Orion Motor Tech V20230602 Engine Timing Tool Set Instruction Manual

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INSTRUCTION MANUAL

SAFETY INFORMATION

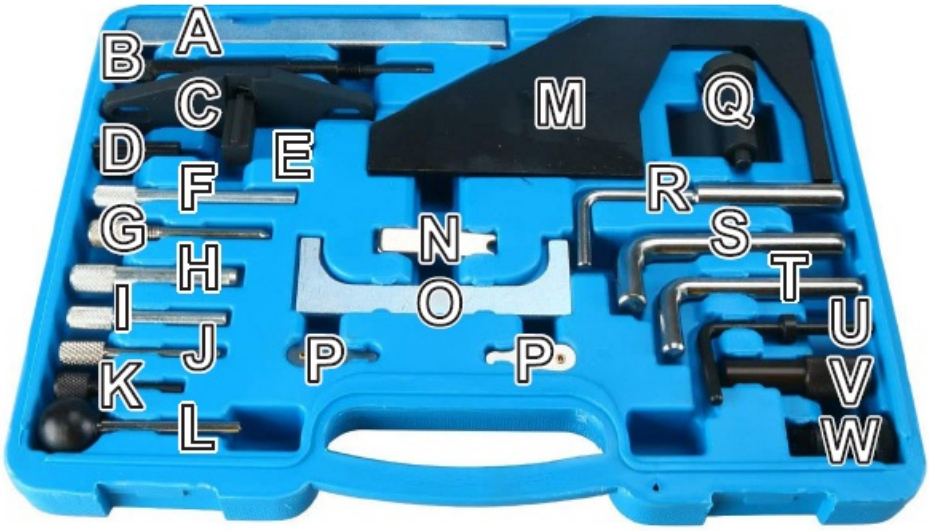
Danger!

- The instructions provided herein are only for general information. ALWAYS perform all repairs in full compliance with your vehicle's service manual. After any repair, test your engine and vehicle in your workshop and at low speed before returning to normal use. Failure to do so may result in brake failure, serious property damage, and severe personal injury.
- DO NOT allow children or those unfamiliar with this product and its compatible brake systems to use it. Do not use while under the influence of alcohol, drugs, or any medication that negatively affects your judgment or reflexes. Keep children and bystanders away during use.
- Keep your work site clean and well lit. Cluttered and dark work areas invite accidents.
- For best results, keep the kit clean and dry. Remove any fluid, oil, or grease before and after work, particularly from the handle and fittings.
- ALWAYS use personal protective equipment (PPE) suitable to your task. Always wear ANSI-approved eye and hand protection while using this product. Nonslip footwear is also highly recommended. Other equipment such as ear, head, and body protection may also be necessary depending on your work and other equipment.
- Dress properly for automotive servicing. Do not wear loose clothing or jewelry and keep hair, clothing, gloves, hoses, and tools away from any moving parts during use.
- ALWAYS know and understand the specific safety warnings and instructions for your vehicle before using this kit. Use the correct fluids, pressures, adapters, etc. for your vehicle. Make sure the parking brake is activated before beginning any work. Use with jack and jack stands able to fully support the necessary weight. Never touch any heated surface with exposed skin.
- Do not overreach. Keep proper footing and balance at all times.
- DO NOT use excessive pressure with this product and do not force it or its attachments.
- Maintain this product. Check for misalignment, binding, wear, or other damage before use. If any damage is detected, repair or replace the problematic components before further use. In a large shop, mark such tools DO NOT USE until they have been repaired. Only replace components with identical parts.

SPECIFICATIONS

Material	AISI 1045 Steel	
Case Dimensions	14.6×11×2.6 in.	37×28×6.5cm
Net Weight	6.6 lb.	3 kg

PARTS LIST


A
B
C
M
Q
D
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H
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K
V
L
W

No.	Name	OEM Equivalent
A	Camshaft Setting Plate	21-162/21-162B/303-367/303-376/49JE01054/49UN303376/999 7151
B	Crankshaft Timing Pin	21-104/303-193
C	Flywheel Locking Tool	21-168/303-393
D	Flywheel Locking Tool Adapter	303-393-01
E	Flywheel Locking Tool Adapter	303-393-02
F	8.25 mm Setting Pin	23-029
G	Crankshaft Timing Pin	21-163/303-620
H	Flywheel Locking Pin	21-262/303-734/0194C/21 262/303 734/49 JE02 020/999 7121/999 7169/EN-52138
I	Camshaft & Crankshaft Timing Pin	21-263/303-735/0132AJ1/0187B/0189B/0194B/09919 58120/21 263/303 735/3031277/49 JE02 021/607 589 01 15 00/999 7122/EN-52137/MOT 1430/Mot.1430
J	Crankshaft & Fuel Pump Alignment Pin	0132AB/0178D/019 4A/077440010400/1.860.617.000/ 11 9 790/21-260/303-732/4527 TS2/49 JE02 018/5711 TD/99360608/999 7169/KM-6349
K	Crankshaft Timing Pin	21-210/303-507
L	Injection Pump/Camshaft Locking Pin	23-019/3359/T20102/U40074/VM9882/MP1301
M	Camshaft Setting Plate	303-1061/49b UN30/310610
N	Tensioner Locking Pin	23-058/310 084/T10008
O	Camshaft Setting Plate	21-105/T10008/2065A2065A/21 105/MP 1 312
P	Shim Set	—
Q	Crankshaft Gear Locking Tool	23-059/310-085/MB995206/T10050
R	9.5 mm Setting Pin	21-123/KM 6011/5711-TB
S	12.7 mm Setting Pin	23-020
T	Double-Ended Flywheel Locking Pin	21-251/303-698
U	6 mm Injection Pump Setting Pin and Washer	23-019
V	15.4 mm Injection Pump Setting Pin	23-04/2064
W	Camshaft Alignment Tool	303-1060

OPERATION INSTRUCTIONS

Preparation

Adjusting timing belts is a complex and time-consuming process that can vary significantly depending on the model. To ensure accurate and safe adjustments, it is highly recommended to refer to your vehicle’s service

manual or consult with a mechanic for specific instructions tailored to your make and model. Follow the steps below as a general guideline:

1. Ideally, wait for at least four hours after the last use of your vehicle to allow the fluids to drain and the heated surfaces to cool down. If this is not possible, make sure to wear sufficient protective equipment to avoid accidental burns.
2. Refer to your vehicle's service manual and follow the instructions to remove any wheels, covers, brackets, components, tubes, hoses, pipes, and wiring that obstruct access to the camshaft. Exercise caution when working around pressurized components and ensure that any filled components are properly drained if their contents might be released. If you remove any belts that will be reinstalled later, mark their current direction of travel to ensure proper replacement.

For maximum safety and control, it is recommended to remove the engine from the vehicle and place it on a firm and stable stand to allow unobstructed access. If you intend to perform the work with the engine in place, make sure to provide suitable support if your vehicle requires disconnecting or removing any engine mounts.

Camshaft Setting Plate (A, O, & M)

1. Follow your vehicle's service manual instructions to remove the camshaft cover and timing belt cover.
2. Rotate the engine in the normal direction of rotation until the camshaft setting plate can be inserted into the machined slot on or over the camshaft.

Crankshaft Timing Pin (B, G, I, & K)

1. Follow your vehicle's service manual instructions to locate the appropriate access point for the crankshaft timing pin. Different engines may have specific points where the pin needs to be inserted.
2. Carefully insert the pin into the designated hole, ensuring a secure fit to lock the crankshaft in the correct timing position.
3. With the crankshaft timing pin in place, you can proceed with your other engine adjustments and/or repairs.
4. When you have completed the necessary tasks, remove the crankshaft timing pin from the access point.

Flywheel Locking Tool (C) & Adapters (D & E)

1. Follow your vehicle's service manual to locate the access point on the flywheel for attaching the locking tool and attach the flywheel locking tool securely to the flywheel. Use one of the provided adapters if necessary.
2. Ensure that the tool provides a firm hold on the flywheel, preventing it from rotating.
3. With the flywheel locked in place, proceed with your engine adjustments and/or repairs.
4. Once the necessary operations are completed, remove the flywheel locking tool.

Flywheel Locking Pins (H & T)

1. Locate the designated hole on the flywheel for the flywheel locking pin. The location may vary depending on the engine model.
2. Insert the flywheel locking pin into the hole, ensuring it is fully engaged and securely seated. The flywheel locking pin will prevent the flywheel and crankshaft from rotating, ensuring they remain in the correct timing position. Verify that the pin is properly inserted and the flywheel is securely locked.
3. With the flywheel locked in place, you can proceed with your other engine adjustments and/or repairs.
4. When you have completed the necessary tasks, remove the flywheel locking pin from the hole on the flywheel.

Crankshaft & Fuel Pump Alignment Pin (J)

1. Follow your vehicle's service manual to locate the appropriate access points for the crankshaft and fuel pump alignment pin. Different engines may have specific points where the pin needs to be inserted. Access the crankshaft and fuel pump areas following the manual's instructions. This may involve removing specific components or covers.

2. Insert the crankshaft and fuel pump alignment pin(s) into the designated hole(s), ensuring a secure fit. The pin(s) will lock the crankshaft and fuel pump in place at the correct timing positions, preventing them from rotating. Verify that the pin(s) are properly seated and the crankshaft and fuel pump are securely held in the desired timing positions.
3. With the crankshaft and fuel pump alignment pin(s) in place, proceed with your other engine adjustments and/or repairs.
4. When you have completed the necessary tasks, remove the crankshaft and fuel pump alignment pin(s) and follow the service manual instructions to reassemble any components or covers that were removed to access the crankshaft and fuel pump areas.

Injection Pump/Camshaft Locking Pin (L)

1. Locate the designated holes on the injection pump and camshaft for the locking pin. These holes are typically machined or provided with markings to indicate their location.
2. Insert the injection pump/camshaft locking pin into the holes, ensuring a secure fit and proper engagement. The locking pin will hold the injection pump and camshaft in place, preventing any rotation or movement during the adjustment or repair process. Confirm that the injection pump and camshaft are firmly locked in their respective positions by gently attempting to rotate them. They should remain stationary.
3. Proceed with your other engine adjustments and/or repairs while the injection pump and camshaft are securely locked.
4. Once the adjustments or repairs are complete, remove the injection pump/camshaft locking pin from the holes. Follow the service manual instructions to reassemble any components or covers that were removed to access the injection pump and camshaft areas.

Instructions for Tensioner Locking Pin (N)

1. Follow your vehicle’s service manual to locate the tensioner on your engine. The tensioner is typically positioned near the timing belt or chain.
2. Insert the tensioner locking pin into the designated hole on the tensioner. Ensure that the pin fits securely and engages with the tensioner. The tensioner locking pin will hold the tensioner in place, preventing any movement or rotation during service work. Confirm that the tensioner is firmly locked by gently attempting to move or rotate it. It should remain stationary.
3. Proceed with your other engine adjustments and/or repairs. Be careful to follow the service manual instructions to properly reset the tensioner or adjust the tension to the recommended specifications.
4. Once the service work is complete, remove the tensioner locking pin and reinstall any components or covers that were removed to access the tensioner area, following the service manual guidelines.

Crankshaft Gear Locking Tool (Q)

1. Follow your vehicle’s service manual to locate the appropriate access point for the crankshaft gear locking tool. The access point may vary depending on the engine model and configuration.
2. Identify the openings or slots on the crankshaft gear and align and position the crankshaft gear locking tool securely. Attempt to rotate the gear by hand to confirm that it is fully locked.
3. Proceed with your other engine adjustments and/or repairs.
4. Carefully remove the crankshaft gear locking tool and reinstall any removed components as instructed in the service manual.

Setting Pins (R & S)

1. Locate the designated access points or holes on the engine components as indicated in your vehicle’s service manual. These pins can be used to set the camshaft timing by inserting them into the designated hole on the camshaft, positioning engine components such as the timing belt tensioner or idler pulley, and adjusting the position of components like the auxiliary drive belt tensioner or pulley.
2. Carefully insert the appropriate setting pin into the designated holes, ensuring a secure fit.
3. Verify that the engine component is now locked or aligned according to the desired adjustment. This may involve checking the alignment marks or other reference points specified in the vehicle’s service manual. If further

adjustment is required, follow the appropriate procedures outlined in your service manual.
4. Once the service work is complete, remove the setting pin and reinstall any components or covers that were removed to access the tensioner area, following the service manual guidelines.

Injection Pump Setting Pins (U & V)

1. Locate the designated hole for the injection pump setting pin. This hole is typically located on the injection pump housing.
2. Carefully insert the injection pump setting pin and washer into the designated location, ensuring a proper fit. This will accurately set the position of the injection pump as required.
3. Proceed with your other engine adjustments and/or repairs.
4. Once the adjustment is complete, carefully remove the injection pump setting pin from the designated hole. Reinstall any components or covers that were removed to access the tensioner area, following the service manual guidelines.

Camshaft Alignment Tool (W)

1. Refer to your vehicle's service manual to find the specified access point for the camshaft alignment tool.
2. Carefully insert the camshaft alignment tool into the designated position to ensure proper alignment of the camshaft during timing procedures. The camshaft alignment tool helps maintain the correct timing and synchronization of engine components.
3. Proceed with your other engine adjustments and/or repairs.
4. Once the service work is complete, remove the setting pin from the hole. Reinstall any components or covers that were removed to access the tensioner area, following the service manual guidelines.

Shim Set (P)

Use the shim set to fill any gaps as you work and to measure the gap between components requiring timing adjustment, such as camshaft and valve clearance or distributor points.

MAINTENANCE

- Clean the tools with a soft damp cloth using a mild detergent or solution after use. Do not rinse them or use abrasive cleaners or caustic chemicals.
- For best results, lubricate the tools with high-quality anticorrosive oil between uses.
- Check the parts of the tools periodically for any wear or damage. Repair or replace any problematic parts before further use.
- If the tools will not be used for an extended period of time, clean and lubricate them and store them in a cool dry place inaccessible to children.

FITMENT

Make	Engine
Ford	1.4L 16V
	Zetec 1.6L 16V
	1.7L
	Zetec 1.8L 16V
	Zetec 2.0L 16V
	2.3L Twin Cam Turbo
	Zetec E 1.6L 16V
	Zetec E 1.8L 16V
	Zetec E 2.0L 16V
Mazda	1.4L 16V
	1.6L 16V
	1.7L
	1.8L 16V
	2.0L 16V
	2.3L Twin Cam Turbo

CONTACT US

Thank you for choosing our products! If you have any questions or comments, contact us at support@orionmotortech.com and we'll resolve your issue ASAP!
For a .pdf copy of the latest version of these instructions, use the appropriate app on your smartphone to scan the QR code to the right.

FAQ

Q: What should I do if I detect damage in a component?

A: If damage is detected, repair or replace the problematic components before further use. Mark tools as "DO NOT USE" until repaired.

Q: Can components be replaced with non-identical parts?

A: Only replace components with identical parts to ensure proper functioning and safety.

Documents / Resources

Engine Timing Tool Kit Manual 	Orion Motor Tech V20230602 Engine Timing Tool Set [pdf] Instruction Manual V20230602 Engine Timing Tool Set, V20230602, Engine Timing Tool Set, Timing Tool Set, Tool Set, Set

References

- User Manual