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MOTOR CYCLE GENERAL PURPOSE HARLEY-DAVIDSON

OPERATING INFORMATION

This publication contains information covering the requirements of Categories 2 0 and 3 at information level 1

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PREFACE

Sponsor : ES52c
Publication Authority : LSTPA

INTRODUCTION

1 Service users should forward any comments on this publication through the channels prescribed in AESP 0100-P-011-013. An AESP Form 10 is provided at the end of this publication. It should be photocopied and used for forwarding comments on this AESP.

2 The subject matter of this publication may be affected by Defence Council Instructions (DCIs), by Standing Operating Procedures (SOPs) or by local regulations. When any such Instruction, Order or regulation contradicts any portion of this publication it is to be taken as the overriding authority.

3 For periods of servicing and lubricants to be used, reference must be made to the Maintenance Schedule.

RELATED AND ASSOCIATED PUBLICATIONS

Related publications

4 The Octad for the subject equipment consists of the publications shown below. All references are prefixed with the first eight digits of this publication. The availability of the publications can be checked by reference to the relevant Group Index (see AESP 0100-P-001-013).

CATEGORIES AND INFORMATION LEVELS

Category	1	2			3	4		5				6		7		8	
Level	0	0	1	2	0	1	2	1	2	3	4	0	1	1	2	1	2
1 USER/OPERATOR	101	201	*	*	201	*	*	*	*	*	*	601	*	*	721	*	*
2 UNIT MAINTENANCE	*	*	*	*	302	*	*	*	302	*	*	*	*	*	*	*	*
3 FIELD MAINTENANCE	*	*	*	*	302	*	*	*	302	*	*	*	*	*	*	*	*
4 BASE MAINTENANCE	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

* Not Published

1.0 Purpose & Planning information
2.0 Operating information
2.1 Special to Arms
2.2 Training Aids
3.0 Technical Description
4.1 Installation Instructions
4.2 Prep for Special Environments
5.1 Failure Diagnosis
5.2 Repair Instructions
5.3 Inspection Standards
5.4 Calibration Procedures
6.0 Maintenance Schedules
6.1 Maintenance Schedules (RAF)
7.1 Illustrated Parts Catalogue
7.2 Commercial Parts Lists
8.1 Modification Instructions
8.2 General Instructions

Associated publications

5.	Code No	Type	Title
	P/31927	CES	Motor cycle, General Purpose, L/H Dip Headlight.

DESTRUCTION OF EQUIPMENT TO PREVENT ENEMY USE

CONTENTS

MANDATORY DIRECTIVE

1. Destruction of the equipment when subject to capture by the enemy, will be undertaken by the user arm, ONLY WHEN, in the judgement of the unit commander concerned, such action is necessary in accordance with orders of, or policy established by the Army or Divisional Commanders.

2. The reporting of the destruction of the equipment is to be done through command channels.

Degree of damage

3. The degree of damage inflicted, to prevent the equipment being used by an enemy, shall be as follows:

3.1 Methods of destruction should achieve such damage to equipment and essential spare parts, that it will not be possible to restore the equipment to a usable condition in the combat zone either by repair or by cannibalization.

3.2 Classified equipment must be destroyed in such degree as to prevent, whenever possible, duplication, or determination of operation or function by the enemy.

3.3 Any classified documents, notes, instructions or other written material pertaining to function, operation, maintenance or employment, including drawings or parts lists, must be destroyed in a manner to render them useless to the enemy.

4. In general, destruction of essential parts, followed by burning will usually be sufficient to render the equipment useless. However, selection of the particular method of destruction requires imagination and resourcefulness in utilization of the facilities at hand under the existing conditions. Time is usually critical.

Spare parts

5. The same priority, for destruction of the component parts of a major item necessary to render the item inoperable, must be given to the destruction of similar components in spare parts storage areas.

MEANS AND PROCEDURES

6. If destruction is ordered, due consideration should be given to:

6.1 Selection of a point of destruction that will cause greatest obstruction to enemy movement and also prevent hazard to friendly troops from fragments or ricocheting projectiles which may occur incidental to the destruction by gunfire.

6.2 Observance of appropriate safety precautions.

7. The following information is for guidance only. Of the several means of destruction, those most generally appicable are as follows:

Mechanical

8. This requires an axe, pick , crowbar or similar implement. The equipment should be destroyed in accordance with the priorities given in Table 1 - PRIORITIES.

Burning

WARNING

DUE CONSIDERATION SHOULD BE GIVEN TO THE HIGHLY FLAMMABLE NATURE OF GASOLINE AND ITS VAPOUR. CARELESSNESS IN ITS USE MAY RESLT IN PAINFUL BURNS.

9. This requires gasoline oil, or other flammables.

9.1 Remove and empty the portable fire extinguishers.

9.2 If quantities of combustibles are limited, smash all vital elements, such as switches, instruments and control levers.

9.3 Place ammunition and charges in and about the equipment so that the greatest damage will result from the explosion.

9.4 Pour gasoline and oil over the equipment. Ignite by means of an incendiary grenade fired from a safe distance, by a burst from a flame thrower, by a combustible train of suitable length or other appropriate means. Take cover immediately.

Gunfire

WARNING

FIRING ARTILLERY AT RANGES OF 500 YARDS OR LESS, AND FIRING GRENADES OR ANTI-TANK ROCKETS SHOULD BE FROM COVER.

10. When destroying the equipment by gunfire, proceed as follows:

10.1 Remove and empty the portable fire extinguishers.

10.2 Smash all vital elements as outlined in sub-paragraph 9.2.

10.3 Destroy the equipment by gunfire, using tank guns, self-propelled guns, artillery, rifles using rifle grenades or launchers using anti-tank rockets.

PRIORITIES

11. The priorities for destruction should be considered as follows:

11.1 Priority must be given to the destruction of classified equipment and associated documents.

11.2 When lack of time and/or means prevents complete destruction of equipment, priority is to be given to the destruction of essential parts, and the same parts are to be destroyed on all like equipment.

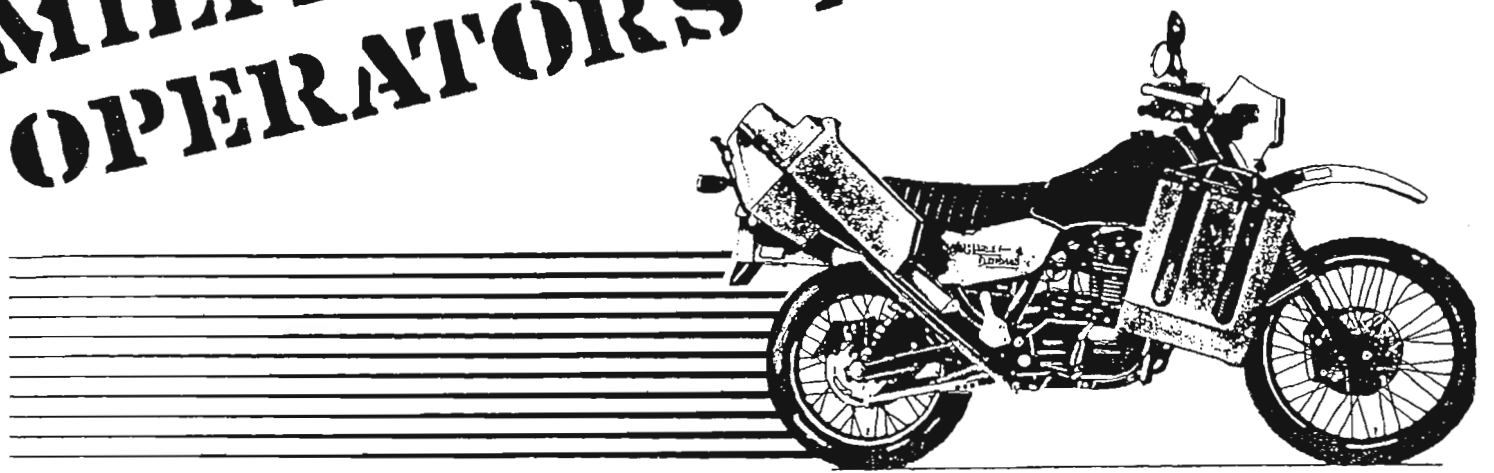
11.3 A guide to priorities for destruction of the equipment is shown in Table 1 - PRIORITIES.

TABLE 1 - PRIORITIES FOR DESTRUCTION

Item	Priority
Engine - barrel and carburrettor	1
Petrol tank	2
Frame	3
Wheels and tyres	4

HARLEY-DAVIDSON, INCORPORATED

MILITARY MOTORCYCLE OPERATOR'S MANUAL



PART NO. 99467-93

IMPORTANT NOTICE!

Statements in this manual preceded by the following words are of special significance:

WARNING

Means there is the possibility of personal injury to yourself or others.

CAUTION

Means there is the possibility of damage to the vehicle.

NOTE

Other information of particular importance has been placed in italic (slanted) type, such as is used in this notice.

We recommend that you take special notice of these items.

OPERATOR'S MANUAL

MOTORCYCLE, GENERAL PURPOSE: MT350E

Harley-Davidson, Inc.
Post Office Box 653
Milwaukee, WI 53201
United States of America

Printed in the United States of America

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LIST OF ILLUSTRATIONS

NOTICE

To the best knowledge of Harley-Davidson, Inc., the material contained herein is accurate as of the date this publication was approved for printing. Harley-Davidson, Inc., reserves the right to change specifications, equipment, or designs at any time without notice and without incurring obligation.

FOREWORD

This manual has been prepared to acquaint you with the operation, care and maintenance of the MT350E motorcycle, and to provide you with important safety information. Follow these instructions carefully for maximum motorcycle performance and for your personal safety.

This *Operator's Manual* contains instructions for operation and maintenance of the MT350E motorcycle. Major repairs are covered in the Harley-Davidson *MT 350E Service Manual.* Such major repairs and all emission system servicing require the attention of a skilled technician and the use of special tools and equipment, and should only be performed by authorized maintenance personnel following the relevant procedures described in the *Service Manual.*

Harley-Davidson, Inc.

SECTION 1

GENERAL INFORMATION, SPECIFICATIONS, AND PERFORMANCE DATA

1-1. SCOPE OF MANUAL

This manual is for your use in operating and maintaining the MT350E General Purpose Motorcycle.

1-2. TOOLS FOR USE BY OPERATOR

The tools required to perform many of the operator maintenance functions are provided in a tool kit stored on the vehicle. Refer tc Sections 5 and 6 for more information concerning the tool kit and additional required tools.

1-3. EQUIPMENT PURPOSE

The MT350E General Purpose Motorcycle is used to transport personnel and/or materiel and to provide a means of enhanced mobility for individual personnel.

1-4. CAPABILITIES AND FEATURES

The MT350E motorcycle is a light, two-wheeled, gasoline-powered vehicle. It is highly mobile and maneuverable. It may be transported by air. The motorcycle is capable of high-speed operation both on and off roads at ranges up to 320 km (200 miles). It can traverse rough terrain, muddy or marshy ground, sand, snow, and ice. It can ford bodies of water to a depth not to exceed 457 mm (18 in.).

The seat is designed to carry a passenger, if necessary, in an emergency situation. Cargo racks, with integral handholds for a passenger, allow the transportation of up to 146 kg (345 lb) total payload, including operator.

1-5. LOCATION OF MAJOR COMPONENTS

Figures 1-1 and 1-2 show the locations of the major components with which the operator must be familiar in order to operate the MT350E motorcycle effectively.

NOTES

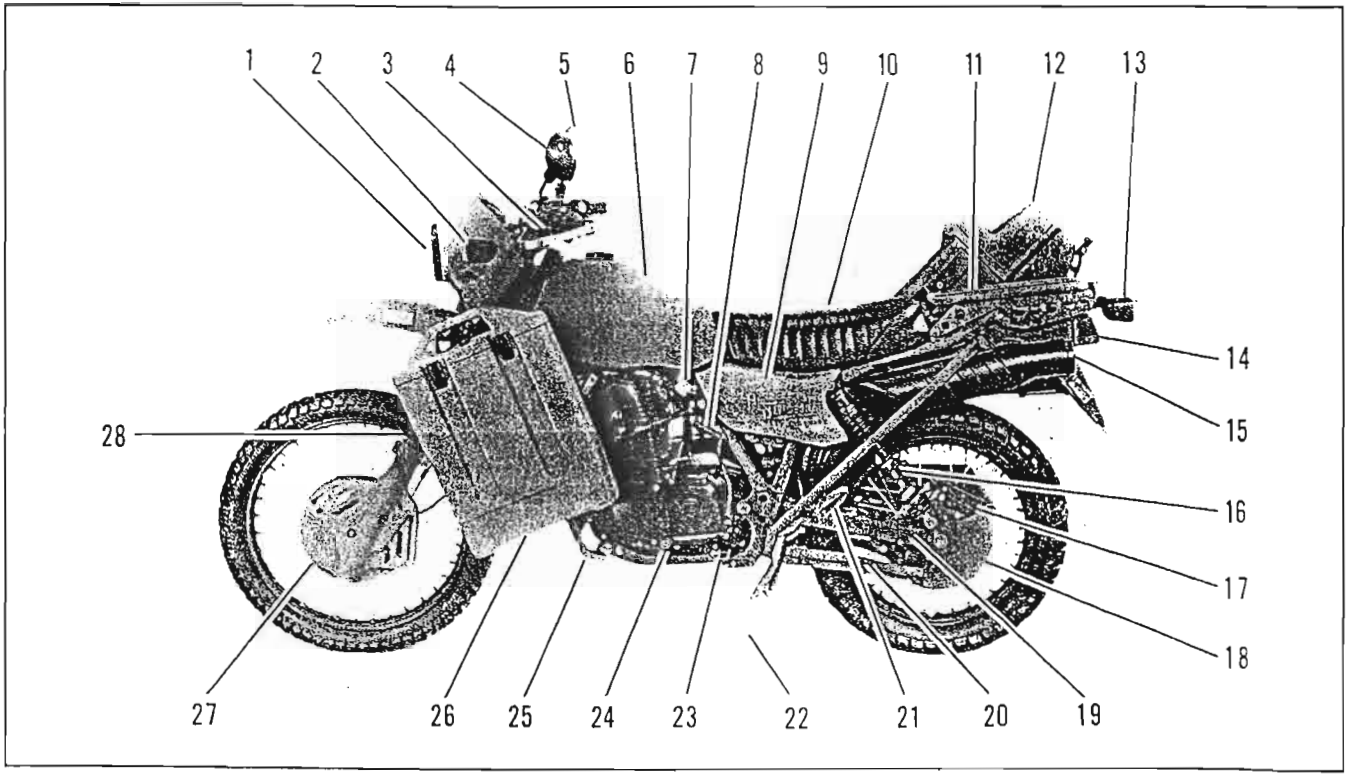


Figure 1-1. MT350E Motorcycle – Left Side View Showing Component Locations

1. Headlamp
2. Front turn signal lamp
3. Clutch control lever
4. Left mirror
5. Right mirror
6. Fuel tank
7. Fuel control valve
8. Kick start lever
9. Side panel
10. Seat
11. Cargo rack
12. Gun box
13. Tail/brake/license plate lamp
14. Rear turn signal lamp
15. Exhaust muffler
16. Rear shock absorber
17. Rear brake caliper
18. Rear brake disc
19. Trailing arm
20. Center stand
21. Passenger footrest
22. Side stand
23. Operator's footrest
24. Gear shift lever
25. Engine guard
26. Pannier
27. Front brake dust shield
28. Front shock absorber

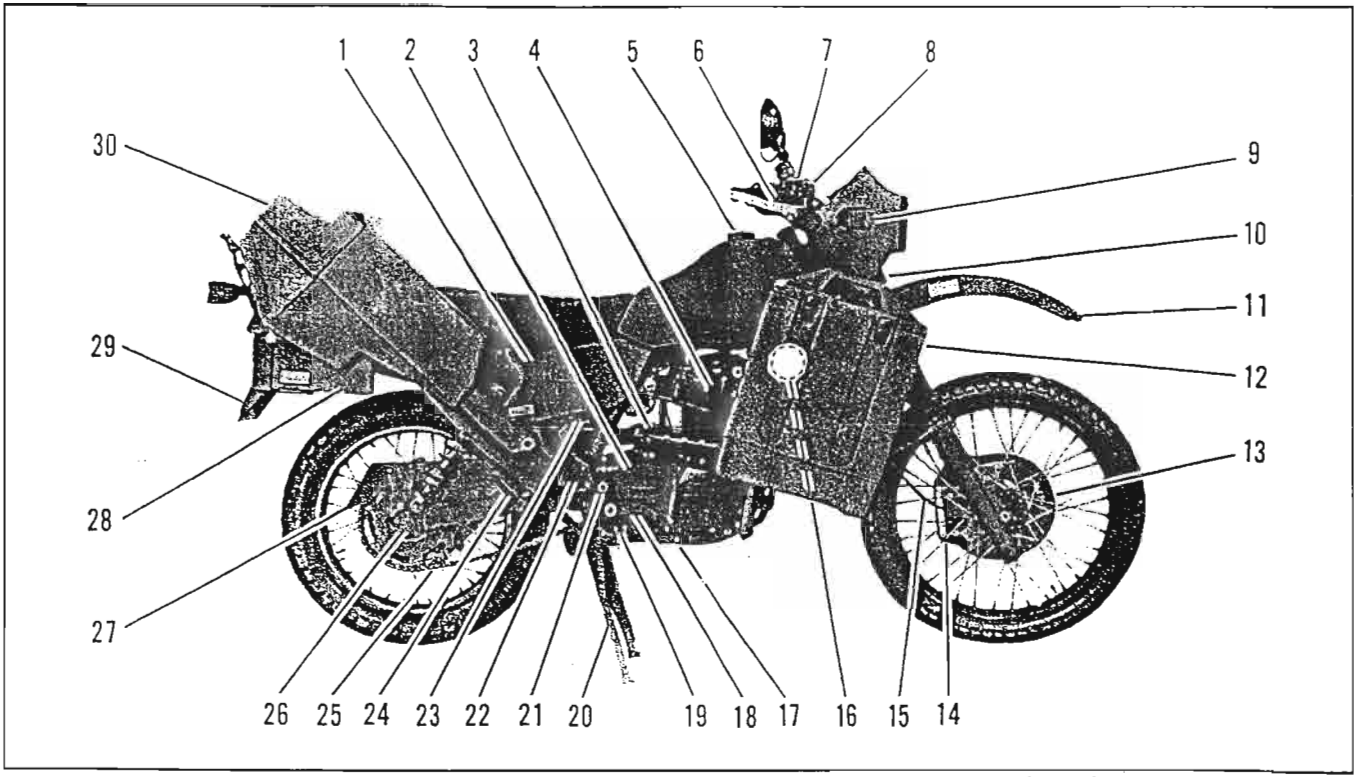


Figure 1-2. MT350E Motorcycle – Right Side View Showing Component Locations

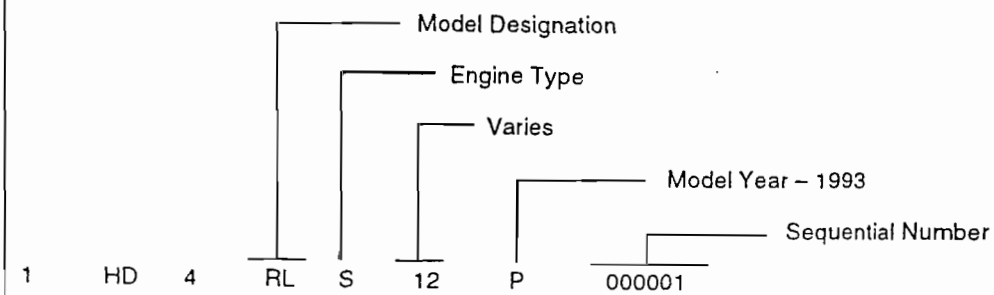
1. Right side panel
2. Drive sprocket cover
3. Exhaust pipe guard
4. Spark plug
5. Fuel filler cap
6. Throttle control
7. Front brake fluid reservoir
8. Tire pump
9. Turn signal
10. Voltage regulator
11. Front fender
12. Pannier
13. Front brake disc
14. Front brake caliper
15. Speedometer cable
16. Horn
17. Crankcase drain plug
18. Rear brake pedal
19. Operator's footrest
20. Center stand
21. Trailing arm pivot lubrication fitting
22. Rear brake master cylinder and cover
23. Battery
24. Passenger's footrest
25. Drive chain
26. Chain tension adjustment cam
27. Chain guard
28. Tool kit storage box
29. Rear fender
30. Gun box

1-6. VEHICLE IDENTIFICATION NUMBER (VIN)

See Figure 1-3. The full 17-digit serial number (1), or Vehicle Identification Number (VIN), is stamped on the left side of the steering head.

NOTE

Always give the full 17-digit Vehicle Identification Number when ordering parts or making any inquiry about your vehicle.



Sample VIN as it appears on the steering head – 1HD4RLS12P000001

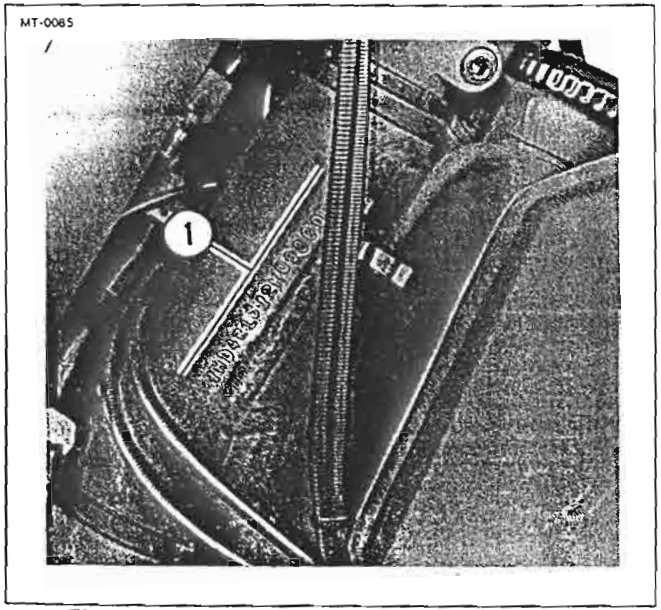


Figure 1-3. Vehicle Identification Number (VIN)

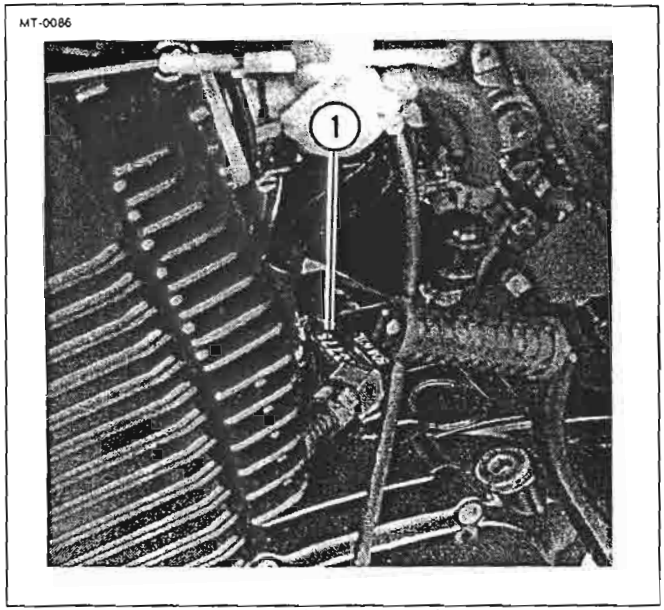


Figure 1-4. Crankcase Serial Number

See Figure 1-4. A six-digit serial number (1) is stamped into the engine crankcase, just behind the crankcase breather hose fitting.

1-7. SPECIFICATIONS AND PERFORMANCE DATA

1-7.1 *GENERAL*

Weight, dry	162 kg (358 lb)
Weight, GVWR (gross vehicle weight)	366 kg (808 lb)
Overall length	2,240 mm (88.2 in.)
Overall width	835 mm (32.9 in.)
Overall height	1,346 mm (53 in.)
Ground clearance	254 mm (10.0 in.)
Weight distribution	37.5% Front, 62.5% Rear

1-7.2 *ENGINE*

Manufacturer	Harley-Davidson/Bombardier
Type	Internal combustion, four-stroke, gasoline
Weight, dry (as installed)	46 kg (101.41 lb)
Number of cylinders	1
Fuel type	CIV GAS
Oil type	H-D Multi-grade, AP1 grade SF or SG, 15W-40 or 15W-50 or OMD80
Displacement	349 cc (21.297 cu in.)
Bore	79.5 mm (3.130 in.)
Stroke	70.4 mm (2.772 in.)
Compression ratio	9:1
Idle speed	1200 rpm
Cylinder cooling	Air
Spark plug type	12 mm NGK D8E-A Champion 12 A6YC
Spark plug electrode gap	0.7 mm (0.027 in.)

1-7.3. *TRANSMISSION*

Manufacturer	Harley-Davidson/Bombardier
Type	Constant mesh
Gear ratios:	
First	1:2.9
Second	1:2.0
Third	1:1.4
Fourth	1:1.1
Fifth	1:0.9 (overdrive)

1-7.4. *ALTERNATOR*

Voltage	12
Amperage	15.8
Drive	Direct from end of crankshaft
Control	Solid state regulator
Alternator Output	3 phase A.C. Flywheel generator 12V 190W

1-7.5. BATTERY

Voltage	12
Capacity	14 amp-hours
Ground connection polarity	Negative

1-7.6. PERFORMANCE

Ambient operating temperature	-18 to +49° C (0 to +120° F.)
Fuel consumption, off-road	12.7 km/liter (30 mpg)
Grade, ascending (maximum)	60%
Side Slope	40%
Turning radius (minimum)	3.2 m (14 ft.)
Fording depth	30.5 cm (12 in.)
Vertical step (maximum)	0.38 m (15 in.)

1-7.7. CAPACITIES

Fuel tank	13.2 liters (3.5 gal US)
Oil (reservoir and engine)	3.2 liters (3.4 qt US)

1-7.8. BULB CHART

Headlamp	H4 quartz halogen
Turn signals	Osram 7506 P21W37R
Tail/Brake/License	Osram 7528 P21/5W

1-7.9. TIRES

Manufacturer	Metzeler or equivalent
Model	Enduro 3 Sahara
Type	Inner tube
Size, Front	90/90—21:54
Maximum load, front	211 kg (465 lb)
Size, rear	4.00-18
Inflation pressures:	
Front, on-road	152 kPa (22 psi)
Front, off-road	124 kPa (18 psi)
Rear, on-road	165 kPa (24 psi)
Rear, off-road	124 kPa (18 psi)

NOTE

Increase inflation pressures by 21 kPa (3 psi) when vehicle is loaded to full gross weight.

1-7.10 BRAKE FLUID

Fluid type	Dot 3

WARNING

CARBON MONOXIDE POISONING IS DEADLY!

Carbon monoxide is a colorless, odorless, deadly poisonous gas which, when breathed, deprives the body of oxyg and causes suffocation. Exposure to air contaminated with carbon monoxide produces symptoms of headach dizziness, loss of muscular control, and apparent drowsiness. Coma, permanent brain damage, or death can res from severe exposure.

Carbon monoxide occurs in the exhaust fumes of the vehicle and becomes dangerously concentrated und conditions of inadequate ventilation. The following precautions must be observed to insure the safety of personnel whenever the engine of the vehicle is operated for maintenance purposes or for tactical use:

1. *Do NOT operate engine of vehicle in an enclosed area unless it is adequately ventilated.*

2. *Be alert at all times during vehicle operation for exhaust odors and exposure symptoms. If either are prese move affected personnel out-of-doors into fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; necessary, administer artificial respiration.*

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS ADEQUATE VENTILATION.

SECTION 2

OPERATING INSTRUCTIONS

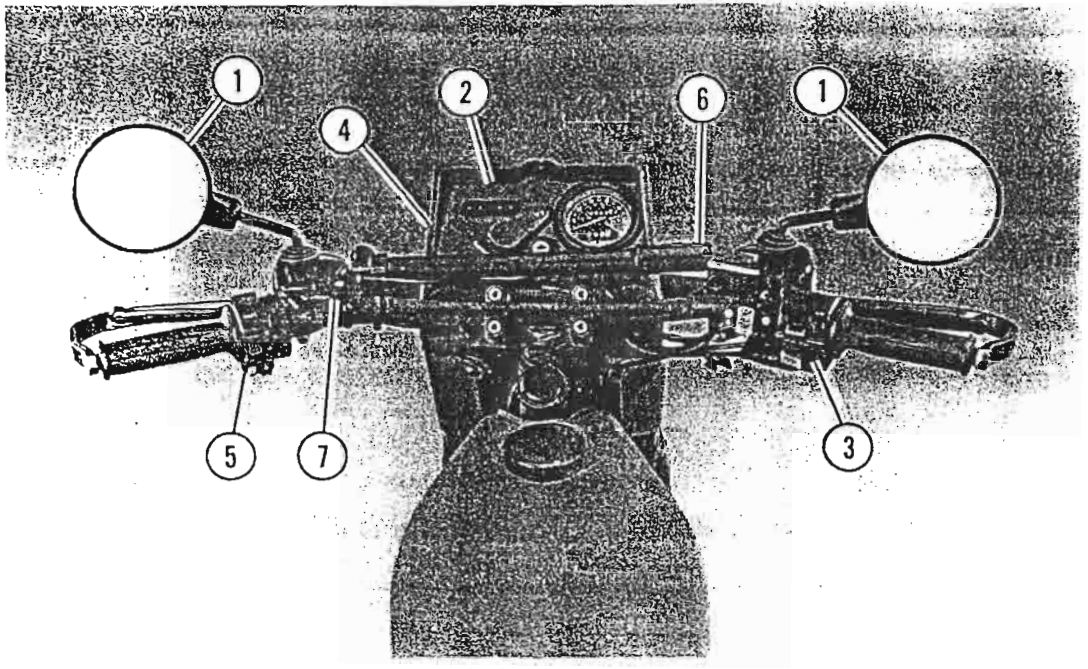


Figure 2-1. Operator's Controls and Instruments

Legend for Figure 2-1.

1. *Rearview Mirrors* – Adjust mirror so that you can see a small portion of your shoulder in the mirror and the area behind the vehicle is clearly reflected in the mirror.

WARNING

Rearview mirrors are the convex type to give a wider view to rear of vehicle than flat mirrors. Objects seen in convex mirrors are closer than they appear to be. Other vehicles and objects seen in convex mirrors will look smaller and farther away than when seen in a flat mirror. Use care when judging the size or distance of objects seen in convex mirrors.

2. *Instrument/Indicator Lamp Cluster* – See Figure 2-4.
3. *Right Handlebar Controls* – See Figure 2-3.
4. *Tripmeter Reset Knob* – Turn counterclockwise to reset trip meter to 000.0.
5. *Left Handlebar Controls* – See Figure 2-2.
6. *Tire Pump*
7. *Enrichment Device Control Lever*

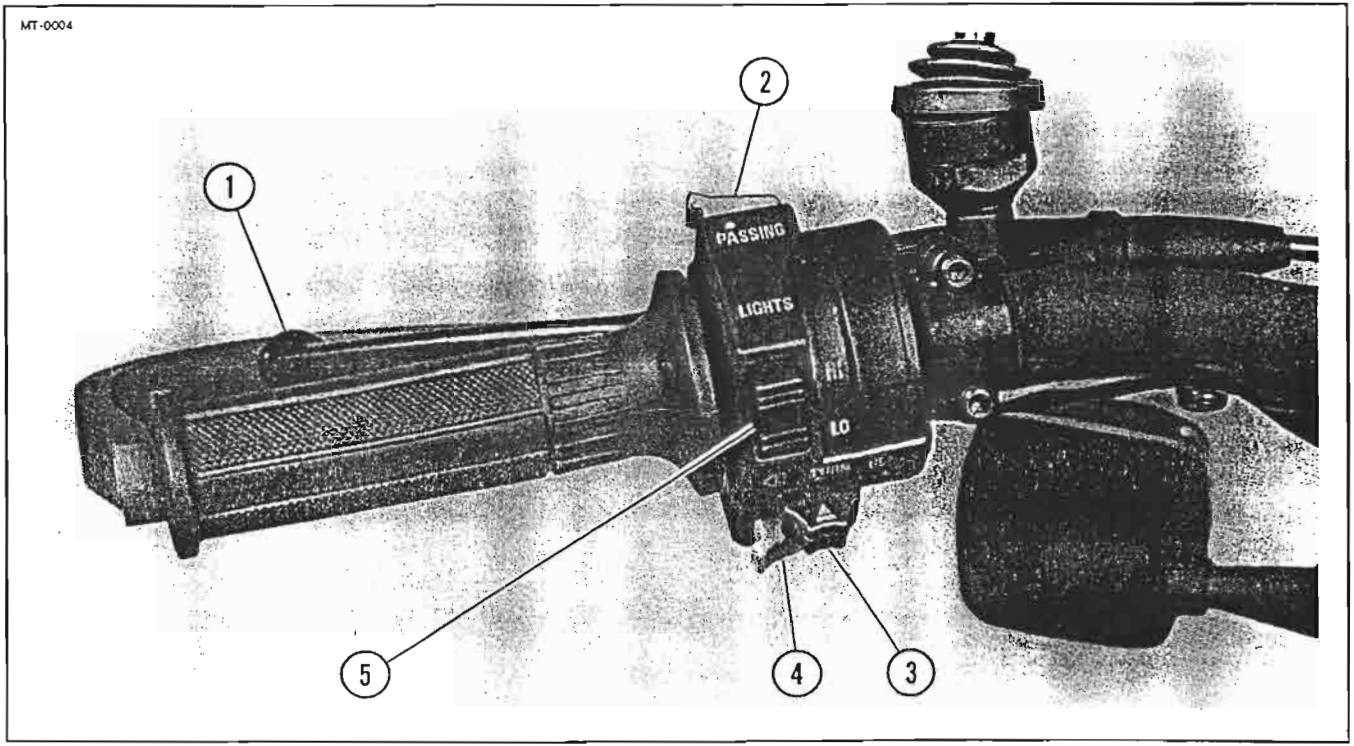


Figure 2-2. Left Handlebar Controls

Legend for Figure 2-2.

1. *Clutch Control Lever* – The clutch control lever is located on the left handlebar where it is operated with the fingers of the left hand. Pull lever in against handlebar grip to disengage clutch; release lever slowly to its outward position to engage clutch.

WARNING

Be sure no fingers are positioned between hand control levers and handlebar grips or control lever operation could be impaired.

2. *Passing Signal* – Depress and release the headlamp dimmer switch momentarily to operate the passing signal when passing another vehicle. The headlamp will briefly switch to high beam and back to low beam.

NOTE

The passing signal does not work when the headlamp is on high beam.

3. *Turn Signal Switch* – Slide switch to the left or to the right to activate the left or right turn signal lamps, as required, then release switch. Switch will return to OFF position, but turn signal lamps will continue to flash. When turn is completed, press switch forward to cancel flashing lamps.

4. *Horn Switch* – Depress the switch to sound the horn.

5. *Headlamp Dimmer Switch* – Use this rocker-type switch to change the headlamp to high or low beam.

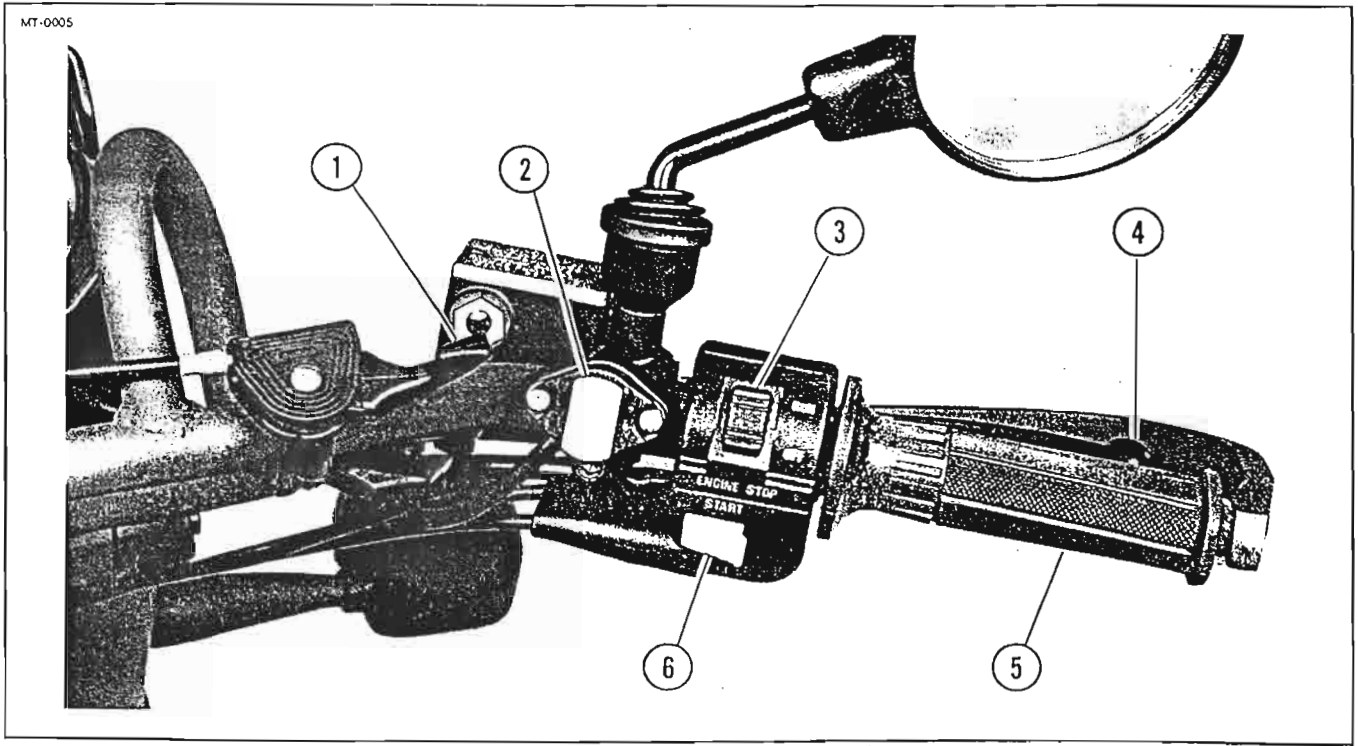


Figure 2-3. Right Handlebar Controls

Legend for Figure 2-3.

1. *Carburetor Enrichener Control Lever* – Activates carburetor enrichener circuit to assist cold engine starting.

2. *Blackout Switch* – Slide switch upward to turn off all vehicle lamps, including instrument panel illumination and indicator lamps. Works in any ignition switch position.

3. *Engine Stop Switch* – Turns ignition electrical circuit OFF at any time to stop engine, especially in an emergency. Must be set to RUN before electric starter can be operated.

NOTE

Engine stop switch must be in RUN position to operate engine.

4. *Front Brake Control Lever* – Controls the front wheel brake. Use fingers to pull lever toward throttle control to apply brake.

WARNING

Do NOT apply front brake strongly enough to lock the wheel. This may cause the wheel to skid, causing loss of vehicle control.

5. *Throttle Control Grip* – Turn grip toward rear of vehicle to open throttle (increase engine speed). Turn grip toward front of vehicle to close throttle (decrease engine speed).

NOTE

Throttle control is spring-loaded to return engine to idle speed if grip is released.

6. *Electric Starter Switch* – Depress switch to crank engine by means of electric starter. Switch can only activate starter if ignition switch is ON and engine stop switch is set to RUN. Release starter switch as soon as engine combustion is self-sustaining.

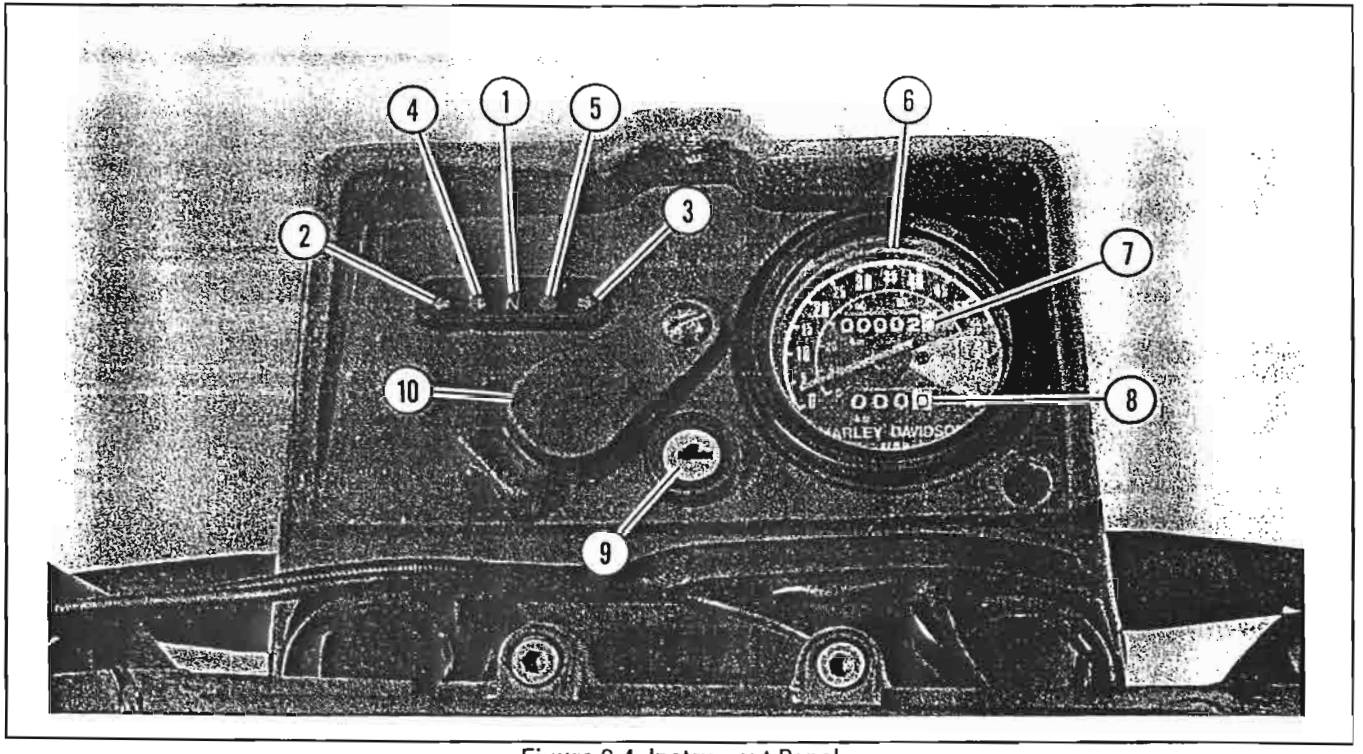


Figure 2-4. Instrument Panel

1. *Gearshift Neutral Position Indicator Lamp* – Green lens. Lights whenever gear shifter is in neutral position.

2. *Left Turn Signal Indicator Lamp* – Green lens. Flashes whenever left turn signal lamps flash.

3. *Right Turn Signal Indicator Lamp* – Green lens. Flashes whenever right turn signal lamps flash.

4. *High Beam Indicator Lamp* – Blue lens. Lights whenever high beam or passing beam of headlamp are on.

5. *Low Voltage Indicator Lamp* – Red lens. Lights whenever electrical charging system (alternator) is not producing enough current to recharge battery.

6. *Speedometer* – The white scale Indicates vehicle road speed in miles per hour. The blue scale Indicates kilometers per hour. Illuminated whenever headlamp is on.

7. *Odometer* – Indicates accumulated vehicle travel from 00,000.0 to 99,999.9 in kilometers.

8. *Trip Meter* – See Figure 2-1. Indicates accumulated trip mileage from 000.0 to 999.9 in kilometers. To reset trip meter to 000.0 at beginning of trip.

9. *Ignition Switch* – See Figure 2-5. Key-operated, four-position switch controls vehicle electrical functions. In OFF position, lamps will not light, engine cannot be cranked using engine start switch, and ignition system is disabled so that engine cannot be started by kick starting.

10. *Ignition Switch Cover* - Provides protection from the weather.

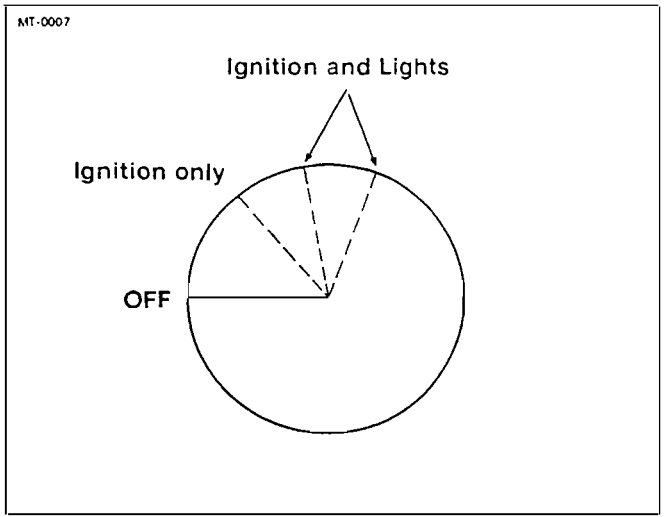


Figure 2-5. Ignition Switch Positions

NOTE

- *The key can only be removed when the switch is in the OFF position.*
- *The OFF position does NOT lock the steering head.*

CAUTION

To prevent theft of vehicle, always set ignition light switch to OFF and remove key when vehicle is left unattended.

In IGNITION ONLY position, the following items are functional:

- NEUTRAL position lamp;
- GENerator lamp;
- Engine electric starter and ignition;
- Turn signals.

No other lamps will operate in IGNITION ONLY position.

In the IGNITION AND LIGHTS position, all vehicle electrical circuits are functional.

NOTE

There are two IGNITION AND LIGHTS positions of the ignition/light switch, either of which will operate all vehicle electrical circuits.

PART II: PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-1. GENERAL

The purpose of PMCS is to discover and correct any defects before serious damage or failure occurs. Doing the PMCS, as outlined on the following pages, will help you keep a well-maintained and properly functioning vehicle.

2-2. PMCS

The PMCS is divided into two parts:

- *Daily* – items which require checks or services each day the vehicle is operated.
- *Weekly* – items that require periodic checks or services.

Always keep the **CAUTION**s and **WARNING**s in mind when performing the PMCS. While you perform the PMCS, use the tools from the vehicle tool kit as necessary, and look carefully for the following:

- *LOOSE BOLTS* – A loose bolt can be difficult to detect without using a wrench. However, you can often identify a loose bolt by loose or chipped paint around the bolt head and bare metal or rust at its base. Tighten all loose bolts.
- *DAMAGED WELDS* – Damaged welds may be detected by rust or chipped paint where the cracks occur.
- *FRAYED ELECTRICAL WIRES AND LOOSE CONNECTORS* – Check electrical wiring for cracked insulation caused by aging and exposure to the elements. Exposed copper electrical conductors can cause shorts and grounds. Tighten loose wiring clamps and connectors.

If an item does not operate or gives an indication of trouble, refer to Troubleshooting, Section 4.

CAUTION

Do not use high pressure water hose or steam cleaner to clean vehicle. Use of high pressure water hose or steam cleaner can damage seals and electrical components.

NOTE

It is recommended that lithium grease be used on all electrical connections.

2-2.1. ENGINE OIL LEVEL

NOTE

Check oil level with vehicle on its sidestand.

1. See Figure 2-6. Remove oil reservoir filler cap/dipstick (1).

2. See Figure 2-7. Wipe dipstick (1) dry with a clean rag. Install filler cap/dipstick and immediately remove. Observe oil level on dipstick. Oil level must be on dipstick somewhere between end and groove (2). If level is below groove, add specified oil (Para. 7-1). If level is above groove, drain oil until level is even with groove.

CAUTION

If oil level does not reach FULL groove on dipstick after adding one liter (1.06 qt. US) of oil, refer to Service Manual and inspect check valve for proper action.

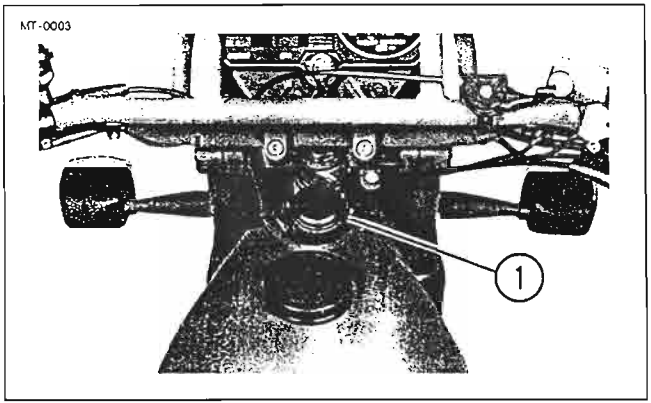


Figure 2-6. Oil Reservoir Filler Cap/Dipstick

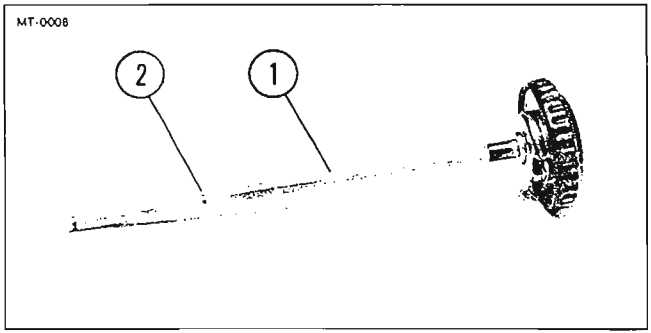


Figure 2-7. "Full" Level Groove

3. See Para. 2-4, ENGINE STARTING. Start engine and allow to reach operating temperature. Stop engine.

4. Check oil level with dipstick, following procedure in Steps 1 and 2 above. Add or drain oil until level is at groove on dipstick.

2-2.2. FUEL TANK

WARNING

- *Remove fuel filler cap slowly. Fill fuel tank slowly to prevent spillage. Do not overfill. Do not fill above the bottom of the filler neck insert. Leave air space to allow for fuel expansion. Expansion can cause an overfilled tank to overflow gasoline through the filler cap onto surrounding areas.*

- *Do not smoke when checking fuel level.*

- *Do not allow open flames or electrical sparks near vehicle when checking fuel level.*

CAUTION

The use of gasoline/methanol blends ("gasohol") as a fuel is NOT recommended because these blends can cause engine and fuel system damage.

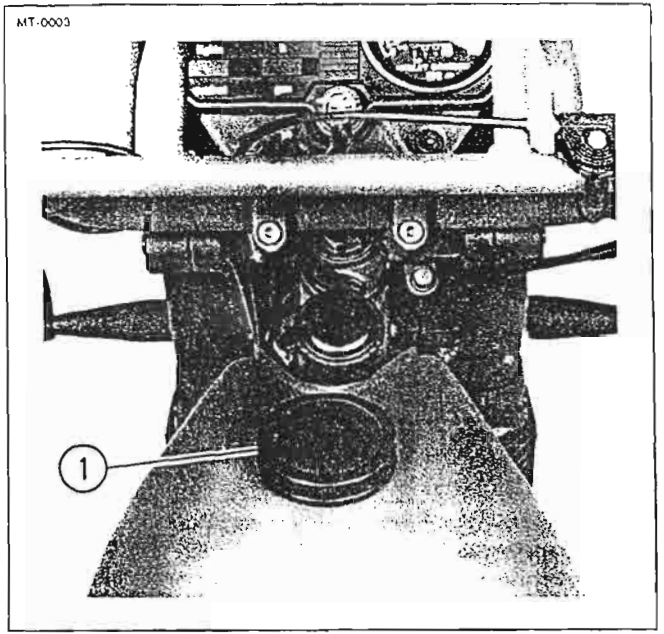


Figure 2-8. Fuel Tank Filler Cap

See Figure 2-8. Remove fuel filler cap (1) slowly. Add unleaded fuel of at least 87 pump octane rating until level with bottom of filler neck insert. Install filler cap, turning until clicking noise occurs, indicating that cap is on tight.

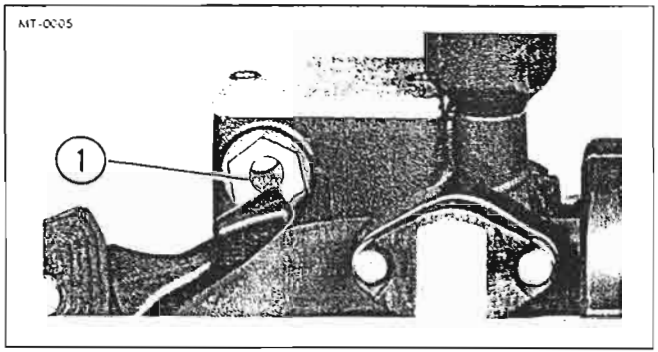


Figure 2-9. Front Brake Fluid Reservoir

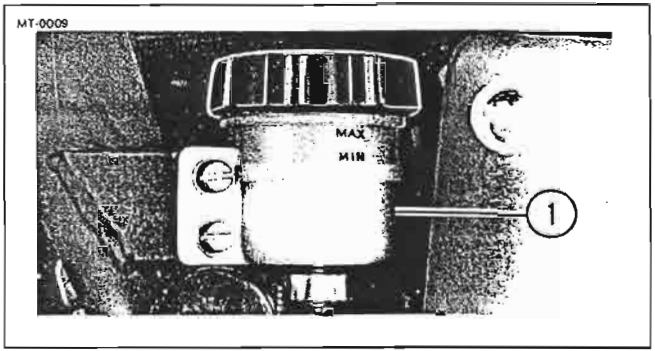


Figure 2-10. Rear Brake Fluid Reservoir

2-2.3. FRONT BRAKE FLUID RESERVOIR LEVEL

WARNING

Brake fluid can cause irritation of eyes and skin and may be harmful if swallowed. If fluid is swallowed, induce vomiting by administering two tablespoons of salt in a glass of warm water. Obtain medical aid immediately. In case of contact with skin or eyes, flush with plenty of water and obtain medical attention at once.

See Figure 2-9. Visually check that fluid level in sight glass (1) of reservoir on right handlebar is about halfway between top and bottom of window.

2-2.4. REAR BRAKE FLUID RESERVOIR LEVEL

Remove left side panel.

See Figure 2-10. Check that fluid level is at MAX line on reservoir (1).

If fluid level is not up to MAX line, unscrew reservoir cover and add fresh DOT 3 brake fluid from a sealed container. Replace reservoir cover. Replace left side panel.

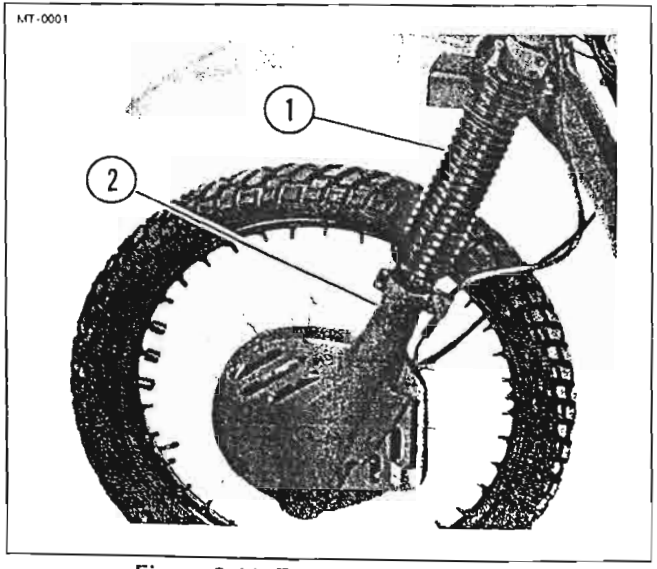


Figure 2-11. Front Shock Absorber

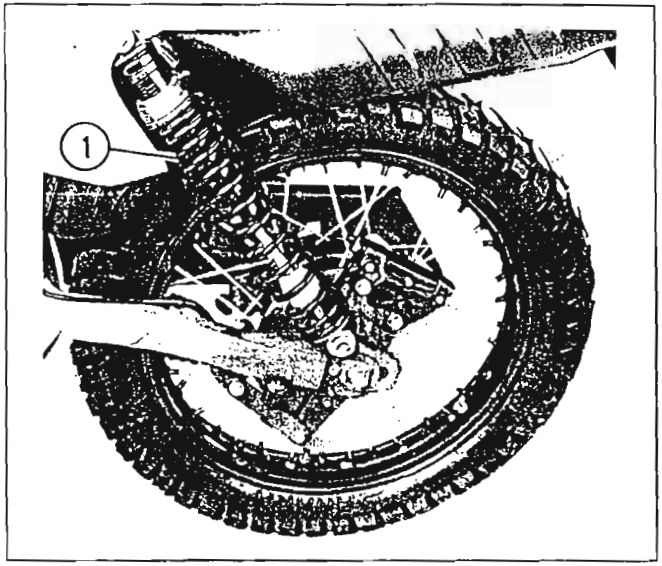


Figure 2-12. Rear Shock Absorber

2-2.5. SHOCK ABSORBERS

1. See Figure 2-11. Check flexible boots (1) on front shock absorbers for cuts, tears, holes, splitting, or other damage. Check for fluid leakage on sliders (2). Refer to *Service Manual* for repairs.

2. See Figure 2-12. Check for fluid leakage on both rear shock absorbers (1). Refer to *Service Manual* for repair procedure if leakage is present.

WARNING

- *Improper tire inflation will cause abnormal tread wear and could result in unstable handling. Underinflation could result in the tire slipping on the rim, or sudden tire failure.*
- *Riding with excessively worn, unbalanced, or improperly inflated tires is hazardous and will adversely affect traction, steering, and handling.*
- *Do not attempt to use damaged, punctured, or repaired tires. Once a motorcycle tire has been damaged or punctured, it is unsafe to use.*
- *Same as original equipment tires should be used. Other tires may not fit correctly, could cause unstable handling, and may be hazardous to use.*
- *Because tires, tubes, and wheels are critical safety items, and servicing these items requires special tools and skills, we recommend that the operator perform tire and wheel service procedures only in an emergency situation.*

CAUTION

Check tire inflation pressures only when tires are cold. Tires are "cold" before vehicle is used after standing at least three hours. Do not bleed air from hot tires to adjust pressure. When tires cool, pressure will be too low and damage will result.

Check tires for damaged or worn tread. Check tire inflation pressures with an ***inflation pressure gauge*** and adjust to these values:

Front tire, on-road use:	152 kPa (22 psi)
Front tire, off-road use:	124 kPa (18 psi)
Rear tire, on-road use:	165 kPa (24 psi)
Rear tire, off-road use:	124 kPa (18 psi)

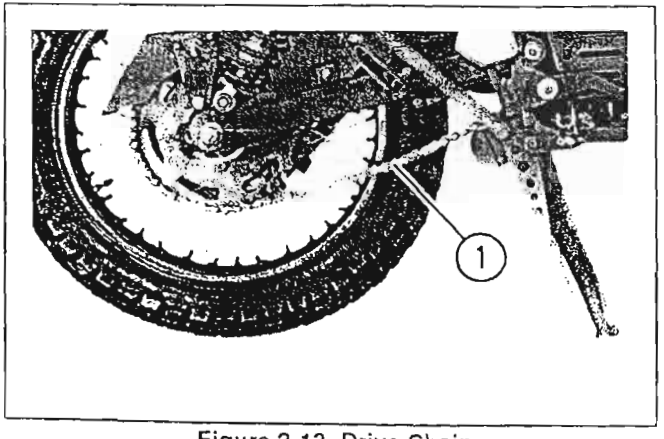


Figure 2-13. Drive Chain

2-2.7. DRIVE CHAIN

CAUTION

- Never soak drive chain in cleaning solvent or lubricant will be washed out of rollers, causing rapid chain wear.
- Be sure that any lubricant applied to the drive chain is approved for use on O-ring seal chains.

NOTE

The O-ring seal drive chain used on this vehicle does not normally require daily lubrication.

See Figure 2-13. Check drive chain (1) for dirt, dust, and other foreign matter. If chain is dirty, raise vehicle rear wheel off ground and clean chain with a stiff bristle brush. Lubricate clean chain with chain lubricant compatible with O-ring seal chains.

2-2.8. STEERING

Position front tire on a smooth surface. Grip handlebars and turn steering fork from full left to full right, checking for smoothness of steering action.

If steering is rough or handlebars cannot be steered to full left or right lock, vehicle is not ready for use. Refer to *Service Manual* for repair procedure.

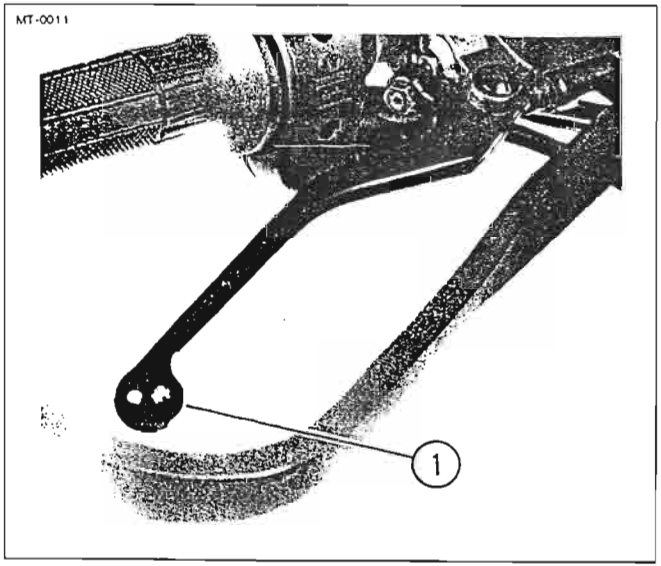


Figure 2-14. Front Brake Control Lever

2-2.9. FRONT AND REAR BRAKES

1. Shift transmission into neutral.
2. Roll vehicle forward *SLOWLY*.
3. See Figure 2-14. Apply front brake control lever (1) and check that application of brake stops vehicle. Release front brake control lever.

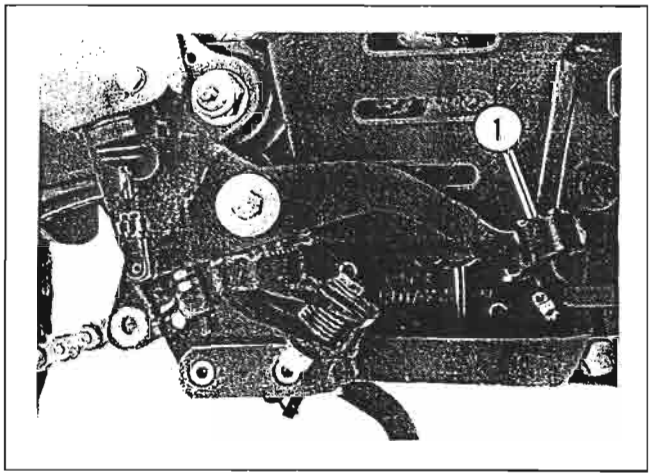


Figure 2-15. Rear Brake Foot Pedal

4. See Figure 2-15. Roll vehicle forward and apply rear brake foot pedal (1), Check that vehicle stops when pedal is applied.

CAUTION

Brake lever should have a firm, hard feel when braking. If brake lever or pedal feels soft or "mushy", refer to *Service Manual* and repair vehicle before operating.

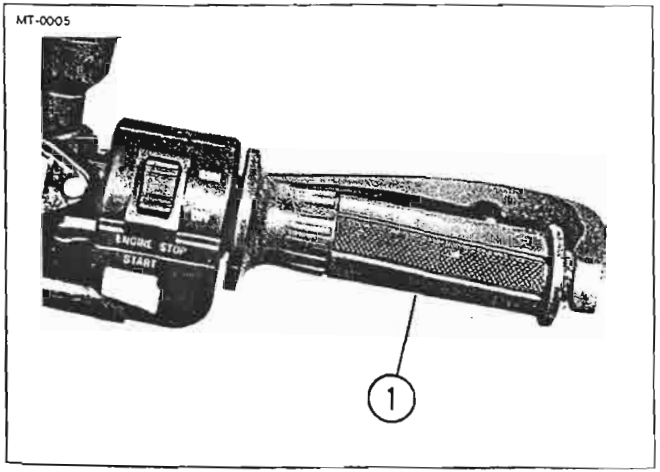


Figure 2-16. Throttle Control

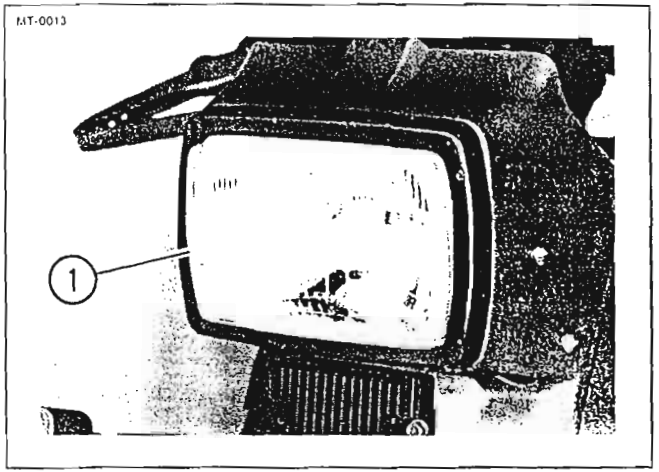


Figure 2-17. Headlamp

2-2.10. THROTTLE CONTROL

See Figure 2-16. Twist throttle control grip (1) backward to full open position and release. Check that throttle control closes quickly and completely.

2-2.11. HEADLAMP

See Figure 2-17. With ignition switch ON, check that headlamp (1) lights. Operate LO-HI rocker switch to check that low and high beams are functional. Depress PASSING switch to check that high beam lights.

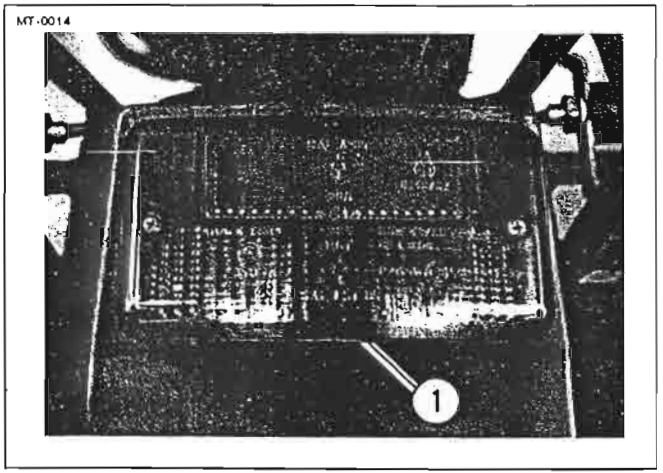


Figure 2-18. Rear Lamp Unit

2-2.12. REAR LAMP UNIT

See Figure 2-18. Check that taillamp (1) lights when ignition switch is ON. Apply brakes and check that brake lamp lights (shines more brightly than taillamp) when ignition switch is ON.

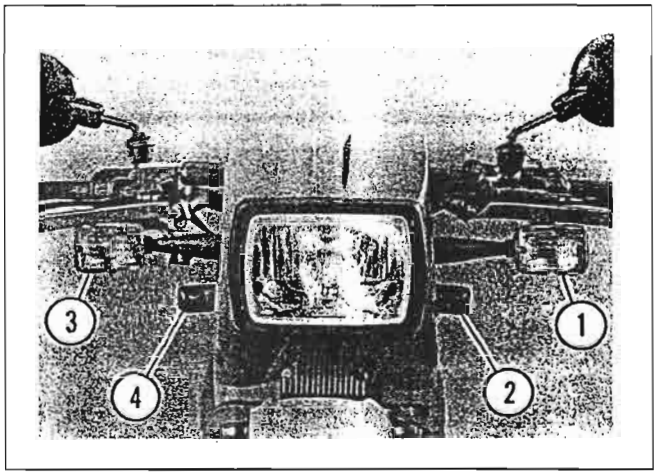


Figure 2-19. Turn Signal Lamps

2-2.13. TURN SIGNAL LAMPS

See Figure 2-19. Set ignition switch ON. Move turn signal switch to left and check that left front turn signal lamp (1), left rear turn signal lamp (2), and left turn indicator lamp on instrument panel flash simultaneously. Move turn signal switch to right and check that front right turn signal lamp (3), right rear turn signal lamp (4), and right turn indicator lamp on instrument panel flash simultaneously.

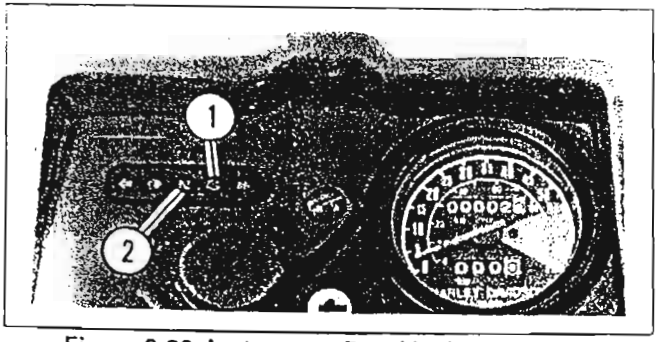


Figure 2-20. Instrument Panel Indicator Lamps

2-2.14. INSTRUMENT PANEL LAMPS

NOTE

Low voltage indicator lamp should not normally be on while engine is running, but it may flicker on and off when engine is at idle speed or is momentarily slowed when under heavy load. This flickering is normal under these conditions.

See Figure 2-20. Insert key into ignition switch and turn clockwise to ON position. Check that low voltage indicator lamp (1) lights. All other lamps should be off.

Place transmission shift lever in neutral position and check that neutral indicator lamp (2) lights.

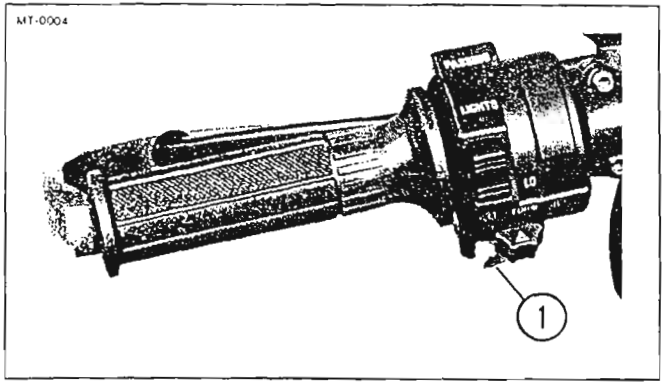


Figure 2-21. Horn Switch

2-2.15. HORN

See Figure 2-21. With ignition switch in ON position, depress horn switch (1) and check that horn sounds. If horn does not sound, refer to Paragraph 4-3.3.

2-2.16. *REAR SHOCK ABSORBER LOAD SETTING*

WARNING

- ***Both shock absorbers must be adjusted to the same setting. If they are adjusted to different settings, handling difficulties may result.***

- ***Shock absorber settings cannot compensate for an overloaded vehicle. Under no circumstances should the gross vehicle weight of 366 kg (808 lb) be exceeded.***

See Figure 2-22. Shock absorbers have settings for different loads carried by vehicle. Use two spanner wrenches (1) from tool kit to adjust shock absorbers as required. Compressing (shortening) the auxiliary (upper) springs enables the vehicle to carry a heavier than normal load and still maintain good suspension rebound control.

Figure 2-22. Adjusting Load Setting

2-3. GENERAL

This section contains weekly PMCS procedures.

2-3.1. AIRBOX FILTER ELEMENT

1. See Figure 2-23. Remove left side panel. Using tool kit screwdriver handle, remove screws (1), plastic washers (2), and airbox lid (3) with attached seal.

2. See Figure 2-24. Remove U-channel and filter element (1). Removal is done most easily by pulling alternately on the top and bottom corners of the element. Clean airbox. Be sure that intake passages to underseat area are open. Inspect filter for dirt, tears, deterioration, or other damage. Element is not washable. Always replace a dirty or damaged element.

3. Reverse removal procedure to install element. Apply a small amount of grease around the edges of the element to allow the element to slip into place easier. Be sure that filter element integral seal goes into cast slots in airbox, contacting all airbox surfaces snugly to ensure that there is no leakage of unfiltered air past element.

4. If element has become wet from fording, refer to Paragraph 5-1.2 for service procedures.

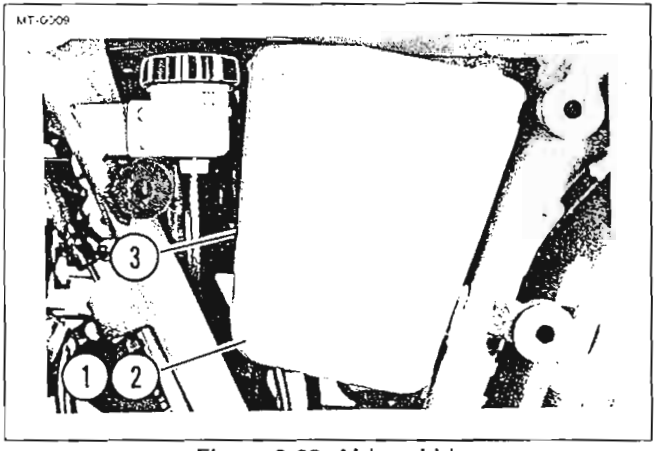


Figure 2-23. Airbox Lid

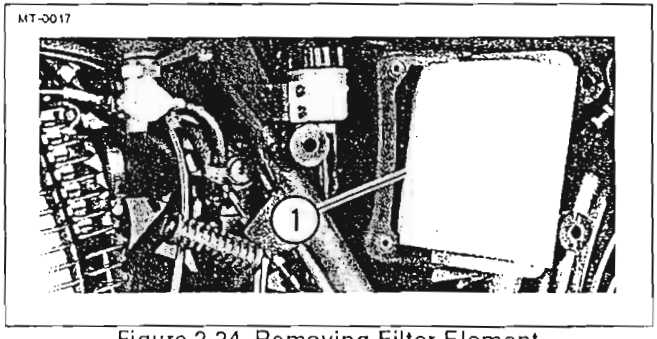


Figure 2-24. Removing Filter Element

2-3.2. *FILLING AND INSTALLATION INSTRUCTIONS FOR SEALED LEAD ACID BATTERY*

WARNING

- ***Set ignition switch to OFF before checking battery.***
- ***Remove all jewelry and watches before checking battery.***

Batteries produce explosive hydrogen gas at all times, especially when being charged. Keep cigarettes, open flame, and sparks away from battery at all times. Ventilate area when charging battery. Always protect hands. Protect eyes with shield or goggles when working near a battery or electrolyte.

WARNING

Set ignition to off before checking battery. Remove all jewelry and watches from your person before checking battery.

DO NOT FILL WITH ELECTROLYTE UNTIL BATTERY IS ACTUALLY PLACED IN SERVICE. This battery is supplied dry and charged. DO NOT FILL WITH ELECTROLYTE UNTIL BATTERY IS TO BE USED.

POISON – CAUSES SEVERE BURNS

Contains sulfuric acid.
Avoid contact with skin, eyes, or clothing.
To prevent accidents, rinse empty container with water.

ANTIDOTE:

EXTERNAL – Flush with water.
INTERNAL – Drink large quantities of water or milk.
Follow with milk of magnesia, beaten eggs or vegetable oil. Call physician immediately.

EYES – Flush with water for 15 minutes and get prompt medical attention.

– KEEP OUT OF THE REACH OF CHILDREN –

WARNING

This battery uses special acid. Use only acid packed with battery. This is a <u>maintenance free</u> battery.

DANGER – BATTERY CONTAINS SULFURIC ACID.
MAY CONTAIN EXPLOSIVE GASES.

— Keep sparks, flame, cigarettes or any flame away.
— Shield eyes, protect skin and clothing when handling acid or battery containing acid or working near such batteries.
— Ventilate when charging or using battery in enclosed space.

CAUTION

1. Do not use any electrolyte other than the acid packed with battery.

2. Empty entire volume of acid contained in each acid bottle section into each corresponding cell of the battery.

3. Once battery is filled with acid and sealed caps are in place. NEVER remove these caps or try to add water to the battery.

4. Do not remove caps during charging.

5. Keep flames, sparks and cigarettes away from battery during charging.

ACTIVATION

Before filling with electrolyte, be sure to read INSTRUCTIONS FOR HANDLING ELECTROLYTE attached to acid bottle.

ACTIVATING

1. Place battery on a level surface. Remove aluminum sealing tape.

2. Acid should be at room temperature before filling battery. Use nippers (side cutters) to carefully cut the neck of each acid bottle between the sealed tip and black insert.

3. Carefully turn the acid bottle upside down to insert its tips into the six (6) filling holes of the battery. Then, cut the lug of each acid bottle with nippers (side cutters) to let the acid flow into the battery.

4. After the acid bottle empties completely, remove it and place sealing caps firmly into the filling holes (tap gently with hammer if necessary) until caps are flush with the battery surface.

5. Allow battery to stand for at least thirty (30) minutes before charging or installing.

CHARGING

Boost charging is recommended before placing battery in service at the rate shown on top of the battery.

CAUTION

DO NOT OPEN the sealed caps during charging. Keep sparks, cigarettes and any flame away.

INSTALLATION INSTRUCTIONS (See Figure 2-25)

1. Remove old battery. Mark which cable is connected to positive (+) (1) and negative (-) (2) terminals. Positive cable is usually red.

2. Clean cable connections with wire brush or sandpaper to remove oxidation.

3. After filling with acid and charging (see instructions), install new battery. Connect cables to the proper terminals. Positive cable to positive terminal (+) and negative cable to negative terminal (-). CONNECT NEGATIVE CABLE LAST.

CAUTION

CONNECTING IN REVERSE, POSITIVE TO NEGATIVE AND NEGATIVE TO POSITIVE, CAN CAUSE SERIOUS DAMAGE TO ELECTRICAL SYSTEM.

4. Securely fasten battery to the motorcycle using its battery to hold-down arrangement. This will minimize destructive vibration.

MAINTENANCE

1. Always keep the battery clean. Apply grease around battery terminals to prevent corrosion.

2. Recharge the battery when engine will not start and/or every three (3) months during storage. Refer to charging instructions shown on top of the battery.

CAUTION

DO NOT OPEN sealed caps or add water to the battery.

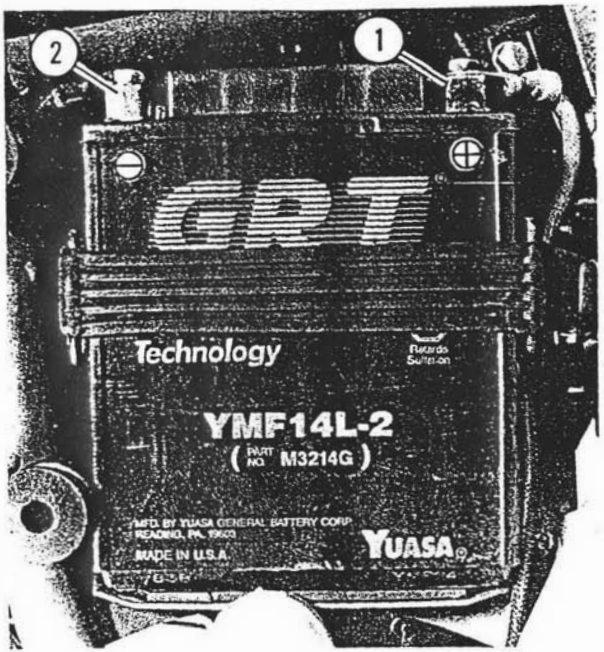
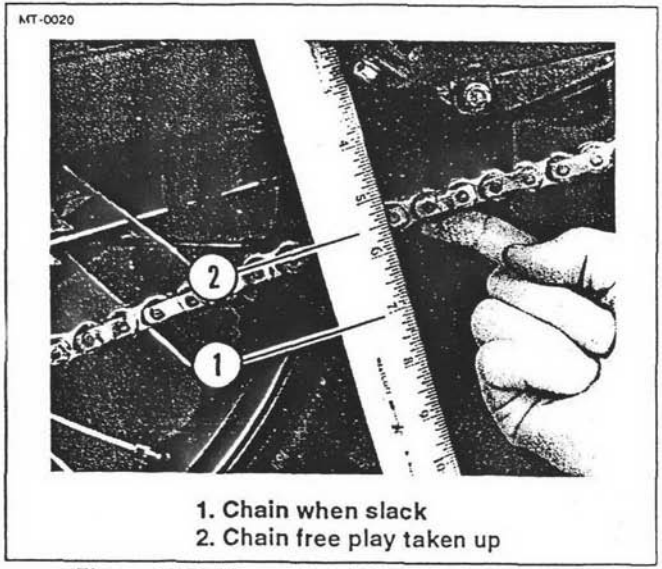


Figure 2-25. Battery



1. Chain when slack
2. Chain free play taken up

Figure 2-26. Measuring Drive Chain Free Play

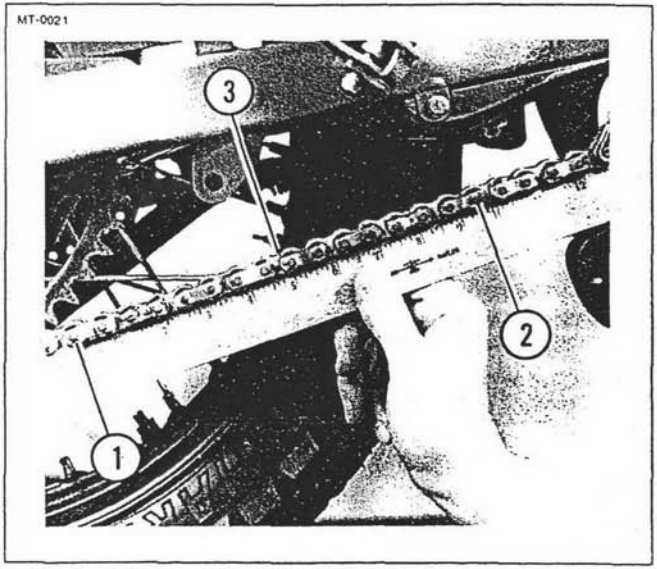


Figure 2-27. Measuring Chain Stretch

2-3.3. DRIVE CHAIN FREE PLAY AND WEAR

1. See Figure 2-26. Place vehicle on center stand. Measure drive chain free play at midpoint between sprockets. Free play should be 40-50 mm (1.6-2.0 in.). Refer to Paragraph 5-7.1 for adjustment procedure.

2. See Figure 2-27. After adjusting chain free play, measure the length of sixteen pitches (1 to 2) of the chain (3). If this distance is more than 25.9 cm (10-7/32 in.), refer to *Service Manual* and replace chain.

2-3.4. *WHEEL SPOKES*

CAUTION

If any spokes appear loose refer to *Service Manual* for repair procedure.

Using an ***8 mm spoke wrench*** (not included in vehicle tool kit), check each spoke for tightness. If any spoke requires more than two turns to tighten, or more than four spokes on a wheel are loose, refer to the *Service Manual* and repair wheel before operating vehicle.

2-3.5. *FRONT BRAKE ASSEMBLY*

1. See Figure 2-28. Using a 4 mm hex key, remove socket head screw (1), lock washer, flat washer, and dust shield (2) from front brake assembly.

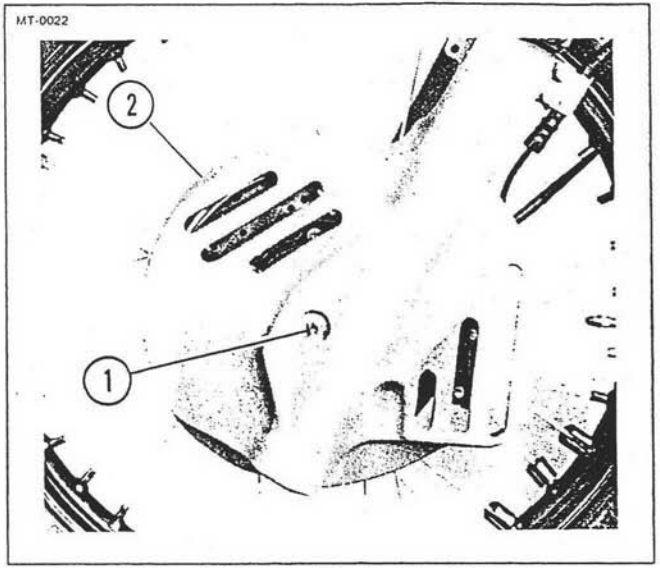


Figure 2-28. Front Brake Dust Shield

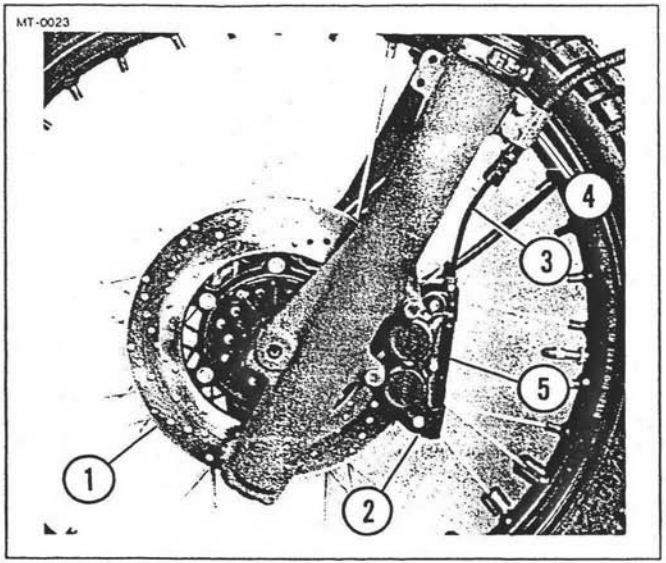


Figure 2-29. Front Brake Assembly

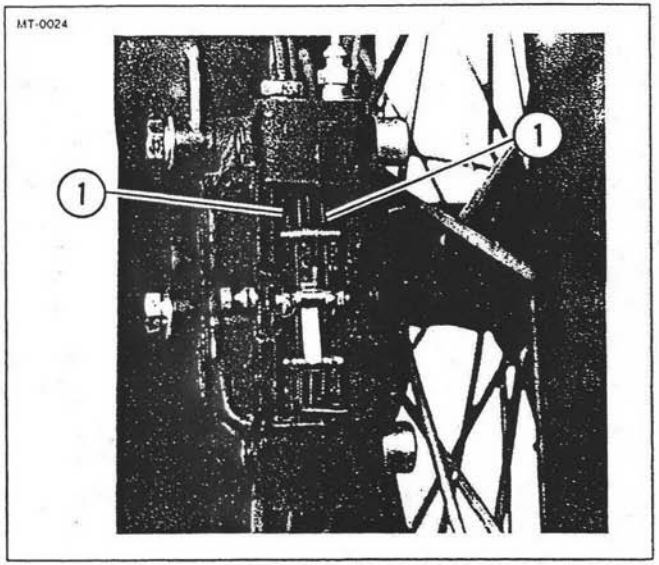


Figure 2-30. Checking Front Brake Pads

2. See Figure 2-29. Check disc (1) for scoring, distortion, warpage, heat checking, cracks, or other damage. Check for leakage from caliper (2) and brake line (3). Be sure brake line is secured from movement by clamp (4).

3. See Figure 2-29. Remove brake pad cover (5), See Figure 2-30. Check brake pads (1) for thickness. If either pad is less than 1.6 mm (1/16 in.) thick or if they are wearing unevenly, refer to *Service Manual* for repair procedure. Install brake pad cover.

4. Vehicle is not ready for operation if brake pads are worn to less than 1.6 mm (1/16 in.) thickness; disc is scored, warped, cracked, or damaged; hydraulic line is abraded, damaged, or leaking; caliper is leaking; or hydraulic line clamp is missing.

2-3.6. REAR BRAKE ASSEMBLY

1. See Figure 2-31. Check disc (1) for scoring, distortion, warpage, heat checking, cracks, or other damage. Refer to *Service Manual* for repair procedures.

2. Check for leaking caliper (2) and/or hydraulic line (3). Refer to *Service Manual* for repair procedures.

3. Check caliper mounting screws (4) for tightness. Be sure the hydraulic line mounting clamp (5) is present and is securely fastened.

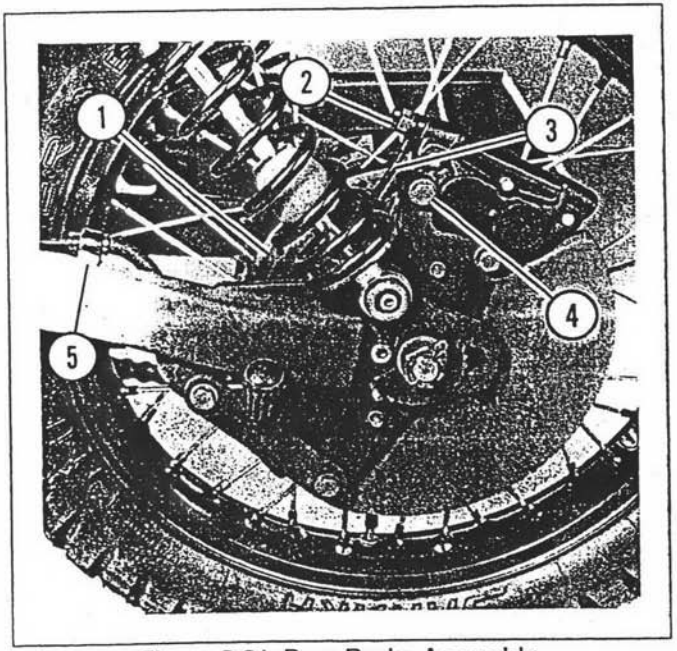


Figure 2-31. Rear Brake Assembly

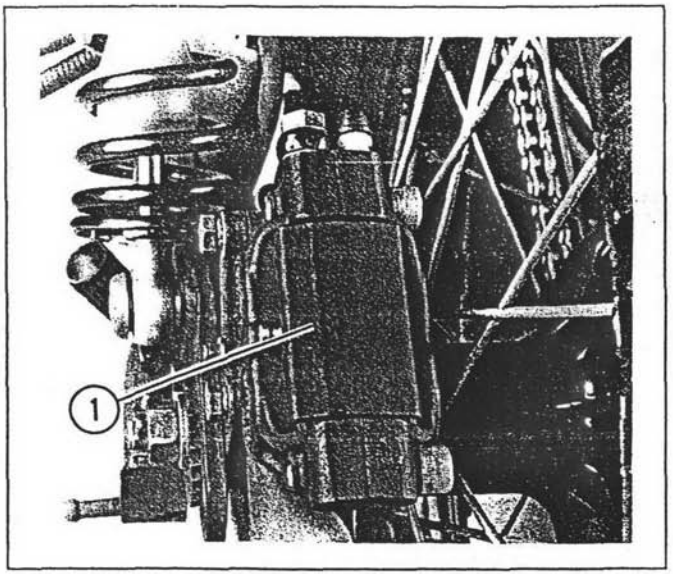


Figure 2-32. Rear Caliper Cover

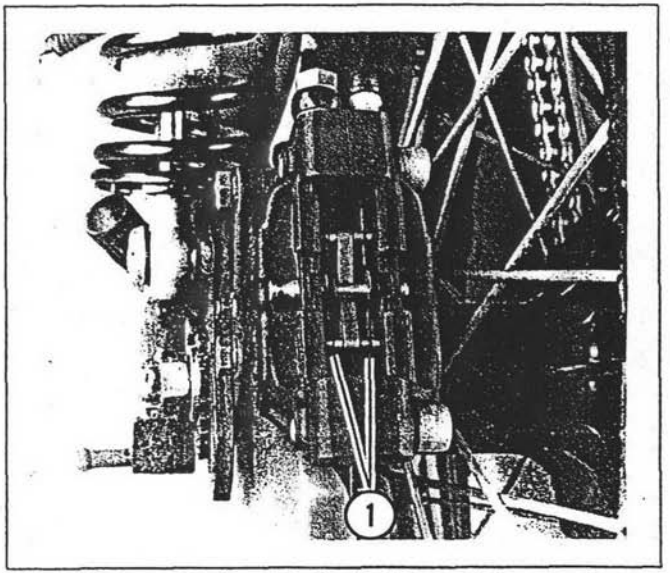


Figure 2-33. Rear Brake Pad Cover Removed

4. See Figure 2-32. Using a flat tip screwdriver, pry off cover (1), from rear brake caliper. See Figure 2-33. Check pads (1) for thickness. If either pad is less than 1.6 mm (1/16 in.) thick or if pads are worn unevenly, refer to *Service Manual* for repair procedures. Install cover.

5. Vehicle is not ready for operation if brake pads are worn to less than minimum thickness of 1.6 mm (1/16 in.); disc is scored, warped, heat checked, cracked, or otherwise damaged; hydraulic line is abraded, damaged, or leaking; caliper is leaking.

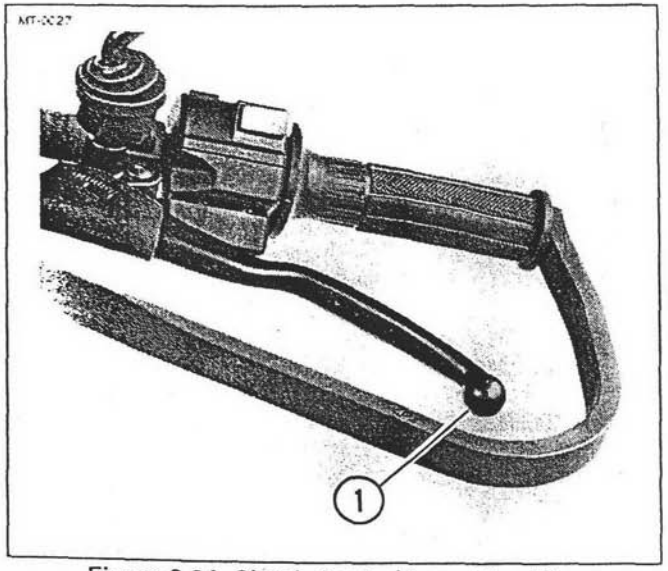


Figure 2-34. Clutch Control Lever Free Play

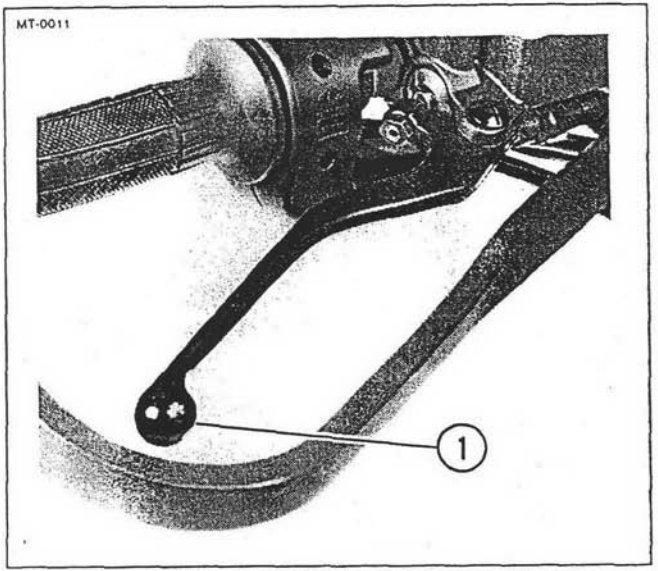


Figure 2-35. Front Brake Lever Free Play

2-3.7. CLUTCH CONTROL LEVER

See Figure 2-34. Check that free play of clutch control lever (1) is 3-5 mm (0.12-0.20 in.) at knob end of lever. If free play is not within this specification, refer to Paragraph 5-8 and adjust.

2-3.8. FRONT BRAKE CONTROL LEVER

See Figure 2-35. Be sure there is 11-13mm free play at knob end of lever (1). See Paragraph 5-9 for adjustment procedure.

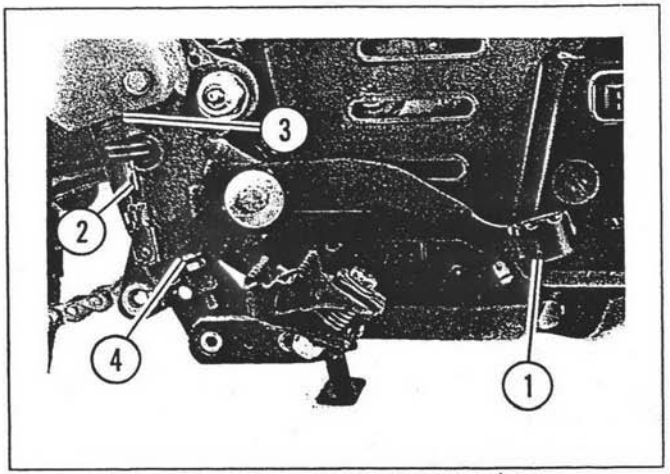


Figure 2-36. Rear Brake Pedal Free Play

2-3.9. REAR BRAKE PEDAL

See Figure 2-36. Depress brake pedal (1) only as far as necessary for push rod (2) to contact piston of master cylinder (3). Measure clearance between brake pedal (1) and adjusting screw (4). Clearance should be 0.8-2.4 mm (1/32 - 3/32 in.). If clearance is not within this specification, refer to Paragraph 5-10 and adjust.

PART III. OPERATION UNDER USUAL CONDITIONS

2-4. GENERAL

2-4.1. ASSEMBLY AND PREPARATION FOR USE

Before operating a new or reconditioned vehicle, perform all daily and weekly PMCS as described in Paragraphs 2-2 through 2-3.

2-4.2. INITIAL ADJUSTMENT AND DAILY CHECKS

Perform the Preventive Maintenance Checks and Services (PMCS) before and after operation to be sure that all adjustments and daily checks required for effective vehicle operation will be completed.

2-4.3. OPERATING PROCEDURES

Familiarize yourself with all the controls, instruments, and procedures before attempting to operate the vehicle.

CAUTION

Never leave the vehicle unattended while the engine is running.

Instructions and procedures required to operate the vehicle under normal conditions follow. Special instructions and procedures for operating under unusual conditions are in Part IV.

2-4.3.1. ENGINE STARTING

NOTE

- *Use the following procedure for starting a cold engine at any ambient temperature. If a warm engine is restarted after only a brief shutdown of a few minutes, follow the same procedure but do not use the enrichener.*

- *If the engine does not start after a few turns or if it fires weakly but does not start, it is usually because of an over-rich (flooded) condition. This is especially true of a hot engine. If the engine is flooded, close the enrichener control lever all the way, turn ignition to ON and operate starter with throttle wide open. Do NOT "pump" the throttle while cranking the engine.*

NOTE

In very cold conditions it is necessary to prime the engine with 2 or 3 turns of the throttle before activating the starter.

CAUTION

Do not crank engine continuously for more than 30 seconds. Wait at least 60 seconds between attempts to start engine in order to allow electric starter motor armature to cool, or damage to starter motor can result. If engine does not start after fourth attempt, refer to *Service Manual*.

1. Turn fuel control valve lever to ON.

2. Turn ignition switch to ON.

3. Shift transmission into neutral. Verify neutral position by checking that NEUTRAL indicator lamp on instrument panel lights.

WARNING

Do not attempt to start engine if throttle will not close completely or snap back quickly.

4. Roll throttle control lever backward and then release to close throttle completely and check throttle operation. Throttle should snap back quickly and smoothly.

5. Move engine run switch to RUN position.

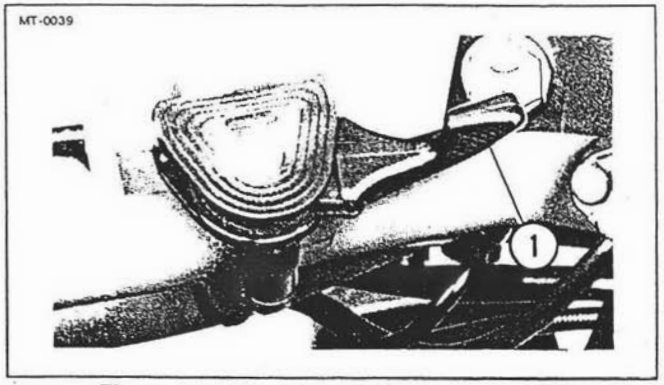


Figure 2-37. Enrichener Control Lever ON

6. See Figure 2-37. Move enrichener control lever (1) counterclockwise 1/4 turn until it points toward operator (ON position).

7. Apply and hold front brake lever and rear brake foot control lever.

NOTE

If engine will not crank by using START button and electric starter, extend kick start lever and push down on it quickly through its full stroke to crank engine. Repeat until engine fires.

8. Depress START switch to crank engine.

9. When engine fires continuously, release START switch.

CAUTION

If engine will not start and run without stalling after four attempts at starting, refer to *Service Manual* for troubleshooting and repair procedures.

10. Modulate engine speed with enrichener control lever until engine is completely warmed up and will maintain a normal idle with lever in OFF (horizontal) position.

11. Release brake control levers.

2-4.3.2. *ENGINE STARTING USING AUXILIARY VEHICLE ELECTRIC POWER (Jump Starting)*

NOTE

Because of the kick start feature of the vehicle, engine starting using an auxiliary vehicle as an electric power source is only recommended when the kick start feature is non-functional and the engine cannot be cranked because of a discharged battery.

WARNING

- ***When making auxiliary power connections, be sure the jumper cable clamps do not accidentally touch each other or anything else except battery terminals or appropriate ground.***
- ***Do not smoke or allow sparks near battery while performing this procedure. Smoking or sparks could cause an explosion.***
- ***Be sure the vehicles are not touching. Metallic parts contact between the two vehicles will cause a common ground which could ignite the gasoline in the tanks.***

NOTE

This procedure presumes the BOOSTER battery is in another vehicle.

CAUTION

- **All Harley-Davidson motorcycles have a 12-volt battery and a 12-volt electrical system. Be sure the booster vehicle has a 12-volt system or electrical components may be damaged.**
- **Be sure radio (if equipped) is turned off. A voltage surge will damage the radio circuits.**

1. Position vehicles near each other, but be sure they are not touching.
2. Turn off all unnecessary electrical equipment in vehicle with discharged battery.
3. Be sure that disabled vehicle transmission is in NEUTRAL.
4. Remove right side panel of disabled vehicle to gain access to battery terminals.
5. See Figure 2-38. Connect one end of a jumper cable to the positive (+) terminal of the DISCHARGED battery.

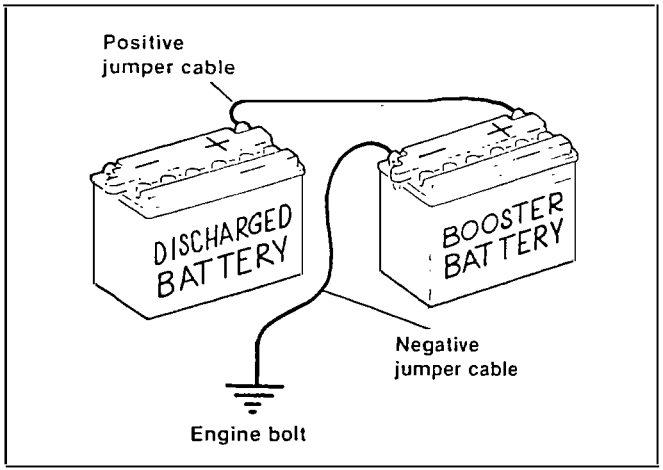


Figure 2-38. Booster Battery Cable Connections

6. Connect the other end of the same cable to the BOOSTER battery positive (+) terminal.

7. Connect one end of a jumper cable to the BOOSTER battery negative (-) terminal.

WARNING

Suggested spot for ground cable connection is ENGINE CASE BOLT of the disabled vehicle.

WARNING

DO NOT connect negative cable to or near the discharged battery negative terminal. If you do, a spark could cause an explosion.

8. Connect the other end of the jumper cable to a good ground on the disabled vehicle, away from the battery.

9. Press engine start switch of the disabled vehicle to start engine.

10. After engine is running smoothly, disconnect booster cables in the reverse order they were connected.

11. Install right side panel on vehicle.

2-4.4. OPERATION OF TURN SIGNAL LAMPS

NOTE

Ignition switch must be in ON position for turn signal lamps to operate when engine is not running.

1. Slide turn signal switch to L position or R position before beginning a left or right turn, respectively.

NOTE

The turn signal lamp switch is not self-cancelling after a turn.

2. After completing a turn, return switch to center (OFF) position to turn off flashing turn signal lamps.

2-4.5. SHIFTING THE TRANSMISSION

CAUTION

The clutch must be fully disengaged before attempting a gear shift.

NOTE

Always start vehicle in motion in first gear.

1. To start moving with vehicle upright and engine idling, pull the clutch lever to disengage clutch fully. See Figure 2-39. Push shifter lever down firmly, but gently, to end of its travel to engage first gear. Then release the clutch lever slowly to engage the clutch and at the same time, open throttle gradually.

2. Engage second gear after the vehicle has run a few meters, as follows: Close the throttle, disengage the clutch and lift the gear shifter pedal up to the end of its travel. Engage the clutch and operate the throttle gradually. Repeat the same operation to engage third, fourth, and fifth gears.

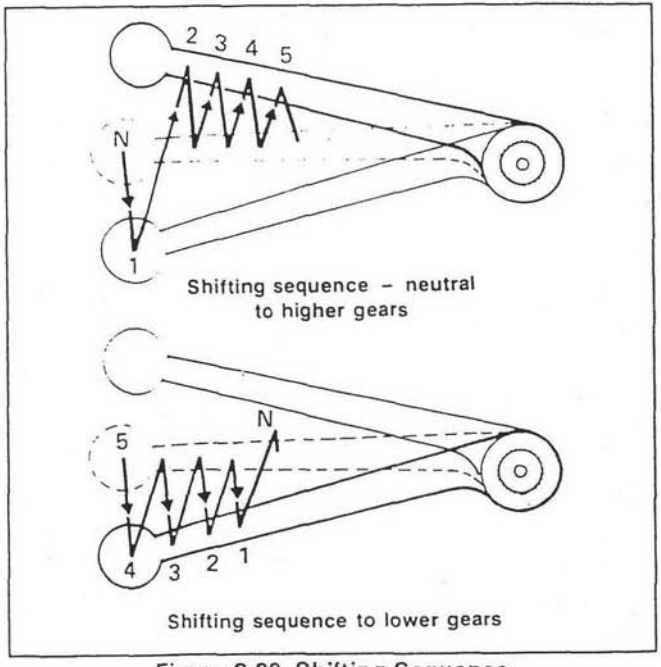


Figure 2-39. Shifting Sequence

WARNING

When shifting to lower gears with the vehicle in motion, do NOT downshift at speeds higher than those listed in Table 2-1. Shifting to lower gears when speed is too high may severely damage the transmission or cause the rear wheel to lose traction.

3. Shift to neutral before stopping the engine. Shifting mechanism can be damaged by shifting gears while engine is stopped.

4. When engine speed decreases, as in climbing a hill or running at a reduced speed, shift to the next lower gear while partially closing the throttle so that the engine accelerates as soon as the clutch lever is pulled.

2-4.6. RIDING THE VEHICLE

CAUTION

Do not idle engine unnecessarily for more than a few minutes if vehicle is stationary.

WARNING

When riding on wet roads or under rainy conditions, braking efficiency is greatly reduced. Caution must be used when applying the brakes, accelerating and turning. This is especially true immediately after the rain begins to fall and the oil from the road surface combines with the rain.

1. After the engine has warmed up and is running smoothly, the motorcycle is ready to ride.

2. Pull in clutch lever and engage 1st gear by pressing down on the gear shift lever. Simultaneously, release clutch lever and gradually open throttle to assure a smooth, positive start.

3. When the engine has reached sufficient RPM, disengage the clutch, lift the gear lever to shift into 2nd gear, and simultaneously close the throttle. Release the clutch and open the throttle to accelerate further.

4. Use the same procedure to shift progressively up to 3rd, 4th, and 5th gears.

5. When stopping or slowing, use front and rear brakes simultaneously and coordinate down shifting with the rate of deceleration so as to stop in 1st gear.

6. When descending a long, steep grade, downshift and use engine compression together with intermittent application of both brakes to slow the motorcycle. Avoid continuous use of the brakes which may overheat them and cause reduced braking efficiency.

7. Do not coast for a long distance with the engine off, because the transmission is properly lubricated only when the engine is running. To prevent transmission damage, do not tow the motorcycle.

2-4.7. MIRRORS

When seated on the vehicle, always adjust the two rear view mirrors before beginning to drive.

WARNING

Objects in mirrors are closer than they appear to be.

The mirrors are the convex type. A convex mirror has a surface. This type of mirror is designed to give a much wider view to the rear of the vehicle than a flat mirror. However, cars and other objects seen in this type of mirror will look smaller and farther away than when seen in a flat mirror. Therefore, you must use care when judging the size or distance of objects seen in these mirrors.

NOTE

Adjust mirrors so that you can see a small portion of your shoulders in each mirror. This will help you establish the relative distance of other vehicles to the rear of your vehicle.

2-4.8. *STOPPING DISTANCE*

See Figure 2-40. The information presented represents results obtainable by skilled operators under controlled road and vehicle conditions. The information may not be correct under other conditions.

These figures indicate braking performance that can be met or exceeded by the vehicle without locking the wheels, under different conditions of loading.

2-4.9. *ENGINE BREAK-IN PERIOD*

When first riding a new vehicle or one that has just had an engine overhaul, the throttle must not be opened more than halfway for the first thirty (30) minutes of operation. Also, observe proper gear shift speeds to prevent engine lugging.

For the first five hours of new or overhauled engine operation, the engine should not be run at excessively high RPM. Vary the engine speed frequently, shifting up and down as required to prevent the engine from running too fast or too slow. Accelerate at a moderate rate. Avoid sudden changes in throttle opening, as from idle to fully open.

During the five-hour engine break-in period, always allow the engine to warm up completely before operating the vehicle.

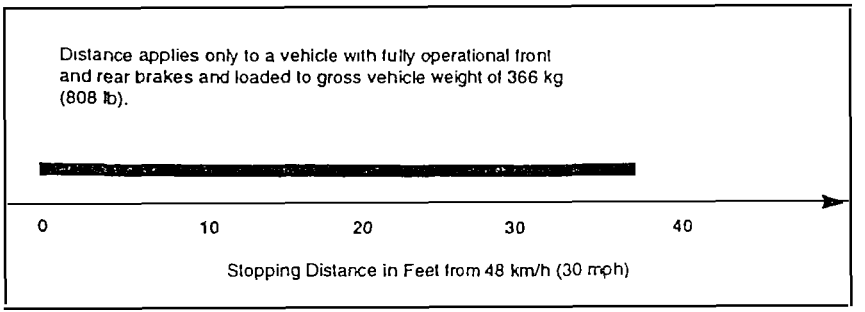


Figure 2-40. Stopping Distance

PART IV. OPERATION UNDER UNUSUAL CONDITIONS

Special care in cleaning and lubrication must be observed where extremes of temperature, humidity, and terrain are present or expected. Proper cleaning and lubrication of equipment is necessary for satisfactory operation and also guards against excessive wear and failure of equipment.

2-5. OPERATION IN UNUSUAL WEATHER

2-5.1. EXTREME MOIST HEAT

1. Lubricate the vehicle at more frequent intervals.
2. Check level of battery electrolyte daily. Add distilled or rain water, if necessary. Batteries self-discharge at a high rate when not in use. If vehicle is not going to be used for several days, disconnect battery.
3. Keep the vehicle and equipment clean and dry.
4. Inspect often for corrosion, moisture, and fungus growth. Dry moisture and remove corrosion and fungus growth.
5. Do not park vehicle in sun for long periods. If shelter is not available, cover vehicle with tarpaulin. Hang tarpaulin above vehicle, if possible, to allow air circulation.

2-5.2. EXTREME DRY HEAT

1. Lubricate the vehicle more often.
2. Check level of battery electrolyte daily. Add distilled or rain water, if necessary. Batteries self-discharge at a high rate when not in use. If vehicle is not going to be used for several days, disconnect battery.
3. Do not park vehicle in sun for long periods. If shelter is not available, cover vehicle with tarpaulin. Hang tarpaulin above vehicle, if possible, to allow air circulation.

2-5.3 EXTREME DUST OR SAND

1. Lubricate the trailing arm pivot pin more often.
2. When halted, cover the vehicle with a tarpaulin.
3. Remove excess lubricant on exposed and noncritical surfaces. This will prevent windblown dust and sand from sticking to the lubricant and forming an abrasive.
4. Inspect air box filter element daily.

2-5.4. SALT AIR OR SEA SPRAY

1. Keep the vehicle clean and dry. If not in daily use, wash with fresh (non-salty) water at least once weekly.

2. Inspect often for corrosion. Remove corrosion and paint areas where paint is cracked or peeling.

3. If vehicle has been operated in salt water, wash with fresh (non-salty) water and allow to dry.

2-5.5. EXTREME COLD

Extreme cold will cause lubricants to thicken, prevent battery from furnishing enough current for starting, and prevent fuel from vaporizing and properly combining with air to form a combustible mixture for starting.

Be cautious when operating after a shutdown. Components may be frozen in place. Tires may have frozen to the ground. Thickened lubricants may cause a failure.

1. Use only fuel blended for cold weather operation.

2. Keep battery fully charged. The colder it gets, the more battery output is reduced. Run engine for five (5) minutes immediately after adding water to battery to mix water and battery electrolyte to prevent freezing.

3. Start engine by following cold weather starting procedure for enrichener use.

CAUTION

Be careful when chipping tires away from frozen ground or snow. Punctured or damaged tires could delay or jeopardize the mission.

4. Do not use vehicle power to break out tires frozen to ground. Chip away frozen material until vehicle can be lifted free.

5. When starting operation, drive slowly in 1st gear for 100 meters (328 ft) to warm engine/transmission oil and circulate it thoroughly before increasing load and speed.

6. Cover or shelter vehicle when halted if there is a threat of snow or freezing rain. Park vehicle on planks, solid ground, or brush to prevent tires from freezing to ground.

2-6. OPERATION ON UNUSUAL TERRAIN

2-6.1. MUD

1. Operate vehicle with transmission in a low gear.
2. Keep vehicle moving steadily to avoid digging in tires.
3. If vehicle becomes stuck, do not dig tires in further by attempting to drive out. Arrange for vehicle to be towed out if it cannot be pushed out.
4. If freezing temperatures are expected, be sure to park on solid ground to avoid having tires freeze in the mud.

2-6.2. SNOW

1. Operate vehicle with transmission in a low gear range.
2. Avoid grades and sharp turns when possible.
3. It may be possible for the vehicle to be operated on heavily crusted snow with only occasional breakthroughs. To climb back onto the crust, reduce engine speed and shift into 1st gear to achieve a very low wheel speed for forward movement without slippage.

2-6.3. ICE

1. Select a higher gear range to move the vehicle steadily without causing much strain to the engine.
2. Operate vehicle cautiously and slowly to avoid skidding. If vehicle skids, slow down engine and proceed with caution. Do NOT spin rear wheel.
3. Avoid grades and sharp turns, if possible.

2-6.4. SAND

1. The main point to remember when operating in sand is to avoid spinning the rear wheel.
2. Drive slowly and use a gear high enough to move the vehicle steadily without causing much strain on the engine.

2-6.5. FORDING

The vehicle is designed to cross a body of water up to 45.7 cm (18 in.) deep.

CAUTION

Do not ford water that exceeds 30.5 cm (12 in.) in depth. Check for soft mud or sandy bottoms. Decrease the 30.5 cm (12 in.) fording depth by the amount that the vehicle will sink in.

NOTE

To judge whether or not a body of water is fordable, remember that the fording depth limit is approximately equal to the top of the front brake disc guard. Do NOT proceed if water rises above this level.

1. Coat unpainted metal parts with preservative lubricating oil.

2. Shift into 1st gear and enter water slowly. Do not exceed 6 kph (4 mph) while fording.

3. Speed up vehicle when exiting water.

4. After fording, clean and dry vehicle. Be sure all mud and debris are removed.

5. Remove oil filler cap/dipstick and check lubricating oil for evidence of water, such as a froth or foam on the dipstick. If there is evidence of water in the lubricating oil, drain and refill the engine/transmission oil at once or serious engine damage may result.

6. Check air box filter element and replace if wet.

NOTE

If vehicle has forded salt water, wash thoroughly with fresh (non-salty) water and dry completely.

SECTION 3

LUBRICATION INSTRUCTIONS

PART I. LUBRICATION INTERVALS (USUAL CONDITIONS)

Lubrication intervals for normal operation in moderate temperature, humidity and air conditions are given in Table 3-1.

Table 3-1. Normal Lubrication Service Intervals

Service Operation	Interval
Drive Chain	Daily or Before Operations
Engine Oil and Filter* Trailing Arm Pivot Control Lever Pivots Foot Peg Hinges Rear Brake Pedal Pivot Kick Start Lever Pivot Side Stand Hinge Center Stand Front Brake Stop Light Switch	4,000 km (2,500 miles) or monthly (whichever occurs first)
Crankcase Oil Sieve*	8,000 km (5,000 miles) (Every other oil and filter service)

* Initial service after first 800 km (500 miles) of operation on a new or rebuilt engine.

PART II. LUBRICATION INTERVALS (UNUSUAL CONDITIONS)

Lubricate more often when operating in unusual conditions: high or low temperatures, prolonged periods of high speed operation, continued operation in sand or dust, immersion in water or exposure to moisture. These conditions impair the protective properties of lubricants.

CAUTION

Always use clean lubricants. Lubricants contaminated with grit, dust or sand act as an abrasive mixture and cause rapid wear of parts.

PART III. OPERATOR LUBRICATION

3-1. DRIVE CHAIN

Refer to Paragraph 1-7.

3-2. ENGINE OIL AND FILTER

3-2.1. REMOVAL

1. Start engine and run until engine reaches normal operating temperature, then stop engine.
2. Remove oil filler cap/dipstick.

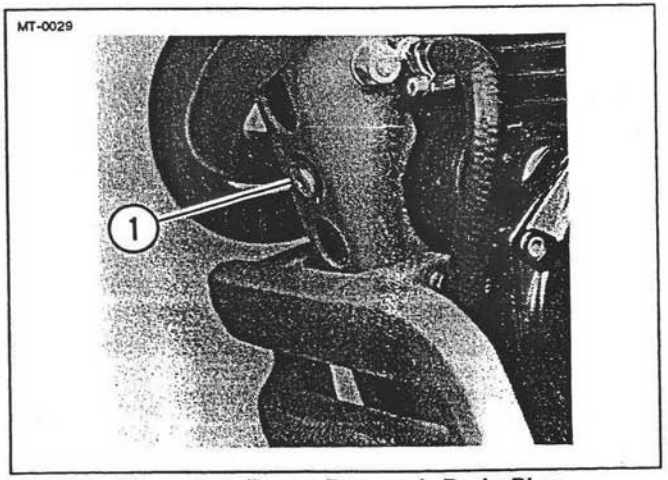


Figure 3-1. Frame Reservoir Drain Plug

3. See Figure 3-1. Using a 5 mm hex key, remove socket head plug (1) on front side of frame tube and drain oil from reservoir in frame.

4. See Figure 3-2. Using a 5 mm hex key, remove socket head screws (1) and chain cover (2) from right crankcase assembly.

5. See Figure 3-3. Using a 5 mm hex key, remove socket head screws (1) and oil filter cover (2).

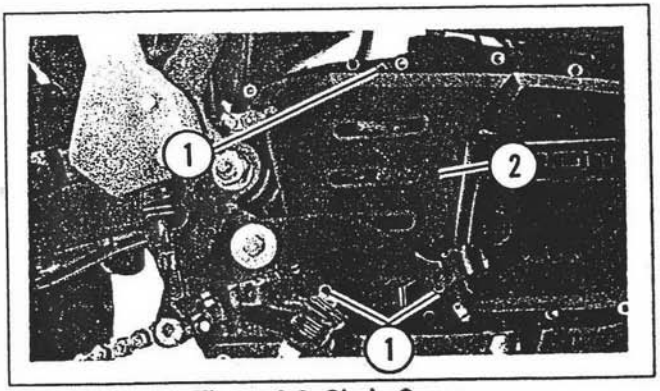


Figure 3-2. Chain Cover

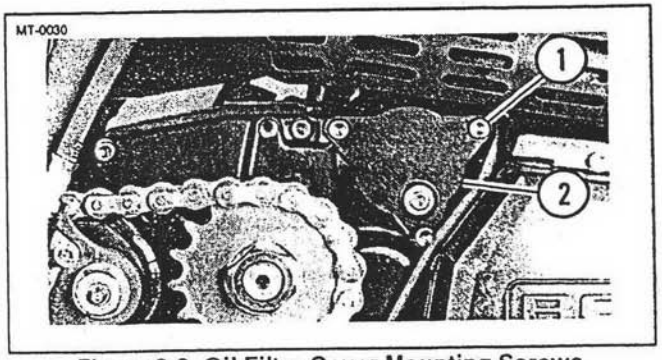


Figure 3-3. Oil Filter Cover Mounting Screws

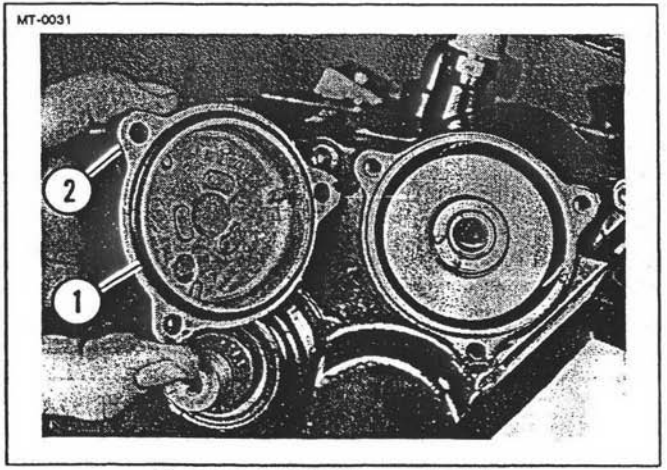


Figure 3-4. Oil Filter and O-Ring

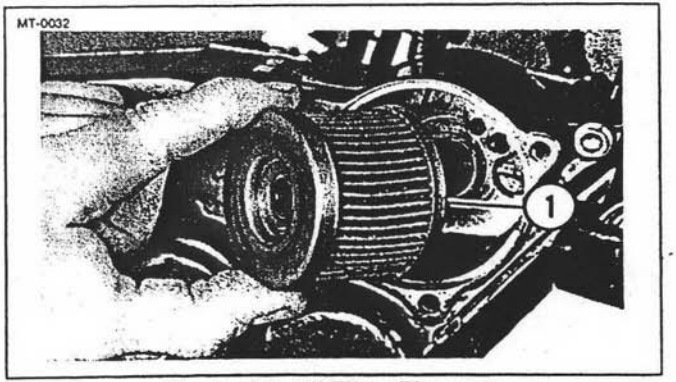


Figure 3-5. Oil Filter Element

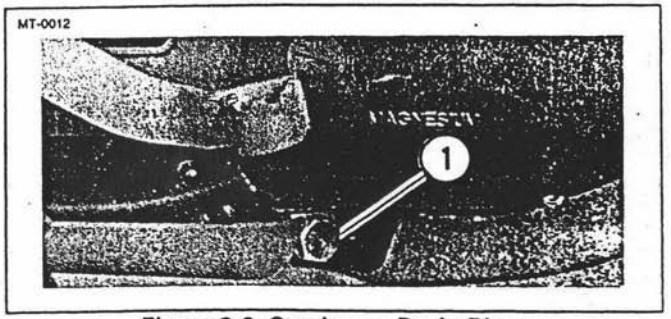


Figure 3-6. Crankcase Drain Plug

6. See Figure 3-4. Remove O-ring (1) from cover (2).

7. See Figure 3-5. Remove and discard filter element (1).

8. See Figure 3-6. Using a 17 mm box wrench, remove drain plug (1) and gasket ring from sieve cover at bottom of crankcase and allow oil to drain into a suitable container. Discard gasket ring.

3-2.2. INSTALLATION AND REFILLING

NOTE

Be sure drain plug is clean before installing in sump cover.

1. See Figure 3-6. Using a ***17 mm box wrench*** (not included in tool kit), install drain plug (1) into cover on right side of crankcase.

2. See Figure 3-5. Install new filter element (1).

3. See Figure 3-4. Install new O-ring (1) on filter cover (2).

4. See Figure 3-3. Using a 5 mm hex key, install filter cover (2) and secure with socket head screws (1).

5. See Figure 3-2. Using a 5 mm hex key, install chain cover (2) on right crankcase assembly and secure with socket head screws (1).

6. See Figure 3-1. Using a 5 mm hex key, install socket head drain plug (1) into front side of frame tube.

7. Add oil of specified type to reservoir until groove on dipstick is reached. See Paragraph 1-7.

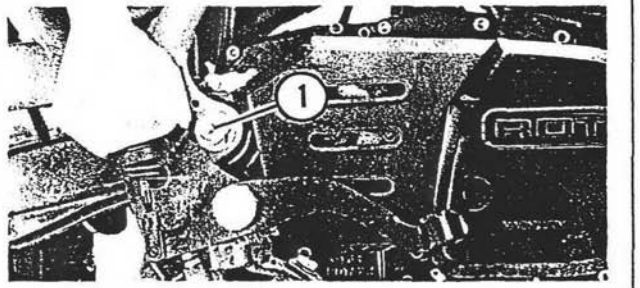


Figure 3-7. Trailing Arm Pivot Grease Fitting

8. Start engine and run until normal operating temperature is reached. Stop engine. Check oil level again and add or drain oil as required so that level is at groove on dipstick.

3-3. SWING ARM PIVOT

1. See Figure 3-7. Using a rag, remove dirt from lubrication fitting (1).

2. Using a hand-operated grease gun, lubricate swing arm pivot lubrication fitting (1) with number 2 soap-based lithium grease.

3. Wipe away any excess grease from trailing arm pivot with rag.

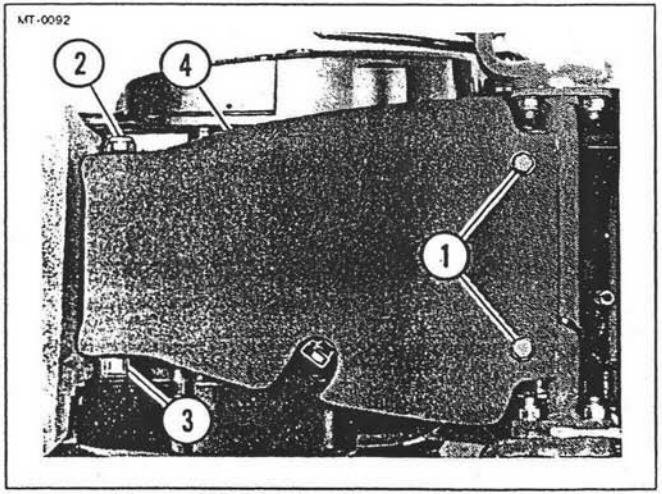


Figure 3-8. Engine Sieve Cover Guard

3-4. ENGINE CRANKCASE OIL SIEVE

3-4.1. REMOVAL

1. Refer to page 3-2. Drain engine oil and remove oil filter element. Discard filter element.

2. See Figure 3-8. Using a 13 mm wrench, remove screws (1), two lock washers, and flat washers.

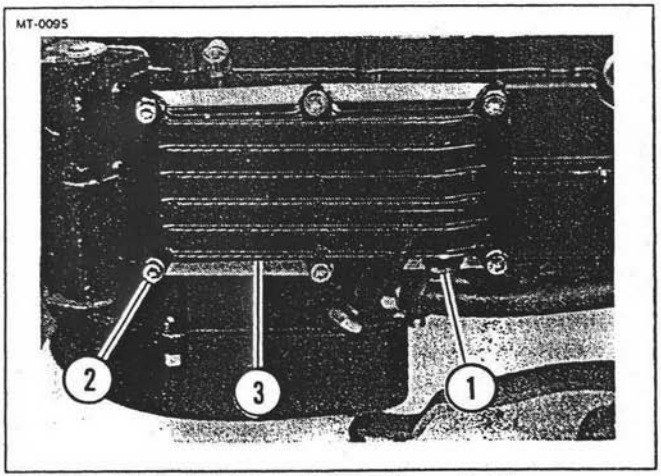


Figure 3-9. Sieve Cover Magnetic Plug

3. Using an 8 mm hex key and a 17 mm box wrench, remove self-locking nut (2), flat washer, socket head bolt (3), flat washer, and sump guard (4). Discard self-locking nut.

4. See Figure 3-9. Using a 6 mm hex key, remove magnetic plug (1) from engine sieve cover.

5. Using a 5 mm hex key, remove socket head screws (2) and sieve cover (3).

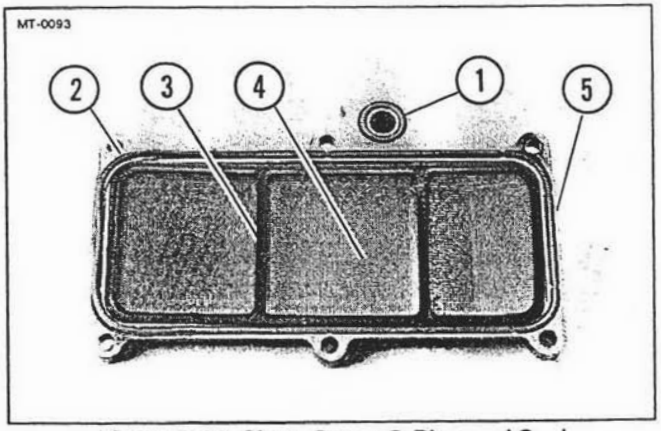


Figure 3-10. Sieve Cover O-Ring and Seal

6. See Figure 3-10. Remove and discard O-ring (1) and rectangular seal (2).

7. Remove three-compartment gasket (3) and screen (4) from sieve cover (5). Do not discard gasket. It can be reused if it is not broken or damaged.

3-4.2. INSTALLATION

1. Thoroughly clean sieve cover, screen, three-compartment gasket, and magnetic drain plug.

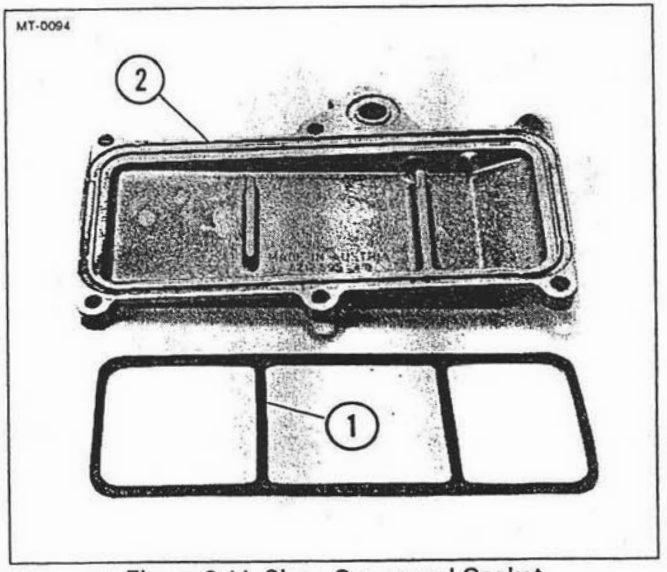


Figure 3-11. Sieve Cover and Gasket

NOTE

See Figure 3-11. When installing screen and gasket in Step 2 below, be sure to install gasket (1) so that ribs of gasket are aligned with ribs cast into cover (2).

2. See Figure 3-10. Install screen (4) and gasket (3) onto cover (5). Install a new rectangular seal (2) and a new O-ring (1) onto cover. If seal will not stay in groove in cover, apply a thin film of bearing grease to keep it in place.

3. See Figure 3-9. Position cover (3) onto crankcase and secure with socket head screws 2). Tighten screws with a 5 mm hex key.

4. See Figure 3-9. Using a 6 mm hex key, install magnetic drain plug (1) into sieve cover (3).

5. See Figure 3-12. Using a 17 mm box wrench, install drain plug (1) into sieve cover.

6. See Figure 3-8. Using an 8 mm hex key and a 17 mm box wrench, install sump guard (4), flat washer, socket head bolt (3), flat washer, and new self-locking nut (2).

7. Using a 13 mm wrench, install flat washers, lock washers, and screws (1) to secure guard to vehicle frame.

8. Refill reservoir with specified engine oil (Paragraph 1-7) until "Full" groove of dipstick is reached.

9. Start engine and run until normal operating temperature is reached. Stop engine. Check oil level and adjust until level is at groove on dipstick.

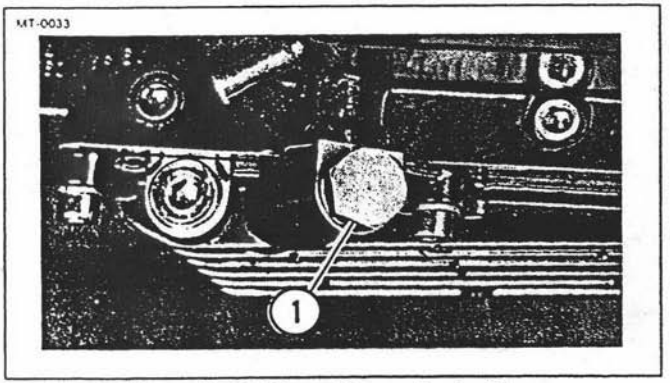


Figure 3-12. Sieve Cover Drain Plug

3-5. OIL CAN POINTS

See Figures 3-13 and 3-14. Using a hand-operated oiler, lubricate the points shown in the illustrations with clean engine oil every 4,000 km (2,500 miles) or monthly, whichever occurs first.

1. Clutch control lever pivot
2. Passenger's foot peg hinge
3. Side stand hinge
4. Operator's foot peg hinge
5. Kick start lever pivot
6. Center stand pivot

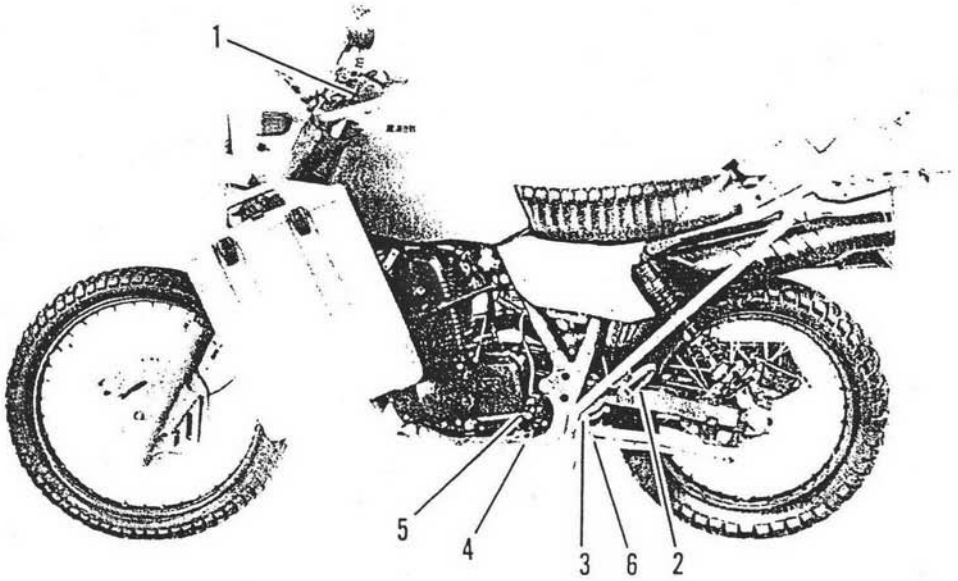


Figure 3-13. Oil Can Points, Left Side of Vehicle

1. Front brake control lever pivot
2. Operator's foot peg hinge
3. Rear brake pedal pivot
4. Passenger's foot peg hinge
5. Front brake lever brake light switch

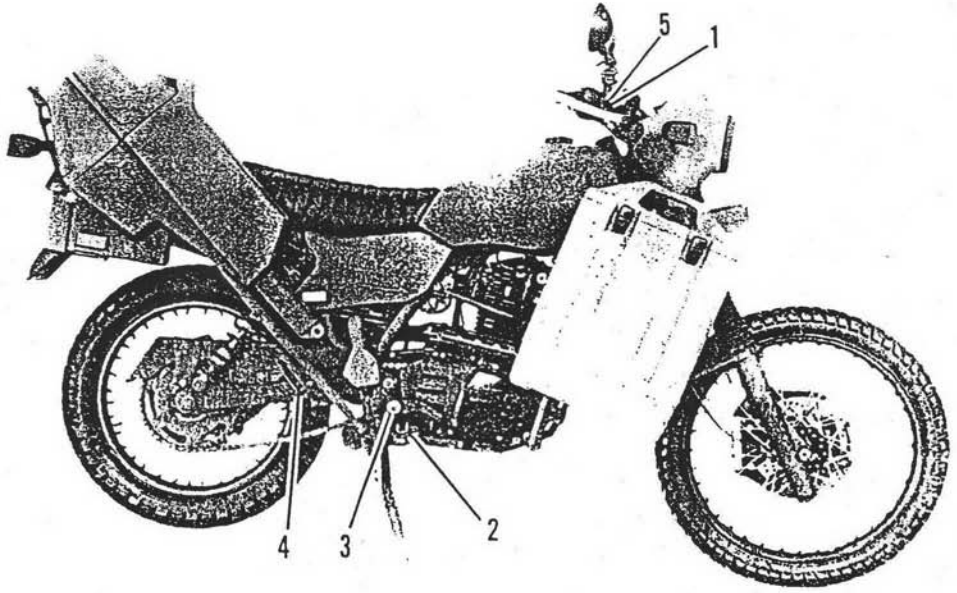


Figure 3-14. Oil Can Points, Right Side of Vehicle

SECTION 4

TROUBLESHOOTING INSTRUCTIONS

SCOPE OF TROUBLESHOOTING SECTION

4-1. GENERAL

This troubleshooting section lists the common malfunctions which may occur during the operation or maintenance of the vehicle. You should perform the tests/inspections and corrections in the order listed.

Each troubleshooting situation states the malfunction, the tests or inspections to perform to locate the cause of the malfunction, and any corrective action to be taken.

This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, refer to the *Service Manual*.

4-2. ENGINE

*4-2.1. ENGINE FAILS TO CRANK OR CRANKS SLOWLY WHEN **START** SWITCH IS DEPRESSED*

Step 1. Check that ignition switch is set to ON.

Step 2. Check that engine run switch is ON.

Step 3. Check battery cables and terminals. Clean and tighten loose connections at battery terminals and ground connection at vehicle frame. If cables are broken, refer to *Service Manual* for replacement procedure

Step 4. Check state of battery charge. Refer to *Service Manual* and test specific gravity of battery electrolyte.

Step 5. Check viscosity of engine oil. Use only oil specified in Paragraph 1-7. Oils with higher viscosity numbers will be too thick when temperature is cold to permit normal engine cranking speed.

Step 6. See Figure 4-1. Remove right side panel. Check that all electrical leads are securely connected to starting motor relay (1). Clean and tighten loose connections. If any cables are missing or damaged, refer to *Service Manual* for replacement procedure.

Step 7. See Figure 4-2. Check that power lead (1) is securely connected to starting motor. Clean and tighten lead as required. If lead is missing or damaged, refer to *Service Manual* for replacement procedure.

4-2.2. ENGINE CRANKS AT NORMAL SPEED BUT FAILS TO START

Step 1. Check to see that there is sufficient fuel in fuel tank to start engine.

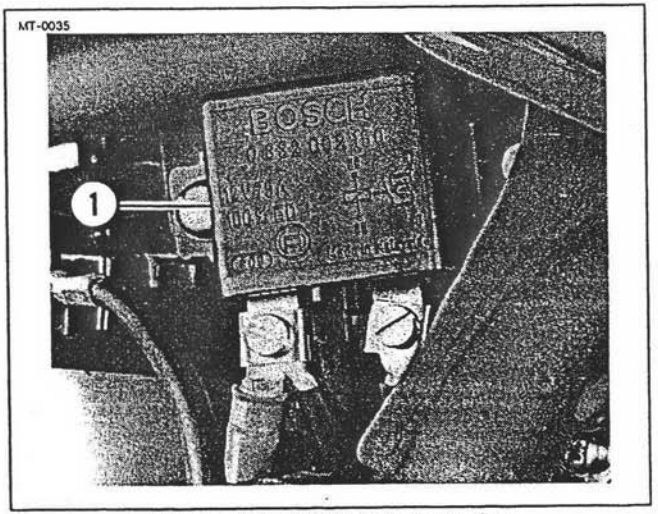


Figure 4-1. Starting Motor Relay

Step 2. See Figure 4-3. Check to see that fuel control valve lever (1) is ON.

Step 3. See Figure 4-4. Check condition of fuel supply hose (1). Be sure it is connected to the control valve (2) and to the carburetor. If hose is cracked or leaking, refer to *Service Manual* for replacement procedure.

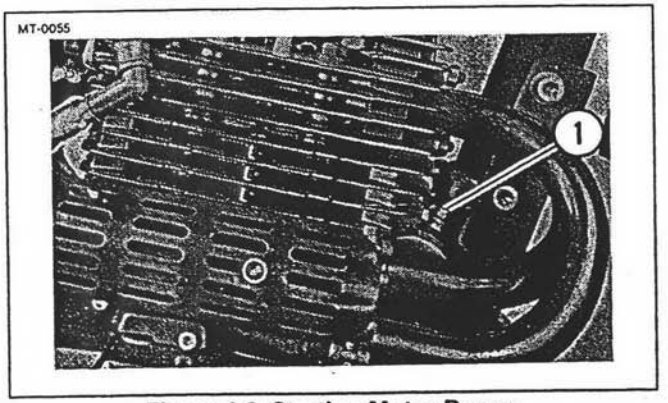


Figure 4-2. Starting Motor Power

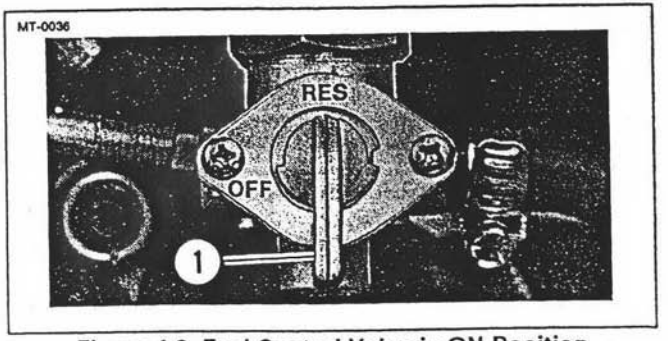


Figure 4-3. Fuel Control Valve in ON Position

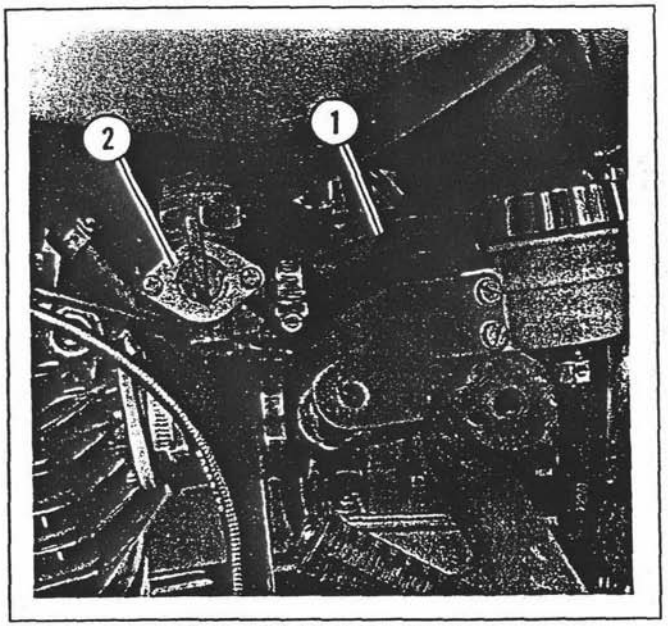


Figure 4-4. Fuel Supply Hose

WARNING

Do NOT touch spark plug cable while engine is being cranked or is running.

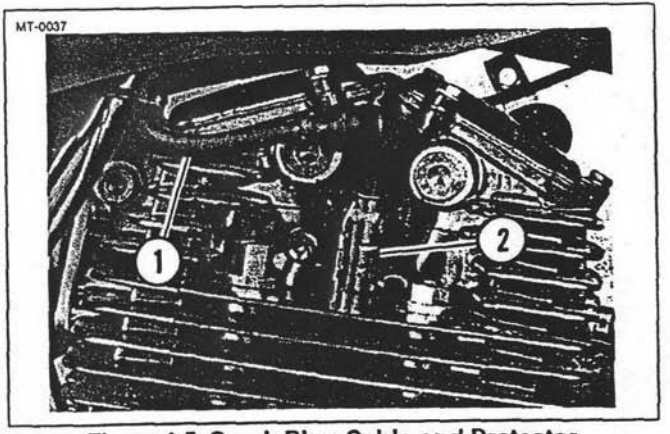


Figure 4-5. Spark Plug Cable and Protector

Step 4. See Figure 4-5. Check spark plug cable (1) to be sure that it is connected *securely* to spark plug protector (2).

Step 5. Check spark plug cable condition. Replace spark plug cable if insulation is hardened, cracked, torn, cut, or otherwise damaged. Refer to *Service Manual* for replacement procedure.

Step 6. Check for fouled, wet, or incorrectly gapped spark plug. Using spark plug socket and screwdriver from vehicle tool kit, remove sparkplug and examine plug for fouling, wetting by fuel, or incorrect electrode gap. Clean, dry, regap, or replace plug as required. Refer to Paragraph 5-6 for installation procedure.

CAUTION

Do not crank engine continuously for more than 30 seconds. Wait at least one minute (60 seconds) between attempts to start engine in order to allow starter armature to cool, or damage to starter can result. If engine does not start after fourth attempt, refer to *Service Manual.*

Step 7. See Figure 4-6. Check for flooded engine caused by over-use of carburetor enrichener. Set enrichener control lever (1) to OFF position. Open throttle completely and crank engine until engine begins to fire, then stop cranking. Close throttle. Crank engine again and start in normal manner.

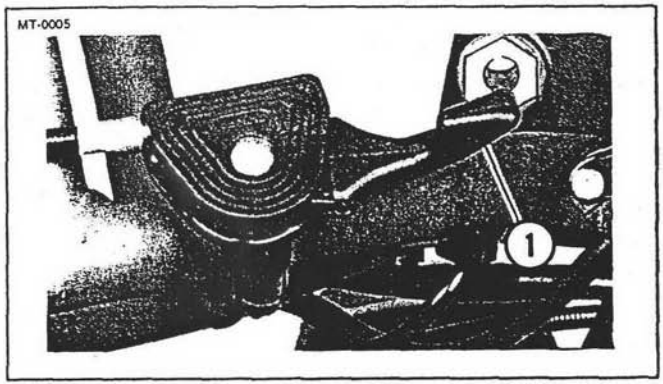


Figure 4-6. Enrichener Control Lever in OFF Position

4-2.3. ENGINE STARTS BUT RUNS UNEVENLY (ROUGHLY), ACCELERATES POORLY, OR DOES NOT DEVELOP FULL POWER

Step 1. Check for dirty or clogged air filter element (see Paragraph 2-3).

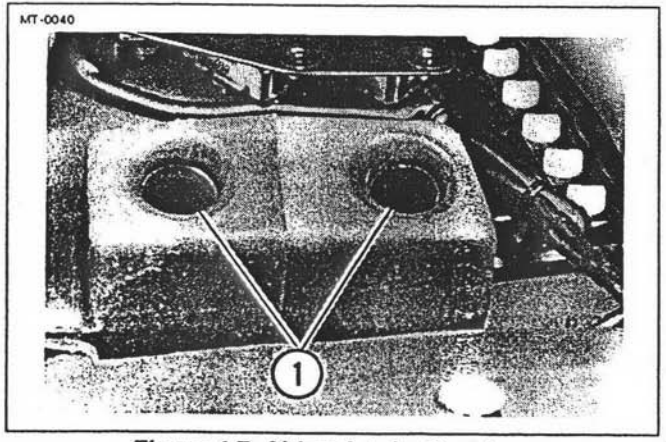


Figure 4-7. Airbox Intake Openings

Step 2. See Figure 4-7. Check for airbox intake obstruction. Remove seat and be sure that airbox intake openings (1) are not obstructed.

Step 3. Refer to page 4-3 and check fuel supply hose and connections for leaks, cracks or other damage.

Step 4. See Figure 4-8. Check crankcase breather tube (1) for cracks or damage. Be sure connection at frame (1) is tight.

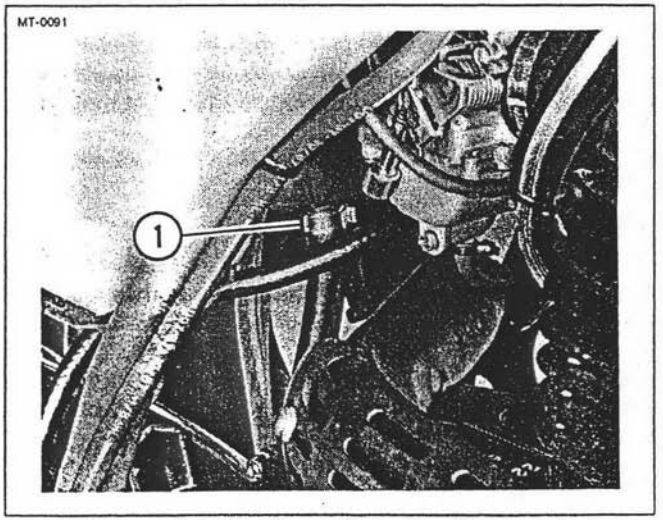


Figure 4-8. Crankcase Breather Tube and Connection at Frame Reservoir

Step 5. See Figure 4-9. Check tube connection (1) at engine. Tighten clamp if loose. Refer to *Service Manual* for replacement procedure if tube is damaged or missing.

Step 6. Check for fouled or incorrectly gapped spark plug.

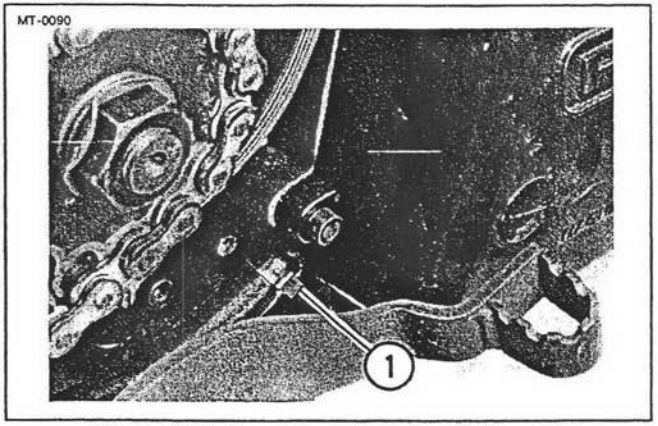


Figure 4-9. Crankcase Breather Tube and Connection at Engine Crankcase

Step 7. Check for exhaust restriction. Be sure spark arrestor is completely open to exhaust flow. Remove all foreign material from spark arrestor. Check muffler and exhaust pipes for dents which cause restriction. Refer to *Service Manual* for exhaust system replacement procedures.

Step 8. Check for contaminated fuel. Drain fuel tank. Refill fuel tank with clean, unleaded gasoline of at least 87 pump octane rating.

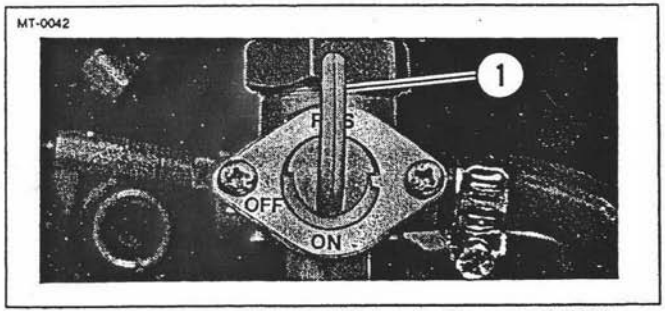


Figure 4-10. Fuel Control Valve in Reserve (RES) Position

4-2.4. ENGINE SPEED VARIES OR ENGINE STALLS FREQUENTLY

Step 1. Check fuel level in tank. See Figure 4-10. If fuel level is low, set fuel control lever (1) to Reserve (RES) position, then fill tank as soon as possible.

Step 2. Check for fuel line leaks. Check fuel supply hose and connections.

Step 3. Check throttle for smoothness of action. If throttle cable is binding, caught, or does not work smoothly, refer to *Service Manual* for repair procedure.

Step 4. Check for restricted fuel filler cap vent. Replace cap with a known good cap. If problem disappears, discard original cap.

4-2.5. ENGINE KNOCKS OR PINGS

Step 1. Check spark plug type. Be sure spark plug is one of the types specified (see Paragraph 1-7).

Step 2. Check fuel quality. Drain fuel tank (see Paragraph 5-2) and refill with 87 pump octane unleaded gasoline. Do NOT use gasohol.

4-2.6. EXCESSIVE SMOKE FROM EXHAUST AFTER ENGINE IS WARMED UP

Check for dirty, clogged, or wet air filter element. Clean, replace, or dry air filter element. If excessive smoke is still present, refer to *Service Manual.*

4-2.7. ENGINE WILL NOT SHUT DOWN BY USING ENGINE RUN SWITCH

Stop engine by turning ignition switch OFF. Refer to *Service Manual* and troubleshoot defect in electrical wiring or switch.

4-2.8 ENGINE ACCELERATES UNCONTROLLABLY

Stop engine by using engine RUN switch or ignition switch. Refer to *Service Manual* and repair throttle control cable or carburetor.

4-3. ELECTRICAL

NOTE

The use of lithium grease is recommended on all electrical connections.

4-3.1. TURN SIGNAL LAMPS DO NOT OPERATE

Check individual lamp bulbs. See Paragraph 5-4.3 and remove and replace lamp bulbs as required. If lamps still do not operate, refer to *Service Manual.*

4-3.2. HEADLAMP IS DIM

Step 1. Check for loose or corroded battery cable connections. Clean and tighten connections.

Step 2. Check low voltage indicator lamp. If lamp is on, refer to *Service Manual* for troubleshooting procedure.

Step 3. Check for corroded or dirty headlamp reflector. Refer to *Service Manual* if headlamp reflector replacement is required.

4-3.3. HORN DOES NOT SOUND

Step 1. See Figure 4-11. Check electrical lead (1) to be sure it is connected to terminal on horn (2). Check that horn is grounded at mounting bracket capscrew (3).

Step 2. Replace horn with a known good horn. If problem is gone, discard original horn.

4-4. CLUTCH

Clutch slips or drags.

Check clutch control lever free play (see page 2-29) and adjust to specification (see Paragraph 5-8).

4-5. BRAKES

4-5.1. FRONT BRAKE APPLIES WITH LESS THAN NORMAL FORCE

Step 1. Check fluid reservoir level (see Paragraph 2-2.3). Fill reservoir with specified brake fluid (DOT 3) to correct level.

Step 2. Check brake control lever free play. Adjust free play to specification (see Paragraph 5-9).

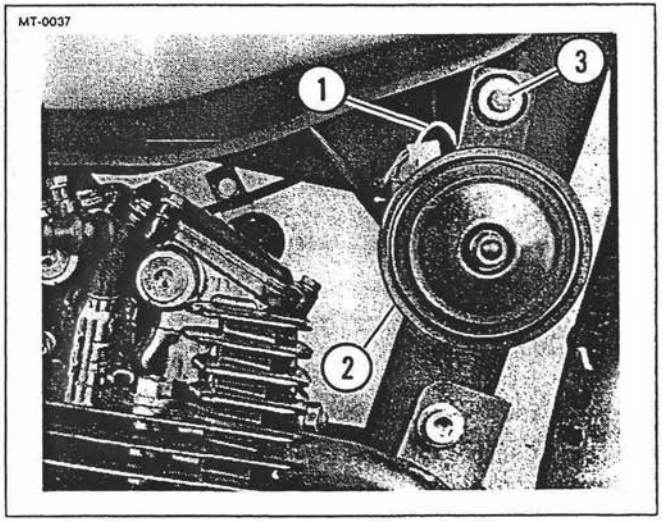


Figure 4-11. Horn and Electrical Lead

4-5.2. REAR BRAKE APPLIES WITH LESS THAN NORMAL FORCE

Check brake pedal free play at pedal tip. Adjust pedal free play to specification (see Paragraph 5-2).

NOTES

SECTION 5

OPERATOR MAINTENANCE INSTRUCTIONS

OPERATOR MAINTENANCE INSTRUCTIONS

This chapter provides maintenance instructions that can be performed by the operator.

The items provided in the tool kit issued with the vehicle are useful in performing many of the procedures described in this chapter. In some procedures, however, tools not included in the vehicle tool kit will be required. When such tools are required, they will be identified in the text by boldface italic type. For example:

> Using an ***8 mm hex driver attachment*** and a ***1/2-inch square-drive torque wrench***, tighten axle nut to 68 N-m (50 ft-lb).

5-1. AIRBOX FILTER ELEMENT

5-1.1. REMOVAL

1. See Figure 5-1. Remove left side panel (1).

2. See Figure 5-2. Using straight blade in end of screwdriver grip from vehicle tool kit, remove screws (1), plastic washers (2), and airbox lid (3).

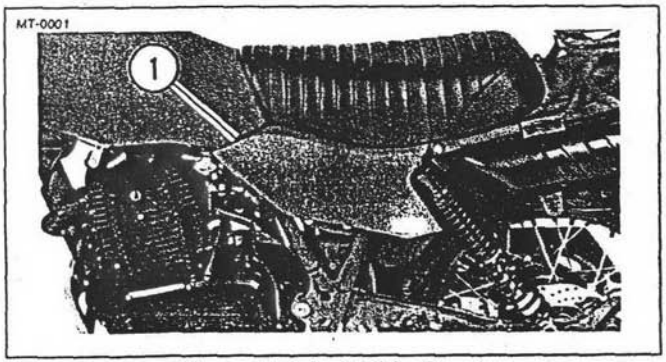


Figure 5-1. Left Side Panel

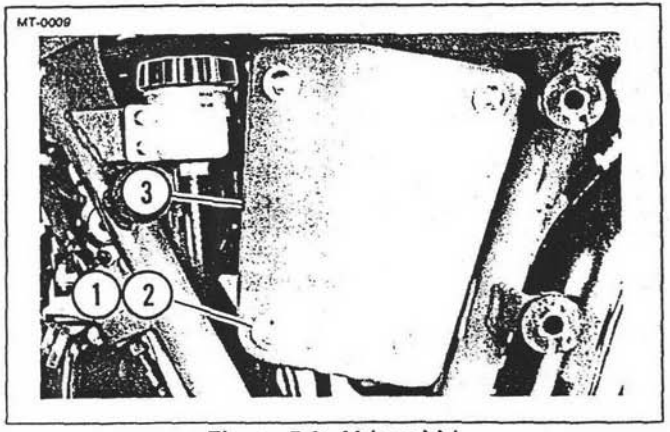


Figure 5-2. Airbox Lid

3. See Figure 5-3. Remove U-channel (1) and airbox filter element (2).

5-1.2. INSPECTION

1. Inspect element for accumulated dirt, oil, or other foreign matter. Do not attempt to clean a dirty element. Discard a dirty element and replace it with a new one.

2. Inspect element for damage, such as punctures or tears. Do not use a damaged element; always replace it with a new one.

3. Inspect seal glued to inside surface of airbox lid. Seal should be resilient. If seal is hardened, torn, or otherwise damaged or deteriorated, refer to *Service Manual* for replacement procedure. Do not operate vehicle if seal is damaged. Always install a new seal before operating vehicle if old seal is damaged.

4. If airbox and element have become wet (from fording a stream, for example), perform the following steps:

   (A) Remove element.

   (B) See Figure 5-4. Squeeze lips of airbox water drain valve (1) to allow accumulated water to drain from airbox.

   (C) Clean and dry airbox with clean rags. Use low pressure compressed air (60 lbs or less), if available, to dry airbox.

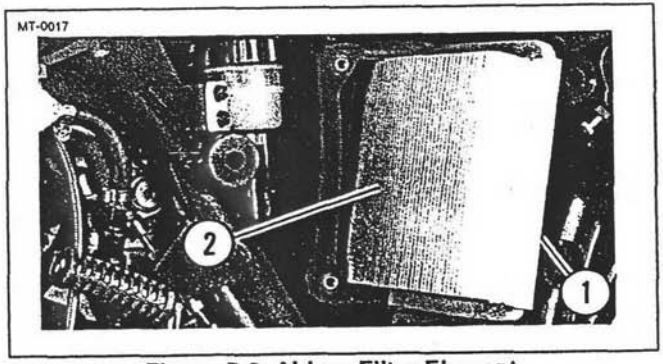


Figure 5-3. Airbox Filter Element

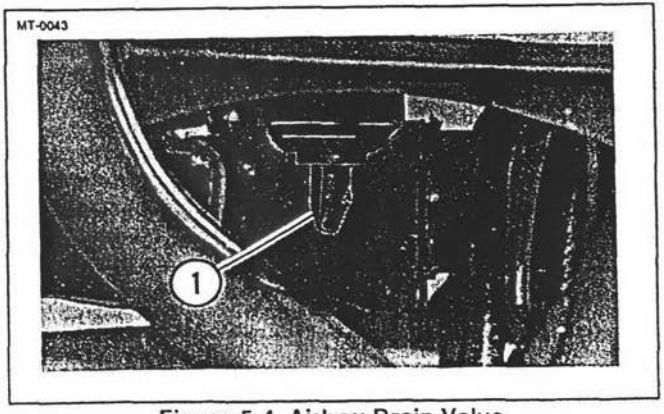


Figure 5-4. Airbox Drain Valve

CAUTION

Do not dry a wet filter element with compressed air (61 lbs or more) or a heat source, such as a light bulb or hot air gun. Do not reuse an element that has been dried by compressed air or a heat source. Small cracks may be caused by these drying methods, allowing dirt to pass through the element and cause damage to the engine.

(D) Allow a wet filter element to dry at room temperature.

5. Inspect rubber seal around edge of element. Seal must be resilient and undamaged. If seal is hardened, cracked, or damaged, replace element.

5-1.3. INSTALLATION

1. See Figure 5-3. Install element (2) into airbox, making sure that seal of element is positioned in channels molded into airbox. Apply a small amount of grease around the edges of the element to allow the element to slip into place easier. Work element into airbox a bit at a time, alternately pushing on the top and then the bottom of the element. When element has been installed to its full length, install U-channel (1) over edge of seal.
2. See Figure 5-2 (page 5-2). Install airbox lid (3) and secure with plastic washers (2) and screws (1).
3. See Figure 5-1 (page 5-2). Install left side panel (1).

5-2. FUEL SYSTEM

NOTE

Draining the fuel tank is not a scheduled maintenance procedure. The procedure is provided for use in situations where the vehicle engine will not operate properly because of known or suspected contaminated fuel.

WARNING

- ***Gasoline is extremely flammable and highly explosive under certain conditions. Do not smoke or allow open flame or sparks anywhere in the area when refueling or servicing the fuel system.***
- ***To avoid accidental start-up of vehicle and possible personal injury, disconnect battery (negative cable first) before performing any of the following procedures.***

1. See Figure 5-5. Turn fuel control valve (1) to OFF position.
2. Remove fuel tank filler cap.

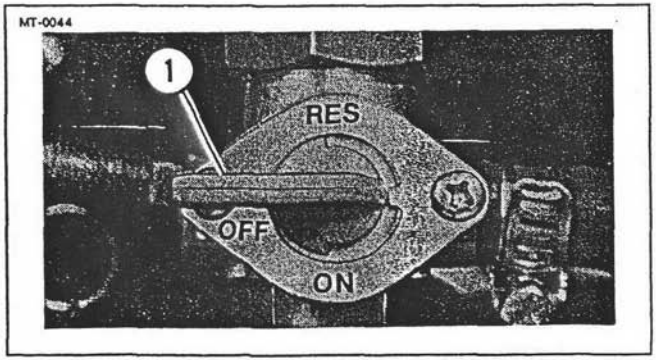


Figure 5-5. Fuel Control Valve – OFF Position

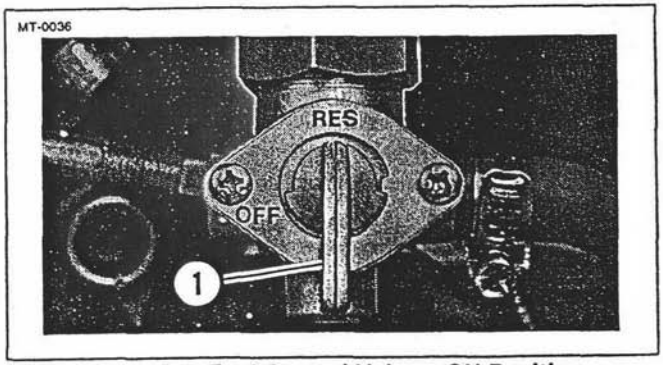


Figure 5-6. Fuel Control Valve – ON Position

3. Disconnect fuel line from rollover valve. Position line so fuel can drain into a suitable container. If line was fastened to valve with crimped-type hose clamp, discard clamp.

4. See Figure 5-6. Set fuel control valve (1) to ON position and allow fuel to drain from hose into container until fuel tank is empty.

5. See Figure 5-5. Set fuel control valve (1) to OFF position.

6. Connect fuel line to rollover valve.

WARNING

Do not re-use crimped-type hose clamps on fuel line. Use only worm gear band clamps when reconnecting rollover valve to fuel lines in order to prevent leakage.

7. Fill fuel tank with clean fuel.

8. Install fuel filler cap onto tank filler neck.

5-3. BATTERY

5-3.1. REMOVAL

WARNING

- ***Be sure all electrical switches are OFF.***
- ***Do NOT smoke or bring an open flame near the battery.***
- ***Batteries contain sulfuric acid which is highly corrosive and can cause chemical burns. Avoid contact with skin, eyes or clothing. Always wear approved eye protection when working around batteries.***

ANTIDOTE

External: *Flush with water.*

Internal: *Drink large quantities of milk or water, followed by Milk of Magnesia®, vegetable oil or beaten eggs. Call doctor immediately.*

Eyes: *Flush with water, get immediate medical attention.*

1. See Figure 5-7. Remove right side panel (1).
2. See Figure 5-8. Unlatch battery retaining strap (1).
3. See Figure 5-9. Gripping battery (1) by sides of case, slide out of frame just far enough to gain access to negative terminal (2) and positive terminal (3)

NOTE

If battery terminals and cable ends are corroded, clean off corrosion with a stiff metal brush and solution of water and sodium bicarbonate (baking soda) before disconnecting cables.

WARNING

Always remove ground (negative, or black) cable first when disconnecting battery cables to prevent sparking and short circuits.

4. See Figure 5-9. Using a 10 mm open end wrench or a cross-tip screwdriver, loosen negative terminal screw (2) and disconnect negative (-) cable.
5. In a similar manner, disconnect positive (+) cable (3) from battery.

Figure 5-7. Right Side Panel

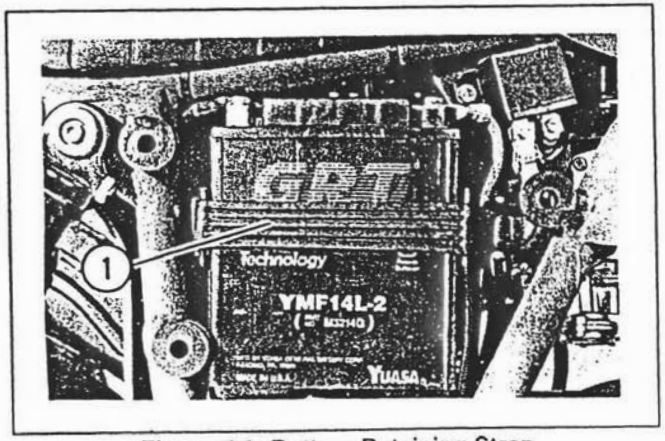


Figure 5-8. Battery Retaining Strap

6. Remove battery (1) from vehicle. See Figure 5-9.

Figure 5-9. Removing Battery

5-3.3. CORROSION

Corrosion is the greenish "fuzz" that builds up on the battery, terminals, and cables. This corrosion not only can prevent starting, but will also damage the cables and connectors.

WARNING

Battery corrosion is an acid and will eat holes in clothing and will burn skin. Wash any corrosion off your skin and clothing immediately with plenty of fresh water.

CAUTION

Be sure battery cell caps are installed tightly and that there are no cracks visible in the battery case, so that no acid-neutralizing cleaning solution can enter to damage electrolyte.

1. Remove corrosion with an alkaline solution of bicarbonate of soda (baking soda) and water. Use a stiff metal brush to scrub corroded areas with solution.
2. After cables are dry and connections have been made, apply petroleum jelly to clean metal parts of terminals to retard formation of corrosion.
3. If battery cables overheat, there may be corrosion or a break within the stranded wiring which is causing resistance. Always remove corrosion as soon as it begins to form.
4. Clean any corrosion from vehicle frame or battery tray.
5. Rinse battery connections, battery case, and cables with clean water to remove alkaline cleaning solution and allow to air dry completely.
6. Keep top of battery clean and dry to prevent current drain (battery electrical discharge) between terminals.

5-3.4. INSTALLATION

1. See Figure 5-9. Place battery (1) on tray in vehicle, leaving enough clearance to connect cables.
2. Using a 10 mm open end wrench or crosstip screwdriver, connect positive (+) cable to positive battery terminal (3) and coat terminal with petroleum jelly.
3. In a similar manner, connect negative (-) cable to negative terminal (2).
4. Slide battery (1) all the way onto tray in vehicle frame.
5. See Figure 5-8. Latch elastic retaining strap (1) to catch on frame to secure battery.
6. See Figure 5-7. Install right side panel (1).

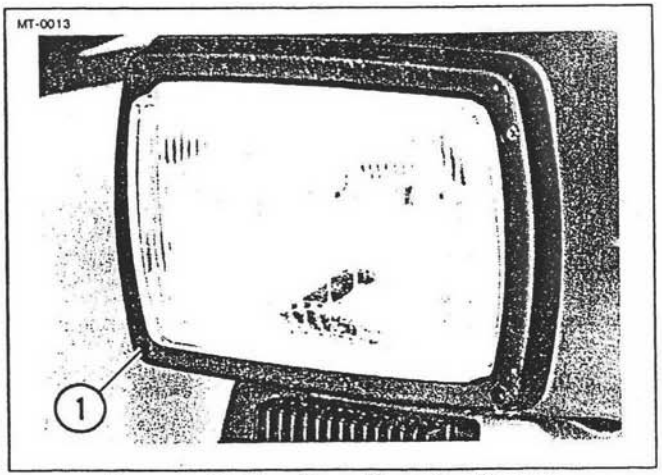


Figure 5-10. Headlamp Mounting Screws

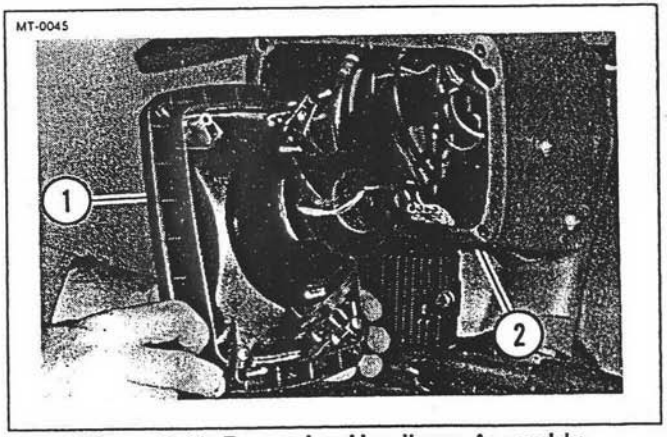


Figure 5-11. Removing Headlamp Assembly

5-4. BULB REPLACEMENT

The following instructions cover bulb replacements that can be performed by the operator. If bulb replacement does not remedy a lighting problem, refer to the *Service Manual.* Be sure that bulbs are replaced with new bulbs of exactly the same power rating (wattage).

5-4.1. HEADLAMP

1. See Figure 5-10. Using a crosstip screwdriver, remove screws (1).

2. See Figure 5-11. Separate headlamp assembly (1) from headlamp cowling (2).

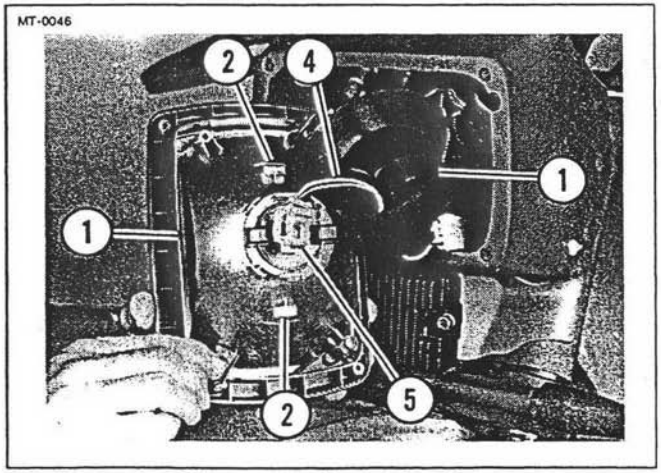


Figure 5-12. Removing Boot

3. See Figure 5-12. Unlatch boot (1) from tabs (2) on headlamp surround (3). Slide boot back along wiring harness (4) far enough to gain access to electrical connector (5). Disconnect connector from terminals of bulb.

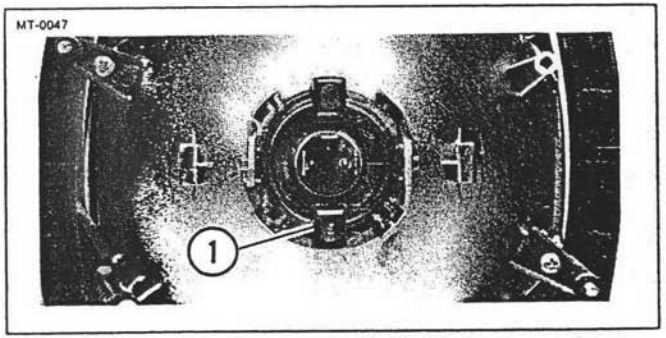


Figure 5-13. Bulb Holder

4. See Figure 5-13. Turn bulb holder (1) counterclockwise 1/4-turn to unlock bulb. Remove bulb holder.

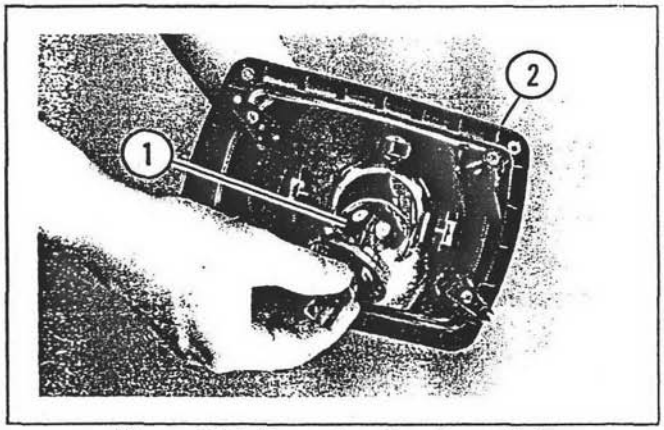


Figure 5-14. Removing Headlamp Bulb

5. See Figure 5-14. Remove headlamp bulb (1) from surround (2).

6. To install headlamp bulb, reverse the sequence of steps used for removal.

5-4.2. REAR LIGHT UNIT

1. See Figure 5-15. Using a crosstip screwdriver, remove screws (1) and lens (2).

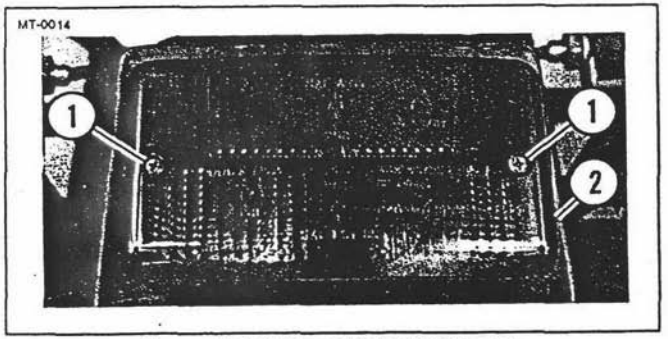


Figure 5-15. Rear Light Unit Lens

2. See Figure 5-17. Depress bulb (1) and turn counterclockwise to remove.

3. To install rear light bulb and lens, reverse the sequence of steps used for removal.

5-4.3. TURN SIGNALS – FRONT AND REAR

1. See Figure 5-17. Using a crosstip screwdriver, remove screws (1) and lens (2).

NOTE

Gasket will usually come off with lens.

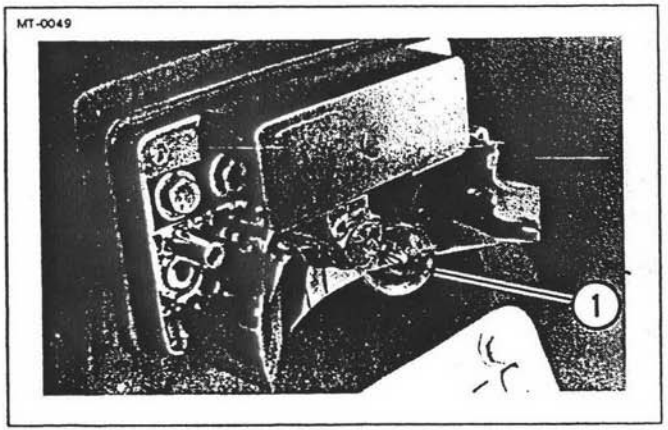


Figure 5-16. Rear Light Bulb

2. See Figure 5-18. Push in gently on bulb (1) and then turn it counterclockwise to remove.

3. Install new bulb and lens by reversing the sequence of steps used for removal.

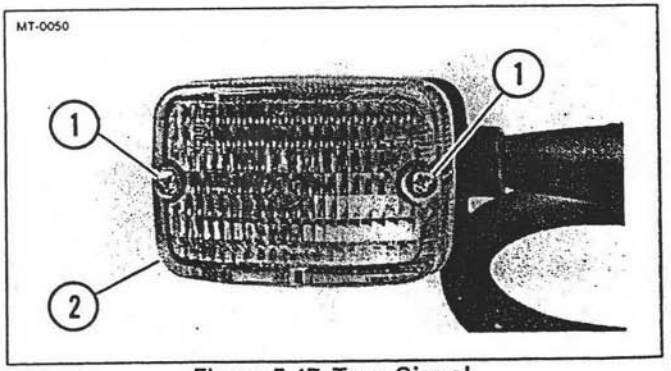


Figure 5-17. Turn Signal

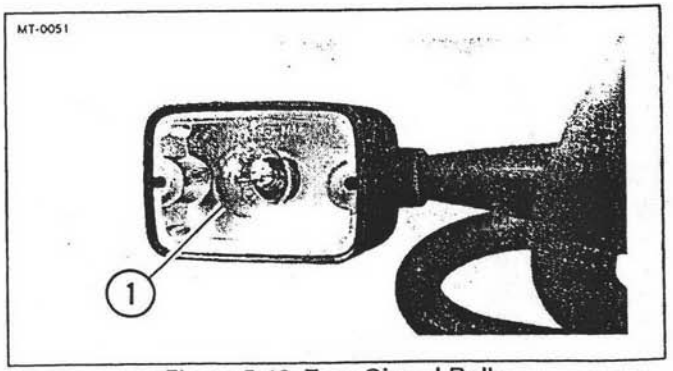


Figure 5-18. Turn Signal Bulb

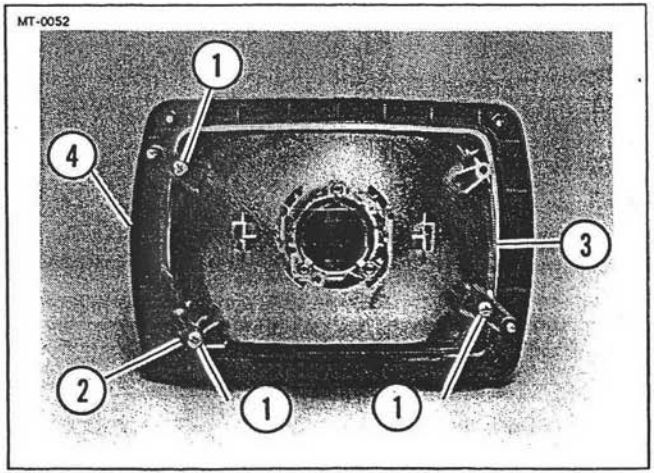


Figure 5-19. Headlamp Unit and Surround

5-5. HEADLAMP UNIT

5-5.1. REMOVAL AND INSTALLATION

1. See BULB REPLACEMENT and remove headlamp bulb.
2. See Figure 5-19. Remove screws (1), retainer (2), and headlamp unit (3) from surround (4).
3. To install headlamp unit, reverse the sequence of steps used for removal.

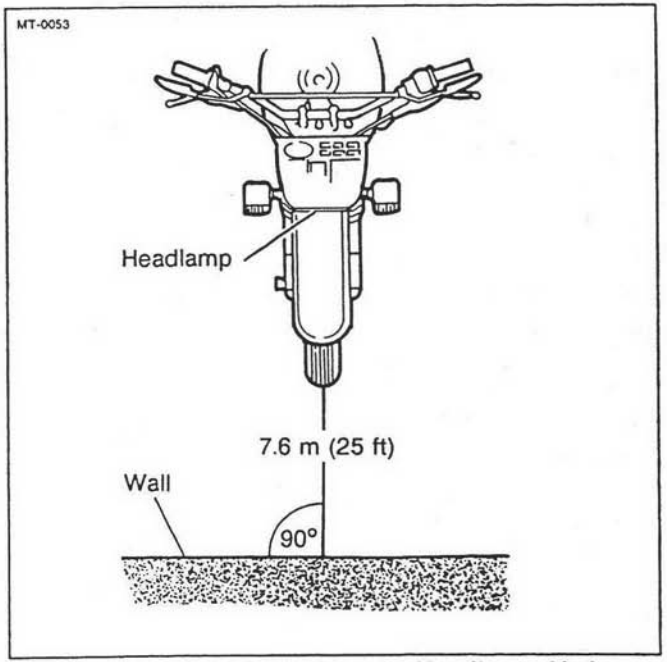


Figure 5-20. Vehicle Position for Headlamp Aiming

5-5.2. ADJUSTMENT

1. See Figure 5-20. Position the vehicle on a flat surface directly perpendicular to a vertical wall 7.6 m (25 ft) from the headlamp lens.

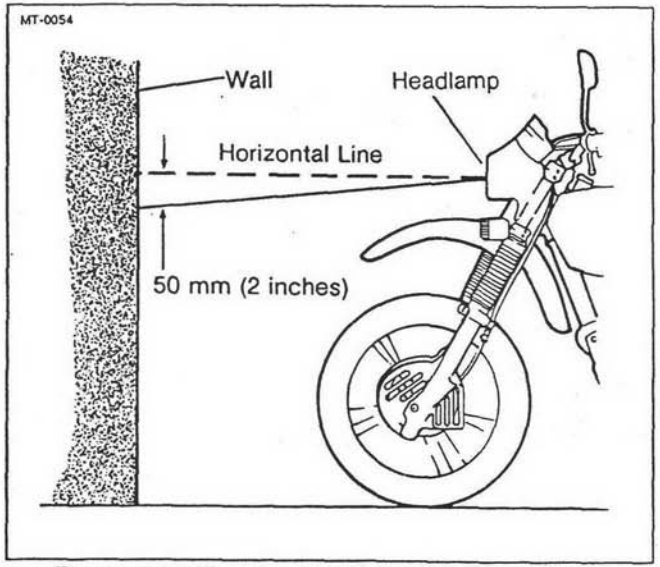


Figure 5-21. Headlamp Adjustment Aiming Point

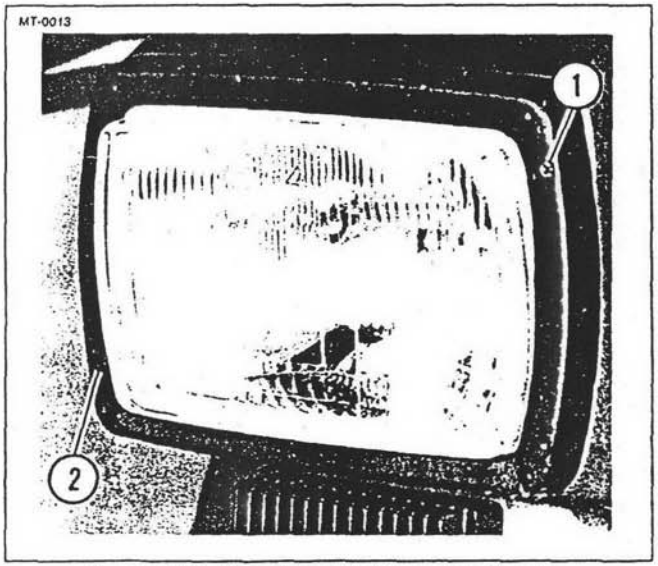


Figure 5-22. Headlamp Adjustment Screws

2. See Figure 5-21. Draw a horizontal line on the wall exactly as high as the center of the headlamp lens is when the operator is seated on the vehicle.
3. Turn on headlamp.
4. See Figure 5-22. Turn vertical adjustment screw (1) and horizontal adjustment screw (2) as required to aim headlamp directly ahead of vehicle and 50 mm (2 in.) lower than the horizontal line marked on wall.
5. Turn headlamp OFF.

5-6. SPARK PLUG

5-6.1. REMOVAL

CAUTION

Pull only on shielded (metal) protector. Do NOT pull on spark plug cable or damage to cable will occur, with resultant loss of engine performance.

1. See Figure 5-23. Disconnect shielded protector (1) from spark plug.

2. See Figure 5-24. Clean debris and dirt away from spark plug (1) and cylinder head to prevent any from falling into the engine.

3. See Figure 5-25. Using spark plug socket (1) and screwdriver (2), remove spark plug from cylinder head.

5-6.2. INSPECTION

If deposits on spark plug electrodes and ceramic insulator are brown, engine combustion is normal and spark plug may be placed back into service.

If deposits on electrodes and ceramic insulator are black, engine air/fuel mixture is too rich and engine will perform poorly and stall. Refer to Service Manual for troubleshooting and repair procedures.

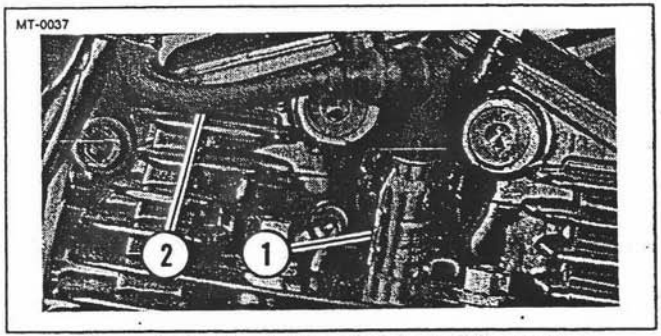


Figure 5-23. Spark Plug Cable and Protector

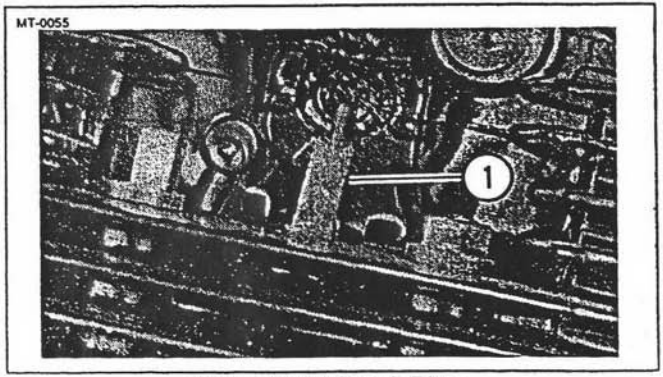


Figure 5-24. Spark Plug

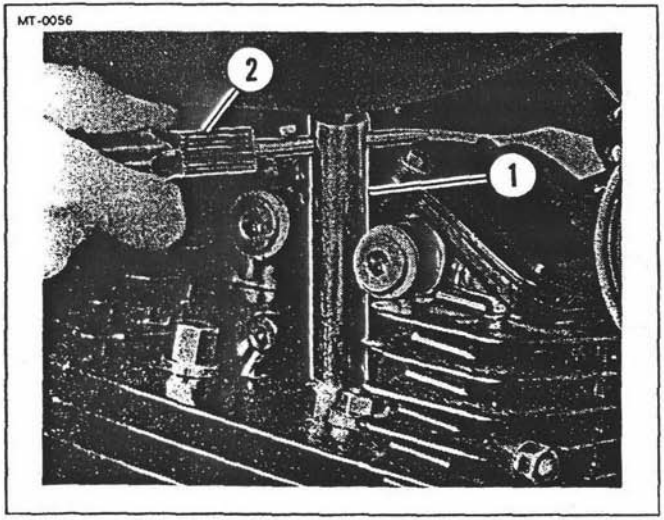


Figure 5-25. Removing Spark Plug

If deposits are light gray or white, air/fuel mixture is too lean and engine is subject to damage from excessive combustion temperatures. Refer to *Service Manual* for troubleshooting and repair procedures.

5-6.3. CLEANING

Use a stiff bristle, natural fiber brush to clean the spark plug. After cleaning, examine the electrode to be sure it is not eroded or damaged.

5-6.4. ADJUSTMENT

Set spark plug electrode gap (clearance between side and center electrodes) to 0.7 mm (0.027 in.). Use a wire-type gauge or special spark plug gap-setting tool when making adjustment. Do NOT use flat feeler gauges or shim stock to adjust gap or an inaccurate setting will result.

Adjust gap by bending side electrode only. Do NOT bend center electrode or contact ceramic insulator with any tool.

5-6.5. INSTALLATION

Spark plugs approved for use in the MT350E are:

- NGK D8E-4
- Champion 12A6YC.

1. Be sure there is only one gasket on base of spark plug. Always use the new gasket that is provided with the new spark plug.

2. Check threads of spark plug hole in cylinder head of engine. If threads are dirty, clean with ***spark plug thread chaser tool.*** If threads are damaged, refer to *Service Manual* for repair procedure.

3. Install spark plug into cylinder head by hand only. DO NOT use socket and screwdriver.

4. Thread spark plug into cylinder head as far as possible by hand, noting any binding or roughness. If plug cannot be installed by hand, spark plug and/or cylinder head threads require further cleaning or repair.

5. See Figure 5-25. After spark plug has been installed by hand as far as possible, tighten plug 1/4-turn (90 degrees) with spark plug socket (1) and screwdriver (2).

   If ***torque wrench*** and ***socket*** are available, tighten spark plug to 27 N-m (20 ft-lb).

6. See Figure 5-24. Wipe ceramic insulator (1) of spark plug clean of oil and other substances.

7. See Figure 5-23. Install shielded protector (1) and cable to spark plug.

5-7. DRIVE CHAIN

NOTE

Vehicle should be on center stand or unladen (no weight).

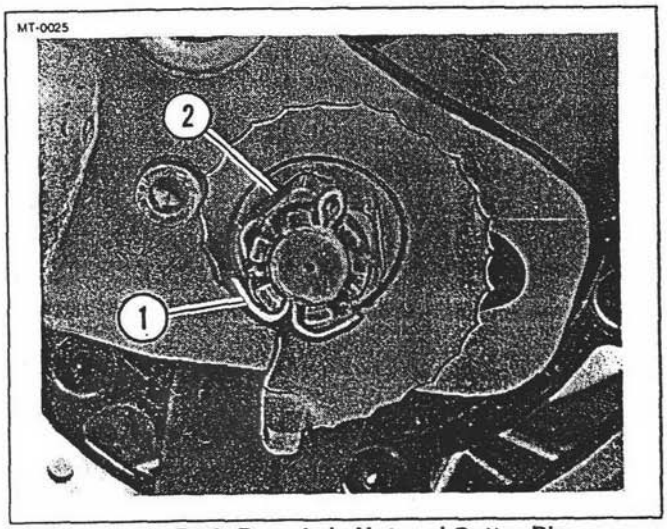


Figure 5-26. Rear Axle Nut and Cotter Pin

5-7.1. ADJUSTMENT

1. See Figure 5-26. Using long-nose pliers, remove and discard cotter pin (1).

2. Using a 24 mm box wrench, loosen axle nut (2).

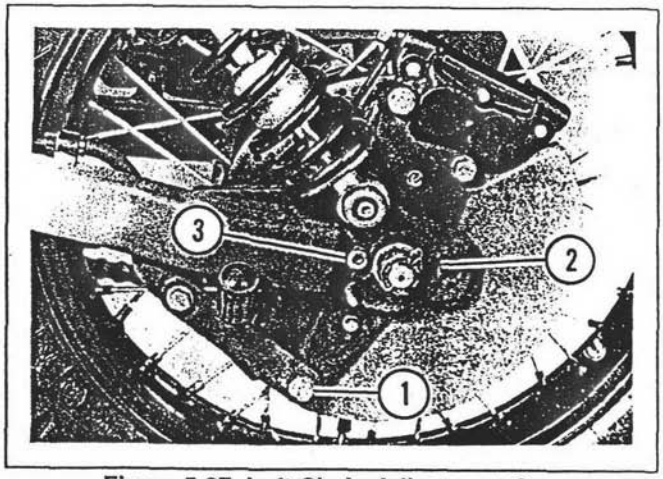


Figure 5-27. Left Chain Adjustment Cam

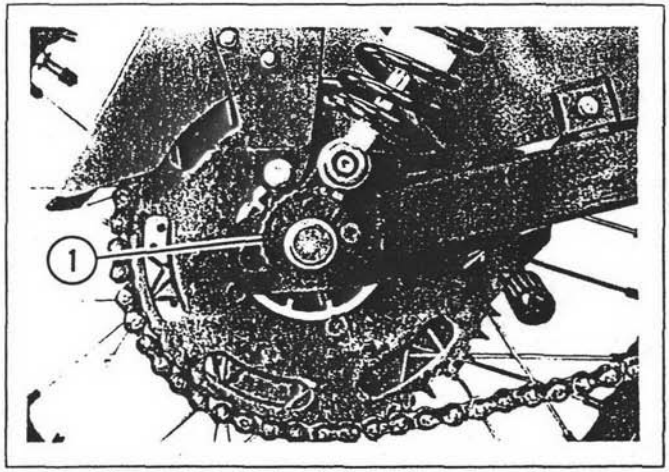


Figure 5-28. Right Chain Adjustment Cam

3. See Figure 5-27. Using a 6 mm hex key and a 13 mm open end wrench, loosen socket head screw (1) on torque arm so that wheel can be moved easily.

4. Pull wheel back until adjustment cam (2) is free of stop screw (3).

NOTE

Be sure that the same detent is engaged on both chain adjustment cams so that correct wheel alignment is maintained.

5. Rotate left adjustment cam (2) to tighten chain to ~~40 - 50 mm (1.6 - 2.0 in.) free play.~~ 55-65mm (2.2-2.6 in) Free play. 10-15mm (0.4-0.6 in) free play must be evident when the weight of the machine is on the wheels AMDT-2 23/11/98 GRCBoyle

6. See Figure 5-28. Rotate right adjustment cam (1) so that same detent is aligned with stop screw as on left cam.

7. Slide wheel forward until detents of adjustment cams engage stop screws. Be sure each adjustment cam is engaged on the same detent.

8. See Figure 5-27. Using a 6 mm hex key and a 13 mm open end wrench, tighten socket head screw (1).

9. See Figure 5-26. Using a ***24 mm socket*** and a ***torque wrench***, tighten axle nut (2) to 102 N-m (75 ft-lb).

CAUTION

Do NOT loosen (turn counterclockwise) axle nut to align hole in axle with slots in nut. Always tighten (turn clockwise) nut so that torque and clamping force are maintained.

10. See Figure 5-26. Using a ***24 mm socket*** and a ***socket wrench handle***, tighten axle nut (2) only far enough to align hole in axle with slots in nut.

11. Using long-nose pliers, install a new cotter pin (1).

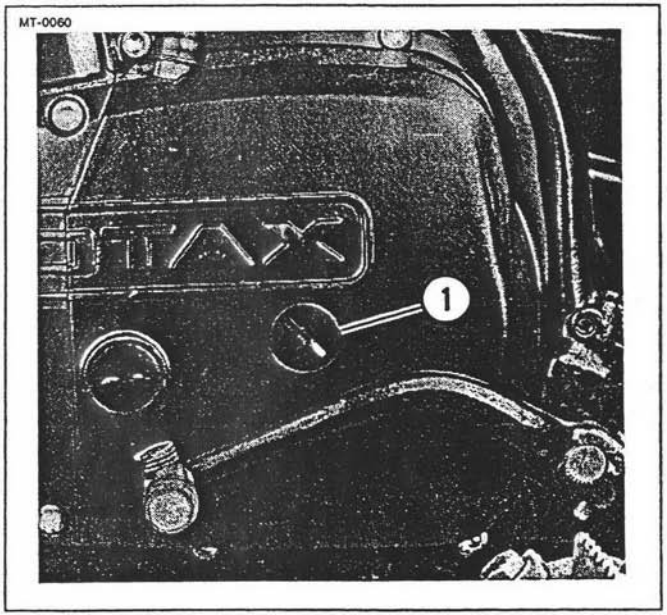


Figure 5-29. Clutch Adjustment Access Plug

5-8. CLUTCH ADJUSTMENT AND CONTROL LEVER FREE PLAY

5-8.1. ADJUSTMENT

1. See Figure 5-29. Using screwdriver handle from vehicle tool kit, remove clutch adjustment access plug (1).

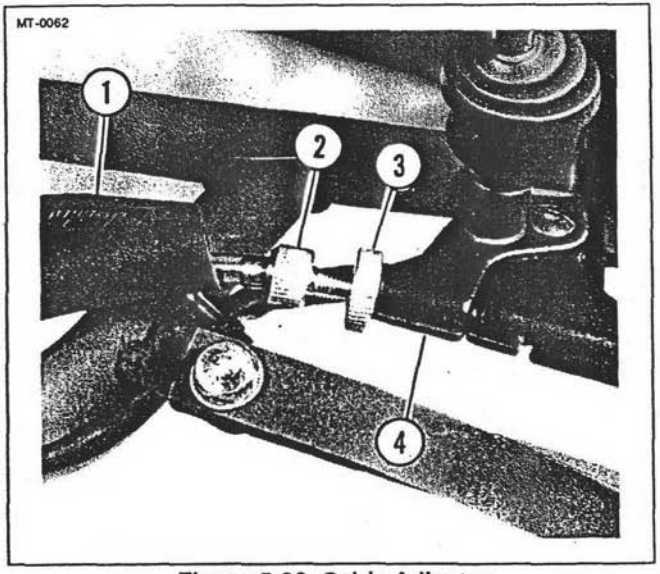


Figure 5-30. Cable Adjuster

2. See Figure 5-30. Pull clutch lever shroud (1) back far enough to expose cable adjuster (2). Loosen locknut (3) and rotate adjuster (2) until it goes as far as possible into clutch lever body (4). This is necessary to remove all tension from the cable and to obtain maximum free play in the lever.

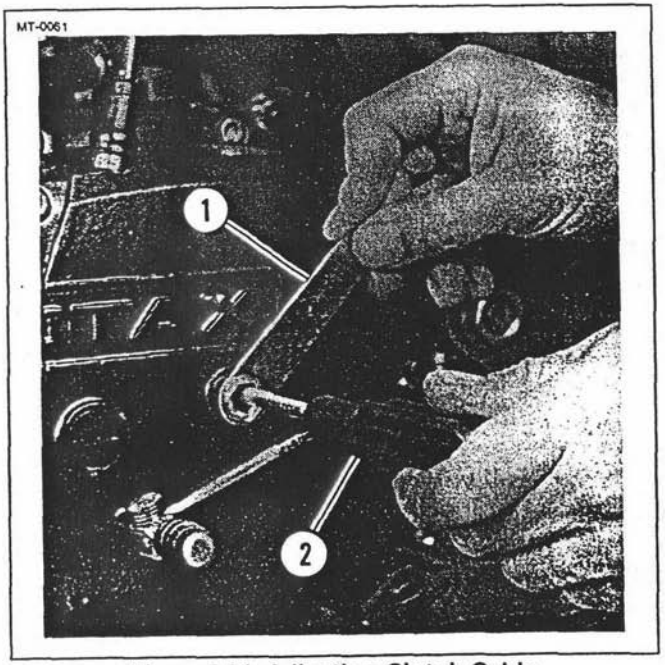


Figure 5-31. Adjusting Clutch Cable

3. See Figure 5-31. Place clutch adjusting wrench (1) from vehicle tool kit onto lock nut accessible through screw plug hole. Hold adjusting screw with flat tip screwdriver (2) and loosen lock nut.

4. Turn adjusting screw clockwise until it bottoms, then back screw off counterclockwise 1/4-turn (90 degrees). While holding screw in this position, tighten lock nut.

5. See Figure 5-30. Rotate adjuster (2) out from clutch lever body (4) until lever is comfortable for operator.

6. Tighten locknut (3) and pull shroud (1) back into position.

7. See Figure 5-29. Replace clutch adjustment access plug (1).

5-9. FRONT BRAKE CONTROL LEVER FREE PLAY

5-9.1. ADJUSTMENT

1. See Figure 5-32. Using a 10 mm box wrench, loosen jam nut (1).

2. Using a 4 mm hex key, turn adjusting screw (2) until free play at knob end of lever is 11-13 mm (0.43 - 0.51 in.).

3. Hold adjusting screw (2) stationary and tighten lock nut (1) with 10 mm box wrench.

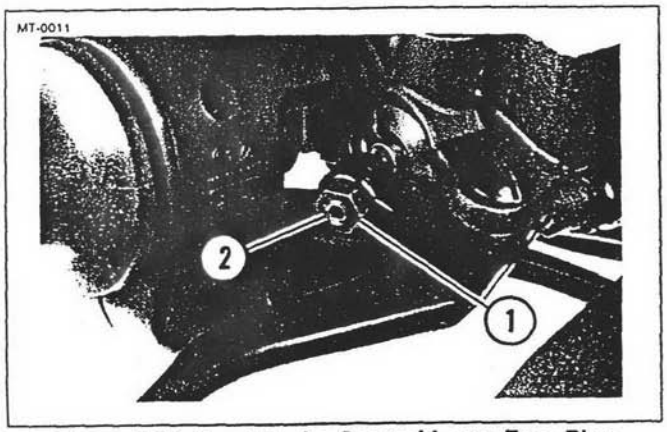


Figure 5-32. Front Brake Control Lever Free Play Adjustment

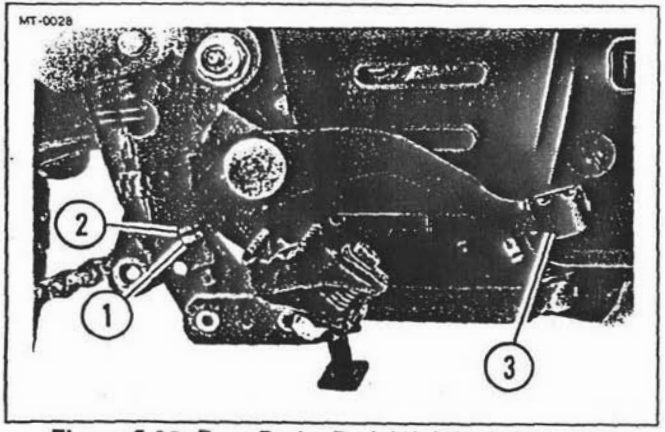


Figure 5-33. Rear Brake Pedal Height Adjustment

5-10. REAR BRAKE PEDAL

5-10.1. ADJUSTMENT

1. See Figure 5-33. Using a 10 mm open end wrench, loosen lock nut (1) and adjust stop screw (2) until brake pedal (3) is at desired height. Tighten locknut (1).

2. See Figure 5-34. Depress brake pedal only as far as necessary for push rod (1) to contact master cylinder piston (a significant resistance can be felt). Hold pedal in this position while making adjustment.

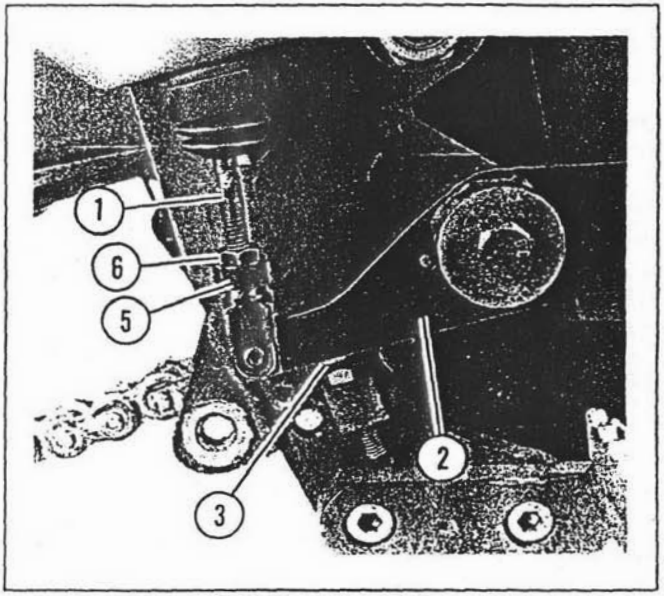


Figure 5-34. Free Play Adjustment

3. Measure clearance between brake pedal (2) and adjusting screw (3). Clearance should be 1.6 mm (1/16 in.).

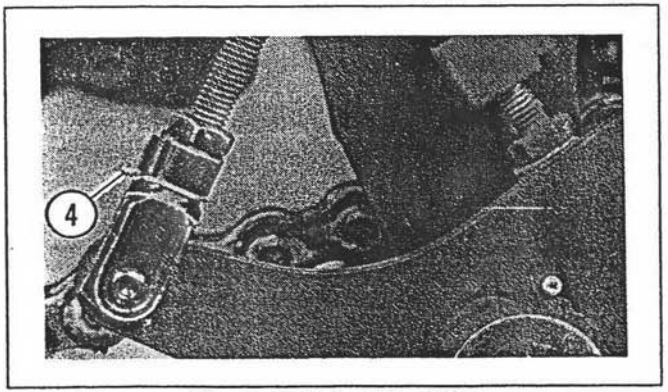


Figure 5-35. Locking Wire

4. See Figure 5-35. If clearance is not 1.6 mm (1/16 in.), use *long nose pliers* and remove and discard locking wire (4).
5. See Figure 5-34. Unsnap clevis lock (5) and swing out of way.
6. Using a 10 mm open end wrench, loosen lock nut (6).
7. Lengthen or shorten push rod (1) by rotating it until clearance is 1.6 mm (1/16 in.).
8. Tighten lock nut (6).
9. Snap clevis lock (5) over clevis.
10. See Figure 5-35. Install new lock wire (4).

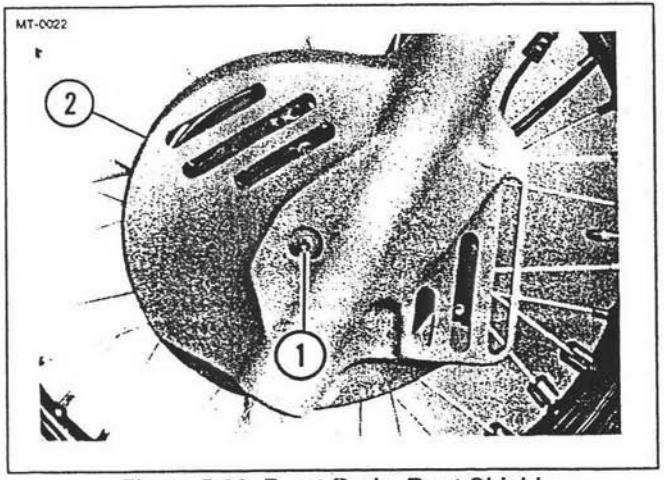


Figure 5-36. Front Brake Dust Shield

5-11. FRONT WHEEL

5-11.1. REMOVAL

NOTE

Vehicle must be supported under frame so that front tire is off ground, or vehicle should be laid on its side after dust shield has been removed in Step 1 below.

1. See Figure 5-35. Using a 5 mm hex key, remove socket head screw (1), lock washer, flat washer, and front brake dust shield (2).

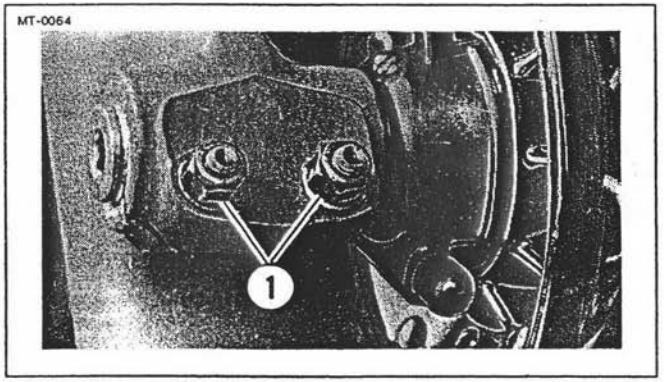


Figure 5-37. Pinch Bolt Nuts

2. See Figure 5-37. Using a 10 mm wrench, loosen pinch bolt nuts (5) on right slider. Do NOT remove nuts.

3. See Figure 5-38. While supporting wheel by one hand, use an 8 mm hex key to loosen and remove front axle (1).

NOTE

See Figure 5-39. When axle is removed, axle spacer (1) on left side of front hub will fall free of hub. Retrieve spacer for use during front wheel installation.

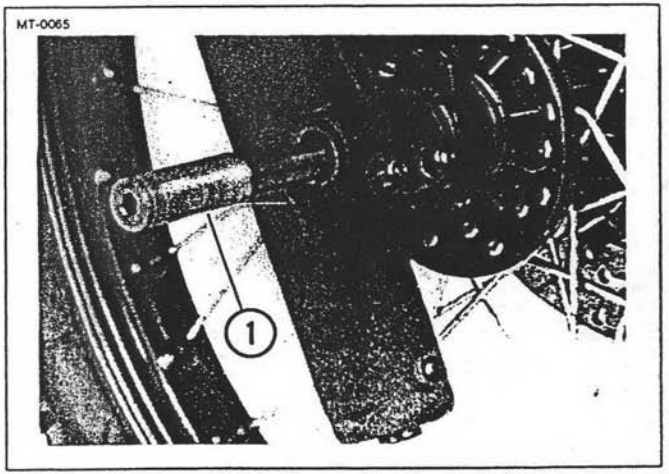


Figure 5-38. Removing Front Axle

4. Remove wheel from between fork sliders, disengaging speedometer drive as wheel is lowered.

CAUTION

Do NOT operate the front brake lever when front wheel is removed. Caliper pistons will be forced out of their bores, requiring disassembly of caliper to replace pistons.

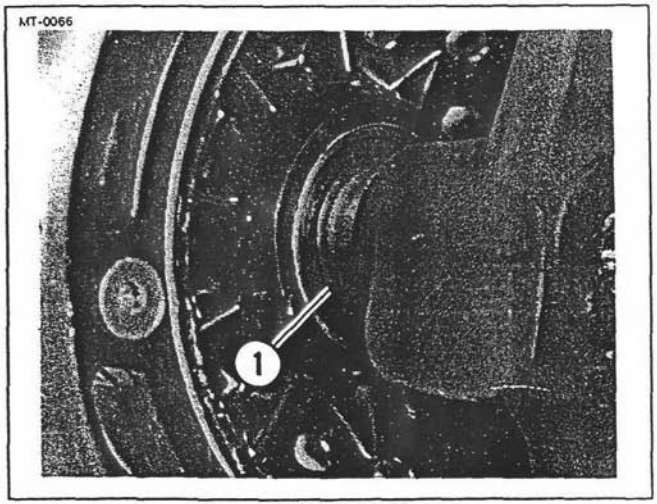


Figure 5-39. Axle Spacer

5-11.2. INSTALLATION

1. See Figure 5-40. Position speedometer cable drive unit (1) onto wheel hub (2), making sure both parts are completely engaged.

2. While keeping speedometer cable drive engaged with wheel hub, position wheel between sliders, making sure that brake disc is placed between brake caliper pads.

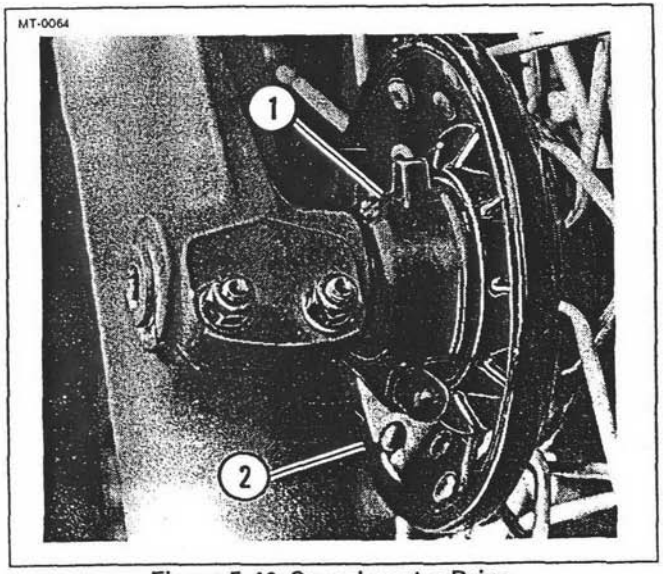


Figure 5-40. Speedometer Drive

3. Support wheel between sliders and install axle until it just begins to exit from left side of wheel hub.

4. See Figure 5-39. Position axle spacer (1) between left side of wheel hub and left slider, then drive spindle through spacer and slider, tapping spindle with a ***soft-headed mallet.***

5. Using an *8 mm hex driver* and a *torque wrench*, tighten axle to 68 N-m (50 ft-lb).

6. Remove frame support from vehicle and set vehicle on ground so normal weight is on front axle.

7. See Figure 5-37. Using a ***10 mm socket*** and a ***torque wrench***, tighten right slider pinch bolt nuts (1) to 6.9 N-m (60 in-lb).

8. See Figure 5-36. Using a 5 mm hex key, install front brake dust shield (2), flat washer, lock washer, and socket head screw (1).

5-12. REAR WHEEL

5-12.1. REMOVAL

NOTE

Rear wheel removal can be performed more easily if vehicle is supported under frame so that rear tire is at least 100 mm (4 in.) off ground. If vehicle cannot be supported in vertical position, lay vehicle down on left or right side, as required, to remove rear wheel.

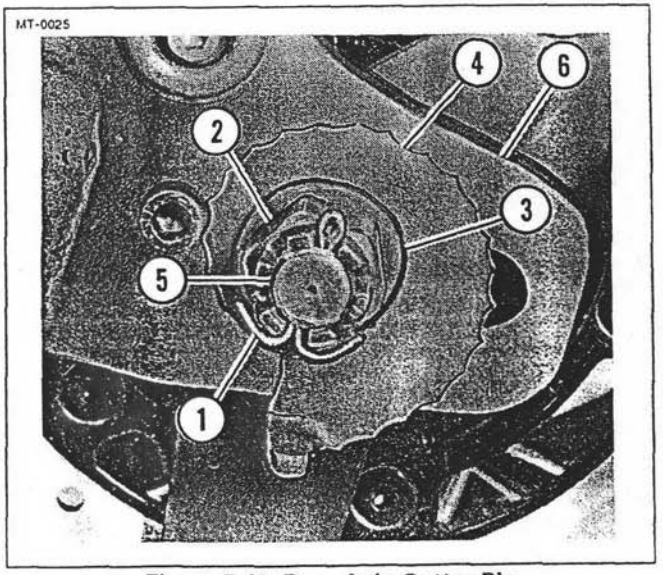


Figure 5-41. Rear Axle Cotter Pin

1. See Figure 5-41. Using ***long-nose pliers***, remove and discard cotter pin (1).

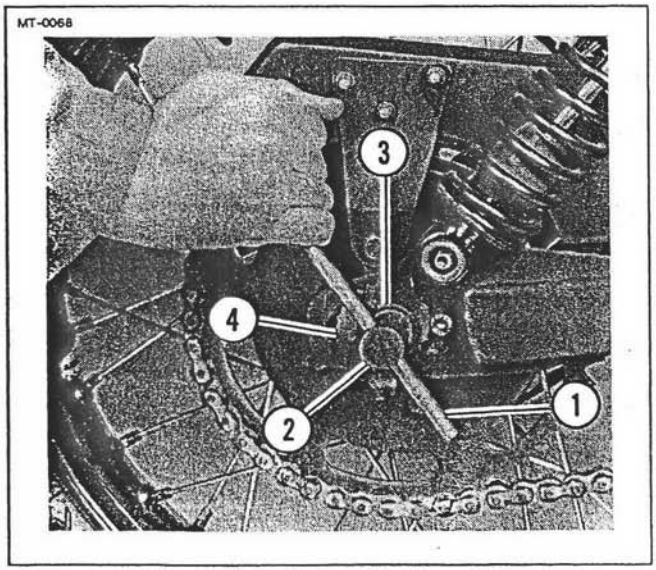


Figure 5-42. Removing Rear Axle

2. See Figure 5-41. Using a 24 mm box wrench, remove axle nut (2), flat washer (3), and left chain tension adjustment cam (4).

3. Using a ***soft-headed mallet***, drive axle (5) toward right side of vehicle until end of axle is flush with swing arm (6).

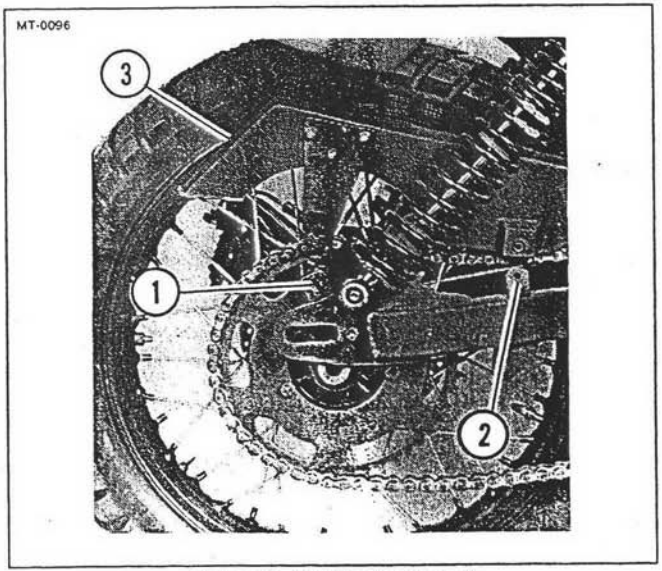


Figure 5-43. Chain Guard

4. See Figure 5-42. Using bar (1) from tool kit, remove axle (2), flat washer (3), and right chain tension adjustment cam (4).

NOTE

It may be necessary to lift up on tire when removing axle to prevent axle from binding in swing arm.

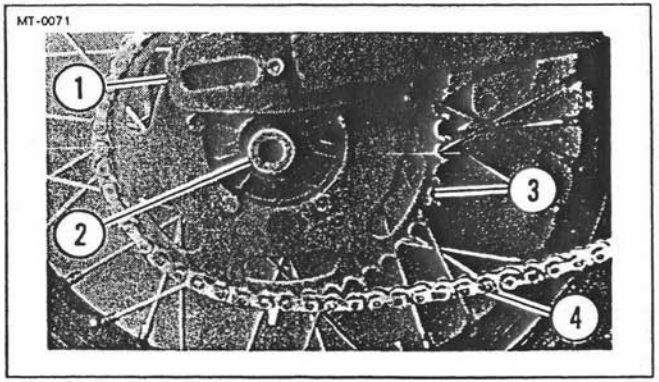


Figure 5-44. Removing Hub Spacer

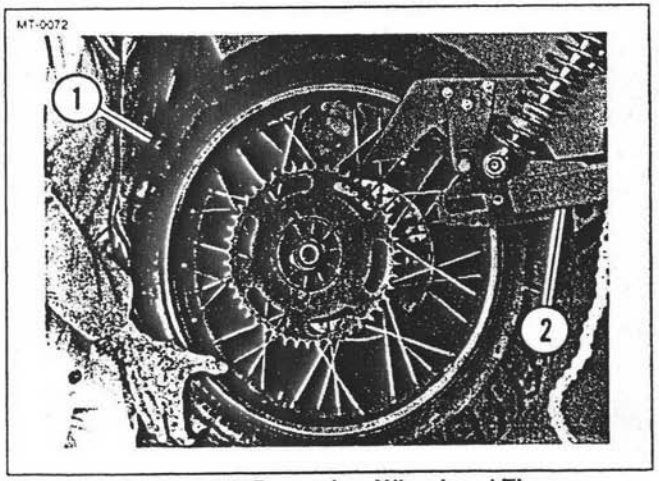


Figure 5-45. Removing Wheel and Tire

5. See Figure 5-43. Using a 13 mm wrench and a 10 mm wrench, remove screw (1) and flat washer, screw (2) and flat washer, and then swing chain guard (3) up and away from sprocket.

6. See Figure 5-44. Push wheel forward so brake disc clears caliper. Lower wheel from swing arm (1) and tilt top of tire to right. Remove spacer (2) from sprocket hub. Disengage drive chain (4) from sprocket (3).

CAUTION

Do NOT operate the rear brake foot lever when caliper and pads are not in position over disc. Caliper pistons will be forced out of their bores, requiring disassembly of caliper to replace pistons.

7. See Figure 5-46. Remove rear wheel and tire (1) from swing arm (2).

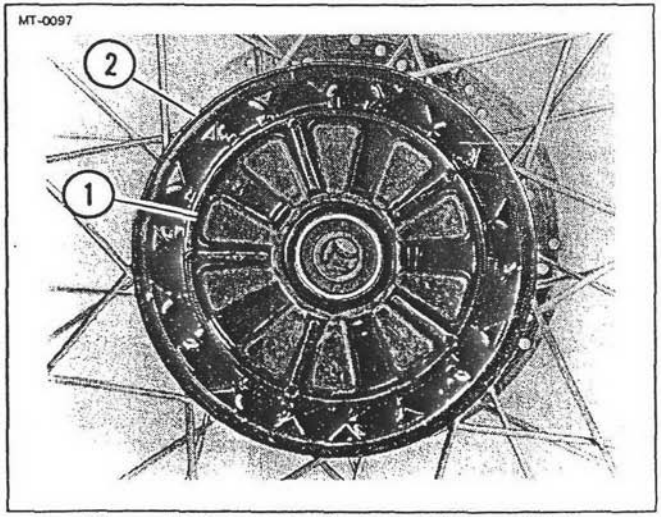


Figure 5-46. Cushion Drive Rubber and Hub

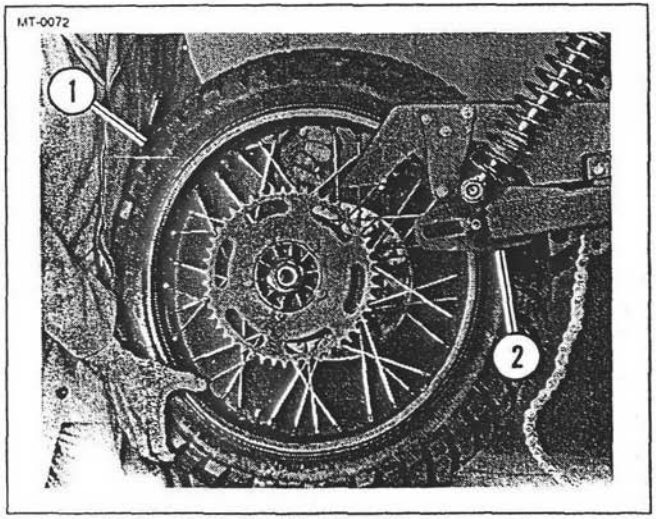


Figure 5-47. Positioning Wheel and Tire

5-12.2. INSTALLATION

1. See Figure 5-46. If cushion drive rubber (1) separated from sprocket hub (2) when wheel was removed, position rubber into hub, being sure to observe correct positioning. Segments of rubber must match arrangement of compartments cast into hub.

2. See Figure 5-47. Position rear wheel and tire (1) in swing arm (2).

3. See Figure 5-44. Place drive chain (4) over teeth of sprocket (3). Install spacer (2) onto sprocket hub (2). Raise wheel and tire, pulling wheel toward rear of vehicle and inserting brake disc between pads of brake caliper.

4. See Figure 5-43. Swing chain guard (3) back into position and install small screw (2) and flat washer, and large screw (1) and flat washer.

5. See Figure 5-42. Install right chain tension adjustment cam (4), flat washer (3), and axle (2). Support tire and wheel with one hand while tapping spindle into hub with a ***soft-headed mallet***.

6. See Figure 5-41. Install left chain tension adjustment cam (4), flat washer (3), and spindle nut (2), but do NOT tighten spindle nut at this time.

7. See DRIVE CHAIN ADJUSTMENT. Adjust drive chain tension so that chain free play is 40-50 mm (1.6 - 2.0 in.) at the midpoint between the sprockets.

8. See Figure 5-41. Using a 24 mm socket and a torque wrench, tighten axle nut (2) to 101 N-m (75 ft-lb).

CAUTION

Do NOT loosen (turn counterclockwise) axle nut to align hole in axle with slots of nut or clamping force will be lost. Always tighten (turn clockwise) nut so that clamping force is maintained.

9. Using a 24 mm socket and a socket wrench handle, tighten axle nut (2) only far enough to align hole in axle with slots in nut so that cotter pin (1) may be installed.

10. Using long-nose pliers, install a new cotter pin (1).

5-13. TIRES

WARNING

Inner tubes should only be repaired as an emergency measure. Replace a damaged or patched inner tube with a new one as soon as possible. Whenever a tire is replaced, the inner tube and rim strip must also be replaced.

5-13.1. REMOVAL

1. See FRONT or REAR WHEEL and remove the wheel with the flat tire.

2. See Figure 5-48. Remove protective cover (1) and valve stem cap (2).

NOTE

Jaws on valve stem cap are used to engage core in order to turn it in valve stem.

3. Using valve stem cap, remove valve stem core and deflate tire.

4. See Figure 5-49. Remove valve nut (1) from valve stem.

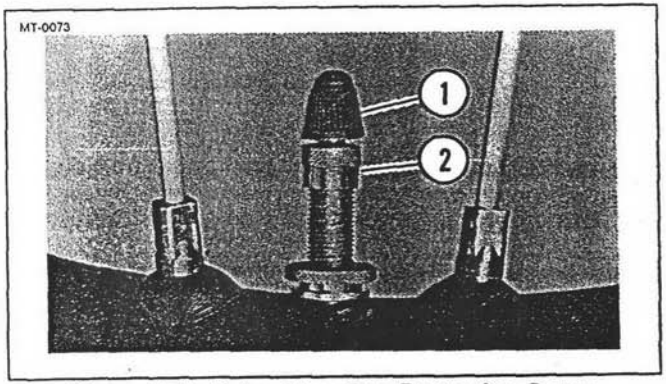


Figure 5-48. Valve Stem Cap Protective Cover

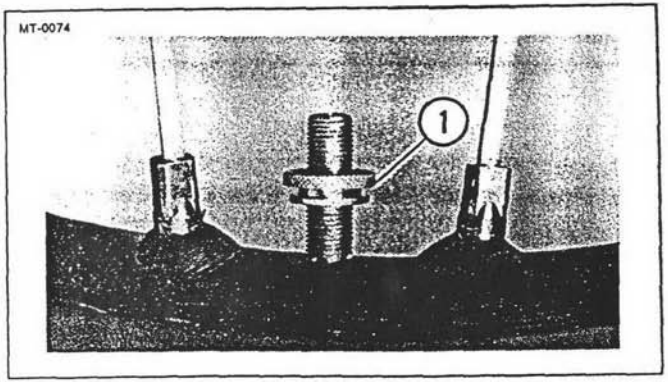


Figure 5-49. Valve Stem Nut

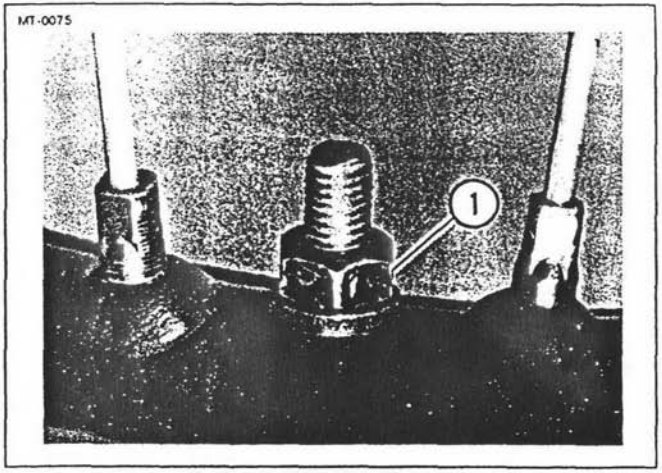


Figure 5-50. Bead Lock Nut

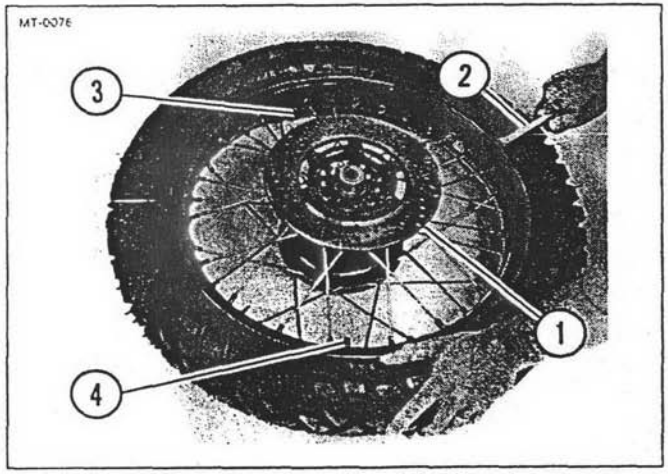


Figure 5-51. Breaking Tire Bead

WARNING

Do NOT use screwdrivers or pry bars to remove or install tires. Such tools have sharp edges that could damage the inner tube or sidewall of the tire, causing failure of the tube and/or tire and injury to the operator.

5. See Figure 5-50. Using a 13 mm wrench, loosen, but do not remove the bead lock nut (1).

6. See Figure 5-51. Starting on side of wheel to which brake disc (1) is mounted, use two tire irons (2) from vehicle tool kit to break tire bead away from wheel rim. Start at bead lock (3) and work around wheel rim toward valve stem (4). Stand on the tire sidewall or push it with your hands as required to separate it from the wheel.

7. Turn wheel over and repeat the actions of Step 6 to break the bead on the other side of the tire.

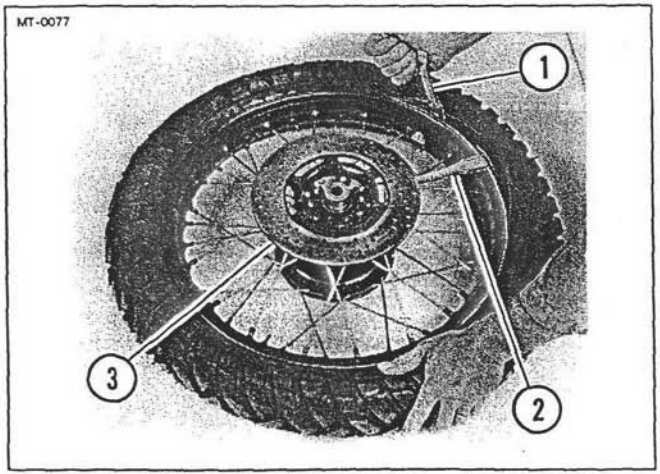


Figure 5-52. Pulling Tire Bead Over Edge of Rim

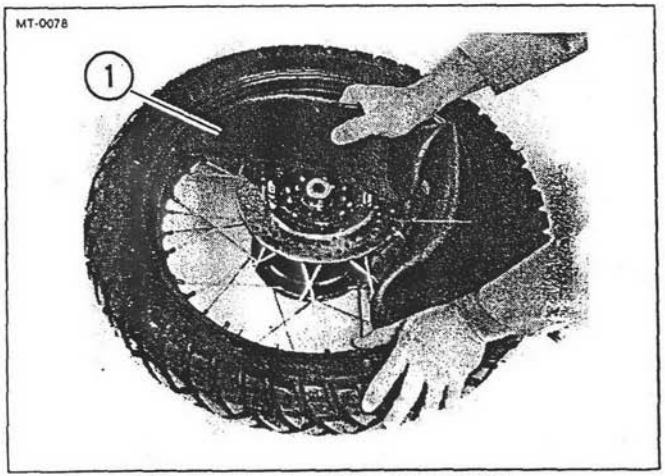


Figure 5-53. Removing Inner Tube

8. Check that bead lock is fully retracted (nut loosened fully, but not removed), then push tire bead into center dropped section of wheel rim.

9. See Figure 5-52. With one tire iron (1), begin to pull tire bead over edge of wheel rim. Stop and place second tire iron (2) under disc (3) and tire bead to prevent bead from slipping back onto wheel rim.

10. Continue to use first tire iron to pull tire bead over wheel rim, working around entire circumference of wheel rim. Remove tire irons.

11. See Figure 5-53. Remove inner tube (1) from tire.

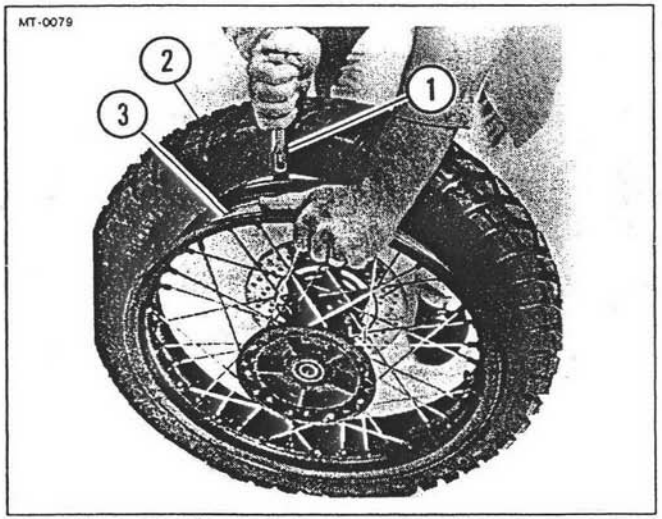


Figure 5-54. Removing Tire

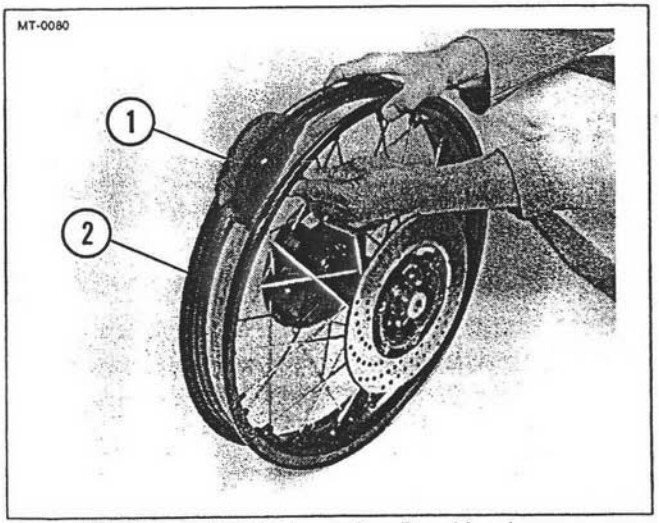


Figure 5-55. Removing Bead Lock

12. See Figure 5-54. Turn wheel over. Using one tire iron (1), pry tire (2) over wheel rim (3) and remove tire. If necessary, tire sidewall may be struck with a soft-headed mallet to assist removal.

13. See Figure 5-55. Remove bead lock (1) from wheel rim (2).

14. See Figure 5-56. Remove and discard rubber rim strip (1) from wheel rim (2).

5-13.2. INSPECTION

Check area of wheel under rubber rim strip for rust. If you find rust, remove and repaint wheel.

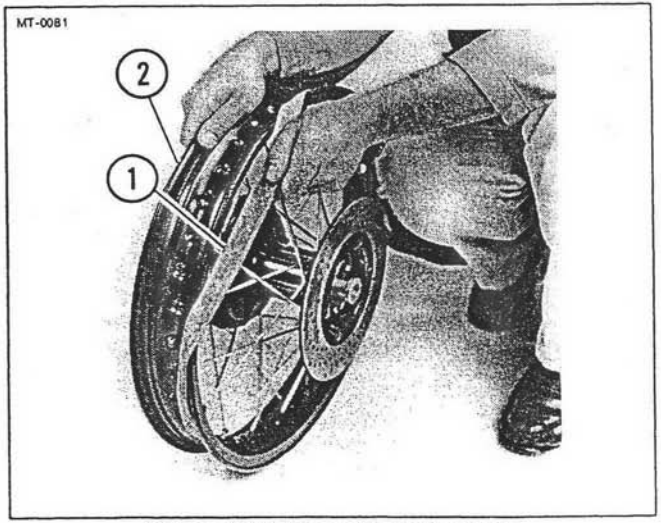


Figure 5-56. Removing Rim Strip

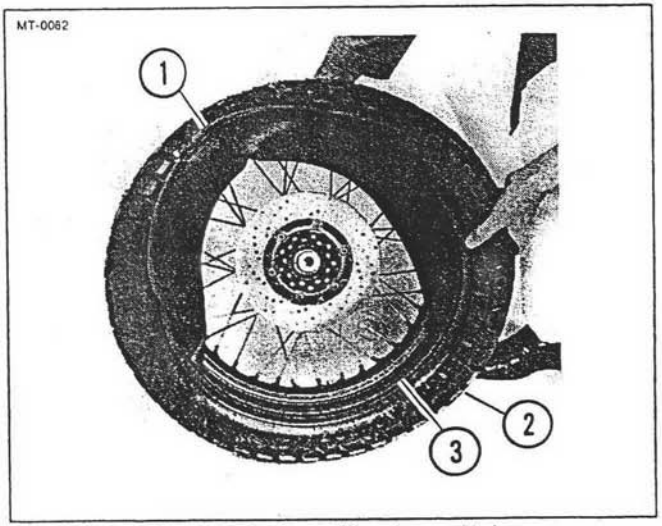


Figure 5-57. Installing Inner Tube

Check for spokes protruding beyond nipples. File or grind ends of spokes until they are flush with nipples to prevent damage to inner tube.

5-13.3. INSTALLATION

CAUTION

Be sure to install tire on wheel in direction of forward rotation indicated by arrow and wording molded into sidewall of tire.

1. See Figure 5-56. Install a new rim strip (1) onto wheel rim (2), aligning hole in rim strip with inner tube valve hole in rim.

2. Inflate inner tube just enough to round it out, removing folds and wrinkles.

3. See Figure 5-57. Position one-half of inner tube (1) inside tire (2) and place tire with tube onto wheel rim (3).

4. See Figure 5-49. Install valve stem nut (3) just far enough so that it engages a few threads and prevents valve stem from being drawn completely into tire.

NOTE

Lubricate tire bead generously with rubber lubricant, or solution of detergent and water, to aid in installation.

5. Using a tire iron, work tire bead onto wheel rim on side of wheel facing upward.

6. Install bead lock, lock washer, and nut.

7. Work inner tube into tire by hand, making sure that tube goes over bead lock and is not pinched between lock and rim.

8. Turn wheel over. Using a ***soft-headed mallet*** as necessary, install remaining tire bead onto wheel rim, starting 90 degrees from bead lock and working toward it, then continuing around 90 degrees more until one-half of the tire bead circumference is mounted on rim.

9. Check that bead lock is completely inside the tire bead.

10. Using a ***soft-headed mallet***, continue around remaining one-half of tire, as in Step 8, to install it onto wheel rim.

11. See Figure 5-49. Tighten valve stem nut (1).

12. Using jaws on end of metal valve stem cap, install valve core.

WARNING

Do not inflate tire to more than 276 kPa (40 psi) to seat the beads. Inflating the tire beyond 276 kPa (40 psi) to seat the beads can cause the tire to burst with force sufficient to cause personal injury. If the beads fail to seat when inflated to 276 kPa (40 psi), deflate the tire and relubricate the bead and rim, then reinflate to seat the beads, but do not exceed 276 kPa (40 psi).

13. Inflate tire to 276 kPa (40 psi) to seat beads on wheel rim, then adjust tire pressure to 152 kPa (22 psi) for on-road use, or 124 kPa (18 psi) for off-road use.

14. See Figure 5-50. Using a 13 mm wrench, tighten bead lock nut (1).

SECTION 6

TOOLS AND ACCESSORIES

6-1. VEHICLE TOOL KIT

See Figure 6-1. Each new vehicle is furnished with a tool kit which is stored in the tool kit box on the right side of the rear fender. Many of the tools in this kit are useful in performing the tasks described in this Operator's Manual.

The vehicle tool kit should be checked regularly to be sure that all tools are present and are in good condition.

The vehicle tool kit should be kept with the vehicle during all operations.

6-2. ADDITIONAL REQUIRED TOOLS

Several of the tasks described in this manual require the use of tools not included in the vehicle tool kit. In the text of this manual, these tools are identified by the use of bold face italic type. Tasks which require the use of such tools are usually performed at a maintenance facility where a wide selection of appropriate tools would normally be available. For your convenience, all additional tools above and beyond those furnished in the vehicle tool kit are listed in Paragraph 6-2.

Legend for Figure 6-1

1. Wrench, box, 22 and 24 mm
2. Wrench, open end, 17 and 19 mm
3. Wrench, open end, 11 and 13 mm
4. Wrench, open end, 10 nd 13 mm
5. Hex, socket-head screw, 5 mm
6. Hex, socket-head screw, 6 mm
7. Hex, socket-head screw, 8 mm
8. Pouch, tool storage
9. Wrenches, shock absorber (2)
10. Grip, screwdriver
11. Shaft, screwdriver, flat blades
12. Shaft, screwdriver, crosstip
13. Bar, lever
14. Socket, 18 mm, spark plug
15. Gauge, feeler, 0.1 mm (see Service Manual)
16. Irons, tire (2)
17. Wrench, clutch adjustment
18. Kit, repair, tire puncture (includes instructions)

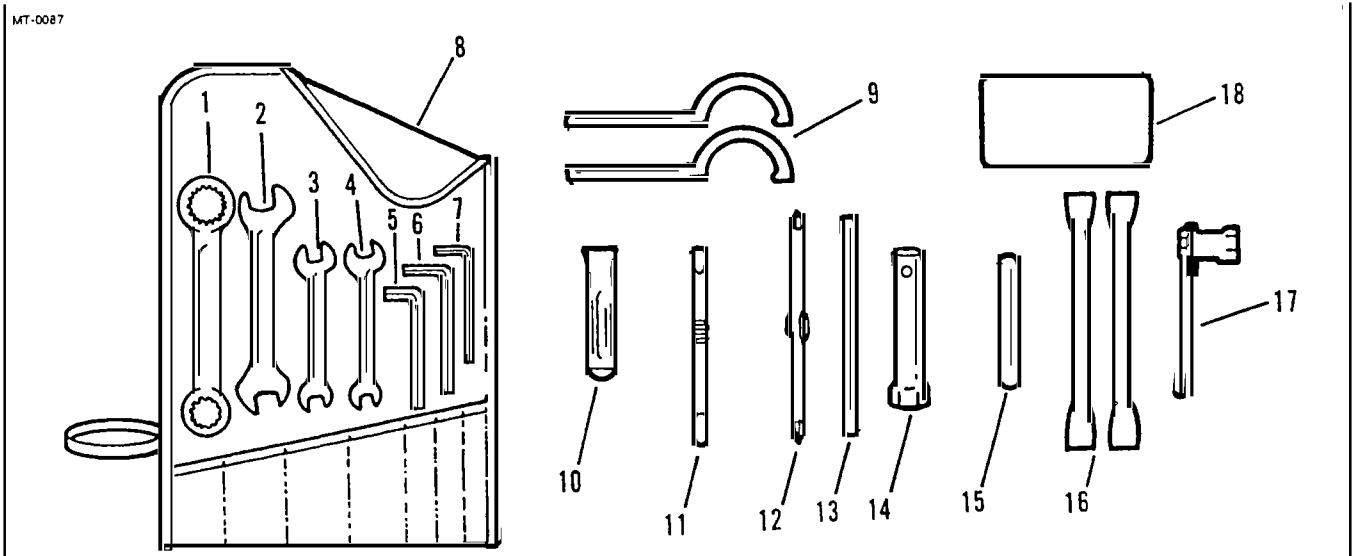


Figure 6-1. Vehicle Tool Kit

6-2. ADDITIONAL REQUIRED TOOLS (cont.)

1. Brush, bristle
2. Chaser, thread, spark plug hole
3. Driver, 8 mm hex, 3/8-inch square-drive
4. Gauge, tire inflation
5. Gauge, wire, spark plug electrode gap
6. Gun, grease, hand operated
7. Mallet, soft-headed
8. Oiler, hand operated
9. Pliers, long nose
10. Ruler, machinist's, 12 inch
11. Socket, spark plug, 17 mm, 3/8-inch square-drive
12. Socket, 10 mm, 3/8
13. Socket, 24 mm, 1/2-inch square-drive
14. Wrench, spoke, 8 mm
15. Wrench, torque, 3/8-inch square-drive, 0-50 ft-lb
16. Wrench, torque, 1/2-inch square-drive, 0-150 ft-lb

6-3. GUN BOX

CAUTION

This gun box is the approved method for carrying the S A 80 weapon. If any other weapon is carried in the gun box, either the gun box or the weapon or both will be damaged.

1. See Figure 6-2. Pull rubber "T" strap (1) up and away from receptacle (4). Open gun box cover (3). Remove weapon.

2. To close gun box cover place cover (3) on gun box (2). Stretch rubber "T" strap (1) up and over receptacle (4).

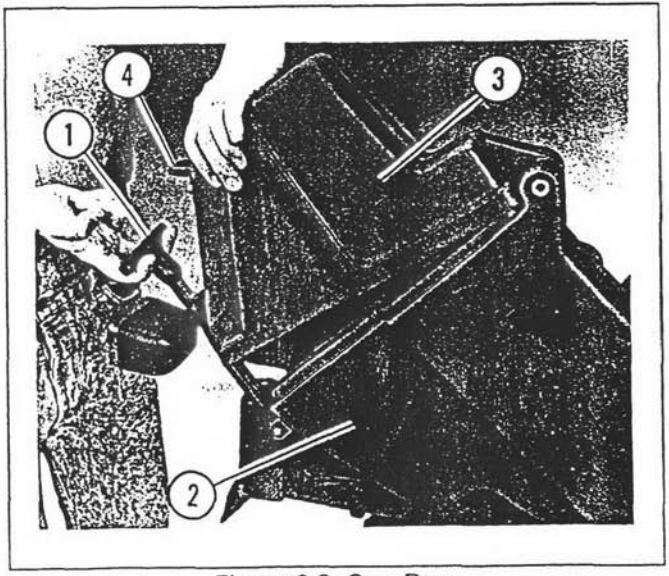


Figure 6-2. Gun Box

6-4. PANNIER

WARNING

Maximum load is 7.5 kg per pannier. Maximum load on rear carrier is 20 kg. Distribute loads evenly left to right. Failure to comply could result in vehicle instability and injury.

1. See Figure 6-3. Remove pannier (1) from vehicle by pulling rubber "T" strap (4) up and away from receptacle (3). Lift pannier (1) up and off pannier retaining bracket (5).

2. Install pannier (1) on vehicle by aligning pannier retainer groove (2) with pannier retaining bracket (5). Slide pannier (1) down until it seats firmly on pannier retaining bracket (5). Stretch rubber "T" strap (4) up and over receptacle (3).

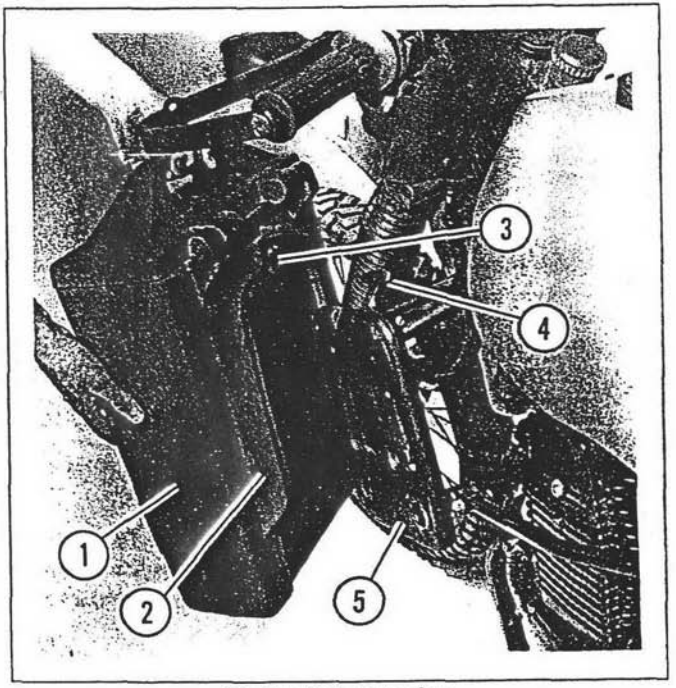


Figure 6-3. Pannier

NOTES

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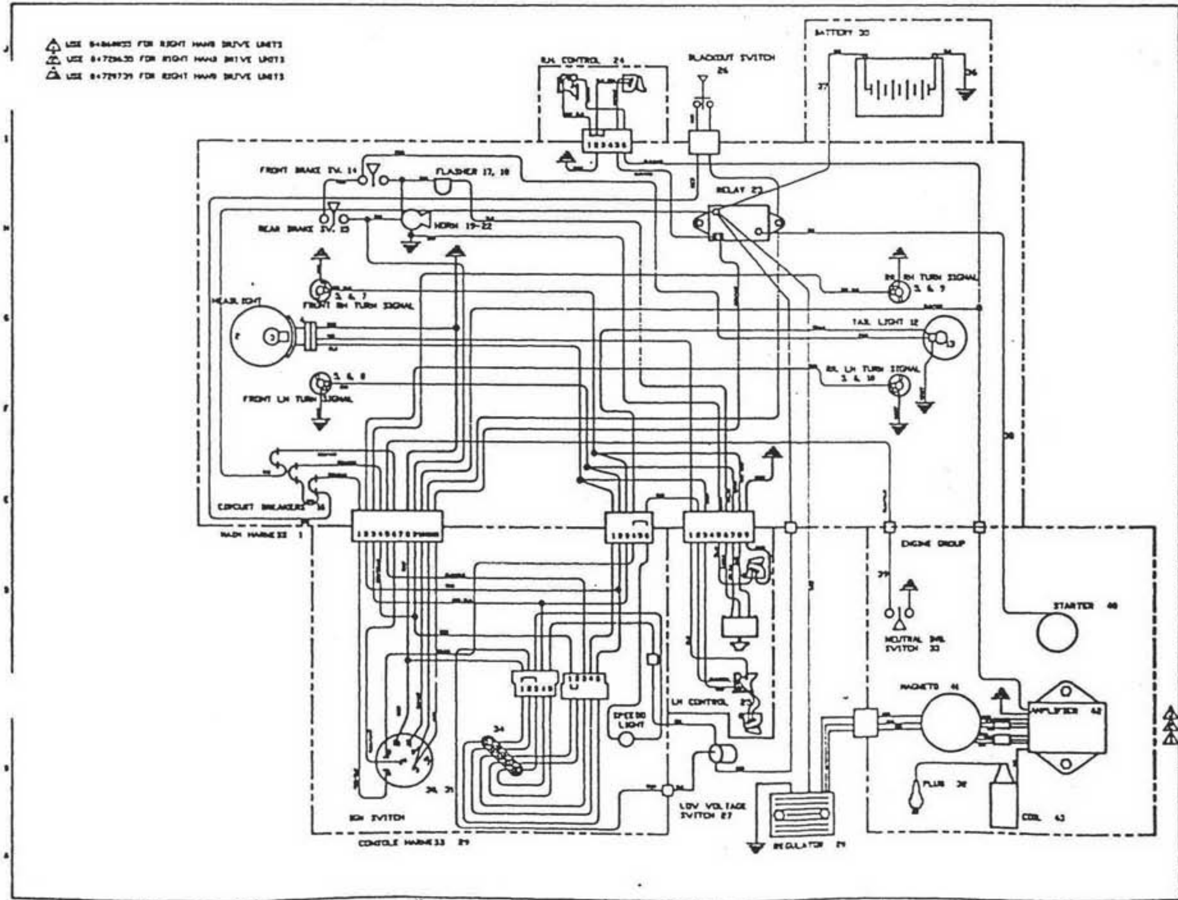

REVISIONS

50			
49			
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43	COIL		REF
42	AMPLIFIER BOX		REF
41	MAGNETO		REF
40	STARTER		REF
39	NEUTRAL START CABLE	84720756	1
38	RELAY TO STARTER CABLE	84721059	1
37	BATTERY CABLE	84722484	1
36	BATTERY GROUND CABLE	84721063	1
35	BATTERY	84722974	1
34	INDICATOR LIGHT ASSY	8472232[illegible]	1
33	NEUTRAL START SWITCH		REF
32	SPARK PLUG		REF
31	IGN. SWITCH LABEL	84762252	1
30	IGNITION SWITCH	84723229	1
29	CONSOL WIRING HARNESS	84723221	1
28	REGULATOR	84820621	1
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26	BLACKOUT SWITCH	8472[illegible]	1
25	LH CONTROL SWITCH	84820646	1
24	RH CONTROL SWITCH	84752417	1
23	RELAY	84721091	1
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20	HORN SPACER	84762814	1
19	HORN	84820661	1
18	FLASHER HOLDER	84720085	1
17	FLASHER	84722228	1
16	CIRCUIT BREAKER	84722305	4
15	REAR BRAKE SWITCH	84752347	1
14	FRONT BRAKE SWITCH	84720333	1
13	TAIL LIGHT BULB	84752759	REF
12	TAIL LIGHT ASSY	84722016	1
11	INDICATOR BULB	84720259	4
10	REAR STCH ASSEMBLY	84820763	1
9	REAR STCH ASSEMBLY	84820763	1
8	FRONT STCH ASSEMBLY	84820695	1
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3	HEADLIGHT BULB	84720242	1 REF
2	HEADLIGHT ASSY	84820312	1
1	MAIN HARNESS	84722453	1
ITEM	DESCRIPTION	PART NO.	QTY.

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