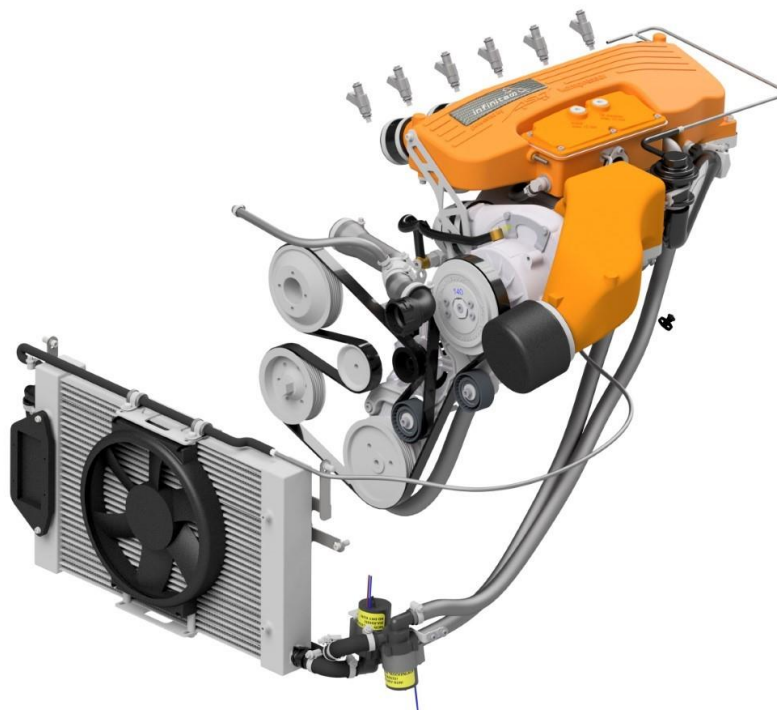




## Installation instruktion compressor kit S54 SK2

### M3 E46/E85/E86



Updated	Author		Pages	Approved by
26.8.2011	FA	Draft	44	
30.9.2011	JS	Revised, for internal use only	43	JS
30.5.2012	JS	V2.0 variant Z4 added	52	JS
10.12.2012	JS	Note Sticker added. V2.01	52	JS
06.12.2019	SJE	GP logo removed	52	SJE
03.11.2020	DZ	Translated	50	JED



## Software customization

It is essential to read the map out before starting the conversion and send it to [support@infinitas-automotive.com](mailto:support@infinitas-automotive.com). We usually need two working days to customize the map.



## Exploded views and parts lists

This manual is completed by the parts list documents and exploded drawings. These are available for customers to download.

Familiarize yourself with the parts lists and exploded drawings of the kits quantity of parts and check the completeness at the same time.

P341-00-04	Complete assembly TM Kit BMW S54 B32 SKI
P341-10-03	Belt drive S54 B32 SKI E46
P341-20-03	Air duct before compressor
P341-40-03	Air duct after compressor S54 B32 E46 SKI
P341-42-03	Intercooler S54
P341-46-00	Bypass system S54
P341-52-08	Water circuit LLK S54 E46 SKI
P341-52-69	Counter-cooler with holders E46
P341-53-02	Crankcase ventilation S54
P341-53-33	Oil supply S54 B32 SKI SMG
P341-53-55	Oil supply S54 B32 SKI MAN
P341-54-02	Coolant hose S54 B32 SKI E46
P341-72-15	Additional water pump wiring
P341-73-11	Temperature sensor cable set



### Before starting the modification

Please strictly adhere to the installation instructions and the prescribed tightening torques.

It is advisable to read the entire installation documentation in its entirety first. The parts highlighted in yellow in the following parts lists are not applicable. The drawings of the individual assemblies are absolutely necessary for understanding these installation instructions.

If you do not see parts (e.g. compressor) installed on the pictures, this is for better presentation and clarity on the pictures.

The manual refers to the BMW program TIS. The corresponding document can be called up directly under the given number (e.g. RA 11 61 050) (TIS access required).



### ASA standard values for tightening torques

These tightening torques apply to all screw connections with screws of strength category 8.8, except for screw connections with special torque specifications. These can be taken from the respective assembly drawings.

#### Standard values for metric ISO – standard screw thread

M5	6 Nm / 4,4 Lb.ft
M6	10 Nm / 7,4 Lb.ft
M8	25 Nm / 18,4 Lb.ft
M10	49 Nm / 36,1 Lb.ft
M12	86 Nm / 63,4 Lb.ft
ASA Oil inlet screw compressor M10x1	14 Nm / 10,3 Lb.ft
Hose clamp width 9 mm	3 Nm / 2,2 Lb.ft
Hose clamp width 12 mm	6 Nm / 4,4 Lb.ft

Grease O-rings before assembly

Use silicone spray to mount the hoses on connections or fittings.

Thoroughly degrease all glued areas before gluing.

#### Required consumables:

- Brake cleaner
- Silicone spray
- Flow adhesive grease
- Loctite Hysol Metal Set S1 3471 A+B



## Preparation for modification

### Disassembly

- Dismantle intake air duct
  - o BMW TIS collector for intake air mounting and dismounting (S54) (RA 11 61 050)
- Remove belt and eccentric roller (not applicable)
  - o Replace BMW TIS drive belt for generator (S54) (RA 11 28 010)
- Remove belt pulley from servo pump
- Unscrew servo pump from servo pump holder
- Dismantle servo pump holder (not applicable)
- Drain coolant
  - o BMW TIS Drain and top up coolant (S54) (RA 17 00 005)
- Remove strut brace with holders (front axle must be loaded)
- Remove front bumper
  - o vehicles with metal carrier
    - BMW TIS front bumper completely mounted and dismounted (RA 51 11 000)
  - o Vehicles with fibre composite carrier
    - BMW TIS front bumper fairing (M3 / lightweight construction) (RA 51 11 156)
    - BMW TIS carrier for front bumper covering - and attach/replace (M3 / lightweight construction) (RA 51 11 050)
- Remove cooling water supply hose between radiator and engine top left
- Engine compartment after completed preparation (Figure 1)

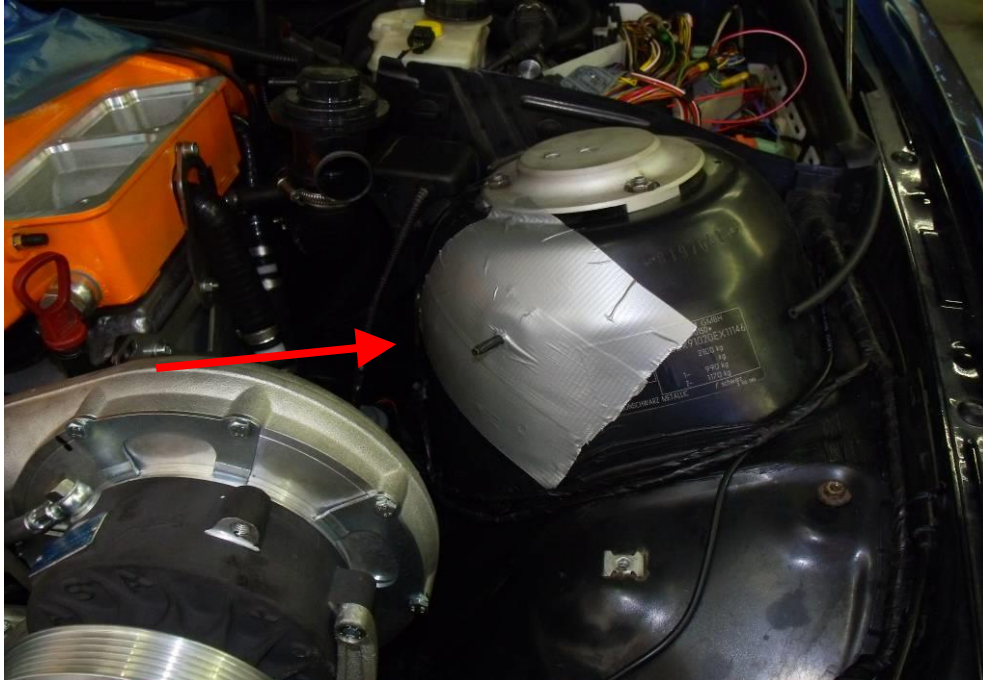


*Illustration 1*



### Remove threaded bolt on left shock absorber dome

- Protect paint against damage



*Illustration 2*

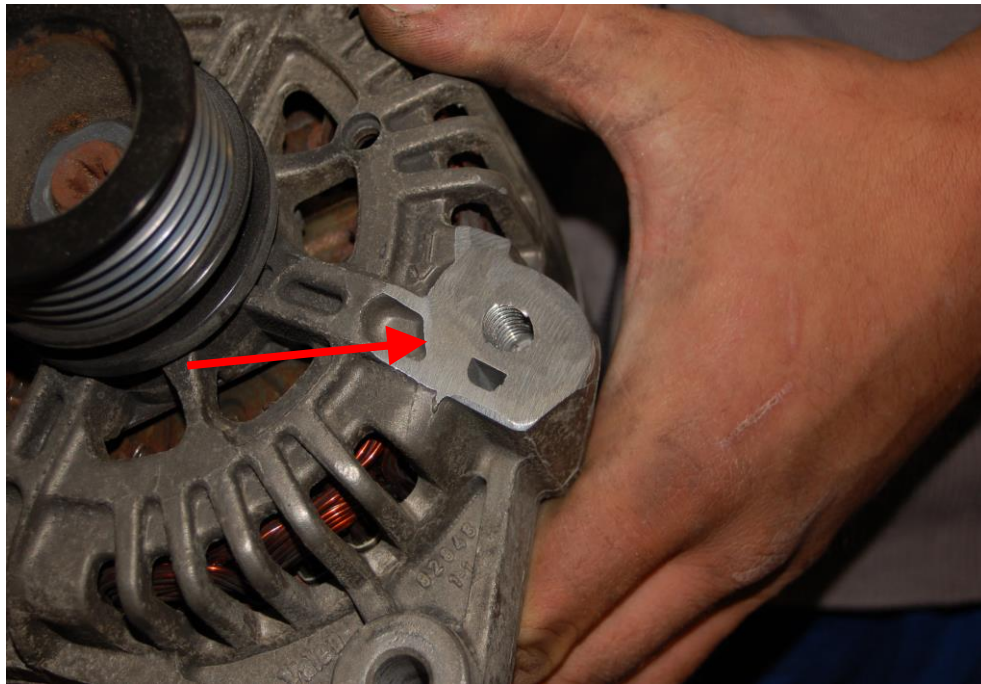
- Saw off bolt (arrow illustration 2) and file flat
- Protect blank areas from corrosion with a touch-up pencil (Illustration 3)



*Illustration 3*

### Alternator modification

- Remove alternator
- Cover with adhesive tape to protect the rotor from dirt
- Modify the alternator as shown in illustration 4, 5 and 6 to ensure planar fit of the base plate



*Illustration 4*



*Illustration 5*

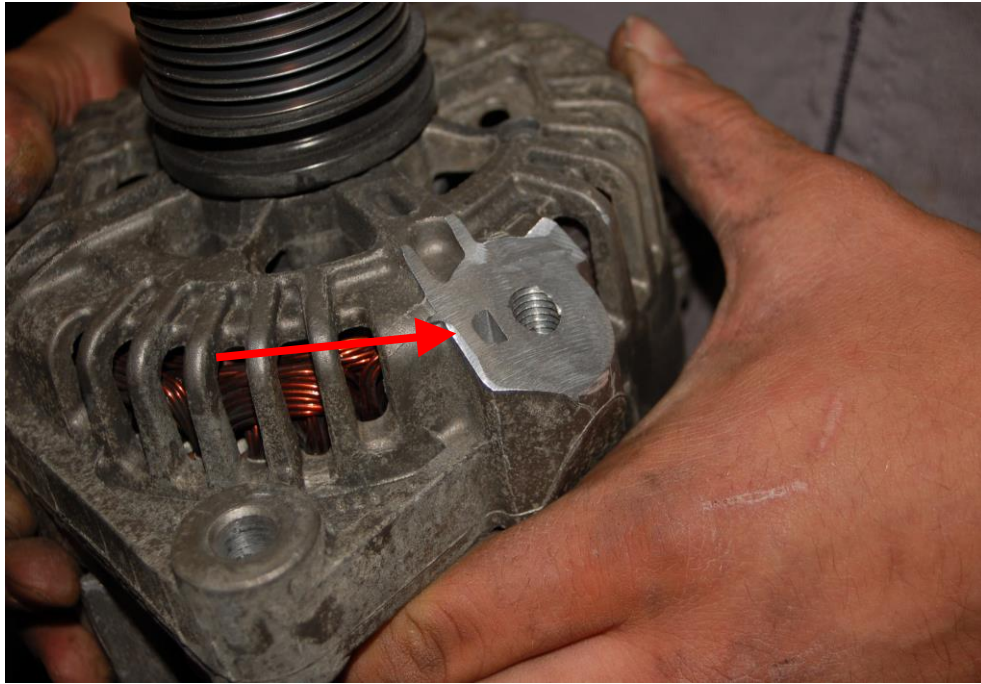




# P341-95-20 Installation instructions

## TM Kit BMW S54 SK2

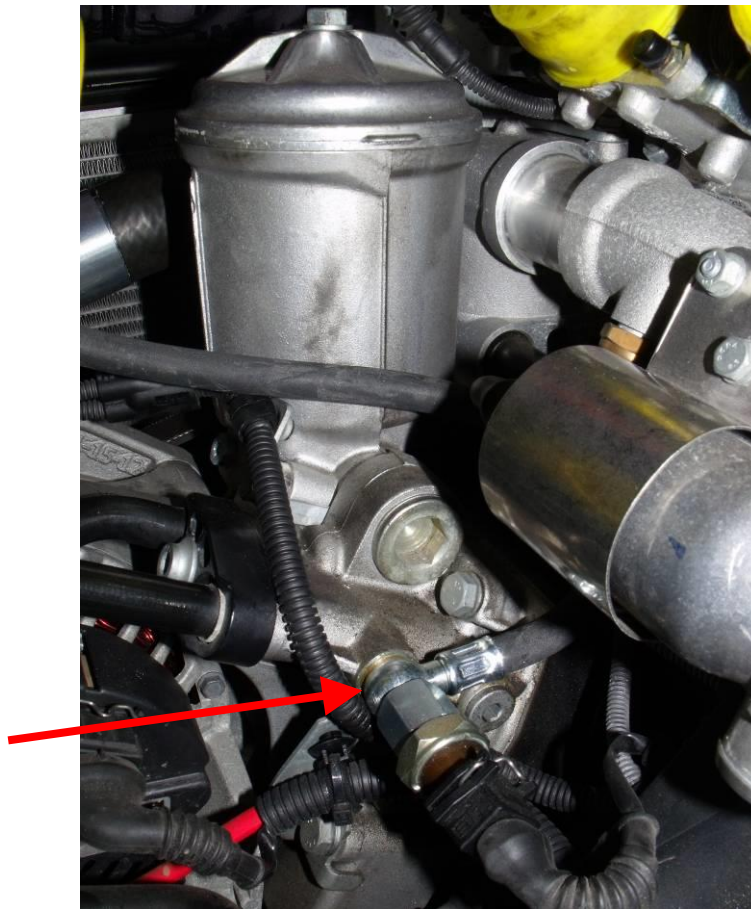
Updated: 2020-11-03  
Created by: DZ



*Illustration 6*

### P341-53-33 Oil supply

- Mount the oil inlet hose between pressure connection and standard pressure switch on the oil filter housing (Illustration 7)
  - o Pass hose as a bend behind idling actuator; will later be fixed to the suction pipe holder at the front (P341-42-30)



*Illustration 7*

- Drill oil return
  - o Jack up vehicle 20 cm in front, then no oil need to be drained
  - o Alignment of the oil return pipe is shown in the pictures
- Drill 25mm hole in oil pan with hole saw (30mm from lower edge of oil pan) and cut two M6 threads for fixing screws (Figure 9). Pay attention to the depth of the hole (Figure 10)
- The long side of the triangular base of the glue nozzle forms a right angle (90°) with the axis of the groove in the oil pan (Figure 11)



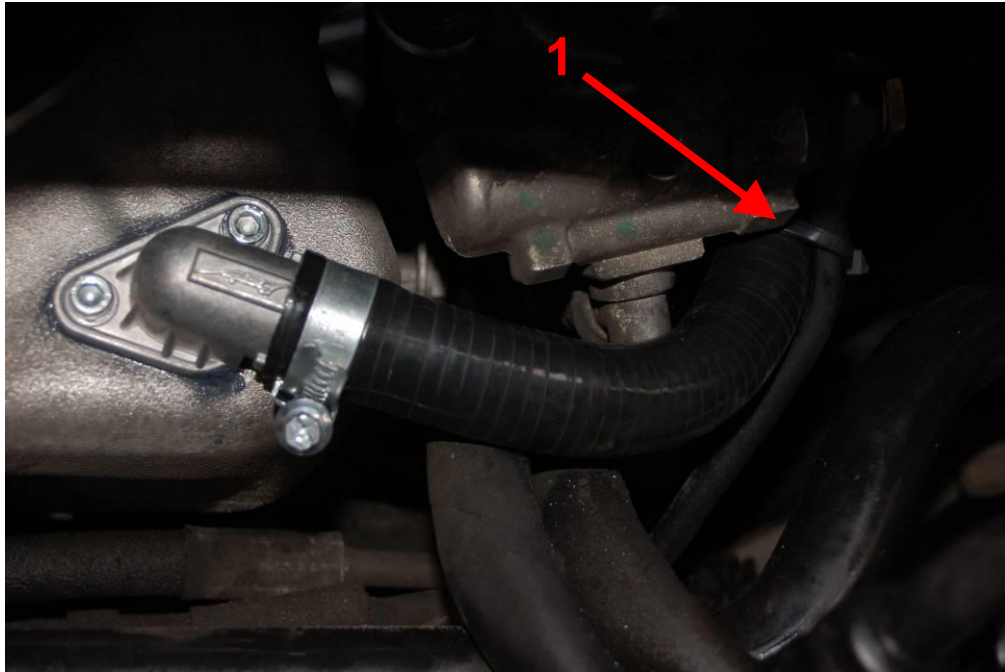
*Illustration 8: Position of the oil return flange*



*Illustration 9*

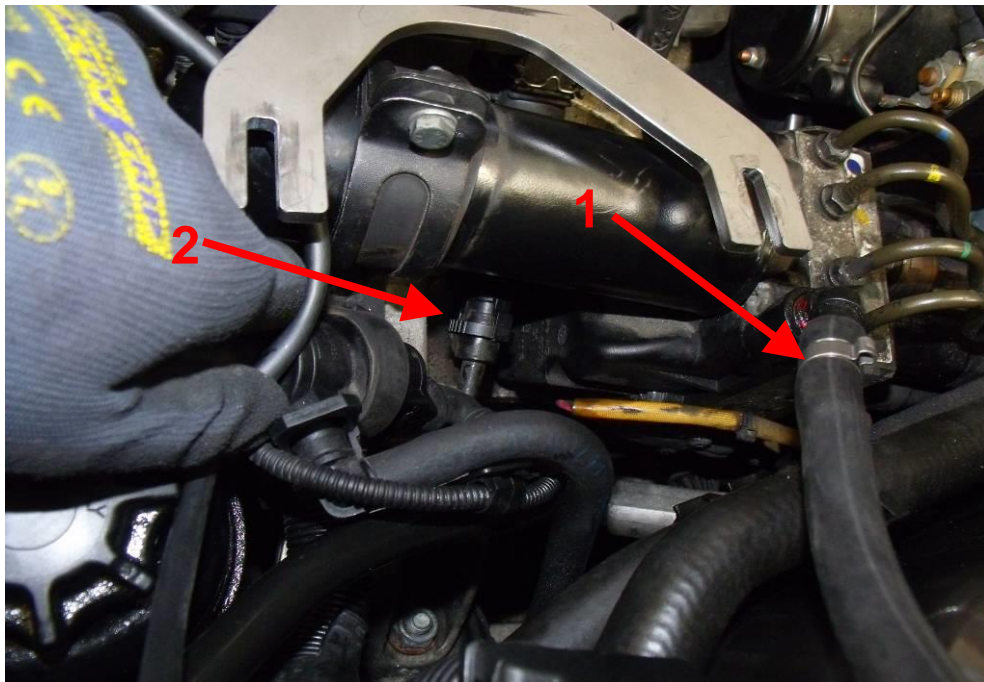
- Roughen and thoroughly degrease the glued areas on the oil pan and glued connection piece
- Glue the adhesive connection with Loctite Hysol Metal Set and secure with screws (M6x10)
- Mount the oil return hose with hose clamp on the connecting piece and secure it to the servo oil line with cable ties (1) in illustration 11





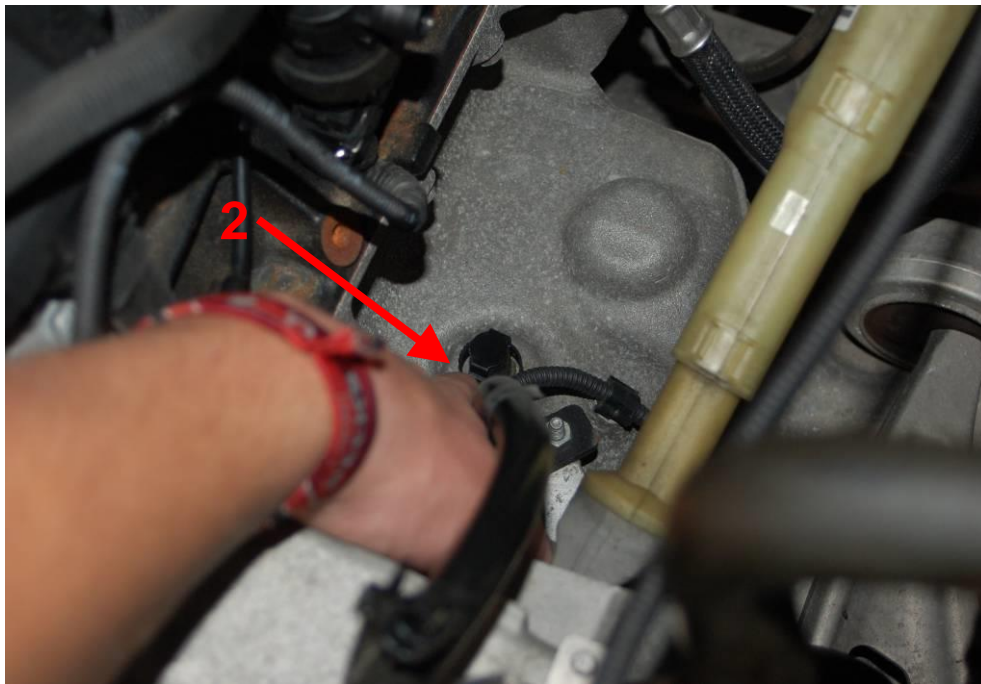
*Illustration 10: Alignment of the oil return nozzle*

- If available: Prepare hose for SMG expansion tank and mount it to the hydraulic unit with standard coupling Figure 12: (1)
- Close the oil return flow from the standard airbox illustration 13: (2)
  - o For E46 with SMG gearbox



*Illustration 11*

- For Z4M and vehicles without SMG transmission



*Illustration 12*

- Put the loose ends of the hoses upwards so that they are later accessible
- For vehicles with SMG gearbox remove closing bolt Illustration 13 (3) from the expansion tank SMG gearbox and mount an hollow screw with ring eye Illustration 14: (4) (M12x1,5)



*Illustration 13*

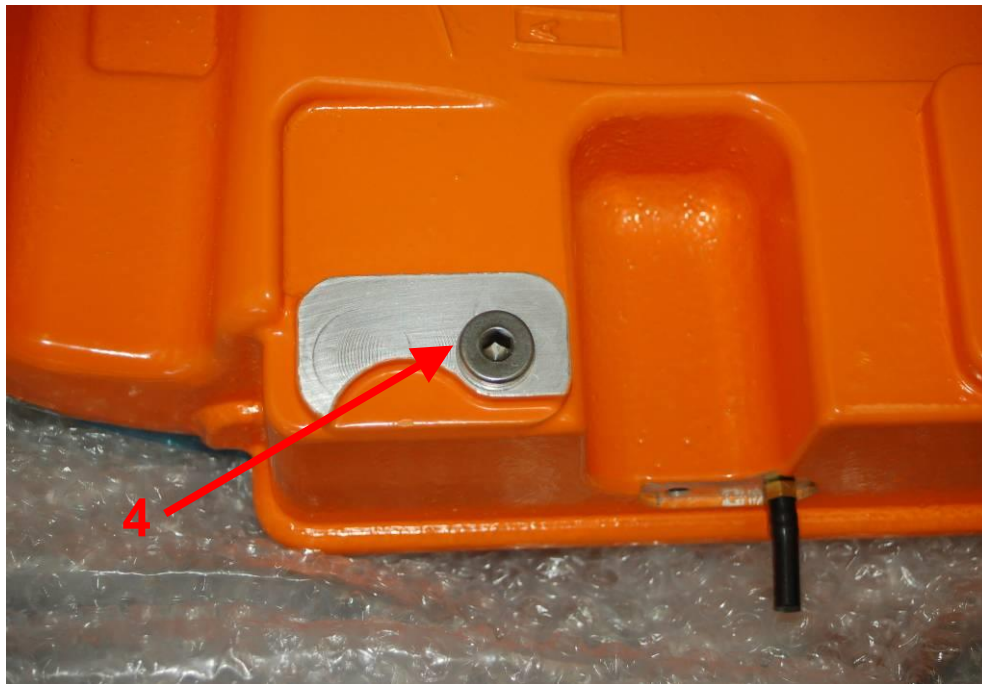




# P341-95-20 Installation instructions

## TM Kit BMW S54 SK2

Updated: 2020-11-03  
Created by: DZ



*Illustration 14*



#### **P341-55-04 Fuel supply**

- Replace original injection nozzles with ASA injection nozzles as specified in the BMW TIS (RA 13 64 501 Remove and install / replace one injection valve (S54)

#### **P341-73-13 Spark plugs**

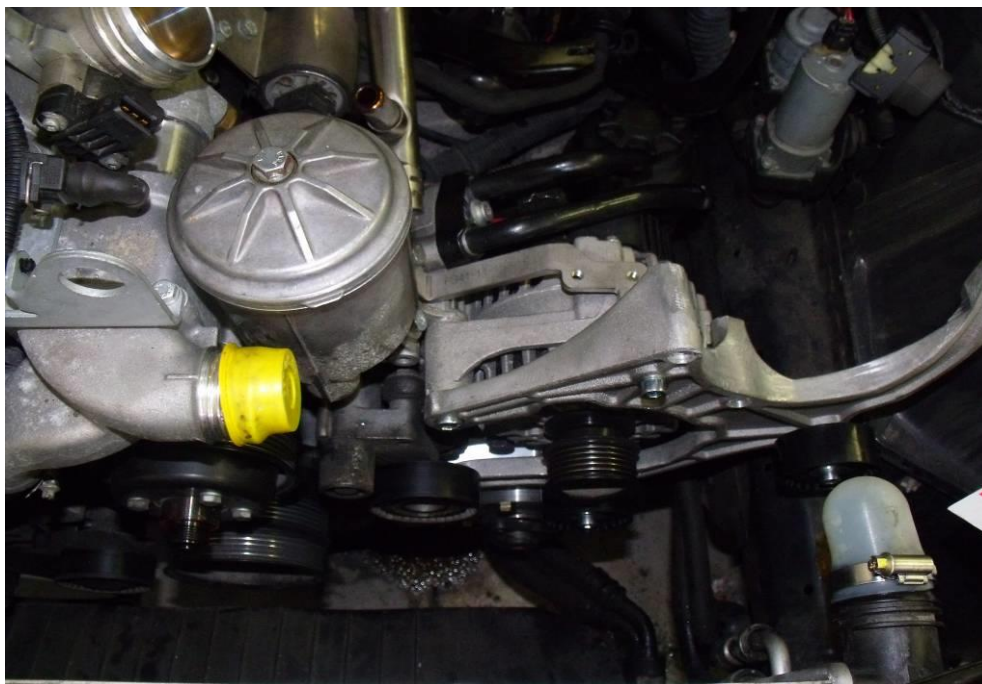
- Replace original spark plugs with ASA spark plugs as specified in BMW TIS (RA 12 12 011 Replace all spark plugs (S54)

#### **P341-73-11 Temperature sensor cable set**

- Extend the cable to the temperature sensor from the mass airflow sensor plug according to the assembly drawing
- For E46 M3 CSL with the supplied extension cable, extend the cable of the standard temperature sensor (no soldering required)

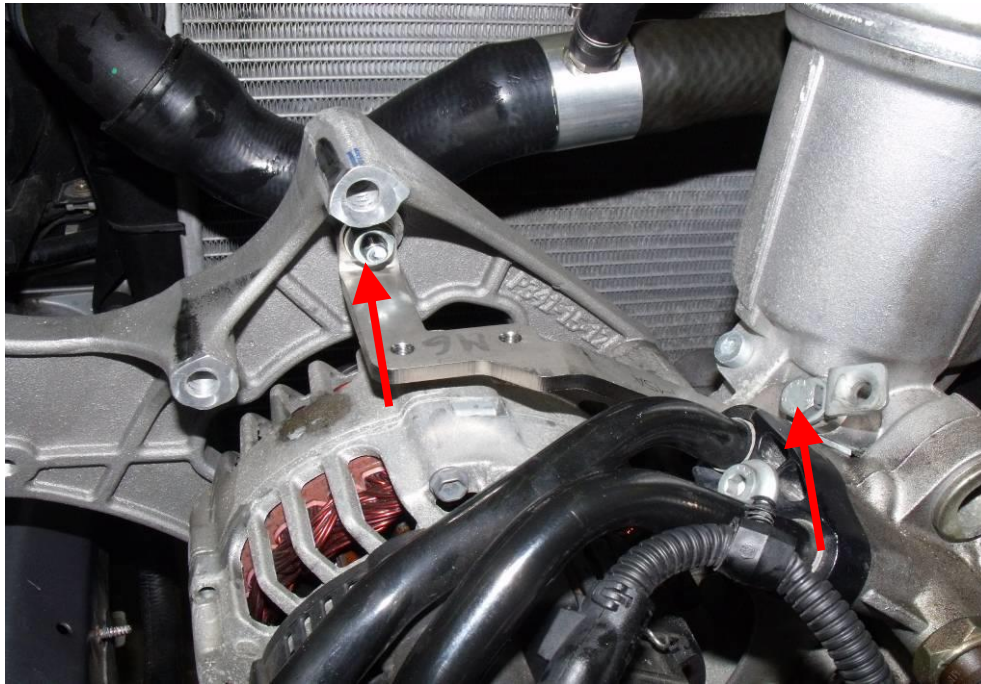
#### **P341-10-03 Belt drive**

- Screw servo pump holder (P341-15-14) to base plate (P341-15-13)



*Illustration 15*

- o First loosely screw in all screws of the base plate and check the fit
- o Check aligned fit of the base plate at all points and make sure that it's not distorted by the installation
- Servo pump and servo pump pulley with original screws
- Deflection rollers (P4030 1044) with centering bushes (P4030 1051) (see assembly)
- Mount support base plate (P341-11-15) (Illustration 16 and 17)



*Illustration 16*

- Screw compressor to base plate
- Tighten all screws to the specified tightening torque
- Place 6PK 2270mm V-ribbed belt



*Illustration 17*

- Mount oil inlet hose to compressor with hollow screw Illustration 17: (1)
  - o Tightening torque 14Nm
- Push the oil return hose onto the connection on the compressor and secure with a hose clamp





### P341-42-03 Intercooler S54

- Assemble the intercooler with brackets according to the assembly drawing (according to Illustration 19)



*Illustration 19*

- Tighten nuts only loosely so that the position of the holders for the suction tube can still be adjusted
- Only tighten screws to the specified torque after final assembly of the suction tube





### P341-40-03 Air ducting after compressor

### [Part 1]

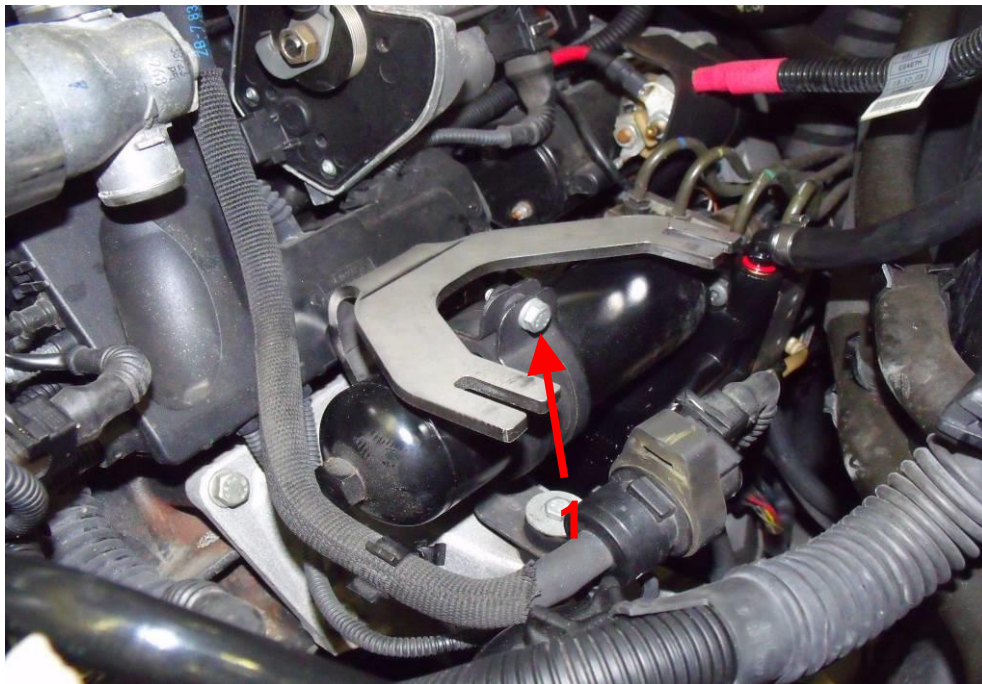
#### Mount the assembly in the following order

- Pre-assemble intercooler
  - o Rubber buffer from original Airbox with loosely screwed on nuts so that the intercooler can be pushed into the slots of the holder (P341-42-44)



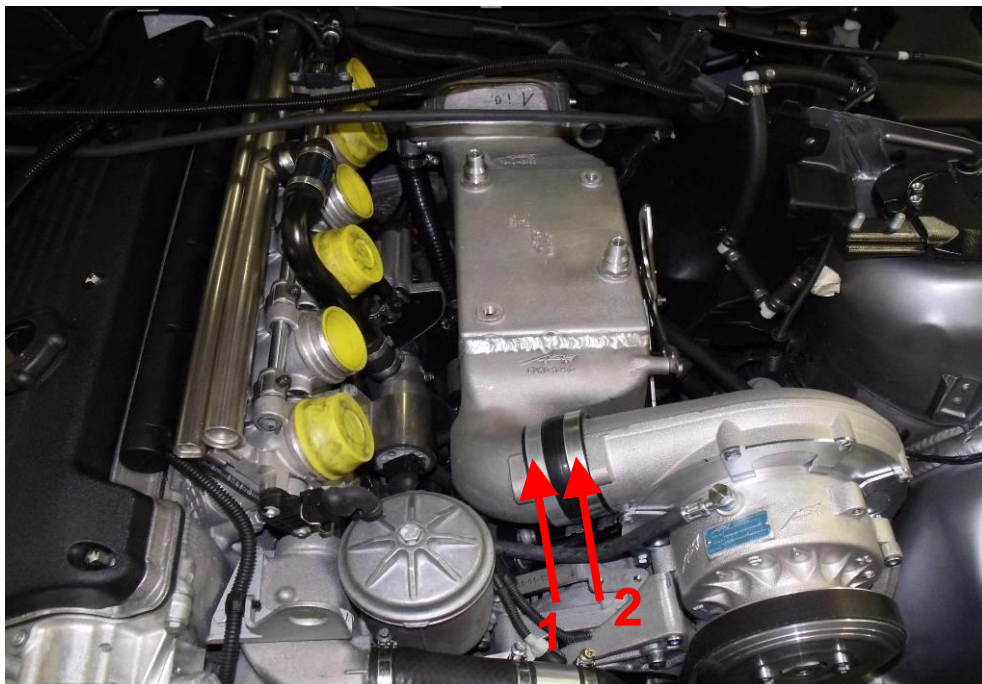
*Illustration 3*

- o Attach hose collector (P341-42-29) to intercooler and push on both hose clamps
- Provide front suction pipe holder (P341-42-30) with edge protection and put aside with fixing screws and cable ties (to be screwed onto support base plate (P341-11-15) after final assembly of the suction pipe)
- Screw the holder intercooler (P341-42-44) instead of the original holder for the airbox (black sheet metal fork) in the center of the slotted hole (Illustration 21)



*Illustration 4*

- o For vehicles with SMG transmission loosen the hydraulic unit (1)
- Slide the intercooler onto the holder and tighten the hose clamps (1) and (2)



*Illustration 5*

- Attach to throttle valve 1 and 6 silicone hoses (P341-42-24) and screw suction pipe to intercooler



- ☐ Check the position of the suction pipe in relation to the throttle body and, if necessary, readjust the holder of the intercooler (P341-42-44)
  - ☐ Connections must be aligned with throttle valve sockets if the hoses to the throttle valve (P341-42-24) are pushed on both sides until the limit
- Front suction pipe holder (P341-42-30b) must be able to be mounted without tension
- Remove the suction pipe again
- Mount idle actuator hose (P341-42-60) (Illustration 23) and shorten intercooler laterally according to the information on the assembly drawing.





*Illustration 6*

- Push all 6 hoses (P341-42-24) onto throttle valve body with both hose clamps and tighten clamps on motor side



*Illustration 7*

- o Ensure that throttle valve operation is not affected by clamp lock

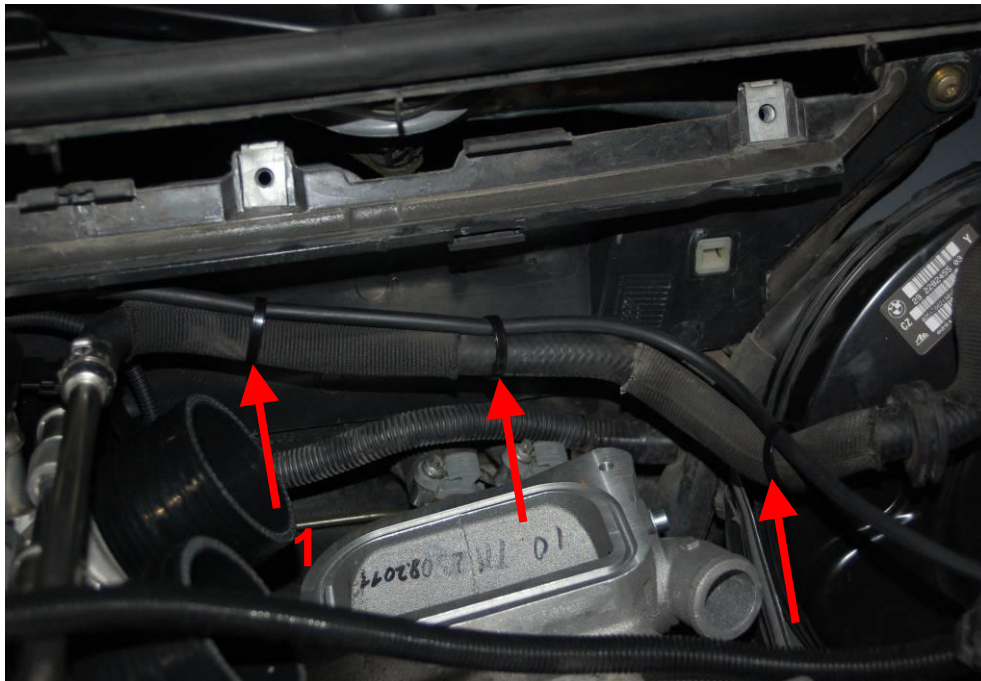
## P341-46-00 Bypass system

- Attach T-piece to vacuum connection Idle actuator bar



*Illustration 8*

- Lay the vacuum hose bypass valve to the left side of the suction pipe and fix it to the hose (1) with cable ties (Illustration 26)

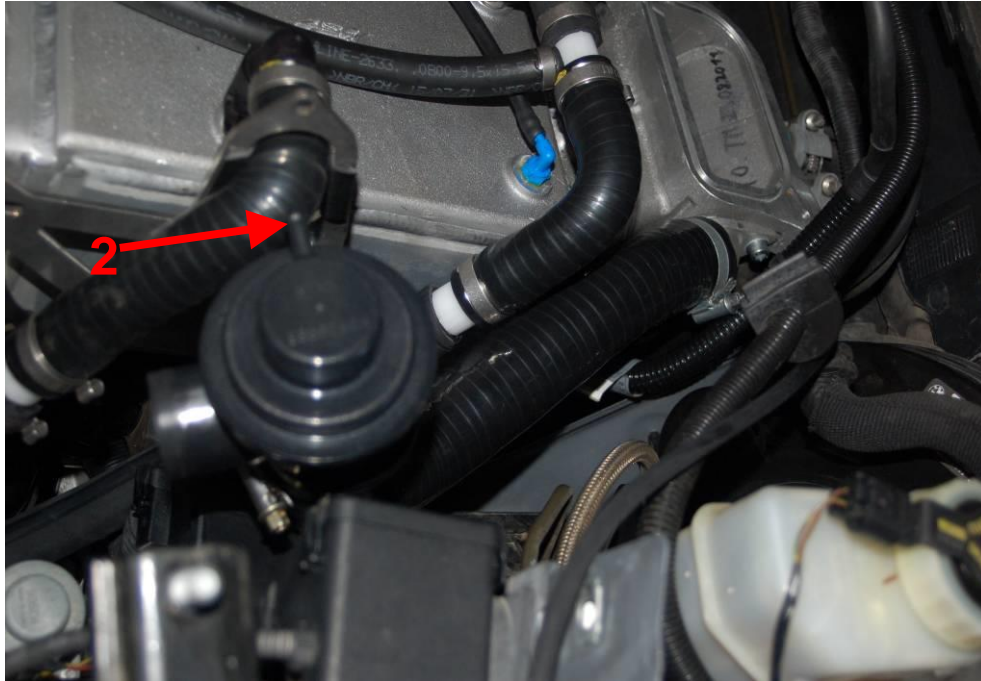


*Illustration 9*





- Mount bypass hose to intercooler and bypass valve



*Illustration 10*

- Attach vacuum hose to vacuum connection Bypass valve (2) (Figure 27)



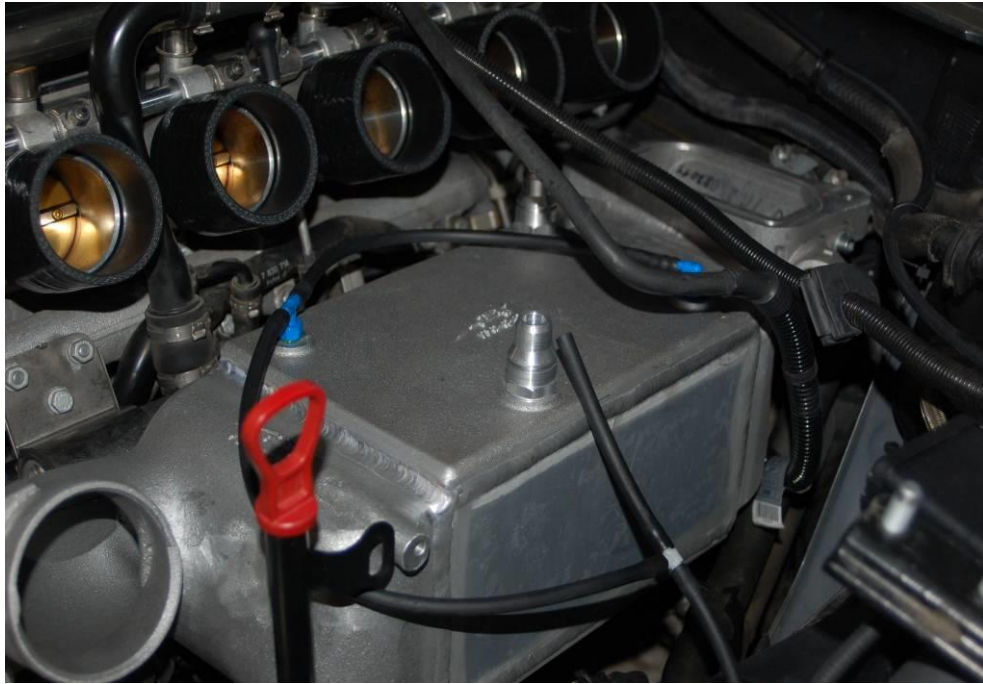
### P341-52-08 Water circuit charge air cooler M3 E46

- Remove front mask and replace standard fastening nuts of the pressure ventilator with hexagonal sleeves M8
- Mount holder for counter cooler to P341-52-69 on hexagonal sleeves
- Screw counter cooler to holder



*Illustration 11*

- Set up the venting of the water circuit and mount it to the intercooler and counter-cooler (Illustration 30)



*Illustration 12*

- With mounted suction pipe



*Illustration 13*



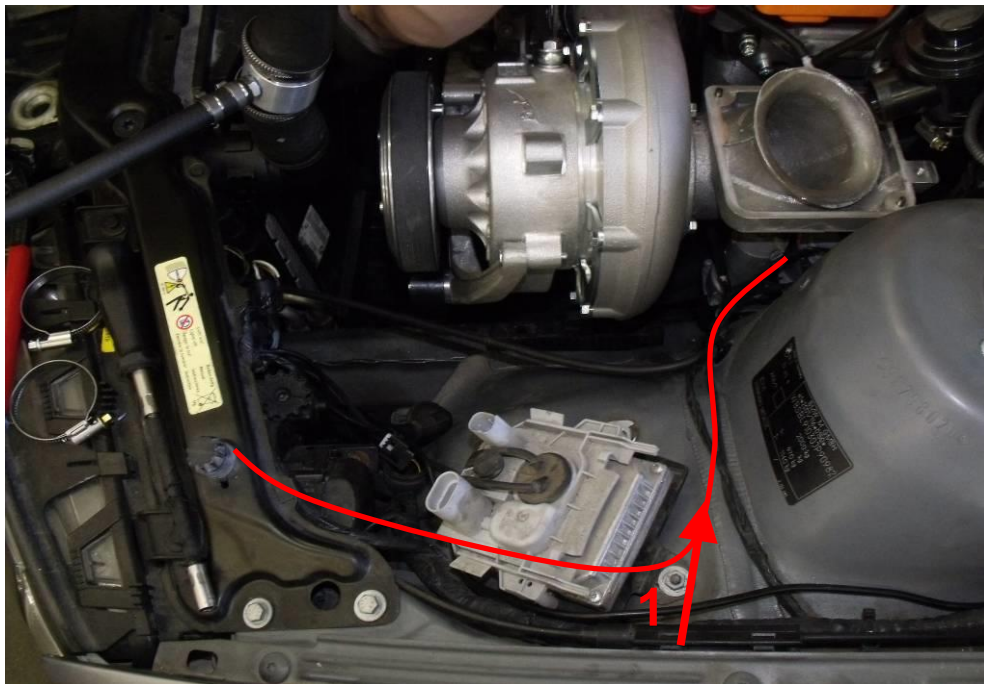


*Illustration 14*



*Illustration 15*

- Verlauf der Entlüftungsleitung zwischen LLK und Gegenkühler
  - o In Kabelclip einclippen (Abbildung 32)
  - o Unter Ansaugtrichter durchführen (Abbildung 33)
- Route of the venting line between intercooler and counter-cooler
  - o Clip into cable clip (Intercooler 32)
  - o Pass under suction funnel (Intercooler 33)



*Illustration 16*

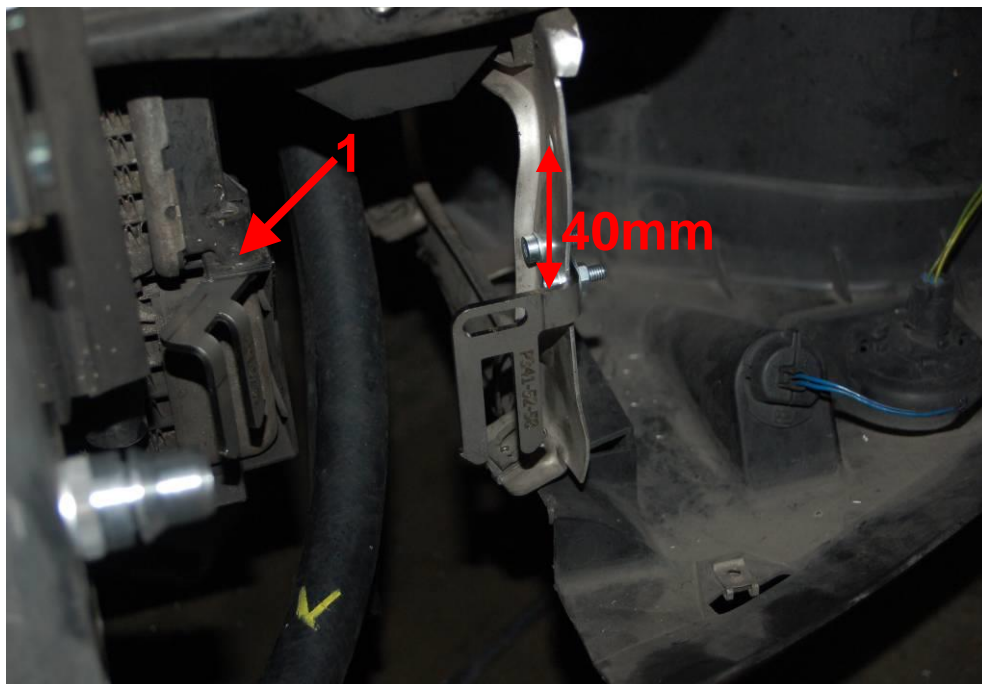
- Instructions and sketches of the molded hoses can be found on page 2 of the assembly drawing
- Set up the flow hose to the counter-cooler and secure all connections with hose clamps
- Install the return hose from the counter-cooler and secure all connections with hose clamps
- Mount water pump holder flow
  - o Remove the brake ventilation duct on the driver's side (2x expanding rivet)
  - o Drill 2x holes Ø5.5mm with 40mm distance to the hole for expanding rivet (Illustration 34)





*Illustration 17*

- o Mount the holder (P341-52-58) with the supplied screws



*Illustration 18*

- o Reassemble brake ventilation duct
- Mount water pump holder return flow
  - o Loosen Torx screw on oil cooler (1) on driver side (Illustration 35)
  - o Attach holder (P341-52-59) to screw and reinstall

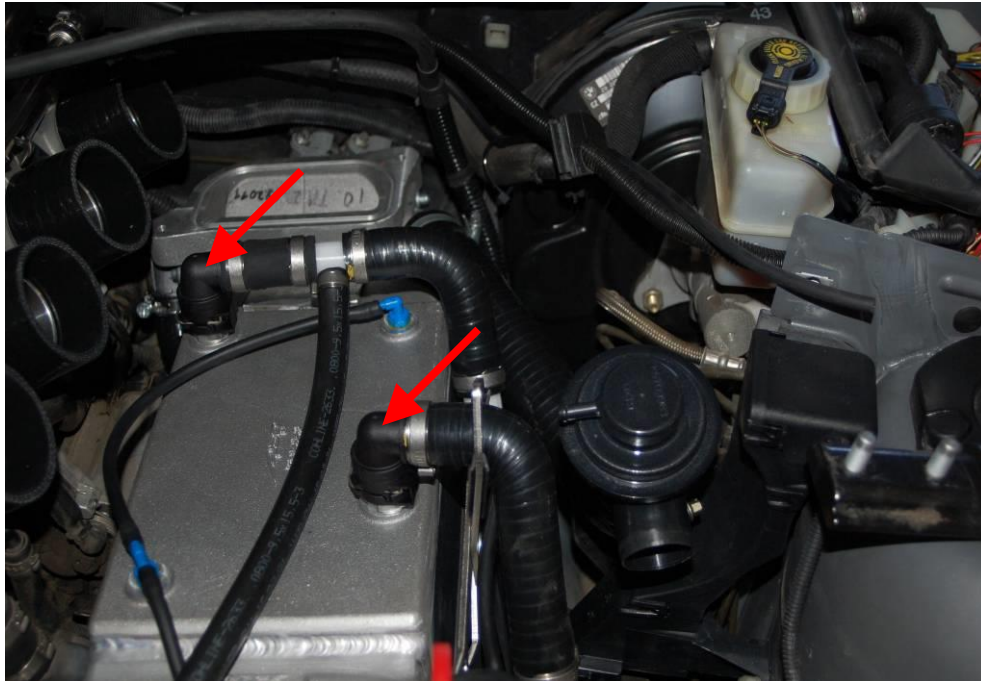


- Thread the rubber sleeves on the water pumps and connect the cables of the two water pumps to one plug (see wiring diagram P341-72-15 Wiring of auxiliary water pump)
- Mount pre-assembled supply and return hose to water pumps and put water pumps on the two holders (Illustration 36)



*Illustration 19*

- Attach the supply and return hoses to the intercooler (Illustration 37)
  - o Hoses run down between the vehicle's longitudinal beam and servo oil lines to the water pumps



*Illustration 20*

- o Pay attention to the direction of flow of the pumps See P341-52-08
- Mount hoses from water pumps to connections on the counter-cooler
- Edit the front grille of the bumper on the driver's side according to images



*Illustration 21*



### P341-52-08 Water circuit intercooler Z4 E85/E86



- Dimensioned sketches of the molded hoses can be found on page 2 of the assembly drawing
- Assemble the flow hose to the counter-cooler from pos. (22) (15) (21) (19) (16) (20) (17) and secure all connections with hose clamps
- Install the return hose from the counter-cooler from pos. (22) (11) (20) (12) and secure all connections with hose clamps
- Insert blind rivet nut for water pump holder in longitudinal beam according to pictures (70mm from front; 180mm from bottom)

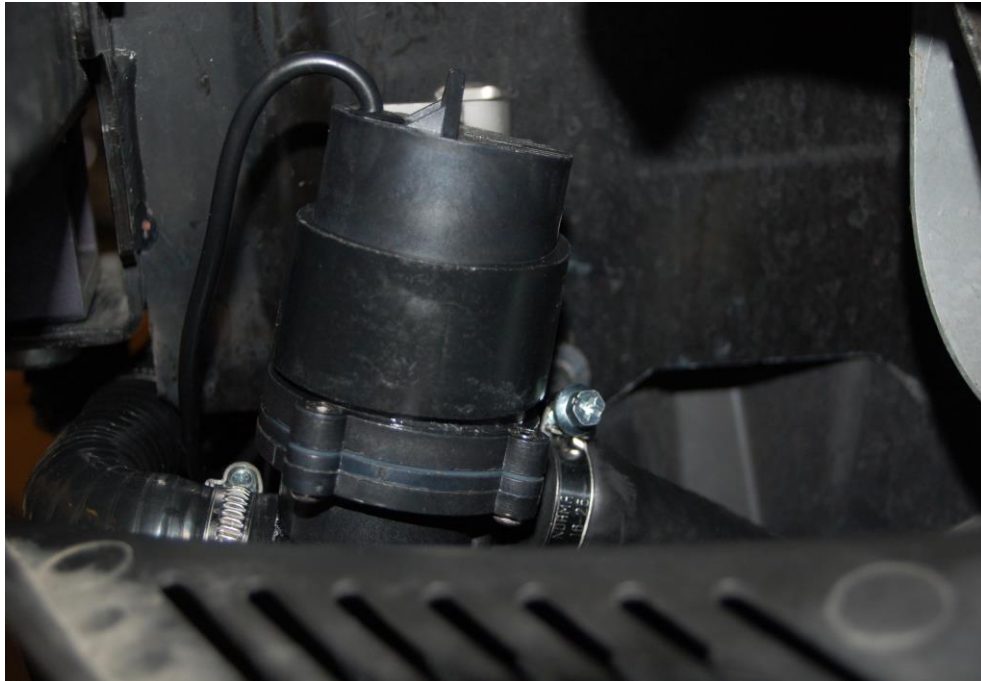




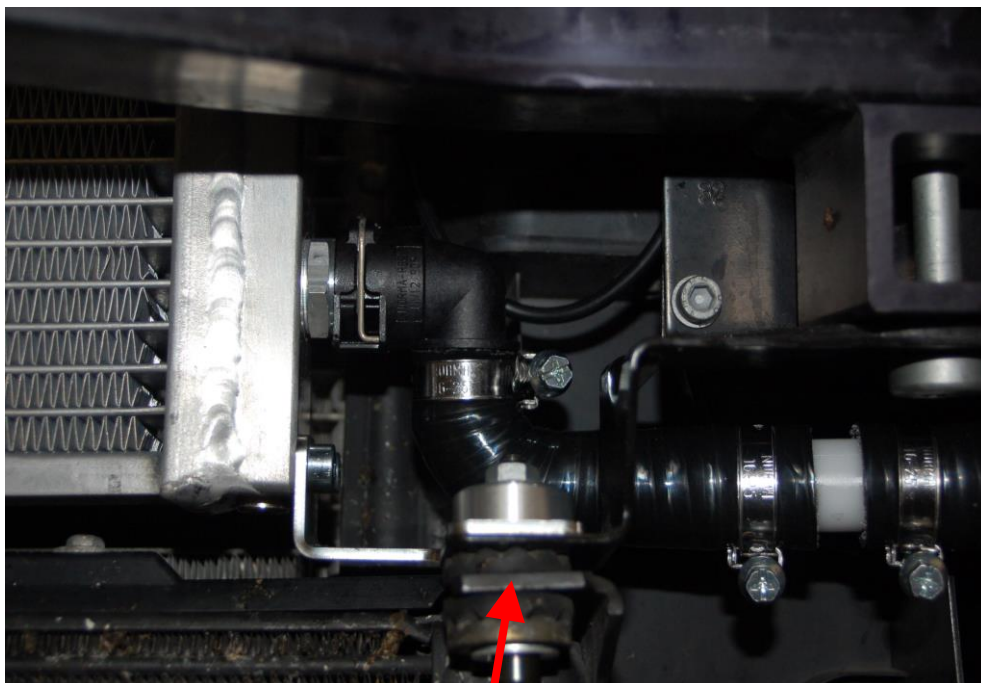
- Mount water pump holder P341-52-52



- Mount water pump return flow



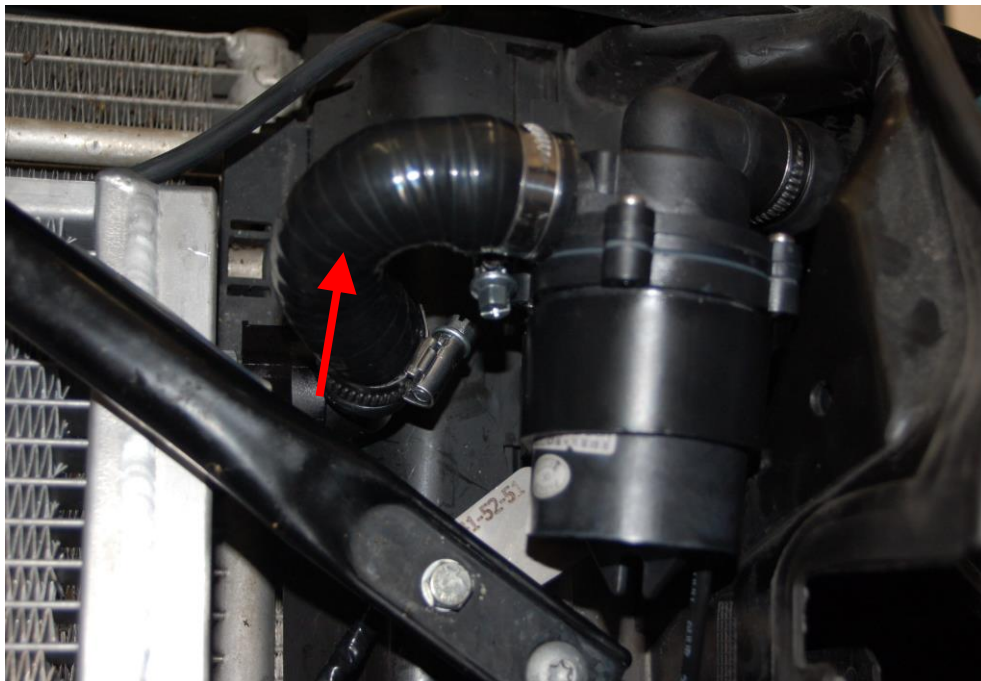
- Pre-assemble the counter-cooler with the lower brackets according to P341-52-09
- Replace screws for oil cooler with supplied screws (DIN912 M6x40 with DIN9021 6.4 washers)
- Place counter cooler on 4-edge and secure with spacer bushes and collar nuts



- Attach the rubber bearing at the top of the hood lock and use it to support the radiator

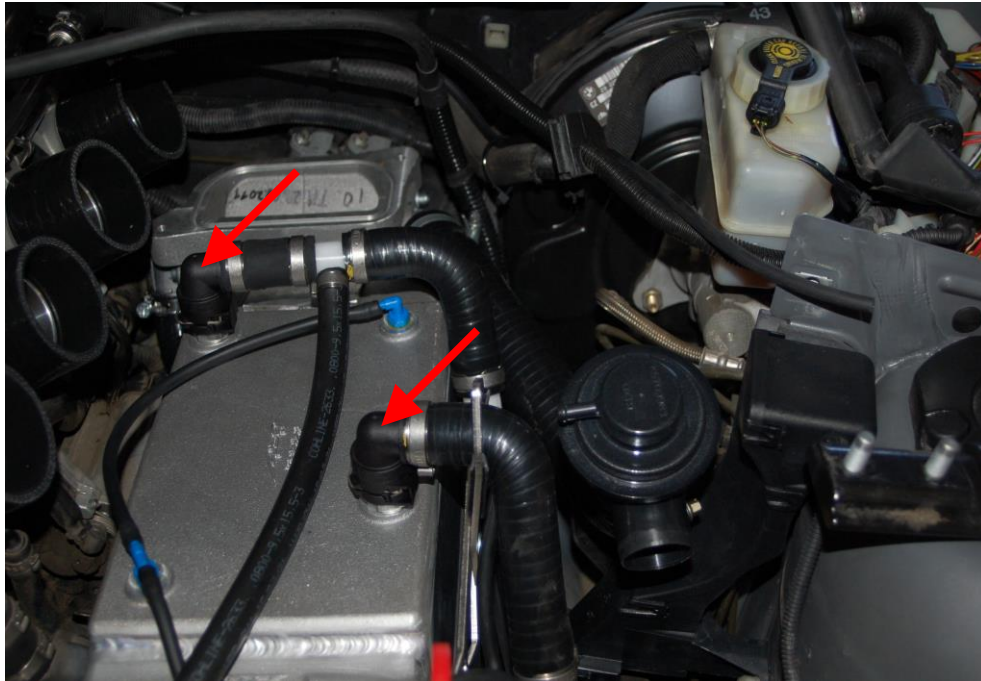


- Slide rubber sleeves onto water pumps and connect cables to a plug
- Mount water pump to front cross brace with holder



- Mount hoses from the intercooler to the pumps on the pumps
- According to P341-52-10 Sheet 2 Cut and attach hoses between pump and counter-cooler
- Attach the supply and return hoses to the intercooler

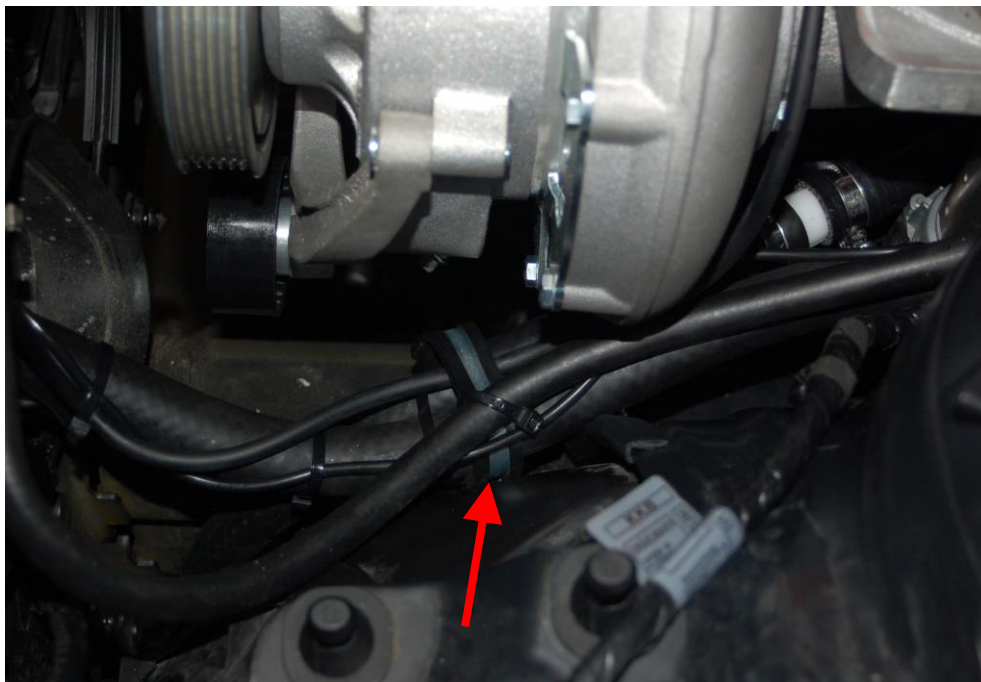




o Pay attention to the direction of flow of the pumps See P341-52-08

-

- Insert blind rivet nut into longitudinal beam and assemble hose guide with NORMA RSGU clamp according to P341-52-10





### P341-40-03 Air flow after compressor

### [Part 2]

- Install suction pipe See P341-40-03
  - o Grease O-ring fit in intercooler (3) and insert O-ring

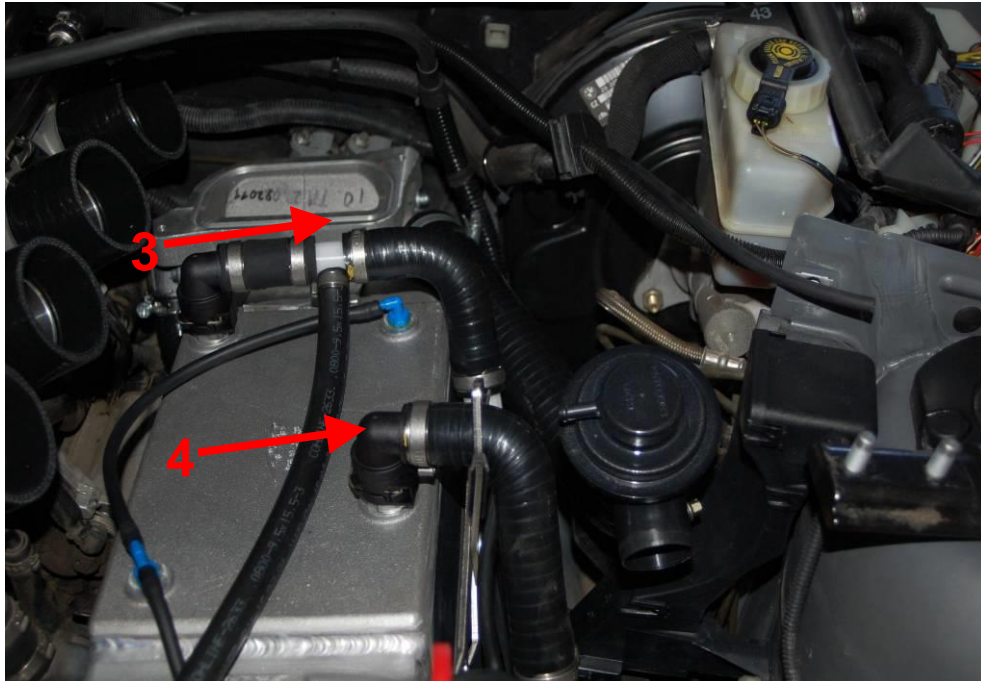


Illustration 22

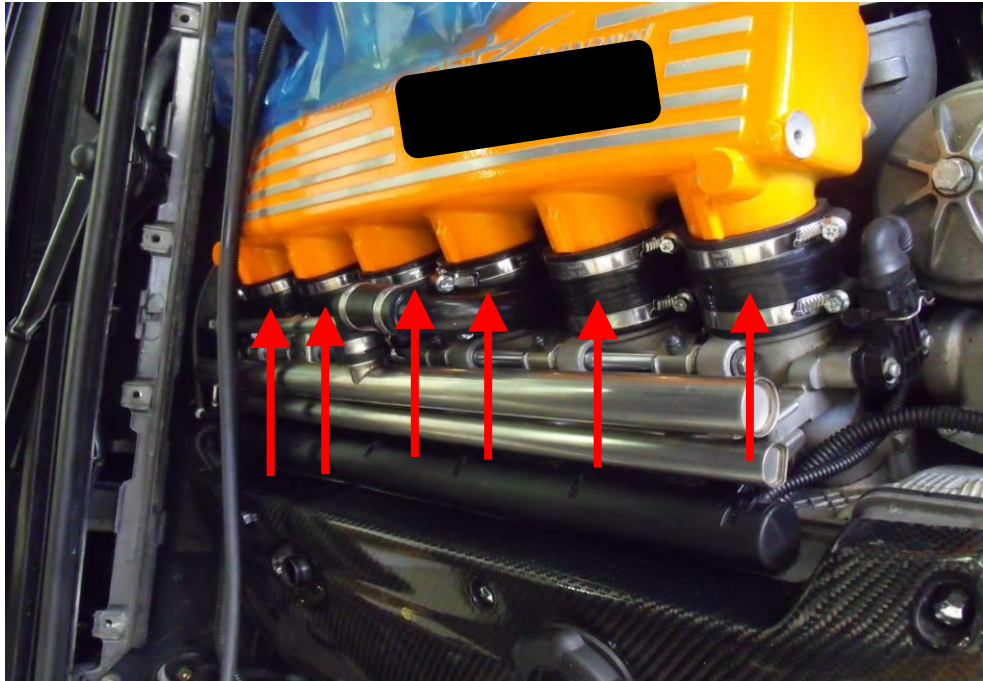
- o o For vehicles with SMG transmission, connect the hose to the expansion tank on the ring eye (5) and secure with a clamp



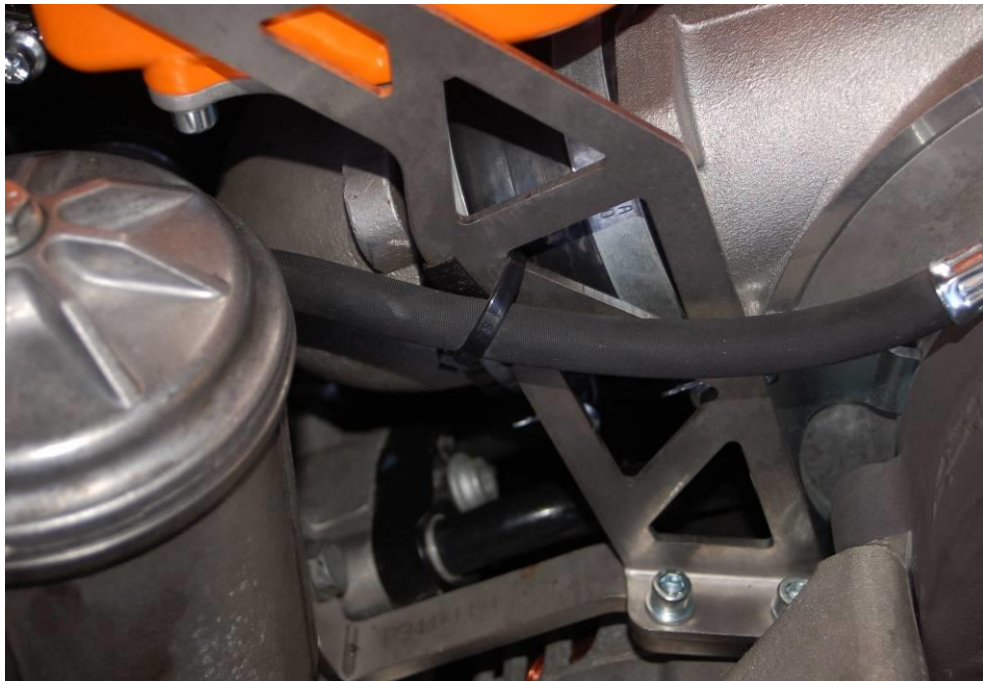
Illustration 23

- o Insert temperature sensor in the suction pipe
- o Hose to the expansion tank cooling water Charge intercooler (4) on ring eye (6) and secure with clamp

- o Move suction pipe into position and screw it with intercooler (2x DIN912 M6)
- o Tighten hose clamps on hoses to throttle valve body from inside to outside (sequence cylinder 3 → 4 → 2 → 5 → 1 → 6)



- o Attach the suction pipe holder at the front (P341-42-30b) and fix the oil supply hose with cable ties. Use edge protection as padding. (Illustration 41)



*Illustration 24*



### P341-20-03 Air duct before compressor

- Mount inlet (P341-22-01) to compressor with O-ring 75x2.5
  - o Screw in the three hexagon head screws loosely
  - o Turn the inlet as far as possible clockwise when looking in the direction of travel



*Illustration 25*

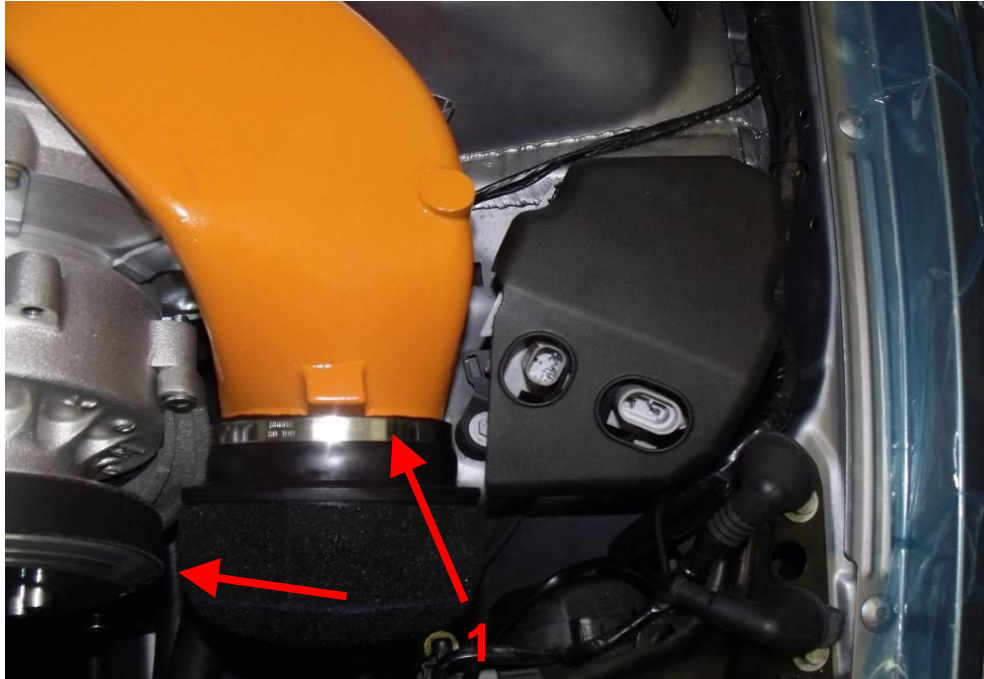
- Screw suction pipe to inlet



*Illustration 26*

- Install air filter; make sure that the belt drive is free

- o Suction tube can be rotated on the inlet to ensure free movement



*Illustration 27*

- After adjustment, tighten all parts to the specified torque
- Modify the cover of the xenon ballast unit according to the images and retighten screw (1) with rubber buffer, which is located there as standard bearing of the air filter box (Illustration 44 and 45)



*Illustration 28*

- Insert bypass valve with O-ring into intake pipe (P341-22-02)
- Remove original brake booster hose and connect according to



### P341-22-04 Close brake booster closure



Illustration 29

### P341-53-02 Crankcase ventilation

- Reuse original connection to crankcase
  - o Cut the plastic hose carefully with a knife and pull it off the connection
- Shorten and mount the molded crankcase ventilation hose according to the drawing



Abbildung 30

### P341-72-15 Additional water pump wiring

- Blue cable to water pump is ground
- Brown cable is plus
- Water pumps are connected parallel
- Always use the specified cables in the control unit box to avoid damage
- Use circuit diagram P341-72-15 (Illustration 51)
- (1) Continuous plus
- (2) Ignition plus (terminal 15)
- (3) Mass
- (4) Load (water pump)
- Tap off continuous positive on plug

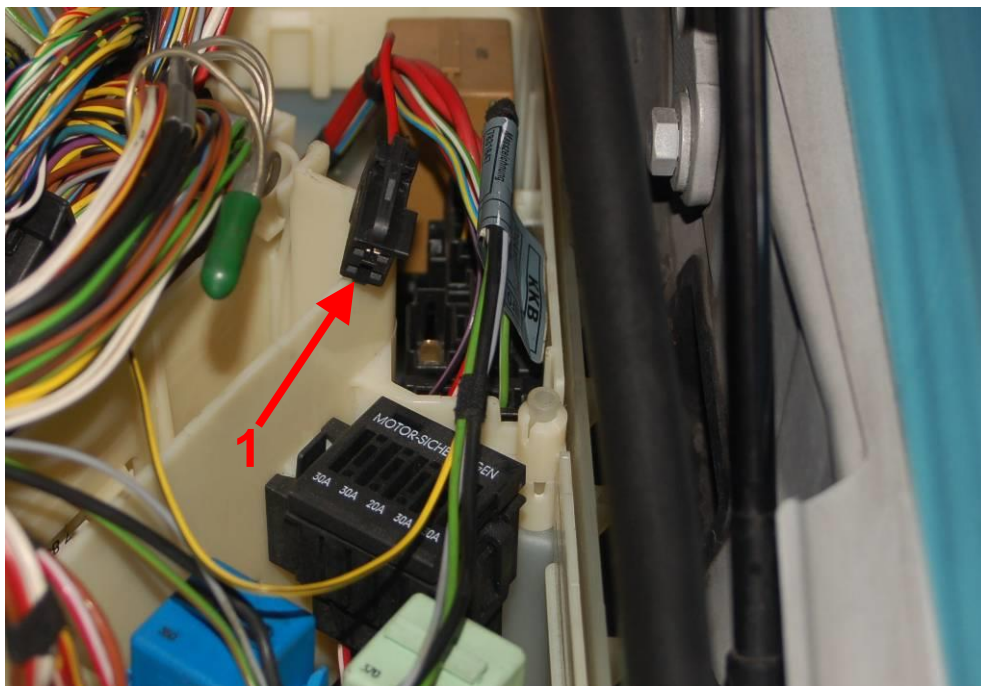
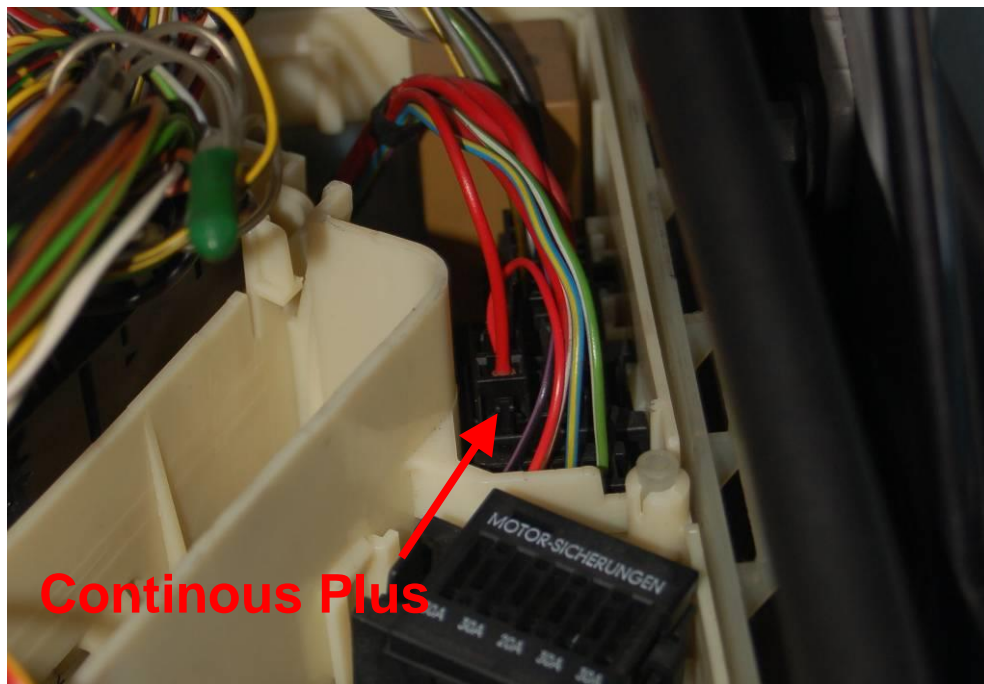


Illustration 31

- Re-insert the plug



- Water pump plus (4); water pump minus (3)

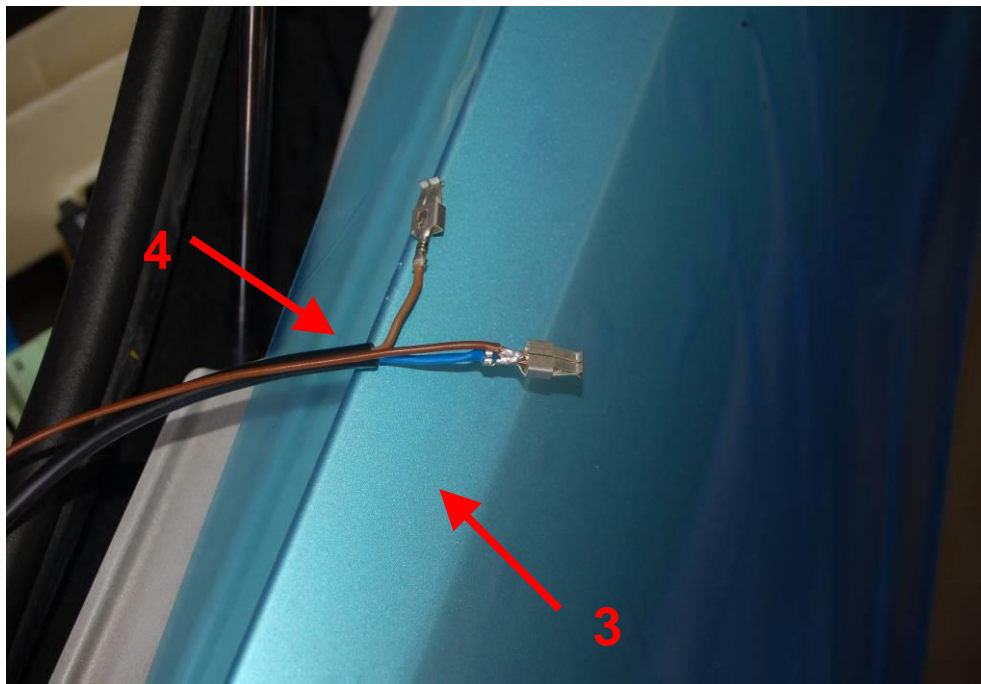


Illustration 32

- ignition plus (2); ground (3); relay (5)



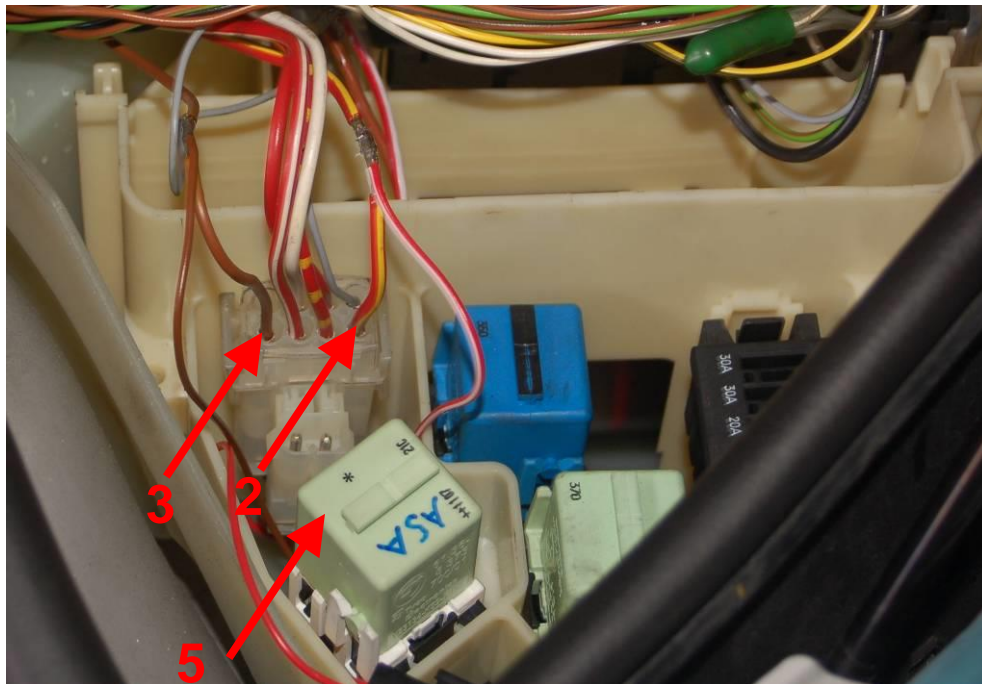


Illustration 33

- Pin all contacts into the relay holder (pay attention to circuit diagram)

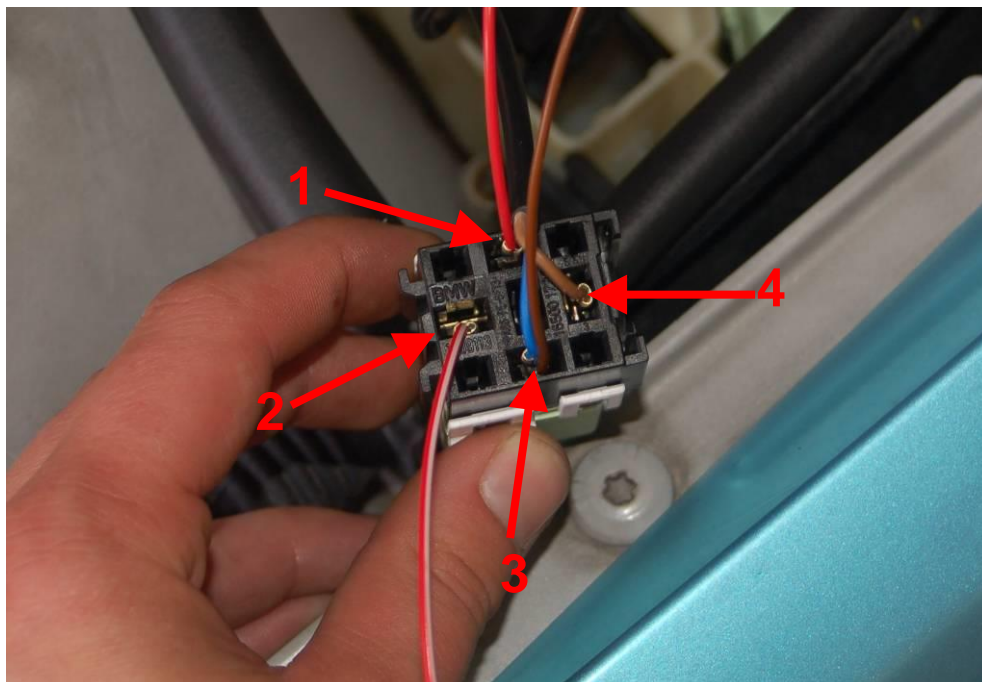


Illustration 34





- Insulate all solder joints
- Attach additional sticker "Dry running of the pump..." in the engine compartment.
- Dry running will destroy the water pumps.
- Filling the circuit, see page 39.
- Laying cables to the pumps along the Bowden cable to actuate the engine hood

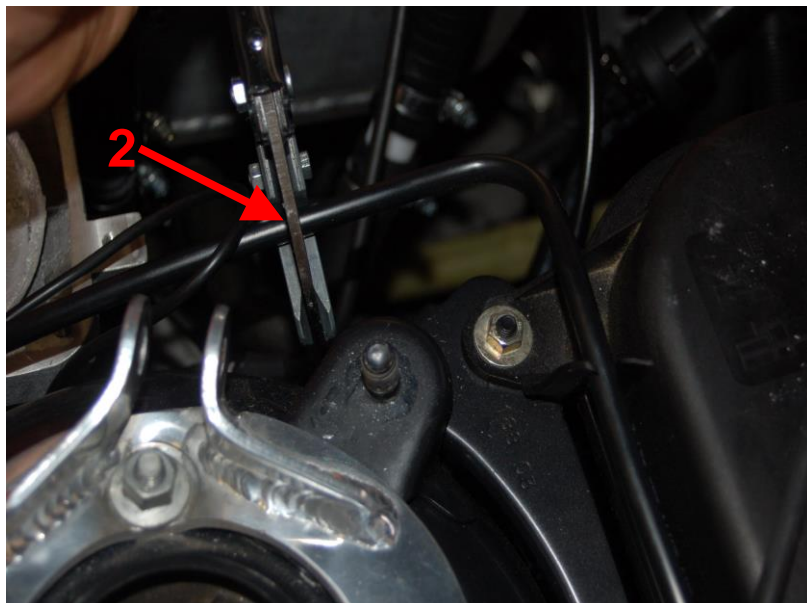


### P341-54-02 Coolant hose E46

- Modify the cooling water hose according to the instructions on the assembly drawing and install it in the vehicle after completion of the modification work

### P341-54-03 Coolant hose Z4M

- Separate the venting hose according to the pictures, replace it with the supplied hose piece and secure with clamps





### Final work

- Venting the intercooler water circuit
  - o Place the vehicle on a horizontal surface
  - o Fill water into the expansion tank through the filler neck
  - o If there is no more lagging, switch on the ignition so that the water pumps run
  - o Add more water (total filling quantity approx. 3l)
  - o If the water pumps do not suck in immediately, it helps to compress the supply and return hose to the counter cooler a few times to transport air still in the pipes to the top for ventilation
  - o Switch off ignition and wait for approx. 5 minutes
  - o Switch ignition on again and allow system to continue to ventilate
  - o After the test drive, check the filling level in the expansion tank and fill up with water if necessary
- Cooling system vent engine
  - o BMW TIS Drain and fill up coolant (S54) (RA 17 00 005)
- Clear error memory and adaptations
- Reattach dismantled vehicle parts
  - o Front bumper
  - o Aggregate underbody protection
  - o Intake silencer
  - o End wall heating (pollen filter)
  - o Fan frame



- After completion



*Illustration 35*

- Attach gasoline type sticker (Illustration 53-56)
  - o Cover the original sticker in the fuel cap with the fuel type sticker



*Illustration 36: Petrol type sticker, cover original sticker*

- o Attach sticker for modified spark plugs to valve cover





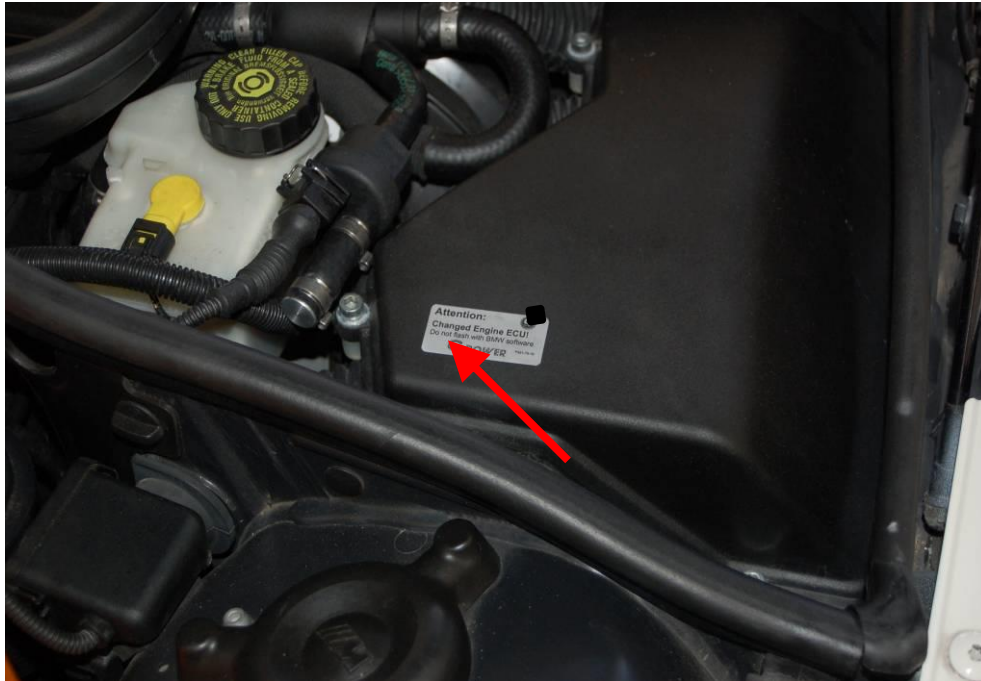
*Illustration 37: Sticker notice spark plugs*

- o 1x Mount sticker ECU near the OBD port in the driver footwell



*Illustration 38: Sticker ECU at OBD socket*

- o 1x Mount sticker ECU on control unit box cover



*Illustration 39: Sticker ECU on cover electrical box*

- Software
- Carry out a final check on the vehicle using the checklist provided.
- Perform a test drive in compliance with the ASA running-in instructions

## **Software customization**

The software adaptation is carried out via the I\_Flash OBD Tool for E models.  
Operating instructions can be found in the download area of the ASA homepage.

<https://gp-infinitas.com/downloads/>



### Checklist after vehicle conversion (final check)

#### components:

- |  |  |
|--|--|
| 1) Air duct tested for tightness                               | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 2) Low temperature circuit tested for leakage                  | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 3) Check belt drive, belt correctly fitted                     | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 4) Abrasion belt / belt drive detectable                       | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 5) Air filter free from belt drive                             | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 6) Spark plugs exchanged according to P341-73-13               | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 7) Injection nozzles exchanged according to P341-55-04         | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 8) ECU updated to latest ASA software version                  | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 9) Suction tube free of cover Xenon ballast                    | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 10) Water hoses free from belt drive                           | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 11) All cooling water nozzles correctly clicked in (4 nozzles) | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 12) Venting line engine cooling water free of visco-fan        | <input type="checkbox"/> yes <input type="checkbox"/> no |

#### operating materials:

- |   |  |
|---|--|
| 1) Coolant engine filled and checked                      | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 2) Engine oil level checked (Castrol TWS 10W60)           | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 3) Servo oil level checked (Pentosin CHF-11S)             | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 4) Filling level compensation tank SMG (Pentosin CHF-11S) | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 5) Cooling water low temperature circuit vented           | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 6) Filling level low temperature circuit checked          | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 7) Leaks under vehicle                                    | <input type="checkbox"/> yes <input type="checkbox"/> no |

#### Miscellaneous:

- |   |  |
|---|--|
| 1) Headlights adjusted or controlled                | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 3) Error memory and adaptations checked and deleted | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 4) Gap dimensions bumper fender controlled          | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 6) Sticker attached                                 | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 7) Install software with I-Flash                    | <input type="checkbox"/> yes <input type="checkbox"/> no |
| 7) Maintenance note inserted                        | <input type="checkbox"/> yes <input type="checkbox"/> no |