

CAMSHAFT INSTALLATION MANUAL



Read this manual before use.
Installation must be done by a professional.

Keep this manual after installation.

NAME OF PRODUCT	CAMSHAFT SET
USAGE	AUTOMOBILE PART
PART NUMBER	22002-AN038 (Full kit)
MANUAL NUMBER	E04121-N49010-00
APPLICATION	NISSAN GT-R R35
ENGINE	VR38DETT
YEAR	2007.12.~
REMARKS	<ul style="list-style-type: none">• This kit was designed on a JDM vehicle and has not yet been tasted in other markets.• In order to use this kit, the following parts are required: Spring Valve Set for VR38DETT Piston + Connecting Rod Set Step2 for VR38DETT or Capacity Upgrade Kit for VR38DETT (VR38DETT 4.1L Kit)• This kit was designed on the assumption of use of stock variable valve timing unit. V/P cannot be properly attained if a unit with larger variable angle is used with this kit.

REVISION OF MANUAL

Rev. No.	Date	Details
3-3.01	2014/09	1st Edition

Published in September, 2014 by HKS Co., Ltd.
(Unauthorized reproduction is strictly prohibited.)

INTRODUCTION

- Thank you for purchasing the HKS CAMSHAFT.
- Installation must be done by a professional installer.
- After installation, follow the instruction in this manual.
- Please read this manual before installation.

NOTICE

- This manual assumes that you have and know to use the tools and equipment necessary to safely perform service operations on your vehicle.
- This manual assumes that you are familiar with typical automotive systems and basic service and repair procedures.
- Do not attempt to carry out the operations shown in this manual unless these assumptions are correct.
- Always have access to a factory repair manual.
- To avoid injury, follow the safety precautions contained in the factory repair manual.

PRODUCT FEATURES

- This product was developed to improve engine output to a higher range, and for race use on a closed course, where this kit is highly effective. However, when the power is increased, generally, the water temperature and/or the oil temperature tend to increase, and the oil pressure runs lower. Check the conditions of these to maintain the engine performance.
- To use this product on public roads, follow the necessary procedures and regulations for modified vehicles.

ATTENTION

- This manual indicates items you need to pay attention to in order to install this product safely and lists precautions to avoid any possible damage and/or accidents.
- This product is an automobile part. Do not use for any other purposes.
- HKS will not be responsible for any damage caused by incorrect installation and/or use, or use after modification and/or dismantling of this product.
- This product was designed based on installation onto a specific factory vehicle.
- The specifications of this product are subject to change without notice.
- The instructions are subject to change without notice. Make sure to refer to the most recent instructions.

SAFETY PRECAUTIONS

WARNING

- To prevent explosion and/or fires, always:
 - Work on the vehicle in a well-ventilated area.
 - Handle any flammable objects with care.
- To prevent electrical damage/burns/fires, always:
 - Disconnect the negative terminal of the battery before beginning installation.
 - When disconnecting connectors, take extra care to avoid breaking the connectors.
- Before jacking up the vehicle, always use wheel blocks and position the jack correctly. Also, do not start working under the vehicle without using jack stands.
 - Positioning the jack incorrectly imbalances the vehicle and may damage the vehicle body.
 - Incorrect use of jack stands may result in the vehicle falling causing serious injury or possibly death.

CAUTION

- Do not misuse this product.
 - Misuse of this product may lead to engine damage.
 - Misuse of this product may lead to loss of its original function.
- Prior to installation, make sure the engine bay temperature has cooled to approximately 40°C /104°F.
 - Failure to let the engine cool down properly can lead to severe burns.
- Insert clean rags into open piping to prevent contaminants from entering the pipes.
 - If neglected, contaminants in the piping can lead to engine damage.

- Make sure that all of the parts listed in the Parts List are included in the kit.
- Reference the factory service manual when removing factory parts.
- Be careful when handling this product; avoid dropping or subjecting it to excessive impacts. Failure to do so may result in product damage or improper installation.
- Use the proper tools when tightening nuts and bolts. If over-tightened, the bolts may become damaged.
- Keep the removed factory parts in a safe place for ease of reinstallation at a later date (if necessary). It is recommended to mark the positions of the removed factory parts.
- When refilling oil, make sure to use the appropriate type of oil.

PARTS LIST

No.	DESCRIPTIONS	QTY	REMARKS
1	Camshaft	1	Right Bank Intake Side (RIN-stamped)
2	Camshaft	1	Right Bank Exhaust Side (REX-stamped)
3	Camshaft	1	Left Bank Intake Side (LIN-stamped)
4	Camshaft	1	Left Bank Exhaust Side (LEX-stamped)
5	Installation Manual	1	

INSTALLATION

1. Removal of Factory Parts.

Remove factory parts referring to the factory service manual.

2. Installation of Factory Trigger

Remove the trigger and bolt from the factory intake camshaft.

Trigger's installation position for the right bank/intake side is different from the left bank/intake side. Make sure the convex part on the inside of the trigger is securely aligned with the groove of the camshaft's rear end.

Install the factory trigger to the intake camshaft using the factory bolt referring to the factory service manual.

3. Installation of Camshaft

Referring to the factory service manual, adjust the height of valve axis' end. Adjust the height by replacing the lifter if the height is out of the specified range.

Scratch on the valve lifter may cause seizure in the lifter. If scratch on the valve lifter is found, replace the lifter with a new one.

Before installation, wash the camshafts by kerosene as wash oil. Make sure to remove if any foreign object and/or dust are clogged in the oil holes and/or screw threads. Blow the camshafts to remove kerosene and dry them after washing.

Make sure there is no burr and/or dust left on the cam lobes and/or journals; then apply new engine oil to the camshafts.

Before installation, remove all cam caps single cylinder head, and place the camshaft on the cylinder head. Make sure if the camshaft can be lightly rotated.

If the cam lobe comes in contact with any other part of the cylinder head, remove the portion of the cylinder head that comes in contact with the camshaft using a file or grinder. Make sure to remove only a necessary minimum range.

After removal, make sure there are no burr and or warpage left in the cylinder head. Make sure not to make any scratch on any other parts. Install the camshafts after confirming things described above.

Check and adjust the valve clearance after installation.

When replacing with the valve spring, replace the retainer if abrasion of the retainer is noticed.

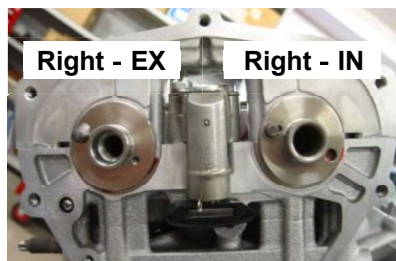
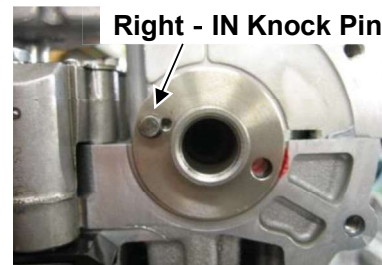
Retainer Nissan Genuine Part Number: 13209-AC700

4. Exhaust camshaft (right bank) installation. (Confirmation of the knock pin position)

The right bank cannot be assembled to the knock pin's position shown in the factory service manual since the lift amount is high.

Arrange the right exhaust camshaft's knock pin position to be the same position shown in the pictures below, and assemble the camshaft to the cylinder head.

The subsequent installation procedures must be performed referring to the factory service manual.



Confirmation after Installation

(1) Check the following before starting the engine:

- Make sure pipes and hoses are routed and connected correctly.
- Make sure hoses are not twisted or bent.
- Make sure the negative cable terminal is securely attached to the battery.
- Make sure the level gauge for the engine oil is between H (F) – L.
- Make sure all bolts and nuts are tightened.
- Make sure all installed components do not come in contact with other parts.

(2) Start the engine and check the following:

*Do not raise the engine RPM when the engine reaches the normal operation temperature. (Let it idle.)

- Make sure oil is not leaking.
- Make sure air is not leaking.
- Make sure fuel, traction oil, coolant, and air are not leaking after revving the engine 2-3 times while in neutral.
- Make sure the installed parts are not hitting each other.
- Make sure the level gauge for the engine oil is between H (F) – L.

MAINTENANCE

Proper maintenance of this product is necessary in order to maintenance the safety, reliability, and function of this product.

- Maintenance is the responsibility of the driver/owner.
- If work needs to be performed outside the scope of this manual, consult a professional.
- In order to maintain the performance of the kit, routine filter replacement is necessary.
Recommended replacement intervals: Every 3,000-5,000km/2,000-3,200miles or every 3-6months.
- When upgrading spark plugs, choose the appropriate heat range applicable to the engine. Consult a professional for more details.
- For optimal performance, it is recommended to replace the engine oil every 3,000km or every 6 months.

ATTENTION

- Idling must be done before driving the vehicle.
- Before the engine bay temperature warms up, rapid acceleration and/or revving the engine 2-3 times while in neutral must be avoided.
- Even after the engine bay temperature has warm up, excessive revving should be avoided to protect the engine.

TROUBLESHOOTING

WARNING

- Do not start the engine when oil and/or water leakage is noticed.
 - Stop driving if you experience an abnormal drop in oil pressure; oil may be leaking. Do not restart the engine if oil is leaking.
 - Explain the source of the leak to a professional and have the repairs performed by a professional.
 - If oil leakage is serious, ask a professional how to temporarily repair and conduct the repair by yourself to prevent further damage.
 - Always follow the instructions given by a professional. If neglected, oil leakage can lead to a vehicle fire.
- If the vehicle gets damaged, have the repairs performed by a professional.
 - If you experience any abnormal noises, scents, or vibrations from the vehicle while driving, reference the factory service manual.

FOR SUBSEQUENT OWNERS

- If this product is re-sold, please give this Installation Manual to the new owner.
- Consult a professional when removing this product from the vehicle.



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<http://www.hks-power.co.jp/en/>

HKS CAMSHAFT SPECIFICATION CHART

Ver.3-3.01

22002-AN038 (Full kit)

22002-AN038 (Full kit)

ENGINE TYPE: VR38DETT

TOTAL ADVANCE DURATION: IN 270
EX 278

SETTING PARAMETERS:

VALVE SPRINGS: HKS Code No. 22002-AN038
MAXIMUM RPM RANGE: 8100 RPM

Modification of cylinder head to have clearance for camshaft lobe is required. Modify to have 0.5 - 1.0mm clearance between camshaft and cylinder head.

VALVE TIMING:

Values shown when installed with factory cam gears. (May vary by engine)

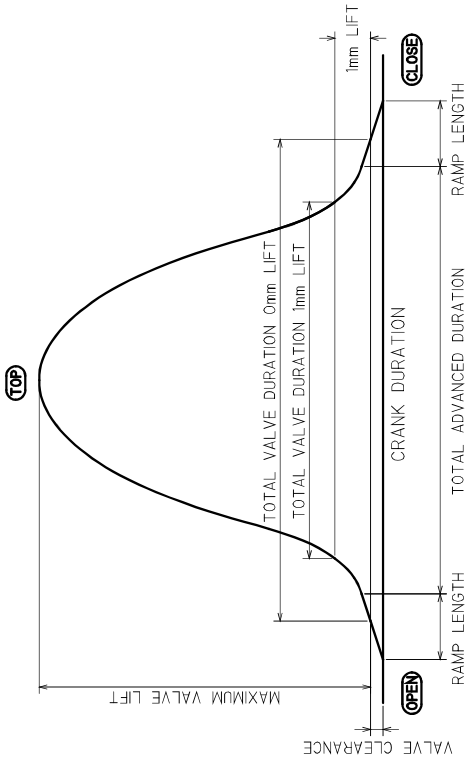
These valve timing values were shown to be optimal during in-house testing at HKS.

Optimal values may vary depending on the power characteristics desired or engine condition. These values are not recommended values.

INTAKE VALVE TIMING		EXHAUST VALVE TIMING	
MAXIMUM VALVE LIFT	11.0 mm	MAXIMUM VALVE LIFT	11.0 mm
MAXIMUM CAM LIFT		MAXIMUM CAM LIFT	
VALVE CLEARANCE HOT		VALVE CLEARANCE HOT	
COLD	0.30 ± 0.04mm	COLD	0.33 ± 0.04mm
0mm VALVE LIFT		0mm VALVE LIFT	
VALVE TIMING	78°	VALVE TIMING	115°
a OPEN TIMING (BTDC)	48°	e OPEN TIMING (BBDC)	65°
b CLOSE TIMING (ABDC)	32°	f CLOSE TIMING (ATDC)	23°
c LOBE CENTER (ATDC)	82°	g LOBE CENTER (BTDC)	111°
d TOTAL VALVE DURATION	→ 260°	h TOTAL VALVE DURATION	268°
1mm VALVE LIFT		1mm VALVE LIFT	
VALVE TIMING	78°	VALVE TIMING	115°
a OPEN TIMING (BTDC)	36°	e OPEN TIMING (BBDC)	51°
b CLOSE TIMING (ABDC)	16°	f CLOSE TIMING (ATDC)	9°
c LOBE CENTER (ATDC)	80°	g LOBE CENTER (BTDC)	111°
d TOTAL VALVE DURATION	→ 232°	h TOTAL VALVE DURATION	240°

***VALVE LIFT AND TOTAL DURATION:**

Total advanced duration at 0mm valve lift and total duration at 1mm valve lift are NOT the same.



1. Make sure there are no scratches or dents on the cylinder head bearing and cam journal. If there is a problem, replace or resurface as necessary. If there is build up or dirt on contact surface, clean thoroughly with a lint-free cloth.

2. Refer to the factory service manual for installation of HKS camshafts. Follow the factory guidelines for torque specification and installation procedures.

BTDC (Before Top Dead Center) ATDC (After Top Dead Center)
BBDC (Before Bottom Dead Center) ABDC (After Bottom Dead Center)

SPRING VALVE INSTALLATION MANUAL



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NAME OF PRODUCT	SPRING VALVE (STEP2)
USAGE	AUTOMOBILE PART
PART NUMBER	22002-AN038 (Full kit)
MANUAL NUMBER	E04123-N49030-00
APPLICATION	NISSAN GT-R R35
ENGINE	VR38DETT
YEAR	2007.12.~
REMARKS	<p>※ This kit was designed on a JDM vehicle and has not yet been tasted in other markets.</p> <ul style="list-style-type: none">• This spring is for exclusive use of HKS camshaft.• Recognition color INTAKE : Purple EXHAUST : Red

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INTRODUCTION

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PARTS LIST

No.	DESCRIPTIONS	QTY	REMARKS
1	Spring Intake Valve	12	Recognition Color : Purple
2	Spring Exhaust Valve	12	Recognition Color : Red
3	Installation Manual	1	

IMPORTANT NOTICE

- Remove and install spring valve referring to the factory service manual.
- Clean spring valve before installing them.
- When retainers are worn out please replace them with new ones.
- When installing the spring valve, the side with a recognition color must be faced to a cylinder head side. (lower side.)

Confirmation after Installation

(1) Check the following before starting the engine:

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- Make sure hoses are not twisted or bent.
- Make sure the negative cable terminal is securely attached to the battery.
- Make sure the level gauge for the engine oil is between H (F) – L.
- Make sure all bolts and nuts are tightened.
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