



Engine Specifications

ENGINE MODELS		GRD-175	GRD-214	GRD-233	(*)	(**) (***)	BLD-250	BLD-269	FBC-318	FBC-361	FBC-401	FBC-450A
Number of Cylinders.....		6	6	6	6	6	6	6	6	6	6	6
Bore.....		3 $\frac{5}{16}$ "	3 $\frac{5}{16}$ "	3 $\frac{5}{16}$ "	3 $\frac{3}{8}$ "	3 $\frac{1}{2}$ "	3 $\frac{1}{16}$ "	3 $\frac{9}{16}$ "	3 $\frac{7}{8}$ "	4 $\frac{1}{8}$ "	4 $\frac{1}{8}$ "	4 $\frac{3}{8}$ "
Stroke.....		4 $\frac{1}{8}$ "	4 $\frac{1}{8}$ "	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	5"	5"
Displacement (cu. in.).....		174.93	213.24	232.65	241.54	259.76	250.56	269.10	318.41	360.82	400.92	450.99
Rated H.P. (A.M.A.).....		21.6	26.3	26.3	27.3	29.4	28.3	30.4	36.03	40.8	40.8	45.9
Brake H.P. (Maximum).....		63.7	82.4	93	84 (94.9)	89.1 (101.0)	99.8	100.5	100.0	111.4	114.2	120
At R.P.M.....		3400	3400	3400	3200	3200 (3000)	3200	3000	2800	2700	2600	2400
Brake H.P. (Net).....		58.2	73.0	80.2	74.1 (84.0)	76.4 (87.8)	84.0	88.6	85.0	93.7	99	104.0
At R.P.M.....		3400	3200	3400	3000 (3200)	3000 (2800)	3000	2800	2600	2600	2400	2300
Torque—Maximum (lb.-ft.).....		120	160	181	175.5 (192.0)	192 (211.0)	200.5	222.0	241	268	308	331
At R.P.M.....		1000	1200	1000	800 (1200)	800 (1600)	2000	1000	800	1500	800	800
Torque—Net (lb.-ft.).....		117.5	158	176.5	171	186	194	216.5	229	260	298	320
At R.P.M.....		800	1000	800	800	800	800	1000	800	1000	700	800
Maximum Recommended Speed, R.P.M.....		3400	3400	3400	3000	3000	3000	3000				
Governed Speed, R.P.M.....												
Compression Ratio.....		6.7	6.3	6.3	5.8 (6.2)	5.74 (6.2)	6.3	6.3	5.38	5.2	5.2	5.2

Engine Specifications

	ENGINE MODELS				
	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	R-6586
Number of Cylinders.....	6	6	6	6	6
Bore.....	3 $\frac{7}{8}$ "	4 $\frac{1}{8}$ "	4 $\frac{1}{8}$ "	4 $\frac{3}{8}$ "	4 $\frac{19}{16}$ "
Stroke.....	4 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	5"	5"	5 $\frac{3}{8}$ "
Displacement (cu. in.).....	318.41	360.82	400.92	450.99	586.62
Rated H.P. (A.M.A.).....	36.03	40.8	40.8	45.9	55.5
Brake H.P. (Maximum).....	124.5	126.0	140	148.3	200.3
At R.P.M.....	3100	2800	2800	2600	2600
Brake H.P. (Net).....	111	111.9	123	133.5	183.0
At R.P.M.....	2800	2800	2800	2600	2600
Torque—Maximum (lb.-ft.).....	250	282	304	361.5	475.0
At R.P.M.....	1600	1200	1000-1500	1000	1000
Torque—Net (lb.-ft.).....	248	278	304	348	462.0
At R.P.M.....	1200	1000	1000	1000	1000
Maximum Recommended Speed, R.P.M.....					
Governed Speed, R.P.M.....	3000	2800	2700	2600	2600
Compression Ratio.....	6.3	6.3	6.3	6.3	6.03

* Figures in brackets apply to FAC-241 Engine Serial Number 2401 and above.

** " " FAC-259
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 Figures in brackets apply to FAC-TH 12

"	"	"	"
* * *	"	"	"
FAC-259A	"	"	"
FAC-259B	"	"	"



Engine Specifications—Continued

ENGINE MODELS	GRD-175 GRD-175A	GRD-214 GRD-214A	GRD-233 GRD-233A	FAC-241 FAC-241A	(*) FAC-241 FAC-241A	(**) FAC-259 FAC-259A	BLD-250	BLD-269 BLD-269A	FBC-318 FBC-318A	FBC-361 FBC-361A	FBC-401 FBC-401A	FBC-450A
Firing Order.....	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4
Crankcase Refill Capacity (qts.).....	5	5	5	7	7	7	7	7	7	7	7	7
Weight—Bare (lbs.).....	527.5	528.5	559.5	755.1	750.1	750.1	782	781	930	913	961	950
Weight—with Standard Accessories.....	592	593	624	848	843	843	875	874	1035	1018	1066	1055
Crankshaft:												
Main Journal Diameter.....	2.635"	2.635"	2.635"	2.372"	2.372"	2.372"	2.7005"	2.7005"	2.7005"	2.7005"	2.7005"	2.7005"
Crankpin Diameter.....	2.636"	2.636"	2.636"	2.373"	2.373"	2.373"	2.7015"	2.7015"	2.7015"	2.7015"	2.7015"	2.7015"
Bearing Clearances.....	2.000"	2.000"	2.000"	2.122"	2.122"	2.122"	2.122"	2.122"	2.247"	2.247"	2.247"	2.247"
Crankshaft End Play.....	2.001"	2.001"	2.001"	2.123"	2.123"	2.123"	2.123"	2.123"	2.248"	2.248"	2.248"	2.248"
Thrust Taken By.....	.001"	.001"	.001"	.001"	.001"	.001"	.0015"	.0015"	.0015"	.0015"	.0015"	.0025"
Hardening Method.....	.0035"	.0035"	.0035"	.0035"	.0035"	.0035"	.004"	.004"	.004"	.004"	.004"	.005"
Main Bearing Bolt Tension (ft. lbs.).....	.002"	.002"	.002"	.0035"	.0035"	.0035"	.0055"	.0055"	.0045"	.0045"	.0045"	.0045"
	.006"	.006"	.006"	.0075"	.0075"	.0075"	.0135"	.0135"	.0085"	.0085"	.0085"	.0085"
	Front Brg.	Front Brg.	Front Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.
	105	105	105	105	105	105	105	105	105	105	105	105

Engine Specifications

ENGINE MODELS	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	(t) RED-450 RED-450-A	(t) RED-450 RED-450-A	R-6586
Firing Order.....	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4	1-5-3-6-2-4
Crankcase Refill Capacity (qts.).....	9	9	9	9	9	9	16
Weight—Bare (lbs.).....	930	913	961	950	950	950	1525
Weight—with Standard Accessories.....	1035	1018	1066	1055	1055	1055	1725
Crankshaft:							
Main Journal Diameter.....	3.2495"	3.2495"	3.2495"	3.2495"	3.2495"	3.2495"	3.249"
Crankpin Diameter.....	3.2505"	3.2505"	3.2505"	3.2505"	3.2505"	3.2505"	3.250"
Bearing Clearances.....	2.751"	2.751"	2.751"	2.751"	2.751"	2.751"	2.999"
Crankshaft End Play.....	2.752"	2.752"	2.752"	2.752"	2.752"	2.752"	3.000"
Thrust Taken By.....	.002"	.002"	.002"	.002"	.002"	.002"	.0022"
Hardening Method.....	.0045"	.0045"	.0045"	.0045"	.0045"	.0045"	.0046"
Main Bearing Bolt Tension (ft. lbs.).....	.004"	.004"	.004"	.004"	.004"	.004"	.006"
	.012"	.012"	.012"	.012"	.012"	.012"	.008"
	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Rear Brg.	Front Brg.
	Tocco	Tocco	Tocco	Tocco	Tocco	Tocco	Tocco
	105	105	105	105	105	105	110

*Figures in brackets apply to FAC-241 Engine Serial Number 2401 and above.

**Figures in brackets apply to FAC-259 Engine Serial Number 3301 and above.

***Figures in brackets apply to FAC-259-A Engine Serial Number 751 and above.

(t) Oil pan refill capacities for earlier RED engines are given in Service Bulletin Add No. 1 to B-41-1945.



Engine Specifications—Continued

ENGINE MODELS	GRD-175 GRD-175A	GRD-214 GRD-214A	GRD-233 GRD-233A	FAC-241 FAC-241A	FAC-259 FAC-259A	BLD-250	BLD-269 BLD-269A	FBC-318 FBC-318A	FBC-361 FBC-361A	FBC-401 FBC-401A	FBC-450A
Camshaft:											
Camshaft Bearing Diameter:											
Front.....	2.1855" 2.1860"	2.1855" 2.1860"	2.1855" 2.1860"	1.811" 1.812"	1.811" 1.812"	1.811" 1.812"	1.811" 1.812"	2.109" 2.110"	2.109" 2.110"	2.109" 2.110"	2.109" 2.110"
Second.....	1.9335" 1.9345"	1.9335" 1.9345"	1.9335" 1.9345"	1.577" 1.578"	1.577" 1.578"	1.577" 1.578"	1.577" 1.578"	2.089" 2.090"	2.089" 2.090"	2.089" 2.090"	2.089" 2.090"
Third.....	1.9135" 1.9145"	1.9135" 1.9140"	1.9135" 1.9140"	1.562" 1.563"	1.562" 1.563"	1.562" 1.563"	1.562" 1.563"	2.069" 2.070"	2.069" 2.070"	2.069" 2.070"	2.069" 2.070"
Rear.....	1.6225" 1.6235"	1.6220" 1.6225"	1.6220" 1.6225"	1.499" 1.500"	1.499" 1.500"	1.499" 1.500"	1.499" 1.500"	1.4995" 1.5005"	1.4995" 1.5005"	1.4995" 1.5005"	1.4995" 1.5005"
Camshaft Bearing Clearance.....	.0015" .0035"	.0015" .0035"	.0015" .0035"	.001" .0035"	.001" .0035"	.001" .0035"	.001" .0035"	.001" .0035"	.001" .0035"	.001" .0035"	.001" .0035"
Camshaft End Play.....	Spring Loaded	Spring Loaded	Spring Loaded	.002" .008"	.002" .008"	.002" .008"	.002" .008"	.002" .008"	.002" .008"	.002" .008"	.002" .008"
Thrust Taken By.....	Thrust Plate Timing	Thrust Plate Timing	Thrust Plate Timing	Thrust Flange .0000"	Thrust Flange .0000"	Thrust Flange .0000"	Thrust Flange .0000"	Thrust Flange .004"	Thrust Flange .004"	Thrust Flange .004"	Thrust Flange .004"
Camshaft Gear Backlash.....	Chain	Chain	Chain	.002"	.002"	.0020"	.0020"	.006"	.006"	.006"	.006"

Engine Specifications

ENGINE MODELS	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	R-6586
Camshaft:					
Camshaft Bearing Diameter:					
Front.....	2.109" 2.110"	2.109" 2.110"	2.109" 2.110"	2.109" 2.110"	2.1220" 2.1225"
Second.....	2.089" 2.090"	2.089" 2.090"	2.089" 2.090"	2.089" 2.090"	2.1220" 2.1225"
Third.....	2.069" 2.070"	2.069" 2.070"	2.069" 2.070"	2.069" 2.070"	2.1220" 2.1225"
Rear.....	1.4995" 1.5005"	1.4995" 1.5005"	1.4995" 1.5005"	1.4995" 1.5005"	2.1220" 2.1225"
Camshaft Bearing Clearance.....	.001" .0035"	.001" .0035"	.001" .0035"	.001" .0035"	.0015" .0025"
Camshaft End Play.....	.002" .008"	.002" .008"	.002" .008"	.002" .008"	.005" .007"
Thrust Taken By.....	Thrust Flange	Thrust Flange	Thrust Flange	Thrust Flange	Thrust Plate
Camshaft Gear Backlash.....	.004" .006"	.004" .006"	.004" .006"	.004" .006"	.001"



Engine Specifications—Continued

ENGINE MODELS	GRD-175 GRD-175A	GRD-214 GRD-214A	GRD-233 GRD-233A	FAC-241 FAC-241A	FAC-259 FAC-259A	BLD-250	BLD-269 BLD-269A	FBC-318 FBC-318A	FBC-361 FBC-361A	FBC-401 FBC-401A	FBC-450A
Connecting Rods:											
Connecting-Rod Bearing End Clearance...	.0045"-. .0105"	.0045"-. .0105"	.0045"-. .0105"	.007"-. .013"	.007"-. .013"	.007"-. .013"	.007"-. .013"	.007"-. .013"	.007"-. .013"	.007"-. .013"	.007"-. .013"
Connecting-Rod Bearing Clearance...	.0010"-. .003"	.0010"-. .003"	.0010"-. .003"	.001"-. .003"	.001"-. .003"	.001"-. .003"	.001"-. .003"	.0015"-. .0035"	.0015"-. .0035"	.0015"-. .0035"	.0015"-. .0035"
Connecting-Rod Bolt Nut Tension (lb.-ft.)	80	80	80	80	80	80	80	80	80	80	80
Pistons:											
Material...	C. I.	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Recommended Piston Clearance...	.003"										
Clearance Bottom of Skirt (Minimum)											
Clearance Top of Skirt...	.0015"-. .0025"	.0015"-. .0025"	.0015"-. .0025"	.0025"-. .003"	.0025"-. .003"	.0025"-. .003"	.0025"-. .003"	.0025"-. .003"	.0025"-. .003"	.0025"-. .003"	.0025"-. .003"
Piston Pins:											
Length...	2.573"	2.885"	2.885"	2.954"	2.954"	2.954"	2.954"	2.954"	2.954"	2.954"	2.954"
Diameter...	.937"	.937"	.937"	.9192"	.9192"	.9192"	.9192"	.9192"	.9192"	.9192"	.9192"
Pin Fit (Room Temperature 70° F.):											
Recommended Clearance in Rod...	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"	.0004"-. .0001"
Recommended Clearance in Piston...	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight	Loose to Tight
Feeler Gauge Ribbon Checking											
Width...	3/8"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
Thickness...	.003"	.003"	.003"	.003"	.003"	.003"	.003"	.003"	.003"	.003"	.003"
Tension on Scale (lb.)	6-12	10-18	10-18	5-12	5-12	5-12	5-12	5-12	5-12	5-12	5-12
Desired Tension (lb.)	9	14	14	9	9	12	12	7	5	5	5

Engine Specifications

ENGINE MODELS	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	R-6586
Connecting Rods:					
Connecting-Rod Bearing End Clearance...	.007"-. .013"	.007"-. .013"	.007"-. .013"	.007"-. .013"	.006"-. .010"
Connecting-Rod Bearing Clearance...	.0015"-. .0035"	.0015"-. .0035"	.0015"-. .0035"	.0015"-. .0035"	.0025"-. .0035"
Connecting-Rod Bolt Nut Tension (lb.-ft.)	80	80	80	80	105
Pistons:					
Material...	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Recommended Piston Clearance...	.00125"-. .00225"	.00125"-. .00225"	.00125"-. .00225"	.00125"-. .00225"	.00125"-. .00225"
Clearance Bottom of Skirt (Minimum)					
Clearance Top of Skirt...	.0025"-. .00425"	.0025"-. .00425"	.0025"-. .00425"	.0025"-. .00425"	.0025"-. .00425"
Piston Pins:					
Length...	3.363"	3.550"	3.550"	3.800"	3.980"
Diameter...	1.109"	1.109"	1.109"	1.109"	1.4999"
Pin Fit (Room Temperature 70° F.):					
Recommended Clearance in Rod...	.0005"-. .0000"	.0005"-. .0000"	.0005"-. .0000"	.0005"-. .0000"	.0005"-. .0000"
Recommended Clearance in Piston...	.0002" Tight	.0002" Tight	.0002" Tight	.0002" Tight	.0002" Tight
Feeler Gauge Ribbon Checking:					
Width...	1/2"	1/2"	1/2"	1/2"	1/2"
Thickness...	.003"	.003"	.003"	.003"	.003"
Tension on Scales (lb.)	7-11	4-7	7-11	7-11	5-10
Desired Tension (lb.)	9	6	9	9	8



Engine Specifications—Continued

ENGINE MODELS	GRD-175 GRD-175A	GRD-214 GRD-214A	GRD-233 GRD-233A	FAC-241 FAC-241A	FAC-259 FAC-259A	BLD-250	BLD-269 BLD-269A	FBC-318 FBC-318A	FBC-361 FBC-361A	FBC-401 FBC-401A	FBC-450A
Piston Rings:											
Compression Rings:											
Number on Each Piston.....	3	3	3	3	3	3	3	3	3	3	3
Size.....	$\frac{1}{8}$ "	$\frac{3}{32}$ "	$\frac{3}{32}$ "	$\left\{ \begin{array}{l} 1-\frac{3}{32}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{3}{32}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{3}{32}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{3}{32}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{3}{32}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{1}{8}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{1}{8}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{1}{8}" \\ 2-\frac{1}{8}" \end{array} \right.$
Oil Rings:											
Number on Each Piston.....	1	1	1	1	1	1	1	1	1	1	1
Size.....	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "
Ring Diameter.....	3"	$3\frac{5}{16}$ "	$3\frac{5}{16}$ "	$3\frac{5}{8}$ "	$3\frac{1}{2}$ "	$3\frac{7}{16}$ "	$3\frac{9}{16}$ "	$3\frac{7}{8}$ "	$4\frac{1}{8}$ "	$4\frac{1}{8}$ "	$4\frac{3}{8}$ "
Ring Gap:											
Compression.....	.007"-.017"	.007"-.017"	.007"-.017"	.010"-.020"	.016"-.026"	.016"-.026"	.013"-.023"	.010"-.020"	.013"-.023"	.013"-.023"	.013"-.023"
Oil Control (Not U-flex).....	.007"-.015"	.007"-.015"	.010"-.035"	.016"-.021"	.013"-.021"	.013"-.021"	.013"-.021"	.010"-.020"	.013"-.021"	.013"-.021"	.013"-.021"

Engine Specifications

ENGINE MODELS	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	R-6586
Piston Rings:					
Compression Rings:					
Number on Each Piston.....	3	3	3	3	3
Size.....	$\left\{ \begin{array}{l} 1-\frac{3}{32}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{1}{8}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{1}{8}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{1}{8}" \\ 2-\frac{1}{8}" \end{array} \right.$	$\left\{ \begin{array}{l} 1-\frac{3}{32}" \\ 2-\frac{3}{32}" \end{array} \right.$
Oil Rings:					
Number on Each Piston.....	1	1	1	1	* 2
Size.....	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{3}{16}$ "	$\frac{1}{4}$ "
Ring Diameter.....	$3\frac{5}{8}$ "	$4\frac{1}{8}$ "	$4\frac{1}{8}$ "	$4\frac{3}{8}$ "	4.8125
Ring Gap:					
Compression.....	.025"-.035"	.025"-.035"	.025"-.035"	.025"-.035"	.013"-.023"
Oil Control (Not U-flex).....	.025"-.035"	.025"-.035"	.025"-.035"	.025"-.035"	.013"-.023"

* Lower Ring is $\frac{3}{16}$ " Plain.

Engine Specifications—Continued

ENGINE MODELS	GRD-175 GRD-175A	GRD-214 GRD-214A	GRD-233 GRD-233A	FAC-241 FAC-241A	FAC-259 FAC-259A	BLD-269 BLD-269A	FBC-318 FBC-318A	FBC-361 FBC-361A	FBC-401 FBC-401A	FBC-450A
Fit in Groove:	.0015" — .003"	.002" — .0035"	.002" — .0035"	.0025" — .004"	.0025" — .004"	.0027" — .0035"	.0025" — .004"	.0015" — .003"	.0015" — .003"	.0015" — .003"
Compression:	.001" — .0025"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.002" — .0025"	.002" — .0025"	.0015" — .003"	.0015" — .003"	.0015" — .003"
Oil Control:	.001" — .0025"	.001" — .0025"	.001" — .0025"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0015" — .003"
Valves:										
Intake Valve:										
Stem Diameter:	.372" — 45°	.372" — 45°	.372" — 45°	.342" — 45°	.342" — 45°	.342" — 45°	.434" — 15°	.434" — 15°	.434" — 15°	.434" — 15°
Angle of Face (See Note):	.015" — .0015"	.015" — .0015"	.015" — .0015"	.018" — .0015"	.018" — .0015"	.018" — .0015"	.015" — .0015"	.015" — .0015"	.015" — .0015"	.015" — .0015"
Tappet Clearance (Hot):	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"
Stem Clearance in Guide:	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"
Width of Valve Seat:	.371" — 45°	.371" — 45°	.371" — 45°	.342" — 45°	.342" — 45°	.342" — 45°	.434" — 15°	.434" — 15°	.434" — 15°	.434" — 15°
Exhaust Valve:										
Stem Diameter:	.371" — 45°	.371" — 45°	.371" — 45°	.342" — 45°	.342" — 45°	.342" — 45°	.434" — 15°	.434" — 15°	.434" — 15°	.434" — 15°
Angle of Face:	.015" — .0015"	.015" — .0015"	.015" — .0015"	.018" — .0015"	.018" — .0015"	.018" — .0015"	.015" — .0015"	.015" — .0015"	.015" — .0015"	.015" — .0015"
Tappet Clearance (Hot):	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"

Engine Specifications

ENGINE MODELS	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	R-6586
Fit in Groove:	.0025" — .004"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.005" — .0065"
Compression:	.002" — .0035"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0025" — .004"
Oil Control:	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0015" — .003"	.0015" — .0035"
Valves:					
Intake Valve:					
Stem Diameter:	.434" — 15°	.434" — 15°	.434" — 15°	.434" — 15°	.4973" — 30°
Angle of Face (See Note):	.018" — .020" — .0015" —	.018" — .020" — .0015" —	.018" — .020" — .0015" —	.018" — .020" — .0015" —	.020" — .008" —
Tappet Clearance (Hot):	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0021" — 1/16" — 3/8"
Stem Clearance in Guide:	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"	.0015" — 1/16" — 3/8"
Width of Valve Seat:	.434" — 45°	.434" — 45°	.434" — 45°	.434" — 45°	.494" — 45°
Exhaust Valve:					
Stem Diameter:	.434" — 45°	.434" — 45°	.434" — 45°	.434" — 45°	.494" — 45°
Angle of Face:	.018" — .020" — .0015" —	.018" — .020" — .0015" —	.018" — .020" — .0015" —	.018" — .020" — .0015" —	.020" — .008" —
Tappet Clearance (Hot):	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0035" — 1/16" — 3/8"	.0021" — 1/16" — 3/8"

Note:
15° Intake Valves used in FBC engines starting with the following serial numbers:

FBC-318.....Engine Serial No. 5682
FBC-318-A.....Engine Serial No. 591
FBC-361.....Engine Serial No. 1953
FBC-361-A.....Engine Serial No. 648
FBC-401.....Engine Serial No. 1189
FBC-401-A.....Engine Serial No. 552
FBC-450.....Engine Serial No. 1110
FBC-450-A.....Engine Serial No. 664



Engine Specifications—Continued

ENGINE MODELS	GRD-175 GRD-175A	GRD-214 GRD-214A	GRD-233 GRD-233A	FAC-241 FAC-241A	FAC-259 FAC-259A	BLD-250	BLD-269 BLD-269A	FBC-318 FBC-318A	FBC-361 FBC-361A	FBC-401 FBC-401A	FBC-450A
VALVES—Continued:											
Exhaust Valve—Continued:											
Stem Clearance in Guide.....	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"
Width of Valve Seat.....	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.001"-.003"	.001"-.003"	.001"-.003"	.001"-.003"
Valve Tappet:											
Clearance in Block.....	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.0005"-.0015"	.001"-.003"	.001"-.003"	.001"-.003"	.001"-.003"
Valve Springs:											
Free Length:											
Inner.....	2 11/16"	2 11/16"	2 11/16"	2 33/64"	2 33/64"	2 33/64"	2 33/64"	2 9/32"	2 9/32"	2 9/32"	2 9/32"
Outer.....	1 15/16"	1 15/16"	1 15/16"	1 45/64"	1 45/64"	1 45/64"	1 45/64"	2 15/32"	2 15/32"	2 15/32"	2 15/32"
Length—Valve Open:											
Inner.....	85 1/2"	85 1/2"	85 1/2"	93"	93"	93"	93"	45	45	45	45
Outer.....	116"	116"	116"	116"	116"	116"	116"	90	90	90	90
Lbs. Pressure—Valve Open:											
Inner.....	85 1/2"	85 1/2"	85 1/2"	93"	93"	93"	93"	45	45	45	45
Outer.....	116"	116"	116"	116"	116"	116"	116"	90	90	90	90
Valve Rocker Arm Clearance on Shaft.....	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"

*Without damper

**With damper

Engine Specifications

ENGINE MODELS	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	R-6586
VALVES—Continued:					
Exhaust Valve—Continued:					
Stem Clearance in Guide.....	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.002"-.004" 5/64"-.7/64"	.0035" 5/64"-.7/64"
Width of Valve Seat.....	.001"-.003"	.001"-.003"	.001"-.003"	.001"-.003"	.0019"
Valve Tappet:					
Clearance in Block or Guide.....	.001"-.003"	.001"-.003"	.001"-.003"	.001"-.003"	.0002"-.0009"
Valve Springs:					
Free Length:					
Inner.....	2 11/16"	2 11/16"	2 11/16"	2 11/16"	2 7/8"
Outer.....	1 15/16"	1 15/16"	1 15/16"	1 15/16"	2 7/8"
Length—Valve Open:					
Inner.....	86	86	86	86	85
Outer.....	136	136	136	136	165
Lbs. Pressure—Valve Open:					
Inner.....	86	86	86	86	85
Outer.....	136	136	136	136	165
Valve Rocker Arm Clearance on Shaft.....	.002"-.004"	.002"-.004"	.002"-.004"	.002"-.004"	.0007"-.0009"

Engine Specifications—Continued

ENGINE MODELS	GRD-175 GRD-175A	GRD-214 GRD-214A	GRD-233 GRD-233A	FAC-241 FAC-241A	FAC-259 FAC-259A	BLD-250	BLD-269 BLD-269A	FBC-318 FBC-318A	FBC-361 FBC-361A	FBC-401 FBC-401A	FBC-450A
Valve Timing:											
Intake Opens (After—Before T.D.C.)	10°— Before	10°— Before	10°— Before	2° (5°) Before	2° (5°) Before	5°—Before	5°—Before	5°—After	5°—After	5°—After	5°—After
Intake Closes (After L.D.C.)	40°	40°	40°	52° (45°)	52° (45°)	45°	45°	45°	45°	45°	45°
Exhaust Opens (Before L.D.C.)	45°	45°	45°	34½° (40°)	34½° (40°)	40°	40°	40°	40°	40°	40°
Exhaust Closes (After T.D.C.)	5°	5°	5°	9½° (10°)	9½° (10°)	10°	10°	10°	10°	10°	10°
Intake Valve Timing Checking Clearance	.020"	.020"	.020"	.016" (.023")	.016" (.023")	.023"	.023"	.0167"	.0167"	.0167"	.0167"
Oil Pump:											
Body Gear End Clearance	.003"	.003"	.003"	.0035"— .006"	.0035"— .006"	.002"— .004"	.002"— .004"	.0035"— .006"	.0035"— .006"	.0035"— .006"	.0035"— .006"
Pump Shaft End Play				.004"— .006"	.004"— .006"	.002"— .004"	.002"— .004"	.004"— .006"	.004"— .006"	.004"— .006"	.004"— .006"
Oil Pressure:											
Minimum (lb.)	5—10	5—10	5—10	10—15	10—15	10—15	10—15	10—15	10—15	10—15	10—15
At R.P.M.	300—350	300—350	300—350	300—350	300—350	300—350	300—350	300—350	300—350	300—350	300—350
Maximum (lb.)	20—30	20—30	20—30	40—45	40—45	40—45	40—45	40—45	40—45	40—45	40—45
At R.P.M.	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800
Cylinder Head:											
Cylinder Head Bolt (ft.-lb.)	65	65	65	80	80	80	80	105	105	105	105

Engine Specifications

ENGINE MODELS	RED-318 RED-318-A	RED-361 RED-361-A	RED-401 RED-401-A	RED-450 RED-450-A	R-6586
Valve Timing:					
Intake Opens (After—Before T.D.C.)	8° Before	8° Before	8° Before	8° Before	12° Before
Intake Closes (After L.D.C.)	52°	52°	52°	52°	62°
Exhaust Opens (Before L.D.C.)	55°	55°	55°	55°	54°
Exhaust Closes (After T.D.C.)	15°	15°	15°	15°	20°
Intake Valve Timing Checking Clearance	.023"	.023"	.023"	.023"	.020"
Oil Pump:					
Body Gear End Clearance	.002"— .004"	.002"— .004"	.002"— .004"	.002"— .004"	.002"— .004"
Pump Shaft End Play	.004"	.004"	.004"	.004"	.004"
Oil Pressure:					
Minimum (lb.)	10—15	10—15	10—15	10—15	Idling 15
At R.P.M.	300—350	300—350	300—350	300—350	300—350
Maximum (lb.)	40—45	40—45	40—45	40—45	50
At R.P.M.	1500—1800	1500—1800	1500—1800	1500—1800	1500—1800
Cylinder Head:					
Cylinder Head Bolt (ft.-lb.)	105	105	105	105	110

Figures in brackets apply to—
 *FAC-241 Engine Serial Number 2401 and above.
 **FAC-259 Engine Serial Number 3301 and above.
 ***FAC-259-A Engine Serial Number 751 and above.