



**Technical Guide**

**TVS2650 SUPERCHARGER**

**BIG BLOCK CHEV**

**HEAVY DUTY DRIVE**



MAY 2024..... Rev 0

## 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 65 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**



**IMPORTANT REQUIREMENTS TO NOTE:-**

This Harrop Supercharger Engine Kit **WILL ONLY SUIT:-**

- Mark IV Big Block Chevrolet with an 9.8" deck height.
- Mark IV style Rectangular, or Oval Port cylinder heads, with a standard port orientation
- Factory Crank Balancer (3 or 6 bolt at PCD 3.2") position

***NOTE:- ANY OTHER CONFIGURATIONS, DECK HEIGHTS, AND ACCESSORIES NOT MENTIONED ABOVE HAVE NOT BEEN TESTED AND/OR NOT CURRENTLY SUPPORTED.***

***ENSURE YOUR ENGINE IS SUITABLE TO ACCEPT THE ADDITIONAL HORSEPOWER A HARROP SUPERCHARGER CAN DELIVER***

### Overview:

Harrop TVS2650 Supercharger Engine kit for a Big Block Chevrolet (9.8" deck height)

### 10PK HD DRIVE

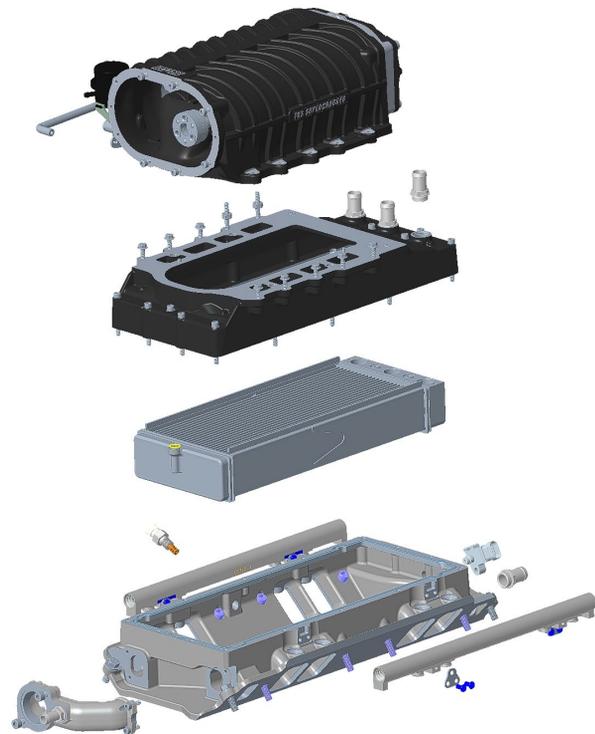
**Part number:** 99-AMFD15710    **Description:** TVS2650 Manifold/Engine Kit Rectangle Port BBC

**Part number:** 99-AMFD15846    **Description:** TVS2650 Manifold/Engine Kit Oval Port BBC

**Part number:** 99-AKIT15717    **Description:** SCK FDFI2650 Install Kit Supercharger BBC

### Technical specifications:

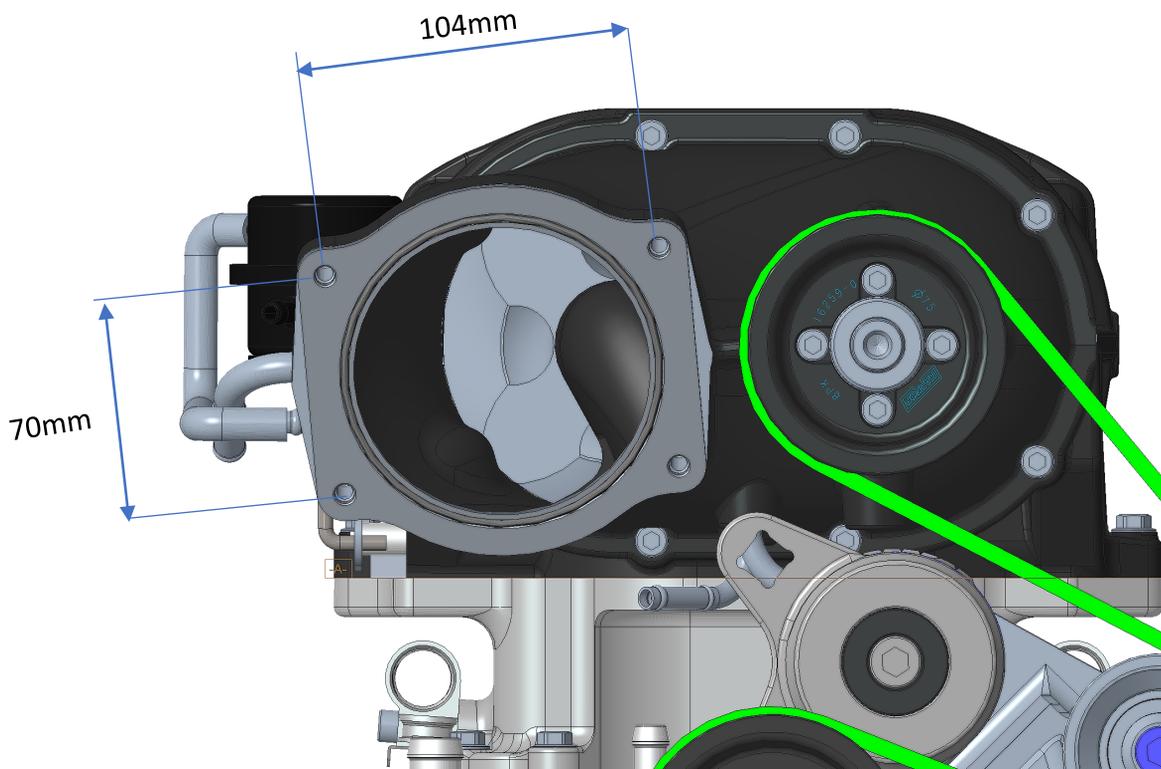
- Eaton TVS2650 supercharger technology.
- Integrated Supercharger Bypass system which relieves boost under light load conditions, reducing drive loss and improving fuel economy.
- In-manifold intercooler:
  - High density fin at 55mm thick
- 17mm water in/out intercooler lines
- Intake Air Temperature (IAT) Sensor (25037388).
- 2.7 Bar MAP Sensor (GM12592525).
- Fuel Rails to suit EV14 Compact Fuel Injectors  
(with -8 AN threads each end).



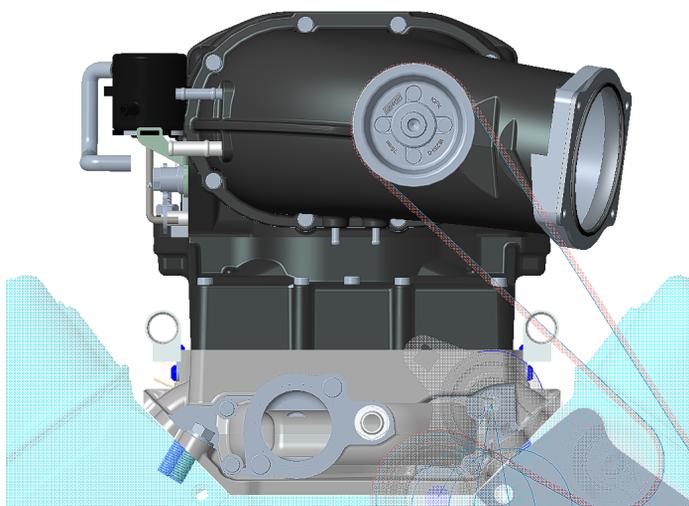
**FDI INLET COVER OPTIONS, SUPERCHARGED – BBC**

| FRONT INLET COVER BIAS                                       | 10PK HD DRIVE |
|--|---------------|
| 99-ACVR13169 110 FWD ETC<br><i>(LS3 throttle body motor)</i> |               |
| 99-ACVR14983 110 FWD CABLE                                   |               |
| 99-ACVR14324 LH BIAS LS                                      | **            |
| 99-ACVR14234 RH BIAS LS                                      | **            |
| 99-ACVR13167 FWD INLET LS                                    | **            |

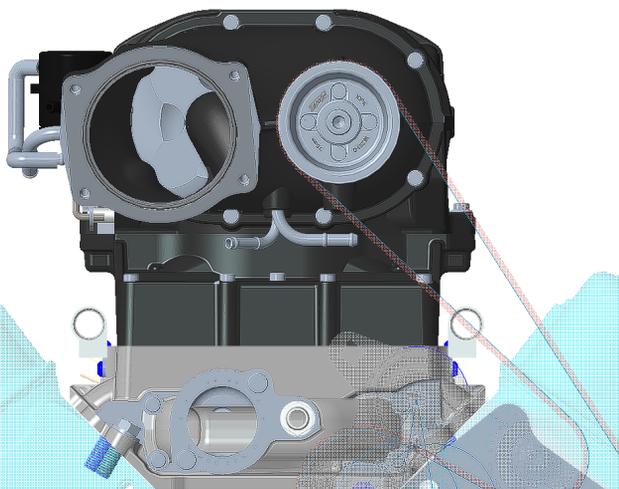
\*\* 104mm x 70mm 4 HOLE THROTTLE BODY MOUNT (TO SUIT LS STYLE ETC OR CABLE TB)



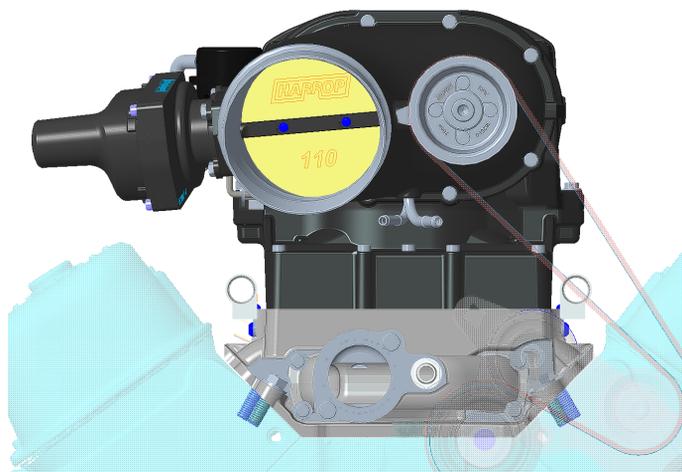
**10PK HD DRIVE - FDFI INLET COVER OPTIONS**



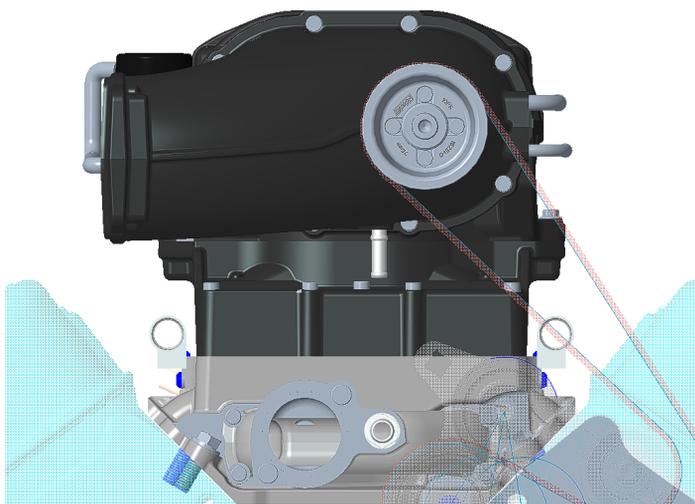
**LEFT BIAS**  
**(99-ACVR14324)**



**FWD BIAS**  
**(99-ACVR13167)**



**110 FWD BIAS**  
**(99-ACVR14983 CBL)**  
**(99-ACVR13169 ETC)**



**RIGHT BIAS**  
**(99-ACVR14234)**

**DRIVE SYSTEMS AVAILABLE**



**DRIVE SYSTEM SUPPORTED ACCESSORIES**

|                  | 10PK HD DRIVE |
|------------------|---------------|
| Air Conditioning |               |
| Power Steering   |               |
| Alternator       |               |
| Water Pump       |               |
| Power (<900hp)   |               |
| Power (>900hp)   |               |

REFER PERFORMANCE TABLE (page 21)



**10PK HD DRIVE:**

- 10PK Crank Pulley Assembly  
(dia 205mm or dia 245mm crank pulley, v-pulley adapter, and fasteners)
- 10PK Tensioner Bracket Assembly
- 99-ABKT16415 Bracket Assembly Alternator BBC (optional) to suit a 140 Amp GM CS130 Alternator with 6-12 O'clock mounting and 6.6" bolt spacing
- 10PK belt
- To suit an Electric, or Mechanical Water Pump
- V-Belt (optional)

*Note: Customer sourced Alternator, Crank Balancer, and Trigger Wheel Assembly – refer pages 15-17.*

**10PK SUPERCHARGER PULLEY:-**

| PULLEY P/No.   | DESCRIPTION                                       |
|----------------|---|
| 99-PLY16249-GT | Pulley, Supercharger, 10PK, Ø65.0 OD, 18.3 Offset |
| 99-PLY16250-GT | Pulley, Supercharger, 10PK, Ø70.0 OD, 18.3 Offset |
| 99-PLY16251-GT | Pulley, Supercharger, 10PK, Ø75.0 OD, 18.3 Offset |
| 99-PLY16252-GT | Pulley, Supercharger, 10PK, Ø80.0 OD, 18.3 Offset |
| 99-PLY16253-GT | Pulley, Supercharger, 10PK, Ø85.0 OD, 18.3 Offset |

**10PK CRANK PULLEY:-**

| PULLEY P/No. | DESCRIPTION        |
|--------------|--------------------|
| 99-PLY15295  | Pulley, 10PK, Ø205 |
| 99-PLY15296  | Pulley, 10PK, Ø245 |

**PULLEYS and BELTS:-**

| SUPERCHARGER PULLEY DIAMETER | CRANK PULLEY DIAMETER | 10PK BELT P/No. | SUPERCHARGER SPEED |
|------------------------------|-----------------------|-----------------|--------------------|
| 65                           | 205                   | 65-10PK2149     | 19550 RPM          |
| 70                           | 205                   | 65-10PK2149     | 18150 RPM          |
| 75                           | 205                   | 65-10PK2162     | 16950 RPM          |
| 80                           | 205                   | 65-10PK2162     | 15900 RPM          |
| 85                           | 205                   | 65-10PK2167     | 14950 RPM          |

| SUPERCHARGER PULLEY DIAMETER | CRANK PULLEY DIAMETER | 10PK BELT P/No. | SUPERCHARGER SPEED |
|------------------------------|-----------------------|-----------------|--------------------|
| 65                           | 245                   | 65-10PK2220     | 23300 RPM          |
| 70                           | 245                   | 65-10PK2233     | 21700 RPM          |
| 75                           | 245                   | 65-10PK2233     | 20250 RPM          |
| 80                           | 245                   | 65-10PK2246     | 18950 RPM          |
| 85                           | 245                   | 65-10PK2265     | 17800 RPM          |

**V-PULLEYS and BELTS:-**

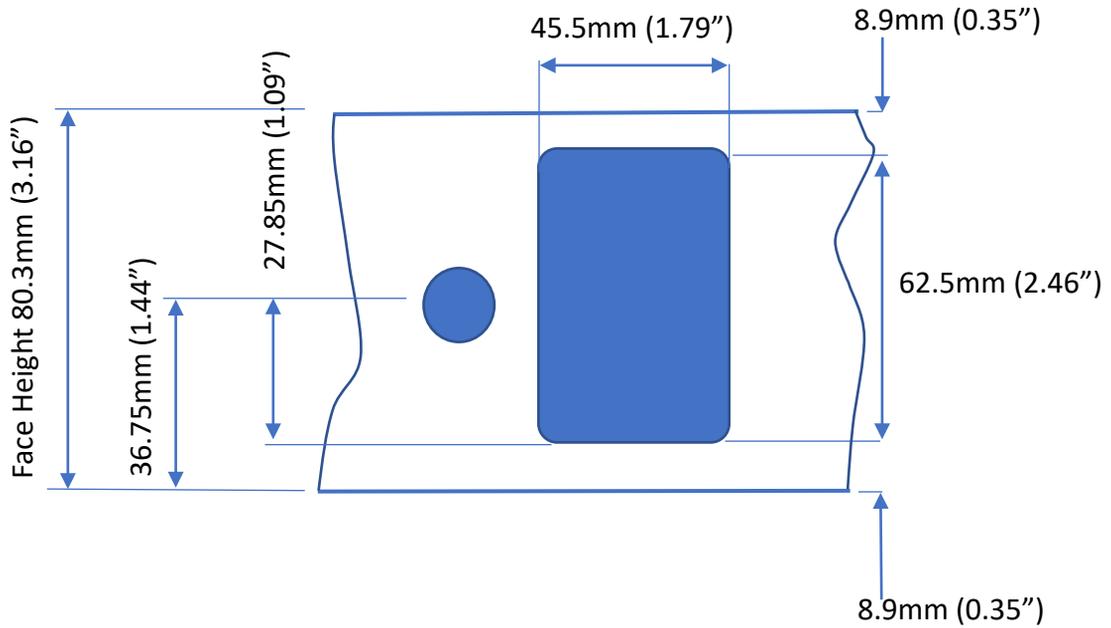
| ALTERNATOR PULLEY DIAMETER | WATER PUMP PULLEY DIAMETER | CRANK V-PULLEY DIAMETER | 11mm V-BELT LENGTH * | V-BELT P/No(s). |
|----------------------------|----------------------------|-------------------------|----------------------|-----------------|
| 68                         | 160                        | 160                     | 1216-1285            | 11A1225         |
| 68                         | N/A                        | 160                     | 1034-1106            | 11A1055         |

| V-PULLEY P/No. | DESCRIPTION                                |
|----------------|--|
| 99-PLY16417    | V-Pulley Water Pump BBC (short water pump) |

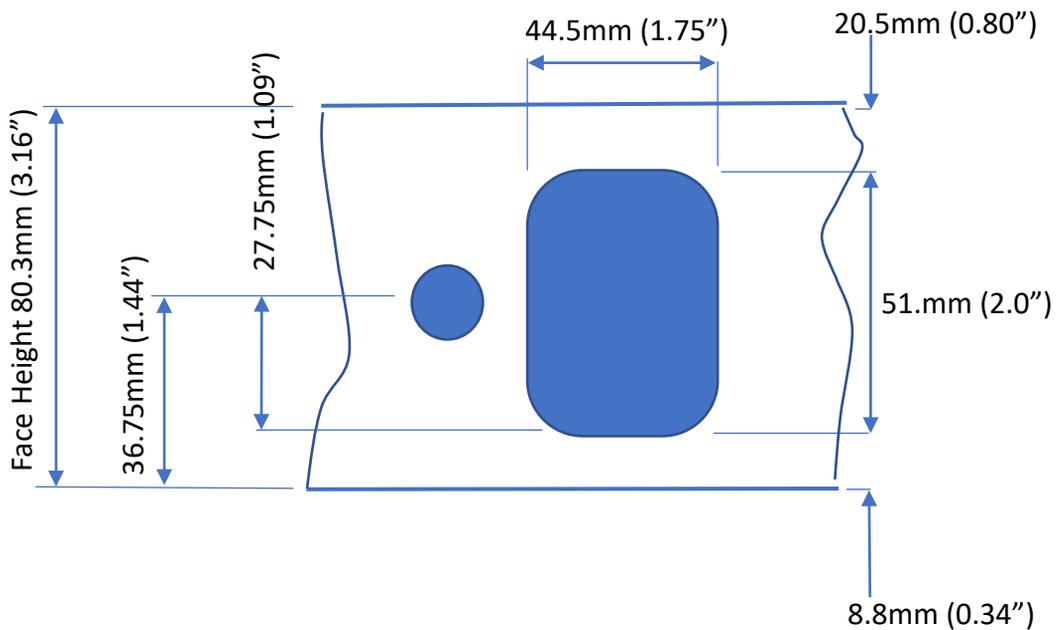
Max crank speed 6200rpm, Max Supercharger Speed 18000rpm (red cells indicate s/c warranty void)

\* WITH OPTIONAL HARROP ALTERNATOR MTG BRKT KIT and CUSTOMER SUPPLIED GM CS130 ALTERNATOR

**INTAKE PORT SPECIFICATIONS**



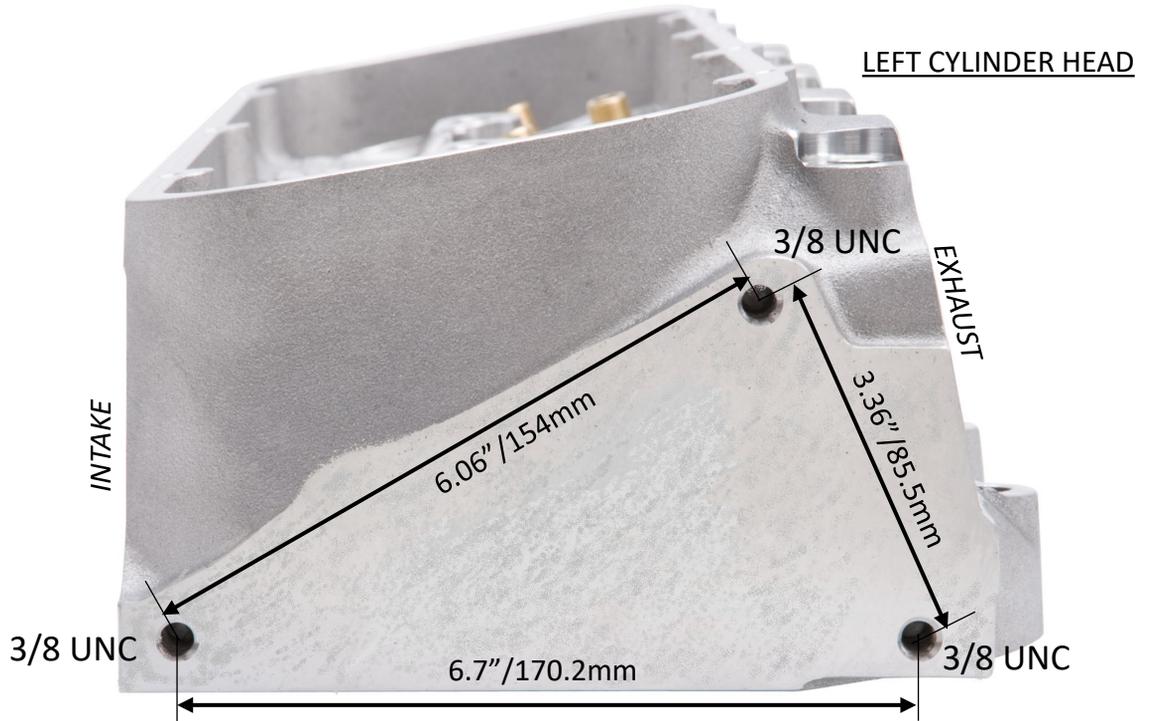
Harrop BBC supercharger lower manifold **Rectangular Port** size



Harrop BBC supercharger lower manifold **Oval Port** size

**CYLINDER HEAD ACCESSORY BOLT PATTERN**

MOUNTING REQUIREMENT FOR 10PK HD DRIVE TENSIONER BRACKET ASSEMBLY

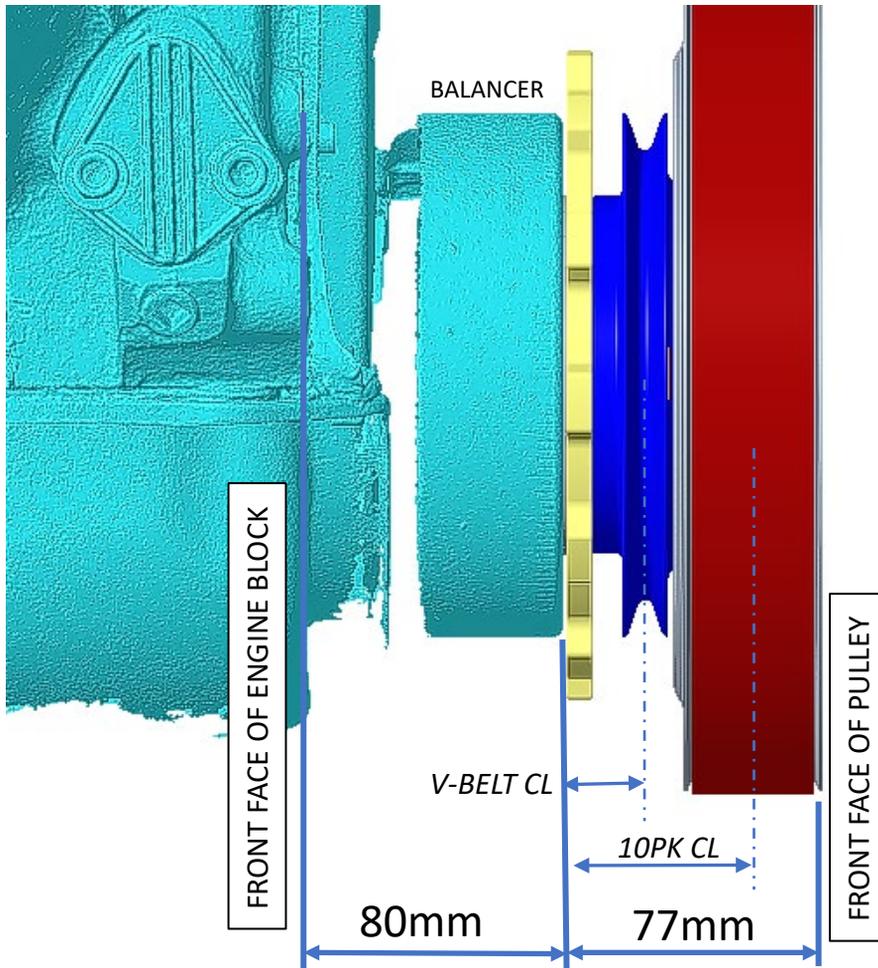


MOUNTING REQUIREMENT FOR OPTIONAL ALTERNATOR MOUNTING KIT - 10PK HD DRIVE



*\* Note: Drilling of optional A16415 Alternator Mounting kit maybe req'd to suit SHx7/16 UNC mounting bolts (not supplied) as thread specifications may vary across makes/models of cylinder heads.*

**POSITION OF CRANK DAMPER MOUNT FACE**

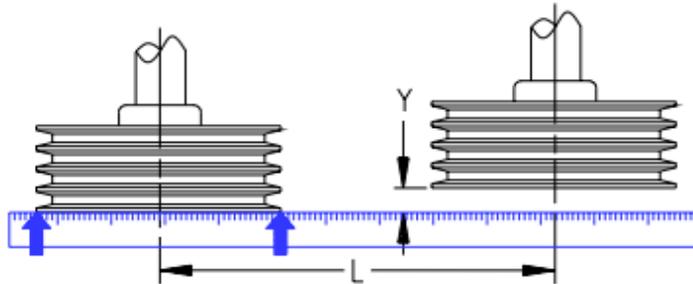


- 80mm - FRONT FACE OF ENGINE BLOCK TO FRONT OF CRANK DAMPER (MOUNT FACE)
- BELT CL – CRANK DAMPER MOUNT FACE TO CENTRE OF BELT (ie. CENTRELINE OF PULLEY)  
 10PK BELT = 56mm  
 V-BELT = 21.5mm
- 77mm - CRANK DAMPER MOUNT FACE TO FRONT FACE OF 10PK PULLEY

*Some machining maybe required to achieve belt/pulley alignment across the entire drive system.  
 Note:- The 10PK V-belt adapter has sufficient material thickness for machining to accommodate a 10mm thick (max) trigger wheel*

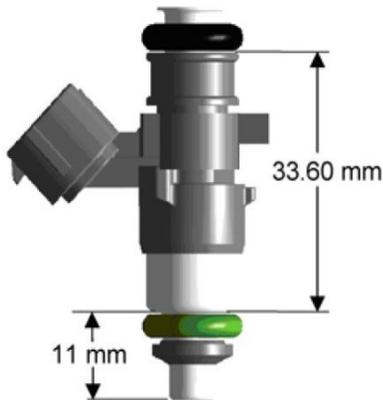
**PULLEY ALIGNMENT:**

Some shimming/machining maybe required to achieve belt/pulley alignment across the entire drive system.



| 10PK RIBBED PULLEY TO RIBBED PULLEY L (mm) | MAXIMUM ALLOWABLE MIS-ALIGNMENT DISTANCE Y (mm) |
|--|---|
| SUPERCHARGER TO TENSIONER BRACKET L=338mm  | 1.4mm   |
| TENSIONER BRACKET TO CRANK L=302mm         | 1.3mm   |

### ADDITIONAL PARTS REQUIRED:

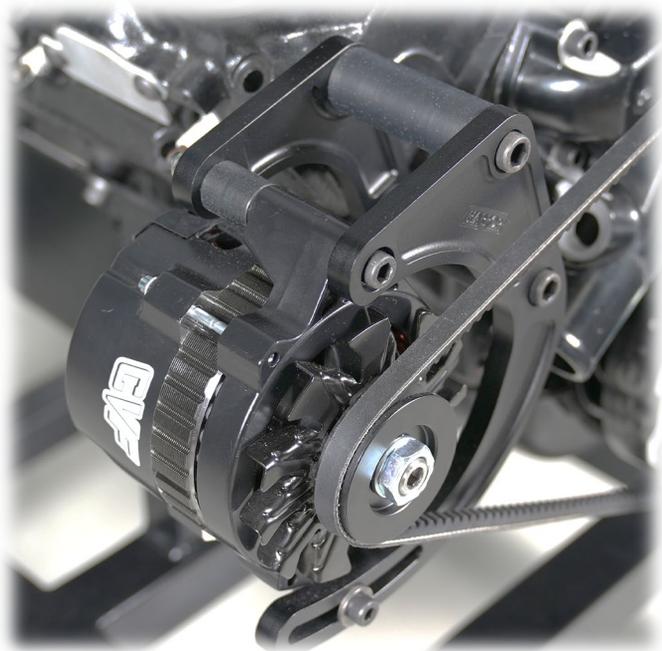


| Harrop option   | Customer to supply  |
|---|---|
| DW-GM Injector (USCAR) set/8-65lb/hr -680cc<br># 65-16U-00-0065-8<br>DW-GM Injector (USCAR) set/8-90lb/hr -945cc<br># 65-16U-00-0090-8<br>DW-GM Injector (Jetronic) set/8-115lb/hr -1200cc<br># 65-16MX-22-1200-8 | EV14 Compact Fuel Injector<br>(33.6mm across O-ring shoulders) x 8 req'd  |
|   | LS Style throttle body (104mm x 70mm 4 Hole Mount) - <i>if not using the 110mm integrated front cover Throttle Body</i>                       |
|   | CAM Sync Sensor (MSD #85141), and clamp   |
|   | Harmonic Balancer - 3 or 6 bolt hole (3.2" PCD)   |
|   | Crank Trigger Assembly – (Innovators West #7004, or #7005)<br><i>Mount kit (#929 or #1064) Alternator position/waterpump outlet dependant</i> |
| 99-PLY16417 V-Pulley Water Pump –BBC<br>(to suit "short" 5 3/4" mechanical water pump)  |   |
| 99-AINT12953 Harrop Universal Intercooler Kit<br>(Intercooler size 560mm x 305mm x 40mm)  | Intercooler, pump, reservoir bottle, hoses and clamps   |
| 99-ABKT16415 Bracket Asm Alternator BBC (to suit a v-belt GM CS130 140amp Alternator with 6-12 o'clock mtg and 6.6" bolt spacing – NOT SUPPLIED)  | Alternator (v-belt), V-Belt, and modified alternator mount  |
|   | Gaskets for Intake manifold and thermostat housing  |



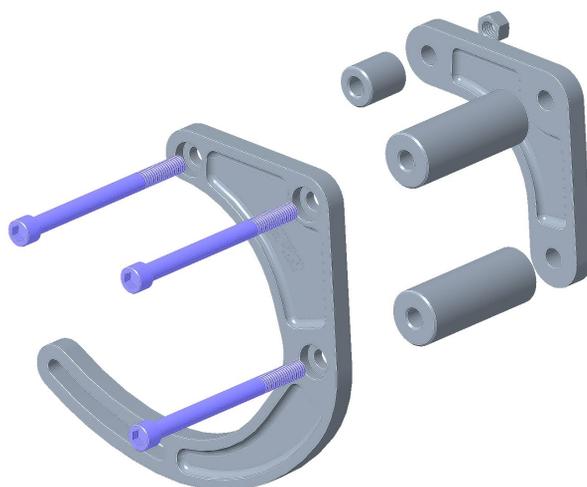
99-PLY16417 Pulley V-Belt Water Pump - BBC  
Suits BBC Short Mechanical Water Pump  
Pilot Shaft 5/8" diameter  
Dia 158 (6.25")  
1.75" PCD

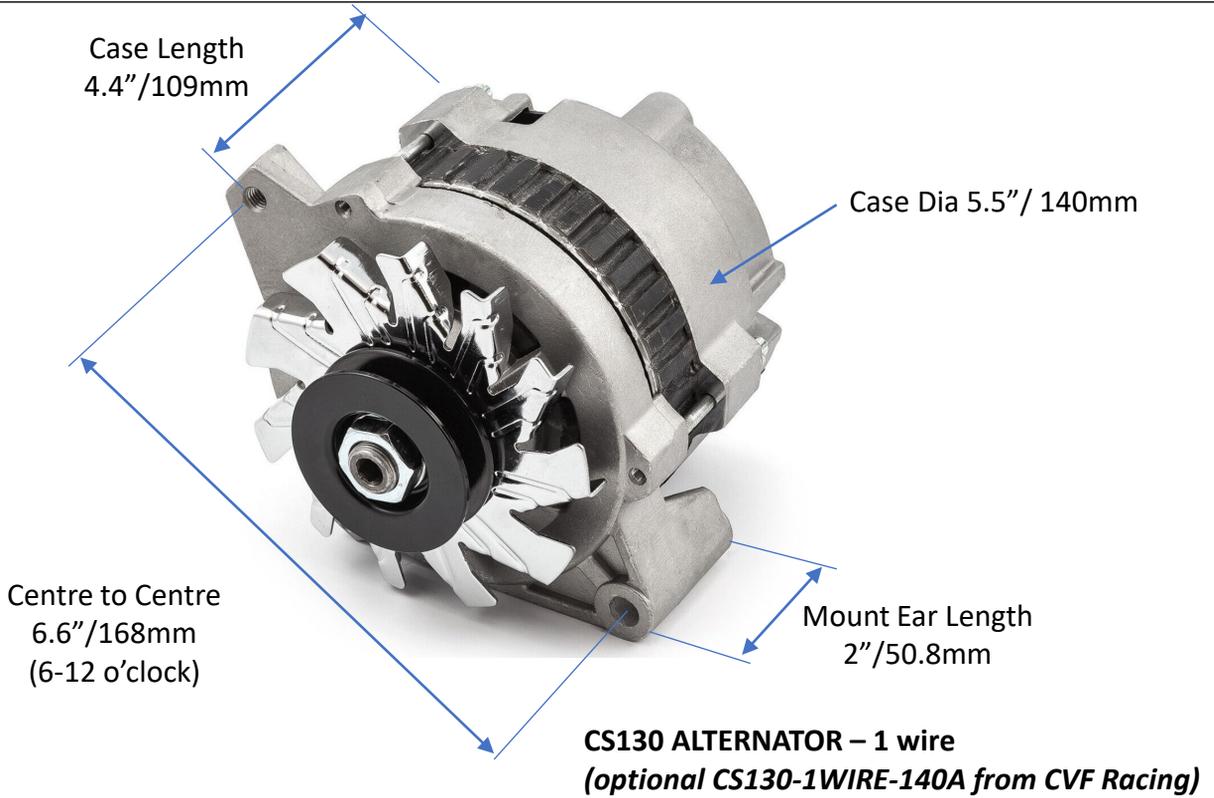
**99-PLY16417 PULLEY, V-BELT WATER PUMP BBC**  
*(use with optional B-BBCS-WP from CVF Racing)*



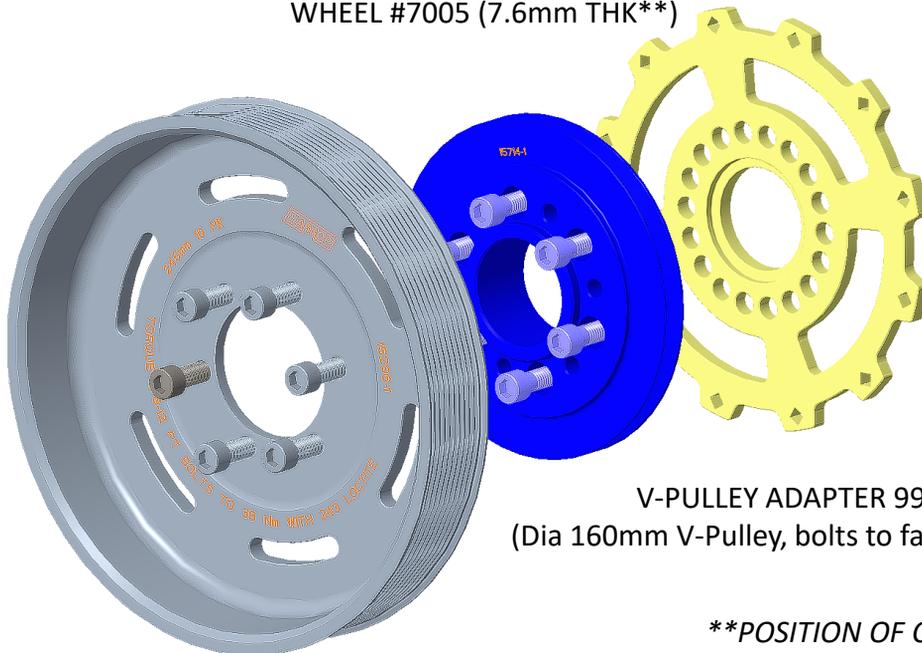
99-ABKT16415 Bracket Asm Alternator BBC  
(Suits a V-belt GM CS130 140amp Alternator  
with 6-12 o'clock mtg and 6.6" bolt spacing)

**99-ABKT16415 BRACKET ASM, ALTERNATOR BBC**





INNOVATORS WEST TRIGGER  
 WHEEL #7005 (7.6mm THK\*\*)



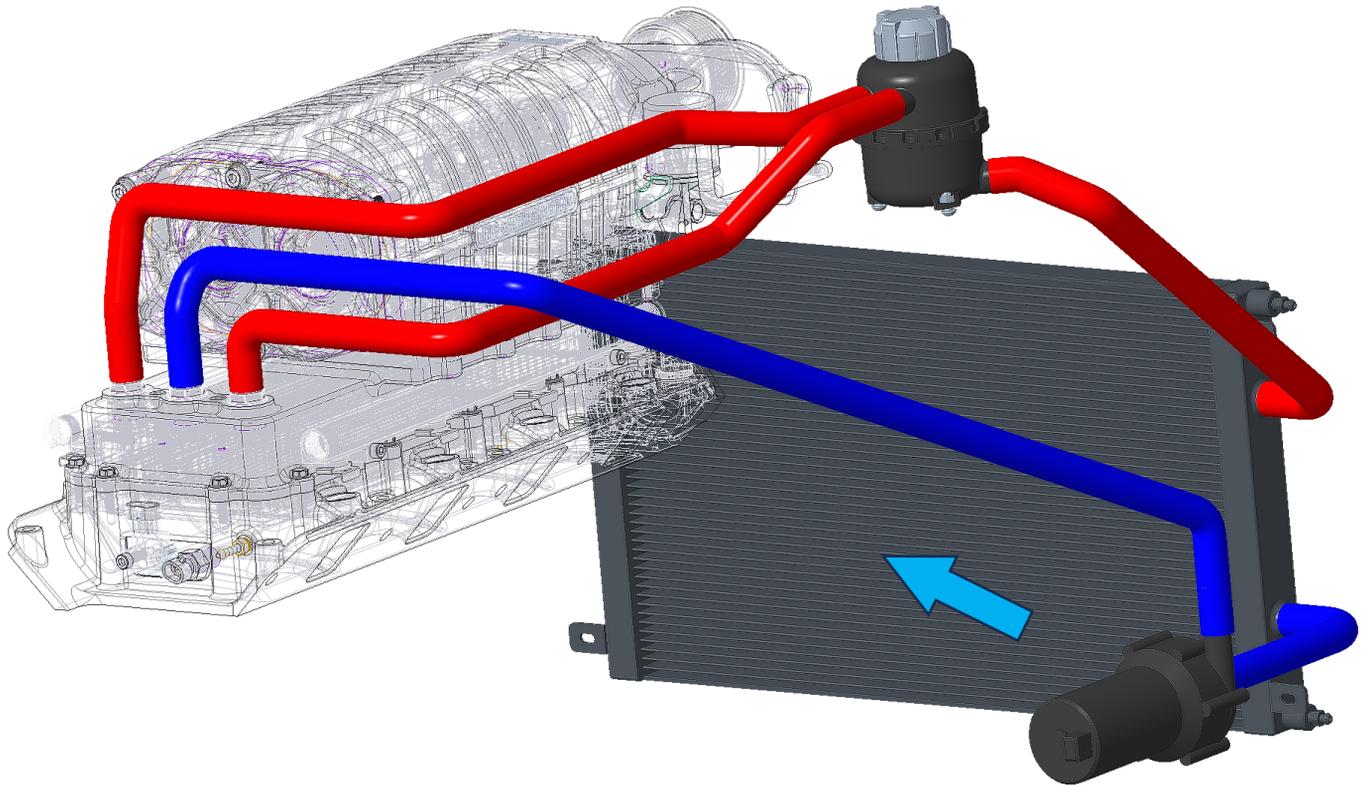
V-PULLEY ADAPTER 99-PLY15714  
 (Dia 160mm V-Pulley, bolts to factory crank damper)

**\*\*POSITION OF CRANK PULLEY BELT  
 CENTRELINE IS CRITICAL TO AVOID  
 MISALIGNED PULLEYS**

10PK Dia205 CRANK PULLEY 99-PLY15295  
 10PK Dia245 CRANK PULLEY 99-PLY15296

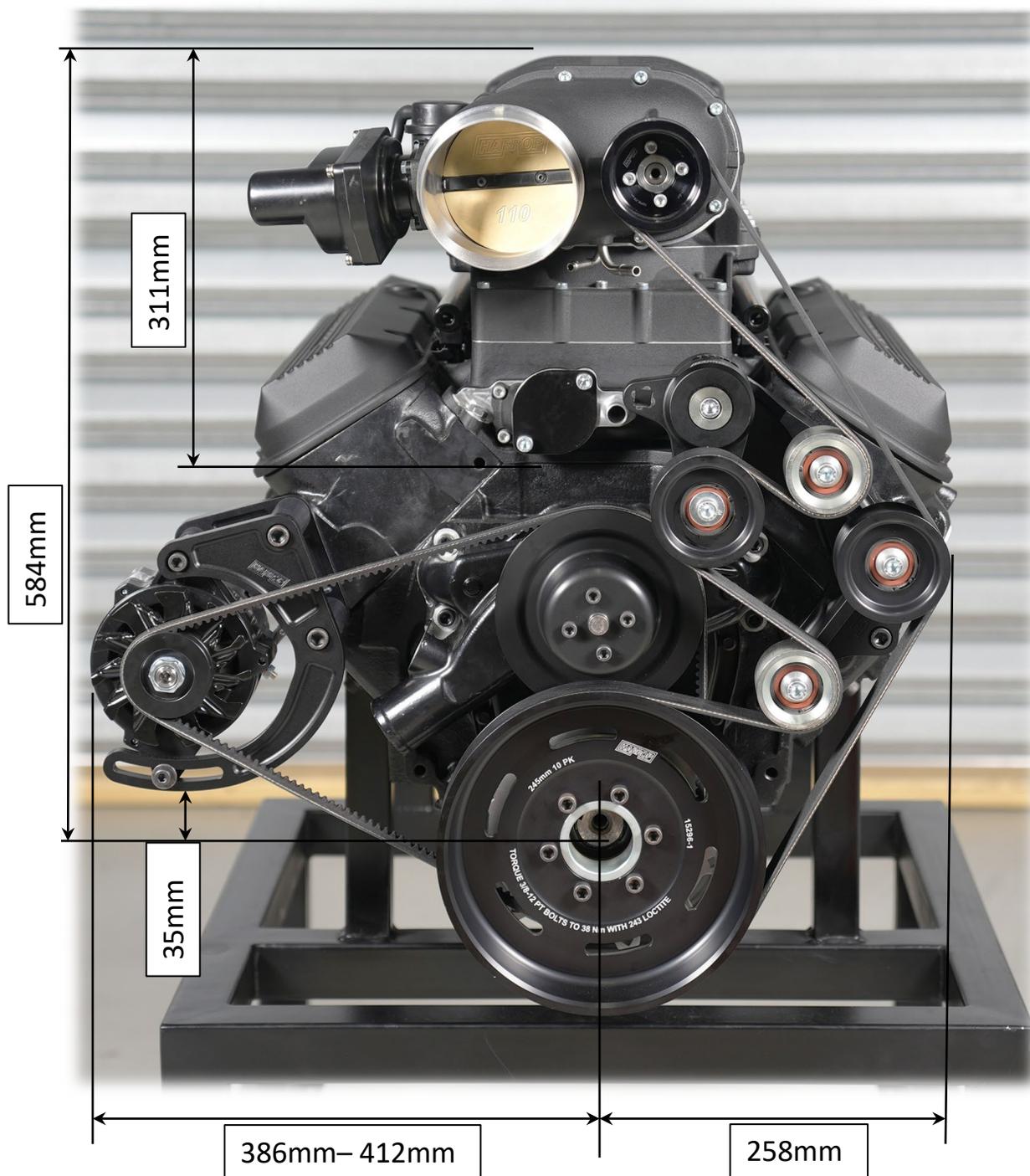
**10PK HD DRIVE CRANK PULLEY ASSEMBLY**

## GENERIC INTERCOOLER ROUTING



### Engine kit does not include reservoir, radiator, pump or hoses

- Illustration is a generic coolant circuit diagram.
- Blue arrow indicates flow direction
- Intercooler reservoir must be mounted at the highest point in the circuit
- Intercooler pump must be mounted lower than the intercooler reservoir
- Intercooler system must be filled with a 1:1 mix of GM6277M coolant concentrate and distilled or deionised water
- Optional:- *HARROP UNIVERSAL INTERCOOLER KIT 99-AINT12953*



584mm C/L OF CRANK TO TOP OF S/C

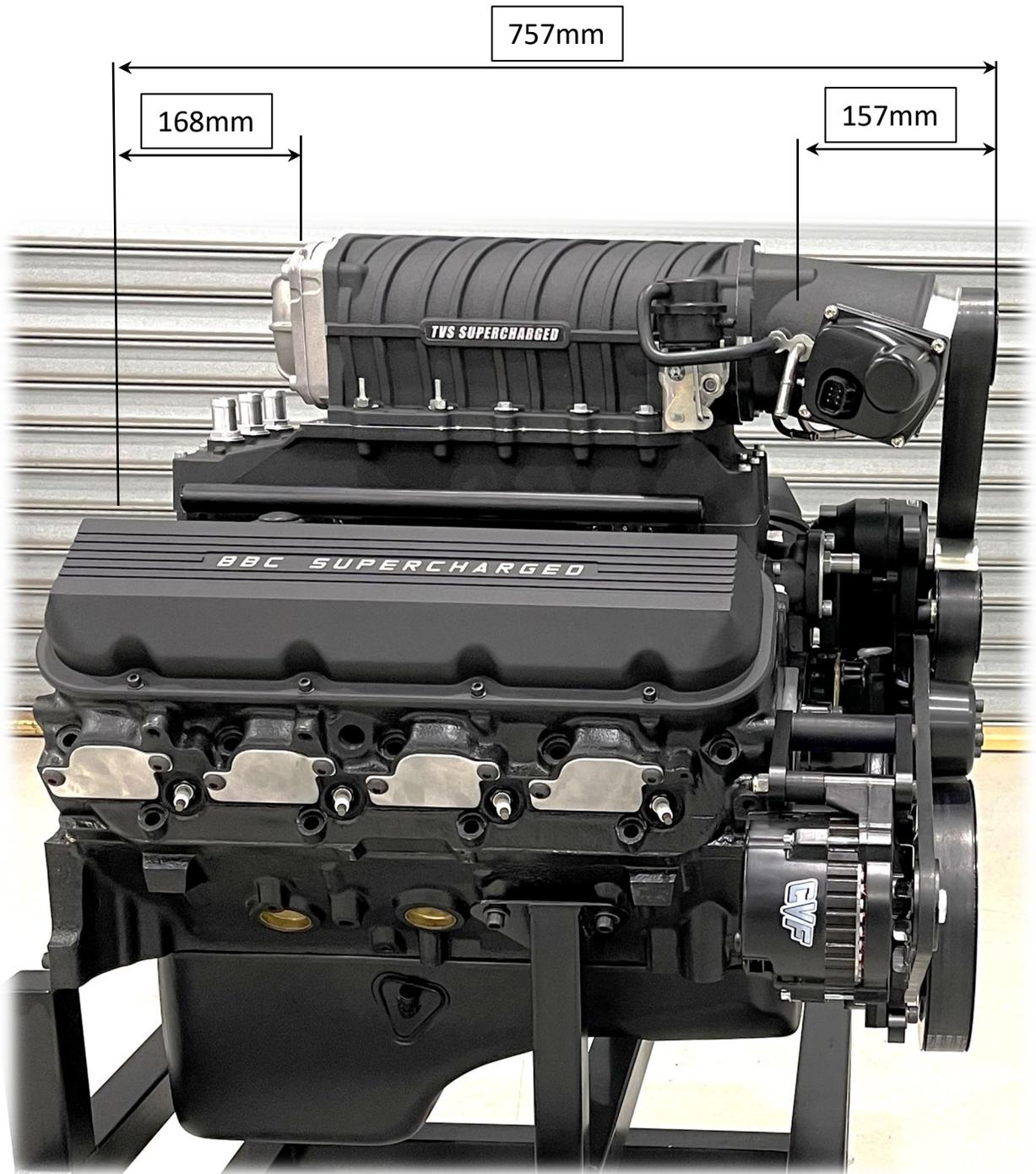
311mm TOP OF ENGINE BLOCK TO TOP OF S/C

258mm C/L OF CRANK TO OUTER EDGE OF PULLEY

386mm C/L OF CRANK TO OUTER EDGE OF OPTIONAL ALTERNATOR BRACKET

412mm C/L OF CRANK TO OUTER EDGE OF CS130 STYLE ALTERNATOR

*C/L = Centreline S/C = Supercharger*



157mm FRONT OF LEFT CYLINDER HEAD TO FRONT OF 10PK PULLEY  
757mm REAR FACE OF ENGINE BLOCK TO FRONT FACE OF S/C PULLEY  
168mm REAR FACE OF ENGINE BLOCK TO REAR OF S/C

*C/L = Centreline S/C = Supercharger*

| ENGINE   | COMPONENTS   | POWER CORRECTION | POWER HP | TORQUE Ft lbs | BOOST | SC PULLEY DIAMETER | FUEL   |
|--|--|------------------|----------|---------------|-------|--------------------|--------|
| Mark IV 454 cubic inch<br>Big Block Chev<br>Rectangle Port Cylinder<br>Heads<br>Hydraulic flat tappet<br>cam, roller rockers,<br>performance valve<br>springs and pushrods | Harrop TVS2650<br>Supercharger Kit<br>110mm Throttle<br>Body<br>10PK HD Drive<br>System ALT Only<br>Harrop 245mm<br>Crank Pulley | SAE 2004         | 942 hp   | 754 ft lbs    | 20PSI | 80mm               | 98 RON |

**Watch the video here**

[https://youtu.be/YRRlxniY\\_z4?si=eAMc0duDLHCOHScd](https://youtu.be/YRRlxniY_z4?si=eAMc0duDLHCOHScd)

*The above Performance figures were obtained from a SuperFlow Engine Dyno*

### FAQ:-

#### **The bolts supplied with the alternator mtg kit don't screw into my cylinder head.**

The bolts supplied are to suit a 3/8 unc threaded hole in the rh cylinder head. Some variation in thread sizes may occur across cylinder head years and manufacturers. You will need to drill out the brkt to suit 7/16unc bolt, and then purchase the appropriate socket head bolts to suit.

#### **Will this kit fit my 502 Chevelle?**

This Harrop Supercharger Engine Kit was installed, tested and verified, on a Mk4 9.8" deck height Big Block Chevrolet with Mk4 style aftermarket cylinder heads. Also refer page 19-20 for dimensions.

#### **Im using a different trigger wheel to the one shown?**

Machining of the 10pk v-pulley adapter maybe req'd to suit a max 10mm thick trigger wheel. Alternatively, a spacer (not supplied) maybe req'd to maintain the dimension shown in the above Tech Guide

#### **Can I use an original style distributor?**

No, it will not fit. Harrop suggest a Cam Sync Sensor. Check with your engine builder and tuner.

#### **The Crank Trigger doesn't fit onto the crank damper?**

Using an alternate damper and trigger wheel to those specified in the Tech Guide may require machining. Refer trigger wheel manufactures guidelines.

#### **Can I use my existing Crank Damper?**

Yes. Refer tech guide

#### **Can I use an ATI Super Damper?**

Yes. Refer ATI site to determine the damper that suits your engine requirements.

#### **My belt jumps off?**

Check belt length, and tensioner travel. Check all pulley alignment (using a laser, or long straight edge...refer pulley alignment chart)

#### **The belt squeals, and, or Im losing power?**

Ensure all pulleys and belt are aligned, clean and free of contaminants. Check tensioner functionality. A shorter belt maybe req'd

#### **Can I use my mechanical cooling fan?**

This has not been tested or verified, and is up to the customer

#### **Im using a different alternator to the one listed on page 8 of the Tech Guide?**

The alternator tested was a 140 Amp GM CS130 Alternator with 6-12 O'clock mounting and 6.6" bolt spacing mounted to a Harrop Alternator Bracket Asm. The 10PK HD Drive has a unique v-belt offset. You will need to work out your own mounting strategy and v-belt length depending on your desired alternator type and position.

#### **Can I use my stock alternator bracket?**

Your bracket will require modifications to achieve the desired unique v-belt position. See above.

#### **Can I use an electric water pump for the 10PK HD Drive option?**

Yes. IMPORTANT: Maintain clearance to the 10PK belt tensioner thru its travel. An alternate length v-belt for the alternator is req'd

#### **I want to use air conditioning and power steering?**

The 10PK HD Drive does not support air conditioning or power steering. Please refer to page 8.