

BOMBARDIER

SHOP MANUAL 2001

DS 650



704 100 011

Shop Manual 2001

DS 650

BOMBARDIER
RECREATIONAL PRODUCTS



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SAFETY NOTICE

This manual has been prepared as a guide to correctly service and repair 2001 ATV.

This edition was primarily published to be used by ATV mechanic technicians who are already familiar with all service procedures relating to Bombardier made vehicles. Mechanic technicians should intent to continuous training courses given by Bombardier Training Department.

Please note that the instructions will apply only if proper hand tools and special service tools are used.

This shop manual uses technical terms which may be slightly different from the ones used in parts catalog.

It is understood that this manual may be translated into another language. In the event of any discrepancy, the english version shall prevail.

The content depicts parts and/or procedures applicable to the particular product at its time of writing. Service and Warranty Bulletins may be published to update the content of this manual. Make sure to read and understand these. It does not include dealer modifications, whether authorized or not by Bombardier, after manufacturing the product.

In addition, the sole purpose of the illustrations throughout the manual, is to assist identification of the general configuration of the parts. They are not to be interpreted as technical drawings or exact replicas of the parts.

The use of Bombardier parts is most strongly recommended when considering replacement of any component. Dealer and/or distributor assistance should be sought in case of doubt.

The engines and the corresponding components identified in this document should not be utilized on product(s) other than those mentioned in this document.

Torque wrench tightening specifications must be strictly adhered to. Locking devices (ex.: locking tab, elastic stop nut, self-locking fasteners, etc.) must be installed or replaced with new ones, where specified. If the efficiency of a locking device is impaired, it must be renewed.

This manual emphasizes particular information denoted by the wording and symbols:

WARNING

Identifies an instruction which, if not followed, could cause serious personal injury including possibility of death.

CAUTION: Denotes an instruction which, if not followed, could severely damage vehicle components.

NOTE: Indicates supplementary information needed to fully complete an instruction.

Although the mere reading of such information does not eliminate the hazard, your understanding of the information will promote its correct use. Always use common shop safety practice.

However, Bombardier disclaims liability for all damages and/or injuries resulting from the improper use of the contents. We strongly recommend that any services be carried out and/or verified by a highly skilled professional mechanic. It is understood that certain modifications may render use of the vehicle illegal under existing federal, provincial and state regulations.

WHAT'S NEW

WHAT'S NEW

THIS SECTION INDICATES PROCEDURES THAT WERE MODIFIED OR NEWLY ADDED IN THIS MANUAL.

INTRODUCTION

- Self-locking fasteners procedure.
- Loctite application procedure.

SERVICE TOOLS AND PRODUCTS

Added the following new tools:

- ball joint guide
- ball joint driver.

Added the following new products:

- premix coolant
- Molykote 111 paste
- Molykote G-n paste
- sealing compound Dreibond.

MAINTENANCE

- New clutch adjustment procedure.
- Drive chain adjustment procedure is now in the MAINTENANCE section.

COOLING SYSTEM

- New refilling procedure.

CRANKSHAFT/BALANCER SHAFT

- New procedure to recentre crankshaft and balancer shaft.

REAR SUSPENSION

- Rear suspension adjustment is added in the section.

TECHNICAL DATA

- New starter jet.
- New torque for rear shock bolts.

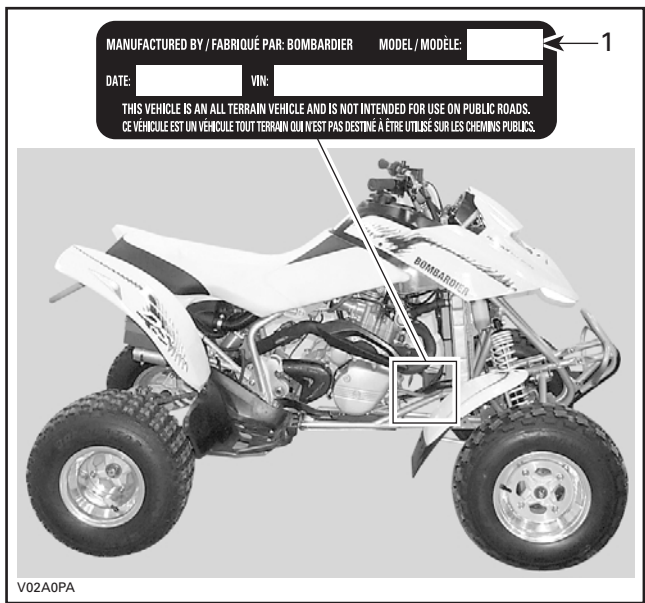
INTRODUCTION

This *Shop Manual* covers the following Bombar-
dier made 2001 ATV:

Model

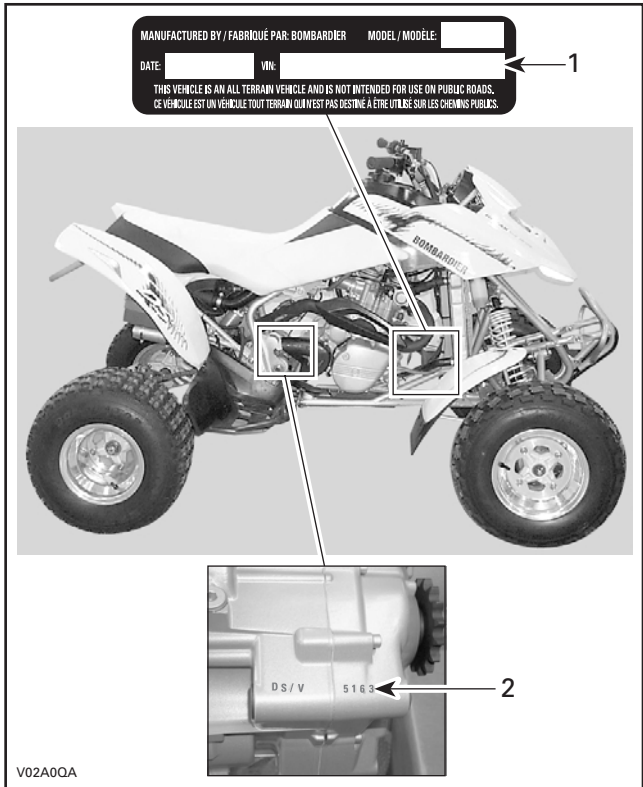
DS* 650 7449

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1. Model number

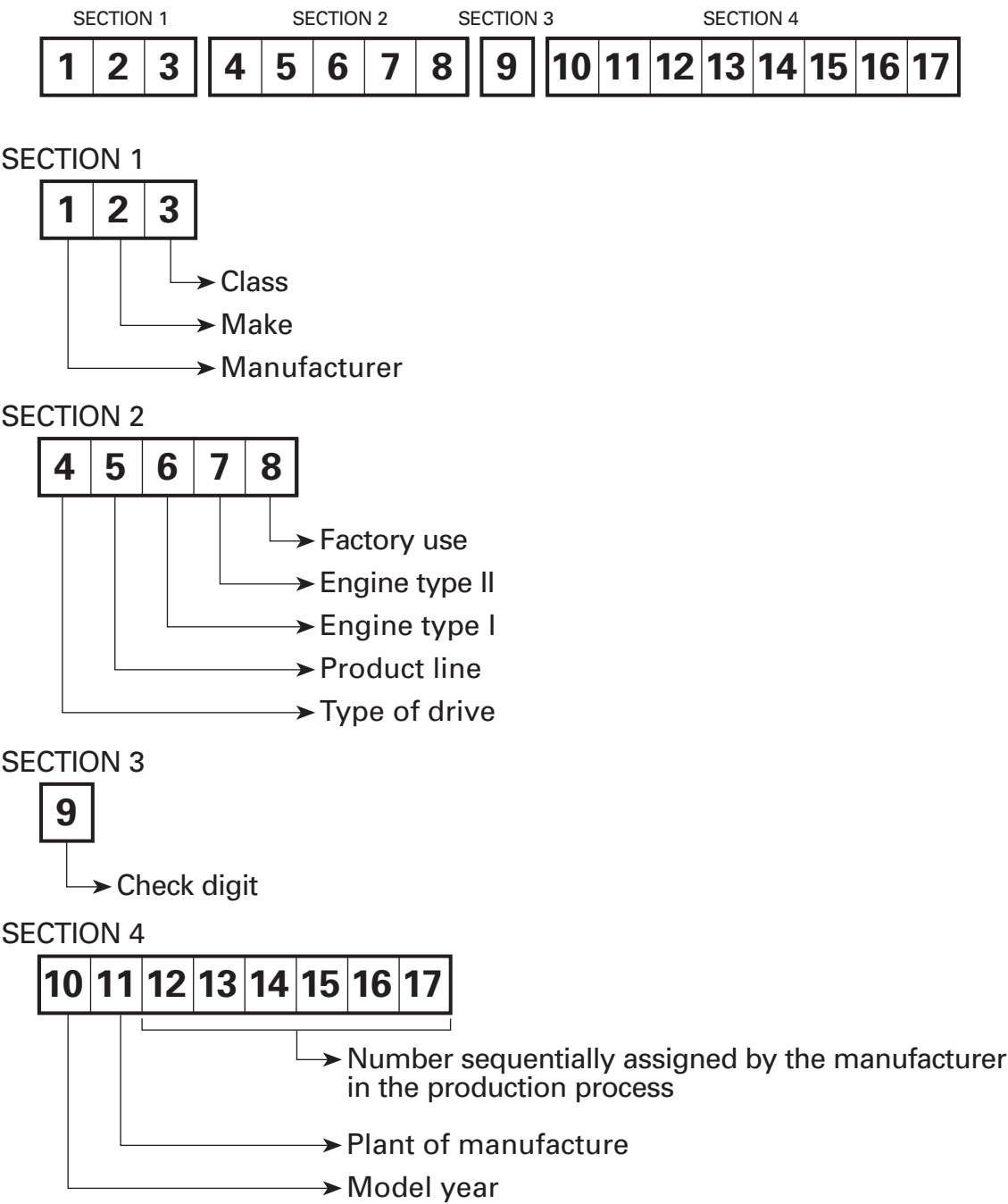
VEHICLE AND ENGINE SERIAL
NUMBER LOCATION



1. Vehicle
2. Engine

INTRODUCTION

Serial Number Meaning



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

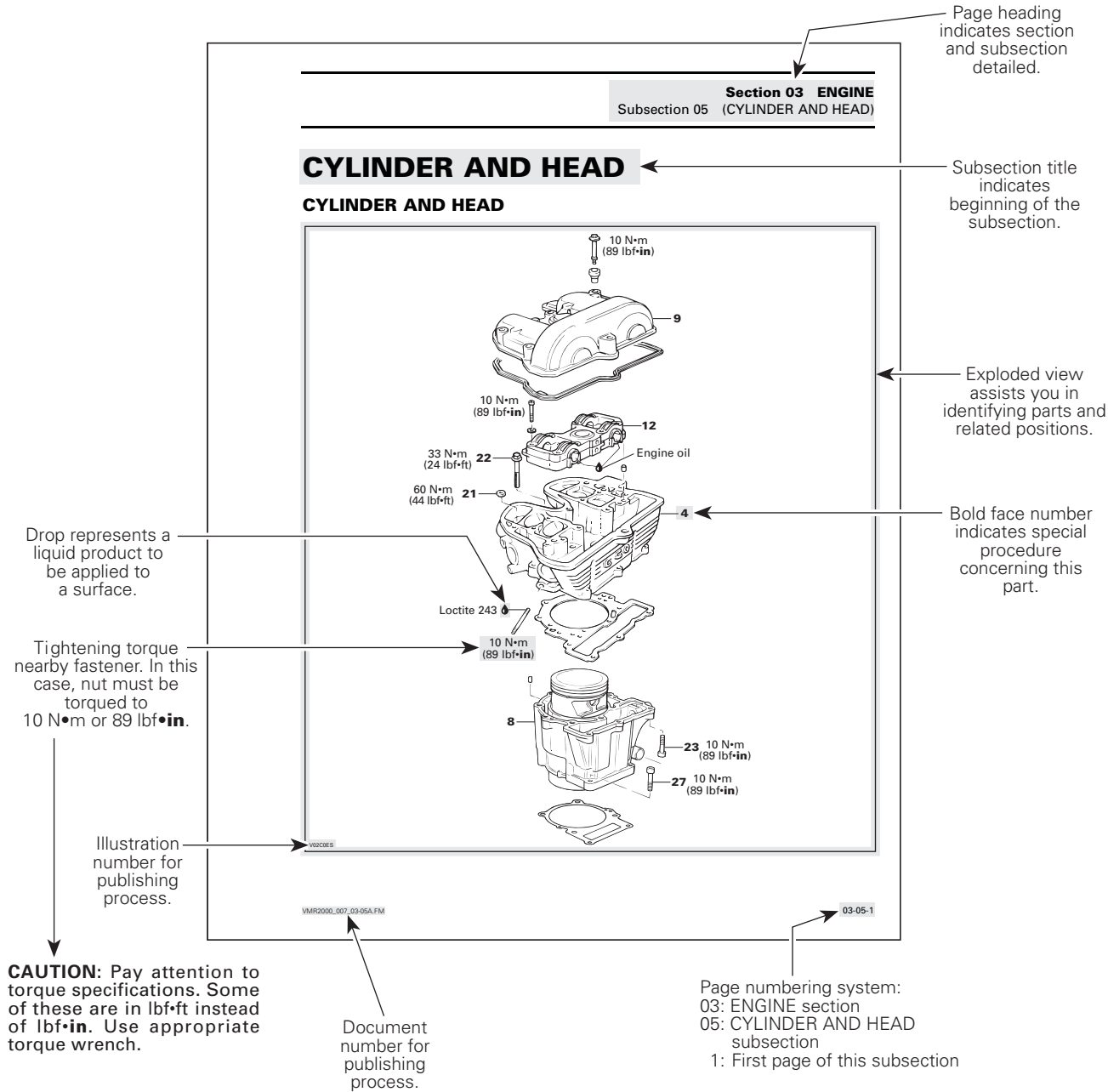
A	ampere
amp	ampere
A•h	ampere-hour
AC	alternate current
BDC	bottom dead center
BTDC	before top dead center
°C	degree Celsius
cm	centimeter
cm ²	square centimeter
cm ³	cubic centimeter
DC	direct current
°F	degree Fahrenheit
fl. oz	fluid ounce
ft	foot
GRD	ground
hal.	halogen
I.D.	inside diameter
IDI	induction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

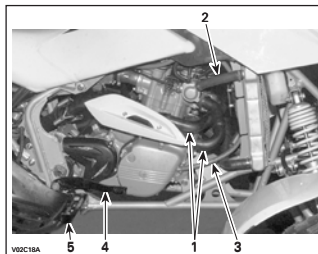


TYPICAL PAGE

Section 03 ENGINE

Subsection 02 (REMOVAL AND INSTALLATION)

- footrest (refer to BODY)
- engine pinion no. 2 (refer to Engine Pinion section)



RH SIDE OF ENGINE

1. Exhaust pipes
2. Radiator inlet hose
3. Oil line
4. Brake pedal
5. Footrest

- carburetor and carburetor adaptor (refer to CARBURETOR AND AIR INTAKE SILENCER)
 - gearshift pedal **no. 9**.
- Unscrew neutral switch connector.

Removal

Remove the upper support bracket no. 10 completely.



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

Remove:

- upper engine support bolt **no. 11** ←
- lower bolts **no. 12** retaining the engine support **no. 13** on either side, then, remove supports
- front lower mounting bolt **no. 14**
- rear lower mounting bolt **no. 15**
- rear upper mounting bolt **no. 16**.

Remove engine from vehicle.

Installation

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

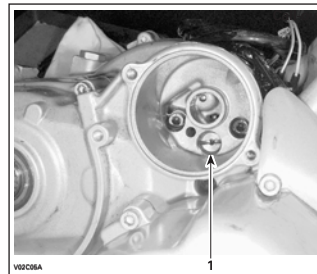
Reattach cables, hoses, wiring harness, etc.

Adjust clutch cable.

Bleed rear brake.

Before to start th

Unfasten pressure bleeding screw.



BEHIND OIL FILTER

1. Bleeding screw

Unscrew and remove one spark plug.

Turn engine using starter until oil emerges in filter chamber.

Tighten pressure bleeding screw.

Install oil filter.

This operation activated the oil pump. Check if vehicle runs correctly.

Call-outs for —
above illustration.

Reference to look-up a certain section and subsection.
In this case it concerns carburetor and air intake silencer.

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

- Subtitle indicates main procedure to be carried-out.

INTRODUCTION

GENERAL INFORMATION

The information and component/system descriptions contained in this manual are correct at time of publication. Bombardier 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 reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring obligation.

ILLUSTRATIONS AND PROCEDURES

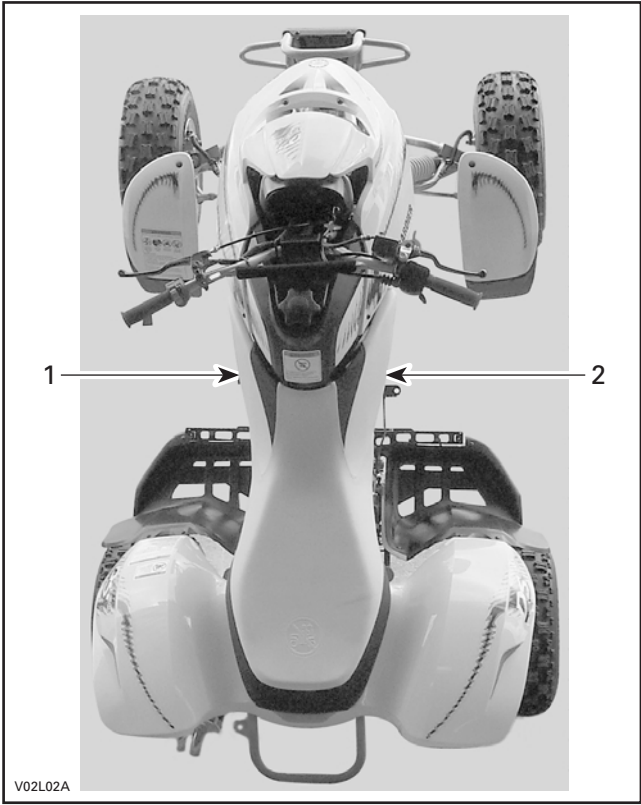
Illustrations and photos show the typical construction of the different assemblies and, in all cases, may not reproduce the full detail or exact shape of the parts shown, however, they represent parts which have the same or a similar function.

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

SELF-LOCKING FASTENERS PROCEDURE

The following describes the most common application procedures when working with self-locking fasteners.

Use a metal brush or a screwtap to clean the hole properly then use a solvent (Methyl-Chloride), let act during 30 minutes and wipe off. The solvent utilization is to ensure the adhesive works properly.

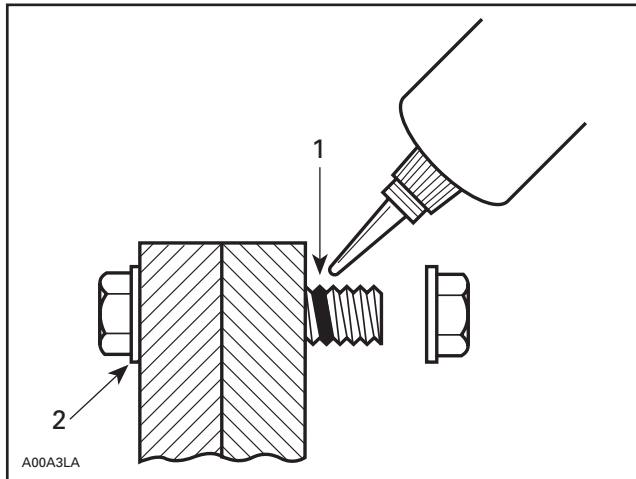
LOCTITE APPLICATION PROCEDURE

The following describes the most common application procedures when working with Loctite products.

NOTE: Always use proper strength Loctite product as recommended in this *Shop Manual*.

Threadlocker

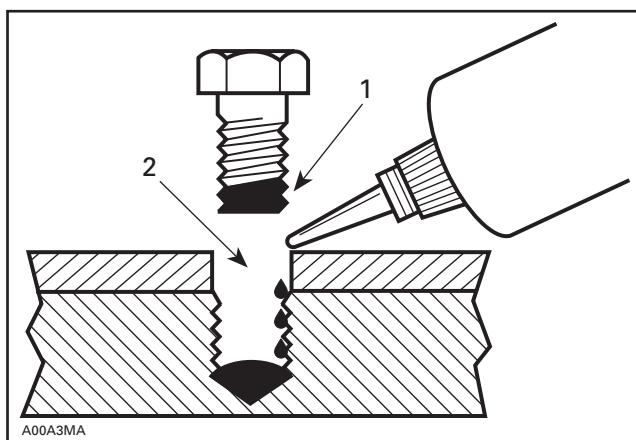
Uncovered Holes (bolts and nuts)



1. Apply here
2. Do not apply

1. Clean threads (bolt and nut) with solvent.
2. Apply Loctite Primer N (P/N 293 800 041) on threads and allow to dry.
3. Choose proper strength Loctite threadlocker.
4. Fit bolt in the hole.
5. Apply a few drops of threadlocker at proposed tightened nut engagement area.
6. Position nut and tighten as required.

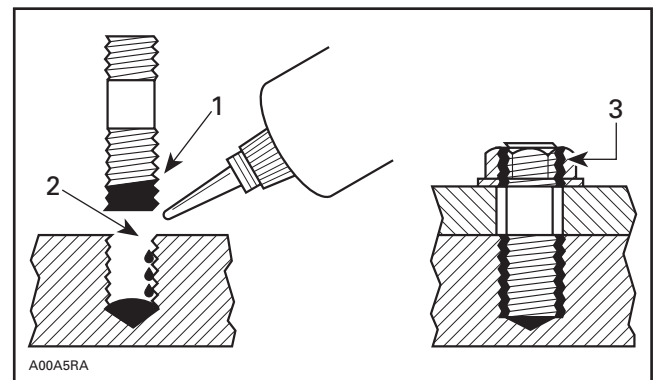
Blind Holes



1. On threads
2. On threads and at the bottom of hole

1. Clean threads (bolt and hole) with solvent.
2. Apply Loctite Primer N (P/N 293 800 041) on threads (bolt and nut) and allow to dry for 30 seconds.
3. Choose proper strength Loctite threadlocker.
4. Apply several drops along the threaded hole and at the bottom of the hole.
5. Apply several drops on bolt threads.
6. Tighten as required.

Stud in Blind Holes

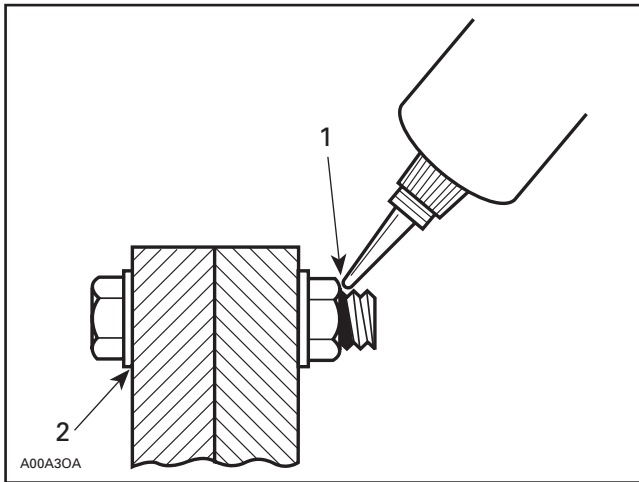


1. On threads
2. On threads and in the hole
3. Onto nut threads

1. Clean threads (stud and hole) with solvent.
2. Apply Loctite Primer N (P/N 293 800 041) on threads and allow to dry.
3. Put several drops of proper strength Loctite threadlocker on female threads and in hole.
4. Apply several drops of proper strength Loctite on stud threads.
5. Install stud.
6. Install cover, etc.
7. Apply drops of proper strength Loctite on uncovered threads.
8. Tighten nuts as required.

INTRODUCTION

Preassembled Parts

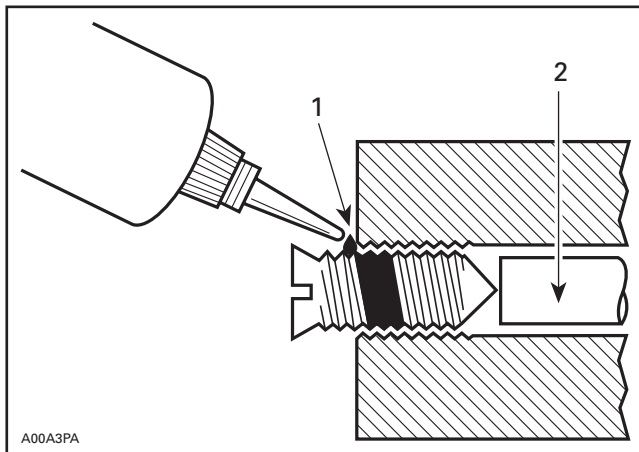


1. Apply here
2. Do not apply

1. Clean bolts and nuts with solvent.
2. Assemble components.
3. Tighten nuts.
4. Apply drops of proper strength Loctite on bolt/nut contact surfaces.
5. Avoid touching metal with tip of flask.

NOTE: For preventive maintenance on existing equipment, retighten nuts and apply proper strength Loctite on bolt/nut contact surfaces.

Adjusting Screw



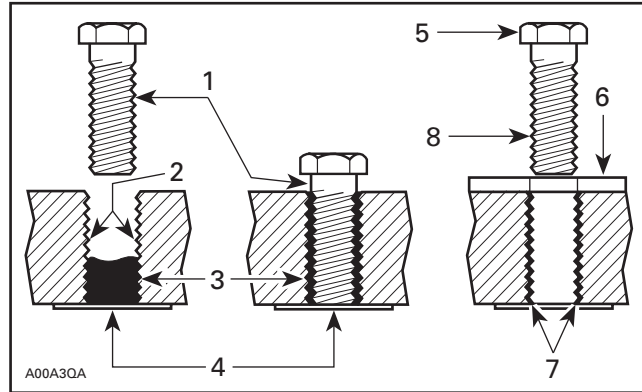
1. Apply here
2. Plunger

1. Adjust screw to proper setting.
2. Apply drops of proper strength Loctite thread-locker on screw/body contact surfaces.
3. Avoid touching metal with tip of flask.

NOTE: If it is difficult to readjust, heat screw with a soldering iron (232°C (450°F)).

Stripped Thread Repair

Stripped Threads



1. Release agent
2. Stripped threads
3. Form-A-Thread
4. Tape
5. Cleaned bolt
6. Plate
7. New threads
8. Threadlocker

Standard Thread Repair

1. Follow instructions on Loctite FORM-A-THREAD (P/N 413 708 600) package.
2. If a plate is used to align bolt:
 - a. Apply release agent on mating surfaces.
 - b. Put waxed paper or similar film on the surfaces.
3. Twist bolt when inserting it to improve thread conformation.

NOTE: NOT intended for engine stud repairs.

Repair of Small Holes/Fine Threads

Option 1: Enlarge damaged hole, then follow **Standard Thread Repair** procedure.

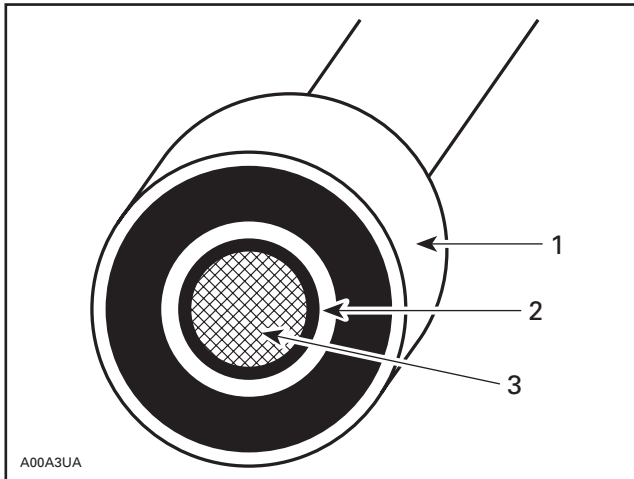
Option 2: Apply FORM-A-THREAD on the screw and insert in damaged hole.

Permanent Stud Installation (light duty)

1. Use a stud or thread on desired length.
2. DO NOT apply release agent on stud.
3. Do a **Standard Thread Repair**.
4. Allow to cure for 30 minutes.
5. Assemble.

Mounting on Shaft

Mounting with a Press



1. Bearing
2. Proper strength Loctite
3. Shaft

Standard

1. Clean shaft external part and element internal part.
2. Apply a strip of proper strength Loctite on shaft circumference at insert or engagement point.

NOTE: Retaining compound is always forced out when applied on shaft.

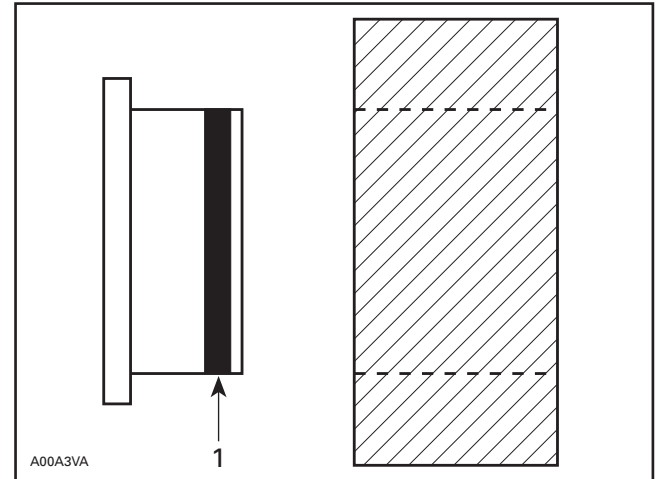
3. DO NOT use anti-seize Loctite or any similar product.
4. No curing period is required.

Mounting in Tandem

1. Apply retaining compound on internal element bore.
2. Continue to assemble as shown above.

Case-In Components

Metallic Gaskets



1. Proper strength Loctite

1. Clean inner housing diameter and outer gasket diameter.
2. Spray housing and gasket with Loctite Primer N (P/N 293 800 041).
3. Apply a strip of proper strength Loctite on leading edge of outer metallic gasket diameter.

NOTE: Any Loctite product can be used here. A low strength liquid is recommended as normal strength and gap are required.

4. Install according to standard procedure.
5. Wipe off surplus.
6. Allow it to cure for 30 minutes.

NOTE: Normally used on worn-out housings to prevent leaking or sliding.

It is generally not necessary to remove gasket compound applied on outer gasket diameter.

INTRODUCTION

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

We would be pleased if you could communicate to Bombardier any suggestions you may have concerning our publications.

Bombardier SERVICE PUBLICATIONS REPORT

Publication title and year _____ Page _____

Machine _____ Report of error ☐ Suggestion ☐

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Zip code/Postal code _____

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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)

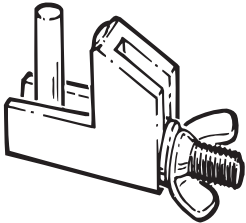
ENGINE — MANDATORY SERVICE TOOLS

Engine installation and removal tool
(P/N 529 035 619)



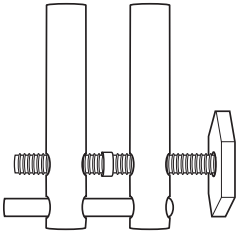
V02B0N4

Small hose pincher
(P/N 295 000 076)



A01B2I4

Large hose pincher
(P/N 529 032 500)



F01B234

Magneto puller
(P/N 420 976 235)



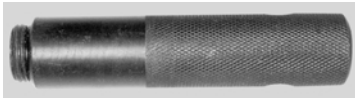
F01B294

Fuel system pressure test
(P/N 529 033 100)



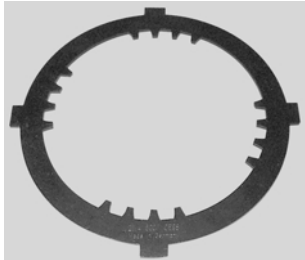
A01B5E4

Magneto cover removal tool
(P/N 529 035 622)



V02B024

Clutch basket holder
(P/N 529 035 618)



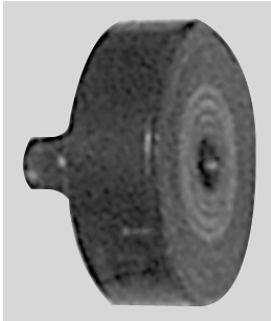
V02B034

Crankshaft locking bolt
(P/N 529 035 617)



V02B044

Crankshaft protector
(P/N 420 876 557)



V02B054

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

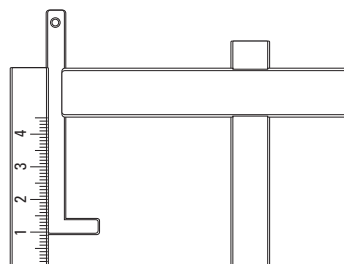
ENGINE — RECOMMENDED SERVICE TOOLS

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



V01B0K4

Float level gauge
(P/N 529 035 520)



A00B4N4

Valve spring compressor
Not sold by Bombardier

Snap-on
CF811



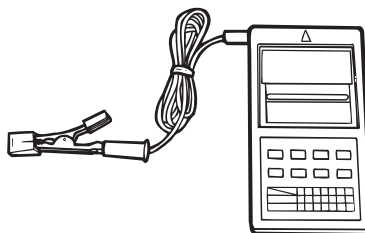
V01B014

Ring compressor
Not sold by Bombardier
Snap-on RCW60
or
Lisle 21700



V01B0H4

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



F01B1G4

Special pliers for valve stem seal
removal

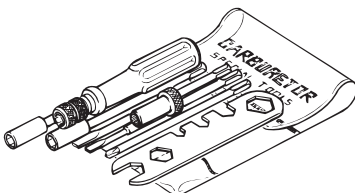
Not sold by Bombardier

Snap-on
YA 8230



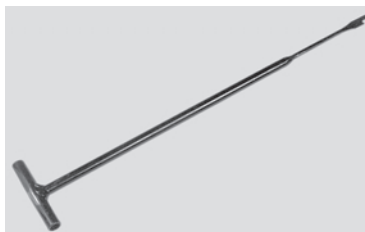
V02B064

Carburetor tool kit
(P/N 404 112 000)



A00B2F4

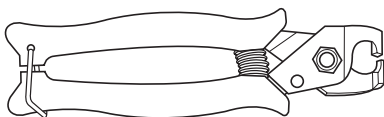
Exhaust spring installer/remover
(P/N 529 035 401)



A01B584

Pliers
(P/N 295 000 054)

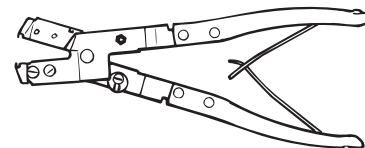
Caillau



F01B1T4

Pliers
(P/N 295 000 069)

Oetiker 1090



F01D184

Section 01

SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02

(SERVICE TOOLS)

ELECTRICAL — RECOMMENDED SERVICE TOOLS

Terminal remover

Not sold by Bombardier

Snap-on

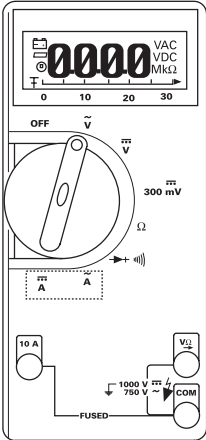
TT 600-4



F01B1J4

Multimeter

(P/N 529 022 000)



F01B1O4

SUSPENSION — RECOMMENDED SERVICE TOOL

Swing arm key
(P/N 529 035 696)



V02B0K4

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS

Subsection 02 (SERVICE TOOLS)

DRIVE — RECOMMENDED SERVICE TOOLS

Brake hub remover
(P/N 529 035 695)



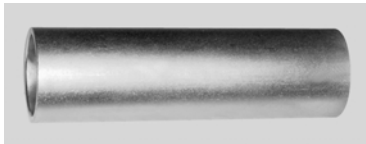
V02B0M4

Front hub seal installer
(P/N 529 035 632)



V02B0T4

Front knuckle wear ring installer
(P/N 529 035 637)



V02B0R4

Ball joint guide
(P/N 529 035 705)



V02B0P4

Rear hub seal installer
(P/N 529 035 634)



V02B0U4

Rear axle wear ring installer
(P/N 529 035 694)



V02B0S4

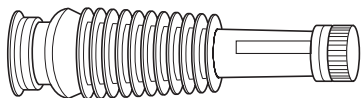
Ball joint driver
(P/N 529 035 706)



V02B0Q4

VEHICLE — RECOMMENDED SERVICE TOOL

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



F04B044

SERVICE PRODUCTS

MANDATORY SERVICE PRODUCTS

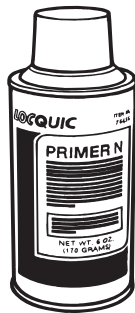
Loctite® is a trademarks of Loctite Corporation.

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)

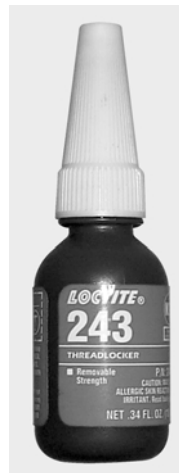
Loctite 764



A00B3N4

Medium strength threadlocker
(P/N 293 800 060)

Loctite 243 (blue)
(10 mL)



F00A0Q4

High temperature threadlocker
(P/N 413 711 400)

Loctite 648 (green)
(5 g)



A00B3D4

Gasket stripper
(P/N 413 508 500)

(500 mL)



F01B1W4

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

510 g (18 oz)



A00B574

Retaining compound
(P/N 413 703 100)

Loctite RC/609 (green)
(10 mL)



A00B2S4

Dielectric grease
(P/N 293 550 004)

Dow Corning
(150 g)



F01B164

Section 01 SERVICE TOOLS AND SERVICE PRODUCTS
Subsection 03 (SERVICE PRODUCTS)

MANDATORY SERVICE PRODUCTS (continued)

Pipe sealant
(P/N 293 800 013)

Loctite 567
(250 mL)



A00B2W4

Petamo grease
(P/N 420 899 271)



A00B584

High strength threadlocker
(P/N 293 800 005)

Loctite 271 (red)
(10 mL)



A00B2U4

High temp RTV silicone ULTRA
COPPER
(P/N 413 710 300)

(85 g)



A00B5A4

Synthetic grease
(P/N 413 711 500)

(400 g)



A01B574

Premixed coolant - 52°C (- 62°F)
(P/N 413 711 802)

(16 x 1 L)



A00B5E4

Super Lube (grease)
(P/N 293 550 014)



A00B474

Synthetic grease
(P/N 293 550 010)

(400 g)



F01B154

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

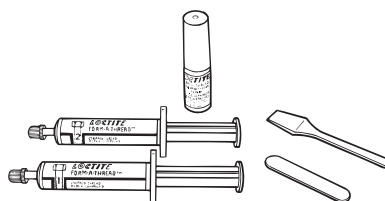
BOMBARDIER LUBE
(P/N 293 600 016)

(12 x 14 oz)



F01B0S4

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



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 OR 400 KM	EVERY 25 HOURS OR 1250 KM	EVERY 50 HOURS OR 2500 KM	EVERY 100 HOURS OR 5000 KM OR ONCE A YEAR	EVERY 200 HOURS OR 10000 KM OR TWO YEARS	REFER TO THE SECTION
ENGINE/ TRANSMISSION	Engine/transmission oil level	EVERY RIDE					N.A.
	Engine/transmission oil and filter replacement	✓		✓			02-03
	Spark arrester	✓			✓		
	Valve clearance	✓			✓		
	Oil tank strainer cleaning					✓	03-07
	Engine mount fasteners	✓			✓		03-02
	Exhaust system	✓			✓		
	Condition of seals	✓			✓		N.A.
	Coolant level	EVERY RIDE					
	Coolant replacement					✓	03-03
	Cooling system condition	✓			✓		
	Radiator cap pressure test	✓				✓	
	Radiator condition/cleanliness (radiator fines)	✓		✓			
	Clutch and transmission operation				✓		03-08/ 03-09
	Clutch lever adjustment	✓		✓			02-03
FUEL SYSTEM	Air filter cleaning/draining	✓	✓				02-03
	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 connections				✓		N.A.
	Wiring harness, cables and lines	✓			✓		05-06
	Condition of ignition switch and start/stop button	EVERY RIDE					
	Condition of lighting system (hi/lo intensity, brake light, etc.)	EVERY RIDE					
	Headlight beam aiming	✓			✓		
DRIVE TRAIN	Drive chain lubrication	EVERY RIDE					06-02
	Drive chain adjustment	EVERY RIDE					
	Drive chain protector and roller condition	EVERY RIDE					
	Sprockets inspection	✓			✓		
	Wheel bearing condition				✓		06-03
	Rear wheel hub lubrication					✓	
	Axle adjustment nut lubrication					✓	
	Rear axle tightness (eccentric axle housing)	✓	✓				

Section 02 MAINTENANCE
Subsection 02 (MAINTENANCE CHART)

LUBRICATION AND MAINTENANCE CHART		INITIAL 10 HOURS OR 400 KM	EVERY 25 HOURS OR 1250 KM	EVERY 50 HOURS OR 2500 KM	EVERY 100 HOURS OR 5000 KM OR ONCE A YEAR	EVERY 200 HOURS OR 10000 KM OR TWO YEARS	REFER TO THE SECTION
STEERING/ CONTROL SYSTEMS	Throttle condition	EVERY RIDE					07-02
	Choke condition	EVERY RIDE					04-03
	Handlebar fastener tightness				✓		07-02
	Steering system mechanism	✓			✓		
	Tie rod ends			✓			
	Steering adjustment	✓			✓		
	Front wheel alignment	✓			✓		07-02
	Tire pressure	EVERY RIDE					02-03
	Wheel mount tightness and stud lubrication	✓			✓		
	Wear and condition of tires	EVERY RIDE					
SUSPENSION	Swing arm condition				✓		08-02/ 08-03
	Swing arm lubrication		✓				
	A-arm lubrication		✓				
	A-arm condition			✓			
	Ball joint boot condition	✓	✓				
	Ball joint free play			✓			
	Shock absorber condition			✓			
BRAKE	Brake fluid level front/rear	EVERY RIDE					09-02
	Brake fluid replacement front/rear				✓		
	Brake system condition (discs, hoses, etc.)				✓		
	Brake pads condition		✓				
	Brake line fittings	EVERY RIDE					
BODY/FRAME	Engine area cleaning			✓			N.A.
	Fastener condition/tightness			✓			10-02/ 10-03
	Skid plate condition	✓		✓			
	Seat latch				✓		
	Frame inspection	EVERY RIDE					
	Vehicle cleaning and protection			✓			

N.A.: Not Available

The initial maintenance is very important and must not be neglected.

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

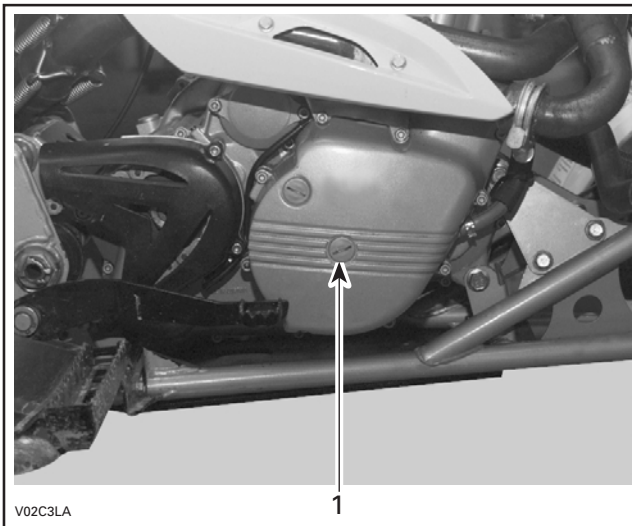
ADJUST VALVE CLEARANCE

Removal

Remove:

- fuel tank
- valve cover
- spark plugs.

Unfasten centre screw plug to right of engine housing cover.



RH SIDE OF VEHICLE

1. Remove this screw plug

Move crankshaft into TDC setting with an allen key.

Use feeler gauge to check valve clearance and change adjusting plates if necessary.

VALVE CLEARANCE mm (in)	
SERVICE LIMIT	
Exhaust	0.10 to 0.15 mm (.004 to .006 in)
Intake	

Note down valve clearance recorded.

Unfasten socket head screw beside support for oil return and secure crankshaft with the crankshaft locking bolt (P/N 529 035 617).

NOTE: Check tightness with the allen key.

To adjust valves, remove the camshaft bridges and the camshafts.

Remove adjusting plates, blow clean with compressed air.

Installation

NOTE: Before installation, check thickness of adjusting plates with micrometer.

For installation, reverse the removal procedure.

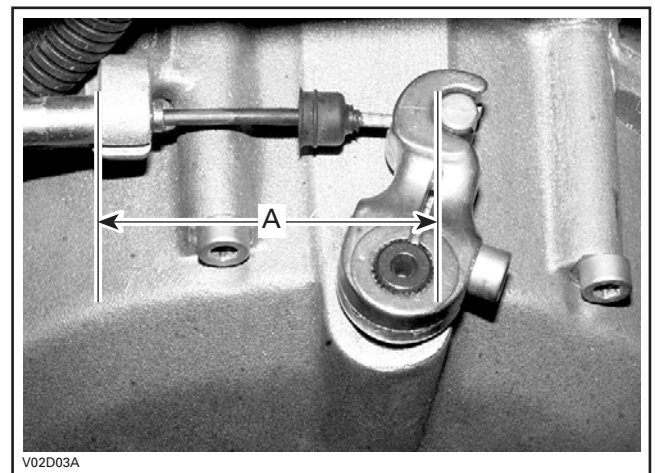
CLUTCH ADJUSTMENT

Loosen cable tension.

Adjust clutch release mechanism.

The release lever must locate on the spline in such a way that dimension A is obtained. See the following illustration.

NOTE: If necessary, unscrew the Allen socket screw and withdraw release lever. Replace the lever at the appropriate position then tighten socket screw to 10 N•m (89 lbf•in).

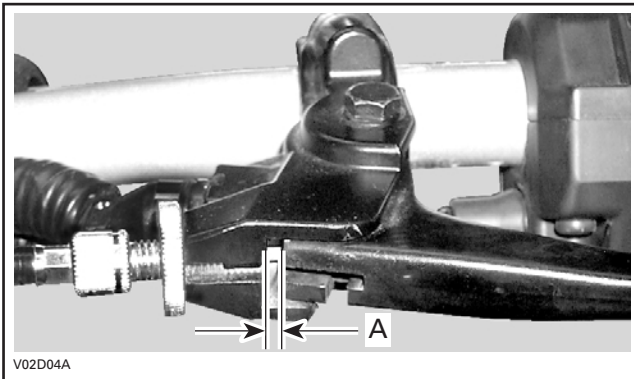


A. 68 to 75 mm (2-11/16 to 2-31/32 in)

Section 02 MAINTENANCE

Subsection 03 (MAINTENANCE/LUBRICATION)

Adjust cable free play.



A. $2 \pm 0.5 \text{ mm}$ ($5/64 \pm 1/64 \text{ in}$)

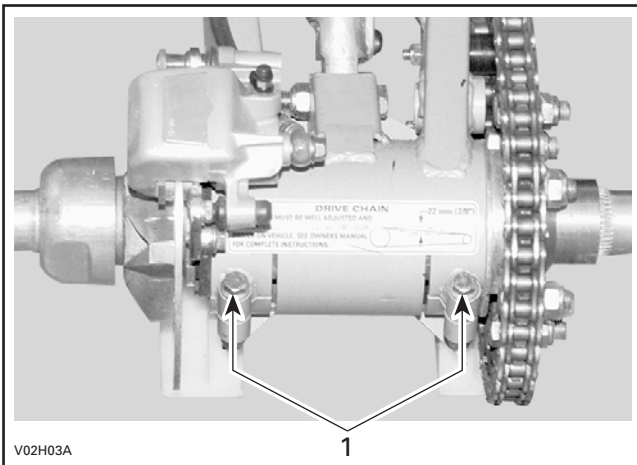
DRIVE CHAIN

Adjustment

NOTE: Always adjust drive chain with the driver, or equivalent weight, installed on the vehicle.

Select a level surface and set transmission to NEUTRAL.

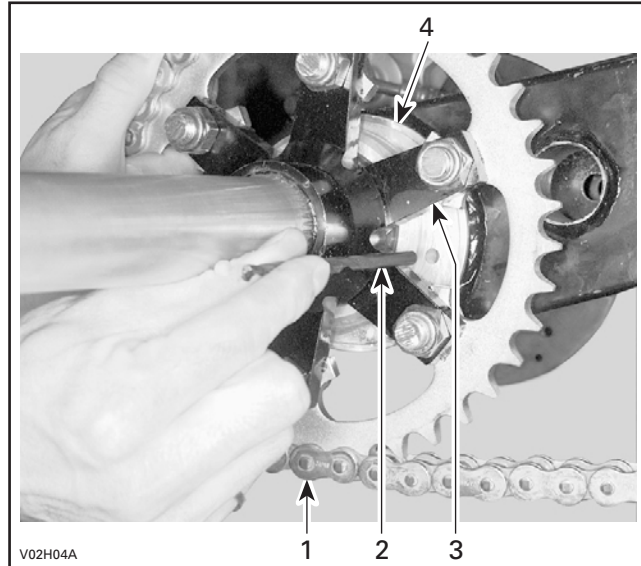
Loosen rear axle lock bolts **no. 12**.



1. Rear axle lock bolts

Insert adjuster lock through rear hub **no. 13** and into eccentric axle housing **no. 6**.

Turn the axle forward to increase or backward to decrease chain slack.



1. Drive chain
2. Adjuster lock
3. Sprocket hub
4. Eccentric axle housing

NOTE: Correct chain slack adjustment is 19 to 25.4 mm ($3/4$ to 1 in) at midway between sprockets.

Tighten the rear axle lock bolts to 28 N•m (21 lbf•ft).

Lift rear of vehicle (without driver), by the frame or by the bumper, and recheck the chain slack. The chain slack should be 44.5 to 51 mm ($1\text{-}3/4$ to 2 in). If not, redo the drive chain adjustment.

Lubrication and Cleaning

CAUTION: Never wash the chain with a high pressure washer or gasoline. Damage to the O-ring will result, causing premature wear and drive chain failure.

Clean the side surfaces of the chain with a dry cloth.

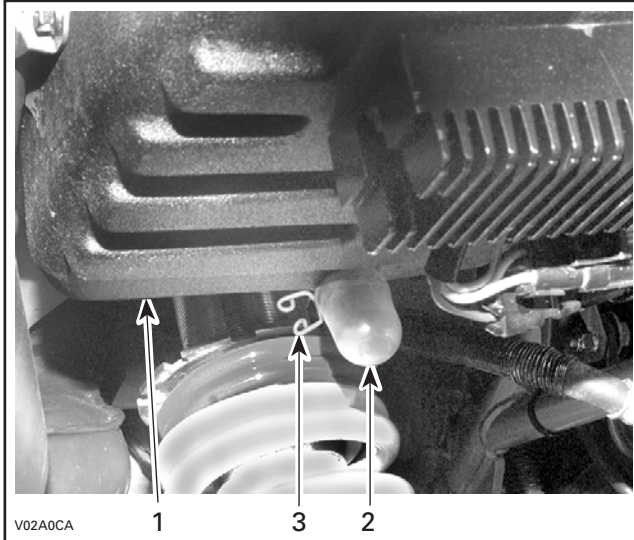
NOTE: Do not brush chain.

Lubricate only with the approved O-ring chain lubricant. Other commercial chain lubricants may contain solvent which could damage the O-rings.

AIR FILTER CLEANING/DRAINING

Air Filter Box Draining

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



- 1. Air filter box
- 2. Drain plug
- 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.

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

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

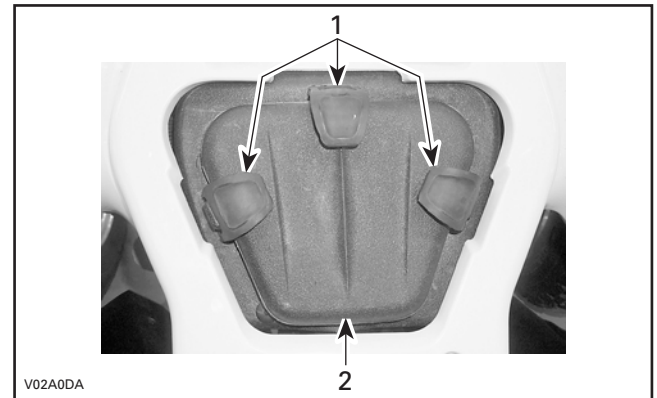
Remove air filter as explained below.

Air Filter Removal

CAUTION: Never remove or modify any component in the air box. Always use genuine parts or suitable equivalent 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.

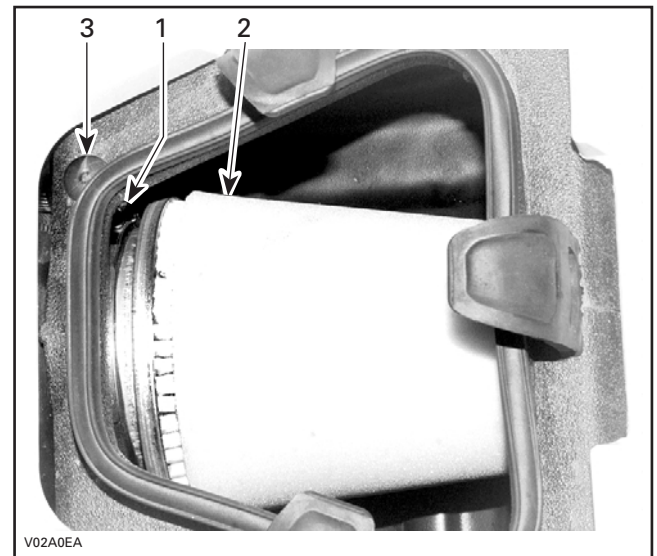
Remove seat.

Release latches and remove air filter box cover.



- 1. Latches
- 2. Air filter cover

Remove screw driver cap, push inside of air box. Loosen screw on clamp and remove filter. Remove foam.



- 1. Clamp
- 2. Air filter and foam
- 3. Screw driver cap

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.

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.

Section 02 MAINTENANCE

Subsection 03 (MAINTENANCE/LUBRICATION)

BOLTS, FASTENERS AND NUTS

Check bolts, fasteners and nuts at the regular intervals.

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

ENGINE OIL AND FILTER

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.

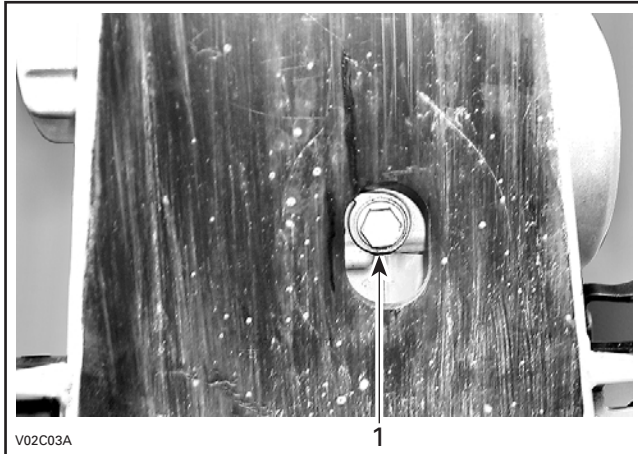
Remove dipstick.

Clean the drain plug area.

Drain all oil from oil tank by removing drain plug on the oil tank. Wipe out any oil spillage on vehicle.

Place a drain pan under the engine drain plug area.

Unscrew drain plug.

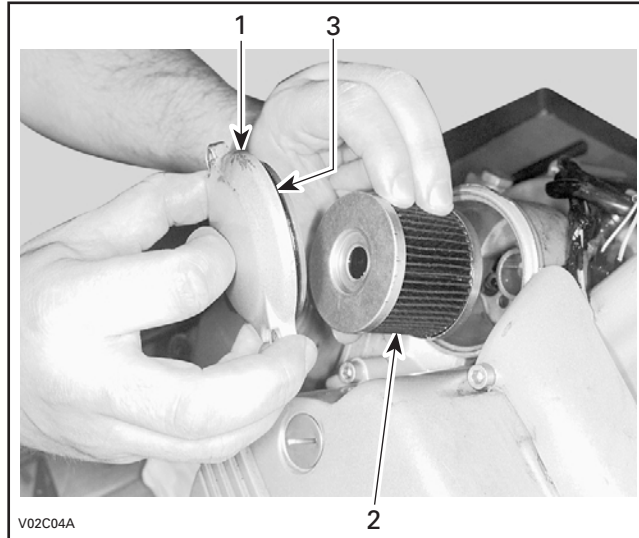


1. Oil drain plug

Wait a while to allow oil to flow out of oil filter. Reinstall drain plug. Torque to 20 N•m (15 lbf•ft).

Remove oil filter and replace by a new.

NOTE: Check and change the O-ring, if necessary.



RH SIDE OF ENGINE

1. Oil filter cover
2. Oil filter
3. O-ring

Wipe out any oil spillage on engine.

Inspect gasket on engine drain plug and replace as necessary. Clean gasket area on engine and drain plug then reinstall plug. Torque to 40 N•m (30 lbf•ft).

Refill oil tank at the proper level with the recommended oil. Refer to TECHNICAL DATA for capacity.

NOTE: The same oil lubricates both engine and transmission. **Don't use synthetic or semi-synthetic oil.** They affect the clutching calibration.

Start engine and let idle for a few minutes.

Check if the RED indicator lamp stay ON. If yes, stop engine and bleed system by removing oil filter and bleeding screw. See procedure below.

Ensure oil filter area, hose and drain plug areas are not leaking.

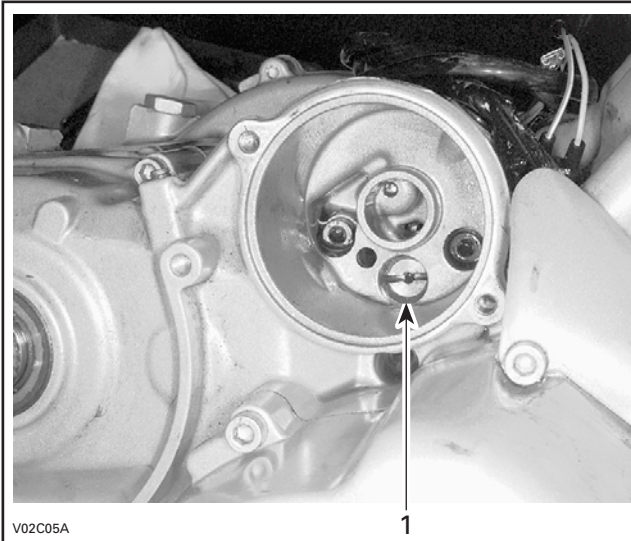
Stop engine and check oil level. Refill as necessary.

Dispose oil as per your local environmental regulations.

Bleeding Engine Oil Circuit

Remove oil filter.

Unfasten pressure bleeding screw.



BEHIND OIL FILTER

1. Bleeding screw

Unscrew and remove one spark plug.

Turn engine using starter until oil emerges in filter chamber.

Tighten pressure bleeding screw. Torque to 25 N•m (18 lbf•ft).

Install oil filter.

SPARK ARRESTER

The muffler must be periodically purged of accumulated carbon. See the maintenance chart.

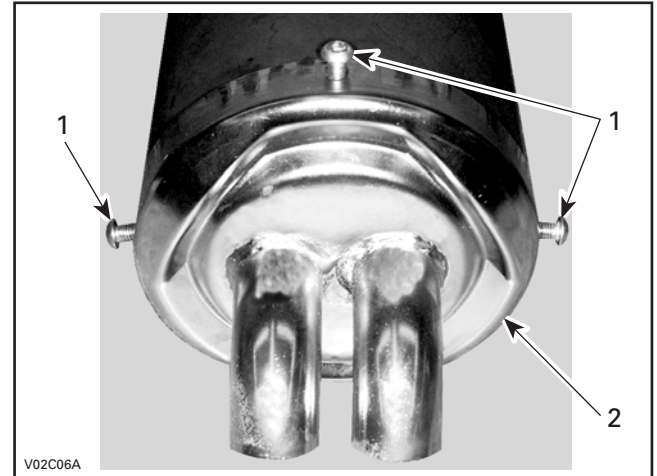
Removal

WARNING

Never perform this operation immediately after the engine has been run because exhaust system is very hot. Wear eye protection and gloves. Respect all applicable laws and regulations.

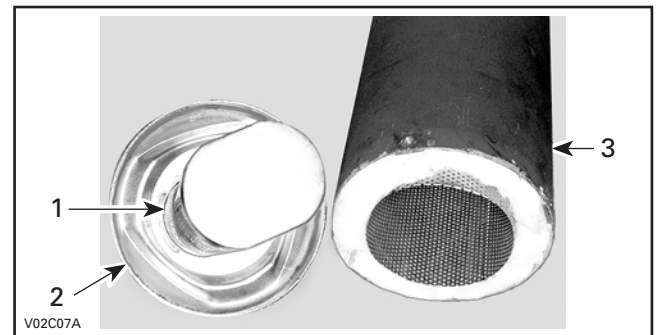
Remove:

- the screws retaining the spark arrester to the muffler



1. Screws
2. Spark arrester

- spark arrester and sealant joint



1. Spark arrester
2. Sealant joint
3. Muffler

- inner grill with wool.

Remove all carbon deposit in the muffler.

Remove carbon deposits from the spark arrester using a brush.

NOTE: Use a soft brush and be careful to avoid damaging spark arrester.

Section 02

MAINTENANCE

Subsection 03 (MAINTENANCE/LUBRICATION)

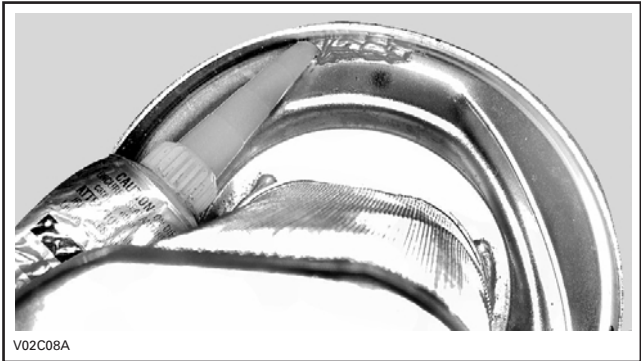
Installation

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

Check:

- wool and change if it deteriorate
- the spark arrester condition, it must be free of breaks and holes. Replace if necessary.

Remove the old sealant joint and replace by a new one. Use ULTRA COOPER sealant (P/N 413 710 300).



Be sure that wool is in place when inserting grill. Align grill properly in bottom of muffler shell.

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.

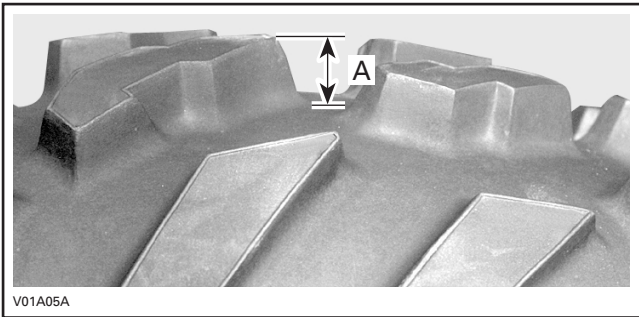
NOTE: Tire pressure changes with temperature and altitude. Recheck pressure if one of these conditions has changed.

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

TIRE PRESSURE		
RECOMMENDED	FRONT	REAR
	35 kPa (5 PSI)	35 kPa (5 PSI)
MINIMUM	21 kPa (3 PSI)	21 kPa (3 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.



TYPICAL
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 52.5 N•m (39 lbf•ft).

ENGINE AREA

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

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 the section MAINTENANCE/LUBRICATION.

Remove air box cover, air filter and foam to spray storage oil (P/N 496 041 100) 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 half a can).

Remove spark plugs and spray storage oil into cylinder. Press start button, 1 or 2 seconds maximum, to lubricate cylinder.

Stop the engine and remove the battery. Store it in dry and cool place out of the sun.

Turn the fuel valve to OFF and drain carburetor.

Reinstall the spark plugs, 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 inlets and exhaust system outlets using clean rags.

The air intake tubes are located under fuel tank 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 cloths 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.

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

Section 02 MAINTENANCE

Subsection 04 (STORAGE/PRE-SEASON PREPARATION)

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.

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 02-03
	Coolant Replacement and Pressurization of System		✓	Section 03-03
	Condition of Seals		✓	N.A.
	Spark Arrester		✓	Section 02-03
	Exhaust System Condition		✓	Section 03-02
	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 02-03
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 05-06
DRIVE TRAIN	Drive Chain Lubrication	✓		Section 06-02
	Drive Chain Adjustment	✓		
	Drive Chain Protector Condition	✓		
	Sprockets Inspection	✓		
STEERING/ CONTROL SYSTEM	Steering System Inspection and Adjustment		✓	Section 07-02
	Handlebar Fastener Tightness		✓	
	Wheel Tightness		✓	
	Tire Pressure	✓		Section 02-03
	Tire Condition		✓	
SUSPENSION	Suspension System Inspection		✓	Sections 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		✓	Sections 10-02 and 10-03
	Seat Latch		✓	

N.A.: Not available

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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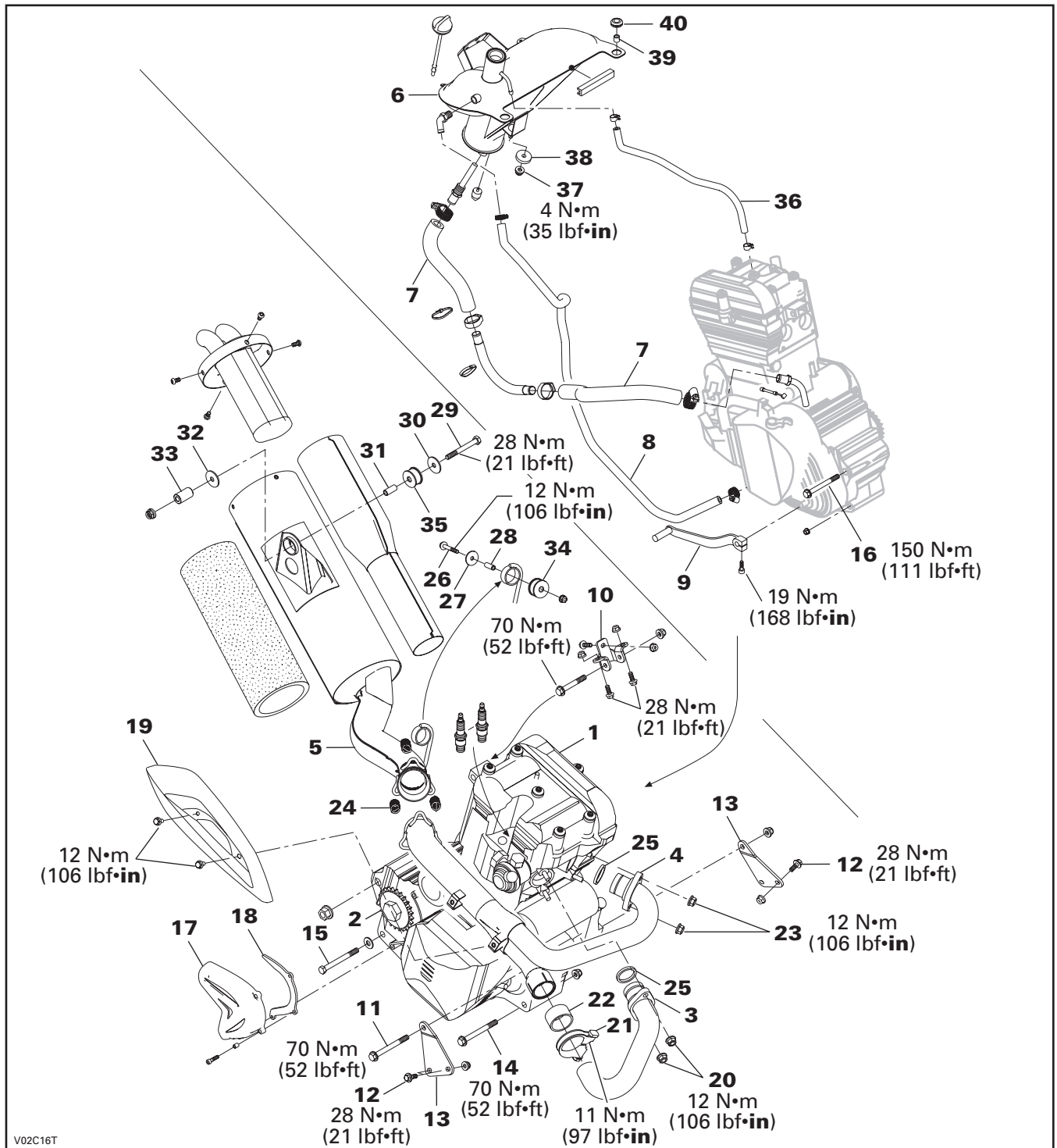
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REMOVAL AND INSTALLATION



Section 03 ENGINE

Subsection 02 (REMOVAL AND INSTALLATION)

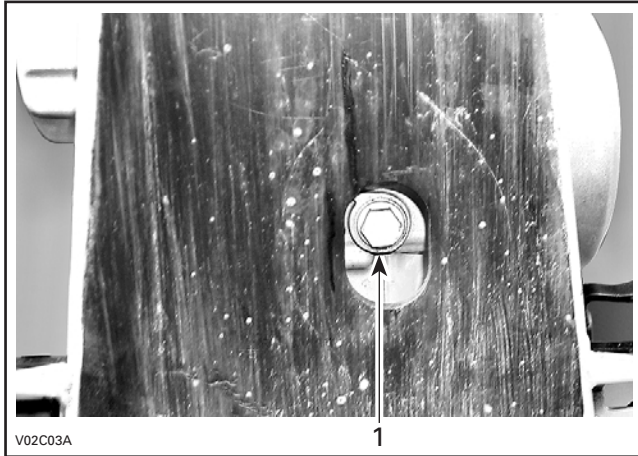
1, ENGINE

Vehicle Preparation

Place the vehicle on level surface and apply the parking brake.

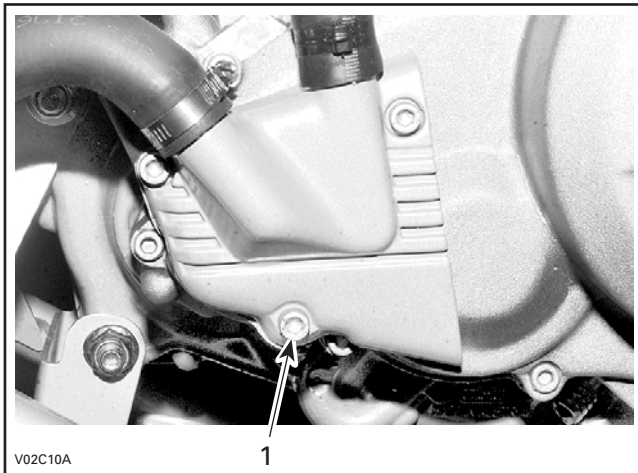
Close fuel valve.

Drain engine oil and engine coolant by drain plugs.



UNDER ENGINE

1. Engine oil plug



LH SIDE OF ENGINE

1. Engine coolant plug

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

WARNING

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

Remove:

- seat
- front facia
- fuel tank.

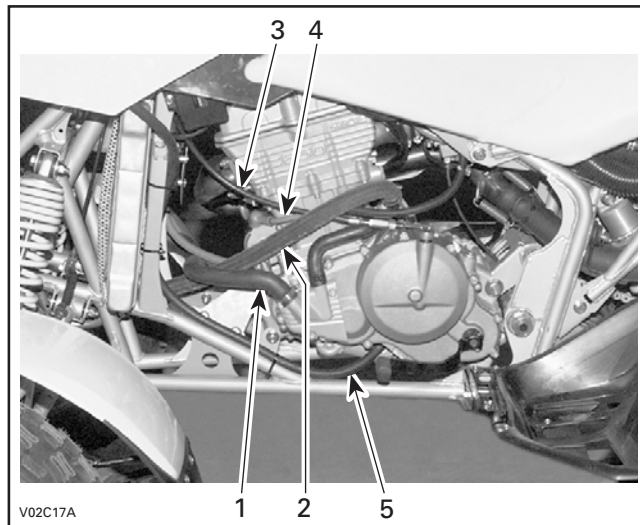
Engine Preparation

Unplug:

- spark plug cables
- oil pressure sensor, on the top of oil filter housing
- temperature sensor and temperature sender, located near thermostat housing
- magneto and trigger wiring harness connectors.

Remove:

- oil tank vent **no. 36** on the top of engine
- radiator outlet hose
- oil inlet hose **no. 7**
- clutch cable
- starter cable
- oil outlet hose **no. 8**



LH SIDE OF ENGINE

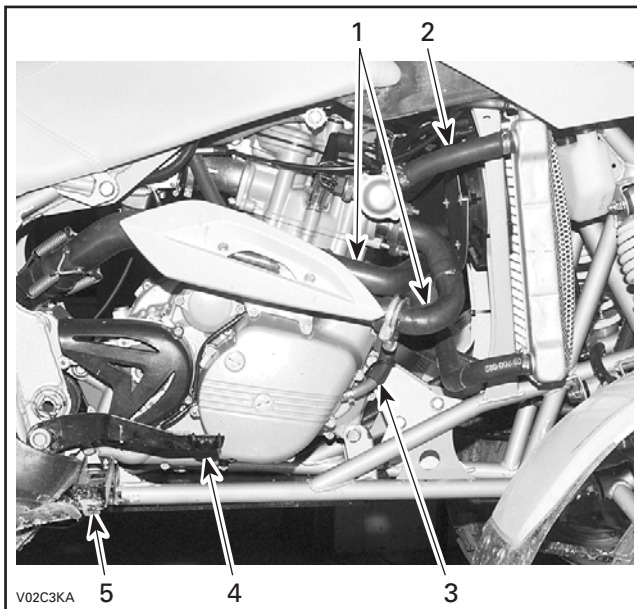
1. Radiator outlet hose
2. Oil inlet hose
3. Clutch cable
4. Starter cable
5. Oil outlet hose

- exhaust pipes **no. 3** and **no. 4** (refer to **Exhaust System** section)
- radiator inlet hose
- oil line
- brake pedal (refer to **HYDRAULIC BRAKES**)

Section 03 ENGINE

Subsection 02 (REMOVAL AND INSTALLATION)

- RH footrest (refer to BODY)
- engine pinion **no. 2**
(refer to **Engine Pinion** section)



RH SIDE OF ENGINE

1. Exhaust pipes
2. Radiator inlet hose
3. Oil line
4. Brake pedal
5. Footrest

- carburetor and carburetor adaptor (refer to CARBURETOR AND AIR INTAKE SILENCER)
- gearshift pedal **no. 9**.

Unscrew neutral switch connector.

Removal

Remove the upper support bracket **no. 10** completely.



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

Remove:

- upper engine support bolt **no. 11**
- lower bolts **no. 12** retaining the engine support **no. 13** on either side, then, remove supports
- front lower mounting bolt **no. 14**
- rear lower mounting bolt **no. 15**
- rear upper mounting bolt **no. 16**.

Remove engine from vehicle.

Installation

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

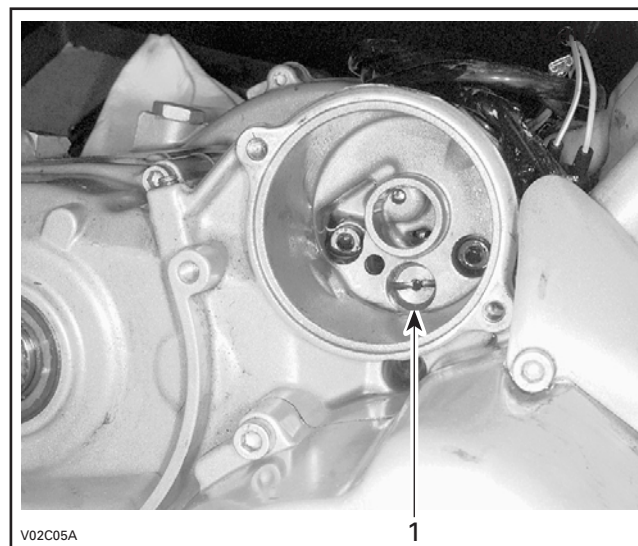
Reattach cables, hoses, wiring harness, etc.

Adjust clutch cable.

Bleed rear brake.

Before to start the engine, remove oil filter.

Unfasten pressure bleeding screw.



BEHIND OIL FILTER

1. Bleeding screw

Unscrew and remove one spark plug.

Turn engine using starter until oil emerges in filter chamber.

Tighten pressure bleeding screw. Torque to 25 N•m (18 lbf•ft).

Install oil filter.

This operation activated the oil pump. Check if vehicle runs correctly.

Section 03 ENGINE

Subsection 02 (REMOVAL AND INSTALLATION)

2, ENGINE PINION

Removal

Slack drive chain.

Remove pinion cover **no. 17** and metallic chain guard **no. 18**.

Set the first gear.

Unlock retaining ring then, unscrew the retaining nut.

NOTE: Discard the retaining ring.

Remove engine pinion and drive chain together.

Inspection

Check pinion for wear or other damage. Replace if necessary.

Installation

CAUTION: Replace chain, sprocket and pinion together to prevent rapid chain and sprocket wear. Install a new retaining ring each time the pinion is removed.

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

Install pinion with lips on the engine side.



Install retaining ring then retaining nut.

Torque retaining nut to 140 N•m (103 lbf•ft), then lock retaining ring.

Adjust drive chain. Refer to MAINTENANCE.

EXHAUST SYSTEM

WARNING

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

Exhaust Pipe Removal

3, RH Exhaust Pipe

Remove heat shield **no. 19**.

Remove exhaust pipe nuts **no. 20**.

Unscrew exhaust clamp **no. 21**.

Pull exhaust pipe forward.

Remove pipe gasket **no. 22**.

4, LH Exhaust Pipe

Remove RH exhaust pipe.

Remove exhaust pipe nuts **no. 23**.

Remove springs **no. 24** retaining exhaust pipe and muffler. Use exhaust spring installer/remover (P/N 529 035 400).

Pull exhaust pipe forward.

Remove pipe gasket **no. 25**.

Exhaust Pipe Installation

RH Exhaust Pipe

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

Use a new exhaust pipe gasket and make sure that it is properly installed.

Tighten flange nuts, making sure RH exhaust pipe is properly aligned inside LH exhaust pipe.

LH Exhaust Pipe

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

Use a new exhaust pipe gasket and make sure that it is properly installed.

Install flange nuts, making sure exhaust pipe is properly aligned inside muffler ball socket then install retaining springs after pushing muffler forward in exhaust pipe. Do not torque yet.

Install RH exhaust pipe.

Torque all flange nuts.

5, Muffler Removal

Remove exhaust pipes.

Remove screw **no. 26**, washer **no. 27** and spacer **no. 28**.

Under rear fender, remove screw **no. 29**, washer **no. 30**, bushing **no. 31**, another washer **no. 32** and spacer **no. 33**.

Remove muffler.

Muffler Installation

For installation, reverse the removal procedure.

NOTE: Check rubber bushings **nos. 34** and **35** for cracks or other damages, change if necessary.

6, OIL TANK

Removal

Remove front facia. Refer to BODY.

Remove head light. Refer to ACCESSORIES.

Drain engine oil.

Remove:

- oil inlet hose **no. 7**
- oil outlet hose **no. 8**
- oil tank vent **no. 36**.

Unscrew bolts retaining oil tank and fuel tank cover to the frame.

Unscrew bolt **no. 37** under oil tank.

Pull oil tank.

Installation

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

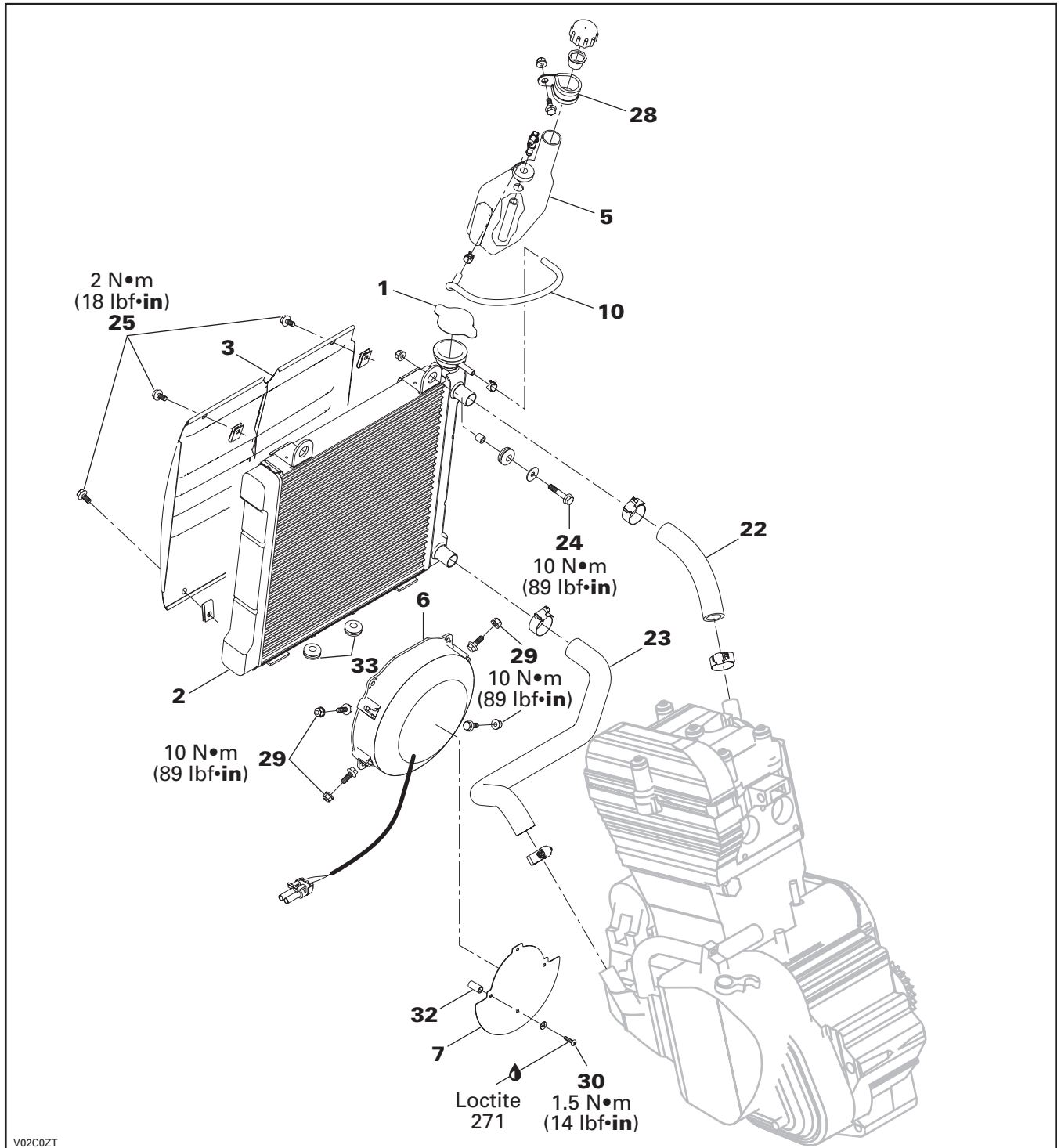
Install rubber washer **no. 38** between oil tank and frame.

Do not forget spacers **no. 39** in the grommets **no. 40**.

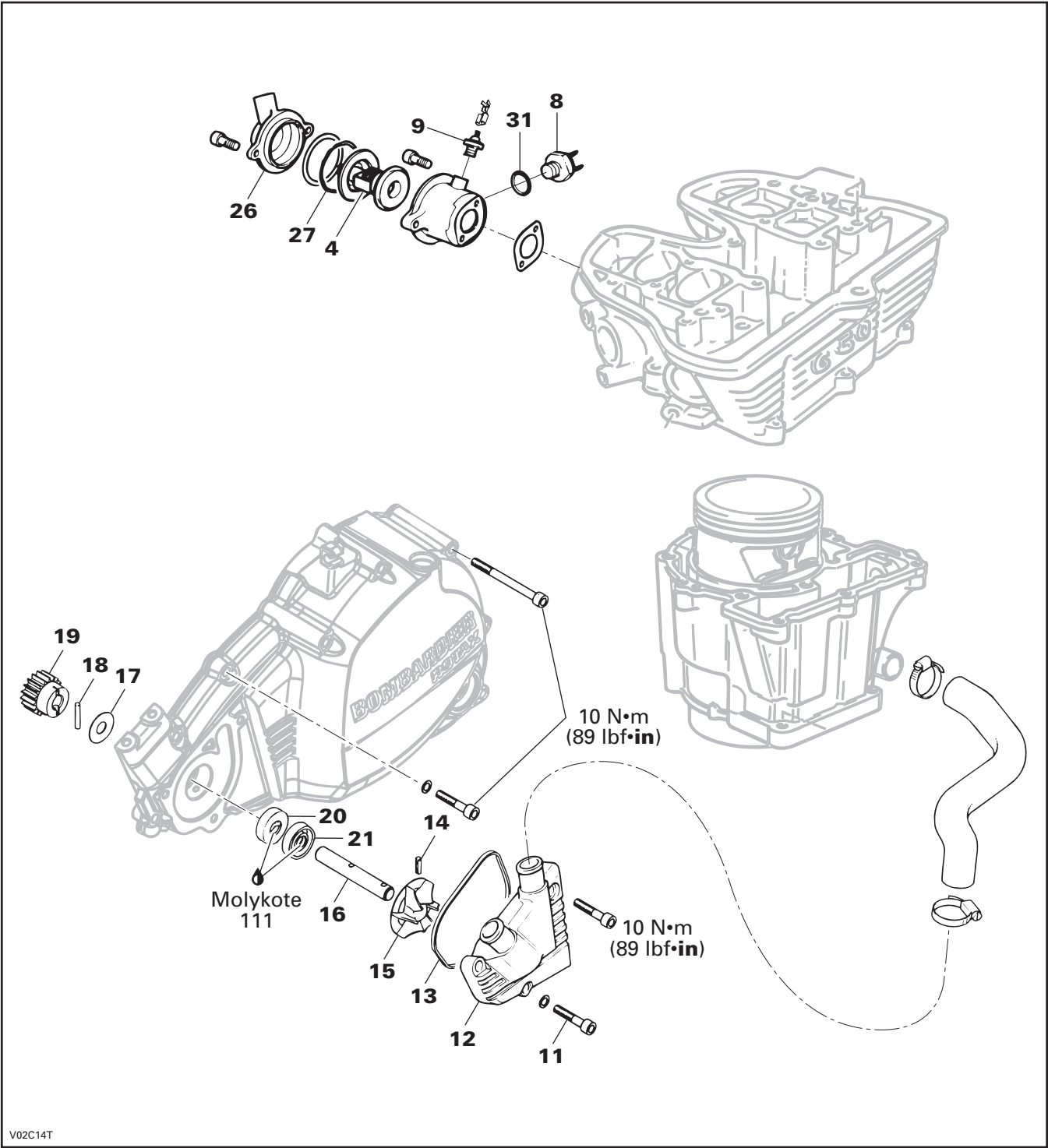
Bleed engine if necessary. Refer to MAINTENANCE.

COOLING SYSTEM

RADIATOR



WATER PUMP



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. 10**. 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.

INSPECTION

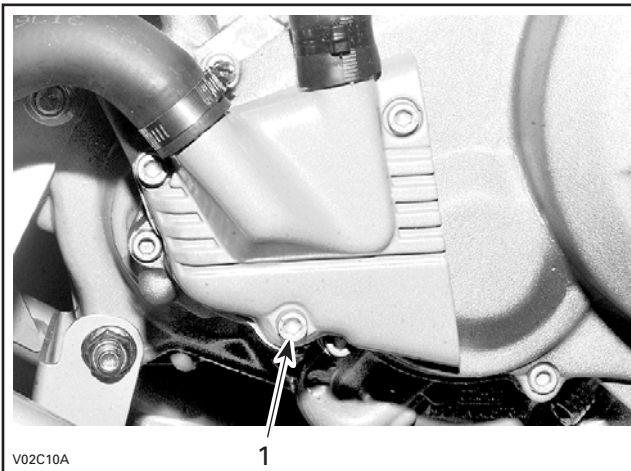
Check general condition of hoses and clamp tightness.

DRAINING THE SYSTEM

WARNING

Never drain or refill cooling system when engine is hot.

To drain cooling system, unscrew cooling plug **no. 11** on water pump cover and remove pressure cap **no. 1**.



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 .

Refilling Procedure

With vehicle on a flat surface, engine cold, remove the temperature sensor **no. 9** on the top of thermostat housing. Fill radiator **no. 2** until coolant get out by the temperature sensor hole. Install the temperature sensor and continue the cooling system filling by the radiator. Fill coolant tank **no. 5** up to cold level mark. Install radiator pressure cap. Run engine for brief period then stop engine. Refill up to mark, if necessary.

When engine has completely cooled down, recheck coolant level in radiator **no. 2** and coolant tank **no. 5** and top up if necessary.

Check coolant concentration (freezing point) with proper tester.

1, PRESSURE CAP

Check if cap pressurizes the system. If not, install a new 110 kPa (16 PSI) cap (do not exceed this pressure).

WATER PUMP

Removal

Drain off coolant.

Remove cover **no. 12** from water pump with O-ring **no. 13**.

Drive out spring pin **no. 14** and remove impeller **no. 15**.

Remove left engine housing cover.

Remove shaft **no. 16** by pulling inwards.

Remove thrust washer **no. 17**, needle pin **no. 18** and gear **no. 19**.

Press out sealing rings **no. 20** and **no. 21**.

Inspection

Check shaft for traces of sealing rings and replace if necessary.

Installation

For installation, reverse the removal procedure.

NOTE: Do not drive spring pin into impeller until engine housing cover has been installed.

Drive internal sealing ring **no. 20** firmly into place.

Section 03 ENGINE

Subsection 03 (COOLING SYSTEM)

Fill cavity between sealing rings with Molykote 111 paste.

Drive external sealing ring **no. 21** into place with the relevant adapter until flush with the race.

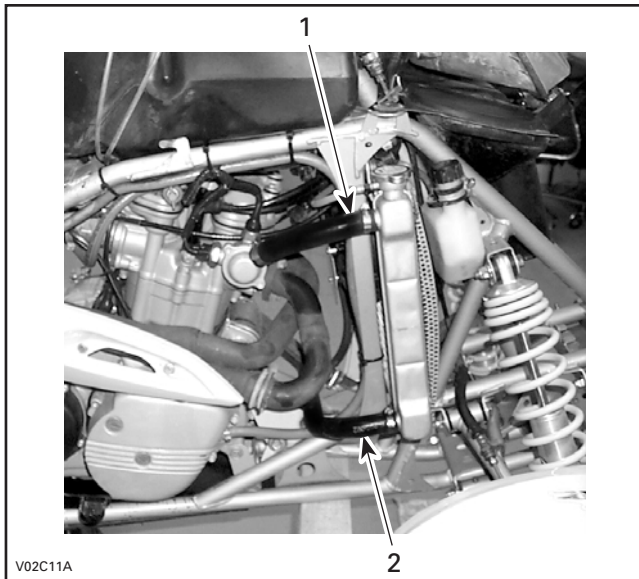
2, RADIATOR

Removal

Drain cooling system.

Remove:

- front facia (refer to BODY)
- inlet **no. 22** and outlet **no. 23** hoses



1. Radiator inlet hose
2. Radiator outlet hose

- overflow hose **no. 10**
 - headlight
 - ignition coils
 - radiator protector
 - mounting bolts **no. 24** on the top.
- Pull radiator out of frame by the RH side.

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.

Refill radiator.

NOTE: Do not forget rubber bushings **no. 33** under radiator.

3, RADIATOR PROTECTOR

Removal

Remove screws **no. 25** retaining protector on radiator.

Inspection

Check protector air passage for damage.

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

Installation

For installation, reverse the removal procedure.

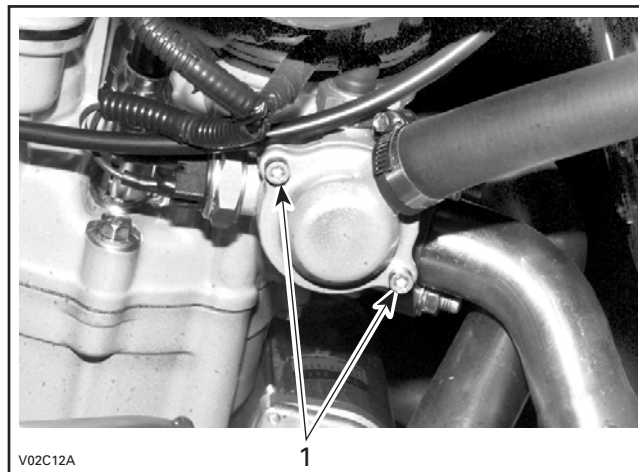
4, THERMOSTAT

The thermostat is a single action type.

Removal

The thermostat is located on the RH side of engine.

Unfasten cover **no. 26** from thermostat housing.



RH SIDE OF ENGINE

1. Remove screws

Pull out thermostat.

Remove O-ring **no. 27**. Check O-ring for damage and change if necessary.

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.

5, 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 110 kPa (16 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. 10**.

Unfasten the hose anchor **no. 28** retaining coolant tank.

Empty coolant tank.

Installation

The installation is the reverse of the removal procedure.

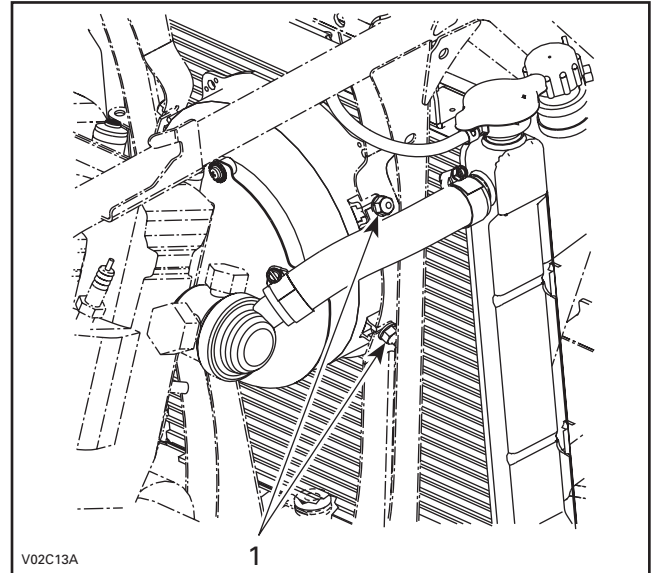
6,7, FAN AND HEAT SHIELD

Test

Refer to ACCESSORIES.

Fan Removal

Unscrew nuts **no. 29**, and pull fan in exhaust direction.



1. Remove bolts (two bolts on each side)

Unplug fan connector.

Fan Installation

For the installation, reverse the removal procedure.

Heat Shield Removal

Remove fan.

Remove bolts **no. 30** and spacers **no. 32**.

Heat Shield Installation

The installation is the reverse of the removal procedure.

NOTE: Apply Loctite 271 on threads.

Section 03 ENGINE

Subsection 03 (COOLING SYSTEM)

8, TEMPERATURE SENDER

Removal

Unplug temperature sender connectors.

Unscrew temperature sender.

Test

Using a multimeter, measure the resistance between both temperature sender connectors.

The multimeter should indicate an infinite resistance (O.L.), if not change the temperature sender.

If the resistance is infinite (O.L.), heat the temperature sender, above 95°C (203°F). The resistance should be 0.1 Ω . If not, change the temperature sender.

Installation

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

Check gasket no. 31 and change if necessary.

CAUTION: Don't apply any product on the threads or on the gasket.

9, TEMPERATURE SENSOR

Removal

Unplug temperature sensor connector.

Unscrew temperature sensor.

Test

Using a multimeter, measure the resistance between connector on the top of temperature sensor and threads.

The multimeter should indicate an infinite resistance (O.L.), if not change the temperature sensor.

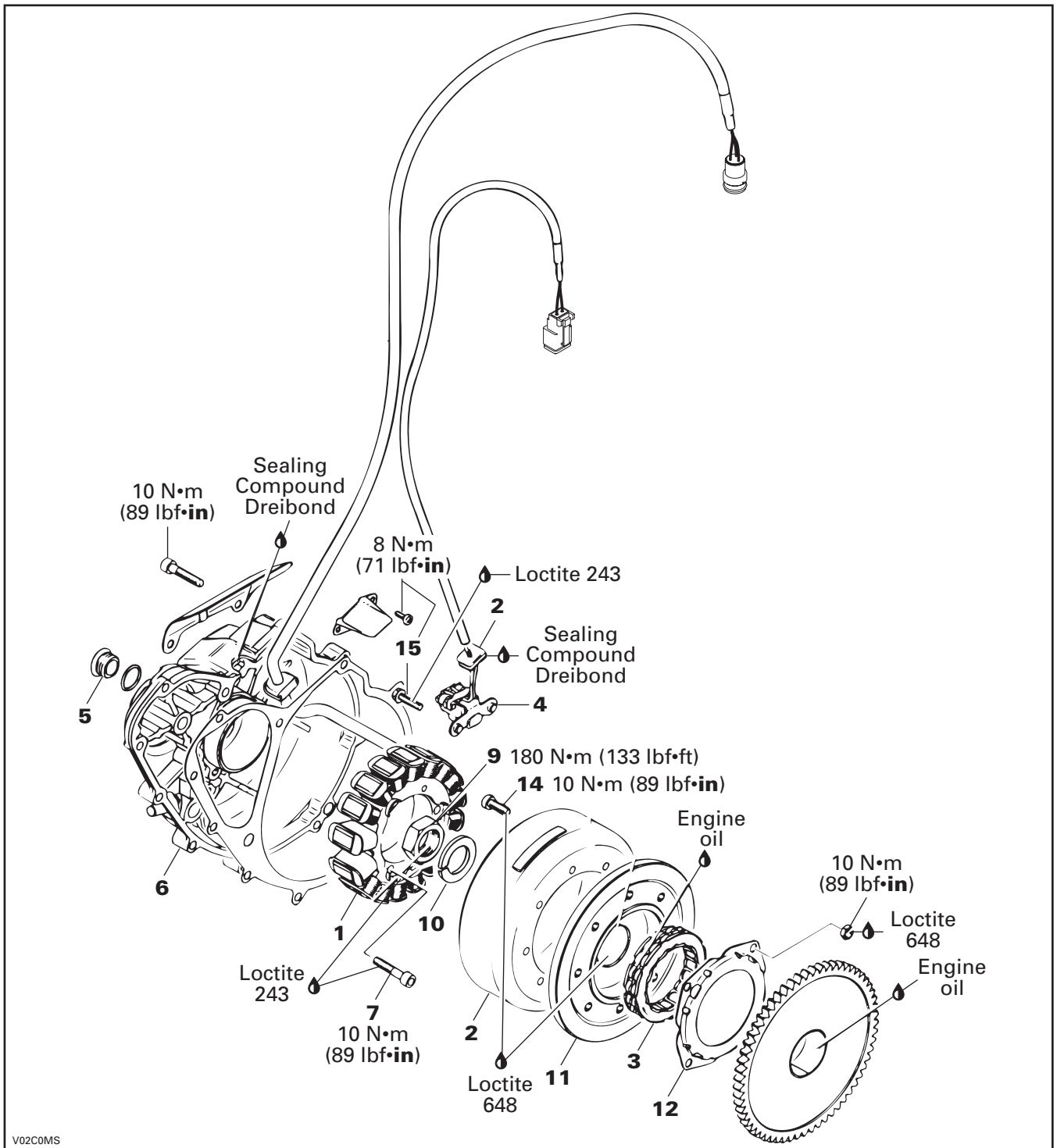
If the resistance is infinite (O.L.), heat the temperature sensor, above 115°C (239°F). The resistance should be 0.1 Ω . If not, change the temperature sensor.

Installation

The installation is the reverse of the removal procedure.

CAUTION: Don't apply any product on the threads.

MAGNETO SYSTEM



Section 03 ENGINE

Subsection 04 (MAGNETO SYSTEM)

1, MAGNETO

WARNING

Never disconnect harness on ignition system while engine is running.

Removal

Unfasten socket screws on right engine housing cover.

Unfasten central screw plug **no. 5**, screw in handle (P/N 529 035 622) and remove ignition cover **no. 6**.



RH SIDE

Remove gasket.

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. 7** retaining magneto to ignition cover then pull magneto.

Installation

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

Seal rubber grommet **no. 8** on electrical line with sealing compound Dreibond (P/N 420 297 906).

Screw handle in center bore.

Fit magneto housing and screw down.

Unfasten handle and install screw plug in cover.

NOTE: Install a new gasket on ignition cover.

2, ROTOR

Removal

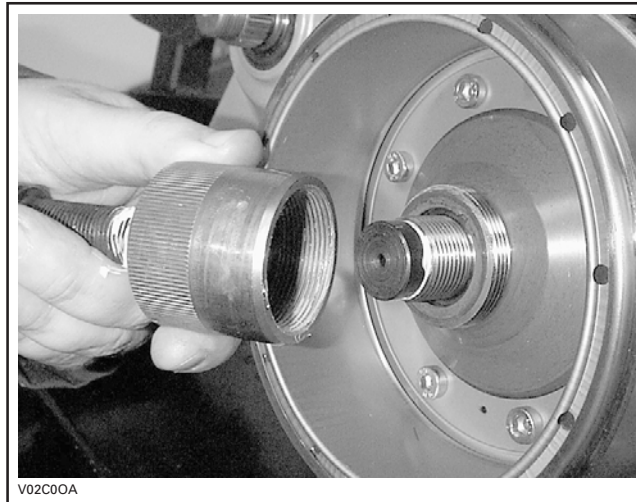
Lock crankshaft with locking bolt (P/N 529 035 617). Refer to CRANKSHAFT/BALANCER SHAFT.

Remove ignition cover **no. 6**.

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

Remove lock washer **no. 10**.

Install magneto puller (P/N 420 976 235) and crankshaft protector (P/N 420 876 557) then remove rotor.



Installation

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

Apply light coat of Loctite 648 to taper on rotor hub **no. 11**.

Oil sparg clutch **no. 3** in sparg clutch housing **no. 12**.

Slide rotor onto crankshaft, woodruff key and groove must be aligned in one line.

Rotate starter double gear counterclockwise to enable the sparg clutch to slide on the collar of sparg clutch gear **no. 13**.

CAUTION: Taper on crankshaft and rotor must be free of grease.

Install lock washer and nut on crankshaft end. Apply Loctite 243 on threads. Torque to 180 N•m (133 lbf•ft).

3, SPARG CLUTCH

Removal

Remove rotor **no. 2**.

Unscrew all socket screws **no. 14** retaining rotor and sparg clutch housing **no. 12**.

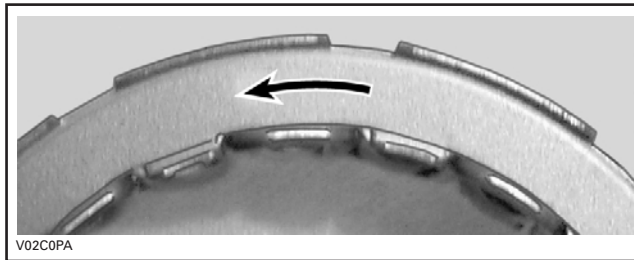
Remove sparg clutch from sparg clutch housing.

Installation

For installation, reverse the removal procedure.

NOTE: Apply engine oil on sparg clutch.

Install sparg clutch with the arrow on the top.



4, TRIGGER COIL

Removal

Remove the ignition cover **no. 6**.

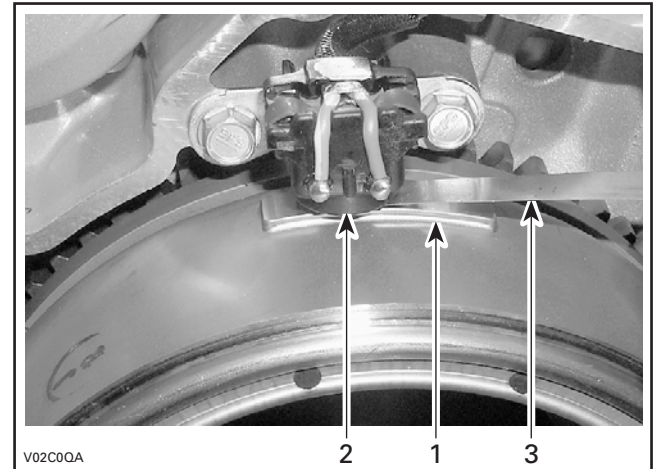
Unscrew bolts **no. 15** retaining trigger coil to housing then remove trigger coil.

Coat rubber grommet **no. 8** of trigger coil with sealing compound Dreibond (P/N 420 297 906) and install in housing.

Secure trigger coil with taptite screws and fix screws with Loctite 243.

Twist rotor **no. 2** until guide piece faces towards trigger coil.

Use feeler gauge to measure gap between guide piece and trigger coil.



- 1. Guide piece
- 2. Trigger coil
- 3. Feeler gauge

GAP BETWEEN GUIDE PIECE AND TRIGGER COIL	0.75 ± 0.25 mm (.03 ± .01 in)
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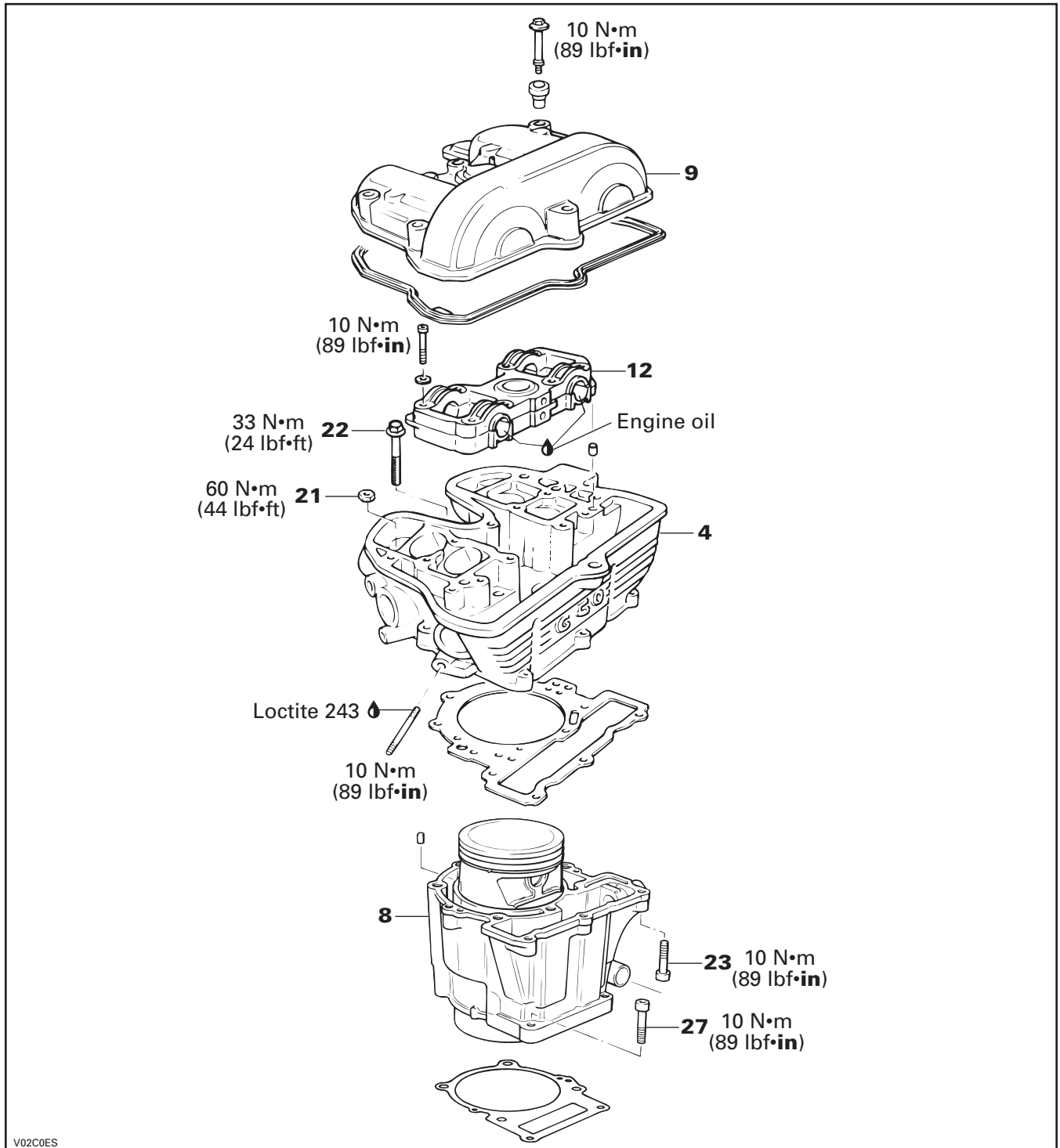
If necessary, correct gap by bending the retaining plate.

Coat rubber grommet on trigger coil and line from magneto in ignition cover beside sealing face with sealing compound Dreibond (P/N 420 297 906).

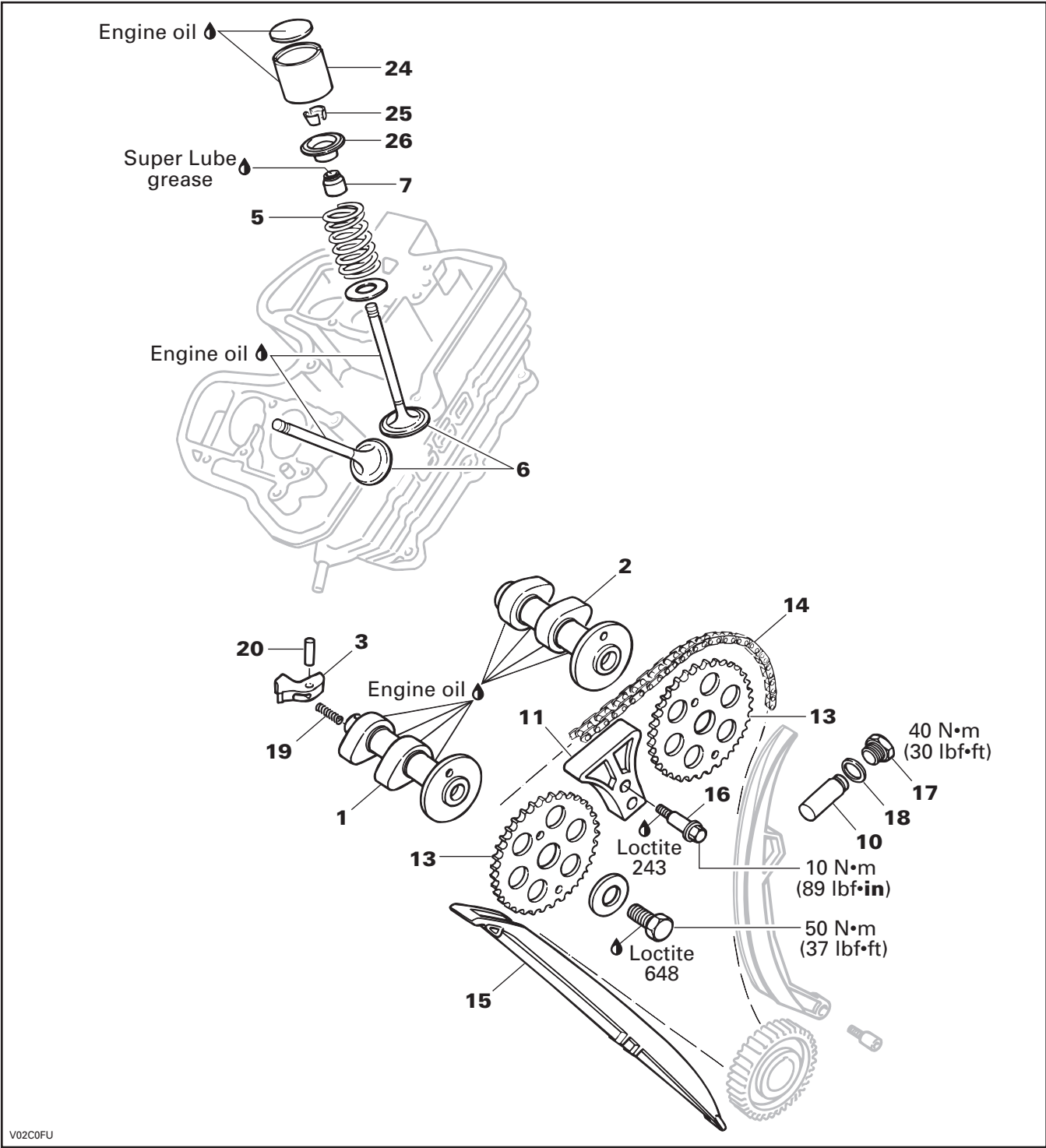
Fit gasket.

CYLINDER AND HEAD

CYLINDER AND HEAD



VALVE



1,2, CAMSHAFT

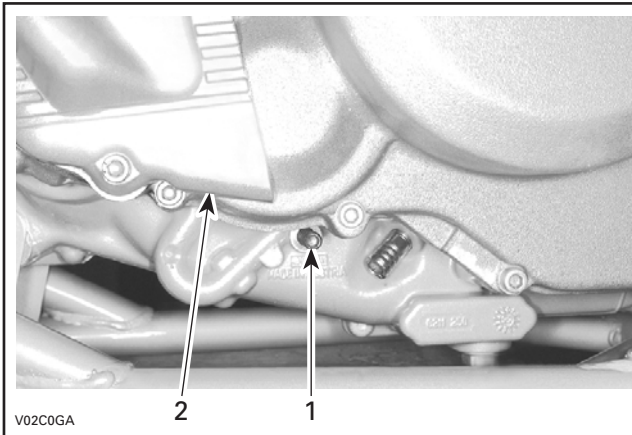
Removal

Remove fuel tank. Refer to FUEL CIRCUIT.

Unfasten center screw plug to right of engine housing cover.

Move crankshaft into TDC setting with the Allen key.

Install the crankshaft locking bolt (P/N 529 035 617).



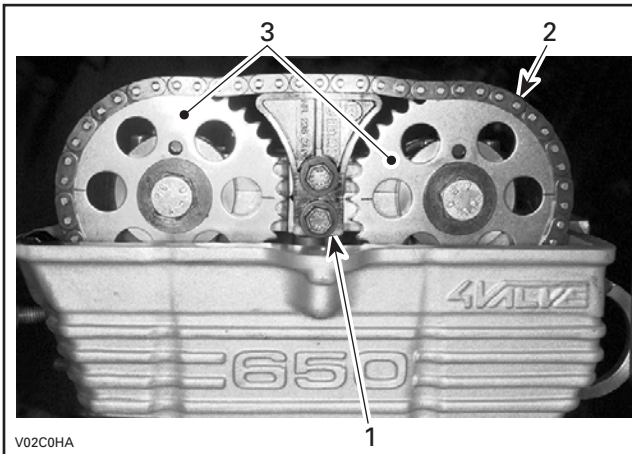
LH SIDE OF ENGINE

1. Crankshaft locking bolt
2. Water pump cover

Remove cylinder head cover no. 9.

Remove chain tensioner no. 10.

Unfasten chain guide no. 11.



1. Chain guide
2. Timing chain
3. Timing gears

Remove the upper section of camshaft carrier no. 12.

Remove camshafts no. 1 and no. 2 with timing gears no. 13.

NOTE: Only unfasten timing gears if they need to be replaced.

Secure timing chain no. 14 with a retaining wire.

Remove front chain rail no. 15.

Inspection

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

Measure camshaft base circle diameter and lobe height, using a micrometer.

CAMSHAFT LOBE HEIGHT	
SERVICE LIMIT	39.7 mm (1.56 in)

Measure clearance between camshaft and camshaft carriers, using the plastic feeler gauge.

NOTE: The plastic feeler gauge is available at automotive parts retailer.

Tighten camshaft carrier to specified torque.

Unfasten camshaft carrier and determine clearance using comparative scale.

CAMSHAFT DIAMETER	
MINIMUM	21.950 mm (.864 in)

I.D. DIAMETER OF CAMSHAFT CARRIER	
MAXIMUM	22.040 mm (.868 in)

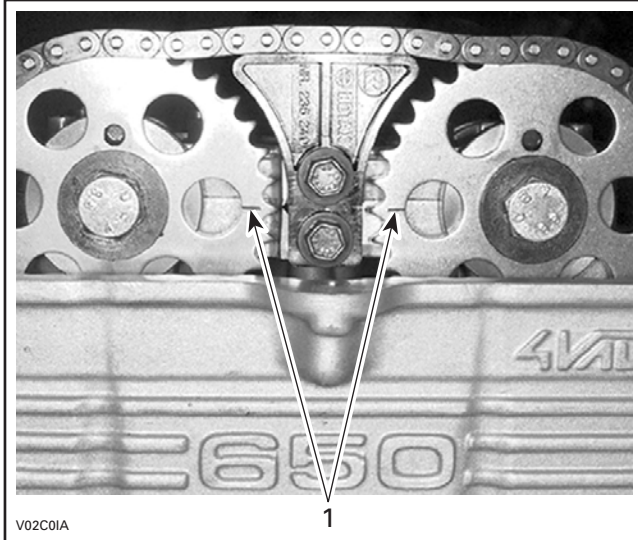
CLEARANCE BETWEEN CAMSHAFT AND CAMSHAFT CARRIER	
MAXIMUM	0.09 mm (.004 in)

Section 03 ENGINE

Subsection 05 (CYLINDER AND HEAD)

Installation

CAUTION: The markings on the timing gears must be aligned opposite the joint in the camshaft carrier.



1. Align marks

Tighten screws **no. 16** for chain guide with Loctite 243, hand tight.

Fit upper section of camshaft carrier and tighten down.

Check valve clearance. Refer to MAINTENANCE/LUBRICATION.

Install chain tensioner and tighten screw **no. 17** with sealing ring **no. 18**.

Install valve cover with gasket.

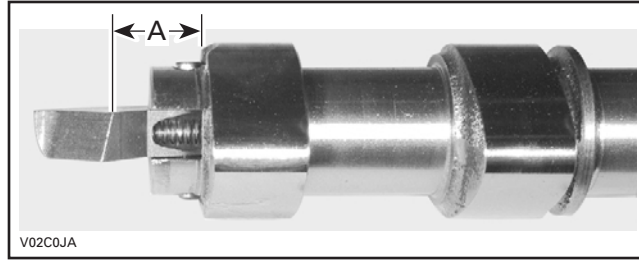
Unscrew and remove crankshaft locking bolt. Install the screw plug with sealing ring. Torque to 24 N•m (18 lbf•ft).

3, CENTRIFUGAL DECOMPRESSOR

Inspection

Hold down exhaust camshaft **no. 1** in horizontal position with cam tips facing downwards.

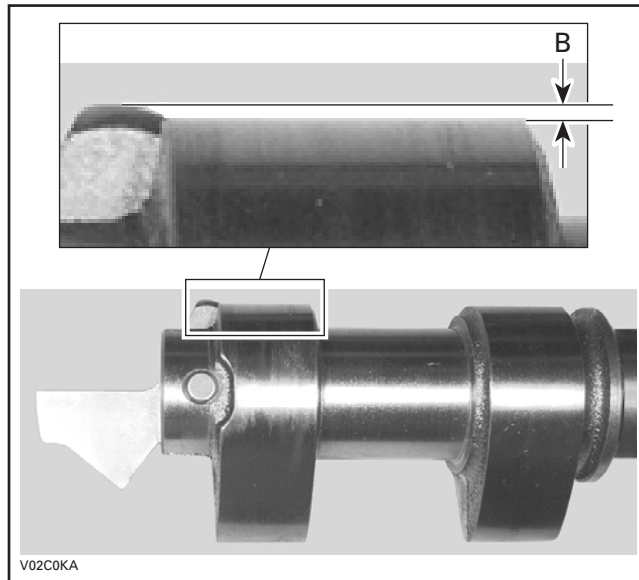
The spring **no. 19** must press the lever upwards to dimension "A", replace spring if necessary.



A. 11.5 mm (0.45 in)

NOTE: Never stretch spring since this alters the defined spring force.

When activated, the amount of lifting arm protruding over the cam pitch circle must not be less than dimension "B".



B. 0.4 mm (0.0157 in)

Disassembly

Remove the exhaust camshaft **no. 1**.

Use an appropriate punch to press shaft **no. 20** out of centrifugal weight **no. 3**.

Assembly

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

If the centrifugal decompressor was dismantled, **ALWAYS** replace the spring.

After assembly, check if the centrifugal weight move smoothly.

4, CYLINDER HEAD

Removal

Remove engine from vehicle. Refer to INSTALLATION AND REMOVAL.

Remove starter. Refer to STARTING SYSTEM.

Remove camshafts.

Withdraw the front chain rail **no. 11**.

Unfasten nuts **no. 21** on stud bolts and collar screws **no. 22**.

Unfasten socket screws **no. 23** linking cylinder head to cylinder.

Remove cylinder head.

Inspection

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

Installation

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

Fitting cylinder head gasket.

Slide timing chain through chain duct.

Tighten cylinder head and cylinder hand tight with collar screws.

Screw collar nuts onto stud bolts and tighten crosswise.

Tighten collar screws crosswise.

Tighten socket screws on cylinder base.

Install camshafts.

5, VALVE SPRING

Removal

Remove:

- cylinder head **no. 4**
- valve tappet **no. 24**.

Compress valve spring, use a spring compressor.

Remove valve cotters **no. 25**.

Remove spring compressor, valve spring retainer **no. 26** and valve spring.

Inspection

Check valve spring for rust or corrosion and free length.

VALVE SPRING FREE LENGTH	
SERVICE LIMIT	44.5 mm (1-3/4 in)

Installation

For installation, reverse the removal procedure.

6, VALVE

Removal

Remove valve spring **no. 5**.

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

Inspection

Valve Clearance

Refer to MAINTENANCE/LUBRICATION.

Valve

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

Valve Stem and Valve Guide

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	5.935 mm (.233 in)
Intake	5.95 mm (.234 in)

I.D. VALVE GUIDE mm (in)	
SERVICE LIMIT	
Exhaust	6.080 mm (.239 in)
Intake	

Section 03

ENGINE

Subsection 05 (CYLINDER AND HEAD)

Change valve if valve stem is out of specification.
Change cylinder head if valve guides are 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	1.8 mm (.07 in)
Intake	1.6 mm (.06 in)

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

Installation

Install valve.

NOTE: Remove assembly sleeve once again.

Install valve spring and valve plate spring.

NOTE: Install valve tappets with a small amount of grease to facilitate assembly.

7, VALVE STEM SEAL

Removal

Remove valve.

Remove valve stem seal with a special pliers.

Inspection

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

Installation

For installation, reverse the removal procedure.

8, CYLINDER

Removal

Remove:

- cylinder head **no. 4**, if necessary

NOTE: If the cylinder head does not have to be disassembled, do not separate cylinder head from cylinder.

- water cooling hose from cylinder
- socket screws **no. 27** retaining cylinder to the crankcase housing.

Pull cylinder.

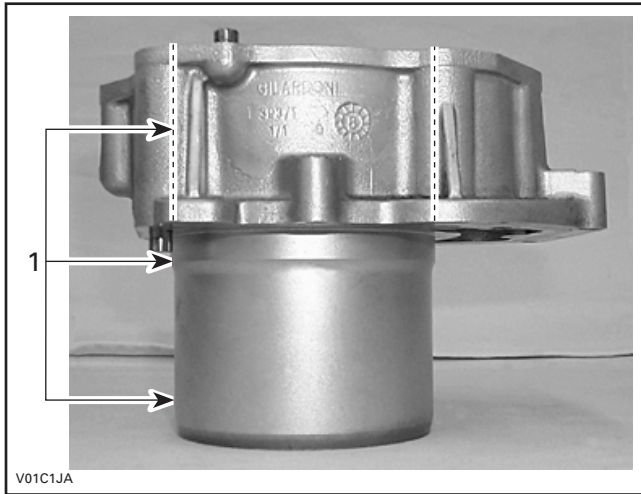
Inspection

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.



TYPICAL

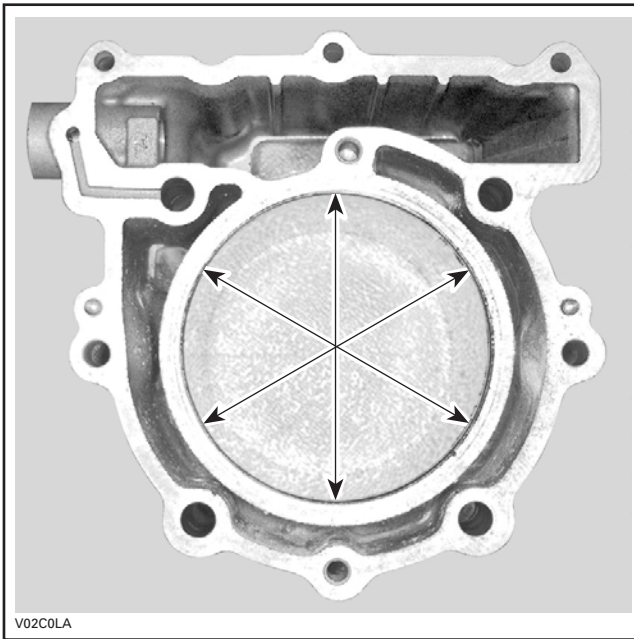
1. Measure at three points

Difference between measurements should not exceed 0.10 mm (.004 in). If so, replace cylinder.

LIFTER BORE CLEARANCE	
SERVICE LIMIT	100.03 mm (3.9382 in)

Cylinder Out of Round

Measure cylinder bore at distance of 60 mm (2-3/8 in) from the upper edge with an internal micrometer at three points. Difference between measurements should not exceed 0.10 mm (.004 in). If so, replace cylinder.



Installation

Coat piston rings with oil and slide the ring compressor over piston rings from above, allowing piston to protrude approximately 2 mm (3/32 in) from ring compressor.

Slide timing chain through chain duct, then slide cylinder over piston.

Remove the ring compressor.

Secure cylinder on engine housing with the socket screws. Do not torque yet.

Fit cylinder head.

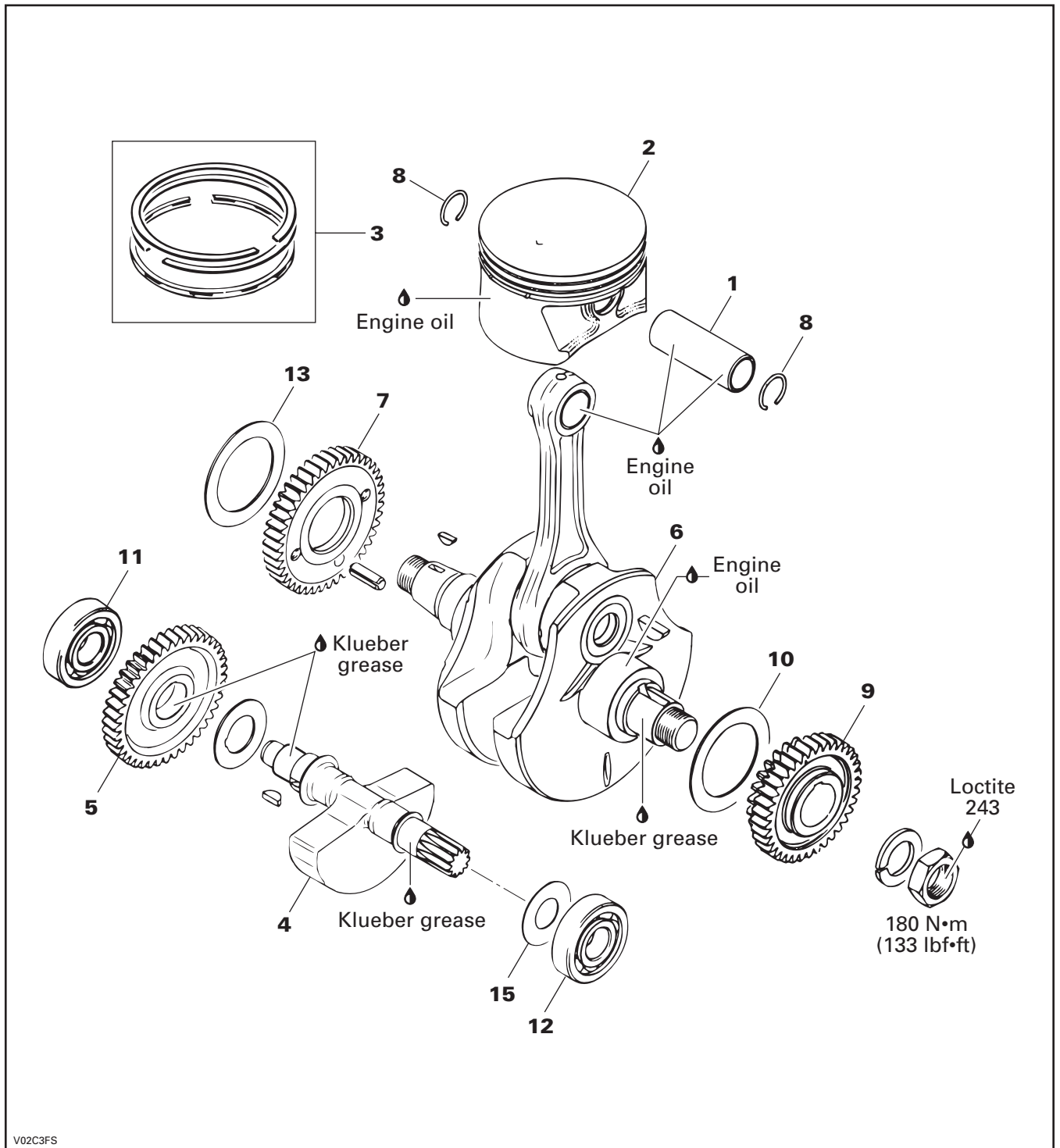
Tighten cylinder and cylinder head hand tight with collar screws.

Screw collar nuts onto stud bolts and tighten crosswise.

Tighten collar screws crosswise.

Tighten socket screws on cylinder base.

CRANKSHAFT/BALANCER SHAFT



1, PISTON PIN

Removal

Remove engine. Refer to REMOVAL AND INSTALLATION.

Remove cylinder. Refer to CYLINDER AND HEAD.

Remove both piston pin circlips **no. 8** then press out piston pin.

Inspection

Check piston pin for crack or other damage.

Measure both ends of piston pin with a micrometer.

PISTON PIN DIAMETER	
SERVICE LIMIT	21.98 mm (0.865 in)

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.

2, PISTON

Removal

Remove piston pin **no. 1**.

Detach piston from connecting rod.

NOTE: Mark base of piston on exhaust end.

Remove cylinder.

Remove both piston pin circlips **no. 8** then push piston pin **no. 1** out of piston.

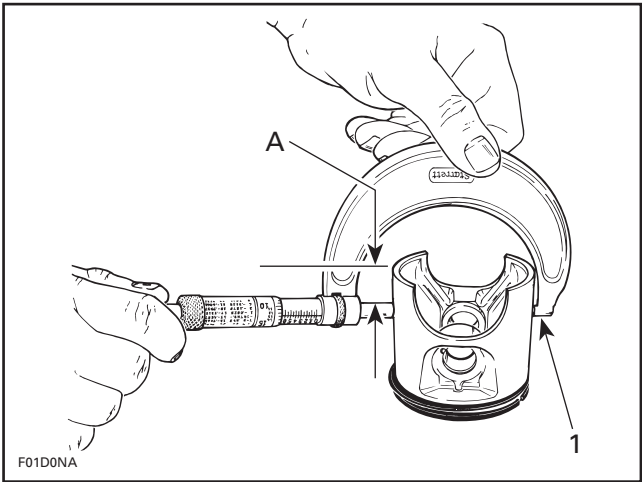
Detach piston from connecting rod.

NOTE: Mark base of piston on exhaust end.

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.

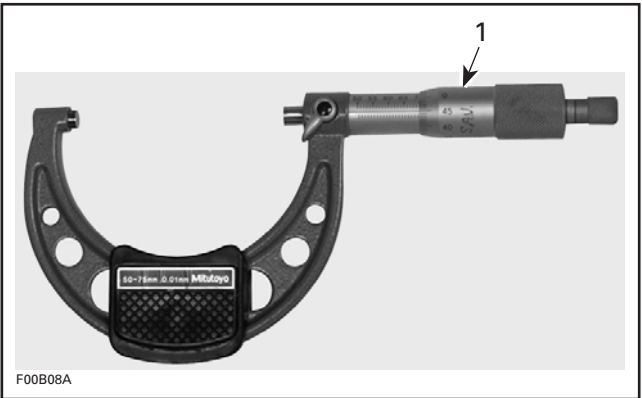
PISTON MEASUREMENT	
SERVICE LIMIT	99.94 mm (3.9346 in)

Piston/Cylinder Clearance

PISTON/CYLINDER CLEARANCE	
SERVICE LIMIT	0.09 mm (0.004 in)

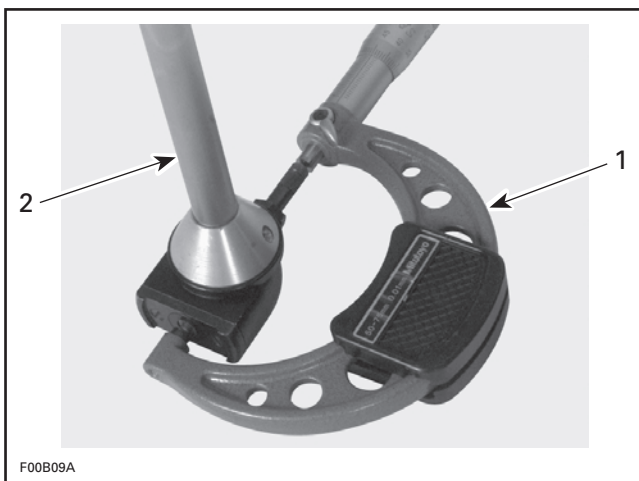
NOTE: Make sure used piston is not worn. See PISTON MEASUREMENT table above.

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.

NOTE: Install piston with removal mark (on base of piston) in direction of exhaust end.

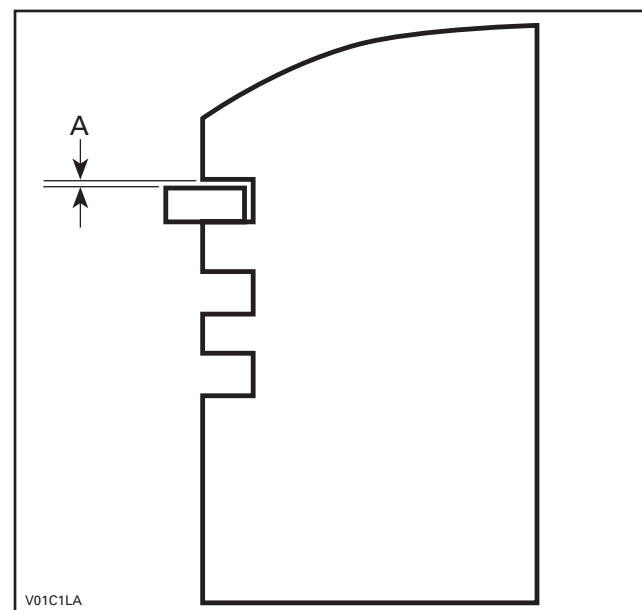
3, PISTON RINGS

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 (.006 in)



- A. Measure here

Ring End Gap

RING END GAP mm (in)	
SERVICE LIMIT	1.0 mm (.04 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.

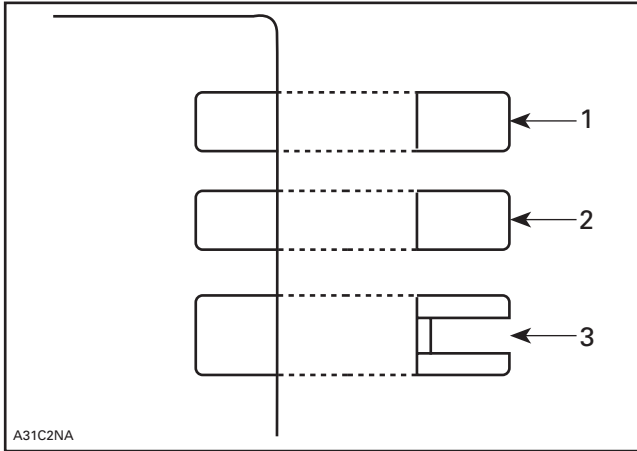
Section 03 ENGINE

Subsection 06 (CRANKSHAFT/BALANCER SHAFT)

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.



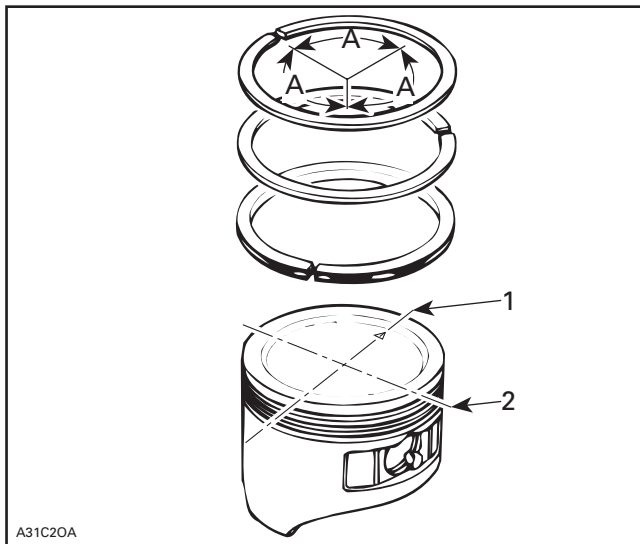
1. Top ring (rectangular, black/gray color)
2. Second ring (scraper, chrome/stainless steel looking ring)
3. Oil ring

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°

4, BALANCER SHAFT

Removal

Remove:

- engine (refer to REMOVAL AND INSTALLATION)
- cylinder (refer to CYLINDER AND HEAD)
- piston no. 2.

RH Side

Remove:

- magneto (refer to MAGNETO SYSTEM)
- free wheel and idle gears
- oil filter and unfasten two screw connections on base plate for engine housing.

LH Side

Remove:

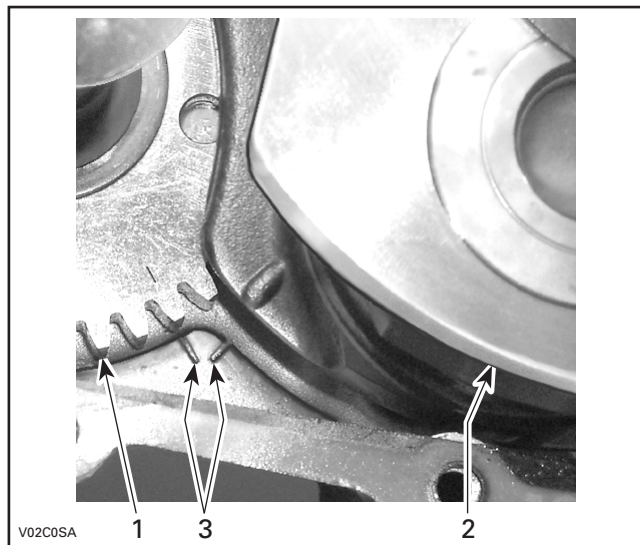
- clutch (refer to CLUTCH)
- double drive gear no. 9 and timing chain.

Lift up left side of engine housing, striking alternate gentle blows with plastic hammer on mainshaft, countershaft and balancer shaft to ensure that these remain on magnet side.

CAUTION: Do not tilt engine housing; this can cause damage to bearing cup.

Remove shims no. 10 and no. 15 on crankshaft and balancer shaft.

Align marks on balancer shaft and crankshaft with marks on housing.



1. Balancer shaft
2. Crankshaft
3. Marks on housing

First lift out crankshaft, then balancer shaft.

NOTE: Take care of spacer discs on crankshaft.

Inspection

Check balancer shaft bearings **nos. 11** and **12** in front and rear housing for excessive play and smooth operation. Replace if necessary.

Installation

Install balancer shaft in engine housing, mark must be aligned with mark on housing.

Coat thrust washer **no. 13** with oil and install in crankshaft.

Rotate crankshaft before installing so that mark is aligned with mark on housing.

Fit gasket.

NOTE: Coat bearing points on shafts. Recentre crankshaft and balancer shaft if either housing, crankshaft or balancer shaft were replaced. See RECENTRE CRANKSHAFT.

5, BALANCER GEAR

Removal

Mount balancer shaft in vise with protective jaws.

Use puller (P/N 529 035 623) to remove balancer gear.

Inspection

Check gears teeth for damage. Change if necessary.

Installation

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

Heat balancer gear to 80°C (176°F).

6, CRANKSHAFT

Removal

Use the same removal procedure that balancer shaft.

Inspection

Crankshaft Bearing Radial Play

Measure bearing journal diameter. The minimum diameter for bearing journal is 47.975 mm (1.888 in). If the measure exceeds specified tolerance, replace the crankshaft.

Measure the interior diameter of the crankshaft bushing.

Subtract bearing journal diameter from inside bushing diameter. The result is the main bearing radial play. If the measure exceeds specified tolerance, replace the crankshaft and/or bushing.

CRANKSHAFT BEARING RADIAL PLAY mm (in)	
SERVICE LIMIT	0.10 mm (.004 in)

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	0.80 mm (.031 in)

Connecting Rod/Piston Pin Clearance

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

CONNECTING ROD SMALL END DIAMETER	
SERVICE LIMIT	22.04 mm (.868 in)

PISTON PIN BORE CLEARANCE	
SERVICE LIMIT	0.06 mm (.002 in)

Installation

For installation, refer to balancer shaft installation.

Section 03 ENGINE

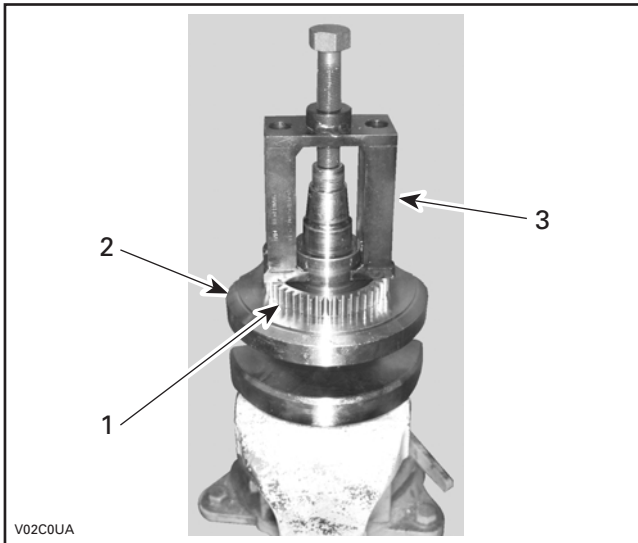
Subsection 06 (CRANKSHAFT/BALANCER SHAFT)

7, COUNTER GEAR

Removal

Clamp crankshaft in vise with protective jaws.

Using extractor (P/N 529 035 624) extract counter gear.



1. Counter gear
2. Crankshaft
3. Extractor

Inspection

Check counter gear teeth for damage. Replace if necessary.

Installation

Heat counter gear to 140°C (284°F).

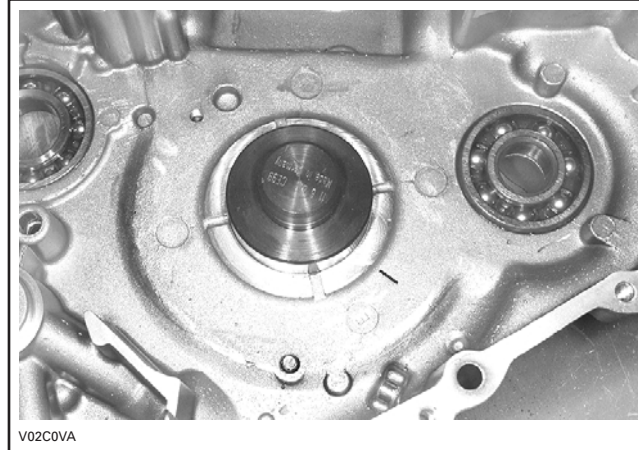
CAUTION: The roller pin no. 14 must not protrude from bore in counter gear; this is the support face for the thrust washer.

CRANKSHAFT BUSHING

Removal

Heat engine housing to 100°C (212°F).

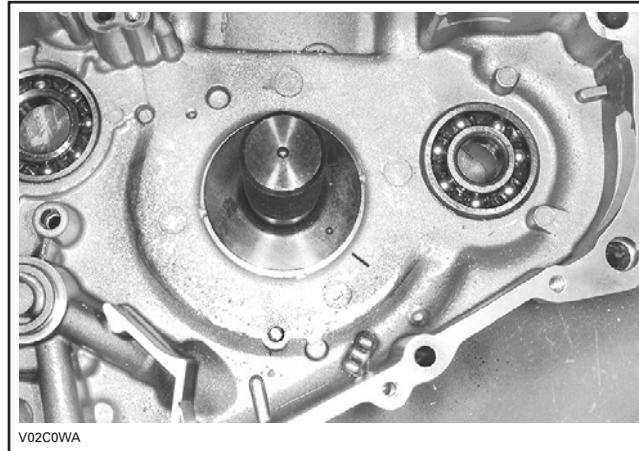
Drive out bushing with punch (P/N 529 035 688).



Installation

Heat engine housing to 100°C (212°F).

Coat bushing with Klueber grease (P/N 711 297 616) and drive home with punch (P/N 529 035 689), striking from inside.



CAUTION: Mark position of oil hole in bushing on housing. Align mark on punch with mark on housing. Bushing must be inset behind oil holes. The notch on the bushing should always face the balancer shaft.

BALL BEARINGS IN HOUSING

Removal

Heat output shaft in the housing to 80°C (176°F).
Using a suitable slide hammer, extract ball bearing.

Installation

Place the housing in oven to 100°C (212°F).

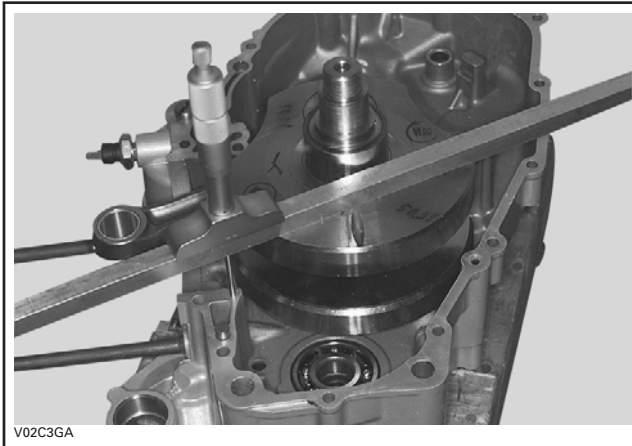
NOTE: The sealed ends of the cage must point outwards.

RECENTRE CRANKSHAFT

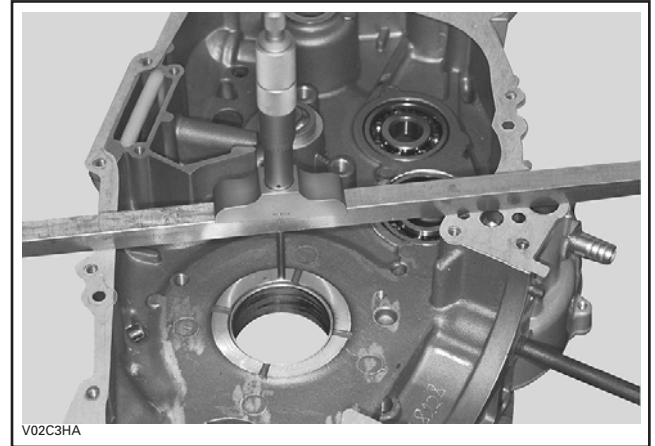
NOTE: Only fit spacer on clutch end. On magneto side, the spacer is always 1.0 mm (.04 in).

Place crankshaft into right engine housing (magneto side). Do not install spacer on clutch side.

Using depth gauge, measure distance between crank web and housing joint. This is the dimension "B".



Determine dimension between compressed gasket in left engine housing (clutch side) and washer contact face. This is the dimension "A".



Subtract dimension "B" from dimension "A", the result is the end float of crankshaft plus spacer thickness.

Select suitable spacer to ensure the correct end float is obtained.

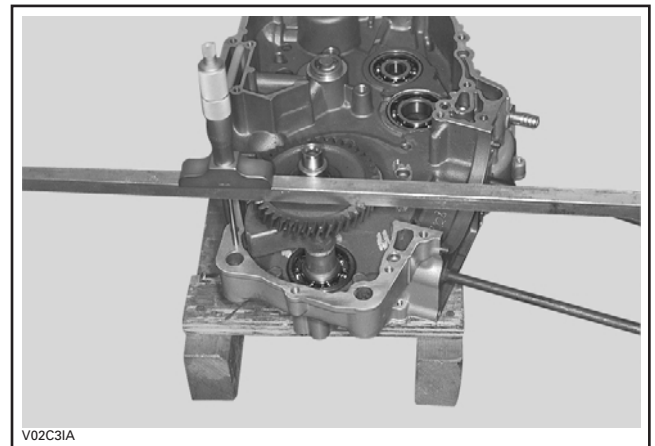
END FLOAT OF CRANKSHAFT	0.1 to 0.3 mm (.004 to .012 in)
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RECENTRE BALANCER SHAFT

NOTE: Only fit spacer on clutch end.

Place balancer shaft into left engine housing (clutch side). Do not install spacer on clutch side.

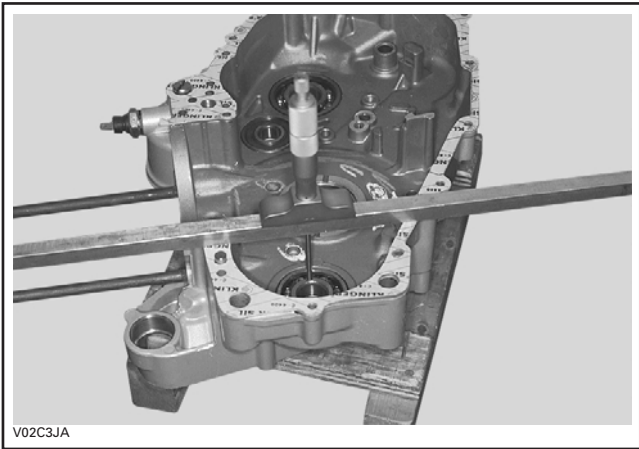
Using depth gauge, measure distance between the top of balancer gear and housing joint. This is the dimension "B".



Section 03ENGINE

Subsection 06(CRANKSHAFT/BALANCER SHAFT)

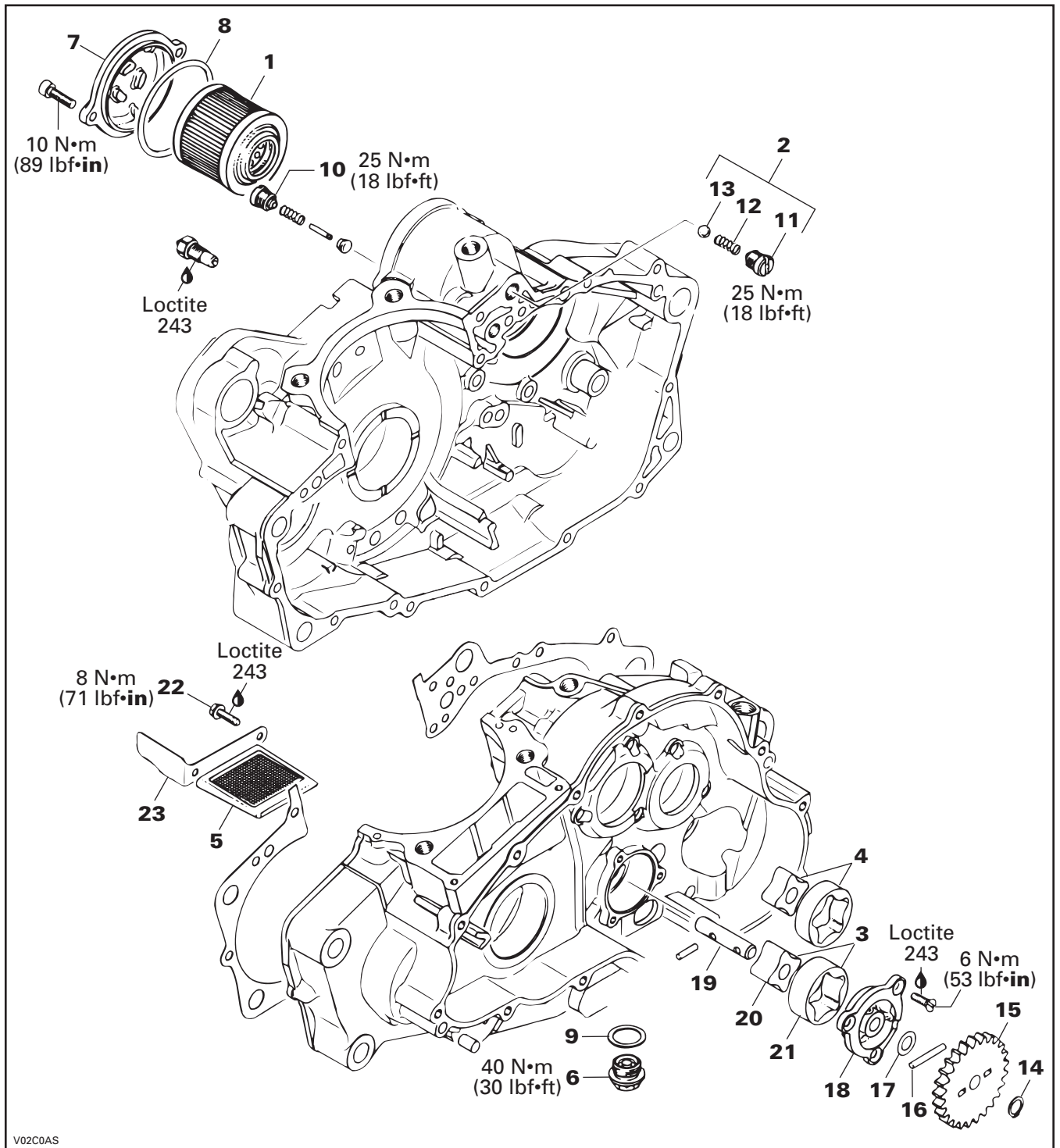
Determine dimension between compressed gas-ket in right engine housing (magneto side) and in-ner ring of bearing. This is the dimension “A”.



Subtract dimension “B” from dimension “A”, the result is the end float of balancer shaft plus spacer thickness.
Select suitable spacer to ensure the correct end float is obtained.

END FLOAT OF BALANCER SHAFT	0.1 to 0.3 mm (.004 to .012 in)
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LUBRICATION SYSTEM



Section 03 ENGINE

Subsection 07 (LUBRICATION SYSTEM)

TROUBLESHOOTING

Oil Level Low

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

Low or No Oil Pressure

- clogged oil orifice(s)
- incorrect oil being used
- leaking oil seal
- oil strainer
- oil pump worn or damaged
- defective oil pressure regulator

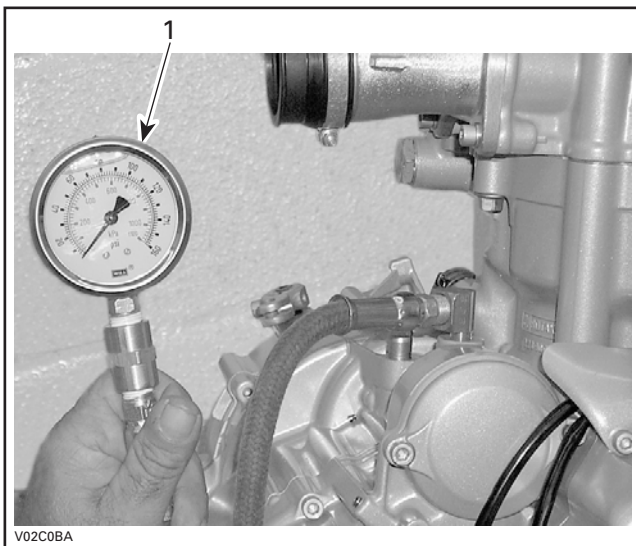
Oil Contamination (white appearance)

- coolant mixing with oil
- faulty water pump seal
- faulty head gasket
- water leak in crankcase
- air trapped at pump inlet

ENGINE PRESSURE TEST

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

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



1. Oil pressure gauge

The engine pressure should be 50 kPa (7 PSI) minimum at idle and 300 kPa (44 PSI) at 6000 RPM.

NOTE: The maximum oil pressure is 600 kPa (87 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.

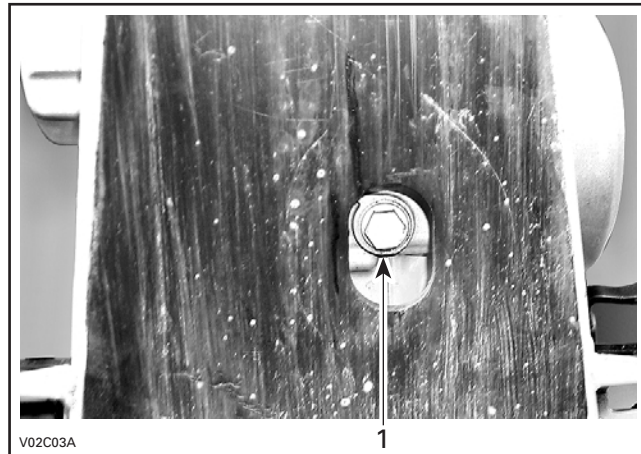
Remove dipstick.

Clean the reservoir drain plug area.

Drain all oil from oil tank by removing drain plug. Wipe out any oil spillage.

Place a drain pan under the engine drain plug area.

Unscrew drain plug **no. 6**.



UNDER VEHICLE

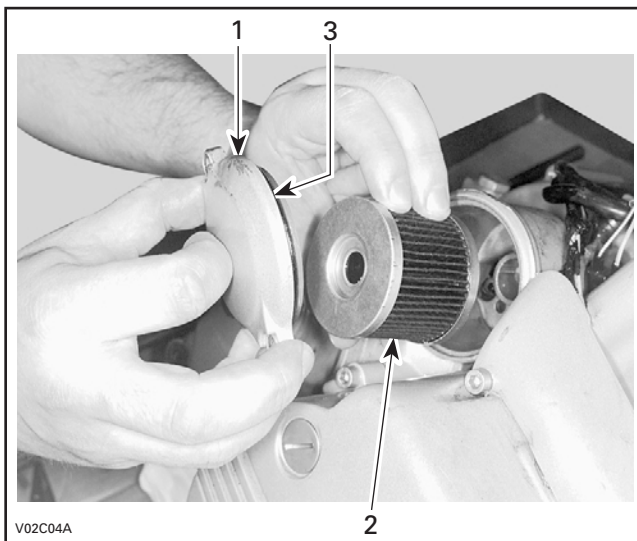
1. Oil drain plug

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

Unscrew oil filter cover **no. 7**.

Remove oil filter and replace by a new.

NOTE: Check and change O-ring **no. 8**, if necessary.



RH SIDE OF VEHICLE

1. Oil filter cover
2. Oil filter
3. O-ring

Wipe out any oil spillage on engine.

Change gasket **no. 9** on engine drain plug. Clean gasket area on engine and drain plug then reinstall plug. Refill oil tank at the proper level with the recommended oil. Refer to TECHNICAL DATA for capacity.

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

Check if the RED indicator lamp stays ON, if yes, stop engine and bleed system by removing oil filter and bleeding screw **no. 10**. Refer to **Bleeding Engine Oil Circuit** below.

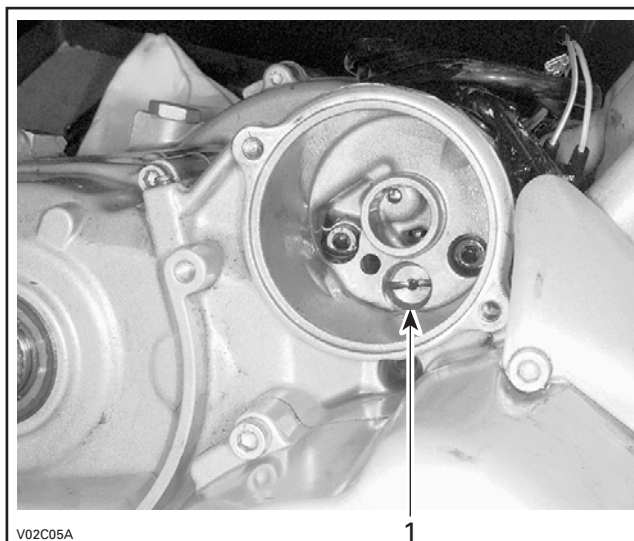
Stop engine and check oil level. Refill as necessary.

Dispose oil as per your local environmental regulations.

Bleeding Engine Oil Circuit

Remove oil filter **no. 1**.

Unfasten pressure bleeding screw **no. 10**.



BEHIND OIL FILTER

1. Bleeding screw

Unscrew and remove one spark plug.

Turn engine using starter until oil emerges in filter chamber.

Install pressure bleeding screw.

Install oil filter.

1, OIL TANK STRAINER

The oil tank strainer is located under oil tank.

Removal

Ensure vehicle is on a level surface.

Drain oil tank.

Remove hose under oil tank.

Unscrew and remove oil tank strainer.

Cleaning and Inspection

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

Installation

For installation, reverse the removal procedure.

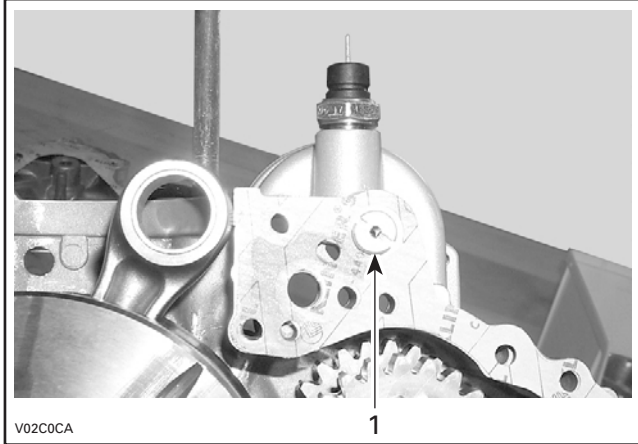
NOTE: Apply Loctite 567 on oil tank strainer threads.

Section 03 ENGINE

Subsection 07 (LUBRICATION SYSTEM)

2, ENGINE OIL PRESSURE REGULATOR

The engine oil pressure regulator is located in magneto side of the crankcase housing.



1. Engine oil pressure regulator

Removal

Remove the plug screw **no. 11**, compression spring **no. 12** and ball **no. 13**.

Inspection

Check compression spring for squareness or other damage.

Installation

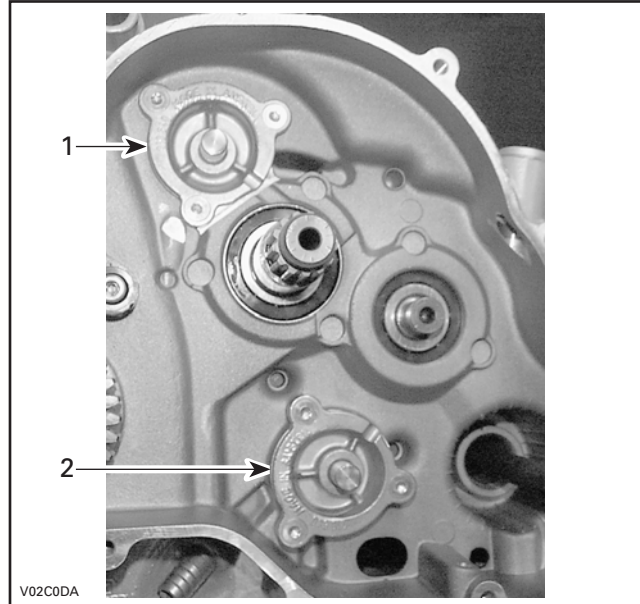
For installation, reverse the removal procedure.

3, RETURN OIL PUMP

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

Removal

Remove clutch. Refer to CLUTCH.



1. Pressure oil pump
2. Return oil pump

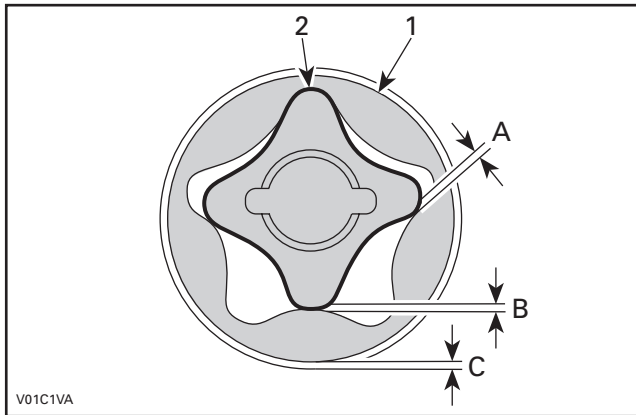
Remove:

- snap ring **no. 14**
- oil pump gear **no. 15**
- needle pin **no. 16**
- thrust washer **no. 17**
- oil pump cover **no. 18**
- oil pump shaft **no. 19**
- oil pump rotor **no. 20**
- inner rotor **no. 21**.

Inspection

Inspect oil pump for marks or other damages, specially scratches in crankcase between inlet and outlet parts.

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



- 1. Oil pump rotor
- 2. 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 0.25 mm (0.009 in). If so, replace oil pump rotor.

Installation

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

Markings on inner rotor and oil pump rotor must be visible.

Coat inner rotor and oil pump rotor with oil.

4, PRESSURE OIL PUMP

For removal, inspection and installation, use the same procedures that return oil pump.

5, ENGINE OIL STRAINER

The engine oil strainer is located between both crankcase housings.

Removal

Separate both crankcase housings.

Unscrew the bolts **no. 22** retaining the oil strainer guide **no. 23**.

Cleaning and Inspection

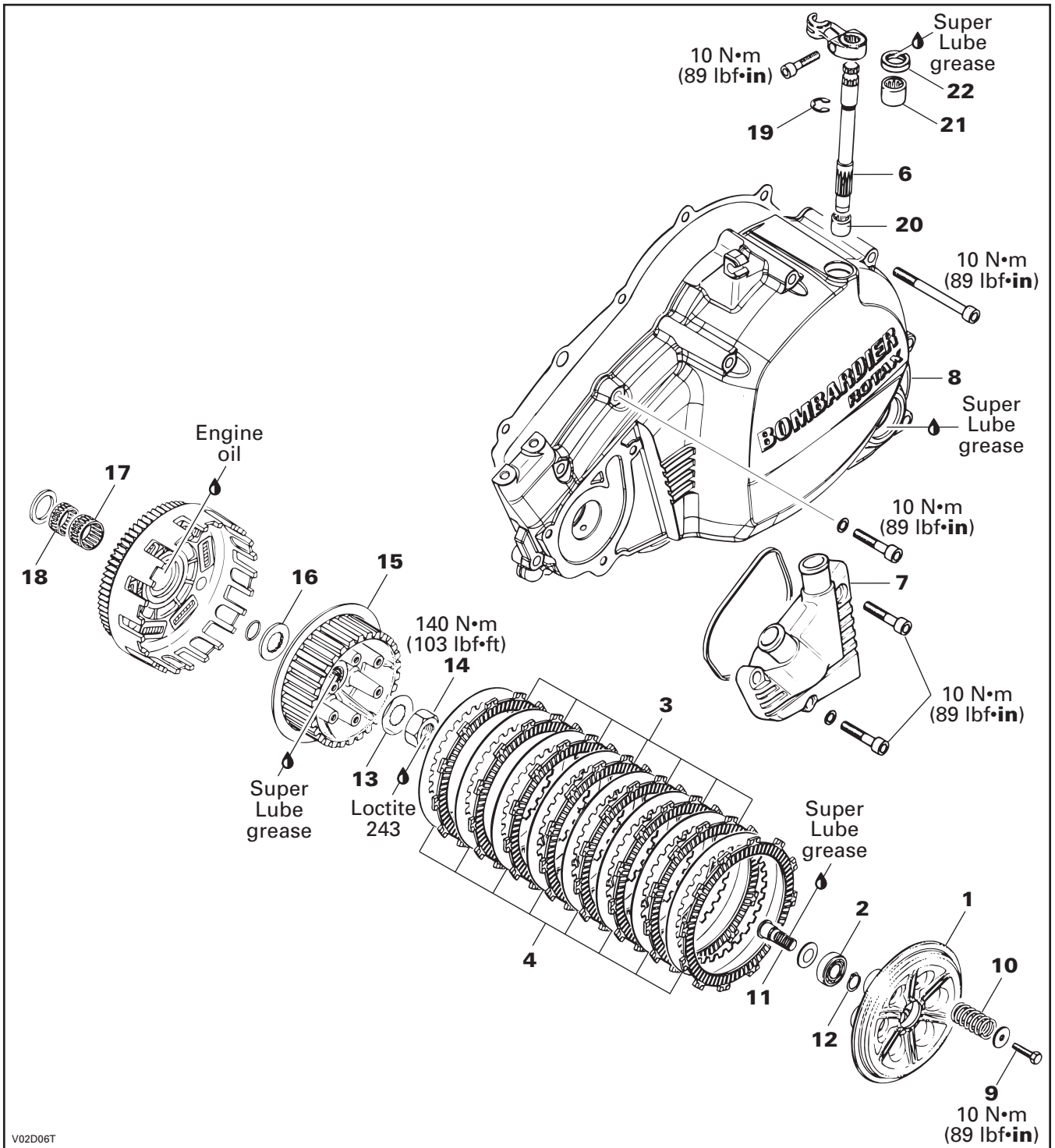
Clean engine oil strainer with the parts cleaner then use an air gun to dry it.

Check engine oil strainer for damage and change if necessary.

Installation

For installation, reverse the removal procedure.

CLUTCH



Section 03 ENGINE

Subsection 08 (CLUTCH)

CLUTCH ADJUSTMENT

The clutch adjustment is necessary after any works in the clutch system. Refer to MAINTENANCE for procedure.

1, PRESSURE PLATE

NOTE: It's not necessary to remove engine from vehicle to disassemble the clutch.

Removal

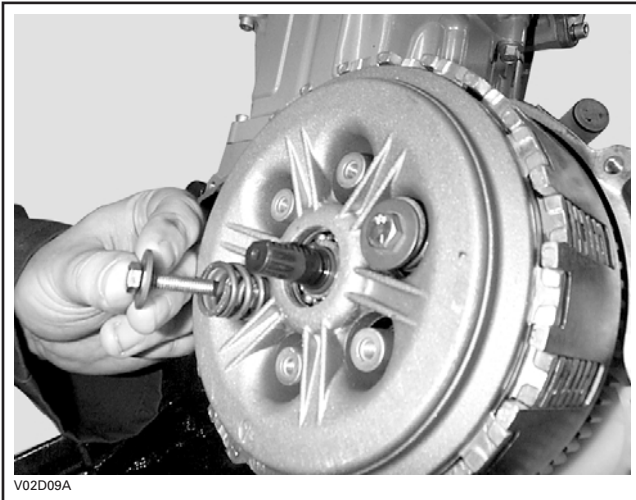
Drain engine oil and coolant.

Detach clutch cable.

Remove:

- starter
- water pump cover no. 7
- LH engine housing cover no. 8.

Unfasten screws no. 9, retaining clutch spring no. 10 and pressure plate, crosswise.



Lift off pressure plate completely.

Inspection

Check pressure plate for crack or other damage. Change if necessary.

Installation

For installation, reverse the removal procedure.

CAUTION: Never pull clutch release lever backwards when the engine is hot. The pressure plate bearing may come out of pressure plate.

2, PRESSURE PLATE BEARING

Inspection

Pressure plate bearing must have full freedom of movement. If not, change the bearing.

Check spline on clutch actuator rack no. 11. Change if necessary.

Disassembly

Remove the retaining ring no. 12 with retaining ring pliers.

Heat pressure plate to 80°C (176°F) then remove pressure plate bearing.

Assembly

For assembly, reverse the disassembly order.

CAUTION: Never pull clutch release lever backwards when the engine is hot. The pressure plate bearing may come out of pressure plate.

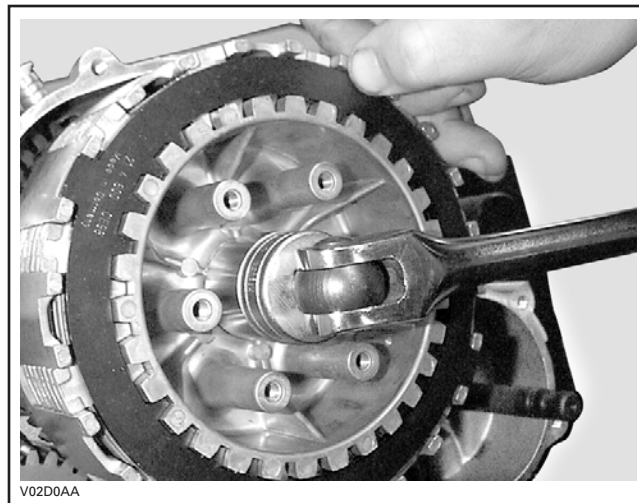
3,4,5, FRICTION DRIVE PLATE, STEEL DRIVEN PLATE AND CLUTCH BASKET

Disassembly

Remove the pressure plate no. 1.

Remove friction plates no. 3 and steel driven plates no. 4 from clutch basket no. 5.

Unlock the tab washer no. 13 then install spanner tool for clutch basket (P/N 529 035 618).



Unscrew the clutch lock nut **no. 14** then remove tab washer.

Remove clutch hub **no. 15**, clutch basket including thrust washer **no. 16** and needle bearings **no. 17** and **no. 18**.

Inspection

Friction Drive Plate

Measure the package of friction drive plate thickness.

Friction drive plates must be replaced when thickness is 27.5 mm (1.827 in) thick or less for the whole package.

FRICITION DRIVE PLATE MINIMUM THICKNESS FOR THE WHOLE PACKAGE	27.5 mm (1.0827 in)
--	------------------------

The friction drive plate maximum warpage should fall through a slot of 3.75 mm (.148 in).

Steel Driven Plate

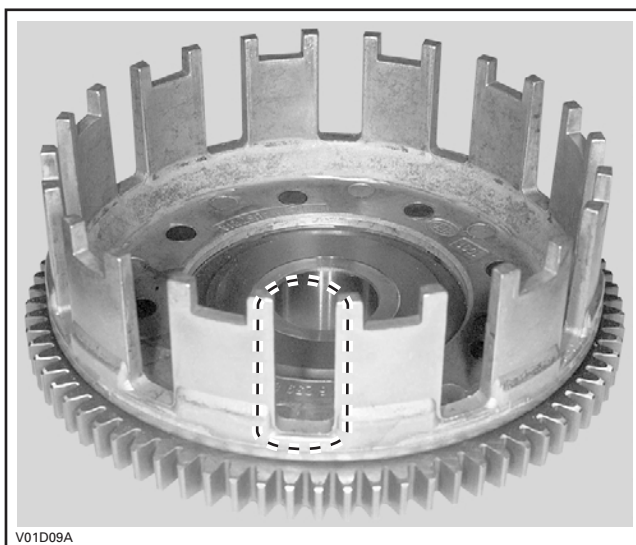
The steel driven maximum warpage should fall through a slot of 1.63 mm (.064 in).

The wear limit of the whole package is 11.5 mm (.453 in).

Clutch Basket

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

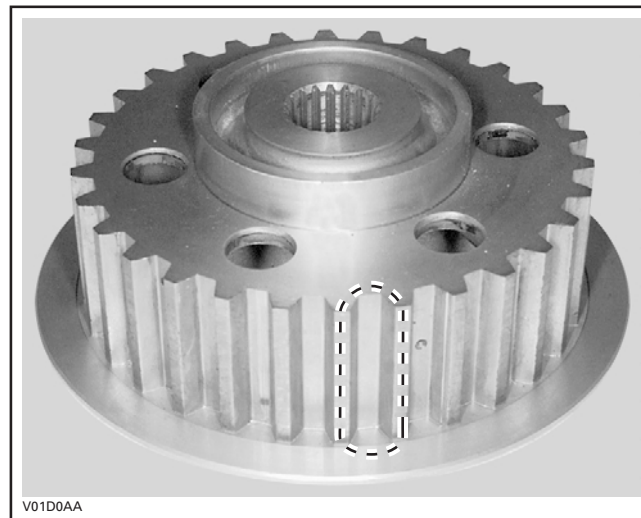
Change if necessary.



TYPICAL

Clutch Hub

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

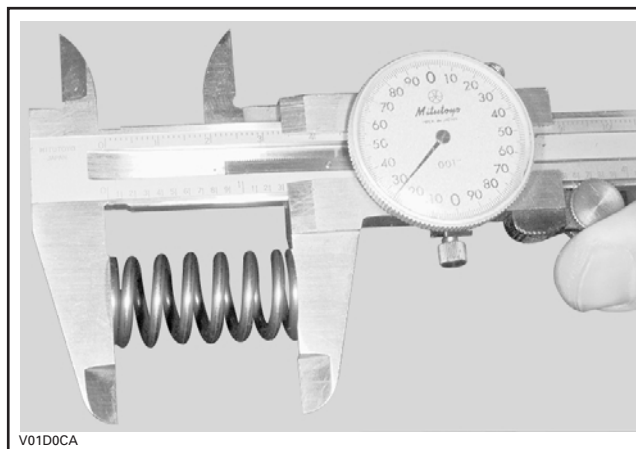


TYPICAL

Clutch Spring

Measure each clutch springs free length.

CLUTCH SPRING MINIMUM LENGTH	43 mm (1.69 in)
---	-----------------



TYPICAL

Assembly

Assembly in the reverse sequence of disassembly.
 Install the needle bearings.

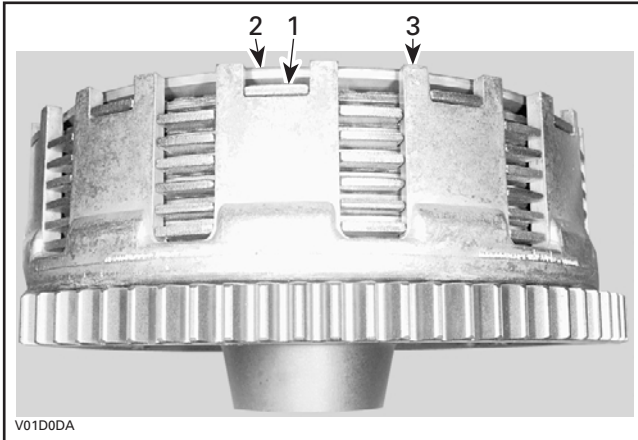
NOTE: Install small needle bearing underneath.

Coat spline on countershaft with Loctite anti-seize.
 In first, install steel driven plate, then friction drive plate in alternate order.

Section 03 ENGINE

Subsection 08 (CLUTCH)

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



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

6, CLUTCH RELEASE SHAFT

Removal

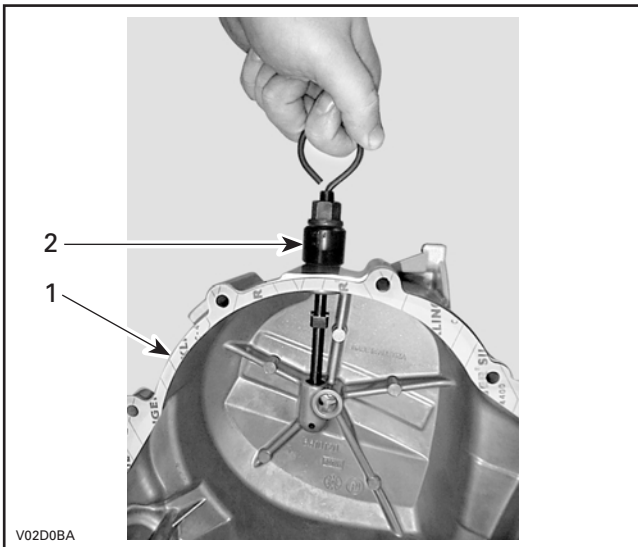
Detach clutch cable.

Remove LH engine housing cover.

Remove the retaining ring **no. 19**.

Withdraw clutch release shaft from housing.

With the extractor (P/N 529 035 690), remove both needle bearings **nos. 20** and **21**, and seal **no. 22** together.

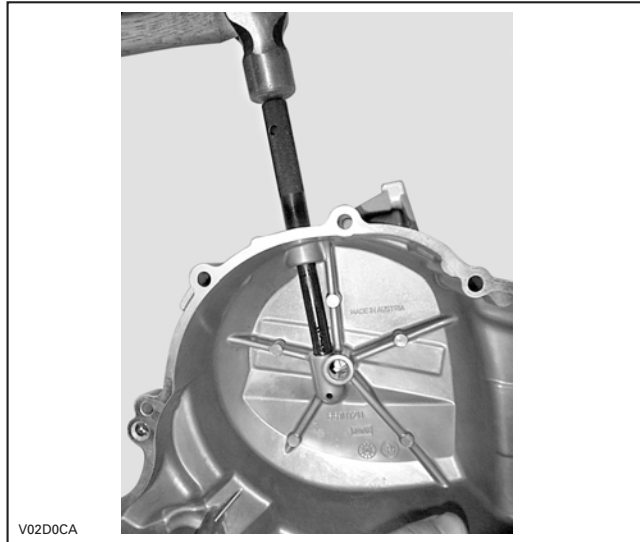


1. Clutch cover
2. Extractor

NOTE: With a heat gun, heat the clutch cover near bearings area.

Installation

Drive in lower and upper needle bearing together using the punch (P/N 529 035 691).



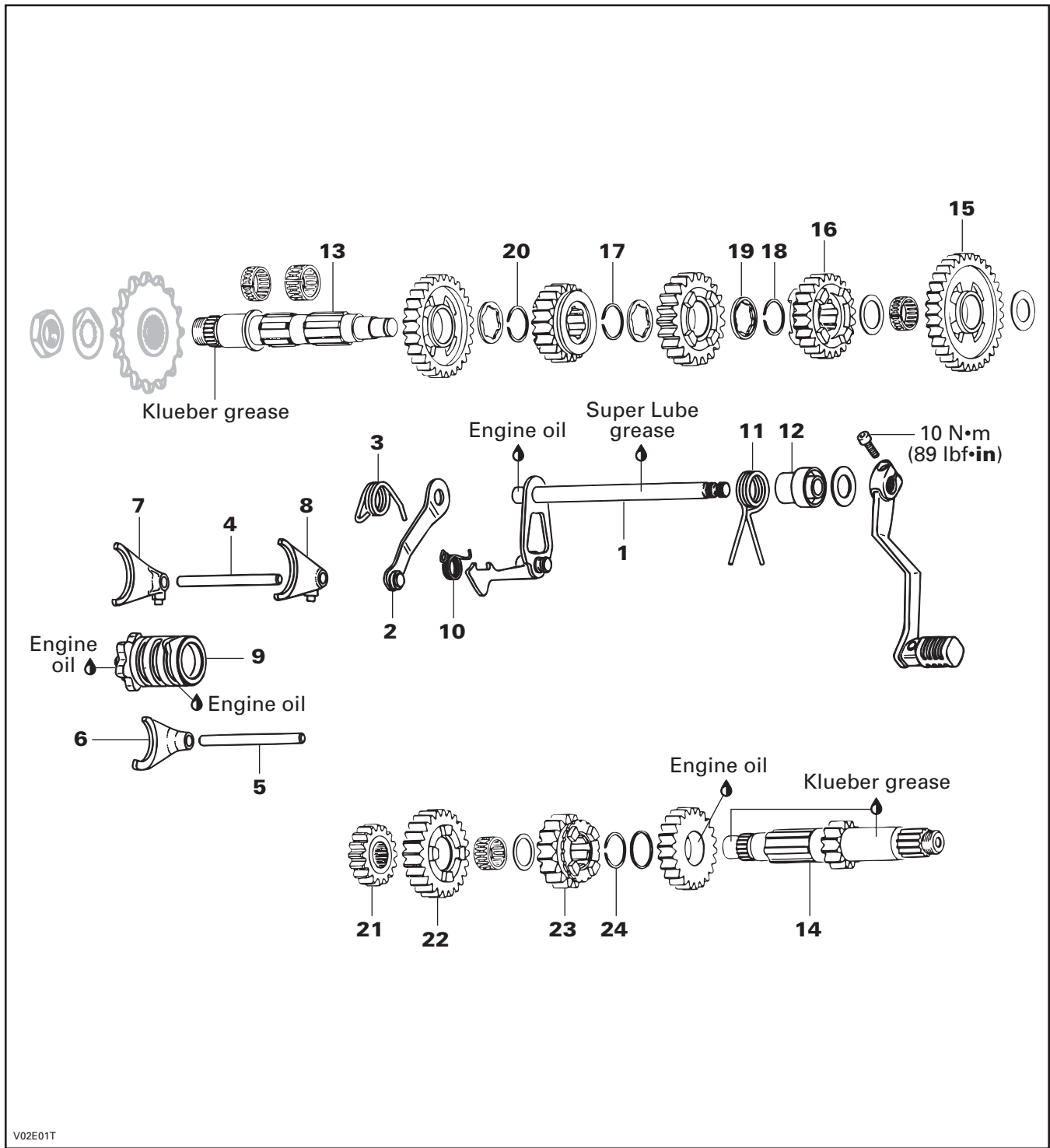
Insert clutch release shaft.

Using punch (P/N 529 035 693), drive in seal.

Install LH engine housing cover and do not forget gasket.

CAUTION: Never pull clutch release lever backwards when the engine is hot. The pressure plate bearing may come out of pressure plate.

TRANSMISSION



SHIFTING MECHANISM

Removal

Remove engine from vehicle. Refer to REMOVAL AND INSTALLATION.

Separate both crankcase housings. Refer to CRANKSHAFT/BALANCER SHAFT.

Press shift pawl slightly outwards and withdraw shift shaft **no. 1** with shift pawl.

Remove index lever **no. 2** and index spring **no. 3**.

Remove shift fork shafts **nos. 4** and **5** from shift forks **nos. 6, 7** and **8**.

Swivel shift forks outwards and remove.

Withdraw shift drum **no. 9**.

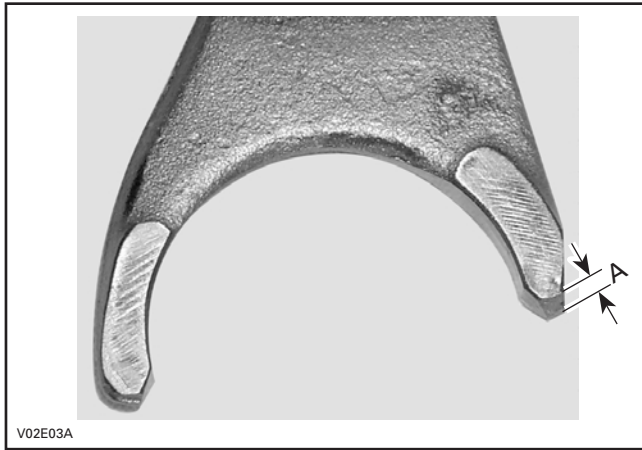
Inspection

Check for:

- worn or scored shifting forks
- rounded engagement dogs and slots
- bent shift forks
- bent shift fork shafts
- worn tracks on shift drum.

Measure the shift fork claw thickness.

SHIFT FORK CLAW THICKNESS mm (in)	
SERVICE LIMIT	3.45 mm (.136 in)

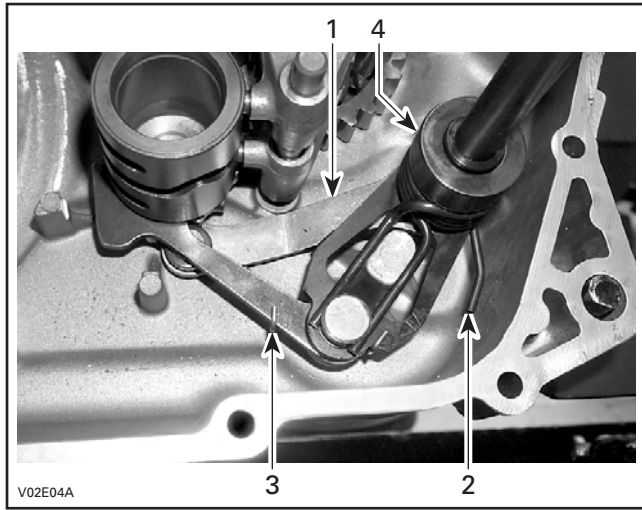


TYPICAL
A. Shift fork claw thickness

Measure the O.D. of the shift fork shaft in three places using an outside micrometer.

O.D. OF SHIFT FORK SHAFT mm (in)	
SERVICE LIMIT	5.85 mm (.230 in)

Installation



- 1. Index lever
- 2. Index spring
- 3. Pawl spring
- 4. Sleeve

Install index lever **no. 2** with index spring **no. 3** in housing.

Attach pawl spring **no. 10** to pawl.

Insert shift shaft **no. 1** in housing and secure index lever.

Slide spring **no.11** and sleeve **no. 12** onto shift shaft.

Attach spring to shift shaft pivot.

Insert shift fork **no. 6** in selector gear of clutch shaft.

Install shift fork shaft **no. 5** with the selector fork in the direction of the crankshaft.

Insert shift fork **no. 7** and **no. 8** in the corresponding selector gears of the mainshaft.

Install shift fork shaft **no. 4** with the shift forks outwards.

Install shift drum **no. 9** in the idle setting.

Press back index lever and shift pawl and install the shift drum.

Move index lever and shift pawl into mesh.

Check transmission function: shift up and down through all gears, checking that the detent in all gears disengages smoothly from the shift pawl.

Assemble engine.

Once again, shift up and down through all gears, slowly allowing selector lever to return to its original position. The clicking noise of the engaging shift pawl must be clearly audible.

Install engine.

TRANSMISSION

Removal

Remove the shifting mechanism. Refer to the above section.

Remove shift fork shafts **nos. 4 and 5**.

Swivel shift forks **nos. 6, 7 and 8** outwards and remove.

Withdraw shift drum **no. 9**.

Using a plastic mallet, tap mainshaft **no. 13** to assist withdrawing mainshaft together with clutch shaft **no. 14**.

NOTE: Before removal withdraw the separate gears **nos. 15 and 16** from mainshaft.

Disassembly

Mainshaft

Using special pliers slide circlip **no. 17** slightly backwards to remove circlip **no. 18** which is secured by the angled ring **no. 19**.

Remove gears.

Remove circlip **no. 20** and withdraw gear.

CAUTION: Retaining ring must not be overstretched.

Clutch Shaft

Remove gear **nos. 21, 22 and 23**.

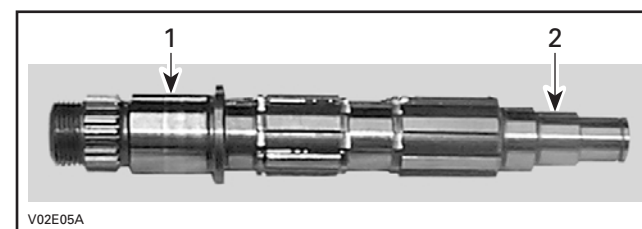
Remove circlip **no. 24** with special pliers.

Remove gear.

Inspection

Check mainshaft for wear.

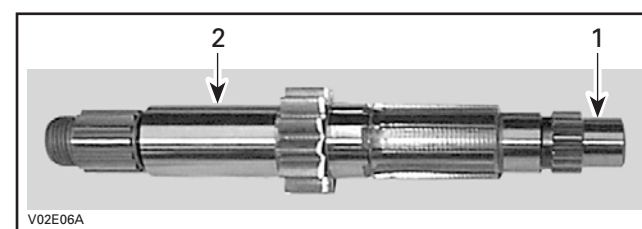
MAINSHAFT mm (in)	
SERVICE LIMIT	
Magneto end	24.98 mm (.98 in)
Clutch side	16.98 mm (.67 in)
Run-out	0 mm (0 in)



1. Magneto end
2. Clutch side

Check clutch shaft for wear.

CLUTCH SHAFT mm (in)	
SERVICE LIMIT	
Magneto end	16.98 mm (.67 in)
Clutch side	24.97 mm (.98 in)
Run-out	0 mm (0 in)



1. Magneto end
2. Clutch side

Check all bearings, bearing points, tooth flanks, taper grooves and annular grooves. Annular grooves must have sharp edges.

Replace gears only together with the corresponding meshing gears.

NOTE: Always replace circlips and install using special pliers.

Section 03 ENGINE

Subsection 09 (TRANSMISSION)

Assembly and Installation

For assembly and installation, reverse the disassembly and removal procedures. Paying attention to the following details.

Install clutch shaft and mainshaft together, and coat main bearing points with Loctite anti-seize.

Seat shafts fully home by tapping them into place with a plastic hammer.

NOTE: Before installation of the transmission shafts, remove crankshaft to simplify assembly operation.

Install the shifting mechanism.

TRANSMISSION SHAFT BEARINGS

Removal

Heat left or right engine housing to 80 - 100°C (170 - 212°F).

Using the suitable bearing extractor to remove bearings.

Tap out the mainshaft sealing ring from the inside.

Installation

Place new bearings in a freezer for 10 minutes before installation.

Place left or right engine housing in oven to 100°C (212°F) to ease bearings installation.

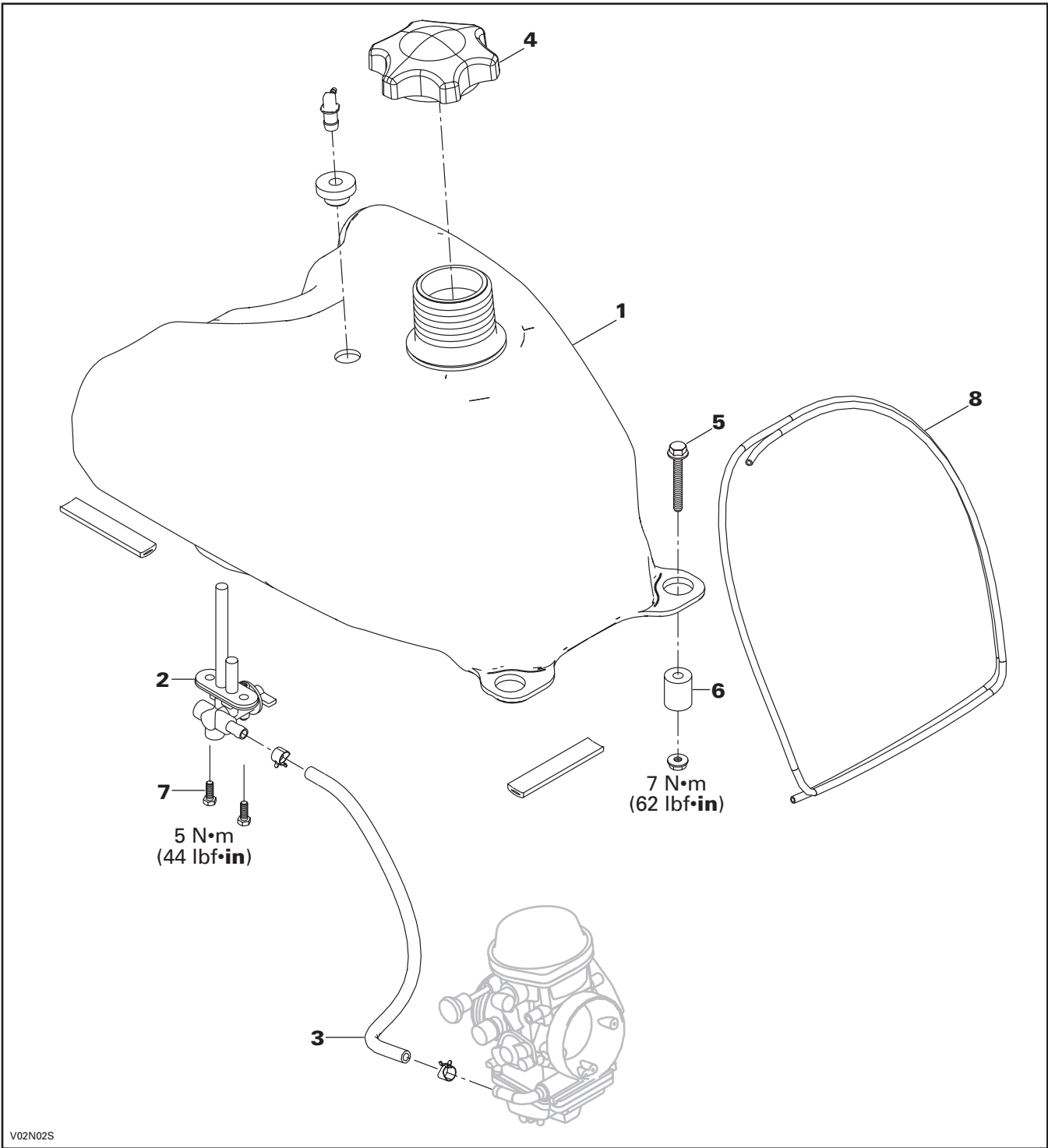
NOTE: Always replace the mainshaft sealing ring by a new one.

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FUEL CIRCUIT



Section 04 FUEL SYSTEM

Subsection 02 (FUEL CIRCUIT)

FUEL LINE

WARNING

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

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

WARNING

Use of improper fuel line 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.

1, FUEL TANK

NOTE: Disconnect BLACK negative cable from battery.

Draining

Turn fuel valve **no. 2** to the position OFF then obstruct line **no. 3** with a hose pincher (P/N 295 000 076).

Disconnect fuel line from carburetor.

Place fuel line in a reservoir, turn fuel valve on RE-SERVE and remove hose pincher.

NOTE: To accelerate fuel tank draining and ensure complete draining, remove cap **no. 4**.

When the tank is empty, turn valve OFF.

Removal

Drain fuel tank.

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

- seat
- front fascia
- fuel tank cover.

Inspection

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

Installation

Reverse removal procedure, however pay attention to the following:

Perform fuel system pressurization as described in the following procedure.

2, FUEL VALVE

Removal

Remove fuel tank.

Place fuel tank on the side.

Unscrew the bolts **no. 7** retaining fuel valve to fuel tank.

Remove fuel valve.

Inspection

Check strainer on each end of fuel valve rods. If one strainer is damaged, change fuel valve.

Check gasket between fuel valve and fuel tank for damage. If so, replace by a new.

Installation

For installation, reverse the removal procedure.

Clean strainer on each end of fuel valve rods.

Perform fuel system pressurization as described in the following procedure.

FUEL SYSTEM PRESSURIZATION

Fill up fuel tank **no. 1**.

Remove seat and fuel tank cover.

Install on fuel tank the special cap included in the fuel and oil system tester kit (P/N 529 033 100).

Install hose pinchers (P/N 295 000 076) on fuel tank vent line **no. 8** and on the outlet hose **no. 3** at carburetor, as shown in the following photos.

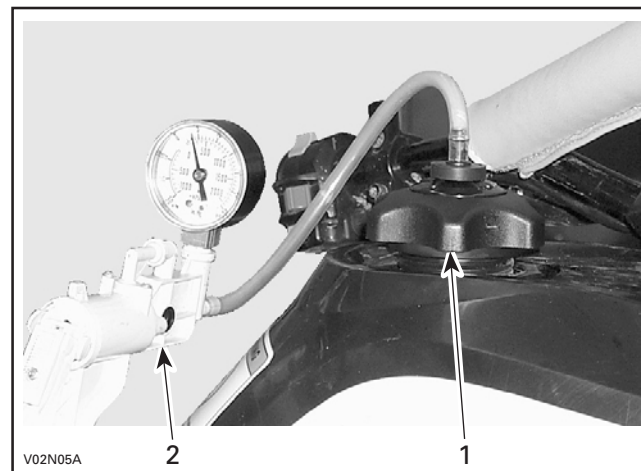


HOSE PINCHER INSTALLED ON FUEL TANK VENT LINE



HOSE PINCHER INSTALLED ON FUEL PUMP OUTLET

Using air pump (P/N 529 021 800) inject air into fuel tank. See next photo.



1. Special cap on tank
2. Air pump

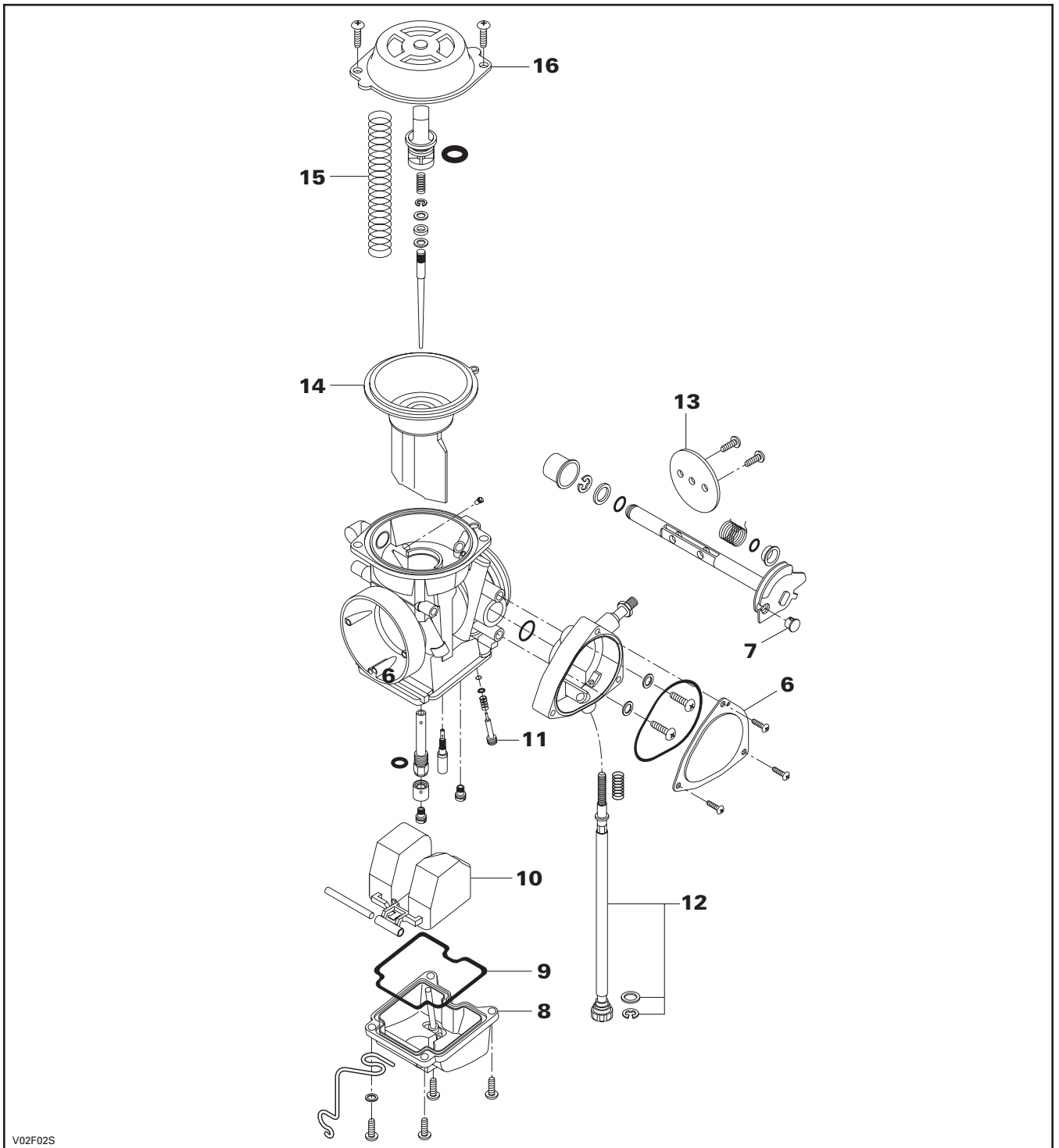
Pressurize fuel system to 21 kPa (3 PSI). That pressure must not drop during 3 minutes.

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

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

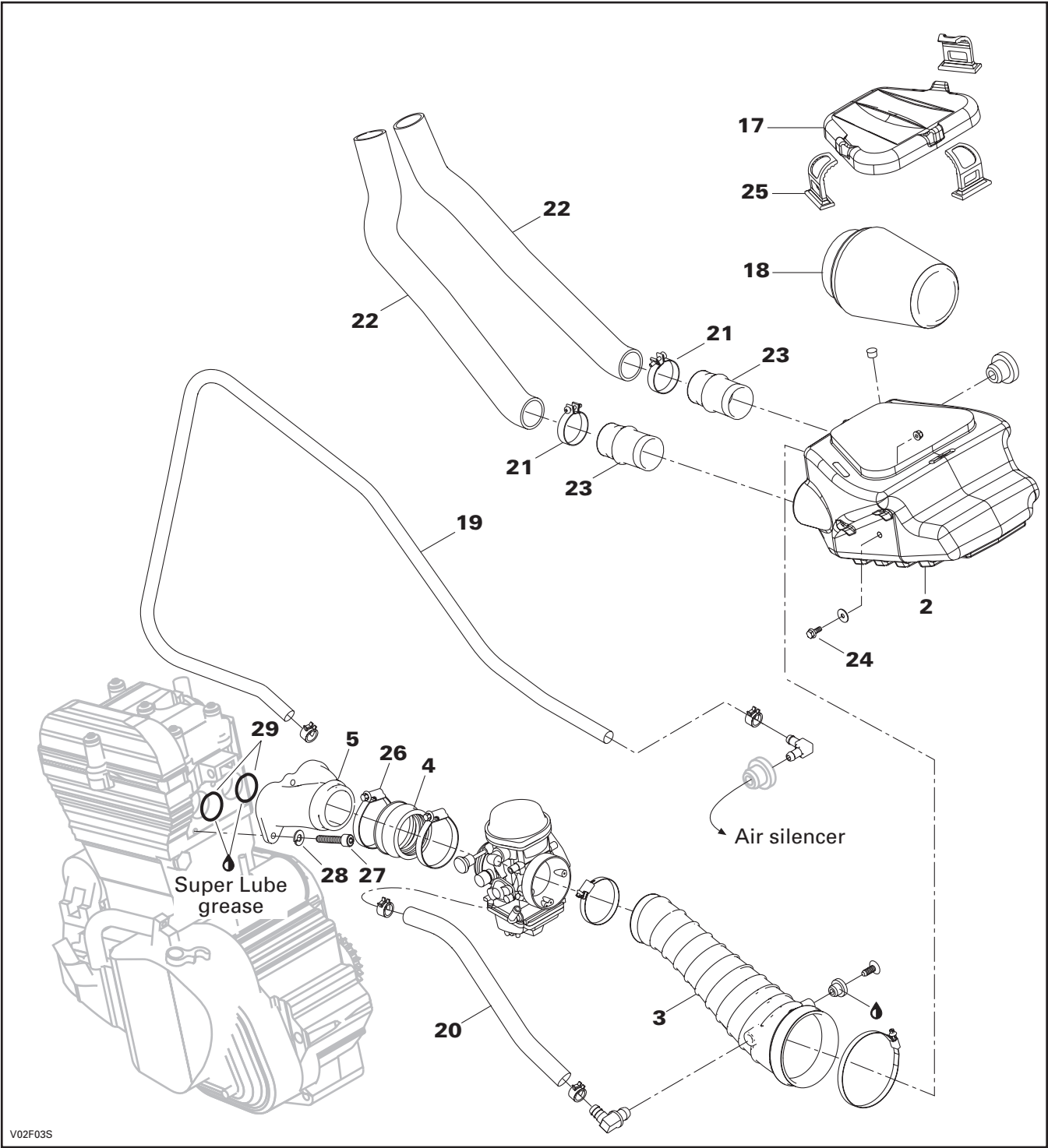
CARBURETOR AND AIR INTAKE SILENCER

CARBURETOR



V02F02S

AIR INTAKE SILENCER



V02F03S

CAUTION: Although some jets can 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.

1, CARBURETOR

Removal

Disconnect BLACK negative cable from battery.

Remove seat.

Unplug all hoses from carburetor.

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

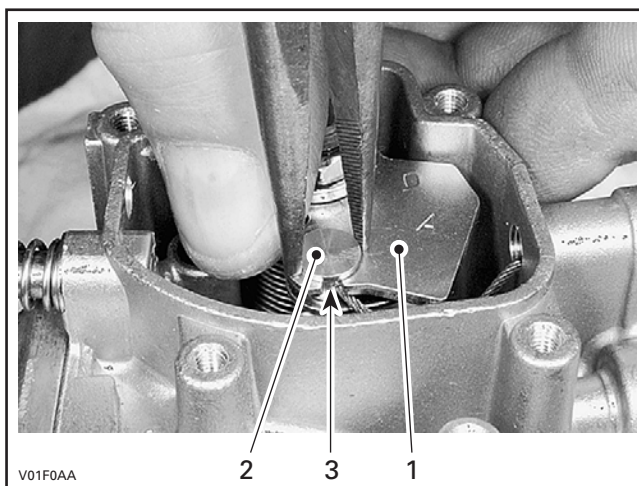
Loosen both carburetor and air box clamps.

Pull out carburetor.

Throttle Cable Removal

Remove carburetor side cover **no. 6**.

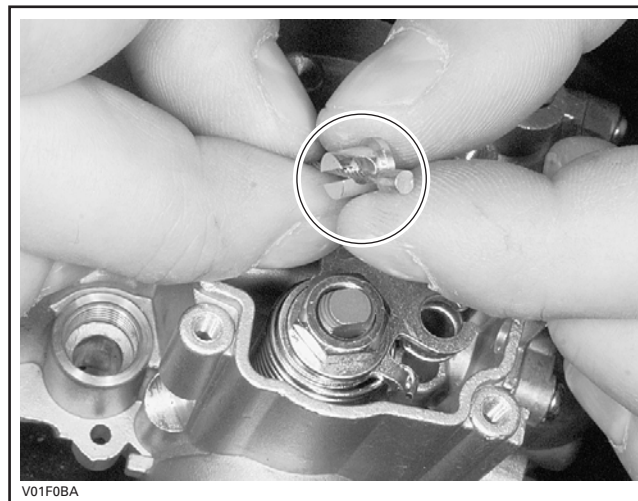
Using thumb, release tension on throttle lever. With long nose pliers, rotate cable end bushing **no. 7** so that cable aligns with throttle lever recess, then lift cable end. See next photo.



TYPICAL

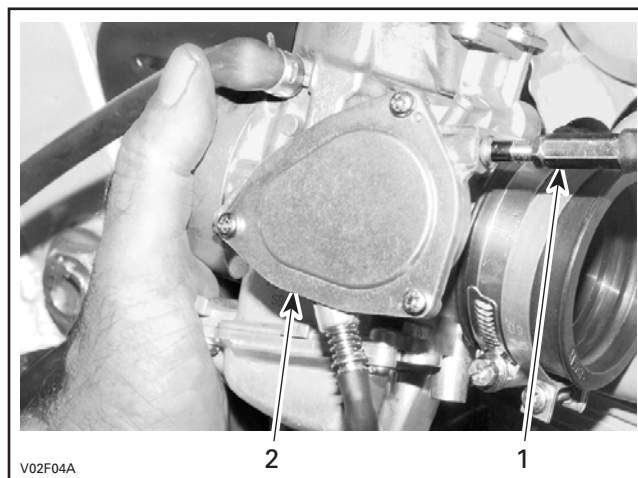
1. Release tension on throttle lever
2. Cable end bushing
3. Throttle lever recess

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



TYPICAL — REMOVE CABLE END BUSHING

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



1. Loosen this nut
2. Side cover

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.

Section 04 FUEL SYSTEM

Subsection 03 (CARBURETOR AND AIR INTAKE SILENCER)

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:

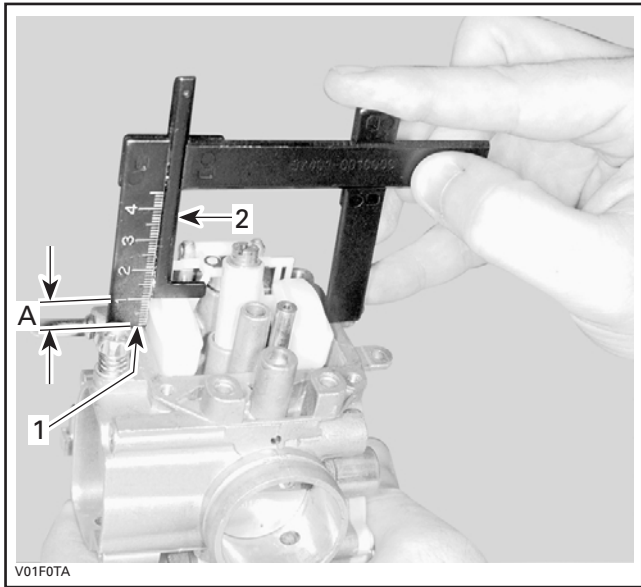
- Remove float bowl no. 8 and gasket no. 9 from carburetor.
- Make sure that float arm no. 10 is symmetric, not distorted.

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.

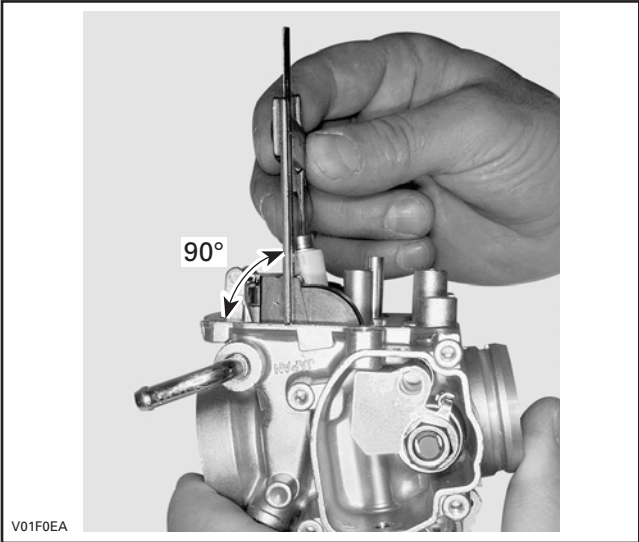
Ensure that both float level gauge tips are properly positioned on carburetor body and that “L” arm is leaning on float with compressing valve spring.

Refer to following photos for proper float level gauge positioning.



TYPICAL

- 1. Gauge tips
- 2. “L” arm
- A. Height H



TYPICAL — 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.

CARBURETOR FLOAT LEVEL ADJUSTMENT	
H	10 ± 0.5 mm (.39 ± .02 in)

Installation

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

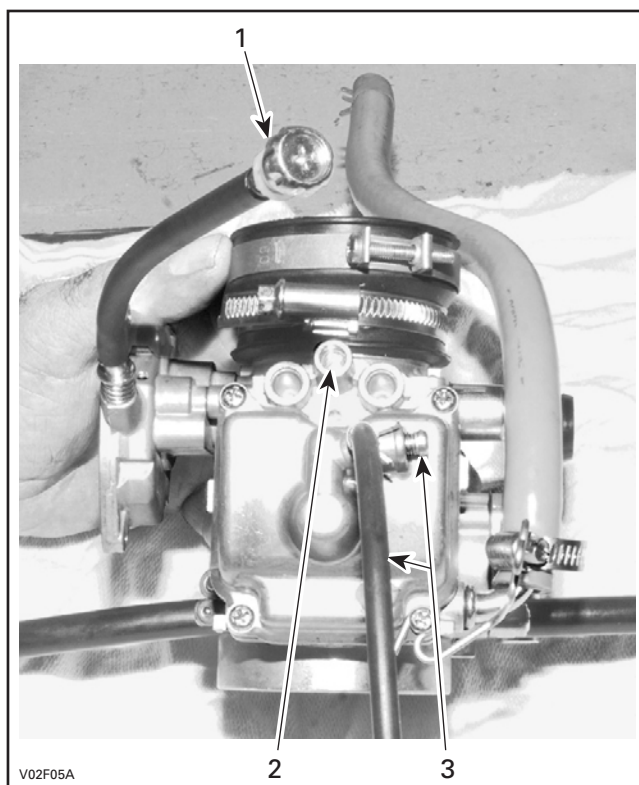
- Inspect throttle cable housing prior to installation.
- Reinstall and adjust throttle cable, then side cover. Refer to next section CARBURETOR ADJUSTMENTS.
- Reinstall carburetor on engine.

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

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

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

Carburetor Adjustments



BOTTOM VIEW

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

Pilot Screw Preliminary Adjustment

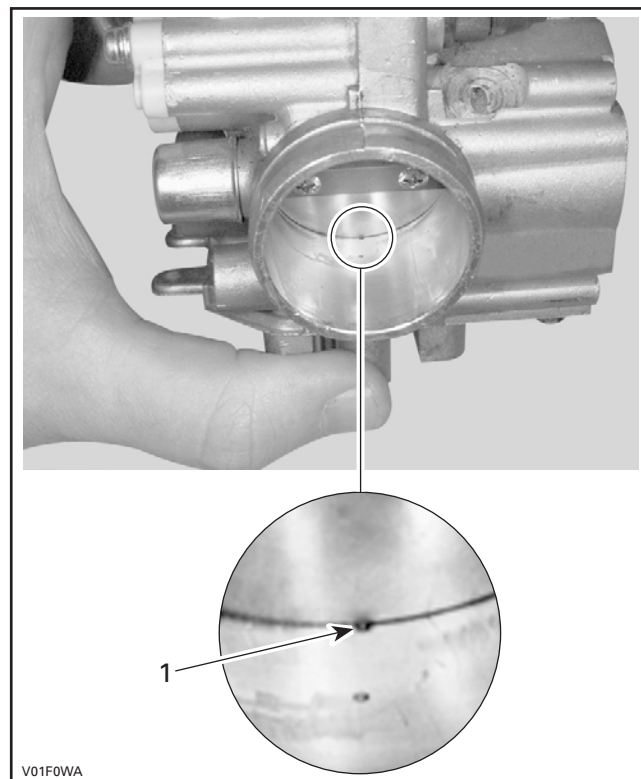
NOTE: The pilot screw no. 11 is factory pre-set. Adjustment is not necessary unless the carburetor is overhauled or replaced.

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

Refer to TECHNICAL DATA for specifications.

Idle Speed Preliminary Adjustment

Adjust idle speed screw no. 12 to 1-1/2 turn or so so that throttle valve no. 13 closes bypass hole by half, as shown in the next photo.



TYPICAL

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 for idle speed specifications.

Section 04 FUEL SYSTEM

Subsection 03 (CARBURETOR AND AIR INTAKE SILENCER)

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.

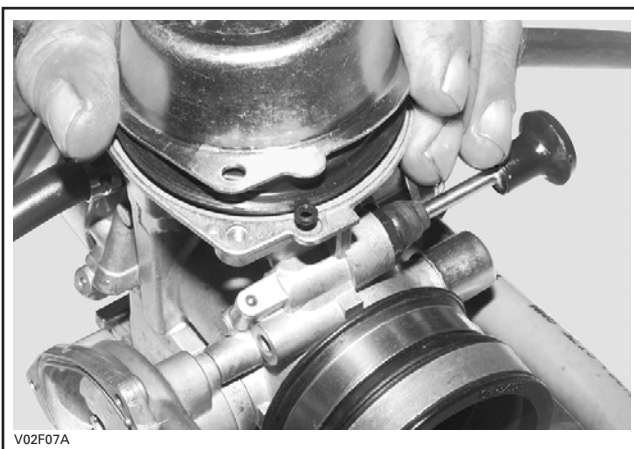
Diaphragm Installation

Carefully replace diaphragm **no. 14** in its original position.

Make sure spring is located properly in carburetor cover **no. 15** 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).

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

Retorque lock nut.

AIR INTAKE SILENCER

2, Air Filter Box

Removal

Remove:

- seat
- air box cover **no. 17**
- air filter **no. 18**
- rectifier located under air filter box.

Disconnect the air intake tube **no. 3** from carburetor.

Remove the oil line **no. 19** on the RH side and the hose **no. 20** on the LH side.

Unscrew clamps **no. 21** retaining the vent hoses **no. 22** to the deflectors **no. 23**.

Unscrew bolts **no. 24**.

Pull air filter box out of frame with air intake tube.

Inspection

Check air filter box for cracks or other damages. Change air filter box if necessary.

Check air filter box latches **no. 25** for cracks or other damages. Change the air filter box latches if necessary.

Installation

For installation, reverse the removal procedure.

3, Air Intake Tube

Removal

Remove air filter box.

Separate air intake tube from air filter box.

Inspection

Check air intake tube for cracks or other damages.
Change it if necessary.

Installation

For installation, reverse the removal procedure.

4, Carburetor Adaptor

Removal

Remove carburetor.

Unscrew clamp **no. 26**.

Separate the carburetor adaptor from the intake adaptor **no. 5**.

Inspection

Check carburetor adaptor for cracks or other damages. Change it if necessary.

Installation

For installation, reverse the removal procedure.

5, Intake Adaptor

Removal

Remove carburetor.

Unscrew socket screws **no. 27** and washers **no. 28** then remove intake adaptor.

Inspection

Check intake adaptor for cracks or other damages, change if necessary.

Check O-rings **no. 29** and change if necessary.

Installation

For installation, reverse the removal procedure.

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Section 05

ELECTRICAL

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OVERVIEW

GENERAL OPERATION INFORMATION

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

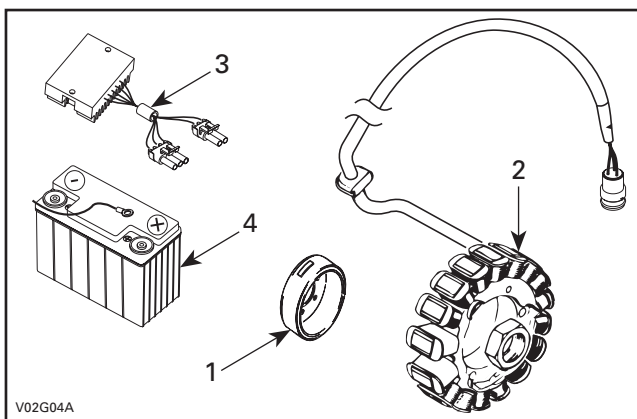
- charging system
- starting system
- ignition system
- accessories.

The following gives an outline of each components.

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, delta 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

Voltage Regulator/Rectifier

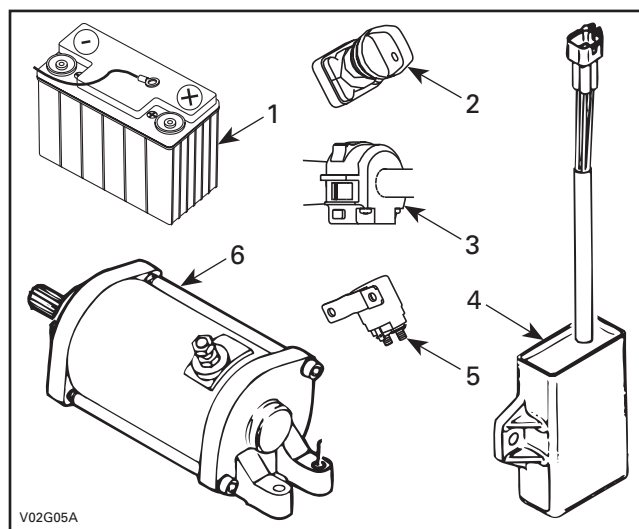
A 3-phase full-wave series-type voltage regulator/rectifier receives the AC voltage and rectifies (converts) it into DC. The voltage is also regulated to a maximum of 14.5 volts (DC).

Battery

The battery supplies the entire vehicle. Therefore, DC current only is used in the entire electrical system.

STARTING SYSTEM

When ignition switch is turned on and start button is pressed, a signal is sent 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 button
4. Electronic module
5. Solenoid
6. Electric starter

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

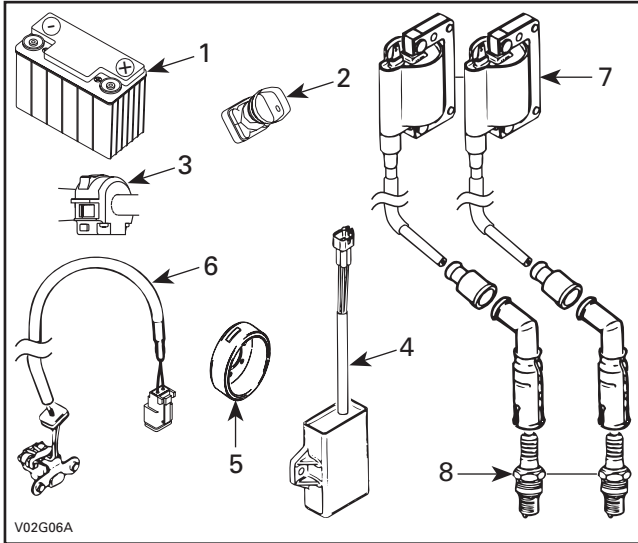
Transmission must be on NEUTRAL or pull in the clutch lever to allow engine starting.

Section 05 ELECTRICAL

Subsection 02 (OVERVIEW)

IGNITION SYSTEM

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



TYPICAL

1. Battery
2. Ignition switch
3. Start button
4. Electronic module
5. Magneto flywheel
6. Trigger coil
7. Ignition coils
8. Spark plugs

Battery/Ignition Switch

The ignition switch allows battery to supply the electronic module for the ignition system.

Start Button

Besides enabling the starting system, the start button enables/disables the ignition system.

Magneto Flywheel/Trigger Coil

The magneto flywheel features one protrusion that are working with the trigger coil. The trigger coil sends the signals to the electronic module to be processed for the ignition system.

Ignition Coils/Spark Plugs

The ignition coil receives its signal from the electronic module. The ignition coil steps up the input voltage for the CDI system and the end result is firing of the spark plugs. It is two coils that provides a separate spark to each spark plug.

ACCESSORIES

The battery supplies the DC current to all accessories.

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. 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 any electric or electronic part(s), always check electrical connections. Make sure that they are very tight and they make good contact and that they are corrosion-free. 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. Take this into account when troubleshooting the electrical system.

Pay attention to grounding wires.

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.

FUSES LOCATION

If a fuse is damaged, replace it by one of the same rating.

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

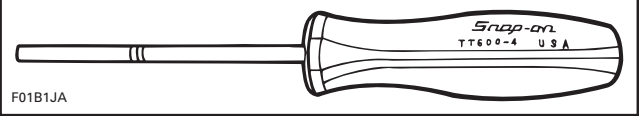
Fuses are located under seat, between engine and air box.



- 1. Fan (15 A)
- 2. Main (25 A)

SERVICING PACKARD CONNECTORS

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

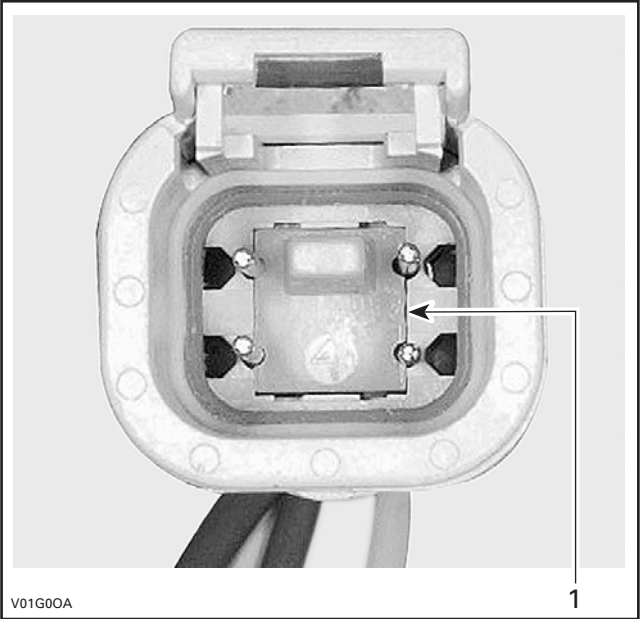


SERVICING DEUTSCH CONNECTORS

Waterproof Connector Housing
Female and Male Connector Housing

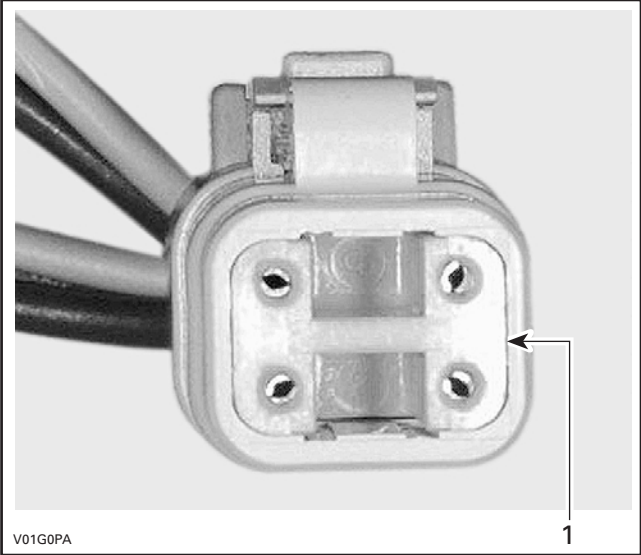
To remove:

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



FEMALE HOUSING

- 1. Female lock

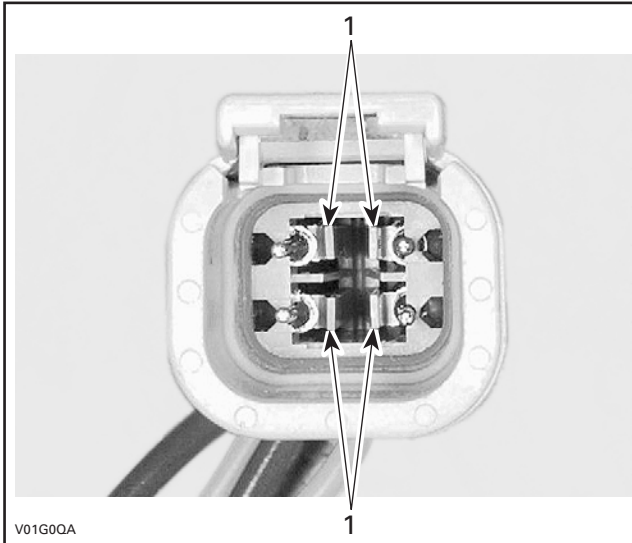


MALE HOUSING

- 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

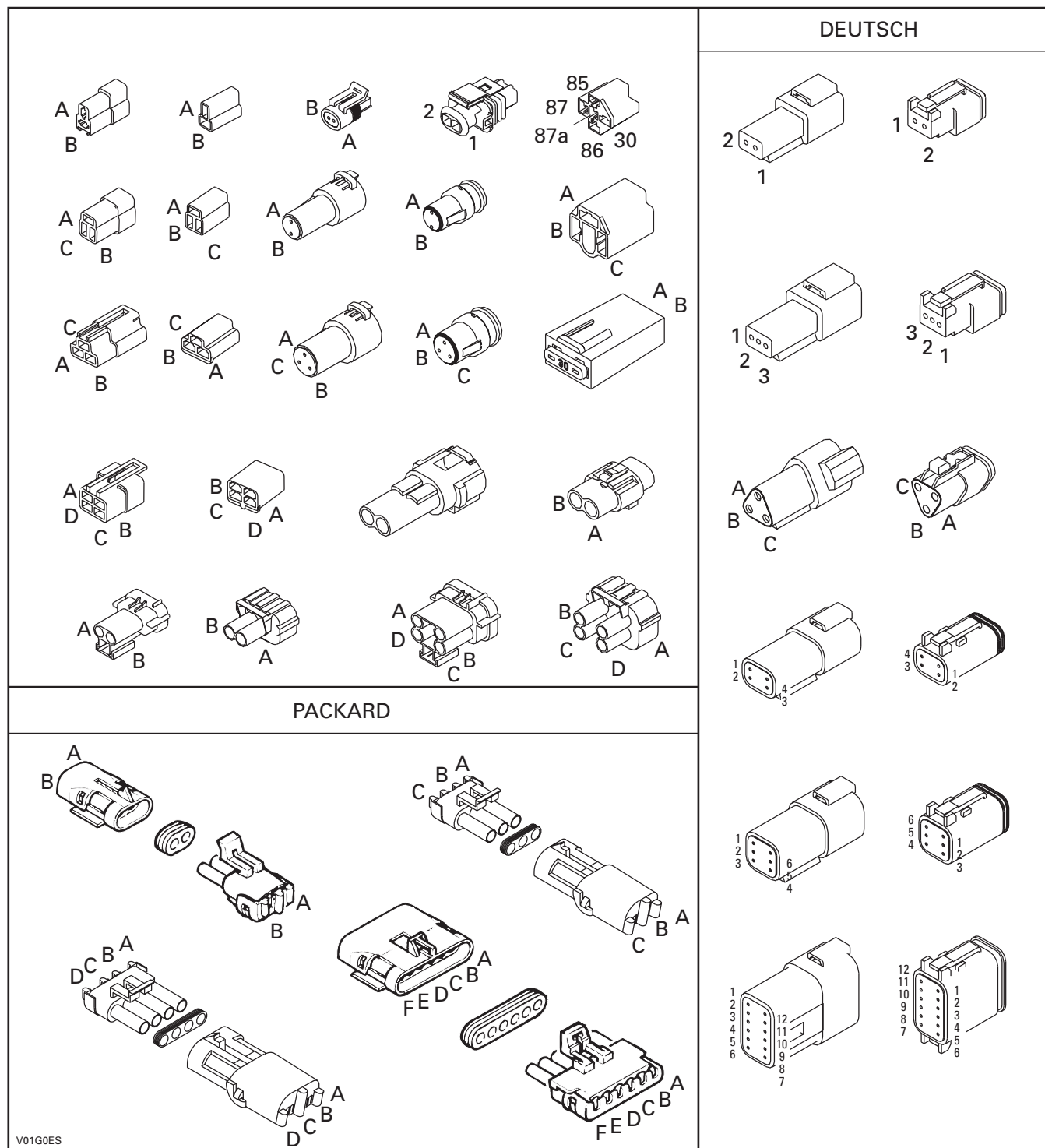
To install:

- 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.

Subsection 02 (OVERVIEW)

IDENTIFICATION OF MAJOR CONNECTOR PINS



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 main (25 amp) fuse 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 3500 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 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.

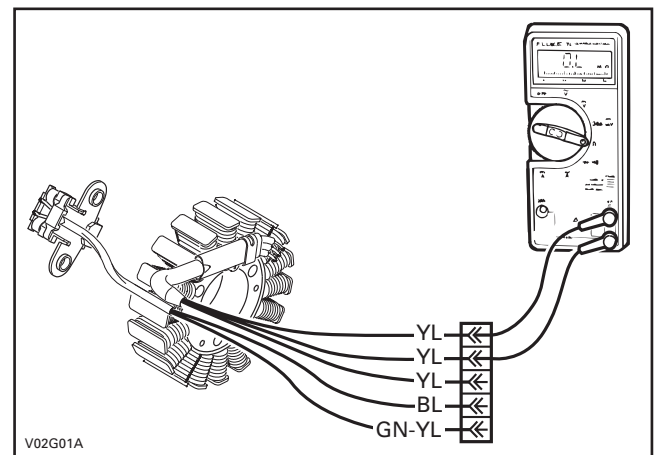
If there is no charging at the battery with the preceding voltage test, the following test can also be performed.

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.

Stator

STATIC TEST: CONTINUITY

1. Disconnect the magneto wiring harness 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 $0.3 \Omega \pm 0.2$.

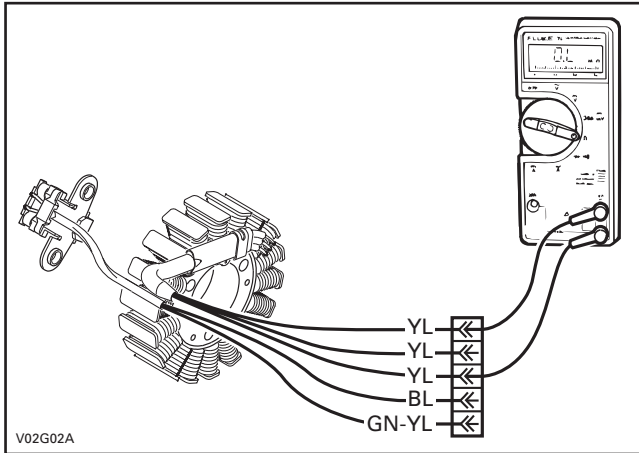


TYPICAL

Section 05 ELECTRICAL

Subsection 03 (CHARGING SYSTEM)

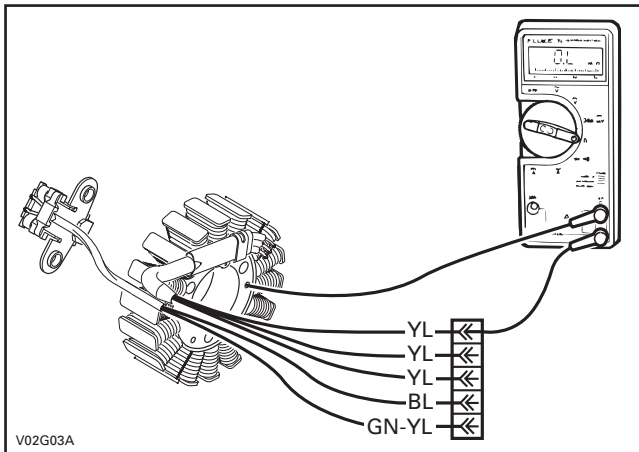
2. Place either meter test probe into the remaining stator lead (AC-3) and note the resistance (same as step no. 1). If the readings are out of specification, the stator will need to be replaced.



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/repaired respectively.



TYPICAL

DYNAMIC TEST

1. Unplug magneto wiring harness connector.
2. On magneto side, connect test probes of the multimeter to two of the YELLOW wires.
3. Set multimeter to Vac scale.
4. Start engine. The obtained value should be between 10 and 12 Vac.
5. Repeat operation 3 times.
6. If the stator is out of specification, replace it.

Trigger Coil

STATIC TEST

NOTE: The trigger coil connector is located on the frame, near rearward of fuel tank.

Unplug the trigger coil connector.

Measure the resistance between BLUE and GREEN/YELLOW wires. The obtained value should be between 190 to 300 Ω .

If the resistance is out of specifications, change the trigger coil.

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 (doesn't keep a full charge loose rectifier).	Replace.
4. Main system fuse burnt or faulty voltage regulator/rectifier.*	First check charging system. 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.

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 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.

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.

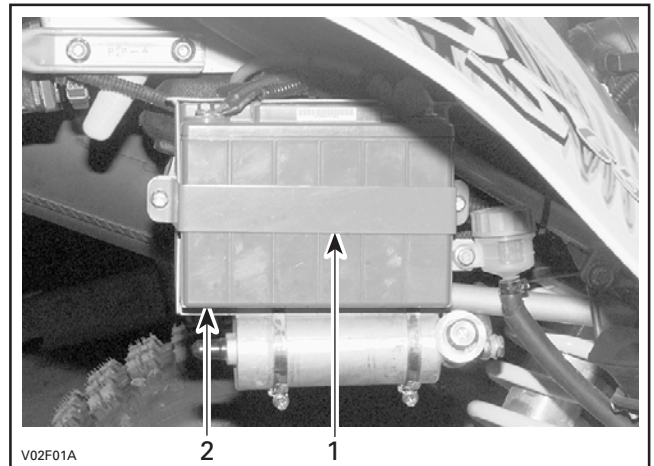
REMOVAL

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 bolts retaining battery holder from rack.



1. Battery holder
2. Rack

CLEANING

Clean the battery casing, 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.

Section 05 ELECTRICAL

Subsection 04 (STARTING SYSTEM)

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.

Inspect battery rack mounting.

Inspect battery posts for security of mounting.

BATTERY STORAGE

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

The battery must always be stored in fully charged condition.

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 using a solution of baking soda and water. 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 to a minimum.

ACTIVATION OF A NEW BATTERY

WARNING

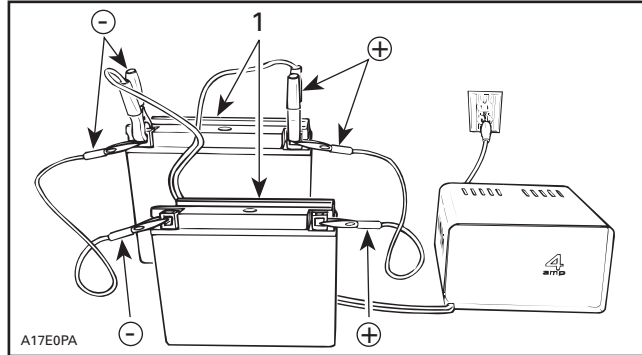
Never charge or boost battery while installed on vehicle.

1. Connect a 10 A battery charger for a few hours.
2. Disconnect battery charger.
3. Test battery state of charge. Use a multimeter.

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

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 batteries to be charged.



TYPICAL

1. Two batteries connected in parallel

INSTALLATION

Reinstall battery in vehicle. Fasten battery holder.

WARNING

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

STARTING SYSTEM TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
Starter does not turn.	Ignition switch is in the OFF position.	Turn switch in the ON position.
	Engine stop switch is in the OFF position.	Place the engine stop switch to run position.
	Burnt fuse.	Check main fuse and wiring condition.
	Transmission is not set on Neutral.	Set transmission in Neutral or squeeze the clutch lever.
	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 button, engine stop switch, ignition switch or starting solenoid.	Check and replace defective part.
	Neutral switch is defective.	Check neutral switch and wiring condition.
	Clutch switch is defective.	Check clutch switch and wiring condition.
	Electronic module is defective.	Check wiring. Change electronic module.
	Engine mechanical problem (ensure that other electric components are good).	Check and replace defective part.
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. Otherwise, test the starting system.

Causes of troubles are not necessarily related to starter but may be due to a burnt fuse faulty battery, start button, ignition switch, engine stop switch, starting solenoid, electrical cables or connections or the electronic module.

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 main fuse is in good condition. If the fuse tests 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. Turn the ignition switch ON then place the headlight switch in ON position. If the lights turn on, the ignition switch is good. Otherwise, refer to IGNITION SYSTEM for testing procedure. If it tests good, continue the other tests.

Engine Stop Switch

If engine does not turn when placing engine stop switch to RUN and pressing the start button, test the engine stop switch as follows.

Remove the front facia and unplug the multi-function switch connector.

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

POSITION	WIRE	RESISTANCE
Switch to OFF	BLACK and BLACK/WHITE	1 Ω max.
Switch to RUN		Infinite (0.L)

Replace multi-function switch if defective.

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

Start Button

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

Remove the front facia and unplug the multi-function switch connector.

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

POSITION	WIRE	RESISTANCE
Switch released	RED/VIOLET and YELLOW/RED	Infinite (0.L)
Switch depressed and held		0.6 Ω max.

Replace multi-function switch if defective.

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

Starting Solenoid

NOTE: Solenoid is located on frame, behind battery rack.

Ensure the solenoid receives electric current as follows. Using a multimeter, measure the voltage between the following wires when pressing the start button with the ignition key turned ON and the engine stop switch to RUN.

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

If solenoid does not properly receive current, the electronic module can be suspected. See **Electronic Module** section below.

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 electronic module can be suspected. See **Electronic Module** 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

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 electronic module can be suspected. See **Electronic Module** below.

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

Electronic Module

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

ELECTRIC STARTER

REMOVAL

Turn OFF ignition switch.

Disconnect BLACK cable ground connection from battery.

WARNING

Always disconnect ground cable first and reconnect last.

Disconnect RED cable connection from battery.

Clean starter area.

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.

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

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. main fuse condition
2. spark occurrence
3. battery condition
4. ignition switch
5. trigger coil
6. ignition coil
7. electronic module.

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.

Main Fuse Condition

Check main fuse 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 for proper operation. Check battery voltage.

Ignition switch

A quick test to validate it is working. Turn the ignition switch ON then place the headlight switch in ON position. If the headlight turn on, the ignition switch is good.

Test

Disconnect ignition switch.

Measure voltage between RED 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	WHITE and BROWN	Infinite (0.L)
ON	WHITE and BROWN	0.6 Ω max.

Replace switch if defective.

If switch is good, continue the other tests.

Trigger Coil Voltage Testing

NOTE: The trigger coil is not adjustable.

STATIC TEST: CONTINUITY

Check resistance with a high-sensitivity ohmmeter.

1. Disconnect the Deutsch 2-pin connector.
2. Connect multimeter probes to the GREEN/YELLOW wire and to the BLUE wire.
3. Measure resistance; it should be between 190 - 300 ohms.

DYNAMIC TEST

1. Disconnect the Deutsch 2-pin connector.
2. Connect one of the multimeter probes to the GREEN/YELLOW wire and the other to the engine, then bring selector switch to $\bar{V}$ and scale to 00.0^{Vac}.
3. Press START button, note result. The obtained value should be between 0.4 and 0.7 Vac. Repeat operation 3 times.
4. 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.

Primary Winding

Disconnect the wire connector on the primary side of the ignition coil.

Using a multimeter, check the resistance between the terminal and the ignition coil body ground.

The resistance should be between 0.2 and 0.5 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 electronic module.

There should be 12 Vdc between the RED/VIOLET and BLACK/WHITE wires while starting the engine.

If there is no voltage, either the electronic module 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.

Measure resistance between ignition coil terminals and spark plug caps. The obtained value should be between 6 and 13 KΩ. 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.

Electronic Module

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

TEST

NOTE: On the multimeter, set measuring range from 1 K Ω – 10 K Ω . Make sure that positive and negative tester probes are installed on the appropriate wires.

	COLORS	NEGATIVE (-) TESTER LINE				
		BL	WH	OR	RD	BK
POSITIVE (+) TESTER LINE	BL		O	O	O	O
	WH	O		O	O	O
	OR	X	Δ		Δ	X
	RD	O	O	O		O
	BK	O	O	O	O	

SYMBOLS:

O: Open circuit, value/pointer change continuously

X: No open circuit, value/pointer do not register any change

Δ : Value/pointer changer and move to ∞

If a fault is detected, the electronic module must be replaced.

IGNITION TIMING

It is impossible to check the ignition timing with a timing lamp because there is no access window or mark.

Section 05 ELECTRICAL

Subsection 05 (IGNITION SYSTEM)

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.

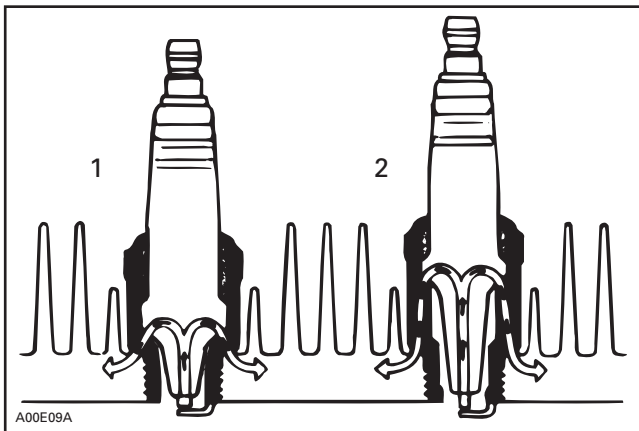
A too "hot" plug will result in overheating pre-ignition, etc.

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.

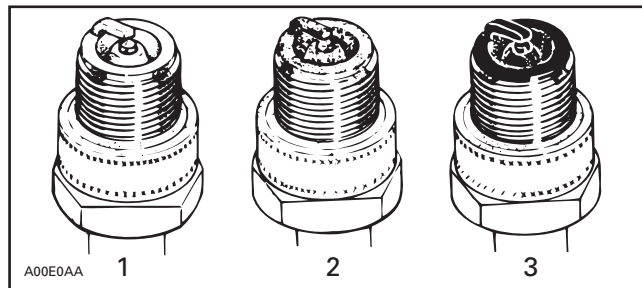
SPARK PLUG ANALYSIS



TYPICAL

1. Cold
2. Hot

CAUTION: Severe engine damage might occur or major plastic parts might melt if a wrong heat range plug is used.



TYPICAL

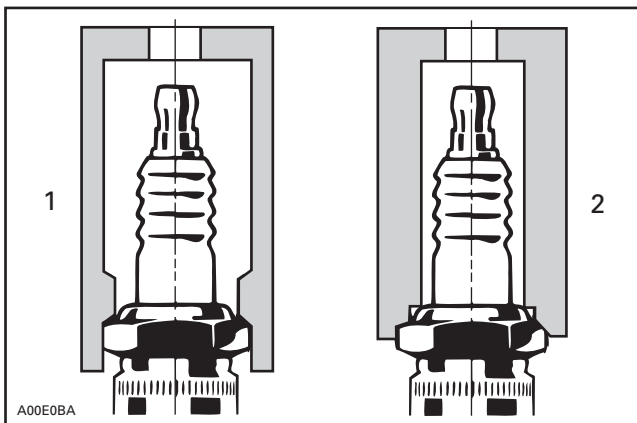
1. Overheated (light grey, white)
2. Normal (light brown, brown)
3. Fouled (black, wet or dry, dark deposits, grey, melted coating)

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).

SPARK PLUG INSTALLATION

Prior to installation make sure that contact surfaces of the cylinder head and spark plug are free of grime.

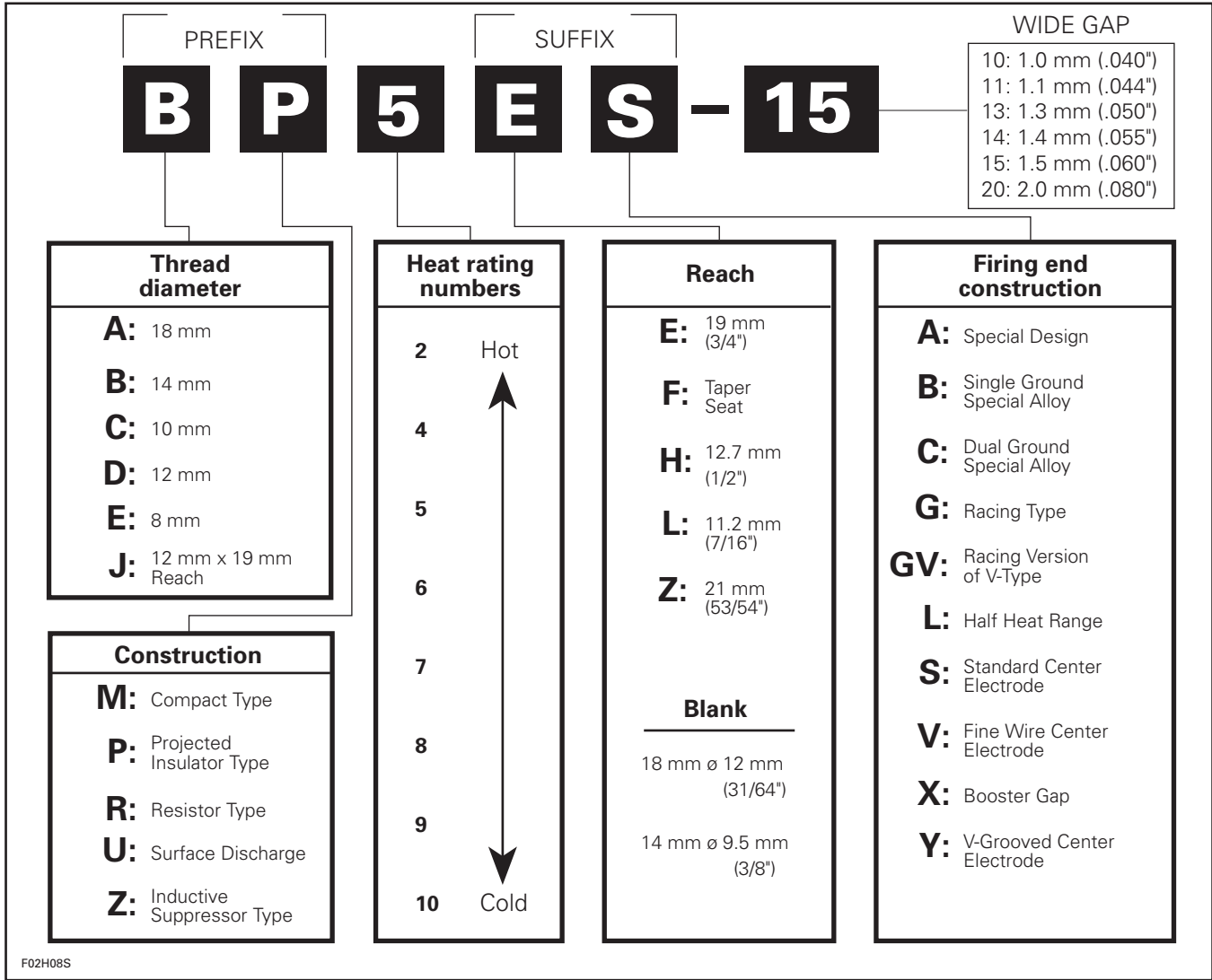
1. Using a wire feeler gauge, set electrode gap according to the following chart.
2. Apply anti-seize lubricant over the spark plug threads to prevent possible seizure.
3. Hand screw spark plug into cylinder head and tighten with a torque wrench and a proper socket.



1. *Proper socket*
2. *Improper socket*

4. Torque spark plug to 20 N•m (15 lbf•ft).

NGK SPARK PLUG SYMBOL EXPLANATION



ACCESSORIES

REMOVAL AND INSTALLATION

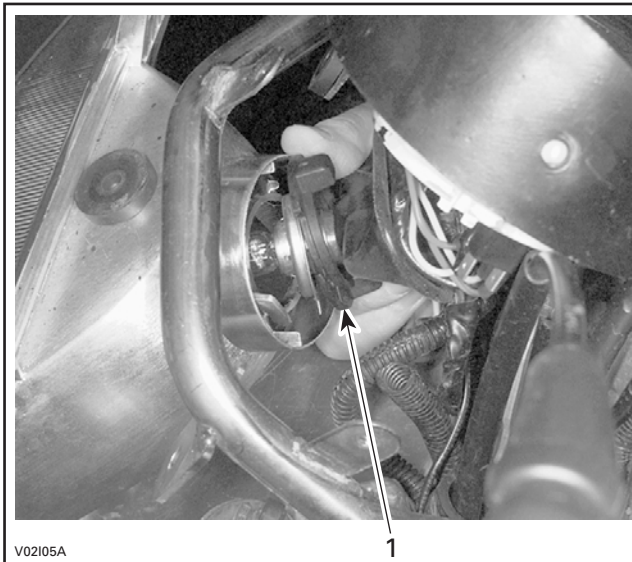
CAUTION: It is recommended to always disconnect the battery when replacing any electric or electronic parts.

HEADLIGHT

If the Headlight Bulb is Burnt

Remove front facia and dashboard.

Remove rubber boot and turn counterclockwise bulb retaining ring.



1. Retaining ring

Detach bulb and replace.

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

CAUTION: On applicable models, never touch glass portion of an halogen bulb with bare fingers, it shortens its operating life. If glass is touched, clean it with isopropyl alcohol which will not leave a film on the bulb.

Removal

Remove front facia and dashboard. Refer to BODY. Unscrew the bolts retaining headlight then unplug the connector.

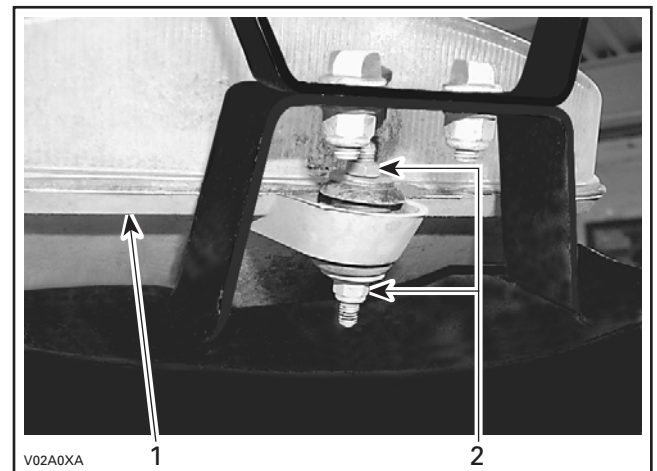
Installation

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

Adjustment

Adjust beam aiming as follows:

Turn nuts to adjust beam height orientation as explained below.



1. Headlight
2. Beam height adjustment

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.

Section 05 ELECTRICAL

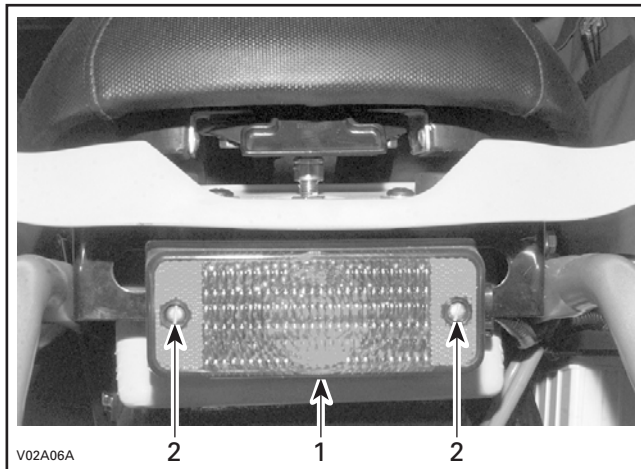
Subsection 06 (ACCESSORIES)

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.

Removal

Lift the dashboard and unscrew the ignition switch nut.

Unplug the switch connectors.

Installation

For the installation, reverse the removal procedure.

INDICATOR LIGHTS

Test

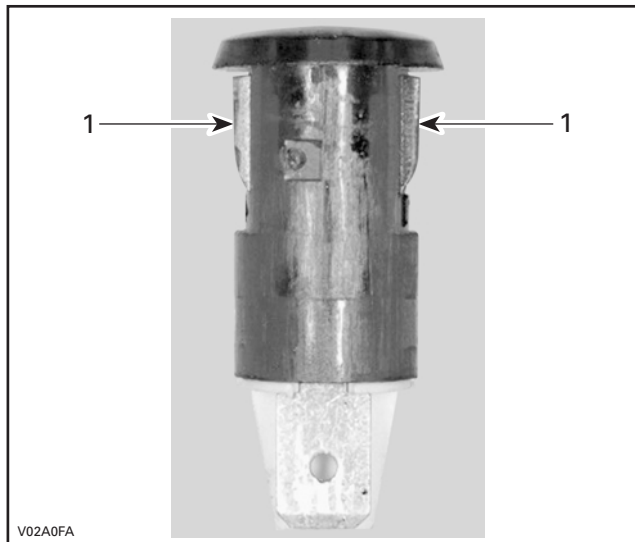
Refer to TESTS section.

Removal

Remove dashboard.

Unplug wires on indicator lamp.

Press both tabs then push indicator lamp out of hole.



- 1. Tabs

Installation

For the installation, reverse the removal procedure.

NOTE: The LED have polarity. Make sure to reconnect the RED/VIOLET wire on the positive (+) tab.

TESTS

COOLING FAN OPERATION TEST

Unplug the temperature sender connectors.
Install a jumper wire end in each connector. Turn key ON. Replace the fan if it does not work.

HEADLIGHT

Using a multimeter, measure the voltage between GREEN and BLACK wires at LOW beam and between BLUE and BLACK wires at HI beam.

Start the engine. The obtained value should be between 12 and 14.5 Vdc.

- No voltage:
 - Check wiring condition and HI-LO switch.
- Voltage is good:
 - Change headlight.

MULTI-FUNCTION SWITCH

Unplug connector located near oil tank, under front facia.

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

POSITION	WIRE	RESISTANCE
Switch OFF	RED/VIOLET and GREEN	Infinite (0.L)
Switch OFF	RED/VIOLET and BLUE	Infinite (0.L)
Switch to LO	RED/VIOLET and GREEN	0.4 Ω max.
Switch to HI	RED/VIOLET and BLUE	0.4 Ω max.

Replace switch if defective.

INDICATOR LIGHTS

Remove steering cover.

Neutral Indicator Light (GREEN)

Unplug the neutral indicator light connectors.
With the RED probe of the multimeter to the positive (+) connector on the LED and the black probe to the other connector.

Select the testing diodes/continuity function on the multimeter.



NOTE: Do not use Ω function to check LED.
The measure should be between 1.6 and 2.0.

- LED is good:
 - Check wiring condition.
 - Check neutral switch. Refer to TRANSMISSION.
- LED is burned:
 - Change indicator light.

Engine Indicator Light (RED)

Unplug the neutral indicator light connectors.
Test LED with a multimeter.

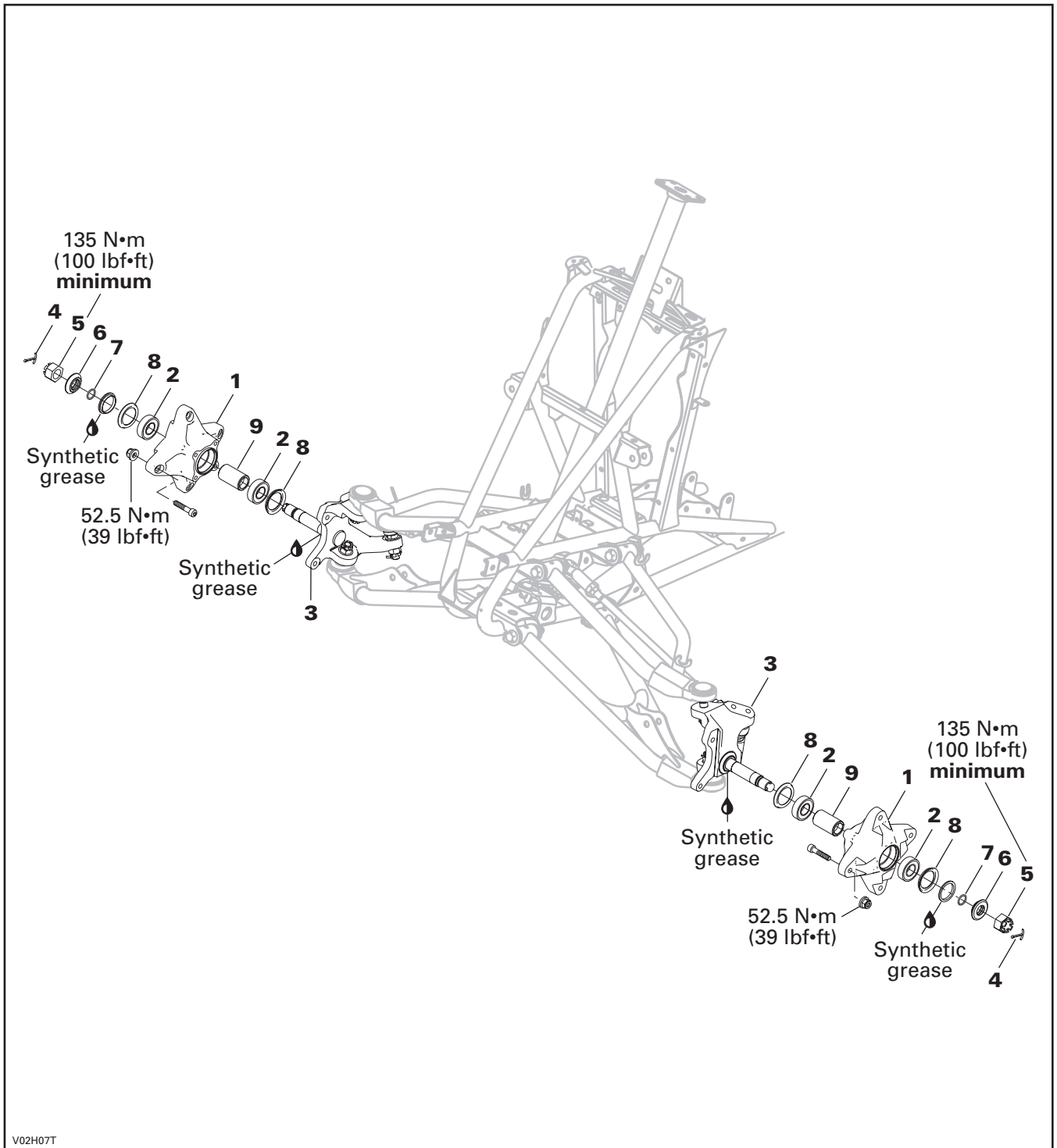
- LED is good:
 - Check wiring condition.
 - Check oil sensor. Refer to LUBRICATION SYSTEM.
 - Check temperature sensor. Refer to COOLING SYSTEM.
- LED is burned:
 - Change indicator light.

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FRONT DRIVE



Section 06 DRIVE TRAIN

Subsection 02 (FRONT DRIVE)

1, WHEEL HUB

Removal

Remove wheel.

Remove and discard cotter pin **no. 4**.

Unscrew the castle nut **no. 5**.

Remove caliper. Refer to HYDRAULIC BRAKES.

Remove the outside bushing **no. 6** and O-ring **no. 7**.

Remove hub with brake disc.

NOTE: Use a plastic hammer if necessary.

Remove brake disc. Refer to HYDRAULIC BRAKES.

Inspection

Check hub for crack or other damage.

Check O-ring for damage and change if necessary.

Installation

For installation, reverse the removal procedure.

Apply grease to wear ring.

Install new seals into wheel hub until they are flush with hub surface.

Tighten castle nut to the specific torque and further tighten until its grooves align with cotter pin hole.

Install a new cotter pin.

2, WHEEL HUB BEARING

Inspection

Check inner race of each bearing with a finger. The bearing should turn smoothly and quietly.

Check if bearing outer race fits tightly in the hub.

Remove and discard bearings if races do not turn smoothly and quietly or if they fit loosely in hub. Replace bearings and hub if bearings fit loosely into hub.

NOTE: Replace wheel hub bearings in pairs. Do not reuse old bearings.

Removal

Remove seal **no. 8**.

Place wheel hub in vise.

Insert a punch into the inside bushing **no. 9**.

Place the end of punch on the inside bushing lips and drive bearing out of wheel hub.



Remove the inside bushing **no. 9** and drive out the outer bearing.

Installation

Drive in a new bearing squarely until is fully seated.

Install inside bushing and drive the outer new bearing squarely until is fully seated.

3, KNUCKLE

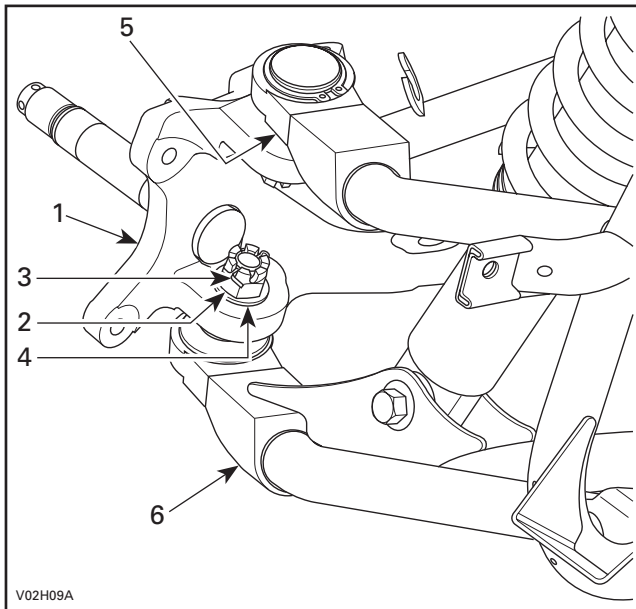
Removal

Remove wheel hub.

Remove tie-rod from knuckle. Refer to STEERING AND CONTROLS SYSTEM.

Remove the cotter pins from the upper and lower A-arm ball joints.

Unscrew castle nut and remove hardened washer.



- 1. Knuckle
- 2. Castle nut
- 3. Cotter pin
- 4. Hardened washer
- 5. Upper A-arm
- 6. Lower A-arm

Use a ball joint remover and detach upper and lower A-arm from knuckle.

CAUTION: Never hit the knuckle with a hammer.

Inspection

Check knuckle for damage or cracks.

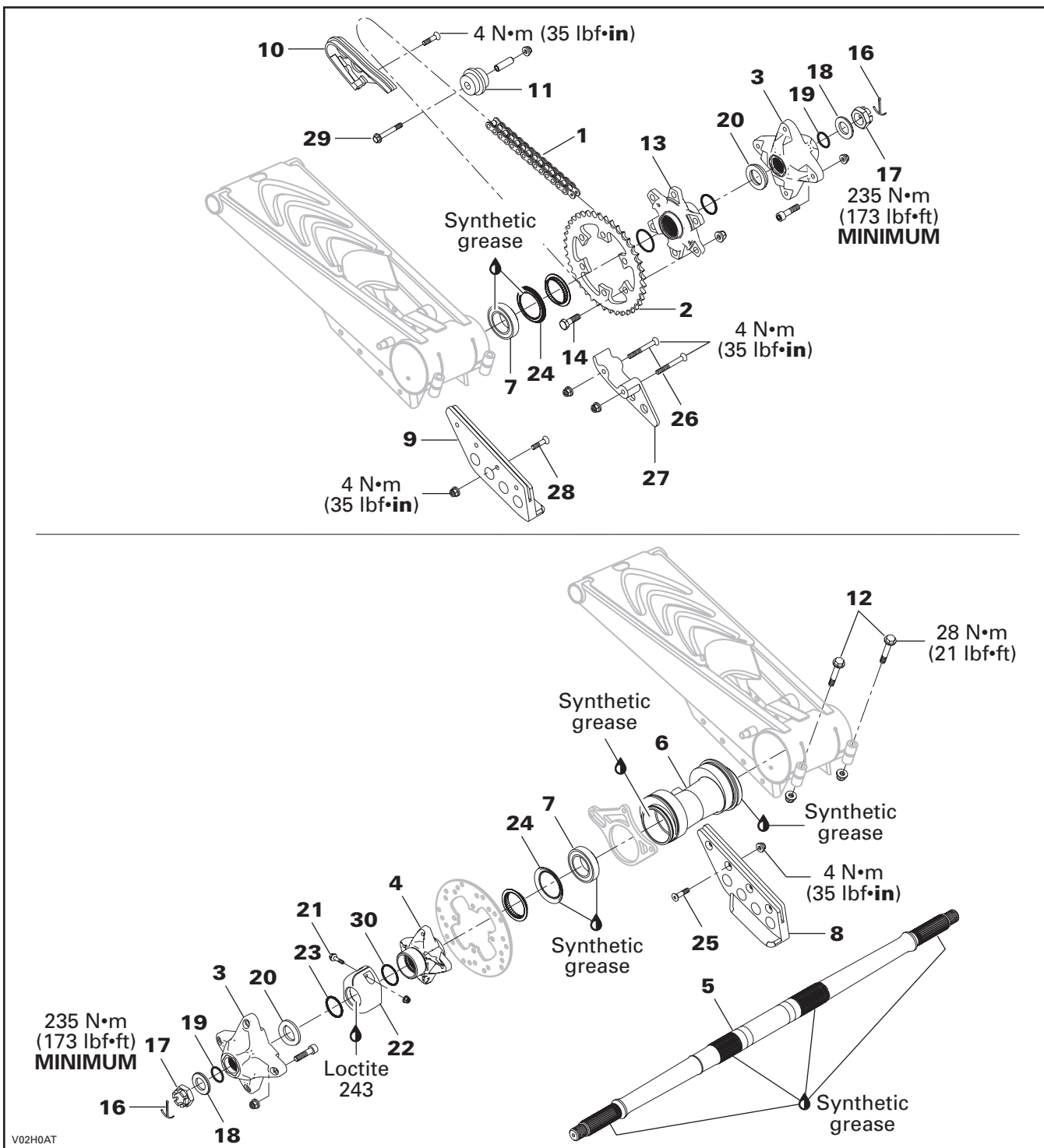
Installation

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

Install knuckle onto the upper and lower A-arms with hardened washer and castle nut.

Tighten castle nut to the specific torque and further tighten until its grooves align with the next cotter pin hole.

FINAL DRIVE



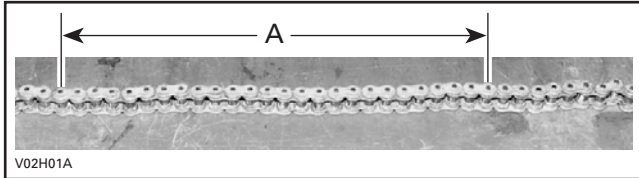
Section 06 DRIVE TRAIN

Subsection 03 (FINAL DRIVE)

1, DRIVE CHAIN

Inspection

With the chain installed on vehicle and the slack adjusted correctly, measure the distance between a span of 13 links from pin center to pin center.



A. 403 mm (15-7/8 in)

Change drive chain if the distance exceeds the service limits.

CAUTION: Replace chain, sprocket and pinion together to prevent rapid chain and sprocket wear. Install a new retaining ring each time the pinion is removed.

Check for damaged or missing O-ring and rollers.

Removal

Lift the rear of vehicle and install jack stands under the frame to support the rear of vehicle off the ground.

Remove chain guard on engine.

Withdraw swig arm shaft. Refer to REAR SUSPENSION.

Loosen rear axle lock bolts **no. 12**.

Insert adjuster lock through hub axle and into eccentric axle housing.

Turn the axle ahead.

Withdraw adjuster lock.

Remove drive chain from sprocket **no. 2** and engine sprocket.

Installation

Installation takes place in the reverse order of removal.

Adjust chain slack. Refer to MAINTENANCE for the proper procedure.

2, SPROCKET

Removal

Lift rear of vehicle and install jack stands under the frame to support the rear of vehicle off the ground.

Remove RH rear wheel and wheel hub **no. 3**.

Unfasten bolts **no. 14** and nuts **no. 15** retaining sprocket to rear hub.

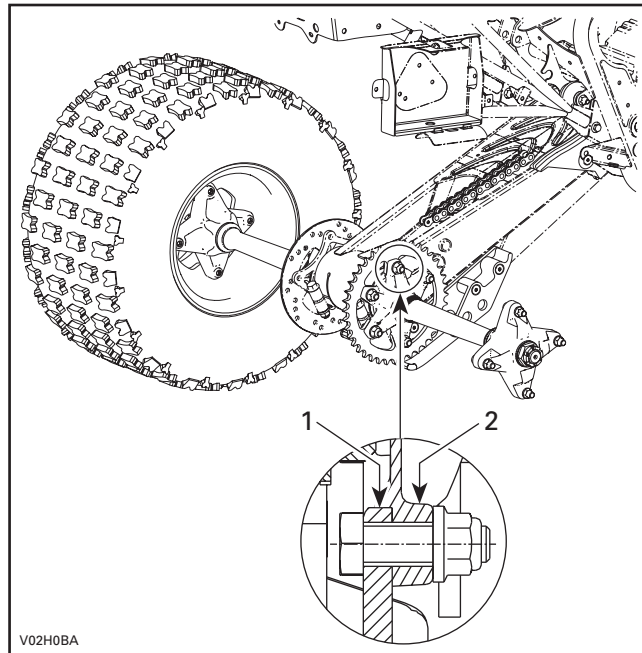
Remove sprocket.

Installation

CAUTION: Replace chain, sprocket and pinion together to prevent rapid chain and sprocket wear. Install a new retaining ring each time the pinion is removed.

For installation, reverse the removal procedure.

Install sprocket with the flat side on hub side.



1. Sprocket
2. Hub

3, REAR WHEEL HUB

Removal

Lift rear of vehicle and install jack stands under the frame to support the rear of vehicle off the ground.

Remove rear wheels.

NOTE: Use the same procedure for both wheel hubs.

Place transmission on first gear and apply rear brake.

Remove cotter pin **no. 16** and unscrew castle nut **no. 17**.

Remove hardened washer **no. 18** and the O-ring **no. 19**.

Pull out wheel hub.

Remove ring support **no. 20**.

Inspection

Check wheel hub for crack or other damage. Change if necessary.

Check O-ring for damage, if so change it.

Installation

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

Apply grease blended with molybdenum on splines.

Install new cotter pins. Both ends of cotter pins must be folded.

4, BRAKE HUB

Removal

Remove the left wheel hub.

Remove caliper. Refer to HYDRAULIC BRAKES.

Unscrew bolt **no. 21** retaining adjusting nut **no. 22**.

Screw adjusting nut completely so that ring retainer **no. 23** is apparent.

Withdraw ring retainer.

Withdraw adjusting nut.

Clean brake hub and rear axle then, pull and rotate brake hub with the brake disc. Use the brake hub extractor (P/N 529 035 695).

Remove brake disk. Refer to HYDRAULIC BRAKES.

Inspection

Check for crack or other damage. Replace if necessary.

Check for worn splines and free play on the rear axle spline.

Installation

Installation takes place in the reverse order of removal.

Make sure O-ring **no. 30** is correctly inserted in hub. Apply grease to O-ring and splines.

5, REAR AXLE

Removal

Lift rear of vehicle and install jack stands under the frame to support the rear of vehicle out off the ground.

Remove rear wheels.

Withdraw the LH wheel hub and brake hub **no. 4**.

Slide rear axle, a little bit, by the RH side to clear the RH protector **no. 9**.

Remove drive chain from sprocket.

Remove rear axle completely.

Inspection

Check axle for bend, torsion or other damage. Change if necessary.

Check axle for spot of rust. A spot of rust indicates a possible damage to axle. Change axle if necessary.

Check for worn bearing race.

Installation

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

Clean adjusting nut **no. 22** and brake hub threads thoroughly with Loctite Cleaning Solvent (P/N 293 800 019), removing all grease.

CAUTION: Failure to thoroughly clean the threads will cause Loctite 243 to be useless.

Apply Loctite 243 on **thoroughly cleaned disc brake hub threads**, approximately 6 mm (1/4 in) wide by 25 mm (1 in) long, on top of disc brake hub.

Make sure its **threads are thoroughly cleaned** and screw adjusting nut back into position.

Secure adjusting nut with its retaining ring.

Section 06 DRIVE TRAIN

Subsection 03 (FINAL DRIVE)

Reinstall in their proper order all removed parts.
Secure with a new cotter pin.

Preload Adjustment

Turn adjusting nut counterclockwise (towards front of ATV) and **hand tighten only**.

CAUTION: Do not over tighten using a tool; this would cause tapered bearings to overheat and thus reduce their life expectancy.

Ensure axle turns freely and without bearing play and then tighten adjusting nut lock screw **no. 21** to 10 N•m (89 lbf•in).

WARNING

Torque wrench tightening specifications must strictly be adhered to. Locking devices (ex.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

NOTE: Adjust chain slack. Refer to MAINTENANCE for the proper procedure.

6, ECCENTRIC AXLE HOUSING

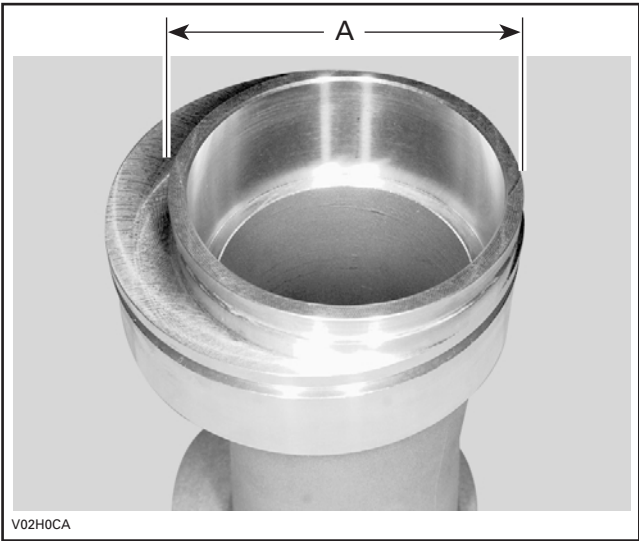
Removal

Remove the rear axle.
On the LH side, remove the circlip and the caliper bracket.
Loosen rear axle lock bolts.
Pull out, by the RH side, the eccentric axle housing.

Inspection

Check for worn diameter where the caliper bracket seats.

ECCENTRIC AXLE LH O.D.	
SERVICE LIMIT	75 mm (2.95 in)



A. 75 mm (2.95 in)

Installation

Installation takes place in the reverse order of removal.

7, ECCENTRIC AXLE BEARINGS

Inspection

Eccentric axle bearings must have full freedom of movement. If not, change the bearings.

Removal

NOTE: Bearings and seals must be replaced if removed.
Pry out drive axle seals **no. 24**. Be careful not to damage seal bore or eccentric axle housing.
Use a punch and drive bearings cup outward from opposite end of housing.

Installation

Place new bearings in a freezer for 10 minutes before installation.
Place eccentric axle housing in oven to 100°C (212°F) to ease bearings installation for a half hour maximum.

WARNING

Clean all grease, outside and inside, from eccentric housing before put in oven.

8,9, PROTECTORS

Removal

LH Protector

Remove brake hub with brake disc.

Unfasten socket head screws **no. 25**.

Withdraw LH protector **no. 8** from swing arm.

RH Protector

Remove sprocket on rear hub.

Unfasten socket head screws **no. 26** retaining the chain protector **no. 27** to the RH protector **no. 9**.

Remove the other socket head screws **no. 28** retaining RH protector to swing arm.

Withdraw RH protector from swing arm.

Installation

For installation, reverse the removal procedure.

10, SLIDER-SHOE

Removal

Withdraw swing arm. Refer to REAR SUSPENSION.

Remove slide-shoe.

Installation

Installation takes place in the reverse order of removal.

11, CHAIN ROLLER

Removal

Unscrew bolt **no. 29** retaining the chain roller.

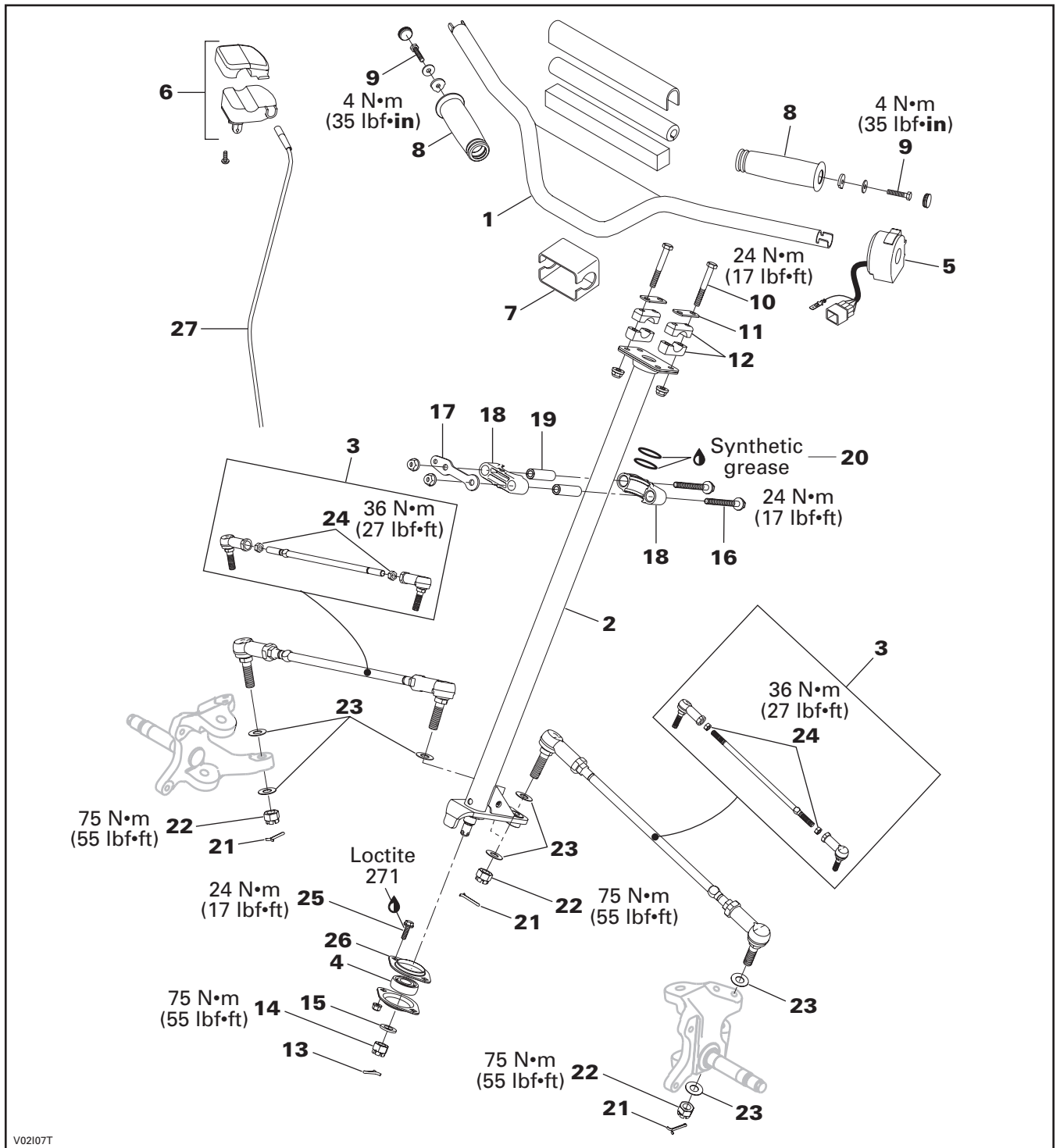
Installation

For installation, reverse the removal procedure.

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STEERING/CONTROL SYSTEMS



V02107T

Section 07 STEERING/CONTROL SYSTEMS
Subsection 02 (STEERING/CONTROL SYSTEMS)

1, HANDLE BAR

Removal

- Remove:
- steering cover **no. 7**
 - handle bar grips **no. 8** (discard screws **no. 9**)
 - brake lever (refer to HYDRAULIC BRAKES)
 - clutch lever
(refer to REMOVAL AND INSTALLATION)
 - throttle handle **no. 6** and multi-function switch **no. 5** (refer to the specific section below)
 - steering clamp mounting bolts **no. 10**, reinforcements **no. 11** and steering clamps **no. 12**
 - handle bar.

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.

2, STEERING COLUMN

Removal

- Remove:
- front facia and dashboard (refer to BODY)
 - handle bar
 - fuel tank (refer to FUEL CIRCUIT)
- NOTE:** Do not remove fuel tank completely, separate fuel tank from frame only. Do not remove fuel lines.
- headlight (refer to ACCESSORIES)
 - oil tank (refer to REMOVAL AND INSTALLATION)
 - cotter pin **no. 13**, castellated nut **no. 14**, form washer and flat washer **no. 15** to bottom end of steering column.

Separate steering column and tie-rods **no. 3**. Refer to TIE-ROD section.

Remove half housing bolts **no. 16**, stopper plates **no. 17**, half housings **no. 18** and housing bushings **no. 19**.

Pull steering column.

Inspection

Inspect steering column for damage, cracks or bending, replace if any problems is detected.

Check O-ring **no. 20** for damage. Replace if necessary.

Installation

For the installation, reverse the removal procedure.

3, TIE-ROD

Removal

Place the vehicle on jack stands and remove front wheel(s).

Remove front fender with fender support. Refer to BODY.

Remove cotter pin **no. 21**, castellated nut **no. 22** and hardened washers **no. 23**.

CAUTION: Never tap the knuckle with a hammer.

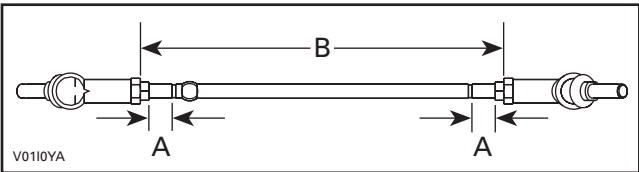
Inspection

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
DS	mm	20 ± 5	311 ± 1
	in	25/32 ± .197	12 1/4 ± .039

NOTE: Torque the ball joint lock nut **no. 24** to 36 N•m (27 lbf•ft).

Toe Adjustment

Place vehicle on level surface.

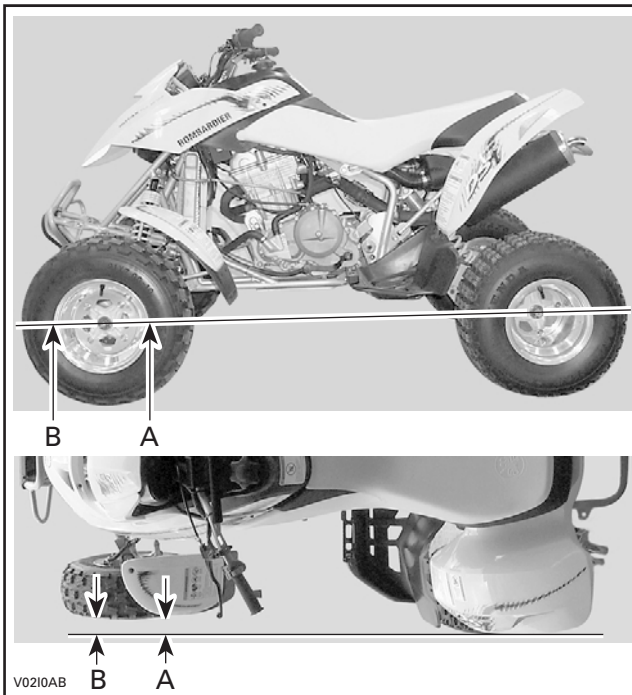
Check that handlebar is straight.

Use a long rule and check if the rear and front wheels are aligned.

Adjust alignment with tie-rod.

Adjust toe-out to 2.6 ± 0.5 mm ($.102 \pm .0197$ in) on each side.

NOTE: Take measure on the rim.



$A - B = 2.6 \pm 0.5$ mm ($.102 \pm .0197$ in)

4, STEERING COLUMN BEARING

Removal

Place vehicle on jack stands and remove front wheels.

Remove steering column.

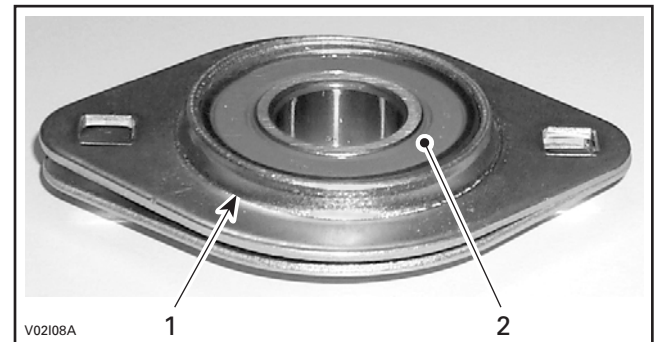
Remove bolts **no. 25** and first bearing flange **no. 26**.

Remove bearing.

Installation

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

Place flanged collar toward outside.



1. Flanged collar
2. Bearing

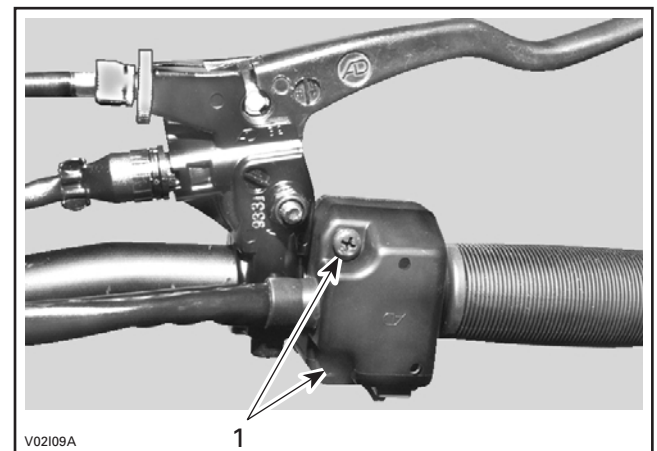
5, MULTI-FUNCTION SWITCH

Test

Refer to ACCESSORIES.

Removal

Remove bolts.



1. Remove the bolts

Separate multi-function switch from handle bar.

Remove front facia. Refer to BODY.

Unplug multi-function switch connector.

Installation

For installation, reverse the removal procedure.

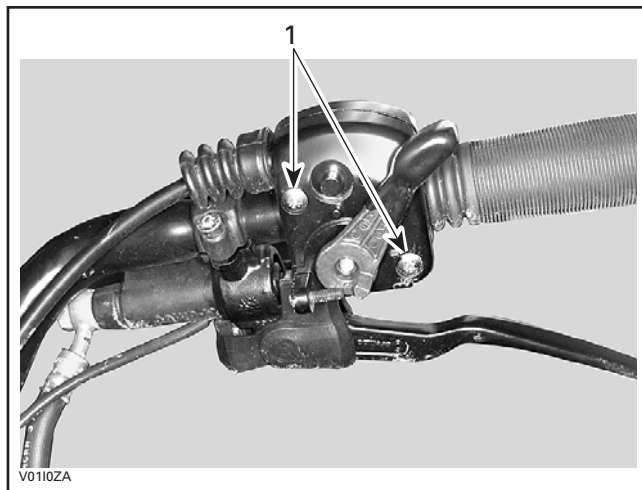
Section 07 STEERING/CONTROL SYSTEMS

Subsection 02 (STEERING/CONTROL SYSTEMS)

6, THROTTLE HANDLE

Removal

Remove screws under throttle handle.

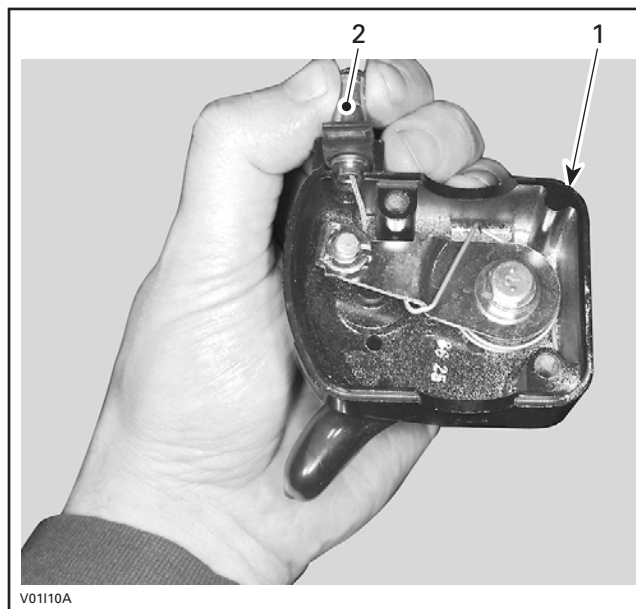


TYPICAL

1. Remove screws

Separate throttle handle from handle bar.

Remove throttle cable **no. 27** from housing.



TYPICAL

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.

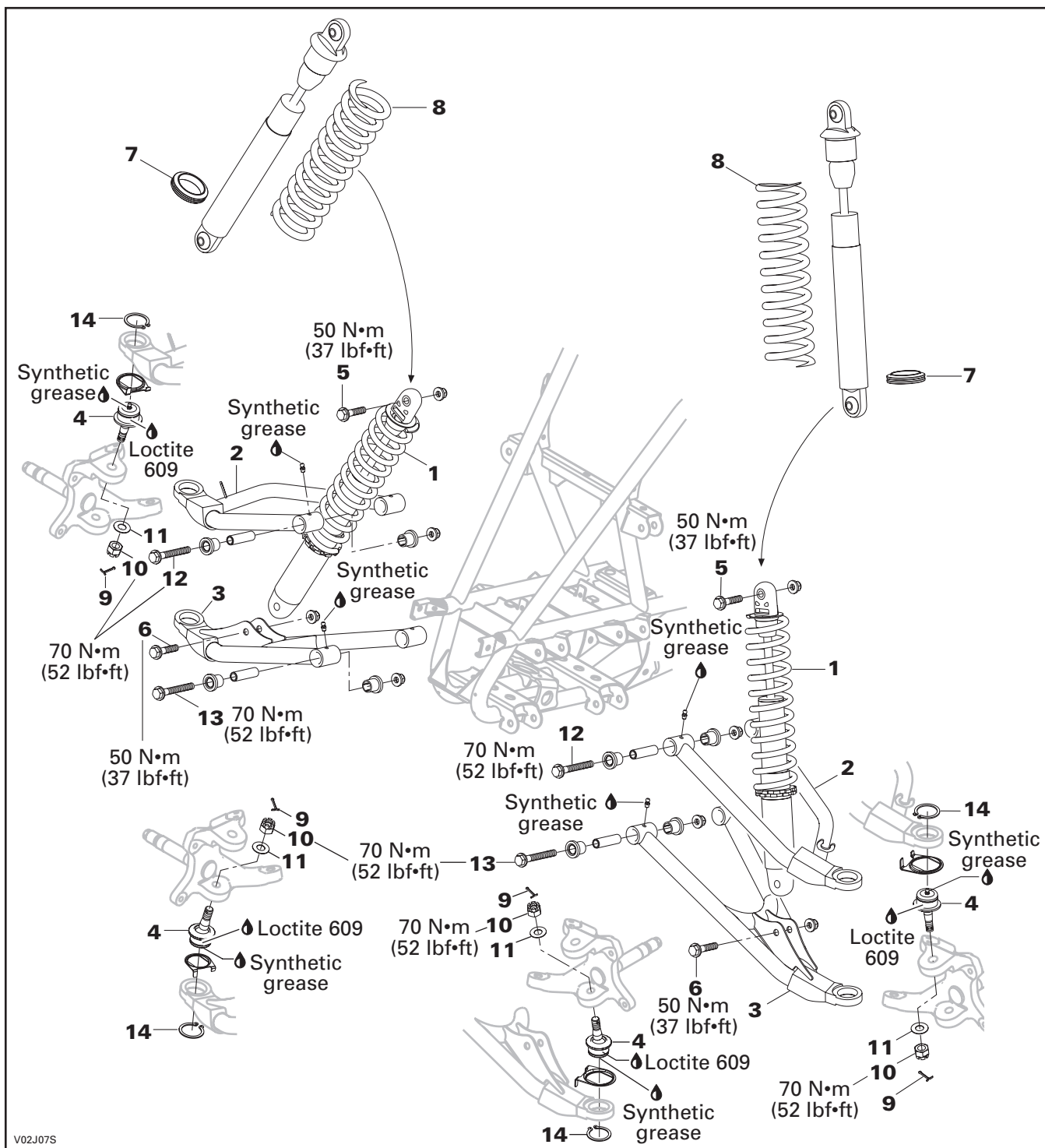
Refer to CARBURATOR AND AIR INTAKE SILENCER for adjustment procedure.

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FRONT SUSPENSION



Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

1, SHOCKS ABSORBER

Removal

Lift front of vehicle and install jack stands 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 lower bolt **no. 5** then upper bolt **no. 6** of 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.

Assembly and Installation

For assembly and installation, reverse the disassembly and removal procedures. Paying attention to the following details.

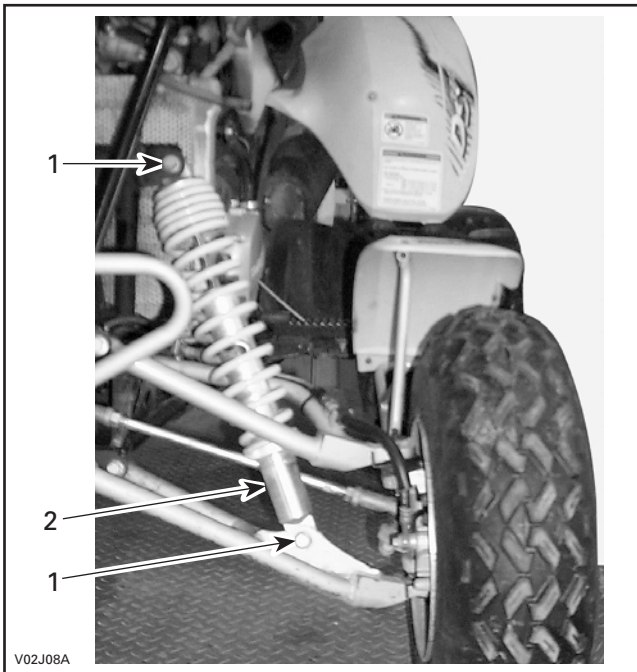
Extend the piston before installing spring, spring seat and snap ring.

2, UPPER A-ARM

Removal

NOTE: Both upper **no. 2** and lower **no. 3** A-arms can be removed without removing the tie rods.

Detach brake hose from upper A-arm.



1. Remove bolts
2. Front shock assembly

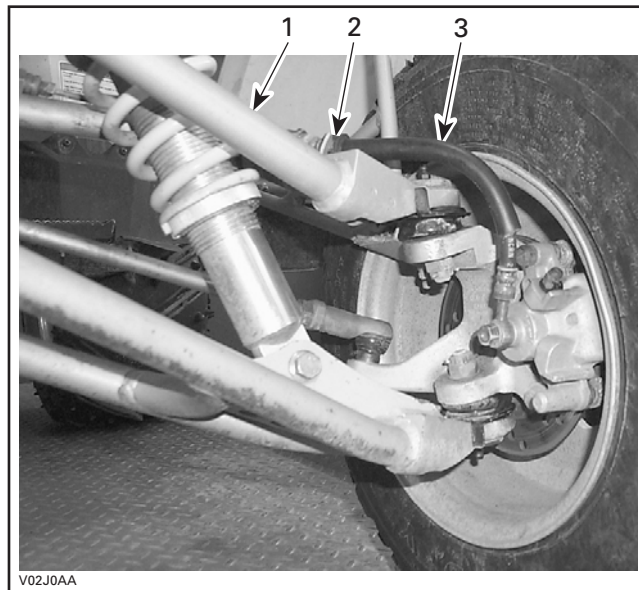
Disassembly

Remove snap ring under spring seat **no. 7**.

Unscrew the spring seat completely and remove the spring **no. 8**.

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:

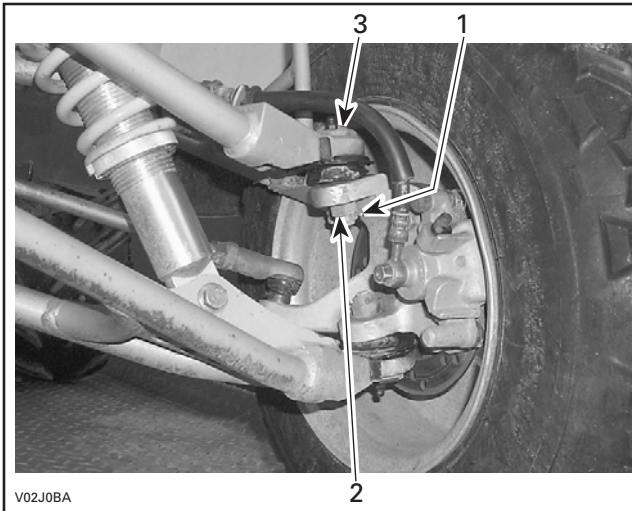


1. Upper A-arm
2. Detach brake hose from tubing
3. Brake hose

Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

Remove cotter pin **no. 9**, castellated nut **no. 10** and hardened washer **no. 11** from upper ball joint **no. 4**.



1. Remove cotter pin
2. Castellated nut
3. Upper ball joint

Loosen wheel nuts.

Lift front of vehicle and install jack stands under the frame to support the vehicle off the ground.

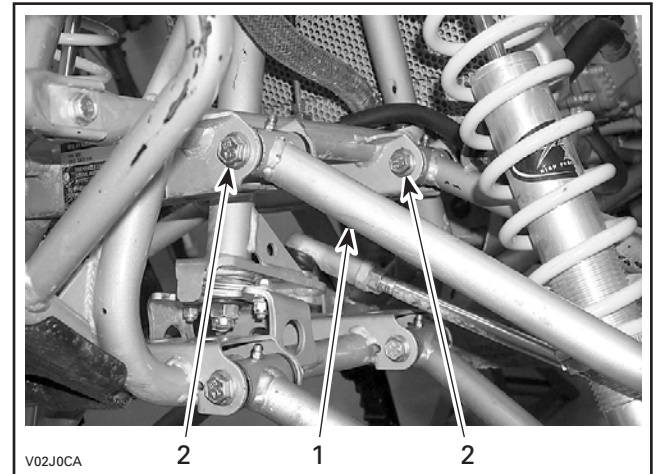
NOTE: Lift up vehicle high enough to have the wheel off the ground and shock absorber **no. 1** fully extended.

Remove wheel(s).

Use a ball joint remover and detach upper A-arm from knuckle.

CAUTION: Never tap the knuckle with a hammer.

Remove bolts **no. 12** and nuts retaining upper A-arm to frame.



1. Upper A-arm
2. Remove nuts and bolts

Remove upper A-arm from vehicle.

Inspection

Check upper A-arm for cracks, distortion or other damages. Replace as required.

Inspect pivot bushings for wear or damages.

Replace pivot bushings if necessary.

Check ball joint bellows on upper A-arm for cracks or any other damage and inspect ball joint stud for damages. Ensure stud is moving freely. Refer to BALL JOINT section below.

Installation

Position upper A-arm and install bolts **no. 12** and nuts.

Torque nuts to 70 N•m (52 lbf•ft).

Attach upper A-arm to knuckle. Install hardened washer **no. 11** and castellated nut **no. 10**.

Torque to 50 N•m (37 lbf•ft). Finish by the hand tightening.

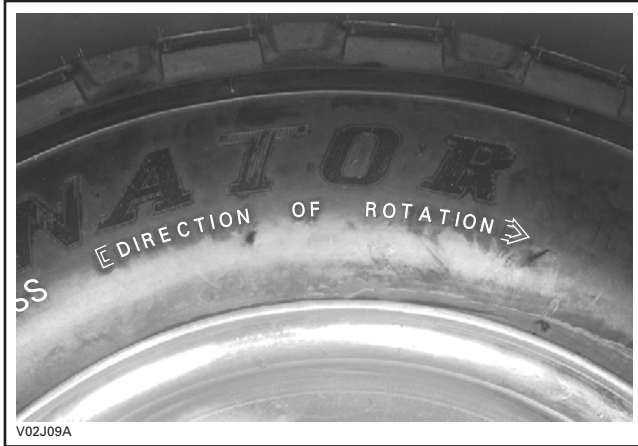
Install a new cotter pin. Both ends of cotter pins must be folded.

Secure brake hose to upper A-arm.

Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

NOTE: Do not interchange left and right tires. Check direction of rotation mark on tires.



DIRECTION OF ROTATION

Torque wheel nuts to 52.5 N•m (39 lbf•ft) in a criss-cross sequence.

Grease each A-arm pivot.

3, LOWER A-ARM

Removal

Remove cotter pin and castellated nut retaining lower A-arm to ball joint on the knuckle.

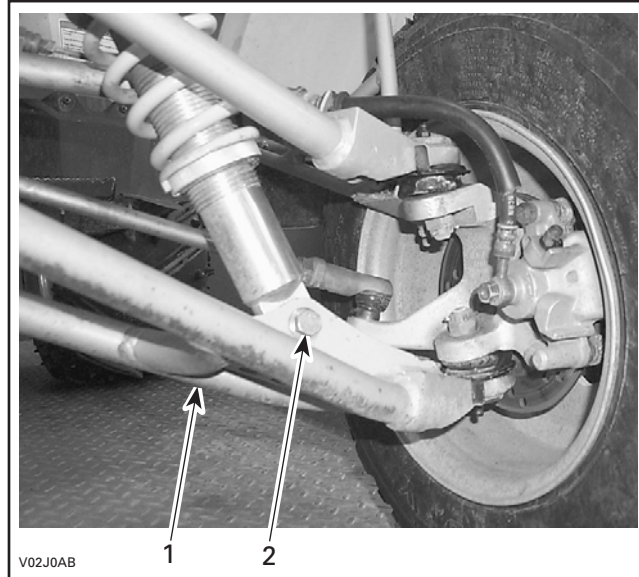
Loosen wheel nuts.

Lift front of vehicle and install jack stands 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 wheel(s).

Remove bolt **no. 6** retaining the shock absorber **no. 1** to lower A-arm.

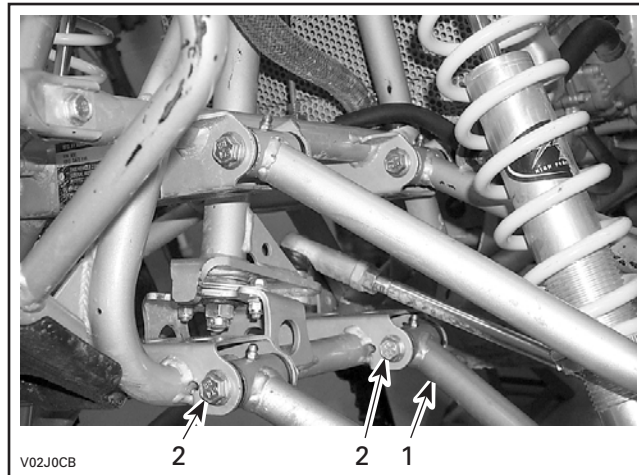


1. Lower A-arm
2. Remove nut and bolt

Use a ball joint remover and detach knuckle from the lower A-arm.

CAUTION: Never tap the knuckle with a hammer.

Remove nuts and bolts **no. 13** retaining lower A-arm to frame.



1. Lower A-arm
2. Remove nuts and bolts

Remove lower A-arm from vehicle.

Inspection

Check lower A-arm for cracks, distortion or other damages. Replace as required.

Inspect pivot bushings for wear or damages.

Replace pivot bushings if necessary.

Check ball joint bellows on lower A-arm for cracks or any other damage and inspect ball joint stud for damages. Ensure stud is moving freely. Refer to BALL JOINT section below.

Installation

For assembly, reverse the disassembly procedure. However, pay attention to the following.

Position lower A-arm and install bolts **no. 13** and nuts.

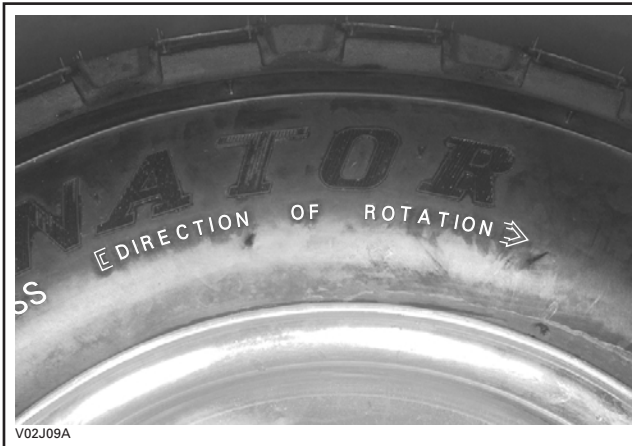
Torque nuts to 70 N•m (52 lbf•ft).

Attach lower A-arm to knuckle. Install hardened washer **no. 11** and castellated nut **no. 10**.

Torque to 50 N•m (37 lbf•ft). Finish by the hand tightening.

Install a new cotter pin. Both ends of cotter pins must be folded.

NOTE: Do not interchange left and right tires. Check direction of rotation mark on tires.



DIRECTION OF ROTATION

Torque wheel nuts to 52.5 N•m (39 lbf•ft) in a criss-cross sequence.

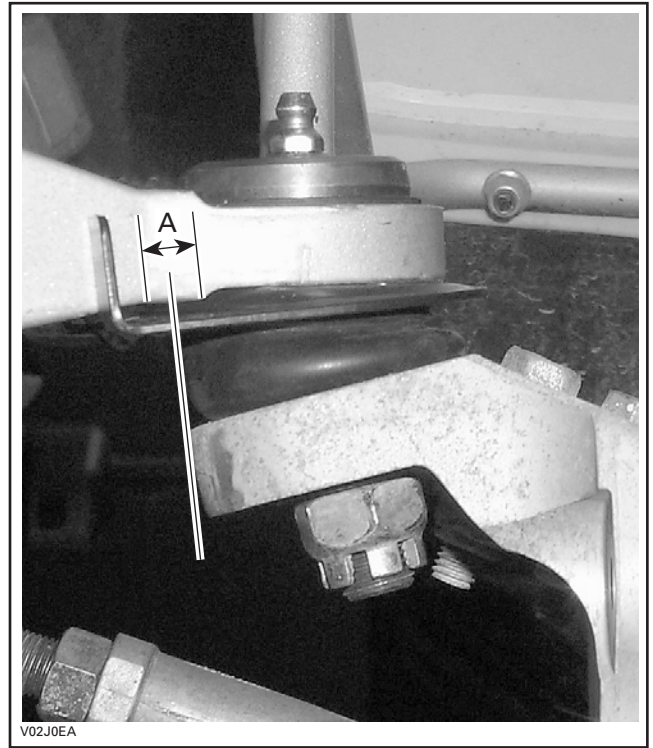
Grease each A-arm pivot.

4, BALL JOINT

Inspection

Upper Ball Joint

Take the top of tire and check upper ball joint lateral play, by push and pull. The maximum lateral play should be 1.5 mm (0.060 in). If the lateral play is out of specification, change the ball joints.



UPPER BALL JOINT LATERAL PLAY

A. Maximum lateral play 1.5 mm (0.060 in)

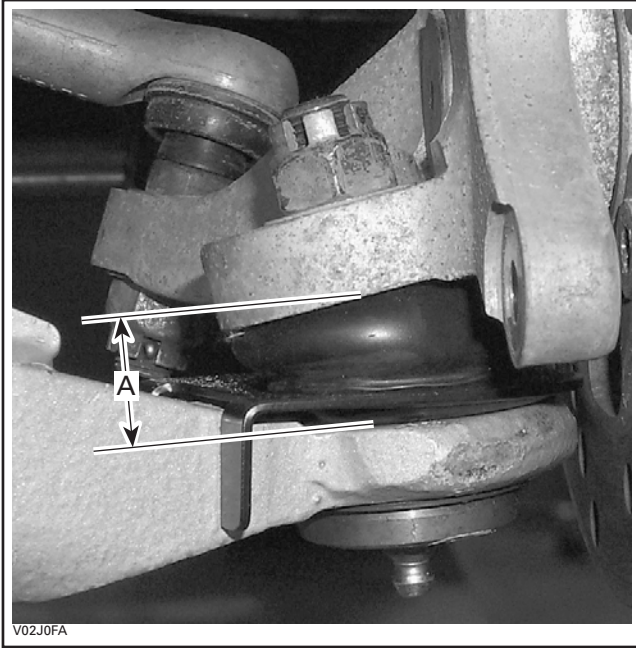
Lower Ball Joint

Place a jack under A-arm and raise vehicle high enough to have the wheel off the ground.

Take tire by the bottom and lift it up. The maximum axial play should be 1.5 mm (0.060 in). If the axial play is out of specification, change the lower ball joints.

Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

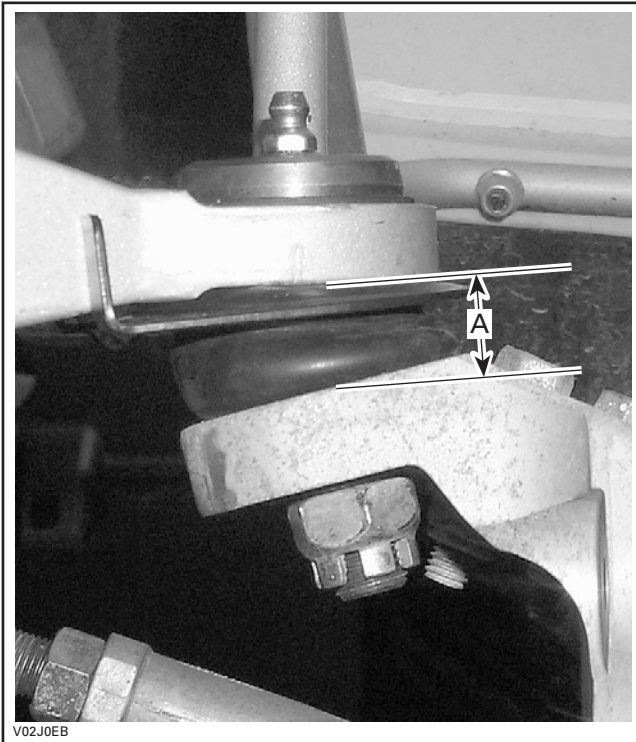


LOWER BALL JOINT AXIAL PLAY

A. Maximum axial play (measurement A +1.5 mm (0.060 in))

Upper Ball Joint

Move the upper A-arm vertically. The maximum axial play should be 1.5 mm (0.060 in). If the axial play is out of specification, change the upper ball joints.



UPPER BALL JOINT AXIAL PLAY

A. Maximum axial play (measurement A +1.5 mm (0.060 in))

Check ball joint bellows for cracks or any other damage and inspect ball joint stud for damages. Ensure stud is moving freely. Replace ball joint if necessary.

NOTE: It is recommended to change both left or right ball joints at the same time.

Install a new circlip.

Removal

Remove upper or lower A-arm.

Remove the circlip no. 14.

Extract the ball joint.

Installation

CAUTION: This ball joint has an oblong opening and therefore must be installed with the appropriate tab lock to ensure proper orientation of the ball joint relative to the A-arm. If there is no tab lock on the ball joint being replaced or if existing tab lock is damaged and would need replacement, the appropriate tab lock must be ordered.

NOTE: Use the same tools for the lower and upper ball joints.

Lower Ball Joint Installation

Apply a thin layer (0.3 mL) of Loctite 609 on the outside diameter of new ball joint (surface that contacts arm). Wipe any excess.

Using the 2 inches long driver (P/N 529 035 705) on a solid flat surface of a bench, align ball joint in that driver, align proper tab lock on ball joint, and then align arm, up side down, making sure that tabs show on each side.

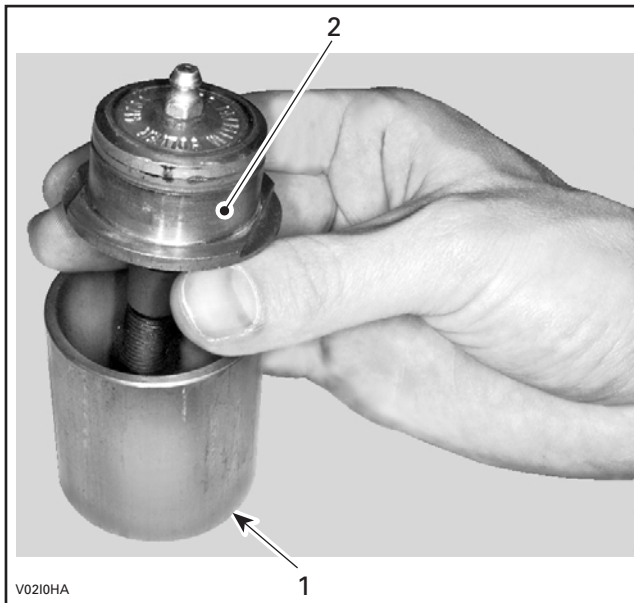
WARNING

If ball joint is installed without tab lock or with tab lock that has its longer tab not facing front of vehicle, it may cause ball joint stud travel to be reduced, (hitting on the side of ball joint housing), leading to stud damage or failure, which may cause an accident.

CAUTION: Longer tab of tab lock must be towards front of vehicle.

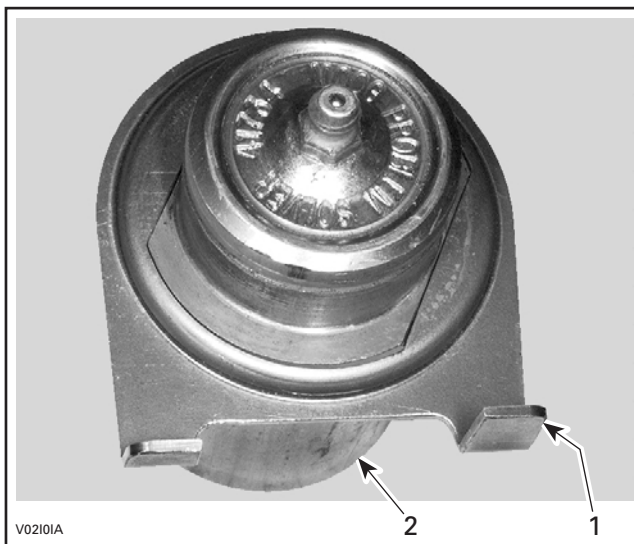
Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)

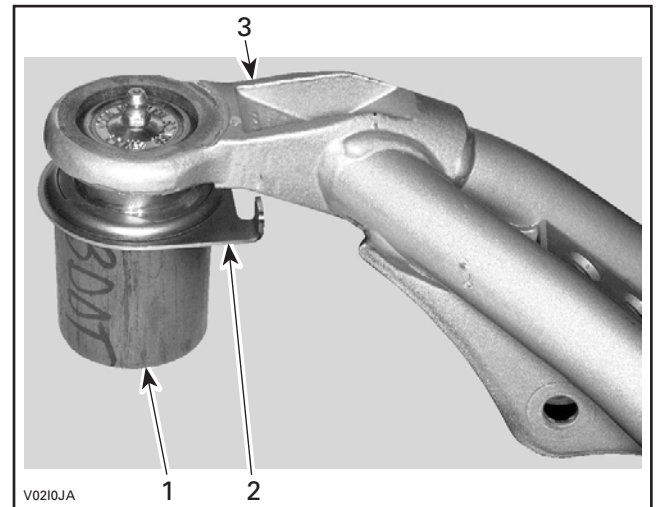


ALIGNING BALL JOINT IN DRIVER

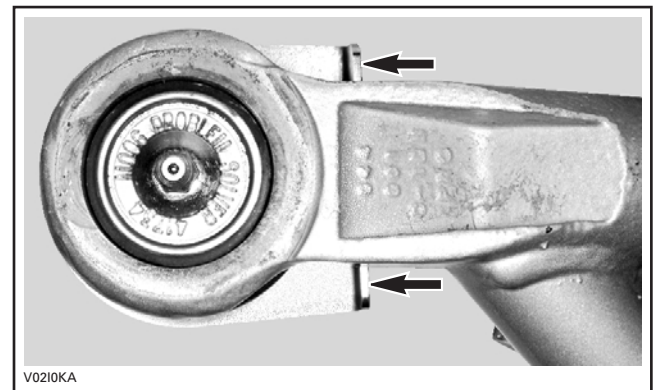
1. 2 inches long driver (P/N 529 035 705)
2. Apply Loctite 609 on this surface



1. Longer tab (**towards front of vehicle**)
2. Driver



1. Driver
2. Tab lock
3. Arm aligned up side down



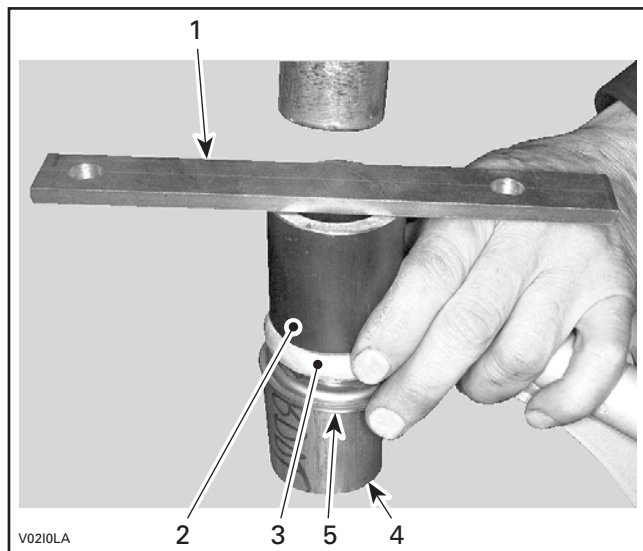
ARROWS SHOW TAB ON EACH SIDE OF ARM

With the use of the second driver (P/N 529 035 706) aligned on arm, **be sure alignment is correct**, properly hammer or press arm on ball joint, making sure snap ring can correctly be installed.

NOTE: The use of a flat bar placed on driver will help ease installation and insure a proper and equal fit.

Section 08 SUSPENSION

Subsection 02 (FRONT SUSPENSION)



1. Flat bar
2. Driver (P/N 529 035 706)
3. Arm
4. Driver (P/N 529 035 705)
5. Tab lock

Secure ball joint with its snap ring.

Reinstall all removed parts with supplied new cotter pins and flanged elastic nuts.

CAUTION: Insure that washer is in place before installing castellated ball joint nut.

Above procedure to be performed for both lower ball joints.

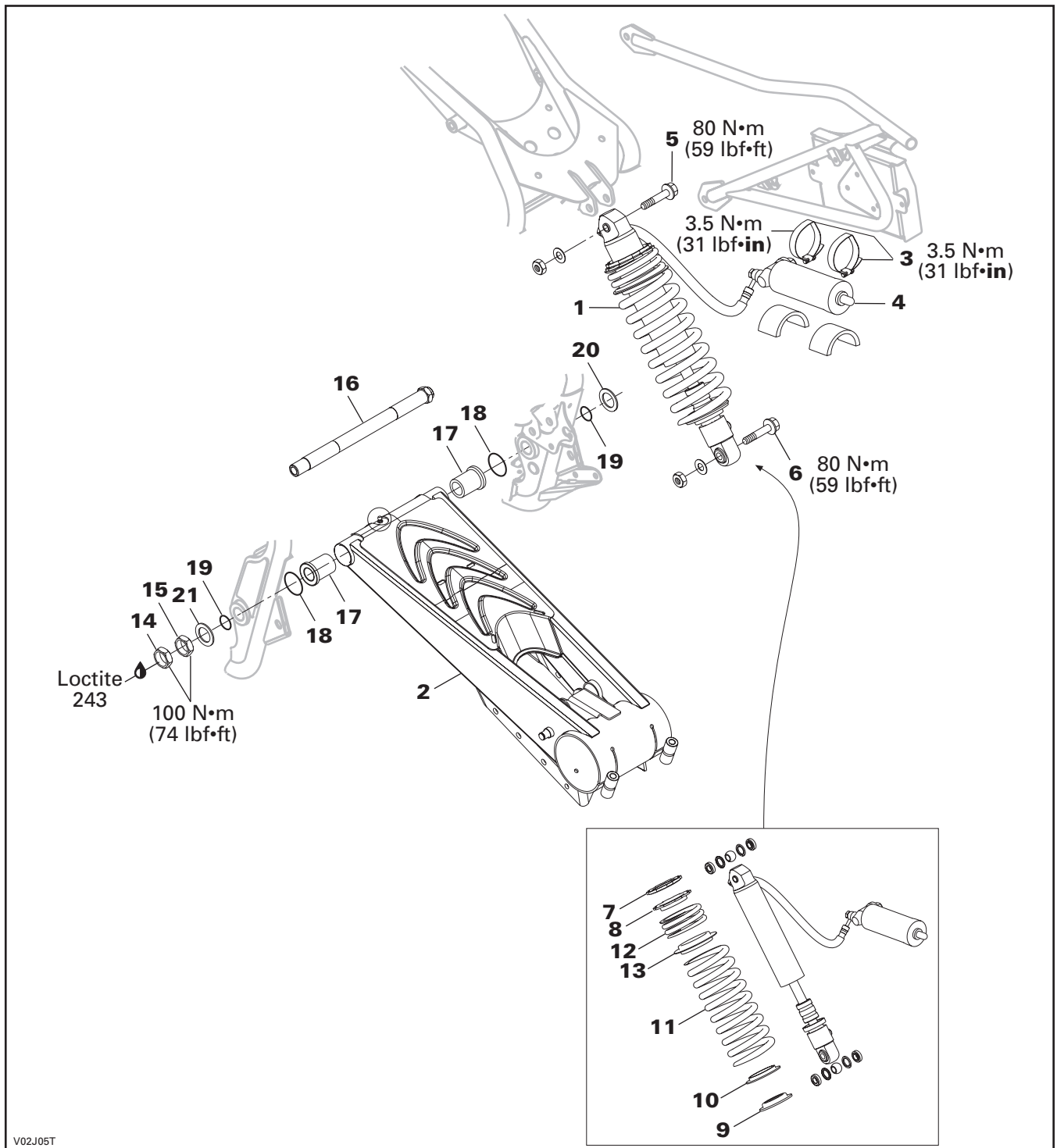
WARNING

Torque wrench tightening specifications must strictly be adhered to. Locking devices (ex.: locking tabs, elastic stop nuts, self-locking fasteners, etc.) must be installed or replaced with new ones where specified. If the efficiency of a locking device is impaired, it must be renewed.

Upper Ball Joint Installation

For installation, use the same procedure that the lower ball joint installation.

REAR SUSPENSION



Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

1, REAR SHOCK WITH RESERVOIR

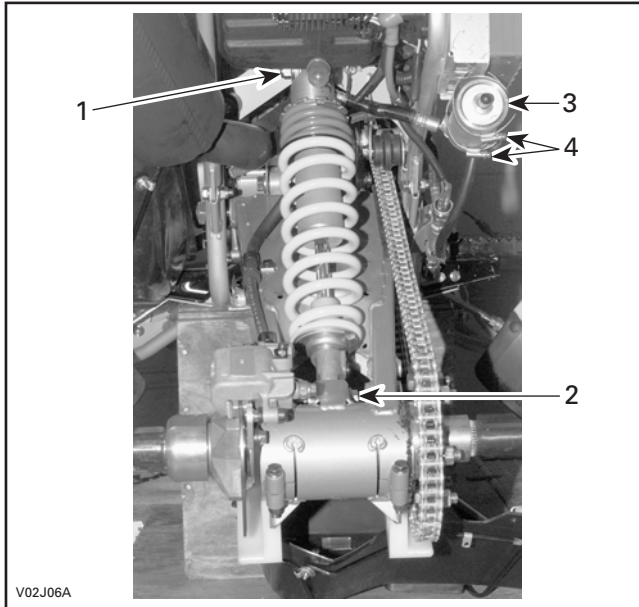
Removal

Lift rear of vehicle until rear shock absorber is fully extended.

Install a jack stand or a block under the frame to support the vehicle.

Unscrew clamps **no. 3** retaining the reservoir **no. 4**.

Remove upper bolt **no. 5** retaining shock absorber then unscrew the lower bolt **no. 6**.



1. Upper bolt and nut
2. Lower bolt and nut
3. Reservoir
4. Clamps

Disassembly

Unscrew the adjusting nuts **nos. 7** and **8**.

Remove spring stopper **no. 9** and spring seat **no. 10**.

Remove two piece dual rate spring **nos. 11** and **12** with ring **no. 13**.

Inspection

Examine 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.

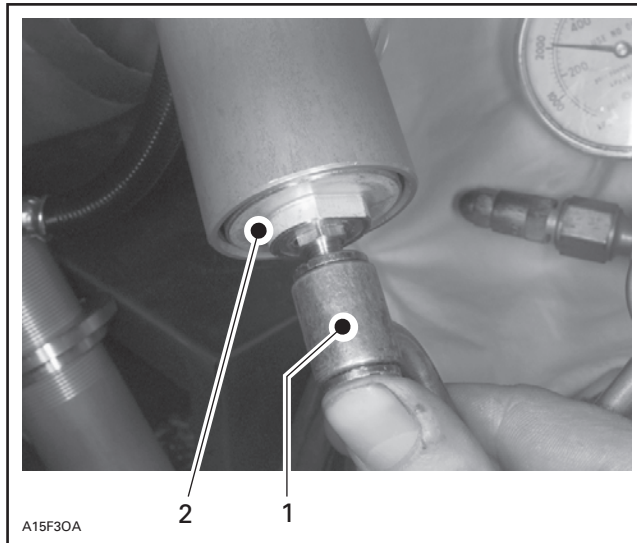
Assembly and Installation

For assembly and installation, reverse the disassembly and removal procedures.

Gas Pressure Adjustment

Nitrogen (N_2) can now be added to reservoir body.

Preset pressure regulator to 2070 kPa (300 PSI), this gas pressure will restore the correct pressure for the damper.



1. Valve tip (Nitrogen)
2. Reservoir cap assembly

CAUTION: Do not exceed the recommended pressure value.

WARNING

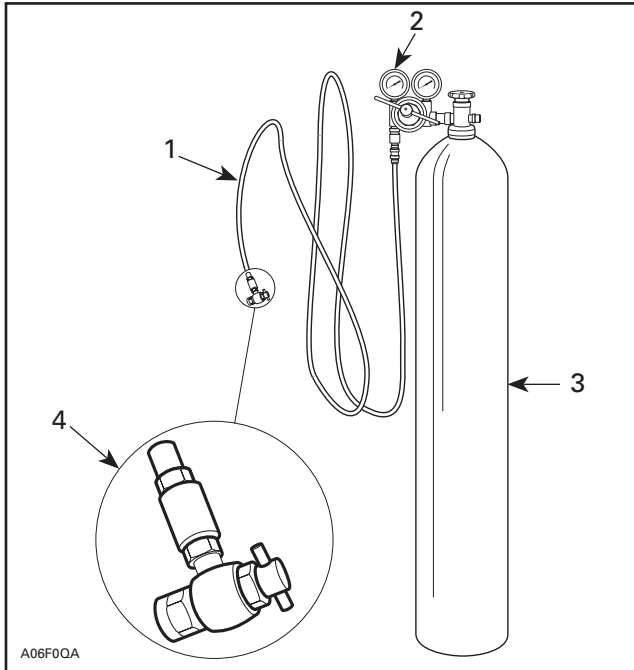
Whenever working with high pressure gas, use eye wear protection. Never direct gas pressure toward anybody.

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

NOTE: Carefully inspect damper for gas or oil leaks. Any leaks must be corrected before continuing.

Damper gas pressure can be confirmed by using a pressure gauge available through your local industrial gas supplier.



1. Automotive type air pressure hose
2. Two stage regulator, delivery pressure range 2070 kPa (300 PSI)
3. High pressure cylinder filled with industrial grade nitrogen
4. Valve tip

Adjustment

WARNING

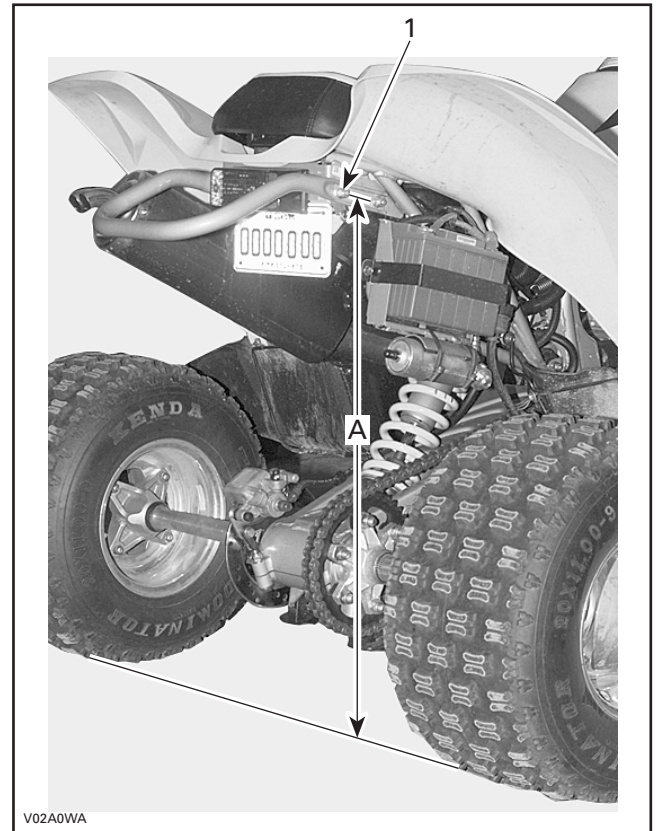
The rear shock includes a damper unit that contains high pressure nitrogen gas. **Do not attempt to disassemble or dispose of the damper.** Dispose as per your local environmental regulations.

Spring Preload

Spring preload may vary from rider to rider depending upon their weight. Preload can be changed by setting the two lock nuts up or down to compress the spring to different lengths. Shortening or lengthening the spring length will increase or decrease the preload.

Before adjusting the spring preload, first measure the ATV's height, without rider, from the rear bumper nut to the ground.

NOTE: Lift the vehicle by the rear bumper. The shock should be fully extended.



1. Rear bumper nut
- A. Measure between rear bumper nut and ground

Next, sit the rider with gear on the ATV and measure the distance between the same two points.

CAUTION: Add all other loads and accessories before measuring the height of the vehicle with the rider on. Do not exceed the total vehicle load allowed.

Calculate the difference between the two lengths. If the vehicle's height decreases more than 127 mm (5 in), increase the preload by 3 mm (1/8 in) increments. If the vehicle's height decreases of less than 102 mm (4 in), decrease the preload by 3 mm (1/8 in) increments. The optimum adjustment range is between 102 mm (4 in) and 127 mm (5 in) but, for heavier or more aggressive riders, it could be between 76 mm (3 in) and 102 mm (4 in).

Preload Adjustment:

To reduce:

- Turn the shock spring adjuster counterclockwise for a light load and smooth condition.

To increase:

- Turn the shock spring adjuster clockwise for a firmer ride and rough condition.

Section 08 SUSPENSION

Subsection 03 (REAR SUSPENSION)

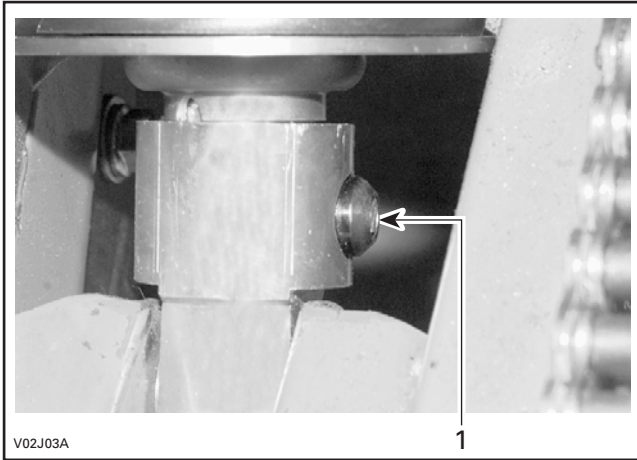
Rebound Damping:

To reduce:

- Turn the shock adjuster counterclockwise for a light load and smooth condition.

To increase:

- Turn the shock adjuster clockwise for a firmer ride and rough condition.



1. Adjuster

NOTE: The adjuster tool is included in the tool kit.

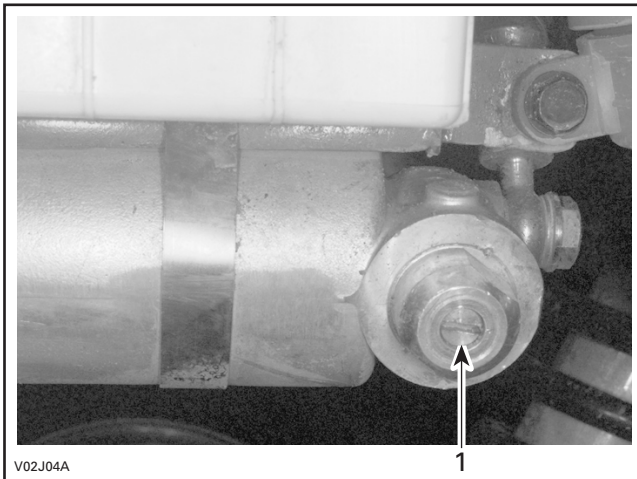
Compression Damping:

To reduce:

- Turn the damper adjuster counterclockwise for a light load and smooth condition.

To increase:

- Turn the damper adjuster clockwise for a firmer ride and rough condition.



1. Adjuster

2, SWING ARM

Removal

Lift rear of vehicle until rear shock absorber is fully extended.

Install a jack stand or a block under the frame to support the vehicle.

Remove rear axle and drive chain. Refer to FINAL DRIVE.

Remove lower bolt **no. 6** retaining shock.

On the LH side, unscrew both nuts **no. 14** and washer **no. 15**.

Remove the swing arm shaft **no. 16**.

Pull swing arm out of frame.

Inspection

Check condition of swing arm. Inspect for distortion, cracks or damage.

Check condition of bushings **no. 17** and O-rings **nos. 18** and **19**. Change if necessary.

Check swing arm shaft for rust, cracks, bend or other damage. Change if necessary.

Installation

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

Insert O-rings **no. 19** in the groove into frame.

Place O-rings **no. 18** on bushings **no. 17** then install the swing arm.

Install the swing arm shaft **no. 16** with washer **no. 20** then push the O-rings **no. 18** between frame and bushings.

Install washer **no. 21** and the nut **no. 15**. Torque to 100 N•m (74 lbf•ft) then, unscrew the nut a quarter turn.

NOTE: Check if the swing arm moves freely.

Install the other nut **no. 14** and torque to 100 N•m (74 lbf•ft).

NOTE: Take the first nut with a key when the second nut is torqued.

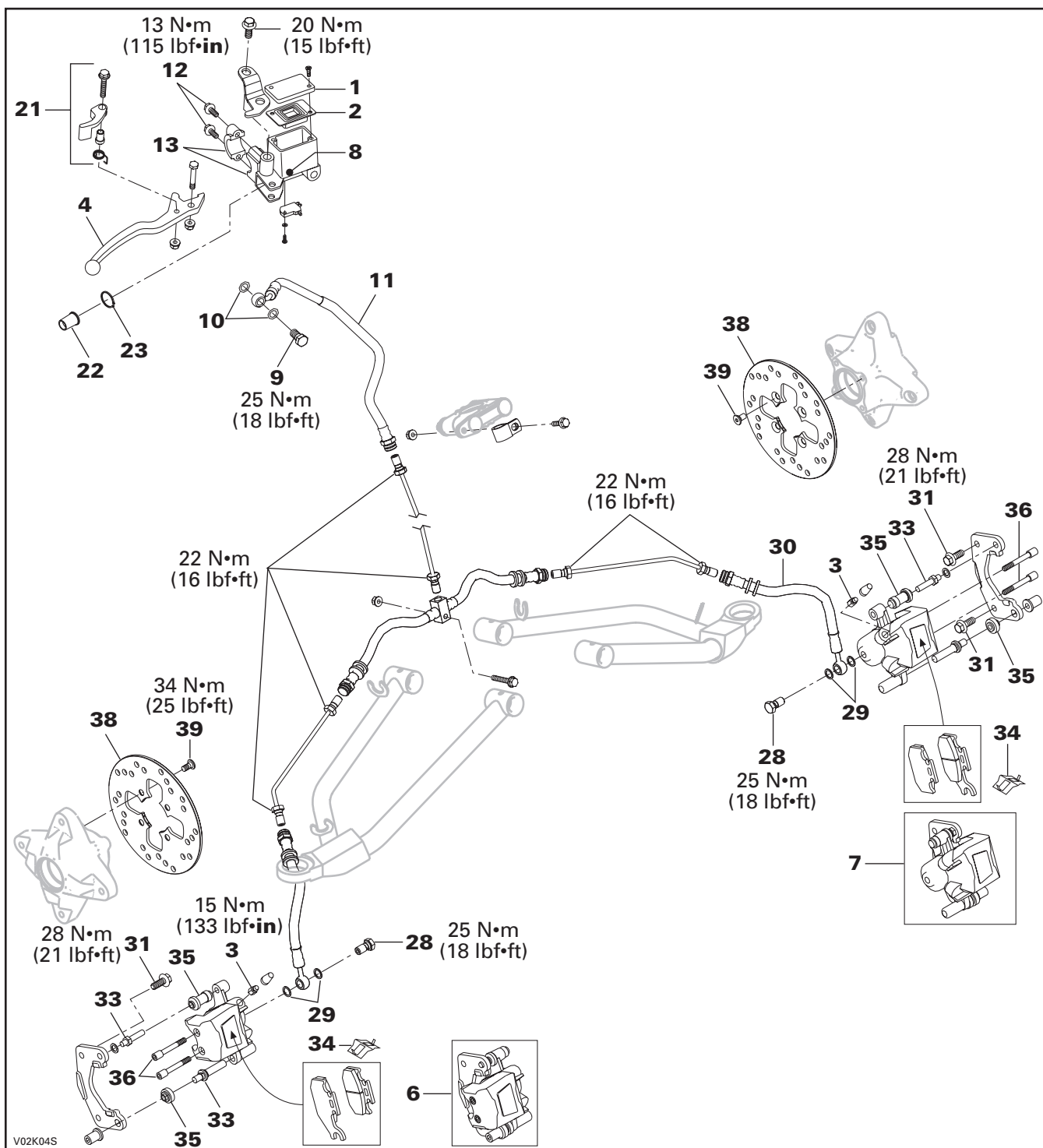
Install rear shock, axle and drive chain.

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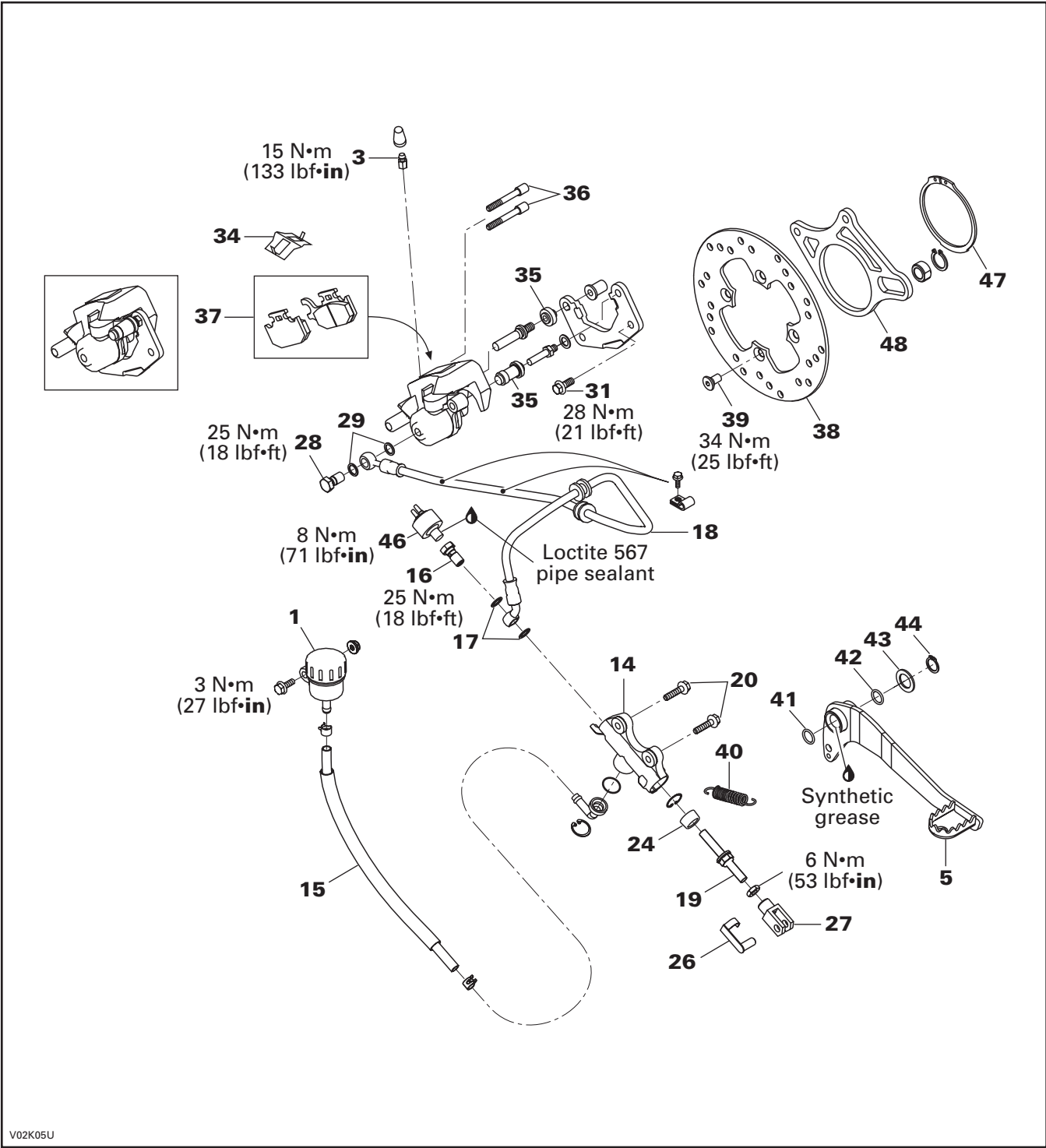
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HYDRAULIC BRAKES

FRONT BRAKES



REAR BRAKE



GENERAL

Hydraulic Brakes System

The brake system consists of two separate circuits. Each system has its own master cylinder and reservoir.

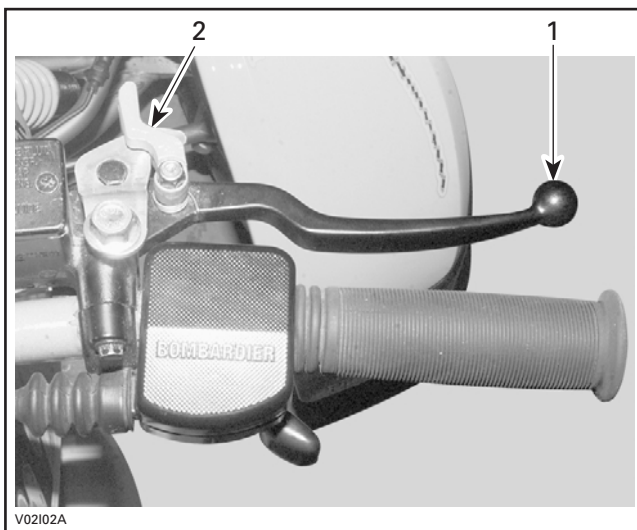
Both front and rear brakes are disc type.

WARNING

Periodically check the brake hoses for damages or leaks. Repair any damage before operate the vehicle.

Parking Device

The parking device operates the front brakes only. It is activated by a locking mechanism on RH brake lever.



1. RH brake lever
2. Locking mechanism

Brake Fluid Replacement

WARNING

A contaminated brake disc or pad reduces stopping power. Discard contaminated pads and clean a contaminated disc with a high quality brake degreasing agent.

CAUTION: Avoid spilling brake fluid on plastic, rubber or painted parts. Protect these parts with a rag when servicing brake system.

Brake Fluid Draining

Remove reservoir cover no. 1 with diaphragm no. 2.

Connect bleed hose to bleed valve no. 3.

Loosen bleed valve and pump brake lever no. 4 or brake pedal no. 5 until no more fluid flows out of bleed valve.

Brake Fluid Filling and Bleeding

Close bleed valve.

Fill reservoir with DOT 4 brake fluid.

CAUTION: Do not mix different types of brake fluid. Use only DOT 4 brake fluid.

Install a commercial available brake bleeder to brake valve. See the manufacturer's operating instructions.

Pump brake bleeder and loosen bleed valve. Close bleed valve and refill reservoir when the fluid level is low.

NOTE: Check fluid level often to prevent air from being pumped into the system.

Repeat the procedures until air bubbles don't appear in bleed hose.

NOTE: For the front brake system, switch to LH and RH caliper. Turn handle bar to full RH side when bleeding right caliper no. 6 and turn to the LH side for the left caliper no. 7. This helps the bleeder to reach air into the caliper.

Close bleed valve and operate brake lever no. 4 or brake pedal no. 5. If it still feels spongy, bleed system again.

Fill reservoir to the upper level with DOT 4 brake fluid.

Install diaphragm and cover on reservoir.

If brake bleeder is not available, use the following procedure.

Install a tube to bleed valve.

Open bleeder. Fill reservoir and pump lever until fluid freely flows out of the tube.

Close bleed valve.

Pump up system pressure with brake lever or brake pedal until lever or pedal resistance is felt.

Squeeze brake lever or depress brake pedal, open bleed valve and then close it.

Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

NOTE: Do not release brake lever or brake pedal until bleed valve has been closed. For the front brake system, switch to LH and RH caliper. Turn handle bar to full RH side when bleeding right caliper **no. 6** and turn to the LH side for the left caliper **no. 7**. This helps the bleeder to reach air into the caliper.

Release brake lever or brake pedal slowly.

Repeat the procedures until air bubbles don't appear in tube and lever or pedal is stiff.

MASTER CYLINDER

Removal

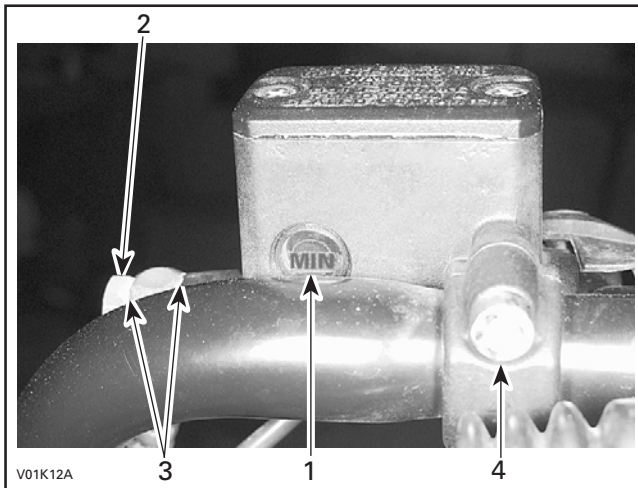
Front Brakes

Drain brake fluid from master cylinder **no. 8**.

Remove bolt **no. 9** and sealing washers **no. 10** retaining brake hose **no. 11** to master cylinder.

Discard sealing washers.

Remove screws **no. 12** from master cylinder holder **no. 13** and remove master cylinder from handlebar.



TYPICAL

1. Oil level mark
2. Bolt
3. Sealing washers
4. Remove screws

Rear Brake

Remove RH foot protector. Refer to BODY.

Unplug brake switch connectors.

Drain brake fluid from rear master cylinder **no. 14**.

Disconnect flexible hose **no. 15** from master cylinder and plug the end to avoid brake fluid spillage.

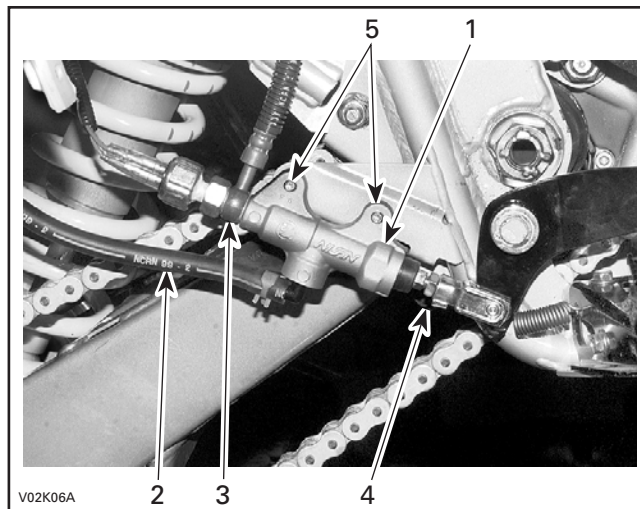
NOTE: At this time, check hoses and fittings for damages or leaks.

Remove banjo fitting **no. 16** and sealing washers **no. 17** retaining brake hose **no. 18** to master cylinder.

Discard sealing washers.

Unhook push rod **no. 19** from brake pedal **no. 5**.

Remove bolts **no. 20** retaining master cylinder to frame.



1. Master cylinder
2. Flexible hose
3. Rear brake hose
4. Push rod
5. Remove bolts

Disassembly

Front Master Cylinder

Remove brake lever **no. 4** and locking mechanism **no. 21** for parking device.

Remove piston boot **no. 22**, snap ring **no. 23**, master piston and spring.

Rear Master Cylinder

Remove boot **no. 24** from master cylinder.

Remove snap ring **no. 25** and push rod **no. 19** using snap ring pliers.

Remove master piston and spring.

Inspection and Lubrication

Discard any remaining fluid inside reservoir.

Clean reservoirs, master pistons and master cylinders thoroughly with clean brake fluid.

Check:

- boots for crack
- springs for damage
- piston cups for wear, deterioration or damage
- master cylinders and pistons for scoring, scratches or other damage.

Change part(s) if necessary.

Check locking pin **no. 26** for excessive wear, replace if necessary.

NOTE: If master cylinder is damaged or leaking, replace as an assembly.

Assembly

Front Master Cylinder

Coat master piston and piston cups with clean brake fluid.

Install:

- spring onto master piston
- master piston into master cylinder
- snap ring into groove in the master cylinder
- boot into master cylinder and the groove in piston.

Apply silicone grease to the brake lever contacting surface of the piston.

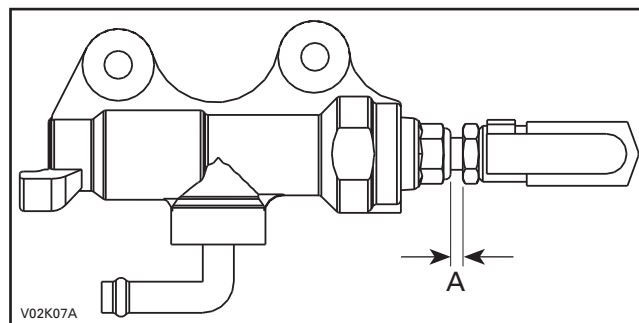
Install brake lever and locking mechanism.

NOTE: Apply silicone grease on lever pivot bolt.

Rear Master Cylinder

For the rear master cylinder use the same procedure that front master cylinder, however pay attention to the following:

If push rod yoke **no. 27** is reinstalled, adjust push rod length, see the following illustration.



A. $3 \pm 1 \text{ mm}$ ($1/8 \pm 1/32 \text{ in}$)

Installation

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

Front Brakes

Place the master cylinder **no. 8** 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 then lower bolt.



TYPICAL

Connect brake hose **no. 11** to master cylinder with bolt **no. 9** and new sealing washers.

Bleed front brake system.

Check for leaks and make sure the brakes operate normally before driving.

Section 09 BRAKES

Subsection 02 (HYDRAULIC BRAKES)

Rear Brake

Install master cylinder to frame.

Install rear brake hose **no. 18** to master cylinder using new sealing washers.

Connect flexible hose from master cylinder.

Fill up reservoir with clean brake fluid.

CAUTION: Do not mix different types of brake fluid. Use only DOT 4 brake fluid.

Bleed rear brake system.

Check for leaks and make sure the brakes operate normally before driving.

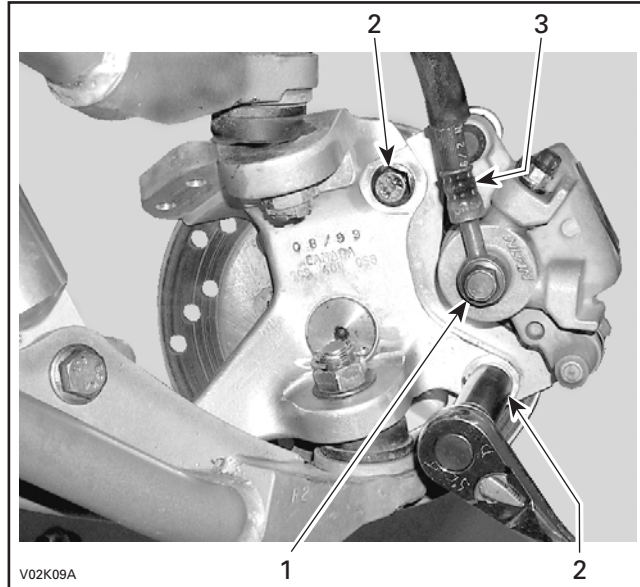
CALIPER

Removal

Loosen wheel nuts.

Raise vehicle and support it securely.

Remove wheels.



1. Remove bolt and washers
2. Unscrew bolts
3. Brake hose

Disassembly

Remove brake pads, see the following section.

Remove:

- caliper bracket **no. 32**
- slide pins **no. 33**
- pad spring **no. 34**.

Place rag over piston.

Place caliper body with piston down and apply small squirts of air pressure to the fluid inlet to remove piston.

WARNING

Do not use high pressure air or bring nozzle too close to inlet.

Remove piston seal.

CAUTION: Be careful not damage piston sliding surface.

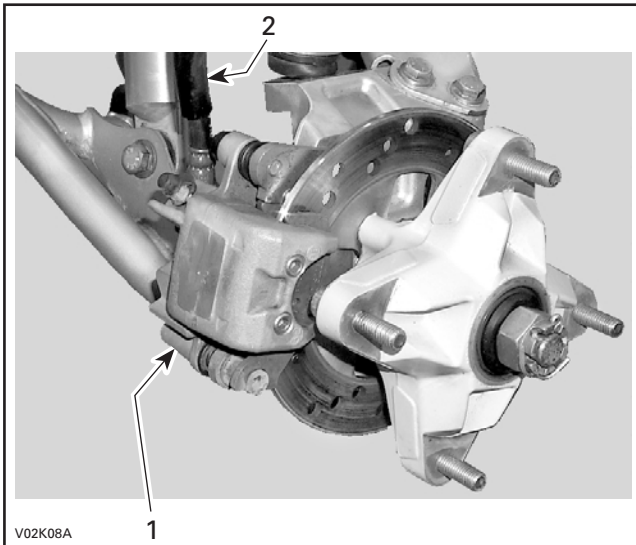
Clean piston grooves, caliper cylinder and piston with clean brake fluid.

Clean slide pins with brake cleaner and a rag.

Inspection

If boots **no. 35** are deteriorated or hard, replace by the new ones.

Check caliper cylinder and piston for scratches, rust or other damages. If so, replace caliper.



RH FRONT BRAKE

1. Caliper
2. Brake hose

Drain brake fluid from brake system.

Remove bolt **no. 28** with sealing washers **no. 29** and detach brake hose **no. 18** or **no. 30** from caliper.

Catch spilled fluid with a rag.

Unscrew bolts **no. 31** retaining caliper to knuckle and remove caliper. Discard bolts.

Assembly

Coat piston seal with clean brake fluid and install it into piston grooves in caliper.

Coat piston with clean brake fluid and install into cylinder with the closing toward caliper body.

Apply silicone grease into sliding bores and install slide pins.

NOTE: Make sure that rubber boots **no. 35** are correctly installed in slide pins grooves.

Install pad spring, caliper bracket and pads.

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.

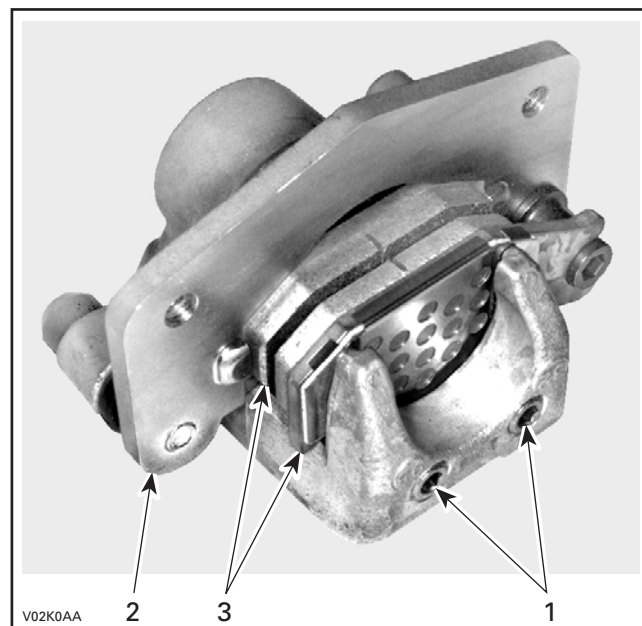
BRAKE PADS

Removal

Raise vehicle and support it securely.

Remove wheels.

Loosen pad pins **no. 36**.



- 1. Pad pins
- 2. Caliper bracket
- 3. Pads

Remove caliper from knuckle.

CAUTION: Don't let the caliper hang by the hose and don't stretch or twist the hose.

It's very important to clean remaining O.D. of piston out from caliper with brake fluid before pushing the piston back in. Make sure the piston is free of any contaminant and is shiny.

Push piston all the way in to allow installation of new pads.

Unscrew pad pins and remove pads **no. 37**.

Discard pad pins.

Section 09

BRAKES

Subsection 02 (HYDRAULIC BRAKES)

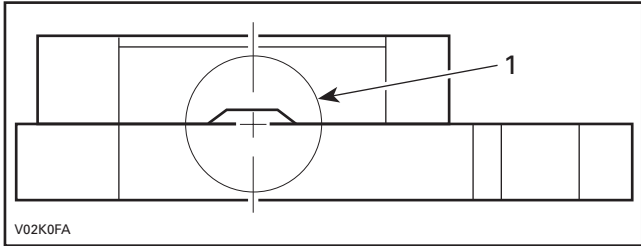
Inspection

CAUTION: Do not clean brake pads in petroleum based solvent. Use brake system cleaner. Soiled brake pads must be replaced by new ones.

Measure brake pad lining thickness.

Brake pads must be replaced when lining is 1 mm (1/32 in) thick or less, or, look the hollow places on both sides on the pad lining.

There are four hollow places on one set of brake pads. When the pad wear reaches one of the hollow places, the pad change is necessary even if the pad wear does not reach another hollow place.



1. Hollow place

BRAKE PAD LINING MINIMUM THICKNESS	1 mm (1/32 in)
---------------------------------------	----------------

CAUTION: Brake pads must always be replaced in pairs.

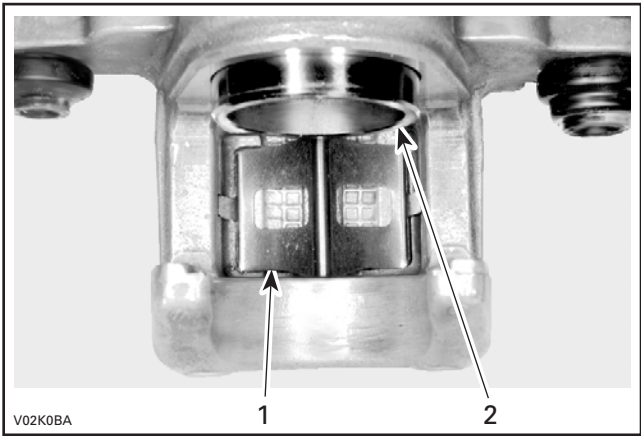
 **WARNING**

Avoid getting oil or grease on brake pads. Contaminated brake pads can affect stopping capacities. Discard any contaminated pads.

Installation

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

Make sure that pad spring **no. 34** is in position.



1. Pad spring
2. Piston

Install new brake pads.

Install new pad pins by pushing in the pads against pad spring to align pad slots in the pads and caliper body.

Install brake caliper so the disc is positioned between pads.

NOTE: Be careful not to damage pads and that pads are correctly inserted in their location.

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. The pads must rest flat on the disk.

BRAKE DISC

Inspection

Brake discs **no. 38** 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 3.5 mm (0.13 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	3.5 mm (.13 in)
DISC RUN OUT (MAX.)	0.5 mm (.02 in)

Removal

Front Brake Disc

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.

Wheel hub has to be removed from vehicle to replace brake disc Refer to FRONT DRIVE.

Remove screws **no. 39** retaining brake disc **no. 38** to wheel hub. Discard screws.

NOTE: Heat up disc around screws to facilitate removal.

Rear Brake Disc

Refer to FINAL DRIVE for brake hub removal instructions.

Installation

Install brake disc on wheel hub and tighten in a criss-cross sequence.



Install new self-locking screws and torque screws **no. 39** to 34 N•m (25 lbf•ft).

BRAKE LEVER

Removal and Installation

Use the same procedure that the front master cylinder.

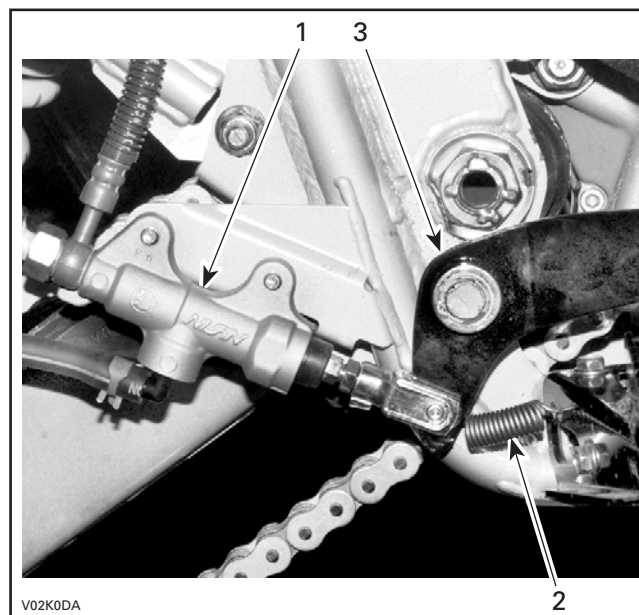
BRAKE PEDAL

Removal

Remove RH side foot protector.

Refer to BODY for removal procedure.

Unhook the return spring **no. 40**.



1. Master cylinder
2. Return spring
3. Brake pedal

Remove circlip **no. 41**, washer **no. 42** and O-ring **no. 43** then remove pedal **no. 5** from pivot.

Remove the O-ring **no. 44** on the pivot.

NOTE: Clean O-ring and pivot pin with BOMBARDIER LUBE (P/N 293 600 016).

Installation

For installation, reverse the removal procedure.

Check O-rings for damage, change if necessary. Apply synthetic grease (P/N 293 550 018).

Section 09 BRAKES

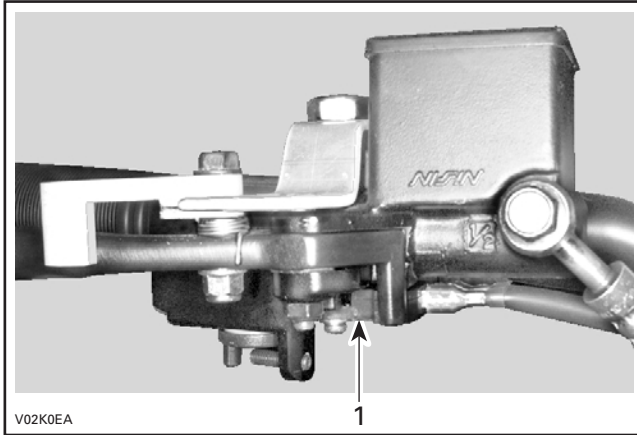
Subsection 02 (HYDRAULIC BRAKES)

BRAKE LIGHT SWITCH

Removal

Front Brake Light Switch

The front brakes switch **no. 45** is located on the master cylinder and cannot be adjusted. Check that switch is securely installed and operates rear light properly.



1. Front brake light switch

Rear Brake Light Switch

The rear brake switch is located on the rear master cylinder banjo fitting **no. 16**.

The rear brake light switch **no. 46** cannot be adjusted.

Remove RH foot protector. Refer to BODY for removal procedure.

Disconnect connectors.

Unscrew rear brake light switch **no. 46** from banjo fitting **no. 16**. Catch spilled fluid with a rag.

Installation

For installation, reverse the removal procedure.

NOTE: Apply pipe sealant on threads.

Bleed the brake system.

REAR CALIPER BRACKET

Removal

Remove brake hub. Refer to FINAL DRIVE.

Remove the large circlip **no. 47**.

Pull the caliper bracket **no. 48**.

Inspection

Check for wear or other damage on the eccentric bearing carrier and on the bracket. Replace parts if free play is excessive.

Installation

For installation, reverse the removal procedure.

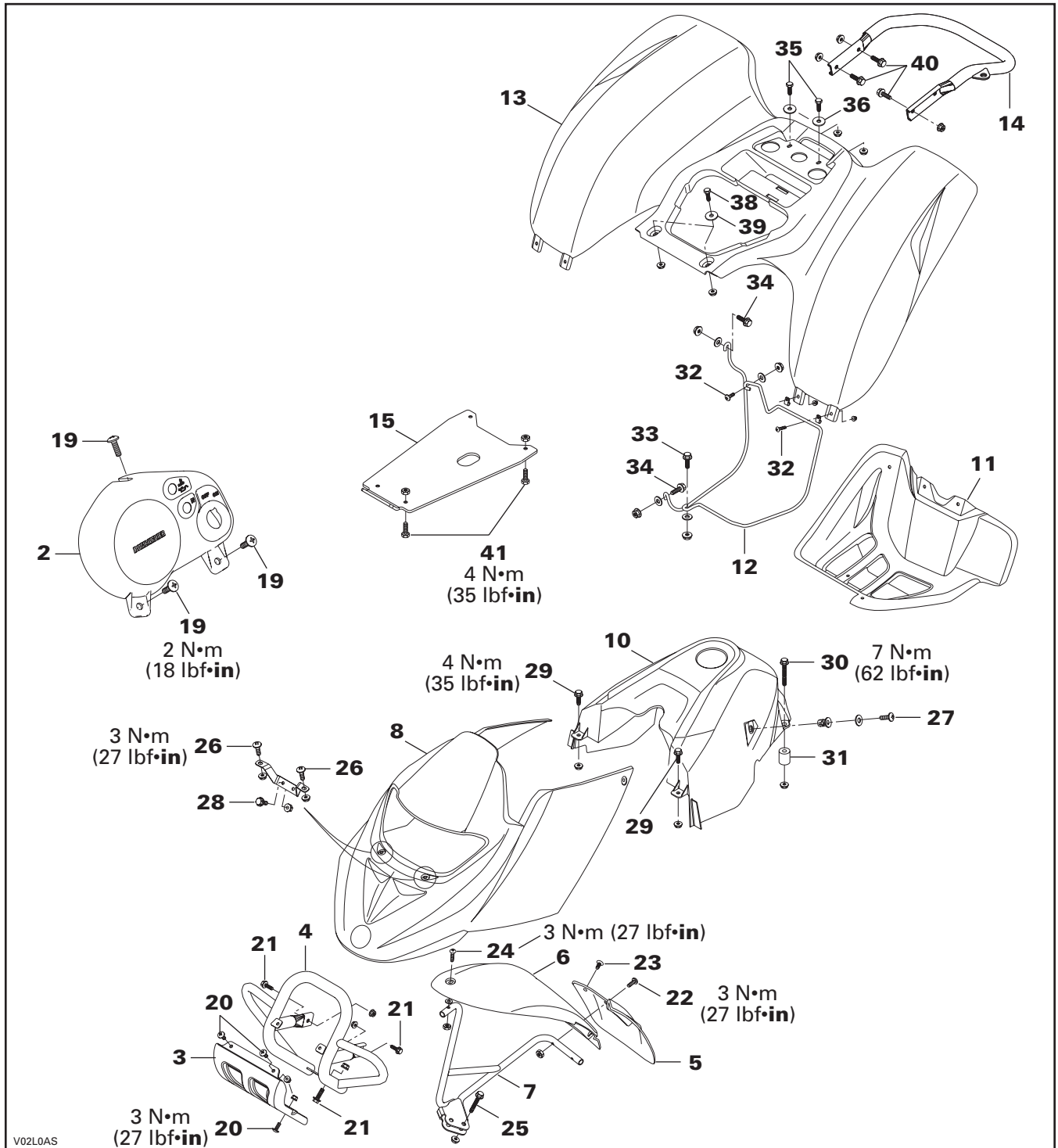
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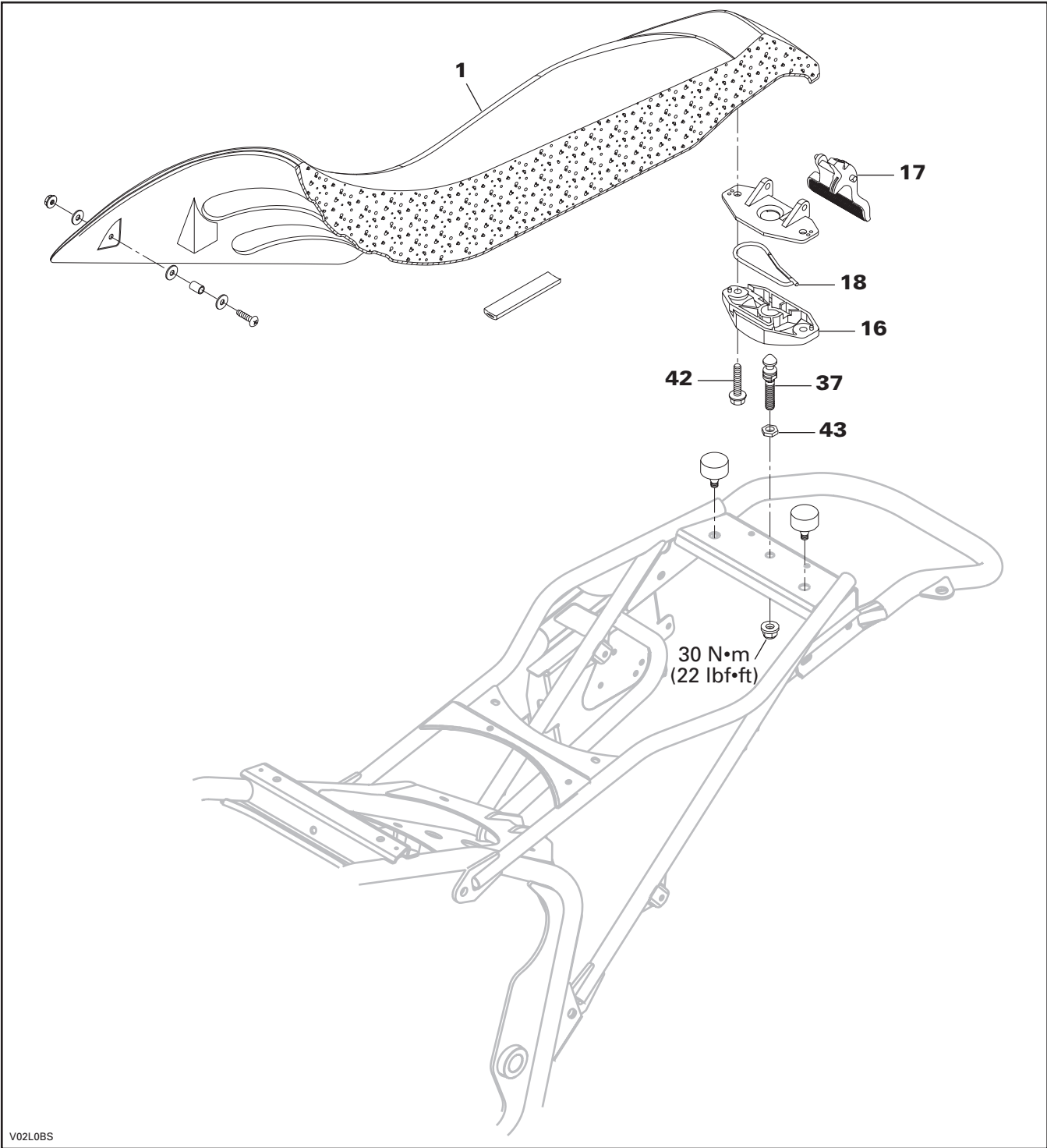
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BODY

BODY PARTS



SEAT

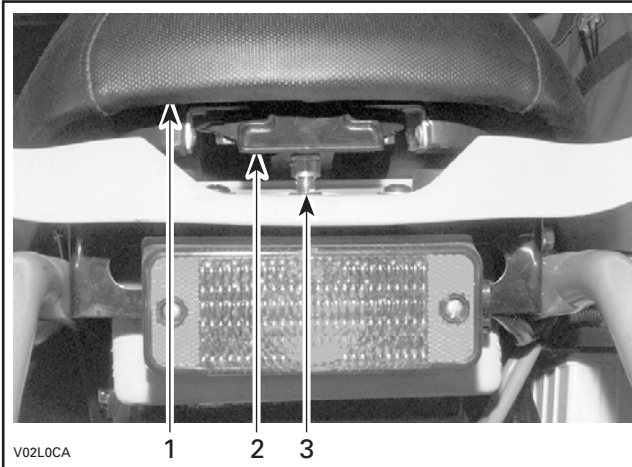


V02L0BS

1, SEAT

Removal

Pull latch upward while gently lifting rear of seat. Continue lifting movement until you can release the front retaining devices, then, completely remove seat.



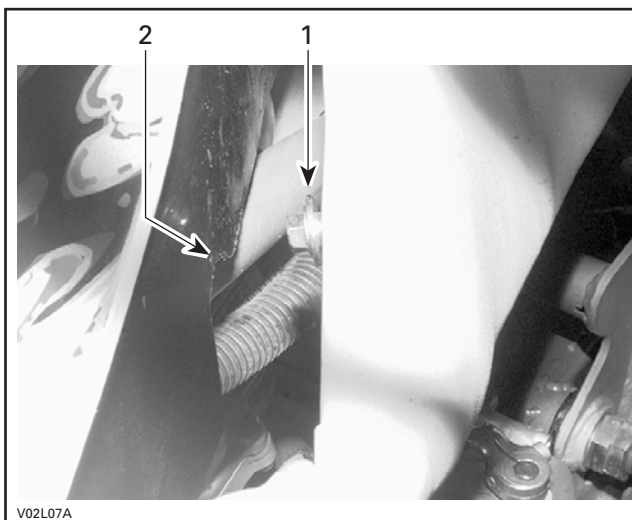
1. Seat
2. Latch
3. Seat lock pin

Installation

Insert seat front tab into hook. Pull latch lever to insert it over the rear lock pin. Release latch lever then firmly push on rear of the seat to relatch.

⚠ WARNING

Make sure both front pins are properly hooked on frame before riding.



1. Seat latch
2. Body hook

⚠ WARNING

Periodically, verify the seat lock pin and tighten if needed. Make sure seat is securely latched before riding.

2, DASHBOARD

Removal

Remove screws no. 19.
Remove ignition switch.
Unplug indicator lamps connectors.

Installation

Installation is the reverse order of removal.

3, FRONT SKID PLATE

Removal

Remove screws no. 20.

Installation

Installation is the reverse order of removal.

4, FRONT BUMPER

Removal

Remove front skid plate.
Remove bolts no. 21.

Installation

Installation is the reverse order of removal.

5, MUDGUARD

Removal

Remove screws no. 22 and dart no. 23.

Installation

Installation is the reverse order of removal.

Section 10 BODY/FRAME

Subsection 02 (BODY)

6,7, FRONT FENDER/SUPPORT

Removal

Front Fender

Remove screws nos. 22 and 24.

Front Fender Support

If necessary, remove mudguard and front fender.
Remove bolts no. 25 retaining the support to the knuckle.

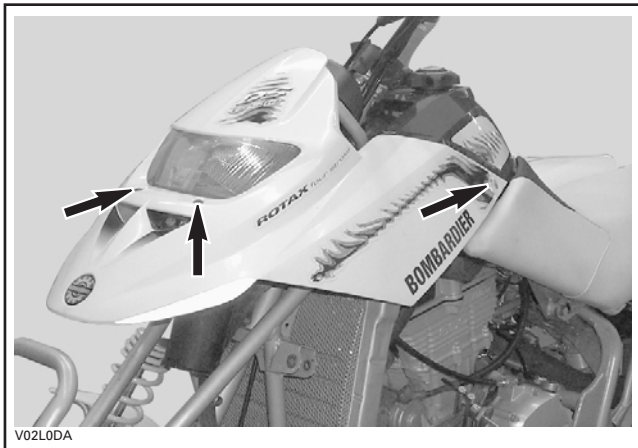
Installation

For the installation, reverse the removal procedure.

8, FRONT FACIA

Removal

Remove screws no. 26 under headlight.
Remove screws no. 27 on each side of fuel tank cover.



Installation

Installation is the reverse order of removal.

9, FRONT FACIA BRACKET

⚠ WARNING

Never perform this operation immediately after the engine has been run because the oil tank can be very hot. Wait until oil tank is warm.

Removal

Remove the front facia.
Unscrew the bolts no. 28 retaining the front facia bracket to the oil tank.

Installation

For the installation, reverse the removal procedure.

10, FUEL TANK COVER

⚠ WARNING

Never perform this operation immediately after the engine has been run because the oil tank can be very hot. Wait until oil tank is warm.

Removal

Remove:

- seat
- front facia
- fuel tank cap.

On the front side, unscrew the bolts no. 29 retaining the fuel tank cover and oil tank.

On the rear side, unscrew the bolts no. 30 and remove spacers no. 31.

Pull fuel tank cover and fuel tank backward then remove fuel tank cover.

Installation

Installation is the reverse order of removal.

11, FOOT PROTECTOR

Removal

Unfasten screws nos. 32 and 33 then remove foot protector.

Installation

Installation is the reverse order of removal.

NOTE: Install all bolts before torque.

12, FOOT PROTECTOR SUPPORT

Removal

Remove foot protector.

Unscrew bolts no. 34 retaining support to the frame.

Installation

Installation is the reverse order of removal.

NOTE: Install all bolts before torque.

13, REAR FENDER

Removal

Remove:

- seat
- screws **no. 35** and washers **no. 36** near the latch stud **no. 37**
- screws **no. 38** and washers **no. 39** located in front of air box cover
- screws **no. 32** retaining foot protector to rear fender.

Installation

Installation is the reverse order of removal.

14, REAR BUMPER

Removal

Remove screws **no. 40** then the screw retaining rear bumper and muffler.

Installation

Installation is the reverse order of removal.

15, ENGINE SKID PLATE

Inspection

The skid plate protects the engine. Check for damage, cracks or looseness.

Change if skid plate is damaged or cracked.

Removal

Under vehicle, remove bolts **no. 41**.

Installation

Installation is the reverse order of removal.

NOTE: Install all bolts before torque.

16,17,18, LATCH BASE/LATCH LEVER/SPRING

Removal

Latch Base

Remove bolts **no. 42** and separate latch base from latch lever and spring.

Latch Lever

Remove latch base.

Separate latch lever from spring.

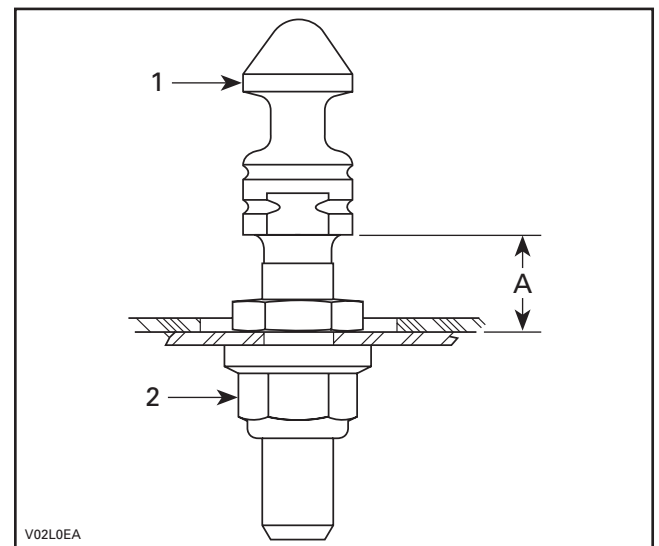
Spring

Remove latch base.

Separate spring from latch base and latch lever.

SEAT ADJUSTMENT

For latch stud **no. 37** adjustment, unscrew the latch stud nut **no. 43** 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. 14 ± 2 mm (9/16 $\pm$ 5/64 in)

Torque the latch stud nut.

SEAT COVER REPLACEMENT

Remove the old seat cover. Check the foam and replace if necessary.

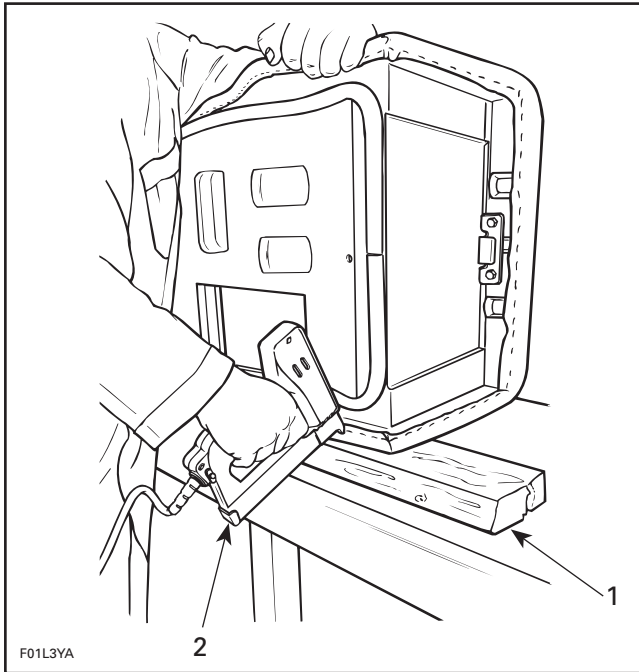
Install staples with an electric tacker such as Arrow tacker no. ETN-50 or with a manual tacker such as Arrow tacker no. T-50.

NOTE: For an easier installation, it's highly recommended to use an electric tacker.

Section 10 BODY/FRAME

Subsection 02 (BODY)

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.

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 ACRYL-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.

PLASTIC MAINTENANCE/REPAIR

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.

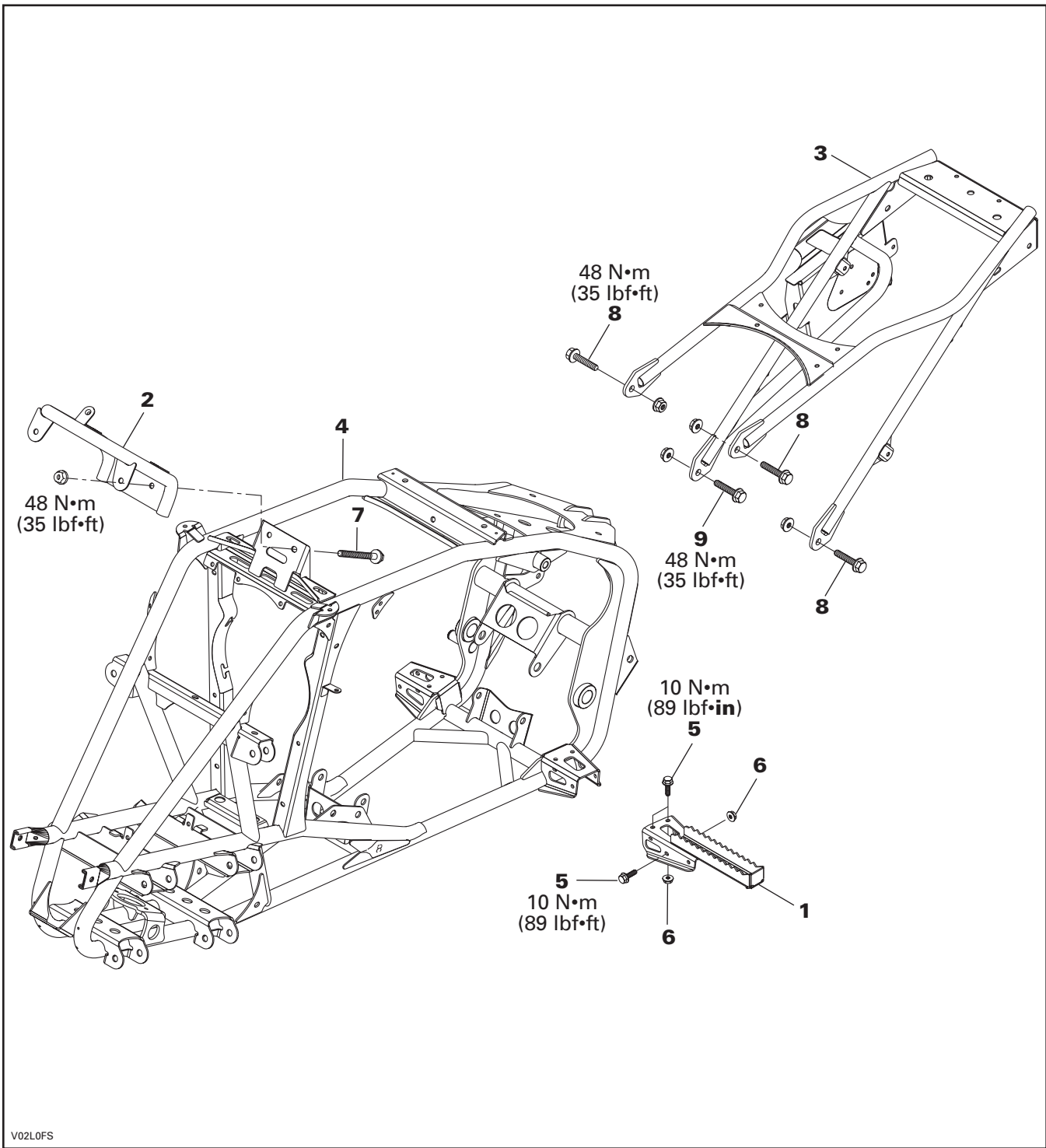
REPAIR

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
- Fuel tank cover - Front facia - Front and rear fender - Steering cover	HIGH DENSITY POLYETHYLENE
- Front skid plate - Foot protector - Skid plate (under vehicle)	LOW DENSITY POLYETHYLENE

FRAME



Section 10 BODY/FRAME

Subsection 03 (FRAME)

1, FOOTREST

Removal

Unfasten foot protector supports from footrest.

Remove mounting flanged bolts **no. 5** and flanged nuts **no. 6**.

Inspection

Check for cracks or bent plate. Change or repair if necessary.

Installation

Installation is essentially the reverse of removal procedure.

2, DASHBOARD SUPPORT

Removal

Remove:

- dashboard
- fuel tank (refer to FUEL CIRCUIT)
- headlight (refer to ACCESSORIES)
- handle bar
(refer to STEERING/CONTROL SYSTEM)
- half housing bolts **no. 7**, stopper plates, half housings and housing bushings retaining steering column
(refer to STEERING/CONTROL SYSTEM).

Pull out the dashboard support.

Inspection

Check for cracks or bent tube. Change or repair if necessary.

Installation

For installation, reverse the removal procedure.

3, REAR FRAME EXTENSION

Removal

Remove:

- rear fender (refer to BODY)
- battery and all wire attached to frame extension
- muffler (refer to REMOVAL AND INSTALLATION)
- rear shock absorber reservoir
(refer to REAR SUSPENSION)
- rear brake fluid reservoir
(refer to HYDRAULIC BRAKES)
- rear brake hose
- upper bolts of foot protectors supports
(refer to BODY)
- air intake silencer (refer to CARBURETOR AND AIR INTAKE SILENCER)
- starting solenoid
- brake light.

Unscrew bolts **nos. 8** and **9** retaining rear extension frame to the frame.

Inspection

Check for cracks, bent tube or other damage. Repair or change if necessary.

Installation

Installation is the reverse of removal procedure.

NOTE: On the RH side, the lower bolt **no. 9** must be installed with the head inside the frame.

4, FRAME

Removal

Remove all parts. Refer to the proper sections.

Installation

For installation, reverse the removal procedure.

Cleaning

Clean frame and rear extension frame 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).

CAUTION: Before performing electrical welding anywhere on the vehicle, unplug the electronic module. Also unplug the negative cable and the voltage regulator. This will protect the electronic module 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 x 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			7449
ENGINE	Engine Type		BOMBARDIER-ROTAX 654,4 Stroke, Double Overhead Camshaft, Bush Chain Drive, Liquid Cooled
	Starting System		Electric (start in any gear with clutch applied or on neutral)
	Number of Cylinder(s)		1
	Number of Valves		4 Bucket Tappet-Operated Valves
	Decompressor Type		Automatic
	Bore	Standard mm (in)	100 (3.94)
	Stroke	mm (in)	83 (3.27)
	Displacement	cm ³ (in ³)	652 (39.7)
	Compression Ratio		9.7: 1
	Calibration Engine Speed		13 + 1
	Intake Valve Opening		17° BTDC
	Intake Valve Closing		45° ABDC
	Exhaust Valve Opening		47° BBDC
	Exhaust Valve Closing		15° ATDC
	Valve Clearance When Engine Cold (maximum 35°C/95°F)	Exhaust/Intake mm (in)	0.1 to 0.15 (0.004 to 0.006)
	Valve Length	Intake mm (in)	90.91 and 90.76 (3.579 and 3.573)
		Exhaust mm (in)	90.65 and 90.05 (3.568 and 3.545)
	Plate Diameter	Intake mm (in)	36 (1.42)
		Exhaust mm (in)	31 (1.22)
	Shaft Diameter	Intake mm (in)	5.95 (0.24)
		Exhaust mm (in)	5.935 (0.23)
	Valve Seat Angle	Intake mm (in)	45°
		Exhaust mm (in)	30°
	Piston Ring End Gap	New Minimum mm (in)	0.2 (0.008)
		New Maximum mm (in)	0.4 (0.016)
		Wear Limit mm (in)	1 (0.04)
	Ring/Piston Groove Clearance	New Minimum mm (in)	0.03 (0.0012)
		New Maximum mm (in)	0.065 (0.0026)
		Wear Limit mm (in)	0.15 (0.006)
	Piston/Cylinder Clearance	Wear Limit mm (in)	0.09 (0.004)
	Cylinder	New Minimum mm (in)	100 (3.9371)
		New Maximum mm (in)	100.012 (3.9376)
		Wear Limit mm (in)	100.03 (3.9382)
	Crankshaft Balance Factor		% 47 ± 3
	Crankshaft Deflection		mm (in) 0.1 (0.004)
	Connecting Rod Big End Axial Play	Wear Limit mm (in)	0.8 (0.794)
	Connecting Rod Small End I.D.	Wear Limit mm (in)	22.04 (0.868)
	Connecting Rod/Piston Pin Clearance	Wear Limit mm (in)	0.06 (0.002)
	Camshaft (intake and exhaust)	Bearing Point Ø mm (in)	21.95 (0.864)
		Cam Height mm (in)	39.7 (1.56)
	Timing Chain (gap from sealing face to piston of chain tensioner)		mm (in) 9.5 (0.374)
	Lubrication		Dry Sump Lubrication by Oil Pump Replaceable Oil Filter
	Oil Filter		Main-Flow Type
	Air Filter Type		Cleanable Synthetic Panelette/Foam
	Exhaust System	Type	Bombardier, Stainless Header Pipe Painted Steel Muffler
		Spark Arrester	USFS Approved

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL			7449
ELECTRICAL	Magnet/Generator			280 W @ 6000 RPM
	Ignition System Type			CDI (Capacitor Discharge Ignition)
	Spark Plug	Make and Type		NGK DR8EA
		Gap	mm (in)	0.65 (.026)
	Trigger Coil			190 - 300 Ω
	Battery Charging Coil			0.2 @ 0.5 Ω
	Ignition Coil	Primary		0.2 to 0.5 @ 20°C (68°F)
		Secondary		6 @ 13 KΩ
	Engine RPM Limiter			7700 (any gear in forward)
	Battery	Type		Dry Battery Type
		Voltage		12 Volts
		Nominal Rating		13 A•h
		Power Starter Output		0.9 KW
	Head Light			60/55 W, H4
	Taillight and Brake Light			8/27 W, 1157
Fuse	Fan		15 A	
	Main		25 A	
CARBURETION	Carburetor	Type		Mikuni Constant Depression Type with Manual Choke
		Model		BSR42
	Idle Engine Speed			1300 ± 100 RPM
	Main Jet			165
	Needle Jet			00
	Jet Needle			6BCY22-60-4
	Needle Valve and Seat			3.0 Hi Flow
	Pilot Jet			40
	Starter Jet No. 1 And No. 2			45 - Ø 1 (1.77 - Ø 0.039) mm (in)
	Main Air Jet			120
	Pilot Air Jet No. 1			110
	Pilot Air Jet No. 2			1.3 (0.05) mm (in)
	Clip Position Number			4
	Choke Plunger Position			2
	Adjustment	Preliminary Pilot Screw Turn		Position for Maximum Speed at Idle
		Idle Speed Preliminary Adjustment		At Least 1 Turn
		Float Level	± 0.5 mm	10
			± 0.020 in	0.394
	Fuel	Type		Super Unleaded Gasoline
Octane No.		91 (Ron + Mon)/2		
COOLING	Cooling Type			Liquid Cooled with Integrated Water Pump
	Radiator			Front Mounted
	Fan			Thermostatic
	Fan Thermostat	Opening Temperature		90°C (205°F)
		Closing Temperature		95°C (221°F)
	Engine Thermostat	Opening Temperature		85°C (185°F)
		Closing Temperature		75°C (167°F)
	Radiator Cap Opening Pressure			110 kPa (16 PSI)
TRANSMISSION	Transmission	Type		Integrated 5-Speed Constant Mesh Transmission
	Clutch			1 Multi-Disc
	Clutch Drum I.D.			145 (5.71) mm (in)
	Friction Plate			3.45 (0.1358) mm (in)
	Warpage (fall through a slot)			3.75 (0.1476) mm (in)
	Wear Limit of the Whole Package			27.5 (1.0827) mm (in)
	Steel Driven Plate			1.45 (0.0571) mm (in)
	Warpage (fall through a slot)			1.63 (0.0642) mm (in)
	Wear Limit of the Whole Package			11.5 (0.4528) mm (in)
	Clutch Spring Minimum Rate			27.4 mm @ 210 N (1.0787 in @ 47 lbf)
	Clutch Spring Minimum Length			43 (1.69) mm (in)

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL			7449
DRIVE TRAIN	Drive Chain			D.I.D. 530 VM
	Engine Pinion	Teeth		16
	Axle Sprocket	Teeth		40
	Rear Axle			Shaft Driven/Solid Axle
	Rear Axle Ratio			3.6: 1
STEERING/ CONTROL	Turning Radius			2.4 m (8 ft)
	Total Toe-Out (vehicle on ground)			2.6 ± 0.5 mm (0.102 ± 0.0197 in)
	Camber Angle			0°
	Tie-Rod Maximum Length Unengaged	± 5 mm		20
		± 0.197 in		0.787
	Tie-Rod Maximum Length	± 5 mm		451.5
± 0.197 in			17.775	
SUSPENSION	FRONT			
	Suspension Type			Independent Suspension — Double A-Arm
	Suspension Travel			305 mm (12 in)
	Shock Absorber	Qty		2
		Type		Oil
	Spring Free Length			363 mm (14.29 in)
	Spring Color Code			Black/White/Black
	Front Preload Adjustment			Seat of Spring Threaded
	REAR			
	Suspension Type			Rigid Swing Arm
	Suspension Travel			292 mm (11.5 in)
	Shock Absorber	Qty		1
		Type		Nitrogen
	Spring Free Length	Short		52.7 mm (2.07 in)
		Long		251.5 mm (9.90 in)
Spring Color Code	Short		Blue/Yellow/Black	
	Long		Blue/Red/Red	
Rear Preload Adjustment			Seat of Spring Threaded	
BRAKES	Front Brake	Qty		2
		Type		Nissin Hydraulic
	Rear Brake	Qty		1
		Type		Nissin Hydraulic
	Parking Device			RH Brake Lever Includes a Lock on Front Wheels
	Lining Material			Metallic
	Minimum Pad Thickness			1 mm (0.04 in) or Refer to the Mark on the Pad
	Minimum Brake Disk Thickness			3.5 mm (0.138 in)
	Maximum Brake Disk Warpage			0.5 mm (0.0197 in)
Caliper			Fixed	
TIRES AND WHEELS	TIRE			
	Pressure	Front	Recommended	34 kPa (5 PSI)
			Minimum	21 kPa (3 PSI)
		Rear	Recommended	34 kPa (5 PSI)
			Minimum	21 kPa (3 PSI)
	Minimum Tire Thread Depth			4 mm (0.16 in)
	Size	Front		533 x 178 x 254 mm (21 x 7 x 10 in)
		Rear		508 x 279 x 229 mm (20 x 11 x 9 in)
	WHEELS			
Size	Front		254 x 152 mm (10 x 6 in)	
	Rear		229 x 229 mm (9 x 9 in)	

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL		7449
DIMENSION	Overall Length		1956 mm (77 in)
	Overall Width	Front	1219.2 mm (48 in)
		Rear	1270 mm (50 in)
	Overall Height		1181 mm (46.5 in)
	Dry Weight		209 kg (460 lb)
	Total Vehicle Load Allowed		125 kg (275.5 lb)
	Wheel Base		1321 mm (52 in)
	Wheel Track	Front	1048 mm (41 in)
		Rear	994 mm (34 in)
	Front and Under Engine Ground Clearance		317.5 mm (12.5 in)
	Rear Rigid Axle Ground Clearance		121 mm (4.75 in)
CAPACITIES	LIQUID		
	Fuel Tank		12.5 L (3.3 U.S. gal)
	Fuel Tank Reserve		2.4 L (0.6 U.S. gal)
	Engine/Transmission Oil	Capacity	3 L (0.8 U.S. gal)
		Recommended	SAE 10W40, 4 Stroke Mineral Based Oil SH or SJ. Do Not Use Synthetic or Synthetic Blend Oil
	Hydraulics Brakes	Capacity	200 mL (6.8 U.S. oz)
		Recommended	Brake Fluid DOT 4, ONLY
	Cooling System	Capacity	1.75 L (0.58 U.S. gal)
		Recommended	Use Coolant Specially Designed for Aluminum Engine
	Ethylene-Glycol Concentration		60%
MATERIAL	Frame	Material	Steel
		Color	Grey
	Front Bumper	Material	Steel
		Color	Grey
	Front/Rear Fender	Material	High Density Polyethylene
		Color	Yellow
	Fuel Tank Cover	Material	High Density Polyethylene
		Color	Black
	Steering Cover	Material	Foam And Vinyl
		Color	Yellow
	Front Facia	Material	High Density Polyethylene
		Color	Yellow
	Air Box and Cover	Material	Low Density Polyethylene
		Color	Black
	Mudguard	Material	Synprene
		Color	Black
	Seat Cover	Material	Vinyl
		Color	Yellow/Black

Section 11 TECHNICAL DATA

Subsection 02 (ENGINE AND VEHICLE)

	VEHICLE MODEL		7449
TORQUE	ENGINE		
	Engine Support	M8	26 N•m (19 lbf•ft)
		M10	64 N•m (47 lbf•ft)
		M14	135 N•m (100 lbf•ft)
	Spark Plug		22 N•m (16 lbf•ft)
	Magnet Nut		180 N•m (133 lbf•ft)
	Starter		10 N•m (89 lbf•in)
	Starter Red (+) Cable		4 N•m (35 lbf•in)
	COOLING		
	Radiator Mount Screw/Nut		10 N•m (89 lbf•in)
	Radiator Protector		2.5 N•m (22 lbf•in)
	Temperature Sensor		35 N•m (26 lbf•ft)
	Water Pump Cover		10 N•m (89 lbf•in)
	Fan Mount Screw/Nut		3 N•m (27 lbf•in)
	Temperature Sender		35 N•m (26 lbf•ft)
	Oil Pressure Switch		15 N•m (133 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		135 N•m (100 lbf•ft) (MINIMUM)
	Rear Wheel Hub Nut		235 N•m (173 lbf•ft) (MINIMUM)
	WHEEL		
	Wheel Nuts		52.5 N•m (39 lbf•ft)
	STEERING/CONTROL		
	Upper/Lower A-Arm Lock Nut		60 N•m (48 lbf•ft)
	Tie Rod Ends		75 N•m (55 lbf•ft)
	Steering Arm (castellated nut)		75 N•m (55 lbf•ft)
	Steering Column Support Screws		24 N•m (17 lbf•ft)
	Handlebar Screws		24 N•m (17 lbf•ft)
	Flanged Bearing Bolts		10 N•m (89 lbf•in)
	SUSPENSION		
	Shock Absorber Bolt	Front	48 N•m (35 lbf•ft)
		Rear	85 N•m (63 lbf•ft)
	Front Upper Swing Arm		67 N•m (49 lbf•ft)
	Front Lower Swing Arm		67 N•m (49 lbf•ft)
	Rear Swing Arm LH First Nut		100 N•m (74 lbf•ft), Unscrew Nut a Quarter Turn
	Rear Swing Arm LH Nut		100 N•m (74 lbf•ft)
	BRAKE		
	Caliper Brake Screws		24 N•m (17 lbf•ft)
	Brake Disk Screws		34 N•m (25 lbf•ft)
	BODY/FRAME		
	Front Bumper		24 N•m (17 lbf•ft)
	Rear Extension Frame		48 N•m (35 lbf•ft)
	Footrest		10 N•m (89 lbf•in)
	Skid Plate		4 N•m (35 lbf•in)

WIRING DIAGRAM

WARNING

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

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.

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



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