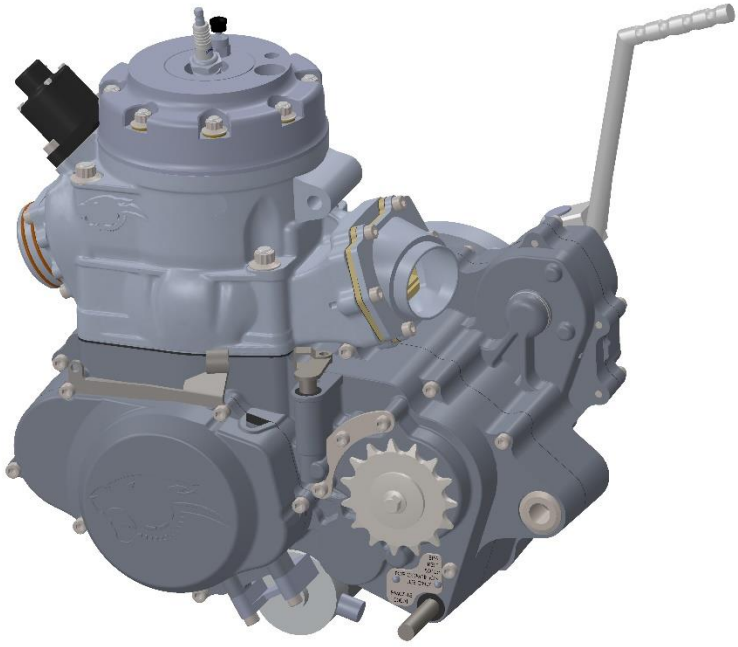
Panthera engine owner manual



PM07-18

Read this manual carefully it contains important information.

Introduction

This manual was produced by Panthera° Motorsports inc. and describes operation procedure and service procedure of the PM07-18 engine.

We recommend that your read this manual before installing and using your Panthera engine. The manual contains a detailed list of topics in the table of contents.

Follow the Maintenance schedule recommendation to ensure the engine is always in peak operating condition.

This publication includes the latest production information available before printing. Panthera Motorsports reserves the right to male changes at any time without notice and without incurring any obligation.

Disclaimer

This engine is sold as is, with all faults, obvious or concealed and there are NO WARRANTIES expressed or implied. Including warranties of merchantability or fitness for purpose.

The purchaser accepts all responsibilities concerning quality, performance, cost of service and/or necessary repairs.

This engine is a competition engine only. The use of this engine should be limited to participation in sanctioned competition event upon a closed course.

Read owner's manual.

Contents

Safety

Always ride within your limits. Major cause of motorsport crashes comes from riding beyond your personal abilities. Alcohol, drugs, fatigue and inattention can significantly reduce your ability to make good judgement and ride safely.

Alcohol and riding don’t mix. Even one drink can reduce your ability to respond to changing condition and your reaction time gets worse with every additional drink.

Keep your vehicle properly maintained and in safe riding condition. To help avoid problem, inspect your vehicle before every ride and perform all recommended maintenance.

Basic operation

Pre-ride inspection

Transmission oil	Check the level and add oil if needed Check for leaks
Radiator coolant	Check the coolant level and add coolant if needed Check for leaks
Fuel	Check the level and add fuel if needed. Also make sure the fuel fill cap is securely fastened. Check for leaks
Throttle	Check for throttle freeplay and adjust if needed. Press the throttle to make sure it moves smoothly without sticking and snaps shut automatically when it is released.
Clutch actuator	Check for smooth operation and adjust freeplay
Kill switch	Check for proper function

Starting procedure

Electric start engine

1. Turn the fuel valve on and ignition switch on
2. Confirm the transmission is in neutral
3. Confirm the engine stop switch is set to RUN
4. Pull the choke know up all the way to ON position if the engine is cold.
5. With the throttle closed, press start button
    a. Pressing the electric start button for more than 5 seconds at a time may cause the starter to overheat and damage the starter. Release the start button for approximately 10 seconds before pressing it again.
6. After the engine start, push the choke knob back to OFF position to keep fast idling.
7. If idling is unstable, open the throttle slightly.

Kick start engine

1. Turn the fuel valve on and ignition switch on
2. Confirm the transmission is in neutral
3. Confirm the engine stop switch is set to RUN
4. Pull the choke know up all the way to ON position if the engine is cold.
5. Lightly depress the kickstarter until resistance is felt. You will feel two resistance close to another then a long free play. Stop right before the first of the two resistance. (Before TDC)
6. After the engine start, push the choke knob back to OFF position to keep fast idling.
7. If idling is unstable, open the throttle slightly.

High air temperature 30°C (86°F): Do not use the choke.

Flooded engine

If the engine fails to start after repeated attempts, it may be flooded with excess fuel. To clear a flooded engine:

Electric start engine

1. Put the engine stop witch at off.
2. Push the choke know at OFF
3. Open the throttle fully
4. Press the start button for 5 seconds.
5. Wait 10 seconds, then turn the engine stop switch to RUN.
6. Repeat the electric start engine normal starting procedure.

Kick start engine

1. Put the engine stop witch at off.
2. Push the choke know at OFF
3. Open the throttle fully
4. Repeat kick start operation approximately 10 times to discharge excessive fuel from the engine.
5. Repeat the kick start engine normal starting procedure.

If the engine still won't start, refer to the ''If your engine quit or won't star'' page.

Stopping procedure/stop switch wiring

Engine stopping signal must be sent to the black wire of the CDI unit. (refer to wiring diagram)

The black wire must be sent to engine ground in order to stop the ignition spark.

Shifting gear

The shift lever is located on the left side of the engine. One full stroke of the shift lever shifts the transmission to the next higher or lower gear in the shifting sequence. The shift lever automatically returns to the horizontal position when released.

PM07-18 engine as six forward gears (1,2,3,4,5 and 6). To upshift, raise the shift lever a full stroke. To downshift, depress the shift lever a full stroke.

Neutral is located between 1st and 2nd gear. To put engine in neutral, softly half stroke the shift lever from 1st going to 2nd or from second going to 1st.

Race maintenance schedule

I : Inspect

C : Clean

R : Replace

ITEM / FREQUENCY	Initial maintenance	Each race or about 2.5 hours	Every 4 races or about 10 hours	Every 9 races or about 22.5 hours
Throttle operation		I		
Air filter		C		
Spark plug			R	
Radiator coolant	Flush after 1st ride	I		
Transmission oil	Flush after 1st ride		R	
Piston and rings			R	
Piston pin and small end bearing			R	
Head o-rings				R
Head carbonizing				C
Balancer bearings				I
Clutch plates			I	

Taking care of the unexpected

If the engine won't start

SYMPTOM: Starter motor doesn't operate (e-start motor only)	
POSSILE CAUSE	WHAT TO DO
Ignition switch OFF	Turn the ignition switch ON
Blown fuse	Replace with a new fuse of the same rating
Battery lead loose	Tighten the battery lead
Low (or dead) battery	Charge the battery. If charging doesn't help, get the battery tested.
Faulty starter motor	If all causes are negative, the starter motor may be faulty. Replace the starter motor.

SYMPTOM: Starter motor works, engine won't start	
POSSILE CAUSE	WHAT TO DO
Ignition switch OFF	Turn the ignition switch ON
Out of fuel	Fill the tank and make sure the fuel petcock is open
Flooded engine	See flooded engine page 6
Loose or unconnected spark plug cap	Install the spark plug cap securely
Unplugged coil signal wire.	Reconnect the signal wire to the ignition coil.
Faulty stator	See stator inspection procedure. Replace the stator if faulty
Faulty stator	See stator inspection procedure. Replace the stator if faulty

High coolant temperature

- A steaming engine indicates a coolant leak. Shut the engine off and way until the steaming stops. Look for a leak, but don't touch the engine or radiator system. Let everything cool off first.
- Check for any restriction of air flow through the radiator.
- If the reserve thank is low or empty, don't ride without adding coolant.
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Technical information

Engine specs

Displacement		548 cc
Bore & Stroke		94.0 x 79.0
Compression ratio		12:1
Spark plug		BR8ES
Spark plug gap		0.56-0.64mm
Idle speed		1500 ± 100 rpm
Primary reduction		2.11
Gear ratio	1st	2.87
	2nd	1.81
	3rd	1.5
	4th	1.25
	5th	1.05
	6th	0.88

Fuel and lubricants

Fuel recommendation	Unleaded fuel, 94 octane or higher
Fuel oil recommendation	Motul 800 2T
Fuel oil mixing ratio	40:1
Transmission oil capacity	1.8 L at disassembly 1.5 L at oil change
Transmission oil recommendation	Klotz flex drive 30
Cooling system recommendation	High quality ethylene glycol antifreeze containing corrosion protection inhibitors specifically recommended for use in aluminium engines.

Torque specifications

Item	Thread dia x pitch (mm)	Torque Nm (ft-lb)
Generic		
	5 mm nut and bolt	5 (3.6)
	6 mm nut and bolt	12 (9)
	8 mm nut and bolt	22 (16)
	10 mm nut and bolt	35 (25)
	5 mm bolt	4 (2.9)
	6 mm bolt	10.5 (7.5)
	8 mm bolt	12 (9)
Maintenance		
Oil check bolt	8 x 1.25	12 (9)
Oil drain bolt	12 x 1.5	30 (22)
Cooling system		
Coolant drain bolt	6 x 1.0	10 (7)
Water pump cover bolt	6 x 1.0	12 (9)
Water pump impeller	6 x 1.0	12 (9)
Cylinder Head/ Cylindre		
Spark plug	14 x 1.25	18 (13)
Cylinder head nut	8 x 1.25	27 (20)
Cylinder mounting nut	10 x 1.25	40 (29)
Cylinder stud bolt	10 x 1.25	12 (9)
Decompressor	10 X 1.0	27 (20)
Clutch/transmission		
Clutch spring bolt	6 x 1.0	10 (7.2)
Clutch center lock	20 x 1.0	90 (65)
Primary gear bolt	12 x 1.25	70 (50)
Drum shifter set plate bolt	6 x 1.0	10 (7)
Balancer nut	16 x 1.0	70 (50)
Sprocket bolt	8 x 1.25	27 (20)
Kick start lever	8 x 1.25	27 (20)

Wiring diagram