



SIB 11 03 26

S68T / XB1T CARBON BLASTER PROCEDURES

2026-07-16

☐	THIS REPAIR IS MOBILE FRIENDLY
☐	THIS REPAIR IS REMOTE SOFTWARE UPGRADE (RSU) FRIENDLY

MODEL

F95 (X5 M Sports Activity Vehicle0	F96 (X6 M Sports Activity Coupe)	G05 (X5 Sports Activity Vehicle)	G06 (X6 Sports Activity Coupe)
G07 (X7 Sports Activity Vehicle)	G09 (BMW XM Sports Activity Vehicle)	G70 (7 Series Sedan)	G90 (M5 Sedan)
G99 (M5 Touring)			

INFORMATION

This Service Bulletin provides instructions to clean the intake valves using the BMW Carbon Blaster Tool P/N 81 29 2 208 034 and the S68T / XB1T Kit P/N 83 30 5 BAD 3D5.

Refer to [SI B04 12 11](#) for existing documentation about the carbon blaster tool and [SI B04 02 26](#) for the S68T /XB1T tool kit.

PROCEDURE

Carbon Blasting the intake valves in the S68T/XB1T engine requires TSARA Hotline approval.

Create a TSARA case with “Carbon Blasting” in the subject line of the case and wait for a response.

PARTS INFORMATION

To determine the other repair-related part numbers that apply to the specific vehicle being repaired, enter the VIN / Chassis number into either ETK or AIR, this will consider the specific equipment and/or options that are fitted to the vehicle.

Sublet - Bulk Supply Materials

Part Number	Description	Quantity
83 19 5A32851	HT-12 Antifreeze RTU (Bulk Drum DN = 1/10 Liter) (Pre-mix)	As needed to refill
Or:		
83 19 2468442	Antifreeze/Coolant (DN = 1 Gallon Concentrate) - HT-12	As needed to refill
SI B11 01 21	0W-30 LL01FE (Drum DN = 1/10th liter billing number)	Top up as needed
Or:		
SI B11 01 21	0W-30 LL01FE (Tanker DN = 1/10th liter billing number)	Top up as needed
83 19 2 446 563	BMW Group R-1234YF - (10 lb / 160 oz) (DN = 1oz)	Top up as needed
83 22 2 339 920	Refrigerant oil Sanden SP-A2 (DN = 250 ml)	Top up as needed
83 22 5 A28 F03	Automatic transmission fluid 8 (DN = 1 L)	Top up as needed
Vendor Supplied	Walnut Shells “Grade E” 20/30 (Vendor Price = 20 kg / 44 lbs., see below the Claim Information section)	10 kg / 22 lbs. (1/2 Half bag)
Or:		
Locally Sourced	Walnut Shells “Grade E” 20/30	10 kg / 22 lbs.

Additionally, other materials and small parts that are not specified above, such as fluids, lubricants (in sublet), one-time use screws, nuts, and seals, which must be replaced or installed (according to the ISTA repair instructions/ETK/AIR), are to be selected from the Electronic Parts Catalog, and/or other approved BMW Group's resources according to the respective vehicle type. Invoiced these items separately under the Repair Code listed in this bulletin.

CLAIM INFORMATION

Covered under the terms of the limited BMW warranty that applies, reimbursement for this repair procedure will be via normal claim entry utilizing the information below that applies.

Repair Code:	1134007600	S68T Inlet valve dirty / blocked
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Obtain the flat rate unit (FRU) allowances for the following that applies.

Diagnosis

Labor Operation	Description	Labor Allowance
00 00 006	Carrying out vehicle test (Main work)	As applicable
Or:		
00 00 556	Carrying out vehicle test (Plusposition)	As applicable
And:		
61 21 528	Supporting voltage of the vehicle electrical system	As applicable

If you are using a Main labor code for another repair, use the Plus code labor operation 00 00 556 instead of 00 00 006, or exclude them (including 61 21 528) when the Vehicle Test is included in another repair.

And:

Labor Operation	Description	Labor Allowance
61 00 006*	Carrying out vehicle diagnosis, ABL (Work time) and other related diagnosis as applicable and required	WT FRU
Or:		
00 58 500*	Diagnosis Worktime Flat Rate	2 FRU

Work time labor operation codes 61 00 006, 00 58 500, and 11 99 000 are not considered Main labor operations.

(*) Based on which one applies to your center, please refer to **SI B01 01 20** or **B01 07 20** for the applicable procedure for documenting, claiming, and explaining, on the RO and in the claim comments, your diagnosis work time (WT), job/repair work time (WT), and the vehicle repairs your center performed, unless otherwise required by State law.

Repair

Labor Operation	Description	Labor Allowance
31 10 501	Completely removing and installing front axle with engine and transmission (Plusposition) (Includes 64 50 510 Extract, evacuate and fill air conditioning system)	As applicable
And:		
11 99 000 (Claim this labor operation code one time)	Work time: Removing and installing the left and right intake plenums (with 31 10 501): • 12 FRU	33 FRU WT Total
	And:	

	Work time: Cleaning the intake valves and intake ports with the carbon blaster tool (with 31 10 501, with the left and right intake plenums removed):	
	• 16 FRU	
	Removing and installing the spark plugs (See below):	
	• 5 FRU	
	And for the 760i xDrive (G70) Only	
	Work time: Additional work to access the driver's side intake plenum (with 31 10 501, and together with the above other work times):	41 FRU WT Total
	• 8 FRU	

And if required after the above repair procedure work is completed:

Additional Work: Straight-Ahead Driving Position of the Steering Wheel is Off Center

Labor Operation	Description	Labor Allowance
32 00 595	Kinematics Diagnosis System wheel alignment with ride height measurement without loading the vehicle (Plusposition)	As applicable
And:		
32 00 601	Adjusting toe-in on front axle (Associated work)	As applicable
And, as needed:		
32 13 905	Commissioning of electromechanical steering gear (EPS) / initialization	As applicable
32 00 650	Additional work for integral active steering (HSR Associated work when applicable)	As applicable

And, as needed, based on the results of checking the vehicle's wheel alignment

Labor Operation	Description	Labor Allowance
32 00 620	Adjusting rear axle	As applicable
Or:		
32 00 621	Adjusting rear axle and renewing with eccentric screws	As applicable

Claim Repair Comments

Reference the SIB number, the issue (briefly), and the work that was performed in the technician's RO notes, and in the claim comments (For example: B11 03 26 Decarbon Valves), unless otherwise required by State law.

And as needed, also explain the additional work that was required to be performed.

Sublet – Walnut Shells Ground Shipping (RO and Claim Comments Required)

Sublet Code 3 (Claim this item one time for the Total Sublet)	Reimbursement for ground shipping cost for one-half bag of vendor supplied repair-related walnut shells. Full bag average shipping cost of \$120.00, supported one half bag cost up to \$60.00 to claim.	See description
	Or:	

Amount that applies)	Exclude up to the \$60.00 shipping when the repair-related walnut shells are obtained locally.	See description
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Sublet – Bulk Supply Materials (RO and Claim Comments Required)

Sublet Code 4 (Claim this time one for the Total Sublet Amount that applies)	One half bag (10 kg / 22 lbs. / \$55.95 at one half = \$27.98.) of the BMW vendor supplied “Grade E” 20/30 walnut shells (Plus the non-BMW PN 20 percent handling = \$33.57 to claim)	See description
	Or:	
	The locally source price for 10 kg / 22 lbs. plus the non-BMW PN 20 percent handling.	See description
	And:	
	Engine coolant, and the top up quantiles of engine oil, AC system refrigerant and AC oil, ATF 8	See above and below

No BMW Part Number (NPN): Vendor supplied walnut shells not available through BMW NA are reimbursed at the cost of the proportional quantity used (1/2 bag) plus 20 percent (WPPM Section 8 Page 25).

Sublet reimbursement calculation for claiming the applicable repair-related bulk supply materials (BMW part numbers) is at the dealer net (DN) price for the full and/or proportional quantities as applicable used, plus your center’s handling.

BMW Antifreeze/Coolant: Claim the corresponding sublet dollar amount for the quantity needed to replace what was drained. The one-gallon concentrate’s part number for the quantity needed to obtain a 50/50 coolant/water solution.

Enter this material cost in sublet and itemize the amount on the repair order and in claim comment section.

BMW Maintenance Program

If the vehicle has an active standard or extended maintenance program, for covered items, and the:

- Engine Oil Service task, or an
- Engine Oil Service task with a connected Spark Plugs task, or a
- Spark Plug Task (Stand-alone, not connected to Engine Oil Service task)

That shows either Bundling Eligible (BE), Recommended or Due in the Service status field, and with the engine assembly dropped from the vehicle to perform the related engine valve repair procedure, as applicable:

- Replace the engine oil filter and replace the engine oil,

And/or

- When covered, swap in the replacement spark plugs in place of those that were removed, then
- Reset the CBS data after the completion of these repairs.

Then, under additional RO line items, include for the following that applies:

- Submit and claim the Standard scope labor operation 00 00 105 (Main) under BMW Maintenance Program Repair Code 85990501MP, then
- Submit and claim for the engine oil and filter part numbers under the BMW Maintenance Program’s Engine Oil Service Task Repair Code that applies without the labor operation code for performing the oil service.

FEEDBACK REGARDING THIS BULLETIN

Technical Feedback	To submit feedback for the technical topic of this bulletin: Submit your feedback in the rating box at the top of this bulletin
Warranty Feedback	To submit feedback for the CLAIMS section of this bulletin: Submit an IDS ticket to the Warranty Department, or use the chat available in the Warranty Documentation Portal
Parts Feedback	To submit feedback for the PARTS section of this bulletin: Submit an IDS ticket to the Parts Department

Supporting Materials

[picture_as_pdf B11 03 26 BMW Group Carbon Blaster Operating Manual V1.0.pdf](#)
[picture_as_pdf B11 03 26 S68T XB1T Carbon Blaster Instructions V5.0.pdf](#)

BMW Group Carbon Blaster

Operating Manual



Required Safety Equipment

Face Shield



Ear Protection



Gloves



Protective Clothing



Maximum air pressure input should not exceed 8 bar.

Ensure the shop air supply is regulated between 6 and 8 bar (85 and 116 PSI) before connecting the carbon blaster.

The shop air supply should be dried using a general purpose filtering system; the tool is not recommended for use with a lubricating system. Water vapor in the compressed air system will clog the filtering screens in the carbon blaster. Repairs due to water damage are not covered under Warranty.

Carbon Blaster Safety Devices

Main Air Supply Valve

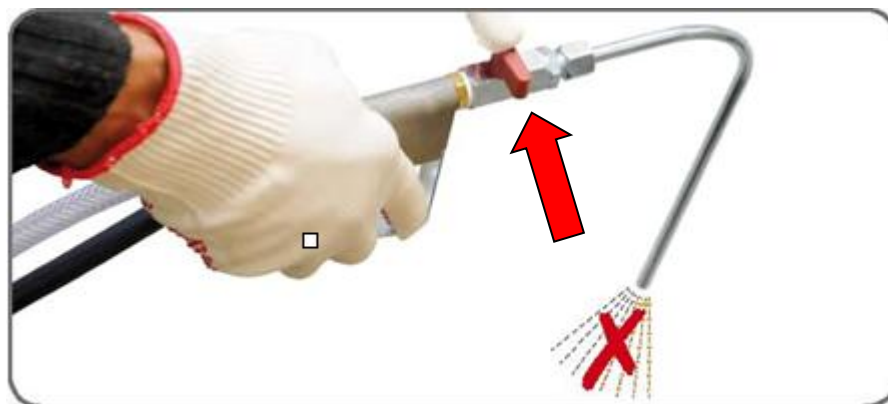


Off Position



On Position

Note: There is a pressure gauge on the tool. The maximum pressure inside this cylinder should never exceed 8 bar. A safety valve is installed in the lid, which will automatically open at 8.5 bar.



There is a two-way ball valve located on the handle. When the tool is not in use, always have this valve closed for safety. The illustration shows the valve in the closed position.

If any of the tool functions fail to operate properly the device should be repaired immediately before use again. Refer to the Service Instructions.



The tool must be operated on a level surface. It is recommended that the tool be placed on the workshop floor while in operation.

Hoses and supply lines must be routed to the vehicle so that they cannot become trapped or tripped over while working.

Note: For clarity purposes, some of the instructions may show the cylinder head removed from the vehicle. Do not remove the cylinder head from the vehicle when performing carbon blasting.

Unpacking The Carbon Blaster



1. Place the box on a level surface.
2. Open the box and carefully remove the carbon blaster.
3. Check for accessories:
 - Granule container with connected hose package and handle
 - Straight blasting wand
 - Angled blasting wand
 - 2 cylinder head vacuum adapters
 - Operating manual – discard the manual included with the carbon blaster, and only use the instructions attached to SI B04 12 11.

Preparing the Carbon Blaster For Operation



The carbon blaster is supplied from the manufacturer without a compressed air male coupling.

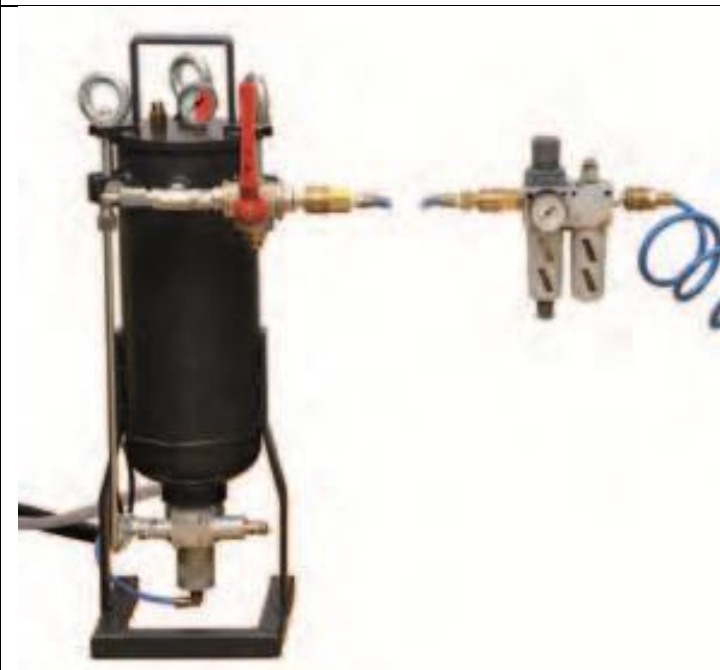
Remove the yellow transportation plug.



Install a male air coupling using ¼ “NPT pipe thread” and gently hand-tighten.



To verify the tool is calibrated properly, the lid must be securely tightened, and the cylinder should be empty.



Maximum air pressure input should not exceed 8 bar. Ensure the shop air supply is regulated between 6 and 8 bar (85 and 116 PSI) before connecting the carbon blaster.



Connect the shop air supply and turn on the air supply valve.

The shop air supply must be oil-free and dry. It is recommended that a suitable in-line shop air water separator be used.

The water separator and air regulator are not included. They must be installed before using the carbon blaster.



The pressure reading on the gauge should not exceed 8 bar if the shop air supply is regulated properly.

The carbon blaster can be operated using a shop air supply pressure between 6 bar and 8 bar (85 and 116 PSI).

Once the proper operating pressure has been verified, disconnect the shop air supply and allow the canister to depressurize before opening.

Filling The Carbon Blaster With Blasting Material	
	The shop air supply must be disconnected and the air supply valve placed in the off position.
	After disconnection, the pressure gauge must read zero pressure. Never open the lid if the pressure gauge is not reading 0 bar.



Loosen all three eye bolts.



Remove the cylinder lid.

Caution: The cylinder lid has a fitted O-ring. Avoid damaging or misplacing it. Make sure the O-ring is clean and in the lid groove before reassembling the lid on the body.



Pour the blasting material into the container.

Blasting Material Specification:

20/30 Walnut shells

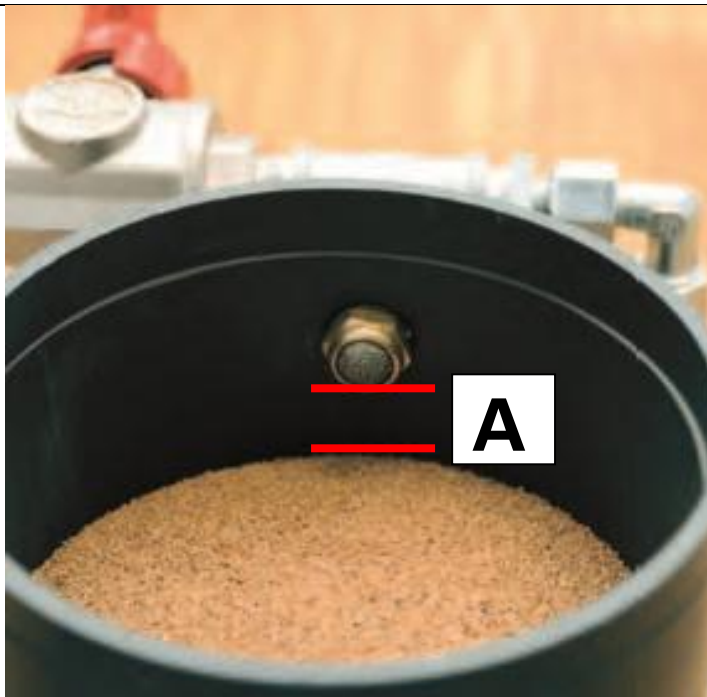
Or

0.45 -0.80mm Walnut shells

Or

Grade E Blast Walnut shells

Never reuse blasting material. Reusing the blasting material will cause clogging of the control valve.



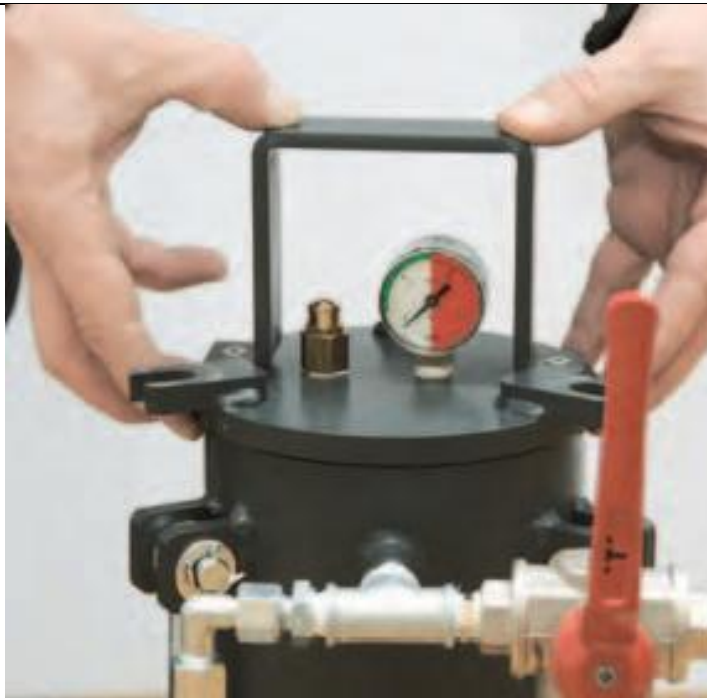
Do not overfill the cylinder!

Fill the cylinder until the material is approximately 30mm below the air inlet port on the side of the cylinder.

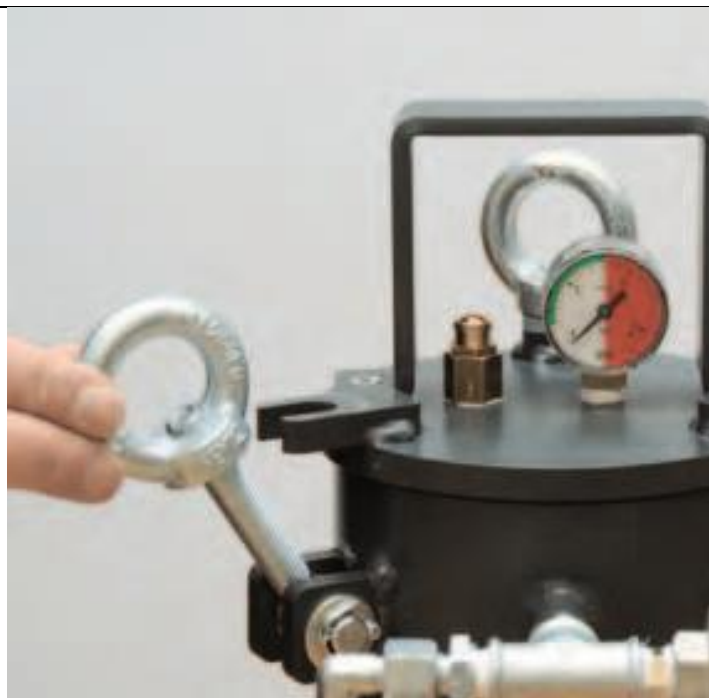
A = 30mm



Verify the condition of the lid O-ring seal.



Place the lid on the container. The gauge should face the control valve assembly, as shown.

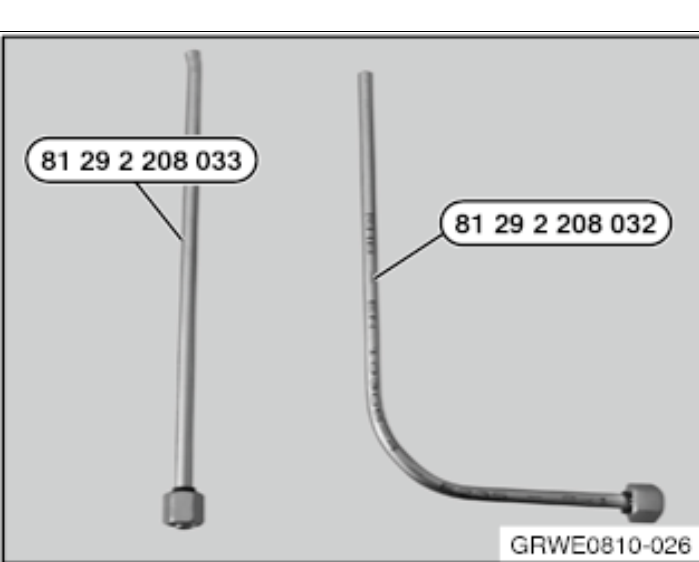


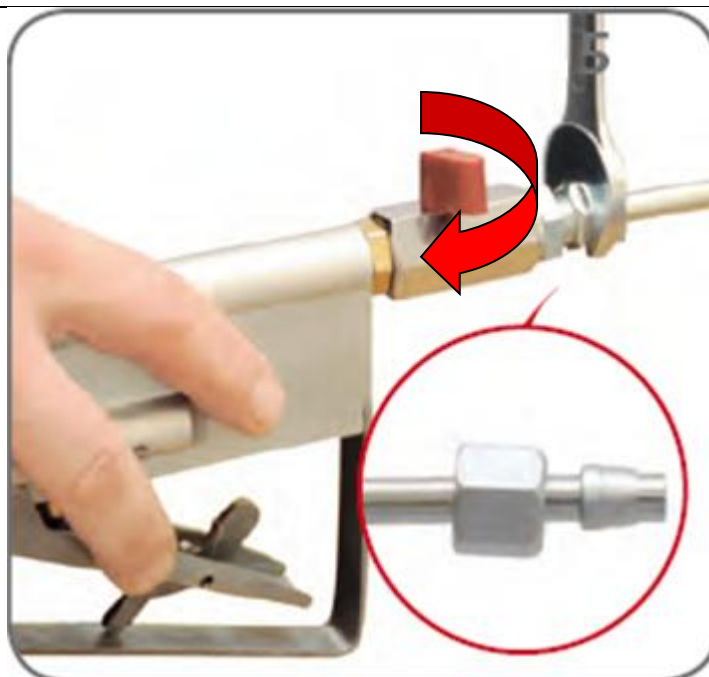
Hand-tighten all three eye bolts.



When not in use, always move the air supply valve to the off position. The off position is shown.

Refer to the S68T / XB1T engine specific carbon blaster instructions for important tools and procedures.

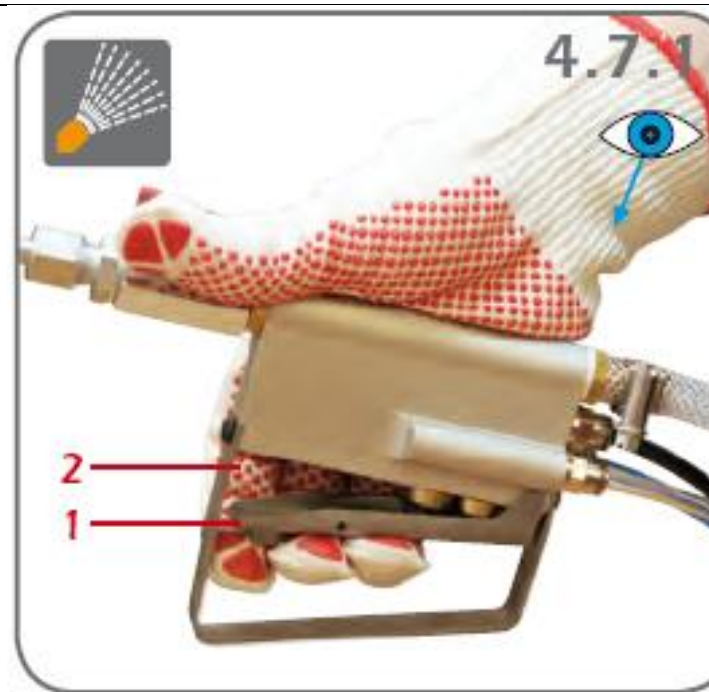
	Neither of the adapters supplied in the kit will fit the S68T cylinder head securely. These are for future use only; do not discard. P/N 81 29 2 208 038 - Future use P/N 81 29 2 208 037 - Future use
Attaching the Blasting Wand to the Carbon Blaster	
	Select the appropriate blasting wand for the engine variant. P/N 81 29 2 208 032 = Future use P/N 81 29 2 208 033 = Future use



Attach the wand to the handle and securely tighten the nut.

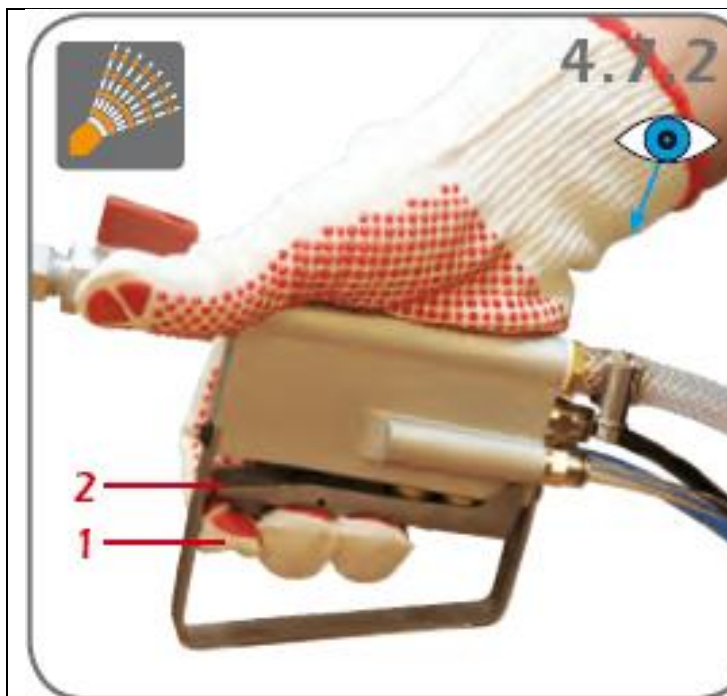
When the tool is not in use, it is recommended to turn the two-way ball valve to the off position. The off position is shown in the illustration.

Trigger Operation Starting the Cleaning Process



Familiarize yourself with the trigger operation with the shop air main supply valve in the off position, and without the shop air connected to the carbon blaster.

The trigger has a safety lever. Flip the lever and slightly depress the trigger. When the trigger is moved to position 1, only shop air is allowed to exit the wand.



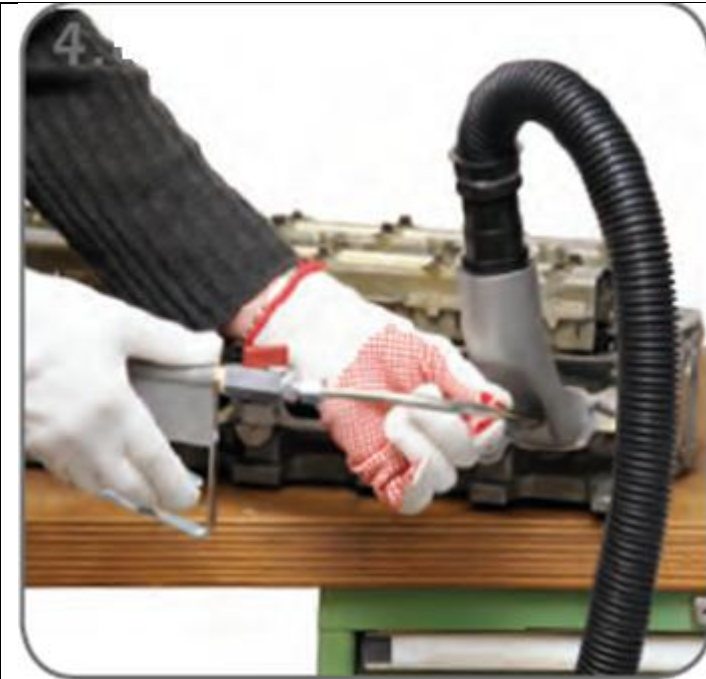
When the trigger is moved to position 2, both shop air and blasting material are allowed to exit the wand.

Blasting material exits the tool at very high velocity. Do not use this tool in a fashion that is not described in this operating manual.

- Place cylinder number one of the engine in TDC position. Use a TDC whistle or a wood dowel with the spark plug removed to determine that TDC has been reached.
- The intake valves of the cylinders must be 100% closed, or the cylinder will fill with blasting material.



Turn on the vacuum. Do not use a vacuum that is full or has a clogged filter.

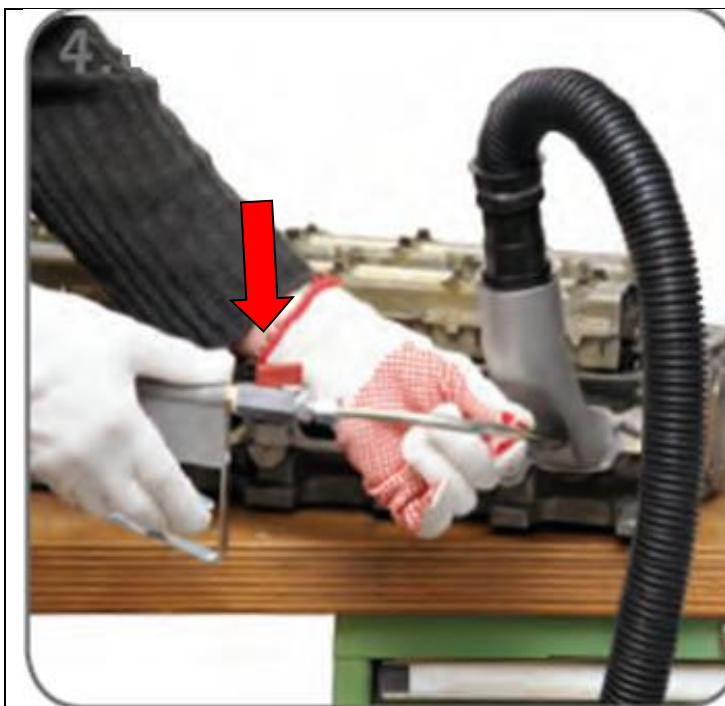


Insert the blasting wand into the cylinder head vacuum adapter.

Note: For clarity purposes, some instructions may show the cylinder head removed from the vehicle. Do not remove the cylinder head from the vehicle.



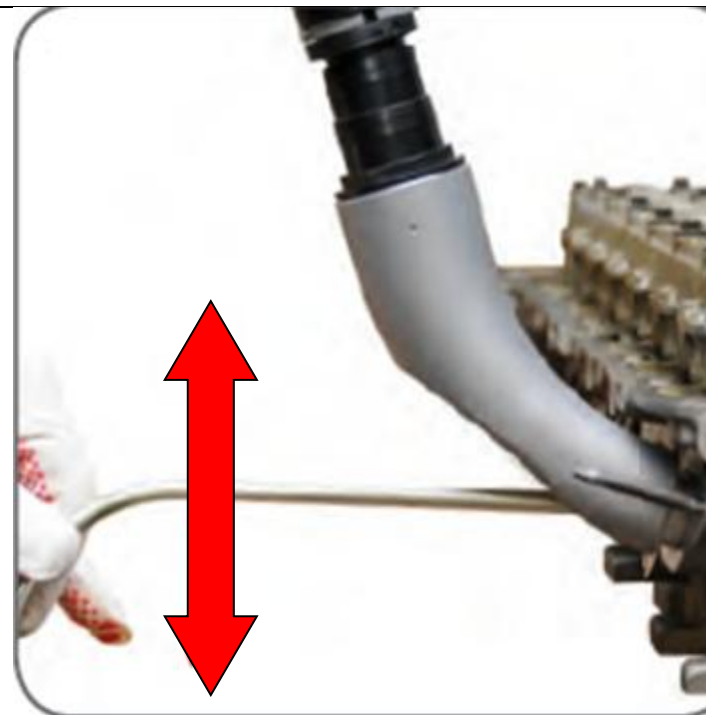
Turn the air supply valve to the "ON" position (horizontal).



Turn on the wand two-way ball valve.

It is recommended that any time the operator's hands are removed from the handle, that the wand two-way ball valve be closed for safety.

While blasting the carbon from the intake valves and the port, it is good practice to move the wand around, left and right, up and down, or in small circles to achieve the best cleaning results.



After approximately 30 seconds of blasting, release the trigger slightly to allow only shop air to enter the intake valve port. Continue to move the wand around to help evacuate the blasting material from the intake port. Depending on the severity of the carbon, you will have to repeat these steps several times to achieve clean results.

When you feel you have completed the cleaning and before you remove the wand from the cylinder head vacuum adapter, always turn off the wand two-way ball valve and shop air supply valve for safety.

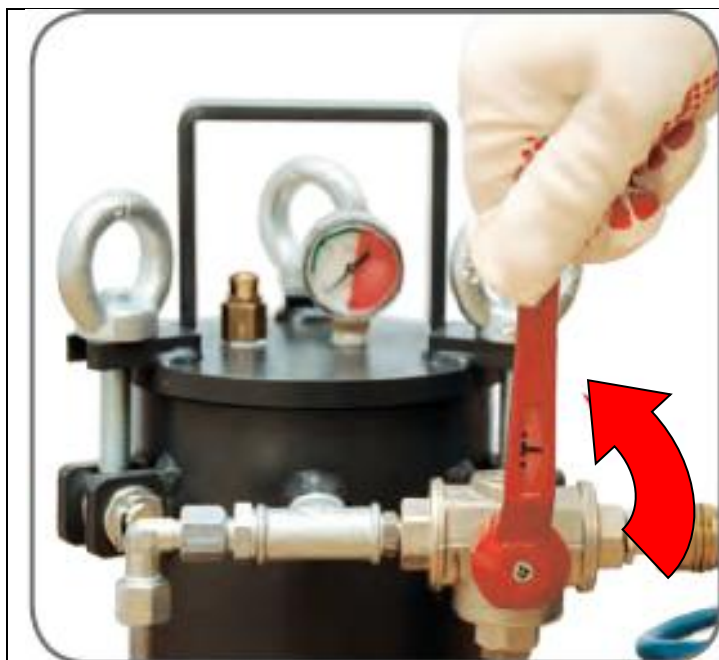
If the results of your first inspection are not 100% clean, you will have to repeat these steps until the intake valves and the ports are clean. In some cases, you will have to use a pick tool to loosen stubborn carbon build-up.



The cleaning is complete once the valves and the ports are free of carbon and blasting material. Ensure all blasting material has been removed, or engine damage can occur.



Repeat these steps for each of the cylinders. Each cylinder must be placed in the TDC position using a TDC whistle or a wood dowel with a spark plug removed, to determine that TDC has been reached.



After cleaning all of the intake valves and ports, turn off the air supply valve and disconnect the shop air supply line.



Allow the pressure to deplete inside the cylinder. The gauge must read zero before opening the lid.



Remove unused blasting material and store it in a dry location.

It is recommended that the carbon blaster be stored in a dry location at room temperature. Abrupt changes in temperature can cause condensation inside the cylinder, resulting in the tool clogging.

Carbon Blaster Tool Maintenance

The blasting material braided hose and brass nipples are subject to wear during operation and must be checked for damage every two months and/or replaced at least once per year if the tool is used on a regular basis. This normal wear and tear is not covered under Warranty.

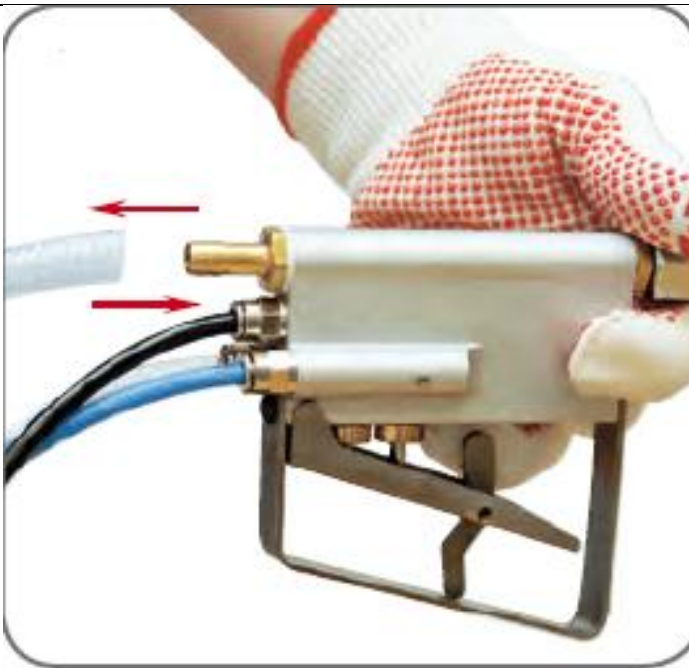


Remove the protective cover from the hose bundle.



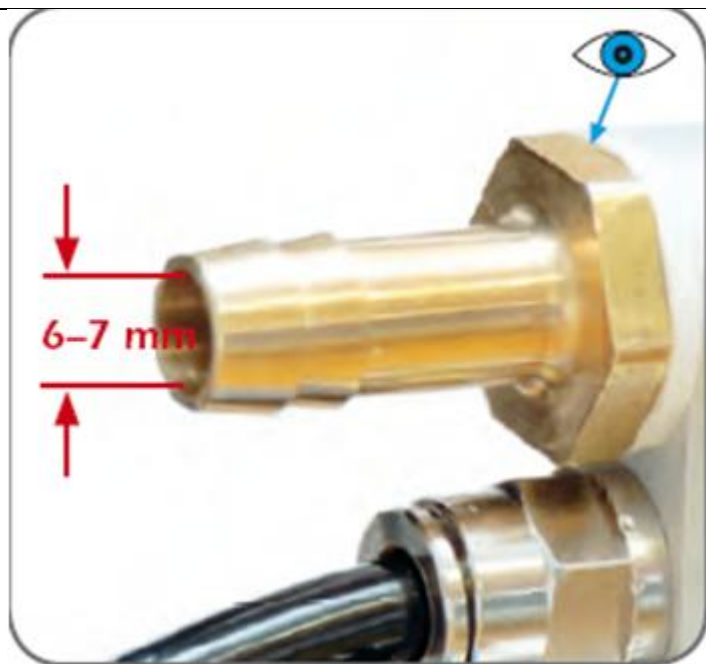
Disconnect the braided hose from the control valve.

Inspect the hose material for deterioration and, if necessary, replace it at least once a year or more frequently, depending on tool usage.



Disconnect the braided hose from the handle.

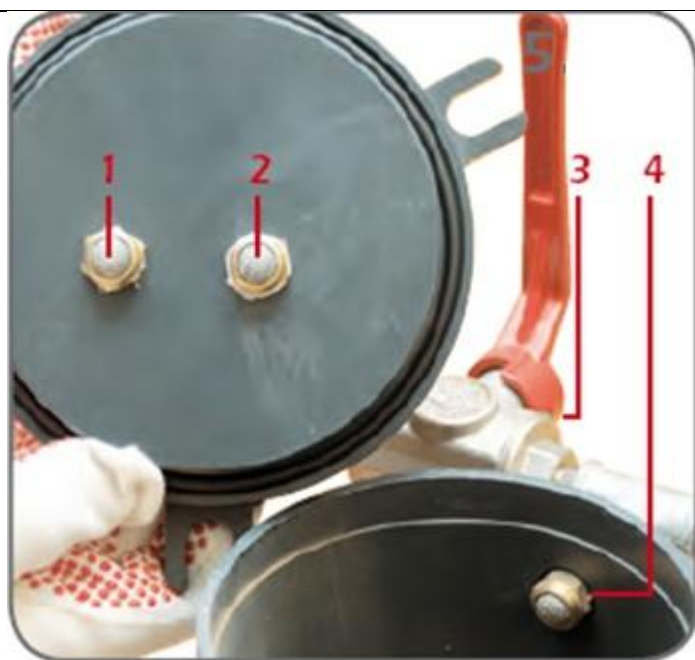
Inspect the hose material for deterioration and, if necessary, replace it at least once a year or more frequently, depending on tool usage.



Inspect the brass barbed nipple on the handle and control valve.

Over time the brass material will be worn away slightly by the blasting material. Measure the inside diameter of the brass nipple using a 7mm drill bit. If the 7mm drill bit fits inside the brass nipple, it must be replaced. This normal wear and tear is not covered under Warranty.

Original diameter = 6mm
Wear limit diameter = 7mm



At regular intervals, but after not more than 15 container fillings, the filter inserts must be cleaned.

1. Filter in lid
2. Filter in lid
3. Filter in supply valve
4. Filter in cylinder

Remove all four filters using a suitable tool.



Using compressed air, gently blow them out to release trapped material.

Always wear the recommended safety equipment described in the beginning of this manual.

Replacement Parts and Tool Overview

Additional parts and tools can be found on TIS. See photo for location.

 Technical Information System

SIB

Search

Home

Service Information

Parts Bulletins

Training

Tools & Equipment

Videos

Noise Catalog

Scope Pattern

Takata Recall

Technical Documentation

ALL

NEW

HISTORY

Technical Documentation

BMW Technical Support (TSARA)

Connected Drive

Driver Assistance Systems

EV Information

General Reference

Programming and Diagnostics

Recall & Delivery Stops

Spec. Tools & Workshop Equip.

TKR (Tools & OSCaR App).

NAx & Gen6.

TechConnect

Workshop Info

Spec. Tools & Workshop Equip.

Find Document

TKR (Tools & OSCaR App)

83 30 5 A39 389 BMW NVLD Spare Parts

Rear Axle Emergency Release Tool – Spare Parts

BMW_TKR_OSCaR_AdminManual

Walnut Blaster - Shell Granulate Ordering

83 30 0 496 885 Injector Tool Spare Parts

HP90 Repair Service 2

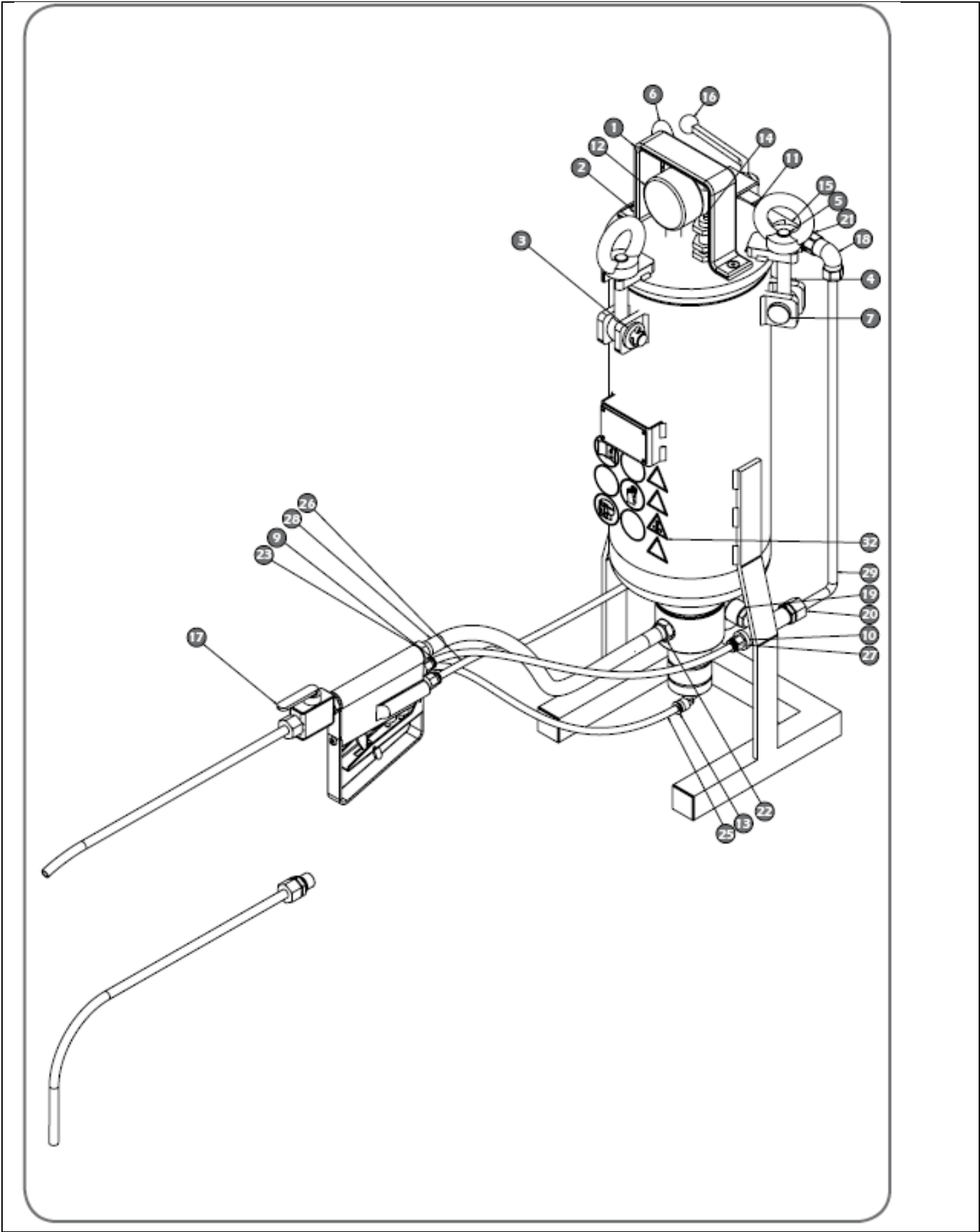
Instructions_OSCaR_App_Support

Walnut Blaster - Service Instructions

PNP90 Repair Service 2

81 29 2 208 034 Walnut Blaster Spare Parts

HP90 Maintenance_Repair_Oil Types



Item no.	Article number	Title
1	07-00000742	Ring nut
2	10-00000009	Exhaust valve G1/4 SW 16
3	10-00000011	GE G1/8" on Ø6
4	10-00000012	GE G1/4" on Ø6
5	10-00000017	Double nipple 1/4"
6	10-00000023	Pressure gauge
7	10-00000024	Angular connection 1/8" on Ø6
8	10-00000025	Safety valve
9	10-00000026	T-piece
10	10-00000027	3-way ball valve
11	10-00000028	2-way ball valve
12	10-00000029	Angular screw connection
13	10-00000030	Double nipple
14	10-00000031	Screw-in connection
15	10-00000032	Screw-in connection
16	10-00000034	Press nipple
17	10-00000035	Threaded grommet
18	12-00000184	O-ring
19	15-00000081	Blue hose
20	15-00000082	Black hose
21	15-00000083	Transparent hose
22	15-00000084	PVC hose
23	15-00000087	Ermeto tube 8x1
24	15-00000088	Protection tubing 20PP
25	50-00000307	Kapsto sealing screw
26	50-00000386	PVC disk for 1/4" connection
27	50-00000610	Kapsto plastic cover
28	50-00000643	Hose clamp
29	BGR-PNW-00000183	Nozzle, angled
30	BGR-PNW-00000184	Nozzle, straight
31	BGR-PNW-00000188	Control block
32	BGR-PNW-00000195	Handle

BMW Group Carbon Blaster Operating Manual (S68T / XB1T)



This document provides the procedures to clean the intake valves using the BMW Carbon Blaster Tool P/N 81 29 2 208 034 and the S68T / XB1T Carbon Cleaning Tool Kit P/N 83 30 5 BAD 3D5

Required Safety Equipment

Face Shield



Ear Protection



Gloves



Protective Clothing



Maximum air pressure input should not exceed 8 bar.

Ensure the shop air supply is regulated between 6 and 8 bar (85 and 116 PSI) for the best cleaning results before connecting the carbon blaster.

The shop air supply should be dried using a general-purpose filtering system; the tool is not recommended for use with a lubricating system. Water vapor in the compressed air system will clog the filtering screens in the carbon blaster. Repairs due to water damage are not covered under Warranty.

Refer to the standard BMW Group Operating Manual for carbon blaster operation, refilling and maintenance.

Use the following instructions and tool P/N 83 30 5 BAD 3D5 specifically for the S68T engine.

Dealer Instructions Overview:

- Engine removed and positioned on the engine table, Refer to Repair Instruction 31 10 001 Completely removing and installing front axle and transmission.

Note: Repair Instruction 31 10 001 states to flush the transmission cooler and this is an error, do not flush the cooler.

- Remove both intake manifolds after lowering the engine and transmission.
- Remove all 8 spark plugs.

Tools Supplied by Dealer:

- Bore scope
- TDC whistle
- Air supply
- Workshop vacuum

Walnut Shell Specification:

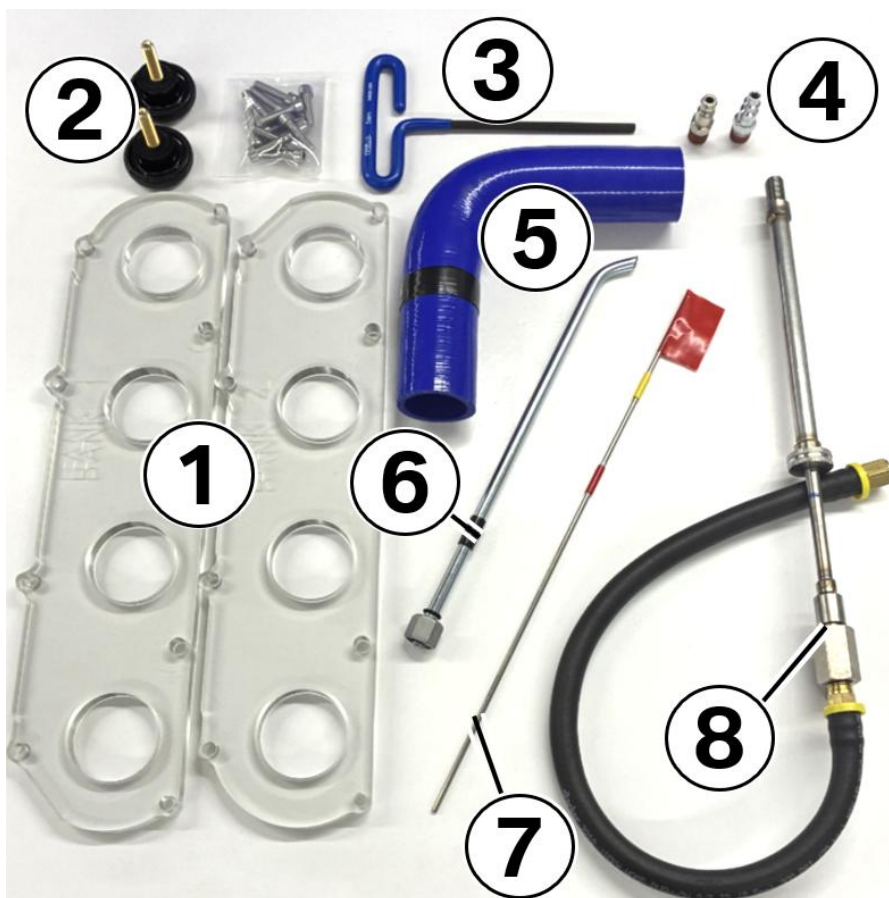
- 20/30 Walnut shells

Or

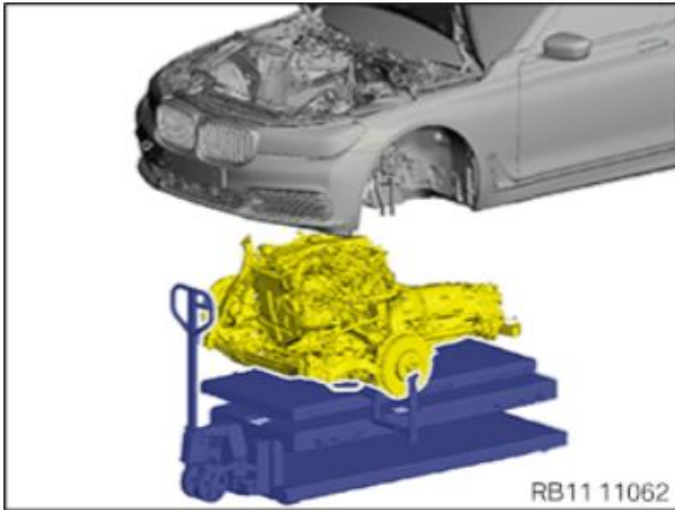
- 0.45 -0.80mm Walnut shells

Or

- Grade E Blast Walnut shells

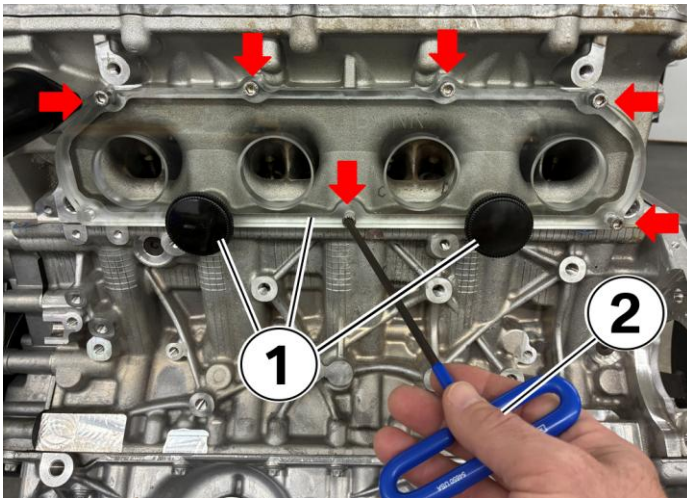
**S68T / XB1T Kit P/N 83 30 5 BAD 3D5 Overview:**

1. Cylinder head intake plates, cylinder bank 1 and cylinder bank 2, each are marked accordingly.
2. Intake plate knobs and screws
3. T-Handle Allen wrench
4. Extra air fittings
5. Blue 90-degree hose.
6. Carbon blaster wand adaptor
7. Top Dead Center (TDC) pin
8. Cylinder evacuation tool



1. Remove the engine and transmission and place it on the engine table, refer to Repair Instruction 31 10 001 Completely removing and installing front axle and transmission.

- Remove both intake manifolds
- Remove all spark plugs
- Do not remove the cylinder head covers

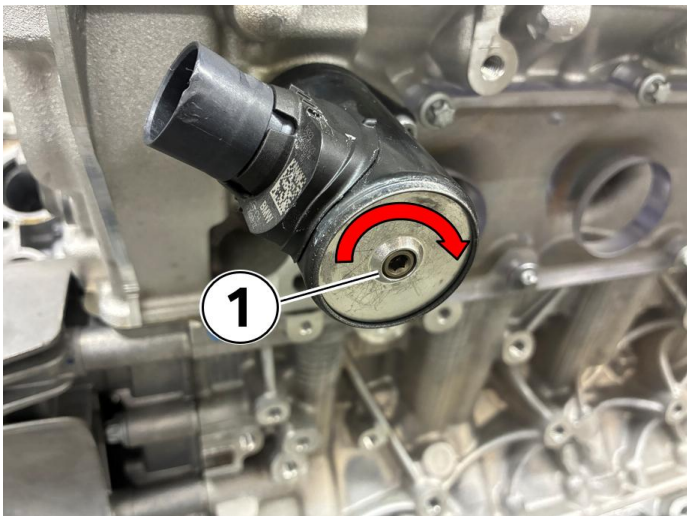


2. Install the cylinder head intake port plate on one side of the engine using the large knobs in the kit (1).

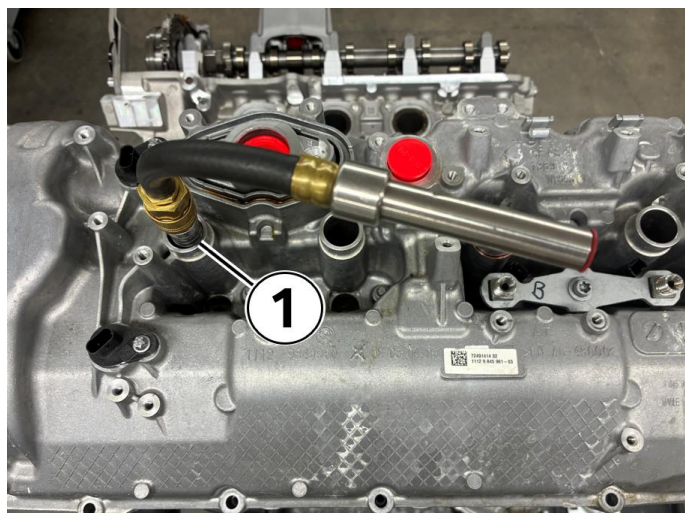
Each is identified by the cylinder bank number.

Install the 6 M6 Allen screws, see red arrows.

Hand and tighten the knobs and then hand tighten the M6 screws with the T-Handle (2).

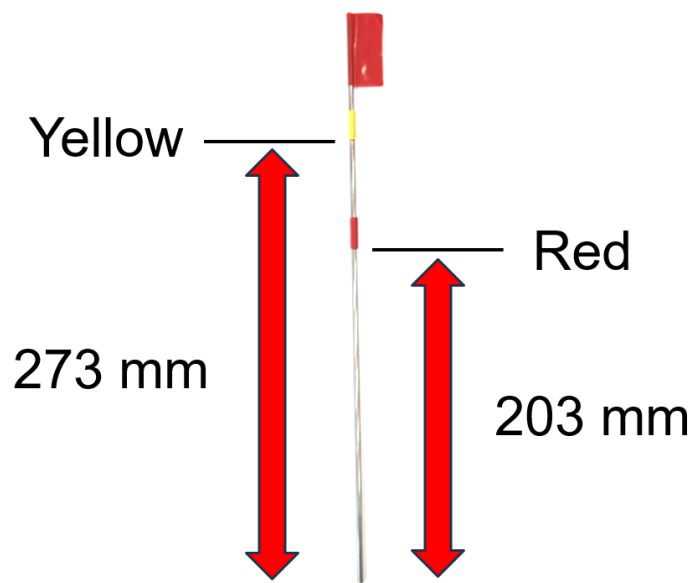


3. Move both VVT motors (1) to maximum lift position by turning each VVT motor with a 4 mm Allen wrench or socket 25 turns clockwise or until it stops on both cylinder banks (see arrow).



4. Use a TDC whistle (1) to bring the cylinder to top dead center (TDC).

Remove the TDC whistle.



5. TDC Pin Overview:

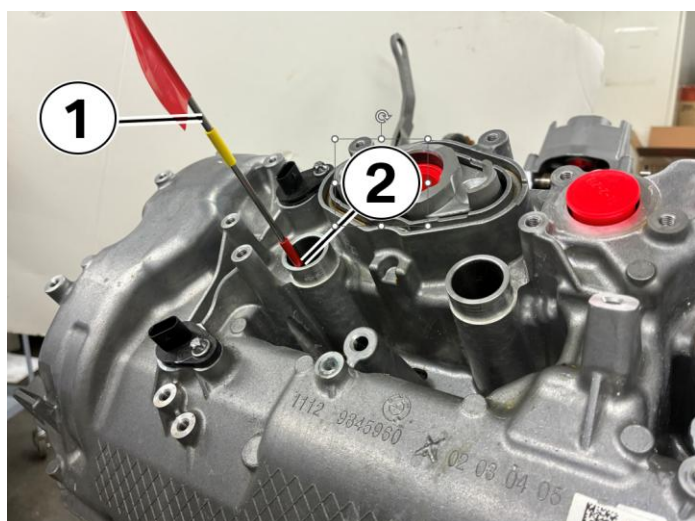
The TDC pin will be marked with vinyl tape in two locations.

Yellow = 273mm from the bottom

Red = 203mm from the bottom

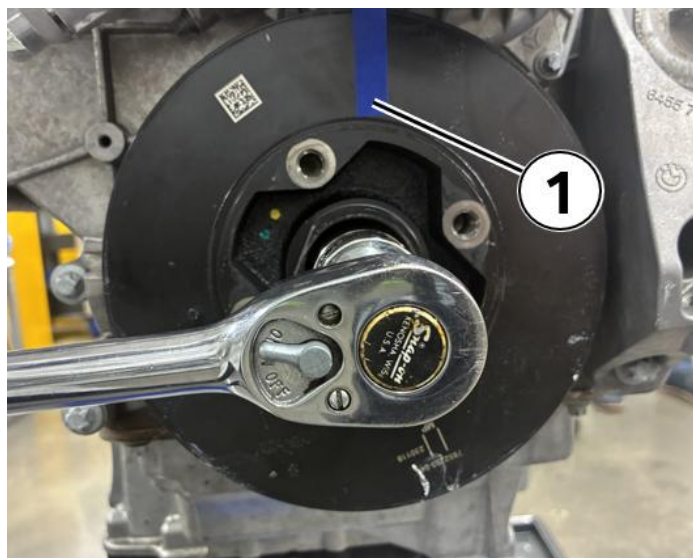
The tape markers are important to determine the proper location of the piston and valve position.

Verify the markers are present and if missing install a new tape line using vinyl electrical tape.



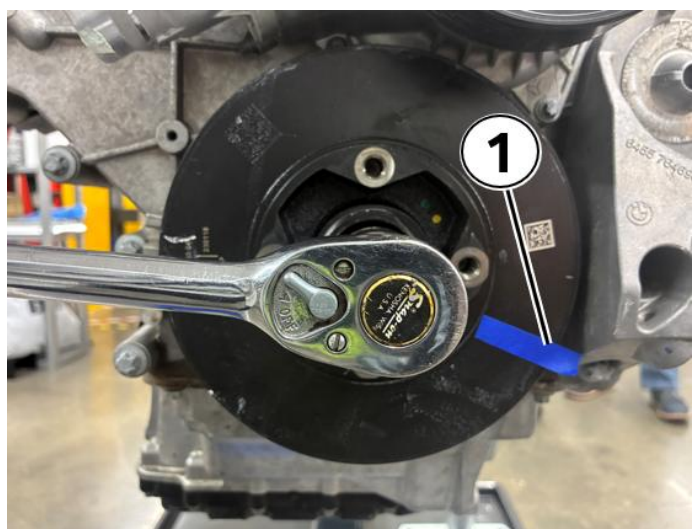
6. Install the TDC pin included in the kit (1).

Verify the cylinder is at TDC by aligning the bottom of the red tape (2) with the top of the ignition coil hole in the cylinder head cover.



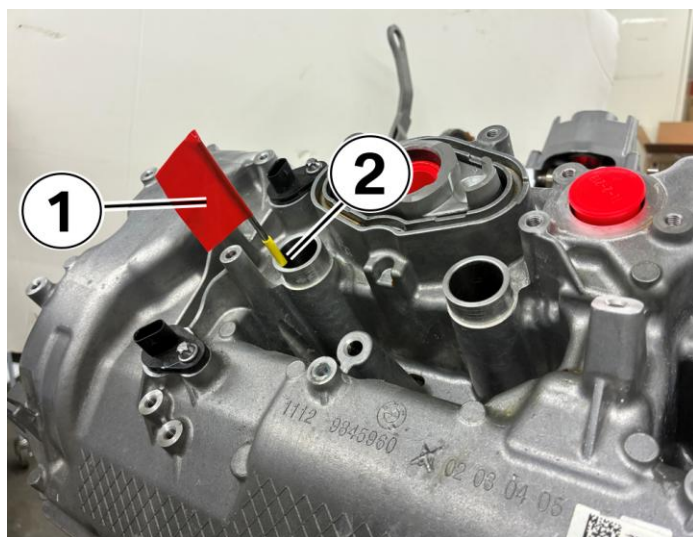
7. Mark the vibration dampener at the 12 O'clock position using removable tape.

The removable tape will need to be moved when changing cylinders. Do not use a permanent marker or paint.



8. Rotate the engine clockwise 1 full turn (360°) plus another 1/3 turn (120°).

The tape on the vibration dampener should be at the 4 O'clock position (1) when completed.



9. The TDC pin (1) will now move to the bottom of the yellow tape (2) and align with the ignition coil hole in the cylinder head cover.

After the position is verified remove the TDC pin from the spark plug hole.

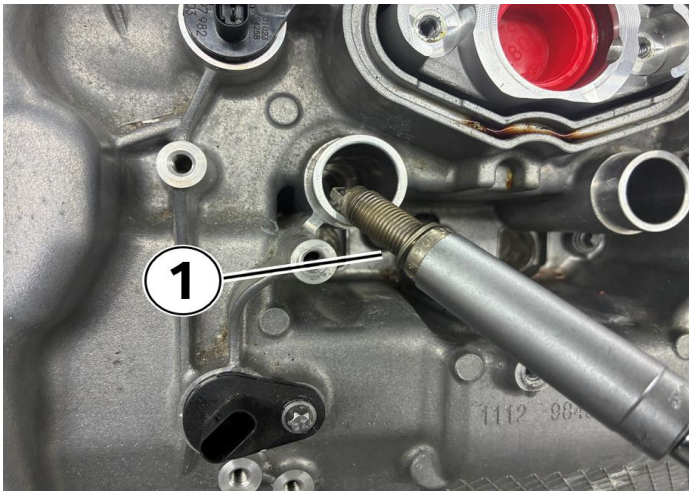


10. Inspect the intake valves for that cylinder.

The valves will be fully open.

The valves must be open to properly clean the valves and seat area.

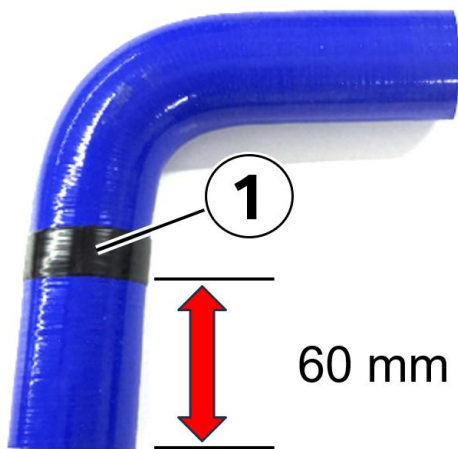
The walnuts will enter the cylinder and exit the opposite valve while the vacuum is on.



11. Reinstall the spark plug for that cylinder only.

Caution: Spark plug must be reinstalled, or the walnuts will exit the engine during the blasting procedure.

Always refer to the BMW Group Carbon Blaster Operating Manual for the carbon blaster required safety equipment, tool operation and maintenance procedures.

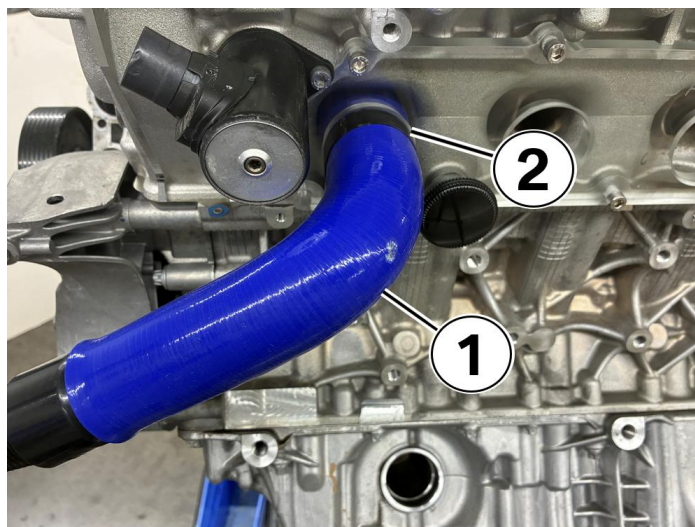


12. Blue hose vacuum adapter overview:

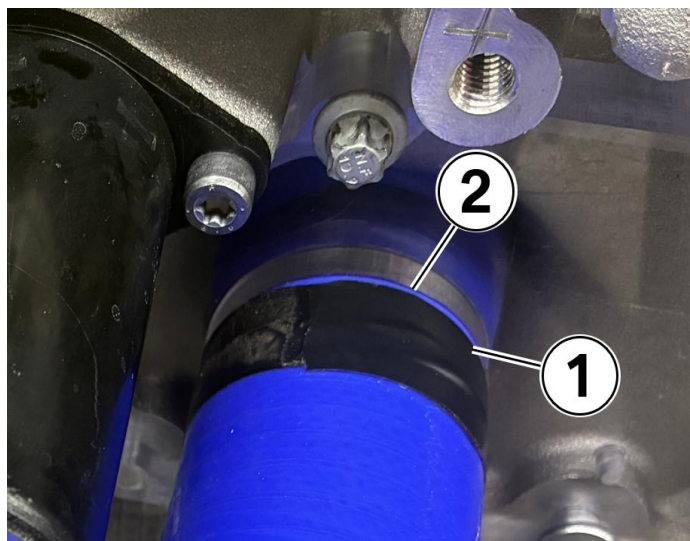
The hose will be marked with vinyl tape (1) 60 mm from end as shown in the photo.

This tape marker is important to determine the depth of the hose so the crankcase ventilation port inside the intake port is blocked from being contaminated with walnut shells.

Verify the marker is present and if missing install a tape line using vinyl electrical tape.

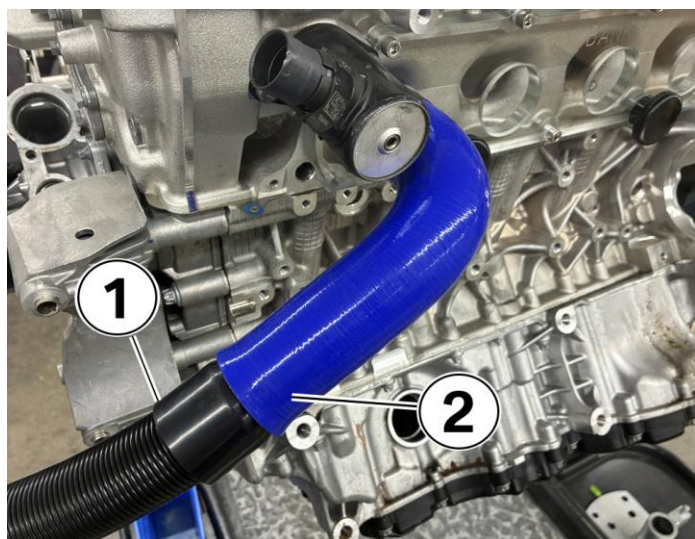


13. Install the blue hose (1) into the cylinder port (2).

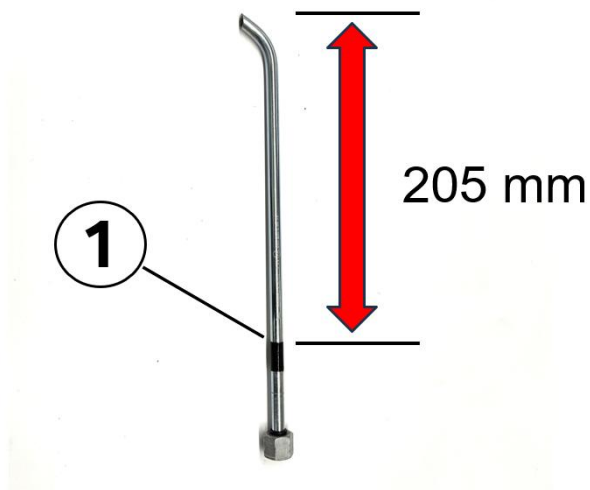


14. Install the blue hose so that the black tape line (1) touches the intake port plate (2).

Important: The blue hose must be installed so that it covers the crankcase ventilation port found inside the top of the cylinder head intake port. The marking on the hose must be touching the intake port plate



15. Connect the workshop vacuum (1) directly to the blue hose vacuum adapter (2).

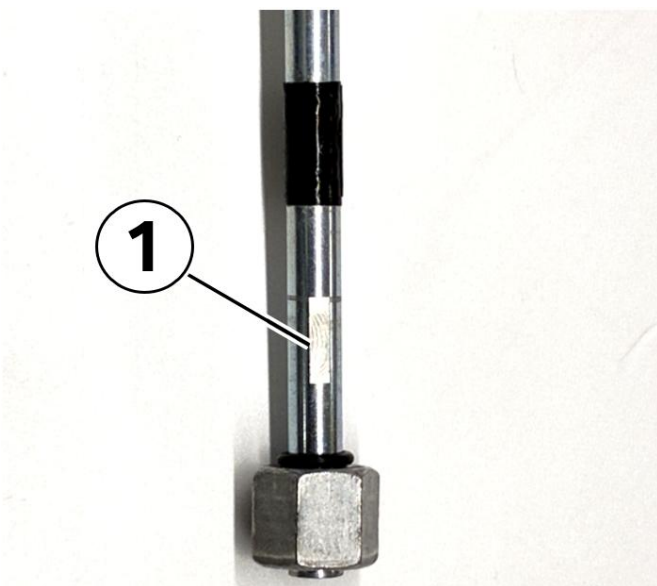


16. Carbon blaster wand overview:

The blaster wand has a mark (1) 205 mm from the curved tip.

This tape marker is important to determine the depth of the tool.

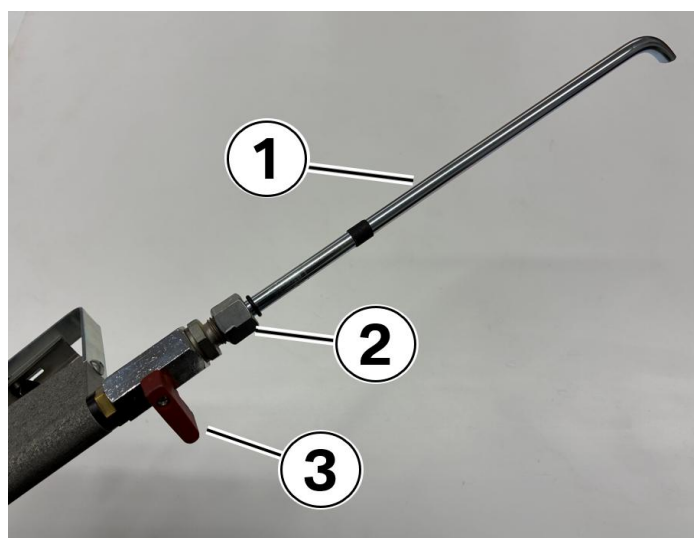
Verify the marker is present and if missing install a tape line using vinyl electrical tape.



17. Carbon blaster wand overview:

Between the blaster wand nut and marker there will be a flat machined surface (1).

This surface indicates the top of the wand and should be used as reference to identify that the curved portion of the wand is always pointing towards the intake valves.



18. Install the blaster tip (1) included in the kit onto the trigger assembly.

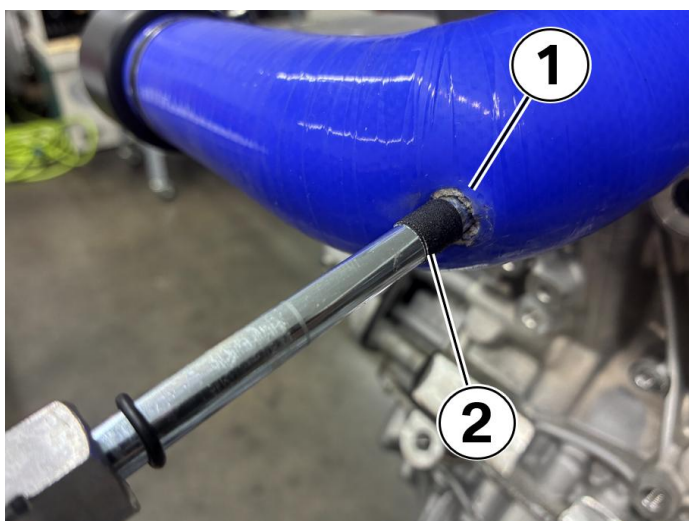
Tighten the nut (2).

Close the safety valve (3).



19. Ensure the blasting tip (1) is pointing downward before inserting the tool into the blue hose.

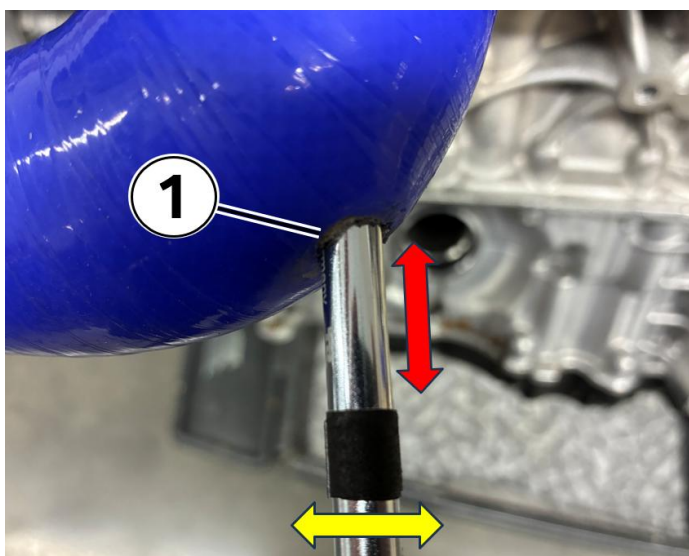
For best results the tip will be pointed directly at the valve.



20. Insert the blaster tip (1) into the hole in the blue hose (2).

The marker on the blasting wand should be in contact with the blue hose.

Turn on the shop vacuum.



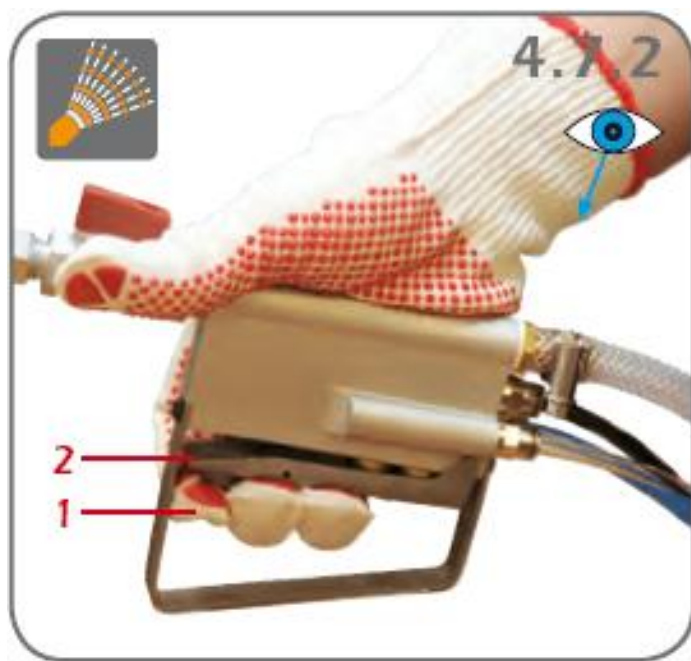
21. Connect the shop air and turn on the carbon blaster valve.

Move the blasting wand in and out of the hose approximately 40 mm (1.5") to clean the entire valve circumference and surrounding port surface.

You will also need to move the blasting wand side to side (see yellow arrow).

Be sure to thoroughly blast both intake valves and intake port surfaces.

For best results always leave the shop vacuum running.

**Important Carbon Blaster Tip:**

Position 1: Air only

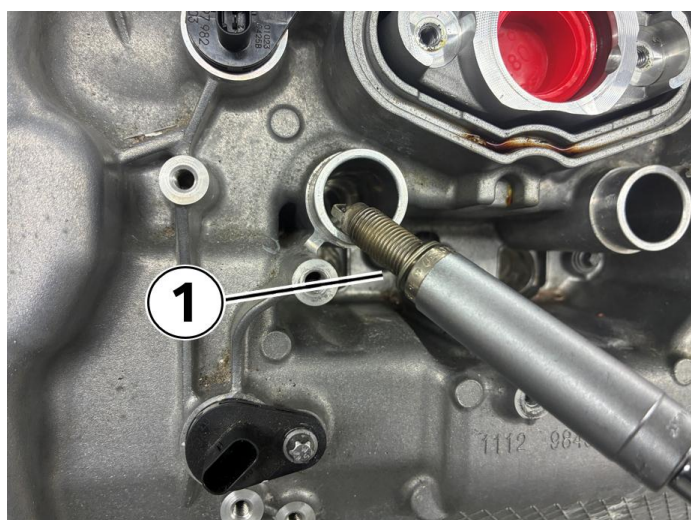
Position 2: Air and walnuts

Pulling the trigger to position 2 for approximately 3 – 4 seconds will allow the walnuts to flow into the intake port, then release the trigger to position 1 for just air for 1 – 2 seconds.

Switching from walnuts to air frequently will evacuate the port of residual walnuts and increase efficiency.

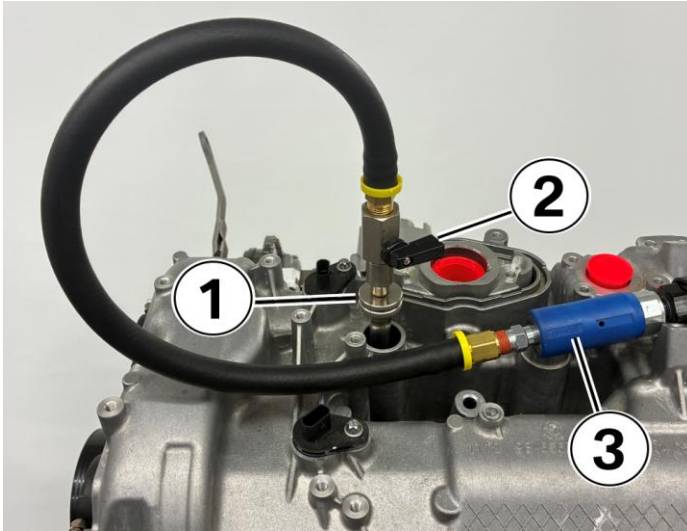
Repeat as needed.

Holding the trigger in position 2 longer will cause the walnuts to build up too fast in the port and the carbon will not be removed efficiently.



22. When complete remove the spark plug (1)

For best results leave the shop vacuum running.



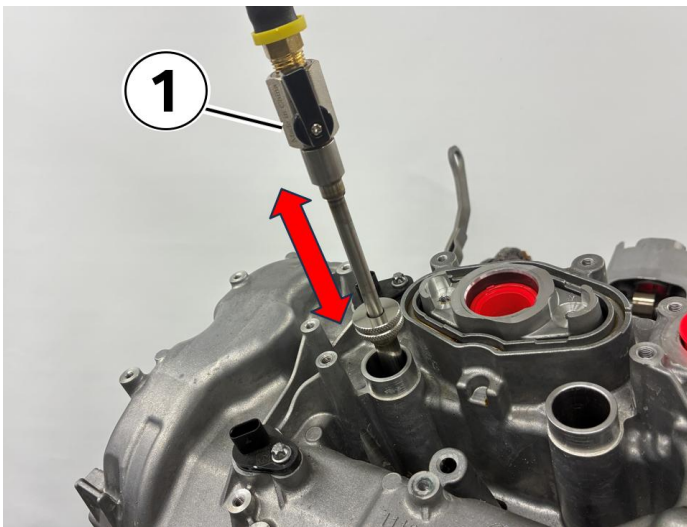
23. Install the cylinder evacuation tool by threading into the spark plug hole (1).

It may be a tight fit with the surrounding hardware you only need to thread it into the spark plug hole just 2-3 turns for safety.

Turn off the valve (2).

Connect the shop air hose (3).

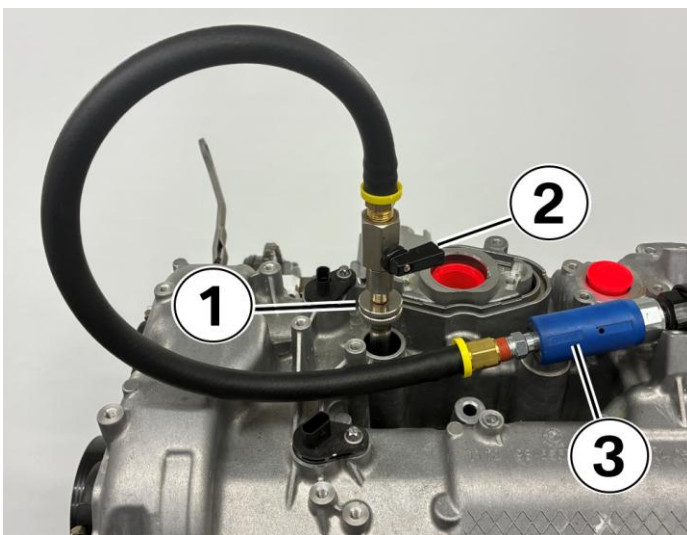
For the best results leave the workshop vacuum running.



24. While holding onto the tool, turn the valve on (1).

You will hear air entering the cylinder.

Move the tool up down in the cylinder 5 - 6 times to evacuate any residual walnuts debris from the cylinder. See red arrow.



25. Turn off the valve (1).

Disconnect the shop air hose (2).

Remove cylinder evacuation tool (3) and turn off the shop vacuum.

Use a borescope to inspect the cylinder. No walnuts should be left in the cylinder.

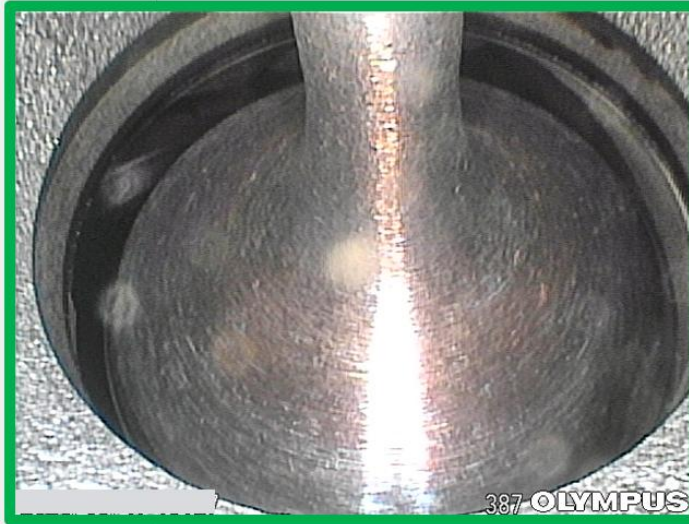
Repeat steps 23 through 25 as needed.

Use the photos below to determine the quality of the blasting.

Inspection of the valves:

The edges of the valve and valve seat are clean and free of all carbon deposits. Go to step 25.

The edges of valve and valve seat have carbon deposits and will require additional carbon blasting. Repeat steps 10 – 25.



26. Repeat steps 4 through 25 on the remaining cylinders.

When the carbon blasting of all cylinders is complete then reassemble the vehicle as per Repair Instruction 31 10 001 Completely removing and installing front axle and transmission.

Note: Repair Instruction 31 10 001 states to flush the transmission cooler and this is an error, do not flush the cooler.

Feedback on this procedure can be submitted to the Powertrain group via a TSARA Info Only Case.