GENERAL MOTORS

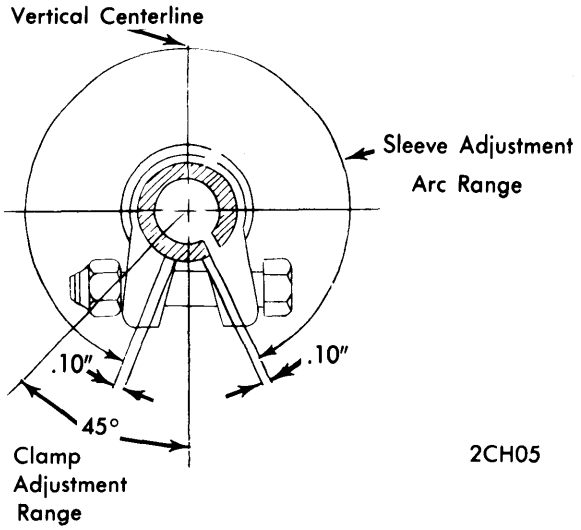
Chevrolet (1965-74)
GMC (1965-74)
GMC Motor Home (1973-74)

Steering System Service Precautions – All steering component fasteners are made of special quality materials. Replacement fasteners must be of same part number or equivalent. Torque all fasteners to specification and install new cotter pins. When installing cotter pins, do not back off castellated nuts to align cotter pin hole, tighten nut to next slot that lines up with hole. Do not hammer on ball studs or damage to threads may result. If threads are not clean and smooth, ball studs may turn in joint when nuts are tightened. Sleeve clamps must always be positioned as specified before tightening bolts.

1965-72 ALL MODELS

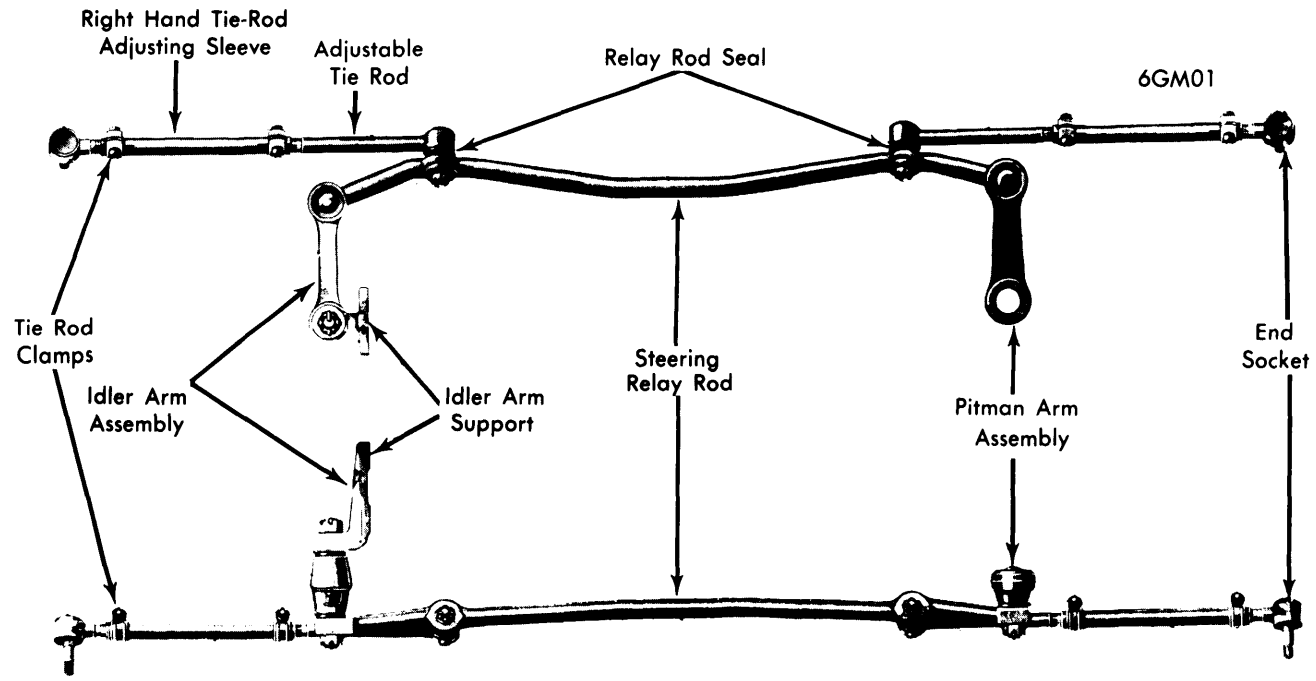
Tie Rod Removal – 1) Raise vehicle and remove cotter pins from ball studs, and remove castellated nuts. To remove outer ball stud, tap on steering arm at tie rod end with a hammer while using another hammer as a backing. Remove inner ball stud from relay rod using same procedure. To remove tie rod ends, loosen clamp bolts and unscrew end assemblies.

2) To install, lubricate tie rod end threads with EP chassis lube and install ends on tie rod so both are threaded an equal amount on tie rod. Check condition of ball stud seals and replace if necessary. Install ball studs in steering arms and relay rod. Install ball stud nuts and torque to specifications. Install new cotter pins. Adjust toe-in. *See Wheel Alignment Specifications & Procedures in WHEEL ALIGNMENT Section.*



TIE ROD CLAMP POSITIONING, 1972-73 ALL MODELS

3) Before tightening tie rod adjusting sleeve clamp bolts, note following: With 1972 models, clamps must be positioned between locating dimples on each tie rod end. Slot of adjuster sleeve may be in any position on arc (see illustration), but not closer than .10" to edge of clamp jaw or between clamp jaws. Rotate sleeve to meet requirements for clamp position as shown. With 1965-71 models, align clamps between dimples (if marked), and slit in adjuster sleeve must center with slot in clamp; and on "C", "P" 10-30 models, clamp slot facing forward.



STEERING LINKAGE COMPONENTS, ALL MODELS WITH INDEPENDENT FRONT SUSPENSION (TYPICAL)

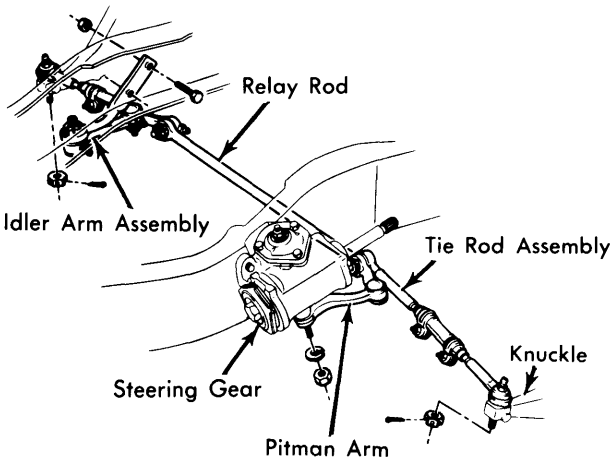
GENERAL MOTORS (Cont.)

1973-74 ALL MODELS

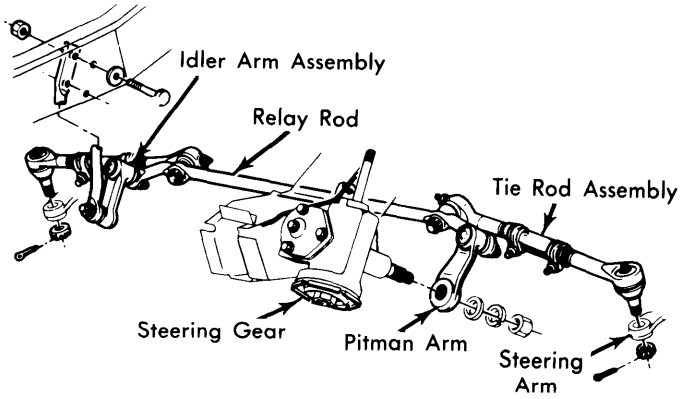
Tie Rod Removal – 1) Raise vehicle and remove tie rod fasteners. Remove outer ball stud by tapping on steering arm at tie rod end with a light hammer while using a heavy hammer as a backing. Remove inner ball stud from relay rod using same procedure.

2) To remove tie rod ends from tie rod, loosen clamp bolts and unscrew end assemblies. Tie rod adjuster clamp bolts often become rusted in service. It is recommended that if torque required to remove the nut from a bolt after breakaway exceeds 7 ft. lbs., discard the nuts and bolts. Apply penetrating oil between clamps and tube, and rotate clamps until they move freely. Use new fasteners during reassembly of same part number to assure proper clamping at specified nut torque.

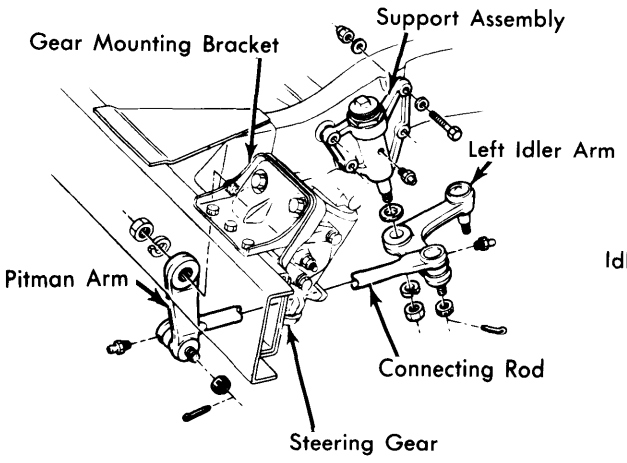
3) To install tie rods, use following procedure: Lubricate tie rod threads with EP chassis lube and install tie rod ends making sure both are threaded an equal distance from tie rod. Check that threads on ball studs and nuts are clean and smooth. Check condition of ball stud seals and replace if necessary using suitable tool (J-24434). Install ball studs in steering arms and relay rod. Install ball stud nuts and torque to specifications, and install new cotter pins. Adjust toe-in. See *Wheel Alignment Specifications & Procedures in WHEEL ALIGNMENT Section.*

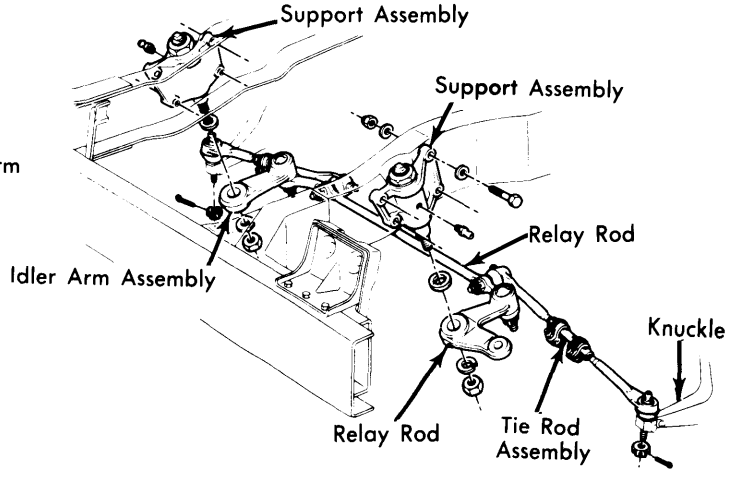


"C" MODELS



"G" MODELS





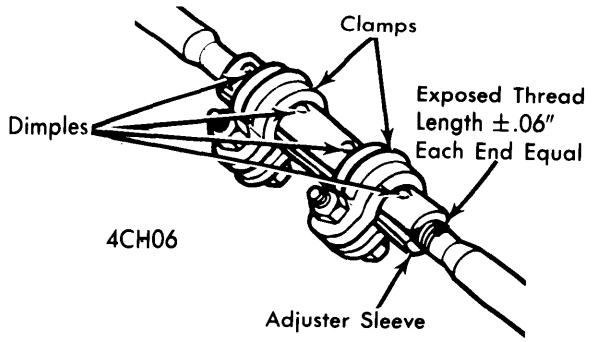
MOTOR HOME

4CH09

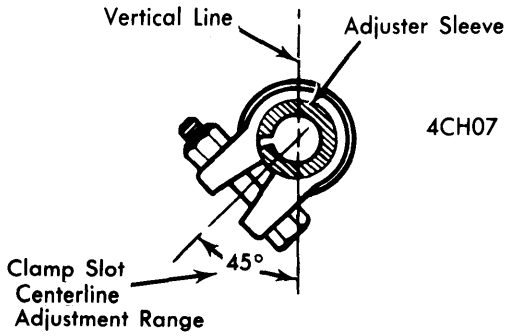
STEERING LINKAGE (1973-74)

GENERAL MOTORS (Cont.)

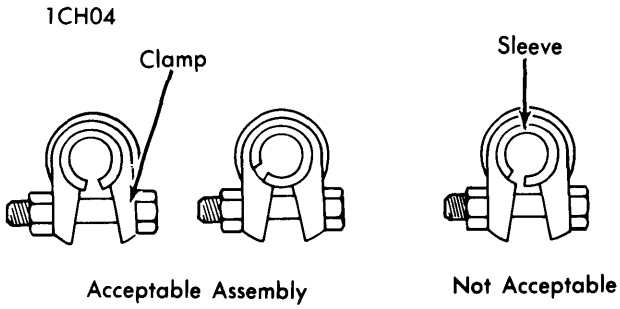
4) Before tightening tie rod adjusting sleeve clamp bolts, note following: Clamps must be positioned between locating dimples at either end of sleeve as shown in illustration. Slot in adjuster sleeve must be within open area of clamp jaws or not closer than .10" to edge of clamp jaw opening. Rotate both inner and outer tie rod housings rearward to limit of ball joint travel before tightening clamps. Tighten clamps to specifications and return tie rod assembly to center of travel. Check each tie rod for a rotation of at least 35° using a bubble protractor and a pair of vise grips. Lubricate inner and outer tie rod ends.



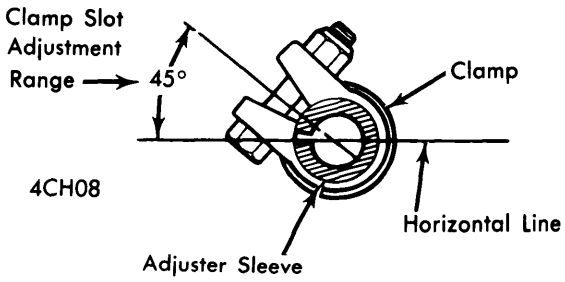
TIE ROD CLAMPS BETWEEN DIMPLES (TYPICAL)



TIE ROD CLAMP POSITIONING, "C", "K" & "P" MODELS (1974)

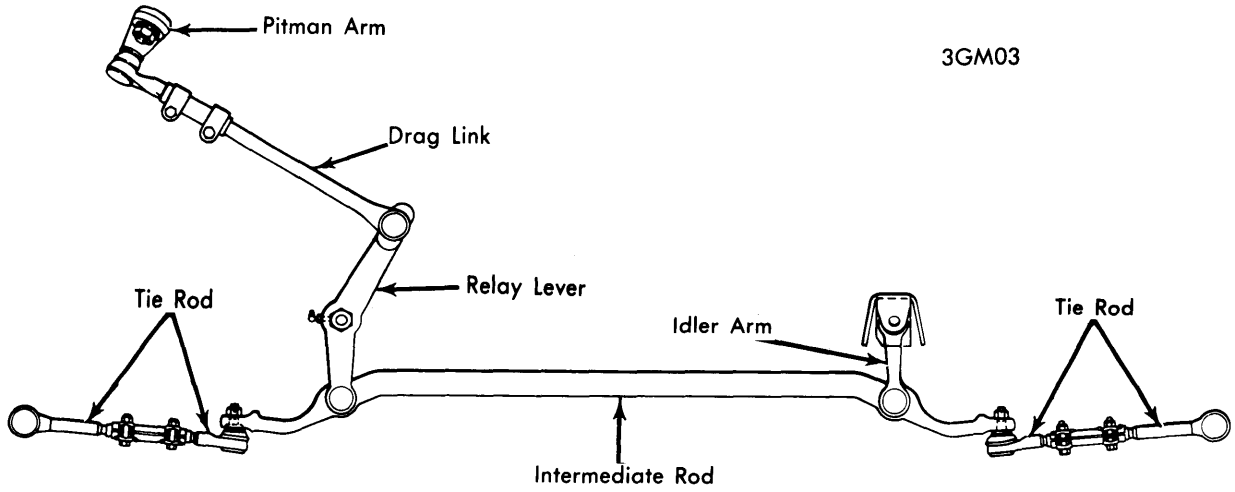


TIE ROD CLAMP POSITIONING, 1965-71 MODELS



TIE ROD CLAMP POSITIONING, "G" MODELS (1974)

Drag Link Removal (GMC Motor Home) – Procedure for removing drag link is the same as tie rod removal. If the drag link is disassembled or a new unit is installed, adjustment on drag link should coincide with steering wheel at center travel and wheels pointing straight ahead. *NOTE – Later production vehicles are equipped with a non-adjustable drag link.*



GMC MOTOR HOME STEERING LINKAGE

GENERAL MOTORS (Cont.)

1965-74 ALL MODELS

Relay Rod Removal – 1) Remove inner ends of tie rods from relay rod (on models where applicable). Remove relay rod ball stud cotter pins and castellated nuts. Remove relay rod from pitman and idler arms by tapping on relay rod ball stud bosses with a hammer, while using another hammer as a backing.

2) To install, reverse removal procedure and note following: Check ball studs and nuts for clean and smooth threads. Check stud seals and replace if necessary. Torque nuts and install new cotter pins.

Idler Arm Removal – 1) Place vehicle on a hoist. Remove fasteners from ball stud at relay rod. Remove ball stud from relay rod by tapping on relay rod boss with a hammer, while using another hammer as a backing. Remove idler arm-to-frame bolts and remove idler arm assembly. *NOTE – Idler arm assembly should always be replaced if it is found that an up and down force of 25 lbs., applied at relay rod end of idler arm, produces a vertical lash of more than ⅛" in straight ahead position.*

2) To install, reverse removal procedure and note following: Install idler arm-to-frame bolts using special plain washers under bolt heads, torque nuts to specifications. Check ball studs and nuts for clean and smooth threads. Check stud seals and replace if necessary. Install idler arm ball stud in relay rod and check position of seal. Torque nuts and install cotter pins.

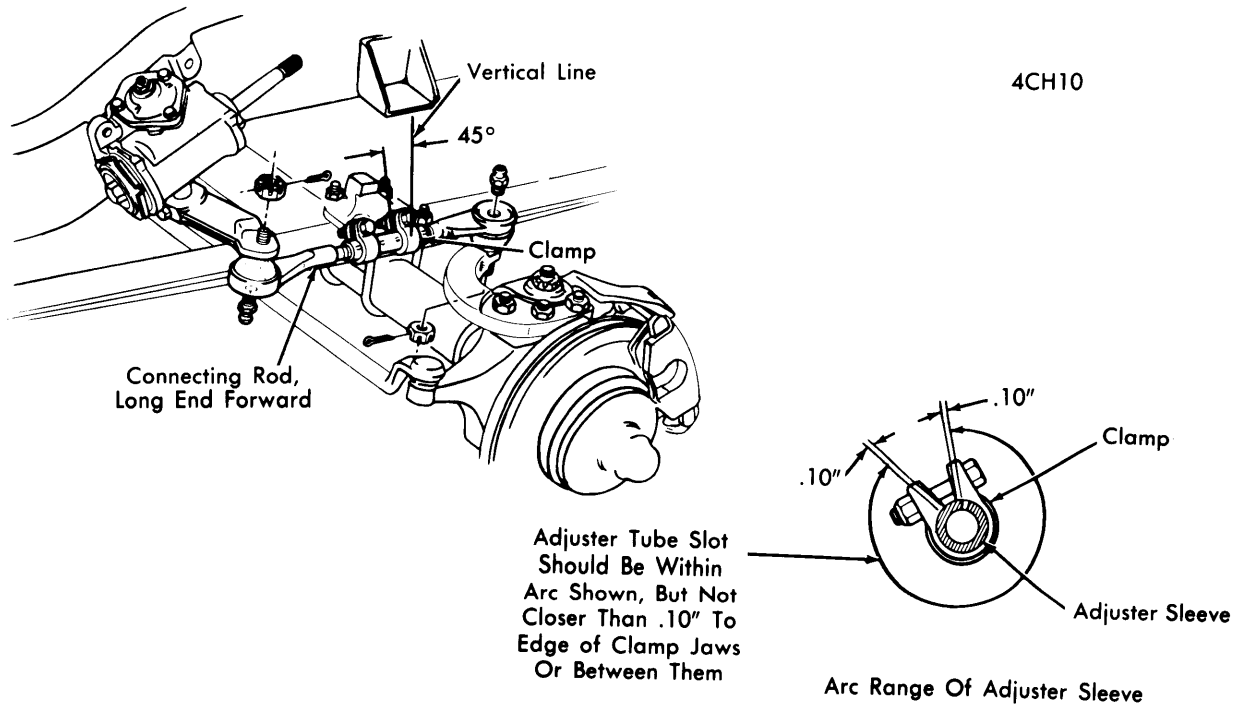
Pitman Arm Removal – 1) Raise vehicle on a hoist. Remove cotter pin from pitman arm ball stud and remove nut. Remove pitman arm or relay rod from ball stud by tapping on side of rod or arm (in which stud mounts) with a hammer while using another hammer as a back-up. Remove pitman arm nut from shaft or clamp bolt from pitman arm, and mark arm-to-shaft position. Remove pitman arm from shaft using suitable puller.

2) To install, reverse removal procedure and note following: If a clamp type pitman arm is used, spread pitman arm with a wedge just enough to slip arm onto shaft by hand pressure. Do not hammer or damage to steering gear may result. Be sure to reinstall the hardened steel washer before installing nut.

"K" MODELS & MOTOR HOME

Steering Connecting Rod – 1) Remove cotter pins from ball studs and remove castellated nuts. Remove ball studs from steering arm and pitman arm boss with a heavy hammer and striking other side of boss with a lighter hammer.

2) To install, reverse removal procedure and note following: Ensure that threads on studs and nuts are clean and smooth. Check ball stud seals and replace if necessary. Install connecting rod on steering components, torque nuts and install new cotter pins. *See illustration for proper alignment and orientation of connecting rod clamps.*



ADJUSTABLE CONNECTING ROD ASSEMBLY, "K" MODELS (1973-74)

GENERAL MOTORS (Cont.)

TIGHTENING SPECIFICATIONS (1967-68)

Application	Ft. Lbs.
Tie Rod Ball Joint Nut	
G 10	26
G 20	105
C & P 10	30
C 20-30	50
K 10-20	45
P 20-30	155
Tie Rod Clamp Bolt	
G 10, C 10-30, P 10	20
G 20	30
K 10-20	35
P 20-30	50
Idler Arm Mounting Bolts	20
Idler Arm-To-Relay Rod Nut	60
Pitman Arm-To-Relay Rod Nut	60
Steering Connecting Rod Nut	50
Pitman Arm-To-Sector Shaft Nut	
G 10-20	95
C 10-30, P 10	140
K 10-20	125
P 20-30	115

TIGHTENING SPECIFICATIONS (1969-71)

Application	Ft. Lbs.
Tie Rod Ball Joint Nut	
G 10 (1969-70)	26
G 20 (1969-70)	105
G 10-20 (1971)	①35
G 30	②70
C & P 10	30
C & P 20-30	50
K 10-20	45
Tie Rod Clamp Bolt	
G 10 (1969-70)	26
G 20 (1969-70)	30
G 10-20 (1971)	11
G 30	20
K 10-20	35
All Others	11
Idler Arm Mounting Bolts	30
Idler Arm-To-Relay Rod Nut	
G 10-30 (1971)	②70
All Others	60
Pitman Arm-To-Relay Rod Nut	
G 10-30 (1971)	②70
All Others	60
Steering Connecting Rod Nut	50
Steering Arm-To-Brake Backing Plate	
G 10-20 (1971)	100
G 30	150
Pitman Arm-To-Sector Shaft Nut	
G & K 10-20	95
All Others	125

① — Maximum permissible torque on nut is 50 ft. lbs.
② — Maximum permissible torque on nut is 100 ft. lbs.

TIGHTENING SPECIFICATIONS (1972-74 MODELS)

Application	Ft. Lbs
Tie Rod Ball Stud Nuts	
C & G-10, P 10-30	①35
All Others	②45
Tie Rod Clamps	
K 10-30	35
All Others	22
Idler Arm Mounting Bolts	30
Idler Arm-To-Relay Rod Nut	
G 10-30	70
All Others	60
Pitman Arm-To-Relay Rod Nut	
G 10-30	70
All Others	60
Steering Connecting Rod Nut	
K 10-20	③50
Steering Connecting Rod Clamps	
K 10-20	40
Pitman Arm-To-Pitman Shaft Nut	
K 10-20	90
All Others (W/Power Steering)	180
All Others (W/Manual Steering)	140

① — Plus torque required to align cotter pin, max. 50 ft. lbs.
② — Plus torque required to align cotter pin, max. 60 ft. lbs.
③ — Plus next slot for cotter pin.

TIGHTENING SPECIFICATIONS (GMC MOTOR HOME)

Application	Ft. Lbs.
Steering Arm-To-Tie Rod End	40-50
Tie Rod Clamp Nuts	19-24
Tie Rod-To-Intermediate Rod	40-50
Idler Arm-To-Intermediate Rod	40-50
Idler Arm-To-Frame	85-110
Relay Lever-To-Intermediate Rod	40-60
Relay Lever-To-Frame	250-300
Drag Link-To-Relay Lever	40-60
Drag Link-To-Pitman Arm	40-60
Pitman Arm-To-Steering Gear	160-210