

Steering Columns

INTERNATIONAL HARVESTER

1310 & 1510MHC
Scout II, Terra & Traveler

NOTE — Information on MS1210 was not available from manufacturer at time of publication.

DESCRIPTION

All the steering columns used on International Harvester vehicles have energy absorbing safety features and column locking devices. On the motor home chassis, a tilt-wheel device is standard.

REMOVAL & INSTALLATION

SCOUT II, TERRA & TRAVELER

Removal — 1) Remove bolt and lock washer securing universal joint to steering shaft. Remove six clamp bolts securing column to dash panel. Remove clamp brackets. Note location of two bolts and nuts.

2) Remove bolts securing steering column to brake mounting bracket. Disconnect electrical wiring. Carefully withdraw steering column assembly from chassis. Remove rubber boot from column.

Installation — 1) Slide rubber boot over steering shaft clamp and onto jacket tube. Carefully position steering column assembly in chassis. Connect electrical wiring. With steering wheel and front wheels in straight-ahead position, insert steering shaft splines into universal joint. Install bolt and lock washer and tighten.

2) Secure upper end of column to brake pedal mounting bracket, tightening bolts finger tight. Position rubber boot and secure column lower end to dash panel with upper and lower clamps. Install four capscrews finger tight, securing clamp brackets to dash panel. Install two bolts, nuts and lock washers securing upper and lower clamp brackets. Tighten bolts.

3) Tighten two upper column mounting bolts to brake pedal mounting bracket. Tighten four capscrews at lower column in following sequence: bottom two first, top two last. Check that there is no binding throughout steering gear range of travel.

1310 & 1510 MHC

Removal & Installation — To disconnect steering column lower end, remove pinch bolt securing steering shaft flange to steering shaft. Refer to body manufacturer's instructions for removal and installation procedures at column upper end.

OVERHAUL

SCOUT II, TERRA & TRAVELER

Disassembly — 1) Twist horn button counterclockwise and remove. Disconnect horn wire. Remove screws and horn contact ring. Remove steering wheel nut and washer. Pull off steering wheel using a suitable puller.

2) Remove horn contact spring. Fabricate a suitable tool as shown in illustration (see Fig. 1) to depress lock plate. Install tool as shown in illustration (see Fig. 2) and depress lock plate as far as possible.

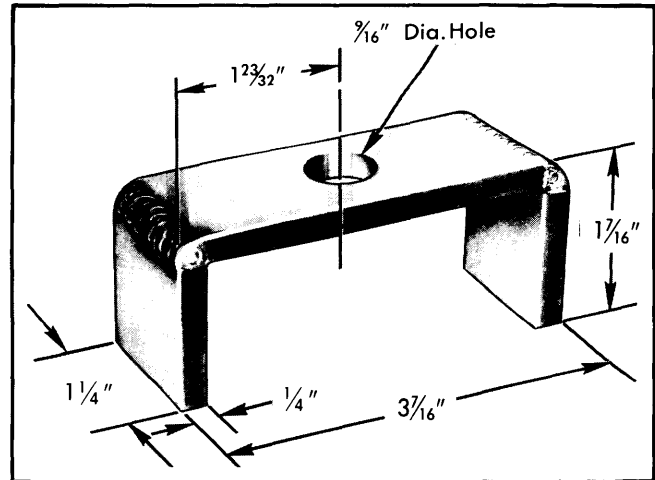


Fig. 1 Lock Plate Depressor Tool

3) Using a small blade screwdriver, pry lock plate snap ring out of groove in shaft. Remove tool, snap ring and lock plate. Steering shaft should slide out bottom of steering column.

4) Remove directional signal cancelling cam, upper bearing preload spring and thrust washer. Remove directional signal lever screw and remove lever. Push hazard warning switch in and unscrew knob.

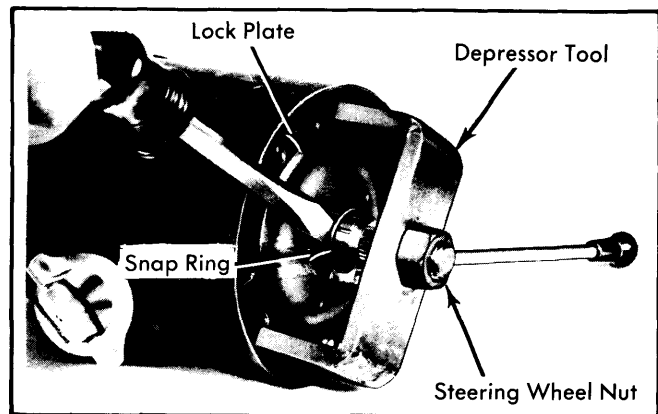


Fig. 2 Removing Snap Ring Using Lock Plate Depressor Tool

5) Remove three directional switch screws. Pull connector out of bracket on column tube. Wrap a piece of tape around upper portion of connector and wires. This will prevent snagging when switch is removed. Pull switch straight out with wire protector.

NOTE — The lock cylinder may be removed in any position ("ACC" to "RUN"), however manufacturer recommends that it be removed in "LOCK" position.

6) Insert a thin tool, such as a machinist's scale or a small knife blade, into the right hand slot next to the switch mounting screw. Depress latch with tool and release lock. Remove lock from steering column.

7) Place ignition switch in "LOCK" position. Pull remote control rod up to stop then push downward one detent. This is the "LOCK" position. Remove two attaching screws from switch and remove switch. Disconnect switch remote control rod from rack.

INTERNATIONAL HARVESTER (Cont.)

8) Remove four screws securing directional signal switch housing to column tube. Remove directional signal switch housing and shroud from column tube. Remove screws and separate directional signal housing from shroud.

9) Remove washer, spring, lock lever and rack, and lock bolt from directional signal housing. Using a drift punch, drive sector out through lock cylinder opening.

10) Pull steering shaft out of column. Remove spacer from shaft. Using a screwdriver, drive lower bearing adapter out of column tube. Carefully drive or press lower bearing out of adapter.

Reassembly - 1) Apply a thin coat of lithium soap base grease to all friction components before reassembly. Drive or

press new bearing into adapter. Insert sector through lock cylinder hole in directional signal switch housing. Place on sector shaft so that tang end faces toward cylinder hole. Press sector on shaft.

2) Install rack and lock bolt in housing from bottom making sure teeth are up toward steering wheel. Make sure the rack and sector are correctly positioned. The first tooth of sector must engage the first rack groove.

3) Install lower bearing with adapter in column tube. Install spacer on steering shaft. Make sure chamfered side of spacer faces toward bearing.

NOTE - If steering shaft clamp was removed, make sure clamp is positioned on shaft, so that when shaft is turned there will be no binding within column.

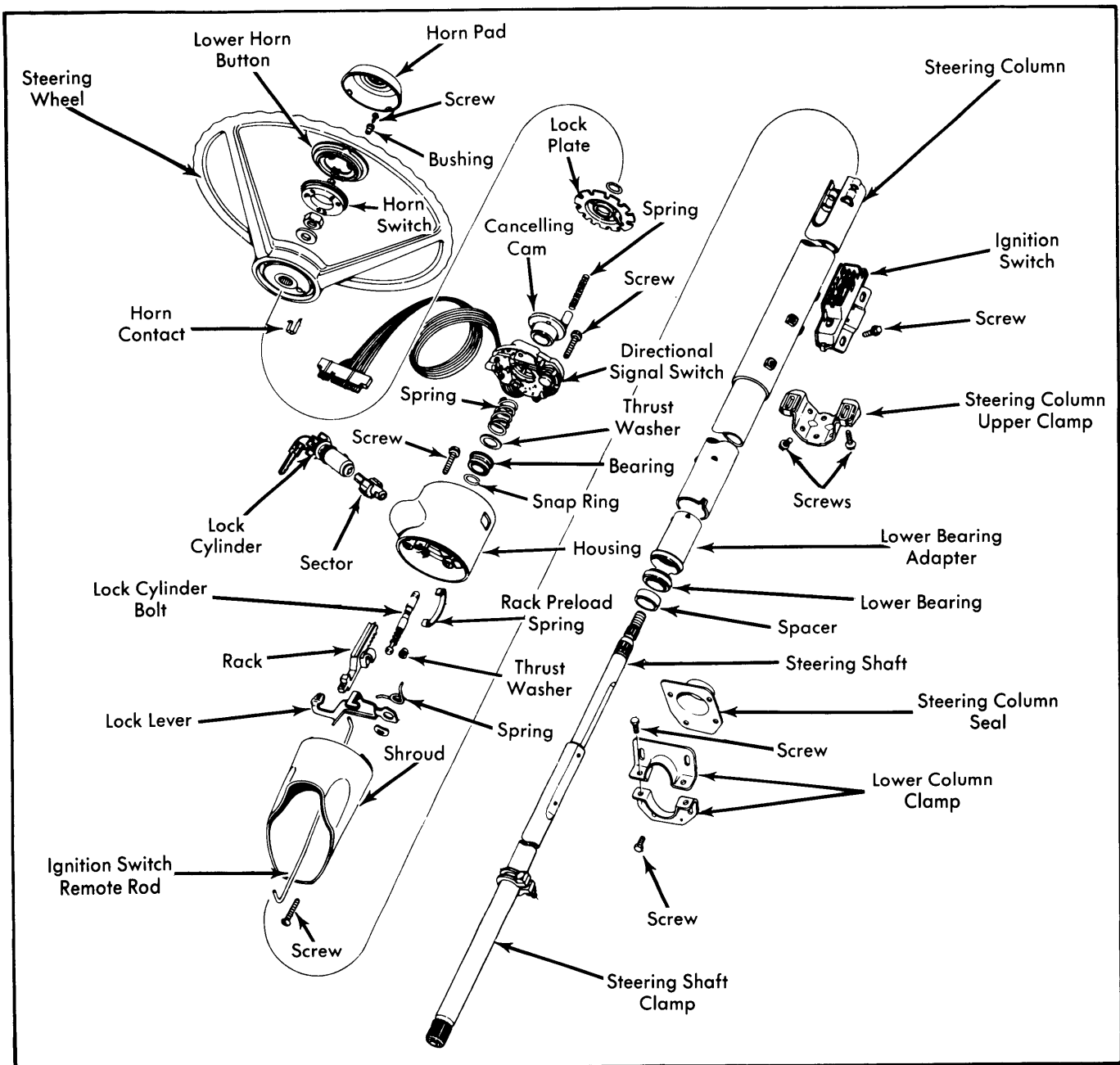


Fig. 3 Exploded View of Scout II, Terra and Traveler Steering Column

Steering Columns

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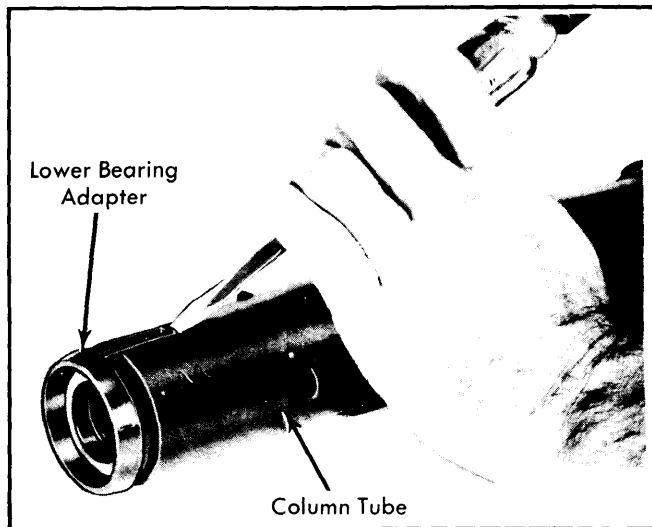


Fig. 4 Removing Lower Bearing Adapter

4) Install steering shaft in column tube. Install lock lever, spring and washer in directional signal housing. Install shroud on directional signal housing. Install and tighten three retaining screws.

5) Install directional signal switch housing on column tube. Install and tighten four retaining screws. Hook ignition switch remote control rod in lower end of rack.

6) Place ignition switch on column tube. Install and tighten two retaining screws. Pull ignition switch remote control rod toward steering wheel end of column as far as possible then move down one detent.

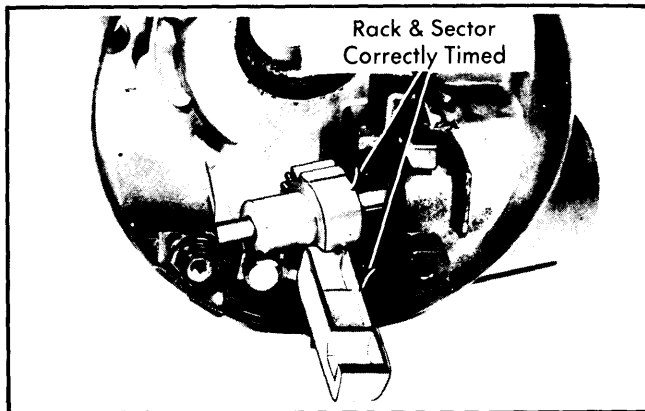


Fig. 5 Correctly Timing Rack and Sector

7) Place lock cylinder in "LOCK" position. Install cylinder in directional signal switch housing. Cylinder will snap into position.

8) Feed directional signal wiring harness down through housing and through bracket on column tube. Place directional signal switch in position. Install and tighten three retaining screws.

9) Install hazard switch knob. Pull out on knob to turn switch off. Install directional signal lever and tighten screw. Install thrust washer, upper bearing preload spring and directional signal cancelling cam on steering shaft.

10) Install lock plate and snap ring on steering shaft. Place depresser tool on steering shaft and tighten steering wheel nut. With lock plate depressed as far as possible, insert snap ring in groove. Remove nut and depressor tool.

11) Install horn contact spring. Install steering wheel. Install and tighten retaining nut and washer. Install horn button.

1310 & 1510MHC

Disassembly — Remove horn pad and pad mounting plate. Mark relationship of steering wheel and shaft. Remove steering wheel retaining nut and washer. Pull off steering wheel using a suitable puller.

2) Remove horn contact spring, directional signal switch cancelling cam and upper bearing spring. Pry wiring harness cover out of column slots. Mark the location of each wire color in connector. Now remove each wire from connector with a suitable terminal remover tool (SE-2406).

3) Remove directional signal switch lever screw and remove lever. Push in on hazard warning light knob. Unscrew and remove knob. Remove automatic transmission selector lever indicator retaining screws. Remove dial, bulb shield and bulb.

4) Unscrew and remove tilt release lever. Place a suitable puller (SE-2407) in directional signal housing as shown in illustration (see Fig. 7).

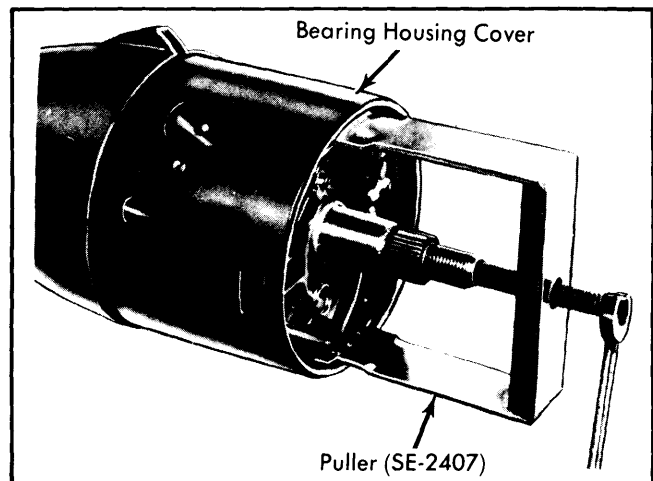


Fig. 7 Removing Directional Signal Housing Cover

5) Make sure puller tangs lock inside cover and pull cover from housing. Remove three directional signal switch mounting screws. Remove switch from column, carefully guiding wiring harness through opening in shift lever housing.

6) Remove lower bearing adapter snap ring. Remove lower bearing adapter retainer. Remove bearing and adapter as an assembly. Press bearing out of adapter. Install tilt release lever and place column in full up position.

7) Remove tilt lever spring and retainer by inserting a screwdriver that just fits into slot opening. Push screwdriver in approximately $\frac{3}{16}$ " and rotate clockwise approximately $\frac{1}{8}$ turn until retainer ears align with grooves in housing. Remove retainer spring.

INTERNATIONAL HARVESTER (Cont.)

8) Remove steering shaft bearing lock nut. Remove upper bearing race seat and bearing. Remove two bearing housing pivot pins using a suitable removal tool (SE-2408).

9) Pull up on tilt release lever to disengage lock shoes and remove bearing housing. Press upper and lower bearings out of housing. Using an expanding type puller connected to a slide hammer, remove bearing races from housing.

10) Remove tilt release lever. Using a suitable punch, drive out shoe release lever pin. Remove lever spring and wedge. Drive out lock shoe retaining pin with a punch. Remove shoes and shoe springs.

11) Pull steering shaft out through upper end of column. Turn upper steering shaft 90° to yoke and lower steering shaft. Slide upper steering shaft and centering spheres from yoke and lower steering shaft.

12) Rotate centering spheres and remove spheres with preload spring from upper shaft. Remove bearing housing support screws and remove support. Remove shift tube snap ring with a screwdriver. Remove thrust washer.

13) Remove neutral safety switch from column. Remove shift tube assembly using a suitable remover tool (SE-2409). Insert hooked end of tool in notch in shift tube just below shift lever bowl shroud key.

14) Guide tool sleeve over threaded end and into upper end of shift tube. Turn nut on tool to force shift tube out of shroud. Removal can be completed by hand if nut bottoms out on tool.

15) Slide lock plate out of column notches by tipping downward toward column shroud to compress wave washer. Remove wave washer. Remove shift lever bowl shroud from column tube.

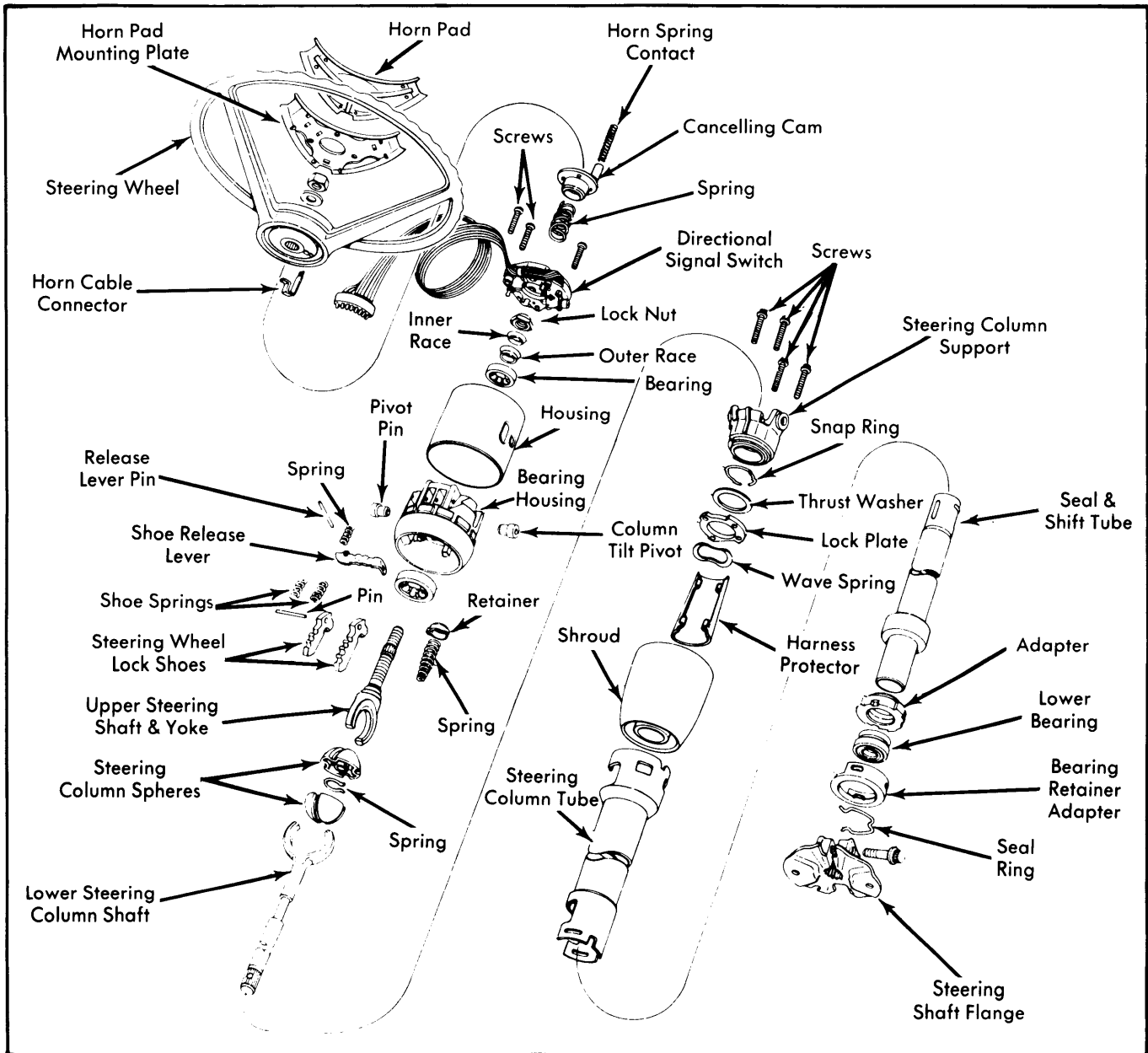


Fig. 6 Exploded View of 1310 and 1510MHC Steering Column

Steering Columns

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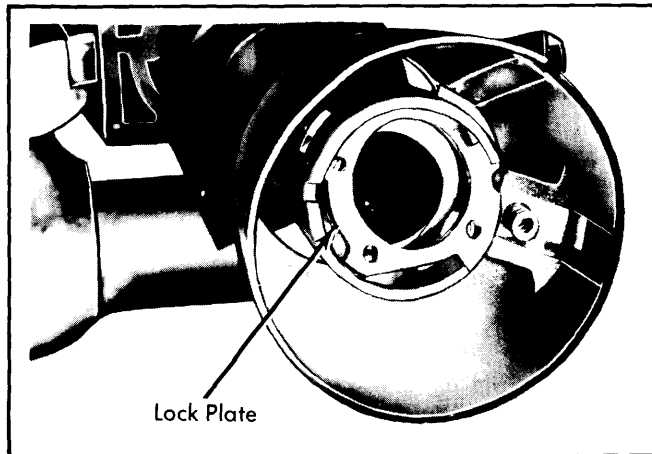


Fig. 8 Removing Lock Plate

Reassembly - 1) Apply Lubriplate 110 to all friction surfaces during reassembly. Place wave washer and lock plate in position in column. Tip plate towards bowl shroud compressing wave washer and working plate into notches.

2) Lubricate lock plate and upper end of shift tube. Install shift tube into lower end of column. Make sure that foam seal is at lower end of shift tube. Align keyway in tube with key in bowl shroud. Use suitable installer tool (SE-2410) to bottom key in shift slot.

3) Remove tool from column. Lubricate and push foam seal in flush with column housing. Pull up on steering column bowl shroud to compress wave washer. Install thrust washer and snap ring. Make sure retaining ring is seated in both slots of shift tube.

4) Lubricate inside of column housing support. Install support, making sure bolt holes in support align with bolt holes in lock plate. Install four support retaining screws. Lubricate and assemble centering spheres and preload spring.

5) Install spheres in upper shaft and rotate 90°. Install yoke and lower steering shaft on upper steering shaft over centering spheres. Slowly straighten shafts while compressing preload spring.

6) Insert shaft assembly in upper end of column tube. Press bearing into adapter. Install bearing and adapter in lower end of steering column. Make sure wide adapter tab is aligned with open slot in column.

7) Position lower bearing adapter retainer over end of column. Make sure open portion of retainer is toward open slot in column. Install snap ring. Make sure all three tabs of snap ring are fully engaged with slots in adapter retainer and jacket tube.

8) Install upper and lower bearing races in housing. Lubricate and install bearings in bearing races. Install lock shoe spring in place in housing. Position lock shoes and compress spring until a small punch can hold shoes in place. Install retaining pins.

9) Install lock shoe release lever. Drive lever pivot pin in position. Install tilt release lever. Install bearing housing support. Hold tilt release lever in up position until shoes have fully engaged support.

10) Lubricate and install bearing housing pivot pins. Press pins in flush with housing. Place housing in full up position and install tilt spring and retainer. Make sure tapered end of spring is installed first. Push retainer into housing approximately $\frac{3}{16}$ " and turn clockwise $\frac{1}{8}$ turn.

11) Lubricate and install upper bearing upper race, race seat and lock nut. Tighten lock nut until it requires 15 INCH Ozs. to rotate steering shaft. Make sure column is in straight ahead position. Remove tilt release lever.

12) Wrap ends of directional signal wiring harness with tape and guide through opening in lower left side of bearing housing and out lower end of bowl shroud. Install directional signal switch. Tighten three screws.

13) Align openings in cover with lever positions. Tap cover into place using a plastic hammer. Install tilt release lever and automatic transmission indicator components. Install directional signal switch lever and hazard warning knob.

14) Bend terminal retaining tabs on each wire end out slightly. Install each wire in marked position in connector. Push in until square part of clip is flush with bottom side of connector. Connect wiring harness to connector.

15) Snap wiring harness cable cover into column retaining slots. Install upper bearing spring. Install turn signal cancelling cam. Make sure directional signal switch is in neutral position when installing cam. Install horn contact spring.

16) Install steering wheel on shaft, aligning marks made during removal. Tap steering wheel into place. Install nut and washer, and tighten. Install horn pad mounting plate and horn pad.

17) Rotate steering wheel 360° clockwise and counterclockwise. Make certain that there is no binding in steering shaft or column components.

TIGHTENING SPECIFICATIONS

| Application | Ft. Lbs. |
|--|----------|
| Scout II, Terra & Traveler | |
| Steering Wheel Nut | 35-45 |
| Steering Column-to-Mount Bracket Bolt | 12-17 |
| Mount Bracket-to-Brake Pedal Mount | 15-25 |
| Lower Column Clamp Bracket Bolt | 35-50 |
| Coupling-to-Steering Gear Clamp Bolt | 35-50 |
| Lower Column Tube Clamp Nut | 40-45 |
| 1310 & 1510MHC | |
| (Information not available at time of publication) | |

| Application | INCH Lbs. |
|--|-----------|
| Scout II, Terra & Traveler | |
| Ignition Switch Mount Bolt | 30-40 |
| Directional Signal Switch Screws | 30-40 |
| Directional Signal Switch Housing Bolt | 70-80 |
| 1310 & 1510MHC | |
| Column Housing Support Screws | 45 |
| Directional Signal Switch Screws | 25 |