

GEMMER WORM-AND-SECTOR TYPES

Used On:

FORD V8, ALL MODELS (1934-36)
HUDSON SIX, ALL MODELS (1935-36)
HUDSON EIGHT, ALL MODELS (1935-36)
HUPMOBILE SIX, MODEL 517-W (1935)
TERRAPLANE, ALL MODELS (1935-36)
WILLYS, MODELS 37 ('37), 38 ('38), 48 ('39)
WILLYS-OVERLAND, MODEL 39 (1939)
WILLYS, COMM'L. MODELS (1940-41)

NOTE:—Hudson Eight, Model HHU (1935) only is equipped with Gemmer Worm-and-Roller Steering Gear. Refer to separate article for data on this type.

DESCRIPTION:—Consists of 'hour glass' type worm mounted on steering shaft and carried on roller bearings at top and bottom. Bearings are provided with an automatic take-up under housing cover at upper end which eliminates necessity for adjustment except after considerable wear. The three-tooth sector on the cross-shaft engages the worm. Cross-shaft is provided with endplay adjustment. Housing cover in which cross-shaft is mounted is provided with eccentric adjusting sleeve and eccentric rivet adjustments to adjust sector clearance

ADJUSTMENT:—Before making adjustments, jack up front wheels and disconnect drag link to free steering gear (front wheels should turn freely with not more than 10 lbs. pull on drag link in either direction). Align steering column by loosening frame bracket bolts to allow gear to shift in frame, tighten bolts, then loosen instrument board bracket bolts to allow bracket to shift in alignment with column, tighten bracket bolts. Adjust as follows:

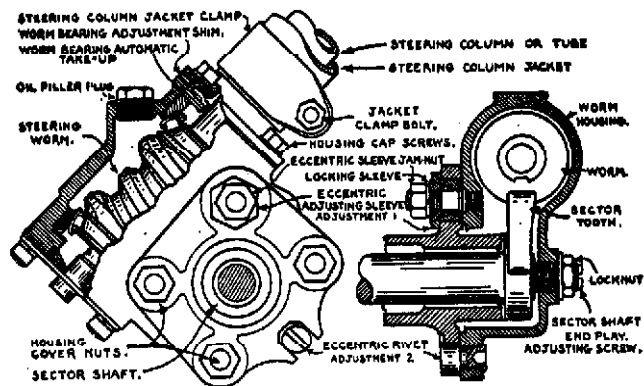
Worm Bearing Endplay:—Evidenced as up and down movement of steering wheel. Adjust when this exceeds .010" (to check, turn wheel 1 turn off center, hold wheel, shake front wheels). To adjust, loosen jacket clamp bolt above housing upper cover, shift clamp up $\frac{3}{8}$ " above lower end of jacket, loosen instrument board bracket clamp, work jacket down until lower end is against housing arm, remove housing capscrews, work jacket up as far as possible. This will provide approximately $\frac{3}{8}$ " clearance between housing cap and housing. Clip and remove one shim, reassemble gear, locating jacket clamp as near bottom end of jacket as possible. Check adjustment. Wheel should turn freely without stiffness.

Cross-shaft Endplay:—See that housing cover nuts and jam nut are securely tightened. Turn steering wheel to extreme end position and then back $\frac{1}{8}$ turn. Loosen locknut and turn adjusting screw in housing at inner end of cross-shaft until shaft rotates freely with no endplay, tighten locknut.

Sector Tooth Mesh in Worm:—Turn steering wheel to 'straight ahead position' midway between end points, loosen housing cover nuts $\frac{1}{4}$ turn and eccentric sleeve jam nut $\frac{1}{2}$ turn. Turn eccentric adjusting sleeve slowly clockwise until backlash can just be felt at ball end of steering arm. Check by turn-

ing steering wheel throughout full travel. If wheel is too tight in any position, turn eccentric sleeve counter-clockwise until wheel is free and then re-adjust. Sleeve must be turned clockwise to finish adjustment. Tighten eccentric sleeve jam nut, then tighten cover nuts. With correct adjustment sector should have minimum clearance at center position and gradually increased clearance toward ends.

Centralization of Tooth Contact:—Check clearance or backlash between sector teeth and worm at points $\frac{1}{3}$ turn of steering wheel each side of center position. If clearance is not equal, note at which point (right or left) backlash is greatest, loosen cover nuts and eccentric sleeve jam nut, turn eccentric rivet in notch in edge of cover slightly clockwise (if greater clearance with wheel turned to right) or counter-clockwise (if greater clearance with wheel turned to left). Tighten cover nuts and jam nut securely, repeat test.



Steering Wheel Position (Hudson-Terraplane '36):—On these models, steering wheel spoke with trademark on underside must point straight down with wheels in 'straight ahead position'. If this spoke more than 2" on either side (position affected by Caster adjustment), steering gear pitman arm should be bent (first cars) or drag link adjusted (later cars) as follows:

To Bend Pitman Arm—Wrap hardened pitman arm ball in wet rags, drip water on ball, heat arm 2" above ball with torch until color begins to show, bend arm with bending bar approximately $\frac{3}{64}$ " backward (if spoke to right of center) or forward (if spoke to left of center) to correct each 1" that spoke is off center. Drag link must be disconnected and ball protected as directed to prevent destroying hardened finish.

To Adjust Drag Link—See Car Pages for serial numbers of cars on which adjustable drag link used. Adjustment consists of shims placed at both ends of pitman arm ball seats at rear end of drag link. Transfer shims from one position to the other to throw pitman arm back (wheel spoke to right) or forward (wheel spoke to left).