BMW S58

LEVEL-UP

CHARGE AIR COOLER MANIFOLD

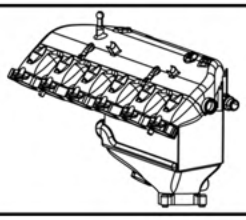
CSF

ULTIMATE PERFORMANCE COOLING

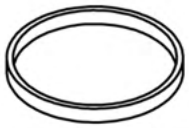
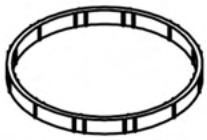
CSFRACE.COM

CHARGE-AIR COOLER MANIFOLD

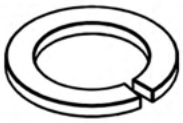
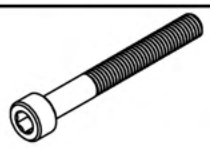
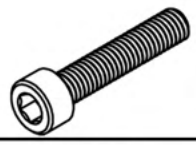
REV. 1.1 - 11/09/22

ID		QTY	DESCRIPTION	CSF #	NOTE
A2		1	CHARGE AIR COOLER MANIFOLD	8233 8233B 8233C	

OEM PARTS (NOT SUPPLIED)

ID		QTY	DESCRIPTION	CSF #	NOTE
I		6	RUNNER O-RING (GREEN)	B58-G-1	(SEE DIAGRAM #3) INSTALL INTO INDIVIDUAL CYLINDER GROOVES ON BOTTOM OF MANIFOLD OUTLET TANK *INSPECT FOR DAMAGE BEFORE INSTALLATION BMW OEM #11-61-8-637-800
V		1	THROTTLE BODY O-RING (RED)	B58-G-3	(SEE DIAGRAM #2) INSTALL ONTO THROTTLE BODY *INSPECT FOR DAMAGE BEFORE INSTALLATION BMW OEM #18-54-8-632-344

HARDWARE (KIT #1)

ID		QTY	DESCRIPTION	CSF #	NOTE
K		10	M6 SPLIT LOCK WASHER (CLEAR ZINC)	B58-W-1	(SEE DIAGRAM #2) INSTALLS ONTO QTY. 3 BOLTS (W) (SEE DIAGRAM #3) INSTALLS ONTO QTY. 7 BOLTS (AN)
W		3	M6 X 1.0 X 50 SHCS (CLEAR ZINC)	B58-B-4	(SEE DIAGRAM #2) INSTALLS ONTO QTY. 3 LOCK WASHERS (K)
T		9	STEEL 1/8" NPT BUNG (CLEAR ZINC)	B58-F-2	OPTIONAL PLUGS - RECOMMEND: SEALING TAPE OR GREASE (SEE DIAGRAM #2) FOR NITROUS/METHANOL PORTS ON OUTLET TANK - QTY. 6 (SEE DIAGRAM #1) FOR VACUUM PAD ON INLET TANK - QTY. 3 *USE WITH THREAD SEALANT
AN		7	M6 X 1.0 X 40 SHCS (CLEAR ZINC)	B58-B-8	(SEE DIAGRAM #3) MANIFOLD TO CYLINDER HEAD BOLT USE QTY. 7 LOCK WASHERS (K)
AC		1	EMISSION PORT CAP (BLACK ANODIZE)	B58-F-7	(SEE DIAGRAM #1) OPTIONAL USE PRE-INSTALLED QTY. 1 O-RING (AG) TO SEAL USE QTY. 1 SCREW (AE)
AD		2	M6 X 1.00 X 16 BHCS (CLEAR ZINC)	B58-B-5	(SEE DIAGRAM #1) USE WITH QTY. 1 BRACKET (PF) TO FASTEN COOLANT TANK RESERVOIR (RESERVOIR SITS ON TOP OF BRACKET)

HARDWARE CONT. (KIT #1)

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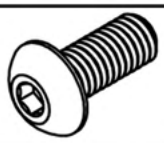
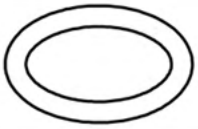
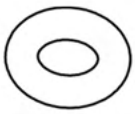
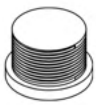
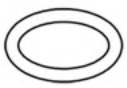
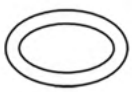
ID		QTY	DESCRIPTION	CSF #	NOTE
AE		1	M5 X 0.8 X 12 BHCS (CLEAR ZINC)	B58-B-6	(SEE DIAGRAM #1) USE WITH QTY. 1 EMISSIONS PORT CAP (AC)
AG		1	EMISSION PORT CAP O-RING (AC) (BLACK)	B58-G-4	(SEE DIAGRAM #1) PRE-INSTALLED ONTO QTY. 1 EMISSIONS PORT CAP (AC)
ZT		3	CABLE TIE	ZT1	TO SECURE WIRE HARNESS (SEE INSTRUCTIONS PAGE 11 - STEP 9 - PHOTO 9)

FUEL (KIT #2)

ID		QTY	DESCRIPTION	CSF #	NOTE
S2		1	THERMAL REJECTION SPACER	8233S	(SEE DIAGRAM #3) *SPACER IS DIRECTIONAL* PLEASE READ INSTRUCTIONS!
C2		1	FUEL RAIL	8233F	(SEE DIAGRAM #5) SEE "OPTIONAL SECONDARY FUEL SYSTEM" INSTRUCTIONS - *RAIL IS DIRECTIONAL* PLEASE READ INSTRUCTIONS!
F		6	INJECTOR PORT BUNG (BLACK ANODIZE)	B58-F-1	(SEE DIAGRAM #4) PRE-INSTALLED QTY. 6 O-RINGS (M) TO SEAL
M		6	INJECTOR PORT BUNG O-RING (BLACK)	B58-G-2	PRE-INSTALLED ON QTY. 6 INJECTOR PORT BUNGS (F)
AB		1	-8 INTERNAL HEX PLUG (BLACK ANODIZE)	B58-F-6	(SEE DIAGRAM #5) ATTACHES TO FUEL RAIL (C2) - (OPTIONAL) INCLUDES PRE-INSTALLED QTY. 1 O-RING (AL) TO SEAL FOR USE ON VEHICLES WITHOUT A SECONDARY FUEL SYSTEM
AJ		2	-10 ORB CRANKCASE QUICK CONNECT HOSE FITTING (BLACK ANODIZE)	B58-F7	(SEE DIAGRAM #1) REQUIRED FOR ALL INSTALLATIONS (SEE DIAGRAM #3) USE IF RUNNING OPTIONAL BOV, MEASURING OTHER PARAMETERS, OR IF INSTALLING ON X3M/X4M + INCLUDES PRE-INSTALLED QTY. 1 O-RING (AM) TO SEAL
AK		1	-10 ORB CRANKCASE BUNG FITTING (BLACK ANODIZE)	B58-F8	(SEE DIAGRAM #3) FOR OPTIONAL BLOCK OFF INCLUDES PRE-INSTALLED QTY. 1 O-RING (AM) TO SEAL
AL		1	-8 INTERNAML HEX PLUG O-RING (BROWN)	B58-G-5	PRE-INSTALLED ON QTY.1 -8 HEX PLUG (AB)
AM		3	-10 O-RING (BROWN)	B58-G-7	PRE-INSTALLED ON QTY. 2 HOSE FITTINGS (AJ) QTY. 1 BUNG FITTING (AK)

PRE-INSTALLED (KIT #3)

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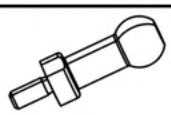
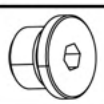
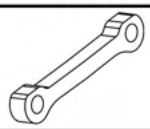
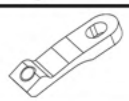
ID		QTY	DESCRIPTION	CSF #	NOTE
PA		2	M6 X 1.0 X 18 BHCS (CLEAR ZINC)		(SEE DIAGRAM #5) USE WITH QTY. 2 WASHERS (PB) PRE-INSTALLED INSTALLS ONTO QTY. 2 FUEL RAIL BRACKETS (PG) (PRE-INSTALLED)
PB		6	M6 FLAT WASHER		(SEE DIAGRAM #1 & 5) USE WITH QTY. 2 BOLTS EACH (PA/PH/PI) (PRE-INSTALLED)
PC		1	M5 X 0.8 X 18 BHCS (CLEAR ZINC)		(SEE DIAGRAM #1) PRE-INSTALLED ON MANIFOLD
PD		1	ENGINE COVER PIN		(SEE DIAGRAM #1) PRE-INSTALLED ON MANIFOLD (REMOVE IF NOT USING ENGINE COVER)
PE		1	-3 ORB BLEEDER PLUG (BLUE ANODIZED)		(SEE DIAGRAM #1) PRE-INSTALLED ON MANIFOLD
PF		1	COOLANT RESERVOIR BRACKET		(SEE DIAGRAM #1) USE WITH QTY. 2 BOLTS (AD) PLACE ON TOP OF MOUNTING BOSSES PLACE RESERVOIR TANK ON TOP OF BRACKET
PG		2	FUEL RAIL BRACKET		(SEE DIAGRAM #5) USE WITH QTY. 2 BOLTS (PI) & QTY. 2 WASHERS (PB) PRE-INSTALLED
PH		2	M5 X 1.0 X 14 BHCS (CLEAR ZINC)		(SEE DIAGRAM #1) USE WITH QTY. 2 WASHERS (PB) PRE-INSTALLED FASTENS WIRE HARNESS BRACKET TO MANIFOLD
PI		2	M5 X 1.0 X 16 BHCS (CLEAR ZINC)		(SEE DIAGRAM #3) USE WITH QTY. 2 WASHERS (PB) PRE-INSTALLED FASTENS QTY. 2 FUEL RAIL BRACKETS (PG) TO MANIFOLD

DIAGRAM #1

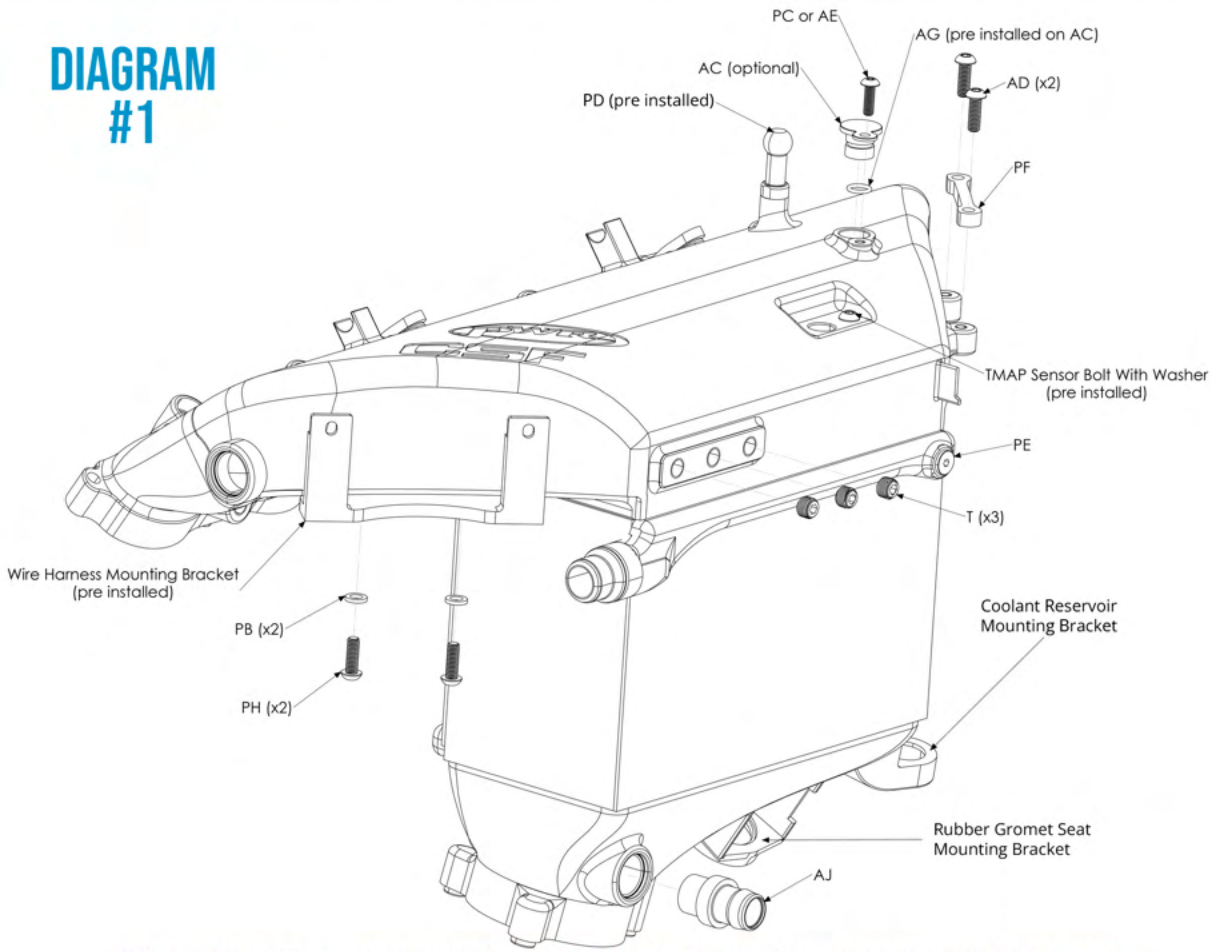


DIAGRAM #2

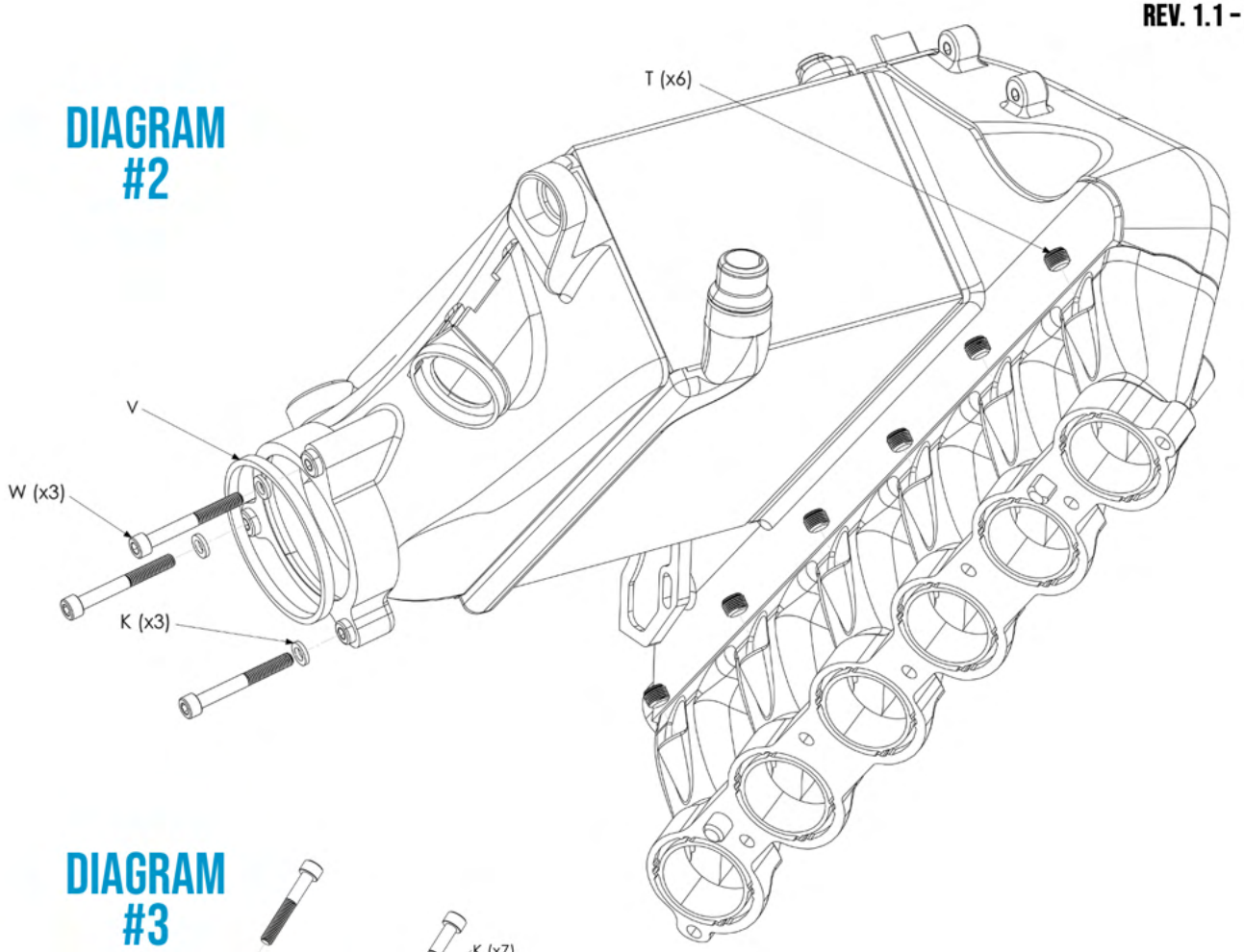
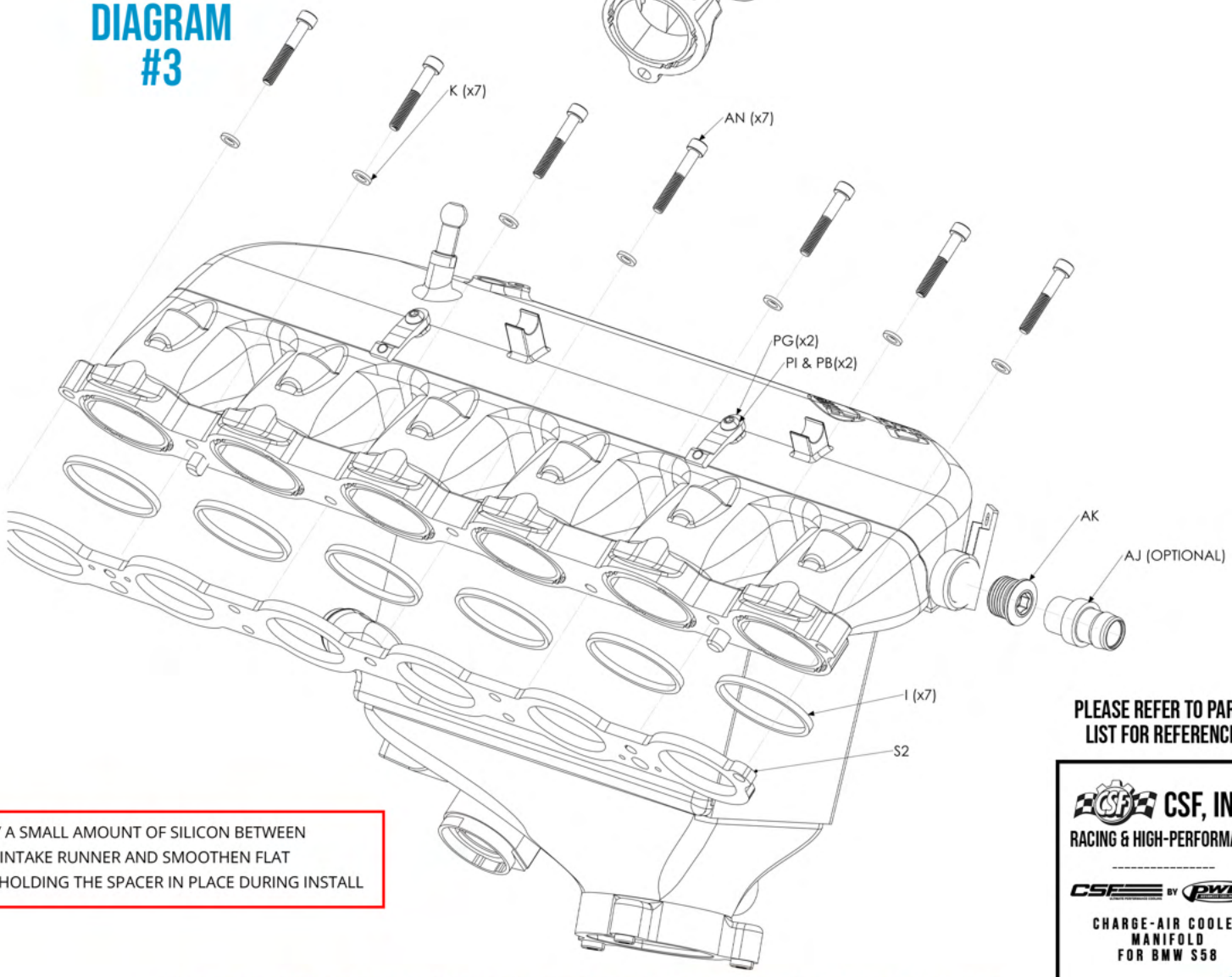


DIAGRAM #3



APPLY A SMALL AMOUNT OF SILICON BETWEEN EACH INTAKE RUNNER AND SMOOTHEN FLAT
*FOR HOLDING THE SPACER IN PLACE DURING INSTALL

PLEASE REFER TO PARTS LIST FOR REFERENCE.

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CSF BY PWR

CHARGE-AIR COOLER MANIFOLD FOR BMW S58

DIAGRAM #4

FOR INSTALLATION WITHOUT PORT FUEL INJECTION

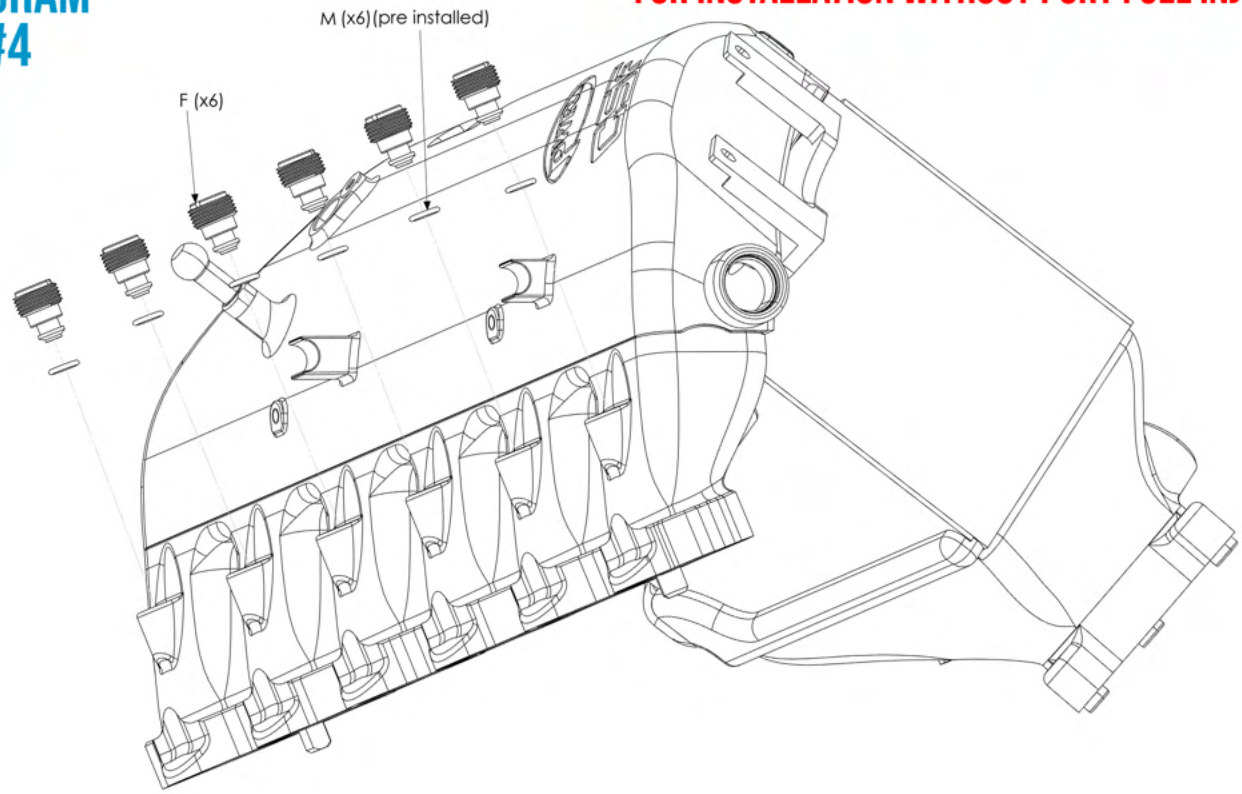
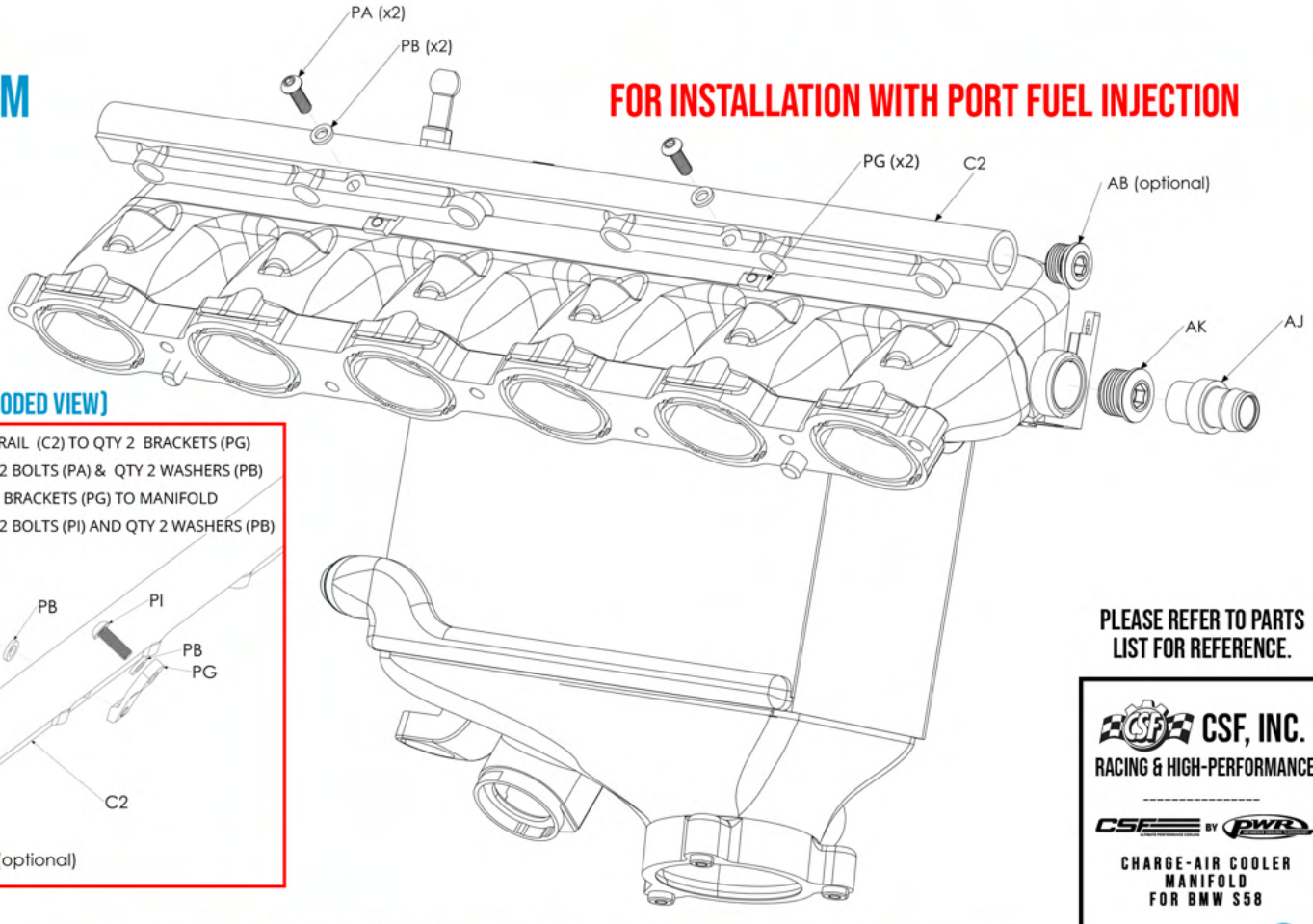


DIAGRAM #5

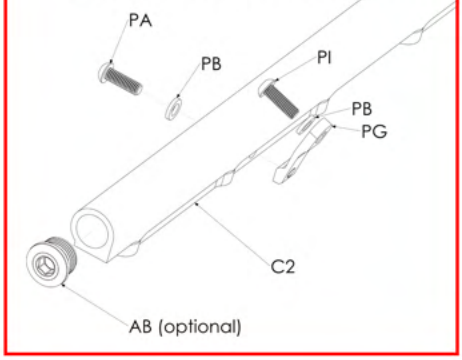
FOR INSTALLATION WITH PORT FUEL INJECTION



FUEL RAIL (EXPLODED VIEW)

STEP 1: BOLT FUEL RAIL (C2) TO QTY 2 BRACKETS (PG)
USING QTY 2 BOLTS (PA) & QTY 2 WASHERS (PB)

STEP 2: BOLT QTY 2 BRACKETS (PG) TO MANIFOLD
USING QTY 2 BOLTS (PI) AND QTY 2 WASHERS (PB)



PLEASE REFER TO PARTS LIST FOR REFERENCE.

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RACING & HIGH-PERFORMANCE

CSF BY PWR

CHARGE-AIR COOLER MANIFOLD
FOR BMW S58

THIS PRODUCT IS DESGINED SOLELY FOR OFF-ROAD OR MOTORSPORTS USE.

INSTRUCTIONS

CSF #8233 – S58 MANIFOLD (G8X)

PLEASE FOLLOW THESE INSTRUCTIONS CAREFULLY IN THE CORRECT SEQUENCE

CSF RECOMMENDS UNSTAPLING THIS INSTRUCTION PACKET AND LAYING IT OUT IN NUMERICAL ORDER

OEM MANIFOLD REMOVAL

FOR XDRIVE VEHICLES There is no clearance from the bottom to gain access to the OEM manifold due to the front transfer case, you will need to remove manifold from the top side only

1.) Remove both strut/chassis braces to clear access to manifold and remove engine cover.
   a. Unbolt the coolant reservoir tank from the manifold.
   b. Unclip the manifold wiring harness and unplug TMAP Sensor.
   c. Remove (1) 10mm bolt holding EVAP sensor onto manifold.
   d. Remove coolant reservoir for more clearance (optional)
   e. Remove DME for additional clearance (required)

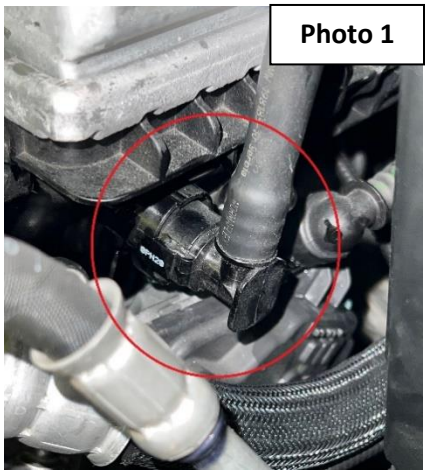
Photo 1

2.) Remove driver side intake assembly (airbox and DME assembly).

3.) Disconnect lower crank case ventilation line located on the lower charge cooler tank. (See Photo 1)

4.) Remove under tray and locate drain plug for the heat exchanger and drain.

5.) Disconnect lower charge pipe from throttle body (c-clip) and disconnect throttle body harness. (See Photo 2)

6.) Disconnect charge cooler coolant reservoir tank and tuck towards fire wall.

7.) Disconnect coolant quick connects located on the charge cooler core (x2) and throttle body (x2).


Photo 2

8.) Disconnect all emission lines from manifold and unclip.
   a. Lift manifold to gain access to disconnect TMAP sensor and move harness aside.
   b. Remove EVAP bracket to gain access to the bolts.
   c. Make sure not to snag wiring harness / hoses (2-person job)

9.) Disconnect both wire harness clips located on the intake manifold & front of the engine.

10.) Loosen charge cooler bolts completely (they do not separate from manifold).

11.) Disconnect vacuum quick connects from "T" located on the underside of manifold. (See Photo 3)

12.) Unclip harness and remove manifold.


Photo 3

PRE-INSTALL

*CSF recommends using painter's tape to cover and prevent scratches/damage to the finish in high touch/interference areas on the manifold and in the engine bay.

1.) Inspect and reinstall OEM gaskets to cylinder runners on the outlet side of the manifold (green color) and throttle body flange (red color). *Recommend to use automotive lube on gaskets. (See Diagram #3)
- Qty. 6 gaskets (I) (green color) - BMW OEM #11-61-8-637-800
- Qty. 1 gasket (V) (red color) - BMW OEM #18-54-8-632-344

2.) Connect throttle body to manifold. (See Diagram #2)
- Qty. 3 bolts (W)
- Qty. 3 lock washers (K)

3.) Install crank case vent quick connect. (See Diagram #1)
- Qty. 1 -10 ORB quick connect (AJ) with pre-installed O-Ring (AM)

4.) Install crank case vent quick connect or bung fitting. (See Diagram #3)
- Qty. 1 -10 ORB quick connect (AJ) with pre-installed O-Ring (AM)
  - Use if running optional BOV, measuring other parameters, or if installing on X3M/X4M
- Qty. 1 -10 ORB bung fitting (AK) with pre-installed O-Ring (AM)
  - Use for optional block off

5.) Install 1/8” NPT into parameter pad if not adding sensors (See Diagram #1).
- Qty. 3 1/8” NTP Plugs (T)

6.) Inspect and reinstall OEM TMAP sensor.
- Qty. 1 bolt pre-installed at location on CSF manifold (See Diagram #1).

7.) Reuse/Install rubber gromet seat from OE Manifold (See Diagram #1).

8.) Reuse/Install rubber gromet from OE manifold for coolant reservoir mounting (See Diagram #1).

9.) Install injector bungs (See Diagram #4) ***ONLY IF NOT RUNNING SECONDARY INJECTOR/FUEL SYSTEM***
- Qty. 6 injector bungs (F)
- Qty. 6 injector bung O-rings (M) pre-installed

10.) Install manifold spacer (S2) – (See Diagram #3)

*Please note the thermal rejection spacer is directional and should be placed onto the manifold as shown below (Photo 4). Ensure directional identification holes (Photo 4) are oriented as shown. (Apply some silicone between each intake runner to help secure the thermal rejection spacer for an easier install).

Photo 4

OPTIONAL: SECONDARY FUEL SYSTEM AND NITROUS/METHANOL INJECTION

*CSF recommends plumbing all secondary fuel lines before installing manifold.
CSF RECOMMENDS bolting the fuel rail to the fuel brackets first, then install the bracket and fuel rail to the manifold. Install the fuel rail after bolting the manifold to the engine.

1.) Build secondary fuel system (if using rail for top feed port injection) (See Diagram #5)
- Plumb fuel line feed fitting into rail before attaching to manifold.
- Block off front of fuel rail if not running a return line.
  - Qty. 1 -8 Internal hex plug (AB)
  - Qty. 1 -8 Internal hex plug O-Ring (AL) pre-installed
- Install injectors (Qty. 6 not supplied) into fuel rail. (Recommend using appropriate lube on O-Rings for easier fit).
  - CSF recommends using Injector Dynamics (ID) injectors for the best performance – the most commonly used injector for this engine has been ID model # 1050.34.14.14.6 (qty 6)

2.) Insert injectors into fuel rail (recommend using appropriate lube on O-rings for easier fit)
*Leave plumed fuel rail to the side. Mount fuel rail to manifold after manifold after has been bolted to the engine.
- Attach fuel rail to fuel rail brackets (x2)
  - Qty. 2 bolts (PA) pre-installed on CSF manifold
  - Qty. 2 brackets (PG) pre-installed on CSF manifold
    *Fuel Rail is directional (See Photo 5) – Bolts (PA) and Washers (PG) must be installed on the side with the recessed machining.

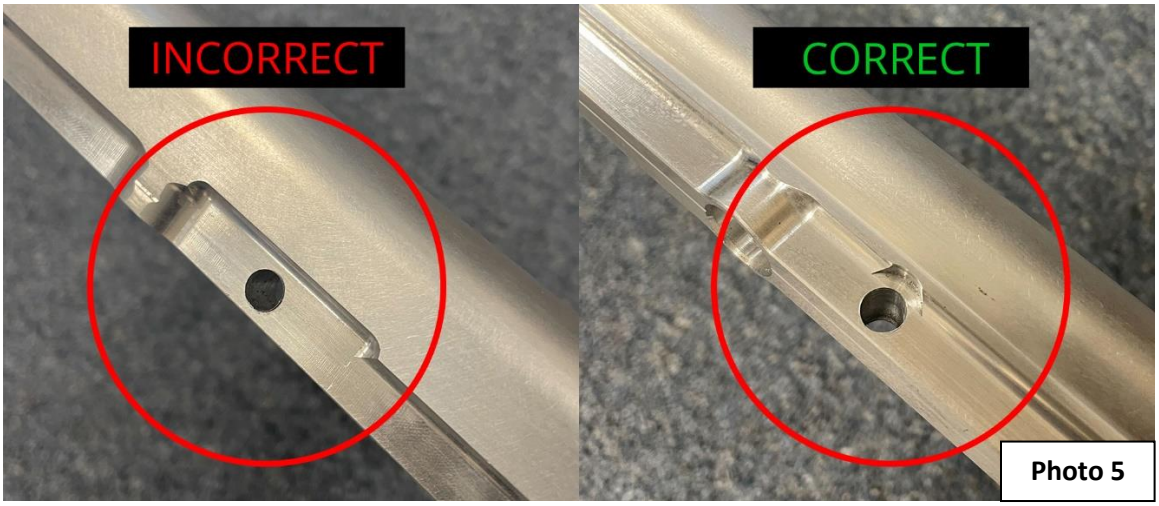

Photo 5

3.) Install emissions port cap (if deleting emission lines or plugging both crank case ventilation ports). (See Diagram #1) ***FOR OFF-ROAD/MOTORSPORTS USE ONLY**
- Qty. 1 emission port cap (AC)
- Qty. 1 emission port cap O-ring (AG) pre-installed
- Qty. 1 bolt (AE)

4.) Build optional nitrous/methanol system and install onto ports located on the backside of the intake runners.
   - If not using nitrous or methanol, use Qty. 6 1/8th NPT Bungs (T) – (See Diagram #2)
     ***CSF Recommends that you use thread sealant**

INSTALLATION

1.) Remove 2x ECM harness clips for clearance (See Photo 6)
Required: remove entire DME unit to gain additional clearance

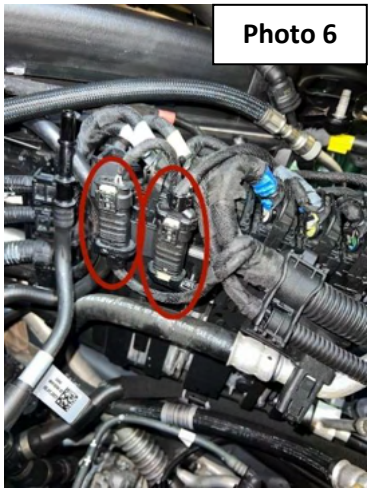
Photo 6

2.) Set manifold into bolting position.
   - Make sure the manifold is resting on the rubber gromet seat securely.
     ***For xDrive vehicles loosen mount to position the manifold correctly, then tighten mount after the manifold is in place.**

3.) Reconnect vacuum quick connects from "T" located on the underside of manifold. (See Photo 3 on page 7)

4.) Connect flange bolts to cylinder head (See Diagram #3)
*Please be sure that you have the manifold spacer installed. If not, please refer to Photo 4 on page 8.
   - Hand thread all bolts in first.
     - Qty. 7 bolts (AN)
     - Qty. 7 lock washers (K)

5.) Reconnect coolant quick connects located on the charge cooler core (x2) and throttle body (x2).
   - Push connectors on until they "click" together.

6.) Reconnect all emissions lines and harnesses.
   - Do not reconnect crank case quick connect. (See Photo 1 on page 6)
   - Clip emissions lines into stand-offs on top of manifold.

7.) Reconnect wire harness to manifold wire harness mounting bracket also on OEM location on the front of engine.
- Qty. 1 Wire Harness Mounting Bracket (See Diagram #1)
- Qty. 2 bolts located on the bottom of CSF manifold can be loosened to adjust the bracket. (See Photo 7).
  *Bracket is slotted for adjustability.

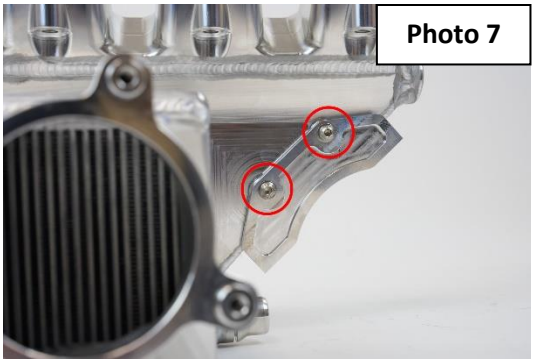
Photo 7

8.) CSF recommends routing TMAP harness towards fire wall – routing it behind the coolant reservoir and under the ECM cover. (See Photo 8)

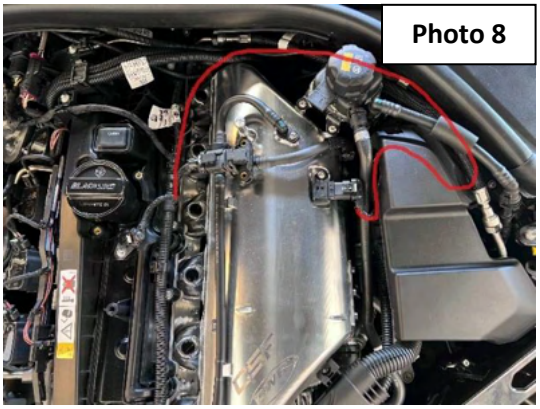
Photo 8

9.) Remove rear harness plastic bracket. (See Photo 9)
- Secure to surrounding harnesses for a clean look. Use Qty. 2-3 Cable Ties (ZT).
- Cut to length after secured.

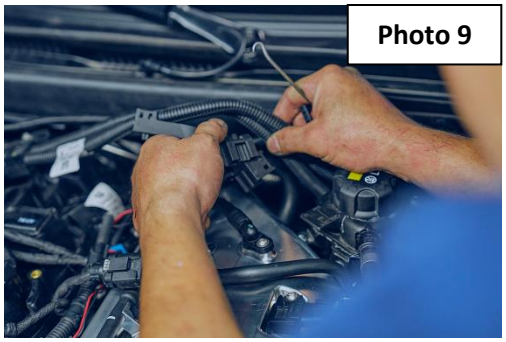
Photo 9

10.) Reinstall air intake system
- Connect crank case quick connect on engine block.

11.) Reinstall coolant reservoir on backside of manifold.
- Install coolant reservoir bracket (PF) on top of mounting bosses. (See Diagram #1)
- Use Qty. 2 Bolts (AD) to secure reservoir through bracket (PF) into threaded mounting bosses.
- Make sure bottom of coolant reservoir is placed correctly into Coolant Reservoir Mounting Bracket (See Diagram #1). Please make sure rubber grommet was installed on bracket (See “Pre-Install” – Step 6 – Page 8)
- Refill coolant. *CSF recommends using factory BMW coolant for the system
- Follow factory coolant bleed instructions.

12.) ENJOY!

D I S C L A I M E R !

This installation involves working on fuel systems and it is not advised for the inexperienced DIY person. Before commencing installation, ensure you have technical information on the replacement process or seek skilled/professional assistance. Always follow national safety standards for working on flammable liquids and health and safety laws. CSF is not responsible for incorrectly fitted parts or consequential loss and/or damages. The installer is responsible for using their own discretion to determine their level of ability, not CSF. Always use appropriately rated safety goggles and use fans to ventilate working space and avoid fume inhalation.

***Installing high flow rate fuel injectors may cause the dashboard instrument cluster fuel consumption and remaining mileage (TRIP) calculations to be incorrect.

CSF pressure tests each #8233 / #8233B / #8233C manifold at 60-70 PSI for a period of ~5 minutes during the Quality Control and Inspection process. The CSF manifold is not designed to operate above 60 PSI. Any users who chose to operate their vehicle with the CSF manifold over 60 PSI does so at their own risk. Operation at these pressure levels will void the CSF Limited Lifetime Warranty.

Motor racing is extremely hazardous, and death may occur. CSF products have no warranty or representations made with ability to protect against injury or death. Motor racing, aggressive driving, including driving for any period of time at full throttle, and car modifications of any kind that facilitate aggressive driving may reduce the useful life of the car and or any of its wearable parts. Improving the performance of an engine by altering the engine's computer software may cause the engine to "work harder" and could result in damage to the car. The user assumes these risks.

Q U E S T I O N S ?
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T H I S P R O D U C T I S D E S G I N E D S O L E L Y F O R O F F - R O A D O R M O T O R S P O R T S U S E .