



STEERING GROUP

The following list shows the L-line truck models and their corresponding steering gear models. Specifications of the individual steering gear models will be found on specifications page 1.

TRUCK MODELS	STEERING GEAR MODELS	TRUCK MODELS	STEERING GEAR MODELS
L-110.....	TA-12	L-184.....	TA-61
L-120.....	TA-12	L-185.....	TA-61
LM-120.....	TA-14	LC-180.....	TA-61
L-130.....	T-14	L-190.....	T-66
LB-140.....	T-14	L-193.....	T-66
L-150.....	TA-14	L-194.....	T-66
L-153.....	TA-14	L-195.....	T-66
LM-150.....	TA-14	LC-190.....	
L-160.....	TA-54	LF-190.....	TA-66
L-163.....	TA-54	L-200.....	TA-66
L-164.....	TA-54	L-204.....	TA-66
L-165.....	TA-54	L-205.....	TA-66
LC-160.....	TA-54	LC-200.....	
L-170.....	TA-54	L-210.....	TA-70
L-173.....	TA-54	LF-210.....	TA-70
L-174.....	TA-61	L-220.....	
L-175.....	TA-54	LF-220.....	
LF-170.....	TA-61	L-225.....	TA-70
L-180.....	TA-61	L-230.....	
L-183.....	TA-61	LF-230.....	

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STEERING GEAR SPECIFICATIONS

STEERING GEAR MODELS	TA-12	T-14	TA-14	TA-54	TA-61	T-66	TA-66	TA-70
Steering Gears:								
Make	Ross	Ross	Ross	Ross	Ross	Ross	Ross	Ross
Ratio	15.4:13.5:15.4	17:15:17	20:18:20	20:18:20	22:18:22	19:17:19	23.4:19.5:23.4	23.4:19.5:23.4
Lever Shaft Diameter9360	.9980	1.1230	1.1230	1.248	1.3730	1.3730	1.4975
Pitman Travel:								
Available	120°	116°	116°	116°	112°	104°	112°	106°
Steering Post Diameter	7/8"	7/8"	7/8"	7/8"	1"	1"	1"	1"
Steering Jacket Diameter	1-1/2"	1-1/2"	1-1/2"	1-1/2"	1-3/4"	1-3/4"	1-3/4"	1-3/4"



STEERING GEARS

TA-12, T-14, TA-14, TA-54, TA-61, T-66, TA-66, TA-70

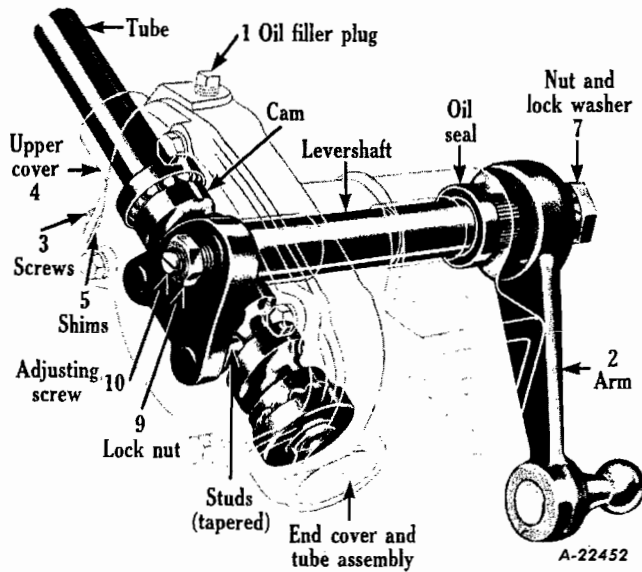


Fig. 1 - Models TA-12, T-14, TA-14.

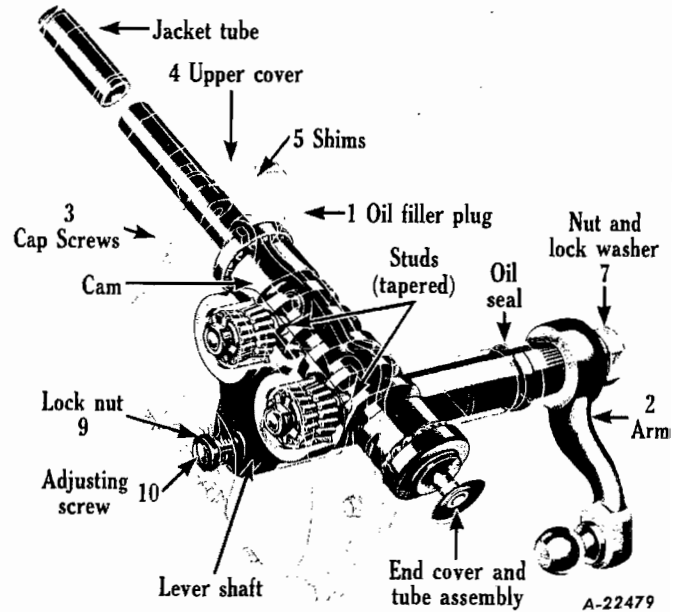


Fig. 2 - Models TA-54, TA-61, T-66, TA-66, TA-70.

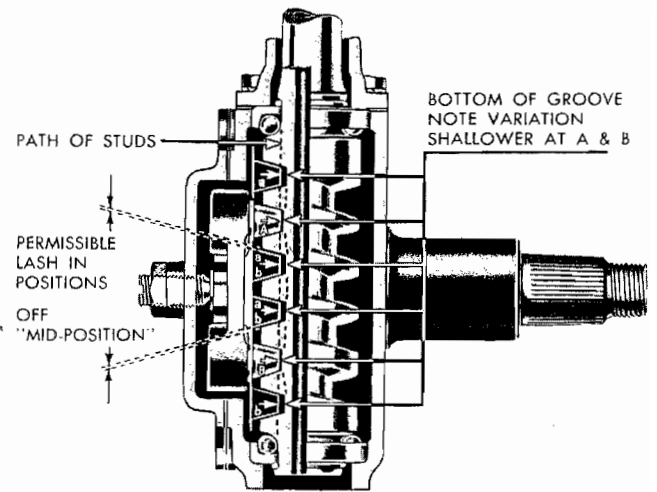
Construction (See Figs. 1, 2, 3)

L-Line Trucks are equipped with (Ross) semi-reversible cam and twin-lever steering gears. The twin-lever construction is shown in Figs. 1 and 2.

There are two types of twin-lever gears used: -

1. Twin-lever with sliding studs -- the studs are riveted in the lever so that the studs have a sliding contact with the cam (Fig. 1).
2. Twin-lever with rolling studs -- the studs are mounted in the lever with tapered roller bearings so that the studs have a rolling contact on the cam (Fig. 2).

Both studs of the twin-lever gear engage the cam for normal straight-ahead driving. As the steering action moves away from the normal driving position into the parking range, one of the studs disengages the cam. The effective leverage of this single stud increases so rapidly, however, that in full parking the leverage is 45 percent greater than with a single-lever type steering gear. This is due largely to the fact that because of the twin levers the steering arm is shorter and, therefore, has a full 100 degrees of travel compared to 76 degrees in a single-lever unit. Actually, the driver has at his disposal a dual-ratio gear which automatically changes from one ratio to another to suit the requirements of steering stability at high speeds, and easy wheel turn for sharp



GEAR (Studs A & B) SHOWN AT MID-POSITION OF TRAVEL
a shows VARIOUS POSITIONS OF STUD A ON TURNS
b shows VARIOUS POSITIONS OF STUD B ON TURNS
IMPORTANT - ADJUST THRU THE MID-POSITION A-23440

Fig. 3

turns in parking. A valuable safety factor is a lessening of the tendency to over-steer on curves and when passing other vehicles at high speed (See Fig. 3).

Adjustments

NOTE: The basic design of the steering gears used in these trucks is similar and the method of servicing applies generally to all units used. For illustrative purposes, assemblies of the more common type are used.



Except for position of the lever shaft in the housing, the steering gear details are similar and are serviced in the same manner.

When making adjustments, free the steering gear of all load, preferably by disconnecting the drag link from the steering arm, and loosen instrument panel bracket clamp on steering gear jacket tube.

If the ball thrust bearings on the cam must be adjusted, make adjustment (1) before making side adjustment to lever shaft studs in cam groove (2).

1. ADJUSTMENT OF BALL THRUST BEARINGS ON CAM.

- (a) Before making this adjustment loosen the housing side cover adjusting screw (9, 10) to free the studs in the cam groove (Fig. 4).
- (b) Adjustment should be made so there is a very slight drag but not so much that steering wheel cannot be turned from extreme to extreme by lightly gripping rim with thumb and forefinger.
- (c) Unscrew the four screws (3) and raise the housing upper cover (4) to permit removal of shims (5). (Shims are of .002", .003" and .010" thickness) (Fig. 5).
- (d) Clip and remove a thin shim or more as required, and draw cover down tight against shims.
- (e) Test as outlined in paragraph (b) and if necessary remove or replace shims until adjustment is correct.

2. ADJUST LEVER SHAFT STUDS IN CAM GROOVE FOR BACKLASH.

- (a) Backlash at this point shows up as end play of lever shaft, also as backlash at steering wheel and at ball on steering arm.
- (b) The groove is purposely cut deeper in ends of cam than in mid-position. This produces a high range through mid-position and makes grooves narrower through this range. This permits take-up of backlash in mid-position, after normal wear of groove, without causing a bind in ends (Fig. 3).
- (c) Adjust to this mid-position high range. Do not adjust in end positions. Play in end position is not objectionable.
- (d) Tighten side cover adjusting screw (10) until a very light drag is felt through the mid-position high range when turning steering wheel slowly

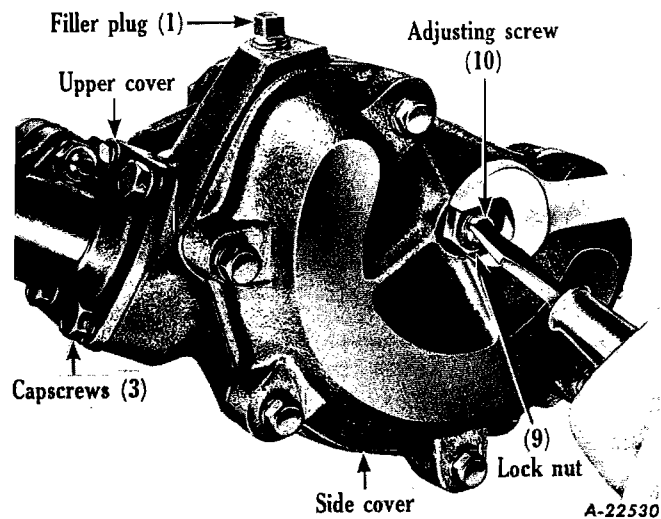


Fig. 4 - Illustrates location of adjusting screw and locknut

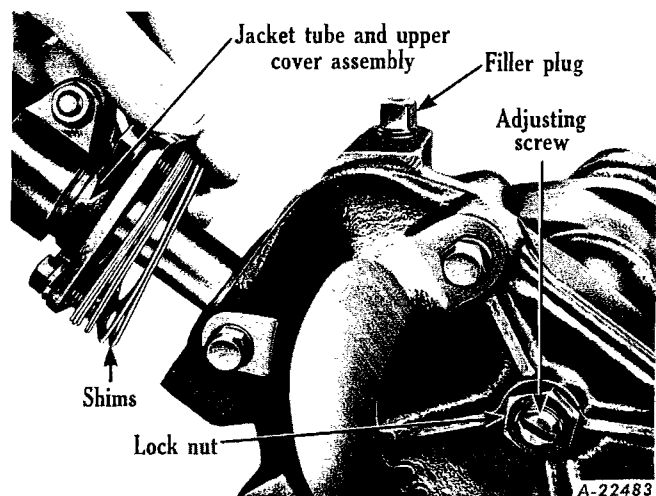


Fig. 5 - Showing location of shims under upper housing cover used to adjust end-play on cam. (Shims are of .002", .003", and .010" thickness)

from extreme to extreme position (Fig. 4).

- (e) **IMPORTANT:** Steering gear must not bind any position. Only a very slight drag should be felt. A closer adjustment will not correct steering looseness caused by wear in other steering gear members, but will damage parts and impair operation.
- (f) When proper adjustment has been made, tighten lock nut (9) and then give gear a final test.
- (g) Make sure steering gear arm is tight on splined lever shaft and that lock-washer and nut are tight also.

3. STEERING COLUMN ALIGNMENT.

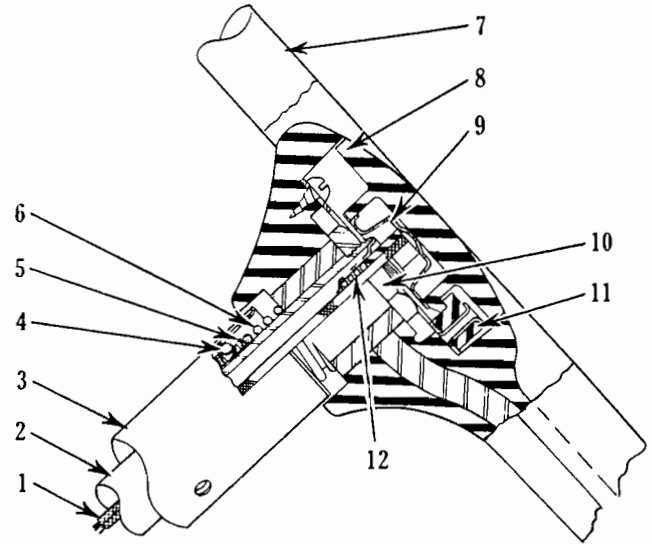
(a) After adjustments have been made and lock screw tightened, turn steering wheel to see if any stiffness exists. If so, steering gear has been adjusted too tight or steering column is out of alignment. Misalignment of the column places a bend in the column, consequently, the wheel tube must undergo reverse bending stresses during each revolution. This is a serious condition and must be avoided. THE STEERING COLUMN MUST NOT BE SPRUNG IN ANY DIRECTION.

4. STEERING GEAR CONNECTION WITH FRONT WHEELS.

(a) The steering gear should be connected to the front wheels so as to obtain as nearly as possible the specified turning radius on both left and right turns. This is accomplished by turning the steering wheel as far to the right as possible, then rotate the wheel in the opposite direction as far as possible and note the total number of turns. Turn the wheel back just one-half of this total movement, thus placing the gear in the mid-position. With the front wheels in position for straight-ahead driving, it should then be possible to connect the drag link to the ball on the end of the steering gear arm without moving the gear to any appreciable extent. If this cannot be done, remove the arm from the steering gear, using a suitable puller, and place it on the splined shaft in the proper position. Otherwise it will not permit the front wheels to swing equally to the left and right. Check steering knuckle stop on front axle to make sure that there is proper clearance for the tire when turning at maximum angle. Axle stops should also be set out sufficiently to prevent steering gear from "bottoming", that is, to stop the gear short of its absolute limit of travel. If the gear is permitted to bottom, damage to internal parts will occur. Check to see if axle stops are set to do this on both left and right turns. See that steering gear housing is filled with lubricant as recommended in "Lubrication Section".

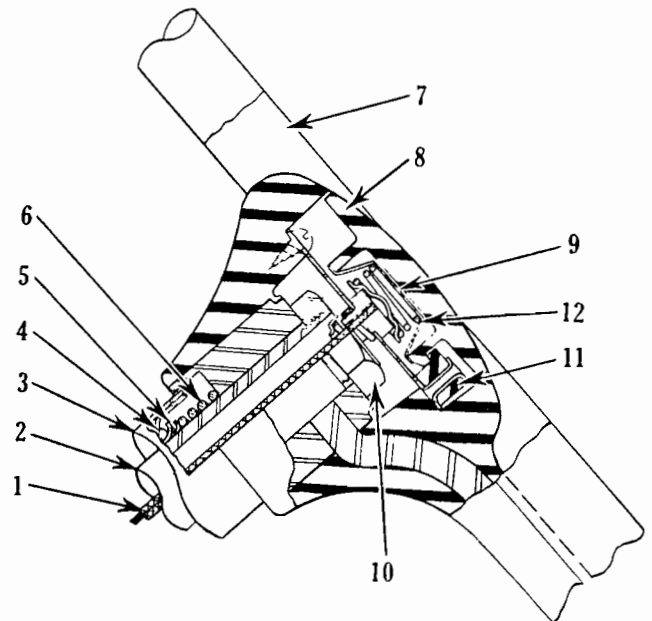
5. TO REMOVE STEERING WHEEL (Figs. 6 and 7).

- (a) Disconnect horn wire at bottom of steering gear.
- (b) Remove horn button (8) by pressing down and turning to right or left with



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Fig. 6, Models TA-12, T-14, TA-14, TA-54



A-21736

Fig. 7, Models TA-61, T-66, TA-66, TA-70

LEGEND for Figs. 6 and 7.

- | | |
|------------------------|-------------------------|
| 1. Horn cable assembly | 7. Steering wheel |
| 2. Steering tube | 8. Horn button |
| 3. Jacket tube | 9. Horn contact cap |
| 4. Bearing assembly | 10. Steering wheel nut |
| 5. Spring seat | 11. Base plate assembly |
| 6. Spring | 12. Horn button spring |

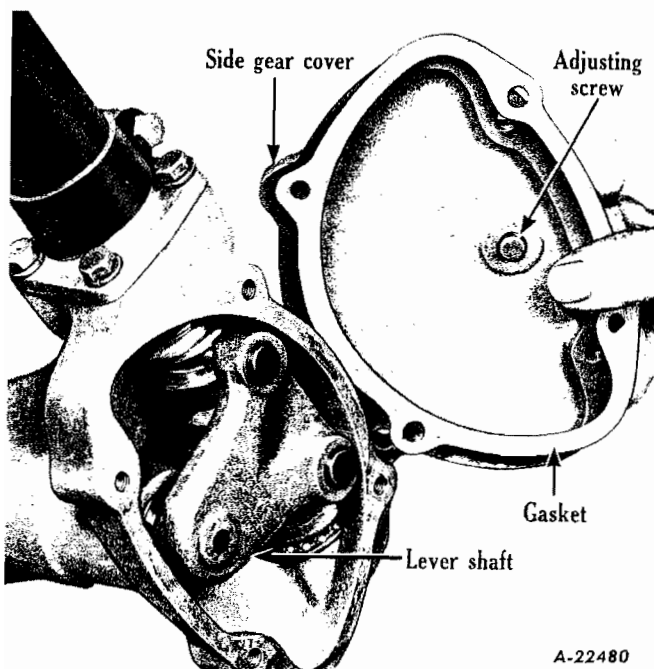


palm of hand or vacuum cup, holding steering wheel stationary.

- (c) Remove contact cap and spring.
- (d) Remove the three screws holding the horn button retainer base plate (11) and remove this plate and horn wire.
- (e) Remove steering wheel nut (10) and take off steering wheel using a suitable puller.

6. TO INSTALL STEERING WHEEL.

- (a) Place in correct position on shaft. Wheel should be installed so that spokes are in shape of a "Y" when seated in driver's seat and with front wheels straight ahead. This will permit driver to read instruments through the top of steering wheel.
- (b) Install steering wheel nut (10) and tighten securely.
- (c) Insert horn wire and thread through hole in cover plate at bottom of steering gear housing. Attach horn button retainer base plate (11) with three screws.
- (d) Install contact plates, spring and horn button. Horn button should be pressed down and turned until it locks in the rubber retainers on retainer base plate, using vacuum cups or palm of hand.



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Fig. 8 - Removal of housing side gear cover revealing lever shaft

- (e) Connect horn wire at bottom of steering gear.

7. DISASSEMBLING STEERING GEAR.

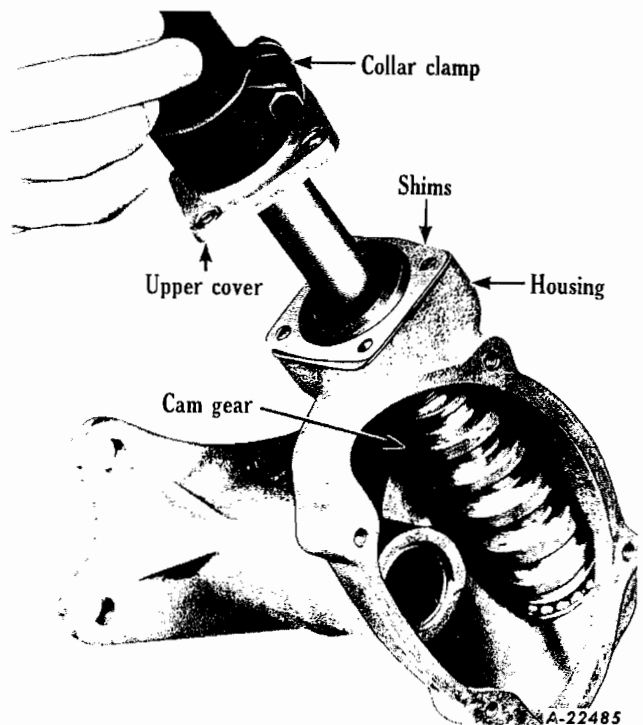
- (a) Remove horn button, cable and steering wheel.
- (b) Remove housing side gear cover and pull out lever shaft (Fig. 8).
- (c) Loosen clamp collar and remove jacket tube and housing upper cover (Fig. 9).
- (d) Remove cam and tube assembly, complete with bearings, from the housing (Fig. 10).
- (e) Remove lever shaft oil seal and clean the counterbore in the gear housing.

8. REASSEMBLING STEERING GEAR.

- (a) Install new lever shaft oil seal (Fig. 11).

Position oil seal in housing with side stamped "Fluid Side" toward bottom of counterbore. Using a hammer, tap lightly on the end of a socket wrench or adapter (cold rolled stock) having a slightly smaller outside diameter than the oil seal. It is important that the seal bottoms in the counterbore of housing.

- (b) Place cam and tube assembly with bearings in the housing (Fig. 10).



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Fig. 9 - Removal of jacket tube and upper housing cover assembly

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Fig. 10 - Removing cam and tube assembly with bearings

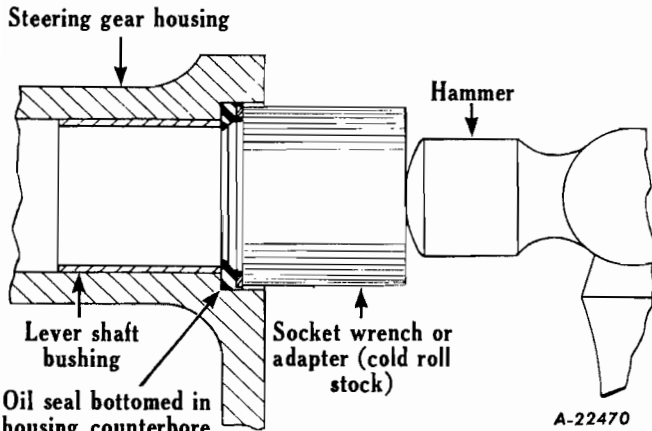


Fig. 11 - Location and installation of lever shaft oil seal

- (c) Assemble housing upper cover with shims and make proper bearing adjustments.
- (d) Install lever shaft in housing and assembly housing side cover, first loosening the adjusting screw (Fig. 8).
Draw side cover screws tight.
- (e) Adjust lever shaft stud in cam groove for backlash and lock adjustment with lock nut.
- (f) Assemble jacket tube with clamp collar and tighten clamp.
- (g) Install steering wheel, horn cable and button.

Drag Link (Figs. 12, 13, 14)

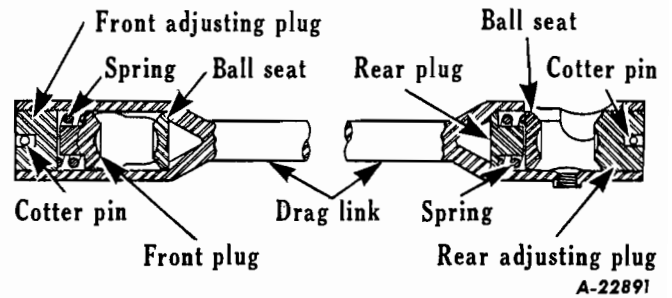


Fig. 12

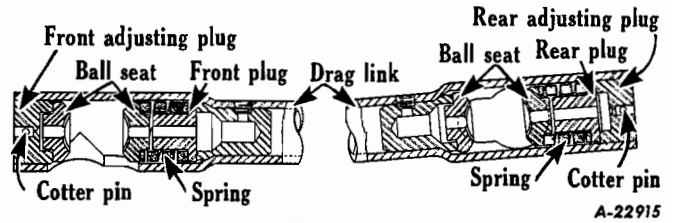


Fig. 13

This type of drag link requires very little care other than periodical lubrication and occasional inspection to make sure that it is properly adjusted. (Figs. 12 and 13).

Adjustment is made by removing cotter pin and turning adjusting plug in the desired direction. To adjust for wear, turn adjusting plug in until it is tight, then back off to first cotter pin hole. Insert a new cotter pin of the correct size and bend ends over securely. Drag link should not be adjusted too tight, otherwise steering will be affected.

The spring is merely to accommodate wear and is not intended to act as a cushion against shock. Fig. 14 shows details of steering gear, relay link and drag link used on L-190 series trucks and up.

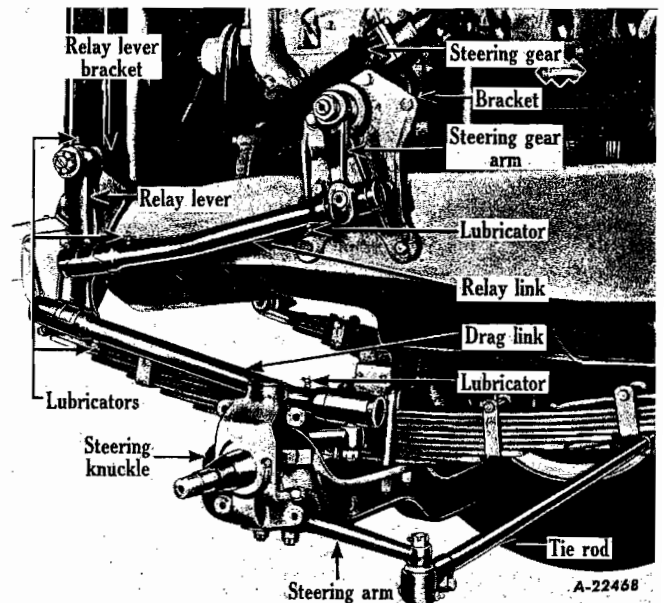


Fig. 14 - Steering gear linkage to front axle for models L-190 series and up



Steering Jacket Tube Bearing

A ball-type steering jacket bearing is used, improving steering gear performance and ease of handling. Fig. 15 illustrates this construction.

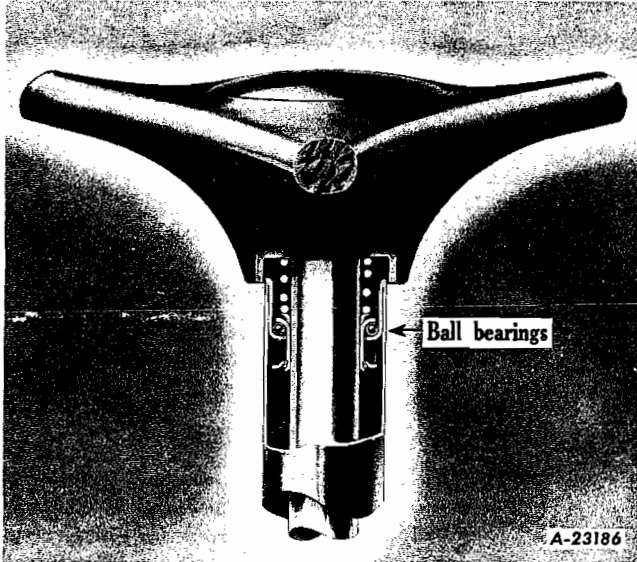
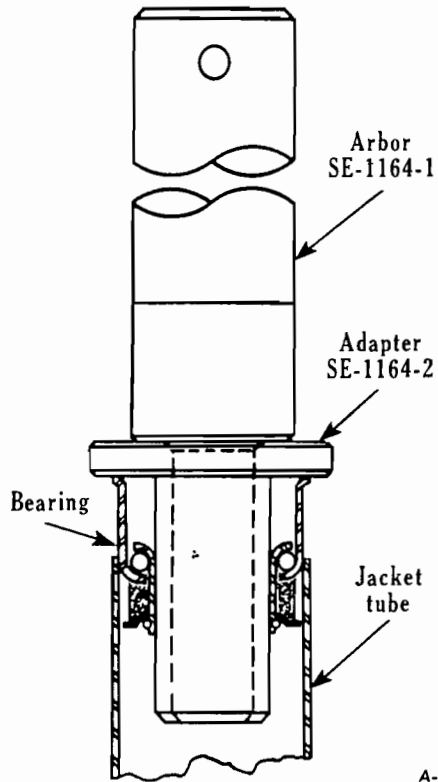


Fig. 15 - Showing location of jacket tube bearing

Special service tools (SE-1164) are available for this bearing, and are to be used for installation of a new bearing (see Fig. 16).



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Fig. 16 - Installation of steering gear jacket tube bearing