

Custom Bike - Parts Checklist & Useful Build Hints

We can supply a Kit Bike - You design the bike - we supply the kit

Model - Name of Custom Bike
 Builder.....Available budget £/\$/Euro/other.....Compare with projected total at bottom
 Start Date.....Finish Date.....

Work out projected build period and multiply x 2 for a realistic build period

Have a blueprint of your bike to hand before you work out the cost. If possible obtain a picture from a book or magazine that looks something like the bike you will build. This will help you throughout your project.

Build Hint - Choose tyres and wheels first. The wider the rear tyre, the less choice you have for tyre sizes fenders and frames/swing arms. Choose carefully and note that the overall width of a 180 rear tyre for example may be as much as 210mm. This is very important when ordering the frame/swingarmfender and when considering the need for offset! Other sizes of rear tyre can have similar dimension variations!

Tyre manufacturers can supply tyre dimensions on request

Some Tyres-especially from Avon/Metzeler are of the low expansion variety. eg.Avon AM23 180/55 18 is only 178mm wide

Warning....If you buy wheels first.....before considering frame and offset requirements.....it is possible that the correct tyre combination may be unavailable.....especially if you need a matched pair. Choice of wheels/tyres/frame/offset should be made first!

Tyre sizes will affect choice of frame/swing arm, fender, offset and offsetting components, and choice of belt or chain final drive.
 Gear ratios are also affected by by tyre/wheel sizes and may influence sizes of pulleys/sprockets/belt/chain
 1 tooth of transmission sprocket = + or - 0.125in/3.2mm. Final drive belt drive pulley = + or - 0.280in/7.1mm
 Rear Belt sizes available.....125,126,127,128, 130, 132, 133, 135,136 teeth Transmission sprockets available.....23, 24, 25 teeth
 Transmission Pulleys Available.....29, 30, 31, 32, 33
 Rear Belt Pulley sizes:61,65,68,70 Rear Chain Sprocket sizes:45,46,47,48,49, to 61 teeth in 1 tooth increments

Build Hint:If you are building in stages due to cost try to start with the following parts:

Frame and swing arm, engine, transmission, primary, rear wheel and related parts. Making sure all these parts fit with primary and final drives in alignment will form a firm foundation for continuing the build at your own speed

Gearing:Overall gearing/ride characteristics/top speed/acceleration will depend on various sprocket sizes/wheel & tyre choice and engine characteristics. In order to make the right selection of comonents we have a gear modelling program for use with a computer PC - Please ask for further details!

Registering the bike is important! Ensure all parts satisfy national standards.....and avoid problems later
 Before commencing - Sit Down - Take a Couple of Aspirins - and Have Someone Close to call a Doctor Before Arriving at a Total

Components	Parts Specified	Price without tax	Price with tax and shipping cost
Engine: Second Hand New Complete-Assembled New Complete-Un-assembled New Long Block - Assembled New Long Block - Un-assembled OEM - Evolution OEM Twin Cam 'A'			

OEM Twin Cam 'B'
Aftermarket Evo Type
Feuling W3
Sportster
Build Hint:The cheapest engine may turn out the most expensive in the long run. Buy quality and be prepared to pay for it
A long block can come without Pushrods, pushrod tubes, ignition, rockers & rocker boxes, alternator, regulator, spark plugs & wires
Long blocks from other aftermarket engine manufacturers come without a different variety of parts - check before you buy..
you will have to buy the rest later.
Different engine builders have different ideas about what makes up a 'complete' engine.....check before you purchase

Parts Required to Complete Engine:

Alternator Stator
Alternator Rotor
Regulator
Regulator fasteners
Oil Filter Mount
Crankcase Vent 1)
Crankcase Vent 2)
Head Breather & Mount
Alternator Cover-for 3 or 4in open belt
Carb-1).....single carb setup
Manifold & fasteners for above
Carb - 2).....dual carb setup
Manifold & fasteners for above
Aircleaner-1)
Aircleaner-2)
Aircleaner covers
Breather Kit
Throttle Cable - see below
Choke Cable & Choke Knob.....custom knobs available
Aircleaner Mounts(Carb 1)
Aircleaner Mounts(Carb 2)
Cam Cover
Cam Cover fasteners
Ignition Cover & hardware
Rocker Box Covers-(2) & Hardware
Pushrod Covers
Oil Cooler & Mounts
Ignition Lobe
Ignition(Single or dual fire - Points or Electronic)
Coil(Single or dual fire - Points or Electronic - Single or Dual Plugs - Check on resistance!)
Coil Mount(coil & motor mount)
Plug Wires
Wire Separators
Balancer - Fisher Terry - Fits onto engine sprocket - They also make offset varieties
Engine sprocket kit

Oil Pump(Billet Oil Pumps from Jims/S&S, Pro-flo from Zippers)
Engine Gaskets-Top/Bottom/Complete-Hint-Buy as a complete kit if possible-You will save money compared to buying separately
Build Hint:Mixing chrome and polished parts does not usually work from a visual stand point - especially parts in close proximity!

Engine Bolts/Nuts/Washers

Exhaust System

Exhaust System Brackets/Gaskets/Flanges/Spring Retainers

Note: Big bore motors can push cam chest outwards. Choice of exhaust system should take this into account.

All exhausts are made to fit OEM engines/frame and

may not fit your choice of frame/engine. Position of exhaust mounting points

on your frame may be different to that on an OEM frame. At the least this will mean

having to fabricate a custom mounting bracket.

ARH & Sons manufacture a large range of good quality and well designed exhaust systems in chrome and SS

Primary Transmission

Outer Primary & Finish

Inspection Cover

Electric or kick start

Derby Cover

Inner Primary & Finish

Inner Primary 'O' ring-use two if offset primary spacer is needed

Inner Primary offset spacer

Primary Gaskets

Primary Case Hardware-Zinc coated,chrome, stainless

Clutch & Chain/Belt Drive

Clutch

Primary Chain

Chain tensioner

Belt Drive

Note: Automatic chain tensioner is preferable and offers slicker gear changes and reduced chain noise

Note: Belt primary is very strong/quiet/needs no oil and can be cheaper to purchase than a chain set up

Starter Unit (Make/KW/Finish)

Build Hint:engines up to approx 113cu in - a high torque 1.4KW will be ok.....For larger engines a 2KW will work better

Transmission:

4/5/6 speed or 5 speed in 4 speed box

5 speed with reverse gear

Right side drive transmission

Electric start

Kicker kit

Additional Side Cover(Hydraulic?) & Finish

Additional Top Cover & Finish

Hydraulic clutch brake hose

Transmission outrigger support/bearing

Transmission Plate

Transmission output sprocket/pulley(Teeth)

Offset Transmission sprocket

Offset kit for wide tyre(inches)

Build Hint: It is possible to purchase transmissions without side and top covers to allow the purchase of preferred parts
Build Hint: Think long and hard before opting for a 'kicker only' setup. What may seem like a good idea at design stage - may not be such a good

idea when the engine is cold and you may not feel up to kicking it over. The main fun is in riding - not trying to prove you are still up to it!

Frame:

Build Hint: Most stock and aftermarket frames allow the use of engines with aftermarket crankcases. Some do not! S.T.D. and Delkron and some billet cases may be too wide for your intended frame. Specify to frame supplier on order! Some aftermarket frames do not have seat tabs and belt pulley brackets. Specify your needs in advance or be prepared to sort these details yourself later. Some brackets you may wish to be left off to allow a more flexible design to evolve
Frame manufacturers employ different methods of achieving the offset to allow wide tyres-check before you buy

Ensure frame can take the size of tyre you want to use and ask if rear wheel has to be offset

Left side or right side drive

Chassis

Rake

Stretch

Steering Neck height - additional or stock height in inches

Additional height for higher than stock motor

Generally-longer stretch and increased rake gives good straight line stability and reduced cornering ability

Build Hint: Select rake in conjunction with fork length/wheel dia and triple tree rake

Brackets- pulley cover/brake brackets/other-see below

Wide Frame

Swingarm

Build Hint: Some frame manufacturers i.e. **HPU**, offer a choice of swing arm design and different styles of chain/belt adjustment

Swing arms from different frame manufacturers require different belt/chain lengths and specific pulley/sprocket combinations

Wide Swingarm

single side swingarm

Distance Axle

Distance Axle Nuts

Swingarm bearings

Stop ring

Sprocket Spacers

Rear axle spacers

Build Hint: Bearing cups with internal fork stops do away with the need for fork stops on lower triple tree/frame

Rock Guard/fasteners

Additional Parts to complete Chassis

Motor Mounts(Top/Front/Transmission)

Rear Belt Guard Mounting Lugs

Side Mount License Plate Mounting Lugs

Gas Tank Mounts

Engine case protector

Brake Caliper Torque Arm Mounting Lug

Headstock bearings

Headstock bearing cups

Triple tree dust shields

Note: Thick welds on frames may be unsightly and require grinding or moulding before painting(also-grind with caution-overgrinding may reduce strength!)

Frames are often delivered with rough grinding marks and scratches that need covering up with moulding prior to painting

Glass fibre fenders likewise often come in a less than perfect state and need special treatment. Many catalogues show these parts off to good effect by painting them. This is not normally how they are delivered to you.

You should be aware of this to avoid undue disappointment and to realise that there will be a cost attached to this finishing work

Rear Shocks

Rear Shock Mounting bolts/nuts/washers/spacers

Air Dam & Fasteners

Seat(Single or Dual) Custom Made? and fasteners

Tanks

Fuel - type and length

Build Hint: Ensure tank length fits frame. If frame stretch is specified check tank dimensions and frame fit!

Petcock - 1)

Petcock - 2)

Fuel Pipe

Tank Cap - 1 or 2

Tank Breather

Tank Breather Pipe

Fuel crossover tube

Tanks-Continued

Tank Mountings(Advise Frame Builder if necessary)

Gas tank grommets

Dash

Build Hint:Decide on Tank before frame purchase-the correct mounts may have to be welded on afterwards or the incorrect ones left off

Oil:

Make and finish

Oil tank fitting

Oil hose

Oil hose separators

Build Hint:select cables and hydraulic hose last-lengths will vary according to frame/stretch/tank choice/fork length/handlebars etc

Carb Cables-Push/Pull, Braided or Plastic, length

Clutch Cable-Braided/Black/Length

Clutch Hydraulic Hose-Braided/Black/Length

Front Brake Hydraulic Hose-Braided/Kevlar/Black/Length/Splitter Required?/Type of fittings at caliper and control ends

Rear Brake Hydraulic Hose-Braided/Kevlar/Black/Length/Stop Light Switch Required?/Type of fittings at caliper and control ends

Offset Components:For use with chain or belt final drive

Primary Spacer-width & longer bolts

Extended engine sprocket extension

Transmission Mounting Plate

Offset Transmission Sprocket

Wheel Spacer

Front End

Build Hint: select fork/risers/wheel/hub/discs/caliper/caliper bracket/rim size/tyre/fender together - to ensure compatibility!

Fork(make/length/dual or single disc/wide, mid, wide glide)

Increased rake triple trees are possible.....also adjustable rake triple trees up to 13deg

Wheel- size/wide or narrow glide

Wheel bearings

Note:Custom Wheels/Hubs sometimes have non-standard disc hole sizes-check before selecting discs/hubs

Specify pre 99 or 2000up wheels

Front Tyre-Make and nominal size

Front Tyre-Overall width

Front Tyre-Overall diameter

Inner Tube(check valve angle with angle of hole in rim)

front axle/nuts

Discs(Size)

Disc Bolts(Countersunk or Counterbored, Thread size and type, chrome or Stainless Steel) see below

Brake Calipers

Brake Caliper Brackets

Brake Hose

Speedo(2:1 or 1:1/Km or MPH)

Speedo Drive(obtain correct type for wheel type and wheel size)chrome speedo cover

Speedo Mounting

Speedo cover

Tachometer & Drive

Tachometer Mounting

Fender & Mounting nuts/bolts

Fender Brackets on forks(Sometimes integral with fork and sometimes separate)

Headlight

Headlight Mount and bolt/nut

Handlebar(internal wiring?)

Handlebar Mounts/Risers inc bolts

Handlebar Dampers

Brake Master Cylinder(5/8in for single disc/3/4in bore for dual disc)

Clutch Levers(hydraulic?)

Brake hose-type and length

Clutch Levers-cable or hose

Light Switches

Handlebar Mirrors

Handlebar Grips

Forward Controls(5/8in or 3/4in bore & Extended)

Forward Control Shifter Rod

Some forward controls come without shift control rod and pegs. Also you may want passenger pegs to match the control pegs

Some manufacturers make extended controls for riders with long legs

Rear brake hose-type and length(Stop light switch?)

Stop light switch(can be specified when selecting hydraulic hose)

Front Indicator Light/mounting

Disc Bolts(5) 5/16in Counterbored

Back End

Specify pre 99 or 2000up wheels

Wheel- size

Wheel bearings

Axle, nuts and washers

Rear Tyre-Make and nominal size

Inner Tube(check valve angle with angle of hole in rim)

Rear Tyre-Overall width(relevant to frame/swingarm/offset)

Rear Tyre-Overall diameter

Fender(fenders with internal struts can save on buying struts and offer a cleaner appearance)

Fender Struts & hardware

Cissy Bar

Brake Disc

Brake Caliper

Brake Caliper Bracket(stock fitting or using torque arm fixed to swingarm)

Rear Light

Rear Indicator Light/mounting

License plate

Side mount license plate set up

Rear Belt or Chain(number of teeth)Ask frame manufacturer what chain/belt lengths & sprocket/pulley combinations are possible

Rear Belt Pulley or Chain Sprocket(No of teeth) Belt pulley-1-1/8in or 1-1/2in wide?

Disc/pulley/brake kit

Disc/sprocket/brake kit

Disc Bolts(5) 3/8in countersunk

Pulley Bolts(5)

Passenger Pegs/Mounts

Number of teeth on rear sprocket/pulley should be determined in relation to engine power characteristics and rear wheel size

Pulley Guard or Chain guard - Upper and lower

Other Bits

Sidestand

Sidestand lowering spacer

Wiring harness

Other Electrical Items

Battery

Build Hint:Go for a good quality battery. Dry cell batteries are good but expensive. Yuasa type or sealed cell are good and not expensive

Build Hint: Decide on battery size before you decide on battery tray size and choice of oil tank

Custom Switch relay

Oil Pressure Switch

Miscellaneous - Nuts/Bolts/Anything Not Already Included

cable ties

cable separators

Hardware

Horn & Mount

Ignition Switch

Frame preparation			
Custom Paint Job and moulding			
Labour cost of subcontracted out work			
Lubricants:			
Brake/hydraulic clutch line fluid - Correct DOT number			
Transmission Oil			
Primary Transmission Oil			
Engine Oil			
Bearing Grease			
Thread lock			
Fork Oil @ correct SAE number			
For those of you who have access to the Internet, there are some very helpful sites if you are building a custom bike			
Total			0

**calculates
the total as
you input
costs**

Remember!

Decide on your budget. Decide on your bike design. Are you going to buy all the parts at once. Buying more parts at one time will allow you to make cost savings and keep carriage costs down. Work out the costs as accurately as possible. Many deliveries of parts will escalate costs quite substantially. Rolling chassis kits will save you money and help keep your costs within budget. If your cost is higher than your budget.....see if you can change your parts cost to fit within your budget. Can you use some second hand parts? Building a custom bike from new parts is not a cheaper alternative to buying a new bike! Building a custom bike from second hand parts is probably not a cheaper alternative to buying a second hand bike! This is not meant to frighten you off building a custom bike.....merely to emphasize that to build and complete the bike of your dreams....you need to be as realistic as possible. There is nothing worse than to have a dream unrealised.....especially if you have to sell your unfinished project at a big financial loss!

There are some books that may help you.

- 1) How To Build The Ultimate V-Twin Motorcycle By T Remus
- 2) How to Build the Ultimate V-Twin Motorcycle Engine By T Remus
- 3) How to Custom Paint your Harley Davidson By T Remus
- 4) How to Customise your Harley Davidson By T Remus
- 5) Harley Davidson Sheet Metal Fabrication By T Remus
- 6) Customising Your Harley Davidson By P Hook

Tyre advice, offset chart, gear ratio modelling, custom bike checklist and costing spreadsheet..available on 3.5in disc/Excel

Final Point. You may expect that parts that should fit.....do fit. However in practice this does not always happen. Expect the unexpected and you will not be disappointed.....just prepared!

At A R Harley & Sons....we specialise in putting together custom bike packages and can assist in keeping costs down when planning your custom bike build. We can also build a bike to your specification - and probably at a lower cost!

This list is not totally comprehensive. If you can think of improvements/additions, then please email them to me and I will update this list of parts. This will ensure this aid to custom bike building can be even more useful in the future

You are free to use and distribute this checklist to others.

All I ask is that you indicate the source - A R Harley & Sons Ltd