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MOTORCYCLE CHASSIS SERVICE FOR BEST HANDLING AND ROADABILITY

Generally, motorcycle service mechanics do high-quality tuning of an engine for best performance but may give little attention to chassis inspection and adjustment, considering this attention to be given only after a mechanical failure, or serious handling difficulties are experienced at high speed.

Good handling of a solo motorcycle, particularly at higher speeds, is primarily dependent upon good maintenance of chassis assemblies.

Particularly, steering head bearings, rear fork bearings, and wheel hub bearings must be correctly adjusted. Spokes must not be allowed to run loose. Tires must be kept correctly inflated and must be transposed frequently enough so front tire does not become worn irregularly or peaked. A front tire with irregular tread wear can cause steering to become unstable at high speed, especially if tire is over inflated.

At regular intervals of 5,000 miles, or at any time a solo motorcycle develops handling irregularities at high speed, check the following and give attention as needed.

MOTORCYCLE CHASSIS MAINTENANCE CHECKS:

1. TIRE PRESSURE TOO HIGH OR LOW

Correct tire inflation pressures for models with standard equipment are shown in following chart:

MODEL	YEAR	TIRE SIZE	PRESSURE	
			FRONT	REAR
FL, FLH	1968 & EARLIER	5.00 x 16 *	12	20
FL, FLH	1969 & LATER	5.10 x 16 **	20	24
XL, XLH	1966 & EARLIER	3.50 x 18	14	18
XLH	1967 TO 1969	3.25/3.50 x 19	16	
		4.00 x 18		20
XLCH	1969 & EARLIER	3.25/3.50 x 19	14	
		4.00 x 18		18
XLH, XLCH	1970 & LATER	3.75 x 19 ***	18	
		4.25 x 18 ***		30
C	1966 & EARLIER	3.00 x 17	20	24
H	1962 & 1963	3.00 x 17	20	24
H	1964 TO 1968	3.00 x 18	22	
		3.50 x 18		22
SS	1967 & LATER	3.25 x 19	22	
		3.50 x 18		22

* Use 5.10 x 16 size for replacement.

** 5.10 x 16/5.00 x 16 inner tube for 5.10 x 16 size tire is mandatory

*** Use only taper base bead tires on taper base bead rims.

The tire inflation pressures given are based on rider weight of approximately 150 lbs. When these loads are exceeded by 50 lbs., or more, increase tire pressures as follows: for each 50 lbs. of overload increase pressure of rear tire 2 lbs.; front tire 1 lb.

2. TIRE TREAD WEAR

If front tire tread is worn off at the sides to a peaked condition at the center of the tread, tire should be replaced. Unstable handling due to this cause will be prevented by regularly transposing tires at 5,000 mile intervals, or sooner if operating conditions warrant.

Intervals at which tires may need transposing vary with the operator's style of riding, and how correctly he maintains tire pressures, also with road surface over which most miles are traveled. One operator may need tire transposing at shorter intervals than another.

3. TIRES AND WHEELS NOT BALANCED

Static and dynamic balancing is necessary for stable handling at high speed. Suitable commercial equipment for balancing wheels and tires is available from automotive service equipment manufacturers.

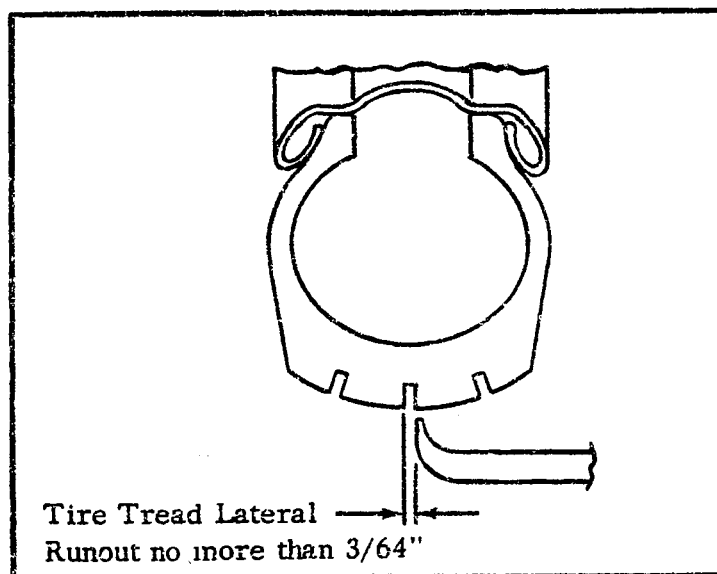
4. LOOSE SPOKES

Check by tapping each spoke. Tighten nipples as necessary to produce a uniform metallic ring when spokes are tapped.

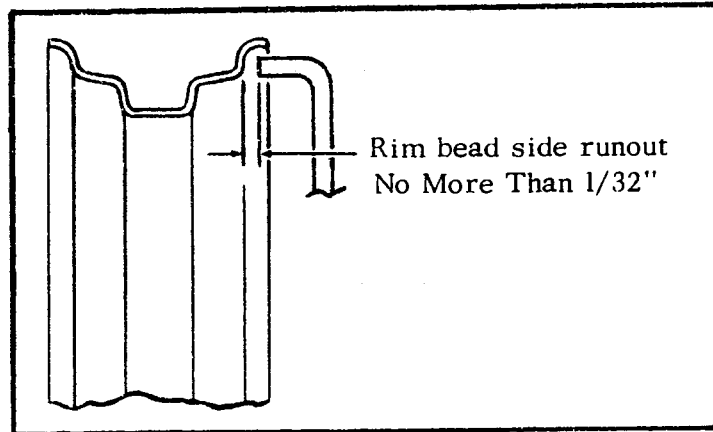
5. RIMS AND TIRES TOO MUCH OUT-OF-TRUE SIDEWAYS

(Tire tread run-out should not be more than $3/64$ "). (Rim bead runout should not be more than $1/32$ ").

Check runout by turning wheel on axle, measuring amount of sideways displacement from a fixed point near the tire (see sketch).



If tire tread runout is more than $3/64$ ", remove tire from rim and check rim bead side runout to see if rim is at fault. (see sketch)

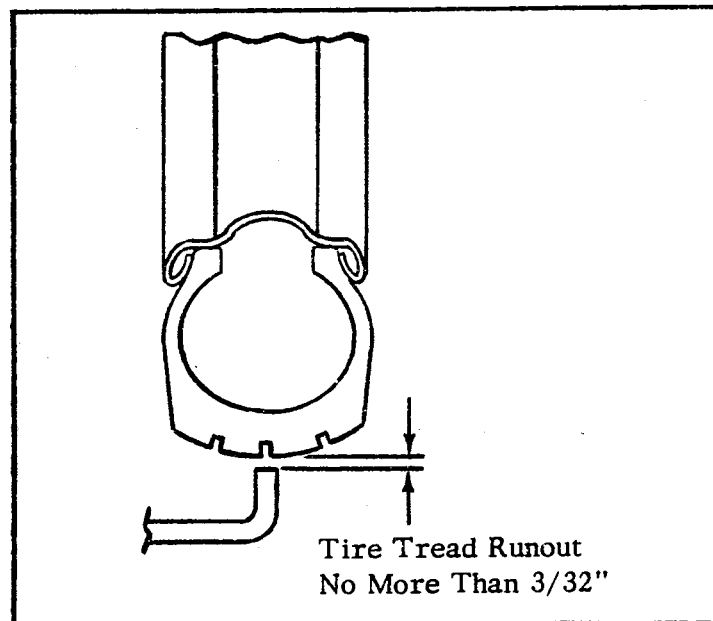


If rim side runout is less than $1/32$ ", tire is at fault and should be replaced. If rim side runout is more than $1/32$ ", correct by tightening selected spoke nipples as outlined in the service manual, reinstall old tire and recheck tire tread lateral runout.

RIMS AND TIRES TOO MUCH OUT-OF-ROUND, OR ECCENTRIC WITH HUB

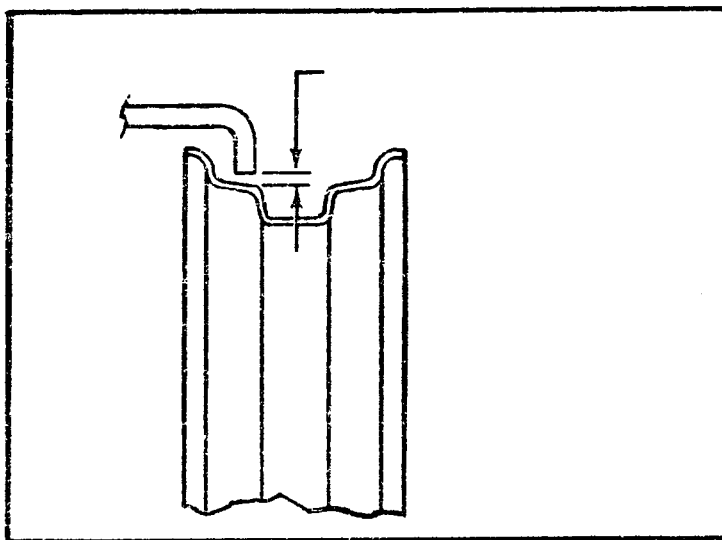
(Tire tread run-out should not be more than $3/32$ "). Rim bead runout should not be more than $1/32$ ").

Check runout by turning wheel on axle, measuring tread runout (see sketch).



If tire tread runout is more than $3/32$ ", remove tire from rim and check rim bead runout to see if rim is at fault, (see following sketch).

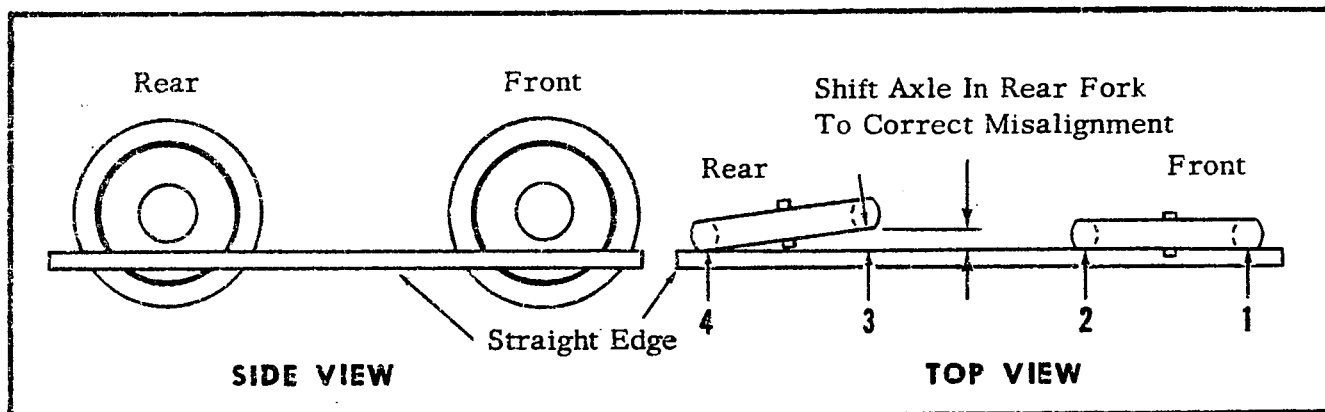
If rim bead runout is less than $1/32$ ", tire is at fault and should be replaced. If rim bead runout is more than $1/32$ " correct by tightening selected spoke nipples as outlined in the service manual, reinstall tire and recheck tire tread runout.



7. WHEEL MISALIGNMENT

Note: rims and tires must be true before checking wheel alignment. (See Item 5).

Front and rear wheels should be in perfect alignment. This can be easily checked with a straight wooden board or length of string by placing against tire sidewalls as far up toward axles as possible. Straightedge should touch tires at all four points (see sketch). Adjust rear wheel in axle clips as necessary to correct misalignment.



8. EXCESSIVE WHEEL HUB BEARING PLAY

If wheel bearing play is noticeable when shaking sideways by hand when wheel is elevated free above floor, bearings and races should be replaced. Be sure wheel axle nuts are tight.

9. FAULTY REAR FORK ACTION

The rear fork should swing up and down smoothly, with shock absorbers disconnected. If there is any roughness, bearings should be removed and inspected. If there is any noticeable side play, bearings should be adjusted. If the side play cannot be adjusted, bearing may be frozen and turning in housing.

Adjustment:

The rear fork Timken Bearings are not to be adjusted free like the steering head bearings, but instead must be pre-loaded. Adjustment is made on the right side of the frame. Remove all parts (rear wheel and shocks) from rear fork. Bend back tang of lock washer, loosen pivot bolt so bearings and fork are perfectly free. Attach a spring scale to extreme end of rear fork and raise fork to a horizontal position with center line of frame. Take scale reading. Tighten up on pivot bolt as necessary to provide from 1-1/2 to 2 pounds more weight with bearings pre-loaded, again weigh rear fork. Scale should show 1-1/2 to 2 pounds more than it did when bearings and fork were perfectly free.

10. FAULTY STEERING

With front end of motorcycle jacked up until wheel is free, (and with all steering damper parts removed if motorcycle is so equipped), the front fork should turn completely free either to full right or to full left. Set fork in straight ahead position at a point where it holds its position, hands off. Give handlebar a slight push in either direction. Fork must fall of its own weight to its full travel stop, both to right and to left.

If front fork does not turn freely its entire travel to right or to left, loosen head bearing adjustment just enough so that free movement is obtained. Of course, head bearings should not be adjusted so loose that any noticeable shake in head bearings can be noted.

If front fork is equipped with a steering damper, and binds due to some drag in steering damper parts, make necessary repair, and/or replacement, to attain completely free turning, as with steering damper removed.

Since steering damper should not be used at high speeds, if there is front fork turning drag with steering damper in completely off position, it may be enough to make motorcycle unstable at high speeds.

11. HEAVY FRONT END LOADING

Non-standard equipment on the front end such as heavy radio receivers, extra lighting equipment or luggage, tends to cause unstable handling. Extra equipment on the front end should be held down to a minimum.

In most every case, high speed handling faults are caused by one or more of the above conditions being present on the motorcycle. The possible exception will be the case where there is serious frame or fork misalignment.

IMPORTANT Transposing wheels and tires at least every 5,000 miles, and inflating no higher than recommended pressures, are of first importance. In many cases you will find that this attention alone corrects a handling problem.

It is suggested you offer riders this chassis check-up as a preventive maintenance service at 5,000 mile intervals. Strongly recommend that they take advantage of it. If you sell this plan, you will most likely hear very little about faulty handling.