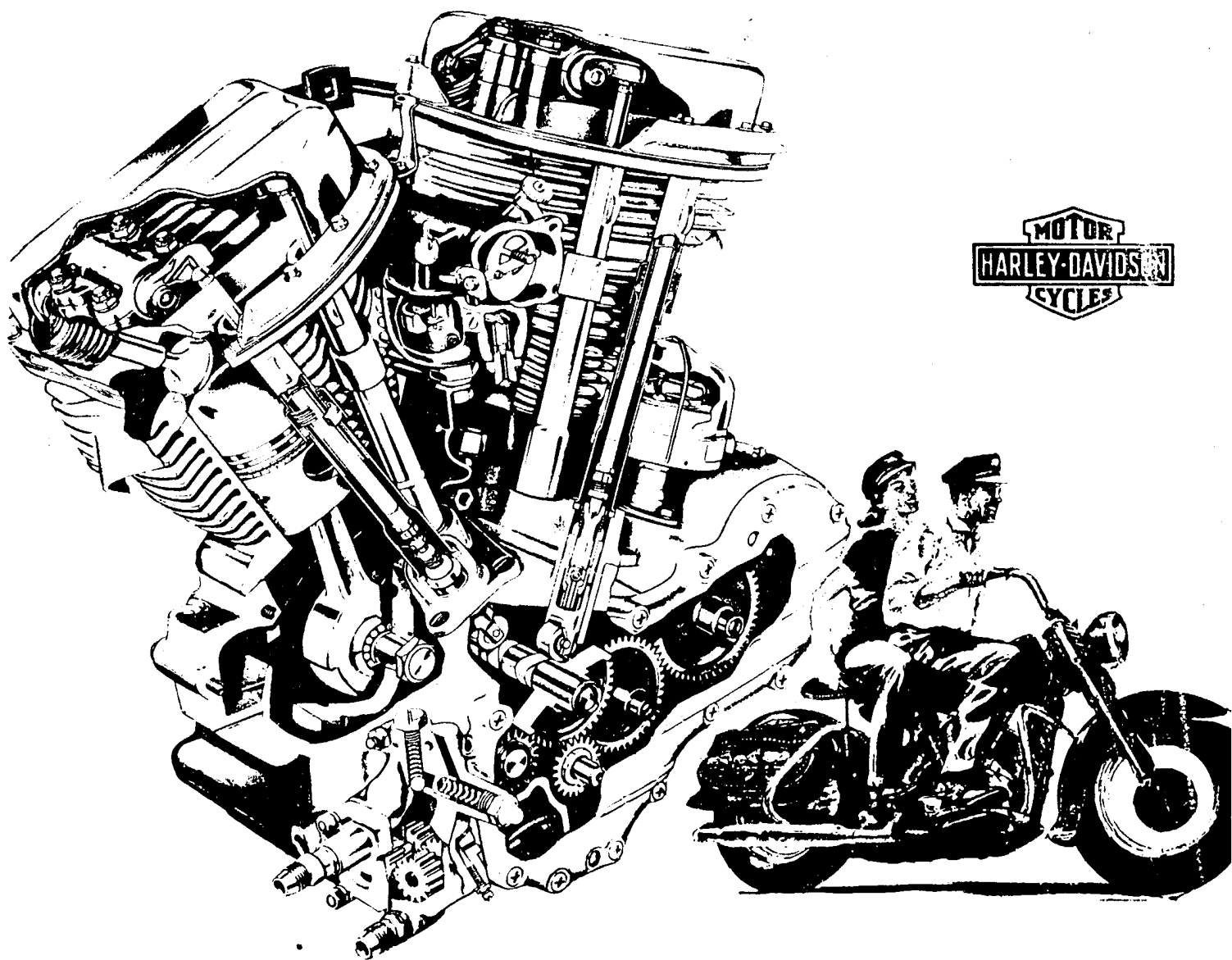


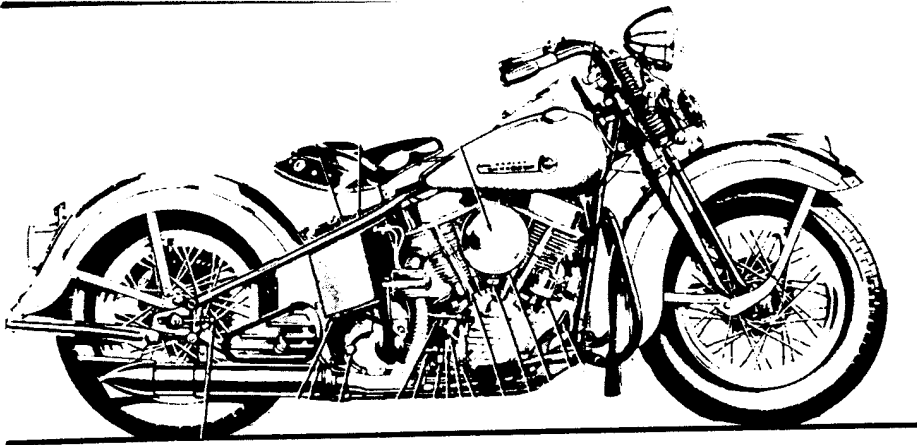
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*Harley-Davidson*

# Panhead Service Manual

*1948-1957 Rigid*





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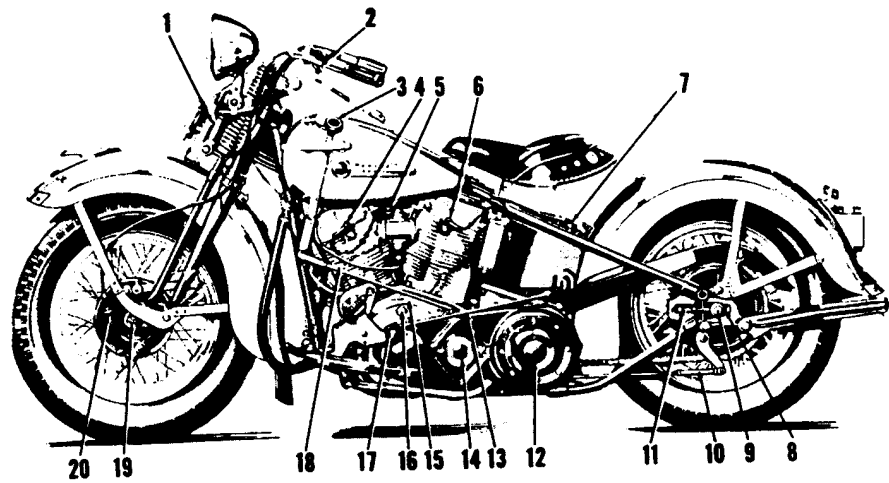
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1948 Left Side View of OHV Model

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

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 <sup>5</sup> / <sub>16</sub> "	3 <sup>7</sup> / <sub>16</sub> "
Stroke	3 <sup>1</sup> / <sub>2</sub> "	3 <sup>31</sup> / <sub>32</sub> "
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 <sup>1</sup> / <sub>2</sub> "	59 <sup>1</sup> / <sub>2</sub> "

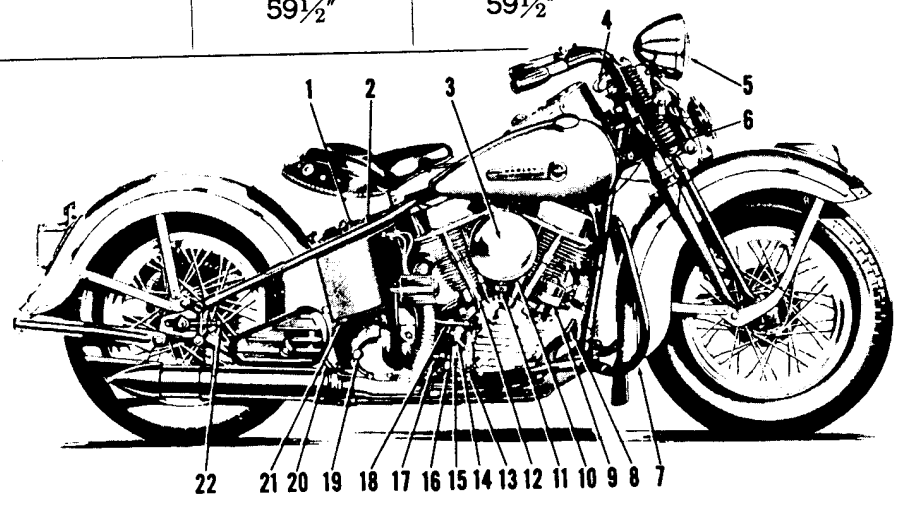


Figure 2 - Right Side View of OHV Model

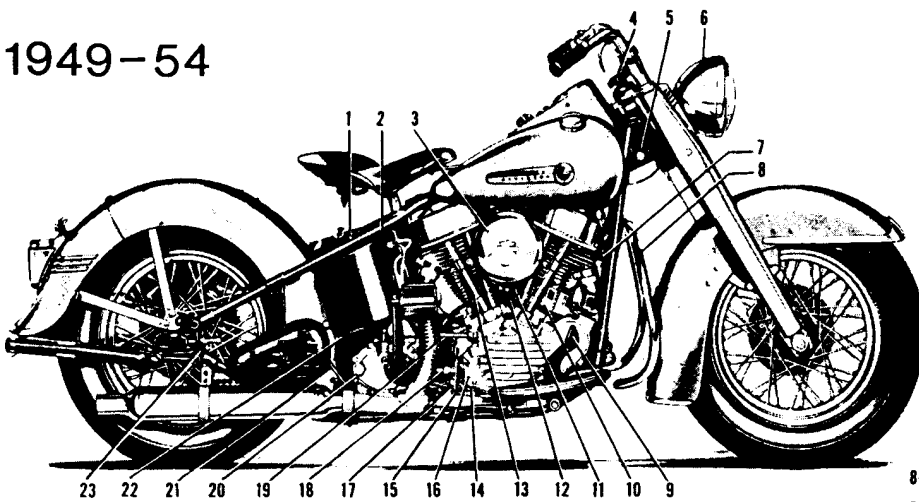
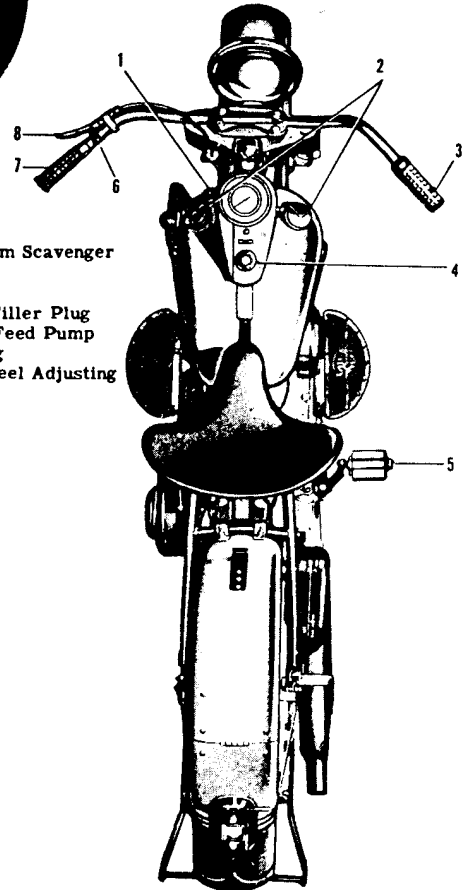


Figure 2 - Right Side View of OHV Model

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



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

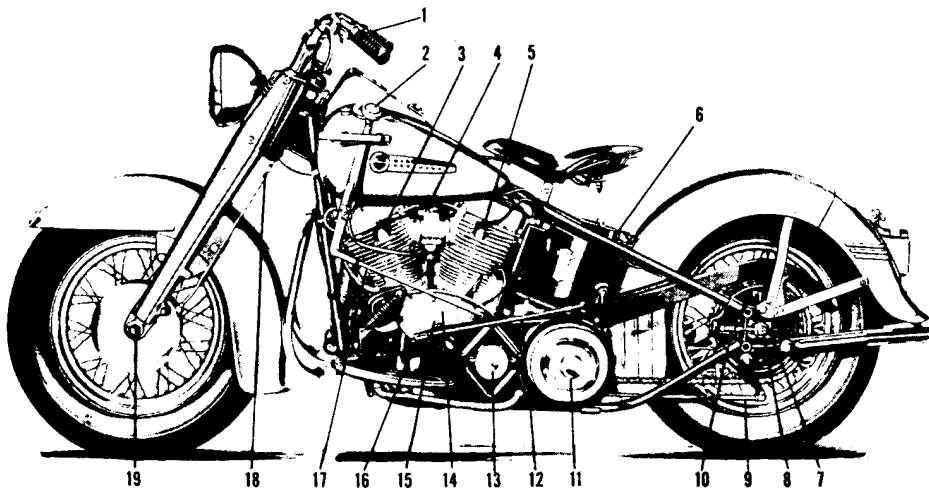


Figure 1 - Left Side View of OHV Model

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

**GEAR RATIOS**

	*Fourspeed Transmission		†Threespeed Transmission	
	Solo	Sidecar	Solo	Sidecar
<b>No. of Sprocket Teeth</b>				
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
<b>Third Gear Ratio</b>				
E 61 and EL 61	4.78	5.28		
F 74 and FL 74	4.58	5.01		
<b>High Gear Ratio</b>				
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

**TIRE DATA**

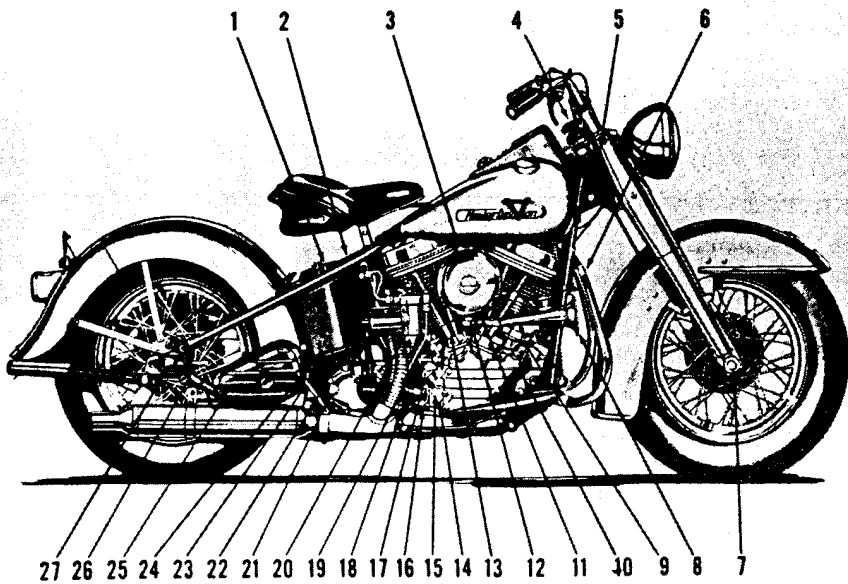
	Front	Rear	Sidecar
<b>Solo - Rider Only</b>			
4.00 x 18 Tire	14 lbs.	16 lbs.	
5.00 x 16 Tire	12 lbs.	14 lbs.	
<b>Solo - Rider and One Passenger</b>			
4.00 x 18 Tire	18 lbs.	26 lbs.	
5.00 x 16 Tire	12 lbs.	16 lbs.	
<b>Sidecar - Rider and One Sidecar Passenger or 150 lb. Sidecar Load</b>			
4.00 x 18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

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

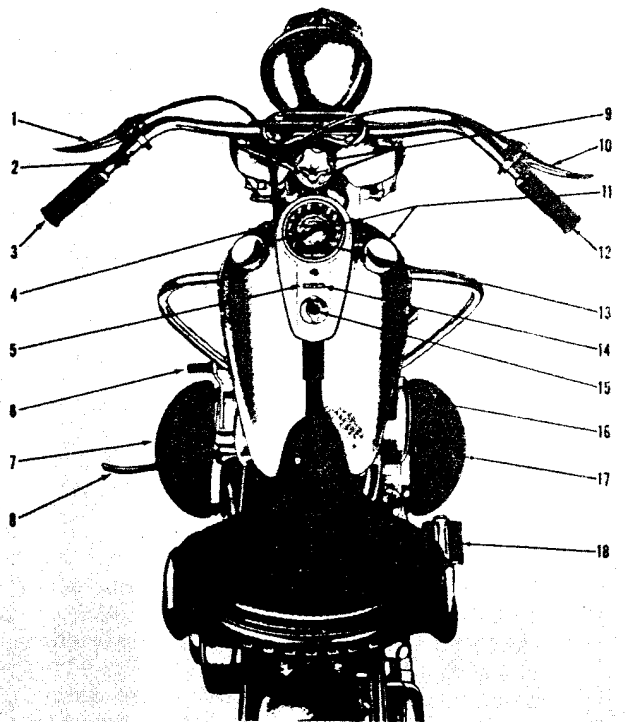
†Or threespeed and reverse transmission

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.

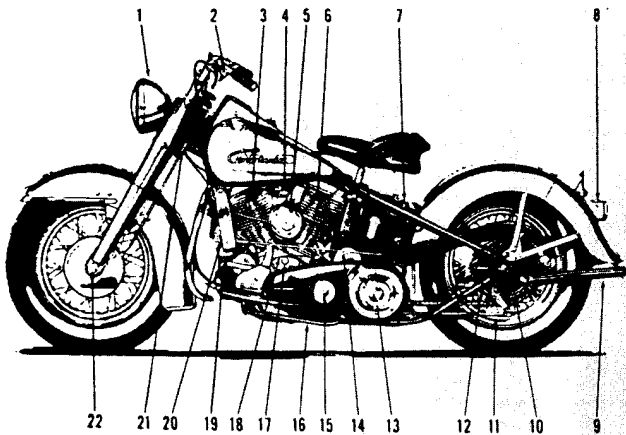




- |   |  |
|---|--|
| 1. Negative (Grounded) Battery Terminal | 14. Front Chain Oiler Adjusting Screw    |
| 2. Oil Tank Cap - Gauge Rod Attached    | 15. Oil Pump                             |
| 3. Carburetor Air Cleaner               | 16. Stop Light Switch                    |
| 4. Steering Damper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



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



- |                                     |  |
|-------------------------------------|--|
| 1. Headlamp                         | 12. Left Rear Wheel Adjusting Screw        |
| 2. Headlamp Dimmer Switch           | 13. Clutch Inspection Hole Cover           |
| 3. Front Cylinder Spark Plug        | 14. Clutch Release Rod                     |
| 4. Carburetor Choke Lever           | 15. Front Chain Inspection Hole Cover      |
| 5. Horn                             | 16. Jiffy Stand                            |
| 6. Rear Cylinder Spark Plug         | 17. Ignition Timing Inspection Hole Cover  |
| 7. Positive Battery Terminal        | 18. Engine (Serial) Number                 |
| 8. Tail Lamp                        | 19. Foot Gear Shift Lever                  |
| 9. Rear Stand                       | 20. Hand Clutch Booster Spring             |
| 10. Rear Axle Nut                   | 21. Front Wheel Brake Adjusting Sleeve Nut |
| 11. Rear Brake Rod Adjusting Clevis | 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 Battery Rear Chain Adjust- ment
	9	Saddle Bar Bearing	5	Brake Hand Lever	25	
	8	Rear Brake Pedal	23	Clutch Control Cable	26	
		Bearing	20	Front Brake Cable		
	11	Foot Shift Lever	7	Throttle Control Cable		
		Bearing		Spark Control Cable		
	1	Hand Clutch Booster	12			
		Bearing				
	17	Front Wheel Hub	21	Clutch Lever Rod		
		Thrust Bearing		Clevis		
18	Rear Wheel Hub		Shifter Control			
	Thrust Bearing		Joints			
			Generator Bearing			
		Foot Clutch Pedal	4			
		Bearing	14	Rear Chain		
	16	Compensating	19	Saddle Post Roller		
		Engine Sprocket		and Bolt		
EVERY 2,000 MILES					27	Oil Filter Fuel Strainer Tappet Oil Screen Front Chain Adjust- ment Front Chain Oiler Rear Chain Oiler
					28	
					29	
					34	
					30	
					31	Circuit Breaker Spark Plugs
					32	
EVERY 5,000 MILES OR 1 YEAR (whichever comes first)	7	Throttle Control			33	Hydraulic Fork Replace: Air Cleaner Oil Filter Time Ignition Switch Tires Adjust Brakes
		Spiral			24	
	6	Spark Control Spiral			27	
	2	Front Wheel Hub (Center)				
	13	Rear Wheel Hub (Center)				
		Sidecar Wheel Hub (Center)				
	31	Circuit Breaker Camshaft				
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 handle 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  $\frac{1}{4}$  or  $\frac{1}{2}$  closed in mild weather,  $\frac{3}{4}$  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  $\frac{1}{4}$  closed position and with throttle closed, operate starter once or twice. Then, with throttle  $\frac{1}{4}$  to  $\frac{1}{3}$  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 over-choking.

#### *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.

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