

FORD, LINCOLN, MERCURY TYPE

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Ball & Strut Type Blocking Synchronizer—With this type synchronizer unit, both synchronizer rings are loose in ends of clutch sleeve and are actuated by struts assembled in slots in inner clutch sleeve and engaging notches in synchronizer rings. Struts are centralized in clutch sleeve assembly by the regular poppet balls and springs so that struts move with the outer clutch sleeve during initial movement to engage the synchronizer rings with the cones on the gear hubs. Teeth on outer rim of synchronizer rings block or prevent gear engagement until synchronization completed when the final movement of the outer clutch sleeve causes the clutch teeth on the inner rim of the sleeve to slide through the synchronizer ring teeth to engage clutch teeth on gear hubs. Inner clutch sleeve is stationary on mainshaft (retained as unit with second speed gear by snap ring in groove on shaft) and does not move during synchronizing.

NOTE—This Ball & Strut type synchronizer can be distinguished from Wire-Bound Strut type synchronizer (below) by absence of shoulder on second speed gear end of outer clutch sleeve.

Wire Bound Strut Type Blocking Synchronizer—Same design as Strut Type (above) except that poppet balls and springs not used. A lock ring or wire is installed in outer clutch sleeve and engages notches on struts to centralize struts in sleeve.

Gearshift Mechanism (1940-42 Pass. Cars):—Consists of two independent shifting levers and shafts mounted on transmission case side cover (rear lever is Low-Reverse, forward lever Second-High). Fork on inner end of lever shaft engages gears directly and no shifter rails are used. Detent balls and interlock mechanism consist of a spring, plunger, and two balls assembled in a tube in a boss within the transmission case so that the balls engage notches in sectors on each of the shifter shafts. The entire gearshift mechanism can be removed as a unit with the side cover by disengaging the forks from the gears. **CAUTION**—When reassembling cover, make certain that rear fork engages low speed gear, forward fork engages outer sleeve of synchronizer unit.

SERVICING:—**Disassembly**—Remove shift lever, cover, shifter shaft and fork assembly (1939 and earlier types), remove side cover and shifter mechanism as an assembly (1940-42 types). Take out capscrews in universal joint front yoke, remove yoke from shaft. Take out capscrews mounting universal joint housing on rear of case, remove housing. Remove locking pin and drive out countershaft. Take out bearing retainer screws on front of case, withdraw clutch shaft main drive gear and bearing assembly. Remove mainshaft rear bearing, withdraw mainshaft assembly through opening in case (remove synchronizer assembly and gears from shaft). On types with blocker type synchronizer units, snap ring must be removed from groove in shaft in front of synchronizer unit before synchronizer and second speed gear can be removed from shaft.

Synchronizing Unit:—Can be removed from front end of mainshaft without being dismantled. If clutch sleeve is to be removed from the inner clutch hub mark both parts and reassemble in same positions, use extreme care not to lose detent balls and springs which will jump out when parts are separated.

Blocking Type Synchronizers—Mark both rings as well as inner and outer clutch sleeves before disassembly to insure reassembling in same relative positions. When installing struts, make certain that

they engage poppet balls (Strut Type) or that locking wire engages notches in struts and is installed with hook on open end engaged between two clutch teeth on outer sleeve midway between struts (Wire Bound Strut Type). Wire Bound Strut Type Synchronizer is mounted on mainshaft as an assembly with the second speed gear as shown below.

Second Speed Gear Assembly:—Positioned on mainshaft by thrust washers at front and rear. To remove gear, insert wire through oil hole at center of gear between teeth, rotate gear until wire can be pushed through hole in bushing, depress plunger until locking key is freed, push key forward to release rear thrust washer, turn washer until prongs (engaged in slot in splines) line up with shaft splines, move washer to rear slightly. Move key back to free front washer (plunger will engage key at center position and must be depressed again to allow key to be shifted further), withdraw wire and move second speed gear back to expose front thrust washer, turn washer until prongs are freed from splines, remove washer and gear. When installing gear, make certain that both thrust washers are turned so that prongs engage slots in splines (to prevent endwise movement) and that key engages both washers (to prevent rotation). See that plunger locks key in place.

Second Speed Gear Assembly (Types with Blocking Type Synchronizer):—Second speed gear and inner sleeve of synchronizer are mounted as an assembly (retained on mainshaft by snap ring at forward end of synchronizer clutch sleeve). To dismantle assembly, remove snap ring, pull clutch sleeve and gear off shaft. When reassembling, make certain that second speed gear turns freely with synchronizer assembled and snap ring installed. Backlash between inner and outer clutch sleeves should be .000-.001".

Second Speed Gear—Gear bushing not furnished separately. When installing gear on shaft, select hub spacer of correct thickness so that gear end-play (with synchronizer in place and snap ring installed) is .004-.008". This hub spacer furnished in two thicknesses—81A-7069-A (.0655-.0665"), and 81A-7069-B (.0705-.0715").

Countergear Assembly:—Counter shaft is retained by locking pin driven in through hole in case and rear end of shaft (pin also locks reverse idler gear shaft in place) and shaft can be driven out after pin removed. Gear cluster is mounted on roller bearings with spacer on shaft between bearings. When installing gear cluster, make certain that tongue on thrust washer at forward end engages slot in case and that rear thrust washer prongs engage gear.

NOTE—On '60' models, floating bushings are used. Spacer (74-7115) must be installed on shaft between bushings.

Reverse Idler Gear:—Shaft retained by countershaft locking pin, may be removed after pin driven out.

Gearshift Assembly (Pass. Cars):—To dismantle the shift assembly, remove lockrings on shifter shaft ends of forks, remove forks from shifter shafts. Drive out locking pins in lever at outer ends of shifter shafts, withdraw shafts from inside of cover using extreme care not to lose detent balls, spring, and plunger. Reassemble shifter mechanism in same manner. See that oil seal in recess in cover at outer end of each shifter shaft is in good condition. See Ford & Lincoln Transmission Control articles for adjustment directions when transmission installed on car.