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1959 to 1969 ELECTRA GLIDE DUO-GLIDE SERVICE MANUAL

The maintenance and repair information in this manual applies to the 1959 to 1969 Harley-Davidson Duo-Glides and Electra Glides.
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### GENERAL

#### SPECIFICATIONS

**DIMENSIONS**
- Wheel Base: 60 in.
- Overall Length: 82 in.
- Overall Width: 35 in.

**CAPACITIES**
- Fuel Tanks: 3-1/2 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 .66.0 HP at 5,600 R.P.M.
- FL .57.0 HP at 5,200 R.P.M.
- Taxable Horsepower: 9.44

**Torque**
- FLH: 65 lb-ft at 3,200 R.P.M.
- FL: 62 lb-ft at 3,200 R.P.M.

**Compression Ratio**
- FLH: 6 to 1

**Spark Plug** (Heat range for average use): No. 3-4

**TRANSMISSION**
- Type: Constant Mesh
- Speeds: Foot Shift
- Hand Shift
- Optional: 3 Forward and 1 Reverse

### SPROCKETS AND GEAR RATIOS

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<td>OR 150 L.B. LOAD</td>
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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 sidetac tire 1 lb. IMPORTANT: Above tires supplied as original equipment are identified on the sidewall as follows: Goodyear 5.10 x 16 Speed Grip and Goodyear 5.00 x 16 Super Eagle 100. These tires are of special design to provide maximum roadability, and should be used exclusively for replacement. CAUTION: Use only 5.00/5.10 x 16 inner tubes with 5.10 x 16 size tires — 5.00 x 16 tube does not fit correctly.

Revised: 3-69
SERVICING A NEW MOTORCYCLE

PREDELIVERY
Service operations to be performed before delivery to customer are specified in the Setting Up Instructions and Important Instructions included with new vehicle.

CHECK AT FIRST 500 MILES
1. Drain oil tank through drain plug, flush with kerosene and refill with fresh oil.
2. Clean oil filter (if applicable). Clean overhead valve and tappet oil supply screen.
3. Drain transmission through drain plug and refill to level of filler opening with fresh oil. Use same grade oil used in engine.
4. Lubricate all points indicated for 3000 mile attention in the regular service intervals chart.
5. Aim headlight.
6. Inspect and service air cleaner if needed.
7. Check adjustment of chains and readjust if necessary.
8. Check lubrication of front chain and readjust chain roller adjusting screw if necessary (1964 and earlier Models).
9. Check lubrication of rear chain and readjust chain roller (if provided).
10. Check wheel mounting bolts and tighten if needed. These bolts must be kept very tight.
11. Check level of solution in battery and add distilled water if needed. See that terminals are clean and connections tight.
12. Check tightness of all cylinder head bolts and all cylinder base nuts, and tighten where necessary.
13. Check brake adjustment and hydraulic fluid level.
14. Check tire pressure and inspect tread.
15. Check front fork bearing adjustment.
17. Clean chain housing magnetic plug (if applicable).
18. Inspect and clean spark plugs.
19. Check ignition timing and circuit breaker point gap.
20. Check all nuts, bolts and screws, and tighten any found loose.
21. Check and tighten wheel spokes.
22. Check clutch adjustment.
23. Road test.

CHECK AT FIRST 1000 MILES
1. Drain oil tank and refill with fresh oil.
2. Clean oil filter (if applicable).
3. Check level of oil in transmission and add oil if needed. Use same grade of oil used in engine.
4. Service air cleaner.
5. Check adjustment of chains and adjust if necessary.
6. Check lubrication of front chain and readjust chain roller adjusting screw if necessary (1964 and earlier Models).
7. Check lubrication of rear chain and readjust chain roller (if provided).
8. Check level of solution in battery, and add distilled water if needed. See that terminals are clean and connections tight.
9. Check circuit breaker point clearance and adjust if necessary.
10. Check brake adjustment and hydraulic fluid level.
11. Check clutch adjustment.
12. Check tire pressure.
13. Road Test.

Above operations are described fully in section pertaining to particular part of motorcycle. See table of contents for location.
## Regular Service Intervals Chart

<table>
<thead>
<tr>
<th>REGULAR SERVICE INTERVAL</th>
<th>FIG. 1B-1 &amp; 1B-1A INDEX NO.</th>
<th>GREASE</th>
<th>OIL</th>
<th>FIG. 1B-1 &amp; 1B-1A INDEX NO.</th>
<th>SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVERY 1,000 MILES</td>
<td></td>
<td>14</td>
<td>Rear Chain (if chain oiler not used)</td>
<td>24</td>
<td>Air Cleaner</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td>Battery</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26</td>
<td>Rear Chain Adjust- ment (if applicable)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33</td>
<td>Hydraulic Brake Fluid</td>
</tr>
<tr>
<td>EVERY 2,000 MILES</td>
<td>10 Saddle Post</td>
<td>15</td>
<td>Clutch Hand Lever</td>
<td>27</td>
<td>Oil Filter</td>
</tr>
<tr>
<td></td>
<td>9 Saddle Bar Bearing</td>
<td>5</td>
<td>Brake Hand Lever</td>
<td>28</td>
<td>Fuel Strainer</td>
</tr>
<tr>
<td></td>
<td>8 Rear Brake Pedal Bearing</td>
<td>23</td>
<td>Clutch Control Cable</td>
<td>29</td>
<td>Tappet Oil Screen (if applicable)</td>
</tr>
<tr>
<td></td>
<td>11 Foot Shift Lever Bearing</td>
<td>7</td>
<td>Front Brake Cable</td>
<td>34</td>
<td>Front Chain Adjust- ment (1965 and later)</td>
</tr>
<tr>
<td></td>
<td>1 Hand Clutch Booster Bearing</td>
<td>12</td>
<td>Throttle Control Cable</td>
<td>30</td>
<td>Front Chain Oiler</td>
</tr>
<tr>
<td></td>
<td>17 Front Wheel Hub Thrust Bearing (1966 &amp; earlier)</td>
<td>21</td>
<td>Clutch Booster Lever Rod Clevis (1967 and earlier)</td>
<td>31</td>
<td>Rear Chain Oiler</td>
</tr>
<tr>
<td></td>
<td>18 Rear Wheel Hub Thrust Bearing (1966 &amp; earlier)</td>
<td>4</td>
<td>Shifter Control Joints</td>
<td>31</td>
<td>Circuit Breaker Points</td>
</tr>
<tr>
<td></td>
<td>22A Foot Clutch Pedal Bearing</td>
<td>10</td>
<td>Generator Bearing (1960 and earlier)</td>
<td>19</td>
<td>Saddle Post Roller and Bolt</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32</td>
<td>Replace: Spark Plugs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27</td>
<td>Oil Filter Element</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>31</td>
<td>Time Ignition</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>Switch Tires</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35</td>
<td>Check Generator Brushes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Check Shock Rubber Bushings</td>
</tr>
<tr>
<td>EVERY 5,000 MILES OR 1 YEAR (whichever comes first)</td>
<td>7 Throttle Control Spiral</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 Spark Control Spiral (1964 and earlier)</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Front Wheel Hub (Center) (1966 and earlier)</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 Rear Wheel Hub (Center) (1966 and earlier)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 Compensating Engine Sprocket (1964 and earlier)</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>16 Circuit Breaker Camshaft Speedometer and Tachometer Cables</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
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<table>
<thead>
<tr>
<th>REGULAR SERVICE INTERVAL</th>
<th>FIG. IB-1 &amp; IB-1A INDEX NO.</th>
<th>GREASE</th>
<th>FIG. IB-1 &amp; IB-1A INDEX NO.</th>
<th>OIL</th>
<th>FIG. IB-1 &amp; IB-1A INDEX NO.</th>
<th>SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVERY 10,000 MILES</td>
<td>22</td>
<td>Repack Rear Fork Pivot Bearings (1959 to 1961 Models)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Generator Bearing (1961 and later)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>EVERY 50,000 MILES</td>
<td>3</td>
<td>Repack Steering Head Bearings</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>WEEKLY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Check Tires</td>
<td>Check Battery</td>
</tr>
</tbody>
</table>

Figure 1B-1A. Lubrication and Service Chart (1964 & earlier Models)
### DUO-GLIDE

#### SERVICE INTERVAL ENGINE AND TRANSMISSION

<table>
<thead>
<tr>
<th>ENGINE OIL</th>
<th>300 MILES</th>
<th>1,000 MILES</th>
<th>2,000 MILES</th>
<th>5,000 MILES or 1 YEAR</th>
<th>SPRING AND FALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check</td>
<td>Check</td>
<td>Change</td>
<td>Change</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>TRANSMISSION OIL</td>
<td>Check</td>
<td></td>
<td>Change</td>
<td>Change</td>
<td></td>
</tr>
</tbody>
</table>

#### LUBRICANTS TO USE ENGINE AND TRANSMISSION

**HARLEY-DAVIDSON OIL**

Use proper grade of oil for the lowest temperature expected before next oil change period as follows:

<table>
<thead>
<tr>
<th>Use Harley-Davidson Oil</th>
<th>Use</th>
<th>Air Temperature (Cold Engine Starting Conditions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Heavy</td>
<td>75</td>
<td>Above 40°F.</td>
</tr>
<tr>
<td>Special Light</td>
<td>58</td>
<td>Below 40°F.</td>
</tr>
<tr>
<td>Regular Heavy</td>
<td>105</td>
<td>Severe operating conditions at high air temperatures.</td>
</tr>
</tbody>
</table>

**HARLEY-DAVIDSON GREASE - ALL GREASE**

Use for all bearings on motorcycle, except where other special lubricants are recommended.

**HARLEY-DAVIDSON CHAIN GREASE, CHAIN SAVER AND CHAIN SPRAY.**

Designed especially as a chain lubricant. Penetrates inner bearings for a long chain life.
The following check list will be helpful in locating most operating troubles:

**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 poor condition.
4. Battery nearly discharged.
5. Loose wire connection at one of battery terminals, or coil or circuit breaker.
6. Carburetor not adjusted correctly.
7. Defective ignition coil.
8. Defective condenser.
10. Engine ignition spark not timed properly.

**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 or too wide.
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 or carburetor vent line closed off restricting fuel flow.
13. Carburetor not adjusted correctly.
14. Weak or broken valve springs.

**IF CRANKING MOTOR DOES NOT OPERATE OR DOES NOT TURN ENGINE OVER**
1. Ignition switch is not on.
2. Transmission is not in neutral.
3. Discharged battery, or loose or corroded connections (solenoïd chatters).
4. Starter control circuit, relay or solenoid defective.
5. Clutch slipping.

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 and/or ignition timing 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 overcharging.
15. Engine and transmission oil too heavy (winter operation).

**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.

**IF ENGINE PRE-IGNITES**
1. Excessive carbon deposit on piston head or in combustion chamber.
2. Too hot a spark plug for the kind of service or for type of engine.
3. Defective spark plugs.
4. Ignition timing too advanced.

**IF ENGINE OVERHEATS**
1. Insufficient oil supply, or oil not circulating.
2. Leaking valves.
3. Heavy carbon deposit.
4. Carburetor adjustment too lean.
5. Ignition timing too late.

**IF ENGINE DETONATES**
1. Unsuitable fuel (octane rating too low).
2. Heavy deposit of carbon on piston head and in combustion chamber (decreases combustion space, thereby increasing compression ratio. The higher the compression ratio, the higher the octane rating of fuel required).

**IF OIL DOES NOT RETURN TO OIL TANK**
1. Oil tank empty.
2. Scavenger pump gear key sheared.
3. Oil feed pump not functioning.

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SECTION 1C
Product - Locating Troubles

IF ENGINE USES TOO MUCH OIL
1. Breather valve incorrectly timed,
2. Piston rings badly worn or in bad condition otherwise,
3. Chain oiler adjusting screw adjusted for an excessive amount of oil,
4. Oil leak to outside.

EXCESSIVE VIBRATION
1. Cylinder head bracket loose or broken,
2. Engine mounting bolts loose,
3. Broken frame,
4. Front chain badly worn, or links tight as a result of insufficient lubrication,
5. Transmission and/or transmission sub-mounting plate loose in chassis,
6. Wheels and/or tires defective.

IF GENERATOR DOES NOT CHARGE
1. Brushes badly worn,
2. Brushes sticking in holders,
3. Voltage regulator not grounded,
4. Voltage regulator incorrectly adjusted,
5. Defective voltage regulator,
6. Commutator dirty or oily,
7. Positive brush holder grounded,
8. Generator "A" terminal grounded,
9. Loose or broken wire in generator-battery circuit,
10. Broken field coil wire or loose terminal (both coils),
11. Commutator shorted,
12. Defective armature.

IF GENERATOR CHARGING RATE IS BELOW NORMAL
1. Voltage regulator incorrectly adjusted,
2. Broken field coil wire or loose terminal (one coil),
3. Commutator worn and not turning true with shaft - throws brushes at high speed,
4. Commutator dirty or oily,
5. Brushes gummy and sluggish in holders,
6. Defective armature.

IF CARBURETOR FLOODS
1. Float set too high (1966 & earlier),
2. Inlet valve sticking,
3. Inlet valve and/or valve seat worn or damaged,
4. Dirt or other foreign matter between valve and its seat,
5. Carburetor float not located correctly in bowl - may be binding (1966 & earlier),
6. Carburetor inlet lever not set correctly (1967),
7. Excessive "pumping" of hand throttle grip.

IF TRANSMISSION SHIFTS HARD
1. Bent shifter rod,
2. Clutch dragging slightly,
3. Transmission oil too heavy (winter operation),
4. Shifter forks (inside transmission) sprung as a result of using too much force when shifting,
5. Corners worn, off shifter clutch dogs (inside transmission) - makes engagement difficult.

IF TRANSMISSION JUMPS OUT OF GEAR
1. Shifter rod improperly adjusted,
2. Shifter forks (inside transmission) improperly adjusted,
3. Shifter engaging parts (inside transmission) badly worn and rounded.

IF CLUTCH SLIPS
1. Clutch controls improperly adjusted,
2. Insufficient clutch spring tension,
3. Worn and/or oil soaked friction discs.

IF CLUTCH DRAGS OR DOES NOT RELEASE
1. Clutch controls improperly adjusted,
2. Clutch spring tension too tight,
3. Friction discs gummy,
4. Clutch key ring badly worn,
5. Clutch discs warped.

IF CLUTCH CHATTERS
1. Clutch disc rivets loose,
2. Clutch spring disc too flat.

IF BRAKE DOES NOT HOLD NORMALLY
1. Brake shoes improperly adjusted,
2. Brake controls binding,
3. Brake linings impregnated with grease as a result of over-lubrication,
4. Brake linings badly worn,
5. Brake drum badly worn or scored,

(Hydraulic brake only)
1. Master cylinder low on fluid,
2. Brake line contains air bubbles,
3. Master or wheel cylinder piston worn.
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<td>Fork</td>
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<tr>
<td>Seat</td>
<td>2H-1</td>
</tr>
<tr>
<td>Fiberglass Body Care and Repair</td>
<td>2J-1</td>
</tr>
<tr>
<td>Tools</td>
<td>2T-1</td>
</tr>
</tbody>
</table>
DRIVE

CHAINS

GENERAL

Chain adjustment must be checked at regular intervals of 1000 miles for rear chain and 2000 miles for front chain. Rear chain requires more frequent attention than front, or primary chain. As chains stretch and wear, they run tighter at one spot than another. Always adjust free movement at tightest spot in chain to allow specified play midway between sprockets. Do not adjust tighter. Running chains too tight will result in excessive wear, particularly on chain tensioner shoe of 1965 and later models.

Inspect chains frequently for cracked, broken, or badly worn links. The rear chain may be taken apart for replacement or repair at the connecting, or master link. The front chain does not have a connecting link. It is necessary to remove the engine sprocket before the chain is removed for replacement. Repair of the rear chain is not recommended. See "Stripping Motorcycle for Engine Repair," Section 3A, for engine sprocket removal.

FRONT CHAIN ADJUSTMENT

1964 and earlier Models:

To adjust front chain loosen four nuts and one cap screw that secure the transmission to its mounting plate and bracket on the right side frame tube. Move the transmission backward or forward by means of the adjusting screw at the rear of the transmission on the right side. Turn adjusting screw clockwise to tighten chain and counterclockwise to loosen chain.

Specified front chain play is 1/2 in. for 1964 & earlier models. When correctly adjusted, tighten the transmission securely to its mounting. Check mounting plate bolts occasionally and keep them tight.

Adjusting front chain requires adjustment of rear chain. Moving the transmission to adjust the front chain may require adjustment of gear shifter and clutch controls. Readjust if necessary (see "Adjusting Clutch Control," Section 4B, and "Adjusting Shifting Linkage," Section 4D).

1965 and later Models (Fig. 2B-1)

Remove rear pivot bolt from left footboard and swing rear end of footboard down, away from chain cover. Remove 6 cover attaching screws and remove cover.

Front chain tension is adjusted by means of a shoe (1) which is raised or lowered underneath the chain to tighten or loosen it. The shoe support bracket (2) moves up or down in slotted backplate (3) after loosening center bolt (4) in backplate nut. Adjust shoe support as necessary to obtain specified up and down free movement in upper strand of chain, midway between sprockets and retighten bolt securely.

Front chain adjustment:
5/8 to 7/8 in. chain slack with cold engine
3/8 to 5/8 in. chain slack with hot engine.

Shoe support bracket (2) and outer plate (5) have two sets of shoe attaching holes (A and B) so that entire assembly can be inverted to accommodate various sprocket sizes or chain lengths. To change over, remove center bolt (4), remove two shoe attaching capscrews (6) from set of holes (A), invert shoe and attach to alternate set of holes (B) with capscrews (6). Invert support bracket and outer plate and re-attach with center bolt engaged in backplate nut.

Figure 2B-1. Adjusting Front Chain (1965 and later)

Figure 2B-1A. Adjusting Rear Chain
SECTION 2B
Chassis - Drive

REAR CHAIN ADJUSTMENT (Fig. 2B-1A)

Remove the rear axle nut, lock washer, and loosen brake sleeve nut (1) and brake anchor stud nut (4). Loosen the lock nuts on wheel adjusting screws (2). Turn the adjusting screws as necessary to correctly adjust the chain. Turn each screw (3) an equal number of turns in order to keep wheel in alignment. Check correct alignment of the wheel to see that the tire runs in center of rear fork and also that the rear sprocket runs centrally in the chain. Specified rear chain play is 1/2 in. When readjustment is completed, be sure to securely tighten the sleeve nut, anchor stud nut, axle nut, and adjusting screw lock nuts in that order.

FRONT CHAIN LUBRICATION

1964 and earlier Models:

A well lubricated chain has an oily surface and is clean and free of discoloration. If chain has a brownish hue and a rusty appearance at the side and center plates, it is under-lubricated even though the surface may be oily. Readjust the front chain as follows: Loosen lock nut (1, Fig. 2B-2) and turn adjusting screw (2, Fig. 2B-2) outward for more oil; turn screw inward for less oil. Turn screw only a fraction of a turn at a time. Lock adjusting screw in place with lock nut.

The adjusting screw fits into an orifice through which engine oil bleeds to the chain and controls the flow of oil by controlling the size of the orifice. Since very little oil is needed to lubricate the chain, the orifice is very small. Sediment and gummy matter accumulate in the oil supply and form deposits in and around this orifice, gradually decreasing the oil supplied to the chain. A chain that has been lubricated perfectly the first 2000 miles may run short of oil the second 2000 miles. For this reason, even though inspection indicates the chain is amply lubricated, it is advisable to flush away accumulated sediment and restore the orifice to its original size at intervals of approximately 2000 miles. To do this, loosen the chain oiler adjusting screw, and back it out exactly two full turns. Tighten lock nut. Operate this way for a few miles and then reset screw to its established setting. To reset adjusting screw to its established setting, turn adjusting screw inward exactly two full turns and lock in place with lock nut.

If established setting of adjusting screw should become completely lost while making readjustment or flushing orifice, back up lock nut and turn the screw inward until its point bottoms lightly but firmly against its seat. Then back screw out about 1-1/4 turns and establish this setting with lock nut. This is the approximate original factory setting.

1965 and later Models:

A fixed amount of oil is supplied through an oil line from metering orifice in the oil pump. Oil drops on front chain from oiler outlet tube (7, figure 2B-1). Excess oil collects at rear of chain compartment and is drawn back into engine gear case breather.

Figure 2B-2. Adjusting Front Chain Oilier (1963 & earlier)

When the front chain adjustment is checked at 2000-mile intervals, also check to see that oil comes out of oiler tube when engine is running, when viewing through cover inspection hole. If oil does not come from oiler, the supply orifice at pump is probably blocked due to accumulation of dirt, and requires cleaning. To do this, remove orifice screw and washer from oil pump and blow out passage to chain compartment with compressed air.

REAR CHAIN LUBRICATION

Under normal operating conditions brush the dirt off and lubricate the rear chain at 1000-mile intervals. Lubricate with Harley-Davidson 'Chain Saver' if available; if not, use lightest engine oil available.

If motorcycle is equipped with rear chain oiler, disregard above instructions and proceed as follows: At regular 2000-mile intervals, make a close inspection of rear chain. If rear chain does not appear to be getting sufficient lubrication, or if there is evidence of an over-supply of oil, proceed as follows:

CHAIN GUARD OILER: On 1964 models equipped with front chain guard oiler, the rear chain receives its lubrication from the rear chain oiler outlet tube located at the rear of the front chain guard back. A shelf inside the front chain guard picks up oil thrown off by the front chain. This oil drains out through a small tube onto the rear chain.

Check the front chain oiler adjustment as explained previously under "FRONT CHAIN LUBRICATION". Normally, if the front chain oiler is adjusted for correct front chain lubrication, the rear chain will be adequately lubricated.

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If the rear chain is dry, the oiler outlet tube may have become blocked with dirt. This may occur when motorcycle is operated under extremely dusty or dirty conditions. Check to see that oiler outlet tube is open by inserting a 1/8" dia. wire into the tube behind the chain guard.

Oil Return Line Bleed Type Oilier: This rear chain oilier is located on the oil return line at the oil pump. To adjust the chain oilier, follow the same procedure explained in adjusting the front chain oilier (1964 and earlier models).

Normal setting of adjusting screw is 1/4 turn open. If orifice becomes blocked it will be necessary to clean as follows:

Back out adjusting screw lock nut as far as possible without allowing the adjusting screw to turn.

Turn adjusting screw inward until it bottoms on its seat. Keep a count of the number of turns.

Remove adjusting screw and clean orifice with compressed air.

Re-install adjusting screw and turn it inward until it bottoms on its seat.

Turn adjusting screw outward the same number of turns determined in step 2 and lock in place with locking nut.

Lubrication - Unusual Conditions

If the motorcycle is operated under extremely dusty or dirty conditions, whether equipped with a rear chain oilier or not, additional lubrication of the rear chain may be advisable. Remove chain from motorcycle. Soak and wash thoroughly in a pan of kerosene. Remove chain from kerosene and hang so kerosene will drain off. Immerse in a pan of grease heated to consistency of light engine oil, or use light engine oil. While immersed, move chain around to be sure that hot grease or oil works through all inside parts. After removing, allow chain to drain and wipe all surplus grease or oil from surface of chain. Install chain on motorcycle. Inspect connecting link and spring clip closely for bad condition. Replace if at all questionable. Be sure spring clip is properly and securely locked on pin ends with open end trailing direction of chain travel.

Removing and Installing Rear Chain

Locate and remove spring on connecting link. Free-fit connecting link used on early models can be removed by hand. Connecting link having press fit in side plate can be pressed apart with Chain Tool, Part No. 95020-38 which is supplied in accessory rider tool kit. A Shop Tool is available under Part No. 95021-29 for this purpose. To install new press fit connecting link, use Rear Chain Assembling Tool, Part No. 95020-50.

Repairing Drive Chains

To repair a chain, remove damaged link or links by pushing out pins with chain repair tool. Assemble new links and secure with connecting links. Front chain is a double-row or duplex chain; rear chain is a single-row chain. The chain tool furnished in the tool kit is designed to accommodate both. Note: Repair of front chain by use of a repair link is not recommended for chain tensioner equipped models. Entire chain should be replaced. This will avert chain breakage and possible damage to the crankcase.

Gauging Chain Wear

When chain has been removed for cleaning, check it for elongation caused by wear as follows:

1. Lay chain on a flat surface.

2. Take up the play in the links by pushing the chain ends toward each other, a few links at a time.

3. When the chain is fully compressed, measure its length. Stretch the chain to its full length and measure again. Replace rear chain if play exceeds 1 in.; replace front chain if play exceeds 1 in.

Note: Front chain is not equipped with a connecting link so it may be checked only if it has been opened for repair. Front chain of models with tensioner shoe should not be opened. Replace chain when you run out of shoe adjustment.

Removing and Installing Front Chain

1964 and earlier models:

Remove chain guard cover. If motorcycle is equipped with compensating sprocket, use Compensating Sprocket Shaft Nut Wrench, Part No. 94557-55, to remove compensating sprocket shaft nut. If not equipped with compensating sprocket, use Crank Pin Nut Wrench, Part No. 94545-26, to remove nut. Loosen nut by striking wrench handle several sharp blows with hammer. Remove push rod adjusting screw lock nut (nut on center screw of clutch sprocket), slip washer (any steel washer 1-3/4 in. in diameter with 3/8 in. hole) over push rod adjusting screw and replace lock nut. Remove three spring tension adjusting nuts and pull clutch outer disc and spring collar assembly off clutch drive hub pins. Move clutch sprocket and engine sprocket off shafts.

1965 and later models:

Remove chain housing cover and lower front chain tensioner shoe as previously described under "Front Chain Adjustment, 1965 and Later”. Then remove engine sprocket and clutch sprocket as described above.

Note: Engine sprocket is aligned with clutch sprocket by a selection of spacers between sprocket and crankcase bearing. Reinstall same thickness of spacers as you removed, or determine correct spacer size as follows:

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With clutch disassembled from clutch hub and compensating sprocket disassembled from sprocket shaft as shown, determine spacer (6) thickness as follows:

Example

1. Measure from chain cover surface to clutch disc friction surface .......... 2.000 in.
2. Add dimension to secure alignment (constant) .............................. .200 in.
3. Total .................................................. 2.200 in.
4. Measure from chain cover surface to Timken Bearing Inner Race (1965-68) or Shield Washer (1969) ................................. 2.773 in.
5. Subtract Total (Step 3) from measurement (Step 4) ....................... 2.200 in.
6. Spacer thickness ............................................. .573 in. (.576 in.)

Spacers come in .516, .546, .576, .606, .636, and .666 thicknesses. In this case a .576 in. thick spacer would be used to obtain chain alignment.

Figure 2B-2A. Determining Engine Sprocket Spacer Thickness to Secure Chain Alignment

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WHEELS

In most every case, high speed handling faults are caused by one or more of the above conditions being present on the motorcycle. The possible exception will be the case where there is serious frame or fork misalignment.

Switching wheels and tires approximately every 5000 miles and inflating to recommended pressure are of major importance. In many cases, this attention alone applied to a solo motorcycle will remedy faulty handling at higher speeds.

It is advisable to rebalance wheels and tires, at least statically, whenever casing and/or tube is replaced.

SERVICING WHEELS

Front and rear wheels may be removed as necessary for wheel or tire service. When removing a wheel, apply brake to hold drum securely while pulling wheel from drum. When detached from drums, Duo-Glide and Electra-Glide wheels are interchangeable.

REMOVING FRONT WHEEL (Fig. 2C-1)

Block motorcycle under frame until front wheel is clear of ground. Disassemble in following order:

Remove the cotter pin (1), axle nut (2) and flat washer (3). Servi-Car wheel disassembly includes removing bushings (4); also remove the five wheel mounting socket screws (5), loosen the two slider cap nuts (7) and remove axle (6). Remove front wheel, leaving the brake drum in its place over the brake shoes.

When replacing the wheel, assemble in reverse order. Important: Clamping faces on wheel hub and brake drum must be clean so that wheel will be true and tight against brake drum when socket screws are tightened. Securely tighten wheel mounting socket screws (5) and axle nut (8), and then tighten the two slider cap nuts (7). This will insure correct alignment of fork sides.

REMOVING REAR WHEEL (DUO-GLIDE AND ELECTRA-GLIDE)

Elevate motorcycle rear end with service stand, or suitable blocking under frame so rear wheel is off the ground. Remove two rear screws from fender support, and raise end of fender as shown in Fig. 2C-2. Remove the five socket screws (4) that secure wheel to brake drum. The socket screw wrench can be inserted only at the rear of axle; turn wheel to bring each screw to this position.

Remove axle nut (3) and axle nut lock washer (2). Remove axle (1) from brake drum side of motorcycle and then remove spacer (5) from between wheel hub and right axle clip. Apply rear brake and remove wheel.

NOTE

Foot Brake Lever Locking Tool, Part No. 95873-58, can be used to lock brake. To
use tool, raise right side foot board, slip tool over brake lever stop pin, depress brake pedal and rotate tool so that cam on tool end locks brake pedal in depressed position. When installing wheel, reverse the removal procedure. Important: Clamping faces on drum and wheel hub must be clean so that wheel will be true and tight against brake drum when socket screws are tightened. Securely tighten the five wheel socket screws before tightening the axle nut (3). To avoid possibility of wheel working loose and damaging clamping flange, it is important that socket screws be pulled very tight.

**REMOVING SIDECAR WHEEL.**

Raise wheel by blocking up under sidecar chassis. Loosen nut that secures fender front bracket to sidecar step lug. Loosen the fender inner brace clip bracket nut. Remove outside axle nut, lock washer and outer brake. Hinge fender forward, taking care to provide slack for taillamp wiring. Remove extension nut, axle nut and washer. Pull wheel from axle with brake drum attached.

Detachment of wheel from brake drum is necessary only when wheel or brake drum is to be replaced or wheel interchanged. To detach wheel from brake drum, remove the five wheel mounting socket screws that secure wheel to brake drum.

To replace wheel, reverse removal procedure. Tighten wheel mounting socket screws securely to

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**Figure 2C-1. Removing Front Wheel**

1. Cotter pin  
2. Axle nut  
3. Flat washer  
4. Bushing  
5. Wheel mounting socket screws  
6. Axle  
7. Slider cap nuts  
8. Slider cap  
*Not used on Duo-Glide*

**Figure 2C-2. Removing Rear Wheel**

1. Axle  
2. Axle nut lock washer  
3. Axle nut  
4. Wheel mounting socket screws  
5. Spacer
DUO-GLIDE
SERVI-CAR

avoid possibility of wheel working loose and damaging hub flange.

SERVICING 1966 AND EARLIER ROLLER BEARING WHEEL HUBS (Fig. 2C-3)

All spoked wheel hubs are identical. However, keep parts for all wheels separated. Bearing assemblies (20, 21 and 11, 12) and thrust bearing adjusting shims (7) have been fitted at the factory, and subsequent hub repairs may have included installing oversize bearings. A transposition of parts will result in oversize or undersize fit.

DISASSEMBLING ROLLER BEARING WHEEL HUB (Fig. 2C-3)

Remove five thrust bearing cover screws (1) and lock washers (2). Lift off thrust bearing outer cover (3), cork grease retainer (4), thrust-bearing housing (5), gasket (6), a number of adjusting shims (7) which varies with the hub, thrust washer (8), thrust bearing sleeve (9) and another thrust washer (10).

Remove bearing rollers (11) and retainer (12), and roller retainer thrust washer (13).

Turn hub over and remove spring lock ring (14), retaining washer (15), hub inner sleeve (16), cork grease retainer (17), spring lock ring (18) and roller bearing washer (19).

Large diameter retainer (21) and bearing rollers (20) are then free to be removed from hub shell (22).

INSPECTION AND REPAIR (Fig. 2C-3)

Clean and dry all parts and inspect for wear. If excessive sideplay is present, one or more bearing adjusting shims (7) must be added. Thrust bearing sleeve (9) must be free with thrust bearing outer cover (3) completely screwed down. A clearance of .005 in. to .007 in. is correct. Leave cork grease retainer (4) out of thrust assembly while determining correct adjustment of thrust sleeve, and reinstall it when adjustment is completed.

Excessive radial (up and down) play in wheel hub bearings can be taken up by fitting oversize rollers (11 and 20). Bearing rollers are available from .001 in. undersize to .001 in. oversize in steps of .0002 in. Select roller size that will give .001 in. to .0015 in. clearance.

ASSEMBLING ROLLER BEARING WHEEL HUB (Fig. 2C-3)

Assemble hub components in reverse order of dis-assembly. Closed sides of roller bearing retainers (12 and 21) go toward center of hub. Be sure to include a plain washer (25) under grease fitting (24) in thrust bearing housing (5). Failure to do so will cause end of fitting to crimp adjusting shims (7).

Apply a thin coating of "Grease-All" grease to rollers, races and thrust washers. After final assembly, inject 1 ounce additional grease into hub. Carefully check hub to avoid a bearing fit too tight. Roller bearings must turn freely and have slight play. Do not over-lubricate hub. An over-lubricated hub will throw grease that may get into brake assembly.

Figure following name of part indicates quantity necessary for one complete assembly.
Servicing 1967 AND LATER BALL BEARING WHEEL HUB (Fig. 2C-3A)

Front and rear wheels have permanently lubricated and sealed, retainer type ball bearings. The wheel hub has one bearing opposite the brake side. The brake drum has one bearing (front wheel) and two bearings (rear wheel).

Bearings require no interval attention. Excessive looseness or roughness in the bearings when wheel is turned indicates worn bearings, and they must be replaced.

DISASSEMBLING BALL BEARING WHEEL HUB AND BRAKE DRUM

Remove 5 wheel mounting socket screws (1) and remove brake drum (2) from wheel hub (9). Remove bearing spacer (3) from wheel hub. Press bearing or bearings (8) out of brake drum with suitable plug from wheel hub side. Wheel hub ball bearing locknut (4) has a left hand thread. Using tool, Part No. 94630-67 engage slot and turn to right to remove nut from hub. Remove seal (5), and spacer (6) from wheel hub. Press bearing (7) out of wheel hub with suitable plug from brake drum side.

INSPECTION AND REPAIR

Turn bearings by hand to check for roughness and check also for excessive looseness of the inner and outer race. Inspect seal lip for wear or damaged rubber. Replace defective parts.

ASSEMBLING BALL BEARING WHEEL HUB AND BRAKE DRUM

Assemble hub and brake drum components in reverse order of disassembly.

When assembling bearings, apply a liberal quantity of grease to fill space on both sides of bearing in wheel hub and on inside bearing of brake drum.

Important: Clamping faces on drum and wheel hub must be clean so that wheel will be true and tight against brake drum when socket screws are tightened.

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1. Wheel mounting socket screw (5)
2. Brake drum (front shown)
3. Bearing spacer
4. Bearing lock nut
5. Seal
6. Spacer
7. Ball bearing
8. Ball bearing (1 front) (2 rear)
9. Wheel hub
REPLACING REAR WHEEL SPROCKET

To replace a worn rear wheel sprocket, remove wheel from motorcycle as described in "Removing and Installing Rear Wheel." Disassemble brake drum from wheel. Chisel heads off all rivets and dowel pins from brake shell side and punch them out. If the rivet holes are not worn, use the rivet holes again. If the rivet holes are found slightly worn or elongated and drum is in good condition, drill a new set of rivet holes in drum flange midway between original dowel and rivet holes.

To drill new rivet holes, proceed as follows using new sprocket as a template for locating holes.

1. Drill a hole from the brake shell side.
   - Size: 1958 to early 1961 - 5/32 in. dia. drill
     Early 1961 and later - .1935 in. dia. (No. 10 drill) for 3/16" rivet

2. Drill one hole and insert rivet (do not head rivet).

3. Drill a hole directly opposite first hole and insert rivet (do not head rivet).

4. Drill remaining 14 rivet holes.

5. Remove remaining 14 rivet holes.

6. Remove burrs from newly drilled holes.

Whenever a rear wheel sprocket is replaced, it is very important to drill new dowel holes to insure a press fit for the dowel pins. Use the new sprocket as a template and drill the four dowel pin holes 3/16 in. dia. for a press fit.

Position sprocket and drum on center support flange of Riveting Jig, Part No. 95800-33B. Proceed as follows, inserting and seating dowel pins first, and then rivets.

1. Insert dowel pins and rivets from brake shell side.

2. Use hollow driver and seat dowel pins and rivets at the same time driving sprocket and hub flange together.

Figure 2C-4. Starting Spokes in Wheel Hub

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Figure 2C-5. Spoking Wheel

3. Use punch to flare dowel pin ends and rivet ends until heads extend 3/64 in. above sprocket face for 5/32 in. rivet size and 3/32 in. for 3/16 in. rivet size. Use concave end punch for small diameter rivets and dowel pins. Use flat end punch for larger diameter rivets.

4. Rivet opposite dowel pins and rivets until all are in place.

SPOKING WHEELS

Front, rear (motorcycle) and sidecar wheels are spoked identically. Spoke holes in hub flanges are in two rows around flange, ten inner row holes and ten outer row holes in each flange.

All spokes must be inserted from inside of flange.

1. Place hub on bench with brake drum end of hub up.

2. Insert spokes in ten inner spoke holes of brake side flange (see Fig. 2C-4).

3. Swing loose end of spokes counterclockwise as far as hub will allow without turning hub.

4. Place rim over hub (with tire valve hole 90 degrees to 180 degrees from hub grease fitting) and insert spokes in upper row of holes in rim that angle in same direction as spokes.

NOTE
18 in. rim is placed over hub, either side down; 16 in. rim is placed over hub with tire valve hole down (opposite brake drum side of hub).

Just start nipples on spokes as they are inserted in rim.

5. Insert spokes in outer ten holes of flange and swing spokes clockwise (see Fig. 2C-5).
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6. Select any outer spoke, cross it over four inner spokes (A, B, C and D) and insert spoke in nearest upper rim hole and start nipple. Follow same procedure with balance of spokes.

7. Turn rim and hub over. Repeat operations 2, 3, 5 and 6, except in operation 3 swing spokes clockwise and in operation 5 swing spokes counterclockwise.

NOTE
Outer spokes on both sides point in same direction.

TRUING WHEEL

1. Install truing arbor in wheel hub and place wheel in Wheel Truing Stand, Part No. 95500-29A. Secure arbor nuts so that hub will turn on its bearings.

2. Turn each nipple on just far enough to cover spoke threads.

3. Start at valve hole and tighten all nipples three full turns each, using special Nipple Wrench, Part No. 94681-39. If further tightening is needed to pull spokes snug, tighten all nipples one full turn at a time until spokes are snug.

4. Check rim for centering sideways with hub, for running true sideways and concentricity. Centering rim sideways with hub and truing rim sideways must be done as one operation.

Rim must be properly centered sideways in relation to hub for correct alignment and "tracking" of front and rear wheels. Fig. 2C-6 shows method of using a straightedge to determine correct sideways centering of wheel rims as specified. Straightedge should be a perfectly straight metal bar; except on 160t 1967 and later 16" wheels it must be notched out to clear hub flange edges as shown in figure 2C-6.

For 16 in. wheel (5.00 in. tire), place straightedge across hub on brake side and measure the distance from straightedge to rim well as shown.

For 18 in. wheel (4.00 in. tire), lay straightedge across brake side spoke flange of hub and measure distance from straightedge to rim as shown.

Adjust truing stand gauge to side of rim well as shown in Fig. 2C-7 so rim at highest point will strike gauge as wheel is rotated slowly. Loosen nipples at highest point of rim on gauge side and tighten nipples on opposite side the same amount. Repeat this operation until rim runs true sideways. Reverse loosening and tightening of nipples as explained above if rim moves too far away from gauge. After each loosening and tightening of spokes, check rim in relation to hub as explained in above paragraphs. Rim should be true to within 1/32 in. sideways runout.

After rim has been centered sideways with wheel hub and runs true sideways, check it for concentricity. Adjust truing stand gauge to rim tire bead seat as shown in Fig. 2C-8. If rim runs eccentric (radial runout), nipples must be loosened at points rim does not contact gauge, and nipples tightened at points rim contacts gauge. Amount nipples are to be loosened or tightened is determined by the amount rim is out of round. Rim should be true to 1/32 in. or less radial runout.

5. After above operations have been checked and corrected, start at valve hole and tighten nipples one turn at a time all the way around rim until spokes are normally tight. While tightening nipples, repeatedly check rim with gauge according to instructions in step 4.

After all nipples have been pulled up until spokes are normally tight and wheel is true, or nearly so, seat
DUO-GLIDE
SERVI-CAR

Figure 2C-8. Truing Rim Concentric with Hub

each spoke head into hub flange with a sharp blow, using a flat nose punch and hammer. Then retighten all nipples and finish truing wheel. This method allows spokes to be drawn tighter at the start and prevents possibility of spokes loosening, due to spoke heads seating into flange, after wheel is put into service.

CAUTION

Do not tighten spokes too tight or nipples may draw through rim, or hub flanges may be distorted. If spokes are left too loose, they will continue to loosen when wheel is put in service.

6. File or grind off ends of spokes protruding through nipples to prevent puncturing tube when tire is mounted.

REMOVING AND INSTALLING TIRES

Wheel rims are of the drop-center type, having a depression or “well” in center of rim. Rim-well, being smaller in circumference than rest of rim, allows one casing bead to fit loosely in it while other bead is being worked over edge of rim.

REMOVING TIRE FROM RIM

Remove wheel; lay wheel on its side.

Remove valve cap and valve core to free all air from tube. Remove valve stem nut (18 in. rim).

Loosen both beads from rim flanges by stepping on sides of tire or by using a tire tool. Stand or kneel on tire opposite valve to push bead into rim-well.

Using tire tools (not sharp instruments), start upper bead over edge of rim at valve. Don’t use force when starting bead over edge of rim with tire iron, because bead wires may be broken or stretched and tire ruined. Carefully remove tube before attempting to remove second bead.

Push lower bead into rim-well on one side and insert tire iron on opposite side and pry bead over flange. After a portion of second bead is started over rim edge, tire can be further removed from rim without aid of tire iron.

It is not always necessary to completely remove casing from rim. Removing one side allows tube to be removed and reinstalled and also allows inside of casing to be inspected.

MOUNTING TIRE ON RIM

Before installing tube in tire, all dust and dirt, particularly hard particles which might chafe an inflated tube, must be removed. Wipe tube and inside of tire thoroughly with clean, dry cloth. If rim is dirty or rusty, clean with a stiff wire brush. Be sure to examine a used tire carefully for fabric injuries that may damage tube.

Before mounting tire, see that rubber rim strip is in place in rim-well, and that rim strip valve hole registers with valve hole in rim.

Tire balance mark on Firestone tires is a red triangle and on Goodyear tires a red dot.

CAUTION

Use correct inner tube for tire size. See "Tire Data" Section 1A.

Insert tube in tire, (placing valve at tire balance mark). Swab thoroughly all around base of tube, between the tube and side walls of tire with a heavy sud solution of tire mounting compound and water. Bead seat of tire should not be coated. Inflate tube just enough to round it out. With wheel lying flat, place tire on rim and align valve with hole in rim.

Push bottom bead into rim-well near valve and hold in well while forcing remaining portion of bead over rim flange with a tire tool.

Spread tire and insert valve through hole in rim.

Force upper bead over rim flange and into well at opposite valve. Stand or kneel on this side of tire to hold it in well and pry remaining portion of tire over rim flange. While forcing bead over rim flange, keep as much bead as possible in rim-well. Be careful not to damage beads or pinch tube. Infl ate tire to recommended pressure and check valve for leak. See tire inflation pressures in "Tire Data," Section 1A.

After inflating to recommended pressure, completely deflate to smooth out any wrinkles in tube and allow tube to find its place, free from strain or stress. Again inflate to recommended pressure and check valve for leak.
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CHECKING TIRE TRUENESS SIDEWAYS (LATERAL RUNOUT)

Check runout by turning wheel on axle, measuring amount of sideways displacement from a fixed point near the tire (see Fig. 2C-8A).

Figure 2C-8A. Checking Tire Lateral Runout

Tire tread runout should be no more than 3/64 in. If tire tread runout is more than 3/64", remove tire from rim and check rim bead side runout to see if rim is at fault (see "Truing Wheel").

If rim side runout is less than 1/32", tire is at fault and should be replaced. If rim side runout is more than 1/32", correct by tightening selected spoke nipples as outlined previously, reinstall old tire and recheck tire tread lateral runout.

Figure 2C-8B. Checking Tire Radial Runout

CHECKING TIRE ROUNDNESS (RADIAL RUNOUT)

Check runout by turning wheel on axle, measuring tread runout (see Fig. 2C-8B).

Tire tread runout should be no more than 3/32". If tire tread runout is more 3/32", remove tire from rim and check rim bead runout to see if rim is at fault (see "Truing Wheel").

If rim bead runout is less than 1/32", tire is at fault and should be replaced. If rim bead runout is more than 1/32" correct by tightening selected spoke nipples as outlined previously then reinstall tire and recheck tire tread runout.

WHEEL ALIGNMENT

NOTE

Rims and tires must be true before checking wheel alignment, as outlined in previous paragraphs.

Front and rear wheels should be in perfect alignment. This can be easily checked on the motorcycle with a straight wooden board or length of string by placing against tire sidewalls as far up toward axles as possible. Straightedge should touch tires at all four points (see Fig. 2C-8C). Adjust rear wheel in axle clips as necessary to correct misalignment.

Figure 2C-8C. Wheel Alignment Diagram

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SERVICING HANDLEBAR CONTROLS

NOTE
Spark control information applies to earlier models having manual spark advance.

Handlebar controls for throttle and spark advance must operate freely. If a control becomes stiff and hard to adjust, parts must be removed and cleaned of caked grease, gum and dirt. A kinked control coil must be replaced if complete straightening cannot be accomplished.

DISASSEMBLING HANDLEBAR CONTROLS (Fig. 2D-2)

Disconnect control coil and wire at carburetor or circuit breaker. Loosen clip which secures spark control coil to upper frame tube.

Insert a large screwdriver through hole in end of grip as shown in Fig. 2D-1 and loosen handlebar end screw (1). Handlebar end screw and spring (2) will remain inside grip. Remove grip sleeve assembly (3), exposing working parts.

Slip two rollers (5) off roller pin (4) and remove roller pin from plunger (6). Plunger with control

Figure 2D-1. Removing Handlebar Controls

Figure 2D-2. Handlebar Controls - Exploded View

1. End screw (2) 4. Roller pin (2) 7. Control coil set screw (2) 10. Coil (2)
2. Spring (2) 5. Roller (4) 8. Control wire (2)
3. Grip (2) 6. Plunger (2) 9. Coil end plug (2)

Figure following name of part indicates quantity necessary for one complete assembly.

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wire (8) may be pulled through handlebar. If the control wire is broken, remove lower end at carburetor or circuit breaker. The control wire is fastened into the end of the plunger by means of set screw (7).

If control coil is to be removed, loosen the lock screw under the horn or starter button retainer on the handlebar that positions the coil end plug (9) in handlebar. The throttle end plug lock screw is exposed on the underside of the right handlebar. After loosening, control coils and end plugs may be pulled out of handlebar ends.

INSPECTION AND REPAIR

Clean all parts in solvent. Be sure they are free from rust, gum and dirt. Inspect all parts including inside of grip and replace all worn parts.

ASSEMBLING HANDLEBAR CONTROLS (Fig. 2D-2)

Slip control coil through handlebar and secure at end plug with lock screw through handlebar (screw must register in groove of end plug). Slip roller pin through plunger and assemble rollers to ends of roller pin, rounded side out. Attach control wire to plunger assembly by means of the set screw (7).

Apply a light coat of grease or oil to control wire as it is inserted into coil. Lubricate remaining parts with grease. Turn grip onto handlebar with rollers following spiral grooves inside grip.

Handlebar end screw may be started without danger of crossing threads by holding grip sleeve assembly back slightly when starting screw in handlebar end. This squares screw with end of grip sleeve, aligning threads. Tighten screw securely.

Connect throttle and/or spark control wires at carburetor and circuit breaker. Adjust throttle control so throttle closes and opens fully with grip movement. Allow about 3/8 in. of throttle control coil to extend beyond carburetor control coil clip when throttle is in a closed position.

With circuit breaker in fully-advanced position, the end of the spark control wire must point directly at hole in timer adjuster stud. Allow about 3/8 in. of spark control coil to extend beyond clamp. Adjust spark control so circuit breaker advances and retards fully with spark control grip movement.
FRAME

To rough check a frame for correct alignment, see Fig. 2E-1. The dimensions shown will provide basic information to determine whether a frame is enough out of alignment to require a major realigning job or replacement.

Straightening a badly bent frame requires special tools and fixtures for holding, bending and gauging. If frame straightening facilities are not available locally, damaged frames may be returned to the factory for repair (through authorized Harley-Davidson dealers only).

NOTE

Replace all badly bent or broken frames. The cost of repair would be prohibitive.
Figure 2E-1. Frame with Basic Dimensions
GENERAL

The Hydra-Glide fork is comprised of two sets of telescoping tubes that work against springs, with an oil filled (hydraulic) dampering mechanism to control the action. The unit is engineered to give long service with a minimum of repair. Oil change is not necessary unless oil has been contaminated or leakage has occurred.

DUO-GLIDE (NON-ADJUSTABLE). The non-adjustable Duo-Glide fork, as illustrated in Fig. 2F-3, is for use on a solo motorcycle. The fork "trail" (the distance, at ground level, from the fork stem axis to a perpendicular through the wheel axle) is set and cannot be adjusted. This fork may be recognized by the two hexagon head upper bracket bolts (2, Fig. 2F-3) in the slider tube tops.

DUO-GLIDE (ADJUSTABLE). The adjustable Duo-Glide fork is for use on a motorcycle which operates with and without a sidecar. It is essentially the same as the non-adjustable fork except it has a two-position bracket that allows the trail to be changed for best solo or sidecar-equipped operation, also a steering damper adjusting mechanism which dampens the steering head to suit conditions and rider preference. All other adjustments and repairs are made exactly as on the non-adjustable fork. This fork may be recognized by the reversing bracket bolt washers, bolt and stem design (18, 19, 20, Fig. 2F-4) as described in "Adjusting Front Fork Trail."

SERVI-CAR (NON-ADJUSTABLE). The Servi-Car fork is a combination of the above forks. It has greater trail than the non-adjustable Duo-Glide fork, but is itself non-adjustable. The stem and bracket are the same as the adjustable fork except for the bracket bolt washers. In appearance, it is similar to the adjustable fork.

CHANGING OIL

DUO-GLIDE (NON-ADJUSTABLE). Remove upper bracket bolt (2, Fig. 2F-3) at top of each fork tube.

DUO-GLIDE (ADJUSTABLE) AND SERVI-CAR. Remove fork cover side panels or headlamp housing and fork filler screws (23, Fig. 2F-4).

ALL MODELS. Remove drain plug, Fig. 2F-3 at the outside bottom of each slider tube with a 3/16 in. Allen wrench and drain. Draining speed will be increased by gently flexing the fork as it empties. Replace drain plugs and pour 6-1/2 oz. of Harley-Davidson Hydra-Glide Fork oil into each tube, 7 oz. if fork has been disassembled and washed. Measure amount very carefully. Flow of oil into tubes will be increased if fork is worked up and down during filling operation. Replace upper bracket bolts and tighten securely.

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The fork filling device shown in Fig. 2F-1 will hasten and simplify the filling operation. The unit consists of a Neoprene (not rubber) stopper to fit the hole in the top of the fork, a length of flexible tubing, a funnel and an appropriate size can, soldered to the top of the funnel.

To make a filler can, drill a dozen 1/4 in. holes in the bottom of a one quart tin can (2), near the outside edge. Shape the bottom of the can with a light hammer so that it is dished upward to assure complete draining of oil through the holes.

Figure 2F-1. Fork Filler Can Components
Figure 2F-2. Filling Hydraulic Fork with Oil

Select a tin funnel (3) with the funnel mouth about the same size as the bottom of can (2). Swage and shape the funnel spout so that a piece of 1/4 in. metal tubing (4), about 2 in. long, (a piece of fuel line is suitable) can be soldered into it. Solder (3) onto the bottom of (2). Improvise and attach bail (1) to the filler can.

Make plug (7) from a rubber bottle stopper purchased from a drug store. Rubber stopper should be 1 in. to 1-1/8 in. long, and its largest diameter about 5/8 in.

Hold rubber stopper in vise and drill a 3/32 in. hole lengthwise through the center. Then enlarge the hole with a 1/4 in. drill. After hole is drilled in the stopper, insert a 1/4 in. rod through the hole and grind the stopper to a 5/8 in. diameter at the large end, and slightly under 1/2 in. diameter at the small end, straight taper between ends, to form the plug.

Slightly flare one end of a piece of 1/4 in. tubing (6), about 2 in. long and insert into plug (7). Attach filler can to plug with transparent flexible tubing (5) about 2 feet long. See Fig. 2F-2.

Push the plug into the filler hole in fork top, Fig. 2F-2. Pour exact amount of oil into can. Work fork up and down. Air escaping through oil in filler can as fork is pushed downward will cause the oil to bubble violently, but because the bottom of the can serves as a baffle, no oil will be lost. Compressing the fork forces air out, releasing it draws oil into fork.

After the can appears to be empty, allow several minutes for can to completely drain then work fork once more. This assures getting into fork side the full quantity of oil poured into can.

INSPECTION PROCEDURE

If hydraulic fork does not work properly; that is, if it leaks oil or lacks original-snubbing action, check the following before disassembling:

If oil leaks from vent hole in upper bracket bolt (2, Fig. 2F-3 and filler screw (3, Fig. 2F-4) when fork flexes, check for over-filling. Drain and refill with exact amount of oil.

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Figure 2F-3. Hydra-Glide Fork - Exploded View

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Figure 2F-4. Adjustable Fork - Exploded View

1. Steering damper adjusting screw
2. Spring
3. Spider spring cover
4. Spider spring
5. Pressure disc (2)
6. Friction washer (2)
7. Anchor plate
8. Friction washer (see item 6)
9. Pressure disc (see item 9)
10. Fork stem nut
11. Upper bracket bolt and washer (2 each)
12. Upper bracket cover
13. Upper bracket
14. Head bearing nut
15. Head bearing (2)
16. Slider tube plug (2)
17. Bracket clamping stud (2)
18. Bracket with stem
19. Bracket bolt with nut and cotter pin
20. Bracket bolt washer (2)
21. Bracket
22. Fork tube and slider assembly (2)
23. Filler screw (2)
24. Filler screw valve (2)
25. Filler screw washer (2)

Figure following name of part indicates quantity necessary for one complete assembly.
If oil leaks from vent hole in upper bracket bolt when fork tubes contain correct amount of oil, check breather valve in upper bracket bolt or hole. To replace breather valve, place bolt in vise and tap back three stake locks with small punch and hammer. Pry valve from recess with length of stiff wire. If unable to free valve, drill hole in valve larger and pry valve out with small pin or screwdriver. In some cases, it is necessary to drill and tap hole in valve and pull it out with tap. Insert new valve assembly and stake three spots on bolt lip.

If fork action is stiff or soft and spongy and breather valves are functioning and oil content is correct, damper valves in fork tubes are inoperative. Fork must be disassembled. If fork is submerged in water, oil must be replaced at once. Water will rust damper tube valve parts. In neglected cases, the valves may stick and result in almost no snubbing action.

If oil bypasses slider tube bushings and leaks at top of sliders, bushings are worn and must be replaced. To replace slider bushings, fork must be disassembled. If slider bushings are worn, water will contaminate oil. Oil will appear emulsified, aerated and light brown.

If fork slider has play on slider tubes, bushings are worn and must be replaced. Fork must be disassembled. However, it is not necessary to disassemble entire fork and steering head unless desired.

**DISASSEMBLING FRONT FORK SLIDER AND TUBES**

If necessary repairs involve only sliders and slider tubes, the entire fork need not be disassembled.

To remove sliders and slider tubes, proceed as follows:

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Remove front wheel as described in "Wheels," Section 2C. Remove front brake hand lever coil clip on fender. Turn off axle sleeve nut and pivot stud nut, and pull brake side cover and shoe assembly plus axle sleeve off fork. Remove front fender.

Loosen fork bracket clamping studs (8, Fig. 2F-3 or 17, Fig. 2F-4). Remove the two upper bracket bolts with oil seals (2 and 3, Fig. 2F-3; 23, Fig. 2F-4), Pull fork slider and slider tube assemblies out bottom of slider covers.

Proceed with fork slider and slider tube disassembly and repair as described in a following paragraph, "Disassembling Front Fork."

**DISASSEMBLING FORK SLIDER**

The slider only may be removed without disassembling remainder of fork assembly as follows:

Remove front wheel axle as described in "Wheels", Section 2C, and fender mounting screws from slider.

Right slider may be removed after turning off damper valve stud lock nut (13, Fig. 2F-3).

To remove left slider, first remove wheel, brake drum and brake side cover as described in "Disassembling Front Fork Slider and Tubes" above, and damper valve stud lock nut (13, Fig. 2F-3).

**ADJUSTING STEERING DAMPER (DUO-GLIDE ADJUSTABLE AND SERVI-CAR)**

Turn steering damper adjusting screw (1, Fig. 2F-4) clockwise to apply dampening action and counterclockwise to reduce dampening action. Apply steering damper only when operating under conditions where some degree of dampening stabilizes steering.
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It is best to keep the damper set a little snug when operating with a sidecar.

ADJUSTING FRONT FORK TRAIL (DUO-GLIDE ADJUSTABLE) (Fig. 2F-4)

To adjust fork trail for use with sidecar, turn off nut on bracket bolt (19). Tap bolt head back far enough to pry out washer (20). Grasp fork tubes and pull forward sharply. It may be necessary to loosen upper bracket bolts (11) to move fork forward or backward. Revolve bracket bolt washers 180 degrees until pin on washer is forward. Seat washer pin in slot in bracket (21) boss. Tap bracket bolt (19) into position and turn on nut.

To adjust fork for solo riding, follow same procedure except push fork tubes back and insert washer (20) so pins are rearward.

DISASSEMBLING FRONT FORK

Prepare for disassembling by raising front end of motorcycle on stand or suitable support, so wheel is off the floor.

Remove front and side fork trim panel or headlamp housing. Remove headlamp. Disconnect at terminal strip the two headlamp wires and all wires that pass through handlebars. Disconnect throttle and spark advance cables from carburetor and circuit breaker.

Remove front wheel as described in Section 2C. Remove front brake hand lever bracket and coil clip on fender. Turn off front axle sleeve nut and pivot stud nut, and pull brake side cover and shoe assembly and axle sleeve off fork. Remove front fender. Slider bushing play can best be checked at this point. Remove the handlebars.

DUO-GLIDE (NON-ADJUSTABLE) (Fig. 2F-3)

Remove the fork stem nut (1) and nut lock (1A) (if used). Remove the two upper bracket bolts (2) with oil seal (3) and upper bracket cover (4) (if used). Lift off handlebar and fork bracket (5). Remove head bearing nut (6). Remove upper head bearing (7) and pull fork out bottom of steering head.

Note: Frame head bearing Lock Nut Wrench, Part No. 95219-50, is used to remove nut (6).

Loosen fork bracket clamping studs (8) and slide fork bracket (9) off fork tubes with fork slider covers (10). Turn out two slider tube plugs (11) and invert sliders to drain out oil and remove fork springs (12).

Figure 2F-6. Removing Fork Slider Bushing

Figure 2F-7. Driving in Fork Slider Bushing

2F-6

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Figure 2F-9. Indicating High Point

the bearing outer race, and the roller bearing with inner race. The outer races are pressed into the steering head cups in the frame head. The lower roller bearing is assembled over the fork stem and the upper roller bearing is held in place on the fork stem by the bearing lock nut on the upper threaded end of the fork stem.

After fork is removed inspect bearings and races for pitting, roughness or wear. Roughness of the roller bearings can be determined by rolling the bearings on the bearing races by hand. If bearings or races require replacement it is best to replace them in sets.

To replace bearing race, knock head cup from steering head using a suitable drift. Press new bearing race in new head cup and then press assembly into frame head. If you wish to use old head cups, holes must be drilled in back side of cup so that race can be driven out by using small diameter drift or by some other improvised means.

NOTE: Two types of bearings and races and head cups are in use. These parts are not interchangeable. 1960 and later bearing has 19 rollers and must be used with bearing race which is 27/64 high - 1.960 O.D. 1959 and earlier head cup must be used with this bearing race for proper press fit.

1959 and earlier bearing has 16 rollers and must be used with bearing race which is 5/8 high - 1.960 O.D., 1959 and earlier head cap must be used with this bearing race for proper press fit.

REPLACING FRONT FORK SLIDER BUSHINGS

The front fork slider bushings (25, Fig. 2F-3) may be replaced using three special tools.

1. Part No. 96255-50, Fork Slider Bushing Puller.
2. Part No. 96285-50, Bushing Driver and Guide.

REMOVING SLIDER BUSHINGS. Position fork slider in vise as shown in Fig. 2F-6.

Remove spring ring, steel retaining washer and felt wiper from slider upper end. Pry out oil seal with large screwdriver.

Install Fork Slider Bushing Puller, Part No. 96255-50, so the three claws expand inside the tube under the upper, or shorter bushing. Place puller cap in oil seal count bore, apply oil to screw threads and

DUO-GLIDE (ADJUSTABLE) AND SERVI-CAR (Fig. 2F-4)

Prepare for disassembly as described in paragraph above. Turn out steering damper adjusting screw (1) and lift out parts 2 through 9. Parts 5, 7 and 9 may be loosened by inserting a screwdriver tip between parts and prying upward.

Turn off stem nut (10). Remove upper bracket bolts and washers (11) and lift off bracket cover (12) and upper bracket (13). Remove head bearing nut (14). Lift out upper head bearing (15) and slip fork assembly out of frame steering head.

NOTE: Frame head bearing Lock Nut Wrench, Part No. 96219-50, is used to remove nuts (10) and (14).

Remove slider tube plugs (16) and loosen clamping studs (17). Slip fork tube and slider assembly (22) out of bracket (21). Slider tube and slider disassembly is the same as described for non-adjustable fork.

STEERING HEAD BEARINGS

Each steering head bearing consists of two pieces,
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steel washer. Turn nut down against puller cap and use engine sprocket wrench on nut to extract bushing. See Fig. 2F-6.

Remove lower bushing in the same manner.

INSTALLING FORK SLIDER BUSHINGS. New, replacement bushings are installed with Fork Slider Bushing Driver and Guide, Part No. 96265-50.

Wash out fork slider and lubricate slider bore with engine oil. Position new lower bushing in bushing driver guide to compress bushing, then place driver guide with bushing in slider oil seal counterbore as shown in Fig. 2F-7.

Drive bushing through the driver guide into fork slider. Bushing is positioned correctly in slider bore when second groove from top on driver is flush with top edge of driver guide. Do not drive bushing deeper than specified, or it will collapse enough so it cannot be finish-reamed.

Install upper bushing in the same manner lower bushing was installed. Drive it into slider until lower groove on driver is flush with top of driver guide. This positions upper bushing 1/16 in. below slider oil seal counterbore.

REAMING BUSHINGS. The Fork Slider Bushing Reamer with pilots, Part No. 96300-50, is used to ream the bushings to finished size.

Attach long pilot to reamer as shown in Fig. 2F-8. The long pilot fits into the unfinished lower bushing, acting as a guide, while reaming the upper bushing. Do not drop reamer into bushing. Slowly lower reamer into cutting position and ream bushing, turning reamer clockwise. Continue turning reamer clockwise as it is being extracted when cut is finished.

Remove long pilot from reamer and attach short pilot. Finish lower bushing in same manner as upper bushing. Use caution when passing reamer cutters through the upper bushing.

Figure 2F-10. Pressing High Point

Figure 2F-11. Pressing Fork Tube Round

INSPECTING AND SERVICING FRONT FORK

Clean and air dry all parts. Inspect outside of slider tubes and inside of slider for scratches, grooves, nicks and scoring. Minor burrs may be taken off with a fine oil stone. Replace all badly worn parts.

Inspect damper tube valve parts for rust and broken springs. Replace broken springs and all valve parts that are deeply pitted or otherwise in unusable condition.

Inspect slider tube plug for loose or displaced fork upper baffle cups and broken spring. Solder loose cups in place and replace any broken parts. Be sure cups are arranged with slots for oil passage on alternate sides. Improper arrangement may cause oil leak at upper bracket bolt.

STRAIGHTENING FORK TUBES

Straightening fork tubes requires several special tools including hydraulic or arbor press, dial indicator and straightening blocks. If facilities are not available locally, fork tubes may be returned to the factory for straightening.

IMPORTANT

Repair fork tubes must be sent to the factory through an authorized Harley-Davidson dealer.

Never attempt to straighten a fork tube that has a sharp angle bend. It should be scrapped because the metal is stretched.

Before beginning the straightening operation, clean the fork tube. Locate bends with dial indicator. A fork tube is usually bent in two or three places, seldom only one. Place fork tube on straightening blocks. Correct bend in tube with an arbor or hydraulic press.
Figure 2F-12. Correcting Bracket Bow

Find the highest point out of round with a dial indicator (Fig. 2F-9) and mark with chalk. Press high point as shown in Fig. 2F-10. Repeat indicating and pressing operations until tube is within .003 in. to .004 in. of being straight.

Sometimes fork tubes are out of round, especially at the point it is clamped in the fork bracket. Place tube in straightening blocks and press until perfectly round as shown in Fig. 2F-11, checking with dial indicator and micrometer. Finally, check tube by inserting in new fork slider. Work tube up and down. If it does not bind, it is straight.

STRAIGHTENING FORK STEM AND BRACKET ASSEMBLY

Straightening a fork stem and bracket assembly requires a great deal of skill, experience and several tools and fixtures. Special tools necessary include Fork Tube Straightening blocks, Part No. 96246-50; four blocks are needed; Bending Bar, Part No. 96606-40; Fork Stem and Bracket Aligning Gauge, Part No. 96246-51. In addition, the following pieces of bar stock are needed: Two bars, 1-5/8 in. diameter, about 12 in. long; two bars 1 in. x 4 in. x 12 in. (approximately); assorted pieces of rectangular bar stock to use in transmitting arbor pressure to unit to be straightened.

If facilities are not available locally, fork stem and bracket assembly may be sent to factory for straightening providing it is not badly bent or broken.

NOTE

Repair fork stem and bracket assemblies must be sent to factory through authorized Harley-Davidson dealers.

To straighten stem and bracket, proceed as follows: Insert the two 1-5/8 in. x 12 in. bars in fork bracket and secure with two clamping studs. Sometimes the bracket is so badly bent that the bars cannot be inserted. In this case, press the bars into place with an arbor press, then press on the front edge of bracket to correct the "bow" distortion as shown in
Fig. 2F-12. Repeat pressing operation along edge until bars are loose in bracket.

A bracket assembly is usually out of alignment along the horizontal centerline, with one or both legs bent.

NOTE

Reference to vertical and horizontal centerlines applies to bracket and fork stem as positioned on arbor press (see Fig. 2F-12).

If both legs are twisted, place bracket assembly on arbor press as shown in Fig. 2F-13 with blocks placed under two low legs only (A and B). With press block placed across bracket and bar assembly, press until high legs (C and D) are in alignment.

If one leg is bent, place bracket and bar assembly on three straightening blocks, two blocks under straight leg and one block under low end of other leg. Place press block diagonally across bracket assembly to high leg until high leg is forced down and into alignment with the other three leg ends.

Place the fork stem and bracket assembly on the four straightening blocks located on the surface plate (see Fig. 2F-14). If the legs rest squarely on straightening blocks, the bracket assembly is correctly true on a horizontal plane. If bracket is not true, press again, checking alignment after each operation.

Use a square to check if bracket assembly is bent, distorted or out of parallel on a horizontal plane as shown in Fig. 2F-15. Place bracket and bar assembly in a heavy vise and straighten using the Bending Bar.

Check fork stem alignment with Fork Stem and Bracket Aligning Gauge as shown in Fig. 2F-16. Use Bending Bar to bring stem into position. Recheck the fork completely.

ASSEMBLING FRONT FORK (DUO-GLIDE NON-ADJUSTABLE) (Fig. 2F-3)

Replace upper oil seal (23) and felt washer (22) in top of fork slider. Wash chips and oil from fork slider and position new oil seal in counterbore. Drive oil seal into counterbore and against seat with driver (Part No. 96250-50) and mallet as shown in Fig. 2F-17. Drive with light blows and stop immediately when seal has bottomed. Insert spring ring washer (21) and spring ring (20). Position spring ring so its gap is directly over water drain hole in slider top.

Clamp a length of about 1 in. steel rod upright in a vise so that 13-1/2 in. extends above top of jaws. Assemble damper valve (19) with gasket (18), lower bushing (17) and lower bushing gasket (16). Make sure all of old gasket is removed before installing new part. Insert slider tube over length of rod in vise and drop damper valve assembly in place. Install snap ring (15) in notch provided in bottom of slider tube. Check clearance between snap ring and lower bushing. If clearance exceeds .004 in., remove snap ring, gasket and lower bushing and insert additional shims to bring to a maximum of .004 in. clearance.

Lubricate outside of slider tube with fork oil and slip slider assembly down over slider tube. Turn lock nut (13) on damper valve stud extending out bottom of slider. Work slider to check for bind. If bind is present, release lock nut, rotate slider 180 degrees and reassemble. Fasten fork slider covers (10) to fork bracket (9), and slip fork bracket over slider tubes. Adjust so 5-1/16 in. of slider tube extends above top of fork bracket and temporarily tighten bracket clamping studs (8).

Pour 7 oz. of Harley-Davidson Front Fork Oil into each slider tube, insert fork springs (12) and turn in slider tube plugs (11).

Press lower head bearing guard (27) and greased lower head bearing (26) onto stem. Install stem steering head on motorcycle. Grease and position upper head bearing (7). Turn on head bearing nut...
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Figure 2F-17. Inserting New Oil Seal

(6), until there is noticeable drag in bearing when fork is turned - then loosen nut enough so fork turns freely. Install handlebar and fork bracket (5), bracket cover (4). Securely tighten slider tube plugs. Loosen bracket clamping studs (8) and rotate slider tubes so flats on slider tube plugs are to the sides of the fork assembly. They must be in this position to have the slider tube plugs function properly. Install fork stem nut and then securely tighten bracket clamping studs.

Slip plug oil seal (3) on upper bracket bolt (2) and screw into slider tube plug. Replace handlebar, etc. Reassemble motorcycle in reverse order of disassembly.

ASSEMBLING FRONT FORK (DUO-GLIDE ADJUSTABLE AND SERVI-CAR) (Fig. 2F-4)

Follow procedure described for non-adjustable front fork except for the following points:

1. Position slider tubes in bracket (21) so top of slider tube is exactly 5-1/16 in. above top of bracket, and flat surfaces on slider tube plugs are directly toward side of motorcycle with filler screw (23) toward rear of fork.

Assemble remainder of fork and steering head in reverse order of disassembly.

SHOCK ABSORBERS

ADJUSTING REAR SHOCK ABSORBER SPRING

The rear shock absorber springs can be adjusted to three positions for the weight the motorcycle is to carry. The average weight solo rider would use the extended spring position (off cam); when in low position (off cam), the cam lobes should be next to each other: that is, single lobes and double lobes matched. If necessary, rotate the cam to line them up properly. A heavy solo rider might require the position with springs slightly compressed (first cam step); buddy seat riders require the fully compressed spring position (second cam step).

To adjust the rear shock absorber springs, turn cushion spring adjusting cam to desired cam position with Spanner Wrench, Part No. 94700-52B. Both cushion spring adjusting cams must be adjusted to the same position. Always back off cam in opposite direction when releasing spring tension to intermediate or solo position.

Note: If shock cam is turned too far so that it falls off top position, it will not be matched correctly with other cam. To correct this condition, continue 180° in same direction until it falls off again and then adjust to desired position.

DISASSEMBLING REAR SHOCK ABSORBER

Position motorcycle on Service Stand, Part No. 96810-65, or suitable blocking.

1966 AND EARLIER (FIG. 2F-18)

Loosen shock absorber cover clamp (1) and slip off shock absorber top cover (2), exposing shock absorber top stud. Remove top and bottom mounting stud nut (3), stud cover (2A), washer (4 or 4A), stud rubber bushing (5), and slip shock absorber assembly off upper and lower studs.

Turn shock absorber upside down in Rear Shock Absorber Tool, No. 97010-52A, and compress absorber spring enough to turn lower stud eye 90 degrees. (See Fig. 2F-19.) Release spring compression and remove absorber assembly from tool.

Slip off cam support (6), turn absorber end for end and rap lower end sharply on surface to free bumper (7) from retaining flange inside absorber cover (8). Remove absorber assembly and spring (9) from cover and slip lower cam (10), spring rotating cam (11 or 11A) cam sleeve (12), dirt seal (13) and washers (14) off absorber unit. Shock absorber bumper (7) is split and may be sprung and slipped off absorber piston shaft after it has been extended.
Figure 2F-18. 1966 and Earlier Rear Shock Absorber - Exploded View

Figure 2F-18A. 1967 & Later Rear Shock Absorber - Exploded View

Figure following name of part indicates quantity necessary for one complete assembly.
1967 AND LATER (Fig. 2F-18A)

Remove top and bottom mounting stud nut (1), upper stud cover (2) if used, and cup washer (3). Slip shock absorber assembly off upper and lower studs. Push rubber bushings (4) from shock absorber mounting eyes. Remove retaining ring (5) from assembly. Place shock absorber in Rear Shock Absorber Tool, Part No. 97010-52A with split key (6) up. Compress absorber spring enough to remove each half of split key (6) from flange on shock eye. Release spring compression and remove absorber assembly from tool. Remaining items can be removed in order shown in Fig. 2F-18A.

INSPECTION

Examine absorber unit for traces of fluid leaking, especially at upper end. Unit should have no leaks and should compress slightly easier than it extends. If possible, compare action with unused unit. Shock absorbers cannot be repaired. Faulty units must be replaced.

Clean and examine all other parts for wear and damage, paying particular attention to the condition of the stud rubbers, the ride control adjustment cams, dirt seal and spring.

ASSEMBLING REAR SHOCK ABSORBER

Rear shock absorber assembly is essentially the reverse of disassembly.

1966 AND EARLIER (Fig. 2F-18)

Apply a thin coat of "Grease-All" grease to the cam sleeve (12) and cam surface of spring rotating cam (11 or 11A), and slip 11 or 11A over 12. Drive roller pin (16) into hole in side of lower cam (10) and position cam support (6) over lower cam with pin in appropriate slot. On 1964 and earlier models, slot marked "A" is for left side assembly, and slot marked "B" is for right side assembly. Either slot can be used on 1965 and later models.

Extend absorber piston rod and slip split bumper (7) over rod. Slide spring (9) into cover (8) and shock absorber into spring. Turn assembly over and rap upper mounting stud loop on surface to seat bumper in flange.

Place dirt seal washer (14) and dirt seal (13) into cover and position assembly of parts 6, 10, 11 or 11A, and 12 on them over absorber. Compress spring in tool and turn lower mounting stud loop 90 degrees to register with notch in cam support.

On 1964 and earlier models, assemble unit to motorcycle so letters "A" and "B" are facing rearward. On later models, shock can be installed with eye in any position.

1967 AND LATER (FIG. 2F-18A)

Apply a thin coat of grease to all surfaces of both cams. Note that cams (12) are identical and be sure to position cam lobes correctly as shown in Fig. 2F-18A inset. Place assembly in compressor tool and compress spring enough to install key halves (6). Release spring compression. Keys will lock into place in inside diameter of covers 7 or 7A. Install retaining ring (5).

Figure 2F-19. Disassembling Shock Absorber (1966 & Earlier Shown)
DISASSEMBLING REAR FORK

To disassemble rear fork, first remove following assemblies:

1. Rear wheel (see Section 2C).
2. Rear brake side cover with connecting control linkage (see Section 2Q).
3. Rear shock absorbers (see "Shock Absorbers").

See Fig. 2F-20. Turn back locking ear on pivot bolt lock washer (2) and turn out pivot bolt (1). Remove fork (3) from frame. With appropriate size arbor pin, push out bearing spacer (4), bearing seal (5) and bearing with outer race (6) from each side of fork pivot bearing.

INSPECTION AND SERVICING

Clean pivot bolt hole in fork and bearing parts. Check for wear of bearing, bearing race and bearing seal.

Rough check the rear fork for correct alignment. Dimensions shown in Fig. 2F-20 will provide enough information to determine if fork is far enough out of alignment to require re-aligning or replacement. Straightening a badly bent fork requires special tools and fixtures for holding, bending and gaging. If facilities are not available locally, damaged rear fork can be returned to the factory for repair through any authorized Harley-Davidson dealer.

ASSEMBLING REAR FORK

Press outer bearing races into fork. Grease bearings with Harley-Davidson "Grease-All" grease and insert. Apply additional grease to outside face of bearing so that space between bearing and seal will be filled when seal is installed. Grease bearing seals in groove between sealing lips and press into place. Put bearing spacers over seals.

NOTE

1962 and later models have grease fitting in fork pivot housing. Apply additional quantity of grease to fitting with hand grease gun to fill space between bearings. A very small quantity of grease should be applied to fitting with hand grease gun at 2000 mile intervals.

Assemble pivot bolt with lock washer and tighten bolt to preload bearings one to two pounds as follows:

1. Pivot bolt
2. Pivot bolt lock washer
3. Rear fork
4. Pivot bearing spacer (2)
5. Bearing seal
6. Bearing
7. Grease fitting

Figure following name of part indicates quantity necessary for one complete assembly.

With bearings free, weigh extreme rear end of fork by attaching a spring scale and raising the fork to a horizontal position. Tighten bearing pivot bolt just enough to increase bearing drag one to two pounds.

For example, if fork with bearings free weighs four pounds, tighten pivot bolt until fork movement to horizontal position registers five to six pounds on scale. Lock pivot bolt lock washer.
DISASSEMBLING FRONT BRAKE (Fig. 2G-2)
Remove wheel with brake drum from fork as described in 2C. Spring brake shoes out and away from side cover (23) at top to free shoes (2 and 4) and springs (1 and 3) from pivot stud (8) and cam lever (18).

Remove cotter pin (16), cam lever washer (17) from cam lever stud (20). Disconnect cable ferrule from anchor pin in hand lever by loosening clamp nut (10) and depressing brake band lever. Slip cam lever assembly off stud. Make complete disassembly in order shown.

INSPECTION AND SERVICING (Fig. 2G-2)
If linings are worn down to rivet heads, impregnated with grease as a result of over-greasing wheel hubs, cracked or ridged badly, they must be replaced. When relining a shoe, start at one end and work to the other to make linings bear tightly against shoe.

If a riveting machine is not available, set rivets with hand tools and bevel lining ends.

Examine drums for ridging and scoring. Surface must be reasonably smooth and flat. If ridged, turn down drums to clean up. Wash cam lever and cam lever stud and check fit. If play exists, force out cam lever bushing (24) and install new part.

ASSEMBLING FRONT WHEEL BRAKE (Fig. 2G-2)
Assemble in reverse order of disassembly except, for ease of assembly, connect two shoes with top return spring (3). Position unit on pivot stud (6) and cam lever (18). Insert lower spring (1). Spring hooks must be in shoe spacer notch nearest side cover. When reassembling cable ferrule in hand lever anchor pin, side slot, be sure slot is toward inside as shown. Earlier type pin with slotted end should have open end facing downward.

HAND LEVER
ANCHOR PIN
CABLE FERRULE
SLOT OPEN END MUST FACE TOWARD INSIDE OF LEVER

Figure 2G-1A. Correct Handlelever Control Cable Assembly

ADJUSTING FRONT BRAKE CABLE (Fig. 2G-1)
Front brake cable may be adjusted as follows: Loosen adjusting sleeve lock nut (3) and turn adjusting sleeve nut (4) to obtain desired amount of hand lever (1) free movement; clockwise for less movement and counterclockwise for more movement. About 3/16 in. of brake cable movement should be free, or about 1/4 of the full lever movement. Tighten adjusting sleeve lock nut.

ADJUSTING FRONT BRAKE SHOES
Raise front wheel off ground so it may be rotated. Loosen brake shoe pivot stud nut (5, Fig. 2G-1) and loosen axle sleeve nut. Apply brake. With brake pressure applied, tighten axle sleeve nut and pivot stud nut. This procedure centers shoes against drum for full lining length contacts drum on brake application.

DISASSEMBLING REAR WHEEL BRAKE (Fig. 2G-3)
Remove rear wheel from motorcycle as described in Section 2C. Disconnect shoe return spring (1) and slip shoes (2 and 2A) and anchor (lower) spring (3) away from side cover. Remove hold-down springs (4) from side cover. If necessary, remove wheel cylinder by turning out the two cylinder screws (5) on outside of side cover.
INSPECTION AND SERVICING (Fig. 2G-3)

Follow inspection procedure as described in this section under front wheel brake except examine wheel cylinder and side cover for signs of leaking fluid.

NOTE
Do not depress rear wheel brake pedal with shoe assemblies disassembled.

Figure 2G-2. Front Wheel Brake - Exploded View

- 1. Brake shoe spring (2)
- 2. Brake shoe and lining (2)
- 3. Brake shoe spring (see item 1)
- 4. Brake shoe and lining (see item 2)
- 5. Brake shoe pivot stud nut
- 6. Pivot stud flat washer
- 7. Pivot stud lock washer
- 8. Pivot stud
- 9. Pivot stud washer
- 10. Clevis clamp nut
- 11. Cable clevis clamp
- 12. Cotter pin
- 13. Flat washer
- 14. Cam lever clevis pin
- 15. Cable clevis
- 16. Cotter pin
- 17. Cam lever washer
- 18. Cam lever
- 19. Set screw
- 20. Cam lever stud
- 21. Axle sleeve nut
- 22. Front axle sleeve
- 23. Brake side cover
- 24. Cam lever bushing

Figure following name of part indicates quantity necessary for one complete assembly.

Figure 2G-3. Rear Wheel Brake - Exploded View

- 1. Shoe return spring
- 2. Front brake shoe
- 2A. Rear brake shoe
- 3. Brake shoe spring
- 4. Hold-down spring (2)
- 5. Cylinder screw and lock washer (2 each)
- 6. Boot (2)
- 7. Platen (2)
- 8. Cup (2)
- 9. Spring
- 10. Bleeder nipple
- 11. Wheel cylinder
- 12. Brake side cover

Figure following name of part indicates quantity necessary for one complete assembly.
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If faulty unit is found, install a repair kit. Remove old boots (6), pistons (7), cups (8) and spring (9). Be sure cylinder wall and pistons are free from burrs. Dip replacement parts in brake fluid and assemble. Never dip or wash hydraulic brake cylinder parts in gasoline, kerosene or oil. If necessary to clean parts use denatured alcohol.

NOTE

When linings are worn down at any point so rivet heads come close to contacting drum surface, shoes or linings should be replaced.

Linings and rivets are available separately for 1963 and later rear wheel brakes, but entire shoe and lining assembly must be replaced on 1958 to 1962 models.

Scored or grooved brake drums should be refinished before installing new shoes or linings. Brake Drum turning arbor, Part No. 97280-60 can be used to refinish brake drum inside diameter on a lathe as necessary to clean up.

Use standard size shoe or lining set for brake drums refinished up to 8.040 in. maximum on inside diameter.

Use a .030 in. oversize shoe or lining set for brake drums refinished over 8.050 in. but not more than 8.100 in. maximum on inside diameter.

ASSEMBLING REAR WHEEL BRAKE (Fig. 2G-3)

Assemble rear wheel brakes in reverse order of disassembly except: Apply a light coat of grease on hold-down springs (4) and spots on side cover (12) where shoes touch when in operating position.

1. Front brake shoe adjusting cam nut
2. Rear brake shoe adjusting cam nut

Figure 2G-4. Adjusting Rear Brake

Revised: 3-63

SECTION 2G
Chassis - Brakes

1. Rod clevis pin with washer and cotter pin
2. Lever clevis
3. Master cylinder plunger
4. Master cylinder plunger
5. Cylinder boot
6. Stop wire
7. Stop washer
8. Piston assembly
9. Piston cup
10. Piston return lock nut
11. Master cylinder
12. Valve

Figure 2G-5. Brake Master Cylinder - Exploded View

CAUTION

Front shoe (2) and rear shoe (2A) are of different widths on 1963 and later models. Narrow shoe must be in rear position and wide shoe in front position.

Assemble shoes (3) to lower return spring (3), position shoe assembly on plate anchor block at bottom of side cover and install top spring. Short hook is inserted in elongated hole on front shoe. Reassemble wheel.

ADJUSTING REAR WHEEL BRAKE SHOES (Fig. 2G-4)

Raise rear wheel so it can be turned freely by hand. Brakes are adjusted by means of two adjusting cams located on outside of brake side cover. Turn front adjusting cam nut (1) counterclockwise until wheel has noticeable drag. Spin wheel forward and backward to center shoes. Slowly turn cam nut clockwise until wheel turns freely. Repeat process on rear cam nut (2) which spreads shoes with a clockwise rotation and retracts shoes with a counterclockwise rotation.

SIDECAR WHEEL BRAKE

Remove wheel with brake drum as described in Section 2C.

Procedure for servicing sidecar wheel brake is the same as for rear wheel brake as given in preceding paragraphs.

DISASSEMBLING BRAKE MASTER CYLINDER (Fig. 2G-5)

It is not necessary to remove master cylinder from motorcycle to remove piston assembly if replacement is required. Remove rear brake rod clevis pin
Figure 2G-6. Bleeding Hydraulic Brake System

1. Bleeder nipple  
2. Plastic tubing  
3. Container

Figure 2G-7. Adjusting Rear Brake Pedal

1. Brake pedal  
2. Piston rod  
3. Lock nut  
4. Plunger  
5. Rubber boot

In order to bleed the system to expel all air, see Fig. 2G-6.

Slip a length of appropriate size plastic tubing (2) over wheel cylinder bleeder nipple (1, Fig. 2G-6) with the other end in any container (3).

NOTE

Bleed sidecar line first then motorcycle rear wheel.

Open bleeder nipple by rotating counterclockwise about one-half turn. With master cylinder full of fluid at all times, slowly depress foot pedal repeatedly until fluid flows from bleeder nipple free of air bubbles. Add fluid to master cylinder to bring to original level. Close bleeder nipple. Do not re-use fluid unless it is clear and free from sediment. If it is impossible to bleed all air from system, the master cylinder check valve is faulty and a master cylinder repair kit must be installed.

ADJUSTING REAR BRAKE PEDAL (Fig. 2G-7)

When the brake is properly adjusted, the foot pedal should move freely about 1-1/2 in. before the plunger (4) contacts piston in master cylinder and brake takes effect. This contact may be easily felt if pedal is depressed by hand.

Pull rubber boot (5) away from master cylinder housing to expose piston push rod link. Holding push rod link in center of opening, work brake pedal (1) back and forth by hand to determine free play.

Adjustment is made by loosening lock nut (3) and turning plunger (4) to shorten or lengthen piston push rod (2) as needed. Tighten lock nut (3).
SEAT POST SPRINGING

Two seat post spring arrangements are available for each model. A standard spring set is suitable for riders weighing up to 220 pounds. A heavy spring set for weights over that amount include heavier springs and longer guide collars. The heavy set is indicated by a letter "D" (Duo-Glide) or an "E" (Servis-Car) stamped on the upper end of the seat post plunger. See Fig. 2H-1 for cutaway view of seat post springing arrangement. Duo-Glide and Servis-Car assemblies have same number of components with following exceptions: (See Fig. 2H-2.)

Duo-Glide assembly omits seat post recoil spring (14A) and incorporates two auxiliary springs (14 and 17).

DISASSEMBLING SEAT POST (Fig. 2H-2)

Remove rod lock nut (1) and washer (2) from bottom of frame seat post tube. Pull back of seat upward sharply to break loose seat post rod nut (5) at the base of seat post tube. Unsnap clevis pin spring (3) and pull out clevis pin (4). Tip seat forward and lift out seat post assembly. Disassemble remaining parts in order indicated.

INSPECTION AND SERVICE

Wash and air dry all parts. Inspect for broken or "set" springs. New spring length appears in Fig. 2H-2 listing. Replace seat bar bushings (19) if worn appreciably.

ASSEMBLING SEAT POST (Fig. 2H-2)

Seat post assembly is reverse of disassembly. Apply liberal coating of "Grease-All" grease to parts, working it into the springs.

For correct spring preloading, draw up spring adjusting nut to compress total visible spring length to 11 in. for standard springs and 10-1/2 in. for "D" heavy springs, on Duo-Glide assemblies; 11-1/2 in. on standard and "E" heavy Servis-Car sets. Lock with one lock nut (6). Turn on other lock nut. Position rod nut (5) on rod so bottom end of rod extends through rod nut exactly 3/4 in. Lock adjustment with second lock nut.

Figure 2H-1. Cutaway of Seat Post Springing
Figure 2H-2. Seat Post - Exploded View

1. Rod lock nut
2. Rod lock nut washer
3. Clevis pin spring
4. Clevis pin
5. Seat post rod nut
6. Lock nut (2)
7. Spring adjusting nut
8. Cushion spring (5-1/8 in.)
9. Guide collar (2)
10. Cushion spring (2-13/16 in.)
11. Guide collar (see item 9)
12. Cushion spring (5-1/8 in.)
13. Plunger lock nut
14A. Seat post recoil spring
(Servi-Car only)
15. Seat post rod
16. Auxiliary spring (3 in.)
17. Auxiliary spring (2-3/4 in.)
18. Seat post plunger
19. Seat bar bushings

Figure following name of part indicates quantity necessary for one complete assembly. Dimensions indicate free length of new spring.
FIBERGLASS BODY CARE AND REPAIR

Parts are made of molded fiberglass. There are 3 types of fiberglass material finishes:

1. Gel Coat finish: This finish is made of a special pigment and blended polyester resin several thousandths of an inch thick.

2. Molded-in-Color finish: This finish is molded into the fiberglass material which is the same color throughout its thickness.

3. Painted finish: This finish is painted on the natural color fiberglass material using standard painting procedure.

The Gel Coat and molded-in-color finishes require minimum care and can be kept new looking by following these easy maintenance rules:

Clean, buff and wax the exterior periodically to renew finish.

An automotive wax type cleaner containing fine rubbing compound is suitable for removing minor scratches and scuffs. Scratches which are not removed by the rubbing compound can be removed by wet sanding with 400 grit sandpaper. Then wet sand with 600 grit sandpaper, rebuff and apply wax polish.

Care should be taken not to cut through the gel coat surface when buffing. A power buffer may be used with care or the surface may be buffed by hand, using a rubbing compound.

Patch and fill in deep scratches, scars and small breaks.

Repair any major breaks as soon as possible, to avoid any additional damage.

For damage to the gel coat finish, you will need a can of Gel Coat of the same color and a small amount of catalyst. For damage to the molded-in-color surface, you will need a can of Filler Coat of the same color and a small amount of catalyst. For deeper holes, breaks, or gouges, you will also need some fiberglass mat and pre-accelerated polyester resin. Gel coat and Filler Coat with catalyst are available in kit form from the Harley-Davidson Motor Co. The other materials including fiberglass mat, and pre-accelerated polyester resin are supplied in fiberglass repair kits which are available at most marine or automotive supply stores.

Damage to the painted type finish can be repaired by sanding, priming and painting using regular painting procedure.

SURFACE FINISHING

A. GEL COAT TOUCH-UP AND SURFACE REPAIRS

This type of damage may be classified as damage to the gel coat only, or a hole or gouge that is deep enough to slightly penetrate fiberglass material.

Repair as follows:

1. To be sure that the area to be patched is dry, clean and free of any wax or oil, wash with lacquer thinner.

2. Roughen the bottom and sides of the damaged area, using a power drill with a burr attachment. Feather the edge surrounding the scratch or gouge, being careful not to undercut this edge. See Figure 2J-1.

3. A small amount of gel coat, the same color as the finish should be placed in a small can lid or on a piece of cardboard. Use just enough to fill the damaged area. If damage has penetrated through fiberglass material, an equal amount of fibers, which can be taken from glass mat and shredded into small fibers, should be mixed with the gel coat - using a putty knife or flat stick. Add three drops of catalyst per teaspoon of gel coat using an eye dropper. Be sure to mix the catalyst thoroughly for maximum working time. Maximum working time (pot life) will be about 15 to 20 minutes at which time it begins to "gel". See Figure 2J-2.

4. Fill the scratch or hole above the surrounding undamaged area about 1/16", working the material into the damaged area with the sharp point of a knife. Be careful to puncture and eliminate any air bubbles which may occur. See Figure 2J-3.

NOTE

If fiberglass fibers have not been used in mixture, skip steps 5 thru 7 and proceed with step 8.

5. When the patch feels rubbery to touch (10 - 15 minutes), trim the patch flush with the surface, and then allow to cure completely (30 - 60 minutes). Patch will shrink slightly as it cures, making a depression. See Figure 2J-4.
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