



DEFENDER GUARD GENERATION 2 FIELD MANUAL

Revolutionary cable protectors engineered, designed and manufactured using the highest quality Canadian materials so you know you're getting the best.

DASCO ESP INC.
sales@dascoesp.com
780 538 4815

DASCO Quality Manual DEFENDER Cable Guards Well Site Installation of DEFENDER Guards

1.0 Purpose

1.1 This instructional manual will help organize and correctly complete the installation process for DEFENDER Cross Collar and Mid Joint Cable Guards used for protection of the Electric Submersible Pumping equipment power cables.

2.0 Responsibilities

2.1 The correct installation method is important to guarantee the proper protection and correct support function of ESP cables protected by DEFENDER Cable Guards. Normally installation or recovery of the DEFENDER Cable Guards is a two man operation when running or pulling the cable and tubing from the existing oil well.

3.0 Definitions

3.1 Liner: A casing installed inside an existing casing internal bore without a tie back to surface

3.2 Casing: steel threaded tubes used to line the well bore, provide pressure control and maintain well geometry

3.3 ESP: Electric Submersible Pump

3.4 Wellhead: Device maintaining pressure integrity at the surface of an oil or gas well

3.5 Work Over: The process of pulling and running ESP's or performing maintenance on an existing production oil well

3.6 Work Over Rig: A smaller light weight rig used to pull tubing and run some casing, but more mobile than a drilling rig

3.7 Rig Supervisor: Person in charge of normal work over rig operations

4.0 Equipment/Software

Description	Part Number	Supplier
Pneumatic Wrench with low speed 50- to 150 RPM	CP7829	Greggs Dist.
Air Supply Hose ¾" inch minimum with quick pneumatic connections	HOR-75-1 (2 sections required) crimp on fittings 3/8" NPT Male	Greggs Dist.
Pneumatic Filter, Regulator and Lubricator Set	Regulator - 600008, Filter – 600108P, Lubricator -600208P, , Automatic Drain Conversion Kit - 600301	Greggs Dist.
Pressure Gauge 0-200 PSI	Air Gauge – 66100 (2 each)	Greggs Dist.
Air tool and hose fittings	Female Couplings – 61-482(6), Male Fittings – 61485 (6)	Greggs Dist.
Torque Wrench 0-80 ft. lbs maximum	QD2FR75	Snap-On
Deep Impact Sockets 7/16 inch – Machined Tip to 0.660" or use a chrome deep socket.	7714H	Greggs Dist.
Dead blow hammer for installing or removing guards	605-9016	Greggs Dist.
Air tool oil	ATC-17	Greggs Dist.
Tool Box	00-2606	Greggs Dist.
20 retention nuts	B3752685	Dasco
20 guard fasteners	N3751000	Dasco
40 circlip retainers	98555A130	Dasco

5.0 Instructions

- 5.1 Inspect the tools and materials. Before each operation check that the air supply is regulated within the range of 70-100psi so that the pneumatic wrenches can function without a problem.
- 5.2 Oil the pneumatic air ratchet liberally before starting operations and after every 10 guards installed in addition to the lubricator oil in the air system.
- 5.3 Check to see that the cable guards have bolts and that the circlip is installed on the tip of the bolt. **NOTE: there should be two clips installed on each bolt.**



- 5.4 Place the guards on the rig floor for easy access during the installation process – a lifting basket is supplied with shipment.
- 5.5 Verify Cable Manufacture etching is correct and located on the cable compression pad.
IF NO SCRIBE IS PRESENT DO NOT USE THE GUARD.

COMPRESSION PAD MACHINE THICKNESS				
CABLE	AWG	THICKNESS	TOLLERANCE	SCRIBE
BHGE	#4	0.477	+/- 0.010	B
SLB	#4	0.460	+/- 0.010	S
BORETS	#4	0.465	+/- 0.010	BO



- 5.6** Place the first cross collar protector on cable (and capillary lines, if equipped) and press onto coupling. If required, tap the protector together using a mallet.
- 5.6.1** **Always ensure the capillary lines are installed into the correct channel. On the Gen 2 DEFENDER guard, the 1/2" cap line lands on the hinge side of the guard.**
- 5.7** Close the protector over the coupling and swing bolts into the clamping position. If debris is present on tubing or the guard you may lightly tap the guard body with a dead blow hammer provided with the installation tool kit.
- 5.8** Maximum torque on collar guards 3/8 UNC bolt is 30ft lbs.
- 5.9** Tighten both bolts using the supplied air ratchet moving from top to bottom on low RPM in (2) rotations. Do not go back and forth more than twice.
- 5.10** Using the torque wrench set at 30ft lbs tighten each bolt to the required torque. Never go back and forth more than once on each bolt to avoid inadvertently overtightening the bolts.

5.11 When using capillary tubes with defender cable guards, ensure the tubes are aligned before tightening the bolts. Double check the capillary lines are installed into the correct channels before tightening.

5.11.1 Note: Generation 2 guards have the 1/2" capillary line on the opposite side of generation 1. For this reason it is not recommended to combine the 2 model types.



GEN 2 - 1/4" Cap
Line is on the
Bolt Side"

GEN 2 - 1/2"
Cap Line is on
the Hinge Side



GEN 2 - ½"
Cap Line is on
the Hinge Side

NOTE – The DEFENDER guard will frame load at 30 Ft/lbs, preventing cable damage from over-torque. However, it is still possible to damage the bolt, so spec for torque should never exceed 30 Ft/lbs.

- 5.12** Avoid the use impact wrenches the speed and torque abilities will over torque the bolt and can cause product failure.
- 5.13** Visually inspect the DEFENDER Cable Protector to ensure it is evenly installed and the cable and/or capillary tubes are fully protected by the clamp assembly before running into the well bore.

Cable and cap lines will always be tight inside the guard. If the cable or cap lines moves from side to side at all there is something incorrect about the assembly.

NEVER RUN DEFENDER GUARDS IF THERE IS ANY MOVEMENT OF THE CABLE OR CAPILLARY LINES.

6.0 Identification:

6.1 Generation 2 Defender guards can be identified in the following ways.

6.1.1 Yellow colored stripe is a Generation 2 Defender Guards

6.1.2 Red colored stripe is a Generation 1 Defender Guard

**Generation 2
Defender Guard:
Yellow**

**Generation 1
Defender Guard:
Red**



6.2 Capillary Line Location

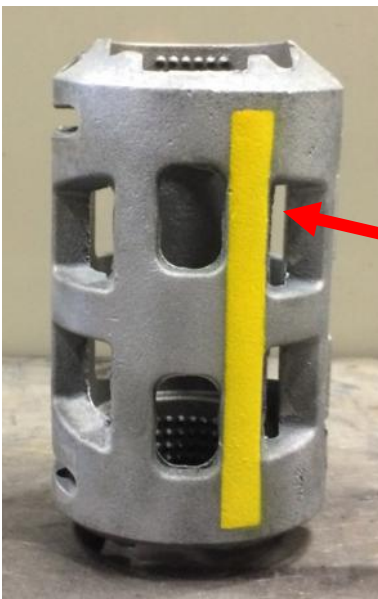
6.2.1 Capillary line locations can be identified 1 of 3 ways on the Gen 2 Defender Guard.

Method 1: The ½” capillary line is located on the hinge side of the guard.



GEN 2 - ½”
Cap Line is on
the Hinge Side

Method 2: Remanufactured generation 2 defender guards have a yellow stripe along the channel for the ½” capillary line.



GEN 2 - ½”
Cap Line =
Yellow Line

Method 3:

GEN 2 - ½" Cap Line is in the larger and higher channel on the hinge side of the guard.



7.0 Mid Joint Guards

7.1 If utilizing DEFENDER mid-joint guards, lower the tubing to the desired location of the guard.

Note: Mid Joint guards are only used as tubing centralizers they do not contact the cable or cap lines.



- 7.2** Install the DEFENDER mid-joint clamp onto the tubing in the identical manner as the cross coupling guard, ensuring that the cable and capillary tubes are in their correct location.
- 7.3** Tighten Mid joint protector to 45ft lbs. Mid joints do not have the benefit of a collar to prevent sliding the extra torque aids in the holding ability of the mid joint guards. A second torque wrench is recommended to avoid re-calibrating

NOTE – The DEFENDER mid-joint clamp should never be torqued above 45 Ft/lbs.



NOTE: All capillary lines share the open channel with the ESP cable when using a mid joint guard.

Revision	Party	Date
Revision 1	Dale Serafinchan	May 17 2018
Revision 2	Mike Tweedie	May 28 2018
Revision 3	Dale Serafinchan	May 28 2018