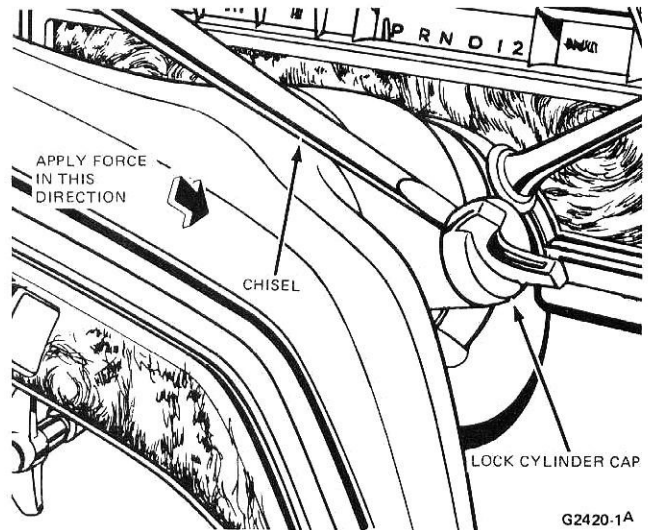


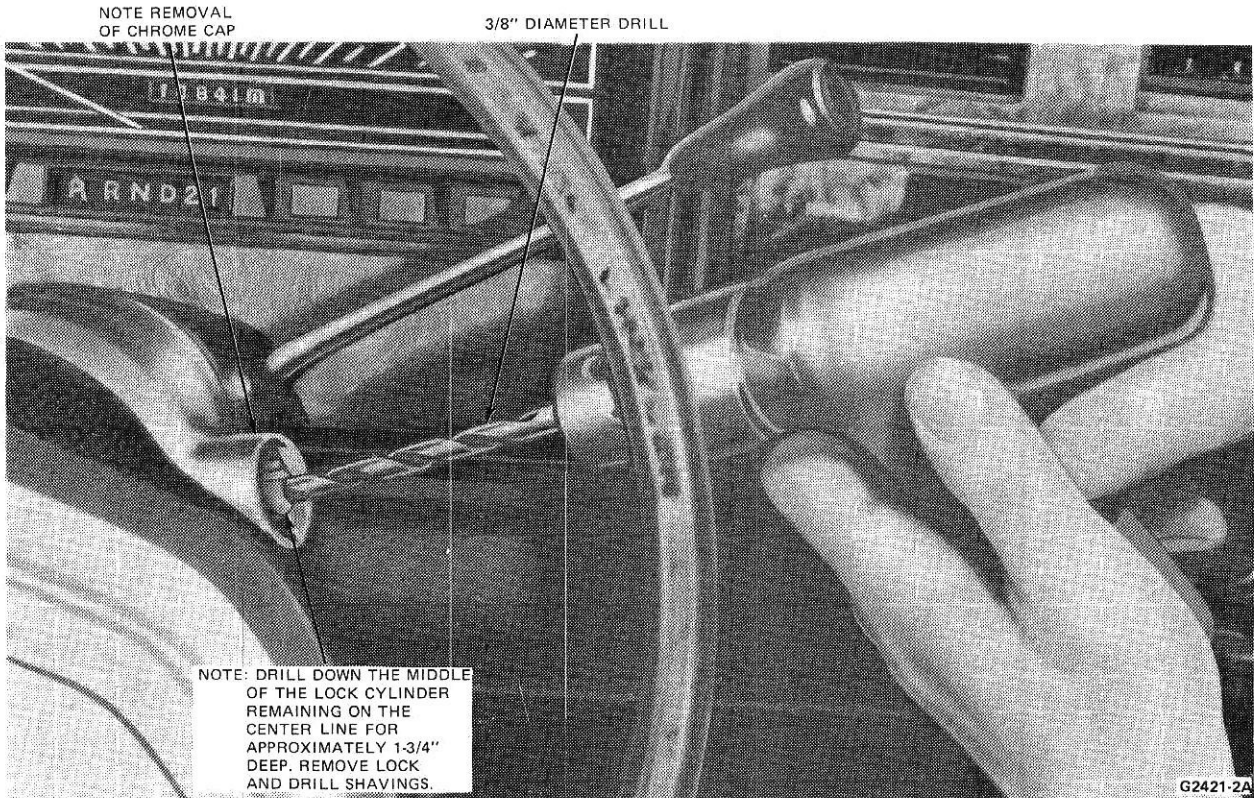
NOTE: When drilling out the retaining pin use care not to damage the cover cast housing or the hazard flasher switch.

5. Tilt the steering column to the full down position. Place a chisel at the base of the ignition lock cylinder cap and using a hammer strike the chisel with sharp blows to break the cap away from the lock cylinder (Fig. 11).
6. Using a 3/8 inch diameter drill, drill down the middle of the ignition lock key slot approximately 1 3/4 inch until the lock cylinder breaks loose from the steering column cover casting. Remove the lock cylinder, and the drill shavings from the base of the cover cast housing (Fig. 12).
7. Remove the steering wheel and pad as described earlier in this Part.
8. Remove the turn signal lever from the column and then remove the (2) attaching screws from the turn



G2420-1A

FIG. 11 Breaking the Cap Away From the Lock Cylinder



G2421-2A

FIG. 12 Drilling Out The Lock Cylinder

signal switch and (1) attaching screw from the key warning buzzer terminal. Lift the turn signal switch up and over the end of the steering shaft but do not disconnect it from the wiring harness.

9. Remove the (4) attaching screws from the cover casting and lift the casting over the end of the steering shaft allowing the turn signal switch to pass through the cover casting. The removal of the cover casting will expose the upper actuator (3E723). Remove the upper actuator.
10. Remove the drive gear, snap ring and washer from the cover casting along with the upper actuator mentioned above. Thoroughly clean the components in an acceptable cleaning solution. Carefully inspect all components for any damage resulting from the drilling operation. If any of the components show signs of damage they must be replaced. Clean the removed cover casting with compressed air to remove any drill shavings or

foreign particles and carefully inspect it for damage. If the cover casting is damaged, replace it with a new one primed and painted to match the existing column.

Installation

1. Attach the upper actuator to the lower actuator and lubricate the upper actuator. Reassemble the cover casting, upper actuator, turn signal switch and lever, lock drive gear, lock cylinder, steering wheel and pad, and the steering column trim shrouds as described earlier in this Part.
2. Using the ignition key, rotate the lock cylinder to insure correct mechanical operation in all positions.
3. Connect the battery ground cable.
4. Check for proper start in Park or Neutral. Also check to make certain that the start circuit cannot be actuated in the Drive and Reverse positions.

CLEANING AND INSPECTION

POWER STEERING GEAR

CLEANING

1. Use a clean work bench and tools.
2. Clean the exterior of the gear with solvent. If necessary, drain off excess hydraulic fluid.
3. Handle the parts carefully to avoid nicks, burrs, scratches and dirt. Do not use solvent on seals.

INSPECTION

1. Check the sector shaft contact surface in the cover for wear. If the surface is worn, replace the cover.
2. Inspect the input shaft bearing. Check the fit of the bearing on the input shaft. Replace the bearing, if necessary.
3. Inspect the valve housing for wear, scoring, or burrs.
4. Inspect the tube seats in the pressure and return ports for nicks. Replace them if necessary.
5. Check the sector shaft contact surface in the housing for wear. If the surface is worn, replace the housing.
6. Check the fluid passages for obstruction or leakage.
7. Inspect the gear housing for cracks and stripped threads, and the mating surfaces for burrs. Inspect the piston bore for scoring or wear. If necessary, replace the housing.
8. Be sure the input shaft bearing rotates freely.
9. Check the input shaft for freedom of movement in the sleeve. If movement is impaired, inspect the valve spool for burrs and remove. **Stone the input shaft in a radial direction only.** Recheck for freedom of movement.
10. Inspect the piston rack and sector shaft teeth for nicks and burrs.

FLUSHING THE POWER STEERING GEAR

Always flush the power steering gear when replacing the pump due to fluid contamination. Follow the steps below:

1. Remove the pump and pulley, and repair the pump as outlined in Parts 13-50 and 13-52.
2. Install the pulley on the repaired pump. Install the pump. Flush the pressure line before installing. **Connect only the pressure hose.**
3. Place the fluid return line from the gear in a container, and plug the reservoir return line.
4. Fill the reservoir with ATF C1AZ-19582-A, -C or -D (ESW M2C33-F) except Lincoln and Mark V which require D5AZ-19582-A (ESW-M2C128-D).
5. Disconnect the coil wire and raise the front wheels off the ground.
6. While adding approximately two quarts of fluid, turn on the ignition (using the ignition key) and crank the engine with the starter while turning the steering wheel from left to right.
7. When all the fluid has been added, turn off the ignition and attach the coil wire.
8. Remove the plug from the reservoir return line, and attach the line to the reservoir.
9. Check the fluid level. Add fluid, if necessary. **Do not overfill** the reservoir.
10. Lower the vehicle.
11. Turn the steering wheel from side to side without hitting the stops to expel any trapped air.

FLUSHING THE POWER STEERING PUMP

If dirt is found in the power steering gear, flush the pump as follows:

1. Making sure all other hoses are connected, disconnect the pressure line at the gear.
2. Place the line in a container.

3. Fill the reservoir with ATF C1AZ-19582-A, -C, or -D (ESW-M2C33-F) except Lincoln and Mark V, which require D5AZ-19582-A (ESW-M2C128-D).
4. Disconnect the coil wire.
5. While adding approximately two quarts of fluid, turn on the ignition and crank the engine with the starter. As soon as all fluid has been added, turn off the ignition.
6. Attach the pressure hose at the gear.
7. Check the fluid level.
8. Crank the engine with the starter and add fluid until the level remains constant.
9. Lower the vehicle and attach the coil wire.
10. Start the engine and turn the steering wheel from side to side to expel any air trapped in the system. This will restore normal steering action.

CLEANING THE POWER STEERING PUMP

Wash all parts except seals in a chlorinated solvent and dry with compressed air.

INSPECTION (FORD)

To determine when to replace power steering pump components, follow these guidelines. **Some components must be replaced regardless of condition.**

1. Re-use the outlet fitting if the corners are not rounded and the threads intact.
2. Replace all seals except the rotor shaft seal. Re-use the rotor shaft seal if it does not leak.
3. Re-use the reservoir assembly if the reservoir seal areas are not damaged. Check for a broken or missing baffle.
4. Re-use the housing or housing assembly if the O-ring and snap ring surfaces are not damaged.
5. Re-use the upper and lower pressure plates if there is no scoring on the wear surface. Polish the phosphate coating, if necessary but do not remove it.
6. Re-use the rotor and cam assembly if wear is limited to removal of the phosphate coating on the cam contour. Do not disassemble the unit. Push the rotor part way through the cam insert, being careful not to dislodge the slippers and springs. Check the cam ID for scoring or burring. Check the rotor faces and OD for scoring and chipping. **Do not repair or refinish the upper and lower pressure plates,**

cam or rotor assembly. If wear or burring is evident, replace them with new components.

7. Install a new rotor and cam assembly if the slippers are worn. Replace the springs if they are bent or broken.
8. Re-use the rotor shaft if the thrust faces, bushing diameter, and shaft seal diameter are not excessively worn or scored.
9. Re-use the housing and bushing assembly if all of the threaded holes are not damaged beyond repair, and the bushing diameter is not scored or worn .0005 inch over the .6897 inch maximum. Repair threaded holes by drilling out the damaged threads and installing helicoil inserts. If the bushing is scored or excessively worn, install a new housing and bushing assembly.
10. Re-use valve body if valve bore is free of nicks and scoring. Valve must fall freely in valve bore. Replace valve housing and/or valve if valve sticks in bore.

INSPECTION (SAGINAW PUMP)

To determine when to replace power steering pump components follow these guidelines. **Some components must be replaced regardless of condition.**

1. Replace all seals except the rotor shaft seal. Re-use the rotor shaft seal if it does not leak.
2. Re-use the flow control valve assembly if it is free of scores and burrs.
3. Re-use the housing assembly if there are no scratches or burrs on machined surfaces, especially mating surfaces on O-ring seats. If the shaft bushing in the pump housing is scored or excessively worn, replace the pump housing assembly.
4. Re-use the pressure plate if the V-shaped notches at the edges of the discharge ports are not damaged. These notches must be clean to cushion hydraulic shock and prevent pump noise.
5. Re-use the cam ring if it is not cracked or scored. The ring is treated for wear resistance with a material which leaves a light grey finish on the wear surface. A wavy grain appearance inside the ring is normal.
6. Remove the vanes from the rotor and examine them for wear. Re-use them if they are not damaged.
7. Re-use the rotor shaft if the splines, bearing, and seal surfaces are not damaged.

SPECIFICATIONS

Tool No.	Description
Rotunda 97-0001 or Equivalent	Flow/Pressure Analyzer

CG1847-1G

POWER STEERING PUMP RELIEF PRESSURE – FORD/TRW PUMP	
VEHICLE	MIN. RELIEF PRESSURE
Granada and Monarch	1050 PSI
LTD II, Cougar, Thunderbird Ford 5.8L/6.6L (351M/400 CID) Mercury 5.8L (351M CID) Mustang II, Pinto, Bobcat	1125 PSI
SAGINAW PUMP	
Ford 7.5L (460 CID) Mercury 6.6L/7.5L (400/460 CID)	1350 PSI
Continental Mark V, Lincoln Continental	1350 PSI

CG2120-1E

POWER STEERING PUMP MODEL IDENTIFICATION

The power steering pumps have a service identification tag to identify assemblies for service purposes. Tags are located and contain information as shown below:

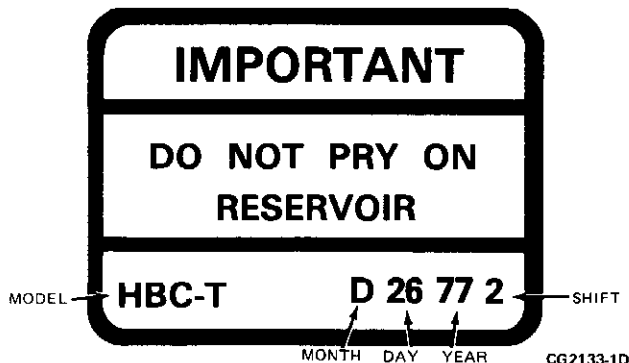
Tag Location: On Reservoir Body. **Ford Built:** SERVICE MODEL IDENTIFICATION

SAGINAW STEERING PUMPS

The prefix HBC of the Serial Number HBC-T will be omitted from the identification label fastened to the outboard side of the reservoir with adhesive.

STATIC STEERING WHEEL TURNING EFFORTS (Lbs.)		
Vehicle	Power	Manual
FORD, MERCURY, LINCOLN, MARK V, THUNDERBIRD	5.0	
LTD II, THUNDERBIRD, COUGAR	5.0	
FAIRMONT/ZEPHYR	N.A.	N.A.
GRANADA, MONARCH	7.0	3.3L/4.1L (200/250 CID) 29.0
		5.0L/5.8L (302/351 CID) 31.0
PINTO, BOBCAT MUSTANG II	5.0	30.0
	5.0	34.0

CG2121-1E



CG2133-1D

Steering Columns—Conventional (Convolved Absorber Type)

**PART
13-03**

Applies To Ford/Mercury, Lincoln Continental

SUBJECT	PAGE	SUBJECT	PAGE
ADJUSTMENTS		REMOVAL AND INSTALLATION (Cont'd.)	
Pre-Set Clutch Adjustment — PRND21		Ignition Lock Actuator And	
Following Column Removal	03-2	Steering Wheel Lock Pin	03-9
Self-Adjusting Transmission			Refer to Part
Selector Indicator	03-2	Ignition Lock Cylinder Assembly	13-01
Steering Wheel Spoke Position	03-1	Ignition Lock Drive Gear —	
Transmission Selector — Ford		Fixed Or Tilt Columns	03-12
and Mercury	03-1	Steering Column Assembly	03-3
		Steering Column Shift Tube	03-10
DESCRIPTION		Steering Shaft Anti-Rattle Clips	03-11
Steering Column	03-1	Steering Wheel	03-2
		Tilt Column Mechanism —	
REMOVAL AND INSTALLATION		Ford/Mercury, Lincoln	03-7
Flange And/Or Socket Casting		Upper Shaft Bearing	03-3
(Fixed And Tilt Columns)	03-9		
Flexible Coupling	03-12	SPECIAL TOOLS	03-13

CG2422-2B

DESCRIPTION

STEERING COLUMN

If an accident occurs, the tube collapses approximately six inches at the bellows on hard impact. The shift tube and the steering shaft collapse in proportion to the outer tube.

Once the steering column is collapsed, a new column and brackets must be installed.

The tilt column features five driving positions (two up, two down, and a center position). Both fixed and tilt columns feature an emergency warning flasher control, a turn signal indicating switch with a lane changer position, and are equipped with an anti-theft locking device which locks the transmission linkage and steering system.

ADJUSTMENTS

STEERING WHEEL SPOKE POSITION

When the steering gear is on the high point, the front wheels should be in the straight-ahead position, and the steering wheel spokes in their normal position with the Pitman arm pointing directly forward. If the spokes are not in their normal position when the front wheels are straight, adjust the steering wheel as outlined in Part 14-01.

TRANSMISSION SELECTOR INDICATOR— FORD AND MERCURY

Before adjusting the transmission selector indicator, adjust the manual linkage to correspond to insert stop without regard to indicated setting. Adjust indicator in the following steps below.

The PRND21 mechanism features a slip clutch which is automatically adjusted when the shift lever is shifted

to "1" or "S". If the steering column is removed for service, reset the slip clutch as outlined in Group 33, Part 50.

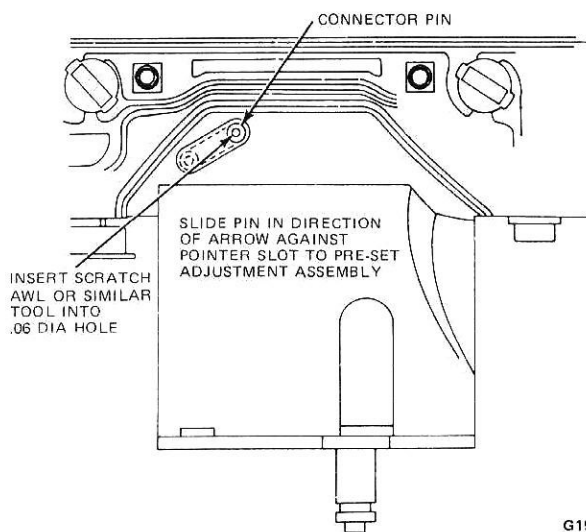
SELF-ADJUSTING TRANSMISSION SELECTOR INDICATOR

1. Shift the transmission selector to "P". **Never adjust the selector with the lever in the "1" or "S" position.**
2. Place the loop on the indicator assembly over the retainer pin on the socket casting. Place the column mounting bracket in the "T" slot and secure with a screw. Torque the screw to 20 in-lb minimum.
3. Shift the column selector lever firmly against the stop to either the "1" or "S" position.
4. Shift the selector to "D" and check the indicator setting: The pointer must fall within the letter "D" when viewed parallel to the centerline of the column from the driver position.
5. Place the indicator cable in the tab of the shroud retainer clip on the column.
6. In all other positions, the indicator must touch the shift position letters or numerals.

PRE-SET CLUTCH ADJUSTMENT- PRND21 FOLLOWING COLUMN OR CLUSTER REMOVAL

1. Remove the cluster assembly from the instrument panel.
2. Turn the assembly to expose the PRND21 adjustment mechanism at the bottom of the backplate (Fig. 1).

3. Pre-set the mechanism by inserting a scratch awl or similar tool into the hole at the bottom of the connector pin. Slide the pin and spring assembly to the left until it bottoms against the pointer slot. (Fig. 1).



G1972-1A

FIG. 1 Bottom View—Instrument Cluster Assembly

4. Re-install the cluster assembly.
5. Repeat the self-adjusting transmission selector indicator adjustments.
6. Adjust linkage as required.

REMOVAL AND INSTALLATION

STEERING WHEEL

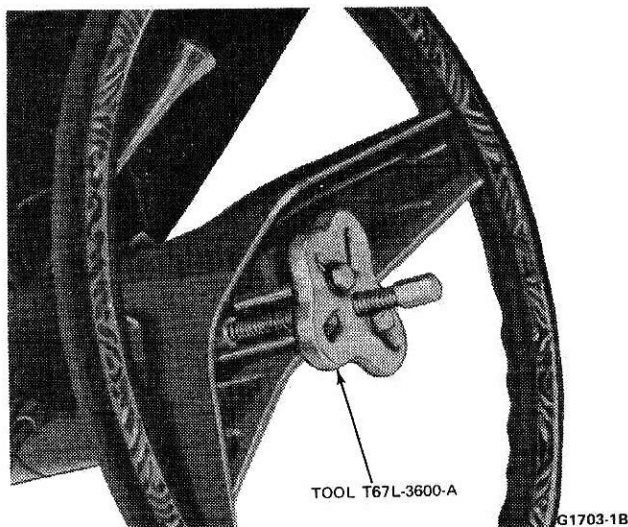
Removal

1. Disconnect the negative battery cable from the terminal.
2. Remove the steering wheel horn cover.
3. Disconnect the horn and speed control wires (if equipped). Remove the steering wheel locknut. **Do not re-use locknut.**
4. Using Tool T67L-3600-A, remove the steering wheel (Fig. 2).

Do not hammer the end of the steering column upper shaft or use a knock-off type steering wheel puller. Either procedure will damage the steering column.

Installation

1. Place the steering wheel on the steering column upper shaft, so that the mark on the wheel is in line with the mark on the shaft. **Be sure the front wheels are straight ahead when the steering wheel is in the normal position.**
2. **Install a new steering wheel lock nut.** Torque the nut to 30 to 40 ft-lb.
3. Connect the horn and speed control wires (if equipped).



G1703-1B

FIG. 2 Removing Steering Wheel

4. Install the steering wheel horn cover pad. Torque the screws to 13 to 20 in-lb.
5. Connect the negative battery cable to the terminal.
6. Test the steering column for proper operation.