



1-877-764-7606

Form No. 521291

Operating Instructions  
for:

MFC1100

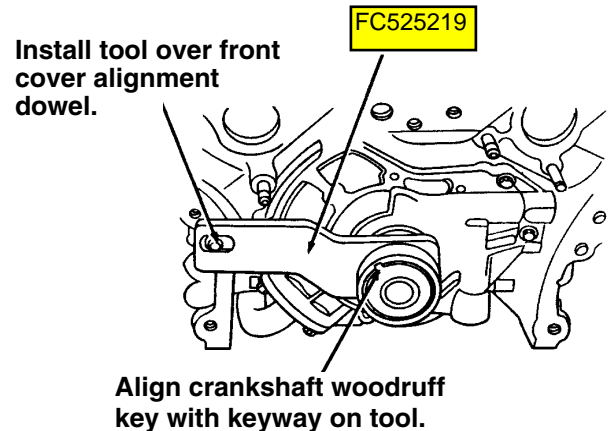
## Ford Crankshaft Positioning Tool

Applications: 1993 & newer 4.2L, 4.6L two valve; 4.6L four valve; and 5.4L and 6.8L V-8 engines

**⚠ CAUTION:** To prevent damage to valves and pistons, **DO NOT** rotate the crankshaft and/or camshaft(s) when removing the timing chain(s) and installing the cylinder heads. Because this is not a free-wheeling engine, if it has “jumped time” there will be damage to the valves and/or pistons, which will require the removal of the cylinder heads.

1. Install crankshaft positioning tool No. **FC525219** (same as Ford No. 303-448) over crankshaft and engine front cover alignment dowel. This will position the crankshaft at top dead center for proper timing chain installation.

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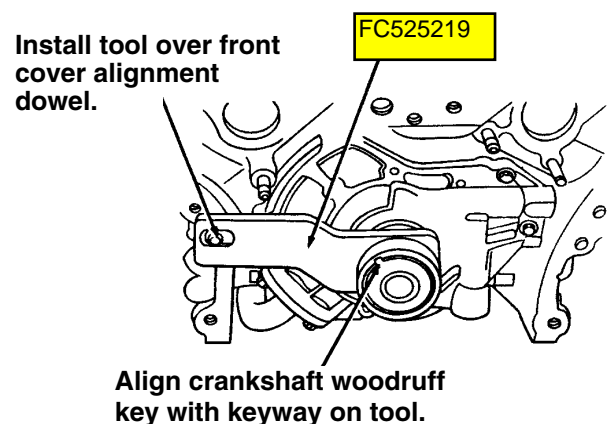
## Ford Crankshaft Positioning Tool

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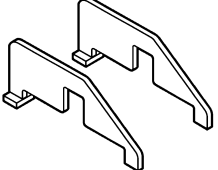
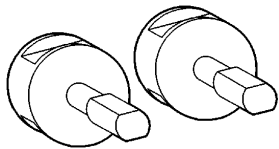
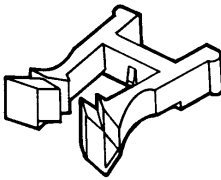
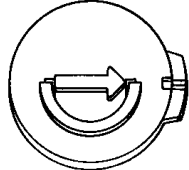
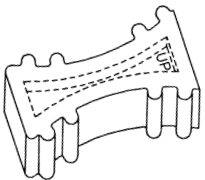
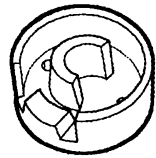
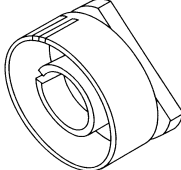
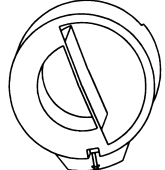
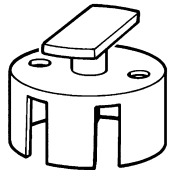
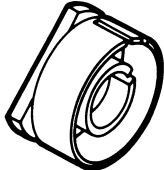
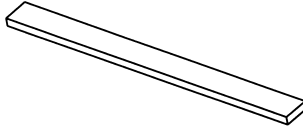
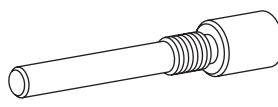
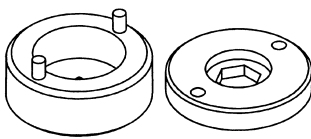
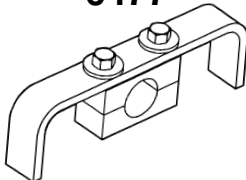
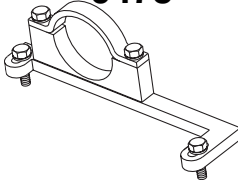
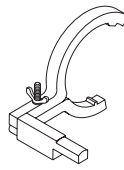
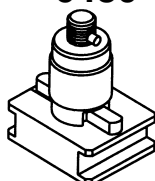
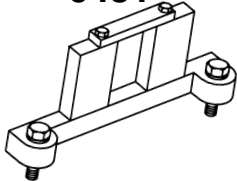
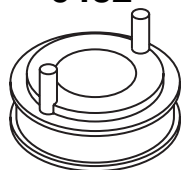
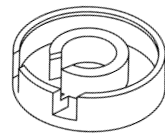
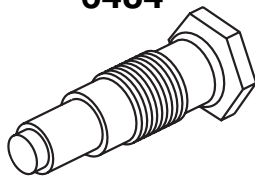
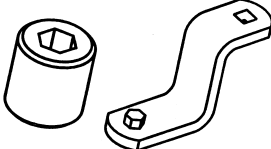
1. Install crankshaft positioning tool No. **FC525219** (same as Ford No. 303-448) over crankshaft and engine front cover alignment dowel. This will position the crankshaft at top dead center for proper timing chain installation.

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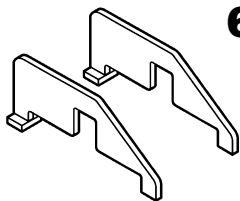
*Parts List & Operating Instructions for*

# No. 6489 Master Service Set for Ford Cam and Valve Train Repair

<p><b>6009</b></p> 	<p><b>6020</b></p> 	<p><b>6466</b></p> 	<p><b>6467</b></p> 
<p><b>6468</b></p> 	<p><b>6469</b></p> 	<p><b>6470</b></p> 	<p><b>6471</b></p> 
<p><b>6472</b></p> 	<p><b>6473</b></p> 	<p><b>6474</b></p> 	<p><b>6475</b></p> 
<p><b>6476</b></p> 	<p><b>6477</b></p> 	<p><b>6478</b></p> 	<p><b>6479</b></p> 
<p><b>6480</b></p> 	<p><b>6481</b></p> 	<p><b>6482</b></p> 	<p><b>6483</b></p> 
<p><b>6484</b></p> 	<p><b>6485</b></p> 		

## Ford Tool Application Chart

Year	Make & Model	Engine	Tool Description	Part No.	Ford No. American Part No.	Ford Global Part No.
1995-1997	Aerostar	3.0L V6	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1996-1998	Aerostar	4.0L V6	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1994-2002	Contour	2.0L 4 cyl. DOHC Zetec	Cam Alignment Tool	6474 (511541)	T94P-6256-CH	303-465
1997-2002	Contour	2.0L 4 cyl. DOHC Zetec	Crankshaft TDC Timing Pin	6475 (511542)	T97P-6000-A	303-574
1991-1998	Crown Victoria	4.6L 2V V8	Cam Positioning Tool	6009 (511532)	T91P-6256-A	303-380
1992-1998	Crown Victoria	4.6L 2V V8	Cam Positioning Tool	6020 (511555)	T92P-6256-A	303-413
1997-2002	Econoline	4.2L V6	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1997-1998	Econoline	4.6L & 5.4L V8, 6.8L V10	Cam Positioning Tool	6009 (511532)	T91P-6256-A	303-380
			Cam Positioning Tool	6020 (511555)	T92P-6256-A	303-413
1997-2002	Econoline	4.6L & 5.4L	Cam Positioning Tool Set	6476 (511543 & -4)	T96T-6256-AR	303-S568
1997-2002	Econoline	5.4L V8	Cam Holding Tool	6477 (511545)	T96T-6256-B	303-557
1997-2002	Econoline	6.8L V10	Cam Positioning Tool Set	6476 (511543 & -4)	T96T-6256-AR	303-S568
			Cam Holding Tool	6477 (511545)	T96T-6256-B	303-557
1997-2002	Econoline	Windsor V8	Cam Holding Tool	6477 (511545)	T96T-6256-B	303-557
1997-1998	Expedition	5.4L V8	Cam Positioning Tool	6009 (511532)	T91P-6256-A	303-380
			Cam Positioning Tool	6020 (511555)	T92P-6256-A	303-413
1997-2002	Expedition	5.4L V8	Cam Positioning Tool Set	6476 (511543 & -4)	T96T-6256-AR	303-S568
			Cam Holding Tool	6477 (511545)	T96T-6256-B	303-557
1996-1998	Explorer	4.0L V6	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1997-2002	Explorer	4.0L SOHC V6	Cam Gear Holding Tool	6478 (511546)	T97T-6256-B	303-564
			Crankshaft Holding Tool	6479 (511547)	T97T-6303-A	303-573
			Cam Holding Tool Adapter	6480 (511548)	T97T-6256-D	303-576
			Cam Holding Tool	6481 (511549)	T97T-6256-C	303-577
			Cam Gear Holding Tool Adapter	6482 (511550)	T97T-6256-A	303-578
			Timing Chain Tensioner Tool	6484 (511552)	T97T-6K254-A	303-571
			Cam Gear Bolt Socket & Ext.	6485 (511553 & -4)	T97T-6256-F, -G	303-565, -575
1999-2002	Explorer	4.0L Push Rod V6	Cam Sensor Synch Tool	6483 (511551)		303-638
1996-1998	Explorer	5.0L V8	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1999-2002	Explorer	5.0L V8	Cam Sensor Synch Tool	6470 (511537)		303-630
1997-2002	F-Series Truck	4.2L V6	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1997-1998	F-Series Truck	4.6L & 5.4L V8	Cam Positioning Tool	6009 (511532)	T91P-6256-A	303-380
			Cam Positioning Tool	6020 (511555)	T92P-6256-A	303-413
1997-2002	F-Series Truck	4.6L & 5.4L	Cam Positioning Tool Set	6476 (511543 & -4)	T96T-6256-AR	303-S568
1997-2002	F-Series Truck	5.4L V8	Cam Holding Tool	6477 (511545)	T96T-6256-B	303-557
1997-2002	F-Series Truck	Windsor V8	Cam Holding Tool	6477 (511545)	T96T-6256-B	303-557
1994-1995	Mustang	3.8L V6	Cam Sensor Synch Tool	6467 (511534)	T89P-12200-A	303-358
1996-1998	Mustang	3.8L V6	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1999-2002	Mustang	3.8L V6	Cam Sensor Synch Tool	6470 (511537)		303-630
1993-1997	Probe	2.0L 4 cyl.	Cam Pulley Holding Tool	6468 (511535)	T92C-6256-AH	303-398
1989-1997	Ranger	2.3L, 4 cyl. dual plug	Crankshaft Sensor Positioner	6466 (511533)	T89P-6316-A	303-354
1995-1997	Ranger	3.0L V6	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1998-2002	Ranger	3.0L V6	Cam Sensor Synch Tool	6473 (511540)		303-589
1996-1998	Ranger	4.0L V6	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1993-1995	Taurus	3.0L V6	Cam Sensor Synch Tool	6471 (511538)	T93P-12200-A	303-453
1996-1997	Taurus	3.0L V6 2-valve	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1998-2002	Taurus	3.0L V6	Cam Sensor Synch Tool	6473 (511540)		303-589
1989-1995	Thunderbird	Supercharged 3.8L V6	Cam Sensor Synch Tool	6467 (511534)	T89P-12200-A	303-358
1990-1995	Thunderbird	3.8L V6	Cam Sensor Synch Tool	6467 (511534)	T89P-12200-A	303-358
1997	Thunderbird	3.8L V6	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1995-1997	Windstar	3.0L V6	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1998-2002	Windstar	3.0L V6	Cam Sensor Synch Tool	6473 (511540)		303-589
1995	Windstar	3.8L V6	Cam Sensor Synch Tool	6467 (511534)	T89P-12200-A	303-358
1996-1998	Windstar	3.8L V6	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1999-2002	Windstar	3.8L V6	Cam Sensor Synch Tool	6470 (511537)		303-630
1998	Lincoln Navigator	5.4L V8	Cam Positioning Tool	6009 (511532)	T91P-6256-A	303-380
			Cam Positioning Tool	6020 (511555)	T92P-6256-A	303-413
1998-2002	Lincoln Navigator	5.4L V8	Cam Positioning Tool Set	6476 (511543 & -4)	T96T-6256-AR	303-S568
			Cam Holding Tool	6477 (511545)	T96T-6256-B	303-557
1989-1995	Cougar	Supercharged 3.8L V6	Cam Sensor Synch Tool	6467 (511534)	T89P-12200-A	303-358
1990-1995	Cougar	3.8L V6	Cam Sensor Synch Tool	6467 (511534)	T89P-12200-A	303-358
1997	Cougar	3.8L V6	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1991-1998	Grand Marquis	4.6L 2V V8	Cam Positioning Tool	6009 (511532)	T91P-6256-A	303-380
1992-1998	Grand Marquis	4.6L 2V V8	Cam Positioning Tool	6020 (511555)	T92P-6256-A	303-413
1997-2002	Mountaineer	4.0L SOHC V6	Cam Gear Holding Tool	6478 (511546)	T97T-6256-B	303-564
			Crankshaft Holding Tool	6479 (511547)	T97T-6303-A	303-573
			Cam Holding Tool Adapter	6480 (511548)	T97T-6256-D	303-576
			Cam Holding Tool	6481 (511549)	T97T-6256-C	303-577
			Cam Gear Holding Tool Adapter	6482 (511550)	T97T-6256-A	303-578
			Timing Chain Tensioner Tool	6484 (511552)	T97T-6K254-A	303-571
			Cam Gear Bolt Socket & Ext.	6485 (511553 & -4)	T97T-6256-F, -G	303-565, -575
1999-2002	Mountaineer	4.0L Push Rod V6	Cam Sensor Synch Tool	6483 (511551)		303-638
1996-1998	Mountaineer	5.0L V8	Cam Sensor Synch Tool	6469 (511536)	T96T-12200-A	303-562
1999-2002	Mountaineer	5.0L V8	Cam Sensor Synch Tool	6470 (511537)		303-630
1994-2002	Mystique	2.0L 4 cyl. DOHC Zetec	Cam Alignment Tool	6474 (511541)	T94P-6256-CH	303-465
1997-2002	Mystique	2.0L 4 cyl. DOHC Zetec	Crankshaft TDC Timing Pin	6475 (511542)	T97P-6000-A	303-574
1993-1995	Sable	3.0L V6	Cam Sensor Synch Tool	6471 (511538)	T93P-12200-A	303-453
1996-1997	Sable	3.0L V6 2-valve	Cam Sensor Synch Tool	6472 (511539)	T95T-12200-A	303-529
1998-2002	Sable	3.0L V6	Cam Sensor Synch Tool	6473 (511540)		303-589



## 6009 Ford Camshaft Positioning Tool

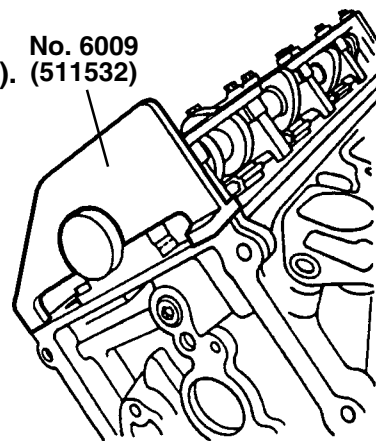
*Application:* 1991 – 1998 4.6L 2V V8 Crown Victoria, Grand Marquis  
1997 – 1998 4.6L & 5.4L V8, 6.8L V10 Econoline  
1997 – 1998 4.6L & 5.4L V8 F-Series Truck  
1998 5.4L V8 Navigator  
1997 – 1998 5.4L V8 Expedition

**NOTE:** Same as Ford No. 303-380 (T91P-6256-A). (511532)

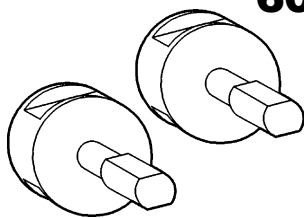
**CAUTION:** To prevent damage to valves and pistons, do NOT rotate the crankshaft and / or camshaft(s) when removing the timing chain(s) and installing the cylinder heads.

Because this is not a free-wheeling engine, if it has "jumped time," there will be damage to the valves and / or pistons which will require the removal of the cylinder heads. The cam sprocket should be disassembled from the camshaft only when one of the components must be replaced.

1. Remove all necessary components to access the timing chains.
2. Rotate the engine to No. 1 TDC.
3. Install the No. 6009 (511532) on flats of the camshaft as shown to prevent accidental rotation of the camshafts.
4. Perform camshaft service as required.
5. Refer to the vehicle service manual for the correct camshaft-to-crankshaft timing procedure.



## 6020 Ford Camshaft Positioning Tool



*Application:* 1992 – 1998 4.6L 2V V8 Crown Victoria, Grand Marquis  
1997 – 1998 4.6L & 5.4L V8, 6.8L V10 Econoline  
1997 – 1998 4.6L & 5.4L V8 F-Series Truck  
1998 5.4L V8 Navigator  
1997 – 1998 5.4L V8 Expedition

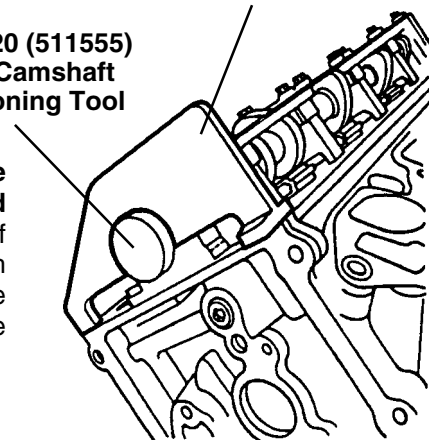
**No. 6009 (511532)  
Ford Camshaft  
Positioning Tool**

**NOTE:** Tool No. 6020 (511555) (same as Ford No. 303-413/T92P-6256-A) must be used with tool No. 6009 (511532) (same as Ford No. 303-380/T91P-6256-A).

**Caution:** To prevent damage to valves and pistons, DO NOT rotate the crankshaft and/or camshaft(s) when removing the timing chain(s) and installing the cylinder heads. Because this is not a free-wheeling engine, if it has "jumped time" there will be damage to the valves and/or pistons, which will require the removal of the cylinder heads. The cam sprocket should be disassembled from the camshaft only when one of the components must be replaced.

1. Remove all necessary components to access the timing chains.
2. Rotate the engine to No. 1 top dead center.
3. **Disassembly:** Install Camshaft Positioning Tool (6020/511555) and Cam Positioning Tool (6009/511532) into each camshaft end, as shown, before removing timing chain tensioners and chains to prevent valve train damage.
4. **Assembly:** Install Camshaft Positioning Tool (6020/511555) and Cam Positioning Tool (6009/511532) into each camshaft end, as shown, before installing timing chains and tensioners to prevent valve train damage.

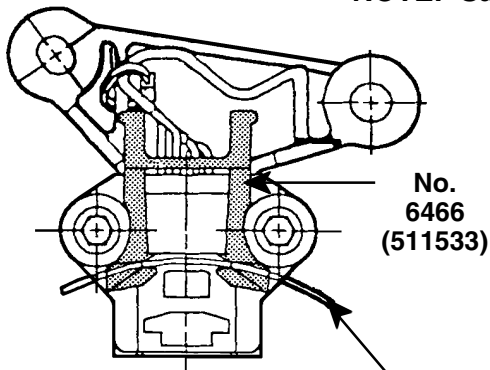
**No. 6020 (511555)  
Ford Camshaft  
Positioning Tool**



## 6466 Ford Crankshaft Sensor Positioner

Application: 1989 – 1997 Ford Ranger w/ 2.3L, 4 cyl., dual plug engine

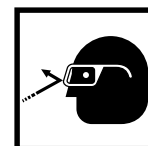
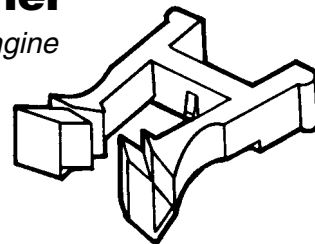
NOTE: Same as Ford No. 303-354 (T89P-6316-A).



No.  
6466  
(511533)

Outer vane of  
crankshaft pulley  
hub assembly.

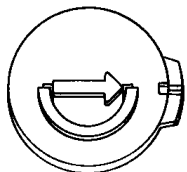
1. Install Crankshaft Sensor Positioner No. 6466 (511533) on sensor as shown.
2. Rotate crankshaft so outer vane on crankshaft pulley hub assembly engages both sides of tool. Tighten sensor assembly retaining bolts to specifications.
3. Rotate crankshaft so vane on crankshaft pulley hub assembly is no longer engaged in tool. Remove tool.



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6467 Ford Camshaft Sensor Synchronizer Tool

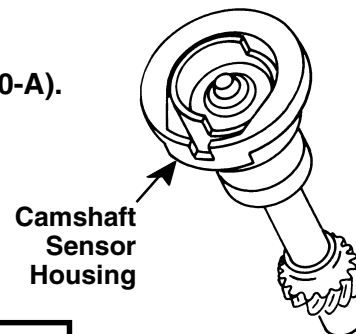
Application: 1990 – 1995 3.8L V6 Thunderbird/Cougar  
1989 – 1995 3.8L V6 Supercharged Thunderbird/Cougar  
1994 – 1995 3.8L V6 Mustang  
1995 3.8L V6 Windstar



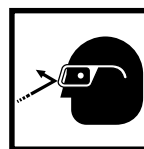
NOTE: Same as Ford No. 303-358 (T89P-12200-A).

**Important:** Before removing the camshaft sensor housing assembly, note the position of the camshaft sensor electrical connector. The connector **MUST** be reassembled in the same position during installation.

1. Rotate crankshaft to set No. 1 cylinder at 26° after top dead center of the compression stroke.
2. Engage camshaft sensor housing vane in slot of tool No. 6467 (511534).
3. Rotate tool on camshaft sensor housing until tool engages housing notch. (Tool should be square and in contact with entire top of housing.)
4. Install camshaft sensor housing and tool assembly into engine according to instructions in the vehicle service manual. Torque fasteners to factory specifications.



Camshaft  
Sensor  
Housing

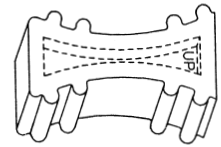


**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

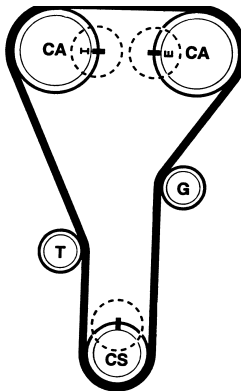
## 6468 Ford Camshaft Pulley Holding Tool

Application: 1993 – 1997 Ford Probe w/ 2.0L, 4 cyl., engine

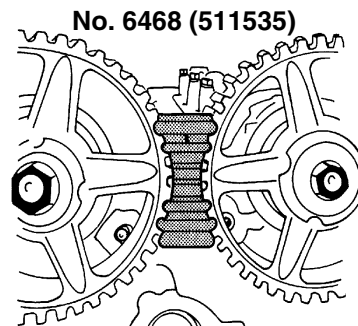
NOTE: Same as Ford No. 303-398 (T92C-6256-AH).



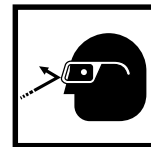
**1.** Rotate engine to align camshaft timing marks with crankshaft timing marks.



**2.** Insert No. 6468 (511535) between intake and exhaust cam pulleys. The tool will fit correctly only one way. The side of tool marked UP must be facing the technician and top of engine.



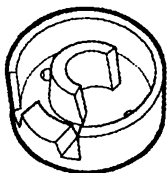
**3.** Follow vehicle service manual procedure to service timing belt as required. Remove tool when finished.



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6469 Ford Camshaft Sensor Synchronizer Tool

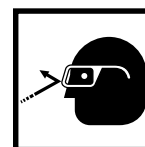
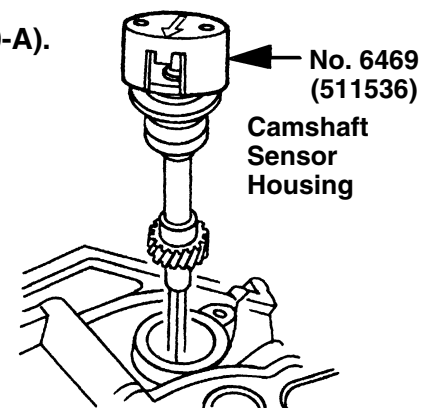
Application: 1996 – 1998 3.8L V6 Mustang, Windstar  
 1997 3.8L V6 Thunderbird/Cougar  
 1997 – 2002 4.2L V6 Econoline, F-Series Truck  
 1996 – 1998 5.0L V8 Ford Explorer, Mercury Mountaineer



NOTE: Same as Ford No. 303-562 (T96T-12200-A).

**Important:** Before removing the camshaft sensor housing assembly, note the position of the camshaft sensor electrical connector. The connector **MUST** be reassembled in the same position during installation.

1. Rotate crankshaft to set No. 1 cylinder at top dead center of the compression stroke.
2. Engage camshaft sensor housing vane in slot of tool No. 6469 (511536).
3. Rotate tool on camshaft sensor housing until tool engages housing notch. (Tool should be square and in contact with entire top of housing.)
4. Install camshaft sensor housing and tool assembly into engine according to instructions in the vehicle service manual. Torque fasteners to factory specifications.



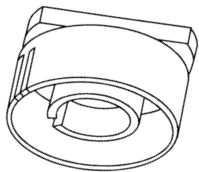
**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.



## 6470 Ford Camshaft Sensor Synchronizer Tool

Application: 1999 – 2002 3.8L V6 Mustang, Windstar  
1999 – 2002 5.0L V8 Ford Explorer, Mercury Mountaineer

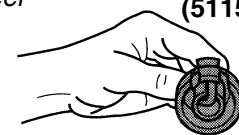
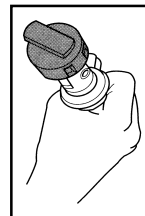
No. 6470  
(511537)



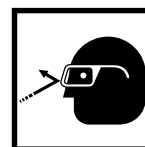
**NOTE:** Same as Ford No. 303-630.

**Important:** Before removing the camshaft sensor housing assembly, note the position of the camshaft sensor electrical connector. The connector **MUST** be reassembled in the same position during installation.

1. Rotate crankshaft to set No. 1 cylinder at top dead center of compression stroke.
2. Engage camshaft sensor housing vane in slot of tool No. 6470 (511537).
3. Rotate tool on camshaft sensor housing until tool engages housing notch. (Tool should be square and in contact with entire top of housing.)
4. Install camshaft sensor housing and tool assembly into engine according to instructions in the vehicle service manual. Torque fasteners to factory specifications.



Camshaft  
Sensor  
Housing

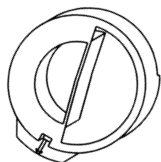


**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6471 Ford Camshaft Sensor Synchronizer Tool

Application: 1993 – 1995 3.0L V6 Ford Taurus/Mercury Sable

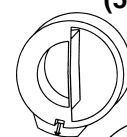
No. 6471  
(511538)



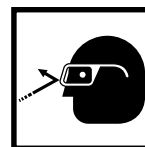
**NOTE:** Same as Ford No. 303-453 (T93P-12200-A).

**Important:** Before removing the camshaft sensor housing assembly, note the position of the camshaft sensor electrical connector. The connector **MUST** be reassembled in the same position during installation.

1. Rotate crankshaft to set No. 1 cylinder at top dead center of compression stroke.
2. Engage camshaft sensor housing vane in slot of tool No. 6471 (511538).
3. Rotate tool on camshaft sensor housing until tool engages housing notch. (Tool should be square and in contact with entire top of housing.)
4. Install camshaft sensor housing and tool assembly into engine according to instructions in the vehicle service manual. Torque fasteners to factory specifications.

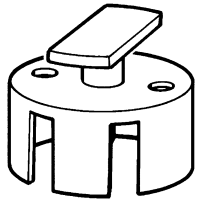


Camshaft  
Sensor  
Housing



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6472 Ford Camshaft Sensor Synchronizer Tool



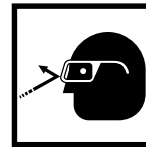
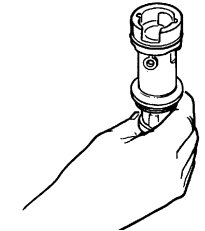
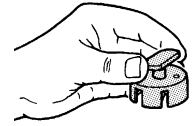
*Application:* 1995 – 1997 3.0L, V6 Windstar, Aerostar, Ranger  
1996 – 1997 3.0L, 2-valve V6 Ford Taurus/Mercury Sable  
1996 – 1998 4.0L, V6 Aerostar, Ranger, Explorer

No. 6472  
(511539)

**NOTE:** Same as Ford No. 303-529 (T95T-12200-A).

**Important:** Before removing the camshaft sensor housing assembly, note the position of the camshaft sensor electrical connector. The connector **MUST** be reassembled in the same position during installation.

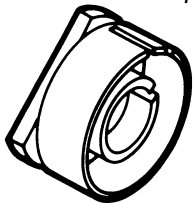
1. Rotate crankshaft to set No. 1 cylinder at top dead center of compression stroke.
2. Engage camshaft sensor housing vane in slot of tool No. 6472 (511539).
3. Rotate tool on camshaft sensor housing until tool engages housing notch. (Tool should be square and in contact with entire top of housing.)
4. Install camshaft sensor housing and tool assembly into engine according to instructions in the vehicle service manual. Torque fasteners to factory specifications.



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6473 Ford Camshaft Sensor Synchronizer Tool

*Application:* 1998 – 2002 3.0L V6 Mercury Sable/Ford Taurus, Ranger, Windstar

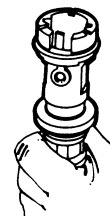


**NOTE:** Same as Ford No. 303-589.

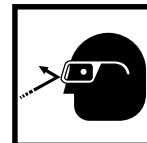
**Important:** Before removing the camshaft sensor housing assembly, note the position of the camshaft sensor electrical connector. The connector **MUST** be reassembled in the same position during installation.

1. Rotate crankshaft to set No. 1 cylinder at top dead center of compression stroke.
2. Engage camshaft sensor housing vane in slot of tool No. 6473 (511540).
3. Rotate tool on camshaft sensor housing until tool engages housing notch. (Tool should be square and in contact with entire top of housing.)
4. Install camshaft sensor housing and tool assembly into engine according to instructions in the vehicle service manual. Torque fasteners to factory specifications.

No. 6473  
(511540)



Camshaft  
Sensor  
Housing



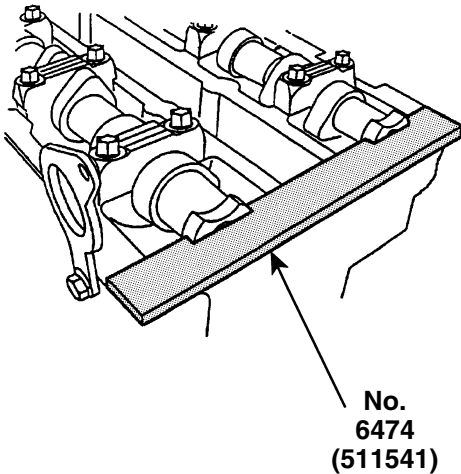
**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.



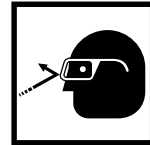
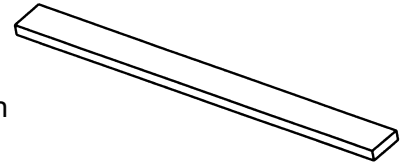
## 6474 Ford Camshaft Alignment Tool

Application: 1994 – 2002 Ford Contour/Mercury Mystique w/ 2.0L, 4 cyl., DOHC Zetec Engine

**NOTE:** Same as Ford No. 303-465 (T94P-6256-CH).



1. Rotate engine to top dead center on the No. 1 cylinder.
2. Align camshafts by installing tool No. 6474 (511541) into the slots at the rear of the camshafts as shown.
3. Service the timing belt as required according to instructions in the vehicle service manual.
4. Torque fasteners to factory specifications.
5. Remove the tool.

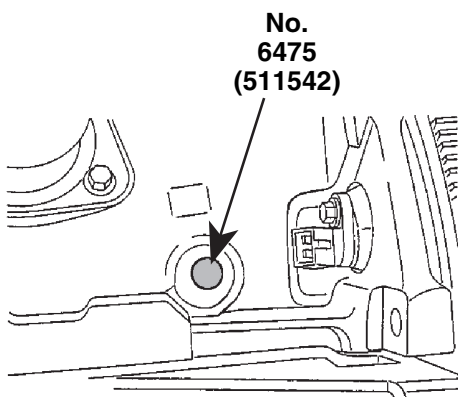


**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6475 Ford Crankshaft TDC Timing Pin

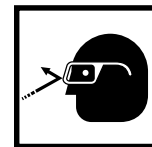
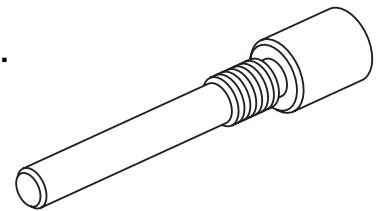
Application: 1997 – 2002 Ford Contour/Mercury Mystique w/ 2.0L 4 cyl.  
DOHC Zetec engine w/ variable cam timing

**NOTE:** Same as Ford No. 303-574 (T97P-6000-A).



1. Rotate crankshaft to set No. 1 cylinder on top dead center of compression stroke.
2. Remove the access plug from the engine, and install No. 6475 (511542) timing pin as shown. (The pin will completely thread into the hole when the engine is at TDC on the No. 1 cylinder.)
3. Service the timing belt as required according to vehicle service manual procedures.
4. Torque fasteners to factory specifications.

**IMPORTANT:** To prevent damage to the engine, remove the No. 6475 (511542) timing pin from the engine and reinstall the access plug **BEFORE** cranking the engine.



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6476 Ford Camshaft Positioning Tool Set

*Application: 1997 – 2002 4.6L & 5.4L Econoline, F-Series Truck*

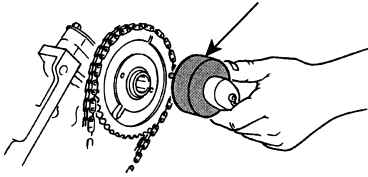
*1997 – 2002 5.4L V8 Ford Expedition*

*1998 – 2002 5.4L V8 Lincoln Navigator*

*1997 – 2002 6.8L V10 Econoline*

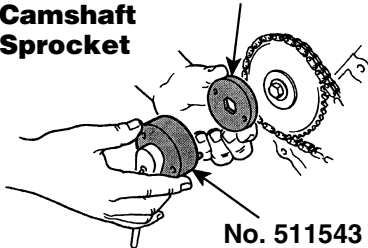
### 2-Hole Camshaft Sprocket

No. 511543



### 18 mm Hex Hd. Camshaft Sprocket

No. 511544



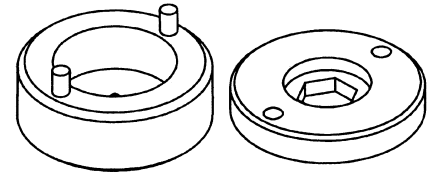
No. 511543

*Note: This tool is used with No. 6477 (511545) Ford Camshaft Holding Tool.*

1. **Two-hole Camshaft Sprocket:** Use tool No. 511543 to position camshaft sprocket (2-hole) on the engine as shown.

**18mm Camshaft Sprocket:** Use tool No. 511543 with tool No. 511544 to position camshaft sprocket (18 mm hex hd.) on the engine as shown.

2. Service the timing chain as required according to procedures in the vehicle service manual.
3. Torque fasteners to factory specifications.

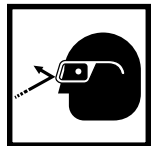


511543

511544

**NOTE:** 511543 is the same as Ford No. 303-569 (T96T-6256-AR1) and 511544 is the same as Ford No. 303-570 (T96T-6256-AR2).

**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.



## 6477 Ford Camshaft Holding Tool

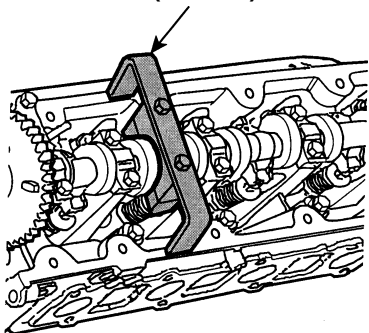
*Application: 1997 – 2002 4.6L Windsor V8 Econoline, F-Series Truck*

*1997 – 2002 5.4L V8 Econoline, Expedition, F-Series Truck*

*1997 – 2002 6.8L V10 Econoline*

*1998 – 2002 5.4L V8 Lincoln Navigator*

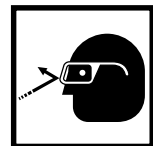
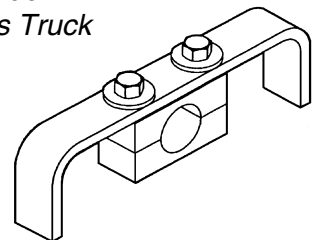
No. 6477  
(511545)



**NOTE:** Same as Ford No. 303-557 (T96T-6256-B).

*Note: This tool is used with No. 6476 (511543 & 511544) Ford Camshaft Positioning Tool Set.*

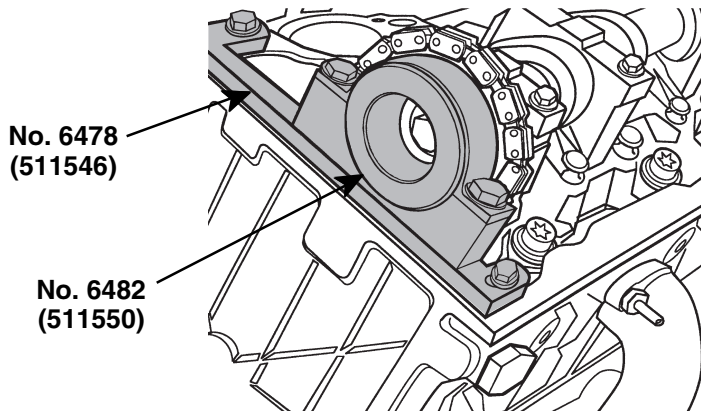
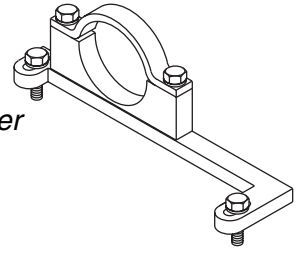
1. Install tool No. 6477 (511545) on the camshaft as shown.
2. Torque hex hd. bolts at 20 ft.•lbs. to ensure correct clamping force. **Note: Each bolt must be engaged by the same number of threads in the bottom clamp to ensure correct clamp alignment.**
3. Repair the engine as required according to instructions in the vehicle service manual.



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6478 Ford Camshaft Gear Holding Tool

Application: 1997 – 2002 4.0L SOHC V6 Ford Explorer, Mercury Mountaineer



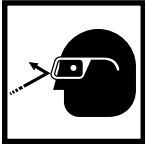
No. 6478  
(511546)

No. 6482  
(511550)

**NOTE:** Same as Ford No. 303-564 (T97T-6256-B).

*Note:* This tool is used with No. 6482 (511550) Ford Camshaft Gear Holding Tool Adapter.

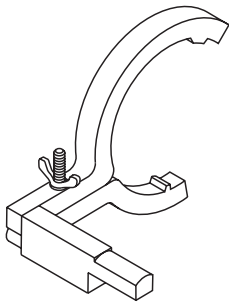
1. Install tool Nos. 6478 (511546) and 6482 (511550) on the camshaft as shown.
2. Secure tool No. 6478 (511546) to the cylinder head.
3. Service the timing chain as required according to instructions in the vehicle service manual.
4. Torque fasteners to factory specifications.



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

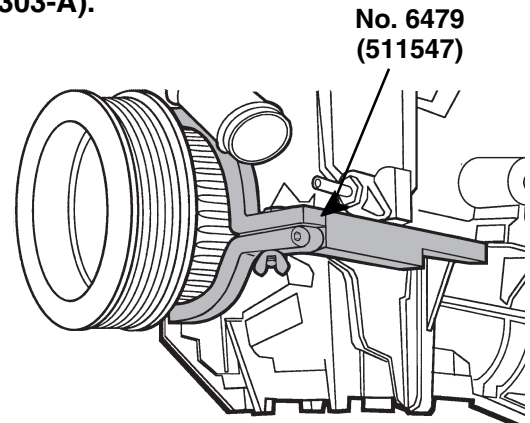
## 6479 Ford Crankshaft Holding Tool

Application: 1997 – 2002 4.0L SOHC V6 Ford Explorer, Mercury Mountaineer

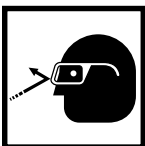


**NOTE:** Same as Ford No. 303-573 (T97T-6303-A).

1. Install tool No. 6479 (511547) on the crankshaft damper.
2. Rotate the engine counterclockwise (CCW) until the tool stops against the engine block.
3. Service the timing chain as required according to instructions in the vehicle service manual.
4. Torque fasteners to factory specifications.



No. 6479  
(511547)

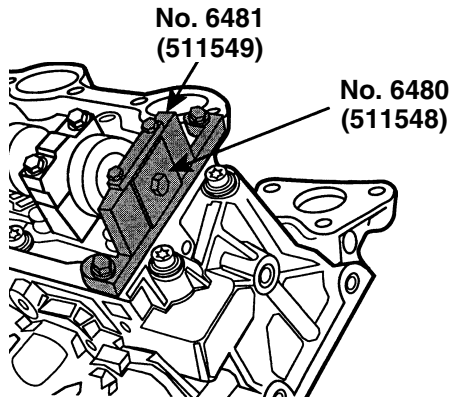


**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6480 Ford Camshaft Holding Tool Adapter

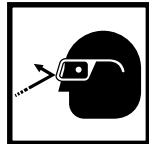
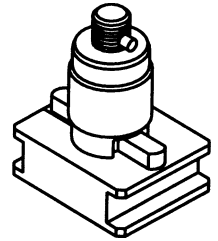
Application: 1997 – 2002 4.0L SOHC V6 Ford Explorer, Mercury Mountaineer

**NOTE: Same as Ford No. 303-576 (T97T-6256-D).**



*Note: This tool is used with No. 6481 (511549) Ford Camshaft Holding Tool.*

1. Install tool Nos. 6480 (511548) and 6481 (511549) on the camshaft as shown.
2. Secure tool No. 6481 (511549) to the cylinder head.
3. Service the timing chain as required according to instructions in the vehicle service manual.
4. Torque fasteners to factory specifications.

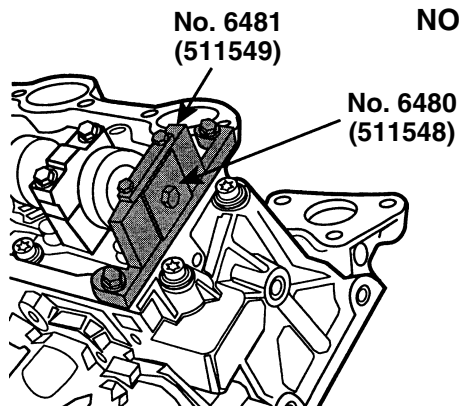


**WARNING: Wear eye protection that meets ANSI Z87.1 and OSHA standards.**

## 6481 Ford Camshaft Holding Tool

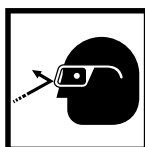
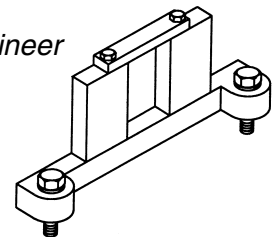
Application: 1997 – 2002 4.0L SOHC V6 Ford Explorer, Mercury Mountaineer

**NOTE: Same as Ford No. 303-577 (T97T-6256-C).**



*Note: This tool is used with No. 6480 (511548) Ford Camshaft Holding Tool Adapter.*

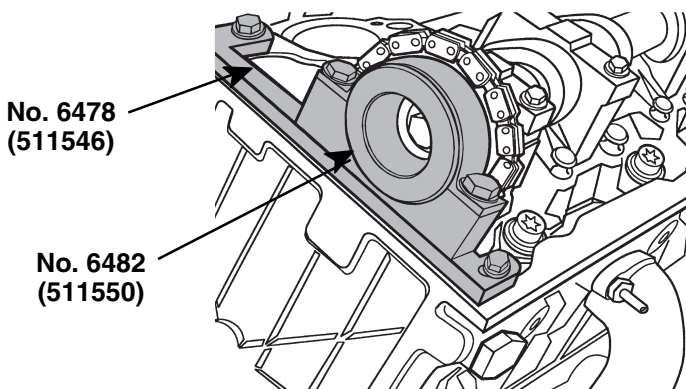
1. Install tool Nos. 6480 (511548) and 6481 (511549) on the camshaft as shown.
2. Secure tool No. 6481 (511549) to the cylinder head.
3. Service the timing chain as required according to instructions in the vehicle service manual.
4. Torque fasteners to factory specifications.



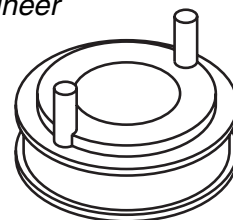
**WARNING: Wear eye protection that meets ANSI Z87.1 and OSHA standards.**

## 6482 Ford Camshaft Gear Holding Tool Adapter

Application: 1997 – 2002 4.0L SOHC V6 Ford Explorer, Mercury Mountaineer

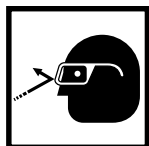


**NOTE:** Same as Ford No. 303-578 (T97T-6256-A).



Note: This tool is used with No. 6478 (511546) Ford Camshaft Gear Holding Tool .

1. Install tool Nos. 6478 (511546) and 6482 (511550) on the camshaft as shown.
2. Secure tool No. 6478 (511546) to the cylinder head.
3. Service the timing chain as required according to instructions in the vehicle service manual.
4. Torque fasteners according to factory specifications.

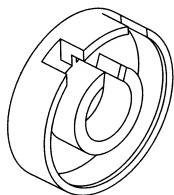


**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6483 Ford Camshaft Sensor Synchronizer Tool

Application: 1999 – 2002 4.0L Push Rod V6 Ford Explorer, Mercury Mountaineer

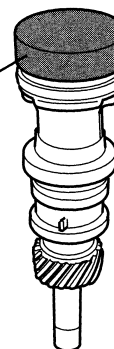
**NOTE:** Same as Ford No. 303-638.



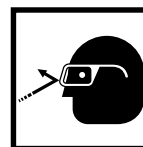
**Important:** Before removing the camshaft sensor housing assembly, note the position of the camshaft sensor electrical connector. The connector **MUST** be reassembled in the same position during installation.

1. Rotate crankshaft to set No. 1 cylinder at top dead center of compression stroke.
2. Engage camshaft sensor housing vane in slot of tool No. 6483 (511551).
3. Rotate tool on camshaft sensor housing until tool engages housing notch. (Tool should be square and in contact with entire top of housing.)
4. Install camshaft sensor housing and tool assembly into engine according to instructions in the vehicle service manual.
5. Torque fasteners to factory specifications.

No. 6483 (511551)



Camshaft Sensor Housing

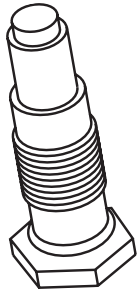


**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.



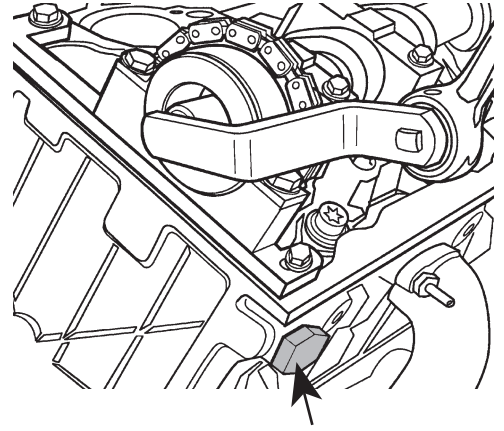
## 6484 Ford Timing Chain Tensioner Tool

Application: 1997 – 2002 4.0L SOHC V6 Ford Explorer, Mercury Mountaineer

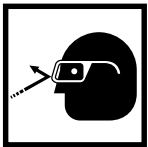


**NOTE:** Same as Ford No. 303-571 (T97T-6K254-A).

1. Remove the hydraulic chain tensioner from the engine.
2. Install tool No. 6484 (511552) into the engine to hold pressure on the timing chain during the cam timing procedure.
3. Adjust camshaft timing according to instructions in the vehicle service manual.
4. Torque fasteners to factory specifications.



No. 6484  
(511552)

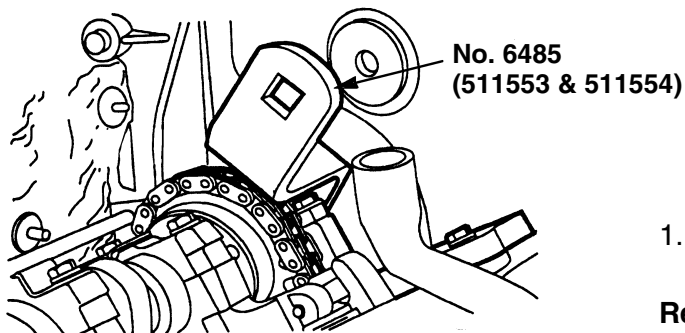


**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.

## 6485 Ford Camshaft Gear Bolt Socket & Extension

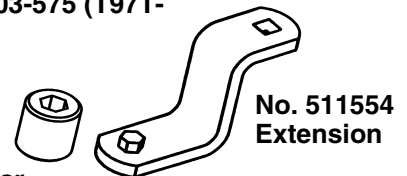
Application: 1997 – 2002 4.0L SOHC V6 Ford Explorer, Mercury Mountaineer

**NOTE:** 511553 is the same as Ford No. 303-565 (T97T-6256-G) and 511554 is the same as Ford No. 303-575 (T97T-6256-F).



No. 6485  
(511553 & 511554)

No. 511553  
Camshaft Gear  
Bolt Socket

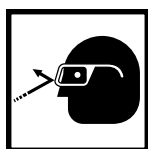


No. 511554  
Extension

1. Assemble the No. 6485 (511553 & 511554) socket and extension on the camshaft gear bolt as shown.

**Removal:** Use a ratchet or breaker bar to loosen and remove the bolt from the camshaft.

**Assembly:** Use a torque wrench to tighten the bolt on the camshaft. Refer to the vehicle service manual for the correct torque specifications.



**WARNING:** Wear eye protection that meets ANSI Z87.1 and OSHA standards.