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Checker Motors Corporation

KALAMAZOO, MICHIGAN

SERVICE INFORMATION

STEERING COLUMN ENERGY ABSORBING

AFTER CHASSIS 90000 ON A11 & A12 MODELS
AND 9000 ON A12W6 & A12W8 MODELS

LOCKING ENERGY ABSORBING STEERING COLUMN

AFTER CHASSIS 01000 ON A11 & A12 MODELS
AND 0100 ON A12 W8 MODELS

ENERGY ABSORBING STEERING COLUMN

DESCRIPTION

The energy absorbing steering column (1969) and the energy absorbing, function locking (1970) steering columns are used on all Checker Motors automobiles.

When an automobile is being driven, the forward movement of the automobile and the forward movement of the driver both constitute a form of energy or force. When an automobile is involved in a frontal collision, the primary force (forward movement of the car) is suddenly halted, while the secondary force (the driver) continues its forward direction. A severe collision generally involves these two forces - the primary and the secondary forces. The secondary impact occurs when the driver is thrust forward onto the steering wheel and column.

The Energy Absorbing Column is designed to absorb these primary and secondary forces to the extent that the severity of the secondary impact is reduced. During a collision the steering column compresses, thereby reducing its tendency to move rearward into the driver's compartment. A split second later when the driver is thrown forward (the secondary impact) his energy is also partially absorbed by the compression characteristics of the column.

The Energy Absorbing Column assembly may be easily disassembled and reassembled. The serviceman should be aware that it is important that only the specified screws, bolts and nuts be used as designated during reassembly, and that they are tightened to their specified torque. This precaution will insure the energy absorbing action of the assembly. Care should be exercised in using overlength bolts as they may prevent a portion of the assembly from compressing under impact. Equally as important is correct torque of the bolts and nuts. Care should be taken to assure that the bolts or nuts securing the column mounting bracket to the instrument panel are torqued to the proper specification in order that the bracket will break away under impact.

When the Energy Absorbing Column is installed in a car it is no more susceptible to damage through usage than an ordinary column; however, when the column is removed, special care must be taken in handling this assembly. Only the specified wheel puller should be used. When the column is removed from the car, such actions as a sharp blow on the end of the steering shaft or shift levers, leaning on the column assembly, or dropping of the assembly could shear or loosen the plastic fasteners that maintain column rigidity. It is, therefore, important that the removal and installation, and the disassembly and reassembly procedures be carefully followed when servicing this assembly.

The energy absorbing, function locking column has the ignition switch lock mounted conveniently on the column. With this column mounted lock, the ignition, steering and gearshift operation can be locked to inhibit theft of the automobile.

The operation of the lock is the same as in previous car models. To start the car, you insert the key in the lock, turn the unit to "start" and let the switch return to the "on" position. The "off", "lock" and "accessory" positions are also the same as in previous years, and are located in exactly the same order as they were when the unit was mounted on the instrument panel. The only thing that has changed is the lock's location and its function. By mounting the ignition lock on the column, two new features are possible.

When you engage the shift lever in "park" for automatic transmissions, or "reverse" for standard transmissions, and lock the ignition, the steering wheel locks and the gearshift locks. Stealing the car now becomes much more difficult.

OPERATION

The unique design permits the steering column (and wheel) to collapse (several inches on the 1969 Mesh type column and up to 8.25 inches on the 1970 plastic injected model) toward the instrument panel during a collision. This forward movement is permitted and achieved with a special bracket mounting the column to the instrument panel. When a severe force is applied at the steering-wheel-end of the colomn, special mounting-bracket capsules allow the column to break away from the instrument panel and travel forward. Simultaneously, on severe impact, the lower end, to which the steering gear is attached, has the ability to move rearward several inches resulting in an overall reduction in column length.

The steering column assembly generally consists of three parts; 1. The outside jacket (1969) has a special perforated-steel (mesh-like) mid-section of about 10 inches long with five built-in bulges. In a collision, bulges fold and the jacket collapses with accordion-like action. 2. The steering shafts (solid and tubular) and the jacket on the 1970 model are held together by a plastic and metal joint. Collision impact is predicted to snap this joint while the two parts then shorten by over-riding one another. 3. The gearshift tube simply telescopes on impact, that is, one section collapses into the other section having a larger diameter.

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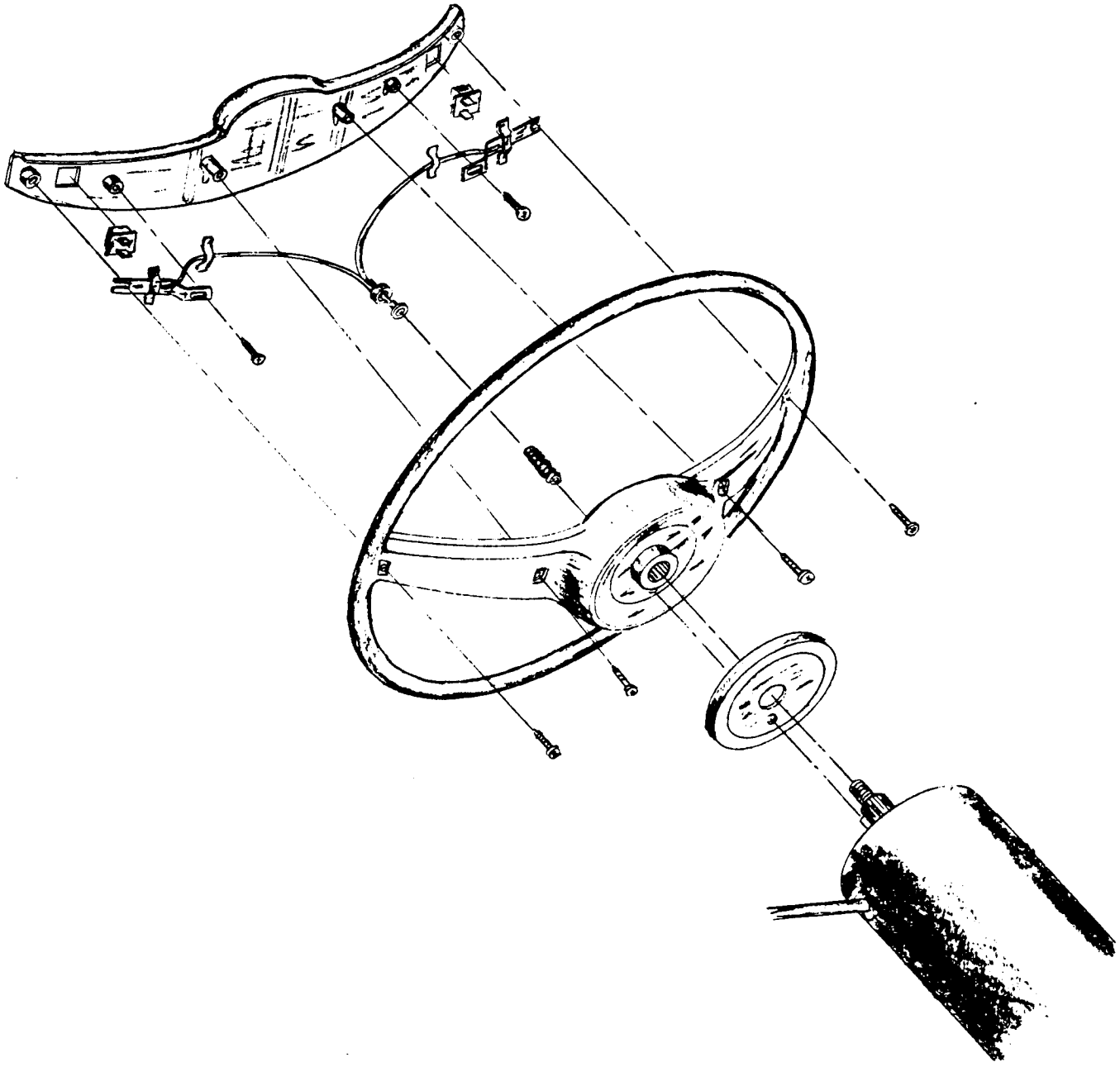
STEERING WHEEL REMOVAL & INSTALLATION

Remove the shroud and horn contact assembly by loosening the four bottom attaching screws.

Remove steering wheel with Puller J-21232. Note lineup of dash marks on steering shaft and steering wheel.

On installation tighten steering wheel nut to 25-35 foot-pounds torque.



STEERING WHEEL AND SHROUD

ILLUSTRATION NO. 1

STEERING COLUMN REMOVAL

NOTE: Once the steering column is removed from the car, the column is extremely susceptible to damage. Dropping the column assembly on its end could collapse the steering shaft or loosen the plastic injections which maintain column rigidity. Leaning on the mast jacket could cause jacket to bend or deform. Any of the above damage could impair the column's collapsible design. If it is necessary to remove the steering wheel, use standard wheel puller. Do not hammer on end of shaft, as hammering could loosen plastic injections which maintain column rigidity.

Remove two nuts securing halves of flexible coupling together.

Disconnect shift linkage from shift lever.

Disconnect all electrical connectors from steering column assembly.

Remove screws securing the left hand and right hand plate and gasket assembly to floor.

Remove bolts securing bracket to instrument panel and carefully withdraw column.

Note location of wedges at front. Remove bracket to column bolts and remove bracket.

CAUTION: Set bracket aside to protect breakaway capsules.

NOTE: Bracket capsules are slotted to permit column movement for adjustment.

Remove column from car.

STEERING COLUMN INSTALLATION

Make sure this procedure is followed in exactly this order.

Attach mounting bracket to column.

Install column into position and loosely attach mounting bracket to pedal support with two mounting bolts.

CAUTION: Do not use longer bolts or over-torque the bolts. The correct bolts and torque are necessary to insure the breakaway action of the bracket and capsules in the event of a collision.

Attach column at coupling with torque of 15-20 foot-pounds on the bolt.

Tighten mounting bracket bolts to pedal support with torque of 15-25 inch-pounds.

Attach left hand and right hand cover and gasket assembly to the floor.

Re-connect all electrical connections.

Re-assemble and adjust shift linkage.

WARNING: Make certain that column instrument panel mounting is never unsupported when either dash mounting or gear mounting is connected.

1969 STEERING COLUMN DISASSEMBLY (Refer to Illustration 2 for all callouts.)

Remove wire protector and cover (12 & 13).

Use Steering Column Support Fixture Tool J-22573-1 to mount steering column jacket tube assembly in a vise, or clamp in the vise at the tapped mounting plate.

Remove directional signal lever. Push Hazard Warning knob in and remove knob.

Drive out the shift lever pivot pin and remove the shift lever.

Remove the directional signal cam by prying it off the steering shaft.

Remove the retaining "C" snap ring (39) from the upper end of the steering shaft with Steering Shaft Snap Ring Remover and Installer Tool J-22569.

Index the tool into the snap ring opening and force the snap ring out of the groove by twisting the tool. Complete the snap ring removal with a screw driver and remove thrust washer and wave washer (40 & 41).

Remove the steering shaft assembly (14) to eliminate the possibility of its sliding out and being damaged. The adjuster assembly components and spring will remain on the steering shaft.

NOTE: It is not necessary to further disassemble the steering column for steering shaft replacement. Refer to Steering Shaft Installation for correct shaft adjustment.

Loosen the three directional signal mounting screws until the cover assembly (32) can be rotated counterclockwise. To aid in assembly, do not completely disengage the screws. Rotate the cover assembly counterclockwise and pull straight up off the top of the jacket tube.

If it is necessary to service the components of the cover assembly, remove the three mounting screws from the lock plate (35). Use caution during removal of the screws so that the springs are not lost.

The gear shift lever housing can now be removed (17)

Remove the neutral switch or back-up light switch.

The following two steps are required to disassemble the lower end of the manual transmission.

Remove the three bolts that secure the reinforcement ring and the adapter assembly to the jacket tube.

Remove the adapter assembly, including the bearing, low-reverse lever and lever spacer.

The following three steps are required to disassemble the lower end of automatic and floor shift columns.

Remove the bearing adapter wire clip.

Remove the bearing adapter, the adjuster assembly components and spring.

Remove the indicator wire and clip.

Withdraw the operating shaft (15) from the lower end of the jacket tube.

Remove the lower bowl bearing (11) from the jacket tube (10).

NOTE: In case only the operating shaft requires service, it is not necessary to remove the gear shift housing or directional signal housing. However, the gear shift lever must be removed.

1969 STEERING COLUMN REASSEMBLY

Apply a coating of grease to all friction surfaces.

Install the lower shift bowl bearing (11) into the jacket tube (10).

Insert the operating shaft in the jacket tube. Install the lever spacer, low-reverse lever, adapter assembly and reinforcing ring on the lower end of the jacket tube. Install the three original cap screws loosely.

NOTE: The raised projections on the shift levers must face each other. Place a .005" shim between the low-reverse lever and the lever spacer. Using Shift Lever Adjusting Spanner Wrench Tool J-22568, rotate the adapter assembly clockwise as viewed from the bottom of the tube (4).

When this adjustment has been made, tighten the three bolts to 15-22 inch-pounds torque.

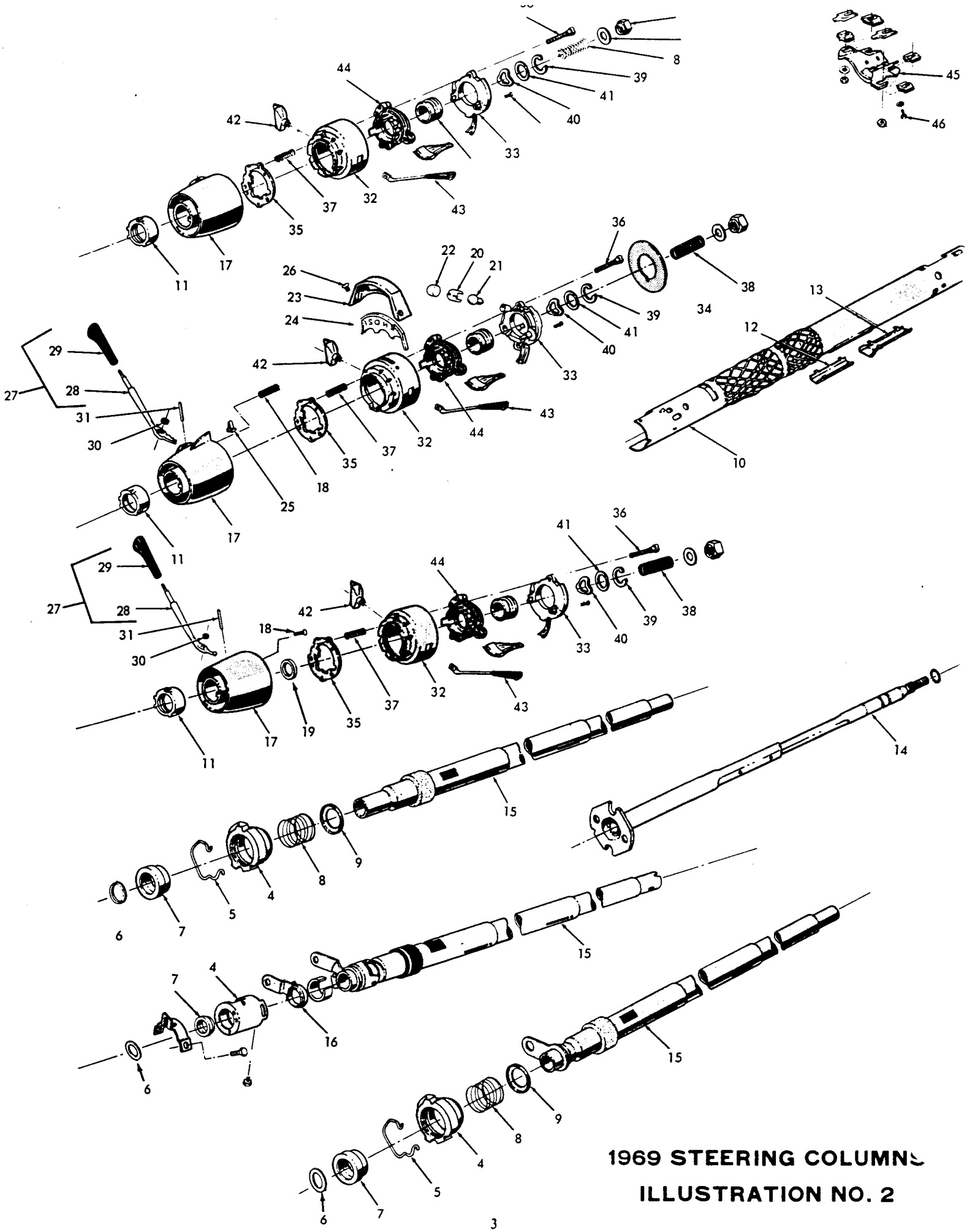
Install the bearing adapter retaining clip (5).

Using original screws attach the neutral switch or back-up light switch. Make certain the switch toggle enters in the opening in the operating shaft. The switch will be adjusted after the linkage is secured to the lower levers.

Install switch assembly on top of switch housing and feed wires through switch cover.

Feed switch wires through the gear shift housing and place directional signal housing on top of gear shift housing.

Place the gear shift housing and directional signal housing on top of the jacket tube. Make certain that the tang on the I.D. of the lock plate is aligned with the slot in the jacket tube.



1969 STEERING COLUMNS

ILLUSTRATION NO. 2

Push down on the assembly and rotate fully clockwise.

Tighten the three mounting screws to 30 to 40 inch-pounds torque.

Install the steering shaft including the adjuster assembly from the lower end of the jacket tube.

Install the wave washer and thrust washer (40 & 41) over the steering shaft and against the bearing.

Install "C" snap ring (39) on taper of steering shaft and with the use of Steering Shaft Snap Ring Remover and Installer Tool J-22569, press the snap ring into the groove on the steering shaft.

1970 STEERING COLUMN DISASSEMBLY (Refer to Illustration 3 for all callouts)

DISASSEMBLY OF UPPER END

Make sure column is not bent during removal from car.

Remove steering wheel using standard wheel puller. **Do not hammer end of steering shaft.**

Remove the three cover screws and lift cover off the shaft.

Depress lock plate (35) downward as far as possible using special tool and the hand wheel nut. Pry the round wire snap ring out of the shaft groove. Remove the snap ring and lock plate. (Caution: with ring removed, shaft could slide out bottom of column causing damage to shaft.)

Slide upper bearing preload spring (45) and turn signal cancelling cam (12) off upper steering shaft.

Slide thrust washer (47) off upper steering shaft.

Remove turn signal lever screw and lever (61 & 62).

Push hazard warning switch (57) in and unscrew knob.

Remove three switch mounting screws (42). Disconnect the turn signal switch and wire assembly (51) at the jacket. Wrap a piece of tape around the upper part of the connector and wires to prevent snagging when removing switch.

Pull the switch straight up with wire protector.

The lock cylinder may be removed in any position from "accessory" to "run". However, the "off-lock" position is recommended because of its positive location.

Insert a thin tool (small screw driver or knife blade) into the slot next to the switch mounting screw boss (right-hand slot) and depress spring latch at bottom of slot, which releases lock. Remove lock.

The buzzer switch (19) can be pulled straight out of the housing. A flat spring wedges the switch toward the lock cylinder. (This may be done without the removal of the lock cylinder. If the lock cylinder is in the housing, it must be in the "run" position.)

NOTE: If service is required on the upper end only, the preceding can also be performed on the car.

To remove any further parts from the upper end, the ignition switch (50) should be removed. The switch should be positioned in "off-lock" position before removing. If the lock cylinder has already been removed, the connecting rods to the switch should be pulled up to a definite stop and then moved down one detent, which is the "off-lock" position. Now remove the two attaching screws and the switch.

Drive out upper shift lever pivot pin and remove upper shift lever.

Remove the four screws (41) attaching the upper housing to the jacket. Remove the upper housing assembly (11).

Remove thrust cup (21)

Remove the rack and lock bolt (22).

Remove the load spring (25).

Remove the shift gate (18).

Remove the sector (24) through the lock cylinder hole by pushing firmly on the block tooth of the sector with a blunt punch.

Remove shift bowl (7) and shroud (15) from the jacket (28).

DISASSEMBLY OF LOWER END

NOTE: Steering wheel, cover, shaft lock, "C" ring, spring, cancelling can and flat washer must be removed prior to disassembly of the lower end. Following instructions above.

Pull steering shaft (30) assembly from bottom of column.

Remove the two screws (56) holding the neutral-start switch or the back-up switch and remove switch (53 & 54).

Remove bearing adapter clip (34)

Remove bearing adapter (2), bearing (1) (also first-reverse lever on Standard Transmission model) and shift tube spring (44). (Bearing may be removed from adapter by a light press-out operation on the outer race.)

Remove three screws from bearing at lower end on manual transmission models.

Slide out shift tube assembly (31).

Remove wave washer (48) and lower bowl bearing (27) from top of jacket.

1970 STEERING COLUMN REASSEMBLY

REASSEMBLY OF UPPER END

Apply a thin coat of lithium soap grease to all friction surfaces.

Install the sector (24) in the lock cylinder hole over the sector shaft with the tang end to the outside of the hole. Press the sector over the pin with a blunt tool.

Install the shift gate (18) to the housing.

Insert the rack spring (25) in the housing from the bottom side. The long section should be toward the handwheel and hook on the edge of the housing.

Assembly the bolt (16) to the cross-over arm (22) of the rack.

Insert the rack and lock bolt into the housing from the bottom with the teeth up (toward handwheel) and toward the centerline of the column.

Install the thrust cup (21) on the bottom hub of the housing.

Install lower bowl bearing (27) in jacket and place wave washer (48) in bowl bearing.

With the bowl in place, install the upper bearing housing (11) assembly on the jacket. The bowl should be in the "park" position and the rack pulled downward. Be sure the housing is seated on the jacket and drive the screws.

Assemble buzzer switch (19) to spring clip (20) with formed end of clip around the lower end of switch and spring bowed away from switch. This should lay on the switch opposite the contacts. Push switch and spring into hole with contacts toward the cylinder bore.

To replace the turn signal switch (51), be sure the wire harness is in the protector (37). Feed the connector and protector down through the housing and under the mounting bracket. Drive the three mounting screws. Clip the connector to the bracket on the jacket.

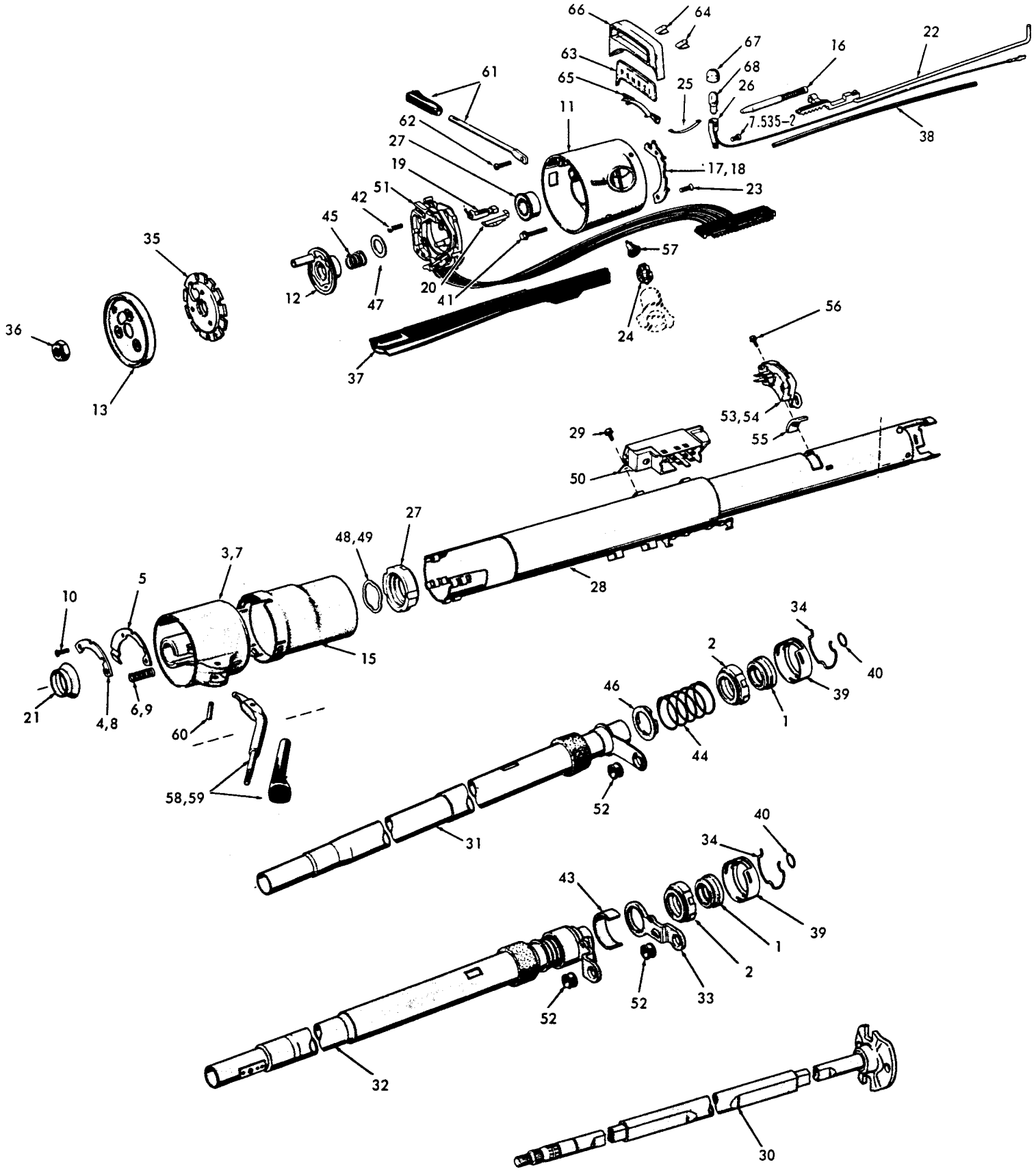
To install lock, hold lock cylinder sleeve and rotate knob clockwise against stop. Insert cylinder into housing bore with key on cylinder sleeve aligned to keyway in housing, push in to abutment of cylinder and sector. Rotate knob counterclockwise, maintaining a light push inward on cylinder, until drive section of cylinder mates with sector. Push in until drive section of cylinder mates with sector. Push in until snap ring pops into grooves and lock cylinder is secured in housing. Check freedom of rotation.

When replacing the ignition switch, place the lock in "off-lock" or detent position. Place the switch in "off-lock" by the following procedure:

1. Position the switch on the jacket.
2. Move the slider to the extreme left.
3. Move the slider back one position to the right of the "off-
3. lock" position.

Fit the actuator rod into the slider hole and assembly to the column with two screws. Caution should be exercised to prevent moving the switch out of detent. Use only the correct screws. Tighten to 30-40 pound-inches.

Assemble washer, spring and cancelling cam on shaft, making certain that the turn signal switch is in "neutral" and the hazard warning plunger is out. Assemble the shaft



1970 STEERING COLUMN - FUNCTION LOCKING, ENERGY ABSORBING

ILLUSTRATION NO. 3

lock plate on the shaft, depress these parts and install a new snap ring in groove on shaft. The switch assembly may be damaged if the above procedure is not followed.

Place cover on shaft lock and drive screws.

Assemble steering wheel and levers. Be sure to use tongue depressor in bowl spring. Be sure bowl is in "drive" when inserting shift lever.

REASSEMBLY OF LOWER END

Apply a thin coat of lithium soap grease to all friction surfaces.

Press the lower bearing assembly into adapter assembly.

Insert the shift tube assembly into the lower end of the jacket and rotate until the upper shift tube key slides into the bowl keyway.

On standard transmission column, loosely attach three screws into the bottom of the jacket and shift tube bearing.

Assemble the spring and adapter assembly and the first-reverse lever on manual transmission into the bottom of the jacket. Holding the adapter in place, insert the snap ring in the jacket slots.

On standard transmission models, place a .005" shim between the first-reverse lever and lever spacer and turn upper shaft bearing down and tighten the three screws. Remove the shim.

Install the neutral-start switch or the back-up switch, **making certain the proper screws are used.**

Slide steering shaft assembly into column. (The upper housing should be in place before the shaft is assembled.)

TROUBLE SHOOTING

LOCK SYSTEM

Lock System will not function.

Switch will not unlock.
Check for collapsed sector, damaged lock bolt, defective lock cylinder or damaged housing. Replace.

Switch will not lock.
Check for broken or defective lock bolt spring, damaged sector tooth, defective lock cylinder or damaged housing. Replace. Also check for possible burr on lock bolt or housing or incorrect adjustment on transmission linkage. Remove burr or readjust linkage.

High effort to turn key.
Check for defective lock cylinder, ignition switch or broken or deformed rack preload spring. Replace.
Check for burrs on sector, rack or housing. Remove.
Check for actuator rod restriction. Remove restriction.
Check for bent sector shaft. Replace housing assembly.

High effort on lock cylinder between "off" and "off-lock".
Check for burr on tang of shift gate or distorted rack. Remove or replace.

Switch will stick in start.
Check for deformed actuator rod or any high effort condition.
Straighten or replace actuator rod and check items under high effort section.

Lock bolt hits shaft lock in "off" position and "park".
Check correctness of ignition switch setting. Readjust.

Key cannot be removed in "off-lock".
Check correctness of ignition switch setting and/or check for defective lock cylinder. Readjust or replace.

Lock cylinder can be removed without depressing retainer.
Check for defective lock cylinder retainer or burr over retainer slot in housing. Replace or remove burr.

IGNITION SYSTEM

Electrical system will not function.
Check for defective fuse in "accessory" circuit, connector body looseness or defectiveness, defective wiring or defective ignition switch. Replace, tighten or repair.

Switch will not actuate mechanically.
Check for defective ignition switch. Replace.

BUZZER SYSTEM

Buzzer will not function.
Check for defective buzzer switch, defective switch retainer, defective terminals on signal switch, buzzer switch wedged in tapered hole in housing, door switch failure or dog on lock cylinder defectiveness. Replace.

Buzzer on continuously.
Check buzzer plunger on lock cylinder, defective buzzer switch, short in buzzer terminals or wires of signal switch or short in door switch. Repair or replace.

SIGNAL SYSTEM

Hazard warning, lane change or signal switch without power.
Check for defective fuse, bulb or flasher, defective signal switch. Replace.
Also check for poor connector body connections with main wiring harness. Repair.

Turn signal switch not cancelling from either turn signal position.
Check for broken flat detent spring, broken cancelling springs on signal switch, defective cancelling cam lobes or defective signal switch. Replace.

Turn signal wires shorted out.
Check for wires shorted to each other or to the column (on reassembly, check for burrs and sharp edges). Repair or replace.
Check for defective signal switch. Replace.

Signal switch loose.
Check three mounting bolts. Tighten to 30-40 inch-pounds.
Check signal lever screw. Tighten to 25-30 inch-pounds.
Check signal switch and hub nut. Replace.

Hazard warning knob loose.
Check threads. Tighten knob to 2-5 inch-pounds. If signal switch defective, replace.

Noise in Column.

Coupling bolts not tightened.
Check pinch bolts. Tighten to 25-35 inch-pounds.
Check coupling bolts. Tighten to 25-35 inch-pounds. (Parts should be inspected for damage before reassembly. If serrations or threads are damaged, replace parts.

Column incorrectly aligned.
Check alignment. Realign column.

Coupling pulled apart.
Check coupling. Replace coupling and realign column.
Check lower joint. If broken, replace steering shaft.

Horn contact ring.
Check for lubrication. Lubricate.

Bearing.
Check for lack of lubrication. Lubricate.
Check for lower shaft bearing failure. Replace. (Check shaft and replace if scored.
Check for upper shaft bearing failure. Replace housing assembly.

Shaft lock plate cover loose.
Check three screws. Tighten or replace.
CAUTION: Use specified screws.

Shaft lock snap ring not seated.
Check snap ring and groove. Replace and check for proper seating.

Defective buzzer dog cam on lock cylinder.
Inspect. Replace lock cylinder.

High Steering Shaft effort.
Check for misalignment of column. Realign.
Check for improperly installed or deformed dust seal. Replace.
Check upper and lower bearing. Replace.

High Shift effort.
Check column alignment. Realign.
Check for incorrect lower bowl bearing assembly. Reassemble correctly.
Check for improperly installed or deformed dust seal. Replace.
Check wave washer in lower bowl bearing. Replace if defective.
Check for grease on seal or bearing areas. Lubricate.

Improper Transmission shifting.
Check for sheared shift tube joint. Replace tube assembly.
Check transmission linkage adjustment. Readjust.
Check shift lever for looseness. Replace shift tube assembly.
Check gate plate. Replace.

Lash in Mounted Column Assembly.
Check mounting bolts. Tighten.
Check for broken weld nuts in jacket. Replace jacket assembly.
Check bracket capsules. Replace bracket assembly.