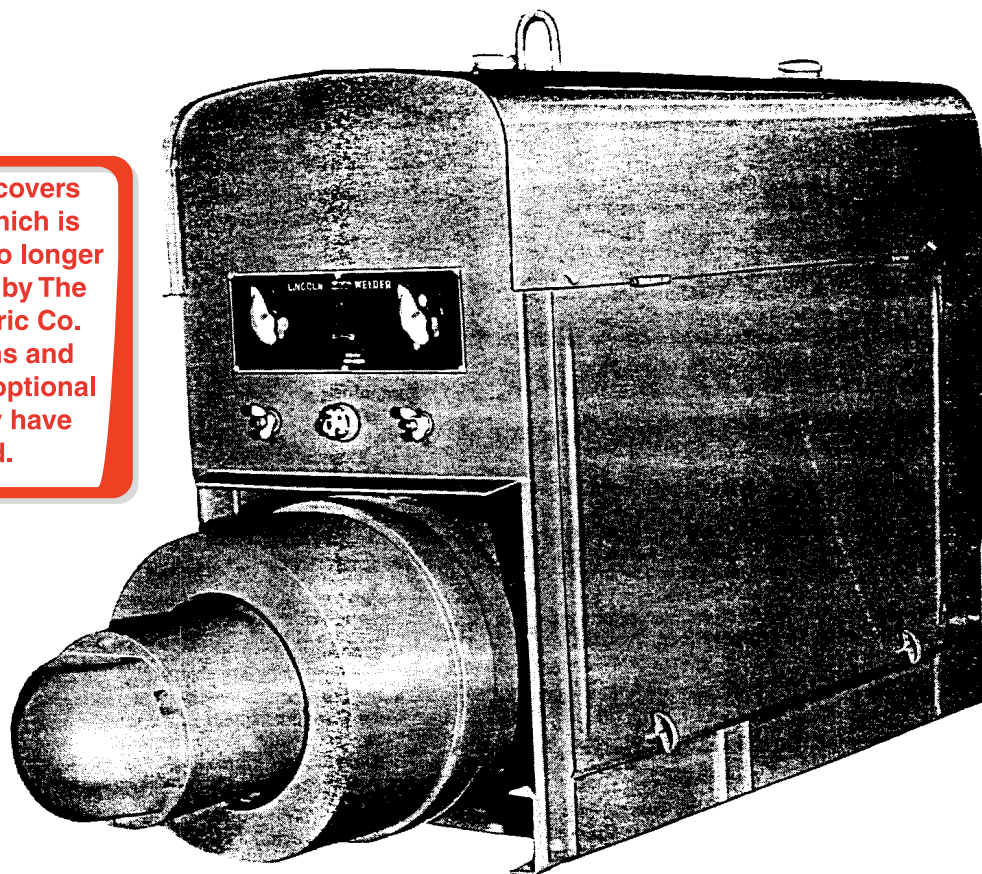


OPERATING MANUAL

Shield-Arc **SA-200** Welder With CONTINENTAL 4-CYLINDER GASOLINE ENGINE

This manual covers equipment which is obsolete and no longer in production by The Lincoln Electric Co. Specifications and availability of optional features may have changed.



IM142
SA-200 Continental
F-162
215; 244; 317; 370; 371;
445; 459; 527; 671; 681;
960; 974; 1122; 1123;
1223; 1228; 1421; 1422;
1678; 1679; 1827; 1828;
1846; 1847; 1903; 1904;
2163; 2164; 2292; 2293;
2364; 2365; 2866; 2867;
2954; 2955; 3311; 3312

TYPE S-6090 AND S-6090-SM
(Codes below 3400)
For K-6090 and K-6090-SM See IM-208

SAFETY DEPENDS ON YOU

Lincoln arc welding equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS OPERATING MANUAL AND THE ARC WELDING SAFETY PRECAUTIONS ON THE INSIDE FRONT COVER.** And, most importantly, think before you act and be careful.

ARC WELDING SAFETY PRECAUTIONS

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. READ AND UNDERSTAND BOTH THE SPECIFIC INFORMATION GIVEN IN THE OPERATING MANUAL FOR THE WELDER AND/OR OTHER EQUIPMENT TO BE USED AS WELL AS THE FOLLOWING GENERAL INFORMATION.

1. Have all installation, maintenance and repair work performed only by qualified people.

2. ELECTRIC SHOCK can kill.

Protect yourself from possible dangerous electrical shock:

- a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Never permit contact between "hot" parts of the circuits and bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
- b. Always insulate yourself from the work and ground using dry insulation when welding in damp locations, on metal floors, gratings or scaffolds, and particularly when in positions (such as sitting or lying) where large areas of your body can be in contact with a conductive surface.
- c. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition.
- d. Never dip the electrode holder in water for cooling.
- e. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
- f. If using the welder as a power source for mechanized welding, the above precautions also apply for the automatic electrode, electrode reel, welding head, nozzle or semiautomatic welding gun.
- g. When working above floor level, protect yourself from a fall should you get a shock. Never wrap the electrode cable around any part of your body.
- h. Also see Item 7.

FUMES AND GASES can be dangerous to your health.

- a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding on galvanized, lead or cadmium plated steel and other metals which produce toxic fumes, even greater care must be taken.
- b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
- c. Also see Item 8b.

4. ARC RAYS can injure eyes and burn skin.

Arcburn may be more severe than sunburn. Therefore:

- a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Filter lens should conform to ANSI Z87.1 standards.
- b. Use suitable clothing to protect your skin and that of your helpers from the arc rays.
- c. Protect other nearby personnel with suitable non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

5. FIRE OR EXPLOSION can cause death or property damage.

- a. Remove fire hazards well away from the area. If this is not possible cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- b. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

- c. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been "cleaned." For information purchase "Safe Practices for Welding and Cutting Containers That Have Held Combustibles", A6.0-65 from the American Welding Society, Miami, Florida 33125.
- d. Vent hollow castings or containers before heating, cutting or welding. They may explode.
- e. Also see Items 6c and 8c.

Additional Safety Precautions

6. For Welding in General.

- a. Droplets of molten slag and metal are thrown or fall from the welding arc. Protect yourself with oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses when in a welding area. Use glasses with side shields when near slag chipping operations.
- b. Keep all equipment safety guards, covers and devices in position and good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.
- c. Be sure the work cable is connected to the work as close to the welding area as practical. Work cables connected to the building framework or other locations some distance from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

7. For Electrically Powered Equipment.

The high voltage and rotating parts associated with such units requires observance of these additional precautions:

- a. Disconnect and lock out all power sources before doing any work on the equipment.
- b. Make the electrical installation in accordance with the National Electrical Code and all local codes.
- c. Properly ground the equipment in accordance with the National Electrical Code and the manufacturer's recommendations. The work or metal to be welded must also be connected to a good electrical ground.

8. For Engine Powered Equipment.

The required fuel and rotating parts associated with such units requires observance of these additional precautions:

- a. Whenever possible, turn the engine off before troubleshooting and maintenance work.
- b. Operate internal combustion engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.
- c. Do not add the fuel near an open flame or when the engine is running. Stop the engine and, if possible, allow it to cool to prevent spilled fuel from igniting on contact with hot engine parts or electrical sparks. Do not spill fuel when filling tank.
- d. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.
- e. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

For more detailed information it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting — ANSI Standard Z49.1" from the American Welding Society, Miami, Florida 33125.

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HOW TO ORDER REPLACEMENT PARTS

In ordering replacement parts, refer to the pictures of the welder shown on the preceeding pages to get part name and number. From the nameplate, get the serial number, code number and name and model of welding machine. Parts should be ordered from The Lincoln Electric Co., its branch offices, or the nearest Authorized Field Service Shop. (The "Lincoln Service Directory" listing these shops geographically is available on request). All Authorized Field Shops and branch offices can quote current prices for these replacement parts.

— BUY ONLY GENUINE LINCOLN REPLACEMENT PARTS.

SERVICE

The Lincoln Electric Company has Authorized Field Service Shops in all industrial centers in the United States, Canada, and Hawaii. These shops stock GENUINE Lincoln Replacement Parts and have Factory Trained men to service your welder. They also offer Preventive Service and Welder Rental. "Keep It in Welding" The Lincoln FSS Exchange Plan, extended only through the FSS, give you factory built and guaranteed STATORS, ARMATURES and other parts at material savings over rewinding.

GUARANTEE

The Lincoln Electric Company the Seller warrants all new equipment except engines and accessories thereof against defects in workmanship and mate-

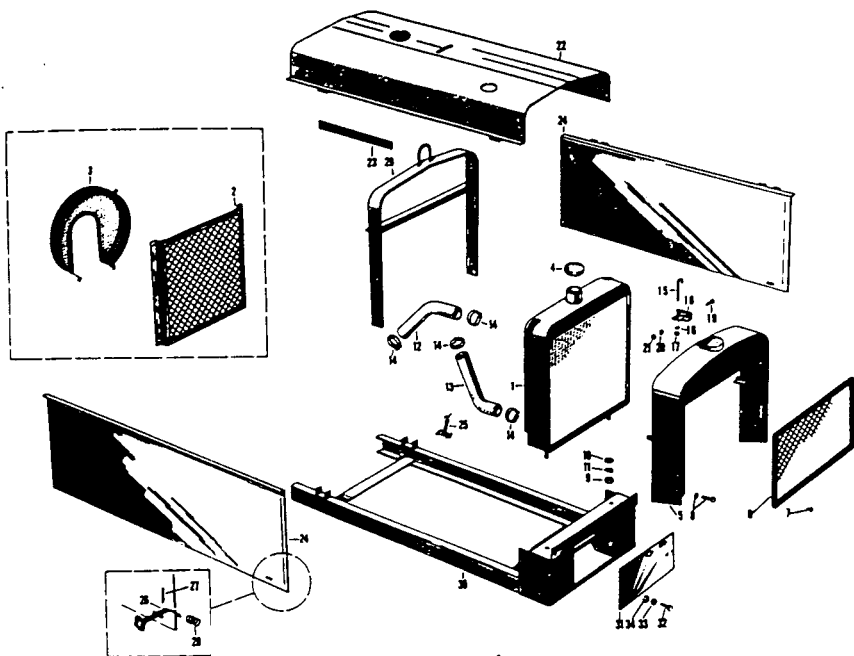
rial for a period of one year from date of shipment, provided the equipment has been properly cared for, and operated under normal conditions. Engines and engine accessories are warranted free from defects for a period of ninety days from the date of shipment.

If the Buyer gives the Seller written notice of any defects in equipment or electrode within any period of warranty and the Seller's inspection confirms the existence of such defects, then the seller shall correct the defect or defect at its option, either by repair or replacement at O. B. its own factory or other place as designated by the Seller.

No license, liability or responsibility will be assumed by the Seller for repairs made outside of the Seller's factory without written authority from the Seller.

The Seller shall not be liable for any consequential damages in case of any failure to meet the conditions of any warranty. The liability, of the Seller arising out of the supplying of said equipment or electrode or its use by the Buyer, whether on warranties or otherwise, shall not in any case exceed the cost of correcting defects in the equipment or replacing defective electrode in accordance with the above guarantee. Upon the expiration of any period of warranty, all such liability shall terminate.

The foregoing guarantees and remedies are exclusive and there are no other guarantees or warranties either expressed or implied.



RADIATOR, HOSES, BASE AND CANOPY

FIGURE 5141-A

ITEM	DESCRIPTION	QTY.	Note (A)	CODE						Note (B)	Note (C)	3311 2954	3312 2955	Part No.
				960	974	1122	1123							
1.	Radiator Ass'y	1	.	x	x	x	x	x	x	.	.	.	.	S-7904
	Radiator Ass'y	1	.	.	.	.	.	.	.	.	.	.	.	S-9810
	Radiator Ass'y incl.	1	x	.	.	.	.	.	.	.	.	.	.	G-916
2.	Front Guard	1	x	.	.	.	.	.	.	.	.	.	.	G-916-B
3.	Fan Shroud	1	x	.	.	.	.	.	.	.	.	.	.	G-916-A
4.	Radiator Cap (1)	1	x	.	.	.	.	.	.	.	.	.	.	S-8353
	Radiator Cap (1)	1	.	x	x	x	x	x	x	.	.	.	.	S-8354
	Radiator Cap	1	.	.	.	.	.	.	.	.	.	x	x	S-9970-1
5.	Radiator Shell	1	.	x	x	.	x	x	x	.	.	x	x	L-2597
	Radiator Shell	1	.	.	.	.	.	.	.	.	.	.	.	L-3007
6.	Front Screen Ass'y	1	.	.	.	.	.	.	.	.	.	x	x	S-9809
7.	Thread Cutting Screw	4	.	.	.	.	.	.	.	.	.	.	.	S-8025-38
8.	Thread Cutting Screw	4	.	x	x	x	x	x	x	.	.	x	x	S-9225-8
9.	Nut	2	x	x	x	x	x	x	x	.	.	x	x	1/2-13
10.	Plain Washer	2	x	x	.	.	x	x	x	.	.	.	.	3/32
	Plain Washer	2	.	.	.	.	.	.	.	.	.	x	x	S-92625
11.	Lockwasher	2	x	x	x	x	x	x	x	.	.	x	x	E-106-A-5
12.	Hose, Upper	1	.	.	.	.	.	.	.	.	.	.	.	T-8632
	Hose, Upper	1	.	x	x	.	x	x	x	.	.	.	.	S-7895
	Hose, Upper	1	.	.	.	.	.	.	.	.	.	x	x	S-9788
13.	Hose, Lower	1	x	x	x	x	x	x	x	.	.	.	.	M-6591
	Hose, Lower	1	.	.	.	.	.	.	.	.	.	.	.	M-7999
14.	Hose Clamp	4	x	x	x	x	x	x	x	.	.	x	x	T-10004-1
15.	Roof Hook, Front	2	x	x	x	x	x	x	x	.	.	x	x	T-8818
	Roof Hook, Rear	2	x	x	x	x	x	x	x	.	.	x	x	T-8818-1
16.	Lockwasher	4	x	x	x	x	x	x	x	.	.	x	x	E-106-A-3
17.	Nut	4	x	x	x	x	x	x	x	.	.	x	x	5/16-18
18.	Bracket Left Hand	1	.	x	x	x	x	x	x	.	.	x	x	S-8050-2
	Right Hand	1	.	x	x	x	x	x	x	.	.	x	x	S-8050-1
19.	Screw Hex Hd. Cap	2	.	x	x	x	x	x	x	.	.	x	x	5/16-18x1
20.	Lockwasher	2	.	x	x	x	x	x	x	.	.	x	x	5/16 Std.
21.	Nut	2	.	x	x	x	x	x	x	.	.	x	x	5/16x18
22.	Roof (2)	1	x	x	.	.	.	.	.	.	.	.	.	L-2637
	Roof (2)	1	.	.	.	.	.	.	.	.	.	x	x	L-3209
23.	Lincoln Decal	2	x	x	x	x	x	x	x	.	.	x	x	M-5249-1
24.	Door Ass'y Incl. (3)	2	x	x	x	x	x	x	x	.	.	x	x	M-7533-A
	Hinge Barrel Ass'y	2	x	x	x	x	x	x	x	.	.	.	.	T-8429-1
25.	Door Hook Ass'y	4	x	x	x	x	x	x	x	.	.	.	.	S-4828-A
26.	Door Hook	4	.	.	.	.	.	.	.	.	.	x	x	S-8929-1
27.	Cotter Pin	4	.	.	.	.	.	.	.	.	.	x	x	1/8x1
28.	Spring	4	.	.	.	.	.	.	.	.	.	x	x	T-9721-1
29.	Left Bale Ass'y	1	x	x	x	x	x	x	x	.	.	x	x	T-8486
30.	Base Ass'y (4)	1	x	.	.	.	.	.	.	.	.	.	.	M-6427
	Base Ass'y (4)	1	.	x	x	x	x	x	x	.	.	.	.	M-6780
	Base Ass'y (4)	1	.	.	.	.	.	.	.	.	.	x	x	M-6954
	Base Ass'y (4)	1	.	.	.	.	.	.	.	.	.	.	.	S-10403
31.	Base Panel	1	.	.	.	.	.	.	.	.	.	.	.	S-9225-2
32.	Hex Head Screw	2	.	.	.	.	.	.	.	.	.	x	x	1/4-20x1/2
	Hex Head Screw	2	.	.	.	.	.	.	.	.	.	.	.	T-1095
33.	Washer	2	.	.	.	.	.	.	.	.	.	.	.	E-106-A-2
34.	Lockwasher	2	.	.	.	.	.	.	.	.	.	x	x	

Note (A) For Codes 215, 224, 317, 370, 371, 445, 459, 671 and 681.

Note (B) For Codes 1223, 1228, 1421, 1422, 1678, 1679, 1827, 1828, 1846, 1847, 1903 and 1904.

Note (C) For Codes 2163, 2164, 2292, 2293, 2364, 2365, 2866 and 2867.

(1) G-940 Radiator uses S-8354 cap. G-944 Radiator uses S-8353 cap.

(2) Roof does not include hinge barrels or hinge pins.

(3) On machine code numbers 1904 & lower it is necessary to order kit T-9874 (which includes items 25, 26, 27).

(4) M-6954 Base Ass'y includes foot supports T-8824 (Item 60, page 6). Base Assemblies M-6427 and M-6780 do not include foot supports.

* Order G-1087 Radiator, L-3007 Radiator Shell (Item 5), and M-8858 Fan Shroud.

WELDING GENERATOR

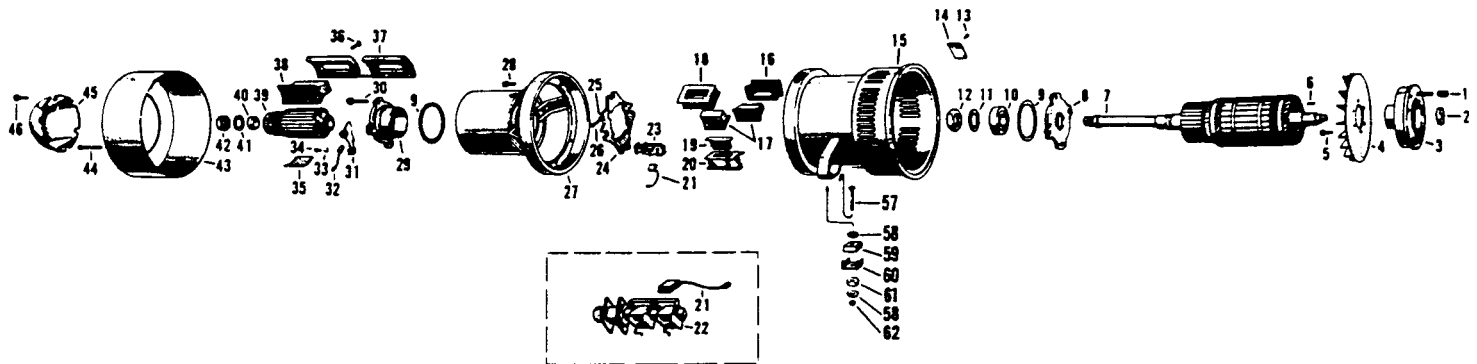


FIGURE 5141-B-1

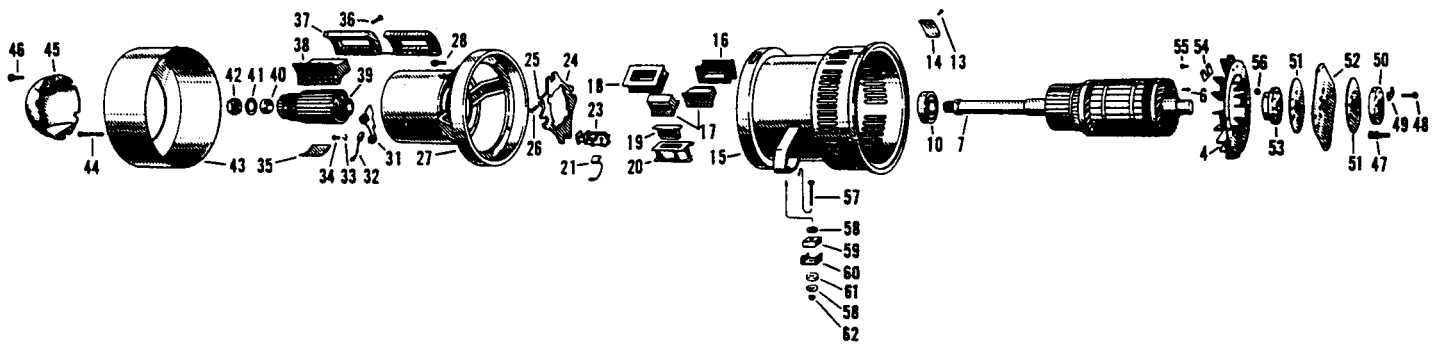


FIGURE 5141-C-1

CONVERSION KIT TO OVERSIZE (FDW) EXCITER

1. Codes 215 thru 371, Part No. M-6879, (Note 1).
2. Codes 445, 671, 960 and 1122, Part No. M-6878, (Note 2).
3. Codes above 1122 all have the Oversize Exciter.

Note 1: M-6879 includes: Engine Regulator, Rheostat, Power Outlet Receptacle, Oversize Exciter, End Bracket, Exciter Pole Pieces and Field Coils, plus misc. leads, screws, etc., and instructions.

Note 2: M-6878 includes: Mercury Switch (for Engine Regulator), Rheostat, Power Outlet Receptacle, Oversize Exciter, End Bracket, Exciter Pole Pieces and Field Coils, plus misc. leads, screws, etc., and instructions.

WELDING GENERATOR (Cont'd) FIGURES 5141-B & 5141-C

Ref. Pict.	Item	Description	Qt'y	CODE																Part Number
				215	244	317	370	371	445	459	671	681	960	974	1122	1123	1223	1228	NOTE (C)	
B	1	Lord Bushing (in Flywheel)	6	x	x	x	x	x	x	x	x	x								T-8845
B	2	Pilot Bearing	1	x	x	x	x	x	x	x	x	x								205
-	-	Coupling & Blower Ass'y, incl:	1	x	x	x	x	x	x	x	x	x								M-4587-A
B	3	Coupling Ass'y, incl:	1	x	x	x	x	x	x	x	x	x								L-2427
-	-	Coupling	1	x	x	x	x	x	x	x	x	x								S-9311-5
-	-	Locking Pin	6	x	x	x	x	x	x	x	x	x								S-9311-9
-	-	Drive Pin	6	x	x	x	x	x	x	x	x	x								S-7247
B	4	Blower	1	x	x	x	x	x	x	x	x	x								M-6140
C	4	Blower	1	.	.	.	.	.	.	.	.	.	x	x	x	x	x	x		M-6774
B	5	Hex Hd. Cap Screw	6	x	x	x	x	x	x	x	x	x								3/8-16x2
B,C	6	Key, (3/8 x 3/8 x 1-7/8) (1)	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		E-261-6
B	7	Armature Ass'y, including: (2)	1	x	x	x	x	x												M-5860
-	-	Armature Coil Set (2)	1	x	x	x	x	x												FJW-28.6B
-	-	Shaft	1	x	x	x	x	x	x	x	x	x								M-5859
-	-	Commutator (83 bar) (2)	1	x	x	x	x	x												M-6111-E
B	7	Armature Ass'y, including	1	x	x	x	x	x	x	x	x	x								M-5860-1
-	-	Armature Coil Set (3)	1	.	.	.	.	.	x	x	x	x								FJW-27.6
-	-	Shaft	1	x	x	x	x	x	x	x	x	x								M-5859
-	-	Commutator (81 bar, tang) (3)	1	.	.	.	.	.	x	x	x	x								M-6111-F
C	7	Armature Ass'y, including: (1)	1	.	.	.	.	.	.	.	.	.	x	x	x	x	x	x		M-6820-1
-	-	Armature Coil Set	1	.	.	.	.	.	.	.	.	.	x	x	x	x	x	x		FJW-27.6A
-	-	Shaft (keyed hub) (1)	1	.	.	.	.	.	.	.	.	.	x	x	x	x	x	x		M-6775
-	-	Commutator (81 bar, tangless)	1	.	.	.	.	.	.	.	.	.	x	x	x	x	x	x		M-6816
C	7	Armature Ass'y, including;	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	M-7014-1
-	-	Armature Coil Set	1	.	.	.	.	.	.	.	.	.	x	x	x	x	x	x		FJW-27.6A
-	-	Shaft (welded hub)	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	M-7015
-	-	Commutator (81 bar, tangless)	1	.	.	.	.	.	.	.	.	.	x	x	x	x	x	x		M-6816
B	8	Inner Dust Cap	1	x	x	x	x	x	x	x	x	x								S-4386
B	9	Gasket, Dust Cap	2	x	x	x	x	x	x	x	x	x								T-3633-8
B,C	10	Generator Armature Bearing	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		308
B	11	Washer, Bearing Spacer	1	x	x	x	x	x	x	x	x	x								T-8533
B	12	Locknut, Bearing	1	x	x	x	x	x	x	x	x	x								T-8532
B,C	13	Screw, Inst. Plate	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		S-8025-8
B,C	14	Instruction Plate	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		S-7300
B	15	Generator Frame Ass'y	1	x	x	x	x	x	x	x	x	x	x	x	x	x				M-6431
B,C		Generator Frame Ass'y	1														x	x		M-6873
B	16	Series Field Coil	2	x																FJW-115H
B,C		Series Field Coil	2	.	x	x	x	x	x	x	x	x	x	x	x	x	x	x		FJW-115M
B,C	17	Generator Main Pole	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		T-7925-5
B,C	18	Shunt Field Coil	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		FJW-5K
-	-	Interpole Coil & Pole Ass'y, incl:	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		S-5050-1
B,C	19	Pole Piece	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		S-6704-1
B,C	20	Coil	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		S-5050
B,C	21	Generator Brush	8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		1-2687
B	22	Generator Brushholder Ass'y (4)	4	x	x	.	.	x												S-5382
B,C	23	Generator Brushholder Ass'y (4)	4	.	.	x	x	.	x	x	x	x	x	x	x	x	x	x		M-6964-2-A
B,C	24	Rock	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		M-1961
B,C	25	Lockwasher	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		3/16
B,C	26	Screw, Fil. Head	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		10-24x3/4
B,C	27	End Bracket, St'd Exciter	1	x	x	x	x	x	x	.	x									M-6429
B,C		End Bracket, Oversize Exciter	1	.	.	.	.	.	.	x	.	x								M-6428-1
B,C		End Bracket, St'd Exciter	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.		M-6771
B,C		End Bracket, Oversize Exciter	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	x	M-6773
B,C	28	Screw, Hex Hd. Cap	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		1/2-13x3 1/2

(c) For codes 1421, 1422, 1678, 1679, 1827, 1828, 1846, 1847, 1903, 1904, 2163, 2164, 2292, 2293, 2364, 2365, 2866, 2867, 2954, 2955, 3311 and 3312.

WELDING GENERATOR (Cont'd) FIGURES 5141-B-1 & 5141-C-1

				CODE																Part Number							
Ref. Pict.	Item	Description	Qty	215	244	317	370	371	445	459	671	681	960	974	1122	1123	1223	1228	NOTE (C)		NOTE (D)	NOTE (E)					
H	29	Outer Dust Cap	1	x	x	x	x	x	x	x	x	x														S-4387	
B	30	Screw, Hex Hld. Cap, Dust Cap	4	x	x	x	x	x	x	x	x	x														X-20x2X	
-	-	Grease Pipe	1	x	x	x	x	x	x		x		x		x											T-7599-9	
-	-	Grease Pipe Cap	1	x	x	x	x	x	x		x		x		x											1/8 Std	
-	-	Grease Hole Plug	1	.	.	.	.	.	x		x		x		x	x	x	x	x	x	x					1/8 Std	
B,C	31	Exciter Brushholder Ass'y, incl:	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					S-6531-A	
-	-	Spring	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-6887	
-	-	Insulation Tube	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-8167	
-	-	Insulation Washer	8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-7626	
B,C	32	Exciter Brush	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-6968	
B,C	33	Plain Washer	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					1-1095	
B,C	34	Screw, Ex. B. H. Mt'g	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					S-9225-1	
B,C	35	Lead Shield	1	x	x	x	x	x	x		x		x		x											T-2454	
B,C		Lead Shield	1	.	.	.	.	.	x		x		x		x	x	x	x	x	x	x					T-9100	
B,C	36	Screw, Hex Hd. Cap	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					5/16-18x1	
B,C	37	Exciter Field Coil Set	1	x	x	x	x	x	x		x		x		x											FBS-SD	
B,C		Exciter Field Coil Set	1	.	.	.	.	.	x		x		x		x	x	x	x	x	x	x					FDW-SE	
B,C	38	Exciter Pole Piece	2	.	.	.	.	.	x		x		x		x											T-3980-1	
H,C		Exciter Pole Piece	2	x	x	x	x	x	x		x		x		x											T-3980-4	
B,C	39	Exciter Armature	1	x	x	x	x	x	x		x		x		x											FBS-24.104	
B,C		Exciter Armature	1	.	.	.	.	.	x		x		x		x	x	x	x	x	x	x					FDW-24.28A	
B,C		Exciter Armature	1	.	.	.	.	.	.		.		.		.	.	.	.	.	.	.						FDW-24.27
B,C	40	Collar Exciter Sleeve	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-5345	
B,C	41	Exciter Nut Washer	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					1-7090-1	
B,C	42	Exciter Nut	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-6225-1	
B,C	43	Generator End Shell	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					M-7594	
B,C	44	Screw, Rd. Hd.	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					1/4-20 x 2 1/2	
B,C	45	Exciter Cover	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					L-2594	
B,C	46	Screw, Rec. Hd. Th'd Cutting #1	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					1/4-20x4	
C	47	Stud (in Cast Iron Flywheel)	4	.	.	.	.	.	.		.		x	x	x	x	x	x	x	.	.					T-8906	
C	47	Stud (in Steel Flywheel)	4	.	.	.	.	.	.		.		.		.	.	.	.	.	.	x	x					T-9663
-	-	Coupling Ass'y, including: (1)	1	.	.	.	.	.	.		.		x	x	x	x	x	.	.	.	.					M-6870-B	
C	48	Screw, Disc to Hub	8	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					T-8833-2	
C	49	Locking Clip, Inner	4	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					T-9450	
C	50	Clamping Ring	1	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					S-7803	
C	51	Disc, Secondary	2	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					S-8042	
C	52	Disc, Main	1	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					M-6730	
C	53	Coupling Hub (1)	1	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					S-7892	
C	54	Locking Clip, Outer	4	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					T-9049	
C	55	Screw, Disc to Flywheel	8	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					T-8833-1	
C	56	Set Screw, Hollow Cup Pt. (1)	1	.	.	.	.	.	.		.		x	x	x	x	x	x	x	x	x					3/8-16x4	
B,C	57	Screw, Hex. Hd	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					1/2-13x3	
B,C	58	Washer	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					S-9262-1	
B,C	59	Cushion, Upper	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-8823	
B,C	60	Foot Support	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-8824	
B,C	61	Cushion, Lower	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-8822	
B,C	62	Huglock Nut	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					T-9187-4	

FOOTNOTES:

1. Welders code number 960 and higher may have had original armature M-6820-1 replaced by M-7014-1 which has welder coupling hub rather than keyed hub.
 2. Armature Assembly M-5860 replaced by M-5860-1. When ordering either armature coils or commutator determine correct part number by number of commutator bars.
 3. Replacement M-5860-1 armatures may have tangless commutator M-6816 and armature coil set FJW-27.6A.
 4. For component parts see pictures S111-A and S111-B.
- (C) For codes 1421, 1422, 1678, 1679, 1827, 1828, 1846, 1847, 1903, 1904, 2163, 2164, 2292 and 2293.
- (D) For codes 2364 and 2365.
- (E) For codes 2866, 2867, 2954, 2955, 3311 and 3312.

CONTROL PANEL

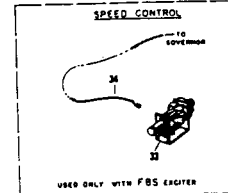
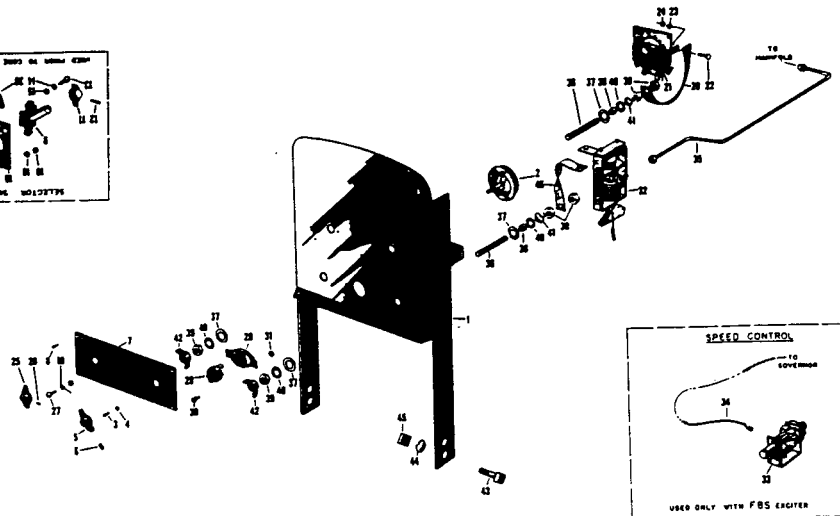
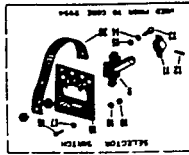


FIGURE 5141-K

ITEM	DESCRIPTION	QTY.	Note (A)	CODE										Part No.
				445	459	671	681	960	974	1122	(D)	3311 2954	3312 2955	
.....	Control Panel Ass'y Incl:	1	x	.	.	.	.	.	.	.	.	.	.	L-2479-A
.....	Control Panel Ass'y Incl:	1	.	x	.	x	.	x	.	.	x	.	.	L-2479
.....	Control Panel Ass'y Incl:	1	.	.	x	.	x	.	x	.	.	x	.	L-2478-A
.....	Control Panel Ass'y Incl:	1	.	.	.	.	.	.	.	.	.	x	.	L-3011
.....	Control Panel Ass'y Incl:	1	.	.	.	.	.	.	.	.	.	.	.	L-2636
1.	Control Panel	1	x	x	x	x	x	x	x	x	.	x	.	L-2636-A
	Control Panel	1	.	.	.	.	.	.	.	.	.	.	.	M-5090-C
2.	Rheostat	1	.	.	x	.	x	.	x	.	x	x	.	10-24-3/8
3.	Screw	2	x	x	x	x	x	.	x	.	x	.	.	3/16 Std.
4.	Lockwasher	2	x	x	.	x	x	.	.	.	.	x	.	E-106-A-1
	Lockwasher	2	.	.	.	.	.	.	.	.	.	x	.	S-8158
5.	Handle	1	x	x	x	x	x	x	x	x	.	x	.	10-24x3/16
6.	Set Screw Headless	1	x	x	x	x	x	x	x	x	.	x	.	M-7811
7.	Nameplate	1	.	.	.	.	.	.	.	.	.	.	.	M-7805
	Nameplate	1	x	x	.	x	.	x	.	x	.	.	.	S-8025-13
8.	Screw	6	x	x	x	x	x	x	x	x	x	.	.	M-5048
	Selector Ass'y Incl.	1	x	x	x	x	x	x	x	x	.	.	.	S-6251
9.	Moving Ass'y	1	x	x	x	x	x	x	x	x	.	.	.	S-6193
10.	Stationary Ass'y	1	x	x	x	x	x	x	x	x	.	.	.	S-10066
11.	Handle	1	x	x	x	x	x	x	x	x	.	.	.	1/8x3/4
12.	Groove Pin	1	x	x	x	x	x	x	x	x	.	.	.	1/4-20x3/4
13.	Fillister Hd. Stop Screw	2	x	x	x	x	x	x	x	x	.	.	.	5/16 Std.
14.	Lockwasher	2	x	x	x	x	x	x	x	x	.	.	.	1/4-20
15.	Hex Nut	2	x	x	x	x	x	x	x	x	.	.	.	1/4-20-3/4
16.	Rd. Hd. Machine Screw	2	x	x	x	x	x	x	x	x	.	.	.	T-1095
17.	Plain Washer	2	x	x	x	x	x	x	x	x	.	.	.	E-106-A-2
18.	Lockwasher	4	x	x	x	x	x	x	x	x	.	.	.	1/4-20
19.	Hex Nut	4	x	x	x	x	x	x	x	x	.	.	.	T-8445
20.	Lead	1	x	x	x	x	x	x	x	x	.	.	.	M-8179
21.	Selector Switch	1	.	.	.	.	.	.	.	.	.	x	.	5/16-18x3/4
22.	Sq. Hd. Screw	1	.	.	.	.	.	.	.	.	.	x	.	E-106-A-3
23.	Lockwasher	1	.	.	.	.	.	.	.	.	.	.	.	5/16-18
24.	Hex Nut	1	.	.	.	.	.	.	.	.	.	.	.	S-10066
25.	Handle	1	.	.	.	.	.	.	.	.	.	.	.	10-24x3/16
26.	Set Screw (Cup Point)	1	.	.	.	.	.	.	.	.	.	.	.	1/4-20x1/2
27.	Rd. Hd. Screw	2	.	.	.	.	.	.	.	.	.	.	.	S-7588-1
28.	Receptacle	1	.	.	.	.	.	.	.	.	.	.	.	S-7587-1
29.	Plug	1	.	.	.	.	.	.	.	.	.	.	.	10-24x1/2
30.	Screw	2	.	.	.	.	.	.	.	.	.	.	.	10-24
31.	Nut	2	.	.	.	.	.	.	.	.	.	.	.	L-2299-D
32.	Engine Regulator (1)	1	.	.	.	.	.	.	.	.	.	.	.	L-2299
	Engine Regulator (1)	1	x	x	.	.	x	.	x	.	x	.	.	S-7291-1
33.	Speed Control Ass'y	1	x	x	.	.	.	.	.	.	.	.	.	S-8158
	Handle	1	x	x	.	.	.	.	.	.	.	.	.	S-7291
	Speed Control	1	x	x	.	.	.	.	.	.	.	.	.	T-8667-1
34.	Chain	1	x	x	.	.	.	.	.	.	.	.	.	S-8658-2
35.	Air Line	1	.	.	.	.	.	.	.	.	.	.	.	T-8061
	Stud Ass'y Incl.	2	x	x	x	x	x	x	x	x	.	.	.	T-6931-2
	Stud	2	x	x	x	x	x	x	x	x	.	.	.	T-2719
37.	Insulating Washer	4	x	x	x	x	x	x	x	x	.	.	.	T-4122
38.	Insulating Bushing	2	x	x	x	x	x	x	x	x	.	.	.	1/2-13
39.	Brass Jam Nut	6	x	x	.	.	.	.	.	.	.	.	.	T-10114
	Brass Jam Nut	5	.	.	.	.	.	.	.	.	.	.	.	1-1/16x17/32x1/16
40.	Washer	2	x	x	.	.	.	.	.	.	.	.	.	S-9262
	Washer	4	.	.	.	.	.	.	.	.	.	.	.	E-106-A-5
41.	Lockwasher	2	x	x	x	x	x	x	x	x	.	.	.	T-3960
42.	Wing Nut	2	x	x	x	x	x	x	x	x	.	.	.	3/8-16x1
43.	Screw Sq. Hd.	4	x	x	x	x	x	x	x	x	.	.	.	E-106-A-4
44.	Lockwasher	4	x	x	x	x	x	x	x	x	.	.	.	3/8-16
45.	Nut, Sq. Hd.	4	x	x	x	x	x	x	x	x	.	.	.	T-8581-1
46.	Lead	1	.	.	.	.	.	.	.	.	.	.	.	T-9075
—	Connector, Airline to Manifold	1	.	.	.	.	.	.	.	.	.	.	.	

(1) For component parts of Engine Regulator, Refer to IM-117.

(A) For codes 215, 244, 317, 370 and 371.

(D) For codes 1123, 1223, 1228, 1421, 1422, 1678, 1679, 1827, 1828, 1846, 1847, 1903, 1904, 2163, 2164, 2292, 2364, 2365, 2866 and 2867.

GENERATOR BRUSHOLDERS

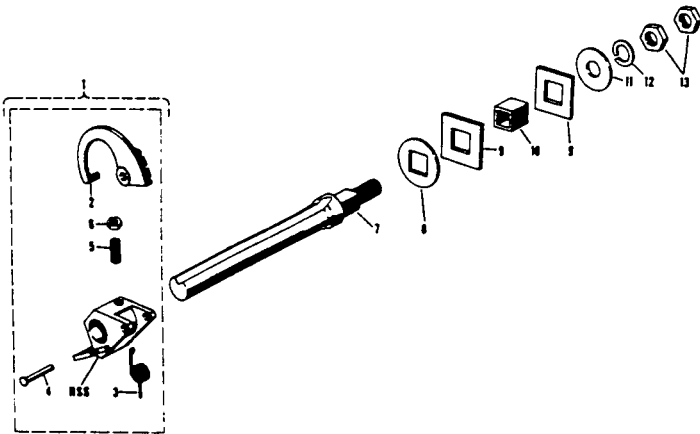


FIGURE 5111-A

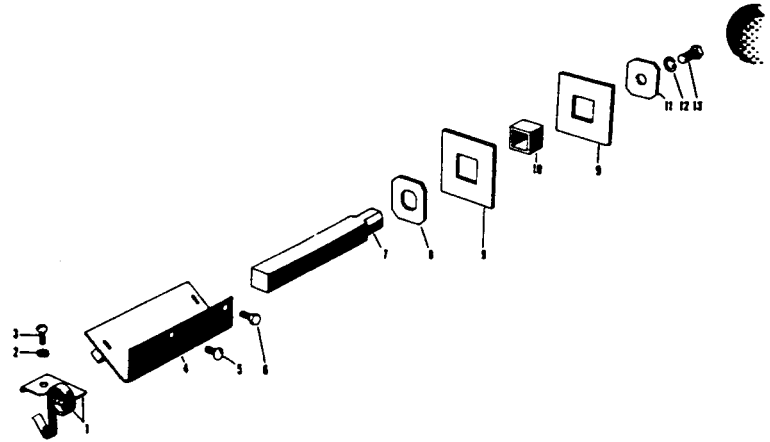


FIGURE 5111-B

Item	Description	Qt'y	Part No.
--	Brushholder & Stud Ass'y incl.	4	S-5382
1	Brushholder Ass'y, incl.	8	S-3939
2	Finger	8	T-574
3	Spring	8	T-1448
4	Finger Stud	8	T-579
5	Set Screw, Allen	8	5/16-18x5/8
6	Nut, Hex Jam	8	5/16-18
7	Stud	4	T-3117
8	Washer	4	T-3121
9	Insulating Washer	8	T-4479
10	Insulating Tube	4	T-2667
11	Washer	4	T-1455
12	Lockwasher	4	5/8 St'd
13	Nut, Hex Jam	8	T-1449

NSS means "Not Stocked Separately"; is sold only in the Assembly of Item 1.

Item	Description	Qt'y	Part No.
--	Brushholder Ass'y incl.	4	M-6964-2A
1	Spring & Clip Ass'y	8	T-8495
2	Lockwasher (Note 2)	8	E-106-A-2
3	Screw, Rd. Hd.	8	T-10107-1
4	Plate & Retainer Ass'y	4	M-6304-2B
5	Screw, Rd. Hd.	4	5/16-18x1/2
6	Screw, Hex Hd. Cap	4	5/16-18x3/2
7	Stud (1)	4	M-6963-4
8	Washer	4	T-9020
9	Insulating Washer	8	T-4479
10	Insulating Tube	4	T-2667
11	Washer	4	T-2414
12	Lockwasher (Note 2)	4	E-106-A-4
13	Screw, Hex Hd. Cap	4	T-10106-1

1. If early style Brushholder Stud (with taper pin) is required, replace by ordering M-6963-4 Stud and Inner Washer T-9020.
2. These lockwashers no longer used on current production models.

1) SERVICE GASKET KIT S-9250-193

2) CYLINDER AND CRANKCASE ASSEMBLIES:

- a) S-9250-1-A includes Cylinder and Crankcase, Camshaft Bushings, Main Bearings and Caps, Studs, Valve Guides
- b) S-9250-1-C includes S-9250-1-A plus Pistons, Rings and Piston Pins
- c) S-9250-1-I includes S-9250-1-C plus Valves and Tappets
- d) S-9250-1-R includes S-9250-1-I plus Connecting Rods, Camshaft, Crankshaft, Front End Plate
- e) S-9250-1-S includes S-9250-1-R plus Filler Blocks, Oil Pump, Oil Pan, Cylinder Head, Gear Cover.

CRANKCASE FIGURE 5141-F-1 (See Page 10)

Unless specified to the contrary, the same part numbers apply to all of the various welder code numbers.

Item	Description	Qt'y	Part No.
1	Cyl. Water Outlet Elbow (Codes 215 thru 1904)	1	S-9311-10
	Cyl. Water Outlet Elbow (Codes 2163 & higher)	1	S-9250-129
2	Nut	2	T-10940-1
3	Lockwasher	2	E-106-A-111
4	Gasket	1	S-9250-143
7	Stud, Elbow (Codes 215 thru 1904)	2	S-9311-11
	Stud, Elbow (Codes 2163 & higher)	2	S-9250-148
8	Plug	1	S-9250-189
9	Cylinder Head (Codes 215 thru 681)	1	S-9311-12
	(Codes 960 & up)	1	S-9250-118
10	Cylinder Head Gasket	1	S-9250-137
11	Nut Cylinder Head	15	S-9250-161
12	Washer	15	S-9250-172
13	Stud, Cylinder Head	15	S-9250-21
14	Filler Cap Assembly	1	S-9250-66
15	Oil Filler Tube	1	S-9250-120
16	Drain Cock	1	T-9956
17	Oil Gauge Rod	1	S-9250-91
18	Oil Rod Support	1	S-9250-15
19	Block	1	S-9250-2
20	Lift Eye (Codes 215 thru 2164)	2	S-9311-13
21	Oil Filter, Fram (Codes 960 & higher)	1	L-2676
	Oil Filter, Michiana (Codes 215 thru 681)	1	S-9311-14
22	Filter Element, Fram (Codes 960 & higher)	1	L-2676-1
	Filter Element, Michiana (Codes 215 thru 681)	1	S-9311-15

Item	Description	Qt'y	Part No.
23	Stud	2	S-9250-147
24	Lockwasher	2	E-106-A-3
--	Plain Washer	2	T-1093
25	Nut, Hex	2	5/16-18
26	Oil Line (Codes 960 & higher)	1	T-9955
26A	Oil Line (Note 1)	1	T-10153
27	Elbow (Codes 960 & higher)	2	T-9949
28	Bushing (Note 2)	1	T-9948
28A	Tee Fitting	1	T-9738
29	Gasket, Front Plate	1	S-9250-114
30	Front End Plate	1	S-9250-113
31	Gasket, Gear Cover	1	S-9250-116
32	Gear Cover	1	S-9250-115
33	Ring Dowell, Front Plate	1	S-9250-135
34	Ring Dowell, Gear Cover	1	S-9250-136
35	Screw & Washer Assembly	1	S-9250-159
36	Nut, G.C. to End Plate	1	S-9250-163
37	Lockwasher	1	S-9250-170
38	Screw, G.C. to End Plate	1	S-9250-158
39	Oil Seal	1	S-9250-117
40	Nut, G.C. Dowell Screw	1	S-9250-165
41	Lockwasher, Dowell Screw	1	S-9250-171
42	Screw, Dowell Screw	1	S-9250-149
43	Screw, G. C. to Filler Block (Early Models Only)	1	S-9250-158
44	Lockwasher	8	3/8 St'd
45	Screw, G.C. to Filler Block	3	S-9250-154
46	Screw, G.C. to Block	1	S-9250-158
47	Screw, G.C. to Block (At Ring Dowel)	1	S-9250-155
48	Nut, G.C. to Stud	2	S-9250-163
49	Stud, G.C. to Block (Upper Holes)	2	S-9311-16
50	Oil Pan Gasket	2	S-9250-73
51	Front Filler Block	1	S-9250-128

Note 1 Used on earlier models without identical oil lines.

Note 2 Used on machines with identical oil lines and all codes 2954 & higher.

CRANKCASE, GEAR COVER & ASSOCIATED PARTS

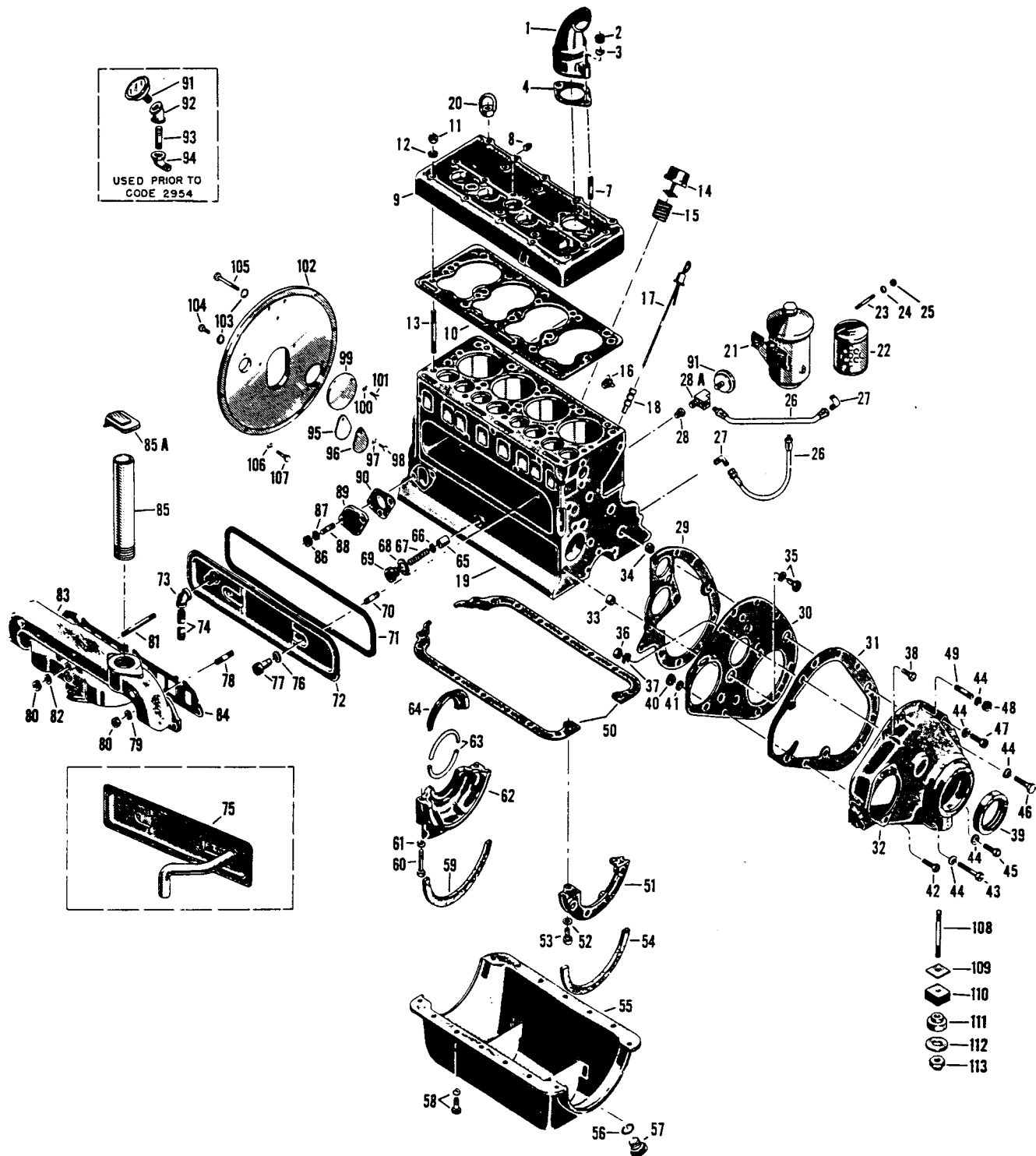


FIGURE 5141-F-1

CRANKCASE (Cont'd) FIGURE 5141-F-1

Item	Description	Qt'y	Part No.
52	Lockwasher	2	S-9250-168
53	Screw, Ft. Filler Block	2	S-9250-156
54	Cork, Filler Block	1	S-9250-142
55	Oil Pan Assembly	1	S-9250-70
56	Gasket, Drain Plug	1	S-9250-72
57	Drain Plug	1	S-9250-71
58	Screw & Washer Assembly	14	S-9250-159
59	Cork, Rear Filler Block	1	S-9250-142
60	Screw	2	S-9250-157
61	Lockwasher	2	S-9250-168
62	Rear Filler Block	1	S-9250-111
	Rear Br'g. Oil Guard Ass'y. Incl.	1	S-9250-203
63	Seal, Rear Filler Block	2	S-9250-48
64	Rear Br'g. Oil Guard	1	S-9250-47
	Felt	1	S-9250-201
65	O. P. Relief Valve	1 AS	S-9250-123
66	Plain Washer	Req'd	S-9250-173
67	Relief Valve Spring	1	S-9250-124
68	Gasket, Relief Valve	1	S-9250-139
69	Plug, Relief Valve	1	S-9250-186
70	Stud, Vlv. Chamber Cover	2	S-9250-16
71	Gasket, Valve Cover	1	S-9250-68
72	Valve Chamber Cover (Codes 215 thru 1422)	1	S-9311-17
73	Elbow, Vent Tube (Codes 215 thru 1422)	1	S-9311-18
74	Tube, Vent (Codes 215 thru 1422)	1	S-9311-19
75	Valve Chamber Cover (Codes 1678 & higher)	1	S-9250-67
76	Gasket	2	S-9250-146
77	Nut, Valve Cover	2	S-9250-167
78	Stud, Manifold	6	S-9250-19
79	Washer, End & Ctr. Studs	3	S-9250-177
80	Nut, Manifold	6	S-9250-164
81	Stud, Manifold Center	1	S-9250-20
82	Washer	4	S-9250-178
83	Manifold	1	S-9250-92
84	Gasket, Manifold	1	S-9250-140

Item	Description	Qt'y	Part No.
85	Exhaust Pipe	1	S-7348
85A	Exhaust Pipe Cover	1	S-10271
86	Nut	2	S-9250-162
87	Lockwasher	2	S-9250-169
88	Stud, Hole Cover	2	S-9250-17
89	Cover	1	S-9250-121
90	Gasket	1	S-9250-138
91	Gauge, Oil Pressure	1	S-8163
92	Elbow, 45° (Codes 1678 & higher)	1	T-9960
93	Pipe (Codes 1678 & higher)	1	T-9959-2
94	Elbow, 90° (Codes 1678 & higher)	1	T-9958
95	Felt, Timing Hole Cover	1	S-9311-20
96	Timing Hole Cover	1	S-9311-21
97	Lockwasher	1	3/8
98	Screw	1	3/8-16x5/8
99	Cover, Starter Hole (Codes 1223 & higher)	1	S-8076
100	Lockwasher (Codes 1223 & higher)	2	7/16
101	Screw, Cover (Codes 1223 & higher)	2	7/16-14x1/2
102	Rear End Plate and Timing Pin Ass'y. Incl. Rear End Plate Timing Pin (Codes 1223 & higher)	1 1 1	S-9352 L-2883-1 T-10088
102	Rear End Plate (Codes 215 thru 1123)	1	S-9311-22
103	Lockwasher	5	T-9695-4
104	Screw, Dowell	2	T-9944
105	Screw — 7/16" - 14 x 1	3	T-8833-1
106	Lockwasher, Gen. Mt'g	6	T-9695-4
107	Screw, Gen. Mt'g	6	3/8-16x1
108	Stud (1)	1	T-8911
109	Washer	1	T-9054
110	Upper Engine Mount	1	T-8823
111	Lower Engine Mount	1	T-8823
112	Washer	1	T-1455
113	Huglock Nut	1	T-9187-3

1. When replacing T-8911 stud, order T-9187-3 Huglock nut.

PISTONS, CRANKSHAFT, FLYWHEEL

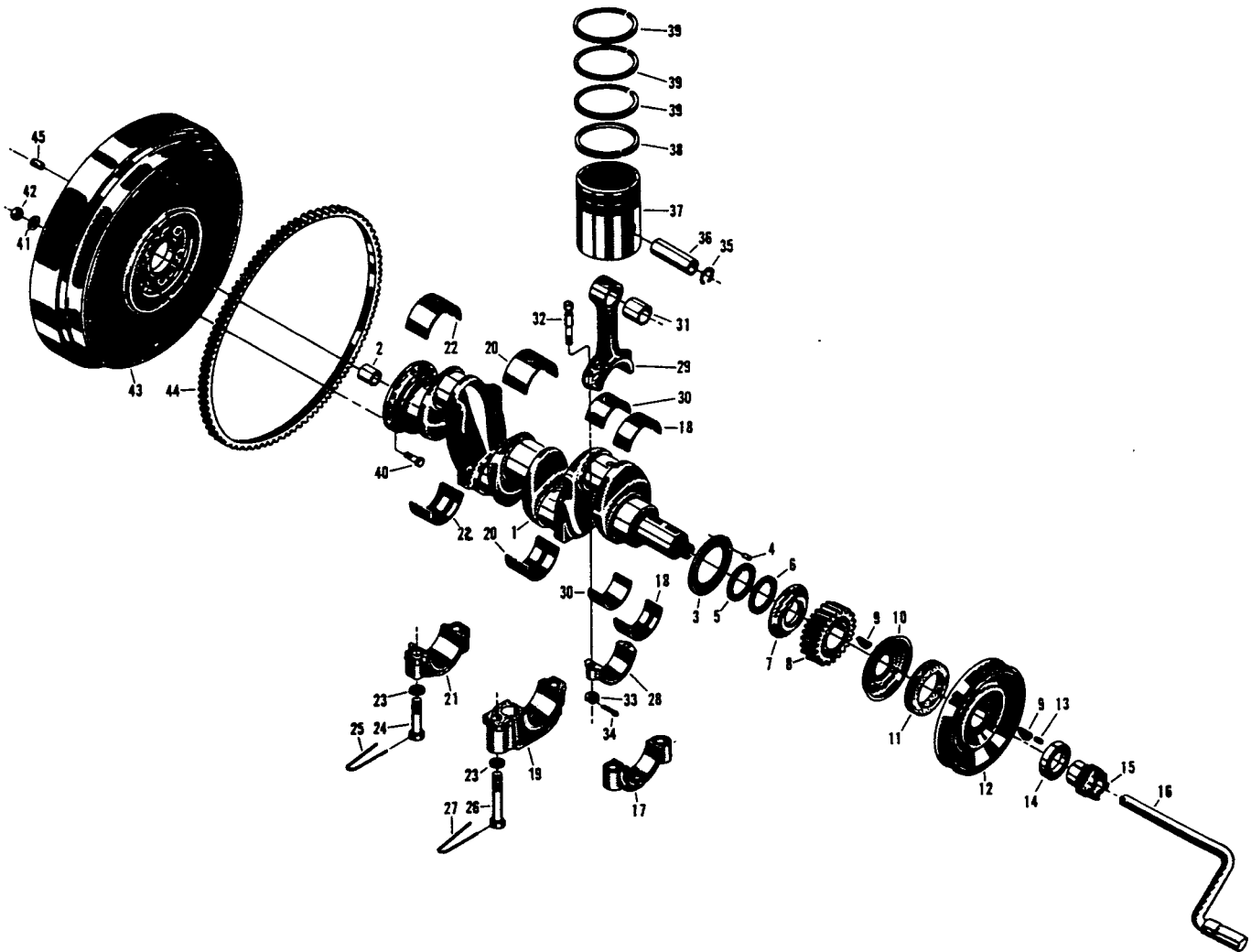


FIGURE 5141-G

OVERSIZE AND UNDERSIZE DESIGNATIONS

To specify either an oversize or undersize Piston, Ring or Bearing add the desired over or under-size dimension to the part number as a suffix; for example:

The standard Connecting Rod Bearing (#2 & 4 Cylinders) is S-9250-65, if a .020" undersize is desired order S-9250-65-020. Available sizes are .020" and .002".

(1) Piston Assembly Kit S-9250-192.

PISTONS, CRANKSHAFT, FLYWHEEL, FIGURE 5141-G

Item	Description	Qt'y	Part No.
1	{Crankshaft - Code 1223 & higher.	1	S-9250-204
	{Crankshaft, incl: - Code 215 thru 1123	1	S-9311-1
2	Bushing - Code 215 thru 1123	1	S-9311-2
3	Thrust Washer.	2	S-9250-35
4	Pin, Thrust Washer	3	S-9250-46
5	Shim, .002"	8	S-9250-32
6	Shim, .008"	8	S-9250-33
7	Thrust Plate	1	S-9250-34
8	Crankshaft Gear.	1	S-9250-122
9	Key.	2	S-9250-37
10	Oil Thrower.	1	S-9250-133
11	Seal, Fan Pulley	1	S-9250-144
12	Pulley	1	S-9250-126
13	Cork	1	S-9250-145
14	Spacer Collar	1	S-9250-176
15	Starting Jaw	1	S-9022
16	Crank.	1	S-7430
17	Bearing Cap, Ft. Main.	1	S-9250-9
18	Bearing Ass'y, Ft. Main (Note 1) (one bearing ass'y is two halves).	1	S-9250-38
19	Bearing Cap, Ctr. Main	1	S-9250-10
20	Bearing Ass'y, Ctr. Main (one bearing ass'y is two halves).	1	S-9250-40
21	Bearing Cap, Rear Main	1	S-9250-11
22	Bearing Ass'y, Rear Main (one bearing ass'y is two halves).	1	S-9250-39
23	Washer, Plain.	6	S-9250-14
24	Screw, Bearing Cap, Ft. & Rr.	4	S-9250-12
25	Lockwire #19	2	S-9250-183
26	Screw, Ctr. Br'g. Cap.	2	S-9250-13
27	Lockwire #19	1	S-9250-182
--	Connecting Rod Ass'y #1-3, incl:	2	S-9250-58
28	Cap	2	N. S. S.
29	Rod	2	N. S. S.
30	Bearing (one bearing is one half)	4	S-9250-62
31	Bushing, Pin.	2	S-9250-59
32	Bolt.	4	S-9250-60
33	Nut	4	S-9250-61
--	Connecting Rod Ass'y #2-4, incl:	2	S-9250-64
28	Cap	2	N. S. S.
29	Rod	2	N. S. S.
30	Bearing (one bearing is one half)	4	S-9250-65
31	Bushing, Pin.	2	S-9250-59
32	Bolt.	4	S-9250-60
33	Nut	4	S-9250-61
34	Cotter Pin	8	S-9250-180
35	Ring, Pin Retaining.	8	S-9250-57
36	Piston Pin	4	S-9250-56
37	Piston	4	S-9250-53
38	Piston Ring, Oil	4	S-9250-55
39	Piston Ring, Taper Face.	12	S-9250-54
40	Bolt, Flywheel	6	S-9250-36
41	Lockwasher	6	T-9695-5
42	Nut.	6	T-10018
--	Flywheel Ass'y, including-- Codes 215 thru 681	1	S-9311-6
43	Flywheel - Codes 215 thru 681	1	S-9311-7
45	Lord Bushing - Codes 215 thru 681	6	T-8845
--	Expansion Plug - Codes 215 thru 681	6	S-9311-23
43	Flywheel Ass'y - Codes 960 thru 1123 (Note 2).	1	S-9311-8
--	Flywheel Ass'y, incl: - Codes 1223 & higher.	1	M-7671
43	Flywheel - Codes 1223 & higher.(Note 2)	1	L-2880
44	Ring Gear - Codes 1223 & higher	1	M-7664

N.S.S. Not Serviced Separately

Note 1. For service of old bearing with flange — order present bearing and F-600-C-220 Thrust Washer.

Note 2. Flywheel does not include studs (item 47, page 6).

OIL PUMP, VALVES & CAMSHAFT

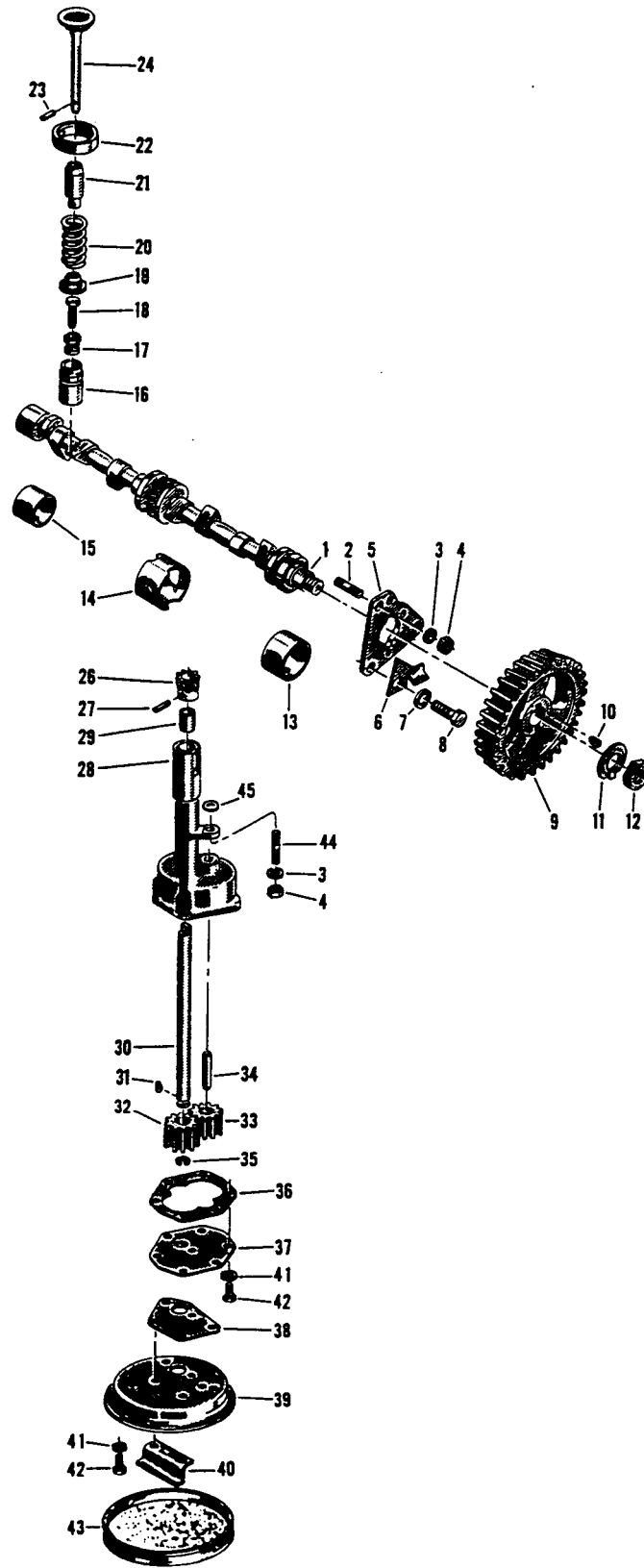


FIGURE 5141-H

OIL PUMP, VALVES AND CAMSHAFT, FIGURE 5141-H

Item	Description	Qt'y	Part No.
1	Camshaft	1	S-9250-41
2	Stud, Camshaft, Thrust Plate	2	S-9250-18
3	Lockwasher 3/8"	3	S-9250-170
4	Nut 3/8-16.	3	S-9250-163
5	Thrust Plate	1	S-9250-131
6	Plate, Oiler, Timing Gear.	1	S-9250-134
7	Lockwasher	1	S-9250-171
8	Screw 7/16"-14 x 1-1/4"	1	S-9250-160
9	Gear, Camshaft	1	S-9250-130
10	Key, Woodruff #6	1	S-9250-184
11	Lock Nut	1	S-9250-132
12	Nut 3/4-16 x 1/4 PHK	1	S-9250-166
13	Bushing, Camshaft, Front	1	S-9250-198
14	Bushing, Camshaft, Center.	1	S-9250-199
15	Bushing, Camshaft, Rear.	1	S-9250-200
	Valve Tappet Assembly, incl.	8	S-9250-42
16	Tappet.	8	S-9250-43
17	Lock Nut.	8	S-9250-44
18	Screw	8	S-9250-45
19	Seat, Valve Spring	8	S-9250-28
20	Valve Spring	8	S-9250-27
21	Valve Stem Guide	8	S-9250-24
22	Insert, Exhaust Valve Seat	4	S-9250-5
23	Lock, Valve Spring	8	S-9250-29
24	Valve, Intake.	4	S-9250-25
--	Valve, Exhaust	4	S-9250-26
--	Oil Pump Assembly, incl.*	1	S-9250-93
26	Gear, O.P. Dr. Gear	1	S-9250-96
27	Pin, O.P. Dr. Gear 3/16 x 5/16.	1	S-9250-108
28	O.P. Body Ass'y, incl.	1	S-9250-94
29	Bushing.	1	S-9250-95
30	Shaft	1	S-9250-102
31	Key, Woodruff #5 or #3.	1	S-9250-106
32	Gear, O.P. Driver	1	S-9250-97
33	Gear, O.P. Driven	1	S-9250-98
34	Stud, O.P. Idler Gear	1	S-9250-103
35	Snap Ring, O.P. Dr. Shaft	1	S-9250-110
36	Gasket, O.P. Cover.	1	S-9250-104
37	Cover Assembly O.P.	1	S-9250-99
38	Gasket, Strainer Screen	1	S-9250-105
39	Strainer Frame.	1	S-9250-100
40	Strainer Spacer	1	S-9250-101
41	Lockwasher.	6	S-9250-90
42	Screw 1/4"-20 x 5/8".	6	S-9250-107
43	Oil Strainer Screen	1	S-9250-109
44	Stud, Body to Cap 3/8-16 x 1-5/8".	1	S-9250-51
45	Washer, O.P. Spacer.	1	S-9250-179

* Oil Pump Repair Kit S-9250-197

WATER PUMP

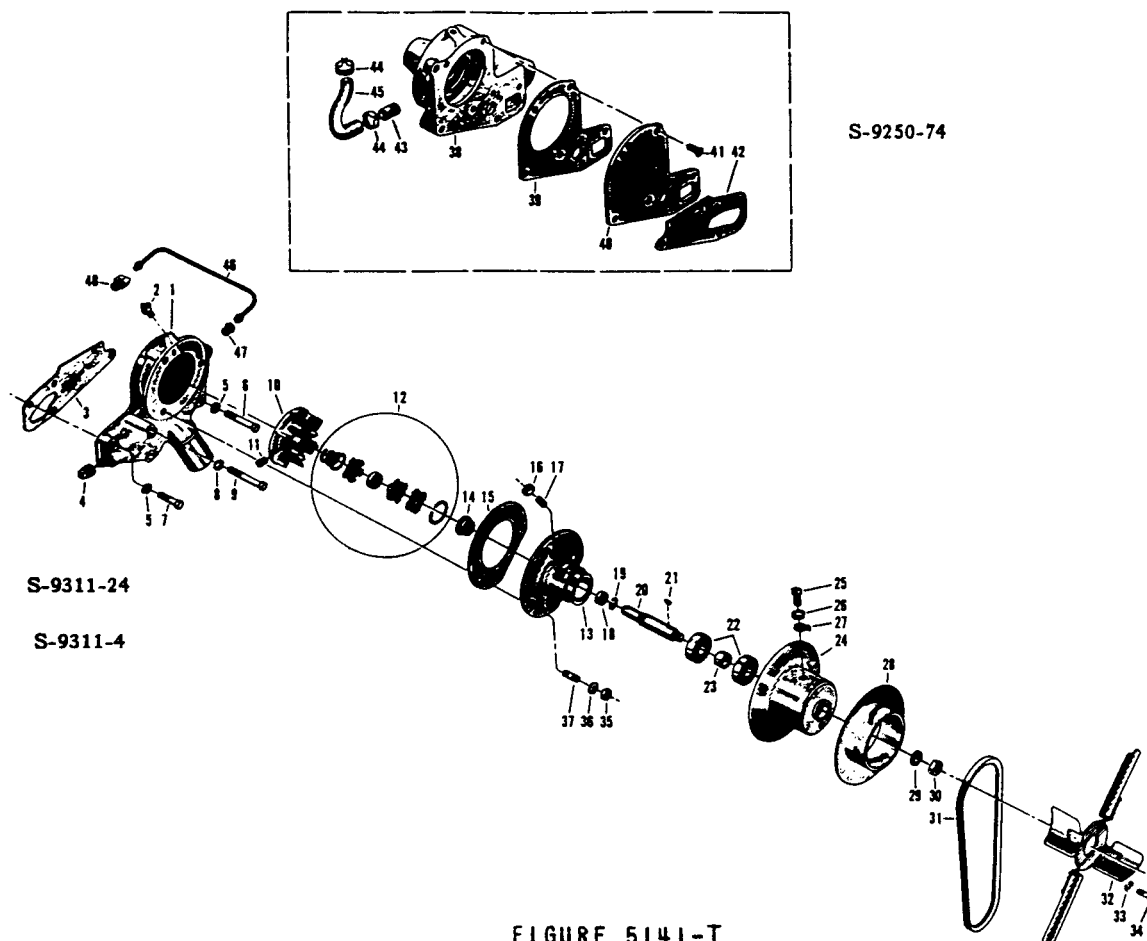


FIGURE 5141-I

PREFACE: Three different Water Pumps have been used on the original installations:

S-9311-24 Codes 215 thru 681 (Note 1) Order S-9311-64

S-9311-4 Codes 960 thru 1904 (Note 1) Order S-9311-64

S-9250-74 Codes 2163 & higher (Note 1) Order S-9311-64

Item	Description	Qt'y	S-9311-24	S-9311-4	S-9250-74
1	Water Pump Body.	1	S-9311-25	S-9311-25	see #38
2	Grease Fitting	1	S-9311-26	S-9311-26	----
3	Gasket, Water Pump to Block.	1	S-9250-141	S-9250-142	see #42
4	Plug	1	S-9311-28	S-9311-28	----
5	Lockwasher	3	S-9250-170	S-9250-170	S-9250-170
6	Screw.	3	S-9250-153	S-9250-153	S-9250-153
7	Screw.	1	S-9311-29	S-9250-152	S-9250-152
8	Copper Washer, Ctr.	1	S-9250-174	S-9250-174	S-9250-174
9	Screw.	1	S-9311-30	----	----
10	Impeller	1	S-9311-31	S-9311-31	S-9250-202
11	Set Screw.	1	S-9311-38	S-9311-38	----

NOTE 1. Although specific code numbers identify specific water pumps sent out as original equipment, due to replacements in the field there is no definite way of identifying a particular water pump when a code number is furnished. Therefore, in replacing a water pump for any code, order S-9311-64 water pump and Repair Kit which fits all models and codes.

WATER PUMP (Cont'd) FIGURE 5141-I

Item	Description	Qt' y	S-9311-24	S-9311-4	S-9250-74
12	Seal Assembly.	1	S-9311-32	S-9311-32	S-9250-78
13	Support Assembly, including.	1	S-9311-33	S-9311-33	---
--	Bushing	1	S-9311-34	S-9311-34	---
14	Water Shedder.	1	---	---	S-9250-80
15	Gasket	1	S-9311-35	S-9311-35	---
16	Nut.	1	S-9311-39	S-9311-39	---
17	Set Screw, Bearing	1	S-9311-40	S-9311-40	---
18	Retainer	1	S-9311-41	S-9311-41	---
19	Snap Ring.	1	S-9311-42	S-9311-42	S-9250-79
20	Shaft.	1	S-9311-43	S-9311-44	S-9250-76
21	Key.	1	S-9311-45	S-9311-46	---
22	Bearing.	2	S-9311-47	S-9311-47	---
23	Spacer	1	S-9311-48	S-9311-48	---
24	Fan Hub.	1	S-9311-49	S-9311-50	S-9250-86
25	Screw, Flange.	2	S-9311-51	S-9311-51	S-9250-89
26	Lockwasher	2	S-9250-90	S-9250-90	S-9250-90
27	Lock Nut	2	S-9250-88	S-9250-88	S-9250-88
28	Flange	1	S-9250-87	S-9250-87	S-9250-87
29	Lockwasher	1	S-9311-52	S-9311-52	---
30	Nut.	1	S-9311-53	S-9311-53	---
31	Fan Belt, No Starter	1	S-8075	S-8075	S-8075
	Fan Belt, With Starter	1	---	S-8074	S-8074
32	Fan Blade Ass'y.	1	S-9311-54	L-2649	L-2649
33	Lockwasher	4	E-106-A-3	E-106-A-3	E-106-A-3
34	Screw.	4	5/16-18x $\frac{3}{4}$	5/16-18x $\frac{3}{4}$	5/16-18x $\frac{3}{4}$
35	Nut.	3	S-9311-55	S-9311-55	---
36	Lockwasher	3	S-9311-56	S-9311-56	---
37	Stud	3	S-9311-57	S-9311-57	---
38	Body	1	---	---	S-9250-75
39	Cover Gasket	1	---	---	S-9250-83
40	Cover.	1	---	---	S-9250-82
41	Screw.	4	---	---	S-9250-81
42	Gasket, To Block	1	---	---	S-9250-141
43	Nipple	1	---	---	T-10113
44	Hose Clamp	2	---	---	T-9957
45	Hose	1	---	---	T-9950
46	Tube Assembly.	1	S-9311-58	S-9311-59	---
47	Bushing, Water Pump.	1	S-9311-60	S-9311-60	---
48	Elbow, Cylinder Outlet Elbow	1	S-9311-61	S-9311-61	---
--	Water Pump and Repair Kit (1)	-	S-9311-64	S-9311-64	S-9311-64

(1)S-9250-191 WaterPump and Repair Kit (Includes:S-9250-74, S-9250-129, S-9250-141, S-9250-143, T-10113, S-9250-153, S-9250-152, S-9250-148, T-9950, T-9957, M-6591, S-9250-170)

FUEL SYSTEM

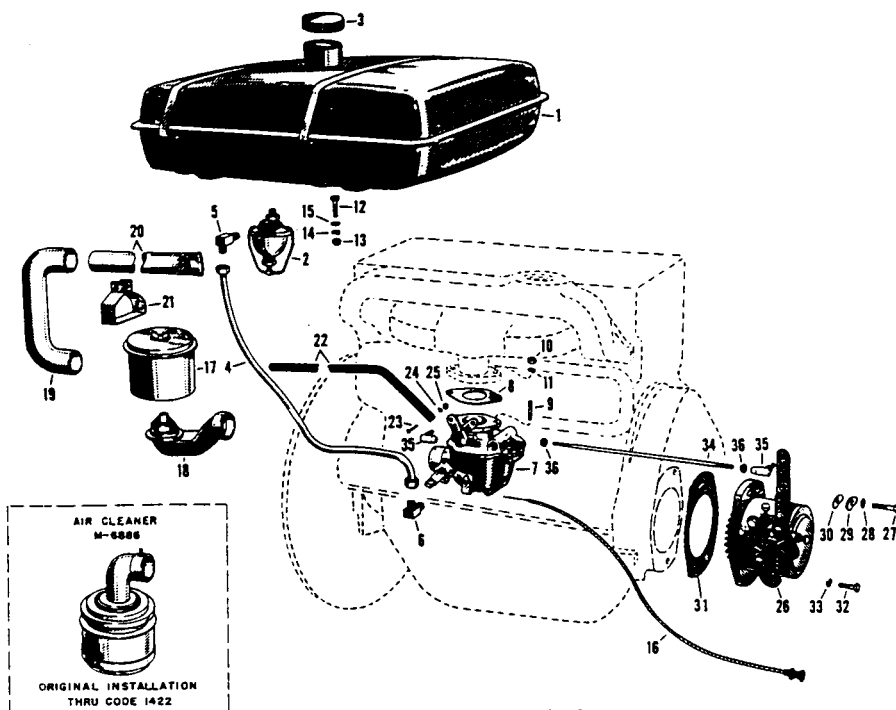


FIGURE 5141-J-1

Item	Description	Qt'y	Part No.
1.	Fuel Tank Assy. (6)	1	L-2581-A
	Fuel Tank Assy. Incl:	1	L-3167-A
	Fuel Tank, (6)	1	L-2581
	Fuel Tank	1	L-3167
2.	Fuel Strainer (1)	1	
	Bowl	1	S-6185-1
	Screen	1	S-6185-2
	Gasket	1	S-6185-3
3.	Filler Cap (6)	1	S-8000
	Filler Cap	1	S-10149
4.	Fuel Line	1	S-4893-49
5.	Fitting Straight	1	T-8644
	(Codes 215 thru 1123)		
6.	Fitting Elbow	1	T-8645
	(Codes 1223 & higher)		
6.	Elbow & Strainer Assy.	1	T-9961
7.	Carburetor (2) (6)	1	S-9239
	Carburetor	1	S-9790
8.	Gasket	1	S-9233
9.	Stud	1	T-9954
10.	Nut	1	5/16-18
11.	Lockwasher	2	E-106-A-3
12.	Sq. Hd. Bolt	4	3/8-16x1
13.	Sq. Hd. Nut	4	T-10384
14.	Lockwasher	4	E-106-A-4
15.	Plain Washer	4	7/8x3/8x1/16
16.	Choke Control	1	S-7525
17.	Air Cleaner	1	M-6886
	(Codes 215 thru 1422)		
18.	Air Cleaner	1	M-7311
	(Codes 1678 & higher)		
19.	Elbow	1	M-7161-1
	(Codes 1678 & higher)		
20.	Hose, Air Heater (Note 5)	1	S-8688
	(Codes 1846 & higher)		
20.	Heater Tube	1	S-8626
21.	Clamp, Tube	1	T-9486
	(Codes 1846 & higher)		

Item	Description	Qt'y	Part No.
22.	Control Rod	1	T-8583
	(Codes 215 thru 1422)		
23.	Control Rod	1	S-6192-5
	(Codes 1678 & higher)		
23.	Screw	1	10-24x3/4
24.	Lockwasher	1	3/16 St'd
25.	Nut	1	10-24
26.	Governor Assy. (6) (Note 4)	1	M-8217
	Governor Assy. (Note 4)	1	M-8028
	Governor Drive Gear	1	M-7018-1
	Governor Operating Spring	1	M-7018-2
27.	Screw, Top Mtg. (6)	1	3/8-16x3-1/8
28.	Washer, Cu Asbestos	1	S-9236
29.	Cover Plate	1	S-9240
30.	Gasket, Cover Plate	1	S-9235
31.	Gasket, Governor	1	S-9234
32.	Screw, Hex. Hd.	1	3/8-16x1-1/8
33.	Lockwasher	1	E-106-A-4
34.	Governor Rod	1	T-9962
35.	Ball Joint (3)	2	T-9963
36.	Hex Nut	2	1/4-28

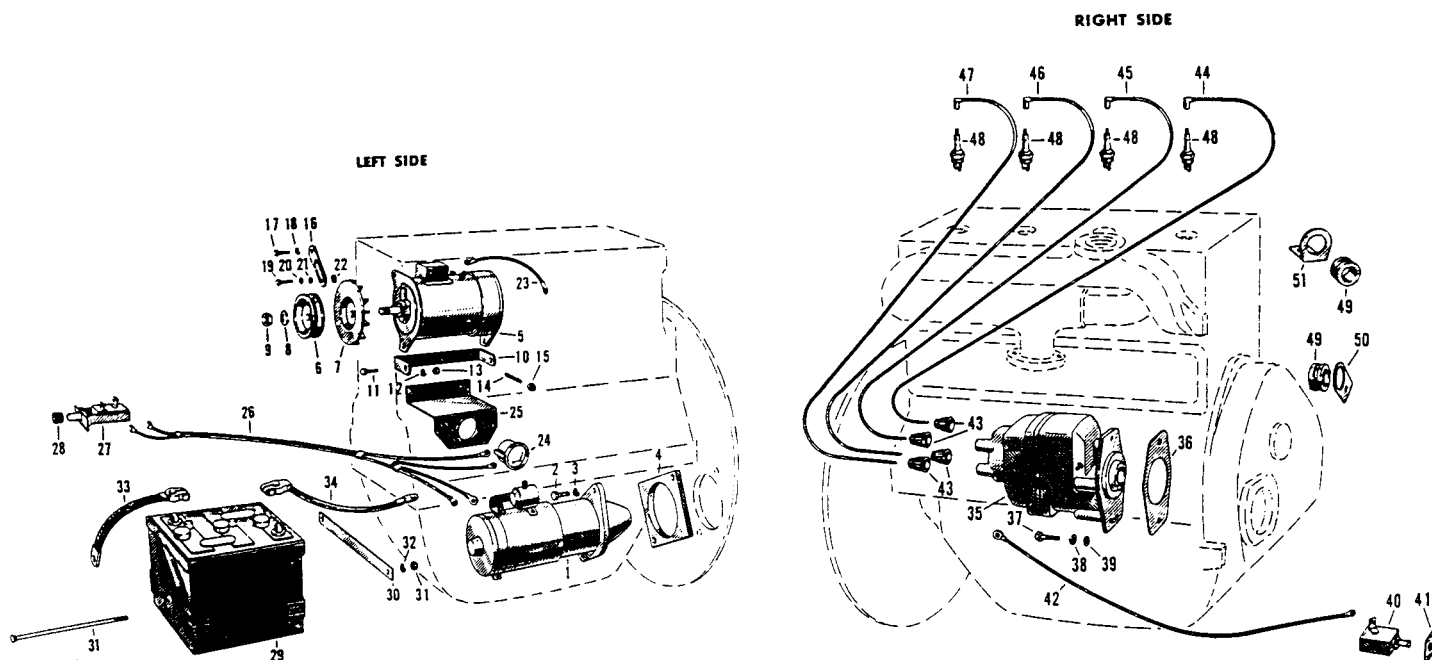
ANTI-FROST KIT

- A. For codes 215 thru 1422: Kit part number S-8685 includes new valve cover plate, air heater hose and tube, new air cleaner, new oil gauge fittings and engine regulator rod.
- B. For codes 1678 thru 1828: Kit part number S-8686 includes air heater hose and tube, new cleaner shell.

FOOTNOTES:

- Early model machines require 1/2" to 3/8" reducing bushing for application of latest S-6185 strainer.
- For component parts see page 20.
- On machines with plain (not tapped) hole in governor arm use one T-8624 ball joint.
- Order Governor M-7018 for models with speed control.
- Air Heater Hose mounted on Lift Bale (item 28, page 3) when welder leaves factory.
- Codes prior to 2954.

ENGINE ELECTRICAL SYSTEM



Item	Description	Qty.	Part No.
2.	Screw, Hex Hd. Cap	2	7/16-14x1-1/2
3.	Lockwasher	2	E-106-A-8
4.	Starter Spacer	1	S-8073
6.	Generator Pulley	1	M-7204
7.	Generator Pulley Fan (Codes 2954 & higher)	1	Delco 1866400
8.	Lockwasher	1	S-9311-36
9.	Nut	1	S-9311-37
10.	Bracket (3) (7)	1	S-8532
	Bracket (3)	1	S-10249
11.	Screw	2	3/16-18x1
12.	Lockwasher	2	E-106-A-3
13.	Nut, Hex	2	5/16-18
14.	Stud	2	T-9087
15.	Nut, Hex	2	3/8x16
16.	Adj. Strap (4)	1	S-8533
17.	Screw	1	3/8-16x7/8
18.	Lockwasher	1	E-106-A-4
19.	Screw	1	5/16-18-7/8
20.	Lockwasher	1	E-106-A-3
21.	Plain Washer	1	T-1093
22.	Plain Washer	1	T-1096
23.	Lead, Gen. to Ammeter	1	S-7816-19
24.	Ammeter	1	S-7514
25.	Ammeter, Panel	1	M-6955
26.	Harness	1	M-6957
....	Switch Assy. incl:	1	T-9623
27.	Switch	1	S-9157
28.	Bushing	1	S-8334
29.	Battery, Domestic	1	M-6962-1
	Export	1	M-6962-2
30.	Battery, Strap	1	S-8069
31.	Carriage Bolt & Nut	2	1/4-20x7-1/2
32.	Lockwasher	2	E-106-A-3
33.	Ground Lead	1	S-8070
34.	Battery Lead	1	S-5938-R

Item	Description	Qty.	Part No.
35.	Magneto (5) (7)	1	L-2677
....	Magneto	1	L-3228
36.	Magneto Gasket	1	S-9234
37.	Screw, Hex Hd. Cap.	1	3/8-16x3-1/4
38.	Lockwasher	1	E-106-A-4
39.	Washer	1	S-9262-2
40.	Switch Magneto	1	S-8020
41.	Plate, Switch	1	T-9061
....	Adapter, Switch Plate (Codes 215 thru 1123)	1	T-9101
42.	Lead Assembly	1	T-8609-21
43.	Nipple	4	T-8627
44.	Ignition Wire #1 Cyl.	1	S-7518-5
45.	Ignition Wire #2 Cyl.	1	S-7518-7
46.	Ignition Wire #3 Cyl.	1	S-7518-11
47.	Ignition Wire #4 Cyl.	1	S-7518-14
48.	Spark Plug	4	S-8159
49.	Grommet	3	S-9250-194
50.	Bracket, Wire Support	1	S-9250-196
51.	Bracket, Wire Support	2	S-9250-195

BATTERY START CONVERSION KIT — M-6996

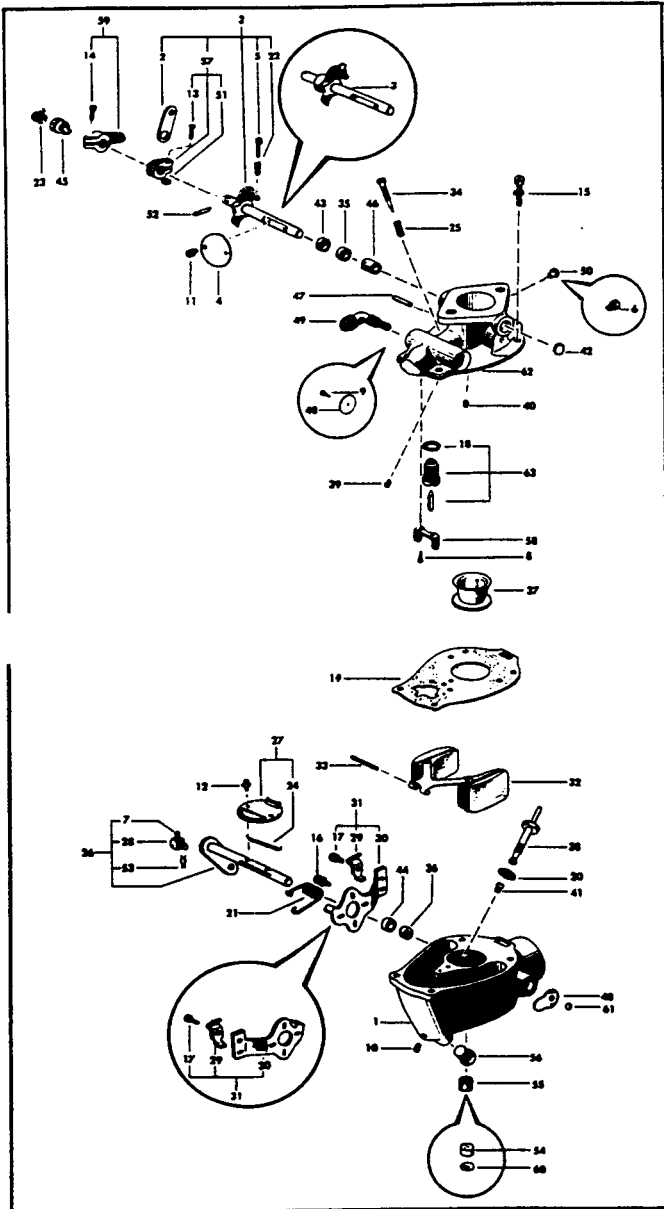
Possible only on welder's code number 1223 & higher.

FOOTNOTES:

1. S-8532 Bracket for Delco Remy Generator; order S-8140 for units with Elec. AutoLite Generator.
2. S-8533 Strap for Delco Remy Generator; order S-8071 for units with Elec. AutoLite Generator.
3. Many types of magnetos have been used — order component parts by magneto nameplate reading.
4. On switch replacements for welder's code 215 thru 1123 order new S-8020 switch, adapter T-9101 and plate T-9061.
5. Codes prior to 2954.

MARVEL - SCHEBLER CARBURETOR PARTS

Carburetor Part Number S-9239



ITEM	PART NAME AND DESCRIPTION	PART NO.	NO. REQ'D.
1	Body Assembly	10-3180	1
2	Lever, Throttle, Loose	12-A38	1
3	Shaft, Stop & Lever Ass'y. Throttle	13-930*	1
4	Valve, Throttle (20°)	14-227	1
5	Screw, Throttle Stop (8-32 x 3/4)	15-42	1
7	Screw, Choke Swivel (8-32 x 5/16)	15-285	1
8	Screw, Drive, Float Bk't. (2 x 1/4)	15-343	2
10	Screw, Nozzle Hole Plug (8-32)	15-409	1
11	Screw & L.W. Ass'y. (4-40 x 1/4)	15-A91*	2
12	Screw & L.W. Ass'y. (4-40 x 1/4)	15-A91*	2
13	Screw, Clevis Clamp (10-24 x 5/8)	15-A55	1
14	Screw, L.W. Ass'y. (12-24 x 5/8)	15-A82	1
15	Screw, L.W. Ass'y. (12-24 x 5/8)	15-A82	4
16	Screw, L.W. Ass'y. (8-32 x 3/8)	15-A93	1
17	Screw, L.W. Ass'y. (8-32 x 5/16)	15-A99	1
18	Gasket, Float Valve Seat	16-4	1
19	Gasket, Throttle Body to Bowl	16-80	1
20	Gasket, Main Nozzle	16-449	1
21	Spring, Choke Return	24-247*	1
22	Spring, Throttle Stop Screw	24-262	1
23	Spring, Governor Lever	24-281	1
24	Spring, Choke Valve Flapper	24-425	1
25	Spring, Idle Needle	24-340*	1
26	Lever & Shaft Ass'y. Choke	26-659	1
27	Valve Assy. Choke	27-539	1
28	Swivel, Choke Lever	28-49	1
29	Clip, Choke Bracket	29-81	1
30	Bracket, Choke	29-104	1
31	Bracket, Ass'y. Choke	29-528	1
32	Float & Lever Ass'y.	30-600	1
33	Shaft, Float Lever	32-27*	1
34	Needle, Idle Adjusting	43-33*	1
35	Packing, Throttle Shaft	44-38*	1
36	Packing, Choke Shaft	44-39*	1
37	Venturi (25/32" Dia.)	46-457	1
38	Nozzle, Main	47-180	1
39	Jet, Idle	49-203*	1
40	Jet, Economizer	49-145*	1
41	Jet, Power	49-188*	1
42	Cup, Throttle Shaft	55-230*	1
44	Retainer, Choke Shaft Packing	55-243*	1
45	Bushing, Governor Lever	60-257	1
47	Pin, Throttle Stop	62-167	1
50	Plug, Idle Drilling	80-171	1
51	Nut, Clevis Clamp (10-24)	81-1	1
52	Pin, Cotter	82-14	1
53	Cotter, Hairpin	82-16	1
54	Strainer, Fuel Drain	95-40	1
56	Plug, Bowl Drain	99-7	1
57	Clevis Ass'y.	121-504	1
58	Bracket, Float	136-54	1
59	Lever Ass'y., Governor	155-590	1
60	Plug, Expansion Fuel Drain	179-35	1
61	Bail, Numbering Plate	206-36	1
62	Throttle Body & Shaft Ass'y.	227-1130	1
63	Valve & Seat Ass'y., Float	233-536*	1
-	Repair Kit (See*Note)	286-856	-
-	Gasket Kit	16-613*	-
*These parts included in repair kit 286-856			