

**MASTER CYLINDER,
REPLACE**

All Models

To remove the master cylinder, disconnect the brake line tube at the master cylinder. Remove the clevis pins which

connect the piston push rod and pedal. (On trucks equipped with piston type booster brakes, remove the clevis pins which connect the piston push rod and operating link.) Unfasten the master cylinder from the clutch housing and lift out the unit.

Install the master cylinder in the reverse order of removal and bleed the

brake system.

POWER BRAKES

Vacuum booster brakes are described in the *Vacuum Brakes* chapter and the air brake actuating system is covered in the *Air Brakes* chapter.

Wheel Alignment & Steering Gear Section

WHEEL ALIGNMENT SPECIFICATIONS

Model	Year	Caster, Deg.	Camber, Deg.	Toe-In, Inch	Kingpin Inclination, Deg.
B-1-FA	1949	1	2	1/8	7
B-1-FL	1949	1	2	1/8	7
B-1-FM	1949	1	2	1/8	7
B-1-FMA	1949	1	2	1/8	7
B-1-H	1949	1	2	1/8	7
B-1-HA	1949	1	2	1/8	7
B-1-HH	1949	1	2	1/8	7
B-1-HHA	1949	1	2	1/8	7
B-1-HHM	1949	1	2	1/8	7
B-1-HHMA	1949	1	2	1/8	7
B-1-HM	1949	1	2	1/8	7
B-1-HMA	1949	1	2	1/8	7
B-1-J	1949	1	2	1/8	7
B-1-JA	1949	1	2	1/8	7
B-1-JAL	1949	1	2	1/8	7
B-1-JL	1949	1	2	1/8	7
B-1-JM	1949	1	2	1/8	7
B-1-JMA	1949	1	2	1/8	7
B-1-JMAL	1949	1	2	1/8	7
B-1-JML	1949	1	2	1/8	7
B-1-KA	1949	1	2	1/8	7
B-1-KAL	1949	1	2	1/8	7
B-1-KMA	1949	1	2	1/8	7
B-1-KMAL	1949	1	2	1/8	7
B-1-PW	1949	1/2	1 1/2	1/8	8
B-1-R	1949	1 1/2	2	1/8	7
B-1-RA	1949	1 1/2	2	1/8	7
B-1-T	1949	2	1	1/8	8
B-1-TA	1949	2	1	1/8	8
B-1-V	1949	2	1	1/8	8
B-1-VA	1949	2	1	1/8	8
B-1-VX	1950	2	1	1/8	8
B-2-B	1950	1	1 1/2	1/8	4
B-2-C	1950	1 1/2	1 1/2	1/8	4
B-2-D	1950	1	1 1/2	1/8	4
B-2-F	1950	1 1/2	2	1/8	7
B-2-FA	1950	1 1/2	2	1/8	7
B-2-FL	1950	1 1/2	2	1/8	7
B-2-G	1950	1 1/2	2	1/8	7
B-2-GA	1950	1 1/2	2	1/8	7
B-2-GM	1950	1 1/2	2	1/8	7
B-2-GMA	1950	1 1/2	2	1/8	7
B-2-H	1950	2	2	1/8	7
B-2-HA	1950	2	2	1/8	7
B-2-HM	1950	2	2	1/8	7

Model	Year	Caster, Deg.	Camber, Deg.	Toe-In, Inch	Kingpin Inclination, Deg.
B-2-HMA	1950	2	2	1/8	7
B-2-HH	1950	2	2	1/8	7
B-2-HHA	1950	2	2	1/8	7
B-2-HHM	1950	2	2	1/8	7
B-2-HHMA	1950	2	2	1/8	7
B-2-J	1950	2	2	1/8	7
B-2-JA	1950	2	2	1/8	7
B-2-JAL	1950	2	2	1/8	7
B-2-JL	1950	2	2	1/8	7
B-2-JM	1950	2	2	1/8	7
B-2-JMA	1950	2	2	1/8	7
B-2-JMAL	1950	2	2	1/8	7
B-2-JML	1950	2	2	1/8	7
B-2-K	1950	2	2	1/8	7
B-2-KA	1950	2	2	1/8	7
B-2-KAL	1950	2	2	1/8	7
B-2-KL	1950	2	2	1/8	7
B-2-KM	1950	2	2	1/8	7
B-2-KMA	1950	2	2	1/8	7
B-2-KMAL	1950	2	2	1/8	7
B-2-KML	1950	2	2	1/8	7
B-2-PW	1950	1/2	1 1/2	1/8	8
B-2-R	1950	2 1/2	2	1/8	7
B-2-RA	1950	2 1/2	2	1/8	7
B-2-T	1950	1 3/4	1	1/8	8
B-2-TA	1950	1 3/4	1	1/8	8
B-2-V	1950	1 3/4	1	1/8	8
B-2-VA	1950	1 3/4	1	1/8	8
B-2-Y	1950	1 3/4	1	1/8	8
B-2-YA	1950	1 3/4	1	1/8	8
B-3-B	1951-53	3	1 1/2	1/8	4
B-3-C	1951-53	2 1/2	1 1/2	1/8	4
B-3-D	1951-53	1 1/2	1 1/2	1/8	4
B-3-DU	1951-52	1 1/2	1 1/2	1/8	4
B-3-EU	1951-52	1 1/2	2	1/8	7
B-3-F	1951-53	1 1/2	2	1/8	7
B-3-FA, FS	1951-53	1 1/2	2	1/8	7
B-3-G	1951-53	1 1/2	2	1/8	7
B-3-GA, GS	1951-53	1 1/2	2	1/8	7
B-3-GM	1951-52	2	2	1/8	7
B-3-GMA	1951-52	2	2	1/8	7
B-3-H	1951-53	2	2	1/8	7
B-3-HH	1951-53	2	2	1/8	7
B-3-HA	1951-53	2	2	1/8	7
B-3-HHA, HS	1951-53	2	2	1/8	7

Model	Year	Caster, Deg.	Camber, Deg.	Toe-In, Inch	Kingpin Inclination, Deg.
B-3-HHM	1951-53	2	2	1/8	7
B-3-HHMA	1951-53	2	2	1/8	7
B-3-HM	1951-53	2	2	1/8	7
B-3-HMA	1951-53	2	2	1/8	7
B-3-J	1951-53	1	2	1/8	7
B-3-JA	1951-53	1	2	1/8	7
B-3-JM	1951-53	2	2	1/8	7
B-3-JMA	1951-53	2	2	1/8	7
B-3-JS	1951-53	2 1/2	2	1/8	7
B-3-K	1951-53	1	2	1/8	7
B-3-KA	1951-53	1	2	1/8	7
B-3-KM	1951-53	2	2	1/8	7
B-3-KMA	1951-53	2	2	1/8	7
B-3-PW	1951-52	1	1 1/2	1/8	8
B-3-R	1951-53	2 1/2	2	1/8	7
B-3-RA	1951-53	2 1/2	2	1/8	7
B-3-RS	1951-53	1 3/4	1	1/8	8
B-3-T	1951-53	1 1/2	1	1/8	8
B-3-TA	1951-53	1 1/2	1	1/8	8
B-3-V	1951-53	2	1	1/8	5 1/2
B-3-VA	1951-53	1 1/2	1	1/8	8
B-3-VX	1951-53	1 1/2	1	1/8	8
B-3-Y	1951-53	2	1	1/8	5 1/2
B-3-YA	1951-53	1 1/2	1	1/8	8
B-3-YX	1951-52	2	1	1/8	5 1/2
B-4-G, GA	1953	1 1/2	2	1/8	7
B-4-H, HA	1953	2	2	1/8	7
B-4-HM	1953	2	2	1/8	7
B-4-HMA	1953	2	2	1/8	7
B-4-J	1953	1	2	1/8	7
B-4-JA	1953	1	2	1/8	7
B-4-JM	1953	2	2	1/8	7
B-4-JMA	1953	2	2	1/8	7
B-4-K	1953	1	2	1/8	7
B-4-KA	1953	1	2	1/8	7
B-4-KMA	1953	2	2	1/8	7
B-4-R	1953	2 1/2	2	1/8	7
B-4-RA	1953	2 1/2	2	1/8	7
B-4-T	1953	1 1/2	1	1/8	8
B-4-TA	1953	1 1/2	1	1/8	8
B-4-V	1953	2	1	1/8	5 1/2
B-4-VA	1953	1 1/2	1	1/8	8
B-4-Y	1953	2	1	1/8	5 1/2
B-4-YA	1953	1 1/2	1	1/8	8
C-1-B6	1954	3	1 1/2	0-1/8	4
C-1-C6	1954	2 1/4	1 1/2	0-1/8	4
C-1-D6	1954	2 1/4	1 1/2	0-1/8	4
C-1-DU6	1954	1 1/2	1 1/2	0-1/8	4
C-1-EU6	1954	1 1/2	2	0-1/8	7
C-1-F6	1954	1 1/2	2	0-1/8	7
C-1-G6	1954	1 1/2	2	0-1/8	7
C-1-GA6	1954	1 1/2	2	0-1/8	7
C-1-G8	1954	1 1/2	2	0-1/8	7
C-1-GA8	1954	1 1/2	2	0-1/8	7
C-1-H6	1954	1	2	0-1/8	7
C-1-HA6	1954	1	2	0-1/8	7
C-1-HM6	1954	1	2	0-1/8	7
C-1-HMA6	1954	1 1/4	2	0-1/8	7
C-1-H8	1954	1	2	0-1/8	7
C-1-HA8	1954	1	2	0-1/8	7
C-1-J6	1954	1 1/4	2	0-1/8	7
C-1-JA6	1954	1 1/4	2	0-1/8	7
C-1-JM6	1954	1 1/4	2	0-1/8	7

Model	Year	Caster, Deg.	Camber, Deg.	Toe-In, Inch	Kingpin Inclination, Deg.
C-1-JMA6	1954	1 1/4	2	0-1/8	7
C-1-J8	1954	1 1/4	2	0-1/8	7
C-1-JA8	1954	1 1/4	2	0-1/8	7
C-1-K6	1954	1/4	2	0-1/8	7
C-1-KA6	1954	1/4	2	0-1/8	7
C-1-KMA6	1954	1/4	2	0-1/8	7
C-1-K8	1954	1/4	2	0-1/8	7
C-1-KA8	1954	1/4	2	0-1/8	7
C-1-R8	1954	2	2	0-1/8	7
C-1-RA8	1954	2	2	0-1/8	7
C-1-T8	1954	2 3/4	1	0-1/8	8
C-1-TA8	1954	2 3/4	1	0-1/8	8
C-1-V8	1954	2 1/2	1	0-1/8	5 1/2
C-1-VA8	1954	2 1/2	1	0-1/8	5 1/2
C-1-Y6	1954	3 1/4	1	0-1/8	5 1/2
C-1-YA6	1954	3 1/4	1	0-1/8	5 1/2
C-1-PW6	1954	1/2	1 1/2	0-1/8	4
C-3-B6	1955	3	1 1/2	0-1/8	4
C-3-B8	1955	3	1 1/2	0-1/8	4
C-3-C6	1955	2 1/4	1 1/2	0-1/8	4
C-3-C8	1955	2 1/4	1 1/2	0-1/8	4
C-3-CN6	1955	2 1/4	1 1/2	0-1/8	4
C-3-D6	1955	2 1/4	1 1/2	0-1/8	4
C-3-D8	1955	2 1/4	1 1/2	0-1/8	4
C-3-DN6	1955	2 1/2	1 1/2	0-1/8	4
C-3-DU6	1955	1 1/2	1 1/2	0-1/8	4
C-3-EU6	1955	1 1/2	1 1/2	0-1/8	4
C-3-F6	1955	1 1/2	2	0-1/8	7
C-3-F8	1955	1 1/2	2	0-1/8	7
C-3-FN6	1955	2 1/2	1 1/2	0-1/8	4
C-3-G6	1955	1 1/2	2	0-1/8	7
C-3-G8	1955	1 1/2	2	0-1/8	7
C-3-H6	1955	1	2	0-1/8	7
C-3-H8	1955	1	2	0-1/8	7
C-3-HM6	1955	1	2	0-1/8	7
C-3-J6	1955	1 1/4	2	0-1/8	7
C-3-J8	1955	1 1/4	2	0-1/8	7
C-3-JM6	1955	1 1/4	2	0-1/8	7
C-3-K6	1955	1 1/4	2	0-1/8	7
C-3-KA6	1955	1 1/4	2	0-1/8	7
C-3-K8	1955	1 1/4	2	0-1/8	7
C-3-KA8	1955	1 1/4	2	0-1/8	7
C-3-KMA6	1955	1 1/4	2	0-1/8	7
C-3-PW6	1955	1/2	1 1/2	0-1/8	4
C-3-R8	1955	2	2	0-1/8	7
C-3-RA8	1955	2	2	0-1/8	7
C-3-T8	1955	2 3/4	1	0-1/8	8
C-3-V8	1955	2 1/2	1	0-1/8	5 1/2
C-3-Y6	1955	3 1/4	1	0-1/8	5 1/2
C-3-YX6	1955	3 1/4	1	0-1/8	5 1/2
K-D100	1957	3	1 1/2	0-1/8	4
K-D200	1957	2 1/2	1 1/2	0-1/8	4
K-D300	1957	2 1/2	1 1/2	0-1/8	4
K-P300	1957	2 1/2	1 1/2	0-1/8	4
K-W300	1957	1/2	1 1/2	0-1/8	8
K-D400	1957	1 1/2	2	0-1/8	7
K-P400	1957	1 1/2	2	0-1/8	7
K-C500	1957	2 1/2	2	0-1/8	7
K-D500	1957	2 1/2	2	0-1/8	7
K-W500	1957	2 1/2	3/4	0-1/8	8
K-C600	1957	1/4	2	0-1/8	7
K-D600	1957	1/4	2	0-1/8	7
K-C700	1957	1/4	2	0-1/8	7

Model	Year	Caster, Deg.	Camber, Deg.	Toe-In, Inch	Kingpin Inclination, Deg.
K-D700	1957	1/4	2	0-1/8	7
K-T700	1957	2 3/4	1	0-1/8	5 1/2
K-D800	1957	2 3/4	1	0-1/8	5 1/2
K-T800	1957	3 1/4	1	0-1/8	5 1/2
K-D900	1957	2 3/4	1	0-1/8	5 1/2
K-T900	1957	3 1/4	1	0-1/8	5 1/2
L-D100	1958	3	1 1/2	0-1/8	4
L-W100	1958	3	1 1/2	0-1/8	7 1/2
L-D200	1958	2 1/2	1 1/2	0-1/8	4
L-W200	1958	3	1 1/2	0-1/8	7 1/2
L-D300	1958	2 1/2	1 1/2	0-1/8	4
L-P300	1958	2 1/2	1 1/2	0-1/8	4
L-W300	1958	3 1/2	1 1/2	0-1/8	7 1/2
L-W300M	1958	1/2	1 1/2	0-1/8	8
L-D400	1958	1 1/2	2	0-1/8	7
L-P400	1958	1 1/2	2	0-1/8	7

Model	Year	Caster, Deg.	Camber, Deg.	Toe-In, Inch	Kingpin Inclination, Deg.
L-S400	1958	1 1/2	2	0-1/8	7
L-W500	1958	2 1/2	3/4	0-1/8	8
L-D500	1958	2 1/2	2	0-1/8	7
L-S500	1958	2 1/2	2	0-1/8	7
L-C500	1958	2 1/2	2	0-1/8	7
L-D600	1958	1/4	2	0-1/8	7
L-C600	1958	1/4	2	0-1/8	7
L-S600	1958	2 3/4	1	0-1/8	5 1/2
L-C700	1958	1/4	2	0-1/8	7
L-S700	1958	2 3/4	1	0-1/8	5 1/2
L-T700	1958	2 3/4	1	0-1/8	5 1/2
L-D800	1958	2 3/4	1	0-1/8	5 1/2
L-T800	1958	3 1/4	1	0-1/8	5 1/2
L-D900	1958	2 3/4	1	0-1/8	5 1/2
L-T900	1958	3 1/4	1	0-1/8	5 1/2

GEMMER WORM & ROLLER STEERING GEAR

Light & Medium Duty Trucks

In this type steering gear, Fig. 1, the worm is integral with the steering shaft and is supported on each end by opposed tapered roller bearings. The triple tooth roller is attached to the roller shaft by means of a steel shaft. Two needle bearing assemblies are installed between this shaft and the roller. (Some light duty models have a two tooth roller shaft).

The roller shaft is mounted in the steering gear housing on two needle bearing assemblies which are pressed into the housing. The housing cover is attached to the housing by four cap screws. An adjustment screw, mounted in the cover, controls roller shaft end play and worm and roller mesh adjustment.

The steering wheel and roller shaft arm (pitman arm) are splined to the steering shaft and roller shaft respectively. Both the pitman arm and steering wheel have master splines to insure correct installation.

Worm End Play, Adjust

1. Free the steering gear of all load by disconnecting the drag link and loosening the steering column braces.
2. Loosen the four cover screws about 1/8".
3. Use a knife to separate the top shim, passing the blade all the way around between the shims, being careful not to damage the remaining shims.
4. Remove one shim at a time between inspections to remove the end play.
5. The adjustment is correct when there is no end play and no stiffness in the steering gear throughout the complete range of its travel.

Roller Shaft End Play, Adjust

1. Turn the steering gear to either extreme and back off 1/8 of a turn.
2. Gripping the pitman arm at the hub,

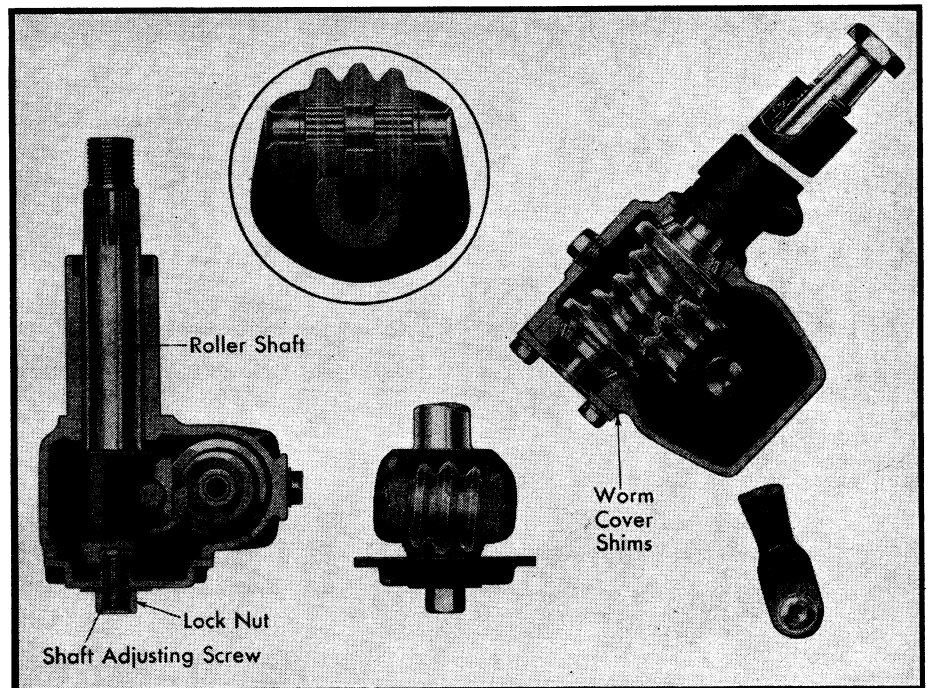


Fig. 1 Gemmer worm and roller steering gear. Light and medium duty trucks

- the roller shaft should rotate freely without a particle of end play.
3. If end play exists, adjust as required by means of the roller shaft adjusting screw in the side cover.
 4. Be sure to tighten the lock nut securely and inspect for end play and free rotation throughout the entire range of steering gear travel.

Worm & Roller Mesh, Adjust

1. Loosen the roller shaft adjusting screw lock nut.
2. With the steering gear in its central position (drag link disconnected) tighten the roller shaft adjusting screw just enough to remove play between the roller shaft roller tooth and worm.
3. Check this by the amount of play

- felt at the pitman arm. It is better to leave a slight amount of play at this point than to tighten too much.
4. If tightened beyond the point where the lash is removed, serious results will occur which will cause poor steering operation.
 5. Tighten the adjusting screw lock nut.

ROSS CAM & LEVER STEERING GEAR

Heavy Duty Trucks

This steering gear, Fig. 2, is the cam and twin lever type in which the cam is mounted on ball bearings and the lever shaft turns on steel backed bronze bushings.

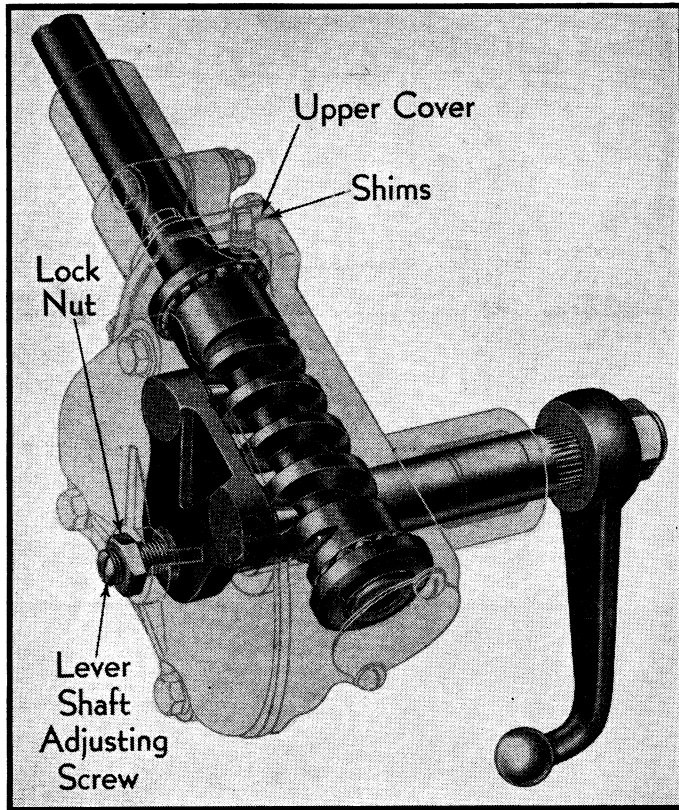


Fig. 2 Ross cam and twin lever steering gear. Heavy duty trucks

As the cam is turned by the wheel tube, the follower studs are pulled along the cam groove, causing the lever arm to rotate the lever shaft. The groove in the cam is cut shallower in the straight-ahead driving position to provide closer adjustment between the studs and the cam where most of the steering action occurs.

Cam End Play, Adjust

1. Free the steering gear of all load by disconnecting the drag link and loosening the steering column braces.
2. Loosen the lock nut adjusting screw in the side cover to free the studs in the cam groove.
3. Remove the upper cover stud nuts and raise the housing upper cover to permit removal of the adjusting shims, which are .002", .003" and .010" thickness.
4. Clip and remove one thin shim, tighten down the cover and check the adjustment. There should be a slight drag but the steering wheel should turn freely with the thumb and forefinger lightly gripping the rim. If necessary, remove or replace shims until the adjustment is correct.

Lever Shaft Backlash, Adjust

1. Centralize the steering gear by turning the wheel all the way to the right. Then, starting from this point, count the number of turns required to reach end of travel to the left.

Turn the wheel back half this number of turns to the mid-position.

2. Tighten the side cover adjusting screw until a very slight drag is felt through the mid-position when turning the steering wheel slowly from one side to the other. The gear should not bind in any position but a slight drag should be felt in the mid-position only.
3. After proper adjustment is secured, tighten the lock nut and give the gear a final check for binding.

GEMMER WORM & SECTOR STEERING GEAR

Power Wagon & Route Vans

In this type steering gear, Fig. 3, the worm is integral with the steering shaft and is supported on each end by opposed tapered roller bearings. The triple tooth sector and shaft is mounted in the steering gear housing in two bushings which are pressed in the housing. The housing cover is attached to the housing by cap screws. An adjustment screw, mounted in the cover, controls sector shaft end play and worm and sector mesh adjustment.

Adjustments

Adjustment of this type steering gear is accomplished in the same manner as outlined for the Gemmer Worm & Roller type.

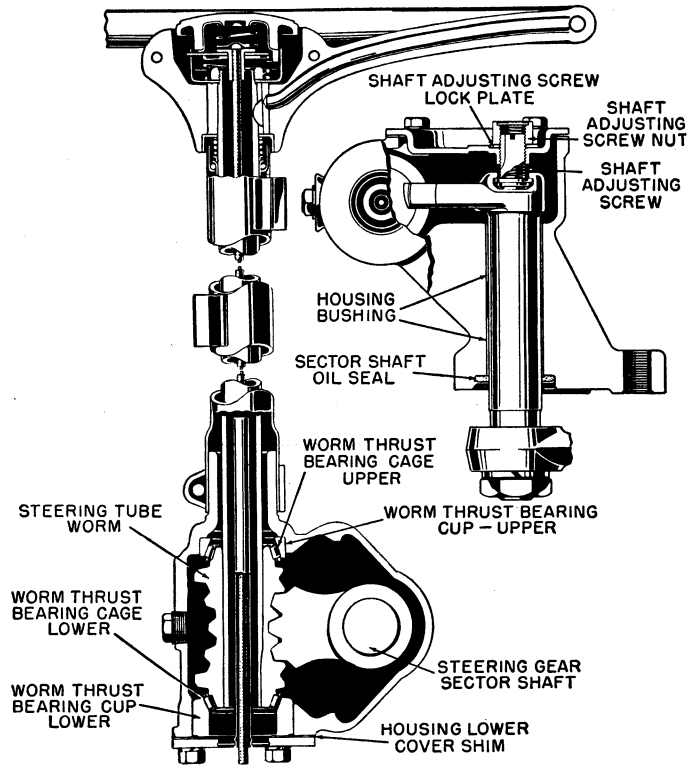


Fig. 3 Gemmer worm and sector steering gear. Power Wagon and Route Vans

STEERING GEAR, REPLACE

All Models Except Route Vans

1. Disconnect the horn wire at the connector between the bottom of the steering gear and horn.
2. Press firmly on the horn button and rotate it to the right as far as it will go. Relieve the pressure and the button will pop out.
3. Remove horn button contact washer and plate.
4. Remove steering wheel nut.
5. Remove wheel with a puller.
6. Unfasten steering column from instrument panel bracket.
7. Remove pitman arm.
8. Remove floor panels (except C. O. E.).
9. Unfasten steering gear housing from frame and lower the steering gear assembly from the truck.
10. To install, reverse the foregoing procedure.

C-1 & C-3 Route Vans

1. Remove left front wheel and lower section of front wheel housing pan.
2. Remove lower toe board.
3. Remove pitman arm.
4. Disconnect steering column bracket clamp.
5. Remove steering gear mounting bolts and take out gear.
6. When installing the steering gear, loosen the stud nuts at the split in the housing. Bolt the frame part of the housing to the top of the side rail. Then fasten the steering column support brace at the instrument panel.