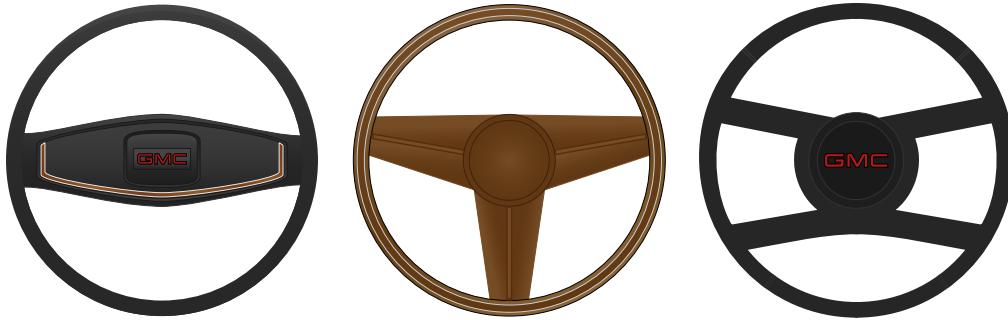


GMC Motorhome Basic Steering Inspection Guide

Compiled by Rob Mueller



Introduction

The following is a step-by-step procedure to check for play in the steering system that could contribute to the amount of play in the steering wheel. Keep in mind that play in the steering components checked by this procedure will be magnified by the radius of the steering wheel. The procedure starts at the top of the steering column and works its way out to both the wheels. YES, it is long and YES, it's going to take you some time to go through it but when you're done you will KNOW where there is play in the system, how it is effecting your steering; and what needs attention. You will note I have instructed you to record the amount of relative motion of two areas quite often throughout this procedure by putting your fingers on the parts I've noted to feel the play. PLEASE BE careful not to get your fingers pinched! Have your assistant move the steering wheel slowly back and forth only enough for you to determine if there is any play.

Copies of pages from Parts Book 78Z have been provided so you can locate each of the parts to be checked. You will note that "Key" refers to the annotated number on the illustration. The scanned pages follow the text of this document.

For your convenience I have also included a copy of the parts listings that correspond to the illustrations. The parts listings follow the illustrations.

Note also that this document is a total revision of the first document made available earlier in 2011. At the Dixielanders work rally (Bean Station, Tennessee) I validated the procedure by checking three coaches. Two of them were fine; one of them had worn parts. The document has also been vetted by several other, knowledgeable GMCers who are very familiar with the steering system. Byron Songer has also given of his time and abilities as may be noticed in the professional design and layout of this document. PLEASE feel free to comment and make suggestions.

The Procedure

This procedure will require two people, one in the driver's seat and one checking the components. The person in the driver's seat should record what the person checking the components finds upon completion of each step.

To perform this procedure your GMC must have all six wheels on level ground with the front wheels heading straight ahead as they would be when driving down a freeway. A pit or a drive on lift will make access to all the components under the coach easy; however, if you do not have access to a pit or drive on lift you will have to crawl under the GMC while it is on the ground. I have been advised that it is possible to check drag link and tie rod ends by pinching the rubber boot between your thumb and forefinger and having the person in the drivers seat "jiggle" the steering wheel back and forth. I have not verified if that will work or not. When I verified this procedure I ran my index finger tip up between the boot and the joints to feel if there was any movement between the ball and socket when the steering wheel was moved left and right. It should be noted that the boots are made of different materials and some are harder to get your index finger tip under the boot in order to touch the taper and ball and the socket. Safety is of utmost concern; position your GMC so that there is a bit of distance between it and anything in front or behind it. The handbrake must function properly and applied during performance of this procedure. Also you must have chocks in front and behind the rear wheels on both sides of the GMC.

In addition if you perform this procedure with the GMC on the ground you must place jack stands or stack up wood blocks under the frame where the front frame bolts to the frame rails on both sides of the GMC.

The handbrake and chocks will prevent you from being run over should the transmission slip into gear accidentally while the engine is running. The jack stands or stacked up blocks will prevent you from being crushed in the unlikely event of a component in the suspension failing. This procedure starts at the steering wheel and finishes at the outer tie rod ends on both sides. It checks each steering component that could contribute to steering wheel play (slop) and road wander. You will note that I have not quantified the amount of play or wear in each component as that task would be extremely difficult; use common sense. It should be noted that the effects of individual worn components in the steering system is cumulative. A number of components that display a small amount of wear can result in a lot of slop in the steering just as one component that is extremely worn. Furthermore it should be noted that there are components in the suspension system that can also contribute to steering wander; they will not be covered in this procedure.

Once the handbrake is on, chocks have been placed in front and behind each of the four rear wheels and jack stands or wood blocks have been placed under the frame you are ready to begin.

Consider wearing surgical gloves to keep your hands from getting very greasy as there is a lot of grease and dirt around the various steering system components.

Reference Figure 16.035 Column - Tilt Steering

- 1 Key 1 - Bearing - Steering Column:** There is a bearing at both ends of the housing (Key 1A) which support the steering shaft. Take the steering wheel in your hands and gently move it left and right then up and down. Make sure you're not moving the entire column when you move the steering wheel. Movement between the steering wheel and the column could mean that one or both of the bearings are worn or defective.
- 2 Key 50 - Sphere, Centering:** Have an assistant turn the steering wheel gently to the left and right slightly while you hold the CV joint flange (Key 10 - Figure 16.020 Shaft - Steering Lower) located directly below the bottom of the steering column under the driver side hood. The steering wheel and CV joint flange should move in unison. If they do not move in unison it means that the centering sphere could be worn or defective.
- 3 Key 55 - Bearing, Steering Column, Lower:** Attempt to gently move the CV joint flange located directly below the bottom of the steering column (Key 10 - Figure 16.020 Shaft - Steering Lower) left and right then up and down. Movement could mean the bearing could be worn or defective.

Reference: 16.002 Linkage - Steering

- 4 Key 2 - Clamp:** Check that the clamp is tight. Have an assistant turn the steering wheel gently to the left and right slightly while you observe to verify that the splined end of the steering shaft moves in unison with the flange. If they do not move in unison indicates that the splines on the end of the shaft or in the flange could be worn or defective.

Reference: 16.002 Linkage - Steering - Key 4 Shaft Assy

Note: See Figure 16.020 Shaft - Steering, Lower for details listed below

- 5 Key 8 - Joint Assy. - Disc. Lower Shaft:** The disc is a CV joint. Have an assistant turn the steering wheel gently to the left and right slightly while you hold Flange (Key 10) and Shaft Assy (Key 6). They should move in unison. If they do not move in unison could indicate that the CV joint could be worn or defective.
- 6 Key 6 - Shaft Assy & Key 3 - Yoke:** Place your thumb and fore finger tips on both sides of the blue shaft (Key 6) where it enters the top of the Yoke Assy (Key 3). Have an assistant turn the steering wheel gently to the left and right slightly. The parts should move in unison. If they do not could indicate that the blue shaft and / or the yoke could be worn or defective.
- 7 Key 2 - Journal Kit:** Observe / hold the upper and lower yokes (Key 3 & Key 1). Have an assistant gently turn the steering wheel to the left and right slightly. Watch / feel for relative motion between the upper and lower sections of the journal kit (universal joint). The two sections should move in unison. If they do not the universal joint could be worn or defective.

- 8 Key 1 - Yoke:** Have an assistant gently turn the steering wheel to the left and right slightly. Verify that the yoke does not move on the steering box input spline. If it does it means that the bolt may not be tight enough or the splines on the yoke or on the steering box could be worn or defective.

The following steps will have to be done under the GMC with the engine running. You may or may not have enough room to roll under the GMC on a creeper so put down a large clean piece of cardboard or thin plywood you can slide on easily.

Before you venture under the GMC verify that:

- 1) the handbrake is on and functioning properly
- 2) the transmission is in Park
- 3) there are chocks in front and behind the rear wheels on both sides of the GMC
- 4) there are jack stands or a stack of wood blocks under the frame where the front frame bolts to the frame rails on both sides of the GMC
- 5) your GMC is positioned so that there is a bit of distance between it and anything in front or behind it

Start the engine and allow it to warm up and come off the high idle cam. Depress the foot brake and move the shift lever to Drive, release the foot brake and verify the GMC does not move forward. Leave your foot off the brake pedal, move the shift lever to Reverse and verify that the GMC does not move backwards. With your foot off the brake pedal move the shift lever back to Drive and verify the GMC does not move forward. Continue to move the shift lever from Drive to Reverse and back again until you are certain that the GMC WILL NOT MOVE when Drive or Reverse is selected with the brakes off. Leave the engine running and move the shift lever to Park.

While you are under the GMC be cautious not to come in contact with any of the accessory drive belts or fan. Also be careful not to touch the exhaust system or any other hot components.

Reference: 16.002 Linkage - Steering (Includes Component Parts)

- 9 Key 7 - Steering Gear (Steering Box):** Place a finger tip at the point where the steering box splines enter the steering box (below the lower yoke (Key 4) and another finger tip where the steering box output splines leave the steering box under the Pitman arm (Key 9). Have an assistant gently turn the steering wheel to the left and right slightly. The input and output splines should move in unison. If they do not move in unison indicates that the steering box needs to be adjusted or replaced.

Note: It is extremely important that the steering box be on center with the wheels straight ahead, not being on center will contribute to steering wander. The procedure to adjust the steering box can be found in Maintenance Manual X-7525, Section 9 – Steering, Pages 9-38 to 9-40, Paragraph – Pitman Shaft “Over-Center” Sector Adjustment.

- 10 Key 16 - Drag Link Assy (Pitman arm end):** Work your index finger up under the rubber boot which covers the drag link tapered shaft and ball. Some drag link boots are difficult to get ones

finger tip under. Place the tip where the tapered shaft enters the socket. Have an assistant gently turn the steering wheel to the left and right slightly. The tapered shaft and ball should move in unison with the socket. Any motion between them indicates that the end is worn or defective which will contribute to steering slop.

Note: Some GMC's have one piece non-adjustable Drag Link Assemblies.

- 11** **Key 14 - Drag Link Assy (Relay Lever End):** Work your index finger up under the rubber boot which covers the drag link tapered shaft and ball. Place the tip where the tapered shaft enters the socket. Have an assistant gently turn the steering wheel to the left and right slightly. The tapered shaft and ball should move in unison with the socket. Any motion between them indicates that the end is worn or defective which will contribute to steering slop.
- 12** **Key 30 - Rod, Relay Tie:** Slide under the GMC far enough so you can see this rod and all the attaching parts clearly. Have an assistant apply the brakes then move the shift lever from Park to Drive. Then have him move it back and forth between Drive and Reverse while you watch the relay tie rod. If the relay tie rod moves up and down it could be an indication that the bushings in the relay lever and/or idler arm are worn.
- 13** **Key 25 - Lever, Relay:** Have an assistant move the shift lever back and forth between Drive and Reverse while you watch relay lever pivot point on the front cross member. If the relay lever rocks up and down like a see saw at the pivot point indicates that the clearance between the relay lever bushings is worn which will contribute to steering slop. Have an assistant put the shift lever in Park.
- 14** **Key 25 - Lever, Relay – Relay Rod Attachment Point:** Put your fingers on the end of the relay lever that is behind the front crossmember where it connects to the relay rod. Have an assistant gently turn the steering wheel to the left and right slightly. The end of the relay lever and relay rod should move in unison. Any motion between them indicates wear in the relay lever that will contribute to steering slop.
- 15** **Key 49 - Arm, Idler - Pivot Point:** Have an assistant move the shift lever back and forth between Drive and Reverse while you watch the idler arm pivot point on the front cross member. If the idler arm rocks up and down at the pivot point indicates that the idler arm bushing (Key 50) is worn which will contribute to steering slop. Have an assistant put the shift lever in Park.
- 16** **Key 49 - Arm, Idler – Relay Rod Attachment Point:** Put your fingers on the end of the idler arm that is behind the front crossmember where it connects to the relay rod. Have an assistant gently turn the steering wheel to the left and right slightly. The end of the idler arm and relay rod should move in unison. Any motion between them indicates wear that will contribute to steering slop.
- 17** **Key 38 - Rod Assy.- Inner Tie (Drivers Side):** Work your index finger up underneath the rubber boot on the inner tie rod end. Have an assistant gently turn the steering wheel to the left

and right slightly. The tapered shaft and ball should move in unison with the socket. Any motion between them indicates that the end is worn or defective which will contribute to steering slop.

18 Key 38 - Rod Assy.- Inner Tie (Passenger Side): Work your index finger up underneath the rubber boot on the inner tie rod end. Have an assistant gently turn the steering wheel to the left and right slightly. The tapered shaft and ball should move in unison with the socket. Any motion between them indicates that the end is worn or defective which will contribute to steering slop.

19 Key 33 - Rod Assy.- Outer Tie (Drivers Side): Work your index finger up underneath the rubber boot on the inner tie rod end. Have an assistant gently turn the steering wheel to the left and right slightly. The tapered shaft and ball should move in unison with the socket. Any motion between them indicates that the end is worn or defective which will contribute to steering slop.

20 Key 33 - Rod Assy.- Outer Tie (Passenger Side): Work your index finger up underneath the rubber boot on the inner tie rod end. Have an assistant gently turn the steering wheel to the left and right slightly. The tapered shaft and ball should move in unison with the socket. Any motion between them indicates that the end is worn or defective which will contribute to steering slop.

Please note the following:

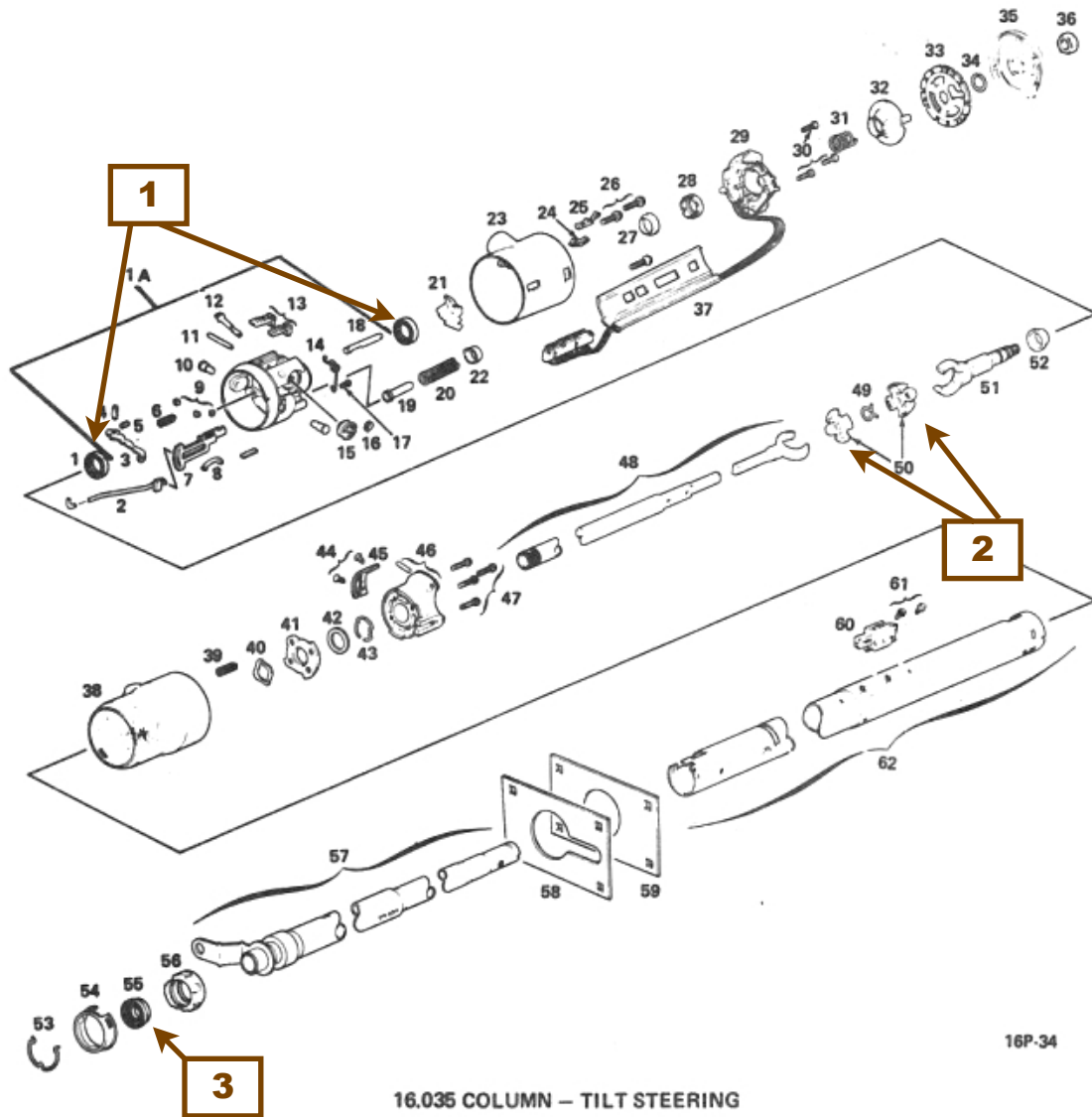
Steps 1 through 3 are on page 7 of this document.

Step 4 is illustrated on page 10 (as well as 9 through 20).

Steps 5 through 8 are provided on page 12.

Steps 9 through 20 are displayed on page 10 (where step 4 is also illustrated).

STEERING



16.035 COLUMN - TILT STEERING

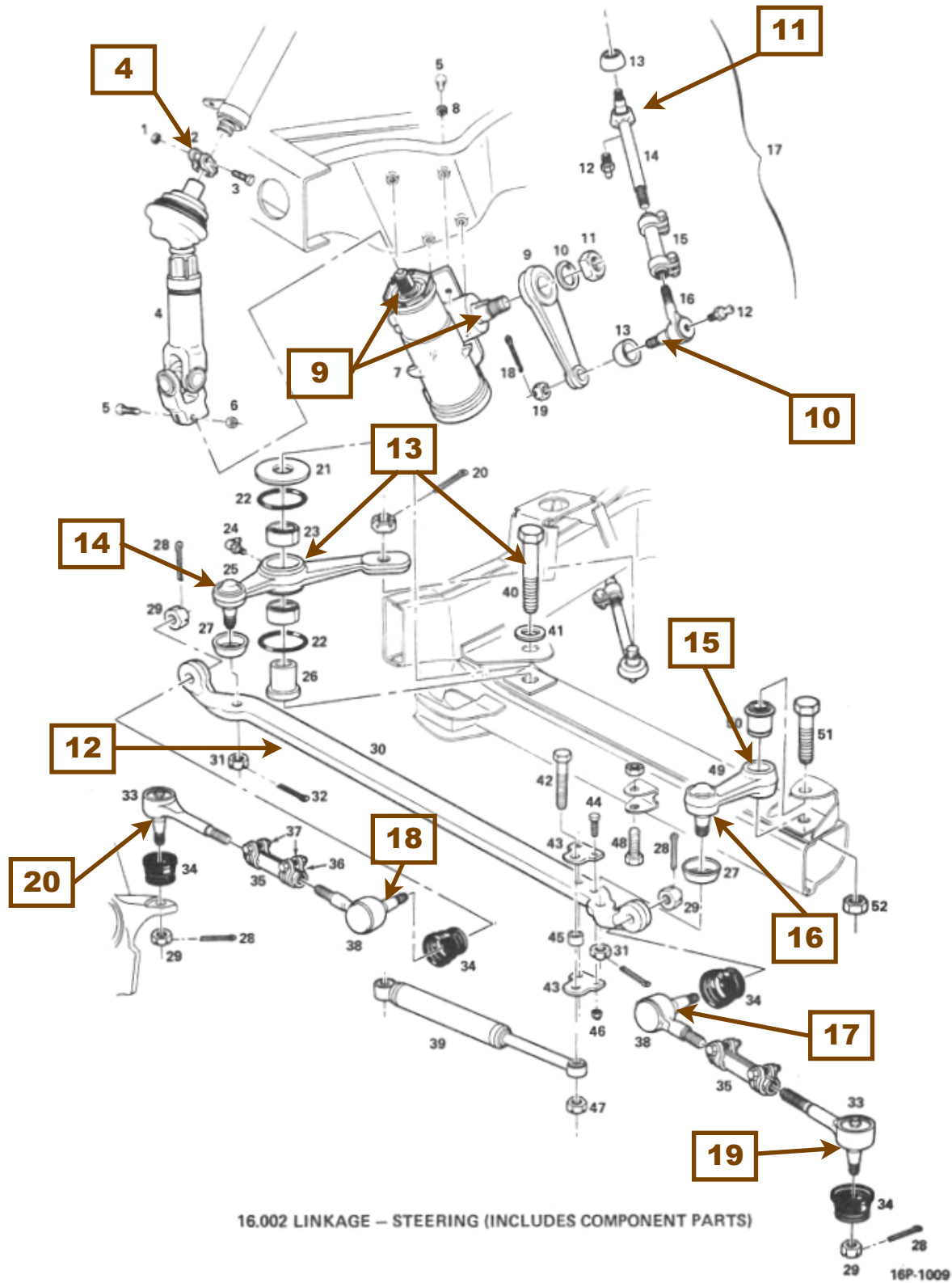
STEERING

KEY	230	260	PART NUMBER	
16.035 COLUMN — TILT STEERING				
—	1	1	7815326	COLUMN ASSY.—steering (First Design) (ref. only)
—	1	1	7819122	COLUMN ASSY.—steering (exc. / Transmode 1977) (Second Design) (repl. 791158, 2000853, 2009968, 7815326)
—	1	1	7827961	COLUMN ASSY.—steering (second design) (w/Transmode 1977)
—	1	1	7829693	COLUMN ASSY.—steering (w/Transmode 1978)
NOTE: The above Column Assemblies include the following items thru asterisk as indicated.				
—	1	1	7809755	SHAFT ASSY.—steering (w/7815326 column)
—	1	1	7818892	SHAFT ASSY.—steering (w/7819122, 7827961 column)
—	1	—	7829694	SHAFT ASSY.—steering (w/7829693 column)
1	2	2	5696210	BEARING—steering column (SOA)
1A	1	1	7813067	HOUSING ASSY.—steering column (w/7815326 column)
1A	1	1	7819440	HOUSING ASSY.—steering column (w/7819122 column) (repl. 7819748)
1A	1	1	7827172	HOUSING ASSY.—steering column (w/7827961, 7829693 column)
NOTE: The above Housing Assemblies include items 2 thru 18.				
2	1	1	7819862	ACTUATOR KIT.—ignition switch (w/7815326, 7819122 column) (repl. 7805376)
2	1	1	7818778	ACTUATOR ASSY.—ignition switch (w/7827961, 7829693 column)
3	1	1	7800154	LEVER—shoe release
4	1	1	5698406	PIN—steering housing release lever
5	1	1	5698410	SPRING—release lever
6	2	2	7804912	SPRING—steering wheel, lock shoe
—	1	1	7819749	KIT—switch actuator and rack (repl. 7804923)
7	1	1	7827157	RACK—switch actuator (w/7827172 Hsg.)
8	1	1	7804908	SPRING—rack pre-load
9	3	3	5698416	BUMPER—steering housing
10	2	2	7810363	PIN—pivot
11	1	1	7806567	PIN—dowel, steering housing
12	1	1	7809368	SHAFT—drive
13	1	1	7804925	SHOE—steering wheel lock (3 positions)
13	1	1	7804926	SHOE—steering wheel lock (4 positions) (repl. 7813068)
14	1	1	7805827	SPRING—lock bolt
15	1	1	7805158	SECTOR—switch actuator (w/7819440 Hsg.)
15	1	1	7827156	SECTOR—switch actuator (w/7827172 Hsg.)
16	1	1	7804911	RING—retaining switch actuator
17	1	1	7803623	SCREW—switch actuator
18	1	1	7808613	BOLT—lock steering housing
19	1	1	7800176	GUIDE—spring
20	1	1	7812854	SPRING—steering wheel tilt
21	1	1	7805608	SHIELD—opening, tilt lever
22	1	1	7800177	RETAINER—spring
23	1	1	7805986	LOCK—housing cover
24	1	1	7804518	CLIP—retaining, buzzer switch
25	1	1	7811092	SWITCH ASSY.—buzzer (SOA) (optional sw. 7815611)
26	3	3	9428927	SCREW—housing cover
27	1	1	5693941	RACE—inner bearing
28	1	1	7815184	SEAT—race, bearing (upper, inner)
29	1	1	1997963	SWITCH ASSY.—turn signal (w/7815326, 7819122 column)
29	1	1	1997983	SWITCH ASSY.—turn signal (SOA) (w/7827961, 7829693 column)
30	3	3	7809128	SCREW—turn signal switch
31	1	1	7815185	SPRING—upper bearing
32	1	1	7812211	CAM UNIT—converter, steering wheel (incl. cancel)
33	1	1	7805227	LOCK—steering shaft
34	1	1	5694191	RING—retaining
35	1	1	7806159	COVER ASSY.—lock, steering shaft
35	1	1	7819738	COVER—lock, steering shaft (opt.)
36	1	1	—	NUT—steering wheel (procure locally) (ref. 124939)
37	1	1	7815106	PROTECTOR—wiring, steering shaft
38	1	1	7805991	BOWL—gear shift lever
39	1	1	7812853	SPRING—shift lever
40	1	1	3884595	WASHER—wave (repl. 7805159)
41	1	1	7804915	PLATE—lock, steering shaft
42	1	1	7804906	WASHER—thrust
43	1	1	7804907	RING—retaining, shaft tube
44	2	2	7800639	SCREW—oval head, cross recess

STEERING

487	238	260	PART NUMBER	
16.035 COLUMN — TILT STEERING (Cont.)				
45	1	1	7811691	GATE—support
46	1	1	7811692	SUPPORT ASSY.—housing, steering column (incl. pin)
47	4	4	7807274	SCREW—support
48	1	1	7809745	SHAFT ASSY.—lower steering (SOA)
49	1	1	7805259	SPRING—joint pre-load
50	2	2	7805258	SPHERE—centering
51	1	1	7810569	SHAFT ASSY.—upper steering, (incl. race) (w/7809755 shaft)
51	1	1	7818890	SHAFT ASSY.—upper steering (incl. race) (SOA) (w/7818892 shaft)
51	1	—	7828404	SHAFT ASSY.—upper steering (incl. race) (SOA) (w/7829694 shaft)
52	1	1	5693941	RACE—shaft assembly, steering, upper (inner)
53	1	1	7804439	CLIP—lower bearing actuator
54	1	1	7804440	RETAINER—bearing adapter
55	1	1	7805700	BEARING ASSY.—lower (SOA)
56	1	1	7805822	ADAPTER—lower bearing
57	1	1	7809800	TUBE ASSY.—shift
58	1	1	696173	PLATE—steering column, lower
59	1	1	696174	SEAL—lower, steering column
60	1	1	1990099	SWITCH ASSY.—ignition (SOA) (w/7815326, 7819122, 7827961 column) (repl. 1990096)
61	2	2	7806433	SCREW—washer head
62	1	1	7805257	JACKET ASSY.—steering column (SOA) (w/7815326, 7819122 column)
62	1	1	7827423	JACKET ASSY.—steering column (SOA) (w/7827961 column)
62	1	—	7828834	JACKET ASSY.—steering column (SOA) (w/7829693)
—	1	1	408239	LEVER ASSY.—steering column tilt locking
—	1	1	554640	LEVER—shift
—	1	1	419454	CLIP—column nut retaining
—	1	1	7819748	KIT—column housing (w/7815326, 7819122 column)
—	1	1	7819749	KIT—switch actuator and rack (w/7815326, 7819122 column)
—	1	1	7810077	KIT—steering shaft (repair) (w/7827961, 7829693 column)
—	1	1	20071252	SET ASSY.—ignition lock (1976) (details not available at time of publication) (repl. 1723200)
—	1	1	20022700	SET ASSY.—ignition lock (1977) (ref. only) (details not available at time of publication)
—	1	1	20071252	SET ASSY.—ignition lock (1978) (details not available at time of publication)
—	1	1	7812051	CAM ASSY.—turn signal (SOA) (w/7827961 7829693 column)
—	1	1	7825867	SHAFT—lock (w/7827961 7829693 column)

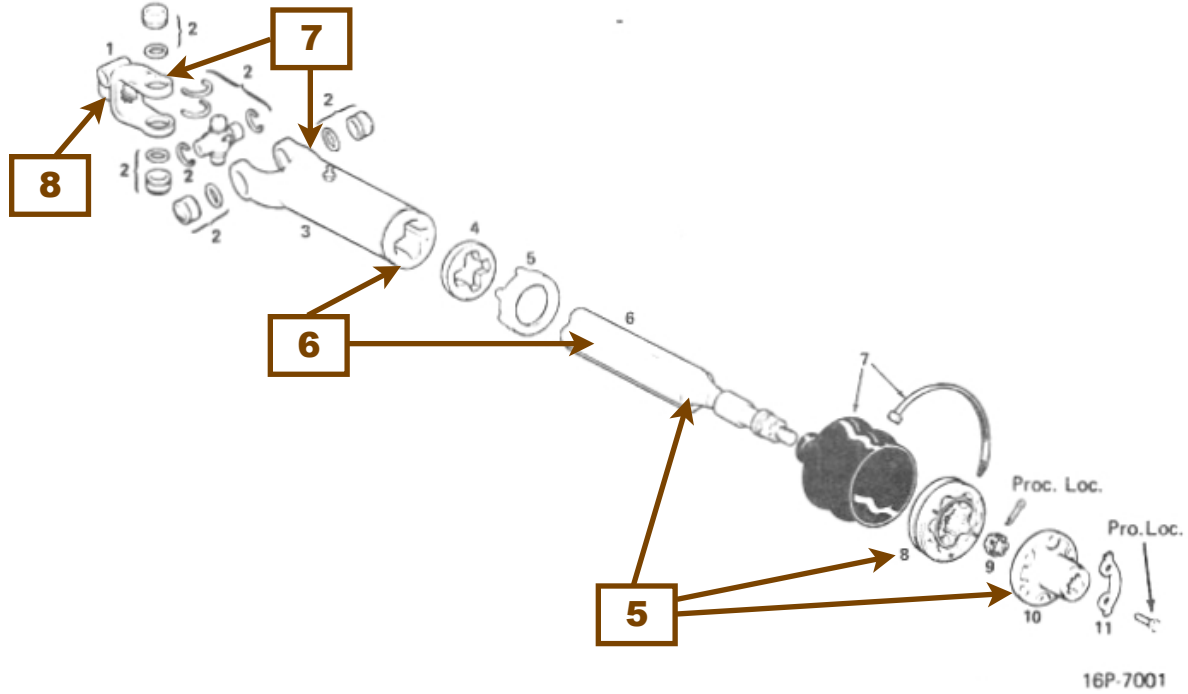
STEERING



STEERING

KEY	230	260	PART NUMBER	
16.002 LINKAGE — STEERING (INCLUDES COMPONENT PARTS)				
1	1	1	7810280	NUT—clamp, steering (300M)
2	1	1	7802922	CLAMP—steering
3	1	1	7803464	BOLT—clamp steering (300M)
4	1	1	692860	SHAFT ASSY.—steering column to gear (see grp. 16.020 for details)
5	2	2	—	BOLT—shaft to gear (procure locally)
6	1	1	9422299	NUT—steering (301M)
7	1	1	7815876	GEAR ASSY.—steering (see grp. 16.010 for details) (1973)
7	1	1	7817940	GEAR ASSY.—steering (see grp. 16.010 for details) (eff. w/1974)
8	1	1	103328	WASHER—bolt
9	1	1	697067	ARM—pitman
10	1	1	5697702	WASHER—arm, pitman
11	1	1	258779	NUT—arm, pitman (replaces 5667628)
12	2	2	5675948	FITTING—arm, lubrication
13	2	2	704802	BOOT—drag link
14	1	1	702013	DRAG LINK ASSY.—steering, LH
15	1	1	6259076	TUBE—adjusting, sleeve
16	1	1	702014	DRAG LINK ASSY.—steering, RH
17	1	1	716898	LINK ASSY.—steering, drag (SOA) (repl. 698758)
18	1	1	103387	PIN—arm (cotter)
19	2	2	3983808	NUT—drag link (repl. 125267)
20	1	1	103387	PIN—lever assembly
21	1	1	700446	WASHER—lever
22	2	2	2398984	SEAL—idler, lever dust
23	2	2	2399043	BUSHING—relay lever
24	1	1	9417908	FITTING—lube, fitting relay lever
25	1	1	697068	LEVER ASSY.—steering relay (incl. seal bushing)
26	1	1	697069	BUSHING—steering
27	1	1	5697840	SEAL ASSY.—idler arm
28	4	4	103385	PIN—rod tie
29	4	4	—	NUT—rod tie (procure locally) (1/2-20) (ref. 274428)
30	1	1	7815525	ROD—relay tie
31	1	1	9418844	NUT—lever steering
32	1	1	103387	PIN—lever steering
33	2	2	7817092	ROD ASSY.—tie, outer w/ends (repl. 7810467)
34	2	2	6259391	SEAL—(Socket) (repl. 5679728)
35	2	2	7812118	TUBE KIT—adjusting
36	4	4	7807288	CLAMP—tie rod
37	4	4	9422277	NUT—tie rod
38	2	2	7817093	ROD ASSY.—inner tie, ball and stud (repl. 5695507)
39	1	1	4975363	ABSORBER ASSY.—shock (repl. 4949828)
40	1	1	9427898	BOLT—steering relay lever pivot (1973-1974) (fine thread) (first design)
40	1	1	9430934	BOLT—steering relay lever pivot (eff. w/1975) (coarse thread) (second design)
41	1	1	2436168	WASHER—lever
42	1	1	9421122	BOLT—shock, bracket (7/16-14 x 300M) (procure locally)
43	2	2	393170	BRACKET—shock
44	1	1	9430680	BOLT—shock bracket
45	1	1	393171	SPACER—shock to intermediate
46	1	1	—	NUT—shock bracket (procure locally)
47	1	1	9422299	NUT—shock
48	1	1	9419089	BOLT—frame bracket (7/16-14) (procure locally) 280M
49	1	1	7805966	ARM ASSY.—idler, steering
50	1	1	NS	BUSHING ASSY.—idler arm (part of arm)
51	1	1	—	BOLT—arm to frame (5/8-11 x 3-3/4) 280M (procure locally) (ref. 9424047)
52	1	1	9422305	NUT—arm
—	2	2	7816937	SEAL—tie-rod

STEERING



KEY	230	260	PART NUMBER
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16.020 SHAFT — STEERING, LOWER

—	1	1	692860	SHAFT ASSY —steering, lower
1	1	1	703326	YOKE —end
2	1	1	703325	JOURNAL KIT—shaft (SOA)
3	1	1	NS	YOKE ASSY —slip (ref. 704387)
4	1	1	703328	WASHER—slip yoke
5	1	1	703327	CAP—dust, steering, lower shaft
6	1	1	703319	SHAFT ASSY —stub (incl items 1 thru 5)
7	1	1	703320	BOOT KIT—lower shaft
8	1	1	703321	JOINT ASSY —disc, lower shaft
9	1	1	703323	NUT—hex, companion flange
10	1	1	703322	FLANGE—companion, lower shaft
11	1	1	703324	LOCK—companion flange
—	1	1	7802922	CLAMP ASSY —steering column to lower shaft
—	1	1	7803464	BOLT—clamp, column to lower shaft
—	1	1	9425686	BOLT—steering gear to lower shaft (procure locally)
—	1	1	7810280	NUT—clamp bolt
—	1	1	9422299	NUT—bolt, steering gear to lower shaft

END

