

ZA4T Air-Hydraulic Torque Wrench Pump

L2919 Rev. A 06/10

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Repair Parts Sheets for this product are available from the Enerpac web site at www.enerpac.com, or from your nearest Authorized Enerpac Service Center or Enerpac Sales office.

1.0 IMPORTANT RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

SAFETY FIRST

2.0 SAFETY ISSUES



Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation. Enerpac cannot be responsible for damage or injury resulting from unsafe product use, lack of maintenance or incorrect product and/or system operation. Contact Enerpac when in doubt as to the safety precautions and operations. If you have never been trained on high-pressure hydraulic safety, consult your distribution or service center for a free Enerpac Hydraulic safety course.

Failure to comply with the following cautions and warnings could cause equipment damage and personal injury.

A **CAUTION** is used to indicate correct operating or maintenance procedures and practices to prevent damage to, or destruction of equipment or other property.

A **WARNING** indicates a potential danger that requires correct procedures or practices to avoid personal injury.

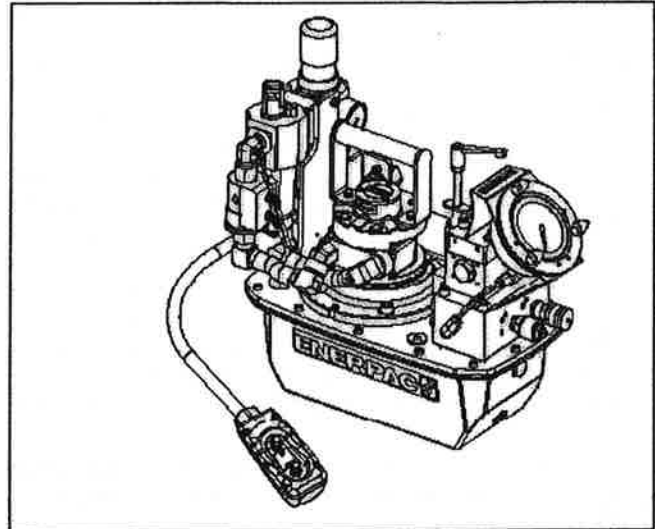
A **DANGER** is only used when your action or lack of action may cause serious injury or even death.



WARNING: Wear proper personal protective gear when operating hydraulic equipment.



WARNING: Stay clear of loads supported by hydraulics. A cylinder, when used as a load lifting device, should never be used as a load holding device. After the load has been raised or lowered, it must always be blocked mechanically.



WARNING: USE ONLY RIGID PIECES TO HOLD LOADS. Carefully select steel or wood blocks that are capable of supporting the load. Never use a hydraulic cylinder as a shim or spacer in any lifting or pressing application.



DANGER: To avoid personal injury keep hands and feet away from cylinder and workpiece during operation.



WARNING: Do not exceed equipment ratings. Never attempt to lift a load weighing more than the capacity of the cylinder. Overloading causes equipment failure and possible personal injury. The cylinders are designed for a max. pressure of 700 bar [10,000 psi]. Do not connect a jack or cylinder to a pump with a higher pressure rating.



Never set the relief valve to a higher pressure than the maximum rated pressure of the pump. Higher settings may result in equipment damage and/or personal injury.



WARNING: The system operating pressure must not exceed the pressure rating of the lowest rated component in the system. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system.



CAUTION: Avoid damaging hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose leading to premature hose failure.



Do not drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.



IMPORTANT: Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or other means of safe transport.



CAUTION: Keep hydraulic equipment away from flames and heat. Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C [150°F] or higher. Protect hoses and cylinders from weld spatter.



DANGER: Do not handle pressurized hoses. Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.



WARNING: Only use hydraulic cylinders in a coupled system. Never use a cylinder with unconnected couplers. If the cylinder becomes extremely overloaded, components can fail catastrophically causing severe personal injury.



WARNING: BE SURE SETUP IS STABLE BEFORE LIFTING LOAD. Cylinders should be placed on a flat surface that can support the load. Where applicable, use a cylinder base for added stability. Do not weld or otherwise modify the cylinder to attach a base or other support.



Avoid situations where loads are not directly centered on the cylinder plunger. Off-center loads produce considerable strain on cylinders and plungers. In addition, the load may slip or fall, causing potentially dangerous results.



Distribute the load evenly across the entire saddle surface. Always use a saddle to protect the plunger.



IMPORTANT: Hydraulic equipment must only be serviced by a qualified hydraulic technician. For repair service, contact the Authorized ENERPAC Service Center in your area. To protect your warranty, use only ENERPAC oil.



WARNING: Immediately replace worn or damaged parts with genuine ENERPAC parts. Standard grade parts will break causing personal injury and property damage. ENERPAC parts are designed to fit properly and withstand high loads.



WARNING: Start the pump with the valve in the neutral position to prevent accidental cylinder operation. Keep hands clear of moving parts and pressurized hoses.



WARNING: These pumps have internal factory adjusted relief valves, which must not be repaired or adjusted except by an Authorized Enerpac Service Center.



▼ ZA4T PERFORMANCE CHART

Motor Size (hp)	Output Flow Rate in ³ /min				Dynamic Air Pressure Range (psi)	Air Consumption (scfm)	Sound Level @ 100 psi dynamic (dBA)	Relief Valve Adjustment Range (psi)
	100 psi	700 psi	5,000 psi	10,000 psi				
4*	600	500	80	60	60-100	20-100	80-95	1,400-10,000 for "Q" version 1,400-11,600 for "E" version

*Actual power consumption depends on the application. See Figure 1.

3.0 SPECIFICATIONS

3.1 Performance Chart (see Performance Chart below)

3.2 Flow Chart

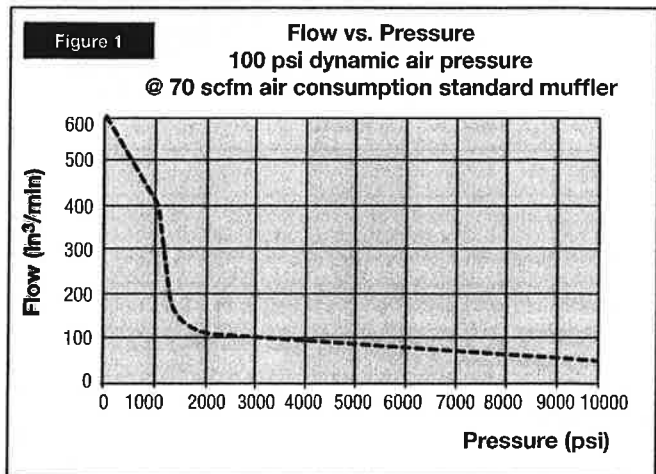


Figure 1

4.0 INSTALLATION

Install or position the pump to ensure that air flow around the motor and pump is unobstructed. Keep the motor clean to ensure maximum cooling during operation.

4.1 Breather Cap and Oil Fill Plug (See Figure 2)

A shipping plug (A) is installed in the breather port on the top of the reservoir. Before using the pump, replace the shipping plug (A) with the breather cap (B) and adapter fitting (C). **Note:** The oil fill port is located on the opposite side of the pump. The oil fill port uses an SAE #10 plug (D).

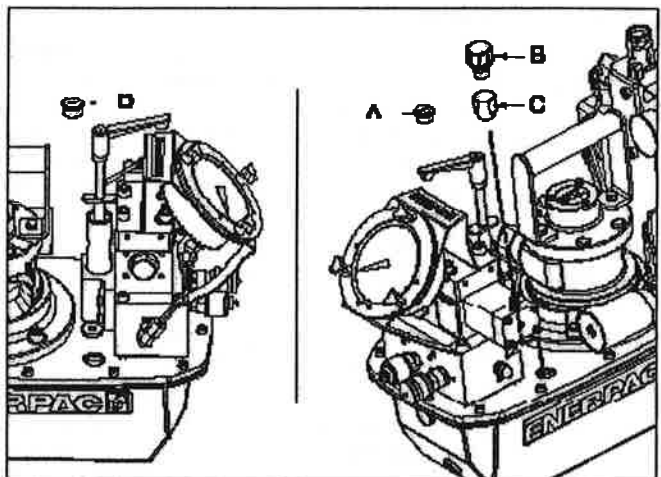


Figure 2, Oil Fill Plug and Breather Cap

4.2 Pump Mounting

Refer to Figure 3 for mounting dimensions to secure the pump to a fixed surface.

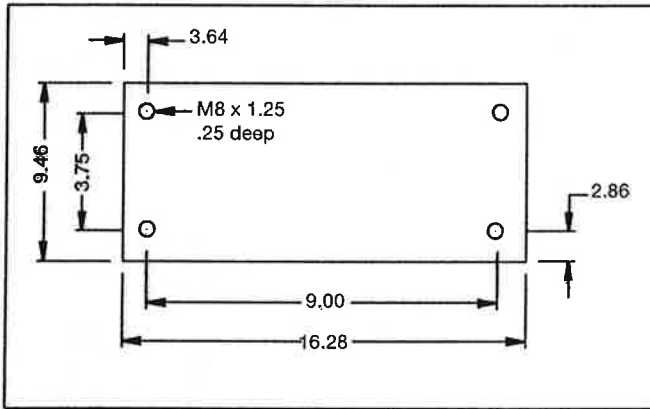


Figure 3

4.3 Air Supply Connections

Pump requires 60-100 psi dynamic air pressure at 20-100 cfm. Attach incoming air supply to the 1/2" NPT port on the regulator/filter/lubricator.

4.4 Fluid Level

Check the oil level of the pump prior to start-up, if necessary add oil by removing the SAE #10 plug from the cover plate (see Fig. 2). The reservoir is full when the oil level reaches the top of the sight glass. (Fig. 4).

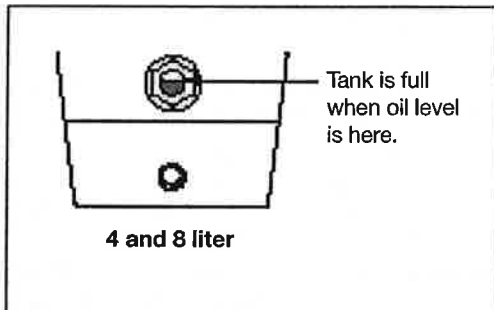


Figure 4

IMPORTANT: Add oil only when all system components are fully retracted, or the system will contain more oil than the reservoir can hold.

4.5 Connect Hydraulic Hoses

Connect hoses as shown in Figure 5.

1. (-E) Pump type for Enerpac SQD and HXD torque wrenches. Be sure to use hoses marked "ENERPAC THC-700 SERIES - 800 Bar/11,600 psi max." The couplers on these hoses are "polarized" at the factory to ensure correct wrench operation. (See figure 5.)
 - A. Hose and wrench female couplers. Hand tighten threaded coupler lock rings, no tools are required.
 - B. The (-E) pump's female couplers are self locking, press mating couplers together until coupler lock ring snaps forward. To disconnect, twist coupler lock ring clockwise and push away from connection.
2. (-Q) Pump type for Enerpac S and W torque wrenches and other brands. Use hoses marked "Enerpac THQ-700 series-700 bar/10,000 psi max.". Couplers must be polarized per figure 5 for correct wrench operation. Ensure couplers are fully engaged and tightened before operating. Partial coupler engagement will prevent proper wrench operation.

4.6 Filling Air Lubricator

Fill lubricator reservoir with a light misting type oil suitable for compressed air tools.



CAUTION: Maintaining the lubricator oil level is critical to the life of the pump.

4.7 Air Lubricator Adjustment

The adjustment knob (E) is factory-adjusted fully clockwise, so no oil is delivered to lubricate the system. To make initial adjustment, turn on the air and start flow to the system. Turn knob to adjust oil drip rate. Turning knob counter-clockwise increases drip rate. (see Fig. 6) Set the drip rate to one or two drops per minute initially and fine tune the rate after the system reaches its normal operating temperature.

To check lubrication, hold a mirror near the equipment exhaust. If a heavy film develops, reduce lubrication.

4.8 Air Pressure Regulator Adjustment

Pull knob straight up to unlock. The adjustment knob must be turned clockwise to increase and counter-clockwise to decrease outlet pressure setting. To reduce pressure, first reduce to a pressure less than that desired, then increase to the desired outlet pressure.

(See figure 6.)

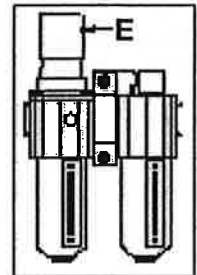


Figure 6

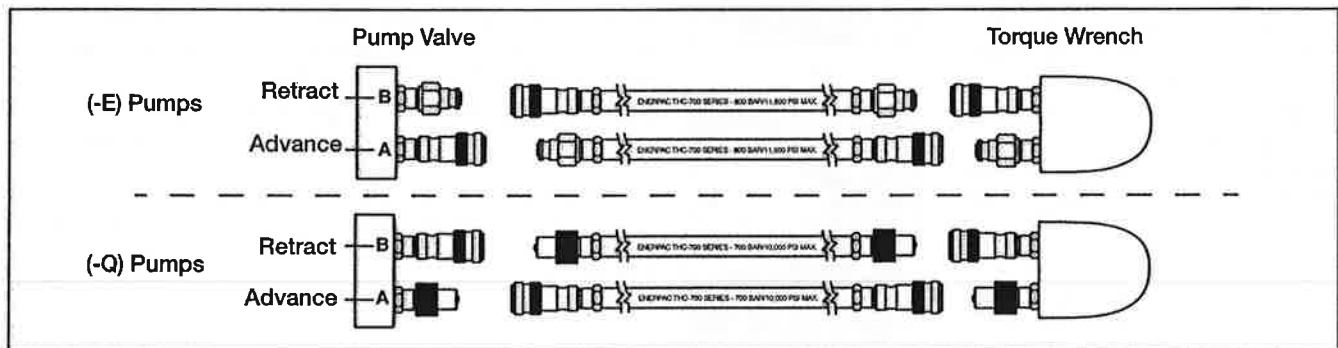


Figure 5

5.0 OPERATION

IMPORTANT: When possible, a single user should operate the torque wrench and pump. This can prevent accidental activation of the pump while the operator is positioning the wrench.

1. Check all system fittings and connections to be sure they are tight and leak free.
2. Check oil level in reservoir and add oil if necessary. (see section 4.4)
3. Make sure the shipping plug has been removed and the breather cap is installed. (see section 4.1)



WARNING: In the following step, the pump motor will start and the valve will shift automatically, retracting the torque wrench. Verify torque wrench is positioned to avoid injury or equipment damage before starting motor.

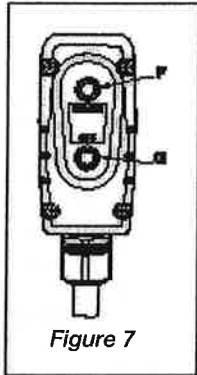


Figure 7

4. To start the pump, press the green "ON/ADV" button (F) on the pendant (handset). The wrench will advance as long as the green button is held down.
5. Release the green button to retract the wrench. The motor will remain "ON".
6. Press the red "OFF" button (G) on the pendant to stop the pump motor.
7. To release hydraulic pressure on the wrench and hoses, press and hold the red "OFF" button. Press and release the green "ON/ADV" button 3 or more times until the pressure gauge reads 0 pressure. The hoses can now be removed.



CAUTION: MAKE SURE THE MOTOR IS TURNED OFF AND IS NOT RUNNING BY PRESSING THE RED "OFF" BUTTON, BEFORE THE AIR SUPPLY SOURCE IS TURNED OFF OR DISCONNECTED.

5.1 Air Removal

When the wrench is first connected to the pump, air will be trapped in the components. To ensure smooth and safe operation, remove air by cycling wrench several times without load. Cycle until wrench advances and retracts without hesitation.

Check oil level before operation.

5.2 Gauge and Overlay Operation Procedure

The pump is supplied with a pressure gauge installed. For your convenience, torque overlays are provided with each pump. A torque overlay fits over the pressure gauge dial face and easily converts pressure readings to torque readings (see Fig. 8). The overlay has imperial units (Ft-Lbs.) on one side and metric units (Nm) on the other. To change scales simply slip overlay over.



Figure 8



WARNING: Each overlay is sized for a specific Enerpac torque wrench ONLY. Do not use with other wrenches.

5.3 Changing the Overlay

1. Remove the three black wing knobs which hold the front gauge flange in place (see Fig. 9).

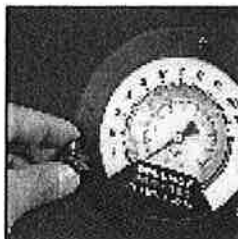


Figure 9

2. Remove the front flange and overlay (see Fig. 10.)
3. Insert new overlay (remember to verify correct overlay to the Enerpac torque wrench being used) onto the flange, aligning the overlay with the dimples on the back of the flange (see Fig. 11).
4. While holding the overlay behind the flange (see Fig. 10.) insert the flange onto the knob studs, repositioning the overlay as needed, and secure knobs finger tight (see Fig. 9).



Figure 10



Figure 11

The flange will press the overlay onto the gauge and secure it in place. See torque wrench instructions for amount of pressure required to produce desired torque. Note that the maximum pressure varies for different wrenches and accessories.



CAUTION: Refer to torque wrench instructions for wrench operating procedure.

5.4 Pressure (Torque) Setting



WARNING: Make these adjustments BEFORE putting torque wrench on nut or bolt head. The pump pressure setting may not be above the pressure needed to provide the required torque for your application. Exceeding required torque will cause equipment damage and may lead to serious personal injury.

To limit the advance pressure to the torque wrench, adjust the relief valve as described in the following procedure. See Figure 12.

1. Loosen the relief valve locking nut.
2. Rotate relief valve handle counter-clockwise as required, until there is little or no resistance when turning. When this occurs, the valve is at its lowest setting.

Note: Relief valve handle will rotate only about two thirds of a full turn. When rotation stops, pull up on handle to disengage. Then, reposition and re-engage handle to allow additional adjustment (as required).

3. Press and hold the pendant "ON/ADV" button. Motor will start and pressure will begin building in the A-Port advance circuit.
4. While continuing to hold down the "ON/ADV" button, SLOWLY rotate relief valve handle clockwise, until pressure increases to the desired setting.

Note: To obtain an accurate setting, always decrease the pressure to a point below the final setting and then slowly increase the pressure until the final setting is reached.

5. Release the "ON/ADV" button to allow the system pressure to return to the B-port retract setting. The motor will continue to run.
6. Press and hold the "ON/ADV" button again to recheck the advance circuit pressure setting. Verify that the desired pressure is indicated on the pressure gauge.
7. After the desired pressure setting has been obtained, tighten the relief valve locking nut.

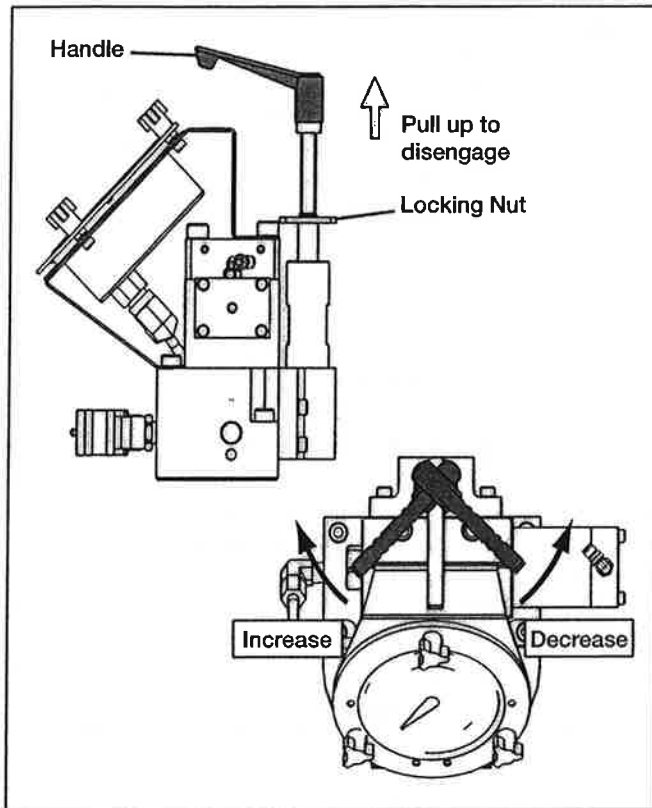


Figure 12, Relief Valve Adjustment

6.0 MAINTENANCE

Frequently inspect all system components for leaks or damage. Repair or replace damaged components.

6.1 Check Oil Level

Check the oil level of the pump prior to start-up, and add oil, if necessary, by removing the fill port cap. Always be sure hydraulic wrenches are fully retracted before adding fluid to the reservoir. See Figure 2.

6.2 Change Oil and Clean Reservoir

Enerpac HF oil is a crisp blue color. Frequently check oil condition for contamination by comparing pump oil to new Enerpac oil. As a general rule, completely drain and clean the reservoir every 250 hours, or more frequently if used in dirty environments.

NOTE: This procedure requires that you remove the pump from the reservoir. Work on a clean bench and dispose of used oil according to local codes.

1. Unscrew the 13 bolts holding the coverplate to the reservoir and lift the pump unit out of the reservoir. Be careful not to damage the filter screen.
2. Pour all oil out of the reservoir.
3. Thoroughly clean the reservoir and reservoir magnet with a suitable cleaning agent.
4. Remove the pick-up filter screen for cleaning. (Do not pull on the screen or the bottom of the intake to avoid possible damage.) Clean the screen with solvent and a soft brush. Reinstall.
5. Reassemble the pump and reservoir, installing a new reservoir gasket.
6. Fill the reservoir with clean Enerpac hydraulic oil. The reservoir is full when oil level is in middle of the sight gauge (see figure 4).

6.3 Cleaning the Muffler

When the pump is run for long periods of time, ice may form on the muffler element and must be removed. To clean the muffler, unscrew and remove any debris.

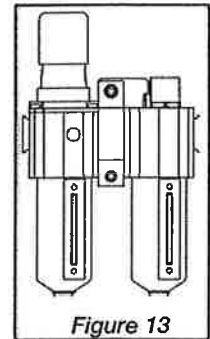
6.4 Cleaning the Air-Filter Lubricator

Inspect the air-filter lubricator frequently to detect for damage. Replace damaged bowls.

Keep the filter bowl clean to maintain filtering efficiency. The unit is equipped with an automatic drain, which opens around 3 psig and closes at approximately 5 psig. (See Figure 13.)

A visible coating of dirt or condensate on the filter element or an excessive air pressure drop indicates that cleaning is necessary. Depressurize the unit before removing bowl for cleaning.

CAUTION: Clean filter bowl with household soap only.



7.0 TROUBLESHOOTING (SEE TROUBLE-SHOOTING GUIDE)

Only qualified hydraulic technicians should service the pump or system components. A system failure may or may not be the result of a pump malfunction. To determine the cause of the problem, the complete system must be included in any diagnostic procedure. The following information is intended to be used only as an aid in determining if a problem exists. For repair service, contact your local Authorized Enerpac Service Center.

Trouble-shooting Guide		
Problem	Possible Cause	Action
Pump will not start	Air turned off or line blocked	See section 5.0 Operation for details
Motor stalls under load	Low air pressure Muffler plugged; contaminated air	See section 4.8 Reduce load or add cylinder capacity Check hydraulic couplers for full engagement
Pump fails to build pressure or less than full pressure	Low oil level Relief valve set too low External system leak Internal leak in pump Internal leak in valve Internal leak in system component	Add oil per section 4.4 Adjust per section 5.4 Inspect and repair or replace See authorized service center See authorized service center See authorized service center
Wrench will not retract	Valve malfunction Return flow line restricted or blocked	See authorized service center Check couplers for full engagement
Low oil flow rate	Inadequate air supply Dirty air filter Clogged inlet filter	See Section 4.3 See Section 6.4 See Section 6.4