PART 2. CONVENTIONAL STEERING

SPECIFICATIONS

Type	Rack and pinion
Steering column type	Collapsable type
Pinion turning torque	0.25 Nm
Total turning torque	0.9 Nm
Steering wheel free play (maximum)	30 mm

TORQUE WRENCH SETTINGS

Steering wheel nut	40 Nm
Tie rod end castelated nuts	70 Nm
Tie rod end clamp bolt	20 Nm
Steering gear mounting bolts	45 Nm
Flexible coupling clamp bolt	38 Nm
Steering column to dash bolts	45 Nm
Tie rod ball end to rack	90 Nm

1. DESCRIPTION

The steering gear is of the rack and pinion type and is mounted on the suspension cross member by brackets and rubber mounts.

The rack is supported at one end of the housing by a bush and a spring loaded damper at the other end of the assembly. An adjusting plug and locknut are provided for adjustment of the damper block to eliminate service wear. The pinion is supported by an upper and lower ball bearing inside the housing. Adjustment of the pinion is achieved by a bearing preload adjuster ring and locknut. Connected to the pinion shaft is a flexible coupling which in turn is connected to the intermediate shaft then to the steering shaft.

The whole assembly is protected against the entry of dust, dirt and water by a seal and dust cap on the pinion adjuster ring and by rubber boots on the tie rods, secured by clamps to the housing.

2. STEERING GEAR ASSEMBLY

Special Equipment Required:

To Measure Pinion Preload — Special small tension wrench with a suitable adaptor

TO REMOVE AND INSTAL

(1) Raise the front of the vehicle and support on chassis stands. Remove both the front road wheels.

(2) Remove the split pins from both tie rod end castellated nuts and remove the castellated nuts from the tie rod ends.

(3) Disconnect each tie rod end stud by placing a suitable dolly or hammer against one side of the steering knuckle eye and striking the opposite side with a hammer.

(4) Using a quick drying paint mark the position of the flexible coupling in relation to the pinion shaft to aid assembly.

(5) Remove the clamp bolt retaining the flexible coupling to the pinion shaft.

(6) Suitably mark the position of both steering gear mounting brackets to ensure that they are returned to their original positions.

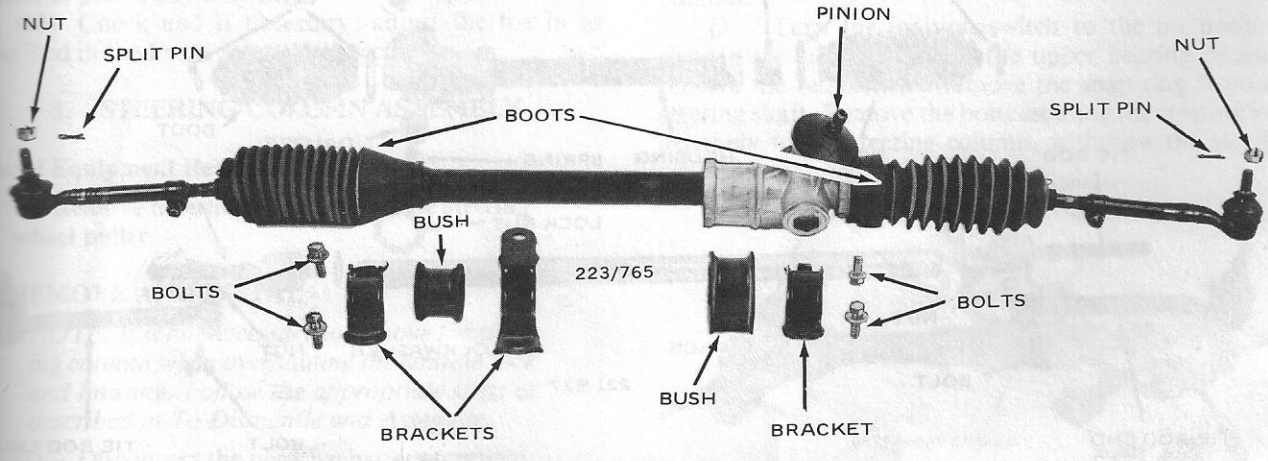
Remove the bolts retaining the steering gear mounting brackets and remove the brackets.

(7) Lower the steering gear slightly to disconnect the pinion shaft and withdraw the steering gear from the right hand side of the vehicle.

Installation is a reversal of the removal procedure with attention to the following points:

(1) Inspect the mounting brackets and rubbers and replace worn or damaged components.

(2) Instal the steering gear assembly from the right hand side of the vehicle, align the marks made before removal and connect the pinion shaft to its original posi-



Steering gear removed from the vehicle.

tion to the flexible coupling. Instal but do not tighten the clamp bolt at this stage.

(3) Raise the steering gear to the correct position, instal the mounting brackets and instal and tighten the retaining bolts to the specified torque.

(4) Tighten the clamp bolt retaining the flexible coupling to the pinion shaft to the specified torque.

(5) Instal the tie rod ends to their respective steering arms and tighten the castellated nuts to the specified torque. Instal new split pins to prevent the castellated nuts from loosening during service.

(6) Instal the road wheels and lower the vehicle to the ground.

(7) Check and if necessary adjust the front wheel toe in as described in the Front Suspension section.

TO DISMANTLE

(1) Thoroughly clean the outer surfaces of the steering gear in a suitable cleaning solvent.

(2) Mount the steering gear in a vice fitted with protective jaw plates.

(3) Loosen the clamp bolts and unscrew the tie rod ball joints from the tie rods. Count and note the number of turns necessary to unscrew each tie rod ball joint to ensure correct assembly.

(4) Release the rubber boot retaining clips at the steering gear housing, then detach the boots from the assembly by sliding them over the tie rods.

(5) Using a suitable drift and hammer, tap the tie rod ball end lock tabs away from the shoulder of the tie rod ball end.

(6) Using the machined flats on both the rack and tie rod ball ends, unscrew the tie rod ball ends from the rack with the aid of suitable spanners.

(7) Loosen the locknut, remove the adjusting plug from the housing and withdraw the damper and spring from the housing.

(8) Align the cutaway in the rack with the pinion shaft, loosen the pinion shaft adjustment locknut, remove the adjusting ring and withdraw the pinion shaft from the housing.

NOTE: If difficulty is incurred withdrawing the pinion shaft, firmly grasp the pinion shaft with a pair of pliers and pull the pinion shaft outwards whilst tapping the steering gear housing with a soft faced hammer in the opposite direction.

(9) Withdraw the rack from the pinion end of the housing to avoid damaging the rack bush.

(10) If it is necessary to renew the lower pinion bearing, heat the housing to 80°C and tap the housing with a soft faced hammer to remove the bearing.

TO CLEAN AND INSPECT

(1) Wash all components thoroughly in a suitable solvent and blow dry with compressed air.

(2) Inspect the pinion shaft seals and bearings for deterioration or damage.

(3) Examine the pinion and rack for correct tooth contact, wear or damage.

(4) Check the bearings for roughness in operation and corrosion.

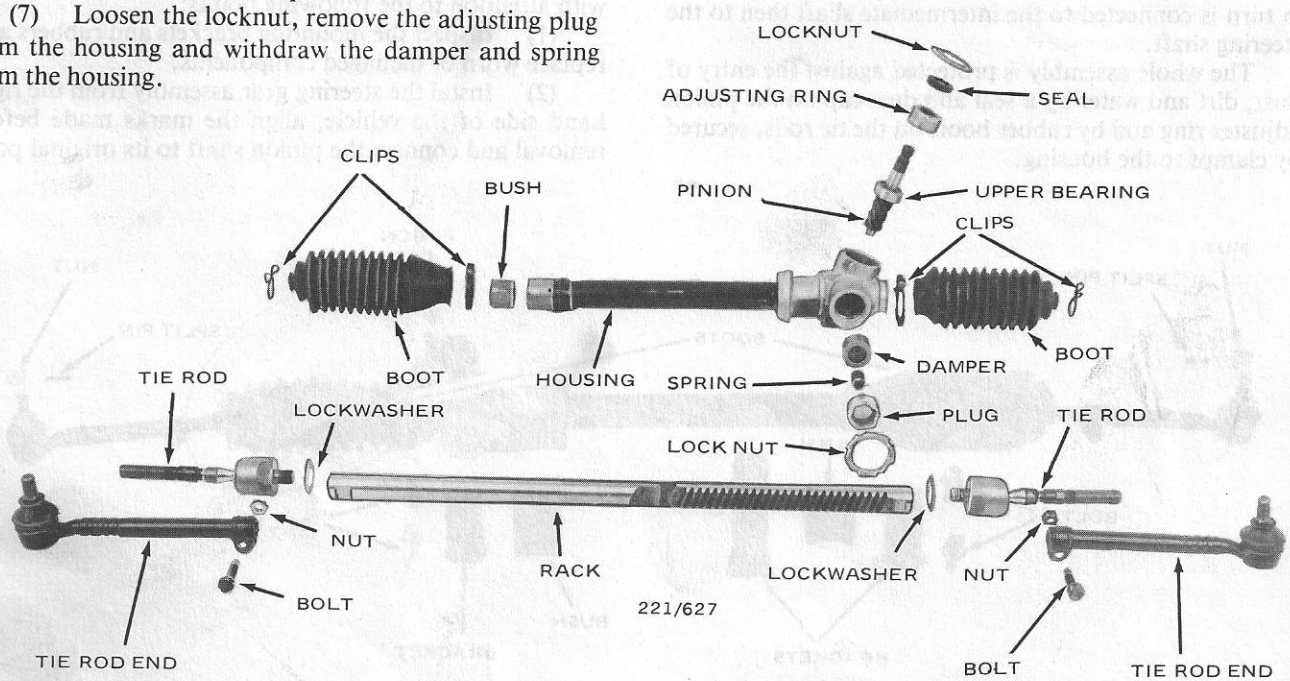
(5) Check the rack bush for scoring or wear.

(6) Examine the tie rod inner and outer ball joints for smoothness in operation and loose fitting.

(7) Inspect the damper for wear and the spring for distortion and loss of tension.

(8) Inspect the housing for straightness, wear and damage.

(9) Renew all components which are found to be unserviceable.



Dismantled view of steering gear.

TO ASSEMBLE

Assembly is a reversal of the dismantling procedure with attention to the following points:

(1) Generously apply molybdenum disulphide grease to the sliding surface of the steering rack and to the pinion bearings. Instal the rack into the housing and align the cutaway with the pinion lower bearing.

(2) Lubricate the pinion with the recommended grease and instal the pinion into the housing. Slide the rack to engage the pinion and centralise the rack in the housing.

(3) Lubricate a new pinion shaft seal and instal into the housing with the lip facing inwards.

(4) With the rack still in the central position instal and tighten the pinion preload adjusting plug until the pinion turning torque, measured with a special small tension wrench and adaptor, reaches Specifications.

NOTE: To check the pinion turning torque a special tension wrench with low torque capabilities should be used.

(5) Apply sealant to the adjusting plug locknut, instal and tighten the locknut and recheck the turning torque. Instal the pinion shaft dust seal.

(6) Apply grease to the damper, instal the damper and spring into the housing then instal and tighten the adjusting plug until the total pinion turning torque reaches Specifications.

(7) Apply sealant to the damper adjusting plug locknut, instal and tighten the locknut and check the total pinion turning torque.

(8) Instal new lock tab washers to the tie rod inner ball ends, tighten to Specifications and stake the locktabs using a suitable drift.

(9) Generously apply grease to the ball ends and the insides of the rack boots, instal the boots to the steering gear and instal and tighten the inner boot clamps.

(10) Align the marks which are moulded into the rubber boots and instal and tighten the outer boot clamps.

(11) Instal the tie rod ends the same number of turns as noted on dismantling and tighten the clamp bolts.

(12) Instal the mounting rubbers and brackets to the steering gear assembly and instal the steering gear to the vehicle as previously described.

(13) Check and if necessary, adjust the toe in as described in the Front Suspension section.

3. STEERING COLUMN ASSEMBLY

Special Equipment Required:

To Remove Steering Wheel – Suitable steering wheel puller

TO REMOVE AND INSTAL

NOTE: It is not necessary to remove the steering column when overhauling the ignition lock and housing. Follow the appropriate steps as described in To Dismantle and Assemble.

(1) Disconnect the negative battery terminal.

(2) Mark the flexible coupling and the intermediate shaft with quick drying paint to aid assembly and remove the clamp bolt.

(3) Working inside the vehicle, centralise the steering wheel, insert a small screwdriver at the base of the steering wheel escutcheon, lever the escutcheon upwards and remove the escutcheon plate from the steering wheel.

(4) Remove the steering wheel retaining nut and washer. Suitably mark the steering shaft and the steering wheel boss with quick drying paint to aid assembly and using a puller, remove the steering wheel.

NOTE: It is imperative that a puller be used as a sharp blow can cause irrepairable damage to the steering column.

(5) Remove the screws retaining the lower facia panel and remove the facia panel.

(6) Remove the shroud retaining screws and remove the lower shroud from the column.

(7) Disconnect the electrical connectors to the combination switch and ignition switch.

(8) Manoeuvre the floor covering away from the bottom of the steering column and remove the bolts retaining the steering column lower mounting to the floor.

(9) Remove the bolts retaining the mounting bracket to the dash, lower the column and remove the upper shroud.

(10) Withdraw the steering column to disconnect the intermediate shaft from the flexible coupling and remove the steering column from the vehicle.

Installation is a reversal of the removal procedure with attention to the following points:

(1) Coat the rubber gasket positioned between the lower mounting and the floor with a suitable sealant before installing the column.

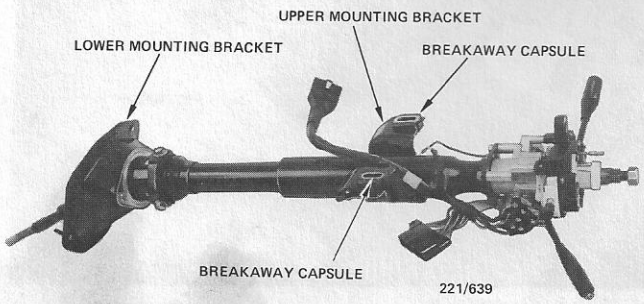
(2) When installing the intermediate shaft to the flexible coupling, align the marks made on removal.

TO DISMANTLE

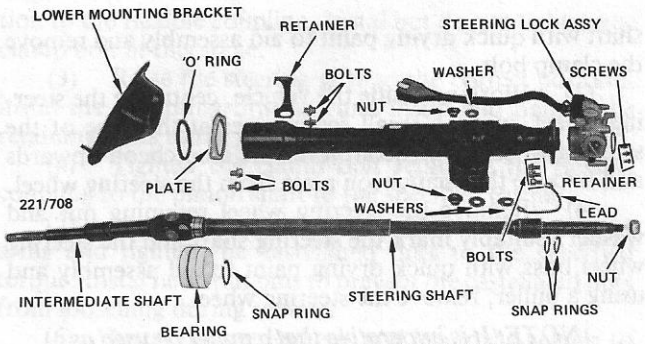
(1) Remove the steering column assembly as previously described.

(2) Remove the screws retaining the combination switch to the column and withdraw the switch from the column.

(3) Turn the ignition switch to the on position, remove the screws securing the upper bearing retainer, remove the retainer and remove the snap ring from the steering shaft. Remove the bolts securing the steering lock assembly to the steering column, withdraw the steering



Steering column removed from vehicle.



Dismantled view of steering column.

lock assembly from the steering shaft and remove the lower snap ring.

(4) Remove the upper mounting bracket from the steering column.

(5) Remove the bolts retaining the cover plate to the lower mounting bracket and withdraw the bracket from the column. Remove the 'O' ring, align the cutaway and remove the cover plate from the column.

(6) Remove the bolts securing the lower bearing retainer to the steering column, remove the retainer and withdraw the steering shaft from the steering column.

TO INSPECT

(1) Check the lower support bearing on the steering shaft for wear and damage. Check for looseness in the column, repack with grease and renew faulty components.

(2) Check the steering shaft for damage or bend, check the steering shaft universal joint for wear and check the shear pin for damage.

(3) Check the upper support bearing for wear and looseness in the steering lock assembly and repack with grease. Check the steering lock mechanism for correct operation and renew faulty components as necessary.

TO ASSEMBLE

Assembly is a reversal of the dismantling procedure with attention to the following points:

(1) Assemble the steering shaft into the steering column ensuring that the shaft is not bumped, instal the lower bearing retainer and instal and tighten the retaining bolts.

(2) Instal the lower snap ring onto the steering shaft, instal the steering lock assembly onto the shaft and instal the upper snap ring onto the steering shaft.

(3) Instal and tighten the bolts retaining the steering column to the steering lock assembly, instal the bearing retainer and instal and tighten the bearing retainer securing screws.

(4) Align the cover plate cutaway with the pawl on the steering column and assemble the cover plate on the steering column. Instal the 'O' ring, instal the lower support then instal and tighten the retaining bolts.

(5) Instal the combination switch to the steering column and instal and tighten the retaining screws.

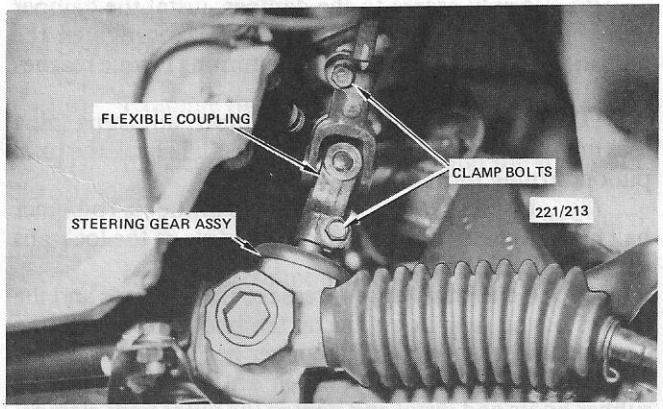
(6) Instal the upper mounting bracket to the steering column and instal and tighten the retaining bolts.

(7) Instal the steering column to the vehicle as previously described.

4. FLEXIBLE COUPLING

(1) Mark the splines on the steering gear, the flexible coupling and the intermediate shaft to aid assembly.

(2) Remove the clamp bolts from the steering gear side and the intermediate shaft side of the flexible coupling.



Installed view of flexible coupling.

(3) Slide the coupling off the pinion shaft on the steering gear side then off the intermediate shaft.

NOTE: If difficulty is encounted disconnecting the flexible coupling, remove the steering gear mounting bolts and pull the steering gear forward to gain extra clearance.

Assembly is a reversal of the removal procedure.