



C SERIES

ENGINES AND GENSETS
EPA Certified C-46 C-66 C-96 and C-101



C SERIES ENGINES

EPA Certified C-46, C-66, C-96, C-101 and Certifiable C-106, C-255

Arrow's C Series Engines are built to excel at one of the toughest, most demanding jobs - continuous operation in the oil-field. That's why they are the best you can buy... not only to power pump jacks, but to pump liquids, generate electricity and provide the "muscle" necessary for many other jobs. Arrow C Series Engines utilize heavy flywheels to provide high internal momentum for smooth, high torque while running at constant low RPM. The advantages of low RPM are substantial: less wear, less maintenance, less repair and in the long run less frequent replacement. Compared to high RPM engines, the C Series engine lasts many times longer and costs less to operate.

FEATURES

Continuous Duty: Arrow C Series Engines are designed for continuous duty. They provide the dependability that is so essential to oil-field operation. Arrow's heavy duty design features a heavy flywheel, a governor speed control, and a pressurized full flow lubrication system to assure continuous operation.

Oil-field Tough: Over 75,000 Arrow engines are powering pump jacks in oil fields from the frozen tundras of Canada, to the mountains of South America; from the deserts of the Middle East, to the jungles of Indonesia. Many of the original engines built in the 1940's are still running today.

Gas Fueled: Arrow engines run on a variety of low BTU gases: natural gas, methane, butane or propane. In many areas, locally available gas fuel frequently costs much less than bringing in liquid fuel or electric power.

Economical Operation: Studies performed in the U.S. have shown that operating costs for Arrow engines can be as low as half the cost for equivalent HP electric motors. Since every area is different, you owe it to yourself to compare the costs in your area.

Easy Maintenance: Arrow engines are designed for easy, quick field maintenance. Easy access enables replacing piston rings and wet cylinder sleeves in the field; and Arrow parts are interchangeable from the first model made.

Ignition: Solid State Ignition Systems are standard for Single Cylinder engines. Altronic ignition systems are also available as an option.



SPECIFICATIONS

Specifications	C-46	C-66	C-96	C-101	C-106	C-255
BHP Range	5-9 BHP	7-13 BHP	11-19 BHP	19-24.5 BHP	17-32 BHP	32-55 BHP
RPM Range	400-800 RPM	350-700 RPM	300-600 RPM	400-800 RPM	300-800 RPM	400-750 RPM
Continuous Duty RPM	9 HP 800 RPM	13 HP 700 RPM	19 HP 600 RPM	24.5 HP 800 RPM	32 HP 800 RPM	65.7 HP 750RPM
EPA Emissions Compliance	Certified	Certified	Certified	Certified	Certifiable	Certifiable
Bore and Stroke	5" x 6 1/4" 127x159mm	5 3/4" x 7 1/2" 146x190.5mm	7" x 8 1/2" 178x216mm	7 1/2" x 8 1/2" 190.5x216mm	7 1/2" x 8 1/2" 190.5x216mm	7 1/2" x 7 1/2" 190. x190.5mm
Displacement	122.7 CI 2 L	195 CI 3.3 L	327 CI 5.5 L	376 CI 6.4 L	376 CI 6.4 L	660 CI 10.8 L
Compression Ratio	4.8:1	5.2:1	4.8:1	6.2:1	6.2:1	7:1
WR²	290 LB FT ² 12.18 Kg-M ²	600 LB FT ² 25.20 Kg-M ²	1600 LB FT ² 67.20 Kg-M ²	1760 LB FT ² 73.92 Kg-M ²	1760 LB FT ² 73.92 Kg-M ²	1430 LB FT ² 60.06 Kg-M ²
PTO Shaft Size	1 7/16" 36.5 mm	2 1/4" 57.2 mm	2 1/4" 57.2 mm	2 1/4" 57.2 mm	2 1/4" 57.2 mm	3" 76 mm
Oil Capacity *	7 QT 6.6 L	7 QT 6.6 L	11 QT 10.4 L	11 QT 10.4 L	11 QT 10.4 L	25 QT 23.7 L
Water Capacity	12 QT 11.5 L	16 QT 15 L	20 QT 19 L	20 QT 19 L	20 QT 19 L	9 GAL 34 L
Spark Plug Size	18mm	18mm	18mm	18mm	18mm	18mm
Exhaust Connection	1 1/2" NPT	2" NPT	2 1/2" NPT	2 1/2" NPT	2 1/2" NPT	2 1/2" NPT
Fuel Gas Pipe Size	3/8" NPT	3/8" NPT	1/2" NPT	3/4" NPT	1/2" NPT	3/4" NPT
MTG. Bolts: Qty - Size	4 - 3/4"	4 - 3/4"	4 - 1"	4 - 1"	4 - 1"	4 - 1"
Shipping Weight	1,433 LB 650 Kg	1,811 LB 821 Kg	2,790 LB 1,266 Kg	2,975 LB 1,349 Kg	2,975 LB 1,349 Kg	4,510 LB 2,046 Kg
Truck Load Quantity **	24	22	16	10	16	10
Safety Controls	Water Level and Oil Pressure standard					
Ignition	Solid State Ignition					
Fuel	Gaseous					
Lubrication	Full Pressure					
Oil Filtration	Replaceable Full Flow Filter					
Clutch PTO (Double Bearing)	C-107-SP-5-DB	C-110-HP-4	C-110-HP-3	SP-111-HP-3	SP-111-HP-3	SP-114-PO
Starting Equipment	12 Volt Ring Gear Starter standard					

* Oil Filter Changes add 1 QT

** 45' Truck Bed



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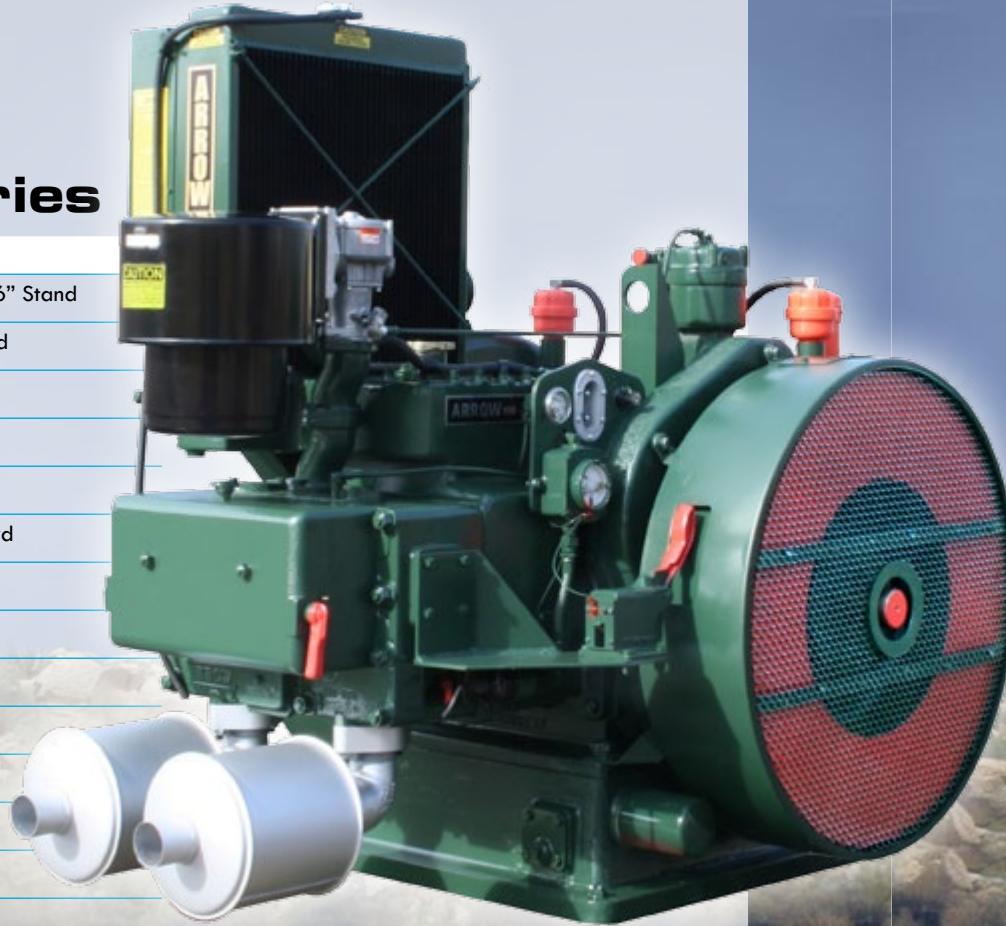
THE ARROW C-SERIES IS STILL THE # 1 CHOICE FOR INDUSTRY PUMPING APPLICATIONS:

- Continuous Duty
- Oil Field Tough
- Natural Gas Fueled
- Economical Operations
- Easy Maintenance
- EPA Certified C-46, C-66, C-96 & C-101
- Auto Start System Option
- Solid State Ignition

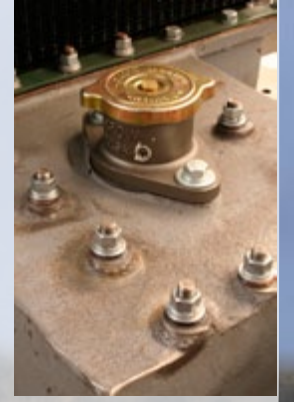
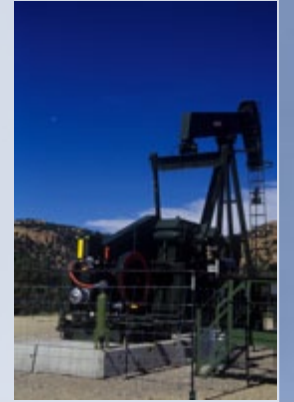
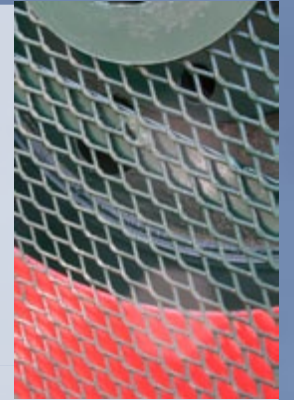


Options & Accessories

Part Number	Description
15G-(36/56)	15 Gallon Tank with 36" or 56" Stand
30G-56-OP	30 Gallon Tank with 56" Stand
20-SD-250-OP	High Temp Shutdown-Option
332-TSK-46-1-OP	Thermosiphon Option
368-A-(46/66/96/101/106)-OP	Aluminum Flywheel Guard
368-ASE-(46/66/96)-OP	Shearer Plastic Flywheel Guard
512-K-OP	Regulator Oil Level
512-C-KIT-OP	Equilibrium System
ALT-(46/66/96/101/106)-OP	Alt & Brkt OP
HBD-2459-F	Volume Tank - FS
HBD-2459-G	6" Volume Tank Assembly
HBD-2459-H	10" Volume Tank Assembly
VTHF10	Hose Assembly C46-66
VTHF13	Hose Assembly C245, C255
VTHF14	Hose Assembly for C-96/106



Production, bpd	Plunger Size	API Rod Size	Strokes Per Min	Hp	Engine	API Pumping Unit Size
2,000 Foot Pump Depth						
100	1.5	55	14.0	2.6	C-46	25-53-30
200	1.75	55	17.3	5.3	C-46	40-89-36
300	2.0	55	14.9	6.0	C-46	80-109-48
400	2.0	55	17.3	10.6	C-66	80-119-54
500	2.25	55	17.6	13.3	C-66	114-133-54
600	2.25	55	15.0	16.0	C-96	160-143-74
800	2.5	755	16.5	21.3	C-106	160-143-74
1000	2.75	66	16.7	26.6	C-106/VR260	228-173-74
1250	2.75	66	17.5	33.3	C-255/VR260	320-218-86
1500	2.75	77	14.4	39.9	C-255/VR330	456-213-120
3,000 Foot Well Depth						
100	1.25	55	16.5	14.0	C-46	40-89-36
200	1.5	55	17.2	18.0	C-46	80-109-48
300	1.75	55	17.6	12.0	C-66	114-133-54
400	1.75	55	16.3	16.0	C-96	160-143-74
500	2.0	66	15.5	20.0	C-96	228-178-74
600	2.0	66	15.8	23.9	C-106/VR260	320-213-86
800	2.25	66	16.9	32.0	C-255/VR260	320-213-86
1,000	2.5	76	12.4	39.9	C-255/VR330	456-213-120
1,250	2.5	76	15.2	50.0	L-795/VR330	640-305-120
1,500	2.75	76	15.3	60.0	L-795/VR330	640-305-120
4,000 Foot Well Depth						
100	1.25	66	12.3	5.3	C-46	80-109-488
200	1.5	66	11.1	10.6	C-66	160-143-74
300	1.5	66	15.5	16.0	C-96	228-173-74
400	1.75	76	13.9	21.3	C-106	320-213-86
500	1.75	76	16.5	26.6	C-106/VR260	320-213-86
600	1.75	76	14.2	32.0	C-255/VR260	456-213-120
800	2.0	76	14.9	42.6	C-255/VR330	640-305-120
1000	2.5	86	10.6	53.2	L-795/VR330	912-365-144
5,000 Foot Well Depth						
100	1.5	75	11.3	6.7	C-46	80-133-48
200	1.5	75	12.1	13.3	C-66	228-173-74
300	1.75	76	11.3	20.0	C-96	320-213-86
400	1.75	76	15.0	26.7	C-106/VR260	320-213-86
500	1.75	85	12.6	33.4	C-255/VR260	640-305-120
600	1.75	86	14.2	40.0	C-255/VR260	640-305-120
6,000 Foot Well Depth						
100	1.25	75	10.6	8.0	C-46	114-143-64
200	1.25	75	16.6	16.0	C-96	228-173-74
300	1.5	76	14.9	24.1	C-106/VR260	320-213-86
400	1.75	86	10.5	32.0	C-106/VR260	640-305-120
500	1.75	85	13.1	40.0	C-255/VR330	640-305-120
600	1.75	86	12.2	47.9	L-795/VR330	942-365-144
7,000 Foot Well Depth						
100	1.25	75	9.9	9.3	C-46	160-173-74
200	1.25	75	16.0	18.6	C-96	228-173-74
300	1.5	76	15.6	27.9	C-106/VR260	320-213-86
400	1.75	85	12.1	37.2	C-255/VR260	640-305-120
500	1.75	85	14.1	46.6	C-255/VR330	640-305-120
600	1.75	86	9.2	55.9	L-795/VR330	942-365-144
10,000 Foot Well Depth						
100	1.25	85	8.6	13.3	C-66	320-256-100
200	1.25	85	11.0	26.7	C-106/VR260	456-256-120
300	1.25	96	10.5	39.9	C-255/VR330	912-365-168
11,000 Foot Well Depth						
100	1.25	85	8.7	14.6	C-96	320-256-100
200	1.25	85	8.5	29.3	C-106/VR260	640-305-168
300	1.25	96	9.3	43.9	C-255/VR330	280-427-192



GAS vs ELECTRIC

Rising production costs require every operator to evaluate all aspects of artificial lift, which includes selecting the right type of prime mover to fit the application. Although the slow-speed natural gas engine was the workhorse of the industry well into the 1970's, a variety of factors have conspired to make electric motors the de facto standard in oil production over the past three decades. However, the gas engine's time has come again. With more wells pumping continuously and electric rates skyrocketing, matching the right natural gas engine to the beam pumping application can deliver both operational and economic benefits.

Is it more costly to pump the well with Arrow gas engines than with electricity?

On many wells, 50% or more of the lifting cost can be attributed to the electricity charges. When all factors are known about the well requirements, the prevailing electric rates, and the drop charges, it can be shown by cost analysis that the Arrow gas engine has the "Cost Advantage"; the higher the horsepower the greater the savings. Arrow has developed an online utility to help you calculate your savings – visit www.arrowengine.com and click on "Toolbox."

What kind of warranty do I get with an Arrow gas engine?

Arrow Engine Company offers its customers the best warranty in the industry. We are the only manufacturer that offers a 36 month limited warranty on many of our engines' primary components. Contact our Customer Service Department and one of our Team Members will be happy to send you a copy of our engine warranty.

Once I have Arrow gas engines, how do I find out about maintenance and technical support?

Arrow offers free phone support and has published an instruction and parts manual that is periodically updated with the latest maintenance information. One of these manuals ships with every engine. Copies can also be downloaded from our web site or you may contact our Customer Service Department and we'll be happy to send one to you. Arrow also offers an exclusive 3 day engine service school designed to fully train field personnel in the maintenance and operation of Arrow gas engines. In certain situations, Arrow is willing to conduct these classes at your facility or in the field.

Can the operation of C-Series engines be automated?

Arrow offers an Auto-Start® System package for our engines as well as other brands. This flexible programmable system allows for different cycles for each day of the week as well as continuous monitoring of critical operating parameters and automatic shutdown when potentially hazardous conditions are detected. Some additional key features of the unit include automatic on/off cycle timing, oil circuit integrity monitoring, selectable speed ranges, programmable start-up sequence, and a built in start attempt counter. For further information you can contact our Customer Service Department, view a video demonstration or download product information on our web site.



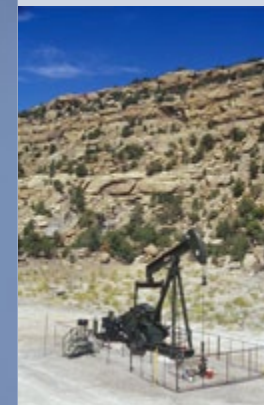
ARROWGUARD

Aluminum Safety Flywheel Guard

The ArrowGuard Aluminum Safety Flywheel Guard ensures maximum personnel safety and access for field service.

Normal field servicing and adjustments can be performed safely with the ArrowGuard in place on your engine. This lightweight metal cover shields the flywheel to guard against the possibility of any accidental contact with service personnel or foreign objects.

With the guard in place, the unit can be started with its own electric starter, plus ArrowGuard has been designed to accommodate both a hand crank or removable power starter. The protective cap is easily installed over the shaft after startup.



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C SERIES GENSETS

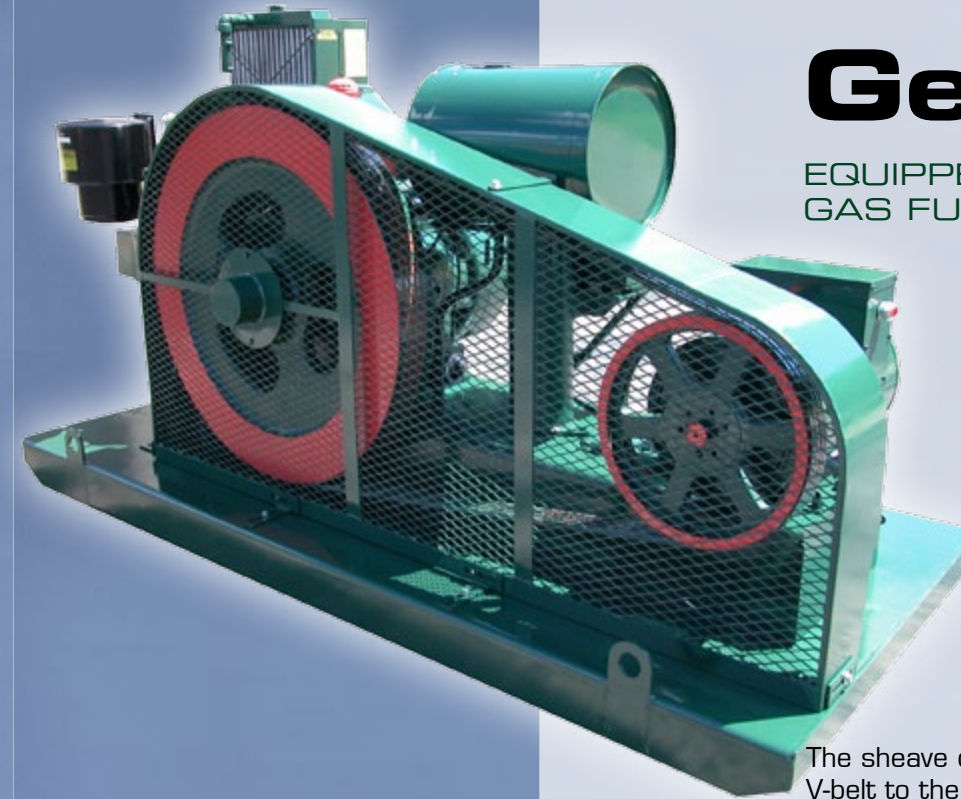


The Arrow C-255 Slow Speed Engine, powering a Global Power Systems InGen Induction Generator System in Northern Oklahoma.

Continuous Cathodic Protection

Cathodic protection, in simplest terms, means providing an electrical charge to reduce corrosion. To gas and oil professionals around the world, Cathodic protection is a real concern. If the countless miles of pipelines were not protected, the threat of leakage or failure would be greatly increased. In the U.S. the D.O.T. Office of Pipeline Safety states that pipelines operating at certain pressures must have cathodic protection installed. The installation of a cathodic protection system reduces or eliminates corrosion. In the corrosion process, minute metal particles are carried from the pipeline by the resulting current flow, which causes a pitting or weakening of the pipeline, ending in leakage or failure of the line.

Arrow Engine Company has a solution to the problem of cathodic protection for remote site locations along gas pipelines. Our single cylinder generator set GenSet can be strategically placed along the pipeline using natural gas to generate D.C. current to control the flow of current onto the pipeline structure. This process cuts down the wear and tear on the lines that carry millions of cubic feet of gas per day.



GenSets

EQUIPPED WITH C-SERIES NATURAL GAS FUELED ENGINES FEATURING:

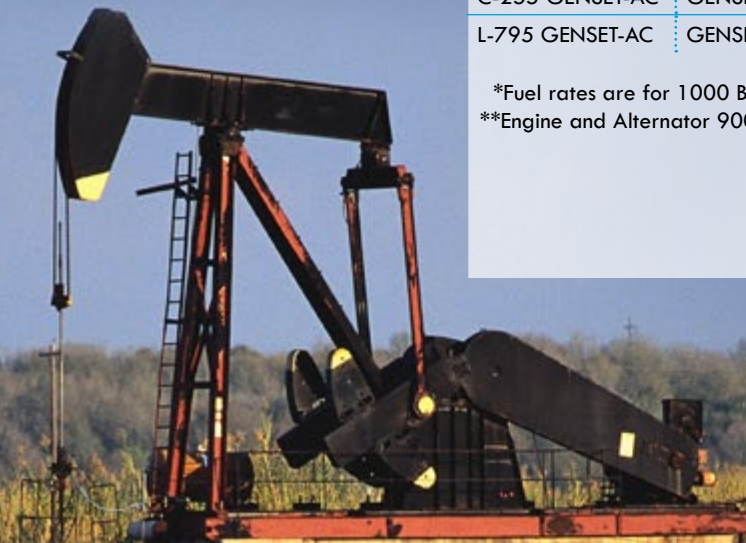
- Oil Bath Air Cleaner
- Full Flow Lube Oil Filtration
- Pressure Lubrication throughout Engine
- Starfire 600 Ignition
- Electrical Engine Speed Governor
- Safety Switches for:
 - Low Oil Pressure
 - Low Lube Oil
 - Low Coolant Level
- 12 Volt Electric Ring Gear Starter
- Synchronous 60Hz Alternator
- Remote Mounted Electrical Control Panel

The sheave drive on the engine is directly connected via V-belt to the alternator. Both the engine and alternator are mounted on a common steel base.

Engine Model #	Description	Engine RPM	Alternator RPM	Fuel Required*
C-46 GENSET-AC	GENSET 5KW	700	1800	2.2 MCF/D
C-46 GENSET-DC	GENSET 5KW DC	700	1800	2.2 MCF/D
C-66 GENSET-AC	GENSET 7.5KW	600	1800	3.0 MCF/D
C-96 GENSET-AC	GENSET 12KW	550	1800	4.7 MCF/D
C-106 GENSET-AC	GENSET 20KW	700	1800	8.2 MCF/D
C-255 GENSET-AC	GENSET 41KW	900**	900**	14.5 MCF/D
L-795 GENSET-AC	GENSET 41KW	500	1800	15 MCF/D

*Fuel rates are for 1000 BTU rated gas: BTU Rating x Engine Requirement x 0.001 = Fuel Rate

**Engine and Alternator 900 RPM Direct Coupled



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ARROW ENGINE Co

In 1955 Arrow Engine Company opened for business, beginning the tradition of providing premium service and exceptional products to the oil & gas industry, as well as the industrial engine market, throughout the world. Arrow Engine Company is part of the TriMas Corporation. TriMas consists of 11 business units with 2006 revenues of over \$1 billion and maintains a workforce of over 5,000 people at 80 different facilities in 10 countries around the world.

With a consistent focus on our customers' needs, striving to help them grow their business, and producing the most reliable equipment and parts in the industry, Arrow has forged a 52 year tradition of excellence.



AutoStart NS-2

Our new Autostart-NS-2 for all Arrow engines is a simple, programmable system that allows for different cycles each day of the week as well as continuous monitoring of critical engine operating parameters and automatic shutdown. This system features a built in tachometer, hour meter and battery voltage meter. The automation can be set to real time, interval timing, manual mode or remote start, giving you everything you need to easily automate and monitor your oil field operations.



Clutch Actuator FOR C SERIES ENGINES

Arrow has introduced its new patented Clutch Actuator (CO-00) for C-Series and A-Series Engines. This new actuator features a simple 2 wire and 12V connection for ease of installation. All adjustments are made outside the unit on the linkage that connects the actuator to the clutch lever. This in conjunction with the New Style Auto Start (Autostart-NS) is the simplest and easiest to use and install electronic automation package available anywhere.



ARROW K6 SLOW SPEED ENGINE

- Continuous Duty
- Oil Field Tough
- Natural Gas Fueled
- Economical Operation
- Easy Maintenance
- EPA Certified
- Electric Start
- Arrow 100 Carburetor
- Solid State Ignition
- 2.7-4.8 HP, 400-800 RPM
- 1 Year Warranty



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ARROW MANUFACTURED
**REPLACEMENT
PARTS**

Caterpillar® Engines

G379 G3304
G398 G3306
 G399

Waukesha® Engines

F2895 P9390
F3521 145G/F817
F5108 140G/F554
L5790 WAK/1197
 L7042

Fairbanks Morse® Engines

ZC-118 ZC-503
ZC-208 ZC-739
 ZC-346

Ajax® Engines

5 x 6½
EA-22, 6½ x 8 CMA
EA-30, 7¼ x 8 CMA
E-30, 7½ x 10 CMA
E-42, 8½ x 10 CMA
DP-60, 9½ x 10 CMA
DP-70/80/160, 11 x 14 CMA
DP-115/230, 13¼ x 16

Piston & Rod Assemblies
180
360
600
800

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OEM

C-Series

*C-46 *C-96
*C-66 *C-101
*C-106 *C-255

VR-Series

VR-155 VR-310
VR-220 *VR-330
VR-232 *VR-330CF
*VR-260 VR-265
VR-283 *VR-380

A-Series

*A42 *A54 *A62

K6 Slow Speed Engine

*

Lufkin Engines

L-333 L-1770
*L-795 L-2165

Witte Engines

98 E15 F32
B12 E20 F42

Arrow Chemical Pumps

* 10 Series (beam operated)
* 12 & 13 Series (pneumatic)
* 430 Series (electric)
* 500 & 510 Series (pneumatic)
* Solar Chempump

Gas Compressors

* *VRC-2 *VRC-CNG

Gas Products

* Volume Tanks
* Vertical & Horizontal Separators
* Suction Scrubbers
* Meter Runs
* Coalescers
* Skids



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