



**TECHNICAL GUIDE**  
**TVS2650 SUPERCHARGER**  
**SMALL BLOCK FORD**



DEC 2023 (Rev 1)

### 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:**

- Small Block Ford with an 8.2" deck height. I.E- 289-302 Windsor engine block
- Windsor style cylinder heads
- Early style Timing Cover
- Early style Water Pump with LH inlet
- ATI Balancer

### **NOTE:**

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

### Overview:

Harrop TVS2650 Supercharger Engine kit for a Small Block Ford (8.2" Deck Height)

**Part number:** 99-AMFD15765      **Description:** MANIFOLD ASM TVS2650 SBF 8.2 DECK

### 8PK FRONT DRIVE (Refer to Page 7)

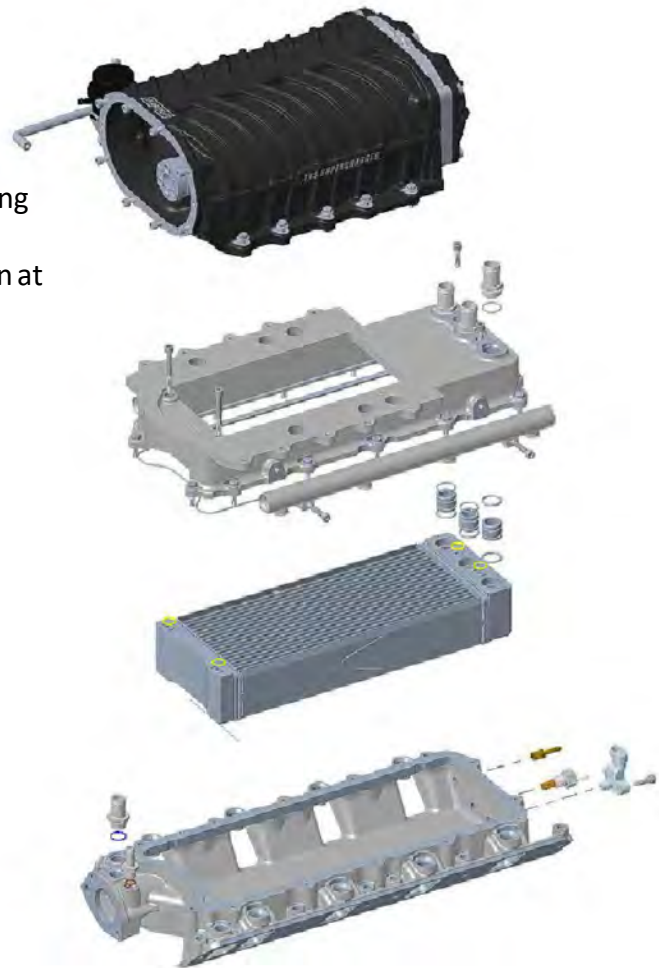
**Part number:** 65-B-5.0L-WRAPTOR-AC      **Description:** B-5.0L-WRAPTOR-AC-HARROP

### 10PK HD DRIVE (Refer to Page 8)

**Part number:** 99-AKIT15780      **Description:** KIT 10PK FRONT DRIVE SBF

### 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 charge air intercooler: High density fin at 61mm 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 injectors *(with -8 AN threads each end).*



### DRIVE SYSTEMS AVAILABLE



**8PK FRONT DRIVE**  
*(CVF all inclusive Wraptor 8 track Supercharger Serpentine System)*  
 Refer [www.cvfracing.com](http://www.cvfracing.com)

**10PK HD DRIVE**

### DRIVE SYSTEM SUPPORTED ACCESSORIES

	8PK FRONT DRIVE	10PK HD DRIVE
Air Conditioning	Green	Red
Power Steering	Green	Red
Alternator	Green	
Water Pump	Green	
Power (<900hp)	REFER PERFOR	ANCE TABLE (page 25)
Power (>900hp)	REFER PERFOR	ANCE TABLE (page 25)



**8PK FRONT DRIVE:**

- 8PK dia 160mm Crank Pulley
- Premium 8PK Belt
- CVF all inclusive *Wraptor 8* Track Supercharger Serpentine System features  
Water Pump - High Flow Aluminium Reverse direction, 5.7" tall, 5/8" pilot, Driver (LH Inlet), and modified mounting boss.  
Alternator - 140 Amp GM CS130 Style with 6-12 O'clock mounting and 6.6" bolt spacing.  
Power Steering Pump - GM Type II pump.  
Compressor - Peanut Style (7B10) AC Compressor with 8 Rib Clutch.  
HD Tensioner  
All Pulleys, Idlers, and mounting hardware and instructions.

*Note: Customer sourced ATI Balancer and Trigger Wheel Assembly – refer pages 15/16.*



### 10PK HD DRIVE:

- 10PK dia 205mm Crank Pulley Assembly  
(crank pulley, v-pulley adapter, and fasteners)
- 10PK Tensioner Bracket Assembly
- Alternator mounting bracket kit to suit a 140 Amp GM CS130 Alternator with 6-12 O'clock mounting and 6.6" bolt spacing (bracket kit optional)
- Mechanical Water Pump V-Pulley to suit Driver (LH Inlet) 5.7" tall Water Pump (optional)
- 10pk belt
- V-Belt (optional)

*Note: Customer sourced Alternator, ATI Balancer and Trigger Wheel Assembly – refer pages 15/ 16.*



### 8PK SUPERCHARGER PULLEY:-

PULLEY P/No.	DESCRIPTION
99-PLY16257-GT	Pulley, Supercharger, 8PK, Ø65.0 OD, 22.3 Offset
99-PLY16258-GT	Pulley, Supercharger, 8PK, Ø70.0 OD, 22.3 Offset
99-PLY16259-GT	Pulley, Supercharger, 8PK, Ø75.0 OD, 22.3 Offset
99-PLY16245	Pulley, 8PK, Ø160, CVF SBF

SUPERCHARGER PULLEY DIAMETER	CRANK PULLEY DIAMETER	BELT P/No.	SUPERCHARGER SPEED
65	160	65-8PK2533	15300 RPM
70	160	65-8PK2540	14200 RPM
75	160	65-8PK2554	13300 RPM

### 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-PLY16237	Pulley, 10PK, Ø205 4x90
99-PLY16238	Pulley, 10PK, Ø245 4x90

### 10PK PULLEYS and BELT:-

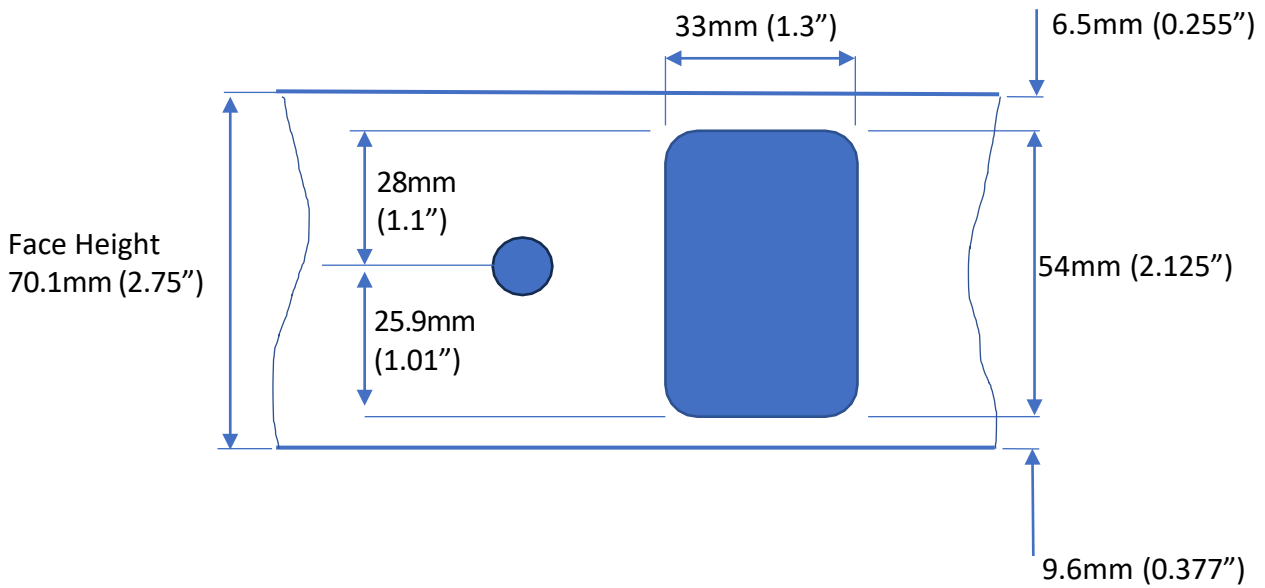
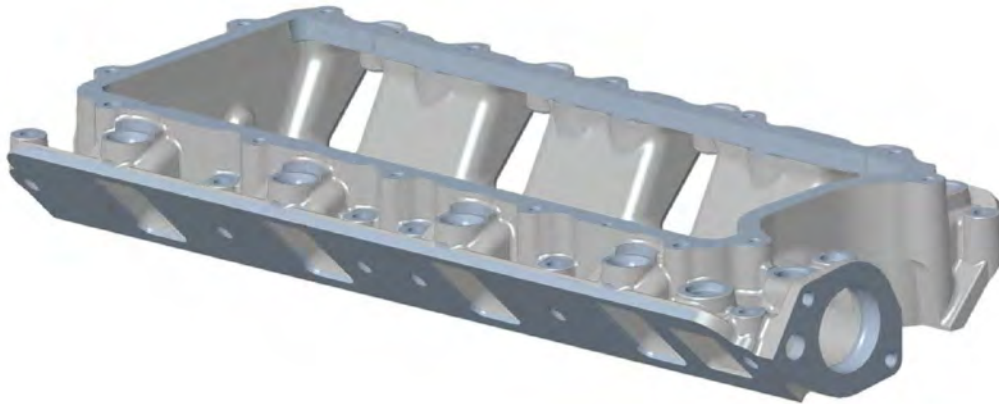
SUPERCHARGER PULLEY DIAMETER	CRANK PULLEY DIAMETER	10PK BELT P/No.	SUPERCHARGER SPEED
65	205	65-10PK1962	19550 RPM
70	205	65-10PK1962	18150 RPM
75	205	65-10PK1976	16950 RPM
80	205	65-10PK2018	15900 RPM
85	205	65-10PK2018	14950 RPM

ALTERNATOR PULLEY DIAMETER	WATER PUMP PULLEY DIAMETER	V-BELT LENGTH *	V-BELT P/No(s).
65	118	950	11A0950, 7375
65	N/A	TBA	TBA
PULLEY P/No.	DESCRIPTION		
99-PLY16239	Pulley, V-Belt Water Pump SBF		

Max crank speed 6200rpm, Max Supercharger Speed 18000rpm

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

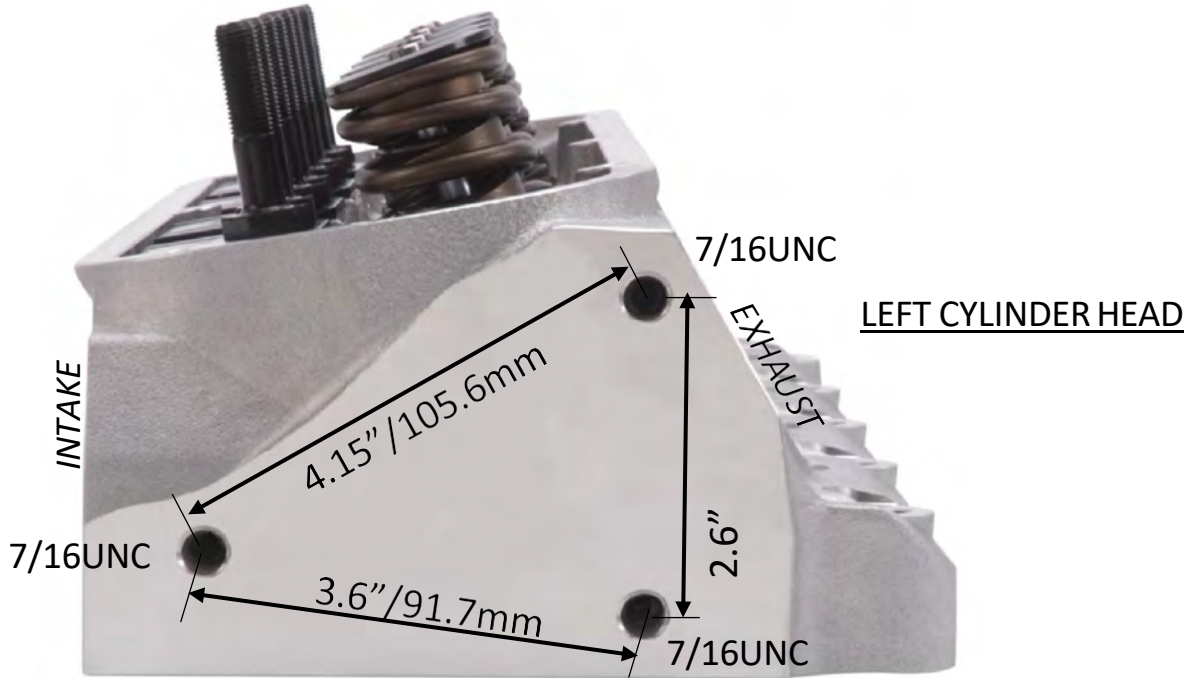
## INTAKE PORT SPECIFICATIONS



Harrop SBF Supercharger Lower Manifold port size to suit an 8.2" deck height Small Block Ford engine.

## CYLINDER HEAD ACCESSORY BOLT PATTERN

MOUNTING REQUIREMENT FOR 10PK HD DRIVE TENSIONER BRACKET ASSEMBLY



MOUNTING REQUIREMENT FOR 10PK HD DRIVE OPTIONAL ALTERNATOR BRACKET

## RIGHT CYLINDER HEAD



**WATER PUMP AND TIMING COVER – AS TESTED**



**8PK Front Drive**  
 Early Style Water Pump (CVF supplied)  
 5.7" tall, reverse rotation, 5/8" pilot,  
 Driver Inlet  
 (Use with Early Model Mechanical Fuel  
 Pump Timing Cover, or Dorman 635-100)



**10PK HD Drive**  
 Early Style Water Pump (GMB) - SBF  
 5.7" tall, 5/8" pilot, Driver Inlet  
 (Use with Early Model Mechanical Fuel Pump  
 Timing Cover, or Dorman 635-107)



**Water Pumps  
 DO NOT FIT  
 this late  
 model EFI  
 style front  
 timing cover**

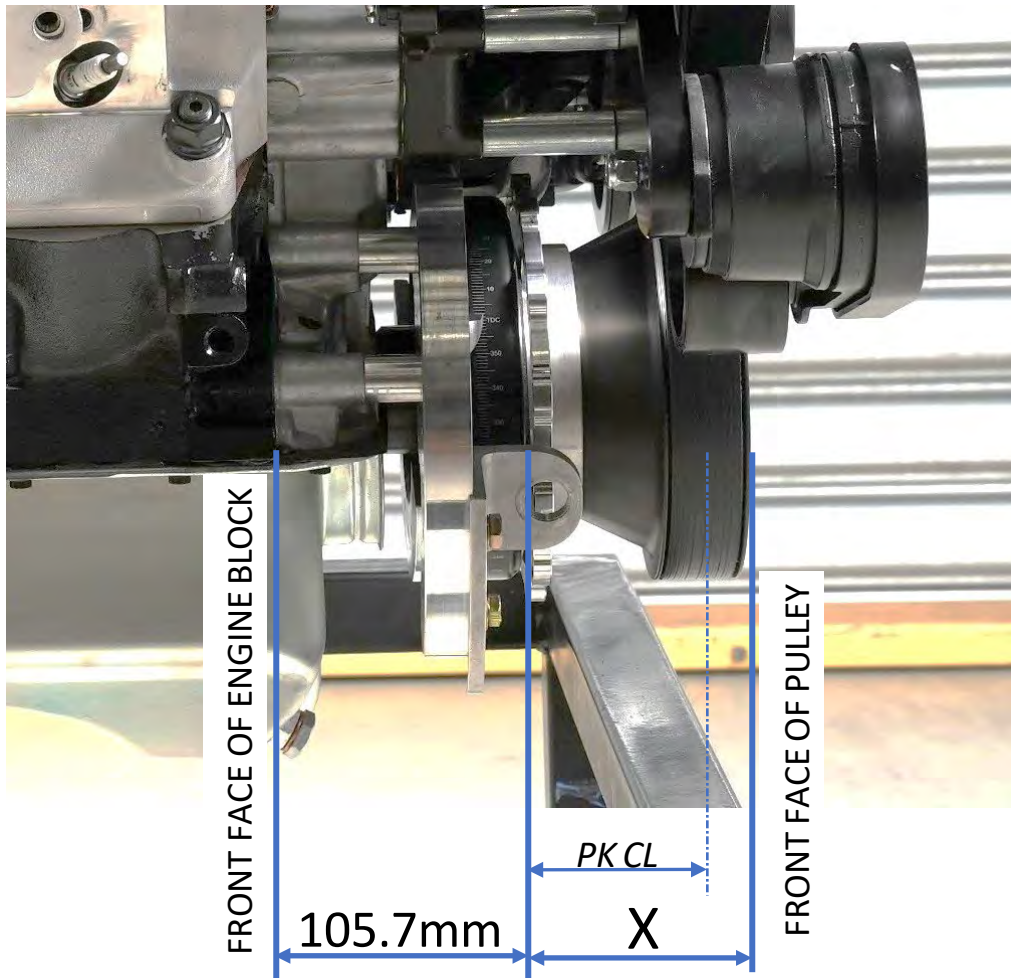


**Early model "mechanical fuel pump style" Front  
 Timing Cover (as tested with 8PK and 10PK)**

*DORMAN Timing Cover*  
 10PK HD Drive - Ref P/No 635-107  
 8PK Front Drive - Ref P/No 635-100

**Late model "EFI style" Front Timing**

**POSITION OF CRANK DAMPER MOUNT FACE**



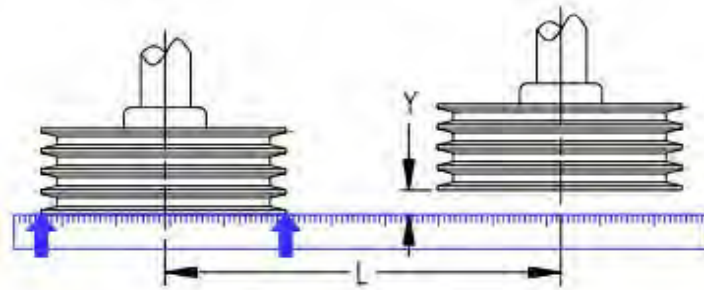
- **105.7mm** - FRONT FACE OF ENGINE BLOCK TO FRONT OF CRANK DAMPER (MOUNT FACE)
- **PK CL** – CRANK DAMPER MOUNT FACE TO CENTRE OF BELT (ie. CENTRELINE OF PULLEY)  
 8PK BELT = 69.8mm  
 10PK BELT = 65.8mm
- **V-PLY CL** – CRANK DAMPER MOUNT FACE TO CENTRE OF V-BELT (ie. CENTRELINE OF PULLEY)  
 10PK HD Drive V-BELT = 32.3mm
- **X** - CRANK DAMPER MOUNT FACE TO FRONT FACE OF PULLEY  
 8PK BELT = **87.2mm**  
 10PK BELT = **86.9mm**



*Some machining may be required to achieve belt/pulley alignment across the entire drive system.  
 Note:- The 8pk crank pulley, and the 10pk v-belt adapter have sufficient material thickness for machining, to accommodate a 10mm (max) thick “sandwich style” trigger wheel.*

**PULLEY ALIGNMENT:-**

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



8PK PULLEY TO PULLEY L (mm)	MAXIMUM ALLOWABLE MIS-ALIGNMENT DISTANCE Y (mm)
ALTERNATOR TO P/S PUMP L=130mm	0.6mm

NOTE:- The CVF Idler pulleys have a decorative cap which “closes in” the 8PK belt. These idler pulleys must be aligned to eliminate any belt shredding.

10PK RIBBED PULLEY TO RIBBED PULLEY L (mm)	MAXIMUM ALLOWABLE MIS-ALIGNMENT DISTANCE Y (mm)
SUPERCHARGER TO TENSIONER BRACKET L=238mm	1.0mm
TENSIONER BRACKET TO CRANK L=313mm	1.3mm

# SMALL BLOCK FORD TVS2650 SUPERCHARGER

## TECHNICAL GUIDE



### ADDITIONAL PARTS REQUIRED:



Harrop to supply (option)	Customer to supply
DW-GM Injector (USCAR) set/8-65lb/hr -680cc # 65-16U-00-0065-8 DW-GM Injector (USCAR) set/8-90lb/hr -945cc # 65-16U-00-0090-8 DW-GM Injector (Jetronic) set/8-115lb/hr -1200cc # 65-16MX-22-1200-8	EV14 Compact Fuel Injector (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>
	ATI Balancer (externally balanced #918900) ATI Balancer (internally balanced #918920)
	CAM Sync Sensor (MSD #85221)
	Crank Trigger Assembly – RIGHT side location STD (Innovators West #7001)
Universal Intercooler Kit A12953 (Intercooler size 560mm x 305mm x 40mm)	Intercooler, pump, reservoir bottle, hoses and clamps
	Gaskets for Intake manifold and thermostat housing
99-PLY16239 V-Pulley (use with mechanical water pump) – <u>10PK HD Drive only</u>	
Bracket Asm Alternator Mount HD #A16351 ( <i>to suit a v-belt GM CS130 140amp Alternator with 6-12 oclock mtg and 6"bolt spacing – NOT SUPPLIED</i> ) – <u>10PK HD Drive only</u>	Alternator (v-belt), and modified alternator mount – <u>10PK HD Drive only</u>

INNOVATORS WEST TRIGGER  
WHEEL #70001 (7.6mm THK\*\*)

ATI BALANCER  
(#918900)  
*externally balanced*

SH 3/8 UNC x 1.75



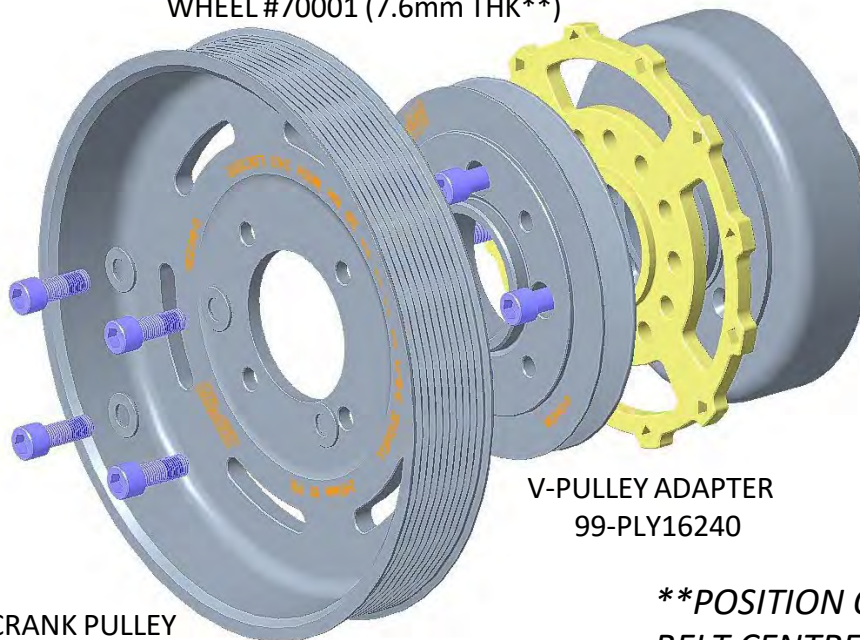
8PK CRANK PULLEY  
99-PLY16245

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

### 8PK FRONT DRIVE CRANK PULLEY ASSEMBLY

INNOVATORS WEST TRIGGER  
WHEEL #70001 (7.6mm THK\*\*)

ATI BALANCER  
(#918900)  
*externally balanced*



10PK CRANK PULLEY  
99-PLY16237

V-PULLEY ADAPTER  
99-PLY16240

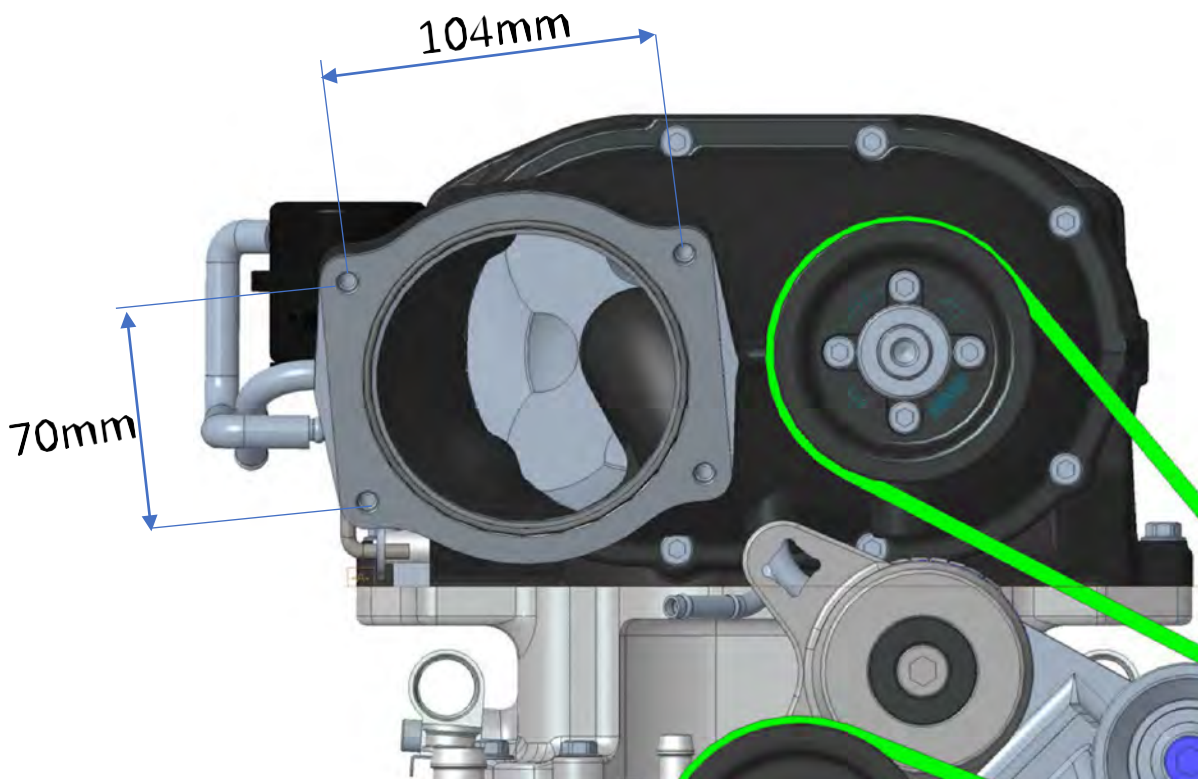
**\*\*POSITION OF CRANK PULLEY  
BELT CENTRELINE IS CRITICAL  
TO AVOID MISALIGNED PULLEYS**



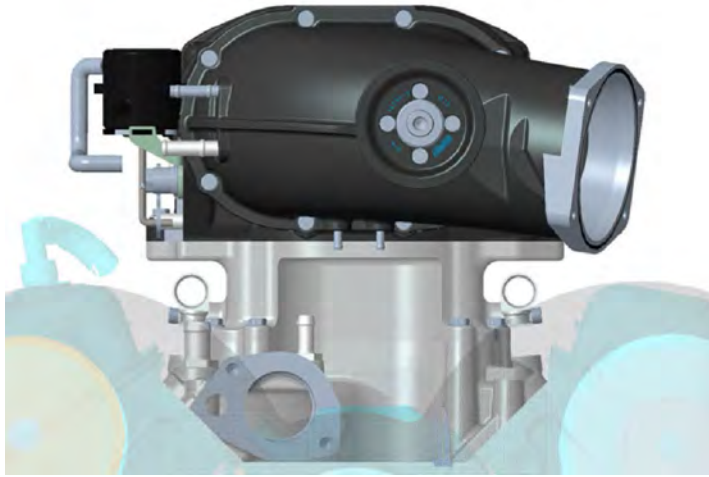
### FDFI INLET COVER OPTIONS, SUPERCHARGED – SBF

FRONT INLET COVER BIAS	8PK FRONT DRIVE	10PK HD DRIVE
99-ACVR13169 110 FWD ETC <i>(LS3 throttle body motor)</i>		
99-ACVR14983 110 FWD CABLE		
99-ACVR14324 LH BIAS	**	**
99-ACVR14234 RH BIAS	**	**
99-ACVR13167 FWD INLET	**	**

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



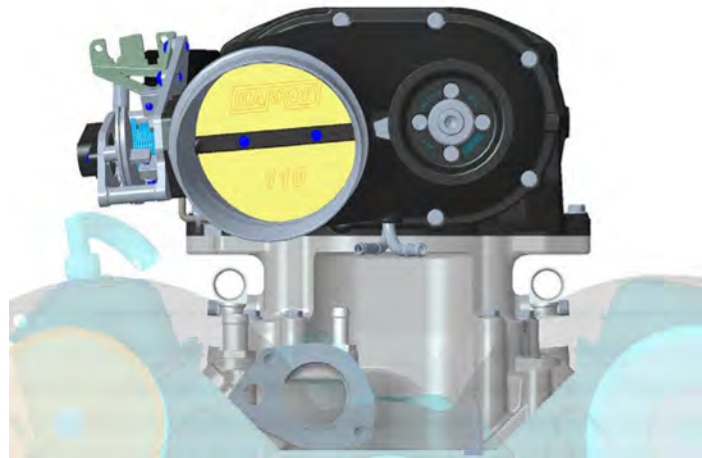
**8PK FRONT DRIVE - FDFI INLET COVER OPTIONS**



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



**FWD BIAS**  
**(99-ACVR-13167)**

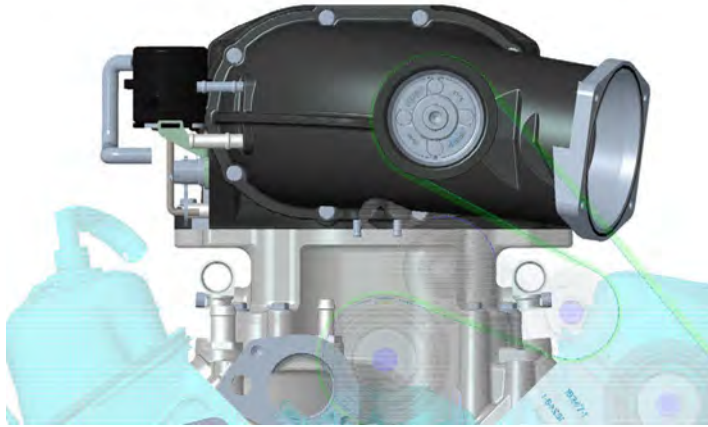


**110 FWD BIAS**  
**(99-ACVR14983 CBL)**  
**(99-ACVR13169 ETC)**



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

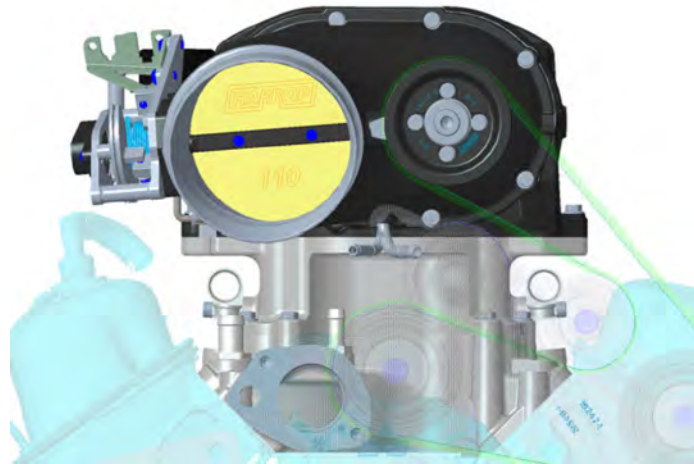
**10PK HD DRIVE - FDFI INLET COVER OPTIONS**



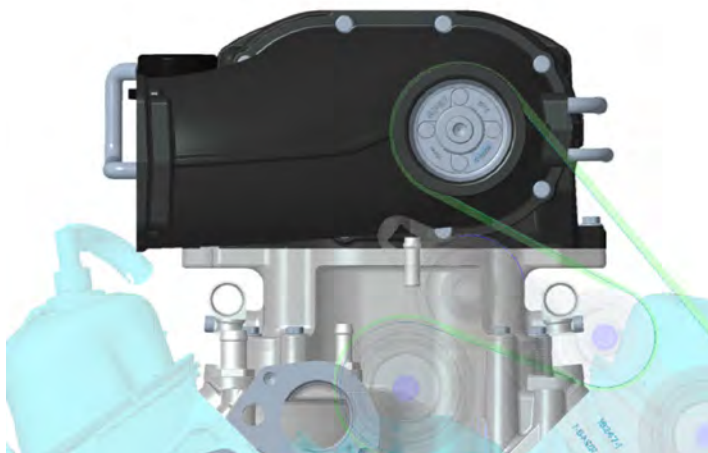
**LEFT BIAS**  
**(99-ACVR14324)**



**FWD BIAS**  
**(99-ACVR-13167)**

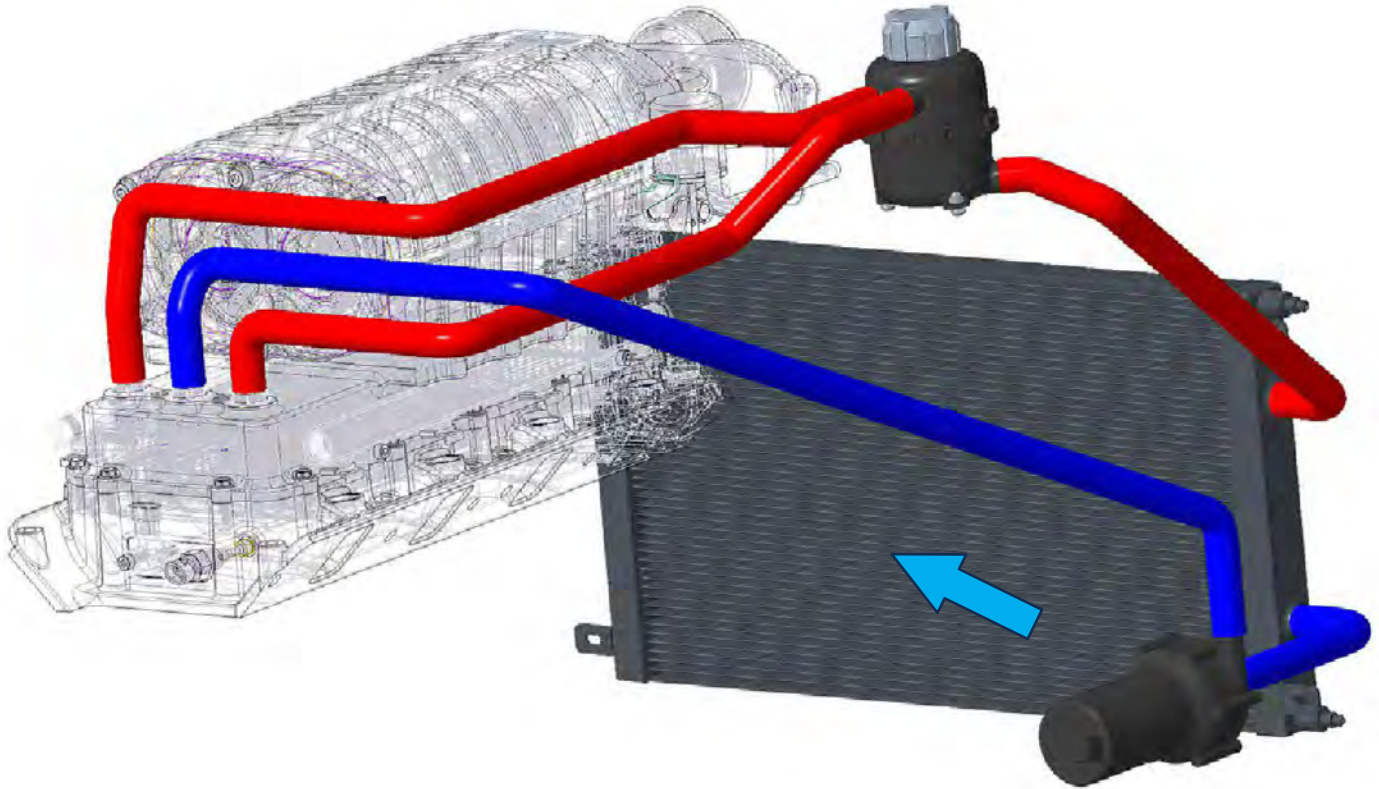


**110 FWD BIAS**  
**(99-ACVR14983 CBL)**  
**(99-ACVR13169 ETC)**



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

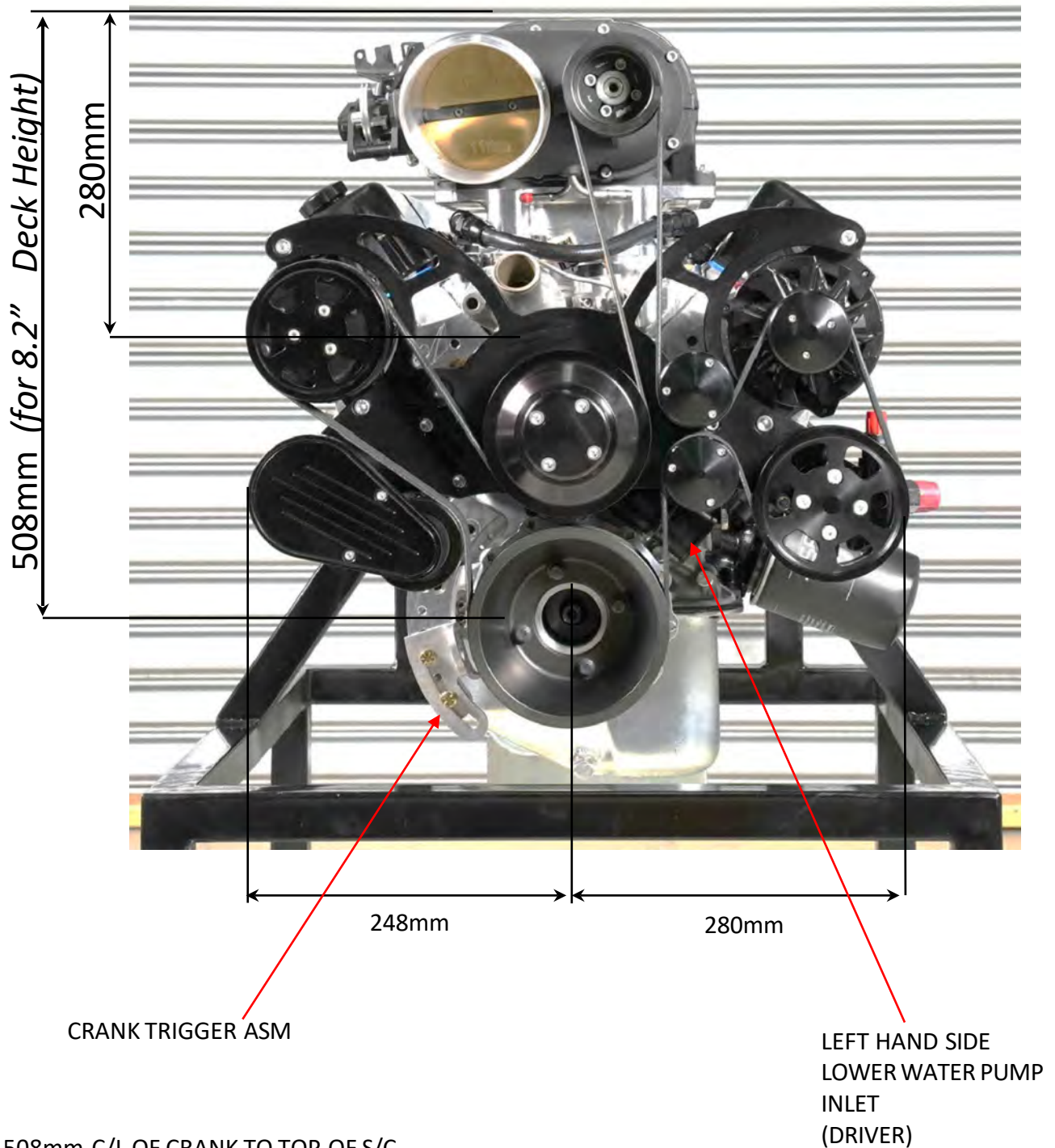
### GENERIC INTERCOOLER ROUTING



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

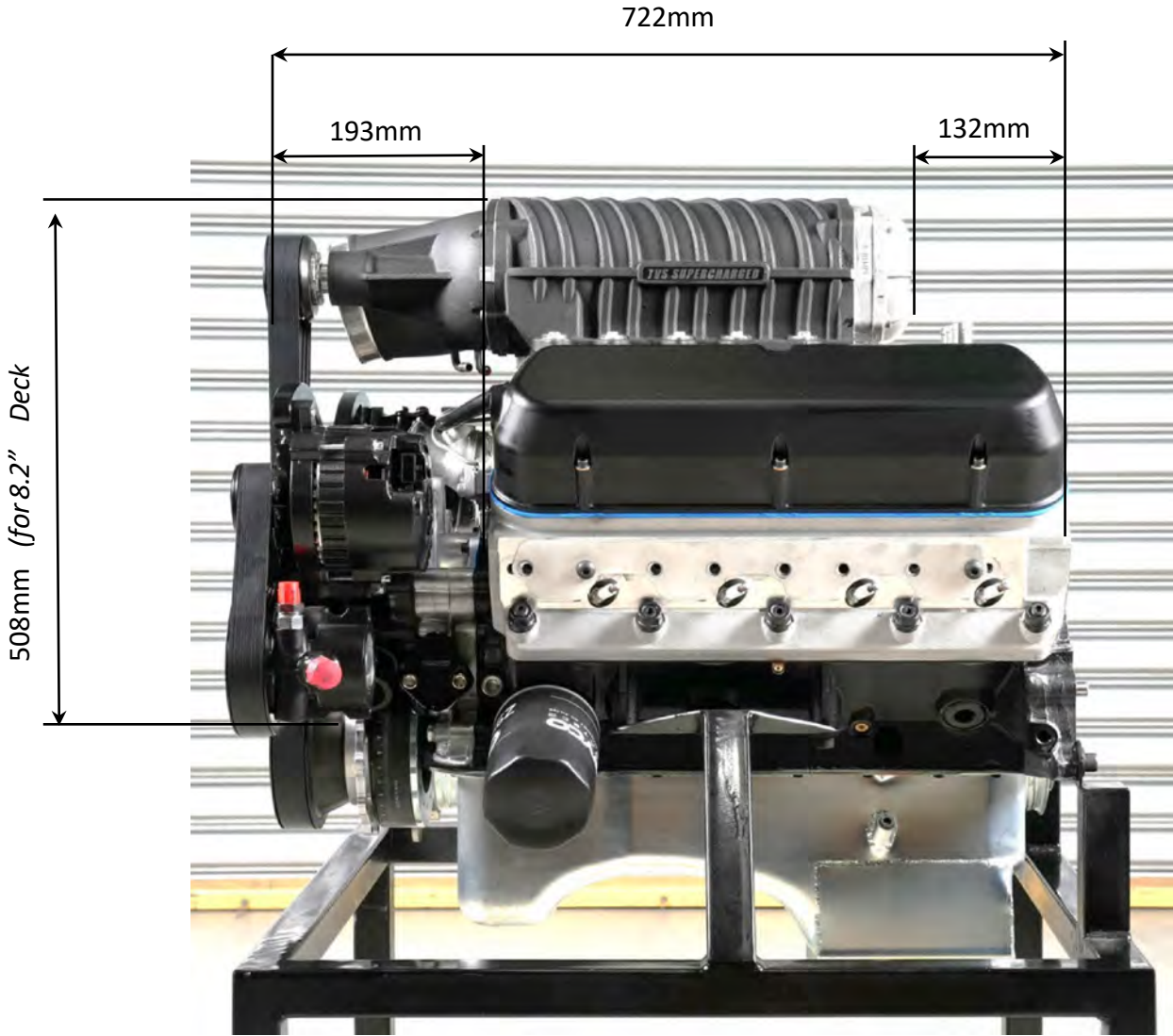
- Illustration is a generic coolant circuit diagram.
- Blue arrow indicates flow direction
- Intercooler reservoir must be mounted at the highest point in the circuit
- Intercooler pump must be mounted lower than the intercooler reservoir
- Intercooler system must be filled with a 1:1 mix of GM6277M coolant concentrate and distilled or deionised water
- Optional:- *KIT-INSTALLATION, INTERCOOLING, GENERIC, FDFI, SUPERCHARGER – A12953*

## 8PK FRONT DRIVE



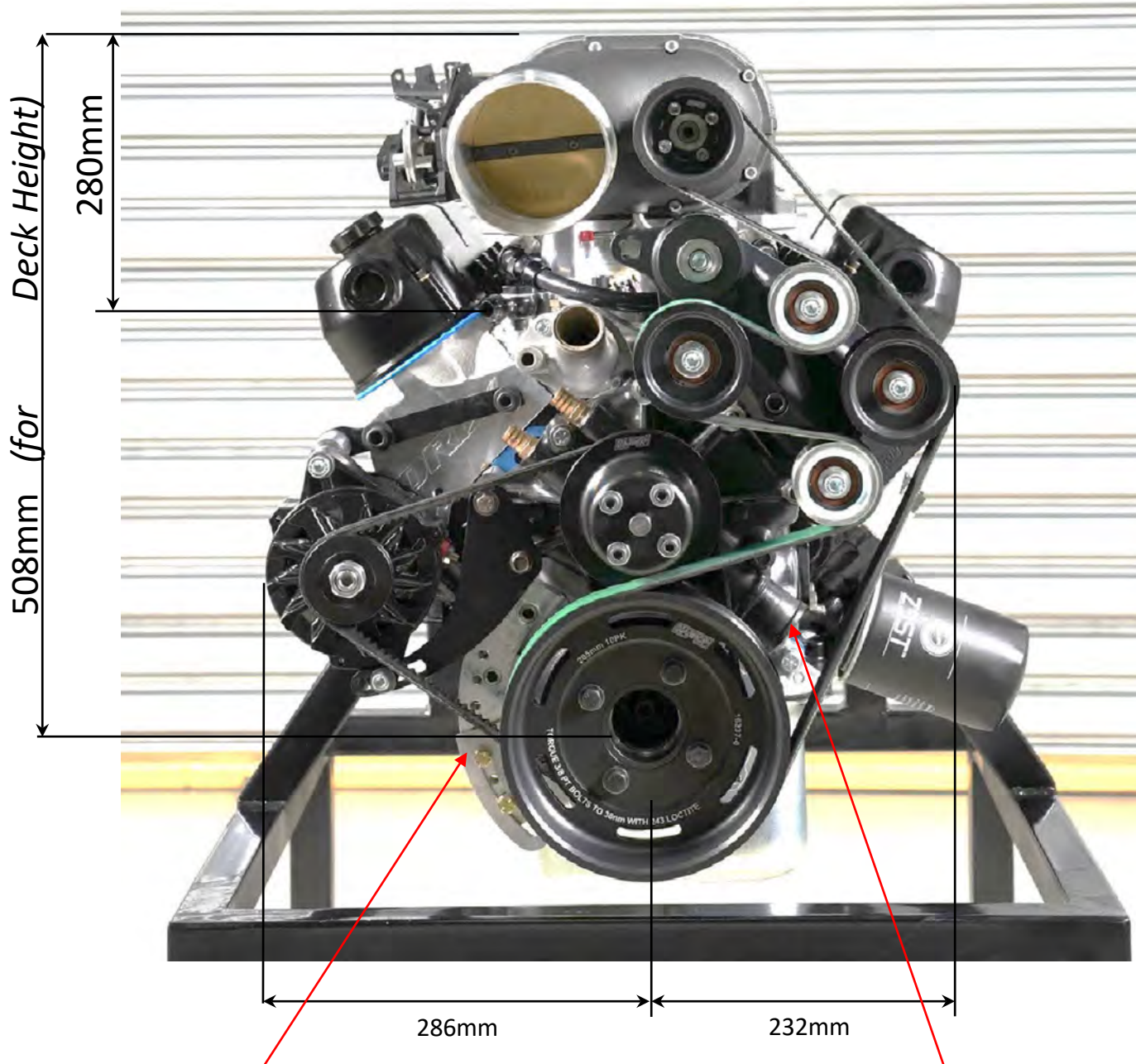
- 508mm C/L OF CRANK TO TOP OF S/C
- 280mm TOP OF BLOCK TO TOP OF S/C
- 248mm C/L OF CRANK TO OUTSIDE OF HD TENSIONER
- 280mm C/L OF CRANK TO OUTSIDE OF POWER STEERING PUMP

**8PK FRONT DRIVE**



- 508mm C/L OF CRANK TO TOP OF S/C
- 193mm FRONT FACE OF BLOCK TO FRONT FACE OF S/C PULLEY
- 132mm REAR FACE OF BLOCK TO REAR FACE OF S/C
- 722mm REAR FACE OF BLOCK TO FRONT FACE OF S/C PULLEY

## 10PK HD DRIVE

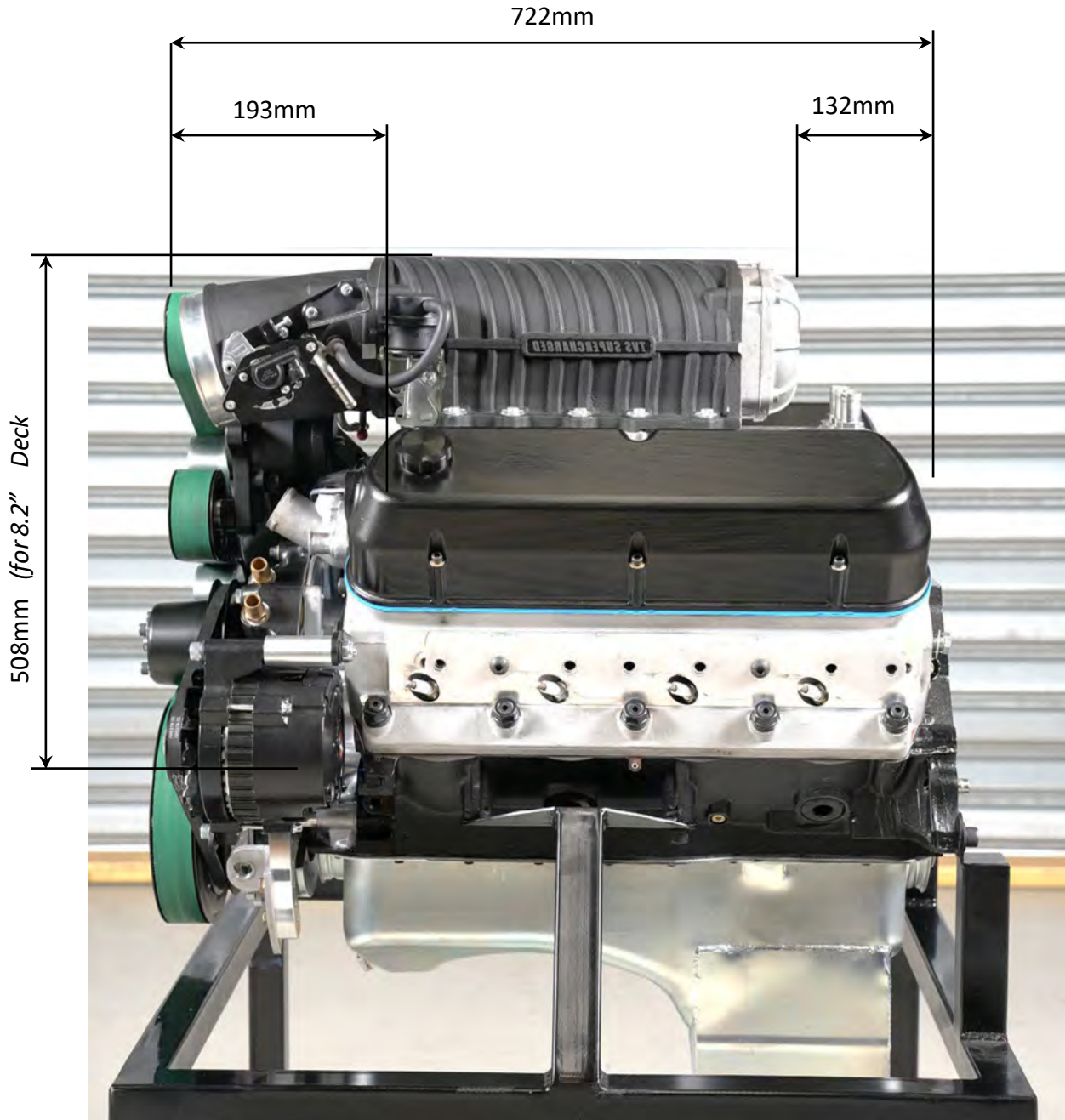


CRANK TRIGGER ASM

LEFT HAND SIDE  
LOWER WATER PUMP  
INLET  
(DRIVER)

508mm C/L OF CRANK TO TOP OF S/C  
280mm TOP OF BLOCK TO TOP OF S/C  
286mm C/L OF CRANK TO OUTSIDE OF ALTERNATOR AT MAX TRAVEL  
232mm C/L OF CRANK TO OUTSIDE OF PULLEY

**10PK HD DRIVE**



- 508mm C/L OF CRANK TO TOP OF S/C
- 193mm FRONT FACE OF BLOCK TO FRONT FACE OF S/C PULLEY
- 132mm REAR FACE OF BLOCK TO REAR FACE OF S/C
- 722mm REAR FACE OF BLOCK TO FRONT FACE OF S/C PULLEY



### Performance Table: SBF and Harrop TVS2650

Engine	Components	Power correction	Power HP	Torque ft lbs	Boost	SC Pulley Diameter	Fuel
Ford 363ci" Windsor Boss 302 Block DRP Cylinder Heads Hydraulic Roller Cam Roller Rockers Performance Valve Springs Performance Pushrods	Naturally Aspirated Dual Plance Carby Intake	SAE 2004	442 HP	396 ft lbs	-	-	98 RON
Above Combination	Harrop TVS2650 Supercharger kit 110mm throttle body Harrop 160mm crank pulley 8rib front drive system with A/C & P/S	SAE2004	812 HP	633ft lbs	14 PSI	75MM	98 RON
Above Combination	Above Combination with E85	Above Combination	878 HP	688 ft lbs	14PSI	75MM	E85
Above Combination	Harrop TVS2650 Supercharger 110mm Throttle Body 10rib HD drive system ALT only 205mm crank pulley	Above Combination	922 HP	756 ft lbs	18.4 PSI	85MM	Above Combination
Above Combination	Above Combination with alt size s/c pulley	Above Combination	978 HP	803 ft lbs	20.3 PSI	80MM	Above Combination
Above Combination	Above Combination with alt size s/c pulley	Above Combination	1007 HP	839 ft lbs	22.7 PSII	75MM	Above Combination

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

To watch the Harrop TVS2650 Supercharger Engine kit on the Small Block Ford, click the link below

<https://www.youtube.com/watch?v=HW7L86FGQB0&pp=ygUKaGFycm9wIHNIzG%3D%3D>

### FAQs:

#### Will this kit fit my 351 Cleveland?

This Harrop Supercharger Engine Kit was installed, tested and verified, on a Small Block Ford with an 8.2" deck height. I.e 289-302 Windsor engine block with Windsor style cylinder heads.

#### ALL OTHER DECK HEIGHTS ARE NOT CURRENTLY SUPPORTED

The CVF 8pk Drive kit supplied suits a Windsor water pump and timing case covers listed on page 12.

#### Will this kit fit my 302W Ford Falcon?

This Harrop Supercharger Engine Kit was installed, tested and verified, on an 8.2" deck height Small Block Ford with early style mechanical timing case cover, and early style water pump. Refer page 12.

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

Machining of the 10pk v-pulley adapter, or 8pk crank pulley 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

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

No. Use ATI BALANCER, and I-W TRIGGER WHEEL. Refer tech guide

#### 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 fan?

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

### FAQs:

#### 8PK DRIVE:-

Is a larger alternator available?

A 300amp is available – refer CVF web site

I want to use my current power steering pump.

Refer CVF web site (GM pump bolts to mainbrkt, Hydroboost and Saginaw Pumps require a CVF mount kit).

The CVF supplied water pump doesn't fit my timing cover

This water pump only fits the early type timing chain cover with mechanical fuel pump mount (or Dorman 635-100 Cover). Refer Tech Guide page 12

Can I use an electric water pump for the 8PK Drive option?

No

#### 10PK HD DRIVE:

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 Bracket Asm Alternator Mount HD #A16351.

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, if not using the above tested components.

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?

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

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

Will the 10PK HD Drive suit a "late model" EFI timing cover?

This has not been tested or verified, and is up to the customer. Refer Tech Guide page 12