

David R. Wells 23 July 2006 0.4.1 This page contains some basic information about Ford's 60 degree "Cologne" V-6s. It is primarily intended for Capri owners, however owners of other Ford vehicles which used this engine may find it useful as well.

Cologne V-4 & V-6 Information for Capri owners

Compiled by David R. Wells

Draft 0.4.1 (a work in progress)

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1.0 Abstract

This page contains some basic information about Ford's 60 degree "Cologne" V-6s. It is primarily intended for Capri owners, however owners of other Ford vehicles which used this engine may find it useful as well. This is a draft page, subject to editing and corrections.

2.0 History

The Cologne V-6 has a long, strange history. Unlike many other engines, the Cologne V-6 has evolved considerably over time, with numerous changes in the basic iron castings.

The story actually begins in the United States, where the engine was initially developed as a V-4. Ford US could never figure out what to do with this engine, (one of the few American applications was the often forgotten mid-engined Mustang I show car) so they handed it off to Ford Germany. Ford Germany used the V-4 in several small cars. Apparently the Ford Taunus P4 got the 1.5 and 1.7 liter V-4s as early as 1962. Curiously enough, the V-4 was also used in several Saabs!) but they soon decided that it would be relatively easy to add two more cylinders to it, and thus the Cologne V-6 was born. The V-6 was initially used in the Ford Taunus, but it became much more famous in the European Ford Capri. (known in North America as the Mercury Capri) Cologne V-6 powered Capri RS-2600 race cars (with special aluminum Weslake heads) dominated Group 2 racing in 1971 and 1972. Capris used the Cologne V-6 until production ended late in 1986.

The Cologne V-6 kept going after Capri production ended. It was used in Ford Sierras, Ford (Merkur) Scorpions, and Ford Ranger pickup trucks, and Ford Bronco II SUVs in the 1980s.

In 1991, the bore and deck height were increased to increase displacement to 4 liters. This engine best known for its use in the Ford Explorer SUV, however it was also used in Ranger pickup trucks. It was also used in the Mazda clones of these vehicles. (Mazda Navajo and B-4000 pickup truck) Starting in 2005, the SOHC version is being used in the Ford Mustang.

3.0 Cologne V-4 & V-6 Dimensions

Engine	Bore	Stroke	Deck Height	Comp Dist	Connecting Rod
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Disp.	Config.	Years	Cam Drive									Length	
				(inches)	(mm)	(inches)	(mm)	(inches)	(mm*)	(inches)	(mm*)	(inches)	(mm*)
1.2	V4	1964-1967	Gears		80		58.86	8.084	205.3			5.140	130.06
1.3	V4	1969-1972	Gears		84		58.86	8.084	205.3			5.140	130.06
1.5	V4	1962-1972	Gears	3.545	90		58.86	8.084	205.3			5.140	130.06
1.7	V4	1962-1972	Gears	3.545	90	2.630	66.8	8.084	205.3			5.140	130.06
1.8	V6	1964-1967	Gears		80		58.86	8.084	205.3			5.140	130.06
2.0	V6	1970-80	Gears	3.31	84	2.370	60.14	8.084	205.3			5.140	130.06
2.3	V6	1970-80	Gears	3.545	90	2.370	60.14	8.084	205.3	1.546	39.27	5.140	130.06
2.4	V6	1986-89	Chain	3.31	84	2.835	72	8.084	205.3	1.546	39.27	5.140	130.06
2.6	V6	1972-1973	Gears	3.545	90	2.630	66.8	8.084	205.3	1.546	39.27	5.140	130.06
2.8	V6	1974-1984	Gears	3.661	93	2.700	68.5	8.084	205.3	1.539	39.09	5.140	130.06
2.9	V6	1986-1992	Chain	3.661	93	2.835	72	8.084	205.3	1.461	37.11	5.140	130.06
4.0	V6	1990-1998	Chain	3.950	100	3.320	84.3	8.858	225	1.458	37.03	5.748	146

- 2.6, 2.8, 2.9, & 4.0 data per the 1998 Ford SVO Catalog, data provided by Don Haulsee.
- V-4 and 1.8 V-6 information provided by Hans Beijer.
- 2.4 V-6 information provided by Svein Arne Hagen.

The following modifications have been made to the Ford SVO table:

- The original table listed 3.650" bore pistons for the 2.8 liter engine. After consultation with Sven Pruett et al., we're pretty sure that the pistons are 3.66 inches (93mm) in reality.
- The original table listed the deck height for the 2.9 liter as 8.858 inches. (225mm) Sven Pruett told me that the deck height is in fact 8.084 inches.

Distance between bore centers is 4.760 in all cases. (data from Ford's performance parts catalogue - 2003.)

V-6 firing order is 1-4-2-5-3-6 in all cases.

RS-2600 used a 69mm stroke crankshaft instead of the stock 66.8 crankshaft.

1983-86 2.8 liter engines have a stronger block than 1974-82 Cologne V-6s.

* = Figures calculated from SVO specification in inches, using 1 inch = 25.4 mm.

4.0: Cologne V-4 & V-6 Block Information

Disp.	Config.	Block Casting Code	Block Part Number	Years	Cam Drive	Comments
1.2	V4			1964-1967	Gears	
1.3	V4	C		1969-1972	Gears	
1.5	V4	A		1962-1972	Gears	
1.7	V4	A		1962-1972	Gears	
1.8	V6			1964-1967	Gears	
2.0	V6	C	74TM6015DA	1970-80	Gears	Used on many Capri in Continental Europe (i.e. not the UK) between 1970 and 1980. They were not exported to the USA. I'm a little suspicious of the part number that Svein Arne Hagen provided, since it indicates that it was first produced in 1974. We know that there were 2.0 liter Cologne V-6 Capris as early as 1970. There may be other earlier part numbers.

2.3	V6	A	74TM6015GA	1970-80	Gears	Used on many Capri in Continental Europe (i.e. not the UK) between 1970 and 1980. They were not exported to the USA. I'm a little suspicious of the part number that Svein Arne Hagen provided, since it indicates that it was first produced in 1974. We know that there were 2.3 liter Cologne V-6 Capris as early as 1970. There may be other earlier part numbers.
2.4	V6	D		1986-89	Chain	We don't know much about this one. It was apparently used in some European Scorpions. It is apparently a close relative of the 2.9, with an 84mm bore.
2.6	V6	A	70TM6015AA	1972-1973	Gears	
2.8	V6	E	73TM6015AA	1974-1982	Gears	Often called the "automotive" block. While best known for its application in the Ford's European Capri from 1974-83, it was also used in the 1974-78 Mustang II, and several Ford USA "Fox" chassis cars (including the Mercury Capri) from 1979-80. Presumably, there were many other European Fords which used this engine.
2.8	V6	E	83TM6015AA	1983-1986	Gears	Often called the "truck" block, since it was used in the US in Ford trucks such as the Ranger and Bronco II. Apparently, it was also used in many Capris including the 2.8i. It is somewhat stronger than the earlier 2.8 block. It also uses somewhat larger cam bearings.
2.9	V6	F	87TM6015AA	1986-1992	Chain	Designed for hydraulic valve lifters.
4.0	V6		90TM6015AB	1990-1995	Chain	Often called "the Explorer engine", it was also used in Ford Ranger pickup trucks.
4.0	V6	L	95TM6015AB	1995-1997	Chain	
4.0	V6		97TM6015AA	1997-	Chain	

4.1: Locating the Block Casting Numbers & Letters

4.1.1: On left and Right:

When I say "left", I mean the left side when facing forward. Thus, the "left" side of the engine is the "driver's side" for LHD countries like the USA, and the "passenger side" for RHD countries like the United Kingdom.

4.1.2 Casting Letter:

The block casting code is usually a large raised letter cast into the block. It should be located at the rear of the engine block, to the right of the distributor.

Since the 4.0 has no distributor, it might be a little more difficult to locate.

The casting letter may indicate the bore more than anything else. Note that the four engines with the "A" casting code (1.5 V-4, 1.7 V-4, 2.3 V-6 and 2.6 V-6) all have the 90mm bore.

Casting Letter	Bore (mm)
?	80
C	84
A	90
E	93

4.1.3 Part Number:

The part number should be cast into the block on the left side. The first two digits in the part number are the last two digits of first the first year the casting was produced. "TM" appears to indicate the Cologne engine family. "6015" apparently indicates an engine block. The last two letters may indicate minor changes in the casting. "AA" seems to indicate the initial version of the casting.

5.0 Cologne V-6 Cylinder Heads

Head "name"	intake ports	exhaust ports	Casting Number	Comments
2.6	3	2	70TM	Used on 1972-73 US-spec Capri I 2600. Apparently, it is also used on the 2.0 liter version, and I'd guess on the 2.3 as well. Some people like to put these heads on later 2.8 engines. Some people believe that the earlier 2.6 heads flow better. The 2.6 heads make it possible to fit the Kugelfischer fuel injection system used on the Capri RS-2600. These heads will not easily fit on the later 2.8 block however, due to water passage alignment problems.
Weslake	3	3	WRP 151 4001	Used on 1971-73 Capri RS-2600 race cars. These aluminum heads are extraordinarily rare, and similarly expensive. They will only work with the corresponding Weslake injection intake. Casting number is a Weslake code, not a Ford code.
2.8 non-smog	2	3	74TM	Used on 1974 US-spec Capri I.
2.8 smog	2	3	75TM	Used on 1976-77 US-spec Capri II.
2.8 European	3	2	79TM	Used on 1979-86 European-spec Capri III.
Swaymar	3	3	79TM?	A modification of the 2.8 European head, with the exhaust port "un-siamesed".
2.8	3	3	85TM	Used in Sierra XR 4x4 and Scorpio=(Granada MK3 in UK) , circa 1986-87
2.9 (early)	3	3	86TM	Used on 1986-1992 Ford Rangers and Ford Bronco IIs.
2.9 (Scorpio)	3	3	86TM	Used on 1989 Ford (Mercur) Scorpios
2.9 (late)	2	3	89TM	Used on mid 1988-1992 Ford Rangers and Ford Bronco IIs.
2.9 Cosworth DOHC			?	Used on a few European Ford Scorpios. Many people have wondered whether these DOHC heads could be fitted to a 4.0 block. Sven Pruett has done it, and apparently he even made it work fairly well, but it took an enormous amount of effort to get it to work. Cosworth has also apparently done it with the FBD and FBF engines, but I don't know if these ever made it into production.
4.0 OHV	3	3	90TM	Used on Ford Rangers and Explorers.
4.0 OHV	3	3	93TM	Used on Ford Rangers and Explorers. Similar to 90TM, but said to be a stronger casting.
4.0 OHV	3	3	95TM	Used on Ford Rangers and Explorers. The first of the "Small chamber" heads. Smooth intake port, old style exhaust port.
4.0 OHV	3	3	98TM	Used on Ford Rangers and Explorers. A refinement of the 95TM head, it has smooth intake ports, small chambers, and round exhaust ports.
4.0 SOHC	3	3	97JM	Single overhead cam version of the 4.0, Used on Ford Rangers, Explorers, and 2005 Mustangs.

6.0: Cologne V-4 & V-6 Crankshaft Information

Disp.	Config.	Crank Part Number	Years	Cam Drive	Comments
1.2	V4		1964-1967	Gears	
1.3	V4		1969-1972	Gears	
1.5	V4		1962-1972	Gears	
1.7	V4		1962-1972	Gears	

1.8	V6		1964-1967	Gears	
2.0	V6	74TM6303DA	1970-80		
2.3	V6	82TM 6303EA	1970-80		
2.4	V6	86TM6303__	1986-89	Chain	The 2.4 apparently uses the same crankshaft as the 2.9.
2.6	V6	11448510	1972-1973	Gears	
2.8	V6	74TM 6303__	1974-1982	Gears	
2.8	V6	82TM6303__	1983-1986	Gears	
2.9	V6	86TM6303__	1986-1987	Chain	
2.9	V6	88TM6303__	1988-1992	Chain	
4.0	V6	90TM6303AB	1990-1995	Chain	
4.0	V6	96TM6303__	1996-?	Chain	
4.0	V6	97JM6303AC	1997-	Chain	Apparently, this crank is used on both OHV and SOHC Cologne V-6s.

7.0: Cosworth FB_ Series Engines

The Cologne V-6s with the greatest performance potential are the DOHC Cosworth FB_ series. Here's some basic information on these engines:

Cosworth Code	Displacement	Date	Notes
FBA	2.9	1990	Ford Scorpio engine.
FBB	2.9	1990	Modified FBA, for 4WD Scorpions
FBC	3.4	1990	Modified FBA, based on 4-liter block
FBD	4.0	1990	4-liter version of FBA
FBE	3.0	1991	Racing version of FBA.
FBF	4.0	1993	4-liter prototype of FBC..

Data taken from [Cosworth's history page](#).

The Cosworth engines apparently have some slight differences in the block as well. I have heard from a couple of sources that the FBA does not have the holes for the pushrods drilled into it.

To the best of my knowledge, Cosworth did not use casting numbers on the heads like Ford did.

Cosworth apparently used a different block casting, and a different crankshaft. The FBA block is number 919M6015AA, and apparently it does not have pushrod holes drilled into it.

The first FBA crankshaft was 919M6303AA. Apparently, later FB_ series crankshafts were 959M6303 AA and 969M6303 AA. We speculate that these were from 1995 and 1996, and might be stronger than the earlier version. These crankshafts are apparently Ford items, as they have Ford ovals cast into them.

Note that in both cases, the engine family code is "9M" instead of "TM"

8.0: Differences Between Ranger 2.9 and Scorpio 2.9

Note: This section written by Don Haulsee.

1. Bolts on front of heads for mounting accessory drives are different sizes.
2. Main bearings caps are different.... The two engines take different main crank bearings
3. Engine mount bracket bolt patterns are different. IE, a Ranger 2.9 block will NOT bolt to Capri 2.8 engine mounts. The bosses for the Euro mounts are on the Ranger 2.9 but they are not drilled and tapped. You can use a Scorpio 2.9 block with the Ranger mounts but extra holes need to be drilled in both the block and the engine mounts.

4. The engine front covers are different but interchange
5. Oil pump pickup is different but interchange
6. Upper AND lower intakes are different. The lower has different external water connections. The upper is VERY different.

I don't know if the Ranger 2.8 blocks also have different engine mount bolt patterns. It may be possible to use 2.8 Ranger mounts with the Scorpio 2.9 and not have this problem (when putting into a Ranger).

I have a 4 liter block and will check to see if the 4 liter engine mount pattern matches the Ranger 2.9 pattern. BTW, it is possible to mount a Scorpio 2.9 oil pan to a 4.0 engine if you drill and tap 4 holes in the block. The Scorpio pan clears the 4.0 crank and rods fine.

The Scorpio cam is different from the Ranger cam.....Putting a Scorpio cam in a 2.9 Ranger seems to improve high rpm performance. OK, maybe that's NOT what you want with a truck but....

The flexplate and adapter bushing to the torque converter is different but the Ranger parts will bolt to the Scorpio 2.9. If you use a Scorpio flexplate with a Ranger A4LD then the torque converter bolts won't go through the flexplate. Don't ask how I know this....

4.0's and 2.9's share the same oil pump

Scorpio 2.9 exhaust manifolds will bolt to a 4.0 head but the ports are slightly misaligned. Nothing a die grinder won't fix.....

9.0: Publication History

Data first compiled in July, 2003.

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10.0: Thanks To.....

- **Sven Pruett**, for much advice, and for writing his very useful book *How to Build and Modify Ford 60 Degree V-6 Engines* (ISBN 0-87938-914-1)
- **David Valone**, for getting the casting numbers off of his 2600 head
- **David Hinns**, for getting the casting numbers off of his European 2.8 head.
- **Don Haulsee**, for providing data from the Ford SVO Catalog, and for writing virtually all of the section on the differences between the Ranger and Scorpio 2.9s.
- **Mark Wilson**, for providing data on the SOHC and Cosworth heads. He also provide much of the data on crankshafts.
- **Hans Beijner**, for providing data on the 1.2, 1.5 & 1.7 liter V-4 engines, and the 1.8 liter V-6. He also provided information on early Taunuses.
- **Jim Brozynski**, for providing the bore spacing distance.
- **Norm Murdock**, for providing data on the Weslake race engine
- **Svein Arne Hagen**, for providing data on 2.0 & 2.3 liter V-6s. He also pointed out to me that all Cologne engines except the 4.0 have the same deck height, and use the same connecting rods. (5.14 inch) He has also given me quite a bit of useful information on the Cosworth FB_ series engines.
- **Jake Delgado**, for providing information on the correct number of intake ports on the 2.9 heads.
- the late **Romolo Lanna**, for compiling data on 1.3, 1.5 & 1.7 liter V-4s. <http://web.cz3.nus.edu.sg/~shing/capri/hbook/engine.html> We still remember you, Romolo.....



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