

OPEL 1900 AND MANTA STEERING COLUMN ASSEMBLY

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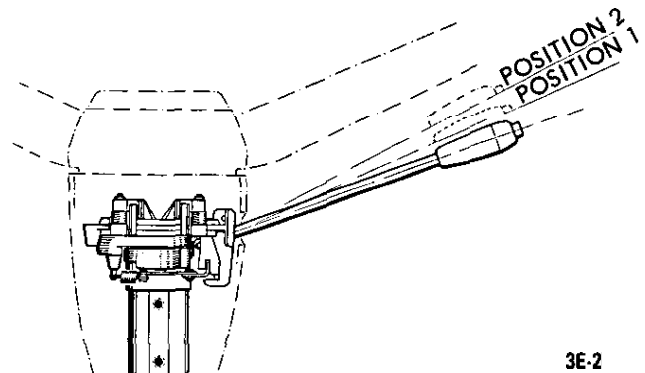
DESCRIPTION AND OPERATION

DESCRIPTION AND OPERATION OF DIRECTIONAL SIGNAL LEVER

The direction signal switch lever is a multi-purpose lever controlling direction signals, passing signal and headlight high and low beams. See Figure 3E-2.

The **direction** signal lever is provided with a two-step mechanism for operation of headlight high and low beams, and passing signal (not in N.J.). With headlights off, moving the lever repeatedly towards steering wheel flashes headlights as a passing signal. With headlights on, moving the lever repeatedly towards steering wheel up to **first** stop also flashes passing signal regardless whether or not the direction signals are switched on. When the lever is moved up to the second stop, the headlights are changed from

high to low beam or vice versa. On all 1900 Rallye cars, when switching from low to high beam position, with the fog lamp instrument panel switch ON



3E-2

Figure 3E-2 Directional Signal Lever Position for Headlamp Operation

and ignition switch in RUN position, the fog lights are automatically switched off. Direction signals work in the normal manner; pushing the lever up for right turn signal and pulling the lever down for left turn signal.

DESCRIPTION AND OPERATION OF HORN

The **horn** button is located in the center part of the steering wheel. The horn is actuated by pushing on the ends of the spokes for the Opel 1900 - Manta and by pushing on the center horn button on 57R, 57L, and GT. The button is provided with a plug connection for each springloaded plunger. See Figure 3E-3.

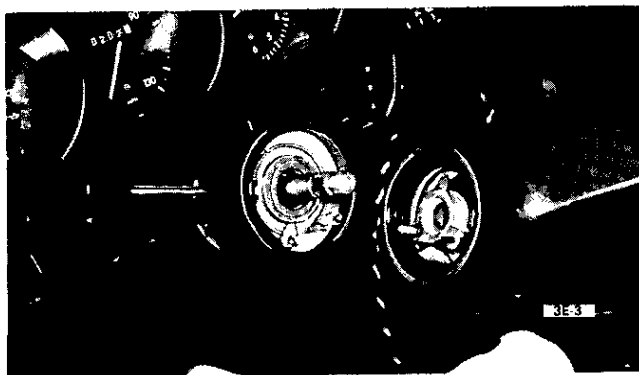


Figure 3E-3 Horn Button Connections (Opel 1900 Manta)

DESCRIPTION OF STEERING COLUMN ASSEMBLY

The steering column mast jacket is provided with a tube-frame section (See B of Figure 3E-4) with bulges which compresses or folds itself, if a sufficiently large energy is exerted to one or other end of the steering mast jacket assembly. This tube-frame section absorbs most of the energy. The steering column consists of two parts, the upper and lower mast jacket assembly and the steering shaft. The **upper** steering mast is firmly connected to the tube **while** the lower steering mast is clearance-free attached to the tube by **means** of injected plastic (See Figure 3E-4). Consequently, the steering mast withstands all torsional stresses.

As soon as the primary energy becomes effective, the plastic pins (c) shear off and the steering shaft compresses. Thereafter the steering mast **jacket** is partly compressed.

A slide-off base is welded to the steering mast jacket. It is provided with two (2) slots for the respective attaching bolts. A metal piece (See Figure 3E-4) is located in each slot which is attached to the slide-off **base** with injected plastic. The open sides of the slots face the driver so that the primary energy cannot

push the steering mast jacket assembly into the passenger compartment. The secondary energy caused **by** the driver can on the other hand effect a shearing of the plastic pins and loosening of the slide-off base so that it moves downwards. Thereby the steering mast jacket assembly is compressed further and absorbs the impact energy to a large extent.

The energy absorbing steering is not more susceptible to damage than a standard steering. However, the steering mast jacket assembly, especially if removed, has in contrast with the standard steering to be given a **different** treatment.

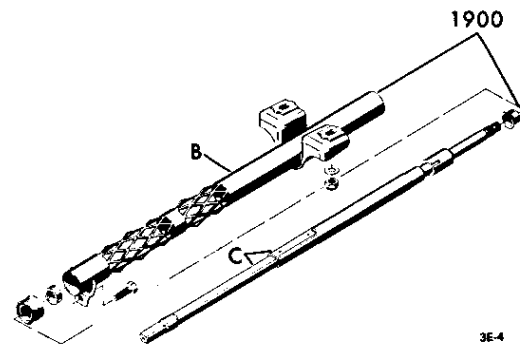


Figure 3E-4 Energy Absorbing Steering Column

The energy absorbing steering column must **by no** means be subject to impacts or blows. A sharp blow onto the exposed steering shaft ends, leaning onto steering column or dropping may loosen or even shear off the plastic attachments which bring **about** rigidity of assembly. In spite of a steering column damaged in this way the operating function of the steering is retained due to the lateral flattenings on steering shaft tube and lower steering shaft. However, after a short period of operation rattling noises will be noticeable so that the steering column has to be replaced. For pulling steering wheel off steering column use appropriate special tool. Therefore, it is of importance that the instructions for removal and installation as well as disassembly and assembly are Strictly adhered to.

MAJOR REPAIR

REMOVAL AND INSTALLATION OF STEERING COLUMN ASSEMBLY

The removal of this assembly is only necessary for

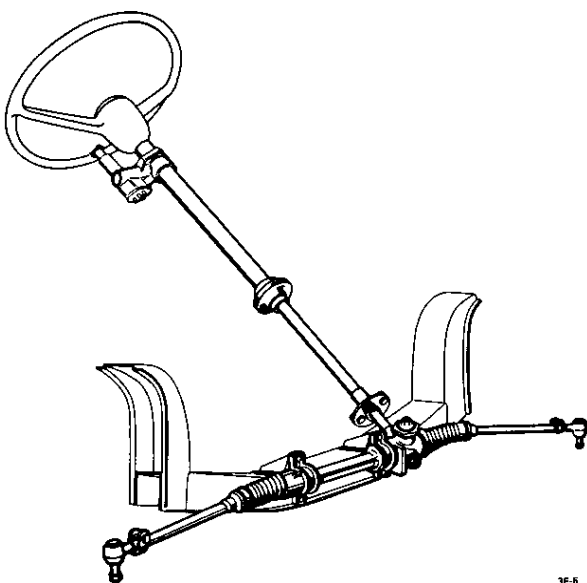


Figure 3E-5 Steering Column Assembly With Gear

replacement of steering column or steering ignition lock parts.

Removal (Opel 1900 . Manta)

1. Disconnect battery.
2. From underside of car, remove clamp screw of upper steering mast out of universal joint flange. See Figure 3E-6.

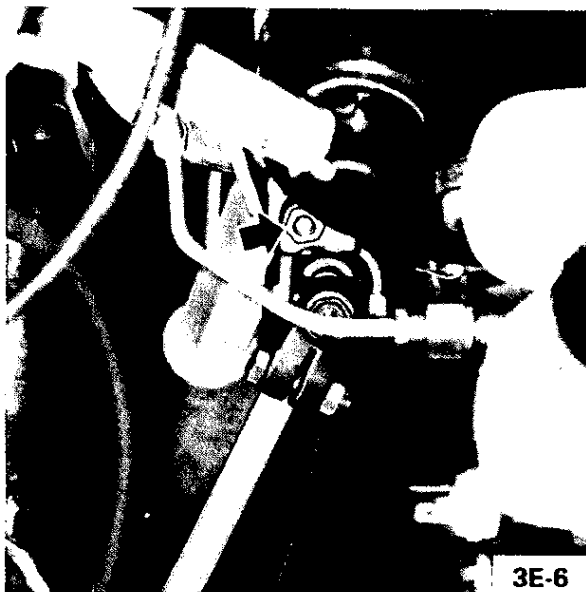


Figure 3E-6 Upper Steering Mast Clamp Screw

3. Remove hex nut from steering mast jacket attachment at front of dash panel. See Figure 3E-7.

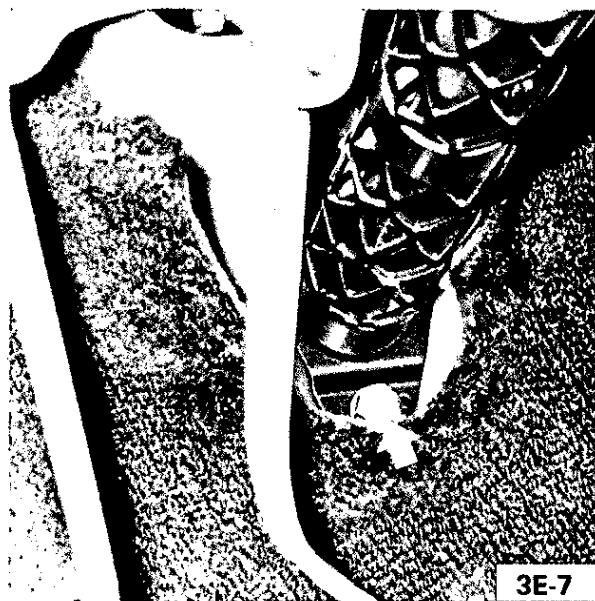


Figure 3E-7 Steering Mast Jacket Attachment

4. Pull off signal switch, as well as steering and ignition lock wire sets.

5. Unscrew slide-off base from underside of instrument panel and remove steering column assembly from car. See Figure 3E-8. Carefully put down assembly. Avoid impacts and blows to steering column assembly.

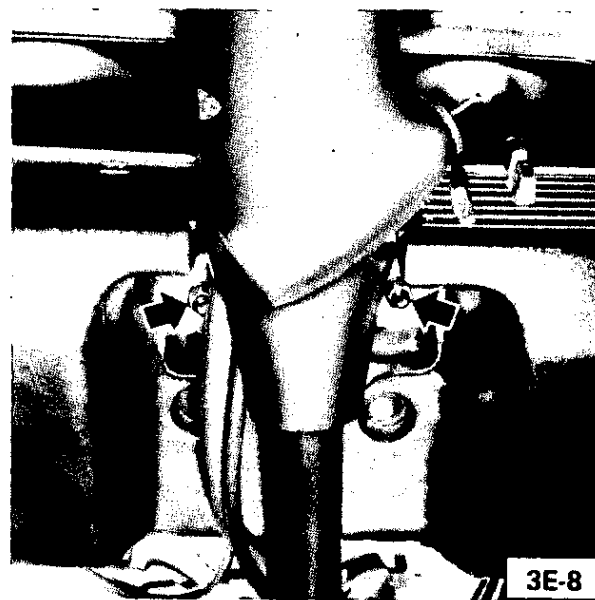


Figure 3E-8 Slide-Off Base Attaching Nuts

Installation (Opel 1900. Manta)

CAUTION: Fasteners are important attaching parts in that they could affect the performance of vital com-

ponents and systems, and/or could result in major repair expense. They must be replaced with one or the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.

On installation, make sure steering wheel spokes point downwards and steering gear is in high point.

1. Carefully insert steering mast into universal joint flange.
2. Loosely attach slide-off base attaching nuts at underside of instrument panel.
3. Attach steering mast jacket at front of dash, using a notched hex nut.
4. Torque nuts at slide-off base to 11 lb.ft.
5. Tighten screw at steering mast clamp to 22 lb.ft.
6. Reconnect wires to directional signal switch and ignition switch.
7. Reconnect battery.

REMOVAL AND INSTALLATION OF STEERING WHEEL

This procedure may be performed with the steering column assembly either removed or installed in the car.

Removal

1. Disconnect battery.
2. Pry off horn cap and remove wires from cap. See Figure 3E-3.
3. Bend lockplate tabs down and take off steering shaft nut and lockplate.
4. Install steering wheel remover J-21686 as shown in Figure 3E-9 and pull off steering wheel.

Installation

1. Before installing steering wheel, lubricate return pin and sliding area on directional signal switch return cams and horn contact ring.
2. Make sure that clamp bolt in steering shaft flange is on top.
3. Make sure notch on steering shaft face is in horizontal position.

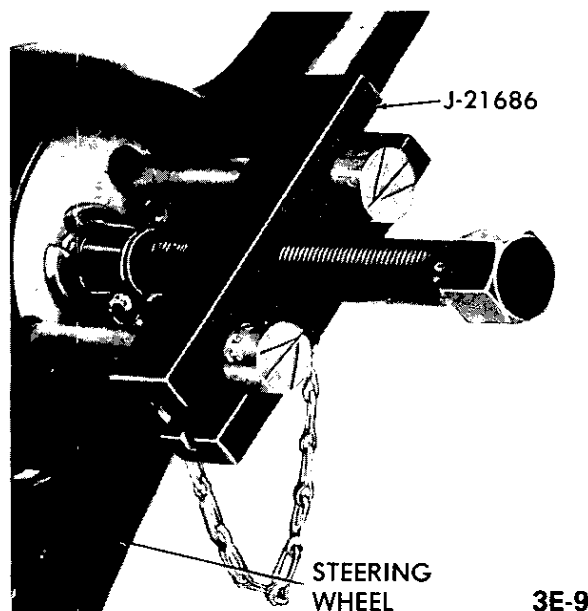


Figure 3E-9 Removing Steering Wheel

4. With the steering wheel centered, place the steering wheel onto the steering shaft.
5. Install steering wheel lockplate and nut. Torque to 11 lb.ft.

CAUTION: This steering wheel to steering shaft fastener is an important attaching part in that it could affect the performance of vital components and systems, and/or could result in major repair expense. It must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of this part.

6. Bend lockplate tabs up, connect horn cap wires and replace cable and cap.
7. Reconnect battery.

REMOVAL AND REPLACEMENT OF HORN CONTACT RING

1. Remove steering wheel.
2. Cut off defective contact ring at wire.
3. Strip wire approximately 1/8".
4. Install new part and solder connection with resin core solder.
5. Lubricate contact ring with lubriplate, or equivalent.
6. Reinstall steering wheel.

DISASSEMBLY AND REASSEMBLY OF DIRECTIONAL SIGNAL SWITCH

This procedure may be performed with the steering column assembly removed or installed in the car.

Disassembly (Opel 1900, Manta)

1. Remove steering wheel (see paragraph above).
2. Pull off signal switch and steering and ignition lock wire set.
3. Pull directional signal lever out of seat. Lever is held in place by a lock ball.
4. Unscrew lower half of signal switch housing cover. See Figure 3E-10.

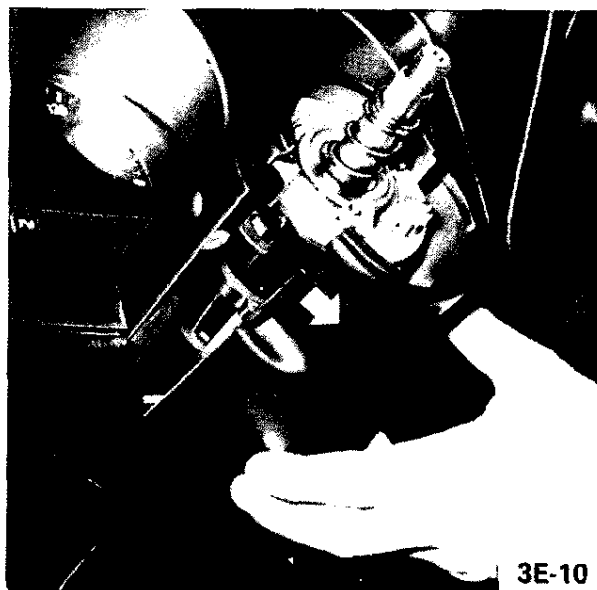


Figure 3E-10 Lower Half of Signal Switch Housing Cover

5. Remove hex nut from steering mast jacket attachment at front of dash panel. See Figure 3E-7.
6. Unscrew slide-off base from underside of instrument panel and remove upper part of signal switch housing cover. See Figure 3E-11.
7. Place a thick piece of wood onto front seat and let down steering mast jacket assembly. When doing this, the front seat must be in its front position.
8. Centerpunch tear-off bolt for steering and ignition lock bracket attachment. Drill a .12 in. (3mm) diameter hole, using an angular-type drill and with a bolt remover with left-hand twist screw out bolt. See Figure 3E-12.

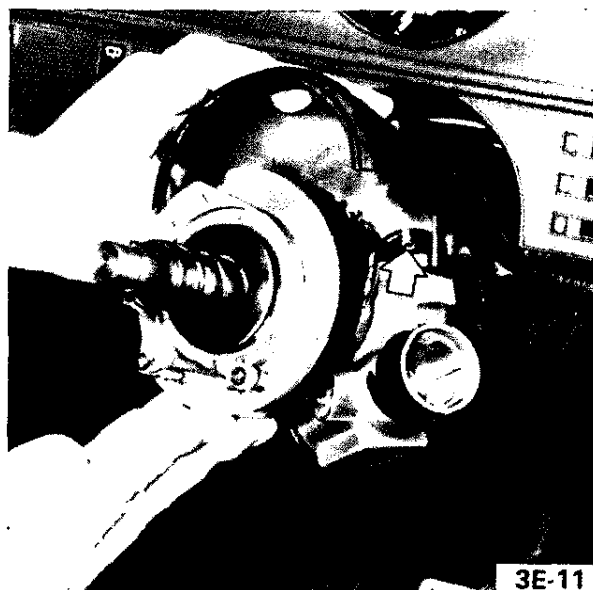


Figure 3E-11 Removing Upper Part of Signal Switch Housing Cover

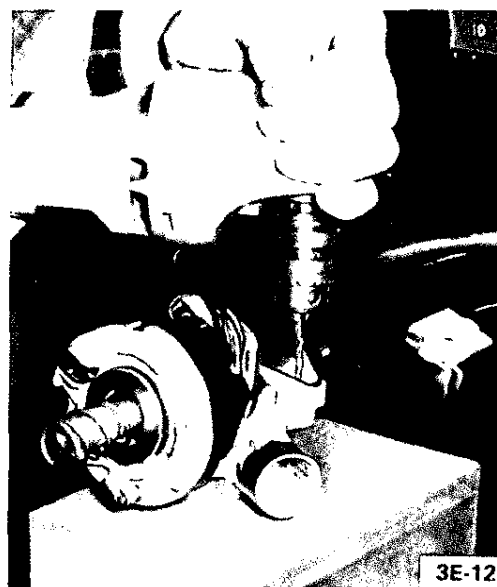


Figure 3E-12 Removing Tear-Off Bolt

9. Remove steering and ignition lock, as well as signal switch from steering mast jacket and *loosely* attach slide-off base below instrument panel.

Reassembly (Opel 1900 - Manta)

1. When replacing a new directional signal switch, install new bearing and snap ring in switch assembly.
2. Install signal switch, as well as steering and ignition lock, to steering mast jacket. To do this, screw

on steering and ignition lock bracket using a new tear-off bolt (hexagon head tears off).

3. Disconnect slide-off base, install upper half of signal switch housing cover, and loosely reattach slide-off base.

4. Attach steering mast jacket at front of dash panel. See Figure 3E-7.

5. Torque slide-off base attaching nuts to 11 lb.ft.

6. Install lower half of signal switch housing cover and connect signal switch, as well as steering ignition lock wire set.

7. Install steering wheel and torque nut to 11 lb.ft. Always use new lock plate.

DISASSEMBLY AND REASSEMBLY OF STEERING AND IGNITION LOCK CYLINDER AND ELECTRICAL SWITCH FROM MAST JACKET ASSEMBLY

Disassembly. GT

Disconnect the **battery** before proceeding.

1. Remove steering wheel.
2. Turn ignition switch to ON position.
3. Insert a suitable rod into stop pin hole on side of steering and ignition lock (See Figure 3E-13) and take out steering and ignition lock cylinder.

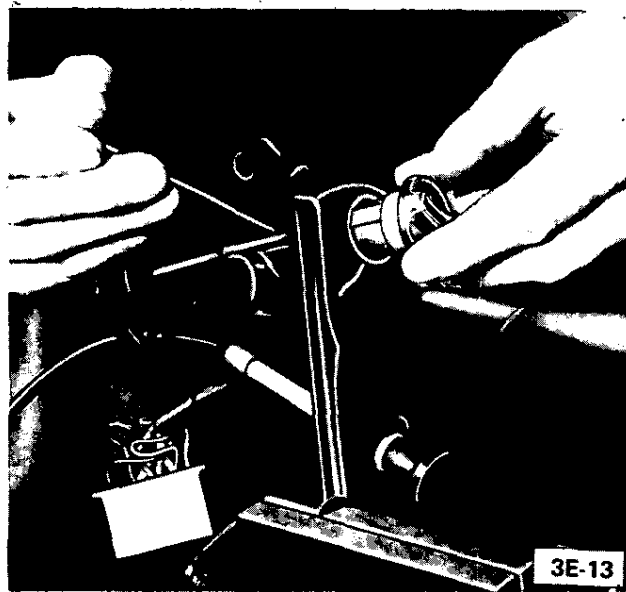


Figure 3E-13 Removing Ignition Lock Cylinder

4. Remove two screws securing electrical switch to steering and ignition lock housing and take out switch.

Disassembly (Opel 1900 • Manta)

1. Remove steering wheel.
2. Unscrew split signal switch housing cover and remove lower half. See Figure 3E-10.
3. Remove lock cylinder by pushing in lock spring of the cylinder using a piece of wire. Cylinder must be in the "1" position. See Figure 3E-14.

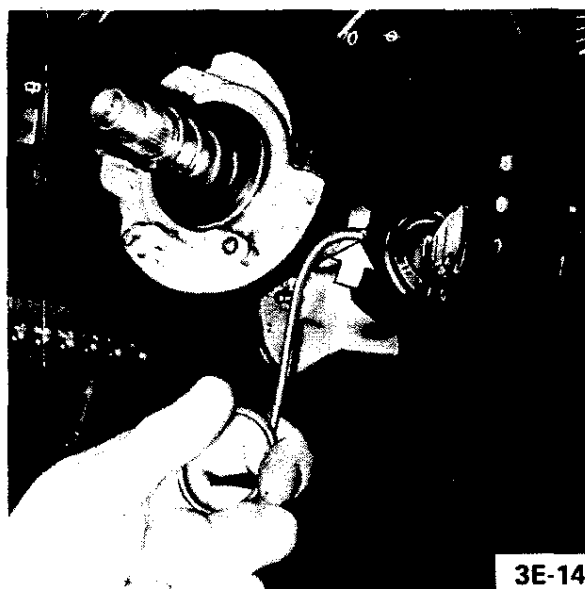


Figure 3E-14 Removing Lock Cylinder

Reassembly

1. On the GT reassemble electrical switch into steering and ignition **lock** housing and rotate switch until: (1) cam in lock housing recess fits into slotted hole in rear of electrical switch, and (2) projection on electrical switch fits into recess on lock housing.
2. On the Opel 1900 • Manta, insert lock cylinder in the "1" position into housing. Install lower half of signal switch housing.
3. Reinstall steering wheel.

SPECIFICATIONS

Steering Column Tightening Specifications

Part	Location	Torque Lb.Ft.
Nut	Steering Wheel Retaining (1900 • Manta)	11
Bolt	Steering Column Flexible Coupling (1900 • Manta)	22
Nut	Slide Off Base Attaching (1 900 • Manta)	10
Nut	Mass Jacket (1 900 • Manta)	11
screw	Steering Mast Clamp (1900 • Manta)	22

GT STEERING COLUMN ASSEMBLY

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DESCRIPTION AND OPERATION

DESCRIPTION OF STEERING COLUMN

The Energy Absorbing, Locking Steering Column assembly is used on the GT. This column is designed to compress under impact. 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 and thereby reduces 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, Locking 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. Particular care should be exercised to avoid using overlength bolts as they may prevent a portion of the assembly from compressing under impact. Equally as important is correct torquing of all bolts and nuts.

When the Energy Absorbing, Locking Column is

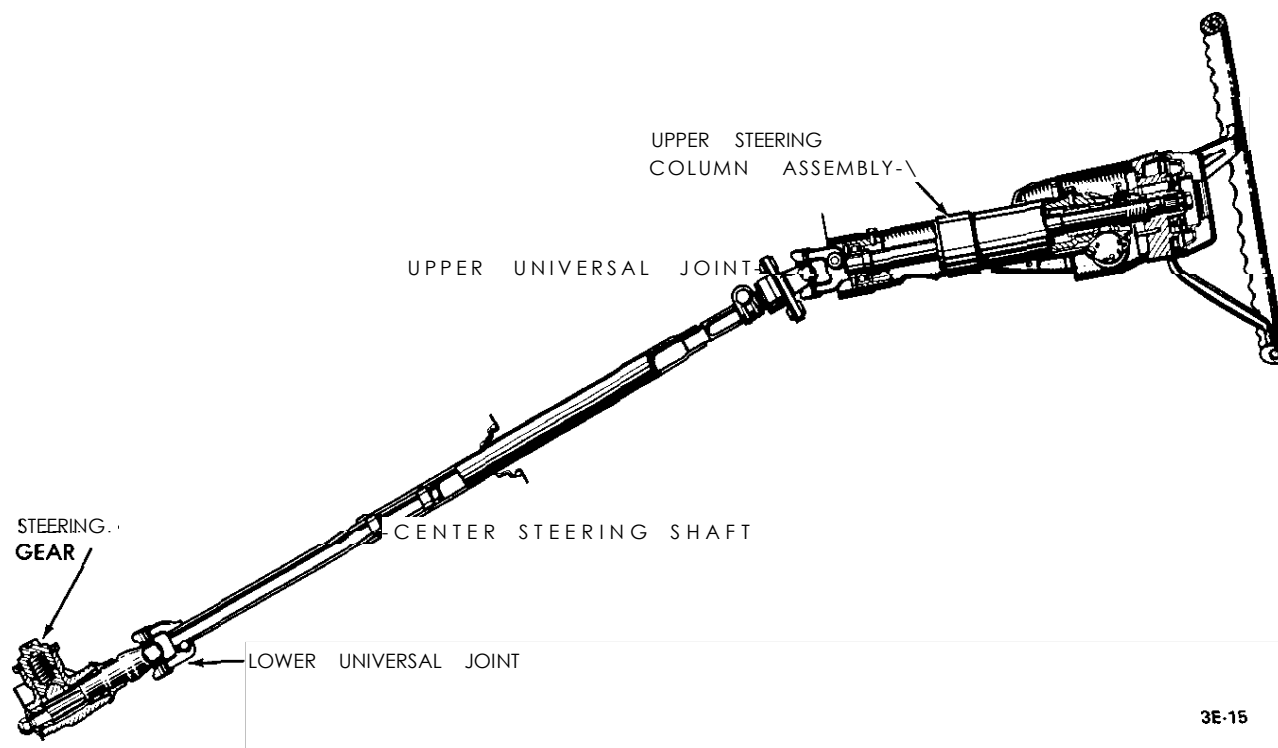


Figure 3E-15 GT Steering Column Assembly

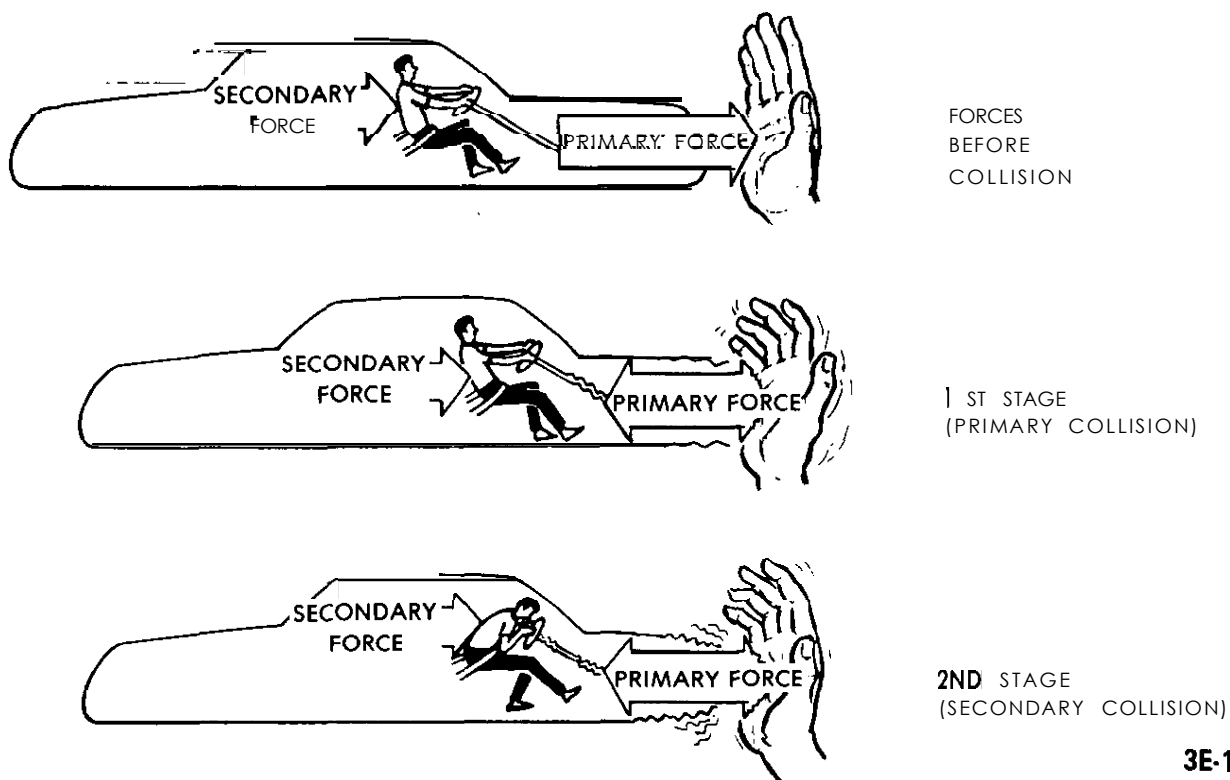


Figure 3E-16 Reaction of Forces in a Collision

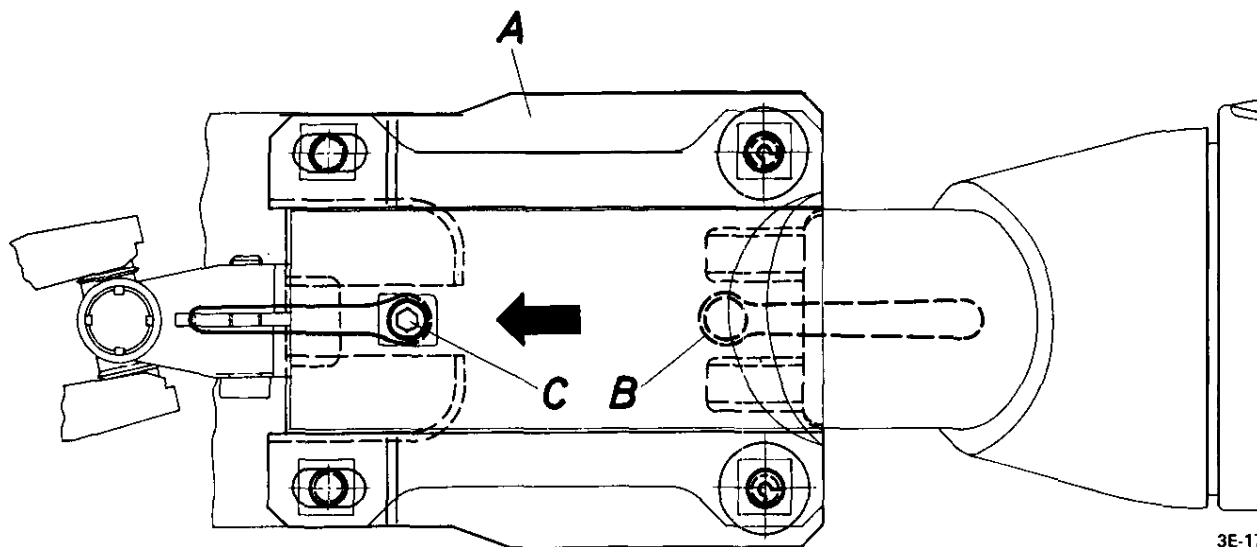


Figure 3E-17 Steering Column Bracket

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 laying things across or on top of the column assembly, leaning on the column assembly, or dropping of the assembly could shear or loosen the plastic fasteners that maintain column rigidity or possibly bend the assembly causing a binding condition. *It is therefore important that the removal and installation and the disassembly and reassembly procedures be strictly followed when servicing this assembly.*

The steering column assembly is attached with a bracket (A) at four points to the connecting brace below the instrument panel. See Figure 3E-17. The two upper bolts are designed as tear-lock-bolts. A bolt (B) is welded to the bracket which engages in a narrowing elongated hole. The same applies to the upper bolt (C) of the steering column lower bearing attachment which engages in a hole of the connecting brace.

As soon as a sufficiently large secondary energy becomes effective, the steering mast jacket slides towards the front whereby the bolt (B) as well as the bolt head (C) is additionally pushed into the respective narrowing elongated holes. Both elongated holes are arranged so that the primary energy cannot push the steering mast assembly into the passenger compartment.

The GT steering column incorporates two universal

joints to allow for the offset between the steering column and the gear assembly.

The upper steering column assembly is connected to the center steering shaft with one universal joint, while the lower universal joint connects the center steering shaft to the steering gear pinion shaft.

REMOVAL AND INSTALLATION

REMOVAL AND INSTALLATION OF STEERING WHEEL

This procedure may be performed with the steering column assembly either removed or installed in the car.

Removal

1. Disconnect battery.
2. Remove horn cap.
3. Bend lockplate tabs down and remove steering wheel nut, lockplate and washer.
4. Mark shaft and wheel hub for reassembly alignment.
5. Remove steering wheel using steering wheel puller J-21686. Do not rap on end of puller in order to free wheel from shaft as this would very likely loosen plastic injections that maintain steering shaft rigidity. Striking of underside of steering wheel to jar it

loose must never be done. The only recommendation for freeing frozen steering wheels is to use a penetrating lubricant.

Installation

1. Before installing steering wheel, lubricate return pin and slide area on direction signal switch return cams and horn ring contact.
2. With steering wheel properly aligned to shaft, install lockplate and nut. Torque nut to 15 lb.ft.

CAUTION: This steering wheel to steering shaft fastener is an important attaching part in that it could affect the performance of vital components and systems, and/or could result in major repair expense. It must be replaced with one of the same part number or with an equivalent part, if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of this part.

3. Bend up lockplate tab and install horn cap.
4. Reconnect battery.

REMOVAL AND INSTALLATION OF IGNITION LOCK CYLINDER

Removal

This procedure may be performed with the steering column assembly either removed or installed in the car.

1. Remove steering wheel, as outlined previously in this Group.
2. Position lock cylinder to run position.
3. Using suitable piece of wire, push in lock cylinder retaining pin and remove lock cylinder. See Figure 3E-18.

Installation

1. Insert lock cylinder into lock cylinder housing.
2. Install steering wheel, as outlined previously in this section.

REMOVAL AND INSTALLATION OF STEERING COLUMN ASSEMBLY

Removal

1. Position steering so that front wheels are straight ahead.

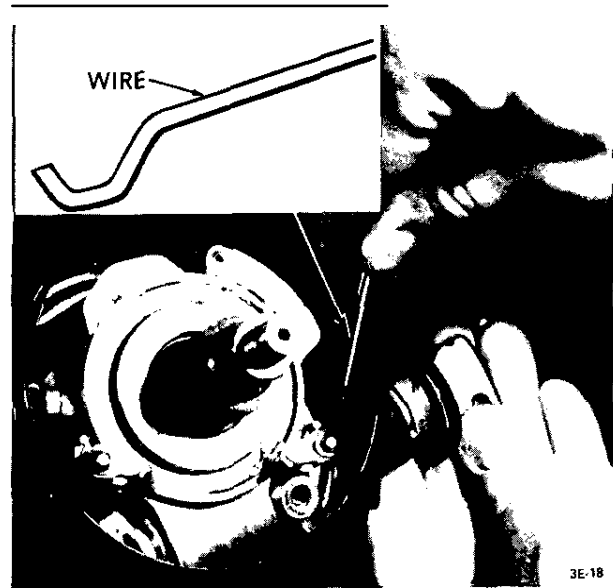


Figure 3E-18 Removing Lock Cylinder

2. Loosen steering shaft upper universal joint lower clamp bolt. See Figure 3E-19.
3. Drill off heads of both tear bolts by first drilling an 3/16 inch pilot hole and then inserting a 1/4 inch bolt extractor to remove lockbolt.
4. Disconnect ignition (white) and direction signal (black) wire set plugs.
5. Support steering column assembly and remove both hex. head bolts.
6. Pull steering column assembly off center steering shaft. Do not apply any force as plastic injections in center steering shaft may be loosened and shaft would then require replacement.

Installation

CAUTION: Fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.

1. Install steering column assembly onto steering shaft and torque steering shaft upper universal joint lower clamp bolt to 14 lb.ft.
2. Install hex head bolts and torque to 14 lb.ft.

NOTE: Be sure to install ground wire.

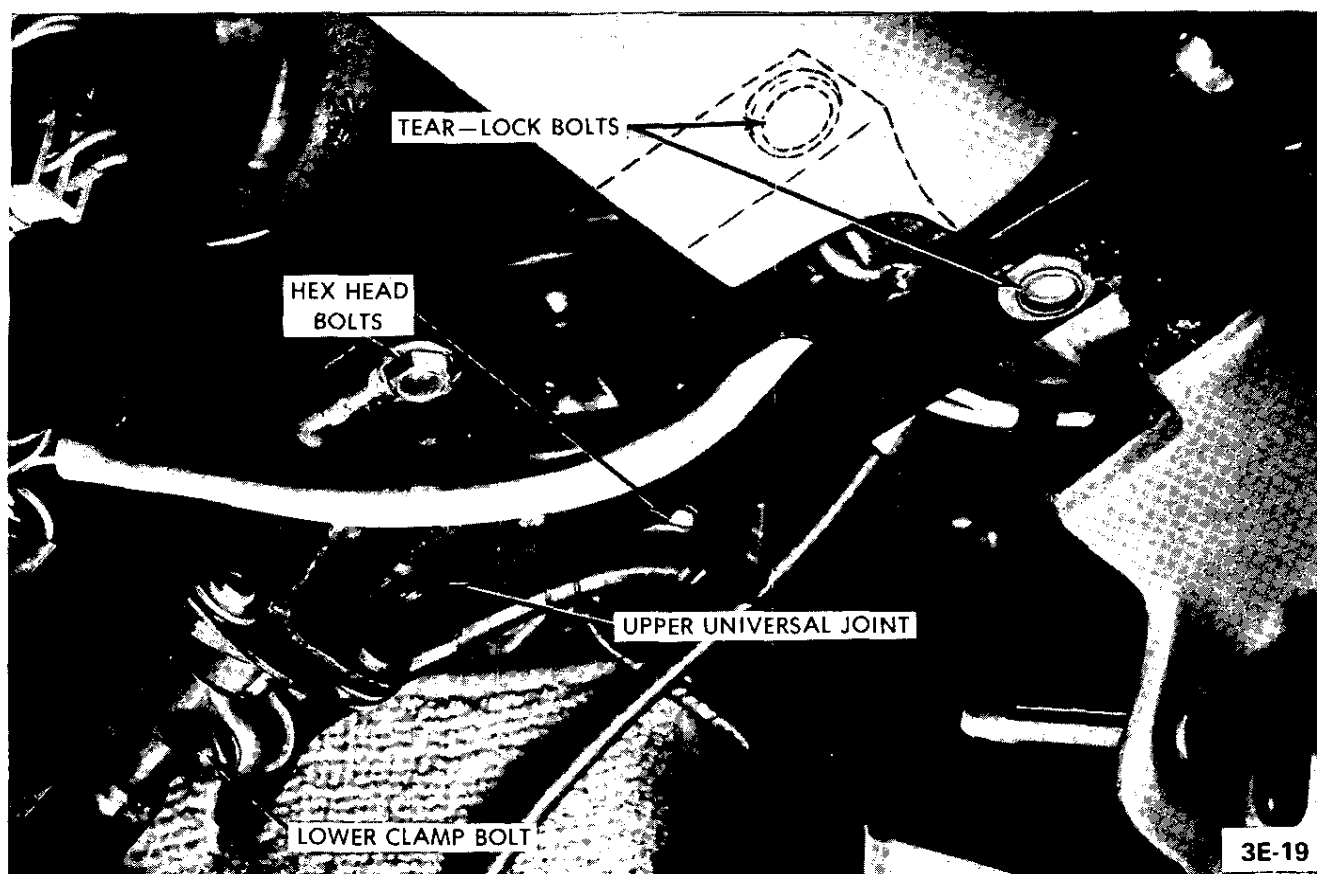


Figure 3E-19 Steering Column Attachments

3. Install new tear bolts and tighten until hex head of bolt is torn off.
4. Reconnect ignition and direction signal wire sets.

REMOVAL AND INSTALLATION OF CENTER STEERING SHAFT

Removal

Steering shaft must be handled carefully so as not to loosen plastic injections as shaft would then require replacement.

1. Position steering so that front wheels are straight ahead.
2. Loosen steering shaft upper universal joint lower clamp bolt.
3. Remove steering shaft lower universal joint upper clamp screw.
4. Carefully push center steering shaft up into steel washer joint until lower end is free.
5. Remove steering shaft through bottom.

Installation

CAUTION: Fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part or lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts.

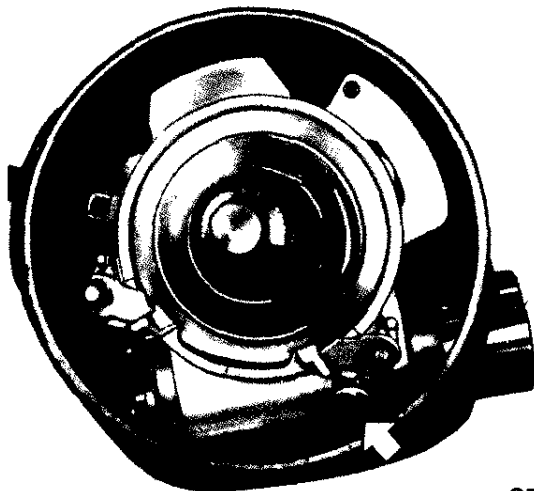
1. Install steering shaft through bottom and position into upper universal joint.
2. Insert shaft into lower universal joint and torque bolt to 22 lb.ft.
3. Torque upper universal joint bolt to 14 lb.ft.

REMOVAL AND INSTALLATION OF IGNITION SWITCH AND/OR STEERING LOCK

Removal

1. Remove ignition lock cylinder, see previous paragraph in this section.

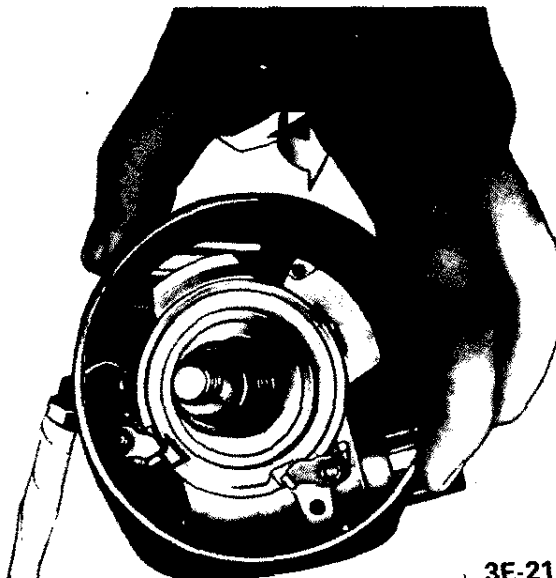
2. Disconnect ignition (white) wire set plug.
3. Remove steering lock retaining screw. See Figure 3E-20.



3E-20

Figure 3E-20 Steering Lock Retaining Screw

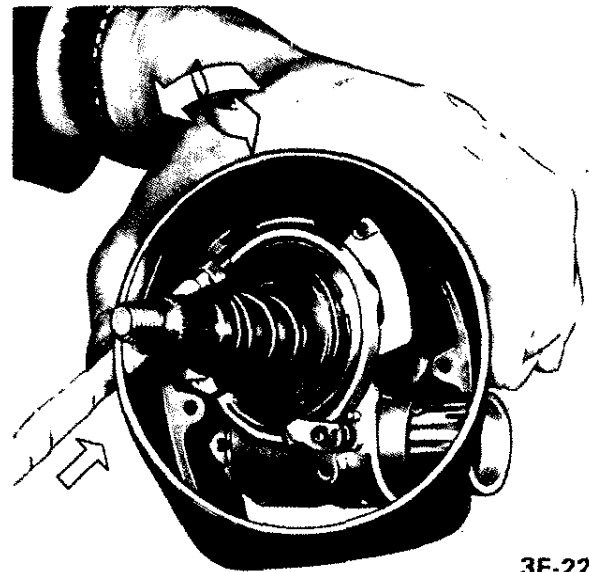
4. Remove direction signal switch lever.
5. Remove three screws securing signal switch cover to housing.
6. To remove housing cover, (a) pull cover toward direction signal switch and move it slightly to the right. See Figure 3E-21. (b) Turn cover toward the left and move it further to the right so that the left retaining screw ear is positioned under the left signal switch return cam. See Figure 3E-22. (c) Insert direc-



3E-21

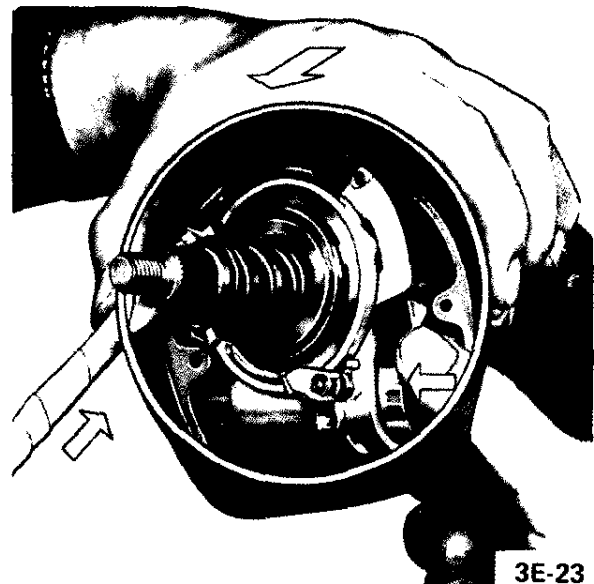
Figure 3E-21

tion signal switch lever into oblong opening in cover and push steering lock into housing and remove cover. See Figure 3E-37.



3E-22

Figure 3E-22



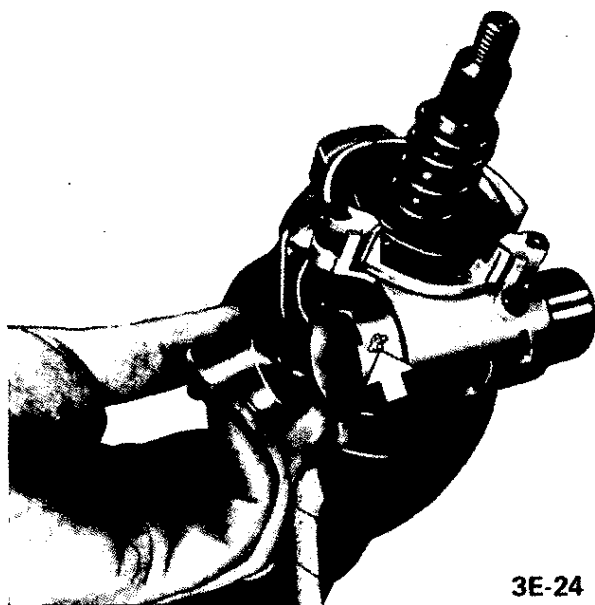
3E-23

Figure 3E-23

7. Remove ignition switch electrical unit. See Figure 3E-24.
8. Remove wires from connector plug making certain to note location of each.
9. Tape wire ends together and remove electrical unit and wire harness.

Installation

1. Position electrical unit wire harness through column and reconnect to connector plug.



3E-24

Figure 3E-24 Removing Electrical Unit

Before installing electrical unit be sure unit is in RUN position. Using a Philips screwdriver, turn inner sleeve to the tight until a springy resistance is felt. See Figure 3E-25.



3E-25

Figure 3E-25 Checking for RUN Position

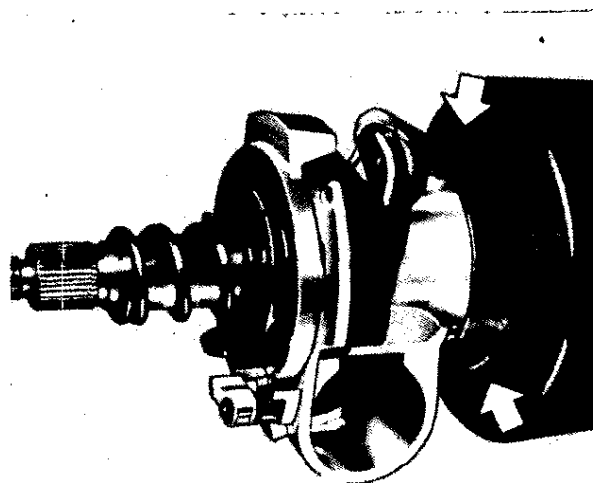
2. Install ignition switch electrical unit. See Figure 3E-24.
3. Install housing cover by attaching with three (3) screws.
4. Install steering lock retaining screw. See Figure 3E-20.
5. Reconnect ignition (white) wire set plug.

6. Install direction signal switch lever.
7. Install ignition lock cylinder. See previous paragraph in this section.

REMOVAL AND INSTALLATION OF UPPER STEERING BEARING AND/OR DIRECTION SIGNAL SWITCH

Removal

1. Remove ignition switch and steering lock, see previous paragraph in this section.
2. Disconnect direction signal (black) wire set plug.
3. Remove wires from connector plug making certain to note location of each.
4. Remove screws and direction signal housing and switch assembly. See Figure 3E-26.



3E-26

Figure 3E-26 Removing Direction Signal Switch Assembly

5. To remove upper bearing, pull horn wire out of bearing housing and pry out bearing assembly using a flat screwdriver. See Figure 3E-27.

Installation

1. If upper bearing has been removed, install by using the thumbs of both hands being sure to line bearing up with notched portion of housing.
2. Install direction signal housing and switch assembly. See Figure 3E-26.
3. Reposition wires into connector plug and connect direction signal wire set.

4. Install ignition switch and steering lock

REMOVAL AND INSTALLATION OF STEERING COLUMN LOWER BEARING

Removal

The following is with steering column assembly removed.

1. Remove steering wheel.
2. Remove screws securing lower bearing housing to mast jacket.
3. Remove steering shaft together with universal joint and bearing and housing.
4. Remove universal joint from shaft. See Figure 3E-28.

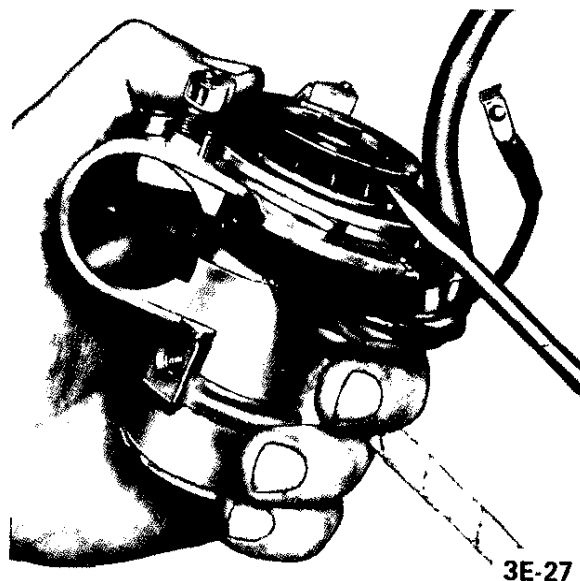


Figure 3E-27 Removing Upper Bearing

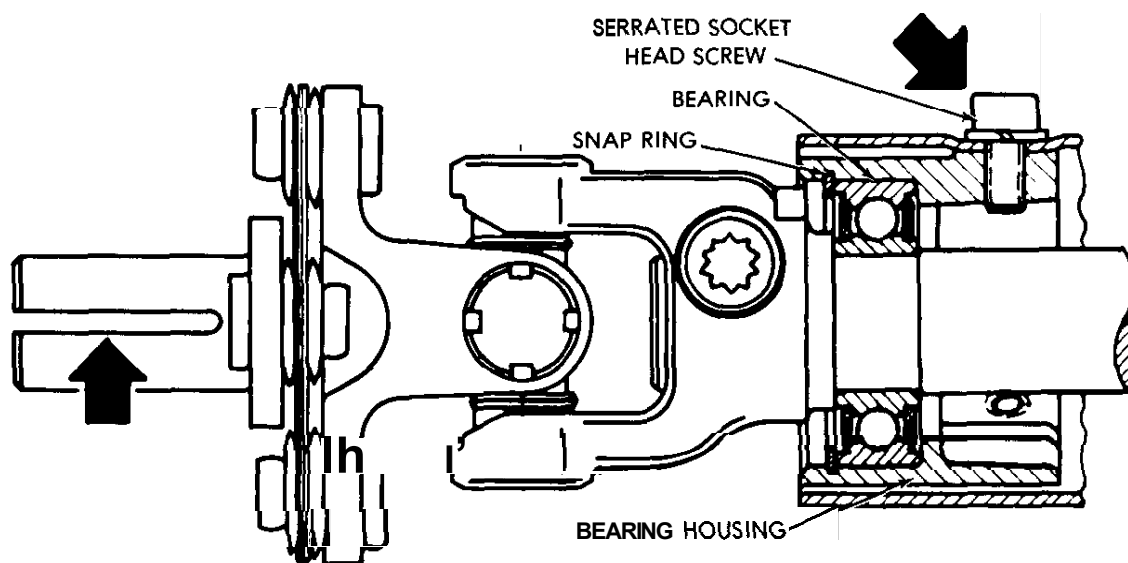


Figure 3E-28 Removing Lower Bearing

5. Remove bearing retainer snap ring and remove bearing.

Installation

1. Install bearing and bearing retainer snap ring.
2. Install universal joint and torque to 22 lb.ft.

3. Install steering shaft, together with universal joint bearing and housing to mast jacket. Serrated socket head screw must be installed on **top** side of steering column assembly. See Figure 3E-28.

4. Install steering wheel. On installation of steering wheel, make sure that with flats of lower portion of universal joint horizontal, the center steering wheel spoke must be vertical.

PART	LOCATION	TORQUE LB.FT.
	Steering Wheel	15
	Upper Universal Joint • Lower Clamp	14
Bolt	Upper Universal Joint • Hex Head	14
Bolt	Lower Universal Joint	22