

INTRODUCTION

This Shop Manual covers the following BOMBARDIER made SEA-DOO® 2004 watercraft models.

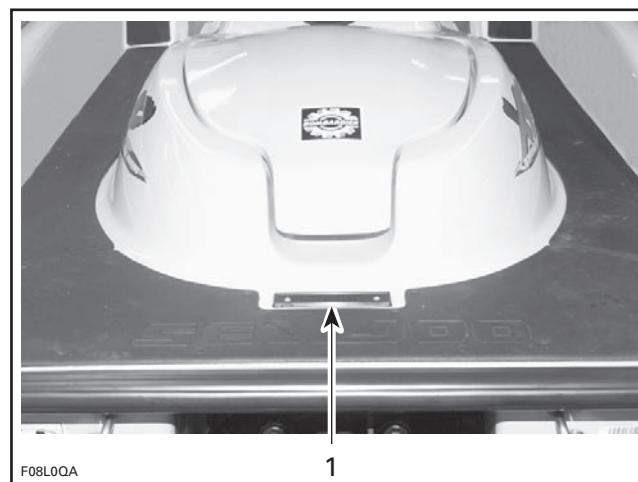
MODEL	ENGINE TYPE	MODEL NUMBER
GTI (blue jay)	717	6133
GTI International (blue jay)	717	6134
GTI LE (Sonora sand)	717	6135
GTI LE International (Sonora sand)	717	6136
GTI RFI (blue jay)	787 RFI	6137
GTI RFI International (blue jay)	787 RFI	6138
GTI RFI LE (Sonora sand)	787 RFI	6139
GTI RFI LE International (Sonora sand)	787 RFI	6140
GTX 4-TEC NA	1503	6147
GTX 4-TEC NA International	1503	6148
GTX 4-TEC Supercharged Limited International (blue pearl)	1503	6142
GTX 4-TEC Supercharged Limited (blue pearl)	1503	6141
GTX 4-TEC Supercharged (yellow)	1503	6143
GTX 4-TEC Supercharged International (yellow)	1503	6144
GTX 4-TEC Wakeboard Edition (viper red)	1503	6149
GTX 4-TEC Wakeboard Edition International (viper red)	1503	6150
RXP (apple green)	1503	6115
RXP International (apple green)	1503	5599
RXP (yellow)	1503	6162
RXP International (yellow)	1503	6163
XP DI (viper red)	947 DI	6151
XP DI International (viper red)	947 DI	6152

HULL IDENTIFICATION NUMBER (H.I.N.)

It is located on footboard at the rear of watercraft.



1. Hull Identification Number (H.I.N.)



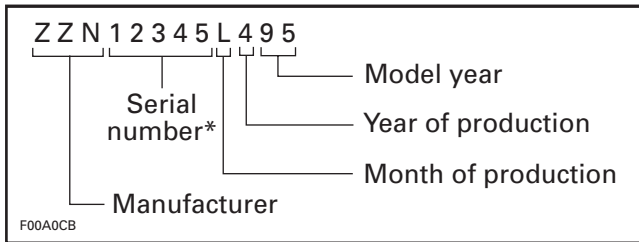
TYPICAL

1. Hull Identification Number (H.I.N.)

All Models

The Hull Identification Number is composed of 12 digits:

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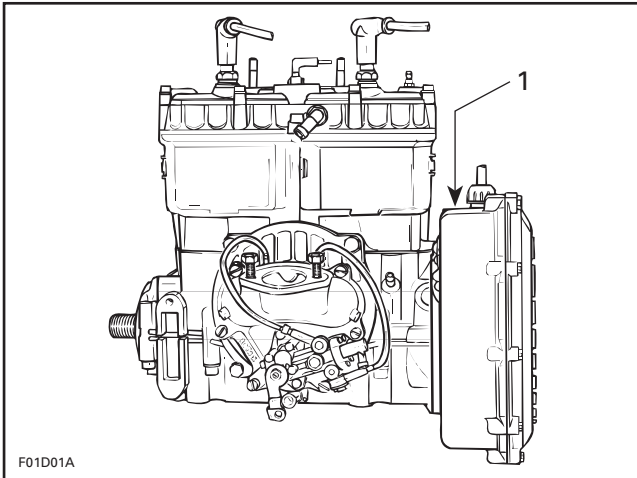


*A letter may also be used as a digit.

ENGINE IDENTIFICATION NUMBER (E.I.N.)

717 Engines

The Engine Identification Number is located on the upper side of the magneto housing.

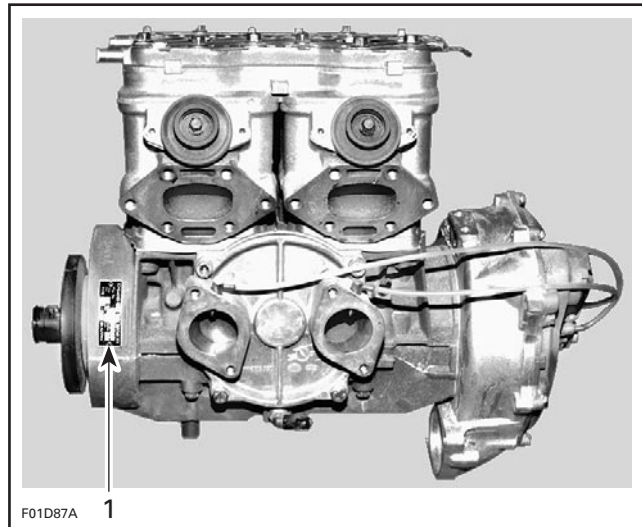


TYPICAL

1. Engine Identification Number (E.I.N.)

787 RFI Engines

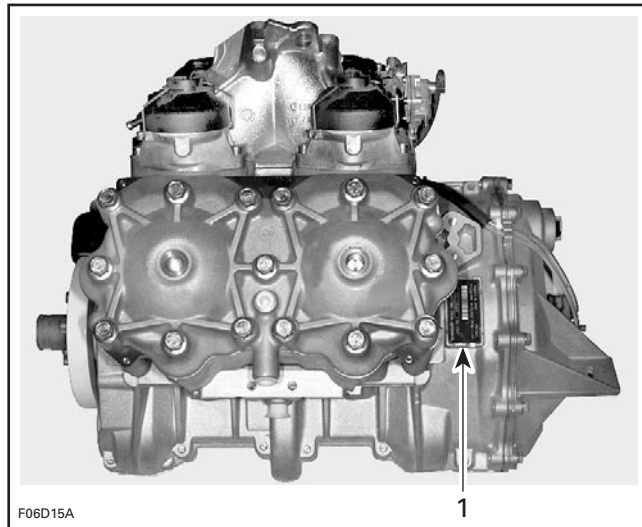
The Engine Identification Number is located on the upper crankcase on PTO side.



1. Engine Identification Number (E.I.N.)

947 DI Engines

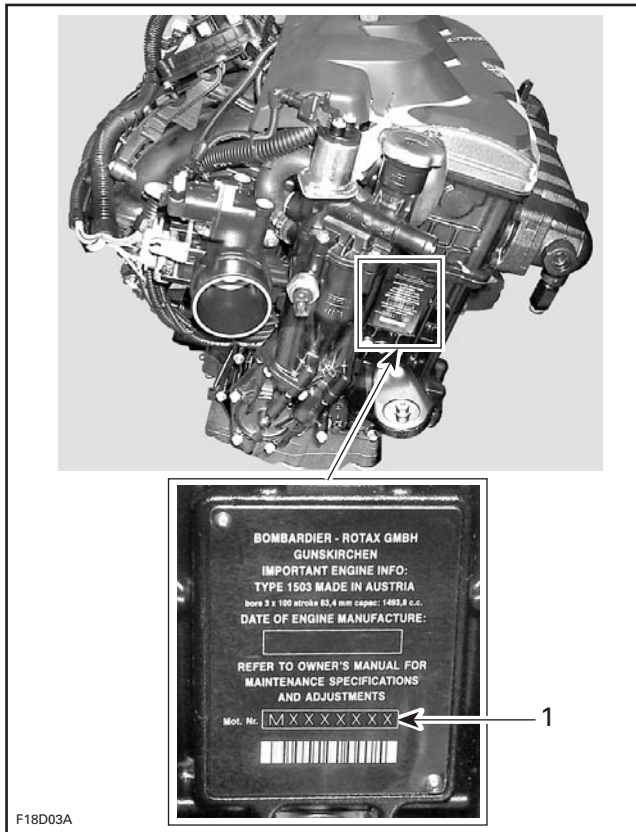
The Engine Identification Number is located on the upper crankcase on MAGNETO side.



1. Engine Identification Number (E.I.N.)

1503 Engines

The Engine Identification Number is located on front end of the engine.



F18D03A

1. Engine Identification Number (E.I.N.)

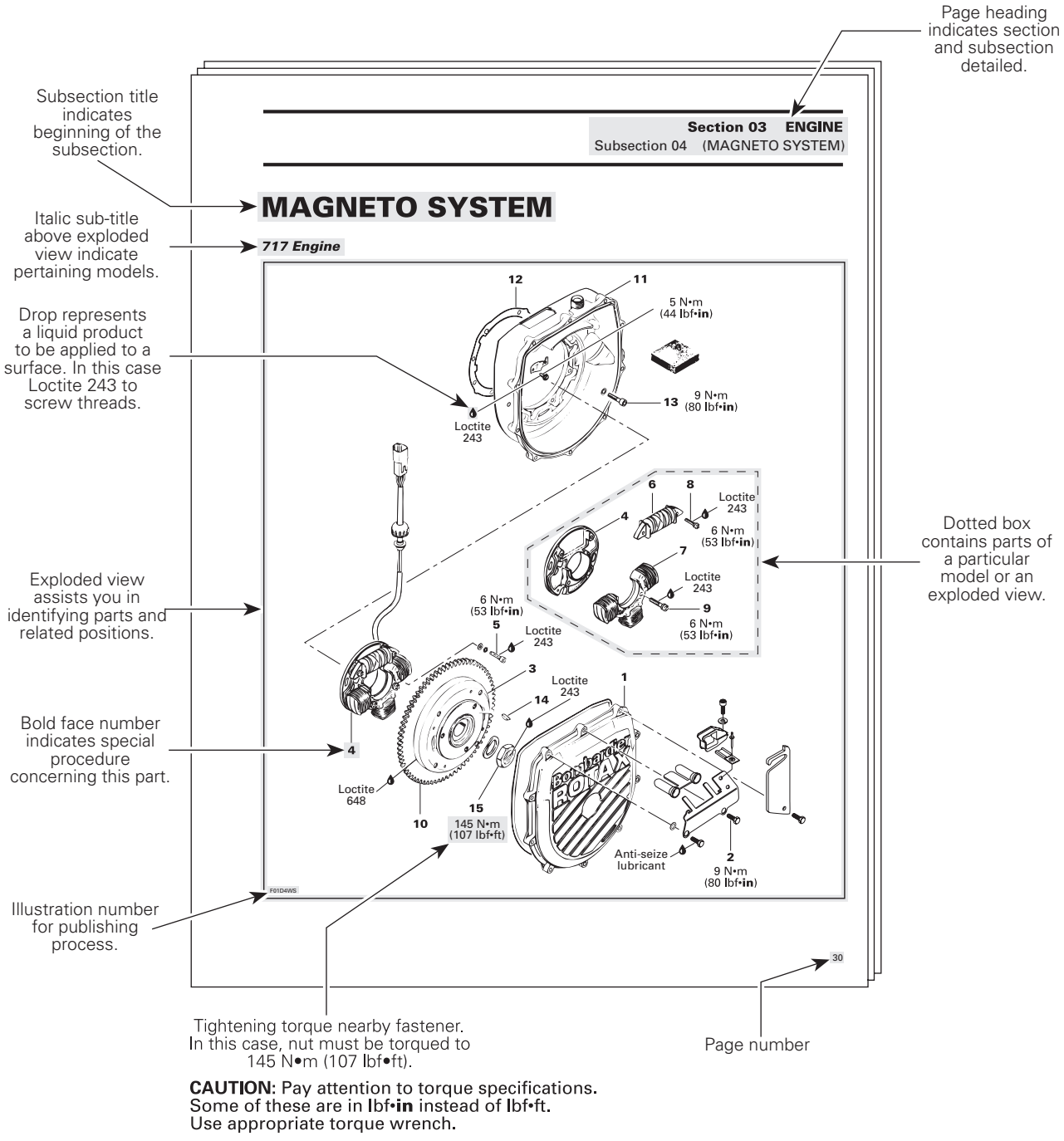
ARRANGEMENT OF THIS MANUAL

The manual is divided into many major sections as you can see in the main table of contents at the beginning of the manual.

Several sections are divided in various subsections. There is a table of contents at the beginning of many sections.

INTRODUCTION

TYPICAL PAGE



Subsection title indicates beginning of the subsection.

Italic sub-title above exploded view indicate pertaining models.

Drop represents a liquid product to be applied to a surface. In this case Loctite 243 to screw threads.

Exploded view assists you in identifying parts and related positions.

Bold face number indicates special procedure concerning this part.

Illustration number for publishing process.

Page heading indicates section and subsection detailed.

Dotted box contains parts of a particular model or an exploded view.

TYPICAL PAGE

Sub-title with part name(s) from exploded view.

Section 06 FUEL SYSTEM
Subsection 03 (CARBURETORS)

Title indicates main procedure to be carried-out.

CARBURETOR REMOVAL

To remove carburetors from engine, proceed as follows:
Remove air vent tube support.
Unlock retaining slides holding air intake silencer base.
Remove air intake silencer base from watercraft.
Remove screws holding flame arrester base support to cylinder head cover.
Unscrew base retaining screws then remove base from carburetors and move to front of watercraft.
Turn the valve to OFF position.

Service tool to be used to perform a certain procedure.

NOTE: For fuel line removal, use pliers (P/N 295 000 054).

Title in italic indicates a particular procedure concerning a model.

Disconnect pulse line from fuel pump.
Disconnect fuel supply line from fuel pump.
Disconnect fuel return line.
Disconnect oil injection pump cable, throttle cable and choke cable.

XP Model Only

Remove screws no. 6 and lock washers no. 7 retaining carburetors.

All Others Models

Remove 4 bolts no. 8 and lock washers no. 12 from rotary valve cover then move carburetor and rotary valve cover on top of engine.

Sub-sub-title in this case indicates that particular procedure for XP is finished, so from this point, all others models are concerned.

NOTE: When removing rotary valve cover, pay attention that the rotary valve stay in place, otherwise it must be timed.

Remove carburetors from intake manifold.
Disconnect fuel bypass line between carburetors (twin carburetors).
Remove carburetor(s) from rotary valve cover.

DISASSEMBLY AND INSPECTION

Inspect parts for corrosion damage (shaft, butterfly, spring, etc., check valve housing, etc.).

Diaphragm

PUMP DIAPHRAGM LEAK TEST

Using a suitable pump gauge tester, perform the following test proceeding as follows:

- Install pump gauge tester (P/N 295 000 083) on pulse nipple.
- Pump tester until it reaches 28 kPa (4 PSI).

Sub-sub-title in capital indicates a particular testing, adjustment or repair procedure.

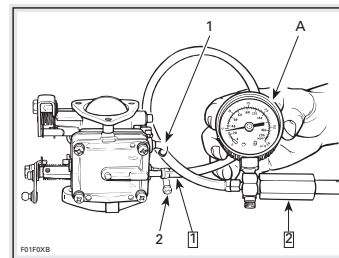


Illustration always follows text it is pertained to.

TYPICAL

- Step 1: Install pump gauge tester to pulse nipple
- Step 2: Pump tester until it reaches the desired pressure

- 1: Fuel outlet nipple
- 2: Fuel inlet nipple
- A: 28 kPa (4 PSI)

Diaphragm must stand pressure for 10 seconds. If pressure drops, replace diaphragm.

"TYPICAL" mention indicates a general view which does not represent full detail.

Numbered step are used to give a sequence to be performed.

Letters are used for any measures.

Bold numbers in the text refer to the parts shown in the exploded view at the beginning of the subsection.

Numbers are used for description of components.

INTRODUCTION

LIST OF ABBREVIATIONS USED IN THIS MANUAL

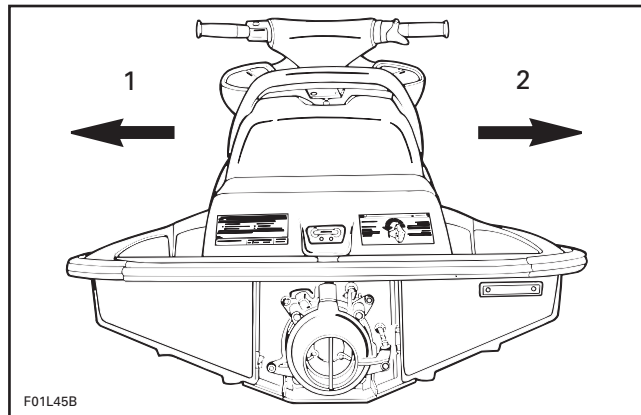
ABBREVIATION	DESCRIPTION
4-TEC NA	Naturally-Aspirated Engine
ADC	Analog to Digital Conversion
AC	Alternate Current
APS	Air Pressure Sensor
ATS	Air Temperature Sensor
B.U.D.S.	Bombardier Utility and Diagnostic Software
CDI	Capacitor Discharge Ignition
CPS	Crankshaft Position Sensor
CSI	Cooling System Indicator
DC	Direct Current
DESS	Digitally Encoded Security System
DI	Direct Injection
E.I.N.	Engine Identification Number
ECM	Engine Control Module
ECU	Electronic Control Unit
EPA	Environmental Protection Agency (USA)
HP	Horse Power
LED	Light Emitting Diode
IC	Intercooler
LED	Light Emitting Diode
MAG	Magneto
MPEM	Multi-Purpose Electronic Module
MPH	Mile Per Hour
MPI	Multi Protocol Interface
N.A.	Not Applicable
OPT	Optional
P/N	Part Number
PFD	Personal Flotation Device
PSI	Pound Per Square Inch
PTO	Power Take Off
RAVE	Rotax Adjustable Variable Exhaust
RFI	Rotax Fuel Injection
RPM	Revolution Per Minute
Sc	Supercharger
STD	Standard

ABBREVIATION	DESCRIPTION
TBD	To Be Determined
TDC	Top Dead Center
TPS	Throttle Position Sensor
VDC	Volt Direct Current
VCK	Vehicle Communication Kit
Vdc	Volt Direct Current
VTS	Variable Trim System
WTS	Water Temperature Sensor

GENERAL INFORMATION

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

Besides, in the marine industry, FRONT is called BOW and REAR is called STERN.



1. Left (port)
2. Right (starboard)

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

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

This *Shop Manual* uses technical terms which may be different from the ones of the *Parts Catalogs*.

When ordering parts always refer to the specific model *Parts Catalogs*.

ILLUSTRATIONS AND PROCEDURES

The illustrations 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: These watercraft are designed with parts dimensioned mostly in the metric system. However some components may be from the imperial system. When replacing fasteners, make sure to use only those recommended by Bombardier.

As many of the procedures in this manual are inter-related, 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 undertaking any procedure, be sure that you have on hand all the tools required, or approved equivalents.

ENGINE EMISSIONS INFORMATION

Manufacturer's Responsibility

Beginning with 1999 model year engines, PWC manufacturers of marine engines must determine the exhaust emission levels for each engine horsepower family and certify these engines with the United States of America Environmental Protection Agency (EPA). An emissions control information label, showing emission levels and engine specifications, must be placed on each vehicle at the time of manufacture.

Dealer Responsibility

When performing service on all 1999 and more recent Sea-Doo watercrafts that carry an emissions control information label, adjustments must be kept within published factory specifications.

Replacement or repair of any emission related component must be executed in a manner that maintains emission levels within the prescribed certification standards.

Dealers are not to modify the engine in any manner that would alter the horsepower or allow emission levels to exceed their predetermined factory specifications.

Exceptions include manufacturer's prescribed changes, such as altitude adjustments for example.

Owner Responsibility

The owner/operator is required to have engine maintenance performed to maintain emission levels within prescribed certification standards.

The owner/operator is not to, and should not allow anyone to modify the engine in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

EPA Emission Regulations

All new 1999 and more recent Sea-Doo watercrafts manufactured by Bombardier are certified to the EPA as conforming to the requirements of the regulations for the control of air pollution from new watercraft engines. This certification is contingent on certain adjustments being set to factory standards. For this reason, the factory procedure for servicing the product must be strictly followed and, whenever practicable, returned to the original intent of the design.

The responsibilities listed above are general and in no way a complete listing of the rules and regulations pertaining to the EPA requirements on exhaust emissions for marine products. For more detailed information on this subject, you may contact the following locations:

VIA U.S. POSTAL SERVICE:

Office of Mobile Sources

Engine Programs and Compliance Division

Engine Compliance Programs Group (6403J)

401 M St. NW Washington, DC 20460

VIA EXPRESS or COURIER MAIL:

Office of Mobile Sources

Engine Programs and Compliance Division

Engine Compliance Programs Group (6403J)

501 3rd St. NW Washington, DC 20001

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EPA INTERNET WEB SITE:
<http://www.epa.gov/omswww>

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.

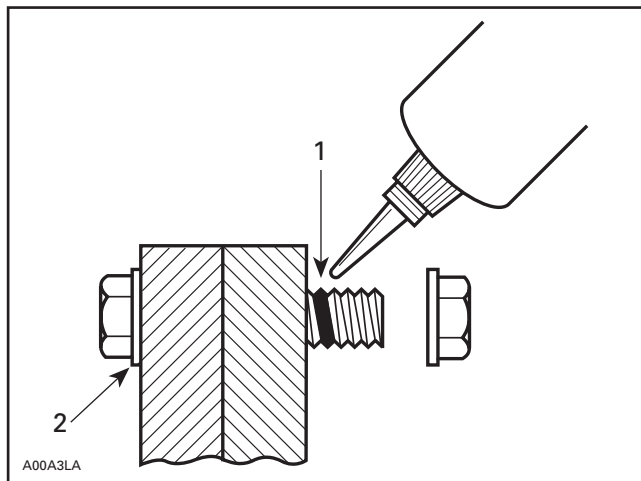
LOCTITE APPLICATION PROCEDURE

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)

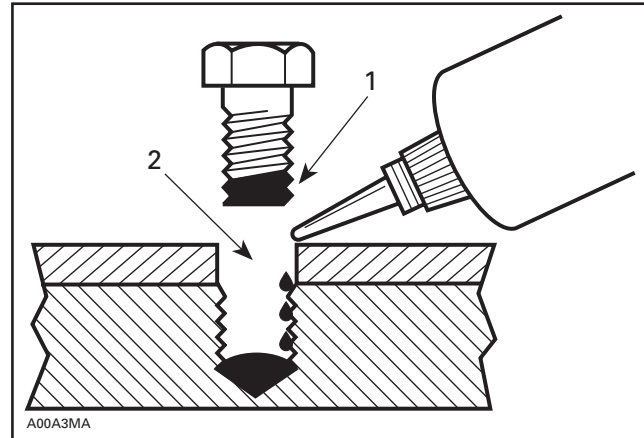


1. Apply here
2. Do not apply

- Clean threads (bolt and nut) with solvent.
- Apply Loctite Primer N (P/N 293 800 041) on threads and allow to dry.
- Choose proper strength Loctite threadlocker.
- Fit bolt in the hole.

- Apply a few drops of threadlocker at proposed tightened nut engagement area.
- Position nut and tighten as required.

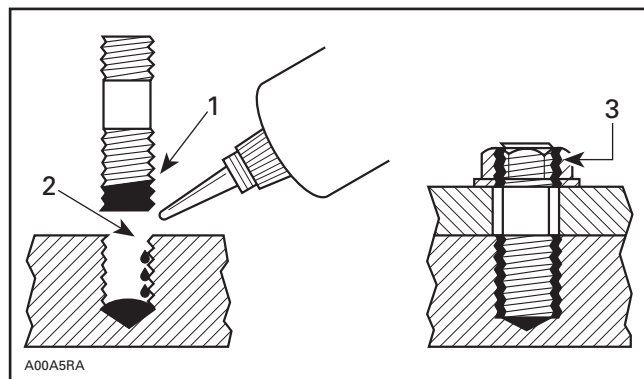
Blind Holes



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

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

Stud in Blind Holes

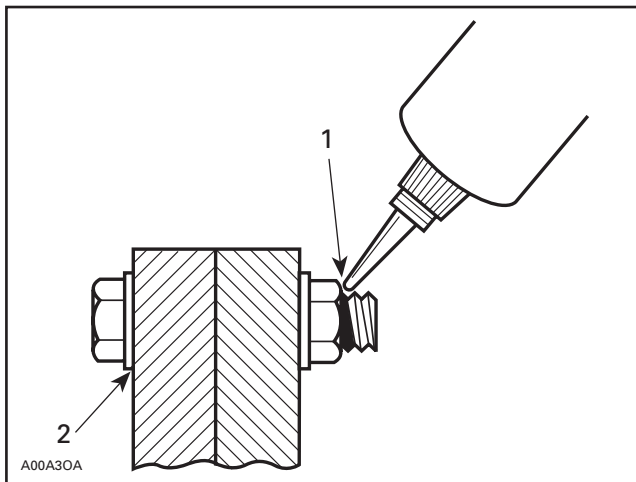


1. On threads
2. On threads and in the hole
3. Onto nut threads

- Clean threads (stud and hole) with solvent.

- Apply Loctite Primer N (P/N 293 800 041) on threads and allow to dry.
- Put several drops of proper strength Loctite threadlocker on female threads and in hole.
- Apply several drops of proper strength Loctite on stud threads.
- Install stud.
- Install cover, etc.
- Apply drops of proper strength Loctite on uncovered threads.
- Tighten nuts as required.

Preassembled Parts

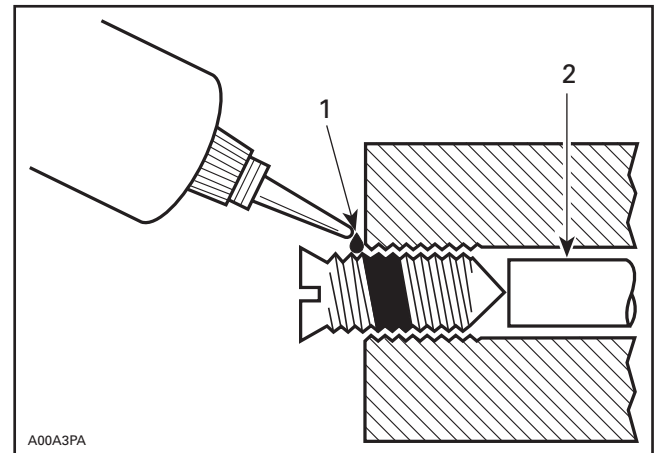


1. Apply here
2. Do not apply

- Clean bolts and nuts with solvent.
- Assemble components.
- Tighten nuts.
- Apply drops of proper strength Loctite on bolt/nut contact surfaces.
- 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



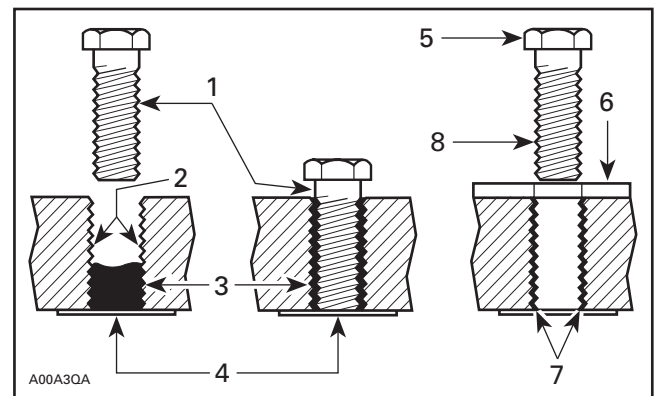
1. Apply here
2. Plunger

- Adjust screw to proper setting.
- Apply drops of proper strength Loctite threadlocker on screw/body contact surfaces.
- 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

- Follow instructions on Loctite FORM-A-THREAD 81668 package.

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- 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.
- 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.

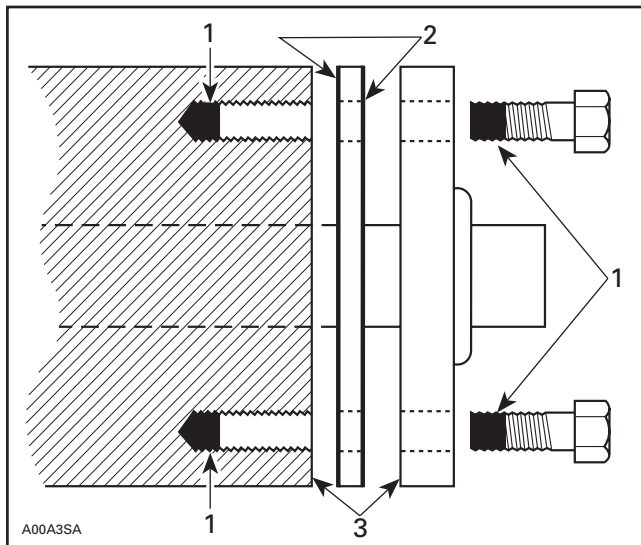
Option 2: Apply FORM-A-THREAD on the screw and insert in damaged hole.

Permanent Stud Installation (light duty)

- Use a stud or thread on desired length.
- DO NOT apply release agent on stud.
- Do a Standard Thread Repair.
- Allow to cure for 30 minutes.
- Assemble.

GASKET COMPOUND

All Parts



1. Proper strength Loctite
2. Loctite Primer N (P/N 293 800 041) and Gasket Eliminator 518 (P/N 293 800 038) on both sides of gasket
3. Loctite Primer N only

- Remove old gasket and other contaminants with Loctite Chisel remover (P/N 413 708 500). Use a mechanical mean if necessary.

NOTE: Avoid grinding.

- Clean both mating surfaces with solvent.

- Spray Loctite Primer N on both mating surfaces and on both sides of gasket. Allow to dry 1 or 2 minutes.
- Apply GASKET ELIMINATOR 518 (P/N 293 800 038) on both sides of gasket, using a clean applicator.
- Place gasket on mating surfaces and assemble immediately.

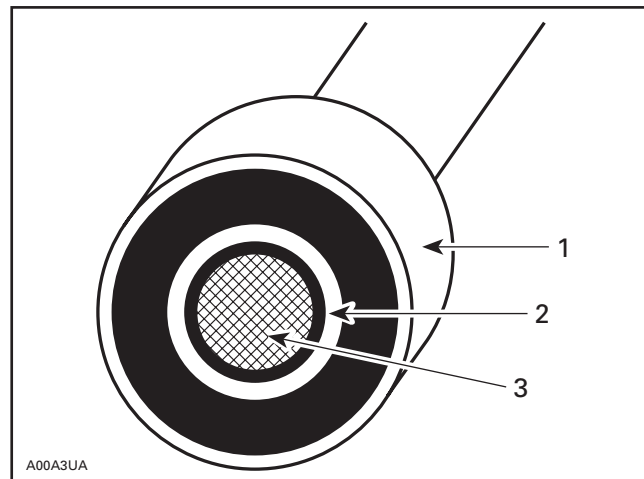
NOTE: If the cover is bolted to blind holes (above), apply proper strength Loctite in the hole and on threads. Tighten.

If holes are sunken, apply proper strength Loctite on bolt threads.

- Tighten as usual.

MOUNTING ON SHAFT

Mounting with a Press



1. Bearing
2. Proper strength Loctite
3. Shaft

Standard

- Clean shaft external part and element internal part.
- 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.

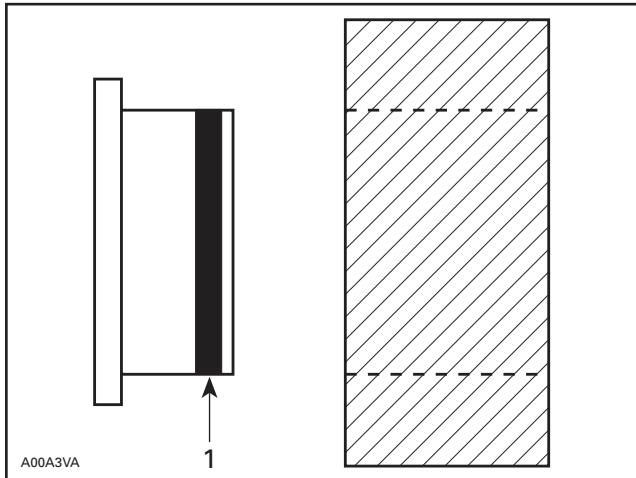
- DO NOT use anti-seize Loctite or any similar product.
- No curing period is required.

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*

- Clean inner housing diameter and outer gasket diameter.
- Spray housing and gasket with Loctite Primer N (P/N 293 800 041).
- 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.

- Install according to standard procedure.
- Wipe off surplus.
- 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.

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TIGHTENING TORQUES

Tighten fasteners to torque mentioned in exploded views and/or text, When they are not specified, refer to following table.

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.

In order to avoid a poor assembling, tighten screws, bolts or nuts in accordance with the following procedure:

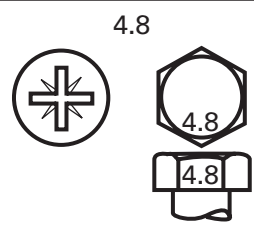

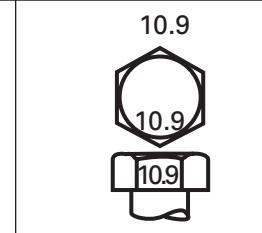
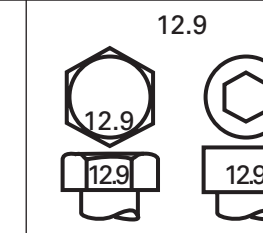
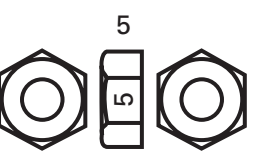
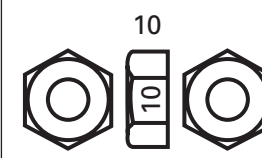
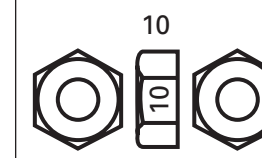
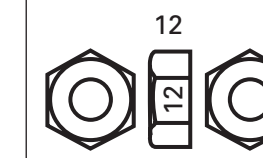
- Manually screw all screws, bolts and/or nuts.
- Apply the half of the recommended torque value.

CAUTION: Be sure to use the proper tightening torque for the proper strength grade.

NOTE: When possible, always apply torque on the nut.

- Torque to the recommended torque value.

NOTE: Always torque screws, bolts and/or nuts in a criss-cross sequence.

Property class and head markings				
Property class and nut markings				

A00A8BS

FASTENER SIZE	FASTENER GRADE/TORQUE			
	5.8 Grade	8.8 Grade	10.9 Grade	12.9 Grade
M4	1.5 — 2 N•m (13 — 18 lbf•in)	2.5 — 3 N•m (22 — 27 lbf•in)	3.5 — 4 N•m (31 — 35 lbf•in)	4 — 5 N•m (35 — 44 lbf•in)
M5	3 — 3.5 N•m (27 — 31 lbf•in)	4.5 — 5.5 N•m (40 — 47 lbf•in)	7 — 8.5 N•m (62 — 75 lbf•in)	8 — 10 N•m (71 — 89 lbf•in)
M6	6.5 — 8.5 N•m (58 — 75 lbf•in)	8 — 12 N•m (71 — 106 lbf•in)	10.5 — 15 N•m (93 — 133 lbf•in)	16 N•m (142 lbf•in)
M8	15 N•m (11 lbf•ft)	24.5 N•m (18 lbf•ft)	31.5 N•m (23 lbf•ft)	40 N•m (30 lbf•ft)
M10	29 N•m (21 lbf•ft)	48 N•m (35 lbf•ft)	61 N•m (45 lbf•ft)	72.5 N•m (53 lbf•ft)
M12	52 N•m (38 lbf•ft)	85 N•m (63 lbf•ft)	105 N•m (77 lbf•ft)	127.5 N•m (94 lbf•ft)
M14	85 N•m (63 lbf•ft)	135 N•m (100 lbf•ft)	170 N•m (125 lbf•ft)	200 N•m (148 lbf•ft)