



Ariel Frame Data Sheet

Model: KBZ/4

Stroke: 6.75 in

Class: (KBZ)



Frame:

Number of Throws: 4
Rated Power: 5200.0 BHP
Frame Friction Power: 46.00 BHP
Cyl Friction Factor: 0.95
Guide Type: Separate

Weights:

Avg. Weight without Cylinders: 27300.00 lbs
Maximum Recip: 1604.65 lbs
Maximum Imbalance: 5.00 lbs
Crankshaft: 2730.00 lbs
Connecting Rod: 273.90 lbs
Pin Assembly: 93.10 lbs
Stub Shaft: 9.30 lbs

Speed Ratings:

Rated Piston Speed @ RPM: 1125.0 FPM
Maximum Speed: 1000.00 RPM
Minimum Speed: 500.00 RPM
Minimum PRC Speed: 500.00 RPM
Maximum Process Speed: 750.00 RPM

Frame Dimensions:

Center Line Height: 24.00 in
Max. Overall Height: 42.00 in
Max. Overall Width with Cylinders: 192.00 in
(Std Guide, widest dbl. Cyl, No HEH devices)
Length: 135.00 in

Component Dimensions:

Piston Rod Diameter: 2.875 in
Connecting Rod Center Distance: 18.500 in
Crankshaft Pin Diameter: 8.000 in
Crankshaft Journal Diameter: 8.000 in
Main Bearing Width: 4.750 in

Internal Gas Rod Loads:

Total: 150000 lbf
Compression: 80000 lbf
Tension: 75000 lbf
Single Acting Tension: 75000 lbf

Lubrication:

Oil Pump Flow Rate: 84.0 GPM
Oil Sump Capacity: 77.0 gal
Oil Heat Rejection: 130000.0 BTU/h

Material Specifications:

Crankcase: Gray Iron
Crosshead Guide: Gray Iron
Crankshaft: Forged Carbon Steel
Connecting Rod: Forged Carbon Steel
Main Bearing: Tri-metal
Thrust Bearing: Bronze
Connecting Rod Bearing: Tri-metal
Crosshead: Ductile Iron
Crosshead Pin: Alloy Steel
Crosshead Pin Bushing: Steel Backed Bronze
Stress Bolts, standard: Grade 8

Ariel Spec

12G
12G
11N
18N

11B
16D

(Reference)

(ASTM A48 Class 30)
(ASTM A48 Class 30)
(ASTM A668 Class DH/AISI 1045)
(ASTM A521 Class AC or CG/AISI 1045)
(Tri-metal)
(SAE 64)
(Tri-metal)
(ASTM A536 Grade 65-45-12)
(AISI 8620)
(Steel Backed Bronze)
(Grade 8)

**Ariel Cylinder Data Sheet****Model: 20-1/8Z:10****Bore: 20.125in****MAWP: 345.0 psig**Flange: Ariel Peanut
(Ariel Supplied)Stroke: 6.75 in
Rated Speed: 1000 RPMCyl Assembly Wt: 4510.00 lbs
Piston/Rod Std Wt: 295.18 lbs**Pressure Ratings:**

MAWP: 345.0 psig

RDP: 313.6 psig

HTP: 517.5 psig

Piston and Velocity Data:

	HE	CE	Total
Piston Rod Diameter, in	n/a	2.875	
Piston Area, in ²	318.10	311.61	
Piston Displacement at 1000 RPM, CFM	1242.57	1217.21	2459.79
API Suct Valve Velocity at 1000 RPM, FPM	7245.96	7098.08	

Clearance:

		w/Vlvs		w/Vlvs
Normal Clearance, % (in ³)	9.06 (194.474)	14.00	9.61 (202.134)	14.66
Non-Std Clearance, % (in ³)	0.00 (0.000)		0.00 (0.000)	

Spacer Data:

	Suction	Discharge	Suction	Discharge
Spacers (Maximum)	N/A	N/A	N/A	N/A
Spacer Clearance, % (in ³)	0.00 (0.000)		0.00 (0.000)	

Cylinder ADJ Equivalent Area, in²

58.778	89.785	58.778	89.785
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Valve Data:	HE	Suction	CE	HE	Discharge	CE
Num valves/Corner:	3	3	3	3	3	3
Nominal Diameter, in:	7.64	7.64	7.64	7.64	7.64	7.64
Model:	179CT	179CT	179CT	179CT	179CT	179CT
Clearance, % (in ³):	0.76 (16.350)	0.78 (16.350)	0.89 (19.040)	0.91 (19.040)		
Lift, in (Area, in ²):	0.102 (16.463)	0.102 (16.463)	0.083 (13.297)	0.083 (13.297)		
Adj Equivalent, in ² :	16.865	16.865	15.360	15.360		
Plate Material:	NYX (Low Temp Nylon X)	NYX (Low Temp Nylon X)	PKX (High Temp X)	PKX (High Temp X)		
Seat Material:	AISI 1141 (Carbon Steel)	AISI 1141 (Carbon Steel)	AISI 1141 (Carbon Steel)	AISI 1141 (Carbon Steel)		
Guard Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	AISI 1141 (Carbon Steel)	AISI 1141 (Carbon Steel)		
Spring Material(s):	SS 17 - 7PH	SS 17 - 7PH	SS 17 - 7PH	SS 17 - 7PH		
Bolt Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		

Variable Volume Clearance Pockets:

	----- Minimum -----		----- Pocket -----		Total	Total	Total	Total	Chg per	Chg per	Weight
	in3	%	in3	%	Turns	Stk,in	Pos,in	%	in, %	turn, %	lbs
Selected	13.40	0.62	907.92	42.28	32.00	4.00	8.63	42.91	10.6	1.3	713.00

Fixed Volume Clearance Pockets:

----- Pocket 1 -----				----- Pocket 2 -----				----- Pocket 3 -----			
----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----	
in ³	%	in ³	%	in ³	%	in ³	%	in ³	%	in ³	%
26.70	1.24	227.00	10.57	42.50	1.98	455.00	21.19				
20.80	0.97	227.00	10.57	50.30	2.34	911.00	42.43				
38.70	1.80	476.20	22.18	71.30	3.32	911.00	42.43				

Material Specifications:

Body:	Ductile Iron
Piston:	Ductile Iron
Piston Rod:	Alloy Steel
Piston Ring:	GMFTFE
Piston Wear Band:	CFTFE
Rod Packing Case:	Gray Iron
Rod Packing Rings:	CFTFE
Stress Bolt:	Grade 8

Ariel Spec14D
10D
13C**(Reference)**(ASTM A395 Grade 60-40-18)
(ASTM A536 Grade 80-55-06)
(AISI 4100 Series)
(Glass Moly Filled Teflon)
(Carbon Filled Teflon)
(ASTM A278 Class 30)
(Carbon Filled Teflon)
(Grade 8)



Ariel Cylinder Data Sheet



Model: 15-7/8Z

Bore: 15.375in

MAWP: 635.0 psig

Flange: 10"- 300 FF

Stroke: 6.75 in
Rated Speed: 1000 RPM

Cyl Assembly Wt: 3100.00 lbs
Piston/Rod Std Wt: 266.50 lbs

Pressure Ratings:

MAWP: 635.0 psig

RDP: 577.3 psig

HTP: 952.5 psig

Piston and Velocity Data:

	HE	CE	Total
Piston Rod Diameter, in	n/a	2.875	
Piston Area, in ²	185.66	179.17	
Piston Displacement at 1000 RPM, CFM	725.24	699.88	1425.12
API Suct Valve Velocity at 1000 RPM, FPM	6458.36	6232.54	

Clearance:

		w/Vlvs		w/Vlvs
Normal Clearance, % (in ³)	10.31 (129.148)	16.59	11.08 (133.950)	17.59
Non-Std Clearance, % (in ³)	0.00 (0.000)		0.00 (0.000)	

Spacer Data:

	Suction	Discharge	Suction	Discharge
Spacers (Maximum)	3	3	3	3
Spacer Clearance, % (in ³)	2.61 (32.706)		2.70 (32.706)	

Cylinder ADJ Equivalent Area, in²

36.653	59.853	36.653	59.853
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Valve Data:	HE	Suction	CE	HE	Discharge	CE
Num valves/Corner:	3	3		3	3	
Nominal Diameter, in:	6.66	6.66		6.66	6.66	
Model:	148CT	148CT		148CT	148CT	
Clearance, % (in ³):	0.83 (10.370)	0.86 (10.370)		1.27 (15.900)	1.31 (15.900)	
Lift, in (Area, in ²):	0.102 (10.780)	0.102 (10.780)		0.083 (8.707)	0.083 (8.707)	
Adj Equivalent, in ² :	11.006	11.006		10.134	10.134	
Plate Material:	NYX (Low Temp Nylon X)	NYX (Low Temp Nylon X)		MTX (Med Temp Nylon X)	MTX (Med Temp Nylon X)	
Seat Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	
Guard Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	
Spring Material(s):	SS 17 - 7PH	SS 17 - 7PH		SS 17 - 7PH	SS 17 - 7PH	
Bolt Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	

Variable Volume Clearance Pockets:

	----- Minimum -----		----- Pocket -----		Total	Total	Total	Total	Chg per	Chg per	Weight
	in3	%	in3	%	Turns	Stk,in	Pos,in	%	in, %	turn, %	lbs
Selected	9.21	0.73	530.93	42.37	32.00	4.00	8.63	43.10	10.6	1.3	486.00
	21.90	1.75	530.93	42.37	0.00	4.00	eVCP	44.11	10.6	0.0	758.00

Fixed Volume Clearance Pockets:

----- Pocket 1 -----				----- Pocket 2 -----				----- Pocket 3 -----			
----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----	
in3	%	in3	%	in3	%	in3	%	in3	%	in3	%
56.70	4.52	196.00	15.64								
56.70	4.52	272.00	21.70								
56.70	4.52	354.00	28.25								
56.70	4.52	430.00	34.31								
56.70	4.52	518.00	41.33								



Ariel Cylinder Data Sheet



Model: 15-7/8Z

Bore: 15.375in

MAWP: 635.0 psig

Material Specifications:

Body:	Ductile Iron
Piston:	Ductile Iron
Piston Rod:	Alloy Steel
Piston Ring:	GMFTFE
Piston Wear Band:	GMFTFE
Rod Packing Case:	Gray Iron
Rod Packing Rings:	CFTFE
Stress Bolt:	Grade 8

Ariel Spec

14D
10D
13C

(Reference)

(ASTM A395 Grade 60-40-18)
(ASTM A536 Grade 80-55-06)
(AISI 4100 Series)
(Glass Moly Filled Teflon)
(Glass Moly Filled Teflon)
(ASTM A278 Class 30)
(Carbon Filled Teflon)
(Grade 8)

**Ariel Cylinder Data Sheet****Model: 20-1/8Z:10****Bore: 20.125in****MAWP: 345.0 psig**Flange: Ariel Peanut
(Ariel Supplied)Stroke: 6.75 in
Rated Speed: 1000 RPMCyl Assembly Wt: 4510.00 lbs
Piston/Rod Std Wt: 295.18 lbs**Pressure Ratings:**

MAWP: 345.0 psig

RDP: 313.6 psig

HTP: 517.5 psig

Piston and Velocity Data:

	HE	CE	Total
Piston Rod Diameter, in	n/a	2.875	
Piston Area, in ²	318.10	311.61	
Piston Displacement at 1000 RPM, CFM	1242.57	1217.21	2459.79
API Suct Valve Velocity at 1000 RPM, FPM	7245.96	7098.08	

Clearance:

		w/Vlvs		w/Vlvs
Normal Clearance, % (in ³)	9.06 (194.474)	14.00	9.61 (202.134)	14.66
Non-Std Clearance, % (in ³)	0.00 (0.000)		0.00 (0.000)	

Spacer Data:

	Suction	Discharge	Suction	Discharge
Spacers (Maximum)	N/A	N/A	N/A	N/A
Spacer Clearance, % (in ³)	0.00 (0.000)		0.00 (0.000)	

Cylinder ADJ Equivalent Area, in²

58.778	89.785	58.778	89.785
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Valve Data:	HE	Suction	CE	HE	Discharge	CE
Num valves/Corner:	3	3		3	3	
Nominal Diameter, in:	7.64	7.64		7.64	7.64	
Model:	179CT	179CT		179CT	179CT	
Clearance, % (in ³):	0.76 (16.350)	0.78 (16.350)		0.89 (19.040)	0.91 (19.040)	
Lift, in (Area, in ²):	0.102 (16.463)	0.102 (16.463)		0.083 (13.297)	0.083 (13.297)	
Adj Equivalent, in ² :	16.865	16.865		15.360	15.360	
Plate Material:	NYX (Low Temp Nylon X)	NYX (Low Temp Nylon X)		PKX (High Temp X)	PKX (High Temp X)	
Seat Material:	AISI 1141 (Carbon Steel)	AISI 1141 (Carbon Steel)		AISI 1141 (Carbon Steel)	AISI 1141 (Carbon Steel)	
Guard Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 1141 (Carbon Steel)	AISI 1141 (Carbon Steel)	
Spring Material(s):	SS 17 - 7PH	SS 17 - 7PH		SS 17 - 7PH	SS 17 - 7PH	
Bolt Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	

Variable Volume Clearance Pockets:

	----- Minimum -----		----- Pocket -----		Total	Total	Total	Total	Chg per	Chg per	Weight
	in3	%	in3	%	Turns	Stk,in	Pos,in	%	in, %	turn, %	lbs
Selected	13.40	0.62	907.92	42.28	32.00	4.00	8.63	42.91	10.6	1.3	713.00

Fixed Volume Clearance Pockets:

----- Pocket 1 -----				----- Pocket 2 -----				----- Pocket 3 -----			
----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----	
in ³	%	in ³	%	in ³	%	in ³	%	in ³	%	in ³	%
26.70	1.24	227.00	10.57	42.50	1.98	455.00	21.19				
20.80	0.97	227.00	10.57	50.30	2.34	911.00	42.43				
38.70	1.80	476.20	22.18	71.30	3.32	911.00	42.43				

Material Specifications:

Body:	Ductile Iron
Piston:	Ductile Iron
Piston Rod:	Alloy Steel
Piston Ring:	GMFTFE
Piston Wear Band:	CFTFE
Rod Packing Case:	Gray Iron
Rod Packing Rings:	CFTFE
Stress Bolt:	Grade 8

Ariel Spec14D
10D
13C**(Reference)**(ASTM A395 Grade 60-40-18)
(ASTM A536 Grade 80-55-06)
(AISI 4100 Series)
(Glass Moly Filled Teflon)
(Carbon Filled Teflon)
(ASTM A278 Class 30)
(Carbon Filled Teflon)
(Grade 8)

**Ariel Cylinder Data Sheet****Model: 9-5/8Z****Bore: 9.125in****MAWP: 1900.0 psig**

Flange: 6"- 900 FF

Stroke: 6.75 in
Rated Speed: 1000 RPMCyl Assembly Wt: 3180.00 lbs
Piston/Rod Std Wt: 229.20 lbs**Pressure Ratings:**

MAWP: 1900.0 psig

RDP: 1727.3 psig

HTP: 2850.0 psig

Piston and Velocity Data:

	HE	CE	Total
Piston Rod Diameter, in	n/a	2.875	
Piston Area, in ²	65.40	58.90	
Piston Displacement at 1000 RPM, CFM	255.46	230.10	485.55
API Suct Valve Velocity at 1000 RPM, FPM	7806.80	7031.83	

Clearance:

		w/lvs		w/lvs
Normal Clearance, % (in3)	9.84 (43.449)	14.74	12.00 (47.709)	17.43
Non-Std Clearance, % (in3)	0.00 (0.000)		0.00 (0.000)	

Spacer Data:

	Suction	Discharge	Suction	Discharge
Spacers (Maximum)	2	2	2	2
Spacer Clearance, % (in3)	2.72 (12.016)		3.02 (12.016)	

Cylinder ADJ Equivalent Area, in²

14.733 21.115

14.733 21.115

Valve Data:	HE	Suction	CE	HE	Discharge	CE
Num valves/Corner:	2	2		2	2	
Nominal Diameter, in:	4.90	4.90		4.90	4.90	
Model:	100CGD	100CGD		100CGD	100CGD	
Clearance, % (in3):	1.35 (5.970)	1.50 (5.970)		1.09 (4.830)	1.21 (4.830)	
Lift, in (Area, in ²):	0.079 (4.712)	0.079 (4.712)		0.079 (4.712)	0.079 (4.712)	
Adj Equivalent, in ² :	4.761	4.761		4.761	4.761	
Plate Material:	PCX (Carbon Filled X)	PCX (Carbon Filled X)		PCX (Carbon Filled X)	PCX (Carbon Filled X)	
Seat Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	
Guard Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	
Spring Material(s):	SS 17 - 7PH	SS 17 - 7PH		SS 17 - 7PH	SS 17 - 7PH	
Bolt Material:	AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)		AISI 416 (Mart 400 Series)	AISI 416 (Mart 400 Series)	

Variable Volume Clearance Pockets:

	---- Minimum ----		----- Pocket -----		Total	Total	Total	Total	Chg per	Chg per	Weight
	in3	%	in3	%	Turns	Stk,in	Pos,in	%	in, %	turn, %	lbs
Selected	2.85	0.65	176.71	40.03	32.00	4.00	8.63	40.68	10.0	1.3	369.00

Fixed Volume Clearance Pockets:

----- Pocket 1 -----				----- Pocket 2 -----				----- Pocket 3 -----			
----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----		----- Min -----		----- Pocket -----	
in3	%	in3	%	in3	%	in3	%	in3	%	in3	%
15.60	3.53	73.00	16.54								
15.60	3.53	107.00	24.24								
15.60	3.53	135.00	30.58								
15.60	3.53	177.00	40.10								



Ariel Cylinder Data Sheet



Model: 9-5/8Z

Bore: 9.125in

MAWP: 1900.0 psig

Material Specifications:

Body:	Ductile Iron
Piston:	Gray Iron
Piston Rod:	Alloy Steel
Piston Ring:	GMFTFE
Piston Wear Band:	GMFTFE
Rod Packing Case:	Gray Iron
Rod Packing Rings:	CFTFE
Stress Bolt:	Grade 8

Ariel Spec

14D
12G
13C

(Reference)

(ASTM A395 Grade 60-40-18)
(ASTM A48 Class 30)
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