

**FEDERAL AVIATION AGENCY**

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|---|
| E-218<br>Revision 12<br><b>WRIGHT</b><br>Double Row Cyclone<br>739C18BA3<br>745C18BA3,4<br>749C18BD1,3<br><br>December 28, 1983 |
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AIRCRAFT ENGINE SPECIFICATION

Engines of models described herein conforming with this specification and approved data on file with the Federal Aviation Agency meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft specifications and applicable portions of the Civil Air Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

|  |  |  |                        |                         |
|--|--|--|------------------------|-------------------------|
| Manufacturer                                 | Curtiss-Wright/Marquette, Inc.<br>Fountain Inn, South Carolina |  |                        |                         |
| Model  | Double Row Cyclone   | <u>739C18BA3</u>   | <u>745C18BA3,4</u>     | <u>749C18BD1,3</u>      |
| Type   | 18RA   | 16:7 reduction gearing   | --                     | --                      |
| Rating (with low impeller gear ratio)        |  | 6.06:1   | 6.46:1                 | --                      |
| Maximum continuous, hp, rpm, in.Hg., at:     |  |  |                        |                         |
| Critical altitude ((ft.))                    |  | 2000-2400-41.0-4200  | 2000-2400-41.5-4800    | 2100-2600-41.5-6500     |
| Sea level pressure altitude                  |  | 2000-2400-42.0-S.L.  | 2000-2400-43.5-S.L.    | 2100-2600-43.0-S.L.     |
|  |  |  |                        | or 2100-2400-42.5-4400  |
|  |  |  |                        | 2100-2400-44.0-S.L.     |
| Takeoff (5 min.), hp, rpm, in.Hg., at:       |  |  |                        |                         |
| Critical altitude (ft.)                      |  | 2200-2800-42.0-7000  | 2200-2800-44.0-6300    | 2500-2800-51.0-3100     |
| Sea level pressure altitude                  |  | 2200-2800-44.0-S.L.  | 2200-2800-46.0-S.L.    | 2500-2800-51.5-S.L.     |
|  |  | or 2200-2600-42.5-5200   | or 2200-2600-44.5-4500 |                         |
|  |  | 2200-2600-44.5-S.L.  | 2200-2600-46.5-S.L.    |                         |
| Rating (with high impeller gear ratio)       |  | —  | 8.67:1                 | --                      |
| Maximum continuous, hp, rpm, in.Hg., at:     |  |  |                        |                         |
| Critical altitude (ft.)                      |  | —  | 1800-2400-40.0-15000   | 1800-2400-42.5-9000     |
| Low critical pressure altitude (ft.)         |  | —  | 1800-2400-43.0-8000    | 1800-2400-41.0-16000    |
| Takeoff (5 min.), hp, rpm, in.Hg., at:       |  |  |                        |                         |
| Critical altitude (ft.)                      |  | —  | 1900-2600-42.0-16200   | 1900-2600-43.5-15700    |
| Low critical pressure altitude (ft.)         |  | —  | 1900-2600-44.0-10600   | 1900-2600-44.0-10800    |
| Fuel (minimum grade aviation gasoline)       |  | 100/130  | --                     | --                      |
| Bore and stroke, in.                         |  | 6.125 X 6.312  | --                     | --                      |
| Displacement, cu. in.                        |  | 3348   | --                     | --                      |
| Compression ratio                            |  | 6.5:1  | --                     | --                      |
| Weight (dry), lbs.                           |  | 2742   | 2780                   | 3000                    |
| C.G. location (dry)                          |  |  |                        |                         |
| From crankcase mounting pad counterbore, in. |  | 14.4   | --                     | —                       |
| From thrust nut face, in.                    |  | 28.1   | --                     | —                       |
| Above propeller shaft, in.                   |  | 0.2  | --                     | —                       |
| Propeller shaft, SAE No.                     |  | 60   | --                     | --                      |
| Catburetion or Fuel Injection Model          |  | Bendix-Stromberg Type<br>58-18-E1A direct fuel<br>injection      | --                     | --                      |
| Ignition, dual                               |  | Scintilla DF18LN-1 mag.<br>(with secondary condenser<br>removed) | --                     | Scintilla DLN-9 magneto |
| Timing, °BTC                                 |  | 28   | --                     | 20 (30 in cruising)     |
| NOTES  |  | 1,2,3,4,5,11,12  | 1,2,3,4,5,10,11,12     | 1,2,3,7,9,12            |

"- -" indicates "same as preceding model."  
 "—" indicates "does not apply."

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Certification basis                   Type Certificate No. 218  
 Production basis                    Production Certificate No. 8

NOTE 1:           Maximum permissible temperatures are as follows:

|              | <u>Head (well type thermocouple)</u> | <u>Head (spark plug gasket thermocouple)</u> | <u>Barrel</u> | <u>Oil Inlet</u> |
|--------------|--------------------------------------|--|---------------|------------------|
| C18BA series | 475°F (450°F for C18BA4)             | 500°F  | 325°F         | 220°F            |
| C18BD series | (T.O.) 500°F                         | —  | 350°F         | 220°F            |
|              | (MC) 475°F                           | —  |               |                  |

NOTE 2.           Fuel and oil pressure limits:

|  | Oil pressure - rear pump (psi)  | <u>Min.</u> | <u>Max.</u>                                  | <u>Idle</u> |
|--|---------------------------------|-------------|--|-------------|
|  | C18BA series                    | 50          | 70   | 15          |
|  | C18BD series                    | 60          | 70   | 15          |
|  | Oil pressure - front pump (psi) |             |  |             |
|  | C18BA series                    | 30          | 55   | 15          |
|  | C18BD series                    | 35          | 45   | 15          |
|  | Fuel pressure (psi)             |             |  |             |
|  | C18BA series                    | 15          | 19   |             |
|  |                                 | (20)        | 22 with high press. spring in injector pump) |             |
|  | C18BD series                    | 19          | 21   |             |
|  |                                 | (23)        | 25 with high press. spring in injector pump) |             |

NOTE 3.           The following accessory drives are provided:

|  | 745C18B<br>A3,4 | 745C18B<br>A3,4* | 749C18B<br>D1,3 | 739C18B<br>A3 | Rotation<br>** | Speed (X<br>Crankshaft) | Maximum<br>Torque<br>(in.lb.) |        | Maximum<br>Overhang<br>Moment<br>(in.-lb.) |
|--|-----------------|------------------|-----------------|---------------|----------------|-------------------------|-------------------------------|--------|--|
|  |                 |                  |                 |               |                |                         | Cont.                         | Static |  |
| Starter                                  | X               | X                | X               | X             | C              | 1.000                   | —                             | 36000  | 350  |
| Fuel pump                                | X               | X                | X               | X             | CC             | 1.000                   | 25                            | 450    | 15   |
| Vacuum pump                              | X               |                  |                 | X             | CC             | 1.400                   | 525                           | 2250   | 50   |
| Vacuum pump - right hand                 |                 | X                | X               |               | C              | 1.400                   | 525                           | 2250   | 50   |
| Hydraulic pump                           | X               | X                | X               | X             | CC             | 1.400                   | 525                           | 2250   | 50   |
| Generator & accessory gear left hand     | X               | X                | X               | X             | C              | 2.800                   | 600                           | 5100   | 350  |
| Generator & accessory gear right hand    | X               |                  |                 | X             | C              | 2.800                   | 600                           | 5100   | 350  |
| Generator & accessory gear right hand*** |                 | X                | X               |               | C              | 2.800                   | 675                           | 5100   | 350  |
| Tachometer                               | X               |                  |                 | X             | C              | .500                    | 2                             | 50     | 15   |
| Tachometer                               | X               |                  |                 | X             | CC             | .500                    | 2                             | 50     | 15   |
| Tachometer                               |                 | X                | X               |               | C              | .500                    | 22                            | 50     | 15   |
| Tachometer                               |                 | X                | X               |               | CC             | .500                    | 22                            | 50     | 15   |
| Propeller governor                       | X               | X                |                 | X             | C              | 1.000                   | 65                            | 600    | 30   |
| Propeller governor                       |                 |                  | X               |               | CC             | .879                    | 125                           | 600    | 30   |
| Spare hydraulic drive                    | X               | X                | X               | X             | C              | 1.000                   | 525                           | 2250   | 50   |
| Generator gear box****                   | X               |                  |                 | X             | C              | 1.485                   | 1200                          | 12000  | 252  |

\*With "-A" after serial number

\*\*C-clockwise, CC-counterclockwise

\*\*\*The right hand generator drive in the alternate configuration shall withstand a maximum continuous load of 60 hp at any engine speed between 1200 and 2000 rpm. Above 2000 rpm the drive shall withstand a maximum continuous torque load of 675 inch pounds.

\*\*\*\*The generator gear box shall be mounted on the left-hand generator drive. The right-hand generator drive shall be supplied with a 16 tooth spline adapter.

- NOTE 4. The C18BA engines incorporate a torquemeter, provisions for cylinder head or crankcase mounting, and single-acting hydraulic propeller provisions.
- NOTE 5. The 745C18BA engine may be converted to a modified single speed 739C18BA model in accordance with the manufacturer's Service Rework Bill of Materials No. 301A. Engines reworked in this manner are identified by Serial No. suffix "M."
- NOTE 6. The approval for models 739C18BA1, 2, 4 and 745C18BA1 and 2 for use in certificated aircraft expired June 1, 1947.
- NOTE 7. The C18BD engines incorporate a torquemeter, provisions for crankcase mounting, and double-acting hydraulic propeller provisions.
- NOTE 8. Deleted June 9, 1954.
- NOTE 9. The 749C18BD3 engine incorporates a viscous type vibration damper and is otherwise similar to model 749C18BD1.
- NOTE 10. Model 745C18BA4 is identical to Model 745C18BA3 except it incorporates forged head type cylinder assemblies. Ratings and limitations of these engines are the same except cylinder head temperature limits as listed in Note 1.
- NOTE 11. 739C18BA3, 745C18BA3 and 745C18BA4 model engines with "-A" after the serial number have 749C18BD1 or 749C18BD3 rear sections and corresponding accessory drive limitations.
- NOTE 12. The following spark plugs are approved on these engines:  
AC - 171, 181, 271, 273, 281.  
BG - RB19R-2, RB27R-1  
Champion - C35S, RC35S, R37S-1, REA37N, REB37N, RHA37N, RHA37E, RHB37N, RHB37E, R115.

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