



***Installation Guide***  
***LSA Supercharger Upgrade***  
***TVS2650 Supercharger Kit***



# LSA UPGRADE TO 2650 SUPERCHARGER KIT



ENGINEERING PERFORMANCE SINCE 1955

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



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ATTENTION: READ BEFORE PROCEEDING

## 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.

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## INSTALLATION GUIDE

This document is intended 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.

Hood clearance, on VE model cars the pulley comes very close to the hood lining and may need the fitting of the Harrop infill panel number PAN11555, it is not recommend fitting a pulley larger than 80mm in diameter for clearance reasons.

### 1. Removal of the Factory TVS1900 Supercharger

- 1.a. Disconnect the clean air intake
- 1.b. Drain and disconnect the intercooler lines, disconnect the RH hose where the quick connect join is half way down the RH side radiator support panel that can be seen from the engine bayside. Disconnect the other side off the pump located on the LH side in the engine bay
- 1.c. Disconnect the fuel hose where it joins the hard line near the fire wall.
- 1.d. Disconnect the loom from the 3 MAP sensors, throttle body and fuel injectors
- 1.e. Disconnect the vacuum lines
- 1.f. Remove the SC drive belt
- 1.g. Remove the factory TVS1900 supercharger.
- 1.h. Mask up the head intake ports
- 1.i. Remove the factory belt idler assembly on the front of the water pump

### 2. Replacing the factory valley plate

- 2.a. Unplug the oil pressure sender unit from the factory valley plate
- 2.b. Unplug the breather hose
- 2.c. Unscrew the valley plate and remove it
- 2.d. Transfer the plastic oil breather separator from the factory valley plate to the Harrop supplied valley plate



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- 2.e. Transfer the oil pressure sender unit onto the new valley plate, use a suitable thread sealant to ensure no oil will leak passed the threads
- 2.f. Reinstall the Harrop valley plate with the M8 button-head cap screws. Apply anti seize under the heads of the screws and torque to 18Nm from the center out
- 2.g. Connect the oil sender loom



### 3. Installation of the Harrop TVS2650 Supercharger Assembly

- 3.a. Remove the gasket locator from the supplied gaskets if heads on vehicle are factory LSA heads with a Dremel
- 3.b. Carefully stand the supercharger and manifold assembly on its side and support securely without damaging any of the components. Place 1x gasket onto the manifold-head face and insert 2x pop rivets into the pre-drilled holes as shown
- 3.c. Install the pop rivets ensuring that the gasket is pulled flat onto the manifold surface and the head of the pop rivet is recessed below the gasket face. Ensure that the pop rivet pins are collected and discarded so that they cannot accidentally enter the engine or supercharger manifold assembly
- 3.d. Repeat step 3.b & 3.c for the other side of the manifold





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3.e. Remove the current coolant bleed tubes from both the front left and right hand heads. Clean the head surfaces and fit the supplied LS3 type cross over steam pipe ensuring the O rings are fitted and connect it back up to the radiator

3.f. Swap over the idler and tensioner pulley as per image below to provide clearance for throttle body



3.g. Clean any possible debris from the head/valley plate region and then remove the masking tape off the intake ports

3.h. Transfer the MAP sensor from the standard manifold to the port on the right front of the supercharger manifold (or purchased 2 Bar sensor for MAFless tunes)

**Note: The sensor will be retained by the bracket captured under the head of the right forward-most manifold bolt. If the vehicle is an "early" build that uses a MAP sensor with a Ø10 spigot, it will be necessary to utilize the reduction bush supplied (usually tied to the fuel rail. Insert with a coating of sealer e.g. Loctite 515/518)**

3.i. Fit the original fuel injector retaining clips to the supercharger fuel rails, ensuring that they secure the injectors to the fuel-rails



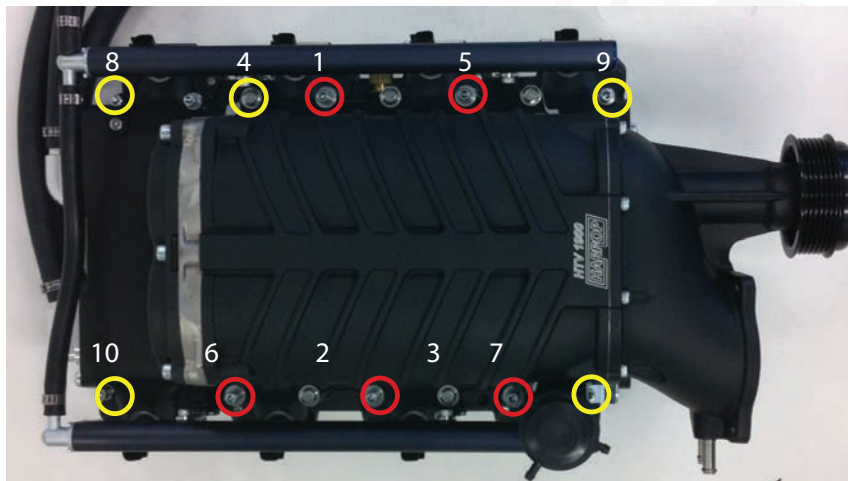
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3.j. Remove the masking tape from the heads and install the supercharger assembly onto the engine. Inspect Supercharger manifold assembly including the ports to ensure there is no foreign objects or debris.

3.k. Install the M6x80mm intake manifold bolts (encircled yellow) and M6x100mm intake manifold bolts (encircled red), torque them in the sequence shown below in 2 stages



3.l. Using the extension loom supplied connect the MAP sensor on the RH side of the engine, the other end of the loom connects to the engine harness that connected to the left hand rear MAP sensor (wire colours, lime green and white trace, black and green trace and white with red trace)

3.m. Using the supplied bracket mount the remaining 2 MAP sensors on the LH front fuel rail mount as per image below, mount the rear one first followed by the front one





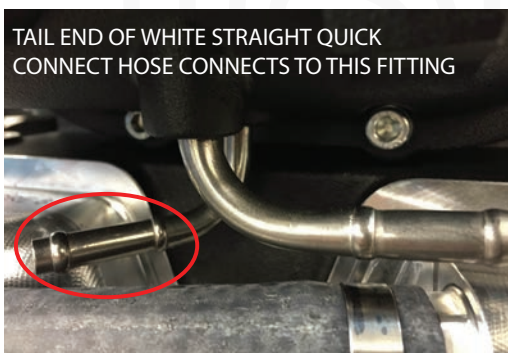
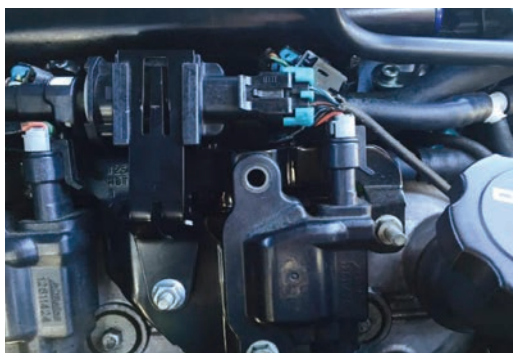
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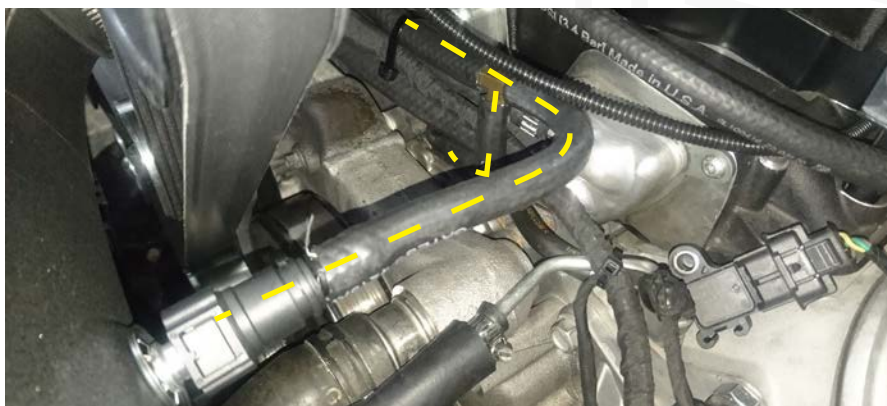
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3.n. Using the new purge valve and the new bracket supplied mount this off the coil mounts on the right hand side, see image below. With the supplied hoses connect the rear of the purge valve to the fuel tank purge located up against the fire wall and the front of the purge valve to the fitting located under the front snout of the supercharger. Once the hoses are connected then connect the loom to the valve

3.o. Connect the charge air temp sender located on the LH side of the supercharger manifold



3.p. Connect the vacuum/breather from the RH head to a TEE which is connected to the valley plate vent. The other end of the TEE will connect to the OTR, see image below



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3.q. Connect the LH rear valve cover breather to the underside of the supercharger snout as per image below. Images from FDFI install



3.r. Connect the supercharger fuel hose to the hard line on the vehicle located against the firewall

3.s. Route the brake booster line along the fire wall and down in between the supercharger head unit and the fuel rail and connect into the RH side of the supercharger snout

**Note: It may be easier to connect the hose to the booster fitting, if the booster fitting is removed from the booster first. Some vehicles with bi-modal exhaust will require a "T" piece to be fitted in this hose**



3.t. Plug the injector loom back onto the injectors ensuring that the lock clips snap down

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3.u. Mount the reservoir bottle to the supercharger FEAD tensioner mount as per image below, to get easy access you may need to remove the rear FEAD tensioner



3.v. Once mounted connect the upper intercooler hoses to the reservoir. Now connect the moulded hose supplied to the Y fitting on the lower intercooler hoses from the intercooler cores, (note 90deg end to the intercooler Y piece). Route this hose over the rear FEAD tensioner and under the front SC tensioner to the quick connect fitting located at the lower RH side chassis rail near the radiator. Install the supplied quick connect fitting into the moulded hose and connect it to the quick connect on the vehicle. Connect the 19mm straight hose supplied to the reservoir and route hose across to the left side and connect it into the pump.



3.w. Once all of the intercooler hoses have been connected and clamped off, fill the system using **GM6277M**, mixed with distilled or deionised water in a 50% concentrate.

**Note; Filling with a noncompliant coolant will void warranty.**

Purge/bleed the system of air and then re check once the car has been started later in the install

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### 4. Install the throttle body extension loom

- 4.a. Install the LS3 throttle body to the supercharger inlet and connect it to the engine harness using the extension loom supplied
- 4.b. Install the new idler mount to the front of the water pump using the supplied 4 screws, short screw is used on the lower left (torque settings for the bolts is 18-20N/m)
- 4.c. Fold the belt and feed it through between the lower idlers so that it can be fitted to the crank pulley, route the belt as per image below



- 4.d. Relocate and mount the boost control valve to the ABS module and connect the hose to the pressure port of the supercharger actuator





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### 5. VE MY12 & VF Radiator Brackets

5.a. Remove the two lower sections of the mounts

5.b. Remove the 2 M6 bolts

5.c. Use needle nose pliers to compress clips on the loom & push them through the lower section of radiator mount. There are 2 clips per mount

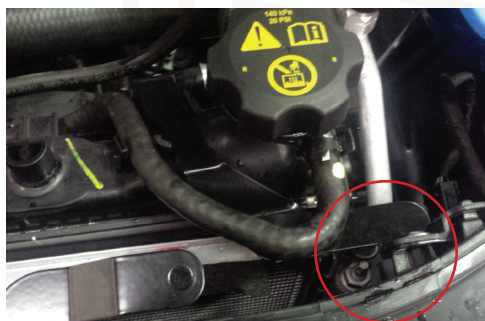
**Note: Retain the bolts to use with the OTR specific radiator bracket**



5.d. Remove the torx screw securing the washer filler bracket to the front panel.

5.e. Remove the fan mounting screw from the rear LH of the radiator.

5.f. Position the LH radiator bracket as shown. Fit the screw back through the radiator bracket to secure the radiator bracket and fan. The front of the bracket will slide in between the washer filler bracket and the radiator support panel. Insert the torx screw and tighten.





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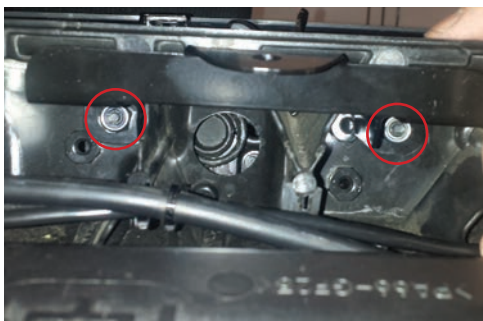
5.g. Place the RH OTR bracket onto the mounting face for the standard radiator mount, place the RH radiator bracket over the OTR bracket as shown below. Push the radiator bracket down on top of the radiator to hold it in place. Fasten using the standard M6 bolt



5.h. Fit the LH OTR bracket onto the mounting face for the standard radiator mounts

5.i. Place the centre OTR bracket onto the back of the bonnet latch M8 bolts

5.g. Fasten using the two nylock M8 nuts supplied in the bracket kit (M8 bolts and washers supplied if required)



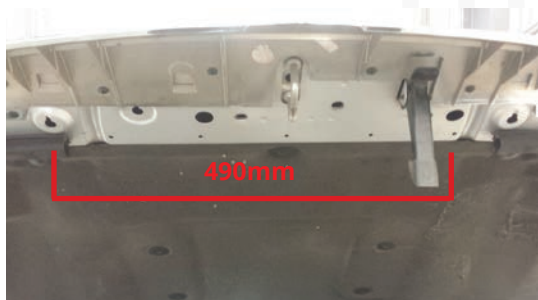
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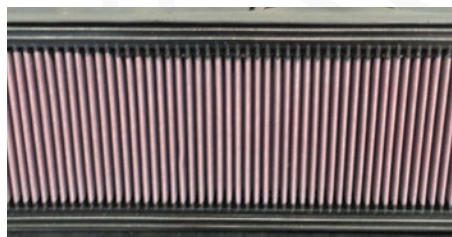
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### 6. Assembly and Installation of the MAFless OTR

- 8.a. Cut away 490mm of rubber seal from the inside of the bonnet as shown
- 8.b. Place boot over rear half of the OTR. Fasten with hose clamp #80 (117-140mm hose clamp)
- 8.c. Insert the duckbill drain and 2 grommets into the bottom front half of the OTR
- VE Pre MY12 uses grommets with internal diameter 13mm
- VF & VE MY12 uses grommets with internal diameter 20mm



- 18.d. Place the filter into the rear of the OTR. **Note: The side of the filter with 3 steps should be placed into the back of the OTR.**



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8.e. Place the front of the OTR over the rear of the OTR. Secure the two halves of the OTR together with the 8 spring clips, ensure they are centred in the clip pockets (3 clips on the top, 3 on the bottom and 1 either side)



8.f. Install the throttle body into the rubber boot at the back of the OTR. This option makes it easier to install, alternatively fit throttle body on supercharger and fit OTR with connection boot assembled to OTR. Fit a 91-114mm hose clamp to back of OTR/boot but do not tighten

8.g. Fit the OTR. Slide the OTR into the space between the radiator and the front bar

**Note: Hold the looms back as you insert the OTR to avoid catching the OTR on the looms**



8.h. Align the grommet holes with the bosses on the radiator and gently push the OTR down until it is firmly seated on top of the radiator

8.i. Screw the throttle body onto the supercharger using original bolts

**Note: Ensure throttle body O-ring is placed between throttle body and supercharger. Connect the wiring harness to the throttle body. Tighten hose clamp on the back of the OTR/boot**