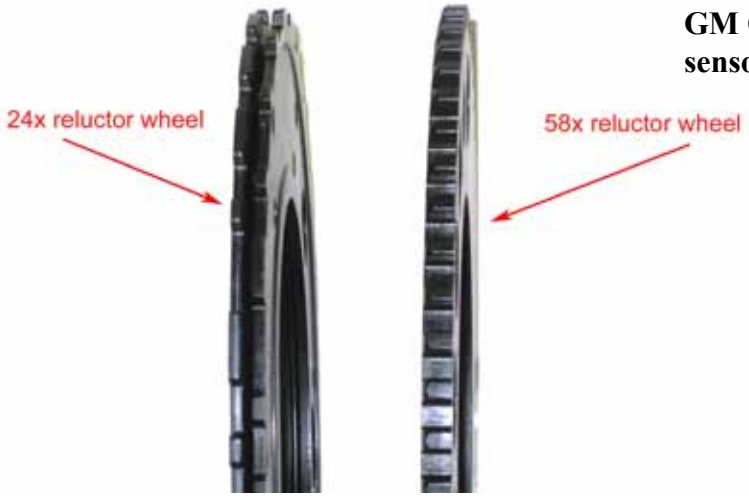
Crankshaft reluctor wheel images:

Left image - 24X crankshaft reluctor wheel found on all Gen III V8 engines (LS1, LS6, LQ4, LQ9) and early Gen IV V8 engines (2005 LS2 Corvette, 2005-2006 LS2 GTO, 2005-2006 LS2 SSR). GM part number 12551520 or 12559353.

Right image - 58X crankshaft reluctor wheel found on later Gen IV V8 engines (2006-2007 Corvette LS2, 2006-2009 Corvette LS7, 2008-2009 Corvette LS3 etc.). GM part number 12586768.

Not shown - LS9 58X crankshaft reluctor wheel. This reluctor wheel is smaller and diameter and requires a different sensor.





GM Gen IV front timing cover with sensor and jumper harness:

Table 1 - Engine crankshaft reluctor wheel and camshaft gear tooth count information							
Year	**Make**	**Model**	**Engine**	**Crankshaft reluctor tooth count**	**Camshaft gear count**	**Cam gear bolt pattern**	**PCM/ ECM type**
2004	Buick	Rainier	5.3L LM4	24x	1x (on camshaft)	3	Warren
2005-2006	Buick	Rainier	5.3L LH6	24x	1x	3	E40
2007	Buick	Rainier	5.3L LH6	58x	4x	1	E67
2004-2005	Cadillac	CTS-V	5.7L LS6	24x	1x (on camshaft)	3	Warren
2006	Cadillac	CTS-V	6.0L LS2	58x	4x	3	E67
2007	Cadillac	CTS-V	6.0L LS2	58x	4x	1	E67
2009-2015	Cadillac	CTS-V	6.2L LSA	58x	4x	1	E67
2001-2006	Cadillac	Escalade	5.3L & 6.0L	24x	1x (on camshaft)	3	Warren
2007-2013	Cadillac	Escalade	6.2L L92	58x	4x	1	E38
1998-2002	Chevrolet	Camaro	5.7L LS1	24x	1x (on camshaft)	3	Warren
2010-2015	Chevrolet	Camaro	6.2L LS3 & L99	58x	4x	1	E38
2012-2015	Chevrolet	ZL1 Camaro	6.2L LSA	58x	4x	1	E67
2015	Chevrolet	Z28 Camaro	7.0L LS7	58x	4x	1	E38
2011-2016	Chevrolet	Caprice PPV	6.0L L77	58x	4x	1	E38
1997-2004	Chevrolet	Corvette	5.7L LS1	24x	1x (on camshaft)	3	Warren
2001-2004	Chevrolet	Z06 Corvette	5.7L LS6	24x	1x (on camshaft)	3	Warren
2005	Chevrolet	Corvette	6.0L LS2	24x	1x	3	E40
2006	Chevrolet	Corvette	6.0L LS2	58x	4x	3	E38
2006-2013	Chevrolet	Z06 Corvette	7.0L LS7	58x	4x	3	E38
2007	Chevrolet	Corvette	6.0L LS2	58x	4x	1	E38
2008-2013	Chevrolet	Corvette	6.2L LS3	58x	4x	1	E38
2010-2013	Chevrolet	Corvette	6.2L LS3 Dry Sump	58x	4x	3	E38
2009-2013	Chevrolet	ZR1 Corvette	6.2L LS9	58x	4x	3	E67
2003-2007	Chevrolet	Express	4.8L, 5.3L, 6.0L, 8.1L	24x	1x (on camshaft)	3	Warren
2008-2009	Chevrolet	Express	4.8L, 5.3L, 6.0L	58x	4x	1	E38
1999-2007	Chevrolet	Silverado, Avalanche*	4.8L, 5.3L & 6.0L	24x	1x (on camshaft)	3	Warren
2007-2013	Chevrolet	Silverado, Avalanche**	4.8L, 5.3L & 6.0L	58x	4x	1	E38
2011-2014	Chevrolet	Silverado 2500HD	6.0L	58x	4x	1	E78
2003-2004	Chevrolet	SSR	5.3L	24x	1x (on camshaft)	3	Warren
2005-2006	Chevrolet	SSR	6.0L LS2	24x	1x	3	E40
2001-2006	Chevrolet	Suburban	4.8L, 5.3L, 6.0L, 8.1L	24x	1x (on camshaft)	3	Warren
2001-2006	Chevrolet	Tahoe	4.8L, 5.3L, 6.0L	24x	1x (on camshaft)	3	Warren
2007-2013	Chevrolet	Tahoe, Suburban	4.8, 5.3, 6.0 & 6.2L	58x	4x	1	E38
2003-2004	Chevrolet	Trailblazer	5.3L LM4	24x	1x (on camshaft)	3	Warren
2005-2006	Chevrolet	Trailblazer	5.3L LH6	24x	1x	3	E40
2007-2009	Chevrolet	Trailblazer	5.3L LH6	58x	4x	1	E67
2006	Chevrolet	Trailblazer SS	6.0L LS2	24x	1x	3	E40
2007-2009	Chevrolet	Trailblazer SS	6.0L LS2	58x	4x	1	E67
2003-2004	GMC	Envoy	5.3L LM4	24x	1x (on camshaft)	3	Warren
2005-2006	GMC	Envoy	5.3L LH6	24x	1x	3	E40
2007-2009	GMC	Envoy	5.3L LH6	58x	4x	1	E67
2003-2007	GMC	Savana	4.8L, 5.3L, 6.0L	24x	1x (on camshaft)	3	Warren
*1999 was a transition year for the CK truck platform from the Gen I SBC engine (5.0L & 5.7L engines) to the Gen III engines and the new vehicle chassis/body.							
**2007 was another transition year for the CK truck platform from the Gen III engines to the Gen IV engines and the new chassis/body.							

Table 1 - Engine crankshaft reluctor wheel and camshaft gear tooth count information							
Year	**Make**	**Model**	**Engine**	**Crankshaft reluctor tooth count**	**Camshaft gear count**	**Cam gear bolt pattern**	**PCM/ ECM type**
2008-2009	GMC	Savana	4.8L, 5.3L, 6.0L	58x	4x	1	E38
1999-2007	GMC	Sierra*	4.8L, 5.3L, 6.0L, 8.1L	24x	1x (on camshaft)	3	Warren
2007-2013	GMC	Sierra**	4.8L, 5.3L & 6.0L	58x	4x	1	E38
2011-2014	GMC	Sierra 2500HD	6.0L	58x	4x	1	E78
2001-2006	GMC	Yukon, Denali, Yukon XL	4.8L, 5.3L & 6.0L	24x	1x (on camshaft)	3	Warren
2007-2013	GMC	Yukon, Denali, Yukon XL	4.8, 5.3, 6.0 & 6.2L	58x	4x	1	E38
1999-2005	Holden	Commodore	5.7L	24x	1x (on camshaft)	3	Warren
2007-2008	Holden	Commodore	6.0L L98	58x	4x	1	E38
2001-2005	Holden	Monaro	5.7L	24x	1x (on camshaft)	3	Warren
2005-2006	Holden Special Vehicles (HSV)		6.0L LS2	24x	1x	3	E40
2007-2009	Holden Special Vehicles (HSV)		6.0L	58x	4x	1	E38
2003-2007	Hummer	H2	6.0L LQ4	24x	1x (on camshaft)	3	Warren
2008-2009	Hummer	H2	6.2L L92	58x	4x	1	E38
2008-2009	Hummer	H3 Alpha	5.3L	58x	4x	1	E67
2003-2004	Isuzu	Ascender	5.3L LM4	24x	1x (on camshaft)	3	Warren
2005-2006	Isuzu	Ascender	5.3L LH6	24x	1x	3	E40
2003-2004	Oldsmobile	Bravada	5.3L LM4	24x	1x (on camshaft)	3	Warren
1998-2002	Pontiac	Firebird	5.7L LS1	24x	1x (on camshaft)	3	Warren
2008-2009	Pontiac	G8	6.0L	58x	4x	1	E38
2009	Pontiac	G8 GXP	6.2L LS3	58x	4x	1	E38
2004	Pontiac	GTO	5.7L LS1	24x	1x (on camshaft)	3	Warren
2005-2006	Pontiac	GTO	6.0L LS2	24x	1x	3	E40
2005-2006	Saab	9-7x	5.3L LH6	24x	1x	3	E40
2007-2009	Saab	9-7x	5.3L LH6	58x	4x	1	E67
2008-2009	Saab	9-7x Aero	6.0L LS2	58x	4x	1	E67
*1999 was a transition year for the CK truck platform from the Gen I SBC engine (5.0L & 5.7L engines) to the Gen III engines and the new vehicle chassis/body.							
**2007 was another transition year for the CK truck platform from the Gen III engines to the Gen IV engines and the new chassis/body.							

TRG-002 hardware and software versions:

- These instructions are for use with TRG-002 modules and not for the earlier TRG-001 or TRG-001A. If your module has TRG-001 or TRG-001A printed on the front label then you need a different set of instructions. If you need instructions for one of these modules please check our web site or contact our sales department.
- The date code/batch code for each TRG-002 is marked on the back of the plastic case. You may be asked to provide this information when calling in with technical support related questions.

Service

In case of malfunction, this Lingenfelter Performance Engineering (LPE) component will be repaired or replaced free of charge according to the terms of the warranty. When returning LPE components for service, Proof of Purchase must be supplied for warranty verification. After the warranty period has expired, service costs are based on time and materials costs and you will be contacted with the cost to service or replace the unit before any work is done.

All returns must have a Return Goods Authorization (RGA) number issued to them before being returned. To obtain a RGA number please contact LPE Customer Service at (260) 724-2552. You may obtain a blank RGA form from our web site at www.lingenfelter.com.

When returning the unit for repair be sure to include a detailed account of any problems experienced; the make, model and year of your vehicle; and a detailed list of what components and accessories are installed on the vehicle.

The repaired unit will be returned as soon as possible after receipt. Return shipping within the USA is covered by warranty (shipping method at LPE's discretion). For more information, call LPE at (260) 724-2552. LPE technicians are available from 8:00 AM to 5:00 PM Monday - Friday & 8 AM to 12 noon on Saturday (Eastern Time).

Limited Warranty

LPE warrants the TRG-002 58X to 24X Trigger Conversion Module to be free from defects in material and workmanship under normal use and if properly installed for a period of one year from date of purchase. If the module is found to be defective as mentioned above, it will be replaced or repaired if returned prepaid along with proof of date of purchase. This shall constitute the sole remedy of the purchaser and the sole liability of LPE. To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations whether expressed or implied, including any implied warranty of merchantability or fitness. In no event shall LPE be liable for special or consequential damages.

For additional product installation information and technical support, contact LPE or your LPE products distributor. You can also find technical support and usage discussions regarding this product and many other LPE products in our Internet forums:

http://www.lingenfelter.com/LPEforumfiles

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