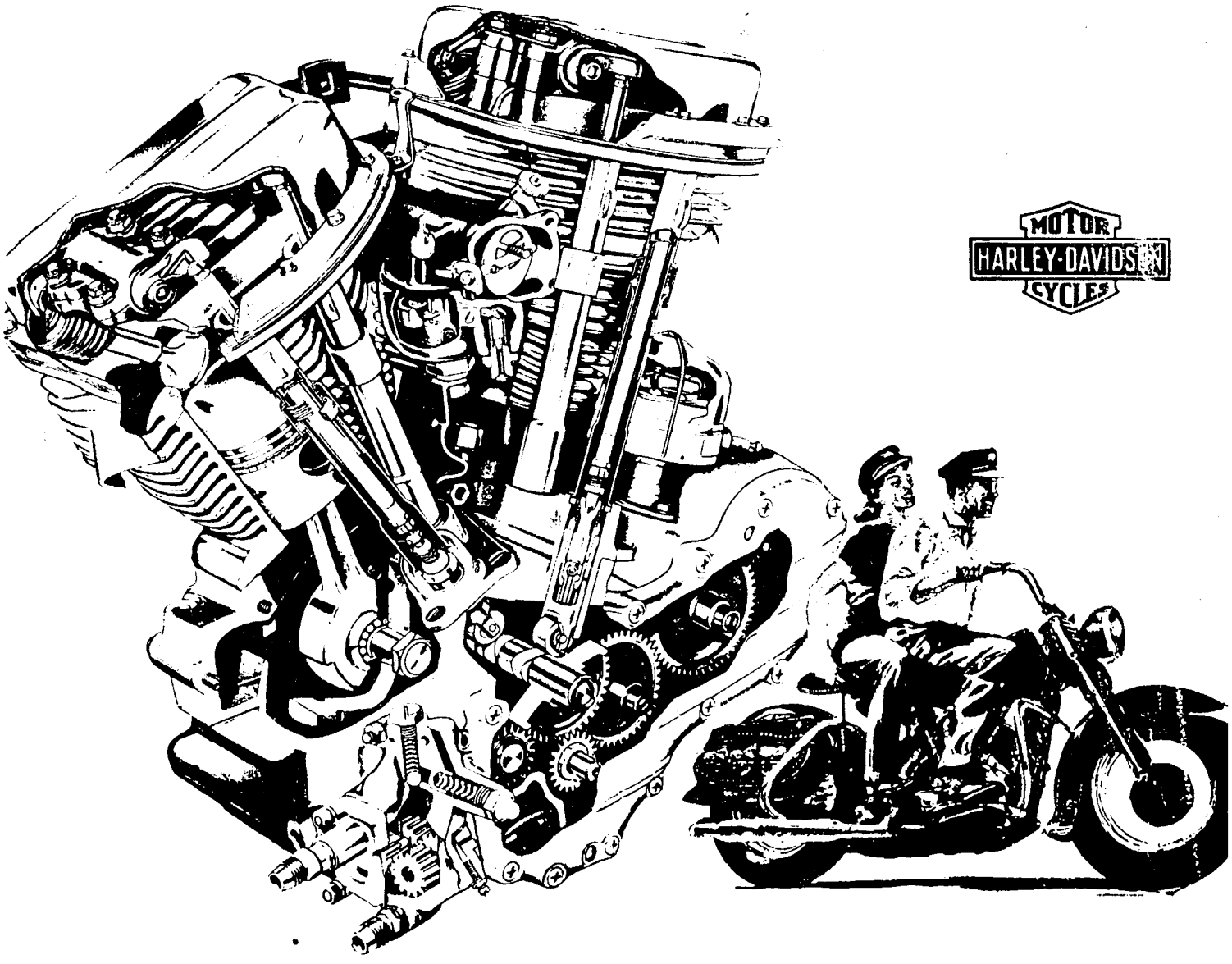
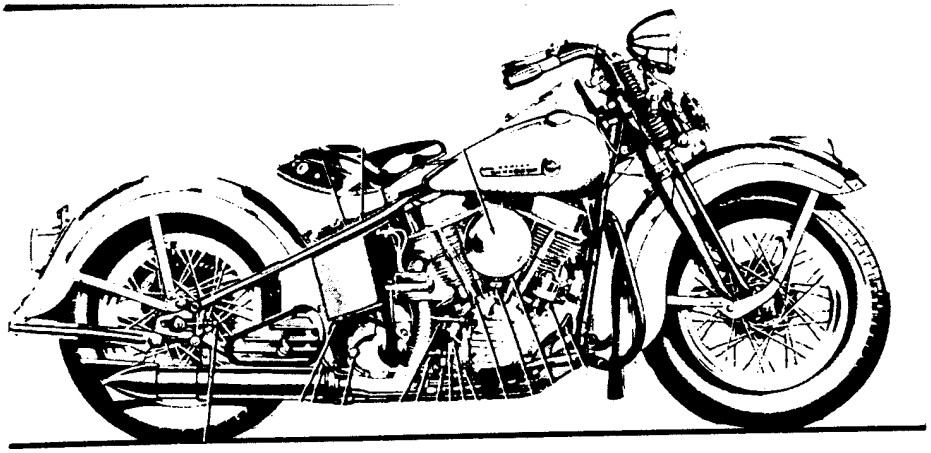
$12.50

Harley-Davidson

Panhead Service Manual

1948-1957 Rigid





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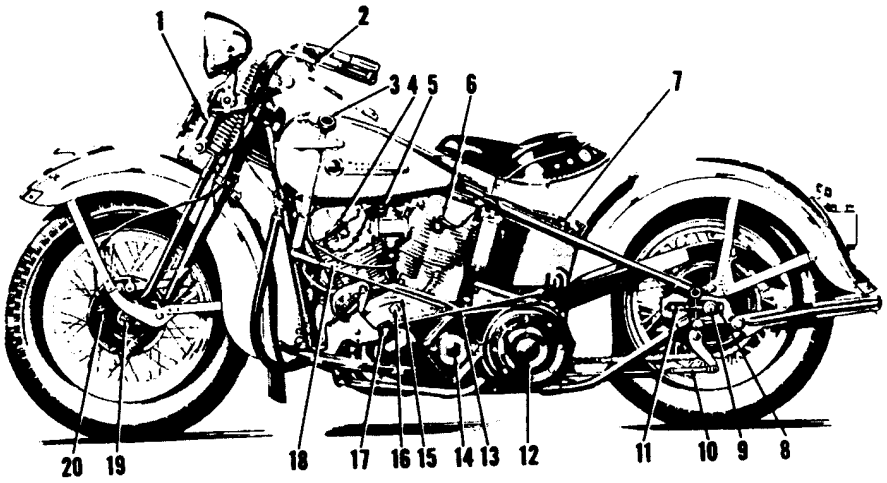


1948 Left Side View of OHV Model

1. Hydraulic Shock Absorber
2. Headlamp Dimming Switch
3. Gear Shifter Lever
4. Front Spark Plug
5. Carburetor Choke Lever
6. Rear Spark Plug
7. Positive Battery Terminal
8. Brake Sleeve Nut
9. Rear Axle Nut
10. Rear Brake Rod Adjusting Clevis
11. Left Side Rear Wheel Adjusting Screw
12. Clutch Inspection-Hole Cover
13. Clutch Footpedal Rod
14. Front Chain Inspection-Hole Cover
15. Engine (Serial) Number
16. Ignition Timing Inspection-Hole Plug
17. Clutch Footpedal
18. Gear Shifter Rod
19. Front Wheel Axle Nut
20. Front Wheel Brake Adjusting Sleeve

1948 - 1954

GENERAL SPECIFICATIONS

MODEL	E and EL	F and FL
Type of Engine	61 Cu. In. O.H.V. Twin	74 Cu. In. O.H.V. Twin
Cylinder Bore	3 5/16"	3 7/16"
Stroke	3 1/2"	3 31/32"
Piston Displacement	60.32 Cu. In.	73.66 Cu. In.
Compression Ratio (Low compression engine)	E Model 6.5 to 1	F Model 6.6 to 1
Compression Ratio (High compression engine)	EL Model 7.0 to 1	FL Model 7.0 to 1
Horsepower (N.A.C.C. Rating)	8.77	9.44
Wheelbase	59 1/2"	59 1/2"

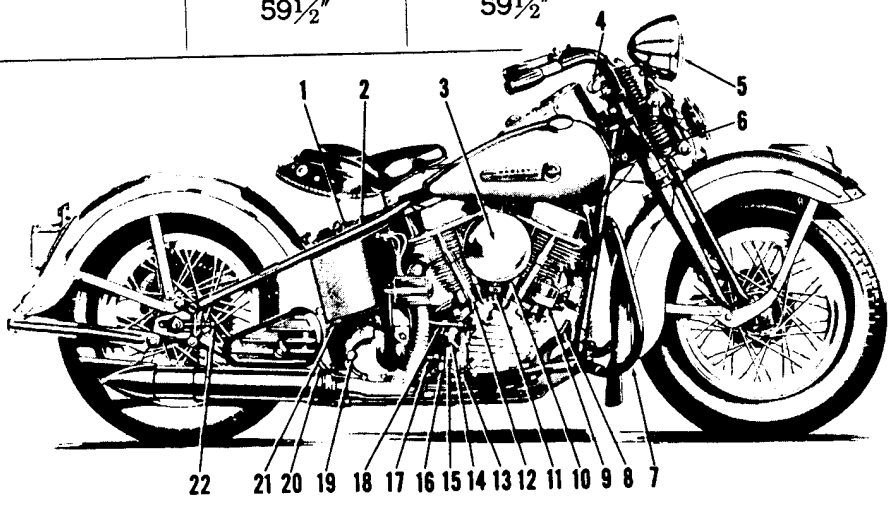


Figure 2 - Right Side View of OHV Model

1949-54

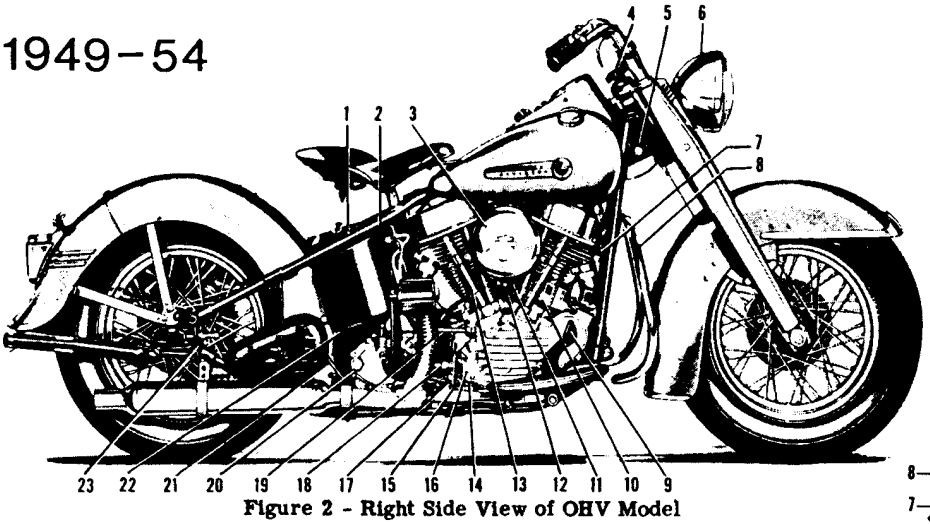
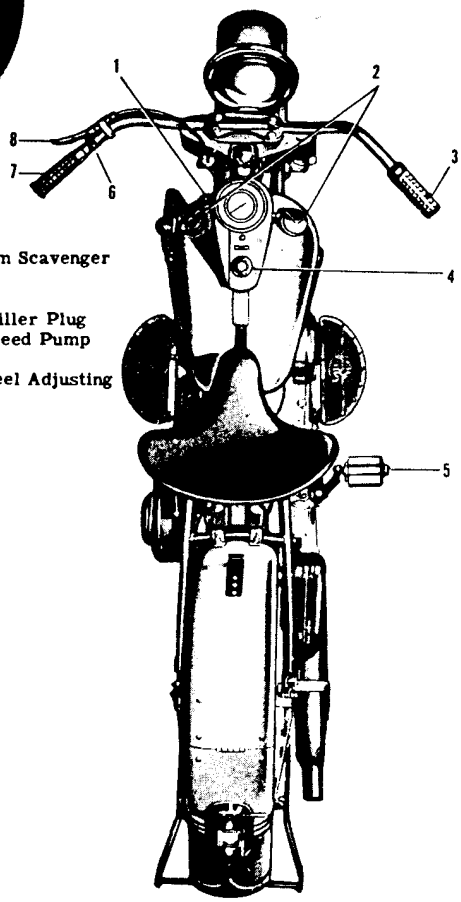


Figure 2 - Right Side View of OHV Model

1. Negative (grounded) Battery Terminal
2. Oil Tank Cap with Gauge Rod Attached
3. Carburetor Air Cleaner
4. Steering Damper Adjusting Knob
5. Head Lock
6. Head Lamp
7. Horn
8. Safety Guard (Extra Equipment)
9. Rear Wheel Brake Foot Pedal
10. Ignition Circuit Breaker
11. Carburetor Bowl Drain Plug
12. Gasoline Strainer
13. Valve Push Rod Cover
14. Adjusting Screw in Oil Pump Body for Front Chain Oiling
15. Oil Pressure Indicating Light Switch
16. Oil Pump
17. Stop Light Switch
18. Oil Return Pipe from Scavenger Pump
19. Oil Tank Vent Pipe
20. Transmission Oil Filler Plug
21. Oil Supply Pipe to Feed Pump
22. Oil Tank Drain Plug
23. Right Side Rear Wheel Adjusting Screw



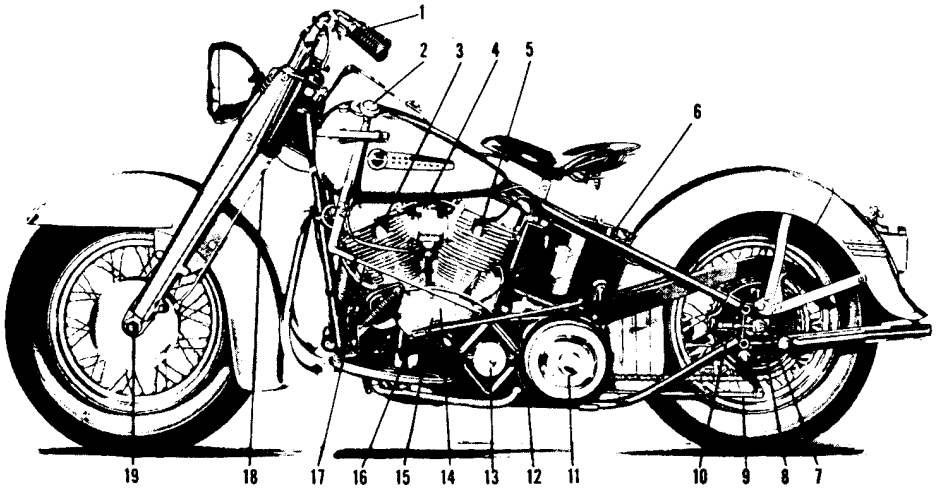


Figure 1 - Left Side View of OHV Model

1. Head Lamp Dimming Switch
2. Gear Shifter Lever
3. Front Spark Plug
4. Carburetor Choke Lever
5. Rear Spark Plug
6. Positive Battery Terminal
7. Brake Sleeve Nut
8. Rear Axle Nut
9. Rear Brake Rod Adjusting Clevis
10. Left Side Rear Wheel Adjusting Screw
11. Clutch Inspection Hole Cover
12. Clutch Foot Pedal Rod
13. Front Chain Inspection Hole Cover
14. Engine (Serial) Number
15. Ignition Timing Inspection Hole Plug
16. Clutch Foot Pedal
17. Gear Shifter Rod
18. Front Wheel Brake Adjusting Sleeve
19. Front Wheel Axle Nut

1. Gas Shut-off and Reserve Supply Valve Plunger
2. Gas Tank Cap (2)
3. Throttle Control Grip
4. Ignition - Light Switch
5. Starter Crank Pedal
6. Horn Button
7. Spark Control Grip
8. Front Wheel Brake Hand Lever

GEAR RATIOS	*Fourspeed Transmission		†Threespeed Transmission	
	Solo	Sidecar	Solo	Sidecar
No. of Sprocket Teeth				
Engine Sprocket E 61 and EL 61	22	20	22	18
Engine Sprocket F 74 and FL 74	23	21	23	20
Clutch Sprocket	37	37	37	37
Countershaft Sprocket	22	22	22	22
Rear Sprocket	51	51	51	51
Third Gear Ratio				
E 61 and EL 61	4.78	5.28		
F 74 and FL 74	4.58	5.01		
High Gear Ratio				
E 61 and EL 61	3.90	4.29	3.90	4.76
F 74 and FL 74	3.73	4.08	3.73	4.29

*With fourspeed transmission use "Third" gear when driving slowly and when accelerating. Cruise in high gear.

†Or threespeed and reverse transmission

TIRE DATA

	Front	Rear	Sidecar
Solo - Rider Only			
4.00 x 18 Tire	14 lbs.	16 lbs.	
5.00 x 16 Tire	12 lbs.	14 lbs.	
Solo - Rider and One Passenger			
4.00 x 18 Tire	18 lbs.	26 lbs.	
5.00 x 16 Tire	12 lbs.	16 lbs.	
Sidecar - Rider and One Sidecar Passenger or 150 lb. Sidecar Load			
4.00 x 18 Tire	20 lbs.	24 lbs.	14 lbs.
5.00 x 16 Tire	14 lbs.	16 lbs.	14 lbs.

The tire inflation pressures given are based on rider and passenger weight of approximately 150 lbs. each. When these loads are exceeded by 50 lbs. or more, increase tire pressure as follows: For each 50 lbs. of overload, increase pressure of rear tire 2 lbs.; front tire, 1 lb.; sidecar tire, 1 lb.

1955 - 1957
GENERAL

SPECIFICATIONS

DIMENSIONS

Wheel Base . . . . . 60 in.
Overall Length . . . . . 92 in.
Overall Width . . . . . 35 in.

CAPACITIES

Fuel Tanks . . . . . 3-3/4 Gallons (U.S.)

Oil Tank . . . . . 1 Gallon (U.S.)
Transmission . . . . . 1-1/2 Pints

ENGINE

Model Designation Letters . . . . . FL - FLH
Number of Cylinders 2
Type . . . . . 45 Degree V Type
Horsepower . . . . . FLH . . 60.0 HP at 5,400 R.P.M.
FL . . 55.0 HP at 5,400 R.P.M.
Taxable Horsepower 9.44

Bore . . . . . (87.3mm) 3-7/16 in.
Stroke . . . . . (100.8mm) 3-31/32 in.
Piston Displacement . . . . . (1,207 cc) 73.66 cu. in.
Torque . . . . . FLH . . 65 lb-ft at 3,200 R.P.M.
FL . . 62 lb-ft at 3,200 R.P.M.
Compression Ratio . . FLH . . . . . 8 to 1
FL . . . . . 7.25 to 1
Spark Plug (Heat range for average use) . . . No. 3-4

NOTE: The engine (serial) number is stamped on the left side of the engine crankcase. Always give this number when ordering parts or making an inquiry.

TRANSMISSION

Type . . . . . Constant Mesh
Speeds - Foot Shift . . . . . 4 Forward
Hand Shift . . . . . 4 Forward
(Optional) 3 Forward and 1 Reverse

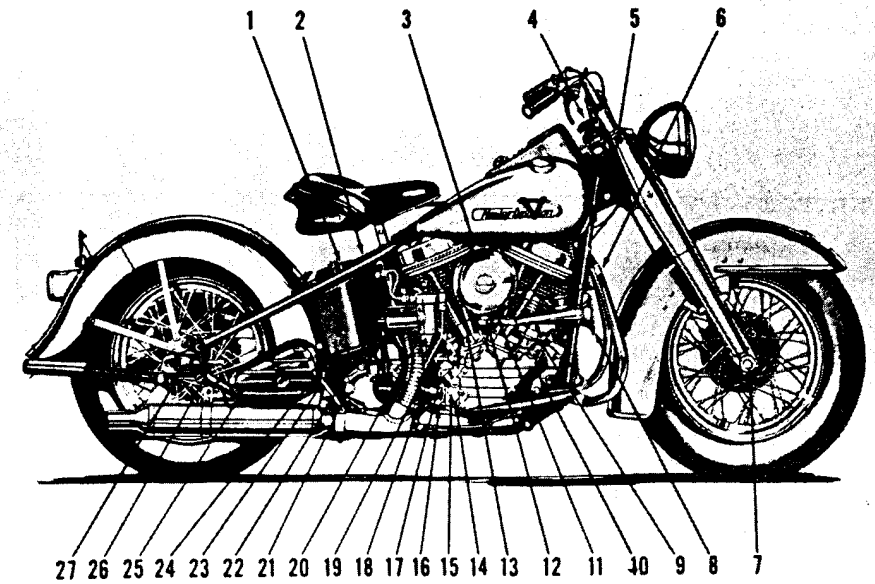
SPROCKETS AND GEAR RATIOS

SPROCKET TEETH ALL MODELS Clutch . . . . 37 Transmission 22 Rear Wheel . 51	4 SPEED TRANSMISSION			3 SPEED TRANSMISSION			
	SOLO		SIDECAR	SOLO		SIDECAR	
	FL	FLH	FL & FLH	FL	FLH	FL	FLH
Engine Sprocket	23	24	21 22	23	24	19	21 22
High Gear Ratio	3.73	3.57	4.08 3.90	3.73	3.57	4.50	4.08 3.90

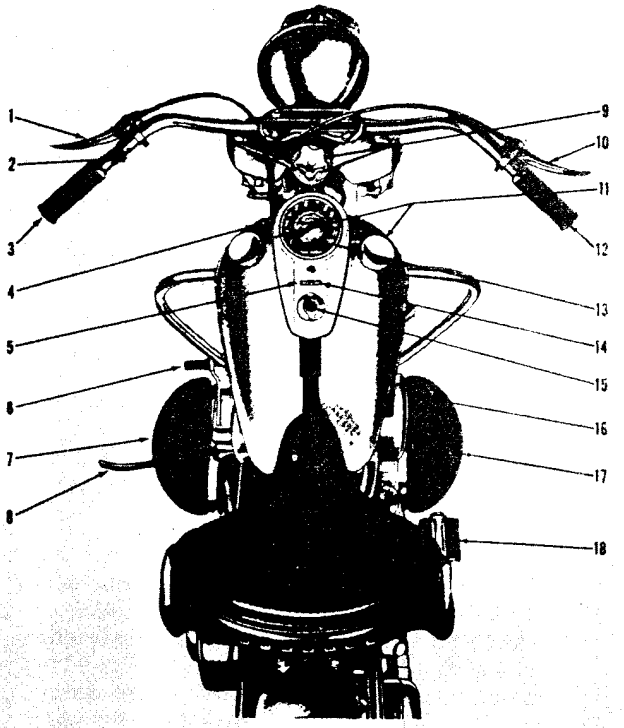
TIRE DATA

TIRE SIZE		TIRE PRESSURE - POUNDS		
		FRONT	REAR	SIDECAR
SOLO RIDER	4.00 x 18 4.50 x 18 5.00 x 16	14 12 12	16 14 14	
RIDER AND ONE PASSENGER	4.00 x 18 4.50 x 18 5.00 x 16	18 12 12	26 16 16	
RIDER AND ONE SIDECAR PASSENGER OR 150 LB. LOAD	4.00 x 18 4.50 x 18 5.00 x 16	20 14 14	24 16 16	14 14 14

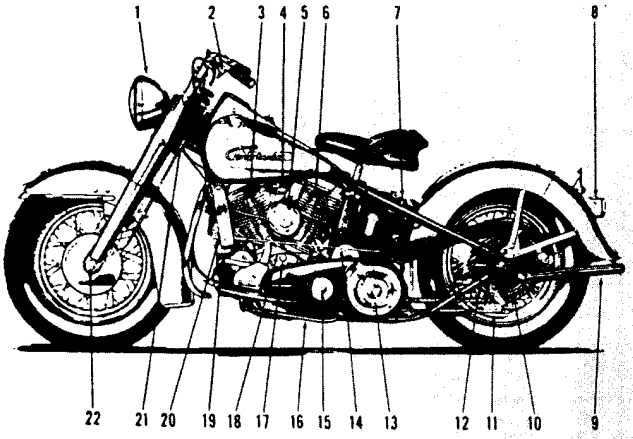
Above tire inflation pressures are based on rider and passenger weights of approximately 150 lbs. each. For each 50 lbs. extra weight, increase pressure of rear tire 2 lbs., front tire 1 lb., and sidecar tire 1 lb. IMPORTANT: 5.00 x 16 tires supplied as original equipment are identified by the numeral "100" on the sidewall. These tires are of special design to provide maximum roadability, and should be used exclusively for replacement.



1. Negative (Grounded) Battery Terminal
2. Oil Tank Cap - Gauge Rod Attached
3. Carburetor Air Cleaner
4. Steering Damper Adjusting Knob
5. Head Lock
6. Safety Guard (Extra Equipment)
7. Front Wheel Axle
8. Horn Trumpet
9. Ignition Circuit Breaker
10. Rear Wheel Brake Foot Pedal
11. Carburetor Bowl Drain Plug
12. Gasoline Strainer
13. Valve Push Rod Cover
14. Front Chain Oiler Adjusting Screw
15. Oil Pump
16. Stop Light Switch
17. Oil Pressure Indicating Light Switch
18. Oil Return Pipe
19. Oil Tank Vent Pipe
20. Oil Filter (Extra Equipment)
21. Transmission Oil Filler Plug
22. Starter Crank
23. Oil Supply Pipe
24. Oil Tank Drain Plug
25. Tool Box
26. Right Rear Wheel Adjusting Screw
27. Rear Wheel Axle



1. Clutch Hand Lever
2. Horn Button
3. Spark Control Grip
4. Gas Shut-off and Reserve Supply Valve
5. Generator Signal Light
6. Foot Gear Shift Lever
7. Left Foot Board
8. Jiffy Stand
9. Steering Damper Adjusting Knob
10. Front Brake Hand Lever
11. Gas Tank Cap (2)
12. Throttle Control Grip
13. Speedometer
14. Oil Pressure Signal Light
15. Ignition - Light Switch
16. Rear Brake Foot Lever
17. Right Foot Board
18. Starter Crank Pedal



1. Headlamp
2. Headlamp Dimmer Switch
3. Front Cylinder Spark Plug
4. Carburetor Choke Lever
5. Horn
6. Rear Cylinder Spark Plug
7. Positive Battery Terminal
8. Tail Lamp
9. Rear Stand
10. Rear Axle Nut
11. Rear Brake Rod Adjusting Clevis
12. Left Rear Wheel Adjusting Screw
13. Clutch Inspection Hole Cover
14. Clutch Release Rod
15. Front Chain Inspection Hole Cover
16. Jiffy Stand
17. Ignition Timing Inspection Hole Cover
18. Engine (Serial) Number
19. Foot Gear Shift Lever
20. Hand Clutch Booster Spring
21. Front Wheel Brake Adjusting Sleeve Nut
22. Front Wheel Axle Nut

The following chart outlines recommended Maintenance and Lubrication intervals after performance of service on a new motorcycle and the initial break-in period. Refer to Figure 1B-1 when using the chart.

IMPORTANT: To prevent over-greasing, use hand grease gun on all grease fittings.

REGULAR LUBRICATION AND SERVICE INTERVALS CHART

REGULAR SERVICE INTERVAL	FIG. 1B-1 INDEX NO.	GREASE	FIG. 1B-1 INDEX NO.	OIL	FIG. 1B-1 INDEX NO.	SERVICE
EVERY 1,000 MILES	10	Saddle Post	15	Clutch Hand Lever	24	Air Cleaner
	9	Saddle Bar Bearing	5	Brake Hand Lever	25	Battery
	8	Rear Brake Pedal Bearing	23	Clutch Control Cable	26	Rear Chain Adjustment
			20	Front Brake Cable		
	11	Foot Shift Lever Bearing	7	Throttle Control Cable		
	1	Hand Clutch Booster Bearing	12	Spark Control Cable		
	17	Front Wheel Hub Thrust Bearing	21	Clutch Lever Rod Clevis		
	18	Rear Wheel Hub Thrust Bearing		Shifter Control Joints		
			4	Generator Bearing		
		Foot Clutch Pedal Bearing	14	Rear Chain		
	16	Compensating Engine Sprocket	19	Saddle Post Roller and Bolt		
EVERY 2,000 MILES					27	Oil Filter
					28	Fuel Strainer
					29	Tappet Oil Screen
					34	Front Chain Adjustment
					30	Front Chain Oiler
						Rear Chain Oiler
					31	Circuit Breaker
					32	Spark Plugs
EVERY 5,000 MILES OR 1 YEAR (whichever comes first)	7	Throttle Control Spiral			33	Hydraulic Fork
	6	Spark Control Spiral				Replace:
					24	Air Cleaner
	2	Front Wheel Hub (Center)			27	Oil Filter
	13	Rear Wheel Hub (Center)				Time Ignition
		Sidecar Wheel Hub (Center)				Switch Tires
	31	Circuit Breaker Camshaft				Adjust Brakes
EVERY 10,000 MILES						
EVERY 50,000 MILES	3	Repack Steering Head Bearings				
WEEKLY						Check Tires
						Check Battery

INSTRUMENT PANEL SIGNAL LIGHTS

Red light marked "GEN" in center of instrument panel indicates whether or not generator is charging.

Red light marked "OIL" in center of instrument panel indicates whether or not oil is circulating.

All Models: When switch is turned "ON" preparatory to starting engine, both lights should go "ON." (Exception: When switch is turned "ON" immediately after engine has been primed by cranking, oil pressure signal may not light, but will light after a few seconds. This is due to oil pressure built up by cranking and is most likely to be noticed in cold weather.)

With engine started and running at a fair idling speed, both lights should go "OFF." At slow idling speed or under about 20 miles per hour road speed in high gear, generator signal will normally flash "ON" and "OFF" because at that speed generator output is very low and unsteady.

Should generator signal fail to go "OFF" at speeds above approximately 20 miles per hour, generator is either not charging at all or its output is not up to normal and it should be inspected at once.

Should oil circulation signal fail to go "OFF", at speeds above idling, it is most likely due to: empty oil tank; oil supply badly diluted, or using very light grade of oil and pump not building up normal pressure; if freezing weather, oil feed pipe may be clogged with ice or sludge. However, it may be: grounded oil signal switch wire, faulty signal switch; or oil pump in bad order. Give due attention to oil supply and, if signal still does not operate normally, check to see if oil returns to tank. To do this, remove oil tank cap and, with engine running, look for pulsating return of oil. A small flashlight is an aid in making this check. If oil is returning, motorcycle can be driven slowly, but no further than absolutely necessary before checking and servicing oiling system. If oil is not returning, do not drive further before having the fault corrected, as engine is likely to be damaged.

STARTING ENGINE

When starting engine, gear shifter handlever must be in neutral and clutch fully engaged. Spark should be fully advanced or nearly so.

Note: Choke lever positions are as follows:

O.H.V. Engine: Choke lever all the way down, choke is "closed"; choke lever all the way up, choke is "open."

Side Valve Engine: Choke lever all the way up, choke is "closed"; choke lever all the way down, choke is "open."

All Models: Starting Cold Engine: Set choke lever in fully-closed position, open throttle wide, and with ignition switch "OFF," prime cylinders by operating starter crank once or twice.

Then, with choke lever set ¼ or ½ closed in mild weather, ¾ or fully closed in extremely cold weather, and throttle slightly open, turn ignition switch "ON" and start engine with vigorous strokes of starter.

CAUTION: It is only in extremely cold weather that engine may start best with choke fully closed, and even then, it will have to be moved from this position immediately after engine starts. Under no conditions will engine continue to run with full choke.

As soon as engine starts, set throttle for moderate idling speed while warming up or until ready to set motorcycle in motion.

As engine warms up and misfires due to an over-rich mixture, gradually move choke lever toward open position. After engine has thoroughly warmed up, move choke lever to fully open position.

Starting Warm Engine: This applies to engine half way between hot and cold. Move choke lever to ¼ closed position and with throttle closed, operate starter once or twice. Then, with throttle ¼ to ⅓ open, turn ignition switch "ON" and operate starter. Soon after engine starts, choke lever should be moved back to fully open position. Remember: This procedure calls for having throttle part way open during starting strokes after switch has been turned "ON."

Starting Hot Engine: If engine has been shut off for only a brief period and is at about normal running temperature, it is not necessary to use choke lever. Simply close throttle, turn ignition switch "ON" and operate starter. With some engines, depending on carburetor adjustment, hot starting is more dependable if starter is given one stroke before turning ignition switch "ON."

When a hot engine does not start readily, that is, with two or three starter strokes, it is usually due to an over-rich (flooded) condition, and the proper procedure then is to open throttle wide so more air can enter, closing it quickly as engine starts.

TO STOP ENGINE

Stop engine by turning ignition switch "OFF." If engine should be stalled or stopped in any other way than with switch, turn switch "OFF" at once to prevent battery from being discharged through circuit breaker points.

Don't idle engine unnecessarily with motorcycle standing.

RUNNING IN NEW ENGINE

Don't run new motorcycle faster than 35 miles per hour the first 250 miles; 40 miles per hour the second 250 miles; 45 miles per hour (sidecar) or 50 miles per hour (solo) the next 500 miles. Avoid running at or near top speed for long distances below 2000 miles.

After a new motorcycle has been run 500 to 1000 miles it needs to be thoroughly checked over and any loose screws and nuts tightened. Particular attention must be given to those that secure engine and transmission; also to wheel mounting socket screws. See that this attention is given.

Both chains should be checked for ample lubrication.

HIGH SPEED TIPS

Develop the habit of frequently snapping throttle shut for an instant when running at high speed. This draws additional lubrication to pistons and cylinders and helps cooling.

In cold weather run engine slowly until it is thoroughly warmed up, to avoid possible damage to piston rings, pistons and other parts before oil is warm enough to circulate freely.

A motorcycle run long distances at high speed must be given closer than ordinary attention to avoid overheating and possible consequent damage. Engine must be kept well tuned, especially as concerns valve seating, good compression, spark plugs and ignition timing. Carburetor should be adjusted moderately rich, rather than too lean. This applies particularly when motorcycle is equipped with handlebar windshield and legshields.

TROUBLE CHART

Engine

Note: Too frequently, spark plugs and or ignition coil are thought to be defective when engine starts hard, runs irregularly, or fails to start.

Sometimes when a spark plug fails to function normally, it is the result of an accumulation of dirt on plug core which becomes a conductor when damp or wet, allowing spark to jump from cable terminal to plug base, instead of across electrodes in combustion chamber. Under such a condition, wiping plug core clean with a dry rag will allow plug to function normally.

An ignition coil suspected of being defective may only need new spark plug cables installed. Cable insulation eventually deteriorates and sometimes cracks at the point where cable enters coil case. Spark may then jump from cable to cable packing nut (on coil case) instead of across electrodes in combustion chamber, especially if cables are damp or wet.

If engine starts hard:

1. Spark plugs in bad condition, or partially fouled.
2. Spark plug cables in bad condition and "leaking."
3. Circuit breaker points out of adjustment or in need of cleaning.
4. Battery nearly discharged.
5. Loose wire connection at one of battery terminals or at coil or circuit breaker.
6. Carburetor not adjusted correctly.
7. Defective ignition coil.
8. Defective condenser.

If engine starts but runs irregularly or misses:

1. Spark plugs in bad condition, or partially fouled.
2. Spark plug cables in bad condition and "leaking."
3. Spark plug gap too close.
4. Circuit breaker points out of adjustment or in need of cleaning.
5. Condenser connections loose.
6. Defective ignition coil.
7. Defective condenser.
8. Battery nearly discharged.
9. Loose wire connection at one of battery terminals or at coil or circuit breaker.
10. Intermittent short circuit due to damaged wiring insulation.
11. Water or dirt in fuel system and carburetor.
12. Gasoline tank cap vent plugged and tank air bound.
13. Carburetor not adjusted correctly.
14. Weak or broken valve springs.

If engine fails to start, it may be due to one or more of the following conditions:

1. Gasoline tank empty.
2. Gasoline valve shut off.
3. Gasoline line clogged.
4. Discharged battery or loose or broken battery terminal connection. Check by turning light switch "ON."
5. Fouled spark plugs.
6. Spark plug cables in bad condition and "leaking."
7. Badly oxidized ignition circuit breaker points.
8. Circuit breaker points badly out of adjustment.
9. Loose wire connection at one of battery terminals or at coil or circuit breaker.
10. Defective ignition coil.
11. Defective condenser.
12. Clutch slipping and starter not turning engine over.
13. Sticking valves, or tappets too tight.
14. Engine flooded with gasoline as a result of overchoking.

If a spark plug fouls repeatedly:

1. Too cold a plug for the kind of service or for type of engine.
2. Piston rings badly worn or in bad condition otherwise.
3. Oil pump improperly adjusted—oil pressure too high.
4. O.H.V. Engine—intake valve spring cover oil return line clogged with carbon or sludge. One or more push rod cover cork washers in bad condition or push rod covers not seating properly against cork washers.

If engine preignites:

1. Excessive carbon deposit on piston head or in combustion chamber.