

# HARROP

## **Installation Guide** **R53 Mini Cooper S** **TVS900 Supercharger Kit**



# R53 MINI 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



# R53 MINI SUPERCHARGER KIT



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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.

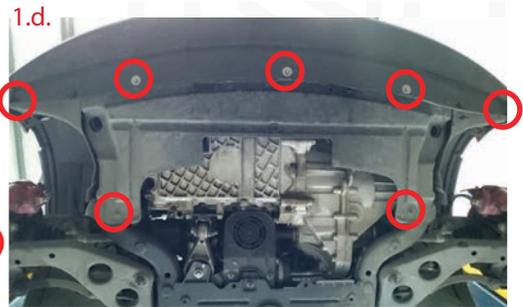
### 1. Remove the front section of the car

1.a. Remove the front wheels and then remove the inner liner 4 scrivets from each side.

1.b. Remove the outer liner to front bar cover screw from each side, top view shown, head of screw from inside wheel arch.

1.c. Remove the 2 torx head bolts from front bar cover.

1.d. Remove the under tray and lower bar cover screws. Once this is done the bar cover can be removed taking care to disconnect the lights, horns and the ambient temp sensor fixed in the bar cover on the lower left middle side.



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1.e. Remove the front crash beam by undoing the 8 nuts marked in the image.



1.f. Remove the lower outer crash beams that connect to the sub frame by undoing the two large bolts located on the underside of the vehicle and the M6 screw that fixes into the radiator support panel from the front.



1.g. Depending on the condition of the vehicle these beams may need to be tapped off using a rubber mallet.

1.h. Drain the radiator by removing the hose off the bottom outlet of the radiator and collecting the coolant into a suitable container. Once the bulk of the coolant is drained disconnect the top hose.



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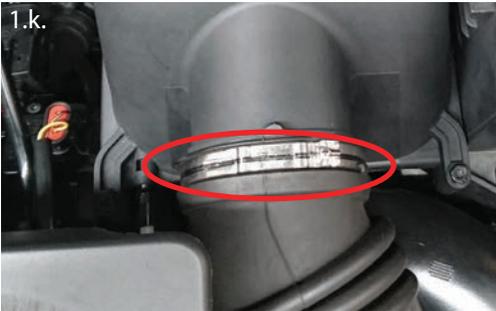
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1.i. Remove the two screws that secure the condenser to the radiator support panel. Lift the condenser up out of its location and manoeuvre it towards the left side, rest it on a box or the floor pending how high you have the vehicle off the ground.

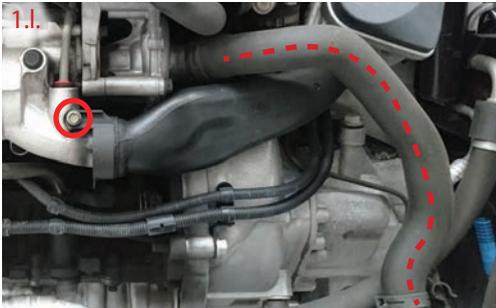
1.j. Disconnect the electric fan, the driving lights and the fresh air intake tube, this should now enable you to remove the front radiator support panel with the fan and radiator as a package.



1.k. Remove the throttle body by unclipping the duct from the air box. Disconnect the throttle body, remove the 4 screws and the vacuum hose connected to the throttle body on the lower LH rear of the throttle body.



1.l. Remove the lower radiator hose and the supercharger inlet duct by removing the retaining screw, unclipping the by-pass hose and two vacuum hoses at the rear of it.



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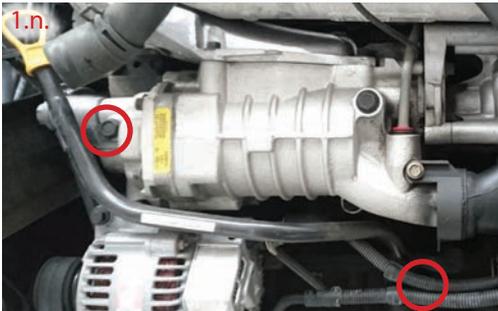
## INSTALLATION GUIDE

1.m. The vacuum hoses are quick connect fittings so by depressing the red rings on the duct the hoses should be able to be pulled out.



1.n. Remove the engine oil dip stick and then the engine oil dipstick tube. There are two screws, once the screws are removed you will need to pull up on the tube to release it from the block. Note there are two looms that need to be unclipped from the dipstick tube.

1.o. Once the dip stick tube has been removed you will need to plug the hole so that water will not pour into it in one of the following steps.



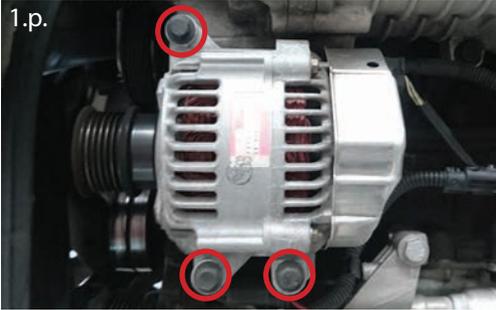
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1.p. Disconnect the battery and remove the ribbed FEAD belt, disconnect the alternator and unbolt the alternator.

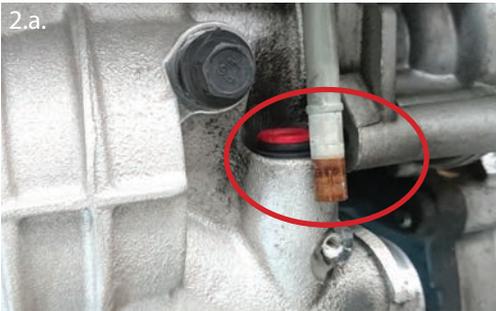
1.q. Remove the charge air intercooler (CAC) by first removing the plastic grill and then the silicone oval hose clamps on both ends. Remove the front steel brackets that hold the intercooler in its correct position.



## 2. Remove the old Supercharger

2.a. Firstly remove the breather tube by depressing the red ring and pulling up on the tube.

2.b. Located behind the water pump is the heater return hose, disconnect this hose.



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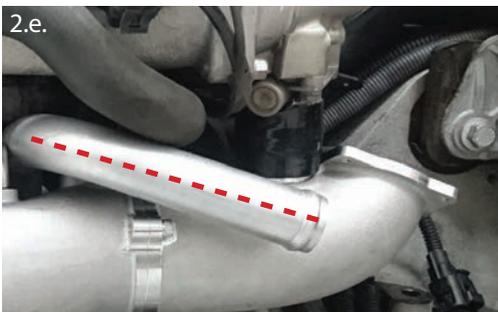
2.c. Remove the supercharger mounting bolts, the tensioner support arm bolt will be able to be loosened but not fully removed due to chassis rail proximity, the other 4 screws can be fully removed. Once these have been removed you should be able to pull the assembly towards the front of the vehicle, some force may be required to break the O ring seal on the back of the pump going into the block.

2.d. Remove the aluminium flange that sealed the rear of the water pump into the block from the block.



2.e. Fit the O ring from this flange into the flange on the new outlet pipe supplied and screw it back onto the block, ensure sealing face is cleaned on the block first.

2.f. Remove the charge pipe and gasket from the old supercharger. Clean the gasket and place it on top of the Harrop supercharger.



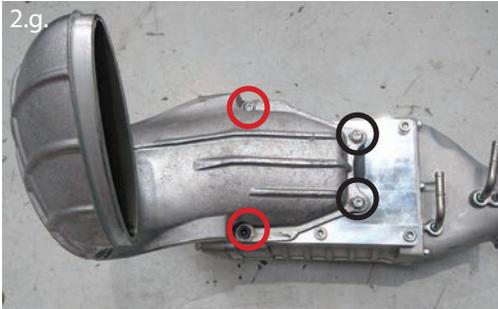
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2.g. Place and screw the old charge duct on top of the new Harrop supercharger. Use the screws supplied and use a thread sealer on the two screws highlighted in black. (3 screws M8 x 16 button head & 1 M8 x 30 cap screw.)

2.h. Fit the supplied O ring into the throttle body tube and screw the tube to the supercharger intake using the supplied screws, M6 x 16 long cap screws.



2.i. Fit the three supplied 8mm ID hoses to the three 90 degree tubes to correspond with the following lengths:

1 = 520 long, breather

2 = 380 long, fuel purge

3 = 270 long, MAP sensor

4 = Fit the boost by-pass hose and 2 hose clamps. Note clamp orientation.

2.j. Disconnect the MAP sensor located next to the air box and unscrew it from its holder using a 4mm hex key. Remove the grey plastic tube that connected into the black clean air intake tube and place aside.



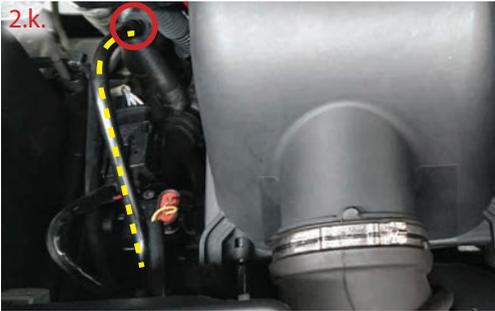
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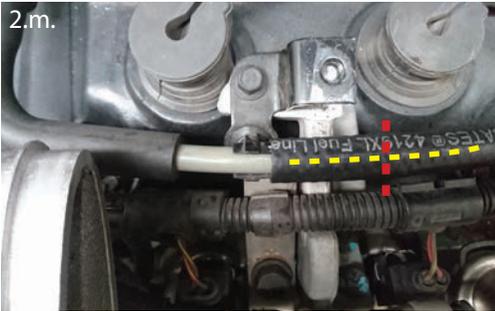
2.k. Remove the plastic fuel purge line that connected into the black clean air tube, there is a quick connect near the fire wall where this can be disconnected.

2.l. Pull back the plastic breather tube(PCV), out from under the manifold. Fit the supercharger as per the image, use the 2 by M8 x 30mm long socket head cap screws supplied to secure it in position. Ensure that the 3 rubber hoses have been fed under and up and through the manifold. Inspect Supercharger manifold assembly including the ports to ensure there is no foreign objects or debris.



2.m. Cut the original breather tube about 30mm towards the right of the image (red line) and fit the newly pulled through rubber hose as per the image over the end of it.

2.n. Using the removed fuel purge tube, remove the quick connect tube out from it and fit this to the newly fitted rubber hose and connect it into the purge line located near the fire wall.



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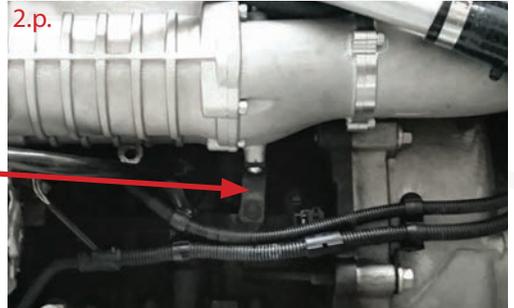
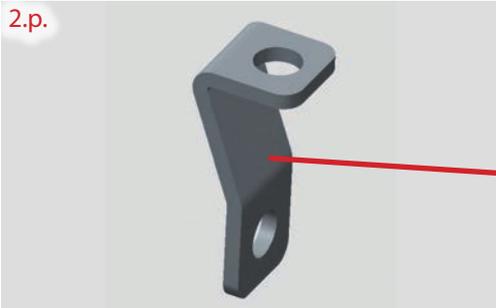


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2.o. Pull the MAP hose through under the thermostat and connect it into the MAP hose adaptor once the grey plastic tube has been removed. Remount the MAP sensor and connect the plug.



2.p. Remove the plug from the dipstick hole in the block and refit the dipstick tube into the block. Using the supplied M8 x 12 long button head screw and the rear supercharger support, now secure the dipstick tube and supercharger using original screw.

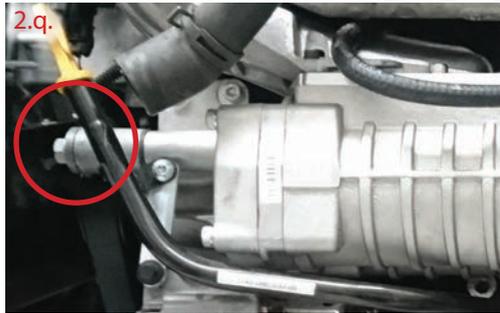


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2.q. Using the original alternator mounting screws fit the supplied dipstick tube mount plate up against the head of the long bolt and install into the alternator. On the other end fit the supplied spacer to the screw, now remount and connect the alternator to the engine. Using the supplied M8 x 12 long button head screw secure dipstick tube to new mount plate. Refit the dipstick. Now fully tighten the RH upper 2 supercharger screws and the by-pass hose clamps. Install the FEAD belt and tighten the tensioner bracket to the supercharger.



2.r. Feed the new supplied straight end of the heater hose with the supplied worm drive clamp through beside the supercharger by-pass hose and secure with the 90 degree bend pointing to the left of the vehicle.



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2.s. Screw the supplied bracket to the supplied electric water pump using 5 x 16 long M4 cap screws, use a thread locker (Loctite). Fit the outlet hose to pump with 2 worm drive clamps, do not tighten yet. Install the pump to the LH gearbox mount and the engine inlet tube ensuring that the pump is hard up against the supercharger intake.

2.s.



2.s.



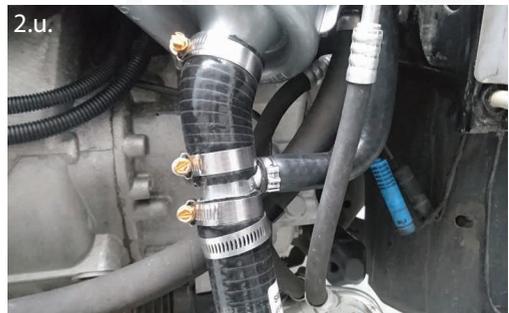
2.t. Locate the hoses and clamps as per the image, note the hose clamp orientation, when fitted as per image these can be retightened at any point should there be any compression set of the hoses. Run, cable tie and connect the end of the heater hose using the Cobra clamp supplied to the Tee piece, ensure the hose is not kinked under manifold and that it will not rub through with engine movement along its routing.

2.u. Note the bottom radiator hose orientation may need to be aligned with the front radiator support panel in position, trial fit for alignment may need to be done prior to tightening the clamps.

2.t.



2.u.



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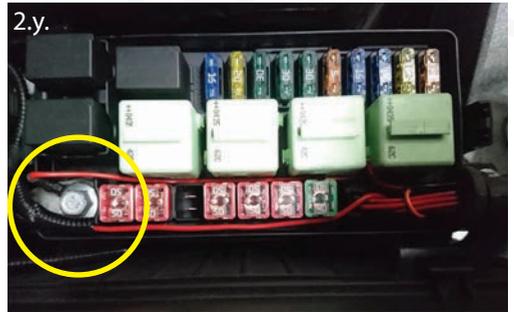
2.v. Reinstall the throttle body remembering to connect the vacuum hose and electrical connector. Connect the clean air intake hose to the air box.

2.w. Unplug the RH front connector in the fuse box located under the hood. Depress and slide the plastic locking clip towards the wires to release the clip. Using a pin tool remove the end red wire with the blue trace from the connector.



2.x. Solder the orange wire from the supplied pump loom to the pin as per image. Reinstall the pin into the connector, refit the plastic locking clip and insert connector back into the fuse box.

2.y. Run the red wire in between the fusible links and the relays and install it under the screw of the main power infeed wire. Tuck the wire under the main loom infeed from the engine bay and close the fuse box.



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2.z. Mount the electric water pump relay as per image, note you may need to drill the hole larger in the supplied relay bracket. Connect the earth wire to the body earth shown in the image. Connect the pump loom to the pump and neatly cable tie up the loom to existing wires and hoses.

2.aa. Reinstall the front radiator support panel and connect the radiator outlet hose, electric fan, fresh air duct and driving lights. Reinstall the condenser, lower crash beams and the complete front, remembering to connect the ambient air sensor, horns and lights. Fill and bleed the cooling system.

2.ab. Reinstall the CAC to the top of the engine.

2.ac. Reinstall the plastic grill to the CAC unit.

2.ad. Connect the battery and start the engine, check for coolant leaks, check to see if the electric water pump runs (note it will run on for about 2 minutes once engine is turned off).

2.ae. When supercharger is fitted with a pulley smaller than 70mm in diameter it is advisable to have the standard tune checked.

