AMF | HARLEY-DAVIDSON **SERVICE BULLETIN**

No. M-743 April 3, 1979

CAM GEAR SELECTION FOR QUIET OPERATION

Timing gears for 1200/1340/1000cc models are installed in original engines and supplied through parts order in matched sets to provide the proper gear lash (tooth clearance) for quiet operation.

Cam gears for late model 1200/1340/1000cc engines are color coded according to the diameter size as measured with special gauge pins.

The gear diameter is measured with a micrometer over .105 in. diameter gauge pins on opposite sides of the gear as shown in Figure 1. 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 2 places 90° apart. The required gauge pin set is available from the factory under part No. 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 tooth 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 clearances between the mating gears for quieter operation.

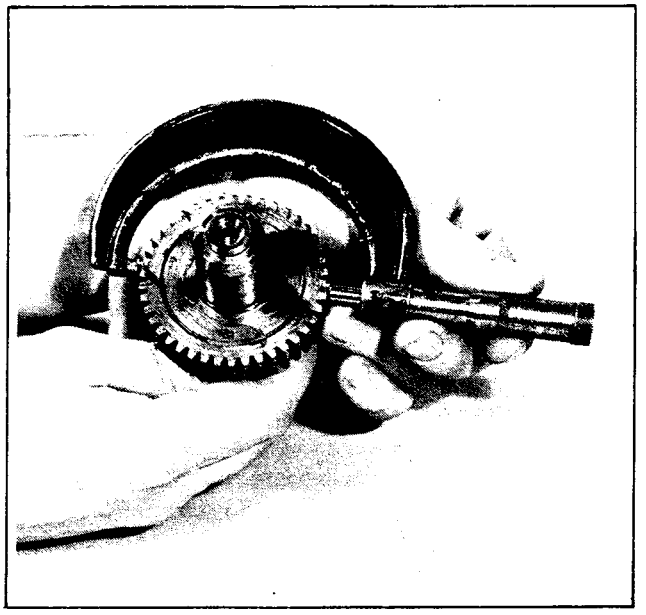


FIGURE 1. MEASURING CAM GEAR SIZE

1000cc MODELS

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

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.

An alternative method of gear selection requires removal of the valve push rods and 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

(OVER)

should not be too tight at any one spot -- this would indicate that the gear is out of round.

1200/1340cc MODELS

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 go to smaller sizes progressively to reduce whine. See Figure 3.

Note: It is possible that gear "whine or howl" 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.

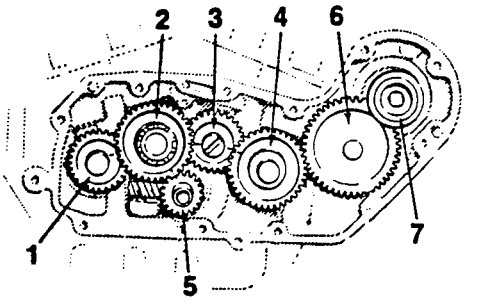
HARLEY-DAVIDSON MOTOR CO., INC.

FIGURE 2. CAM GEAR FITTING PROCEDURE - 1000cc MODELS

Measure gear size (diameter) over .105 in. dia. pins, part No. 95632-79 using a micrometer caliper.

Select gear size to obtain proper tooth clearance for quietest operation. Gear rattle indicates looseness (size is too small). Gear whine or howl indicates tightness (size is too large).

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 (Inner & Outer)
3. Front intake cam gear
4. Front exhaust cam gear (Inner & Outer)
5. Pinion gear
6. Intermediate gear (has no timing mark)
7. Generator drive gear

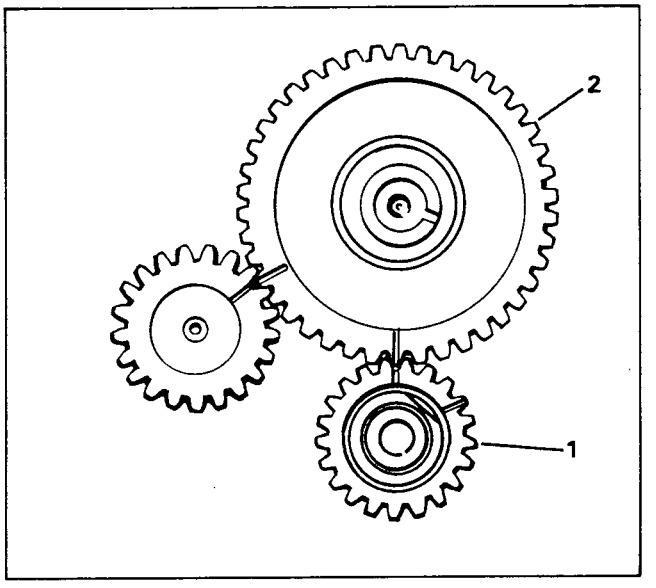
Gear No.	1	2	2	3	4	4	5	6
Year	1959 & Later	1971 & Later		1959 & Later	1971 & Later		1954 & Later	1957 & Later
Part No.	25504-59	25485-71		25501-59	25503-71		24015-74 24011-37	25576-57
Color Code	Rear Exhaust	Rear Intake Inner	Rear Intake Outer	Front Intake	Front Exhaust Inner	Front Exhaust Outer	Pinion	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

FIGURE 3. CAM GEAR FITTING PROCEDURE - 1200/1340cc MODELS

Measure gear size (diameter) over .105 in. dia. pins, part No. 95632-79 using a micrometer caliper.

Select gear size to obtain proper tooth clearance for quietest operation. Gear rattle indicates looseness (size is too small). Gear whine or howl indicates tightness (size is too large).

Increase or decrease size of gears 1 and 2 one color code at a time to reduce noise.



COLOR CODE	1 PINION GEAR		2 CAM GEAR
LATE 1977 & LATER 1200/1340 MODELS (MATCHED SET PART NO. 24582-77)			
	Part No.	Size(in.)	Part No. 25523-77/Size(in.)
Orange	24040-78	1.4756/1.4751	2.7324/2.7334
White	24041-78	1.4751/1.4745	2.7334/2.7344
Yellow	24042-78	1.4745/1.4737	2.7344/2.7354
Red	24043-78	1.4737/1.4729	2.7354/2.7364
Blue	24044-78	1.4729/1.4721	2.7364/2.7374
Green	24045-78	1.4721/1.4715	2.7374/2.7384
Black	24046-78	1.4715/1.4710	2.7384/2.7394

1954 TO EARLY 1977 1200 MODELS		
	Part No. 24010-54/size(in.)	Part No.'s 25523-56 / 25523-70 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

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→									