

MOTOR UNITS

DISASSEMBLY AND REASSEMBLY

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1. GENERAL

1.01 This section provides the disassembly and re-assembly procedures for miniature, standard, heavy duty synchronous motor units, and series governed and series governed variable speed motor units. It is issued to describe removal and replacement of the motor units from their associated teletypewriter apparatus.

1.02 Reference should be made to the exploded views found in the appropriate parts literature for an illustration of the mechanism to be disassembled, for location and visual identification of parts, and detailed disassembly and reassembly features. Refer to maintenance tool Section 570-005-800TC for necessary tools.

1.03 When disassembling a motor unit, carefully note the location of springs, spring washers, and shims on the rotor shaft and other motor components, so that reassembly can be done correctly.

1.04 Retaining rings are made of spring steel and have a tendency to release suddenly when being removed. Loss of the retainer can be minimized as follows: Hold the retainer with the left hand to prevent it from rotating. Place the blade of a suitable screwdriver in one of the slots of the retainer. Rotate the screwdriver in a direction to increase the diameter of the retainer for removal.

1.05 To help identify the motor unit that is to be disassembled refer to Motor Unit Identification Table. First find the motor unit code number on the identification plate located on the motor bracket, then find the code number in the table. (For example: an LMU28 motor is found under the heading Series Governed Motor Units.)

2. MINIATURE SYNCHRONOUS MOTORS

DISASSEMBLY

CAUTION: REMOVE ELECTRICAL POWER FROM SET BEFORE STARTING DISASSEMBLY.

2.01 Remove any shaft extension or hardware attached to the motor shaft that would prevent removal of the motor unit.

2.02 Loosen screws and remove motor power line leads from base terminal block.

2.03 Remove four screws and lockwashers that secure the motor unit to the base. Lift motor unit off the base.

2.04 To remove the motor from its cradle bracket, loosen mounting strap screw on each end of motor and remove motor.

2.05 Loosen air duct screws and remove air duct(s) from motor.

MOTOR UNIT IDENTIFICATION TABLE

MINIATURE SYNCHRONOUS MOTOR UNITS	STANDARD AND HEAVY DUTY MOTOR UNITS	SERIES GOVERNED MOTOR UNITS	SERIES GOVERNED VARIABLE SPEED MOTOR UNITS
MU43, LMU19, LMU20, LMU24, LMU26, LMU31, LMU35, LMU45, LMU56	LMU3, LMU15, LMU21, LMU30, LMU33, LMU36, LMU37, LMU38, LMU42, LMU46, LMU49, LMU51, LMU52, LMU55, YMU2, YMU3, YMU4	LMU6, LMU13, LMU28, LMU29, LMU39, LMU41, LMU57, LMU61, LMU63, LMU64, YMU5	LMU47, LMU60

2.06 When the motor is completely removed from the mounting bracket, the remaining motor components can be removed by loosening the screws and clamps that secure them to the mounting bracket.

2.07 To remove end shields and rotor:

- (1) Remove screw and lockwasher that mount pinion to the shaft. Remove pinion from shaft.
- (2) Remove the two nuts and the two bolts that secure the end shields to the stator.
- (3) Remove the end shields. Remove the rotor and note the positioning of spring washer and shims on the rotor shaft so that the parts when replaced are positioned correctly.

REASSEMBLY

Note: The pinion end of the rotor is positioned opposite the leads end of the stator.

- 2.08 To assemble motor, reverse the disassembly procedure.
- 2.09 For the adjustment of motor, components, and air duct(s), refer to Section 570-220-700TC.
- 2.10 When replacing the motor unit on the mounting base, reverse the removal procedure given in 2.01 through 2.03, and make sure the ground strap is attached to the mounting screw.

3. STANDARD AND HEAVY DUTY SYNCHRONOUS MOTORS

DISASSEMBLY

CAUTION: REMOVE ELECTRICAL POWER FROM SET BEFORE STARTING DISASSEMBLY.

- 3.01 If the set contains a typing unit it must be removed to gain access to the motor unit, as follows:
- (1) Remove electrical cable connector(s) from the right side of the typing unit.
 - (2) Remove four screws and lift typing unit off the base.
- 3.02 Remove any shaft extensions or hardware attached to the motor shaft that would prevent removal of the motor unit.
- 3.03 Loosen screws and remove motor power line leads from the base terminal block.
- 3.04 Remove four screws and lockwashers that secure the motor unit to the base. Remove motor unit from base.
- 3.05 To remove motor from the cradle:
- (1) Loosen mounting strap screw on each end of motor and remove motor unit.

(2) Remove the remaining motor components by loosening the screws and clamps that secure them to the mounting bracket. On some units the motor components are secured by tension springs. Unhook the ends of the springs to remove motor components.

(3) For components mounted in a compartment below the motor and secured to a mounting plate, loosen four screws and remove mounting plate. The motor components are now exposed for removal.

3.06 To remove end shields and rotor:

- (1) Remove fan from the shaft if furnished.
- (2) Remove screw and lockwasher that mount pinion to shaft. Remove pinion from shaft.
- (3) Remove the two nuts and two bolts that secure the end shields to the stator. Remove end shields, rotor, spring, and washer.

REASSEMBLY

Note: Position the spring with the tapered end down. Place washer on top of the spring in the end shield bearing recess located at the leads end of the stator. The pinion end of the rotor, which is the longest shaft end from the ball bearing, is positioned opposite to the leads end of the stator.

3.07 To reassemble motor, reverse the disassembly procedure.

3.08 For the adjustment of motor and components, refer to Section 570-220-700TC.

3.09 When replacing the motor unit on the base, reverse the removal procedure shown in 3.01 through 3.04, and make sure the ground strap is attached to the mounting screw.

4. SERIES GOVERNED MOTORS

DISASSEMBLY

CAUTION: REMOVE ELECTRICAL POWER FROM SET BEFORE STARTING DISASSEMBLY.

4.01 Remove the typing unit from the base to gain access to the motor unit, as follows:

- (1) Remove electrical cable connector(s) from the right side of typing unit.
- (2) Remove four screws and lift typing unit off the base.

4.02 Remove gear guard and connections that prevent removal of motor unit.

4.03 Loosen screws and remove motor power line leads from base terminal block.

4.04 Remove four screws and lockwashers that secure the motor mounting bracket to the base and lift motor unit off the base.

4.05 Remove four screws that secure the screened cover on the motor end. Remove cover.

Note: To avoid damaging the screen do not grip cover over screened openings.

4.06 Remove two screws on the rear face of governor cover. Remove governor cover.

4.07 To remove governor, remove screw and lockwasher that is threaded through the shaft.

4.08 Remove motor brush caps and motor brushes. The positioning of each brush should be noted or marked so that each brush may be inserted in the same holder with the same side up. Make sure the insulators are kept inside each of the brush caps.

4.09 Loosen mounting strap on governor end and unhook from cradle. Do not remove mounting strap. Loosen and remove mounting strap on opposite end of motor. Remove motor from cradle.

Note: In some units the motor can be removed from the cradle for only a short distance due to the length of the cable stored in the bracket compartment.

4.10 To remove end shield and armature:

- (1) Remove screw and lockwasher that mount pinion to the shaft. Remove pinion from shaft.
- (2) Remove the two nuts and lockwashers securing the end shield to the stator.
- (3) When removing the end shield, it may be necessary to pry it loose from the stator.
- (4) Remove the armature. Remove the washers and spring that are found in the end shield bearing recess on the governor end. The spring is positioned with the tapered end in the end shield bearing recess with the washers on top of the spring.

REASSEMBLY

4.11 Hold motor in upright position being careful not to damage governor brushes. Place tapered end of spring downward into bearing recess and place washers on top of the spring.

Note: Before pushing armature shaft completely through end shield on governor end, the governor brushes must be pushed into their respective spring loaded brush holders and held depressed so that armature shaft can clear the brushes.

4.12 Place armature into stator with commutator end down and make sure the armature shaft clears the governor brushes as indicated in note (4.11).

4.13 Assemble end shield with ball oilers in line with oilers on governor end. Most of the motor units have ball oilers positioned upward (opposite leads out location). For inverted mounting, ball oilers are positioned downward (same side as leads out location). Place washer and nut on each end shield bolt. Tighten nuts.

4.14 Place motor on cradle mounting bracket and position both mounting straps making sure the mounting strap screw heads face to the right while viewing the governor end. Tighten mounting strap screws. Check tightness of both screws on governor brush terminals.

4.15 Replace motor brushes making sure they are properly assembled (see 4.08). Insulators must be in brush caps. The pigtails of the brushes should be free from kinks and move freely in the spring coils.

4.16 When replacing the governor, retract each carbon brush as the governor is pushed on the shaft. Align the hole in the flat side of the governor hub with the threaded hole in the shaft. Place lockwasher and screw through governor hub hole and thread into the shaft. Tighten screw.

Note: Make sure the governor brush leads do not interfere with governor fins. Push leads down to allow ample clearance. Position each brush pigtail terminal to allow free travel of the brush in its guide.

4.17 For the adjustments of motor and components refer to Section 570-220-700TC.

4.18 Assemble governor cover and tighten both screws.

4.19 Replace screened cover and tighten four screws.

Note: To avoid damaging the screen, do not grip cover over screened openings.

4.20 Assemble motor unit to mounting base as follows:

- (1) Place motor unit on mounting base.
- (2) Assemble ground strap and four mounting screws to base. Tighten screws.

4.21 Replace typing unit and four mounting screws. Tighten screws.

4.22 Replace electrical cable connector(s) on right side of typing unit.

5. SERIES GOVERNED VARIABLE SPEED MOTORS

DISASSEMBLY

CAUTION: REMOVE ELECTRICAL POWER FROM SET BEFORE STARTING DISASSEMBLY.

5.01 Remove the typing unit from the base to gain access to motor unit, as follows:

- (1) Remove electrical cable connector(s) from the right side of typing unit.
- (2) Remove four screws and lift the typing unit off the base.

5.02 Remove the retaining ring and stud from brake shoe slide.

5.03 Remove gear guard and connections that would prevent removal of motor assembly.

5.04 Loosen screws and remove motor power line leads from base terminal block.

5.05 Remove four screws and lockwashers that secure the motor unit to the base. Remove the motor unit from the base.

5.06 Remove the governor screened end cap by loosening but not removing the four screws.

5.07 To remove governor brake shoe assembly, loosen but do not remove the two screws on the front brake guide and the rear brake guide. Remove governor brake shoe assembly.

5.08 Remove access plate from governor cover by loosening two screws.

5.09 To remove governor gear train assembly, use access hole to locate screw by rotating the shaft. Remove screw and lockwasher. Remove governor gear train assembly.

- 5.10 Remove four screws and lockwashers around the screened cover. Remove screened cover.
- 5.11 Remove motor brush caps and motor brushes. The position of each brush should be noted or marked so that each brush may be inserted in the same holder with the same side up. Make sure the insulators are kept inside the brush caps.
- 5.12 Loosen mounting strap on governor end and unhook from cradle, but do not remove mounting strap. Loosen and remove mounting strap on opposite end of motor.
- 5.13 Motor units that do not have their motor components soldered to the bracket compartment may be completely removed by loosening the motor components mounting screws, lockwashers, and clamps.
- 5.14 To remove end shield and armature:
- (1) Remove pinion screw and lockwasher. Remove pinion from shaft.
 - (2) Remove the two nuts and lockwashers securing the end shield to the stator.
 - (3) When removing the end shield it may be necessary to pry it loose from the stator.
 - (4) Remove the armature. Remove the washers and spring that are nested in the end shield bearing recess on the governor end. The spring is positioned, tapered end down, with washer on top of the spring.

REASSEMBLY

- 5.15 Hold motor in upright position being careful not to damage governor brushes. Place tapered end of spring downward into bearing recess and place washers on top of spring.

Note: Before pushing armature shaft completely through end shield on governor end, the governor brushes must be pushed into their respective spring loaded brush holders and held depressed so that armature shaft can clear the brushes.

- 5.16 Place armature into stator with commutator end down and make sure the armature shaft clears the governor brushes as indicated in note (5.15).
- 5.17 Assemble end shield with ball oilers in line with ball oilers on governor end. Place lockwashers and nuts on end shield bolts. Tighten nuts.

- 5.18 Place motor on cradle and position both mounting straps making sure the mounting strap screw heads face to the right while viewing the governor end. Tighten mounting strap screws. Check tightness of both screws on governor brush terminals.
- 5.19 Replace pinion on shaft with lockwasher and screw. Tighten screw.
- 5.20 Replace motor brushes making sure they are properly assembled (5.11). Insulators must be in brush caps. The pigtails of the brushes should be free from kinks and move freely in the spring coils.
- 5.21 Replace screened cover with access hole facing up (opposite from leads out location in motor).
- 5.22 When replacing governor gear train assembly, retract each carbon brush as governor is pushed on the shaft. Align the hole in the flat side of the governor hub with the threaded hole in the shaft. Use a tweezer to position lockwasher and screw. Tighten screw.

Note: Make sure the governor brush leads do not interfere with governor fins. Push leads down to allow ample clearance. Position each brush pigtail terminal to allow free travel of the brush in its guide.

- 5.23 For the adjustments of motor and components refer to Section 570-220-700TC.
- 5.24 Position access plate on screened cover and replace four screws, lockwashers, and flat washers. Tighten screws.
- 5.25 Replace brake shoe slide assembly with brake slide lever to the left while viewing governor end. Tighten the screws on the front brake guide and rear brake guide friction tight. Make sure governor gear train assembly clears the governor shoes by rotating motor shaft. Adjust brake guides if required. Tighten the screws on front and rear brake guides.
- 5.26 Replace governor screened end cap and tighten screws.
- 5.27 To assemble motor unit to mounting base:
- (1) Place motor unit on mounting base.
 - (2) Assemble ground strap and four mounting bolts to base. Tighten mounting bolts.
- 5.28 Align the hole in the brake slide lever and link. Assemble stud and retainer ring.
- 5.29 Replace typing unit and four mounting screws. Tighten screws.
- 5.30 Replace electrical cable connector(s) on the right side of the typing unit.