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IH: Engine Mechanicals

Sub-Documents

* . . . [Installation of the Top End](#)

Heads

Head Sets with Year Changes

The chart below, with head part numbers, is a compilation of parts catalogs and shows when the changes occurred and to which year models the changes affected. [1\)](#) [2\)](#) [3\)](#) [4\)](#) [5\)](#) [6\)](#) [7\)](#)

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Part Number	Year Models Used On	Date(s) Available
(F) 16677-57 (R) 16678-57	1957-1959 XL	1957-1958
(F) 16677-57A (R) 16678-57A	1958 XLC	1959
(F) 16673-58 (R) 16674-58	1958-1969 XLH/XLCH	1958
(F) 16673-58A (R) 16674-58A		1959
(F) 16673-70 (R) 16674-70	1970-E1973 XLH/XLCH	1970
(F) 16673-71 (R) 16674-71		1971
(F) 16673-72 (R) 16674-72		1972-E1973

(F) 16673-73 (R) 16674-73	L1973-1985 XLH/XLCH/XL/XLS/XLX	L1973-1978
(F) 16673-73A (R) 16674-73A		1979
(F) 16673-73B (R) 16674-73B		1980
(F) 16673-80 (R) 16674-80		1980
(F) 16673-73C (R) 16674-73C		1981-1984
(F) 16673-73D (R) 16674-73D		E1985
(F) 16673-84 (R) 16674-84		L1985

Head Identification

4 steps to head identification just from site plus head bolt spacing: ²⁹⁾

1a. If these fins are present, your looking at 900 heads for sure. In later 71 these fins disappeared. That means: ³⁰⁾	1b. There are some 900 heads that didnt have those fins and no 1000 heads have these fins. If no fins go to step 2. ³¹⁾	2a. Decide if the heads are later 71 (900) or 1000. Do that by looking at oil drain size Note the size of drain compared to head bolt holes. ³²⁾
 <p>1957-71 bolt pattern (inside of hole to inside of hole, diagonally) is 3.440". 57-mid 73,threads for head bolts, come all the way up to the head gasket surface on the cylinders.³³⁾</p>		

2b. 1000 uses 3/16" oil drains. Now you know if your looking at late 1971 900 (big drains) or 1000 (small drains). If heads have small drains go to step 3 to determine if heads are E1000 (72-E73) or L1000 (L73-78).³⁴⁾ When the change to 1000 happened in 72 the cylinders casting size was increased but for augments sake the head casting was not. Consider the cylinders: The bore was opened .094" radius. That pushed to the oil holes in cylinder to a larger pattern. To get the matching larger pattern in the old heads, the holes needed to be reduced in size so they still fit in the 900 size casting.³⁵⁾



3a. E1000 (72-E73) On 900 heads (smallest bolt circle), the bolt holes bulls-eye the casting boss. Looking close at the 72 heads you can see the bolt circle was slightly enlarged while the casting boss stayed at the original position.³⁶⁾



72-mid 73 1000 bolt pattern (inside of hole to inside of hole, diagonally) is 3.540".⁴⁰⁾

3b. L1000 (L73-78). In later 73 the 1000 heads change to bigger bolt pattern.³⁷⁾ The L73+ heads have the spot facing further out on the casting boss. In other words, the PCD of the spot facing is greater than on the 72/e73 heads.³⁸⁾ In L73 the bolt circle was really enlarged. Again the boss stayed at the 900 position. There is added meat around the bolt holes between the fins but that's a moot point in identifying what year heads your gawking at.³⁹⁾



L73 - 85 bolt pattern (inside of hole to inside of hole, diagonally) is 3.640". Late 73-85 threads for head bolts are recessed in the cylinders by 1/2".⁴¹⁾

4. In 79 a boss was added for a/c mounting. This is a 79 only head. 1980-1983 is same as 1979 but doesn't have the intake o-ring lip. 84-85 had no intake o-ring lip either. The air cleaner boss was still present but it wasn't drilled or tapped.⁴²⁾

84-85 heads also had the shoulder-less valve guides and took a small washer for the inner valve spring instead of the full size lower spring collar the previous heads used. The valve guides do require machining if you want to use a seal the top spring collar will contact them.⁴³⁾ While this info is accurate, don't let missing guides or incorrect vintage guide installation influence you in identifying what heads you are looking at.⁴⁴⁾



Pics of Heads



1969 Iron Heads ⁴⁵⁾

Valves

Sub-Documents

- * . . . [Three angle valve seats - 1980 and up FLT/FL/FX/XL models](#)
- * . . . [1983 valve guide changes](#)

Intake Valves and Components with Year Changes

The chart below, with valve component part numbers, is a compilation of parts catalogs and shows when the changes occurred and to which year models the changes affected. ⁴⁶⁾ ⁴⁷⁾ ⁴⁸⁾ ⁴⁹⁾ ⁵⁰⁾ ⁵¹⁾ ⁵²⁾

⁵³⁾ ⁵⁴⁾ ⁵⁵⁾ ⁵⁶⁾ ⁵⁷⁾ ⁵⁸⁾ ⁵⁹⁾ ⁶⁰⁾ ⁶¹⁾ ⁶²⁾ ⁶³⁾ ⁶⁴⁾ ⁶⁵⁾ ⁶⁶⁾ ⁶⁷⁾ ⁶⁸⁾ ⁶⁹⁾ ⁷⁰⁾ ⁷¹⁾ ⁷²⁾ ⁷³⁾

Intake Group	1957-1959 XL 1958 XLC	1958-1969 XLH/XLCH	1970-1979 XLH/XLCH	1980-1985 XL / XLS / XLX
Valve	18070-57 1-11/16" Dia (1.6875") ⁷⁴⁾	18070-58 1-13/16" Dia (1.8125) ⁷⁵⁾	18070-70 (1.937") ⁷⁶⁾	18070-70 (last use in 80) 18027-80 (Nittan) 18028-80 (Eaton) (1.937") ⁷⁷⁾ either brand is standard for 79-85
			18027-80 (Nittan) 18028-80 (Eaton) (1.937") ⁷⁸⁾ either brand is standard (added in 81) (replacement for 1979)	
Valve Guide	18176-57 (Std) 18179-57 (.001" OS) 18180-57 (.002" OS) (replaced in '59 by ↓)	18176-57 (Std) 18179-57 (.001" OS) 18180-57 (.002" OS) (replaced in '59 by ↓)	18176-57A (Std) 18179-57A (.001" OS) 18180-57A (.002" OS) (replaced in '80 by ↓)	18176-80 (Std) (80 only) 18176-57B (Std) (80) 18179-57B (.001" OS) 18180-57B (.002" OS) 18191-79 (.004" OS) (81) (shouldered valve guides) (All replaced in '83 by ↓)
	18176-57A (Std) 18179-57A (.001" OS) 18180-57A (.002" OS)	18176-57A (Std) 18179-57A (.001" OS) 18180-57A (.002" OS)	18176-57B (Std) 18179-57B (.001" OS) 18180-57B (.002" OS) 18191-79 (.004" OS) (81) (shouldered valve guides) (for 79-82)	18176-57C (Std) 18179-57C (.001" OS) 18180-57C (.002" OS) 18191-79A (.004" OS) (shoulder-less valve guides) (for 79-85)
			18176-57C (Std) 18179-57C (.001" OS) 18180-57C (.002" OS) 18191-79A (.004" OS) (available in 83) (shoulder-less valve guides) (for 79-85)	See also 1983 Valve Guide Changes
Valve Guide Retainer Ring				18120-80 (80 only)
Valve Seat Repair Insert	18055-58 (added in 74) (for 58-69)	18055-58 (added in 74) (for 58-69)	18055-70 (added in 74) (for 70 up)	18055-70

Intake Group	1957-1959 XL 1958 XLC	1958-1969 XLH/XLCH	1970-1979 XLH/XLCH	1980-1985 XL / XLS / XLX
Spring Collar (lower)	18220-57	18220-57	18220-57	18220-80 (80 only) 18220-57 (57-E81) 18220-81 (L81-E83) 18220-83 (flat washer) (L83-85)
Valve Spring (inner)	18204-57 (replaced in 71 by ↓)	18204-57 (replaced in 71 by ↓)	18204-57 (replaced in 71 by ↓)	18204-57A (71-E83) 18204-83 (L83-85)
	18204-57A (for 57-E83)	18204-57A (for 57-E83)	18204-57A (for 57-E83)	
Valve Spring (outer)	18203-57 (replaced in 71 by ↓)	18203-57 (replaced in 71 by ↓)	18203-57 (replaced in 71 by ↓)	18203-57A (71-E83) 18203-83 (L83-85)
	18203-57A (for 57-E83)	18203-57A (for 57-E83)	18203-57A (for 57-E83)	
Spring Collar (upper)	18221-57 (replaced in '59 by ↓)	18221-57 (replaced in '59 by ↓)	18221-57A (replaced in 82 by ↓)	18221-57A (L58-81) 18221-57B (82) (for 79-85)
	18221-57A (for 57 up)	18221-57A (for 58 up)	18221-57B (for 79-85)	
Valve Keepers (keys)	18228-30	18228-30	18228-30	18228-30
Valve Stem Cap	X	X	X	X

Exhaust Valves and Components with Year Changes

Exhaust Group	1957-1959 XL 1958 XLC	1958-1969 XLH/XLCH	1970-1979 XLH/XLCH	1980-1985 XL / XLS / XLX
Valve	18080-57 1-1/2" Dia (1.5000") ⁷⁹⁾	18080-58 1-9/16" Dia (1.5625") ⁸⁰⁾ (58-62 XLH) (58-61 XLCH) (obsolete for 63)	18080-58A 1-9/16" Dia (1.5625") ⁸¹⁾	18080-58B (last use in 80) 18033-80 (Nittan) (81) 18036-80 (Eaton) (81) 1-9/16" Dia (1.5625") ⁸²⁾ either brand is standard for 79-85
		18080-58A 1-9/16" Dia (1.5625") ⁸³⁾ (63 and up XLH) (62 and up XLCH) (58 and up replacement)	18033-80 (Nittan) 18036-80 (Eaton) 1-9/16" Dia (1.5625") ⁸⁴⁾ either brand is standard (added in 81) (replacement for 1979)	

Exhaust Group	1957-1959 XL 1958 XLC	1958-1969 XLH/XLCH	1970-1979 XLH/XLCH	1980-1985 XL / XLS / XLX
Valve Guide	18170-57 (Std) 18171-57 (.001" OS) 18172-57 (.002" OS)	18170-57 (Std) 18171-57 (.001" OS) 18172-57 (.002" OS)	18170-57 (Std) 18171-57 (.001" OS) 18172-57 (.002" OS) (replaced in '80 by ↓)	18170-80 (Std) (80 only) 18170-57A (Std) (80) 18171-57A (.001" OS) 18172-57A (.002" OS) 18168-79 (.004" OS) (81) (for 79-82) (shouldered valve guides) (All replaced in '83 by ↓)
			18170-57A (Std) 18171-57A (.001" OS) 18172-57A (.002" OS) 18168-79 (.004" OS) (81) (shouldered valve guides) (for 79-82)	18170-57B (Std) 18171-57B (.001" OS) 18172-57B (.002" OS) 18168-79A (.004" OS) (shoulder-less valve guides) (for 79-85) See also 1983 Valve Guide Changes
			18170-57B (Std) 18171-57B (.001" OS) 18172-57B (.002" OS) 18168-79A (.004" OS) (shoulder-less valve guides) (available in 83 for replacement) (for 79-85)	
Valve Guide Retainer Ring				18120-80 (80 only)
Valve Seat Repair Insert	18052-58 (added in 74) (for 58-85)	18052-58 (added in 74) (for 58-85)	18052-58 (added in 74) (for 58-85)	18052-58
Spring Collar (lower)	18220-57	18220-57	18220-57	18220-80 (80 only) 18220-57 (57-E81) 18220-81 (L81-E83) 18220-83 (flat washer) (L83-85)
Valve Spring (inner)	18204-57 (replaced in 71 by ↓)	18204-57 (replaced in 71 by ↓)	18204-57 (replaced in 71 by ↓)	18204-57A (71-E83) 18204-83 (L83-85)
	18204-57A (for 57-E83)	18204-57A (for 57-E83)	18204-57A (for 57-E83)	

Exhaust Group	1957-1959 XL 1958 XLC	1958-1969 XLH/XLCH	1970-1979 XLH/XLCH	1980-1985 XL / XLS / XLX
Valve Spring (outer)	18203-57 (replaced in 71 by ↓)	18203-57 (replaced in 71 by ↓)	18203-57 (replaced in 71 by ↓)	18203-57A (71-E83) 18203-83 (L83-85)
	18203-57A (for 57-E83)	18203-57A (for 57-E83)	18203-57A (for 57-E83)	
Spring Collar (upper)	18222-57 (57-E58)	18222-57 (57-E58)	18221-57A (replaced in 82 by ↓)	18221-57A (L58-81) 18221-57B (82) (for 79-85)
	18221-57A (L58 up)	18221-57A (L58 up)	18221-57B (for 79-85)	
Valve Keepers (keys)	18228-57 (57-E58)	18228-57 (57-E58)	18228-30	18228-30
	18228-30 (L58 up)	18228-30 (L58 up)		
Valve Stem Cap	18234-57 (57-E58 only)	18234-57 (57-E58 only)		
	(L58 up - Obsolete)	(L58 up - Obsolete)	X	X

Pistons

Standard Piston Grading

- From a Service Bulletin in October of 1981, all standard sized pistons are graded for size in .00025" increments. This is done for production purposes only and does not apply to oversized (.010"-.070") pistons. ⁸⁵⁾
- The grade number is stamped on the dome of all standard pistons. In the case of a grade 10 piston, the number 10 is stamped on the dome. This is a standard sized piston and should not be confused with a .010" oversized piston which also has a number 10 stamped on the dome. If there is any doubt about a piston's size, it's largest diameter should be measured.
- In the future, all grade 10 standard pistons will be marked "G10" for ease of identification. All oversized pistons used in oversized cylinder bores (.010"-.070") will continue to be stamped in the usual manner.
- Example:
 - Standard Grade 10 piston range: 3.18725"-3.18700" stamped with "10" or the new G10 stamping (old style).
 - Oversized .010" piston range: 3.197"-3.196"

Connecting Rods

Rod Play

When checking for the up and down play, it helps to spray the crank pin area down with brake cleaner. ⁸⁶⁾
This is to rinse down any oil that may be clinging to the roller bearings.
The oil can take up space between the rollers and not give an accurate feel.

However, don't forget to oil it back up before re-assembly. ⁸⁷⁾
You don't want raw metal rubbing each other on start up.

Side shake measurement (76 and earlier models) can be done with a ruler using the outside edge of the case as a base line.

57-64 models

Check rods for (up and down) play as well as (upper end side shake or rod tip) with the pistons removed from the rods. ⁸⁸⁾

When appreciable up and down play is found and side shake at the extreme upper end of the rod is more than the following specs;
The lower bearing should be re-fitted.

Specs:

Front: 3/32" or more

Rear: 3/32" or more

57-69 models

Check rods for (up and down) play as well as (upper end side shake or rod tip) with the pistons removed from the rods. ⁸⁹⁾

When appreciable up and down play is found and side shake at the extreme upper end of the rod is more than the following specs;
The lower bearing should be re-fitted.

Specs:

Front: 11/64" or more

Rear: 3/32" or more

76 and earlier models

Motorcycles using rod bearings with steel retainers:

Check rods for (up and down) play as well as (upper end side shake or rod tip) with the pistons removed from the rods.

When appreciable up and down play is found and side shake at the extreme upper end of the rod is more than the following specs;

The lower bearing should be re-fitted.

Specs:

76 and earlier (from the 70-76 FSM): ⁹⁰⁾

Front: 11/64" or more

Rear: 3/64" or more

76 and earlier (from the 70-78 FSM): ⁹¹⁾

Front: 3/64" or more

Rear: 1/64" or more

77 and 78 models

Motorcycles using rod bearings with aluminum retainers:

Check rods for (up and down) play with the pistons removed from the rods. ⁹²⁾

Side shake cannot be used to determine bearing wear.

When appreciable up-and-down movement is found, the lower bearing should be refitted.

79-85 models

Check rods for up and down play in lower bearings. ⁹³⁾

Measuring side shake is no longer recommended in the FSM as in above.

When up and down play is detected, the lower bearing should be refitted.

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1959-1961 HD Supplement to Spare Parts Catalog for Sportster and K Models

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1959-1962 HD Supplement to Spare Parts Catalog for Sportster and K Models

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1963 HD Parts Catalog for Sportster and KH Models

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