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INTRODUCTION

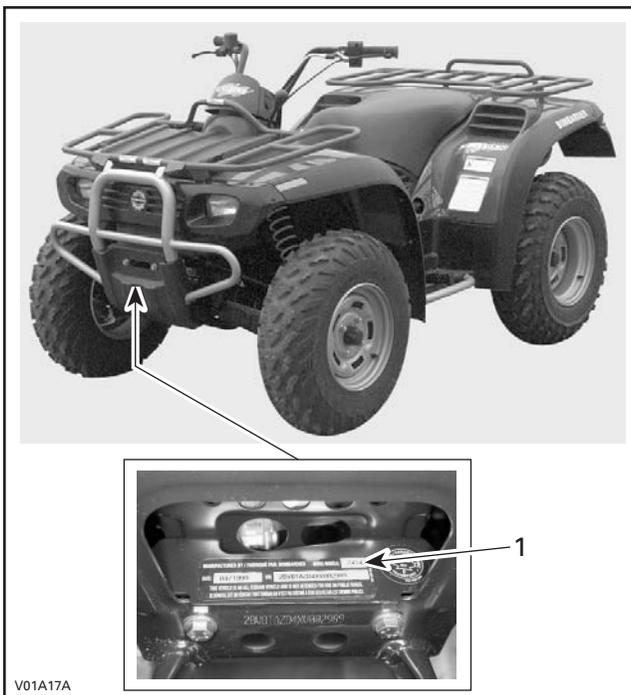
This *Shop Manual* covers the following Bombar-
dier made 1999 ATV:

Models

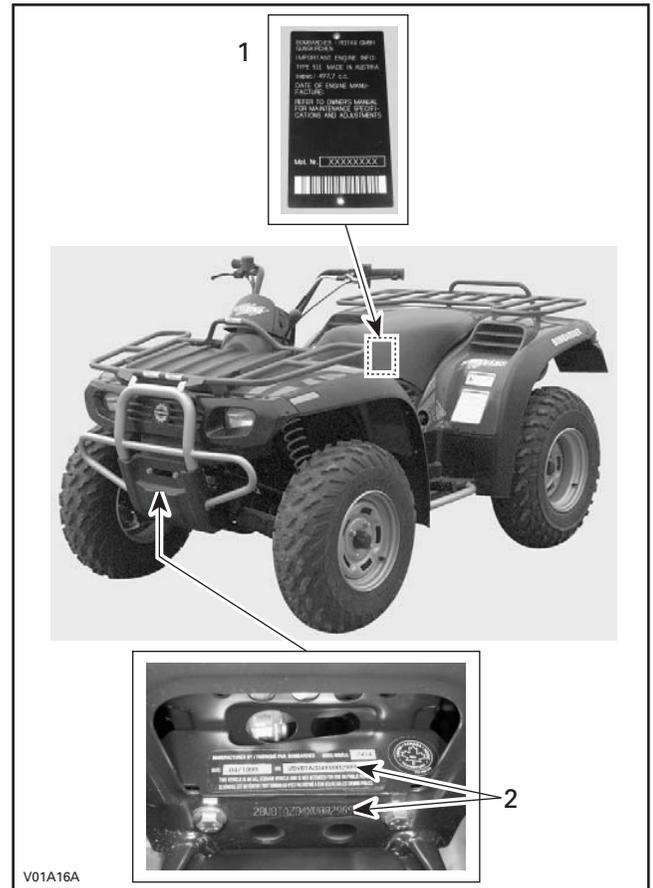
TRAXTER* (Canada)	7400
TRAXTER* (Canada)	7413
TRAXTER* (Canada)	7415
TRAXTER* (Canada)	7417
TRAXTER* (U.S.).....	7401
TRAXTER* (U.S.).....	7414
TRAXTER* (U.S.).....	7416
TRAXTER* (U.S.).....	7418

*Trademark of Bombardier Inc.

VEHICLE AND ENGINE SERIAL NUMBER LOCATION



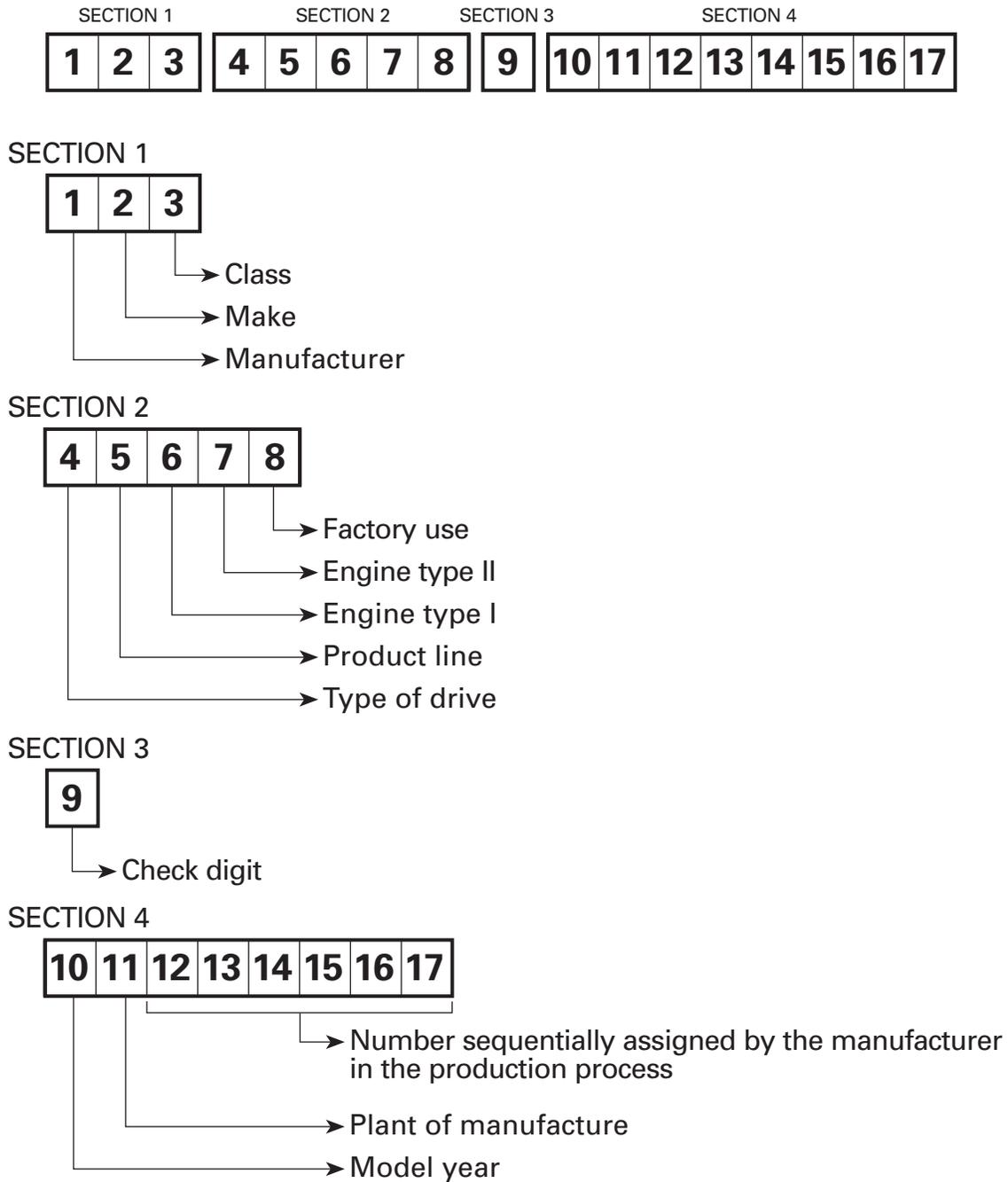
1. Model number



1. Engine
2. Vehicle

INTRODUCTION

Serial Number Meaning



V01A0PS

ARRANGEMENT OF THE MANUAL

The manual is divided into 12 major sections:

- 01 SERVICE TOOLS AND SERVICE PRODUCTS
- 02 MAINTENANCE
- 03 ENGINE
- 04 FUEL SYSTEM
- 05 ELECTRICAL
- 06 DRIVE TRAIN
- 07 STEERING/CONTROL SYSTEMS
- 08 SUSPENSION
- 09 BRAKES
- 10 BODY/FRAME
- 11 TECHNICAL DATA
- 12 WIRING DIAGRAM

Each section is divided in various subsections, and again, each subsection has one or more division.

LIST OF ABBREVIATIONS USED IN THIS MANUAL

A	ampere
amp	ampere
A•h	ampere-hour
AC	alternate current
BDC	bottom dead center
BTDC	before top dead center
°C	degree Celsius
cm	centimeter
cm ²	square centimeter
cm ³	cubic centimeter
DC	direct current
°F	degree Fahrenheit
fl. oz	fluid ounce
ft	foot
GRD	ground
hal.	halogen
I.D.	inside diameter
IDI	induction discharge ignition
imp. oz	imperial ounce

in	inch
in ²	square inch
in ³	cubic inch
k	kilo (thousand)
kg	kilogram
km/h	kilometer per hour
kPa	kilo pascal
L	liter
lb	pound
lbf	pound (force)
lbf/in ²	pound per square inch
LH	left hand
m	meter
MAG	magneto
Max.	maximum
Min.	minimum
mL	milliliter
mm	millimeter
MPEM	multi-purpose electronic module
MPH	mile per hour
N	newton
N.A.	not applicable
no.	number
00.0	continuity
O.L	overload (open circuit)
O.D.	outside diameter
OPT	optional
oz	ounce
P/N	part number
PSI	pound per square inch
PTO	power take off
RPM	revolution per minute
Sp. Gr.	specific gravity
TDC	top dead center
U.S. oz	ounce (United States)
V	volt
Vac	volt (alternative current)

INTRODUCTION

This *Shop Manual* uses technical terms which may be slightly different from the ones in the parts catalog.

TYPICAL PAGE

Section 03 ENGINE
Subsection 02 (REMOVAL AND INSTALLATION)

REMOVAL AND INSTALLATION

10 N·m (97 lbf·in)
24 N·m (17 lbf·ft)
48 N·m (35 lbf·ft)

Therma Lube grease

Drop

03 02 1

Page heading indicates section and subsection detailed.

Subsection title indicates beginning of the subsection.

Exploded view assists you in identifying parts and related positions.

Tightening torque nearby fastener. In this case, nut must be torqued to 48 N·m or 35 lbf·ft.

Bold face number indicates special procedure concerning this part.

Illustration number for publishing process.

CAUTION: Pay attention to torque specifications. Some of these are in lbf·in instead of lbf·ft. Use appropriate torque wrench.

Drop represents a liquid product to be applied to a surface.

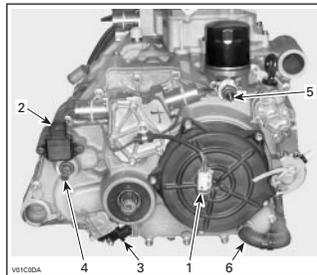
Page numbering system:
03: ENGINE section
02: REMOVAL AND INSTALLATION subsection
1: First page of this subsection

TYPICAL PAGE

Section 03 ENGINE Subsection 02 (REMOVAL AND INSTALLATION)

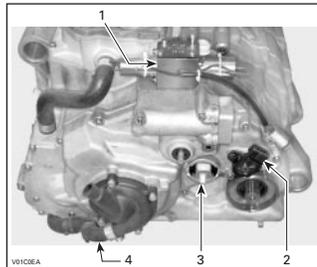
ENGINE REMOVAL

Title indicates main procedure to be carried out.



- 1 Clutching and clutch modulator valves connector
- 2 STPS (Sub Transmission Position Sensor)
- 3 VSS (Vehicle Speed Sensor)
- 4 Shifting engine rod
- 5 Oil pressure sensor
- 6 Engine coolant hose

Call outs for above illustration.



- 1 Shifting valve
- 2 GBPS (Gear Box Position Sensor)
- 3 Magneto/Trigger plug
- 4 Engine coolant hose

03 02 2

Vehicle Preparation

Place the vehicle on jackstands and place the shifter **no. 1** on park position
Remove front wheels
Drain engine oil and engine coolant
Remove seat, front and rear fenders, inner fenders, side panels, steering cover, shifter guide cover and skid plate Refer to the section 09-02 BODY
Disconnect BLACK negative cable from battery, then RED positive cable

WARNING

Always disconnect battery or starter cables exactly in the specified order, BLACK negative cable first. It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

Front Part Preparation

Remove fuel tank and fuel valve Refer to the section 03-02 FUEL CIRCUIT
Disconnect the interlock cable **no. 2** under shifter lever
Remove seat pivot bar and unplug the clutching and clutch modulator valves connector
Remove the STPS (Sub Transmission Position Sensor)
Remove shifting rod **no. 3** Refer to the SHIFTING ROD REMOVAL section
Remove front propeller shaft Refer to the section 05-02 FRONT DIFFERENTIAL
Unplug the VSS (Vehicle Speed Sensor), located under engine drive shaft

Engine Preparation

Unplug spark plug cables
Unplug oil pressure sensor
Remove exhaust pipe **no. 5** Refer to the EXHAUST SYSTEM section
Remove radiator inlet hose
Remove breather hose
Unplug the temperature sensor

Bold face number following part name refers to exploded view at beginning of subsection.

Reference to look up a certain section and subsection. In this case it concerns exhaust system.

INTRODUCTION

GENERAL INFORMATION

The information and component/system descriptions contained in this manual are correct at time of publication. Bombardier Inc. however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on products previously manufactured.

Due to late changes, it may have some differences between the manufactured product and the description and/or specifications in this document.

Bombardier Inc. reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring obligation.

ILLUSTRATIONS AND PROCEDURES

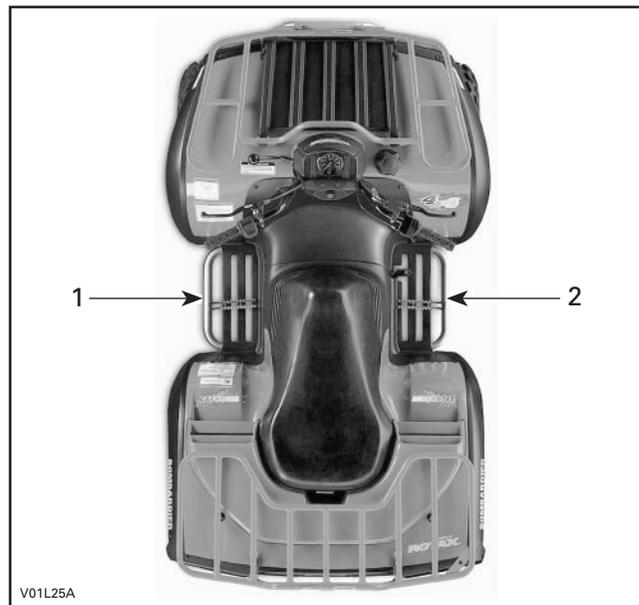
Illustrations and photos show the typical construction of the different assemblies and, in all cases, may not reproduce the full detail or exact shape of the parts shown, however, they represent parts which have the same or a similar function.

CAUTION: Most components of those vehicles are built with parts dimensioned in the metric system. Most fasteners are metric and must not be replaced by customary fasteners or vice-versa. Mismatched or incorrect fasteners could cause damage to the vehicle or possible personal injury.

As many of the procedures in this manual are interrelated, we suggest, that before undertaking any task, you read and thoroughly understand the entire section or subsection in which the procedure is contained.

A number of procedures throughout the book require the use of special tools. Before commencing any procedure, be sure that you have on hand all the tools required, or approved equivalents.

The use of RIGHT and LEFT indications in the text, always refers to driving position (when sitting on vehicle).



1. Left
2. Right

TIGHTENING TORQUES

Tighten fasteners to torque mentioned in exploded views and text. When they are not specified refer to following table. The table also gives the metric conversion.

N•m	FASTENER SIZE (8.8)	Lbf•in
1		9
2	M4	18
3		27
4	M5	35
5		44
6		53
7		62
8		71
9		80
10	M6	89
11		97
12		106
13		115
14		124
15		133
16		142
17		150
18		159
19		168

N•m	FASTENER SIZE (8.8)	Lbf•ft
20		15
21		15
22		16
23	M8	17
24		18
25		18
26		19
27		20
28		21
29		21
30		22
31		23
32		24
33		24
34		25
35		26
36		27
37		27
38		28
39		29
40		30
41		30
42		31
43		32
44		32
45		33
46		34
47		35
48	M10	35
49		36
50		37
51		38
52		38
53		39
54		40
55		41
56		41
57		42
58		43
59		44
60		44
61		45
62		46
63		46
64		47

INTRODUCTION

N•m	FASTENER SIZE (8.8)	Lbf•ft
65		48
66		49
67		49
68		50
69		51
70		52
71		52
72		53
73		54
74		55
75		55
76		56
77		57
78		58
79		58
80	M12	59
81		60
82		60
83		61
84		62
85		63
86		63
87		64
88		65
89		66
90		66
91		67
92		68
93		69
94		69
95		70
96		71
97		72
98		72
99		73
100		74
101		74
102		75
103		76
104		77
105		77
106		78
107		79
108		80

N•m	FASTENER SIZE (8.8)	Lbf•ft
109		80
110		81
111		82
112		83
113		83
114		84
115		85
116		86
117		86
118		87
119		88
120		89
121		89
122		90
123		91
124		91
125		92
126		93
127		94
128		94
129		95
130		96
131		97
132		97
133		98
134		99
135	M14	100
136		100
137		101
138		102
139		103
140		103
141		104
142		105
143		105
144		106
145		107
146		108
147		108
148		109
149		110
150		111

TIGHTENING TORQUES FOR 8.8 GRADE BOLTS AND NUTS

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SERVICE PRODUCTS 01-03-1

MANDATORY SERVICE PRODUCTS	01-03-1
RECOMMENDED SERVICE PRODUCTS	01-03-2

SERVICE TOOLS

This is a list of tools to properly service ATV vehicle. If you need to replace or add to your tool inventory these items can be ordered through the regular parts channel.

Following mention points out new tool: 

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

ENGINE — MANDATORY SERVICE TOOLS

Lifting bar
(P/N 529 035 610)

NEW



V01B094

Magneto puller
(P/N 529 035 547)



F01B294

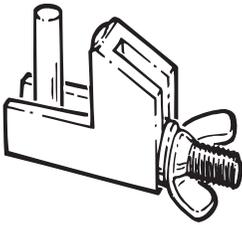
Spanner tool for clutch basket
(P/N 529 035 647)

NEW



V01B084

Small hose pincher
(P/N 529 009 900)



A01B214

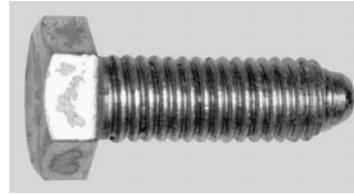
Fuel and oil system leak tester kit
(P/N 529 033 100)



A01B5E4

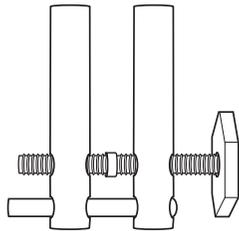
Crankshaft locking bolt
(P/N 529 035 645)

NEW



V01B0C4

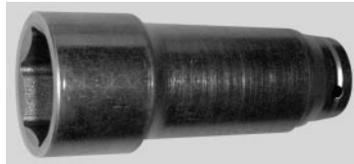
Large hose pincher
(P/N 529 032 500)



F01B234

46 mm socket for crankshaft
(P/N 529 035 648)

NEW



V01B0A4

Crankshaft protector
(P/N 290 876 557)

NEW



V01B0D4

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

ENGINE — RECOMMENDED SERVICE TOOLS

Sub-transmission positioner
(P/N 529 035 651)

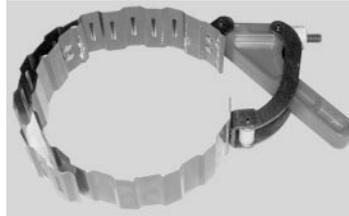
NEW



V01B0E4

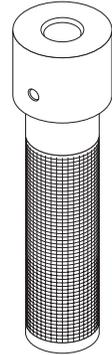
Ring compressor
Not sold by Bombardier

Snap-on
RCW60



V01B0H4

Handle for insertion jig
(P/N 420 877 650)



A00C3V4

Oil pressure gauge (1 to 8 bar)
(P/N 529 035 652)

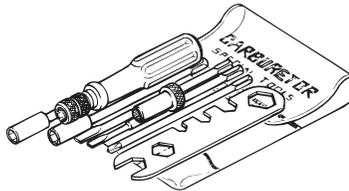
NEW



V01B0K4

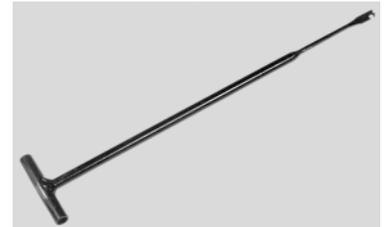
Carburetor tool kit
(P/N 529 035 660)

NEW



A00B2F4

Exhaust spring installer/remover
(P/N 529 035 400)



A01B5B4

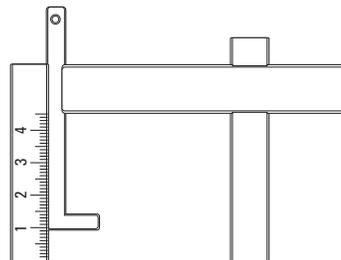
Lifting ring
(P/N 529 035 644)

NEW



V01B0F4

Float level gauge
(P/N 529 035 520)



A00B4N4

Valve spring compressor
Not sold by Bombardier

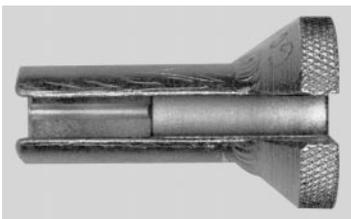
Snap-on
CF811



V01B0I4

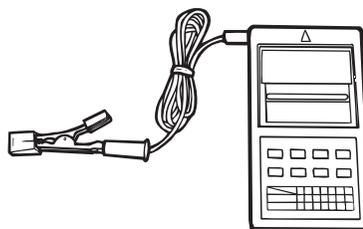
Choke nut tool
(P/N 529 035 660)

NEW



V01B0G4

Digital/induction type tachometer
(P/N 529 014 500)



F01B1G4

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

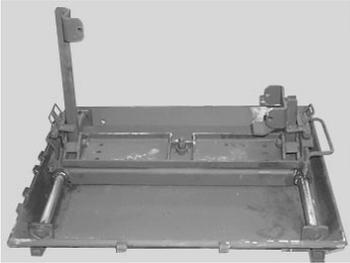
Subsection 02 (SERVICE TOOLS)

ENGINE — RECOMMENDED SERVICE TOOLS (continued)

Engine stand

(P/N 529 035 646)

NEW



V01B0J4

ELECTRICAL — MANDATORY SERVICE TOOLS

Six-pin magneto harness
(P/N 529 035 654)

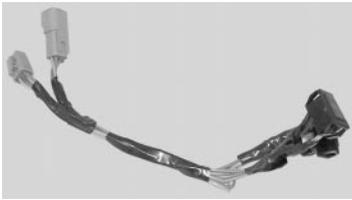
NEW



F01B284

T-Harness for diagnoses of
solenoids
(P/N 529 035 653)

NEW



V01B0L4

Jumper for self-diagnoses
(P/N 529 035 605)

NEW



V01B0M4

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

ELECTRICAL — RECOMMENDED SERVICE TOOLS

Crimping tool
(P/N 295 100 164)



F00B0E4

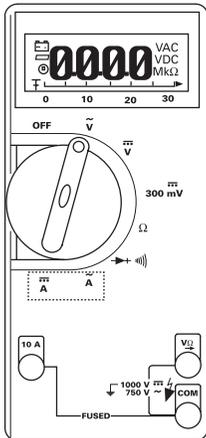
Terminal remover
Not sold by Bombardier

Snap-on
TT 600-4



F01B1J4

Multimeter
(P/N 529 022 000)



F01B1O4

SUSPENSION — MANDATORY SERVICE TOOLS

Front suspension space bar
(P/N 529 035 611)

NEW



V01B0N4

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

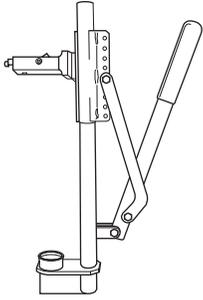
SUSPENSION — RECOMMENDED SERVICE TOOLS

Shock spring removal kit

(P/N 529 027 100)

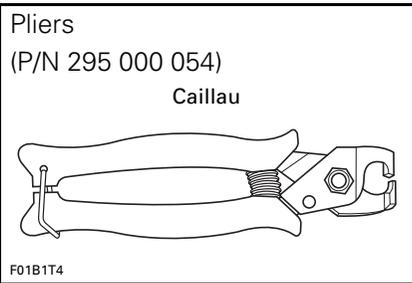
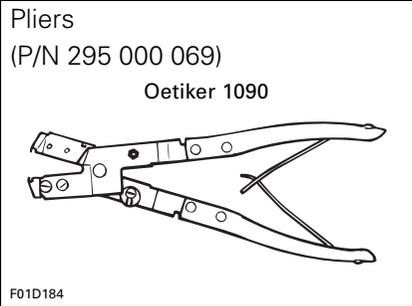
Replacement clevis pin:

(P/N 414 528 400)



A01B404

DRIVE — MANDATORY SERVICE TOOLS



Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

DRIVE — RECOMMENDED SERVICE TOOLS

Differential spanner socket
(P/N 529 035 649)

NEW

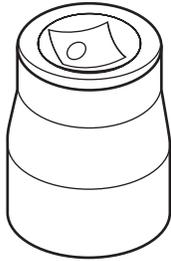


V01B0S4

VEHICLE — MANDATORY SERVICE TOOLS

41 mm socket for swing arm nut
(P/N 529 035 650)

NEW



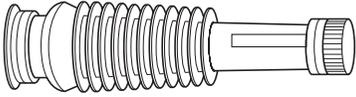
V01B0T4

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

VEHICLE — RECOMMENDED SERVICE TOOLS

Flexible spout for oil container
(P/N 414 837 300)



F04B044

SERVICE PRODUCTS

MANDATORY SERVICE PRODUCTS

Loctite® is a trademarks of Loctite Corporation.

Permatex® is a trademark of Loctite™ Corporation.

Dow Corning® is a trademarks of Dow Corning Corporation.

Primer for gasket eliminator
(P/N 293 800 041)

Loctite 764



A00B3N4

Medium strength
threadlocker

(P/N 293 800 060)

Loctite 243 (blue)
(10 mL)



A00B324

The Right Stuff (sealant)
(P/N 293 800 053)

Permatex®
(198 g)



F00B0V4

Gasket stripper
(P/N 413 508 500)

(500 mL)



F01B1W4

Gasket/paint remover
(P/N 413 708 500)

Loctite® 79040 Chisel
510 g (18 oz)



A00B3L4

High strength
threadlocker
(P/N 293 800 005)

Loctite 271 (red)
(10 mL)



A00B2U4

Dielectric grease
(P/N 293 550 004)

Dow Corning
(150 g)



F01B164

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 03 (SERVICE PRODUCTS)

RECOMMENDED SERVICE PRODUCTS

Anti-seize lubricant
(P/N 413 701 000)

Loctite anti-seize
lubricant 454 g (16 oz)



F01B174

Degreaser
(P/N 413 708 400)

Permatex® 48 TA
433 g (15 oz)



A00B3K4

Fuel stabilizer
(P/N 413 408 600)

236 mL (8 oz)



A00B3V4

Bombardier storage oil
(P/N 413 711 600)

(12 x 350 g)



A02B054

Plastic & vinyl cleaner
(P/N 413 711 200)

(6 x 1 L)



A00B4V4

Paste gasket
(P/N 413 702 700)

Loctite® 515:
Gasket eliminator (50 mL)



A00B2T4

Silicone compound
(P/N 420 897 061)

Dow Corning® MS4



A00B3R4

BOMBARDIER LUBE
(P/N 293 600 016)

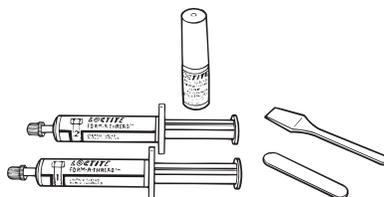
(12 x 14 oz)



F01B0S4

Stripped threads repair kit
(P/N 413 708 600)

Loctite 81668
Form-A-thread 81668



A00A1J4

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MAINTENANCE CHART

NOISE EMISSION CONTROL SYSTEM REGULATION

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED!

U.S. Federal law and Canadian provincial laws may prohibit the following acts or the causing there of:

1. The removal or rendering inoperative by any person other than for purposes of maintenance, repair or replacement of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use or
2. The use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

AMONG THOSE ACTS PRESUMED TO CONSTITUTE TAMPERING ARE THE ACTS LISTED BELOW:

1. Removal or alteration or the puncturing of the muffler or any engine component which conducts removal of engine exhaust gases.
2. Removal or alteration or the puncturing of any part of the intake system.
3. Replacing any moving parts of the vehicle or parts of the exhaust or intake system, with parts other than those specified by the manufacturer.
4. Lack of proper maintenance.

Section 02 MAINTENANCE

Subsection 02 (MAINTENANCE CHART)

MAINTENANCE CHART

LUBRICATION AND MAINTENANCE CHART		INITIAL 10 HOURS	EVERY 25 HOURS	EVERY 50 HOURS	EVERY 100 HOURS OR ONCE A YEAR	EVERY 200 HOURS OR 2 YEARS	REFER TO THE SECTION
ENGINE/ TRANSMISSION	Engine/transmission oil level	✓	✓				02-02
	Engine/transmission oil and filter replacement	✓		✓			
	Spark arrester (cleaning)				✓		
	Engine mount fasteners	✓					03-02
	Exhaust system (leak)	✓			✓		
	Condition of seals	✓			✓		N.A.
	Coolant density				✓		02-04
	Coolant level	✓	✓				03-03
	Coolant replacement					✓	
	Cooling system condition	✓			✓		
	Radiator cap pressure test					✓	
	Radiator condition/cleanliness (air ducts)	✓		✓			
	Rewind starter rope condition				✓		03-04
	Clutch and transmission operation				✓		05-06
PCV valve (inspection)					✓	04-04	
FUEL SYSTEM	Air filter cleaning/draining		✓				02-02
	Air filter and foam replacement				✓		
	Fuel lines and connections	✓			✓		04-02
	Fuel tank strainer replacement					✓	
	Carburetor adjustment	✓			✓		04-03
ELECTRICAL	Spark plug inspection/replacement	✓			✓		05-05
	Battery electrolyte level and vent condition	✓		✓			05-04
	Battery connections				✓		
	Wiring harness, cables and lines	✓			✓		05-07
	Condition of ignition switch and start/stop button	✓			✓		
	Condition of lighting system (hi/lo intensity, brake light, etc.)	✓			✓		
	Headlight beam aiming	✓			✓		
DRIVE TRAIN	Drive shaft boot inspection and protector condition	✓	✓				06-02
	Front propeller shaft joint lubrication (grease fitting)	✓		✓			
	Drive shaft joint inspection				✓		
	Wheel bearing condition				✓		
	Rear propeller shaft joint lubrication (grease fitting)				✓		06-03
	Front differential and rear rigid axle oil level, seals and vent condition	✓		✓			06-02/ 06-03
	Front differential and rear rigid axle oil replacement	✓				✓	

Section 02 MAINTENANCE
Subsection 02 (MAINTENANCE CHART)

LUBRICATION AND MAINTENANCE CHART		INITIAL 10 HOURS	EVERY 25 HOURS	EVERY 50 HOURS	EVERY 100 HOURS OR ONCE A YEAR	EVERY 200 HOURS OR 2 YEARS	REFER TO THE SECTION
STEERING/ CONTROL SYSTEMS	Throttle condition	✓			✓		04-03
	Choke condition	✓			✓		
	Handlebar fastener tightness				✓		
	Steering system mechanism	✓			✓		07-02
	Tie rod ends inspection			✓			
	Steering adjustment	✓			✓		
	Tire pressure	✓	✓				02-02
	Wheel mount tightness and stud lubrication	✓			✓		
	Wear and condition of tires		✓				
	Front wheel alignment	✓			✓		N.A.
SUSPENSION	Swing arm condition				✓		08-02/ 08-03
	Shock absorber condition			✓			
BRAKE	Brake fluid level front/rear	✓	✓				09-02
	Brake fluid replacement front/rear				✓		
	Brake cable condition	✓			✓		
	Brake cable adjustment	✓		✓			
	Brake system condition (discs, hoses, etc.)				✓		
	Brake pads condition		✓				
BODY/FRAME	Engine compartment	✓		✓			02-02
	Fastener condition/tightness			✓			
	Skid plate condition	✓		✓			10-02
	Hitch/trailer ball condition (if installed)	✓		✓			
	Seat latch				✓		
	Frame inspection				✓		
	Vehicle cleaning and protection			✓			
	Storage cover latches	✓		✓			

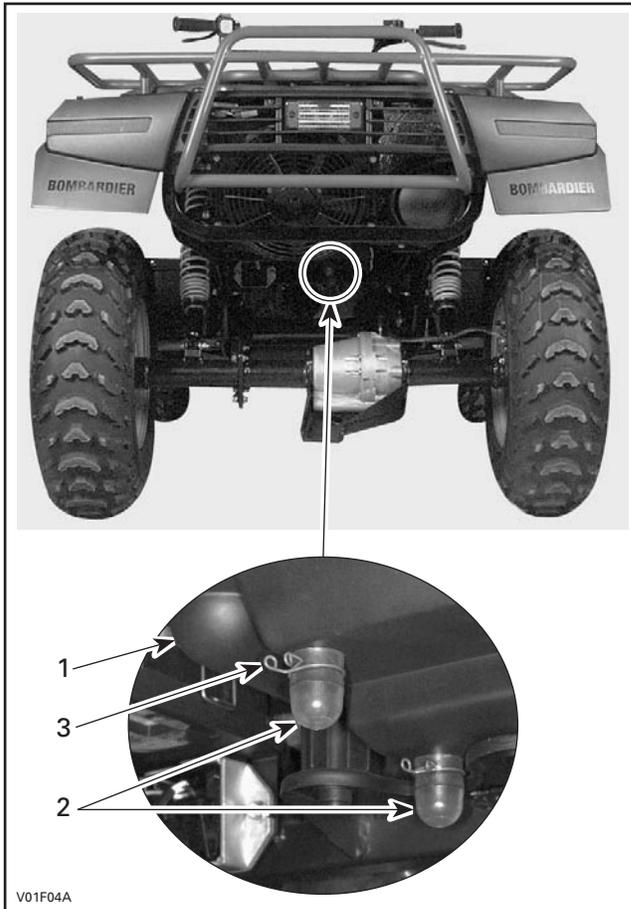
NOTE: Some riding conditions and hauling loads may result in requiring more frequent maintenance. Some items are part of the pre-operation checks and must always be performed prior to operating the vehicle.

MAINTENANCE/LUBRICATION

AIR FILTER CLEANING/DRAINING

Air Filter Box Draining

Periodically inspect air filter box drain plugs for water or deposits. Refer to the maintenance chart.



1. Air filter box
2. Drain plugs
3. Clamp

NOTE: If vehicle is used in dusty area, inspect more frequently than specified in maintenance chart.

If water/deposits are found, squeeze the clamp and remove. Pull drain tube out. Proceed with each drain plug.

CAUTION: Do not start engine when water is found in the drain tubes.

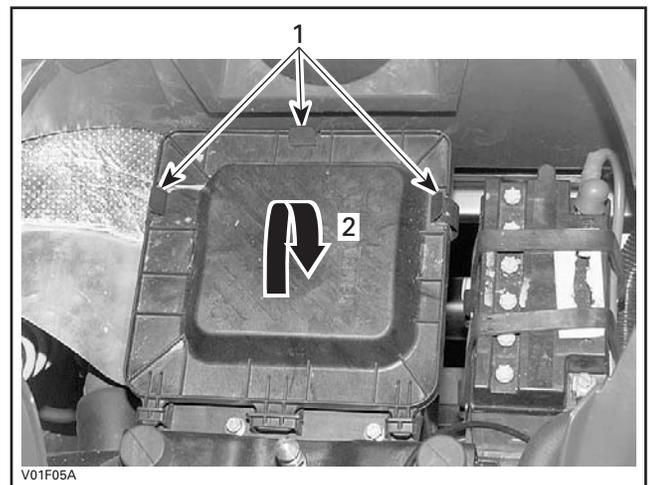
When water/deposits are found, air filter must be inspected/dried/replaced depending on its condition.

Remove air filter as explained below.

Air Filter Removal

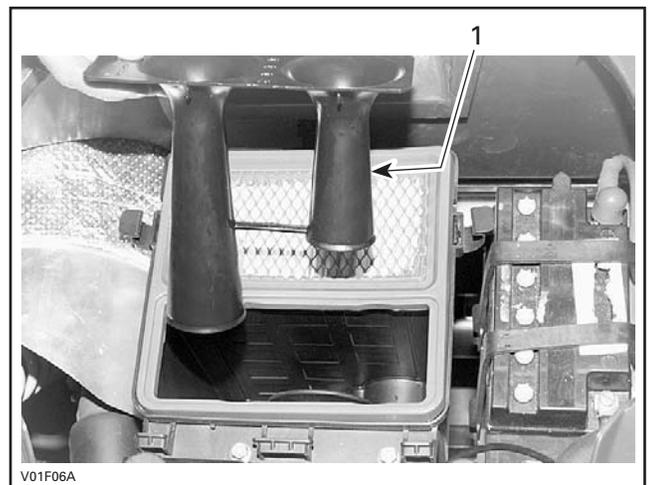
Remove seat.

Release clamps and remove air filter box cover.



1. Release clamps
2. Lift to remove

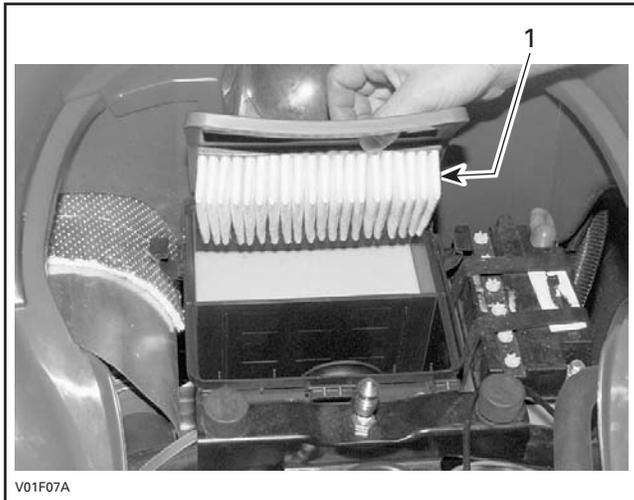
Remove air baffles, air filter and foam.



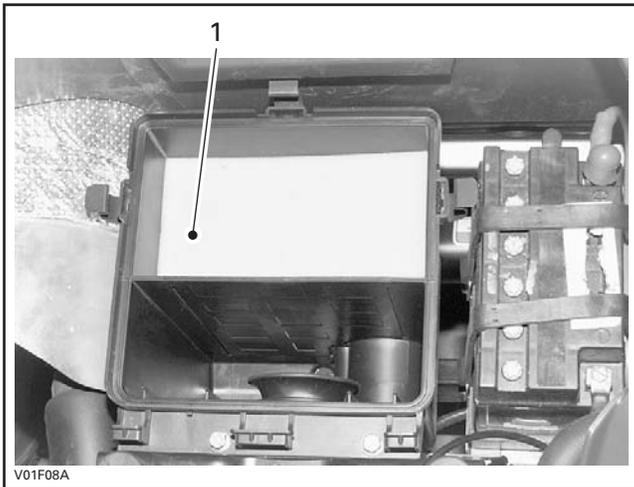
1. Air baffle

Section 02 MAINTENANCE

Subsection 03 (MAINTENANCE/LUBRICATION)



1. Air filter



1. Foam

Clean inside of air box.

Wash air filter and foam with warm water and a mild detergent as necessary.

Squeeze foam to remove excess water. Let dry air filter and foam thoroughly.

If air filter element or foam is dirty, replace with a new one.

CAUTION: Never remove or modify any component in the air box. Always use genuine parts when replacing air filter and foam. The engine carburation is calibrated to operate specifically with these components. Otherwise, engine performance degradation or damage can occur.

NOTE: Slight dust may be cleaned using a low-pressure airgun. Blow compressed air backward of operating air flow.

Properly reinstall removed parts in the reverse order of their removal.

BOLTS, FASTENERS AND NUTS

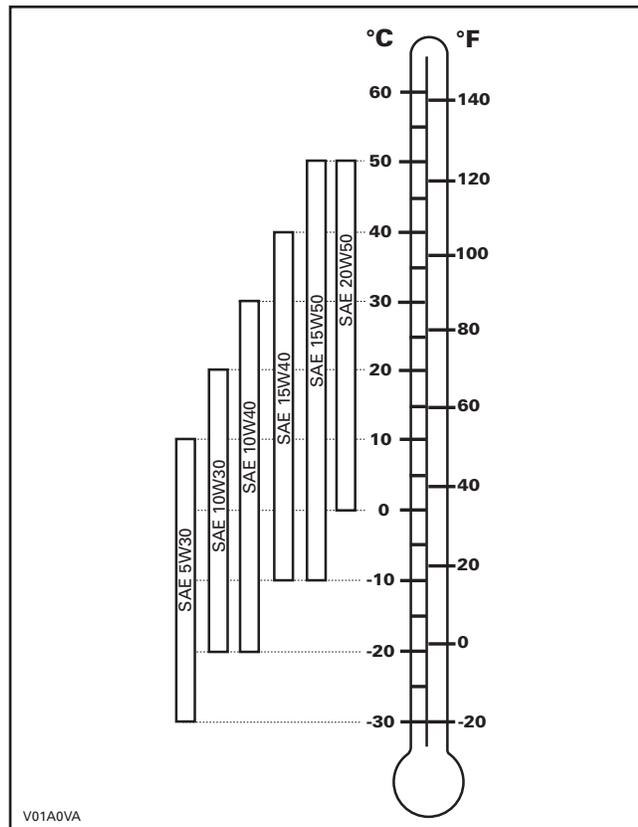
Check that all fasteners, bolts and nuts are tightened to the proper torque.

ENGINE OIL AND FILTER

Oil Viscosity

SAE 10W40 is recommended for general use.

Other viscosity should be used if the average temperature is outside the range of the recommended oil. See chart below.



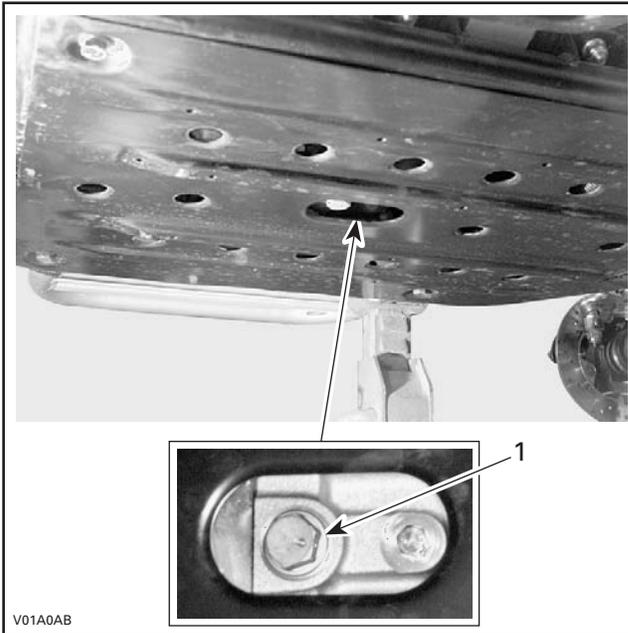
Oil and Oil Filter Change

WARNING

The engine oil can be very hot. Wait until engine oil is warm.

NOTE: Oil and filter are to be replaced at the same time. Oil change should be done with a warmed up engine.

- Ensure vehicle is on a level surface.
- Clean the drain plug area.
- Remove dipstick.
- Place a drain pan under the engine drain plug area.
- Unscrew drain plug.



1. Oil drain plug

Wait a while to allow oil to flow out of oil filter (10 minutes approximately).

Carefully unscrew oil filter and as soon as it can leave the engine, turn it upright. Discard filter.

Be sure that the old filter O-ring is removed.

CAUTION: Only use Bombardier high pressure filter. The Bombardier filter is specifically designed for this engine. This filter does not operate at the same pressure than other brands. Using a non-recommended filter may cause serious engine damage.

Lubricate the O-ring on the filter with engine oil. Install the new filter then screw one full turn after O-ring contact.

Wipe out any oil spillage on engine.

Inspect gasket on drain plug and replace as necessary. Clean gasket area on engine and drain plug then reinstall plug.

Refill engine at the proper level with the recommended oil. Refer to TECHNICAL DATA section 11 for capacity. Do not overfill.

NOTE: The same oil lubricates both engine and transmission. **Don't use synthetic oil, synthetic blend oil or special additives.** As they could affect the clutching performance.

Start engine and let idle for a few minutes. Ensure oil filter area and drain plug areas are not leaking.

Stop engine. Wait a while to allow oil to flow down to crankcase then check oil level. Refill as necessary.

Dispose oil as per your local environmental regulations.

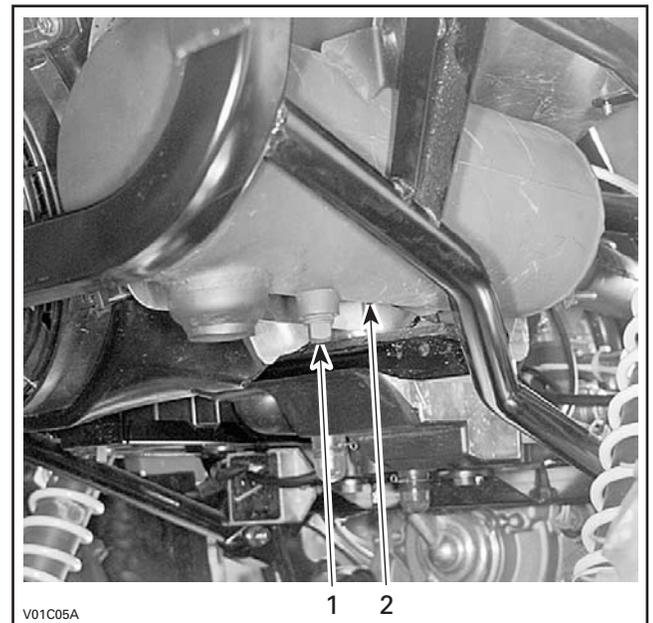
SPARK ARRESTER

The muffler must be periodically purged of accumulated carbon.

Select a well-ventilated area and make sure the muffler is cool.

Place transmission on park position.

Remove the clean out plug.



1. Clean out plug

Block the end of muffler with a shop rag and start engine.

Momentarily increase engine RPM several time to purge accumulated carbon out the muffler.

Stop engine and allow muffler to cool.

Remove shop rag and reinstall the clean out plug.

Section 02 MAINTENANCE

Subsection 03 (MAINTENANCE/LUBRICATION)

WARNING

Never run engine in an enclosed area.
Never perform this operation immediately after the engine has been run because exhaust system is very hot.
Make sure that there are no combustible materials in the area.
Wear eye protector and gloves.
Never stand behind the vehicle while purging exhaust system.
Respect all applicable laws and regulations.

Check the exhaust system for damage, crack or leak (exhaust pipe). Repair or change if necessary.

TIRES AND WHEELS

Tire Pressure

CAUTION: Underpressure may cause tire to deflate and rotate on wheel. Overpressure might burst the tire. Always follow recommended pressure. Since tires are low-pressure type, a manual pump should be used.

Check pressure when tires are cold before using the vehicle.

NOTE: Tire pressure changes with temperature and altitude. Recheck pressure if one of these conditions has changed.

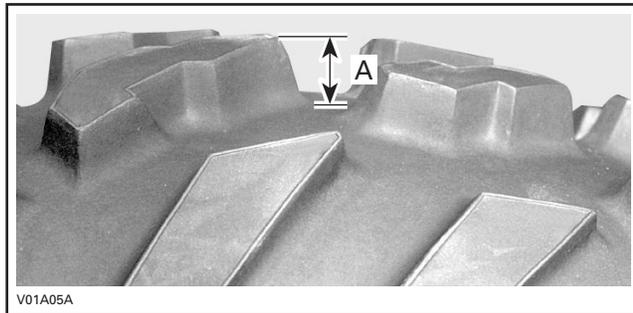
For your convenience, a pressure gauge is supplied in tool box.

TIRE PRESSURE

TIRE PRESSURE		
RECOMMENDED	FRONT 48 kPa (7 PSI)	REAR 38 kPa (5.5 PSI)
MINIMUM	45 kPa (6.5 PSI)	35 kPa (5 PSI)

Tire/Wheel Condition

Check tire for damage and wear. Measure thread height. It should be 4 mm (5/32 in) minimum. Replace if damaged or worn.



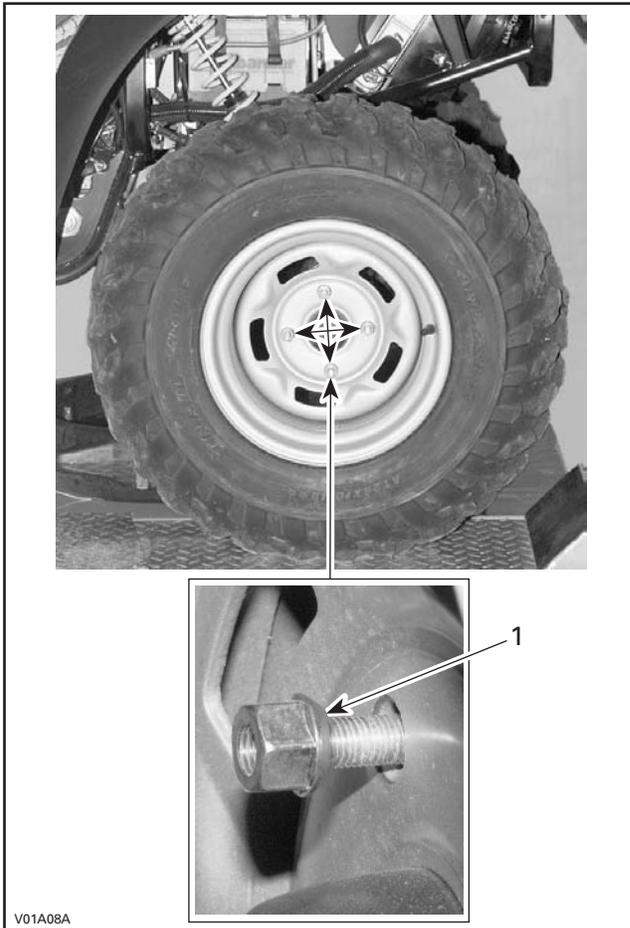
A. 4 mm (5/32 in)

NOTE: Do not make a tire rotation. The front and rear tires have a different size. Besides, these tires are directional and their rotation must be kept in a specific direction for proper operation.

Wheel Removal

Untighten nuts then lift vehicle where needed. Place a support under vehicle. Remove nuts then withdraw wheel.

At installation, it is recommended to apply anti-seize lubricant on threads. Gently tighten nuts in a criss-cross sequence then apply a final torque of 75 N•m (55 lbf•ft).



1. Taper side of nut

ENGINE COMPARTMENT

Check in the engine compartment, for leak or other damage. Clean mud, leaves, etc. from engine compartment.

STORAGE/PRE-SEASON PREPARATION

STORAGE

If the ATV is to be stored for an extended period of time more than 1 month, be sure to thoroughly check the vehicle for needed repairs and have them performed.

FUEL STABILIZER

A fuel stabilizer (P/N 413 408 600) can be added in fuel tank to prevent fuel deterioration and avoid draining fuel system for storage. Follow manufacturer's instructions for proper use.

If above fuel stabilizer is not used, drain fuel system including fuel tank and carburetor.

CAUTION: Fuel stabilizer should be added prior to engine lubrication to ensure carburetor protection against varnish deposit.

ENGINE LUBRICATION

Engine internal parts must be lubricated to protect them from possible rust formation during the storage period.

Proceed as follows:

- Place the vehicle on blocks to raise all four tires off the ground.
- Start the engine and allow it to run at idle speed until the engine reaches its operating temperature.
- Stop the engine.
- Change engine oil and filter. Refer to MAINTENANCE/LUBRICATION 02-03.
- Remove air box cover, air filter, foam and baffles to spray storage oil (P/N 413 711 600) into carburetor bore.
- Restart engine and run at idle speed.
- Inject storage oil until the engine stalls or until a sufficient quantity of oil has entered the engine (approximately a quarter of can).
- Stop the engine and remove the battery. Store it in dry and cool place out of the sun, refer to BATTERY 05-04. Remove the spark plugs and spray storage oil into cylinder.

- Crank slowly 2 or 3 revolutions to lubricate cylinder.
- Turn the fuel valve to OFF and drain carburetor.
- Reinstall the spark plugs, baffles, foam, air filter and air box cover.

WARNING

This procedure must only be performed in a well-ventilated area. Do not run engine during storage period.

RAGS IN AIR INTAKE AND EXHAUST SYSTEM

At storage preparation, block air intake inlet and exhaust system outlet using clean rags.

The air intake hole is located under steering cover.

NOTE: Remove those rags at pre-season preparation.

VEHICLE CLEANING AND PROTECTION

Wash and dry the vehicle.

Remove any dirt or rust.

To clean the plastic parts, use only flannel clothes or Kimtowels® wipers no. 58-380 from Kimberly-Clark.

CAUTION: It is necessary to use flannel clothes or Kimtowels wipers on plastic parts to avoid damaging further surfaces to clean.

To clean the entire vehicle, including metallic parts with a **thick** coat of grease, use Endust® imported by Bristol Myers, available at hardware stores or supermarkets.

CAUTION: Do not use Bombardier Cleaner on decals, plastic parts or vinyl.

To clean the entire vehicle, including metallic parts with a **thin** coat of grease, use Simple Green® from Sunshine Makers Inc., available at hardware stores or at automotive parts retailer.

Section 02 MAINTENANCE

Subsection 04 (STORAGE/PRE-SEASON PREPARATION)

For vinyl and plastic parts, use Vinyl & Plastic Cleaner (P/N 413 711 200 (6 x 1 L)).

CAUTION: Never clean plastic parts with strong detergent, degreasing agent, paint thinner, acetone, products containing chlorine, etc.

Inspect the vehicle and repair any damage. Touch up all metal spots where paint has been scratched off. Spray all metal parts with BOMBARDIER LUBE (P/N 293 600 016).

NOTE: Protect the vehicle with a cover to prevent dust accumulation during storage.

CAUTION: The vehicle has to be stored in a cool and dry place and covered with an opaque tarpaulin. This will prevent sun rays and grime from affecting plastic components and vehicle finish.

COOLANT DENSITY

Test the density of the coolant using an antifreeze hydrometer.

NOTE: Follow manufacturer's instructions for proper use.

A 60/40 mixture of antifreeze and distilled water will provide the optimum cooling, corrosion protection and antifreeze protection.

Do not use tap water, straight antifreeze or straight water in the system. Tap water contains minerals and impurities which build up in the system. Straight water or antifreeze will cause the system to freeze.

Change coolant if necessary.

Section 02 MAINTENANCE
Subsection 04 (STORAGE/PRE-SEASON PREPARATION)

PRE-SEASON PREPARATION

SYSTEM	PRE-SEASON OPERATIONS	TO BE PERFORMED BY		REFER TO
		CUSTOMER	DEALER	
ENGINE/ TRANSMISSION	Test Run Vehicle. Check Clutch and Transmission Operation		✓	N.A.
	Engine Oil and Filter Oil Replacement ①	✓		Section 02-02
	Coolant Replacement and Pressurization of System		✓	Section 03-04
	Condition of Seals		✓	N.A.
	Spark Arrester		✓	Section 02-02
	Exhaust System Condition		✓	Section 03-02
	Rewind Starter, Rope Condition		✓	Section 03-05
	Rags Removal (Intake and Exhaust) ②	✓		Section 02-03
FUEL SYSTEM	Fuel Line and Connectors Condition		✓	Section 04-02
	Carburetor Adjustment		✓	Section 04-03
	Throttle and Choke Cable Inspection/Adjustment		✓	
	Air Filter Cleaning/Replacement	✓		Section 02-02
ELECTRICAL	Spark Plug Replacement ③	✓		Section 05-05
	Battery Condition/Charging and Installation		✓	Section 05-04
	Starter Connections and Routing		✓	
	Operation of Lighting System	✓		Section 05-07
DRIVE TRAIN	Drive Shaft Boot Inspection		✓	Section 06-02 and 06-03
	Front Propeller Shaft Lubrication		✓	
	Front Differential and Rigid Axle Oil Level and Vent Tube Condition		✓	
STEERING/ CONTROL SYSTEM	Steering System Inspection and Adjustment		✓	Section 07-02
	Handle Bar Fastener Tightness		✓	
	Wheel Tightness	✓		Section 02-02
	Tire Pressure	✓		
	Tire Condition	✓		
SUSPENSION	Suspension System Inspection		✓	Section 08-02 and 08-03
	Bearing Condition		✓	
	Swing Arm Condition		✓	
BRAKES	Brake Fluid Change		✓	Section 09-02
	Brake Condition		✓	
	Brake Cable Adjustment		✓	
BODY/FRAME	Frame and Skid Plate Condition		✓	Section 10-02 and 10-03
	Hitch/Trailer Ball Condition	✓	✓	
	Front Cover Compartment Cover Latch Condition	✓	✓	

① Replace oil and filter only if it has not been previously performed at the storage.

② Remove rags in intake and exhaust that were installed at the storage.

③ Before installing new spark plugs at pre-season preparation, it is suggested to burn excess storage oil by starting the engine with the old spark plugs. Only perform this operation in a well-ventilated area.

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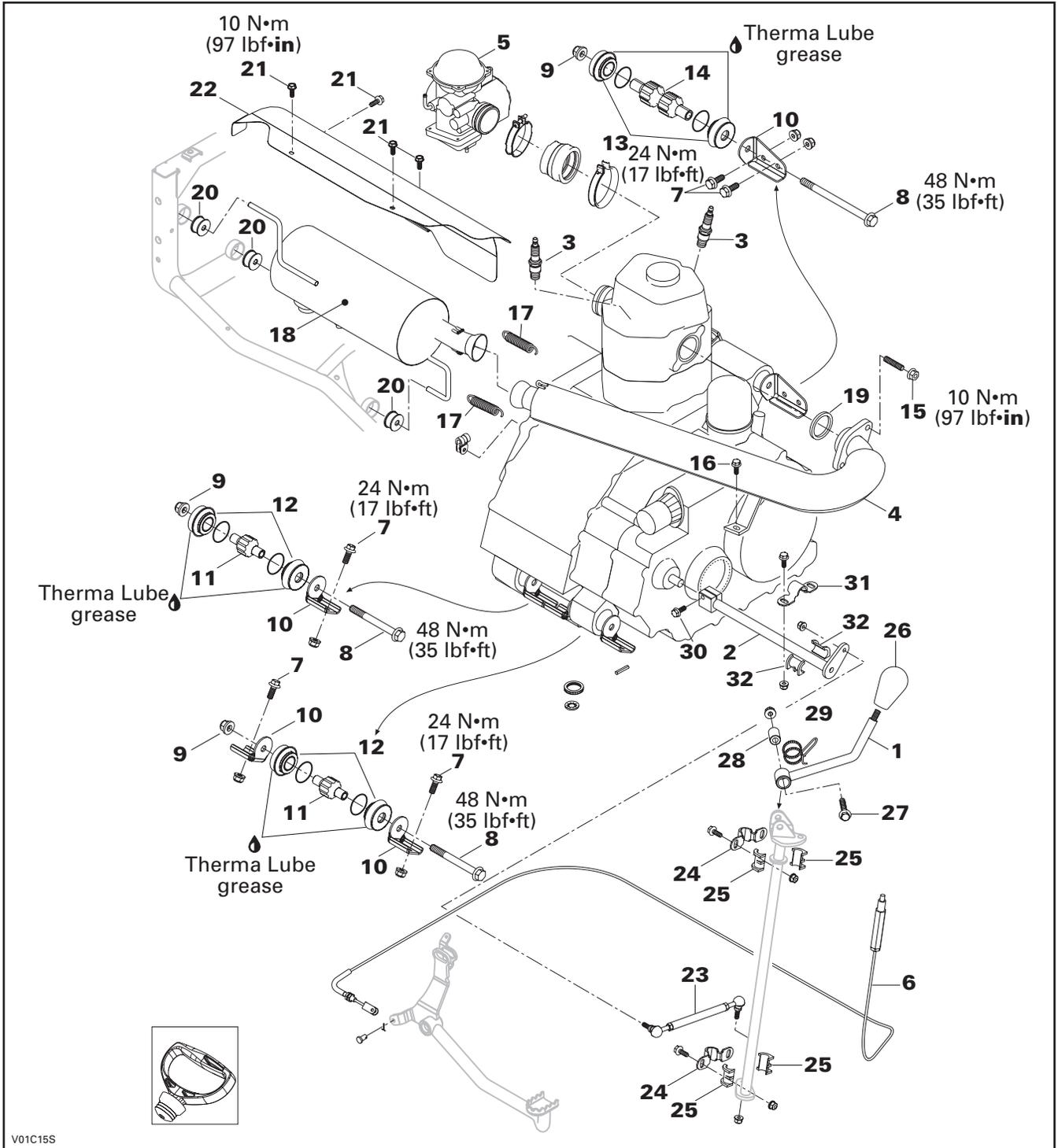
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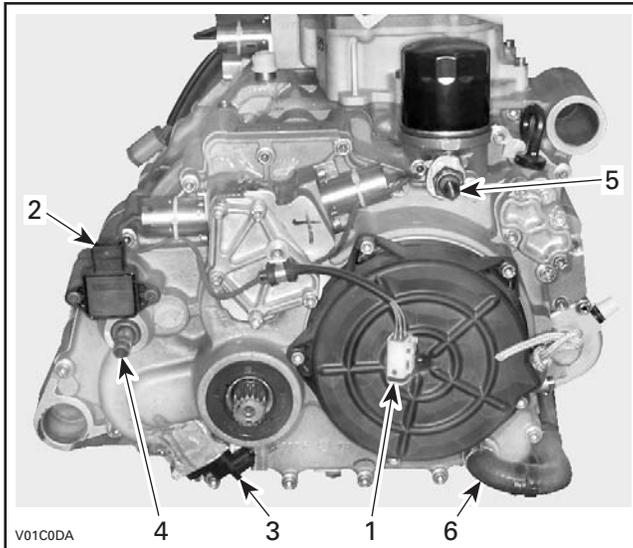
REMOVAL AND INSTALLATION



Section 03 ENGINE

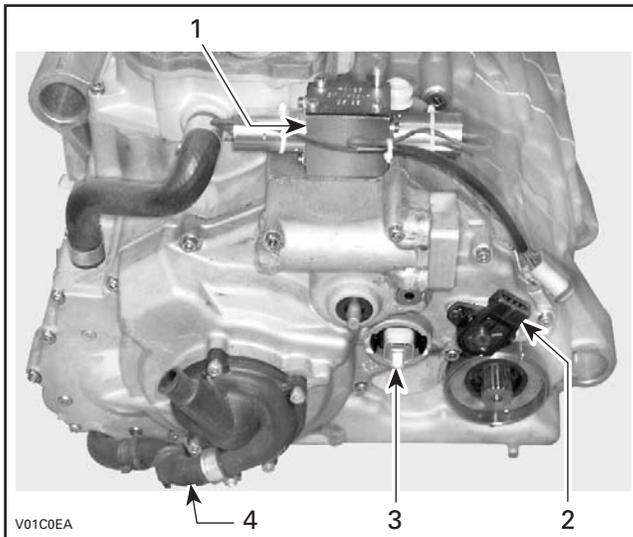
Subsection 02 (REMOVAL AND INSTALLATION)

ENGINE REMOVAL



FRONT VIEW

1. Clutching and clutch modulator solenoids connector
2. STPS (Sub Transmission Position Sensor)
3. VSS (Vehicle Speed Sensor)
4. Shifting engine rod
5. Oil pressure sensor
6. Engine coolant hose



REAR VIEW

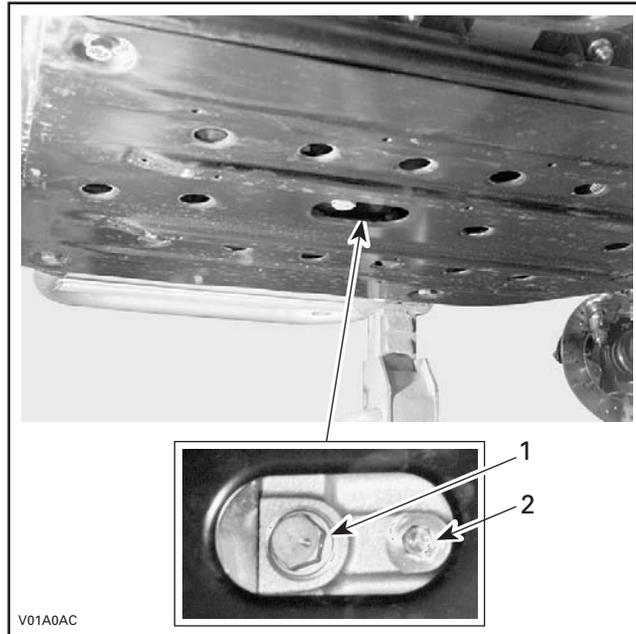
1. Shifting valve
2. GBPS (Gear Box Position Sensor)
3. Magneto/trigger plug
4. Engine coolant hose

Vehicle Preparation

Place the vehicle on jack stands and place the shifter **no. 1** on park position.

Remove front wheels.

Drain engine oil and engine coolant by drain plug.



UNDER ENGINE

1. Engine oil plug
2. Engine coolant plug

Remove seat, front and rear fenders, inner fenders, side panels, shifter guide cover and skid plate. Refer to BODY 10-02.

Disconnect BLACK negative cable from battery, then RED positive cable.

⚠ WARNING

Always disconnect battery or starter cables exactly in the specified order, BLACK negative cable first. It is recommended to disconnect electrical connections prior to disconnecting fuel lines.

Front Part Preparation

Remove fuel tank and fuel valve. Refer to FUEL CIRCUIT 04-02.

Remove seat pivot bar and unplug clutching and clutch modulator solenoids connector.

Remove STPS (Sub Transmission Position Sensor).

NOTE: Do not unplug only, remove sensor completely.

Remove shifting rod **no. 2**. Refer to **Shifting Rod Removal** section.

Remove front propeller shaft. Refer to FRONT DIFFERENTIAL 06-02.

Unplug VSS (Vehicle Speed Sensor), located under engine drive shaft.

Engine Preparation

Unplug spark plug cables.

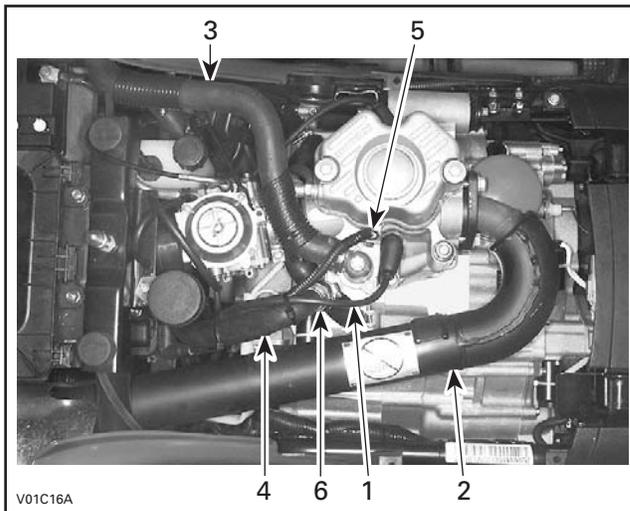
Unplug oil pressure sensor.

Remove exhaust pipe **no. 4**. Refer to **Exhaust System** section.

Remove radiator inlet hose.

Disconnect breather hose at PCV valve.

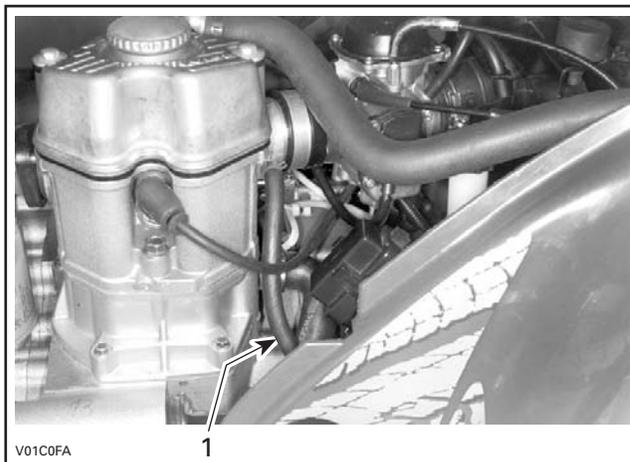
Unplug temperature sensor.



1. Spark plug cables
2. Exhaust pipe
3. Radiator inlet hose
4. Breather hose
5. Temperature sensor
6. PCV valve

Remove carburetor **no. 5**. Refer to **FUEL PUMP AND CARBURETOR** 04-03.

Remove engine impulse line.



1. Engine impulse line

Remove fuse box.

Remove shifting valve. Refer to **ELECTRIC SHIFT SYSTEM** 05-06.

Disconnect the interlock cable **no. 6** from rear brake pedal.

Remove brake pedal, rear master cylinder and brake switch. Refer to **HYDRAULIC BRAKES** 09-02.

Rear Part Preparation

Unplug GBPS (Gear Box Position Sensor).

Separate rear propeller shaft from engine. Refer to **REAR SUSPENSION** 08-03.

NOTE: Do not separate swing arm from rear axle.

Unplug magneto/trigger wiring harness connector.

Remove radiator outlet hose.

Remove starter.

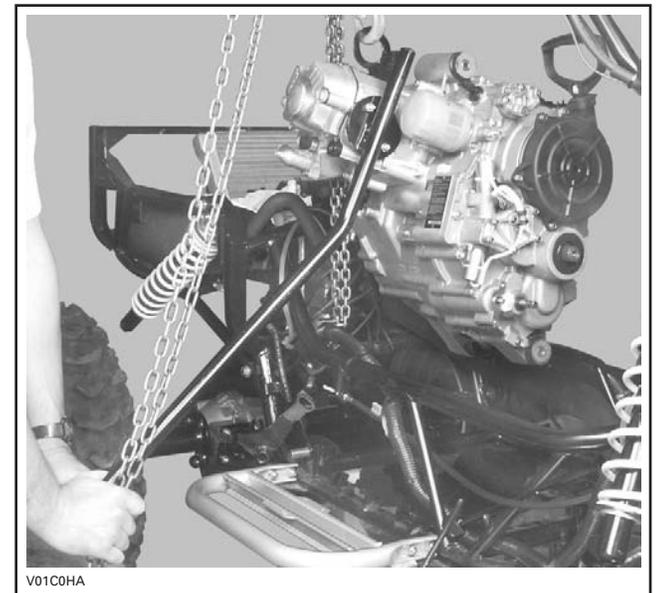
Remove engine coolant hose (the hose with the starter clamp).

Separate rear air intake tube from air intake silencer.

Install engine lifting tool (P/N 529 035 610) then install a hoist.

Remove engine bracket mounting bolts **no. 7**.

Pull down engine lifting tool arm and lift engine.



Section 03 ENGINE

Subsection 02 (REMOVAL AND INSTALLATION)

ENGINE INSTALLATION

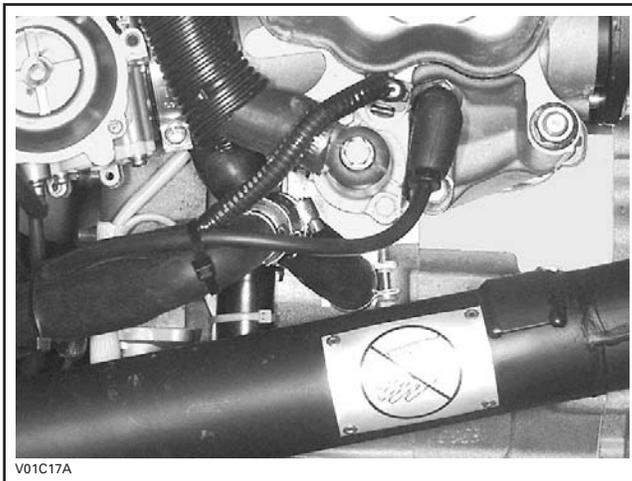
For installation, reverse the removal procedure, paying attention to the following details.

NOTE: At the time of seat pivot bar installation, it is possible that the frame is too wide or too restricted. According to your needs, close or widen the frame slightly.

Torque interlock cable lightly.

For the adjustment from interlock, refer to HYDRAULIC BRAKES 09-02.

Reattach cables, hoses, harness wiring, etc.



Before to start the engine, remove spark plugs and ground them on engine or frame. Start vehicle about thirty seconds. This operation activated the oil pump. Reinstall spark plug and check if vehicle run correctly.

Let the engine idle for one minute to ensure full charge of hydraulic valve lifter.

Calibrate STPS and GBPS. Refer to ELECTRIC SHIFT SYSTEM 05-06.

ANTI-VIBRATION SYSTEM

Anti-Vibration System Removal

Remove flanged bolt no. 8, elastic nut no. 9 and engine brackets no. 10.

RH Anti-Vibration System

Remove support bushing no. 11, push out with a punch.

Insert a punch in hole of anti-vibration bushing no. 12 and push other anti-vibration bushing out housing.

Use punch to remove the other bushing.

CAUTION: Do not use a screwdriver for anti-vibration bushing removal.

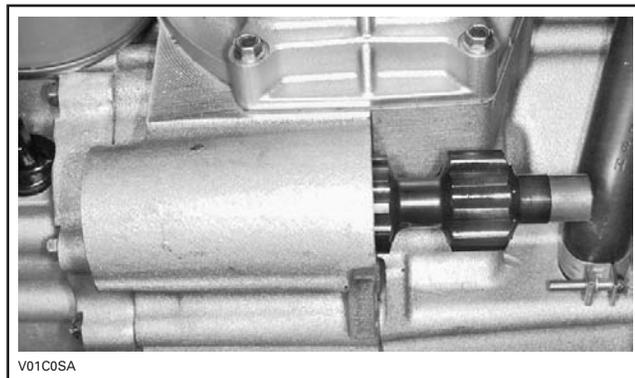
LH Anti-Vibration System

Insert a punch in hole of anti-vibration bushing no. 13 and push support bushing no. 14 and anti-vibration bushing out the housing.

Use punch to remove the other bushing.

Anti-Vibration System Installation

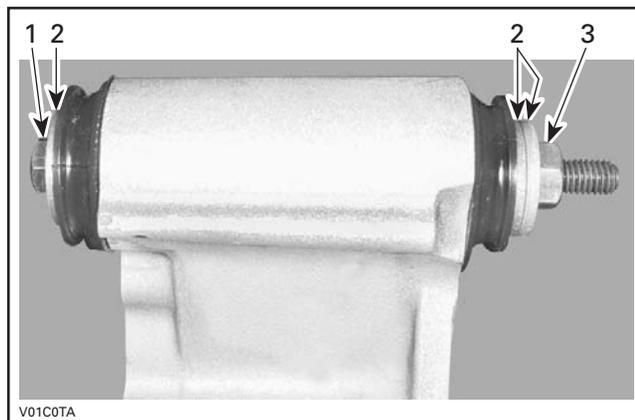
Insert support bushing in engine support. Before insert support bushing, spray BOMBARDIER LUBE (P/N 293 600 016) in support.



Install a new O-ring in anti-vibration bushing grooves.

Apply grease on anti-vibration bushings and insert in engine support, one on each side.

For installation, use a 152 mm (6 in) bolt for LH side and 102 mm (4 in) for RH side, three washers and a nut. Refer to the following illustration.



1. Bolt
2. Washers (3)
3. Nut

EXHAUST SYSTEM

WARNING

Never touch exhaust system components immediately after the engine has been run because these components are very hot.

Heat Shield Removal

Remove the rear fender. Refer to BODY 10-02.
Remove screws no. 21 retaining heat shield no. 22.

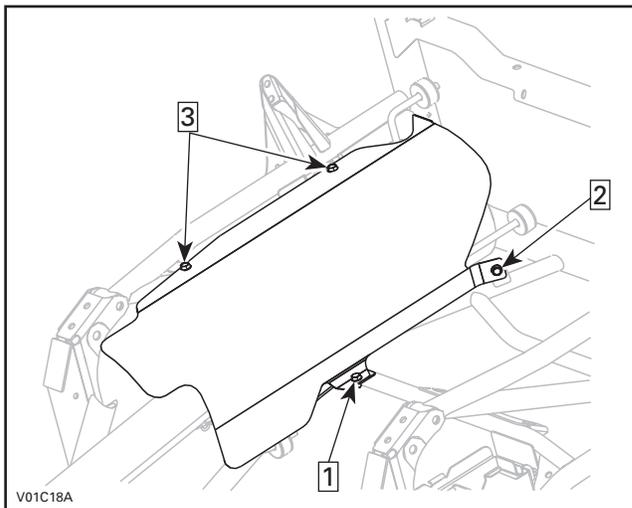
Heat Shield Installation

For installation, reverse the removal procedure. Paying attention to the following details.

In first, install bottom screw then rear screw, do not tighten yet.

Install the screws on top of heat shield.

Torque all screws to 10 N•m (89 lbf•in).



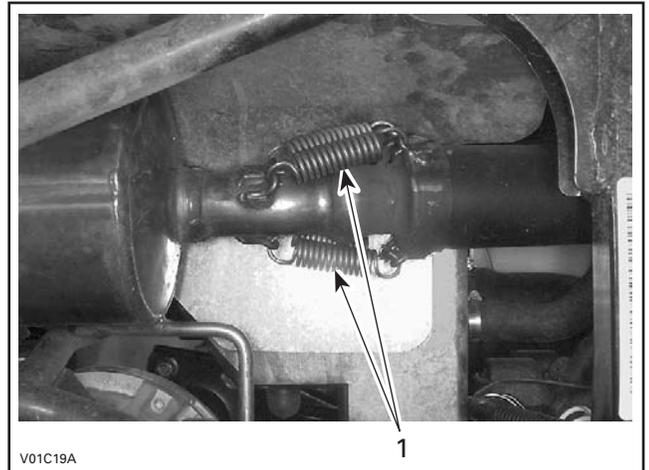
- Step **1**: Bottom screw
Step **2**: Rear screw
Step **3**: Screws on top

Exhaust Pipe Removal

Remove the exhaust pipe nuts no. 15.



Remove screw from exhaust pipe bracket no. 16.
Remove springs no. 17 retaining exhaust pipe and muffler no. 18.



1. Retaining springs

Pull exhaust pipe forward.

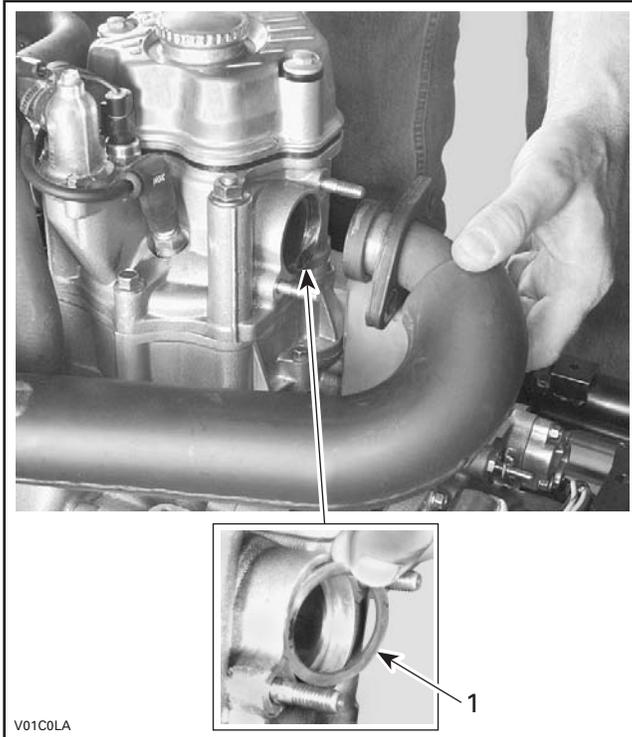
Section 03 ENGINE

Subsection 02 (REMOVAL AND INSTALLATION)

Exhaust Pipe Installation

For installation, reverse the removal procedure, paying attention to the following details.

Use a new exhaust pipe gasket **no. 19** and make sure that it is properly installed.



1. Exhaust pipe gasket

With muffler secured in its rubber mounts, fit exhaust pipe, securing it loosely at its flange and on engine.

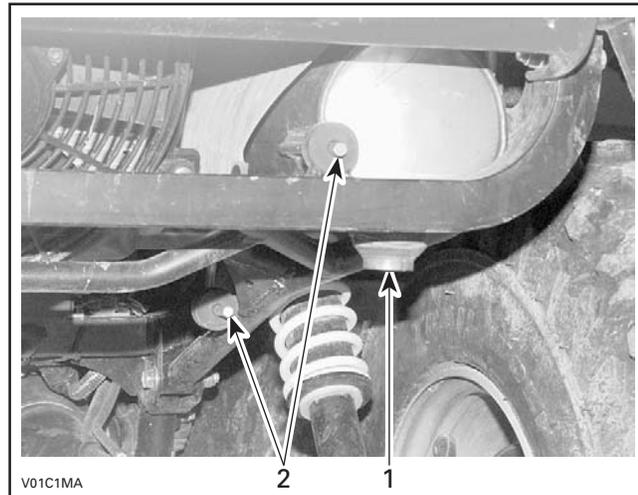
Tighten flange nuts, making sure exhaust pipe is properly aligned inside muffler ball socket then install retaining springs after pushing muffler forward in exhaust pipe.

Tighten exhaust pipe support bolt.

Muffler Removal

Remove heat shield **no. 22** and exhaust pipe **no. 4**.

Pull muffler **no. 18** forward, pull out retaining rod from supports and remove muffler.



1. Muffler
2. Retaining rod

Muffler Installation

For the installation, reverse the removal procedure.

NOTE: Check rubber bushings **no. 20** for cracks or other damages, change if necessary.

SHIFTING SYSTEM

NOTE: Always set the PARK position before remove any parts from shifting system.

Shifter Tie-Rod Removal

Remove fuel tank. Refer to FUEL CIRCUIT 04-02.

NOTE: Separate fuel tank from frame only, do not remove tank completely. Do not remove fuel lines.

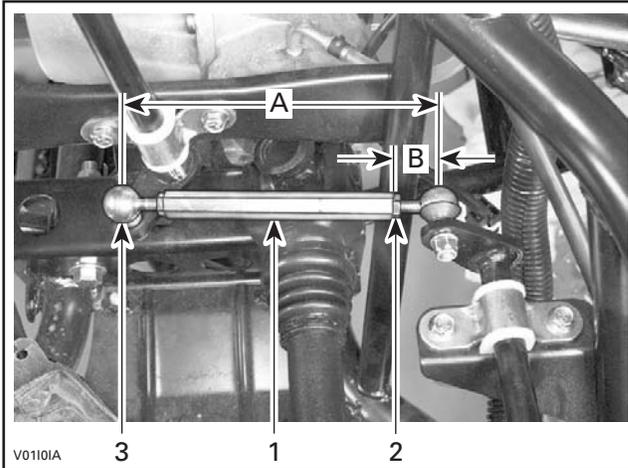
Remove elastic nuts of shifter tie-rod **no. 23**, one on LH ball joint and one on RH ball joint.

Shifter Tie-Rod Installation

For installation, reverse the removal procedure, paying attention to the following details.

Pre-adjust shifter tie-rod to 150 mm (5-29/32 in).

NOTE: Shifter tie-rod must have 20 mm (25/32 in) maximum between center from ball joint and jam nut. See the following illustration.



- 1. Shifter tie-rod
- 2. Jam nut
- 3. Ball joint
- A. Shifter tie-rod length 150 mm (5-29/32 in)
- B. Ball joint length 20 mm (25/32 in) maximum

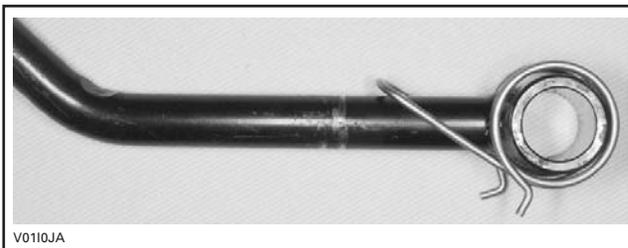
Install shifter tie-rod.

Lever Removal

Remove fuel tank. Refer to FUEL CIRCUIT 04-02.
 Remove upper and lower retaining clamps **no. 24** and half rings **no. 25**.
 Unscrew lever button **no. 26**.
 Remove shifter lever **no. 1** from shifter guide.
 Unscrew lever retaining bolt **no. 27** and pull lever.

Lever Installation

For installation, reverse the removal procedure, paying attention to the following details.
 Place nylon bushing **no. 28** in shifter lever.
 Place lever spring **no. 29** properly.



LEVER SPRING INSTALLATION

Shifter Column Removal

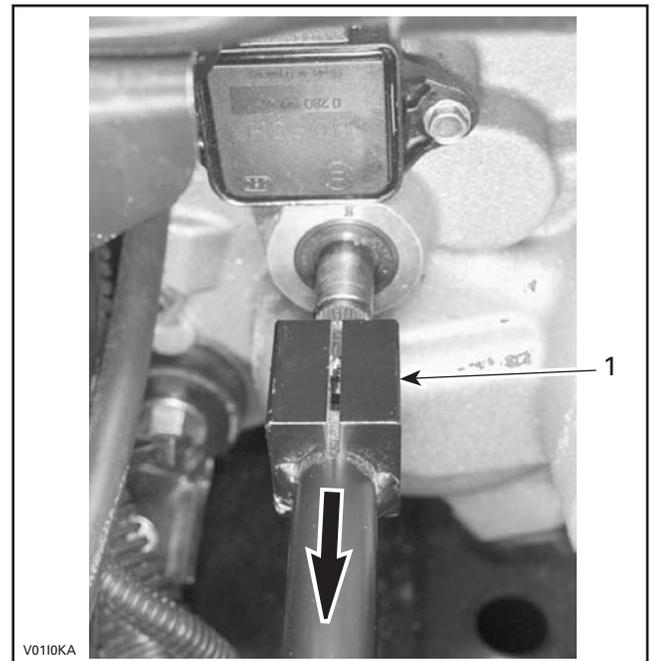
Remove shifter lever **no. 1**.
 Remove shifter tie-rod **no. 23**.

Shifter Column Installation

For installation, reverse the removal procedure.

Shifting Rod Removal

Remove fuel tank. Refer to FUEL CIRCUIT 04-02.
NOTE: Separate fuel tank from frame, do not remove tank completely.
 Separate shifting rod **no. 2** from shifting engine rod. Unscrew bolt **no. 30** and pull shifting rod forward.



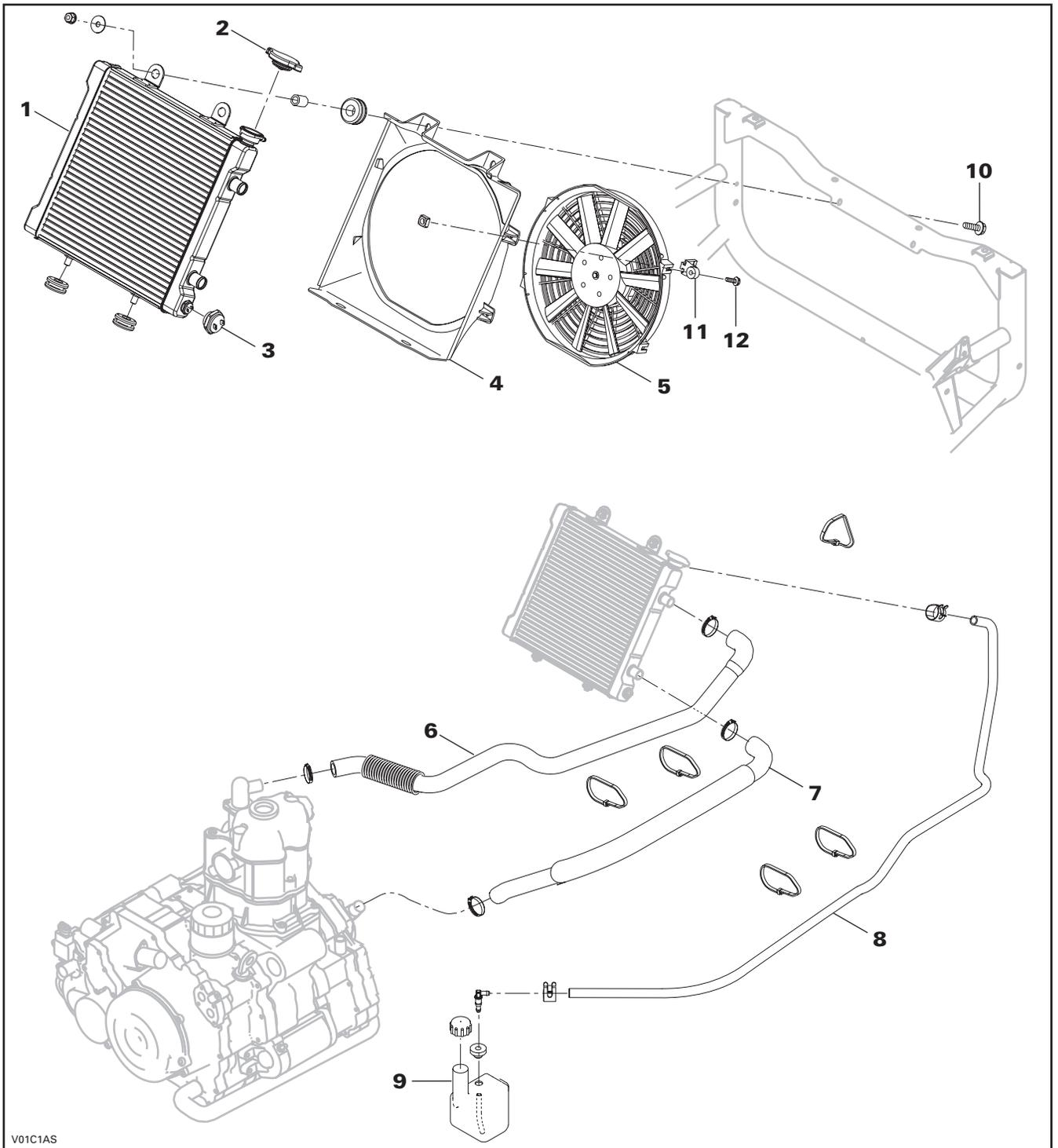
1. Shifting rod

Unscrew elastic nuts from RH ball joint.
 Remove retaining clamp **no. 31** and half rings **no. 32**.

Shifting Rod Installation

For installation, reverse the removal procedure.

COOLING SYSTEM



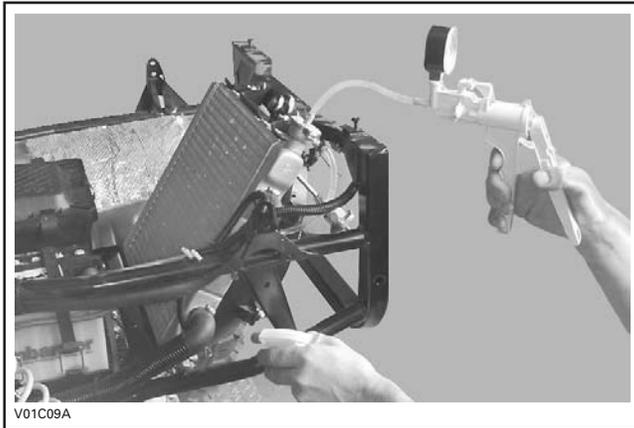
Section 03 ENGINE

Subsection 03 (COOLING SYSTEM)

COOLING SYSTEM LEAK TEST

Install special plug (radiator cap) (P/N 529 021 400) and hose pincher (P/N 529 009 900) on overflow hose **no. 8**. Pressurize all system through coolant reservoir to 103 kPa (15 PSI).

Check all hoses, radiator and cylinder/base for coolant leaks. Spray a soap/water solution and look for air bubbles.



NOTE: The rear fender removal is not necessary.

INSPECTION

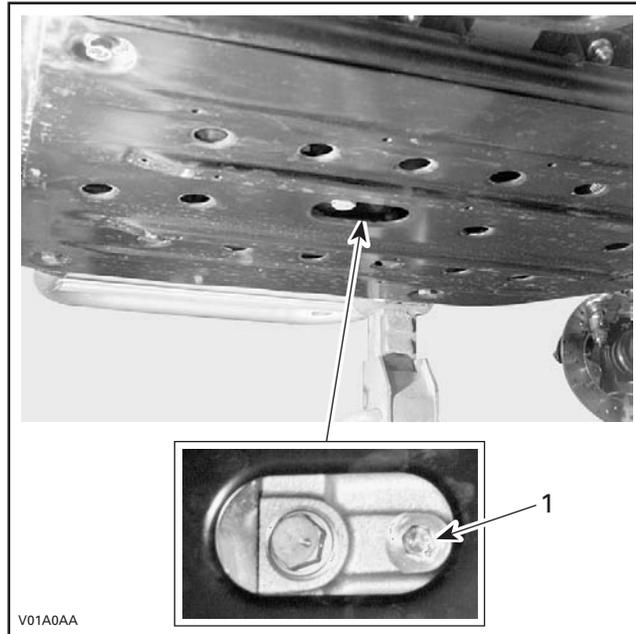
Check general condition of hoses and clamp tightness.

DRAINING THE SYSTEM

WARNING

Never drain or refill cooling system when engine is hot.

To drain cooling system, unscrew plug under engine and remove pressure cap.



1. Cooling plug

COOLING SYSTEM REFILLING

Recommended Coolant

Use a blend of 60% antifreeze with 40% water. Do not reinstall pressure cap.

CAUTION: To prevent rust formation or freezing condition, always replenish the system with 60% antifreeze and 40% water. Pure antifreeze without water freezes. Always use ethylene glycol antifreeze containing corrosion inhibitors specifically recommended for aluminum engines.

System Capacity

Refer to TECHNICAL DATA 11-02.

Refilling Procedure

Use hose pincher on coolant hose at thermostat outlet. Unscrew bleeder on top of thermostat housing.

With vehicle on a flat surface, engine cold, refill radiator **no. 1** and coolant tank **no. 9** up to cold level mark. Wait a few minutes then refill to mark. Install pressure cap. Run engine until thermostat opens then stop engine. Refill up to mark.

Reinstall pressure cap.

When engine has completely cooled down, re-check coolant level in radiator **no. 1** and coolant tank **no. 9** and top up if necessary.

Check coolant concentration (freezing point) with proper tester.

PRESSURE CAP

Check if cap pressurizes the system. If not, install a new 90 kPa (13 PSI) cap (do not exceed this pressure).

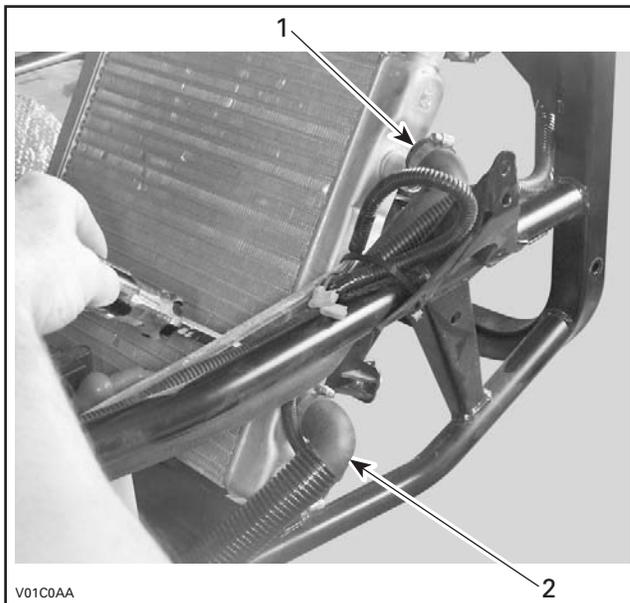
RADIATOR

Removal

Drain cooling system.

Remove rear fender. Refer to BODY 10-02.

Remove inlet **no. 6** and outlet **no. 7** hoses.



1. Radiator inlet hose
2. Radiator outlet hose

Remove overflow hose **no. 8**.

Remove mounting bolts **no. 10** on the top.

Unplug temperature sender **no. 3**.

Inspection

Check radiator air passage for clogging or damage.

Remove insects, mud or other obstructions with compressed air or low pressure water.

Check for any coolant leakage from radiator and hoses.

Installation

For installation, reverse the removal procedure. Paying attention to the following detail.

Install hose pincher on coolant hose at thermostat outlet. Unscrew bleeder on top of thermostat housing.

Refill radiator and when coolant overflows by the thermostat cover hole, reinstall the screw.

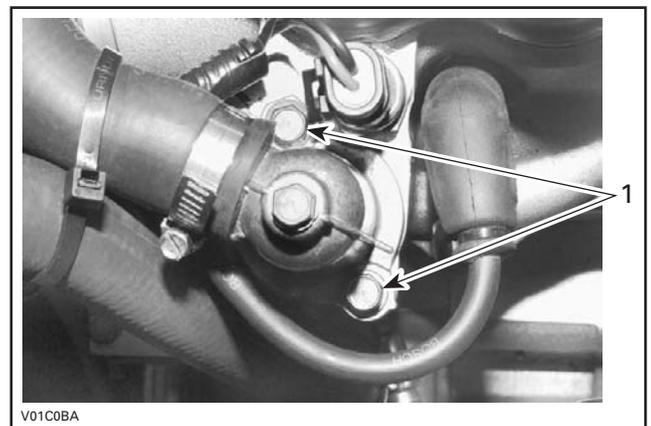
THERMOSTAT

The thermostat is a single action type.

Removal

The thermostat is located on the top of engine.

Remove screws and pull thermostat cover with hose.



1. Remove screws

Remove gasket.

Test

To check thermostat, put in water and heat water. Thermostat should open when water temperature reaches 75°C (167°F).

Installation

For installation, reverse the removal procedure, paying attention to the following details.

Install thermostat with a new gasket.

Section 03 ENGINE

Subsection 03 (COOLING SYSTEM)

COOLANT TANK

Overflow Coolant Tank

The coolant expands as the temperature (up to 100 - 110°C (212 - 230°F)) and pressure rise in the system. If the limiting system working pressure cap is reached 90 kPa (13 PSI), the pressure relief valve in the pressure cap is lifted from its seat and allows coolant to flow through the overflow hose into the overflow coolant tank.

Removal

Remove overflow hose no. 8.

Pull coolant tank no. 9 upward.

Empty coolant tank.

Installation

The installation is the reverse of the removal procedure.

FAN AND OUTLET DEFLECTOR

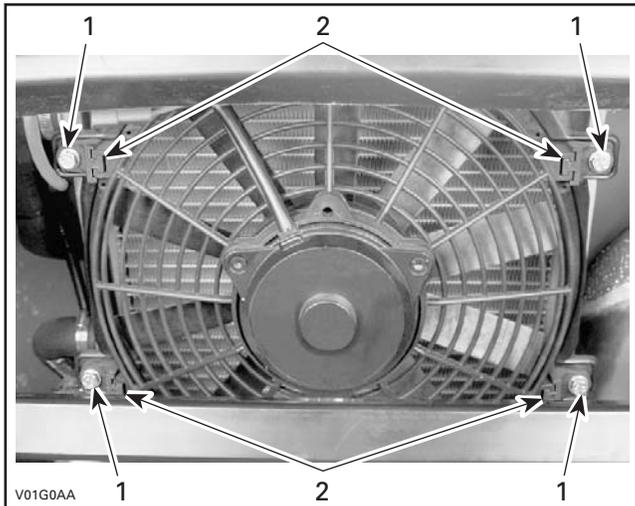
Test

Refer to INSTRUMENTS AND ACCESSORIES 05-07.

Fan Removal

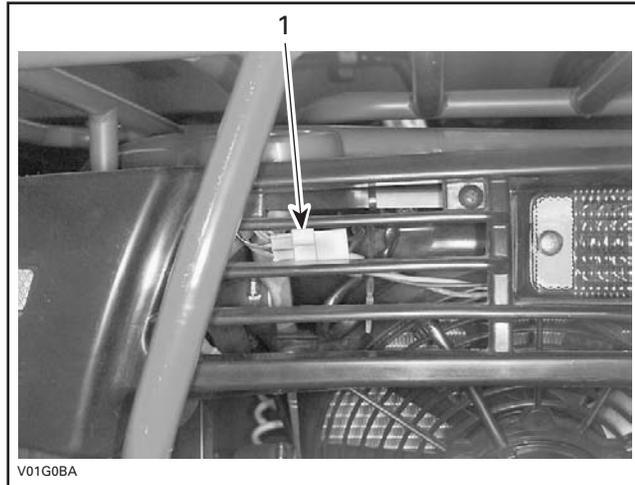
Remove rear fender. Refer to BODY 10-02.

Remove bolts no. 12 and fan supports no. 11. Discard bolts.



1. Remove bolts
2. Fan support

Unplug fan connector.



1. Fan connector

Fan Installation

For the installation, reverse the removal procedure.

NOTE: When fan is reinstalled, use new self-locking bolts.

Outlet Deflector Removal

Remove fan no. 5.

Remove radiator.

Pull outlet deflector upward no. 4.

Outlet Deflector Installation

The installation is the reverse of the removal procedure.

TEMPERATURE SENDER

Test

Refer to INSTRUMENTS AND ACCESSORIES 05-07 for proper procedure.

Removal

Unplug temperature sender connectors.

Unscrew temperature sender no. 3.

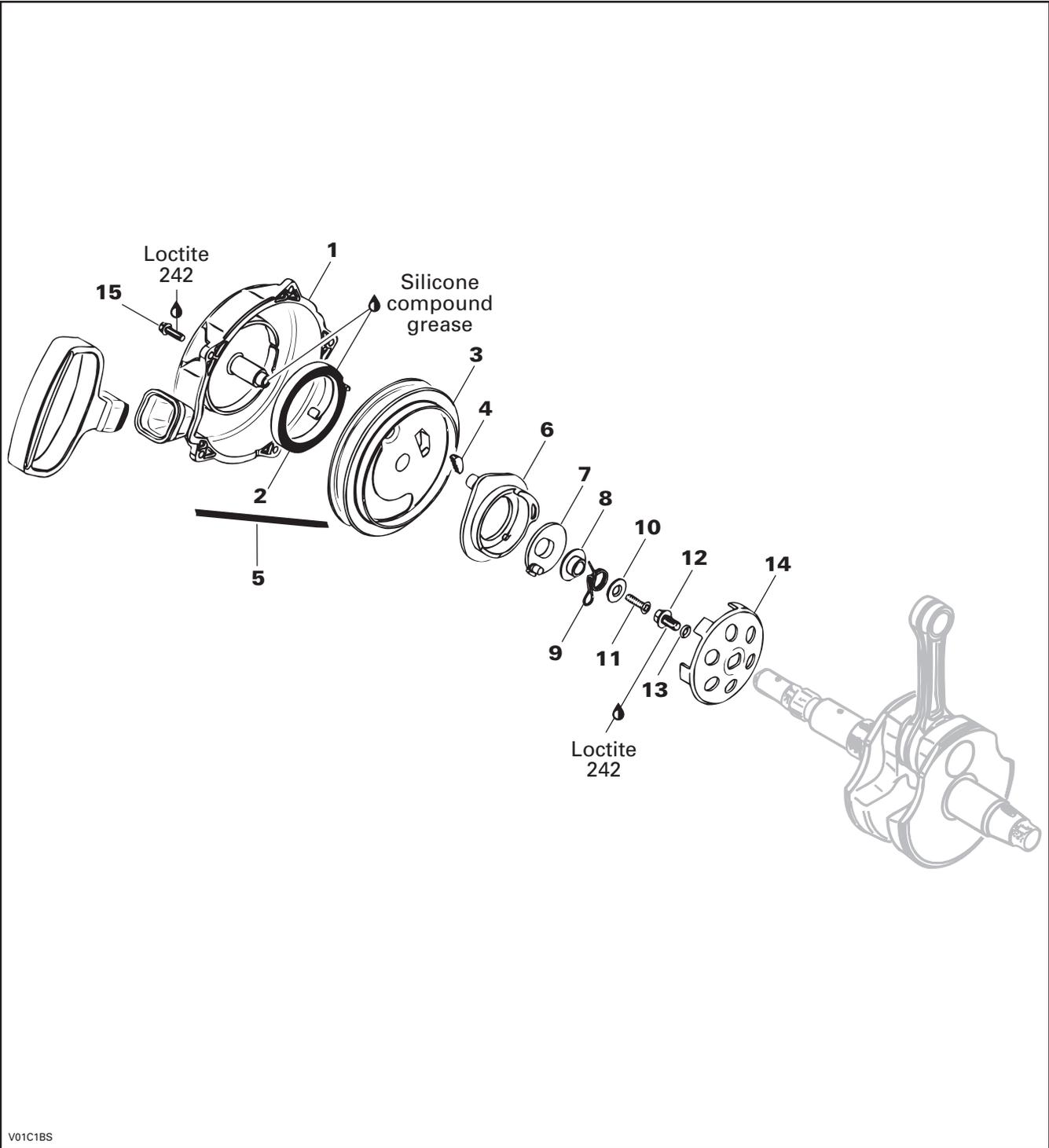
Installation

The installation is the reverse of the removal procedure, paying attention to the following detail.

Check O-ring and change if necessary.

CAUTION: Don't apply any product on the threads or on the O-ring.

REWIND STARTER



V01C1BS

Section 03 ENGINE

Subsection 04 (REWIND STARTER)

REWIND STARTER

Removal

Remove fuel tank cover and skid plate. Refer to BODY 10-02.

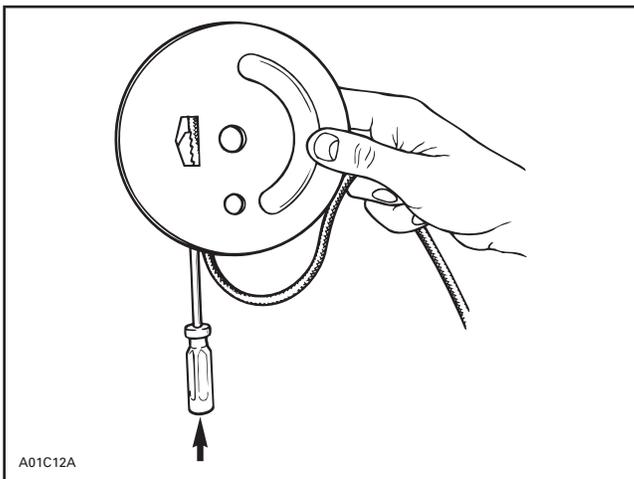
Remove seat pivot bar and unplug clutching and clutch modulator valve connector.

Remove rewind mounting bolts no. 15 and pull rewind starter.

Disassembly

To remove rope from rewind starter mechanism:

- First remove flat washer and screw no. 10 and 11, locking spring no. 9, locking spring washer no. 8, pawl lock no. 7 and pawl no. 6.
- Remove sheave no. 3 from starter housing no. 1.
- Disengage key no. 4 and pull out rope no. 5.



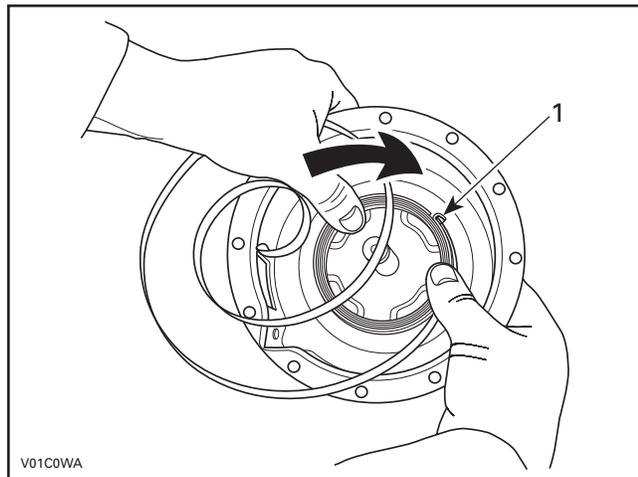
TYPICAL — GENTLY TAP ON KEY

Assembly

At assembly, position spring no. 2 outer end into spring guide notch then wind the spring clockwise into guide.

WARNING

Since the spring is tightly wound inside the guide it may fly out when rewind is handled. Always handle with care.



TYPICAL

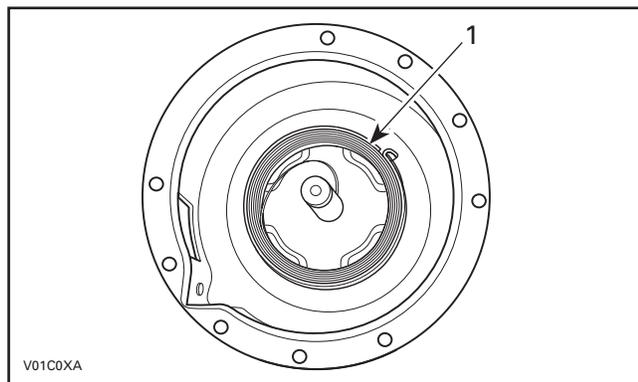
1. Outer end into guide notch

NOTE: Due to dust accumulation, rewind starter must be periodically cleaned, inspected and re-lubricated.

CAUTION: It is of the utmost importance that the rewind starter spring(s) be lubricated periodically using specific lubricants. Otherwise, rewind starter component life will be shortened and/or rewind starter will not operate properly under very cold temperatures.

Lubricate spring assembly with silicone compound grease (P/N 420 897 061) and position into starter housing as illustrated.

CAUTION: This lubricant must NOT be used on rewind starter locking spring as it does not stay on under vibration.

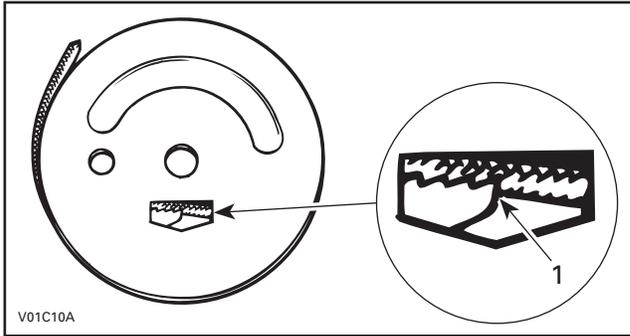


TYPICAL

1. Grease inside spring guide

CAUTION: The use of standard multi-purpose grease could result in rewind starter malfunction.

To install a new rope no. 5, insert rope into sheave orifice and lock it with the key no. 4 as illustrated.



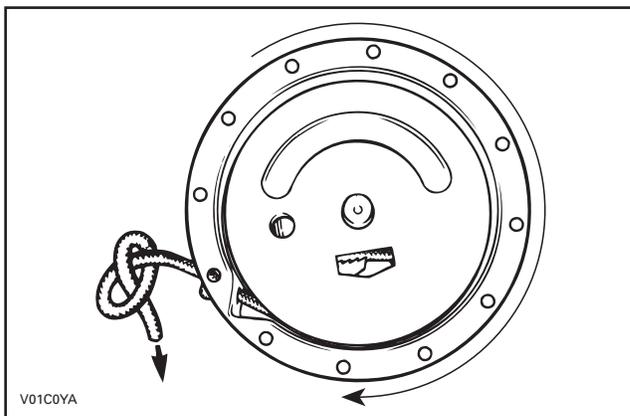
TYPICAL
 1. Push to lock

To adjust rope tension:

Wind rope on sheave and place rope sheave into starter housing making sure that the sheave hub notch engages in the rewind spring hook.

Rotate the sheave counterclockwise until rope end is accessible through starter housing orifice.

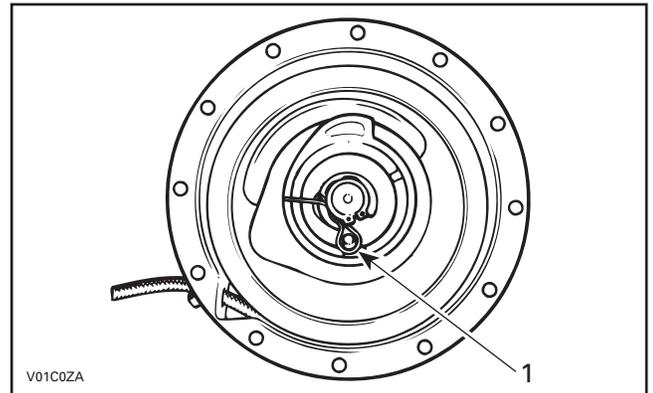
Pull the rope out of the starter housing and temporarily make a knot to hold it. One turn preload will give 7 turns of tension when fully extended.



TYPICAL

Position pawl no. 6, pawl lock no. 7 and locking spring washer no. 8.

Install locking spring no. 9 and lubricate with MOLYKOTE G-n paste from Dow Corning® or equivalent.



TYPICAL
 1. Spring coated with MOLYKOTE G-n paste

Install locking ring.

CAUTION: This lubricant must NOT be used on rewind springs as it does not stay on when dry.

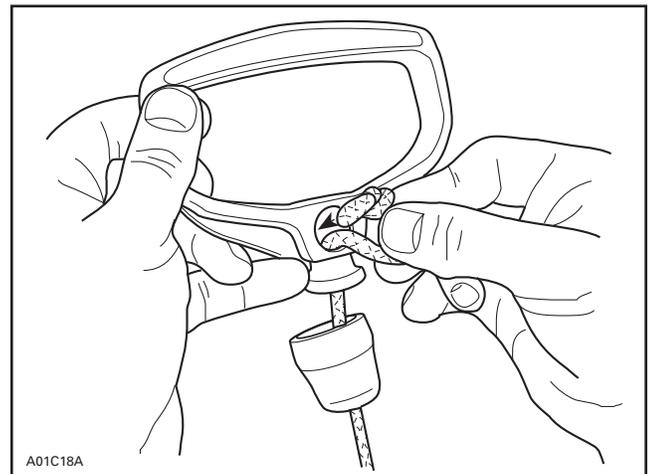
Installation

Thread starter rope no. 5 through rope guide when applicable.

Reinstall rewind starter assembly on engine.

NOTE: Before torque mounting bolts no. 15, apply Loctite 242 on threads.

Prior to installing starter grip on new rope, it is first necessary to fuse the rope end with a lit match. Pass rope through starter grip and tie a knot in the rope end. Fuse the knot with a lit match then insert rope end down and pull the starter grip over the knot.



TYPICAL

Section 03 ENGINE

Subsection 04 (REWIND STARTER)

STARTING PULLEY

Removal

Remove rewind starter.

Remove screw **no. 12** and O-ring **no. 13** retaining starting pulley **no. 14** to crankshaft.

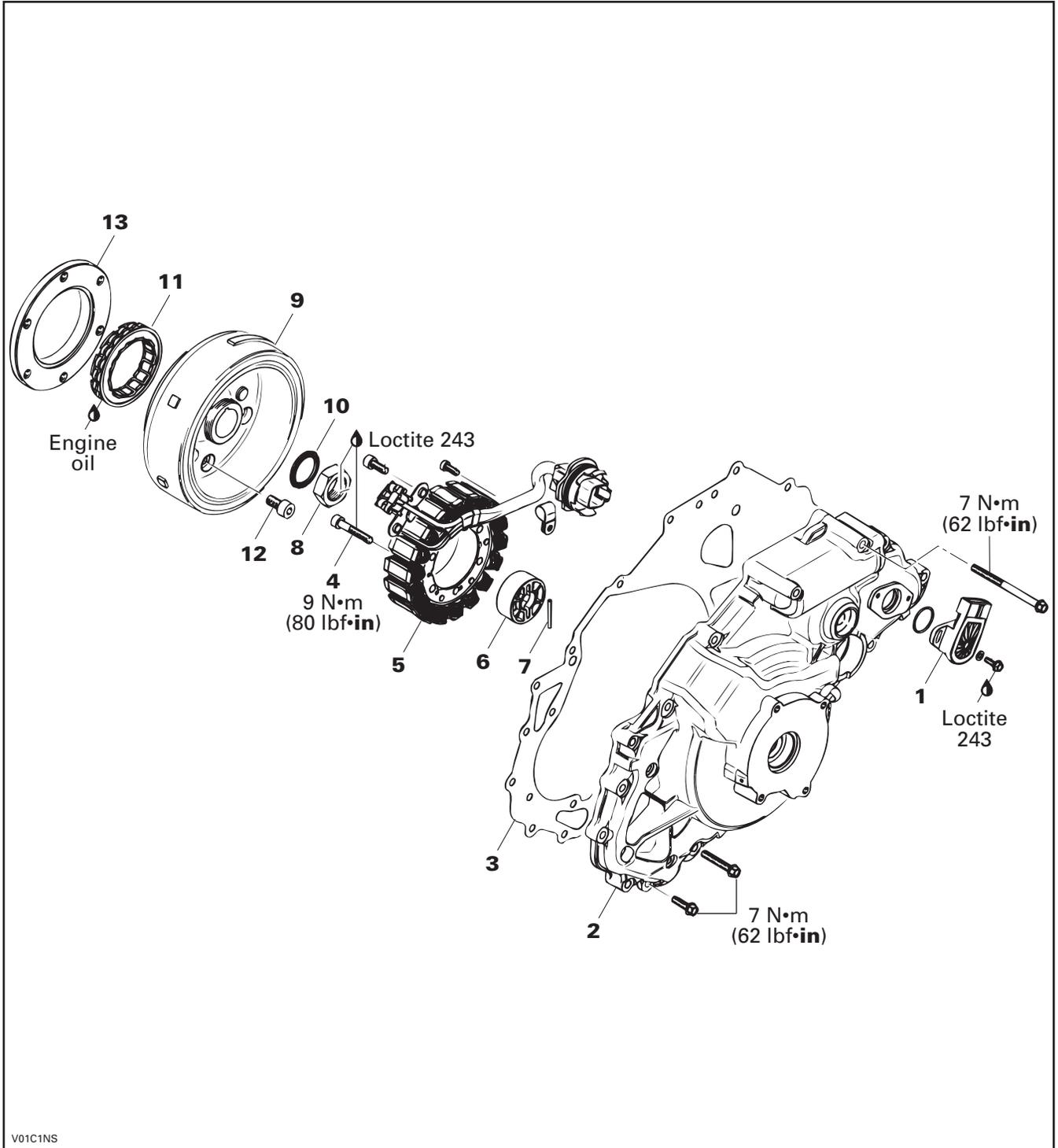
Installation

For installation, reverse the removal procedure. Paying attention to the following detail.

Check O-ring for damage and change if necessary.

Apply Loctite 242 on threads and torque the screw to 21 N•m (15 lbf•in).

MAGNETO SYSTEM



Section 03 ENGINE

Subsection 05 (MAGNETO SYSTEM)

MAGNETO

Removal

Remove engine. Refer to REMOVAL AND INSTALLATION 03-02.

Install engine on engine stand (P/N 529 035 646).

Remove water pump. See the instructions as follows.

Remove:

- radiator outlet hose
- water cooling hose
- bolts
- water pump housing and rubber ring
- circlip on water pump shaft

Unscrew water impeller, use the spanner for water pump impeller (P/N 529 035 659). Turn counter-clockwise.

Water pump removal is completed.

Remove:

- STPS (Sub-Transmission Position Sensor) **no. 1**
- all bolts retaining ignition cover
- ignition cover **no. 2**
- gasket **no. 3**.

NOTE: Clean all metal component in a non-ferrous metal cleaner. Use Bombardier gasket remover (P/N 413 708 500) or suitable equivalent.

Remove all socket screws **no. 4** retaining magneto **no. 5** to ignition cover then pull magneto.

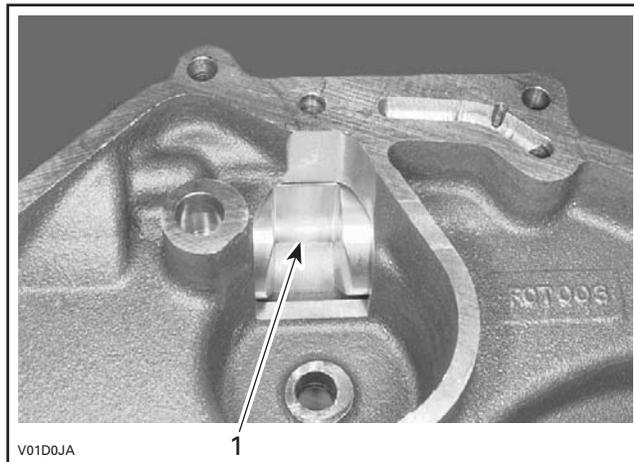
Installation

For installation, reverse the removal procedure. Paying attention to the following details.

At the time of the socket screws installation retaining magneto, apply Loctite 243 on threads.

Install a new gasket on ignition cover.

Place hydraulic piston properly before install ignition cover. If it has a space between ignition cover and crankcase, remove ignition cover and replace the hydraulic piston.



1. Hydraulic piston

Slide STPS inside sealing tube.

Align STPS drive with shift drive shaft.

ROTOR

Removal

Lock crankshaft with locking bolt (P/N 529 035 645). Refer to CRANKSHAFT/BALANCER SHAFT 03-07.

Remove:

- ignition cover **no. 2**
- pawl **no. 6** and needle pin **no. 7**

Unscrew nut **no. 8** retaining rotor **no. 9**.

Remove serrated washer **no. 10**.

Install magneto puller (P/N 529 035 547) and crankshaft protector (P/N 290 876 557) then remove rotor.

Installation

For installation, reverse the removal procedure. Paying attention to the following details.

Insert ring gear in sparg clutch **no. 11**.

Install nut on crankshaft end. Apply Loctite 243 on threads. Torque to 140 N•m (103 lbf•ft).

SPARG CLUTCH

Removal

Remove rotor **no. 9**.

Unscrew all socket screws **no. 12** retaining rotor and sparg clutch housing **no. 13**.

Remove sparg clutch from sparg clutch housing.

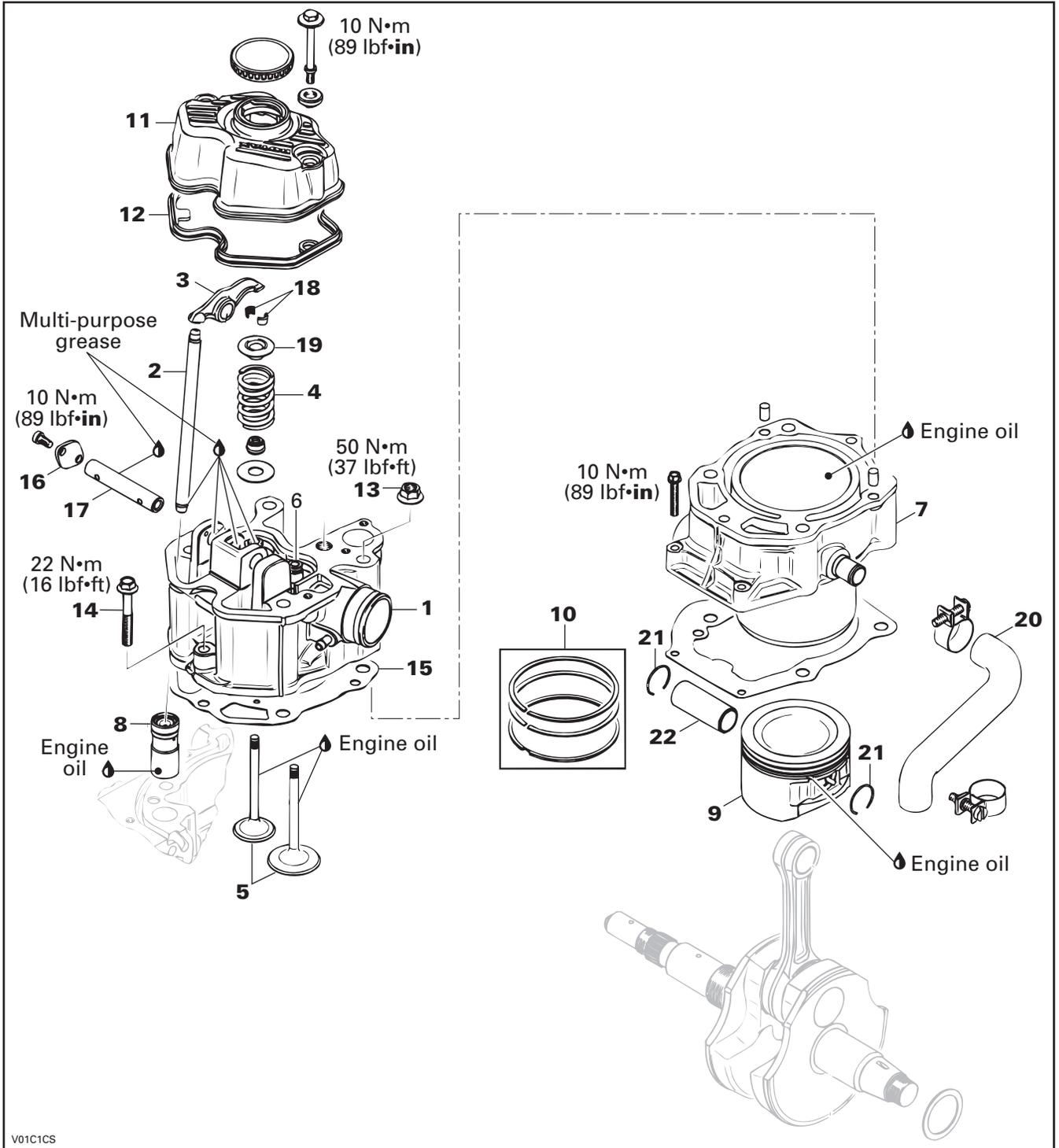
Installation

For installation, reverse the removal procedure.

NOTE: Apply engine oil on sparg clutch.

Install sparg clutch with the arrow on the top.

CYLINDER AND HEAD



NOTE: For cylinder head, cylinder and piston removal, it is not necessary to remove engine from vehicle.

Section 03 ENGINE

Subsection 06 (CYLINDER AND HEAD)

1, CYLINDER HEAD

Removal

Remove engine oil and coolant.

Disconnect temperature sensor.

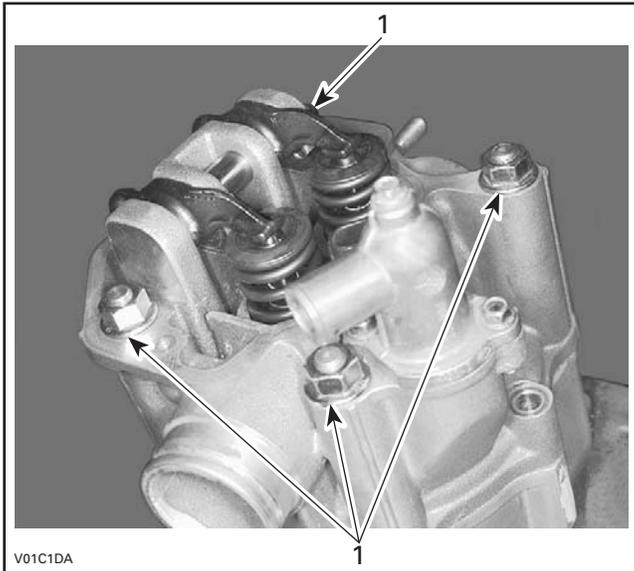
Unplug radiator inlet hose.

Remove screws retaining air box.

Unscrew the clamp retaining carburetor adaptor to engine. Pull back the air box with carburetor assembly.

Remove:

- exhaust pipe (refer to REMOVAL AND INSTALLATION 03-02)
- valve cover **no. 11** and gasket **no. 12**
- flanged bolts **no. 14** retaining cylinder head to cylinder base
- flanged nuts **no. 13** retaining cylinder head to the engine



1. Flanged nuts

Pull up cylinder head.

Inspection

Check for crack between valve seats, if so, replace cylinder head.

Installation

For installation, reverse the removal procedure.

Install a new gasket **no. 15** between cylinder head and cylinder base **no. 7**.

Install the flanged nuts **no. 13** in first then flanged bolts **no. 14**.

2, PUSH ROD

Removal

Remove cylinder head **no. 1**.

Pull the push rods out of cylinder base **no. 7**.

Inspection

Check push rod end for wear or damage.

Check push rod for bends by placing the rod on a flat metal plate. Rotate rod and measure the deflection with a dial indicator.

If the rod is bent, it should be replaced.

PUSH ROD BEND	
SERVICE LIMIT	0.2 mm (0.008 in)

Installation

For installation, reverse the removal procedure.

NOTE: Apply engine oil on push rod.

3, ROCKER ARM

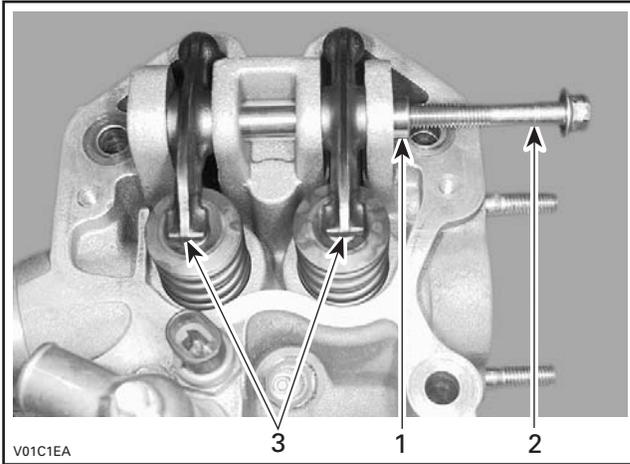
Removal

Remove:

- cylinder head **no. 1**
- holding strip **no. 16**

Extract rocker arm shaft **no. 17** using a M8 x 53.5 screw.

NOTE: Use a flanged bolt **no. 14** retaining cylinder head to cylinder base.



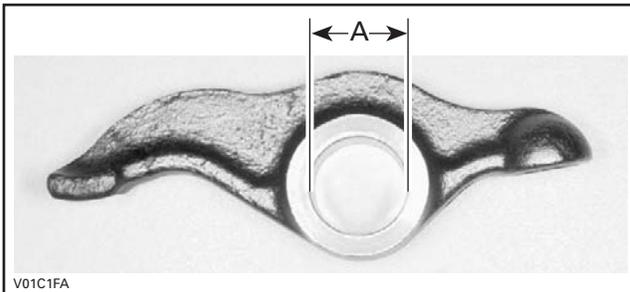
V01C1EA
 1. Rocker arm shaft
 2. Flanged bolt
 3. Rocker arm

Inspection

Rocker Arm

Inspect each rocker arm for cracks and scored friction surfaces. If so, replace parts.

Measure rocker bore diameter. If diameter is out of specification, change the rocker arm.



V01C1FA
 A. 13.76 mm (0.542 in)

ROCKER ARM BORE DIAMETER	
SERVICE LIMIT	13.76 mm (0.542 in)

Rocker Arm Shaft

Check for scored friction surfaces, if so, replace parts.

Insert shaft in rocker arm and check for excessive play.

Measure of shaft diameter.

ROCKER ARM SHAFT DIAMETER	
SERVICE LIMIT	13.67 mm (0.538 in)

Any area worn excessively will require part replacement.

Installation

For installation, reverse the removal procedure.

NOTE: Apply engine oil on rocker arm shaft.

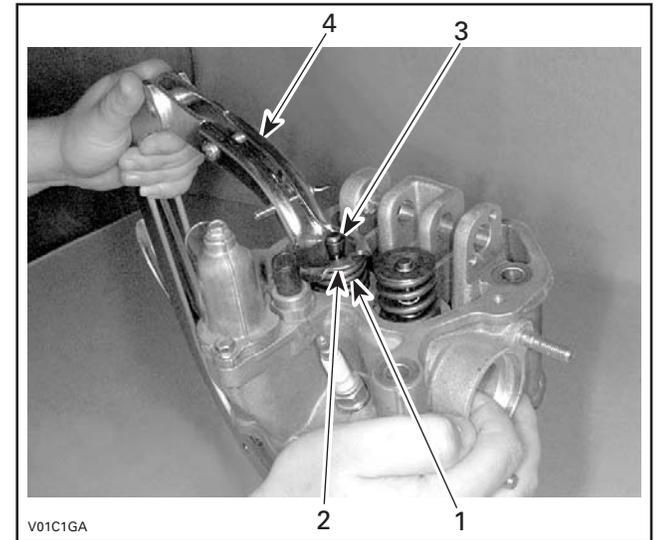
4, VALVE SPRING

Removal

Remove:

- cylinder head no. 1
- rocker arm no. 3

Compress valve spring with an universal C-clamp spring compressor such as Snap-on CF811.



V01C1GA
 1. Valve spring
 2. Valve spring retainer
 3. Valve cotten
 4. C-clamp spring compressor

Remove valve cotten no. 18.

Remove spring compressor, valve spring retainer no. 19 and valve spring.

Inspection

Check valve spring for rust or corrosion, free length and squareness.

VALVE SPRING FREE LENGTH	
SERVICE LIMIT	38 mm (1-1/2 in)

VALVE SPRING MAXIMUM SQUARENESS	
SERVICE LIMIT	1.1 mm (0.043 in)

Section 03 ENGINE

Subsection 06 (CYLINDER AND HEAD)

Installation

For installation, reverse the removal procedure.

5, VALVE

Removal

Remove valve spring no. 4.

Push the valve stem then pull valve out of valve guide.

Inspection

Valve

Inspect valve surface, check for abnormal stem wear and bending. If so, replace by a new one.

Valve Stem and Valve Guide Clearance

Check valve stem and valve guide for wear or friction surfaces, if so, replace parts.

Measure valve stem and valve guide in three places, using a micrometer and a small hole gauge.

NOTE: Clean valve guide to remove carbon deposits before measuring.

VALVE STEM DIAMETER mm (in)	
SERVICE LIMIT	
Exhaust	6.95 mm (0.274 in)
Intake	

VALVE GUIDE CLEARANCE mm (in)	
SERVICE LIMIT	
Exhaust	0.13 mm (0.005 in)
Intake	

Change valve if valve stem is out of specification.

Valve Face and Seat

Check valve face and seat for burning, pitting, and other signs of damage.

Apply some lapping compound to valve face and work valve on its seat with a lapping tool.

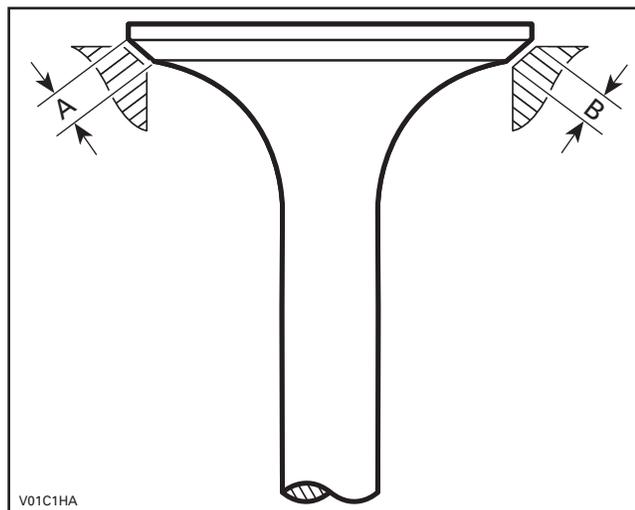
Measure valve face contact width.

NOTE: The location of contact area should be in center of valve face.

Measure valve seat width, using a caliper.

VALVE SEAT CONTACT WIDTH mm (in)	
SERVICE LIMIT	
Exhaust	2 mm (0.078 in)
Intake	1.8 mm (0.07 in)

If valve seat contact width is too wide, too narrow or has spots, the seat must be ground or cylinder head replaced.



A. Valve face contact width
B. Valve seat contact width

Installation

For installation, reverse the removal procedure.

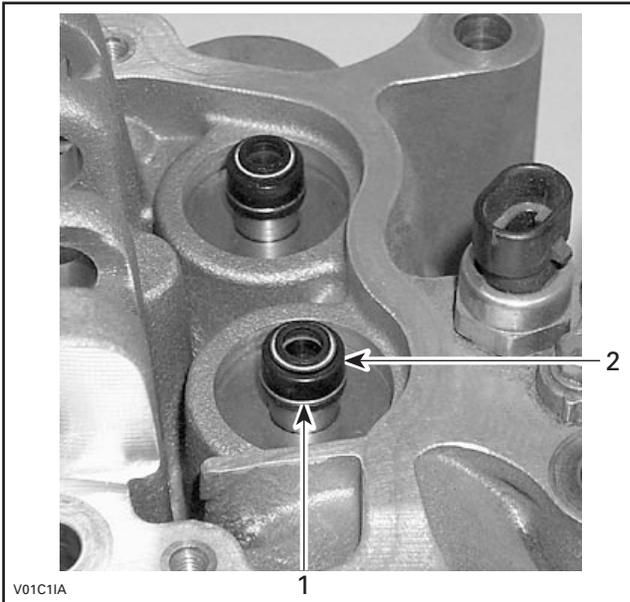
NOTE: Apply engine oil on valve stem.

6, VALVE STEM SEAL

Removal

Remove valve.

Remove circlip on the bottom of valve stem seal.



1. Circlip
 2. Valve stem seal

Inspection

Inspection of valve stem seals is not needed as new seals should always be installed whenever a cylinder head is disassembled.

Installation

For installation, reverse the removal procedure.

7, CYLINDER

Removal

Remove:

- flanged bolts **no. 23** retaining cylinder to crankcase housing
- cylinder head **no. 1**
- water cooling hose from cylinder **no. 20**
- push rods **no. 2**
- all flanged screws retaining cylinder to the crankcase housing

Pull cylinder.

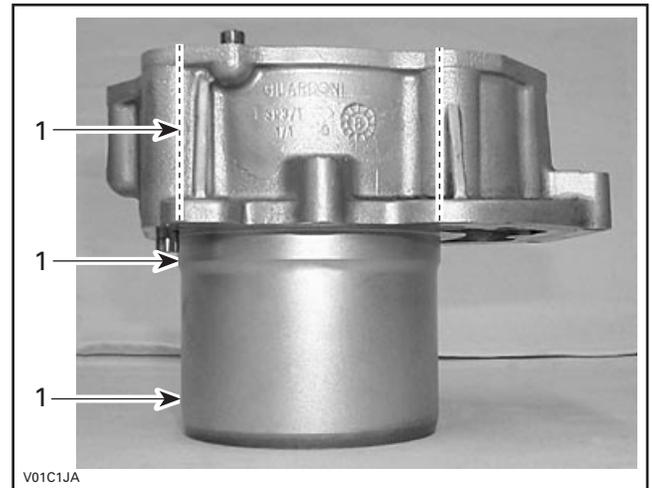
Inspection

Cylinder

Check cylinder for cracks, scoring, rust and wear ridges on the top and bottom of the cylinder.

Cylinder Taper

Measure cylinder diameter 16 mm (5/8 in) from top of cylinder then half-way through and finally at 13 mm (1/2 in) from bottom.

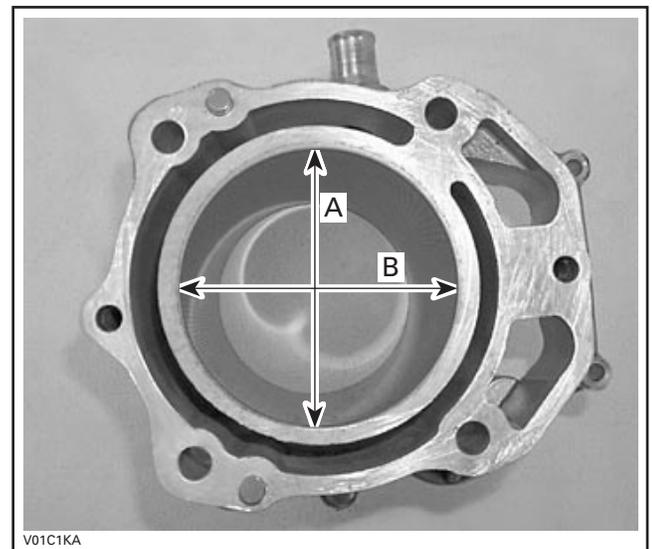


1. Measure at three points

Difference between measurements should not exceed 0.10 mm (0.004 in). If so, replace cylinder.

Cylinder Out of Round

Measure cylinder diameter in piston axis direction from top of cylinder. Take an other measurement 90° from first one and compare. Difference between measurements should not exceed 0.10 mm (0.004 in). If so, replace cylinder.



A. Perpendicular to crankshaft axis
 B. Parallel to crankshaft axis

Section 03 ENGINE

Subsection 06 (CYLINDER AND HEAD)

Installation

For installation, reverse the removal procedure. Paying attention to the following details.

Apply engine oil in cylinder bore.

Using a ring compressor, slide piston into cylinder. Install bolts **no. 23** in first, then flanged bolts **no. 14**, then flanged nuts **no. 13**.

8, LIFTER

Removal

Remove cylinder **no. 7**.

Pull lifter out of crankcase.

Inspection

Check for excessive clearance between lifter and its bore or straightness.

A telescoping gauge and micrometer are used to check the lifter bore clearance. Subtract lifter diameter from lifter bore diameter to determine clearance.

LIFTER AND LIFTER BORE mm (in)	
SERVICE LIMIT	
Lifter	22.19 mm (0.874 in)
Lifter bore	22.27 mm (0.876 in)

LIFTER BORE CLEARANCE	
SERVICE LIMIT	0.08 mm (0.003 in)

If the clearance is out of specified tolerance change lifter and/or crankcase.

Installation

For installation, reverse the removal procedure.

9, PISTON

Removal

Remove cylinder **no. 7**.

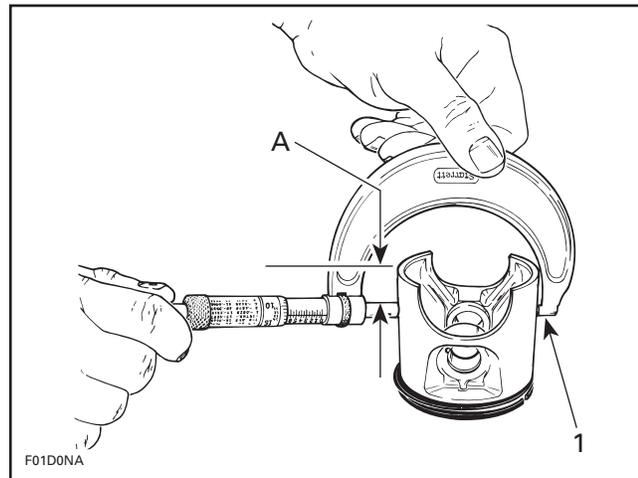
Remove both piston pin circlips **no. 21** then push piston pin **no. 22** out of piston.

Detach piston from connecting rod.

Inspection

Inspect piston for scoring, cracking or other damages.

Using a micrometer, measure piston at 16 mm (5/8 in) perpendicularly (90°) to piston pin axis.



TYPICAL

1. Measuring perpendicularly (90°) to piston pin axis
- A. 16 mm (5/8 in)

The measured dimension should be as described in the previous table. If not, replace piston.

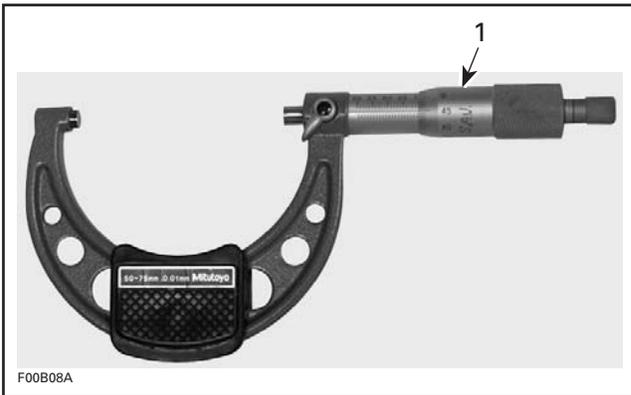
PISTON MEASUREMENT	
SERVICE LIMIT	88.9 mm (3.5 in)

Piston/Cylinder Clearance

PISTON/CYLINDER CLEARANCE	
SERVICE LIMIT	0.13 mm (0.005 in)

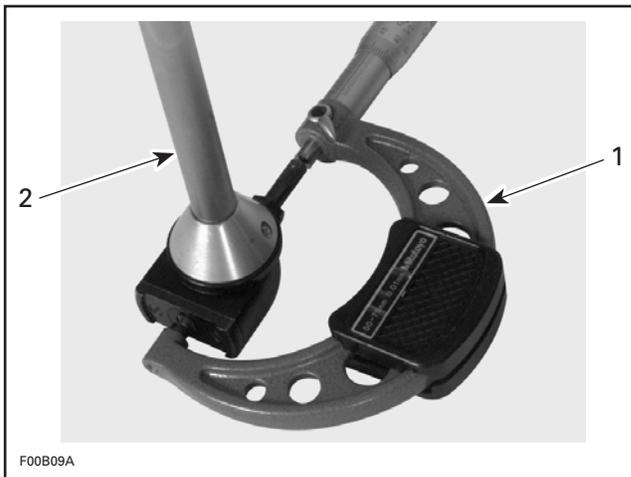
NOTE: Make sure used piston is not worn. See PISTON MEASUREMENT TABLE above.

Adjust and lock a micrometer to the piston dimension.

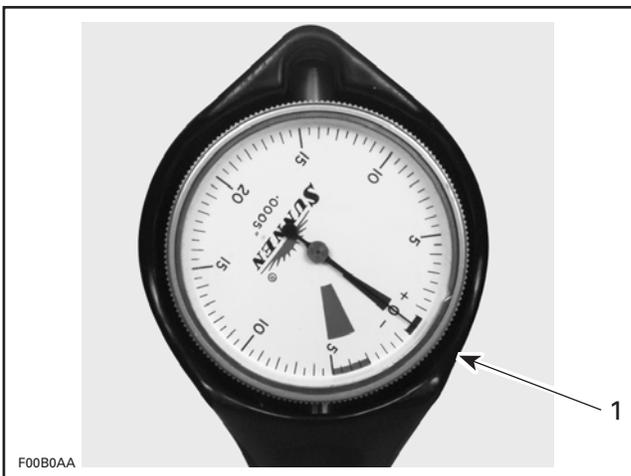


1. Micrometer set to the piston dimension

With the micrometer set to the dimension, adjust a cylinder bore gauge to the micrometer dimension and set the indicator to 0 (zero).



1. Use the micrometer to set the cylinder bore gauge
 2. Dial bore gauge



TYPICAL
 1. Indicator set to 0 (zero)

Position the dial bore gauge at 16 mm (5/8 in) below cylinder top edge, measuring perpendicularly (90°) to piston pin axis.

Read the measurement on the cylinder bore gauge. The result is the exact piston/cylinder wall clearance. If clearance exceeds specified tolerance, replace cylinder or rebore. See previous table.

NOTE: Make sure the cylinder bore gauge indicator is set exactly at the same position as with the micrometer, otherwise the reading will be false.

Installation

For installation, reverse the removal procedure. Paying attention to the following details.

Apply engine oil on the piston pin.

Insert piston pin into piston and connecting rod.

Secure piston pin with both piston pin circlips.

NOTE: Do not align the end gap of the piston pin circlips with the cutout in the piston bore.

10, PISTON RINGS

Inspection

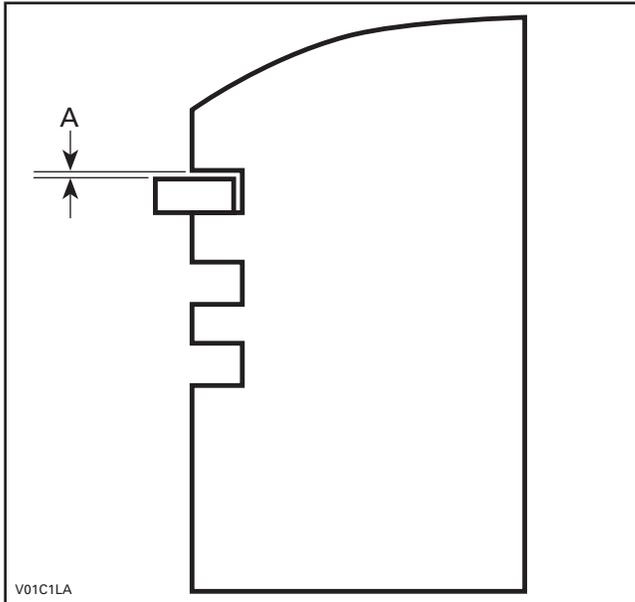
Ring/Piston Groove Clearance

Using a feeler gauge measure each ring/piston groove clearance. If the clearance is too large, the piston should be replaced.

RING/PISTON CLEARANCE mm (in)	
SERVICE LIMIT	0.15 mm (0.006 in)

Section 03 ENGINE

Subsection 06 (CYLINDER AND HEAD)



A. Measure here

Ring End Gap

RING END GAP mm (in)	
SERVICE LIMIT	1.5 mm (0.06 in)

Position ring 16 mm (5/8 in) from top of cylinder.

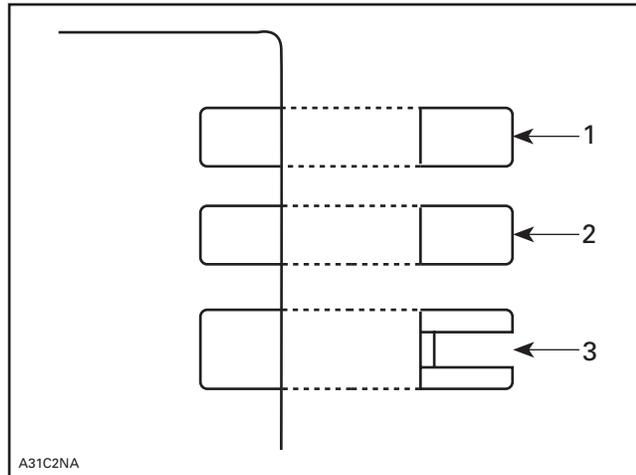
NOTE: In order to correctly position the ring in the cylinder, use piston as a pusher.

Using a feeler gauge, check ring end gap. Replace ring, if gap exceeds specified tolerance. See above table.

Installation

For installation, reverse the removal procedure. Paying attention to the following details.

Install the oil ring first, then the middle ring with the word TOP facing up, then the top ring with a dot facing up.

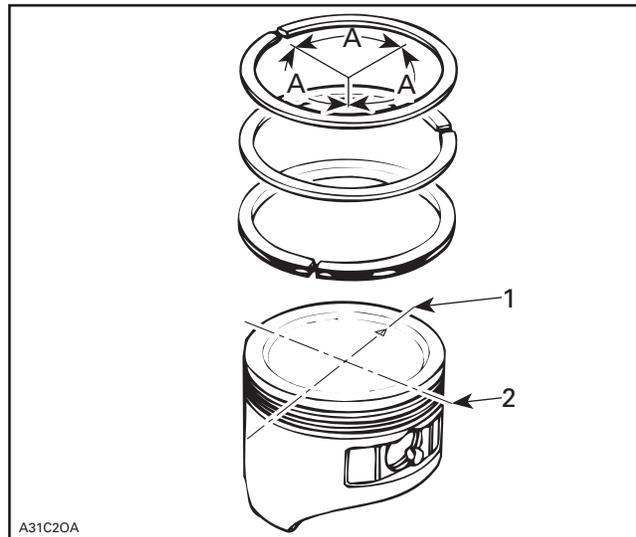


1. Top ring (rectangular, black/gray color)
2. Second ring (scraper, chrome/stainless steel looking ring)
3. Oil ring

CAUTION: Ensure that top and second rings are not interchanged.

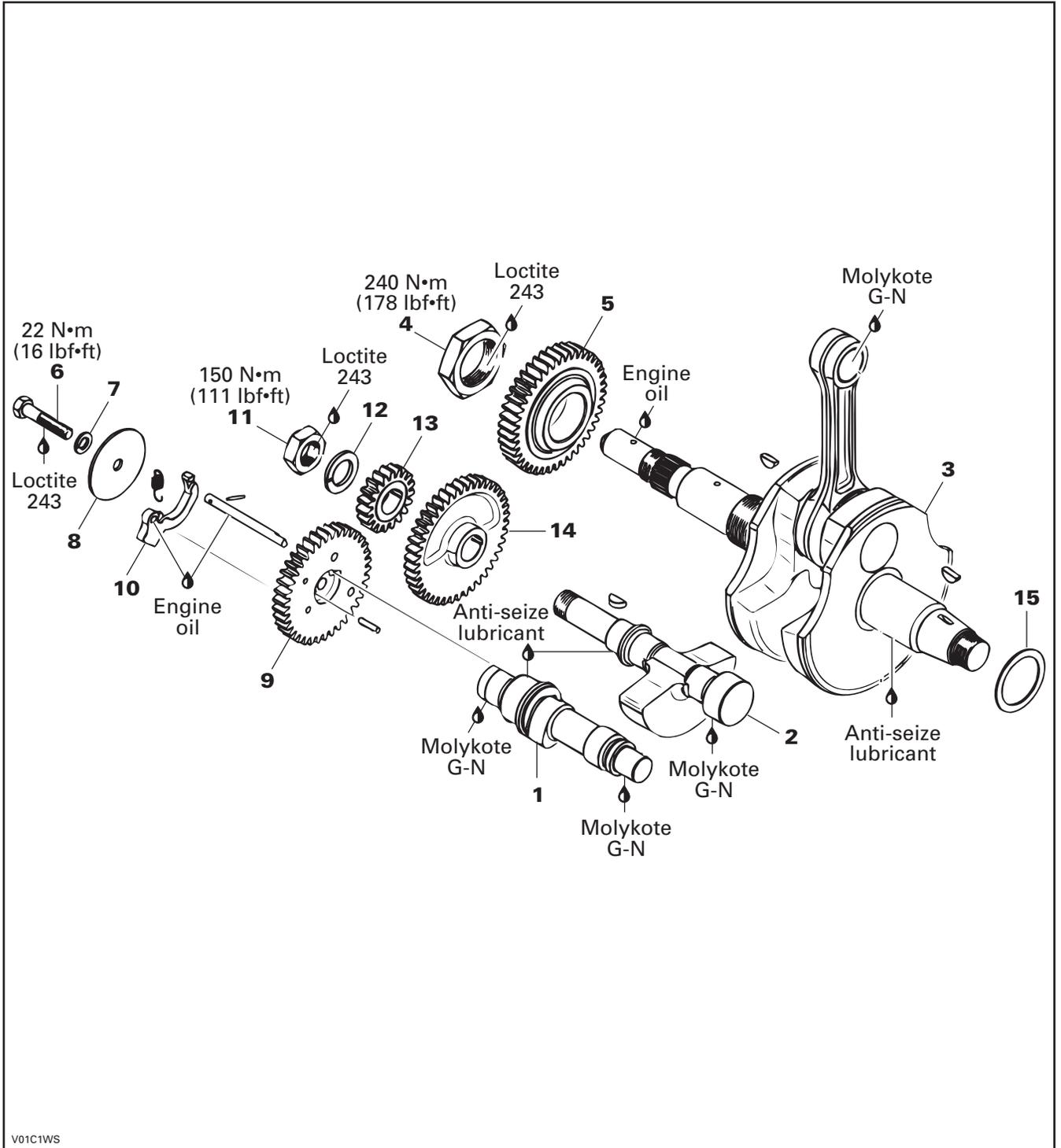
NOTE: Use a ring expander to prevent breakage during installation. The oil ring must be installed by hand.

Check that rings rotate smoothly after installation. Space the piston ring end gaps 120° apart and do not align the gaps with the piston pin bore or the thrust side axis.



1. DO NOT align ring gap with piston thrust side axis
2. DO NOT align ring gap with piston pin bore axis
- A. 120°

CRANKSHAFT/BALANCER SHAFT



V01C1WS

Section 03 ENGINE

Subsection 07 (CRANKSHAFT/BALANCER SHAFT)

1, CAMSHAFT

Removal

Remove engine from vehicle (refer to INSTALLATION AND REMOVAL 03-02).

Front Side

Remove:

- rewind starter (refer to REWIND STARTER 03-04)
- clutch (refer to CLUTCH 03-09)
- sub-transmission system (refer to TRANSMISSION 03-10)
- cylinder head, cylinder and piston (refer to CYLINDER AND HEAD 03-06)
- crankshaft gear nut **no. 4**, use 46 mm socket (P/N 529 035 648), then remove crankshaft gear **no. 5**
- bolt **no. 6**, lock washer **no. 7** and washer **no. 8** retaining cam shaft gear **no. 9** with centrifugal weight **no. 10**
- nut **no. 11** and lock washer **no. 12** retaining control gear **no. 13** and balancing shaft gear **no. 14**. Remove the both gears
- oil pump gear
- holding strip retaining oil pipe

Rear Side

Remove:

- starter, water pump, magneto and ring gear (refer to MAGNETO SYSTEM 03-05)
- shifting system (refer to TRANSMISSION 03-10)

Separate crankcase housings.

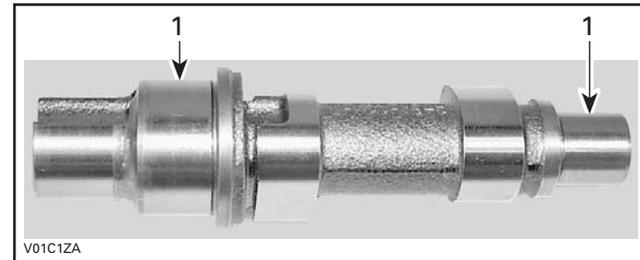
Remove camshaft.

Inspection

Check each lobe for scoring, scuffing, cracks, or other sign of wear.

Measure each end of camshaft.

CAMSHAFT ENDS mm (in)	
SERVICE LIMIT	
Clutch side	31.95 mm (1.258 in)
Magneto side	17.96 mm (0.707 in)



1. Measure here

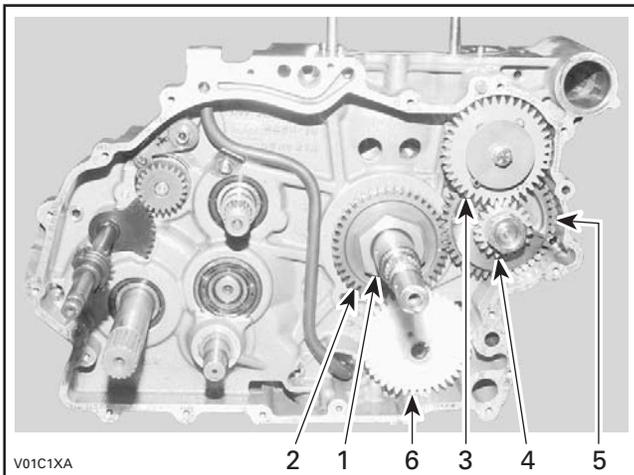
Measure the camshaft bore in both housing.

CAMSHAFT BORE mm (in)	
SERVICE LIMIT	
Clutch housing	32.036 mm (1.261 in)
Magneto housing	18.035 mm (0.71 in)

Subtract the camshaft end diameter from the proper bore diameter to find clearance.

CAMSHAFT END CLEARANCE mm (in)	
SERVICE LIMIT	
Clutch side	0.086 mm (0.0034 in)
Magneto side	0.075 mm (0.0029 in)

If necessary, change camshaft and/or crankcase.



1. Crankshaft gear nut
2. Crankshaft gear
3. Cam shaft gear
4. Control gear
5. Balancing shaft gear
6. Oil pump gear

- all bolts and socket screws retaining crankcase

Installation

For installation reverse the removal procedure.
NOTE: Always install a new crankcase gasket.

2, BALANCER SHAFT

Removal

Refer to CAMSHAFT REMOVAL section above.
 Use the same procedure.

Remove balancer shaft.

Inspection

Check balancer shaft bearing in the front and rear housing for excessive play and smooth operation.
 Replace if necessary.

Installation

For installation, reverse the removal procedure.

3, CRANKSHAFT

Removal

Use the same removal procedure that camshaft and balancer shaft.

Remove crankshaft and adjusting washer **no. 15**.

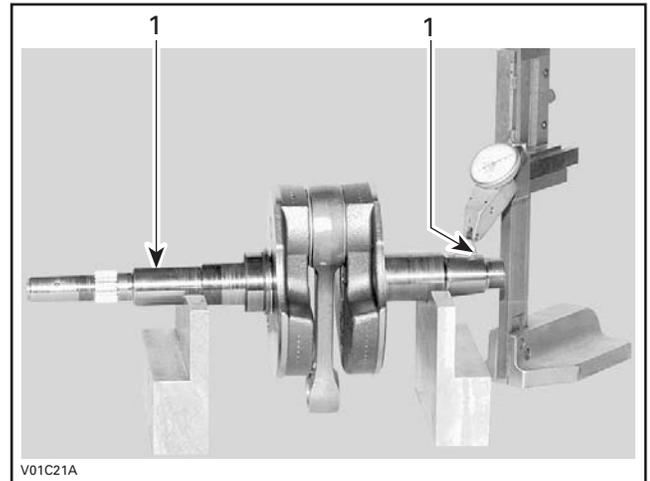
Inspection

Crankshaft Deflection

Crankshaft deflection is measured with a dial indicator.

Check crankshaft deflection on V-shaped blocks.
 If deflection exceeds the specified tolerance, change it.

CRANKSHAFT DEFLECTION mm (in)	
SERVICE LIMIT	
Clutch side	0.08 mm (0.003 in)
Magneto side	0.05 mm (0.002 in)



1. Measure here

Connecting Rod Big End Axial Play

Using a feeler gauge, measure distance between thrust washer and crankshaft counterweight. If the distance exceeds specified tolerance, replace the crankshaft.

CONNECTING ROD BIG END mm (in)	
SERVICE LIMIT	
Axial play	1.3 mm (0.05 in)

Connecting Rod/Piston Pin Clearance

Measure piston pin. Compare to inside diameter of connecting rod.

CONNECTING ROD SMALL END DIAMETER	
SERVICE LIMIT	
	22.05 mm (0.868 in)

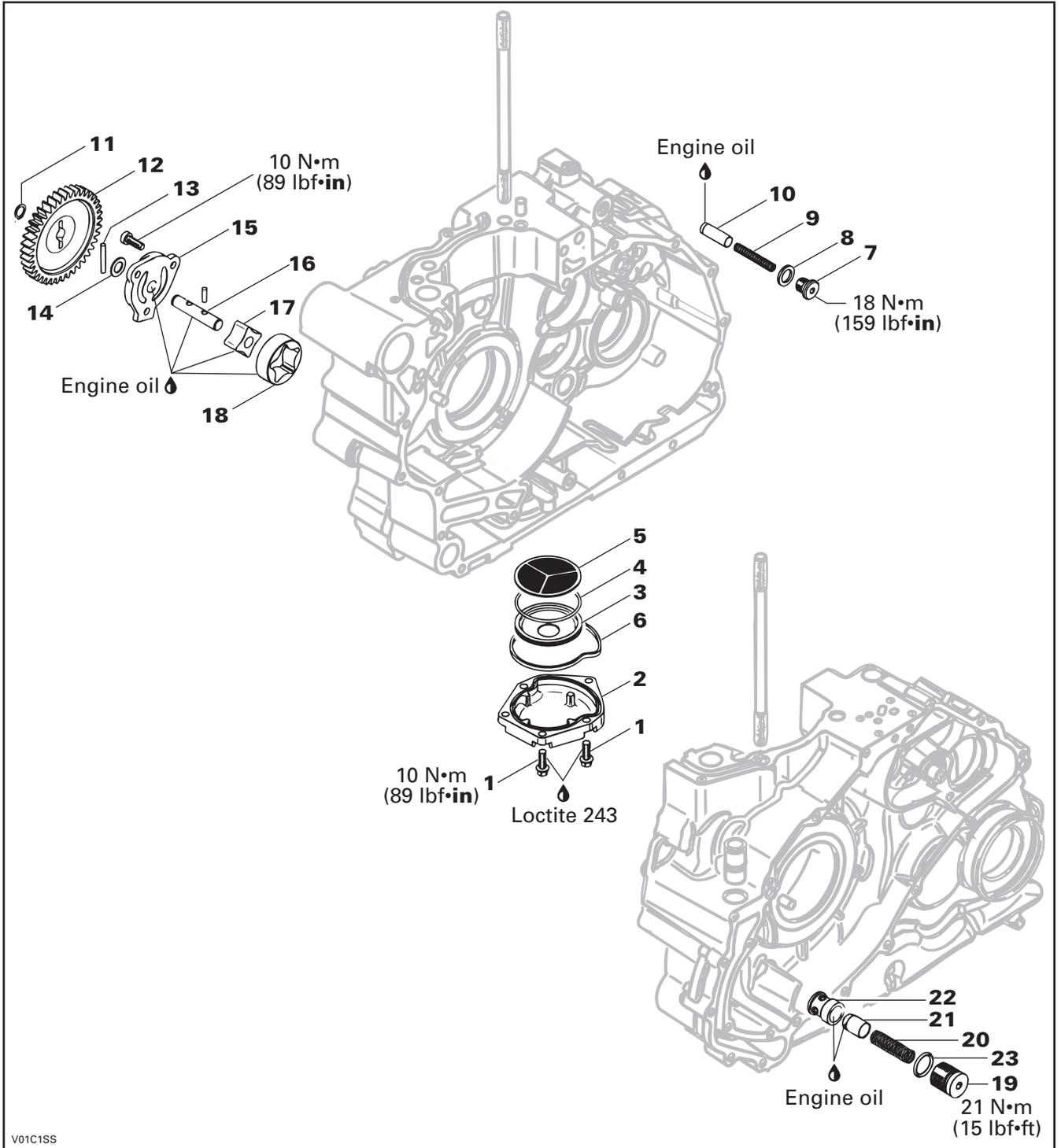
PISTON PIN DIAMETER	
SERVICE LIMIT	
	21.99 mm (0.866 in)

PISTON PIN BORE CLEARANCE	
SERVICE LIMIT	
	0.06 mm (0.002 in)

Installation

For installation, reverse the removal procedure.

LUBRICATION SYSTEM



Section 03 ENGINE

Subsection 08 (LUBRICATION SYSTEM)

TROUBLESHOOTING

Oil Level Low

- external oil leak
- worn or incorrect piston rings installation
- worn valve seal
- oil pump worn or damaged

Low or No Oil Pressure

- clogged oil orifice(s)
- incorrect oil being used
- defective oil pump
- leaking oil seal
- oil strainer

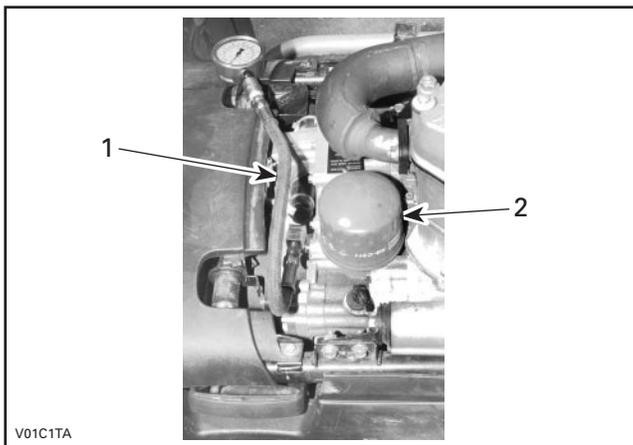
Oil Contamination (white appearance)

- coolant mixing with oil
- faulty water pump seal
- faulty head gasket
- water leak in crankcase

ENGINE PRESSURE TEST

NOTE: The engine pressure test should be done with a warm engine and the recommended oil.

Remove the oil pressure switch under oil filter and install the oil pressure gauge (P/N 529 035 652).



1. Oil pressure gauge
2. Oil filter

The engine pressure should be between 101 kPa (14.7 PSI) and 608 kPa (88 PSI).

When the hydraulic shifter is used, the engine pressure must increase up to about 810 kPa (118 PSI).

If the engine pressure is out of specifications, check the points described in LOW OR NO OIL PRESSURE section above.

OIL CHANGE AND OIL FILTER REPLACEMENT

Oil and filter are to be replaced at the same time. Oil change should be done with a warm engine.

⚠ WARNING

The engine oil can be very hot. Wait until engine oil is warm.

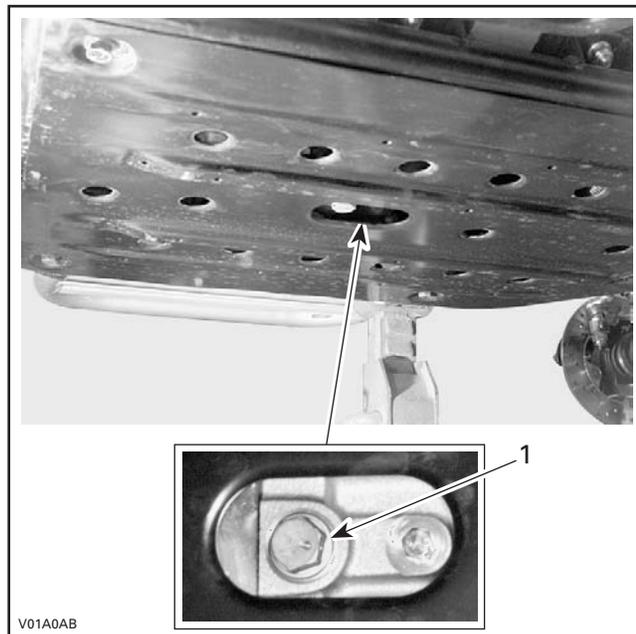
Ensure vehicle is on a level surface.

Clean the drain plug area.

Remove dipstick.

Place a drain pan under the engine drain plug area.

Unscrew drain plug.



1. Oil drain plug

Wait a while to allow oil to flow out of oil filter.

Carefully unscrew oil filter and as soon as it can be removed from the engine, turn it upright. Discard filter.

NOTE: Be sure that the old filter O-ring is removed.

CAUTION: Only use Bombardier high pressure filter or suitable equivalent. The Bombardier filter is specifically designed for this engine. This filter does not operate at the same pressure as other brands. Using a non-recommended filter may cause serious engine/transmission damage.

Lubricate the O-ring on the filter with engine oil. Install the new filter then screw one full turn after O-ring contact.

Wipe out any oil spillage on engine.

Change gasket on drain plug. Clean gasket area on engine and drain plug then reinstall plug. Refill engine at the proper level with the recommended oil. Refer to TECHNICAL DATA 11-02 for capacity.

Start engine and let idle for a few minutes. Ensure oil filter area and drain plug areas are not leaking.

Stop engine. Wait a while to allow oil to flow down to crankcase then check oil level. Refill as necessary.

Dispose oil as per your local environmental regulations.

OIL STRAINER

Removal

Ensure vehicle is on a level surface.

Remove:

- skid plate under vehicle
- engine oil
- screws **no. 1** retaining oil strainer cover **no. 2**
- oil collector **no. 3** and O-ring **no. 4**
- oil strainer **no. 5**

Cleaning and Inspection

Clean oil strainer with the parts cleaner then use an air gun to dry it.

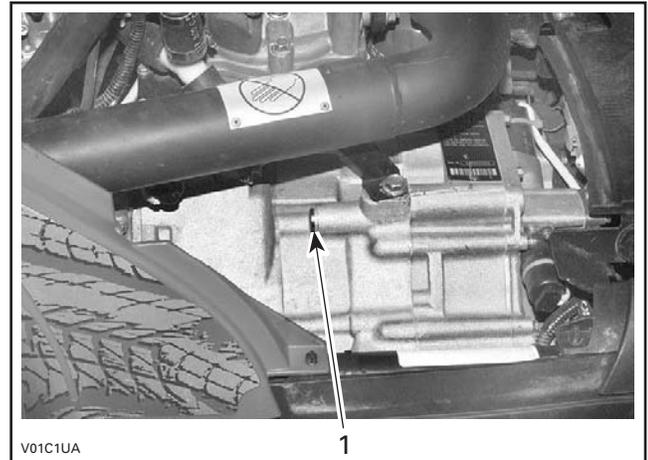
Inspect O-ring and oil strainer gasket **no. 6** for damage. Change if necessary.

Installation

For installation, reverse the removal procedure.

ENGINE OIL PRESSURE REGULATOR

The engine oil pressure regulator is located near exhaust pipe bracket.



1. Engine oil pressure regulator

Removal

Remove the plug screw **no. 7**, sealing ring **no. 8**, compression spring **no. 9** and piston **no. 10**.

Inspection

Inspect piston for scoring or other damages.

Check compression spring for free length, squareness or other damage.

COMPRESSION SPRING FREE LENGTH	
SERVICE LIMIT	42 mm (1.65 in)

Installation

For installation, reverse the removal procedure.

NOTE: Always install a new sealing ring when the oil pressure regulator is removed.

Section 03 ENGINE

Subsection 08 (LUBRICATION SYSTEM)

OIL PUMP

The oil pump is located on the clutch side of the crankcase housing.

Removal

Remove engine. Refer to REMOVAL AND INSTALLATION 03-02.

Remove clutch cover and clutch housing. Refer to CLUTCH 03-09.

Remove:

- snap ring **no. 11**
- oil pump gear **no. 12**
- needle pin **no. 13**
- thrust washer **no. 14**
- oil pump cover **no. 15**
- oil pump shaft **no. 16**
- oil pump rotor **no. 17**
- inner rotor **no. 18**

Inspection

Inspect oil pump for marks or other damages.

Using a feeler gauge, measure the clearance between oil pump rotor and inner rotor.

OIL PUMP ROTOR AND INNER ROTOR CLEARANCE mm (in)	
SERVICE LIMIT	
A	0.25 mm (0.009 in)
B	
C	

Measure oil pump rotor thickness and oil pump rotor bore depth.

Difference between measurements should not exceed 0.2 mm (0.007 in). If so, replace oil pump rotor.

Installation

For installation, reverse the removal procedure.

CLUTCH OIL PRESSURE REGULATOR

Removal

Remove water pump and ignition cover. Refer to MAGNETO SYSTEM 03-06.

Unscrew plug **no. 19**.

Remove compression spring **no. 20**, valve piston **no. 21** and valve seat sleeve **no. 22**.

Inspection

Inspect piston for scoring or other damages.

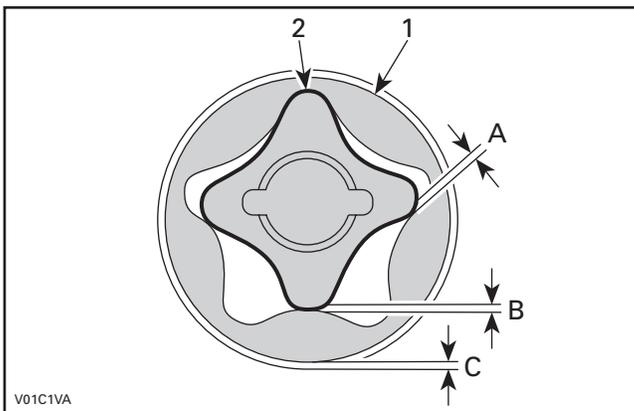
Check O-ring **no. 23** for damage. Change if necessary.

Check compression spring for free length, squareness or other damage.

COMPRESSION SPRING FREE LENGTH	
SERVICE LIMIT	59.5 mm (2.34 in)

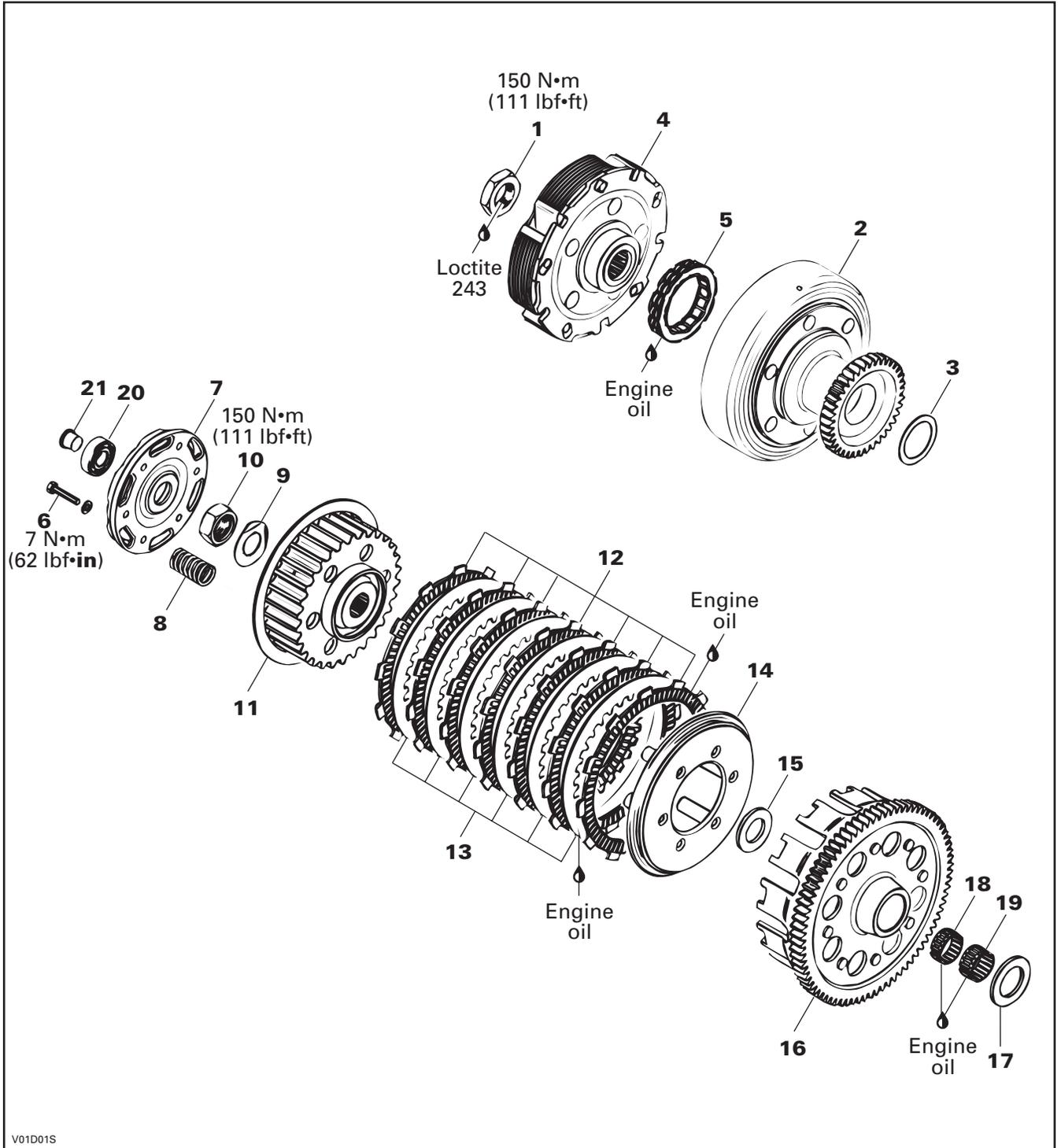
Installation

For installation, reverse the removal procedure.



1. Oil pump rotor
2. Inner rotor

CLUTCH



Section 03 ENGINE

Subsection 09 (CLUTCH)

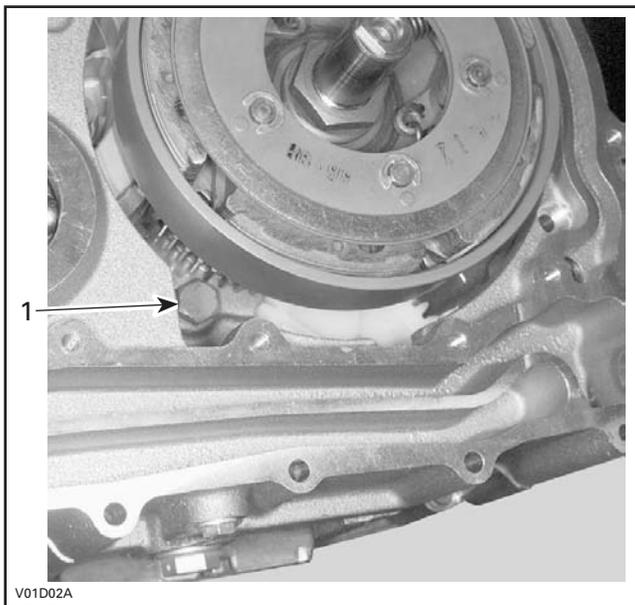
CLUTCH DRUM, CLUTCH WEIGHT AND SPRAG CLUTCH

Disassembly

Remove:

- engine oil and coolant
- rewind starter
- clutch cover

Install the crankshaft locking bolt (P/N 529 035 645).



1. Crankshaft locking bolt

Unscrew nut **no. 1** retaining clutch weight ass'y **no. 2** to crankshaft.

Pull clutch drum out of housing and remove thrust washer **no. 4**.

Separate clutch weight ass'y from clutch drum.

Inspection

Clutch Drum

Check inside of drum clutch for excessive wear or scratches. Change if necessary.

Measure the inside diameter of clutch drum. If the I.D. is over to 140.4 mm (5-17/32 in) change clutch drum.

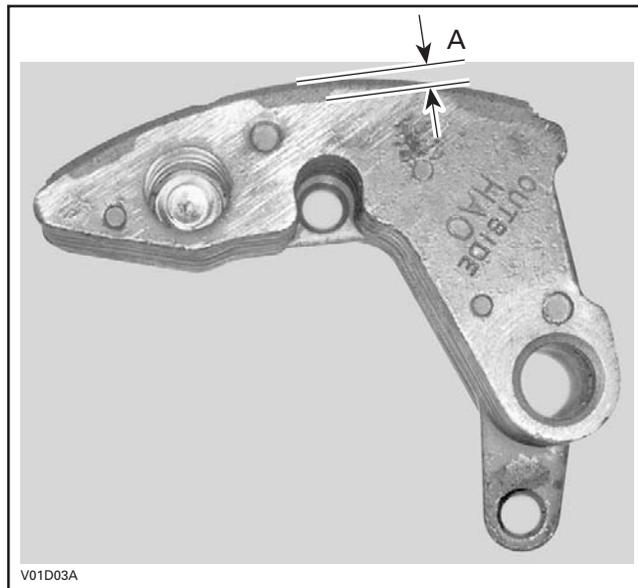
Sparg Clutch

Hold clutch drum and rotate clutch weight. The clutch weight should only turn counterclockwise.

Inspect sparg clutch **no. 5** for smooth operation and roller for excessive wear. Change sparg clutch if necessary.

Weight Lining

Measure weight lining thickness. The weight lining thickness must have 2.0 mm (5/64 in).

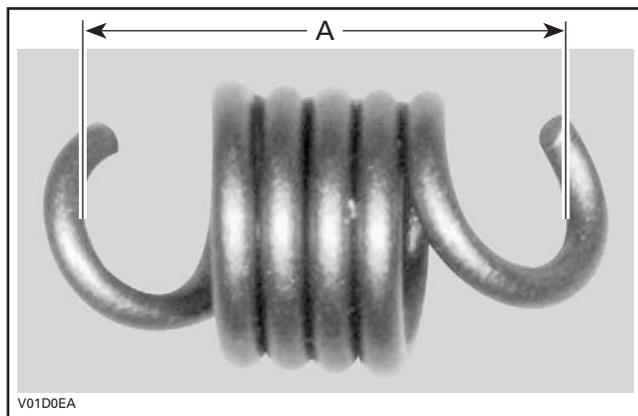


A. Weight lining

Weight Spring

Remove E-clips, washer, clutch spring and washer. Remove clutch weights and weight springs from plate.

Measure length of weight springs. If they are longer than 21.6 mm (0.85 in), change springs.



A. 21.6 mm (0.85 in)

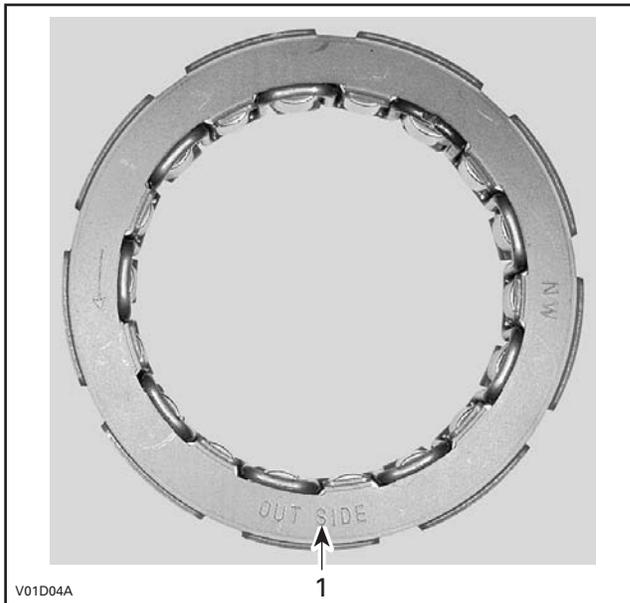
Check weight springs for wear or other damage. Replace if necessary.

Assembly

For installation, reverse the removal procedure. Paying attention to the following details.

Install weight springs with the open ends down.

Install sparg clutch in clutch drum with its OUT SIDE mark facing out. Apply engine oil on sprag clutch.

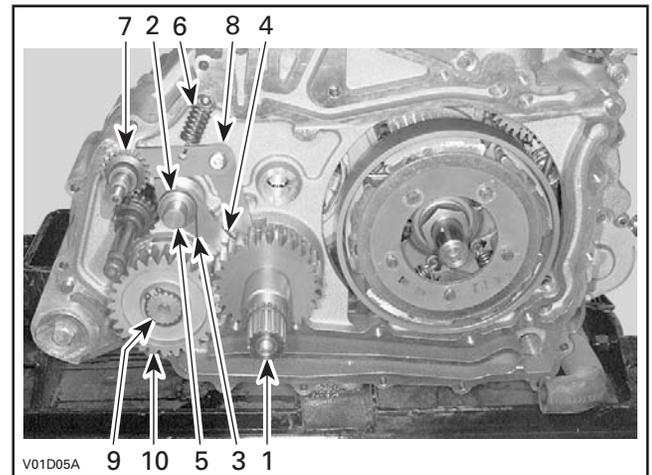


1. Out side mark

FRICITION DRIVE PLATE, STEEL DRIVEN PLATE AND CLUTCH BASKET

Disassembly

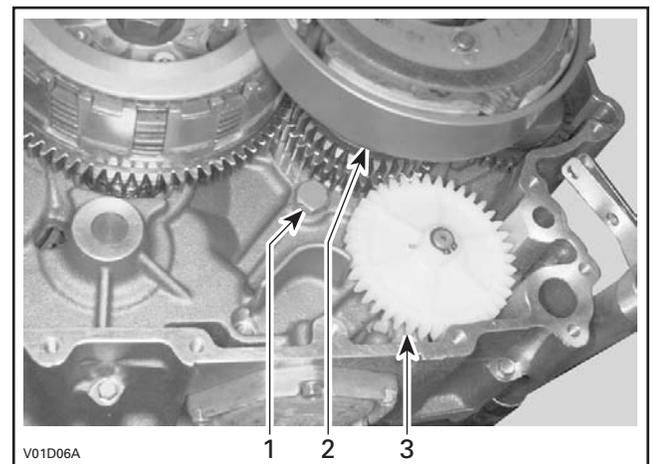
- engine oil and coolant
- rewind starter
- clutch cover
- front output shaft
- collar sleeve
- helical spring
- parking locking lever
- shaft
- tension spring
- indicator shaft
- actuating lever and thrust washer
- circlip
- output gear



1. Front output shaft
2. Collar sleeve
3. Helical spring
4. Parking locking lever
5. Shaft
6. Tension spring
7. Indicator shaft
8. Actuating lever
9. Circlip
10. Output gear

Remove the clutch housing.

Install the crankshaft locking bolt (P/N 529 035 645).



1. Crankshaft locking bolt
2. Clutch drum
3. Oil pump gear

Remove clutch drum no. 3 and thrust washer no. 4.

Remove clutch bolts no. 6, pressure plate no. 7 and clutch spring no. 8.

Unlock the tab washer no. 9 then install spanner tool for clutch basket (P/N 529 035 647).

Unscrew the clutch lock nut no. 10 then remove tab washer.

Section 03 ENGINE

Subsection 09 (CLUTCH)

Remove:

- clutch hub **no. 11**
- friction drive plates **no. 12**
- steel driven plates **no. 13**
- inner plate **no. 14**
- thrust washer **no. 15**
- clutch basket **no. 16**
- needle bearings **no. 18** and **no. 19**
- large thrust washer **no. 17**

Inspection

Friction Drive Plate

Measure each friction drive plate thickness.

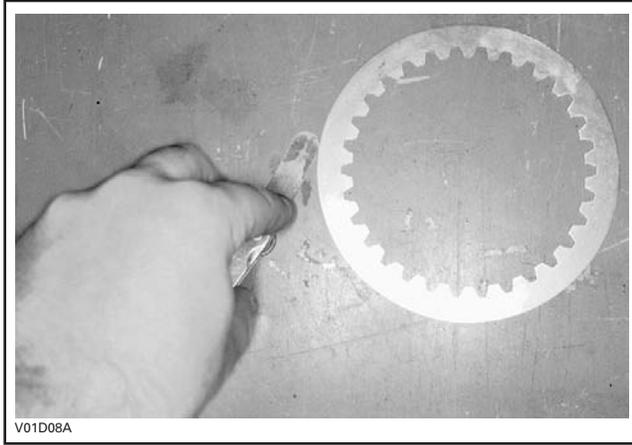
Friction drive plates must be replaced when lining is 2.7 mm (0.11 in) thick or less.

FRICION DRIVE PLATE MINIMUM THICKNESS
--

2.7 mm (0.11 in)

STEEL DRIVEN PLATE MAXIMUM WARPAGE

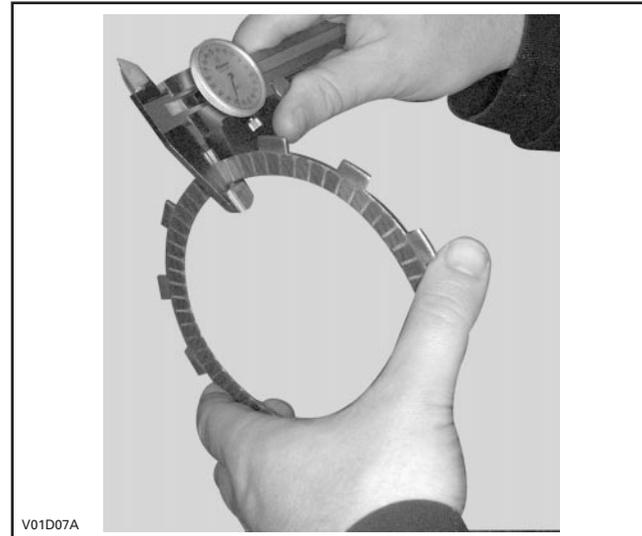
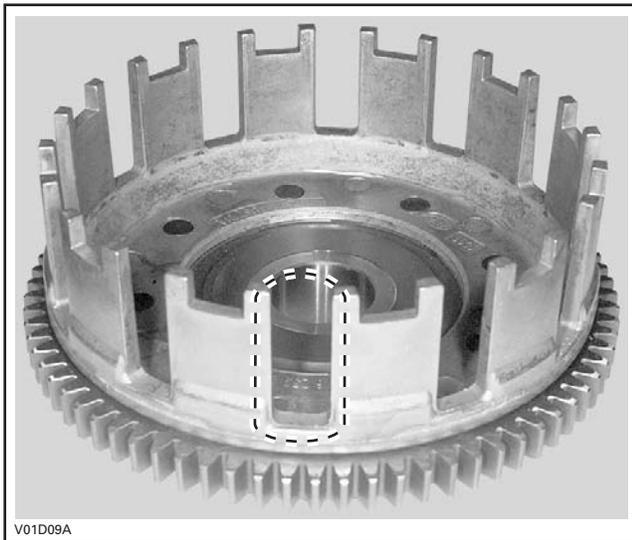
0.25 mm (0.01 in)



Clutch Basket

Check slots of clutch basket for damage or wear caused by friction drive plates.

Change if necessary.

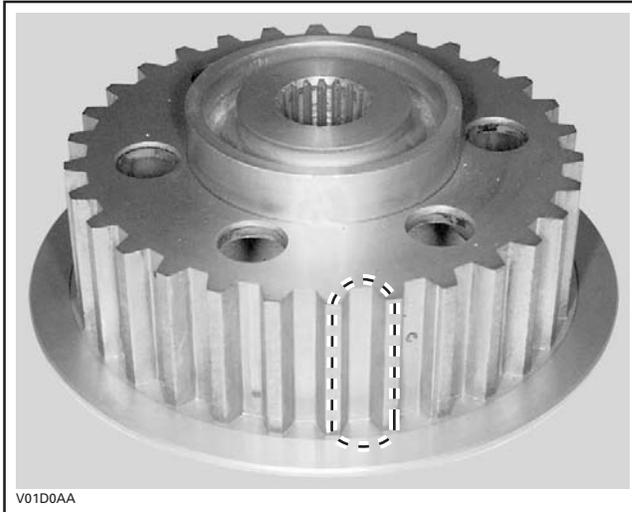


Steel Driven Plate

Using a feeler gauge, check each steel driven plate for warpage on a plate surface. Change if the warpage is over to 0.25 mm (0.01 in) or if they show signs of discoloration.

Clutch Hub

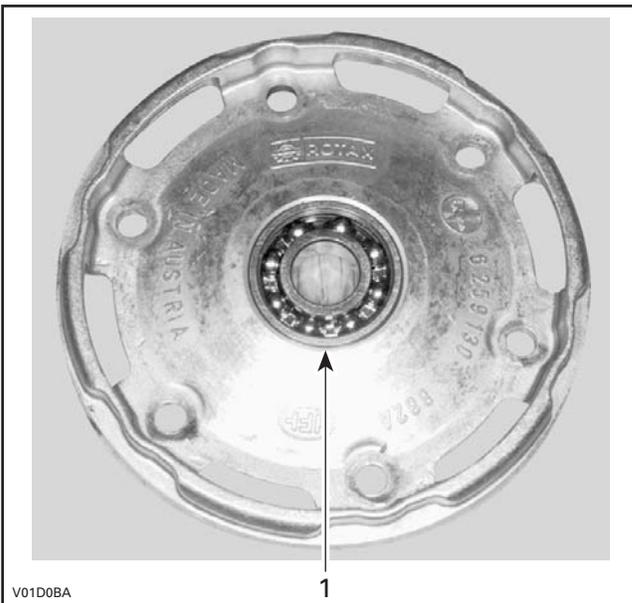
Check grooves of clutch hub for damage or wear caused by steel driven plates.



Pressure Plate Bearing

Check the pressure plate bearing no. 20. Turn the bearing with your finger.

The bearing should turn smoothly and don't have excessive play. Replace if necessary.

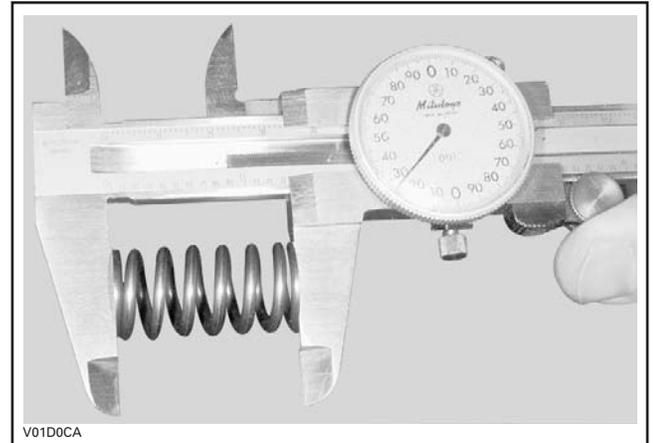


1. Retaining plate bearing

Clutch Spring

Measure each clutch springs free length.

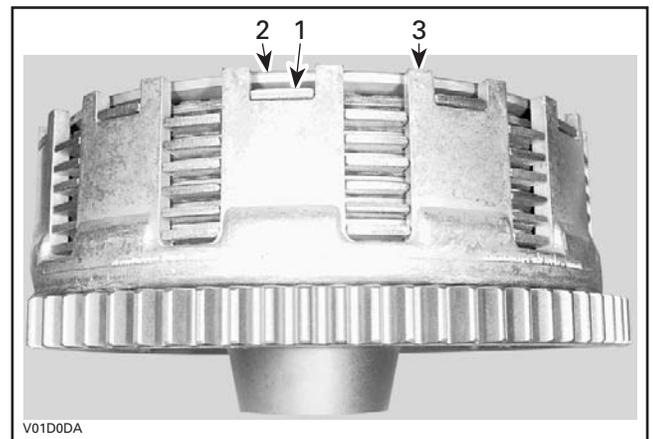
CLUTCH SPRING MINIMUM LENGTH	32.5 mm (1.28 in)
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Assembly

Assemble friction drive plates, steel driven plates, inner plate and clutch hub in clutch basket. Apply engine oil on each friction drive plate.

NOTE: Place the last friction drive plate in short slots of clutch basket.

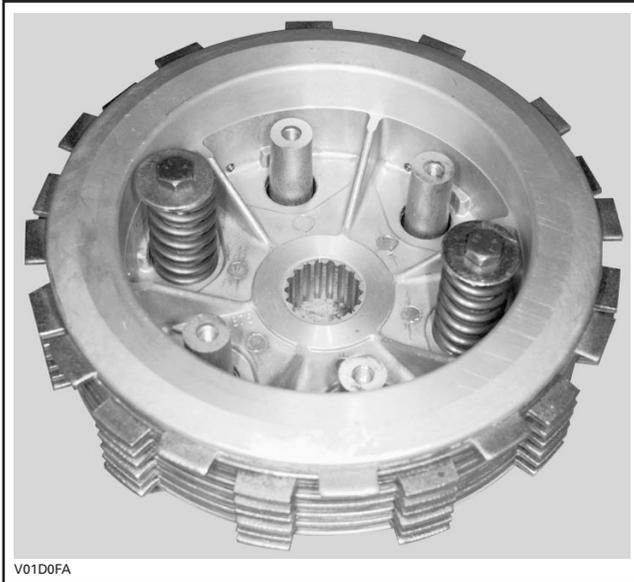


1. Last friction drive plate
2. Retaining plate
3. Clutch basket

Section 03 ENGINE

Subsection 09 (CLUTCH)

Install 2 clutch springs. Remove clutch hub assembly from clutch basket.

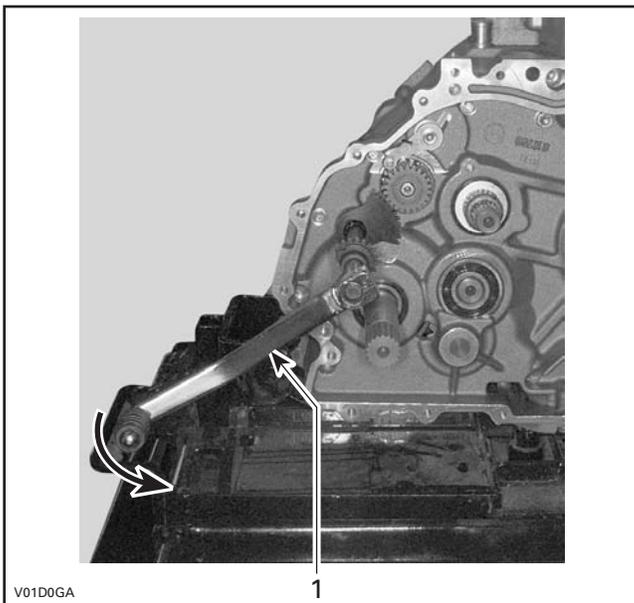


NOTE: Do not remove shift shaft. If the shift shaft is removed, refer to TRANSMISSION 03-10 for proper installation.

Install the large thrust washer on main shaft.

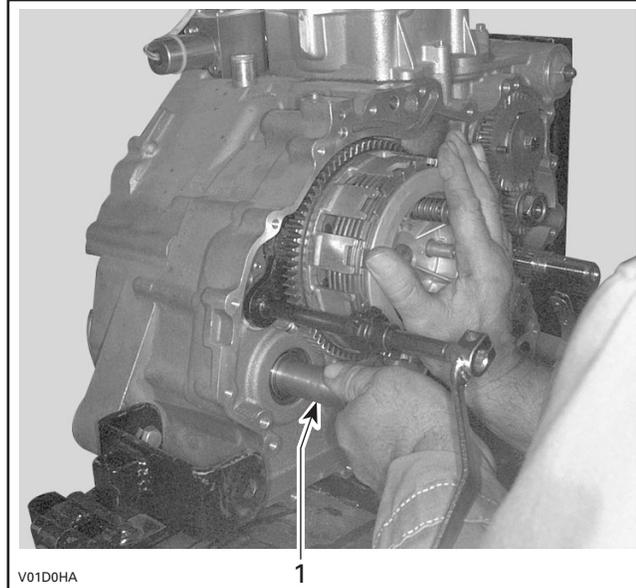
Install needle bearings, the large bearing in first, large thrust washer, clutch basket and then the small thrust washer on main shaft. Apply engine oil on needle bearings.

Using the sub-transmission positioner (P/N 529 035 651), select an other position than PARK.



1. Sub-transmission positioner

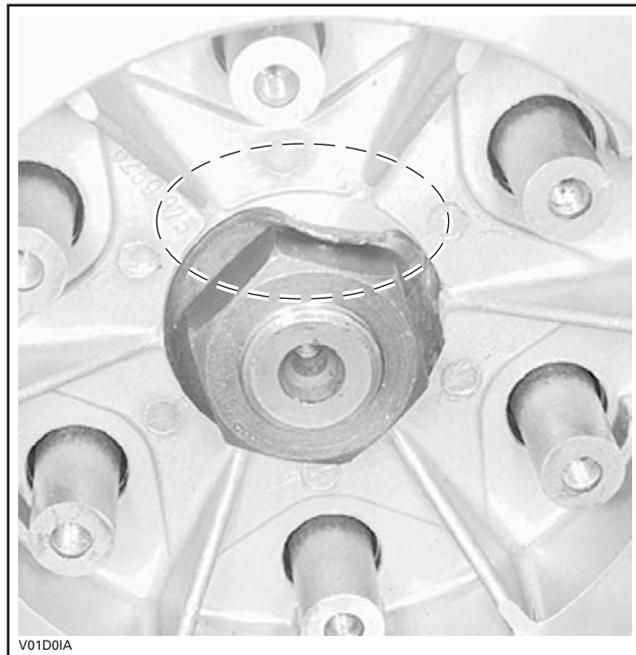
Install clutch hub. Move the output shaft slowly and push clutch hub.



1. Output shaft

CAUTION: Do not use clutch lock nut when you insert clutch hub in clutch basket.

Install a new tab washer and clutch lock nut. Fold up tab washer on nut.

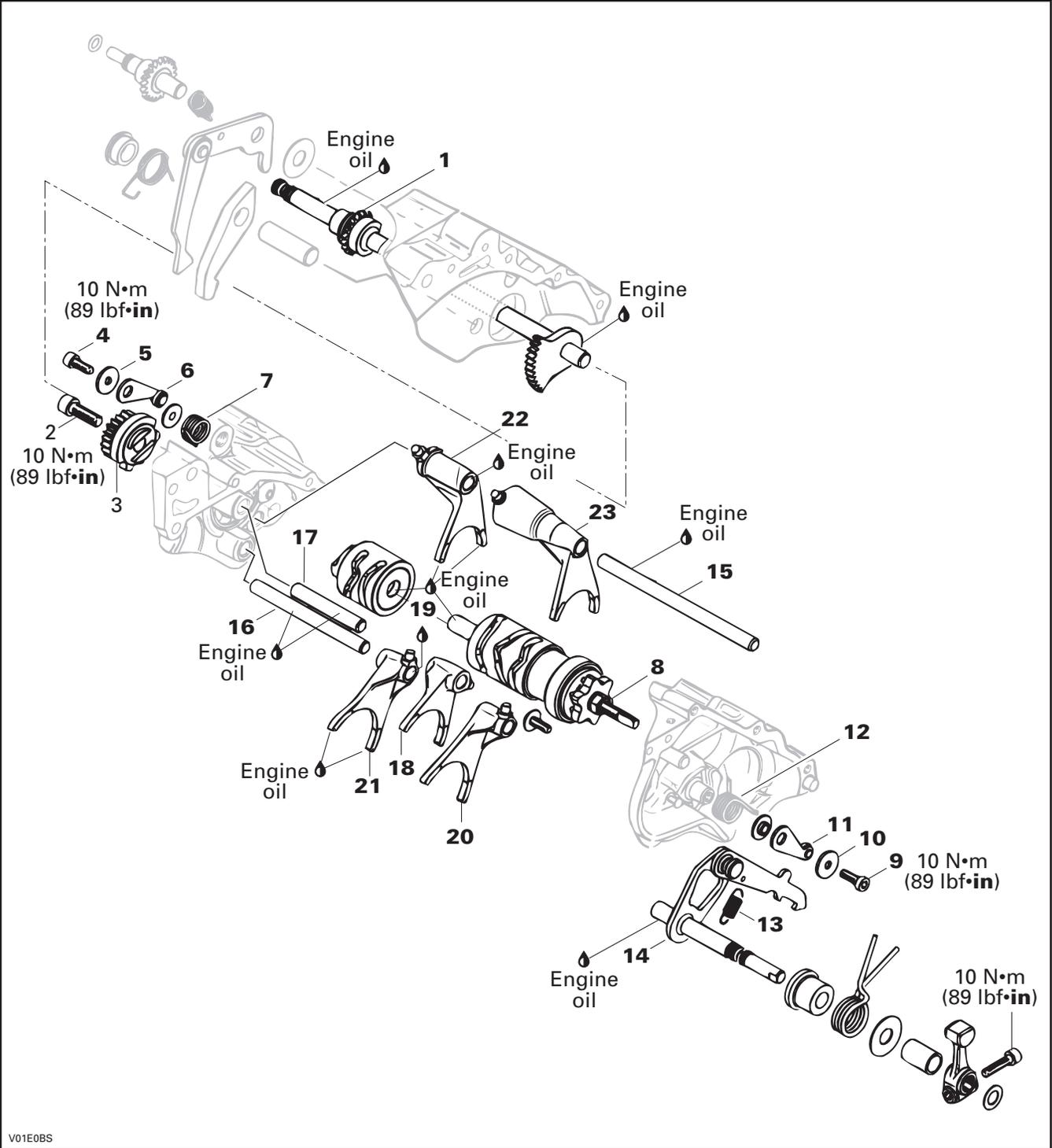


Replace the transmission in PARK position.

At the time of indicator shaft installation, refer to TRANSMISSION 03-10 for the proper procedure.

TRANSMISSION

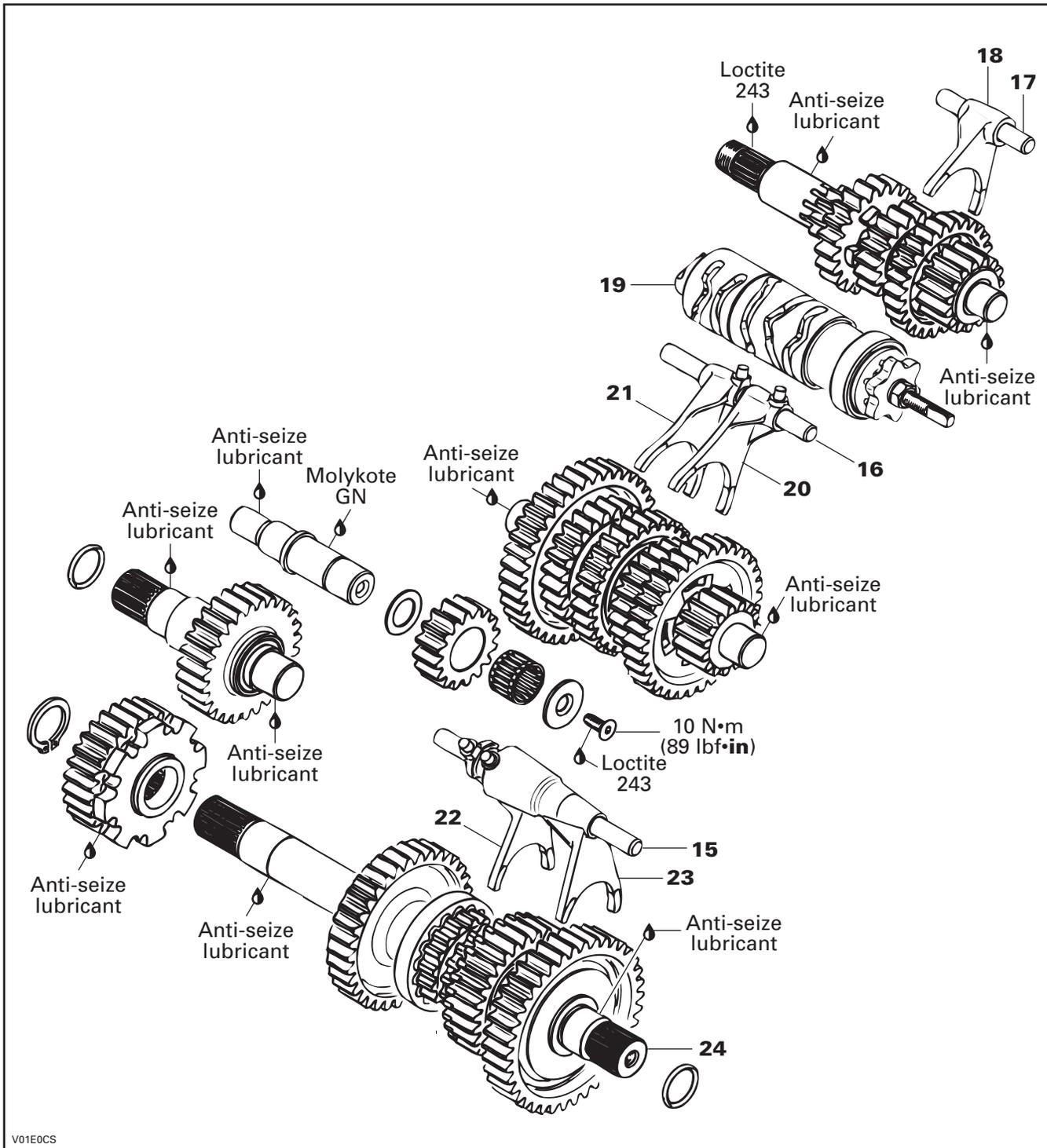
GEAR SHIFT SYSTEM



Section 03 ENGINE

Subsection 10 (TRANSMISSION)

TRANSMISSION



V01E0CS

GEAR SHIFT MECHANISM

Disassembly

Front Side

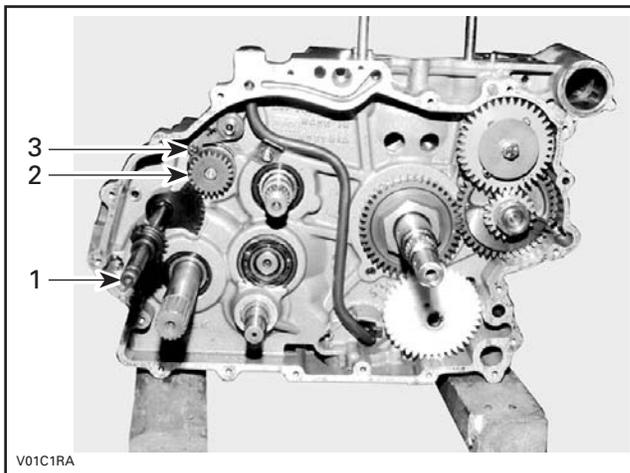
Remove:

- engine from vehicle
(refer to REMOVAL AND INSTALLATION 03-02)
- rewind starter
(refer to REWIND STARTER 03-04)
- clutch (refer to CLUTCH 03-09)

Remove the shift shaft no. 1.

Unscrew socket screw no. 2 retaining index gear no. 3.

Remove socket screw no. 4, washer no. 5, index lever no. 6 and index spring no. 7.



1. Shift shaft
2. Index gear
3. Index lever

NOTE: Insert a flat screw driver in the index lever slot and twist the screw driver clockwise then pull index gear.

Rear Side

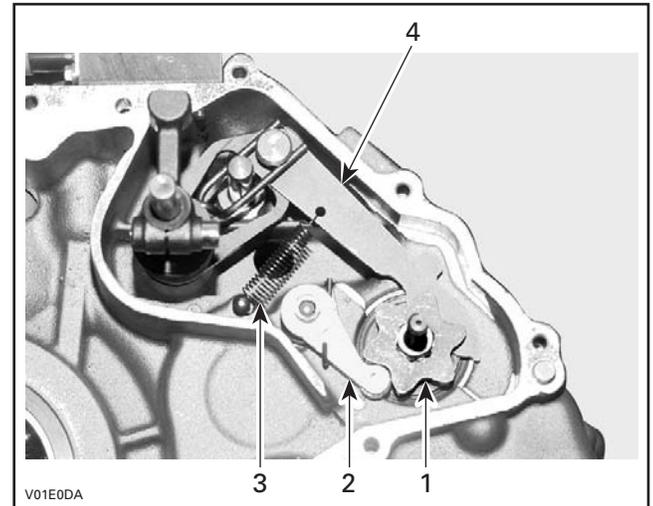
Remove water pump and magneto cover.

Remove nut retaining shift drum gear no. 8.

Remove socket screw no. 9, washer no. 10, index lever no. 11 and index spring no. 12.

NOTE: Insert a flat screw driver in the index lever slot and twist the screw driver clockwise then pull index gear.

Remove the tension spring no. 13 then pull shift shaft with pawl no. 14 out of housing.



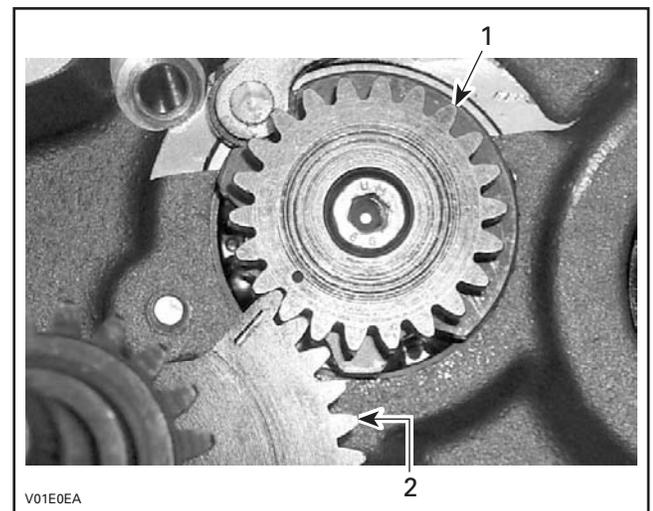
1. Shift drum gear
2. Index lever
3. Tension spring
4. Shift shaft with pawl

Assembly

Front Side

Reassemble in the reverse order of disassembly. Paying attention to the following detail.

Align mark on index gear with mark on shift shaft.

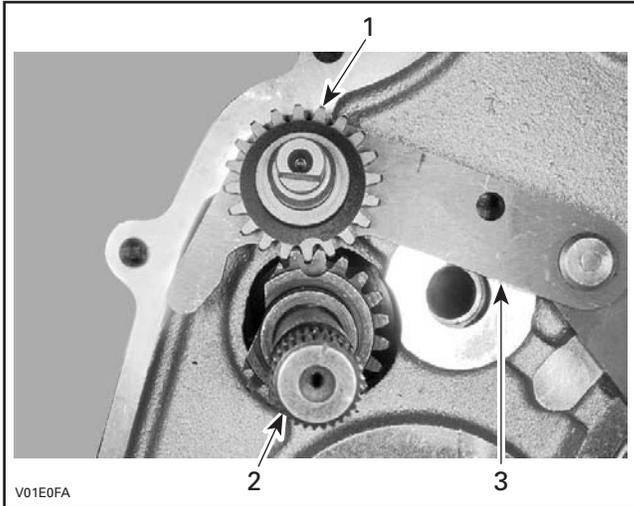


1. Index gear
2. Shift shaft

Section 03 ENGINE

Subsection 10 (TRANSMISSION)

After clutch housing installation, align mark on shift shaft with mark on indicator shaft.



1. Indicator shaft
2. Shift shaft
3. Transmission actuating lever

Rear Side

Reassemble in the reverse order of disassembly.

TRANSMISSION

Disassembly

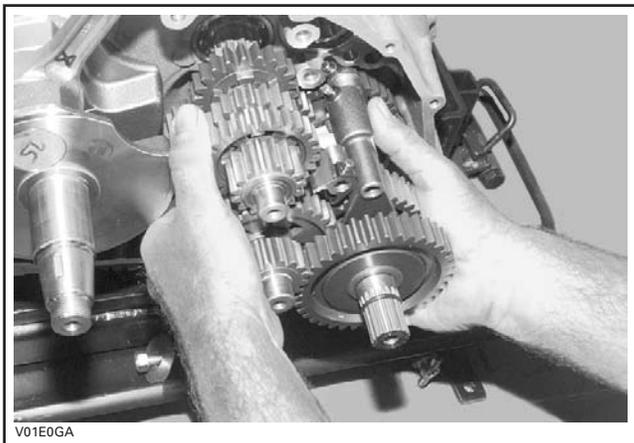
Remove gear shift mechanism.

Separate both housing of crankcase.

Remove the shift fork shafts **no. 15**, **no. 16** and **no. 17**.

Remove shift fork **no. 18** then pull shift drum **no. 19**.

At the same time, pull all gears and shafts.



Inspection

Turn the inner race of each bearing with your finger. The bearings should turn smoothly and quietly. Replace if necessary.

During and after transmission disassembly, inspect the condition of each parts closely. In particular, check for:

- gear teeth damage
- worn or scored bearing surfaces
- worn or scored shifting fork
- worn or scored shift fork shaft
- rounded engagement dogs and slots
- bent shift forks
- bent shift fork shaft
- worn shift fork engagement pins
- worn tracks on shift drum
- worn splines on shafts and gears

Assembly

Reassemble in the reverse order of disassembly. Paying attention to the following details.

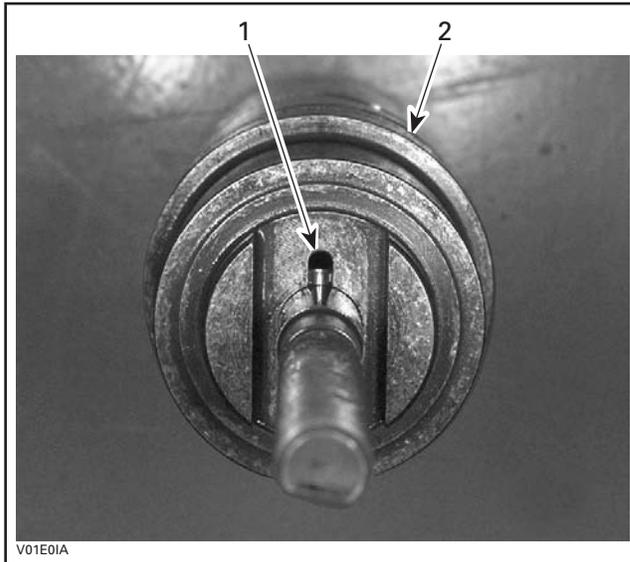
NOTE: Install all shafts and gears together.

Place the shift forks **no. 20**, **no. 21**, **no. 22** and **no. 23** in the proper shift drum tracks before install the transmission in half housing.

When the transmission is installed, place the last shift fork **no. 18**.

Install the shift drum.

NOTE: Check if the shaft pin is properly installed in drum slot before housing installation.



1. Shaft pin
2. Shift drum

Install the shift fork shafts.

NOTE: Make sure all of the shift fork pins are aligned with the grooves in the shift drum.

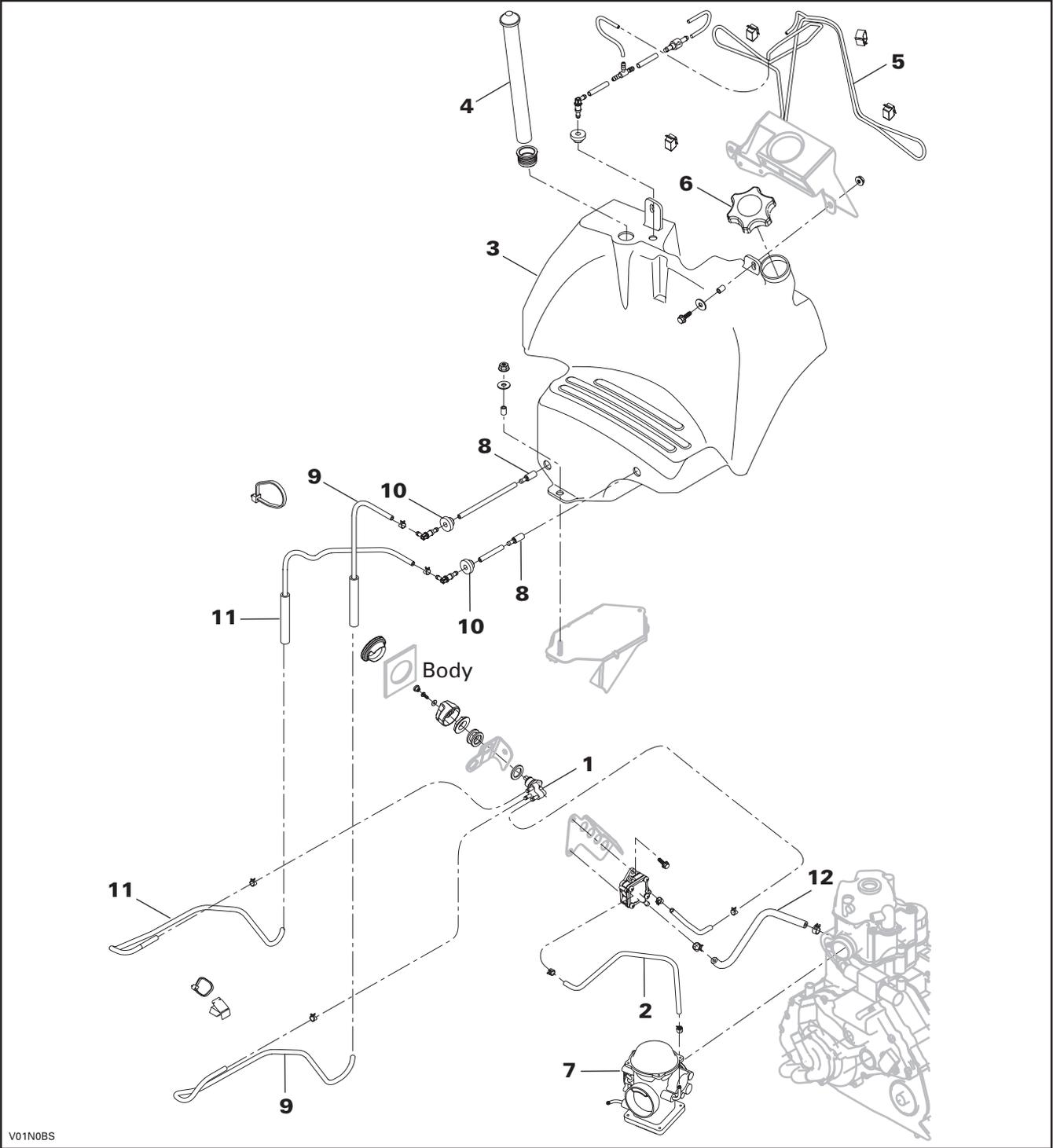
Install the index gear on end of shift drum.

At the same time, turn the sub-transmission shaft **no. 24** and the index gear **no. 3**. The transmission should turn smoothly.

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FUEL CIRCUIT



Section 04 FUEL SYSTEM

Subsection 02 (FUEL CIRCUIT)

FUEL LINES

WARNING

Whenever working on fuel system, always verify for water or dust infiltration in reservoir. Replace any damaged, leaking or deteriorated fuel lines.

When replacing fuel lines, be sure to use hoses as available from Bombardier parts department. This will ensure continued proper and safe operation.

WARNING

Use of improper fuel lines could compromise fuel system integrity.

WARNING

When draining a fuel tank or whenever a fuel line is disconnected, obstruct line with a hose pincher (P/N 295 000 076) or equivalent device. Fuel is flammable and explosive under certain conditions. Ensure work area is well ventilated. Do not smoke or allow open flames or sparks in the vicinity.

FUEL TANK STRAINER

Removal

Close fuel valve **no. 1**.

Remove fuel tank cover. Refer to BODY10-02.

Disconnect BLACK negative cable from battery.

Drain fuel tank **no. 3** by unplugging reserve fuel hose **no. 9** on fuel valve (top hose).

NOTE: To accelerate fuel tank draining and ensure complete draining, remove cap **no. 6**.

Manually pull grommet **no. 10** out of fuel tank, as shown in the next photo.

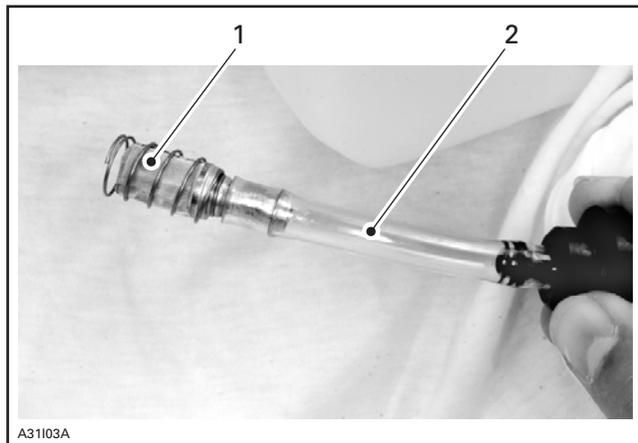
NOTE: In the case that grommet is too tight, use a flat screwdriver and carefully pull out grommet, as shown in the next photo.



USE SCREWDRIVER ONLY IF GROMMET IS TOO TIGHT

Inspection

Ensure that fuel tank strainer **no. 8** and fuel line are clean and not damaged, as per following photo.



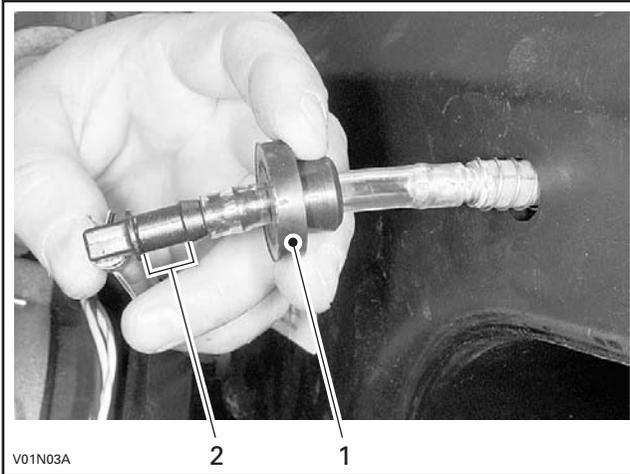
TYPICAL

1. Fuel tank strainer
2. Fuel line

Installation

NOTE: To ease grommet insertion, apply BOMBARDIER LUBE (P/N 293 600 016 (12 x 14 oz)).

Position grommet on fuel line, as shown in the next photo then insert grommet in tank hole.



1. Grommet properly position for tank insertion
2. Fitting recess

Once grommet is inserted in tank hole, push fitting until its recess properly sits in grommet.

Refuel tank and ensure there are no leaks.

FUEL VALVE

Removal

NOTE: To ease reinstallation, mark all hoses before removing fuel valve **no. 1**.

From outside body, remove plastic cap from valve **no. 1**.

Unscrew valve nut, as shown in the next photo.



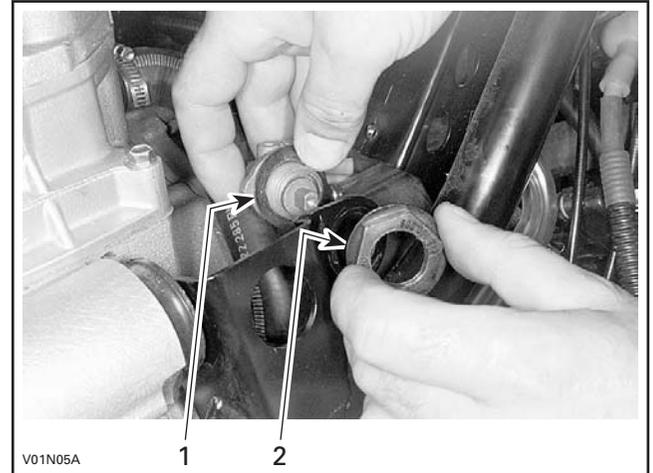
UNSCREW VALVE NUT

Unplug all 3 hoses from fuel valve.

Remove valve.

Installation

Reinstall fuel valve by positioning rubber washer inside and nut outside vehicle. See next photo.



1. Rubber washer inside
2. Nut outside

Replug all hoses according to the following table.

HOSE	VALVE POSITION
Fuel tank top hose	ON
To fuel pump	OUT
Fuel tank bottom hose	RES

FUEL TANK

Removal

Disconnect BLACK negative cable from battery.

Drain fuel tank **no. 3** by unplugging reserve fuel hose **no. 9** on fuel valve (top hose).

NOTE: To accelerate fuel tank draining and ensure complete draining, remove cap **no. 6**.

Remove following items from body. Refer to BODY 10-02 for complete detailed procedure:

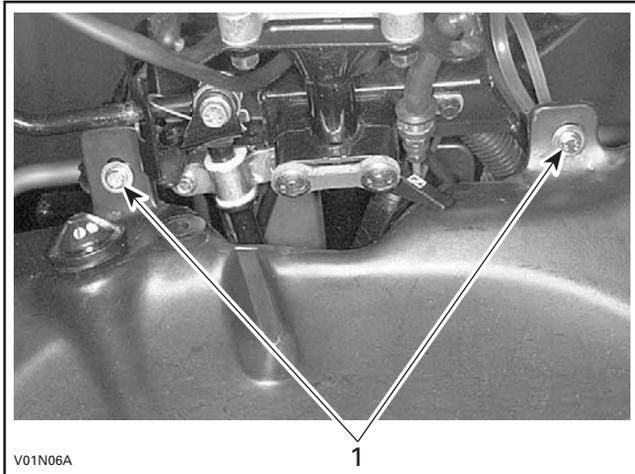
- steering cover
- shifter guide indicator
- front inner fenders
- seat
- fuel tank cover
- front bumper
- front fender with rack

Section 04 FUEL SYSTEM

Subsection 02 (FUEL CIRCUIT)

Unplug fuel hoses from tank and disconnect fuel vent line **no. 5**.

Remove both fuel tank top screws, as shown in the next photo.



1. Remove both top fuel tank screws

Remove fuel tank bottom nut located beside re-wind starter.

Inspection

Visual

Inspect fuel tank for any damage or cracks which may result in fuel leaks. If so, replace tank with new one.

Pressure Test

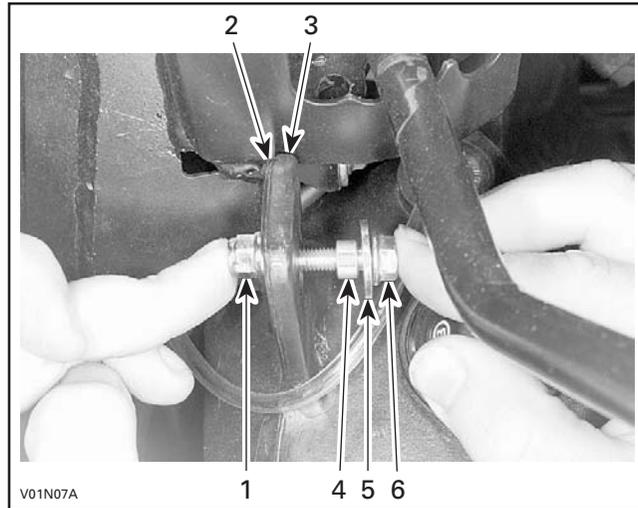
Refer to next section FUEL SYSTEM PRESSURIZATION for complete detailed procedure.

Installation

Reverse removal procedure, however pay attention to the following:

Ensure that main fuel tank hose **no. 11** and reserve fuel tank hose **no. 9** are not inverse. Refer to FUEL VALVE table.

Position top screws/nuts, washers and spacers as shown in the next photo.



1. Nut
2. Frame bracket
3. Fuel tank holding tab
4. Spacer
5. Washer
6. Screw head

Perform fuel system pressurization as described in the following procedure.

FUEL GAUGE

Removal

Remove front fender. Refer to BODY 10-02.

Pull out fuel gauge **no. 4** from fuel tank. At the same time, remove the fuel gauge gasket.

Installation

The installation is the reverse of the removal procedure.

NOTE: Check gasket for crack or other damage. Change if necessary.

FUEL SYSTEM PRESSURIZATION

Fill up fuel tank **no. 3**.

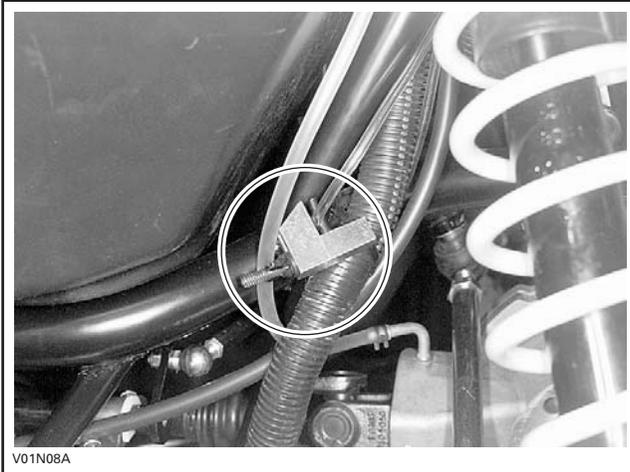
Remove seat, fuel tank cover and right side inner fender.

Install on fuel tank special cap of leak testing kit (P/N 529 033 100).

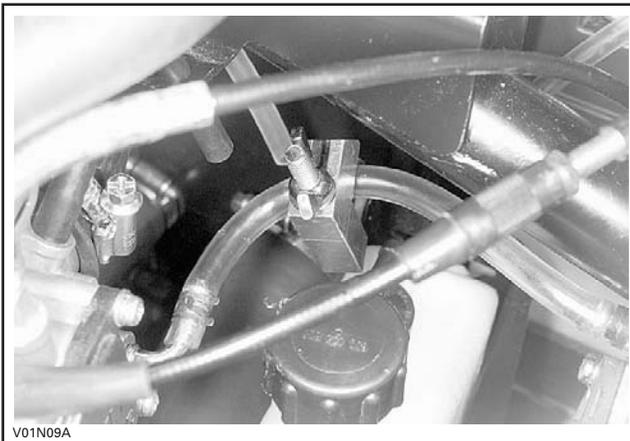
Section 04 FUEL SYSTEM

Subsection 02 (FUEL CIRCUIT)

Install hose pinchers (P/N 295 000 076) on fuel tank vent line and fuel pump outlet hose **no. 2** at carburetor(s), as shown in the following photos.

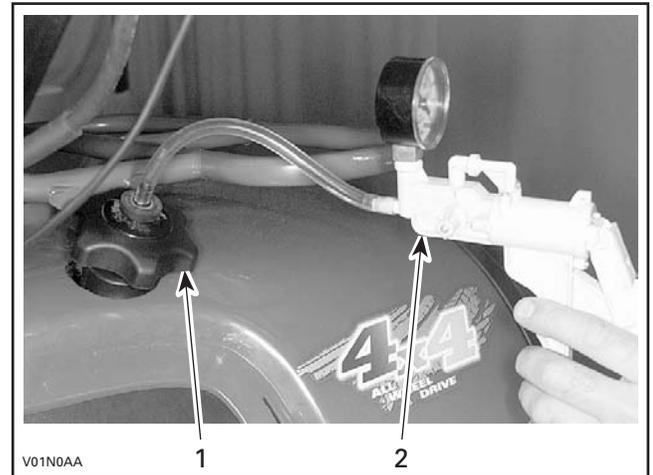


HOSE PINCHER INSTALLED ON FUEL TANK VENT LINE



HOSE PINCHER INSTALLED ON FUEL PUMP OUTLET

Using air pump from engine leak test kit (P/N 861 749 100) inject air into fuel tank. See next photo.



1. Special cap on tank
2. Air pump

Pressurize fuel system to 21 kPa (3 PSI). That pressure must not drop during 3 minutes.

If pressure drops, locate fuel leak(s) and repair/replace leaking component(s).

To ease locating leak(s) at fuel tank vent fitting, fuel gauge or fuel cap spray soapy water on components, bubbles will indicate leak location(s).

CARBURETOR AND FUEL PUMP

CARBURETOR

CAUTION: Although some jets be replaced by other jets from other carburetors, such modifications shouldn't be performed. They can greatly affect engine calibration and can cause severe damage to engine. Use only recommended jetting specific for this carburetor.

REMOVAL

Disconnect BLACK negative cable from battery.

Remove seat.

Unplug all fuel hoses from carburetor no. 7.

NOTE: To ease reinstallation, mark all hoses before unplugging.

Loosen both carburetor and air box clamps.

Loosen air box bolts and move backward.

Pull out carburetor.

Choke Cable Removal

Put carburetor on a clean rag.

Unscrew choke plastic nut from carburetor, as shown in the next photo.



REMOVE CHOKE PLASTIC NUT

NOTE: To ease choke plastic nut removal use an open key as shown in the next photo. This tool can be made with an existing 12 mm key.



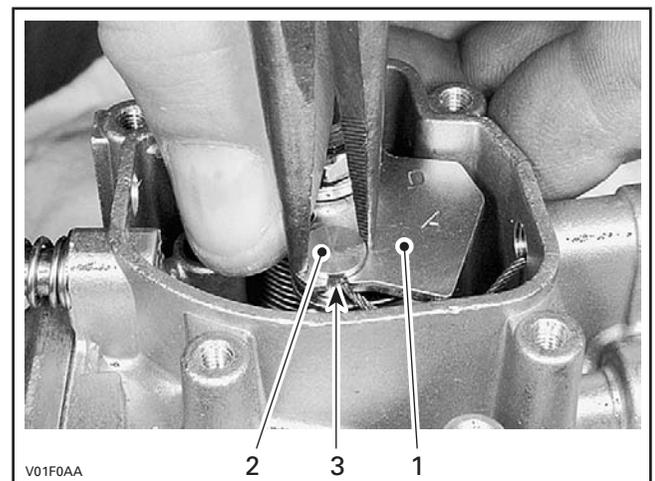
1. Open key end here

Pull choke cable to remove choke plunger from carburetor.

Throttle Cable Removal

With carburetor on a clean rag, remove carburetor side cover.

Using thumb, release tension on throttle lever. With long nose pliers, rotate cable end bushing so that cable aligns with throttle lever recess, then lift cable end. See next photo.

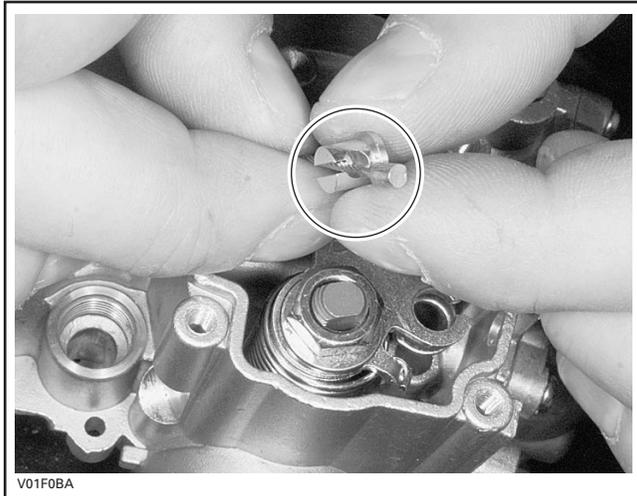


1. Release tension on throttle lever
2. Cable end bushing
3. Throttle lever recess

Section 04 FUEL SYSTEM

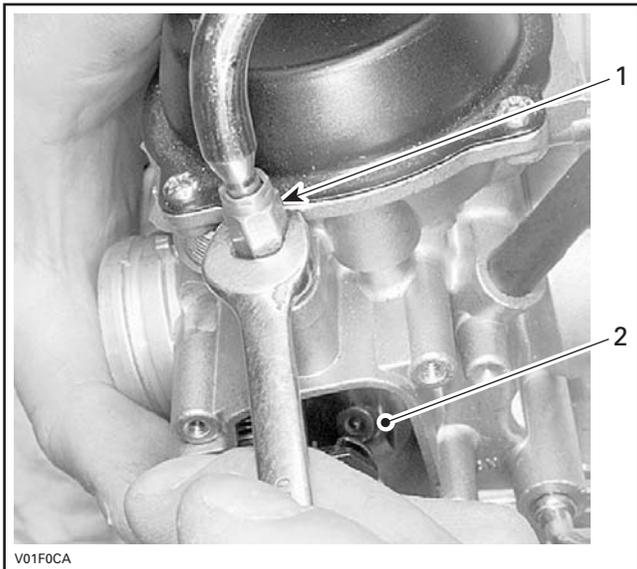
Subsection 03 (CARBURETOR AND FUEL PUMP)

Separate cable end bushing from throttle cable end, as shown in the next photo. Keep bushing.



REMOVE CABLE END BUSHING

Loosen throttle cable nut, as shown in the next photo.



1. Loosen this nut
2. Side cover removed

Pull cable out from carburetor.

CLEANING AND INSPECTION

The entire carburetor should be cleaned with a general solvent and dried with compressed air before disassembly.

CAUTION: Heavy duty carburetor cleaner may be harmful to the float material and to the rubber parts, O-rings, etc. Therefore, it is recommended to remove those parts prior to cleaning.

Carburetor body and jets should be cleaned in a carburetor cleaner following manufacturer's instructions.

⚠ WARNING

Solvent with a low flash point such as gasoline, naphtha, benzol, etc., should not be used as they are flammable and explosive.

CARBURETOR FLOAT LEVEL ADJUSTMENT

Correct fuel level in float chamber is vital toward maximum engine efficiency. To check for correct float level proceed as follows:

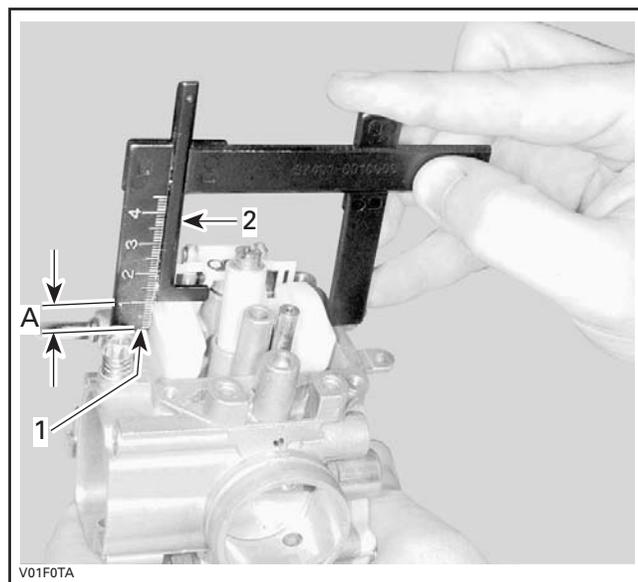
- Remove float bowl and gasket from carburetor.
- Make sure that float arm is symmetric-not distorted.

With carburetor chamber up side down:

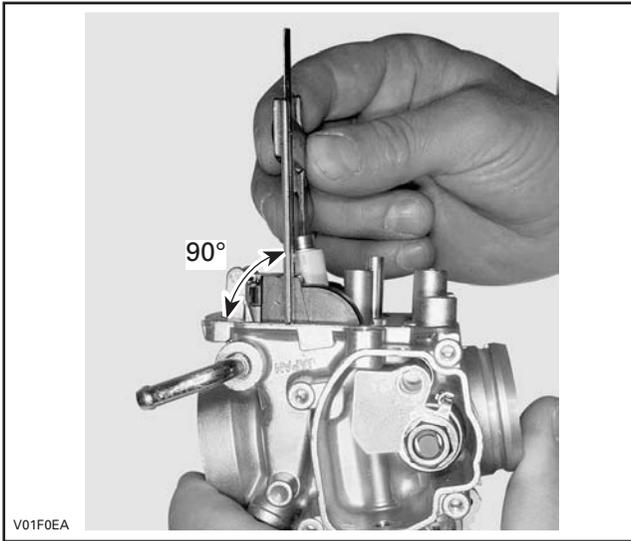
- Measure height H between bowl seat and the top edge of float arm. Use float level gauge (P/N 529 035 520).
- Keep float level gauge perfectly vertical and in line with main jet hole.

Ensure that both float level gauge tips are properly positioned on carburetor body and that "L" arm is leaning on float without compressing valve spring.

Refer to following photos for proper float level gauge positioning.



1. Gauge tips
2. "L" arm
- A. Height H



GAUGE ALIGNED WITH MAIN JET

To adjust height H, bend the contact tab of float arm until the specified height is reached.

CAUTION: When adjusting lever, do not pry it. This will apply pressure on needle and damage valve seat/needle.

INSTALLATION

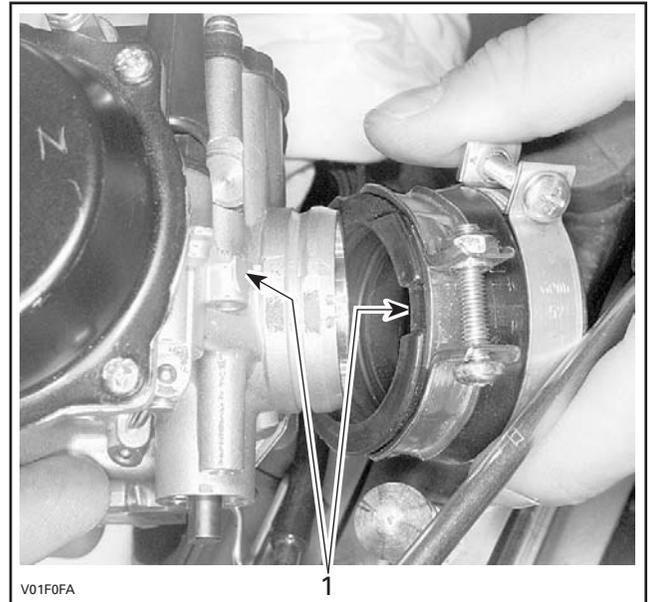
To install carburetor on engine, inverse removal procedure, as described:

- Inspect throttle and choke cable housing prior to installation.
- Reinstall and adjust throttle and choke cables, then side cover. Refer to next section CARBURETOR ADJUSTMENTS.
- Reinstall carburetor on engine.

When reinstalling carburetor on engine, pay attention to the following:

CAUTION: The rubber flanges must be checked for cracks and/or damage. At assembly, the rubber flanges must be perfectly matched with the air box, carburetor and engine or severe engine damage will occur.

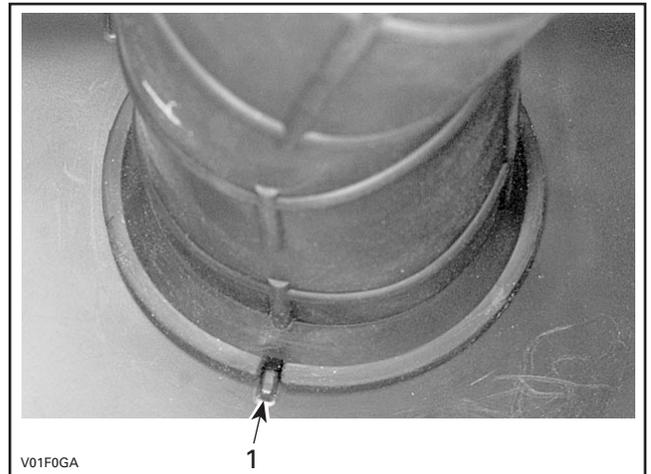
Install clamps in a way that their tightening bolts are staggered — not aligned.



CARBURETOR SIDE — RUBBER FLANGE INSTALLATION

1. Flange recess aligned with carburetor notch

Install rubber flange on air box side so that its recess aligns with air box notch, as shown in the next photo.



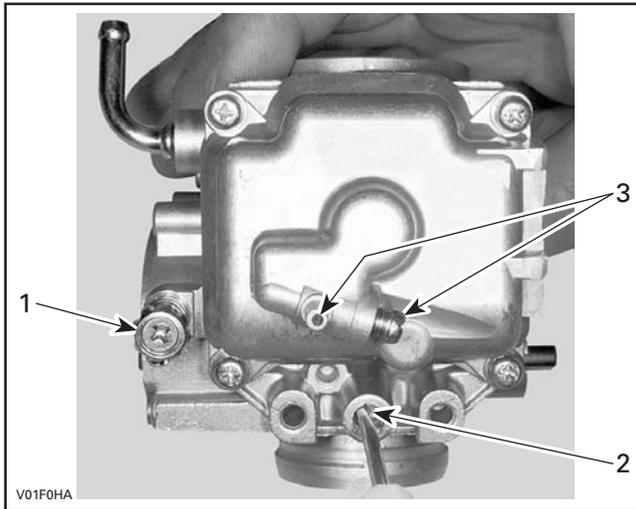
AIR BOX SIDE — RUBBER FLANGE INSTALLATION

1. Notch aligned with recess

Section 04 FUEL SYSTEM

Subsection 03 (CARBURETOR AND FUEL PUMP)

CARBURETOR ADJUSTMENTS



BOTTOM VIEW

1. Idle speed screw
2. Pilot screw
3. Drain plug and screw

Pilot Screw Preliminary Adjustment

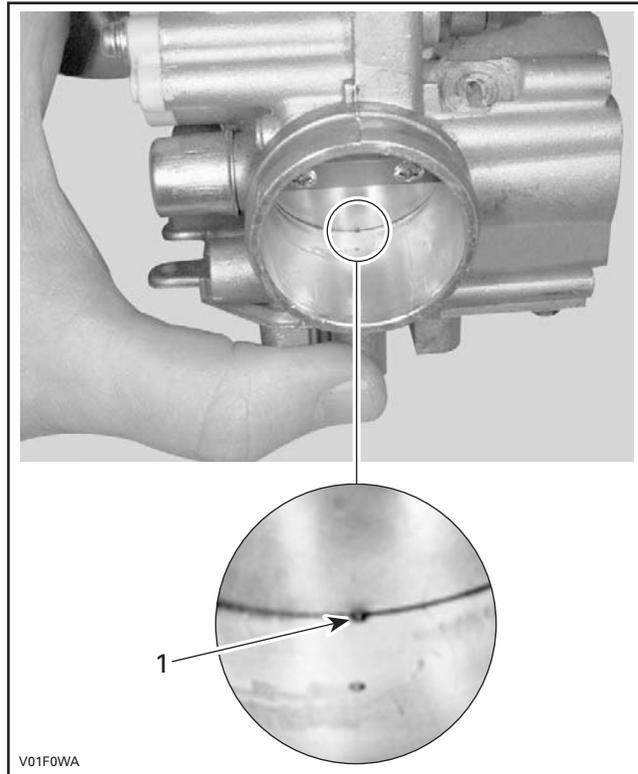
NOTE: The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or replaced.

Completely close the **pilot screw** (until a slight seating resistance is felt) then back off as specified.

Refer to TECHNICAL DATA 11-02 for specifications.

Idle Speed Preliminary Adjustment

Adjust throttle screw to 1-1/2 turn or so that throttle valve closes bypass hole by half, as shown in the next photo.



1. Bypass hole closes to halfway

Idle Speed Adjustment

Start engine and allow it to warm then adjust idle speed to specifications by turning **idle speed screw** clockwise to increase engine speed or counterclockwise to decrease it.

NOTE: Use the digital induction tachometer (P/N 529 014 500). Turn tachometer wire around spark plug wire, about 4 or 5 turns, for the best measure.

CAUTION: Do not attempt to set the idle speed by using the pilot screw.

Refer to TECHNICAL DATA 11-02 for idle speed specifications.

Choke

Remove top cover from carburetor.

Detach diaphragm from carburetor body, then pull out throttle slide.

With choke lever at fully closed position, choke plunger must be fully closed. With lever halfway, plunger must be opened to specification and with lever completely opened, plunger must be opened.

See next photos for proper choke lever and plunger positioning.

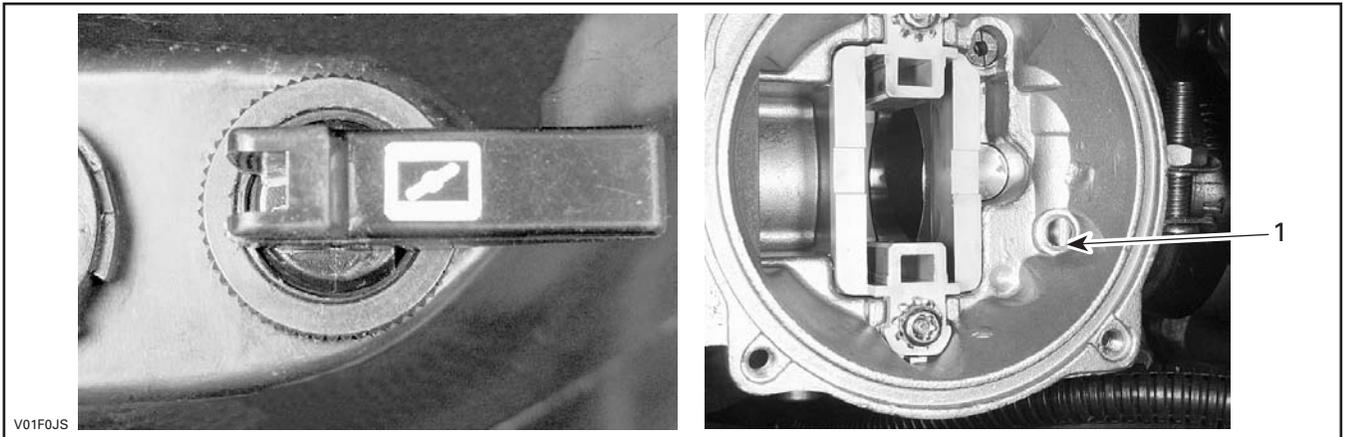
Pilot Screw Adjustment

NOTE: The pilot screw is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or replaced. Warm the engine to operating temperature.

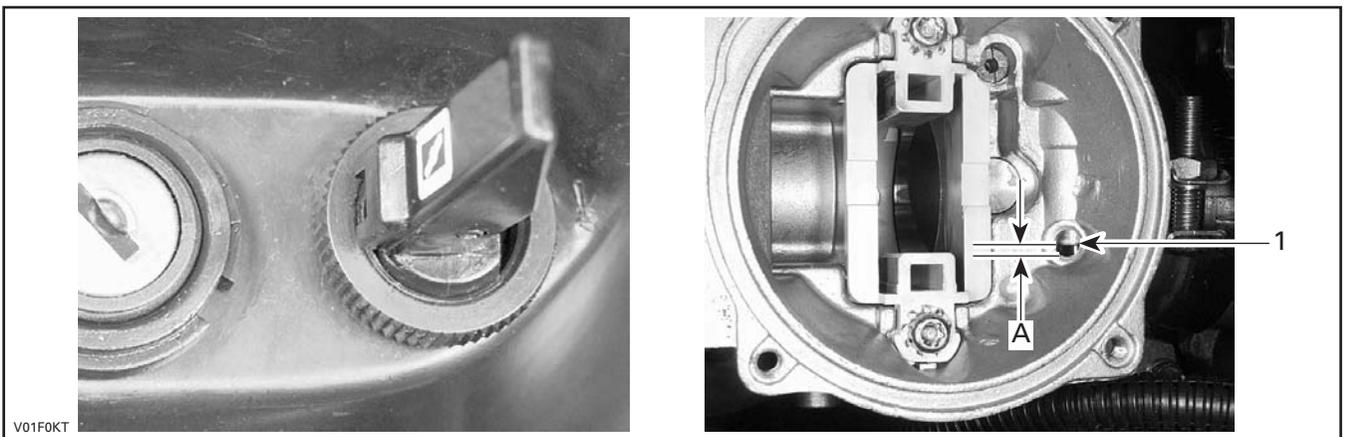
Turn the pilot screw clockwise until you hear the engine misses or decreases air speed, then turn counterclockwise until the engine again misses or decreases air speed.

Center the pilot screw exactly between these two extreme positions.

If idle speed changes after adjustment of the pilot screw, readjust the idle speed screw.



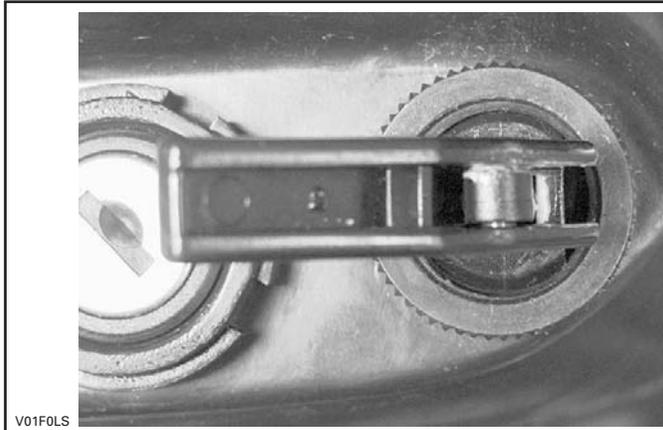
FULLY CLOSED POSITION
1. Plunger end must be here



HALFWAY POSITION
1. Plunger end must be here
A. Opening to specification value

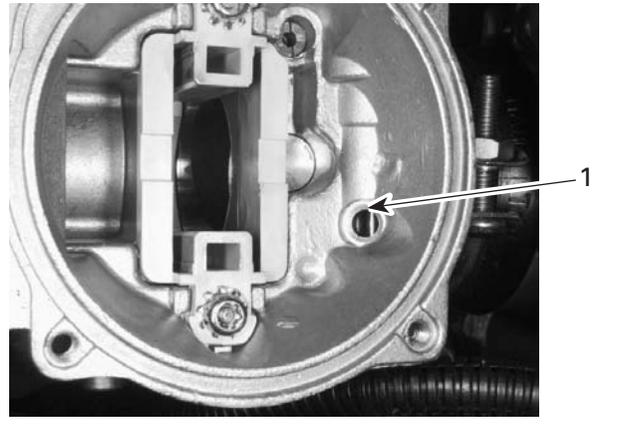
Section 04 FUEL SYSTEM

Subsection 03 (CARBURETOR AND FUEL PUMP)



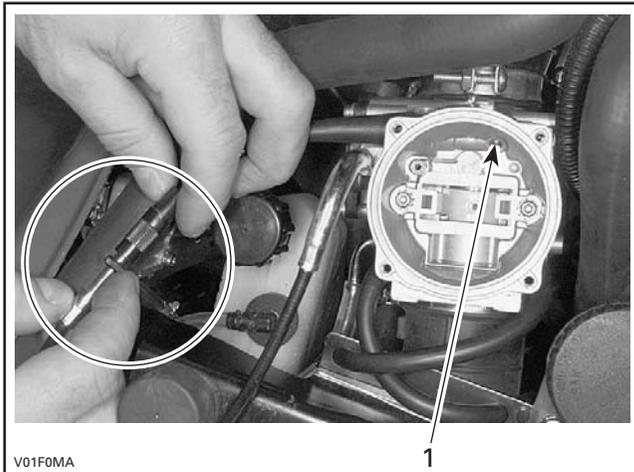
FULLY OPENED POSITION

1. Plunger end must be here



Plunger Adjustment

If plunger needs to be adjusted use cable adjuster, as shown in the next photo.



USE CABLE ADJUSTER TO ADJUST PLUNGER POSITION

1. Choke plunger

NOTE: For the proper adjustment at halfway position, use a bit with diameter to opening specification.

Diaphragm Installation

Carefully replace diaphragm in its original position. Make sure spring is located properly in carburetor cover before screwing.

NOTE: Check and place correctly the indexation lob.

Throttle

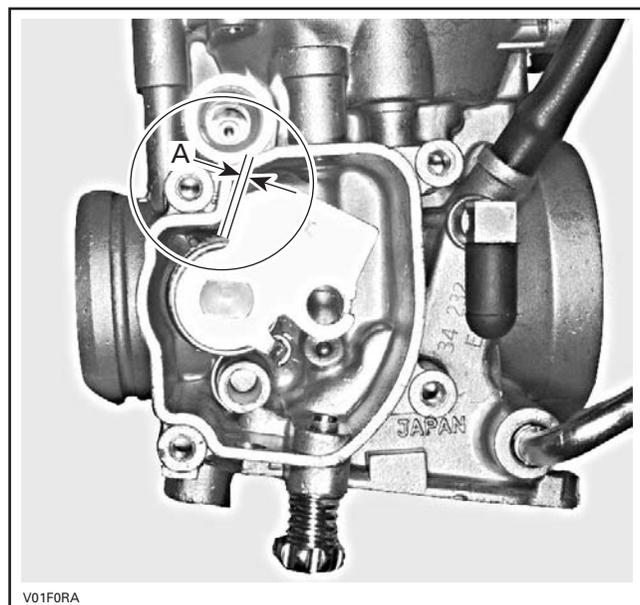
WARNING

Ensure the key is turned OFF, prior to performing the throttle cable adjustment.

Before adjusting the throttle cable, adjust idle speed (preliminary adjustment) and choke.

On the carburetor, loosen lock nut and adjust throttle cable.

Make sure the throttle lever, at the full position, doesn't lean against carburetor body.



THROTTLE LEVER AT THE FULL POSITION

A. 1 mm (1/32 in)

Retorque lock nut.

FUEL PUMP

REMOVAL

Close fuel valve.

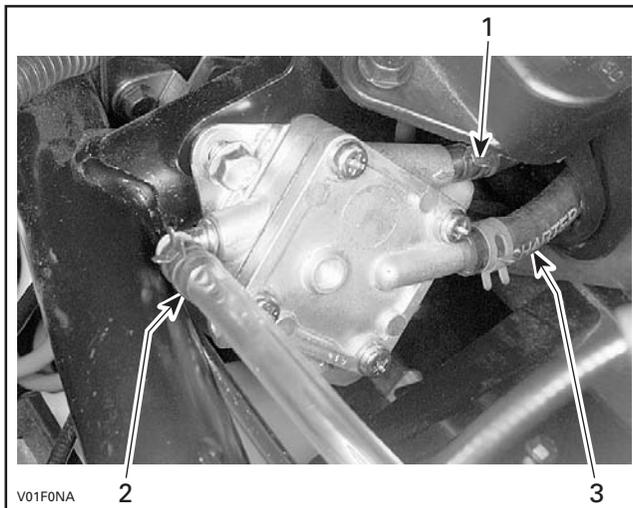
Lift coolant tank.

Unplug fuel hose coming from fuel valve.

NOTE: It may be easier to unplug fuel hose coming from fuel valve at fuel valve location.

Unplug fuel hose going to carburetor.

Disconnect impulse hose **no. 12**.



1. Fuel hose coming from fuel valve
2. Fuel hose going to carburetor
3. Impulse hose

Remove fuel pump **no. 2**.

VERIFICATION

Connect a clean plastic tubing to the inlet nipple and alternately apply pressure and vacuum with pump of leak test kit. The inlet valve should release with pressure and hold under vacuum.

Repeat the same procedure at the outlet nipple. This time the outlet valve should hold with pressure and release under vacuum.

Check impulse diaphragm and gasket on high-supply fuel pump with twin outlets as follows:

Connect a clean plastic tubing to the impulse nipple and plug vent hole on top cover. Either apply pressure or vacuum. The diaphragm/gasket must not leak.

CLEANING AND INSPECTION

The entire pump should be cleaned with general purpose solvent before disassembly.

Fuel pump components should be cleaned in general purpose solvent and dried with compressed air.

⚠ WARNING

Solvent with a low flash point such as gasoline, naphtha, benzol, etc., should not be used as each is flammable and explosive.

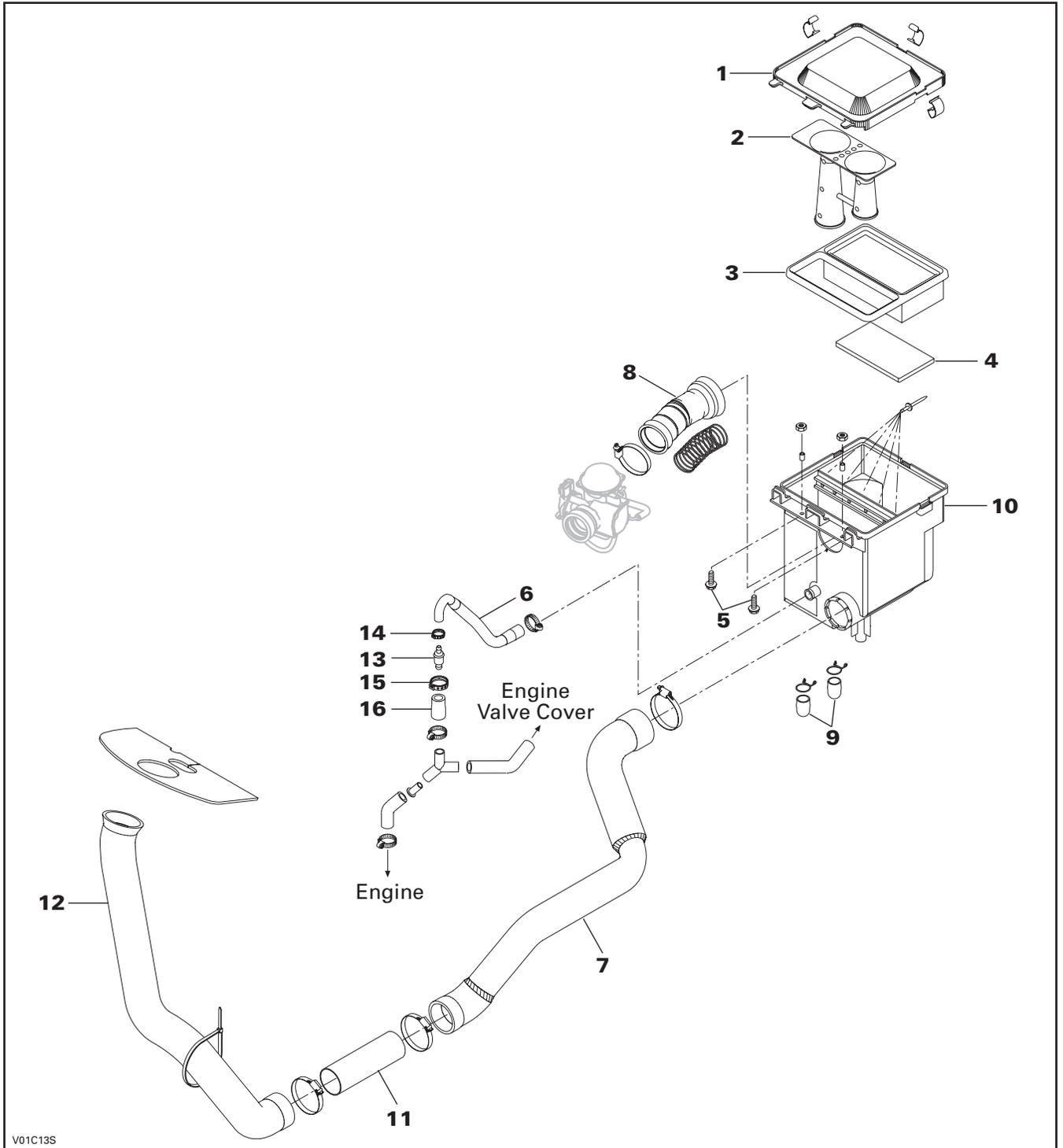
Inspect diaphragm. The pumping area should be free of holes, tears or imperfections.

Replace pump as needed.

INSTALLATION

To install fuel pump, reverse removal procedure. However, pay attention to fuel hose position. Refer to arrows on fuel pump.

AIR INTAKE SILENCER



V01C13S

Section 04 FUEL SYSTEM

Subsection 04 (AIR INTAKE SILENCER)

AIR FILTER BOX

Removal

Remove:

- seat
- air filter box cover **no. 1**
- air baffle **no. 2**, air filter **no. 3** and foam **no. 4**

Detach:

- breather hose **no. 6**
- rear air intake tube **no. 7**
- intake adaptor **no. 8** from carburetor

Unfasten bolts **no. 5** and remove drain tubes **no. 9** under air filter box **no. 10**.

Pull out the air filter box.

Installation

For installation, reverse the removal procedure.

REAR AIR INTAKE TUBE

Removal

Remove:

- front fender
- LH inner fender
- LH side panel

NOTE: For all body parts removal, refer to BODY 10-02.

Detach rear air intake tube **no. 7** from air filter box **no. 10**.

In front of vehicle, disconnect rear air intake tube from sleeve **no. 11**.

Remove rear air intake tube from vehicle.

NOTE: Before removing rear air intake tube from vehicle, note tube routing for reinstallation.

Inspection

Inspect air intake tube for cracks, blisters or any other damage. Change if necessary.

Installation

For installation, reverse the removal procedure.

FRONT AIR INTAKE TUBE

Removal

Remove:

- front fender
- LH inner fender

Refer to BODY 10-02

Disconnect front air intake tube **no. 12** from the sleeve **no. 11**.

NOTE: Before removing front air intake tube from vehicle, note tube routing for reinstallation.

Remove front air intake tube from vehicle.

Inspection

Inspect air intake tube for cracks, blisters or any other damage. Change if necessary.

Installation

For installation, reverse the removal procedure.

PCV VALVE

The positive crankcase ventilation (PCV) valve is used to reduce the signal for pulsation coming from crankcase so that the pressure in the air intake circuit stays constant.

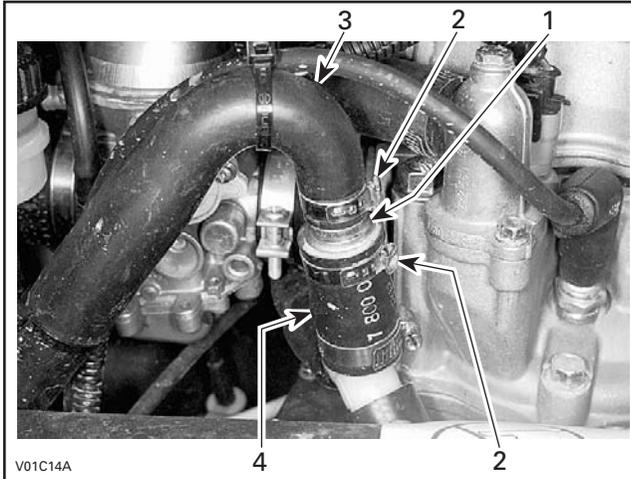
Test

If idle speed engine is not constant, remove the breather hose from PCV valve. When a finger is placed over PCV valve inlet, a strong vacuum should be felt immediately. If not, replace the PCV valve.

Removal

Remove and discard clamps no. 14 and no. 15.

Separate PCV valve no. 13 from breather hose no. 6 and from connecting tube no. 16.



1. PCV valve
2. Clamps
3. Breather hose
4. Connecting tube

Installation

For installation, reverse the removal procedure.

NOTE: Install PCV valve with the new clamps.

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OVERVIEW

GENERAL OPERATION INFORMATION

The electrical system consist of different sub-systems where some are inter-related:

- MPEM (Multi-Purpose Electronic Module)
- Charging System
- Starting System
- Ignition System
- Electric Shift System
- Gauges and Accessories

The following gives an outline of each components.

MPEM (Multi-Purpose Electronic Module)

The MPEM itself is not a system, it is rather part of other systems in the electrical system. Therefore, the MPEM functions will be described specifically in the system into which it belongs. See below in the specific system for more information.

The MPEM includes a micro-controller. It is basically responsible for interpreting/computing information, distribution of information, as a timed/untimed power source, managing the starting system, ignition system, the engine RPM limiter, the vehicle speed limiter and the transmission shifting timing and clutch modulation. It reads information through many external sensors to then compute the output actions to the related systems.

The MPEM stores engine RPM limiter parameters that are applied to all the 5 gears in EACH High, Lo and Reverse. It also limits the vehicle speed to 15 km/h (9 MPH) in reverse operation whatever the gear.

The MPEM controls the indicator lights display. It uses many sensors to acquaint the different system condition and THEN turns on the proper light. Besides monitoring the shifting system sensors, it also monitors the engine oil pressure and the coolant temperature. When oil pressure is too low, the engine light turns on and remain on. When the engine overheats, the engine light flashes.

The MPEM features a diagnostic/setting mode with coded light display to troubleshoot and set the shifting system.

The MPEM is equipped with an automatic power shut-down. This feature prevents the battery from losing its charge if ignition switch is left turned ON when the engine is not running.

The MPEM also controls the accessories such as the speedometer, the cluster display, headlight intensity dimming and taillight.

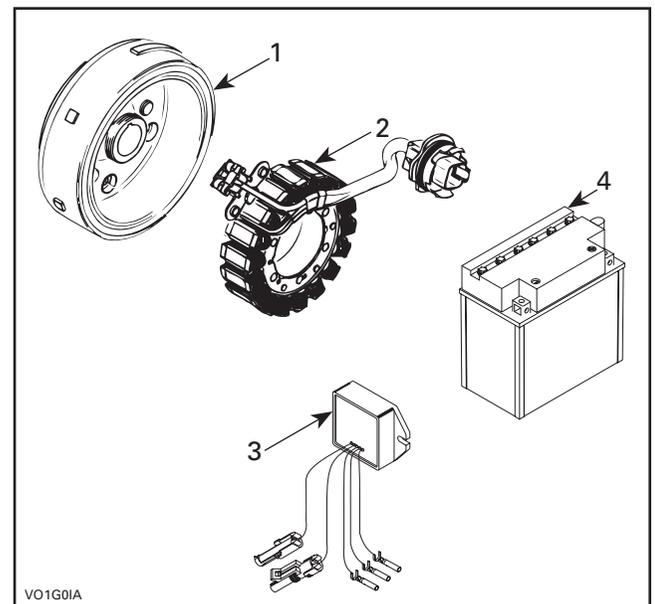
The module doesn't contain fuses since it is not easily accessible to the user. The module includes an internal overload protection device to supply circuits. An external fuse (in the fuse block) is used to protect the module supply circuit.

The module does not control the loads connected directly to the battery, such as the fan, the DC accessory outlet, brake light and the optional winch.

CHARGING SYSTEM

It is the source of electrical energy to charge the battery and keep it at a full state of charge. The magneto is coupled to the engine and it transforms magnetic field into electric current through a 3 phase, "Y" wound stator on 18 poles.

The magneto supplies unregulated AC current (alternative current) to the voltage regulator/rectifier.



1. Magneto flywheel
2. Stator
3. Voltage regulator/rectifier
4. Battery

Section 05 ELECTRICAL

Subsection 02 (OVERVIEW)

Voltage Regulator/Rectifier

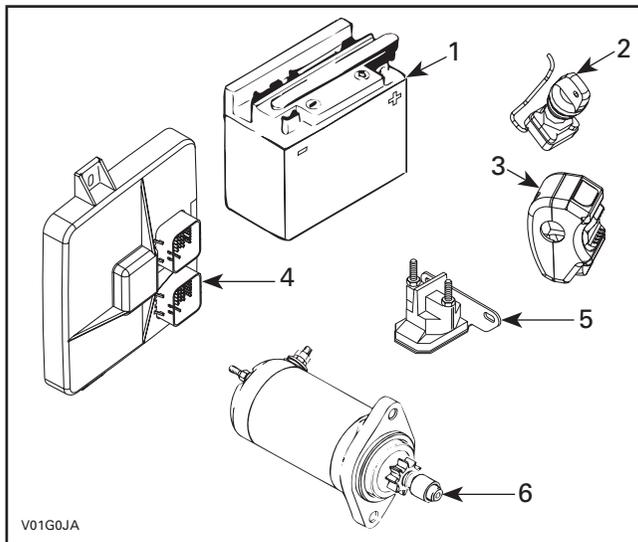
A 3-phase full-wave shunt-type voltage regulator/rectifier receives the AC voltage and rectifies (converts) it into DC. The voltage is also regulated to a maximum of 14.5 volts (DC).

Battery

The battery supplies the entire vehicle and particularly the MPEM which then distributes the current to many components. Therefore, DC current only is used in the entire electrical system.

STARTING SYSTEM

When ignition switch is turned on and start/stop switch is pressed, the MPEM sends a signal to the starting solenoid. The battery then supply the starter through the starting solenoid to start the engine.



TYPICAL

1. Battery
2. Ignition switch
3. Start/stop switch
4. MPEM
5. Solenoid
6. Electric starter

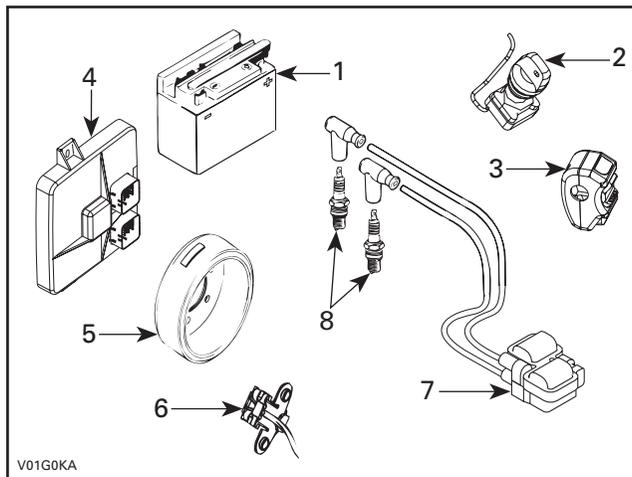
Engine can be started in any gear (from 1 to 5).

Transmission lever must be on PARK or NEUTRAL to allow engine starting.

However, an override mode allows to start the engine with the transmission lever in any position when holding any brake lever while pressing the start button.

IGNITION SYSTEM

An IDI (Induction Discharge Ignition) system is utilized. The ignition system is made up of the following components:



TYPICAL

1. Battery
2. Ignition switch
3. Start/stop switch
4. MPEM
5. Magneto flywheel
6. Trigger coil
7. Ignition coil
8. Spark plugs

Battery/Ignition Switch

The ignition switch allows battery to supply the MPEM for the ignition system.

Start/Stop Switch

Besides enabling the starting system, the start/stop switch enables/disables the ignition system through the MPEM.

MPEM (Multi-Purpose Electronic Module)

The MPEM is fed by the battery but the ignition is activated by the ignition switch. The MPEM receives the signals from the start/stop switch as well as from the trigger coil and takes action to the ignition system. The MPEM feeds the ignition coil so that a spark is produced at the proper moment. The MPEM controls the spark advance according to different pre-defined parameters.

Magneto Flywheel/Trigger Coil

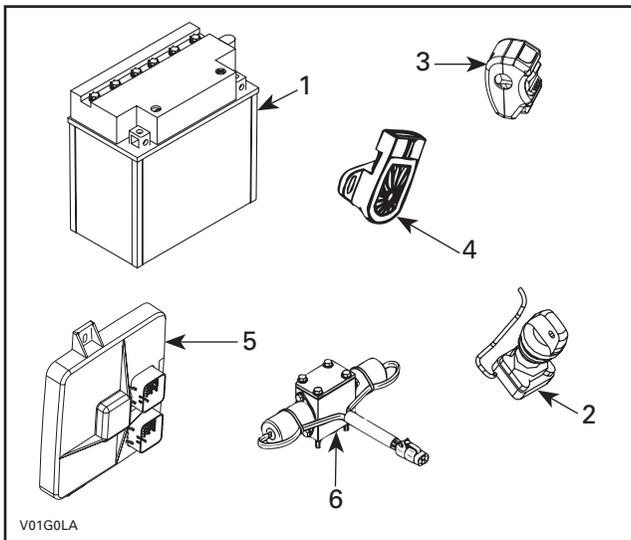
The magneto flywheel features six protrusions that are working with the trigger coil. The trigger coil sends the signals to the MPEM to be processed for the ignition system. The MPEM also uses these signals to accurately calculate the engine RPM and among other things, control the maximum engine RPM.

Ignition Coil/Spark Plugs

The ignition coil receives its signal from the MPEM. The ignition coil steps up the input voltage for the IDI system and the end result is firing of the spark plugs. It is a double coil that provides a separate spark to each spark plug. The double control circuit in the MPEM works separately on each part of the ignition coil so, one ignition coil still could work while the other might be defective.

ELECTRIC SHIFT SYSTEM

An electronically controlled hydraulic shift system is utilized. It is made up of the following components:



1. Battery
2. Ignition switch
3. Upshift/downshift switch
4. Sensor
5. MPEM
6. Solenoid/valve

Battery/Ignition Switch

The ignition switch allows battery to supply the MPEM. The MPEM then supplies the solenoids for the shifting system.

Upshift/Downshift Switch

When the upshift or downshift button is pressed, the MPEM activates the proper solenoid (up or down) that moves the shared hydraulic valve.

Sensor

Many sensors are used to assist the MPEM to acquire the conditions where the vehicle is operated to allow the MPEM to compute and select the proper parameters accordingly.

The VSS (vehicle speed sensor) supplies the MPEM with the vehicle speed.

The GBPS (gearbox position sensor) supplies the MPEM with the gear position (1, 2, 3, 4, 5).

The STPS (sub-transmission sensor) supplies the MPEM with the sub-transmission position (P, R, N, H, L).

The brake light switch is also used by the MPEM to allow engine starting in other position than PARK and NEUTRAL.

Other sensors are utilized but they are not related to the shifting system.

MPEM

The MPEM is responsible to properly engage/disengage/modulate the clutch and to shift gears.

Although the shift system is performed by hydraulic valves on mechanical components, it is electronically-controlled through the MPEM.

The MPEM uses pre-defined parameters to change engine RPM, modify the engine timing curve, control the shift timing and modulation depending on the sensors reading to accomplish an accurate shifting adapted to each specific condition.

Solenoid/Valve

The solenoids/valves combo are the electro-hydraulic devices that actually activate the mechanical operations. Besides the shifting valve (upshift/downshift), there is a clutching valve that pushes an actuator to open and close the clutch and at last, a clutch modulator valve that regulates the oil pressure to control the speed at which the clutch is opened and released (modulation). The hydraulic system is enclosed in the engine/transmission case and the same oil as the engine is used for the hydraulic valves.

GAUGES/ACCESSORIES

The battery supplies the DC current to all accessories. Some are fed directly by the battery or through the fuse block and some are fed through the MPEM.

GENERAL TESTING/TROUBLESHOOTING INFORMATION

The following gives general electrical-related problems. For specific system-related problems, refer to proper system section.

It is possible that a component seems to operate in static condition but in fact, it is defective. In this case, the best way to solve this problem is to remove the original part and replace it with one which is in good condition.

IMPORTANT: When having to solve an electrical problem, the first thing to do is to check battery condition as well as its cables and connections. Never use a battery charger to replace temporarily the battery, as it may cause the MPEM to work erratically or not to work at all. Also ensure the ignition switch is turned on. Check related-circuit fuse condition with an ohmmeter — visual inspection could lead to false results — and solidity (close to battery). Also visually examine harness and connections.

CAUTION: It is recommended to always disconnect the battery when replacing any electric or electronic parts.

To perform verifications, a good quality multimeter such as Fluke 73 (P/N 529 022 000) should be used.

Pay particular attention to ensure that pins are not out of their connectors or out of shape. The troubleshooting procedures cover problems not resulting from one of these causes.

WARNING

Ensure all terminals are properly crimped on wires and connector housings are properly fastened.

Before replacing a MPEM, always check electrical connections. Make sure that they are very tight and they make good contact and that they are corrosion-free. A “defective module” can be repaired simply by unplugging and replugging the MPEM. The voltage and current might be too weak to go through dirty wire pins. Check carefully if posts show signs of moisture, corrosion or if they look dull. Clean pins properly and then coat them with silicon-based dielectric grease or other appropriate lubricant (except if otherwise specified) when reassembling them. See connectors information below.

It is recommended to always disconnect the battery when replacing the any electric or electronic part(s).

IMPORTANT: In usual electric circuit, the battery supplies a switch which then supplies the electric consumer. Therefore the switch opens and closes the positive side of the circuit. However, in our electrical system, the battery supplies the electric consumer then **the switch completes the circuit to the ground**. So the switch opens and closes the negative side of the circuit. This is particularly true with the MPEM. **The MPEM switches the ground to complete the electrical circuits it controls.** Take this into account when troubleshooting the electrical system.

Pay attention to grounding wires. Do not mix grounds. It may affect the MPEM operation.

Checking for Shorts Between 2 Wires

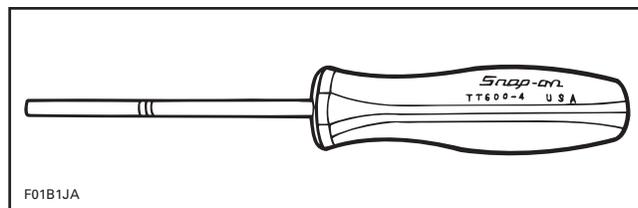
When checking continuity of a wire in a circuit, wires should be checked for short circuit as follows.

Make sure to isolate circuit wires by unplugging connectors.

Let's suppose that the circuit to be checked has a RED and a BLACK wire. Using an ohmmeter, measure the resistance between the RED and the BLACK wire. The resistance should be infinite (0 L). Otherwise, there is a short circuit between both wires. We must therefore identify and correct the fault.

SERVICING PACKARD CONNECTORS

To remove terminal from Packard connector housing, use Snap-on TT600-4 tool.



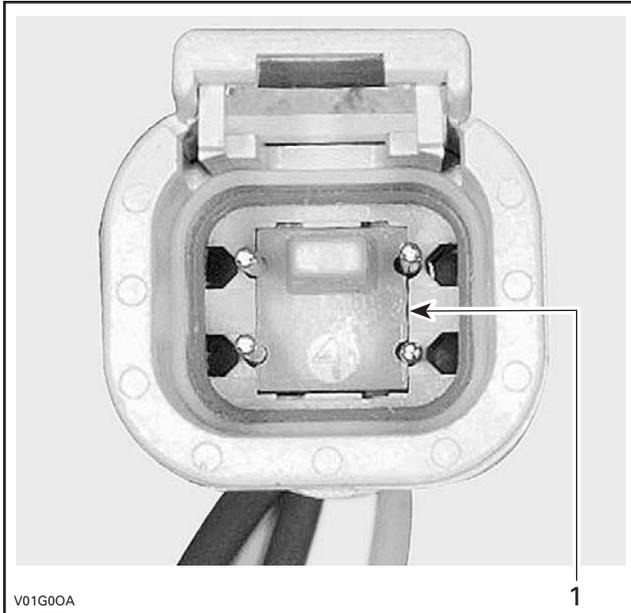
SERVICING DEUTSCH CONNECTORS

Waterproof Connector Housing

Female and Male Connector Housing

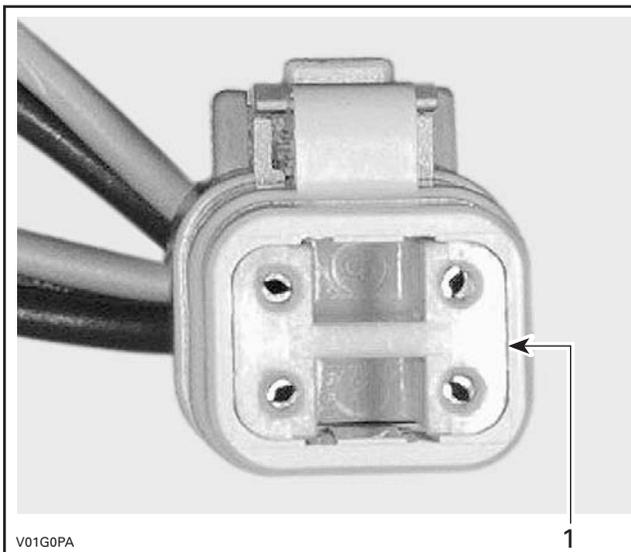
To remove:

- Using a long nose pliers, pull out the lock.



FEMALE HOUSING

1. Female lock

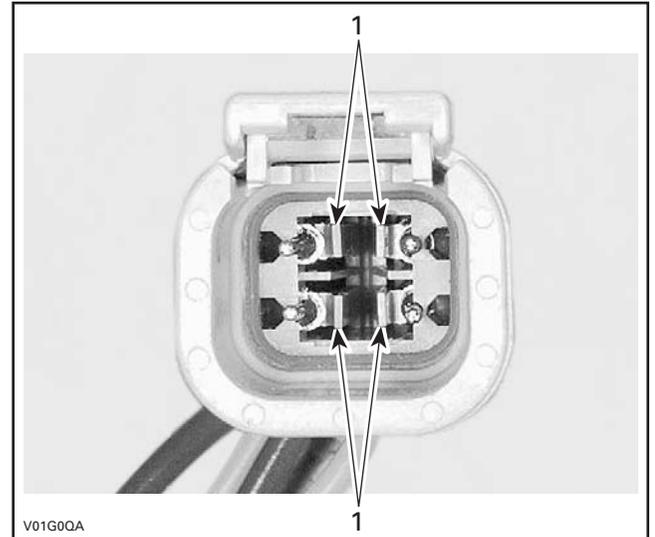


MALE HOUSING

1. Male lock

NOTE: Before extraction, push wire forward to relieve pressure on retaining tab.

- Insert a 4.8 mm (0.189 in) wide screwdriver blade inside the front of the contact cavity.
- Pry back the retaining tab while gently pulling wire back until contact is removed.



FEMALE CONNECTOR HOUSING

1. Retaining tab

To install:

- For insertion of signal contact, make sure the lock is removed.
- Insert contact into appropriate circuit cavity and push as far as it will go.
- Pull back on the contact wire to be sure the retention fingers are holding the contact.
- After all required contacts have been inserted, the lock must be installed.

CAUTION: Never apply dielectric grease on contacts in plug connector. The use of dielectric grease will make the seal swollen and move out of the connector. Do not lubricate.

SERVICING AMP CONNECTORS (26 PINS)

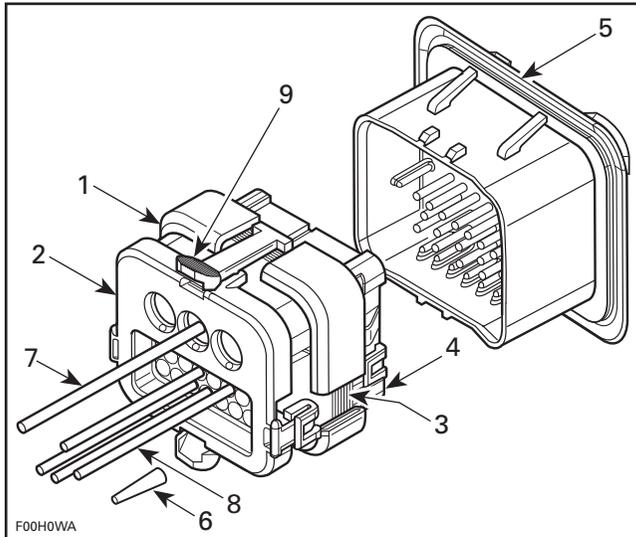
When servicing electrical system, special care must be taken when working with AMP plug connectors in order to prevent any malfunction of the system.

Section 05 ELECTRICAL

Subsection 02 (OVERVIEW)

Identification

Parts

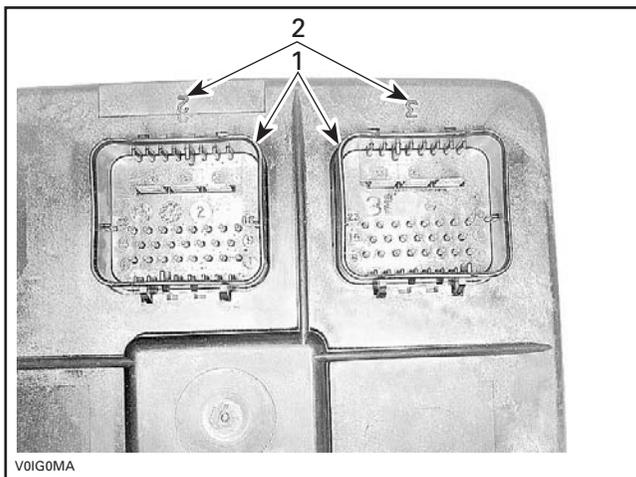


1. Plug assembly
2. Cover assembly
3. Mating seal
4. Wedge lock
5. Header assembly
6. Seal plug
7. Power wire
8. Signal wire
9. Locking tabs

Connectors

Each connector is identified by a unique number from 2 to 3, number 2 being the upper connector. The number is found on the MPEM close to the connector.

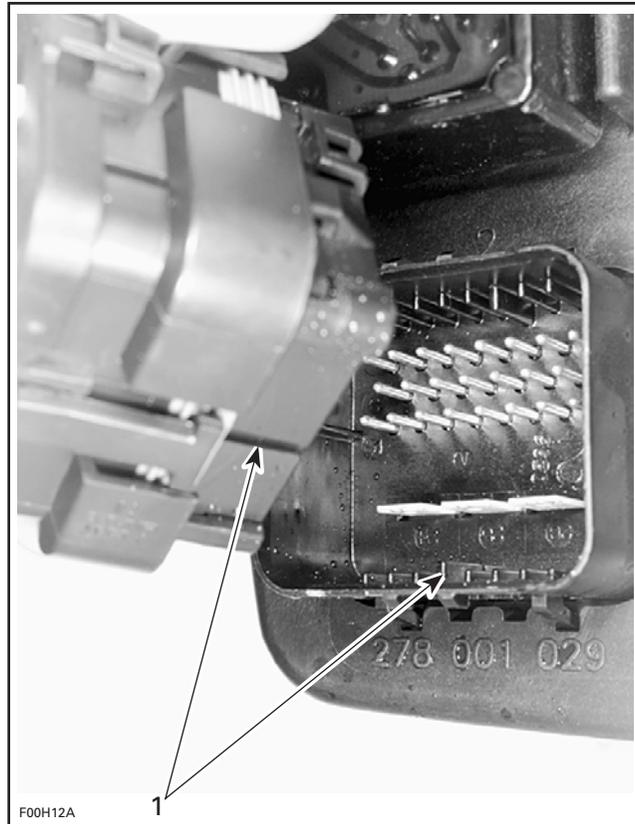
NOTE: There is no number 1.



TYPICAL

1. AMP connectors
2. Identification numbers

Each plug assembly is mechanically keyed to mate only with identical mechanical keyed header on the MPEM.



TYPICAL

1. Mechanically keyed

To remove plug connector from the header assembly on the MPEM, press both tabs and pull plug.

Wire Selection and Preparation

The size of the wires must be 20 to 16 AWG with a wire insulation diameter having a minimum dimension of 1.7 mm (0.067 in) and a maximum dimension of 2.78 mm (0.106 in).

The wire strip length shall be 5.1 mm (13/64 in).

NOTE: When stripping wires, ensure conductor is not nicked, scrapped or cut. Wire stripping tool jaws may leave marks on the surface of the wire insulation. If these marks occur at the location of the wire seal, leakage may result. Insulation surface within 25 mm (1 in) from the tip of the contact must be smooth.

Contact Crimping

All contacts in AMP plug connectors must be crimped using the crimping tool (P/N 295 100 164).

CAUTION: If contacts are not crimped using the proper crimping tool, the wire seal may be damaged.

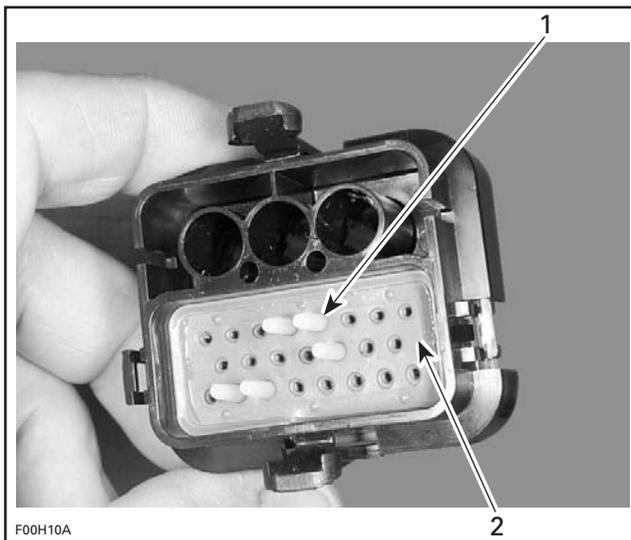


CRIMPING TOOL (P/N 295 100 164)

All circuits are sealed by a diaphragm in the rubber wire seal. When installing wire contacts in plug connector, the diaphragm is pierced as the contact passes through it.

If the diaphragm is pierced and the cavity is not used, install a seal plug, **large end first**, into circuit cavity as far as it will go.

NOTE: It is suggested that all unused circuit cavities be sealed with a seal plug, even if they are not pierced.



1. Seal plug
2. Wire seal

CAUTION: Do not pierce the diaphragm with a sharp point for electrical troubleshooting. The resulting pin holes in the insulation will allow moisture to penetrate the system and possibly result in system failure.

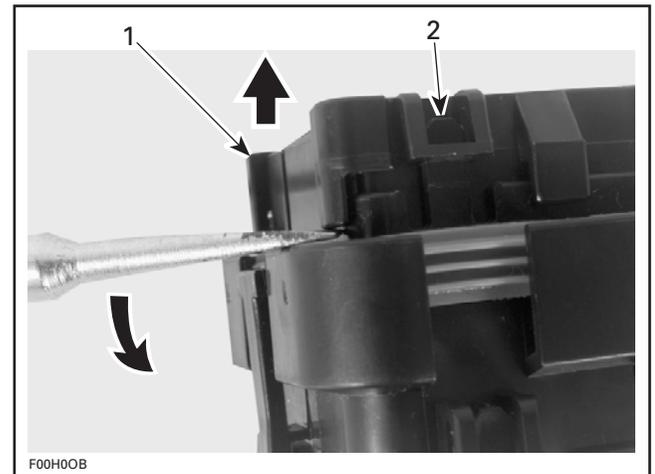
Contact Removal

Signal Contact

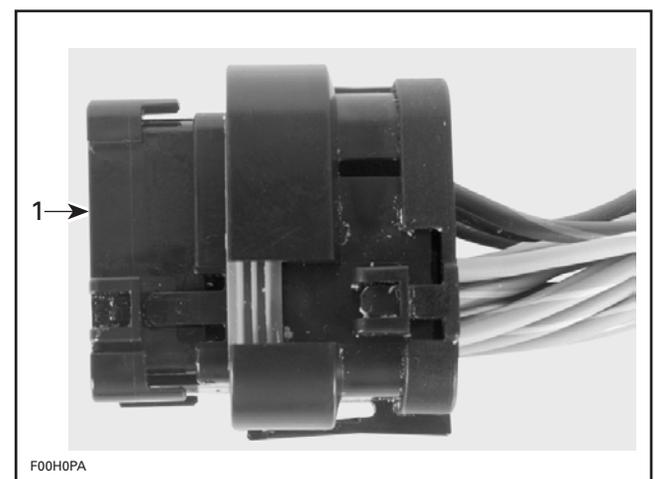
Insert a screwdriver blade between the mating seal and the wedge lock tab.

Release the plug locking tab and at the same time, pry open the wedge lock to the open position.

CAUTION: The wedge lock should never be removed from the housing for insertion or removal of the signal wire contacts.



1. Wedge lock
2. Locking tab



1. Wedge lock in open position

Section 05 ELECTRICAL

Subsection 02 (OVERVIEW)

While rotating the wire back and forth over a half turn (1/4 turn in each direction), gently pull the wire until the contact is removed.

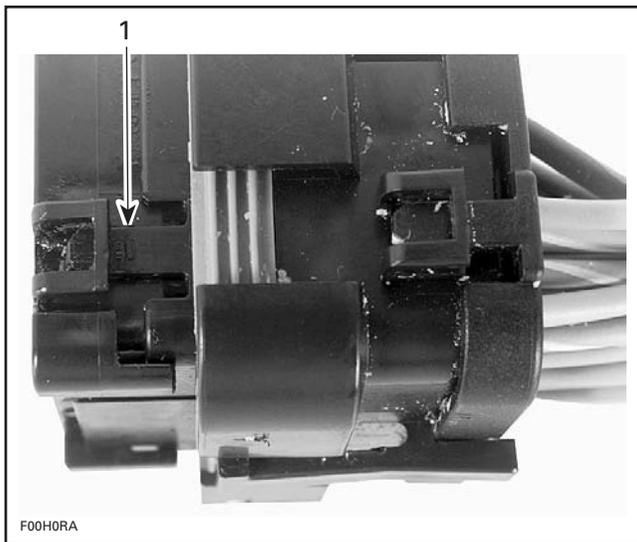


1. Rotate wire back and forth
2. Pull wire

Power Contact

NOTE: The wedge lock must be removed to extract power contact.

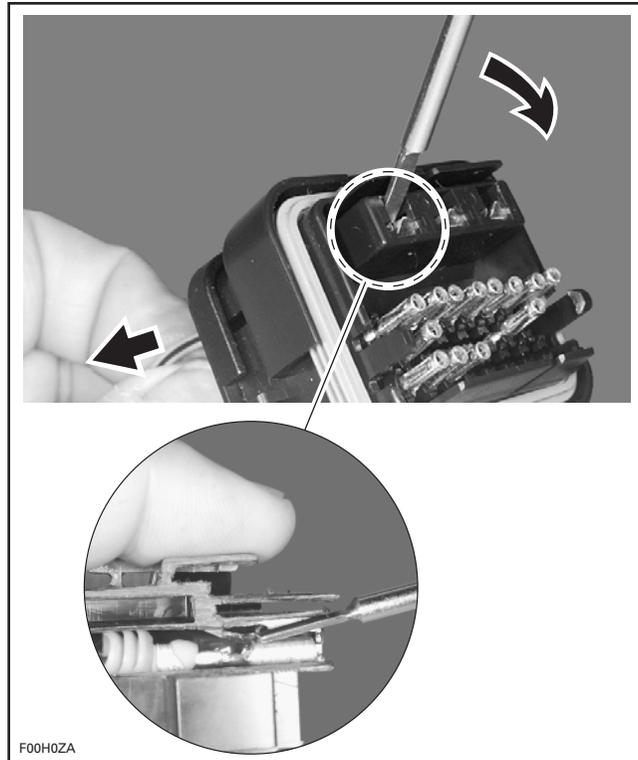
Pull both locking tabs and remove wedge lock from plug assembly.



1. Pull locking tab (both sides)

Before extraction, push wire forward to relieve pressure on retaining tab.

Insert a 4.8 mm (0.189 in) wide screwdriver blade inside the front of the contact cavity.



Pry back the retaining tab while gently pulling wire back until contact is removed.

Contact Installation

For insertion of signal contact, make sure the wedge lock is in the open position.

NOTE: For insertion of power contact, the wedge lock may or may not be on the open position.

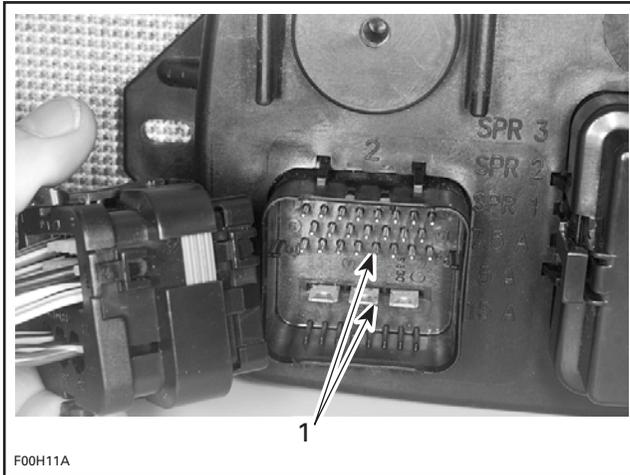
Insert contact into appropriate circuit cavity and push as far as it will go.

Pull back on the contact wire to be sure the retention fingers are holding the contact.

After all required contacts have been inserted, the wedge lock must be closed to its locked position.

CAUTION: Never apply dielectric grease on contacts in plug connector. The use of dielectric grease will create hydrolock and poor sealing.

Apply a thin coat of DEOXIT contact lubricant to the pins of the header on the MPEM only.



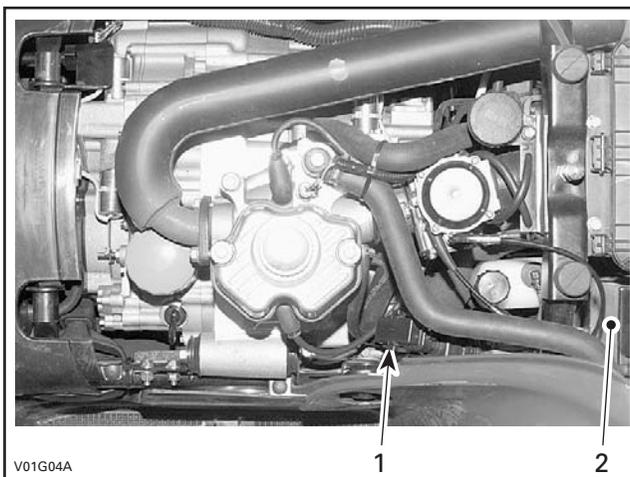
TYPICAL

1. Apply a thin coat of DEOXIT contact lubricant

CAUTION: Do not apply lubricant excessively. Care must be taken so that the lubricant will not come in contact with the mating seal; the seal may lose its sealing capacities. Do not apply lubricant on contacts inside plug connector.

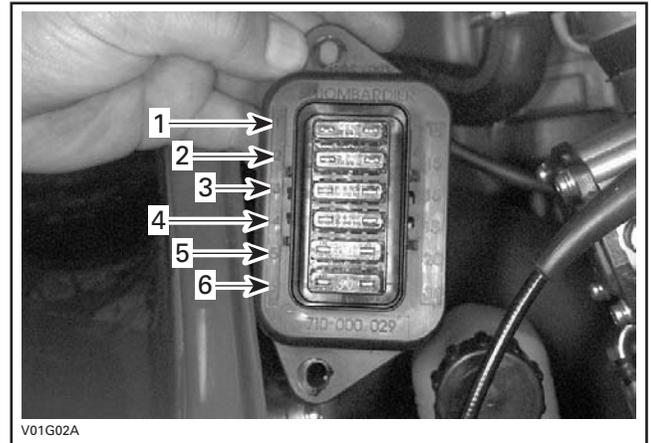
IDENTIFICATION OF FUSE BLOCK ON VEHICLE

Fuses are located in engine compartment on LH side of battery.



1. Battery
2. Fuse holder

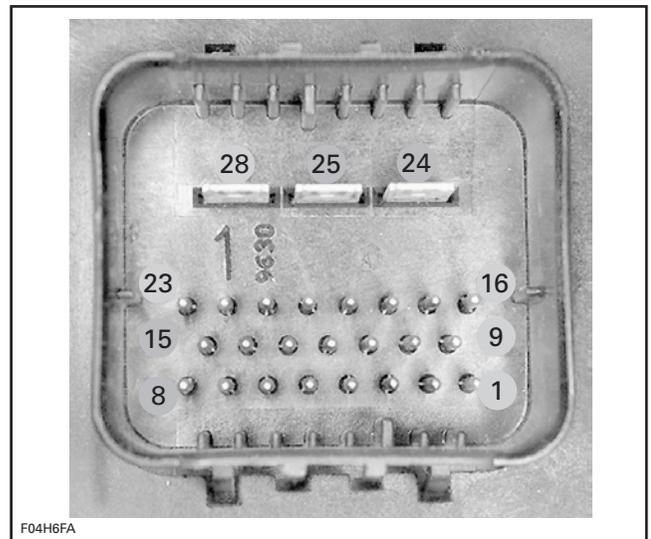
Fuses are identified by a number located beside the fuses.



1. Ignition system
2. Accessories (power outlet and auxiliary supply)
3. Solenoids
4. Fan
5. MPEM (Multi-Purpose Electronic Module)
6. Charging system

IDENTIFICATION OF MAJOR CONNECTOR PINS

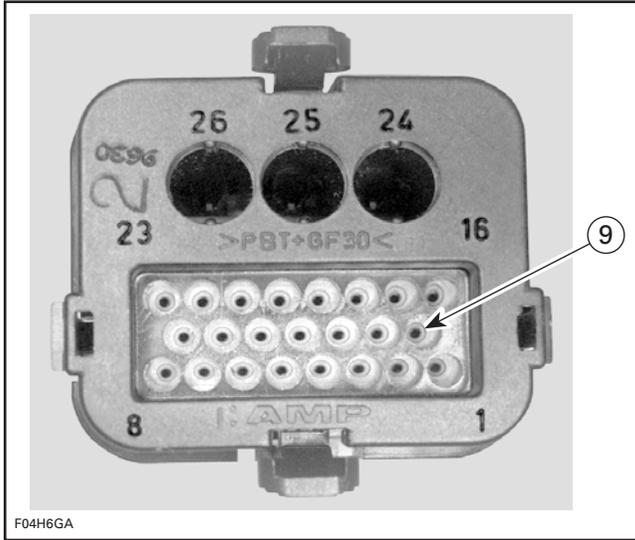
AMP Connectors of MPEM



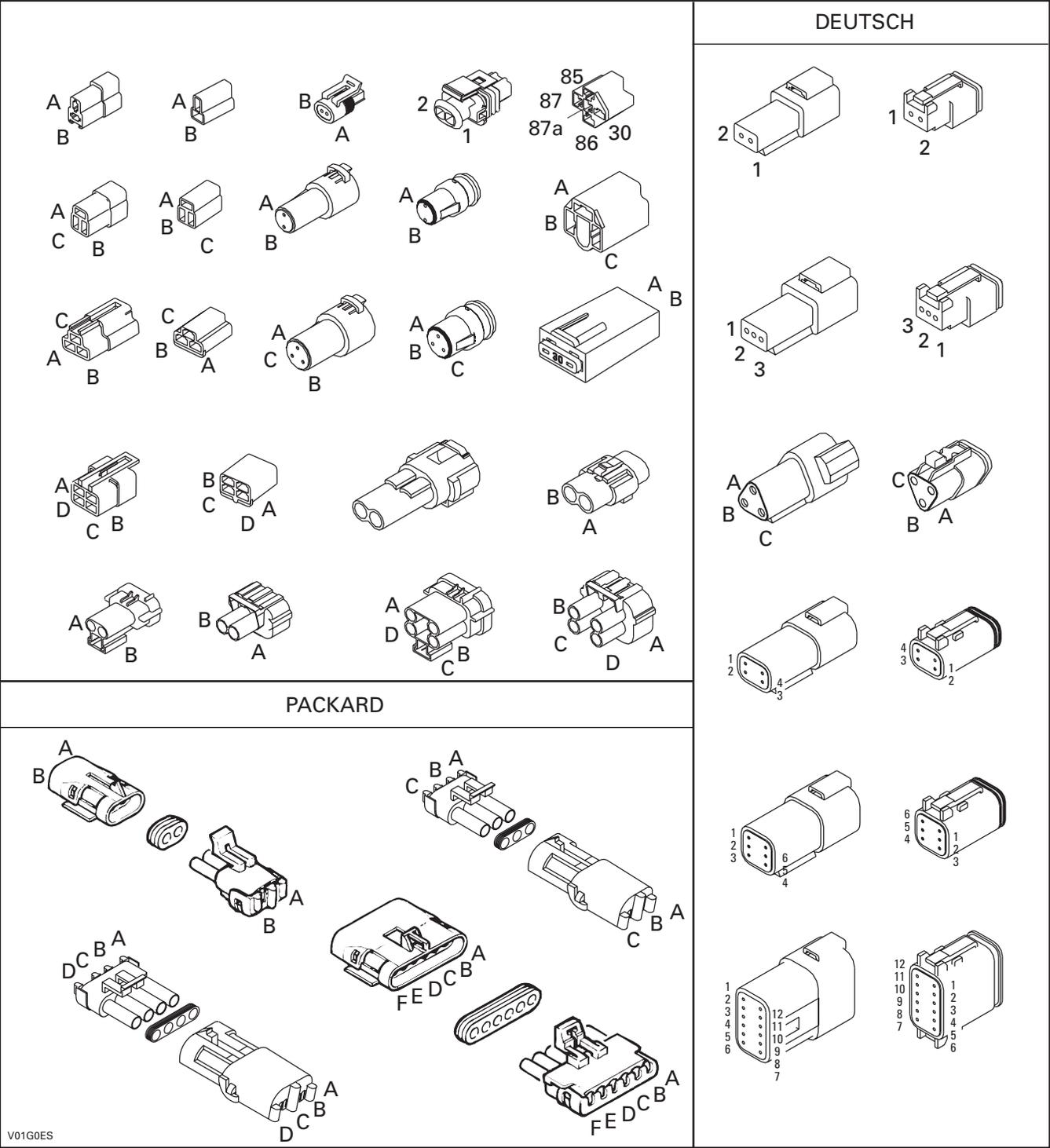
Section 05 ELECTRICAL

Subsection 02 (OVERVIEW)

AMP Connectors of Wiring Harness



Other Deutsch and Packard Connectors Pin-Out



CHARGING SYSTEM

TESTING PROCEDURE

NOTE: First, ensure that battery is in good condition prior to performing the following test using a current inductive ammeter such as Snap-on MT 110.

If the battery is regularly discharged, check charging system fuse **no. 6** condition.

The voltage regulator/rectifier could be the culprit of a blown fuse. To check, simply disconnect the voltage regulator/rectifier from the circuit.

If the fuse still burns, check for a defective wire.

CAUTION: Do not use a higher rated fuse as this can cause severe damage.

Voltage Regulator/Rectifier

STATIC TEST: CONTINUITY

1. Due to internal circuitry, there is no static test available.

DYNAMIC TEST

Current Test

Proceed as follows:

- Start engine.
- Lay an inductive ammeter on positive cable of battery.
- Bring engine to approximately 3500 RPM.

Depending on battery charge, current reading should be approximately **5 amperes**. If not, check magneto output prior to concluding that voltage regulator/rectifier is faulty.

Voltage Test

Proceed as follows:

- Start engine.
- Connect a multimeter to battery posts. Set multimeter to Vdc scale.
- Bring engine to approximately 5500 RPM.

If multimeter reads over 15 volts, voltage regulator/rectifier is defective. Replace it.

NOTE: Whatever the voltmeter type used (peak voltage or RMS), the voltage must not exceed 15 V. A faulty voltage regulator/rectifier will allow voltage to exceed 15 V as engine speed is increased.

NOTE: If it is continually necessary to add distilled water to the battery, this indicates an over voltage situation, requiring replacement of the voltage regulator/rectifier. If, on the other hand, the battery will not stay charged, the problem can be any of the charging circuit components. If these all check good, you would be accurate in assuming the problem to be in the voltage regulator/rectifier.

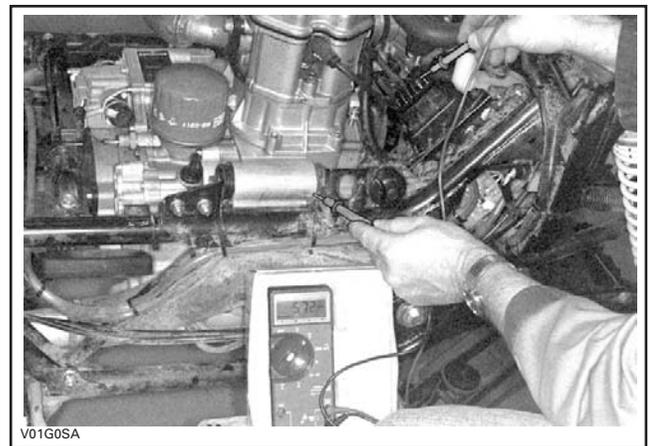
If there is no charging at the battery with the preceding voltage test, the following test can also be performed.

Voltage Regulator/Rectifier Output Test

Remove the charging system fuse.

Connect the negative probe on engine and the positive probe in the charging system fuse location where the value is 0 Vdc. The obtained value in the other location should be 12 Vdc.

Place shifter lever on NEUTRAL position and start engine. The obtained value should be between 4 and 7 Vdc.



NOTE: If the voltage regulator/rectifier is within the specification, the wiring harness between the voltage regulator/rectifier and battery is defective. If the voltage regulator/rectifier is out of specification and the stator test good, the voltage regulator/rectifier is defective.

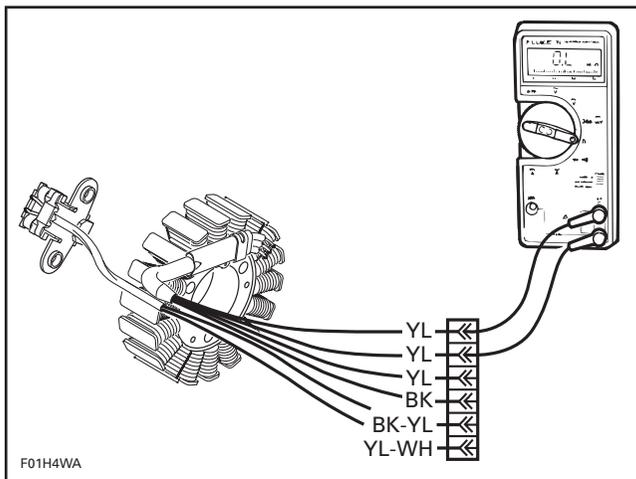
Section 05 ELECTRICAL

Subsection 03 (CHARGING SYSTEM)

Stator

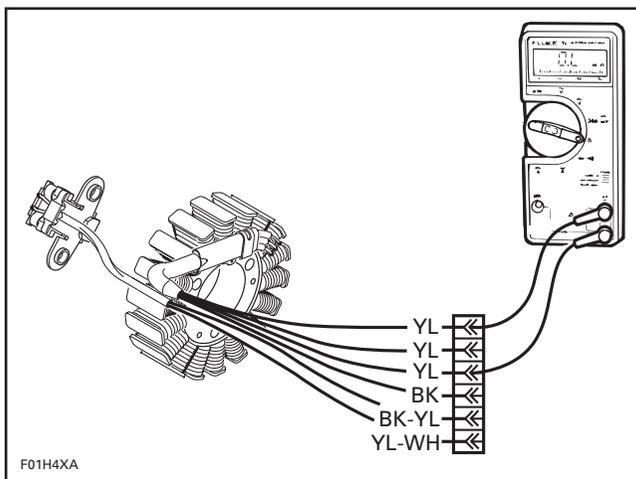
STATIC TEST: CONTINUITY

1. Disconnect the magneto wiring harness connector. Connect the 6-pin magneto test harness (P/N 295 000 136) on the engine connector. With a good multimeter (preferably a digital one), place the 2 meter test probes onto the stator wire leads AC-1 and AC-2 of the stator. The resistance should be $0.4 \Omega \pm 0.1$.



TYPICAL

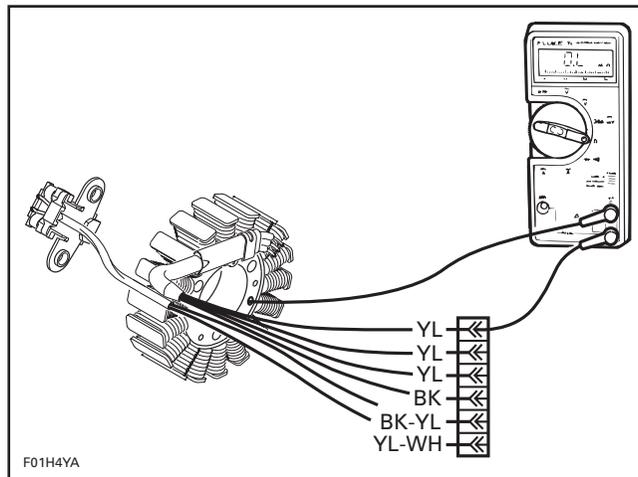
2. Place either meter test probe into the remaining stator lead (AC-3) and note the resistance (same as step no. 1). If the readings are out of specification, the stator will need to be replaced.



TYPICAL

STATIC TEST: INSULATION

With the stator leads disconnected, insert either meter test probe onto AC-1 and ground the other meter test probe to the engine or the stator iron core and note the reading. There should be no continuity (infinity) between the stator insulated coils and ground. If there is a reading, the stator coils and/or the wiring from the coils is grounded and needs to be replaced/repared respectively.



TYPICAL

DYNAMIC TEST

1. Unplug magneto connector at engine.
2. Connect the 6-pin magneto test harness (P/N 295 000 136) between the unplugged connectors.
3. Connect test probes of the multimeter to two of the YELLOW wires of the 6-pin magneto harness adapter.
4. Set multimeter to Vac scale.
5. Start and rev engine. The obtained value should be between 10 and 12 Vac.
6. If the stator is out of specification, replace it.

STARTING SYSTEM

BATTERY

TROUBLESHOOTING

SYMPTOM: DISCHARGED OR WEAK BATTERY	
CAUSE	REMEDY
1. Battery posts and/or cable terminal oxidized.	Clean and coat with dielectric grease.
2. Loose or bad connections.	Check wiring and connector cleanliness, damaged or short circuit.
3. Faulty battery (sulfated, doesn't keep a full charge, damaged casing, loose rectifier).	Replace.
4. Charging system fuse burnt or faulty voltage regulator/rectifier.*	First check charging system generator coil. If it is in good condition replace fuse or rectifier.
5. Faulty charging system generator coil.*	Replace.

* To test charging system, refer to CHARGING SYSTEM 05-03.

BATTERY TESTING

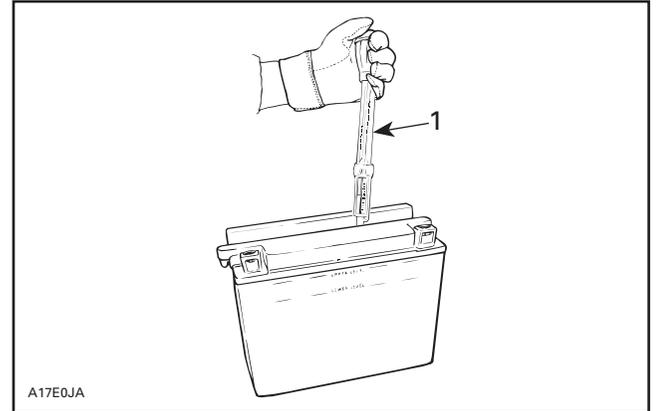
There are 2 types of battery tests: unloaded and loaded. An unloaded test is made on a battery without discharging current. It is the simplest and commonly used. However, be aware that the voltage test can be good while the battery has not enough power to start the engine. A load test gives more accuracy of the battery condition.

Unload Test

Check charge condition using either a hydrometer or a multimeter.

With a multimeter, voltage readings appear instantly to show the state of charge. Always respect polarity. A fully charged battery will have a reading of 12.6 Vdc.

A hydrometer more accurately measures the charge of a battery in terms of specific gravity of the electrolyte. A fully charged battery will have a specific gravity between 1.265 to 1.280.



TYPICAL

1. Specific gravity 1.265

A hydrometer measures the charge of a battery in terms of specific gravity of the electrolyte. Most hydrometers give a true reading at 21°C (70°F).

In order to obtain correct readings, adjust the initial reading by **adding** .004 points to the hydrometer readings for each 5.5°C (10°F) **above** 21°C (70°F) and by **subtracting** .004 point for every 5.5°C (10°F) **below** 21°C (70°F).

This chart will be useful to find the correct reading.

ELECTROLYTE TEMPERATURE		OPERATION TO PERFORM
°C	°F	
38	100	.012
32	90	add .008 to the reading
27	80	.004
21	70	correct reading
16	60	.004
10	50	subtract .008 from the reading
4	40	.012
-1	30	.016

EXAMPLE NO. 1

Temperature below 21°C (70°F):
Hydrometer reading: 1.250
Electrolyte temperature: -1°C (30°F)
Subtract .016 Sp. Gr.
Corrected Sp. Gr. is 1.234

EXAMPLE NO. 2

Temperature above 21°C (70°F):
Hydrometer reading: 1.235
Electrolyte temperature: 38°C (100°F)
Add .012 Sp. Gr.
Corrected Sp. Gr. is 1.247

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)

Load Test

This is the best test of battery condition under a starting load. Use a load testing device that has an adjustable load.

Apply a load of 3 times the ampere-hour rating of the battery. At 14 seconds into the test, check battery voltage; if battery is in good condition, it will have at least 10.5 Vdc.

REMOVAL

Remove seat.

Disconnect negative BLACK cable first then positive cable.

WARNING

Always respect this order for disassembly; disconnect BLACK negative cable first. Electrolyte or fuel vapors can be present in engine compartment and a spark may ignite them and possibly cause personal injuries.

Remove the holding straps.

Pull out vent tube from frame.

Remove battery from vehicle being careful not to tilt it so that electrolyte flows out of vent tube.

WARNING

Electrolyte is poisonous and dangerous. Avoid contact with eyes, skin and clothing. Wear protective eyeglasses and a suitable pair of non-absorbent gloves when removing the battery by hand.

CAUTION: Should any electrolyte spillage occur, immediately wash off with a solution of baking soda and water.

CLEANING

WARNING

Electrolyte is poisonous, dangerous and explosive. It contains sulfuric acid and can cause severe burns. Avoid contact with eyes, skin and clothing.

Clean the battery casing, caps, cables and battery posts using a solution of baking soda and water.

Remove corrosion (if so) from battery cable terminals and battery posts using a firm wire brush. Rinse with clear water and dry well.

INSPECTION

Visually inspect battery casing for cracks or other possible damage. If casing is damaged, replace battery and thoroughly clean battery rack with water and baking soda.

WARNING

Should the battery casing be damaged, wear a suitable pair of non-absorbent gloves when removing the battery by hand.

Inspect battery rack mounting.

Inspect battery posts for security of mounting.

Inspect for cracked or damaged battery caps, replace defective caps.

WARNING

Battery caps do not have vent holes. Make sure that vent tube is not obstructed.

BATTERY STORAGE

Disconnect and remove battery from the vehicle (see above).

Check electrolyte level in each cell, add distilled water up to upper level line.

CAUTION: Do not overfill.

The battery must always be stored in fully charged condition. If required, charge until specific gravity of 1.260 is obtained.

CAUTION: Battery electrolyte temperature must not exceed 50°C (122°F). The casing should not feel hot.

Clean battery terminals and cable connections using a wire brush. Apply a light coat of dielectric grease (P/N 413 701 700) or petroleum jelly on terminals.

Clean battery casing and caps using a solution of baking soda and water. Do not allow cleaning solution to enter battery, otherwise it will destroy the electrolyte. Rinse battery with clear water and dry well using a clean cloth.

Store battery on a wooden shelf in a cool dry place. Such conditions reduce self-discharging and keep fluid evaporation to a minimum.

During the storage period, recheck electrolyte level and specific gravity readings at least every 40 days. As necessary, keep the battery at its upper level line and near full charge as possible (trickle charge).

ACTIVATION OF A NEW BATTERY

⚠ WARNING

Never charge or boost battery while installed on vehicle.

CAUTION: Prior to charging the battery, always remove it from the vehicle to prevent electrolyte spillage.

A new battery is factory fresh dry charged. For storage purposes, it is fitted with a temporary sealing tube.

Do not remove the sealing tube or loosen battery caps unless activation is desired.

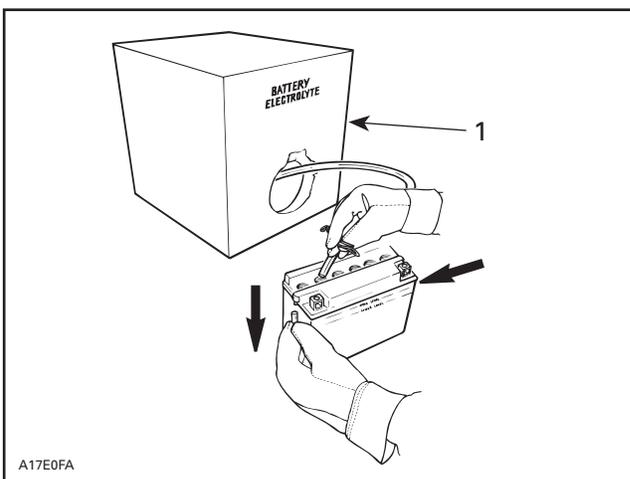
In case of accidental premature removal of caps or sealing tube, battery should be given a full charge.

Perform the following operations anytime a new battery is to be installed.

1. Remove the sealing tube from the vent elbow. Install vent tube, included in the battery kit, to battery elbow.

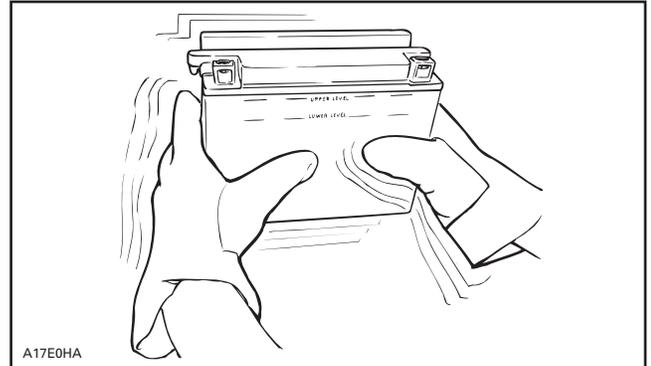
⚠ WARNING

Failure to remove the sealing tube could result in an explosion.



1. Battery electrolyte

2. Remove caps and fill battery to UPPER LEVEL line with electrolyte (specific gravity: 1.260 at 20°C (68°F)).
3. Allow the battery to stand for 30 minutes MINIMUM so that electrolyte soaks through battery cells.
4. Allow gas bubbles to escape by lightly shaking battery by hand.



5. Readjust the electrolyte level to the UPPER LEVEL line.
6. Connect a 2 A battery charger for 10 to 20 hours.

CAUTION: If charging rate raises higher than 2.4 A reduce it immediately. If cell temperature rises higher than 50°C (122°F) (if the casing feels hot) discontinue charging temporarily or reduce the charging rate.

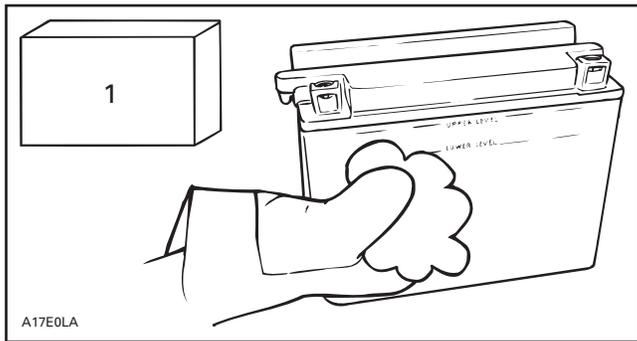
⚠ WARNING

Gases given off by a battery being charged are highly explosive. Always charge in a well ventilated area. Keep battery away from cigarettes or open flames. Always turn battery charger off prior to disconnecting cables. Otherwise a spark will occur and battery might explode.

7. Disconnect battery charger.
8. Test battery state of charge. Use a hydrometer.
9. Let battery settle for 1 hour.
10. Allow gas bubbles to escape by lightly shaking battery.
11. Readjust electrolyte level.
12. Reinstall caps and clean any electrolyte spillage using a solution of baking soda and water.

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)



1. Baking soda

CAUTION: Do not allow cleaning solution to enter battery interior since it will destroy the electrolyte.

NOTE: It is recommended to verify the battery charge once a month. If necessary, fully charge battery.

TIPS FOR CHARGING A USED BATTERY

⚠ WARNING

Prior to charging the battery, always remove it from vehicle.

For best results, battery should be charged when the electrolyte and the plates are at room temperature. A battery that is cold may not accept current for several hours after charging has begun.

Do not charge a frozen battery. If the battery charge is very low, the battery may freeze. If it is suspected to be frozen, keep it in a heated area for about 2 hours before charging.

⚠ WARNING

Do not place battery near open flame.

The time required to charge a battery will vary depending on some factors such as:

- **Battery temperature:** The charging time is increased as the temperature goes down. The current accepted by a cold battery will remain low. As the battery warms up, it will accept a higher rate of charge.

- **State of charge:** Because the electrolyte is nearly pure water in a completely discharged battery, it cannot accept current as well as electrolyte. This is the reason the battery will not accept current when the charging cycle first begins. As the battery remains on the charger, the current from the charger causes the electrolytic acid content to rise which makes the electrolyte a better conductor and then, the battery will accept a higher charging rate.
- **Type of charger:** Battery chargers vary in the amount of voltage and current that they can supply. Therefore, the time required for the battery to begin accepting measurable current will also vary.

Charging a Very Flat or Completely Discharged Battery

Unless this procedure is properly followed, a good battery may be needlessly replaced.

- Measure the voltage at the battery posts with an accurate voltmeter. If it is below 10 volts, the battery will accept current at very low rate, in term of milliamperes, because electrolyte is nearly pure water as explained above. It could be some time before the charging rate increases. Such low current flow may not be detectable on some charger ammeters and the battery will seem not to accept any charge.
- Exceptionally for this particular case, set the charger to a high rate.

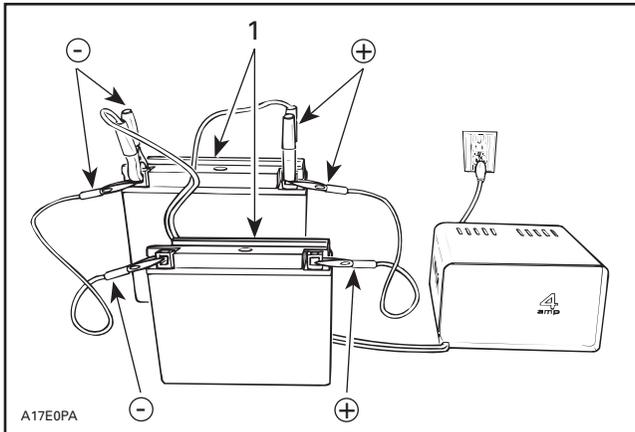
NOTE: Some chargers have a polarity protection feature which prevents charging unless the charger leads are connected to the correct battery terminals. A completely discharged battery may not have enough voltage to activate this circuitry, even though the leads are connected properly. This will make it appear that the battery will not accept a charge. Follow the charger manufacturer's instruction on how to bypass or override this circuitry so that the charger will turn on and charge a low-voltage battery.

- Since the battery chargers vary in the amount of voltage and current they provide, the time required for the battery to accept measurable charger current might be up to approximately 10 hours or more.
- If the charging current is not up to a measurable amount at the end of about 10 hours, the battery should be replaced.

- If the charging current is measurable before the end or at the end of about 10 hours, the battery is good and charging should be completed in the normal manner.
- It is recommended that any battery recharged by this procedure be load tested prior to returning it to service.

CHARGING 2 OR MORE BATTERIES AT A TIME

Connect all positive battery posts together and use a charger with a capacity (rated) equal to number of battery to be charged.



TYPICAL

1. Two batteries connected in parallel

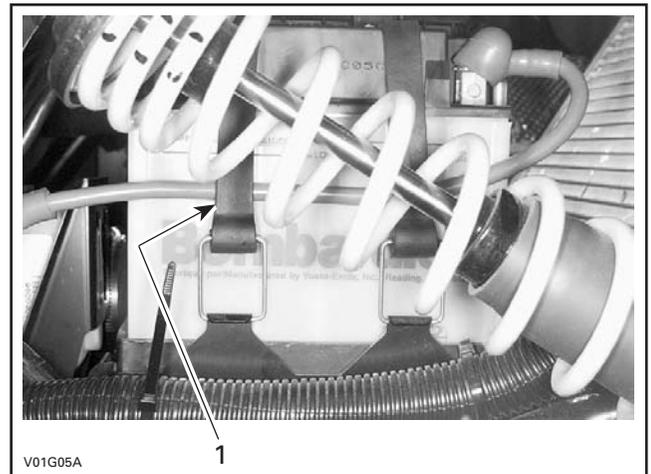
INSTALLATION

Reinstall battery and fasten making sure to reinstall the vent tube.

⚠ WARNING

Connect positive RED cable first then negative cable. Always connect RED positive cable first.

NOTE: Place the positive RED cable between holding straps and battery.



1. Cable between battery and strap

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)

STARTING SYSTEM TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
Starter does not turn.	Ignition switch is in the OFF position.	Turn switch in the ON position.
	Burnt fuse.	Check solenoid fuse, MPEM fuse and wiring condition.
	Transmission is not set on the Park or Neutral.	Set transmission either in Park or Neutral or use the override mode.
	Poor contact of battery terminal(s) or ground cable connections.	Clean and tighten terminal(s).
	Weak battery.	Recharge battery.
	Poor contact or open circuit of: start/stop button ignition switch or starting solenoid.	Check and replace defective part.
	STPS (Sub Transmission Position Sensor) is defective.	Check STPS and wiring condition.
	MPEM is defective.	Check wiring. Change MPEM.
	Engine mechanical problem (ensure that other electric components are good).	Communicate with the Service Representative.
Starter turns; but does not crank the engine.	Poor contact of battery terminal(s).	Clean and tighten terminal(s).
	Poor battery ground cable connection.	Clean and tighten.
	Burnt or poor contact of solenoid switch contact disc.	Replace starting solenoid.
	Poor contact of brush.	Straighten commutator and brush or replace electric starter.
	Burnt commutator.	Turn commutator in a lathe or replace electric starter.
	Worn commutator segments.	Undercut mica or replace electric starter.
	Shorted armature.	Replace electric starter.
	Weak brush spring tension.	Replace electric starter.
	Weak magnet.	Replace electric starter.
	Worn bushings.	Replace electric starter.
Weak battery.	Recharge or replace battery.	
Starter turns, but overrunning clutch pinion does not mesh with ring gear.	Worn clutch pinion gear.	Replace electric starter.
	Defective clutch.	Replace electric starter.
	Poor movement of clutch on splines.	Replace electric starter.
	Worn clutch bushing.	Replace electric starter.
	Worn ring gear.	Recharge ring gear.
Starter motor keeps running.	Shorted starting solenoid switch winding.	Replace starter solenoid.
	Melted solenoid contacts.	Replace starter solenoid.
	Sticking or defective starter clutch.	Lubricate or replace electric starter.

STARTING SYSTEM TESTS

GENERAL

First ensure the problem is not related to engine mechanical components. Try cranking the engine with the rewind starter. If it does not turn, perform the necessary repair. Otherwise, test the starting system.

Causes of troubles are not necessarily related to starter but may be due to a burnt fuse (solenoids or MPEM) faulty battery, start/stop switch, ignition switch, start/stop switch, STPS (Sub-Transmission Position Sensor), starting solenoid, electrical cables or connections or the MPEM.

Check these components before removing starter. Consult also the Starting System Troubleshooting table above for a general view of possible problems.

⚠ WARNING

Short circuiting electric starter is always a danger, therefore disconnect the battery ground cable before carrying out any kind of maintenance on starting system. Do not place tools on battery.

Fuses

Make sure the solenoids fuse **no. 3** (includes the starting system) and the MPEM fuse **no. 5**, in the fuse block, are in good condition. If they test good, continue the other tests.

Battery

To check battery condition, refer to **Battery** above. If it tests good, continue the other tests.

Ignition Switch

A quick test to validate it is working. If the lights turn on in the cluster display just after turning on the key, the ignition switch is good. Otherwise, refer to IGNITION SYSTEM, section 05-05 for testing procedure. If it tests good, continue the other tests.

STPS

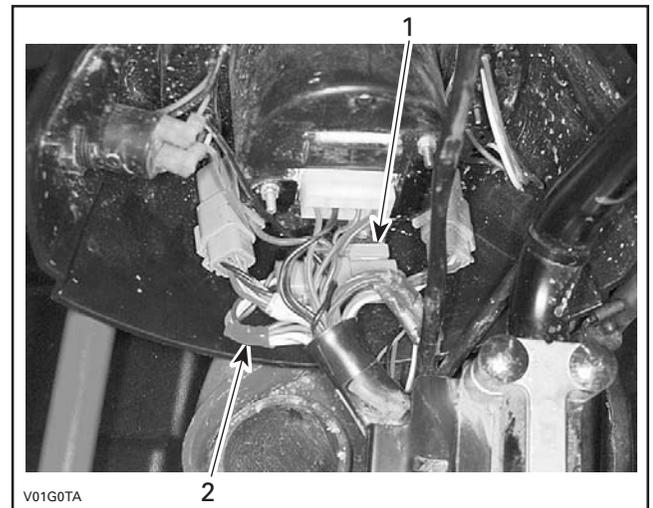
(Sub-Transmission Position Sensor)

Ensure the transmission lever is either in PARK or in NEUTRAL. To quickly check the STPS, temporarily bypass it by pressing any brake lever and try to start engine. If engine turned, the STPS can be suspected. Refer to ELECTRIC SHIFT SYSTEM, section 05-06. If it tests good, continue the other tests.

Start/Stop Switch

If engine does not turn when pressing the start/stop button, test the switch as follows.

Remove steering cover and unplug the multi-function switch connector.



1. Unplug connector
2. RED wiring harness

Using a multimeter, measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
Switch released	BLACK and YELLOW	Infinite (0.L)
Switch depressed and held		0.4 Ω max.

Replace switch if defective.

If switch tests good, check wiring going to MPEM. If it tests good, continue the other tests.

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)

Starting Solenoid

NOTE: Solenoid is located on frame, behind fuse block.

Ensure the solenoid receives electric current as follows. Using a multimeter, measure the voltage between the following wires when pressing the start/stop button with the ignition key turned on.

WIRE COLOR	CONNECTOR		VOLTAGE
WHITE/RED	Position B	On wiring connecting to solenoid	12 Vdc
BLACK	—	Battery ground post (-)	

If solenoid does not properly receive current, the MPEM can be suspected. See **MPEM** below.

If voltage is adequate, test the MPEM as follows. Using a 12 V test light, connect its positive wire to the positive post of the battery. Connect the negative wire of the test light to the YELLOW/RED wire connecting to the solenoid. When pressing the start/stop button with the ignition key turned on, the test light must turn on. Otherwise, it indicates a defective MPEM or wiring going to the MPEM.

If solenoid receives current, test the solenoid as follows.

Disconnect large cables from solenoid.

Inspect connections and clean as necessary. Solenoid condition can be checked with an ohmmeter. Install test probes on large connectors of solenoid. Measure resistance when current is applied to small connectors; if it is more than a few ohms, replace solenoid.

If solenoid test good, check the electric starter. If starter test good, the MPEM can be suspected. See **MPEM** below.

Electrical Cables or Connections

Check all connections, cables and wires. Tighten any loose cables. Replace any chafe wires/cables.

If wiring and connectors are good, check the electric starter. See below.

Electric Starter

NOTE: Starter is located behind LH side panel.

Remove LH side panel to give access to the starter. Refer to BODY/FRAME, section 10-02.

Using boosting cables, carefully supply current from the battery directly to the starter. Connect the BLACK negative cable first. Then connect the remaining jump cable from the battery then to the starter.

If starter now turns ensure the cables/connections from battery to solenoid and to starter are in good condition. If they test good, the MPEM can be suspected. See **MPEM** below.

If starter does not turn, check for mechanical problems in the starter.

MPEM

When other components have been tested above and are good, the MPEM can be suspected. Ensure wiring and connectors are in good condition prior to replacing the MPEM.

ELECTRIC STARTER

REMOVAL

Turn OFF ignition switch.

Disconnect BLACK cable ground connection from battery.

WARNING

Always disconnect ground cable first and re-connect last.

Disconnect RED cable connection from battery.

Clean starter area.

Remove LH side panel. Refer to BODY/FRAME 10-02.

Remove starter mount screws.

Pull starter out.

INSTALLATION

Installation is essentially the reverse of removal procedure. However, pay particular attention to the following.

Make sure that starter and engine mating surfaces are free of debris. Serious trouble may arise if starter is not properly aligned.

Properly torque starter screws.

Connect the RED battery cable to the starter and torque nut to 6 N•m (53 lbf•in). Apply dielectric grease on terminal and nut.

First connect RED cable to battery then connect the BLACK cable.

WARNING

Always connect RED positive cable first then BLACK negative cable last. Whenever connecting the RED positive cable to the starter motor make sure the battery cables are disconnected to prevent electric shock.

Test starter operation.

IGNITION SYSTEM

IGNITION SYSTEM TESTING PROCEDURE

GENERAL

Ignition Problems

When dealing with ignition problems, the following items should be checked in this order. After one item has been checked and it is found not to be the problem, continue with the next item.

1. Ignition and MPEM (Multi-Purpose Electronic Module) fuses condition.
2. Spark occurrence.
3. Battery condition.
4. Ignition switch.
5. Trigger coil.
6. Ignition coil.
7. MPEM.

Intermittent Ignition Problems

In dealing with intermittent problems there is no easy diagnosis. For example, problems that occur only at normal engine operating temperature have to be tested under similar conditions.

In most cases of temperature and/or vibration failure, only parts replacement might solve the problem as most of these failures return to normal when engine is not running.

Multiple Problems

There is always the possibility of more than one faulty part. If after a component has been replaced, the problem still persists, carefully repeat the complete test procedure to find the other faulty part.

IGNITION SYSTEM TEST

Safety Precautions

WARNING

To prevent powerful electric shocks while cranking engine, neither touch any electronic ignition components (ignition coil, high tension wire, wire harness, etc.) nor tester lead clips. Also make sure that tester leads do not touch any metallic object.

Ignition and MPEM Fuse Condition

Check ignition fuse no. 1 and MPEM fuse no. 5 condition. Replace burnt fuse as necessary.

Spark Occurrence

Remove one spark plug and connect to its cable. While holding the spark plug against a metallic part of the engine, start the engine. Look for a spark at the spark plug tip. Proceed the same with the other spark plug. Replace defective spark plug.

NOTE: If a spark plug is found defective, replace both spark plugs at the same time.

Both spark plugs must be checked individually. If one works and the other isn't, try another spark plug.

Keep in mind that a spark plug might test good this way while not being able to work properly under combustion chamber mixture and pressure.

If known good spark plug(s) do(does) not work, continue the other tests.

NOTE: Spark occurrence can be checked with a tester such as Superex Canada Ltd P/N 15-785 or the equivalent.

Battery Condition

A battery must be present in the vehicle to allow the ignition system to work. Also, at least 8 V is required at the MPEM for proper operation. Check battery voltage.

Section 05 ELECTRICAL

Subsection 05 (IGNITION SYSTEM)

Ignition switch

A quick test to validate it is working. If the lights turn on in the cluster display just after turning on the key, the ignition switch is good.

Test

Ensure the MPEM fuse no. 5 is in good condition.

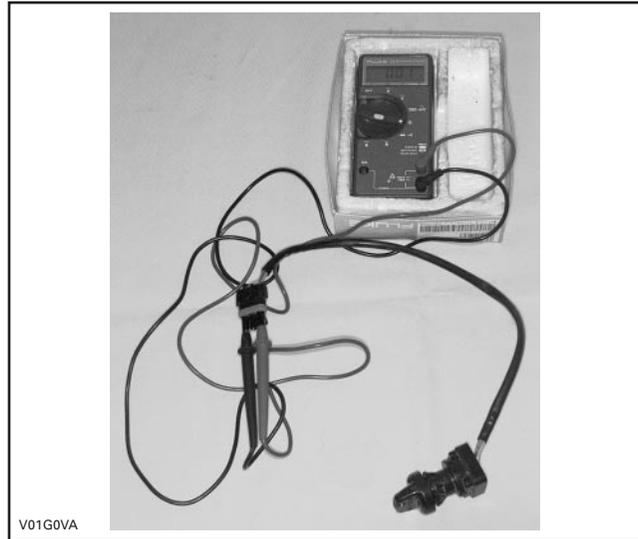
Disconnect ignition switch.

Measure voltage between RED/GREEN supply wire and the battery ground. If voltage is lower than battery voltage, test the wiring. If voltage is good, test switch.



Use a multimeter and measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
OFF	RED/GREEN and RED/YELLOW	Infinite (0.L)
OFF	RED/GREEN and RED/VIOLET	Infinite (0.L)
ON (w/lights)	RED/GREEN and RED/VIOLET	0.1 Ω max.
ON (w/o lights)	RED/GREEN and RED/YELLOW	0.1 Ω max.



Replace switch if defective.

If switch is good, test wiring going to MPEM. If it tests good continue the other tests.

Trigger Coil

IMPORTANT: If wires of trigger coil are inverted, no spark will take place. Ensure BLACK/YELLOW wire is in cavity E of connector.

The trigger coil is not adjustable.

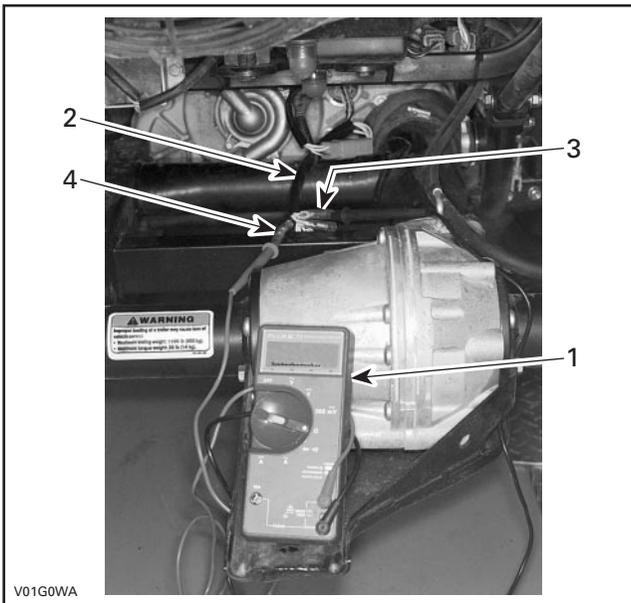
STATIC TEST: CONTINUITY

Check resistance with a high-sensitivity ohmmeter.

1. Disconnect the Deutsch 6-pin connector at engine.
2. Install the 6-pin magneto harness adapter (P/N 295 000 136).



3. Connect one of the multimeter leads to the WHITE/YELLOW wire of the 6-pin magneto harness adapter.
4. Connect the other multimeter lead to the BLACK wire of the 6-pin magneto harness adapter.
5. Measure resistance; it should be between 190 - 300 ohms.



1. Multimeter
2. 6-pin magneto harness adapter
3. WHITE wire
4. BLACK wire

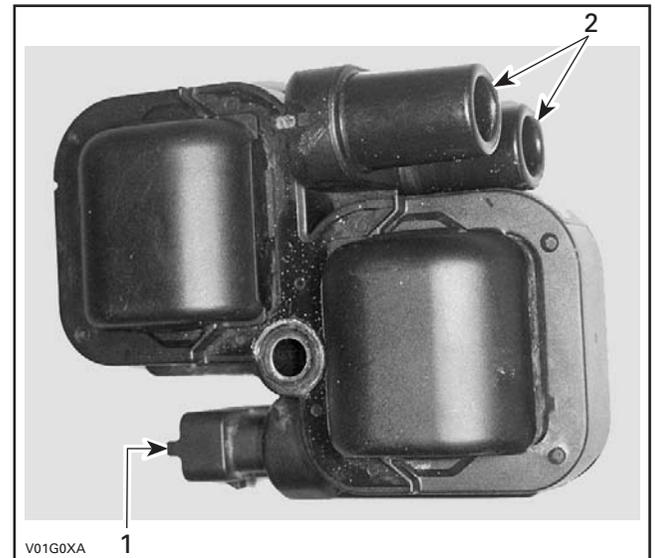
DYNAMIC TEST

1. Disconnect magneto wiring harness connector.
2. Install the 6-pin magneto harness adapter (P/N 295 000 136).
3. Connect one of the multimeter leads to the WHITE/YELLOW wire of the 6-pin magneto harness adapter.
4. Connect the other multimeter lead to the BLACK/YELLOW wire of the 6-pin magneto harness adapter.
5. Remove the ignition fuse and press START/STOP button, note result. The obtained value should be between 0.4 and 0.7 Vac.
6. If the trigger coil is out of specification, replace it. If it tests good continue the other tests.

Ignition Coil

NOTE: An ignition coil with good resistance measurement can still be faulty. Voltage leak can occur at high voltage level which is not detectable with an ohmmeter. Replacing the ignition coil may be necessary as a test.

Ignition Coil



IGNITION COIL

1. Primary side
2. Secondary side

Primary Winding

Disconnect the wire connector on the primary side of the ignition coil.

Using a multimeter, check the resistance between the terminals 1 and 2. Repeat a resistance test between terminals 2 and 3.

The resistance should be between 0.4 and 0.9 Ω at 20°C (68°F).

If not within specification, replace the ignition coil.

If the ignition coil test good, check the power supply on the primary side.

There should be 12 Vdc between the RED/YELLOW and BLACK/GREEN wires or between the RED/YELLOW and GREEN wires while starting the engine.

If there is no voltage, either the MPEM or the wiring harness is defective.

Secondary Winding

Due to the integrated diode, it is not possible to take any resistance measurement.

The output voltage should not be less than 12 kV (12 000 V).

The ignition coil outlet caps and the spark plug caps include a resistance. They should be checked prior to replacing a suspected ignition coil.

Section 05 ELECTRICAL

Subsection 05 (IGNITION SYSTEM)

Measure resistance between ignition coil outlet caps and spark plug caps. The obtained value should be between 5.4 and 5.7 Ω . If resistance is good, continue check. If not, change spark plug wires.

DYNAMIC TEST

An ignition coil tester available from after-market tool/equipment suppliers can be used.

CAUTION: Do NOT use coil tester on metal work bench. Follow manufacturer instructions.

If the ignition coil is out of specification, replace it. If it tests good ensure the wiring and connectors are in good condition then continue the other tests.

MPEM

When every other components above have been tested and are good, the MPEM can be suspected. Ensure wiring and connectors are in good condition prior to replacing the MPEM.

OTHER IGNITION SYSTEM PROBLEMS

If engine does not stop when pressing the start/stop button, refer to STARTING SYSTEM 05-04 for testing procedure.

If switch is good, test wiring going to MPEM. If it tests good the MPEM may be suspected. Try another one. Refer to INSTRUMENTS AND ACCESSORIES 05-07.

IGNITION TIMING

It is impossible to check the ignition timing with a timing lamp because there is no access window or mark. The MPEM adjust the timing automatically and the mechanics can not verify and adjust the ignition timing.

SPARK PLUG

DISASSEMBLY

First unscrew the spark plug one turn.

Clean the spark plug and cylinder head with pressurized air then completely unscrew.

HEAT RANGE

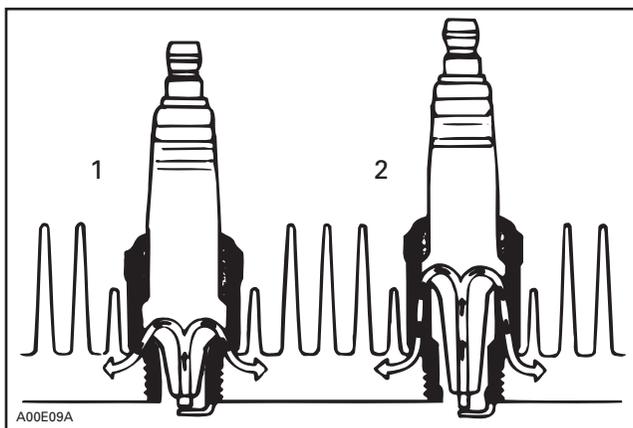
The proper heat range of the spark plugs is determined by the spark plugs ability to dissipate the heat generated by combustion.

The longer the heat path between the electrode tip to the plug shell, the hotter the spark plug operating temperature will be and inversely, the shorter the heat path, the colder the operating temperature will be.

A "cold" type plug has a relatively short insulator nose and transfers heat very rapidly into the cylinder head.

Such a plug is used in heavy duty or continuous high speed operation to avoid overheating.

The "hot" type plug has a longer insulator nose and transfers heat more slowly away from its firing end. It runs hotter and burns off combustion deposits which might tend to foul the plug during prolonged idle or low speed operation.



TYPICAL

1. Cold
2. Hot

CAUTION: Severe engine damage might occur or major plastic parts might melt if a wrong heat range plug is used.

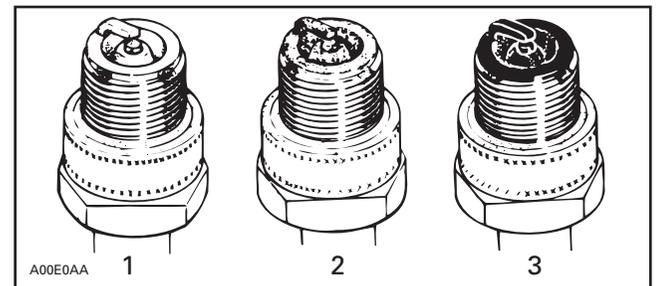
A too "hot" plug will result in overheating pre-ignition, etc.

A too "cold" plug will result in fouling (shorting the spark plug) or may create carbon build up which can heat up red-hot and cause pre-ignition or detonation.

FOULING

Fouling of the spark plug is indicated by irregular running of the engine, decreased engine speed due to misfiring, reduced performance, and increased fuel consumption. This is due to a loss of compression. Other possible causes are: prolonged idling or low-speed riding, or running on a too rich mixture due to abuse of choke, a clogged air filter, a faulty carburetor adjustment, incorrect fuel, defective ignition system, incorrect ignition timing, incorrect spark plug gap, lubricating oil entering the combustion chamber, or too cold spark plug. The plug face of a fouled spark plug has either a wet black deposit or a black carbon fouling. Such coatings form a conductive connection between the center electrode and ground.

SPARK PLUG ANALYSIS



TYPICAL

1. Overheated (light grey, white)
2. Normal (light brown, brown)
3. Fouled (black, wet or dry, dark deposits, grey, melted coating)

The plug face reveals the condition of the engine, operating condition, method of driving and fuel mixture. For this reason it is advisable to inspect the spark plug at regular intervals, examining the plug face (i.e. the part of the plug projecting into the combustion chamber).

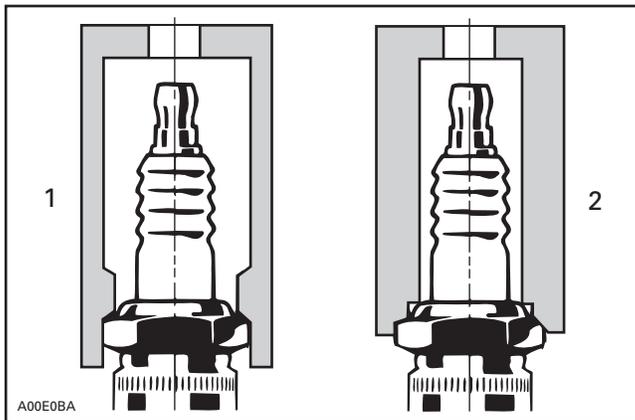
Section 05 ELECTRICAL

Subsection 05 (IGNITION SYSTEM)

SPARK PLUG INSTALLATION

Prior to installation make sure that contact surfaces of the cylinder head and spark plug are free of grime.

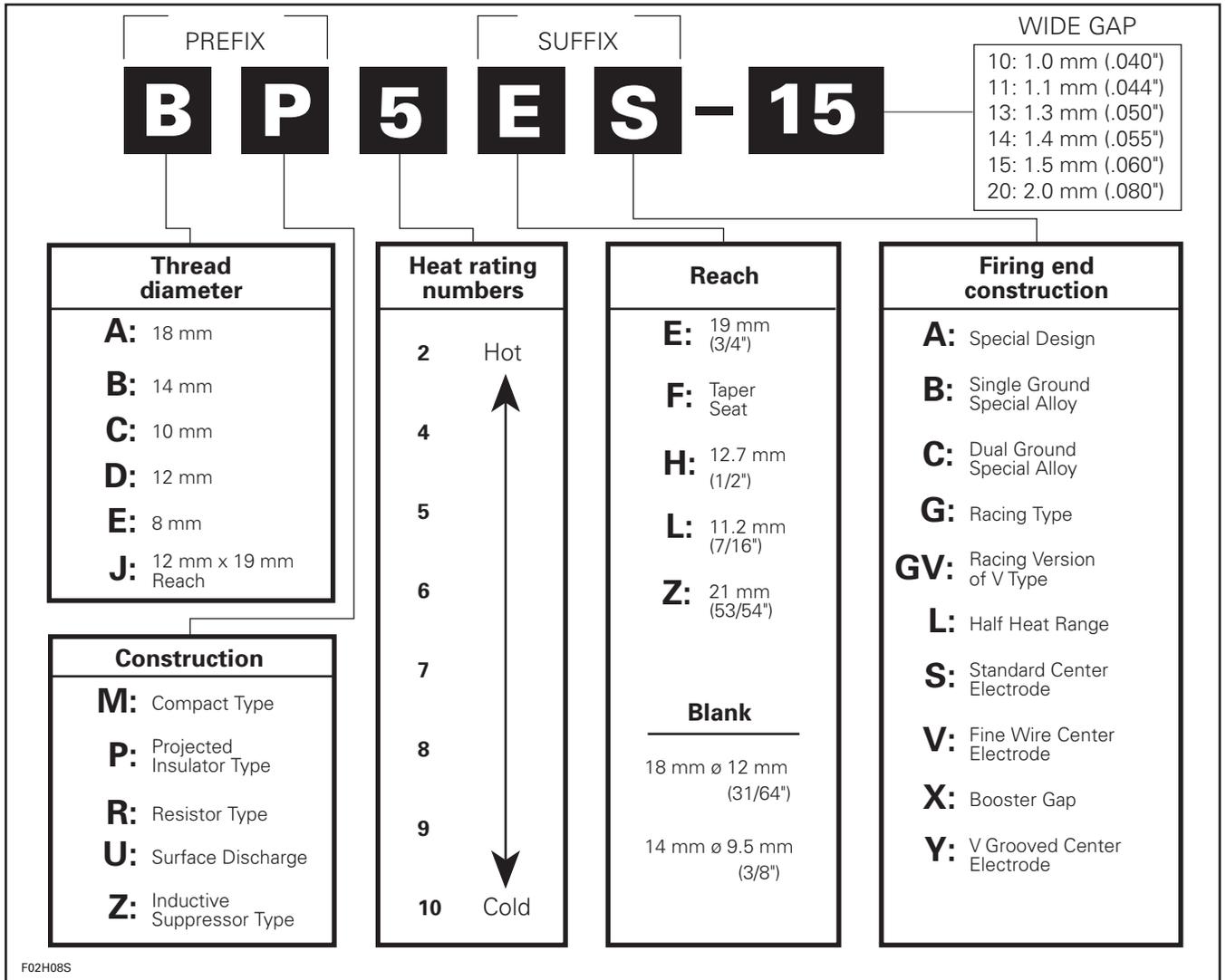
1. Using a wire feeler gauge, set electrode gap according to the following chart.
2. Apply anti-seize lubricant over the spark plug threads to prevent possible seizure.
3. Hand screw spark plug into cylinder head and tighten with a torque wrench and a proper socket.



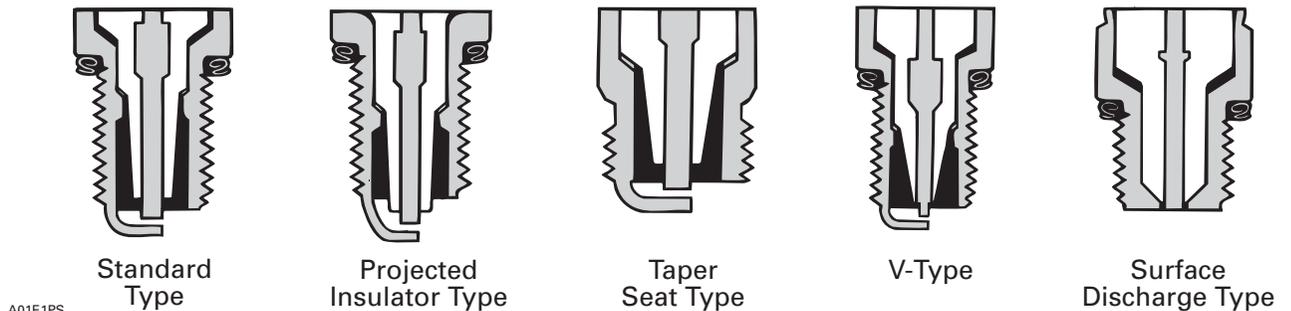
1. *Proper socket*
2. *Improper socket*

4. Torque spark plug to 22 N•m (16 lbf•ft).

NGK SPARK PLUG SYMBOL EXPLANATION



CROSSCUTS AND GAP STYLES OF SPARK PLUGS



ELECTRIC SHIFT SYSTEM

GENERAL

The electric shift system controls several valves/solenoids that control the shifting and also allow an adjustment to the clutch pressure to modify the gear change.

It is possible to calibrate the clutch for the hardness or smoothness of shifting action. This calibration is to be used when the clutch is slippery or is too hard.

If a new sensor or valve/solenoid is installed, the GBPS (Gear Box Position Sensor) and STPS (Sub-Transmission Position Sensor) calibration is necessary. The MPEM (Multi-Purpose Electronic Module) adjust values with the new specifications of new components installed.

The diagnostic/calibration mode preserves in memory the previous problems. The reset option erases the codes registered in memory.

Refer to the following text for specific procedures.

TROUBLESHOOTING

Problem with the shifting system, refer to the annexes 1 and 2.

DIAGNOSTIC/CALIBRATION MODE

The diagnostic/calibration mode of the MPEM is used to display light-coded signals to indicate problems mainly in the shifting system and in the MPEM. When in operation, the MPEM continuously monitors the system. When needed, we can enable the diagnostic/calibration mode to check the system condition.

The MPEM can detect the following problems:

- short circuits of external components
- internal MPEM problems
- electric current overload

The diagnostic/calibration mode is also used to:

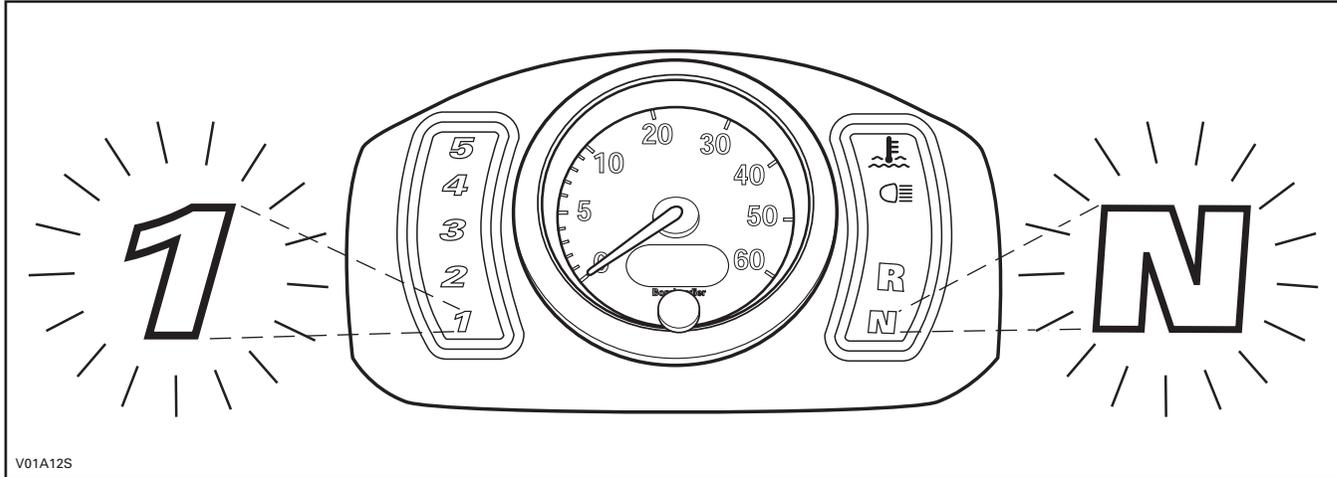
- calibrate clutch pressure and clutch modulation
- calibrate sensors when replacing components

Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

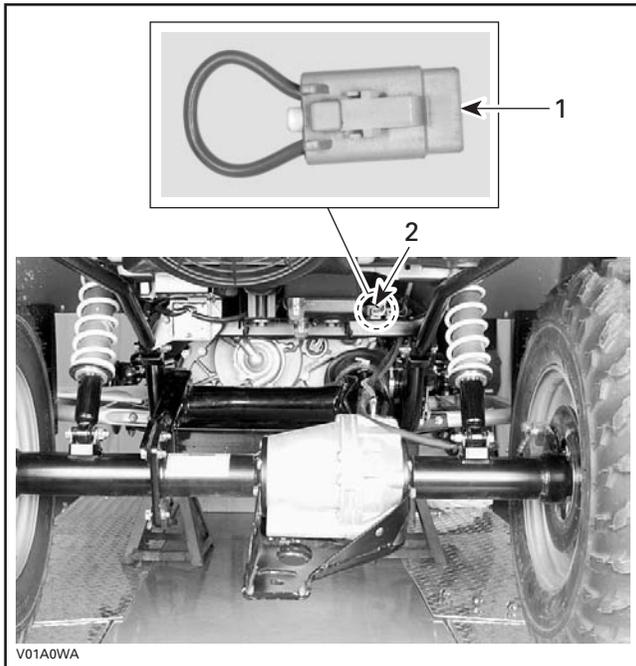
PREPARATION

Before going into the diagnostic/calibration mode, the ignition switch needs to be on position OFF, the transmission in FIRST gear and shifter lever on NEUTRAL position.



To set the MPEM into the diagnostic/calibration mode, the following sequence needs to be done:

- Place a diagnostic jumper in the diagnostic connector.



1. Diagnostic jumper
2. Diagnostic connector

- Turn ignition switch to ON.

Once the MPEM detects the diagnostic jumper in diagnostic connector, it sets itself into the diagnostic/calibration mode. During the diagnostic/calibration mode, the engine is off, all the solenoids are not working, and the accessory output is off.

NOTE: At any time, if the jumper is removed during the diagnostic/calibration mode, the MPEM is powered off automatically.

TESTING

The following tasks are performed in this order by the MPEM in the diagnostic/calibration mode:

- Task 1: Indicator lights test.
- Task 2: Clutch modulator calibration.
- Task 3: Sensors and solenoids verification.
- Task 4: GBPS (Gear Box Position Sensor) calibration.
- Task 5: STPS (Sub-Transmission Position Sensor) calibration.

See below for detailed steps.

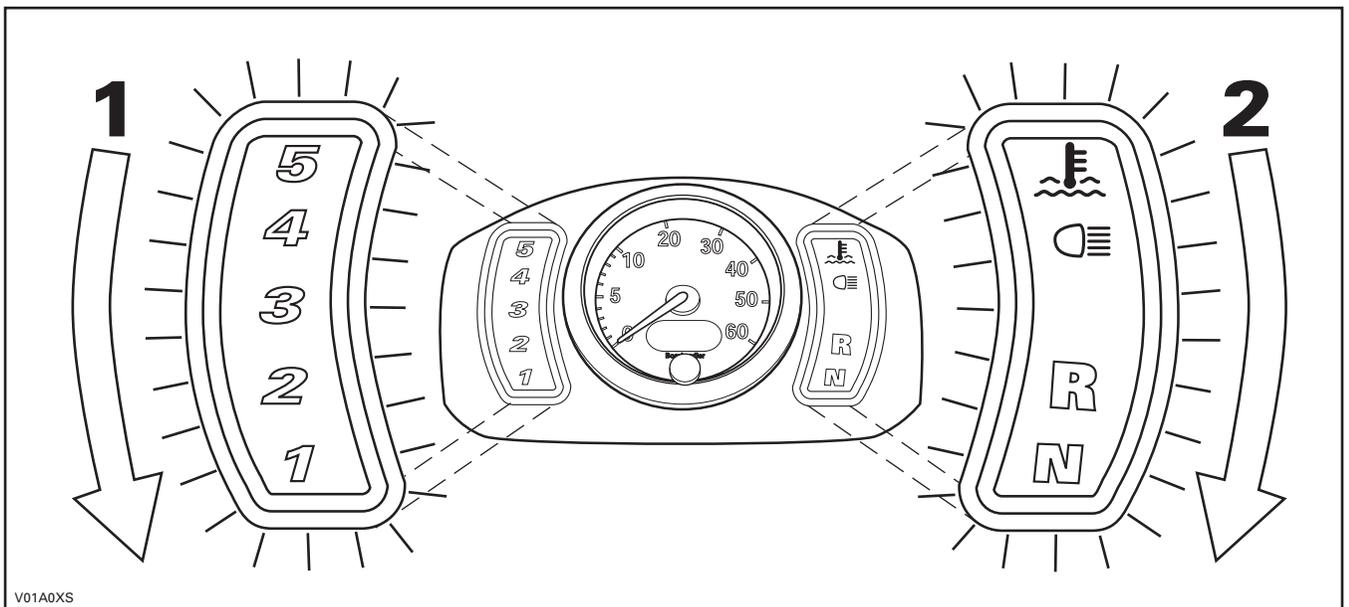
Once each task has been completed, the MPEM goes to the next task if the proper button(s) is(are) not activated after 3 seconds.

Task 1: Indicator Lights Test

This validates all indicator lights are good to allow proper display of the diagnostic codes.

All LEDs turn ON. The LED "5" blinks first, through "1" and after the LED "Check Engine" through the LED "Neutral".

If a LED is found defective, replace it prior to continuing the other tests.

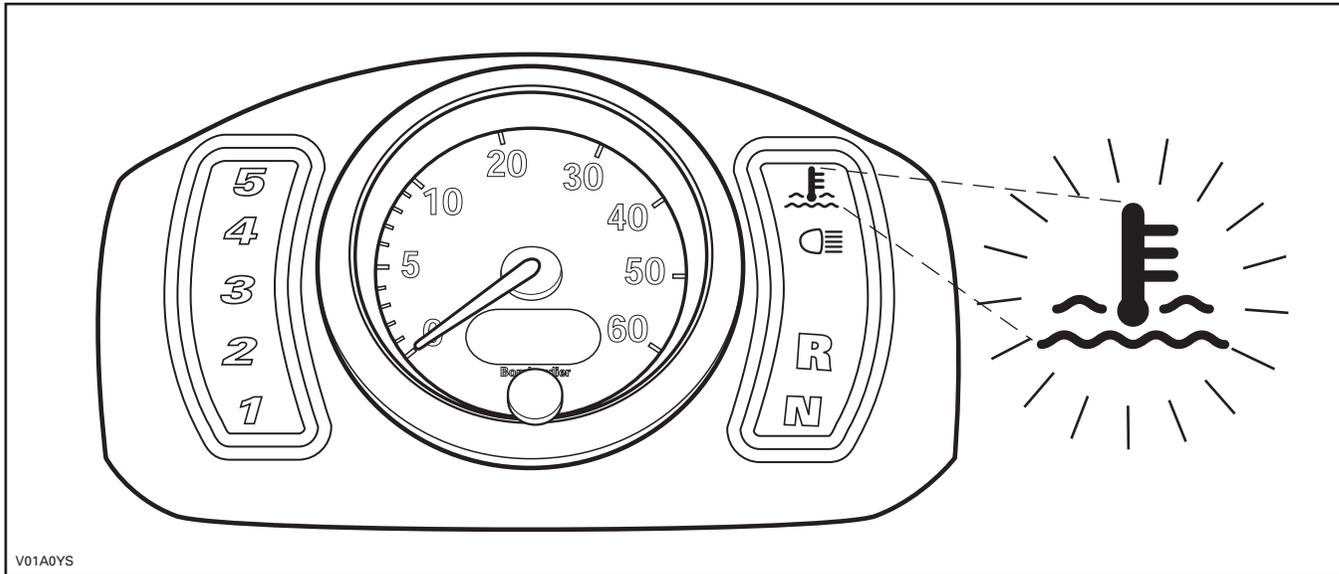


Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

Task 2: Clutch Modulator Calibration

The LED "Check Engine" blinks for a maximum time of 5 seconds or until the user begins the calibration process or removes the jumper.



The upshift/downshift button is used to change the calibration of the clutch modulator valve. When one of these buttons is activated, the LED "Check Engine" stops to blink and goes ON. The corresponding LEDs are turned ON according to the calibration (See table below).

Table 1: Corresponding Clutch Modulation Calibration

GEAR LED								
← HARDNESS			SMOOTHNESS →					
1	1 + 2	2	2 + 3	3	3 + 4	4	4 + 5	5

If the upshift/downshift button is not activated during the time the LED "Check Engine" blinks, the MPKM goes to the next task. Run vehicle to verify if the calibration is OK. The jumper needs to be removed and the key turned OFF and back ON before running the vehicle with the new calibration.

Task 3: Sensors and Solenoids Verification

The MPEM reads all sensors and solenoids and displays the information with the LED "Hi-Lo beam". The LED "Reverse" is ON during all the time the MPEM is verifying the components.

Each abnormal components is represented by a coded number (see table below) and each code number correspond to the number of blinks that the LED "Hi-Lo beam" is doing. When there are two or more abnormal items, the lowest coded numbered item is first indicated and a delay of 2 seconds separates each following code.

When a problem happens, all leds blink in the dashboard to show that there is a problem and will do so until the key switch is turned off. The corresponding register is increased when a problem happen.

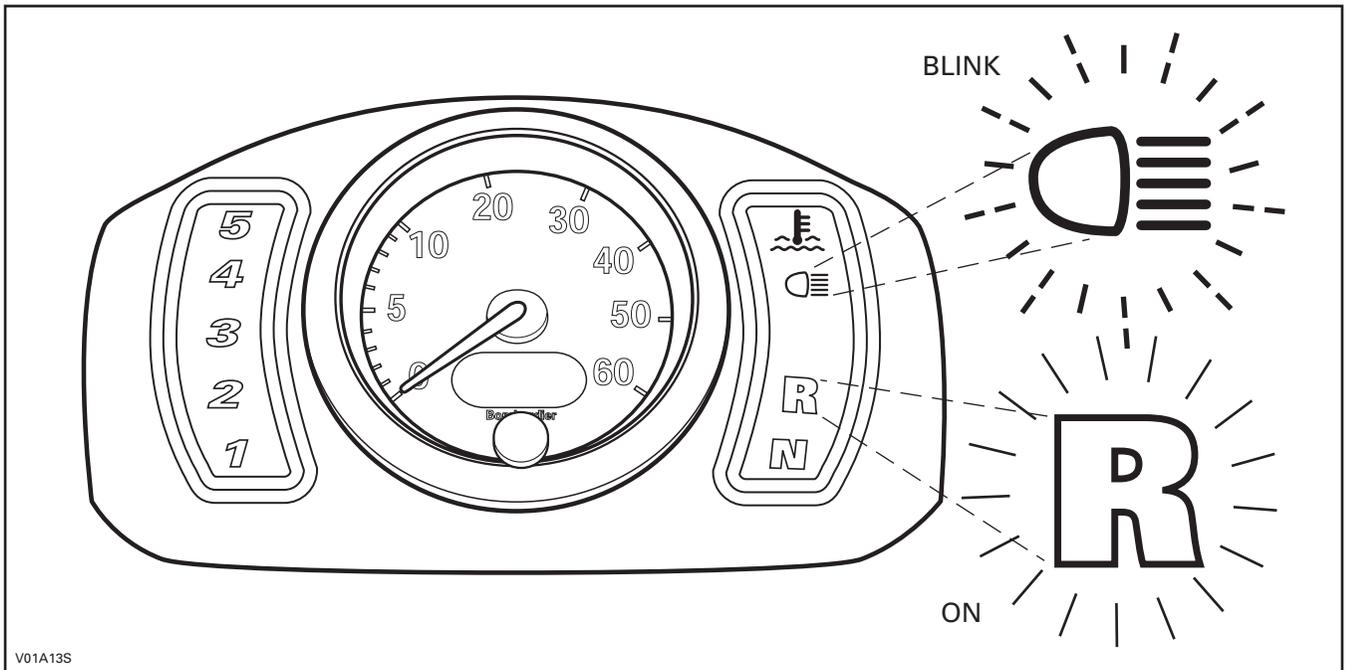


Table 2: Abnormality-Diagnosis Components

CODE NO.	DIAGNOSIS COMPONENT	LED "REVERSE"	LED "HI-LO BEAM"
0	No abnormal components found	LED ON for 3 seconds only	LED OFF
1	Starter solenoid	LED ON	LED blinks 1 time
2	Clutching valve	LED ON	LED blinks 2 times
3	Clutch modulator valve	LED ON	LED blinks 3 times
4	Downshift solenoid	LED ON	LED blinks 4 times
5	Upshift solenoid	LED ON	LED blinks 5 times
6	MPEM Memory	LED ON	LED blinks 6 times
7	Headlight supply	LED ON	LED blinks 7 times
8	Accessory supply	LED ON	LED blinks 8 times
9	Reference supply output	LED ON	LED blinks 9 times

Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

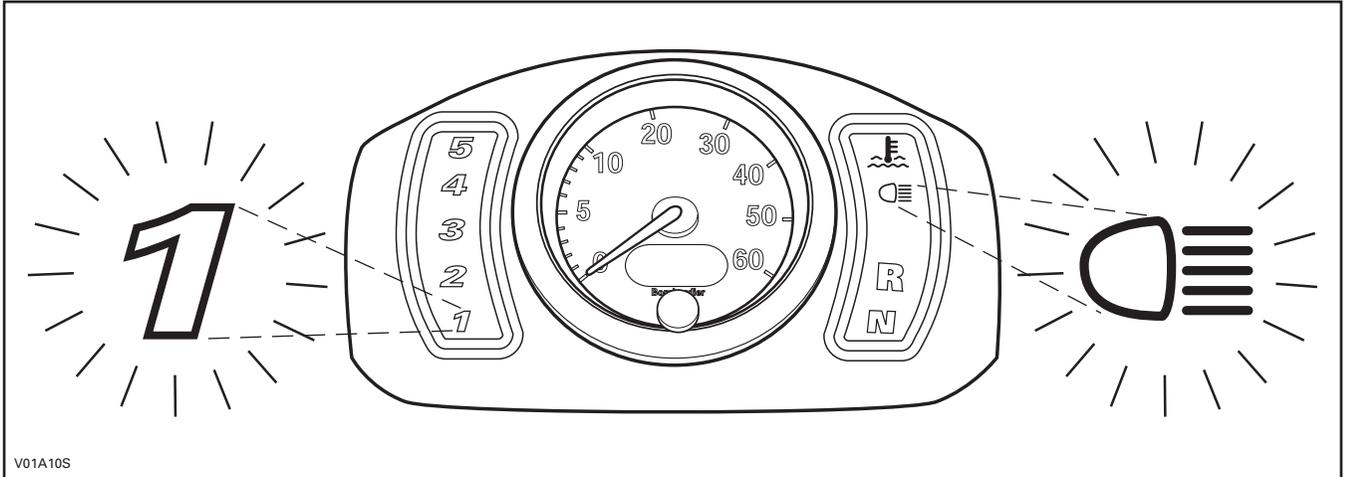
Table 3: Abnormality Conditions

CODE NO.	ABNORMALITY CONDITION	ACTION
1	<ul style="list-style-type: none">– Short circuit to battery is detected.– Operating current on the starter output has exceeded the overload threshold.	Refer to STARTING SYSTEM 05-04.
2	<ul style="list-style-type: none">– Short circuit to battery is detected.– Operating current on the clutch solenoid output has exceeded the overload threshold.	Change clutching valve. Refer to VALVE REMOVAL/INSTALLATION section.
3	<ul style="list-style-type: none">– Short circuit to battery is detected.– Operating current on the clutch modulator valve output has exceeded the overload threshold.	Change clutch modulator valve. Refer to VALVE REMOVAL/INSTALLATION section.
4	<ul style="list-style-type: none">– Short circuit to battery is detected.– Operating current on the downshift solenoid output has exceeded the overload threshold.	Change shifting valve. Refer to VALVE REMOVAL/INSTALLATION section.
5	<ul style="list-style-type: none">– Short circuit to battery is detected.– Operating current on the upshift solenoid output has exceeded the overload threshold.	Change shifting valve. Refer to VALVE REMOVAL/INSTALLATION section.
6	<ul style="list-style-type: none">– Programmable parameters are corrupted.	Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.
7	<ul style="list-style-type: none">– Short circuit to ground is detected ①.– Operating current on the headlight supply output has exceeded ① the overload threshold.	Check: <ul style="list-style-type: none">– Wiring condition.– Headlight. Refer to INSTRUMENTS AND ACCESSORIES 05-07.
8	<ul style="list-style-type: none">– Short circuit to ground is detected.– Operating current on the accessory supply output has exceeded the overload threshold.	Check: <ul style="list-style-type: none">– Wiring condition.– Speedometer. Refer to INSTRUMENTS AND ACCESSORIES 05-07.
9	<ul style="list-style-type: none">– Short circuit to ground is detected.	Check: <ul style="list-style-type: none">– Wiring condition.– STPS and GBPS sensors. Refer to SENSOR TESTS section.

① These abnormality conditions are not detected when the headlight supply output is in dimming mode.

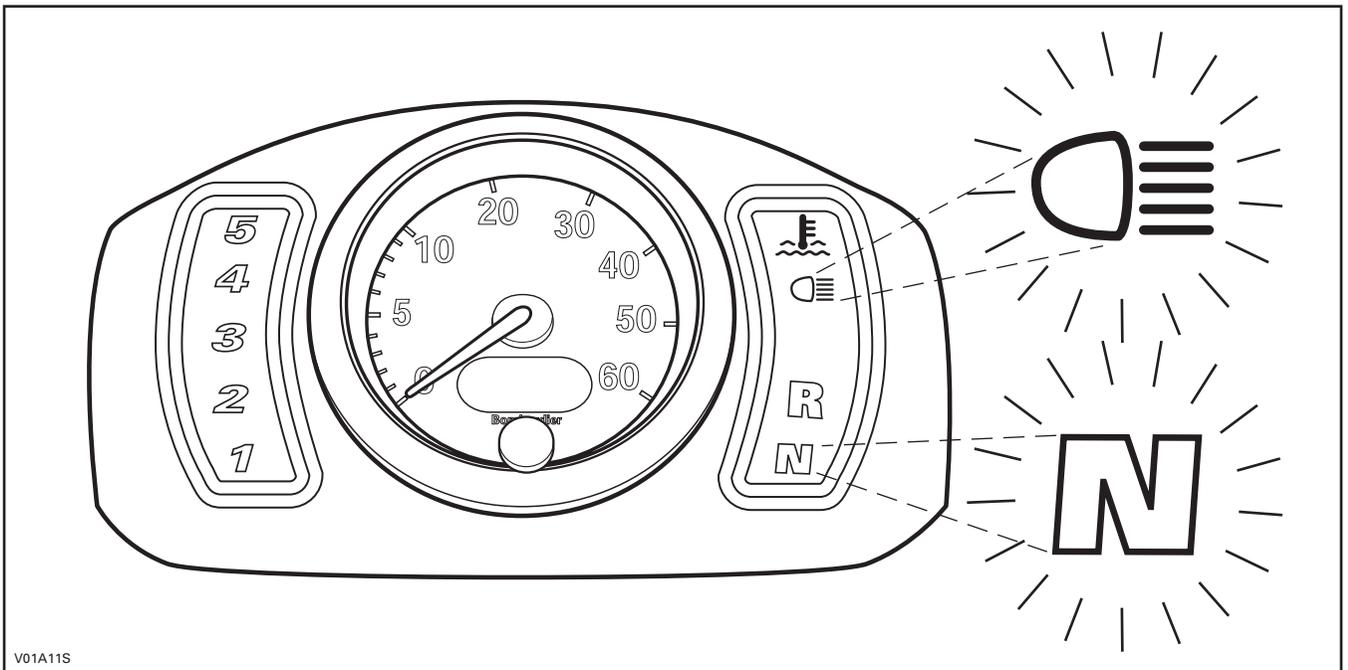
Task 4: GBPS (Gear Box Position Sensor) Calibration

The LEDs "1" and "Hi-Lo beam" are ON during a maximum of 5 seconds or until the user sets the calibration. This calibration mode sets the nominal position of sensor. The GBPS calibration is automatically set when the Start/Stop button and the Hi/Lo beam button are activated at the same time.



Task 5: STPS (Sub-Transmission Position Sensor) Calibration

The LEDs "Neutral" and "Hi-Lo beam" are ON during a maximum of 5 seconds or until the user sets the calibration. This calibration mode sets the nominal position of sensor. The STPS calibration is automatically set when the Start/Stop button and the Hi/Lo beam button are activated at the same time.



The MP3M waits 3 seconds before exiting the diagnostic/calibration mode and switch off.

The jumper needs to be removed and the ignition switch turned OFF and back ON before running the vehicle with the new calibration.

Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

Resetting the Diagnostic Components Register

Before resetting the diagnostic components registers, the MPEM needs to be in the diagnostic/calibration mode.

The register is automatically reset when the following sequence is performed:

- The jumper on the diagnostic connector is removed while the START/STOP button is activated.

The MPEM will reset the register (See table ABNORMALITY-DIAGNOSIS COMPONENTS and table ABNORMALITY CONDITIONS) and after it will turn off itself.

Table 4: Summary of all Tasks

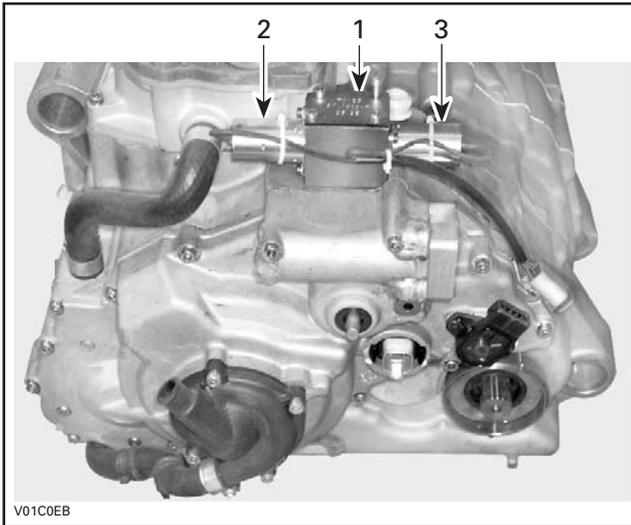
TASK	LED	OPERATION
1. INDICATOR LIGHTS TEST	"5" blinks first, through "1" and after "Check Engine" through "Neutral".	This validates all indicator lights are good.
2. CLUTCH MODULATOR CALIBRATION	"Check Engine" blinks.	Press  button.
3. SENSORS AND SOLENOIDS TEST	"Reverse" is ON "Hi-Lo Beam" blinks.	Do not press any button. Each code number correspond to the number of blinks that the "Hi-Lo Beam" is doing.
4. GBPS CALIBRATION	"1" and "Hi-Lo Beam" are ON.	Simultaneously, press  and  buttons.
5. STPS CALIBRATION	"Neutral" and "Hi-Lo Beam" are ON.	Simultaneously, press  and  buttons.
RESET REGISTERS	N.A.	Remove the jumper on the diagnostic connector and press the  button simultaneously.

VALVE REMOVAL/INSTALLATION

CAUTION: It is recommended to always disconnect the battery when replacing any electric or electronic part(s).

SHIFTING VALVE

The upshift/downshift solenoids are installed on shifting valve. This valve is located on the rear part of engine.



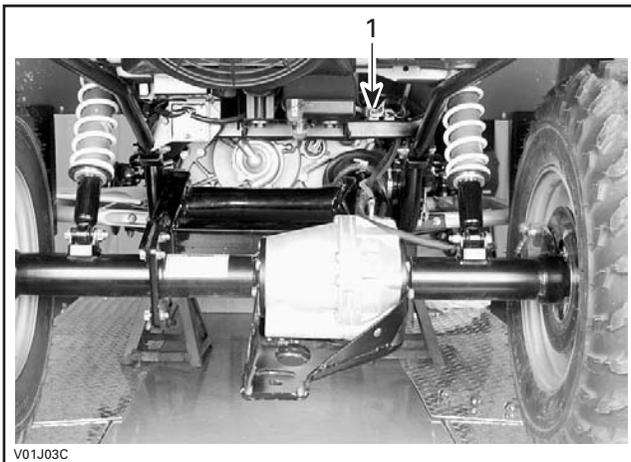
1. Shifting valve
2. Upshift solenoid
3. Downshift solenoid

Test

Refer to VALVES/SOLENOIDS TESTS section.

Removal

Remove seat.
Unplug connector.



1. Upshift/downshift solenoid connector

Remove screws on top of shifting valve.
Pull shifting valve.

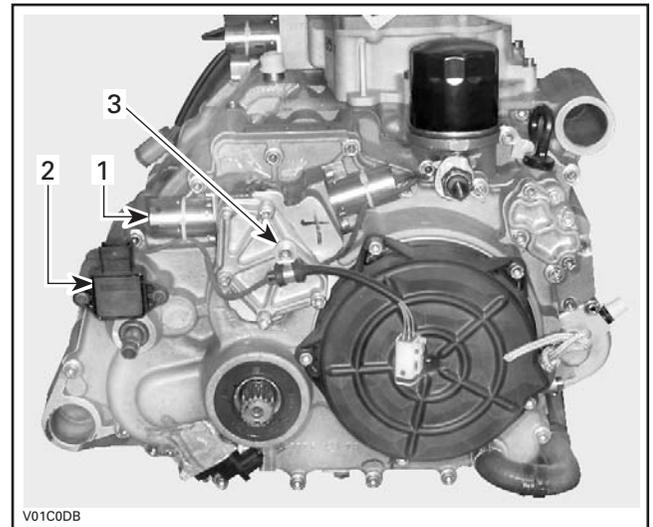
Installation

For the installation, reverse the removal procedure, paying attention to the following details:

- Install a new gasket.
- Apply Loctite 242 on threads and torque to 5 N•m (44 lbf•in).
- Calibrate GBPS (Gear Box Position Sensor) and STPS (Sub-Transmission Position Sensor). Refer to DIAGNOSTIC/CALIBRATION MODE section, tasks 4 and 5.

CLUTCHING VALVE

The clutching valve is located on front of engine.



1. Clutching valve
2. STPS (Sub-Transmission Position Sensor)
3. Cable clip

Test

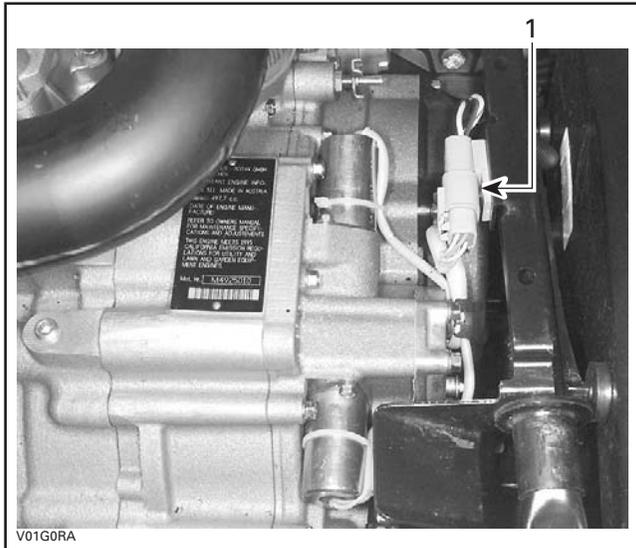
Refer to TEST section.

Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

Removal

Remove fuel tank cover. Refer to BODY 10-02.
Unplug connector on seat pivot bar.



1. Unplug this connector

Remove seat pivot bar.
Remove cable clip from oil duct cover.
Separate wires from Deutsch connector.
Unplug STPS (Sub-Transmission Position Sensor).
Remove screw retaining clutching valve.
Pull clutching valve. Use a pair of pliers and a flat screwdriver.

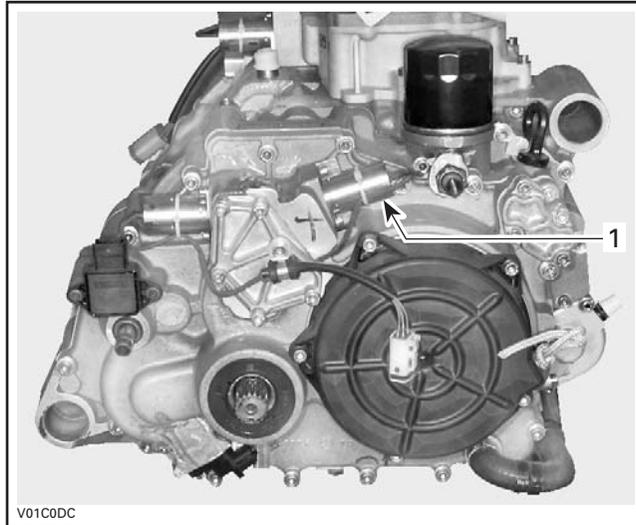
Installation

For the installation, reverse the removal procedure, paying attention to the following details:

- Apply engine oil on O-rings.
- Insert clutching valve in place.
- Tap clutching valve gently with a rubber hammer.
- Apply Loctite 242 on threads and torque screws to 3 N•m (27 lbf•in).
- Calibrate GBPS (Gear Box Position Sensor) and STPS (Sub-Transmission Position Sensor). Refer to DIAGNOSTIC/CALIBRATION MODE section, tasks 4 and 5.

CLUTCH MODULATOR VALVE

The clutch modulator valve is located in front of engine.



1. Clutch modulator valve

Test

Refer to VALVES/SOLENOIDS TESTS section.

Removal

Remove fuel tank cover. Refer to BODY 10-02.
Unplug connector on seat pivot bar.

Remove seat pivot bar.
Remove cable clip from engine.
Separate wires from Deutsch connector.

Remove screw retaining clutch modulator valve.
Pull clutch modulator valve. Use a pair of pliers and flat screwdriver.

For the installation, reverse the removal procedure, paying attention to the following details:

- Apply engine oil on O-rings.
- Insert clutch modulator valve in place.
- Tap clutch modulator valve gently with rubber hammer.
- Apply Loctite 242 on threads and torque screws to 3 N•m (27 lbf•in).
- Calibrate GBPS (Gear Box Position Sensor) and STPS (Sub-Transmission Position Sensor). Refer to DIAGNOSTIC/CALIBRATION MODE section, tasks 4 and 5.

SENSOR REMOVAL/INSTALLATION

CAUTION: It is recommended to always disconnect the battery when replacing any electric or electronic part(s).

STPS (Sub-Transmission Position Sensor)

The STPS is located on front of engine.

Test

Refer to SENSORS TESTS section.

Removal

Remove fuel tank cover. Refer to BODY 10-02.

Remove seat pivot bar.

Unplug STPS.

Remove screws and lock washers retaining STPS on engine.

Pull STPS.

Installation

For installation, reverse the removal procedure. Pay attention to the following details:

- Check O-ring and change if necessary.
- Align interior of the STPS and engine shaft.
- Place connector on top. Secure with screws and lock washers. Apply Loctite 242 on threads.
- Torque screws to 3 N•m (27 lbf•in).
- Calibrate STPS.
Refer to DIAGNOSTIC/CALIBRATION MODE section, task 5.

GBPS (Gear Box Position Sensor)

The GBPS is located on rear of engine.

Test

Refer to SENSORS TESTS section.

Removal

Unplug GBPS.

Remove screws and lock washers.

Pull GBPS.

Installation

For installation, reverse the removal procedure. Pay attention to the following details:

- Check O-ring and change if necessary.
- Align interior of GBPS and engine shaft.
- Place connector on top. Secure with screws and lock washers. Apply Loctite 242 on threads.
- Torque screws to 3 N•m (27 lbf•in).
- Calibrate GBPS.
Refer to DIAGNOSTIC/CALIBRATION MODE section, task 4.

VSS (Vehicle Speed Sensor)

The VSS is located on front of engine.

Test

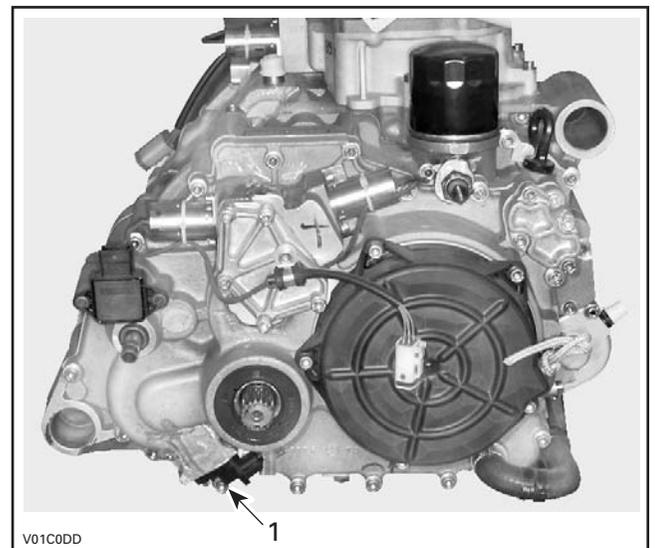
Refer to SENSORS TESTS section.

Removal

Remove skid plate under vehicle. Refer to BODY 10-02.

Remove engine oil. Refer to MAINTENANCE 02-02.
Unplug VSS.

Remove engine bolt under VSS.



1. Remove this bolt in first

Remove bolt retaining VSS.

Pull VSS out of engine.

Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

Installation

For installation, reverse the removal procedure.

Pay attention to the following detail:

- Check O-ring and change if necessary.
- Install VSS and secure with screw. Torque to 9 N•m (80 lbf•in).

NOTE: Don't apply Loctite on threads.

- Install engine bolt. Torque to 9 N•m (80 lbf•in).
- Refill engine with oil.
Refer to MAINTENANCE/LUBRICATION 02-03.

VALVES/SOLENOIDS TESTS

CLUTCHING VALVE AND CLUTCH MODULATOR VALVE TESTS

CAUTION: It is recommended to always disconnect the battery when replacing any electric or electronic part(s).

Always place the transmission on NEUTRAL position and select FIRST gear.

WARNING

Apply parking device.

Place vehicle on level surface.

Install vehicle on jack stands to raise all four tires off the ground.

Unplug clutching and clutch modulator valve connector.

Plug tester (P/N 529 035 653).

Start engine.

Place transmission on HI or LO position and select SECOND or THIRD gear to permit upshift and downshift selection.

Rev engine (about 2500 RPM) and push upshift button.

If RED and BLUE indicator lights blink when button is pushed, clutching valve and clutch modulator valve are operational.

If RED indicator light blinks when button is pushed, clutching valve is operational and clutch modulator valve can be defective. Check the following details:

- Check wiring condition of clutch modulator valve.
- Check upshift/downshift switch, refer to UPSHIFT/DOWNSHIFT BUTTON TESTS section.
- Install a new clutch modulator valve. Refer to VALVES REMOVAL/INSTALLATION section.
- Check AMP connectors on MPEM. Refer to OVERVIEW 05-02.
- Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.

If BLUE indicator light blinks when button is pushed, clutch modulator valve is operational and clutching valve can be defective. Check the following details:

- Check wiring condition from clutching valve.
- Check upshift/downshift switch, refer to UPSHIFT/DOWNSHIFT BUTTON TESTS section.

– Install a new clutching valve. Refer to VALVES REMOVAL/INSTALLATION section.

– Check AMP connectors on MPEM. Refer to OVERVIEW 05-02.

– Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.

If no indicator light blinks when button is pushed:

– Check fuse.

– Check wiring condition.

– Check upshift/downshift switch, refer to UPSHIFT/DOWNSHIFT BUTTON TESTS section.

– Install a new clutching valve and a new clutch modulator valve. Refer to VALVES REMOVAL/INSTALLATION section.

– Check AMP connectors on MPEM. Refer to OVERVIEW 05-02.

– Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.

UPSHIFT/DOWNSHIFT SOLENOIDS TESTS

Unplug shifting valve connector.

Connect tester.

Start engine.

Place transmission on NEUTRAL position and select SECOND or THIRD gear.

Push upshift/downshift button.

If RED and BLUE indicator light blink when button is pushed, the solenoids are good.

If RED or BLUE indicator light doesn't blink when button is pushed:

– Check wiring condition.

– Check upshift/downshift switch, refer to UPSHIFT/DOWNSHIFT BUTTON TESTS section.

– Install a new shifting valve, refer to VALVES REMOVAL/INSTALLATION section.

– Check AMP connectors on MPEM. Refer to OVERVIEW 05-02.

– Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.

If no indicator light blinks when button is pushed on upshift or downshift position:

– Check fuse.

Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

- Check wiring condition.
- Check upshift/downshift switch, refer to UPSHIFT/DOWNSHIFT BUTTON TESTS section.
- Install a new shifting valve, refer to VALVES REMOVAL/INSTALLATION section.
- Check AMP connectors on MPEM. Refer to OVERVIEW 05-02.
- Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.

SENSOR TESTS

STPS (Sub-Transmission Position Sensor) AND GBPS (Gear Box Position Sensor) TESTS

NOTE: The reverse vehicle speed limiter doesn't work when STPS is faulty.

If STPS or GBPS sensor blink code is indicated.

The sensor can be defective. Check the following details:

SENSOR	LED	
STPS	R and N	Blinks
GBPS	1 to 5 (simultaneously)	Blinks

- Check wiring condition.
- Remove sensor and turn inner parts with a finger:
 - If LEDS work properly, sensor is good. Continue check.
 - If LEDS don't work when inner parts are turned, change sensor and calibrate the new sensor, see DIAGNOSTIC/CALIBRATION MODE section, task 4 or 5.
- Check AMP connectors on MPEM. Refer to OVERVIEW 05-02.
- Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.
- If the problem persists, mechanical problem is probable. Call SERVICE REPRESENTATIVE.

VSS (Vehicle Speed Sensor) TESTS

If VSS is not working properly, the speedometer will not indicate vehicle speed. Check the following details:

- Measure voltage between BLACK/BROWN and PINK wires on speedometer connector under steering cover. Place vehicle on NEUTRAL position, turn ignition switch ON and move vehicle very slowly. The obtained value vary between 0.5 and 8 Vdc. If voltage is good, continue check. If not, change VSS.
- Check wiring condition.
- Check AMP connectors from MPEM. Refer to OVERVIEW 05-02.
- Install a new MPEM. Refer to INSTRUMENTS AND ACCESSORIES 05-07.

Section 05 ELECTRICAL

Subsection 06 (ELECTRIC SHIFT SYSTEM)

UPSHIFT/DOWNSHIFT SWITCH TESTS

UPSHIFT/DOWNSHIFT SWITCH

Open multi-function switch box.

Using a multimeter, measure resistance between the following wires.

POSITION	WIRE	RESISTANCE
UPSHIFT		
Switch released	BLACK and RED	Infinite (0.L)
Switch depressed and held		0.4 Ω max.
DOWNSHIFT		
Switch released	BLACK and GREEN	Infinite (0.L)
Switch depressed and held		0.4 Ω max.

Replace switch if defective.

INSTRUMENTS AND ACCESSORIES

REMOVAL AND INSTALLATION

CAUTION: It is recommended to always disconnect the battery when replacing any electric or electronic parts.

12-VOLT AUXILIARY POWER OUTLET

The 12-volt auxiliary power outlet is located on the LH rear part of the rear extension frame. The connectors are protected by heat shrink tubing.

The 12-volt auxiliary power outlet allows the installation of additional accessories.

Test

Refer to TESTS section.

12-VOLT POWER OUTLET

Test

Refer to TESTS section.

Removal

Remove the steering cover. Refer to BODY 10-02.
Unplug the connectors of the power outlet.
Unscrew the retaining nut.

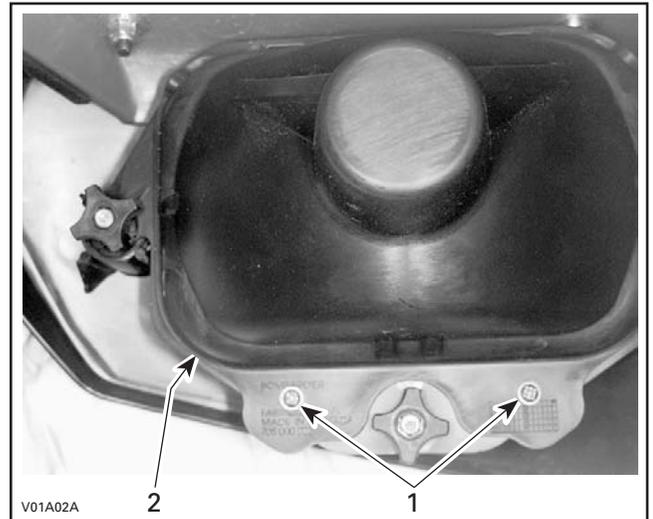
Installation

Reverse the removal procedure.

HEADLIGHT

Removal

Remove screw and lift up the sealed beam cover.



1. Remove screws
2. Lift up the sealed beam cover

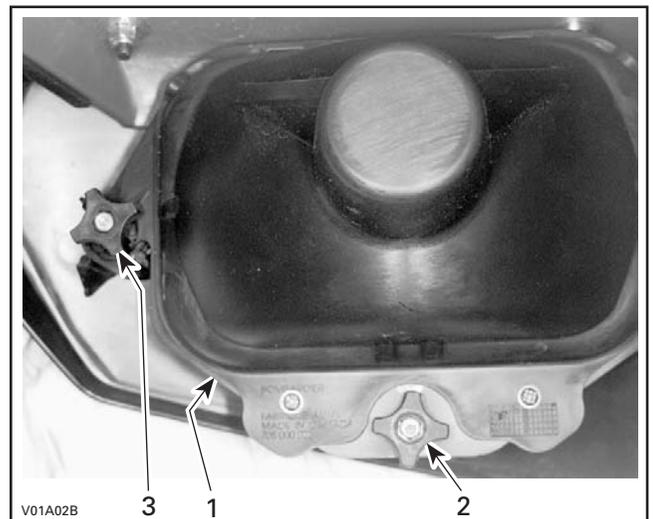
Installation

Properly reinstall removed parts in the reverse order of their removal.

Adjustment

Adjust beam aiming as follows:

Turn knobs to adjust beam height and side orientation as explained below. Adjust both headlights evenly.



1. Headlight
2. Beam height adjustment
3. Beam side adjustment

Section 05 ELECTRICAL

Subsection 07 (INSTRUMENTS AND ACCESSORIES)

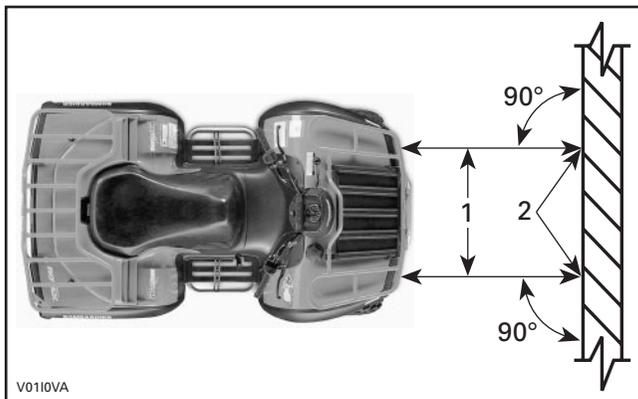
HEADLIGHT BEAM AIMING

Select **high** intensity.

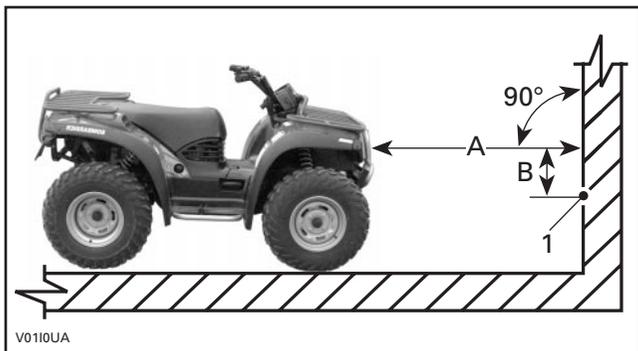
Beam aiming is correct when center of high beam is 131 mm (5 in) below the headlight horizontal center line, scribed on a test surface, 5 m (17 ft) away.

NOTE: Sit down the driver or place the same weight on the vehicle.

Measure headlight center distance from ground. Scribe a line at this height on test surface (wall or screen). Light beam center should be 131 mm (5 in) below scribed line.



1. Headlights center lines
2. Light beam center



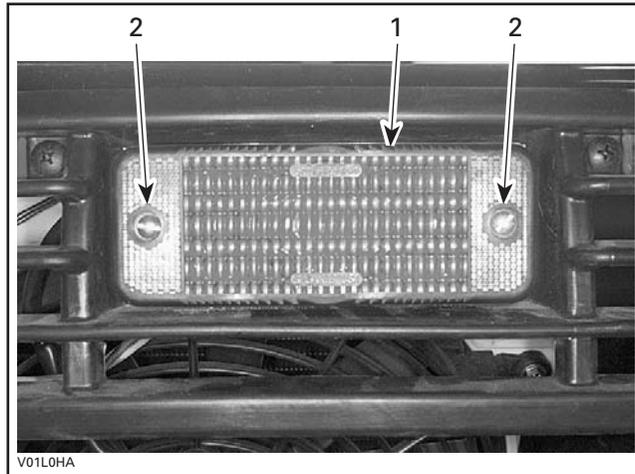
1. Light beam center
- A. 5 m (17 ft)
- B. 131 mm (5 in)

Taillight Bulb Replacement

Unscrew lens screws to expose bulb.

Push bulb in and hold while turning counterclockwise to release.

Install the new bulb by first pushing in while turning clockwise.



1. Lens
2. Screws

IGNITION SWITCH

Test

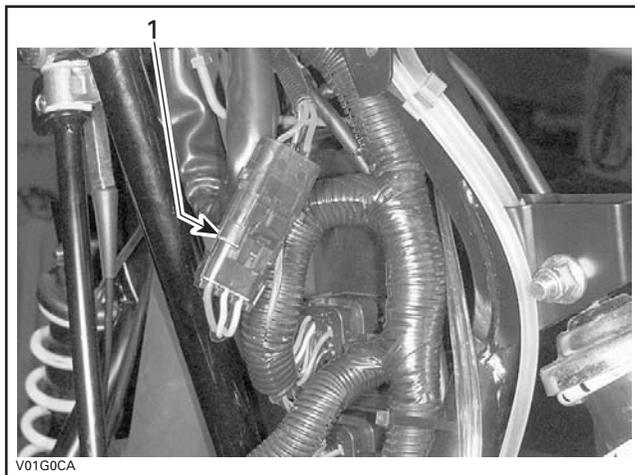
Refer to IGNITION SYSTEM 05-05.

Removal

Lift the steering cover and unscrew the ignition switch nut.

NOTE: Do not unplug connectors when steering cover is lifted.

Unplug the switch connector.



1. Switch connector

Installation

For the installation, reverse the removal procedure.

INDICATOR LIGHTS

Test

Refer to TESTS section.

Removal

Remove the steering cover. Refer to BODY 10-02.

NOTE: Do not unplug all connectors. Lift up the steering cover and unplug the indicator lights connector(s) only.

Press locking tabs on each side of the indicator lights and push the indicator lights outside.

Installation

For the installation, reverse the removal procedure.

MPEM

Test

Refer to specific system (ignition system, etc.) for testing procedures.

Removal

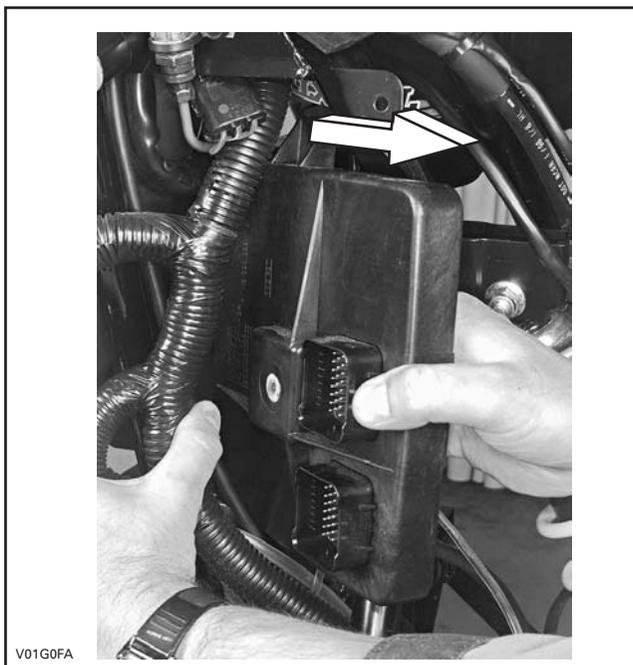
Remove fuel tank.

NOTE: It's not necessary to remove fuel tank completely, lean toward engine only.

Unplug AMP connectors.

Remove the screws on the top of MPEM.

Slide MPEM to right side.



Installation

For the installation, reverse the removal procedure.

SPEEDOMETER

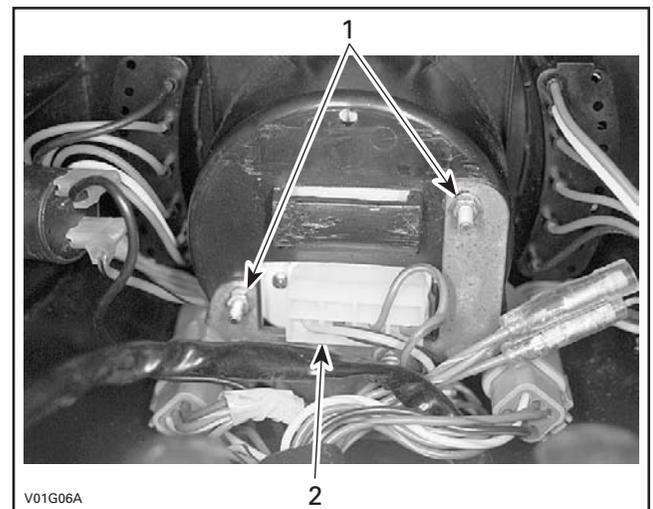
Test

Refer to TESTS section.

Removal

Remove the steering cover. Refer to BODY 10-02.

Remove the two nuts under speedometer and unplug the connector.



1. Remove the two nuts
2. Unplug the connector

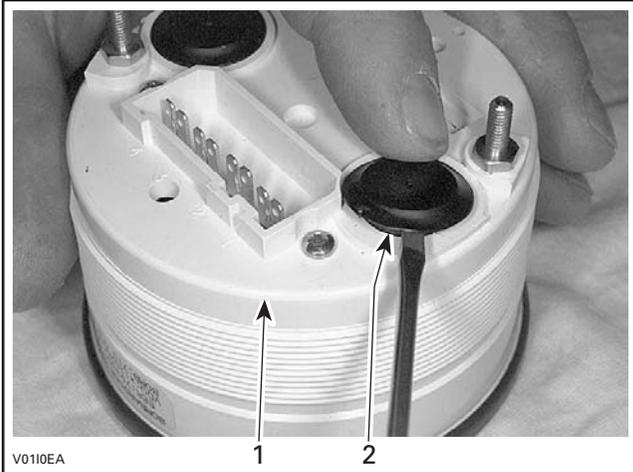
Section 05 ELECTRICAL

Subsection 07 (INSTRUMENTS AND ACCESSORIES)

Speedometer Bulbs Replacement

Each bulb can be replaced individually. Proceed as follows:

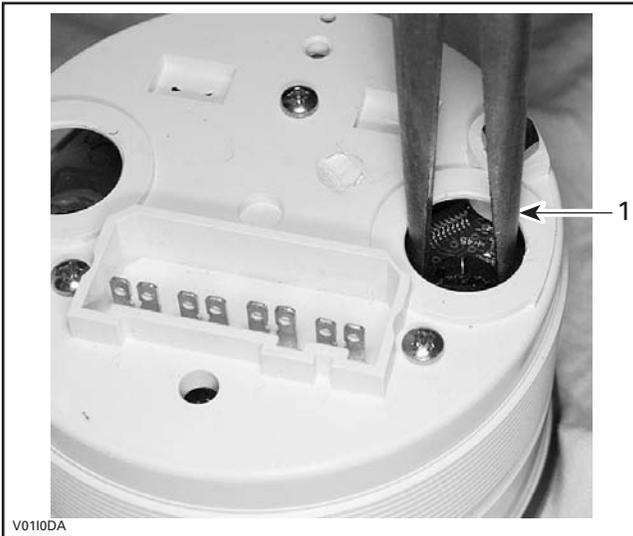
Using a small screwdriver, pry cap out to expose bulb socket.



1. Speedometer
2. Pry cap out

Insert a small screwdriver in socket slot and turn counterclockwise until stopped.

Use small long nose pliers to pull bulb out or carefully pry out using a small screwdriver.



1. Pull bulb out

Reinstall new bulb using long nose pliers. Turn bulb socket clockwise to lock.

Installation

For the installation, reverse the removal procedure.

TESTS

12-VOLT AUXILIARY POWER OUTLET

Using a multimeter, measure the voltage between RED/BLACK and BLACK wires.

The obtained value should be between 12 and 14.5 Vdc.

- No voltage:
 - Check fuse no. 2 and wiring condition.
- Voltage is good:
 - Check outer accessory.

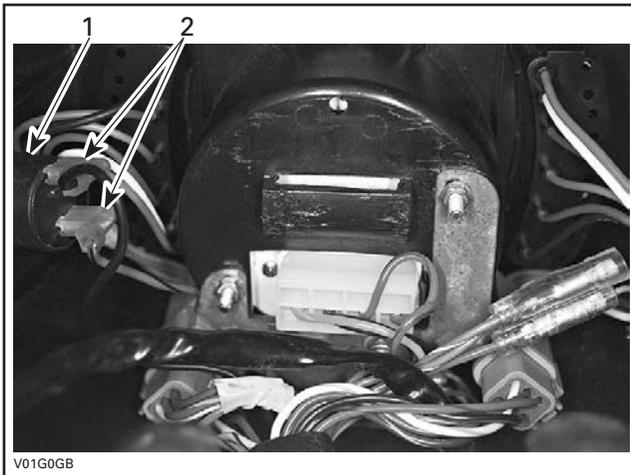
12-VOLT POWER OUTLET

Remove the steering cover.

Unplug the power outlet connectors.

Using a multimeter, measure the voltage between RED/BLACK and BLACK wires.

The obtained value should be between 12 and 14.5 Vdc.



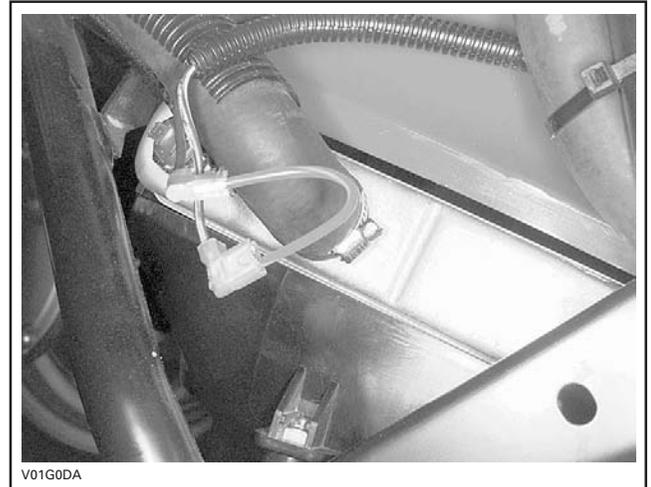
1. 12-volts power outlet
2. Power outlet connectors

- No voltage:
 - Check fuse and wiring condition.
- Voltage is good:
 - Change power outlet.

COOLING FAN OPERATION TEST

Unplug the temperature sender connectors.

Install a jumper wire end in each connector. Replace the fan if it does not work.



HEADLIGHT

Using a multimeter, measure the voltage between GREEN/ORANGE and BLACK wires.

Start the engine. The obtained value should be between 12 and 14.5 Vdc.

NOTE: In diming mode, the obtained value should be between 7 and 10 Vdc.

- No voltage:
 - Check wiring condition and HI-LO switch.
- Voltage is good:
 - Change headlights.

HI-LO SWITCH

Open multi-function switch box.

Using a multimeter, measure the resistance between the following wires.

POSITION	WIRE	RESISTANCE
Switch released	BLACK and BLUE	Infinite (0.L)
Switch depressed and held		0.4 Ω max.

Replace switch if defective.

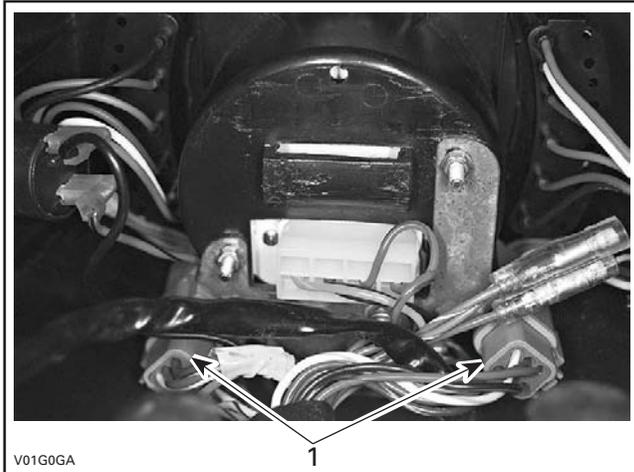
Section 05 ELECTRICAL

Subsection 07 (INSTRUMENTS AND ACCESSORIES)

INDICATOR LIGHTS

Remove steering cover. If switch tests good, check wiring condition and MPEM.

Unplug indicator light connector.



1. Indicator lights connectors

Test each LEDS with two 1.5 V battery (AA), connected in series.

- LEDS are good
 - Check wiring condition.
 - Check AMP connectors.
 - Change MPEM.
- LEDS are burned
 - Change indicator lights.

SPEEDOMETER

Using a multimeter, measure the voltage between RED/GREY and BLACK/BROWN wires.

Turn ignition switch to ON. The obtained value should be between 12 and 14.5 Vdc.



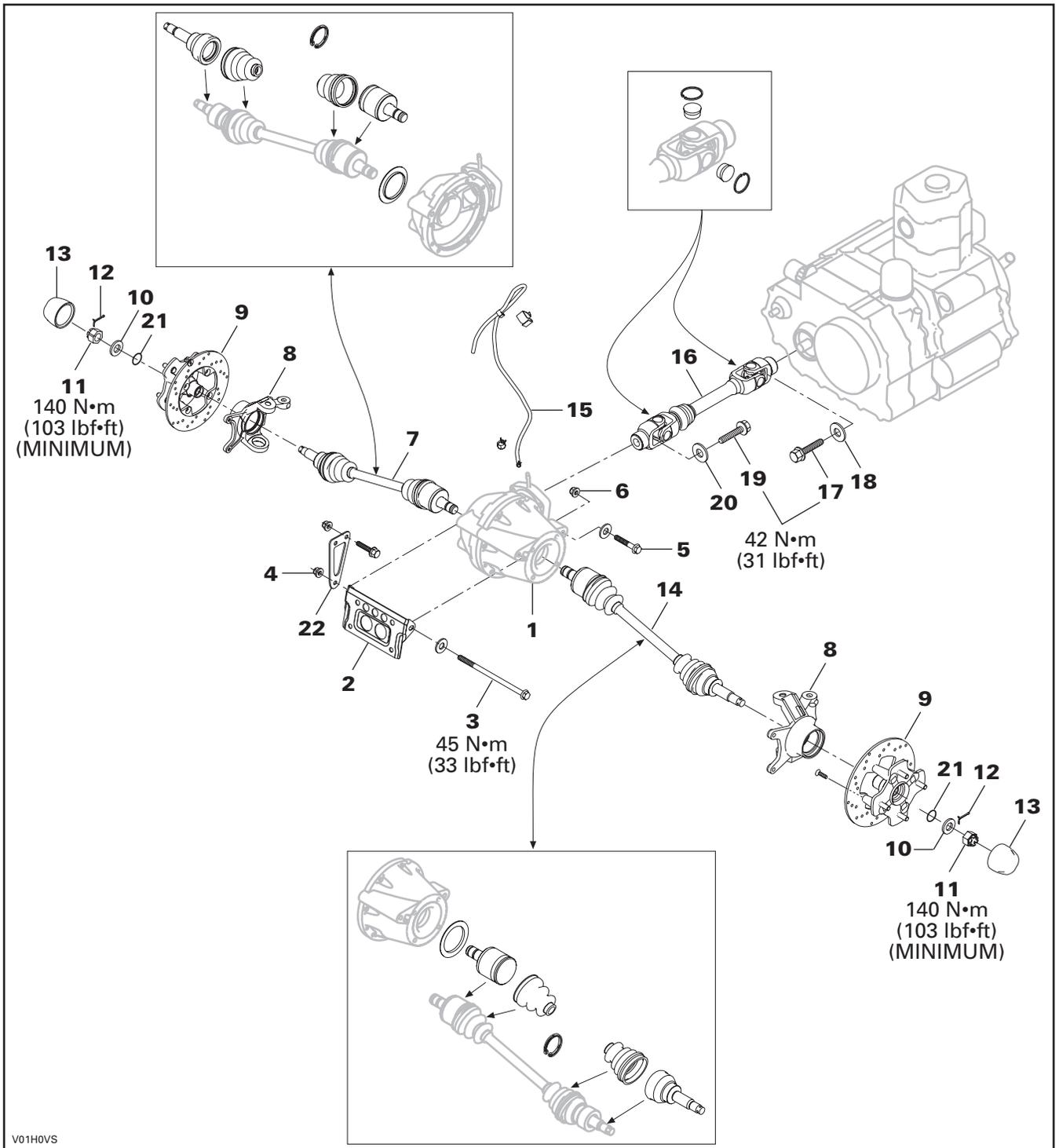
- No voltage on speedometer:
 - Check VSS (Vehicle Speed Sensor), refer to ELECTRIC SHIFT SYSTEM 05-06. If VSS voltage is good, check fuse no. 3 and wiring condition.
- No voltage on speedometer and VSS:
 - Check MPEM wiring condition and/or change MPEM.
- Voltage on speedometer:
 - If VSS voltage is good, change speedometer.
 - No voltage on VSS. Check VSS.

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REAR PROPELLER SHAFT.....	06-03-4

FRONT DIFFERENTIAL



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Section 06 DRIVE TRAIN

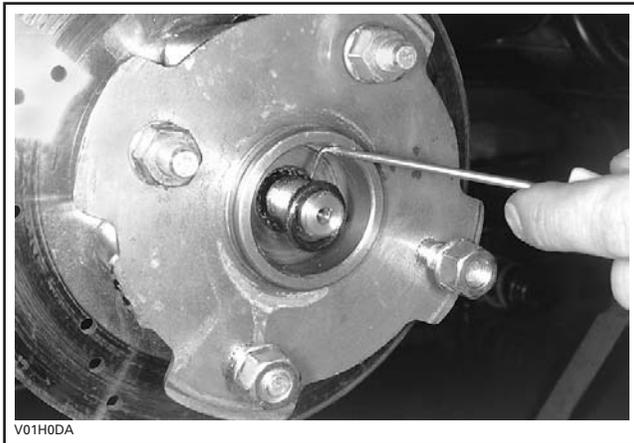
Subsection 02 (FRONT DIFFERENTIAL)

FRONT DRIVE SHAFT

Removal

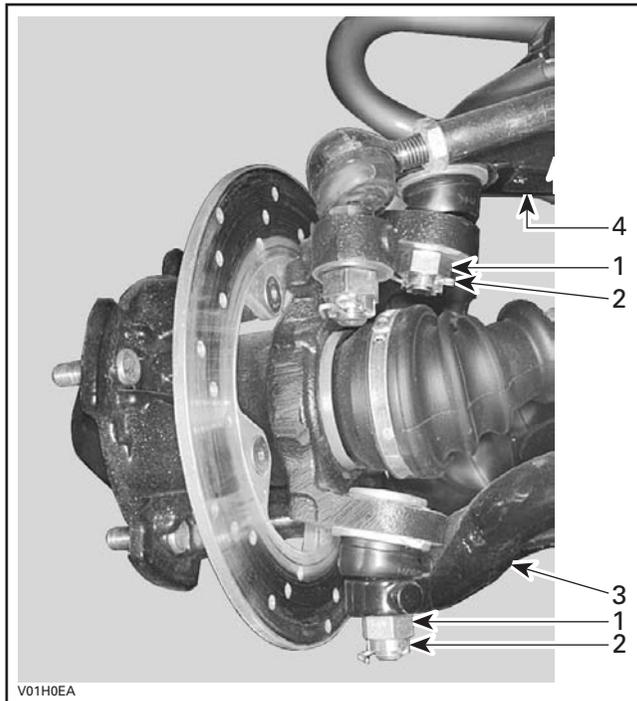
Raise the front of vehicle, support it securely on jack stands and remove front wheel(s).

Remove wheel cap no. 13, cotter pin no. 12, castellated nut no. 11, flat washer no. 10 and O-ring no. 21.



CHECK THE O-RING FOR DAMAGE, REPLACE IF NECESSARY

Remove cotter pin and castellated nut from upper and lower suspension arms.



1. Castellated nut
2. Cotter pin
3. Lower suspension arm
4. Upper suspension arm

Separate knuckle no. 8, with hub and disk brake no. 9, from lower and upper suspension arms.

Separate knuckle from the drive shaft no. 7 or no. 14.

Pull drive shaft out of differential no. 1.

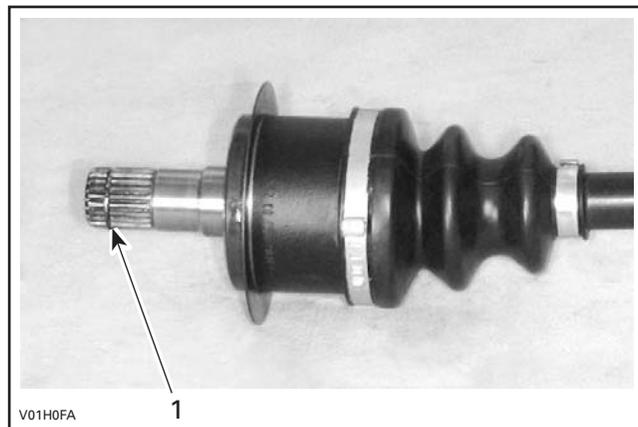
NOTE: Pull drive shaft strongly.

Inspection

Inspect the condition of boots. If there is any damage or evidence of leaking lubricant, replace them. Refer to **Drive Shaft Boot** section.

Installation

Apply grease (P/N 293 550 019) to the splines and insert the end of drive shaft in differential and pull joint a little to make sure that the stop ring is locked in differential side gear groove.



1. Stop ring

Insert the other end of drive shaft in the knuckle and install the knuckle, with hub and disk brake, to the lower and upper suspension arm. Torque the castellated nuts to 75 N•m (55 lbf•ft) and install a new cotter pin.

Install the flat washer and torque the castellated nut on the drive shaft end to 140 N•m (103 lbf•ft) minimum. Install a new cotter pin and the wheel cap.

Reinstall the front wheel(s) and torque the four nuts to 75 N•m (55 lbf•ft).

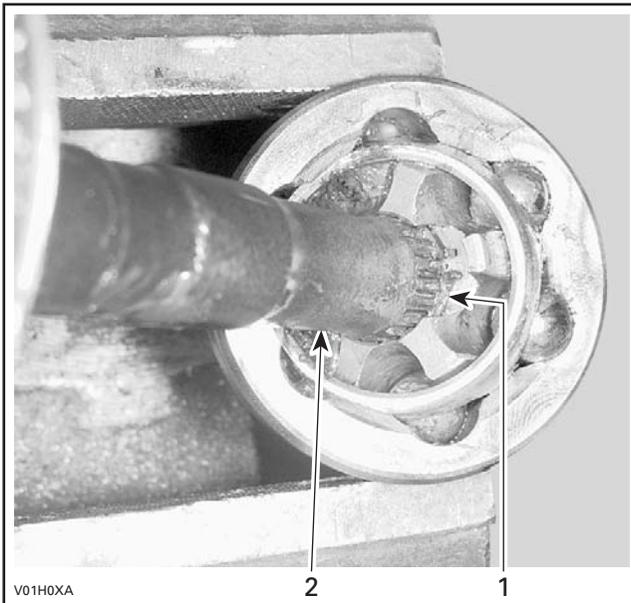
Drive Shaft Boot

Removal

Remove:

- clamps from rubber boot using boot clamp pliers (P/N 295 000 069 and 295 000 054)
- large end of the boot from plunging joint or CV joint

Move apart circlip and pull out the shaft from bearing. Do not remove circlip.



1. Circlip
2. Shaft

Remove boot from drive shaft.

Inspection

Check bearing in plunging joint or CV joint. If bearing is hard to move, change plunging joint or CV joint.

Check circlip for damage, change as necessary.

Installation

For installation, reverse the removal procedure. Paying attention to the following details.

Insert boot, do not forget the small clamp.

Insert shaft and push firmly.

Pack bearing area with grease (including with the new boot kit).

NOTE: Do not use an other grease.

FRONT DIFFERENTIAL

Removal

Raise front of vehicle, support it securely on jack stands and remove front wheels.

Remove:

- skid plate
- winch protector
- front bumper
- inner fender

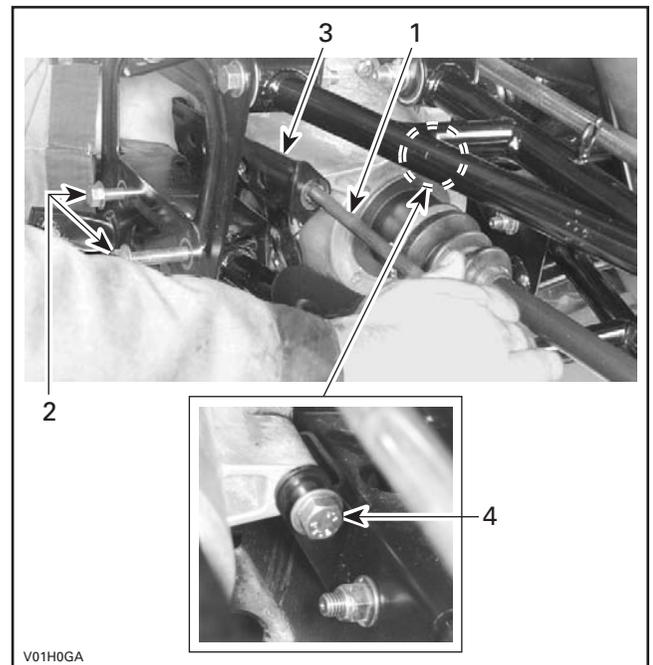
Refer to BODY 10-02 for the proper instructions.

On LH side, remove:

- wheel cap **no. 13**
- cotter pin **no. 12**
- castellated nut **no. 11**
- flat washer **no. 10**
- O-ring **no. 21**

On front side, remove:

- differential mounting bracket bolt
- front mounting bolt **no. 3**
- rear mounting bolt **no. 5**
- differential bracket **no. 22**
- mounting bracket **no. 2**



1. Front mounting bolt M10 x 200
2. Differential mounting bracket bolts
3. Bracket
4. Rear mounting bolt M10 x 60

Section 06 DRIVE TRAIN

Subsection 02 (FRONT DIFFERENTIAL)

On RH side, remove drive shaft.

Unscrew propeller shaft bolt **no. 19**. Differential side only.

Remove vent tube **no. 15** on the top from the front differential.

Pull differential forward then separate propeller shaft from differential.



Remove front differential by the RH side.

Separate drive shaft **no. 14** from differential.

Inspection

Turn front differential gear with a finger; it should turn smoothly. Replace if necessary.

With drive shafts installed, check backlash and axial play.

Installation

For installation, reverse the removal procedure.

NOTE: Do not forget flat washer when rear mounting bolt **no. 5** installation.

Front Differential Oil Level

Clean filler plug prior to check oil level.

With vehicle on a level surface, check oil level by removing filler plug. Oil level must reach the lower edge.

Add oil if necessary. Refer to TECHNICAL DATA 11-02 for capacity and recommended oil.

Front Differential Oil Change

Place vehicle on a level surface. Set transmission in park position.

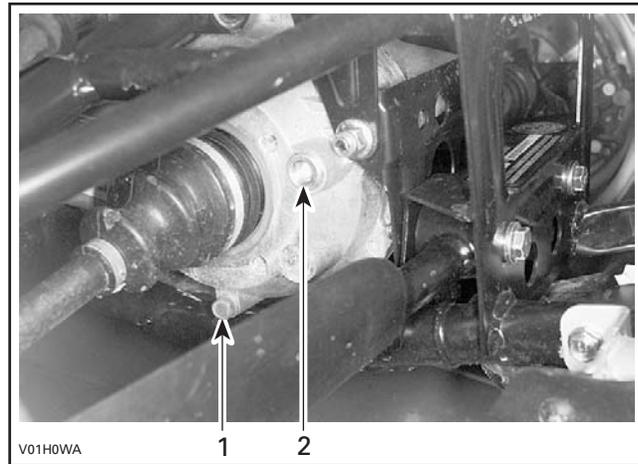
Lift LH side of vehicle.

Clean drain plug area.

Place a drain pan under differential drain plug area.

Remove drain plug.

Unscrew filler plug.



1. Drain plug
2. Filler plug

Clean drain plug area then reinstall plug.

Lower vehicle.

Use a funnel and refill front differential at the proper level with the recommended oil. Refer to TECHNICAL DATA 11-02.

Reinstall filler plug.

FRONT PROPELLER SHAFT

Removal

Remove:

- skid plate
- winch protector
- front bumper
- inner fender

Refer to BODY 10-02 for the proper instructions.

Remove propeller shaft bolts and flat washers. One on engine side **no. 17** and **18**, one on differential side **no. 19** and **20**. Discard bolts.

Remove vent tube **no. 15** on the top from the front differential.

Pull differential forward then separate propeller shaft from differential and engine.

Inspection

Check propeller shaft for wear or damage, replace if necessary.

Installation

Installation is the reverse of removal procedure.



- 1. Engine side
- 2. Differential side

NOTE: Secure propeller shaft with new self-locking screws.

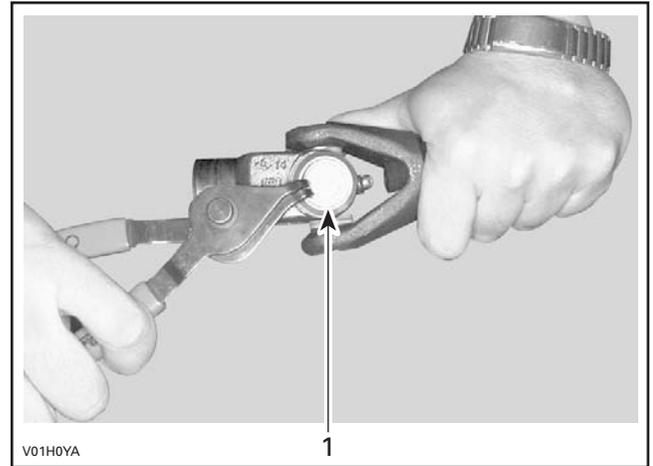
Front Propeller Shaft Lubrication

- Place vehicle on a level surface.
- Set transmission in park position.
- Remove inner fender on front right side.
- Set transmission on neutral position and move vehicle back and forth to place grease fittings toward opening.
- Re-set transmission in park position.
- Grease rear and front U-joint. Use a grease gun with SHELL, Alvania EP-2 grease **only**.
- Reinstall inner fender.

Front Propeller Shaft U-joint

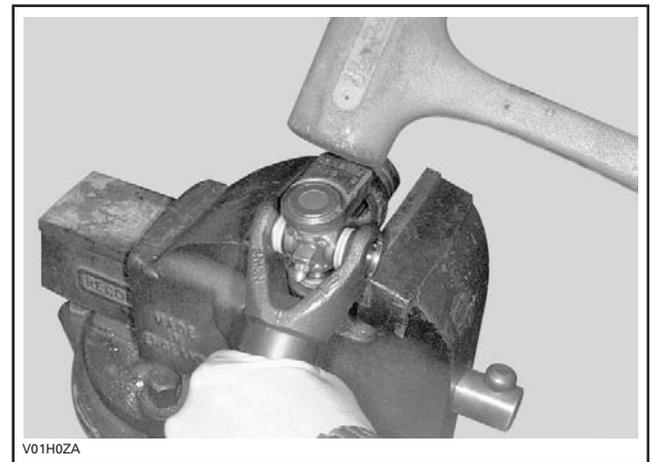
Removal

Remove internal snap ring from bearing caps.



- 1. Snap ring

Support inner yoke in vice and drive other yoke down with a soft hammer.



Support U-joint in vice and drive inner yoke down to remove remaining bearing caps.

Remove U-joint cross.

Installation

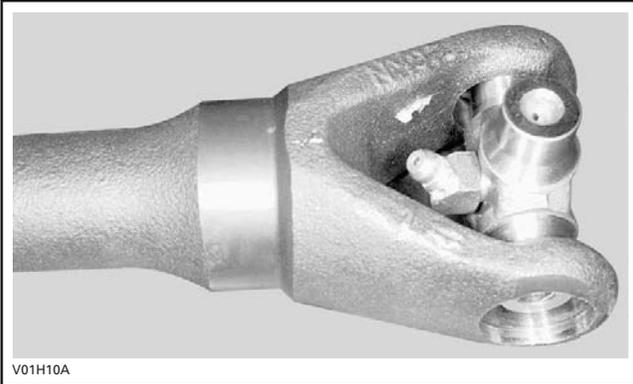
Install new U-joint cross in inner yoke.

Install new bearing cap by hand.

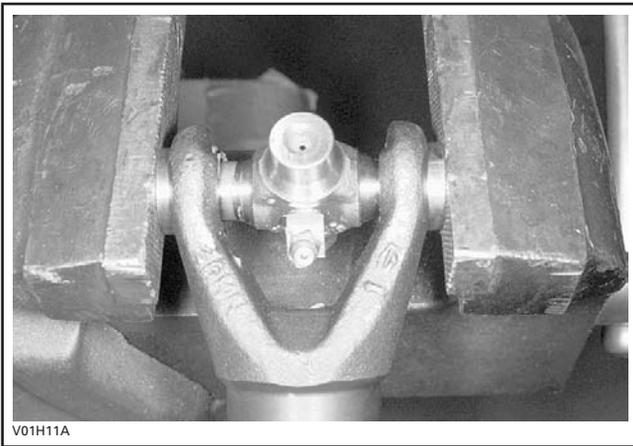
NOTE: Carefully install U-joint cross with grease fitting properly positioned.

Section 06 DRIVE TRAIN

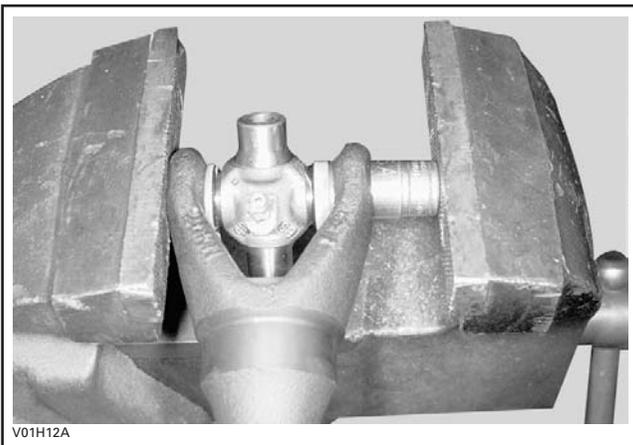
Subsection 02 (FRONT DIFFERENTIAL)



Tighten vise to force bearing caps in.



Using a suitable arbor, fully seat bearing cap in one side. Continually, check for free movement of bearing cross as bearing caps are assembled.

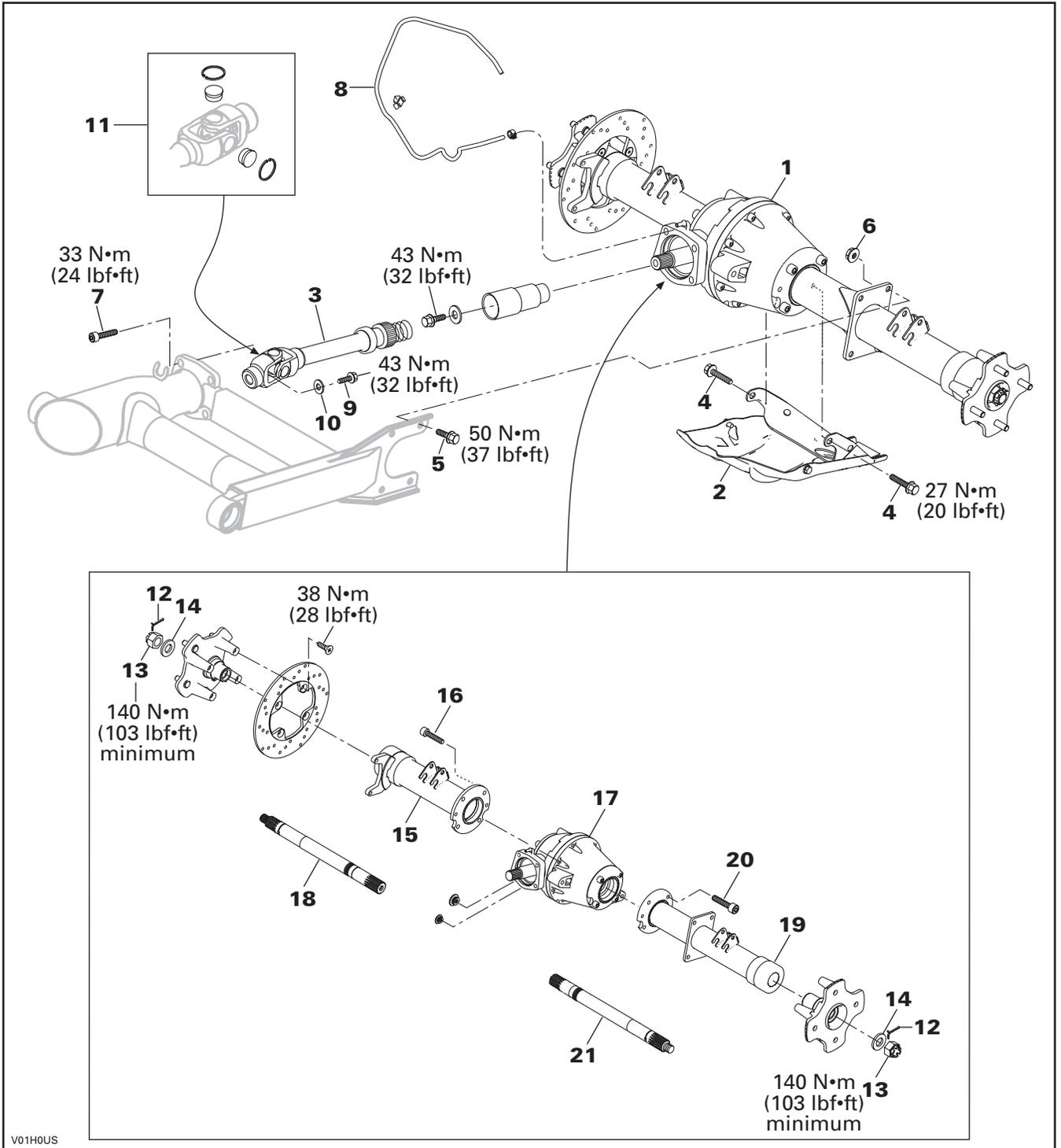


Install snap ring.

Repeat procedure for other sides.

Grease U-joint, using a grease gun with SHELL, Alvania EP-2 grease **only**.

REAR AXLE



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Section 06 DRIVE TRAIN

Subsection 03 (REAR AXLE)

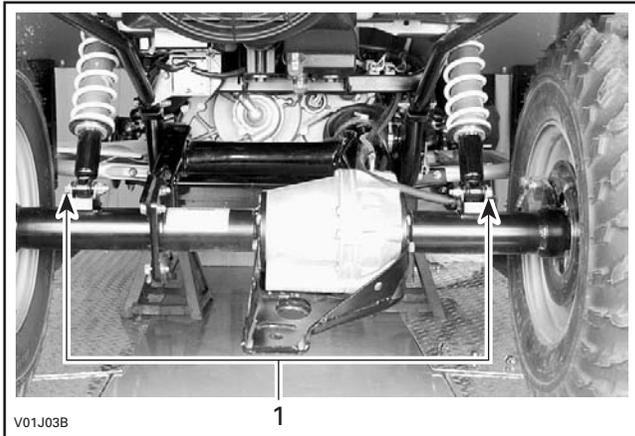
RIGID AXLE

Removal

Lift rear of the vehicle until rear shock absorbers are fully extended. Install jack stands under frame to support vehicle.

Remove the rear wheels.

Remove lower shock absorber bolts and elastic flanged nuts.

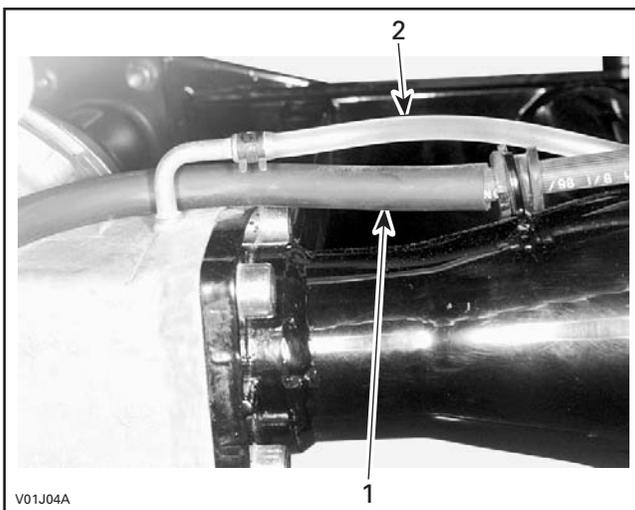


1. Lower shock absorber bolts

Remove rear brake caliper and detach brake hose from bracket on rigid axle no. 1.

CAUTION: Don't let caliper hang by the hose and don't stretch or twist brake hose.

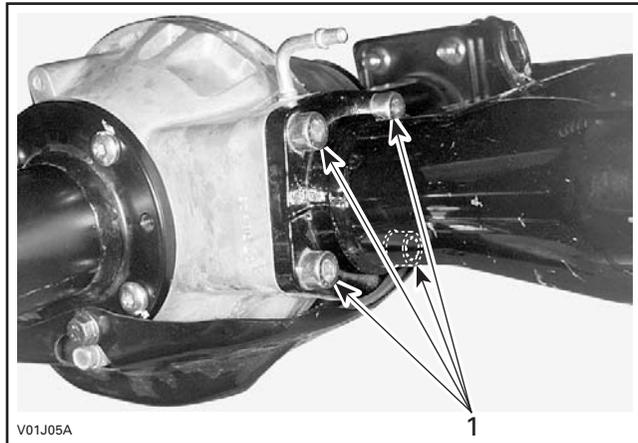
Disconnect vent tube no. 8 on rigid axle.



1. Brake hose
2. Vent tube

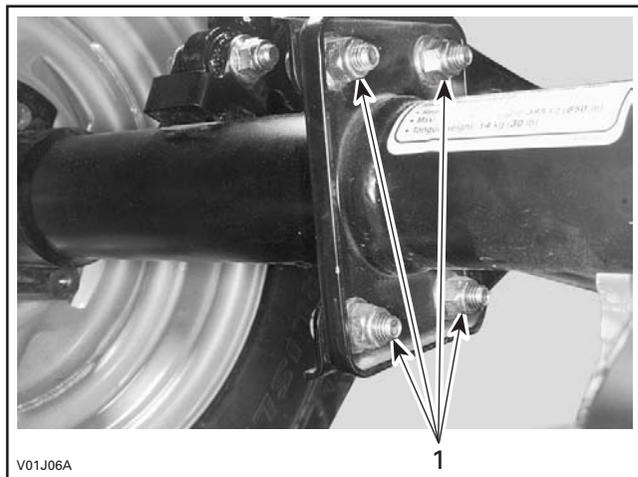
Remove the M8 x 10 flanged bolts no. 4 retaining protector no. 2 under rear rigid axle center section.

Remove the M10 x 25 socket screws no. 7 retaining rigid axle center section to swing arm.



1. Remove M10 x 25 socket screws

Remove the M10 x 25 flanged bolts no. 5 and elastic flanged nuts no. 6 retaining swing arm to rigid axle.



1. Remove flanged bolts and elastic flanged nuts

Detach rigid axle from swing arm.

Installation

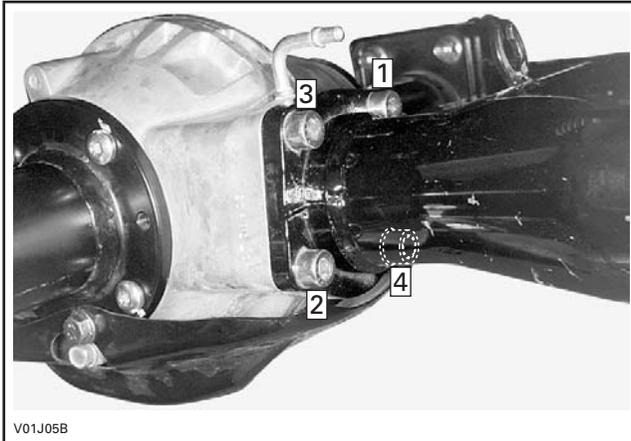
Installation is essentially the reverse of removal procedure. Paying attention to the following details.

Apply grease (P/N 293 550 019) on the spring to the end of the propeller shaft.

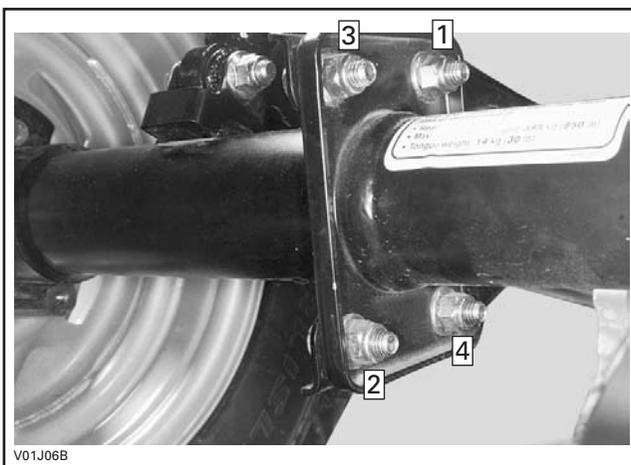
Secure rear rigid axle center section to swing arm with socket screws. Apply sealant Right Stuff (P/N 293 800 053) between both parts. Do not tighten yet.

Secure rear axle tube to swing arm with bolts. Do not tighten yet.

When all bolts are installed, torque in a criss-cross sequence.



RIGID AXLE CENTER SECTION



REAR AXLE TUBE

Rear Axle

Removal

RH SIDE AXLE

Remove:

- wheel and wheel cap
- cotter pin **no. 12**
- castellated nut **no.13**
- flat washer **no. 14** and O-ring
- caliper
- rigid axle center section protector **no. 2**
- lower bolt retaining shock from axle housing **no. 15**

Unfasten TORX head screws **no. 16** retaining axle housing from rear rigid axle center section **no. 17**.

Remove axle housing then pull out axle **no. 18**.

Inspection

Check axle for wear or other damage, replace if necessary.

Installation

For installation, reverse the removal procedure, paying attention to the following details.

Apply grease (P/N 293 550 019) on splines.

Torque castellated nut **no.13** to 140 N•m (103 lbf•ft) **minimum**.

LH SIDE AXLE

Remove:

- wheel and wheel cap
- cotter pin **no. 12**
- castellated nut **no.13**
- flat washer **no. 14** and O-ring
- rigid axle from vehicle

Unfasten TORX head screws **no. 20** retaining axle tube from rear rigid axle center section **no. 17**.

Remove axle tube then pull out axle **no. 21**.

Inspection

Check axle for wear or other damage, replace if necessary.

Installation

For installation, reverse the removal procedure, paying attention to the following details.

Apply grease (P/N 293 550 019) on splines.

Torque castellated nut **no.13** to 140 N•m (103 lbf•ft) **minimum**.

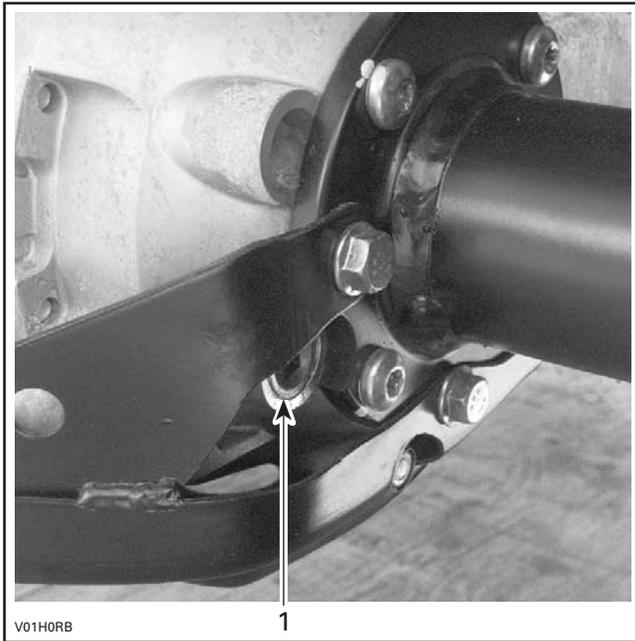
Section 06 DRIVE TRAIN

Subsection 03 (REAR AXLE)

Rear Rigid Axle Center Section Oil Level

Lift back of vehicle. Place swing arm to the horizontal position.

Clean filler plug prior to check oil level. Check oil level by removing filler plug. Oil level must reach lower edge.



1. Filler plug

Add oil if necessary. Refer to TECHNICAL DATA 11-02 for capacity and recommended oil.

Rear Rigid Axle Center Section Oil Change

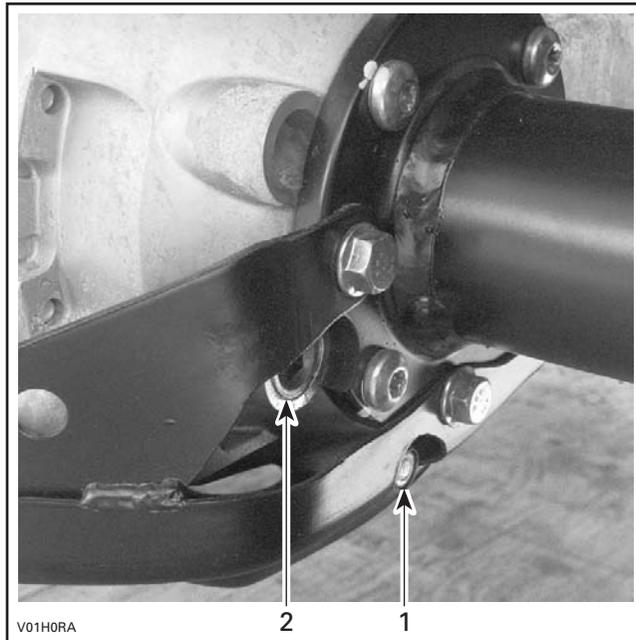
Ensure vehicle is on a level surface.

Clean drain plug area.

Place a drain pan under rigid axle center section drain plug area.

Unscrew filler plug.

Remove drain plug.



1. Drain plug
2. Filler plug

Clean drain plug area then reinstall drain plug.

Use a funnel and refill rear rigid axle center section at the proper level with recommended oil. Refer to TECHNICAL DATA 11-02.

Reinstall filler plug.

REAR PROPELLER SHAFT

Removal

Remove swing arm with rigid axle assembly. Refer to REAR SUSPENSION 08-03.

Remove the M8 x 16 propeller shaft bolt **no. 9** and flat washer **no. 10**.

Separate rear propeller shaft **no. 3** from engine.

Inspection

Check yoke U-joint **no. 11** for wear, backlash or axial play, replace if necessary.

Installation

Installation is essentially the reverse of removal procedure.

Apply grease (P/N 293 550 019) to spring and splines before insert the end of the propeller shaft into swing arm.

Apply grease to splines from engine.

Grease U-joint from rear propeller shaft. Use a grease gun with SHELL, Alvania EP-2 grease **only**.

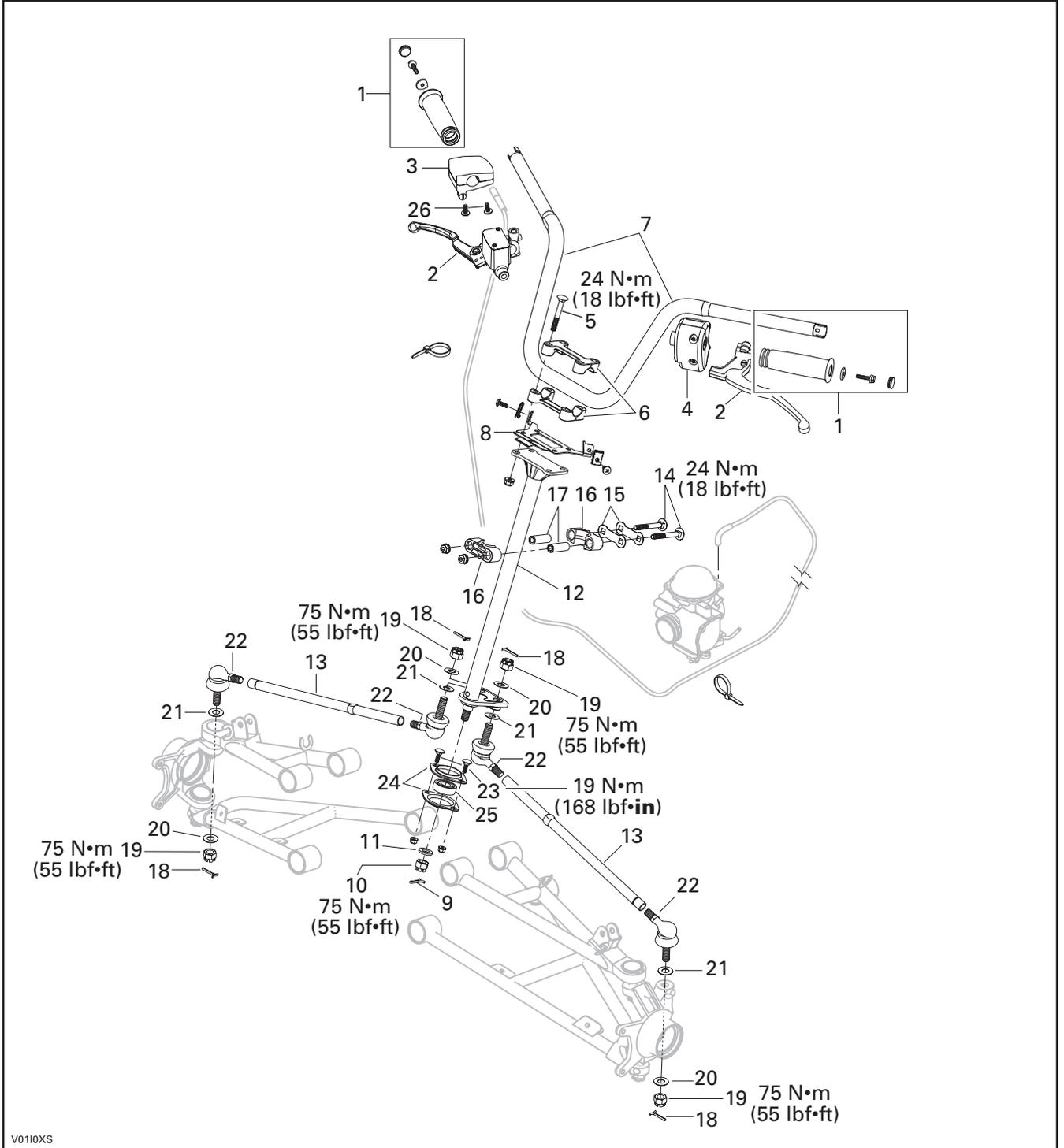
Rear Propeller Shaft U-Joint

Refer to FRONT PROPELLER SHAFT U-JOINT 06-02.

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STEERING/CONTROL SYSTEMS



Section 07 STEERING/CONTROL SYSTEMS

Subsection 02 (STEERING/CONTROL SYSTEMS)

HANDLE BAR

Removal

Remove:

- steering cover (refer to BODY 10-02)
- handle bar grips **no. 1** (discard screws)
- brake handles **no. 2**. (refer to HYDRAULIC BRAKES 09-02)
- throttle handle **no. 3** and multi-function switch **no. 4** (refer to the specific section)
- steering clamp mounting bolts **no. 5** and steering clamp **no. 6**
- handle bar **no. 7**

Inspection

Inspect the handle bar for damage, cracks or bending, replace if any problems is detected.

Installation

For the installation, reverse the removal procedure.

NOTE: Replace screws retaining handle bar grip by a new self-locking screws.

STEERING COLUMN

Removal

Remove:

- steering cover (refer to BODY 10-02)
- steering clamp mounting bolts **no. 5**, steering clamp **no. 6** and steering cover support **no. 8**
- fuel tank (refer to FUEL CIRCUIT 04-02)

NOTE: Do not remove fuel tank completely, separate fuel tank from frame only. Do not remove fuel lines.

- cotter pin **no. 9**, castellated nut **no. 10** and flat washer **no. 11** to bottom end of steering column **no. 12**

Separate steering column and tie-rods **no. 13**. Refer to TIE-ROD section.

Remove half housing bolts **no. 14**, stopper plates **no. 15**, half housings **no. 16** and housing bushings **no. 17**.

Pull steering column.

Inspection

Inspect steering column for damage, cracks or bending, replace if any problems is detected.

Installation

For the installation, reverse the removal procedure.

TIE-ROD

Removal

Place the vehicle on jack stands and remove front wheel(s).

Remove front fender. Refer to BODY 10-02.

Remove fuel tank. Refer to FUEL CIRCUIT 04-02.

NOTE: Do not remove tank completely, separate fuel tank from frame. Do not remove fuel lines.

Remove cotter pin **no. 18**, castellated nut **no. 19**, hardened washer **no. 20** and flat washer **no. 21**.

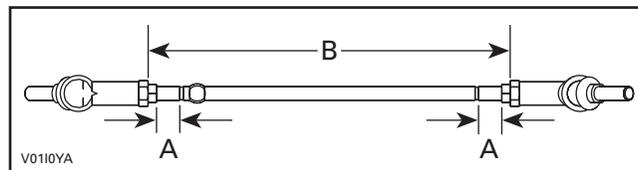
Inspection

Inspect ball joint ends for wear or looseness, if excessive, replace.

Installation

For the installation, reverse the removal procedure. Pay attention to the following details.

At the time of the reinstallation or the new tie-rod(s) installation, screw threaded end of tie-rod into ball joint. The maximum length for tie-rod groove to ball joint end must be the value **A** in the following chart:



MODEL		A	B
	mm	20 ± 5	311 ± 1
TRAXTER	in	25/32 ± 0.197	12 1/4 ± 0.039

NOTE: Torque the ball joint lock nut **no. 22** to 36 N•m (27 lbf•in).

Toe Adjustment

Place vehicle on level surface.

Check that handlebar is straight.

Use a long rule and check if the rear and front wheels are aligned.

Adjust alignment with tie-rod.

Adjust toe to $0^\circ \pm 0.3^\circ$.

STEERING COLUMN BEARING

Removal

Place vehicle on jack stands and remove front wheels.

Remove front fender. Refer to BODY 10-02.

Remove fuel tank. Refer to FUEL CIRCUIT 04-02.

NOTE: Do not remove tank completely, separate fuel tank from frame. Do not remove fuel lines.

Separate tie-rods **no. 13** from steering column **no. 12**. Refer to TIE-ROD section.

Remove cotter pin **no. 9**, castellated nut **no. 10** and flat washer **no. 11** to bottom end of steering column **no. 12**.

Pull up steering column.

Remove carriage bolts **no. 23** and first bearing flange **no. 24**.

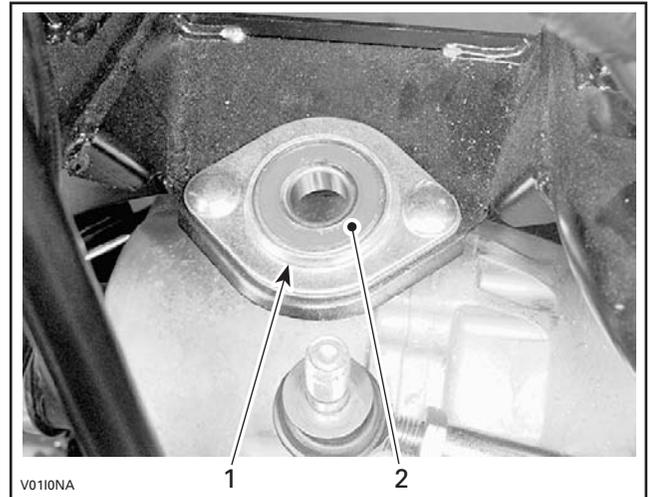
Remove bearing **no. 25**.

Installation

For installation, reverse the removal procedure. Pay attention to the following detail.

Place flanged collar toward outside.

Install carriage bolts **no. 23**, apply Loctite 277 on threads.



1. Flanged collar
2. Bearing

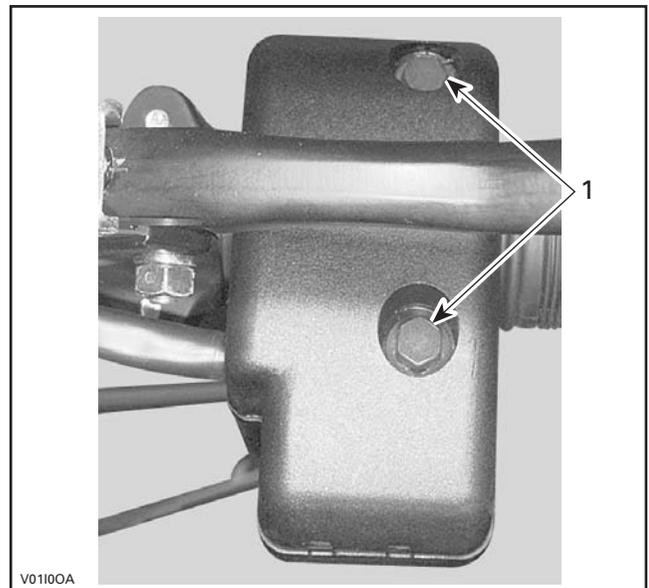
MULTI-FUNCTION SWITCH

Test

Refer to ELECTRIC SHIFT SYSTEM 05-06 for the START/STOP button and UPSHIFT/DOWNSHIFT button. Refer to INSTRUMENTS AND ACCESSORIES 05-07 for Hi-Lo Beam button.

Removal

Remove bolts.



1. Remove the bolts

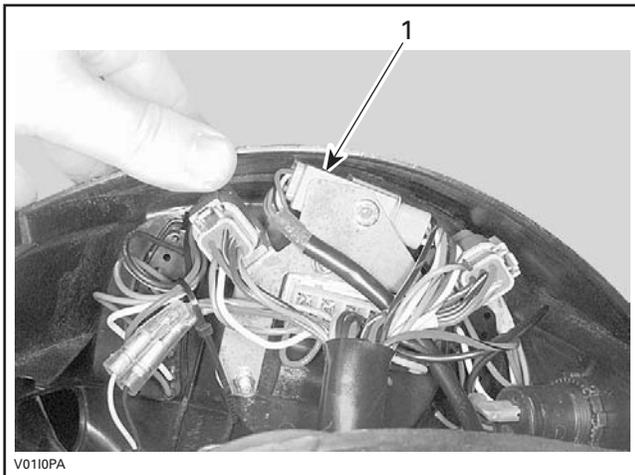
Section 07 STEERING/CONTROL SYSTEMS

Subsection 02 (STEERING/CONTROL SYSTEMS)

Separate multi-function switch no. 5 from handle bar no. 7.

Remove steering cover. Refer to BODY 10-02.

Unplug multi-function switch connector. The connector is located under steering cover.



UNDER STEERING COVER

1. Unplug this connector

Installation

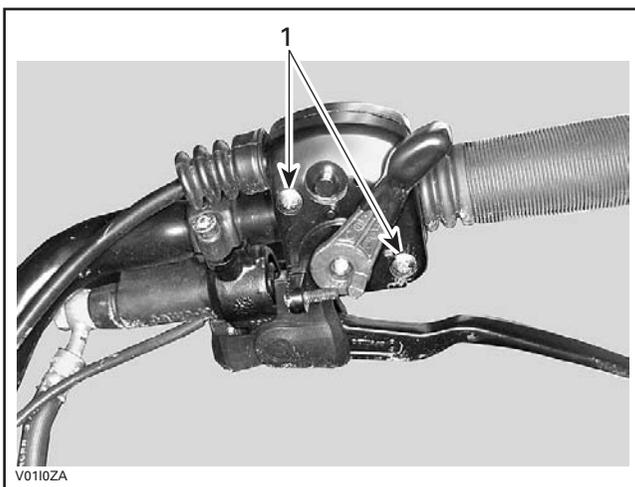
For installation, reverse the removal procedure.

If replaced, the calibration is required. Refer to ELECTRIC SHIFT SYSTEM 05-06.

THROTTLE HANDLE

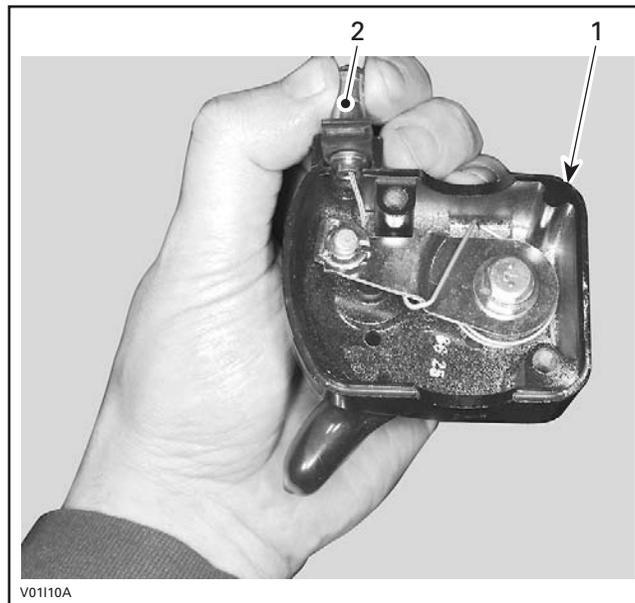
Removal

Remove screws no. 26.



1. Remove screws

Separate throttle handle no. 3 from handle bar no. 7.
Remove throttle cable from housing.



1. Throttle handle housing
2. Throttle cable

Slide cable in clip slot and remove the end of the cable from clip.

Installation

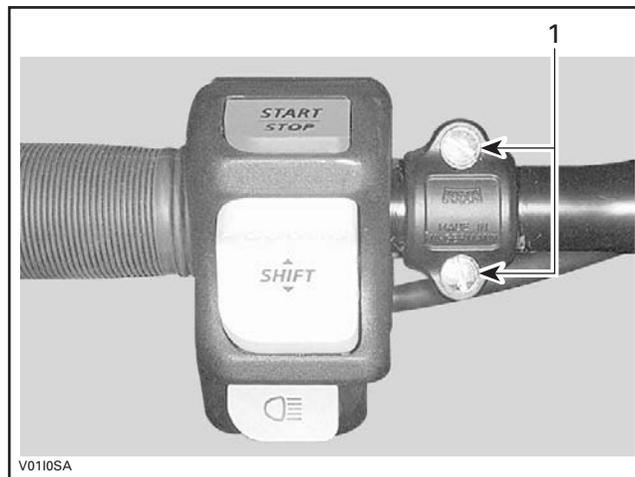
For installation, reverse the removal procedure.

Refer to CARBURATOR AND FUEL PUMP 04-03 for adjustment procedure.

LH HANDLE BRAKE

Removal

Remove screws.



1. Remove the screws

Separate handle brake no. 2 from handle bar no. 7.
If necessary, cut locking tie.

Cable Removal

Refer to HYDRAULIC BRAKES 09-02 for specifics instructions.

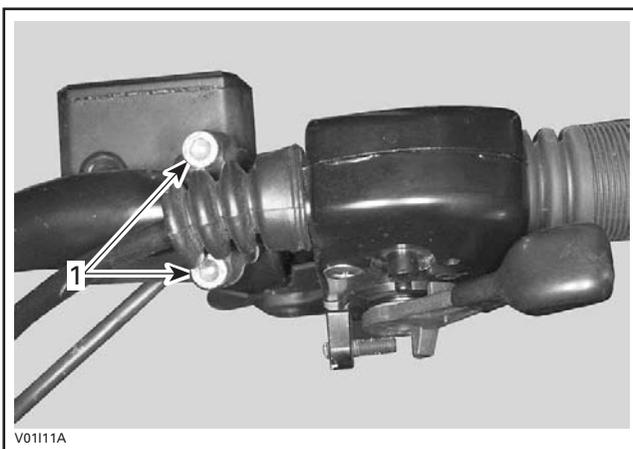
Installation

For installation, reverse the removal procedure.

RH HANDLE BRAKE

Removal

Remove screws.



1. Remove the screws

Separate handle brake **no. 2** from handle bar **no. 7**.

If necessary, unplug connectors under steering cover and cut locking tie.

Hose Removal

Refer to HYDRAULIC BRAKES 09-02 for specifics instructions.

Installation

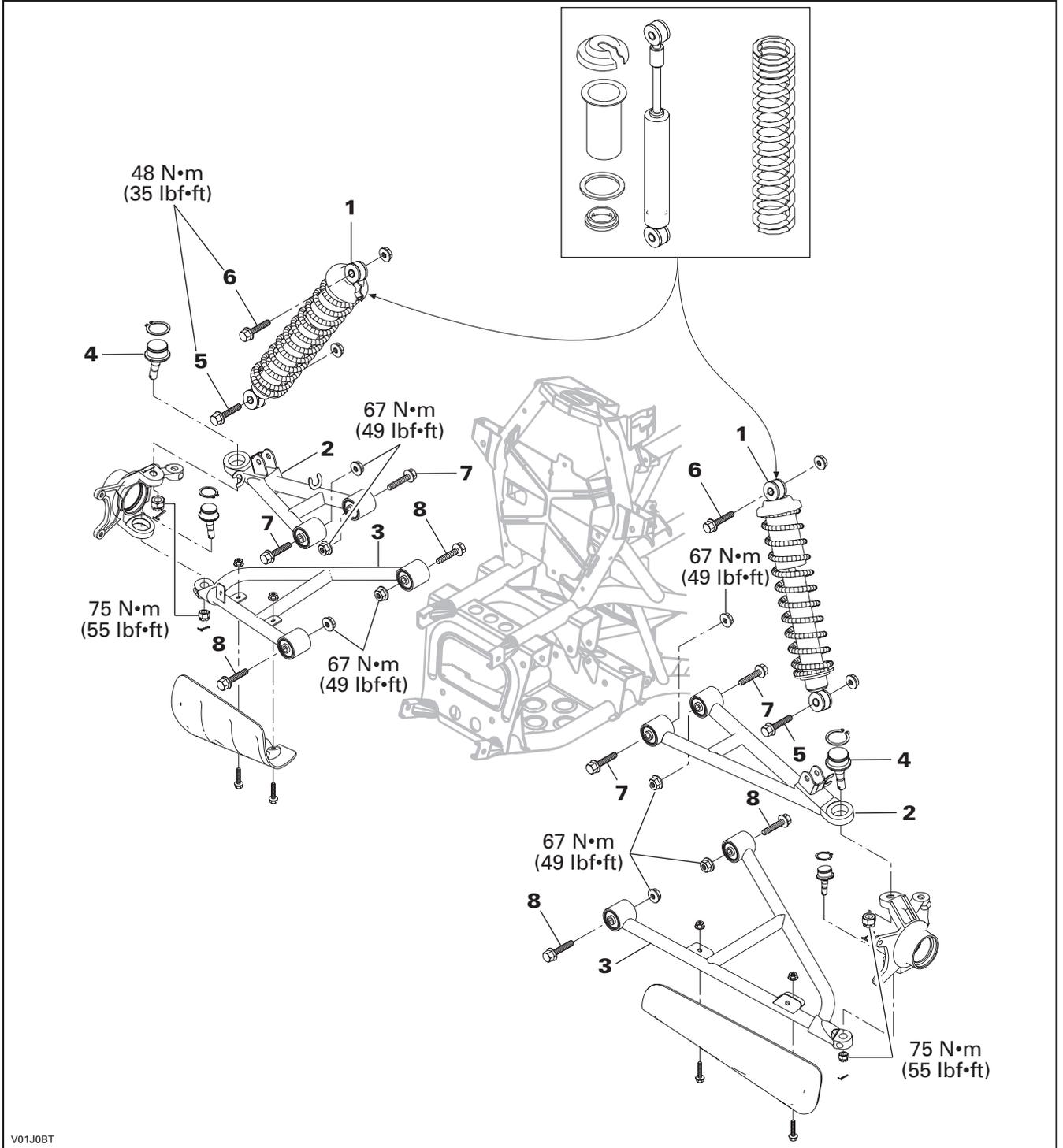
For installation, reverse the removal procedure.

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FRONT SUSPENSION



Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

SHOCKS ASSEMBLY

Removal

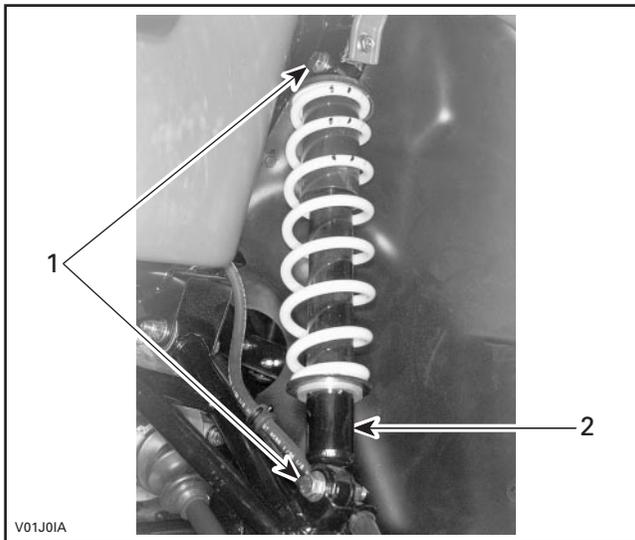
Loosen wheel nuts.

Lift front of vehicle and install a jack stand under the frame to support the vehicle off the ground.

NOTE: Lift up vehicle high enough to have the wheel off the ground and shock absorber **no. 1** fully extended.

Remove wheels.

Remove lower bolt **no. 5** then upper bolt **no. 6** of shock.

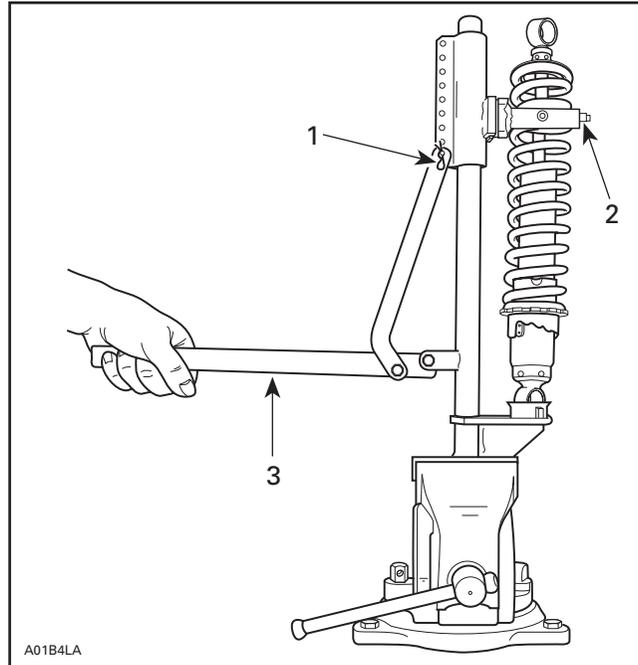


1. Remove bolts
2. Front shock assembly

Disassembly

For shock spring disassembly use shock spring remover (P/N 529 027 100) in a vise. Mount shock in it and turn shock so that spring coils matched spring compressor.

Close and lock the bar. Adjust the handle horizontal position by changing the position of the clevis pin.



TYPICAL

1. Clevis pin
2. Bar
3. Handle horizontal

Push down on the handle until it locks. Remove spring stopper then release handle.

Inspection

Inspect the spring for damage. Replace if necessary.

Inspect shock for oil leakage. Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with its rod upwards. Any of the following conditions will denote a defective shock:

- A skip or hang back when reversing stroke at mid travel.
- Seizing or binding condition except at extreme end of either stroke.
- A gurgling noise after completing one full compression and extension stroke.

Replace shock if any of these conditions are found.

Installation

For assembly, reverse the disassembly and removal procedures.

NOTE: Do not interchange left and right tires. Check direction of rotation mark on tires.



DIRECTION OF ROTATION

Torque wheel nuts to 75 N•m (55 lbf•ft) in a criss-cross sequence.

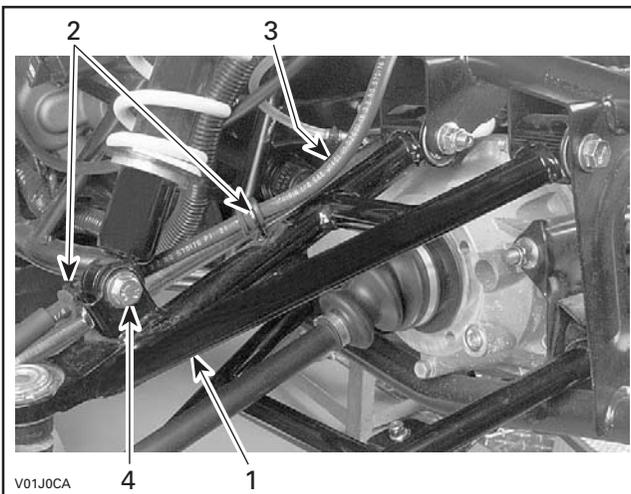
UPPER A-ARM

Removal

NOTE: Both upper **no. 2** and lower **no. 3** A-arms can be removed without removing the tie rods.

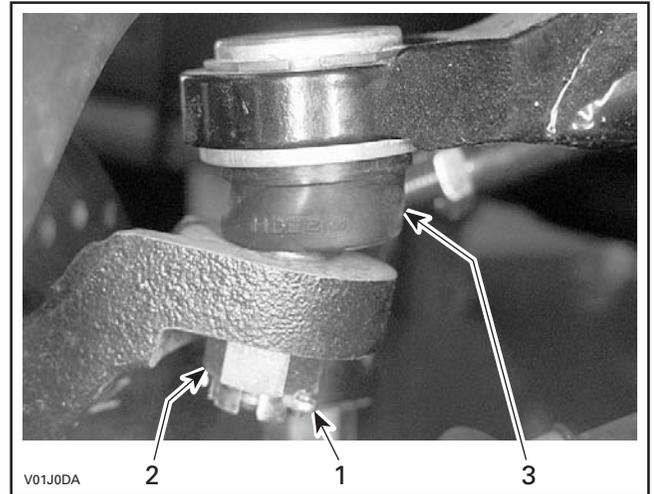
Remove bolt **no. 5** retaining the shock absorber **no. 1** to upper A-arm.

Detach brake hose from upper A-arm.



1. Upper A-arm
2. Detach brake hose from tubing
3. Brake hose
4. Remove nut and bolt

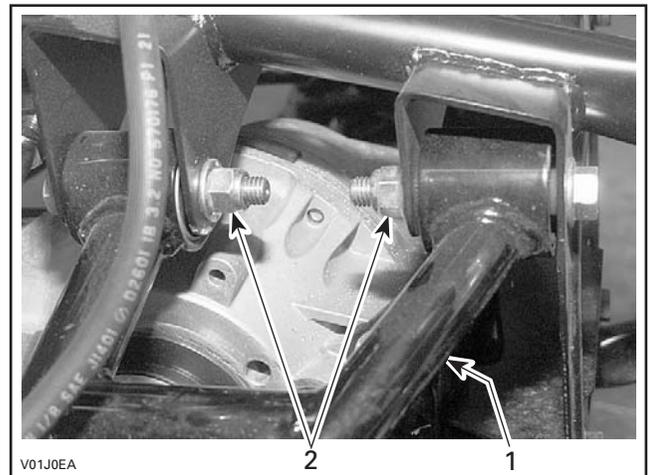
Remove cotter pin and castellated nut from upper ball joint **no. 4**.



1. Remove cotter pin
2. Castellated nut
3. Upper ball joint

Use a suitable ball joint remover and detach upper A-arm from knuckle.

Remove bolts **no. 7** and nuts retaining upper A-arm to frame.



1. Upper A-arm
2. Remove nuts and bolts

Remove upper A-arm from vehicle.

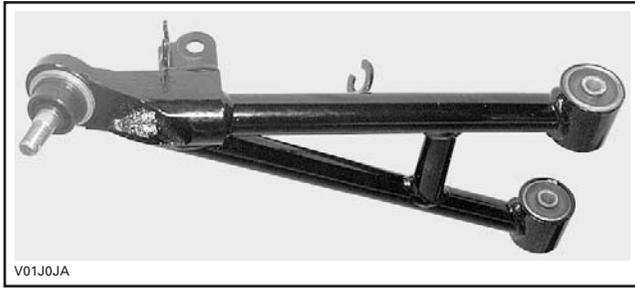
Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

Inspection

Check ball joint rubber on upper A-arm for crack or any other damage.

Inspect ball joint end for damages. Ensure it is moving freely. Replace upper A-arm as an assembly if ball joint is damaged.



RH UPPER A-ARM ASSEMBLY

Check upper A-arm for distortion or damage. Replace as required.

Inspect pivot bushings for wear or damages.

Replace A-arms if necessary.

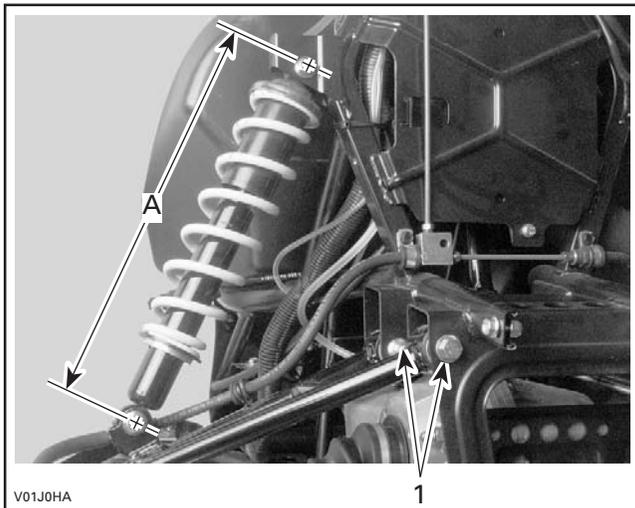
Installation

Position upper A-arm and install bolts and nuts.

Do not torque yet.

Install bolt and nut retaining shock absorber to upper A-arm.

NOTE: Position the upper A-arm in order to have a distance of 311 mm (12 in) between shock absorber retaining bolts (center to center). Use special A-arm tool (P/N 529 035 611).



1. Torque nuts to 65 N•m (48 lbf•ft)
- A. 311 mm (12 in)

Torque nuts to 67 N•m (49 lbf•ft).

Attach upper A-arm to knuckle. Install castellated nut and torque to 75 N•m (55 lbf•ft).

Install a new cotter pin.

Secure brake hose to upper A-arm.

NOTE: Do not interchange left and right tires. Check direction of rotation mark on tires.



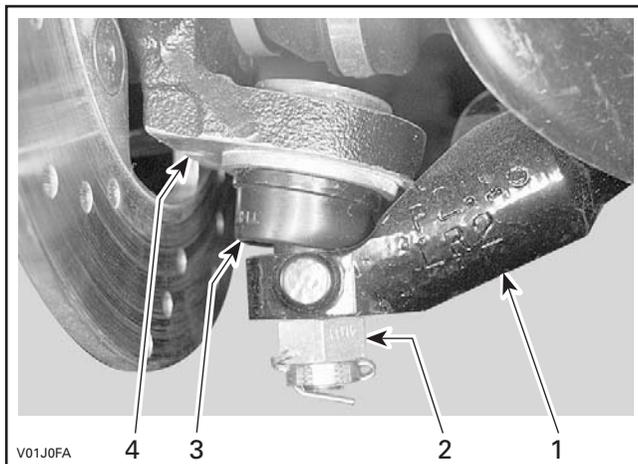
DIRECTION OF ROTATION

Torque wheel nuts to 75 N•m (55 lbf•ft) in a criss-cross sequence.

LOWER A-ARM

Removal

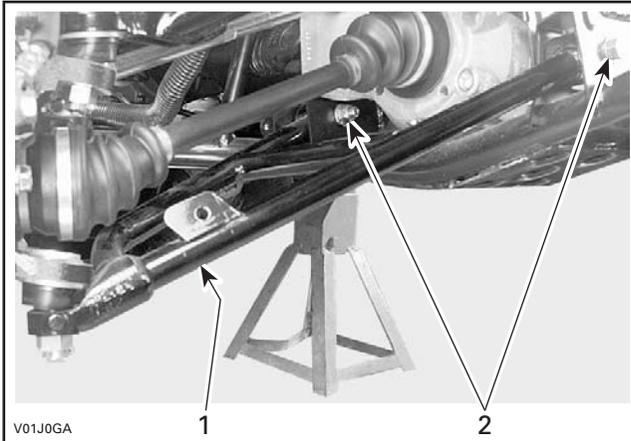
Remove cotter pin and castellated nut retaining lower A-arm **no. 3** to ball joint on the knuckle.



1. Lower A-arm
2. Castellated nut
3. Lower ball joint
4. Knuckle

Use a suitable ball joint remover and detach knuckle from the lower A-arm.

Remove nuts and bolts **no. 8** retaining lower A-arm to frame.



1. Lower A-arm
2. Remove nuts and bolts

Remove lower A-arm from vehicle.

Inspection

Check ball joint rubber on lower A-arm for crack or any other damage. Inspect ball joint end for damages. Ensure it's moving freely. Replace lower A-arm assembly if ball joint is damaged.

Check lower A-arm for distortion or damage.

Inspect pivot bushings for wear or damages.

Replace A-arms if necessary.

Installation

For assembly, reverse the disassembly procedure. However, pay attention to the following.

Install lower A-arm to frame and torque nuts to 67 N•m (49 lbf•ft).

Attach lower A-arm **no. 2** to knuckle. Install castellated nut and new cotter pin.

NOTE: Do not interchange left and right tires. Check direction of rotation mark on tires.



DIRECTION OF ROTATION

Torque wheel nuts to 75 N•m (55 lbf•ft) in a criss-cross sequence.

KNUCKLE

Removal

Raise front of vehicle, support it securely on jack stands and remove front wheel(s).

Remove wheel cap, cotter pin, castellated nut, flat washer and O-ring.

NOTE: Check O-ring for damage, replace if necessary.

Remove hub. Refer to HYDRAULIC BRAKES 09-02.

Remove cotter pin and castellated nut from upper and lower suspension A-arm.

Detach upper and lower suspension A-arm from knuckle.

Remove cotter pin and castellated nut from tie-rod and separate tie-rod from knuckle.

Separate knuckle from drive shaft.

Inspection

Inspect knuckle for damage.

If any damage is detected, change the knuckle.

Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

Installation

For installation, reverse the removal procedure. Pay attention to the following details.

For hub installation, refer to HYDRAULIC BRAKE 09-02.

Reinstall front wheel(s) and torque nuts to 75 N•m (55 lbf•ft) in a criss-cross sequence.

NOTE: Do not interchange left and right tires. Check direction of rotation mark on tires.

WHEEL BEARING CONDITION

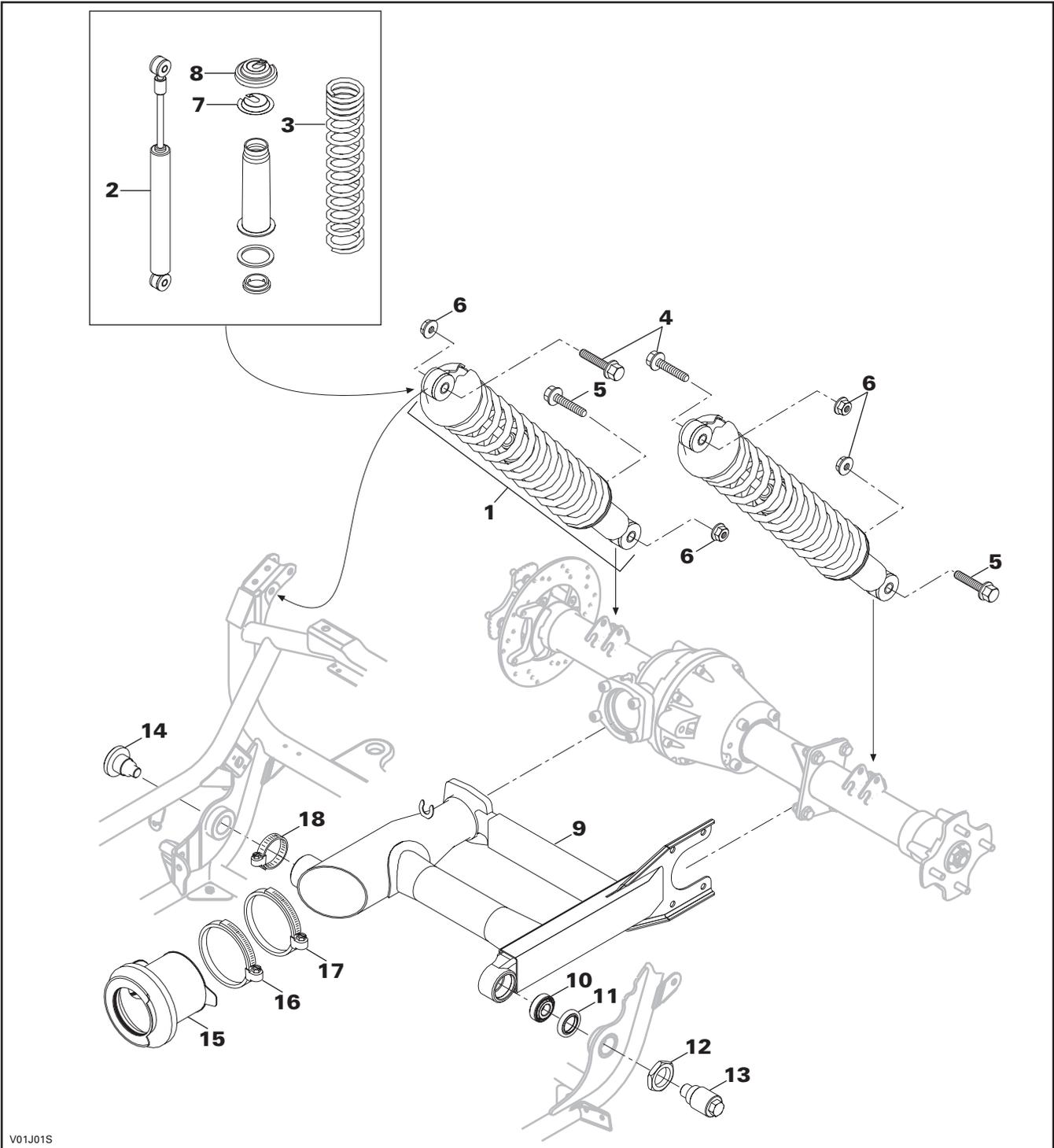
Raise front of vehicle.

Take tire by the top and the bottom. Check lateral play.

If there is any play, change knuckle and hub assembly.

NOTE: Be careful not to misjudge play in the suspension ball joint. Refer to STEERING/CONTROLS SYSTEMS 07-02 for inspection.

REAR SUSPENSION



V01J01S

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

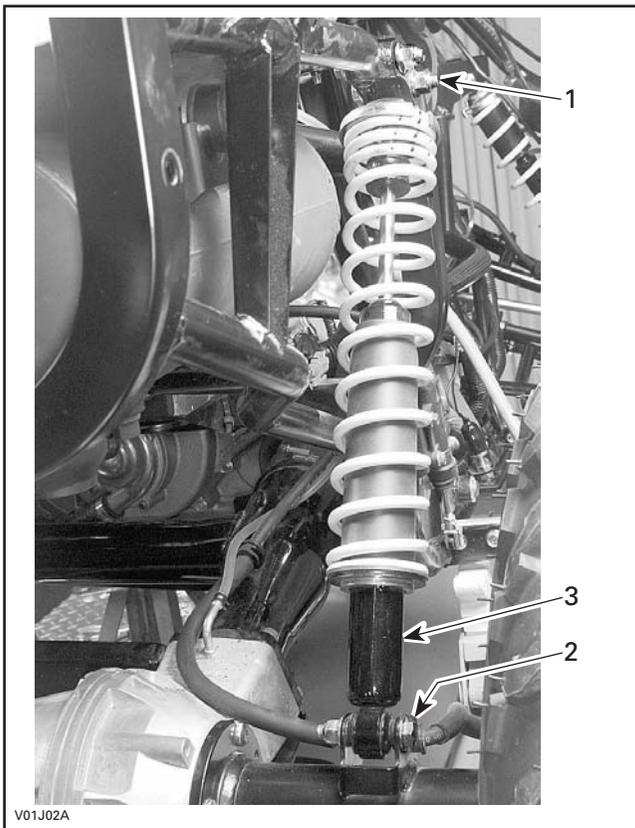
REAR SHOCK

Removal

Lift rear of vehicle until rear shock absorbers **no. 1** are fully extended.

Install a jack or a block under the frame to support the vehicle.

Remove upper **no. 4** and lower **no. 5** bolts and nuts **no. 6** retaining shock absorbers each side.



RIGHT SIDE SHOWN

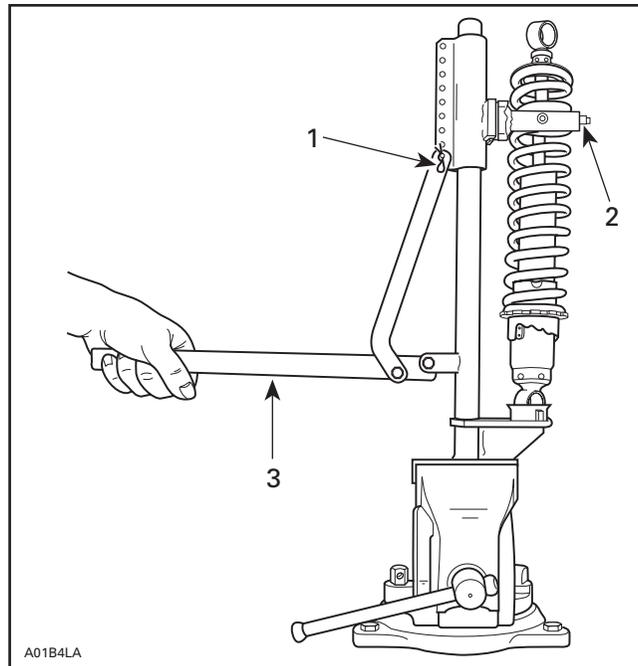
1. Upper bolt and nut
2. Lower bolt and nut
3. Rear shock absorber RH

Disassembly

Use shock spring remover (P/N 529 027 100) and put it in a vise. Mount shock in it and turn shock so that spring coils **no. 3** match spring compressor.

Close and lock bar. Adjust handle horizontal by changing position of clevis pin.

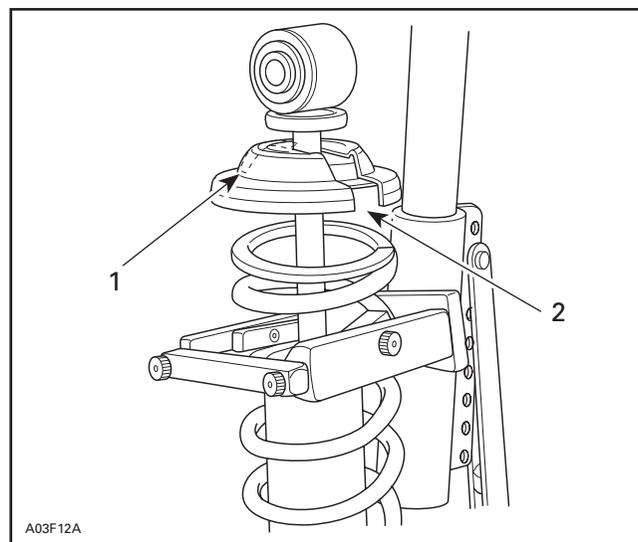
Push down on handle until it locks. Remove spring stopper and cap then release handle.



TYPICAL

1. Clevis pin
2. Bar
3. Handle horizontal

At installation, cap opening **no. 8** must be 180° from spring stopper opening **no. 7**.

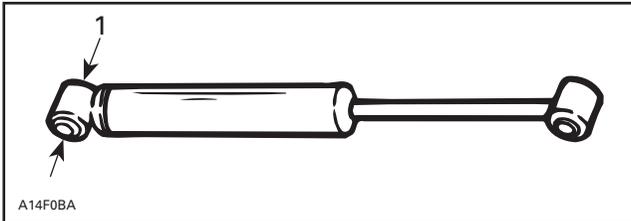


TYPICAL

1. Cap opening
2. Spring stopper opening

Inspection

Secure the shock body end **no. 2** in a vise with its rod upward.



TYPICAL

1. Clamp here

CAUTION: Do not clamp directly on shock body.

Examine each shock for leaks. Extend and compress the piston several times over its entire stroke. Check that it moves smoothly and with uniform resistance with its rod upward.

Pay attention to the following conditions that will denote a defective shock:

- A skip or a hang back when reversing stroke at mid travel.
- Seizing or binding condition except at extreme end of either stroke.
- Oil leakage.
- A gurgling noise, after completing one full compression and extension stroke.

Renew if any faults are present.

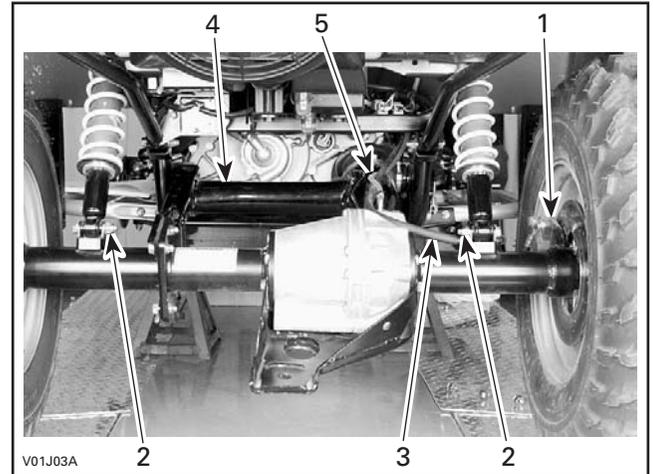
SWING ARM

Removal

Lift rear of vehicle until rear shock absorbers **no. 1** are fully extended.

Install a jack or a block under the frame to support the vehicle.

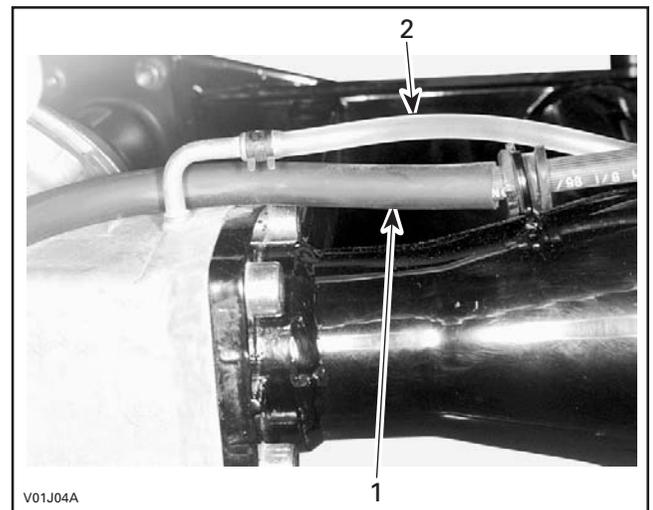
Remove lower nuts **no. 6** and bolts **no. 5** retaining shock to rear drive train each side.



1. Rear brake caliper
2. Remove bolts
3. Brake hose
4. Swing arm
5. Vent tube

Detach brake hose from brackets on rear axle tube and on swing arm.

Disconnect vent tube.



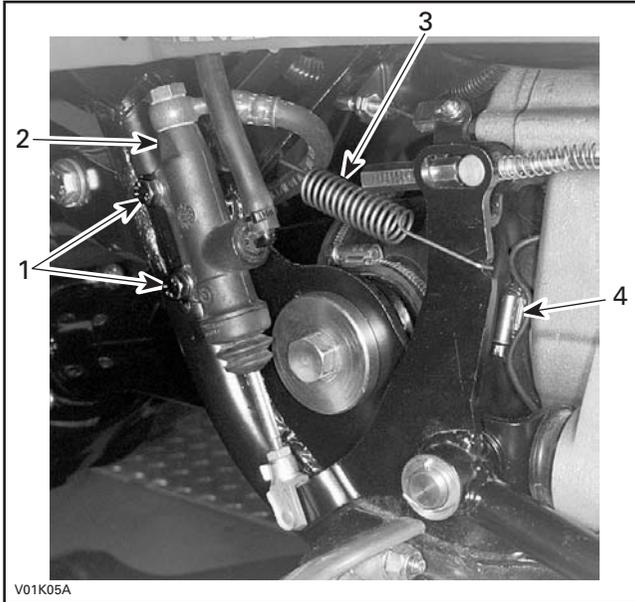
1. Brake hose
2. Vent tube

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

Remove M8 flanged screws retaining master cylinder.

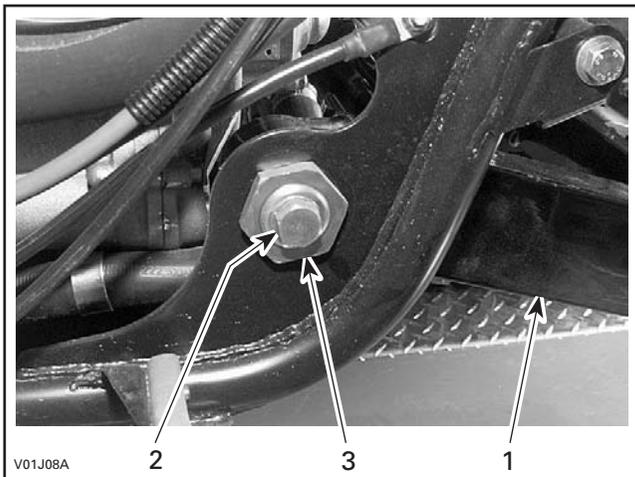
CAUTION: Don't let caliper hang by the hose and don't stretch or twist brake hose.



1. Remove bolts
2. Master cylinder
3. Remove spring
4. Loosen clamp

Loosen clamp no. 16 retaining swing arm bellows no. 15 to engine.

Loosen jam nut no. 12. Unscrew and remove LH pivot bolt no. 13.



1. Swing arm
2. Pivot bolt LH
3. Jam nut

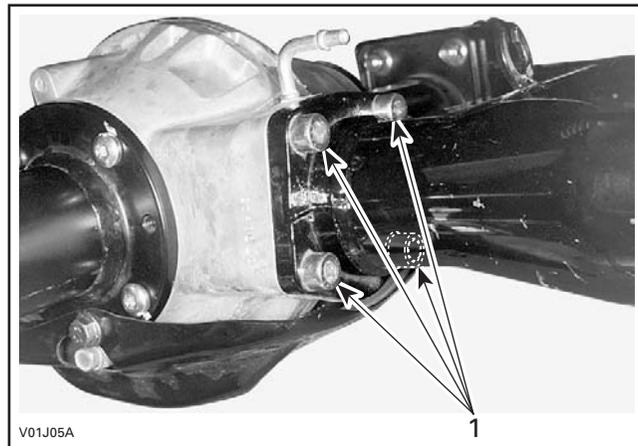
Unscrew and remove RH pivot bolt no. 14.



1. Swing arm bellows
2. Pivot bolt RH

Pull back rear train assembly to detach swing arm assembly from the frame and disengage the propeller shaft.

Remove the M10 x 25 socket screws retaining rear rigid axle center section to swing arm.

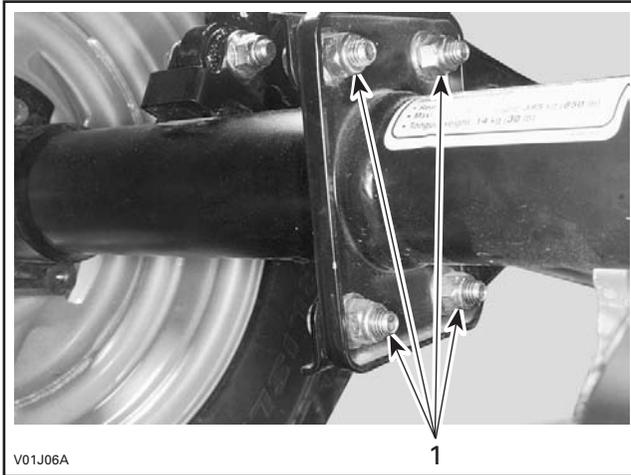


1. Remove M10 x 25 socket screws

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

Remove M10 nuts and bolts retaining swing arm to rear axle tube.



1. Remove nuts and bolts

Detach swing arm **no. 9** from rear drive system assembly.

Inspection

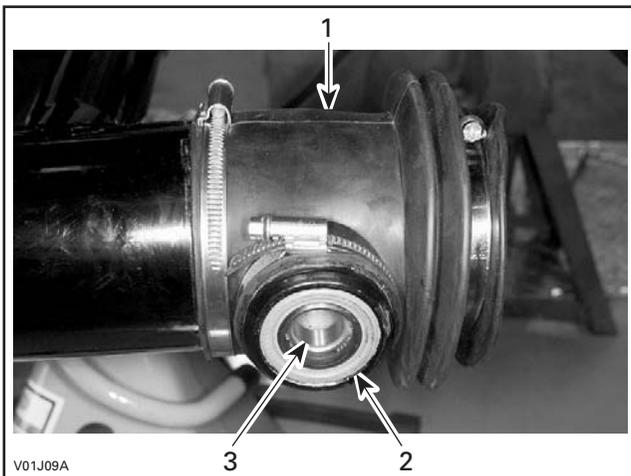
Check condition of swing arm. Inspect for distortion or damage.

Check swing arm bellows for cracks or damage.

Check oil seals **no. 11** for wear or damage. Replace swing arm if necessary.

Check condition of bearings **no. 10**. Make sure they turn smoothly. Replace swing arm if necessary.

Ensure outer race of bearing fits tightly inside swing arm pivot.



1. Swing arm bellows
2. Oil seal
3. Cone bearing

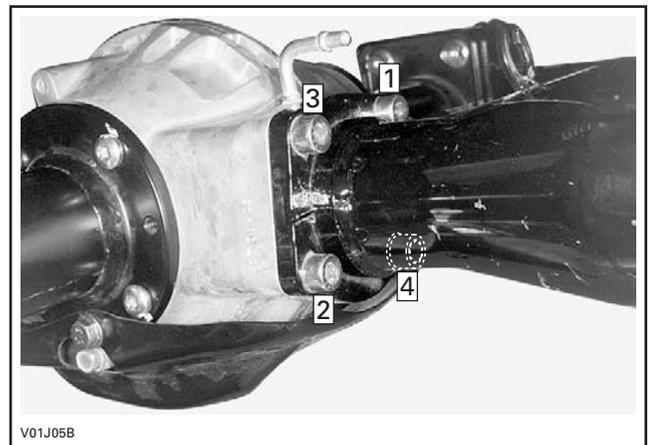
Installation

Installation is essentially the reverse of removal procedure. However, pay attention to the following details.

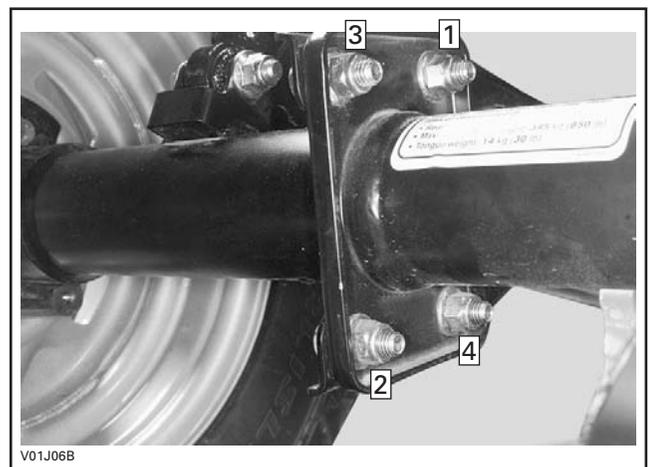
Secure rear rigid axle center section to swing arm with socket screws. Apply sealant Right Stuff (P/N 293 800 053) between both parts. Do not tighten yet.

Secure rear axle tube to swing arm with bolts. Do not tighten yet.

When all bolts are installed, tighten in a criss-cross sequence.



RIGID AXLE CENTER SECTION



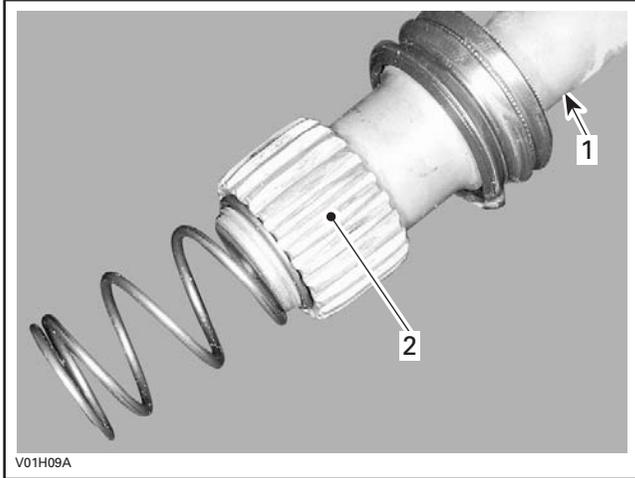
REAR AXLE TUBE

Install cone bearings into cavity. Pack bearing cavities with Therma Lube grease (P/N 293 550 018).

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

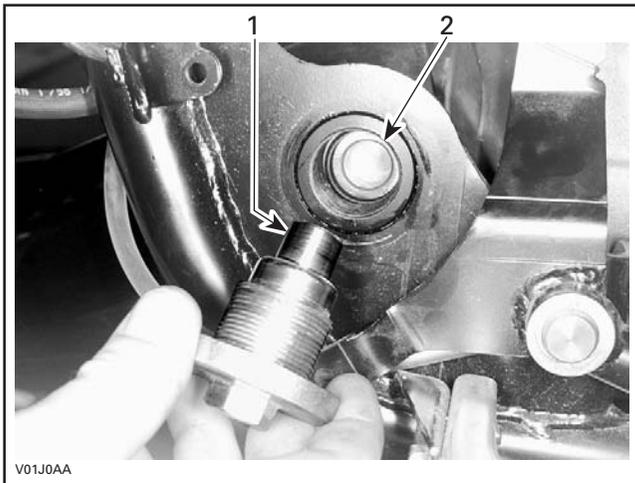
Apply grease (P/N 293 550 019) to spring and splines before insert the end of the propeller shaft into swing arm.



1. Propeller shaft
2. Apply grease

Push rear drive train assembly toward the engine to engage propeller shaft splines and position the swing arm in the frame.

Line up cone bearing and install RH pivot bolt. Torque to 147 N•m (108 lbf•ft).



1. RH pivot bolt
2. Pivot bearing

Install LH pivot bolt.

Move the swing arm up and down several times and tighten LH pivot bolt. Torque LH pivot bolt to 12 N•m (9 lbf•ft).

Install jam nut and torque to 147 N•m (108 lbf•ft) while holding pivot bolt.

WARNING

The LH pivot bolt must have more than 2 threads out of jam nut.

Attach swing arm bellows to engine and install clamp. Torque to 5 N•m (4 lbf•ft).

Reinstall master cylinder. Check brake pedal adjustment. Refer to HYDRAULIC BRAKES 09-02 for complete adjustment procedure.

Route brake hose and secure to the brackets.

Connect vent hose.

Reinstall shock absorbers.

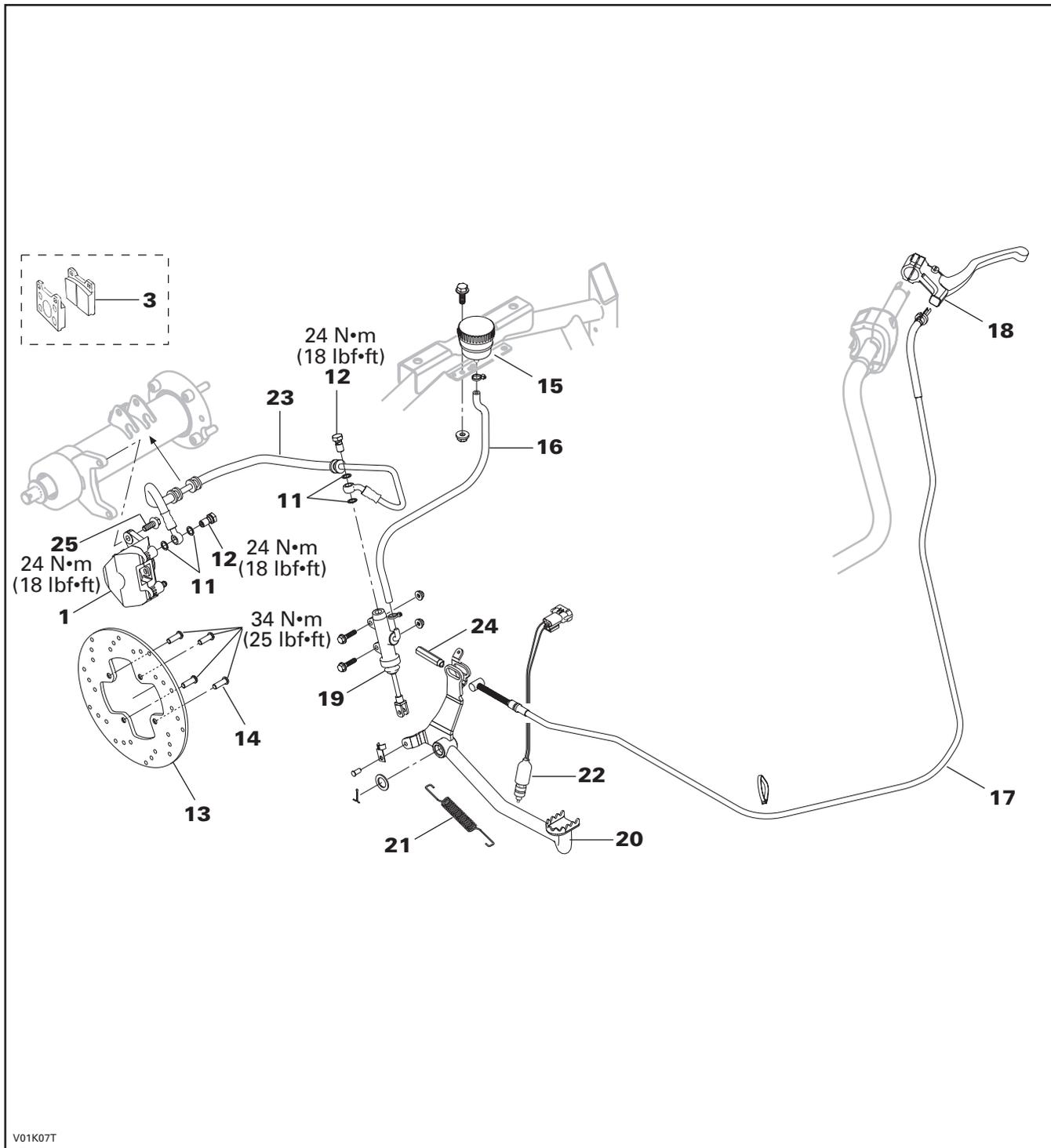
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Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

REAR BRAKE



V01K07T

GENERAL

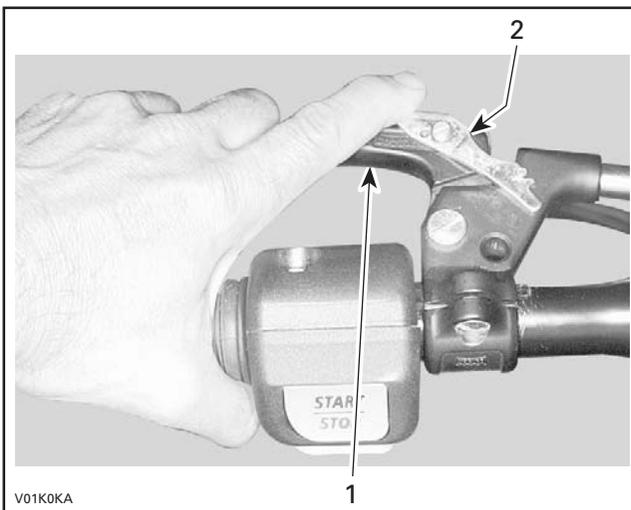
Hydraulic Brakes System

The brake system consists of two separate circuits. Each system has its own master cylinder and reservoir.

Both front and rear brakes are disc type.

Parking Device

The parking device operates the rear brake only. It is activated by a locking mechanism on LH brake lever.



1. LH Brake lever
2. Locking mechanism

MASTER CYLINDER

Removal

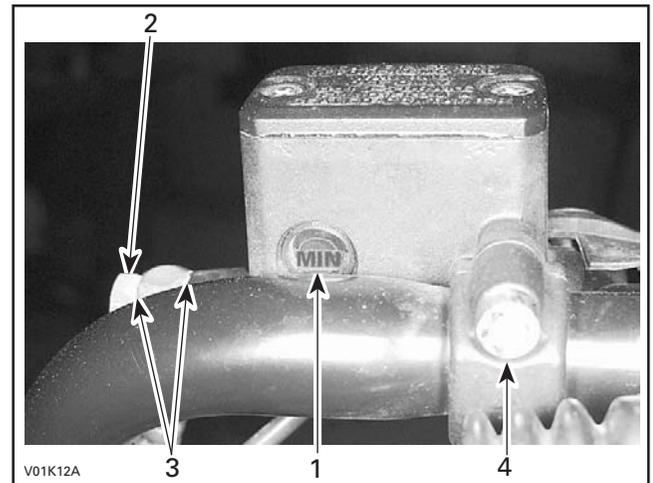
Front Brakes

Remove reservoir cover with diaphragm and drain brake fluid from master cylinder **no. 4**.

CAUTION: Avoid spilling brake fluid on plastic, rubber or painted parts. Protect these parts with a rag when servicing brake system.

Remove bolt **no. 12** and sealing washers **no. 11** retaining brake hose **no. 5** to master cylinder.

Remove screws from master cylinder holder and remove master cylinder from handlebar.

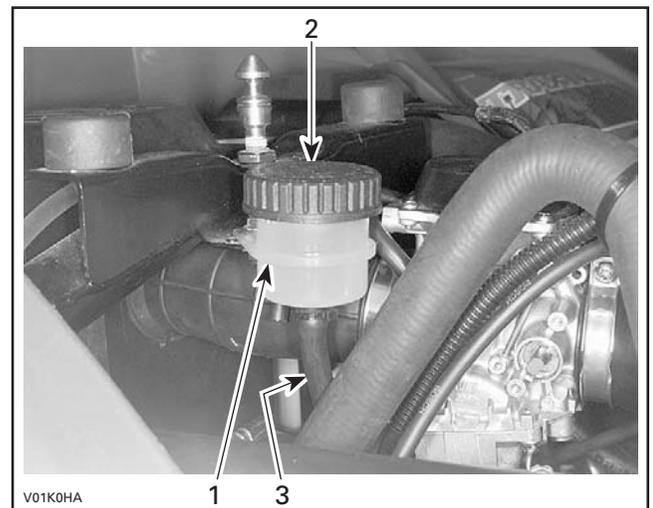


1. Oil level mark
2. Bolt
3. Sealing washers
4. Remove screws

Rear Brake

Remove seat to have access to master cylinder reservoir **no. 15**.

Unscrew reservoir cover.



1. Brake fluid reservoir
2. Reservoir cover
3. Flexible hose

Raise rear of vehicle and support it securely.

Remove RH wheel to have access to rear brake master cylinder **no. 19**.

Disconnect flexible hose **no. 16** from reservoir and plug the end to avoid brake fluid spillage.

Section 09 BRAKES

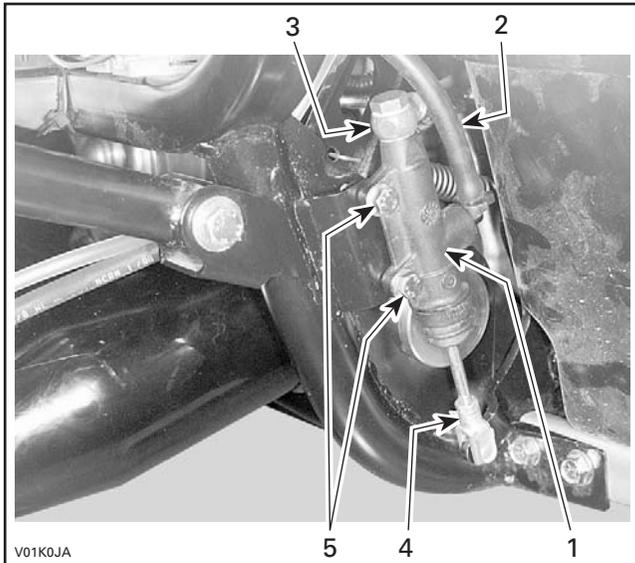
Subsection 02 (HYDRAULIC BRAKES)

Remove bolt no. 12 and sealing washers no. 11 retaining brake hose no. 23 to master cylinder no. 19.

Discard sealing washers.

Unhook push rod from brake pedal no. 20.

Remove bolt retaining master cylinder no. 19 to frame.



1. Master cylinder
2. Flexible hose
3. Rear brake hose
4. Push rod
5. Remove bolts

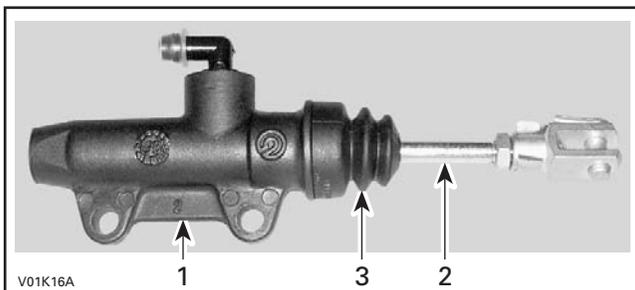
Inspection and Lubrication

Discard any remaining fluid inside reservoir.

Clean reservoir thoroughly with clean brake fluid.

If master cylinder is damaged or leaking, replace as an assembly.

Before rear master cylinder installation, remove the pusher and boot. Apply grease (P/N 293 550 007), about 2 g, inside the boot then reinstall boot and pusher. Wipe out any grease spillage on boot.



1. Rear master cylinder
2. Pusher
3. Boot

Installation

For the installation, reverse the removal procedure, paying attention to the following details.

Front Brakes

Place the master cylinder no. 4 on the handlebar.

Position cylinder holding bracket with the UP mark upward.

Install bolts and tighten loosely.

With the handlebar in straight ahead position, position cylinder reservoir parallel to the ground. Tighten upper bolt in first.



Connect brake hose to master cylinder with bolt and new sealing washers.

Rear Brake

Install master cylinder to frame.

Install rear brake hose to master cylinder using new sealing washers.

Connect flexible hose from reservoir and secure with new locking tie.

Fill up reservoir with clean brake fluid.

CAUTION: Do not mix different types of brake fluid. Use only DOT 4 brake fluid.

Bleed both front and rear brake systems.

Check for leaks and make sure the brakes operate normally before driving.

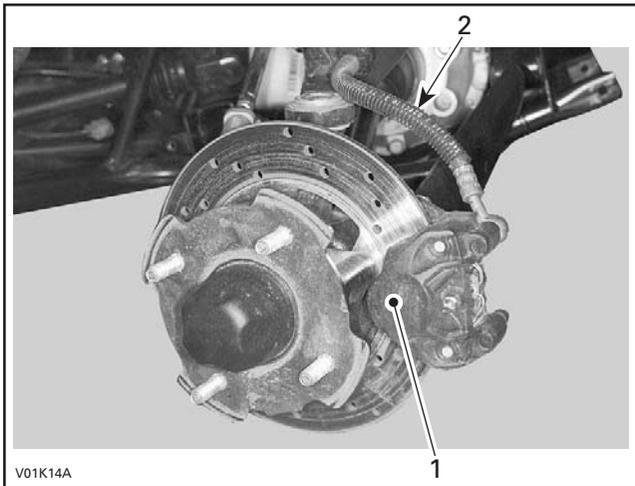
CALIPER

Removal

Loosen wheel nuts.

Raise vehicle and support it securely.

Remove wheels.



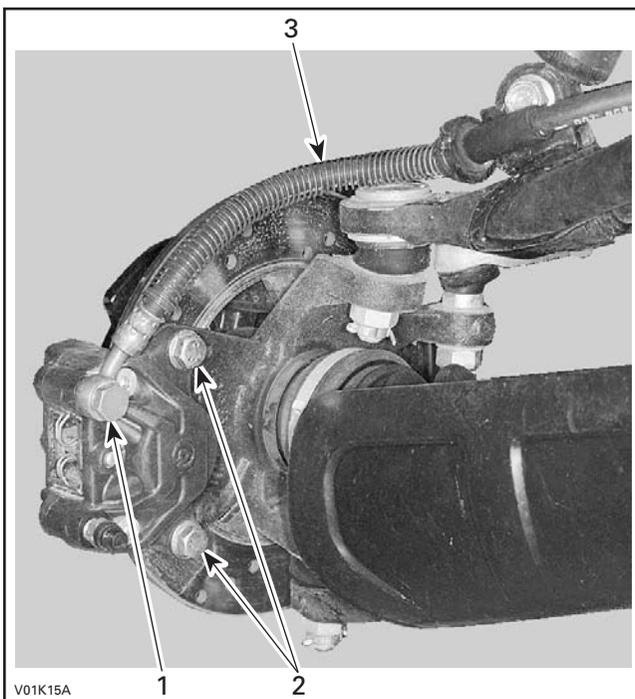
RH FRONT BRAKE

1. Caliper
2. Brake hose

Remove bolt no. 12 with sealing washers no. 11 and detach brake hose from caliper.

Catch spilled fluid with a rag. Attach the brake hose in a position to prevent the fluid from flowing out.

Unscrew bolts no. 25 retaining caliper to knuckle and remove caliper. Discard bolts.



1. Remove bolt and washers
2. Unscrew bolts
3. Brake hose

Disassembly

Only brake pads are available as spare parts. If caliper is damaged, replace as an assembly.

Installation

For the installation, reverse the removal procedure, paying attention to the following details.

Use new sealing washers when installing bolt retaining brake hose to caliper.

Install caliper to knuckle with the new self-locking bolts.

If hose was disconnected, bleed the brakes.

Check for leaks and make sure the brakes operate normally before driving.

BRAKE PADS

Removal

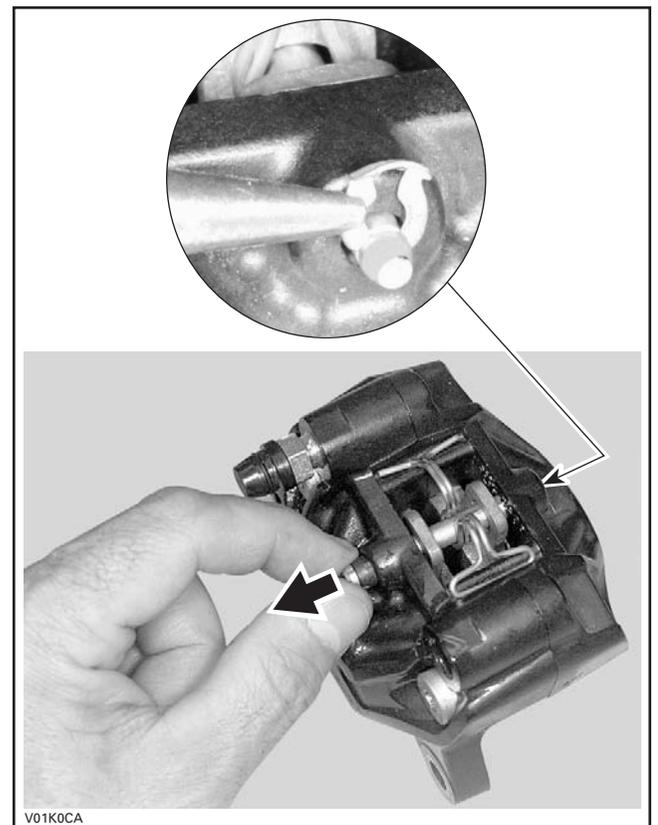
Raise vehicle and support it securely.

Remove wheels.

Remove caliper from knuckle.

Remove retaining clip.

While holding spring, pull out pin retaining brake pads.



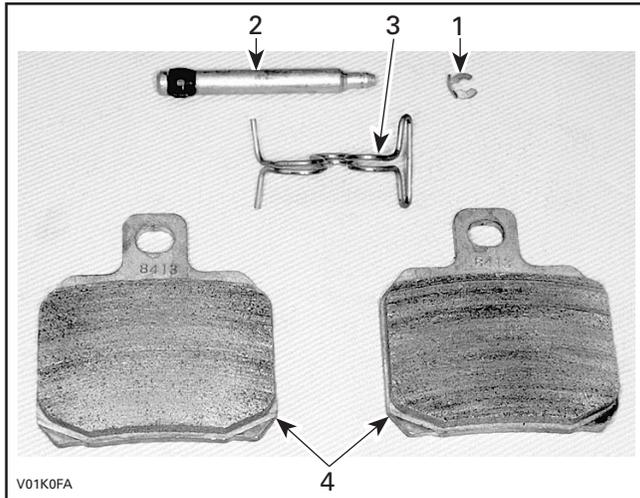
Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

Remove brake pads no. 3 from caliper.

CAUTION: Don't let the caliper hang by the hose and don't stretch or twist the hose.

Inspection



1. Clip
2. Pin
3. Retaining spring
4. Brake pads

CAUTION: Do not clean brake pads in petroleum based solvent. Use brake system cleaner or clean brake fluid only. Soiled brake pads must be replaced by new ones.

Measure brake pad thickness.

Brake pads must be replaced when lining is 1 mm (1/32 in) thick or less.

BRAKE PAD MINIMUM THICKNESS	1 mm (1/32 in)
-----------------------------	----------------

CAUTION: Brake pads must always be replaced in pairs.

⚠ WARNING

Avoid getting oil or grease on brake pads. Contaminated brake pads can affect stopping capacities.

Installation

Push caliper pistons inward before installing brake pads.

After the job is completed, firmly depress the brake lever a few times to bring the pads in contact with the disc.

Check for leaks and make sure the brakes operate normally before driving.

BRAKE DISC

Inspection

Brake discs no. 13 can be inspected without removing from the vehicle.

Raise vehicle and support it securely. Remove wheels and visually inspect disc surfaces for scratches or grooves. Make sure to check both sides of disc.

Measure thickness of the disc. Minimum thickness is 4.7 mm (0.18 in).

Replace disc if not within specifications.

CAUTION: Brake discs should never be machined.

Turn the disc by hand and check run out.

DISC MINIMUM THICKNESS	4.7 mm (0.18 in)
DISC RUN OUT (MAX.)	0.25 mm (0.01 in)

Removal

Remove caliper as described previously.

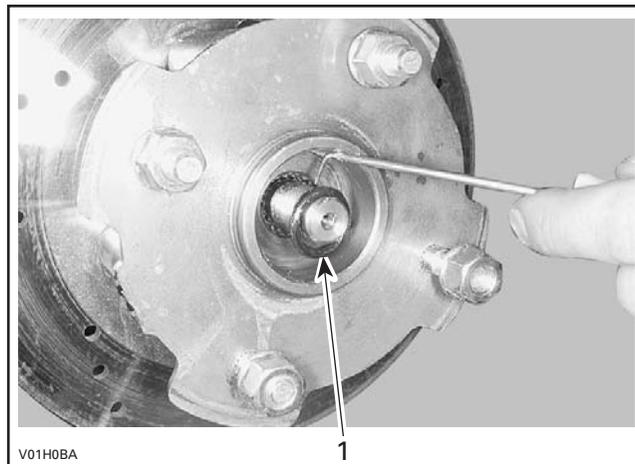
After removing the caliper, suspend it out of the way.

CAUTION: Don't let the caliper hang by the hose and don't stretch or twist the hose.

NOTE: Wheel hub has to be removed from vehicle to replace brake disc no. 13.

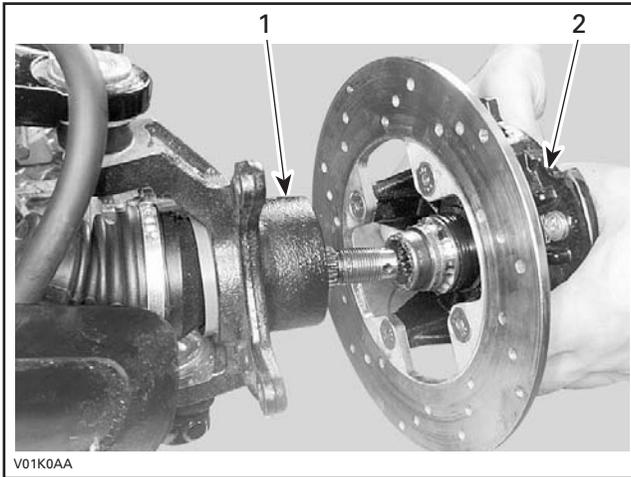
Remove cotter pin and unscrew castellated nut.

Remove O-ring.



1. Remove O-ring

Using a suitable puller, pull out wheel hub with disc.



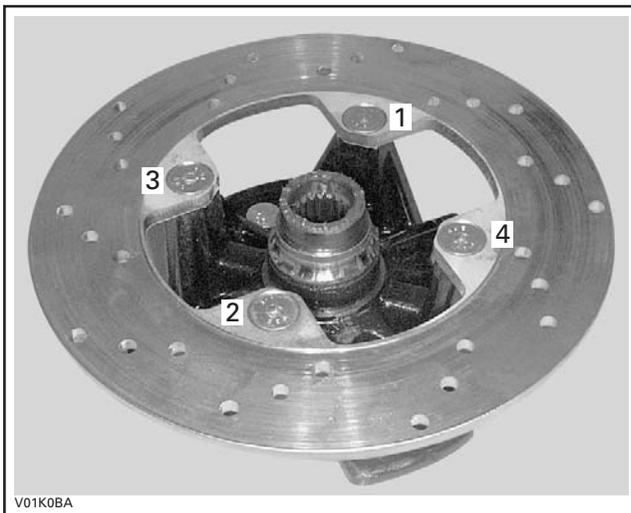
1. Knuckle
2. Wheel hub

Remove screws **no. 14** retaining brake disc **no. 13** to wheel hub. Discard screws

NOTE: Heat up disc around screws to facilitate removal.

Installation

Install brake disc on wheel hub and tighten in a criss-cross sequence.



TORQUE TO 34 N•m (25 lbf•ft)

Install new self-locking screws and torque screws **no. 14** to 34 N•m (25 lbf•ft).

BRAKE PEDAL

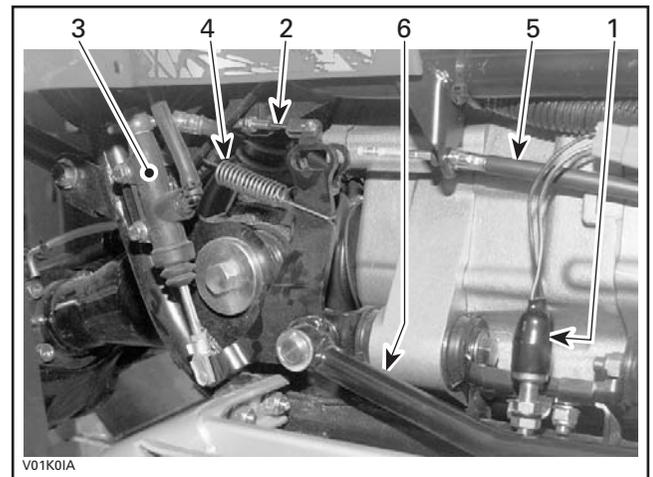
Removal

Remove RH side panel with foot peg.

Refer to section 10-02 BODY for removal procedure.

Unhook the return spring **no. 21**.

Unhook the brake cable **no. 17**, interlock cable and push rod from brake pedal.



1. Brake light switch
2. Interlock cable
3. Master cylinder
4. Return spring
5. Brake cable
6. Brake pedal

Remove cotter pin and washer then remove pedal **no. 20** from pivot.

Installation and Adjustment

Place a shim between brake pedal lever and switch nut. The tightness of the shim must be 2 mm (5/64 in).

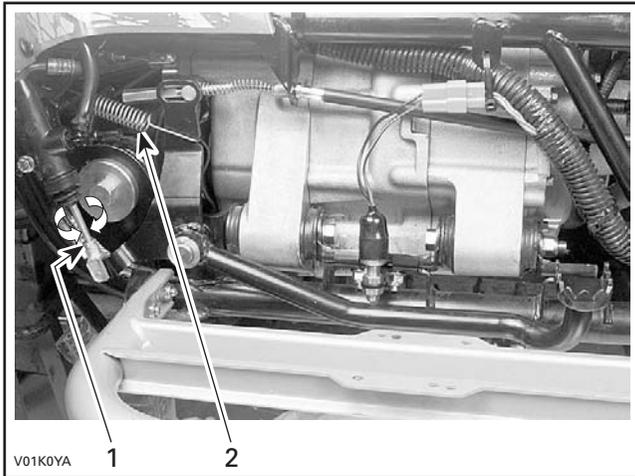
Adjust push rod to eliminate free play between brake pedal lever and master cylinder.

When the light pressure is feeling, torque push rod nut to 4.5 N•m (39 lbf•in).

Remove the shim and press the brake pedal lever. Check for the light play in the system.

Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)



1. Push rod jam nut
2. Brake pedal return spring

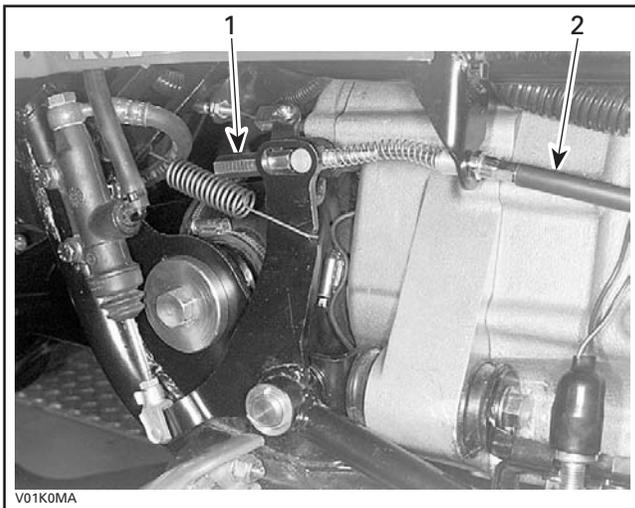
BRAKE CABLE

Removal

NOTE: Before removing brake cable from vehicle, note cable routing for reinstallation.

Brake Pedal

Remove adjusting nut **no. 24** and disconnect brake cable **no. 17** from brake pedal.



1. Adjusting nut
2. Brake cable

It may be necessary to hold the rod with locking pliers to prevent it from turning.

Release cable housing from frame bracket.

Brake Handle

Unscrew the bolt retaining the parking lever lock from brake lever **no. 18** and remove the lever.

Release the tension on brake lever. Rotate cable end bushing so that cable aligns with the brake lever recess, then lift cable end.

Inspection

Inspect cable ends for wear or deterioration. Replace if necessary.

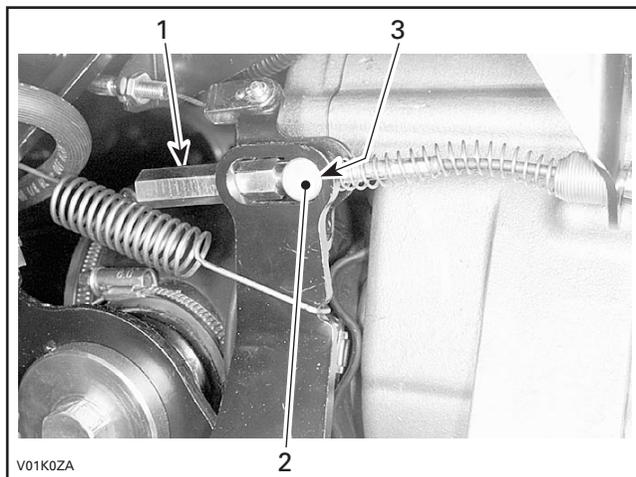
Installation and Adjustment

Installation is the reverse of the removal procedure.

NOTE: Adjust brake pedal prior to adjusting brake cable. If brake pedal is not correctly adjusted, the parking device will not function properly.

While holding rod with locking pliers, turn the adjustment nut until stopper comes in contact with the brake pedal lever.

Unscrew adjustment nut approximately 1/4 turn to make sure there is no tension on brake cable.



1. Adjustment nut
2. Stopper
3. Max. 1 mm (1/32 in) gap

INTERLOCK CABLE

Removal

NOTE: Before removing interlock cable from vehicle, note cable routing for reinstallation.

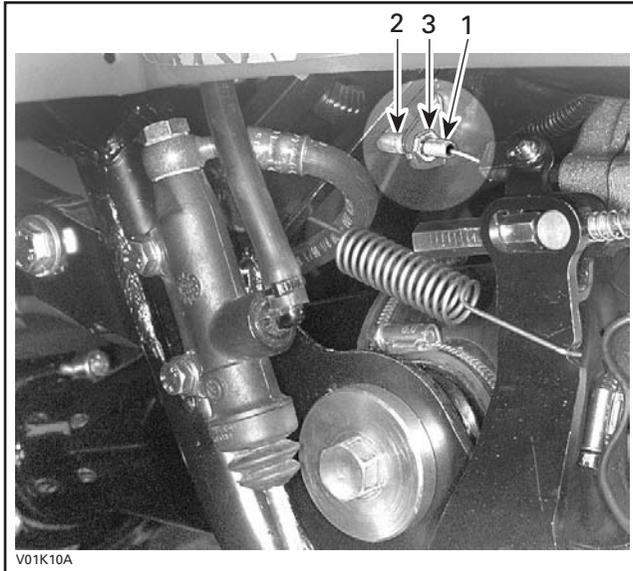
Remove the fuel tank. Refer to FUEL CIRCUIT 04-02.

Remove the LH and RH side panels. Refer to BODY 10-02.

Disconnect the interlock cable under shift lever.

Unscrew the nut from interlock adjustment.

Remove the interlock cable from interlock bracket.



1. Interlock adjustment
2. Interlock bracket
3. Unscrew this nut completely

Rotate cable end bushing so that cable align with the interlock fastener recess, then lift cable end.

Inspection

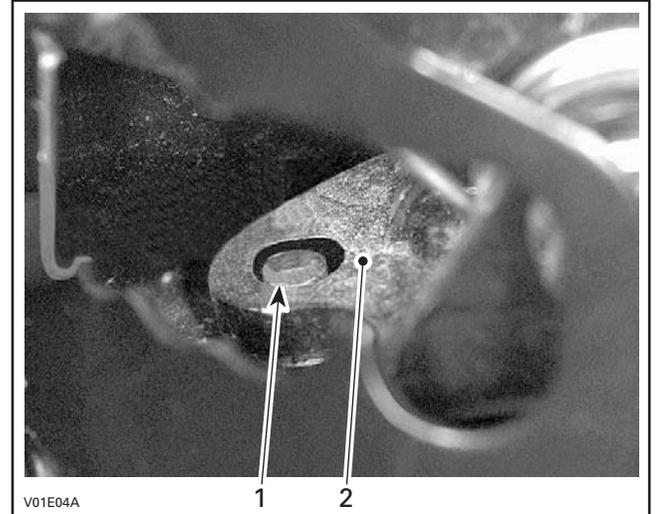
Inspect cable ends for wear or deterioration. Replace if necessary.

Installation and Adjustment

Installation is the reverse of the removal procedure.

NOTE: Under shifter lever, torque interlock cable lightly.

Adjust cable so that the pin end from interlock cable is flush with the shifter lever plate. Use the interlock cable adjustment.



1. Interlock pin end
2. Shifter lever plate

Torque nut and jam nut.

BRAKE HOSES AND BRAKE TUBES

Removal

Front Flexible Brake Hoses

Remove front luggage rack and front fender assembly.

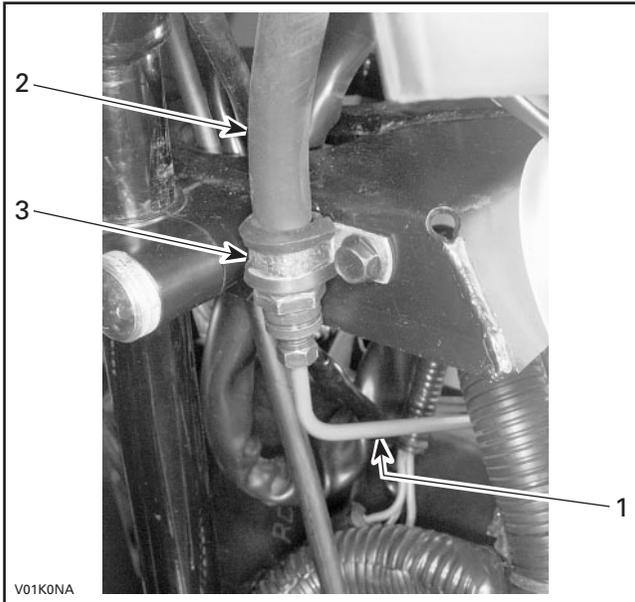
Remove fuel tank cover.

Refer to BODY 10-02 for complete procedure.

Unscrew the brake tube **no. 6** from the hose fitting **no. 7**.

Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

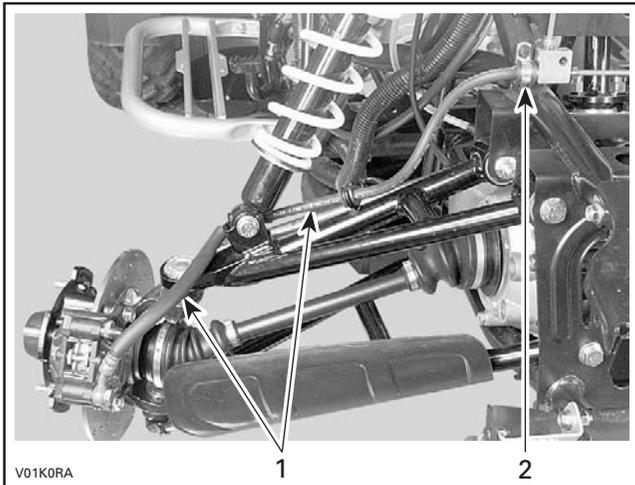


1. Vertical brake tube
2. Brake hose
3. Tube clip

Be careful not to bend the brake tubes.

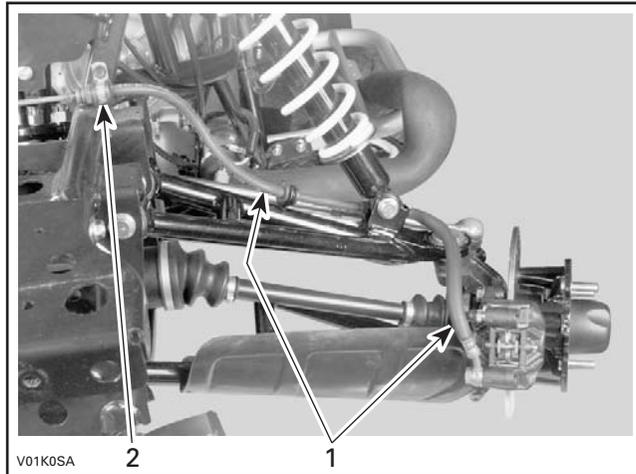
Remove screw holding tube clip **no. 10** and detach hoses from the frame or upper swing arm.

Remove bolt **no. 12** from caliper or master cylinder and discard sealing washers **no. 11**.



RIGHT HAND SIDE

1. Flexible hose
2. Tube clip

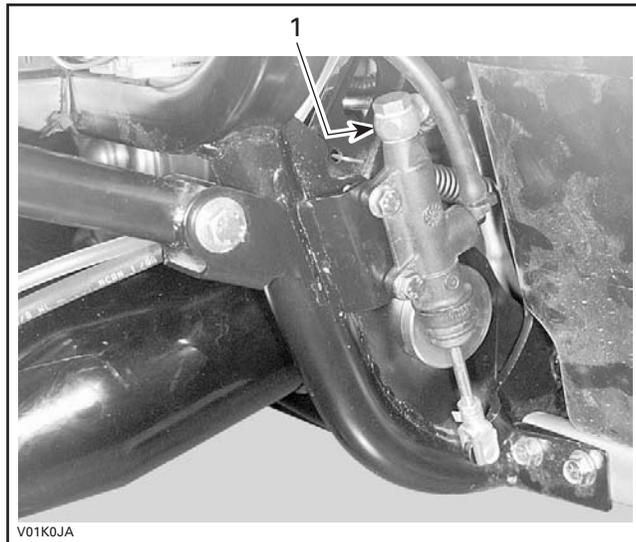


LEFT HAND SIDE

1. Flexible hose
2. Tube clip

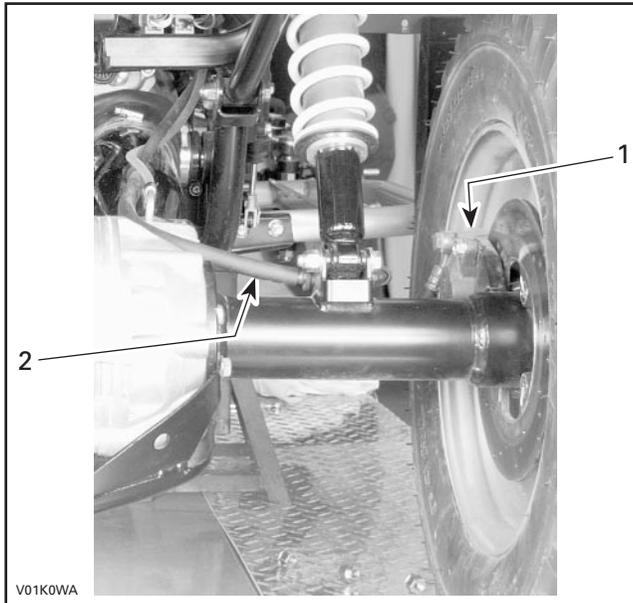
Rear Flexible Brake Hose

Remove bolt **no. 12** retaining flexible hose **no. 23** on top of rear master cylinder **no. 19**.



1. Disconnect brake hose

Remove bolt **no. 12** and washers **no. 11** retaining hose to rear caliper.



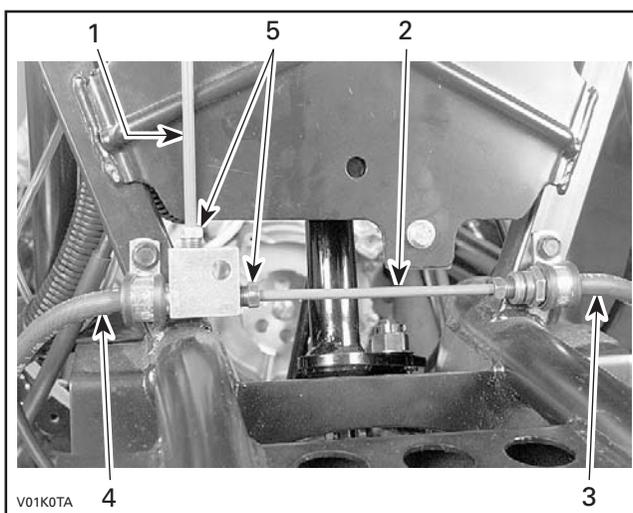
1. Rear brake caliper
2. Flexible brake hose

Detach hose **no. 23** from swing arm and remove from vehicle.

Brake Tubes

Disconnect the brake tubes **no. 6** and **no. 8** from fitting on flexible hoses **no. 9**.

Remove tube clip **no. 10** retaining left flexible hose to frame.



1. Vertical tube
2. Horizontal tube
3. Left flexible hose
4. Right flexible hose
5. Unscrew tube fitting

Inspection

Periodically inspect flexible brake hoses for cracks, leaks, blisters and any other damage.

If any sign of deterioration is found, replace the defective part with a new one.

Installation

Flexible Hoses

To install hoses, attach it to the caliper first. Always use new washers on both sides of the fitting.

Make sure brake hoses are properly secured and that they do not come in contact with moving parts.

Brake Tubes

Connect the brake tubes to the hose fitting but don't tighten yet. Install the tube clips **no. 10** retaining the brake hose to the frame.

Tighten the brake tube fitting, paying attention not to twist tubes.

BRAKE SYSTEM BLEEDING

If the brake hoses have been disconnected at the master cylinder, or if air has entered the system due to low fluid level, it will be necessary to bleed complete system.

If a brake hose has been disconnected only at one wheel, only that caliper must be bled.

Remove cover and fill reservoir with DOT 4 brake fluid.

Check the fluid level often during the bleeding operation. Keep sufficient brake fluid in reservoir at all times.

CAUTION: Do not mix different types of brake fluid. Use only DOT 4 brake fluid.

Place caliper on the top of the disk brake. The bleeder must be as high as possible.

Install a hose on left side bleeder. Route this hose to a container.

Connect the plastic hose of the brake bleeder tool to the bleeder valve of the right side front caliper.

NOTE: Use the air pump (P/N 529 021 800) and bottle included in engine leak tester (P/N 861 749 100). Use the pump in vacuum mode.

Pump gauge lever and open bleeder valve. And check for air to escape.

Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

NOTE: Check the fluid level often in the reservoir. Add brake fluid when level is low.

Repeat procedure until no air appears in hose.

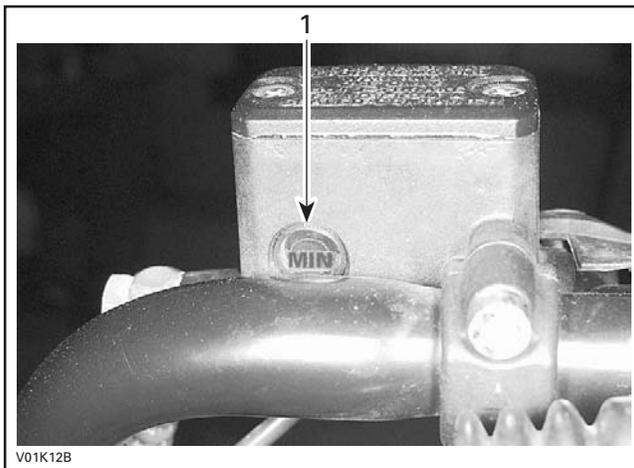
Proceed the same way with the left side front caliper.

NOTE: Front and rear brakes must be bled separately as they are separate systems.

Refill the master cylinder to proper level at the end of the operation.



REAR BRAKE MASTER CYLINDER



FRONT BRAKE MASTER CYLINDER

1. Indicator level

Install cover on master cylinder.

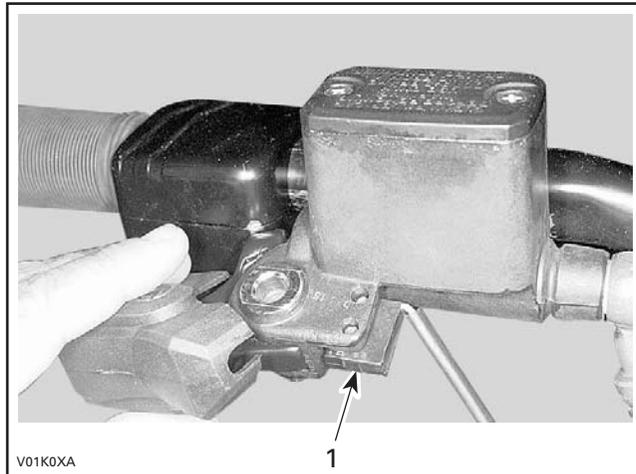
Check for leaks and make sure the brakes operate normally before driving.

BRAKE LIGHT SWITCH

Removal

Front Brake Light Switch

The front brakes switch is located on the master cylinder and cannot be adjusted. Check that switch is securely installed.



1. Front brake light switch

Rear Brake Light Switch

The rear brake switch is located above brake pedal.

Remove RH side panel with foot peg.

Refer to BODY 10-02 for removal procedure.

Disconnect wire harness.

Unscrew jam nut and remove switch from bracket.

Inspection and Installation

Check switch for dirt or corrosion. Make sure it is operating properly.

Depress brake pedal and check for brake light to turn on.

For installation, reverse the removal procedure.

The rear brake light switch cannot be adjusted.

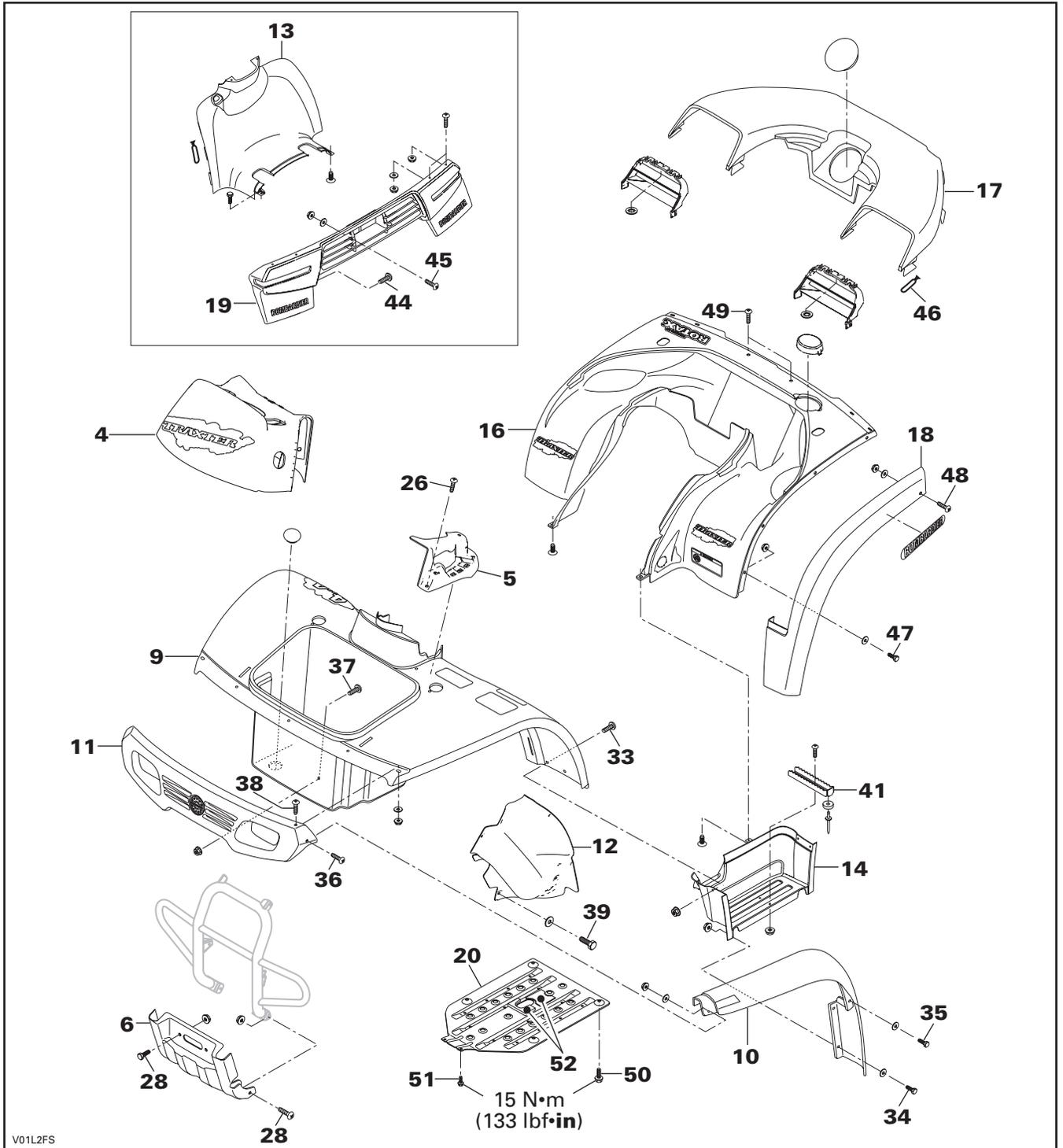
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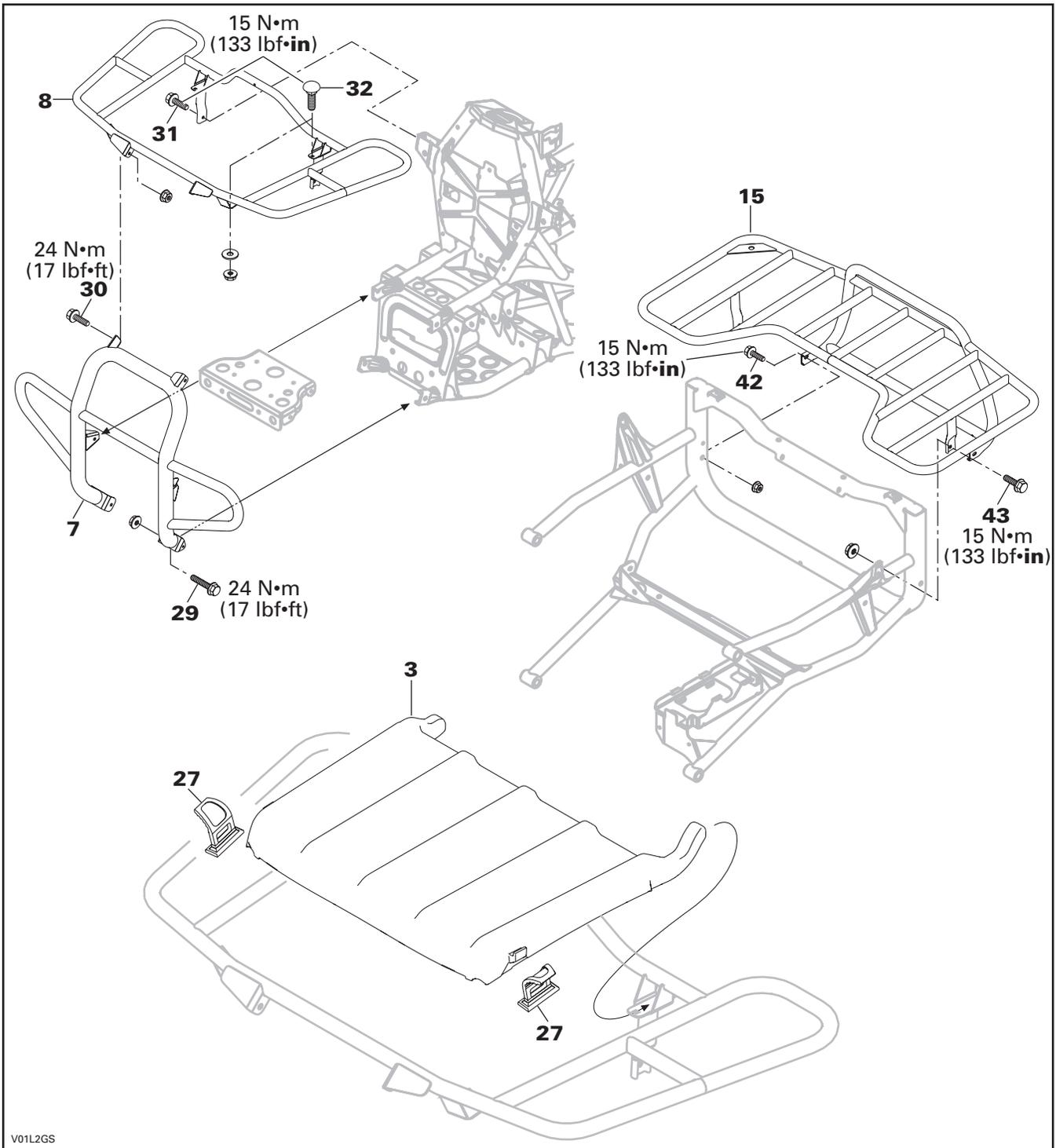
BODY

BODY PARTS



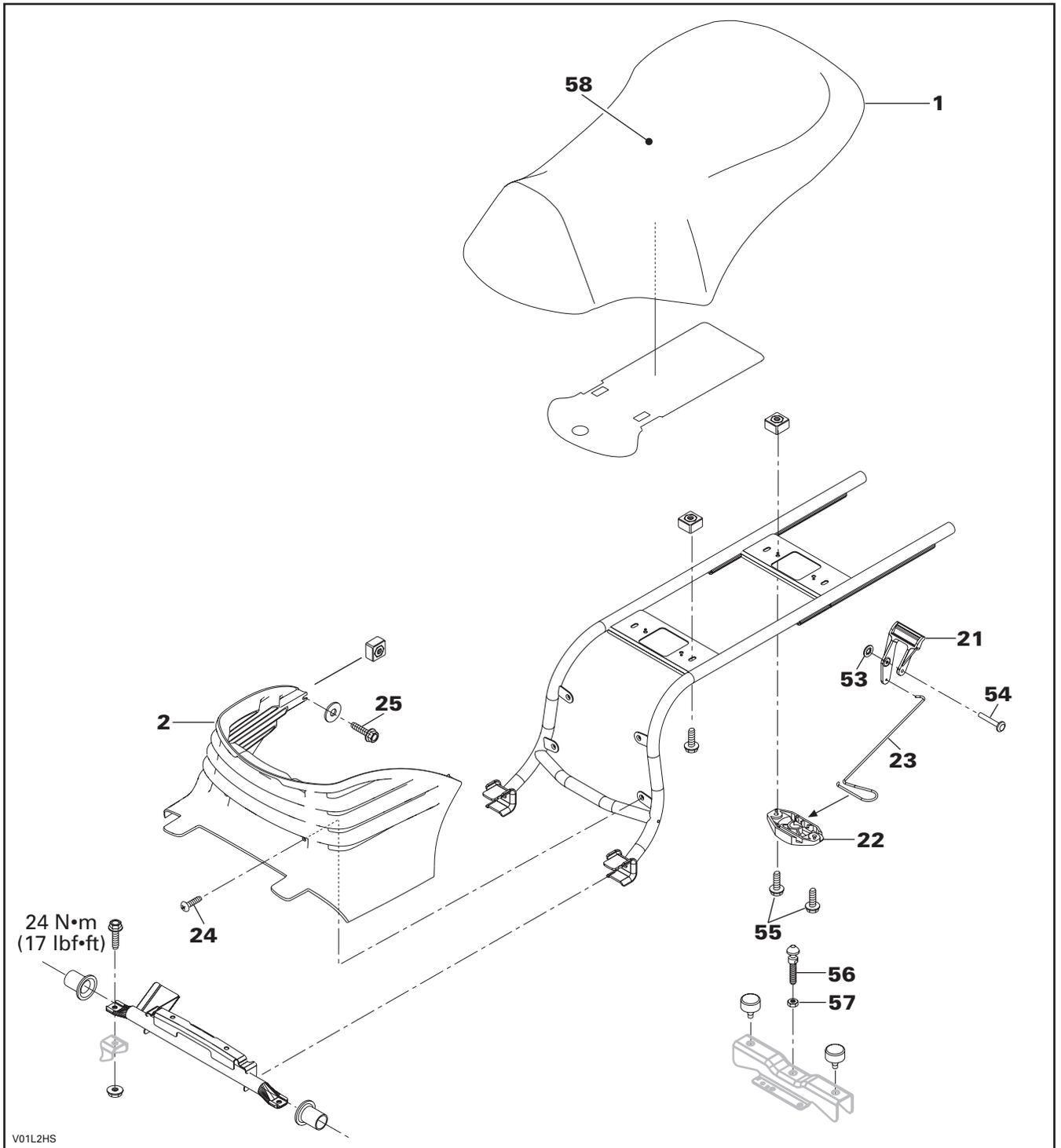
Section 10 BODY/FRAME

Subsection 02 (BODY)



V01L2GS

SEAT



Section 10 BODY/FRAME

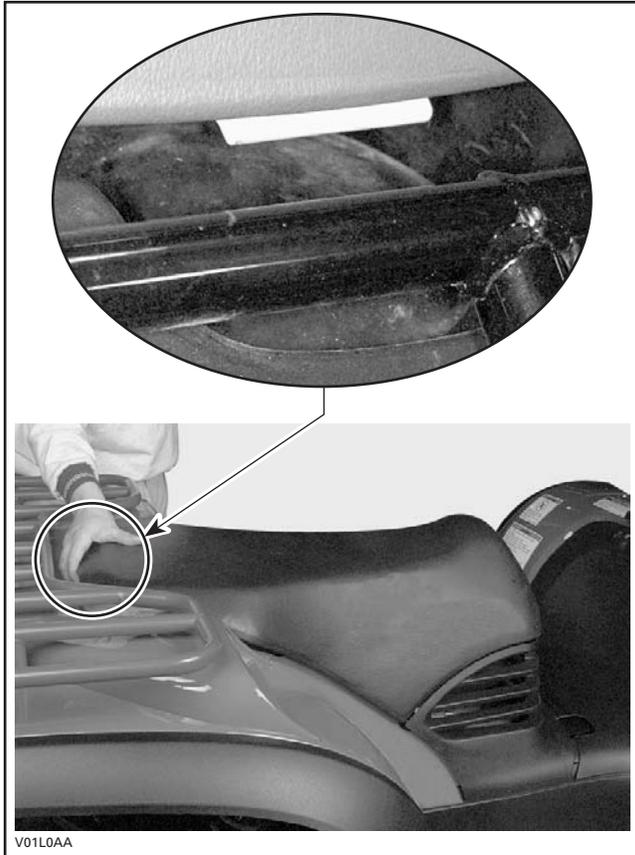
Subsection 02 (BODY)

SEAT/ENGINE COVER

Removal

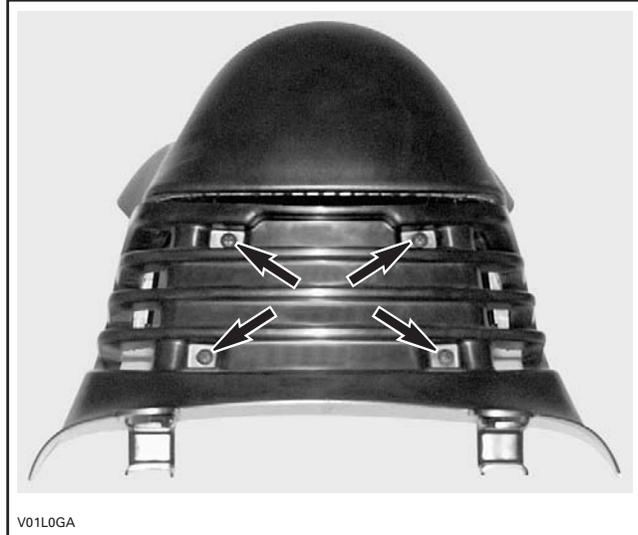
1, Seat

Pull latch upward while gently lifting rear of seat. Continue lifting movement until you can release the front retaining devices, then, completely remove seat.

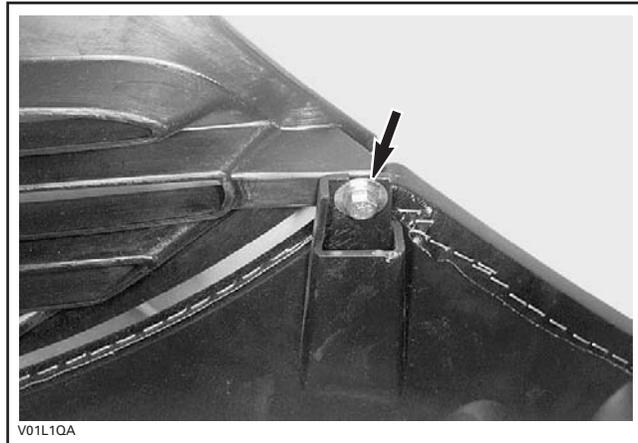


2, Engine Cover

Remove seat and screws no. 24.



On the inside, remove bolts no. 25.



Installation

Installation is the reverse order of removal.

STORAGE/STEERING/SHIFTER GUIDE COVER

Removal

3, Storage Cover

Unlatch cover, lift then remove cover.

4, Steering Cover

Remove screws under handle bar.



Remove ignition switch and choke lever.

NOTE: For the choke lever removal, remove the roll pin retaining the lever then unscrew the large plastic nut.

Unplug all connectors.

5, Shifter Guide Cover

Remove steering cover.

Unfasten plastic screws **no. 26**.



Inspection

Check latches **no. 27** from storage cover for cracks or other damages. Change if necessary.

Installation

Installation is the reverse order of removal.

FRONT SKID PLATE/BUMPER/LUGGAGE RACK

Removal

6, Front Skid Plate

Remove bolts **no. 28**.



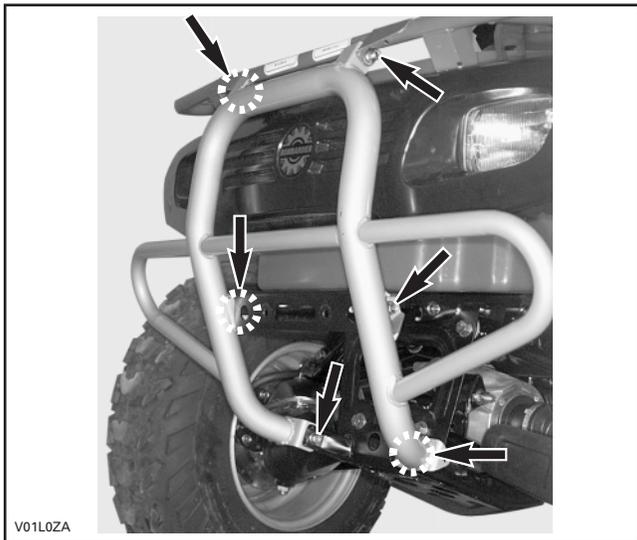
7, Front Bumper

Remove front skid plate.

Remove bolts **no. 29** and **no. 30**.

Section 10 BODY/FRAME

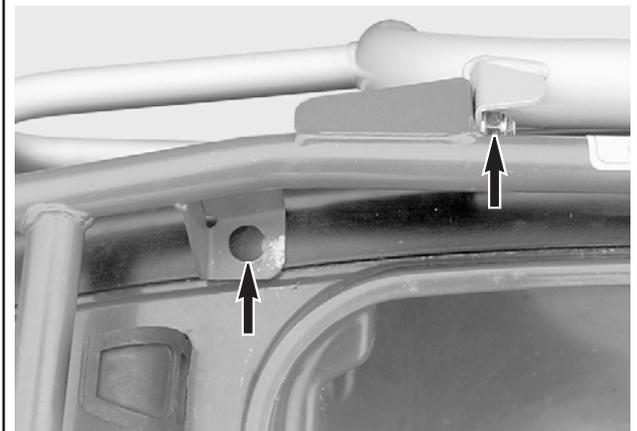
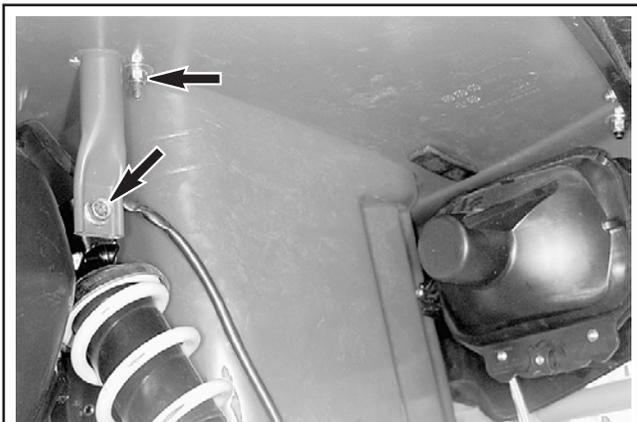
Subsection 02 (BODY)



8, Front Luggage Rack

Remove bolts no. 30, no. 31 and no. 32.

NOTE: Remove sealed beam to reach nut. Refer to INSTRUMENTS AND ACCESSORIES 05-07.



Cut locking tie holding the cable of the sealed beam.

NOTE: Install a new locking tie at the time of luggage rack installation.

Pull upside.

Installation

Installation is in the reverse order of removal.

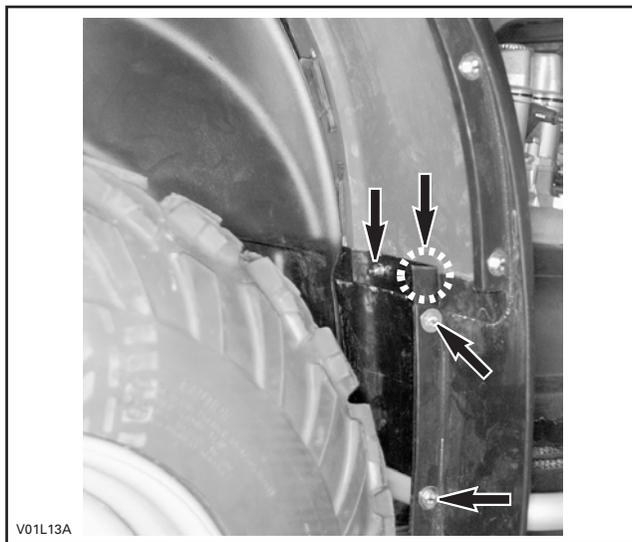
FRONT FENDER/MUDGUARD/FACIA

Removal

9, Front Fender

Remove front luggage rack and shifter guide cover.

Remove screws no. 33 and no. 34 on each side.



Remove fuel cap.

10, Front Mudguard

Remove screws no. 34 and no. 35.

Remove screw no. 36 near the front facia.

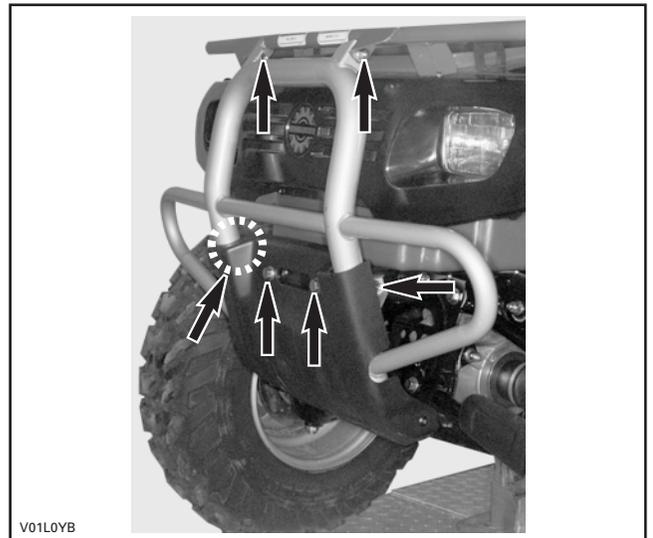


Remove bolts no. 28, no. 29 and no. 30.

11, Front Facia

Remove sealed beams.

Remove the screws no. 37 under facia.



Pull front bumper forward.

Installation

Installation is the reverse order of removal.

Remove the screws no. 38 on the top of facia.

Section 10 BODY/FRAME

Subsection 02 (BODY)

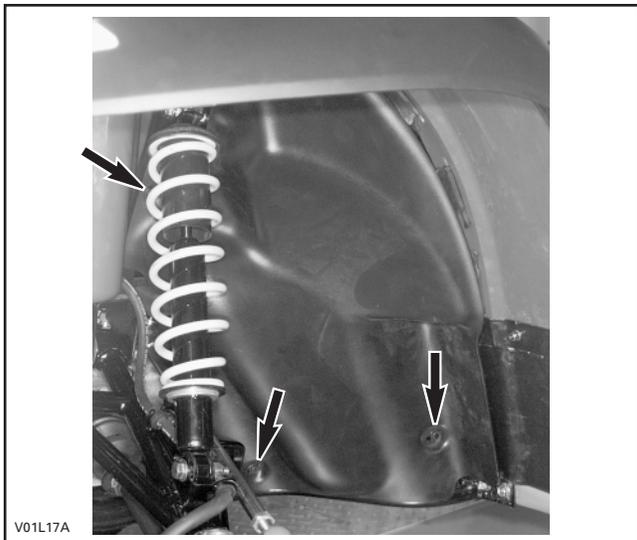
INNER FENDER

Removal

12, Inner Fender

Remove front wheel.

Remove screws no. 39, two on bottom side and one behind shock.



Installation

Install in first, the upper screw; secondly, the lower front screw and then the lower rear screw.

NOTE: Install all screws before torque.

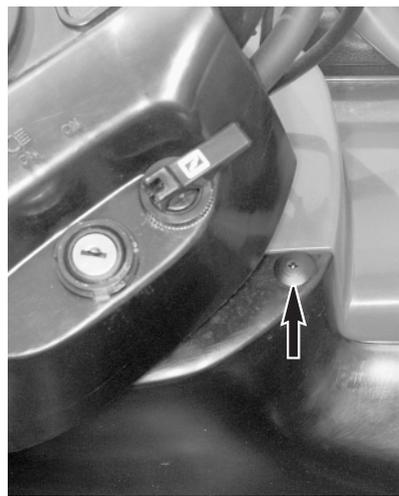
FUEL TANK COVER/SIDE PANEL

Removal

13, Fuel Tank Cover

Remove seat.

Turn steering to the right side and remove screw retaining shifter guide cover and fuel tank cover. Turn steering to the left side and remove the other screw.

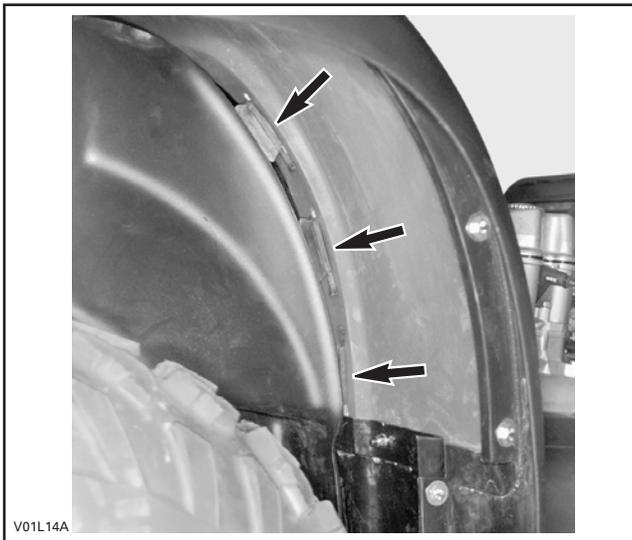


Remove screw on the LH side and separate from dart on the RH side.



1. Screw
2. Dart

Remove latches no. 40. Three by side.

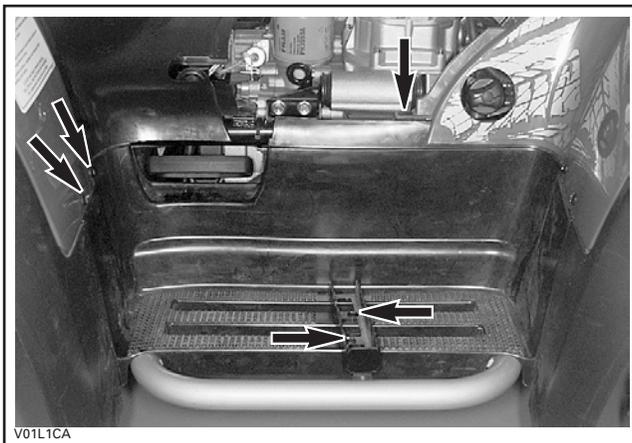


14, Side Panel

Remove seat.

Remove footpeg.

Remove plastic pin and screws retaining the side panel with front and rear fender.



On front and rear mudguards, remove the three first screws no. 35 and screws no. 34 retaining side panel with mudguards.



Installation

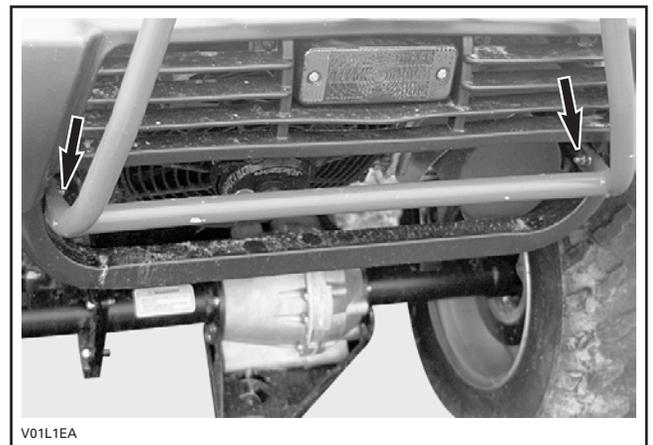
Installation is the reverse order of removal.

REAR LUGGAGE RACK

Removal

15, Rear Luggage Rack

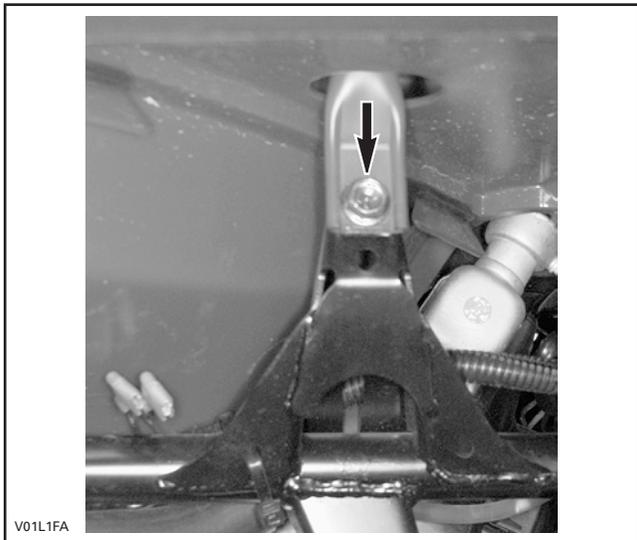
Remove bolts no. 42 under rear facia.



Section 10 BODY/FRAME

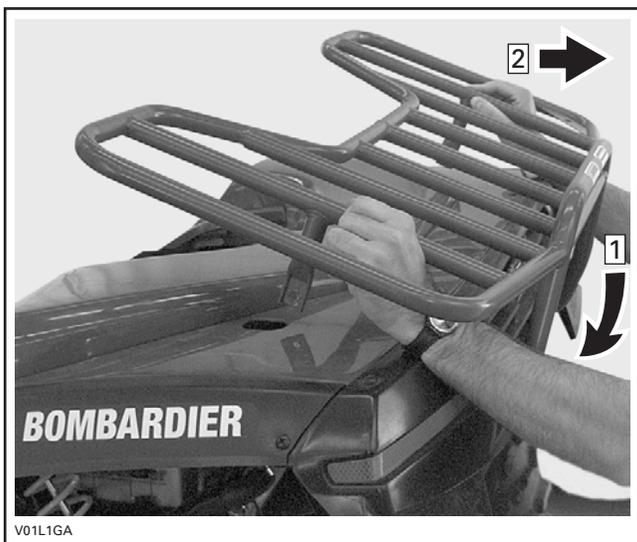
Subsection 02 (BODY)

Under rear fender, remove bolts no. 43. One on each side.



Pivot the bottom of rear luggage rack toward inside of ATV.

Pull the rear luggage rack toward back.



Step 1: Pivot bottom of rear rack toward inside

Step 2: Pull rear rack toward back

Installation

Installation is the reverse order of removal.

NOTE: Install all bolts before torque.

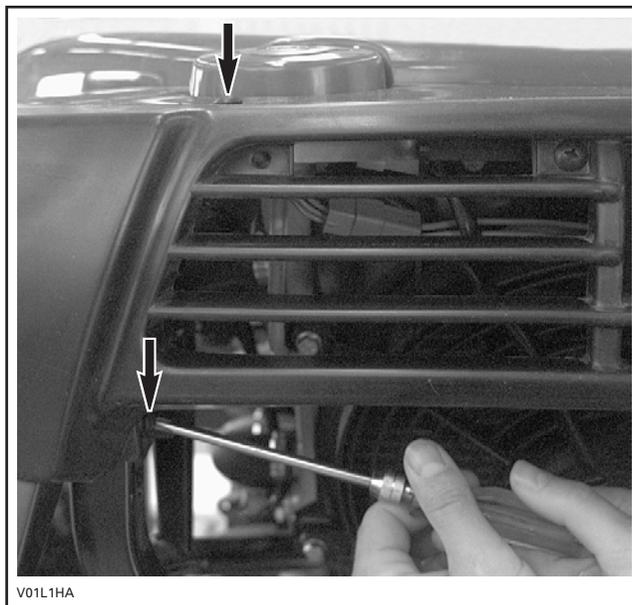
REAR FENDER/REAR FENDER COVER

Removal

16, Rear Fender

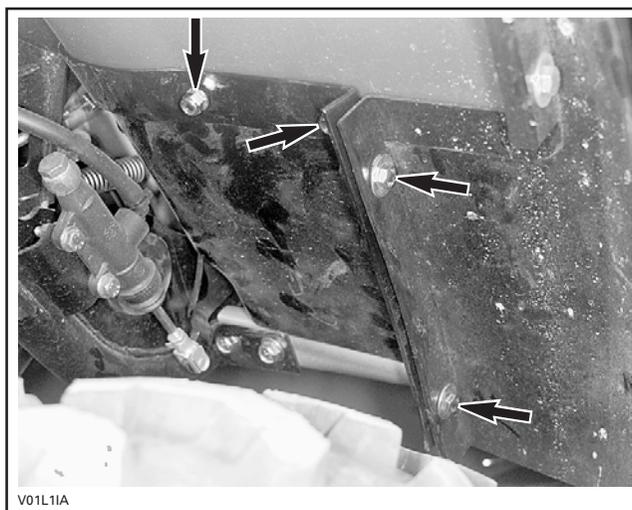
Remove seat and rear luggage rack.

Remove screws no. 44 under rear facia and screws no. 45 on the top.



Remove plastic pin of rear fender.

Remove screws no. 33 and no. 34.

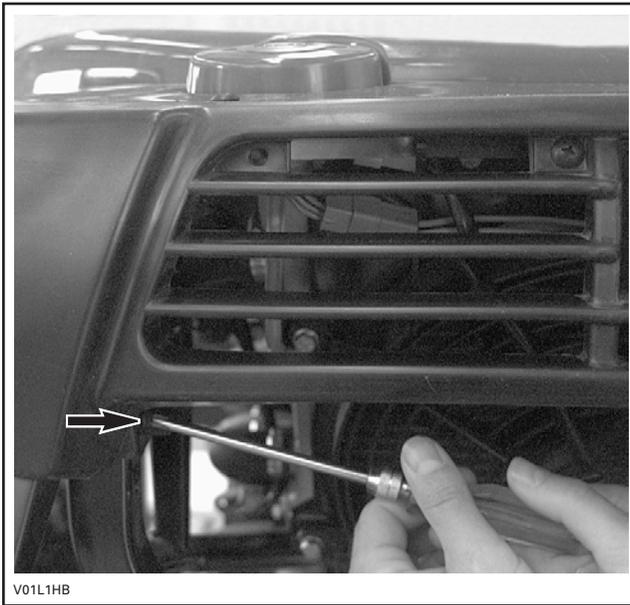


Disconnect brake light.

Rear Fender Cover

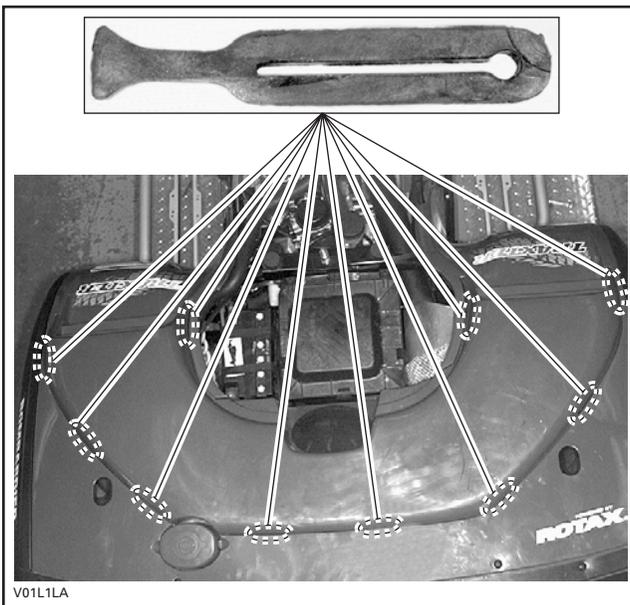
Remove rear luggage rack.

Remove screws **no. 44** under rear facia.



V01L1HB

Lift the rearward of the rear fender and remove the ten latches **no. 46**.



V01L1LA

Installation

Installation is the reverse order of removal.

REAR MUDGUARD/FACIA

Removal

18, Rear Mudguard

Remove screws **no. 47** retaining mudguard and rear fender.

Remove screws retaining mudguard and side panel.



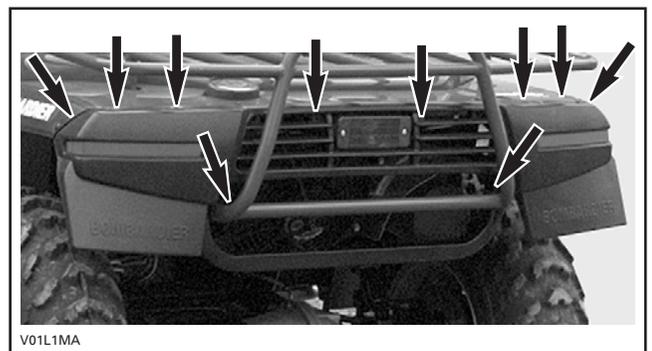
V01L1B

Remove screw **no. 48** near rear facia.

19, Rear Facia

Remove rear luggage rack.

Unfasten screws **no. 44** and **no. 49**.



V01L1MA

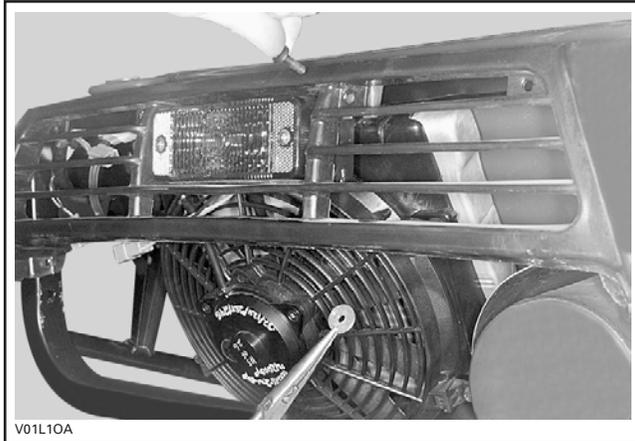
Section 10 BODY/FRAME

Subsection 02 (BODY)

Installation

Installation is the reverse order of removal. However, pay attention to the following details.

For the rear facia installation, install the flat washers between rear fender and rear facia with a needle nose pliers.



SKID PLATE

Inspection

The skid plate protected the engine. Check for damage, crack or looseness.

Change if skid plate is damaged or cracked.

Torque all bolts at the regular interval.

Removal

20, Skid Plate

Under vehicle, remove bolts no. 50 and no. 51.

Installation

CAUTION: Be sure to install rubber spacer no. 52 between skid plate and engine.

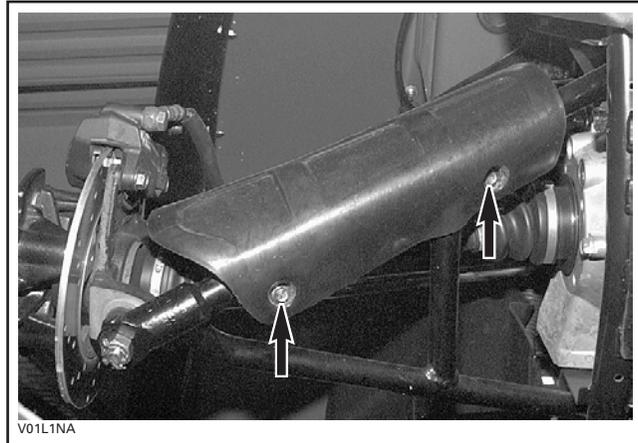
Installation is the reverse order of removal.

NOTE: Install all bolts before torque.

ARM PROTECTOR

Removal

Remove the bolts.



Installation

Installation is the reverse order of removal.

LATCH LEVER/LATCH BASE/ SPRING

Removal

21, Latch Lever

Remove push nut no. 53 and rivet no. 54.

Separate latch lever from spring no. 23.

22, Latch Base

Remove bolts no. 55 and separate latch base from spring.

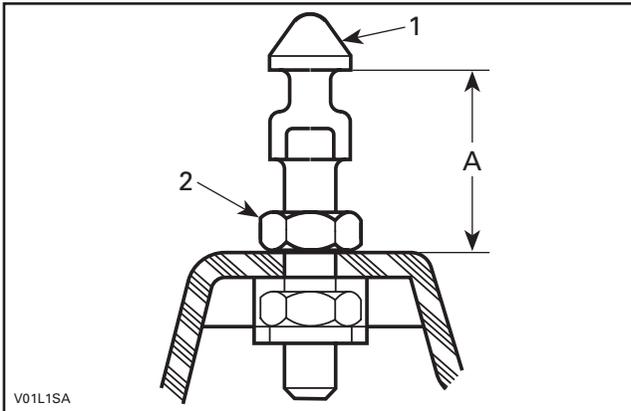
23, Spring

Remove latch base.

Separate spring from latch base and latch lever.

SEAT ADJUSTMENT

For latch stud no. 56 adjustment, unscrew the latch stud nut no. 57 and screw or unscrew the latch stud to the best height. See the following illustration.



1. Lock pin
2. Adjustment nut (apply Loctite 271)
- A. $38 \pm 1 \text{ mm}$ ($1\text{-}1/2 \pm 3/64 \text{ in}$)

Torque the latch stud nut.

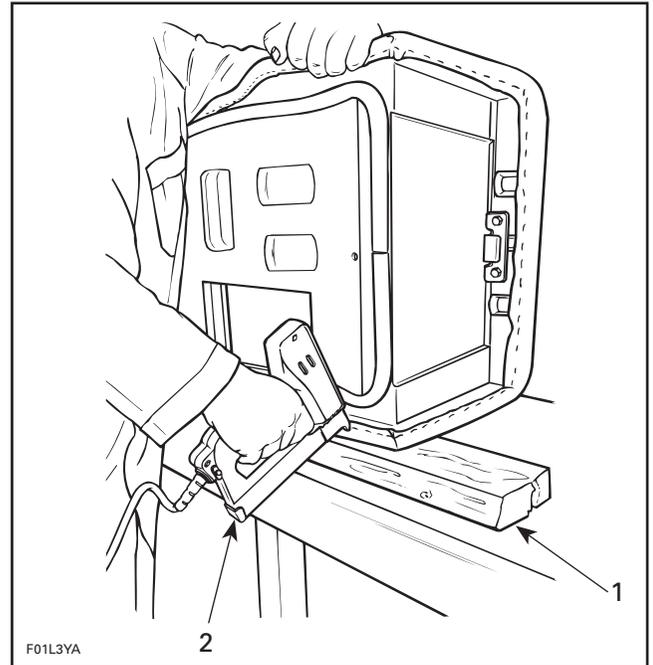
SEAT COVER REPLACEMENT

Remove the old seat cover no. 58. Check the foam and replace if necessary.

Install staples with an electric tacker such as Arrow tacker no. ETN-50 or with a manual tacker such as Arrow tacker no. T-50.

NOTE: For an easier installation, it's highly recommended to use an electric tacker.

Ensure that the seat rest firmly against a hard surface such as a piece of wood. This is done to get the staples completely pushed in place.



TYPICAL

1. Piece of wood
2. ETN-50 (electric) or T-50 (manual)

After cover installation cut all around the excess of material.

STORAGE COVER LATCH

Inspection

Inspect for crack or damage. Change if a any crack or damage are detected.

Removal

Under front fender, pull the storage cover latch.

Installation

Under front fender, insert the storage cover latch in the slot. Pull the latch by the top.

Section 10 BODY/FRAME

Subsection 02 (BODY)

SEAT CLEANING

It is recommended to clean the seat with a solution of **warm soapy water**, using a soft clean cloth.

CAUTION: Avoid use of harsh detergents such as strong soaps, degreasing solvents, abrasive cleaners, paint thinners, etc. that may cause damage to the seat cover.

DECALS REPLACEMENT

Removal

Using a heat gun warm up one end of decal for a few seconds until decal can roll off when rubbing with your finger.

Pull decal slowly and when necessary apply more heat to ease removal on the area that has to be peeled off.

If decal tears while pulling off, it has to be heated for a few seconds longer. If decal tends to stretch while pulling off, stop heating and wait a few seconds to let it cool, then peel it off.

Installation

There are 2 types of decals used on ATV. One has a protective film on back side and the other has a protective film on both sides. They are used on 2 types of materials; plastic and metal.

DECALS HAVING A PROTECTIVE FILM ON BACK SIDE ONLY

These decals usually contain written information (ex.: warning) and are used on metal.

Clean surface with a good solvent such as ACRYLIC CLEAN DX 330 from PPG or equivalent (refer to manufacturer instructions).

Using a pencil and the decal as a template, mark the area where decal will be located.

Remove half of the decal back protective film and align decal with marks. Start sticking it from center and remove the other half of the film to stick it completely. Carefully squeegee decal beginning at center and working outward using, firm, short, overlapping strokes.

DECALS HAVING A PROTECTIVE FILM ON BOTH SIDES

These decals usually contain graphics and are used on plastic.

INSTALLATION ON PLASTIC

Clean surface with isopropyl alcohol.

Using a pencil and the decal as a template, mark the area where decal will be located.

Apply an activator (P/N 293 530 036) to prepare the surface using a clean cloth. After a few seconds, when the activator evaporates, the surface is ready.

CAUTION: Do not use soapy water to locate decal on plastic parts.

Remove back protective film from decal and carefully align decal with marks. When well aligned squeegee decal beginning at center and working outward using firm, short, overlapping strokes.

HITCH/TRAILER BALL

Inspection

The hitch/trailer ball is optional. If the vehicle is equipped with this option, often check the solidity of the installation.

PLASTIC MAINTENANCE

MAINTENANCE

Clean the vehicle thoroughly, removing all dirt and grease accumulation.

To clean use a soft clean cloth and either soapy water or isopropyl alcohol.

To remove grease, oil or glue use isopropyl alcohol.

CAUTION: Do not apply isopropyl alcohol or acetone directly on decals.

CAUTION: The following products must not be used to clean or wax any of the plastic components used on the vehicles:

- gasoline
- brake fluid
- kerosene
- diesel fuel
- lighter fluid
- varsol
- naphtha
- acetone
- strong detergents
- abrasive cleaners
- waxes containing an abrasive or a cleaning agent in their formula

Section 10 BODY/FRAME

Subsection 02 (BODY)

PLASTIC REPAIR

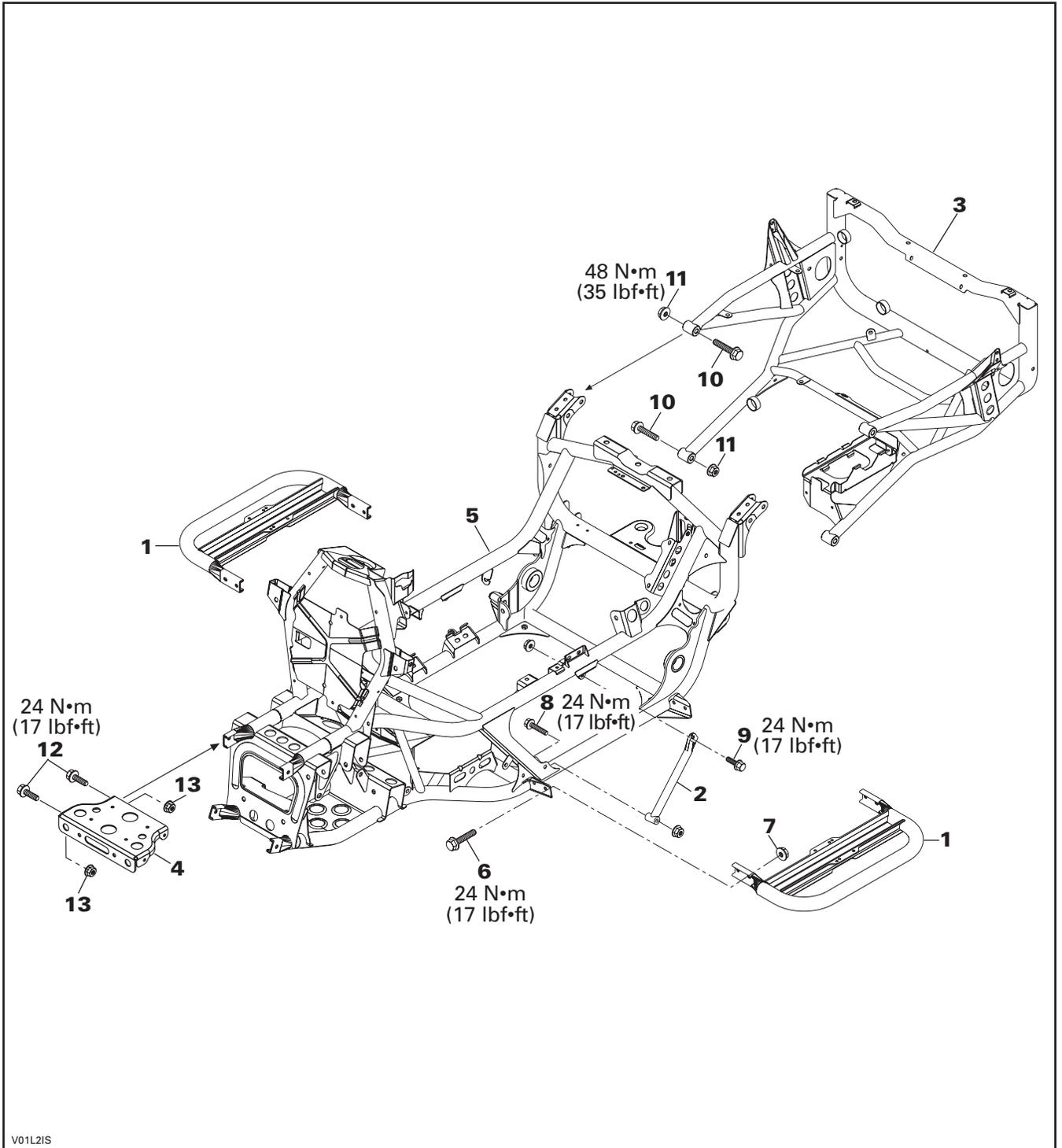
REPAIR

The very first step before repairing plastic materials is to find out exactly which type of material is involved. Refer to following chart.

CAUTION: Consult the plastic maintenance chart carefully, some maintenance products are not compatible with certain plastics.

PART	IRREPARABLE		
	HIGH MOLECULAR WEIGHT POLYETHYLENE	HIGH DENSITY POLYETHYLENE	LOW DENSITY POLYETHYLENE
Fuel tank cover Front and rear facia Front and rear fender Rear fender cover Side panel Steering cover Storage cover			
Front and rear mudguard			
Inner fender Front skid plate			

FRAME



Section 10 BODY/FRAME

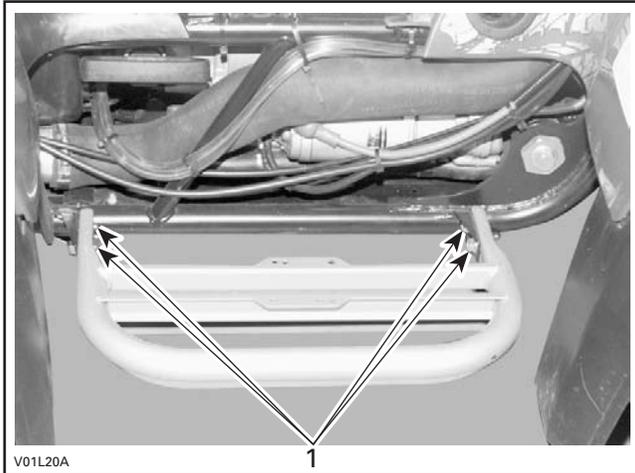
Subsection 03 (FRAME)

1, FOOTREST

Removal

Remove footpeg and side panel. Refer to BODY 10-02.

Remove M8 x 20 mounting flanged bolts **no. 6** and flanged nuts **no. 7**.



1. M8 x 20 mounting flanged bolts

Inspection

Check for cracks or bent tube. Change or repair if necessary.

Installation

Installation is essentially the reverse of removal procedure.

2, REMOVABLE BRACE

Removal

Remove footpegs and side panel. Refer to BODY 10-02.

Unscrew bolts **no. 8** and **no. 9**.

Inspection

Check for crack or bent tube. Change if necessary.

Installation

For the installation, reverse the removal procedure.

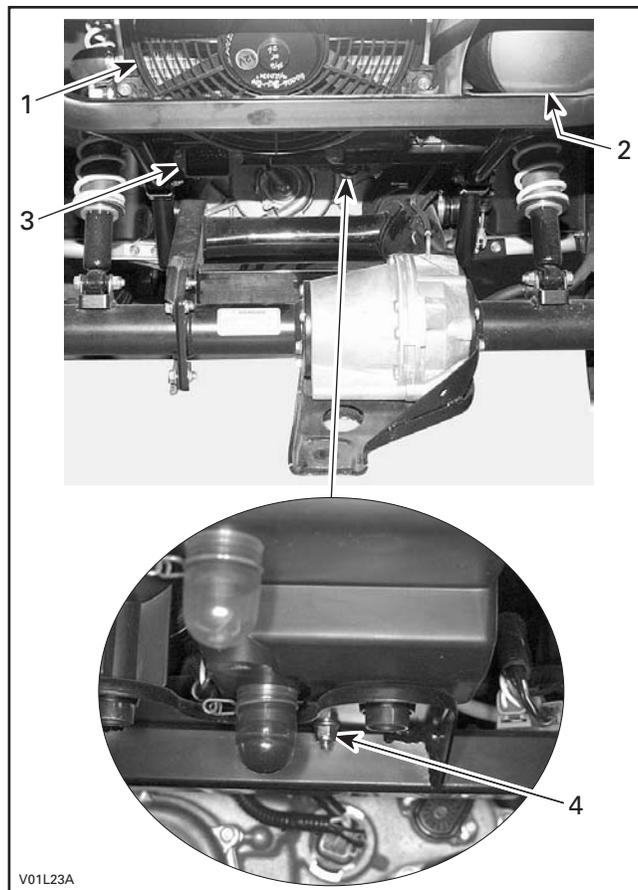
3, REAR EXTENSION FRAME

Removal

Remove rear fender. Refer to BODY 10-02.

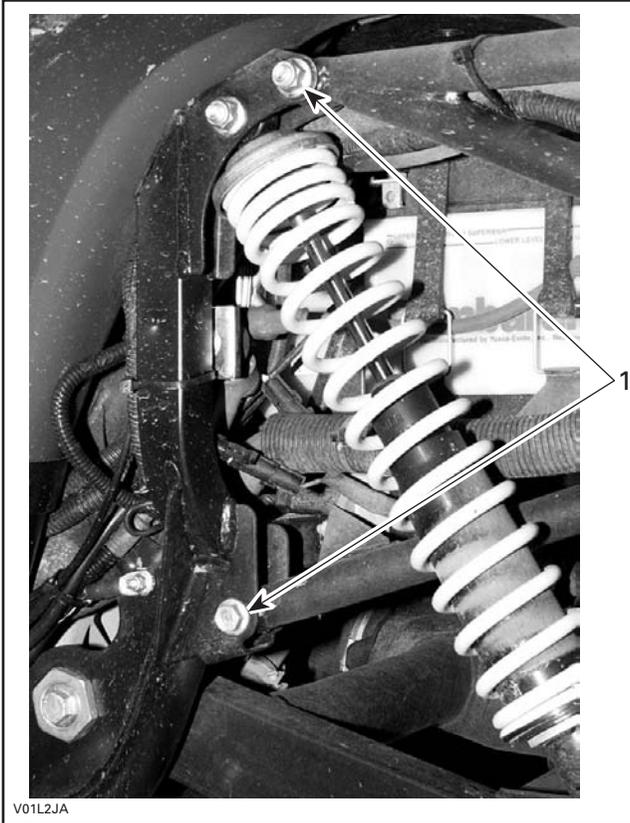
Remove:

- radiator, (refer to COOLING SYSTEM 03-03)
- muffler, (refer to REMOVAL AND INSTALLATION 03-02)
- voltage regulator, (refer to CHARGING SYSTEM 05-03)
- ignition coil retaining bolt



1. Radiator with ventilator
2. Muffler
3. Voltage regulator
4. Ignition coil retaining bolt

Remove M10 x 55 mounting flanged bolts no. 10 and the flanged nuts no. 11.



1. Remove the M10 x 55 mounting flanged bolts

Inspection

Check for crack, bent tube or other damage. Repair or change if necessary.

Installation

Installation is the reverse of removal procedure.

4, WINCH PLATE

Removal

Remove front skid plate and front bumper. Refer to BODY 10-02.

Remove M8 x 20 flanged bolts no. 12 and flanged nut no. 13.



1. Remove M8 x 20 flanged bolts

Inspection

Check for crack or other damage. Change if necessary.

Installation

Installation is the reverse of removal procedure.

5, FRAME

Cleaning

Clean frame and frame extension with appropriate cleaners and rinse with high pressure hose.

Touch up all metal spots where paint has been scratched off. Spray all bare metal parts of vehicle with metal protector.

Welding

Steel Frame:

- electric welding
- amperage: 70 - 110 A
- voltage: 20 - 24 V
- rod: E-7014 (3/32 in)

Section 10 BODY/FRAME

Subsection 03 (FRAME)

CAUTION: Before performing electrical welding anywhere on the vehicle, unplug the multiple connector at the MPEM. Also unplug the negative cable and the voltage regulator. This will protect the MPEM and battery against damage caused by flowing current when welding.

NOTE: Install the ground as close as possible from the reparation area.

CAUTION: If welding is to be done near plastic material, it is recommended to either remove the part from the area or to protect it with aluminum foil to prevent damage.

TECHNICAL DATA

SI* METRIC INFORMATION GUIDE

BASE UNITS			
DESCRIPTION	UNIT	SYMBOL	
length	meter	m	
mass	kilogram	kg	
force	newton	N	
liquid	liter	L	
temperature	Celsius	°C	
pressure	kilopascal	kPa	
torque	newton•meter	N•m	
speed	kilometer per hour	km/h	
PREFIXES			
PREFIX	SYMBOL	MEANING	VALUE
kilo	k	one thousand	1 000
centi	c	one hundredth	0.01
milli	m	one thousandth	0.001
micro	μ	one millionth	0.000001
CONVERSION FACTORS			
TO CONVERT	TO †	MULTIPLY BY	
in	mm	25.4	
in	cm	2.54	
in ²	cm ²	6.45	
in ³	cm ³	16.39	
ft	m	0.3	
oz	g	28.35	
lb	kg	0.45	
lbf	N	4.4	
lbf•in	N•m	0.11	
lbf•ft	N•m	1.36	
lbf•ft	lbf•in	12	
PSI (lbf/in ²)	kPa	6.89	
imp. oz	U.S. oz	0.96	
imp. oz	mL	28.41	
imp. gal	U.S. gal	1.2	
imp. gal	L	4.55	
U.S. oz	mL	29.57	
U.S. gal	L	3.79	
MPH	km/h	1.61	
Fahrenheit	Celsius	(°F - 32) ÷ 1.8	
Celsius	Fahrenheit	(°C × 1.8) + 32	

* The international system of units abbreviates SI in all languages.

† To obtain the inverse sequence, divide by the given factor. To convert "mm" to "in", divide by 25.4.

NOTE: Conversion factors are rounded off to 2 decimals for easier use.

Section 11 TECHNICAL DATA
Subsection 02 (ENGINE AND VEHICLE)

ENGINE AND VEHICLE

	VEHICLE MODEL		7400/7401	7413/7414	7415/7416/7417/7418
ENGINE	Engine type		BOMBARDIER-ROTAX 511, longitudinal mount, liquid cooled		
	Starting system		Electric and manual		
	Number of cylinder(s)		1		
	Number of valves		2 valves with hydraulic lifters (no adjustment)		
	Decompressor type		Automatic		
	Bore	Standard	mm (in)	89 (3.5)	
	Stroke		mm (in)	80 (3.15)	
	Displacement		cm ³ (in ³)	498 (30.4)	
	Compression ratio			9:1	
	Maximum HP RPM		± 100 RPM	6000	
	Lubrication		Wet sump with replaceable oil filter		
	Oil filter		BOMBARDIER-ROTAX		
	Air filter type		Cleanable synthetic panelette		
	Exhaust system	Type	Nelson, stainless steel		
Spark arrester		USDA approved			
Magneto/generator		400 W @ 6000 RPM			
Ignition system type		I.D.I. (Inductive Discharge Ignition)			
Spark plug	Make and type		NGK BR8EA		
	Gap	mm (in)	0.65 (.026)		
Trigger coil		Ω	190 – 300		
Battery charging coil		Ω	0.4 ± 01		
Ignition coil	Primary	Ω	0.4 to 0.9 @ 20°C (68°F)		
	Secondary	kΩ	Not measurable		
Engine RPM limiter		7500			
Battery	Type		Electrolyte battery type		
	Voltage		12 volts		
	Nominal rating		19 A•h (21 optional)		
	Power starter output		0.6 KW		
Fuses	Ignition		15 A		
	Accessories		15 A		
	Solenoids		15 A		
	Fan		15 A		
	MPEM		20 A		
	Charging system		30 A		
Carburetor	Type		Mikuni constant depressurant type with manual choke and ECS (Enricher Coating System)		
	Model		BST34-232		
Fuel pump	Type		Mikuni		
	Model		External (vacuum-operated)		
Idle engine speed		RPM	1050 ± 50	1100 ± 100	1100 ± 100
Needle jet		0-7M (850)			
Jet needle		5GBF61-2			
Clip position number		Middle			
Choke plunger position	Opening Halfway	± 0.5 mm	2.5	2.5	Variable choke
		± .039 in	0.098	0.098	
Adjustment	Throttle cable		0.5 mm (0.02 in)		
	Preliminary pilot screw turn		2.25 turn (see section 04-03 for setting procedure)		
	Float level	± 0.5 mm	10.6		
		± 0.020 in	0.417		
Fuel	Type		Regular unleaded gasoline		
	Octane no.		87 (Ron + Mon)/2		

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL	7400/7401	7413/7414	7415/7416/7417/7418	
COOLING	Fan		Thermostatic		
	Fan thermostat	Opening temperature	96°C (205°F)		
		Closing temperature	102°C (221°F)		
	Engine thermostat	Opening temperature	85°C (185°F)		
		Closing temperature	75°C (167°F)		
Radiator cap opening pressure		90 kPa (13 PSI)			
DRIVE TRAIN	Transmission	Type	Dual range (HI-LO) with park, neutral and reverse		
		Speeds	5		
		Model	Electronically controlled hydraulic shift		
	Normal oil operating pressure of engine	Minimum	101 kPa (14.7 PSI)		
		Maximum	608 kPa (88 PSI)		
	Operating pressure for shifting and clutching		810 kPa (118 PSI)		
	Clutch type		1 centrifugal and 1 multi-disk hydraulically controlled		
	Engagement RPM	± 100 RPM	1300	1600	1600
	Front differential		Shaft driven/single Auto-Lock differential (pump driven)		
	Front differential ratio		3.6:1		
	Rear axle		Shaft driven/solid axle		
Rear axle ratio		3.6:1			
STEERING/ CONTROL	Turning radius		3.3 m (11 ft)		
	Total toe (vehicle on ground)		± 0.3°		
	Camber angle		0°		
	Tie-rod maximum length unengaged	± 5 mm	20		
		± 0.197 in	0.787		
SUSPENSION	FRONT				
	Suspension type		Independent suspension — double A-arm		
	Suspension travel		178 mm (7 in)		
	Shock absorber	Qty	2		
		Type	oil		
	Spring free length		270 mm (11 in)		
	Spring color code		Silver/Blue/Black		
	Front preload adjustment		N.A.		
	REAR				
	Suspension type		Rigid swing arm		
	Suspension travel		191 mm (8 in)		
	Shock absorber	Qty	2		
		Type	Oil		
	Spring free length		355 mm (14 in)		
	Spring color code		Blue/Black/Black		
Rear preload adjustment		N.A.			
BRAKES	Front brake	Qty	2		
		Type	Brembo hydraulic		
	Rear brake	Qty	1		
		Type	Brembo hydraulic		
	Parking brake		Transmission brake and brake lever lock on LH brake lever		
	Lining material		Metallic		
	Minimum pad thickness		1 mm (0.04 in)		
	Minimum brake disk thickness		4.7 mm (0.18 in)		
	Maximum brake disk warp		0.25 mm (0.01 in)		
Caliper		Fixed			

Section 11 TECHNICAL DATA
Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL	7400/7401	7413/7414	7415/7416/7417/7418	
TIRES AND WHEELS	TIRE				
	Pressure	Front	Recommended	48 kPa (7 PSi)	
			Minimum	45 kPa (6.5 PSi)	
		Rear	Recommended	38 kPa (5.5 PSi)	
			Minimum	34.5 kPa (5 PSi)	
	Minimum tire thread depth		4 mm (0.16 in)		
	Size	Front	635 x 203 x 305 mm (25 x 8 x 12 in)		
		Rear	635 x 254 x 305 mm (25 x 10 x 12 in)		
	WHEELS				
	Size	Front	305 x 165 mm (12 x 6.5 in)		
Rear		305 x 203 mm (12 x 8 in)			
DIMENSION	Overall length		2071 mm (81.5 in)		
	Overall width		1194 mm (47 in)		
	Overall height		1143 mm (45 in)		
	Dry weight		340 kg (755 lb)		
	Wheel base		1296 mm (51 in)		
	Wheel track	Front	992 mm (39 in)		
		Rear	940 mm (37 in)		
	Front and under engine ground clearance		244 mm (9.6 in)		
	Rear rigid axle ground clearance		188 mm (7.4 in)		
CAPACITIES	LIQUID				
	Fuel tank		20 L (5.7 U.S. gal)		
	Fuel tank reserve		6 L (1.6 U.S. gal)		
	Engine/transmission oil	Capacity		3 L (0.8 U.S. gal)	
		Recommended		SAE 10W40, a 4 stroke mineral based oil SH or SJ	
	Differential oil	Capacity	Front	650 mL (22 U.S. oz)	
			Rear	300 mL (10 U.S. oz)	
		Recommended		Synthetic polyolester oil 75W90 (API GL5)	
	CV joint grease		TEXACO, HTBJ grease (M3014), ONLY		
	Propeller shaft grease		SHELL, Alvania EP-2, ONLY		
	Hydraulics brakes	Capacity		250 mL (8.5 U.S. oz)	
		Recommended		Brake fluid DOT 4, ONLY	
	Cooling system		2.5 L (0.7 U.S. gal)		
	Ethylene-glycol concentration		60%		
	BODY AND FRAME				
	Weight distribution		Front/rear		49/51
	Front storage tray		10 kg (22 lb)		
	Rack	Front		40 kg (90 lb)	
		Rear (including tongue weight)		80 kg (175 lb)	
	Total vehicle load allowed		220 kg (485 lb)		
	Gross vehicle weight rating		540 kg (1200 lb)		
	Towing		500 kg (1100 lb)		
Tongue (included with rear rack weight)		14 kg (30 lb)			

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL	7400/7401	7413/7414	7415/7416	7417/7418
MATERIAL	Frame	Material	Steel		
		Color	Black		
	Front/rear rack	Material	Steel		
		Color	Red	Black	
	Front bumper	Material	Steel		
		Color	Silver		
	Front/rear fender	Material	High density polyethylene		
		Color	Red	Green	
	Fuel tank cover	Material	High density polyethylene		
		Color	Black		
	Steering cover	Material	High density polyethylene		
		Color	Black		
	Storage compartment cover	Material	High density polyethylene		
		Color	Black		
	Front/rear facia	Material	High density polyethylene		
		Color	Black		
	Side panel	Material	High density polyethylene		
		Color	Black		
Mudguard	Material	Low density polyethylene			
	Color	Black			
Seat cover	Material	Thermoformed vinyl			
	Color	Black			
TORQUE	ENGINE				
	Engine support	24 N•m (17 lbf•ft)			
	Engine mount	48 N•m (35 lbf•ft)			
	Spark plug	22 N•m (16 lbf•ft)			
	Rewind starter	10 N•m (89 lbf•in)			
	Rear solenoid block	5 N•m (44 lbf•in)			
	Magneto	9 N•m (80 lbf•in)			
	Starter	10 N•m (89 lbf•in)			
	Starter RED (+) cable	6 N•m (53 lbf•in)			
	STPS (Sub-Transmission Position Sensor)	3 N•m (27 lbf•in)			
	GBPS (Gear Box Position Sensor)	3 N•m (27 lbf•in)			
	COOLING				
	Radiator mount screw/nut	10 N•m (89 lbf•in)			
	Temperature sensor	17 N•m (151 lbf•in)			
	Water pump	10 N•m (89 lbf•in)			
	Fan mount screw/nut	4 N•m (35 lbf•in)			
	Temperature sender	3 N•m (27 lbf•in)			
	EXHAUST				
	Exhaust nut	11 N•m (97 lbf•in)			
	Heat shield screws	10 N•m (89 lbf•in)			
	FUEL				
	Carburetor mounting clamp	0.6 N•m (5.4 lbf•in)			
	DRIVE TRAIN				
Front wheel hub nut	140 N•m (103 lbf•ft) (MINIMUM)				
Rear wheel hub nut	140 N•m (103 lbf•ft) (MINIMUM)				
Front differential	Front	48 N•m (35 lbf•ft)			
	Rear	48 N•m (35 lbf•ft)			
Rear differential socket screws	48 N•m (35 lbf•ft)				
Propeller shaft screw	Engine side	32 N•m (24 lbf•ft)			
	Differential side	42 N•m (31 lbf•ft)			

Section 11 TECHNICAL DATA
Subsection 02 (ENGINE AND VEHICLE)

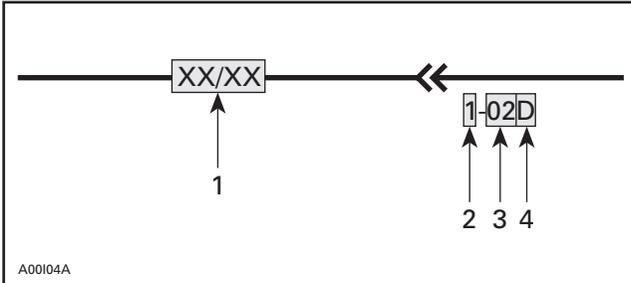
	VEHICLE MODEL	7400/7401	7413/7414	7415/7416	7417/7418
TORQUE	WHEEL				
	Wheel nuts			75 N•m (55 lb•ft)	
	STEERING/CONTROL				
	Upper/lower A-arm lock nut			75 N•m (55 lb•ft)	
	Tie rod ends			75 N•m (55 lb•ft)	
	Steering arm (castellated nut)			75 N•m (55 lb•ft)	
	Steering column support screws			24 N•m (17 lb•ft)	
	Handlebar screws			24 N•m (17 lb•ft)	
	Flanged bearing bolts			24 N•m (17 lb•ft)	
	SUSPENSION				
	Shock absorber bolt			48 N•m (35 lb•ft)	
	Front upper swing arm			67 N•m (49 lb•ft)	
	Front lower swing arm			67 N•m (49 lb•ft)	
	Rear swing arm RH pivot			147 N•m (108 lb•ft)	
	Rear swing arm LH pivot			11 N•m (97 lb•in)	
	Rear swing arm LH nut			147 N•m (108 lb•ft)	
	Rear swing arm hexagonal screws			48 N•m (35 lb•ft)	
	BRAKE				
	Caliper brake screws			24 N•m (17 lb•ft)	
	Brake disk screws			34 N•m (25 lb•ft)	
	BODY/FRAME				
	Front bumper			24 N•m (17 lb•ft)	
	Front rack	Front		24 N•m (17 lb•ft)	
		Rear		15 N•m (133 lb•in)	
	Rear rack	Upper		15 N•m (133 lb•in)	
		Lower		15 N•m (133 lb•in)	
	Rear extension frame			48 N•m (35 lb•ft)	
	Front differential support			24 N•m (17 lb•ft)	
	Seat pivot bar			24 N•m (17 lb•ft)	
	Winch plate support			24 N•m (17 lb•ft)	
	Footrest			24 N•m (17 lb•ft)	
	Removable brace			24 N•m (17 lb•ft)	
	Skid plate			15 N•m (133 lb•in)	
Headlight adjustment			0.6 N•m (5.4 lb•in)		

WIRING DIAGRAM

WIRING CONNECTORS CODING

⚠ WARNING

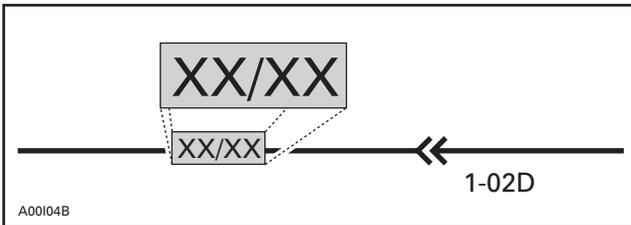
Ensure all terminals are properly crimped on the wires and all connector housings are properly fastened.



1. Wire colors
2. Connector housing area
3. Housing number per area
4. Wire connector location in housing

WIRE COLORS

It identifies the color of a wire. When a 2-color scheme is used, the first color is the main color while the second color is the tracer color.

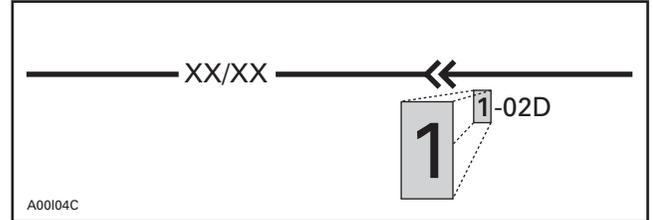


THE SHADED PART INDICATES THE WIRE COLOR

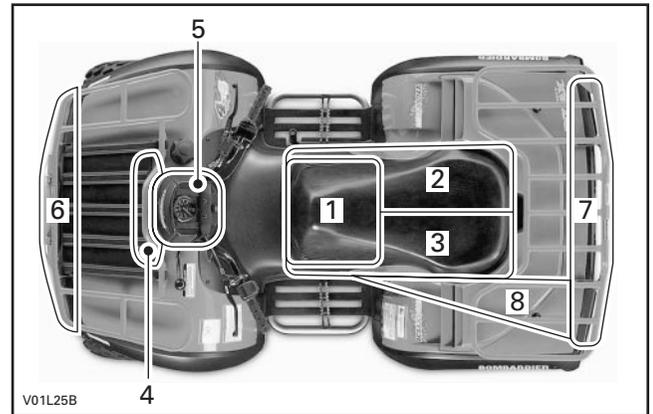
Example: YL/BK is a YELLOW wire with a BLACK stripe.

COLOR CODE					
BK	—	BLACK	PK	—	PINK
BL	—	BLUE	RD	—	RED
BR	—	BROWN	TA	—	TAN
GN	—	GREEN	VI	—	VIOLET
GY	—	GREY	WH	—	WHITE
OR	—	ORANGE	YL	—	YELLOW

CONNECTOR HOUSING AREA



THE SHADED PART INDICATES THE CONNECTOR HOUSING AREA



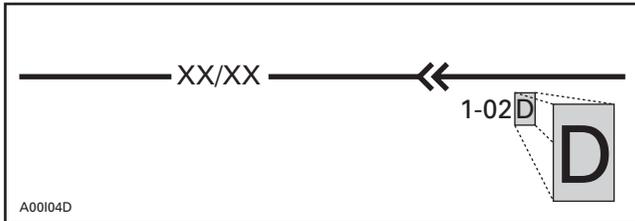
AREA	LOCATION
1	Front of engine compartment
2	RH side of engine compartment
3	LH side of engine compartment
4	Behind fuel tank
5	Under steering cover
6	Front of vehicle
7	Rear of vehicle
8	Near radiator hoses

Section 12 WIRING DIAGRAM

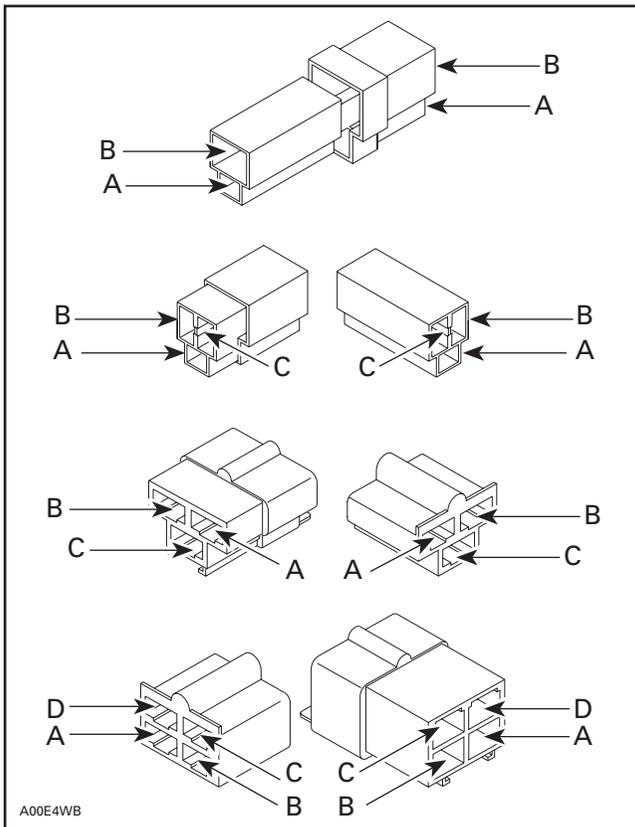
Subsection 01 (WIRING DIAGRAM)

CONNECTOR LOCATION IN HOUSING

This is the wire position in the connector. The number or letter given refers to the physical identification stamped on the connector.

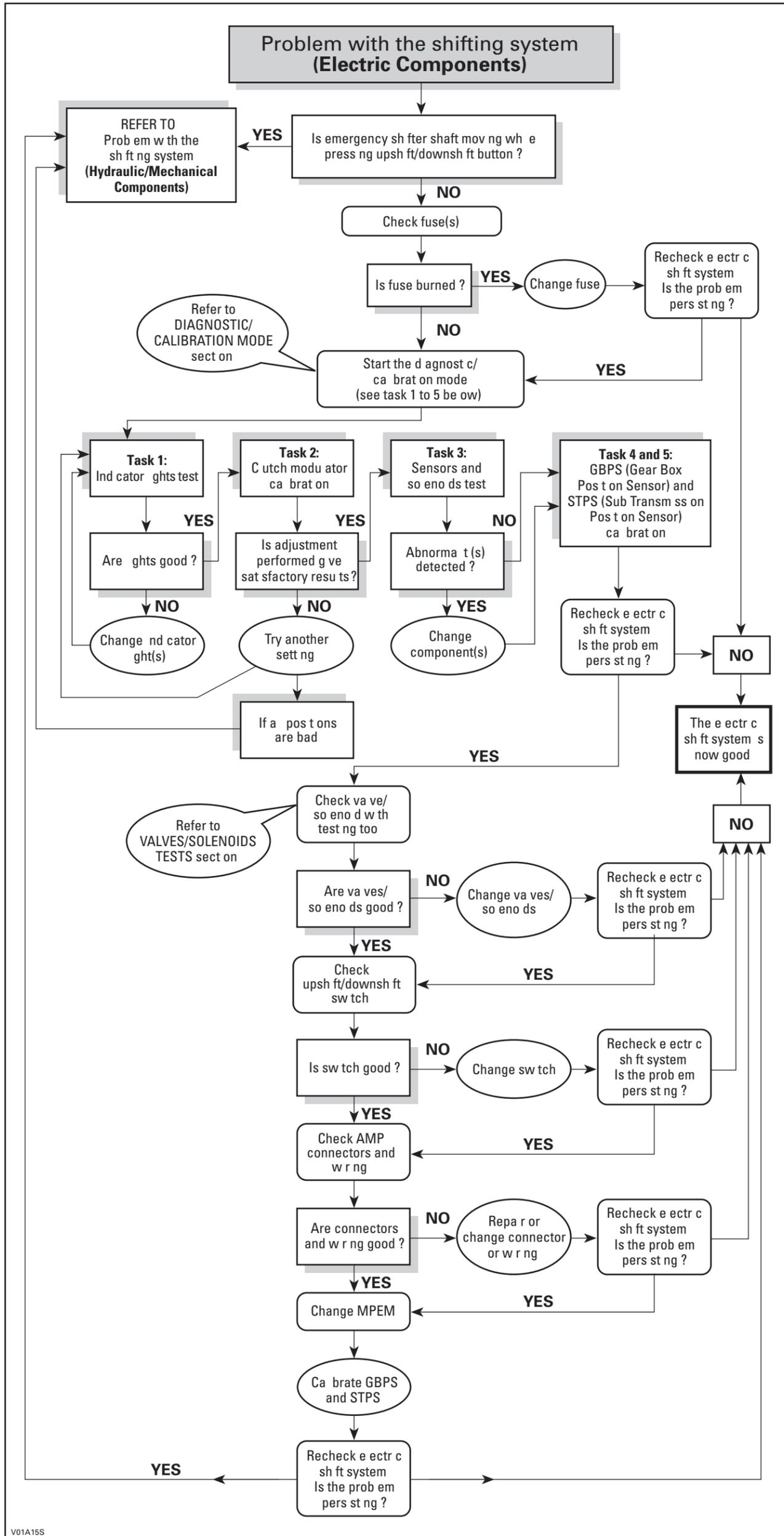


THE SHADED PART INDICATES THE CONNECTOR LOCATION IN HOUSING



TYPICAL

See connector housing illustration to OVERVIEW 05-02.



ANNEX 2

