

HKS SLIDE CAM PULLEY

INSTRUCTIONS MANUAL

NAME OF PRODUCT	SLIDE CAM PULLEY
USE	AUTOMOBILE PARTS
PART NUMBER	22004-AT002
MANUAL'S PART NUMBER	E04127-T30010-00 Ver.3-1.01 (September, 2004)
MAKE	TOYOTA
ENGINE	3S-G(T)E
REMARKS	This product cannot be installed onto camshafts for VVT-i.

NOTICE

This manual assumes that you have and know how 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 CHARACTERISTICS

- This product was developed to adjust the valve timing and was designed to be used for racing in a closed circuit. Adjusting the valve timing has a great effect on the characteristics of engine output and is effective in maximizing the engine's potential.
- To use this product on the public road, follow the necessary procedures if there are any regulations for a tuned vehicle.
- The center of the scale is designed to be the same phase of the factory pulley.
- **One scale of the inner plate is equivalent to approximately 2 degree of the crank angle.**
- The adjustable range of this product is $\pm 20^\circ$ of the crank angle.





THIS MANUAL & THIS PRODUCT

- This manual indicates items you need to pay attention in order to install this product safely and lists precautions to avoid any possible damage and/or accidents.
- HKS will not be responsible for any damage caused by incorrect use or use after modification and/or dismantling of this product.
- This product was designed based on installing it onto a factory vehicle or a vehicle using other HKS products. The performance and/or safety cannot be guaranteed if this product was installed onto other vehicles mentioned above.
- This product is designed for use in Japan only. It must not be used in any other country.
- The specifications of this product including fittings are subject to be changed without notice.
- This manual is subject to be revised without notice.

NOTE FOR HANDLING CAM PULLEY:

- The Alumite color may be change due to heat or engine oil.
- Repeated angle adjustments may discolor or scratch the pulley.
- To clean the scale, wipe it with a cloth or wash it with water.
- Using the cam pulley with the belt cover removed may cause damage to the belt and/or the teeth.
- Replacing the timing belt is recommended when installing the slide cam pulley.
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PARTS LIST

NO.	PART NO.	DESCRIPTION	QT	IMAGE	REMARKS
1		INNER PLATE	1		Scale for Angle Adjustment Duralumin Made Purple Alumite
2		OUTER PULLEY	1		Duralumin Made Nickel-plated
3		HEXAGON SOCKET HEAD FLANGE BOLT M6 P=1.0 L=14	3		For Angle Adjustment Parts
4		INSTRUCTIONS MANUAL	1		

INSTALLATION**BEFORE THE INSTALLATION:**

- Make sure the application is correct.
- Make sure all necessary components are present and nothing is damaged.
- A special surface treatment has been applied to this product; however, due to processing reasons, there may be some areas where coloring was not done.

INSTALLING THE PULLEY**1. Removing the Timing Belt Cover**

- (1) Remove those 5 bolts on the cover to remove the timing belt cover.
(See Fig.1)

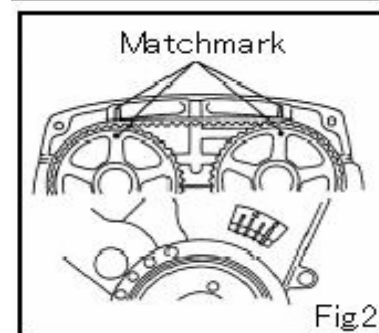
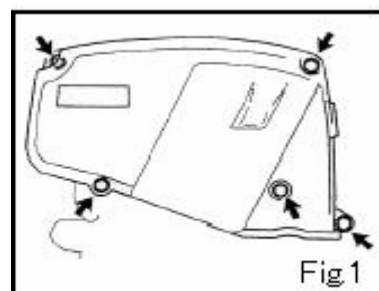
2. Removing the Timing Belt

- (1) Set No.1 cylinder at the points shown on Fig.2 (TDC).
- (2) Put approximately 700kgf·cm of force on the timing belt idler for about 2 minutes (to pre-load tension on the belt) until the service hole of the timing belt idler is aligned with the top of the hole of the cylinder head. Insert a hexagonal wrench (3 mm width across flats) into the hole to hold the timing belt idler in place. (See Fig.3)
- (3) Remove the timing belt from the factory cam pulley.

ADVICE

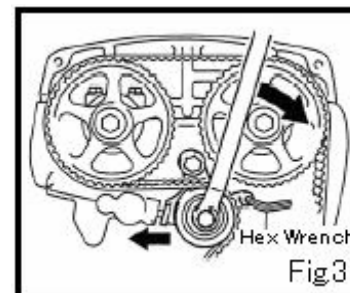
Do not turn the crankshaft after removing the timing belt. The valves may come in contact with pistons.

- (4) Cover the opening with a cloth to avoid entering foreign debris into the timing belt cover.



WARNING	Keep the timing belt clean. Oil, water, and any foreign objects on the belt may cause a breakage in the belt and cause damage to the engine.
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※This manual shows a typical installation. Actual installation may vary depending on the vehicle application. Refer to the factory manual when installing this product.

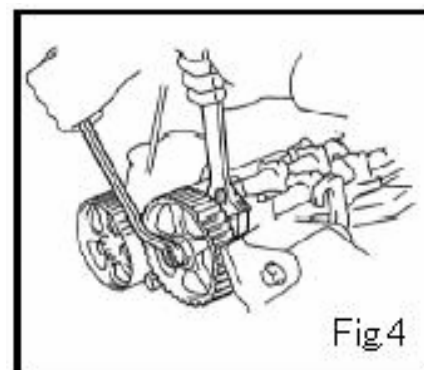


3. Removing the Factory Cam Pulley

- (1) Remove the cylinder head cover. (Bolt x 10, Seal Washer x 10)
- (2) Hold the hexagon wrench head portion of the camshaft with a wrench, and loosen the pulley bolt. (See Fig.4)
- (3) Remove the factory cam pulley.

4. Installing the Slide Cam Pulley

- (1) Before installation, make sure the center of the inner plate's scale and the outer pulley's mark are matched.



- (2) Set the torque spec of the angle adjusting bolt as follows:

Torque Spec of Angle Adjusting Bolt: T=8N·m (0.8kgf·m)

- (3) Install the slide cam pulley where the cam dowel pin can be inserted into the hole on the pulley.
- (4) Hold the camshaft's hexagonal section (to prevent cam movement); then tighten the cam pulley bolt.

Torque Spec of Cam Pulley Bolt: T=60N·m (6.0kgf·m)

WARNING	Each bolt must be tightened using the designated torque spec. If the torque is not enough, the bolt may loosen and cause engine damage.
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5. Installing the Timing Belt

- (1) Align the mark of the rear belt cover to the matchmark on the slide pulley. (See Fig.2 & 5)
- (2) Install the timing belt onto the slide cam pulley.
- (3) Make sure the matchmark on the timing belt matches the end of the timing belt cover. If it's not matched, remove the timing belt from the slide cam pulley, adjust the position of the camshaft, and reinstall the timing belt.
- (4) Put approximately 700kgf·cm of force on the timing belt idler; then remove the hexagonal wrench which holds the timing belt idler. (See Fig.3)
- (5) Turn the crankshaft clockwise; then make sure the matchmark of the crank pulley and the slide cam pulley are matched. (See Fig.2)

6. Installing the Timing Belt Cover

- (1) Install the cylinder head cover.
- (2) Install the timing belt cover. (See Fig.1)

AFTER INSTALLTION

- Make sure the installed components are not in contact with each other and other parts of the vehicle.
- Make sure the tightening torque specs of bolts are correct.
- Make sure the tension of the timing belt is correct.

WARNING	Use the provided bolt to adjust the angle. If another bolt is used, it may break the inner plate and/or be in contact with the belt cover; which may cause engine damage.
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INSTALLING POSITION OF SLIDE CAM PULLEY

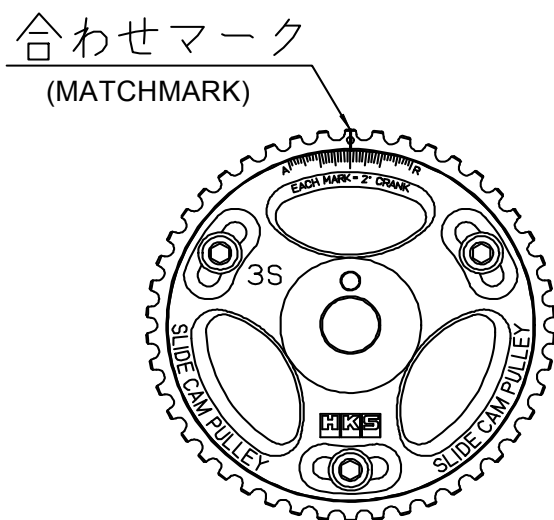


Fig.5 Intake / Exhaust

ADJUSTING VALVE TIMING

- Loosen the angle adjusting bolt, turn the outer pulley toward A (Advance); the valve timing is advanced. Turn it toward R (Retard); the timing is retarded. (See Fig.8)
- After adjusting the valve timing, tighten the angle adjusting bolt by the designated torque spec.

Torque Spec of Angle Adjusting Bolt: **T=8N·m (0.8kgf·m)**

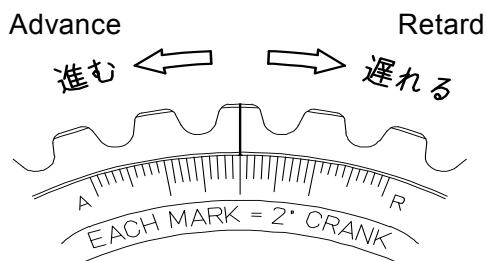


Fig.8 Scale of the Outer Pulley