



990 STARTER

PARTS & OPERATION

990STARTER-RP-B-OCT15

**A Tradition of Excellence
Since 1955**



Arrow Engine Company was founded in 1955 as Arrow Specialty Company by Jeff Davis in Tulsa, Oklahoma, beginning a tradition of providing premium service and exceptional products to the oil & gas industry, as well as other industrial markets throughout the world. Arrow is a market-leading provider of natural gas powered engines and parts, as well as gas compressors, gas production equipment, meter runs, engine electronics and chemical pumps. Today, Arrow continues its tradition of focusing on producing the most reliable equipment, parts and extraordinary customer service in the industry.

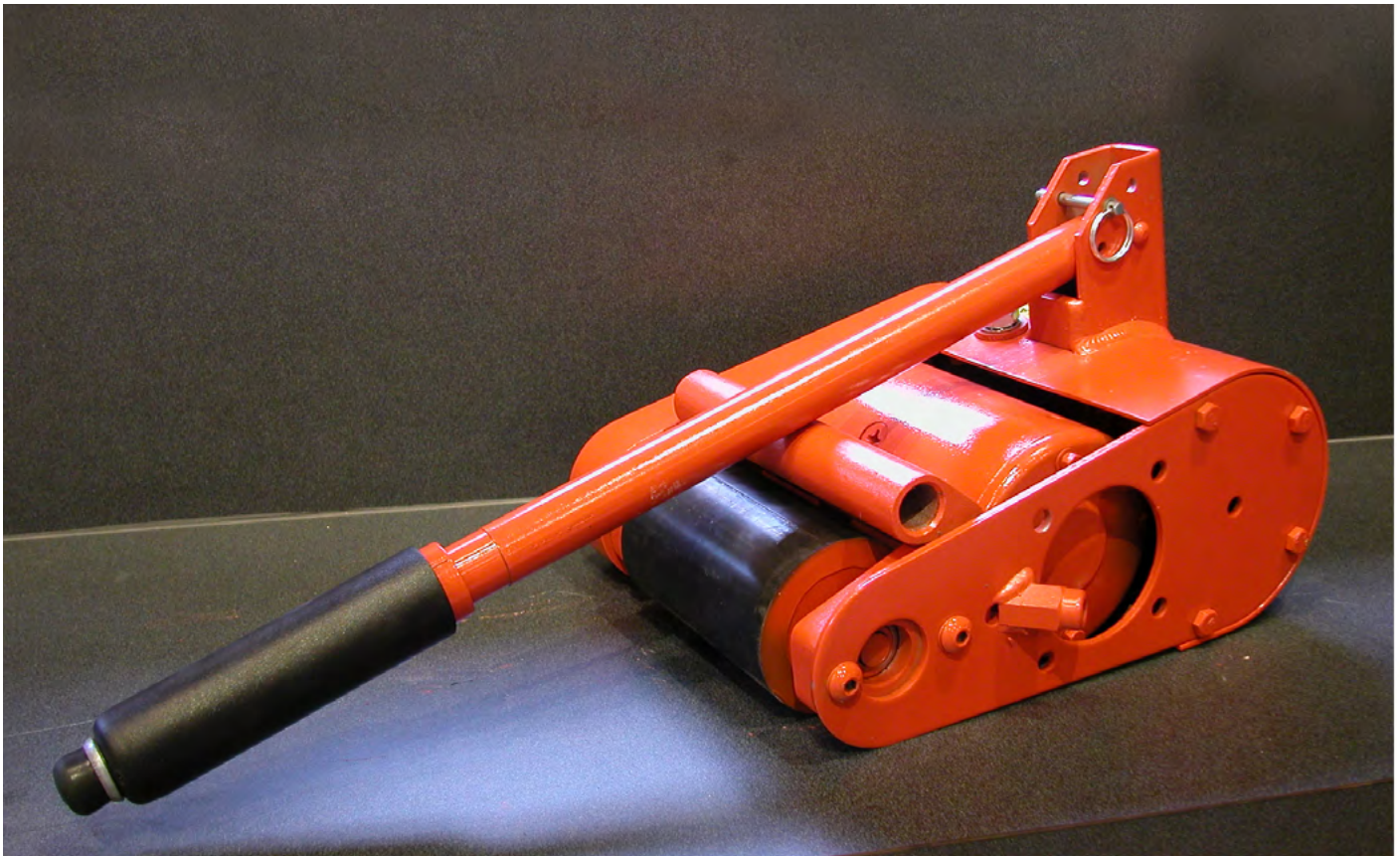


Arrow is a part of IES Infrastructure, which operates as one of four divisions under IES Holdings, Inc. comprised of over 8,000 employees nationwide. IES Infrastructure provides electrical and mechanical apparatus services, custom steel fabrication, and custom power solutions including generator enclosures and bus systems to customers both in the United States and abroad.

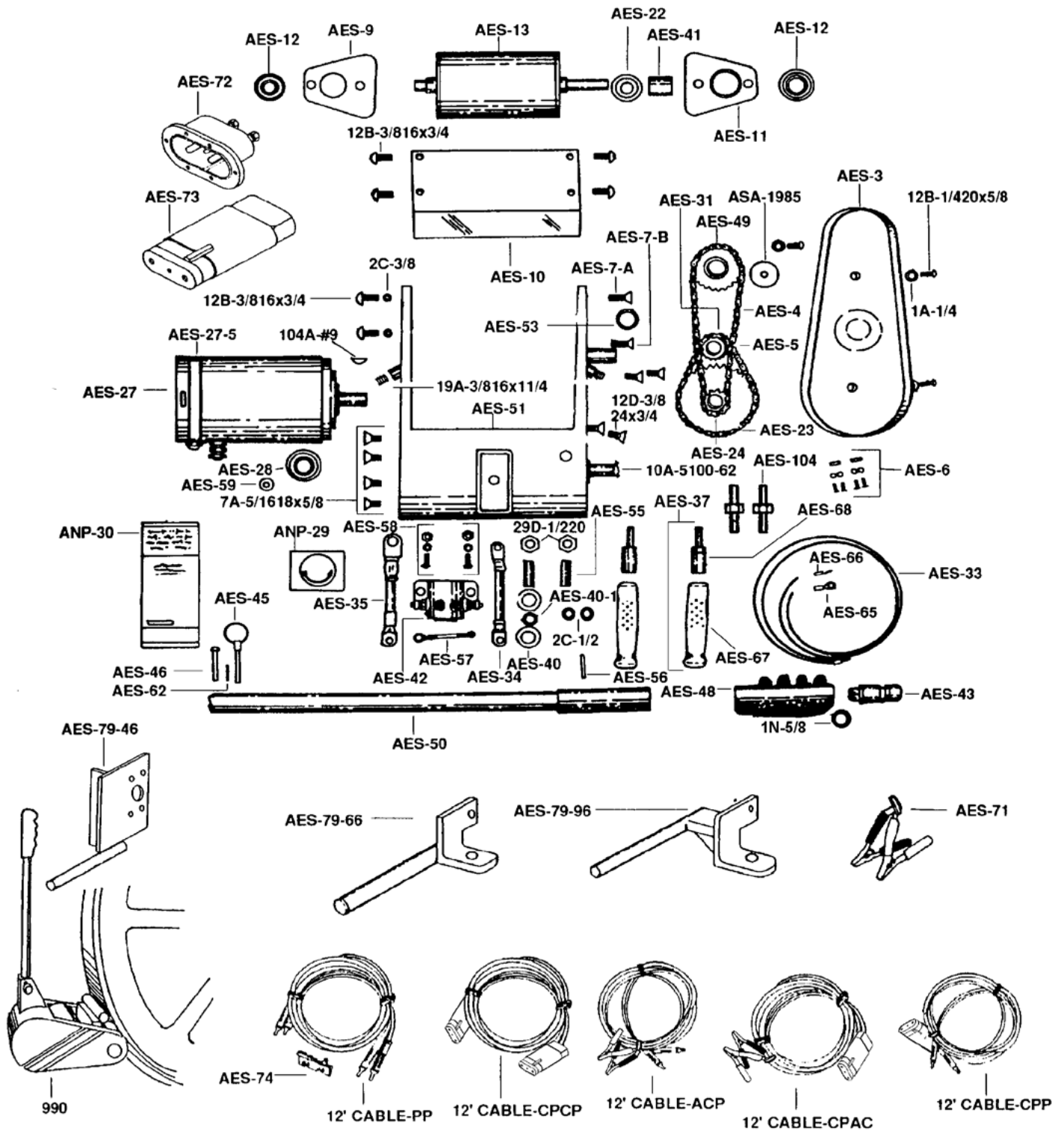


990 Arrow Engine Starter

- **Arrow torque 12-volt motor with extra heavy duty winding & armature with anti-friction ball bearings**
- **Heavy duty construction equipment starter button**
- **Sealed permanent lube ball bearings, throughout**
- **High performance special composition roller**
- **Plug-in-type high amp capacity connectors**
- **New larger capacity safety clutch**
- **Lightweight - portable - 43 lbs.**
- **Safe single hand operation**



Arrow Portable Electric Starter (990 Starter)



Arrow Portable Electric Starter (990 Starter)

Arrow Part No.	Description	Quantity
1A-1/4	Plated Lockwasher	5
1N-1/4	Washer Flat SAE	2
1N-5/8	Wahser Flat SAE	1
2C-3/8	Internal Lockwasher	2
2C-1/2	Internal Lockwasher	2
7A-5/1618x5/8	Capscrew Hex Hd	4
10A-5100-62	Ext Retaining Ring	1
12B-1/420x5/8	Capscrew Button Head	5
12B-3/816x3/4	Capscrew Button Head	2
12D-3/824x3/4	Mach. Screw Flat Soc	4
29A-1/420	Finished Hex Nut	2
29D-1/220	Finished Hex Jam Nut	5
104A-#9	Woodruff Key	1
AES-3	Chain Drive Cover	1
AES-4	Chain-60 #35 PTCH	1
AES-5	Roller Chain-Short	1
AES-6	35-1 Chain Conn Link	2
AES-7-A	Capscrew-Sm Hd	1
AES-7-B	Capscrew-Lg Hd	1
AES-9	Alum Brg Housing w/Brg	1
AES-10	Pivot Bracket	1
AES-11	Alum Brg Housing w/Brg	1
AES-12	Bearing	2
AES-13	Strt Friciton Roller	1
AES-22	Sproket Spacer	1
AES-23	Dbl Sprkt w/Bushing	1
AES-24	Dbl Sprkt Bushing	1
AES-27	Electric Motor 12VDC	1
AES-27-5	Motor Brush Cover	1
AES-28	Bearing	1
AES-30	Motor-Brushes-Set	1
AES-31	Sprocket-Motor	1
AES-33	Starter Btn Wire	2
AES-34	Cable-Mtr-Solenoid	1
AES-35	Cable-Sol to Recep	1
AES-40	Insulated Washer	2
AES-40-1	1/2" Insulator	1
AES-41	Clutch Plate	1
AES-42	Solenoid	1
AES-43	Starter Btn	1

Continued

Arrow Portable Electric Starter (990 Starter)

Arrow Part No.	Description	Quantity
AES-45	Lock Pin	1
AES-46	Pin Handle Rivet	1
AES-48	Grip Cover	1
AES-49	Rlr Dr w/Clutch	1
AES-50	Starter Handle Assy	1
AES-51	Frame	1
AES-53	Clutch	1
AES-55	Receptacle Brass	2
AES-56	Pin Handle Grip Sleeve	1
AES-57	Solenoid Wire	1
AES-58	Screw, Nut & Washer	2
AES-59	Grommet for Starter	1
AES-62	Retainer Pin	1
AES-65	Large Hole Eyelet	1
AES-66	Small Hole Eyelet	1
AES-67	Starter Cable Grips	2
AES-68	Starter Cable Plugs	2
ASA-1985	Check Valve Disc Pltd.	1
ANP-29	Rotation Decal	1
ANP-30	Warning Release Roller	1
ACCESSORIES:		
12' Cable-ACP	Allig. Clips & Plugs	1
16' Cable-ACP	Allig. Clips & Plugs	1
20' Cable-ACP	Allig. Clips & Plugs	1
12' Cable-CPAC	Cannon Plugs, Allig, Clips	1
16' Cable-CPAC	Cannon Plugs, Allig, Clips	1
20' Cable-CPAC	Cannon Plugs, Allig, Clips	1
12' Cable-CPCP	Cannon Plug Both Ends	1
16' Cable-CPCP	Cannon Plug Both Ends	1
20' Cable-CPCP	Cannon Plug Both Ends	1
12' Cable-PP	Plugs w/Female Recep	1
16' Cable-PP	Plugs w/Female Recep	1
20' Cable-PP	Plugs w/Female Recep	1
*Custom Length Cables Also Available		
*All Cables Made w/ #4 Welding Cable		
AES-37	Male Plug w/Insulator Kit	1
AES-71	Alligator Clips-Pair	1
AES-72	Cannon Receptacle	1
AES-72-RK	Cannon Recep. Repair Kit	1
AES-73	Cannon Plug Assy	1
AES-73-RK	Cannon Plug Recep. Kit	1
AES-74	Recep Mounting Bracket	1
AES-79-46	Starter Bracket	1
AES-79-66	Starter Bracket	1
AES-79-96	Starter Bracket	2
AES-104	Adapter Plug	1

Operation and Installation Instructions



Figure 1

Figure 1 shows a typical mounting bracket permanently placed on the engine or engine base. The mounting bracket or pin should be approximately 11" long and 3/4" in diameter. The pin should extend parallel to the axis of the flywheel and approximately 1" perpendicular distance from the surface on the outside diameter of the flywheel. This will allow for maximum single hand leverage of the

roller against the engine flywheel. Due to the various types of bases used on engines we do not furnish the mounting pin; it is normally furnished by the welder or installer, in the field. All current Arrow engines are equipped with starter brackets.

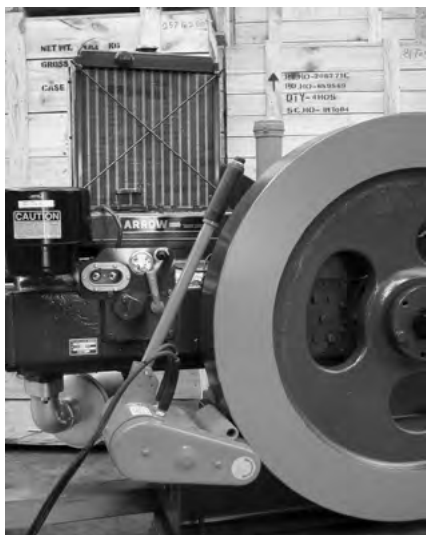


Figure 3

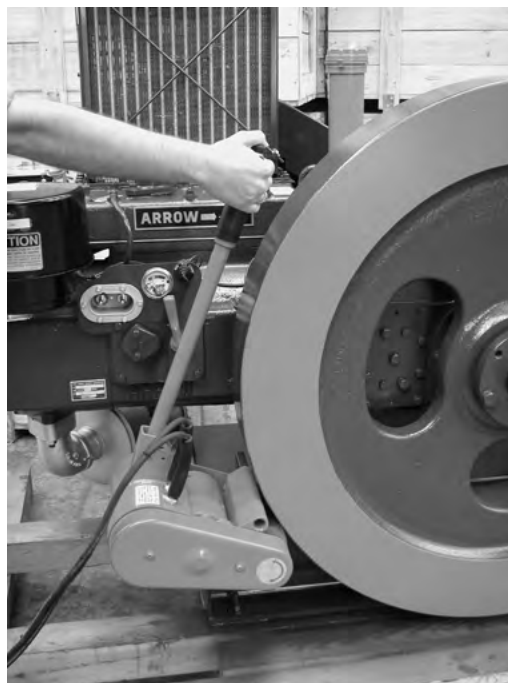
Safety Clutch will prevent the engine flywheel from transmitting excessive RPM to the starter motor armature. Failure to release the roller immediately can result in serious damage to the motor armature windings without the Safety Clutch.

Figures 2 & 3 show the Arrow Engine Starter installed complete with the standard 12-foot No. 4 cables plugged into the vehicles power supply.

The new model 990 Arrow Engine Starter is equipped with a new, large size, built-in automatic Safety Clutch. If the operator does not release the roller from the flywheel immediately after the engine starts operating, the



Figure 2





C-SERIES	C-46	C-66	C-96	C-101	C-106	C-255
A-SERIES	A-32	A-42	A-54	A-62 A-62 Turbo A-62 Genset	A-90 A-90 Turbo A-90 Genset	A-160 A-160 Turbo A-160 Genset
K-SERIES	K6					
L-SERIES	L-795					



GAS PRODUCTS	Meter Runs Meter Skids	Volume Tanks Coalescers Structural Skids	2 & 3-Phase Separators Fuel Gas Cond. Skid	Heater Treater Indirect Heater H2S Scavenger Unit	Dehydration Unit Liquid Stabilizer
CHEMICAL PUMPS	10 Series (beam operated)	430 Series (electric)	12, 500, & 510 Series (pneumatic)	Solar Chemical Pumps	OEM & Aftermarket Spare Parts



COMPRESSION PRODUCTS	Compressor Frames VRC-2 VRS-2 VRS-4 (Coming Soon)	CNG Compressor Frames & Packages VRC-CNG	Vapor Recovery Units VRU-1 VRU-2	Gas Lift Packages Electric HP Gas Engine (VR, A-Series, Cat)	Custom Compression Packages
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Arrow Engine Company
2301 East Independence • Tulsa, Oklahoma 74110
fax (918) 699-2202
local (918) 583-5711



(800) 331-3662

www.ArrowEngine.com



CATERPILLAR®	G379	G398	G399	G3304	G3306
WAUKESHA®	F2895 F3521 F5108	L5790 L7042	P9390	145G/F817 140G/F554	F18 H24 WAK/1197
FAIRBANKS®	ZC-118	ZC-208	ZC-503	ZC-739	ZC-346
AJAX®	5x 6½	EA-22, 6½ x 8 CMA EA30, 7½ x 10 CMA EA-30, 7¼ x 8 CMA E-42, 8½ x 10 CMA		DP-60, 9½ x 10 CMA DP-115/230, 13½ x 16 DP-70/80/160, 11 x 14 CMA	

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