



Installation Guide

Front Drive Front Inlet 2300

Series 3, 4 & 5 Y62 Nissan Patrol



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 (93 AKI).

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.

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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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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.



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.

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The Harrop TVS2300 Supercharger kit has been developed for Nissan Patrol vehicles with the 5.6 Liter VK56-VD V8 Gasoline engine. This Harrop supercharger kit is not compatible with E85 fuel.

All hoses used throughout installation meet the requirements of SAE J20R3, J30R7 or J1037. Hoses are printed with identification at time of manufacture.

Coolant hose - SAE J20R3	PCV/EEC hose - SAE J30R7
5/16" Automotive coolant hose: Gates #28408	3/4" PCV/EEC Vacuum hose: Gates #27021
Harrop Intercooler hose #15013	3/8" PCV/EEC Vacuum hose: Gates #27004
Harrop Intercooler hose #15011	5/8" PCV/EEC Vacuum hose: Gates #27020
Harrop Intercooler hose #15012	
Harrop Intercooler hose #15060	
Harrop Intercooler hose #15061	
Harrop Radiator hose #13711	

The following part numbers should be referenced when ordering so the correct kit is supplied, as there are subtle differences in the hardware.

Vehicle Applications

Part #	Make	Model	Engine Desc	Model Year
99-KSM43K26	NISSAN	PATROL	5.6L NA	2016-2020

Preparation

- Ensure that the fuel tank contains only fuel which has minimum 91-AKI (93-RON). E85 fuel is not compatible
- Allow the engine to cool before starting installation
- Disconnect the battery and remove from vehicle

Throughout this guide, Right-Hand Side (RHS) and Left-Hand Side (LHS) of the vehicle is from the driver's perspective when in the driving position.



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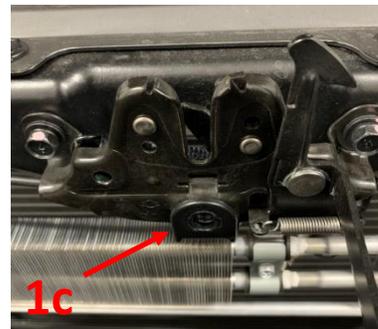
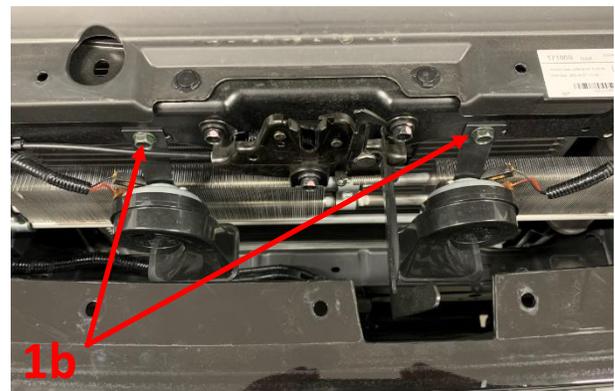
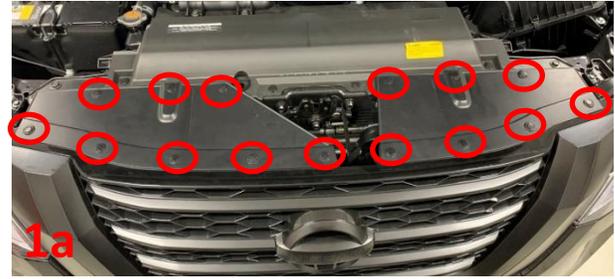
1. Install Intercooler Radiator

1.a) Remove front grill by removing the top Scrivets that hold down the grill to the radiator support panel. Use a flat head screwdriver inserted through grill slots to rotate the two top grill securing clips. Once these have been removed you should be able to get your arm down between the grill and radiator support panel and squeeze each arrow head tab together to work the grill out of the front bar cover.

1.b) Remove the two horns and set aside for re-installation later.

1.c) Remove the middle lower screw from the hood latch.

1.d) Insert the supplied 2x spacers and grommets to the supplied Intercooler Radiator lower mounts.

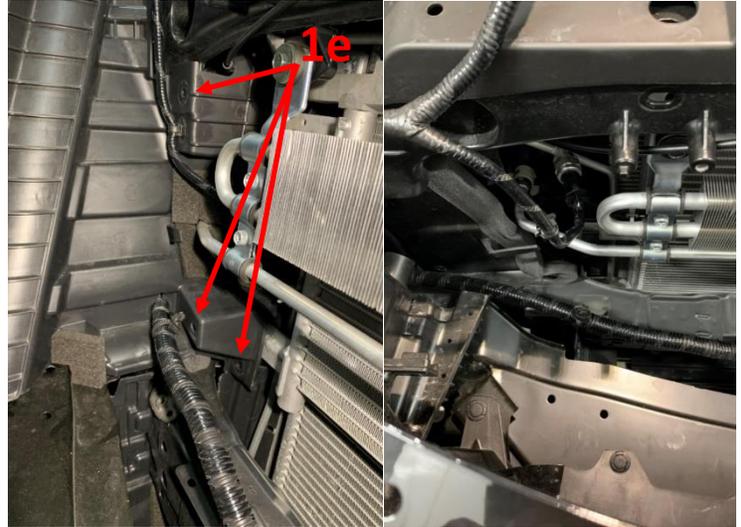


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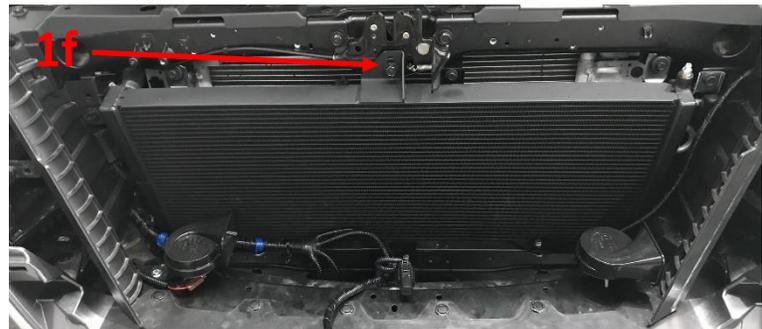
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1.e) Unclip any wiring harness clips and remove 3x panel clips from the RHS Radiator infill panel. Remove the infill panel.



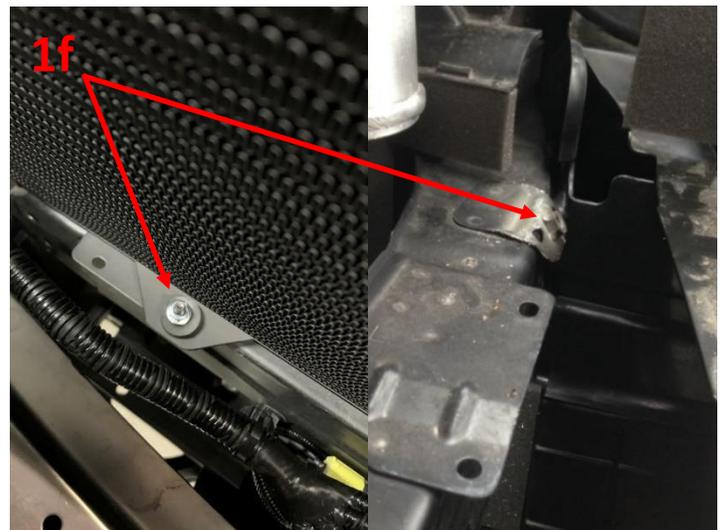
1.f) Sit the radiator into position as per image 1.f and secure with the new 30mm long screw supplied to the hood latch. The bottom holes should line up with the auxiliary cable fixing holes, note if there are cables attached to the holes then these must be unclipped out of the way.



On some models it may be necessary to bend the two tags welded to the front rail forward to enable radiator fitment.

Secure the lower intercooler radiator mounts with the supplied M6x 30 cap screw and M6 flanged nut.

Check that the auxiliary coolers in front of the condenser do not touch the newly positioned intercooler radiator. There must be at least 10mm of clearance; if there isn't then the auxiliary cooler brackets will need to be slightly modified towards the engine.



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1.g) For series 3&4 only. Install the RH Horn to the existing screw as per image 1.g. For the LH horn, flatten the tab on the horn bracket and secure it as shown.

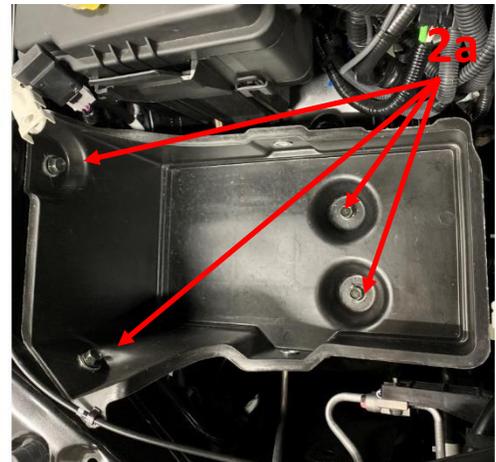
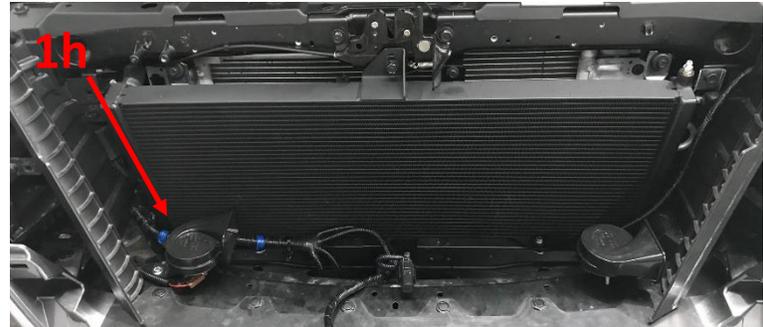
Adjust the bracket so that the horn sits closer towards the engine to provide sufficient clearance for the grill.

1.h) For series 5 only. Install the horns onto existing holes in the lower radiator support panel using the supplied M6 x 16 cap screws and nyloc nuts.

Finally, double check that the core has a minimum of 10mm of clearance from accessories including the ambient temperature sensor

2. Install Intercooler Pump and Loom

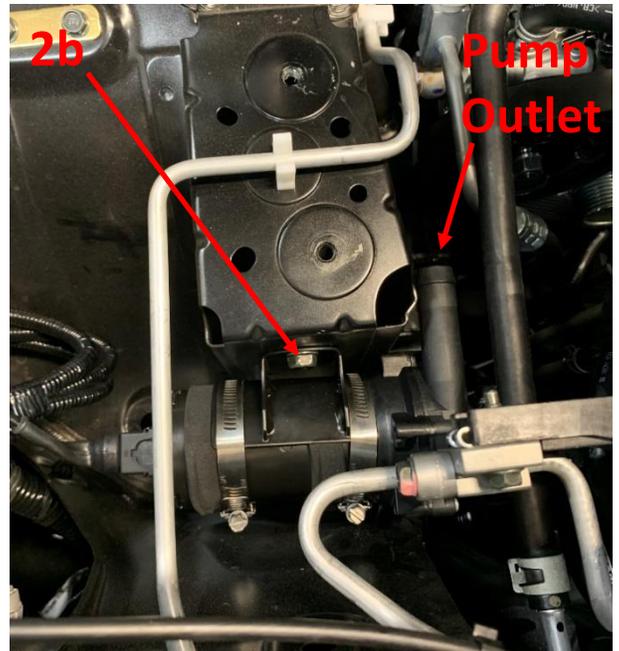
2.a) Removing 4 bolts, remove the battery tray.



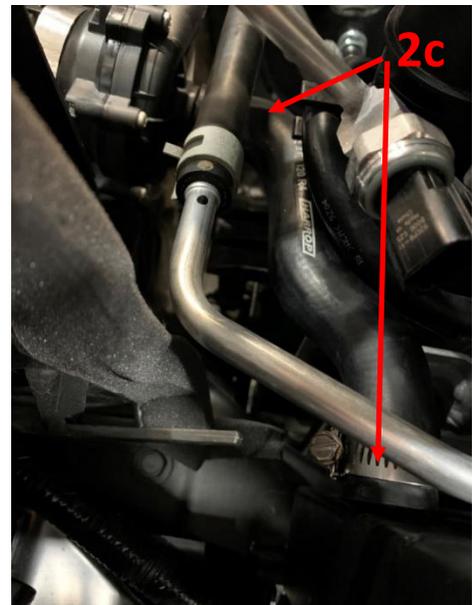
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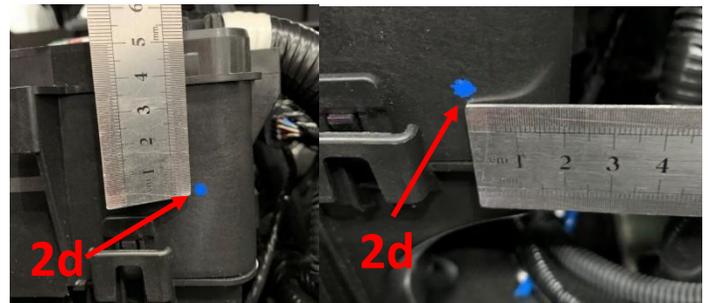
2.b) Install pump assembly as per image 2.b using the M8 hex screw supplied, this screws into an existing hole in the battery support bracket. There should be just enough space between the outlet of the pump and the sheet-metal for the hose which will be connected at a later step.



2.c) Connect the Pump inlet hose between the lower Intercooler Radiator fitting and the Pump inlet, securing with 2x 18-32mm hose clamps.



2.d) Lift off the fuse/relay cover. Drill a $\varnothing 2$ -4mm pilot hole in the position as marked (approx. 50-53 down from the top edge and 20-23mm in from the engine side). Open the hole out to $\varnothing 12.0$ mm and remove any burrs.

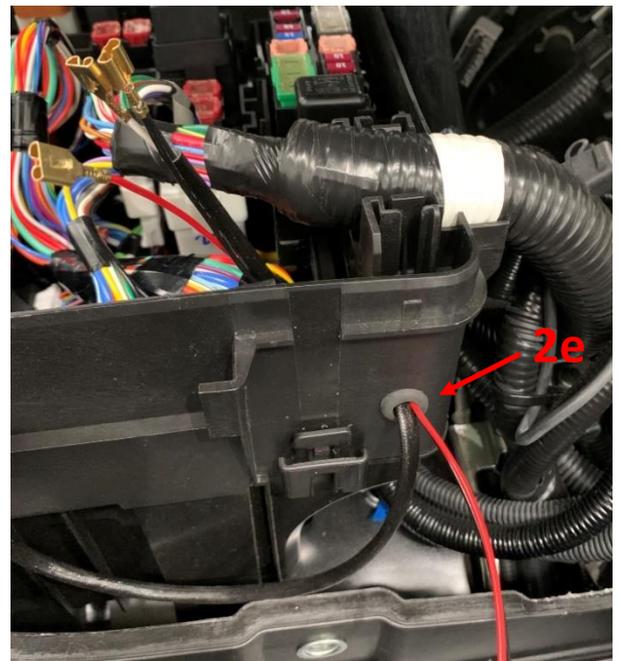


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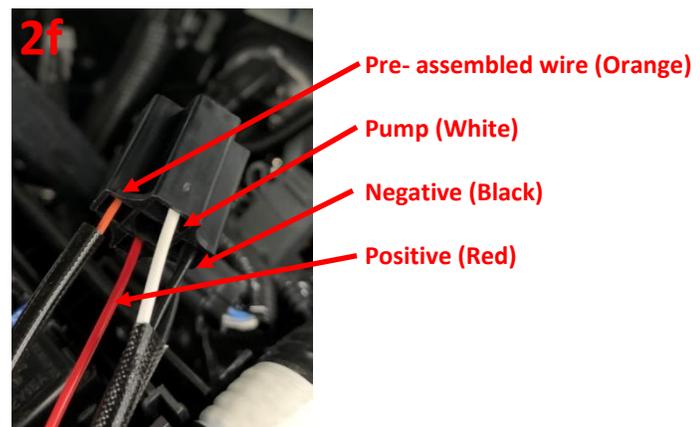


2.e) Using the supplied Intercooler Pump loom, Feed the Pump (white), Positive (red) and Negative (black) wires through the grommet and then into the fuse-box through the 12mm hole drilled in step 2.d



2.f) Once all the wires are through these must be pushed into their correct pin holes into the rear of the relay connector. The connector comes preassembled with one wire (Orange or Red). Looking from the rear of the plug moving in an anticlockwise direction assemble the positive wire then the earth and then the pump positive (white).

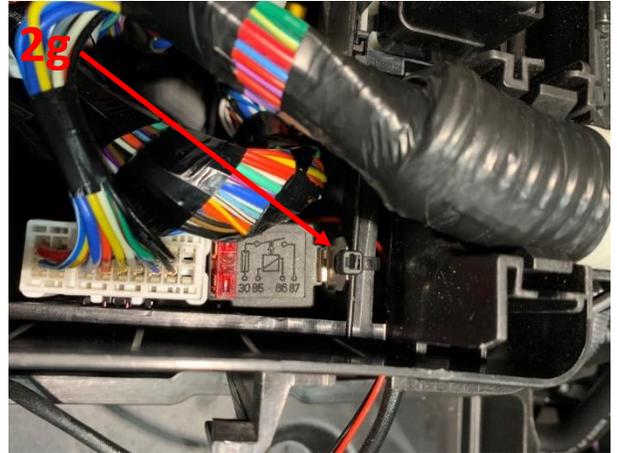
Run the pump end of the loom beside the radiator to the intercooler pump. Plug in the connector onto the pump.



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2.g) Inside the fuse box, connect the Relay to the connector and cable tie the relay in the position shown.



2.h) Remove the “VDC” fuse, in its position plug in the “add a circuit fuse tap”.

Refit the fuse box lid into position.

The Red and Black wires with eyelet ends will be connected to the Battery at step 8a.



3. Remove Nissan Intake Manifold and Ancillary Hoses

3.a) Remove the sump guard from under the engine.

3.b) Drain the engine radiator into a clean container and seal. There is a drain plug beneath the lower Radiator hose.

3.c) Remove the engine cover.

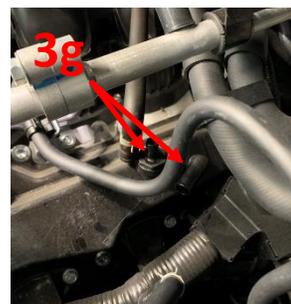
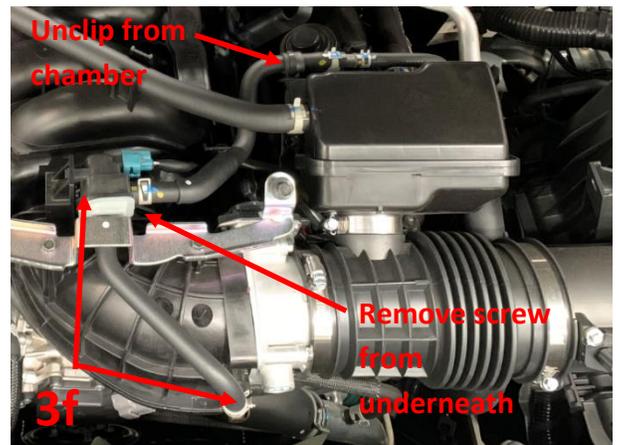
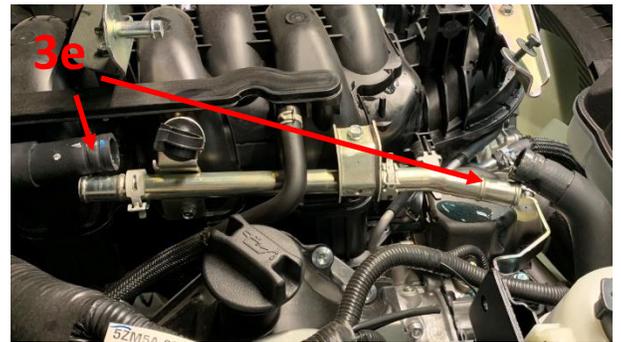
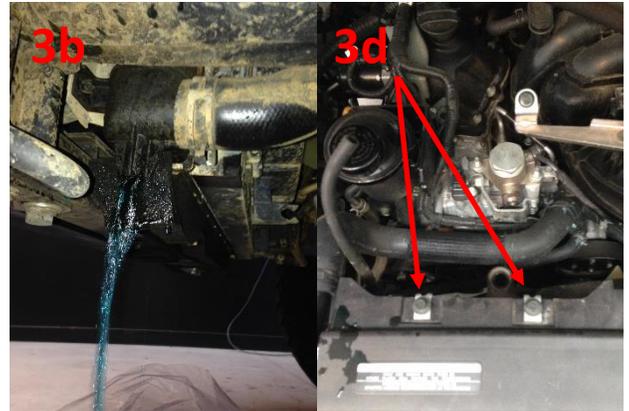
3.d) Remove the engine coolant reservoir from the top of the radiator by removing 2x M6 screws.

3.e) Disconnect the heater hose hard-line from the RH side of the manifold. Retain the spring-band clips for re-use.

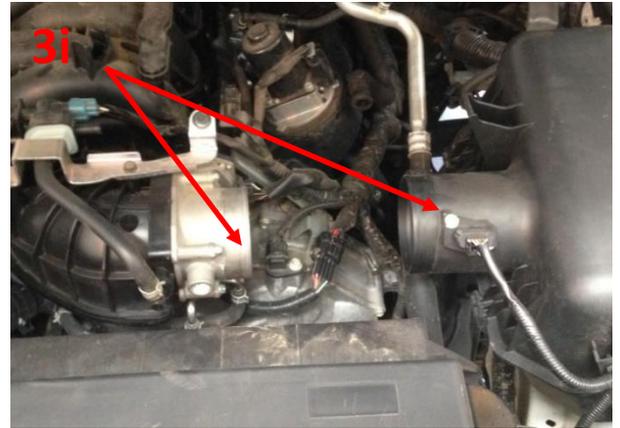
3.f) Remove the Purge Valve Solenoid and associated hoses from the manifold. Leave the end at the LHS connected to the vehicle and set the Solenoid aside to be re-connected at a step 5.f

3.g) Disconnect the Valve cover vent hose and PCV vacuum hose from the LHS valve cover.

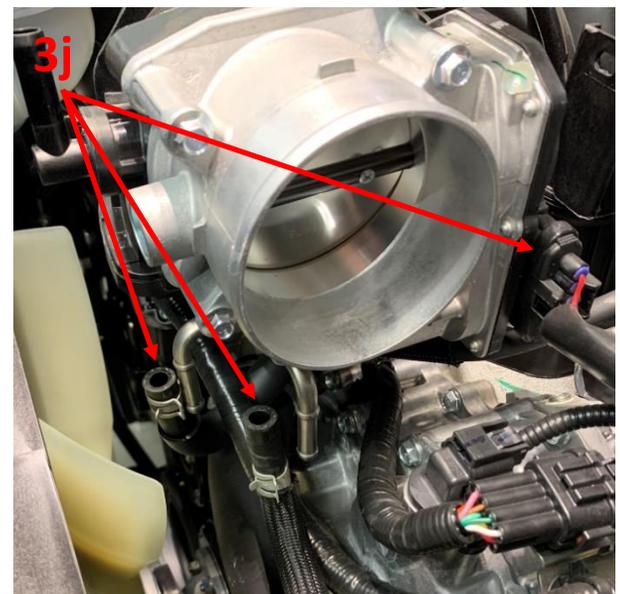
3.h) Disconnect the Valve cover vent hose and PCV vacuum hose from the RHS valve cover and remove the Intake chamber and hoses.



3.i) Remove the flexible intake tube from between the Throttle body and Airbox. Unclip the airbox lid to make this easier.



3.j) Disconnect the throttle body coolant lines and wiring loom.



3.k) Unscrew the loom bracket from both sides of the rear of manifold.

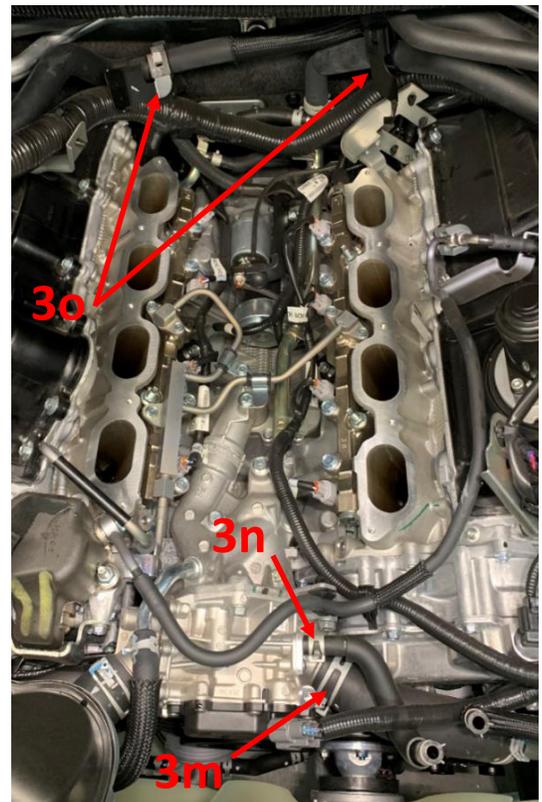


3.l) Remove 10x Manifold screws from the cylinder heads and remove the manifold from the engine. Place tape over the inlet ports to prevent dirt from entering.

3.m) Disconnect the lower radiator hose from the thermostat housing. Also disconnect the lower radiator hose at the radiator.

3.n) Remove the 3/8" coolant hose from the thermostat housing. Retain the clamps for re-use.

3.o) Remove 2x loom brackets from the loom at the rear of the engine.



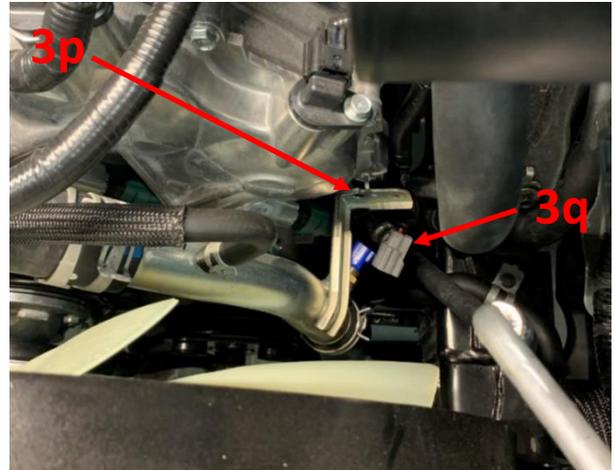
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3.p) Remove the M8 screw from the radiator hard-line bracket on the LHS timing cover.

3.q) Unplug the coolant temperature sender loom adjacent to the bracket.

3.r) Remove the lower radiator hose assembly from the front of the engine. The lower hose, temperature sensor and all spring-band clamps will be re-used.

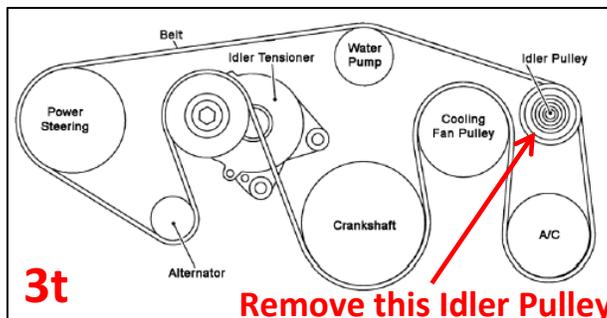


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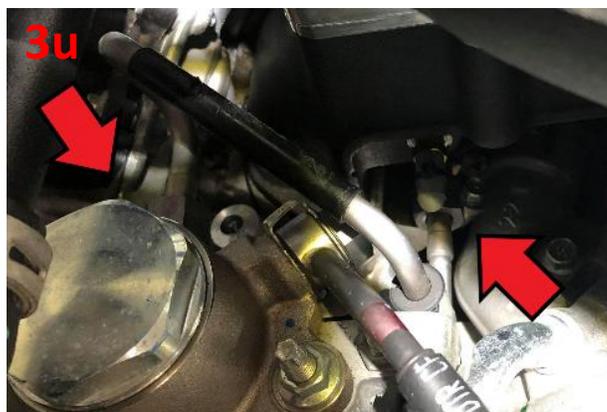


3.s) Remove the FEAD belt

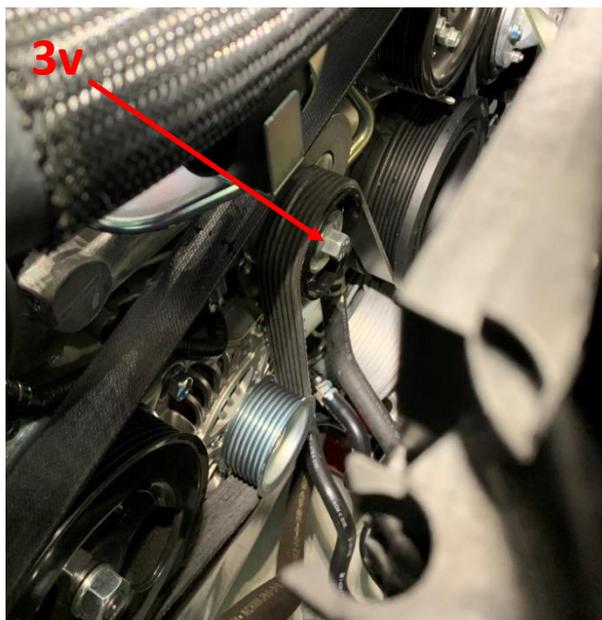
3.t) Remove the plastic cover on the OE idler pulley on the front LH side of the engine and then remove the pulley. This is not re-used.



3.u) Remove high pressure fuel line for DI pump to fuel rail, this will need removed to allow room to install supercharger manifold.



3.v) Replace the tensioner pulley with the supplied pulley. Re-use the OE bolt, which is a left-hand thread.

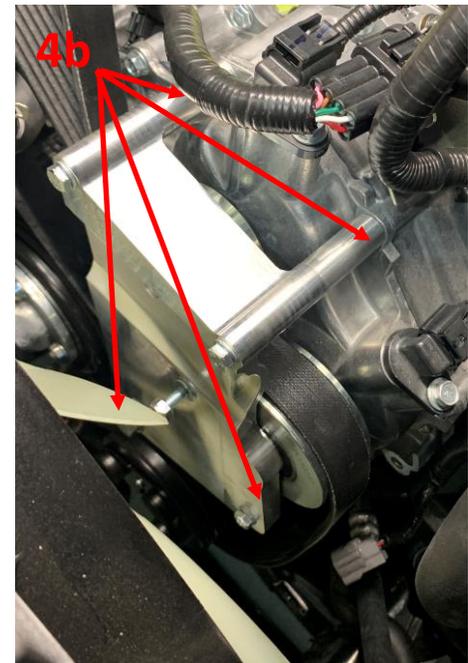


4. Assemble and Install Ancillaries

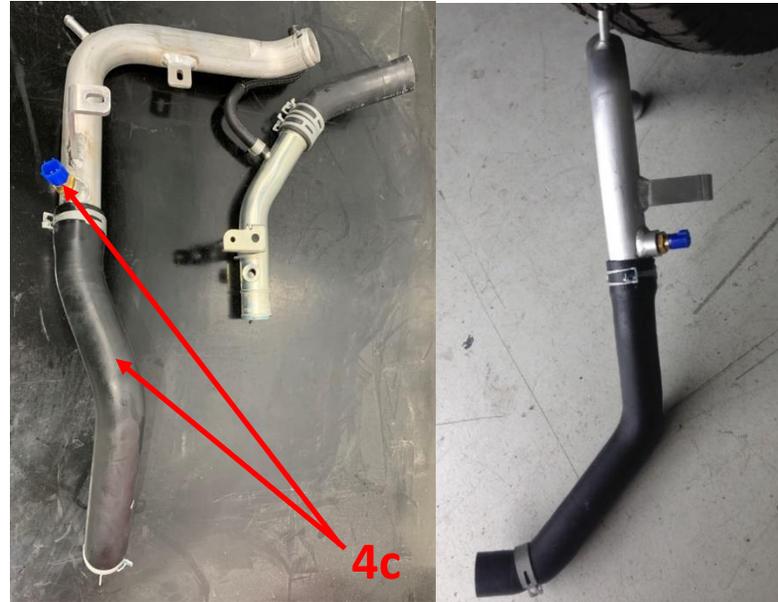
4.a) Loop the supplied belt around the idlers of the Harrop idler bracket before installing to the front of the engine, ensuring the grooved side is facing the grooved idler pulley.

4.b) Remove 3x M6 screws from the LH timing cover that will be replaced with the Idler bracket screws. Install the idler bracket and belt together to the front of the engine, ensuring that the belt is not wrapped around the lower post of the bracket.

The lower M10x1.25 bolt screws into the timing cover in place of the OE idler removed previously.



4.c) Swap the lower radiator hose and coolant temp sender to the Harrop hard-line. Re-use the OE spring-band clamps.



4.d) Fit the smaller end of the supplied reducer hose to the thermostat, re-use two OE spring-band clamps.



4.e) Insert the radiator hose assembly into position and then insert into the reducer hose.

Fit the tag on the hard-line over the stud on the front of the idler bracket and secure with the washer and Nyloc nut. The hard-line bracket will bolt back with the original fastener and location.

Fit and secure the lower radiator hose to the radiator outlet. Re-use OE spring-band clamps.

Ensure that the engine fan has a minimum of 6mm clearance to the hard-line.

Re-connect the temp sender loom.



5. Install the Supercharger Manifold Assembly

5.a) Ensure the MAP sensor port at the rear of the supercharger manifold is blanked off before installing. Check that the 8x manifold O-rings are in place around the ports.

Remove the tape covering the cylinder head inlet ports and ensure the head faces are clean.

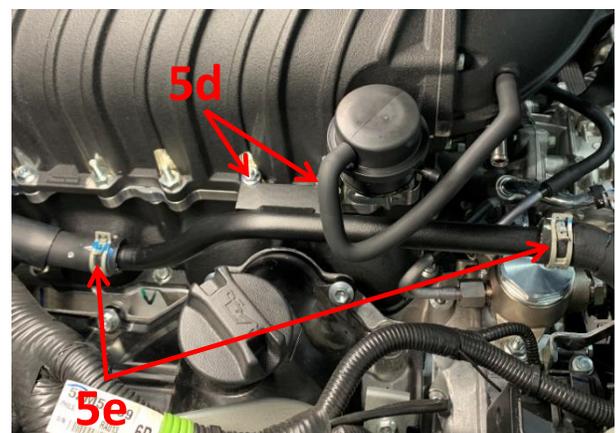
5.b) Install the Supercharger/Manifold assembly to the engine using the supplied M6x20 flange head screws. **Torque to 12Nm +/- 2Nm.**

Note that the front and rear screws on the vehicle LHS will locate the manifold, and the other screws are designed with generous clearance.

5.c) Once the supercharger is in place, reinstall the DI fuel line removed in step 3.u.

5.d) Install the Harrop Heater hard-line to the front two studs in the RHS of the supercharger, securing with the supplied M6 flange nuts.

5.e) Re-connect the heater hoses to each end of the Harrop heater hard-line and secure with the OE spring-band clamps.



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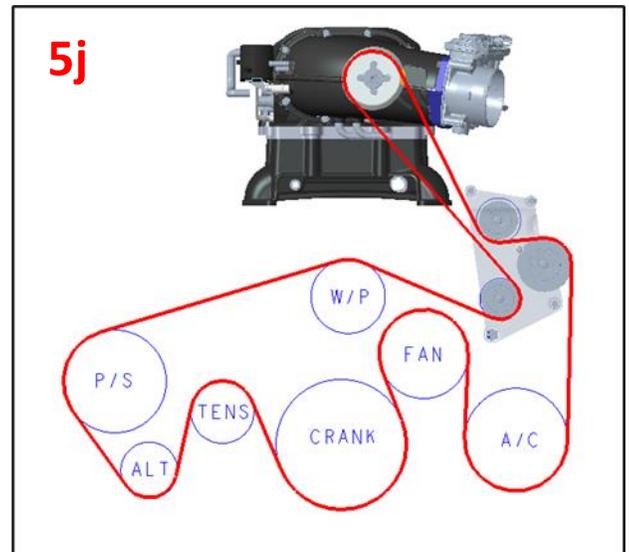
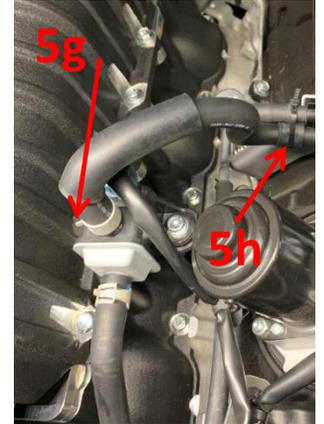
5.f) Fit the supplied fuel purge solenoid bracket and screw to the fuel purge solenoid as shown.

5.g) Fit the fuel purge solenoid bracket to the stud on the LHS of the supercharger and secure with the supplied M6 flange nut.

5.h) Cable tie the fuel purge hose to the adjacent fuel line.

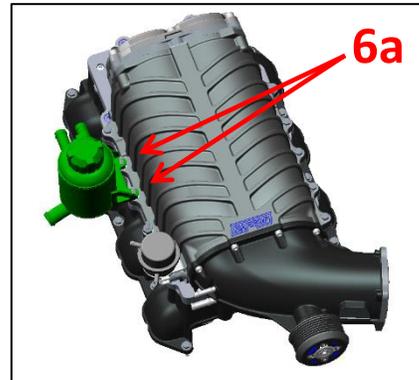
5.i) Attach the free end of the fuel purge hose to the rear fitting under the Supercharger inlet. Secure with the OE spring-band clamp.

5.j) Install the Supercharger drive belt in the original FEAD route, through the idler bracket and over the supercharger.

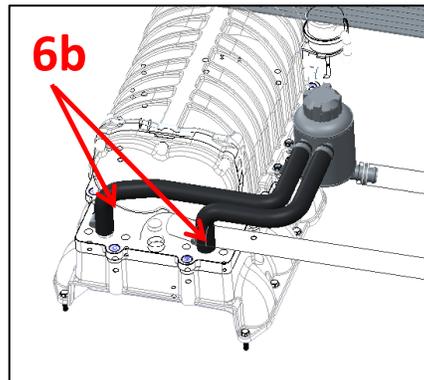


6. Install the Intercooler Coolant circuit

6.a) Install the Intercooler Reservoir to the rear two studs on the RH side of the supercharger and secure with the supplied M6 flange nuts.

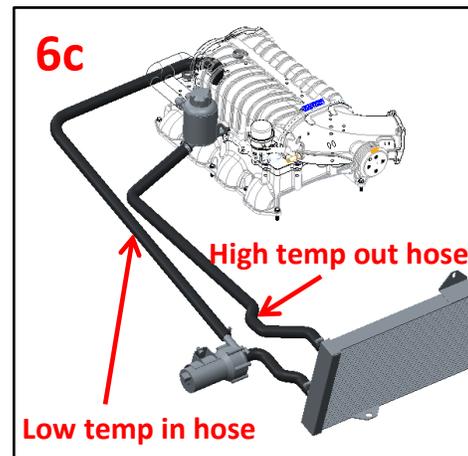


6.b) Install the Intercooler outlet hoses between the two $\varnothing 16\text{mm}$ hose tails at the rear of the Supercharger manifold and the two $\varnothing 16\text{mm}$ hose tails on the Intercooler Reservoir.

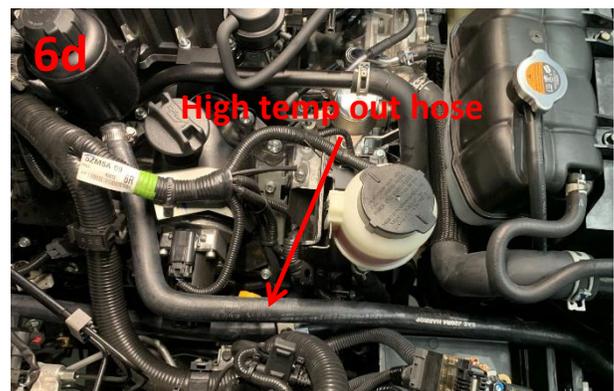


Secure with 4x supplied 16-24mm hose clamps.

6.c) Attach the Low temp-in Intercooler hose between the pump outlet and centre $\varnothing 20$ hose tail at the rear of the Supercharger manifold.



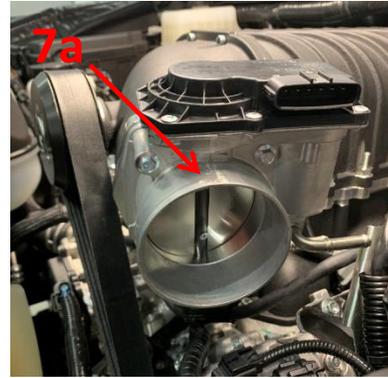
6.d) Attach the High temp-out Intercooler hose between the $\varnothing 20$ Reservoir outlet and the top Intercooler Radiator inlet.



Secure with the supplied 18-32mm hose clamps.

7. Install throttle, intake and wiring looms

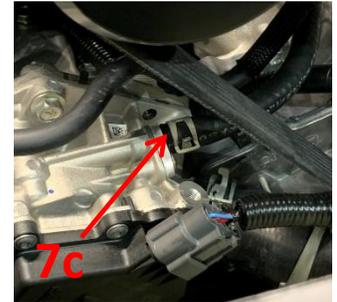
7.a) Swap the OE throttle body to the supercharger inlet in the position shown using the 4x OE fasteners.



7.b) Connect the supplied \varnothing 5/16" coolant hose between the upper elbow on the throttle body and the barb on the Harrop radiator pipe, trim to length required and secure with the OE spring-band clamps.

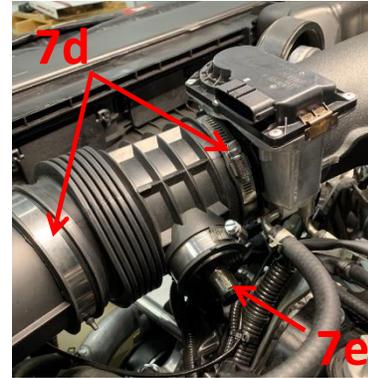


7.c) Connect the remainder of the \varnothing 5/16" coolant hose between the lower elbow on the throttle body and the barb on the thermostat housing. Secure with the OE spring-band clamps.

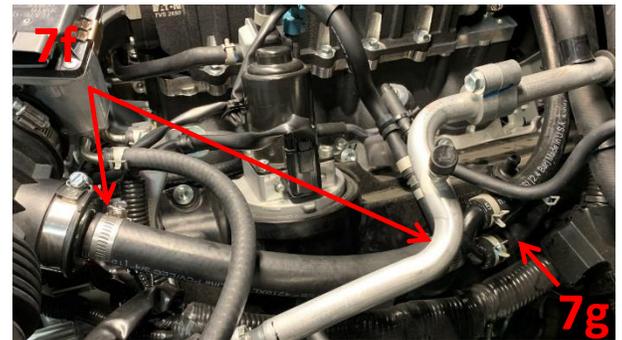


7.d) Install the OE intake tube between the throttle and airbox. Secure with the OE clamps.

7.e) Install the supplied valve cover vent reducer to the OE intake tube and secure with the OE clamp.

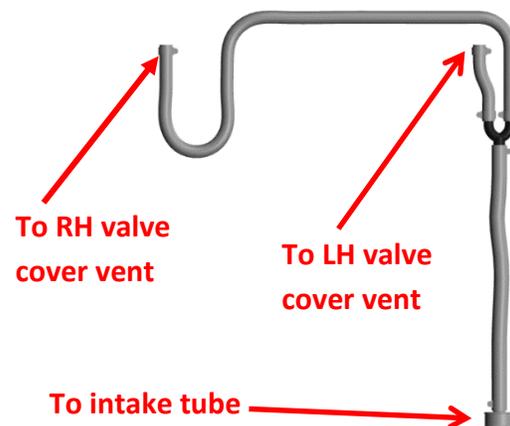


7.f) Using the supplied $\varnothing 3/4$ " PCV hose, attach the supplied Y-piece to the adapter installed in step 7.c and secure with 2x 18-32mm hose clamps.



7.g) Cut a short piece of the supplied $\varnothing 5/8$ " PCV hose (approx. 3") and fit between one leg of the Y-piece and the LH valve cover, secure with the OE spring-band clamps.

7.h) Using the remainder of the $\varnothing 5/8$ " PCV hose, connect the other leg of the Y-piece and the RH valve cover, secure with the OE spring-band clamps.

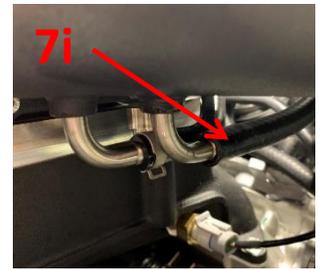


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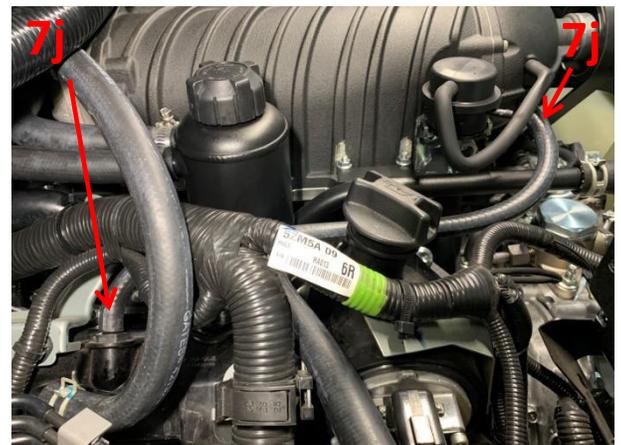
Installation Guide



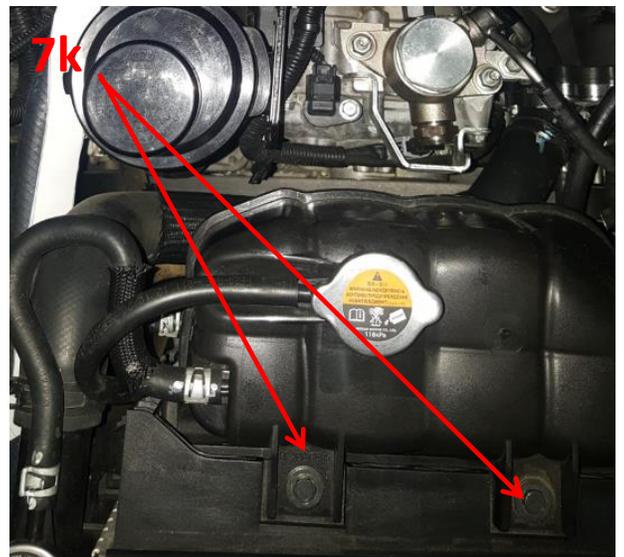
7.i) Using the supplied $\text{\O}3/8''$ PCV hose, connect the LH valve cover to the front fitting under the supercharger inlet, trim to length as required.



7.j) Using the remainder of the $\text{\O}3/8''$ PCV hose, connect the RH valve cover to the fitting on the RHS of the supercharger inlet.



7.k) Re-Install the Engine coolant Reservoir, making the original hose connections.

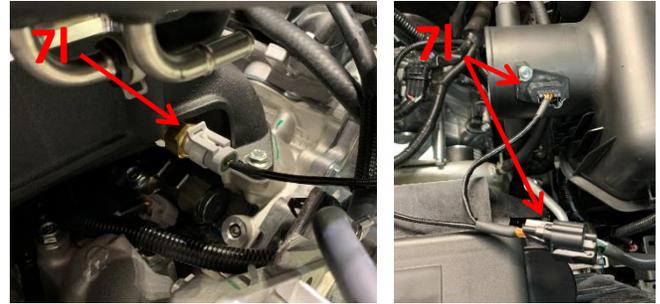


Nissan Patrol TVS2300 Supercharger

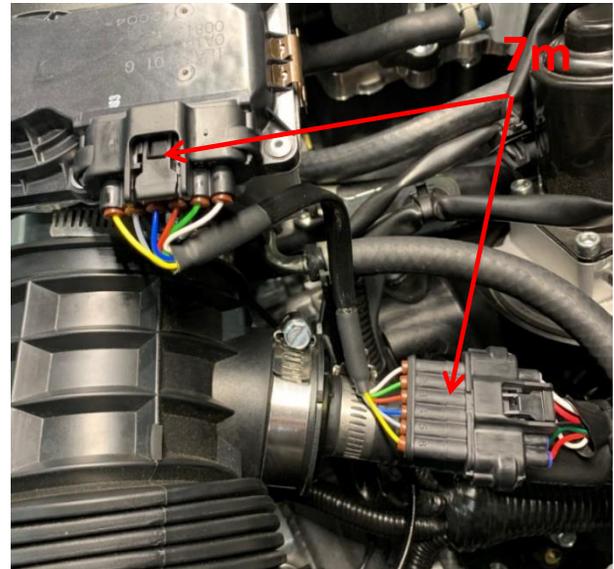
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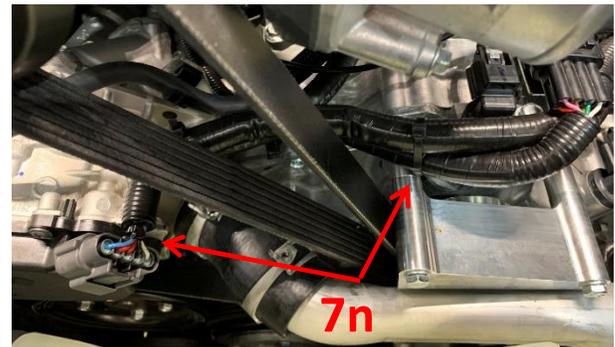
7.l) Connect the Harrop MAF-IAT loom to the MAF plug on the air-box, the IAT sensor on the front of the supercharger manifold and re-connect the OE MAF loom to the Harrop loom.



7.m) Install the Throttle extension Loom between the OE Throttle plug and the OE throttle Loom.



7.n) Re-route the Thermostat loom behind the Supercharger belt and cable tie it to the Harrop idler bracket so that it can't come into contact with the belt.



7.o) Check that all engine coolant hoses are secured with hose clamps and re-fill the Engine cooling system with the OE coolant via the Coolant reservoir above the radiator.

8. Fill intercooler system

Re-install the Battery Tray and Battery.

Ensure all Intercooler hoses are secured with hose clamps.

8.a) Connect the Intercooler pump power (red) and Earth (Black) wires to the battery terminals.

8.b) Fill the Intercooler Reservoir with Automotive engine coolant GM6277M, mixed with deionised or distilled water in a 50% concentrate. **Note: Filling with a noncompliant coolant will void warranty.**

8.c) Open the bleed screw on the top front LH side of the Intercooler radiator.

8.d) Close the reservoir fill cap and run the Intercooler pump by switching the ignition on without starting the engine.

Close the bleed screw when air is no longer coming out.

Re-fill the reservoir and repeat this process until all air is expelled from the system.

8.d) Re-fit the Radiator shutters and front grille.

8.e) Flash the ECU with the base calibration and start the engine.

9.f) Check that the Supercharger belt is tracking on all pulleys and that there is clearance between the engine coolant hard-line, supercharger belt and engine fan.

Check all components, including wiring and hoses and tidy installation where needed with cable ties.

