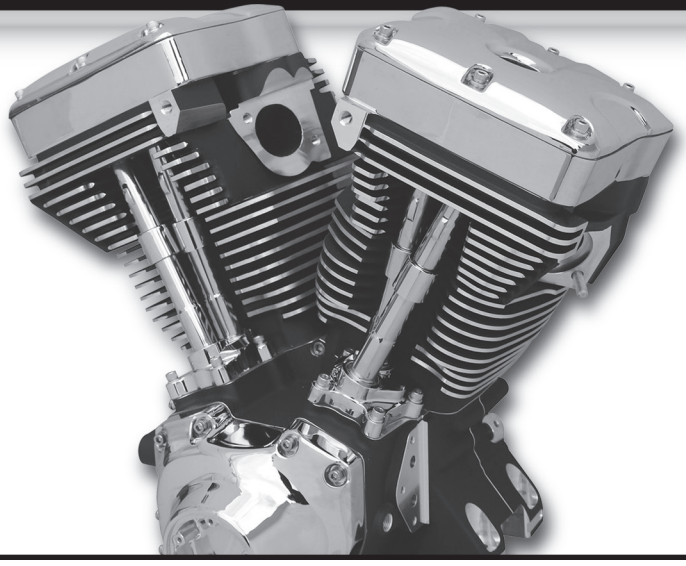
ULTIMA®

MOTOR WORKS

ENGINE OWNERS MANUAL



COMPETITION SERIES ENGINES FOR TWIN CAM® REPLACEMENT

*NOT EPA COMPLIANT

ULTIMA COMPANY LLC

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All words used in this catalog denoting any motorcycle manufacturer, models of motorcycle, or part numbers are intended for use as reference only.

Although our replacement engines are not original factory equipment for some manufacturers, our intention is to provide an exceptional quality replacement part that will outperform the original equipment of many OEM manufacturers.

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WARNING

Serious injury, death and property damage can result from the improper use, control, alteration, or maintenance of motorcycles. The dealer and dealers customers must exercise good judgement in the use, control, alteration, part selection and installation, and maintenance of motorcycles. Ultima® has no control over the judgement of others and assumes no responsibility or liability of any nature for the failure of others to use good judgement.

ULTIMA® COMPETITION SERIES ENGINES

DISTRIBUTED EXCLUSIVELY BY MIDWEST MOTORCYCLE SUPPLY

Failure to read and comply with this document completely may Void Warranty.

COMPETITION SERIES ENGINE WARRANTY:

Ultima's Complete Assembled Competition Series engines are guaranteed to the original purchaser to be free of manufacturing defects in materials and workmanship from the date of purchase for a period of: 24 months on 110 CI Twin Cam®, 12 months on 113 CI Twin Cam® & 6 months on 124 CI Twin Cam® replacement engines.

Merchandise that fails to conform to these conditions will be repaired by Ultima if the parts are returned to Midwest Motorcycle Supply by the purchaser within the specified warranty period or within 10 days thereafter. **Cost associated with removing or installation of complete engines are not covered under this warranty. This warranty covers Ultima® parts only and no other associated expenses.**
In the event that any warranty service is required, the original purchaser must call or write Midwest Motorcycle Supply immediately with the problem. Many problems can be rectified by a telephone call and need no further course of action. Merchandise that is suspected of being defective must not be replaced by a Dealer or End User without prior authorization from Midwest Motorcycle Supply. If it is deemed necessary for Ultima to make an evaluation to determine whether the part was defective, it must be packaged properly to prevent further damage and be returned prepaid to Ultima Company LLC. You must include a copy of the original invoice and a detailed letter outlining the nature of the problem. You must also outline how the part was used and the circumstances at the time of failure. If, after an evaluation has been made by Ultima and the part was found to be defective, repair to the existing part or replacement will be granted **at Ultima's discretion**. Engines that have been modified in any way from the original purchased configuration will have the warranty void.

For any warranty issues please contact: Ultima Company LLC • 2100 Highway Z, Pevely, MO 63070 • 636-931-3394 • tech@midwestmc.net

ATTENTION! DUE TO THE LARGE DISPLACEMENT OF THIS ENGINE IT IS STRONGLY ADVISED TO USE A QUALITY OIL TANK BREATHER KIT TO ASSIST CRANK CASE BREATHING.

ENGINE INSTALLER'S RESPOSIBILITY:

Ultima's® Competition Series replacement engine for Twin Cam® are sold without a fuel system or ignition system. It is the installers responsibility to choose the correct carburetor or fuel injection set up. Ultima® Twin Cam Engines have no provision for a **cam position sensor.** 1999-2000 model motorcycles will need an updated ignition system. Suggested carburetor jetting is located on the carburetor info page of this manual. When using a electronic fuel injection system Ultima® suggests using highflow fuel injectors. Ultima® part number 39-131, OEM# 27609-01 (yellow band injectors) or equivalent. It is the installer's responsibility to tune the fuel system and the ignition properly. Failure to do so could result in engine damage and **WILL NOT BE COVERED UNDER WARRANTY. WARRANTY FOR DEFECTIVE, REPAIR TO EXISTING PARTS OR REPLACEMENT WILL BE GRANTED AT ULTIMA'S® DISCRETION. IT IS ADVISED TO USE AN OIL COOLER.**

COMPONENTS:

All of Ultima's individual engine components or kits including long blocks, fuel systems and ignition systems are covered by a 12 Month Warranty. **This warranty covers part replacement only and no other associated expenses**. In the event that any warranty service is required, the original purchaser must call or write Midwest Motorcycle Supply immediately with the problem. Many problems can be rectified by a telephone call and need no further course of action. Merchandise that is suspected of being defective must not be replaced by a Dealer or End User without prior authorization from Midwest Motorcycle Supply. If it is deemed necessary for Ultima to make an evaluation to determine whether the part was defective, it must be packaged properly to prevent further damage and be returned prepaid to Midwest Motorcycle Supply. You must also include a copy of the original invoice and detailed letter outlining the nature of the problem. You must also outline how the part was used and the circumstances at the time of failure. If, after an evaluation has been made by Ultima and the part was found to be defective, repair to the existing part or replacement will be granted **at Ultima's discretion**.

ADDITIONAL WARRANTY PROVISIONS:

1. Ultima® shall have no obligation in the event an Ultima® part is modified by any other person or organization.
2. Ultima® shall have no obligation in the event an Ultima® part becomes defective in whole or in part as a result of improper installation, improper maintenance, improper use, abnormal operation, or any other misuse or mistreatment of the Ultima® part.
3. Ultima® shall not be liable for any consequential or incidental damage resulting from the failure of an Ultima® part, the breach of any warranties, the failure to deliver, delay in delivery, delivery in non-conforming condition, or for any other breach of contract or duty between Ultima® and a customer.
4. Ultima® parts are designed exclusively for use in Harley-Davidson® type motorcycles. Ultima® shall have no warranty or liability obligation if an Ultima® part is used in any other application.

General Specifications

Not EPA Compliant

100 C.I.

Displacement: cc/ci 1638/100”
Bore: 3.875”
Stroke: 4.250”
Compression: 9.5:1
Compression release valves
Valve: Int 2.100”
Valve: Ex 1.700”
Cam lift: Int .510”
Cam lift: Ex .510”
Pushrods: 4140 adjustable steel
Piston: forged dome
Rod length: 7.67”
Flywheel: forged 3 pc
Rocker boxes: 93’ later Evo
Rocker ratio: 1.675”
Billet oil pump
Billet cam support plate
Late model hydraulic chain tensioners

113 C.I.

Displacement: cc/ci 1853/113
Bore: 4.000”
Stroke: 4.500”
Compression: 10.0:1
Compression Release Valves
Valve: Int 2.100”
Valve: Ex 1.70”
Cam lift intake: .570”
Cam lift exhaust: .570”
Pushrod 4140 adjustable steel
Piston: Forged Dome
Rod length 7.67”
Flywheel Forged 3 Piece
Rocker Boxes ‘93 Later EVO
Rocker Ratio 1.675
Billet Oil Pump
Late Model Hydraulic Chain Tensioners
Billet Cam Support Plate

124 C.I.

Displacement: cc/ci 2032/124”
Bore: 4.125”
Stroke: 4.625”
Compression: 10:1
Compression releases
Valve: int 2.100”
Valve: ex 1.700”
Cam lift: Int .570”
Cam lift : Ex .570”
Pushrods: 4140 adjustable steel
Pistons: forged dome
Rod length: 7.67”
Flywheel: forged 3 pc
Rocker boxes 93’ later Evo
Rocker ratio: 1.675”
Billet oil pump
Billet cam support plate
Late model hydraulic chain tensioners

COMPETITION SERIES ULTIMA
TWIN CAM® REPLACEMENT

Cam Information
100 CI engine for Twin Cam® replacement:

Timing information is Open/Close @ .053

Int 18/38	236 Dur	Lift .510	TDC .174
Ex 46/14	240 Dur	Lift 510	TDC .148

Cam Information
113 CI & 124 CI engine for Twin Cam® replacement:

Timing information is Open/Close @ .053

Int 24/48	252 Dur	Lift .570	TDC .209
Ex 58/22	260 Dur	Lift 570	TDC .187

Oil Recommendations

For the break in process we recommend using Ultima® conventional motor oil. The oil's viscosity should be matched with the climate conditions. After the break in period, in most cases Ultima full synthetic 20w50 motor oil will work fine. Continue using 103-115 for great protection and maximum service life of your engine .

Oil Filters

The oil filter mount will bolt in the stock location. Use a premium Twin Cam® 10 micron filter with anti drain back. Ultima® micro glass filters MW# 25-70 Chrome or #25-71 Black.

It is strongly advised to use a quality Oil Cooler.

Charging system selection

Ultima® engines are supplied with MW part #98-960 main seal spacer for 1999 thru 2002 FLT models. It may be neccessary to change the space for your application.

General Information

Compression Release Valves

All Ultima® 100 CI and larger engines are supplied with manually operated push button compression release valves. These valves aid in starting your engine and can greatly increase your starter and battery life. To operate these simply depress the Top Cap as shown in Figure 1 and they will pop back up automatically once the engine is cranking. These are designed to help the starter to begin spinning the engine by providing a small bypass hole to relieve compression as the engine is rotated. When the cylinder pressure overcomes the CR valves spring tension it automatically shuts. After prolonged use valves can become sticky and closing can be slow. A slight blip of the throttle while the engine is running should shut the valves immediately.

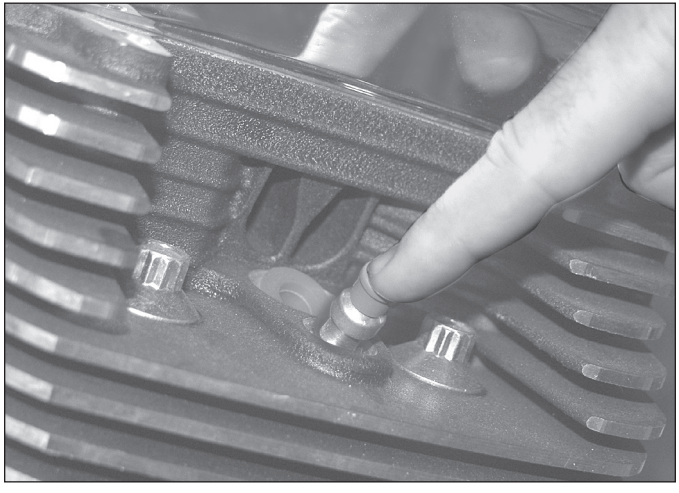

FIG. 1

PCV System and Rocker Boxes:

All Ultima® engines are designed to use 1993 & later style PCV systems (Rocker Boxes). Proper installation and free operation of the Cylinder Head Vent lines are very important to your engine's oiling system and overall performance.

Clutch and Driveline Considerations:

When installing any performance engine you should consider upgrading your clutch and inspecting or replacing your Primary Chain and adjuster. Increased power levels and aggressive riding styles can cause stock or worn components to fail or work poorly and they may need to be upgraded. Ultima® recommends Midwest part#**96-730** high performance clutch for use on 98'-06' HD® chassis.

Gearing Considerations:

When installing a performance engine selecting the proper gearing is very important in achieving the performance levels you desire. In many cases engines with less power that are geared properly can outperform more powerful engines that are geared poorly for particular applications. Another important factor is gross vehicle weight. Motorcycles that are heavy should not be geared with highway gears and a Six Speed unless the engine used is very, very powerful. On these types of bikes a 3.2-3.37 ratio will give much better acceleration. On most late model motorcycles the factory gearing is a good choice for all around riding. In lighter bikes we recommend a 2.92 to 3.15 overall ratio for highway riding. On heavier bikes used for highway riding or lighter bikes wanting quick acceleration for around town riding use 3.23 to 3.37 overall ratio.

Exhaust System Selection

Ultima® engines can be very exhaust-system sensitive and proper selection of exhaust system will yield the highest power levels. When selecting exhaust systems avoid large diameter pipes that do not have a smaller primary pipe that exits the head for at least 4-8" and **avoid installing torque cones** as these were made for small cubic inch engines (80ci-96ci). Overall the owner's satisfaction of the selected pipe is most important but it can also have a negative effect on rated power levels. For peak power levels a good stepped exhaust (1-3/4" Primary 4"-8" long to 2" pipe 12"-16" long to 2-1/4" pipe for the balance) drag pipe 32"-38" long will yield the highest numbers. For all around rideability select a free flowing staggered dual muffler set or the 2 into 1 systems. There are many exhaust systems out there with just as many opinions on what works. We recommend Ultima® step tuned competition exhaust and Ultima® 2 into 1 exhaust systems for the best results.

Starter and Battery Considerations

Ultima® configurations will typically have no starting problems when using components with comparable power ratings as used on OEM motorcycles built after 1989. Ultima® starters, batteries & battery cables are recommended when upgrading from the stock components. Typically an Ultima Thunderfire® starter with a 1.4 to 1.75kw rating when used with an Ultima® AGM battery & high quality Ultima® cables will give the best performance on our engines. An Ultima Thunderfire® starter with a 2.0 to 2.4kw rating when used with an Ultima® AGM battery & high quality Ultima® cables will give the best performance.

ULTIMA® THUNDERVOLT AGM HIGH POWER BATTERIES

ULTIMA® PREMIUM BATTERY CABLES

ULTIMA® THUNDERFIRE HIGH OUTPUT STARTERS

Carburetors and Initial Tuning

Typically higher elevations or hotter climates will require different jetting and ignition timing than those shown in this guideline. At any elevation it is important that your initial tune is not excessively rich, which is indicated by excessive black smoke, and equally important, avoid running the engine lean for the initial break in as this condition creates heat fast. Prior to starting your engine you should check your carburetor's initial idle mixture setting and fuel pump setting recommended by the manufacturer. Ultima® provides the proper base line jetting for each engines size but idle mixture and fuel pump setting must be done on an individual basis. When selecting the initial jetting for your engine remember that exhaust systems and ignition settings can have a great effect on the engine's fuel demands.

An experienced tuner should make the final decision for your particular jetting and timing needs with your combination and at your elevation. Thoroughly read and understand your carburetor instructions before installing it or starting your engine.

Baseline Jetting Suggestions

	113 CI
Ultima R1	76/31
Mikuni 42mm	170/25
Mikuni 45mm	175/27.5
Mikuni 48mm	175/25
S&S 'G'	76/31
S&S 'D'	82/31

USING EFI

When using EFI it is very important that the fuel and timing are tuned correct. When using a electronic fuel injection system Ultima® suggests using highflow fuel injectors. Ultima® part number 39-131, OEM# 27609-01 (yellow band injectors) or equivalent. Failure to do so could result in engine damage and will not be covered under warranty. Ultima® strongly suggests only **Experienced Tuners** set up the EFI and ignition systems.

TIMING CONSIDERATIONS

It is the responsibilty of the installer to tune ignition correctly. Failere to do so can result in engine damage **voiding the factory warranty**. The timing curve below is a good starting point for the Ultima® 113 Competition Series engine for Twin Cam® replacement. Rev limiter should be set to 6000 RPM.

RPM	DEGREES ADVANCED
1000	10°
2000	15°
3000	20°
4000	25°
5000	30°
6000	30°

START UP AND BREAK IN RECOMMENDATIONS

To give your engine maximum life and performance please read these recommendations thoroughly. These recommendations are assuming that your engine has been installed by a professional mechanic and all aspects of proper engine installation have been addressed.

Pre-Start Checks

Oil System:

Some things that you should not do prior to starting your engine are:

1. Never assume your oil tank is clean enough:
   Oil is your engine's life blood and installing a new engine in a motorcycle that has not had the oil system (tank, cooler, filter housing) thoroughly cleaned with new oil lines installed is definitely something not to do. All new tanks and coolers should be inspected and cleaned prior to installation.

Rev Limiters

During break-in we suggest setting Rev Limiters to the lowest setting (5,500 or less) to insure over revving will not occur. Most Ultima® engines will not produce power beyond 6,000 rpm and little if anything is gained by revving these engines past this rpm when in the stock configuration. **A major contributor to a shortened engine life is high RPM.**

Priming the oil system prior to Start-up

All engines should be checked for oil pressure prior to start up.
To verify that you have pressure before running your engine follow these steps:
Make sure you have filled your oil tank with clean engine oil and no oil lines are crimped.

1. Disconnect all wires from the coil.
2. Remove spark plugs from engine.
3. With the motorcycle in neutral, turn on the ignition and crank at least 5 times for approx. 20 seconds total.
   You will now have oil to the lifters and can start the engine.

Fuel Recommendations:

High quality fuel will have a direct effect on your engine's performance.
Ultima® engines are designed to run on a Minimum of 92 octane fuel. Higher octane fuels will be beneficial to your engine only up to a point and above about 100-105 octane you can lose performance as the engine's fuel requirements and ignition timing requirements with these fuels will change. Search out the best fuels in your area. There are large variations in fuel quality nationwide.

Initial Start Up

One of the most important parts of the break-in procedure is the initial starting of your engine!!!!
Read this completely before starting the engine!!!!!!

1. Remove the Air Filter Cover.
2. Twist the throttle wide open and make sure that the fuel pump is working.
3. Give the engine 2 full fuel squirts and full enrichment or choke.
4. Leave the throttle shut and start the engine.

Upon start of the engine, immediately set the idle at approx. 1000-1200 rpm and let the engine idle while initial idle mixture or air bleed settings are adjusted, if needed, to allow the engine to idle properly.

Some of the things you should not do to a new engine are:

- **Do not start the engine without first going though the oil pump/lifter priming process described earlier.**
- **Do not start the engine without a large fan pointed at the engine and on its highest setting.**
- **Do not rev the engine or blip the throttle repeatedly.**
- **Do not let the engine idle for long periods.**

While these things may seem unimportant please consider that new engines create much more heat than engines that have been broke in. Remember these are **Air Cooled engines.**

On the initial start we recommend letting the engine run approx. 2 minutes then letting it cool before repeating this procedure. Do overall checks before restarting. Do not over heat the engine! For each 2 minute cycle, run the engine at idle 10-15 seconds then at 2000-2600 rpm for 10-15 seconds. Check and verify that your engine has adequate oil pressure and is returning oil to the oil tank.

After you have run the engine for approx. 4-5 minutes, verify that no intake air leaks or oil leaks are present.

Let the engine cool to room temperature.

Do not let the engine get excessively hot! You can now T**AKE YOUR FIRST RIDE!**

Break-in procedures for Ultima® Engines

Follow these guidelines closely or you may void your warranty.

Avoid over heating your engine!!!!!!!!!!!

The heat of a new engine can be directly related to engine rpm, load and friction.

Do not lug the engine. If you have a 6-speed transmission do not run your bike in 6th gear during break-in. We strongly recommend you keep the engine rpm above 2400 and below 3500 rpm for the first 500 miles and run the engine at varying speeds. Setting the Idle at a minimum of 900-1100 rpm during break–in is desired.

Short trips under 10 miles **and not in traffic** on the first 2 rides are preferred. Try to ride on cool evenings and do not idle the bike very long. Keep air moving around the engine to keep it cool. Making the next 3-4 trips fewer than 30 miles will help to keep the heat down. When taking your initial rides on your new engine do so riding solo **to avoid lugging the engine. If the engine feels like it is getting excessively hot shut it down** and let it cool.

If an engine overheats during break-in due to improper ignition timing, improper jetting, or excessive heat you can collapse or (stick) a piston which may not be covered under warranty.

During the first 500 miles of operation we highly recommend running the engines on open road at varying engine speeds.

For the first 1000-1500 miles you should monitor your engine temperature and **always avoid prolonged idling or sitting in traffic. If you get stuck in traffic pull over and take a break. DO NOT break-in your engine at Daytona or Sturgis or any other rally.**

After 2000 miles avoid running your engine above 5500 rpm and if your ignition has a rev limiter, set it to work at this RPM. In most stock Ultima® engines no additional power is made above 5500 rpm and running the engines at these higher rpm's will only shorten engine life especially on poorly tuned engines.

Break-In Service and Hardware Re-torquing

With a new engine we feel the first oil/filter change should occur after the first 50-100 miles and all cover bolts and engine-mounting bolts should be checked for proper torque. Keeping your engine oil clean is very important to the overall life of the engine. During the Break-In, or look at it as the "Wear-In" period, engines produce very small metallic pieces that need a good filter to remove them. Checking cover bolts and engine mounting bolts is just good preventative maintenance during this period. See torque specifications below for specs.

Dyno Tuning

After your engine's break-in procedure has been strictly adhered to, we recommend that you have your engine dyno tuned for optimum performance. Typically a new engine will have different fuel demands than an engine that has been through the break-in procedure and additional tuning may be required for optimal performance.

Troubleshooting

Below you will find a list of common issues we have encountered with new engine installations. If you do not see your problem or cannot resolve one of these problems please contact your dealer for more information.

Engine Won't Start

Common causes: **1.** No fuel supply. **2.** No spark. **3.** Engine has been flooded.
When trying to start the engine for the first time, and it is difficult, you need to verify that you have compression, fuel and spark. If you remove the air filter cover and give the throttle 1-2 full turns prior to starting you can see if the fuel pump is working properly and that fuel is being delivered. Please refer to the Carburetor manufacturers instruction on how to set the fuel pump. After you give the engine a few squirts from the fuel pump, give it a full enrichment or choke for best initial starting and do this **with the throttle closed.** Do not keep twisting the throttle if the engine does not start. Stop and evaluate the problem or you can Gas Foul the spark plugs. If no spark is present verify all connections and contact the ignition manufacturer for technical help.

Excessive lifter noise

Common causes: **1.** Engine was not properly primed prior to start-up. **2.** No oil feed to lifters. **3.** Improper pushrod adjustment.
If you have excessive lifter noise at start-up **shut the engine off immediately and go through the priming process described earlier in this document.** Ultima® engines are primed from the factory but if no oil is being fed from the oil pump the lifters will lose their prime quickly. Engines that are run with dry lifters are at risk to bend pushrods and can have permanent damage.

Lifter Adjustment procedure for Ultima® Engines

When performing any service work always disconnect the battery!!!

Remove the spark plugs and pushrod tube clips to access the pushrods. With a stable lift get the rear wheel of the bike off of the ground and put the bike in 5th gear. Use the rear wheel to rotate the engine slowly.

Never rotate the engine with the Starter motor while adjusting pushrods.

1. Rotate the engine until you are on the compression stroke for the cylinder you are adjusting. This occurs after the cylinder to be adjusted has had its **Intake** lifter go to full lift and back to Zero lift during forward rotation of the engine. At this time the piston will be coming up and both valves will be closed at Top Dead Center. Put the piston at the very top of its stroke (TDC). You can now adjust both pushrods for that cylinder.
2. Loosen both pushrods until there is play between the lifter and pushrod.
3. With your Fingers rotate the adjuster until there is no play between the lifter and pushrod (zero lash) but with no load on the lifter.
4. Extend the adjuster another **2-1/2 turns** beyond zero lash and lock the jam nut tight. (This applies to pushrods with 24 threads per inch. If the pushrods are not the stock Ultima® pushrods use the manufacturer's recommended setting.)
5. Wait until you can turn both of the pushrods with your fingers (30 seconds to 15 minute wait). You can then roll the engine over and repeat the process for the next cylinder. **Do not roll the engine before you can turn the pushrods by hand or you can cause damage to the engine. The engine should rotate and not want to stop at any point when adjusting pushrods. If the engine wants to stop at any point do not force the rotation. Stop and reset that pushrod or you can cause damage to the engine.**
6. Repeat this procedure for the remaining pushrod for that cylinder.

General Torque Specs and Adjustments

Rocker Box Bolts	**Lower**	(1/4-20 120-140 In Lb) (5/16-18 15-22 Ft Lb)
	Upper	80-120 In lb
Head Bolts	Antiseize or Lubricated Thread and bolt washer — Torque in 5 steps — twice per sequence. Torque in X Pattern. (1) 60In Lb (2) 10ft Lb (3) 20 Ft Lb (4) 28-30 Ft Lb (5) 40-42 Ft Lb	
Pushrod Adjustment	2-1/2 turns extended beyond zero lash using Crane or Ultima® Speedrods® pushrods.	
Cam Cover/Lifter Covers	1/4-20 bolts 120-150 In Lb	
Oil Pump Bolts	120-140 In Lb	
Case Bolts	All 5/16-18 bolts 14-18 Ft Lb Center 5/16-18 between the cylinders. 90-110 In Lb	
Inner Primary to Engine	22-25 Ft Lb	
Engine Sprocket Bolt	150-165 Ft Lb	
Motor Mount bolts	34-38 Ft Lb	
Spark Plugs	18-20 Ft Lb	
Compression Releases	108-130 In Lb	

MAINTENANCE SCHEDULE

First 100-150 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check torque of all fasteners except head bolts

Technician Signature **Date**

First 500 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check engine mounting bolts

Technician Signature **Date**

First 1500 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check engine mounting bolts

Technician Signature **Date**

Ultima requires following the scheduled maint. guidelines every 3000 miles after the first initial 3000 miles. In an event warranty is needed, Ultima reserves the right to request copies of the signed scheduled maintenance lists. These guidelines are provided to give you maximum engine life, enjoyment & service life of your Ultima engine.

First 3000 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Inspect & clean air filter as necessary
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check torque of all fasteners except head bolts

Technician Signature **Date**

MAINTENANCE SCHEDULE

6000 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Inspect & clean air filter as necessary
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check engine mounting bolts

Technician Signature **Date**

12,000 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Inspect & clean air filter as necessary
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check engine mounting bolts

Technician Signature **Date**

Ultima requires following the scheduled maint. guidelines every 3000 miles after the first initial 3000 miles. In an event warranty is needed, Ultima reserves the right to request copies of the signed scheduled maintenance lists. These guidelines are provided to give you maximum engine life, enjoyment & service life of your Ultima engine.

9000 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Inspect & clean air filter as necessary
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check torque of all fasteners except head bolts

Technician Signature **Date**

15,000 MILE SCHEDULED MAINTENANCE

- ❑ Change oil
- ❑ Change oil filter
- ❑ Replace air filter
- ❑ Replace spark plugs
- ❑ Check fuel valve, lines & fittings for leaks
- ❑ Check oil lines & fittings for leaks
- ❑ Check torque of all fasteners except head bolts

Technician Signature **Date**

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