



HIGH PRESSURE PISTON PUMP

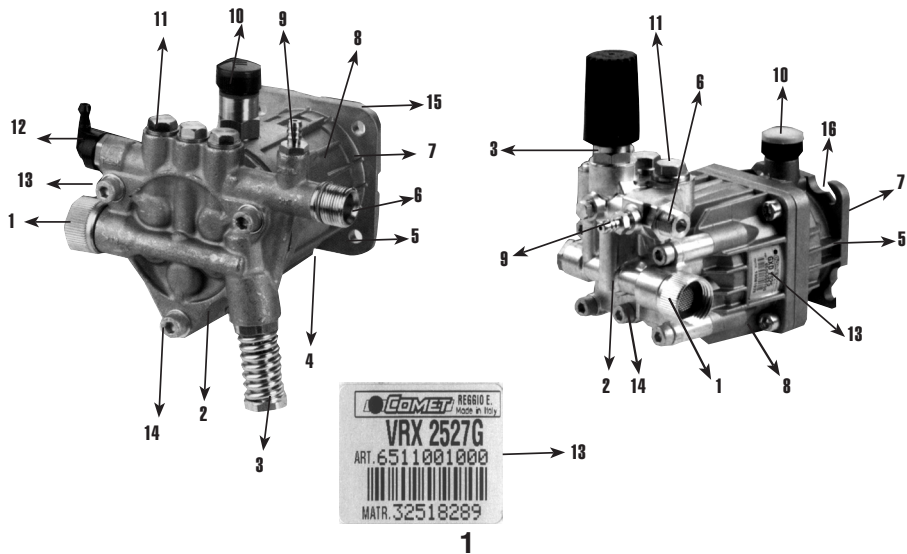


VRX - GXD

USE AND MAINTENANCE MANUAL



Always read your instruction manual thoroughly before operating



Manufacturer's Declaration

according to Directive: 98/37/CE

CometS.p.A.

Via G. Dorso, 4 - 42100 Reggio Emilia - Italia

Declares under its sole responsibility that the pump in the series:

VRX - GXD

with the serial number (to be filled in by purchaser according to the identification label):

which this declaration refers to, is conform to the requirements of Directive 98/37/CE

The following standards were consulted to verify its conformity:

- EN 809
- EN 60335-1
- EN 60335-2-79

In accordance to the precepts established in Attachment II, point B of the above-mentioned Directive, the pump must not be put into operation before the machine that incorporates the pump has been declared compliant to this Directive's requirements.

Reggio Emilia, 7/1/2003


Baldi Renzo
 (Presidente Comet S.p.A.)

1 GENERAL INFORMATION

Congratulations for choosing one of our products! Please do read and follow these instructions carefully.

The symbol:



is to indicate that there is the firm possibility of injury to persons if the relative instructions are not followed.

The symbol:

WARNING

is to indicate that there is the possibility of damaging the pump if the relative instructions are not followed.

The Manufacturer is not liable for damage caused by:

- failure to comply with these instructions and the instructions for the appliance that incorporates the pump;
- use of the pump not included in the list in the “**DESIGNATED USE**” section;
- failure to comply with current safety regulations and regulations for the prevention of accidents in the workplace;
- incorrect installation
- failure to carry out the required maintenance;
- modifications or actions without prior authorisation by the Manufacturer;
- use of non-original or unsuitable spare parts for this model of pump;
- repairs which were not carried out by a **Skilled Technician**, i.e. a person, who has received appropriate training and is authorised to carry out special maintenance and repairs both on the pump and on the appliance that incorporates the pump.

1.1 TERMS OF THE GUARANTEE

The guarantee is valid for a period of 24 months from the date on the sales document (receipt, invoice etc.)

The purchaser has sole right to the replacement of the parts that are deemed faulty by the Manufacturer, or by his authorised representative, as regards their material or manufacture. This does not imply any right to compensation for any type of direct or indirect damage.

Any costs for labour, packing and transportation are at the purchaser's expense.

Should the product be sent to the Manufacturer for repairs under this guarantee, on arrival it must be complete with all its original parts and not be tampered with. Any request under this guarantee will be refused if this is not the case.

All replaced parts become the property of the Manufacturer.

Any faults or failures which occur during or after the period of the guarantee do not imply the right to suspend payment or to any further extension.

This guarantee does not cover the replacement of pump and automatically becomes void should the agreed terms of payment not be abided by.

The following are not covered by the guarantee:

- direct or indirect damage, of any type, caused by falls, incorrect use of the pump and failure to observe regulations regarding safety, installation, operation and maintenance which are contained in these instructions and in the instructions for the machine that incorporates the pump;
- damages due to the inactivity of the pump for repairs;
- any parts which are subject to wear during normal use;
- any parts which are deemed faulty due to negligence or carelessness during use;
- damage caused by the use of non-original spare parts or any not expressly authorised by the Manufacturer, and by repairs not carried out by a **Skilled Technician**

The guarantee becomes void should the pump be tampered with, especially as regards its safety and maximum pressure limiting devices, and the Manufacturer will no longer be liable.

The Manufacturer reserves the right to make any modification at any time which it deems necessary to improve the product and is not liable to make these modifications to previously manufactured products, be they delivered or under delivery.

The conditions in this section exclude any previous explicit or implicit conditions.

1.2 USE AND CONSERVATION OF THESE OPERATING AND MAINTENANCE INSTRUCTIONS

The operating and maintenance instructions are an integral part of the pump and they must be kept in a safe place for future reference so that they may be readily consulted in case of need.

In case of deterioration or loss, a new copy should be requested from the dealer or from an authorised service centre. If the pump is passed on to a third party, please make sure these operating and maintenance instructions are also given to the new owner. The Manufacturer reserves the right to modify, update and correct these instructions without notice. It is illegal to copy these instructions, even partially, without prior authorisation by the Manufacturer in writing.

2. FEATURES AND TECHNICAL SPECIFICATIONS

Features and technical specifications are approximate. The Manufacturer reserves the right to modify the appliance without notice.

	VRX V			VRX G		
	VRX 2017 V	VRX 2022 V	VRX 2522 V	VRX 2522 G	VRX 2524 G	VRX 2527 G
MECHANICAL CONNECTION						
Max absorbed power (kW-CV)	1,9 - 2,6	2,6 - 3,5	2,9 - 4,0	3,1 - 4,2	3,3 - 4,4	3,8 - 5,1
Axis	Vertical			Horizontal		
Max speed of rotation (RPM)	3200			3400		
PUMP OIL						
Type	AGIP ROTRA MULTI THT (1)					
Quantity in weight (kg - lb)	0,09 - 0,20					
Quantity in volume (L - US gall)	0,10 - 0,03					
HYDRAULIC SUPPLY						
Max temperature water (°C -°F)	60 - 140					
Min. temperature water (°C -°F)	5 - 41					
Max. water pressure (bar-psi)	8 - 116					
Max. priming depth (m - ft)	0 - 0					
Min. water flow (l/min - US gpm)	1,3 x maximum flow					
PERFORMANCE						
Max. flow (l/min - US gpm)	7,9 - 2,1	7,9 - 2,1	9,1 - 2,4	9,5 - 2,5	9,5 - 2,5	9,5 - 2,5
Max. pressure (bar-psi)	117 - 1700	152 - 2200	152 - 2200	152 - 2200	165 - 2400	186 - 2700
Sound pressure level	Below 70 dB(A)					
WEIGHT (kg -lb)	2,4 - 5,3	3,5 - 7,7	3,5 - 7,7	3,3 - 7,3	3,5 - 7,7	3,5 - 7,7

	GXD G					GXD E		
	222OG	302OG	2525G	2527G	3025G	2020E	2520E	3020E
MECHANICAL CONNECTION								
Max absorbed power (kW-CV)	2,5 - 3A	3,1 - 4,2	3,1 - 4,2	3,6 - 4,8	4,2 - 5,1	21 - 29	2,9 - 3,9	4,2 - 11
Axis	Horizontal							
Max speed of rotation (RPM)	3400							
PUMP OIL								
Type								
Quantity in weight (kg - lb)	0,124 - 0,27							
Quantity in volume (L - US gall)	0,14 - 0,04							
HYDRAULIC SUPPLY								
Max temperature water (°C -°F)								
Min. temperature water (°C -°F)								
Max. water pressure (bar-psi)								
Max. priming depth (m - ft)								
Min. water flow (l/min - US gpm)								
PERFORMANCE								
Max. flow (l/min - US gpm)	8,4 - 2,2	10,6 - 2,8	8,5 - 2,3	9 - 2,4	10,6 - 2,8	7,2 - 1,9	9,5 - 2,5	10,6 - 2,8
Max. pressure (bar-psi)	138 - 2000	138 - 2000	165 - 2500	185 - 2700	165 - 2500	138 - 2000	138 - 2000	138 - 2000
Sound pressure level								
WEIGHT (kg -lb)	4,7 - 10,4							

(1) Corresponding oils:

U.T.T.O (Universal Tractor Transmission Oil)	API GL-4	JOHN DEERE J20A
Massey - Ferguson M - 1135	FORD M2C-86 B	Esso TORQUE FLUID 62
Mobil MOBILFLUID 422	FORD M2C-134 B/C	Shell DONAX TD

2.1 IDENTIFICATION OF PARTS

Refer to figure 1.

1	Intake coupling	9	Detergent intake coupling
2	Pump head	10	Oil cap (2)
3	Pressure limiting/adjustment valve	11	Delivery valve cap
4	Oil drain cap (1)	12	Thermal cut-out valve
5	Motor flange support	13	Identification label
6	Delivery coupling	14	Pump head screws
7	Pump shaft	15	Screws for motor flange support
8	Pump crankcase	16	Crankcase screw

(1) Optional for versions with horizontal axis only

(2) Only for versions with horizontal axis only

2.2 SAFETY DEVICES

Pressure limiting/adjustment valve

This valve enables adjustment of the operating pressure, allowing the pumped fluid to return to the suction unit, thus preventing the creation of dangerous levels of pressure when delivery is stopped or should pressure be set that is above permitted levels.



CAUTION

- The pressure limiting/adjustment valve has been correctly set by the Manufacturer or by the Manufacturer of the machine that incorporates the pump. Never tamper with the pressure limiting/adjustment valve in order to avoid altering its calibration.

3. DESIGNATED USE



CAUTION

- *The pump is to be used exclusively for the pumping of:*
 - *water under high pressure in cleaning machines (high pressure cleaners);*
 - *water which is not for human consumption;*
- *The pump must not be used for pumping:*
 - *unfiltered water or water containing impurities;*
 - *detergents, paints and chemicals whether neat or diluted with water*
 - *seawater or water with a high concentration of salt;*
 - *all fuels and lubricants;*
 - *inflammable liquids or liquid gas;*
 - *liquids for human consumption;*
 - *liquids at a temperature in excess of 60°C/140°F or less than 5°C/41°F;*
- *The pump must not be used to wash people, animals, energized electrical appliances, delicate objects, the pump itself or the machine that it is part of.*

- *The pump is not suitable for use in certain situations such as in corrosive or explosive atmospheres.*
- *Contact the Manufacturer's service centre before use on board vehicles, ships or airplanes, as there may be additional instructions for use.*

Any other use is considered improper.

The Manufacturer is not liable for any damage caused by improper or incorrect use.

4. OPERATION

4.1 PRELIMINARY PROCEDURES



CAUTION

- ***The pump must not be put into operation if the machine in which it is incorporated does not comply with the safety requirements defined by European Directives. This compliance is guaranteed if the CE mark is present together with the Manufacturer's Declaration of Conformity for the machine that incorporates the pump.***
- *Before starting to use the pump, read the instructions contained both in this manual and in the manual for the machine that incorporates the pump carefully. It is important to be sure that you have fully understood how both the pump and the machine that incorporates the pump work concerning the interception of the liquids.*
- *Complete the preliminary procedures recommended by the Manufacturer of the machine that incorporates the pump.*
- *Make sure all the delivery outlets are closed or connected to closed applications (for example: a cleaner gun);*
- *Make sure that the pump's moving parts are adequately protected and that they are not accessible to unauthorised personnel.*
- *Do not use the pump if:*
 - *it has been bumped*
 - *there are obvious leaks of oil.*
 - *there are obvious leaks of water.*

*In these circumstances, the pump should be tested by a **Skilled Technician**.*

- *Make sure the special maintenance checks are carried out by a **Skilled Technician**.*
- *If the identification label deteriorates during use, contact your dealer or an authorised service centre so it can be replaced.*

WARNING

- *If the pump is being used at very low temperatures, make sure no ice has formed inside it.*
- *Complete the controls required for routine maintenance.*
- *Follow the instructions in the operating and maintenance manual for the machine that incorporates the pump in order to check the intake filter is clean.*

4.1.1 HYDRAULIC CONNECTIONS



CAUTION

- *Follow current regulations for connection to the mains water supply in the country where the pump is installed*

Refer to the table in the technical specifications for the hydraulic connections.

WARNING

- *The pump must always be supplied by a pipe under pressure and the pressure of the water supply*

- must not be above 8 bar/116 psi.
- The pump must be provided with an adequately sized intake filter. In case of doubt, contact a **Skilled Technician**. Check that the filter is perfectly clean at all times.
- The internal diameter of the intake pipes must not be below the pump intake coupling. They must have a nominal pressure of 10 bar /145 psi.
- Do not operate the pump if it is not connected to a water supply.
- Do not supply the pump with salt water or water containing impurities. In this event, run the pump for a few minutes with clean water.

4.2 STANDARD OPERATION (HIGH PRESSURE)



CAUTION

- *The pump must be used with care and attention. It is your responsibility to make sure that any infrequent users have read these instructions and are acquainted with the operation of the pump. The pump must not be used by children or by unauthorised personnel.*
- *Comply with the safety warnings in the operating and maintenance instructions for the machine that incorporates the pump, especially as regards the use of personal protection (protective goggles, headphones etc.)*
- *Complete the start up procedures recommended by the Manufacturer of the machine that incorporates the pump.*
- *It is especially important to pay great attention when the pump is used in areas where there are moving vehicles as these can crush or damage delivery hoses, cleaner gun and lance.*
- *During operation, never leave the pump unattended and make sure it is out of children's reach. Pay particular attention when using it in kindergartens, nursing homes and old people's homes, as unsupervised children, elderly people and disabled people may be present in such places.*
- *Before operating the pump, put on clothing that guarantees adequate protection against the possibility of incorrect manoeuvres of the jet of pressurised liquid. Do not operate the pump near people, unless they are also wearing protective clothing.*
- *High-pressure jets of water can be dangerous if they are not used properly. Do not point the jet in the direction of people, animals, and energized electrical appliances or towards the machine that incorporates the pump.*
- *Hold the cleaner gun, if used, firmly during use: you will be subjected to the backlash of the high pressure when the lever is operated.*
- *Do not point the high-pressure jet towards oneself or other people in order to clean off clothing or footwear.*
- *Do not point the high-pressure jet towards materials, which contain asbestos or other harmful substances.*
- *Pay particular attention to the instructions in the "OPERATION WITH DETERGENTS" section.*
- *Do not use the machine that incorporates the pump in enclosed spaces if it is operated by an internal combustion engine.*
- *Do not get close to moving parts on the high-pressure cleaner, even if there are suitable devices for protection.*
- *Do not remove the protective devices from moving parts.*
- *Do not tamper with hoses containing pressurised liquids.*
- *Do not carry out maintenance on the pump when it is operating.*
- *Follow the instructions in the "DESIGNATED USE" section;*
- *Do not alter the conditions of the pump as supplied: it is especially important not to alter its fastening system and the hydraulic connections.*
- *Do not neutralise or tamper with the safety controls and devices, and the pressure limiting/*

adjustment valve.

- *Operating pressure must never exceed the maximum amount specified for the pump (also refer to the “FEATURES AND TECHNICAL SPECIFICATIONS” section).*

Before proceeding with the steps below, read the operating and maintenance instructions for the machine that incorporates the pump.

- a) Open the mains water supply tap.
- b) Set the delivery pressure to zero by keeping the delivery circuit open (for a high pressure cleaner, for example, by keeping the lever on the cleaner gun pressed) and wait for a continuous jet of water to exit.
- c) Start up the pump.

WARNING

- To allow the pump to prime quickly, follow the instructions at point (a) and (b) every time the pump is drained of liquid.

4.3 OPERATION WITH DETERGENTS



CAUTION

- *Only use the detergents recommended by the Manufacturer of the machine that incorporates the pump. Never suck up liquids containing solvents, petrol, diluents, acetone and fuel oil, as these products become highly inflammable, explosive and toxic when nebulized.*
- *Read the instructions and warnings on the label of the detergent to be distributed by the pump to ensure appropriate action is taken to prevent hazardous situations for the operator or the environment.*
- *Store detergents in a safe place out of children's reach.*
- *Should detergent come into contact with your eyes, wash immediately with water. Contact a doctor without delay and remember to take the container of detergent with you.*
- *If detergent is swallowed, do not provoke vomiting. Contact a doctor without delay and remember to take the container of detergent with you.*

For information on how to use the detergent, refer to the instructions on the label on the container of detergent particularly as regards the amount to use.

Before proceeding with the steps below, read the operating and maintenance instructions for the machine that incorporates the pump.

- a) Keep the pressure of the pump to below 30 bar/435 psi (with a high pressure cleaner, for example, this is achieved by operating at low pressure with a lance fitted with an appropriate nozzle holder head).

WARNING

- We recommend cleaning the pipes by taking up water for a couple of seconds after using detergents in order to prevent the formation of chemical deposits.

5. SWITCHING OFF



CAUTION

- *Follow the instructions for switching off recommended by the Manufacturer of the machine that incorporates the pump.*

There must not be any moving parts on the pump and no pressurised fluid in any of the hoses.

- a) Switch the pump off and close the water supply.
- b) Set the delivery pressure to zero as described at point (b) in the “STANDARD OPERATION (HIGH PRESSURE)” section.

6. CLEANING, STORAGE AND MAINTENANCE



CAUTION

- Only start cleaning and maintenance once the instructions in the '**SWITCHING OFF**' section have been completed, i.e. **when there are no moving parts, there is no pressurised liquid in the hoses and after the machine that incorporates the pump has cooled down completely. It is particularly important to always disconnect the spark plug.**
- Follow the instructions for cleaning, storage and maintenance recommended by the Manufacturer of the machine that incorporates the pump.

6.1 CLEANING AND STORAGE

Follow the instructions in the "SWITCHING OFF" section as well as the instructions in the operating and maintenance manual for the machine that incorporates the pump.

WARNING

- Always drain the pump of liquid after use as instructed in the operating and maintenance manual for the machine that incorporates the pump.
- **The pump is not frost proof.**

In order to prevent the formation of ice inside the pump in cold areas, it is possible to take up a motor-vehicle grade anti freeze before starting the "**SWITCHING OFF**" procedure. Consult a Skilled Technician first in order to check the liquid will not damage its gaskets, and then drain it completely. If it is not possible to protect the pump in cold areas as described above, it must be brought into a warm room for the time required to melt any ice which may have formed inside it before attempting to start it up again.

If these instructions are not followed, the pump may be seriously damaged.



CAUTION

- *dispose of anti-freeze liquid correctly; do not dump it in the environment.*

6.2 ROUTINE MAINTENANCE

Follow the instructions in the "SWITCHING OFF" section and in the table below.

INTERVAL FOR MAINTENANCE	ACTION
Every 50 hours	<ul style="list-style-type: none">• Check the water inlet circuit for leaks• Check the water inlet filter and clean if necessary• Check the pump is securely fastened to the motor that it is connected to and/or to the structure of the machine that incorporates it. <p>Should the pump appear not to be secure, do not use the machine and contact a Skilled Technician (1)</p>

(1) Check more frequently if the pump operates in circumstances with heavy vibrations.

WARNING

- During use, the pump should not be too noisy and no oil should drip from it: only slight drips of water should be tolerated.
A **Skilled Technician** should test the appliance if this is not the case.

6. 3. SPECIAL MAINTENANCE



CAUTION

- Only **Skilled Technicians** are authorised to carry out special maintenance.
 - Only use original spare parts supplied or endorsed by the Manufacturer in order to safeguard the safety of the pump.
 - Dispose of waste oil correctly; do not dump it in the environment
- Follow the instructions in the table below for special maintenance.

WARNING

- The data in the table is approximate. Maintenance may be required more frequently in case of particularly heavy use.

INTERVAL FOR MAINTENANCE	ACTION
Every 100 hours.	<ul style="list-style-type: none">• Check the intake and delivery valves• Check the pump screw are tight (1).• Check the maximum pressure limiting/adjustment valve

(1) Check more frequently if the pump operates in circumstances with heavy vibrations.

7. DISMANTLING AND DISPOSAL

Only trained personnel is allowed to dismantle the pump in accordance with the current regulations in the country where it is installed.

8. PROBLEMS, CAUSES AND SOLUTIONS



CAUTION

- Before taking any steps, follow the instructions in the “SWITCHING OFF” section. If it is not possible to restore correct operation of the pump using the information in the table below, contact a Skilled Technician.

PROBLEM	CAUSE	SOLUTION
The pump does not prime	Air intake Delivery outlet is closed (with a high-pressure cleaner, for example, the cleaner gun is closed)	Check for leaks in the suction circuit Cancel the outlet pressure (with a high-pressure cleaner, for example, by pressing the lever on the cleaner gun)
The pump does not reach maximum pressure.	The water supply is insufficient Unsuitable application (worn nozzle or too large nozzle, for example) The application is set for operation with suction of detergent (low pressure).	Check that the flow of the mains water supply conforms with instructions in the “Features and Technical Specifications” section Change the application Change the application for high-pressure operation
Irregular pressure and flow (pulsating)	Air intake The water inlet filter is dirty. The water supply is insufficient Pump does not finish priming Worn application (clogged nozzle, for example)	Check for leaks in the suction circuit Clean the filter Check that the flow of the mains water supply conforms with instructions in the “Features and Technical Specifications” section Prime the pump as instructed in the “Standard Operation (High pressure)” section Change the application
The pump is noisy	Bottlenecks in suction circuit Temperature of water supply is too high	Check suction circuit Supply the pump with water below 60°C / 140°F.
Poor suction of detergent	The application is not set for operation with intake of detergent (low-pressure) The detergent used is too viscose	Change setting for this type of operation as instructed in the operating and maintenance manual of the machine that incorporates the pump Follow instructions on the detergent’s label regarding its use and dilution.

SECTION RESERVED FOR USE BY SKILLED TECHNICIANS



CAUTION

- *This part of the manual is only for use by **Skilled Technicians** and is not meant to be used by the end user of the pump.*

9. UNPACKING



CAUTION

- *Protective gloves and goggles must be worn when removing the appliance from the packing materials to prevent injury to the hands and eyes.*
- *The packing materials (plastic bags, staples etc.) must not be left in reach of children, as they are potentially dangerous.*
- *The packing materials must be disposed of according to current regulations in the country where the pump is installed.
In particular, plastic bags and packaging must never be abandoned, as they are harmful to the environment.*
- *After removing the pump from the packing materials, check that no parts are missing and check that the identification label is present and is legible.
In case of doubt, do not use the pump in any circumstances and contact the dealer.*
- *This operating manual must always accompany the pump and should be given to the end user.*

10. INSTALLATION



CAUTION

- *The Skilled Technician must follow the instructions for installation in this manual; in particular, the specifications of the internal combustion engine to be used in conjunction with the pump must comply with the performance and the construction features of the pump (power, rotation speed, flanging, etc.) as illustrated in the technical documentation provided by the Manufacturer.*
- *The machine that incorporates the pump must be constructed so that it guarantees compliance with safety regulations laid down by European Directives. This is guaranteed if the CE mark is present and by the Declaration of Conformity issued by the Manufacturer of the machine that incorporates the pump.*
- *The drain for the thermal trip valve (12) must be arranged so it cannot cause any hazardous situations.*
- *Horizontal axis pumps must be installed and operate in a horizontal position. Vertical axis pumps in a vertical position*
- *The pump must be secured so that it is stable.*

10.1 APPLICATIONS



CAUTION

- *Protect moving parts with appropriate protection devices*
- *The pump must not operate at a speed of rotation above that illustrated on its label (also refer to the "FEATURES AND TECHNICAL SPECIFICATIONS" section).*
- *The pump must be securely fastened to the engine flange.*

Always contact the dealer or the Manufacturer to identify the correct application.

The applications for the pump must always be executed according to the general rules of mechanics. The Manufacturer's Service Centre is at the disposal of installers for any further information. The pump may rotate either clockwise or anticlockwise.

10.2 SETTING THE PRESSURE LIMITING/ADJUSTMENT VALVE



CAUTION

- Operating pressure must never exceed the maximum level envisaged for the pump (also refer to the **"FEATURES AND TECHNICAL SPECIFICATIONS"** section).

Turn the hexagonal nut on the valve (3) clockwise to increase pressure; anticlockwise to decrease pressure (refer to figure 1).

10.3 TORQUE WRENCH SETTINGS

The torque wrench settings to be used are illustrated in the following table (refer to fig. 1)

	DESCRIPTION	VRX Torque wrench Nm. lb. ft.	GXD Torque wrench Nm. lb. ft.
3	Hexagonal coupling pressure limiting adjustment valve	22 (16,2)	32 (23,6)
9	Detergent suction coupling	7 (5,2)	
11	Delivery valve cap (brass head)	25 (18,4)	45 (33,2)
12	Hexagonal coupling thermale valve	7 (5,2)	
14	Pump head screw	22 (16,2)	25 (18,4)
15	Screw for engine flange support	7 (5,2)	
16	Crankase screw		25 (18,4)