VOLTS 12 ROTATION See Tabulation BRUSHES 4 POLES 4

DIAMETER 4-1/2"

LUBRICATION — At overhaul, all bronze bearings should be well lubricated with medium engine oil.

Cover armature shaft at drive end with a film of light oil before assembling drive.

BRUSH REPLACEMENT — Replace brushes when they have worn to a length of 1/4" or less.

BRUSH SPRING TENSION — 32 to 40 ounces with new brushes. This tension is measured with the scale hooked under the brush screw or under the bend in the brush spring and the reading is taken just as the brush leaves the commutator. The pull of the spring scale is to be at right angles to the line of force exerted by the brush spring.

TRANSMISSION — See Tabulation

END PLAY — Adjust to .005" minimum on motors with Bendix drive and .005" to .030" on motors with clutch drive. Refer to Parts & Equipment List for thrust washer package.

COMMUTATOR END HEAD — Be sure felt oiling pad is in the outer end of the commutator end bearing before assembling the commutator end head on the motor.

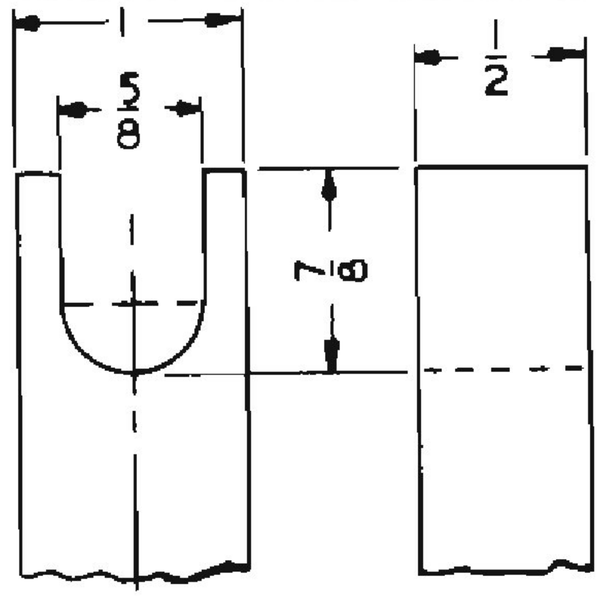
POLE SHOE ASSEMBLY — Install pole shoes so that the long tip is the trailing edge.

MAGNETIC SHIFT CLUTCHES — With plunger sealed, pinion pushed toward commutator end, and pinion stop pushed toward drive end bearing, a clearance of 1/64" to 15/64" between the pinion and pinion stop should be obtained. There are no provisions for adjusting this dimension. If dimension does not check to these limits, the shift fork is excessively worn or the motor is improperly assembled. The pinion will be against the pinion stop when cranking.

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SWITCH ACTION TEST

To test switch action on clutch type motors, slip a steel spacer (see illustration for the dimensions) over the armature shaft between the pinion and the pinion stop. With this spacer in place, the magnetic switch should bottom and the switch contact should close under normal voltages.



SHUNT FIELD DRAW — 8.2 to 9.6 amperes at 10.0 volts.

TEST SPECIFICATIONS — ($77^{o}F/25^{o}C$)

No Load Draw — 10.0 volts, 60 maximum amperes, 4000 minimum RPM.
Stall Torque — 4.0 volts, 250 maximum amperes, 3.6 minimum Ft. Lbs.

Unit	Rotation	Transmission	Pinion Position*	Special Instructions
MDY-6002	CWDE	Mag. Clutch	45/64"- 55/64"	Note 1
MDY-6004	CWDE	Mag. Clutch	1-13/16"-1-31/32"	Note 1
MDY-6005	CWDE	Mag. Clutch	1-25/32"-1-15/16"	Note 1
MDY-6006	CCWDE	Mag. Clutch	1-25/32"-1-15/16"	Note 1
MDY-6007	CWDE	Mag. Clutch	17/32"- 11/16"	Note 1
MDY-6008	CCWDE	Mag. Clutch	17/32"- 11/16"	Note 1
MDY-6009	CWDE	Mag. Clutch	45/64"- 55/64"	Note 1
MDY-6010	CWDE	Mag. Clutch	1-13/16"-1-31/32"	Note 1
MDY-6105	CWDE	Mag. Clutch	45/64"- 55/64"	Note 1
MDY-6106	CWDE	Bendix	1- 9/32"-1-13/32"	Notes 1,2A,3,4
MDY-6107	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-6108	CWDE	Mag. Clutch	45/64"- 55/64"	Note 1
MDY-6110	CWDE	Mag. Clutch	41/64"- 51/64"	Note 1
MDY-6111	CWDF	Mag. Clutch	45/64"- 55/64"	Note 1
MDU-6112	CW	Mag. Clutch	1-23/32"+ 1/16"	Notes 1,4
MDY-6114	CW	Mag. Clutch	23/32"± 5/64"	Notes 1,4
MDY-7001	CWDE	Bendix	29/32"- 1-1/32"	Notes 1,2C,4
MDY-7005	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B4
MDY-7006	CCWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7009	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7010,A	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7011	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7012	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B 4
MDY-7013	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7014	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7015	CWDE	Bendix	1- 1/4"- 1- 1/2"	Note 2D
MDY-7016	CCWDE	Bendix	1- 1/4"- 1- 1/2"	Note 2D
MDY-7017	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7019	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7021	CWDE	Bendix	1- 9/32"-1-13/32"	Notes 1,2A,3,4

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Unit	Rotation	Transmission	Pinion Position*	Special Instructions
MDY-7023	CWDE	Bendix	27/64"- 35/64"	Notes 1,2E,3,4
MDY-7024	CWDE	Bendix	1- 5/32"-1- 9/32"	Notes 1,2F,3,4
MDY-7028	CWDE	Bendix	1-23/32"-1-27/32"	Notes 1,2B,4
MDY-7038	CW	Bendix	1-23/32"-1- 7/8"	Notes 1,2J,3
MDY-7045,A	CW	Bendix	1-25/32"-1-29/32"	Notes 1,2G,3
MDY-7046,A	CCW	Bendix	1-25/32"-1-29/23"	Notes 1,2G,3
MDY-7048	CW	Bendix	3/4" - 55/64"	Notes 1,2H,3
MDY-7049	CCW	Bendix	3/4" - 55/64"	Notes 1,2H,3
MDY-7051	CW	Bendix	3/4" - 55/64"	Notes 1,2H,3
MDY-7054	CW	Bendix	3/4" - 55/64"	Notes 1,2H,3
MDY-7056	CCW	Bendix	1/2" - 39/64"	Notes 1,2I,3
MDY-7060	CCW	Bendix	1-47/64"-1-51/64"	Notes 1,2K,3

* This dimension is measured from the mounting face of the pinion housing to the outer edge of the pinion just before the pinion drops off the spiral on Bendix types or with the overrunning clutch in the "at rest" position. Check with the armature thrust to the commutator end and again with the armature thrust to the drive end. Adjust by installing thrust washers just inside either the commutator end head or intermediate bearings as required. Refer to Parts & Equipment List for thrust washer package. On folo-thru type Bendix drives, the drive may become extended while being worked on. If this happens, adjust in the extended position as noted in the Special Instructions.

Note 1 - The pinion housing bearing must be flush with the bearing bore on the inside of the housing.

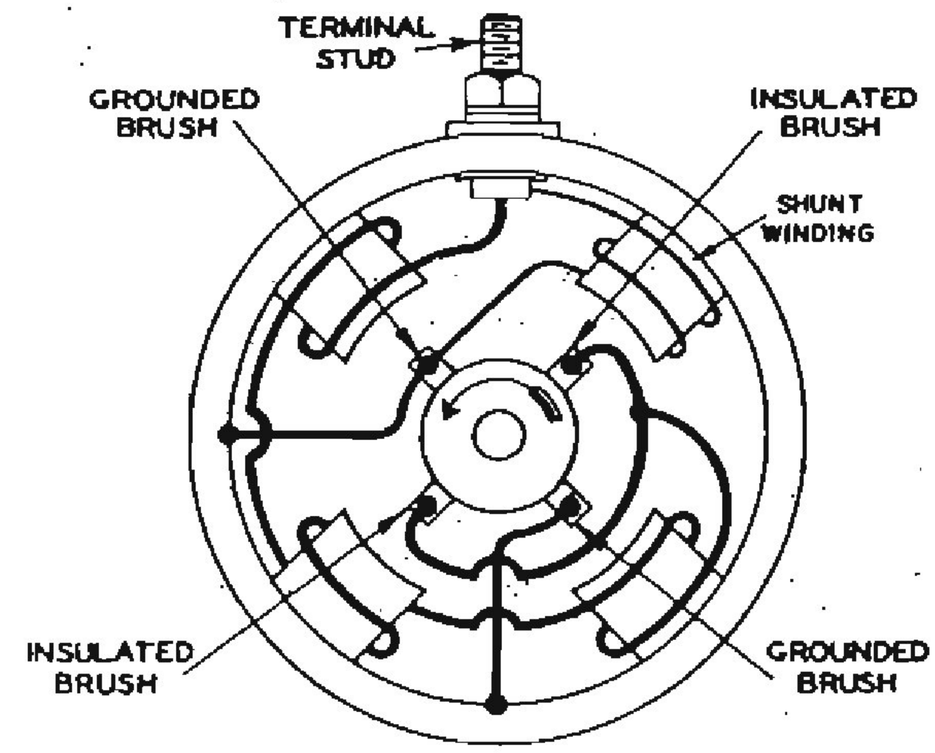
Note 2 - With drive extended, the pinion should be as indicated below when measured from the motor mounting face to the edge of the pinion. Adjust in the same manner as in the "retracted" or "at rest" position, keeping both positions within limits.

A - 1-59/64" to 2- 3/64"	F - 1-51/64" to 1-59/64"
B - 2-15/32" to 2-19/32"	G - 2-27/69" to 2-35/64"
C - 1-21/32" to 1-25/32"	H - 1-25/32" to 1- 1/2"
D - 9/16" to 11/16"	1 - 1- 9/64" to 1- 1/4"
E - 1- 1/16" to 1-11/64"	J - 2-23/64" to 2-33/64"
	K - 2- 3/8" to 2- 7/16"

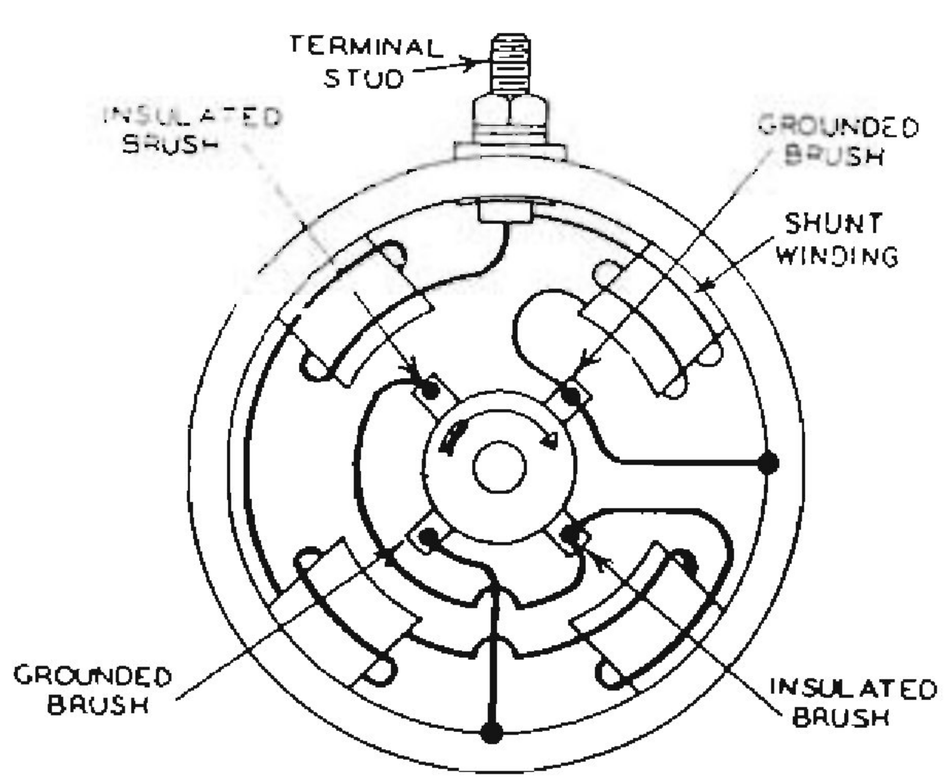
Note 3 - Bendix drive retaining pin must not project beyond outside diameter of pinion sleeve.

Note 4 - Intermediate bearing must be flush with the bearing bore nearest the armature.

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INFORMATION



Internal Wiring of
CWDE Motors



Internal Wiring of
CCWDE Motors

prestolite SERVICE MANUAL

STARTING MOTOR SECTION

(Issued 3-16-78)

VOLTS 12 ROTATION CWDE BRUSHES 4 POLES 4

LUBRICATION

At overhaul, soak new bearings in SAE #20 oil before installing in the bearing bore. Lubricate the bearing surfaces of the armature shaft with SAE #10 oil when assembling motor. Lubricate the armature shaft and splines with a light grade graphite grease before installing the drive assembly.

STARTING SWITCH

Shifting solenoid. Coaxially mounted inside the pinion housing.

BRUSH SPRING TENSION

32 to 40 ounces with new brushes. Measure with a spring scale hooked under the brush spring as near to the brush as possible. Pull the scale on a line opposite the line of force exerted by the brush spring and take the reading just as the spring leaves the brush.

TRANSMISSION

Overrunning clutch.

COMMUTATOR END HEAD

Make sure the felt oiling pad is in the outer end of the bearing before assembling the end head on the motor.

ARMATURE END PLAY

Adjust to .005" to .030" with thrust washers on the commutator end of the shaft. Refer to Parts and Equipment List for thrust washer package.

SWITCH CONTACT HEIGHT

Adjust to .40" to .45" using the PT-1 gauge or a gauge cut to the dimensions shown in Figure 1. Make sure the cover gasket is removed. Adjust by bending the contact support. (Refer to service bulletin SM-11).

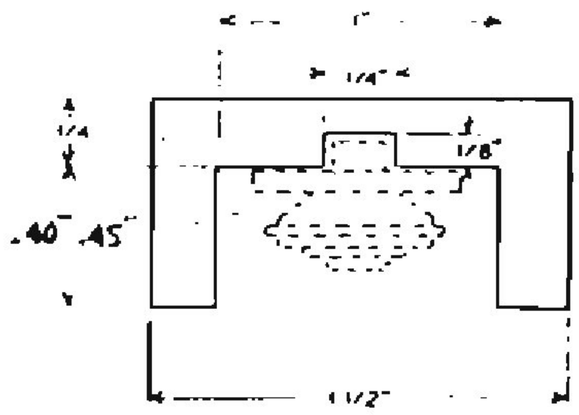


Figure 1.

SHUNT FIELD DRAW

8.2 to 9.6 amperes at 10.0 volts.

TEST SPECIFICATIONS (77°F.)

No Load Draw*	10.0 volts, 81 maximum amperes, 4200 minimum RPM.
Stall Torque*	4.0 volts, 414 maximum amperes, 9.0 minimum Ft. Lbs.

*Includes solenoid current draw.

SOLENOID SPECIFICATIONS (77°F.)

Coil Draw	19.2 to 21.8 amperes at 10.0 volts.
Closing Voltage	The contacts should close at 8.0 volts maximum with a 1/2" interference block between the drive pinion and the pinion stop.

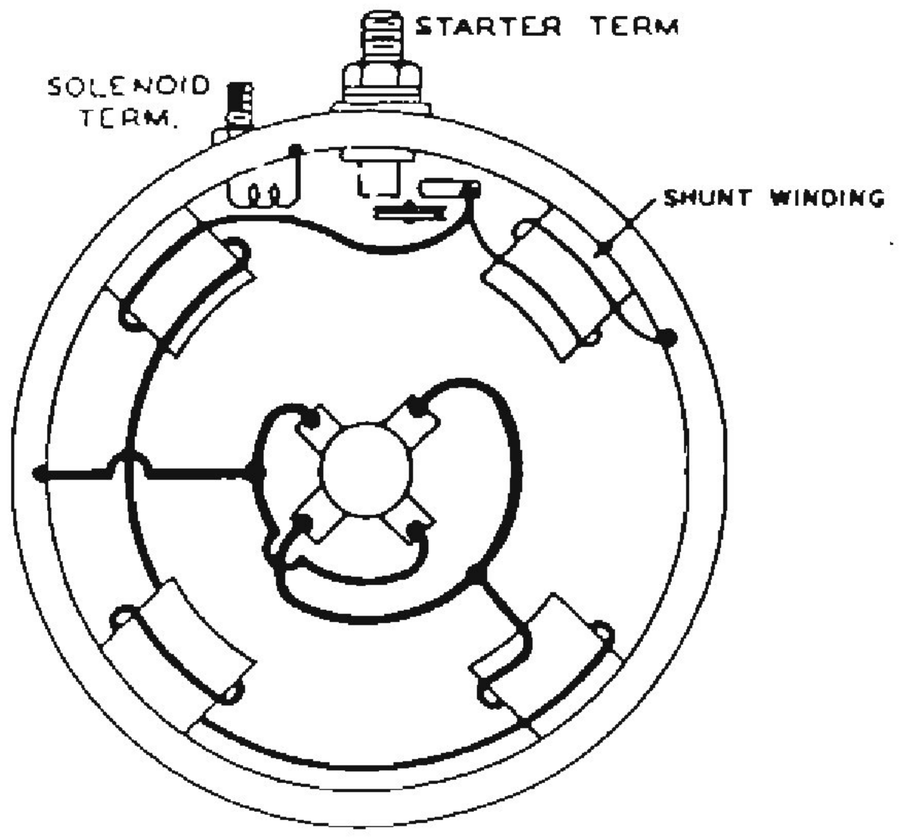
SWITCH COVER

After the motor has been completely assembled and tested, seal the end of the switch cover adjacent to the frame and field assembly and around the switch cover base with a good grade sealant.

Unit	Pinion Position**	Special Instructions
MDY-8006A	1 13/16" to 1 61/64"	See Note 1.
MDY-8101A	45/64" to 27/32"	
MDY-8102A	41/64" to 25/32"	

**This dimension is measured from the face of the mounting flange to the outside edge of the pinion when in the "at rest" position. However, this dimension cannot be adjusted and is to be used as a reference dimension to assure correct starting motor assembly.

NOTE 1. - In addition to sealing the switch cover, seal around the joint between the commutator end head and frame and the pinion housing and frame.



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VOLTAGE 12 ROTATION See Tabulation BRUSHES 4 POLES 4

VENTILATED No FRAME DIAMETER 4-1/2"

BEARINGS

Absorbent bronze used at commutator end. Ball bearing used at drive end. When assembling motor, make sure shielded side of ball bearing is toward armature if only one side of bearing has seal.

LUBRICATION

Soak absorbent bronze bearing and felt oiling pad with SAE 20 oil. Allow excess oil to drain out before assembling end head on motor. Pack open ball bearings 1/4" to 1/2" full with a light grade ball bearing lubricant. Sealed ball bearings require no additional lubrication.

BRUSH REPLACEMENT

Replace brushes when they have worn to a length of 1/4" or less. See note.

SPRING TENSION

32 to 40 ounces with new brushes. Measure with a spring scale hooked under the brush holder at the brush. Pull the scale on a line opposite the line of force exerted by the brush spring and take the reading just as the brush leaves the commutator.

POLE SHOE INSTALLATION

When replacing field coils, install pole shoes so that longer edge is pointing in the same direction as armature rotation.

END PLAY

Adjust all except MDY-6116,S, MDY-6119, and MDY-6121 to .4275" to .4635" dimension from end of armature shaft to the mounting surface with thrust washers at C.E. end. Adjust MDY-6116,S, MDY-6119, and MDY-6121 to .005 minimum. Refers to Parts & Equipment List for thrust washer package.

TEST SPECIFICATIONS (77°F/25°C)

	Terminal Voltage	Maximum Amperes	RPM	Torque Ft. Lbs.
No Load Test	10.0	60	4000	- 0 -
Stall Torque Test	4.0	250	- 0 -	3.6

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Unit	Internal Wiring	Rotation
MDY-6102	Figure 1	CCWDE
MDY-6103	Figure 2	CCWDE
MDY-6104,XP	Figure 1	CCWDE
MDY-6109	Figure 2	CCWDE
MDY-6115	Figure 2	CCWDE
MDY-6116,S	Figure 3	CWDE
MDY-6117	Figure 1	CCWDE
MDY-6118	Figure 2	CCWDE
MDY-6119	Figure 1	CCWDE
MDY-6120	Figure 2	CCWDE
MDY-6121	Figure 2	CCWDE
MDY-6122	Figure 2	CCWDE

Note - When installing new brushes, be sure that MDL-12 brushes are used at ground position and that MDL-12A brushes are insulated from ground.

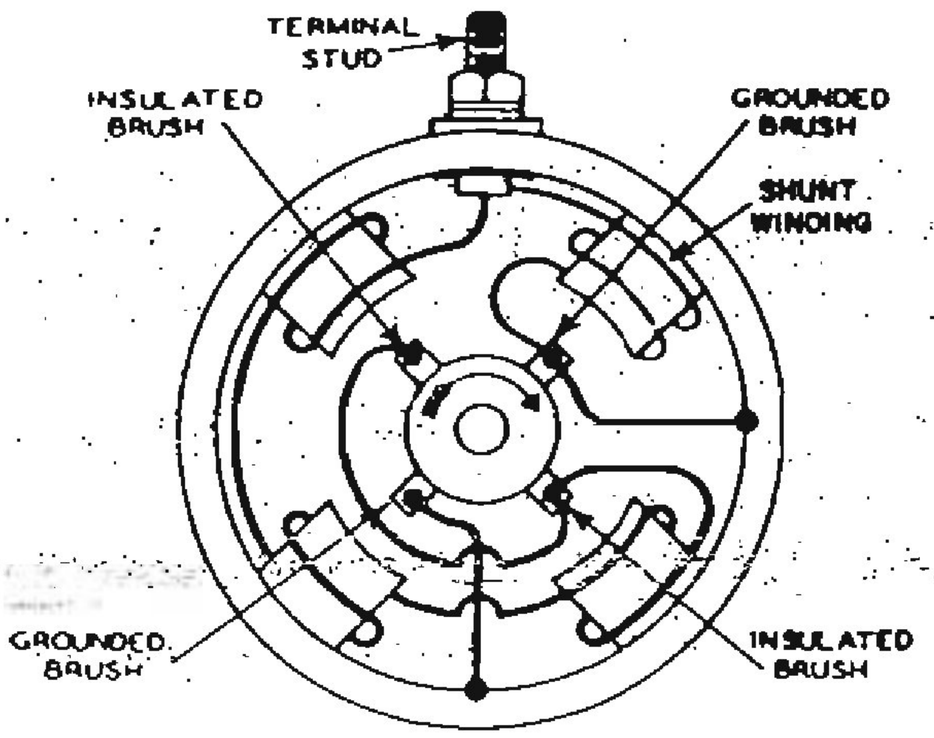


Figure 1

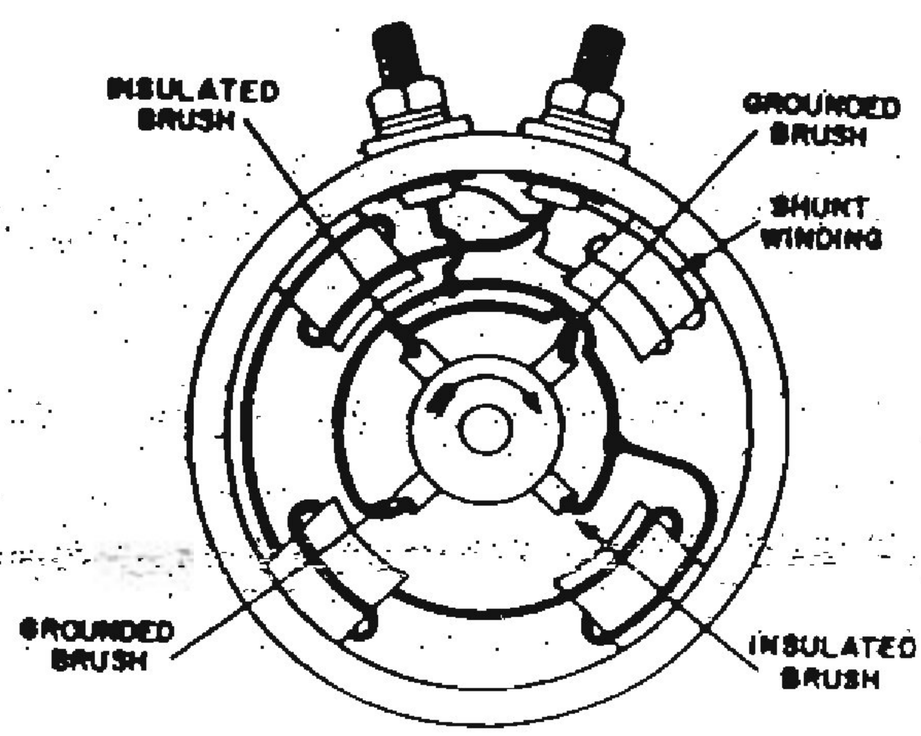


Figure 2

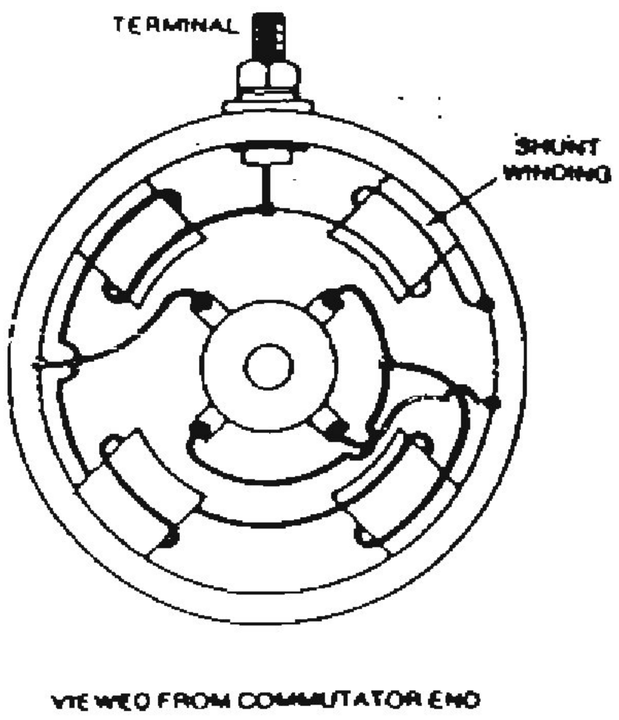


Figure 3

VOLTAGE 12 ROTATION See Tabulation BRUSHES 4 POLES 4

VENTILATED No FRAME DIAMETER 4-1/2"

BEARINGS Absorbent bronze used at commutator end. See tabulation for drive end bearing. Units supplied with D.E. bearings are sealed ball type.

LUBRICATION Soak absorbent bronze bearings and felt oiling pad with SAE 20 oil. Allow excess oil to drain out before assembling end head on motor. Ball bearings are prelubricated and sealed needing no additional lubrication.

SWITCH See tabulation.

BRUSH REPLACEMENT Replace brushes when they have worn to a length of 1/4" or less.

SPRING TENSION 32 to 40 ounces with new brushes. Measure with a spring scale hooked under the brush holder at the brush. Pull the scale on a line opposite the line of force exerted by the brush spring and take the reading just as the spring leaves the brush.

POLE SHOE INSTALLATION When replacing field coils, install pole shoes so that the longer edge is pointing in the same direction as the armature rotation.

END PLAY See tabulation for end play dimension. Adjust with thrust washers at comm end of armature. Refer to Parts & Equipment List for thrust washer package.

TEST SPECIFICATIONS (77°F/25°C)

	Terminal Voltage	Maximum Amperes	RPM	Torque Ft. Lbs.
No Load Test	10.0	60	4000	0
Stall Torque Test	4.0	250	0	3.6

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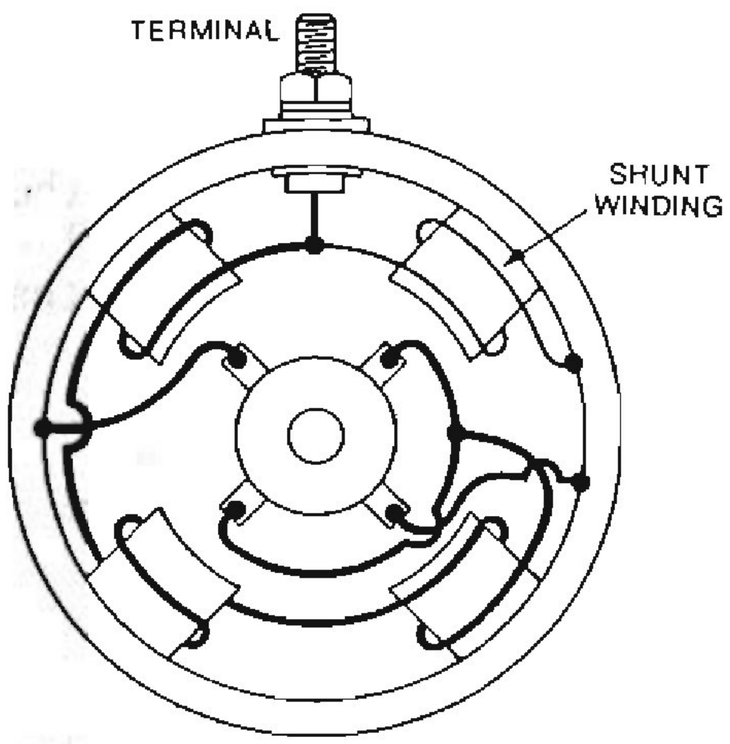
UNIT	ROTATION	SWITCH MOUNTED	END PLAY	INTERNAL WIRING	DRIVE END BEARING
MDY-6201,A	CWDE	Separate	Note 1	Figure 1	Not Supplied
MDY-6202	CCWDE	Separate	Note 2	Figure 2	Ball
MDY-6203	CCWDE	On Motor	Note 2	Figure 2	Ball
MDY-6204	CWDE	Separate	Note 3	Figure 3	Not Supplied
MDY-6205,S	CCWDE	Separate	Note 4	Figure 2	Ball
MDY-6206,S	CCWDE	Separate	Note 4	Figure 2	Ball

Note 1 - Adjust to .06" max.

Note 2 - Adjust to .4275"/.4635" from mounting surface to end of armature.

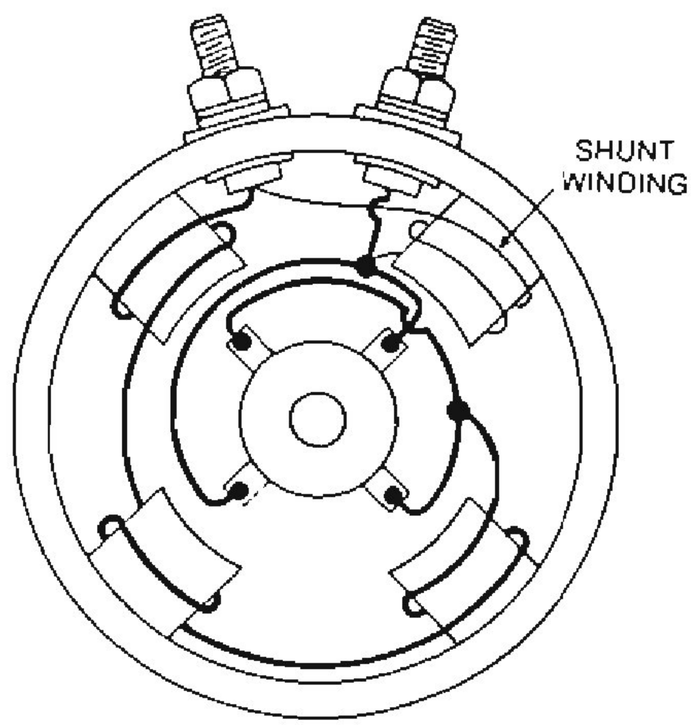
Note 3 - Adjust to 1.041" ± .019" from drive end of frame to end of armature.

Note 4 - Adjust to .005" min.



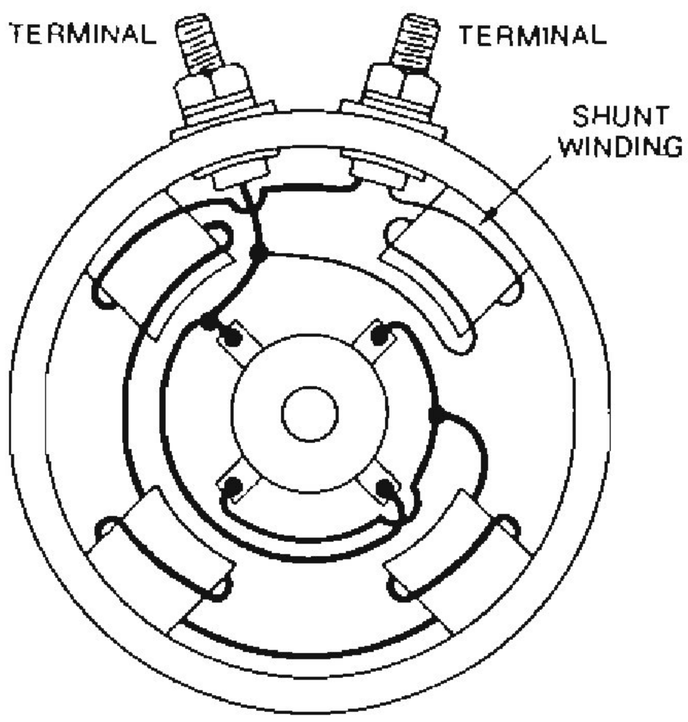
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FIG. 1



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FIG. 2



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IG.

VOLTAGE 12 ROTATION See Tabulation BRUSHES 4 POLES 4

VENTILATED No FRAME DIAMETER 4-1/2"

BEARINGS Absorbent bronze bearing used at comm end. See tabulation for type of drive end bearing. Units using ball bearings with only one shield must install shielded side toward inside of motor.

LUBRICATION Soak absorbent bronze bearings and felt oiling pad with SAE 20 oil. Allow excess oil to drain out before assembling end head on motor. Pack open ball bearings 1/4" to 1/2" full with good grade ball bearing grease. Sealed ball bearings are prelubricated and need no additional lubrication.

SWITCH See tabulation.

BRUSH REPLACEMENT Replace brushes when they have worn to a length of 1/4" or less.

SPRING TENSION 32 to 40 ounces with new brushes. Measure with a spring scale hooked under the brush spring at the brush. Pull the scale on a line opposite the line of force exerted by the brush spring and take the reading just as the brush spring leaves the brush.

POLE SHOE INSTALLATION When replacing field coils, install pole shoes so that long edge is pointing in the same direction as armature rotation.

END PLAY See tabulation for end play dimension. Adjust with thrust washers between the commutator end of armature. Refer to Parts & Equipment List for thrust washer package.

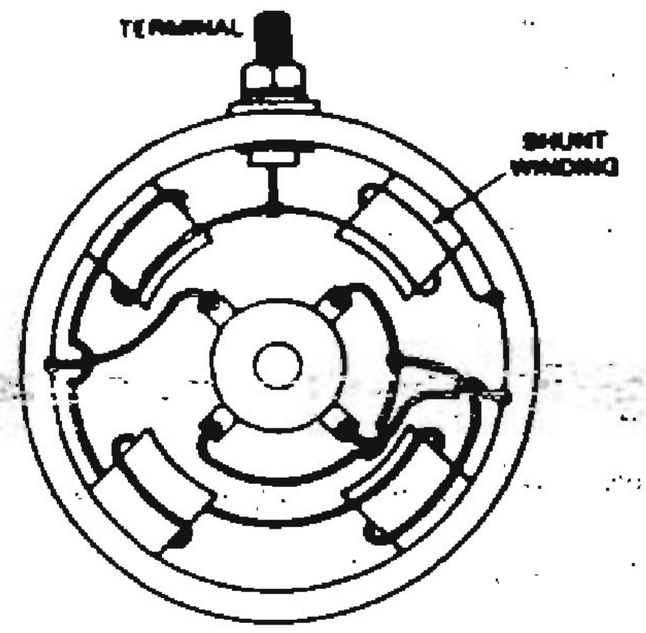
TEST SPECIFICATIONS (77°F/25°C)

	Terminal Voltage	Maximum Amperes	RPM	Torque Ft. Lbs.
No Load Test	10.0	60	4000	0
Stall Torque Test	4.0	250	0	3.6

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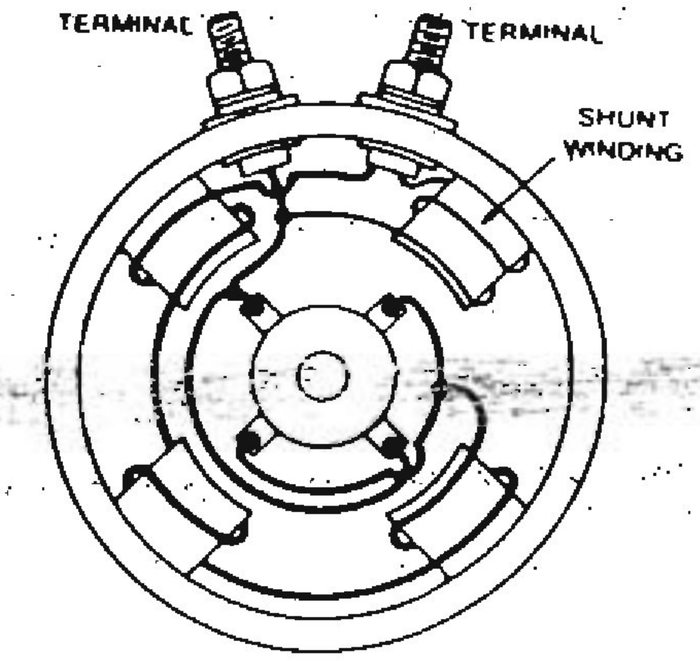
UNIT	ROTATION	BEARINGS	END PLAY	SWITCH MOUNTED	INTERNAL WIRING
MDY-7002	CWDE	Bronze	.005 Min.	Separate	Figure 1
MDY-7003	CWDE	Not Supplied	.005 Min.	Separate	Figure 1
MDY-7004	CWDE	Not Supplied	.005 Min.	On Motor	Figure 1
MDY-7018	CWDE	Not Supplied	.005 Min.	Separate	Figure 1
MDY-7020,A	CWDE	Bronze	.005 Min.	Separate	Figure 1
MDY-7022	CWDE	Ball	Note 1	Separate	Figure 1
MDY-7027	CCWDE	Ball	Note 1	Separate	Figure 3
MDY-7029	CWDE	Bronze	.005 Min.	Separate	Figure 1
MDY-7030	CWDE	Bronze	.005 Min.	Separate	Figure 1
MDY-7031	CWDE	Ball	Note 1	On Motor	Figure 1
MDY-7032	CWDE	Ball	Note 1	Separate	Figure 1
MDY-7032A,B	CWDE	Ball	Note 1	On Motor	Figure 1
MDY-7037	CWDE	Ball	.005 Min.	Separate	Figure 1
MDY-7037,S	CWDE	Not Supplied	.005 Min.	Separate	Figure 1
MDY-7039,S	CWDE	Ball	.005 Min.	Separate	Figure 1
MDY-7040,S	CWDE	Ball	.005 Min.	Separate	Figure 2
MDY-7042,A	CWDE	Ball	.005 Min.	Separate	Figure 1
MDY-7043	CCWDE	Ball	.005 Min.	Separate	Figure 1
MDY-7044	CWDE	Not Supplied	Note 2	Separate	Figure 1
MDY-7047,XP	CWDE	Ball	.005 Min.	Separate	Figure 2
MDY-7050	CCWDE	Ball	.005 Min.	Separate	Figure 1
MDY-7052	CWDE	Bronze	Note 3	Separate	Figure 2
MDY-7053	CWDE	Bronze	Note 3	Separate	Figure 1
MDY-7055	CWDE	Bronze	.005	Separate	Figure 2
MDY-7057	CCWDE	Bronze	.005	Separate	Figure 3
MDY-7058	CWDE	Not Supplied	.005	Separate	Figure 1
MDY-7059	CCWDE	Ball	.005	Separate	Figure 3
MDY-7061	CWDE	Ball	.005	Separate	Figure 1
MDY-7063	CWDE	Ball	.005	Separate	Figure 1
MDY-7064	CCWDE	Ball	.005	Separate	Figure 4
MDY-7065	CCWDE	Ball	.005	Separate	Figure 4
MDY-7066	CWDE	Ball	.005	Separate	Figure 1
MDY-7067	CCWDE	Ball	.005	Separate	Figure 4
MDY-7068	CCWDE	Ball	.005	Separate	Figure 5

End Play Note 1 - Adjust to .4275" to .4635" from mounting surface to end of armature.
Note 2 - Adjust to .524" ± .029" from drive end of frame to end of armature.
Note 3 - Adjust to .275" to .245" from mounting surface to end of armature.



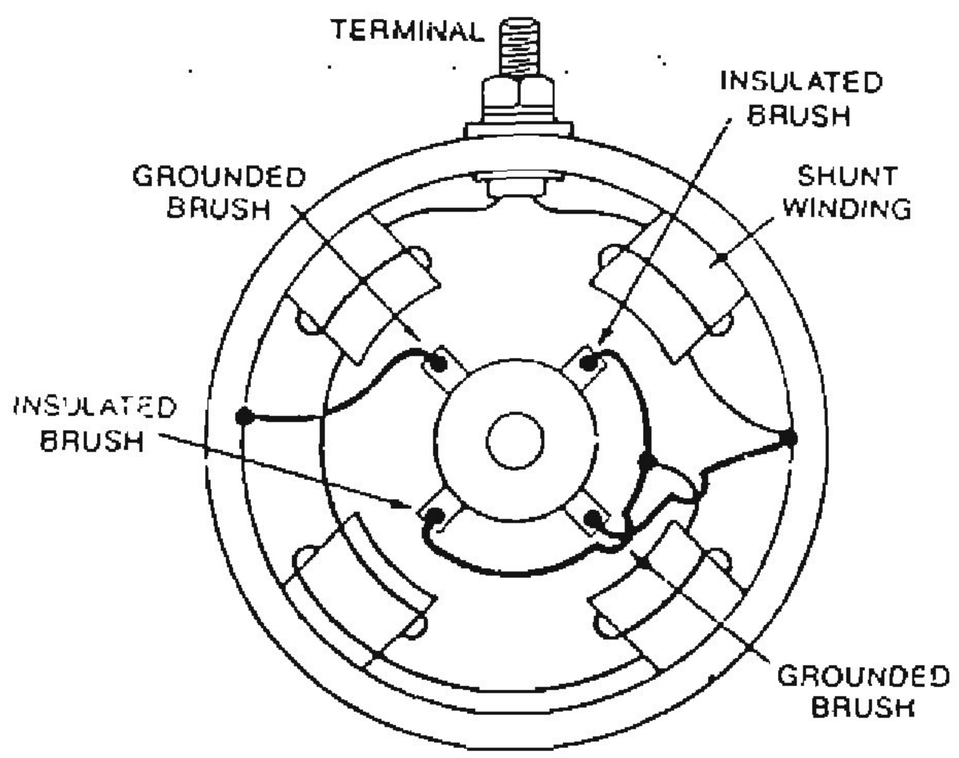
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FIG. 1



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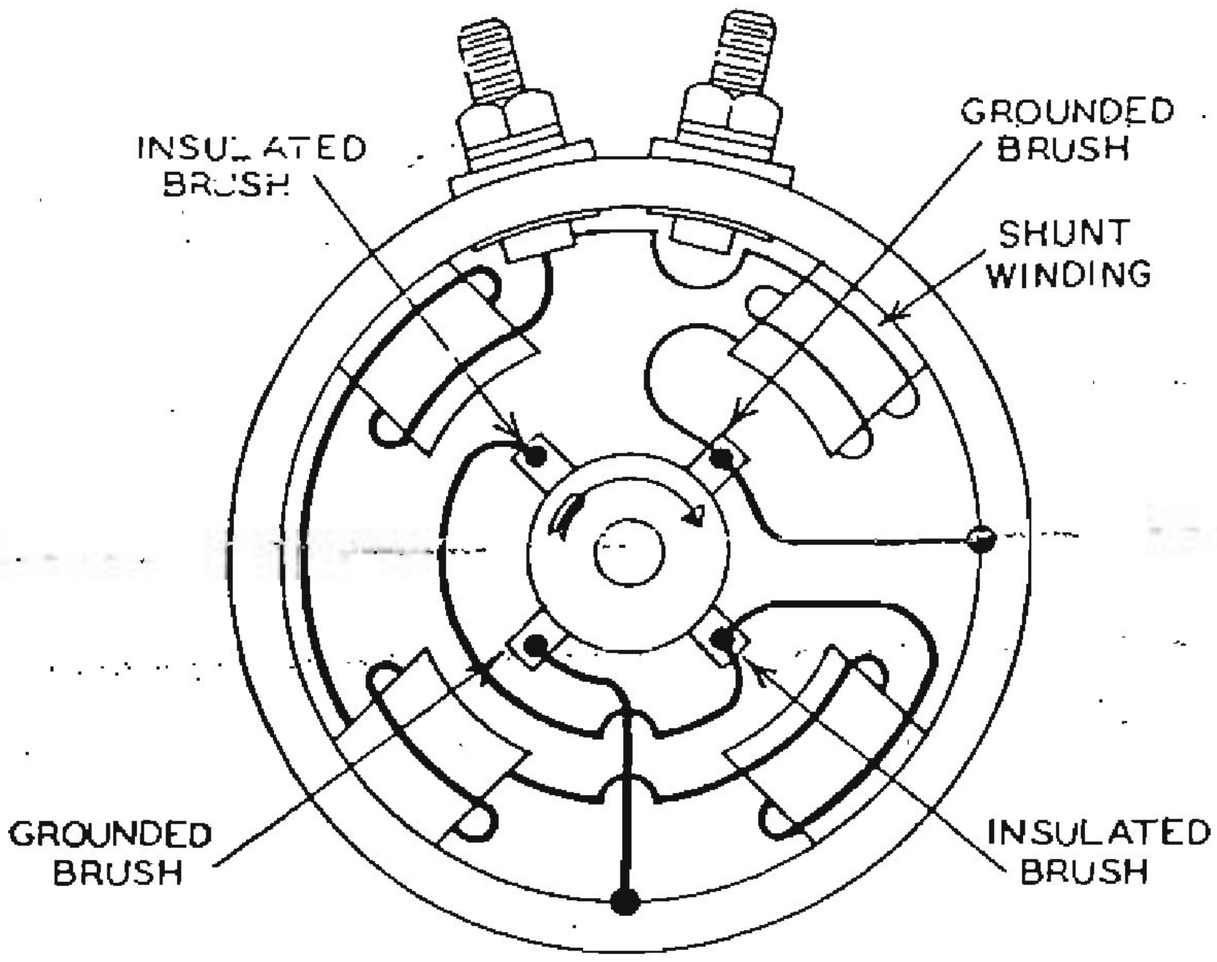
FIG. 2



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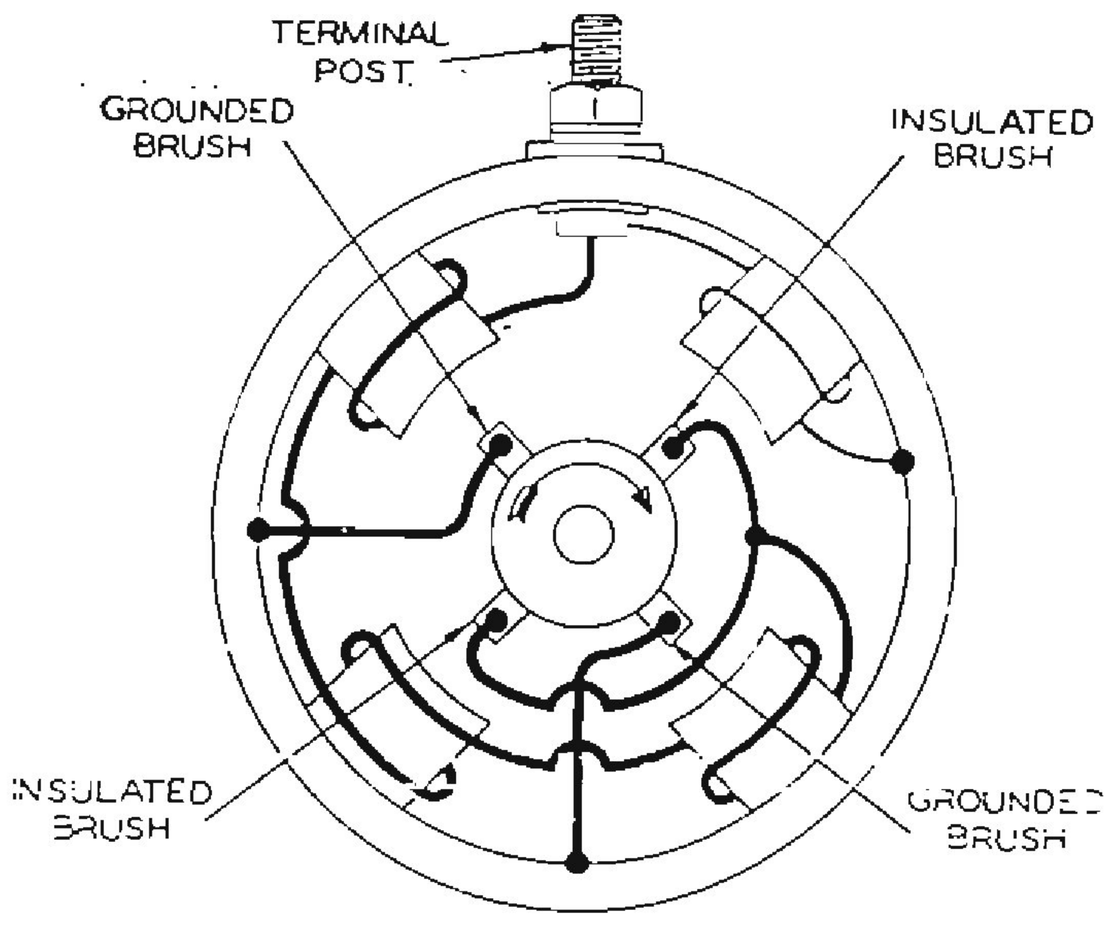
FIG. 3

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FIG. 4



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FIG. 5