ENGINE

Model: FPT F5H FL463 A*F004
Emissions Certification: Tier 4 Final
Type: 4-stroke
Cylinders: 4
Bore/Stroke: 3.9 x 4.3 in (99 x 110 mm)
Displacement: 207 in³ (3.4 L)
Fuel injection: High pressure, common rail injection
Fuel: Diesel
Fuel filter: Spin on, Beta (4) = 20
Air filter: Dry type element w/ warning restriction indicator
Exhaust aftertreatment:
- Particulate Matter Catalyst – PM Catalyst
Radiator:
- Core type: All aluminum
Fan:
- Style: Direct drive
Lubrication/cooling oil pump:
- Style: Integral
Engine oil:
- Pump:
  - Deep sump plate cooler w/ pressurized under-piston nozzles
Pump operating angle ratings:
- Side-to-side: Rated 35°
- Fore and aft: Rated 35°
- Oil filtration: Spin on, full flow
Engine speeds:
- RPM: Rated – full load 2500, Low idle 950, High idle – no load 2500
Horizonpower @ 2500 RPM:
- Gross: 74 hp (55 kW), Net: 70 hp (52 kW)
Peak torque @ 1400 RPM:
- Gross: 233 lb·ft (316 N·m), Net: 227 lb·ft (308 N·m)
NOTE: Gross horsepower and torque per SAE J1349. Net horsepower and torque per SAE J1349.

DRIVETRAIN

Transmission: Hydrostatic transmission
Pump relief: 6,092 psi (42 000 kPa)
Pump flow @ 2500 RPM: 37.0 gpm (140 L/min)
Differential: Open standard/limited slip or 100% lock opt.
Front axles:
- Differential ratio: 3.67
- Planetary ratio: 6.00
- Final axle ratio: 22.00
Gear box:
- 1st ratio: 2.46
- Gear box HS: 1st ratio: 2.75, 2nd ratio: 1.16
Planetarys: Outboard
Service brakes:
- Master cylinder hydraulically actuated, wet disc on front axle
Parking brake:
- Mechanical, caliper on front axle
Travel speeds:
- MPH (kph) @ 2500 RPM:
  - Low: 3.3 (5.3), High: 11.4 (18.3)
- HS MPH (kph) @ 2500 RPM:
  - Low: 3.0 (4.8), High: 8.1 (13.0), 3rd High: 18.6 (30.0)
NOTE: Travel speeds at full engine throttle w/ 365/80 R20 tires.

ELECTRICAL

Voltage: 12 Volts
Alternator: 120 amp
Batteries: 95 AHR, 900 CCA

OPERATOR ENVIRONMENT

Base and Deluxe Cab w/ heater; Key start; Articulated power steering w/ tilt column; Full adjustable, cloth suspension seat; Foot throttle; Single joystick w/ electronic speed shift control F/N/R switch and proportional loader control; Cup holder; Retractable seat belt; Storage tray on Deluxe Cab; Sun screen – front; Opening side window; Dome light; Wipers – front and rear; 12-volt auxiliary power; Lighter cigar and ashtray; Pocket cellular phone; Coat hook; External rearview mirrors; Loader control lockout.
Electronic information center
Displays/Gauges:
- Vehicle speed; Hourmeter; Floating functionality on; High flow functionality on; Clock; Vehicle directions; Gear number engaged; PM Catalyst icons.

HYDRAULICS

Pump – steering/implement:
- Open-centered pressure/flow compensated
Fixed gear type:
- Standard flow:
  - Max. 22.5 gpm @ 2500 RPM @ 3,626 psi (Max. 85 L/min @ 2500 RPM @ 25 000 kPa)
Optional high flow:
- Max. 34.3 gpm @ 2500 RPM @ 2,901 psi (Max. 130 L/min @ 2500 RPM @ 20 000 kPa)
Loader control valve:
- Open-center, Hydraulic Loader Control w/ single lever includes: Forward/Neutral/Reverse switch, Floating switch, Low/High Travel mode switch, Auxiliary Function Roller
Loader auxiliary steering:
- Hydraulic orbital center-pivot articulating w/ on-demand oil flow
Main relief pressure: 3,336 psi (23 000 kPa)
Filtration:
- 15-micron, full flow replaceable cartridges on return line

OPERATING WEIGHT

Z-Bar:
- Unit equipped w/ ROPS/FOPS cab w/ heater, standard counterweight, 365/70 R18 Dunlop Tires, front and rear fenders, 1.2 yd³ (0.9 m³) general purpose bucket w/ edge, full fuel, 165 lb (75 kg) operator: 12,547 lb (5 691 kg)

SERVICE CAPACITIES

Fuel tank: 22.7 gal (86.0 L)
Hydraulic system:
- Reservoir: 10.6 gal (40.0 L)
- Total: 14.0 gal (53.0 L)
Front and rear axle:
- Front axle: 2.3 gal (8.7 L), Rear axle: 2.6 gal (10.0 L), Rear axle HS: 2.5 gal (9.5 L)
Engine oil w/ filter: 1.8 gal (7.0 L)
Cooling:
- 3.4 gal (13.0 L)
NOTE: *1.72 gal (6.5 L) antifreeze + 1.72 gal (6.5 L) water.
## OTHER SPECIFICATIONS

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift cylinders</td>
<td>Two (2)</td>
</tr>
<tr>
<td>Bore diameter</td>
<td>3.3 in (82.5 mm)</td>
</tr>
<tr>
<td>Rod diameter</td>
<td>2.0 in (50.0 mm)</td>
</tr>
<tr>
<td>Stroke</td>
<td>29.6 in (751.0 mm)</td>
</tr>
<tr>
<td>Dump cylinder:</td>
<td></td>
</tr>
<tr>
<td>Bore diameter</td>
<td>3.5 in (88.7 mm)</td>
</tr>
<tr>
<td>Rod diameter</td>
<td>2.3 in (57.1 mm)</td>
</tr>
<tr>
<td>Stroke</td>
<td>20.0 in (507.0 mm)</td>
</tr>
</tbody>
</table>

### Loader:
- **Z-Bar:**
  - Z-Bar loader linkage
  - Single control for lift and tilt
  - Positive hold float
  - Hydraulic attachment coupler: Skid steer compatible/horizontal pin compatible

### Cycle time:
- **Z-Bar:**
  - Raise w/ rated bucket load: 5.8 sec
  - Dump w/ rated bucket load: 1.7 sec
  - Lower – empty: 3.8 sec

## DIMENSIONS

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Height to top of ROPS cab</td>
<td>103.4 in (2,627 mm)</td>
</tr>
<tr>
<td>B. Wheelbase</td>
<td>87.6 in (2,225 mm)</td>
</tr>
<tr>
<td>C. Ground clearance under shaft</td>
<td>17.3 in (440 mm)</td>
</tr>
<tr>
<td>Ground clearance under axles</td>
<td>12.5 in (317 mm)</td>
</tr>
<tr>
<td>D. Angle of departure</td>
<td>27°</td>
</tr>
<tr>
<td>E. Overall without bucket</td>
<td>73.2 in (1,860 mm)</td>
</tr>
<tr>
<td>F. Centerline tread</td>
<td>59.1 in (1,500 mm)</td>
</tr>
<tr>
<td>Turning radius – outside</td>
<td>157.0 in (3,987 mm)</td>
</tr>
<tr>
<td>Turning angle:</td>
<td>40°</td>
</tr>
<tr>
<td>From center</td>
<td></td>
</tr>
<tr>
<td>Total angle</td>
<td>80°</td>
</tr>
<tr>
<td>Rear axle oscillation – total</td>
<td>20°</td>
</tr>
</tbody>
</table>

Line drawings are for illustrative purpose only and may not be exact representation of unit.
## PERFORMANCE SPECS

<table>
<thead>
<tr>
<th>221F Z-Bar</th>
<th>1.2 yd³ GP (0.9 m³) GP Bucket with Bolt-on Edge</th>
<th>1.56 yd³ GP (1.2 m³) LM Bucket with Bolt-on Edge</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO bucket capacity – struck</td>
<td>0.92 yd³ (0.7 m³)</td>
<td>1.31 yd³ (1.0 m³)</td>
</tr>
<tr>
<td>Heaped</td>
<td>1.18 yd³ (0.9 m³)</td>
<td>1.57 yd³ (1.2 m³)</td>
</tr>
<tr>
<td>Bucket width – outside</td>
<td>80.7 in (2 050 mm)</td>
<td>82.7 in (2 100 mm)</td>
</tr>
<tr>
<td>Bucket weight – includes coupler and added components</td>
<td>1,060 lb (481 kg)</td>
<td>1,160 lb (526 kg)</td>
</tr>
<tr>
<td>Operating height – fully raised with spillguard</td>
<td>170.4 in (4 327 mm)</td>
<td>176.0 in (4 470 mm)</td>
</tr>
<tr>
<td>Hinge pin height – fully raised</td>
<td>129.5 in (3 290 mm)</td>
<td>129.5 in (3 289 mm)</td>
</tr>
<tr>
<td>Overall length – bucket level on ground</td>
<td>231.1 in (5 869 mm)</td>
<td>234.8 in (5 964 mm)</td>
</tr>
<tr>
<td>Dump angle – fully raised</td>
<td>48°</td>
<td>48°</td>
</tr>
<tr>
<td>Dump height – fully raised, 45° dump</td>
<td>95.5 in (2 425 mm)</td>
<td>92.8 in (2 358 mm)</td>
</tr>
<tr>
<td>Bucket reach – fully raised, 45° dump</td>
<td>40.2 in (1 020 mm)</td>
<td>42.8 in (1 087 mm)</td>
</tr>
<tr>
<td>Bucket reach – 7 ft 0 in (2.13 m) height, 45° dump</td>
<td>51.5 in (1 309 mm)</td>
<td>51.9 in (1 318 mm)</td>
</tr>
<tr>
<td>Dig depth</td>
<td>3.9 in (98 mm)</td>
<td>3.9 in (98 mm)</td>
</tr>
<tr>
<td>Operating load – ISO</td>
<td>4,007 lb (1 818 kg)</td>
<td>3,984 lb (1 807 kg)</td>
</tr>
<tr>
<td>Maximum material density – ISO</td>
<td>3,404 lb/yd³ (2 020 kg/m³)</td>
<td>2,538 lb/yd³ (1 506 kg/m³)</td>
</tr>
<tr>
<td>Tipping load – ISO:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight</td>
<td>9,318 lb (4 227 kg)</td>
<td>9,287 lb (4 212 kg)</td>
</tr>
<tr>
<td>40° turn</td>
<td>8,014 lb (3 635 kg)</td>
<td>7,968 lb (3 614 kg)</td>
</tr>
<tr>
<td>Lift capacity:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full height</td>
<td>8,317 lb (3 773 kg)</td>
<td>8,217 lb (3 727 kg)</td>
</tr>
<tr>
<td>Maximum reach</td>
<td>10,597 lb (4 807 kg)</td>
<td>10,497 lb (4 761 kg)</td>
</tr>
<tr>
<td>Ground</td>
<td>12,975 lb (5 886 kg)</td>
<td>12,796 lb (5 804 kg)</td>
</tr>
<tr>
<td>Breakout force with tilt cylinder</td>
<td>10,959 lb (4 971 kg)</td>
<td>9,109 lb (4 132 kg)</td>
</tr>
<tr>
<td>Maximum rollback:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ Ground</td>
<td>40°</td>
<td>40°</td>
</tr>
<tr>
<td>@ Carry position</td>
<td>46°</td>
<td>46°</td>
</tr>
<tr>
<td>@ Maximum reach</td>
<td>62°</td>
<td>62°</td>
</tr>
<tr>
<td>@ Full height</td>
<td>62°</td>
<td>62°</td>
</tr>
<tr>
<td>Maximum grading angle with bucket – back dragging</td>
<td>58°</td>
<td>60°</td>
</tr>
<tr>
<td>Loader clearance circle with bucket</td>
<td>368.9 in (9 371 mm)</td>
<td>373.4 in (9 484 mm)</td>
</tr>
</tbody>
</table>

## FORKS

| 221F Z-Bar | | |
| Fork length | 47.2 in (1 200 mm) | |
| Fork weight – includes coupler | 880 lb (399 kg) | |
| Operating load – level ground | 5,002 lb (2 269 kg) | |
| Tipping load – straight | 6,898 lb (3 129 kg) | |
| Tipping load – 40° turn | 6,252 lb (2 836 kg) | |
| Fork load center | 19.7 in (500 mm) | |
STANDARD EQUIPMENT

OPERATOR ENVIRONMENT
See page 1

ENGINE
FPT F5H FL463 A*F004
Fuel filter with water trap
Dual element air cleaner

LOADERS
See page 2

DRIVETRAIN
4-wheel drive
Open – front and rear axles
Hydrostatic transmission
Single joystick with electronic speed shift control F/N/R switch and proportional loader control
Outboard planetary axles
Hydraulic wet disc brakes
Mechanical parking brake

HYDRAULICS
Hydraulic remote control
3-spool loader control valve
3 Diagnostic quick couplers

OTHER
Front and rear fenders
Lights:
  2 Front driving headlights – high/low beam
  2 Rear flood lights
  2 Stop tail lights and backup light
  Front and rear turn signal/flash
Drawbar pin
Articulation locking pin
Tie-down and Lift-up point – front and rear
Backup alarm
Wired for radio
Bucket position indicator

OPTIONAL EQUIPMENT

OPERATOR ENVIRONMENT
Creep speed 0 – 3.1 mph (5 kph)
TeleScop adjustable steering column on Deluxe Cab
Rotating beacon
Limited slip – front and rear axles
100% lock – front and rear axles
Horizontal pin coupler
Air conditioning
Radio ready antenna and speakers

LOADERS
Additional auxiliary flow:
  Max. 22.5 gpm @ 2500 RPM @ 3,626 psi
  (Max. 85 L/min @ 2500 RPM @ 25 000 kPa)
Optional High flow:
  Max. 34.3 gpm @ 2500 RPM @ 2,901 psi
  (Max. 130 L/min @ 2500 RPM @ 20 000 kPa)
Buckets – see performance data:
  General purpose standard
  General purpose light material
  4-IN-1®
STD forks
Tiltable forks
Auto Ride Control
Return to dig

TIRES
14.5-20MPT-04 MITAS
365/80 R20 SPT9 L2(DL.)
365/70 R18 SPT9 L2 DUNL. – Standard
12.5-20 MPT10 PR L2 GDY.
12.5-20 10PRMPT04TBL MITAS
365/80 R20 EM MITAS
365/70 R18 EM MITAS

OTHER
Tool box
Counterweight:
  330 lb (150 kg)
Mounts on rear chassis

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