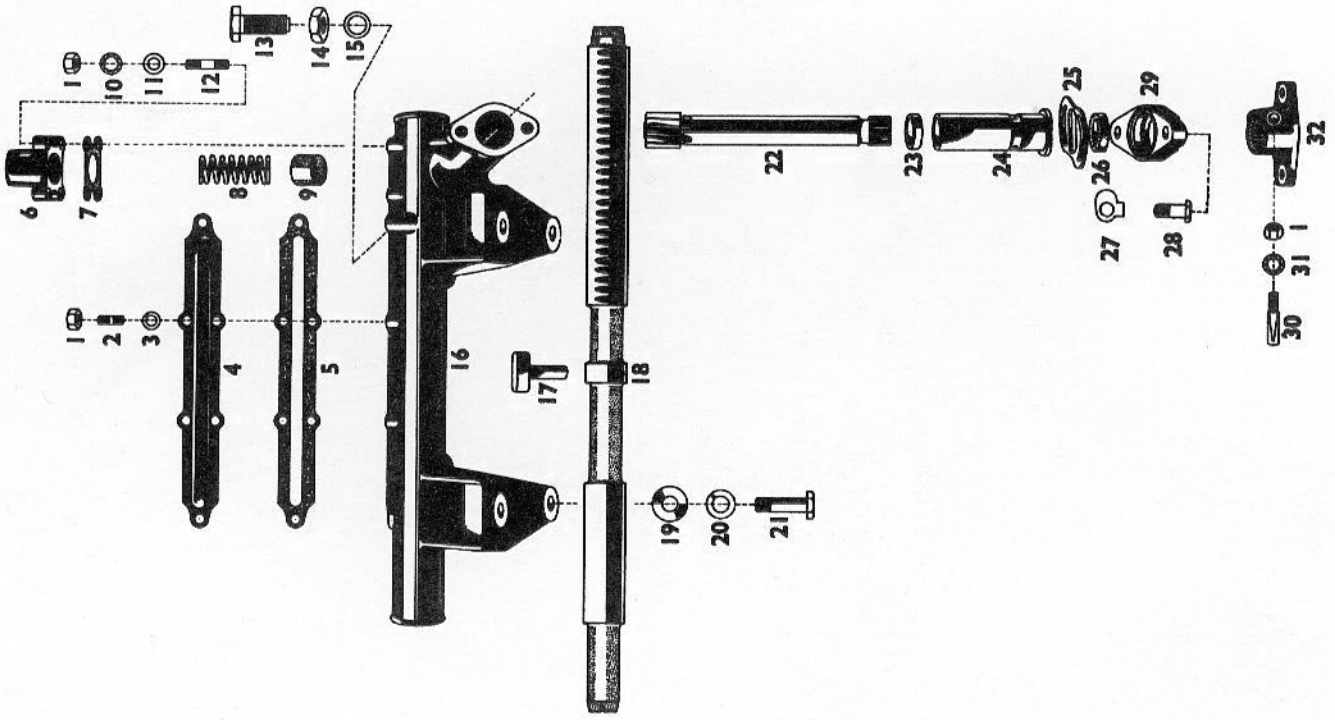
Steering

Steering

List of Contents

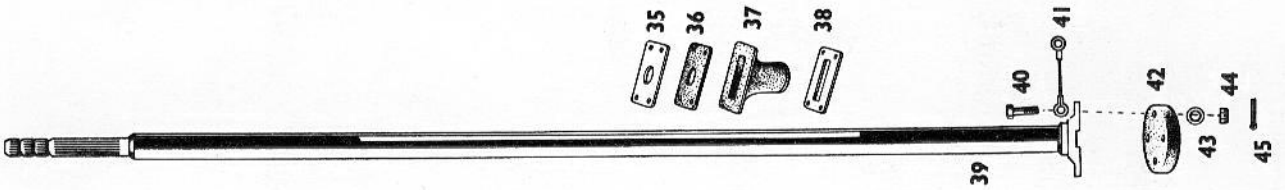
STEERING BOX. RACK AND PINION.

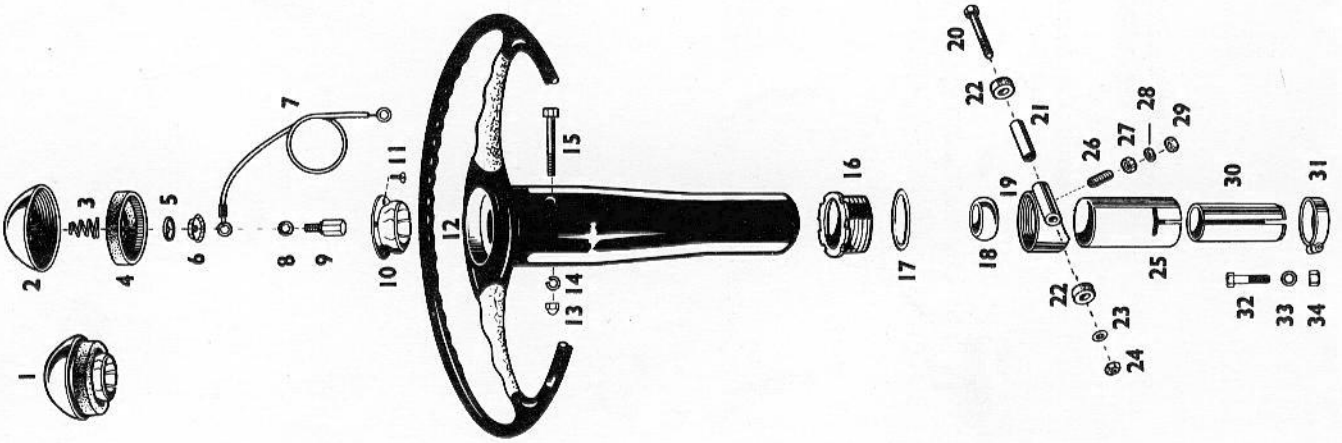
Part No.	Item	Description	No. off per car	Part No.	Item	Description	No. off per car
N.430011	-	Steering Box Assy. R.H. Drive	1	N.430041	17	Locating Bolt for Rack	1
N.431221	-	Steering Box Assy. L.H. Drive	-	N.430031	18	Rack R.H. Drive	1
FN.104/K	1	Nut ¼" BSF	11	N.430631	-	Rack L.H. Drive	1
N.430921	2	Special Stud	6	N.422421	19	Shim	as reqd
-	3	Spring Washer ¼"	6	-	20	Spring Washer 7/16" dia.	4
N.430061	4	Cover Plate for Locating Bolt	1	FB.107/14D	21	Bolt 7/16" BSF	4
N.430051	5	Gasket - Locating Bolt Cover Plate	1	N.430111	22	Pinion Shaft R.H. Drive	1
N.430211	6	Damper Cap	1	N.430641	-	Pinion Shaft L.H. Drive	1
N.430181	7	Gasket for Damper Cap	1	N.430101	23	Thrust Washer for Pinion	1
N.430951	8	Spring for Pressure Block	1	N.430091	24	Eccentric Bush for Pinion	1
N.431101	9	Pressure Block for Damper	1	N.722039	25	Pinion Adjuster	1
-	10	Washer - Shakeproof ¼" 1214 Code/Bead	4	N.430121	26	Packing Ring for Bush Retainer	1
-	11	Washer Plain ¼"	4	N.430141	27	Lock Washer	2
N.430171	12	Stud (Attachment Damper Cap)	4	FB.105/8D	28	Bolt 5/16" BSF	2
N.430071	13	Bolt (Adjuster for Pinion End clearance)	1	N.722040	29	Retainer for Bush	1
FN.208/K	14	Nut ½" BSF	1	N.430161	30	Cotter Securing Crosshead	1
N.430081	15	Gasket. For Adjuster Bolt.	1	-	31	Washer Shakeproof ¼" dia. 1114 Code Abduct Type 11	1
N.430021	16	Steering Box R.H. Drive	1				
N.430651	-	Steering Box L.H. Drive	1	N.430151	32	Crosshead for Pinion Shaft	1



STEERING COLUMN ASSEMBLY.

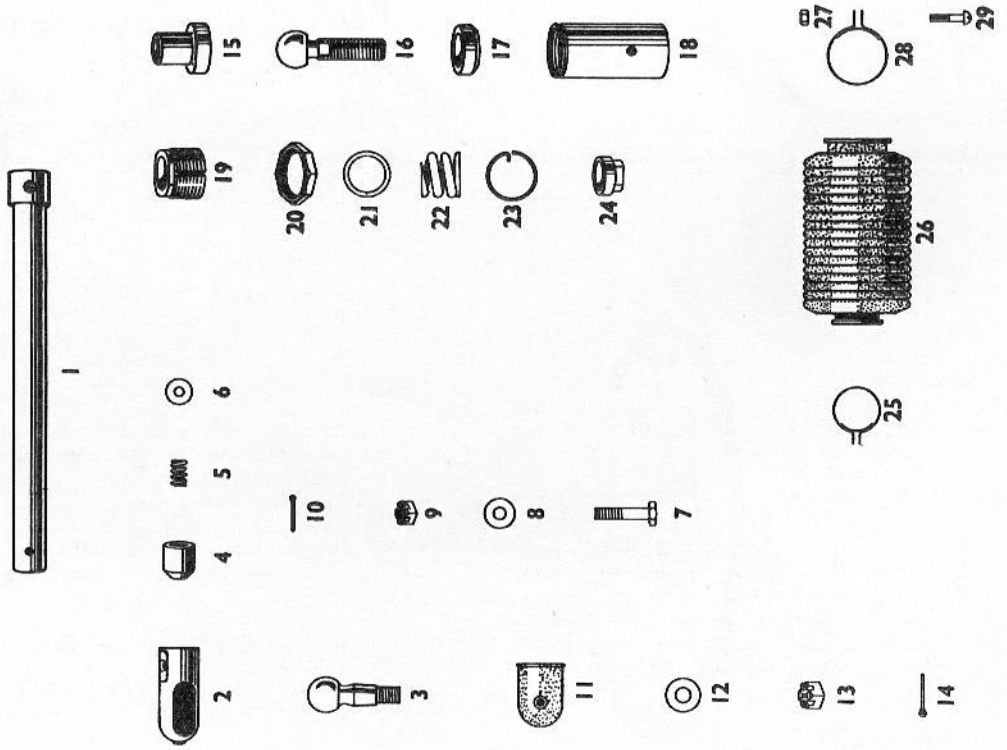
Part No.	Item	Description	No. off per car	Part No.	Item	Description	No. off per car
N.717027	1	Horn Push complete	1	FN.105/L	24	Nut 5/16" BSF	1
N.717024	2	Horn Push	1	405-1-25013	25	Sleeve	1
N.717014	3	Spring	1	404-1-25006	26	Stud 4BA ¾" long	1
N.710010	4	Housing for Horn Push	1	-	27	Nut 4BA Hex.	1
N.717012	5	Contract Cup	1	-	28	Washer 4BA Shakeproof	1
N.717013	6	Contract	1	-	29	Locknut 4BA	1
-	7	Cable complete	1	404-1-25008	30	Insulating Sleeve	1
-	8	4BA Shakeproof Washer	2	N.430841	31	Clip	1
N.717028	9	Special Terminal Horn Push	1	-	32	Bolt 2BA 1¼" long	1
-	10	Spring Cup	1	-	33	Washer 2BA	1
-	11	Screw 6BA Csk.	4	-	34	Nut 2BA	1
405-1-25012	12	Steering Wheel & Fairing Tube	1	404-1-25002	35	Retaining Plate	1
N.717035	13	Domed Nut (Polished Nickel Chromed)	1	404-1-25003	36	Washer	1
AGS.163/E	14	Double Spring Washer 5/16"	1	N.717030	37	Draught Excluder	1
N.717029	15	Bolt 5/16" BSF	1	N.717008	38	Draught Excluder Plate	1
N.430691	16	Retaining Screw	1	405-1-25011	39	Steering Column	1
N.430851	17	Shim	1	N.430811	40	Bolt 5/16 "BSF	4
N.431231	18	Spherical Housing	1	N.430891	41	Earthing Connection	1
404-1-25005	19	Bracket	1	N.430481	42	Flexible Coupling	1
FB.105/28D	20	Bolt 5/16" BSF	1	-	43	Washer 5/16" dia.	4
N.717022	21	Insulating Tube	1	FN.405/K	44	Nut 5/16" dia. slotted	4
N.704097	22	Insulating Washer	2	-	45	Split Pin 1/16" dia. 1" long	4
-	23	Washer 5/16" Shakeproof	1				





TIE TUBE AND BALL JOINT ASSEMBLY WITH TELESCOPIC SLEEVE.

Part No.	Item	Description	No. off per car	Part No.	Item	Description	No. off per car
404-1-23057	-	Tie Tube and Ball Joint Assy.	1	N.430271	15	Socket Bearing (inner)	2
404-1-23043	1	Tie Tube	1	N.430281	16	Ball Bolt (inner)	2
N.704123	2	End Socket (outer)	2	N.430291	17	Bearing Ring (inner)	2
N.430401	3	Ball Bolt (outer)	2	N.430301	18	Housing (inner)	2
N.430381	4	Socket Bearing (outer)	2	N.430321	19	Special Nut (inner)	2
N.430371	5	Spring for Outer Joint	2	N.430331	20	Locknut for special nut	2
N.430361	6	Shim Washers for outer Ball Joint	as reqd	N.430941	21	Packing Washer	2
N.430871	7	Bolt 5/16" BSF	2	N.430311	22	Spring (inner)	2
-	8	Washer 5/16" dia. MS.	2	N.430341	23	Locking Ring for special nut	2
FN.405/K	9	Slotted Nut 5/16" dia.	2	N.430351	24	Locking Nut - Tie tube to rack	2
-	10	Split Pin 1" x 1/16" dia.	2	N.430461	25	Clip - Sleeve to Tie Tube	2
N.430411	11	Oil Retaining Sleeve	2	N.430421	26	Telescopic Sleeve	2
-	12	Washer ½" dia.	2	-	27	Nut 4BA plain MS.	4
FN.408/K	13	Slotted Nut ½" BSF	2	N.430431	28	Clip - Sleeve to Box	2
-	14	Split Pin 3/32" dia. 1¼"	2	-	29	Screw 4BA Rd. head 7/8" long	4



Steering

Description

The steering, which is identical on the Type 404 and Type 405 Cars, is the rack and pinion type with tie tube assemblies connecting the steering rack to the steering arms. A flexible coupling connects the steering column to the steering box.

The assembly is bolted to the chassis front cross member Fig.116.

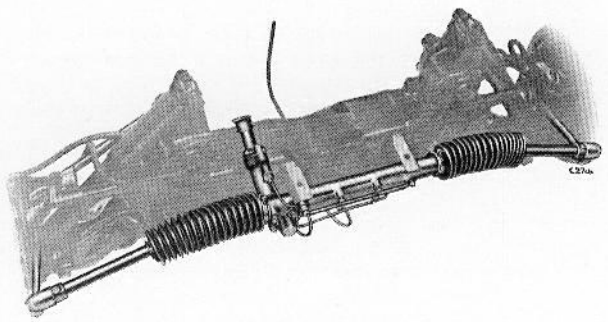


Fig. 116. Steering box and tie tubes

Replacements

No exchange reconditioning scheme is available for steering boxes.

Servicing

The steering box and tie tubes are lubricated by the 'one-shot' lubrication system.

Little attention is normally required and should any adjustments need to be made they can be carried out in situ. Referring to Fig.117, to take up backlash, slacken the two setscrews clamping the adjustment plate and move the plate as required. Tighten carefully and evenly. To take up end float, release the locknut of the adjuster screw at the base of the pinion.

Steering Wheel Adjustment

The steering wheel can be set to one of three positions. To adjust, turn the wheel until the bolt head and nut are accessible through the holes in the tubular fairing of the steering wheel. Remove the nut with a 5/16 inch box spanner and push out the bolt. Set the steering wheel to the selected groove in the column and insert and tighten the bolt.

In addition the steering column rake can be set in one of two alternative positions by means of the two sets of holes in the attachment bracket immediately below the dashboard.

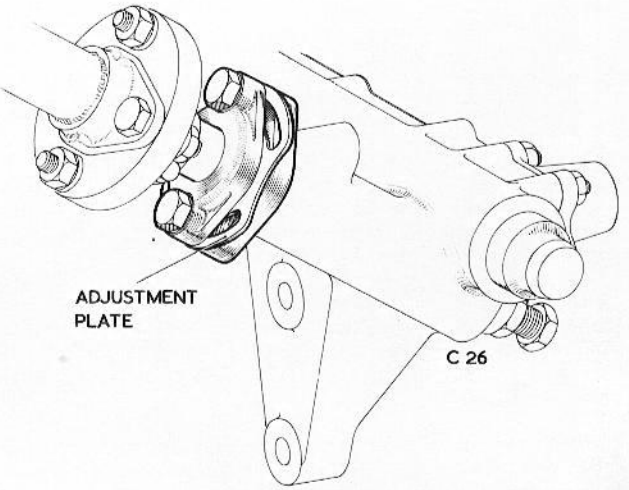


Fig. 117. Pinion adjustment plate

Removing the Steering Box

Raise and support the front of the car.

Disconnect the two lubrication pipes from the unions on the steering box and header, remove the pipe clip from the cover plate, and remove the pipes.

Remove the clips and withdraw the telescopic sleeves from each end of the steering box. Before loosening the tie tube locknuts count the number of threads exposed, in order to retain the tracking of the wheels, then slacken the locknuts and unscrew the inner ball bolts from the rack.

Withdraw the split pins and remove the nuts, bolts, and washers securing the steering column to the cross-head of the pinion. One end of the earthing connection is fitted beneath one of the nuts.

Remove the four 7/16 inch BSF bolts and washers attaching the steering box to the front cross member.

Dismantling the Steering Box Fig. 118.

Remove the nuts and spring washers and detach the cover plate and gasket. Pull out the locating bolt from the slot.

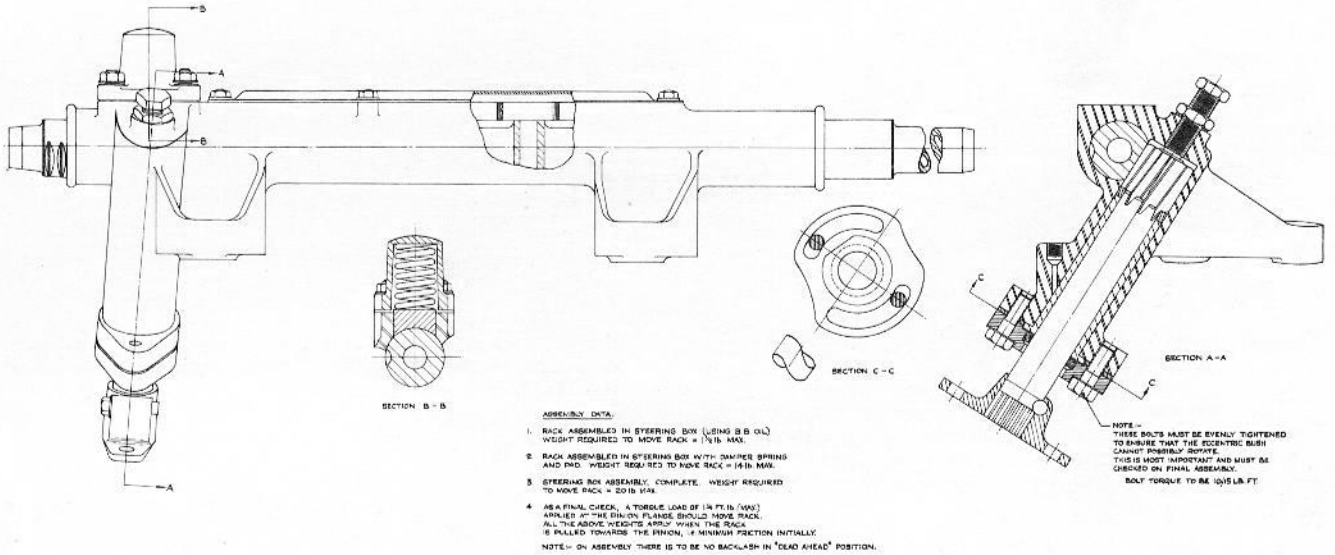


Fig. 118. Steering box assembly

Unscrew the damper cap nuts, evenly and diagonally to ease the tension on the spring, then remove the cap, gasket, spring and pressure block.

Remove the nut and washer, tap out the cotter pin then detach the crosshead from the serrations of the pinion shaft. Release the two 5/16 BSF set bolts and detach the retainer with its felt washer and the pinion adjusting plate.

Withdraw the pinion shaft complete with its eccentric bush and thrust washer. Remove the pinion shaft adjusting screw with its locknut and washer.

Finally remove the rack.

To Re-assemble the Steering Box

Ensure that all parts are serviceable and clean and that the oil passages are free from obstruction. Lubricate freely during assembly.

Assemble the rack to the steering box and see that it is a good sliding fit. Particular care should be taken if it should be a new steering box or rack, or both. Remove any high spots.

When satisfactory, well lubricate and slide the rack into position. Fit the hardened location bolt into the rack and slot and again test for freedom of movement.

It is essential that there is not more than .0035 inch slackness between the diameter of the pinion shaft and the bore of the eccentric bush. Fit the thrust washer and eccentric bush to the pinion shaft then fit them to the steering box engaging the teeth of the pinion with those of the rack. Fit the adjusting plate over the flats of the eccentric bush, fit the felt washer to the retaining plate, position them over the pinion shaft and insert the two 5/16 bolts with lockwasher and screw in sufficiently to allow the adjusting plate to be moved.

Fit the adjusting bolt with its locknut and washer and take up all end float of the pinion shaft, then tighten the locknut securely.

Turn the adjusting plate to take up any backlash between the teeth of the rack and pinion, then tighten the two bolts evenly to a torque loading of 10 to 15 lb. ft. (14.88 to 22.32 Kg/m) and lock with the tabwashers.

Check that the assembly can now be moved steadily without slack and without strain.

Fit the tufnol damper pressure block followed by its spring damper cap and gasket. Secure with the four nuts, plain and shakeproof washers. Tighten evenly.

Fit the cover plate and gasket, spring washers and nuts and tighten evenly.

Slide the crosshead on to its serrations, tap in the cotter pin, fit the washer and nut and tighten.

Refitting the Steering Box to the Chassis

Secure the steering box to the cross member with the four 7/16 BSF bolts and spring washer and tighten at the same time checking that the pinion shaft does not tighten beyond its torque loading of 1.1/2 lb. ft. If it does tighten find the screws which are causing the distortion and check, with feelers, the amount of packing required. Shims .002 inch and .003 inch are available to insert between the faces at the bolt holes.

When this is satisfactory, screw the inner ball bolt of each tie rod into the rack to the setting, ie, number of threads, noted prior to removal. Tighten the locknuts and check through the 1/8 dia. inspection hole at each end to see that the ball bolt thread is not less than this point.

Fit the telescopic rubber sleeves and connect the two lubrication pipes to the steering box and header attaching the pipe clips to the stud of the cover plate.

Finally re-connect the flexible coupling to the pinion crosshead, fitting the earthing connection beneath one of the nuts.

The steering wheel will have to be re-aligned on its splines to give the 'dead ahead' position for the spokes. The tracking of the wheels should be checked.

Removing the Tie Tubes

Withdraw the split pin, remove the slotted nut and the washer securing each tie tube to the steering arm. Separate the taper joint using extractor TFN.5006.

Release the clips and withdraw the telescopic sleeves from the steering box.

Note the position of the inner ball bolt locking nuts by counting the threads which are visible. This will retain the tracking position on re-assembly. Release the locknuts and unscrew the ball bolts from the steering rack.

Dismantling the Tie Tubes

Refer to Fig.119. Remove the split pin, nut, washer and special bolt and take off the outer end socket complete with ball bolt and oil retaining sleeve. Remove the oil retaining sleeve and withdraw the ball bolt. Remove the outer socket bearing, spring and shims from the tie tube.

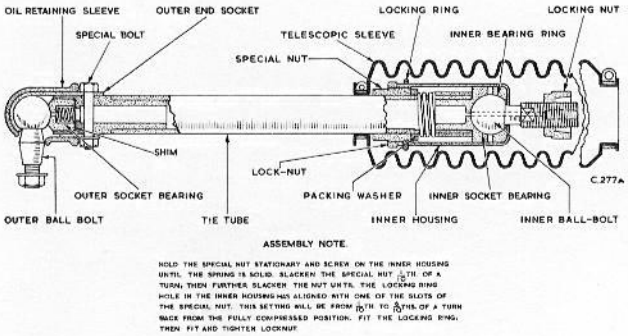


Fig. 119. Tie tube assembly

Loosen the clip and slide off the telescopic sleeve. Release the locknut, remove the locking ring and unscrew the inner housing.

Remove the locking nut from the inner ball bolt and push out the ball bolt and its inner bearing ring.

Inspection of Parts

The ball bolt and sockets are the most important points. In manufacture they are ground and lapped to give a high percentage of bearing surface, and every effort should be made to maintain this finish since failure to do so will have a detrimental effect on the steering. Replace parts if they are badly grooved.

Re-assembly of the Tie Tubes

Lubricate the parts freely during assembly. Locate the inner spring, packing washer and the special nut over the tie tube, in that order, and locate the spring against the ferrule.

Fit the inner bearing ring to the inner housing, pass the thread end of the ball bolt through and screw on the locking nut. Insert the inner socket bearing into the tie tube. To complete the assembly this end see the note on Fig.119.

Slide the rubber telescopic sleeve, large end first, over the tie tube.

Fit the outer ball bolt into the end socket and then fit the oil retaining sleeve.

Assemble the outer socket bearing and its original shims but without the spring to the end of the tie tube, then fit the outer socket and ball bolt. Check the alignment of the bolt holes in the socket and tie tube. The thickness of the shims must be adjusted so that there is no clearance between the ball bolt and its seating when the bolt is inserted.

Dismantle the parts and re-assemble with the correct thickness of shims and with the spring in position. Fit the bolt and lock with a split pin.

On this final assembly load the tie tube with approved oil.

Refitting the Tie Tubes

Screw the inner ball bolt into the steering rack to the setting ie, number of threads, noted prior to removal. Tighten the locknut and check through the 1/8" dia. inspection hole Fig.120 to see that the ball bolt thread is not less than this point.

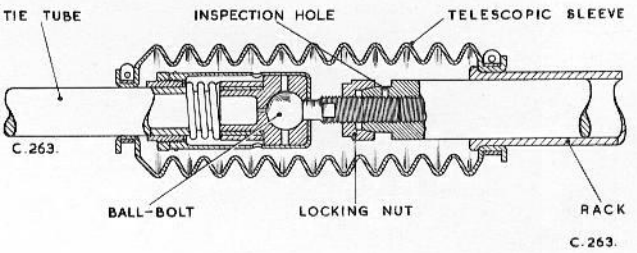


Fig. 120. Inspection hole—tie tube

Fit the telescopic sleeves. Fit the outer ball bolts to the steering arms and lock with a split pin.

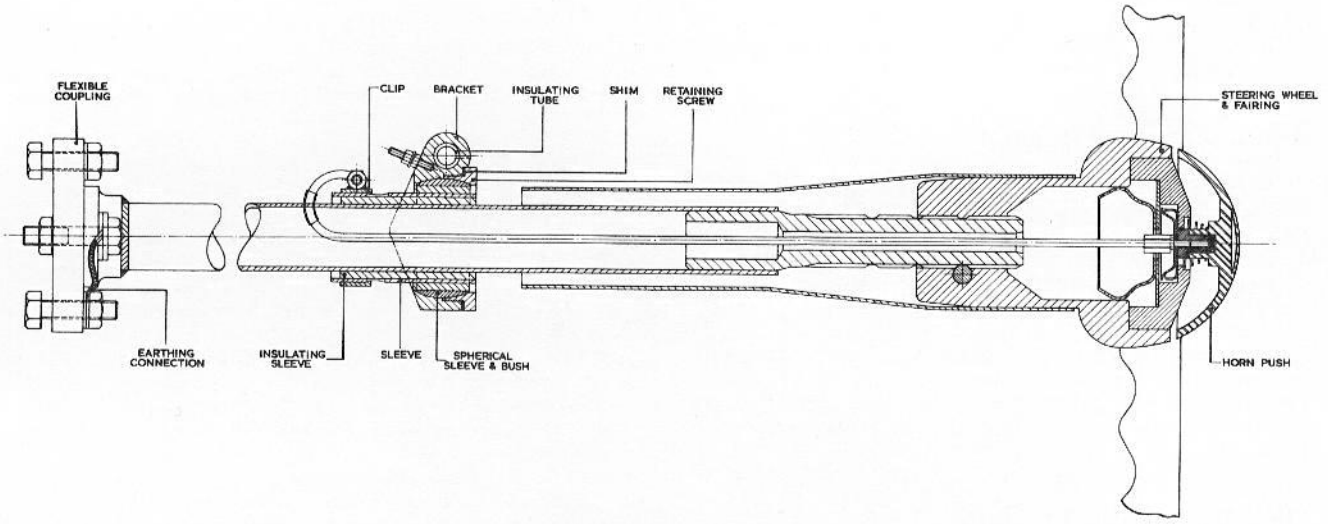
The tracking of the wheels should be checked.

Adjusting the Steering Column Bracket

Referring to Fig.121 the steering column bracket can be adjusted in situ. by adding or removing the shims underneath the head of the retaining screw.

To take off the steering wheel, withdraw by hand the horn push button from the centre of the wheel and disconnect the cable. Remove the bolt from within the steering column fairing and slide the wheel and fairing off of the serrated column.

To adjust the bracket use a close fitting 'C' spanner similar to TFN.5028.



121. Steering column assembly