



Installation Guide

FORD 5.4 BA-BF & FG FALCON

HTV2300 Supercharger Kit



Issue 3: June 2020

ENGINEERING PERFORMANCE SINCE 1955

Important Information

Installing the supercharger indicates your acceptance of the responsibility and liability associated with the fitment and use of this product. Please ensure the owner and drivers of the supercharged vehicle are aware of their responsibilities and liabilities as indicated below.

Thank you for purchasing this supercharger which has been designed and made with pride. The owner and drivers of the enhanced vehicle must be aware that fitment of a supercharger may affect:

- The vehicle's factory warranty.
- Insurance cover and associated liabilities.
- Compatibility with emission and roadworthy certification.
- The validity of a driver's license for a supercharged vehicle.
- The handling & braking capability of the vehicle due to increased engine power & torque characteristics.
- The longevity of the engine.
- The vehicle will need to use premium unleaded fuel only (98 RON).

It is the owner's/driver's responsibility to accept any consequences and liabilities of using the supercharger and any subsequent effect it may have. Harrop Engineering shall not be liable and shall be 'Held Harmless' for any direct and/or indirect/consequential losses, costs, damages, expenses, injuries or liabilities whatsoever incurred by the owner/driver of the vehicle or other parties arising from this supercharger, its installation and/or its operation. It is recommended that vehicles have completed 1,500 km and have been driven, serviced and maintained in accordance with the vehicle manufacturer's handbook before fitting a supercharger. An engine should be deemed reliable and have delivered all reasonable expectations in line with the vehicle manufacturer's specifications prior to fitting a supercharger.

Warranty.

This supercharger is covered by a limited warranty on components and workmanship for a period of 36 months from the date of purchase, subject to the following:

- Installation must be completed by a qualified motor mechanic or technician who has undertaken appropriate training in fitting Harrop superchargers.
- The supercharger has not been modified or "overdriven" by fitting alternative drive pulleys.
- The supercharged vehicle has been tuned by an appropriately qualified and experienced technician.
- The supercharged vehicle has been driven in accordance with the conditions specified by the vehicle manufacturer's normal use of operation, driving care and vehicle service program.
- The supercharged vehicle has not been used for competitive racing.

No warranty shall apply where Harrop have determined improper fitment or handling, misuse in operation, neglect, or accident damage. Engine modifications made prior to or in conjunction with the supercharger fitment may invalidate the Harrop limited warranty. Any warranty claims must be made immediately & directly in writing to Harrop Engineering so that a determination can be made promptly. Involvement of a third party or an attempt to repair a perceived/actual fault may invalidate the warranty. To the extent of the law, the determination on any warranty claim & associated costs will be at the sole discretion of Harrop Engineering.

By installing the supercharger you acknowledge that all conditions pertaining to this supercharger and its operation have been read, understood and accepted

For 60 years Harrop Engineering has been at the forefront of designing, developing and manufacturing precision performance components. Today our innovative and logical approach is applied to low volume automotive OEMs and the performance aftermarket through a dedicated team of 65 staff. Core performance products include Superchargers, Engine Components, Brakes, Differentials and we are also the exclusive Australian Distributor for Forgeline Motorsport Wheels.

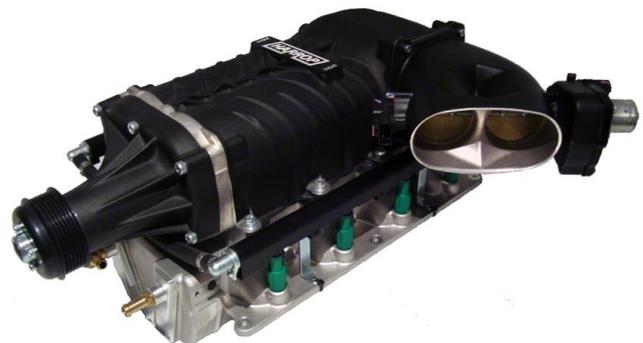
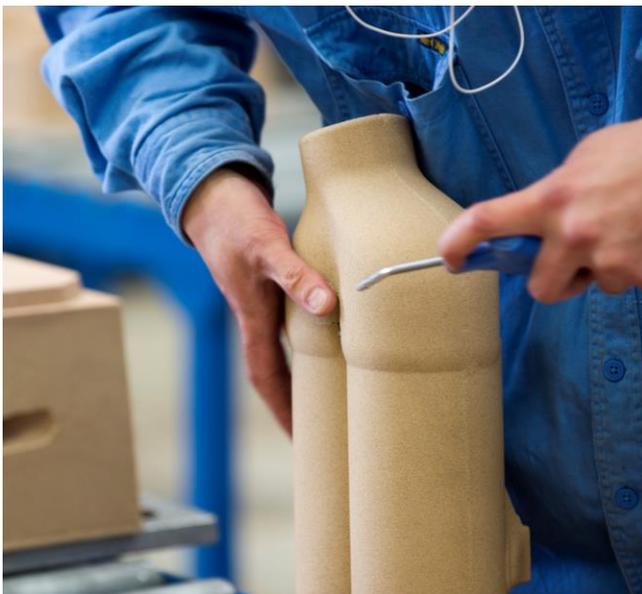
Harrop are also the preferred supplier of Eaton Supercharger and Traction Control technology including dual branded product designed and manufactured in-house. There are currently over 4,000 components in our portfolio and this is growing daily as we continually develop more Harrop Performance Products. Our high profile car manufacturing customers have included Holden, HSV, FPV, Ford, Roush, Toyota, TRD and Lotus.

We also supply to race teams from categories including F1, NASCAR and V8 Supercars and an extensive range of drag, circuit and off-road competitors. Just as importantly, a large portion of our customers are performance enthusiasts and weekend warriors who are highly passionate about their ride.

Please take a moment to review the following pages and learn why Harrop is the first choice in Superchargers.

Thank you for choosing Harrop and enjoy your Harrop Enhanced ride.

- Team **HARROP**



Contents

ISSUE: 3, Dec 2019

Manifold removal and ancillaries	3
Installation of revised heater lines and alternator repositioning	4
Manifold supercharger install	5
Intercooler system installation, BA & FG	6
Intercooler pump wiring	8
Vacuum lines and throttle body installation	9
Intercooler System fill	9
FEAD Installation	10

Quick-start guide for experienced Ford “Modular engine” technicians.

This document is meant only as a guide, as any vehicle modification should be completed by a certified technician who has the relevant experience and equipment to be competent of a safe and effective supercharger installation. The following notes will highlight most of the primary steps needed during the installation of an HTV2300 kit.

Please ensure the safe operation of all tools and equipment are adhered to in accordance with the vehicle and equipment manufacture’s recommendation.

Ensure the vehicle is prepared with premium unleaded fuel.

Remove the original intake manifold after cleaning the engine and disconnecting the battery.

- The fuel line, fuel tank purge line and brake booster line can also be removed from the manifold.
- The PCV tubing can be removed, but some of it will be used on re-installation.
- Leave the fuel tank purge solenoid connected to the vehicle.
- Leave the TMAP sensor in the original manifold as it will be replaced in the supercharger installation.
- Unplug the alternator loom from the alternator and fuse box and remove from the vehicle (this loom is replaced)
- Remove the fuel injector retaining clips from the original fuel-rails, these are to be re-used on the supercharger manifold.
- Ensure the head faces are clean and free from grit.
- Mask the inlet ports to ensure no foreign matter enters the engine.



Remove the airbox & filter assembly

Remove the standard multi V belt

- Remove the alternator (2x M10 bolts to engine block)
- Remove the alternator plug from the standard loom and add it to the supercharger alternator loom



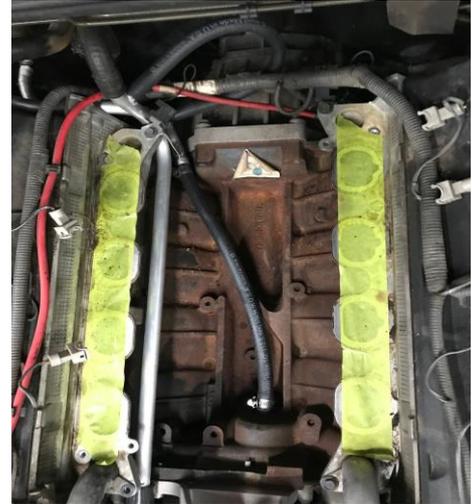
Remove the standard water hard lines, (not hoses from fire wall) in the valley connecting engine to heater system

- Replace the heater water line with the aluminum lines / hose clamps supplied in the supercharger kit (these lines run from the cylinder head bridge pipe and the rear of the water pump under the supercharger to the heater system as shown)
- Re install bolt to waterline bracket at the rear of the right cylinder head.



Alternator installation.

- The alternator is installed to run in the reverse direction with the supercharger kit.
- Remove the standard pulley from the alternator and replace with supplied pulley.
- Remove the bolt from the timing cover refer to 1st image below
- Install the idler pulley to the boss on the left hand side of the timing cover refer to 1st image below
- Install the alternator mount as shown in 2nd image below using the supplied fastener.
- Remove 2 left hand timing cover bolts as shown.
- Connect the alternator charge wire and loom to the alternator before assembly.
- Assemble the alternator to the mount as shown. (be sure to loop new drive belt around the alternator pulley before fitment)
- Assemble lower alternator bracket as shown.
- Route the alternator wiring as shown (from alternator under the radiator cover from left to right and into the fuse box)



Idler bracket installation.

Assemble idler bracket as shown using supplied M8 cap screws. (mounts using the original alternator holes on the front face of the block)

At this point the Alternator wiring and FEAD is complete.



Supercharger / Manifold installation.

- Before installing the supercharger assembly remove the fuel pressure regulator from the standard fuel rail and assemble it to the rear of the right hand supercharger fuel rail **(BE SURE THE CIRCLIP HOLDING THE REGULATOR IN IS SECURELY INSTALLED)**
- Fit the original fuel injector retaining clips to the supercharger fuel-rails, ensuring that they secure the injectors to the fuel-rails.
- Install XR6 TMAP sensor in the front left hand side of the manifold. (apply a small amount of Loctite 515 to the thread)
- Be sure the cylinder head manifold faces are clean and the waterlines are sitting as deep as possible in the valley.
- Trial fit the supercharger assembly to the engine to be sure there is clearance to waterlines / looms etc.
- Remove the assembly from the engine, remove the masking tape from the inlet ports, clean the standard inlet manifold gaskets and position them correctly on the heads.
- Install the supercharger assembly onto the heads (be sure not to slide the manifold on the gaskets as this will damage the seals)
- Once installed torque the manifold bolts and ensure that the fuel rail mounts don't twist when these are torqued.



Intercooler lower temperature radiator installation.

- Remove front bumper from the vehicle
- Remove 2 lower radiator mounting bolts



- Slide the oil cooler forward 30mm (the lines attaching the cooler will slide through the rubber mounts attached to the body)



BA FALCON

- Install the Intercooler radiator as shown
- Using the supplied spacers and mounting hardware mount the radiator as shown



- Check to ensure that the oil cooler has clearance from the low temp radiator. On some variants you may need to install the lower oil cooler relocation brackets supplied in the kit that moves the oil cooler forward.

Intercooler reservoir mounting, (BA & FG)

- Mount intercooler reservoir to the front right of the engine.
- Route the intercooler lines (2 x 1/2") from the front of the manifold to the inlet on the reservoir (top fitting).



BA FALCON

- Mount the pump to the sheet metal below the RH headlamp using the supplied bracket as per image on the RH side.
- Route the bottom reservoir outlet line to the inlet on the pump.



- Route the intercooler lines from the pump outlet to the RH upper intercooler fitting.



- Connect the low temp radiator lower outlet with the supplied 19mm hose to the rear of the supercharger Y piece. Use some of the 19mm hose and split it open and wrap it around the hose securing with cable ties to protect the hose against sharp edges where required.



- Secure all water lines with supplied hose clamps

FG FALCON

- Install the Intercooler radiator as shown
- Using the supplied spacers and mounting hardware mount the radiator as shown

- Fit the supplied spacers so that the heat exchanger is moved forward so that the intercooler can be mounted in behind it.

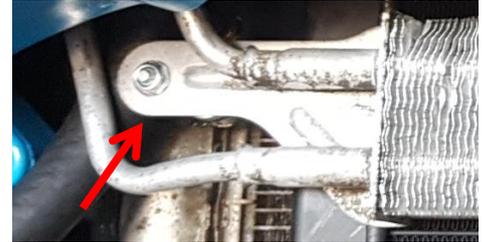
- Mount the pump to the sheet metal below the LH rail using the supplied bracket as per image on the RH side (Note smaller pump shown in image).

- Route the intercooler outlet to the inlet of the pump.

- Route the intercooler lines from the pump outlet to the rear intercooler fittings connecting to the Y piece that splits the hoses.

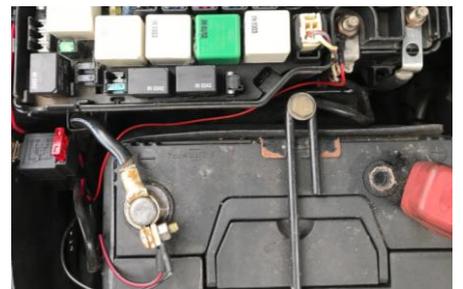
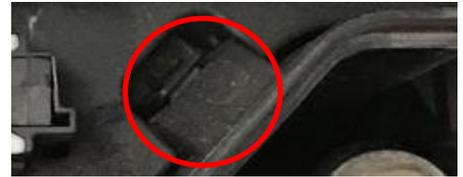
- Connect the reservoir to the front intercooler lines as per image on the right.

- Connect the outlet of the reservoir to the intercooler inlet on the RH side routing the hose down and back up as per image on the right.



Connecting the intercooler pump.

- Disconnect the positive supply wires to the fuse box
- Lift the top section of the box up by releasing the retaining tabs around the outside perimeter of the fuse box.
- Lift the lid up enough to expose the pink fuel pump wire from the relay. Using the supplied loom cut the "add a circuit" (end with 2 fuses) off from the wire and discard the fuse side. Solder this relay trigger wire to the pink wire under the fuse/relay panel. Note feed the relay trigger wire up through the bottom of the fuse box first.
- Once soldered reseal the upper section of the fuse box in to its lower section.
- Connect the black earth to the battery terminal and the other red wire with the eyelet to the positive feed terminal on the fuse box and at the same time reconnect the positive feeds that were removed to lift the lid off.
- Mount the relay to the apron of the vehicle as per image shown. Feed the loom down to the pump and connect the pump.



Fuel system.

- Connect the large fuel fitting to the left hand fuel rail and the smaller line to the fitting on the fuel pressure regulator. **(BE SURE THAT THE LINES ARE SECURE AND CORRECTLY INSTALLED)**
- Connect the fuel pressure regulator to the tail piece locate under the fuel rail in the middle of the manifold on the right hand side with th7/32 vacuum hose supplied.



Throttle body installation.

- Connect all of the injector plugs before installing the throttle body.
- Remove the sticker from the supercharger inlet.
- Install the throttle body adaptor, (insert underneath screw first) to the supercharger using the supplied O-ring and 4 M6 cap screws.
- Install the throttle body onto the adaptor using the supplied O ring/seal.
- Connect the TPS (front side of throttle body)
- At this time also connect the loom extension for the TMAP sensor
- Install the inlet duct / filter assembly to the throttle body as shown
- Fit the supplied support bracket under the clamp of the pod filter and secure it to the valve cover bolt.



Vacuum line installation

- Connect the brake booster line to the rear of the supercharger housing as shown.
- Connect the standard PCV line (from the rear of the right bank) to the standard fitting installed in the throttle body adaptor **1**.
- Connect the fuel tank purge (left hand side of the engine) to the standard hose tail piece fitting installed in the throttle body adaptor, you will need to trim the tube to length and may need a heat gun to soften the plastic tube **3**.
- Connect the bypass actuator rear fitting to the 90 degree tube fitting on the throttle body adaptor using the supplied vacuum hose (5/32 by 150mm long) **2**.



Filling the intercooler system and thoroughly purging the circuit of air.

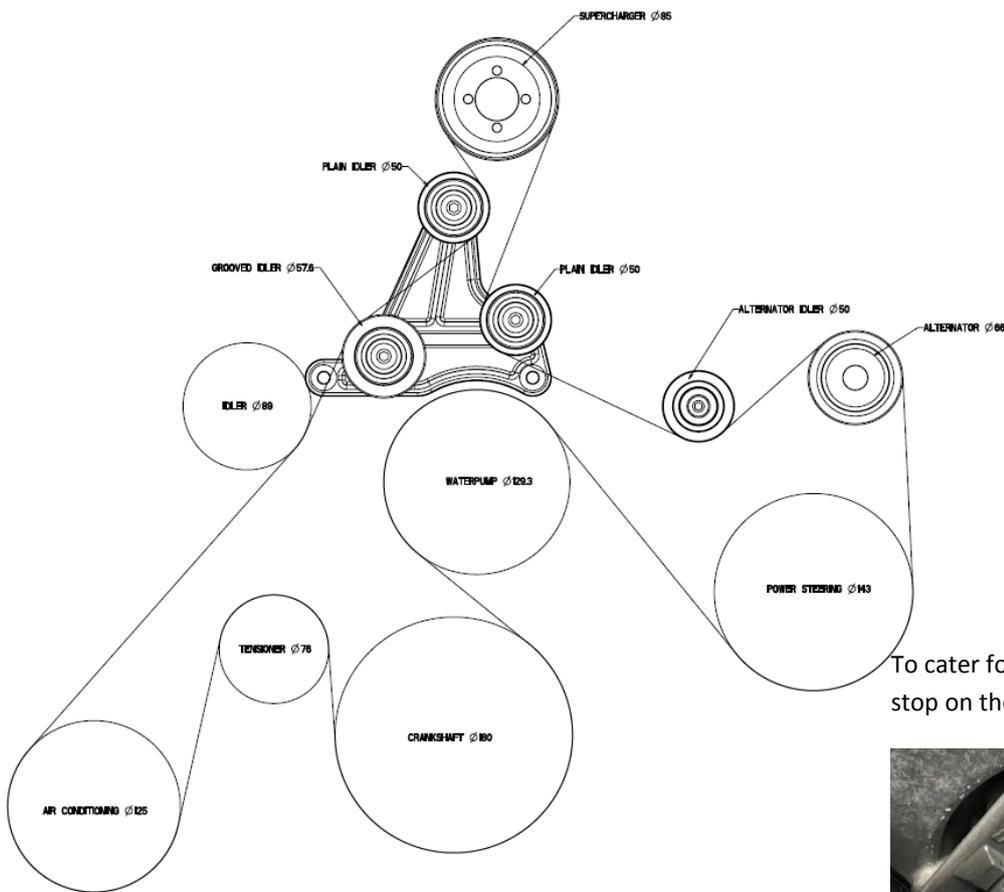
Fill the intercooling system through the reservoir. Coolant to be used is either Ford **WSS-M97B44-D** and/ or **GMW3420**, mixed with distilled or deionised water in a 50% concentrate. **Note filling with a noncompliant coolant will void warranty.**

- As the system fills, release the air from the radiator via the bleed nipple on the low temp radiator
- Operate the intercooler pump for several minutes, ensuring there are no leaks and that any air is purging from the system via the coolant reservoir. A strong flow from the two inlet pipes into the coolant reservoir should be visible.
- 123 The coolant level should be approximately 50mm from the cap sealing face of the reservoir. The level will need to be monitored and replenished during the first few dyno runs, as some air will continue to be purged from the system.

Refit the front bar after checking that there are no leaks.

Install the drive belt and check that is free from debris, oil and coolant residue. Clean if necessary. Refer to the illustration below for the belt route.

- Note that the pulley diameters shown are for reference only and may be different between vehicle model variants.



To cater for the limited available belts the stop on the tensioner needs to be removed.



After re-checking all electrical, fuel, vacuum, duct, coolant and intercooler connections, re-connect the battery.

Without starting the engine, turn the key to ignition and check for fuel and intercooler coolant leaks.

- As the fuel pump may only operate for a few seconds without the engine running, it may be necessary to repeat the process several times.
- Load a tune into the vehicle's Power Control Module (PCM).**
- We strongly recommend tuning the vehicle on a dynamometer to ensure optimum performance and durability.
- The engine will probably operate at no-boost levels with the factory tune. Do not attempt to rev the engine into boost mode with the standard tune, as the PCM may enter "limp" mode.

Re-install any ancillary components that were removed during the supercharger installation.

When satisfied that there is no fuel or coolant leaks, start the engine and re-check for leaks, alignment or interference with moving parts.

Take specific care to check;

- The fuel lines and injector rails for leaks.
- The vacuum lines, including the brake booster line.
- The drive belt alignment.
- The intercooler coolant level.

After the engine has been at operating temperature, let it cool and re-check as above.