AMF | HARLEY-DAVIDSON **SERVICE BULLETIN**

M-830 June 9, 1981

COLOR-CODED CAM GEAR SELECTION

Cam gears for 1000/1200/1340cc models are supplied through Parts and Accessories in matched sets to provide the proper gear lash (tooth clearance) for quiet operation.

Cam gears are matched and color coded according to the diameter size as measured with special gauge pins.

See Figure 1. The gear diameter is measured with a micrometer over .105 in. diameter gauge pins on opposite sides of the gear. The pins are of the proper size to fit between the contacting surfaces of the gear teeth. Gear diameter should be measured in at least two places 90° apart. The required gauge pin set is available from Kent-Moore under Part No. HD-95632-79.

NOTE

Original gears may be different sizes (different color codes), to produce a properly matched set in any one engine. Parts order matched gear sets are of one color.

The accompanying tables list the part numbers of parts order matched gear sets and individual gears, the identifying color paint spot for each size gear and the upper and lower size limits.

Although all meshing gears in the same engine as produced in the factory are matched for proper fit, instances may occur where gears become worn after a period of service and excessive gear lash (tooth clearance) produces a rattling noise particularly noticeable at the gear case cover at low engine rpm.

In such cases, a larger gear size can be selected to reduce the tooth clearance between the mating gears for quieter operation.

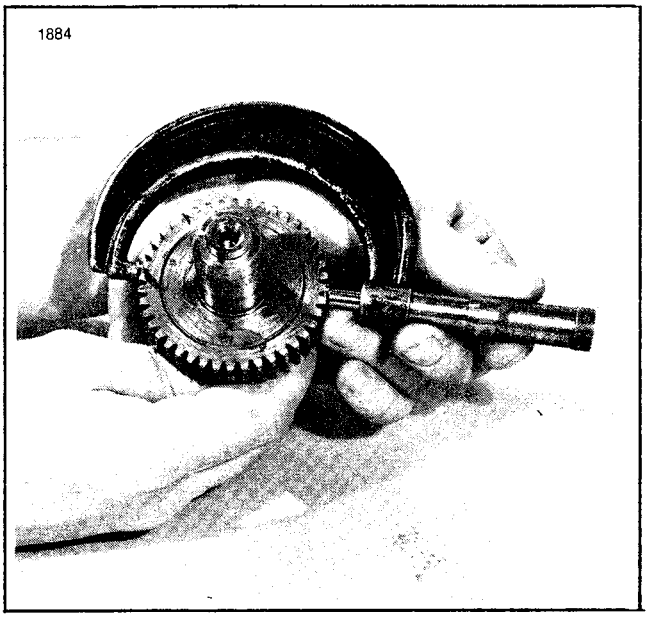


Figure 1. Measuring Cam Gear Size

1000cc Models

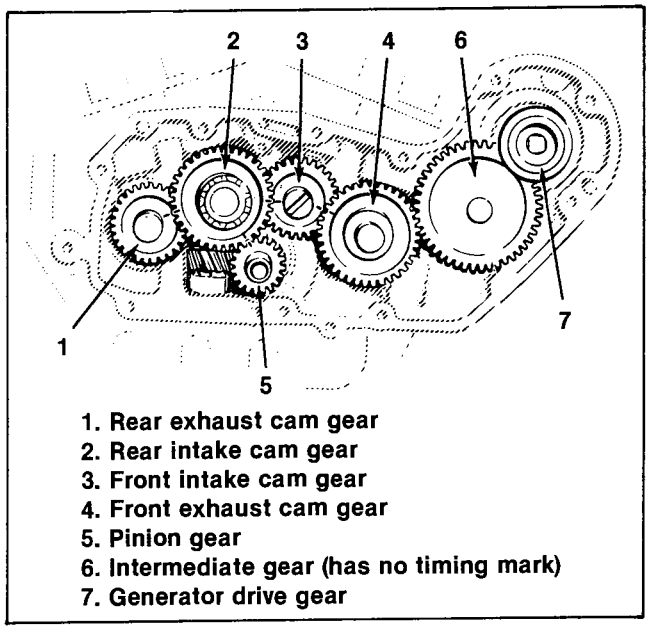
See Figure 2. In 1000cc engines which have four matched cam gears, increase the size of gears 1 and 3 (rear exhaust and front intake) by one color code and run engine to check for noise.

A size increase of gears 1 and 3 may be necessary, but no more than two size increases should be made before also increasing the sizes of gears 5 and 6 (pinion and intermediate gears). However, if a gear whine or howl is produced by a size increase, it indicates that there is not enough tooth clearance and the size of the affected gears must be reduced.

ROUTING:	SERVICE MANAGER	SALES MANAGER	PARTS MANAGER	CHIEF MECHANIC	MECHANIC NO. 1	MECHANIC NO. 2	MECHANIC NO. 3	MECHANIC NO. 4	RETURN THIS TO:
INITIAL HERE									

An alternative method of gear selection requires removal of the valve push rods, tappet blocks and spark plugs. Check for gear tooth tightness by moving gear back and forth with a screwdriver and noting the resistance to movement. Do this for several positions (rotate flywheels). On the average, there should be a slight drag. The gear should not be too tight at any one spot — this would indicate that the gear is out of round.

1. Measure gear size (diameter) over .105 in. dia. pins, Part No. HD-95632-79 using a micrometer caliper.
2. Select gear size to obtain proper tooth clearance for quietest operation. Gear rattle indicates fit is too loose (size is too small). Gear whine or howl indicates fit is too tight (size is too large).
3. As a procedure guide, increase or decrease size of gears 1 and 3 up to 2 color codes, then increase or decrease size of gears 5 and 6 corresponding amounts if necessary.



1. **Rear exhaust cam gear**
2. **Rear intake cam gear**
3. **Front intake cam gear**
4. **Front exhaust cam gear**
5. **Pinion gear**
6. **Intermediate gear (has no timing mark)**
7. **Generator drive gear**

Figure 2. Cam Gear Fitting Procedure — 1000cc Models

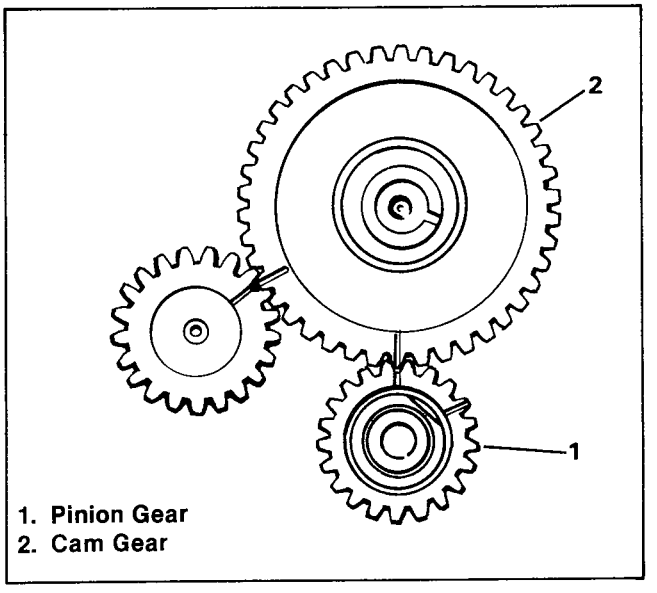
1200/1340cc Models

See Figure 3. The same process is used to reduce gear noise in 1200 and 1340cc engines. Increase the size of the cam gear and pinion gear progressively by one color code to reduce gear rattle and decrease the gear size progressively to reduce whine.

NOTE

It is possible that a mild gear "whine" may be present to some extent in a new engine and may not disappear during break-in. A mild whine is acceptable, but if excessive the gear train can be "fine-tuned" by using smaller size gears as described before.

1. Measure gear size (diameter) over .105 in. dia. pins, Part No. HD-95632-79 using a micrometer caliper.
2. Select gear size to obtain proper tooth clearance for quietest operation. Gear rattle indicates fit is too loose (size is too small). Gear whine or howl indicates fit is too tight (size is too large).
3. Increase or decrease size of gears 1 and 2 one color code at a time to reduce noise.



1. **Pinion Gear**
2. **Cam Gear**

Figure 3. Cam Gear Fitting Procedure — 1200/1340cc Models

Part No. & Color Code	Gear #1 Rear Exhaust
Brown 25650-80	1.8893 1.8903
Blue 25651-80	1.8903 1.8913
Red 25652-80	1.8913 1.8923
White 25653-80	1.8923 1.8933
Green 25654-80	1.8933 1.8943
Yellow 25655-80	1.8943 1.8953
Black 25656-80	1.8953 1.8963

Part No. & Color Code	Gear #3 Front Intake
Brown 25640-80	1.8893 1.8903
Blue 25641-80	1.8903 1.8913
Red 25642-80	1.8913 1.8923
White 25643-80	1.8923 1.8933
Green 25644-80	1.8933 1.8943
Yellow 25645-80	1.8943 1.8953
Black 25646-80	1.8953 1.8963

Part No. & Color Code	Gear #5 Pinion
Brown 24055-74	1.2681 1.2671
Blue 24056-74	1.2671 1.2661
Red 24057-74	1.2661 1.2651
White 24058-74	1.2651 1.2641
Green 24059-74	1.2641 1.2631
Yellow 24060-74	1.2631 1.2621
Black 24061-74	1.2621 1.2611

1980 & Later Color-Coded Cam Gears — 1000cc

GEAR NO.	1	2	2	3	4	4	5	6
Year	1959-1979	1971 - 1979		1959-1979	1971-1979		1954-1979	1957-1979
Part No.	25504-59	25485-71		25501-59	25503-71		24011-67R	25776-57
Color Code	Rear Exhaust	Rear Intake Inner	Rear Intake Outer	Front Intake	Front Exhaust Inner	Front Exhaust Outer	Pinion	Idler
Brown	1.8893 1.8903	1.8953 1.8943	2.3902 2.3912	1.8893 1.8903	1.8953 1.8943	2.3902 2.3912	1.2681 1.2671	3.0223 3.0213
Blue	1.8903 1.8913	1.8943 1.8933	2.3912 2.3922	1.8903 1.8913	1.8943 1.8933	2.3912 2.3922	1.2671 1.2661	3.0213 3.0203
Red	1.8913 1.8923	1.8933 1.8923	2.3922 2.3932	1.8913 1.8923	1.8933 1.8923	2.3922 2.3932	1.2661 1.2651	3.0203 3.0193
White	1.8923 1.8933	1.8923 1.8913	2.3932 2.3942	1.8923 1.8933	1.8923 1.8913	2.8932 2.3942	1.2651 1.2641	3.0193 3.0183
Green	1.8933 1.8943	1.8913 1.8903	2.3942 2.3952	1.8933 1.8943	1.8913 1.8903	2.3942 2.3952	1.2641 1.2631	3.0183 3.0173
Yellow	1.8943 1.8953	1.8903 1.8893	2.3952 2.3962	1.8943 1.8953	1.8903 1.8893	2.3952 2.3962	1.2631 1.2621	3.0173 3.0163
Black	1.8953 1.8963	1.8893 1.8883	2.3962 2.3972	1.8953 1.8963	1.8893 1.8883	2.3962 2.3972	1.2621 1.2611	3.0163 3.0153

1979 & Earlier Color-Coded Cam Gears — 1000cc

COLOR CODE	1 PINION GEAR		2 CAM GEAR	
LATE 1977 & LATER 1200/1340cc MODELS (MATCHED SET PART NO. 24582-77)				
	Part No.	Size (in.)	Part No.	Size (in.)
Orange	24040-78	1.4756/1.4751	25527-81	2.7324/2.7334
White	24041-78	1.4751/1.4745	25528-81	2.7334/2.7344
Yellow	24042-78	1.4745/1.4737	25529-81	2.7344/2.7354
Red	24043-78	1.4737/1.4729	25530-81	2.7354/2.7364
Blue	24044-78	1.4729/1.4721	25531-81	2.7364/2.7374
Green	24045-78	1.4721/1.4715	25532-81	2.7374/2.7384
Black	24046-78	1.4715/1.4710	25534-81	2.7384/2.7394
1954 TO EARLY 1977 1200 MODELS				
	Part No. 24010-54/size (in.)		25523-56 Part No.'s 24423-70 Size (in.)	
Orange	1.449 /1.4485		2.7665/2.7670	
Black	1.4485/1.4480		2.7670/2.7675	
Red	1.4480/1.4475		2.7675/2.7680	
Blue	1.4475/1.4470		2.7680/2.7685	
Green	1.4470/1.4465		2.7685/2.7690	
White	1.4465/1.4460		2.7690/2.7695	
Brown	1.4460/1.4455		2.7695/2.7700	
Yellow	1.4455/1.4450		2.7700/2.7705	
Yellow & Red	1.4450/1.4445		2.7705/2.7710	
Brown & Red	1.4445/1.4440		2.7710/2.7715	

Color-Coded Cam Gears — 1200/1340cc