GENERAL MOTORS TILT & TILT-TELESCOPE

DESCRIPTION

Two versions of movable steering wheels are available in General Motors Divisions. First type allows the steering wheel to be tilted to various tilt positions through a range of approximately 20-30 degrees and automatically locked in the chosen position. This type movable steering wheel is known as "Tilt-Wheel".

Second option offered is "Tilt-Telescope" movable steering wheel. This system offers the same tilt mechanism as the "Tilt-Wheel" model, or type. In addition to the tilt function, the "Tilt-Telescope" system further incorporates mechanism that permits adjustment of the distance between the driver and steering wheel within a range of approximately 3 inches.

Both options employ a steering shaft with a universal joint and adjusting and locking mechanism for tilt adjustment. the "Tilt-Telescope" version contains a telescoping upper shaft and yoke assembly, and locking mechanism for telescopic adjustment. The tilt adjustment and telescopic adjustments are made independently of each other.

DISASSEMBLY

NOTE - Disassembly and assembly procedures for the "Tilt-Wheel" and "Tilt-Telescope" systems are identical except for the upper shaft and yoke procedure on the "Tilt-Telescope" steering wheel which necessitates one additional step. This additional procedure is called out in step 13 of the following.

WARNING - Components and fastenings mentioned in the following steps are important in that a failure or misadjustment could affect the safety of the vehicle, the performance of vital systems, or result in major repair expense. If a component or fastening must be replaced, it must be replaced with one of the same part number or an equivalent part. DO NOT use a replacement part of lesser quality or substitute design.

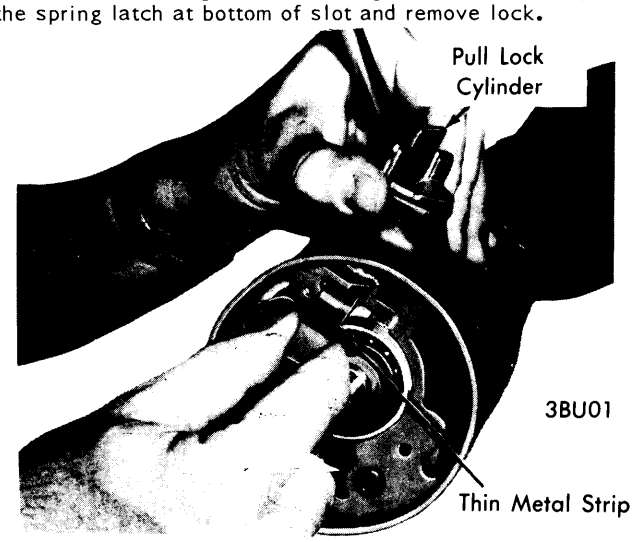
With steering wheel removed from column and column removed from car, mount assembly in vise either by clamping weld nuts on column or by attaching a suitable holding fixture to the column and proceed as follows:

1) Remove signal switch wire protector and remove cover. Remove tilt release lever, turn signal switch lever. Push hazard warning plunger in and remove hazard warning knob. Remove upper shaft lever from bowl.

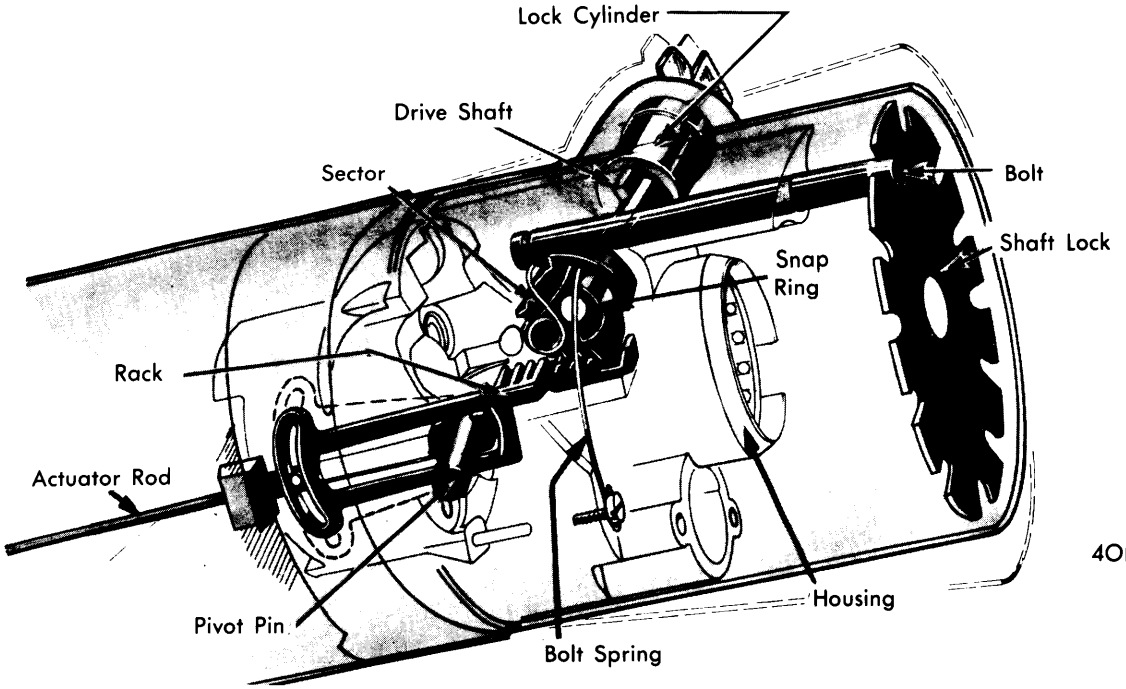
2) Use a suitable tool (Kent Moore J-23131) to depress lock plate and pry snap ring from groove. Discard snap ring, since a new ring must be used in reassembly. Remove cancelling cam and spring.

3) Wrap tape around the upper part of turn signal switch connector and wires and remove switch. Place shift bowl (or shroud) in LOW position. Pull switch straight up.

4) If the lock cylinder is to be removed, place it in the ACCESSORY position. Use a thin tool in the slot next to the switch mounting screw boss (right hand slot) to depress the spring latch at bottom of slot and remove lock.



REMOVING IGNITION LOCK CYLINDER



STEERING LOCKING MECHANISM (LOCKED POSITION)

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5) To remove the buzzer switch (if the lock cylinder is not removed), place lock in RUN and pull buzzer switch straight out of housing. *NOTE – Do not pull on switch terminals. Use bent wire or needle nose pliers to pull on switch clip.* Next, remove housing cover.

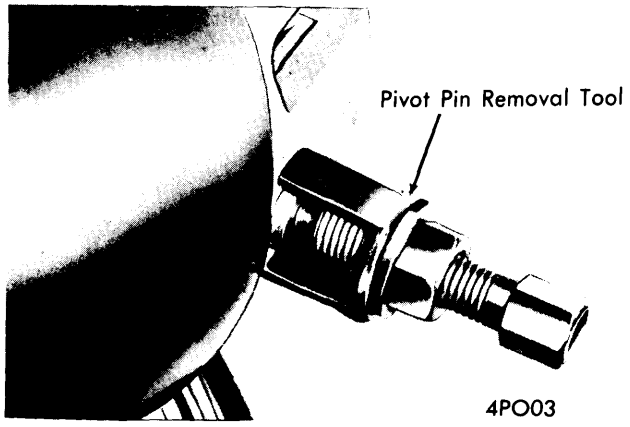
6) Use tilt release lever and place steering wheel in full UP position. Remove tilt spring retainer by inserting a screwdriver in retainer slot. Depress retainer and turn approximately 1/8 turn counterclockwise until ears align with grooves in housing. Remove spring and guide. *NOTE– Be careful when releasing spring as it is under high compression.*

7) With tilt column in neutral position, push upper steering shaft in sufficiently to remove steering shaft inner race seat and race.

8) Remove lower steering shaft flange, no-back washer (if used), spacer, spring, clip and bearing adapter assembly at lower end of the mast jacket.

9) Place ignition switch in ACCESSORY position and remove. Remove neutral-start switch.

10) Use a suitable pivot pin removal tool (J-21854) to remove both pivot pins.



REMOVING PIVOT PINS

11) Install tilt release lever, place in full UP position and disengage lock shoes. Remove bearing housing assembly by pulling upward to extend rack full down and moving housing assembly to the left to disengage rack from actuator. Remove actuator rod assembly. Remove steering shaft assembly from upper end.

12) Disassemble steering shaft assembly by removing centering spheres and anti-lash spring.

13) Disassemble upper steering shaft, locking wedge, locking rod and bumper from upper yoke. *NOTE – This operation necessary only on "Tilt-Telescope" wheels.*

14) Remove support assembly from column. Remove shift tube retaining ring and thrust washer.

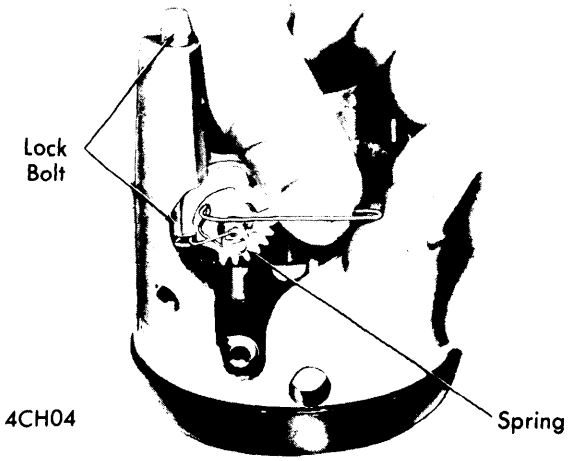
15) Use suitable tool (Kent-Moore J-23072) to remove shift tube from bowl. Pilot the adapter in upper end of shift tube and force tube from bowl. Exercise care not to jam lower shift lever into "T" slot on lower end of mast jacket while removing tube. *CAUTION – Never hammer or pull on lower or upper shift tube. Plastic injection may be sheared.*

16) Remove shift tube assembly from mast jacket from lower end. Remove lock plate and wave washer.

17) Remove bowl from mast jacket. Remove shift lever spring from bowl by winding spring up with pliers and pulling out.

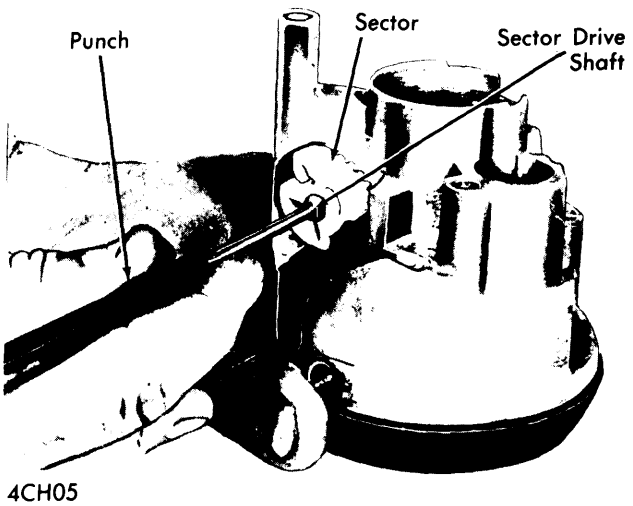
Bearing Housing Disassembly – Remove tilt lever opening shield and proceed as follows:

1) Remove lock bolt spring by removing retaining screw and moving spring clockwise to remove from bolt.



REMOVING LOCK BOLT SPRING

2) Remove snap ring from sector drive shaft. Tap drive shaft from sector and remove shaft, washer, sector and bolt. Remove rack and spring.



REMOVING SECTOR DRIVE SHAFT

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3) Use suitable tool and remove tilt release lever pin and remove lever and spring. (To relieve load on release lever, hold shoes inward and wedge a block between top of shoes (over slots) and bearing housing).

4) Remove lock shoe pin to remove lock shoes and springs. *NOTE – With tilt lever opening on left side, shoes facing up, the four slot shoe is on the left.*

5) Remove bearings from housing **only if they are to be replaced.** Remove separator and balls from bearing. Use a pointed punch against back surface of race to hammer race from housing until bearing puller can be used.

6) To reassemble, reverse disassembly procedure (block tooth on rack to engage block tooth on sector). (When installing lock bolt spring, torque retaining screw to 35 inch lbs.).

REASSEMBLY

With bearing housing assembled, proceed as follows:

1) Install shift lever spring in bowl and slide bowl onto mast jacket. Install wave washer and lock plate.

2) Use suitable installer tool (Kent Moore J-23073) and pull shift tube into bowl. *CAUTION – Do not push or tap on end of shift tube.* Install thrust washer and retaining ring.

3) Install support to jacket. Insert screws through support in lock plate. Torque screws to 60 inch lbs.

4) Align lower bearing adapter notches in jacket and push in lower end of mast jacket. Shift tube should pilot in adapter. Install clip.

5) Assemble upper steering shaft, locking wedge, locking rod, bumper and yoke. *NOTE – This operation necessary only on "Tilt-Telescope" steering wheels.*

6) Assemble upper shaft, centering spheres, anti-lash spring and lower shaft. Install shaft assembly in shift tube from upper end.

7) Install ignition switch actuator rod through bowl from bottom and insert in slot in support. Extend rack downward from bearing housing. Assemble housing over steering shaft and engage rack over end of actuator rod.

8) Install tilt release lever. Hold lock shoes in disengaged position and assemble housing over steering shaft until the pivot pin holes line up. Install pivot pins.

9) With housing in full UP position, install guide, tilt spring and retainer. Install inner race and race seat.

10) Install tilt lever opening shield in housing. Remove tilt release lever, install housing cover and torque screws to 45 inch lbs.

11) Assemble buzzer switch and spring clip. Push switch and spring into hole in cover to the step with contacts toward lock cylinder bore.

12) Install turn signal switch wires and connector through cover, bearing housing and bowl. Push hazard warning knob in, install switch and torque screws to 35 inch lbs. *NOTE – Short screw goes in hole nearest lock cylinder.*

13) Install spring, spacer, no-back washer (if used) and lower steering shaft flange. Torque flange pinch bolt to 30 ft. lbs.

14) Install hazard warning knob and pull knob out. Install cancelling cam spring, cam and shaft lock.

15) Using a suitable tool (Kent Moore J-23131) depress shaft lock plate and install new snap ring in groove on shaft. *NOTE – Turn signal switch assembly may be damaged if above procedure not followed.*

16) Install tilt release lever, signal switch lever and hazard warning knob to proper torques. Install upper shift lever and drive in pivot pin.

17) Install lock in cover bore. Push in until snap ring pops into groove and lock cylinder is secured in cover. Install shaft lock cover and torque screws to 35 inch lbs.

18) Be sure lock cylinder is in LOCK position when installing the ignition switch. Put bowl (or shroud) in PARK. Be sure ignition switch is in LOCK. Fit actuator rod into switch and assemble to column. Torque the two screws to 35 inch lbs.

19) Install neutral-start back-up light switch. Do not tighten screws, as switch must be adjusted in car.

20) Install wire protector over wires and on mast jacket. Install mounting bracket.