

**Subpart D—Machines Assembled
With Certified or Explosion-
Proof Components, Field
Modifications of Approved
Machines, and Permits To Use
Experimental Equipment**

§ 18.80 Approval of machines assembled with certified or explosion-proof components.

(a) A machine may be a new assembly, or a machine rebuilt to perform a service that is different from the original function, or a machine converted from nonpermissible to permissible status, or a machine converted from direct- to alternating-current power or vice versa. Properly identified components that have been investigated and accepted for application on approved machines will be accepted in lieu of certified components.

(b) A single layout drawing (see Figure 1 in Appendix II) or photographs will be acceptable to identify a machine that was assembled with certified or explosion-proof components. The following information shall be furnished:

- (1) Overall dimensions.
- (2) Wiring diagram.
- (3) List of all components (see Figure 2 in Appendix II) identifying each according to its certification number or the approval number of the machine of which the component was a part.
- (4) Specifications for:
 - (i) Overcurrent protection of motors.
 - (ii) All wiring between components, including mechanical protection such as hose conduits and clamps.
 - (iii) Portable cable, including the type, length, outside diameter, and number and size of conductors.
 - (iv) Insulated strain clamp for machine end of portable cable.
 - (v) Short-circuit protection to be provided at outby end of portable cable.
- (c) MSHA reserves the right to inspect and to retest any component(s) that had been in previous service, as it deems appropriate.
- (d) When MSHA has determined that all applicable requirements of this part have been met, the applicant will be authorized to attach an approval plate to each machine that is built in strict accordance with the drawings and specifications filed with MSHA and listed

with MSHA's formal approval. A design of the approval plate will accompany the notification of approval. (Refer to §§ 18.10 and 18.11.)

(e) Approvals are issued only by the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059.

[33 FR 4660, Mar. 19, 1968, as amended at 43 FR 12314, Mar. 24, 1978; 52 FR 17514, May 8, 1987; 73 FR 52211, Sept. 9, 2008]

§ 18.81 Field modification of approved (permissible) equipment; application for approval of modification; approval of plans for modification before modification.

(a) An owner of approved (permissible) equipment who desires to make modifications in such equipment shall apply in writing to make such modifications. The application, together with the plans of modifications, shall be filed with the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059.

(b) Proposed modifications shall conform with the applicable requirements of subpart B of this part, and shall not substantially alter the basic functional design that was originally approved for the equipment.

(c) Upon receipt of the application for modification, and after such examination and investigation as may be deemed necessary by MSHA, MSHA will notify the owner and the District office of the mine workers' organization having jurisdiction at the mine where such equipment is to be operated stating the modifications which are proposed to be made and MSHA's action thereon.

[33 FR 4660, Mar. 19, 1968, as amended at 43 FR 12314, Mar. 24, 1978; 60 FR 35693, July 11, 1995; 73 FR 52211, Sept. 9, 2008]

§ 18.82 Permit to use experimental electric face equipment in a gassy mine or tunnel.

(a) *Application for permit.* An application for a permit to use experimental electric face equipment in a gassy mine or tunnel will be considered only when submitted by the user of the equipment. The user shall submit a written

application to the Assistant Secretary of Labor for Mine Safety and Health, 1100 Wilson Blvd., Room 2322, Arlington, Virginia 22209-3939, and send a copy to the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059.

(b) *Requirements*—(1) *Constructional.*
(i) Experimental equipment shall be so constructed that it will not constitute a fire or explosion hazard.

(ii) Enclosures designed as explosion-proof, unless already certified, or components of previously approved (permissible) machines, shall be submitted to MSHA for inspection and test and shall meet the applicable design requirements of subpart B of this part. Components designed as intrinsically safe also shall be submitted to MSHA for investigation.

(iii) MSHA may, at its discretion, waive the requirements for detailed drawings of component parts, inspections, and tests provided satisfactory evidence is submitted that an enclosure has been certified, or otherwise accepted by a reputable testing agency whose standards are substantially equivalent to those set forth in subpart B of this part.

(2) *Specifications.* The specifications for experimental equipment shall include a layout drawing (see Figure 1 in Appendix II) or photograph(s) with the components, including overcurrent-protective device(s) with setting(s) identified thereon or separately; a wiring diagram; and descriptive material necessary to insure safe operation of the equipment. Drawings already filed with MSHA need not be duplicated by the applicant, but shall be properly identified.

(c) *Final inspection.* Unless equipment is delivered to MSHA for investigation, the applicant shall notify the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059, when and where the experimental equipment will be ready for inspection by a representative of MSHA before installing it on a trial basis. Such inspection shall be completed before a permit will be issued.

(d) *Issuance of permit.* When the inspection discloses full compliance with the applicable requirements of this subpart, the Assistant Secretary will issue a permit sanctioning the operation of a single unit in a gassy mine or tunnel, as designated in the application. If the applicant is not the assembler of the equipment, a copy of the permit also may be sent to the assembler.

(e) *Duration of permit.* A permit will be effective for a period of 6 months. For a valid reason, to be stated in a written application, the Administrator of MSHA may grant an extension of a permit for an additional period, not exceeding 6 months. Further extension will be granted only where, after investigation, the Assistant Secretary finds that for reasons beyond the control of the user, it has not been possible to complete the experiment within the period covered by the extended permit.

(f) *Permit label.* With the notification granting a permit, the applicant will receive a photographic copy of a permit label bearing the following:

- (1) Emblem of the Mine Safety and Health Administration.
- (2) Permit number.
- (3) Expiration date of the permit.
- (4) Name of machine.
- (5) Name of the user and mine or tunnel.

The applicant shall attach the photographic copy of the permit label, or replica thereof, to the experimental equipment. If a photograph is used, a clear plastic covering shall be provided for it.

(g) *Withdrawal of permit.* The Assistant Secretary may rescind, for cause, any permit granted under this subpart.

[33 FR 4660, Mar. 19, 1968, as amended at 43 FR 12314, Mar. 24, 1978; 52 FR 17514, May 8, 1987; 60 FR 35693, July 11, 1995; 67 FR 38384, June 4, 2002; 73 FR 52211, Sept. 9, 2008]

APPENDIX I TO SUBPART D OF PART 18
LIST OF TABLES

Table No.	Title
1	Portable power cable ampacities—600 volts.
2	Portable cord ampacities—600 volts.
3	Portable power cable ampacities—601 to 5,000 volts.
4	Normal diameter of round cables with tolerances in inches—600 volts.
5	Nominal dimension of flat cables with tolerances in inches—600 volts.
6	Nominal diameter of heavy jacketed cords with tolerances in inches—600 volts.
7	Nominal diameter of three-conductor portable power cables with tolerances in inches—601 to 5,000 volts.
8	Fuse ratings or instantaneous settings of circuit breakers for short-circuit protection of portable cables.
9	Specifications for portable cables longer than 500 feet.
10	High voltage trailing cable ampacities and outside diameters.

TABLE 1—PORTABLE POWER CABLE AMPACITIES—600 VOLTS (AMPERES PER CONDUCTOR BASED ON 60 °C. COPPER TEMPERATURE—40 °C. AMBIENT)

Conductor size—AWG or MCM	Single conductor	2-conductor, round or flat	3-conductor, round or flat	4-conductor	5-conductor	6-conductor
8	45	40	35	30	25	20
6	60	50	50	40	35	30
4	85	70	65	55	45	35
3	95	80	75	65	55	45
2	110	95	90	75	65	55
1	130	110	100	85	75	65
1/0	150	130	120	100	90	80
2/0	175	150	135	115	105	95
3/0	205	175	155	130	120	110
4/0	235	200	180	150	140	130
250	275	220	200	160	.....	.....
300	305	240	220	175	.....	.....
350	345	240	235	190	.....	.....
400	375	280	250	200	.....	.....
450	400	300	270	215	.....	.....
500	425	320	290	230	.....	.....

TABLE 2—PORTABLE CORD AMPACITIES—600 VOLTS (AMPERES PER CONDUCTOR BASED ON 60 °C. COPPER TEMPERATURE—40 °C. AMBIENT)

Conductor size—AWG	1-3 conductor	4-6 conductor	7-9 conductor
14	15	12	8
12	20	16	11
10	25	20	14

TABLE 3—PORTABLE POWER CABLE AMPACITIES—601 TO 5,000 VOLTS (AMPERES PER CONDUCTOR BASED ON 75 °C. COPPER TEMPERATURE—40 °C. AMBIENT)

Conductor size—AWG or MCM	3-conductor types G-GC and SIIC-GC 2,000 volts	3-conductor type SHD-GC 2,001-5,000 volts
6	65	65
4	85	85
3	100	100
2	115	115
1	130	130
1/0	145	145
2/0	170	170
3/0	195	195
4/0	220	220
250	245	245
300	275	275
350	305	305

TABLE 4—NOMINAL DIAMETERS OF ROUND CABLES WITH TOLERANCES IN INCHES—600 VOLTS

Conductor size—AWG or MCM	Single conductor	2-conductor			3-conductor			4-conductor—Types W & G	5-conductor—Types W & G	6-conductor	
		Types W & G twisted	Type PG, 2 power	Type PCG, 3 power, ground	Types W & G	Type PG, 3 power, ground	Type PCG, 3 power, 2 control, ground			Type w	Tolerance
8	0.44	0.81	0.84	0.94	0.91	0.93	1.03	0.99	1.07	1.18	±0.03
6 .....	.51	.93	.93	.98	1.01	1.03	1.18	1.10	1.21	1.31	±0.03
4 .....	.57	1.08	1.08	1.10	1.17	1.20	1.29	1.27	1.40	1.52	±0.03
3 .....	.63	1.17	1.17	1.20	1.24	1.27	1.31	1.34	1.48	1.61	±0.03
2 .....	.66	1.27	1.27	1.29	1.34	1.34	1.39	1.48	1.61	1.75	±0.03
1 .....	.74	1.44	1.44	1.44	1.51	1.52	1.52	1.68	1.88	2.05	±0.03
1/0 .....	.77	1.52	1.52	1.52	1.65	1.68	1.68	1.79	1.96	2.13	±0.04
2/0 .....	.82	1.65	1.65	1.65	1.75	1.79	1.79	1.93	2.13	2.32	±0.04
3/0 .....	.87	1.77	1.77	1.77	1.89	1.93	1.93	2.07	2.26	2.49	±0.05
4/0 .....	.93	1.92	1.92	1.92	2.04	2.13	2.13	2.26	2.46	2.71	±0.05
250	1.03	2.16	2.16	2.16	2.39	2.39	2.39	2.66	.....	.....	±0.06
300	1.09	2.32	.....	.....	2.56	.....	.....	2.84	.....	.....	±0.06
350	1.15	2.43	.....	.....	2.68	.....	.....	2.98	.....	.....	±0.06
400	1.20	2.57	.....	.....	2.82	.....	.....	3.14	.....	.....	±0.06
450	1.26	2.67	.....	.....	2.94	.....	.....	3.26	.....	.....	±0.06
500	1.31	2.76	.....	.....	3.03	.....	.....	3.40	.....	.....	±0.06

TABLE 5—NOMINAL DIMENSIONS OF FLAT CABLES WITH TOLERANCES IN INCHES—600 VOLTS

Conductor size—AWG	2-conductor								3-conductor—Type G			
	Type W				Type G				Major		Minor	
	Major		Minor		Major		Minor		O.D.	Tolerance	O.D.	Tolerance
	O.D.	Tolerance	O.D.	Tolerance	O.D.	Tolerance	O.D.	Tolerance				
8	0.84	±0.04	0.51	±0.03	1.02	±0.04	0.56	±0.03	1.65	±0.06	0.67	±0.05
6 .....	.93	±0.04	.56	±0.03	1.15	±0.04	.61	±0.03	1.85	±0.06	.75	±0.05
4	1.05	±0.04	.61	±0.03	1.26	±0.04	.68	±0.03	1.99	±0.06	.77	±0.05
3	1.14	±0.04	.68	±0.03	1.35	±0.04	.73	±0.06	2.10	±0.06	.81	±0.05
2	1.24	±0.04	.73	±0.03	1.55	±0.04	.81	±0.03	2.43	±0.06	.97	±0.05
1	1.40	±0.04	.81	±0.03	1.67	±0.04	.93	±0.03	.....	.....	.....	.....
1/0	1.51	±0.04	.93	±0.03	1.85	±0.04	.99	±0.03	.....	.....	.....	.....
2/0	1.63	±0.04	.99	±0.03	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 5—NOMINAL DIMENSIONS OF FLAT CABLES WITH TOLERANCES IN INCHES—600 VOLTS—Continued

Conductor size—AWG	2-conductor								3-conductor—Type G			
	Type W				Type G				Major		Minor	
	Major		Minor		Major		Minor		O.D.	Tolerance	O.D.	Tolerance
	O.D.	Tolerance	O.D.	Tolerance	O.D.	Tolerance	O.D.	Tolerance				
3/0	1.77	±.04	1.03	±.03	2.00	±.04	1.03	±.03				
4/0	1.89	±.04	1.10	±.03	2.10	±.04	1.10	±.03				

TABLE 6—NOMINAL DIAMETERS OF HEAVY JACKETED CORDS WITH TOLERANCES IN INCHES—600 VOLTS

Conductor size—AWG	2-conductor		3-conductor		4-conductor		5-conductor		6-conductor		7-conductor	
	Diameter	Tolerance	Diameter	Tolerance	Diameter	Tolerance	Diameter	Tolerance	Diameter	Tolerance	Diameter	Tolerance
14	0.64	±0.02	0.67	±0.02	0.71	±0.02	0.78	±0.03	0.83	±0.03	0.89	±0.03
12 .....	.68	±.02	.72	±.03	.76	±.03	.83	±.03	.89	±.03	.98	±.03
10 .....	.73	±.03	.80	±.03	.84	±.03	.90	±.03	1.00	±.03	1.07	±.03

TABLE 7—NOMINAL DIAMETERS OF THREE-CONDUCTOR PORTABLE POWER CABLES WITH TOLERANCES IN INCHES—601 TO 5,000 VOLTS

Conductor size—AWG or MCM	Type G-GC (non-shielded) 2,000 volts		Type SHC-GC (shielded overall) 2,000 volts		Type SHD-GC (individually shielded power conductors) 2,001-3,000 volts		Type SHD-GC (individually shielded power conductors) 3,001-5,000 volts	
	Diameter	Tolerance	Diameter	Tolerance	Diameter	Tolerance	Diameter	Tolerance
6	1.25	+0.10, -0.06	1.39	+0.11, -0.07	1.62	+0.13, -0.08	1.78	+0.14, -0.09
4	1.40	+ .11, - .07	1.55	+ .12, - .08	1.77	+ .14, - .09	1.90	+ .15, - .10
3	1.48	+ .12, - .07	1.62	+ .13, - .08	1.84	+ .15, - .09	1.98	+ .16, - .10
2	1.55	+ .12, - .08	1.71	+ .14, - .09	1.92	+ .15, - .10	2.09	+ .17, - .11
1	1.74	+ .14, - .09	1.89	+ .15, - .09	2.04	+ .16, - .10	2.18	+ .17, - .11
1/0	1.84	+ .15, - .09	2.02	+ .16, - .10	2.18	+ .17, - .11	2.34	+ .19, - .12
2/0	1.99	+ .16, - .10	2.16	+ .17, - .11	2.29	+ .18, - .12	2.46	+ .20, - .12
3/0	2.12	+ .17, - .11	2.30	+ .18, - .11	2.45	+ .20, - .12	2.62	+ .21, - .13
4/0	2.30	+ .18, - .12	2.48	+ .20, - .12	2.62	+ .21, - .13	2.76	+ .22, - .14
250	2.46	+ .20, - .12	2.70	+ .22, - .13	.....	.....	.....	.....
300	2.63	+ .21, - .13	2.84	+ .23, - .14	.....	.....	.....	.....
350	2.75	+ .22, - .14	2.97	+ .24, - .15	.....	.....	.....	.....

TABLE 8—FUSE RATINGS OR INSTANTANEOUS SETTING OF CIRCUIT BREAKERS FOR SHORT-CIRCUIT PROTECTION OF PORTABLE CABLES AND CORDS

Conductor size—AWG or MCM	Ohms/1,000 ft. at 25 °C.	Maximum allowable fuse rating (amperes)	Maximum allowable circuit breaker instantaneous setting (amperes) ¹
14	2.62	20
12	1.65	30
10	1.04	40
8654	80
6410	100
4259	200
3205	250
2162	300
1129	375
1/0102	500
2/0081	.....
3/0064	.....
4/0051	.....
250043	.....
300036	.....

TABLE 8—FUSE RATINGS OR INSTANTANEOUS SETTING OF CIRCUIT BREAKERS FOR SHORT-CIRCUIT PROTECTION OF PORTABLE CABLES AND CORDS—Continued

Conductor size—AWG or MCM	Ohms/1,000 ft. at 25 °C.	Maximum allowable fuse rating (amperes)	Maximum allowable circuit breaker instantaneous setting (amperes) ¹
350 .....	.031	.....	2,500
400 .....	.027	.....	2,500
450 .....	.024	.....	2,500
500 .....	.022	.....	2,500

¹ Higher circuit-breaker settings may be permitted for special applications when justified.

TABLE 9—SPECIFICATIONS FOR PORTABLE CABLES LONGER THAN 500 FEET¹

Conductor size—AWG or MCM	Max. allowable length (feet)	Normal ampacity at 60 °C. copper temperature (40 °C. ambient)	Resistance at 60 °C. copper temperature (ohms)
6	550	50	0.512
4	600	70	.353
3	650	80	.302
2	700	95	.258
1	750	110	.220
1/0	800	130	.185
2/0	850	150	.157
3/0	900	175	.130
4/0	1,000	200	.116
250	1,000	220	.098
300	1,000	240	.082
350	1,000	260	.070
400	1,000	280	.061
450	1,000	300	.054
500	1,000	320	.050

¹ Fuses shall not be used for short-circuit protection of these cables. Circuit breakers shall be used with the instantaneous trip settings not to exceed the values given in Table 8.

[33 FR 4660, Mar. 19, 1968; 33 FR 6345, Apr. 26, 1968, as amended at 42 FR 8373, Feb. 10, 1977]

TABLE 10—HIGH VOLTAGE TRAILING CABLE AMPACITIES AND OUTSIDE DIAMETERS

Power conductor Size AWG or kcmil	Ampacity* Amperes per conductor	Outside diameter** (inches)		
		SHD—GC 2001 to 5000 volts	SHD—CGC 2001 to 5000 volts	SHD—PCG 2001 to 5000 volts
6	93	1.56	1.62	
4	122	1.68	1.73	
3	140	1.78	1.82	1.94
2	159	1.87	1.91	2.03
1	184	1.95	1.98	2.12
1/0	211	2.08	2.10	2.26
2/0	243	2.20	2.20	2.40
3/0	279	2.36	2.36	2.58
4/0	321	2.50	2.50	2.76
250	355	2.69	2.69	
300	398	2.81	2.81	
350	435	2.95	2.95	
500	536	3.31	3.31	

* These ampacities are based on single isolated conductor in air, operated with open-circuited shield for a 90 °C conductor temperature and an ambient temperature of 40 °C.

** Tolerances for the outside diameter are +8%/ - 5%.

[75 FR 17549, Apr. 6, 2010, as amended at 75 FR 20918, Apr. 22, 2010]

APPENDIX II TO SUBPART D OF PART 18
LIST OF FIGURES

Figure No.	Title
1	Typical layout drawing of a machine.
2	Sample bill of material (to accompany layout drawing shown on figure 1)

LIST OF FIGURES

Figure No.	Title
3	Material to be included with the operating instructions on or with the wiring diagram submitted to each customer.
4	Sample factory inspection form.
5	Typical plane joint.
6	Typical combination joint.
7	Typical threaded joint.
8	Typical threaded straight stuffing box and packing gland lead entrance with provision for hose conduit.
9	Typical slip-fit straight-type and angle-type stuffing box and packing gland lead entrance.
10	Typical slip-fit angle-type stuffing box and packing gland lead entrance and typical plug for spare lead entrance hole.

Figure 1
TYPICAL LAYOUT DRAWING OF A MACHINE

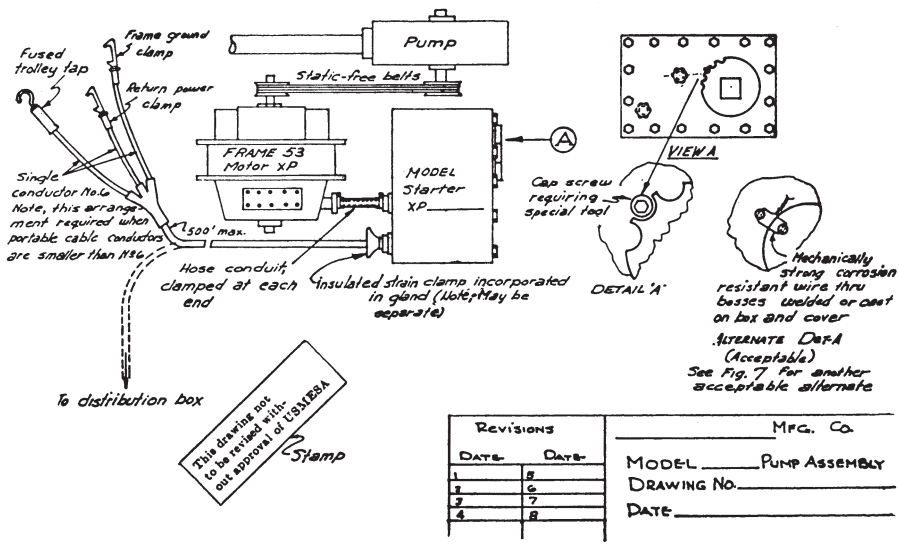


FIGURE 2—SAMPLE BILL OF MATERIAL

B. of M. No. _____
 Date _____
 Revision _____
 Date _____
 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

Bill of Material (Electrical)

Model: _____ (Manufacturing Company)
 _____ (Unit Name)
 Approval 2G- _____
 Motor: _____ (Manufacturing Company)
 Frame _____
 _____ Hp., _____ Volts, _____ Ph.,

_____ Cy., _____ R.P.M.
 X/P _____ (Date).
 _____ (Date) Extension.
 Starter: _____
 _____ (Manufacturing Company)
 Model _____
 _____ Hp., _____ Volts.
 X/P _____ (Date)
 _____ Extension.
 _____ (Date)
 Cable—Motor to Starter:
 Cond. No. _____"
 O.D., _____' Long
 Hose—Motor to Starter Cable:
 _____" I.D., _____" O.D., _____' Long
 Portable (Trailing) Cable—
 Type: _____
 Cond. No. _____"
 O.D., _____' Long
 Hose—for Portable Cable:
 _____" I.D., _____" O.D., _____' Long
 Hose Clamps—
 2 for Motor-Starter Hose conduit _____" D
 1 for Portable Cable Hose conduit _____" D*
 *Only when short length of hose is used. Trolley Tap—
 _____ (Manufacturing Company)
 Model _____ with _____-ampere fuse.
 Rail Clamps, 2.
 1 Ground Clamp, Cat. No. _____
 _____ (Manufacturing Company)
 1 Return Power Conductor, Cat. No. _____
 _____ (Manufacturing Company)
 or—as Optional
 Plug on outby end of potable cable for insertion into receptacle on distribution box or equivalent with short-circuit protective device set at _____ amperes.
 Static-free Belt
 Model _____
 Style _____
 Catalog No. _____,
 _____ (Manufacturing Company)
 Guard for Belt—
 Material _____
 Overall Dimensions _____" Long × _____"
 Wide × _____" High
 NOTE: The foregoing is intended as a guide. Additional electrical components used shall be completely identified.

FIGURE 3—MATERIAL TO BE INCLUDED WITH THE OPERATING INSTRUCTIONS—ON OR WITH THE WIRING DIAGRAM SUBMITTED TO EACH CUSTOMER

(SOMETIMES REFERRED TO AS "CAUTION STATEMENT")

CAUTION

To retain "permissibility" of this equipment the following conditions shall be satisfied:
 1. *General safety.* Frequent inspection shall be made. All electrical parts, including the portable cable and wiring, shall be kept in a safe condition. There shall be no openings into the casings of the electrical parts. A permissible distribution box shall be used for connection to the power circuit unless connection is made in fresh intake air. To maintain the overload protection on direct-current machines, the ungrounded conductor of the portable cable shall be connected to the proper terminal. The machine frame shall be effectively grounded. The power wires shall not be used for grounding except in conjunction with diode(s) or equivalent. The operating voltage should match the voltage rating of the motor(s).

2. *Servicing.* Explosion-proof enclosures shall be restored to the state of original safety with respect to all flame arresting paths, lead entrances, etc., following disassembly for repair or rebuilding, whether by the owner or an independent shop.

3. *Fastenings.* All bolts, nuts, screws, and other means of fastening, and also threaded covers, shall be in place, properly tightened and secured.

4. *Renewals and repairs.* Inspections, repairs, or renewals of electrical parts shall not be made unless the portable cable is disconnected from the circuit furnishing power, and the cable shall not be connected again until all parts are properly reassembled. Special care shall be taken in making renewals or repairs. Leave no parts off. Use replacement parts exactly like those furnished by the manufacturer. When any lead entrance is disturbed, the original leads or exact duplicates thereof shall be used and stuffing boxes shall be repacked in the approved manner.

5. *Cable requirements.* A flame-resistant portable cable bearing a MSHA assigned identification number, adequately protected by an automatic circuit-interrupting device shall be used. Special care shall be taken in handling the cable to guard against mechanical injury and wear. Splices in portable cables shall be made in a workmanlike manner, mechanically strong, and well insulated. Not more than five temporary splices are permitted in a portable cable regardless of length. Connections and wiring to the outby end of the cable shall be in accordance with recognized standards of safety.

FIGURE 4—SAMPLE FACTORY INSPECTION FORM

Date _____
Inspector _____

MACHINE

Designation: _____
Type: _____ Serial No. _____

MOTOR

Manufacturer: _____
Serial No.: _____ Type: _____
Frame: _____
Hp. _____ F.L. Speed: _____ Volts: _____ Amps.
Winding: _____ X/P No. _____ (or parts list designation).

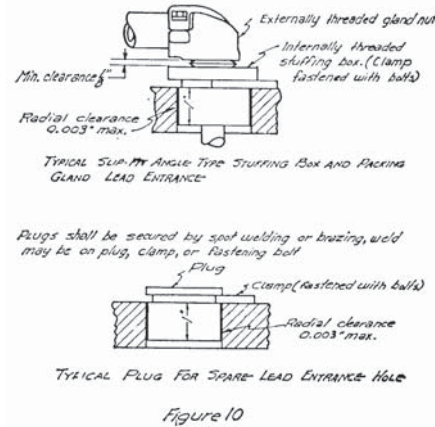
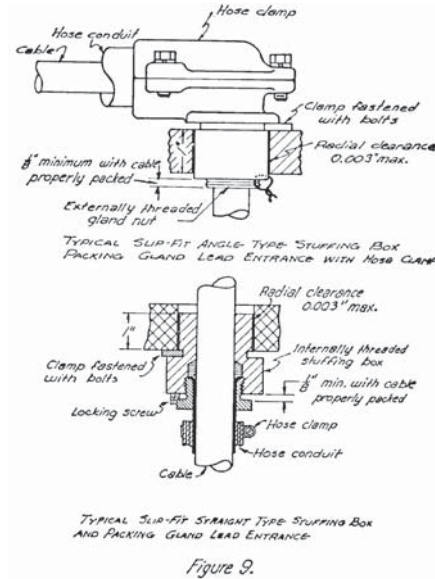
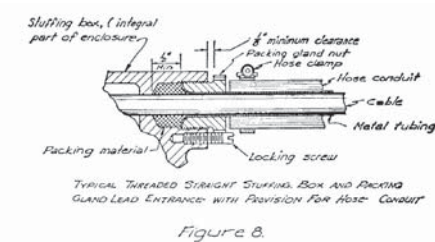
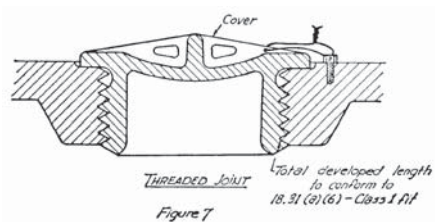
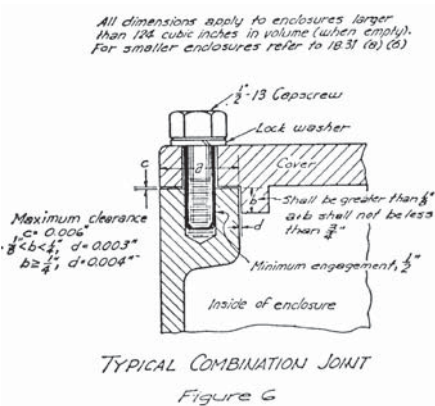
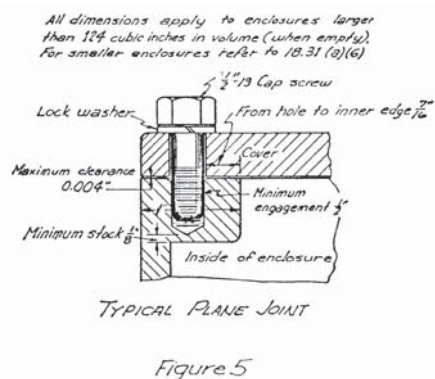
STARTER

Manufacturer: _____
Serial No. _____ Type: _____
Hp. _____ Volts: _____ X/P No. _____ (or parts list designation).
Short-circuit protection _____ amps.
Overload-current protection _____ amps.

PORTABLE CABLE

Manufacturer: _____
Type: _____ Conductors: _____
Length: _____ O.D. _____ MSHA No. _____
Is all wiring around machine adequately protected from mechanical damage?
By hose conduit _____, Troughs _____
Metal tubing _____, Other _____
By removal of all sharp corners or edges? _____
Is wiring separated from hydraulic components? _____
Is an adequate insulated strain clamp provided for the portable cable? _____
Are all packing glands properly packed so that 1/8-inch clearance remains between packing nut and stuffing box? _____
Are lockwashers (or equivalent) provided for all explosion-proof enclosure fastenings? _____
Are all plane joints securely fastened so that an 0.005-inch feeler gage cannot be inserted? _____
Are all threaded covers secured? _____
How? _____
Are all electrical connections secure _____ and properly insulated where necessary? _____

NOTE: Add appropriate material for each explosion-proof enclosure when more than a motor and starter are on a machine.



[33 FR 4660, Mar. 19, 1968, as amended at 42 FR 8373, Feb. 10, 1977; 42 FR 25855, May 20, 1977]

Subpart E—Field Approval of Electrically Operated Mining Equipment

SOURCE: 36 FR 7007, Apr. 13, 1971, unless otherwise noted.

§ 18.90 Purpose.

The regulations of this subpart E set forth the procedures and requirements

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for permissibility which must be met to obtain MSHA field approval of electrically operated machinery used or intended for use in by the last open crosscut of a coal mine which has not been otherwise approved, certified or accepted under the provisions of this part 18, chapter I, title 30, Code of Federal Regulations (Bureau of Mines Schedule 2G).

§ 18.91 Electric equipment for which field approvals will be issued.

(a) Individual field approvals will be issued by MSHA under the provisions of this subpart E for electrically operated machines commercially built, or constructed, by the owner-coal mine operator of such machines including any associated electrical equipment, electrical components, and electrical accessories.

(b) Approvals will not be issued under the provisions of this subpart E for electrically operated mining equipment manufactured or rebuilt primarily for sale or resale to any operator of a coal mine, or for small electrically operated equipment which consumes less than 2,250 watts of electricity, or for instruments and other small devices which employ electric power.

§ 18.92 Quality of material and design.

(a) Electrically operated machinery approved under the provisions of this subpart E shall be rugged in construction and shall be designed to facilitate maintenance and inspection.

(b) MSHA shall conduct field investigations and, where necessary, field test electric machinery only where such machinery is found to be constructed of suitable materials and safe for its intended use.

§ 18.93 Application for field approval; filing procedures.

(a)(1) Investigation and testing leading to field approval shall be undertaken by MSHA only pursuant to individual written applications for each machine submitted in triplicate on MSHA Form No. 6-1481, by the owner-coal mine operator of the machine.

(2) Except as provided in paragraph (b) of this section, each application shall be accompanied by appropriate

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photographs, drawings, specifications, and descriptions as required under the provisions of §18.94 and each such application shall be filed with the Coal Mine Health and Safety District Manager for the District in which such machine will be employed.

(b) The Coal Mine Health and Safety District Manager may, upon receipt of any application filed pursuant to paragraph (a) of this section, waive the requirements of §18.94 with respect to such application if he determines that the submission of photographs, drawings, specifications, or descriptions will place an undue financial burden upon the applicant. In the event a waiver is granted in accordance with this paragraph (b), initial review of the application will be waived and the applicant shall be notified on MSHA Form 6-1481 of such waiver and the date, time, and location at which field inspection of the equipment described in the application will be conducted.

(c) Following receipt of an application filed in accordance with paragraph (a) of this section, the Coal Mine Health and Safety District Manager shall determine whether the application has been filed in accordance with §18.91, and cause the application to be reviewed by a qualified electrical representative to determine compliance with §18.92:

(1) If it is determined on the basis of the application or the data submitted in accordance with §18.94 that further consideration of a field approval is warranted under this subpart E or that the machine appears suitable and safe for its intended use, the Coal Mine Health and Safety District Manager shall advise the applicant in writing that further investigation and inspection of the machine will be necessary. The notice issued by the Coal Mine Health and Safety District Manager shall set forth the time and place at which such inspection will be conducted and specify the location and size of any tapped holes required to be made by the applicant to facilitate the pressure testing of enclosures.

(2) If it is determined on the basis of data submitted in accordance with §18.94 that the applicant is not qualified to receive an approval or that the machine does not appear to be suitable

and safe for its intended use, the Coal Mine Health and Safety District Manager shall so advise the applicant in writing, setting forth the reasons for his denial of the application, and where applicable, the deficiencies in the machine which rendered it unsuitable or unsafe for use.

(3) Rejected applications, together with attached photographs, drawings, specifications and descriptions shall be forwarded by the Coal Mine Health and Safety District Manager to Approval and Certification Center which shall record all pertinent data with respect to the machine for which field approval was sought.

[33 FR 4660, Mar. 19, 1968, as amended at 43 FR 12314, Mar. 24, 1978]

§ 18.94 Application for field approval; contents of application.

(a) Each application for field approval shall, except as provided in § 18.93(b), include the following information with respect to the electrically operated machine for which field approval is sought:

(1) The trade name and the certification number or other means of identifying any explosion-proof compartment or intrinsically-safe component installed on the machine for which a prior approval or certification has been issued under the provisions of Bureau of Mines Schedules 2D, 2E, 2F, or 2G.

(2) The trade name and the flame-resistance acceptance or approval number of any cable, cord, hose, or conveyor belt installed on the machine for which prior acceptance or approval by MSHA has been issued.

(b) Each application for field approval shall be accompanied by:

(1) If the machine is constructed or assembled entirely from components which have been certified or removed from machines approved under Bureau of Mines Schedule 2D, 2E, 2F, or 2G, photographs or a single layout drawing which clearly depicts and identifies each of the permissible components and its location on the machine.

(2) If the machine contains one or more components required to be permissible which has not been approved or certified under Bureau of Mines Schedule 2D, 2E, 2F, or 2G, a single layout drawing which clearly identifies all

of the components from which it was assembled.

(3) All applications shall include specifications for:

(i) Overcurrent protection of motors;

(ii) All wiring between components, including mechanical protection such as hose conduit and clamps;

(iii) Portable trailing cable for use with the machine, including the type, length, diameter, and number and size of conductors;

(iv) Insulated strain clamp for machine end of portable trailing cable;

(v) Short-circuit protection to be provided at outby end of portable trailing cable.

[33 FR 4660, Mar. 19, 1968, as amended at 57 FR 61223, Dec. 23, 1992]

§ 18.95 Approval of machines constructed of components approved, accepted or certified under Bureau of Mines Schedule 2D, 2E, 2F, or 2G.

Machines for which field approval is sought which are constructed entirely from properly identified components that have been investigated and accepted or certified for applications on approved machines under the Bureau of Mines Schedule 2D, 2E, 2F, or 2G, shall be approved following a determination by the electrical representative that the construction of the entire machine is permissible and conforms to the data submitted in accordance with § 18.94.

§ 18.96 Preparation of machines for inspection; requirements.

(a) Upon receipt of written notice from the Health and Safety District Manager of the time and place at which a field approval investigation will be conducted with respect to any machine, the applicant will prepare the machine for inspection in the following manner:

(1) The machine shall be in fresh air out by the last open crosscut and free from obstructions, or, if the machine is located on the surface, moved to a clear area;

(2) All enclosure covers shall be removed;

(3) The flanges and interior of each enclosure, including the cover, shall be cleaned thoroughly;

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(4) All hoses, cables, cord, and conveyor belts shall be wiped clean to expose surface markings;

(5) All electrical components shall be cleaned to reveal all stampings, identification plates, certification numbers, or explosion test markings.

§ 18.97 Inspection of machines; minimum requirements.

(a) Except as provided in § 18.95, all machines approved under the provisions of this subpart E shall, where practicable, meet the minimum design and performance requirements set forth in subpart B of this part 18 and, where necessary, the requirements of § 18.98.

(b) The inspection of each machine shall be conducted by an electrical representative and such inspection shall include:

(1) Examination of all electrical components for materials, workmanship, design, and construction;

(2) Examination of all components of the machine which have been approved or certified under Bureau of Mines Schedule 2D, 2E, 2F, or 2G to determine whether such components have been maintained in permissible conditions;

(3) Comparison of the location of components on the machine with the drawings or photographs submitted to determine that each of them is properly located, identified and marked;

(4) Pressure testing of explosion-proof compartments, when necessary, shall be conducted in accordance with § 18.98; and:

(i) Where the results of pressure testing are acceptable, the applicant shall be advised;

(ii) Where the explosion-proof enclosure is found unacceptable, the applicant shall be so informed;

(iii) If the performance of the explosion-proof enclosure is questionable, the qualified electrical representative may, at the request of the applicant, conduct a further detailed examination of the enclosure after disassembly and record his additional findings on MSHA Form No. 6-1481 under Results of Field Inspections.

[33 FR 4660, Mar. 19, 1968, as amended at 42 FR 8373, Feb. 10, 1977]

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§ 18.98 Enclosures, joints, and fastenings; pressure testing.

(a) Cast or welded enclosures shall be designed to withstand a minimum internal pressure of 150 pounds per square inch (gage). Castings shall be free from blowholes.

(b) Pneumatic field testing of explosion-proof enclosures shall be conducted by determining:

(1) Leak performance with a peak dynamic or static pressure of 150 pounds per square inch (gage); or

(2) A pressure rise and rate of decay consistent with unyielding components during a pressure-time history as derived from a series of oscillograms.

(c) Welded joints forming an enclosure shall have continuous gastight welds.

§ 18.99 Notice of approval or disapproval; letters of approval and approval plates.

Upon completion of each inspection conducted in accordance with § 18.97(b), the electrical representative conducting such inspection shall record his findings with respect to the machine examined on MSHA Form No. 6-1481 together with his recommendation of approval or disapproval of the machine.

(a) If the qualified electrical representative recommends field approval of the machine, the Coal Mine Health and Safety District Manager shall forward the completed application form together with all attached photographs, drawings, specifications, and descriptions to Approval and Certification Center. Approval and Certification Center shall record all pertinent data with respect to such machine, issue a letter of approval with a copy to the Coal Mine Health and Safety District Manager who authorized its issuance and send the field approval plate to the applicant. The approval plate shall be affixed to the machine by the applicant in such a manner so as not to impair its explosion-proof characteristics.

(b) If the electrical representative recommends disapproval of the machine, he shall record the reasons for such disapproval and the Coal Mine Health and Safety District Manager

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shall forward the completed application form and other data to Approval and Certification Center which shall record all pertinent data with respect to such machine and notify the applicant that the application for approval has been rejected and the reasons for the rejection.

[33 FR 4660, Mar. 19, 1968, as amended at 42 FR 8373, Feb. 10, 1977; 43 FR 12314, Mar. 24, 1978]